Package Diagrams

Index of Package Diagrams

20-Pin SOIC Package

Dimensions in Inches   MIN. / MAX.
(Dimensions in millimeters, shown in parentheses, are for reference only)
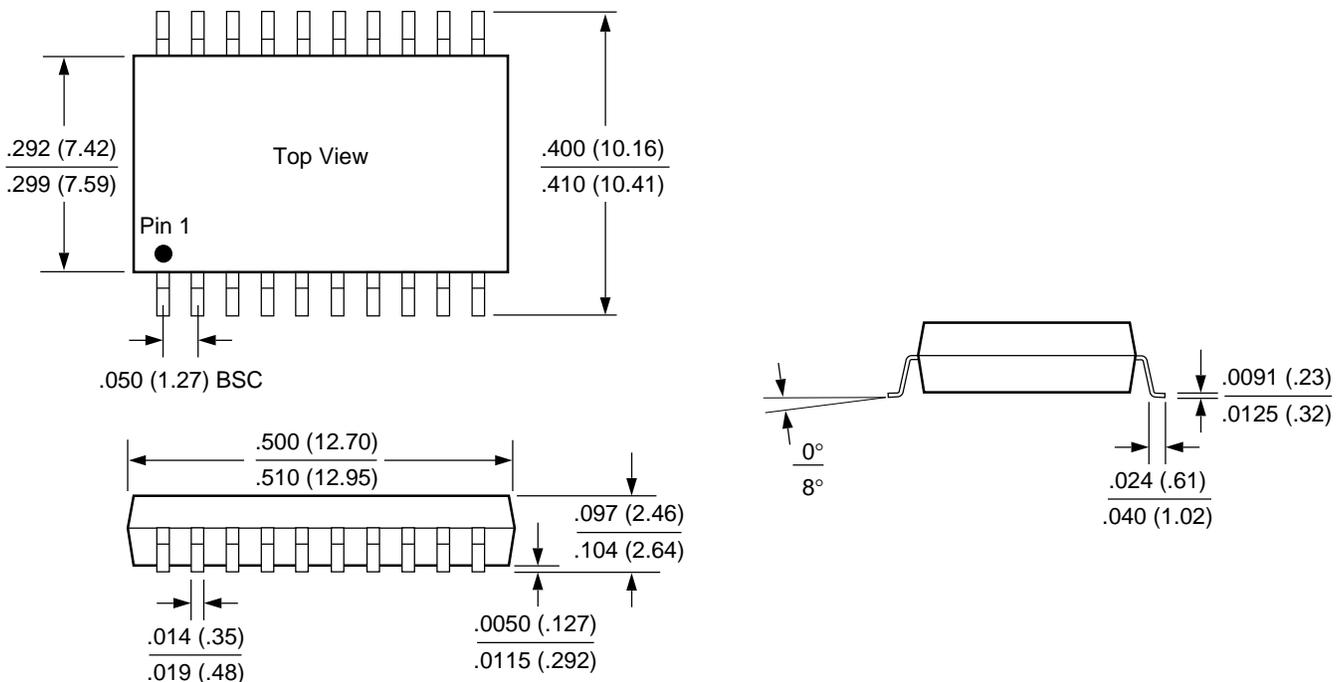
# *Package Diagrams*

20-Pin PLCC Package

Dimensions in Inches   MIN. / MAX.
(Dimensions in millimeters, shown in parentheses, are for reference only)

.042 / .048 x 45°
(1.07 / 1.22 x 45°)

Pin 1

Top View

.385 / .395
(9.78 / 10.03)

.350 / .356
(8.89 / 9.04)

.350 / .356
(8.89 / 9.04)

.385 / .395
(9.78 / 10.03)

.042 / .056
(1.07 / 1.42)

.009 / .015
(.23 / .38)

.042 / .048 x 45°
(1.07 / 1.22 x 45°)

.013 / .021
(.33 / .53)

.026 / .032
(.66 / .81)

.046 / .054
(1.17 / 1.37)

.290 / .330
(7.37 / 8.38)

.020 (.51) MIN

.090 / .120
(2.29 / 3.05)

.165 / .180
(4.19 / 4.57)

20-Pin Plastic DIP

Dimensions in Inches   MIN. / MAX.
(Dimensions in millimeters, shown in parentheses, are for reference only)

Pin 1

.240 / .270
(6.10 / 6.86)

1.015 / 1.043
(25.76 / 26.49)

.180 (4.57) MAX

.015 (.38) MIN

.120 / .140
(3.05 / 3.56)

.050 /.065
(1.27 / 1.65)

.015 /.022
(.38 / .56)

.100 (2.54) BSC

.290 / .325
(7.37 / 8.26)

.008 / .014
(.20 / .36)

0-15°

20-Pin LCC

Dimensions in Inches   MIN. / MAX.
(Dimensions in millimeters, shown in parentheses, are for reference only)

.030 / .050 x 45° (±10°)
(.76 / 1.27 x 45° (±10°))

.005 / .030 x 45° (± 10°)
(.13 / .76 x 45° (±10°))

Pin 1

.050 (1.27) TYP.

Bottom View

.075 (1.90) TYP.

.022 / .028
(.56 / .71)

.045 / .055
(1.14 / 1.40)

.342 / .358
(8.69 / 9.09)

Top View

.342 / .358
(8.69 / 9.09)

.060 / .100
(1.52 / 2.54)

.050 / .088
(1.27 / 2.24)

20-Pin (300-Mil) CERDIP

Dimensions in Inches   MIN. / MAX.
(Dimensions in millimeters, shown in parentheses, are for reference only)

Pin 1

.260 / .310
(6.60 / 7.87)

.290 / .320
(7.37 / 8.13)

.005 (.13) MIN

.930 / 1.060
(23.62 / 26.92)

.200
(5.08)
MAX.

.020 (.51) MIN

.125 / .200
(3.17 / 5.08)

.150 (3.81) MIN

.045 / .065
(1.14 / 1.65)

.014 / .023
(.36 / .58)

.008 / .015
(.20 / .38)

0-15°

.080 (2.03) MAX

.090 / .110
(2.29 / 2.79)
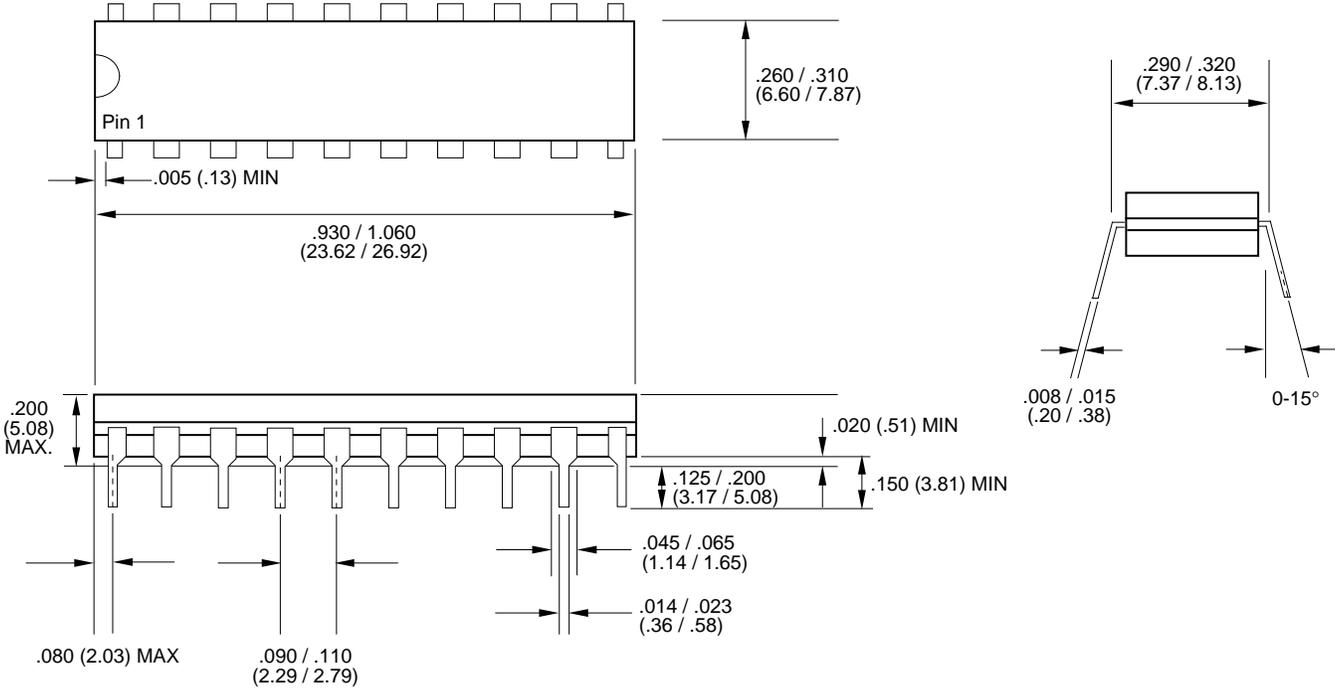
Package Diagrams

