

**Agilent E1411B  
Component Level  
Information**

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# E1411B 5 1/2 Digit DMM Component Level Information

**Information in this packet applies to the following assemblies:**

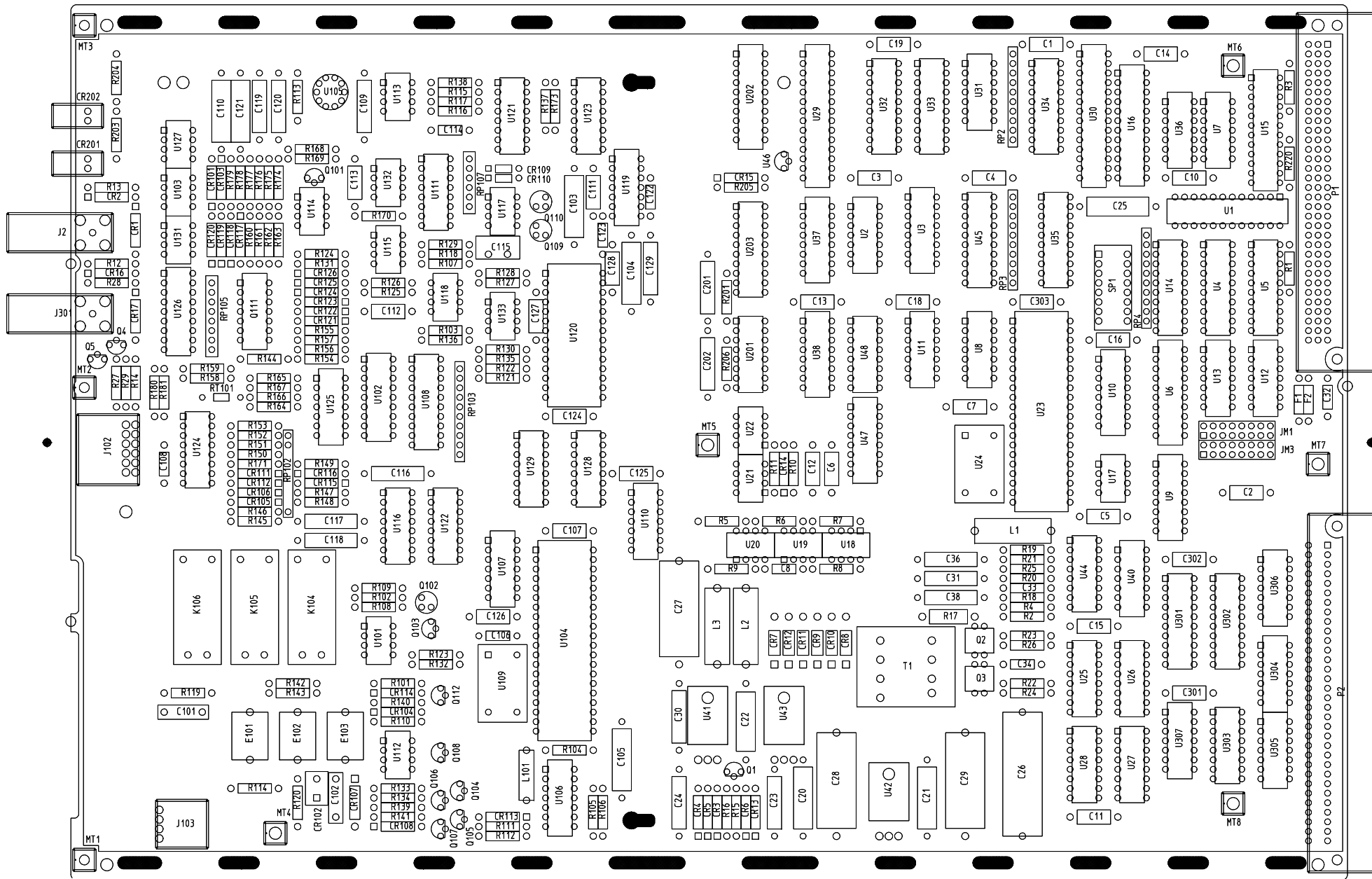
- 1. E1411-66521 PC Assembly**
- 2. E1411-66522 PC Assembly**

**The following is included in this packet:**

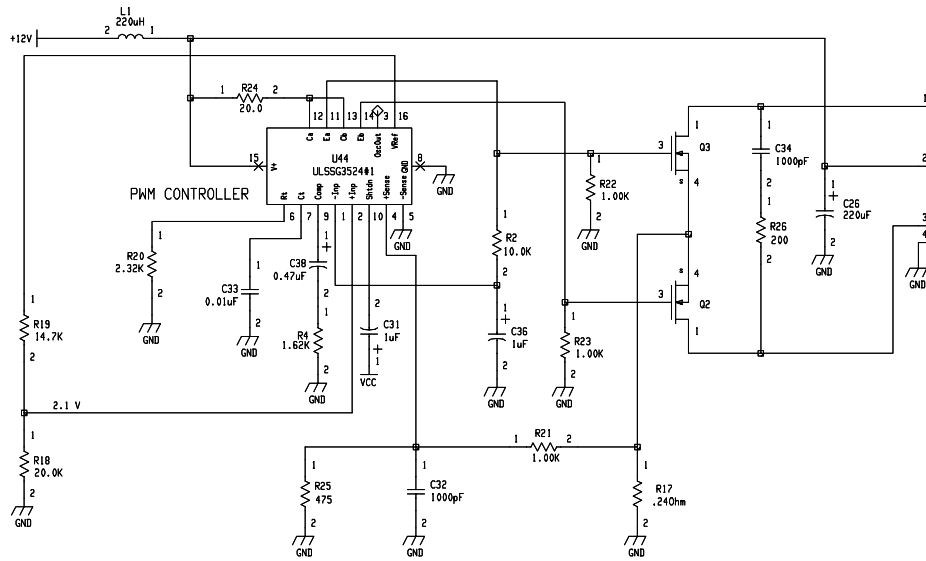
- 1. Component locators**
- 2. Schematics**
- 3. Parts lists with Agilent and manufacturer's part numbers**



**Agilent Technologies**



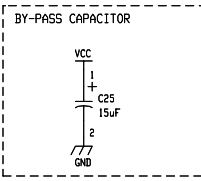
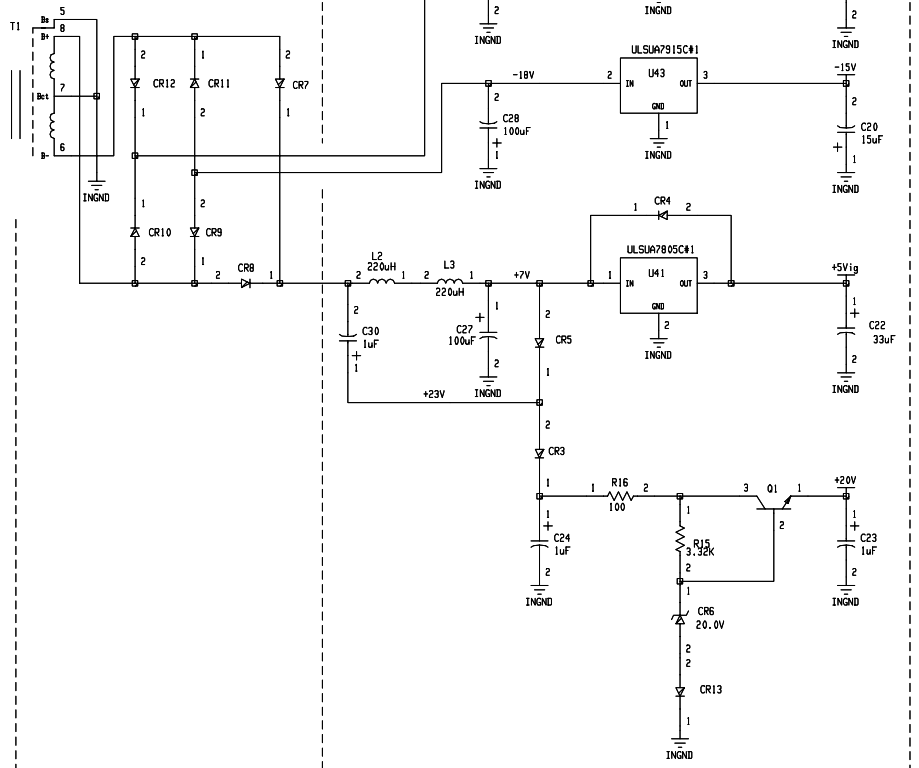
OUTGUARD POWER SUPPLY



