Diodes

Computer
General Purpose
Zener
Hot Carrier
Radiation Resistant
Specialty
Assemblies
Monolithic Diode Arrays

DIODES NUMERICAL INDEX

DIODES NUMERICAL INDEX

Additional Diodes

COMPUTER DIODE SELECTION GUIDE

Breakdown Voltage (Volts)	Forward Current (mA)									
	10-50		100	200-250		300-400		500		
75-100	FD100 FD111 1N914 1N3062 1N3063 1N3064 1N3065	1N4148 1N4151 1N4446 1N4447 1N4454 1N4531 1N4532	1N914B 1N4448 1N5317	FD600 FDH600 FDN600 1N3600 1N4150	1N4606 1N4610 1N5318 FD6666	1N4607		1N5282		
26-74	FD700 1N3067 1N4533 1N4536 1N4727		FDH666 FDN666 1N5319	1N4450		1N4950				
0-25	FD777 1N3596 1N4244 1N4376									

Breakdown Voltage (Volts)	Capacitance (pf)									
	0-1.0		1.1-1.9	2.0		2.5		3.5-4.0		
75-100	1N3062		1N3065	FD100 1N3063 1N3064 1N4151 1N4447	1N4454 1N4532 1N4610 FD6666	FD111 FD600 FDH600 FDN600 1N3600	1N4150 1N4606 1N5282 1N5317 1N5318	1N914 1N4148 1N4446 1N4448 1N4607		
26-74	FD700					1N5319		1N251 JAN FDH666 FDN666 1N4450 1N4531 1N4727 1N4950		
0-25	1N4244 1N4376		FD777							

Breakdown Voltage (Volts)	Switching Speed (nSec)									
	0-0.75		1.0-2.0	4.0				5.0		
75-100			1N3062 1N5282 1N5317	FD100 FD600 FDH600 FDN600 1N914 1N3063 1N3064 1N3065 1N3600 1N4148 1N4150	1N4151 1N4446 1N4447 1N4448 1N4454 1N4531 1N4532 1N4606 1N4607 1N4610 1N5318			FD111 1N3602 FD6666		
26-74	FD700		1N3605 1N4152 1N4533	FDH666 FDN666 1N4450 1N4950 1N5319				1N3603		
0-25	FD777 1N4244 1N4376 1N4376 JAN			1N252 1N3596						

COMPUTER DIODES NUMERICAL INDEX

GENERAL PURPOSE DIODES SELECTION GUIDE

Breakdown Voltage (Volts)	Forward Current (mA) 0-49	50-99	100-149	150-200
150-200	1N458 1N459	1N804	FD200 FD222 1N485B 1N3070 1N3071	FD300 FD333 1N3595
100-149	1N662		1N658 1N808	1N837 1N844
50- 99	1N457	1N795 1N891 1N3069	1N483A 1N483B	1N840
0- 49	1N456 1N925 1N926	1N791	1N482A 1N292	

Leakage Current (nA)	Forward Current (mA) 0-49	50-99	100-149	150-200
>75	1N662 1N813 1N815	1N791 1N804	FD200 1N3070 1N3071	1N837 1N838 1N839 1N4363
50- 74			FD222 1N658	
25- 49	1N456 1N458 1N459		1N485B	
0- 24	1N457 1N812			FD300 FD333 1N3595

GENERAL PURPOSE DIODES NUMERICAL INDEX

ZENER DIODES NUMERICAL INDEX

HOT CARRIER DIODES NUMERICAL INDEX

RADIATION RESISTANT DIODES NUMERICAL INDEX

SPECIALTY DIODES SELECTION GUIDE

Family	Description	Device Type	Family	Description	Device Type
Voltage Variable Capacitor	Low Voltage	FV1006	Reference Diodes	Low TC Series	FCT1035
Voltage Diodes Capacitor	Low Voltage	FV1008	Reference Diodes	Low TC Series	FCT1125
Voltage Diodes Capacitor	Low Voltage	FV1010	Reference Diodes	Low TC Series	FCT1122
Voltage Diodes Capacitor	Low Voltage	FV1012	Reference Diodes	Low TC Series	FCT1121
Voltage Diodes Capacitor	Low Voltage	FV1014	Reference Diodes	Low TC Series	FCT1135
Voltage Diodes Capacitor	Low Voltage	FV1016	Reference Diodes	Multi-Current Series	MCR2225
Voltage Diodes Capacitor	High Voltage	FV1106	Reference Diodes	Multi-Current Series	MCR2222
Voltage Diodes Capacitor	High Voltage	FV1108	Reference Diodes	Multi-Current Series	MCR2221
Voltage Diodes Capacitor	High Voltage	FV1110	Reference Diodes	Multi-Current Series	MCR2235
Voltage Diodes Capacitor	High Voltage	FV1112	Reference Diodes	Multi-Current Series	MCR2525
Voltage Diodes Capacitor	High Voltage	FV1114	Reference Diodes	Multi-Current Series	MCR2522
Voltage Diodes Capacitor	High Voltage	FV1116	Reference Diodes	Multi-Current Series	MCR2521
Pico Ampere Diodes	Ultra Low Leakage	FJT1000	Reference Diodes	Multi-Current Series	MCR2535
Pico Ampere Diodes	Ultra Low Leakage	FJT2000	Reference Diodes	Multi-Current Series	MCR2025
Reference Diodes	Low TC Series	FCT1025	Reference Diodes	Multi-Current Series	MCR2022
Reference Diodes	Low TC Series	FCT1022	Reference Diodes	Multi-Current Series	MCR2021
Reference Diodes	Low TC Series	FCT1021	Reference Diodes	Multi-Current Series	MCR2035

SPECIALTY DIODES NUMERICAL INDEX

DIODE ASSEMBLIES SELECTION GUIDE

Discrete Diode Assemblies

Description	Forward Voltage Match (mV)	Device Type
Encapsulated Pairs	3.0	FA2310E
Encapsulated Pairs	10.0	FA2311E
Encapsulated Pairs	5.0	FA2312E
Encapsulated Pairs	15.0	FA2313E
Encapsulated Pairs	3.0	FA2320E
Encapsulated Pairs	10.0	FA2321E
Encapsulated Pairs	5.0	FA2322E
Encapsulated Pairs	15.0	FA2323E
Encapsulated Pairs	10.0	FA2324E
Encapsulated Pairs	20.0	FA2325E
Encapsulated Pairs	10.0	FA2360E
Encapsulated Pairs	20.0	FA2361E
Unencapsulated Pairs	3.0	FA2310U
Unencapsulated Pairs	10.0	FA2311U
Unencapsulated Pairs	5.0	FA2312U
Unencapsulated Pairs	15.0	FA2313U
Unencapsulated Pairs	3.0	FA2320U
Unencapsulated Pairs	10.0	FA4321U
Unencapsulated Pairs	5.0	FA2322U
Unencapsulated Pairs	15.0	FA2323U
Unencapsulated Pairs	10.0	FA2324U
Unencapsulated Pairs	20.0	FA2325U
Unencapsulated Pairs	10.0	FA2360U
Unencapsulated Pairs	20.0	FA2361U
Encapsulated Quads	3.0	FA4310E
Encapsulated Quads	10.0	FA4311E
Encapsulated Quads	5.0	FA4312E
Encapsulated Quads	15.0	FA4313E
Encapsulated Quads	3.0	FA4320E
Encapsulated Quads	10.0	FA4321E
Encapsulated Quads	5.0	FA4322E
Encapsulated Quads	15.0	FA4323E
Encapsulated Quads	10.0	FA4324E
Encapsulated Quads	20.0	FA4325E
Encapsulated Quads	10.0	FA4360E
Encapsulated Quads	20.0	FA4361E
Unencapsulated Quads	3.0	FA4310U
Unencapsulated Quads	10.0	FA4311U
Unencapsulated Quads	5.0	FA4312U
Unencapsulated Quads	15.0	FA4313U
Unencapsulated Quads	3.0	FA4320U
Unencapsulated Quads	10.0	FA4321U
Unencapsulated Quads	5.0	FA4322U
Unencapsulated Quads	15.0	FA4323U
Unencapsulated Quads	10.0	FA4324U
Unencapsulated Quads	20.0	FA4325U
Unencapsulated Quads	10.0	FA4360U
Unencapsulated Quads	20.0	FA4361U
Bridges	3.0	FA3310
Bridges	10.0	FA3311
Bridges	5.0	FA3312
Bridges	15.0	FA3313
Bridges	3.0	FA3320
Bridges	10.0	FA3321
Bridges	5.0	FA3322
Bridges	15.0	FA3323
Bridges	10.0	FA3324
Bridges	20.0	FA3325
Bridges	10.0	FA3360
Bridges	20.0	FA3361

Chip Assemblies

Family	Description	Device Type
Common Anode	2 diode	FSA1177
Common Anode	2 diode	FSA1178
Common Anode	3 diode	FSA1179
Common Anode	3 diode	FSA1180
Common Anode	4 diode	FSA1182
Common Anode	5 diode	FSA1183
Common Cathode	2 diode	FSA1169
Common Cathode	2 diode	FSA1202
Common Cathode	3 diode	FSA1171
Common Cathode	3 diode	FSA1172
Common Cathode	4 diode	FSA1203
Common Cathode	4 diode	FSA1173
Common Cathode	5 diode	FSA1174
Common Cathode	6 diode	FSA1204
Common Cathode	7 diode	FSA1175
Common Cathode	8 diode	FSA1176
Matrix	2 diode	FSA1184
Matrix	2 diode	FSA1185
Matrix	4 diode	FSA1186
Matrix	4 diode	FSA1187
Matrix	6 diode	FSA1188
Matrix	8 diode	FSA1189
Bridges	Unmatched	FSA1197
Bridges	Unmatched	FSA1198
Bridges	VF Matched	FSA1191
Bridges	VF Matched	FSA1192
Bridges	VF Matched	FSA1195
Bridges	VF Matched	FSA1196
Bridges	VF & IR Matched	FSA1193
Bridges	VF & IR Matched	FSA1194
Transmission Gates	VF Matched	FSA1199
Transmission Gates	VF & IR Matched	FSA1201
Core Driver	8 diode	FSA1400
Common Anode	8 diode	FSA1410
Common Cathode	8 diode	FSA1411
Core Driver	16 diode	FSA1412
Core Driver	8 diode	FSA1413
Core Driver	16 diode	FSA2000
Core Driver	8 diode	FSA2001
Common Cathode	8 diode	FSA2002
Common Anode	8 diode	FSA2003

DIODE ASSEMBLIES NUMERICAL INDEX

MONOLITHIC DIODE ARRAYS SELECTION GUIDE

Family	Description	Device Type	Family	Description	Device Type
Core Driver	16 diode	FSA2500M	Core Driver	Dual 8 diode	FSA2503M
Core Driver	16 diode	FSA2501M	Core Driver	Dual 8 diode	FSA2504M
Core Driver	16 diode	FSA2502M			

MONOLITHIC DIODE ARRAYS NUMERICAL INDEX

FAIRCHILD DIODE ASSEMBLIES

GENERAL DESCRIPTION - Customers' requirements and inquiries constitute the basis for the types of assemblies offered as "off-the-shelf" items, and influence our efforts to obtain and publish technical information. For this reason, we encourage requests for assemblies not currently offered as standard items or requests for additional information.

The specifications contained on the succeeding pages are a condensed revision of the most popular circuit configurations used. Custom assemblies tailored to individual circuit requirements are available on request.

Normal delivery is two to four weeks for types listed in this brochure. For custom assemblies, an additional one to two weeks is required.

SECTION 1 - EPOXY ENCAPSULATED MATCHED DIODE ASSEMBLIES

BASIC DIODE SPECIFICATIONS

MAXIMUM RATINGS (25°C)

		FD1389	FD2389	FD3389	FD6389
V_R	Reverse Voltage	75 V	150 V	125 V	50 V
I_O	Average Rectified Current	75 mA	100 mA	150 mA	200 mA
I_F	Forward Current, DC	115 mA	150 mA	225 mA	300 mA
i_f	Recurrent Peak Forward Current	225 mA	300 mA	450 mA	600 mA
i_f(surge)	1 second pulse width	.5 A	1 A	1 A	1 A
i_f(surge)	1 microsecond pulse width	2 A	4 A	4 A	4 A
P	Power Dissipation	250 mW	500 mW	500 mW	500 mW
T_A	Operating Temperature	— — — —	-65°C to +175°C	— — — —	
T_{stg}	Storage Temperature, Ambient	— — — —	-65°C to +200°C	— — — —	

ELECTRICAL SPECIFICATIONS (25°C unless noted)

BV(min)	Breakdown Voltage at 5 μA(V)	100	–	–	–
	at 100 μA(V)	–	200	150	75
I_R(max)	Reverse Leakage at V_R(nA)	100	100	1	100
	at V_R, 150°C(μA)	100	100	3	100
C(max)	Capacitance at OV(pf)	1.5	5	6	3
V_F(max)	Forward Voltage at 200 mA(V)	–	1.0	1.0	1.0
	at 100 mA(V)	–	.925	.930	.920
	at 50 mA(V)	–	.860	.880	.860
	at 20 mA(V)	1.0	.790	.840	.790
	at 10 mA(V)	.875	.740	.810	.750
	at 5 mA(V)	.800	.700	.770	.710
	at 2 mA(V)	.725	.620	.730	.670
	at 1 mA(V)	.670	.610	.710	.630
t_{rr}(max)	$I_F = I_R$ = 10 mA, Recover to 1 mA(nsec)	4	–	–	4
t_{rr}(max)	$I_F = I_R$ = 30 mA, Recover to 1 mA(nsec)	–	50	–	–
t_{rr}(max)	$I_F = I_R$ = 200 mA, Recover to 20 mA(nsec)	–	–	–	4

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

SECTION 1 - EPOXY ENCAPSULATED MATCHED DIODE ASSEMBLIES

(MATCHING SPECIFICATIONS APPLY OVER TEMPERATURE RANGE OF −55°C TO +100°C)

FORWARD VOLTAGE MATCHED ASSEMBLIES

Basic Diode Specification	Forward Current Matching Range	Maximum Voltage Difference (ΔV_F) Between Diodes	Assembly Type Number: Encapsulated Pair	Unencapsulated Pair	Encapsulated Quad	Unencapsulated Quad	Bridge
FD1389	10 μA to 1.0 mA	3.0 mV	FA2310E	FA2310U	FA4310E	FA4310U	FA3310
FD1389	10 μA to 1.0 mA	10 mV	FA2311E	FA2311U	FA4311E	FA4311U	FA3311
FD1389	1.0 mA to 10 mA	5 mV	FA2312E	FA2312U	FA4312E	FA4312U	FA3312
FD1389	1.0 mA to 10 mA	15 mV	FA2313E	FA2313U	FA4313E	FA4313U	FA3313
FD2389	10 μA to 1.0 mA	3.0 mV	FA2320E	FA2320U	FA4320E	FA4320U	FA3320
FD2389	10 μA to 1.0 mA	10 mV	FA2321E	FA4321U	FA4321E	FA4321U	FA3321
FD2389	1.0 mA to 10 mA	5 mV	FA2322E	FA2322U	FA4322E	FA4322U	FA3322
FD2389	1.0 mA to 10 mA	15 mV	FA2323E	FA2323U	FA4323E	FA4323U	FA3323
FD2389	10 mA to 100 mA (pulse only)	10 mV	FA2324E	FA2324U	FA4324E	FA4324U	FA3324
FD2389	10 mA to 100 mA (pulse only)	20 mV	FA2325E	FA2325U	FA4325E	FA4325U	FA3325
FD6389	10 mA to 100 mA (pulse only)	10 mV	FA2360E	FA2360U	FA4360E	FA4360U	FA3360
FD6389	10 mA to 100 mA (pulse only)	20 mV	FA2361E	FA2361U	FA4361E	FA4361U	FA3361

REVERSE CURRENT — FORWARD VOLTAGE MATCHED ASSEMBLIES

(BASIC DIODE SPECIFICATIONS: FD3389)

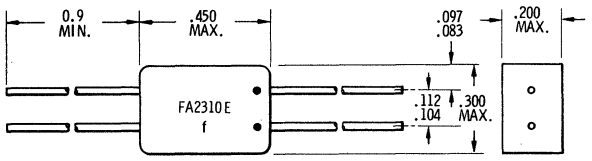
Maximum Reverse Current Difference (ΔI_R) Between Diodes	Forward Current Matching Range	Maximum Forward Voltage Difference (ΔV_F) Between Diodes	Encapsulated Pair	Unencapsulated Pair	Encapsulated Quad	Unencapsulated Quad	Bridge
2.0 nA + 0.064 · V_R	10 μA to 1.0 mA	10 mV	FA2330E	FA2330U	FA4330E	FA4330U	FA3330
2.0 nA + 0.064 · V_R	1.0 mA to 10 mA	15 mV	FA2331E	FA2331U	FA4331E	FA4331U	FA3331
2.0 nA + 0.064 · V_R	10 mA to 100 mA (pulse only)	20 mV	FA2332E	FA2332U	FA4332E	FA4332U	FA3332
4.0 nA + 0.128 · V_R	10 μA to 1.0 mA	10 mV	FA2333E	FA2333U	FA4333E	FA4333U	FA3333
4.0 nA + 0.128 · V_R	1.0 mA to 10 mA	15 mV	FA2334E	FA2334U	FA4334E	FA4334U	FA3334
4.0 nA + 0.128 · V_R	10 mA to 100 mA (pulse only)	20 mV	FA2335E	FA2335U	FA4335E	FA4335U	FA3335

NOTES:

1. The "Basic Diode Specification" column refers to the specifications listed in the table on the preceding page. These specifications are guaranteed for each individual diode of the assembly.
2. The "Maximum Reverse Current Difference (ΔI_R) Between Diodes" means that the difference in reverse current between the diode having the highest I_R and the diode having the lowest I_R in an assembly will not exceed the specified limit. "V_R" is the reverse voltage bias in volts at which the test is performed and may be any value between 0 and 125 V as the user desires. As an example, the specification limit for an FA2330E at a reverse bias of 10 V would be 2.0 nA + 0.064 · 10 = 2.6 nA. See Figure 6 for ΔI_R test circuit.
3. The "Forward Current Matching" ranges of 10 μA to 10 mA may be applied either as a DC current or pulse input current. For the 10 mA to 100 mA current range, the ΔV_F is guaranteed only for short duty cycle (1% or less) input current pulses. Conditions of test in both cases are defined by Figure 5.
4. All specifications are available in five basic configurations as listed under the "Assembly Type Number" column. Encapsulated pairs, quads, and bridges are supplied in the configurations illustrated in Figures 1, 2, and 3 respectively. Unencapsulated pairs and quads meet the dimensional requirements of Figure 4 and are taped securely together for shipment.
5. Capacitance (C) cannot be monitored independently on each diode in a bridge configuration. In measuring this parameter on bridge configurations, the capacitance limit is 4/3 the limit listed in the basic diode specifications table.
6. For matched bridges, the forward current range specified is "per leg." That is, twice the current specified is applied to the assembly.

SECTION 1 - EPOXY ENCAPSULATED MATCHED DIODE ASSEMBLIES

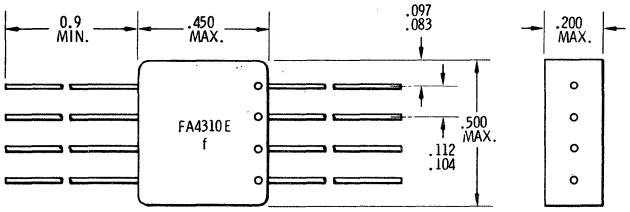
FIG. 1 ENCAPSULATED MATCHED PAIR PACKAGE DIMENSIONS.



NOTES:

1. Dots denote cathode ends of diodes.
2. All dimensions in inches.

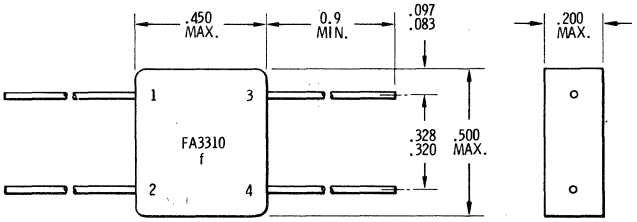
FIG. 2 ENCAPSULATED MATCHED QUAD PACKAGE DIMENSIONS.



NOTES:

1. Dots denote cathode ends of diodes.
2. All dimensions in inches.

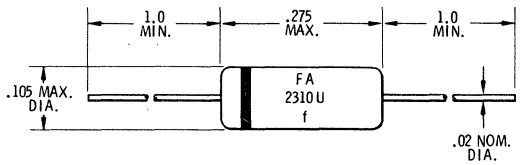
FIG. 3 BRIDGE PACKAGE DIMENSIONS.



NOTES:

1. Numbers 1 and 2 denote the common anode and common cathode terminals of the bridge, respectively. Terminals 3 and 4 denote the two cathode-anode terminals.
2. All dimensions in inches.

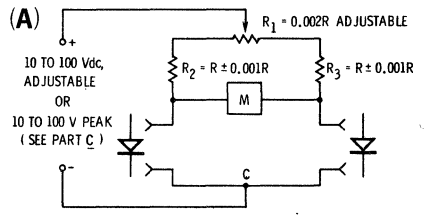
FIG. 4 INDIVIDUAL DIODE DIMENSIONS FOR UNENCAPSULATED MATCHED PAIRS AND QUADS.

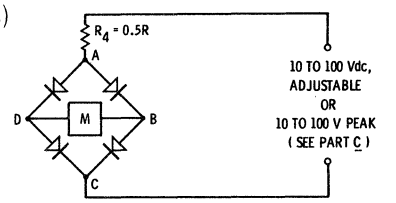


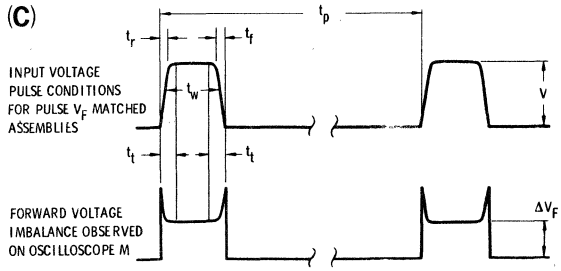
NOTES:

1. Band denotes cathode end of diode.
2. All dimensions in inches.

FIG. 5 ΔV_F DIODE MATCHING CIRCUITS.







t_r Pulse Rise Time (10 to 90% Amplitude)	= 1μsec Max.	t_p Period	= 1 msec
t_f Pulse Fall Time (90 to 10% Amplitude)	= 1μsec Max.	V Voltage Input to Circuit "A or B"	= 10 to 100 V, Adjustable
t_w Pulse Width (50% Amplitude)	= 10 ± 2 μsec	ΔV_f Forward Voltage Difference Between Diodes (Measured Between Transient Times)	= As Specified
t_t Transient Time	= 1μsec Min.		

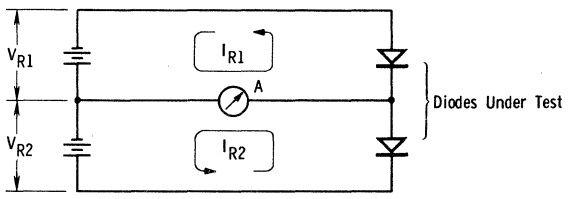
NOTES:

1. R varies depending on the current range. For the most often used current ranges, R is as follows:

Current Range (amperes)	R (ohms)
10^{-5} to 10^{-4}	10^6
10^{-4} to 10^{-3}	10^5
10^{-3} to 10^{-2}	10^4
or 10^{-n} to 10^{-n+1}	10^{n+1}

2. The input voltage pulse conditions illustrated in part C are employed at Fairchild in testing. The user may deviate from the specific conditions above with no variation in results providing the following general conditions are met:
   a. $\frac{tw}{tp} \leq 0.01$
   b. tw <10 milliseconds
   c. Transients occuring during pulse rise and fall times are ignored in observing ΔV_F.

FIG. 6 ΔI_R DIODE MATCHING CIRCUIT



NOTES:

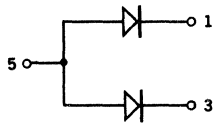
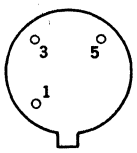
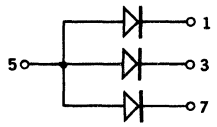
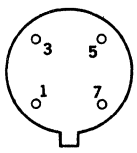
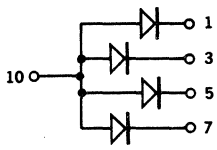
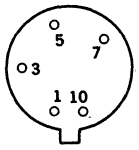
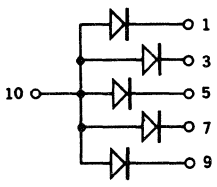
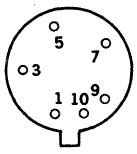
1. $V_{R2} = -V_{R1} \pm 1\%$.
2. $I_{R2} - I_{R1} = \Delta I_R$ (difference in I_R between two diodes under test).
3. A is a center reading μμ ammeter.

BASIC DIODE SPECIFICATIONS

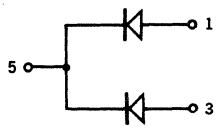
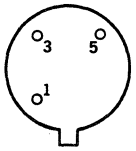
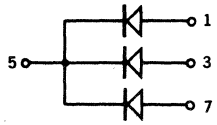
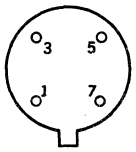
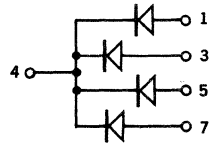
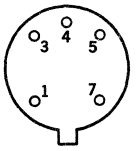
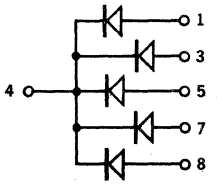
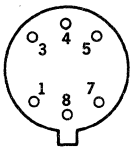
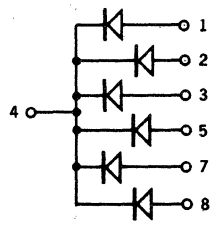
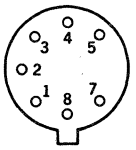
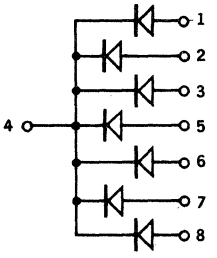
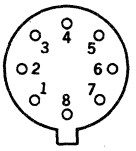
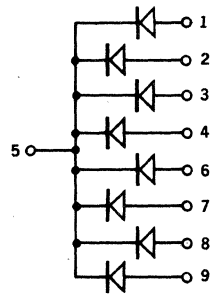
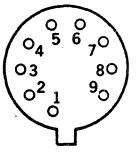
MAXIMUM RATINGS (25°C)		
V_R	Reverse Voltage	50 V
I_O	Average Rectified Current	200 mA
I_F	Forward Current, DC	300 mA
i_f	Recurrent Peak Forward Current	600 mA
i_f(surge)	1 second pulse width	1 A
i_f(surge)	1 microsecond pulse width	4 A
P	Power Dissipation	500 mW
T_A	Operating Temperature	-65°C to +175°C
T_{stg}	Storage Temperature, Ambient	-65°C to +200°C

ELECTRICAL SPECIFICATION (25°C unless noted)		
BV(min)	Breakdown Voltage @100 μA(V)	75
I_R(max)	Reverse Leakage @V_R(nA)	100
	@V_R, 150°C(μA)	100
C(max)	Capacitance @OV(pf)	3
V_F(max)	Forward Voltage @200 mA(V)	1.0
	@100 mA(V)	.920
	@ 50 mA(V)	.860
	@ 20 mA(V)	.790
	@ 10 mA(V)	.750
	@ 5 mA(V)	.710
	@ 2 mA(V)	.670
	@ 1 mA(V)	.630
t_{rr}(max)	$I_F = I_R$ = 10 mA, Recover to 1 mA (nsec)	4
t_{rr}(max)	$I_F = I_R$ = 200 mA, Recover to 20 mA (nsec)	4

COMMON ANODE ASSEMBLIES

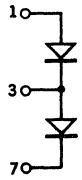
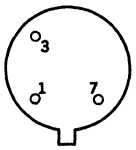
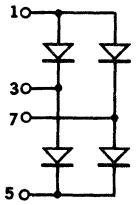
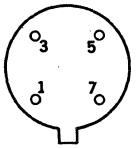
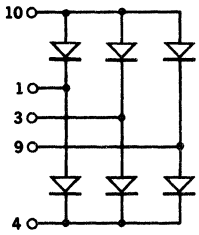
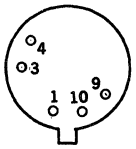
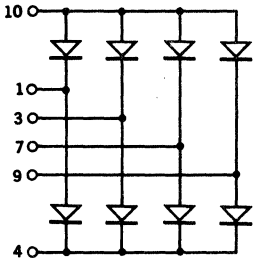
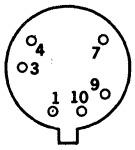
Type Number		Circuit Configuration	Package Configuration	
TO-5	TO-18		TO-5 for Dim. Det. see Fig. 7	TO-18 for Dim. Det. see Fig. 8
FSA 1177	FSA 1178			Same as TO-5
FSA 1179	FSA 1181			Same as TO-5
FSA 1182	----		 For dimensional details see Fig. 9	NONE
FSA 1183	----		 For dimensional details see Fig. 9	NONE

COMMON CATHODE ASSEMBLIES

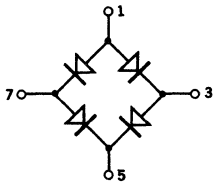
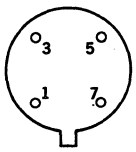
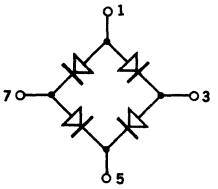
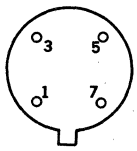
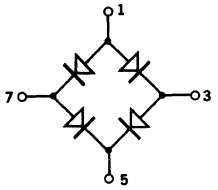
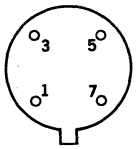
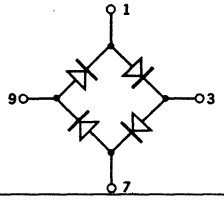
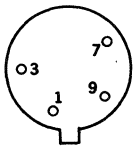
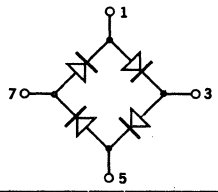
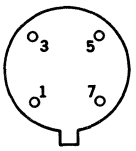
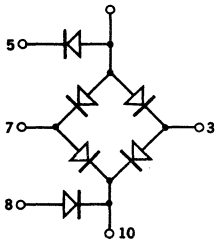
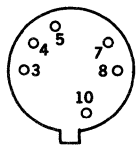
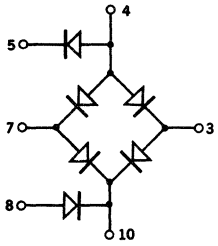
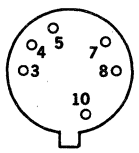
Type Number		Circuit Configuration	Package Configuration	
TO-5	TO-18		TO-5 for Dim. Det. see Fig. 7	TO-18 for Dim. Det. see Fig. 8
FSA 1169	FSA 1202			Same as TO-5
FSA 1171	FSA 1172			Same as TO-5
FSA 1203	FSA 1173			Same as TO-5
FSA 1174	----			NONE
FSA 1204	----			NONE
FSA 1175	----			NONE
FSA 1176	----		 For dimensional details see Fig. 9	NONE

NOTE: Transistor outline assemblies are available using other basic diode types (i.e., FD100, FD200, etc.) on request.

MATRIX ASSEMBLIES

Type Number		Circuit Configuration	Package Configuration	
TO-5	TO-18		TO-5 for Dim. Det. see Fig. 7	TO-18 for Dim. Det. see Fig. 8
FSA 1184	FSA 1185			Same as TO-5
FSA 1186	FSA 1187			Same as TO-5
FSA 1188	----		 For dimensional details see Fig. 9	NONE
FSA 1189	----		 For dimensional details see Fig. 9	NONE

BRIDGES AND TRANSMISSION GATES

Type Number		Circuit Configuration	Package Configuration		Matching Specifications* T_A = -55°C to 100°C (for Test Circuits, see Figs. 10 and 11)
TO-5	TO-18		TO-5 for Dim. Det. see Fig. 7	TO-18 for Dim. Det. see Fig. 8	
FSA 1197	FSA 1198			Same as TO-5	NONE
FSA 1191	FSA 1192			Same as TO-5	$\Delta V_F < 5.0$ mV I_F = 20 μA to 20 mA
FSA 1193	FSA 1194			Same as TO-5	$\Delta V_F < 5.0$ mV I_F = 20 μA to 20 mA $\Delta I_R < 1.0$ μA V_R = 25 V
FSA 1195	----		 **	NONE (see FSA 1196)	$\Delta V_F < 5.0$ mV I_F = 10 μA to 10 mA
----	FSA 1196		NONE (see FSA 1195)		$\Delta V_F < 5.0$ mV I_F = 10 μA to 10 mA
FSA 1199	----		 **	NONE	$\Delta V_F < 5.0$ mV I_F = 20 μA to 20 mA
FSA 1201	----		 **	NONE	$\Delta V_F < 5.0$ mV I_F = 20 μA to 20 mA $\Delta I_R < 1.0$ μA V_R = 25 V

* I_F specified is total bridge current and is applied between common-cathode and common-anode terminals except for FSA 1195 and FSA 1196. For these two types, I_F specified is "per diode."

** For Dimensional Details see Fig. 10.

FIGURE 7*

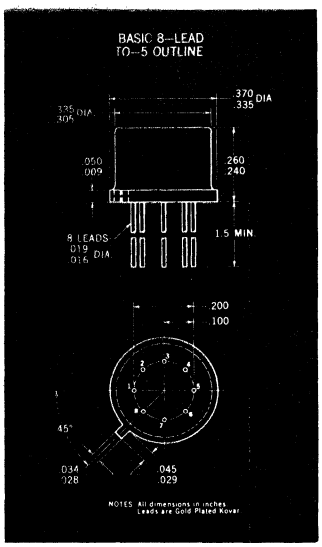


FIGURE 8*

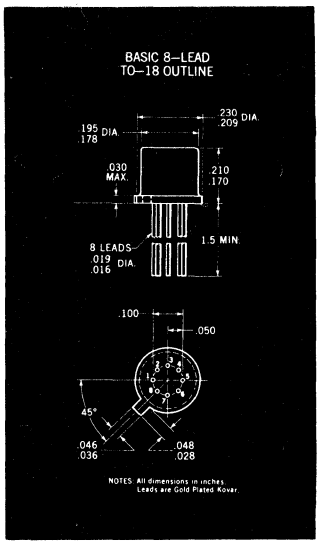
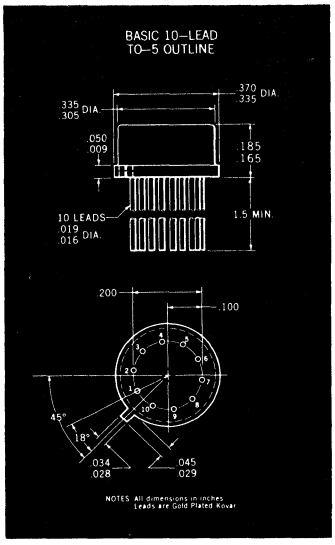


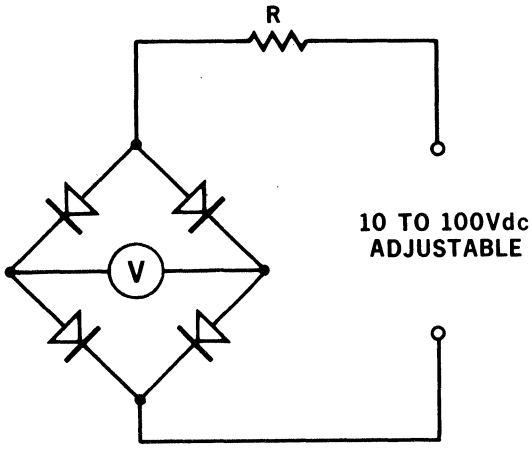
FIGURE 9*



*Figures 7, 8, and 9 provide package dimensions and lead position information for all assemblies. For ease in reference, all possible lead break-outs are illustrated. For a given type, only those leads specified in the "Package Configuration" column of the preceding tables actually appear on the assembly.

FIGURE 10

ΔV_F BRIDGE MATCHING CIRCUIT



NOTES:

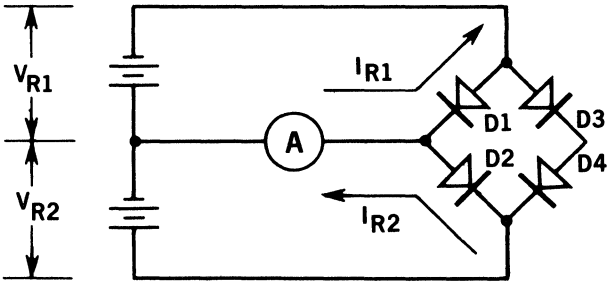
1. R Varies depending on the current range. For the most often used current ranges, R is as follows:

Current Range (amperes)	R (ohms)
10^{-5} to 10^{-4}	10^{6}
10^{-4} to 10^{-3}	10^{5}
10^{-3} to 10^{-2}	10^{4}
or 10^{-n} to 10^{-n+1}	10^{n+1}

2. V indicates mismatch of assembly.

FIGURE 11

ΔI_R BRIDGE MATCHING CIRCUIT



NOTES:

1. $V_{R2} = -V_{R1} \pm 1\%$.
2. $I_{R2} - I_{R1} = \Delta I_R$ (difference in I_R between diodes D1 & D2). To measure diodes D3 & D4, reverse cathode-anode terminal connections.
3. A is a center reading $\mu\mu$ ammeter. ΔI_R indicated directly on A.

FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

FCT Series

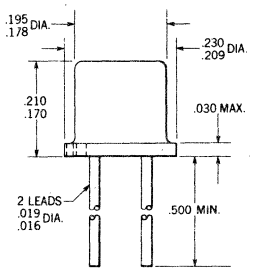
SILICON PLANAR* REFERENCE DIODES

GENERAL DESCRIPTION—These unique low power reference diodes offer the design engineer planar reliability and very high stability. These devices are ideally suited for space vehicles and extremely accurate test equipment which requires low temperature coefficient reference elements with low power dissipation.

FEATURES:

- **LOW Tc AT 0.1 mA AND SINGLE CHIP CONSTRUCTION**
- **REFERENCE VOLTAGE - - 6.7 NOMINAL**
- **VOLTAGE TOLERANCE - - ±5.0%** (Note 1)
- **REVERSE LEAKAGE 100 NANO-AMPS AT 5.0 V**
- **DYNAMIC IMPEDANCE - - 750 Ω MAXIMUM @ 100 μA**
- **MAXIMUM OPERATING JUNCTION TEMPERATURE - - 175°C**

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

TYPE	TEMPERATURE COEFFICIENT @ 100 μA (%/°C)	TEMPERATURE RANGE
FCT 1025	± .005	0 to +100°C
FCT 1022	± .002	
FCT 1021	± .001	
FCT 1035	± .0005	
FCT 1125	± .005	−55°C to +100°C
FCT 1122	± .002	
FCT 1121	± .001	
FCT 1135	± .0005	

*Planar is a patented Fairchild process.

NOTES:

(1) Voltage tolerances tighter than ±5% are available upon request.

(2) Temperature coefficient is determined by measuring VZ at the two temperature extremes and using the following formula:

$$TC = \frac{(V_{T1} - V_{T2})\,100}{V_{(T1\ -\ T2)}} \quad \text{where } V = \frac{V_{T1} + V_{T2}}{2}$$

(3) Devices are mounted in two-leaded TO-18 package and with a black dot opposite cathode lead on side of case.

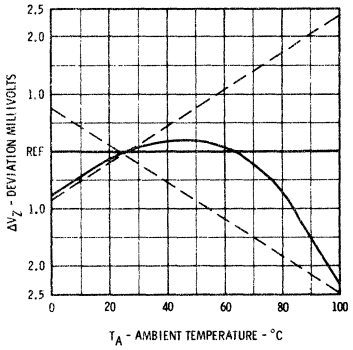
(4) All devices receive the following 100% processing: (a) HTOPL: 96 hrs, +125°C, 100 μA
(b) HTS: 48 hrs, +200°C

FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

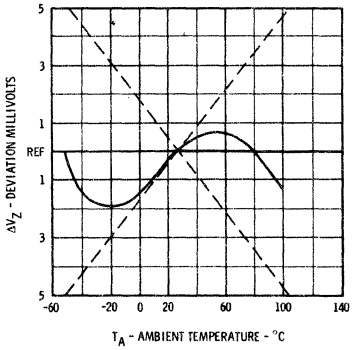
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

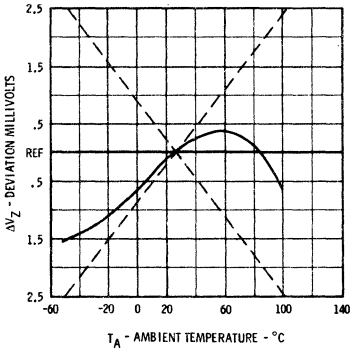
REFERENCE VOLTAGE DEVIATION VERSUS AMBIENT TEMPERATURE TYPICAL FCT-1035, $I_Z = 100\ \mu A$



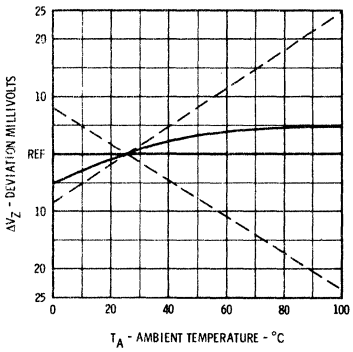
REFERENCE VOLTAGE DEVIATION VERSUS AMBIENT TEMPERATURE TYPICAL FCT-1121, $I_Z = 100\ \mu A$



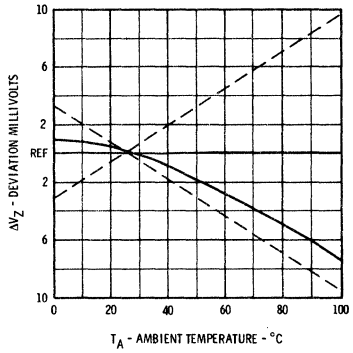
REFERENCE VOLTAGE DEVIATION VERSUS AMBIENT TEMPERATURE TYPICAL FCT-1135, $I_Z = 100\ \mu A$



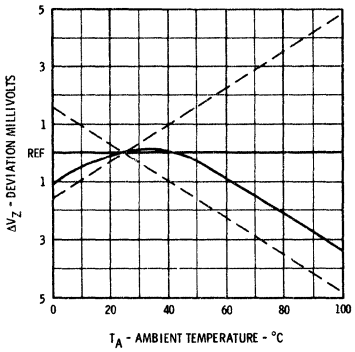
REFERENCE VOLTAGE DEVIATION VERSUS AMBIENT TEMPERATURE TYPICAL FCT-1025, $I_Z = 100\ \mu A$



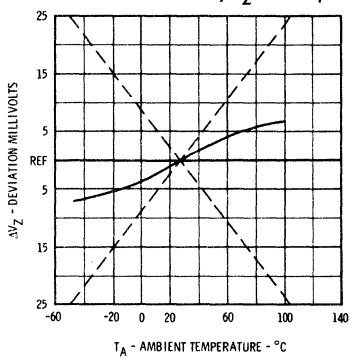
REFERENCE VOLTAGE DEVIATION VERSUS AMBIENT TEMPERATURE TYPICAL FCT-1022, $I_Z = 100\ \mu A$



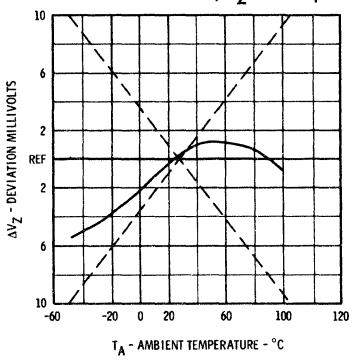
REFERENCE VOLTAGE DEVIATION VERSUS AMBIENT TEMPERATURE TYPICAL FCT-1021, $I_Z = 100\ \mu A$



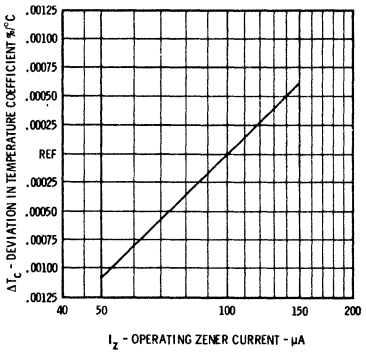
REFERENCE VOLTAGE DEVIATION VERSUS AMBIENT TEMPERATURE TYPICAL FCT-1125, $I_Z = 100\ \mu A$



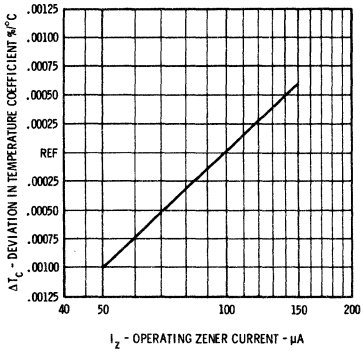
REFERENCE VOLTAGE DEVIATION VERSUS AMBIENT TEMPERATURE TYPICAL FCT-1122, $I_Z = 100\ \mu A$



TEMPERATURE COEFFICIENT DEVIATION VERSUS OPERATING CURRENT



TEMPERATURE COEFFICIENT DEVIATION VERSUS OPERATING CURRENT

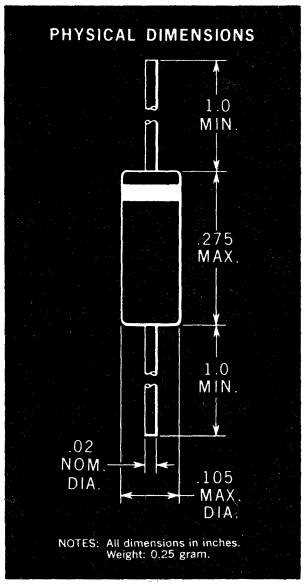


M-CR

SILICON PLANAR MULTI-CURRENT RANGE REFERENCE DIODES

GENERAL DESCRIPTION These unique Fairchild Temperature Compensated Multi-Current Range Diodes (M-CR) offer design freedom not previously available with reference diodes. Their broad operating current range, 1.0 mA through 15 mA, allows considerable freedom in selection of the operating current level. No longer is the design engineer restricted to a 7.5-mA and/or 10-mA current level.

Other features are low leakage at biases approaching the breakdown voltage, low dynamic impedance—approximately 20 to 30 percent lower than similar reference devices, and TC as low as 0.0005 percent. These highly reliable, stable devices are ideally suited for applications in space vehicles and test equipment.



FEATURING OPERATING CURRENT LEVELS FROM 1.0 THROUGH 15.0 mA

ELECTRICAL CHARACTERISTICS

Reference Voltage	6.6 Volts
Voltage Tolerance	±5%
Reverse Leakage Maximum	200 nano amperes at 3.0 Volts at 25°C
Package	DO-7 glass
Operating Temperature	-55°C to +100°C

TYPE		CURRENT RANGE	TEMPERATURE COEFFICIENT (Max) %/°C (Note 1)		IMPEDANCE (Max) Ohms
FSC	JEDEC	(Note 1)	I_Z = 2.0 ±0.2 mA	I_Z = 2.0 ±1.0 mA	(Note 2)
M-CR2225	1N4611	1-3 mA	0.005% at 2 mA	0.01%	75
M-CR2222	1N4611A		0.002% at 2 mA	0.005%	
M-CR2221	1N4611B		0.001% at 2 mA	0.002%	
M-CR2235	1N4611C		0.0005% at 2 mA	0.001%	
			I_Z = 5.0 ±0.5 mA	I_Z = 5 ±2.0 mA	
M-CR2525	1N4612	3-7 mA	0.005% at 5 mA	0.01%	25
M-CR2522	1N4612A		0.002% at 5 mA	0.005%	
M-CR2521	1N4612B		0.001% at 5 mA	0.002%	
M-CR2535	1N4612C		0.0005% at 5 mA	0.001%	
			I_Z = 10.0 ±1.0 mA	$I_Z = 10.0\ ^{+5.0}_{-3.0}$ mA	
M-CR2025	1N4613	7-15 mA	0.005% at 10 mA	0.01%	15
M-CR2022	1N4613A		0.002% at 10 mA	0.005%	
M-CR2021	1N4613B		0.001% at 10 mA	0.002%	
M-CR2035	1N4613C		0.0005% at 10 mA	0.001%	

NOTES:

(1) Operating current may be set anywhere within the indicated current ranges and still exhibit a temperature coefficient equal to or less than the values listed. Temperature coefficient is determined by measuring V_Z at the two temperature extremes and using the following formula:

$$T_C = \frac{(V_Z \text{ at } -55°C - V_Z \text{ at } +100°C)}{V_A(+155°C)} \quad 100 \text{ where, } V_A = \frac{V \text{ at } -55°C + V \text{ at } +100°C}{2}$$

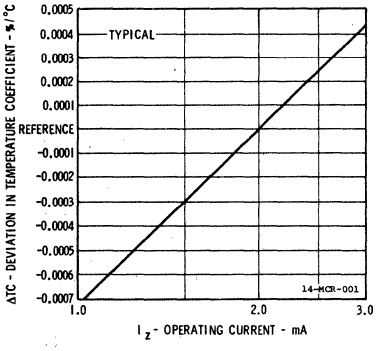
(2) Dynamic impedance is measured at the minimum operating current value (worst case). The M-CR2200 series is measured at IDC = 1.0 mA, M-CR2500 series at IDC = 3.0 mA, etc. IAC is 10% of IDC in all cases.

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

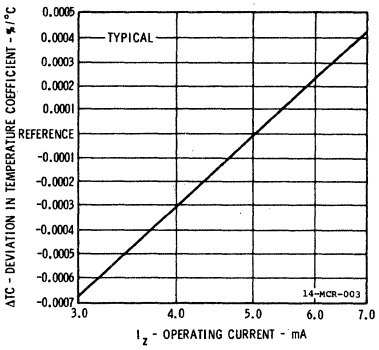
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

SILICON PLANAR MULTI-CURRENT RANGE REFERENCE DIODES

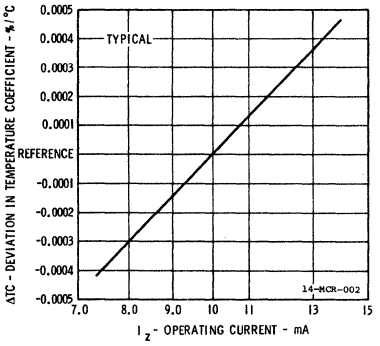
TEMPERATURE COEFFICIENT VS OPERATING CURRENT (MCR 22XX SERIES)



TEMPERATURE COEFFICIENT VS OPERATING CURRENT (MCR 25XX SERIES)



TEMPERATURE COEFFICIENT VS OPERATING CURRENT (MCR 20XX SERIES)



The REFERENCE line on the vertical scale (ΔT_C) of the TEMPERATURE COEFFICIENT VS OPERATING CURRENT graphs represents the temperature coefficient of the device at 2, 5, or 10 mA depending on the type. The typical temperature coefficients are:

T_C at I_X = T_C at I_Z = 2 mA + ΔT_C (M-CR 22XX Series)

T_C at I_X = T_C at I_Z = 5 mA + ΔT_C (M-CR 25XX Series)

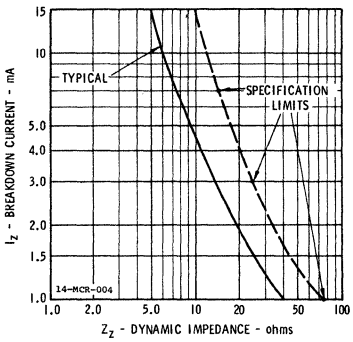
T_C at I_X = T_C at I_Z = 10 mA + ΔT_C (M-CR 20XX Series)

where

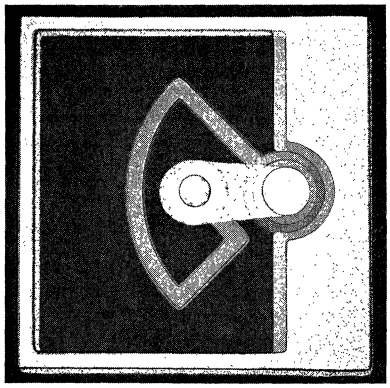
I_X = any current within the range quoted for the series.

ΔT_C = temperature coefficient deviation shown on graphs at $I_Z = I_X$

DYNAMIC IMPEDANCE VS BREAKDOWN CURRENT

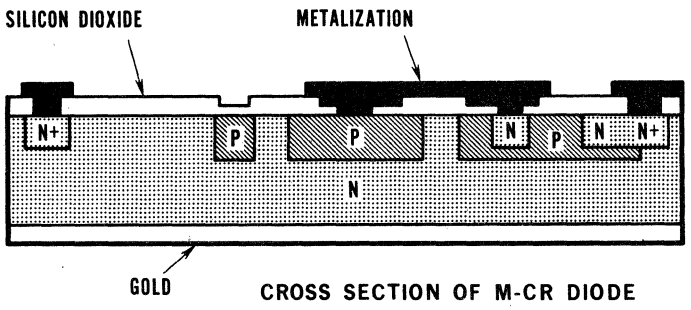


M-CR DIODE: INTEGRATED CIRCUIT IN DO-7 PACKAGE



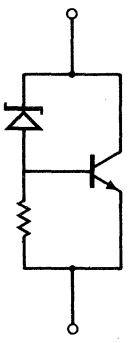
PHOTOMICROGRAPH OF THE M-CR

Fairchild M-CR diodes are actually Monolithic Silicon Integrated Circuits composed of three elements; an NPN transistor, a zener diode, and a resistor. These elements are a result of multiple diffusions into a single n-type silicon wafer. The integrated circuit approach eliminates the interconnections that would be necessary in fabricating the circuit with discrete devices.



CROSS SECTION OF M-CR DIODE

CIRCUIT DIAGRAM



14-MCR-006

FAIRCHILD SILICON PLANAR* ZENER DIODES

400 MILLIWATT VOLTAGE REGULATORS

1N746-1N759 SERIES & 1N957-1N992 SERIES

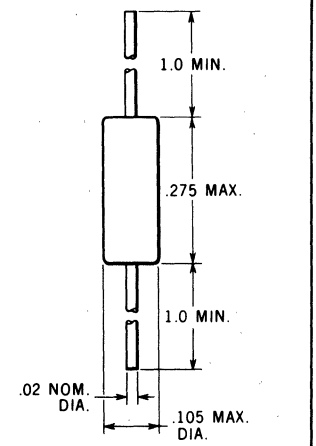
GENERAL DESCRIPTION - The Fairchild General Purpose Voltage Regulator is a Silicon Planar Diode designed for a wide range of voltage regulation and voltage limiting applications. Utilizing the Planar process, these devices offer, ultra-stable reverse voltage, low leakage, low dynamic impedance, and high reliability.

- Extremely low leakage at biases approaching the Zener voltage — typically an order of magnitude lower than specified values.
- Extreme leakage stability. This is a strong reliability indicator.
- Very low dynamic resistance.
- Sharp Zener knees.
- Planar Construction above 5.6 volts.

ABSOLUTE MAXIMUM RATINGS - The maximum ratings are limiting values above which life or satisfactory performance may be impaired.

Operating Temperature	-65°C to +150°C
Storage Temperature	-65°C to +175°C
Power Dissipation	400 mW
Power Derating Factor	3.2 mW/°C

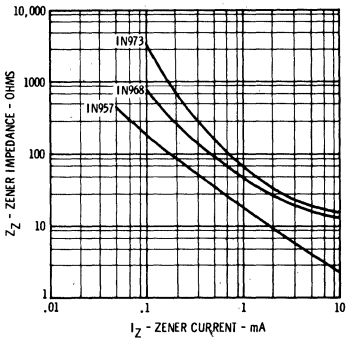
PHYSICAL DIMENSIONS



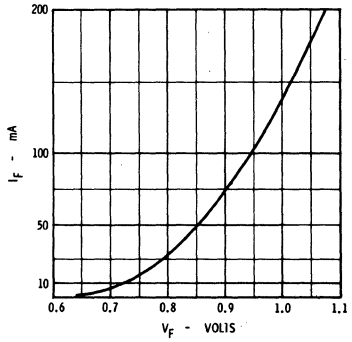
NOTES: All dimensions in inches.
Weight: 0.25 gram.

TYPICAL ELECTRICAL CHARACTERISTICS

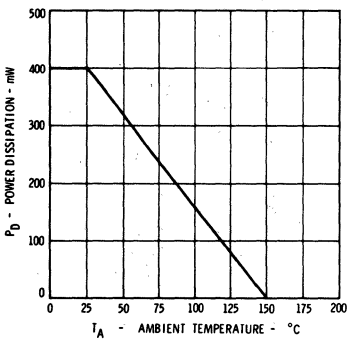
ZENER IMPEDANCE VERSUS REVERSE CURRENT



V_F VERSUS I_F (Typical)



POWER DISSIPATION VERSUS AMBIENT TEMPERATURE



*Planar is a patented Fairchild process.

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

FAIRCHILD 400 MILLIWATT VOLTAGE REGULATORS

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

JEDEC Type No.	V_Z Zener Voltage Nominal	I_{ZT} Test Current	Z_Z Max. Zener Impedance (Note 3)			V_R Reverse Voltage (Note 5)		I_R Max. Reverse Current @ V_R		T.C. Temperature Coefficient (Maximum)	I_{zm} Max. Current (Note 4)
			Z_{ZT} at I_{ZT}	Z_{zk} at I_{zk}				25°C	150°C		
	Volts	mA	Ohms	Ohms	mA	Volts		μA	μA	%/°C	mA
						A	B				
(Note 1)											
1N746	3.3	20.00	28.0			1.0		10.00	30.0	-.070	110.0
1N747	3.6	20.00	24.0			1.0		10.00	30.0	-.065	100.0
1N748	3.9	20.00	23.0			1.0		10.00	30.0	-.060	95.0
1N749	4.3	20.00	22.0			1.0		2.00	30.0	-.055	85.0
1N750	4.7	20.00	19.0			1.0		2.00	30.0	-.043	75.0
1N751	5.1	20.00	17.0			1.0		1.00	20.0	±.030	70.0
1N752	5.6	20.00	11.0			1.0		1.00	20.0	±.028	65.0
1N753	6.2	20.00	7.0			1.0		0.10	20.0	+.045	60.0
1N754	6.8	20.00	5.0			1.0		0.10	20.0	+.050	55.0
1N755	7.5	20.00	6.0			1.0		0.10	20.0	+.058	50.0
1N756	8.2	20.00	8.0			1.0		0.10	20.0	+.062	45.0
1N757	9.1	20.00	16.0			1.0		0.10	20.0	+.068	40.0
1N758	10.0	20.00	17.0			1.0		0.10	20.0	+.075	35.0
1N759	12.0	20.00	50.0			1.0		0.10	20.0	+.077	30.0
(Note 2)											
1N957	6.8	18.50	4.5	700	1.0	4.9	5.2	10.00	50.0	+.050	47.0
1N958	7.5	16.50	5.5	700	0.5	5.4	5.7	10.00	50.0	+.058	42.0
1N959	8.2	15.00	6.5	700	0.5	5.9	6.2	5.00	50.0	+.062	38.0
1N960	9.1	14.00	7.5	700	0.5	6.6	6.9	1.00	10.0	+.068	35.0
1N961	10.0	12.50	8.5	700	0.25	7.2	7.6	1.00	10.0	+.072	32.0
1N962	11.0	11.50	9.5	700	0.25	8.0	8.4	1.00	5.0	+.073	28.0
1N963	12.0	10.50	11.5	700	0.25	8.6	9.1	1.00	5.0	+.076	26.0
1N964	13.0	9.50	13.0	700	0.25	9.4	9.9	0.10	5.0	+.079	24.0
1N965	15.0	8.50	16.0	700	0.25	10.8	11.4	0.10	5.0	+.082	21.0
1N966	16.0	7.80	17.0	700	0.25	11.5	12.2	0.10	5.0	+.083	19.0
1N967	18.0	7.00	21.0	750	0.25	13.0	13.7	0.10	5.0	+.085	17.0
1N968	20.0	6.20	25.0	750	0.25	14.4	15.2	0.10	5.0	+.086	15.0
1N969	22.0	5.60	29.0	750	0.25	15.8	16.7	0.10	1.0	+.087	14.0
1N970	24.0	5.20	33.0	750	0.25	17.3	18.2	0.10	1.0	+.088	13.0
1N971	27.0	4.60	41.0	750	0.25	19.4	20.6	0.10	1.0	+.090	11.0
1N972	30.0	4.20	49.0	1000	0.25	21.6	22.8	0.10	1.0	+.091	10.0
1N973	33.0	3.80	58.0	1000	0.25	23.8	25.1	0.05	1.0	+.092	9.2
1N974	36.0	3.40	70.0	1000	0.25	25.9	27.4	0.05	1.0	+.093	8.5
1N975	39.0	3.20	80.0	1000	0.25	28.1	29.7	0.05	1.0	+.094	7.8
1N976	43.0	3.00	93.0	1500	0.25	31.0	32.7	0.05	1.0	+.095	7.0
1N977	47.0	2.70	105.0	1500	0.25	33.8	35.8	0.05	1.0	+.095	6.4
1N978	51.0	2.50	125.0	1500	0.25	36.7	38.6	0.05	1.0	+.096	5.9
1N979	56.0	2.20	150.0	2000	0.25	40.3	42.6	0.05	1.0	+.096	5.4
1N980	62.0	2.00	185.0	2000	0.25	44.6	47.1	0.05	1.0	+.097	4.9
1N981	68.0	1.80	230.0	2000	0.25	49.0	51.7	0.05	1.0	+.097	4.5
1N982	75.0	1.70	270.0	2000	0.25	54.0	56.0	0.05	1.0	+.098	4.0
1N983	82.0	1.50	330.0	3000	0.25	59.0	62.2	0.05	1.0	+.098	3.7
1N984	91.0	1.40	400.0	3000	0.25	65.5	69.2	0.05	1.0	+.099	3.3
1N985	100.0	1.30	500.0	3000	0.25	72.0	76.0	0.05	1.0	+.110	3.0
1N986	110.0	1.10	750.0	4000	0.25	79.2	83.6	0.05	1.0	+.110	2.7
1N987	120.0	1.00	900.0	4500	0.25	86.4	91.2	0.05	1.0	+.110	2.5
1N988	130.0	0.95	1100.0	5000	0.25	93.6	98.8	0.05	1.0	+.110	2.3
1N989	150.0	0.85	1500.0	6000	0.25	108.0	114.0	0.05	1.0	+.110	2.0
1N990	160.0	0.80	1700.0	6500	0.25	115.2	121.6	0.05	1.0	+.110	1.9
1N991	180.0	0.68	2200.0	7100	0.25	129.6	136.8	0.05	1.0	+.110	1.7
1N992	200.0	0.65	2500.0	8000	0.25	144.0	152.0	0.05	1.0	+.110	1.5

NOTES:

(1) The 1N746-1N759 series have a standard Zener voltage tolerance of ±10%. A tolerance of ±5.0% is also available by suffixing A to the JEDEC type number.

(2) The 1N957-1N992 series have a 20% tolerance. Add suffix A for 10% tolerance, and suffix B for 5.0% tolerance.

(3) The Zener impedances Z_{ZT} and Z_{zk} are derived by superimposing a 60 cycle AC signal, having an RMS value equal to 10% of the DC Zener current, on I_{ZT} or I_{zk}.

(4) Maximum Zener current ratings (I_{zm}) are based on the maximum voltage of a 20% tolerance unit. For closer tolerance units or units where the actual Zener voltage (VZ) is known at the operating point, the maximum Zener current may be increased according to the derating curve.

(5) V_R Value for 20% tolerance = 80% lowest V_z value for each type.

1N753A through 1N759A, and 1N962B through 1N973B are available in Military Qualified (JAN) types.

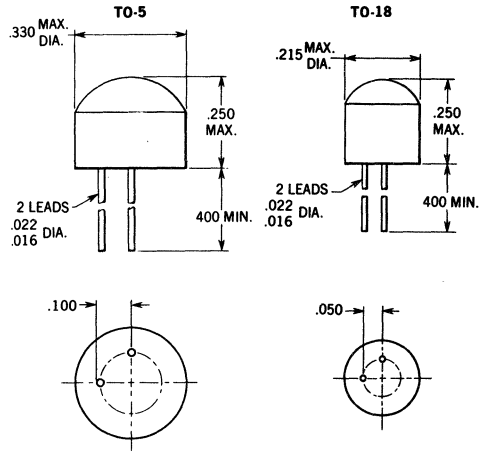
FAIRCHILD SILICON PLANAR* ZENER DIODES

100 MILLIWATT VOLTAGE REGULATORS

FZ900 SERIES & FZ950 SERIES

GENERAL DESCRIPTION — The Fairchild General Purpose FZ900 and FZ950 silicon Planar* zener diodes are designed for voltage limiting applications and voltage regulation and offer controlled voltage breakdown and Planar reliability. These devices are available in epoxy TO-5 and TO-18 packages and are especially suited for circuit economy applications.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches
White dot identifies cathode lead

MAXIMUM RATINGS (1)

I_{ZM}	Maximum zener current	10 mA
P	Power dissipation	100 mW
T_A	Operating temperature	−55°C to +125°C Maximum
T_{stg}	Storage temperature	−55°C to +125°C Maximum

ELECTRICAL CHARACTERISTICS (25°C)

TYPE NO.		V_Z NOMINAL ZENER VOLTAGE I_{ZT} = 2mA	Z_Z MAX. ZENER IMPEDANCE		I_R MAX. REVERSE CURRENT	ΔBV MAX. REGULATION (2)	T.C. TEMPERATURE COEFFICIENT (3)
			Z_{ZT} @ 2mA	Z_{ZK} @ 250μA			
TO-18	TO-5	Volts	Ohms	Ohms	μA	Volts	%/°C
FZ 901	—	5.6 ±10%	100	750	10μA @ V_R = 4V	0.40	0.035
FZ 902	FZ 952	6.5 ±10%	50	750	5μA @ V_R = 5V	0.40	0.035
FZ 903	FZ 953	10.6 ±10%	50	750	5μA @ V_R = 8V	0.40	0.035

* Planar is a patented Fairchild process.

NOTES:

(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.

(2) ΔBV (V_Z Regulation: It is the change in V_Z when measured at I_Z = 1 mA to V_Z measured at I_Z = 5 mA.

(3) $TC = \frac{(V_{T1} - V_{T2})}{V(T_1 - T_2)}$ where $V = \frac{V_{T1} + V_{T2}}{2}$

(V stands for Zener voltage.)

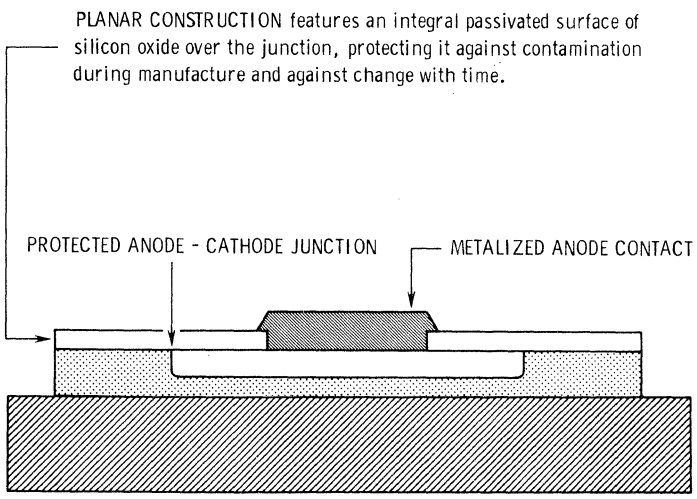
FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

FAIRCHILD SILICON PLANAR ZENER AND REFERENCE DIODES

PLANAR RELIABILITY

Fairchild's Zener and Reference Diode products are manufactured using the time-proven Planar process. An integral silicon oxide surface permanently protects the junction against contamination from the start of the manufacturing process. Elimination of contamination preserves the device's excellent low-leakage and results in stable device parameters that do not degrade after thousands of operational hours.



313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

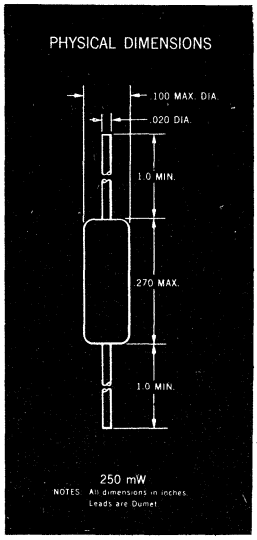
FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

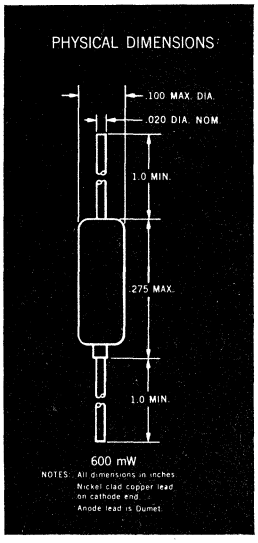
SILICON PLANAR GENERAL PURPOSE ZENER DIODES

General purpose Zeners are low breakdown voltage (called Vz for Zeners) diodes that are designed principally for voltage regulator and voltage limiting applications. Innumerable applications exist for this device.

IMPORTANT FEATURES:

- Wide variety of Zener voltages.
- Extremely low leakage at biases approaching the Zener voltage - as much as two orders of magnitude lower than typical specifications. This is not only an important characteristic in its performance electrically but is also a strong reliability indicator.
- Very low dynamic resistance.
- Planar construction - a rarity for Zeners.