24-Pin Plastic DIP

Dimensions in Inches   MIN. / MAX.
(Dimensions in millimeters, shown in parentheses, are for reference only)

Pin 1

.250 /.270
(6.35 / 6.86)

.290 / .325
(7.37 / 8.26)

.008 / .014
(.20 / .31)

0-15°

1.245 / 1.265
(31.60 / 32.11)

.180 (4.57) MAX

.015 (.38) MIN

.120 / .140
(3.05 / 3.56)

.050 /.065
(1.27 / 1.65)

.015 /.022
(.38 / .56)

.100 (2.54) BSC

24-Pin (300-Mil) CERDIP

Dimensions in Inches   MIN. / MAX.
(Dimensions in millimeters, shown in parentheses, are for reference only)

Pin 1

.220 / .310
(5.59 / 7.87)

.290 / .320
(7.37 / 8.13)

.008 / .015
(.20 / .38)

0-15°

.005 (.13) MIN

1.230 / 1.280
(31.24 / 32.51)

.200
(5.08)
MAX.

.015 / .070
(.38 / 1.78)

.125 / .200
(3.17 / 5.08)

.150 (3.81) MIN

.045 / .065
(1.14 / 1.65)

.014 / .023
(.36 / .58)

.098 (2.49) MAX

.090 / .110
(2.29 / 2.79)
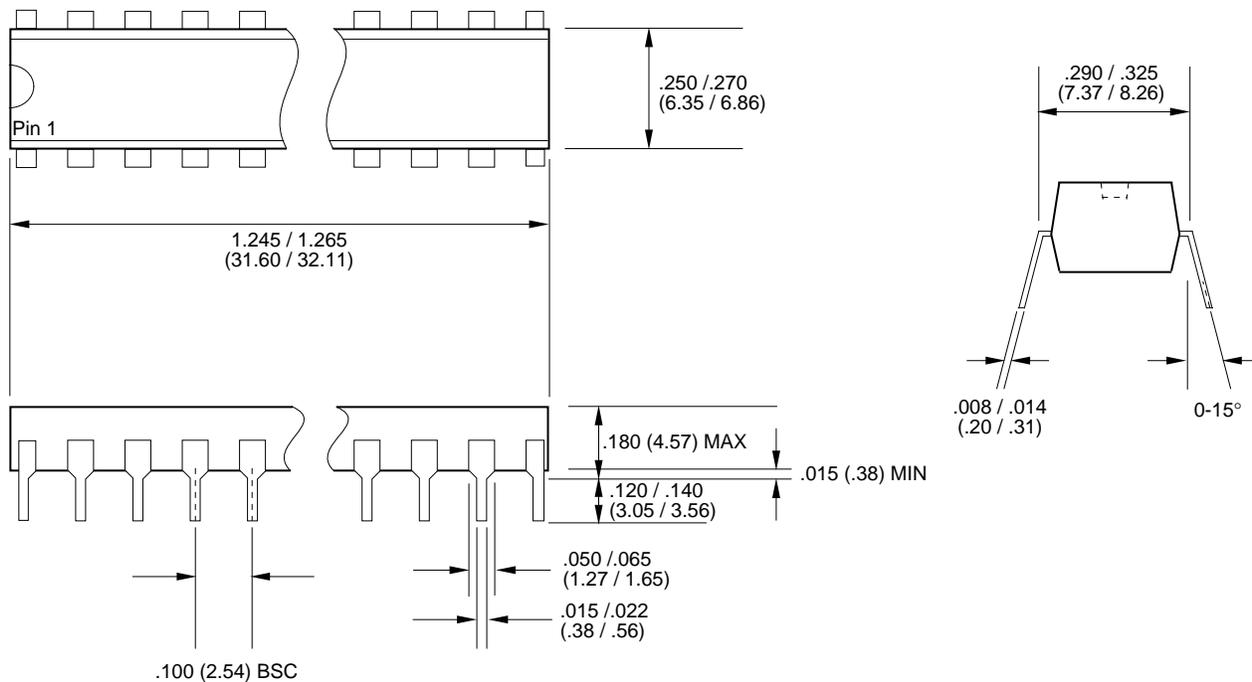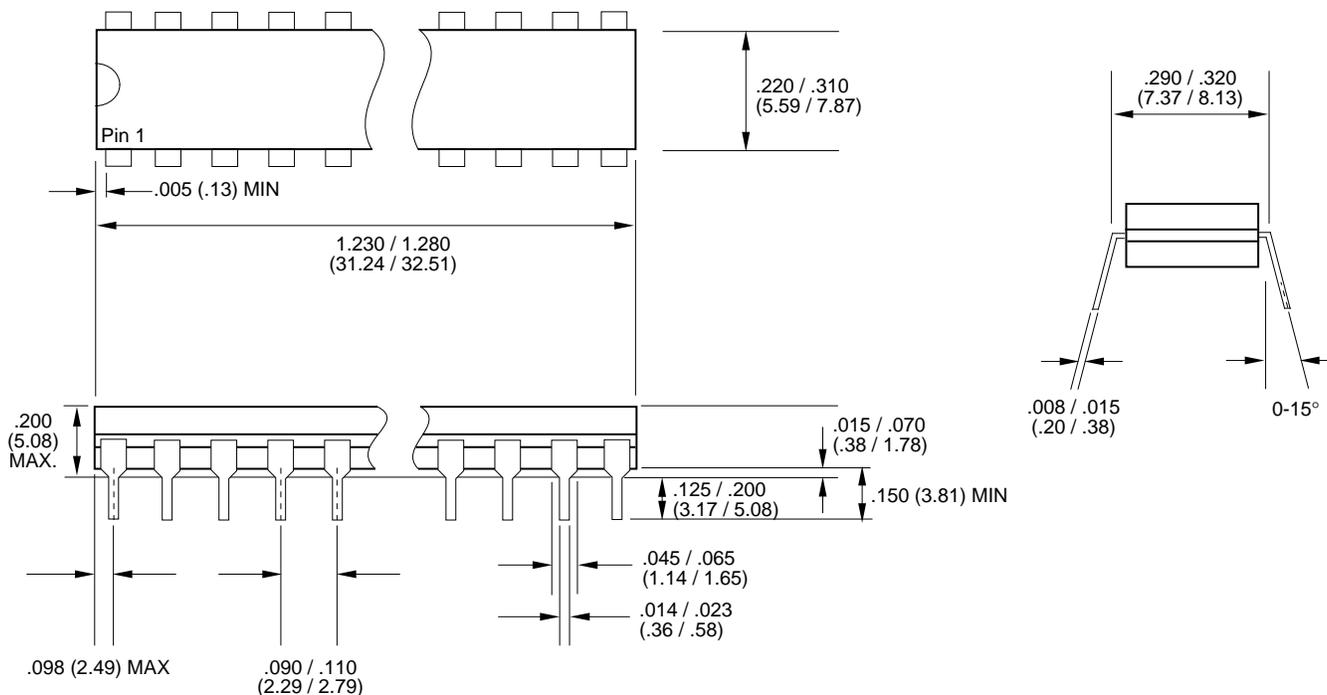
28-Pin SSOP

Dimensions in Millimeters   MIN. / MAX.
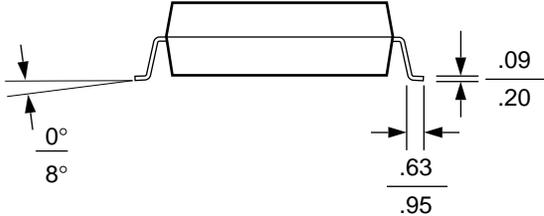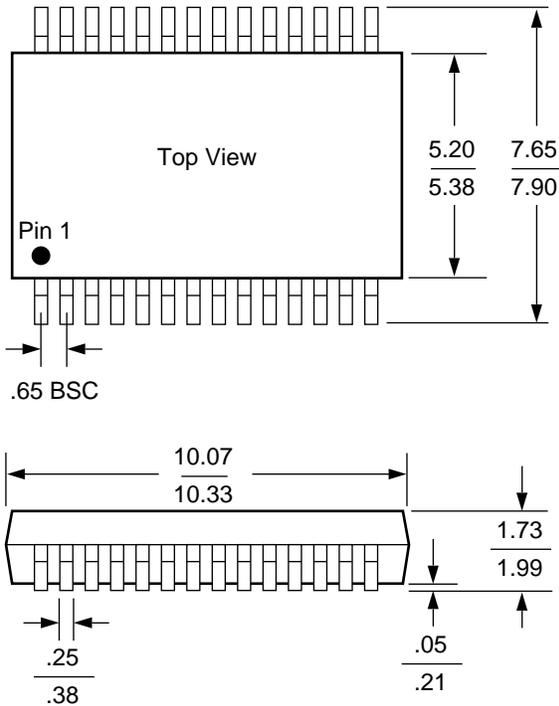
Top View