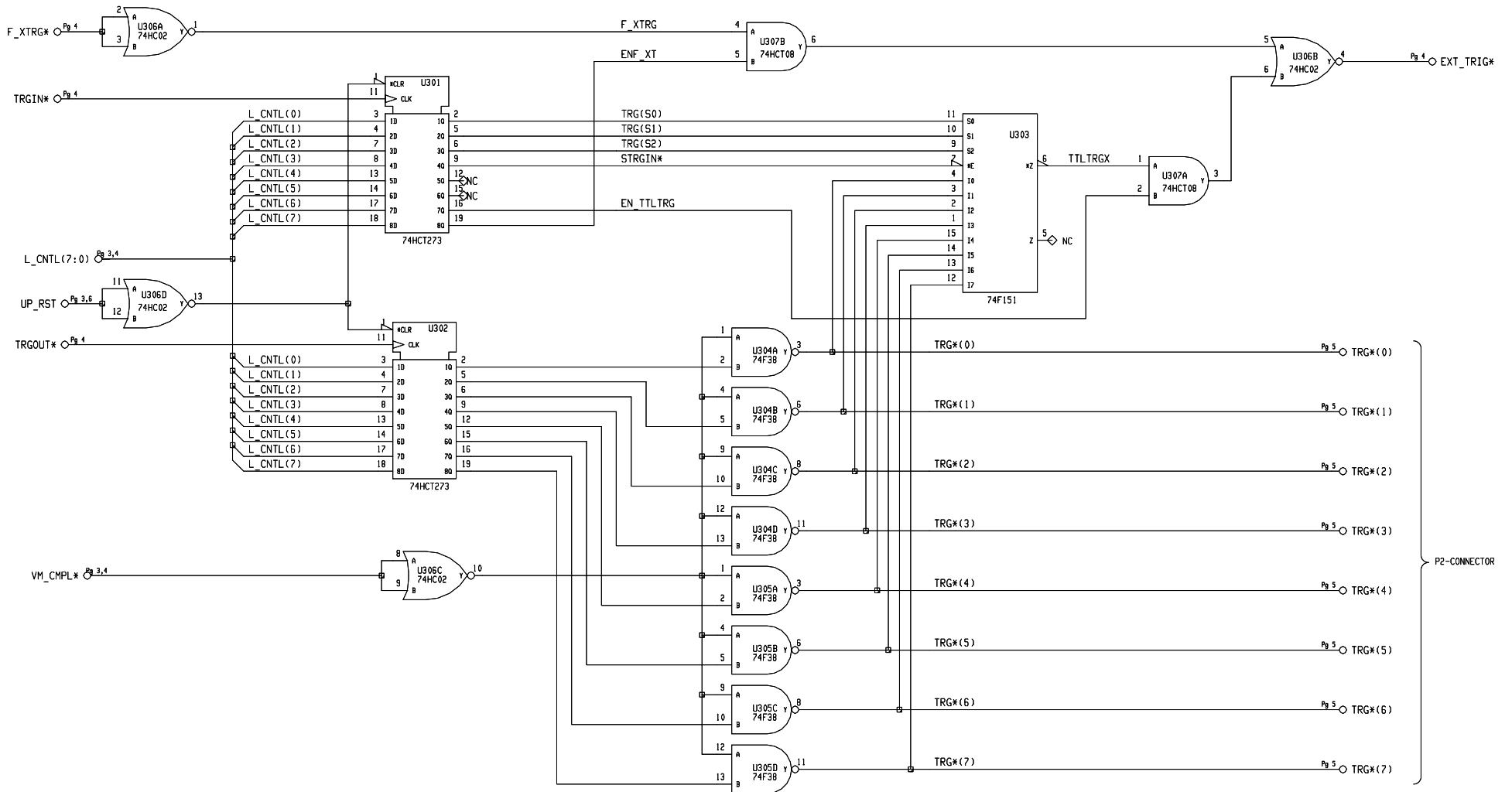
MNEMONIC DEFINITIONS

|               |   |            |  |
|---------------|---|------------|--|
| ALE*          | Address Latch Enable                                    | RAM_CLK    | Non-Volatile RAM Clock                 |
| ALE_KILL      | Address Latch Enable Inhibit                            | RAM_DATA   | Non-Volatile RAM Data                  |
| CMD_STB       | Command register Strobe                                 | RESET      | uP Reset Control Line (Inguard)        |
| CP_EN*        | Command/Parameter Register Enable                       | SERDAT_AV  | Cross-guard Serial Data Available      |
| CP_RDY*       | Command/Parameter Register Ready                        | SER_LO_EN* | Cross-guard Serial Data Lo-Byte Enable |
| CP_STB        | Command/Parameter Register Strobe                       | SER_HI_EN* | Cross-guard Serial Data Hi-Byte Enable |
| DEV_TY*       | Device Type Register Enable                             | ST_CNTL*   | Status/control Register Enable         |
| DONE*         | Command "DONE" Flag                                     | TRIGGER    | Inguard Trigger Line                   |
| DYACK*        | Data Transfer Acknowledge                               | TXD        | Serial Data Transmit                   |
| ERROR         | Error Flag  | UI_INT_EN* | Upper Interrupt Vector Register Enable |
| EXT_TRIG*     | External Trigger  | uP_RST     | uP Reset Control Line (Outguard)       |
| EXT_TRG_EN    | External Trigger Enable                                 | uP_SYSFAIL | System Fail Line from Outguard uP      |
| ID_EM         | Input Data Register "EMPTY" Flag                        | WRITE      | Write                                  |
| ID_FL*        | Input Data Register "FULL" Flag                         | XGCLK*     | Cross-guard Clock Line                 |
| ID_H*         | Input Data Register "HALF-FULL" Flag                    | XGDATA*    | Cross-guard Data Line                  |
| IDH_STB*      | Input Data Register Strobe (Hi-Byte)                    | XG_TRIG*   | Cross-guard Trigger                    |
| IDL_STB*      | Input Data Register Strobe (Lo-Byte)                    |            |  |
| ID_RST*       | Input Data Register Reset (CLEAR)                       |            |  |
| INGD_RST      | Inguard Reset Line                                      |            |  |
| INGD_CNTL*    | Inguard Control Line                                    |            |  |
| INTBUS(15:0)  | Internal Data Bus                                       |            |  |
| INT_VEC_STB   | Interrupt Vector Register Strobe                        |            |  |
| IRQ           | Interrupt Request - PAL                                 |            |  |
| LCL_CNTL(7:0) | Local Outguard Controller Bus                           |            |  |
| NTRGLTCHCLR   | Trigger Latch Clear (Lo-True)                           |            |  |
| NTRGLTCHSET   | Trigger Latch Set (Lo-True)                             |            |  |
| NVRAM_EN      | Non-Volatile RAM Enable                                 |            |  |
| PARAM_STB     | Parameter Register Strobe (not qualified by write line) |            |  |
| PASSED        | Passed Self-test Flag                                   |            |  |
| PR_FULLL      | Parameter Register Full Flag                            |            |  |
| QRY_EN*       | Query Register Enable                                   |            |  |
| QR_STB*       | Query Register Strobe                                   |            |  |
| QR_RDY*       | Query Register Ready                                    |            |  |

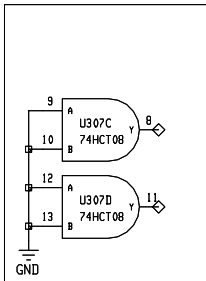
INGUARD POWER SUPPLY



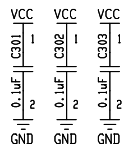
Agilent E1411B  
 VXI C-Size 5 1/2 Digit DMM  
 Cross-Guard Power Supply



UNUSED PARTS

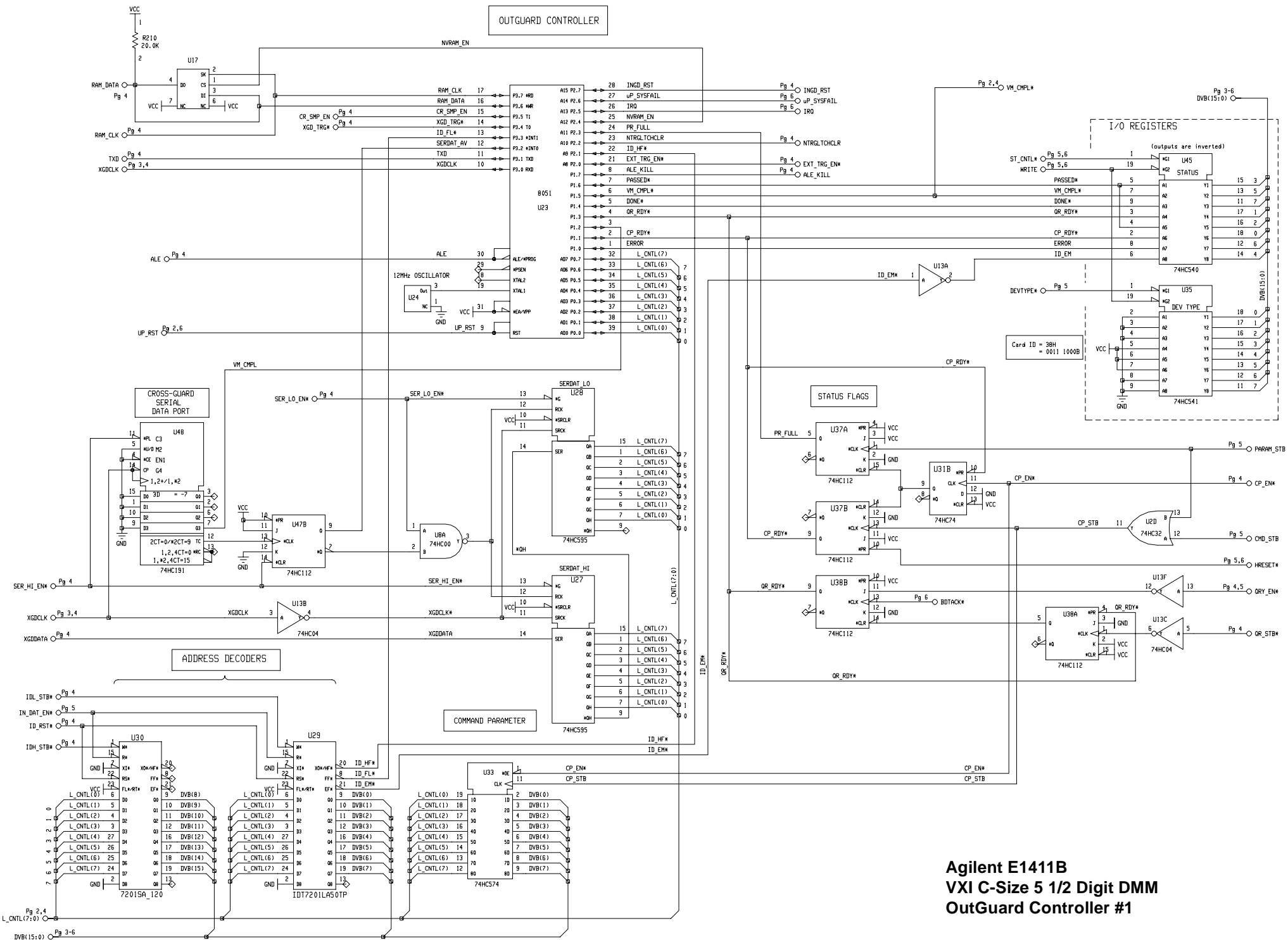


BYPASS CAPS

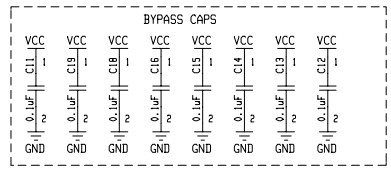
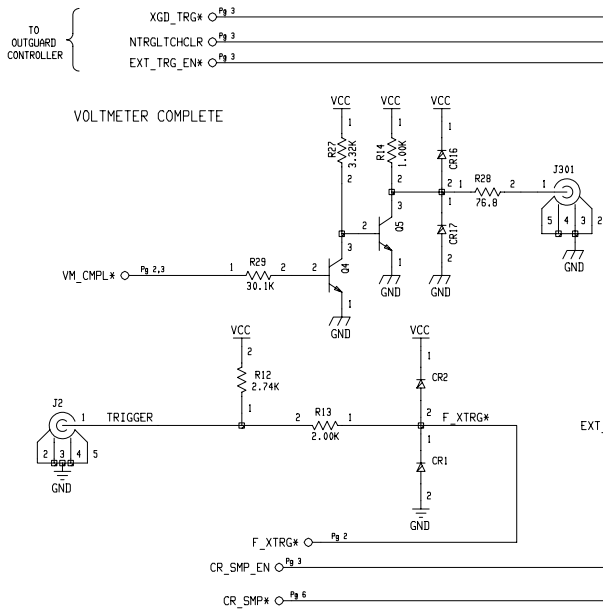
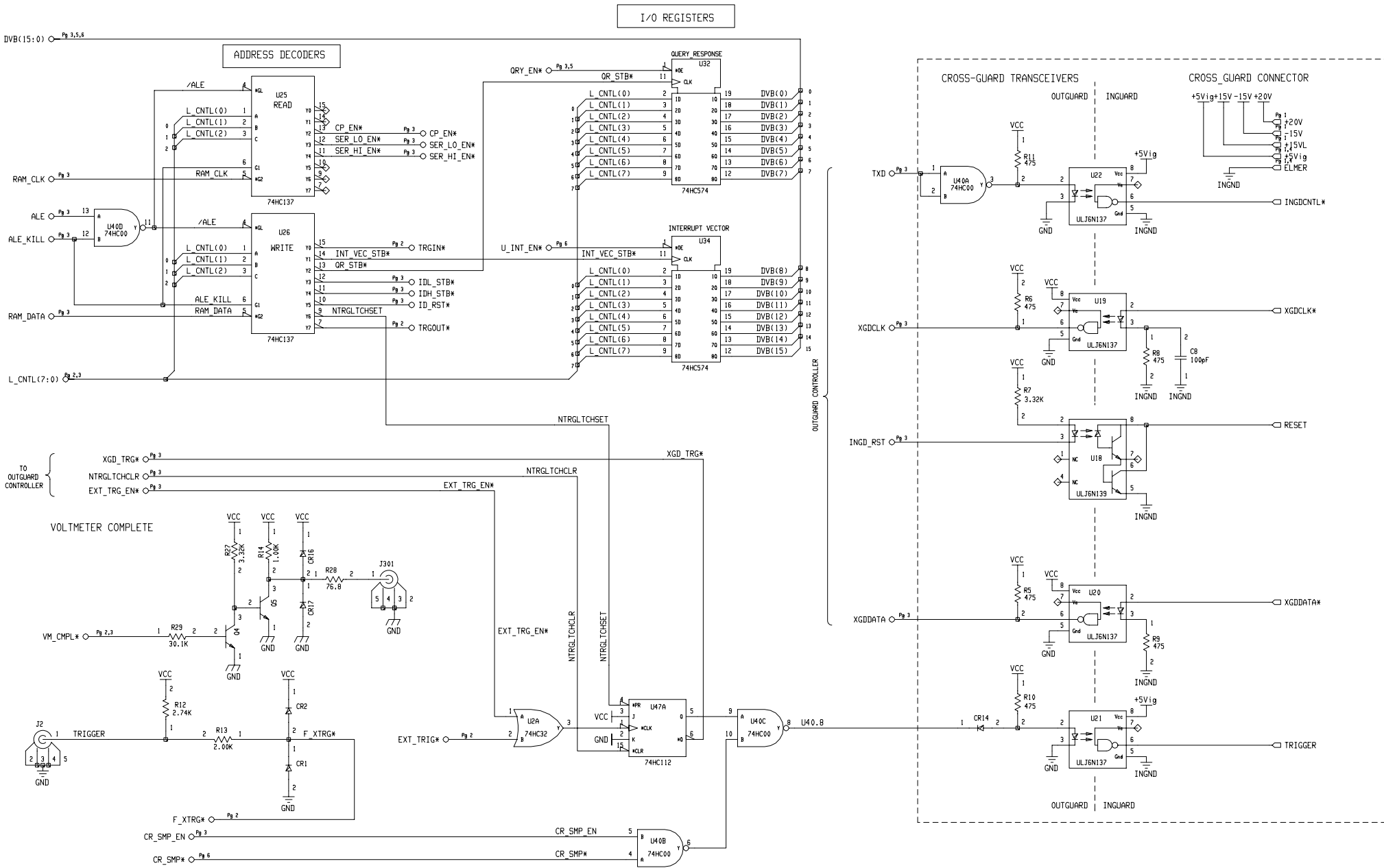


U303, U304 & U305 MUST BE LOCATED WITHIN 1in OF P2.

