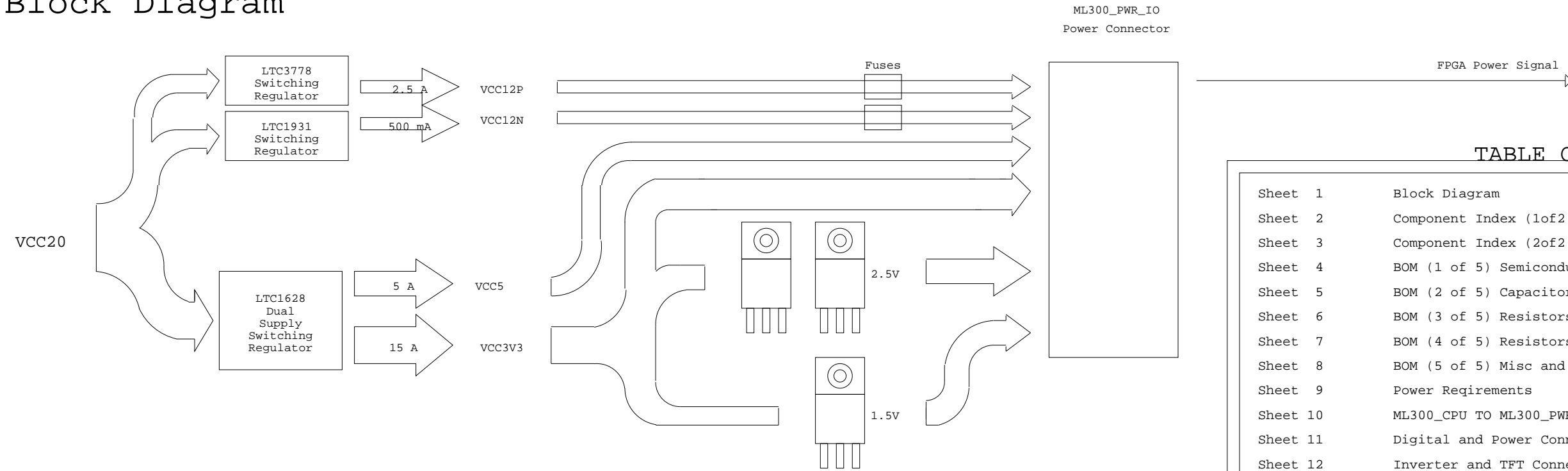
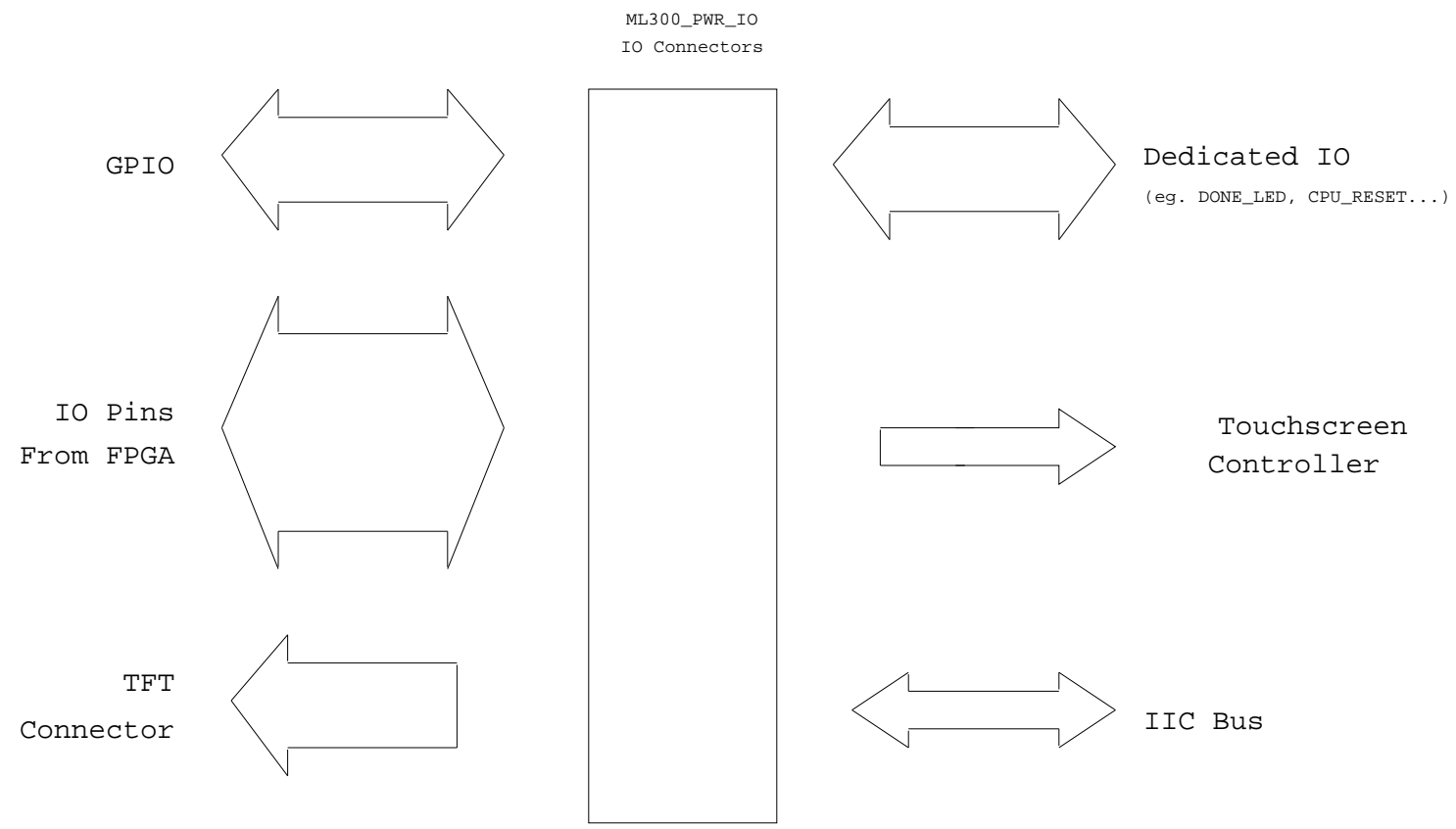


# ML300\_PWR\_IO Board Block Diagram



## TABLE OF CONTENTS

|          |  |
|----------|--|
| Sheet 1  | Block Diagram                          |
| Sheet 2  | Component Index (1of2)                 |
| Sheet 3  | Component Index (2of2)                 |
| Sheet 4  | BOM (1 of 5) Semiconductors            |
| Sheet 5  | BOM (2 of 5) Capacitors and Connectors |
| Sheet 6  | BOM (3 of 5) Resistors (partial)       |
| Sheet 7  | BOM (4 of 5) Resistors (partial)       |
| Sheet 8  | BOM (5 of 5) Misc and DNP              |
| Sheet 9  | Power Requirements                     |
| Sheet 10 | ML300_CPU TO ML300_PWR_IO Pin Mapping  |
| Sheet 11 | Digital and Power Connectors           |
| Sheet 12 | Inverter and TFT Connectors            |
| Sheet 13 | Touchscreen Controller                 |
| Sheet 14 | IIC Bus                                |
| Sheet 15 | GPIO1 Switches Transceiver/Register    |
| Sheet 16 | GPIO1 LED Transceiver/Register         |
| Sheet 17 | GPIO1 Buttons and Switches             |
| Sheet 18 | GPIO1, Bus Error, Status LEDs          |
| Sheet 19 | GPIO2/Test Port LEDs and Headers       |
| Sheet 20 | Power Supply Stand-By Logic            |
| Sheet 21 | +12V and -12V Switching Regulators     |
| Sheet 22 | 3.3V and 5V Switching Regulator        |
| Sheet 23 | 2.5V Linear Regulators                 |
| Sheet 24 | 1.5V Linear Regulator                  |
| Sheet 25 | Power Monitor LEDs                     |
| Sheet 26 | Prototyping Area (1 of 2)              |
| Sheet 27 | Prototyping Area (2 of 2)              |
| Sheet 28 | Fiducials, Mounting Holes, GND Turrets |



|  |             |   |
|--|-------------|---|
|  |             | PCB 1280286<br>ASM 0431195<br>SCH 0381136 |
| Title: ML300_PWR_IO<br>ML300 Power I/O Block Diagram |             |   |
| Date: October 17th, 2002                             | Ver: 1.00   |   |
| Sheet Size: B  | Rev: A      |   |
| Sheet 1 of 28  | Drawn By BF |   |

## Int. Circuit Index (U\*)

| Ref Des | PG | Manufacturer's Part Number | Part Description                          |
|---------|----|----------------------------|---|
| U1      | 13 | ADS7846E                   | Touchscreen A/D Converter                 |
| U4      | 14 | MAX6683                    | IIC Power Monitor for 1.5V - 5V           |
| U3      | 14 | DS1845                     | II Trimpot for TFT Bright and Tchsrm Sens |
| U4      | 14 | MAX6652                    | IIC Power Monitor for 2.5V - 12V          |
| U5      | 15 | 74AVC16646                 | GPIO Bi-Dir Registers                     |
| U6      | 16 | 74AVC16646                 | GPIO Bi-Dir Registers                     |
| U7      | 20 | 74HCT20_SINGLE             | Soft Power Switch 4-Input NAND Gate       |
| U8      | 20 | 74HC14_SINGLE              | Soft Power Switch Schmitt Inverter        |
| U9      | 20 | 74HCT20_SINGLE             | Soft Power Switch 4-Input NAND Gate       |
| U10     | 20 | 74HC74_SINGLE              | Soft Power Switch Flip-Flop               |
| U11     | 20 | LT1963ES8                  | 3.3V Standby Linear Regulator             |
| U12     | 20 | 74ALVC125                  | Soft Power Switch Buffer for Regulators   |
| U13     | 21 | LTC3778                    | 12V Switching Regulator                   |
| U14     | 21 | LT1931                     | -12V Inverting Switching Regulator        |
| U15     | 22 | LTCL628                    | 3.3V and 5V Switching Regulator           |
| U16     | 23 | LT1764EQ                   | 2.5V Linear Regulator                     |
| U17     | 23 | LT1764EQ                   | 2.5V Linear Regulator                     |
| U18     | 23 | LT1366                     | Op-Amp for 2.5V Load Balancing            |
| U19     | 24 | LT1085                     | 1.65V Linear Regulator                    |
| U20     | 25 | LM339                      | FET for Driving LED                       |
| U21     | 25 | LM339                      | FET for Driving LED                       |
| U22     | 25 | LM339                      | FET for Driving LED                       |
| U23     | 25 | LM2937IMP-15               | 15V Standby Linear Regulator              |
| U24     | 14 | X1226                      | IIC Real Time Clock                       |
| U25     | 25 | LM2937IMP-15               | 5V Standby Linear Regulator               |

## Oscillator Index (X\*)

| Ref Des | PG | Manufacturer's Part Number | Part Description        |
|---------|----|----------------------------|-------------------------|
| X1      | 14 | XTAL_2                     | Real Time Clock Crystal |

## Header Index (J\*)

| Ref Des | PG | Manufacturer's Part Number | Part Description                       |
|---------|----|----------------------------|--|
| J1      | 11 | SSQ-132-01-S-D             | 2X32 Digital Connectot #1 to ML300_CPU |
| J2      | 11 | SSQ-132-01-S-D             | 2X32 Digital Connectot #2 to ML300_CPU |
| J3      | 11 | SSQ-125-01-S-D             | 2X25 Power Connector to ML300_CPU      |
| J4      | 11 | RP34-BR-3PDLA              | Primary Power Jack - Dell Power Supply |
| J5      | 12 | DF9-31S-1V                 | TFT Connector                          |
| J6      | 12 | 1L-Z-6S-S125C3             | TFT Inverter Connector                 |
| J7      | 13 | 22-12-2044                 | Touchscreen Connector                  |
| J9      | 19 | P2C32SAAN                  | 1X32 Ground Connector for GPIO         |
| J10     | 19 | P2C32SAAN                  | 1X32 GPIO Connector                    |
| J11     | 20 | 1X2 Header                 | Soft Power Switch Jumper               |
| J12     | 20 | 1X2 Header                 | Soft Power Switch Disable Jumper       |

## Switch Index (SW\*)

| Ref Des | PG | Manufacturer's Part Number | Part Description                 |
|---------|----|----------------------------|----------------------------------|
| SW1     | 17 | SW_SLIDE_SPDT              | Main Power Supply Switch         |
| SW2     | 17 | SW_ROTARY_8POS             | System ACE Configuration Address |
| SW3     | 17 | BTN_MOMENT_RA              | System ACE Reset Button          |
| SW4     | 17 | BTN_MOMENT_RA              | CPU Reset Button                 |
| SW5     | 17 | BTN_MOMENT_RA              | FPGA Program Button              |
| SW6     | 17 | BTN_MOMENT                 | Left-Side Thumb Button (Top)     |
| SW7     | 17 | BTN_MOMENT                 | Left-Side Thumb Button (Left)    |
| SW8     | 17 | BTN_MOMENT                 | Left-Side Thumb Button (Right)   |
| SW9     | 17 | BTN_MOMENT                 | Left-Side Thumb Button (Bottom)  |
| SW10    | 17 | BTN_MOMENT                 | Left-Side Button - Top           |
| SW11    | 17 | BTN_MOMENT                 | Left-Side Button - Middle        |
| SW12    | 17 | BTN_MOMENT                 | Left-Side Button - Bottom        |
| SW13    | 17 | BTN_MOMENT                 | Right-Side Thumb Button (Top)    |
| SW14    | 17 | BTN_MOMENT                 | Right-Side Thumb Button (Left)   |
| SW15    | 17 | BTN_MOMENT                 | Right-Side Thumb Button (Right)  |
| SW16    | 17 | BTN_MOMENT                 | Right-Side Thumb Button (Bottom) |
| SW17    | 17 | BTN_MOMENT                 | Right-Side Button - Top          |
| SW18    | 17 | BTN_MOMENT                 | Right-Side Button - Middle       |
| SW19    | 17 | BTN_MOMENT                 | Right-Side Button - Bottom       |