Pin 1

$\frac{5.20}{5.38}$ $\frac{7.65}{7.90}$

.65 BSC

$\frac{10.07}{10.33}$

$\frac{1.73}{1.99}$

$\frac{.25}{.38}$

$\frac{.05}{.21}$

0°
8°

$\frac{.63}{.95}$

$\frac{.09}{.20}$

28-Pin PLCC Package

Dimensions in Inches   MIN. / MAX.
(Dimensions in millimeters, shown in parentheses, are for reference only)

.042 / .048 x 45°
(1.07 / 1.22 x 45°)

Pin 1

Top View

.485 / .495
(12.32 / 12.57)

.450 / .456
(11.43 / 11.58)

.450 / .456
(11.43 / 11.58)

.485 / .495
(12.32 / 12.57)

.042 / .056
(1.07 / 1.42)

.009 / .015
(.23 / .38)

.042 / .048 x 45°
(1.07 / 1.22 x 45°)

.013 / .021
(.33 / .53)

.026 / .032
(.66 / .81)

.390 / .430
(9.91 / 10.92)

.046 / .054
(1.17 / 1.37)

.020 (.51) MIN

.090 / 1.20
(2.29 / 30.48)

.165 / .180
(4.19 / 4.57)
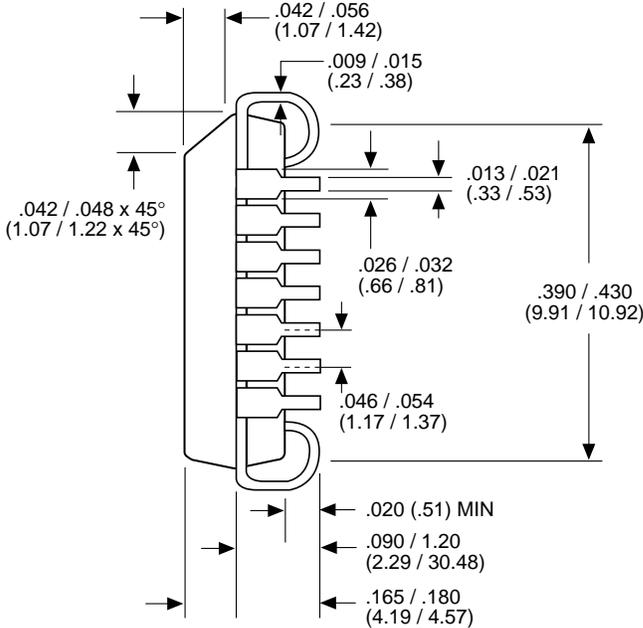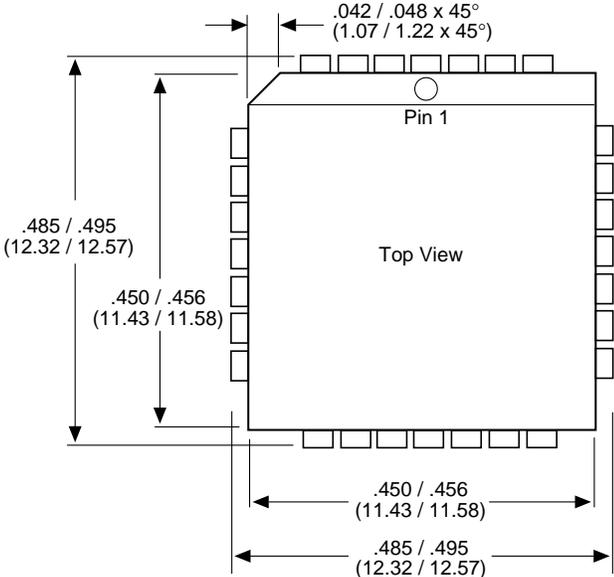
Package Diagrams

28-Pin Plastic DIP

Dimensions in Inches   MIN. / MAX.
(Dimensions in millimeters, shown in parentheses, are for reference only)

Pin 1

.280 /.300
(7.11 / 7.61)

.300 / .325
(7.61 / 8.25)

1.360 / 1.39
(34.54 / 35.31)

.008 / .012
(.20 / .31)

0-15°

.180 (4.57) MAX   .020 (.51) MIN

.125 / .135
(3.17 / 3.43)

.045 /.055
(1.14 / 1.40)

.015 /.021
(.38 / .53)

.100 (2.54) BSC

28-Pin LCC

Dimensions in Inches   MIN. / MAX.
(Dimensions in millimeters, shown in parentheses, are for reference only)

.035 / .045 x 45° (± 0.5°)
(.89 / 1.14 x 45° (± 0.5°))

.015 / .025 X 45° (±0.5°)
(.38 / .64 X 45° (±0.5°))

Pin 1 — .077 / .093
(1.96 / 2.36)

.442 / .460
(11.23 / 11.68)

.060 / .100
(1.52 / 2.54)

.050
(1.27)
TYP.

Bottom View

.022 / .028
(.56 / .71)

Top View

.442 / .460
(11.23 / 11.68)

.075
(1.90)
TYP.

.045 / .055
(1.14 / 1.40)

.050 / .065
(1.27 / 1.65)

44-Pin PLCC Package

Dimensions in Inches   MIN. / MAX.
(Dimensions in millimeters, shown in parentheses, are for reference only)