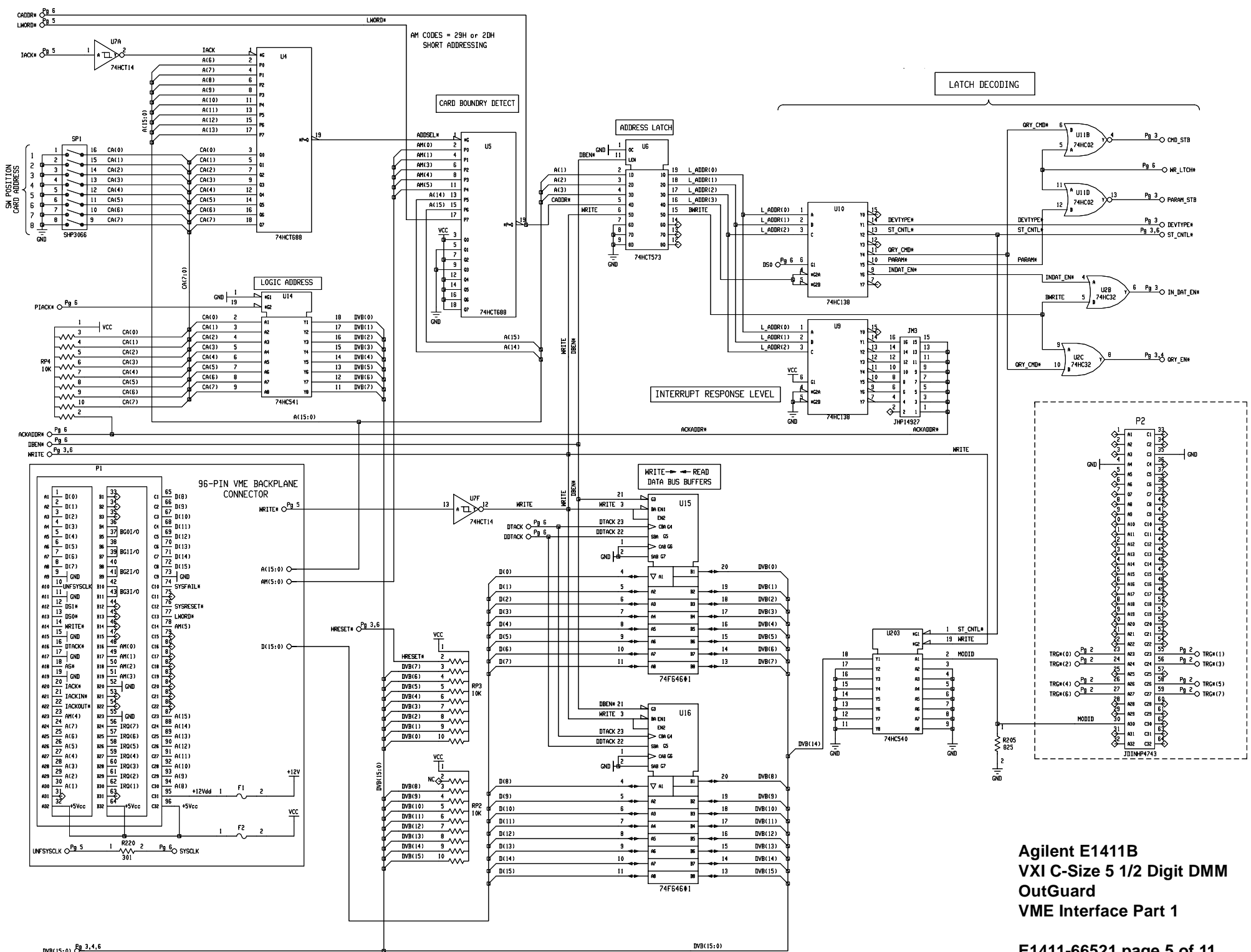
**Agilent E111B**  
**VXI C-Size 5 1/2 Digit DMM**  
**OutGuard**  
**TTLTRG\* (SYNC & ASYNCH)**



**Agilent E1411B  
VXI C-Size 5 1/2 Digit DMM  
OutGuard Controller #1**

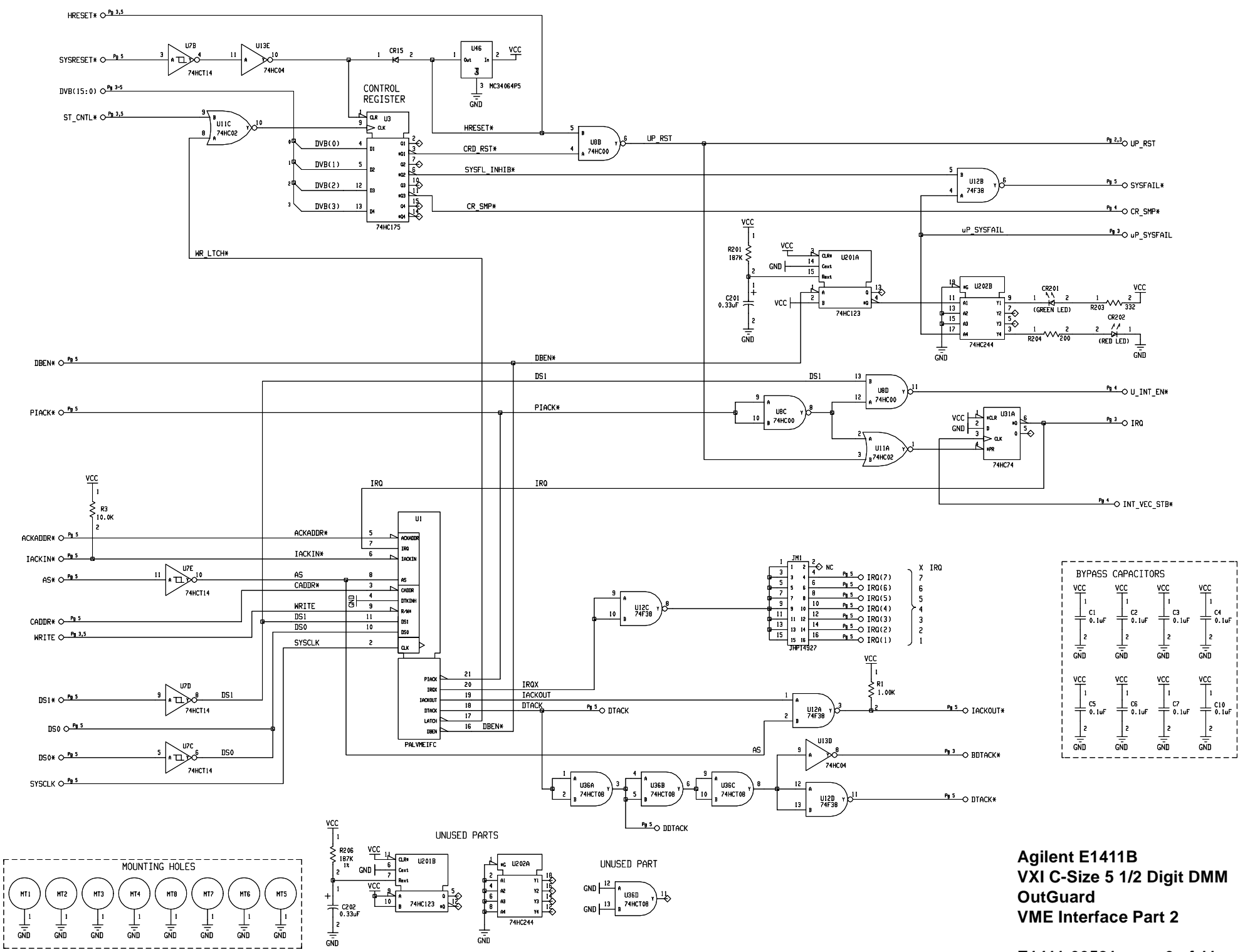


**Agilent E1411B  
VXI C-Size 5 1/2 Digit DMM  
OutGuard Controller #2**



**Agilent E1411B  
VXI C-Size 5 1/2 Digit DMM  
OutGuard  
VME Interface Part 1**

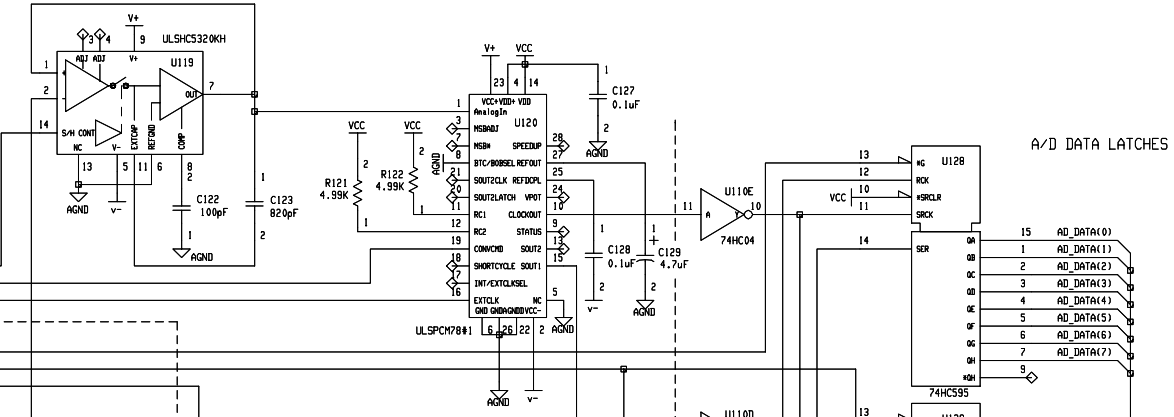




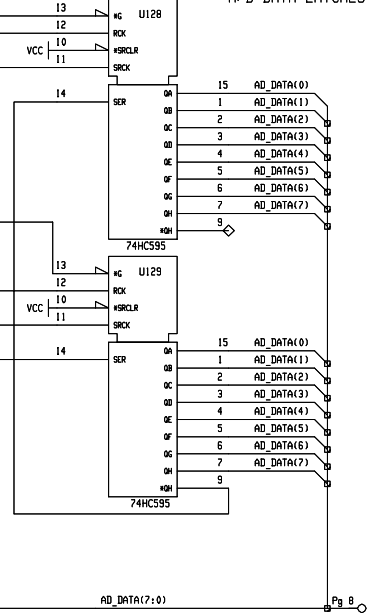
**Agilent E1411B  
 VXI C-Size 5 1/2 Digit DMM  
 OutGuard  
 VME Interface Part 2**

| MNEMONIC DEFINITIONS |  |         |                                       |
|----------------------|--|---------|---------------------------------------|
| AD_CLK               | Address Clock  | SA_ST   | Successive Approximation Start Signal |
| AD_DATA(7:0)         | A/D Data Bus   | SB      | Slope-Select Line "b"                 |
| CHP_LTCH#            | Comparator Latch                                     | SUM_JCT | Integrator Summing Junction           |
| CHP_OUT#             | Comparator Output                                    | +Vref   | +5 Volt A/D Reference Voltage         |
| DC/AC                | DC/AC Function Select                                | -Vref   | -5 Volt A/D Reference Voltage         |
| HBEN#                | High Byte Enable -A/D Data                           |         |                                       |
| HLD/SMP#             | Hold/Sample Control Line                             |         |                                       |
| INT_ZERO             | Integrator Zero Control Line                         |         |                                       |
| LBEN#                | Low Byte Enable -A/D Data                            |         |                                       |
| PRE_OUT              | Pre-amplifier Output                                 |         |                                       |
| RU/RD                | Run-up/Run-down Control Line                         |         |                                       |
| SA                   | Slope-Select Line "a"                                |         |                                       |
| SA_CAL#              | Successive Approximation Calibration DAC Strobe      |         |                                       |
| SA/INT               | Successive Approximation/Integrating A/D Select Line |         |                                       |