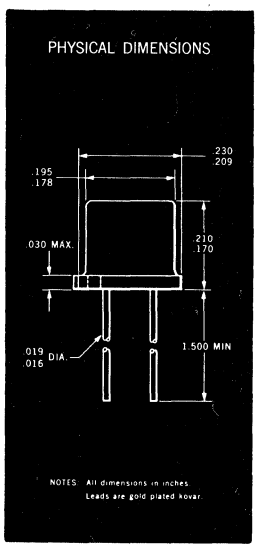


ELECTRICAL CHARACTERISTICS

Type No.	V_Z Nom.	I_Z Test Current	Max. Z @I_Z	V_R Reverse Voltage	Max. I_R @V_R		Z_{zk} I_{DC} = .25 mA I_{AC} = 25 μA
	Volts (tol ± 5%)	mA	Ohms	Volts	25°C	μA 150°C	Ohms
1N753A	6.2	20.0	7.0	1.0	0.1	20.0	
1N754A	6.8	20.0	5.0	1.0	0.1	20.0	
1N755A	7.5	20.0	6.0	1.0	0.1	20.0	
1N756A	8.2	20.0	8.0	1.0	0.1	20.0	
1N757A	9.1	20.0	10.0	1.0	0.1	20.0	
1N758A	10.0	20.0	17.0	1.0	0.1	20.0	
1N759A	12.0	20.0	30.0	1.0	0.1	20.0	
1N962B	11.0	11.5	9.5	8.4	0.1		700
1N963B	12.0	10.5	11.5	9.1	0.1		700
1N964B	13.0	9.5	13.0	9.9	0.1		700
1N965B	15.0	8.5	16.0	11.4	0.1		700
1N966B	16.0	7.8	17.0	12.2	0.1		700
1N967B	18.0	7.0	21.0	13.7	0.1		750
1N968B	20.0	6.2	25.0	15.2	0.1		750
1N969B	22.0	5.6	29.0	16.7	0.1		750
1N970B	24.0	5.2	33.0	18.2	0.1		750
1N971B	27.0	4.6	41.0	20.6	0.1		750
1N972B	30.0	4.2	49.0	22.8	0.1		1000
1N973B	33.0	3.8	58.0	25.1	0.1		1000

SILICON PLANAR FCT REFERENCE DIODES

The 100 μA Reference Diodes are temperature compensated voltage reference elements designed for low-power applications. For applications which are very limited in available power, this device is exceptional in performance:



IMPORTANT FEATURES

- Low temperature coefficient over wide range of temperatures.
- Low dynamic impedance at 100 μA not obtainable with conventional voltage reference elements.
- Low leakage at biases approaching the breakdown (reference) voltage. Although this parameter is of secondary importance in reference voltage applications, low leakage has long been established as a strong reliability indication.
- Silicon Planar construction

ELECTRICAL CHARACTERISTICS:

1. Reference Voltage:	6.7 V nominal
2. Voltage Tolerance:	±5.0%
3. Reverse Leakage:	100 nano-amps at 5.0 V, 25°C
4. Dynamic Impedance:	750 ohms maximum
5. Package:	TO-18

Type Number	Temperature Coefficient at 100 μA (%/°C)	Temperature Range (°C)
FCT 1025	±0.005	0 to 100
FCT 1022	±0.002	
FCT 1021	±0.001	
FCT 1035	±0.0005	
FCT 1125	±0.005	-55 to 100
FCT 1122	±0.002	
FCT 1121	±0.001	
FCT 1135	±0.0005	

NOTES:

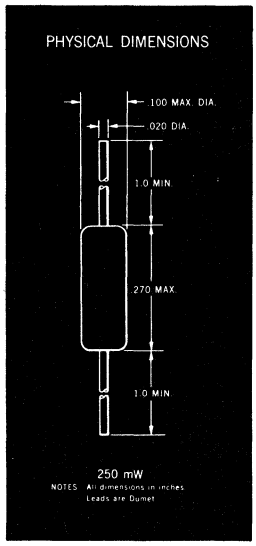
1. Voltage tolerances tighter than ±5% are available upon request.
2. Temperature coefficient is determined by measuring Vz at the two temperature extremes and using the following formula:

$$TC = \frac{(V_{T1} - V_{T2})100}{V(T_1 - T_2)} \qquad \text{where } V = \frac{V_{T1} + V_{T2}}{2}$$

3. Devices are mounted in two-leaded TO-18 package and with a black dot opposite cathode lead on side of case.

SILICON PLANAR MULTI-CURRENT RANGE REFERENCE DIODES

The M-CR Reference diodes are multi-current range reference diodes designed for use over a wide range of current levels. The nearly constant TC vs operating current level allows designers considerable freedom in the selection of the operating current level. Minimum stocking levels may be maintained since one device covers a variety of applications.



IMPORTANT FEATURES:

- Wide range of operating current levels giving the circuit designer freedom to select the reference element to fit his circuit design rather than design the circuit to the reference element.
- Nearly constant TC vs operating current level enabling users to use one off-the-shelf item to meet many different design requirements. In addition, this characteristic eliminates the need for critically close design on current supply amplitude—only stability is important.
- Low leakage at biases approaching the breakdown (reference) voltage—a strong reliability indicator.
- Low dynamic impedance—approximately 20 to 30% lower than similar voltage reference element designs.
- Single chip, planar construction.

ELECTRICAL CHARACTERISTICS:

1. Reverse Voltage: - 6.6 V Nominal
2. Voltage Tolerance: - ±5%
3. Reverse Leakage: - 200 mA @3.0 V, 25°C
4. Package: - DO-7 glass
5. Temperature Range: - -55°C to 100°C

Type	Operating Current (mA) (Note 1)	Impedance (Ohms) (Note 2)	Temperature Coefficient (%/°C) (Note 3)
M-CR 2235	2 mA (1 - 3 mA)	75	.0005
M-CR 2221			.001
M-CR 2222			.002
M-CR 2225			.005
M-CR 2535	5 mA (3 - 7 mA)	25	.0005
M-CR 2521			.001
M-CR 2522			.002
M-CR 2525			.005
M-CR 2035	10 mA (7 - 15 mA)	15	.0005
M-CR 2021			.001
M-CR 2022			.002
M-CR 2025			.005

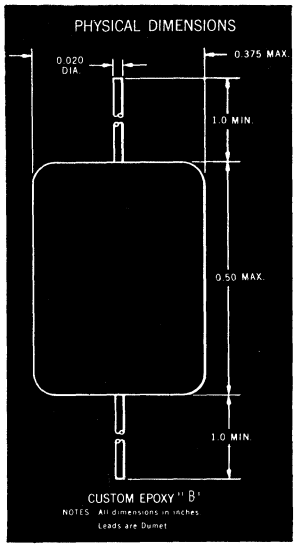
Notes on page 6

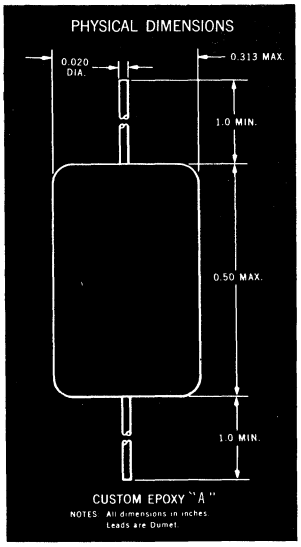
SILICON PLANAR REFERENCE ASSEMBLIES

Reference Assemblies are temperature compensated voltage reference elements designed to provide a variety of reference voltages, with the advantages of reduced installation time and cost, reduced space requirements, and simplified circuit design. Packaged in custom epoxy packages, they are also available in TO-5 and TO-18 configurations.

IMPORTANT FEATURES:

- Wide variety of operating voltage ranges.
- Low dynamic impedance and low leakage at biases approaching the breakdown (reference) voltage.
- Planar construction.
- Variety of packages.





ELECTRICAL CHARACTERISTICS

Type	Epoxy Package	Test Current (mA)	Zener Impedance Idc = 10 mA, Iac = 1 mA	Zener V @ Idc = 10 mA	TC %/°C
FA 8001	A	10	20 Ω	8.0 Min	.0005
FA 8002					.001
FA 8003					.002
FA 8004				8.8 Max	.005
FA 8005	B	10	25 Ω	10.8 Min	.0005
FA 8006					.001
FA 8007					.002
FA 8008				12.0 Max	.005
FA 8009	B	10	30 Ω	14.3 Min	.0005
FA 8010					.001
FA 8011					.002
FA 8012				15.7 Max	.005

NOTES:

(1) Voltages listed are the basic reference voltages available. Other combinations available upon request.

NOTES:

(1) Operating current can be set anywhere within indicated boundaries and still exhibit essentially the same low TC. TC is quaranteed to be better than the next lowest range, i.e., M-CR2235 is better than .0005%/°C at 2 mA and better than .001%/°C at 1 and 3 mA.

(2) Dynamic impedance is measured at the minimum operating current value. The M-CR2200 series is measured at Idc = 1.0 mA, M-CR2500 series at Idc = 3.0 mA, etc. Iac is 10% of Idc in all cases.

(3) Temperature coefficient is determined by measuring Vz at the two temperature extremes and using the following formula:

$$TC = \frac{(V_{T1} - V_{T2})100}{V(T_1 - T_2)} \qquad \text{where } V = \frac{V_{T1} + V_{T2}}{2}$$

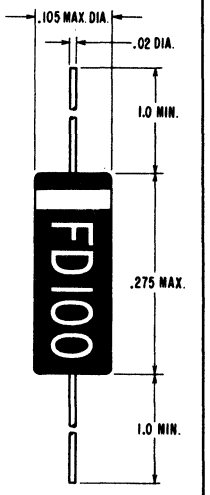
FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

FD100
ULTRA-FAST PLANAR DIODE

MAXIMUM RATINGS (25°C.) [Note 1]

WIV	-	Working Inverse Voltage	50 V
I_o	-	Average rectified current	75 mA
I_F	-	Forward current steady state d. c.	115 mA
i_f	-	Recurrent peak forward current	225 mA
i_f (surge)	-	Peak forward surge current pulse width of 1 second	500 mA
i_f (surge)	-	Peak forward surge current pulse width of 1 microsecond	2000 mA
P	-	Power dissipation	250 mW
$\frac{1}{\theta}$	-	Power derating factor	1.67 mW/°C
T_A	-	Operating temperature	-65° to + 175°C
T_{stg}	-	Storage temperature, ambient	-65° to + 200°C

PHYSICAL DIMENSIONS



NOTE: ALL DIMENSIONS IN INCHES

ELECTRICAL SPECIFICATIONS (25° C unless otherwise noted)

SYMBOL	CHARACTERISTIC	MIN.	TYPICAL	MAX.	TEST CONDITIONS
V_F	Forward Voltage			1.0 V	I_F = 10 mA
I_R	Reverse Current			0.1 μA	V_R = 50 V
I_R	Reverse Current (150° C)			100 μA	V_R = 50 V
BV	Breakdown Voltage	75V			I_R = 5 μA
t_{rr} [Note 2]	Reverse Recovery Time			4.0 nsec	I_f = 10 mA
					I_r = 10 mA
					R_L = 100Ω
t_{rr} [Note 2]	Reverse Recovery Time			2.0 nsec	I_f = 10 mA
					V_r=6.0 V
					R_L = 100Ω
C_o [Note 3]	Capacitance			2.0 pf	V_R = 0 V f = 1 mc
RE	Rectification Efficiency	45%			100 mc [Note 4]
ΔV_F/°C	Change of forward voltage per degree change in temperature		-1.8mV		

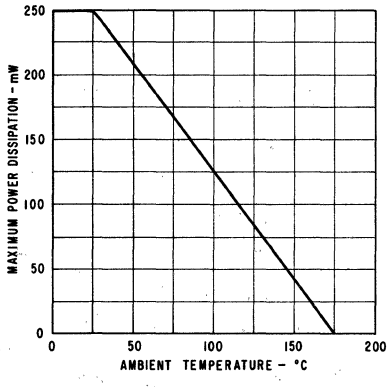
FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

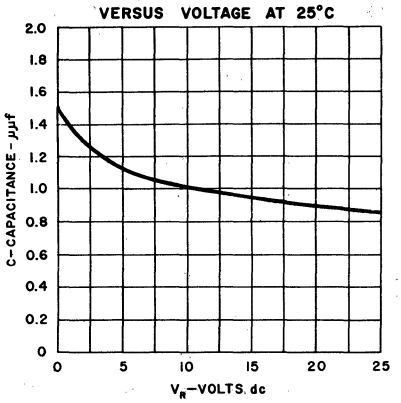
NOTES:
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 1 mA in circuit shown on page 2 of data sheet.
(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75A-S8 Capacitance Bridge or equivalent.
(4) Rectification efficiency is defined as the ratio of D.C. load voltage to peak rf input voltage to the detector circuit, measured with 2.0 V r.m.s. input to the circuit. Load resistance 5 K ohms, load capacitance 20 $\mu\mu$f.

TYPICAL ELECTRICAL CHARACTERISTICS

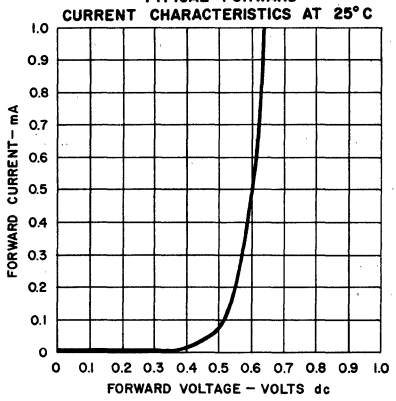
POWER DERATING CURVE



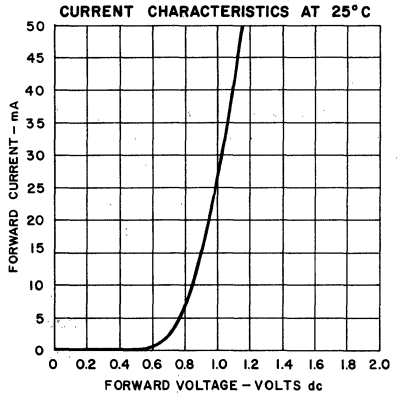
TYPICAL CAPACITANCE VERSUS VOLTAGE AT 25°C



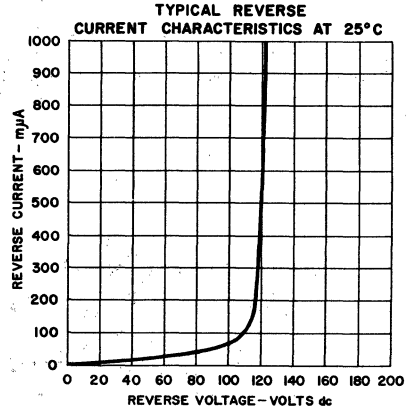
TYPICAL FORWARD CURRENT CHARACTERISTICS AT 25°C



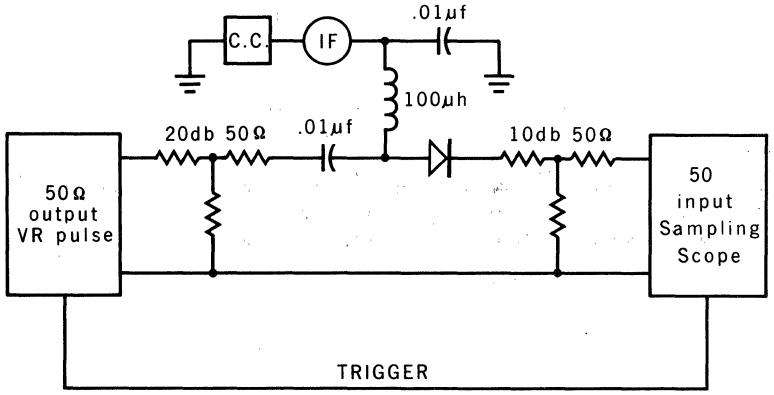
TYPICAL FORWARD CURRENT CHARACTERISTICS AT 25°C



TYPICAL REVERSE CURRENT CHARACTERISTICS AT 25°C



REVERSE RECOVERY TEST CIRCUIT



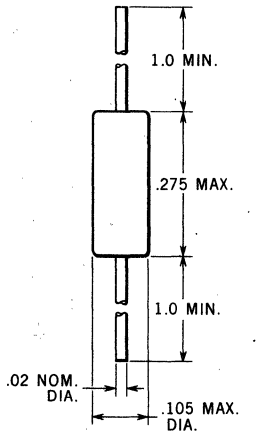
VR pulse risetime ≤ .25nsec
Scope risetime ≤ .35nsec

FD111
ULTRA-FAST PLANAR DIODE

ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	50 V
I_o	Average rectified current	75 mA
I_F	Forward current steady state DC	115 mA
i_f	Recurrent peak forward current	225 mA
i_f (surge)	Peak forward surge current pulse width of 1 second	500 mA
i_f (surge)	Peak forward surge current pulse width of 1 μsec	2000 mA
P	Power dissipation	250 mW
$\frac{1}{\theta}$	Power derating factor	1.67 mW/°C
T_A	Operating temperature	-65°C to +175°C
T_{stg}	Storage temperature, ambient	-65°C to +200°C

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.
Weight: 0.25 gram.

ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

Symbol	Characteristic	Min.	Max.	Units	Test Conditions
V_F	Forward Voltage	.90	1.30	V	I_F = 50 mA
V_F	Forward Voltage	.87	1.20	V	I_F = 40 mA
V_F	Forward Voltage	.78	1.10	V	I_F = 20 mA
V_F	Forward Voltage	.72	1.00	V	I_F = 10 mA
V_F	Forward Voltage	.67	.92	V	I_F = 5 mA
V_F	Forward Voltage	.57	.76	V	I_F = 1 mA
I_R	Reverse Current		100	nA	V_R = -55 V
I_R	Reverse Current (100°C)		6	μA	V_R = -55 V
BV	Breakdown Voltage	75		V	I_R = 5 μA
t_{rr} (Note 2)	Reverse Recovery Time		5	nsec	$I_F = I_R$ = 10 mA, R_L = 100 Ω
C_o (Note 3)	Capacitance		2.5	pf	V_R = 0 V, f = 1 mc

NOTES:

(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.

(2) Recovery to 1 mA in circuit shown on page 2 of data sheet.

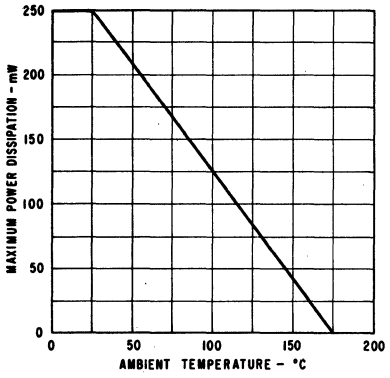
(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75A-S8 Capacitance Bridge or equivalent.

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

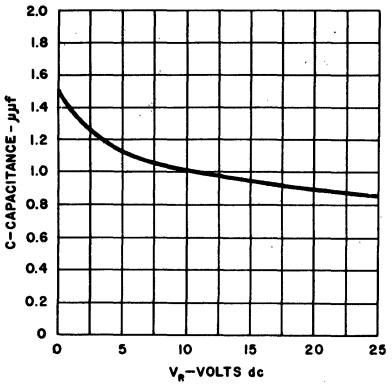
FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

TYPICAL ELECTRICAL CHARACTERISTICS

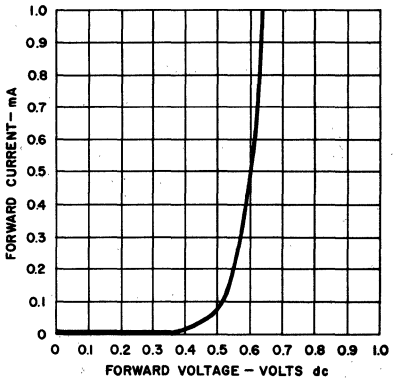
POWER DERATING CURVE



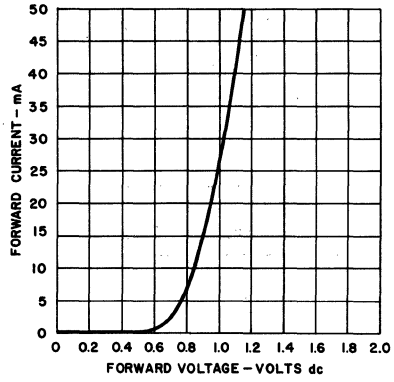
TYPICAL CAPACITANCE VERSUS VOLTAGE AT 25°C



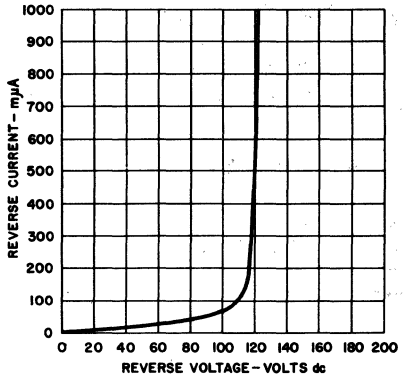
TYPICAL FORWARD CURRENT CHARACTERISTICS AT 25°C



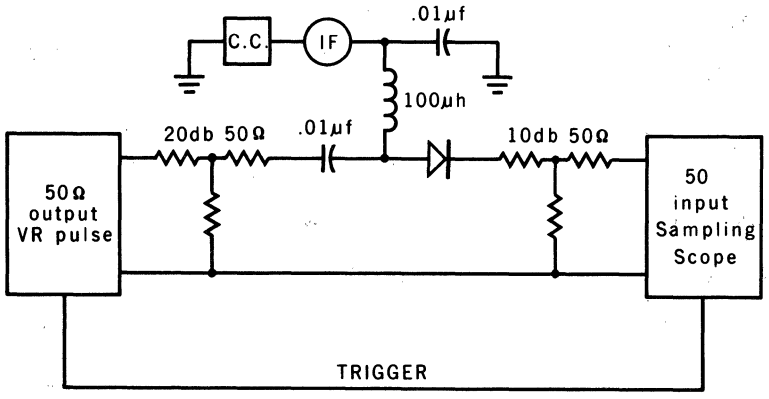
TYPICAL FORWARD CURRENT CHARACTERISTICS AT 25°C



TYPICAL REVERSE CURRENT CHARACTERISTICS AT 25°C



REVERSE RECOVERY TEST CIRCUIT



VR pulse risetime ≤ .25nsec

Scope risetime ≤ .35nsec

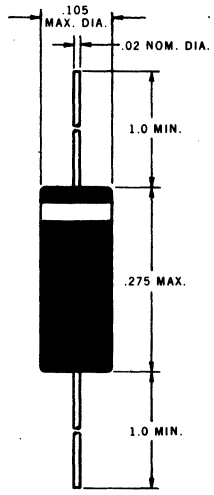
FD200

HIGH SPEED, HIGH CONDUCTANCE PLANAR*DIODE

GENERAL DESCRIPTION - The FD200 is a high conductance ultra-fast Planar* diode. This device couples high speed with high conductance and high breakdown voltage, and enables the designer to choose a diode with Planar reliability to fulfill most general-purpose switching applications.

*Planar is a patented Fairchild Process.

PHYSICAL DIMENSIONS



NOTE: All dimensions in inches

SEE NOTE 3

MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	150 V
I_o	Average Rectified Current	100 mA
I_F	Forward Current Steady State DC	340 mA
i_f	Rec urrent Peak Forward Current	300 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1.0 second	1.0 A
i_f(surge)	Peak Forward Surge Current Pulse Width of 1.0 μsecond	4.0 A
P	Power Dissipation	400 mW
$\frac{1}{\theta}$	Power Derating Factor	3.2 mW/°C
T_A	Operating Temperature	-65°C to +150°C
T_{stg}	Storage Temperature, Ambient	-65°C to +175°C

ELECTRICAL SPECIFICATIONS (25°C unless otherwise noted)

Symbol	†FACT Subgroup	Characteristic	Min.	Max.	Units	Test Conditions
*V_F	1a	Forward Voltage		1.0	V	I_F = 100 mA
*I_{R1}	1a	Reverse Current		0.1	μA	V_R = -150 V
I_{R2}	1b	Reverse Current (150°C)		100	μA	V_R = -150 V
**BV	1a	Breakdown Voltage	200		V	I_R = 100 μA
**t_{rr}	1a	Reverse Recovery Time (Note 2)		50	ns	I_F = I_R = 30 mA, R_L = 100 Ω
*C_o	1a	Capacitance		5.0	pF	V_R = 0 V, f = 1 MHz

†These numerals apply to the FACT program.

*FACT end point, Group B, Subgroup 2, 3, 4, 6, and 7.

**FACT end point, Group B, Subgroup 6 and 7 only.

*Planar is a patented Fairchild Process.

NOTES:

(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.

(2) Recovery to 3 mA

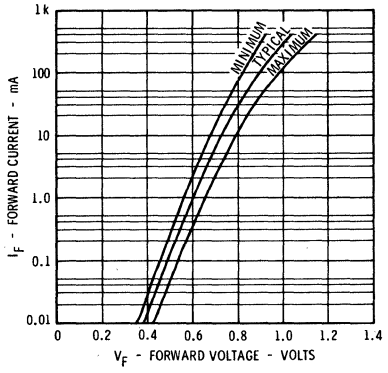
(3) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

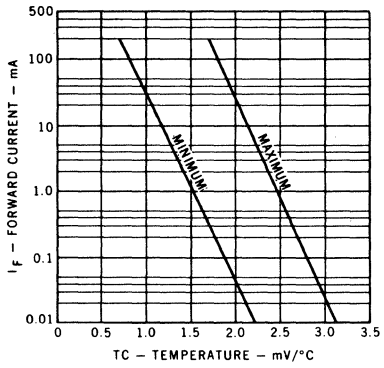
FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

TYPICAL ELECTRICAL CHARACTERISTICS

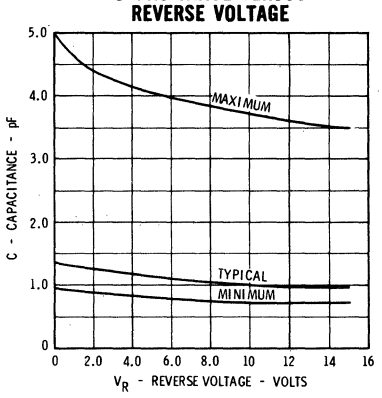
FORWARD VOLTAGE VERSUS FORWARD CURRENT



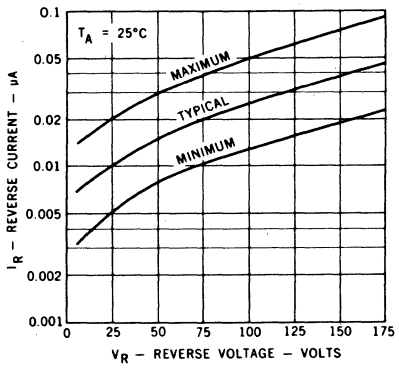
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



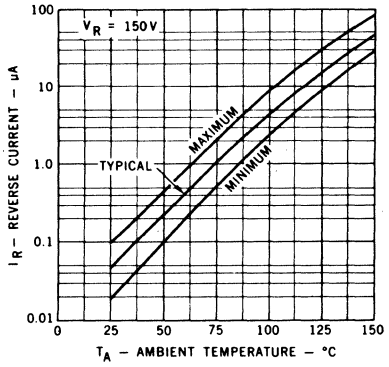
CAPACITANCE VERSUS REVERSE VOLTAGE



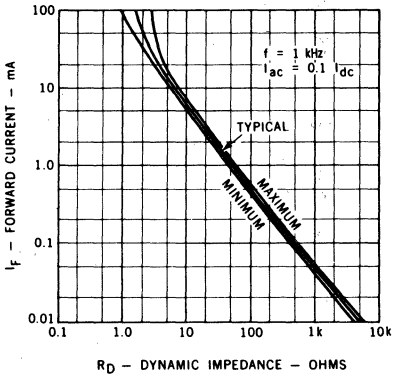
REVERSE CURRENT VERSUS REVERSE VOLTAGE



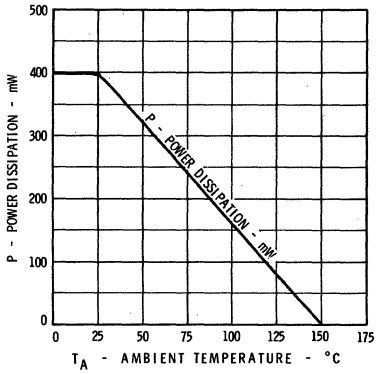
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



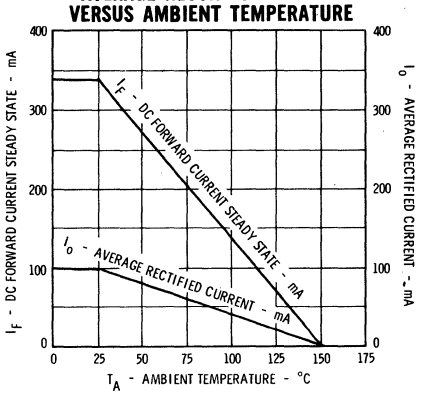
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT VERSUS AMBIENT TEMPERATURE

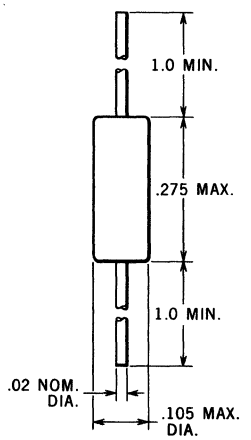


FD222

HIGH SPEED, HIGH CONDUCTANCE PLANAR* DIODE

GENERAL DESCRIPTION — The FD222 is a high speed, high conductance planar diode. This device couples high speed with high conductance and high breakdown voltage enabling designers to choose a diode with planar reliability to fulfill most general purpose switching applications.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.
See note 3.
Weight: 0.25 gram.

ABSOLUTE MAXIMUM RATINGS (25°C) [Note 1]

WIV	Working Inverse Voltage	125 V
I_O	Average rectified current	100 mA
I_F	Forward current steady state DC	300 mA
i_f	Recurrent peak forward current	300 mA
i_f (surge)	Peak forward surge current, pulse width of 1.0 second	500 mA
i_f (surge)	Peak forward surge current, pulse width of 1.0 μSec.	2000 mA
P	Power dissipation	400 mW
$1/\theta$	Power derating factor	3.2 mW/°C
T_A	Operating temperature	−65°C to +150°C
T_{stg}	Storage temperature, ambient	−65°C to +175°C

ELECTRICAL SPECIFICATIONS (25°C unless otherwise noted)

SYMBOL	†FACT Subgroup	CHARACTERISTIC	MIN.	MAX.	UNITS	TEST CONDITIONS
*V_{F1}	1a	Forward Voltage	.96	1.25	V	I_F = 300 mA
V_{F2}	1b	Forward Voltage	.90	1.15	V	I_F = 200 mA
V_{F3}	1b	Forward Voltage	.87	1.08	V	I_F = 150 mA
V_{F3}	1b	Forward Voltage	.83	1.05	V	I_F = 100 mA
V_{F4}	1b	Forward Voltage	.76	.92	V	I_F = 50 mA
V_{F5}	1b	Forward Voltage	.65	.77	V	I_F = 10 mA
*I_R	1a	Reverse Current		50	nA	V_R = −100 V
I_R (100°C)	1a	Reverse Current		10	μA	V_R = −100 V
t_{rr} [Note 2]	1a	Reverse Recovery Time		60	ns	I_F = 10 mA, I_R = 10 mA, R_L = 100 Ω
**C	1a	Capacitance		6	pf	V_R = 0 V, f = 1 MHz
**BV	1a	Breakdown Voltage	150		V	I_R = 100 μA

† These numerals apply to the FACT program.
* FACT end point, Group B, Subgroup 2, 3, 4, 6, 7.
** FACT end point, Group B, Subgroup 6, 7 only.

* Planar is a patented Fairchild process.

NOTES:

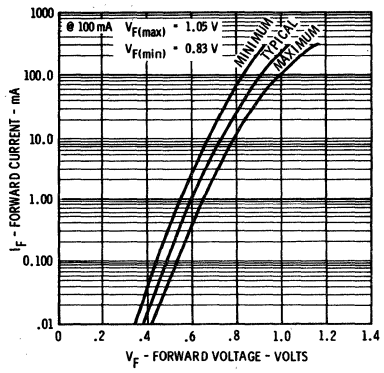
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 1.0 mA.
(3) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

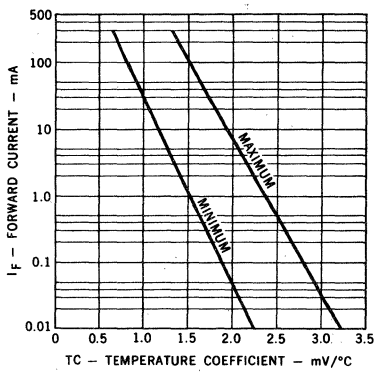
FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

TYPICAL ELECTRICAL CHARACTERISTICS

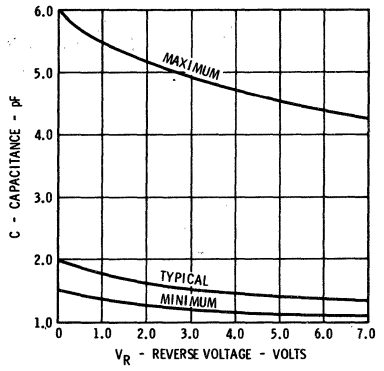
FORWARD VOLTAGE VERSUS FORWARD CURRENT



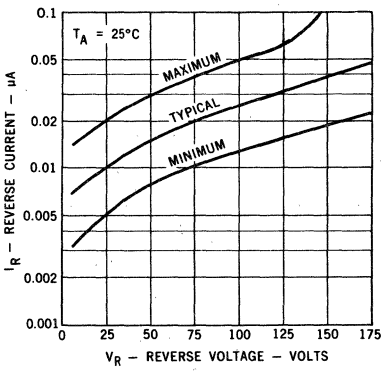
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



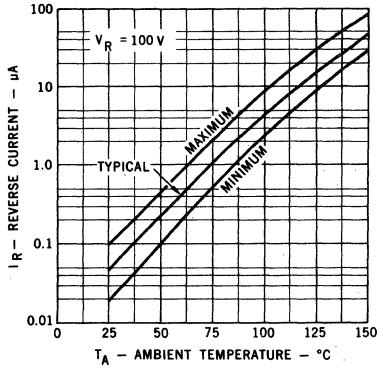
CAPACITANCE VERSUS REVERSE VOLTAGE



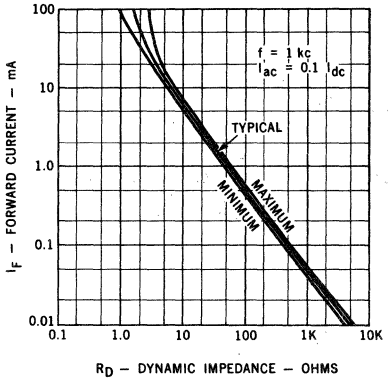
REVERSE CURRENT VERSUS REVERSE VOLTAGE



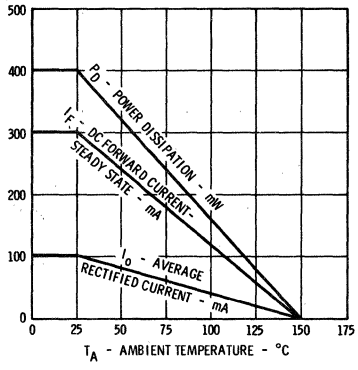
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



POWER DISSIPATION AND AVERAGE RECTIFIED CURRENT AND FORWARD CURRENT VERSUS AMBIENT TEMPERATURE

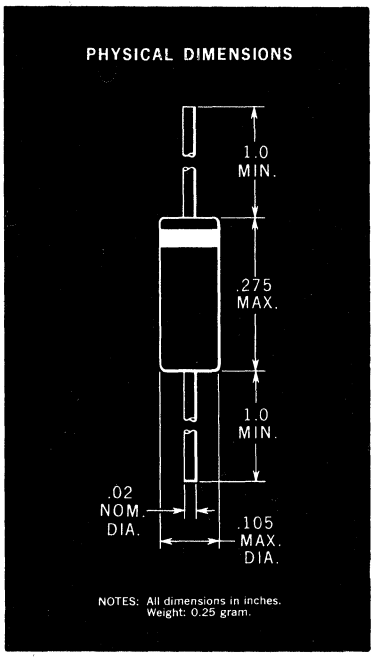


FD300

HIGH CONDUCTANCE LOW LEAKAGE PLANAR DIODE

GENERAL DESCRIPTION - The FD 300 is a high conductance extremely low leakage Planar* diode. Specified maximum values for voltage drop, capacitance, and leakage current mean flexibility in designing circuits which require large numbers of diodes. In those applications where reverse current is a critical design parameter, the inherent qualities of the Fairchild process eliminates the problem of leakage degradation.

*Planar is a patented Fairchild Process.



SEE NOTE 2

MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	125 V
I_o	Average Rectified Current	150 mA
I_F	Forward Current Steady State DC	375 mA
i_f	Recurrent Peak Forward Current	450 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 secopd	500 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 μs.	4000 mA
P	Power Dissipation	400 mW
$\frac{1}{\theta}$	Power Derating Factor	3.2 mW/°C
T_A	Operating Temperature	-65°C to +150°C
T_{stg}	Storage Temperature, Ambient	-65°C to +175°C

ELECTRICAL SPECIFICATIONS (25°C unless otherwise noted)

Symbol	†FACT Subgroup	Characteristic	Min.	Max.	Units	Test Conditions
*V_F	1a	Forward Voltage		1.00	V	I_F = 200 mA
V_F	1b	Forward Voltage		0.92	V	I_F = 100 mA
V_F	1b	Forward Voltage		0.88	V	I_F = 50 mA
V_F	1b	Forward Voltage		0.80	V	I_F = 10 mA
V_F	1b	Forward Voltage		0.75	V	I_F = 5 mA
V_F	1b	Forward Voltage		0.68	V	I_F = 1 mA
*I_{R1}	1a	Reverse Current		1.0	nA	V_R = -125 V
I_{R4}	1b	Reverse Current (150°C)		3.0	μA	V_R = -125 V
**C	1a	Capacitance		6.0	pF	V_R = 0
**BV	1a	Breakdown Voltage	150		V DC	I_R = 100 μA

† These numerals apply to the FACT program.
*FACT end point, Group B, Subgroup 2, 3, 4, 6, and 7.
**FACT end point, Group B, Subgroup 6 and 7 only.

NOTES:

(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.

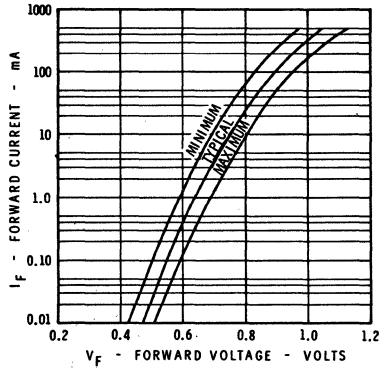
(2) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

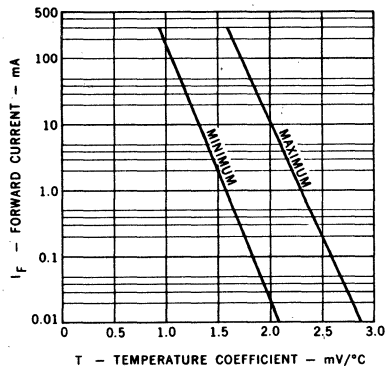
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

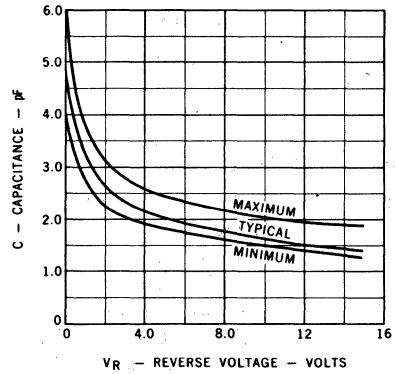
FORWARD VOLTAGE VERSUS FORWARD CURRENT



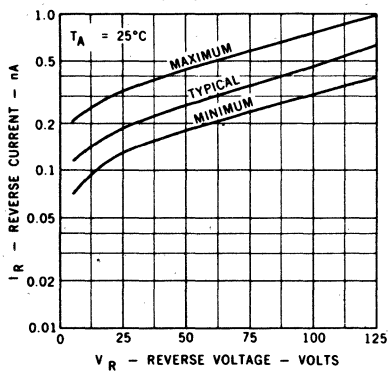
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



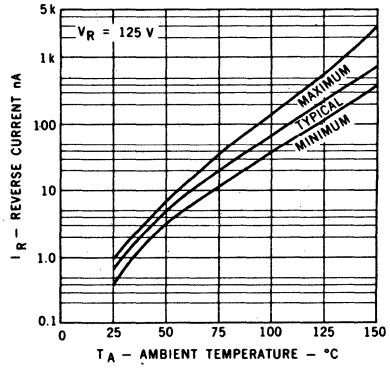
CAPACITANCE VERSUS REVERSE VOLTAGE



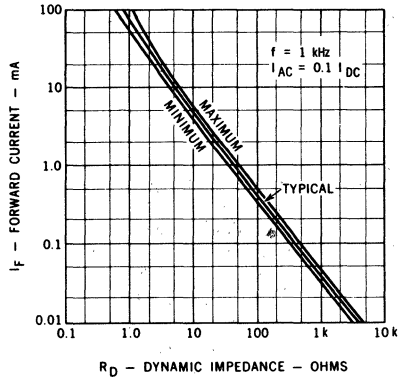
REVERSE VOLTAGE VERSUS REVERSE CURRENT



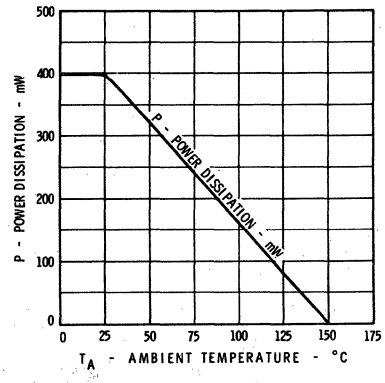
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



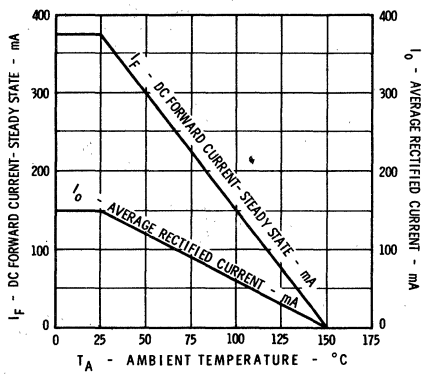
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT VERSUS AMBIENT TEMPERATURE



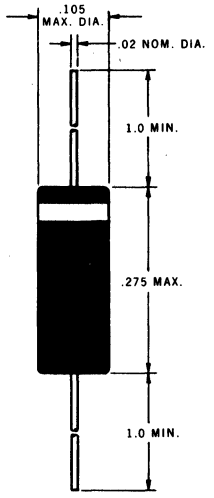
FDR300

RADIATION RESISTANT SILICON PLANAR* RECTIFIER

GENERAL DESCRIPTION —The FDR300 is of special design for radiation resistance, and this unique design permits it to withstand a 5-Amp reverse pulse, to have breakdown voltages as high as 400 volts, and still guarantee forward voltage drop less than 1.5 volts at 100 mA after neutron irradiation of 1×10^{15} nvt.

This high-reliability device is ideal for any application where high-voltage, radiation-tolerant devices are required; such as nuclear propulsion systems, space satellite instrumentation, and nuclear weapon systems.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.
Weight: 0.25 gram.

MAXIMUM RATINGS (25°C)*

WIV	Working Inverse Voltage	250 Volts
I_O	Average Rectified Current	300 mA
I_F	DC Forward Current	450 mA
i_f	Recurrent Peak Forward Current	900 mA
i_f (surge)	Peak Forward Surge Current Pulse Width = 1.0 sec	1000 mA
i_f (surge)	Peak Forward Surge Current Pulse Width = 1.0 μsec	4000 mA
P	Power Dissipation	500 mW
P	Power Dissipation (125°C Ambient)	330 mW
T_A	Operating Temperature	−65°C to +150°C
T_{stg}	Storage Temperature	−65°C to +175°C

ELECTRICAL SPECIFICATIONS PRIOR TO IRRADIATION (25°C Unless Otherwise Noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
V_{F1}	Forward Voltage (−55°C)		1.0	Volts	$I_F = 100$ mA
V_{F2}	Forward Voltage		0.85	Volts	$I_F = 100$ mA
V_{F3}	Forward Voltage (125°C)		0.75	Volts	$I_F = 100$ mA
I_{R1}	Reverse Current		100	nA	$V_R = -250$ Volts
I_{R2}	Reverse Current (125°C)		30	μA	$V_R = -250$ Volts
C	Capacitance		35	pF	$V_R = 0$ V, f = 1.0 MHz
t_{rr}	Reverse Recovery Time		325	ns	$I_F = I_R = 30$ mA, $R_L = 100\ \Omega$, Recovery to 3.0 mA

RADIATION TOLERANCE (See Notes on Back Page)

Radiation Threshold		5.0×10^{14} nvt	$V_F \leqq 1.0$ V at $I_F = 100$ mA
End of Life Dosage	(a)	1.0×10^{15} nvt (at $\geqq$ 10 KeV)	$V_F \leqq 1.5$ V at $I_F = 100$ mA
	(b)	5.0×10^{16} evt (at $\geqq$ 2.0 MeV)	$V_F \leqq 1.5$ V at $I_F = 100$ mA

*The maximum ratings are limiting values above which life or satisfactory performance may be impaired.

*Planar is a patented Fairchild process.

FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

RADIATION RESISTANT SILICON PLANAR RECTIFIER FDR300

DEFINITIONS:

Radiation Threshold:	That radiation dosage above which the electrical parameters of a diode begin to change rapidly.
nvt:	A term defining an integrated dosage of neutron radiation. The number of neutrons per cm^2 with some average velocity for some time period.
evt:	A term defining an integrated dosage of electron radiation. The number of electrons per cm^2 with some average velocity for some time period.
MeV or KeV:	Terms defining the energy level per bombarding particle: MeV = one million electronvolts KeV = one thousand electronvolts

GENERAL EFFECT OF RADIATION ON DIODE PARAMETERS

PARAMETERS	EFFECT
Reverse Current	Increased
Breakdown Voltage	Increased
Reverse Recovery Time	Decreased
Capacitance	Decreased
Forward Voltage	Increased

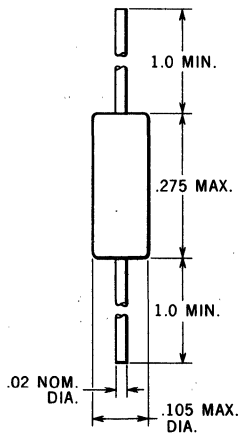
Most radiation effects can be removed by an annealing bake. For neutron radiation, temperatures of 250°C-300°C are required; for electron radiation, temperatures greater than 150°C are required.

FD333

HIGH CONDUCTANCE LOW LEAKAGE PLANAR DIODE

The FD333 is a high conductance extremely low leakage planar diode. Specified maximum values for voltage drop capacitance and leakage current mean flexibility in designing circuits which require large numbers of diodes. In those applications where reverse current is a critical design parameter, the inherent qualities of the Fairchild process eliminate the problem of leakage degradation.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.
See note 3.
Weight: 0.25 gram.

ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	125 V
I_o	Average rectified current	150 mA
I_F	Forward current steady state DC	225 mA
i_f	Recurrent peak forward current	450 mA
i_f (surge)	Peak forward surge current pulse width of 1 second	500 mA
i_f (surge)	Peak forward surge current pulse width of 1 μsec.	4000 mA
P	Power dissipation	500 mW
$\frac{1}{\theta}$	Power derating factor	4.0 mW/°C
T_A	Operating temperature	-65°C to +150°C
T_{stg}	Storage temperature, ambient	-65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

Symbol	Characteristic	Min.	Max.	Units	Test Conditions
V_F	Forward Voltage	.90	1.15	V	I_F = 300 mA
V_F	Forward Voltage	.88	1.08	V	I_F = 250 mA
V_F	Forward Voltage	.87	1.05	V	I_F = 200 mA
V_F	Forward Voltage	.86	.97	V	I_F = 150 mA
V_F	Forward Voltage	.83	.94	V	I_F = 100 mA
V_F	Forward Voltage	.80	.89	V	I_F = 50 mA
I_R	Reverse Current		3	nA	V_R = -125 V
I_R (100°C)	Reverse Current		500	nA	V_R = -125 V
C_o (note 2)	Capacitance		10	pf	V_R = 0 V
BV	Breakdown Voltage	150		V	I_R = 5 μA

NOTES:

(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.

(2) Capacitance as measured on Boonton Electronic Corporation Model No. 75A-S8 Capacitance Bridge or equivalent.

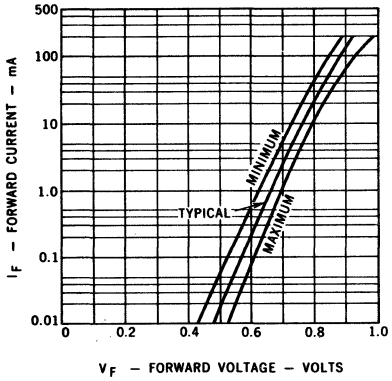
(3) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

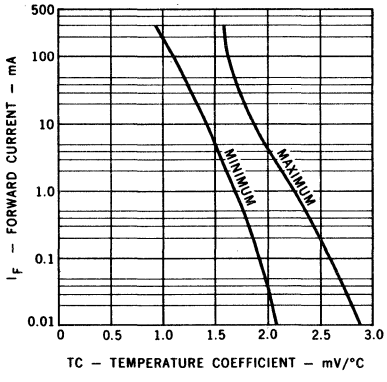
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

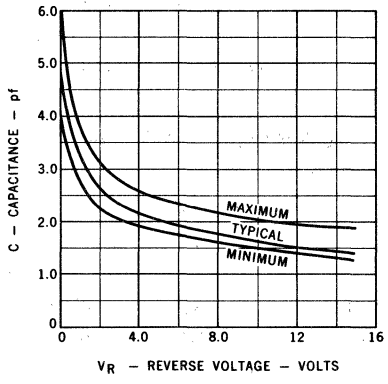
FORWARD VOLTAGE VERSUS FORWARD CURRENT



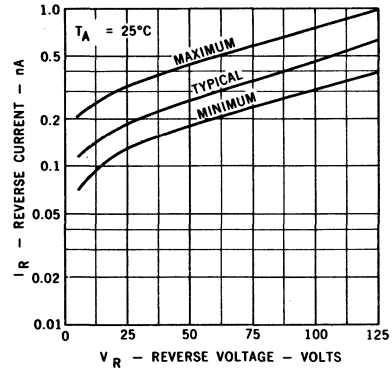
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



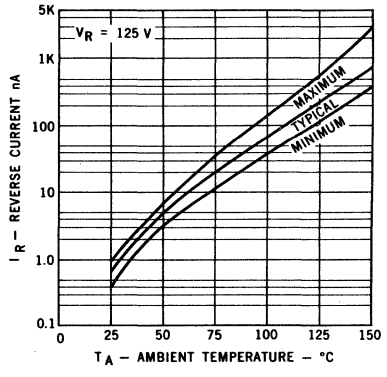
CAPACITANCE VERSUS REVERSE VOLTAGE



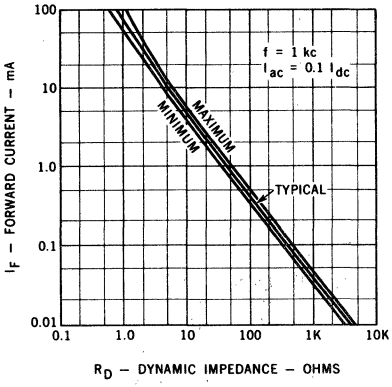
REVERSE VOLTAGE VERSUS REVERSE CURRENT



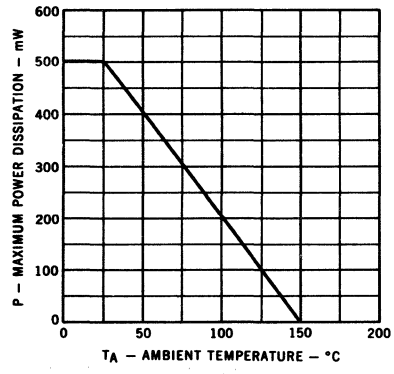
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



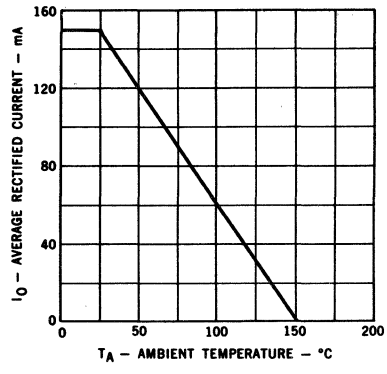
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



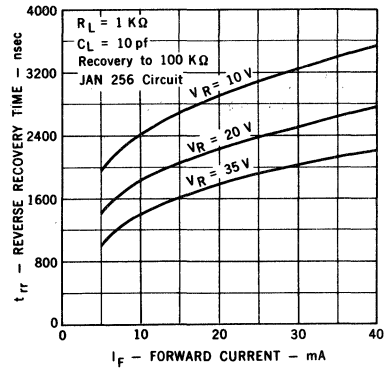
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT AND REVERSE BIAS VOLTAGE

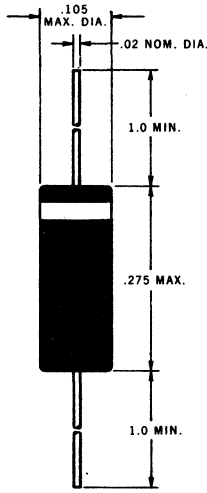


1N456

HIGH CONDUCTANCE, LOW LEAKAGE, PLANAR* DIODE

GENERAL DESCRIPTION — The 1N456 is a high conductance, extremely low-leakage, planar* diode. Specified maximum values for voltage drop, capacitance, and leakage current mean flexibility in designing circuits which require large numbers of diodes. In those applications where reverse current is a critical design parameter, the inherent qualities of the Fairchild process eliminate the problem of leakage degradation.

PHYSICAL DIMENSIONS



NOTE: All dimensions in inches
See note 2.
Weight: 0.25 gram.

ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working inverse voltage	25 V
I_O	Average rectified current	90 mA
I_F	DC forward current	135 mA
i_f	Recurrent peak forward current	450 mA
i_f(surge)	Peak forward surge current pulse width of 1 second	700 mA
i_f(surge)	Peak forward surge current pulse width of 2 μs	1200 mA
P	Power dissipation	200 mW
$1/\theta$	Power derating factor	1.6 mW/°C
T_A	Operating temperature	−65°C to +150°C
T_{stg}	Storage temperature, ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
B_V	Breakdown Voltage	30		V	$I_R = 100\ \mu A$
I_{R1}	Reverse Current		25	nA	$V_R = 25$ V
I_{R2}	Reverse Current (+150°C)		5	μA	$V_R = 25$ V
V_F	Forward Voltage		1.0	V	$I_F = 40$ mA
C	Capacitance		10	pF	$V_R = 0$ V

*Planar is a patented Fairchild process.

NOTES:

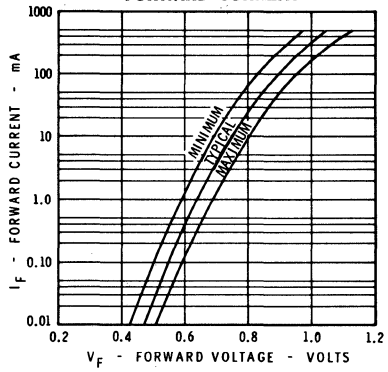
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

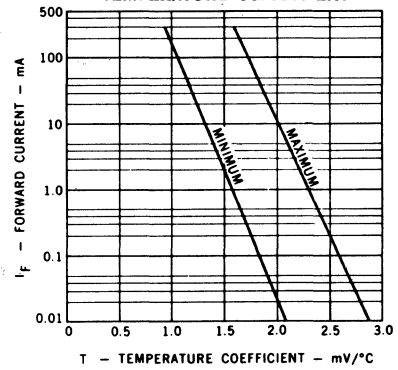
FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

TYPICAL ELECTRICAL CHARACTERISTICS

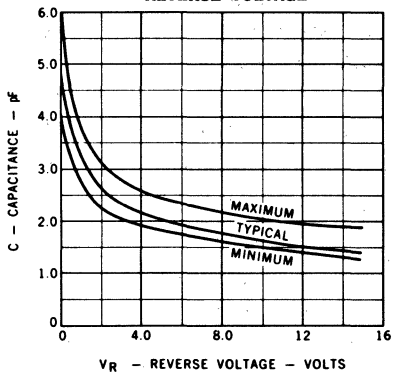
FORWARD VOLTAGE VERSUS FORWARD CURRENT



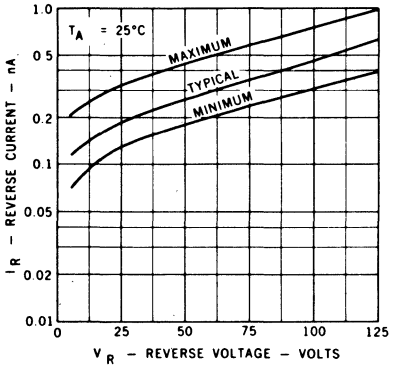
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



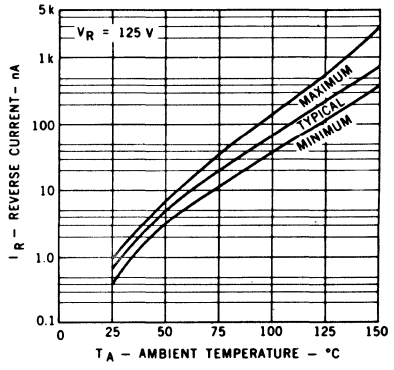
CAPACITANCE VERSUS REVERSE VOLTAGE



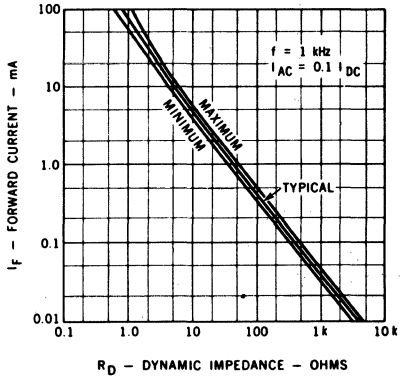
REVERSE VOLTAGE VERSUS REVERSE CURRENT



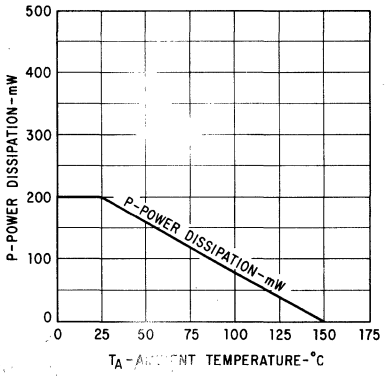
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



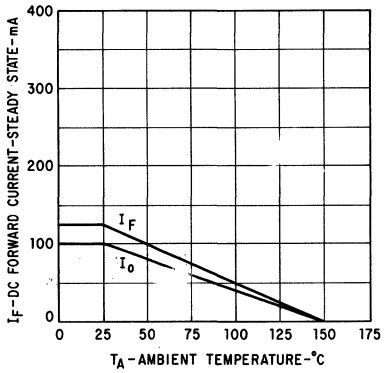
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT VERSUS AMBIENT TEMPERATURE



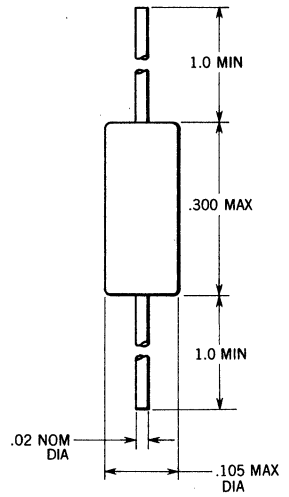
1N457

LOW LEAKAGE PLANAR* DIODE

MAXIMUM RATINGS (25°C) [Note 1]

WIV	Working Inverse Voltage	60 V
I_o	Average Rectified Current	75 mA
i_F	Forward Current steady state d.c.	140 mA
I_f	Recurrent Peak Forward Current	225 mA
i_f (surge)	Peak Forward Surge Current Pulse Width of 1 second	500 mA
i_f (surge)	Peak Forward Surge Current Pulse Width of 1 microsecond	2 A
P	Power Dissipation	400 mW
T_A	Operating Temperature	− 65°C to + 150°C
T_{stg}	Storage Temperature, ambient	− 65°C to + 175°C

PHYSICAL DIMENSIONS
(All dimensions in inches)



ELECTRICAL SPECIFICATIONS (25°C unless otherwise noted)

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
V_F	Forward Voltage			1.0	Volts	$I_F = 20$ mA
I_R	Reverse Current			25	nA	$V_R = -60$ V
I_R	Reverse Current (150°C)			5.0	μA	$V_R = -60$ V
BV	Breakdown Voltage	70			Volts	$I_R = 100$ μA
C_o	Capacitance (f = 1 MHz) [Note 2]			6.0	pF	$V_R = 0$ V

*Planar is a patented Fairchild process.

NOTES:
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Capacitance as measured on Boonton Electronic Corporation Model No. 75A-S8 Capacitance Bridge or equivalent.

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

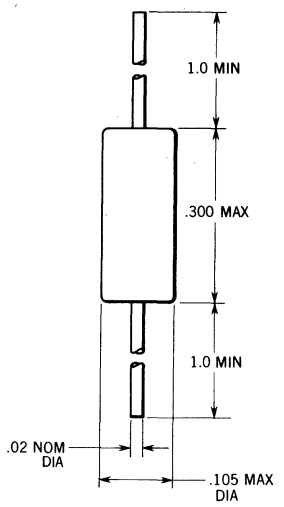
FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

1N458
LOW LEAKAGE PLANAR* DIODE

MAXIMUM RATINGS (25°C) [Note 1]

WIV	Working Inverse Voltage	125 V
I_o	Average rectified current	55 mA
i_F	Forward current steady state d.c.	115 mA
I_f	Recurrent peak forward current	175 mA
i_f (surge)	Peak forward surge current pulse width of 1 second	500 mA
i_f (surge)	Peak forward surge current pulse width of 1 μs	2A
P	Power dissipation	400 mW
T_A	Operating temperature	−65°C to +150°C
T_{stg}	Storage temperature, ambient	−65°C to +175°C

PHYSICAL DIMENSIONS
(All dimensions in inches)



ELECTRICAL SPECIFICATIONS (25°C unless otherwise noted)

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
V_F	Forward Voltage			1.0	Volts	$I_F = 7.0$ mA
I_R	Reverse Current			25	nA	$V_R = -125$ V
I_R	Reverse Current (150°C)			5.0	μA	$V_R = -125$ V
BV	Breakdown Voltage	150			Volts	$I_R = 100$ μA
C_o	Capacitance (f = 1 MHz) [Note 2]			6.0	pF	$V_R = 0$ V

* Planar is a patented Fairchild process.

NOTES:
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Capacitance as measured on Boonton Electronic Corporation Model No. 75A-S8 Capacitance Bridge or equivalent.

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

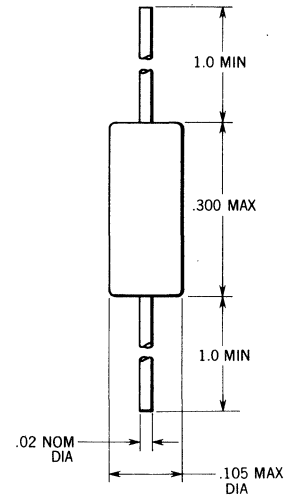
1N459

LOW LEAKAGE PLANAR* DIODES

MAXIMUM RATINGS (25°C) [Note 1]

WIV	Working Inverse Voltage	175 V
I_o	Average rectified current	40 mA
i_F	Forward current steady state d.c.	100 mA
	Recurrent peak forward current	125 mA
i_f (surge)	Peak forward surge current pulse width of 1 second	500 mA
i_f (surge)	Peak forward surge current pulse width of 1 microsecond	2 A
P	Power dissipation	400 mW
T_A	Operating temperature	−65° to +150°C
T_{stg}	Storage temperature, ambient	−65° to +175°C

PHYSICAL DIMENSIONS
(All dimensions in inches)



ELECTRICAL SPECIFICATIONS (25°C unless otherwise noted)

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
V_F	Forward Voltage			1.0	Volts	$I_F = 3.0$ mA
I_R	Reverse Current			25	nA	$V_R = -175$ V
I_R	Reverse Current (150°C)			5.0	μA	$V_R = -175$ V
BV	Breakdown Voltage	200			Volts	$I_R = 100$ μA
C_o	Capacitance (f = 1 MHz) [Note 2]			6.0	pF	$V_R = 0$ V

* Planar is a patented Fairchild process.

NOTES:

(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Capacitance as measured on Boonton Electronic Corporation Model No. 75A-S8 Capacitance Bridge or equivalent.

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

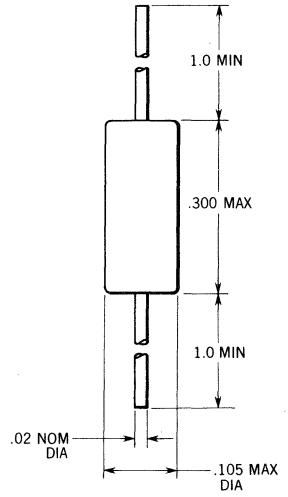
1N485B

LOW LEAKAGE HIGH CONDUCTANCE HIGH VOLTAGE PLANAR* DIODE

MAXIMUM RATINGS (25°C) [Note 1]

WIV	Working Inverse Voltage	175 V
I_O	Average Rectified Current	200 mA
I_F	Forward Current Steady State d.c.	375 mA
I_F	Recurrent Peak Forward Current	450 mA
I_f (surge)	Peak Forward Surge Current Pulse Width of 1 Second	1.0 A
I_f (surge)	Pear Forward Surge Current Pulse Width of 1 μs	4.0 A
P	Power Dissipation	400 mW
T_A	Operating Temperature	− 65°C to + 150°C
T_{stg}	Storage Temperature Ambient	− 65°C to + 175°C

PHYSICAL DIMENSIONS
(All dimensions in inches)



ELECTRICAL SPECIFICATIONS (25°C unless otherwise noted)

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	TEST CONDITIONS
V_F	Forward Voltage			1.0 V	$I_F = 100$ mA
I_R	Reverse Current			25 nA	$V_R = -175$ V
I_R	Reverse Current (150°C)			5.0 μA	$V_R = -175$ V
B_V	Breakdown Voltage	200 V			$I_R = 100$ μA
C_o [Note 2]	Capacitance			6.0 pF	$V_R = 0$ V

*Planar is a patented Fairchild process.

NOTES:
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Capacitance as measured on Boonton Electronic Corporation Model No. 75A-S8 Capacitance Bridge or equivalent.

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

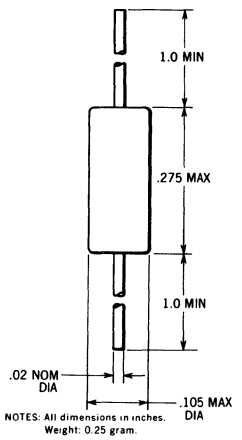
FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

FD600

HIGH CONDUCTANCE, ULTRA-FAST PLANAR EPITAXIAL DIODE

GENERAL DESCRIPTION - The FD600 is a silicon planar epitaxial diode that provides low capacitance, high conductance, and fast reverse recovery. With these features, the device is ideally suited for applications such as core devices, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities.

PHYSICAL DIMENSIONS



MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	50 Volts
I_o	Average Rectified Current	200 mA
i_f	Recurrent Peak Forward Current	600 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 second	1 Amp
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 μsec	4 Amps
P	Power Dissipation	400 mW
P	Power Dissipation	170 mW at 125°C
T_A	Operating Temperature	-65°C to +150°C
T_{stg}	Storage Temperature, Ambient	-65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

Symbol	FACT Subgroup	Characteristic	Min.	Max.	Units	Test Conditions
*V_F	1a	Forward Voltage	0.87	1.00		I_F = 200 mA
V_F	1b	Forward Voltage	0.82	0.92		I_F = 100 mA
V_F	1b	Forward Voltage	0.76	0.86		I_F = 50 mA
V_F	1b	Forward Voltage	0.66	0.74		I_F = 10 mA
V_F	1b	Forward Voltage	0.54	0.62		I_F = 1 mA
I_R	1a	Reverse Current		0.1	μA	V_R = -50 V
I_R	1a	Reverse Current (150°C)		100	μA	V_R = -50 V
BV	1a	Breakdown Voltage	75			I_R = 5 μA
t_{rr}	1a	Reverse Recovery Time (Note 2)		4.0	ns	I_F = I_R = 10-200 mA RL = 100 Ω
t_{rr}	1a	Reverse Recovery Time (Note 2)		6.0	ns	I_F = I_R = 200-400 mA RL = 100 Ω
C_o	1a	Capacitance (Note 3)		2.5	pF	V_R = 0 V, f = 1 MHz
$\Delta VF/°C$		Change of Forward Voltage per Degree Change in Temperature		-1.8 mV/°C Typical		

NOTES:

(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.

(2) Recovery to 0.1 I_R

(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75-AS8 Capacitance Bridge or equivalent.

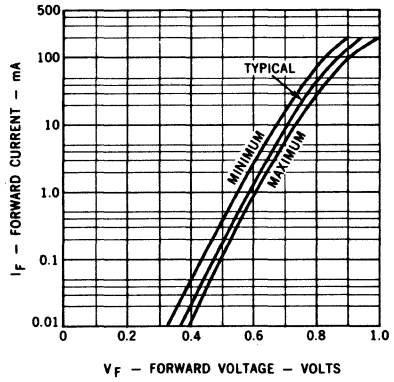
(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

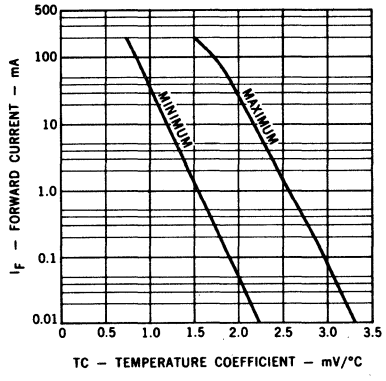
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

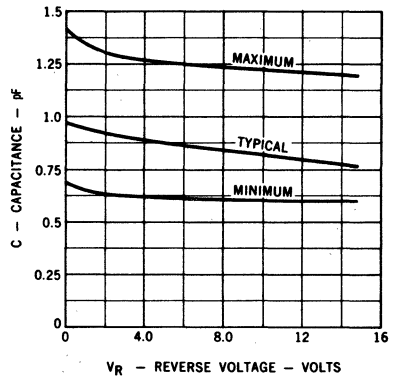
FORWARD VOLTAGE VERSUS FORWARD CURRENT



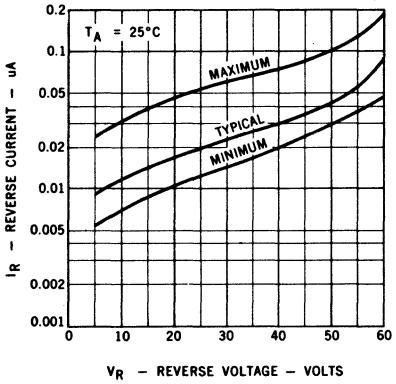
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



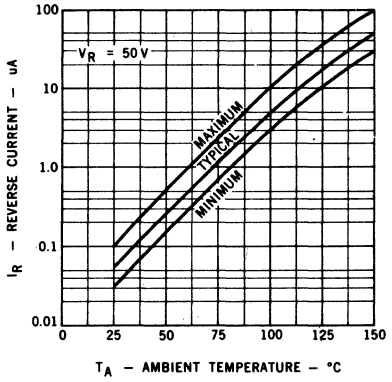
CAPACITANCE VERSUS REVERSE VOLTAGE



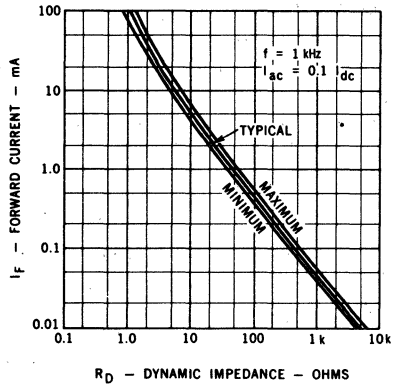
REVERSE VOLTAGE VERSUS REVERSE CURRENT



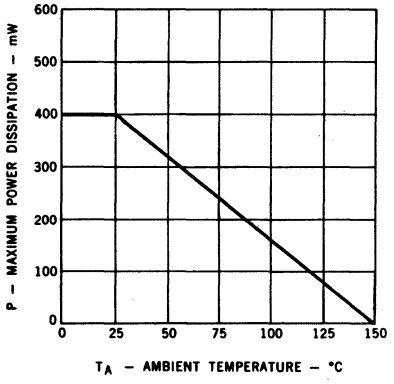
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



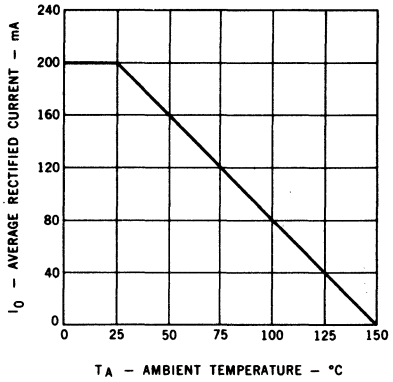
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



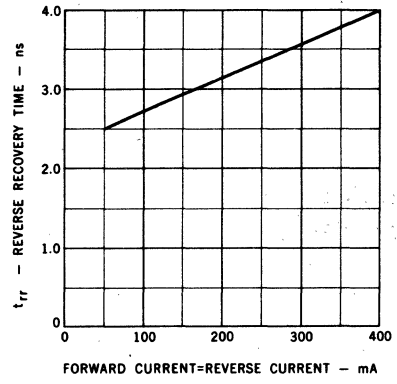
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT ($I_F = I_R$)

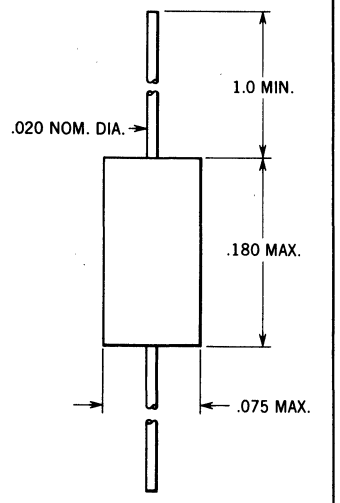


FDH600

MINIATURE SIZE, HIGH CONDUCTANCE, ULTRA-FAST PLANAR* EPITAXIAL DIODE

GENERAL DESCRIPTION – The miniature FDH600 is a silicon planar epitaxial diode that provides low capacitance, high conductance, and fast reverse recovery. With these features, the device is ideally suited for applications such as core devices, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities. Miniature package and high power dissipation are the interesting features of this device.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.

MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	50 Volts
I_o	Average Rectified Current	200 mA
I_F	DC Forward Current	400 mA
i_f	Recurrent Peak Forward Current	600 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 second	1 A
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 μs	4 A
P	Power Dissipation	400 mW
P	Power Dissipation	100 mW at 125°C
T_A	Operating Temperature	-65°C to +150°C
T_{stg}	Storage Temperature, Ambient	-65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

Symbol	†FACT Subgroup	Characteristic	Min.	Max.	Units	Test Conditions
*V_F	1a	Forward Voltage	0.87	1.00		I_F = 200 mA
V_F	1b	Forward Voltage	0.82	0.92		I_F = 100 mA
V_F	1b	Forward Voltage	0.76	0.86		I_F = 50 mA
V_F	1b	Forward Voltage	0.66	0.74		I_F = 10 mA
V_F	1b	Forward Voltage	0.54	0.62		I_F = 1 mA
*I_R	1a	Reverse Current		0.1	μA	V_R = -50 V
I_R	1a	Reverse Current (150°C)		100	μA	V_R = -50 V
**BV	1a	Breakdown Voltage	75			I_R = 5 μA
t_{rr}	1a	Reverse Recovery Time (Note 2)		4.0	ns	I_F = I_R = 10-200 mA, R_L = 100 Ω
t_{rr}	1a	Reverse Recovery Time (Note 2)		6.0	ns	I_F = I_R = 200-400 mA, R_L = 100 Ω
**C_o	1a	Capacitance (Note 3)		2.5	pF	V_R = 0 V, f = 1 MHz

†These Numerals Apply to the Fairchild FACT Program.

*FACT Program End-Point, Group B, Subgroups, 2, 3, 4, 6, 7.

**FACT Program End-Point, Group B, Subgroups 6, 7 Only.

(See notes on back page)

* Planar is a patented Fairchild process.

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

NOTES:

(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.

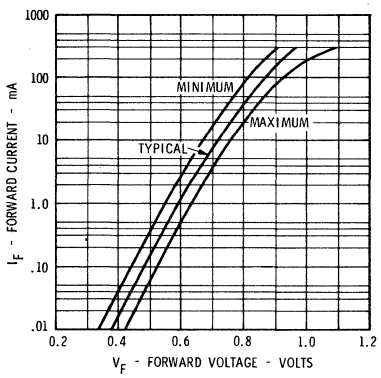
(2) Recovery to 0.1 I_R.

(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75-AS8 Capacitance Bridge or equivalent.

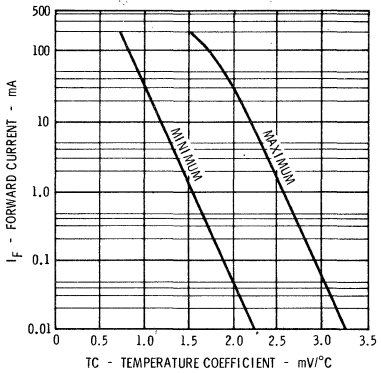
(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

TYPICAL ELECTRICAL CHARACTERISTICS

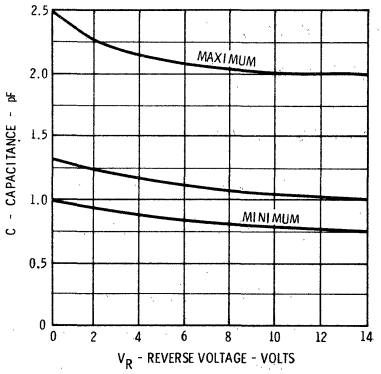
FORWARD VOLTAGE VERSUS FORWARD CURRENT



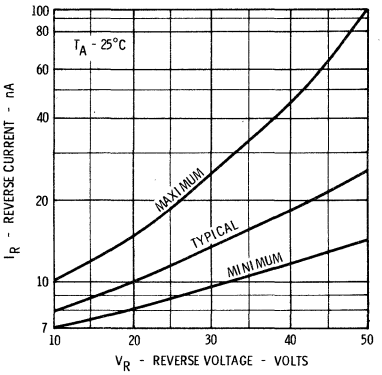
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



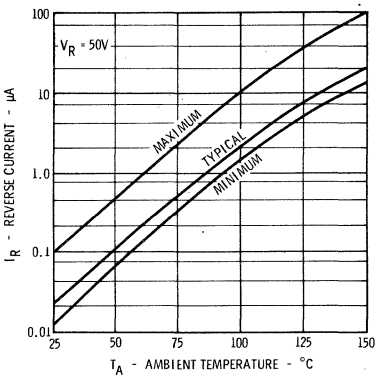
CAPACITANCE VERSUS REVERSE VOLTAGE



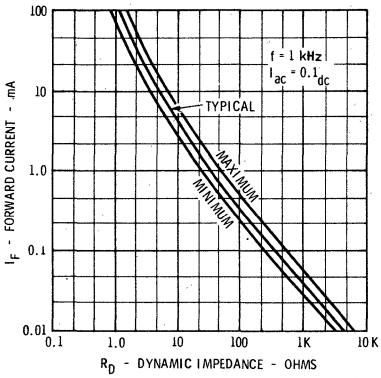
REVERSE CURRENT VERSUS REVERSE VOLTAGE



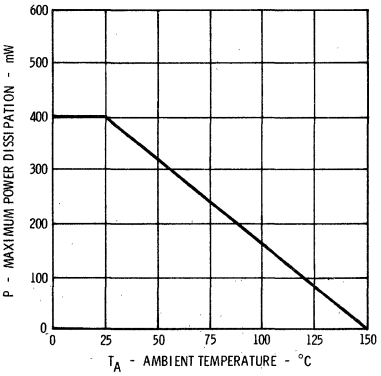
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



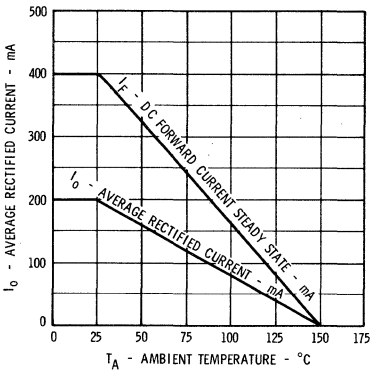
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



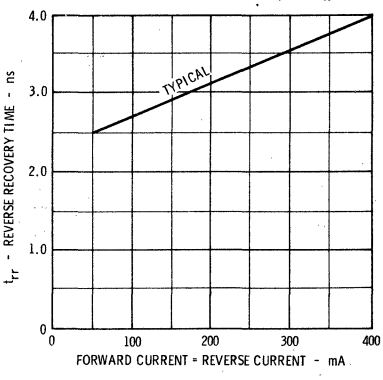
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT AND FORWARD CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT ($I_F = I_R$)

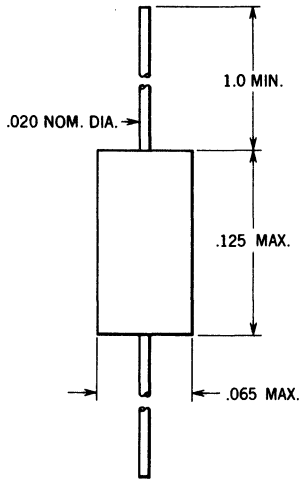


FDN600

ULTRA COMPACT, HIGH CONDUCTANCE, ULTRA-FAST PLANAR* EPITAXIAL DIODE

GENERAL DESCRIPTION – The miniature FDN600 is a silicon planar epitaxial diode that provides low capacitance, high conductance, and fast reverse recovery. With these features, the device is ideally suited for applications such as core devices, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities. Of special interest is the ultra-small size of this device.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.

MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	40 Volts
I_o	Average Rectified Current	125 mA
i_f	Recurrent Peak Forward Current	400 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 second	500 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 μs	2 A
P	Power Dissipation (Package)	350 mW
$1/\theta$	Power Derating Factor	2.8 mW/°C
T_A	Operating Temperature	-65°C to +150°C
T_{stg}	Storage Temperature, Ambient	-65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

Symbol	Characteristic	Min.	Max.	Units	Test Conditions
V_F	Forward Voltage	0.87	1.00		I_F = 200 mA
V_F	Forward Voltage	0.82	0.92		I_F = 100 mA
V_F	Forward Voltage	0.76	0.86		I_F = 50 mA
V_F	Forward Voltage	0.66	0.74		I_F = 10 mA
V_F	Forward Voltage	0.54	0.62		I_F = 1 mA
I_R	Reverse Current		0.1	μA	V_R = -50 V
I_R	Reverse Current (150°C)		100	μA	V_R = -50 V
BV	Breakdown Voltage	75			I_R = 5 μA
t_{rr}	Reverse Recovery Time (Note 2)		4.0	ns	I_F = I_R = 10-200 mA, R_L = 100 Ω
t_{rr}	Reverse Recovery Time (Note 2)		6.0	ns	I_F = I_R = 200-400 mA, R_L = 100 Ω
C_o	Capacitance (Note 3)		2.5	pF	V_R = 0 V, f = 1 MHz

(See notes on back page)

* Planar is a patented Fairchild process.

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

NOTES:

(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.

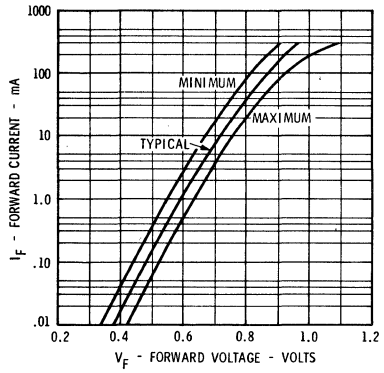
(2) Recovery to 0.1 I_F.

(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75-AS8 Capacitance Bridge or equivalent.

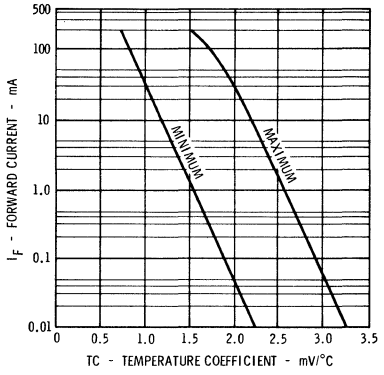
(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

TYPICAL ELECTRICAL CHARACTERISTICS

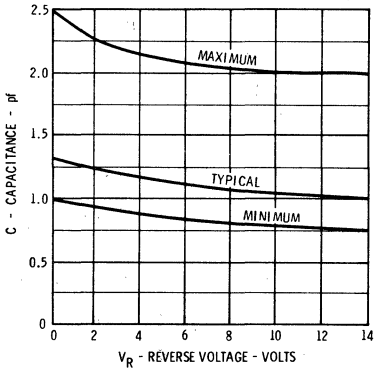
FORWARD VOLTAGE VERSUS FORWARD CURRENT



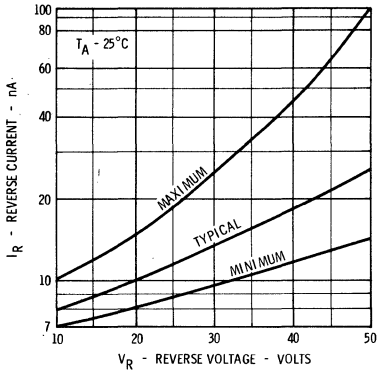
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



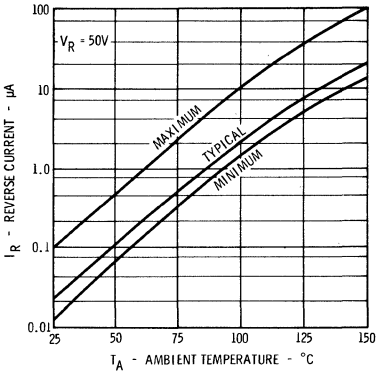
CAPACITANCE VERSUS REVERSE VOLTAGE



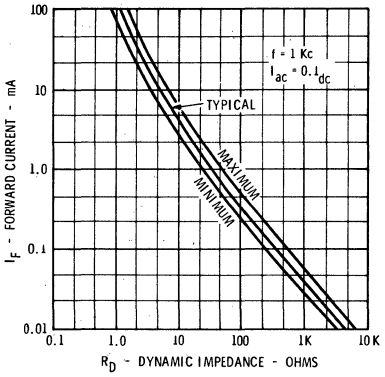
REVERSE CURRENT VERSUS REVERSE VOLTAGE



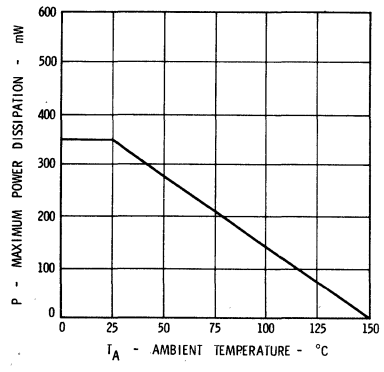
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



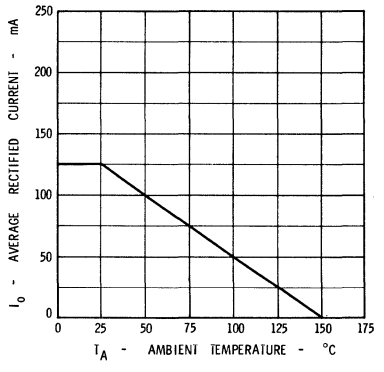
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



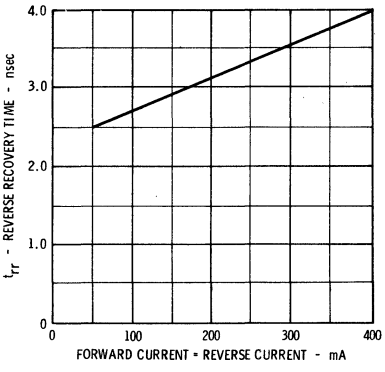
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT ($I_F = I_R$)

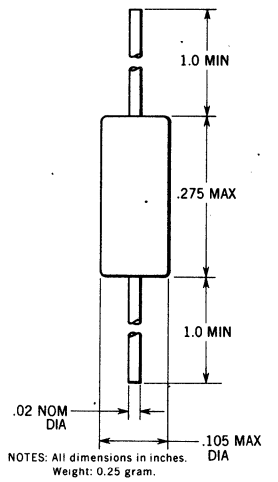


FDR600

RADIATION RESISTANT, HIGH CONDUCTANCE, ULTRA-FAST, PLANAR* EPITAXIAL DIODE

GENERAL DESCRIPTION — The FDR600 is a silicon, planar, epitaxial diode, specially designed to be radiation resistant. This high reliability device provides low capacitance, high conductance, and fast recovery time. It is ideally suited for applications such as nuclear propulsion systems, space satellite instrumentation, and nuclear weapons systems.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.
Weight: 0.25 gram.

MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	50 Volts
I_O	Average Rectified Current	200 mA
I_F	DC Forward Current	400 mA
i_f	Recurrent Peak Forward Current	600 mA
i_f(surge)	Peak Forward Surge Current Pulse Width = 1 sec.	1 A
i_f(surge)	Peak Forward Surge Current Pulse Width = 1 μs	4 A
P	Power Dissipation	500 mW
P	Power Dissipation (125°C Ambient)	100 mW
T_A	Operating Temperature	−65°C to +150°C
T_{stg}	Storage Temperature, Ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C Unless Otherwise Noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
V_{F1}	Forward Voltage	0.87	1.00	Volts	I_F = 200 mA
V_{F2}	Forward Voltage	0.82	0.92	Volts	I_F = 100 mA
V_{F3}	Forward Voltage	0.76	0.86	Volts	I_F = 50 mA
V_{F4}	Forward Voltage	0.66	0.74	Volts	I_F = 10 mA
V_{F5}	Forward Voltage	0.54	0.62	Volts	I_F = 1 mA
I_{R1}	Reverse Current		0.1	μA	V_R = −50 V
I_{R2}	Reverse Current (150°C)		100	μA	V_R = −50 V
BV	Breakdown Voltage	75		Volts	I_R = 5 μA
t_{rr1}	Reverse Recovery Time (Note 2)		4.0	ns	$I_F = I_R$ = 10-200 mA
t_{rr2}	Reverse Recovery Time (Note 2)		6.0	ns	$I_F = I_R$ = 200-400 mA
C	Capacitance (Note 3)		2.5	pF	V_R = 0 V, f = 1 MHz

*Planar is a patented Fairchild process.

RADIATION TOLERANCE (See Notes on Back Page)

Radiation Threshold		1.0×10^{15} nvt	$V_F \leqq 1.0$ V at I_F = 200 mA $I_R \leqq 0.1$ μA at V_R = −50 V
End of Life Dosage	(a)	1.0×10^{15} nvt (at $\geqq$ 10 KeV)	$V_F \leqq 1.0$ V at I_F = 200 mA $I_R \leqq 0.1$ μA at V_R = −50 V
	(b)	5.0×10^{16} evt (at $\geqq$ 2.0 MeV)	$V_F \leqq 1.0$ V at I_F = 200 mA $I_R \leqq 0.1$ μA at V_R = −50 V

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

RADIATION RESISTANT SILICON PLANAR DIODE FDR600

NOTES:

(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 0.1 I_F. $R_L = 100\ \Omega$.
(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75-AS8 Capacitance Bridge or equivalent.
(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

DEFINITIONS:

Radiation Threshold: That radiation dosage above which the electrical parameters of a diode begin to change rapidly.

nvt: A term defining an integrated dosage of neutron radiation. The number of neutrons per cm^2 with some average velocity for some time period.

evt: A term defining an integrated dosage of electron radiation. The number of electrons per cm^2 with some average velocity for some time period.

MeV or KeV: Terms defining the energy level per bombarding particle:

MeV = one million electronvolts
KeV = one thousand electronvolts

GENERAL EFFECT OF RADIATION ON DIODE PARAMETERS

PARAMETERS	EFFECT
Reverse Current	Increased
Breakdown Voltage	Increased
Reverse Recovery Time	Decreased
Capacitance	Decreased
Forward Voltage	Increased

Most radiation effects can be removed by an annealing bake. For neutron radiation, temperatures of 250°C - 300°C are required; for electron radiation, temperatures greater than 150°C are required.

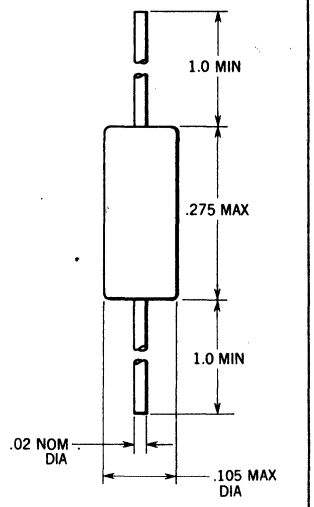
1N658

HIGH CONDUCTANCE, HIGH SPEED PLANAR* DIODE

MAXIMUM RATINGS (25°C) [Note 1]

WIV	Working Inverse Voltage	100 V
I_o	Average Rectified Current	100 mA
I_F	Forward Current Steady State d.c.	150 mA
i_f	Recurrent Peak Forward Current	300 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 second	500 mA
i_f(surge)	Peak Foward Surge Current Pulse Width of 1 μs	2000 mA
P	Power Dissipation	250 mW
P	Power Dissipation	100 mW @ 125°C
T_A	Operating Temperature	−65°C to +175°C
T_{stg}	Storage Temperature, Ambient	−65°C to +200°C

PHYSICAL DIMENSIONS
(All dimensions in inches)



ELECTRICAL SPECIFICATIONS (25°C unless otherwise noted)

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	TEST CONDITIONS
V_F	Forward Voltage			1.0 V	$I_F = 100$ mA
I_R	Reverse Current			0.05 μA	$V_R = -50$ V
I_R	Reverse Current (150°C)			25 μA	$V_R = -50$ V
B_V	Breakdown Voltage	120 V			$I_R = 100$ μA
t_{rr}(Note 2)	Reverse Recovery Time			300 ns	$I_f = 5$ mA $V_r = -40$ V $R_L = 150\ \Omega$

*Planar is a patented Fairchild process.

NOTES:

(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 80K ohms in JAN 258 circuit.

FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

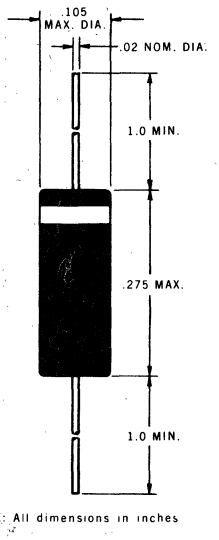
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

1N662

HIGH SPEED, HIGH CONDUCTANCE PLANAR* DIODE

GENERAL DESCRIPTION — The 1N662 is a high conductance ultra-fast planar diode. This device couples high speed with high conductance and high breakdown voltage, and enables the designer to choose a diode with planar reliability to fulfill most general-purpose switching applications.

PHYSICAL DIMENSIONS



SEE NOTE 3

ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working inverse voltage	80 V
I_O	Average rectified current	100 mA
I_F	Forward current steady state DC	340 mA
i_f	Recurrent peak forward current	300 mA
i_f(surge)	Peak forward surge current pulse width of 1.0 second	.5 A
i_f(surge)	Peak forward surge current pulse width of 1.0 μs	2 A
P	Power dissipation	400 mW
$1/\theta$	Power derating factor	3.2 mW/°C
T_A	Operating temperature	−65°C to +150°C
T_{stg}	Storage temperature, ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

SYMBOL	CHARACTRISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
I_{R1}	Reverse Current (+25°C)		20	μA	$V_R = 50$ V
I_{R2}	Reverse Current (+100°C)		100	μA	$V_R = 50$ V
I_{R3}	Reverse Current (+25°C)		1.0	μA	$V_R = 10$ V
I_{R4}	Reverse Current (+100°C)		20	μA	$V_R = 10$ V
V_F	Forward Voltage		1.0	V	$I_F = 10$ mA
BV	Breakdown Voltage	100		V	$I_R = 100$ μA
T_{RR}	Reverse Recovery Time		500	ns	(Note 2)
C	Capacitance		3.0	pF	$V_R = 10$ V

*Planar is a patented Fairchild process.

NOTES:

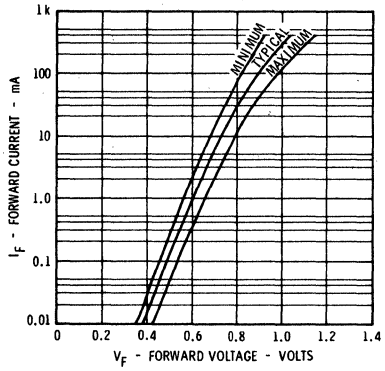
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) $V_R = 40$ V; $I_F = 5$ mA; $R_L = 2.3$ kΩ; $C_L = 40$ pF; Recovery to 100 k.
(3) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

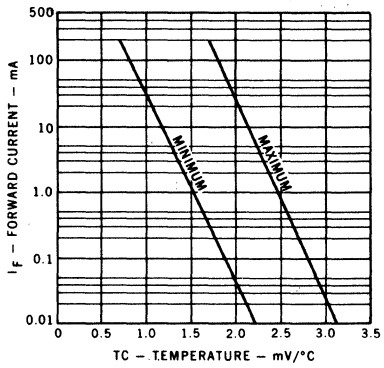
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

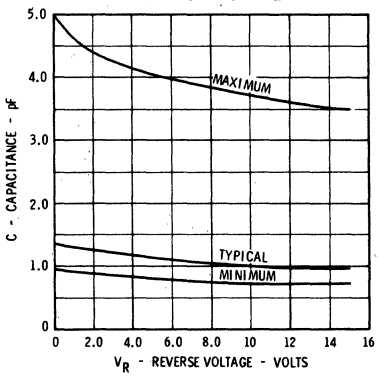
FORWARD VOLTAGE VERSUS FORWARD CURRENT



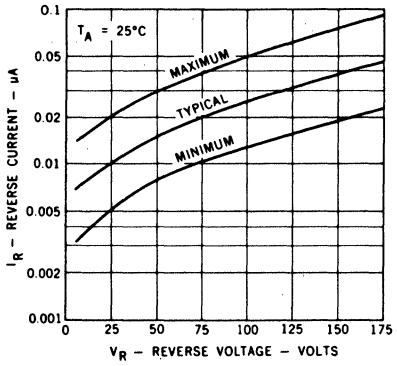
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



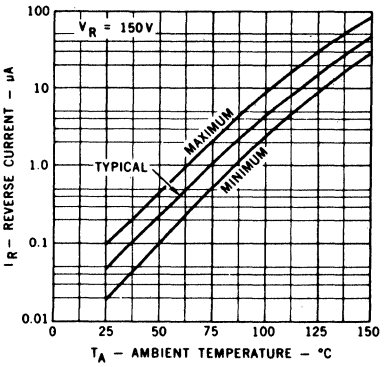
CAPACITANCE VERSUS REVERSE VOLTAGE



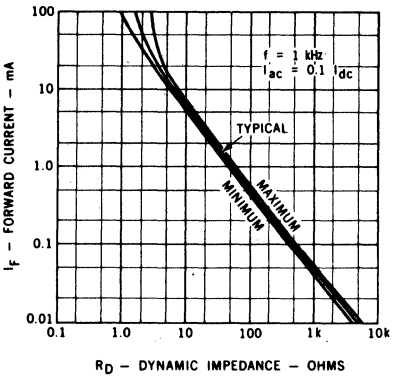
REVERSE CURRENT VERSUS REVERSE VOLTAGE



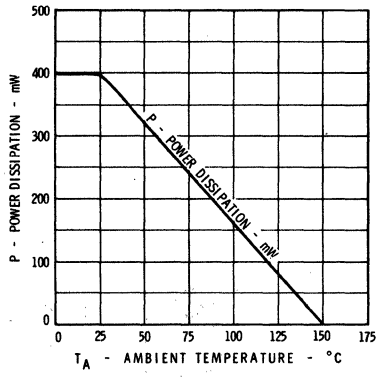
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



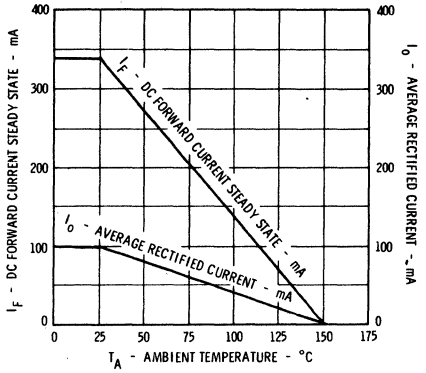
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT VERSUS AMBIENT TEMPERATURE

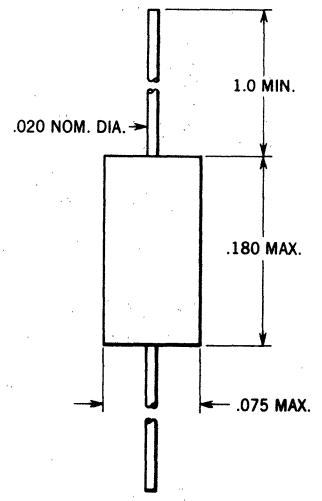


FDH666

MINIATURE SIZE, HIGH CONDUCTANCE, ULTRA-FAST ECONOMICAL PLANAR* EPITAXIAL DIODE

GENERAL DESCRIPTION The miniature FDH666 is a silicon planar epitaxial diode that provides low capacitance, high conductance, and fast reverse recovery. With these features, the device is ideally suited for applications such as core drivers, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities. Miniature package and economy are the interesting features of this device.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.

*Planar is a patented Fairchild process.

MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	25 Volts
I_o	Average Rectified Current	100 mA
I_F	DC Forward Current	200 mA
i_f	Recurrent Peak Forward Current	300 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 second	500 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 μs	2 A
P	Power Dissipation	250 mW
T_A	Operating Temperature	-65°C to +100°C
T_{stg}	Storage Temperature, Ambient	-65°C to +150°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

Symbol	Characteristic	Min.	Max.	Units	Test Conditions
V_F	Forward Voltage		1.00	V	I_F = 100 mA
I_R	Reverse Current		0.1	μA	V_R = -25 V
I_R	Reverse Current (100°C)		100	μA	V_R = -25 V
BV	Breakdown Voltage	40		V	I_R = 5 μA
t_{rr1}	Reverse Recovery Time (Note 2)		4.0	ns	I_F = I_R = 10-200 mA, R_L = 100 Ω
t_{rr2}	Reverse Recovery Time (Note 2)		6.0	ns	I_F = I_R = 200-400 mA, R_L = 100 Ω
C_o	Capacitance (Note 3)		3.5	pF	V_R = 0 V, f = 1 MHz

(See notes on back page)

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

NOTES:

(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.

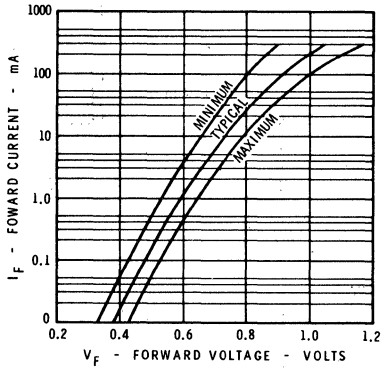
(2) Recovery to 0.1 I_R.

(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75-AS8 Capacitance Bridge or equivalent.

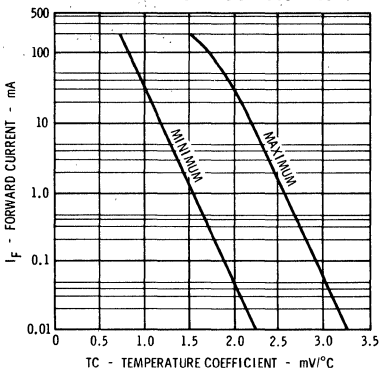
(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

TYPICAL ELECTRICAL CHARACTERISTICS

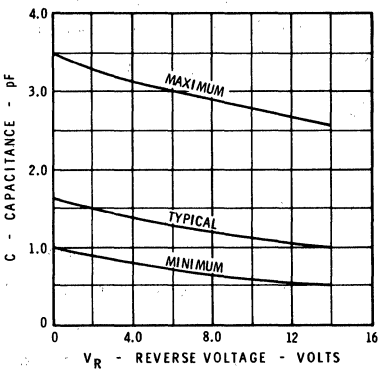
FORWARD VOLTAGE VERSUS FORWARD CURRENT



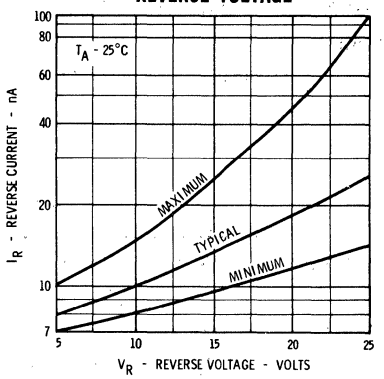
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



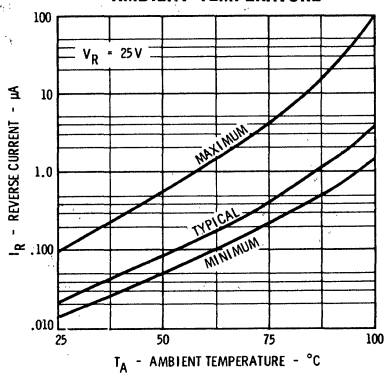
CAPACITANCE VERSUS REVERSE VOLTAGE



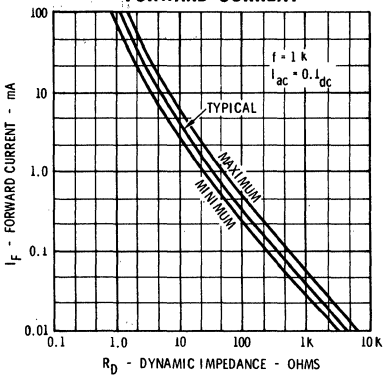
REVERSE CURRENT VERSUS REVERSE VOLTAGE



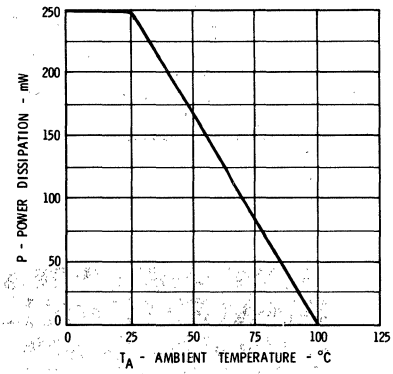
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



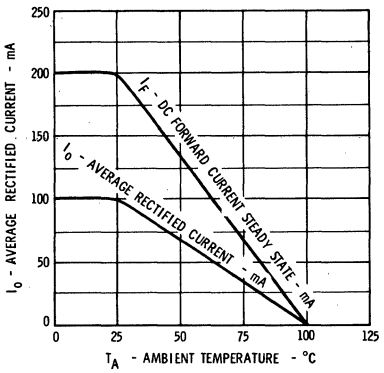
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



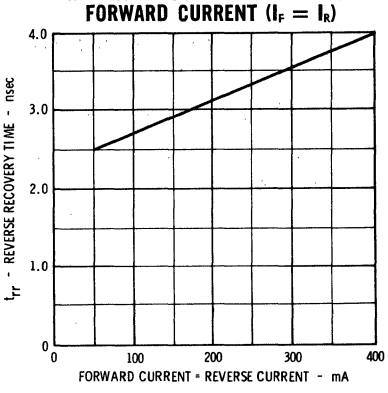
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT AND FORWARD CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT ($I_F = I_R$)

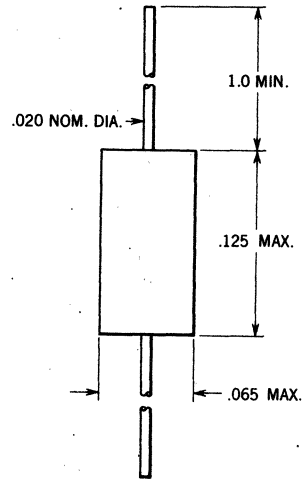


FDN666

ULTRA COMPACT, HIGH CONDUCTANCE, ULTRA-FAST ECONOMICAL PLANAR* EPITAXIAL DIODE

GENERAL DESCRIPTION - The miniature FDN666 is a silicon planar epitaxial diode that provides low capacitance, high conductance, and fast reverse recovery. With these features, the device is ideally suited for applications such as core drivers, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities. Miniature package and economy are the interesting features of this device.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.

MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	25 Volts
I_o	Average Rectified Current	100 mA
i_f	Recurrent Peak Forward Current	200 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 second	400 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 μs	1 A
P	Power Dissipation (Package)	250 mW
T_A	Operating Temperature	-65°C to +100°C
T_{stg}	Storage Temperature, Ambient	-65°C to +150°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

Symbol	Characteristic	Min.	Max.	Units	Test Conditions
V_F	Forward Voltage		1.00	V	I_F = 100 mA
I_R	Reverse Current		0.1	μA	V_R = -25 V
I_R	Reverse Current (100°C)		100	μA	V_R = -25 V
BV	Breakdown Voltage	40		V	I_R = 5 μA
t_{rr1}	Reverse Recovery Time (Note 2)		4.0	ns	I_F = I_R = 10-200 mA, R_L = 100 Ω
t_{rr2}	Reverse Recovery Time (Note 2)		6.0	ns	I_F = I_R = 200-400 mA, R_L = 100 Ω
C_o	Capacitance (Note 3)		3.5	pF	V_R = 0 V, f = 1 MHz

(see notes on back page)

* Planar is a patented Fairchild process.

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

NOTES:

(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.

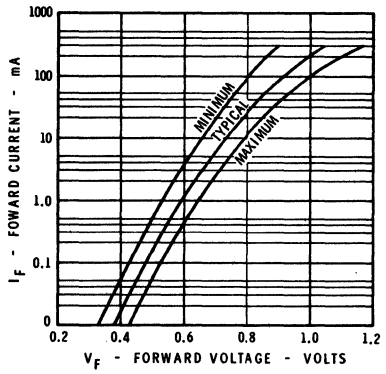
(2) Recovery to 0.1 I_F.

(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75-AS8 Capacitance Bridge or equivalent.

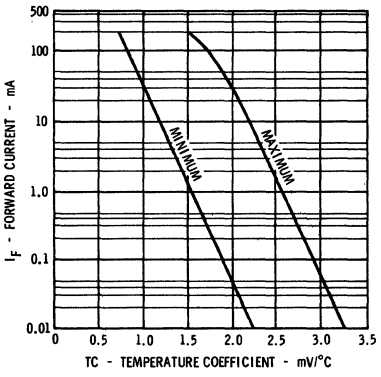
(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

TYPICAL ELECTRICAL CHARACTERISTICS

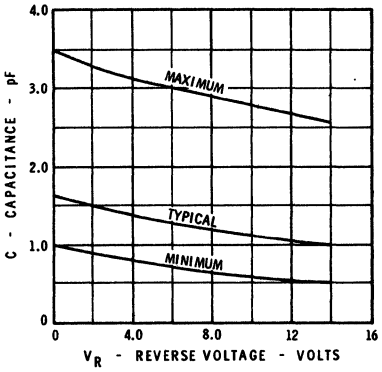
FORWARD VOLTAGE VERSUS FORWARD CURRENT



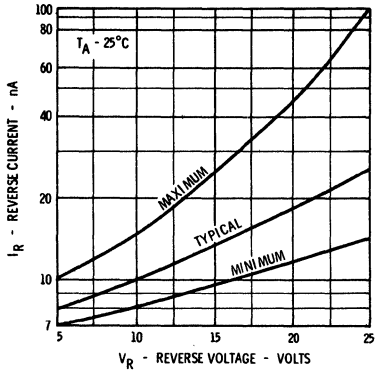
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



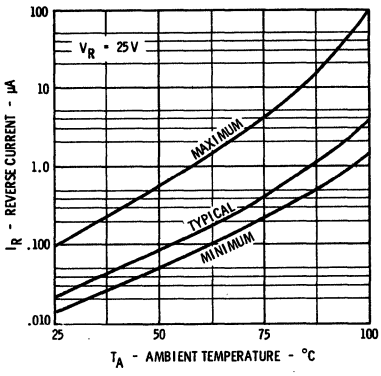
CAPACITANCE VERSUS REVERSE VOLTAGE



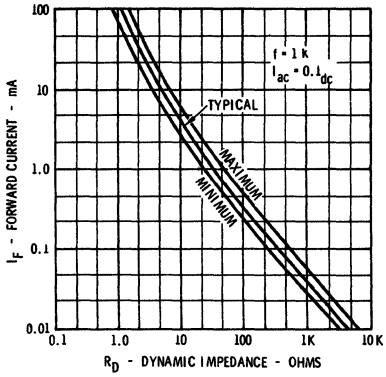
REVERSE CURRENT VERSUS REVERSE VOLTAGE



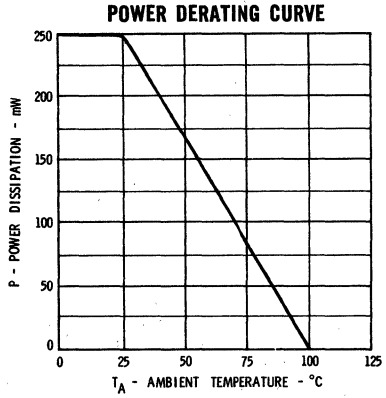
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



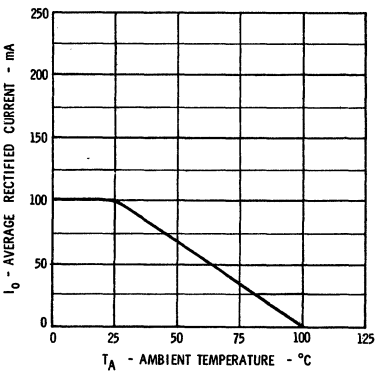
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



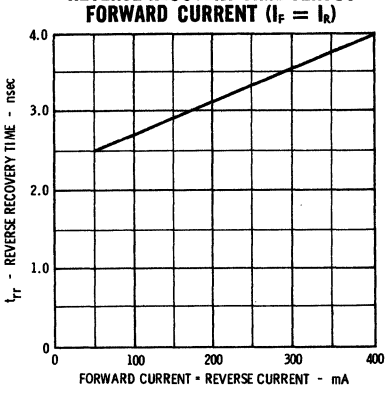
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT (I_F = I_R)

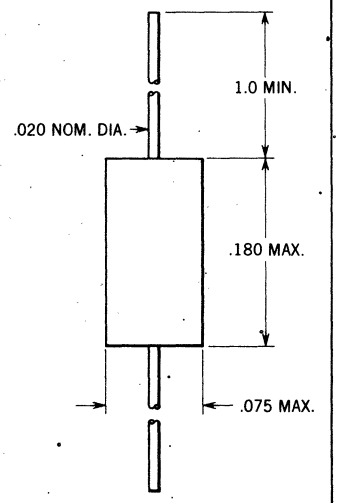


FDH694

MINIATURE SIZE, HIGH CONDUCTANCE, ULTRA-FAST ECONOMICAL PLANAR* EPITAXIAL DIODE

GENERAL DESCRIPTION — The miniature FDH694 is a silicon planar epitaxial diode that provides high conductance and fast reverse recovery. With these features, the device is ideally suited for applications such as core drivers, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities. Miniature package and economy are the interesting features of this device.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.

MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	25 Volts
I_O	Average rectified current	100 mA
I_F	DC Forward Current	200 mA
i_f	Recurrent peak forward current	300 mA
i_f(surge)	Peak forward surge current pulse width of 1 second	500 mA
i_f(surge)	Peak forward surge current pulse width of 1 μs	2 A
P	Power dissipation	250 mW
T_A	Operating temperature	−65°C to +100°C
T_{stg}	Storage temperature, ambient	−65°C to +150°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
V_F	Forward Voltage		1.00	V	$I_F = 100$ mA
I_R	Reverse Current		0.1	μA	$V_R = -25$ V
I_R	Reverse Current (+100°C)		100	μA	$V_R = -25$ V
BV	Breakdown Voltage	35		V	$I_R = 5\ \mu$A
t_{rr1}	Reverse Recovery Time (Note 2)		4.0	ns	$I_F = I_R = 10$-200 mA, $R_L = 100\ \Omega$
t_{rr2}	Reverse Recovery Time (Note 2)		6.0	ns	$I_F = I_R = 200$-400 mA, $R_L = 100\ \Omega$
C_o	Capacitance (Note 3)		5	pF	$V_R = 0$ V, f = 1 MHz

*Planar is a patented Fairchild process.

NOTES:

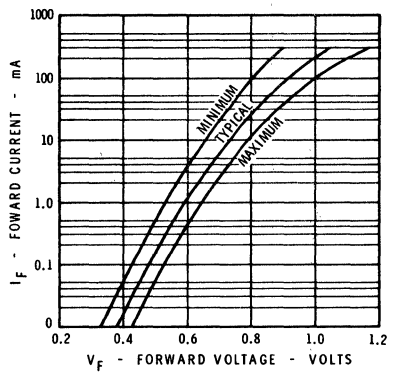
1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
2) Recovery to 0.1 I_F.
3) Capacitance as measured on Boonton Electronic Corporation Model No. 75-AS8 Capacitance Bridge or equivalent.
4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

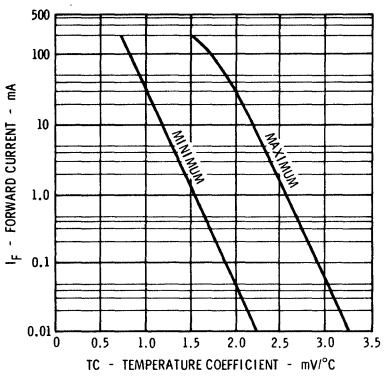
FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

TYPICAL ELECTRICAL CHARACTERISTICS

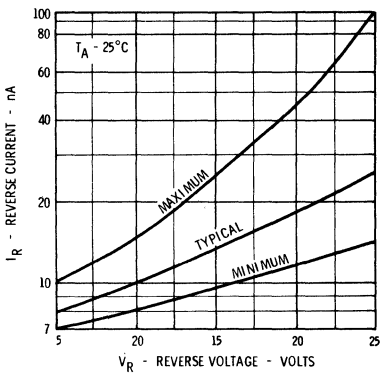
FORWARD VOLTAGE VERSUS FORWARD CURRENT



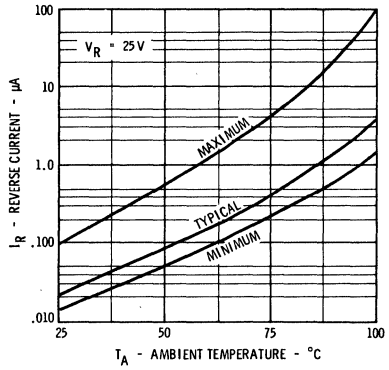
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



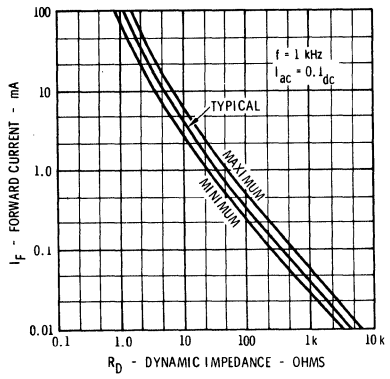
REVERSE CURRENT VERSUS REVERSE VOLTAGE



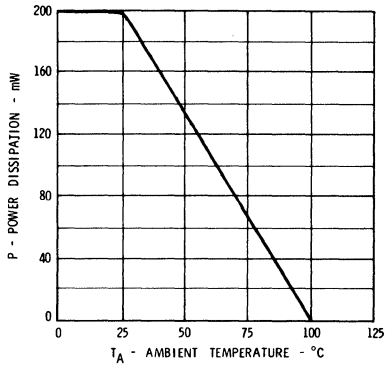
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



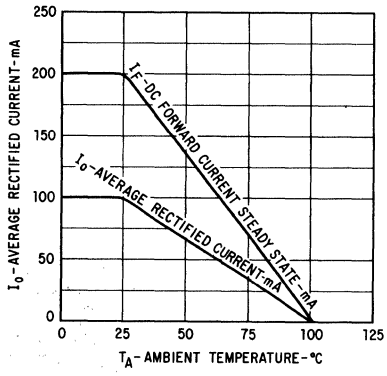
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



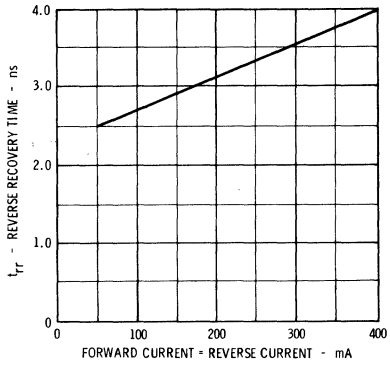
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT AND FORWARD CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT ($I_F = I_R$)



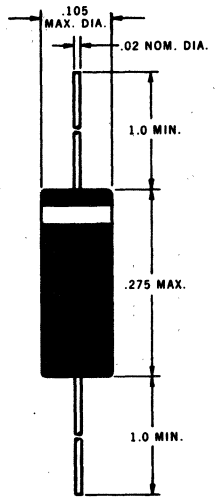
FD700

PICO-SECOND COMPUTER DIODE

GENERAL DESCRIPTION

The FD700 is a silicon planar epitaxial diode providing features necessary for ultra high speed logic circuitry: low capacitance, pico-second recovery times and controlled forward conductance. The planar process ensures the stability of surface-dependent characteristics against change with time. This factor, coupled with the most advanced manufacturing techniques, guarantees the circuit designer continuing reliability in production quantities.

PHYSICAL DIMENSIONS



NOTE: All dimensions in inches
See note 4.
Weight: 0.25 gram.

MAXIMUM RATINGS (25°C) [Note 1]

WIV	Working inverse voltage	20 V
I_o	Average rectified current	50 mA
I_F	Forward current steady state d. c.	150 mA
i_f	Recurrent peak forward current	150 mA
i_f **(surge)**	Peak forward surge current, pulse width 1 second.	250 mA
P	Power dissipation	250 mW
$1/\theta$	Power derating factor	2 mW/°C
T_A	Operating temperature	−65°C to +150°C
T_{stg}	Storage temperature, ambient	−65°C to +175°C

ELECTRICAL SPECIFICATIONS (25°C unless otherwise noted)

Symbol	†FACT Subgroup	Characteristic	Min.	Max.	Units	Test Conditions
*V_{F1}	1a	Forward Voltage	.89	1.1	Vdc	I_F = 50 mA
V_{F2}	1b	Forward Voltage	.81	.95	Vdc	I_F = 20 mA
V_{F3}	1b	Forward Voltage	.76	.88	Vdc	I_F = 10 mA
V_{F4}	1b	Forward Voltage	.64	.74	Vdc	I_F = 1 mA
V_{F5}	1b	Forward Voltage	.52	.61	Vdc	I_F = 0.1 mA
V_{F6}	1b	Forward Voltage	.42	.50	Vdc	I_F = 0.01 mA
**BV	1a	Breakdown Voltage	30		Vdc	I_R = 5 μA
*I_{R1}	1a	Reverse Current		50	nA	V_R = 20 V
I_{R2}	1a	Reverse Current (150°C)		50	μA	V_R = 20 V
τ		Minority Carrier Lifetime		450	ps	See Note 2
t_{rr}	1a	Reverse Recovery Time [Note 3]		700	ps	$I_F = I_R$ = 10 mA, RL = 100 Ω
**C	1a	Capacitance		.75	pF	V_R = 0, f = 1 MHz

† These numerals apply to the FACT program.

* FACT end point, Group B, Subgroup 2, 3, 4, 6, 7.

** FACT end point, Group B, Subgroup 6, 7 only.

NOTES:

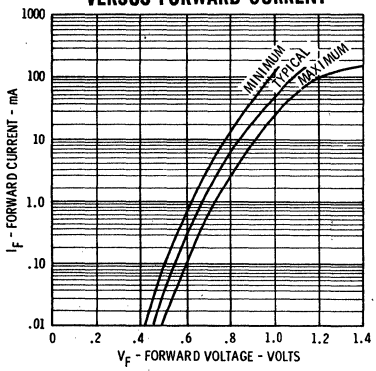
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Measured as suggested by S. M. Krakauer, IRE Proceedings, Volume 60, July 1962, pp 1674–1675.
(3) Recovery to 0.1 I_R.
(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

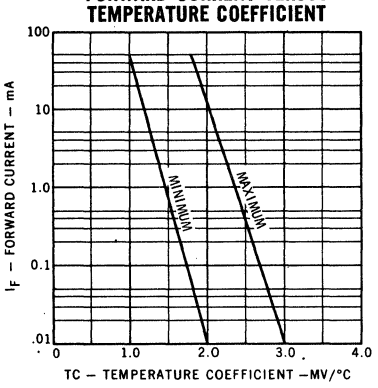
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

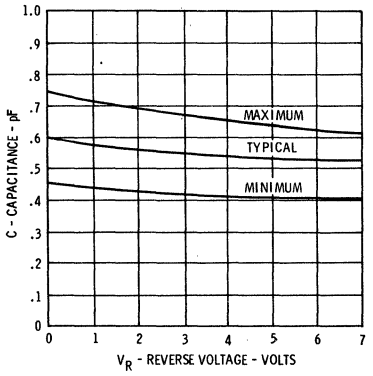
FORWARD VOLTAGE VERSUS FORWARD CURRENT



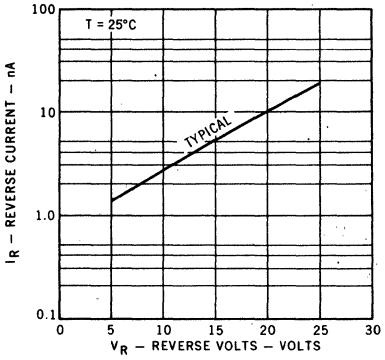
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



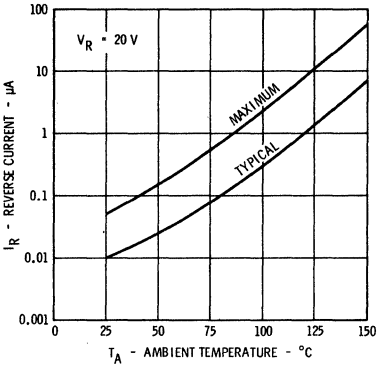
CAPACITANCE VERSUS REVERSE VOLTAGE



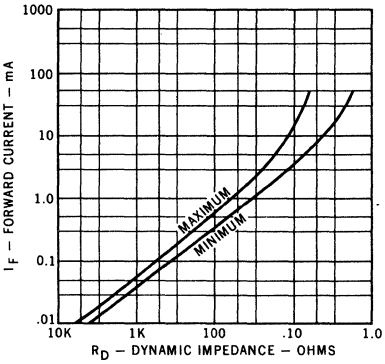
REVERSE VOLTAGE VERSUS REVERSE CURRENT



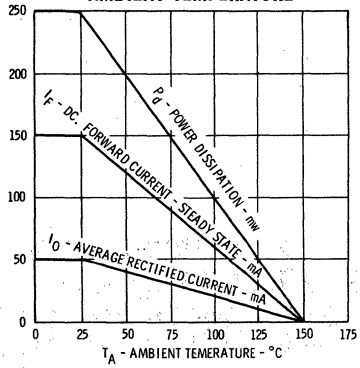
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



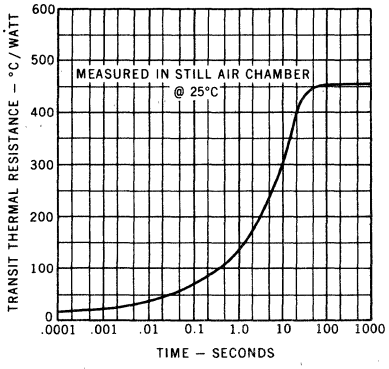
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



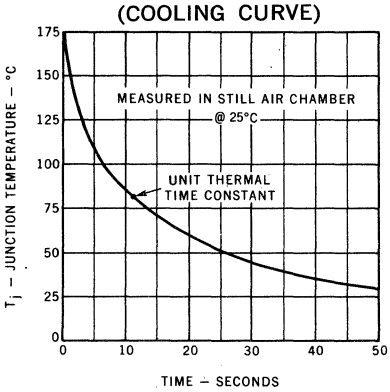
POWER DISSIPATION, AVERAGE RECTIFIED CURRENT AND FORWARD CURRENT VS AMBIENT TEMPERATURE



TRANSIENT THERMAL RESISTANCE VERSUS TIME



JUNCTION TEMPERATURE VERSUS TIME (COOLING CURVE)

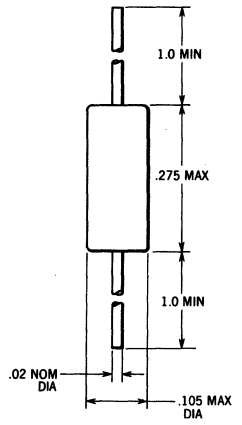


FDR700

RADIATION RESISTANT, PICOSECOND COMPUTER DIODE

GENERAL DESCRIPTION — The FDR700 is a silicon, planar*, epitaxial diode, specially designed to be radiation resistant. This high reliability device provides low capacitance, controlled forward conductance, and ultra fast reverse recovery time. It is ideally suited for applications such as nuclear propulsion systems, space satellite instrumentation, and nuclear weapons systems.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.
Weight: 0.25 gram.

MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	20 Volts
I_O	Average Rectified Current	50 mA
I_F	DC Forward Current	150 mA
i_f	Recurrent Peak Forward Current	150 mA
i_f(surge)	Peak Forward Surge Current Pulse Width = 1 sec.	250 mA
P	Power Dissipation	250 mW
$1/\theta$	Power Derating Factor	2 mW/°C
T_A	Operating Temperature	−65°C to +150°C
T_{stg}	Storage Temperature	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C Unless Otherwise Noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
V_{F1}	Forward Voltage	.89	1.10	Volts	$I_F = 50$ mA
V_{F2}	Forward Voltage	.81	.95	Volts	$I_F = 20$ mA
V_{F3}	Forward Voltage	.76	.88	Volts	$I_F = 10$ mA
V_{F4}	Forward Voltage	.64	.74	Volts	$I_F = 1$ mA
V_{F5}	Forward Voltage	.52	.61	Volts	$I_F = 0.1$ mA
V_{F6}	Forward Voltage	.42	.50	Volts	$I_F = 0.01$/mA
BV	Breakdown Voltage	30		Volts	$I_R = 5\ \mu$A
I_{R1}	Reverse Current		50	nA	$V_R = 20$ V
I_{R2}	Reverse Current (150°C)		50	μA	$V_R = 20$ V
τ	Minority Carrier Lifetime		450	ps	See Note 2
t_{rr}	Reverse Recovery Time (Note 3)		700	ps	$I_F = I_R = 10$ mA RL = 100 Ω
C	Capacitance (Note 4)		.75	pF	$V_R = 0$ V, f = 1 MHz

*Planar is a patented Fairchild process.

RADIATION TOLERANCE (See Notes on Back Page.)

Radiation Threshold	1.0×10^{15} nvt	$V_F \leqq 1.1$ V at $I_F = 50$ mA $I_R \leqq 50$ nA at $V_R = -10$V
End of Life Dosage	1.0×10^{15} nvt (at ≧ 10 KeV)	$V_F \leqq 1.1$ V at $I_F = 50$ mA $I_R \leqq 50$ nA at $V_R = -10$V
	5.0×10^{16} evt (at ≧ 2.0 MeV)	$V_F \leqq 1.1$ V at $I_F = 50$ mA $I_R \leqq 50$ nA at $V_R = -10$V

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

RADIATION RESISTANT SILICON PLANAR DIODE FDR700

NOTES:

(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Measured as suggested by S. M. Krakauer, IRE Proceedings, Volume 60, July 1962, pp. 1674-1675.
(3) Recovery to 0.1 I_F.
(4) Capacitance as measured on Boonton Electronic Corporation Model No. 75-AS8 Capacitance Bridge or equivalent.
(5) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

DEFINITIONS:

Radiation Threshold: That radiation dosage above which the electrical parameters of a diode begin to change rapidly.

nvt: A term defining an integrated dosage of neutron radiation. The number of neutrons per cm^2 with some average velocity for some time period.

evt: A term defining an integrated dosage of electron radiation. The number of electrons per cm^2 with some average velocity for some time period.

MeV or KeV: Terms defining the energy level per bombarding particle:

MeV = one million electronvolts
KeV = one thousand electronvolts

GENERAL EFFECT OF RADIATION ON DIODE PARAMETERS

PARAMETERS	EFFECT
Reverse Current	Increased
Breakdown Voltage	Increased
Reverse Recovery Time	Decreased
Capacitance	Decreased
Forward Voltage	Increased

Most radiation effects can be removed by an annealing bake. For neutron radiation, temperatures of 250°C - 300°C are required; for electron radiation, temperatures greater than 150°C are required.

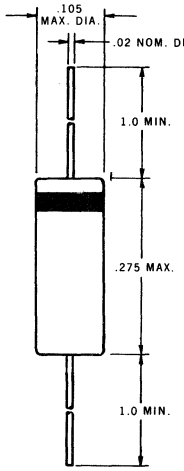
FD777

PICO-SECOND COMPUTER DIODE

GENERAL DESCRIPTION — The FD777 is a silicon, planar, epitaxial diode providing features necessary for ultra high speed computer logic circuitry; low capacitance, picosecond recovery times and controlled forward conductance. The planar process ensures the stability of surface-dependent characteristics against change with time. This factor, coupled with the most advanced manufacturing techniques, guarantees the circuit designer continuing reliability in production quantities.

PHYSICAL DIMENSIONS

DO-7 PACKAGE



NOTE: All dimensions in inches. See note 4

MAXIMUM RATINGS (25°C) [Note 1]

WIV	Working Inverse Voltage	8 V
I_O	Average rectified current	50 mA
I_F	Forward current steady state DC	150 mA
i_f	Recurrent peak forward current	150 mA
i_f (surge)	Peak forward surge current, pulse width of 1.0 second	250 mA
P	Power dissipation	250 mW
$1/\theta$	Power derating factor	2 mW/°C
T_A	Operating temperature	−65°C to +150°C
T_{stg}	Storage temperature, ambient	−65°C to +175°C

ELECTRICAL SPECIFICATIONS (25°C unless otherwise noted)

SYMBOL	†FACT Subgroup	CHARACTERISTIC	MIN.	MAX.	UNITS	TEST CONDITIONS
*V_{F1}	1a	Forward Voltage	.89	1.35	Vdc	I_F = 50 mA
V_{F2}	1b	Forward Voltage	.81	1.0	Vdc	I_F = 20 mA
V_{F3}	1b	Forward Voltage	.76	.94	Vdc	I_F = 10 mA
V_{F4}	1b	Forward Voltage	.64	.79	Vdc	I_F = 1 mA
V_{F5}	1b	Forward Voltage	.52	.64	Vdc	I_F = 0.1 mA
V_{F6}	1b	Forward Voltage	.42	.53	Vdc	I_F = 0.01 mA
**BV	1a	Breakdown Voltage	15		Vdc	I_R = 5 μA
*I_{R1}	1a	Reverse Current		100	nA	V_R = 8 V
I_{R2}	1a	Reverse Current (150°C)		50	μA	V_R = 8 V
τ		Minority Carrier Lifetime		450	ps	See Note 2
t_{rr}	1a	Reverse Recovery Time [Note 3]		750	ps	$I_F = I_R$ = 10 mA, RL = 100 Ω
**C	1a	Capacitance		1.3	pF	V_R = 0, f=1.0MHz

† These numerals apply to the FACT program.
* FACT end point, Group B, Subgroup 2, 3, 4, 6, 7.
** FACT end point, Group B, Subgroup 6, 7 only.

NOTES:
1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
2) Measured as suggested by S. M. Krakauer, IRE Proceedings, Volume 60, July 1962, pp 1674-1675.
3) Recovery to 0.1 I_R.
4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

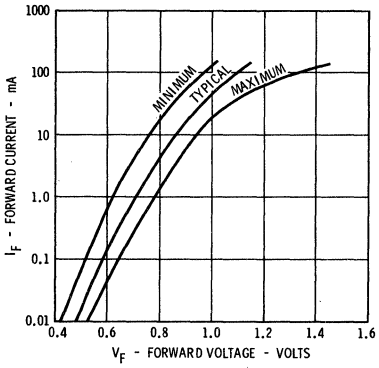
* Planar is a patented Fairchild process.

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

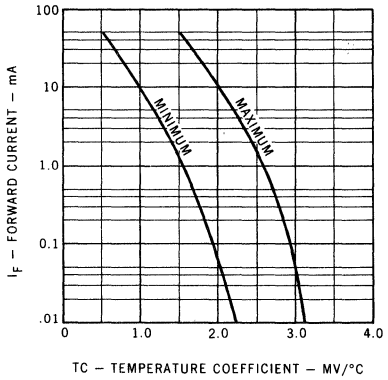
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

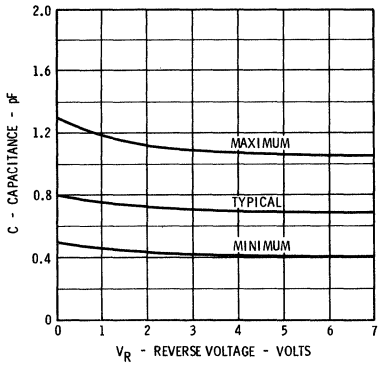
FORWARD CURRENT VERSUS FORWARD VOLTAGE



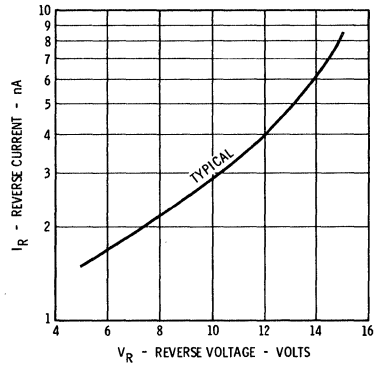
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



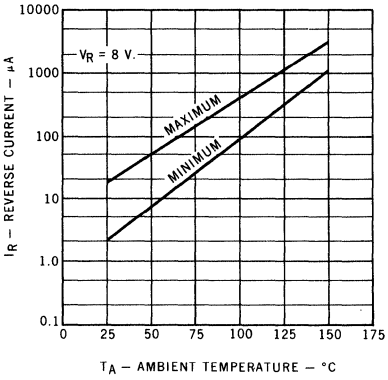
CAPACITANCE VERSUS REVERSE VOLTAGE



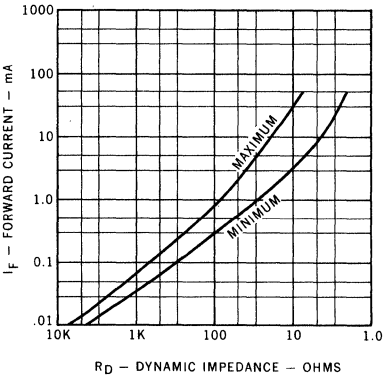
REVERSE CURRENT VERSUS REVERSE VOLTAGE



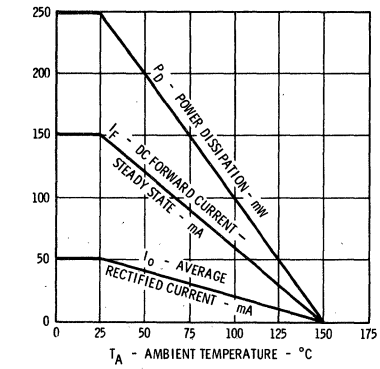
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



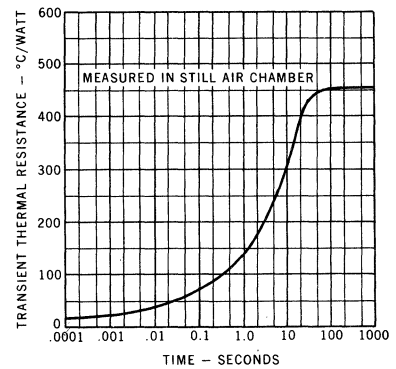
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



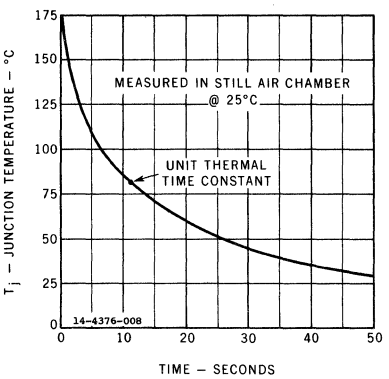
POWER DISSIPATION AND AVERAGE RECTIFIED CURRENT VERSUS AMBIENT TEMPERATURE



TRANSIENT THERMAL RESISTANCE VERSUS TIME



JUNCTION TEMPERATURE VERSUS TIME (COOLING CURVE)

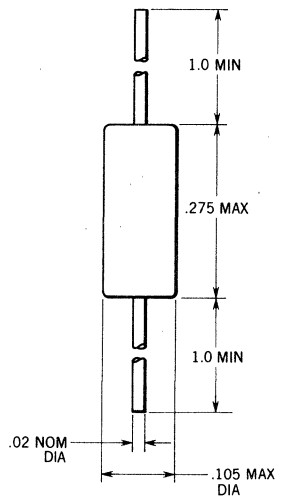


1N914
ULTRA FAST PLANAR* DIODE

MAXIMUM RATINGS (25°C) [Note 1]

WIV	Working Inverse Voltage	20 V
I_O	Average Rectified Current	50 mA
I_F	Forward Current Steady State d.c.	75 mA
I_F	Recurrent Peak Forward Current	150 mA
$i_{f(surge)}$	Peak Forward Surge Current Pulse Width of 1 Second	500 mA
$i_{f(surge)}$	Peak Foward Surge Current Pulse Width of 1 μs	2000 mA
P	Power Dissipation	250 mW
P	Power Dissipation	100 mW at 125°C
T_A	Operating Temperature	−65° to +175°C
T_{stg}	Storage Temperature, Ambient	−65° to +175°C

PHYSICAL DIMENSIONS
(All dimensions in inches)



ELECTRICAL SPECIFICATIONS (25°C unless otherwise noted)

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	TEST CONDITIONS
V_F	Forward Voltage			1.0 V	$I_F = 10$ mA
I_R	Reverse Current			25 NA	$V_R = -20$ V
I_R	Reverse Current (150°C)			50 μA	$V_R = -20$ V
BV	Breakdown Voltage	75 V		50 μA	$I_R = -25$ μA
BV	Breakdown Voltage	100V			$I_R = 100$ μA
t_{rr} (Note 2)	Reverse Recovery Time			4.0 ns	$I_F = 10$ mA $V_R = 6$ V
V_F (Note 5)	Peak forward recovery voltage			2.5 V	$I_F = 50$ mA pulse
C_O (Note 3)	Capacitance			4.0 pF	$V_R = 0$V f = 1
R_E (Note 4)	Rectification Efficiency 45%				f = 100 MHz
ΔV_F/°C	Forward Voltage Temperature Coefficient		−1.8mV/°C		

*Planar is a patented Fairchild process.

NOTES:

(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 1 mA.
(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75A-S8 Capacitance Bridge or equivalent.
(4) Rectification efficiency is defined as the ratio of D.C. load voltage to peak rf input voltage to the detector circuit, measured with 2.0 V r.m.s. input to the circuit. Load resistance 5k ohms, load capacitance 20 pF.
(5) Pulse width = 0.1 μs; Rise time of pulse equal to or less than 25 ns. Repetition rate 5 - 100 kHz.

FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

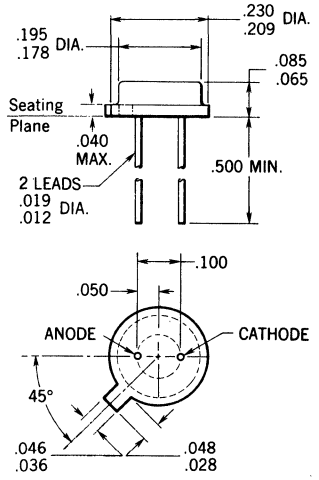
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

FJT1000

SILICON PLANAR* PICO AMPERE DIODE

GENERAL DESCRIPTION — The Fairchild Pico Ampere Diode is characterized by extremely low leakage currents over a wide temperature range. Principal applications are in the protection of FET's; Logarithmic Generators; Sample and Hold Circuits; Peak Follower Circuits; Time Delay Circuits and Operational Amplifier Clamping.