$\frac{0.042 (1.07)}{0.048 (1.22)}$ x 45°

0.050
(1.27)
BSC

Pin 1

Top View

$\frac{0.650 (16.51)}{0.656 (16.66)}$

$\frac{0.685 (17.40)}{0.695 (17.65)}$

0.020
(.51)
Minimum

$\frac{0.590 (14.99)}{0.630 (16.00)}$

$\frac{0.090 (2.29)}{0.120 (3.05)}$

$\frac{0.165 (4.19)}{0.180 (4.57)}$

Seating Plane
Coplanarity not
to exceed 0.004 (.102)
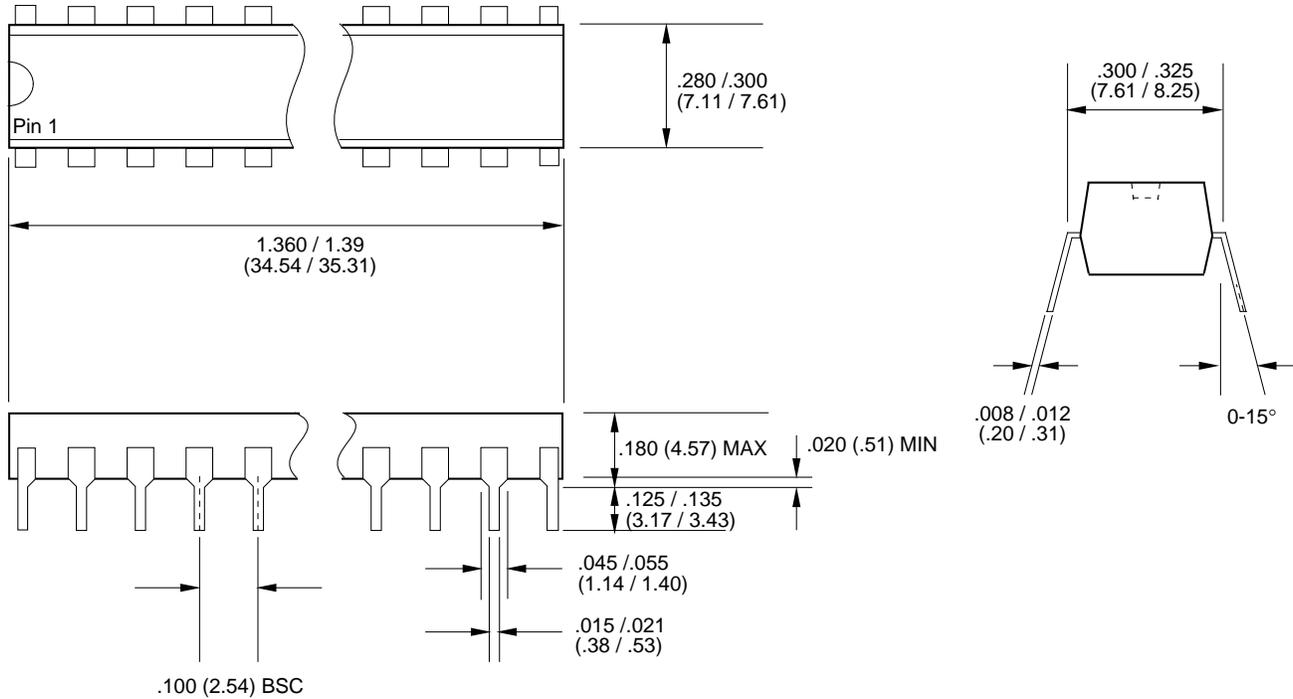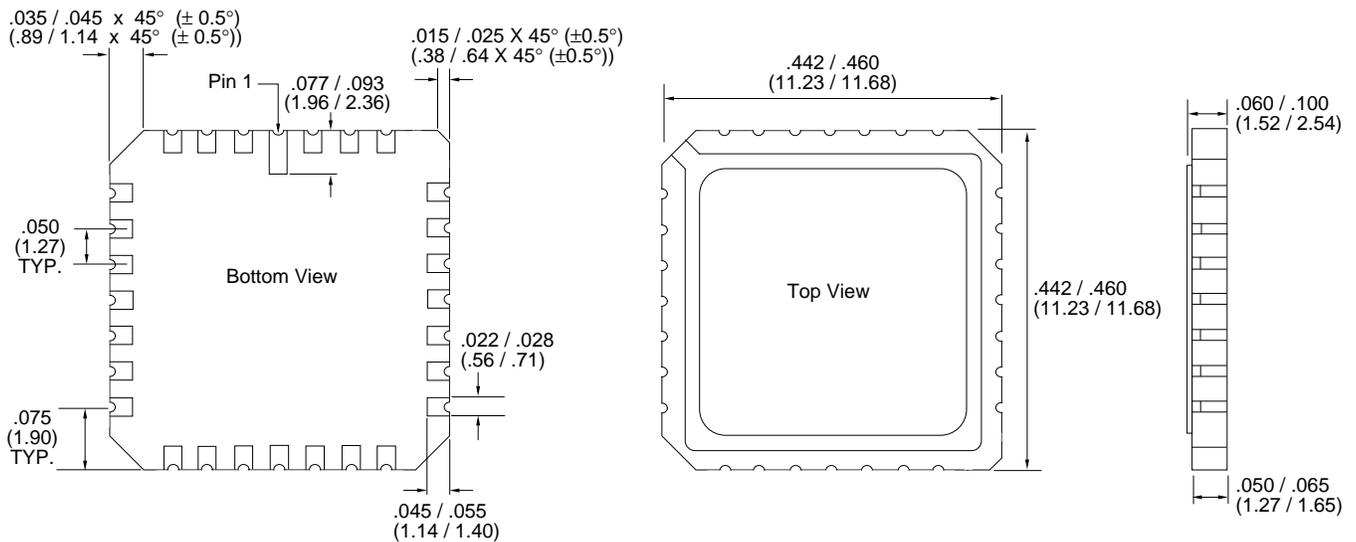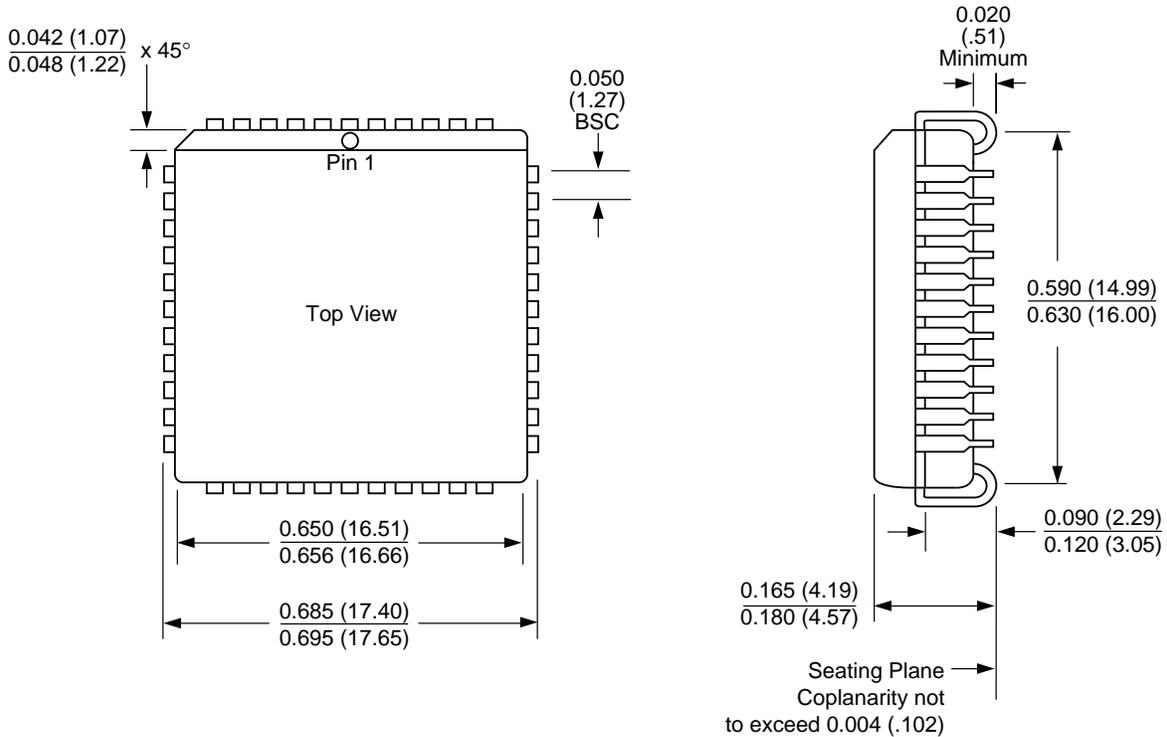
44-Pin TQFP Package (T44)

Dimensions in Millimeters   MIN. / MAX.

0.80 BSC

Pin 1

Top View

10.00 BSC

12.00 BSC

Detail A

$\frac{0.22}{0.45}$

Coplanarity not to
exceed 0.102

0°
7°

$\frac{0.45}{0.75}$

$\frac{0.05}{0.15}$

$\frac{1.35}{1.45}$

Detail A

Package Diagrams

44-Pin TQFP Package (T)

Dimensions in Millimeters   MIN. / MAX.

0.80 BSC

Detail A

Pin 1

Top View

10.00 BSC

12.00 BSC

0° / 7°

$\frac{0.45}{0.75}$

$\frac{0.05}{0.15}$

$\frac{0.30}{0.45}$

$\frac{0.95}{1.12}$

Coplanarity not to
exceed 0.102

Detail A

44-Pin JLCC Package

Dimensions in Inches   MIN. / MAX.
(Dimensions in millimeters, shown in parentheses, are for reference only)

$\frac{0.620\ (15.75)}{0.660\ (16.76)}$ SQ.

0.500 (12.70) BSC

0.050 (1.27) BSC

Pin 1

6

40

7

39

Top View

17

29

18

28

0.065
(1.65)
REF.

0.125 (3.17) NOM.

R- 0.030 (.76) NOM.

$\frac{0.022\ (.56)}{0.035\ (.89)}$

$\boxed{0.011\ (.28)\ \text{M}}$

0.630 (16.00) BSC

$\frac{0.013\ (.33)}{0.023\ (.58)}$

$\frac{0.675\ (17.15)}{0.700\ (17.78)}$

Seating Plane
Coplanarity not
to exceed 0.004 (.102)

48-Pin TQFP Package

Dimensions in Millimeters   MIN. / MAX.

Pin 1

Top View

0.50 BSC

7.00 BSC

9.00 BSC

Detail A

$\dfrac{0.17}{0.27}$

Coplanarity not to exceed 0.102

0°
7°

$\dfrac{0.45}{0.75}$

$\dfrac{0.05}{0.15}$

$\dfrac{1.35}{1.45}$

Detail A

68-Pin PLCC Package

Dimensions in Inches   MIN. / MAX.
(Dimensions in millimeters, shown in parentheses, are for reference only)

$\dfrac{0.042\ (1.07)}{0.048\ (1.22)}$ x 45°

Pin 1

Top View

0.050 (1.27)
BSC

$\dfrac{0.950\ (24.13)}{0.956\ (24.28)}$

$\dfrac{0.985\ (25.02)}{0.995\ (25.27)}$

0.020 (.51)
Minimum

$\dfrac{0.890\ (22.61)}{0.930\ (23.62)}$

$\dfrac{0.090\ (2.29)}{0.120\ (3.05)}$

$\dfrac{0.165\ (4.19)}{0.180\ (4.57)}$

Seating Plane
Coplanarity not
to exceed 0.004 (.102)

Package Diagrams

68-Pin JLCC Package

Dimensions in Inches   MIN. / MAX.