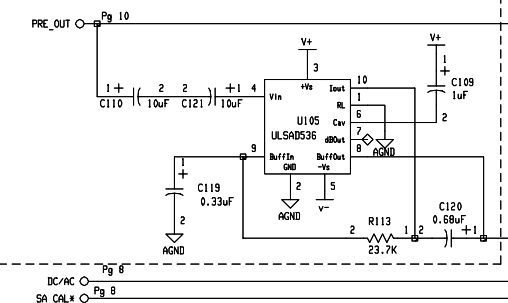
SUCCESSIVE APPROXIMATION A/D



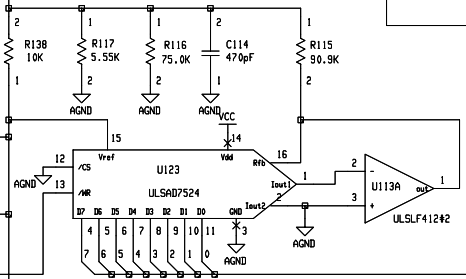
A/D DATA LATCHES



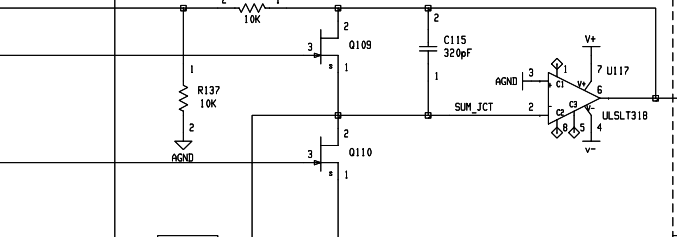
AC-DC CONVERTER



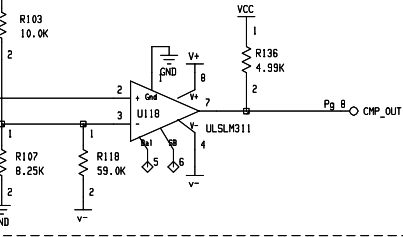
S/A CALIBRATION DAC



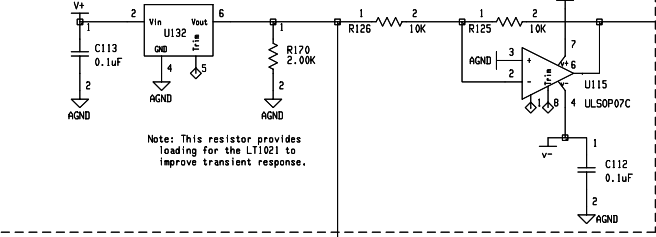
INTEGRATOR



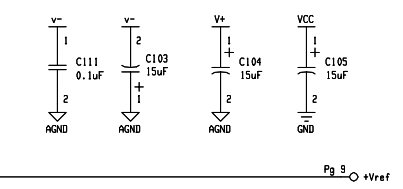
COMPARATOR



REFERENCE

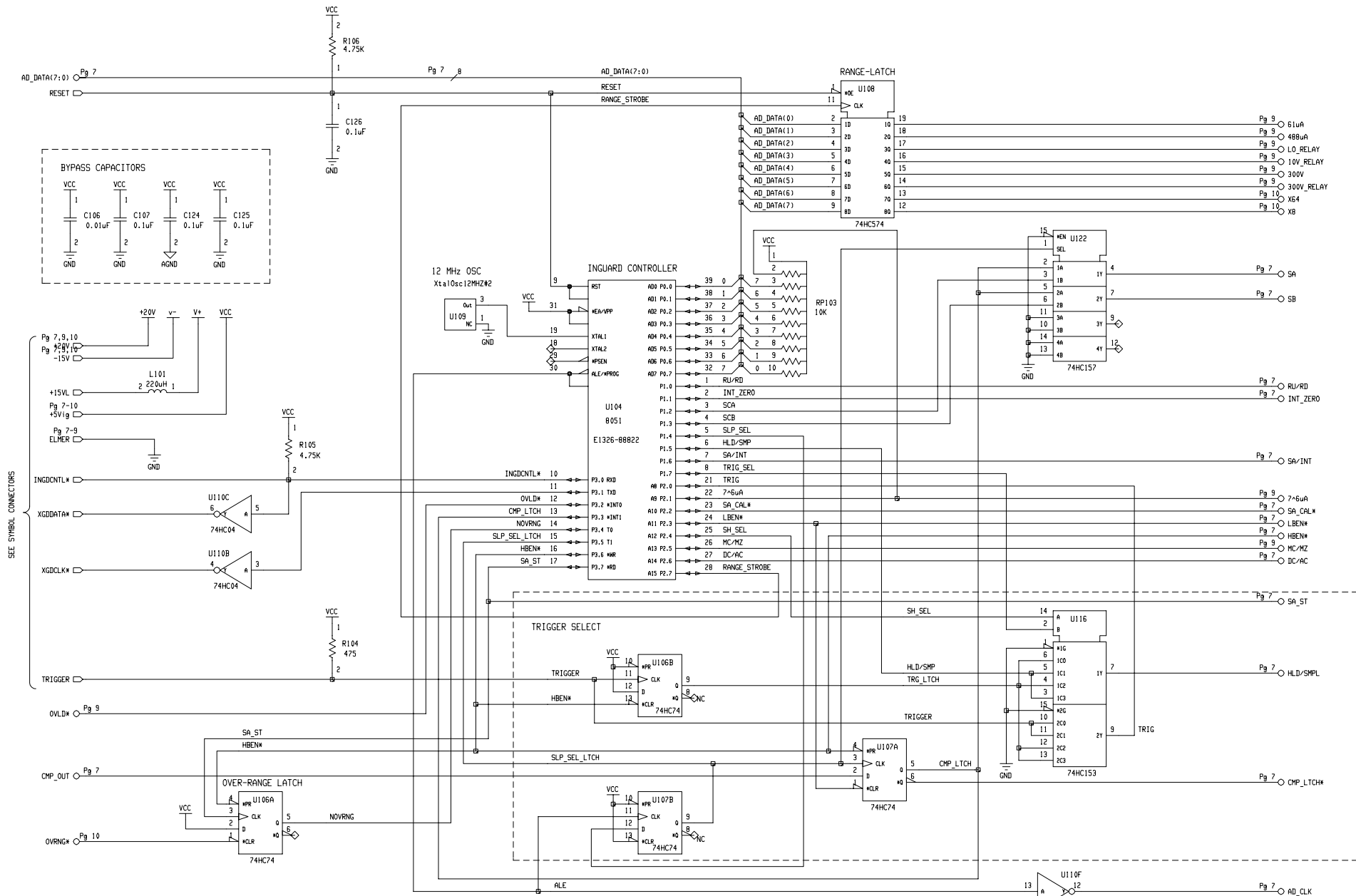


BY-PASS CAPACITORS

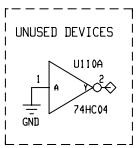


SB Pg 8  
SA Pg 8

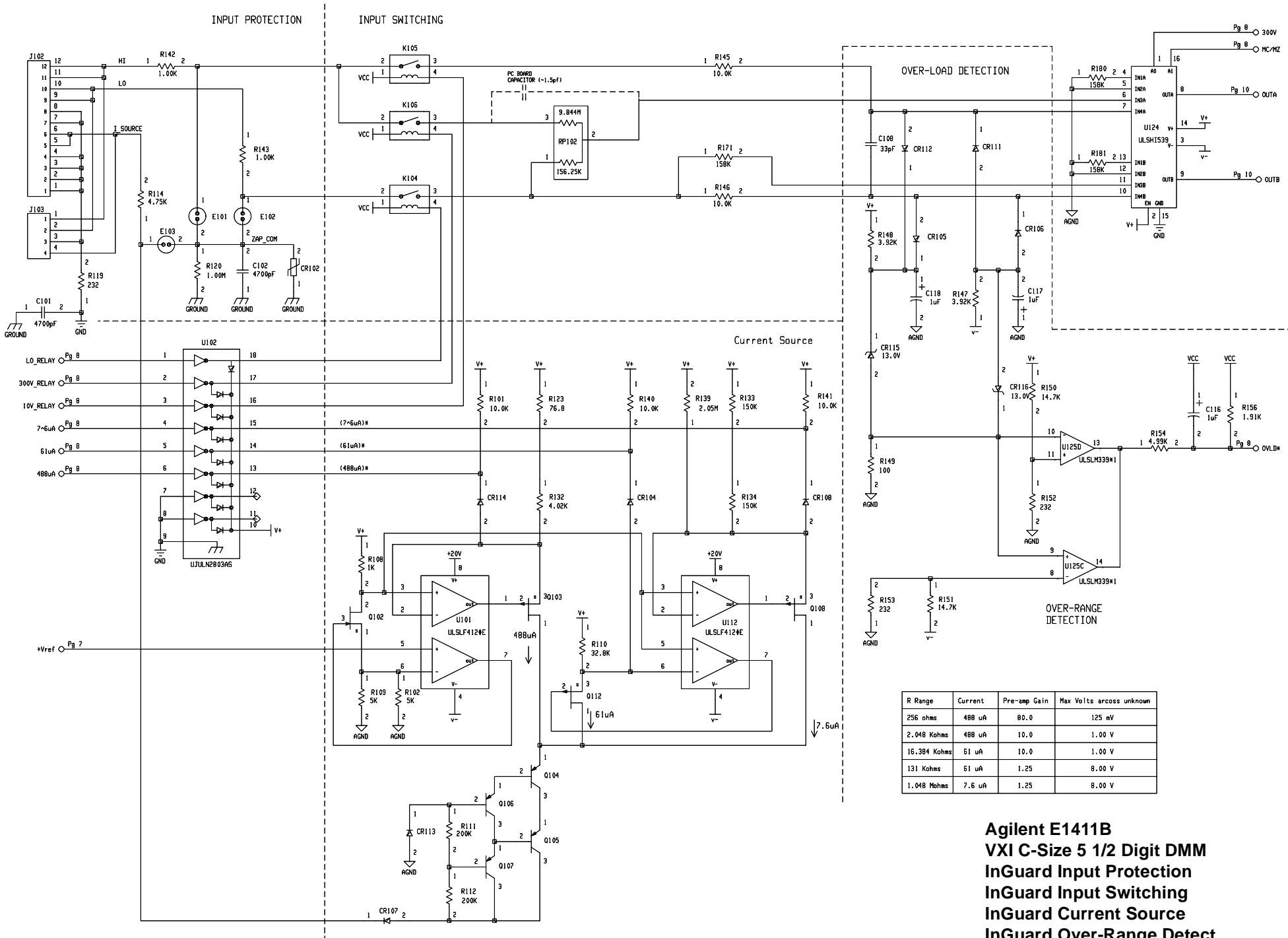
Agilent E1411B  
VXI C-Size 5 1/2 Digit DMM  
InGuard A/D Converter



| MNEMONIC DEFINITIONS                                       |   |
|--|---|
| AD_CLK   | A/D Clock   |
| AD_DATA(7:0)   | A/D Data Bus  |
| ALE  | Address Latch Enable                                  |
| CMP_LTCH*  | Comparator Latch                                      |
| COMP_OUT*  | Comparator Output                                     |
| DC/AC  | DC/AC Function Select                                 |
| HVEN*  | High Byte Enable - A/D Data                           |
| HLD/SMPL   | Hold/Sample Control Line                              |
| IngdCntl*  | Inguard Control                                       |
| INT_ZERO   | Integrator Zero Control Line                          |
| LBEN*  | Low Byte Enable - A/D Data                            |
| Lo_relay   | Select Line for LO (-input) Relay                     |
| MC/MZ  | Measure Customer/Measurement Zero Control Line        |
| NOVRNG   | Over-range Load (Lo-true)                             |
| OVLN*  | Overload  |
| OVRRNG   | Over-range  |
| RANGE_STROBE   | Range Latch Strobe                                    |
| RESET  | uP Reset Control Line (Inguard)                       |
| RU/RD  | Run-up/Run-down Control Line                          |
| Sa   | Slope-Select Line "a"                                 |
| SA_CAL*  | Successive Approximation Calibration DAC Strobe       |
| SA/INT   | Successive Approximation /Integrating A/D Select Line |
| SA_ST  | Successive Approximation Start Single                 |
| Sb   | Slope-Select Line "b"                                 |
| SCA  | A/D Slope Control Signal "A"                          |
| SCB  | A/D Slope Control Signal "B"                          |
| SH_SEL   | Sample-Hold Select                                    |
| SLP_SEL  | Slope Select  |
| SLP_SEL_LATCH  | Slope Select Latch                                    |
| TRG_LTCH   | Trigger Latch (Inguard)                               |
| TRIG   | Inguard Trigger                                       |
| TRIGGER  | Inguard Trigger Line                                  |
| TRIG_SEL   | Inguard Trigger Select                                |
| XgdClk*  | Cross-guard Clock Line                                |
| XgdData*   | Cross-guard Data Line                                 |
| Control line to select low-voltage (<10 volt) input relay  |   |
| Control line to select 64/300 volt range                   |   |
| Control line to select high-voltage (>10 volt) input relay |   |
| Select line for 488 uA current source                      |   |
| Select line for 61 uA current source                       |   |
| Select line for 7.6 uA current source                      |   |
| Select line for 1 volt range                               |   |
| Select line for .125 volt range                            |   |

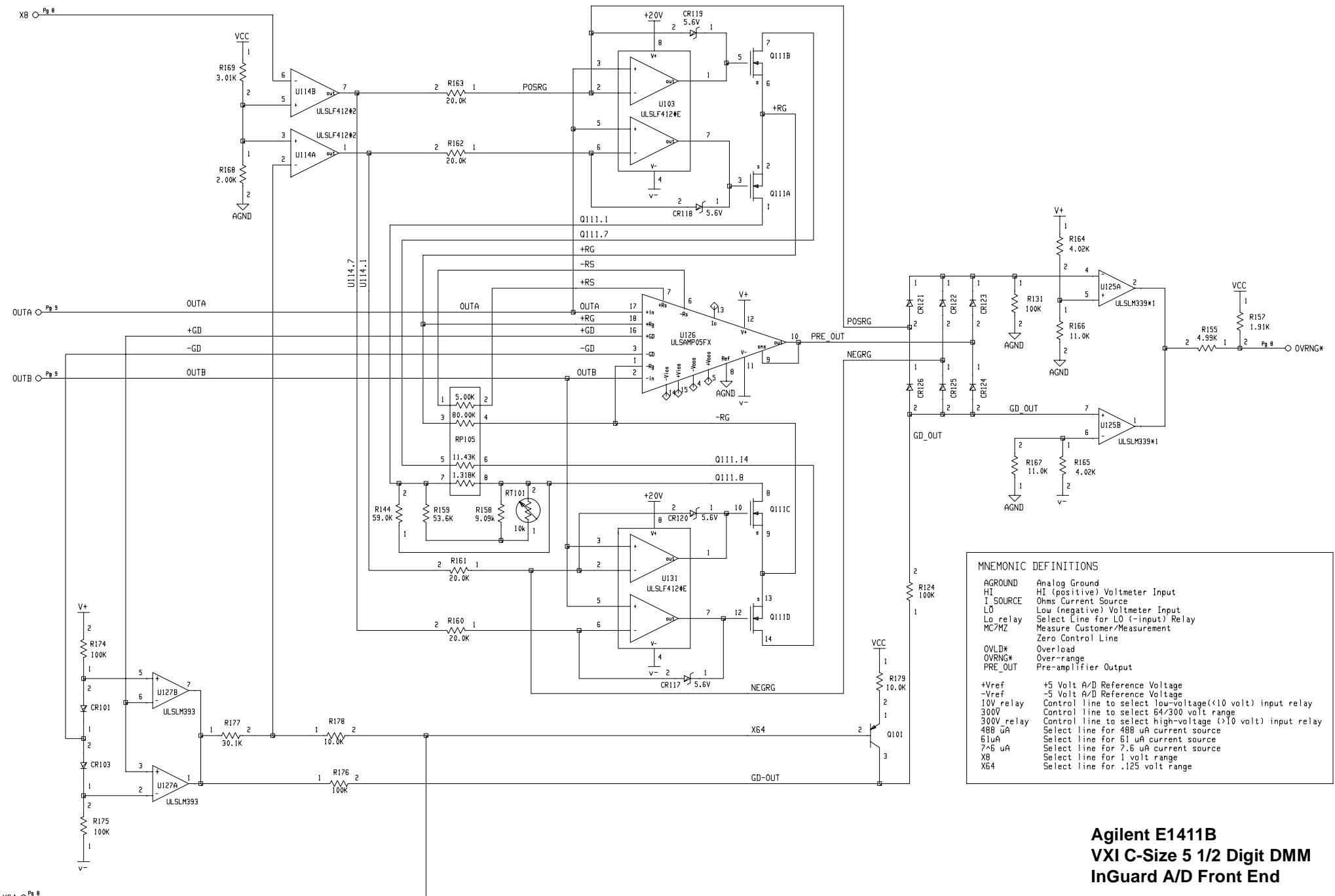


**Agilent E1411B  
VXI C-Size 5 1/2 Digit DMM  
InGuard A/D Controller**



| R Range      | Current | Pre-amp Gain | Max Volts across unknown |
|--------------|---------|--------------|--------------------------|
| 256 ohms     | 488 uA  | 80.0         | 125 mV                   |
| 2.048 Kohms  | 488 uA  | 10.0         | 1.00 V                   |
| 16.384 Kohms | 61 uA   | 10.0         | 1.00 V                   |
| 131 Kohms    | 61 uA   | 1.25         | 8.00 V                   |
| 1.048 Mohms  | 7.6 uA  | 1.25         | 8.00 V                   |