PHYSICAL DIMENSIONS
similar to
JEDEC (TO-46) outline



NOTES: All dimensions in inches
Leads are gold-plated Kovar
Cathode connected to case
Package weight is 0.36 gram

MAXIMUM RATINGS (Note 1)

I_F	Forward Current	100 mA
P	Power Dissipation	125 mW
T_o	Operating Temperature	−55°C to +125°C
T_{stg}	Storage Temperature	−55°C to +125°C
I_Z	Zener Current	2.0 mA

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	PARAMETERS	MIN.	MAX.	UNITS	TEST CONDITIONS
BV	Breakdown Voltage	35		Volts	$I_R = 1.0\ \mu A$
I_R	Reverse Current		5.0	pA	$V_R = 5.0$ V
I_R	Reverse Current		10	pA	$V_R = 20$ V
I_R	Reverse Current		500	pA	$V_R = 5.0$ V, $T_A = 80°C$
V_F	Forward Voltage		1.0	Volts	$I_F = 10$ mA
C	Capacitance		1.3	pF	$V_R = 0$ V, f = 1.0 MHz
t_{rr}	Reverse Recovery Time		250	ns	$I_F = I_R = 10$ mA, $I_{RR} = 1.0$ mA

*Planar is a patented Fairchild process.

NOTES:
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.

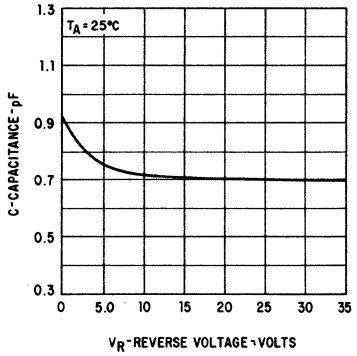
FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

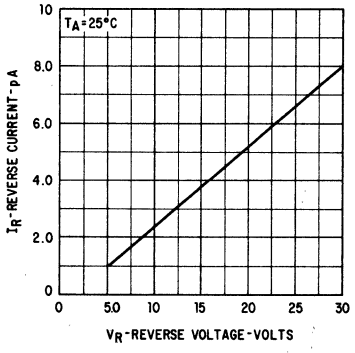
FAIRCHILD PICO AMPERE DIODE FJT1000

TYPICAL ELECTRICAL CHARACTERISTICS

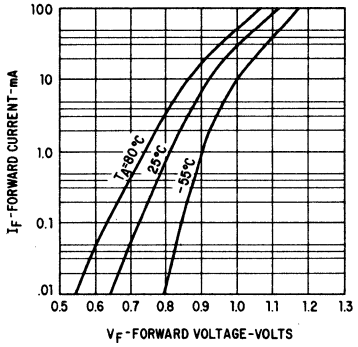
CAPACITANCE VERSUS REVERSE VOLTAGE



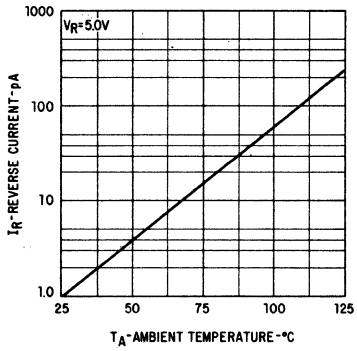
REVERSE CURRENT VERSUS REVERSE VOLTAGE



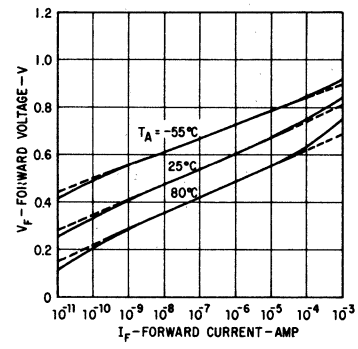
FORWARD CURRENT VERSUS FORWARD VOLTAGE



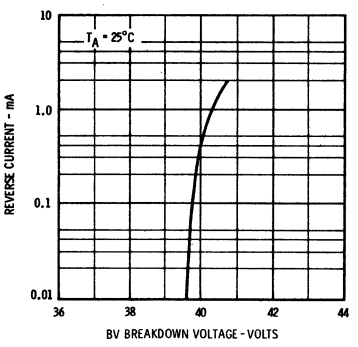
REVERSE CURRENT VERSUS TEMPERATURE



FORWARD VOLTAGE VERSUS FORWARD CURRENT



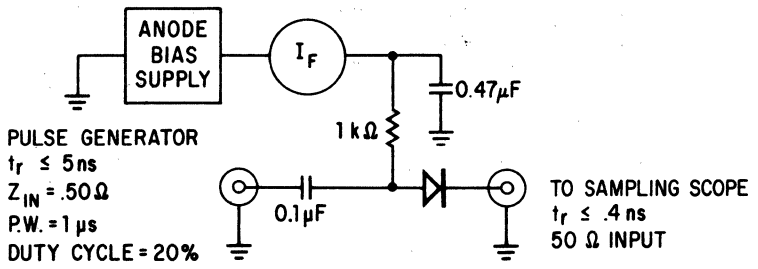
TYPICAL CURRENT VOLTAGE CHARACTERISTICS IN THE BREAKDOWN REGION

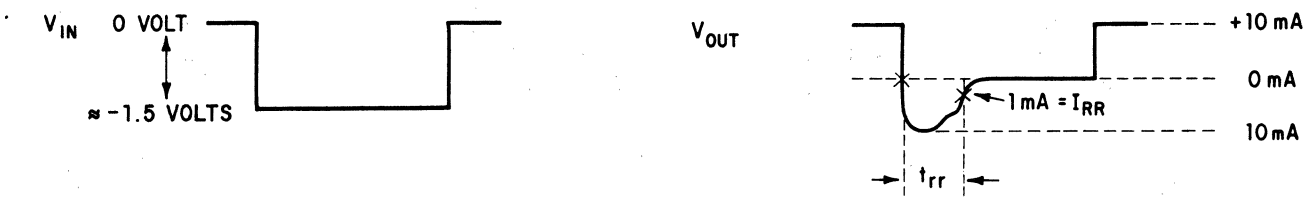


PICO AMP DIODE FJT1000 REVERSE RECOVERY TIME (t_{rr}) TEST CIRCUIT

CONDITION: $I_F = I_R = 10$ mA

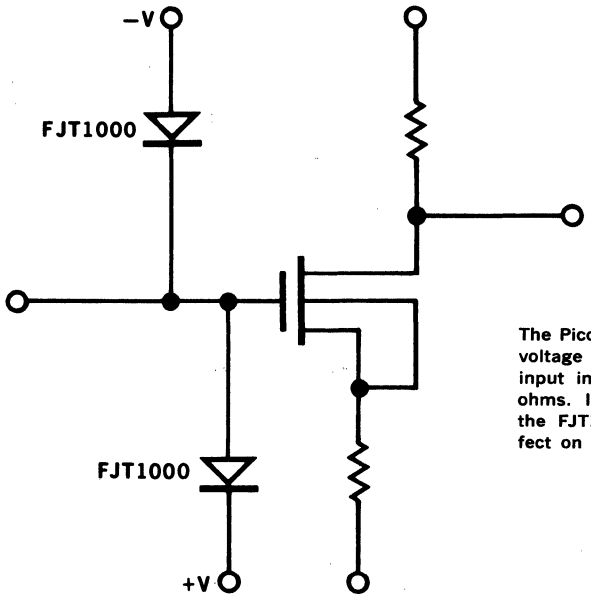
MEASUREMENT $I_{RR} = 1$mA





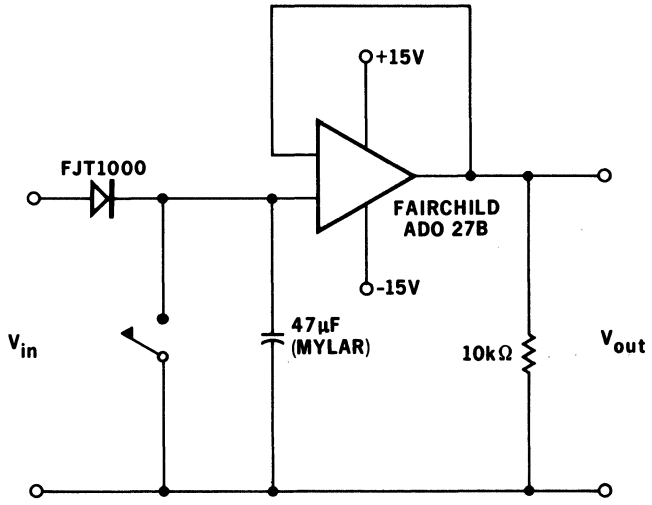
FAIRCHILD PICO AMPERE DIODE FJT1000

MOS FET PROTECTION CIRCUIT

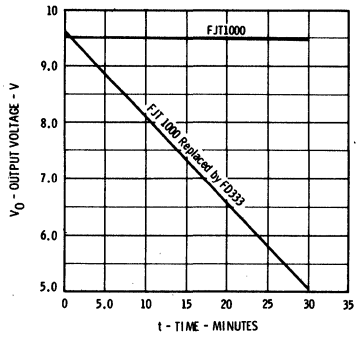


The Pico Ampere Diode affords excellent gate voltage protection while maintaining the DC input impedance at about one million megohms. In addition the very low capacity of the FJT1000 will have a relatively small effect on the circuit input capacity.

PEAK FOLLOWER CIRCUIT

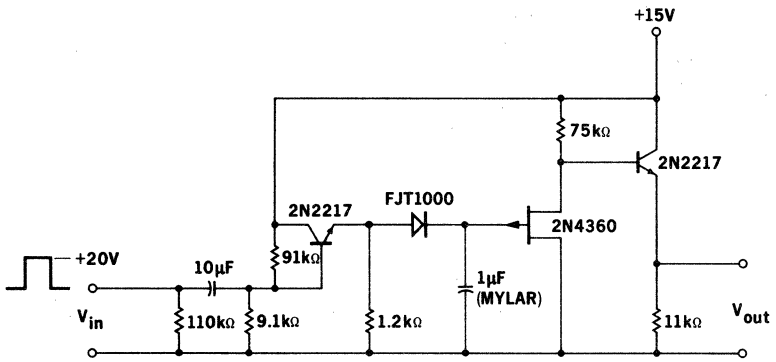


OUTPUT VOLTAGE OF THE PEAK FOLLOWER CIRCUIT VERSUS TIME

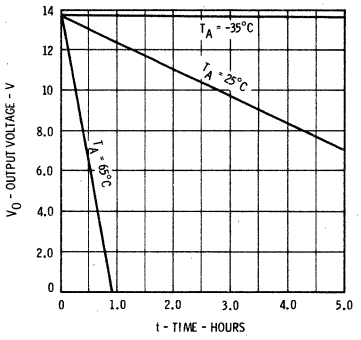


A nearly constant voltage peak follower circuit is available by using a Pico Ampere Diode. A comparison between the use of the FJT1000 and a "low leakage" FD333 diode in the circuit is shown in the curves of V_{out} vs Time.

TIME DELAY CIRCUIT

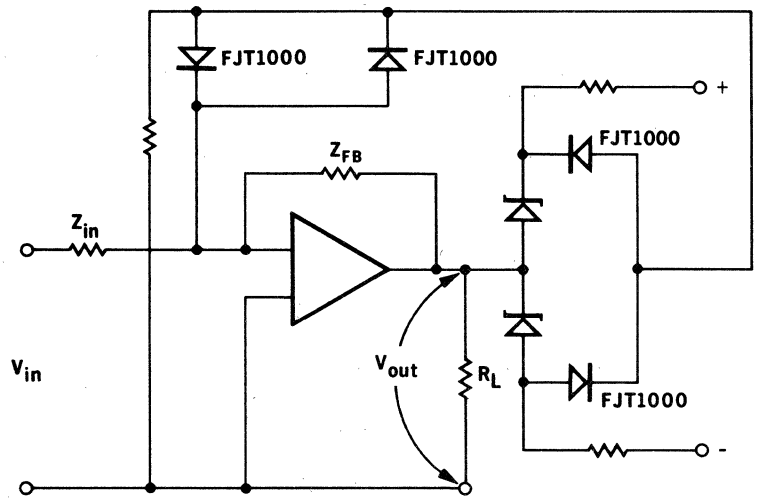


OUTPUT VOLTAGE OF THE TIME DELAY CIRCUIT VERSUS TIME



The voltage decay of the time delay circuit is a function of the leakage across the mylar capacitor. By using the extremely low leakage Pico Ampere Diode, time delays of many hours are measured. Similar applications such as pulse stretching, finite time storage and temperature dependent timing circuits are also feasible.

A BOUND CIRCUIT FOR OPERATIONAL AMPLIFIERS

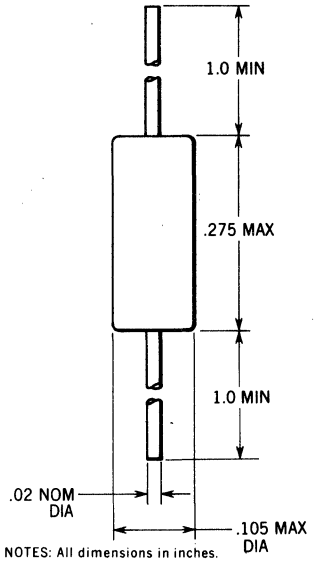


The bound circuit prevents overloading and saturation of operational amplifiers. The circuit has negligible effect on the operational amplifier until overload conditions occur. The use of the low leakage Pico Ampere Diode permits realization of extremely high input impedance for normal input voltages.

FV1006,08,10,12,14,16
FV1106,08,10,12,14,16
VOLTAGE VARIABLE CAPACITORS

GENERAL DESCRIPTION — Fairchild Silicon Voltage-Variable Capacitors (VVC) feature low leakage, high Q, and high capacitance ratio. Principal applications of these devices are in A.F.C. circuits, electronic tuning circuits, filters and voltage-controlled crystal oscillators. The patented Fairchild Planar* process ensures excellent tracking characteristics, making this product ideally suited to applications where simultaneous tuning of several circuits is required.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.
Weight: 0.25 gram.

MAXIMUM RATINGS

MWV	Maximum Working Voltage	
	Low Voltage Series:	60 V
	High Voltage Series:	100 V
I_F	Forward Current	250 mA
P	Power Dissipation	400 mW
T_A	Operating Temperature	−65°C to +150°C
T_{stg}	Storage Temperature	−65°C to +200°C

LOW VOLTAGE SERIES

ELECTRICAL SPECIFICATIONS (T_A = 25°C Unless Otherwise Noted)

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
BV	Breakdown Voltage	65			V	I_R = 10 μA
I_R	Reverse Leakage Current			50	nA	V_R = 60 V
I_R	Reverse Leakage Current			50	μA	V_R = 60 V T_A = 150°C
Q	Figure of Merit	150	250			V_R = 4 V f = 50 MHz

	TEST CONDITIONS	UNITS	FV1006	FV1008	FV1010	FV1012	FV1014	FV1016
Nominal Capacitance	V_R = 4.0 V, f = 1.0 MHz	pF	6.8	10	15	22	33	47
Minimum Capacitance Ratio $\frac{C_1}{C_4}$	V_R = 0.1 V, f = 1.0 MHz (C_1) V_R = 4.0 V, f = 1.0 MHz (C_4)		2.2	2.2	2.2	2.2	2.2	2.2
Minimum Capacitance Ratio $\frac{C_4}{C_{60}}$	V_R = 4.0 V, f = 1.0 MHz (C_4) V_R = 60 V, f = 1.0 MHz (C_{60})		2.9	3.0	3.1	3.2	3.2	3.2

* Planar is a patented Fairchild process.

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

HIGH VOLTAGE SERIES

ELECTRICAL SPECIFICATIONS ($T_A = 25°C$ Unless Otherwise Noted)

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
BV	Breakdown Voltage	110			V	$I_R = 10\ \mu A$
I_R	Reverse Leakage Current			100	nA	$V_R = 100$ V
I_R	Reverse Leakage Current			100	μA	$V_R = 100$ V, $T_A = 150°C$
Q	Figure of Merit [Note 1]	150	250			$V_R = 4$ V f = 50 MHz

	TEST CONDITIONS	UNITS	FV1106	FV1108	FV1110	FV1112	FV1114	FV1116
Nominal Capacitance	$V_R = 4.0$ V, f = 1.0 MHz	pF	6.8	10	15	22	33	47
Minimum Capacitance Ratio $\frac{C_{.1}}{C_4}$	$V_R = 0.1$ V, f = 1.0 MHz ($C_{.1}$) $V_R = 4.0$ V, f = 1.0 MHz (C_4)		2.2	2.2	2.2	2.2	2.2	2.2
Minimum Capacitance Ratio $\frac{C_4}{C_{100}}$	$V_R = 4.0$ V, f = 1.0 MHz (C_4) $V_R = 100$ V, f = 1.0 MHz (C_{100})		3.5	3.7	3.9	4.0	4.1	4.15

Note (1) Q is measured on a Boonton 33A Admittance Bridge.
Part numbers shown have ±20% tolerance.
For ±10%, ±5%, ±2% and ±1% specify part number with A, B, C and D suffixes, respectively.

TYPICAL ELECTRICAL CHARACTERISTICS (25°C)

DIODE CAPACITANCE VERSUS REVERSE VOLTAGE

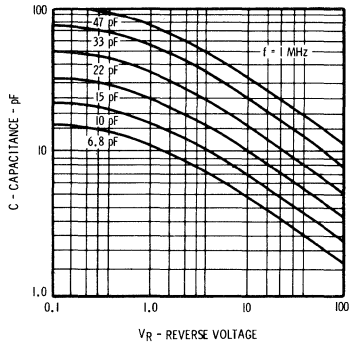


FIGURE OF MERIT VERSUS REVERSE VOLTAGE

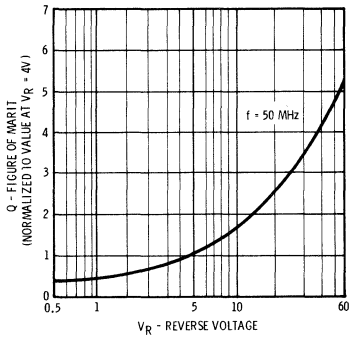
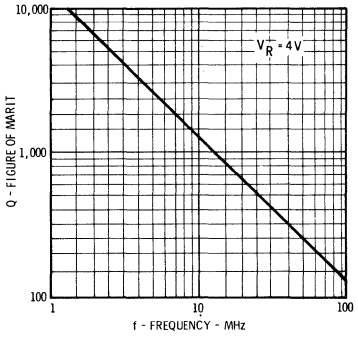


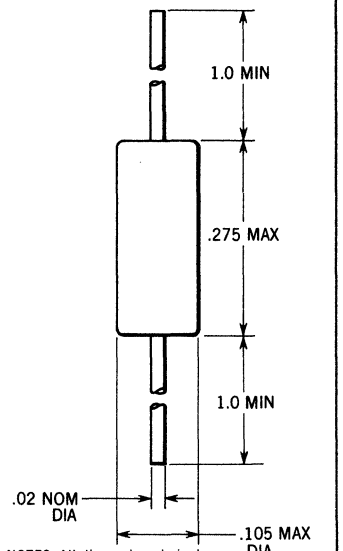
FIGURE OF MERIT VERSUS FREQUENCY



FH1100
HOT CARRIER DIODE

GENERAL DESCRIPTION — The Fairchild FH1100 Hot Carrier Diode features low leakage, high conductance and low noise figure. It is intended primarily for use as the mixer diode in UHF tuners. Its outstanding switching properties make it also ideal for use in ultra-fast switching, detector, and sampling gate applications.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.
Weight: 0.25 gram.

MAXIMUM RATINGS

P	Power Dissipation ($T_A = 25°C$)	100 mW
T_A	Operating Temperature	−55°C to +125°C
T_{stg}	Storage Temperature	−55°C to +150°C

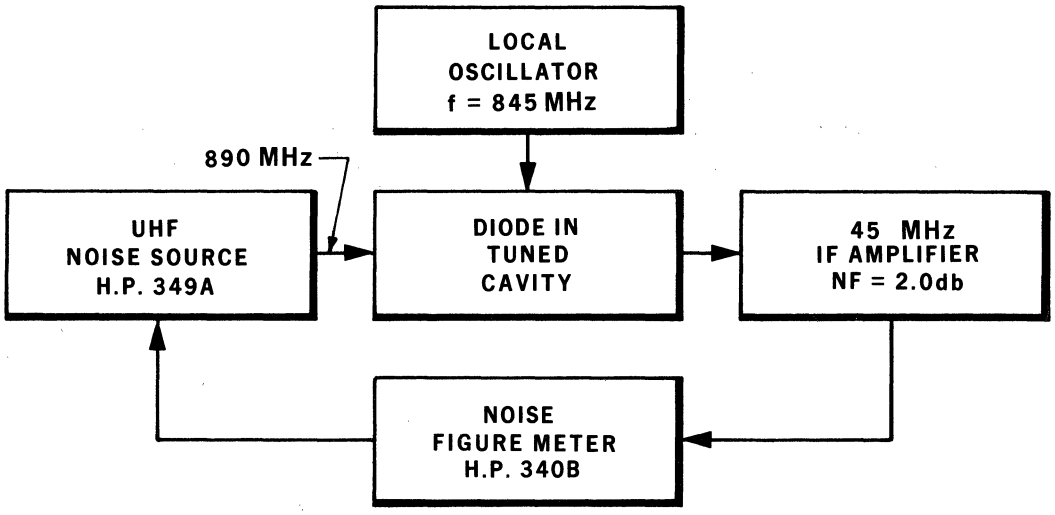
ELECTRICAL SPECIFICATIONS

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
V_F	Forward Voltage			0.55	V	$I_F = 10$ mA
I_R	Leakage Current		50		nA	$V_R = 1$ V $T_A = 25°C$
BV	Breakdown Voltage	5			V	$I_R = 100\ \mu$A
C_o	Capacitance		0.85	1.0	pF	$V_R = 0$ V, f = 1 MHz
NF	Noise Figure			10	dB	f = 890 MHz See Page 2
Q_s	Stored Charge [Note 1]		1.6		pC	$I_F = 10$ mA

Note 1 — Measured on B-Line Electronics QS-3 Stored Charge Meter.

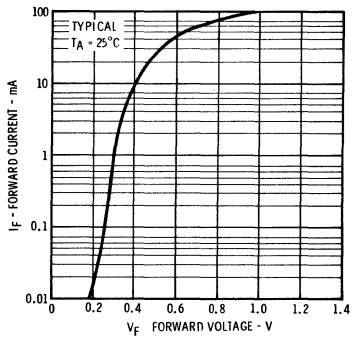
FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

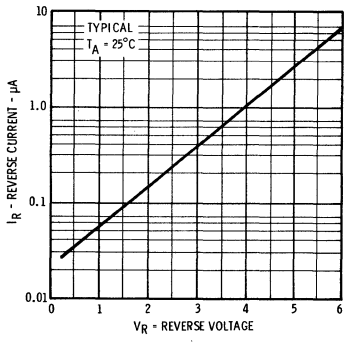


NOISE FIGURE TEST CIRCUIT

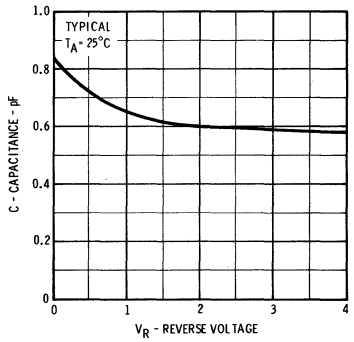
FORWARD CURRENT VERSUS FORWARD VOLTAGE



REVERSE CURRENT VERSUS REVERSE VOLTAGE



CAPACITANCE VERSUS REVERSE VOLTAGE

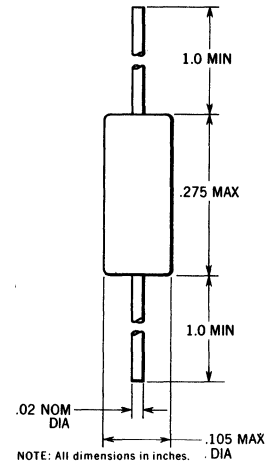


FH1200

HIGH VOLTAGE HOT CARRIER DIODE

GENERAL DESCRIPTION — The Fairchild FH1200 Hot Carrier Diode is a metal-silicon Schottky Barrier device which features high breakdown voltage, low capacitance, low noise figure, and extremely-low stored charge. Its outstanding characteristics make it ideal for use in mixing, ultra fast switching, and detector applications.

PHYSICAL DIMENSIONS



MAXIMUM RATINGS

P	Power Dissipation (25°C)	100 mW
WIV	Working Inverse Voltage	20 V
T_A	Operating Temperature	−55°C to 125°C
T_{STG}	Storage Temperature	−55°C to 150°C

ELECTRICAL SPECIFICATIONS (25°C)

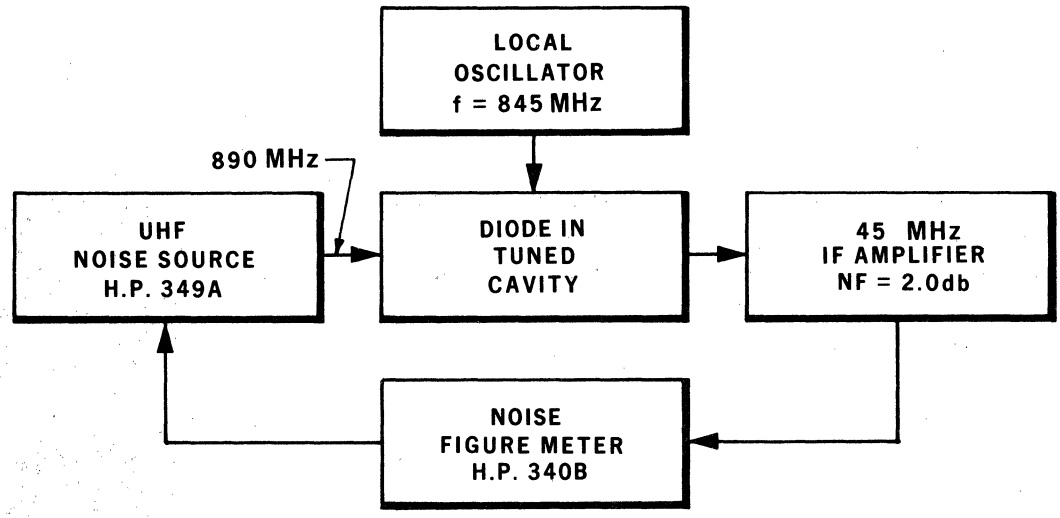
SYMBOL	CHARACTERISTIC	MIN.	MAX.	UNITS	TEST CONDITIONS
B_V	Breakdown Voltage	25		V	$I_R = 100\ \mu A$
I_R	Leakage Current		0.50	μA	$V_R = 10$ V
V_{F1}	Forward Voltage		0.250	V	$I_F = .01$ mA
V_{F2}	Forward Voltage		0.350	V	$I_F = .20$ mA
V_{F3}	Forward Voltage		0.80	V	$I_F = 10$ mA
V_{F4}	Forward Voltage		1.0	V	$I_F = 20$ mA
C	Capacitance		0.80	pf	$V_R = 0$ V
NF	Noise Figure		10	dB	f = 890 MHz See Page 2
Q_S*	Stored Charge		2.0	pC	$I_F = 10$ mA

*Measured on B-Line Electronics QS-3 Stored Charge Meter

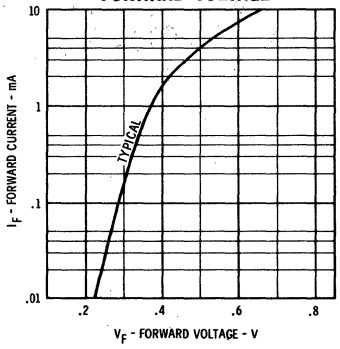
FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

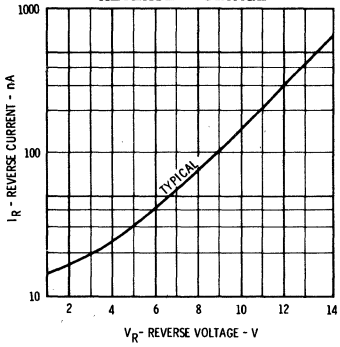
NOISE FIGURE TEST CIRCUIT



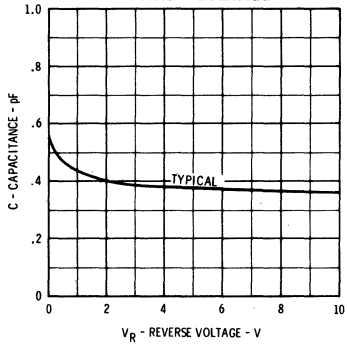
FORWARD CURRENT VERSUS FORWARD VOLTAGE



REVERSE CURRENT VERSUS REVERSE VOLTAGE



CAPACITANCE VERSUS REVERSE VOLTAGE

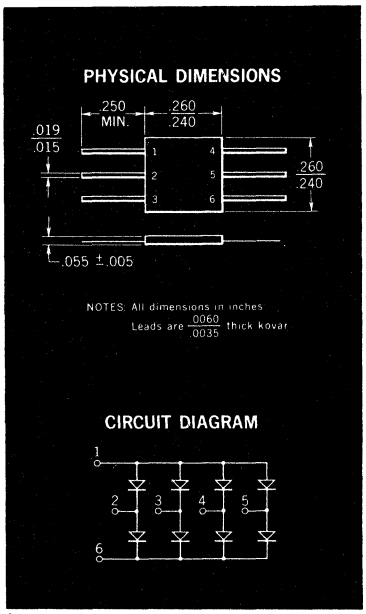


FSA1400

ULTRA FAST, EIGHT DIODE, CORE DRIVER ARRAY

SILICON PLANAR EPITAXIAL CONSTRUCTION

GENERAL DESCRIPTION - These Silicon Planar Epitaxial Diode Arrays were designed especially for high speed core driver applications. They are hermetically sealed in a ceramic package. The excellent thermal conductivity of the ceramic permits operation to 400 mW.



MAXIMUM RATINGS (25°C) [Note 1]

WIV	Working Inverse Voltage	50 V
I_o	Average Rectified Current	100 mA
I_F	Forward Current Steady State DC	150 mA
i_f	Recurrent Peak Forward Current	500 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1.0 sec	500 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1.0 μsec	2000 mA
P	Power Dissipation	400 mW
P	Power Dissipation at 125°C	120 mW
T_A	Operating Temperature	-65°C to +175°C
T_{stg}	Storage Temperature, Ambient	-65°C to +200°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

Symbol	Characteristic	Min.	Max.	Units	Test Conditions
V_{F1}	Forward Voltage		1.30	V	I_F = 500 mA (Note 2)
V_{F2}	Forward Voltage		1.0	V	I_F = 200 mA
V_{F3}	Forward Voltage		0.860	V	I_F = 50 mA
I_R	Reverse Current		100	nA	V_R = -50 V
BV	Breakdown Voltage	75		V	I_R = 100 μA
C	Capacitance		3.0	pf	V_R = 0 V, f = 1 Mc
t_{rr}	Reverse Recovery Time		4.0	nsec	I_F = I_R = 10 mA to 200 mA, R_L = 100 Ω Rec. to 1 mA

NOTES:

(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.

(2) Pulse operation—duty cycle less than 1%.

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

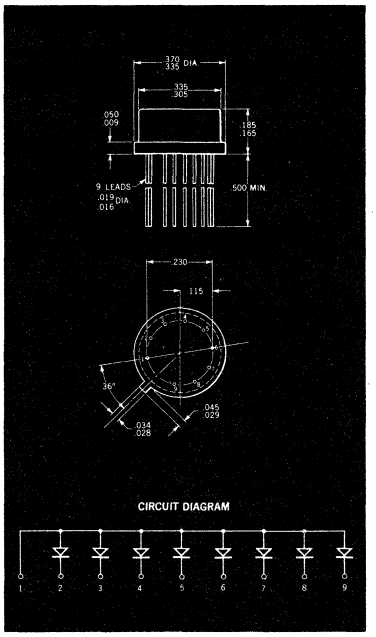
FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

FSA1410

ULTRA FAST, EIGHT DIODE, COMMON-ANODE ARRAY

SILICON PLANAR EPITAXIAL CONSTRUCTION

GENERAL DESCRIPTION - These Silicon Planar Epitaxial Diode Arrays were designed especially for high-speed core driver applications. They are hermetically sealed in the basic 10 lead TO-5 package. The excellent thermal conductivity of the package permits operation to 400 mW.



MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	40 V
I_o	Average Rectified Current	250 mA
I_F	Forward Current Steady State DC	330 mA
i_f	Recurrent Peak Forward Current	800 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1.0 sec	500 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1.0 μsec	2000 mA
P	Power Dissipation	400 mW
$\frac{1}{\theta}$	Power Derating Factors	3.2 mW/°C
T_A	Operating Temperature	-65°C to +150°C
T_{stg}	Storage Temperature, Ambient	-65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

Symbol	Characteristic	Min.	Max.	Units	Test Conditions	
V_{F1}	Forward Voltage		1.50	V	I_F = 500 mA	(Note 2)
V_{F2}	Forward Voltage		1.20	V	I_F = 300 mA	(Note 2)
V_{F3}	Forward Voltage		1.10	V	I_F = 200 mA	(Note 2)
BV	Breakdown Voltage	60		V	I_R = 100 μA	
I_{R1}	Reverse Current		100	nA	V_R = -40 V	
I_{R2}	Reverse Current (T_A = 150°C)		100	μA	V_R = -40 V	
C	Capacitance		7.0	pf	V_R = 0, f = 1 MHz	
t_{rr1}	Reverse Recovery Time		25	ns	$I_F = I_R$ = 10 mA to 200 mA, R_L = 100 Ω, Rec. to 0.1 I_F	
t_{rr2}	Reverse Recovery Time		90	ns	I_F = 300 mA, I_R = 60 mA, R_L = 100 Ω, Rec. to 20 mA	
V_{FM}	Peak Forward Voltage		5.0	V	I_F = 500 mA, $t_r \leq$ 10 ns	(Note 3)
t_{fr}	Forward Recovery Time		40	ns	I_F = 500 mA, $t_r \leq$ 10 ns Rec. to 1.6 V	(Note 3)

(See notes on back page)

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

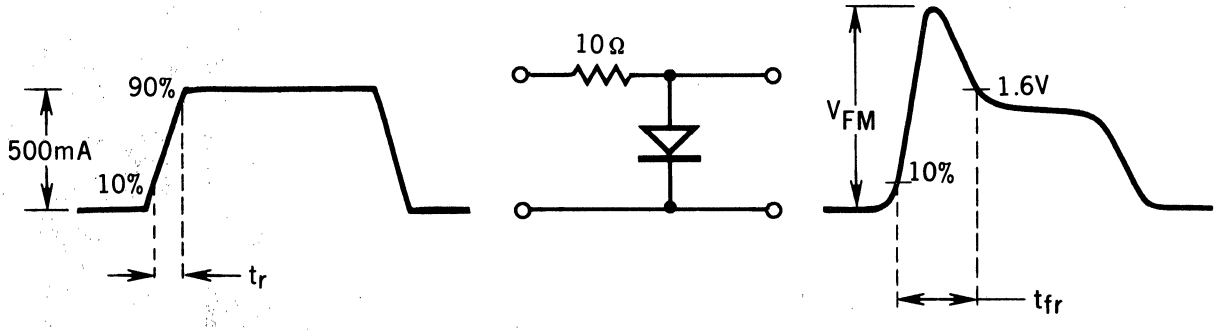
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

NOTES:

(1) Ratings apply to individual diodes. For multiple diode operation, total power must not exceed power dissipation rating listed.

(2) Pulse Input Current - Duty cycle less than 1.0%.

(3) Test Circuit for V_{FM} and t_{fr} is as shown below:



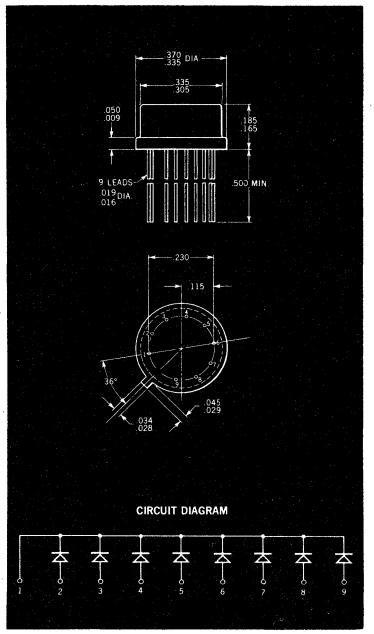
INPUT CURRENT PULSE **OUTPUT VOLTAGE PULSE**

FSA1411

ULTRA FAST, EIGHT DIODE, COMMON-CATHODE ARRAY

SILICON PLANAR* EPITAXIAL CONSTRUCTION

GENERAL DESCRIPTION - These Silicon Planar Epitaxial Diode Arrays were designed especially for high-speed core driver applications. They are hermetically sealed in the basic 10 lead TO-5 package. The excellent thermal conductivity of the package permits operation to 400 mW.



MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	40 V
I_o	Average Rectified Current	250 mA
I_F	Forward Current Steady State DC	330 mA
i_f	Recurrent Peak Forward Current	800 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1.0 sec	500 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1.0 μsec	2000 mA
P	Power Dissipation	400 mW
$1/\theta$	Power Derating Factor	3.2 mW/°C
T_A	Operating Temperature	-65°C to +150°C
T_{stg}	Storage Temperature, Ambient	-65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

Symbol	Characteristic	Min.	Max.	Units	Test Conditions	
V_{F1}	Forward Voltage		1.50	V	I_F = 500 mA	(Note 2)
V_{F2}	Forward Voltage		1.20	V	I_F = 300 mA	(Note 2)
V_{F3}	Forward Voltage		1.10	V	I_F = 200 mA	(Note 2)
BV	Breakdown Voltage	60		V	I_R = 100 μA	
I_{R1}	Reverse Current		100	nA	V_R = -40 V	
I_{R2}	Reverse Current (T_A = 150°C)		100	μA	V_R = -40 V	
C	Capacitance		3.0	pf	V_R = 0, f = 1 MHz	
t_{rr1}	Reverse Recovery Time		25	ns	$I_F = I_R$ = 10 mA to 200 mA, R_L = 100 Ω, Rec. to 0.1 I_F	
t_{rr2}	Reverse Recovery Time		90	ns	I_F = 300 mA, I_R = 60 mA, R_L = 100 Ω, Rec. to 20 mA	
V_{FM}	Peak Forward Voltage		5.0	V	I_F = 500 mA, $t_r \leq$ 10 ns	(Note 3)
t_{fr}	Forward Recovery Time		40	ns	I_F = 500 mA, $t_r \leq$ 10 ns Rec. to 1.6 V	(Note 3)

(See notes on back page)

* Planar is a patented Fairchild process.

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

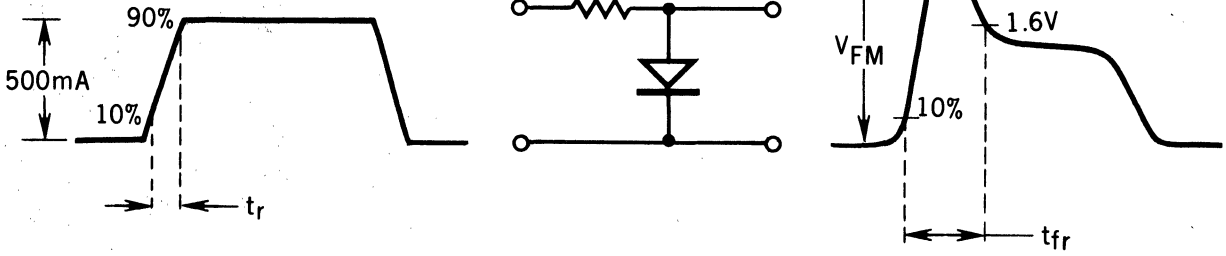
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

NOTES:

(1) Ratings apply to individual diodes. For multiple diode operation, total power must not exceed power dissipation rating listed.

(2) Pulse Input Current - Duty cycle less than 1.0%.

(3) Test Circuit for V_{FM} and t_{fr} is as shown below:



INPUT CURRENT PULSE

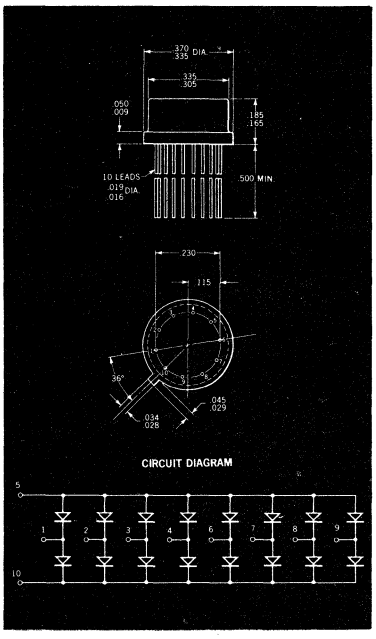
OUTPUT VOLTAGE PULSE

FSA1412

ULTRA FAST, SIXTEEN DIODE, CORE DRIVER ARRAY

SILICON PLANAR* EPITAXIAL CONSTRUCTION

GENERAL DESCRIPTION - These Silicon Planar Epitaxial Diode Arrays were designed especially for high-speed core driver applications. They are hermetically sealed in the basic 10 lead TO-5 package. The excellent thermal conductivity of the package permits operation to 400 mW.



MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	40 V
I_o	Average Rectified Current	250 mA
I_F	Forward Current Steady State DC	330 mA
i_f	Recurrent Peak Forward Current	800 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1.0 sec	500 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1.0 μsec	2000 mA
P	Power Dissipation	400 mW
$1/\theta$	Power Derating Factor	3.2 mW/°C
T_A	Operating Temperature	-65°C to +150°C
T_{stg}	Storage Temperature, Ambient	-65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

Symbol	Characteristic	Min.	Max.	Units	Test Conditions	
V_{F1}	Forward Voltage		1.50	V	I_F = 500 mA	(Note 2)
V_{F2}	Forward Voltage		1.20	V	I_F = 300 mA	(Note 2)
V_{F3}	Forward Voltage		1.10	V	I_F = 200 mA	(Note 2)
BV	Breakdown Voltage	60		V	I_R = 100 μA	
I_{R1}	Reverse Current		100	nA	V_R = -40 V	(Note 3)
I_{R2}	Reverse Current		100	μA	V_R = -40 V	(Note 3)
C	Capacitance		8.0	pf	V_R = 0, f = 1 mc	(Note 4)
t_{rr1}	Reverse Recovery Time		25	ns	$I_F = I_R$ = 10 mA to 200 mA, R_L = 100 Ω, Rec. to 0.1 I_F	
t_{rr2}	Reverse Recovery Time		90	ns	I_F = 300 mA, I_R = 60 mA, R_L = 100 Ω, Rec. to 20 mA	
V_{FM}	Peak Forward Voltage		5.0	V	I_F = 500 mA, $t_r \leq$ 10 ns	(Note 5)
t_{fr}	Forward Recovery Time		40	ns	I_F = 500 mA, $t_r \leq$ 10 ns Rec. to 1.6 V	(Note 5)

(See notes on back page)

* Planar is a patented Fairchild process.

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

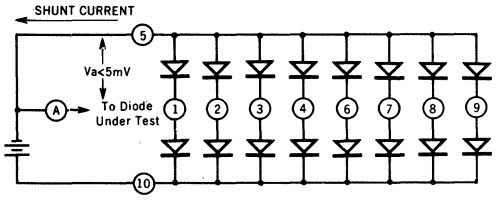
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

NOTES:

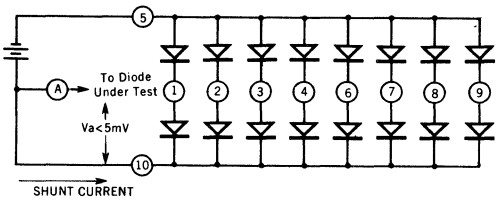
(1) Ratings apply to individual diodes. For multiple diode operation, total power must not exceed power dissipation rating listed.

(2) Pulse Input Current - Duty cycle less than 1.0%.

(3) Reverse current measurements between terminals result in substantial leakage contributions from other diodes in the array. To measure diodes individually (specification limit is for individual diodes), current may be shunted by employing following test configuration.



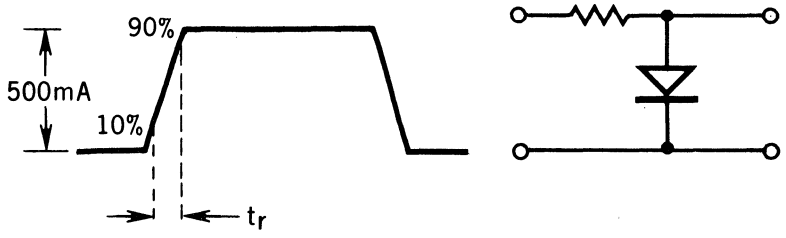
TEST CONNECTIONS FOR COMMON-CATHODE DIODES



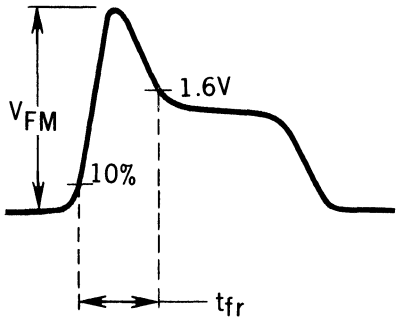
TEST CONNECTIONS FOR COMMON-ANODE DIODES

(4) Capacitance cannot conveniently be measured on individual diodes due to contributions of other diodes in the array. Limit listed is for pin-to-pin capacitance across any one of the diodes (i.e., 5 to 1, 5 to 2, etc. or 10 to 1, 10 to 2, etc.)

(5) Test Circuit for V_{FM} and t_{fr} is as shown below:



INPUT CURRENT PULSE



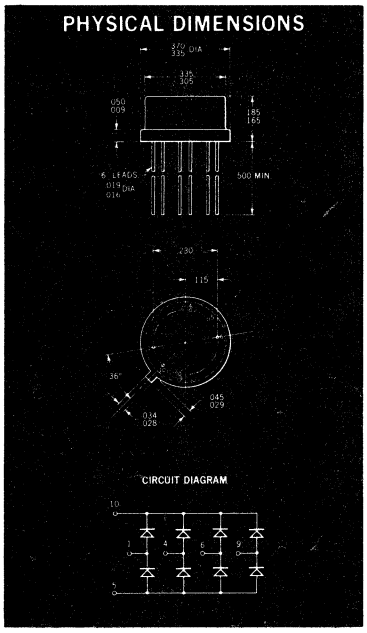
OUTPUT VOLTAGE PULSE

FSA1413

ULTRA FAST, EIGHT DIODE, CORE DRIVER ARRAY

SILICON PLANAR EPITAXIAL CONSTRUCTION

GENERAL DESCRIPTION - These Silicon Planar Epitaxial Diode Arrays were designed especially for high-speed core driver applications. They are hermetically sealed in the basic 10 lead TO-5 package. The excellent thermal conductivity of the package permits operation to 400 mW.



MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	40 V
I_o	Average Rectified Current	250 mA
I_F	Forward Current Steady State DC	330 mA
i_f	Recurrent Peak Forward Current	800 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1.0 sec	500 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1.0 μsec	2000 mA
P	Power Dissipation	400 mW
P	Power Dissipation at 125°C	120 mW
T_A	Operating Temperature	-65°C to +175°C
T_{stg}	Storage Temperature, Ambient	-65°C to +200°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

Symbol	Characteristic	Min.	Max.	Units	Test Conditions	
V_{F1}	Forward Voltage		1.50	V	I_F = 500 mA	(Note 2)
V_{F2}	Forward Voltage		1.20	V	I_F = 300 mA	(Note 2)
V_{F3}	Forward Voltage		1.10	V	I_F = 200 mA	(Note 2)
BV	Breakdown Voltage	60		V	I_R = 100 μA	
I_{R1}	Reverse Current		100	nA	V_R = -40 V	(Note 3)
I_{R2}	Reverse Current		100	μA	V_R = -40 V	(Note 3)
C	Capacitance		8.0	pf	V_R = 0, f = 1 Mc	(Note 4)
t_{rr1}	Reverse Recovery Time		25	nsec	$I_F = I_R$ = 10 mA to 200 mA, R_L = 100 Ω, Rec. to 0.1 I_F	
t_{rr2}	Reverse Recovery Time		90	nsec	I_F = 300 mA, I_R = 60 mA, R_L = 100 Ω, Rec. to 20 mA	
V_{FM}	Peak Forward Voltage		5.0	V	I_F = 500 mA, $t_r \leq$ 10 nsec	(Note 5)
t_{fr}	Forward Recovery Time		40	nsec	I_F = 500 mA, $t_r \leq$ 10 nsec, Rec. to 1.6 V	(Note 5)

(See notes on back page)

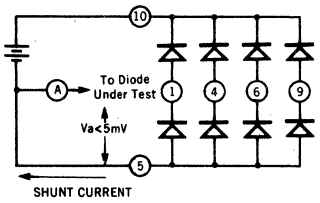
FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

NOTES:

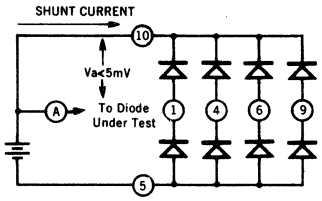
(1) Ratings apply to individual diodes. For multiple diode operation, total power must not exceed power dissipation rating listed.

(2) Pulse Input Current - Duty cycle less than 1.0%.

(3) Reverse current measurements between terminals result in substantial leakage contributions from other diodes in the array. To measure diodes individually (specification limit is for individual diodes), current may be shunted by employing following test configuration.



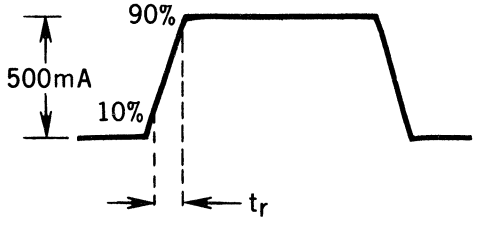
TEST CONNECTIONS FOR COMMON-CATHODE DIODES

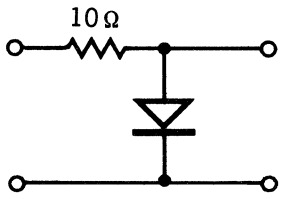


TEST CONNECTIONS FOR COMMON-ANODE DIODES

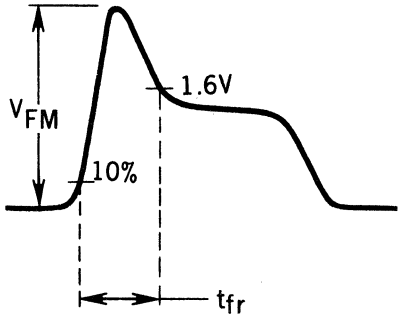
(4) Capacitance cannot conveniently be measured on individual diodes due to contributions of other diodes in the array. Limit listed is for pin-to-pin capacitance across any one of the diodes (i.e., 5 to 1, 10 to 6, etc.)

(5) Test Circuit for V_{FM} and t_{fr} is as shown below:





INPUT CURRENT PULSE

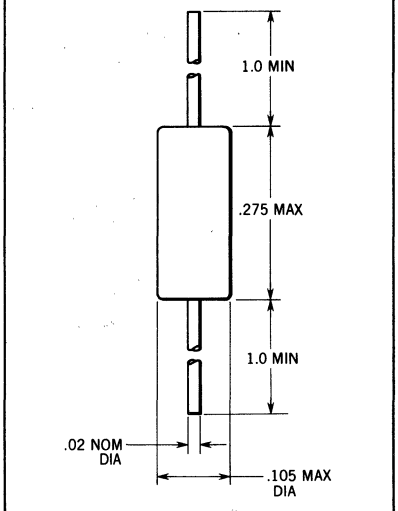


OUTPUT VOLTAGE PULSE

FD1858
ULTRA-FAST PLANAR* DIODE

GENERAL DESCRIPTION — The FD1858 is an ultra-fast silicon planar switching diode. Interesting features of this device are planar reliability and economy.

PHYSICAL DIMENSIONS
(All dimensions in inches)



ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	10 V
I_O	Average rectified current	75 mA
I_F	Forward current steady state DC	115 mA
i_f	Recurrent peak forward current	225 mA
i_f (surge)	Peak forward surge current, pulse width of 1.0 second	500 mA
i_f (surge)	Peak forward surge current, pulse width of 1.0 μs	2000 mA
P	Power dissipation	250 mW
$1/\theta$	Power derating factor	1.67 mW/°C
T_A	Operating temperature	−65°C to +175°C
T_{stg}	Storage temperature, ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
V_F	Forward Voltage	.800	1.40	V	$I_F = 50$ mA
V_F	Forward Voltage	.810	1.34	V	$I_F = 40$ mA
V_F	Forward Voltage	.750	1.20	V	$I_F = 20$ mA
V_F	Forward Voltage	.700	1.07	V	$I_F = 10$ mA
V_F	Forward Voltage	.660	.970	V	$I_F = 5$ mA
V_F	Forward Voltage	.57	.785	V	$I_F = 1$ mA
I_R	Reverse Current		500	nA	$V_R = -10$ V
BV	Breakdown Voltage	25		V	$I_R = 5\ \mu$A
t_{rr} (Note 2)	Reverse Recovery Time		10	ns	$I_F = I_R = 10$ mA, $R_L = 100\ \Omega$
C_o (Note 3)	Capacitance		6	pF	$V_R = 0$ V, f = 1 MHz

NOTES:

(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 1 mA in circuit shown on page 2 of data sheet.
(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75A-S8 Capacitance Bridge or equivalent.

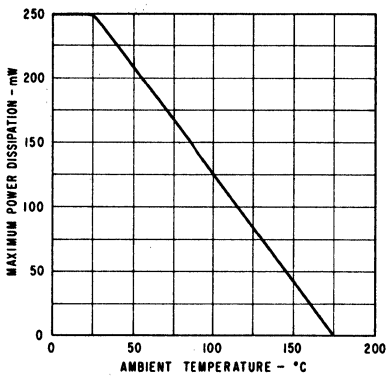
*Planar is a patented Fairchild process.

FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

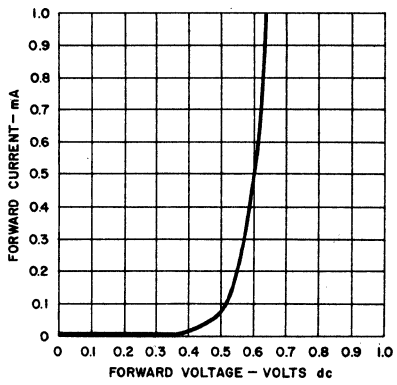
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

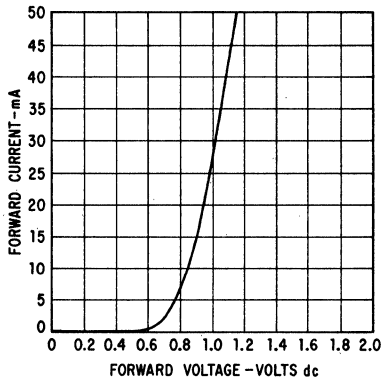
POWER DERATING CURVE



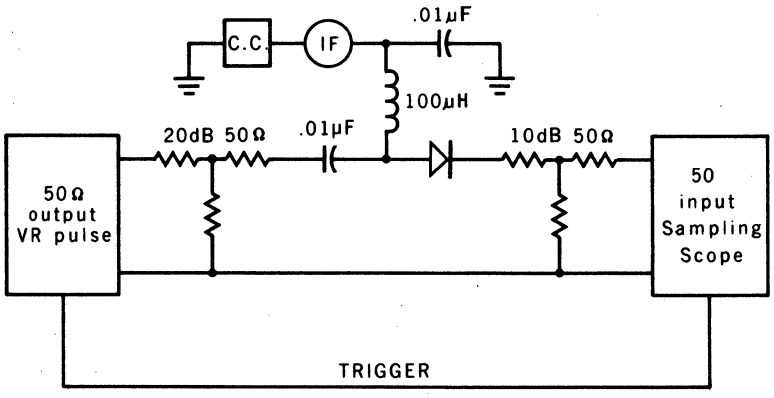
TYPICAL FORWARD CURRENT CHARACTERISTICS AT 25°C



TYPICAL FORWARD CURRENT CHARACTERISTICS AT 25°C



REVERSE RECOVERY TEST CIRCUIT



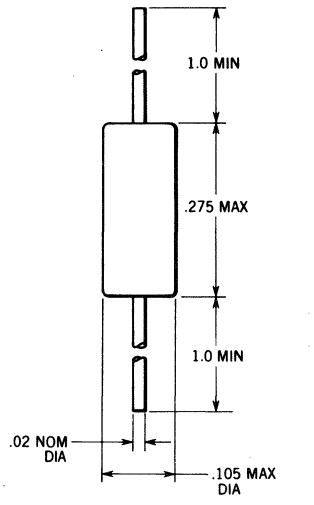
VR pulse risetime ≤ .25ns

Scope risetime ≤ .35ns

FD1859
ULTRA-FAST PLANAR* DIODE

GENERAL DESCRIPTION — The FD1859 is an ultra-fast silicon planar switching diode. Interesting features of this device are planar reliability and economy.

PHYSICAL DIMENSIONS
(All dimensions in inches)



ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	25 V
I_O	Average rectified current	75 mA
I_F	Forward current steady state DC	115 mA
i_f	Recurrent peak forward current	225 mA
i_f(surge)	Peak forward surge current pulse width of 1 second	500 mA
i_f(surge)	Peak forward surge current pulse width of 1 μs	2000 mA
P	Power dissipation	250 mW
$1/\theta$	Power derating factor	1.67 mW/°C
T_A	Operating temperature	−65°C to +175°C
T_{stg}	Storage temperature, ambient	−65°C to +200°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
V_F	Forward Voltage	.800	1.40	V	$I_F = 50$ mA
V_F	Forward Voltage	.810	1.34	V	$I_F = 40$ mA
V_F	Forward Voltage	.750	1.20	V	$I_F = 20$ mA
V_F	Forward Voltage	.700	1.07	V	$I_F = 10$ mA
V_F	Forward Voltage	.660	.970	V	$I_F = 5$ mA
V_F	Forward Voltage	.57	.785	V	$I_F = 1$ mA
I_R	Reverse Current		150	nA	$V_R = -25$ V
BV	Breakdown Voltage	35		V	$I_R = 5$ μA
t_{rr} (Note 2)	Reverse Recovery Time		10	ns	$I_F = I_R = 10$ mA, $R_L = 100\ \Omega$
C_o (Note 3)	Capacitance		5.0	pF	$V_R = 0$ V, f = 1 MHz

*Planar is a patented Fairchild process.

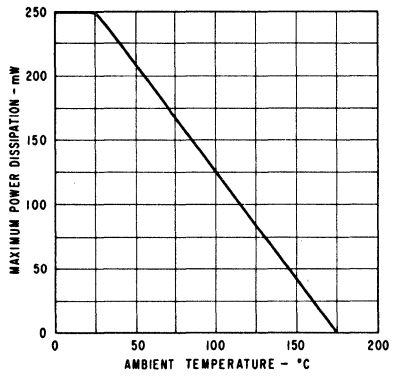
NOTES:
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 1 mA in circuit shown on page 2 of data sheet.
(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75A-S8 Capacitance Bridge or equivalent.

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

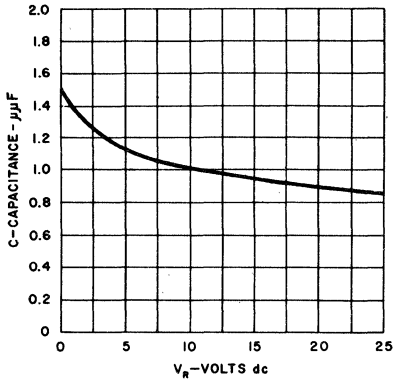
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

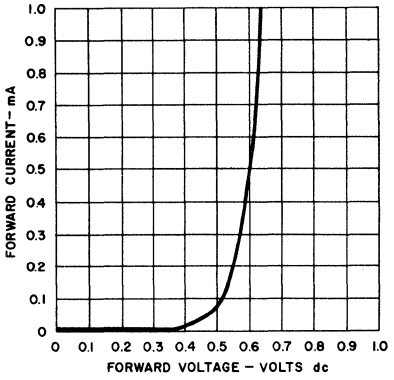
POWER DERATING CURVE



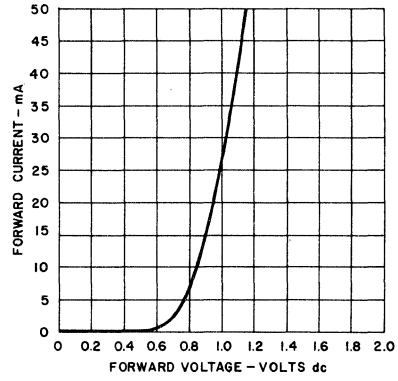
TYPICAL CAPACITANCE VERSUS VOLTAGE AT 25°C



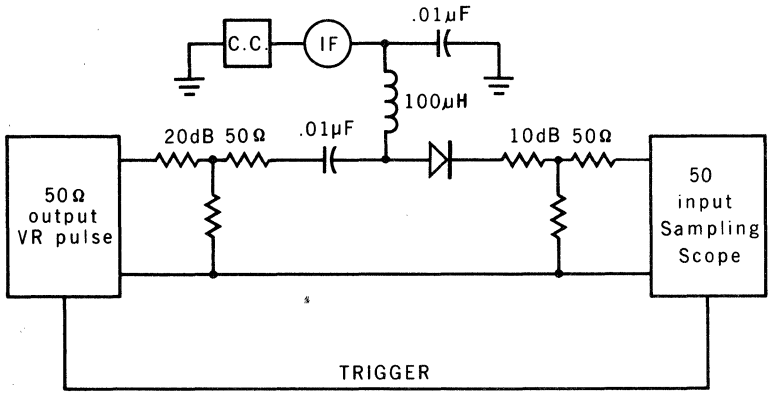
TYPICAL FORWARD CURRENT CHARACTERISTICS AT 25°C



TYPICAL FORWARD CURRENT CHARACTERISTICS AT 25°C



REVERSE RECOVERY TEST CIRCUIT



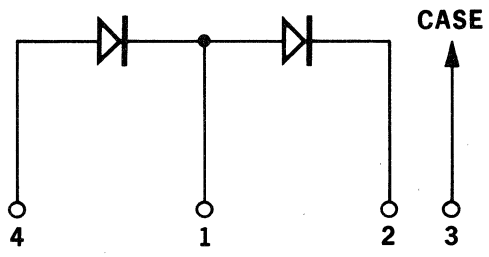
VR pulse risetime ≤ .25ns

Scope risetime ≤ .35ns

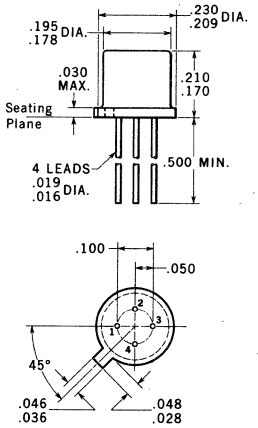
FJT2000
DUAL PICO AMPERE DIODE

GENERAL DESCRIPTION — The Fairchild Dual Pico Ampere Diode is a silicon Planar* epitaxial diode characterized by extremely low reverse leakage currents. The principal application of the series dual configuration is in extremely high impedance protection circuits for FETs. Lead No. 3 is attached to the case to reduce the input capacitance in FET source follower applications. (The case lead is connected to the FET source terminal)

LEAD CONNECTION



PHYSICAL DIMENSONS
in accordance with
JEDEC (TO-72) outline



NOTES: All dimensions in inches
Dimensions similar to JEDEC TO-18 except 4 leads 90° spacing
Leads are gold-plated kovar
Package weight is 0.36 gram

MAXIMUM RATINGS EACH JUNCTION (25°C)

I_F	Forward Current	100 mA
P	Power Dissipation*	125 mW
T_A	Operating Temperature	−55°C to +125°C
T_{stg}	Storage Temperature	−55°C to +125°C

*Rating, for both diode junctions conducting simultaneously, is 80 mW maximum per junction.

ELECTRICAL CHARACTERISTICS EACH JUNCTION (25°C unless otherwise noted)

SYMBOL	PARAMETERS	MIN.	MAX.	UNITS	TEST CONDITIONS
BV	Breakdown Voltage	35		Volts	$I_R = 1.0\ \mu A$
I_R	Reverse Current		5	pA	$V_R = 5$ V
I_R	Reverse Current		10	pA	$V_R = 20$ V
I_R	Reverse Current		500	pA	$V_R = 5$ V, $T_A = 80°C$
V_F	Forward Voltage		1.0	Volts	$I_F = 10$ mA
C	Capacitance		1.3	pF	$V_R = 0$ V, f = 1 MHz
t_{rr}	Reverse Recovery Time		250	ns	$I_F = I_R = 10$ mA, $I_{RR} = 1$ mA

*Planar is a patented Fairchild process.

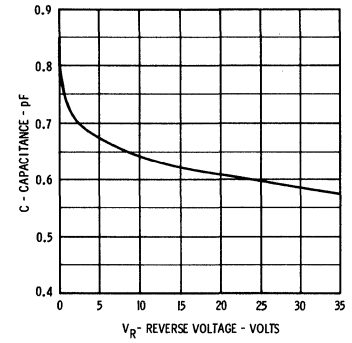
FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

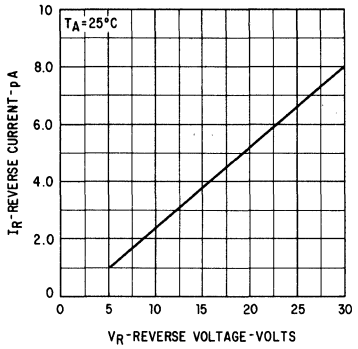
FAIRCHILD DIODE FJT2000

TYPICAL ELECTRICAL CHARACTERISTICS EACH JUNCTION (25°C)

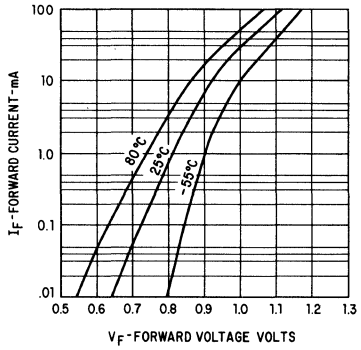
CAPACITANCE VERSUS REVERSE VOLTAGE



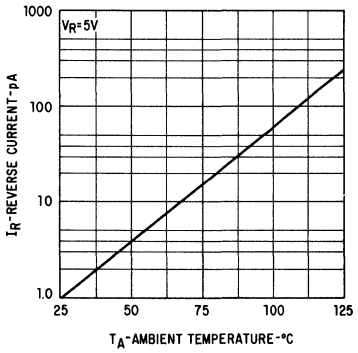
REVERSE CURRENT VERSUS REVERSE VOLTAGE



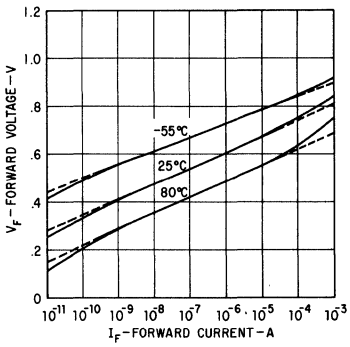
FORWARD CURRENT VERSUS FORWARD VOLTAGE



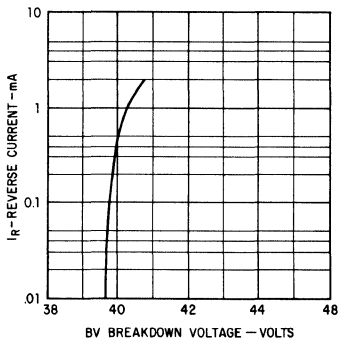
REVERSE CURRENT VERSUS TEMPERATURE



FORWARD VOLTAGE VERSUS FORWARD CURRENT



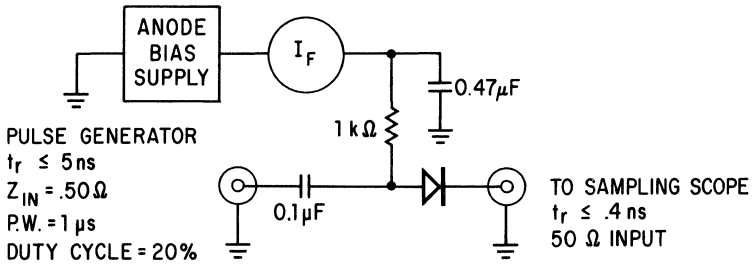
TYPICAL CURRENT-VOLTAGE CHARACTERISTICS IN THE BREAKDOWN REGION

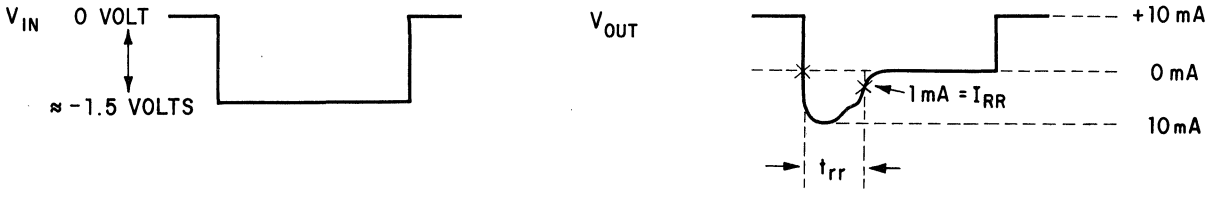


PICO AMP DIODE FJT2000 REVERSE RECOVERY TIME (t_{rr}) TEST CIRCUIT

CONDITION: $I_F = I_R = 10$ mA

MEASUREMENT $I_{RR} = 1$mA



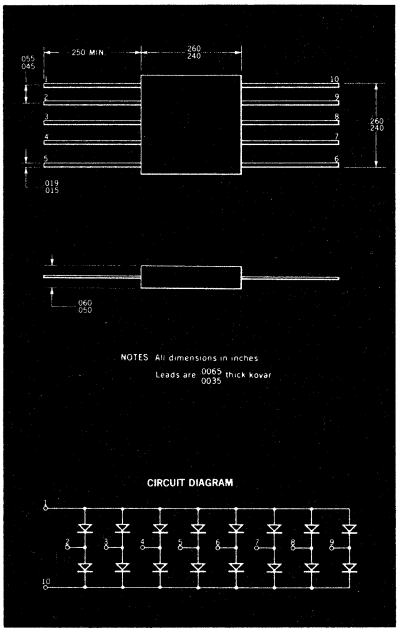


FSA2000

ULTRA FAST, SIXTEEN DIODE, CORE DRIVER ARRAY

SILICON PLANAR EPITAXIAL CONSTRUCTION

GENERAL DESCRIPTION - These Silicon Planar Epitaxial Diode Arrays were designed especially for high-speed core driver applications. They are hermetically sealed in a ceramic package. The excellent thermal conductivity of the ceramic permits operation to 400 mW.



MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	40 V
I_O	Average Rectified Current	250 mA
I_F	Forward Current Steady State DC	330 mA
i_f	Recurrent Peak Forward Current	800 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1.0 sec	500 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1.0 μsec	2000 mA
P	Power Dissipation	400 mW
P	Power Dissipation at 125°C	120 mW
T_A	Operating Temperature	-65°C to +175°C
T_{stg}	Storage Temperature, Ambient	-65°C to +200°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

Symbol	Characteristic	Min.	Max.	Units	Test Conditions	
V_{F1}	Forward Voltage		1.50	V	I_F = 500 mA	(Note 2)
V_{F2}	Forward Voltage		1.20	V	I_F = 300 mA	(Note 2)
V_{F3}	Forward Voltage		1.10	V	I_F = 200 mA	(Note 2)
BV	Breakdown Voltage	60		V	I_R = 100 μA	
I_{R1}	Reverse Current		100	nA	V_R = -40 V	(Note 3)
I_{R2}	Reverse Current (T_A = 150°C)		100	μA	V_R = -40 V	(Note 3)
C	Capacitance		8.0	pf	V_R = 0, f = 1 Mc	(Note 4)
t_{rr1}	Reverse Recovery Time		25	nsec	$I_F = I_R$ = 10 mA to 200 mA, R_L = 100 Ω, Rec. to 0.1 I_F	
t_{rr2}	Reverse Recovery Time		90	nsec	I_F = 300 mA, I_R = 60 mA, R_L = 100 Ω, Rec. to 20 mA	
V_{FM}	Peak Forward Voltage		5.0	V	I_F = 500 mA, $t_r \leq$ 10 nsec	(Note 5)
t_{fr}	Forward Recovery Time		40	nsec	I_F = 500 mA, $t_r \leq$ 10 nsec, Rec. to 1.6 V	(Note 5)

(See notes on back page)

FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

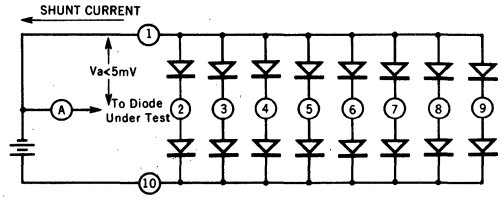
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

NOTES:

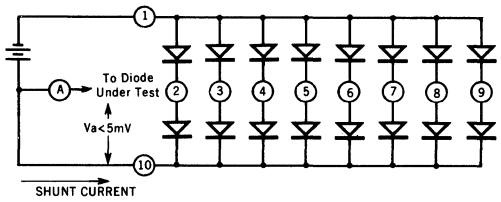
(1) Ratings apply to individual diodes. For multiple diode operation, total power must not exceed power dissipation rating listed.

(2) Pulse Input Current - Duty cycle less than 1.0%.

(3) Reverse current measurements between terminals result in substantial leakage contributions from other diodes in the array. To measure diodes individually (specification limit is for individual diodes), current may be shunted by employing following test configuration.



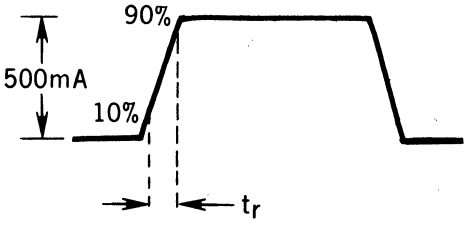
TEST CONNECTIONS FOR COMMON-CATHODE DIODES

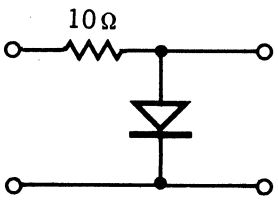


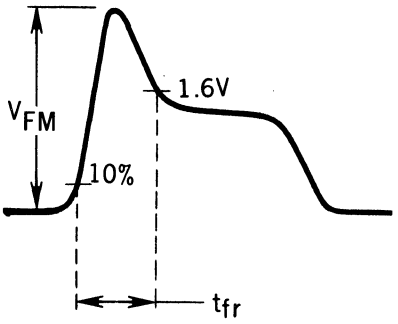
TEST CONNECTIONS FOR COMMON-ANODE DIODES

(4) Capacitance cannot conveniently be measured on individual diodes due to contributions of other diodes in the array. Limit listed is for pin-to-pin capacitance across any one of the diodes (i.e., 1 to 2, 1 to 3, etc. or 10 to 2, 10 to 3, etc.)

(5) Test Circuit for V_{FM} and t_{fr} is as shown below:







INPUT CURRENT PULSE

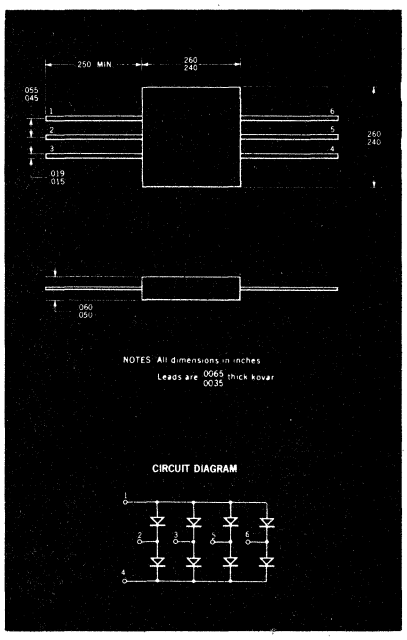
OUTPUT VOLTAGE PULSE

FSA2001

ULTRA FAST, EIGHT DIODE, CORE DRIVER ARRAY

SILICON PLANAR* EPITAXIAL CONSTRUCTION

GENERAL DESCRIPTION – These Silicon Planar Epitaxial Diode Arrays were designed especially for high-speed core driver applications. They are hermetically sealed in a ceramic package. The excellent thermal conductivity of the ceramic permits operation to 400 mW.



MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	40 V
I_o	Average Rectified Current	250 mA
I_F	Forward Current Steady State DC	330 mA
i_f	Recurrent Peak Forward Current	800 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1.0 sec	500 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1.0 μsec	2000 mA
P	Power Dissipation	400 mW
$1/\theta$	Power Derating Factor	3.2 mW/°C
T_A	Operating Temperature	-65°C to +150°C
T_{stg}	Storage Temperature, Ambient	-65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

Symbol	Characteristic	Min.	Max.	Units	Test Conditions	
V_{F1}	Forward Voltage		1.50	V	I_F = 500 mA	(Note 2)
V_{F2}	Forward Voltage		1.20	V	I_F = 300 mA	(Note 2)
V_{F3}	Forward Voltage		1.10	V	I_F = 200 mA	(Note 2)
BV	Breakdown Voltage	60		V	I_R = 100 μA	
I_{R1}	Reverse Current		100	nA	V_R = -40 V	(Note 3)
I_{R2}	Reverse Current		100	μA	V_R = -40 V	(Note 3)
C	Capacitance		8.0	pf	V_R = 0, f = 1 MHz	(Note 4)
t_{rr1}	Reverse Recovery Time		25	ns	$I_F = I_R$ = 10 mA to 200 mA, R_L = 100 Ω, Rec. to 0.1 I_F	
t_{rr2}	Reverse Recovery Time		90	ns	I_F = 300 mA, I_R = 60 mA, R_L = 100 Ω, Rec. to 20 mA	
V_{FM}	Peak Forward Voltage		5.0	V	I_F = 500 mA, $t_r \leq$ 10 ns	(Note 5)
t_{fr}	Forward Recovery Time		40	ns	I_F = 500 mA, $t_r \leq$ 10 ns Rec. to 1.6 V	(Note 5)

(See notes on back page)

* Planar is a patented Fairchild process.

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

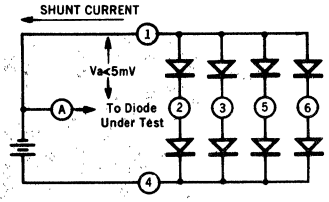
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

NOTES:

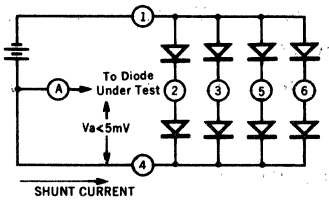
(1) Ratings apply to individual diodes. For multiple diode operation, total power must not exceed power dissipation rating listed.

(2) Pulse Input Current - Duty cycle less than 1.0%.

(3) Reverse current measurements between terminals result in substantial leakage contributions from other diodes in the array. To measure diodes individually (specification limit is for individual diodes), current may be shunted by employing following test configuration.



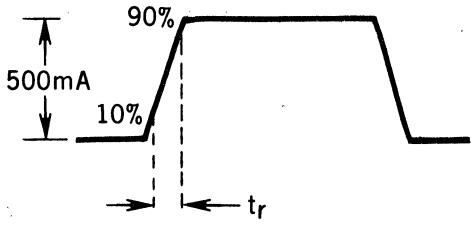
TEST CONNECTIONS FOR COMMON-CATHODE DIODES

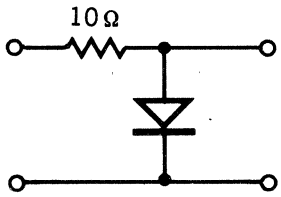


TEST CONNECTIONS FOR COMMON-ANODE DIODES

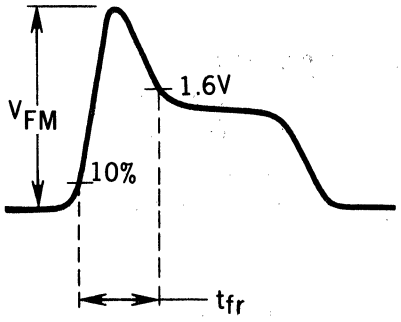
(4) Capacitance cannot conveniently be measured on individual diodes due to contributions of other diodes in the array. Limit listed is for pin-to-pin capacitance across any one of the diodes (i.e., 1 to 2, 1 to 3, etc. or 4 to 2, 4 to 3, etc.)

(5) Test Circuit for V_{FM} and t_{fr} is as shown below:





INPUT CURRENT PULSE



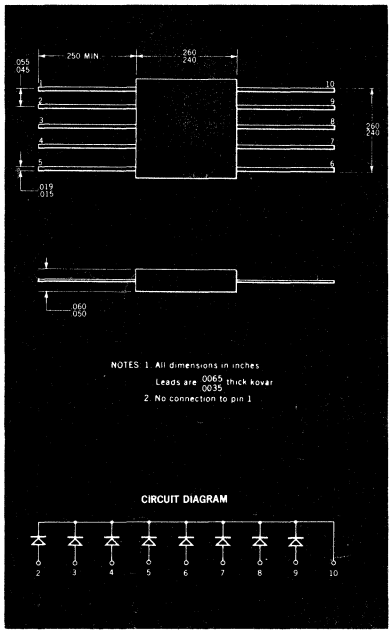
OUTPUT VOLTAGE PULSE

FSA2002

ULTRA FAST, EIGHT DIODE, COMMON-CATHODE ARRAY

SILICON PLANAR EPITAXIAL CONSTRUCTION

GENERAL DESCRIPTION - These Silicon Planar Epitaxial Diode Arrays were designed especially for high-speed core driver applications. They are hermetically sealed in a ceramic package. The excellent thermal conductivity of the ceramic permits operation to 400 mW.



MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	40 V
I_o	Average Rectified Current	250 mA
I_F	Forward Current Steady State DC	330 mA
i_f	Recurrent Peak Forward Current	800 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1.0 sec	500 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1.0 μsec	2000 mA
P	Power Dissipation	400 mW
$\frac{1}{\theta}$	Power Derating Factor	3.2 mW°C
T_A	Operating Temperature	-65°C to +150°C
T_{stg}	Storage Temperature, Ambient	-65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

Symbol	Characteristic	Min.	Max.	Units	Test Conditions	
V_{F1}	Forward Voltage		1.50	V	I_F = 500 mA	(Note 2)
V_{F2}	Forward Voltage		1.20	V	I_F = 300 mA	(Note 2)
V_{F3}	Forward Voltage		1.10	V	I_F = 200 mA	(Note 2)
BV	Breakdown Voltage	60		V	I_R = 100 μA	
I_{R1}	Reverse Current		100	nA	V_R = -40 V	
I_{R2}	Reverse Current (T_A = 150°C)		100	μA	V_R = -40 V	
C	Capacitance		3.0	pf	V_R = 0, f = 1 MHz	
t_{rr1}	Reverse Recovery Time		25	ns	$I_F = I_R$ = 10 mA to 200 mA, R_L = 100 Ω, Rec. to 0.1 I_F	
t_{rr2}	Reverse Recovery Time		90	ns	I_F = 300 mA, I_R = 60 mA, R_L = 100 Ω, Rec. to 20 mA	
V_{FM}	Peak Forward Voltage		5.0	V	I_F = 500 mA, $t_r \leq$ 10 ns	(Note 3)
t_{fr}	Forward Recovery Time		40	ns	I_F = 500 mA, $t_r \leq$ 10 ns Rec. to 1.6 V	(Note 3)

(See notes on back page)

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

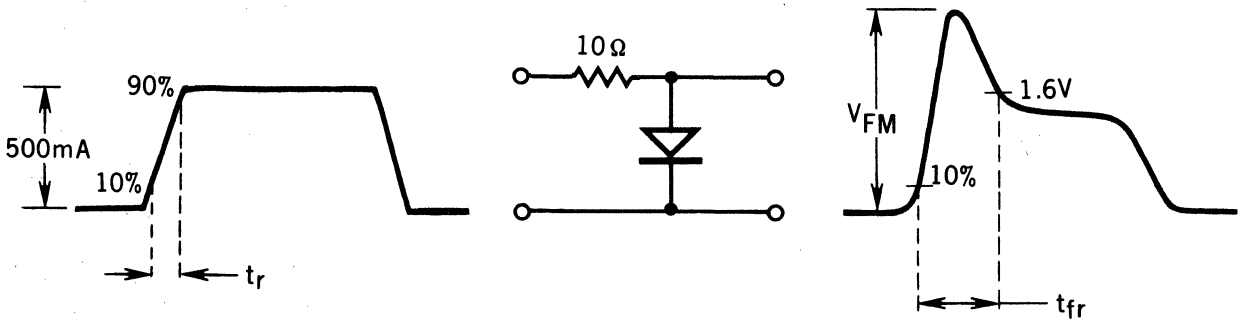
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

NOTES:

(1) Ratings apply to individual diodes. For multiple diode operation, total power must not exceed power dissipation rating listed.

(2) Pulse Input Current - Duty cycle less than 1.0%.

(3) Test Circuit for V_{FM} and t_{fr} is as shown below:



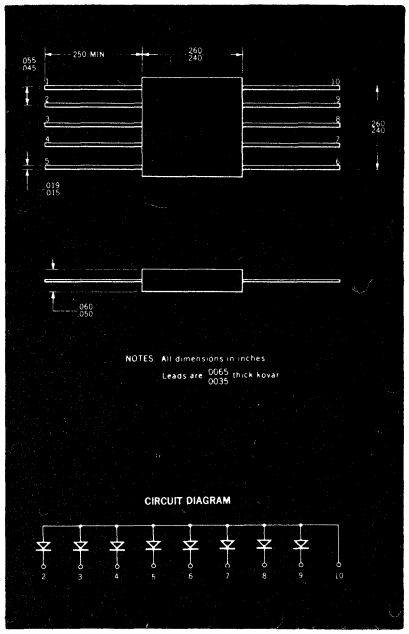
INPUT CURRENT PULSE **OUTPUT VOLTAGE PULSE**

FSA2003

ULTRA FAST, EIGHT DIODE, COMMON-ANODE ARRAY

SILICON PLANAR EPITAXIAL CONSTRUCTION

GENERAL DESCRIPTION - These Silicon Planar Epitaxial Diode Arrays were designed especially for high-speed core driver applications. They are hermetically sealed in a ceramic package. The excellent thermal conductivity of the ceramic permits operation to 400 mW.



MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	40 V
I_o	Average Rectified Current	250 mA
I_F	Forward Current Steady State DC	330 mA
i_f	Recurrent Peak Forward Current	800 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1.0 sec	500 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1.0 μsec	2000 mA
P	Power Dissipation	400 mW
$\frac{1}{\theta}$	Power Derating Factor	3.2 mW/°C
T_A	Operating Temperature	-65°C to +150°C
T_{stg}	Storage Temperature, Ambient	-65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

Symbol	Characteristic	Min.	Max.	Units	Test Conditions	
V_{F1}	Forward Voltage		1.50	V	I_F = 500 mA	(Note 2)
V_{F2}	Forward Voltage		1.20	V	I_F = 300 mA	(Note 2)
V_{F3}	Forward Voltage		1.10	V	I_F = 200 mA	(Note 2)
BV	Breakdown Voltage	60		V	I_R = 100 μA	
I_{R1}	Reverse Current		100	nA	V_R = -40 V	
I_{R2}	Reverse Current (T_A = 150°C)		100	μA	V_R = -40 V	
C	Capacitance		7.0	pf	V_R = 0, f = 1 MHz	
t_{rr1}	Reverse Recovery Time		25	ns	$I_F = I_R$ = 10 mA to 200 mA, R_L = 100 Ω, Rec. to 0.1 I_F	
t_{rr2}	Reverse Recovery Time		90	ns	I_F = 300 mA, I_R = 60 mA, R_L = 100 Ω, Rec. to 20 mA	
V_{FM}	Peak Forward Voltage		5.0	V	I_F = 500 mA, $t_r \leq$ 10 ns	(Note 3)
t_{fr}	Forward Recovery Time		40	nsec	I_F = 500 mA, $t_r \leq$ 10 ns Rec. to 1.6 V	(Note 3)

(See notes on back page)

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

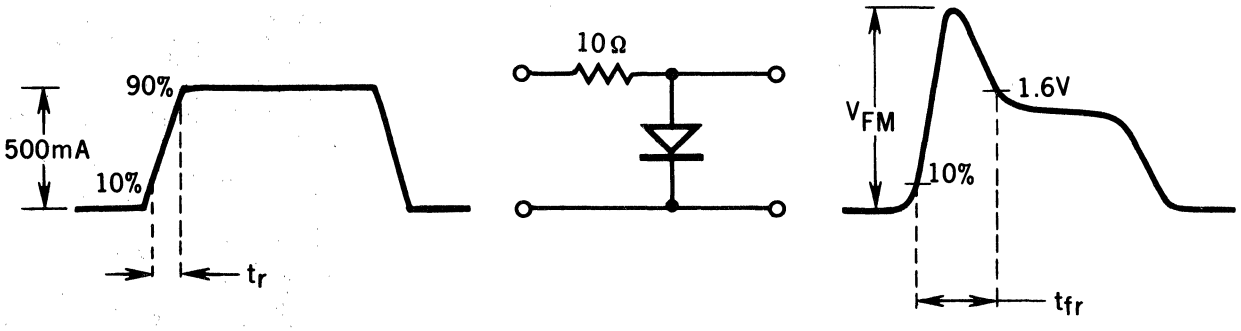
FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

NOTES:

(1) Ratings apply to individual diodes. For multiple diode operation, total power must not exceed power dissipation rating listed.

(2) Pulse Input Current - Duty cycle less than 1.0%.

(3) Test Circuit for V_{FM} and t_{fr} is as shown below:



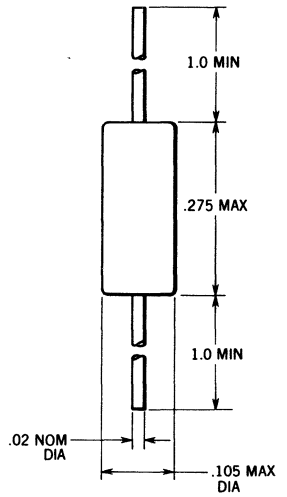
INPUT CURRENT PULSE **OUTPUT VOLTAGE PULSE**

FD2440

HIGH SPEED, HIGH CONDUCTANCE, PLANAR* DIODE

GENERAL DESCRIPTION — The FD2440 is a high speed, high conductance planar diode. This device couples high speed and high conductance enabling designers to choose an economical diode with planar reliability to fulfill most general purpose switching applications.

PHYSICAL DIMENSIONS
(All dimensions in inches)



ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	50 V
I_O	Average rectified current	100 mA
I_F	Forward current steady state DC	300 mA
i_f (surge)	Peak forward surge current, pulse width of 1.0 second	500 mA
i_f (surge)	Peak forward surge current, pulse width of 1.0 μs	2000 mA
P	Power dissipation	400 mW
$1/\theta$	Power derating factor	3.2 mW/°C
T_A	Operating temperature	−65°C to +150°C
T_{stg}	Storage temperature, ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

SYMBOL	†FACT Subgroup	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
*V_{F1}	1a	Forward Voltage	.930	1.30	V	I_F = 300 mA
V_{F2}	1b	Forward Voltage	.890	1.20	V	I_F = 200 mA
V_{F3}	1b	Forward Voltage	.820	1.05	V	I_F = 100 mA
V_{F4}	1b	Forward Voltage	.76	.930	V	I_F = 50 mA
V_{F5}	1b	Forward Voltage	.65	.77	V	I_F = 10 mA
*I_R	1a	Reverse Current		150	nA	V_R = −50 V
t_{rr} (Note 2)	1a	Reverse Recovery Time		75	ns	I_F = 10 mA, I_R = 10 mA, R_L = 100 Ω
**C	1a	Capacitance		7	pF	V_R = 0 V, f = 1 MHz
**BV	1a	Breakdown Voltage	75		V	I_R = 100 μA

† These numerals apply to the FACT program.
* FACT end point, Group B, Subgroup 2, 3, 4, 6, 7.
** FACT end point, Group B, Subgroup 6, 7 only.

*Planar is a patented Fairchild process.

NOTES:

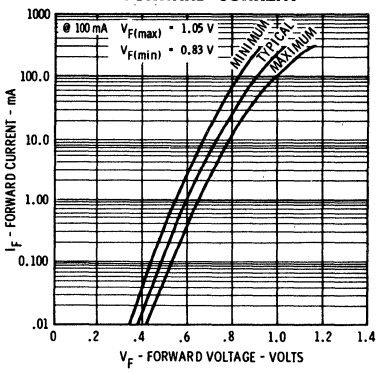
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 1.0 mA.
(3) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

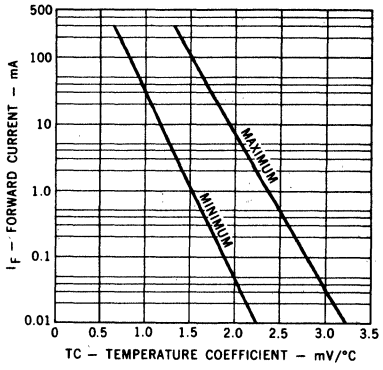
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

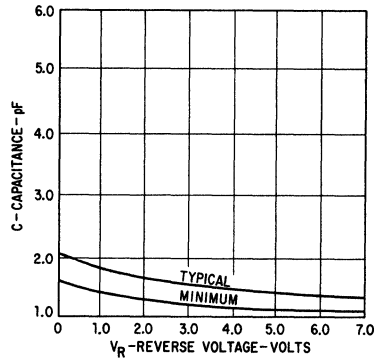
FORWARD VOLTAGE VERSUS FORWARD CURRENT



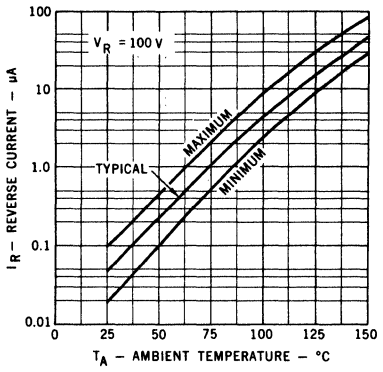
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



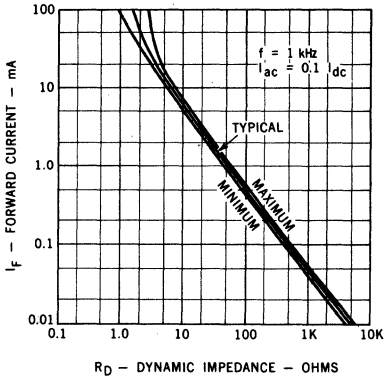
CAPACITANCE VERSUS REVERSE VOLTAGE



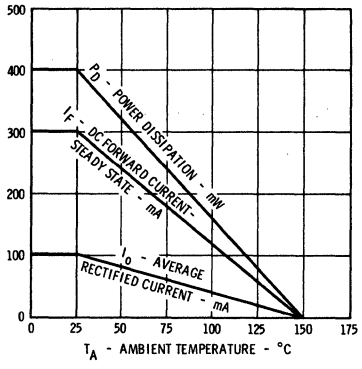
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



POWER DISSIPATION AND AVERAGE RECTIFIED CURRENT AND FORWARD CURRENT VERSUS AMBIENT TEMPERATURE

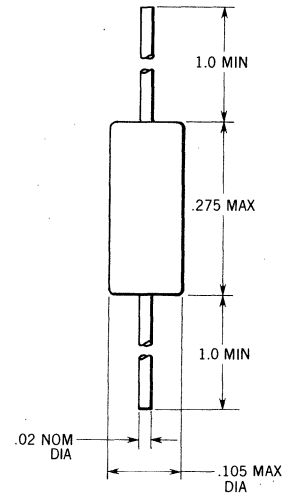


FD2441

HIGH SPEED, HIGH CONDUCTANCE PLANAR* DIODE

GENERAL DESCRIPTION — The FD2441 is a high speed, high conductance planar diode. This device couples high speed with high conductance and high breakdown voltage enabling designers to choose an economical diode with planar reliability to fulfill most general purpose switching applications.

PHYSICAL DIMENSIONS
(All dimensions in inches)



ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	120 V
I_O	Average rectified current	100 mA
I_F	Forward current steady state DC	300 mA
i_f (surge)	Peak forward surge current, pulse width of 1.0 second	500 mA
i_f (surge)	Peak forward surge current, pulse width of 1.0 μs	2000 mA
P	Power dissipation	400 mW
$1/\theta$	Power derating factor	3.2 mW/°C
T_A	Operating temperature	−65°C to +150°C
T_{stg}	Storage temperature, ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

SYMBOL	†FACT Subgroup	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
*V_{F1}	1a	Forward Voltage	.930	1.30	V	$I_F = 300$ mA
V_{F2}	1b	Forward Voltage	.890	1.20	V	$I_F = 200$ mA
V_{F3}	1b	Forward Voltage	.820	1.05	V	$I_F = 100$ mA
V_{F4}	1b	Forward Voltage	.76	.930	V	$I_F = 50$ mA
V_{F5}	1b	Forward Voltage	.65	.77	V	$I_F = 10$ mA
*I_R	1a	Reverse Current		200	nA	$V_R = -120$ V
t_{rr} (Note 2)	1a	Reverse Recovery Time		75	ns	$I_F = 10$ mA, $I_R = 10$ mA, $R_L = 100\ \Omega$
**C	1a	Capacitance		7	pF	$V_R = 0$ V, f = 1 MHz
**BV	1a	Breakdown Voltage	150		V	$I_R = 100\ \mu$A

† These numerals apply to the FACT program.
* FACT end point, Group B, Subgroup 2, 3, 4, 6, 7.
** FACT end point, Group B, Subgroup 6, 7 only.

*Planar is a patented Fairchild process.

NOTES:

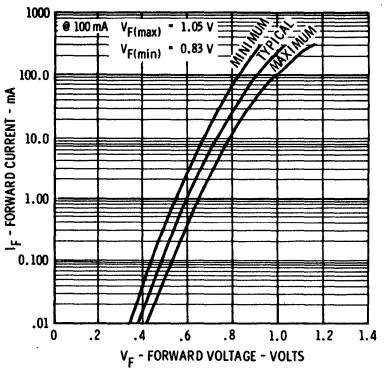
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 1.0 mA.
(3) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

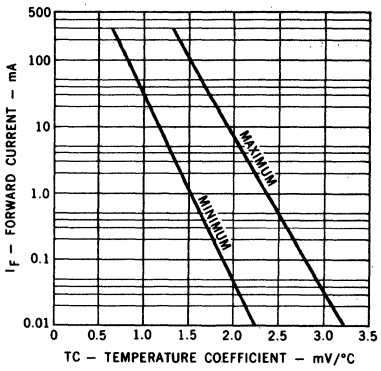
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

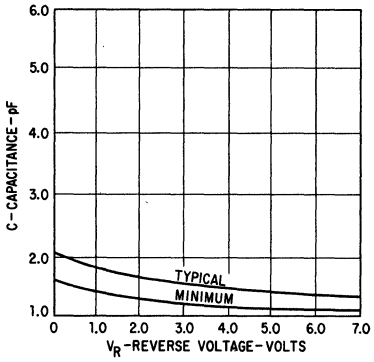
FORWARD VOLTAGE VERSUS FORWARD CURRENT



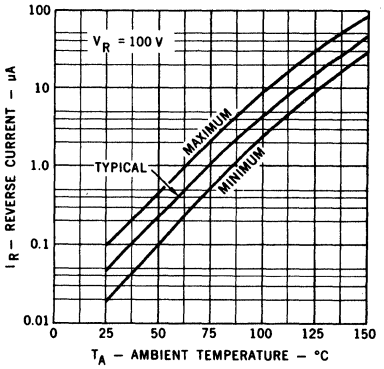
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



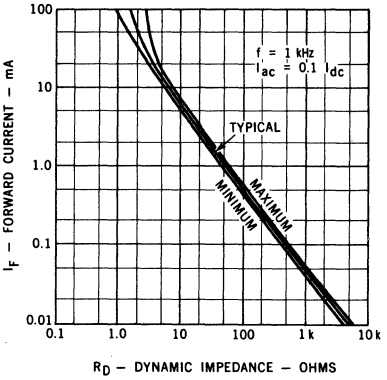
CAPACITANCE VERSUS REVERSE VOLTAGE



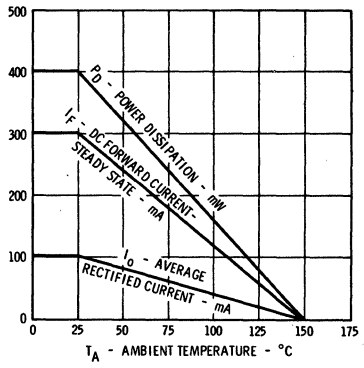
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



POWER DISSIPATION AND AVERAGE RECTIFIED CURRENT AND FORWARD CURRENT VERSUS AMBIENT TEMPERATURE

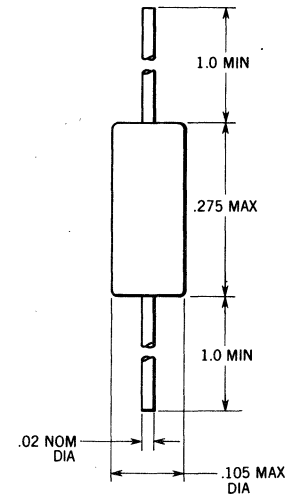


FD2442

HIGH SPEED, HIGH CONDUCTANCE PLANAR* DIODE

GENERAL DESCRIPTION — The FD2442 is a high speed, high conductance planar diode. This device couples high speed with high conductance and high breakdown voltage enabling designers to choose a diode with planar reliability to fulfill most general purpose switching applications.

PHYSICAL DIMENSIONS
(All dimensions in inches)



ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	150 V
I_O	Average rectified current	100 mA
I_F	Forward current steady state DC	300 mA
i_f (surge)	Peak forward surge current, pulse width of 1.0 second	500 mA
i_f (surge)	Peak forward surge current, pulse width of 1.0 μs	2000 mA
P	Power dissipation	400 mW
$1/\theta$	Power derating factor	3.2 mW/°C
T_A	Operating temperature	−65°C to +150°C
T_{stg}	Storage temperature, ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

SYMBOL	†FACT Subgroup	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
*V_{F1}	1a	Forward Voltage	.930	1.30	V	$I_F = 300$ mA
V_{F2}	1b	Forward Voltage	.890	1.20	V	$I_F = 200$ mA
V_{F3}	1b	Forward Voltage	.820	1.05	V	$I_F = 100$ mA
V_{F4}	1b	Forward Voltage	.76	.930	V	$I_F = 50$ mA
V_{F5}	1b	Forward Voltage	.65	.77	V	$I_F = 10$ mA
*I_R	1a	Reverse Current		350	nA	$V_R = -150$ V
t_{rr} (Note 2)	1a	Reverse Recovery Time		75	ns	$I_F = 10$ mA, $I_R = 10$ mA, $R_L = 100\ \Omega$
**C	1a	Capacitance		7	pF	$V_R = 0$ V, f = 1 MHz
**BV	1a	Breakdown Voltage	200		V	$I_R = 100\ \mu$A

† These numerals apply to the FACT program.
* FACT end point, Group B, Subgroup 2, 3, 4, 6, 7.
** FACT end point, Group B, Subgroup 6, 7 only.

*Planar is a patented Fairchild process.

NOTES:

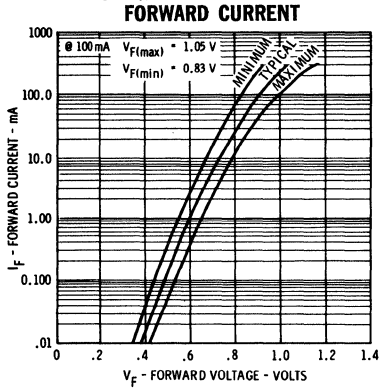
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 1.0 mA.
(3) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

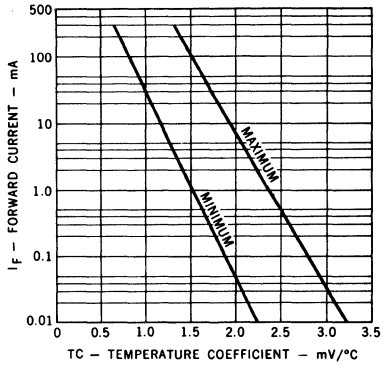
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

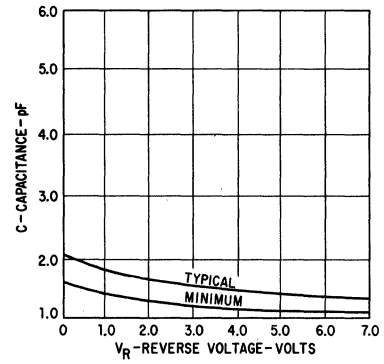
FORWARD VOLTAGE VERSUS FORWARD CURRENT



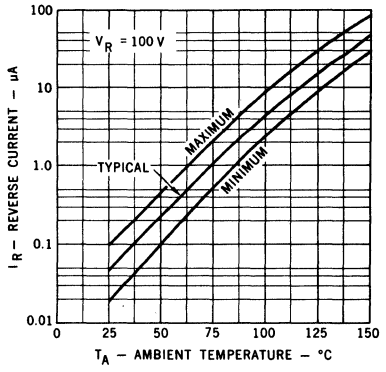
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



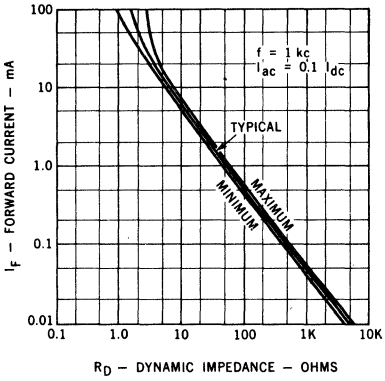
CAPACITANCE VERSUS REVERSE VOLTAGE



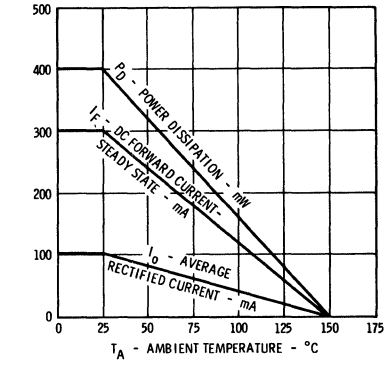
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



POWER DISSIPATION AND AVERAGE RECTIFIED CURRENT AND FORWARD CURRENT VERSUS AMBIENT TEMPERATURE

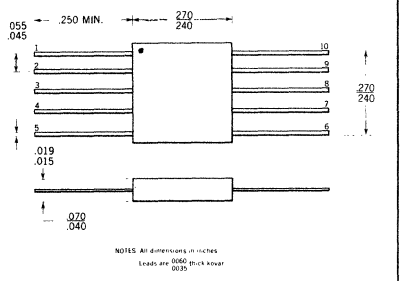


FSA2500M • FSA2501M • FSA2502M

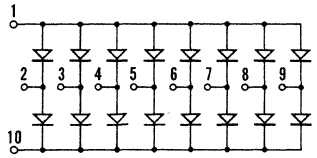
MONOLITHIC 16 DIODE CORE DRIVER

PLANAR* AIR ISOLATED

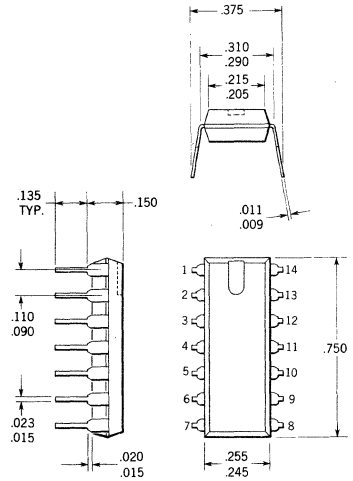
FSA2500M
BG ¼ x ¼

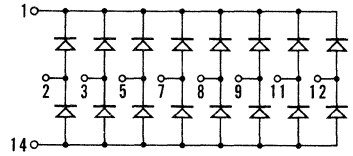


CIRCUIT DIAGRAM

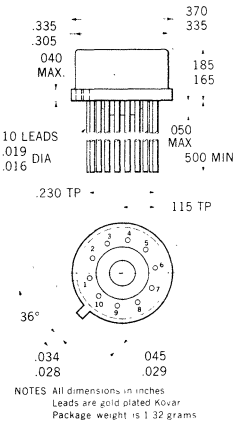


FSA2501M
6E PLASTIC DIP

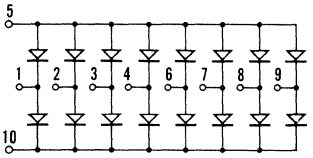




FSA2502M
XA TO-5



CIRCUIT DIAGRAM



GENERAL DESCRIPTION — The FSA2500M, FSA2501M, and FSA2502M are 16 diode monolithic core driver arrays packaged in the ¼ x ¼, Plastic DIP, and TO-5 Outline respectively. The diodes are standard Planar epitaxial devices diffused in a single silicon chip and isolated by an air isolation technique developed by Fairchild Semiconductor. These arrays are used in the drive circuitry of core memories in computers.

INDIVIDUAL DIODE SPECIFICATIONS

ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)		**FSA2500M**	**FSA2501M**	**FSA2502M**
PIV	Peak Inverse Voltage (Note 2)	55V	55V.	55V
I_F	DC Forward Current	350mA	350mA	350mA
i_f	Peak Forward Surge Current Pulse width of 1.0 sec	1 Amp	1 Amp	1 Amp
i_f	Peak Forward Surge Current Pulse width of 1.0 μsec	2 Amp	2 Amp	2 Amp
P	Power Dissipation at 25°C (Note 3)	400mW	400mW	400mW
T_A	Operating Temperature Range	−55°C to +150°C	−55°C to +125°C	−55°C to +150°C
T_{stg}	Storage Temperature, Ambient	−55°C to +200°C	−55°C to +125°C	−55°C to +200°C

*Planar is a patented Fairchild process.

FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

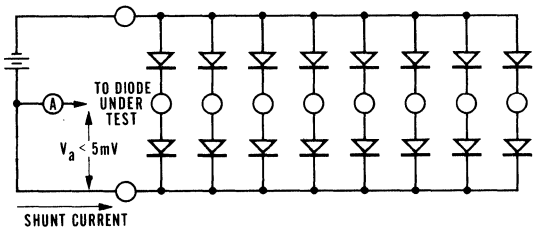
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature) (Note 4)

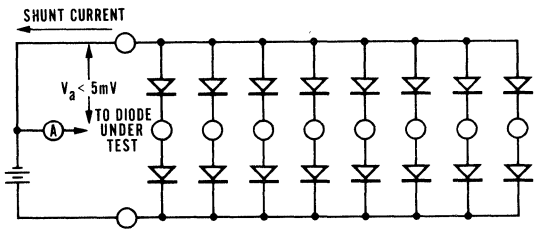
SYMBOL	PARAMETERS	TEST CONDITIONS	UNITS	MIN.	MAX.
BV	Breakdown Voltage	$I_R = 10\ \mu A$	V	60	
V_F	Forward Voltage	$I_F = 100$ mA	V		1.0
V_F	Forward Voltage (Note 5)	$I_F = 200$ mA	V		1.1
V_F	Forward Voltage	$I_F = 500$ mA	V		1.5
I_R	Reverse Current (Note 6)	$V_R = 50$ V	nA		100
I_R	Reverse Current (Note 6)	$V_R = 50$ V	μA		Note 7
C	Capacitance (Note 8)	$V_R = 0$ V, f = 1 mHz	pF		7
V_{FM}	Peak Forward Voltage (Note 9)	$I_F = 500$ mA	V		4
t_{fr}	Forward Recovery Time (Note 9)	$I_F = 500$ mA	ns		40
t_{rr}	Reverse Recovery Time	$I_F = I_R = 10$ mA to 200 mA $R_L = 100\ \Omega$, $t_{rr} = 0.1\ I_R$	ns		10
t_{rr}	Reverse Recovery Time	$I_F = 500$ mA, $I_R = 50$ mA $t_{rr} = 5$ mA, $R_L = 100\ \Omega$	ns		50

NOTES:

(1) The maximum ratings are limiting values above which satisfactory performance may be impaired.
(2) These values apply for a single 8mSec pulse.
(3) These are steady state limits. The factory should be consulted in applications involving pulsed or low duty cycle operation.
(4) Limits and typical electrical characteristics apply to single diode operation only. The diodes not under test are open circuited, except for I_R. See Note 6.
(5) These values apply for a single 50mSec pulse.
(6) To measure reverse current of an individual diode, the following test circuits are used:



TEST CONNECTIONS FOR COMMON-ANODE DIODES

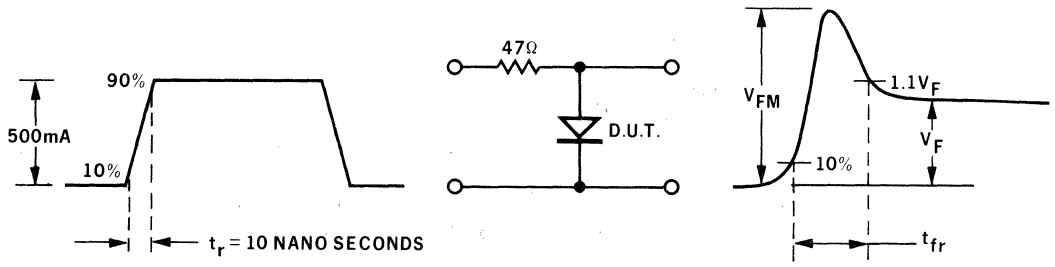


TEST CONNECTIONS FOR COMMON-CATHODE DIODES

(7) FSA2500M $I_R < 200\mu A$ @ 150°C
FSA2501M $I_R < 100\mu A$ @ 125°C
FSA2502M $I_R < 200\mu A$ @ 150°C
(8) The capacitance is measured from pin to pin across any one of 16 diodes. The interaction of other diodes are therefore included in the measured value.

NOTES: (con't)

(9) Test requirements for V_{FM} and t_{fr} is as shown below:

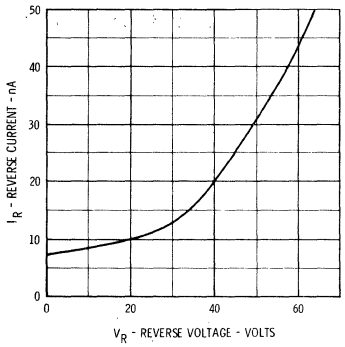


INPUT CURRENT PULSE **OUTPUT VOLTAGE PULSE**

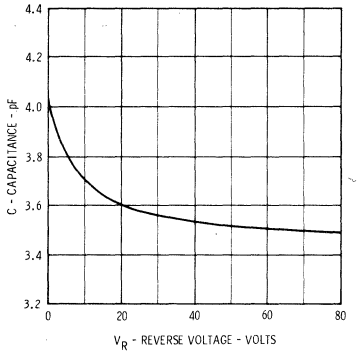
FAIRCHILD FSA2500M • FSA2501M • FSA2502M

TYPICAL ELECTRICAL CHARACTERISTICS

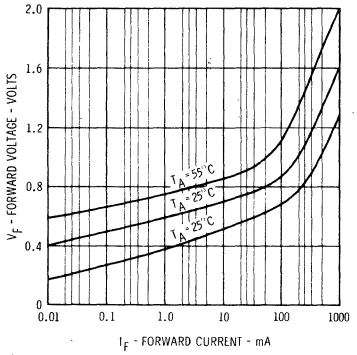
TYPICAL REVERSE CURRENT VERSUS REVERSE VOLTAGE



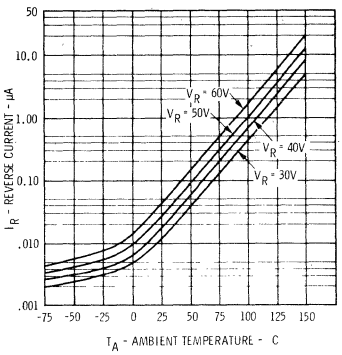
TYPICAL CAPACITANCE VERSUS REVERSE VOLTAGE



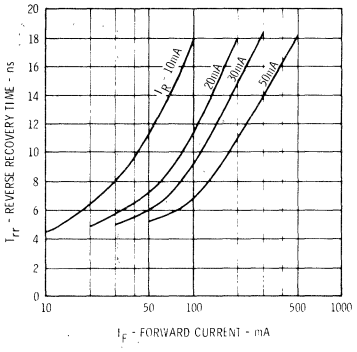
TYPICAL FORWARD VOLTAGE VERSUS FORWARD CURRENT



TYPICAL REVERSE CURRENT VERSUS AMBIENT TEMPERATURE

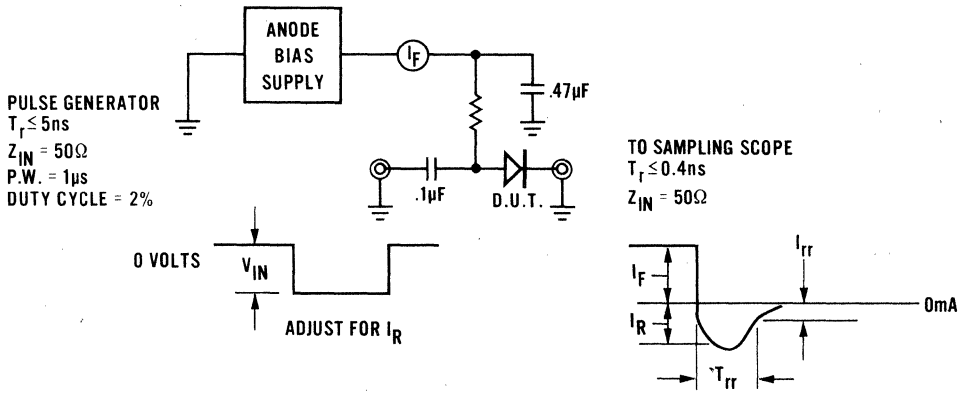


TYPICAL REVERSE RECOVERY TIME VERSUS FORWARD CURRENT



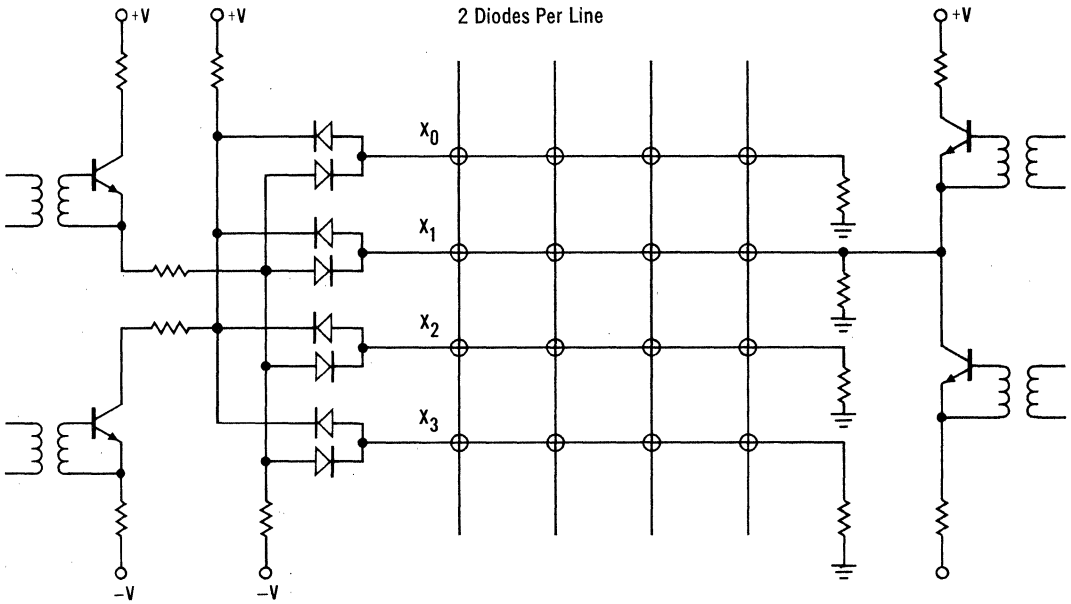
REVERSE RECOVERY TIME (T_{rr}) TEST CIRCUIT

CONDITION $I_F = I_R$ MEASUREMENT $T_{rr} = 0.1\ I_R$



A TYPICAL CORE MEMORY X-LINE DRIVE CIRCUIT

The diode arrays are gating elements which with two diodes per line control the direction of the current flow along the selected line. During a normal operating cycle, two of the sixteen diodes may conduct. Only one diode conducts at any instant. Under quiescent conditions, the matrix diodes are back-biased by a positive voltage applied at the common-cathode, a negative voltage applied at the common-anode, and ground at voltage switches.



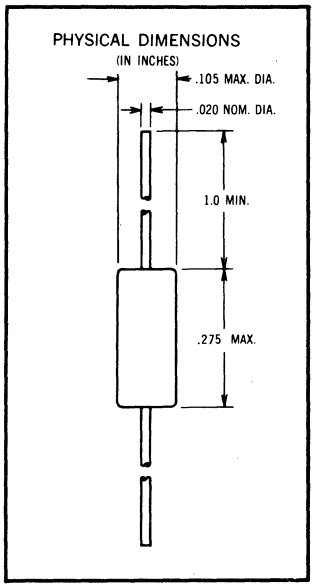
1N3062

LOW-CAPACITANCE PLANAR DIODE

1 pf AT 0 VOLTS

MAXIMUM RATINGS (25° C) [Note 1]

WIV	Working Inverse Voltage	50 Volts
I_o	Average rectified current	75 mA
I_F	Forward current steady state d.c.	115 mA
i_f	Recurrent peak forward current	225 mA
i_f (surge)	Peak forward surge current pulse width of 1.0 Second	500 mA
i_f (surge)	Peak forward surge current pulse width of 1.0 μSecond	2000 mA
P	Power dissipation	250 mW
P	Power dissipation derating factor	1.67 mW/°C
T_A	Operating temperature	-65° C to +175° C
T_{stg}	Storage temperature, ambient	-65° C to +200° C



ELECTRICAL SPECIFICATIONS (25° C unless otherwise noted)

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Conditions
V_F	Forward Voltage			1.0	Volt	I_F = 20 mA
I_R	Reverse Current			0.1	μA	V_R = 50 V
I_R	Reverse Current (150° C)			100	μA	V_R = 50 V
BV	Breakdown Voltage	75			Volts	I_R = 5.0 μA
t_{rr}	Reverse Recovery Time [Note 2]			2.0	nsec	I_f = 10 mA, V_r = 6.0 V, R_L = 100 ohms
C_o	Capacitance [Note 3]			1.0	pf	V_R = 0 V f = 1.0 mc
RE	Rectification Efficiency [Note 4]	45			%	f = 100 mc
$\Delta V_F/°C$	Forward Voltage Temperature Coefficient		-1.8		mV	

NOTES:

1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
2) Recovery to 1.0 mA
3) Capacitance as measured on Boonton Electronic Corporation Model No. 75A-S8 Capacitance Bridge or equivalent.
4) Rectification efficiency is defined as the ratio of D. C. load voltage to peak rf input voltage to the detector circuit, measured with 2.0 V r. m. s. input to the circuit. Load resistance 5.0 K ohms, load capacitance 20 pf.

FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

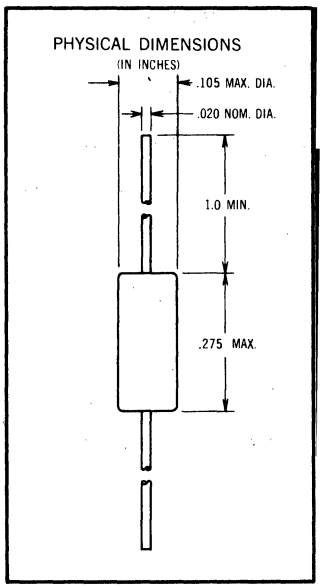
1N3063

ULTRA-FAST PLANAR DIODE

CONTROLLED FORWARD VOLTAGE

MAXIMUM RATINGS (25° C) [Note 1]

WIV	Working Inverse Voltage	50 Volts
I_o	Average rectified current	75 mA
I_F	Forward current steady state d.c.	115 mA
i_f	Recurrent peak forward current	225 mA
i_f (surge)	Peak forward surge current pulse width of 1.0 Second	500 mA
i_f (surge)	Peak forward surge current pulse width of 1.0 μSecond	2000 mA
P	Power dissipation	250 mW
P	Power dissipation at 125° C	100 mW
T_A	Operating temperature	-65° C to +175° C
T_{stg}	Storage temperature, ambient	-65° C to +200° C



ELECTRICAL SPECIFICATIONS (25° C unless otherwise noted)

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Conditions
V_F	Forward Voltage	0.700		0.850	Volt	I_F = 10 mA
V_F	Forward Voltage	0.610		0.710	Volt	I_F = 2.0 mA
V_F	Forward Voltage	0.550		0.650	Volt	I_F = 1.0 mA
V_F	Forward Voltage	0.505		0.575	Volt	I_F = 250 μA
I_R	Reverse Current			0.1	μA	V_R = -50 V
I_R	Reverse Current (150° C)			100	μA	V_R = -50 V
BV	Breakdown Voltage	75			Volts	I_R = 5.0 μA
t_{rr}	Reverse Recovery Time [Note 2]			4.0	mμSec	I_f = 10 mA
						I_r = 10 mA
C_o	Capacitance [Note 3]			2.0	$\mu\mu$f	V_R = 0 V f = 1.0 mc
RE	Rectification Efficiency [Note 4]	45			%	f = 100 mc
ΔV_F/° C	Forward Voltage Temperature Coefficient		-1.8		mV	

NOTES:

(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.

(2) Recovery to 1.0 mA in E. G. and G. circuit.

(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75A-S8 Capacitance Bridge or equivalent.

(4) Rectification efficiency is defined as the ratio of D. C. load voltage to peak rf input voltage to the detector circuit, measured with 2.0 V r. m. s. input to the circuit. Load resistance 5.0 K ohms, load capacitance 20 pf.

FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

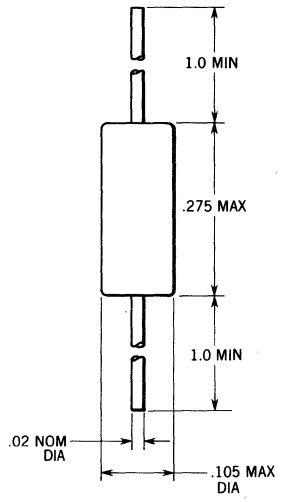
1N3064

ULTRA FAST—LOW CAPACITANCE PLANAR* DIODE

MAXIMUM RATINGS (25°C) [Note 1]

WIV	Working Inverse Voltage	50 Volts
I_o	Average rectified current	75 mA
I_F	Forward current steady state d.c.	115 mA
i_f	Recurrent peak forward current	225 mA
i_f (surge)	Peak forward surge current pulse width of 1.0 Second	500 mA
i_f (surge)	Peak forward surge current pulse width of 1.0 μSecond	2000 mA
P	Power dissipation	250 mW
P	Power dissipation at 125°C	100 mW
T_A	Operating temperature	−65°C to +150°C
T_{stg}	Storage temperature, ambient	−65°C to +175°C

PHYSICAL DIMENSIONS
(All dimensions in inches)



ELECTRICAL SPECIFICATIONS (25°C unless otherwise noted)

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
V_F	Forward Voltage			1.0	Volt	$I_F = 10$ mA
I_R	Reverse Current			0.1	μA	$V_R = -50$ V
I_R	Reverse Current (150°C)			100	μA	$V_R = -50$ V
BV	Breakdown Voltage	75			Volts	$I_R = 5.0\ \mu$A
t_{rr}	Reverse Recovery Time [Note 2]			4.0	ns	$I_f = 10$ mA
						$I_r = 10$ mA ($V_r = 1.0$V)
						$R_L = 100\ \Omega$
V_{fr}	Forward Recovery Peak Voltage [Note 3]			3.0	Volts	$I_f = 100$ mA pulse
C_o	Capacitance [Note 4]			2.0	pF	$V_R = 0$ V f = 1.0 MHz
RE	Rectification Efficiency [Note 5]	45			%	f = 100 MHz
$\Delta V_F/°C$	Forward Voltage Temperature Coefficient		−1.8		mV	

*Planar is a patented Fairchild process.

NOTES:
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 1.0 mA in E. G. and G. circuit.
(3) The oscilloscope used as the response detector shall have a band width of at least 10 MHz (3.0 dB down), and shall be calibrated using a deposited carbon resistor of 50 ohms in the diode test clips. t_{fr} is defined as the difference between the 10% point of the pulse and the point where V_F is to within 10% of the quiescent value. Pulse condition shall be 0.1 ns wide at base, 20 ns maximum rise time, repetition rate = 100 KHz maximum.
(4) Capacitance as measured on Boonton Electronic Corporation Model No. 75A-S8 Capacitance Bridge or equivalent.
(5) Rectification efficiency is defined as the ratio of dc load voltage to peak rf input voltage to the detector circuit, measured with 2.0 V rms. input to the circuit. Load resistance 5.0 KΩ, load capacitance 20 pF.

FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

1N3070

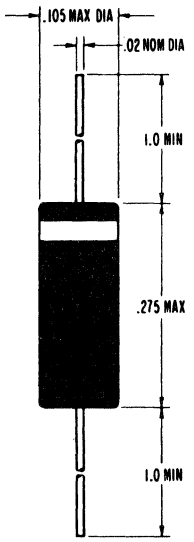
HIGH SPEED, HIGH CONDUCTANCE PLANAR* DIODE

GENERAL DESCRIPTION:

The 1N3070 is a high speed, high conductance, Planar diode. This device couples high speed with high conductance and high breakdown voltage enabling designers to choose a diode with planar reliability to fulfill most general purpose switching applications.

The USN 1N3070 is supplied in accordance with MIL-S-19500/169A.

PHYSICAL DIMENSIONS



NOTE: All dimensions in inches. See note 4

MAXIMUM RATINGS (25°C) [Note 1]

WIV	Working Inverse Voltage	175 V
I_o	Average rectified current	100 mA
I_F	Forward current steady state d.c.	220 mA
i_f	Recurrent peak forward current	300 mA
i_f (surge)	Peak forward surge current pulse width of 1.0 second	1.0 A
i_f (surge)	Peak forward surge current pulse width of 1.0 μSec.	4.0 A
P	Power dissipation	250 mW
	Power dissipation at 125°C	85 mW
T	Operating temperature	−65°C to +175°C
T_{stg}	Storage temperature, ambient	−65°C to +200°C

ELECTRICAL SPECIFICATIONS (25°C unless otherwise noted)

Symbol	†FACT Subgroup	Characteristic	Min.	Max.	Units	Test Conditions
*V_F	1a	Forward Voltage		1.0	Volt	I_F = 100 mA
*I_R	1a	Reverse Current		0.1	μA	V_R = −175 V
I_R	1b	Reverse Current (150°C)		100	μA	V_R = −175 V
**B_V	1a	Breakdown Voltage	200		Volts	I_R = 100 μA
**T_{rr}	1a	Reverse Recovery Time [Note 2]		50	ns	I_F = 30 mA, I_R = 30 mA, RL = 100 Ω
*C_o	1a	Capacitance		5.0	pf	V_R = 0 V, f = 1 MHz
RE	1b	Rectification Efficiency [Note 3]	35		%	f = 100 MHz

† These numerals apply to the FACT program.
* FACT end point, Group B, Subgroup 2, 3, 4, 6, 7.
** FACT end point, Group B, Subgroup 6, 7 only.

* Planar is a patented Fairchild process.

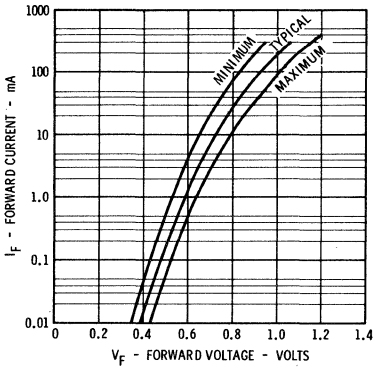
NOTES:
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 1.0 mA.
(3) Rectification efficiency is defined as the ratio of dc load voltage to peak rf input voltage to the detector circuit, measured with 2.0 V rms input to the circuit. Load resistance: 5.0 K ohms, load capacitance 20 pf.
(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

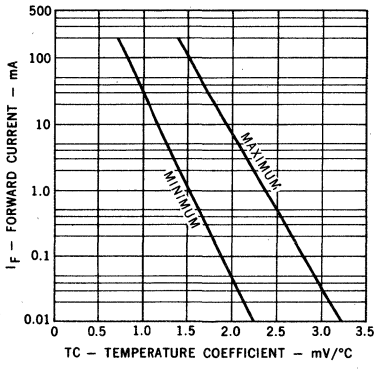
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

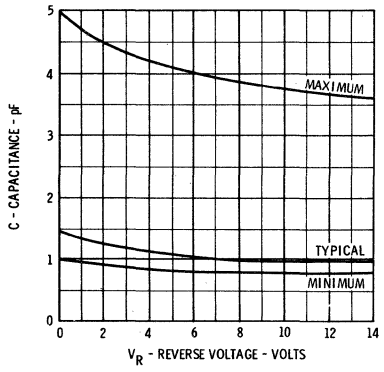
FORWARD VOLTAGE VERSUS FORWARD CURRENT



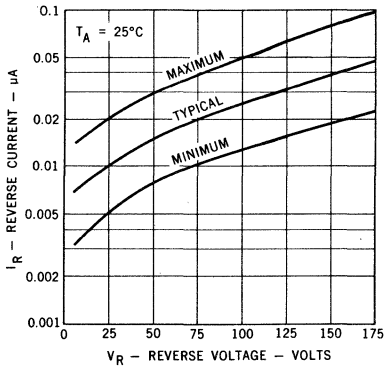
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



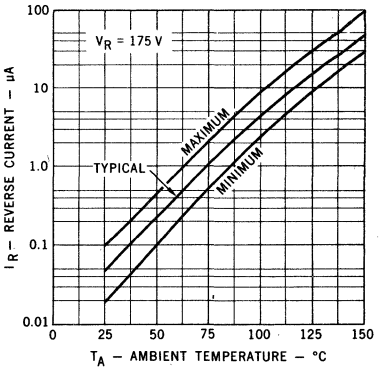
CAPACITANCE VERSUS REVERSE VOLTAGE



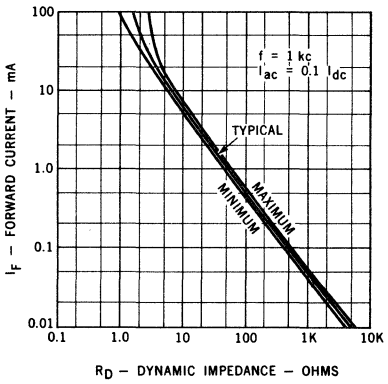
REVERSE VOLTAGE VERSUS REVERSE CURRENT



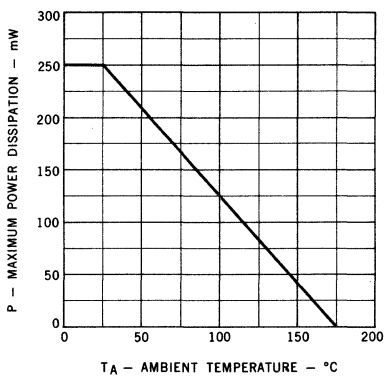
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



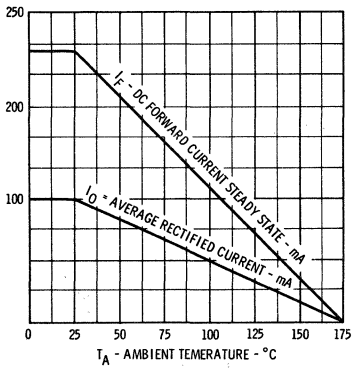
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



POWER DERATING CURVE



FORWARD CURRENT AND AVERAGE RECTIFIED CURRENT VERSUS AMBIENT TEMPERATURE

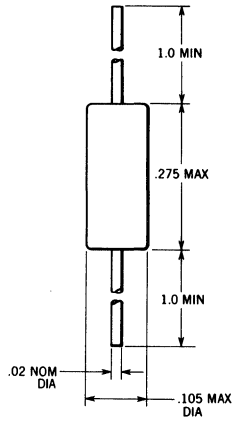


FD3459

HIGH CONDUCTANCE, LOW LEAKAGE PLANAR* DIODE

GENERAL DESCRIPTION — The FD3459 is a high conductance low leakage planar diode. Specified maximum values for voltage drop capacitance and leakage current mean flexibility in designing circuits which require large numbers of economical diodes. In those applications where reverse current is a critical design parameter, the inherent qualities of the Fairchild process eliminate the problem of leakage degradation.

PHYSICAL DIMENSIONS



NOTES:
All dimensions in inches
Package weight is 0.25 gram
See note 3

ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	50 V
I_O	Average rectified current	150 mA
I_F	Forward current steady state DC	225 mA
i_f	Recurrent peak forward current	450 mA
i_f (surge)	Peak forward surge current, pulse width of 1.0 second	500 mA
i_f (surge)	Peak forward surge current, pulse width of 1.0 μs	4000 mA
P	Power dissipation	400 mW
$1/\theta$	Power derating factor	3.2 mW/°C
T_A	Operating temperature	−65°C to +150°C
T_{stg}	Storage temperature, ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
V_F	Forward Voltage	.90	1.2	V	$I_F = 300$ mA
V_F	Forward Voltage	.87	1.15	V	$I_F = 200$ mA
V_F	Forward Voltage	.83	1.00	V	$I_F = 100$ mA
V_F	Forward Voltage	.80	.910	V	$I_F = 50$ mA
I_R	Reverse Current		50	nA	$V_R = -50$ V
C_o (Note 2)	Capacitance		10	pF	$V_R = 0$ V
BV	Breakdown Voltage	75		V	$I_R = 5$ μA

*Planar is a patented Fairchild process.

NOTES:

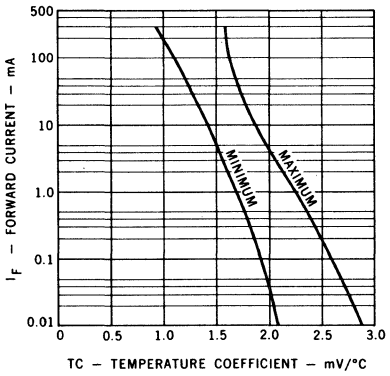
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Capacitance as measured on Boonton Electronic Corporation Model No. 75A-S8 Capacitance Bridge or equivalent.
(3) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

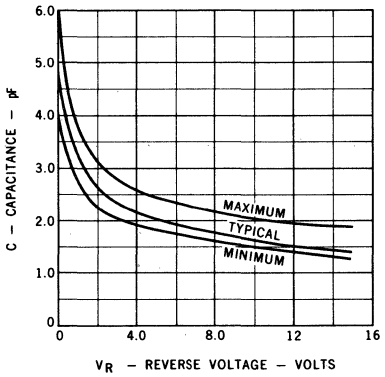
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

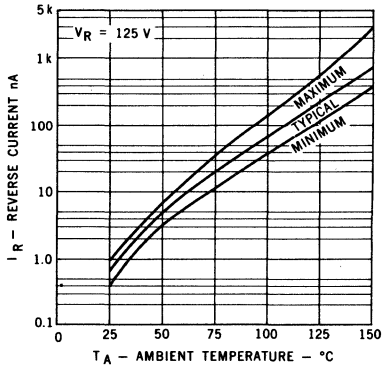
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



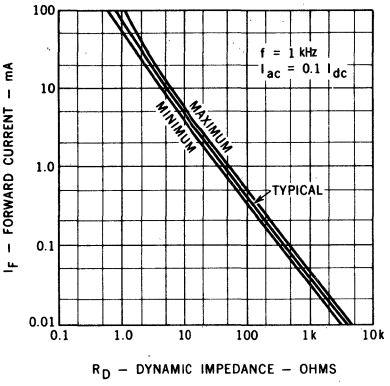
CAPACITANCE VERSUS REVERSE VOLTAGE



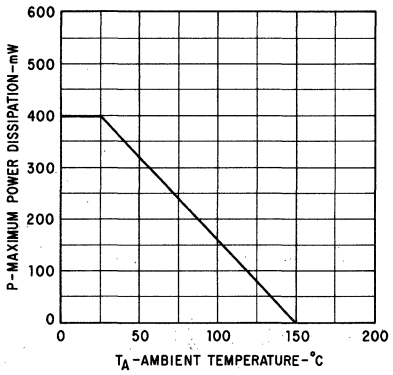
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



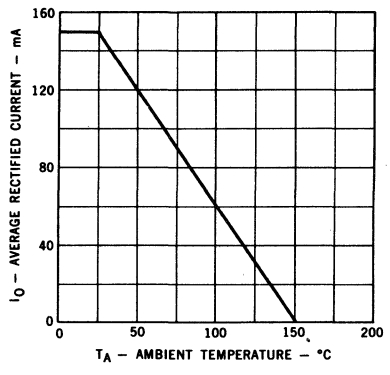
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



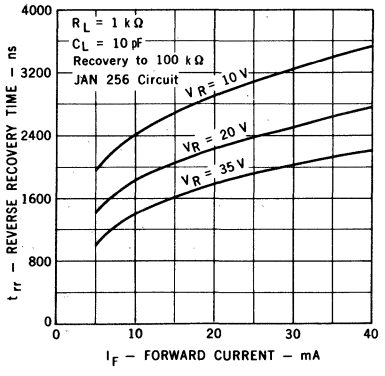
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT AND REVERSE BIAS VOLTAGE



1N3595

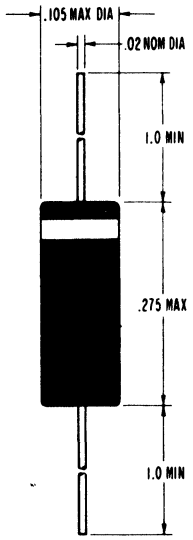
HIGH CONDUCTANCE LOW LEAKAGE PLANAR DIODE

REGISTERED SPECIFICATIONS

The 1N3595 is a high conductance extremely low leakage planar diode. Specified maximum values for voltage drop capacitance and leakage current mean flexibility in designing circuits which require large numbers of diodes. In those applications where reverse current is a critical design parameter, the inherent qualities of the Fairchild process eliminates the problem of leakage degradation.

The USN 1N3595 is supplied in accordance with MIL-S-19500/241A (NAVY). The electrical specifications, as listed in Table III, are identical with those listed in this Military Specification.