(Dimensions in millimeters, shown in parentheses, are for reference only)

$\frac{0.920\ (23.37)}{0.960\ (24.38)}$ SQ.

0.800 (20.32) BSC

0.050 (1.27) BSC

Pin 1

9   61

10   60

Top View

26   44

27   43

0.125 (3.17) NOM.

0.065 (1.65) REF.

R- 0.030 (.76) NOM.

0.011 (.28) Ⓜ

$\frac{0.013\ (.33)}{0.023\ (.58)}$

0.930 (23.62) BSC

$\frac{0.975\ (24.77)}{1.000\ (25.40)}$

$\frac{0.022\ (.59)}{0.035\ (.89)}$

Seating Plane
Coplanarity not
to exceed 0.004 (.102)

84-Pin PLCC Package

Dimensions in Inches   MIN. / MAX.

(Dimensions in millimeters, shown in parentheses, are for reference only)

$\frac{0.042\ (1.07)}{0.048\ (1.22)}$ x 45°

0.050 (1.27) BSC

Top View

0.020 (.51) Minimum

1.090 (27.69)
1.130 (28.70)

0.090 (2.29)
0.120 (3.05)

1.150 (29.21)
1.156 (29.36)
1.185 (30.10)
1.195 (30.35)

$\frac{0.165\ (4.19)}{0.180\ (4.57)}$

Seating Plane
coplanarity not
to exceed 0.004 (.102)

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_

Package Diagrams

84-Pin CPGA Package

Dimensions in Inches   MIN. / MAX.
(Dimensions in millimeters, shown in parentheses, are for reference only)

PIN 1 INDEX

$\frac{1.088 \ (27.64)}{1.180 \ (29.97)}$ SQ

Top View

$\frac{0.070 \ (1.78)}{0.145 \ (3.68)}$

$\frac{0.160 \ (4.06)}{0.200 \ (5.08)}$

$\frac{0.016 \ (.41)}{0.020 \ (.51)}$ DIA.

0.050 (1.27)
DIA 4 PL.

$\frac{0.040 \ (1.02)}{0.060 \ (1.52)}$ 4PL

0.080 (2.03) MAX. DIAMETER

INDEX PIN

11 10 9 8 7 6 5 4 3 2 1

A B C D E F G H J K L

0.100 (2.54) TYP.

1.000 (25.40) BSC

100-Pin TQFP Package

Dimensions in Millimeters   MIN. / MAX.

0.50 BSC

Pin 1

Top View

14.00 BSC

16.00 BSC

Detail A

$\frac{0.17}{0.27}$

Coplanarity not to exceed 0.102

$\frac{0°}{7°}$

$\frac{0.45}{0.75}$

$\frac{0.05}{0.15}$

$\frac{1.35}{1.45}$

Detail A

Package Diagrams

120-Pin PQFP Package
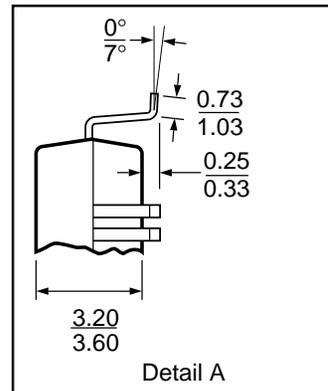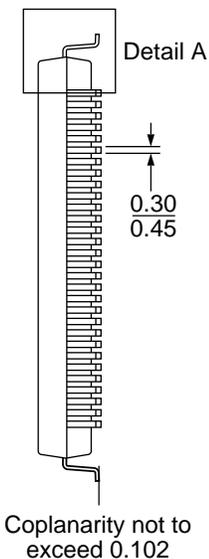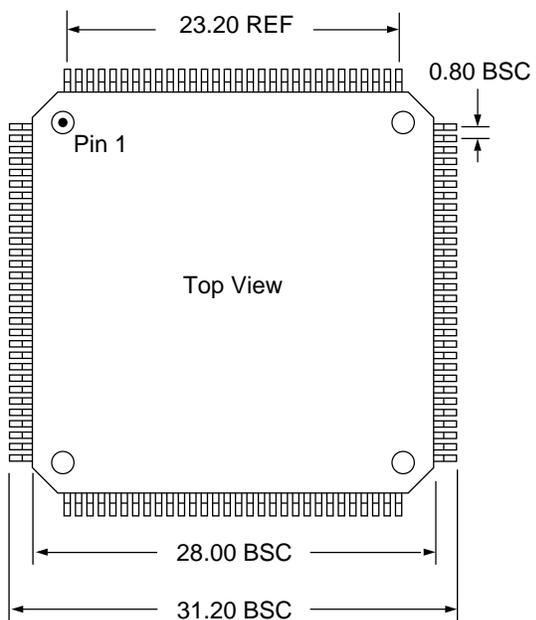
Dimensions in Millimeters   MIN. / MAX.

23.20 REF

0.80 BSC

Pin 1

Top View

28.00 BSC

31.20 BSC

Detail A

$\dfrac{0.30}{0.45}$

Coplanarity not to
exceed 0.102

$0°$
$7°$

$\dfrac{0.73}{1.03}$

$\dfrac{0.25}{0.33}$

$\dfrac{3.20}{3.60}$

Detail A

128-Pin PQFP Package

Dimensions in Millimeters   MIN. / MAX.

24.80 REF

0.80 BSC

Pin 1

Top View

28.00 BSC

31.20 BSC

Detail A

$\dfrac{0.30}{0.45}$

Coplanarity not to
exceed 0.102

$0°$
$7°$

$\dfrac{0.73}{1.03}$

$\dfrac{0.25}{0.33}$

$\dfrac{3.20}{3.60}$

Detail A

128-Pin TQFP Package

Dimensions in Millimeters   MIN. / MAX.

0.40 BSC

Detail A

Pin 1

Top View

$\frac{0.13}{0.23}$

Coplanarity not to exceed 0.102

$\frac{0°}{7°}$

$\frac{0.45}{0.75}$

$\frac{0.05}{0.15}$

$\frac{1.35}{1.45}$

Detail A

14.00 BSC

16.00 BSC

133-Pin CPGA Package

Dimensions in Inches   MIN. / MAX.
(Dimensions in millimeters, shown in parentheses, are for reference only)

PIN 1 INDEX

$\frac{1.445\ (36.70)}{1.475\ (37.46)}$ SQ

Top View

$\frac{0.081\ (2.06)}{0.099\ (2.51)}$

$\frac{0.175\ (4.44)}{0.185\ (4.70)}$

$\frac{0.016\ (.41)}{0.020\ (.51)}$ DIA.

$\frac{0.045\ (1.14)}{0.055\ (1.40)}$ DIA 4 PL.

$\frac{0.045\ (1.14)}{0.055\ (1.40)}$

0.070 (1.78) TYP. DIAMETER

14 13 12 11 10 9 8 7 6 5 4 3 2 1
A B C D E F G H J K L M N P

0.100 (2.54) TYP.