**Agilent E1411B**  
**VXI C-Size 5 1/2 Digit DMM**  
**InGuard Input Protection**  
**InGuard Input Switching**  
**InGuard Current Source**  
**InGuard Over-Range Detect**



**MNEMONIC DEFINITIONS**

|            |  |
|------------|--|
| AGROUND    | Analog Ground  |
| HI         | HI (positive) Voltmeter Input                              |
| I SOURCE   | Ohms Current Source  |
| LO         | Low (negative) Voltmeter Input                             |
| Lo relay   | Select Line for LO (-input) Relay                          |
| MC7MZ      | Measure Customer/Measurement                               |
|            | Zero Control Line  |
| OVL D*     | Overload   |
| OVRNG*     | Over-range   |
| PRE_OUT    | Pre-amplifier Output                                       |
| +Vref      | +5 Volt A/D Reference Voltage                              |
| -Vref      | -5 Volt A/D Reference Voltage                              |
| 10V relay  | Control line to select 10v-voltage (<10 volt) input relay  |
| 300V       | Control line to select 64/300 volt range                   |
| 300V relay | Control line to select high-voltage (>10 volt) input relay |
| 488 uA     | Select line for 488 uA current source                      |
| 61uA       | Select line for 61 uA current source                       |
| 7.6 uA     | Select line for 7.6 uA current source                      |
| X8         | Select line for 1 volt range                               |
| X64        | Select line for .125 volt range                            |

**Agilent E1411B  
VXI C-Size 5 1/2 Digit DMM  
InGuard A/D Front End**



| Reference Designator  | Quantity | Agilent Part Number | Description                          | MPN  | Manufacturer  |
|---|----------|---------------------|--------------------------------------|--|---|
| C1  | 1        | 0160-5975           | CAP-FXD 10pF +-5pct 50 V CER C0G     | 08055A100JAT A<br>C0805C100J5GAC<br>GRM2165C1H100JD01D   | AVX<br>KEMET ELECTRONICS<br>MURATA MANUFACTURING                                    |
| C101, 102   | 2        | 0160-4439           | CAP-FXD 4700pF +-20pct 1 kV PPR-MET  | PME271Y447MR30   | EVOX/RIFA   |
| C106  | 1        | 0160-3334           | CAP-FXD 0.01uF +-10pct 50 V CER X7R  | C410C103K5R5CA<br>DA12X7R1H103K<br>SA105C103KAAH   | KEMET ELECTRONICS<br>TDK<br>AVX   |
| C108  | 1        | 0160-4807           | CAP-FXD 33pF +-5pct 100 V CER C0G    | C410C330J1G5CA<br>SA102A330JAAH<br>SA102A330JAAH   | KEMET ELECTRONICS<br>AVX<br>KYOCERA   |
| C110,C121   | 2        | 0180-0374           | CAP-FXD 10uF +-10pct 20 V TA         | TAAB106K020<br>T110B106K020AS<br>TAAB10K20RX   | AVX<br>KEMET ELECTRONICS<br>STC   |
| C114  | 1        | 0160-4808           | CAP-FXD 470pF +-5pct 100 V CER C0G   | C410C471J1G5CA<br>SA101A471JAAH<br>SA101A471JAAH   | KEMET ELECTRONICS<br>AVX<br>KYOCERA   |
| C115  | 1        | 0140-0226           | CAP-FXD 320pF +-1pct 300 V MICA      | 0140-0226<br>CD15FC321F03  | SHINNITOKU ELECTRIC<br>CORNELL-DUBILIER ELECTRONICS                                 |
| C119,C201,C202  | 3        | 0180-2205           | CAP-FXD 0.33uF +-10pct 35 V TA       | T110A334K035AS   | KEMET ELECTRONICS   |
| C120  | 1        | 0180-0373           | CAP-FXD 0.68uF +-10pct 35 V TA       | T110A684K035AS   | KEMET ELECTRONICS   |
| C123  | 1        | 0160-4823           | CAP-FXD 820pF +-5pct 100 V CER C0G   | C420C821J1G5CA<br>DA13C0G2A821J<br>SA101A821JAAH<br>SA101A821JAAH  | KEMET ELECTRONICS<br>TDK<br>AVX<br>KYOCERA  |
| C129  | 1        | 0180-0309           | CAP-FXD 4.7uF +-20pct 10 V TA        | T110A475M010AS   | KEMET ELECTRONICS   |
| C1-7,C10-16,C18,C19,<br>C107,C111-113,C124-128,<br>C301-303 | 28       | 0160-4835           | CAP-FXD 0.1uF +-10pct 50 V CER X7R   | C420C104K5R5CA<br>SA105C104KAAH<br>SA105C104KAAH   | KEMET ELECTRONICS<br>AVX<br>KYOCERA   |
| C20,C21,C25,C103-105  | 6        | 0180-1746           | CAP-FXD 15uF +-10pct 20 V TA         | TAAB156K020<br>T110B156K020AS<br>TAAB15K20RX   | AVX<br>KEMET ELECTRONICS<br>STC   |
| C22   | 1        | 0180-0229           | CAP-FXD 33uF +-10pct 10 V TA         | TAAB336K010<br>T110B336K010AS<br>TAAB33K10RX   | AVX<br>KEMET ELECTRONICS<br>STC   |
| C23,C24,C30,C31,C36,<br>C109,C116-118                       | 9        | 0180-0291           | CAP-FXD 1uF +-10pct 35 V TA          | TAAA105K035<br>T110A105K035AS<br>TAAA1R0K35RX  | AVX<br>KEMET ELECTRONICS<br>STC   |
| C26   | 1        | 0180-3899           | CAP-FXD 220uF +-20pct 50 V AL-ELCTLT | TVX1H221MCD  | NICHICON  |
| C27-29  | 3        | 0180-3906           | CAP-FXD 100uF +-20pct 50 V AL-ELCTLT | TVX1H101MAD  | NICHICON  |
| C3, C4  | 2        | 0160-7798           | CAP-FXD 0.1uF +-10PCT 50V CER X7R    | 08055C104KAT_A<br>C0805C104K5RAC<br>C2012X7R1H104K<br>GRM21BR71H104KA11L<br>NMC0805X7R104K50TRP<br>VJ0805Y104KXAMT | AVX<br>KEMET ELECTRONICS<br>TDK<br>MURATA MANUFACTURING<br>NIC COMPONENTS<br>VISHAY |

| Reference Designator                    | Quantity | Agilent Part Number | Description                                 | MPN  | Manufacturer  |
|---|----------|---------------------|---|--|---|
| C32,C34                                 | 2        | 0160-4822           | CAP-FXD 1000pF +-5pct 100 V CER C0G         | C420C102J1G5CA<br>SA201A102JAAH<br>SA201A102JAAH | KEMET ELECTRONICS<br>AVX<br>KYOCERA   |
| C33                                     | 1        | 0160-4832           | CAP-FXD 0.01uF +-10pct 100 V CER X7R        | C410C103K1R5CA<br>SA101C103KAAH<br>SA101C103KAAH | KEMET ELECTRONICS<br>AVX<br>KYOCERA   |
| C38                                     | 1        | 0180-0376           | CAP-FXD 0.47uF +-10pct 35 V TA              | T110A474K035AS<br>TAAA0R47K35RX                  | KEMET ELECTRONICS<br>STC  |
| C8,C122                                 | 2        | 0160-4801           | CAP-FXD 100pF +-5pct 100 V CER C0G          | C410C101J1G5CA<br>SA102A101JAAH<br>SA102A101JAAH | KEMET ELECTRONICS<br>AVX<br>KYOCERA   |
| CR102                                   | 1        | 0837-0268           | VOLTAGE SUPPRESSOR RMS VOLTAGE=300V,DC      | V300LA4  | WAVECOM   |
| CR104,CR108,CR113,CR114                 | 4        | 1901-0880           | DIODE-GEN PRP 200MA DO-35                   | FDH300   | FAIRCHILD SEMICONDUCTOR   |
| CR105,CR106,CR111,CR112                 | 4        | E1326-62501         | DIODE                                       |  |   |
|   | 1        | 1901-0880           | DIODE-GEN PRP 200MA DO-35                   | FDH300   | FAIRCHILD SEMICONDUCTOR   |
| CR107                                   | 1        | 1901-0849           | DIODE-PWR RECT 1N4007 1KV 1A DO-41          | 1N4007<br>1N4007                                 | SOLID STATE DEVICES<br>VISHAY   |
| CR109-110                               | 2        | 1901-0535           | DIODE-SCHOTTKY SM SIG                       | 5082-2811<br>A2X356                              | AVAGO TECHNOLOGIES<br>FEI MICROWAVE   |
| CR115,116                               | 2        | 1902-0961           | DIODE-ZNR 13V 5pct DO-35 PD=.4W TC=+.082pct | 1N964B   | MICROSEMI   |
| CR1-5,CR46-17,CR101,<br>CR103,CR121-126 | 18       | 1901-1098           | DIODE-SWITCHING 1N4150 50V 200MA 4NS        | 1N4150<br>1N4150                                 | FAIRCHILD SEMICONDUCTOR<br>ROHM   |
| CR201                                   | 1        | 1990-0966           | LED-LAMP LUM-INT=3MCD IF=20MA-MAX BVR=5V    | HLMP-3507-D00B2                                  | AVAGO TECHNOLOGIES  |
| CR202                                   | 1        | 1990-1022           | LED-LAMP LUM-INT=5.4MCD IF=30MA-MAX         | HLMP-3301-F00B2                                  | AVAGO TECHNOLOGIES  |
| CR6                                     | 1        | 1902-0965           | DIODE-ZNR 20V 5pct DO-35 PD=.4W TC=+.092pct | 1N968B   | MICROSEMI   |
| CR7-12                                  | 6        | 1901-1065           | DIODE-PWR RECT 1N4936 400V 1A 200NS         | 1N4936RLG<br>1N4936<br>1N4936                    | ON SEMICONDUCTOR<br>ALL AMERICAN PRODUCTS<br>VISHAY                                 |
| E101-103                                | 3        | 5185-6741           | LTB OF 1970-0100                            |  |   |
|   | 1        | 1970-0100           | SURGE VOLTAGE PROTECTOR                     |  |   |
| F1,F2                                   | 2        | 2110-0712           | FUSE-SUBMINIATURE 4A 125V NTD AX            | 0251004.   | LITTELFUSE  |
| J102                                    | 1        | 1252-3712           | CONN-POST TYPE .100-PIN-SPCG-MTG-END        | 68668-004  | FCI FRAMATOME BERG  |
| J103                                    | 1        | 1252-3416           | CONN-POST TYPE .100-PIN-SPCG-MTG-END        | 70553-0108                                       | MOLEX   |
| J2, 301                                 | 2        | 1250-1846           | CONNECTOR-RF BNC FEMALE PC-W-STDFS          | 5413631-2<br>28JR342-1<br>31-5507                | TYCO ELECTRONICS AMP<br>FCI FRAMATOME BERG<br>AMPHENOL                              |
| JM1, 3                                  | 2        | 1251-4927           | CONN-HDR VERT 16-PIN 2.54 MM 2 ROW          | 67997-116HLF                                     | FCI FRAMATOME BERG  |
| K104, 105                               | 2        | 0490-1556           | RELAY-REED                                  | 3500-0050  | COTO WABASH   |
| K106                                    | 1        | 0490-1555           | RELAY-REED                                  | 3500-0051  | COTO WABASH   |
| L101                                    | 1        | 9140-0129           | INDUCTOR RF-CH-MLD 220uH +-5pct             | 1537-92<br>15M223J<br>9210-92<br>IM-4 220UH 5%   | AMERICAN PRECISION INDUSTRIES<br>GOWANDA ELECTRONICS<br>ARROW ELECTRONICS<br>VISHAY |
| L1-3                                    | 3        | 9140-1389           | IDCTR-FXD 220uH +-15PCT 0.27W-INX0.7L-IN    | RL-1284-220<br>IHD-1 220UH 15%                   | RENCO ELECTRONICS<br>VISHAY   |
| MP1                                     | 1        | 0050-2183           | CASTING-ZN P.C. BOARD HOLDER                | 20827-074  | PENTAIR   |
| MP1                                     | 1        | E1411-26522         | PC Board                                    |  |   |