## LED Index (DS\*)

| Ref Des | PG | Manufacturer's Part Number | Part Description                    |
|---------|----|----------------------------|-------------------------------------|
| DS1     | 18 | LNJ115W8PRA                | PLB Bus Error Dual LED              |
| DS2     | 18 | LNJ115W8PRA                | OPB Bus Error Dual LED              |
| DS3     | 25 | LNJ115W8PRA                | 1.5V Power Good Dual LED            |
| DS4     | 25 | LNJ115W8PRA                | 2.5V Power Good Dual LED            |
| DS5     | 25 | LNJ115W8PRA                | 3.3V Power Good Dual LED            |
| DS6     | 25 | LNJ115W8PRA                | 5V Power Good Dual LED              |
| DS7     | 25 | LNJ115W8PRA                | +12V Power Good Dual LED            |
| DS8     | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 0 Green LED (LSB)    |
| DS9     | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 1 Green LED          |
| DS10    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 2 Green LED          |
| DS11    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 3 Green LED          |
| DS12    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 4 Green LED          |
| DS13    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 5 Green LED          |
| DS14    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 6 Green LED          |
| DS15    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 7 Green LED          |
| DS16    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 8 Green LED          |
| DS17    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 9 Green LED          |
| DS18    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 10 Green LED         |
| DS19    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 11 Green LED         |
| DS20    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 12 Green LED         |
| DS21    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 13 Green LED         |
| DS22    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 14 Green LED         |
| DS23    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 15 Green LED         |
| DS24    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 16 Green LED         |
| DS25    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 17 Green LED         |
| DS26    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 18 Green LED         |
| DS27    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 19 Green LED         |
| DS28    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 20 Green LED         |
| DS29    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 21 Green LED         |
| DS30    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 22 Green LED         |
| DS31    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 23 Green LED         |
| DS32    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 24 Green LED         |
| DS33    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 25 Green LED         |
| DS34    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 26 Green LED         |
| DS35    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 27 Green LED         |
| DS36    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 28 Green LED         |
| DS37    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 29 Green LED         |
| DS38    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 30 Green LED         |
| DS39    | 19 | SML-LX0603GW-TR            | GPIO2/Test Bit 31 Green LED (MSB)   |
| DS40    | 18 | SML-LX0603IW-TR            | SystemACE Error Red LED             |
| DS41    | 18 | SML-LX0603GW-TR            | SystemACE Status Green LED          |
| DS42    | 18 | SML-LX0603YW-TR            | GPIO1 Bit 15 Yellow LED, Top Edge   |
| DS43    | 18 | SML-LX0603YW-TR            | GPIO1 Bit 14 Yellow LED, Top Edge   |
| DS44    | 18 | SML-LX0603YW-TR            | GPIO1 Bit 13 Yellow LED, Top Edge   |
| DS45    | 18 | SML-LX0603YW-TR            | GPIO1 Bit 12 Yellow LED, Top Edge   |
| DS46    | 18 | SML-LX0603YW-TR            | GPIO1 Bit 11 Yellow LED, Top Edge   |
| DS47    | 18 | SML-LX0603YW-TR            | GPIO1 Bit 10 Yellow LED, Top Edge   |
| DS48    | 18 | SML-LX0603YW-TR            | GPIO1 Bit 9 Yellow LED, Top Edge    |
| DS49    | 18 | SML-LX0603YW-TR            | GPIO1 Bit 8 Yellow LED, Top Edge    |
| DS50    | 18 | SML-LX0603GW-TR            | GPIO1 Bit 6 Green LED, Left Top     |
| DS51    | 18 | SML-LX0603GW-TR            | GPIO1 Bit 5 Green LED, Left Middle  |
| DS52    | 18 | SML-LX0603GW-TR            | GPIO1 Bit 4 Green LED, Left Bottom  |
| DS53    | 18 | SML-LX0603GW-TR            | GPIO1 Bit 2 Green LED, Right Top    |
| DS54    | 18 | SML-LX0603GW-TR            | GPIO1 Bit 2 Green LED, Right Middle |
| DS55    | 18 | SML-LX0603GW-TR            | GPIO1 Bit 0 Green LED, Right Bottom |
| DS56    | 18 | SML-LX0603IW-TR            | FPGA Red INIT LED                   |
| DS57    | 18 | LTST-C190CBKT              | FPGA Blue DONE LED                  |
| DS58    | 18 | LTST-C190CBKT              | GPIO1 Bit 3 Blue LED, Right Thumb   |
| DS59    | 18 | LTST-C190CBKT              | GPIO1 Bit 7 Blue LED, Left Thumb    |
| DS60    | 18 | LNJ115W8PRA                | 20V Power Good Dual LED             |
| DS68    | 18 | LNJ115W8PRA                | -12V Power Good Dual LED            |



PCB 1280286  
ASM 0431195  
SCH 0381136

Title: ML300\_PWR\_IO  
Component Index (1of2)

|             |                    |      |      |
|-------------|--------------------|------|------|
| Date:       | October 17th, 2002 | Ver: | 1.00 |
| Sheet Size: | B                  | Rev: | A    |
| Sheet       | 2                  | of   | 29   |
| Drawn By    | BF                 |      |      |

ML300\_PWR\_IO Board

www.BDTIC.com/XILINX Component Index (1of2)

### Diode Index (D\*)

| Ref Des | PG | Manufacturer's Part Number | Part Description                 |
|---------|----|----------------------------|----------------------------------|
| D2      | 21 | 8360A-13                   | Shottky Diode - +12V Regulator   |
| D3      | 21 | 8360A-13                   | Shottky Diode - +12V Regulator   |
| D4      | 21 | 8360A-13                   | Shottky Diode - -12V Regulator   |
| D5      | 22 | 8360A-13                   | Shottky Diode - 3.3V Regulator   |
| D6      | 22 | 8360A-13                   | Shottky Diode - 5V Regulator     |
| D7      | 22 | 8360A-13                   | Shottky Diode - 5V Regulator     |
| D8      | 22 | 8360A-13                   | Shottky Diode - 3.3V Regulator   |
| D9      | 20 | 1N4148WS-7                 | Diode for Soft Power Switch      |
| D10     | 20 | 1N4148WS-7                 | Diode for Soft Power Switch      |
| D11     | 20 | 1N4148WS-7                 | Diode for Soft Power Switch      |
| D12     | 20 | 1N4148WS-7                 | Diode for Soft Power Switch      |
| D13     | 14 | 1N4148WS-7                 | Diode for Charging RTC Super-Cap |

### Ferrite Bead Index (FB\*)

| Ref Des | PG | Manufacturer's Part Number | Part Description                 |
|---------|----|----------------------------|----------------------------------|
| F1      | 21 | SMD100-2                   | -12V Current Fuse                |
| F2      | 21 | SMD250-S                   | +12V Current Fuse                |
| FB1     | 13 | BLM21AH102SN1D             | GND Filter for Touchscreen A/D   |
| FB2     | 13 | BLM21AH102SN1D             | Power Filter for Touchscreen A/D |

### Inductor Index (LB\*)

| Ref Des | PG | Manufacturer's Part Number | Part Description                         |
|---------|----|----------------------------|--|
| L1      | 21 | PM43-100M                  | -12V Switching Regulator 10UH Inductor   |
| L2      | 21 | PM43-100M                  | -12V Switching Regulator 10UH Inductor   |
| L3      | 17 | DCRH127-100MC              | Primary Power 10UH Inductor              |
| L4      | 21 | CDRH124-150MC              | +12V Switching Regulator 15UH Inductor   |
| L5      | 22 | DO5022P-222HC              | +3.3V Switching Regulator 2.6UH Inductor |
| L6      | 22 | DCRH127-100MC              | +5V Switching Regulator 10UH Inductor    |

### FET Index (Q\*)

| Ref Des | PG | Manufacturer's Part Number | Part Description                             |
|---------|----|----------------------------|--|
| Q2      | 18 | BSS138                     | FET for Re-driving LED Signal                |
| Q5      | 18 | BSS138                     | FET for Re-driving LED Signal                |
| Q6      | 18 | BSS138                     | FET for Re-driving LED Signal                |
| Q7      | 18 | BSS138                     | FET for Re-driving LED Signal                |
| Q8      | 18 | BSS138                     | FET for Re-driving LED Signal                |
| Q9      | 25 | BSS138                     | FET for Re-driving LED Signal                |
| Q10     | 25 | BSS138                     | FET for Re-driving LED Signal                |
| Q11     | 25 | BSS138                     | FET for Re-driving LED Signal                |
| Q12     | 25 | BSS138                     | FET for Re-driving LED Signal                |
| Q13     | 25 | BSS138                     | FET for Re-driving LED Signal                |
| Q14     | 21 | IRF7313TR                  | +12V Switching Regulator Power MOSFET        |
| Q15     | 22 | IRF7313TR                  | 5V Switching Regulator Power MOSFET          |
| Q16     | 22 | SI7840DP                   | 3.3V Switching Regulator Top Power MOSFET    |
| Q17     | 22 | SI7440DP                   | 3.3V Switching Regulator Bottom Power MOSFET |
| Q18     | 22 | SI7440DP                   | 3.3V Switching Regulator Bottom Power MOSFET |
| Q19     | 20 | BSS138                     | FET for Re-driving LED Signal                |
| Q20     | 25 | BSS138                     | FET for Re-driving LED Signal                |
| Q21     | 25 | BSS138                     | FET for Re-driving LED Signal                |
| Q22     | 25 | BSS138                     | FET for Re-driving LED Signal                |
| Q23     | 25 | BSS138                     | FET for Re-driving LED Signal                |
| Q24     | 25 | BSS138                     | FET for Re-driving LED Signal                |
| Q25     | 18 | BSS138                     | FET for Re-driving LED Signal                |
| Q26     | 18 | BSS138                     | FET for Re-driving LED Signal                |



PCB 1280286  
ASM 0431195  
SCH 0381136

Title: ML300\_PWR\_IO  
Component Index (2of2)

|                          |                  |
|--------------------------|------------------|
| Date: October 17th, 2002 | Ver: 1.00        |
| Sheet Size: B            | Rev: A           |
| Sheet 3 of 28            | Drawn By BP & BF |

ML300\_PWR\_IO Board

www.BDTIC.com/XILINX Component Index (2of2)

SEMICONDUCTORS

| QTY | REFDES   | PKG        | MANUFACTURE PN   | MANUFACTURE | DESCRIPTION                                    |
|-----|--|------------|------------------|-------------|--|
| 4   | D9,D10,D11,D12   | SOD-323    | 1N4148WS-7       | Diodes Inc  | Diode, SMD                                     |
| 7   | D2,D3,D4,D5,D6,D7,D8   | DIODE_SMA  | B360A-13         | Diodes Inc  | Diode, Schottky                                |
| 9   | DS1,DS2,DS3,DS4,DS5,DS6,DS7,DS60,DS68  | LED_DUAL   | LNJ115W8PRA      | Panasonic   | LED, Dual Red/Green, SMD                       |
| 39  | DS8,DS9,DS10,DS11,DS12,DS13,DS14,DS15,DS16,DS17,DS18,DS19,DS20,DS21,DS22,DS23,DS24,DS25,DS26,DS27,DS28,DS29,DS30,DS31,DS32,DS33,DS34,DS35,DS36,DS37,DS38,DS39,DS41,DS50,DS51,DS52,DS53,DS54,DS55 | 0603       | SML-LX0603GW-TR  | Lumex       | LED, Green, SMD                                |
| 2   | DS40,DS56  | 0603       | SML-LX0603IW-TR  | Lumex       | LED, Red, SMD                                  |
| 8   | DS42,DS43,DS44,DS45,DS46,DS47,DS48,DS49  | 0603       | SML-LX0603YW-TR  | Lumex       | LED, Yellow, SMD                               |
| 3   | DS57,DS58,DS59   | 0603       | LTST-C190CBKT    | Lite-On     | LED, BLUE, SMD                                 |
| 18  | Q2,Q5,Q6,Q7,Q8,Q9,Q10,Q11,Q12,Q13,Q19,Q20,Q21,Q22,Q23,Q24,Q25,Q26  | SOT23      | BSS138           | Fairchild   | Diode, SMD                                     |
| 2   | Q14,Q15  | SO8        | IRF7313TR        | Intl Rectif | IC, MOSFET, Dual N                             |
| 1   | Q16  | SO8_PPAK_1 | SI7840DP         | Siliconix   | IC, Power MOSFET                               |
| 2   | Q17,Q18  | SO8_PPAK_1 | SI7440DP         | Siliconix   | IC, Power MOSFET                               |
| 1   | U1   | SSOP16     | ADS7846E         | TI          | IC, Analog, Touchscreen Controller             |
| 1   | U2   | 10_UMAX    | MAX6683AUB       | Maxim       | IC, System Monitor, 1.8V, 2.5V, 5V             |
| 1   | U3   | TSSOP14    | DS1845E-010/T&R  | Dallas Semi | IC, Potentiometer, IIC controlled, dual        |
| 1   | U4   | 10_UMAX    | MAX6652AUB       | Maxim       | IC, System Monitor, 12V, 2.5V, 3.3V            |
| 2   | U5,U6  | TSSOP56    | SN74AVC16646DGGR | TI          | IC, Transceiver/Registered                     |
| 2   | U7,U9  | TSSOP14    | TC74VHC20FT(EL)  | Toshiba     | IC, Logic, Dual 4 input NAND gate              |
| 1   | U8   | TSSOP14    | SN74HC14PWR      | TI          | IC, Inverter, Schmitt-Trigger                  |
| 1   | U10  | TSSOP14    | SN74HC74PWR      | TI          | IC, Dual F-F, w/CLR/PRESET                     |
| 1   | U11  | LINEAR_SO8 | LT1963ES8        | Linear Tech | IC, Linear, Voltage Reg, 1.5A, Adjustable, LDO |
| 1   | U12  | TSSOP14    | SN74ALVC125PWR   | TI          | IC, QUAD BUFF TRI STATE                        |
| 1   | U13  | TSSOP20    | LTC3778EF        | Linear Tech | IC, Step-Down Controller                       |
| 1   | U14  | SOT23-5    | LT1931ES5        | Linear Tech | IC, Analog, DC-DC Converter                    |
| 1   | U15  | SSOP28     | LTC1628CG-SYNC   | Linear Tech | IC, Linear, Voltage Reg, Switcher, 5V / 3.3V   |
| 2   | U16,U17  | 5-DD       | LT1764EQ         | Linear Tech | IC, Linear, Voltage Reg, 3A, Adjustable, LDO   |
| 1   | U18  | SO8        | LT1366CS8        | Linear Tech | IC, Analog, Op Amp, SMD                        |
| 1   | U19  | 3-DD       | LT1085CM         | Linear Tech | IC, Linear, Voltage Reg, 3A, Adjustable, LDO   |
| 3   | U20,U21,U22  | SO14       | LM339DR          | TI          | IC, QUAD DIFF COMP                             |
| 1   | U23  | SOT-223    | LM2937IMP-15     | National    | IC, LDO REGULATOR, Fixed, 15V                  |
| 1   | U24  | SOIC8      | X1226S8          | Xicor       | IC, IIC Real Time Clock                        |
| 1   | U25  | SOT-223    | LM2937IMP-5      | National    | IC, LDO REGULATOR, Fixed, 5V                   |



PCB 1280286  
ASM 0431195  
SCH 0381136

Title: ML300\_PWR\_IO  
BOM (Semiconductors) (1of5)

Date: October 17th, 2002 Ver: 1.00

Sheet Size: B Rev: A

Sheet 5 of 28 Drawn By BF

ML300\_PWR\_IO Board

www.BDITC.com/XILINX BOM (Semiconductors) (1of5)

CAPACITORS

| QTY | REFDES  | VALUE  | TOL     | VOLT | KIND    | PKG  | MANUFACTURE PN   | MANUFACTURE |
|-----|---|--------|---------|------|---------|------|------------------|-------------|
| 3   | C27,C28,C29   | 220UF  | 20%     | 6.3V | TANT    | D    | EEJ-L0JD227R     | Panasonic   |
| 5   | C19,C20,C24,C25,C26   | 150UF  | 20%     | 10V  | TANT    | D    | EEJ-L1AD157R     | Panasonic   |
| 3   | C10,C11,C12   | 68UF   | 20%     | 6.3V | TANT    | C    | ECS-T0JC686R     | Panasonic   |
| 1   | C16   | 33UF   | 20%     | 20V  | TANT    | D    | EEJ-L1DD336R     | Panasonic   |
| 6   | C17,C18,C21,C22,C23,C92   | 22UF   | 10%     | 35V  | TANT    | X    | T495X226K035AS   | Kemet       |
| 9   | C70,C77,C80,C81,C82,C83,C84,C85,C95   | 10UF   | 20%     | 20V  | TANT    | C    | ECS-T1DC106R     | Panasonic   |
| 1   | C71   | 10UF   | 20%     | 10V  | TANT    | A    | ECS-T1AY106R     | Panasonic   |
| 6   | C7,C13,C14,C15,C75,C76  | 10UF   | +80/20% | 25V  | CERAMIC | 1210 | ECJ-4YF1E106Z    | Panasonic   |
| 1   | C74   | 6.8UF  | 20%     | 16V  | TANT    | A    | ECS-T1CY685R     | Panasonic   |
| 2   | C72,C73   | 4.7UF  | 10%     | 25V  | TANT    | C    | T491C475K025AS   | Kemet       |
| 1   | C1  | 1UF    | 10%     | 20V  | TANT    | A    | T491A105K020AS   | Kemet       |
| 2   | C4,C5   | 1UF    | +80/20% | 50V  | CERAMIC | 1206 | ECJ-3PF1H105Z    | Panasonic   |
| 8   | C6,C8,C9,C54,C69,C78,C94,C96  | 0.1UF  | 20%     | 50V  | CERAMIC | 0805 | C0805C104M5RACTU | Kemet       |
| 32  | C2,C3,C30,C31,C32,C37,C38,C39,C40,C41,C42,C43,C44,C46,C50,C51,C55,C56,C58,C61,C63,C66,C79,<br>C86,C87,C88,C89,C90,C91,C93,C97,C99 | 0.1UF  | +80/20% | 16V  | CERAMIC | 0402 | 04022F104Z7B20D  | Yageo       |
| 1   | C68   | 0.01UF | 10%     | 16V  | CERAMIC | 0402 | C0402C103K4RACTU | Kemet       |
| 2   | C57,C62   | 1000PF | 10%     | 25V  | CERAMIC | 0402 | ECJ-0EB1E102K    | Panasonic   |
| 1   | C48   | 560PF  | 10%     | 50V  | CERAMIC | 0402 | ECJ-0EB1H561K    | Panasonic   |
| 3   | C49,C59,C60   | 220PF  | 5%      | 50V  | CERAMIC | 0402 | ECJ-0EC1H221J    | Panasonic   |
| 3   | C47,C64,C65   | 100PF  | 10%     | 25V  | CERAMIC | 0402 | ECJ-0EB1E101K    | Panasonic   |