$\frac{1.288\ (32.72)}{1.312\ (33.32)}$

$\frac{1.445\ (36.70)}{1.475\ (37.46)}$ SQ.
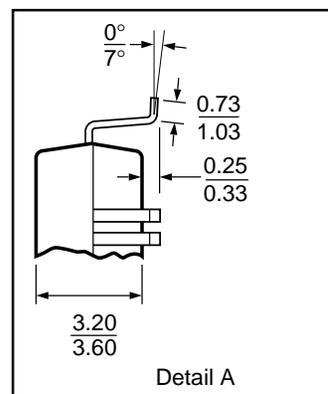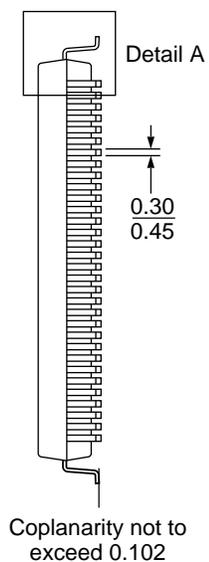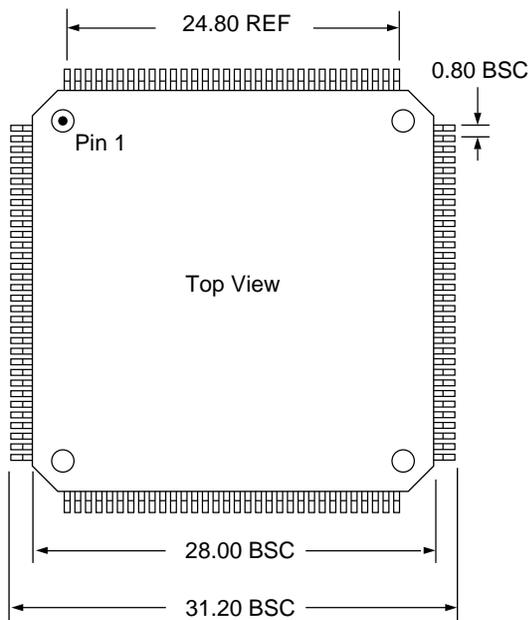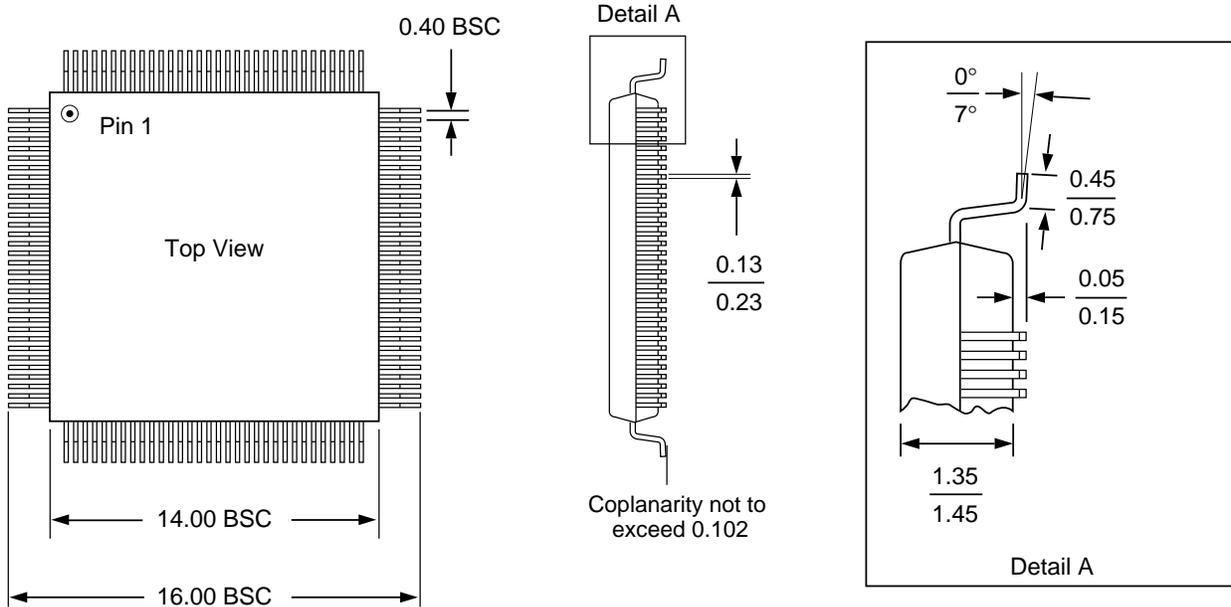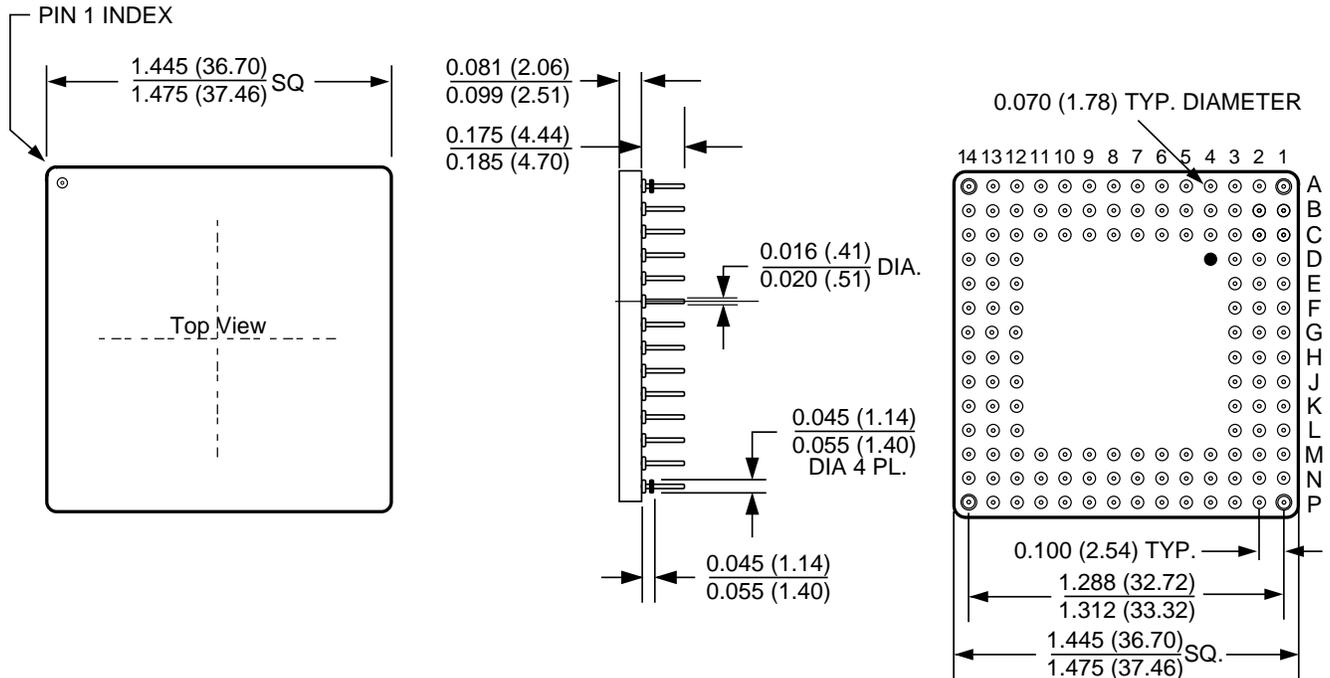
Package Diagrams

160-Pin MQFP Package
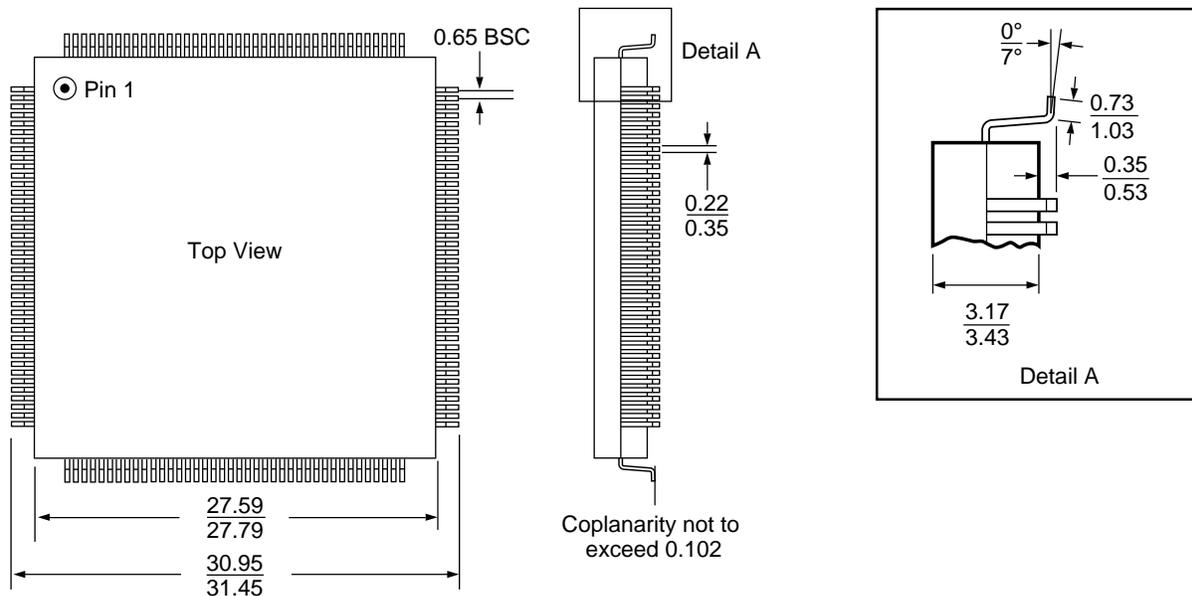
Dimensions in Millimeters   MIN. / MAX.

Pin 1

Top View

0.65 BSC

Detail A

$\frac{0.22}{0.35}$

Coplanarity not to exceed 0.102

$\frac{27.59}{27.79}$

$\frac{30.95}{31.45}$

$0°$
$7°$

$\frac{0.73}{1.03}$

$\frac{0.35}{0.53}$

$\frac{3.17}{3.43}$

Detail A

160-Pin PQFP Package

Dimensions in Millimeters   MIN. / MAX.