PHYSICAL DIMENSIONS



NOTE: All dimensions in inches. See note 2

MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	125 V
I_O	Average rectified current	150 mA
I_F	Forward current steady state d.c.	225 mA
i_f	Recurrent peak forward current	450 mA
i_f **(surge)**	Peak forward surge current pulse width of 1 second	500 mA
i_f **(surge)**	Peak forward surge current pulse width of 1 μSec.	4000 mA
P	Power dissipation	500 mW
$1/\theta$	Power derating factor	4 mW/°C
T_A	Operating temperature	−65°C to +150°C
T_{stg}	Storage temperature, ambient	−65°C to +175°C

ELECTRICAL SPECIFICATIONS (25°C unless otherwise noted)

Symbol	Characteristic	Min.	Max.	Units	Test Conditions
V_{F_1}	Forward Voltage	.83	1.00	Vdc	I_F = 200 mA
V_{F_2}	Forward Voltage	.79	.92	Vdc	I_F = 100 mA
V_{F_3}	Forward Voltage	.74	.88	Vdc	I_F = 50 mA
V_{F_4}	Forward Voltage	.65	.80	Vdc	I_F = 10 mA
V_{F_5}	Forward Voltage	.60	.75	Vdc	I_F = 5 mA
V_{F_6}	Forward Voltage	.52	.68	Vdc	I_F = 1 mA
I_{R_1}	Reverse Current		1.0	nA	V_R = 125 V
I_{R_2}	Reverse Current (125°C)		300	nA	V_R = 30 V
I_{R_3}	Reverse Current (125°C)		500	nA	V_R = 125 V
I_{R_4}	Reverse Current (150°C)		3.0	μA	V_R = 125 V
t_{rr}	Reverse Recovery Time		3.0	μSec	See Table III
C	Capacitance [Note 3]		8.0	pf	V_R = 0 V
BV	Breakdown Voltage	150		Vdc	I_R = 100 μA

NOTES:

(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.

(2) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

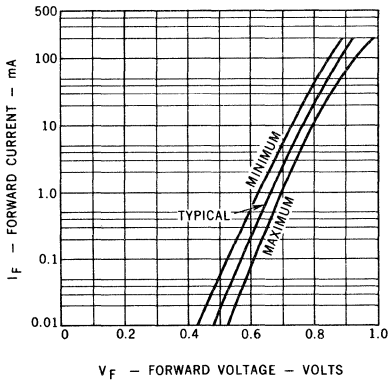
(3) Capacitance as measured on Boonton Electronic Corporation's Model No. 75A-S8 Capacitance Bridge or equivalent.

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

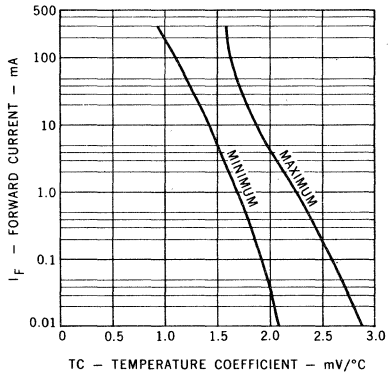
FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

TYPICAL ELECTRICAL CHARACTERISTICS

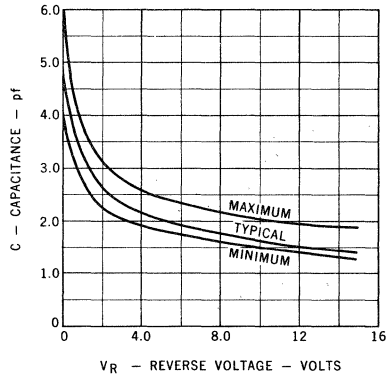
FORWARD VOLTAGE VERSUS FORWARD CURRENT



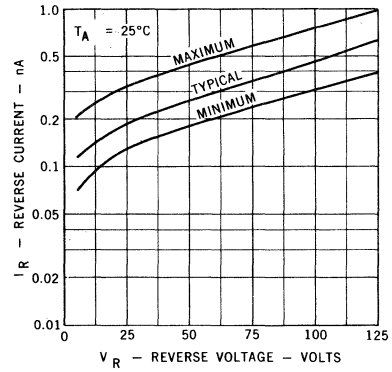
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



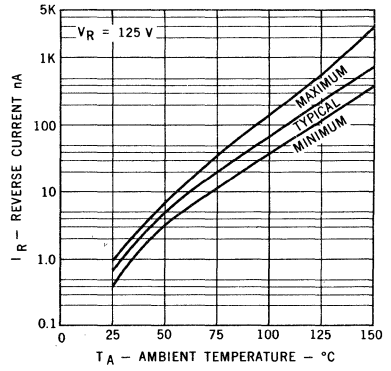
CAPACITANCE VERSUS REVERSE VOLTAGE



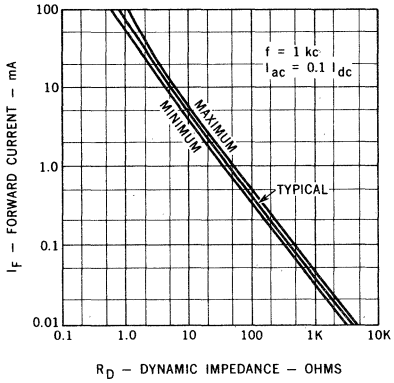
REVERSE VOLTAGE VERSUS REVERSE CURRENT



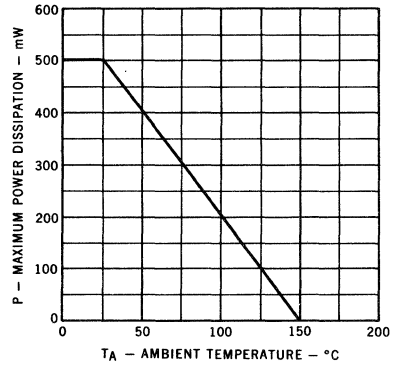
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



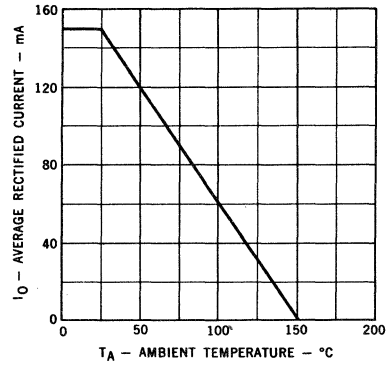
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



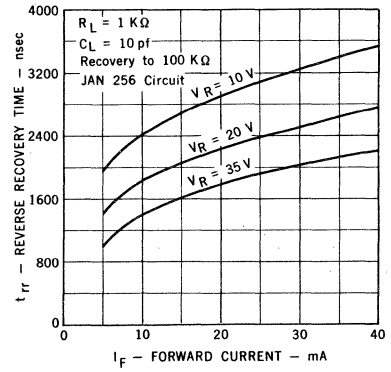
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT AND REVERSE BIAS VOLTAGE



1N3600

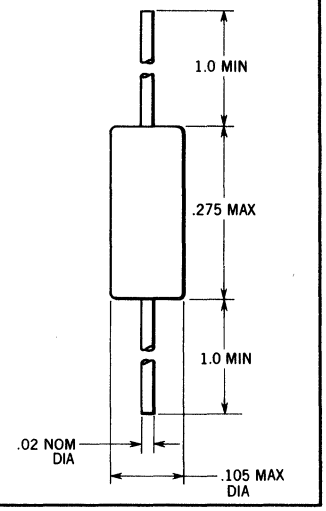
HIGH CONDUCTANCE ULTRA FAST EPITAXIAL PLANAR* DIODE

REGISTERED SPECIFICATIONS

The 1N3600 is a silicon planar epitaxial diode that provides low capacitance, high conductance, and fast reverse recovery. With these features, the device is ideally suited for applications such as core devices, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities.

The USN 1N3600 is supplied in accordance with MIL-S-19500/231. The electrical specifications, as listed in Table III, are identical with those listed in this Military Specification.

PHYSICAL DIMENSIONS
(All dimensions in inches)



MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	50 V
I_O	Average rectified current	200 mA
i_f	Recurrent peak forward current	900 mA
i_f **(surge)**	Peak forward surge current pulse width of 1 second	1 A
i_f **(surge)**	Peak forward surge current pulse width of 1 μs	4 A
P	Power dissipation	500 mW
P	Power dissipation	170 mW @ 125°C
T_A	Operating Temperature	−65°C to +150°C
T_{stg}	Storage temperature, ambient	−65°C to +175°C

ELECTRICAL SPECIFICATIONS (25°C unless otherwise noted)

Symbol	Characteristic	Min.	Max.	Units	Test Conditions
V_F	Forward Voltage	.87	1.00		I_F = 200 mA
V_F	Forward Voltage	.82	.92		I_F = 100 mA
V_F	Forward Voltage	.76	.86		I_F = 50 mA
V_F	Forward Voltage	.66	.74		I_F = 10 mA
V_F	Forward Voltage	.54	.62		I_F = 1 mA
I_R	Reverse Current		0.1	μA	V_R = −50 V
I_R	Reverse Current (150°C)		100	μA	V_R = −50 V
BV	Breakdown Voltage	75			I_R = 5 μA
t_{rr} (note 2)	Reverse Recovery Time		4.0	ns	I_F = I_R = 10 mA to 200 mA, RL = 100 Ω
t_{rr} (note 2)	Reverse Recovery Time		6.0	ns	I_F = I_R = 200 mA to 400 mA, RL = 100 Ω
C_O (note 3)	Capacitance		2.5	pF	V_R = 0 V, f = 1 MHz
$\Delta VF/°C$	Change of forward voltage per degree change in temperature		−1.8 mV/°C typical		

NOTES:
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 0.1 I_F.
(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75-AS8 Capacitance Bridge or equivalent.
(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

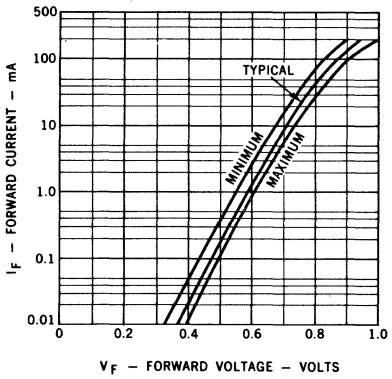
*Planar is a patented Fairchild process.

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

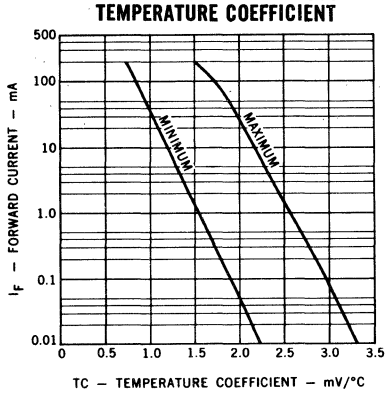
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

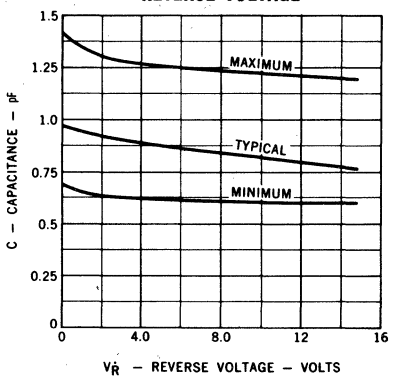
FORWARD VOLTAGE VERSUS FORWARD CURRENT



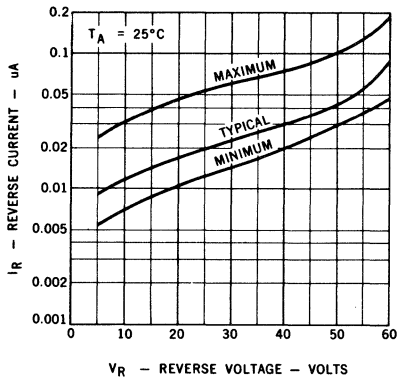
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



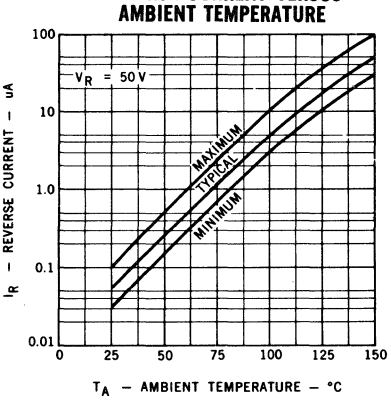
CAPACITANCE VERSUS REVERSE VOLTAGE



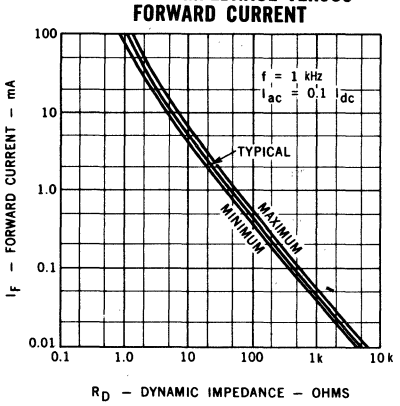
REVERSE VOLTAGE VERSUS REVERSE CURRENT



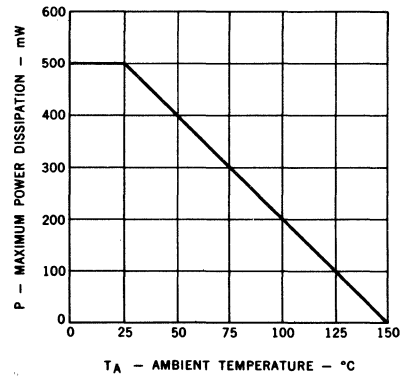
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



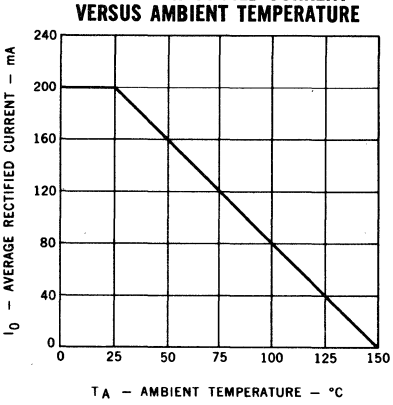
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



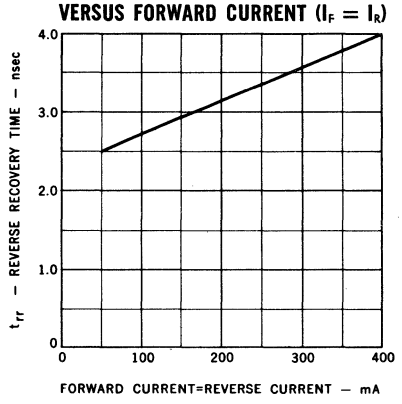
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT ($I_F = I_R$)

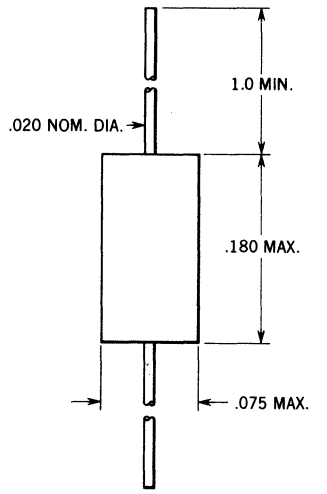


1N4148

MINIATURE SIZE, HIGH CONDUCTANCE, ULTRA FAST, PLANAR* EPITAXIAL DIODE

GENERAL DESCRIPTION — The miniature 1N4148 is a silicon planar epitaxial diode that provides low capacitance, high conductance, and fast reverse recovery. With these features, the device is ideally suited for applications such as core devices, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities. Miniature package and high power dissipation are the interesting features of this device.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.

ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working inverse voltage	75V
I_O	Average rectified current	200 mA
I_F	DC forward current	400 mA
i_f	Recurrent peak forward current	600 mA
i_f(surge)	Peak forward surge current pulse width of 1 second	1 A
i_f(surge)	Peak forward surge current pulse width of 1 μs	4 A
P	Power dissipation	500 mW
P	Power dissipation	100 mW at 125°C
T_A	Operating temperature	−65°C to +150°C
T_{stg}	Storage temperature, ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
V_F	Forward Voltage		1.0	V	$I_F = 10$ mA
I_{R1}	Reverse Current		250	nA	$V_R = 20$ V
I_{R2}	Reverse Current (150°C)		50	μA	$V_R = 20$ V
BV	Breakdown Voltage	75		V	$I_R = 5\ \mu$A
BV	Breakdown Voltage	100		V	$I_R = 100\ \mu$A
T_{RR}	Reverse Recovery Time (Note 2)		4.0	ns	$I_F = I_R = 10$ mA, $R_L = 100\ \Omega$
C	Capacitance (Note 3)		4.0	pF	$V_R = 0$ V

*Planar is a patented Fairchild process.

NOTES:

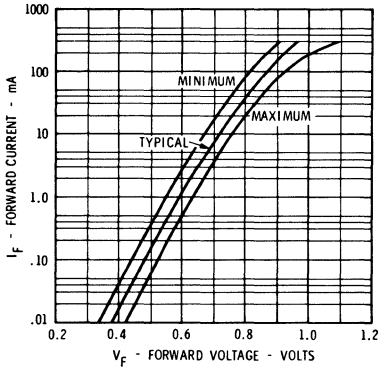
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 0.1 I_R.
(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75A-S8 Capacitance Bridge or equivalent.
(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

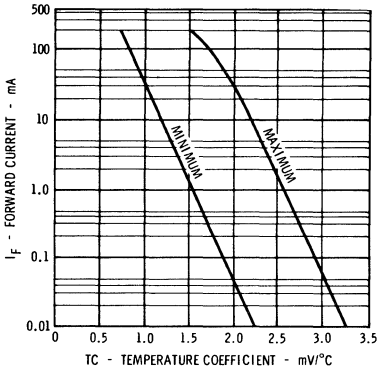
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

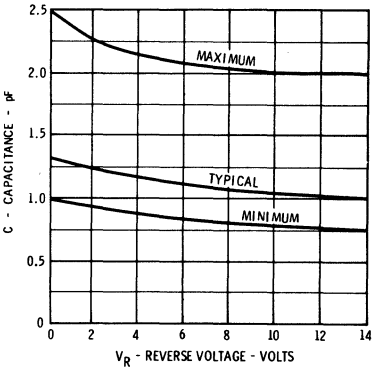
FORWARD VOLTAGE VERSUS FORWARD CURRENT



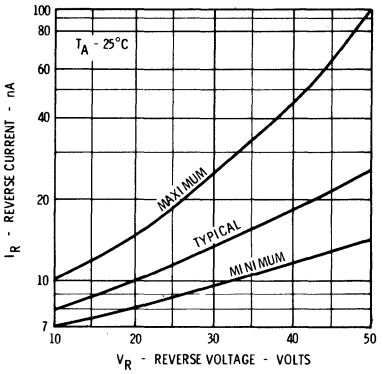
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



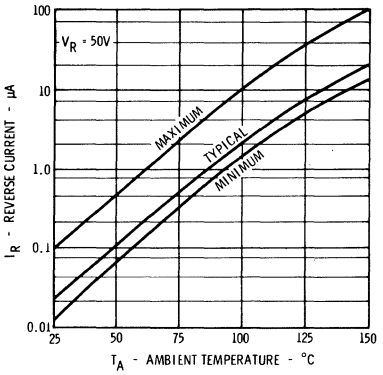
CAPACITANCE VERSUS REVERSE VOLTAGE



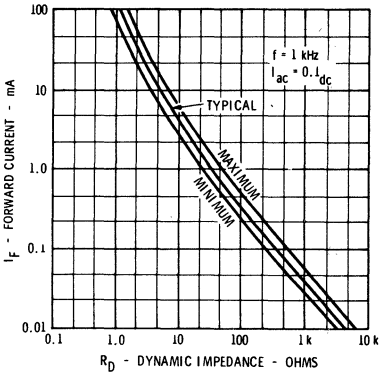
REVERSE CURRENT VERSUS REVERSE VOLTAGE



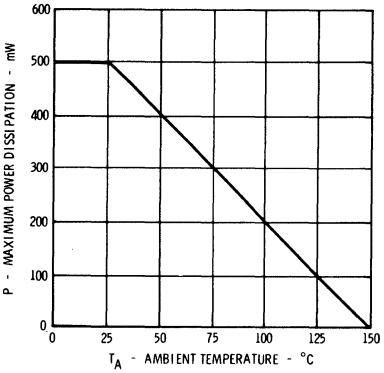
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



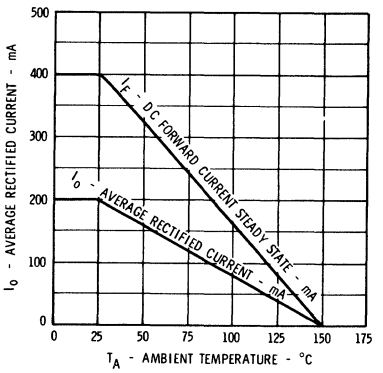
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



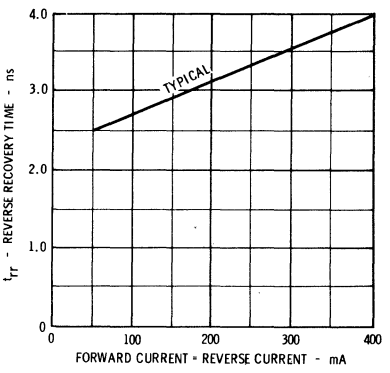
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT AND FORWARD CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT ($I_F = I_R$)

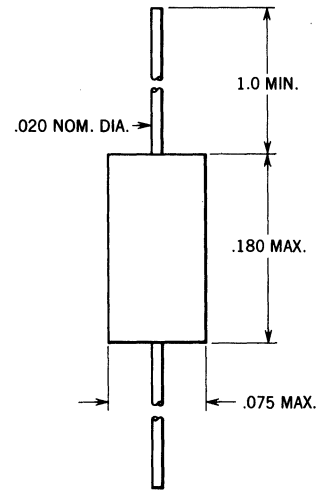


1N4150

MINIATURE SIZE, HIGH CONDUCTANCE, ULTRA FAST, PLANAR* EPITAXIAL DIODE

GENERAL DESCRIPTION — The miniature 1N4150 is a silicon planar epitaxial diode that provides low capacitance, high conductance, and fast reverse recovery. With these features, the device is ideally suited for applications such as core devices, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities. Miniature package and high power dissipation are the interesting features of this device.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.

ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working inverse voltage	50 V
I_O	Average rectified current	200 mA
I_F	DC forward current	400 mA
i_f	Recurrent peak forward current	600 mA
i_f(surge)	Peak forward surge current pulse width of 1 second	1 A
i_f(surge)	Peak forward surge current pulse width of 1 μs	4 A
P	Power dissipation	500 mW
P	Power dissipation	100 mW at 125°C
T_A	Operating temperature	−65°C to +150°C
T_{stg}	Storage temperature, ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
V_{F1}	Forward Voltage	.87	1.0	V	I_F = 200 mA
V_{F2}	Forward Voltage	.82	.92	V	I_F = 100 mA
V_{F3}	Forward Voltage	.76	.86	V	I_F = 50 mA
V_{F4}	Forward Voltage	.66	.74	V	I_F = 10 mA
V_{F5}	Forward Voltage	.54	.62	V	I_F = 1 mA
I_{R1}	Reverse Current		100	nA	V_R = 50 V
I_{R2}	Reverse Current (+150°C)		100	μA	V_R = 50 V
C	Capacitance (Note 3)		2.5	pF	V_R = 0 V
T_{RR}	Reverse Recovery Time (Note 2)		4.0	ns	$I_F = I_R$ = 10-200 mA, R_L = 100 Ω
T_{RR}	Reverse Recovery Time (Note 2)		6	ns	$I_F = I_R$ = 200-400 mA, R_L = 100 Ω
T_{FR}	Forward Recovery Time (Note 5)		10	ns	I_F = 200 mA

NOTES:

(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 0.1 I_R.
(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75A-S8 Capacitance Bridge or equivalent.
(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.
(5) Rise time = ≤.4 ns; Pulse width = 100 ns; V_{FR} = 1.0 V; Duty cycle = 1%.

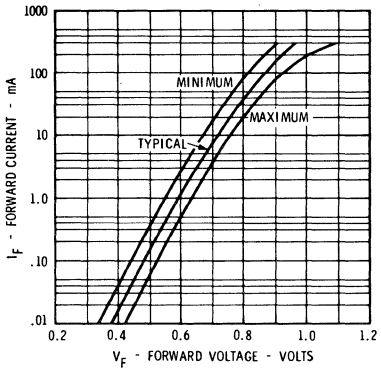
*Planar is a patented Fairchild process.

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

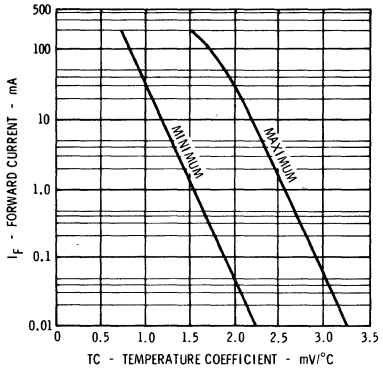
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

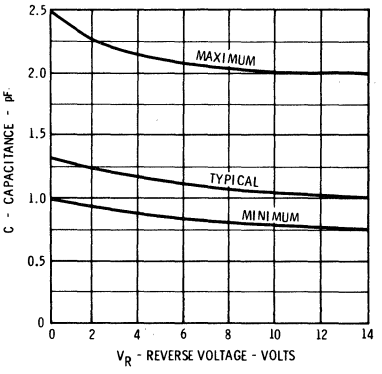
FORWARD VOLTAGE VERSUS FORWARD CURRENT



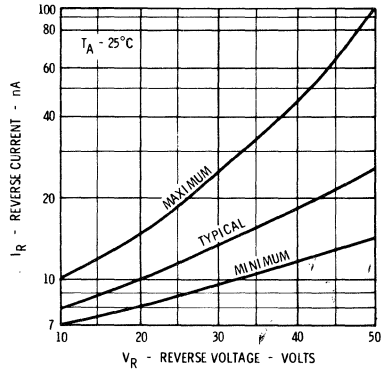
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



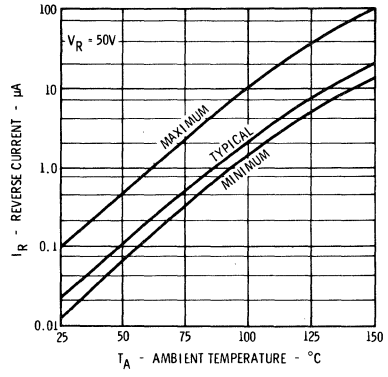
CAPACITANCE VERSUS REVERSE VOLTAGE



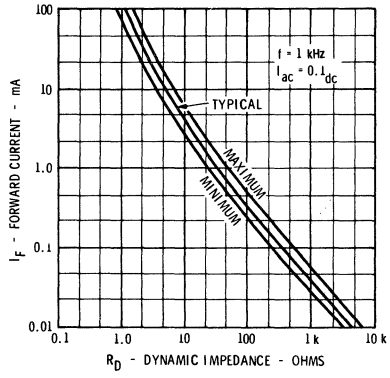
REVERSE CURRENT VERSUS REVERSE VOLTAGE



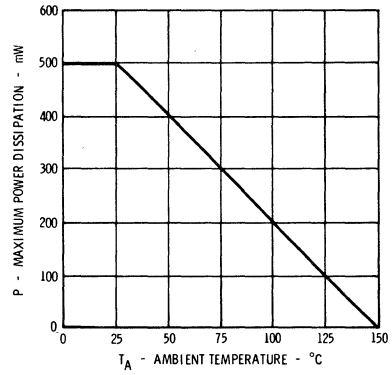
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



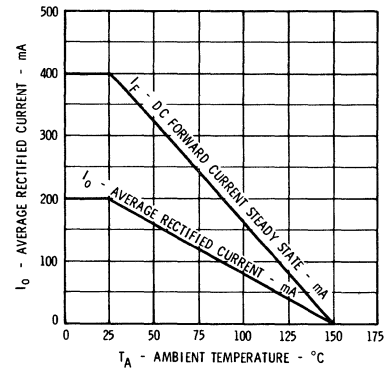
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



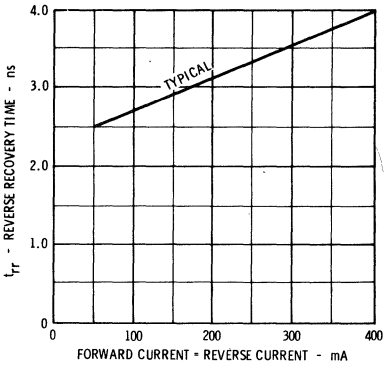
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT AND FORWARD CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT ($I_F = I_R$)

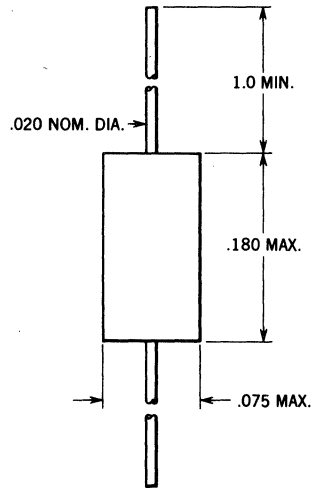


1N4151

MINIATURE SIZE, HIGH CONDUCTANCE, ULTRA FAST, PLANAR* EPITAXIAL DIODE

GENERAL DESCRIPTION — The miniature 1N4151 is a silicon planar epitaxial diode that provides low capacitance, high conductance, and fast reverse recovery. With these features, the device is ideally suited for applications such as core devices, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities. Miniature package and high power dissipation are the interesting features of this device.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.

ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working inverse voltage	50 V
I_O	Average rectified current	200 mA
I_F	DC forward current	400 mA
i_f	Recurrent peak forward current	600 mA
i_f (surge)	Peak forward surge current, pulse width of 1 sec	1 A
i_f (surge)	Peak forward surge current pulse width of 1 μs	4 A
P	Power dissipation	500 mW
P	Power dissipation	100 mW at 125°C
T_A	Operating temperature	−65°C to +150°C
T_{stg}	Storage temperature, ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
V_F	Forward Voltage		1.0	V	$I_F = 50$ mA
I_{R1}	Reverse Current		50	nA	$V_R = 50$ V
I_{R2}	Reverse Current (+150°C)		50	μA	$V_R = 50$ V
BV	Breakdown Voltage	75		V	$I_R = 5\ \mu$A
T_{RR}	Reverse Recovery Time (Note 2)		4.0	ns	$I_F = I_R = 10$ mA, $R_L = 100\ \Omega$
C	Capacitance (Note 3)		2.0	pF	$V_R = 0$ V

*Planar is a patented Fairchild process.

NOTES:

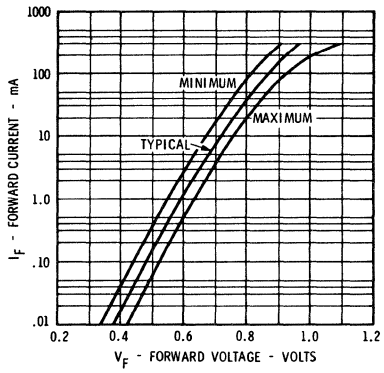
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 0.1 I_R.
(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75A-S8 Capacitance Bridge or equivalent.
(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

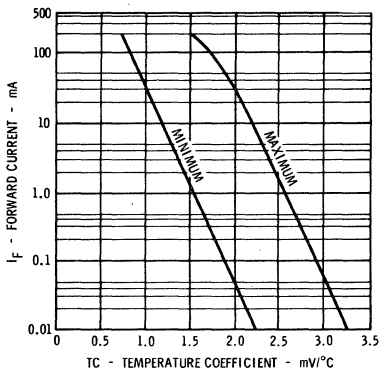
FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

TYPICAL ELECTRICAL CHARACTERISTICS

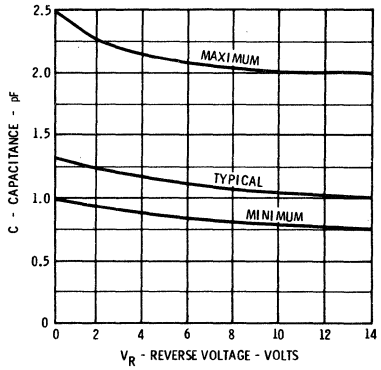
FORWARD VOLTAGE VERSUS FORWARD CURRENT



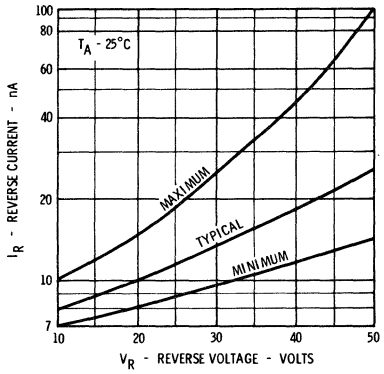
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



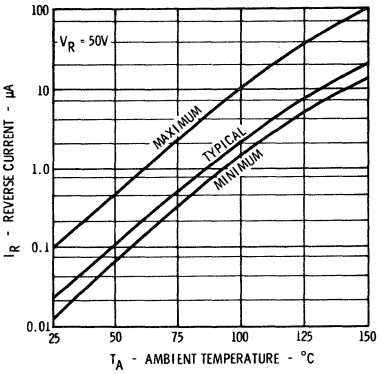
CAPACITANCE VERSUS REVERSE VOLTAGE



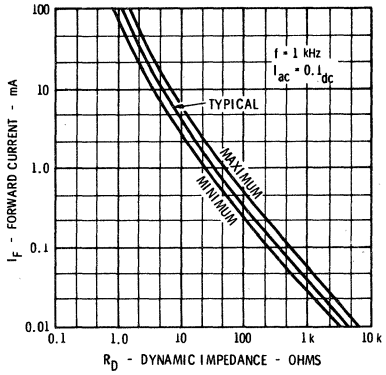
REVERSE CURRENT VERSUS REVERSE VOLTAGE



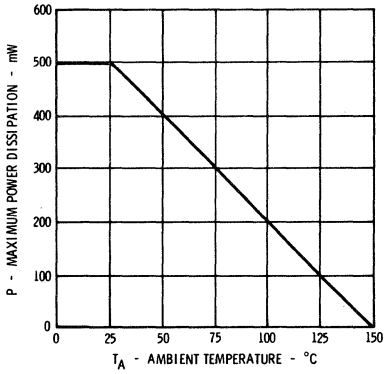
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



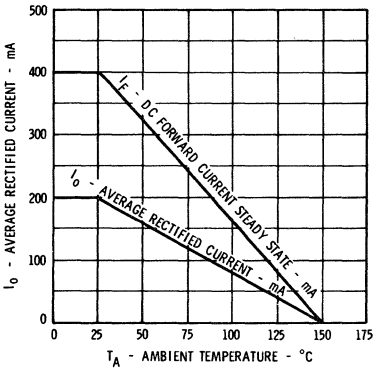
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



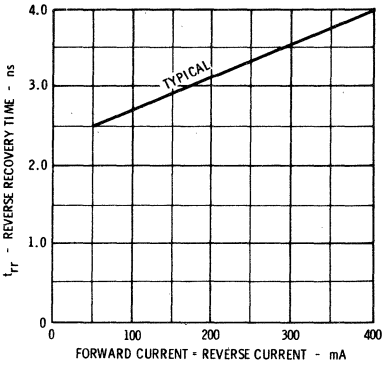
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT AND FORWARD CURRENT VERSUS AMBIENT TEMPERATURE



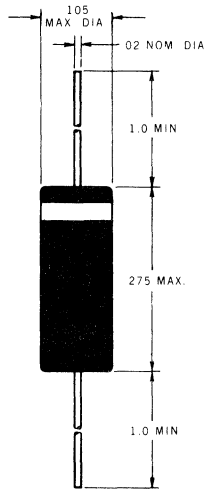
REVERSE RECOVERY TIME VERSUS FORWARD CURRENT ($I_F = I_R$)



1N4244
PICO-SECOND COMPUTER DIODE

GENERAL DESCRIPTION — The 1N4244 is a silicon planar* epitaxial diode providing features necessary for ultra high speed logic circuitry: low capacitance, pico-second recovery times and controlled forward conductance. This device uses the planar process as developed by Fairchild to ensure the stability of surface dependent characteristics against change with time. This factor, coupled with the most advanced manufacturing techniques from the planar wafer through assembly, guarantees the circuit designer of continuing reliability in production quantities.

PHYSICAL DIMENSIONS



NOTE: All dimensions in inches
See note 4
Weight: 0.25 gram.

ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working inverse voltage	10 V
I_O	Average rectified current	50 mA
i_f	Recurrent peak forward current	150 mA
i_f (surge)	Peak forward surge current, pulse width 1 sec	150 mA
P	Power dissipation	250 mW
$1/\theta$	Power derating factor	2 mW/°C
T_A	Operating temperature	−65°C to +150°C
T_{stg}	Storage temperature, ambient	−65°C to +150°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
BV	Breakdown Voltage	20		V	$I_R = 5\ \mu A$
V_F	Forward Voltage		1.0	V	$I_F = 20$ mA
I_{R1}	Reverse Current		100	nA	$V_R = 10$ V
I_{R2}	Reverse Current		250	nA	$V_R = 15$ V
I_{R3}	Reverse Current (+150°C)		100	μA	$V_R = 10$ V
C	Capacitance (Note 3)		0.8	pF	$V_R = 0$ V,
T_{RR}	Reverse Recovery Time (Note 2)		.75	ns	$I_F = I_R = 10$ mA
					$R_L = 100\ \Omega$

*Planar is a patented Fairchild process.

NOTES:

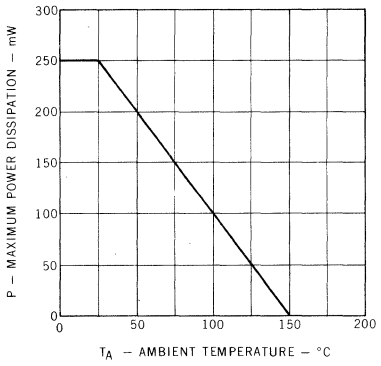
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 0.1 I_R.
(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75A-S8 Capacitance Bridge or equivalent.
(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

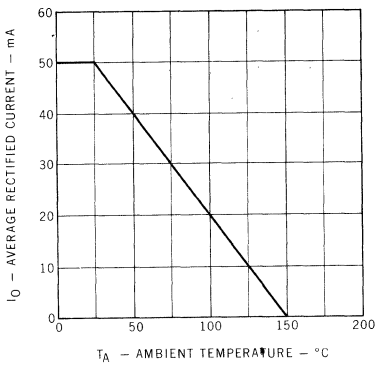
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

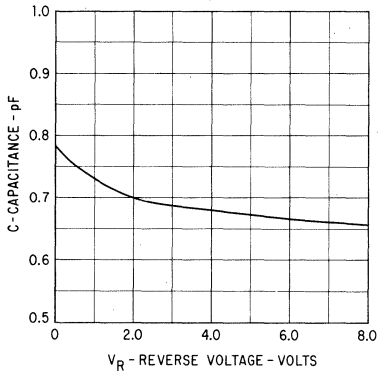
POWER DERATING CURVE



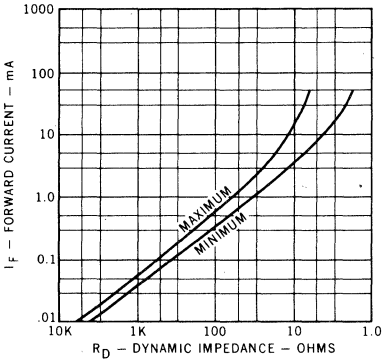
AVERAGE RECTIFIED CURRENT DERATING CURVE



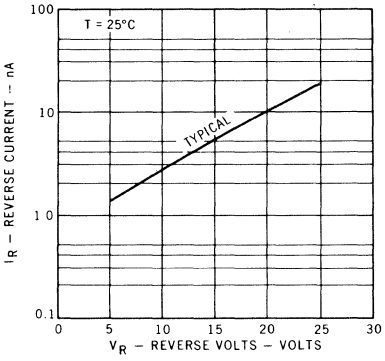
CAPACITANCE VERSUS REVERSE VOLTAGE



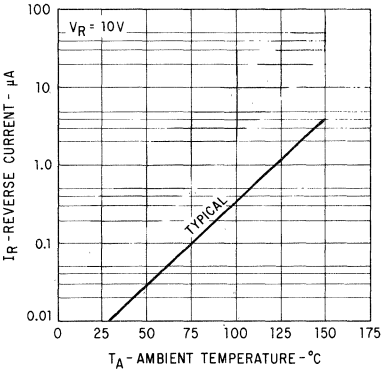
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



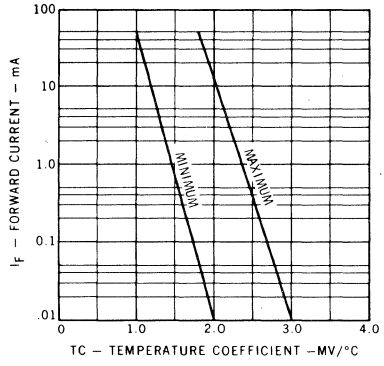
REVERSE VOLTAGE VERSUS REVERSE CURRENT



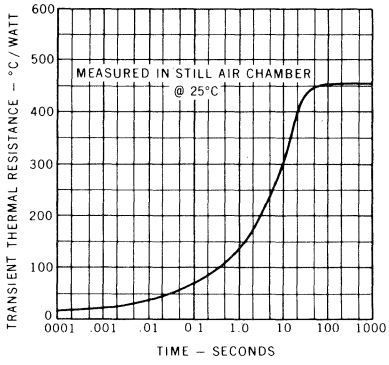
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



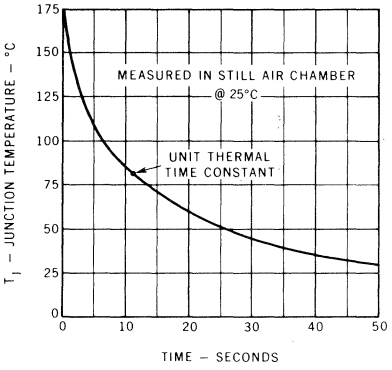
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



TRANSIENT THERMAL RESISTANCE VERSUS TIME



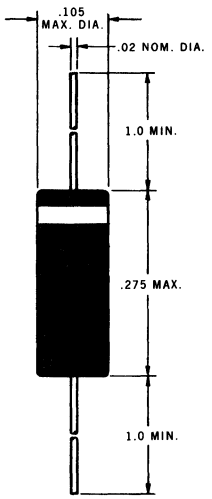
JUNCTION TEMPERATURE VERSUS TIME (COOLING CURVE)



1N4376
PICO-SECOND COMPUTER DIODE

GENERAL DESCRIPTION — The 1N4376 is a silicon planar* epitaxial diode providing features necessary for ultra high speed logic circuitry: low capacitance, pico-second recovery times and controlled forward conductance. This device uses the planar process as developed by Fairchild to ensure the stability of surface-dependent characteristics against change with time. This factor, coupled with the most advanced manufacturing techniques from the planar wafer through assembly, guarantees the circuit designer of a continuing reliability in production quantities.

PHYSICAL DIMENSIONS



NOTE: All dimensions in inches
See note 4.
Weight: 0.25 gram.

ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working inverse voltage	10 V
I_O	Average rectified current	50 mA
i_f	Recurrent peak forward current	150 mA
i_f (surge)	Peak forward surge current, pulse width 1 sec	150 mA
P	Power dissipation	250 mW
$1/\theta$	Power derating factor	2 mW/°C
T_A	Operating temperature	−65°C to +150°C
T_{stg}	Storage temperature, ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
BV	Breakdown Voltage	20		V	$I_R = 5\mu A$
I_R	Reverse Current		100	nA	$V_R = 10$ V
I_R	Reverse Current (+150°C)		100	μA	$V_R = 10$ V
V_{F1}	Forward Voltage	.89	1.10	V	$I_F = 50$ mA
V_{F2}	Forward Voltage	.81	.95	V	$I_F = 20$ mA
V_{F3}	Forward Voltage	.76	.88	V	$I_F = 10$ mA
V_{F4}	Forward Voltage	.64	.74	V	$I_F = 1$ mA
V_{F5}	Forward Voltage	.52	.61	V	$I_F = .1$ mA
V_{F6}	Forward Voltage	.42	.50	V	$I_F = .01$ mA
T_{RR}	Reverse Recovery Time (Note 2)		750	ps	$I_F = I_R = 10$ mA, $R_L = 100\ \Omega$
C	Capacitance (Note 3)		1.0	pF	$V_R = 0$ V, f = 1 MHz

*Planar is a patented Fairchild process.

NOTES:

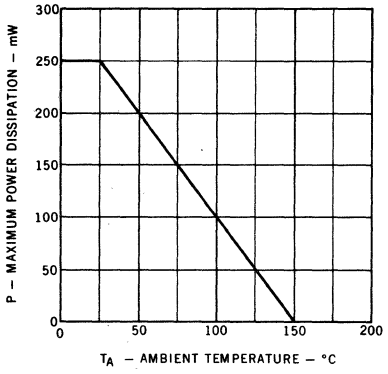
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 0.1 I_R.
(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75A-S8 Capacitance Bridge or equivalent.
(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

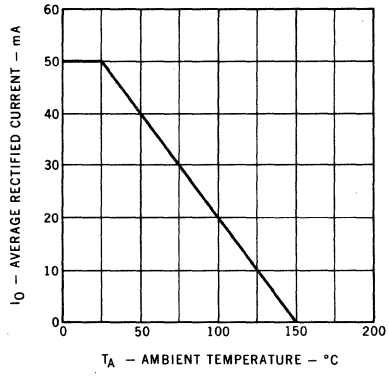
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

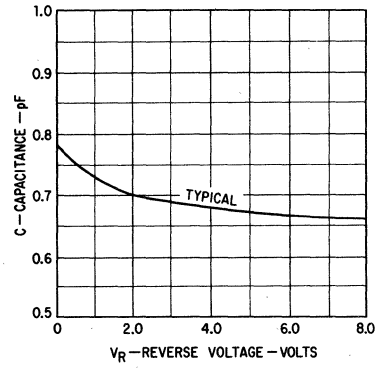
POWER DERATING CURVE



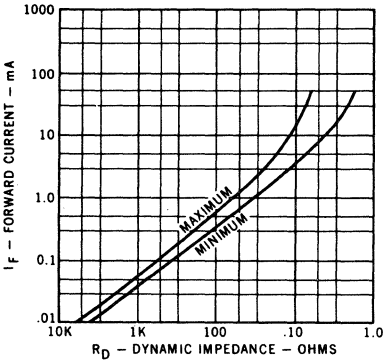
AVERAGE RECTIFIED CURRENT DERATING CURVE



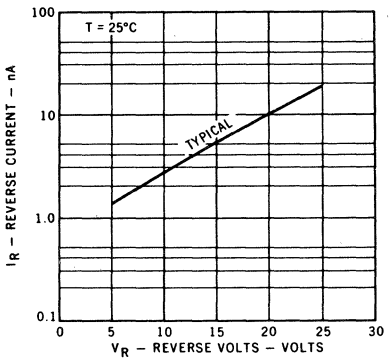
CAPACITANCE VERSUS REVERSE VOLTAGE



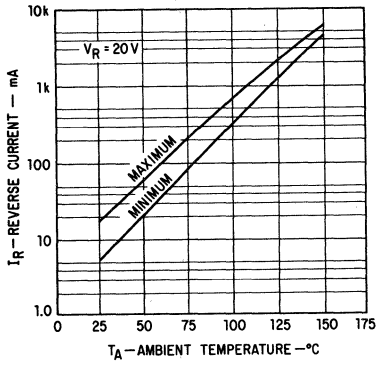
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



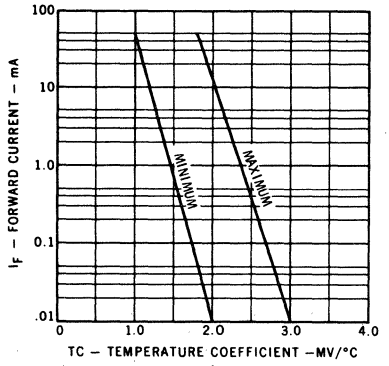
REVERSE VOLTAGE VERSUS REVERSE CURRENT



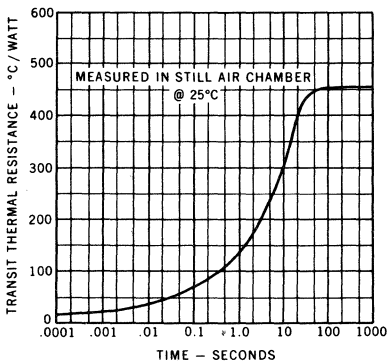
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



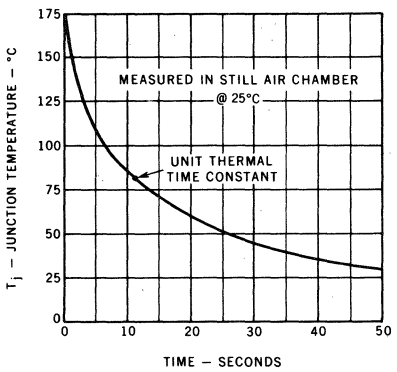
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



TRANSIENT THERMAL RESISTANCE VERSUS TIME



JUNCTION TEMPERATURE VERSUS TIME (COOLING CURVE)

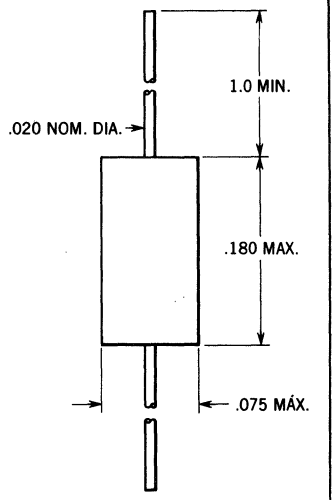


1N4446

MINIATURE SIZE, HIGH CONDUCTANCE, ULTRA FAST PLANAR* EPITAXIAL DIODE

GENERAL DESCRIPTION — The miniature 1N4446 is a silicon planar epitaxial diode that provides low capacitance, high conductance, and fast reverse recovery. With these features, the device is ideally suited for applications such as core devices, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities. Miniature package and high power dissipation are the interesting features of this device.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.

ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	70 Volts
I_O	Average Rectified Current	200 mA
I_F	DC Forward Current	400 mA
i_f	Recurrent Peak Forward Current	600 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 second	1 A
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 μs	4 A
P	Power Dissipation	500 mW
P	Power Dissipation	100 mW at 125°C
T_A	Operating Temperature	−65°C to +150°C
T_{stg}	Storage Temperature, Ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
V_F	Forward Voltage		1.0	V	$I_F = 20$ mA
I_{R1}	Reverse Current		25	nA	$V_R = 20$ V
I_{R2}	Reverse Current (+150°C)		50	μA	$V_R = 20$ V
B_V	Breakdown Voltage	100		V	$I_R = 100\ \mu$A
B_V	Breakdown Voltage	75		V	$I_R = 5\ \mu$A
t_{rr}	Reverse Recovery Time (Note 2)		4.0	ns	$I_F = 10$ mA, $V_R = 6.0$ V, $R_L = 100\ \Omega$
C	Capacitance (Note 3)		4.0	pF	$V_R = 0$ V

*Planar is a patented Fairchild process.

NOTES:

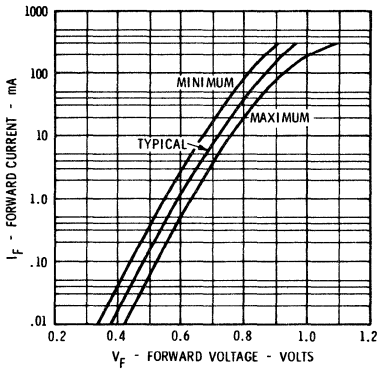
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to $I_R = 1$ mA.
(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75-AS8 Capacitance Bridge or equivalent.
(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

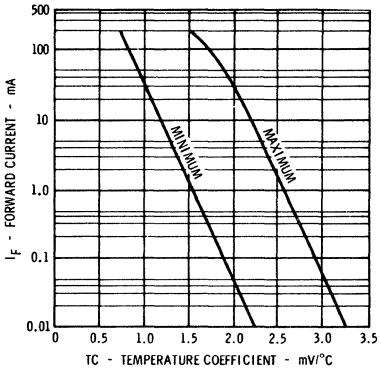
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

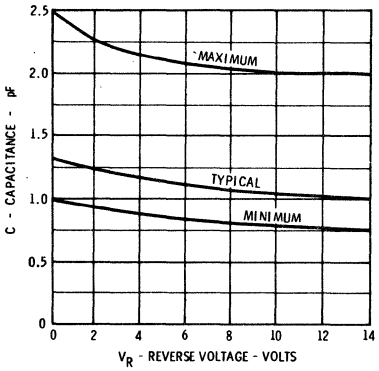
FORWARD VOLTAGE VERSUS FORWARD CURRENT



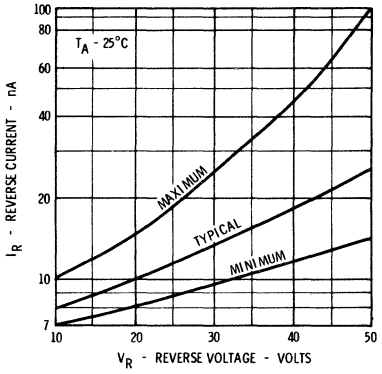
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



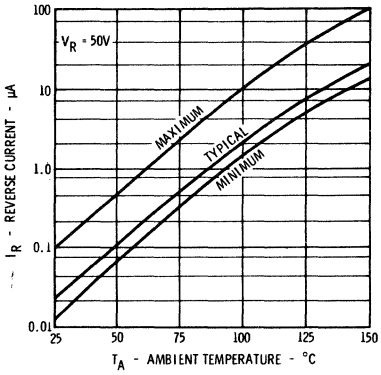
CAPACITANCE VERSUS REVERSE VOLTAGE



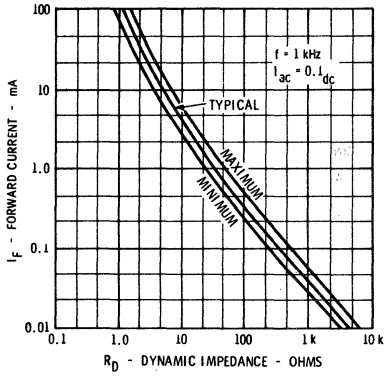
REVERSE CURRENT VERSUS REVERSE VOLTAGE



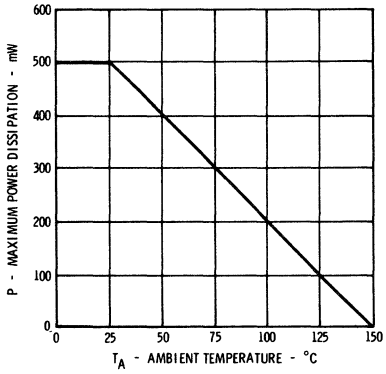
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



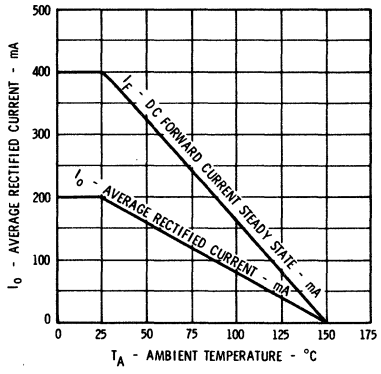
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



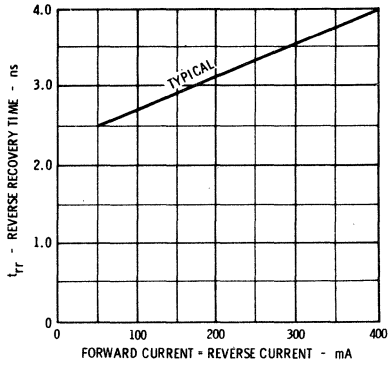
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT AND FORWARD CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT ($I_F = I_R$)

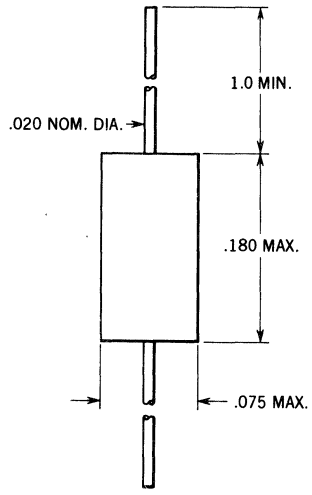


1N4447

MINIATURE SIZE, HIGH CONDUCTANCE, ULTRA FAST PLANAR* EPITAXIAL DIODE

GENERAL DESCRIPTION — The miniature 1N4447 is a silicon planar epitaxial diode that provides low capacitance, high conductance, and fast reverse recovery. With these features, the device is ideally suited for applications such as core devices, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities. Miniature package and high power dissipation are the interesting features of this device.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.

ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	70 Volts
I_O	Average Rectified Current	200 mA
I_F	DC Forward Current	400 mA
i_f	Recurrent Peak Forward Current	600 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 second	1 A
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 μs	4 A
P	Power Dissipation	500 mW
P	Power Dissipation	100 mW at 125°C
T_A	Operating Temperature	−65°C to +150°C
T_{stg}	Storage Temperature, Ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
V_F	Forward Voltage		1.0	V	$I_F = 20$ mA
I_{R1}	Reverse Current		25	nA	$V_R = 20$ V
I_{R2}	Reverse Current (+150°C)		50	μA	$V_R = 20$ V
BV	Breakdown Voltage	100		V	$I_R = 100\ \mu$A
T_{RR}	Reverse Recovery Time (Note 2)		4.0	ns	$I_F = I_R = 10$ mA, $R_L = 100\ \Omega$
C	Capacitance (Note 3)		2.0	pF	$V_R = 0$ V

Notes on page 2.

*Planar is a patented Fairchild process.

NOTES:

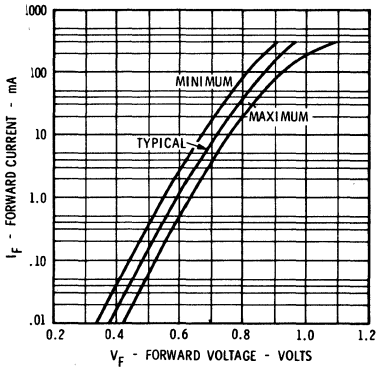
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 0.1 I_R.
(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75-AS8 Capacitance Bridge or equivalent.
(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

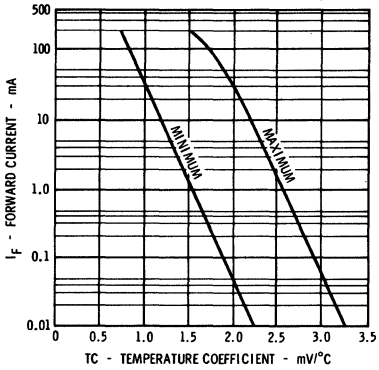
FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

TYPICAL ELECTRICAL CHARACTERISTICS

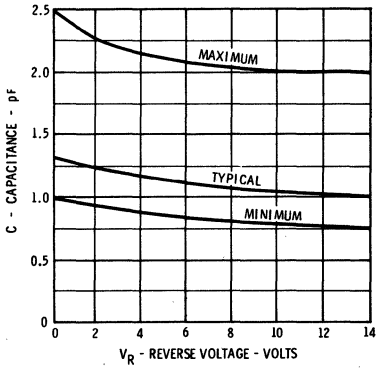
FORWARD VOLTAGE VERSUS FORWARD CURRENT



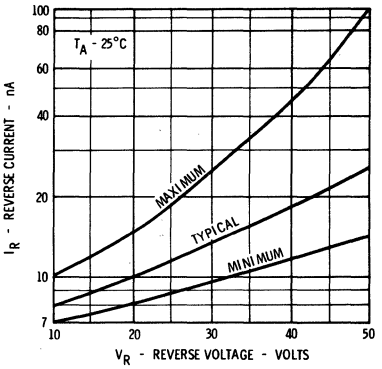
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



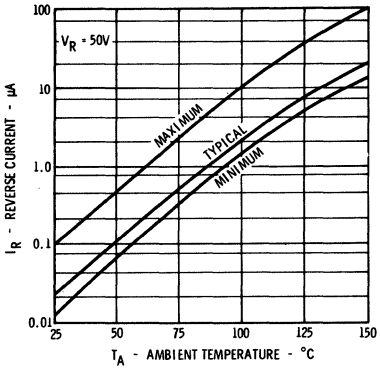
CAPACITANCE VERSUS REVERSE VOLTAGE



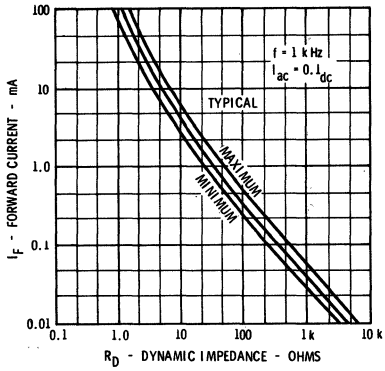
REVERSE CURRENT VERSUS REVERSE VOLTAGE



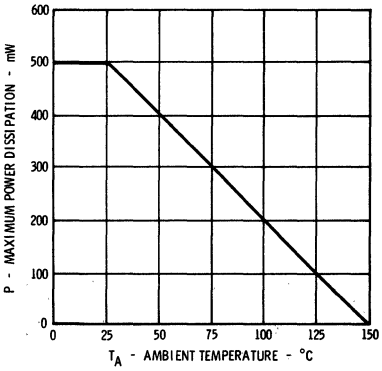
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



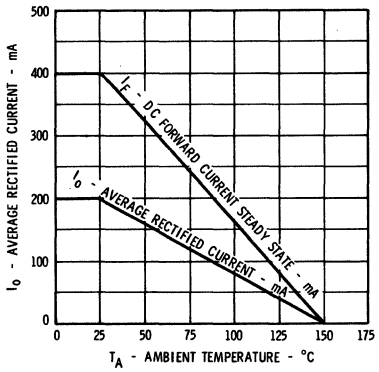
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



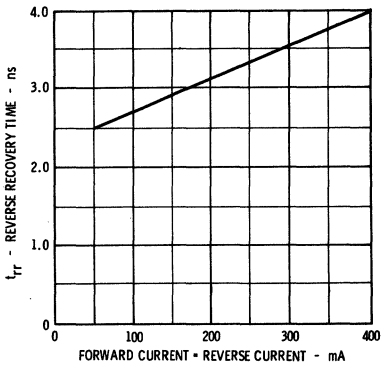
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT AND FORWARD CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT ($I_F = I_R$)

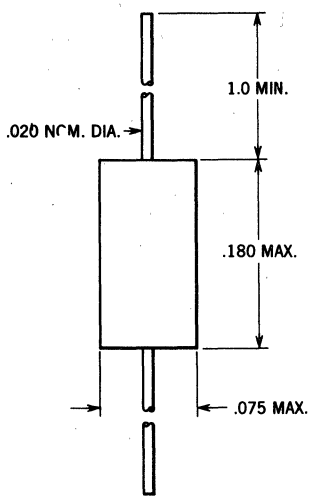


1N4448

MINIATURE SIZE, HIGH CONDUCTANCE, ULTRA FAST PLANAR* EPITAXIAL DIODE

GENERAL DESCRIPTION — The miniature 1N4448 is a silicon planar epitaxial diode that provides low capacitance, high conductance, and fast reverse recovery. With these features, the device is ideally suited for applications such as core devices, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities. Miniature package and high power dissipation are the interesting features of this device.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.

ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	70 Volts
I_O	Average Rectified Current	200 mA
I_F	DC Forward Current	400 mA
i_f	Recurrent Peak Forward Current	600 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 second	1 A
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 μs	4 A
P	Power Dissipation	500 mW
P	Power Dissipation	100 mW at 125°C
T_A	Operating Temperature	−65°C to +150°C
T_{stg}	Storage Temperature, Ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
V_{F1}	Forward Voltage		1.0	V	$I_F = 100$ mA
V_{F2}	Forward Voltage	.62	.72	V	$I_F = 5$ mA
I_{R1}	Reverse Current		25	nA	$V_R = 20$ V
I_{R2}	Reverse Current (+100°C)		3.0	μA	$V_R = 20$ V
I_{R3}	Reverse Current (+150°C)		50	μA	$V_R = 20$ V
B_V	Breakdown Voltage	100		V	$I_R = 100\ \mu$A
B_V	Breakdown Voltage	75		V	$I_R = 5\ \mu$A
V_{fr}	Forward Recovery Voltage		2.5	V	See Note 4
t_{rr}	Reverse Recovery Time (Note 2)		4.0	ns	$I_F = 10$ mA, $V_R = 6.0$ V, $R_L = 100\ \Omega$
C	Capacitance (Note 3)		4.0	pF	$V_R = 0$ V

*Planar is a patented Fairchild process.

NOTES:

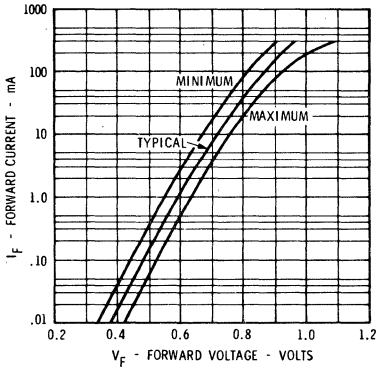
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to $I_R = 1$ mA.
(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75-AS8 Capacitance Bridge or equivalent.
(4) $I_F = 50$ mA peak square wave, $t_R < 30$ ns, pulse width = 100 ns, repetition rate = 5-100 KHz.
(5) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

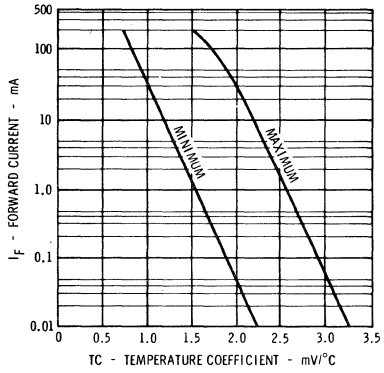
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

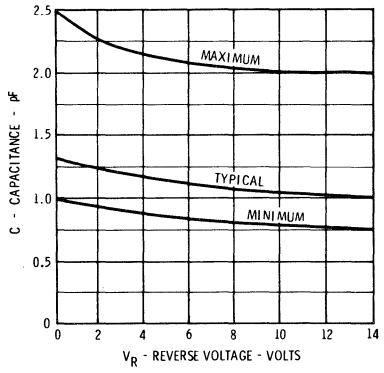
FORWARD VOLTAGE VERSUS FORWARD CURRENT



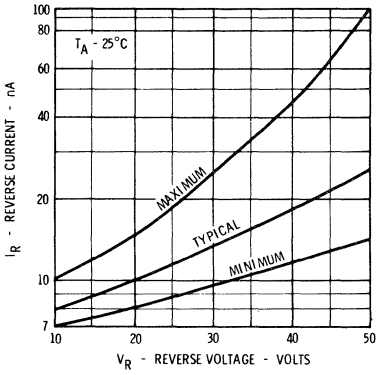
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



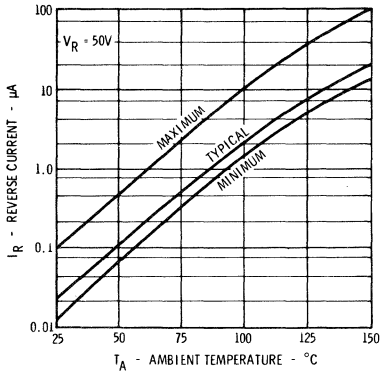
CAPACITANCE VERSUS REVERSE VOLTAGE



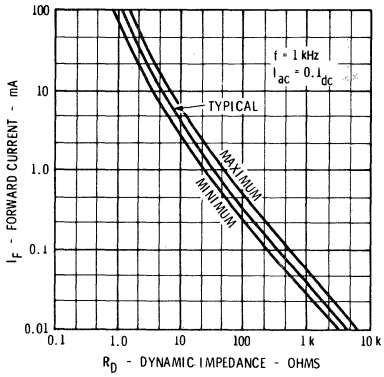
REVERSE CURRENT VERSUS REVERSE VOLTAGE



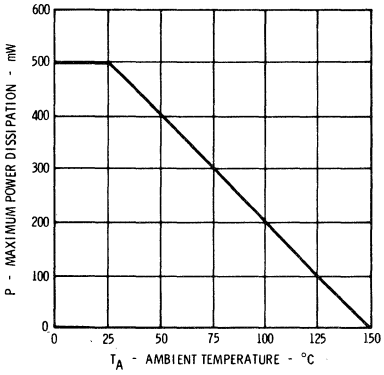
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



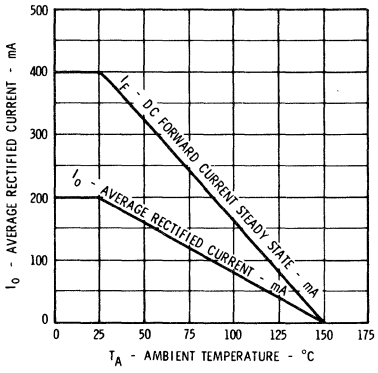
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



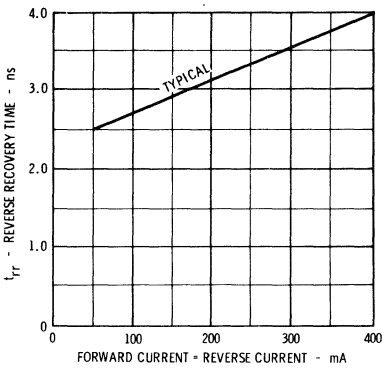
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT AND FORWARD CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT ($I_F = I_R$)

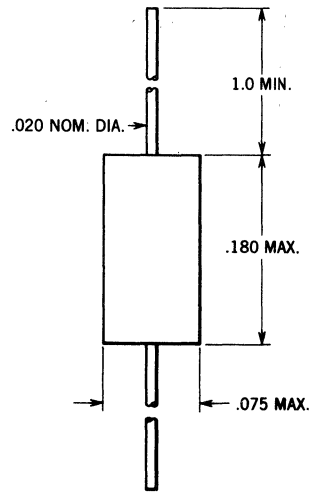


1N4450

MINIATURE SIZE, HIGH CONDUCTANCE, ULTRA FAST PLANAR* EPITAXIAL DIODE

GENERAL DESCRIPTION — The miniature 1N4450 is a silicon planar epitaxial diode that provides low capacitance, high conductance, and fast reverse recovery. With these features, the device is ideally suited for applications such as core devices, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities. Miniature package and high power dissipation are the interesting features of this device.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.

ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	30 Volts
I_O	Average Rectified Current	200 mA
I_F	DC Forward Current	400 mA
i_f	Recurrent Peak Forward Current	600 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 second	1 A
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 μs	4 A
P	Power Dissipation	500 mW
P	Power Dissipation	100 mW at 125°C
T_A	Operating Temperature	−65°C to +150°C
T_{stg}	Storage Temperature, Ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
V_{F1}	Forward Voltage		1.0	V	$I_F = 200$ mA
V_{F2}	Forward Voltage	.420	.540	V	$I_F = .1$ mA
V_{F3}	Forward Voltage	.520	.640	V	$I_F = 1$ mA
V_{F4}	Forward Voltage	.640	.760	V	$I_F = 10$ mA
V_{F5}	Forward Voltage	.800	.920	V	$I_F = 100$ mA
I_{R1}	Reverse Current		50	nA	$V_R = 30$ V
I_{R2}	Reverse Current (150°C)		50	μA	$V_R = 30$ V
BV	Breakdown Voltage	40		V	$I_R = 5$ μA
T_{RR}	Reverse Recovery Time (Note 2)		4.0	nS	$I_F = I_R = 10$ mA $R_L = 100\ \Omega$
C	Capacitance (Note 3)		4.0	pF	$V_R = 0$ V

Notes on page 2.

*Planar is a patented Fairchild process.