| Reference Designator    | Quantity | Agilent Part Number | Description                                     | MPN  | Manufacturer   |
|-------------------------|----------|---------------------|---|--|--|
| MP2                     | 1        | 0361-1295           | RIVET-SEMITUB OVH .095DIA .406LG ; RIVET-SEMITU | 0361-1295<br>0361-1295                                     | CHICAGO RIVET & MACHINE<br>NATIONAL RIVET & MFG                |
| MP7-9                   | 3        | 0590-1076           | THREADED INSERT-NUT M3 X 0.5 1.5-MM-LG          | HCN-M3-2-STAINLESS STEEL<br>KFS2-M3                        | TR FASTENINGS<br>PENN ENGINEERING & MFG                        |
| P1                      | 1        | 1252-1596           | CONN-POST TYPE 2.54-PIN-SPCG-MTG-END            | 10-8557-096-002-025<br>536010-5<br>DIN-96CPC-SRI-TR        | KYOCERA<br>TYCO ELECTRONICS AMP<br>3M                          |
| P1, P2, P3              | 3        | 1253-5003           | CONN-ADAPTOR PLUG 2-ROW 8-PINS .300-SP          | 142-90-308-00-591100                                       | MILL-MAX   |
| P2                      | 1        | 1252-4743           | CONN-POST TYPE 2.54-PIN-SPCG-MTG-END            | 5536011-5<br>10-8557-096-002-026                           | TYCO ELECTRONICS AMP<br>KYOCERA                                |
| P3                      | 1        | 1258-0247           | JUMPER 4 POSITIONS; HOUSING MATERIAL            | 69146-204LF  | FCI FRAMATOME BERG   |
| PCB1                    | 1        | E1411-26521         | PC BOARD, ETCHED (PWB)                          | E1411-26521  | AGILENT TECHNOLOGIES   |
| Q1, 4, 5                | 3        | 1854-1028           | TRANSISTOR NPN SI TO-92 PD=625MW                | 2N3904   | ROHM   |
| Q101                    | 1        | 5188-2519           | LTB FOR 1853-0563                               |  |  |
|                         | 1        | 1853-0563           | TRANSISTOR PNP SI TO-92 PD=625MW                |  |  |
| Q102, 109, 110          | 3        | 1855-0414           | TRANSISTOR J-FET 2N4393 N-CHAN D-MODE           | 1855-0414<br>2N4393  | SOLITRON<br>VISHAY   |
| Q103, 108, 112          | 3        | 1855-0437           | TRANSISTOR J-FET P-CHAN D-MODE TO-92            | 1855-0437<br>J270  | VISHAY<br>FAIRCHILD SEMICONDUCTOR                              |
| Q104-107                | 4        | 1853-0510           | TRANSISTOR PNP SI TO-92 PD 625MW FT 200MHZ      | CEN1122<br>SPS8342   | CENTRAL SEMICONDUCTOR<br>ON SEMICONDUCTOR                      |
| Q2, 3                   | 2        | 1855-0518           | TRANSISTOR MOSFET N-CHAN E-MODE SI              | IRFD110  | INTERNATIONAL RECTIFIER  |
| R1,R14,R21-23,R142,R143 | 7        | 0757-0280           | RESISTOR 1K +-1pct .125W TF TC=0+-100           | 5053HD1K000F<br>CMF-551001FT-1<br>NK4H.125W1%+/-100PPM1001 | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS             |
| R102,109                | 2        | 0699-0059           | RESISTOR 5K +-0.1pct .1W TF TC=0+-5             | PR1/10TC55K0.1%<br>PTF-565K0BT-16<br>UXBA5K0000B           | PRECISION RESISTIVE PRODUCTS<br>VISHAY<br>VISHAY BC COMPONENTS |
| R105,R106,R114          | 3        | 0757-0437           | RESISTOR 4.75K +-1pct .125W TF TC=0+-100        | 5053HD4K750F<br>CMF-554751FT-1<br>NK4H.125W1%+/-100PPM4751 | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS             |
| R107                    | 1        | 0757-0441           | RESISTOR 8.25K +-1pct .125W TF TC=0+-100        | 5053HD8K250F<br>CMF-558251FT-1<br>NK4H.125W1%+/-100PPM8251 | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS             |
| R108                    | 1        | 0698-6414           | RESISTOR 1K +-0.1pct .1W TF TC=0+-5             | PR 1/10T51K0.1%<br>PTF-561K0BT-16<br>UXB0207-05 0,1% RP 1K | PRECISION RESISTIVE PRODUCTS<br>VISHAY<br>VISHAY BC COMPONENTS |

| Reference Designator     | Quantity | Agilent Part Number | Description                                  | MPN   | Manufacturer   |
|--------------------------|----------|---------------------|--|---|--|
| R110                     | 1        | 0698-6407           | RESISTOR 32.8K +-0.1pct .1W TF TC=0+4        | 232214191517<br>PR1/10TC432K8.1%<br>PTF-5632K8B                             | VISHAY BC COMPONENTS<br>PRECISION RESISTIVE PRODUCTS<br>VISHAY |
| R113                     | 1        | 0698-3158           | RESISTOR 23.7K +-1pct .125W TF TC=0+-100     | 5053HD23K70F<br>CMF-552372FT-1<br>NK4H.125W1%+/-100PPM2372                  | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS             |
| R115                     | 1        | 0757-0464           | RESISTOR 90.9K +-1pct .125W TF TC=0+-100     | 5053HD90K90F<br>CMF-559092FT-1<br>NK4H.125W1%+/-100PPM9092                  | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS             |
| R116                     | 1        | 0757-0462           | RESISTOR 75K +-1pct .125W TF TC=0+-100       | 5053HD75K00F<br>CMF-557502FT-1<br>CRB25-FX-7502<br>NK4H.125W1%+/-100PPM7502 | VISHAY BC COMPONENTS<br>VISHAY<br>ROHM<br>E-SIL COMPONENTS     |
| R117                     | 1        | 0698-6963           | RESISTOR 5.55K +-0.1pct .125W TF TC=0+-25    | B0207E5K550B<br>CMF-555551BT-9  | VISHAY BC COMPONENTS<br>VISHAY                                 |
| R118                     | 1        | 0698-4501           | RESISTOR 59K +-1pct .125W TF TC=0+-100       | 5053HD59K00F<br>CMF-555902FT-1<br>NK4H.125W1%+/-100PPM5902                  | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS             |
| R119                     | 1        | 0698-6364           | RES-FXD 50 OHM +-0.1PCT 0.125W TC 0+-25 0207 | CMF-5550R0BT-9<br>MBB0207-25 0.1%_50R                                       | VISHAY<br>VISHAY BC COMPONENTS                                 |
| R12                      | 1        | 0757-0281           | RESISTOR 2.74K +-1pct .125W TF TC=0+-100     | 5053HD2K740F<br>CMF-552741FT-1<br>NK4H.125W1%+/-100PPM2741                  | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS             |
| R120                     | 1        | 0698-8827           | RESISTOR 1M +-1pct .125W TF TC=0+-100        | 5053HD1M000F<br>CMF-551004FT-1  | VISHAY BC COMPONENTS<br>VISHAY                                 |
| R121,R122,R136,R154,R155 | 5        | 0698-3279           | RESISTOR 4.99K +-1pct .125W TF TC=0+-100     | 5053HD4K990F<br>CMF-554991FT-1<br>NK4H.125W1%+/-100PPM4991                  | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS             |
| R124,R131,R174-176       | 5        | 0757-0465           | RESISTOR 100K +-1pct .125W TF TC=0+-100      | 5053HD100K0F<br>CMF-551003FT-1<br>NK4H.125W1%+/-100PPM1003                  | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS             |

| Reference Designator     | Quantity | Agilent Part Number | Description                               | MPN   | Manufacturer   |
|--------------------------|----------|---------------------|---|---|--|
| R125,R126,R137,R138,R173 | 5        | 0698-6360           | RES-FXD 10K +-0.1PCT 0.125W TC 0+-25 0207 | CMF-551002BT-9<br>MBO0207-25 0.1%__10K                                      | VISHAY<br>VISHAY BC COMPONENTS                                 |
| R128,R164,R165           | 3        | 0698-3558           | RESISTOR 4.02K +-1pct .125W TF TC=0+-100  | 5053HD4K020F<br>CMF-554021FT-1<br>CRB25-FX-4021<br>NK4H.125W1%+/-100PPM4021 | VISHAY BC COMPONENTS<br>VISHAY<br>ROHM<br>E-SIL COMPONENTS     |
| R129                     | 1        | 0757-0291           | RESISTOR 24.9 +-1pct .125W TF TC=0+-100   | 5053HD24R90F<br>CMF-5524R9FT-1<br>NK4H.125W1%+/-100PPM24R9                  | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS             |
| R13,R135,R170            | 3        | 0757-0283           | RESISTOR 2K +-1pct .125W TF TC=0+-100     | 5053HD2K000F<br>CMF-552001FT-1<br>NK4H.125W1%+/-100PPM2001                  | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS             |
| R130                     | 1        | 0757-0273           | RESISTOR 3.01K +-1pct .125W TF TC=0+-100  | 5053HD3K010F<br>CMF-553011FT-1<br>NK4H.125W1%+/-100PPM3011                  | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS             |
| R132                     | 1        | 0699-0448           | RESISTOR 4.02K +-0.1pct .1W TF TC=0+-5    | PR1/10T54K02.1%<br>PTF-564K02BT-16<br>UXB0207-05 0.1% RP 4.02K              | PRECISION RESISTIVE PRODUCTS<br>VISHAY<br>VISHAY BC COMPONENTS |
| R133,R134                | 2        | 0698-6620           | RESISTOR 150K +-0.1pct .125W TF TC=0+-25  | B0207E150K0B<br>CMF-551503BT-9  | VISHAY BC COMPONENTS<br>VISHAY                                 |
| R139                     | 1        | 0699-0121           | RESISTOR 2.05M +-1pct .125W TF TC=0+-100  | CMF-552054FT-1  | VISHAY   |
| R147,R148                | 2        | 0757-0435           | RESISTOR 3.92K +-1pct .125W TF TC=0+-100  | 5053HD3K920F<br>CMF-553921FT-1<br>CRB25-FX-3921<br>NK4H.125W1%+/-100PPM3921 | VISHAY BC COMPONENTS<br>VISHAY<br>ROHM<br>E-SIL COMPONENTS     |
| R152,153                 | 2        | 0698-3486           | RESISTOR 232 +-1pct .125W TF TC=0+-100    | 5053HD232R0F<br>CMF-552320FT-1<br>NK4H.125W1%+/-100PPM232R0                 | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS             |
| R156,R157                | 2        | 0698-4430           | RESISTOR 1.91K +-1pct .125W TF TC=0+-100  | 5053HD1K910F<br>CMF-551911FT-1<br>NK4H.125W1%+/-100PPM1911                  | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS             |

| Reference Designator                                       | Quantity | Agilent Part Number | Description                              | MPN   | Manufacturer   |
|--|----------|---------------------|--|---|--|
| R16,R149   | 2        | 0757-0401           | RESISTOR 100 +-1pct .125W TF TC=0+-100   | 5053HD100R0F<br>CMF-551000FT-1  | VISHAY BC COMPONENTS<br>VISHAY                             |
| R161, R163, R169   | 3        | 8159-0005           | RESISTOR 0 CWM                           | 106<br>L-2007-1<br>YZO 1/4<br>Z-25  | MICRO-OHM<br>GETTIG ENGRG & MFG<br>TT ELECTRONICS<br>ASJ   |
| R166,R167  | 2        | 0757-0443           | RESISTOR 11K +-1pct .125W TF TC=0+-100   | 5053HD11K00F<br>CMF-551102FT-1<br>NK4H.125W1%+/-100PPM1102                  | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS         |
| R17  | 1        | 0811-3056           | RESISTOR .24 +-5pct .5W PWI TC=0+-300    | SP-2-0R2-5%   | TT ELECTRONICS   |
| R171,R180,R181   | 3        | 0698-4211           | RESISTOR 158K +-1pct .125W TF TC=0+-100  | 5053HD158K0F<br>CMF-551583FT-1<br>NK4H.125W1%+/-100PPM1583                  | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS         |
| R18  | 1        | 0757-0449           | RESISTOR 20K +-1pct .125W TF TC=0+-100   | 5053HD20K00F<br>CMF-552002FT-1<br>CRB25-FX-2002<br>NK4H.125W1%+/-100PPM2002 | VISHAY BC COMPONENTS<br>VISHAY<br>ROHM<br>E-SIL COMPONENTS |
| R19,R150,R151  | 3        | 0698-3156           | RESISTOR 14.7K +-1pct .125W TF TC=0+-100 | 5053HD14K70F<br>CMF-551472FT-1<br>NK4H.125W1%+/-100PPM1472                  | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS         |
| R2,R3,R101,R103,R127,<br>R140,R141,R145,R146,<br>R178,R179 | 11       | 0757-0442           | RESISTOR 10K +-1pct .125W TF TC=0+-100   | 5053HD10K00F<br>CMF-551002FT-1<br>NK4H.125W1%+/-100PPM1002                  | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS         |
| R20  | 1        | 0698-4434           | RESISTOR 2.32K +-1pct .125W TF TC=0+-100 | 5053HD2K320F<br>CMF-552321FT-1<br>NK4H.125W1%+/-100PPM2321                  | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS         |
| R201,R206  | 2        | 0698-4525           | RESISTOR 187K +-1pct .125W TF TC=0+-100  | 5053HD187K0F<br>CMF-551873FT-1<br>NK4H.125W1%+/-100PPM1873                  | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS         |