25.35 REF

0.65 BSC

Pin 1

Top View

Detail A

$\frac{0.22}{0.38}$

Coplanarity not to exceed 0.102

28.00 BSC

31.20 BSC

$0°$
$7°$

$\frac{0.73}{1.03}$

$\frac{0.25}{0.33}$

$\frac{3.20}{3.60}$

Detail A

167-Pin CPGA Package

Dimensions in Inches   MIN. / MAX.

(Dimensions in millimeters, shown in parentheses, are for reference only)

PIN 1 INDEX

1.750 SQ
(44.45)

Top View

0.095 (2.41)

0.180 (4.57)

0.018 (0.46) DIA.

0.050 (1.27)
DIA 4 PL.

0.050 (1.27)

0.080 (2.03) MAX. DIAMETER

17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

A B C D E F G H J K L M N P R S T

0.100 (2.54) TYP.

1.600 (40.64) BSC

1.750 (44.45)

176-Pin TQFP Package

Dimensions in Millimeters   MIN. / MAX.

Pin 1

Top View

0.50 BSC

Detail A

0.17
0.27

Coplanarity not to
exceed 0.102

24.00 BSC

26.00 BSC

0°
7°

0.45
0.75

0.05
0.15

1.35
1.45

Detail A
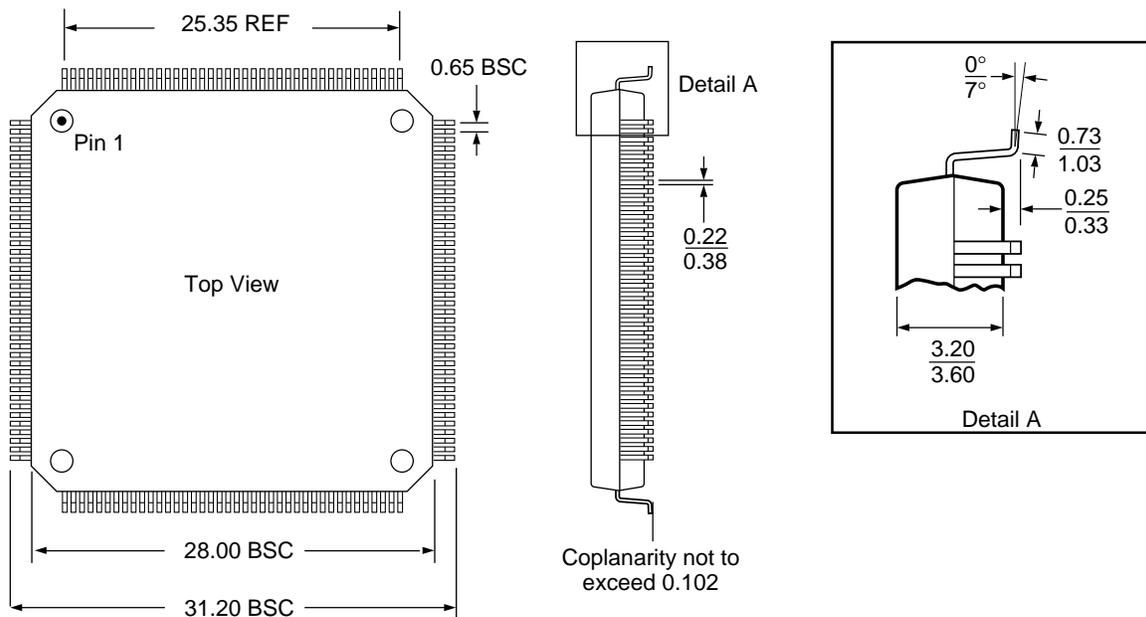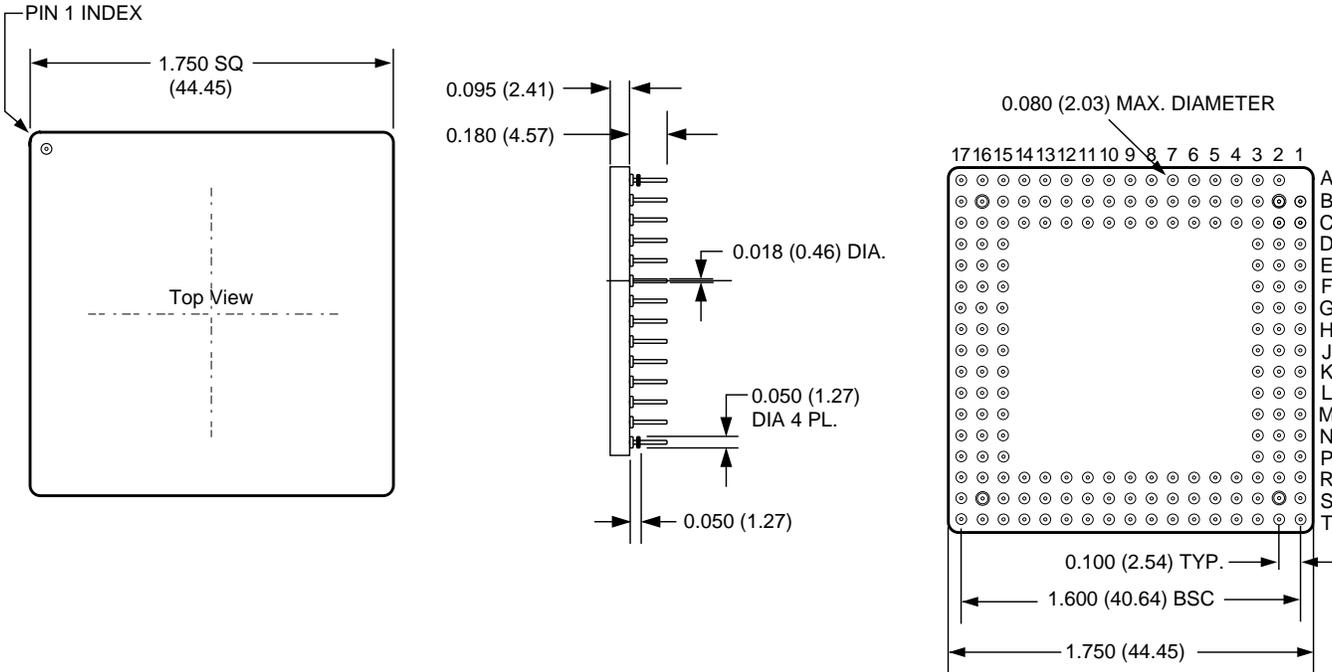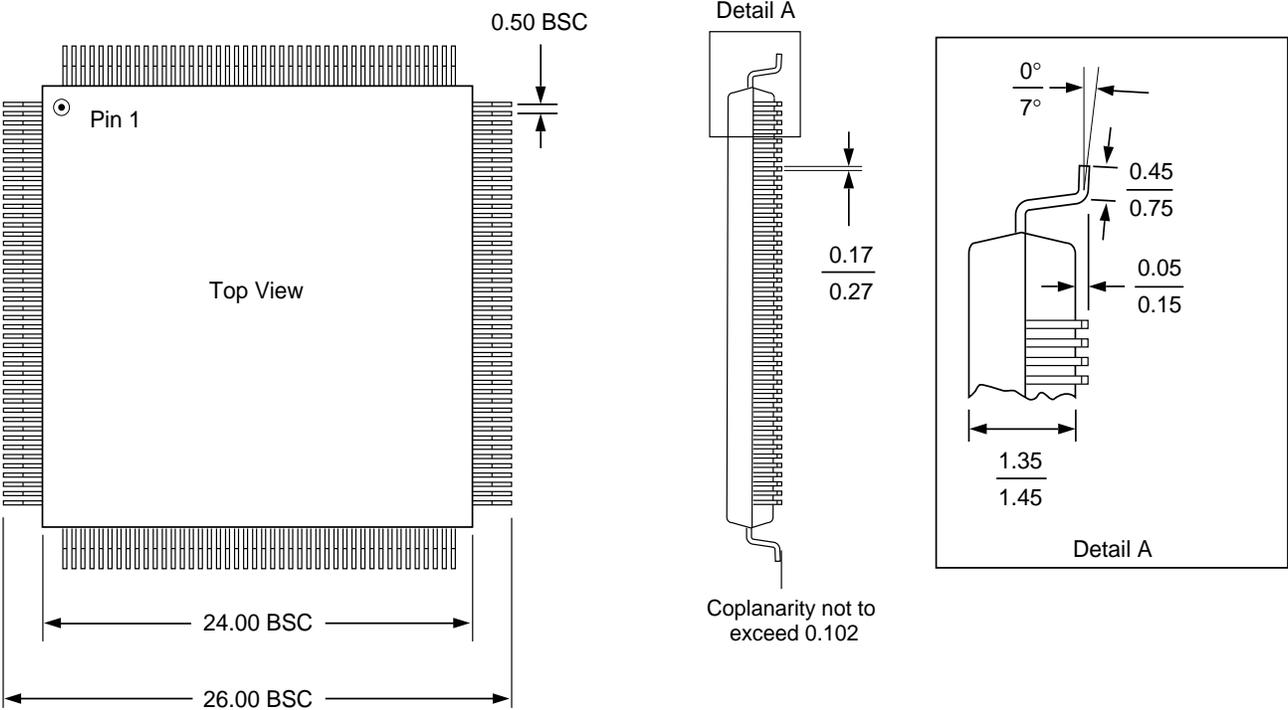
Package Diagrams

208-Pin MQFP Package

Dimensions in Millimeters   MIN. / MAX.