NOTES:

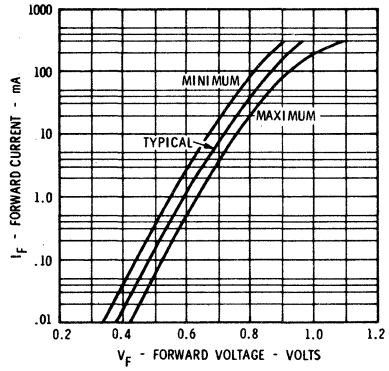
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 0.1 I_R.
(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75-AS8 Capacitance Bridge or equivalent.
(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

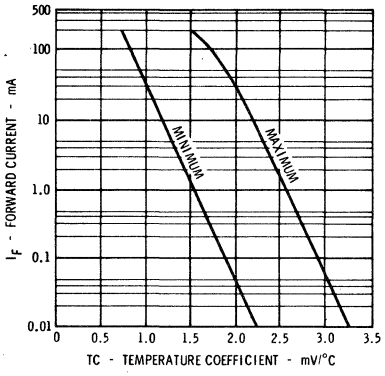
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

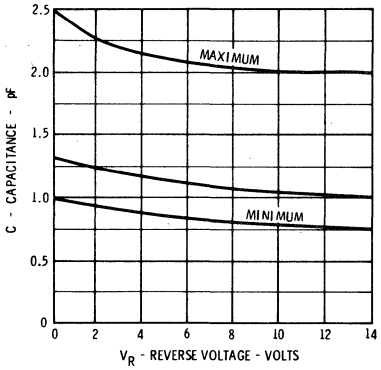
FORWARD VOLTAGE VERSUS FORWARD CURRENT



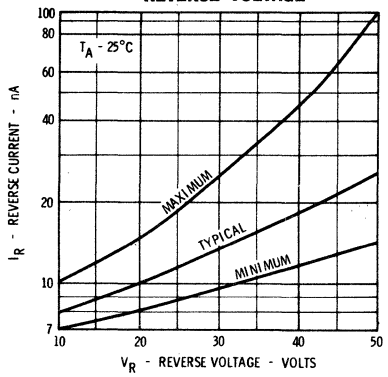
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



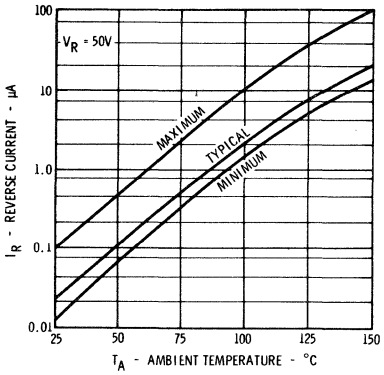
CAPACITANCE VERSUS REVERSE VOLTAGE



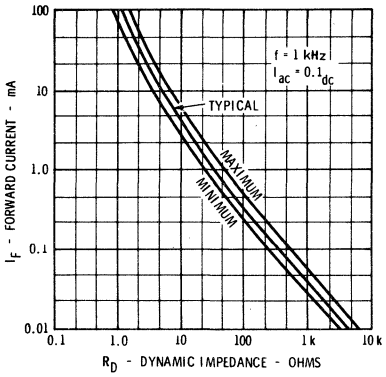
REVERSE CURRENT VERSUS REVERSE VOLTAGE



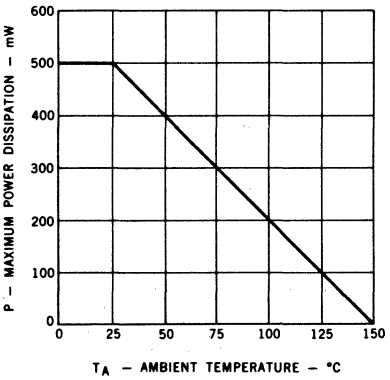
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



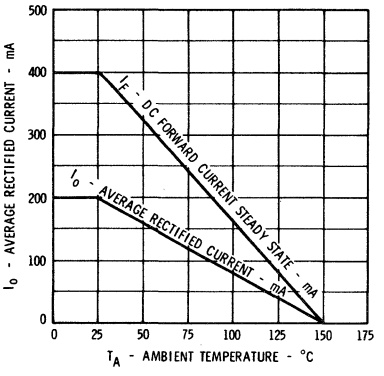
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



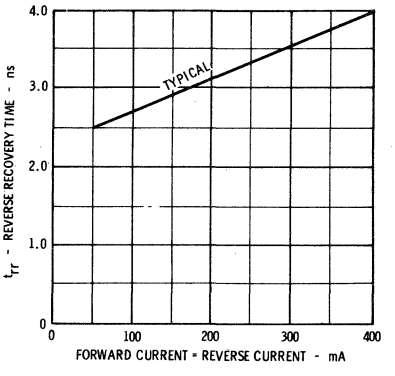
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT AND FORWARD CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT ($I_F = I_R$)

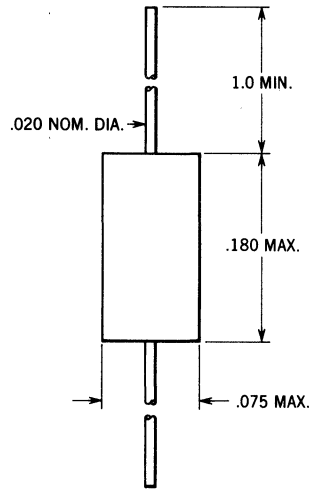


1N4454

MINIATURE SIZE, HIGH CONDUCTANCE, ULTRA FAST PLANAR* EPITAXIAL DIODE

GENERAL DESCRIPTION — The miniature 1N4454 is a silicon planar epitaxial diode that provides low capacitance, high conductance, and fast reverse recovery. With these features, the device is ideally suited for applications such as core devices, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities. Miniature package and high power dissipation are the interesting features of this device.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.

MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	40 Volts
I_O	Average Rectified Current	200 mA
I_F	DC Forward Current	400 mA
i_f	Recurrent Peak Forward Current	600 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 second	1 A
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 μs	4 A
P	Power Dissipation	500 mW
P	Power Dissipation	100 mW at 125°C
T_A	Operating Temperature	−65°C to +150°C
T_{stg}	Storage Temperature, Ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
V_F	Forward Voltage		1.0	Volt	$I_F = 10$ mA
I_R	Reverse Current		0.1	μA	$V_R = -50$ V
I_R	Reverse Current (+150°C)		100	μA	$V_R = -50$ V
BV	Breakdown Voltage	75		Volts	$I_R = 5.0\ \mu$A
t_{rr}	Reverse Recovery Time (Note 2)		4.0	ns	$I_F = I_R = 10$ mA, $R_L = 100\ \Omega$
V_{fr}	Forward Recovery Peak Voltage (Note 3)		3.0	Volts	$I_f = 100$ mA pulse
C	Capacitance (Note 4)		2.0	pF	$V_R = 0$ V, f = 1.0 MHz
RE	Rectification Efficiency (Note 5)	45		%	f = 100 MHz
ΔV_f/°C	Forward Voltage Temperature Coefficient		3.0	mV/°C	

*Planar is a patented Fairchild process.

NOTES:

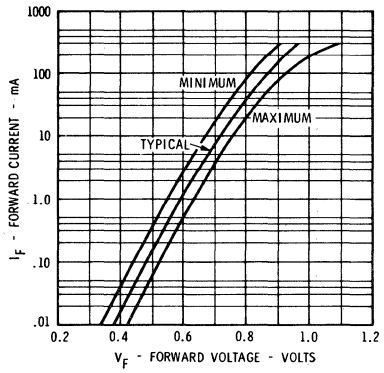
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 0.1 I_R.
(3) Rise time $\leq$ 20 ns; Pulse width min 100 ns; Rep rate = 100 KHz.
(4) Capacitance as measured on Boonton Electronic Corporation Model No. 75A-S8 Capacitance Bridge or equivalent.
(5) Rectification efficiency is defined as the ratio of dc load voltage to peak rf input voltage to the detector circuit, measured with 2.0 V rms. input to the circuit. Load resistance 5.0 kΩ, load capacitance 20 pF.

FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

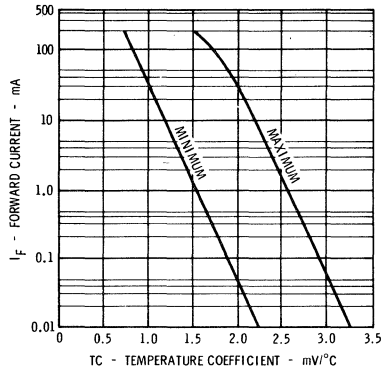
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

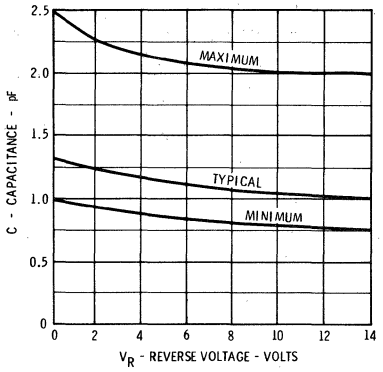
FORWARD VOLTAGE VERSUS FORWARD CURRENT



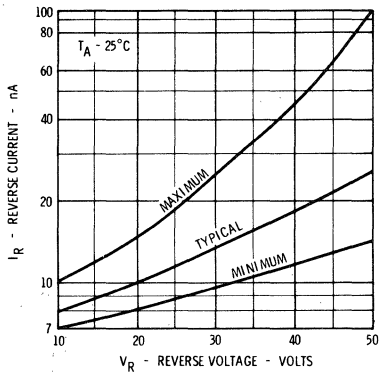
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



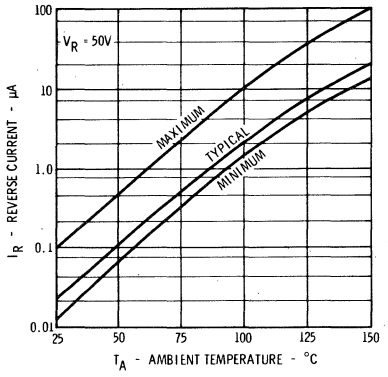
CAPACITANCE VERSUS REVERSE VOLTAGE



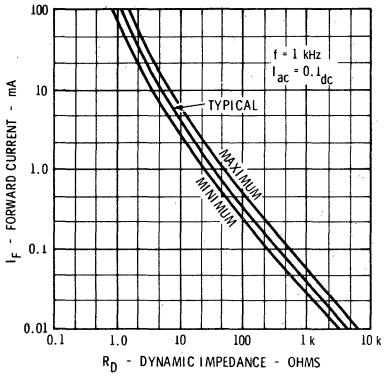
REVERSE CURRENT VERSUS REVERSE VOLTAGE



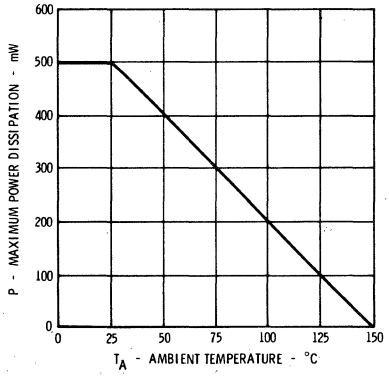
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



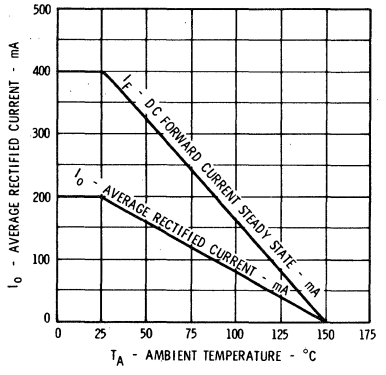
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



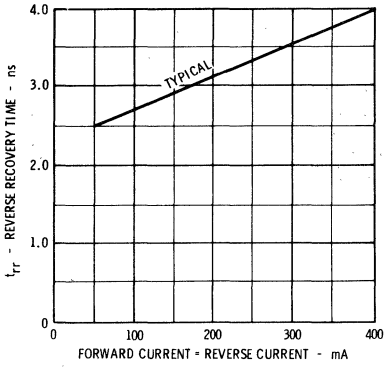
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT AND FORWARD CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT ($I_F = I_R$)

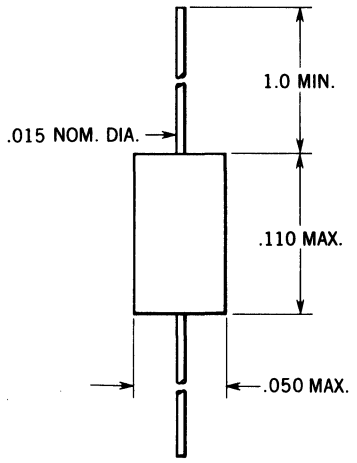


1N4531

ULTRA COMPACT, HIGH CONDUCTANCE, ULTRA FAST PLANAR* EPITAXIAL DIODE

GENERAL DESCRIPTION — The miniature 1N4531 is a silicon planar epitaxial diode that provides low capacitance, high conductance, and fast reverse recovery. With these features, the device is ideally suited for applications such as core devices, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities. Of special interest is the ultra-small size of this device.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.

ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	75 Volts
P	Power Dissipation (Package)	350 mW
$1/\theta$	Power Derating Factor	2.8 mW/°C
T_A	Operating Temperature	−65°C to +150°C
T_{stg}	Storage Temperature, Ambient	−65°C to +200°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
V_F	Forward Voltage		1.0	V	$I_F = 10$ mA
I_{R1}	Reverse Current		25	nA	$V_R = 20$ V
I_{R2}	Reverse Current (+150°C)		50	μA	$V_R = 20$ V
BV	Breakdown Voltage	100		V	$I_R = 100$ μA
t_{rr}	Reverse Recovery Time (Note 2)		4.0	ns	$I_F = 10$ mA; $V_R = 6$ V $R_L = 100\ \Omega$
C	Capacitance (Note 3)		4.0	pF	$V_R = 0$ V

NOTES:

(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 1.0 mA I_R.
(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75-AS8 Capacitance Bridge or equivalent.
(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

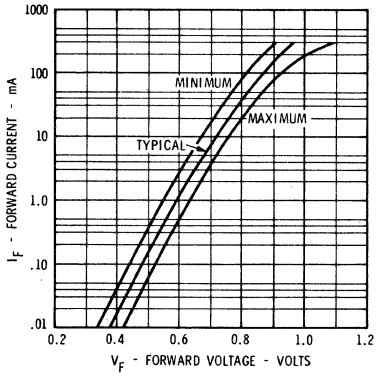
*Planar is a patented Fairchild Process.

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

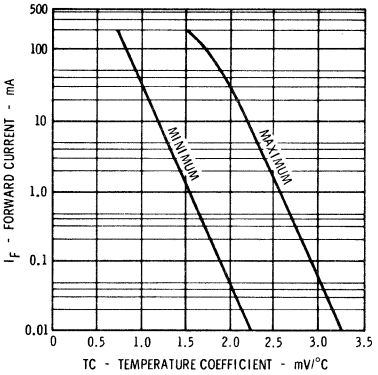
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

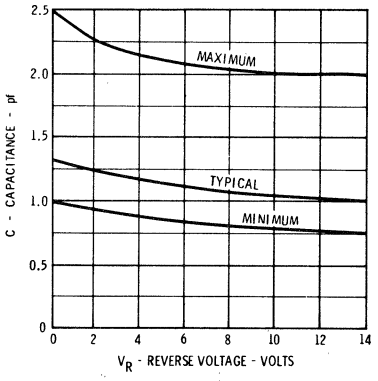
FORWARD VOLTAGE VERSUS FORWARD CURRENT



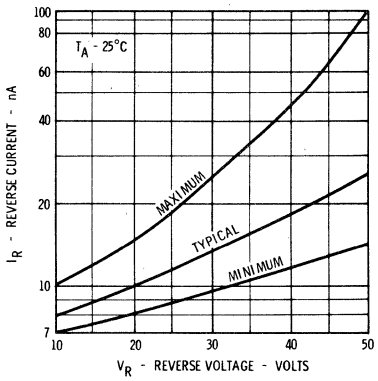
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



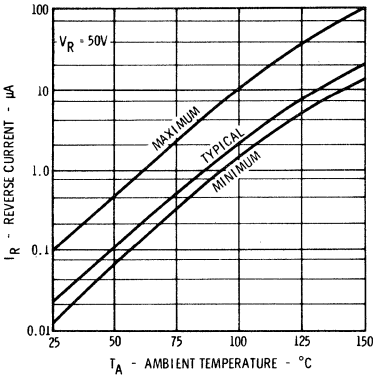
CAPACITANCE VERSUS REVERSE VOLTAGE



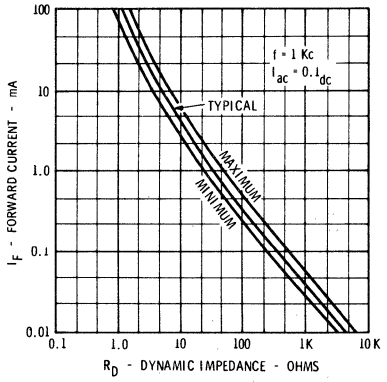
REVERSE CURRENT VERSUS REVERSE VOLTAGE



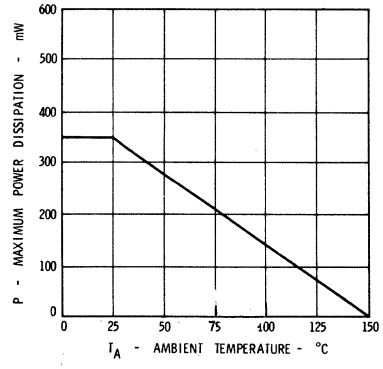
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



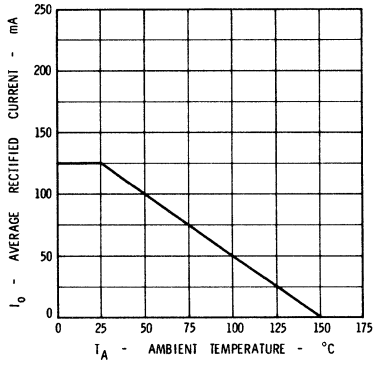
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



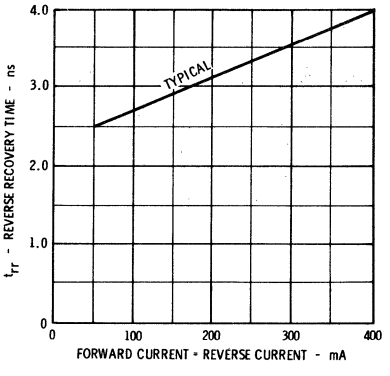
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT ($I_F = I_R$)

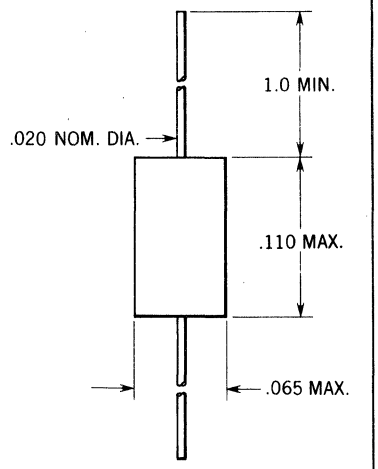


1N4532

ULTRA COMPACT, HIGH CONDUCTANCE, ULTRA FAST PLANAR* EPITAXIAL DIODE

GENERAL DESCRIPTION — The miniature 1N4532 is a silicon planar epitaxial diode that provides low capacitance, high conductance, and fast reverse recovery. With these features, the device is ideally suited for applications such as core devices, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities. Of special interest is the ultra-small size of this device.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.

ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	75 Volts
P	Power Dissipation (Package)	350 mW
$1/\theta$	Power Derating Factor	2.8 mW/°C
T_A	Operating Temperature	−65°C to +150°C
T_{stg}	Storage Temperature, Ambient	−65°C to +200°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
V_F	Forward Voltage		1.0	Volt	$I_F = 10$ mA
I_R	Reverse Current		0.1	μA	$V_R = -50$ V
I_R	Reverse Current (+150°C)		100	μA	$V_R = -50$ V
B_V	Breakdown Voltage	75		Volts	$I_R = 5.0$ μA
t_{rr}	Reverse Recovery Time (Note 2)		2.0	ns	$I_F = 10$ mA, $V_R = 6.0$ V
t_{rr}	Reverse Recovery Time (Note 2)		4.0	ns	$I_F = I_R = 10$ mA
V_{fr}	Forward Recovery Peak Voltage (Note 3)		3.0	Volts	$I_f = 100$ mA pulse
C	Capacitance (Note 4)		2.0	pF	$V_R = 0$ V, f = 1.0 MHz

*Planar is a patented Fairchild process.

NOTES:

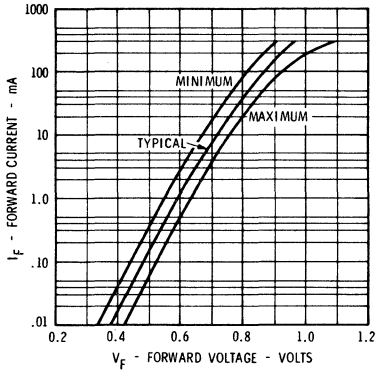
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 1.0 mA. $R_L = 100\ \Omega$.
(3) $I_F = 100$ mA peak square wave; 0.1 μs Pulse width; $R_L = 50\ \Omega$; $T_R \leq 30$ ns; Rep rate = 5-100 KHz.
(4) Capacitance as measured on Boonton Electronic Corporation Model No. 75-AS8 Capacitance Bridge or equivalent.
(5) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

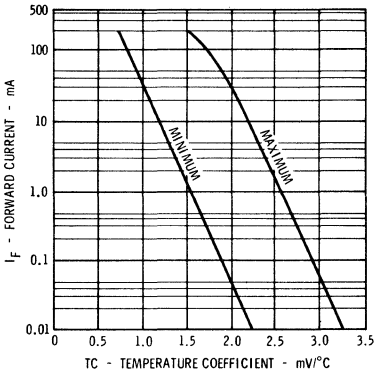
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

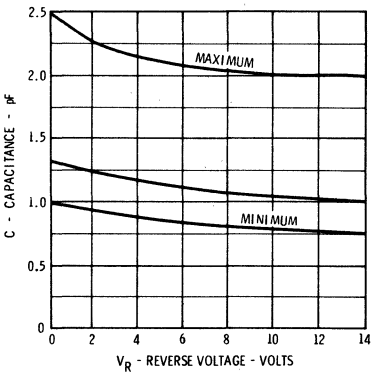
FORWARD VOLTAGE VERSUS FORWARD CURRENT



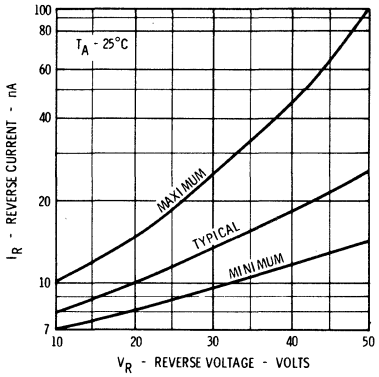
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



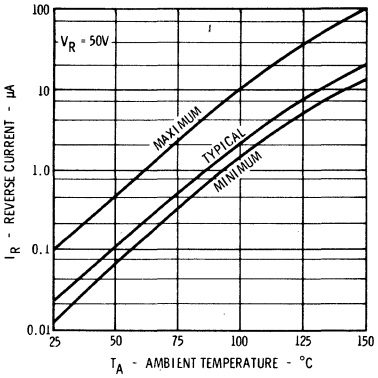
CAPACITANCE VERSUS REVERSE VOLTAGE



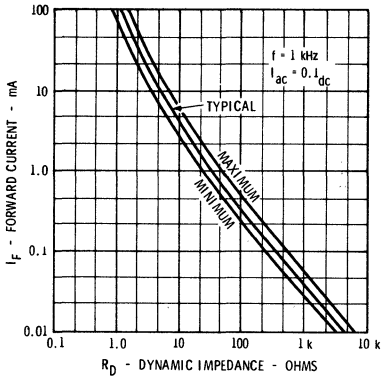
REVERSE CURRENT VERSUS REVERSE VOLTAGE



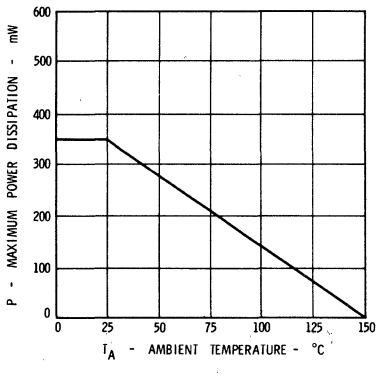
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



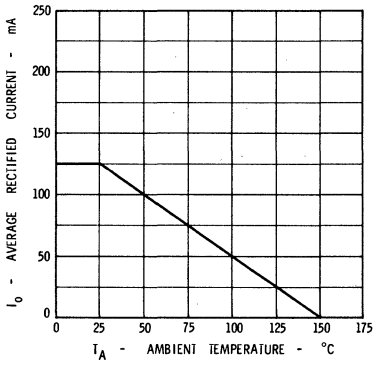
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



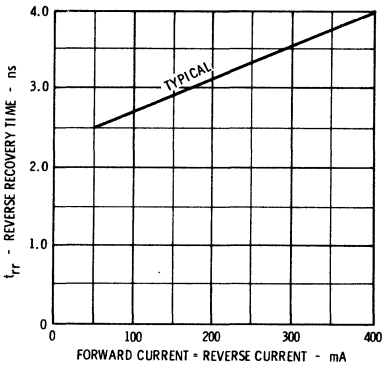
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT ($I_F = I_R$)

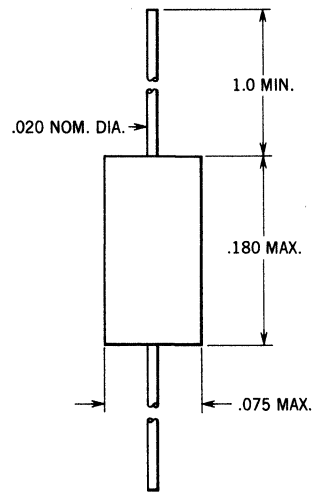


1N4606

MINIATURE SIZE, HIGH CONDUCTANCE, ULTRA FAST PLANAR* EPITAXIAL DIODE

GENERAL DESCRIPTION — The miniature 1N4606 is a silicon planar epitaxial diode that provides low capacitance, high conductance, and fast reverse recovery. With these features, the device is ideally suited for applications such as core devices, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities. Miniature package and high power dissipation are the interesting features of this device.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.

ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	70 Volts
I_O	Average Rectified Current	200 mA
I_F	DC Forward Current	400 mA
i_f	Recurrent Peak Forward Current	600 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 second	1 A
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 μs	4 A
P	Power Dissipation	500 mW
P	Power Dissipation	100 mW at +125°C
T_A	Operating Temperature	−65°C to +150°C
T_{stg}	Storage Temperature, Ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
V_F	Forward Voltage	.430	.550	V	$I_F = 0.1$ mA
V_F	Forward Voltage	.540	.660	V	$I_F = 1.0$ mA
V_F	Forward Voltage	.650	.770	V	$I_F = 10$ mA
V_F	Forward Voltage (Note 5)	.740	.860	V	$I_F = 50$ mA
V_F	Forward Voltage (Note 5)	.790	.920	V	$I_F = 100$ mA
V_F	Forward Voltage (Note 5)	.860	1.0	V	$I_F = 200$ mA
V_F	Forward Voltage (Note 5)		1.1	V	$I_F = 250$ mA
BV	Breakdown Voltage	85		V	$I_R = 100\ \mu$A
I_{R1}	Reverse Current		100	nA	$V_R = 50$ V
I_{R2}	Reverse Current		250	nA	$V_R = 70$ V
I_{R3}	Reverse Current (+100°C)		25	μA	$V_R = 50$ V
t_{rr}	Reverse Recovery Time (Note 2)		4.0	ns	$I_F = I_R = 10$-200 mA, $R_L = 100\ \Omega$
t_{rr}	Reverse Recovery Time (Note 2)		6	ns	$I_F = I_R = 200$-400 mA, $R_L = 100\ \Omega$
C	Capacitance (Note 3)		2.5	pF	$V_R = 0$ V

*Planar is a patented Fairchild Process.

NOTES:

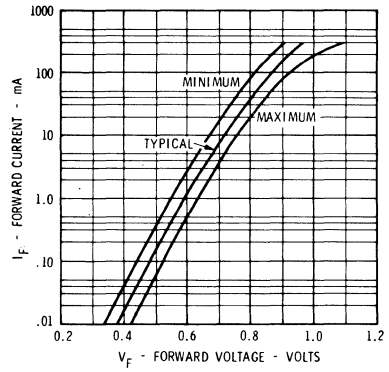
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 0.1 I_R.
(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75-AS8 Capacitance Bridge or equivalent.
(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.
(5) Pulse width $\leq 300\ \mu$s; Duty cycle $\leq 2\%$.

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

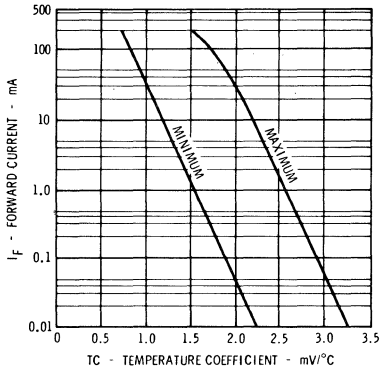
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

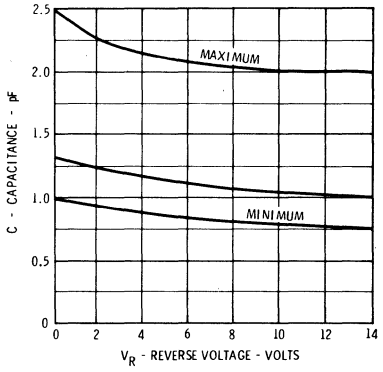
FORWARD VOLTAGE VERSUS FORWARD CURRENT



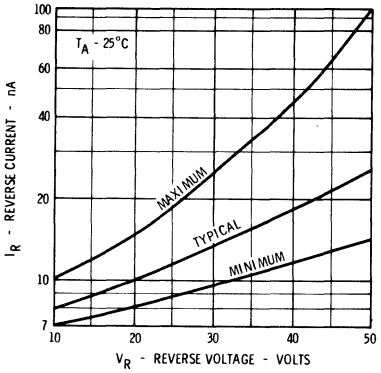
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



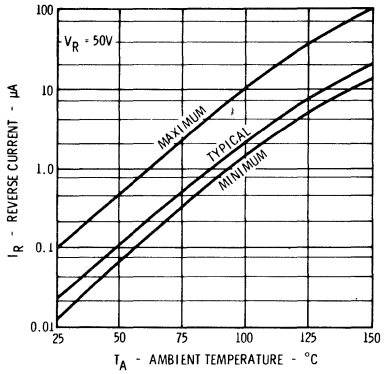
CAPACITANCE VERSUS REVERSE VOLTAGE



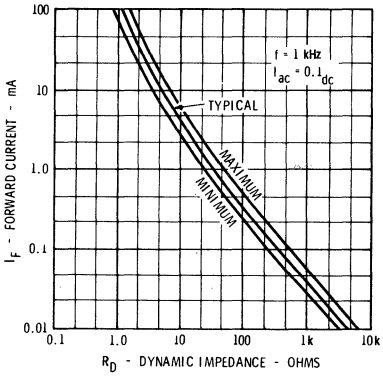
REVERSE CURRENT VERSUS REVERSE VOLTAGE



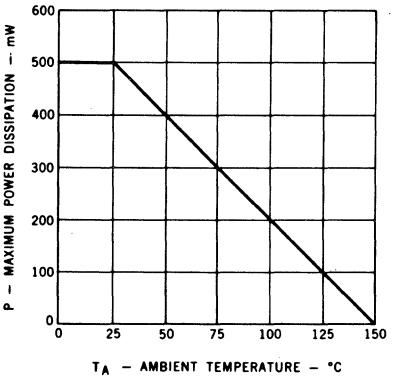
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



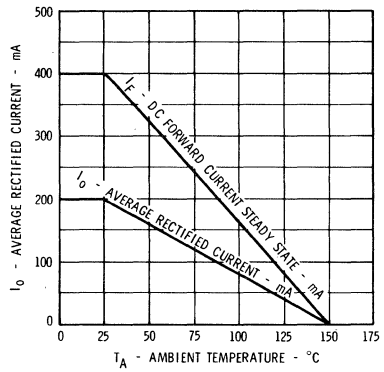
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



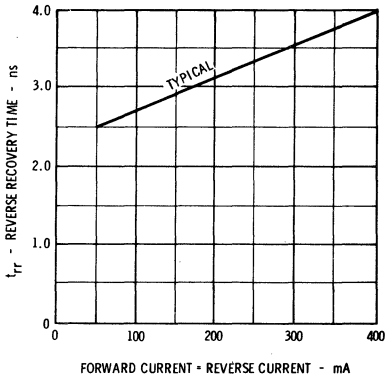
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT AND FORWARD CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT ($I_F = I_R$)

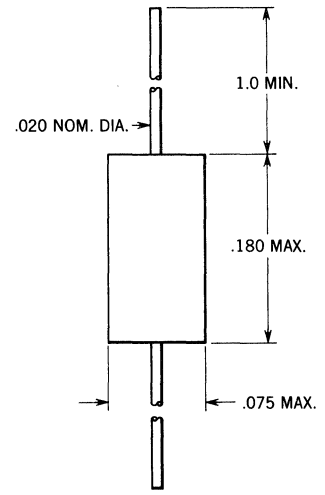


1N4607

MINIATURE SIZE, HIGH CONDUCTANCE, ULTRA FAST PLANAR* EPITAXIAL DIODE

GENERAL DESCRIPTION — The miniature 1N4607 is a silicon planar epitaxial diode that provides low capacitance, high conductance, and fast reverse recovery. With these features, the device is ideally suited for applications such as core devices, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities. Miniature package and high power dissipation are the interesting features of this device.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.

ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	70 Volts
I_O	Average Rectified Current	200 mA
I_F	DC Forward Current	400 mA
i_f	Recurrent Peak Forward Current	600 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 second	1 A
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 μs	4 A
P	Power Dissipation	500 mW
P	Power Dissipation	100 mW at +125°C
T_A	Operating Temperature	−65°C to +150°C
T_{stg}	Storage Temperature, Ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
V_{F1}	Forward Voltage	.390	.500	V	$I_F = 0.1$ mA
V_{F2}	Forward Voltage	.500	.610	V	$I_F = 1.0$ mA
V_{F3}	Forward Voltage	.610	.720	V	$I_F = 10$ mA
V_{F4}	Forward Voltage (Note 5)	.740	.870	V	$I_F = 100$ mA
V_{F5}	Forward Voltage (Note 5)	.810	.950	V	$I_F = 250$ mA
V_{F6}	Forward Voltage (Note 5)		1.0	V	$I_F = 350$ mA
V_{F7}	Forward Voltage (Note 5)		1.1	V	$I_F = 400$ mA
I_{R1}	Reverse Current		250	nA	$V_R = 70$ V
I_{R3}	Reverse Current (+100°C)		25	μA	$V_R = 50$ V
I_{R2}	Reverse Current		100	nA	$V_R = 50$ V
BV	Breakdown Voltage	85		V	$I_R = 100$ μA
t_{rr}	Reverse Recovery Time (Note 2)		10	ns	$I_F = I_R = 10$ mA, $R_L = 100\ \Omega$
t_{rr}	Reverse Recovery Time (Note 2)		15	ns	$I_F = I_R = 500$ mA, $R_L = 100\ \Omega$
C	Capacitance (Note 3)		4.0	pF	$V_R = 0$ V

*Planar is a patented Fairchild Process.

NOTES:

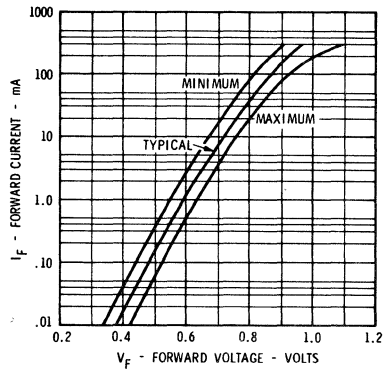
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 0.1 I_R.
(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75-AS8 Capacitance Bridge or equivalent.
(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.
(5) Pulse width $\leq$ 300 μs; Duty cycle $\leq$ 2%.

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

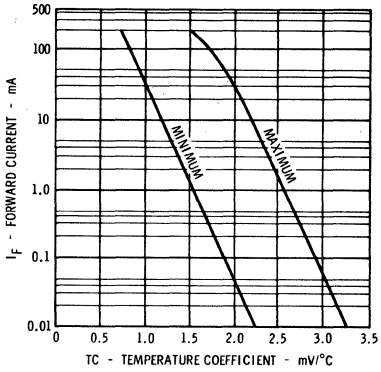
FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

TYPICAL ELECTRICAL CHARACTERISTICS

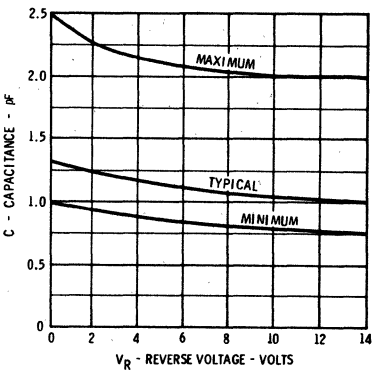
FORWARD VOLTAGE VERSUS FORWARD CURRENT



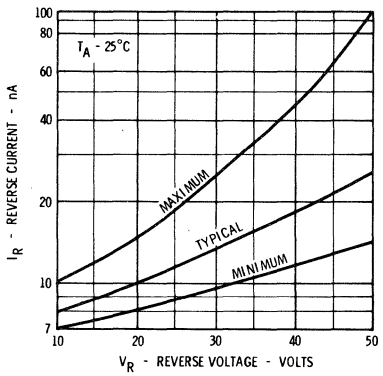
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



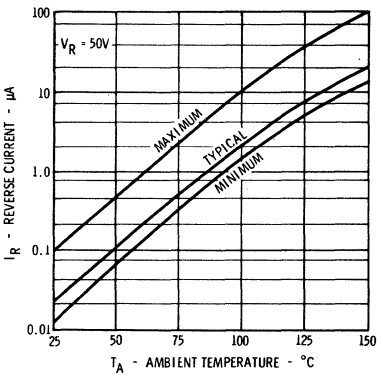
CAPACITANCE VERSUS REVERSE VOLTAGE



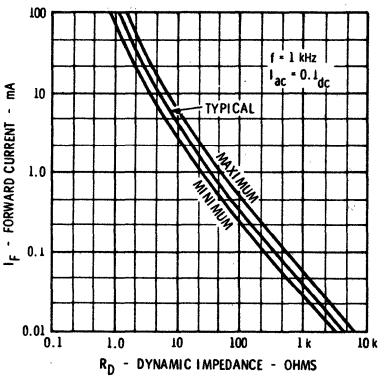
REVERSE CURRENT VERSUS REVERSE VOLTAGE



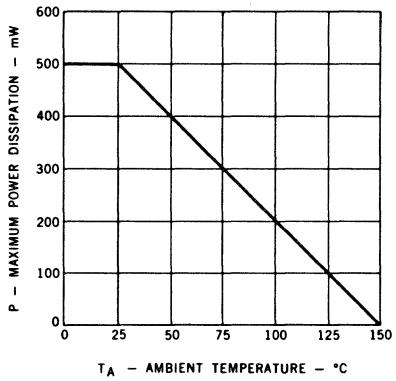
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



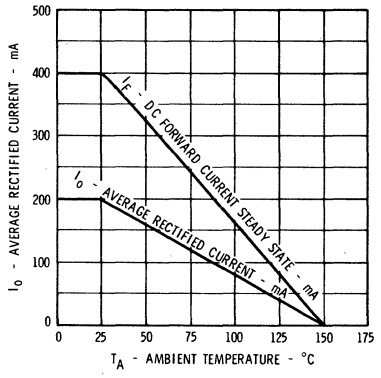
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



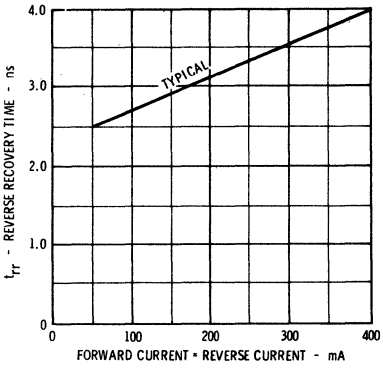
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT AND FORWARD CURRENT VERSUS AMBIENT TEMPERATURE



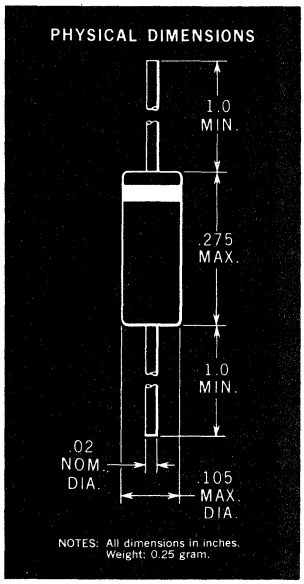
REVERSE RECOVERY TIME VERSUS FORWARD CURRENT ($I_F = I_R$)



1N4610

HIGH CONDUCTANCE ULTRA FAST EPITAXIAL PLANAR DIODE

The 1N4610 is a silicon planar epitaxial diode that provides low capacitance, high conductance, and fast reverse recovery. With these features, the device is ideally suited for applications such as core devices, avalanche circuitry, logarithmic amplifiers for pulse applications, and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities.



ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	55 Volts
I_o	Average Rectified Current	200 mA
i_f	Recurrent Peak Forward Current	600 mA
i_f (surge)	Peak Forward Surge Current Pulse Width of 1 second	1.0 Amp
i_f (surge)	Peak Forward Surge Current Pulse Width of 1 μsec	4.0 Amp
P	Power Dissipation	500 mW
P	Power Dissipation	170 mW at 125°C
T_A	Operating Temperature	-65°C to +150°C
T_{stg}	Storage Temperature, Ambient	-65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

Symbol	† FACT Subgroup	Characteristic	Min.	Max.	Units	Test Conditions
*V_{F1}	1a	Forward Voltage	0.875	1.100	Volts	I_F = 300 mA
V_{F2}	1b	Forward Voltage	0.850	1.000	Volts	I_F = 200 mA
V_{F3}	1b	Forward Voltage	0.800	0.900	Volts	I_F = 100 mA
V_{F4}	1b	Forward Voltage	0.760	0.840	Volts	I_F = 50 mA
V_{F5}	1b	Forward Voltage	0.670	0.740	Volts	I_F = 10 mA
V_{F6}	1b	Forward Voltage	0.640	0.705	Volts	I_F = 5 mA
V_{F7}	1b	Forward Voltage	0.560	0.620	Volts	I_F = 1 mA
V_{F8}	1b	Forward Voltage	0.530	0.590	Volts	I_F = 0.5 mA
V_{F9}	1b	Forward Voltage	0.455	0.505	Volts	I_F = 0.1 mA

† These numerals apply to the FACT (Fairchild Assured Component Test) Program.

* FACT End point measurement parameter for Group B. Subgroup 2, 3, 4, 6, and 7.

Additional Electrical Characteristics on page 2

NOTES:

(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.

(2) Recovery to 10% of I_F.

(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75-AS8 Capacitance Bridge or equivalent.

(4) The power dissipation is measured with an infinite heat sink at 3/8" from the body of the device.

(5) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

Symbol	†FACT Subgroup	Characteristic	Min.	Max.	Units	Test Conditions
*I_R	1a	Reverse Current	-	100	nA	V_R = -55 V
I_R(150°C)	1a	Reverse Current	-	100	μA	V_R = -55 V
**BV	1a	Breakdown Voltage	80		Volts	I_R = 5 μA
t_{rr} (Note 2)	1a	Reverse Recovery	-	4.0	nsec	I_F = I_R = 10 to 200 mA, R_L = 100 Ω
t_{rr} (Note 2)	1a	Reverse Recovery	-	2.0	nsec	I_F = 10 mA, V_R = 6 V, R_L = 100 Ω
**C_o	1a	Capacitance		2.0	pf	V_R = 0 V, f = 1 Mc
t_{fr}	1b	Forward Recovery	-	10	nsec	I_F = 200 mA, t_r = 0.4 nsec, v_{fr} = 1 volt
						Pulse = 100 nsec, Duty cycle ≤ 1%

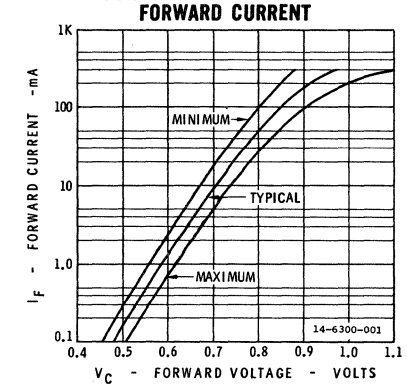
† These numerals apply to the FACT (Fairchild Assured Component Test) Program.

* FACT End point measurement parameter for Group B. Subgroup 2, 3, 4, 6, and 7.

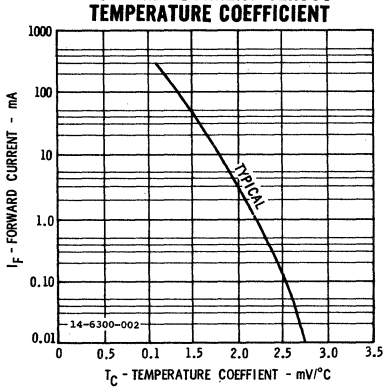
** FACT End point measurement parameter for Group B. Subgroups 6 and 7 only.

TYPICAL ELECTRICAL CHARACTERISTICS

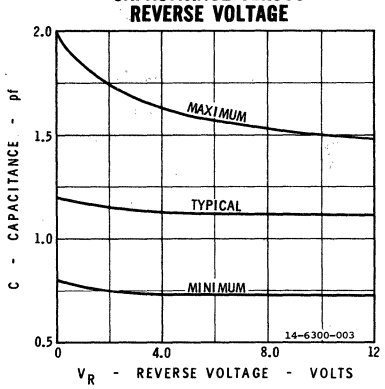
FORWARD VOLTAGE VERSUS FORWARD CURRENT



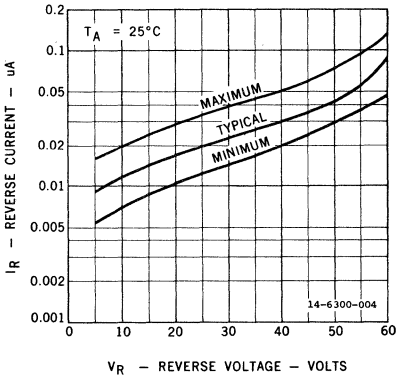
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



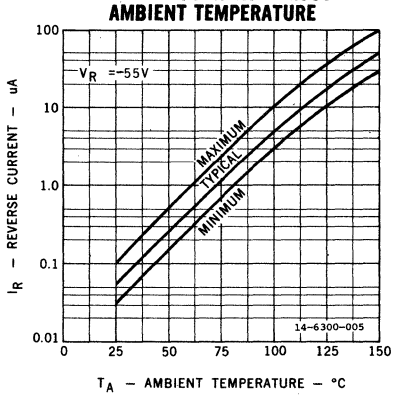
CAPACITANCE VERSUS REVERSE VOLTAGE



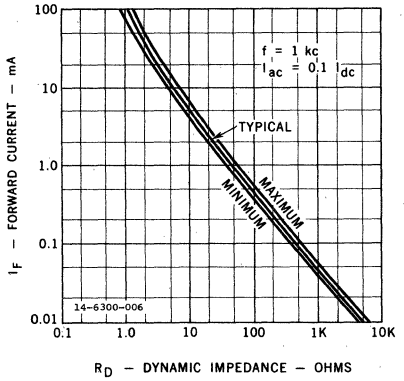
REVERSE VOLTAGE VERSUS REVERSE CURRENT



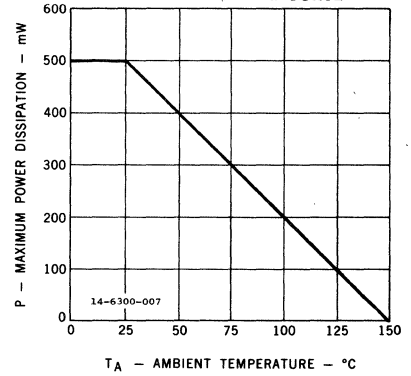
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



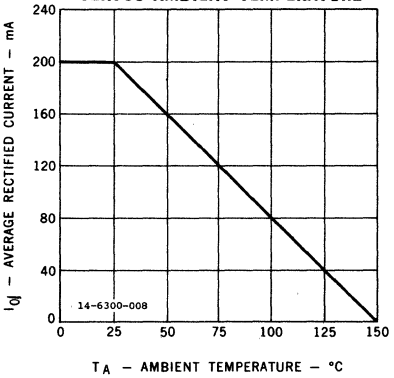
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



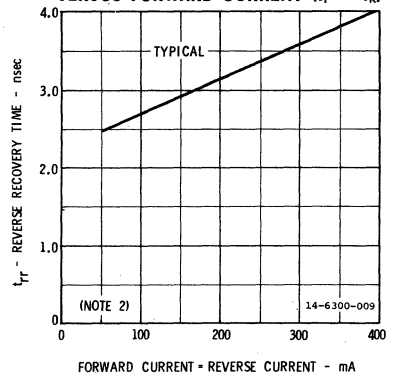
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT (I_F = I_R)

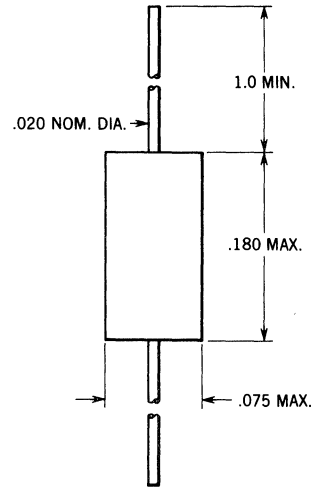


1N4727

MINIATURE SIZE, HIGH CONDUCTANCE, ULTRA FAST PLANAR* EPITAXIAL DIODE

GENERAL DESCRIPTION — The miniature 1N4727 is a silicon planar epitaxial diode that provides low capacitance, high conductance, and fast reverse recovery. With these features, the device is ideally suited for applications such as core devices, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities. Miniature package and high power dissipation are the interesting features of this device.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.

ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	20 Volts
I_O	Average Rectified Current	200 mA
I_F	DC Forward Current	400 mA
i_f	Recurrent Peak Forward Current	600 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 second	1 A
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 μs	4 A
P	Power Dissipation	500 mW
P	Power Dissipation	100 mW at +125°C
T_A	Operating Temperature	−65°C to +150°C
T_{stg}	Storage Temperature, Ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
V_F	Forward Voltage		.85	V	$I_F = 10$ mA
I_{R1}	Reverse Current		100	nA	$V_R = 20$ V
I_{R2}	Reverse Current (+100°C)		10	μA	$V_R = 20$ V
BV	Breakdown Voltage	30		V	$I_R = 5\ \mu$A
Q_S	Stored Charge (Note 2)		40	pC	$I_F = 10$ mA
C	Capacitance (Note 3)		4.0	pF	$V_R = 0$ V

NOTES:

(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Stored charge as measured on B-Line Corporation Model No. QS-3 stored charge meter or equivalent.
(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75-AS8 Capacitance Bridge or equivalent.
(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

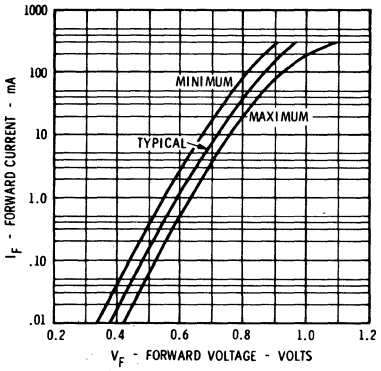
*Planar is a patented Fairchild Process

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

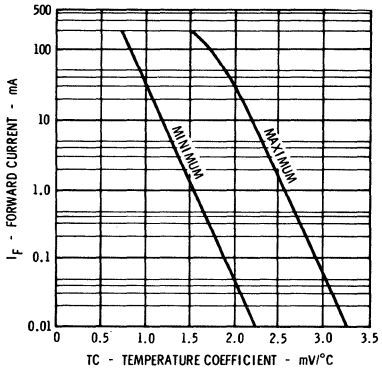
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

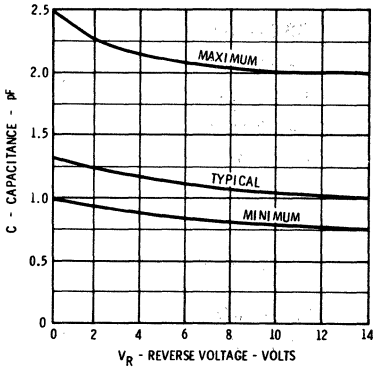
FORWARD VOLTAGE VERSUS FORWARD CURRENT



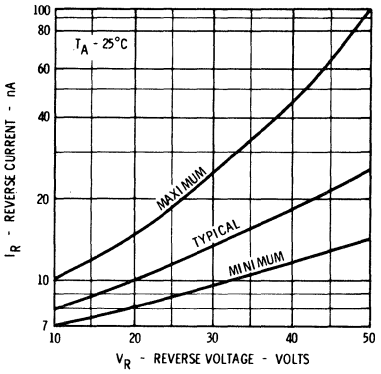
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



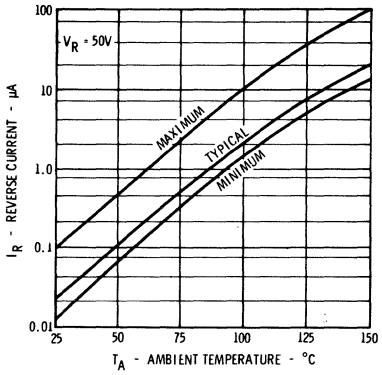
CAPACITANCE VERSUS REVERSE VOLTAGE



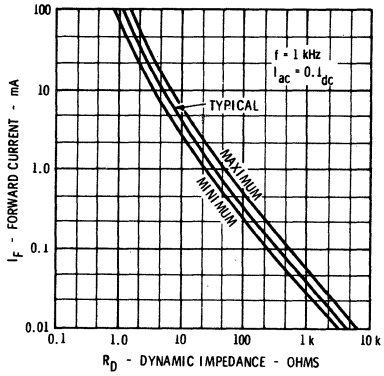
REVERSE CURRENT VERSUS REVERSE VOLTAGE



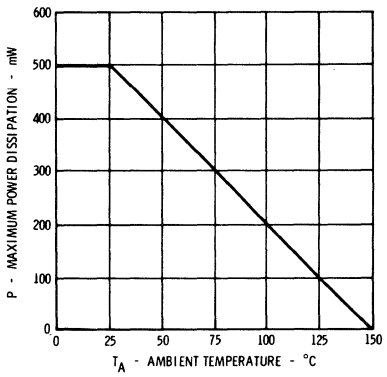
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



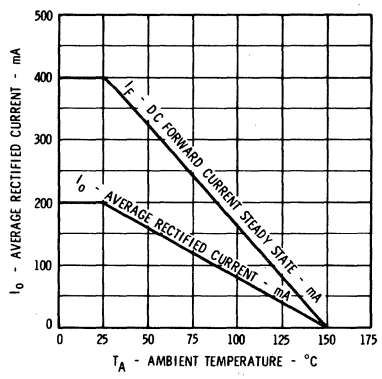
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



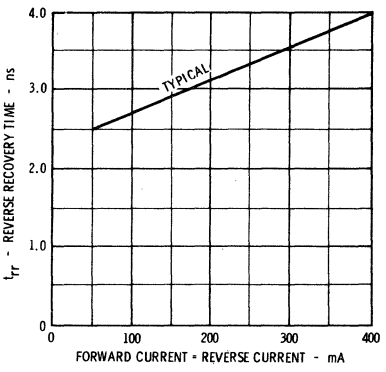
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT AND FORWARD CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT ($I_F = I_R$)

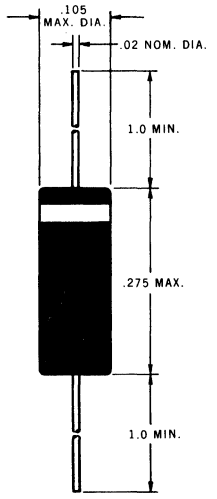


1N4950

HIGH CONDUCTANCE, ULTRA FAST PLANAR* EPITAXIAL DIODE

GENERAL DESCRIPTION — The 1N4950 is a silicon planar epitaxial diode that provides low capacitance, high conductance, and fast reverse recovery. With these features, the device is ideally suited for applications such as core devices, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities.

PHYSICAL DIMENSIONS



NOTE: All dimensions in inches

ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	25 Volts
I_O	Average Rectified Current	200 mA
i_f	Recurrent Peak Forward Current	900 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 second	1 A
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 μs	4 A
P	Power Dissipation	500 mW
P	Power Dissipation	170 mW at +125°C
T_A	Operating Temperature	−65°C to +150°C
T_{stg}	Storage Temperature, Ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
V_{F1}	Forward Voltage	.87	1.00	V	$I_F = 300$ mA
V_{F2}	Forward Voltage	.53	.61	V	$I_F = 1$ mA
V_{F3}	Forward Voltage	.64	.72	V	$I_F = 10$ mA
V_{F4}	Forward Voltage	.72	.82	V	$I_F = 50$ mA
V_{F5}	Forward Voltage	.77	.87	V	$I_F = 100$ mA
V_{F6}	Forward Voltage	.83	.93	V	$I_F = 200$ mA
I_{R1}	Reverse Current		100	nA	$V_R = 25$ V
I_{R2}	Reverse Current (+150°C)		100	μA	$V_R = 25$ V
BV	Breakdown Voltage	30		V	$I_R = 5\ \mu$A
C	Capacitance (Note 3)		3.3	pF	$V_R = 0$ V
t_{rr}	Reverse Recovery Time (Note 2)		4.0	ns	$I_F = I_R = 10$-200 mA $R_L = 100\ \Omega$

*Planar is a patented Fairchild Process.

NOTES:

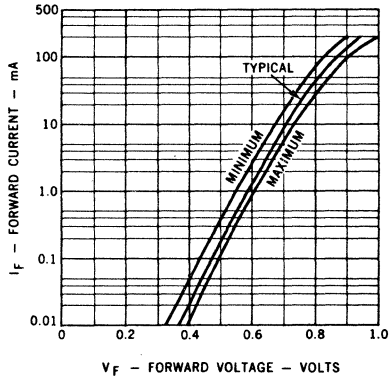
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 0.1 I_R.
(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75-AS8 Capacitance Bridge or equivalent.
(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

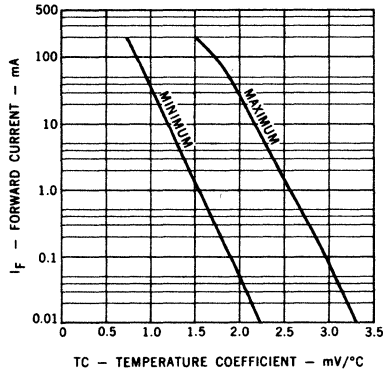
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

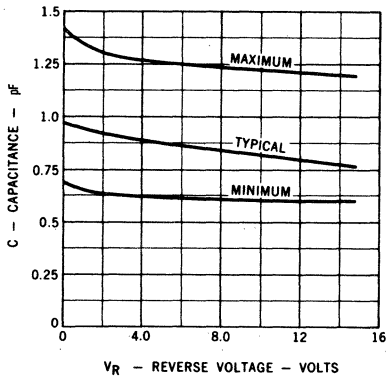
FORWARD VOLTAGE VERSUS FORWARD CURRENT



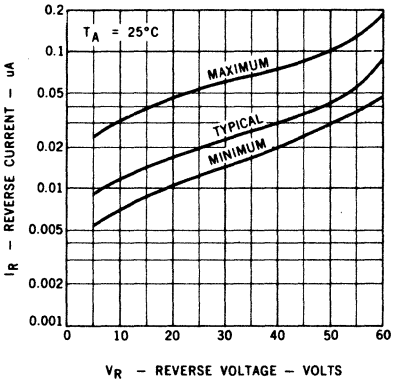
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



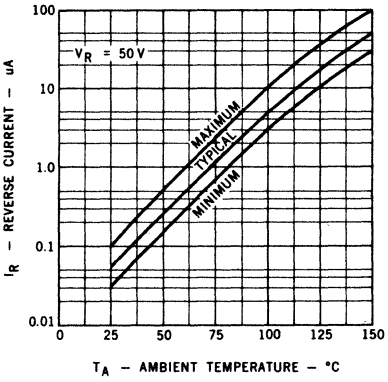
CAPACITANCE VERSUS REVERSE VOLTAGE



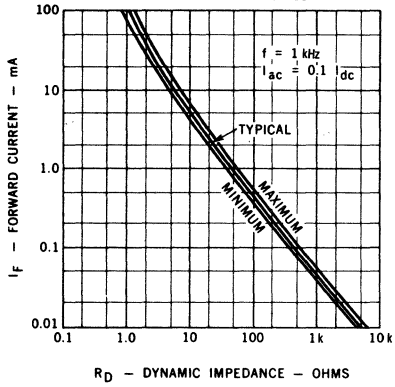
REVERSE VOLTAGE VERSUS REVERSE CURRENT



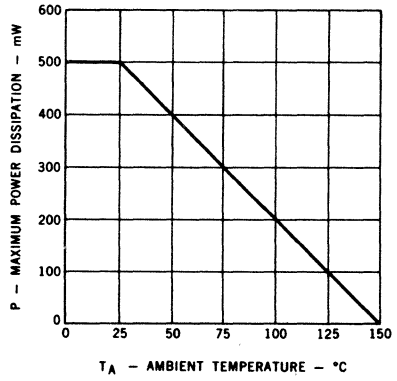
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



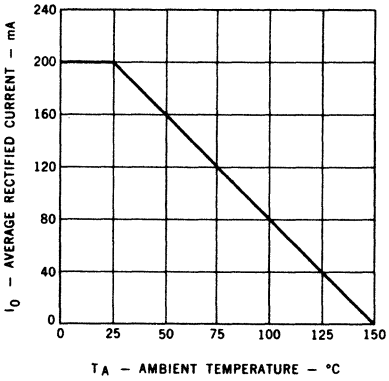
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



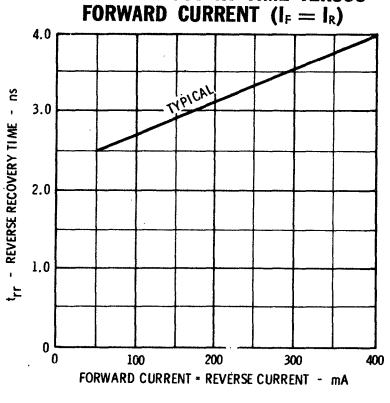
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT ($I_F = I_R$)

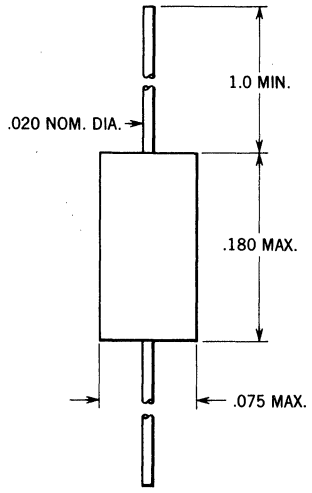


IN5282

MINIATURE SIZE, HIGH CONDUCTANCE, ULTRA-FAST PLANAR* EPITAXIAL DIODE

GENERAL DESCRIPTION — The miniature IN5282 is a silicon planar epitaxial diode that provides low capacitance, high conductance, and fast reverse recovery. With these features, the device is ideally suited for applications such as core devices, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities. Miniature package and high power dissipation are the interesting features of this device.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.

MAXIMUM RATINGS (25°C) [Note 1]

WIV	Working Inverse Voltage	55 Volts
I_O	Average Rectified Current	200 mA
I_F	DC Forward Current	400 mA
i_f	Recurrent Peak Forward Current	600 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 second	1 A
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 μs	4 A
P	Power Dissipation	500 mW
T_A	Operating Temperature	−65°C to +150°C
T_{stg}	Storage Temperature, Ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTIC	MIN.	MAX.	UNITS	TEST CONDITIONS
V_F	Forward Voltage [Pulse, Note 3]	0.950	1.300	V	I_F = 500 mA
V_F	Forward Voltage	0.875	1.100	V	I_F = 300 mA
V_F	Forward Voltage	0.800	0.900	V	I_F = 100 mA
V_F	Forward Voltage	0.670	0.725	V	I_F = 10 mA
V_F	Forward Voltage	0.550	0.600	V	I_F = 1 mA
V_F	Forward Voltage	0.450	0.490	V	I_F = .1 mA
I_R	Reverse Current		0.1	μA	V_R = −55 V
I_R	Reverse Current (150°C)		100	μA	V_R = −55 V
BV	Breakdown Voltage	80			I_R = 5 μA
t_{rr}	Reverse Recovery Time [Note 4]		4.0	ns	I_F = I_R = 10-200 mA
					R_L = 100 Ω
t_{rr}	Reverse Recovery Time [Note 4]		2.0	ns	I_F = 10 mA; V_R = 6 V
					R_L = 100 Ω
C_O	Capacitance [Note 5]		2.5	pF	V_R = 0 V, f = 1 MHz
T_{FR}	Forward Recovery		10	ns	I_F = 200 mA; T_R = .4 ns
					V_{FR} = 1V; Pulse width = 100 ns; Duty Cycle ≤ 1%

(See notes on back page)

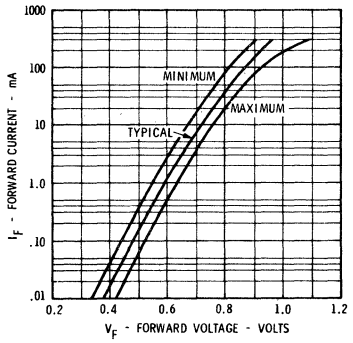
* Planar is a patented Fairchild Process.

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

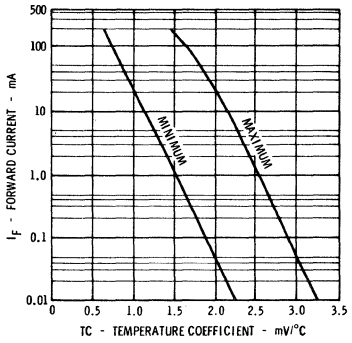
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

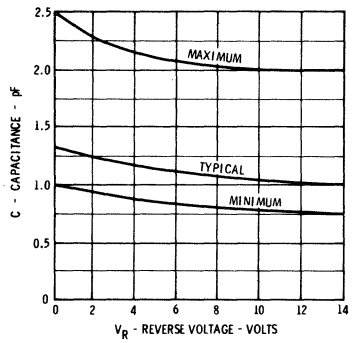
FORWARD VOLTAGE VERSUS FORWARD CURRENT



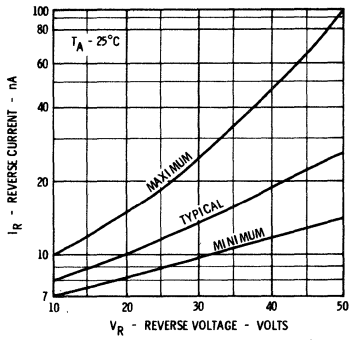
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



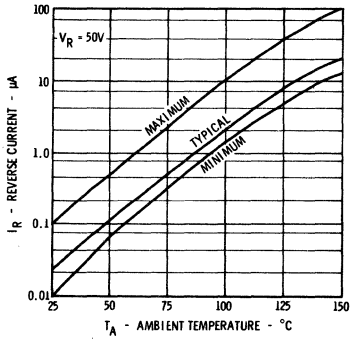
CAPACITANCE VERSUS REVERSE VOLTAGE



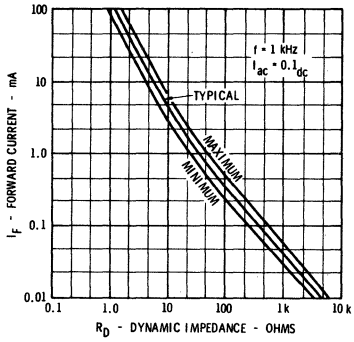
REVERSE CURRENT VERSUS REVERSE VOLTAGE



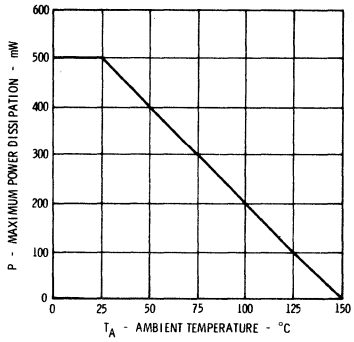
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



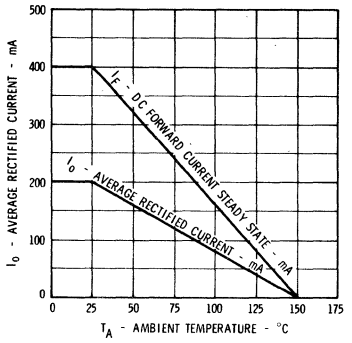
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



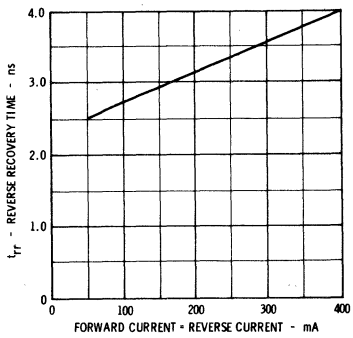
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT AND FORWARD CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT ($I_F = I_R$)



NOTES:

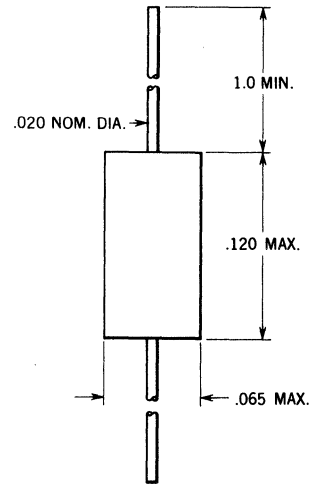
1. Leads are tinned.
2. Heat sunk in copper blocks ¼" from diode body.
3. Pulse width 1 ms, duty cycle $\leq$1%.
4. Recover to .1 I_F.
5. Capacitance as measured on Boonton Electronic Corporation Model No. 15-AS8 Capacitance Bridge or Equivalent.
6. $T_R = 0.4$ ns; $V_{FR} = 1.0$ V; Pulse width = 100 ns; Duty cycle $\leq$ 1%.

1N5317

ULTRA COMPACT, HIGH CONDUCTANCE, ULTRA FAST PLANAR* EPITAXIAL DIODE

GENERAL DESCRIPTION — The miniature 1N5317 is a silicon planar epitaxial diode that provides low capacitance, high conductance, and fast reverse recovery. With these features, the device is ideally suited for applications such as core devices, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities. Of special interest is the ultra-small size of this device.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.

ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	55 Volts
I_O	Average Rectified Current	125 mA
i_f	Recurrent Peak Forward Current	400 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 second	500 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 μs	2 A
P	Power Dissipation (Package) (Note 2)	350 mW
$1/\theta$	Power Derating Factor	2.8 mW/°C
T_A	Operating Temperature	−65°C to +150°C
T_{stg}	Storage Temperature, Ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
V_F	Forward Voltage (Pulse, Note 3)	1.050	1.300	V	$I_F = 500$ mA
V_F	Forward Voltage	0.920	1.100	V	$I_F = 300$ mA
V_F	Forward Voltage	0.800	0.900	V	$I_F = 100$ mA
V_F	Forward Voltage	0.670	0.725	V	$I_F = 10$ mA
V_F	Forward Voltage	0.550	0.600	V	$I_F = 1.0$ mA
V_F	Forward Voltage	0.450	0.490	V	$I_F = 0.1$ mA
I_R	Reverse Current		0.1	μA	$V_R = -55$ V
I_R	Reverse Current (+150°C)		100	μA	$V_R = -55$ V
BV	Breakdown Voltage	80			$I_R = 5\ \mu$A
t_{rr}	Reverse Recovery Time (Note 4)		4.0	ns	$I_F = I_R = 10$-200 mA $R_L = 100\ \Omega$
t_{rr}	Reverse Recovery Time (Note 4)		2.0	ns	$I_F = 10$ mA; $V_R = 6$ V $R_L = 100\ \Omega$
C_o	Capacitance (Note 5)		2.5	pF	$V_R = 0$ V, f = 1 MHz
T_{FR}	Forward Recovery (Note 6)		10	ns	$I_F = 200$ mA
V_{pK}	Peak Forward Voltage (Note 7)		2.0	V	$I_F = 500$ mA

Notes on page 2.