| Reference Designator | Quantity | Agilent Part Number | Description                              | MPN  | Manufacturer   |
|----------------------|----------|---------------------|--|--|--|
| R203                 | 1        | 0757-0411           | RESISTOR 332 +-1pct .125W TF TC=0+-100   | 5053HD332R0F<br>CMF-553320FT-1<br>CRB25-FX-3320<br>NK4H.125W1%+/-100PPM332R0 | VISHAY BC COMPONENTS<br>VISHAY<br>ROHM<br>E-SIL COMPONENTS |
| R205                 | 1        | 0757-0421           | RESISTOR 825 +-1pct .125W TF TC=0+-100   | 5053HD825R0F<br>CMF-558250FT-1   | VISHAY BC COMPONENTS<br>VISHAY                             |
| R220                 | 1        | 0757-0410           | RESISTOR 301 +-1pct .125W TF TC=0+-100   | 5053HD301R0F<br>CMF-553010FT-1<br>NK4H.125W1%+/-100PPM301R0                  | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS         |
| R24                  | 1        | 0757-0384           | RESISTOR 20 +-1pct .125W TF TC=0+-100    | 5053HD20R00F<br>CMF-5520R0FT-1<br>NK4H.125W1%+/-100PPM20R0                   | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS         |
| R26,R204             | 2        | 0757-0407           | RESISTOR 200 +-1pct .125W TF TC=0+-100   | 5053HD200R0F<br>CMF-552000FT-1<br>CRB25-FX-2000<br>NK4H.125W1%+/-100PPM200R0 | VISHAY BC COMPONENTS<br>VISHAY<br>ROHM<br>E-SIL COMPONENTS |
| R28,123              | 2        | 0698-4394           | RESISTOR 76.8 +-1pct .125W TF TC=0+-100  | 5053HD76R80F<br>CMF-5576R8FT-1<br>NK4H.125W1%+/-100PPM76R8                   | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS         |
| R29,R177             | 2        | 0757-0453           | RESISTOR 30.1K +-1pct .125W TF TC=0+-100 | 5053HD30K10F<br>CMF-553012FT-1<br>CRB25-FX-3012<br>NK4H.125W1%+/-100PPM3012  | VISHAY BC COMPONENTS<br>VISHAY<br>ROHM<br>E-SIL COMPONENTS |
| R4                   | 1        | 0757-0428           | RESISTOR 1.62K +-1pct .125W TF TC=0+-100 | 5053HD1K620F<br>CMF-551621FT-1<br>NK4H.125W1%+/-100PPM1621                   | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS         |
| R5,R6,R8-11,R25,R104 | 8        | 0757-0415           | RESISTOR 475 +-1pct .125W TF TC=0+-100   | 5053HD475R0F<br>CMF-554750FT-1<br>NK4H.125W1%+/-100PPM475R0                  | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS         |

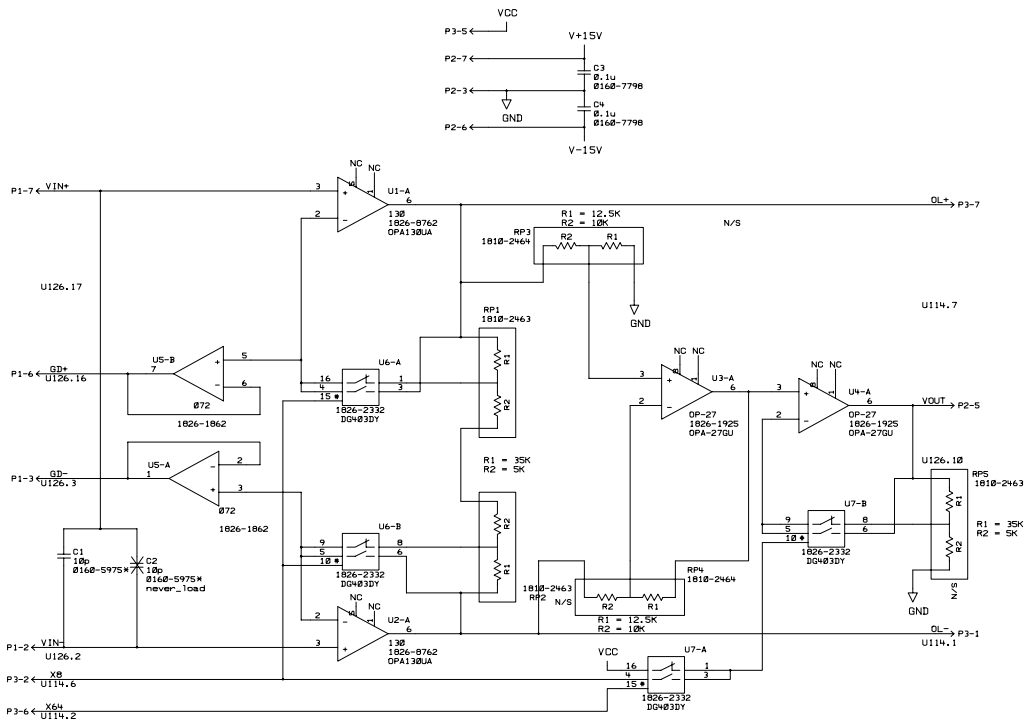
| Reference Designator | Quantity | Agilent Part Number | Description                                      | MPN  | Manufacturer   |
|----------------------|----------|---------------------|--|--|--|
| R7,R15,R27           | 3        | 0757-0433           | RESISTOR 3.32K +-1pct .125W TF TC=0+-100         | 5053HD3K320F<br>CMF-553321FT-1<br>NK4H.125W1%+/-100PPM3321 | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS               |
| RP1, RP2, RP5        | 3        | 1810-2463           | NET-RES 2 35.0K / 5.0K +-1PCT TC 0+-25 1206      | PFC-D1206-03-3502-5001-FB                                  | T T GROUP  |
| RP102                | 1        | 1810-1346           | NET-RES 2 156.25K OHM 9-PIN MULTI-VAL            | VTF340   | VISHAY   |
| RP107                | 1        | 1810-1348           | NET-RES 4 50.0K OHM 6-PIN MULTI-VAL              | VTF157   | VISHAY   |
| RP2-4, 103           | 4        | 1810-0280           | NET-RES 9 10.0K OHM 10-PIN                       | 750-101<br>MSP10A01-103G<br>4310R-94Y-103LF                | TT ELECTRONICS<br>VISHAY<br>BOURNS                               |
| RP3, RP4             | 2        | 1810-2464           | NET-RES 2 12.5K / 10K +-1PCT TC 0+-25            | PFC-UD1206-03-1252-1002-F-T-2                              | T T GROUP  |
| RVT3-6               | 4        | 0361-1294           | RIVET-SEMITUB OVH .098DIA .328LG ; RIVET-SEMITUB | 0361-1294<br>0361-1294                                     | CHICAGO RIVET & MACHINE<br>NATIONAL RIVET & MFG                  |
| SCR1-3               | 3        | 0515-0430           | SCREW-MACHINE ASSEMBLY M3 X 0.5 6MM-LG           | 0515-0430<br>0515-0430<br>0515-0430                        | ILLINOIS TOOL WORKS<br>PIONEER SCREW & NUT<br>TEXTRON            |
| SP1                  | 1        | 3101-3066           | SWITCH-DIP RKR 8-1A 0.15A 30VDC                  | 76Y22968ST   | GRAYHILL   |
| T1                   | 1        | 9100-4798           | TRANSFORMER-SWITCHING                            | 9100-4798  | DT MAGNETICS   |
| U1                   | 1        | 5188-2505           | LTB FOR 1820-6731                                |  |  |
|                      | 1        | 1820-6731           | IC-ASIC  |  |  |
| U1, U2               | 2        | 1826-8762           | IC OP AMP LP SINGLE 8 PIN PLSTC-SOIC             | OPA130UA   | TEXAS INSTRUMENTS  |
| U101,U112,U113       | 3        | 1826-0962           | IC OP AMP LOW-BIAS-H-IMPED DUAL 8 PIN            | LF412CN  | NATIONAL SEMICONDUCTOR   |
| U102                 | 1        | 1858-0069           | TRANSISTOR ARRAY 18-LEAD PLSTC DIP               | ULN2803A   | STMICROELECTRONICS   |
| U104                 | 1        | E1326-85532         | PRG PRT 80C51 (R                                 | E1326-85532  | INTEL  |
| U105                 | 1        | 1826-0893           | RMS/DC 10-METAL BPLR                             | AD536AJH (BURNED-IN)                                       | ANALOG DEVICES   |
| U106,U107            | 2        | 1820-3081           | IC FF CMOS/HC D-TYPE POS-EDGE-TRIG               | MM74HC74AN<br>SN74HC74N<br>MC74HC74ANG                     | FAIRCHILD SEMICONDUCTOR<br>TEXAS INSTRUMENTS<br>ON SEMICONDUCTOR |
| U11,U306             | 2        | 1820-2924           | IC GATE CMOS/HC NOR QUAD 2-INP                   | MM74HC02N<br>SN74HC02N<br>MC74HC02ANG                      | FAIRCHILD SEMICONDUCTOR<br>TEXAS INSTRUMENTS<br>ON SEMICONDUCTOR |
| U111                 | 1        | 1820-3692           | IC ANLG-MUXR/DEMURX CMOS/HC 2-CHANNEL            | 74HC4053N<br>MC74HC4053N<br>74HC4053N                      | PHILIPS<br>ON SEMICONDUCTOR<br>NXP                               |
| U111,U112            | 2        | 0757-0472           | RESISTOR 200K +-1pct .125W TF TC=0+-100          | 5053HD200K0F<br>CMF-552003FT-1<br>NK4H.125W1%+/-100PPM2003 | VISHAY BC COMPONENTS<br>VISHAY<br>E-SIL COMPONENTS               |
| U115                 | 1        | 1826-0635           | IC OP AMP LOW-OFS 8 PIN DIP-P                    | OP-07CN8<br>OP-07CP  | LINEAR TECHNOLOGY<br>ANALOG DEVICES                              |
| U116                 | 1        | 1820-3350           | IC MUXR/DATA-SEL CMOS/HC 4-TO-1-LINE             | SN74HC153N   | TEXAS INSTRUMENTS  |

| Reference Designator | Quantity | Agilent Part Number | Description                             | MPN  | Manufacturer  |
|----------------------|----------|---------------------|---|--|---|
| U117                 | 1        | 1826-1265           | IC OP AMP WB 8 PIN DIP-P                | LT318AN8 (SELECTED)                                | LINEAR TECHNOLOGY   |
| U118                 | 1        | 1826-0065           | IC COMPARATOR PRCN 8 PIN DIP-P          | LM311N<br>LM311P                                   | NATIONAL SEMICONDUCTOR<br>TEXAS INSTRUMENTS                   |
| U119                 | 1        | 1826-1178           | IC OP AMP HS DIP-C                      | HA1-5320-5   | INTERSIL  |
| U12,U304,U305        | 3        | 1820-4057           | IC BFR TTL/F NAND QUAD 2-INP            | 74F38N<br>N74F38N                                  | PHILIPS<br>NXP  |
| U120                 | 1        | 5188-2514           | LTB FOR 1826-1951                       |  |   |
|                      | 1        | 1826-1951           | A/D 16-BIT BPLR 28-PDIP                 |  |   |
| U121                 | 1        | 1826-1086           | ANALOG SWITCH 4 SPST 16 -DIP-P          | SW-06GP  | ANALOG DEVICES  |
| U122                 | 1        | 1820-3177           | IC MUXR/DATA-SEL CMOS/HC 2-TO-1-LINE    | MM74HC157N<br>MC74HC157ANG                         | FAIRCHILD SEMICONDUCTOR<br>ON SEMICONDUCTOR                   |
| U123                 | 1        | 1826-0639           | D/A 8-BIT 16-PLASTIC CMOS               | AD7524JN   | ANALOG DEVICES  |
| U124                 | 1        | 1826-1366           | ANALOG MULTIPLEXER 4 CHNL 16 -CERDIP    | HI1-0539-5   | INTERSIL  |
| U125                 | 1        | 1826-0138           | IC COMPARATOR GP QUAD 14 PIN DIP-P      | LM339N<br>LM339N                                   | NATIONAL SEMICONDUCTOR<br>TEXAS INSTRUMENTS                   |
| U126                 | 1        | E1411-66522         | PCA, daughter board                     | E1411-66522<br>E1411-66522                         | AGILENT TECHNOLOGIES EXT<br>VIEW<br>CELESTICA                 |
| U127,133             | 2        | 1826-0412           | IC COMPARATOR PRCN DUAL 8 PIN DIP-P     | LM393N   | NATIONAL SEMICONDUCTOR  |
| U13,U110             | 2        | 1820-2921           | IC INV CMOS/HC HEX                      | MM74HC04N<br>MC74HC04ANG                           | FAIRCHILD SEMICONDUCTOR<br>ON SEMICONDUCTOR                   |
| U132                 | 1        | 1826-1431           | IC PWR MGT-V-REF-FXD 4.9975/5.0025V 8   | LT1021CCN8-5                                       | LINEAR TECHNOLOGY   |
| U14,U35              | 2        | 1820-3975           | IC DRVR CMOS/HC LINE OCTL               | SN74HC541N   | TEXAS INSTRUMENTS   |
| U15,U16              | 2        | 5041-6300           | LTB OF 1820-5789                        |  |   |
|                      | 1        | 1820-5789           | IC TRANSCEIVER TTL/F BUS OCTL           |  |   |
| U17                  | 1        | 5188-2533           | LTB FOR 1818-3938                       |  |   |
|                      | 1        | 1818-3938           | IC 1K-BIT EEPROM 4-US NMOS              |  |   |
| U18                  | 1        | 1990-0545           | OPTO-ISOLATOR LED-PDIO/XSTR IF=40MA-MAX | 6N139-000E   | AVAGO TECHNOLOGIES  |
| U19,U20              | 2        | 1990-0429           | OPTO-ISOLATOR LED-IC GATE IF 10MA-MAX   | 6N137  | AVAGO TECHNOLOGIES  |
| U2                   | 1        | 1820-3298           | IC GATE CMOS/HC OR QUAD 2-INP           | MM74HC32N<br>MC74HC32ANG                           | FAIRCHILD SEMICONDUCTOR<br>ON SEMICONDUCTOR                   |
| U201                 | 1        | 1820-3673           | IC MV CMOS/HC MONOSTBL RETRIG DUAL      | MM74HC123AN<br>TC74HC123P                          | FAIRCHILD SEMICONDUCTOR<br>TOSHIBA                            |
| U202                 | 1        | 1820-3297           | IC DRVR CMOS/HC BUS OCTL                | 74HC244N<br>MM74HC244N<br>MC74HC244ANG<br>74HC244N | PHILIPS<br>FAIRCHILD SEMICONDUCTOR<br>ON SEMICONDUCTOR<br>NXP |
| U23                  | 1        | E1411-85511         | PRG PRT 80C51 (R                        | P87C51 (L/L 1820-5996)                             | INTEL   |
| U24, 109             | 2        | 5969-5413           | LTB OF 1813-0661                        |  |   |
|                      | 1        | 1813-0661           | CRYSTAL OSC 12.000MHZ 0.01pct           |  |   |