CONNECTORS

| QTY | REFDES  | MANUFACTURE PN | MANUFACTURE               | DESCRIPTION                                   |
|-----|---------|----------------|---------------------------|---|
| 2   | J1,J2   | SSQ-132-01-S-D | Samtec                    | Connector, Through Hole, Female, 100mil       |
| 1   | J3      | SSQ-125-01-S-D | Samtec                    | Connector, Through Hole, Female, 100mil       |
| 1   | J4      | RP34-8R-3PDLA  | Hirose                    | Connector, Dell Laptop Power Jack             |
| 1   | J5      | DF9-31P-1V(20) | Hirose                    | Connector, 1mm, 31 Pin, Straight, Socket, SMT |
| 1   | J6      | IL-Z-6PL-SMTY  | JAE                       | Connector, TFT Inverter, 6 pin                |
| 1   | J7      | 22-12-2044     | Molex                     | Header, 1x4, 100mil, right angle              |
| 2   | J9,J10  | PZC32SAAN      | Sullins Electronics Corp. | Header, Through Hole, 100mil                  |
| 2   | TP1,TP2 | 10-109-3-1     | Concord Electronics       | Testpoint, Turret                             |



PCB 1280286  
ASM 0431195  
SCH 0381136

Title: ML300\_PWR\_IO  
BOM (Caps and Connectors) (2of5)

Date: October 17th, 2002 Ver: 1.00

Sheet Size: B Rev: A

Sheet 6 of 28 Drawn By

ML300\_PWR\_IO Board

BOM (Caps and Connectors) (2of5)  
www.BDTC.com/XILINX

RESISTORS

| QTY | REFDES  | VALUE | TOL | WATT  | PKG  | MANUFACTURE PN    | MANUFACTURE   |
|-----|---|-------|-----|-------|------|-------------------|---------------|
| 1   | R238  | 10.0M | 5%  | 1/16W | 0603 | ERJ-3GEYJ106V     | Panasonic     |
| 1   | R237  | 1.50M | 1%  | 1/16W | 0603 | ERJ-3EKP1504V     | Panasonic     |
| 1   | R239  | 500K  | 1%  | 1/16W | 0603 | 9C06031A5003FKHFT | Yageo America |
| 1   | R154  | 226K  | 1%  | 1/16W | 0402 | 9C04021A2263FLHF3 | Yageo America |
| 1   | R173  | 100K  | 1%  | 1/16W | 0402 | ERJ-2RKF1003X     | Panasonic     |
| 1   | R165  | 97.6K | 1%  | 1/16W | 0402 | 9C04021A9762FLHF3 | Yageo America |
| 1   | R159  | 93.1K | 1%  | 1/16W | 0402 | ERJ-2RKF9312X     | Panasonic     |
| 1   | R169  | 59.0K | 1%  | 1/16W | 0402 | ERJ-2RKF5902X     | Panasonic     |
| 2   | R7,R8   | 47.0K | 1%  | 1/16W | 0402 | 9C04021A4702FLHF3 | Yageo America |
| 3   | R163,R170,R172  | 20.0K | 1%  | 1/16W | 0402 | ERJ-2RKF2002X     | Panasonic     |
| 2   | R171,R185   | 15.0K | 1%  | 1/16W | 0402 | ERJ-2RKF1502X     | Panasonic     |
| 1   | R227  | 13.3K | 1%  | 1/16W | 0402 | ERJ-2RKF1332X     | Panasonic     |
| 1   | R200  | 12.4K | 1%  | 1/16W | 0402 | ERJ-2RKF1242X     | Panasonic     |
| 1   | R209  | 11.8K | 1%  | 1/16W | 0402 | ERJ-2RKF1182X     | Panasonic     |
| 1   | R206  | 11.5K | 1%  | 1/16W | 0402 | 9C04021A1152FLHF3 | Yageo America |
| 1   | R164  | 11.0K | 1%  | 1/16W | 0402 | ERJ-2RKF1102X     | Panasonic     |
| 3   | R28,R186,R187   | 10.0K | 1%  | 1/16W | 0402 | ERJ-2RKF1002X     | Panasonic     |
| 1   | R197  | 9.76K | 1%  | 1/16W | 0402 | ERJ-2RKF9761X     | Panasonic     |
| 1   | R160  | 4.87K | 1%  | 1/16W | 0402 | ERJ-2RKF4871X     | Panasonic     |
| 33  | R66,R67,R88,R89,R90,R107,R108,R109,R110,R111,R112,R113,R114,R115,R116,R117,R118,R119,R120,R121,R122,R123,R124,R149,R152,R156,R207,R220,R221,R222,R223,R243,R246 | 4.7K  | 5%  | 1/16W | 0402 | ERJ-2GEJ472X      | Panasonic     |
| 1   | R199  | 4.53K | 1%  | 1/16W | 0402 | ERJ-2RKF4531X     | Panasonic     |
| 1   | R189  | 4.30K | 1%  | 1/16W | 0402 | 9C04021A4301FLHF3 | Yageo         |
| 1   | R192  | 4.12K | 1%  | 1/16W | 0402 | ERJ-2RKF4121X     | Panasonic     |
| 2   | R190,R191   | 4.02K | 1%  | 1/16W | 0402 | ERJ-2RKF4021X     | Panasonic     |
| 1   | R153  | 3.30K | 1%  | 1/16W | 0402 | 9C04021A3301FLHF3 | Yageo America |
| 1   | R211  | 3.09K | 1%  | 1/16W | 0402 | ERJ-2RKF3091X     | Panasonic     |
| 1   | R204  | 2.49K | 1%  | 1/16W | 0402 | ERJ-2RKF2491X     | Panasonic     |
| 1   | R202  | 2.37K | 1%  | 1/16W | 0402 | ERJ-2RKF2371X     | Panasonic     |
| 2   | R193,R194   | 2.20K | 1%  | 1/16W | 0402 | 9C04021A2201FLHF3 | Yageo         |
| 1   | R150  | 1.69K | 1%  | 1/16W | 0402 | ERJ-2RKF1691X     | Panasonic     |
| 1   | R225  | 1.58K | 1%  | 1/16W | 0402 | ERJ-2RKF1581X     | Panasonic     |
| 5   | R33,R151,R188,R205,R245   | 1.00K | 1%  | 1/16W | 0402 | ERJ-2RKF1001X     | Panasonic     |
| 1   | R198  | 750R  | 1%  | 1/16W | 0402 | ERJ-2RKF7500X     | Panasonic     |
| 12  | R203,R212,R213,R214,R215,R244,R248,R250,R252,R254,R256,R257   | 487R  | 1%  | 1/4W  | 1206 | 9C12063A4870FKHFT | Yageo America |
| 1   | R158  | 487R  | 1%  | 1/16W | 0402 | ERJ-2RKF4870X     | Panasonic     |
| 1   | R210  | 402R  | 1%  | 1/16W | 0402 | ERJ-2RKF4020X     | Panasonic     |
| 2   | R258,R259   | 330R  | 1%  | 1/16W | 0402 | 9C04021A3300FLHF3 | Yageo America |
| 10  | R208,R216,R217,R218,R219,R247,R249,R251,R253,R260   | 300R  | 1%  | 1/16W | 0402 | 9C04021A3000FLHF3 | Yageo America |
| 1   | R201  | 243R  | 1%  | 1/16W | 0402 | ERJ-2RKF2430X     | Panasonic     |
| 6   | R125,R144,R145,R146,R155,R255   | 130R  | 1%  | 1/16W | 0402 | ERJ-2RKF1300X     | Panasonic     |
| 24  | R3,R4,R5,R6,R9,R10,R11,R12,R13,R14,R15,R16,R17,R18,R19,R20,R21,R22,R23,R24,R25,R26,R195,R226  | 100R  | 1%  | 1/16W | 0402 | ERJ-2RKF1000X     | Panasonic     |
| 5   | R129,R142,R143,R147,R148  | 64.9R | 1%  | 1/16W | 0402 | ERJ-2RKF64R9X     | Panasonic     |
| 7   | R130,R131,R132,R137,R139,R140,R141  | 56.2R | 1%  | 1/16W | 0402 | ERJ-2RKF56R2X     | Panasonic     |

CONTINUED NEXT PAGE



PCB 1280286  
ASM 0431195  
SCH 0381136

Title: ML300\_PWR\_IO  
BOM (Resistors - Partial) (3of5)

|                          |           |
|--------------------------|-----------|
| Date: October 17th, 2002 | Ver: 1.00 |
| Sheet Size: B            | Rev: A    |
| Sheet 7 of 28            | Drawn By  |

ML300\_PWR\_IO Board

BOM (Resistors - Partial) (3of5)  
[www.BDITC.com/XILINX](http://www.BDITC.com/XILINX)

RESISTORS (CONT.)

| QTY | REFDES  | VALUE  | TOL | WATT  | PKG  | MANUFACTURE PN    | MANUFACTURE   |
|-----|---|--------|-----|-------|------|-------------------|---------------|
| 1   | R2  | 49.9R  | 1%  | 1/4W  | 1206 | 9C12063A49R9FKHFT | Yageo America |
| 30  | R69,R70,R71,R72,R80,R81,R82,R83,R84,R85,R87,R91,R92,R93,R94,R95,R96,R97,R98,R99,R100,R101,R126,R127,R128,R133,R134,R135,R136,R138 | 49.9R  | 1%  | 1/16W | 0402 | ERJ-2RKF49R9X     | Panasonic     |
| 10  | R34,R35,R37,R38,R39,R40,R41,R42,R43,R44   | 38.3R  | 1%  | 1/16W | 0402 | ERJ-2RKF38R3X     | Panasonic     |
| 1   | R196  | 32.4R  | 1%  | 1/16W | 0402 | ERJ-2RKF32R4X     | Panasonic     |
| 22  | R36,R45,R46,R47,R48,R49,R50,R51,R52,R53,R54,R55,R56,R57,R58,R59,R60,R61,R62,R63,R64,R65   | 15.0R  | 1%  | 1/16W | 0402 | ERJ-2RKF15R0X     | Panasonic     |
| 9   | R166,R167,R176,R177,R178,R179,R180,R181,R184  | 10.0R  | 1%  | 1/16W | 0402 | ERJ-2RKF10R0X     | Panasonic     |
| 1   | R1  | 1.0R   | 1%  | 1/4W  | 1206 | ERJ-8RQF1R0V      | Panasonic     |
| 7   | R229,R230,R232,R233,R234,R235,R236  | 0.01R  | 1%  | 1W    | 2512 | ERJ-MLWSF10MU     | Panasonic     |
| 2   | R228,R231   | 0.003R | 1%  | 1W    | 2512 | ERJ-MLWSF3M0U     | Panasonic     |
| 2   | R161,R175   | 0R     | 5%  | 1/16W | 0402 | ERJ-2GE0R00X      | Panasonic     |



PCB 1280286  
ASM 0431195  
SCH 0381136

Title: ML300\_PWR\_IO  
BOM (Resistors - Partial) (4of5)

Date: October 17th, 2002 Ver: 1.00

Sheet Size: B Rev: A

Sheet 8 of 28 Drawn By

ML300\_PWR\_IO Board

BOM (Resistors - Partial) (4of5)  
[www.BDITC.com/XILINX](http://www.BDITC.com/XILINX)

OTHER

| QTY | REFDES  | VALUE     | PKG             | MANUFACTURE PN    | MANUFACTURE    | DESCRIPTION                        |
|-----|---|-----------|-----------------|-------------------|----------------|------------------------------------|
| 1   | B1  |           |                 | CR1220            | Panasonic      | Battery, LiOn, 3V, 35mAH, 12.5mm   |
| 1   | B1a   |           |                 | KE500             | Keystone Elec  | Holder, Battery, 12.5mm            |
| 1   | F1  | 1.1A      | 2920            | SMD100-2          | RayChem        | Fuse, 1.1A, SMD, Self Healing      |
| 1   | F2  | 2.5A      | 3425            | SMD250-2          | Raychem        | Fuse, 2.5A, SMD, Self Healing      |
| 2   | FB1,FB2   |           | 0805            | BLM21AH102SN1D    | Murata         | Ferrite Bead, SMD                  |
| 2   | L1,L2   | 10UH      | PM43            | PM43-100M         | JW Miller      | Inductor, SMD                      |
| 2   | L3,L6   | 10UH      | CDRH127         | CDRH127-100MC     | Sumida Corp    | Inductor, SMD                      |
| 1   | L4  | 15UH      | CDRH124         | CDRH124-150MC     | Sumida Corp    | Inductor, SMD                      |
| 1   | L5  | 2.6UH     | CEP12D38        | DO5022P-222HC     | Coilcraft      | Inductor, SMD                      |
| 1   | SW1   |           | CKN1047         | 7101MD9AQE        | C&K Components | Switch, Toggle, Right Angle        |
| 1   | SW2   |           | SW_ROT_8POS     | 94HBB08RA         | Grayhill       | Switch, Rotary, 8 position, RA     |
| 3   | SW3,SW4,SW5   |           | BTN_MOMENT_RA   | B3F-3152          | Omron          | Switch, SPST, Pushbutton, Mom, RA  |
| 14  | SW6,SW7,SW8,SW9,SW10,SW11,SW12,SW13,SW14,SW15,SW16,SW17,SW18,SW19 |           | BTN_MOMENT      | EVQ-11L07K        | Panasonic      | Switch, SPST, Pushbutton, Mom      |
| 1   | SW2_CAP   | GREY      | SW_ROT_8POS_CAP | 947705-012        | Grayhill, Inc  | Cap, Rotary Switch, 8 Position     |
| 1   | SW3_CAP   | YELLOW    | KEYCAP_YEL      | B32-1030          | Omron          | Cap, Button, Yellow                |
| 1   | SW4_CAP   | ORANGE    | KEYCAP_ORG      | B32-1020          | Omron          | Cap, Button, Orange                |
| 1   | SW5_CAP   | RED       | KEYCAP_RED      | B32-1080          | Omron          | Cap, Button, Red                   |
| 1   | PCB1  |           |                 |                   | Hunter         | ML300_PWR_IO Printed Circuit Bd    |
| 1   | PCB1a   |           |                 |                   | Axiom          | ML300_PWR_IO Assembly              |
| 1   | X1  | 32.768KHZ |                 | CFS206-32.768KDZF | Citizen        | Crystal, 32.768 KHz, small outline |

DNPS

| QTY | REFDES   | STATE | PKG          |
|-----|--|-------|--------------|
| 5   | BB1, BB2, BB3, BB4, BB5  | DNP   | HDR_1X29     |
| 32  | BB6, BB7, BB8, BB9, BB10, BB11, BB12, BB13, BB14, BB15, BB16, BB17, BB18, BB27, BB28, BB29, BB30, BB31, BB32, BB33, BB34, BB35, BB36, BB37, BB38, BB39, BB40, BB41, BB42, BB43, BB44, BB45 | DNP   | HDR_1X30     |
| 1   | BB46   | DNP   | HDR1X32      |
| 7   | C33, C34, C35, C36, C45, C52, C67  | DNP   | 0402         |
| 2   | J11, J12   | DNP   | SIP2         |
| 14  | MH1, MH2, MH3, MH4, MH5, MH6, MH7, MH8, MH9, MH10, MH11, MH12, MH13, MH14  | DNP   | JACK_109_280 |
| 3   | R240, R241, R242   | DNP   | 0603         |
| 25  | R27, R29, R30, R31, R32, R68, R73, R74, R75, R76, R77, R78, R79, R86, R102, R103, R104, R105, R106, R157, R162, R168, R174, R182, R183   | DNP   | 0402         |
| 4   | FID1, FID2, FID3, FID4   | DNP   |              |