*Planar is a patented Fairchild Process.

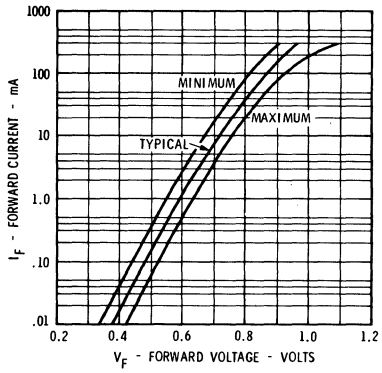
FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

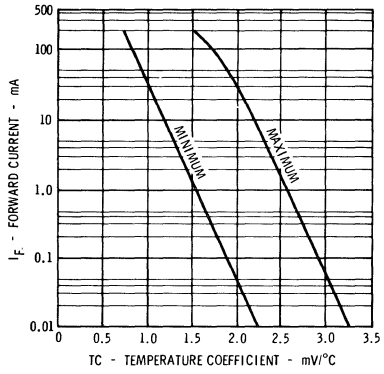
NOTES:
(1) Leads are tinned.
(2) Heat sunk in copper blocks ¼" from diode body.
(3) Pulse width 300 μs; Duty Cycle $\leq$ 1%.
(4) Recovery to .1 I_R.
(5) Capacitance as measured on Boonton Electronic Corporation Model No. 75-AS8 Capacitance Bridge or equivalent.
(6) T_R = .4 ns, V_{FR} = 1.0 V; Pulse Width = 100 ns, Duty Cycle $\leq$ 1%.
(7) T_R = 8 ns; Pulse Width = 1 μs; Duty Cycle $\leq$ 1%.

TYPICAL ELECTRICAL CHARACTERISTICS

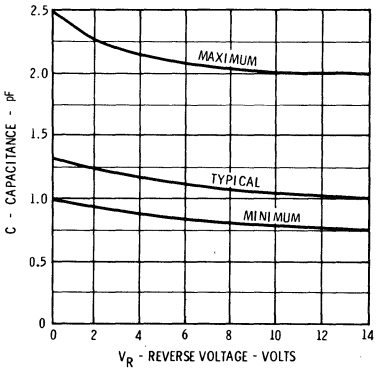
FORWARD VOLTAGE VERSUS FORWARD CURRENT



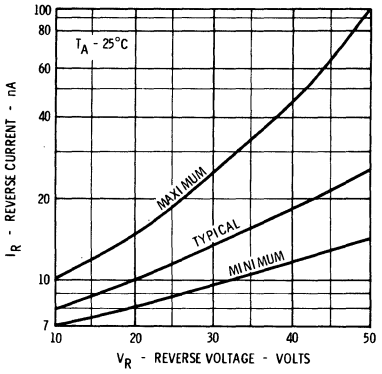
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



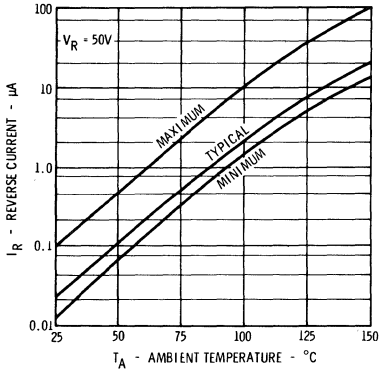
CAPACITANCE VERSUS REVERSE VOLTAGE



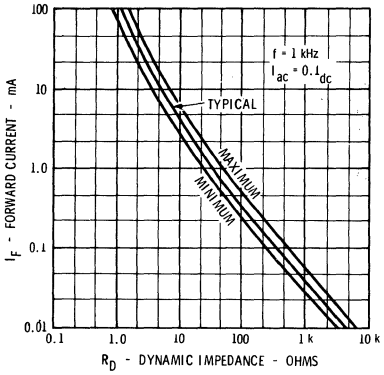
REVERSE CURRENT VERSUS REVERSE VOLTAGE



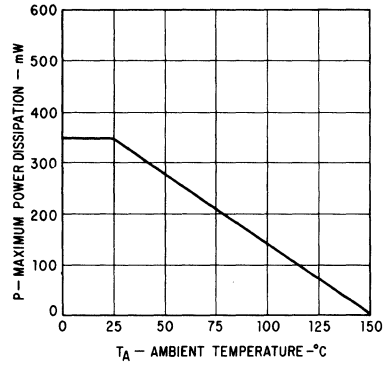
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



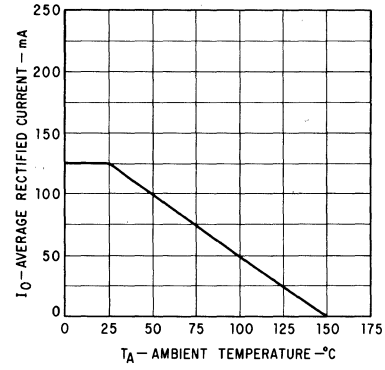
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



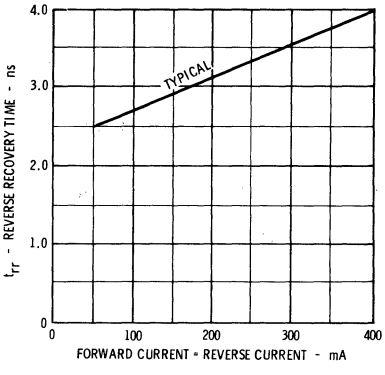
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT ($I_F = I_R$)

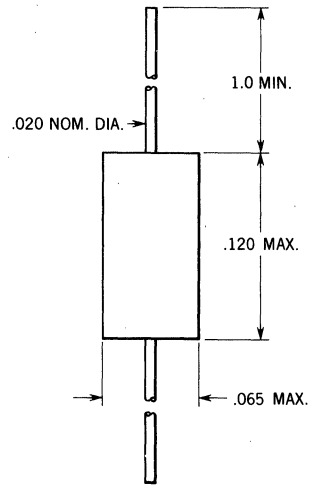


1N5318

ULTRA COMPACT, HIGH CONDUCTANCE, ULTRA FAST PLANAR* EPITAXIAL DIODE

GENERAL DESCRIPTION — The miniature 1N5318 is a silicon planar epitaxial diode that provides low capacitance, high conductance, and fast reverse recovery. With these features, the device is ideally suited for applications such as core devices, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities. Of special interest is the ultra-small size of this device.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.

ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	50 Volts
I_O	Average Rectified Current	125 mA
i_f	Recurrent Peak Forward Current	400 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 second	500 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 μs	2 A
P	Power Dissipation (Package)	350 mW
$1/\theta$	Power Derating Factor	2.8 mW/°C
T_A	Operating Temperature	−65°C to +150°C
T_{stg}	Storage Temperature, Ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
V_F	Forward Voltage	0.87	1.00		$I_F = 200$ mA
V_F	Forward Voltage	0.82	0.92		$I_F = 100$ mA
V_F	Forward Voltage	0.76	0.86		$I_F = 50$ mA
V_F	Forward Voltage	0.66	0.74		$I_F = 10$ mA
V_F	Forward Voltage	0.54	0.62		$I_F = 1.0$ mA
I_R	Reverse Current		0.1	μA	$V_R = -50$ V
I_R	Reverse Current (+150°C)		100	μA	$V_R = -50$ V
BV	Breakdown Voltage	75			$I_R = 5\ \mu$A
t_{rr}	Reverse Recovery Time (Note 2)		4.0	ns	$I_F = I_R = 10$-200 mA $R_L = 100\ \Omega$
t_{rr}	Reverse Recovery Time (Note 2)		6.0	ns	$I_F = I_R = 200$-400 mA $R_L = 100\ \Omega$
C_o	Capacitance (Note 3)		2.5	pF	$V_R = 0$ V, f = 1 MHz

*Planar is a patented Fairchild Process.

NOTES:

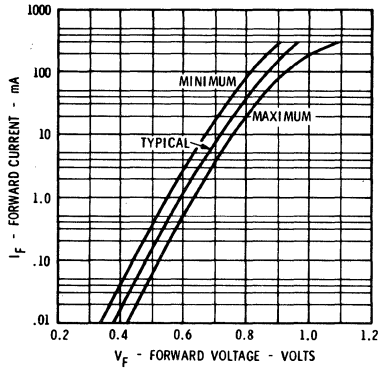
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 0.1 I_R.
(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75-AS8 Capacitance Bridge or equivalent.
(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

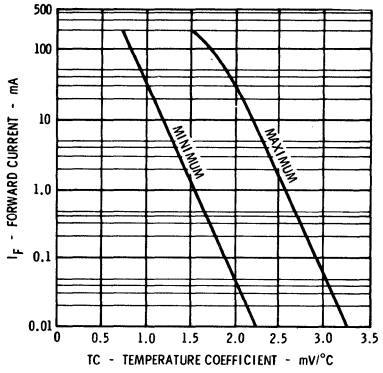
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

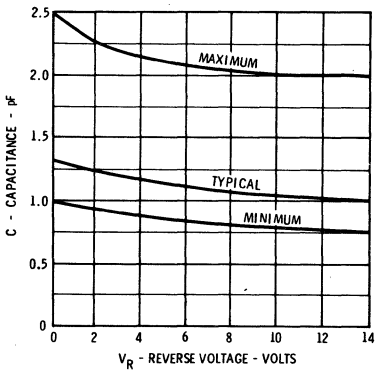
FORWARD VOLTAGE VERSUS FORWARD CURRENT



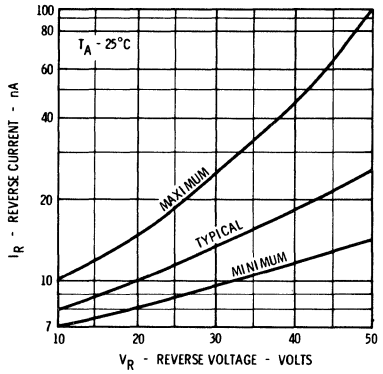
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



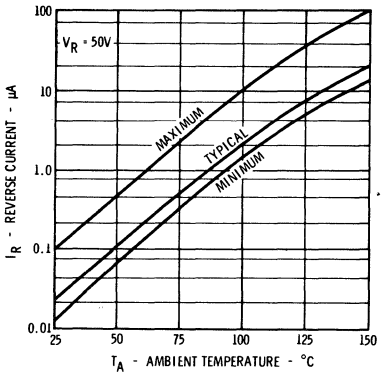
CAPACITANCE VERSUS REVERSE VOLTAGE



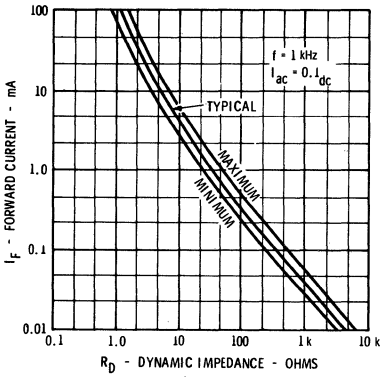
REVERSE CURRENT VERSUS REVERSE VOLTAGE



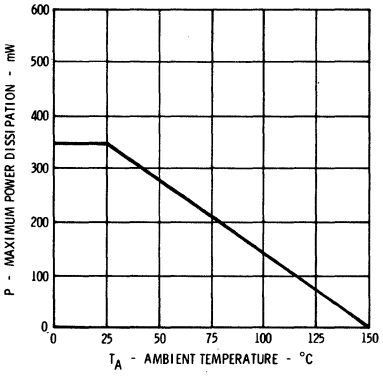
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



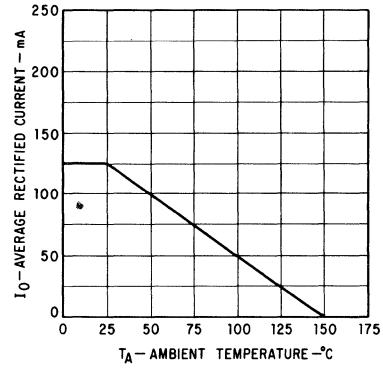
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



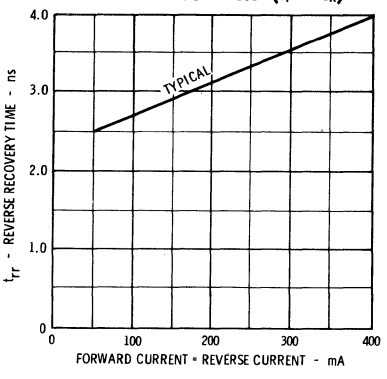
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT ($I_F = I_R$)

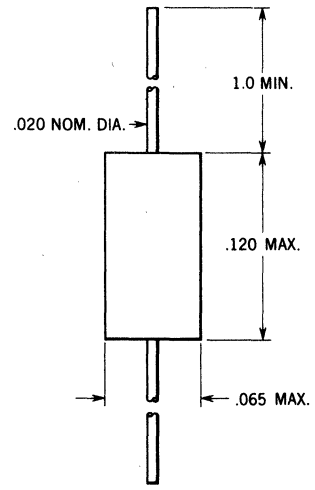


1N5319

ULTRA COMPACT, HIGH CONDUCTANCE, ULTRA FAST PLANAR* EPITAXIAL DIODE

GENERAL DESCRIPTION — The miniature 1N5319 is a silicon planar epitaxial diode that provides low capacitance, high conductance, and fast reverse recovery. With these features, the device is ideally suited for applications such as core drivers, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities. Miniature package and economy are the interesting features of this device.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.

ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	25 Volts
I_O	Average Rectified Current	100 mA
i_f	Recurrent Peak Forward Current	400 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 second	500 mA
i_f(surge)	Peak Forward Surge Current Pulse Width of 1 μs	2 A
P	Power Dissipation (Package)	350 mW
$1/\theta$	Power Derating Factor	2.8 mW/°C
T_A	Operating Temperature	−65°C to +150°C
T_{stg}	Storage Temperature, Ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
V_F	Forward Voltage		1.00	V	$I_F = 100$ mA
I_R	Reverse Current		0.1	μA	$V_R = -25$ V
I_R	Reverse Current (+100°C)		100	μA	$V_R = -25$ V
BV	Breakdown Voltage	40		V	$I_R = 5\ \mu$A
t_{rr1}	Reverse Recovery Time (Note 2)		4.0	ns	$I_F = I_R = 10$-200 mA $R_L = 100\ \Omega$
t_{rr2}	Reverse Recovery Time (Note 2)		6.0	ns	$I_F = I_R = 200$-400 mA $R_L = 100\ \Omega$
C_o	Capacitance (Note 3)		3.5	pF	$V_R = 0$ V, f = 1 MHz

*Planar is a patented Fairchild Process.

NOTES:

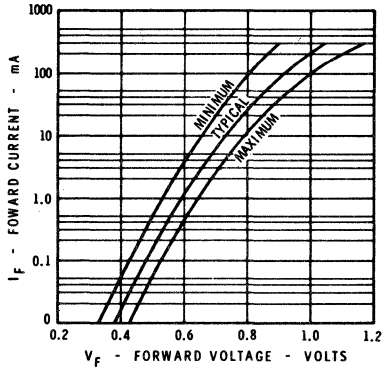
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 0.1 I_R.
(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75-AS8 Capacitance Bridge or equivalent.
(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

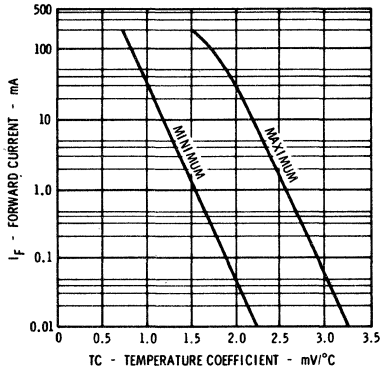
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

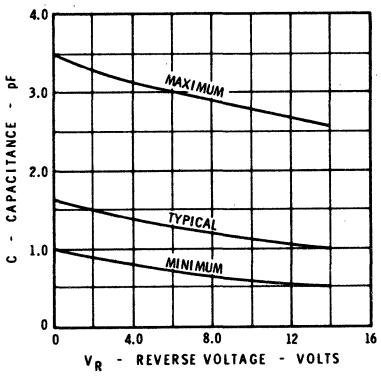
FORWARD VOLTAGE VERSUS FORWARD CURRENT



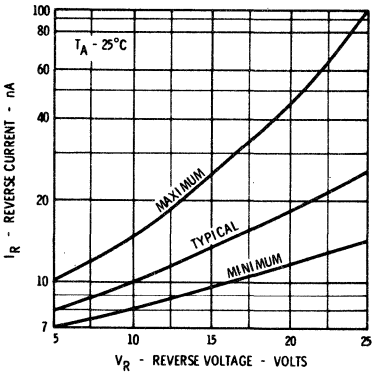
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



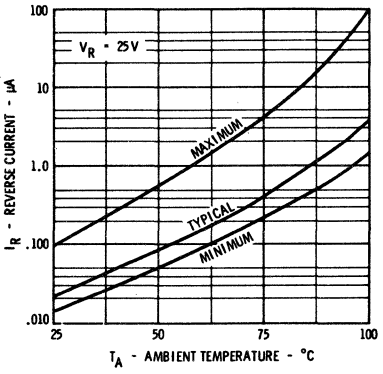
CAPACITANCE VERSUS REVERSE VOLTAGE



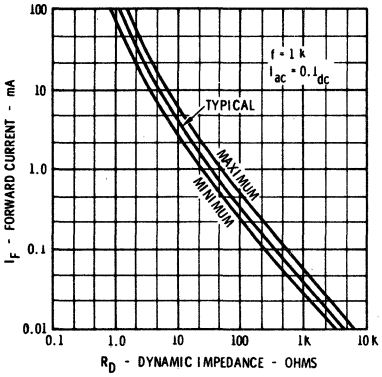
REVERSE CURRENT VERSUS REVERSE VOLTAGE



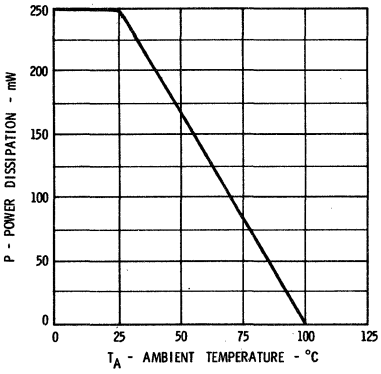
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



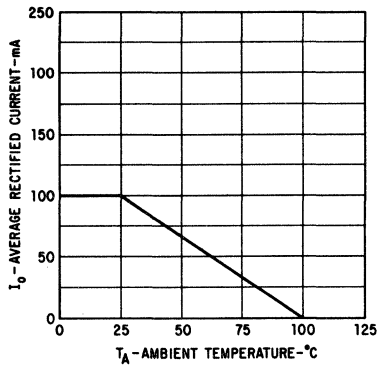
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



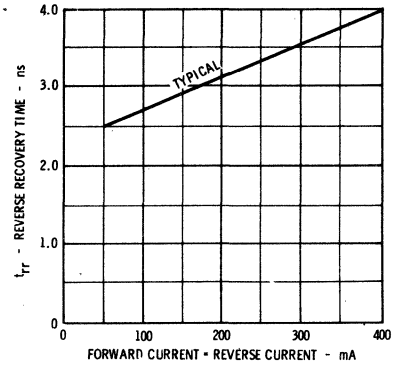
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT VERSUS AMBIENT TEMPERATURE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT ($I_F = I_R$)



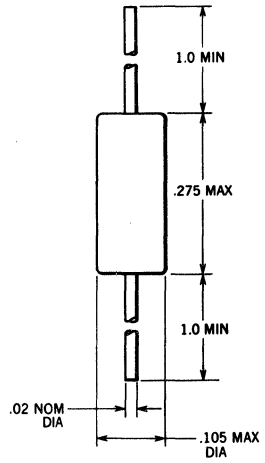
1N5427

RADIATION RESISTANT, FAST SWITCHING, PLANAR* DIODE

FEATURES

- **GUARANTEED PERFORMANCE AFTER FAST NEUTRON DOSAGE OF 1.0 x 10^{15} NVT**
- **LOW CAPACITANCE - - - $<$ 2.0 pF**
- **HIGH SPEED - - - - - - $<$ 4.0 nSec**
- **LOW LEAKAGE - - - - - $<$ 0.10 μA**
- **HIGH VOLTAGE - - - - - $>$ 75 V**

PHYSICAL DIMENSIONS



JEDEC DO-7

ABSOLUTE MAXIMUM RATINGS (25°C)

WIV	Working Inverse Voltage	50 V
I_o	Average Rectified Current	75 mA
i_f	Recurrent Peak Forward Current	225 mA
i_f(surge)	Peak Forward Surge Current, Pulse Width of 1.0 μSec.	2.0 A
P	Power Dissipation (Note 1)	250 mW
T_J	Operating Junction Temperature	−65°C to 150°C
T_A	Ambient Storage Temperature	−65°C to 175°C

ELECTRICAL CHARACTERISTICS (25°C)

SYMBOL	CHARACTERISTIC	PRE IRRADIATION MIN.	PRE IRRADIATION MAX.	POST IRRADIATION* MIN.	POST IRRADIATION* MAX.	UNITS	TEST CONDITIONS
B_v	Breakdown Voltage	75		75		Volts	$I_R = 5\ \mu A$
I_{R1}	Reverse Current		0.10		0.15	μA	$V_R = 50$ V
I_{R2}	Reverse Current		100		150	μA	$V_R = 50$ V, T = 150°C
V_F	Forward Voltage		1.0		1.3	Volts	$I_F = 10$ mA
C	Capacitance		2.0		2.0	pF	$V_R = 0$ V, f = 1 MHz
T_{RR}	Reverse Recovery Time (Note 2)		4.0		4.0	ns	$I_F = I_R = 10$ mA

*IRRADIATION AT 1.0 x 10^{15} NVT, ENERGY LEVEL $>$ 10KeV.

NOTES:
(1) Derate at 2.0 mW/°C.
(2) $R_L = 100\ \Omega$, $C_L = 10$ pF, recover to $I_R = 1.0$ mA.
(3) Leads are Dumet, tin plated. Gold plate with nickel strike is also available.

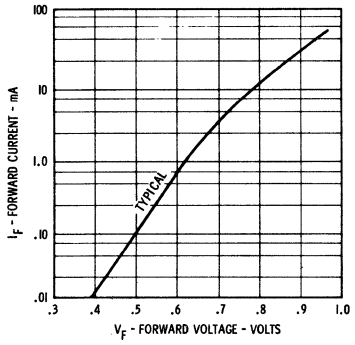
FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

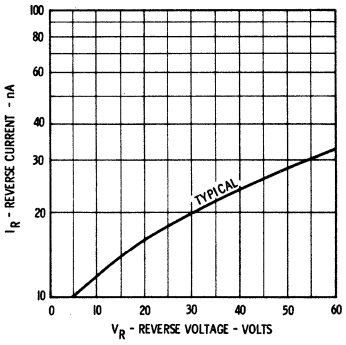
TYPICAL ELECTRICAL CHARACTERISTICS

PRE IRRADIATION

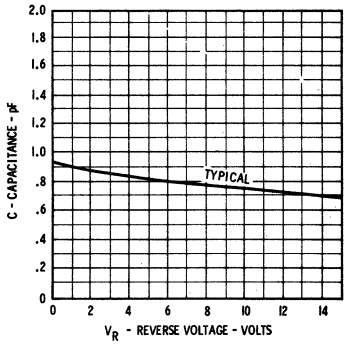
FORWARD VOLTAGE VERSUS FORWARD CURRENT



REVERSE CURRENT VERSUS REVERSE VOLTAGE

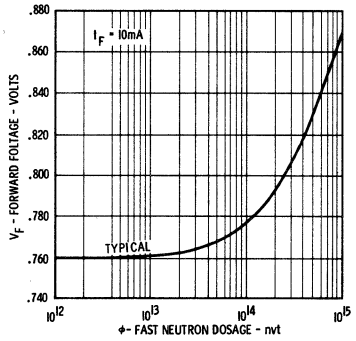


CAPACITANCE VERSUS REVERSE VOLTAGE

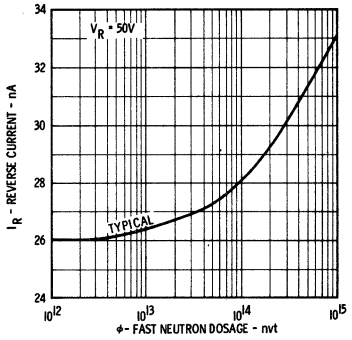


POST IRRADIATION

FORWARD VOLTAGE VERSUS FAST NEUTRON DOSAGE



REVERSE CURRENT VERSUS FAST NEUTRON DOSAGE



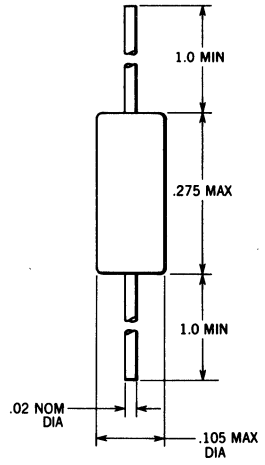
1N5428

RADIATION RESISTANT, HIGH VOLTAGE, FAST SWITCHING, PLANAR* DIODE

FEATURES

- **GUARANTEED PERFORMANCE AFTER FAST NEUTRON DOSAGE OF 3.0 x 10^{14} NVT**
- **HIGH VOLTAGE - - - - - - $>$ 200 V**
- **LOW LEAKAGE - - - - - - - $<$ 0.10 μA**
- **HIGH CONDUCTANCE - - - $>$ 100 mA**
- **LOW CAPACITANCE - - - - $<$ 5.0 pF**

PHYSICAL DIMENSIONS



JEDEC DO-7

ABSOLUTE MAXIMUM RATINGS (25°C)

WIV	Working Inverse Voltage	175 V
I_o	Average Rectified Current	100 mA
i_f	Recurrent Peak Forward Current	300 mA
i_f(surge)	Peak Forward Surge Current, Pulse Width of 1.0 μSec.	4.0 A
P	Power Dissipation (Note 1)	500 mW
T_J	Operating Junction Temperature	−65°C to 150°C
T_A	Ambient Storage Temperature	−65°C to 175°C

ELECTRICAL CHARACTERISTICS (25°C)

SYMBOL	CHARACTERISTIC	PRE IRRADIATION MIN.	PRE IRRADIATION MAX.	POST IRRADIATION* MIN.	POST IRRADIATION* MAX.	UNITS	TEST CONDITIONS
B_v	Breakdown Voltage	200		200		Volts	I_R = 100 μA
I_{R1}	Reverse Current		0.10		0.15	μA	V_R = 175V
I_{R2}	Reverse Current		100		150	μA	V_R = 175V, T = 150°C
V_F	Forward Voltage		1.0		1.3	Volts	I_F = 100 mA
C	Capacitance		5.0		5.0	pF	V_R = 0 V, f = 1 MHz
T_{RR}	Reverse Recovery Time (Note 2)		50		50	ns	$I_F = I_R$ = 30 mA

*IRRADIATION AT 3.0 x 10^{14} NVT, ENERGY LEVEL $>$ 10KeV.

NOTES:
(1) Derate at 4.0 mW/°C.
(2) R_L = 100 Ω, C_L = 10 pF, recover to I_R = 3.0 mA.
(3) Leads are Dumet, tin plated. Gold plate with nickel strike is also available.

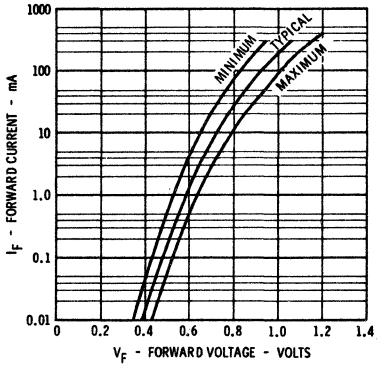
FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

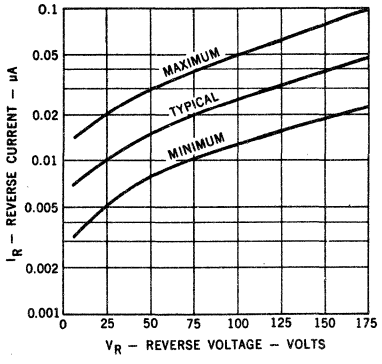
TYPICAL ELECTRICAL CHARACTERISTICS

PRE IRRADIATION

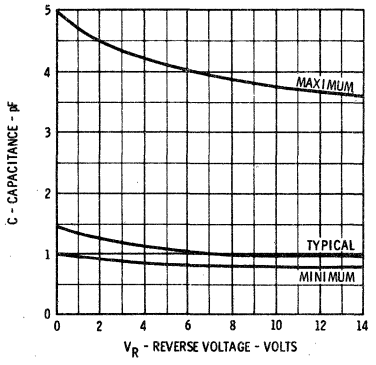
FORWARD VOLTAGE VERSUS FORWARD CURRENT



REVERSE VOLTAGE VERSUS REVERSE CURRENT

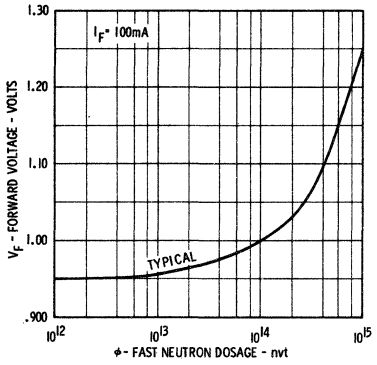


CAPACITANCE VERSUS REVERSE VOLTAGE

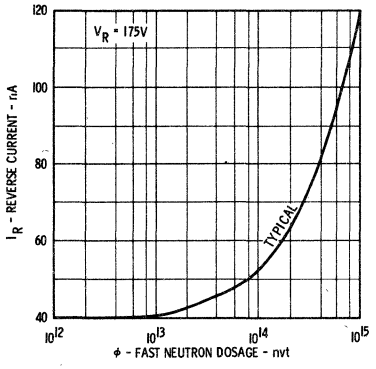


POST IRRADIATION

FORWARD VOLTAGE VERSUS FAST NEUTRON DOSAGE



REVERSE CURRENT VERSUS FAST NEUTRON DOSAGE



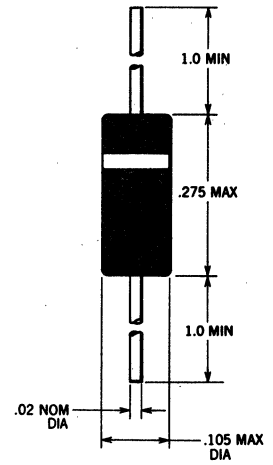
1N5429

RADIATION RESISTANT, LOW LEAKAGE, HIGH CONDUCTANCE, PLANAR* DIODE

FEATURES

- **GUARANTEED PERFORMANCE AFTER FAST NEUTRON DOSAGE OF 3.0 x 10^{14} NVT**
- **LOW LEAKAGE - - - - - - - $<$ 5.0 nA**
- **HIGH VOLTAGE - - - - - - $>$ 200 V**
- **LOW CAPACITANCE - - - - $<$ 6.0 pF**
- **HIGH CONDUCTANCE - - - $>$ 200 mA**

PHYSICAL DIMENSIONS



JEDEC DO-7

ABSOLUTE MAXIMUM RATINGS (25°C)

WIV	Working Inverse Voltage	125 V
I_O	Average Rectified Current	150 mA
i_f	Recurrent Peak Forward Current	450 mA
i_f(surge)	Peak Forward Surge Current, Pulse Width of 1.0 μsec.	4.0 A
P	Power Dissipation (Note 1)	500 mW
T_J	Operating Junction Temperature	−65°C to 150°C
T_A	Ambient Storage Temperature	−65°C to 175°C

ELECTRICAL CHARACTERISTICS (25°C)

SYMBOL	CHARACTERISTIC	PRE IRRADIATION MIN	PRE IRRADIATION MAX	POST IRRADIATION* MIN	POST IRRADIATION* MAX	UNITS	TEST CONDITIONS
B_v	Breakdown Voltage	200		200		Volts	I_R = 100 μA
I_{R1}	Reverse Current		5.0		50	nA	V_R = 125 V
I_{R2}	Reverse Current		3.0		50	μA	V_R = 125 V, T = 150°C
V_{F1}	Forward Voltage	.870	1.0	.870	1.50	Volts	I_F = 200 mA
V_{F2}	Forward Voltage	.800	.880	.800	1.10	Volts	I_F = 50 mA
V_{F3}	Forward Voltage	.580	.680	.470	.700	Volts	I_F = 1.0 mA
C	Capacitance		6.0		6.0	pF	V_R = 0 V, f = 1 MHz

*IRRADIATION AT 3.0 x 10^{14} NVT, ENERGY LEVEL $>$ 10KeV.

NOTES:
(1) Derate at 4.0 mW/°C.
(2) Leads are Dumet, tin plated. Gold plate with nickel strike is also available.

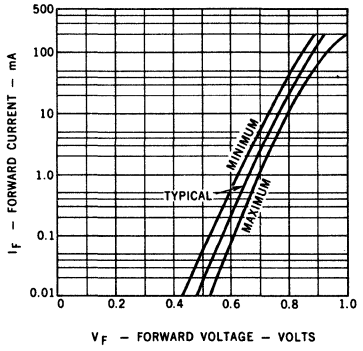
FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

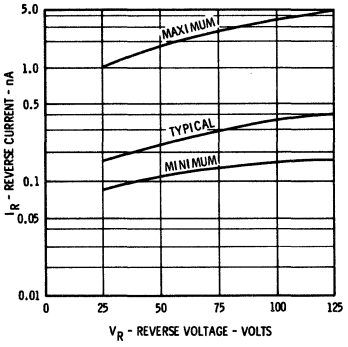
TYPICAL ELECTRICAL CHARACTERISTICS

PRE IRRADIATION

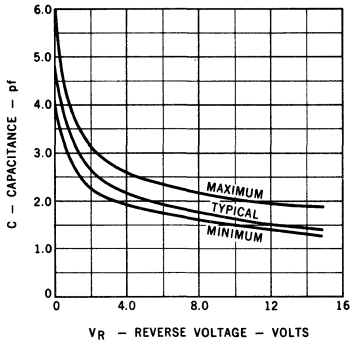
FORWARD VOLTAGE VERSUS FORWARD CURRENT



REVERSE VOLTAGE VERSUS REVERSE CURRENT

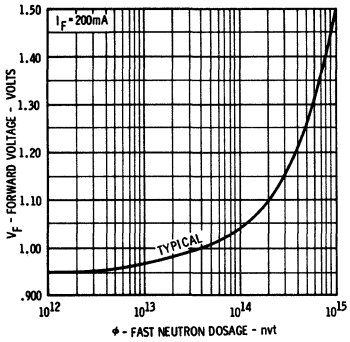


CAPACITANCE VERSUS REVERSE VOLTAGE

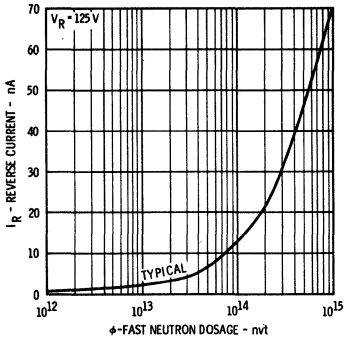


POST IRRADIATION

FORWARD VOLTAGE VERSUS FAST NEUTRON DOSAGE



REVERSE CURRENT VERSUS FAST NEUTRON DOSAGE



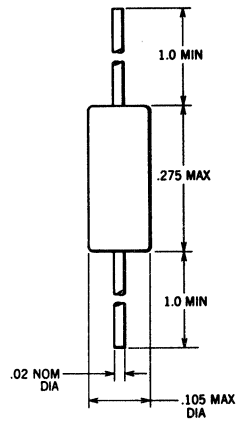
1N5430

RADIATION RESISTANT, HIGH CONDUCTANCE, ULTRA FAST, PLANAR* EPITAXIAL DIODE

FEATURES

- **GUARANTEED PERFORMANCE AFTER FAST NEUTRON DOSAGE OF 1.0 x 10^{15} NVT.**
- **HIGH CONDUCTANCE - - - > 200 mA**
- **LOW CAPACITANCE - - - - < 2.5 pF**
- **HIGH SPEED - - - - - - - - < 4.0 ns**
- **LOW LEAKAGE - - - - - - - < 0.10 μA**

PHYSICAL DIMENSIONS



JEDEC DO-7

ABSOLUTE MAXIMUM RATINGS (25°C)

WIV	Working Inverse Voltage	50 V
I_o	Average Rectified Current	200 mA
i_f	Recurrent Peak Forward Current	900 mA
i_f(surge)	Peak Forward Surge Current, Pulse Width of 1.0 μSec.	4.0 A
P	Power Dissipation (Note 1)	500 mW
T_J	Operating Junction Temperature	−65°C to 150°C
T_A	Ambient Storage Temperature	−65°C to 175°C

ELECTRICAL CHARACTERISTICS (25°C)

SYMBOL	CHARACTERISTIC	PRE IRRADIATION MIN.	PRE IRRADIATION MAX.	POST IRRADIATION* MIN.	POST IRRADIATION* MAX.	UNITS	TEST CONDITIONS
B_v	Breakdown Voltage	75		75		Volts	$I_R = 5$ μA
I_{R1}	Reverse Current		0.10		0.15	μA	$V_R = 50$ V
I_{R2}	Reverse Current		100		150	μA	$V_R = 50$ V, T = 150°C
V_{F1}	Forward Voltage	.870	1.0	.870	1.05	Volts	$I_F = 200$ mA
V_{F2}	Forward Voltage	.660	.740	.620	.760	Volts	$I_F = 10$ mA
V_{F3}	Forward Voltage	.540	.620	.500	.640	Volts	$I_F = 1.0$ mA
C	Capacitance		2.5		2.5	pF	$V_R = 0$ V, f = 1 MHz
T_{RR}	Reverse Recovery Time (Note 2)		4.0		4.0	ns	$I_F = I_R = 10$ mA

*IRRADIATION AT 1.0 x 10^{15} NVT, ENERGY LEVEL > 10 KeV.

NOTES:
(1) Derate at 4.0 mW/°C.
(2) $R_L = 100\ \Omega$, recover to $I_R = 1.0$ mA.
(3) Leads are Dumet, tin plated. Gold plate with nickel strike is also available.

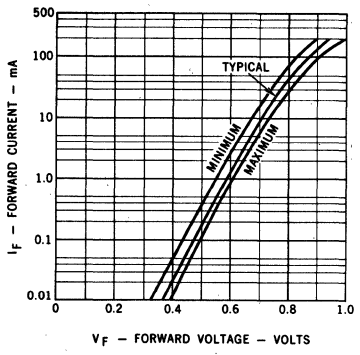
FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

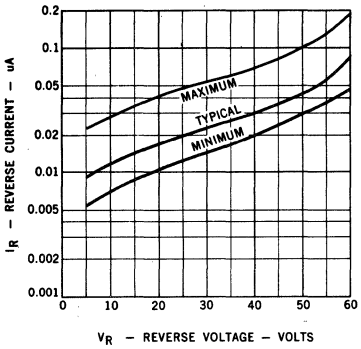
TYPICAL ELECTRICAL CHARACTERISTICS

PRE IRRADIATION

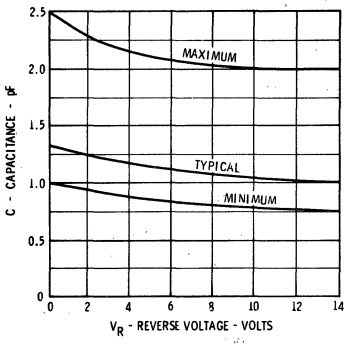
FORWARD VOLTAGE VERSUS FORWARD CURRENT



REVERSE VOLTAGE VERSUS REVERSE CURRENT

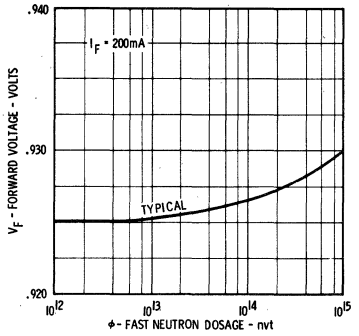


CAPACITANCE VERSUS REVERSE VOLTAGE

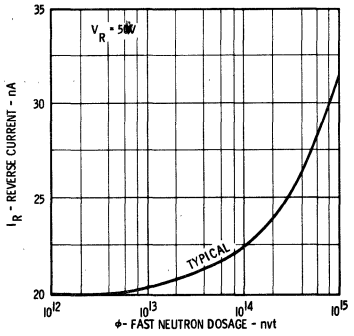


POST IRRADIATION

FORWARD VOLTAGE VERSUS FAST NEUTRON DOSAGE



REVERSE CURRENT VERSUS FAST NEUTRON DOSAGE



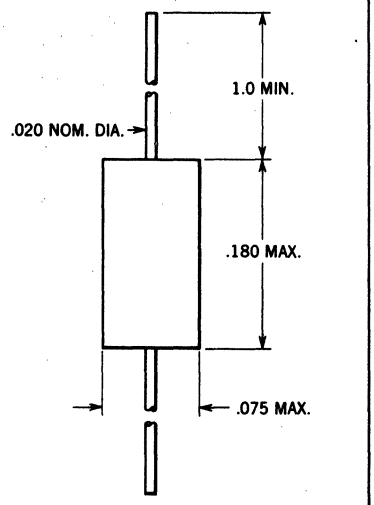
1N5431

RADIATION RESISTANT, MINIATURE SIZE, HIGH CONDUCTANCE, ULTRA FAST, PLANAR* EPITAXIAL DIODE

FEATURES

- **GUARANTEED PERFORMANCE AFTER FAST NEUTRON DOSAGE OF 1.0 x 10^{15} NVT.**
- **SMALL PACKAGE - - - - - - JEDEC DO-35**
- **HIGH CONDUCTANCE - - - > 500 mA**
- **LOW CAPACITANCE - - - - < 2.5 pF**
- **HIGH VOLTAGE - - - - - - > 80 V**
- **LOW LEAKAGE - - - - - - - < 0.10 μA**
- **HIGH SPEED - - - - - - - < 4.0 ns**

PHYSICAL DIMENSIONS



JEDEC DO-35

ABSOLUTE MAXIMUM RATINGS (25°C)

WIV	Working Inverse Voltage	55 V
I_o	Average Rectified Current	200 mA
i_f	Recurrent Peak Forward Current	600 mA
i_f(surge)	Peak Forward Surge Current, Pulse Width of 1.0 μSec.	4.0 A
P	Power Dissipation (Note 1)	500 mW
T_J	Operating Junction Temperature	−65°C to 150°C
T_A	Ambient Storage Temperature	−65°C to 175°C

ELECTRICAL CHARACTERISTICS (25°C)

SYMBOL	CHARACTERISTIC	PRE IRRADIATION MIN.	PRE IRRADIATION MAX.	POST IRRADIATION* MIN.	POST IRRADIATION* MAX.	UNITS	TEST CONDITIONS
B_v	Breakdown Voltage	80		80		Volts	$I_R = 5$ μA
I_{R1}	Reverse Current		0.10		0.15	μA	$V_R = 55$ V
I_{R2}	Reverse Current		100		150	μA	$V_R = 55$ V, T = 150°C
V_{F1}	Forward Voltage	1.05	1.30	1.05	1.35	Volts	$I_F = 500$ mA (Note 2)
V_{F2}	Forward Voltage	.800	.900	.800	.950	Volts	$I_F = 100$ mA
V_{F3}	Forward Voltage	.550	.600	.520	.630	Volts	$I_F = 1.0$ mA
V_{F4}	Forward Voltage	.450	.490	.420	.520	Volts	$I_F = 0.1$ mA
C	Capacitance		2.5		2.5	pF	$V_R = 0$ V, f = I MHz
T_{RR}	Reverse Recovery Time		4.0		4.0	ns	$I_F = I_R = 10$ mA (Note 3)

*IRRADIATION AT 1.0 x 10^{15} NVT, ENERGY LEVEL > 10 KeV.

NOTES:
(1) Derate at 4.0 mW/°C.
(2) Pulse width 300 μSec, duty cycle < 1%.
(3) $R_L = 100\ \Omega$, recover to $I_R = 1.0$ mA.
(4) Leads are Dumet, tin plated. Gold plate with nickel strike is also available.

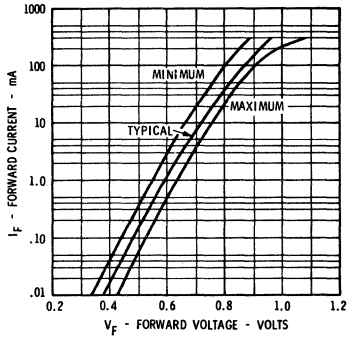
FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

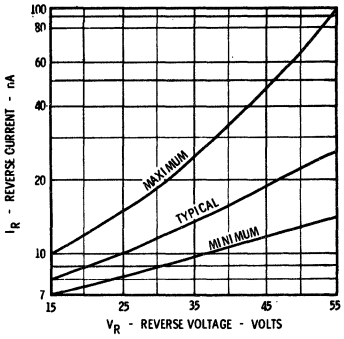
TYPICAL ELECTRICAL CHARACTERISTICS

PRE IRRADIATION

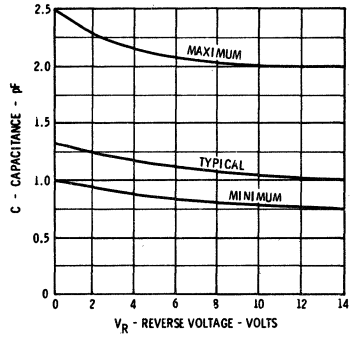
FORWARD VOLTAGE VERSUS FORWARD CURRENT



REVERSE CURRENT VERSUS REVERSE VOLTAGE

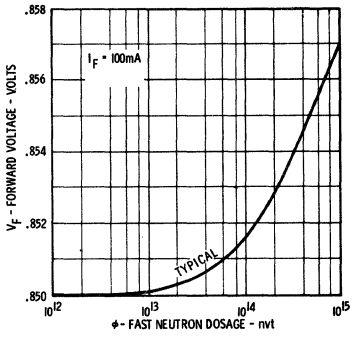


CAPACITANCE VERSUS REVERSE VOLTAGE

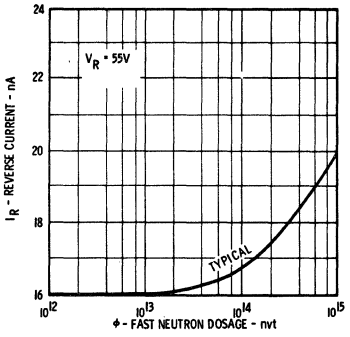


POST IRRADIATION

FORWARD VOLTAGE VERSUS FAST NEUTRON DOSAGE



REVERSE CURRENT VERSUS FAST NEUTRON DOSAGE



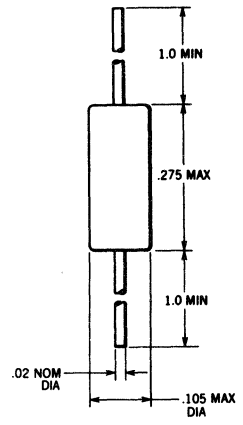
1N5432

RADIATION RESISTANT, PICOSECOND SWITCHING, PLANAR* EPITAXIAL DIODE

FEATURES

- **GUARANTEED PERFORMANCE AFTER FAST NEUTRON DOSAGE OF 1.0 x 10^{15} NVT.**
- **HIGH SPEED - - - - - - < 750 ps**
- **LOW CAPACITANCE - - - < 1.0 pF**
- **LOW LEAKAGE - - - - - < 50 nA**
- **CONTROLLED FORWARD CONDUCTANCE**

PHYSICAL DIMENSIONS



JEDEC DO-7

ABSOLUTE MAXIMUM RATINGS (25°C)

WIV	Working Inverse Voltage	10 V
I_o	Average Rectified Current	50 mA
i_f	Recurrent Peak Forward Current	150 mA
i_f(surge)	Peak Forward Surge Current, Pulse Width of 1.0 μSec.	1.0 A
P	Power Dissipation (Note 1)	250 mW
T_J	Operating Junction Temperature	−65°C to 150°C
T_A	Ambient Storage Temperature	−65°C to 175°C

ELECTRICAL CHARACTERISTICS (25°C)

SYMBOL	CHARACTERISTIC	PRE IRRADIATION MIN.	PRE IRRADIATION MAX.	POST IRRADIATION* MIN.	POST IRRADIATION* MAX.	UNITS	TEST CONDITIONS
B_v	Breakdown Voltage	20		20		Volts	$I_R = 5\ \mu A$
I_{R1}	Reverse Current		0.05		0.06	μA	$V_R = 10$ V
I_{R2}	Reverse Current		50		60	μA	$V_R = 10$ V, T = 150°C
V_{F1}	Forward Voltage	.910	1.30	.890	1.35	Volts	$I_F = 50$ mA
V_{F2}	Forward Voltage	.760	.930	.740	.950	Volts	$I_F = 10$ mA
V_{F3}	Forward Voltage	.530	.610	.510	.630	Volts	$I_F = 0.1$ mA
C	Capacitance		1.0		1.0	pF	$V_R = 0$ V, f = 1 MHz
T_{RR}	Reverse Recovery Time (Note 2)		750		750	ps	$I_F = I_R = 10$ mA (Figure 1)

*IRRADIATION AT 1.0 x 10^{15} NVT, ENERGY LEVEL > 10 KeV.

NOTES:
(1) Derate at 2.0 mW/°C.
(2) $R_L = 100\ \Omega$, recover to $I_R = 1.0$ mA. (See Figure 1 over.)
(3) Leads are Dumet, tin plated. Gold plate with nickel strike is also available.

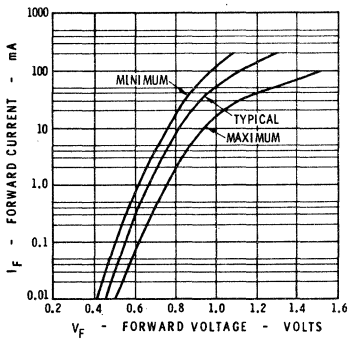
FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

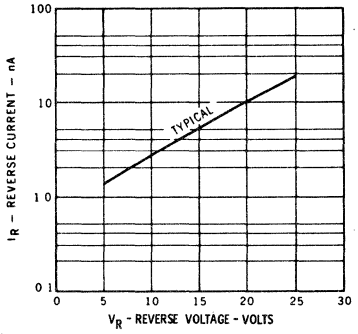
TYPICAL ELECTRICAL CHARACTERISTICS

PRE IRRADIATION

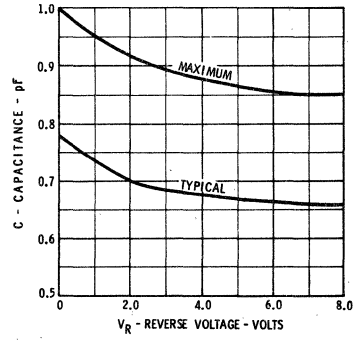
FORWARD CURRENT VERSUS FORWARD VOLTAGE



REVERSE VOLTAGE VERSUS REVERSE CURRENT

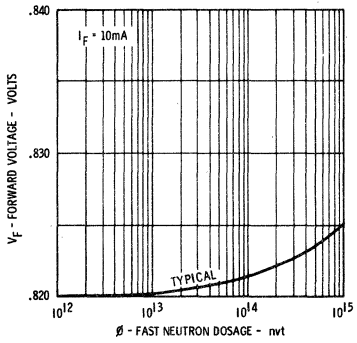


CAPACITANCE VERSUS REVERSE VOLTAGE

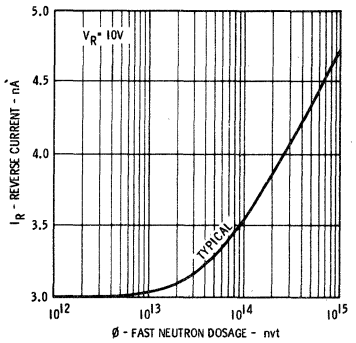


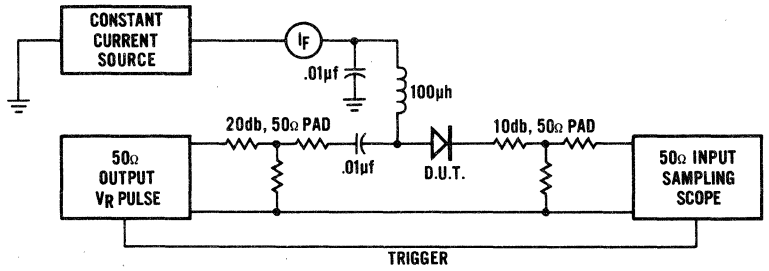
POST IRRADIATION

FORWARD VOLTAGE VERSUS FAST NEUTRON DOSAGE



REVERSE CURRENT VERSUS FAST NEUTRON DOSAGE





V_R PULSE RISETIME ≤0.25ns
DETECTOR RISETIME ≤0.1ns

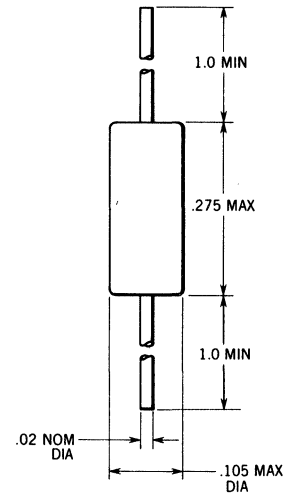
FIGURE 1

FD6385

HIGH CONDUCTANCE ULTRA FAST EPITAXIAL PLANAR* DIODE

GENERAL DESCRIPTION — The FD6385 is a silicon planar epitaxial diode that provides low capacitance, high conductance, economy, and fast reverse recovery. With these features, the device is ideally suited for applications such as core devices, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities.

PHYSICAL DIMENSIONS
(All dimensions in inches)



ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	25 V
I_O	Average rectified current	150 mA
i_f	Recurrent peak forward current	300 mA
i_f (surge)	Peak forward surge current, pulse width of 1.0 second	1 A
i_f (surge)	Peak forward surge current, pulse width of 1.0 μs	4 A
P	Power dissipation	400 mW
$1/\theta$	Power derating factor	3.2 mW/°C
T_A	Operating temperature	−65°C to +150°C
T_{stg}	Storage temperature, ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
V_F	Forward Voltage	.86	1.30	V	$I_F = 300$ mA
V_F	Forward Voltage	.83	1.20	V	$I_F = 200$ mA
V_F	Forward Voltage	.80	1.00	V	$I_F = 100$ mA
V_F	Forward Voltage	.65	.76	V	$I_F = 10$ mA
I_R	Reverse Current		100	nA	$V_R = -25$ V
BV	Breakdown Voltage	35		V	$I_R = 5\ \mu$A
t_{rr} (Note 2)	Reverse Recovery Time		6	ns	$I_F = 10$ mA, $I_R = 10$ mA, $R_L = 100\ \Omega$
C_o (Note 3)	Capacitance		5	pF	$V_R = 0$ V, f = 1 MHz

*Planar is a patented Fairchild process.

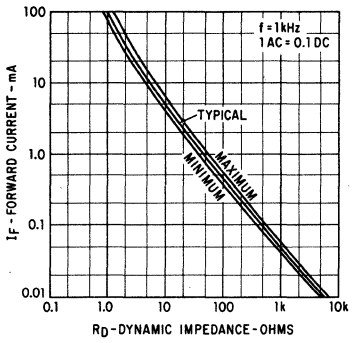
NOTES:
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Recovery to 0.1 I_F.
(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75A-S8 Capacitance Bridge or equivalent.
(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

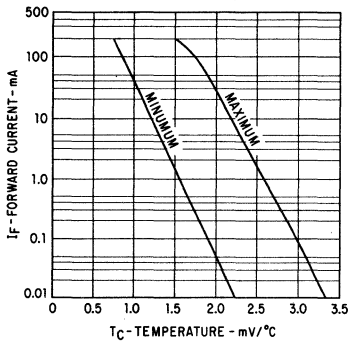
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

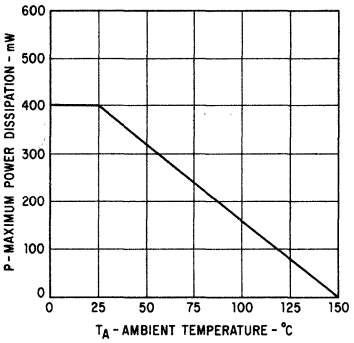
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



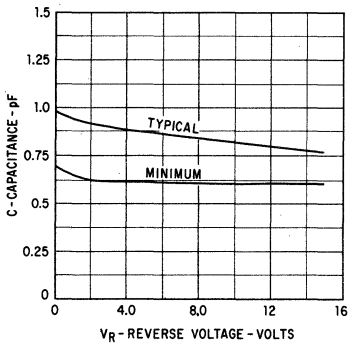
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



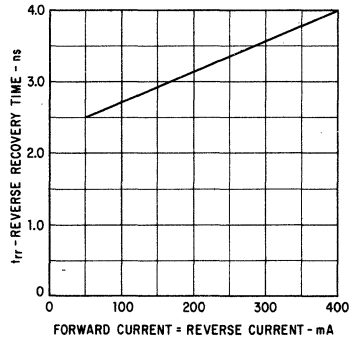
POWER DERATING CURVE



CAPACITANCE VERSUS REVERSE VOLTAGE



REVERSE RECOVERY TIME VERSUS FORWARD CURRENT ($I_F = I_R$)

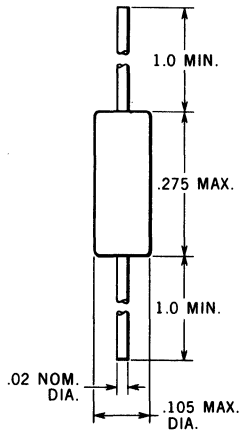


FD6666

HIGH CONDUCTANCE ULTRA FAST EPITAXIAL PLANAR* DIODE

The FD 6666 is a silicon planar epitaxial diode that provides low capacitance, high conductance, and fast reverse recovery. With these features, the device is ideally suited for applications such as core devices, avalanche circuitry, logarithmic amplifiers for pulse applications and for any critical circuit requiring high conductance and low internal power dissipation without sacrifice of speed capabilities.

PHYSICAL DIMENSIONS



NOTES: All dimensions in inches.
See note 4.
Weight: 0.25 gram.

ABSOLUTE MAXIMUM RATINGS (25°C) [Note 1]

WIV	Working Inverse Voltage	50 V
I_o	Average rectified current	200 mA
i_f	Recurrent peak forward current	600 mA
i_f(surge)	Peak forward surge current pulse width of 1 second	1 A
i_f(surge)	Peak forward surge current pulse width of 1 μs	4 A
P	Power dissipation	400 mW
$\frac{1}{\theta}$	Power derating factor	3.2 mW/°C
T_A	Operating temperature	-65°C to +150°C
T_{stg}	Storage temperature, ambient	-65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

Symbol	Characteristic	Min.	Max.	Units	Test Conditions
V_F	Forward Voltage	.86	1.10	V	I_F = 300 mA
V_F	Forward Voltage	.85	1.05	V	I_F = 250 mA
V_F	Forward Voltage	.83	1.00	V	I_F = 200 mA
V_F	Forward Voltage	.82	.94	V	I_F = 150 mA
V_F	Forward Voltage	.80	.90	V	I_F = 100 mA
V_F	Forward Voltage	.65	.75	V	I_F = 10 mA
I_R	Reverse Current		100	nA	V_R = -55 V
I_R (100°C)	Reverse Current		20	μA	V_R = -55 V
BV	Breakdown Voltage	75		V	I_R = 5 μA
t_{rr} (Note 2)	Reverse Recovery Time		5	ns	I_F = 10 mA I_R = 10 mA R_L = 100 Ω
C_o (Note 3)	Capacitance		5	pF	V_R = 0 V, f = 1 MHz

*Planar is a patented Fairchild process.

NOTES:

(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.

(2) Recovery to 0.1 I_R.

(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75-AS8 Capacitance Bridge or equivalent.

(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.

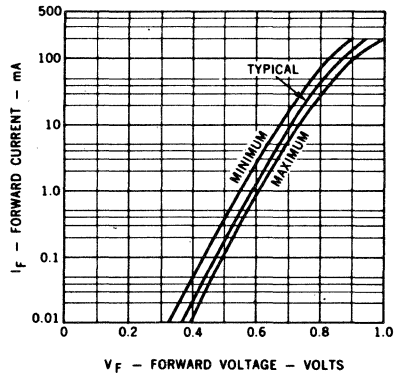
FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

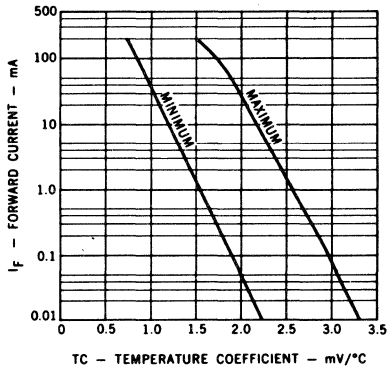
HIGH CONDUCTANCE ULTRA FAST EPITAXIAL PLANAR* DIODE

TYPICAL ELECTRICAL CHARACTERISTICS

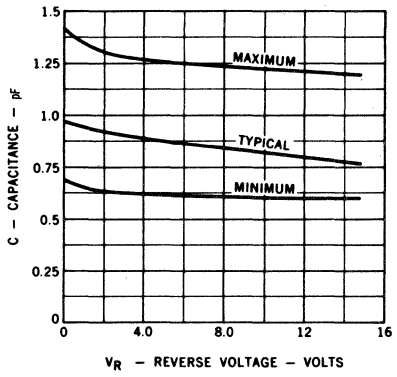
FORWARD VOLTAGE VERSUS FORWARD CURRENT



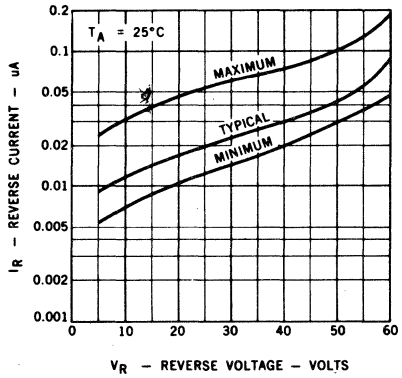
FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



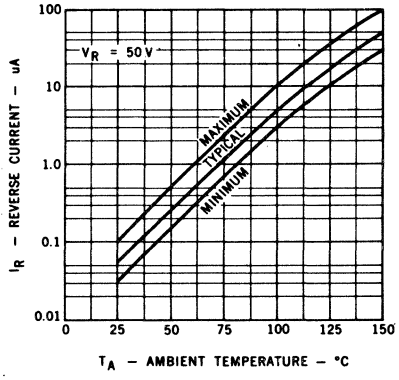
CAPACITANCE VERSUS REVERSE VOLTAGE



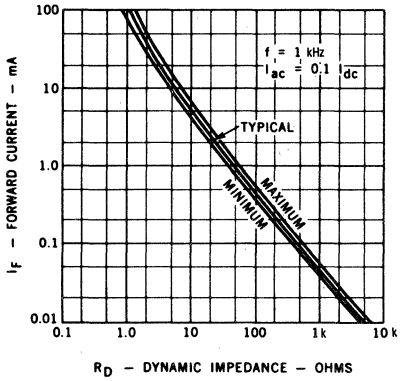
REVERSE CURRENT VERSUS REVERSE VOLTAGE



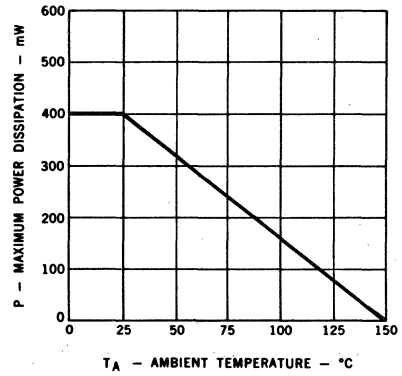
REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



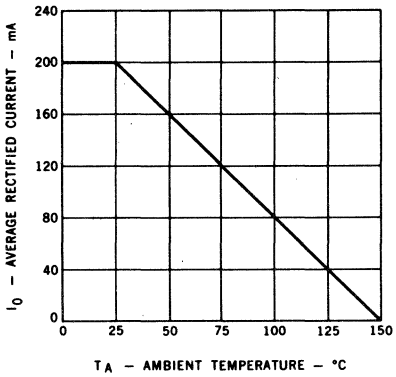
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



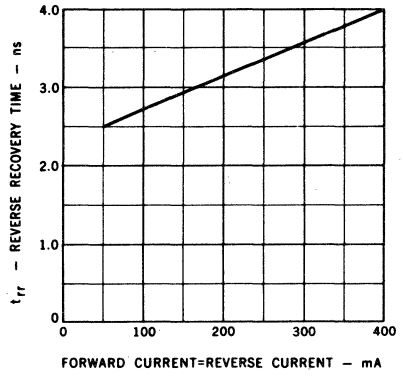
POWER DERATING CURVE



AVERAGE RECTIFIED CURRENT VERSUS AMBIENT TEMPERATURE



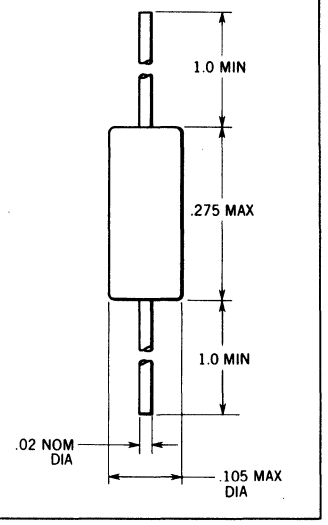
REVERSE RECOVERY TIME VERSUS FORWARD CURRENT ($I_F = I_R$)



FD7102
PICO-SECOND COMPUTER DIODE

GENERAL DESCRIPTION — The FD7102 is an economical silicon planar* epitaxial diode providing features necessary for ultra high speed logic circuitry; low capacitance, controlled forward conductance and guaranteed minimum and maximum voltage drops at +55°C and at 0°C. This device uses the planar process as developed by Fairchild to ensure the stability of surface-dependent characteristics against change with time. This factor, coupled with the most advanced manufacturing techniques from the planar wafer through assembly, guarantees the circuit designer of a continuing reliability in production quantities.

PHYSICAL DIMENSIONS
(All dimensions in inches)



ABSOLUTE MAXIMUM RATINGS (25°C) (Note 1)

WIV	Working Inverse Voltage	5 V
I_O	Average rectified current	50 mA
i_f	Recurrent peak forward current	150 mA
i_f(surge)	Peak forward surge current pulse width of 1 second	150 mA
P	Power dissipation	250 mW
P	Power derating factor	2 mW/°C
T_A	Operating temperature	−65°C to +150°C
T_{stg}	Storage temperature, ambient	−65°C to +175°C

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS
V_{F1}	Forward Voltage	.89	1.5	Vdc	$I_F = 50$ mA
V_{F2}	Forward Voltage	.81	1.3	Vdc	$I_F = 20$ mA
V_{F3}	Forward Voltage	.735	1.00	Vdc	$I_F = 10$ mA
V_{F4}	Forward Voltage	.575	.79	Vdc	$I_F = 1$ mA
V_{F5}	Forward Voltage	.475	.65	Vdc	$I_F = 0.1$ mA
V_{F6}	Forward Voltage	.350	.53	Vdc	$I_F = 0.01$ mA
BV	Breakdown Voltage	15		Vdc	$I_R = 5\ \mu A$
I_{R1}	Reverse Current		100	nA	$V_R = 8$ V
t_{rr}	Reverse Recovery Time		1.5	ns	See Note 5
C	Capacitance (Note 3)		1.5	pF	$V_R = 0$ V, f = 1.0 MHz

*Planar is a patented Fairchild process.

NOTES:

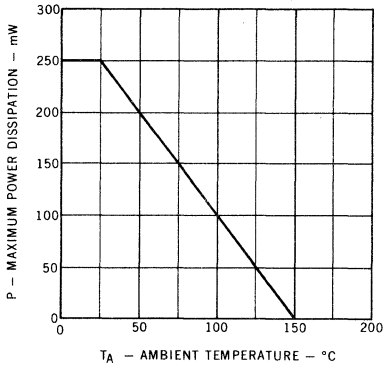
(1) The maximum ratings are limiting values above which life or satisfactory performance may be impaired.
(2) Measured as suggested by S. M. Krakauer, IRE Proceedings, Volume 60, July 1962, pp 1674-1675.
(3) Capacitance as measured on Boonton Electronic Corporation Model No. 75A-S8 Capacitance Bridge or equivalent.
(4) Leads are tinned. Gold plate with nickel strike may be obtained when specified.
(5) $I_F = I_R = 10$ mA, $R_L = 100$ ohms, recover to 1 mA
Pulse generator rise time ≤ 0.25 ns
Detector rise time ≤ 0.1 ns

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

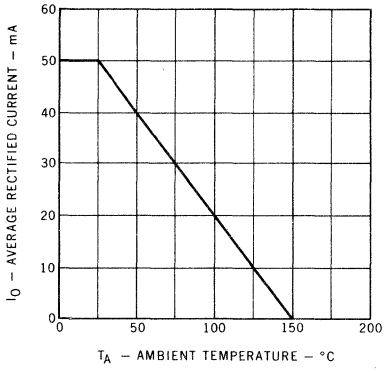
313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

TYPICAL ELECTRICAL CHARACTERISTICS

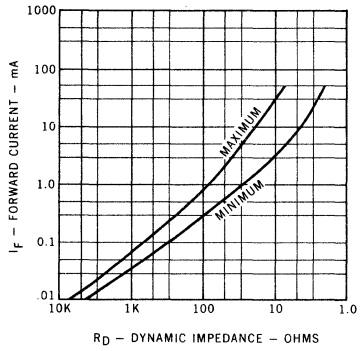
POWER DERATING CURVE



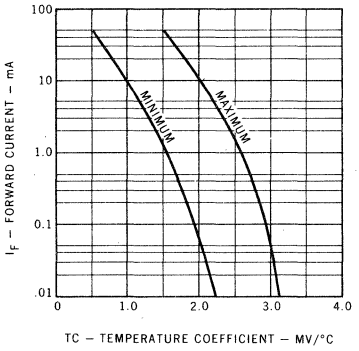
AVERAGE RECTIFIED CURRENT VERSUS AMBIENT TEMPERATURE



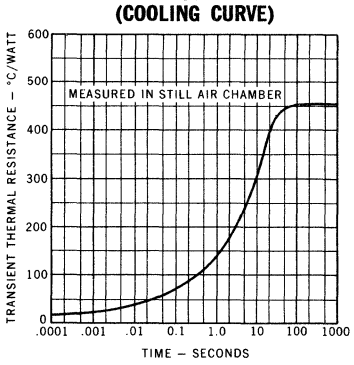
DYNAMIC IMPEDANCE VERSUS FORWARD CURRENT



FORWARD CURRENT VERSUS TEMPERATURE COEFFICIENT



JUNCTION TEMPERATURE VERSUS TIME (COOLING CURVE)



TRANSIENT THERMAL RESISTANCE VERSUS TIME