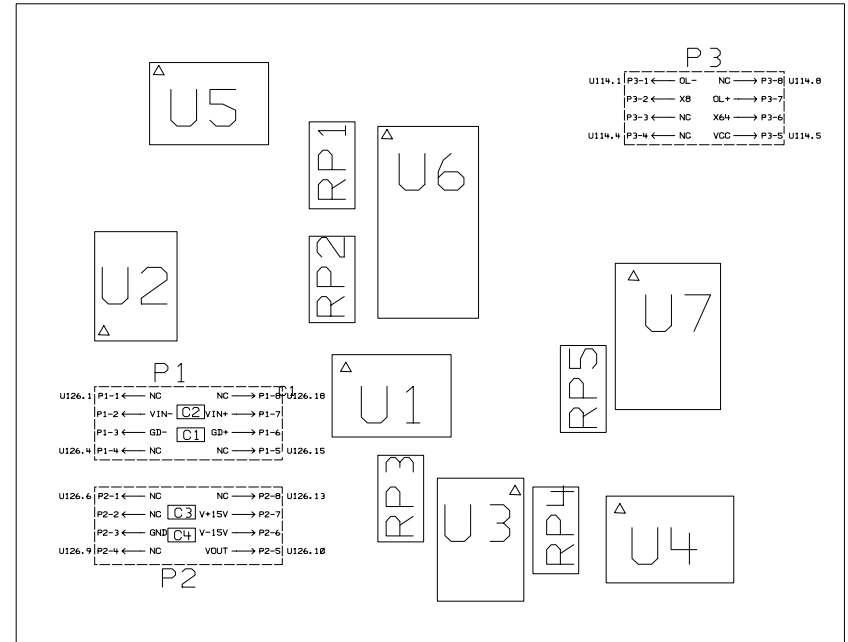
| Reference Designator | Quantity | Agilent Part Number | Description                                 | MPN  | Manufacturer   |
|----------------------|----------|---------------------|---|--|--|
| U25,U26              | 2        | 5063-1434           | LTB OF 1820-4084                            |  |  |
|                      | 1        | 1820-4084           | IC DCDR-DEMUXR CMOS/HC BIN 1-TO-8-LINE      |  |  |
| U27,U28,U128,U129    | 4        | 1820-3344           | IC SHF-RGTR CMOS/HC SYNC/ASYNCHRO SERIAL-IN | MC74HC595ANG                                     | ON SEMICONDUCTOR   |
| U29                  | 1        | 1820-6254           | IC FIFO CMOS ASYNCHRO 4608-BIT              | IDT7201LA50TP                                    | IDT  |
| U3                   | 1        | 1820-3146           | IC FF CMOS/HC D-TYPE POS-EDGE-TRIG COM      | MC74HC175ANG                                     | ON SEMICONDUCTOR   |
| U3, U4               | 2        | 1826-1925           | IC OP AMP LOW-NOISE SINGLE 8 PIN            | OP-27GS<br>OPA27GU/ _E4                          | ANALOG DEVICES<br>TEXAS INSTRUMENTS                              |
| U30                  | 1        | 1820-6475           | IC FIFO CMOS ASYNCHRO 4608-BIT              |  |  |
| U301,U302            | 2        | 1820-4086           | IC FF CMOS/HCT D-TYPE POS-EDGE-TRIG COM     | 74HCT273N<br>74HCT273N                           | PHILIPS<br>NXP   |
| U303                 | 1        | 1820-2936           | IC MUXR/DATA-SEL TTL/F 8-TO-1-LINE          | 74F151APC  | FAIRCHILD SEMICONDUCTOR  |
| U32-34,U108          | 4        | 1820-3789           | IC FF CMOS/HC D-TYPE POS-EDGE-TRIG COM      | MM74HC574N<br>MC74HC574ANG                       | FAIRCHILD SEMICONDUCTOR<br>ON SEMICONDUCTOR                      |
| U36,U307             | 2        | 1820-4583           | IC GATE CMOS/HCT AND QUAD 2-INP             | SN74HCT08  | TEXAS INSTRUMENTS  |
| U37,U38,U47          | 3        | 1820-3173           | IC FF CMOS/HC J-K NEG-EDGE-TRIG             | 74HC112N<br>SN74HC112N<br>74HC112N               | PHILIPS<br>TEXAS INSTRUMENTS<br>NXP                              |
| U4,U5                | 2        | 1820-3631           | IC COMPTN CMOS/HCT MAGTD 8-BIT              | 74HCT688N<br>MM74HCT688N<br>74HCT688N            | PHILIPS<br>FAIRCHILD SEMICONDUCTOR<br>NXP                        |
| U41                  | 1        | 1826-0122           | IC PWR MGT-V-REG-FXD-POS 4.8/5.2V TO-220    | LM340T-5<br>MC7805CTG                            | NATIONAL SEMICONDUCTOR<br>ON SEMICONDUCTOR                       |
| U42                  | 1        | 1826-0106           | IC PWR MGT-V-REG-FXD-POS 14.4/15.6V         | LM340T-15  | NATIONAL SEMICONDUCTOR   |
| U43                  | 1        | 1826-0214           | IC PWR MGT-V-REG-FXD-NEG -14.4/-15.6V       | MC7915CTG  | ON SEMICONDUCTOR   |
| U44                  | 1        | 5188-2512           | LTB FOR 1826-0428                           |  |  |
|                      | 1        | 1826-0428           | IC PWR MGT-V-REG-SWG 1/40V 16 PINS DIP-C    | SG3524J  | MICROSEMI  |
| U45,203              | 2        | 1820-4569           | IC DRVR CMOS/HC LINE OCTL                   | MM74HC540N<br>MC74HC540ANG                       | FAIRCHILD SEMICONDUCTOR<br>ON SEMICONDUCTOR                      |
| U46                  | 1        | 1826-1973           | IC MISC 3 PIN TO-226AA                      | MC34064P-5RAG                                    | ON SEMICONDUCTOR   |
| U48                  | 1        | 1820-3794           | IC CNTR CMOS/HC BIN UP/DOWN SYNCHRO         | 74HC191N<br>MM74HC191N<br>SN74HC191N<br>74HC191N | PHILIPS<br>FAIRCHILD SEMICONDUCTOR<br>TEXAS INSTRUMENTS<br>NXP   |
| U5                   | 1        | 1826-1862           | IC OP AMP LOW-BIAS-H-IMPD DUAL 8-SOIC       | TL072CD<br>TL072CD                               | STMICROELECTRONICS<br>TEXAS INSTRUMENTS                          |
| U6                   | 1        | 1820-4147           | IC LCH CMOS/HCT TRANSPARENT OCTL            | CD74HCT573E<br>MM74HCT573N<br>MC74HCT573ANG      | TEXAS INSTRUMENTS<br>FAIRCHILD SEMICONDUCTOR<br>ON SEMICONDUCTOR |
| U6, U7               | 2        | 1826-2332           | ANALOG SWITCH 2 SPDT 16 -P-SOIC             | DG403DY-E3                                       | VISHAY   |



| Reference Designator | Quantity | Agilent Part Number | Description                                    | MPN  | Manufacturer   |
|----------------------|----------|---------------------|--|--|--|
| U7                   | 1        | 1820-4242           | IC SCHMITT-TRIG CMOS/HCT INV HEX               | CD74HCT14E                                     | TEXAS INSTRUMENTS  |
| U8,U40               | 2        | 1820-2922           | IC GATE CMOS/HC NAND QUAD 2-INP                | 74HC00N<br>MM74HC00N<br>MC74HC00ANG<br>74HC00N | PHILIPS<br>FAIRCHILD SEMICONDUCTOR<br>ON SEMICONDUCTOR<br>NXP      |
| U9,U10               | 2        | 1820-3079           | IC DCDR-DEMUXR CMOS/HC BIN 3-TO-8-LINE 16-PDIP | MM74HC138N<br>MC74HC138ANG                     | FAIRCHILD SEMICONDUCTOR<br>ON SEMICONDUCTOR                        |
| XU124                | 1        | 1200-0607           | SOCKET-IC-DIP 16-CONT DIP DIP-SLDR             | 1-390261-4<br>DILB16P-223T<br>1200-0607        | TYCO ELECTRONICS AMP<br>FCI FRAMATOME BERG<br>AGILENT TECHNOLOGIES |
|                      | 1        | 7121-5729           | LBL-LNE-PTR; 1.5-IN-WD X .25-IN-LG             | THT-45-457-10                                  | BRADY  |



| Power Supplies |       |       |     |     |
|----------------|-------|-------|-----|-----|
|                | V+    | V-    | VL  | COM |
| U1             | V+15V | V-15V |     |     |
| U2             | V+15V | V-15V |     |     |
| U3             | V+15V | V-15V |     |     |
| U4             | V+15V | V-15V |     |     |
| U5             | V+15V | V-15V |     |     |
| U6             | V+15V | V-15V | VCC | GND |
| U7             | V+15V | V-15V | VCC | GND |



Note: P1, P2, and P3 are loaded on the backside, but the pins are numbered like top side components. P1 & P2 plug into location U126 on the base board. P3 plugs into location U114 on the base board.

**Agilent E1411B  
VXI C-Size 5 1/2 Digit DMM  
PWA Daughter Board**

**E1411-66522 PC Assembly Parts List**

| Reference Designator | Quantity | Part Number | Description                                 | MPN  | Manufacturer  |
|----------------------|----------|-------------|---|--|---|
| C1                   | 1        | 0160-5975   | CAP-FXD 10pF +-5pct 50 V CER C0G            | 08055A100JAT A<br>C0805C100J5GAC<br>GRM2165C1H100JD01D   | AVX<br>KEMET ELECTRONICS<br>MURATA MANUFACTURING                                    |
| C3, C4               | 2        | 0160-7798   | CAP-FXD 0.1uF +-10PCT 50V CER X7R           | 08055C104KAT_A<br>C0805C104K5RAC<br>C2012X7R1H104K<br>GRM21BR71H104KA11L<br>NMC0805X7R104K50TRP<br>VJ0805Y104KXAMT | AVX<br>KEMET ELECTRONICS<br>TDK<br>MURATA MANUFACTURING<br>NIC COMPONENTS<br>VISHAY |
| MP1                  | 1        | E1411-26522 | PC Board                                    |  |   |
| P1, P2, P3           | 3        | 1253-5003   | CONN-ADAPTOR PLUG 2-ROW 8-PINS .300-SP      | 142-90-308-00-591100   | MILL-MAX  |
| RP1, RP2, RP5        | 3        | 1810-2463   | NET-RES 2 35.0K / 5.0K +-1PCT TC 0+-25 1206 | PFC-D1206-03-3502-5001-FB  | T T GROUP   |
| RP3, RP4             | 2        | 1810-2464   | NET-RES 2 12.5K / 10K +-1PCT TC 0+-25       | PFC-UD1206-03-1252-1002-F-T-2  | T T GROUP   |
| U1, U2               | 2        | 1826-8762   | IC OP AMP LP SINGLE 8 PIN PLSTC-SOIC        | OPA130UA   | TEXAS INSTRUMENTS   |
| U3, U4               | 2        | 1826-1925   | IC OP AMP LOW-NOISE SINGLE 8 PIN            | OP-27GS<br>OPA27GU/ E4   | ANALOG DEVICES<br>TEXAS INSTRUMENTS   |
| U5                   | 1        | 1826-1862   | IC OP AMP LOW-BIAS-H-IMPED DUAL 8-SOIC      | TL072CD<br>TL072CD   | STMICROELECTRONICS<br>TEXAS INSTRUMENTS   |
| U6, U7               | 2        | 1826-2332   | ANALOG SWITCH 2 SPDT 16 -P-SOIC             | DG403DY-E3   | VISHAY  |

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