ML300\_PWR\_IO Board

BOM (Misc and DNPs) (5 of 5)

www.BDTIC.com/XILINX



PCB 1280286  
ASM 0431195  
SCH 0381136

|   |           |
|---|-----------|
| Title: ML300_PWR_IO<br>BOM (Misc and DNPs) (5 of 5) |           |
| Date: October 17th, 2002                            | Ver: 1.00 |
| Sheet Size: B                                       | Rev: A    |
| Sheet 9 of 28                                       | Drawn By  |



### Power Requirements

| Num                                       | Component                           | Current                            |
|---|-------------------------------------|------------------------------------|
| <b>1.5V DC - From Linear Regulator</b>    |                                     |                                    |
| 1   | X2P7-FF672                          | 2000 mA } 2 Amps<br>3 Amps Capable |
| <b>2.5V DC - From Linear Regulator</b>    |                                     |                                    |
| 1   | X2P7-FF672                          | 1500 mA                            |
| 1   | System ACE                          | 250 mA                             |
| 4   | HYB25D256800AT-7 DDR                | 1200 mA                            |
| 2   | SSTV16857 DDR Register              | 400 mA                             |
| 1   | CDCV857 DDR PLL                     | 300 mA                             |
| 2   | 74ALVC164245 - TFT Level Shifter    | 200 mA                             |
| 1   | 25LC160_SN - SPI EEPROM             | 3 mA                               |
| 2   | MAX3388E - 2.5V RS232 Transceiver   | 80 mA                              |
| 1   | LXT971A - Ethernet Phy              | 200 mA                             |
| } 4 Amps<br>5 Amps Capable                |                                     |                                    |
| <b>3.3V DC - From Switching Regulator</b> |                                     |                                    |
| 1   | X2P7-FF672                          | 400 mA                             |
| 1   | System ACE                          | 250 mA                             |
| 1   | QS34XV245 - ParPort Level Shifter   | 100 mA                             |
| 1   | SN74LVC161284 - ParPort Transceiver | 400 mA                             |
| 1   | PCI4451 - PCI to CardBus Bridge     | 400 mA                             |
| 1   | TSB41AB1IEEE1394 Phy                | 50 mA                              |
| 1   | MAX1617 - IIC FPGA Temp Sensor      | 1 mA                               |
| 1   | LM76CNM_3 - IIC Ambient Temp Sensor | 1 mA                               |
| 1   | 24LC32A - IIC EEPROM                | 3 mA                               |
| 1   | AD1885 - Audio Codec                | 50 mA                              |
| 1   | 74LVC157APWR - Data Sel/MUX         | 50 mA                              |
| 4   | Fiber Transceiver                   | 400 mA                             |
| 1   | ML6554 - DDR VTT Linear Regulator   | 2000 mA                            |
| 1   | LT1963ES8 - MGT VTT Linear Reg      | 400 mA                             |
| 1   | LT1963-25EQ - MGT VCC Linear Reg    | 1200 mA                            |
| } 6 Amps<br>7 Amps Capable                |                                     |                                    |
| <b>5V DC - From Switching Regulator</b>   |                                     |                                    |
| 1   | SN74LVC161284 - ParPort Transceiver | 400 mA                             |
| 1   | SN74CBT16210 - ParPort LED Buffer   | 400 mA                             |
| 1   | LXT971A - Ethernet Phy              | 200 mA                             |
| 3   | QS32X2245 - PCI Clamp Diode         | 600 mA                             |
| 1   | QS316211 - PCI Clamp Diode          | 120 mA                             |
| 1   | TPS2216A - CardBus Power            | 1500 mA                            |
| 1   | AD1885 - Audio Codec                | 50 mA                              |
| 1   | LM4835 - Audio Power Amp            | 250 mA                             |
| 1   | LT1763CS8 - PCI VCC0 Linear Reg     | 500 mA                             |
| 4   | QS32X2245 - Clamp Diode             | 400 mA                             |
| 4   | DM74AS1034AM - Hex Driver           | 200 mA                             |
| 1   | MAX6683AUB - IIC Voltage Comparator | 1 mA                               |
| 1   | MAX6652AUB - IIC Voltage Comparator | 1 mA                               |
| 1   | DS1845E-010 - IIC Pot               | 1 mA                               |
| } 5 Amps<br>6 Amps Capable                |                                     |                                    |
| <b>+12V DC - From Switching Regulator</b> |                                     |                                    |
| 1   | TPS2216A - CardBus Power            | 400 mA                             |
| 1   | TSB41AB1IEEE1394 Phy                | 1000 mA                            |
| 1   | PMC Connector                       | 1000 mA                            |
| } 2.5 Amps                                |                                     |                                    |
| <b>-12V DC - From Switching Regulator</b> |                                     |                                    |
| 1   | PMC Connector                       | 1000 mA } 1 Amps                   |



PCB 1280286  
ASM 0431195  
SCH 0381136

Title: ML300\_PWR\_IO  
Power Requirements

Date: October 17th, 2002 Ver: 1.00

Sheet Size: B Rev: A

Sheet 4 of 28 Drawn By BP & BF

ML300\_PWR\_IO Board

Power Requirements  
[www.BDTIC.com/XILINX](http://www.BDTIC.com/XILINX)

# ML300\_CPU TO ML300\_PWR\_IO Pin Mapping

| ML300_CPU Signal | Type     | ML300_PWR_IO Signal | ML300_CPU Signal | Type    | ML300_PWR_IO Signal            |
|------------------|----------|---------------------|------------------|---------|--------------------------------|
| PMC_CONN4_IO9    | Buffered | R_BLUE_LED_3        | PMC_CONN4_IO41   | Control | OE for GPIO1 LEDs              |
| PMC_CONN4_IO10   | Buffered | R_GREEN_LED_0       | PMC_CONN4_IO42   | Control | DIR for GPIO1 LEDs             |
| PMC_CONN4_IO11   | Buffered | R_GREEN_LED_1       | PMC_CONN4_IO43   | Control | CLKAB                          |
| PMC_CONN4_IO12   | Buffered | R_GREEN_LED_2       | PMC_CONN4_IO44   | Control | CLKBA                          |
| PMC_CONN4_IO13   | Buffered | L_BLUE_LED_7        | PMC_CONN4_IO45   | Control | SAB                            |
| PMC_CONN4_IO14   | Buffered | L_GREEN_LED_4       | PMC_CONN4_IO46   | Control | SBA                            |
| PMC_CONN4_IO15   | Buffered | l_GREEN_LED_5       | PMC_CONN4_IO47   | Control | Optional OE2 for GPIO1 LEDs    |
| PMC_CONN4_IO16   | Buffered | l_GREEN_LED_6       | PMC_CONN4_IO48   | Control | Optional CLKAB2 for GPIO1 LEDs |
| PMC_CONN4_IO17   | Buffered | TOP_YELLOW_LED_8    | PMC_CONN4_IO49   | Control | Optional CLKBA2 for GPIO1 LEDs |
| PMC_CONN4_IO18   | Buffered | TOP_YELLOW_LED_9    | PMC_CONN4_IO50   | Control | Optional SAB2 for GPIO1 LEDs   |
| PMC_CONN4_IO19   | Buffered | TOP_YELLOW_LED_10   | PMC_CONN4_IO51   | Control | Optional SBA2 for GPIO1 LEDs   |
| PMC_CONN4_IO20   | Buffered | TOP_YELLOW_LED_11   | PMC_CONN4_IO52   | Control | OE for Switches                |
| PMC_CONN4_IO21   | Buffered | TOP_YELLOW_LED_12   | PMC_CONN4_IO53   | Control | DIR for Switches               |
| PMC_CONN4_IO22   | Buffered | TOP_YELLOW_LED_13   | PMC_CONN4_IO54   | Control | Optional CLKAB1 for Switches   |
| PMC_CONN4_IO23   | Buffered | TOP_YELLOW_LED_14   | PMC_CONN4_IO55   | Control | Optional CLKBA1 for Switches   |
| PMC_CONN4_IO24   | Buffered | TOP_YELLOW_LED_15   | PMC_CONN4_IO56   | Control | Optional SAB1 for Switches     |
| PMC_CONN4_IO25   | Buffered | L_GAME_SW_LFT       | PMC_CONN4_IO57   | Control | Optional SBA1 for Switches     |
| PMC_CONN4_IO26   | Buffered | L_MID_SW            | PMC_CONN4_IO58   | Control | Optional OE2 for Switches      |
| PMC_CONN4_IO27   | Buffered | L_GAME_SW_BOT       | PMC_CONN4_IO59   | Control | Optional CLKAB2 for Switches   |
| PMC_CONN4_IO28   | Buffered | L_TOP_SW            | PMC_CONN4_IO60   | Control | Optional CLKBA2 for Switches   |
| PMC_CONN4_IO29   | Buffered | L_GAME_SW_RT        | PMC_CONN4_IO61   | Control | Optional SAB2 for Switches     |
| PMC_CONN4_IO30   | Buffered | L_GAME_SW_TOP       | PMC_CONN4_IO62   | Control | Optional SBA2 for Switches     |
| PMC_CONN4_IO31   | Buffered | USER_BIT22          |                  |         |                                |
| PMC_CONN4_IO32   | Buffered | USER_BIT23          |                  |         |                                |
| PMC_CONN4_IO33   | Buffered | R_GAME_SW_TOP       |                  |         |                                |
| PMC_CONN4_IO34   | Buffered | R_GAME_SW_LFT       |                  |         |                                |
| PMC_CONN4_IO35   | Buffered | R_GAME_SW_RT        |                  |         |                                |
| PMC_CONN4_IO36   | Buffered | R_GAME_SW_BOT       |                  |         |                                |
| PMC_CONN4_IO37   | Buffered | R_TOP_SW            |                  |         |                                |
| PMC_CONN4_IO38   | Buffered | R_MID_SW            |                  |         |                                |
| PMC_CONN4_IO39   | Buffered | R_BOT_SW            |                  |         |                                |
| PMC_CONN4_IO40   | Buffered | L_BOT_SW            |                  |         |                                |



PCB 1280286  
ASM 0431195  
SCH 0381136

Title: ML300\_PWR\_IO  
ML300\_CPU TO ML300\_PWR\_IO  
Pin Mapping

Date: October 17th, 2002 Ver: 1.00

Sheet Size: B Rev: A

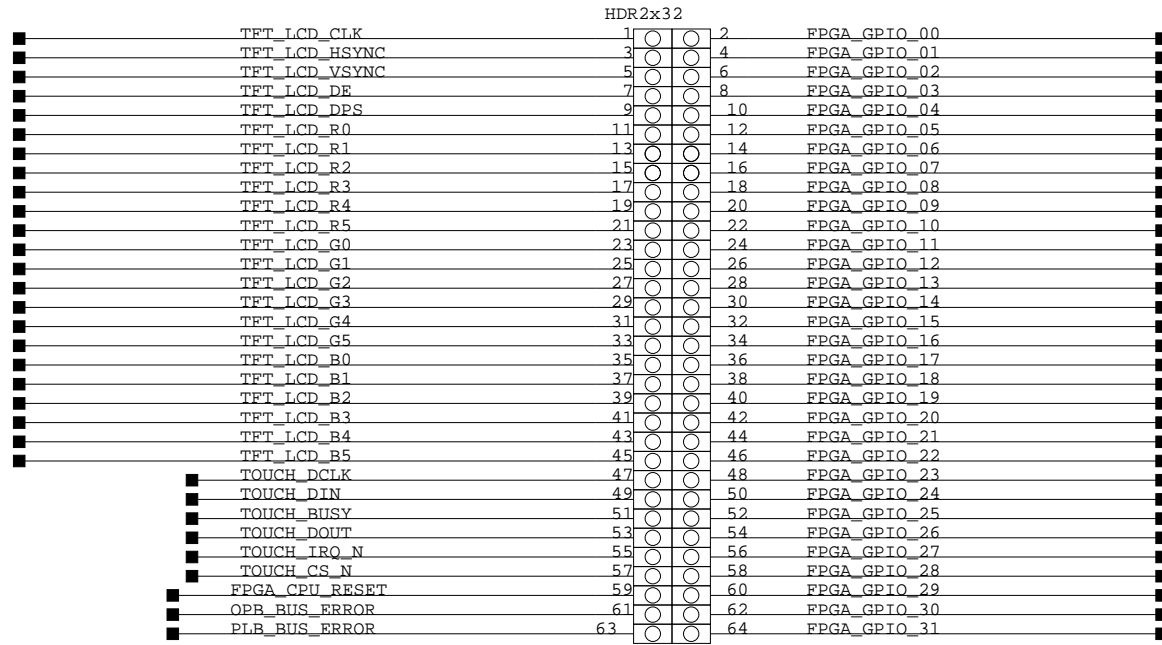
Sheet 10 of 30 Drawn By BF

ML300\_PWR\_IO Board

ML300\_CPU TO ML300\_PWR\_IO Pin Mapping

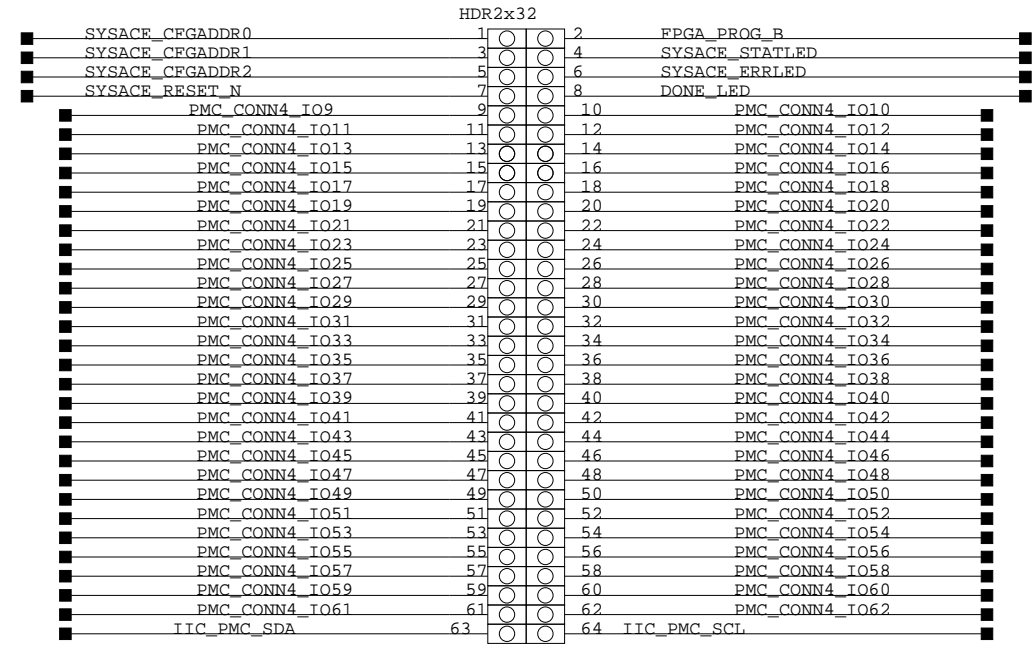
[www.BDTIC.com/XILINX](http://www.BDTIC.com/XILINX)

Silkscreen: "Digital Conn #1"