Pin 1

Top View

0.50 BSC

Detail A

$\dfrac{0.17}{0.27}$

$\dfrac{27.59}{27.79}$

$\dfrac{31.00}{31.40}$

Coplanarity not to exceed 0.08

$\dfrac{0°}{7°}$

$\dfrac{0.73}{1.03}$

$\dfrac{0.29}{0.64}$

$\dfrac{3.17}{3.43}$

Detail A

240-Pin MQFP Package

Dimensions in Millimeters   MIN. / MAX.

Pin 1

Top View

0.50 BSC

Detail A

$\dfrac{0.18}{0.27}$

$\dfrac{31.60}{31.70}$

$\dfrac{34.40}{34.80}$

Coplanarity not to exceed 0.08

$\dfrac{0°}{7°}$

$\dfrac{0.50}{0.75}$

$\dfrac{0.30}{0.60}$

$\dfrac{3.45}{4.01}$

Detail A
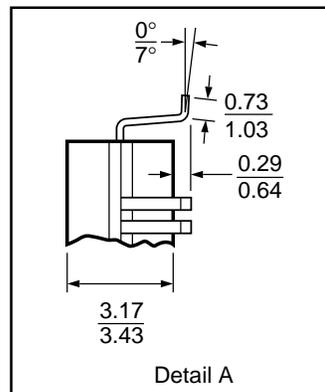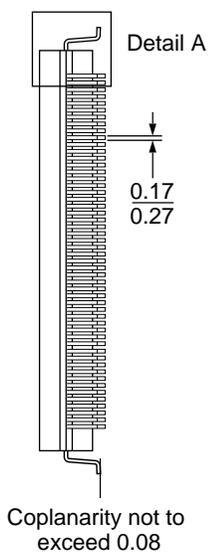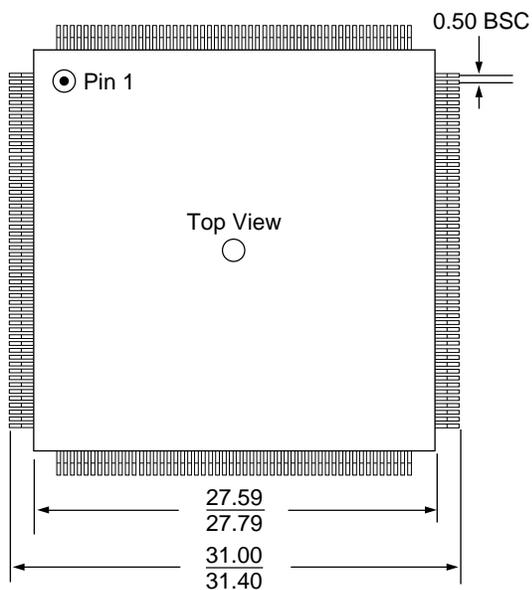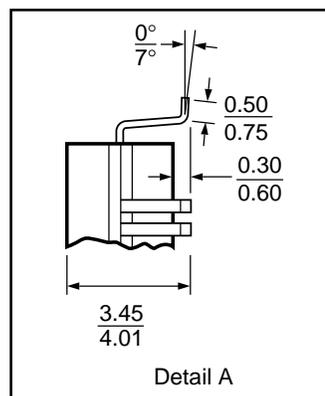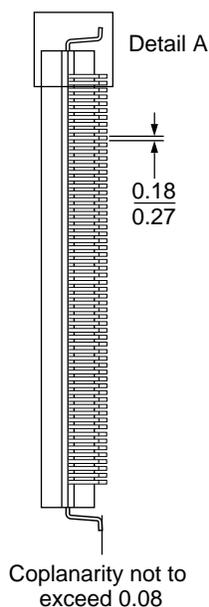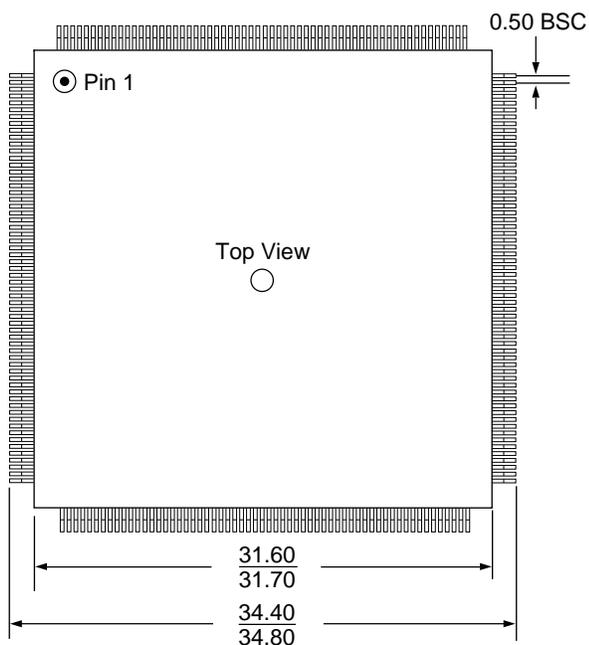
304-Pin MQFP Package

Dimensions in Millimeters   MIN. / MAX.

Detail A

0.50 BSC

Pin 1

Top View

$\dfrac{39.60}{39.70}$

$\dfrac{42.40}{42.80}$

$\dfrac{0.17}{0.27}$

Coplanarity not to
exceed 0.08

$\dfrac{0°}{7°}$

$\dfrac{0.55}{0.70}$

$\dfrac{0.28}{0.47}$

$\dfrac{3.96}{4.41}$

Detail A
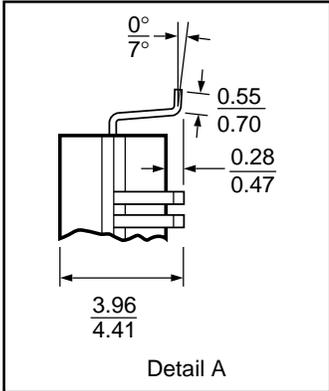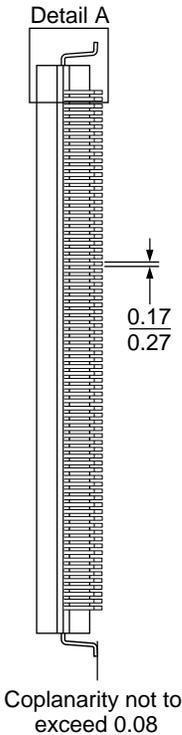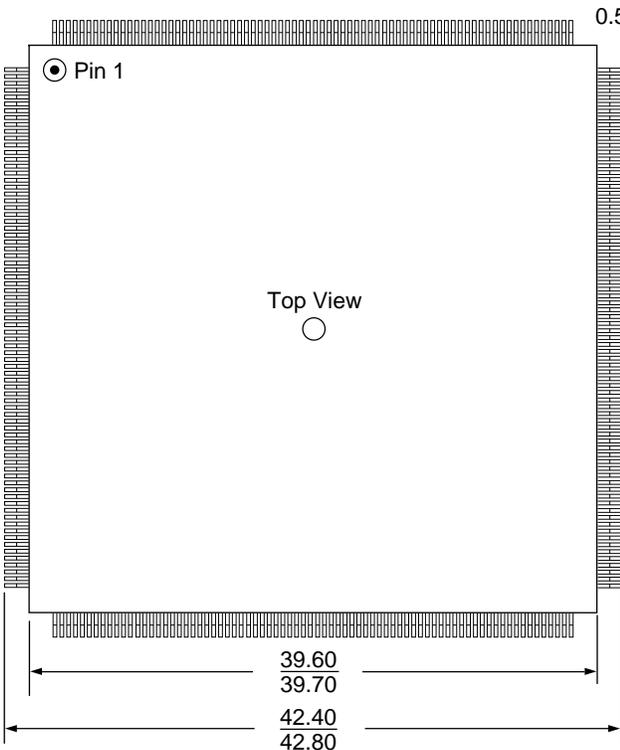
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