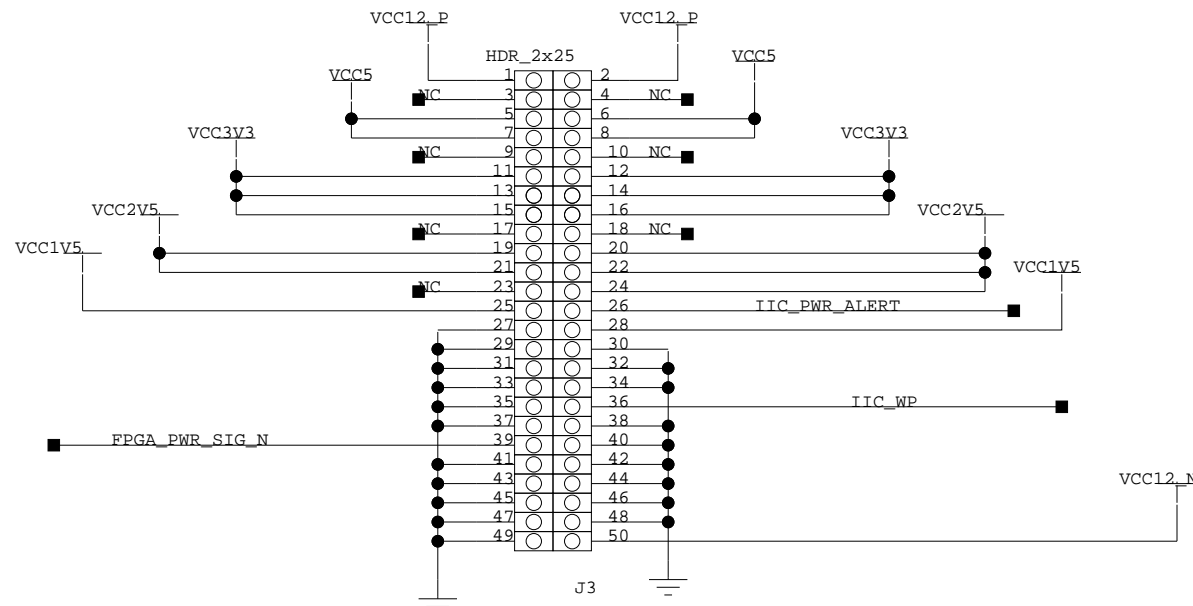
J1  
SSQ-132-01-S-D  
HDR2X32\_BOT

Silkscreen: "Digital Conn #2"



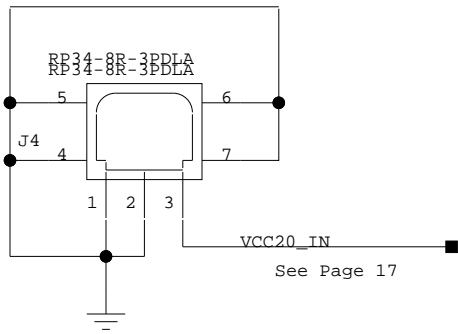
J2  
SSQ-132-01-S-D  
HDR2X32\_BOT

Silkscreen: "Power Conn"

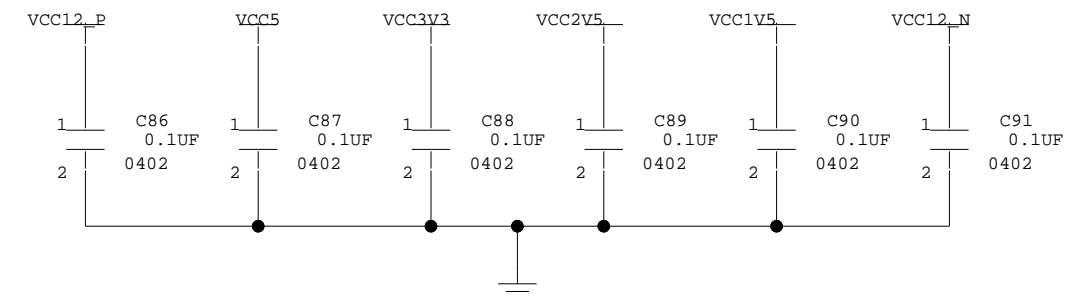
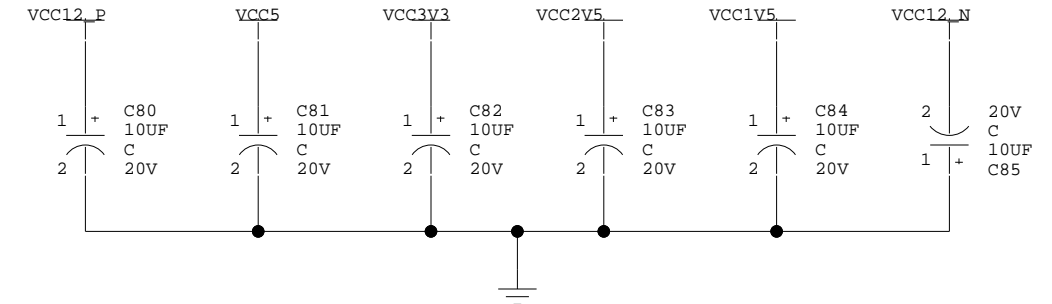


J3  
SSQ-125-01-S-D  
HDR2X25\_BOT

Silkscreen: "Power In"



20V @ 3.5 Amp  
70 Watt



PCB 1280286  
ASM 0431195  
SCH 0381136

Title: ML300\_PWR\_IO  
Digital and Power Connectors

Date: October 17th, 2002 Ver: 1.00

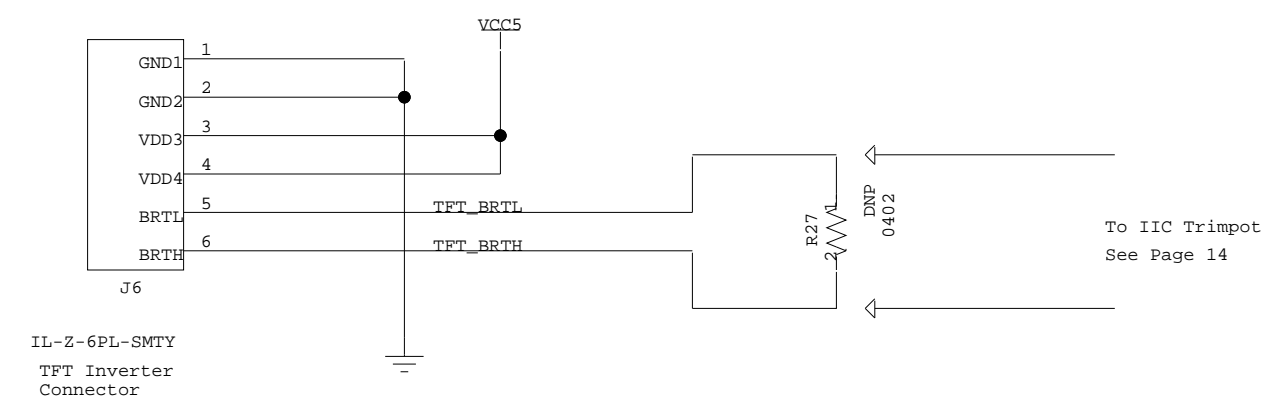
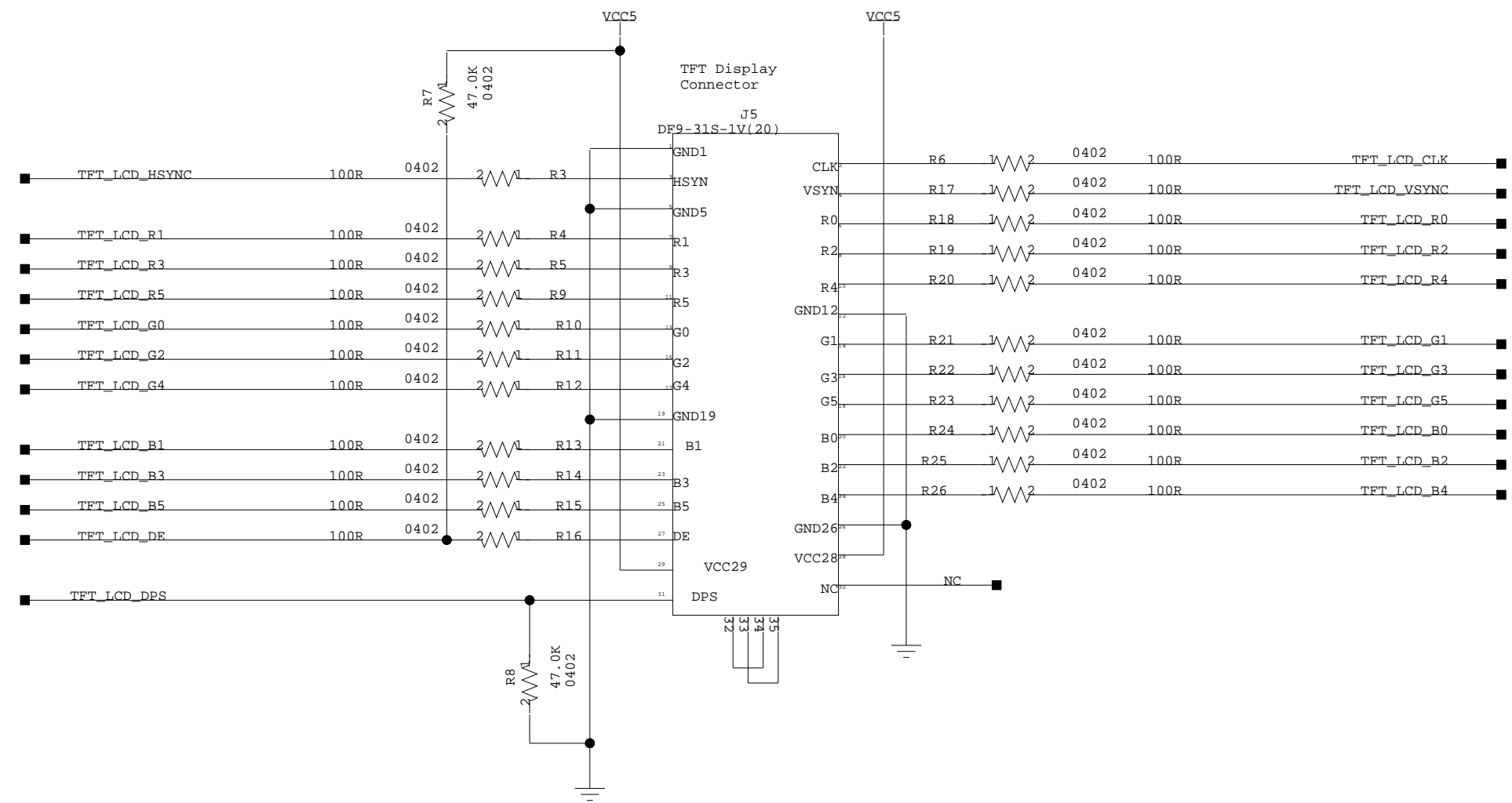
Sheet Size: B Rev: A

Sheet 11 of 29 Drawn By BP & BF

# ML300\_PWR\_IO Board

## Digital and Power Connectors

[www.BDTIC.com/XILINX](http://www.BDTIC.com/XILINX)



PCB 1280286  
ASM 0431195  
SCH 0381136

Title: ML300\_PWR\_IO  
Inverter and TFT Connectors

|                          |             |
|--------------------------|-------------|
| Date: October 17th, 2002 | Ver: 1.00   |
| Sheet Size: B            | Rev: A      |
| Sheet 12 of 28           | Drawn By BF |

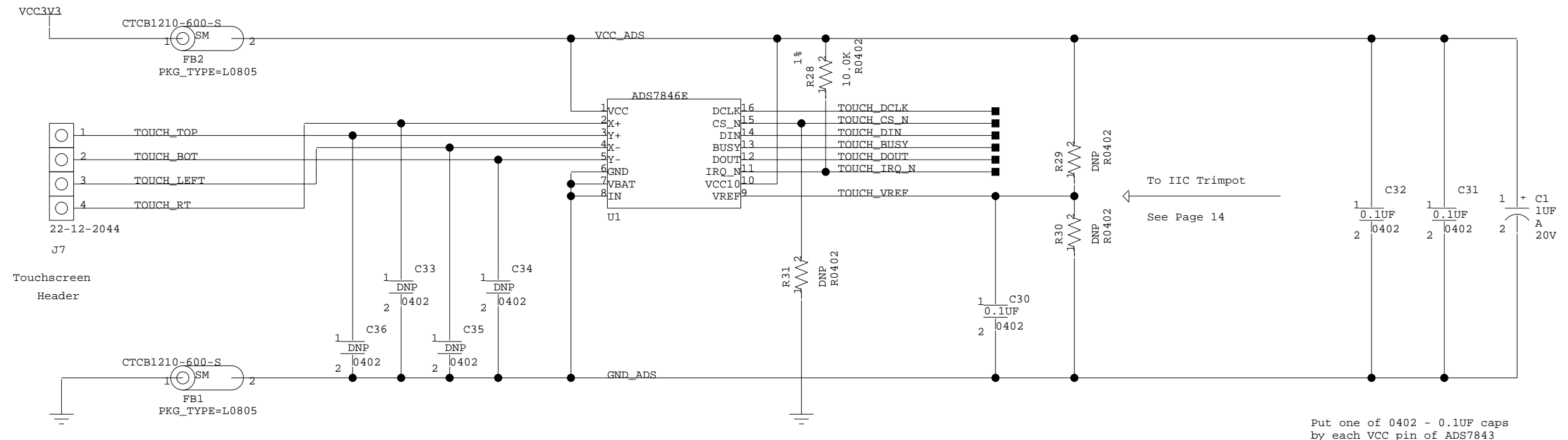
ML300\_PWR\_IO Board

Inverter and TFT Connectors  
[www.BDTIC.com/XILINX](http://www.BDTIC.com/XILINX)

# Touchscreen

Silkscreen:  
"Touchscreen"

Notes  
Ground for the Touchscreen should be an Analog ground, in this case, from the Ferrite Beads  
  
There should be an isolated ground plane immediately Under the ADS7846 and the analog traces, where possible



Put one of 0402 - 0.1uF caps by each VCC pin of ADS7843



PCB 1280286  
ASM 0431195  
SCH 0381136

Title: ML300\_PWR\_IO  
Touchscreen Controller

Date: October 17th, 2002 Ver: 1.00

Sheet Size: B Rev: A

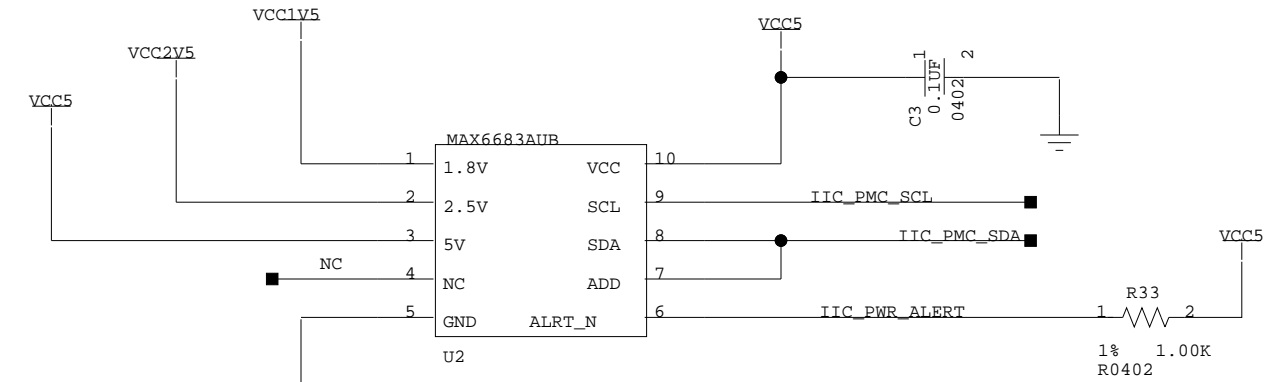
Sheet 13 of 28 Drawn By BF

## ML300\_PWR\_IO Board

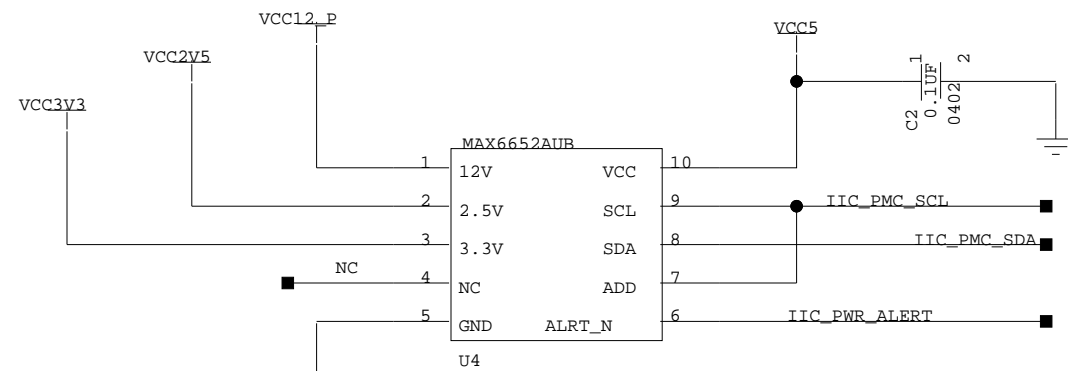
## www.BDTIC.com/XILINX Touchscreen Controller

# IIC Components

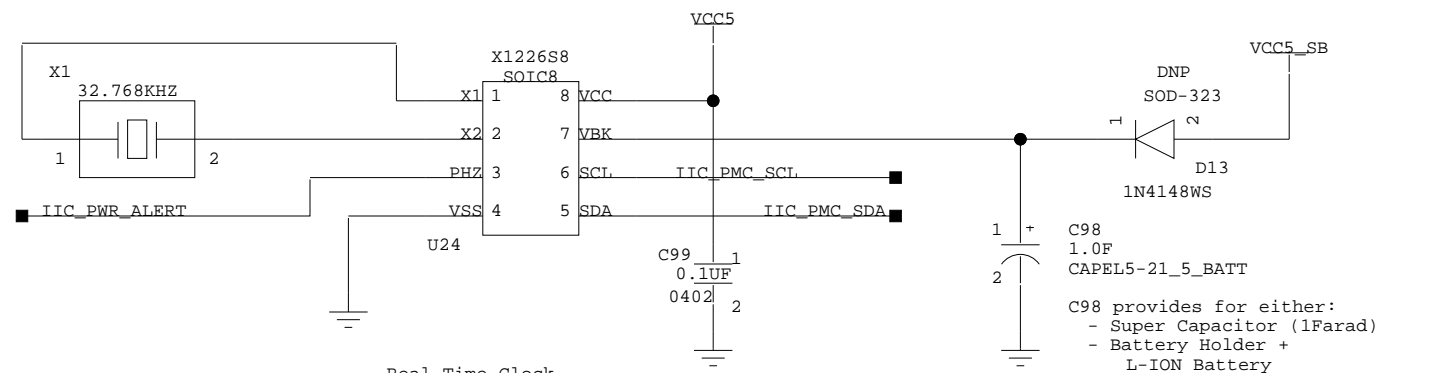
| IC          | BOARD        | REF  | DESCRIPTION                  | ADDR  |
|-------------|--------------|------|------------------------------|-------|
| MAX6683AUB  | ML300_CPU    | U255 | System Monitor 1             | 28/29 |
| MAX6652AUB  | ML300_CPU    | U256 | System Monitor 2             | 2A/2B |
| MAX6652AUB  | ML300_PWR_IO | U4   | System Monitor 4             | 2E/2F |
| MAX6683AUB  | ML300_PWR_IO | U2   | System Monitor 3             | 2C/2D |
| MAX1617     | ML300_CPU    | U251 | FPGA Die/Ambient Temp        | 30/31 |
| LM76CNM_3   | ML300_CPU    | U252 | Ambient Temp                 | 96/97 |
| 24LC32A/SN  | ML300_CPU    | U253 | 32Kbit EEPROM                | A0/A1 |
| DS1845E-010 | ML300_CPU    | U502 | Audio Trimpot                | A6/A7 |
| DS1845E-010 | ML300_PWR_IO | U3   | TFT Touchscreen Trimpot      | AC/AD |
| X1226S8     | ML300_PWR_IO | U24  | Real Time Clock 4Kbit EEPROM | AE/AF |
| X1226S8     | ML300_PWR_IO | U24  | Real Time Clock RTC          | DE/DF |



System Monitor 3  
ADDR : "2C/2D"

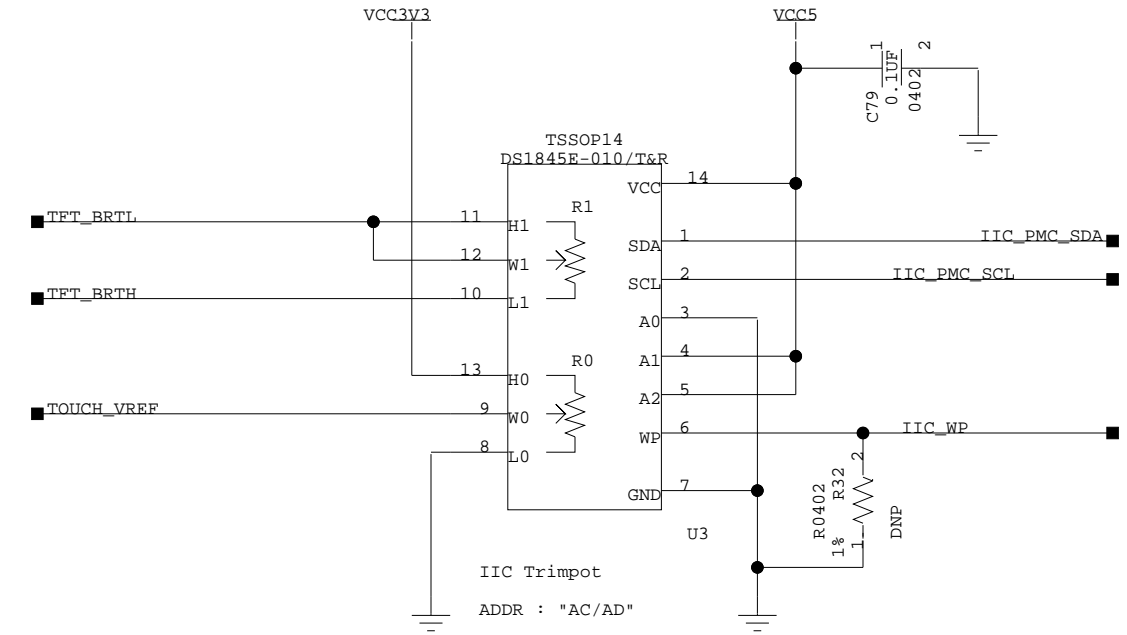


System Monitor 4  
ADDR : "2E/2F"



Real Time Clock  
IIC Address:  
ADDR : "AE/AF" EEPROM  
ADDR : "DE/DF" RTC

Do not populate D13 when using battery option



IIC Trimpot  
ADDR : "AC/AD"

Trimpot 0 Controls Touchscreen Sensitivity  
Trimpot 1 Controls TFT Brightness



PCB 1280286  
ASM 0431195  
SCH 0381136

Title: ML300\_PWR\_IO  
IIC Bus

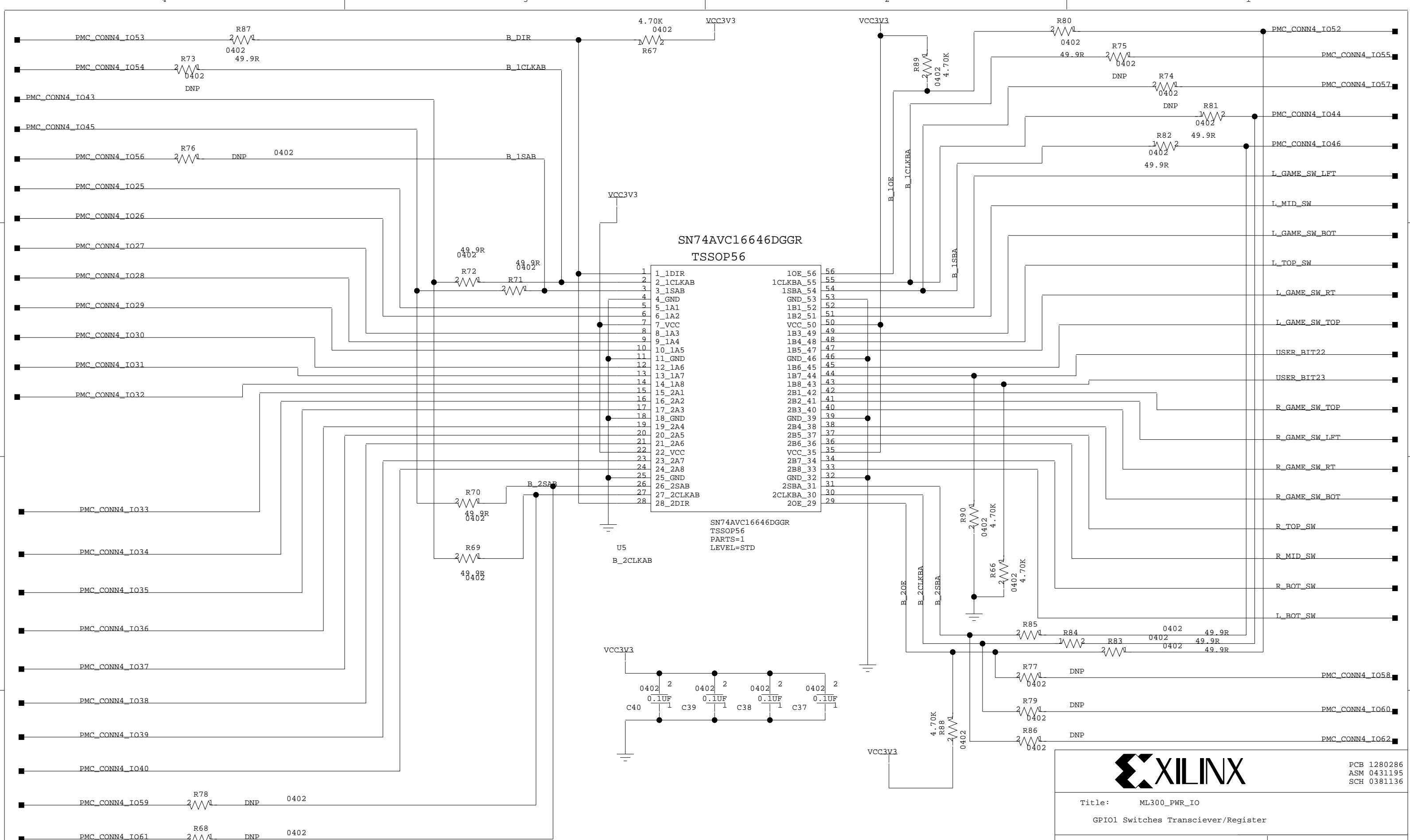
Date: October 17th, 2002 Ver: 1.00

Sheet Size: B Rev: A

Sheet 14 of 28 Drawn By BF

ML300\_PWR\_IO Board

IIC Bus



ML300\_PWR\_IO Board

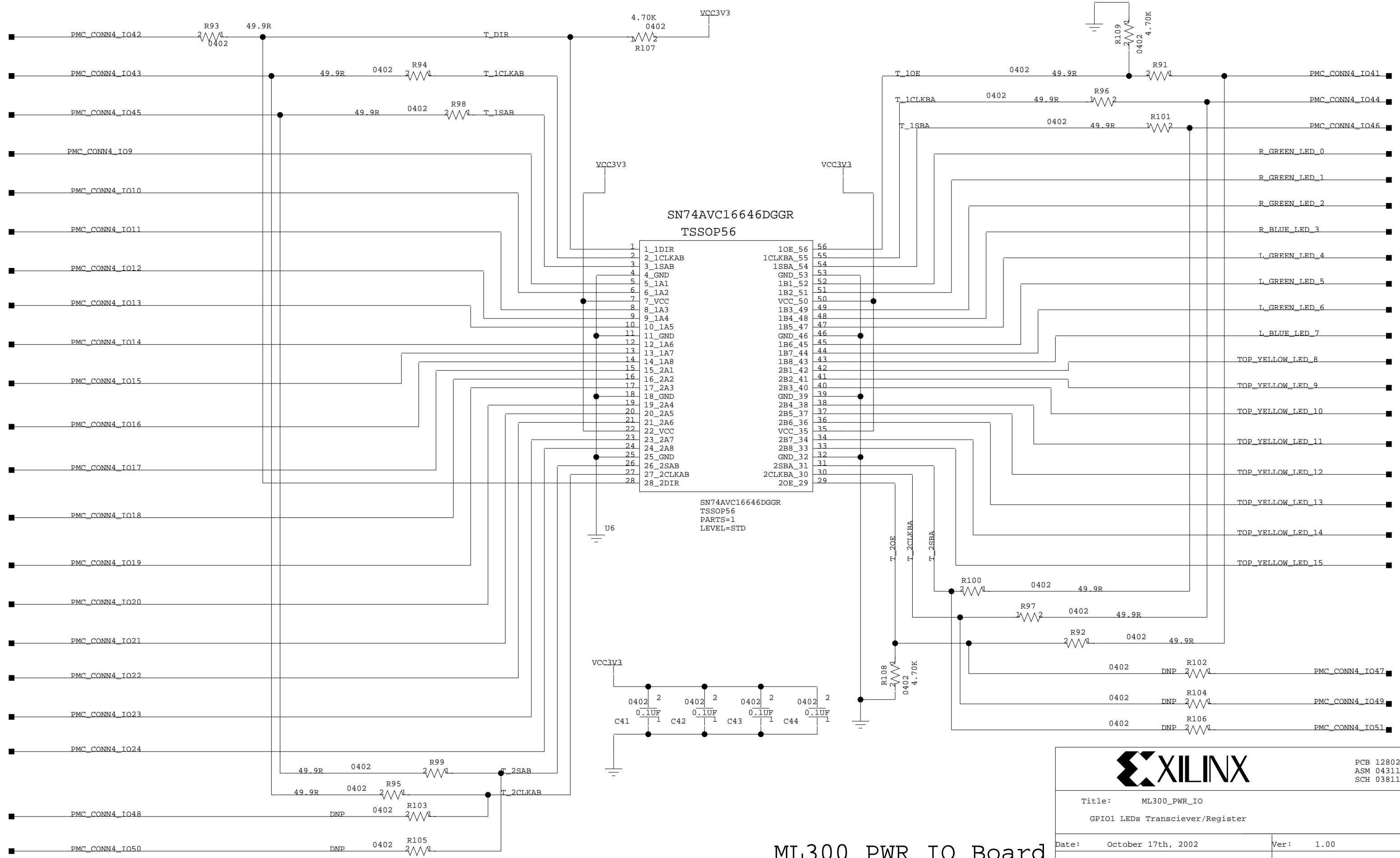
GPI01 Switches Transceiver/Register

www.BDTIC.com/XILINX



PCB 1280286  
ASM 0431195  
SCH 0381136

|  |             |
|--|-------------|
| Title: ML300_PWR_IO<br>GPI01 Switches Transceiver/Register |             |
| Date: October 17th, 2002                                   | Ver: 1.00   |
| Sheet Size: B  | Rev: A      |
| Sheet 15 of 30   | Drawn By BF |



# ML300\_PWR\_IO Board

## GPIO1 LEDs Transceiver/Register

[www.BDTIC.com/XILINX](http://www.BDTIC.com/XILINX)

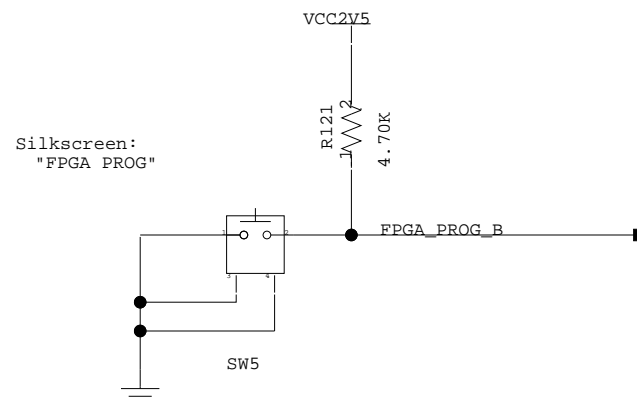
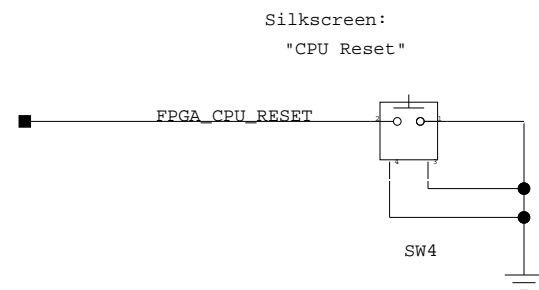
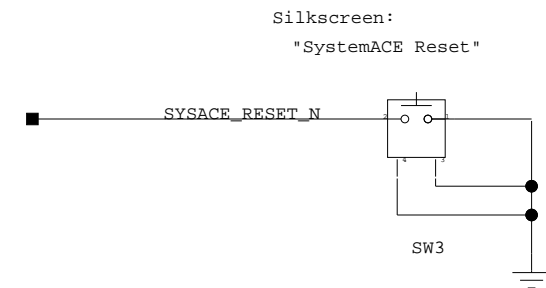
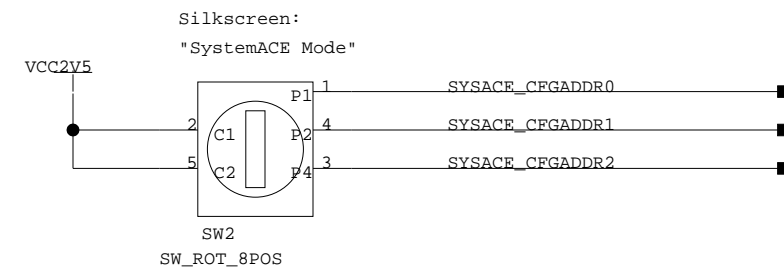
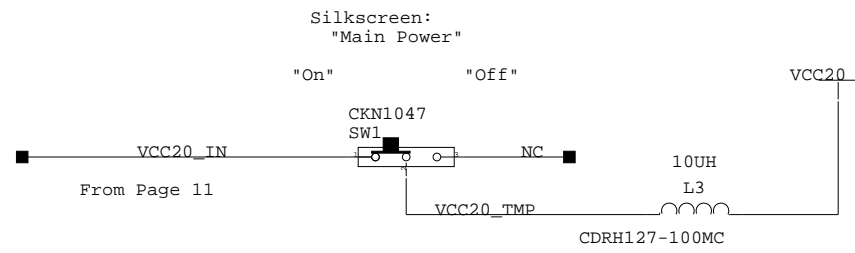
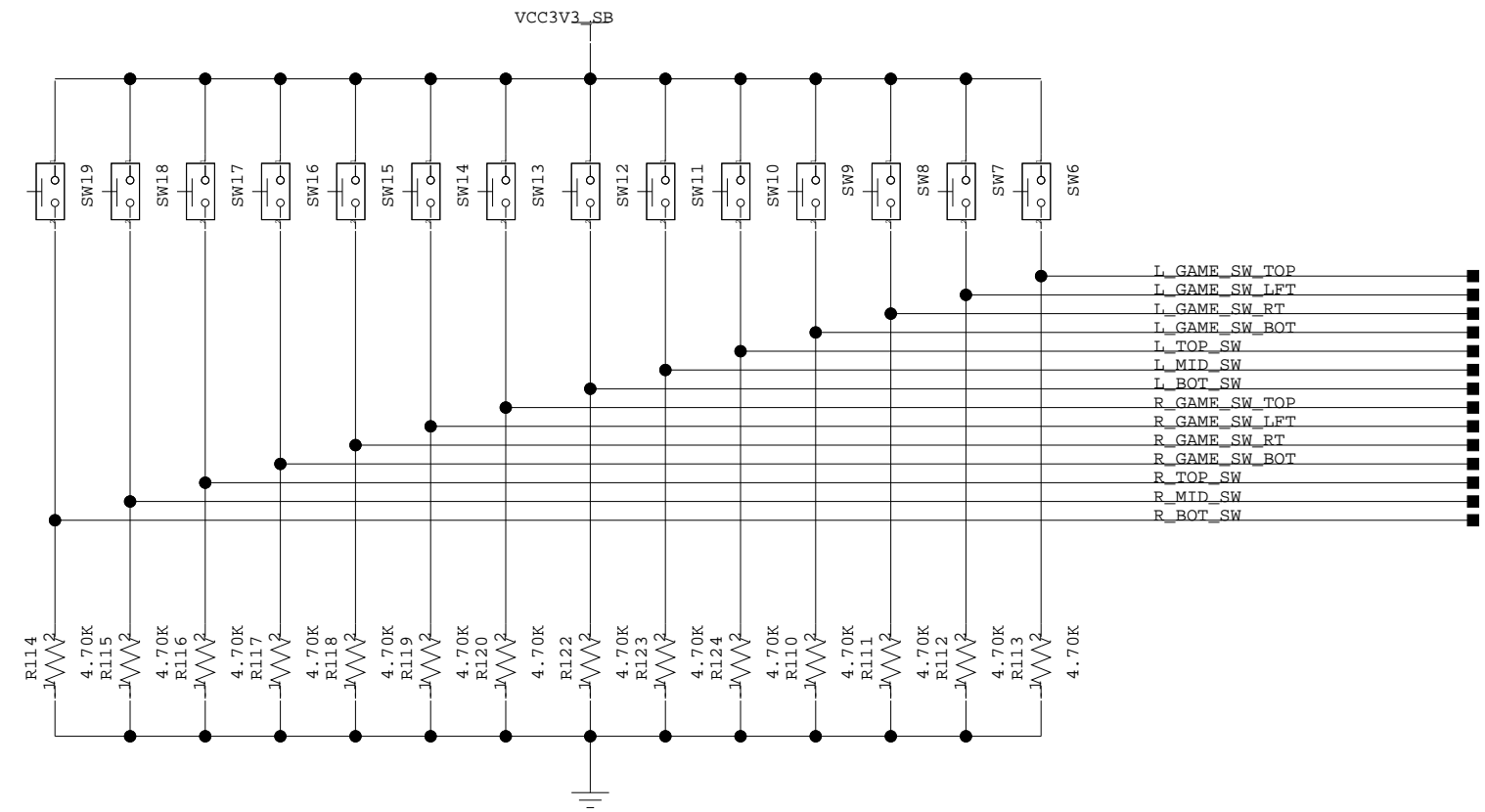
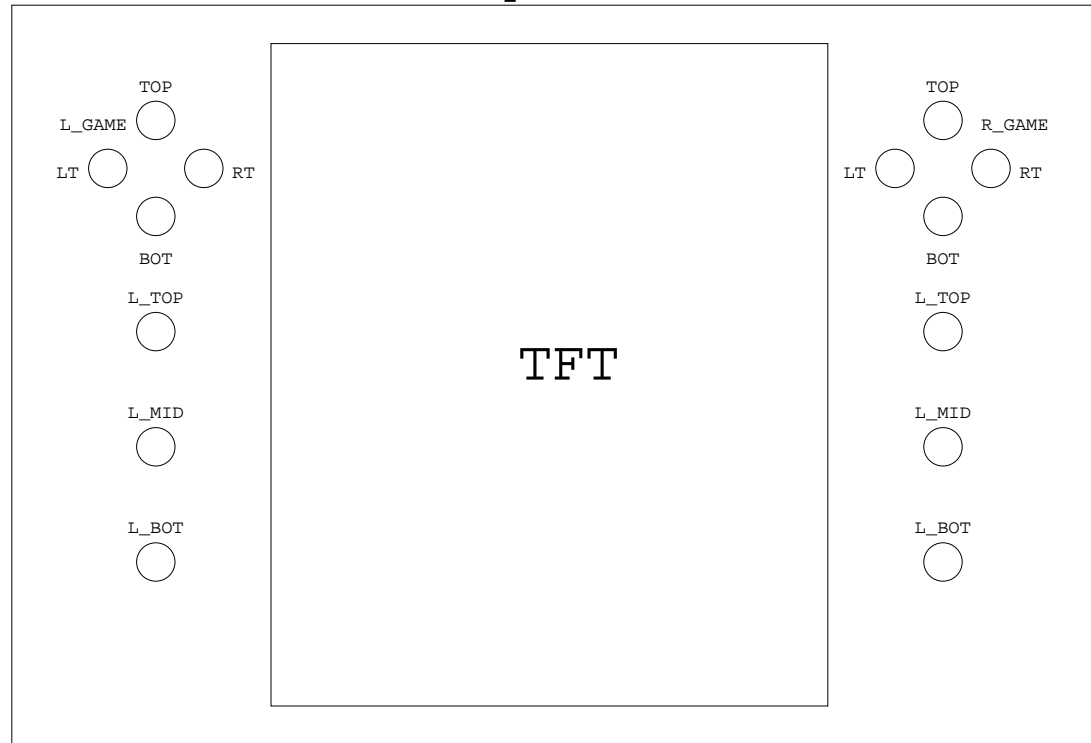


PCB 1280286  
ASM 0431195  
SCH 0381136

|  |             |
|--|-------------|
| Title: ML300_PWR_IO<br>GPIO1 LEDs Transceiver/Register |             |
| Date: October 17th, 2002                               | Ver: 1.00   |
| Sheet Size: B  | Rev: A      |
| Sheet 16 of 30   | Drawn By BF |



Top View



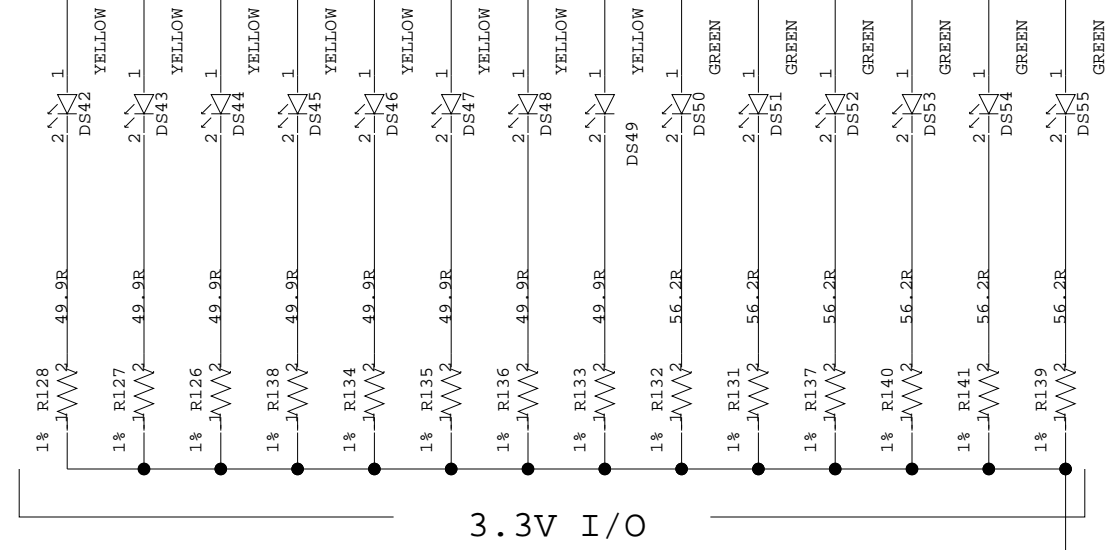
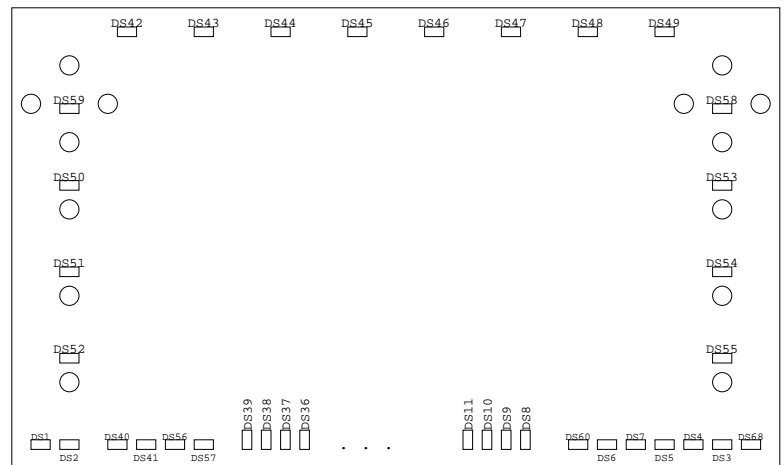
PCB 1280286  
ASM 0431195  
SCH 0381136

|   |             |
|---|-------------|
| Title: ML300_PWR_IO<br>GPIO1 Buttons and Switches |             |
| Date: October 17th, 2002                          | Ver: 1.00   |
| Sheet Size: B                                     | Rev: A      |
| Sheet 17 of 28                                    | Drawn By BF |

ML300\_PWR\_IO Board

GPIO1 Buttons and Switches  
[www.BDTIC.com/XILINX](http://www.BDTIC.com/XILINX)

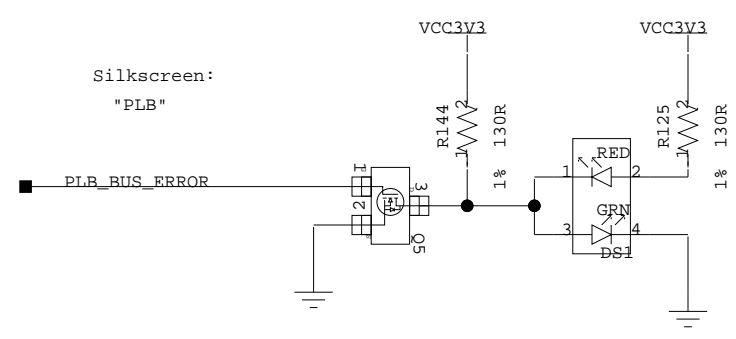
- R\_GREEN\_LED\_0
- R\_GREEN\_LED\_1
- R\_GREEN\_LED\_2
- L\_GREEN\_LED\_4
- L\_GREEN\_LED\_5
- L\_GREEN\_LED\_6
- TOP\_YELLOW\_LED\_8
- TOP\_YELLOW\_LED\_9
- TOP\_YELLOW\_LED\_10
- TOP\_YELLOW\_LED\_11
- TOP\_YELLOW\_LED\_12
- TOP\_YELLOW\_LED\_13
- TOP\_YELLOW\_LED\_14
- TOP\_YELLOW\_LED\_15



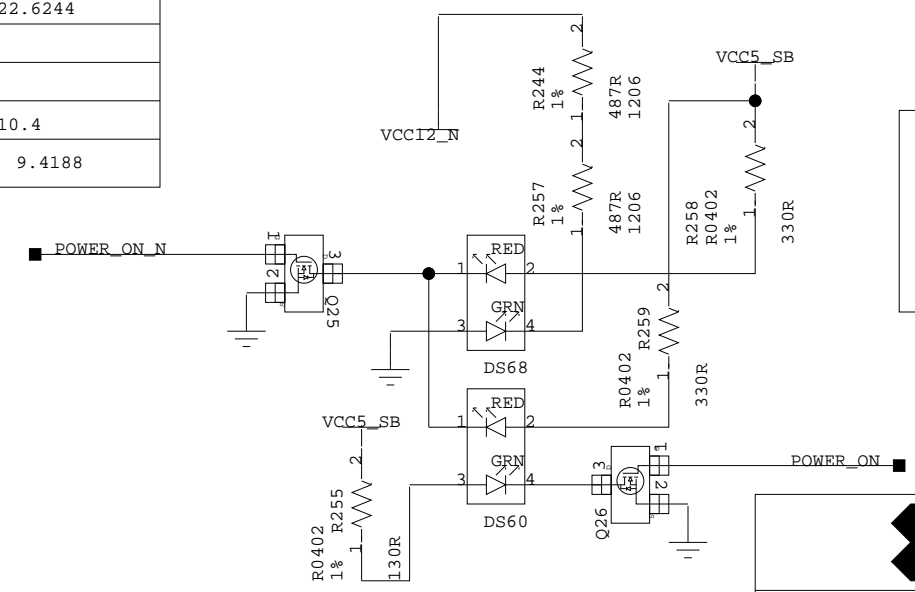
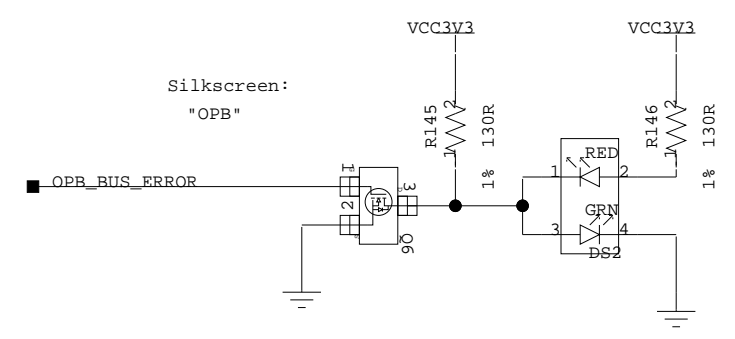
3.3V I/O

| LED       | Vf   | If | mcd | 5V   |     |         | 3.3V |      |         | 2.5V |      |         |
|-----------|------|----|-----|------|-----|---------|------|------|---------|------|------|---------|
|           |      |    |     | Calc | Use | Real If | Calc | Use  | Real If | Calc | Use  | Real If |
| GRN 0603  | 2.2  | 20 | 18  | 140  | 130 | 21.5384 | 55   | 56.2 | 19.6428 | 15   | 20.0 | 15.0000 |
| YEL 0603  | 2.0  | 20 | 60  | 150  | 130 | 23.0769 | 65   | 64.9 | 23.2142 | 25   | 22.1 | 22.6244 |
| RED 0603  | 2.0  | 20 | 14  | 150  | 130 | 23.0769 | 65   | 64.9 | 23.2142 | 25   | 22.1 | 22.6244 |
| BLUE 0603 | 3.7  | 20 | 20  | 65   | 56  | 23.2142 | -20  |      |         | -60  |      |         |
| R-G DUAL  |      |    |     |      |     |         |      |      |         |      |      |         |
| RED       | 1.72 | 10 | 6.7 | 328  | 330 | 9.9393  | 158  | 130  | 12.1538 | 78   | 75   | 10.4    |
| GRN       | 2.03 | 10 | 5   | 297  | 300 | 9.9     | 127  | 130  | 9.7692  | 47   | 49.9 | 9.4188  |

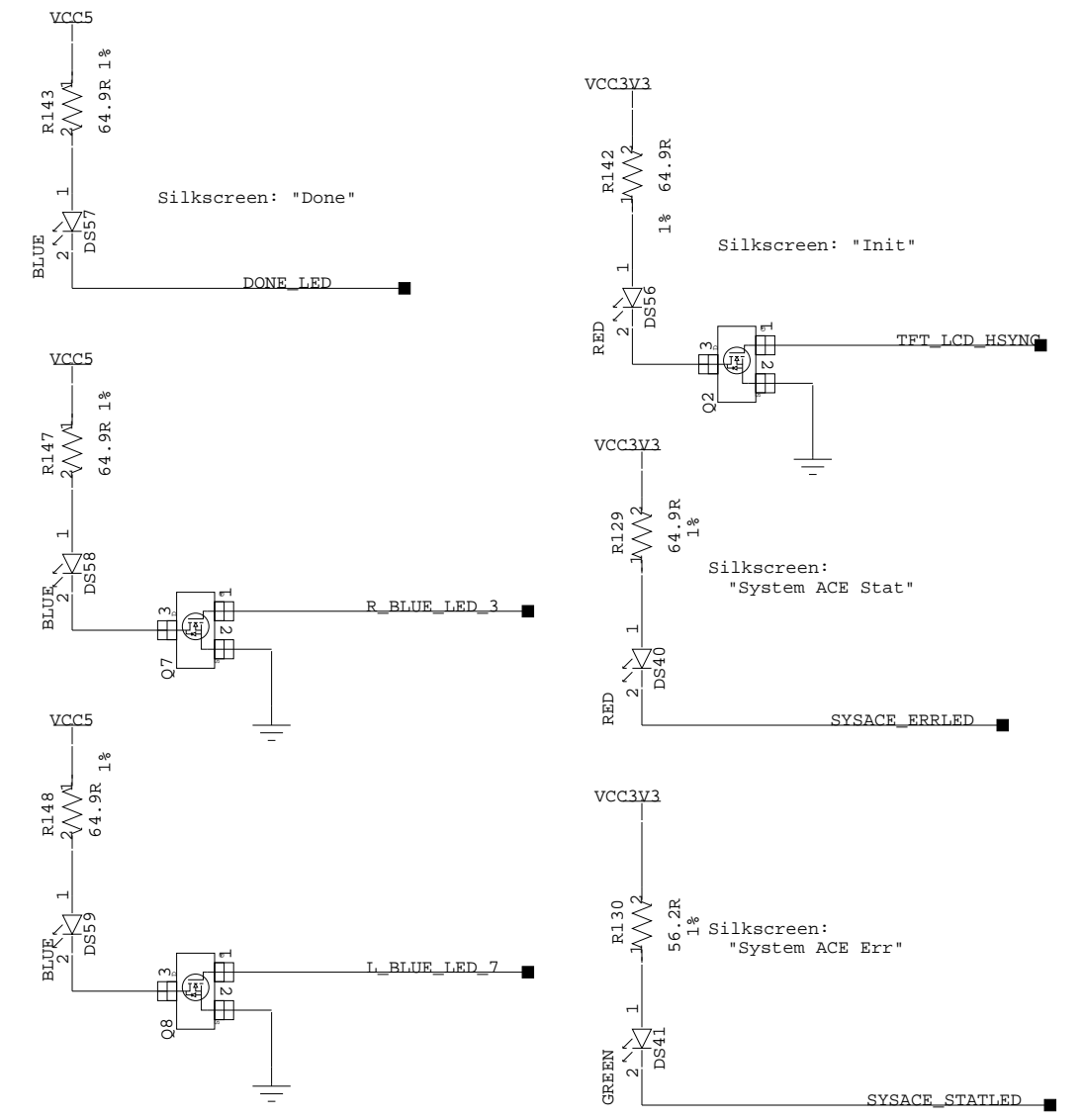
Silkscreen:  
"Bus Error"



Silkscreen:  
"OPB"



DS68 = -12V "Power Monitor" LED  
 DS60 = 20V "Power Monitor" LED  
 Red = SLEEP MODE ONLY  
 GRN = POWER IS PRESENT  
 Voltage not Checked



# ML300\_PWR\_IO Board

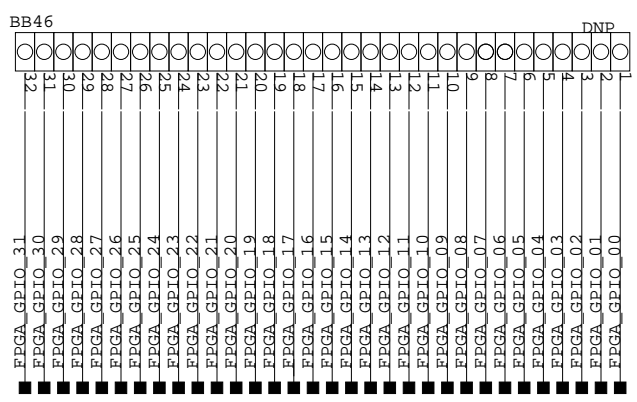
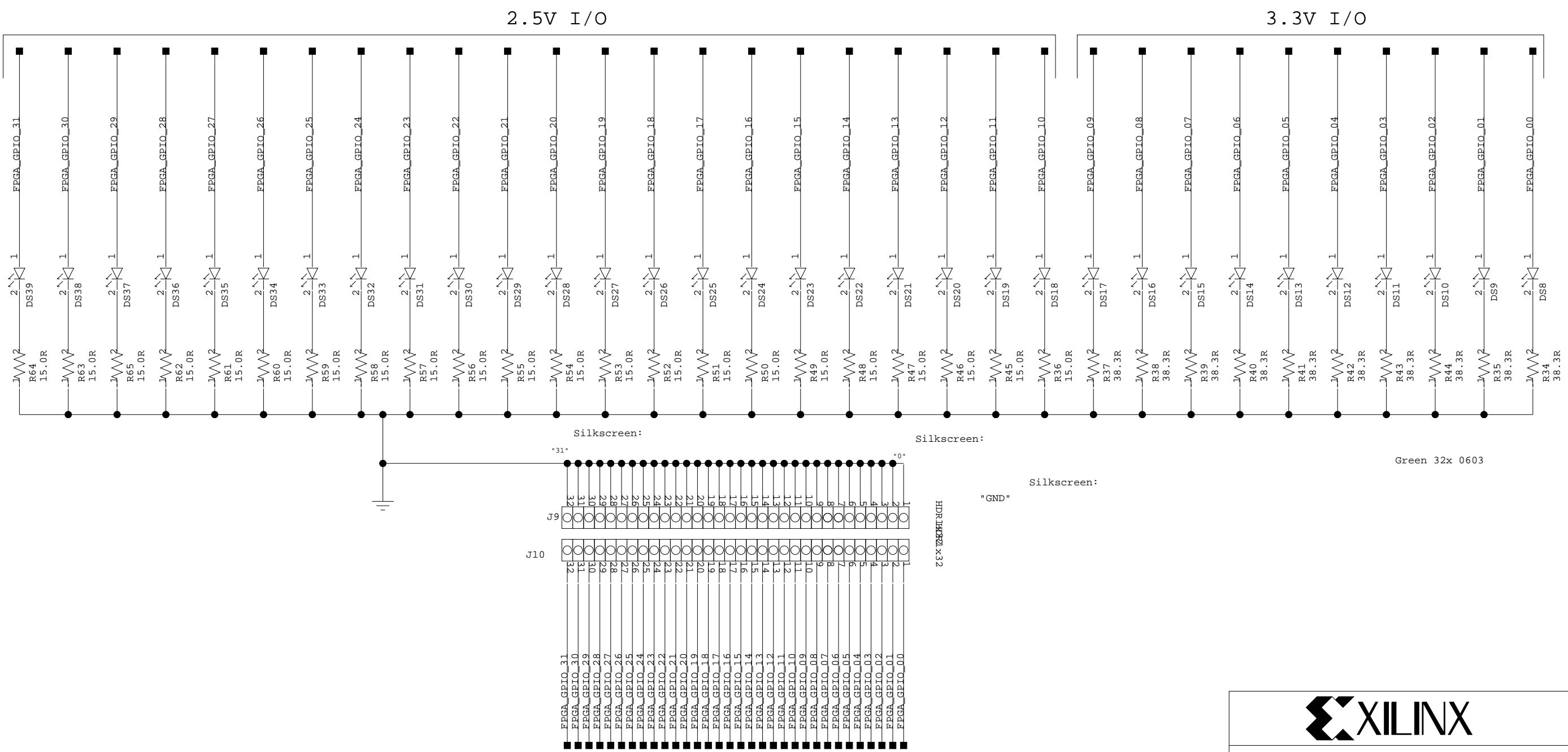
## GPI01, Bus Error, Status LEDs

[www.BDTIC.com/XILINX](http://www.BDTIC.com/XILINX)



PCB 1280286  
 ASM 0431195  
 SCH 0381136

|  |             |
|--|-------------|
| Title: ML300_PWR_IO<br>GPI01, Bus Error, Status LEDs |             |
| Date: October 17th, 2002                             | Ver: 1.00   |
| Sheet Size: B  | Rev: A      |
| Sheet 18 of 28                                       | Drawn By BF |



BB46 is the lower row of holes in the Prototyping Area

# ML300\_PWR\_IO Board

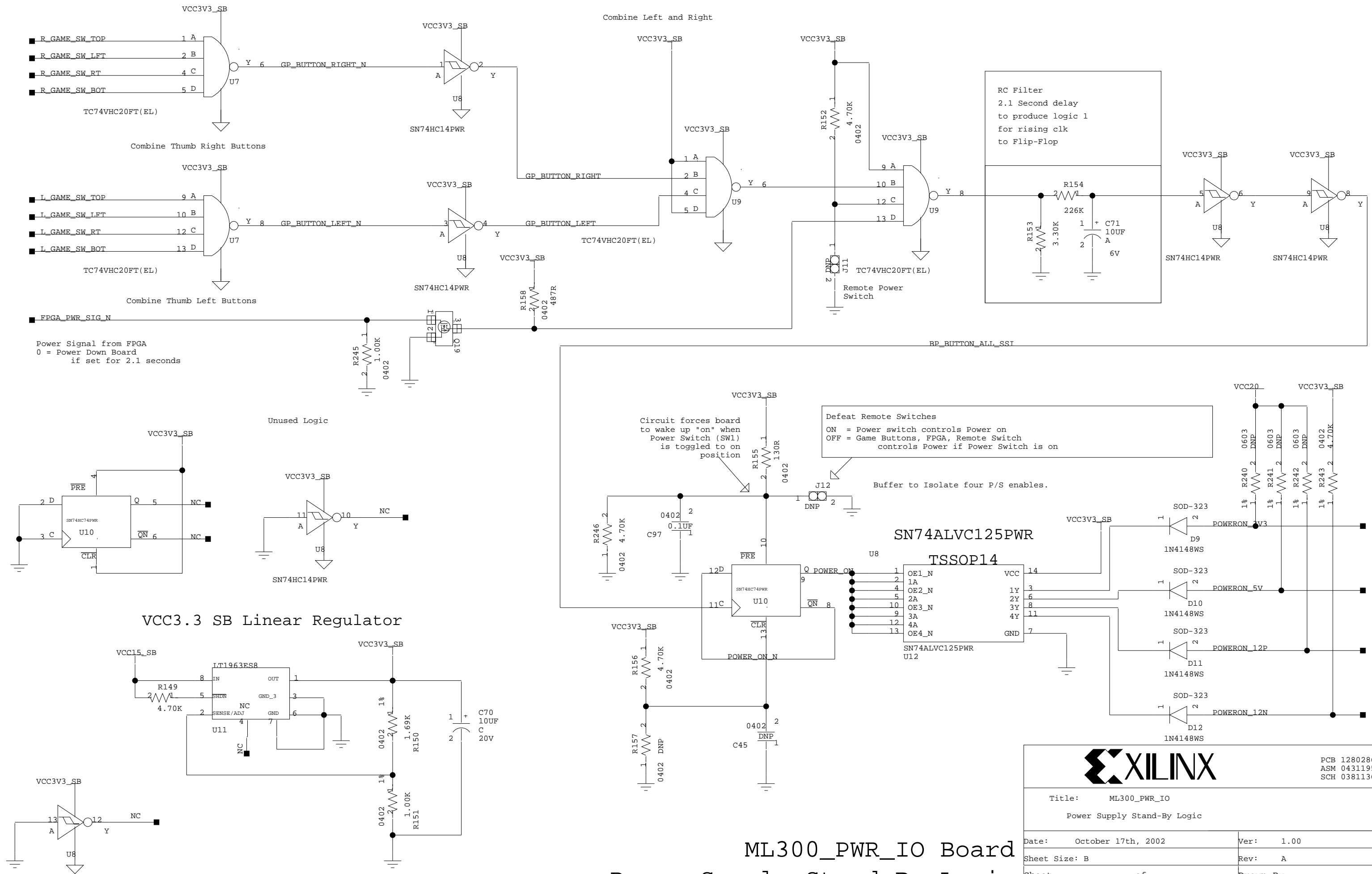
## GPIO2/Test Port LEDs and Headers

[www.BDITC.com/XILINX](http://www.BDITC.com/XILINX)



PCB 1280286  
 ASM 0431195  
 SCH 0381136

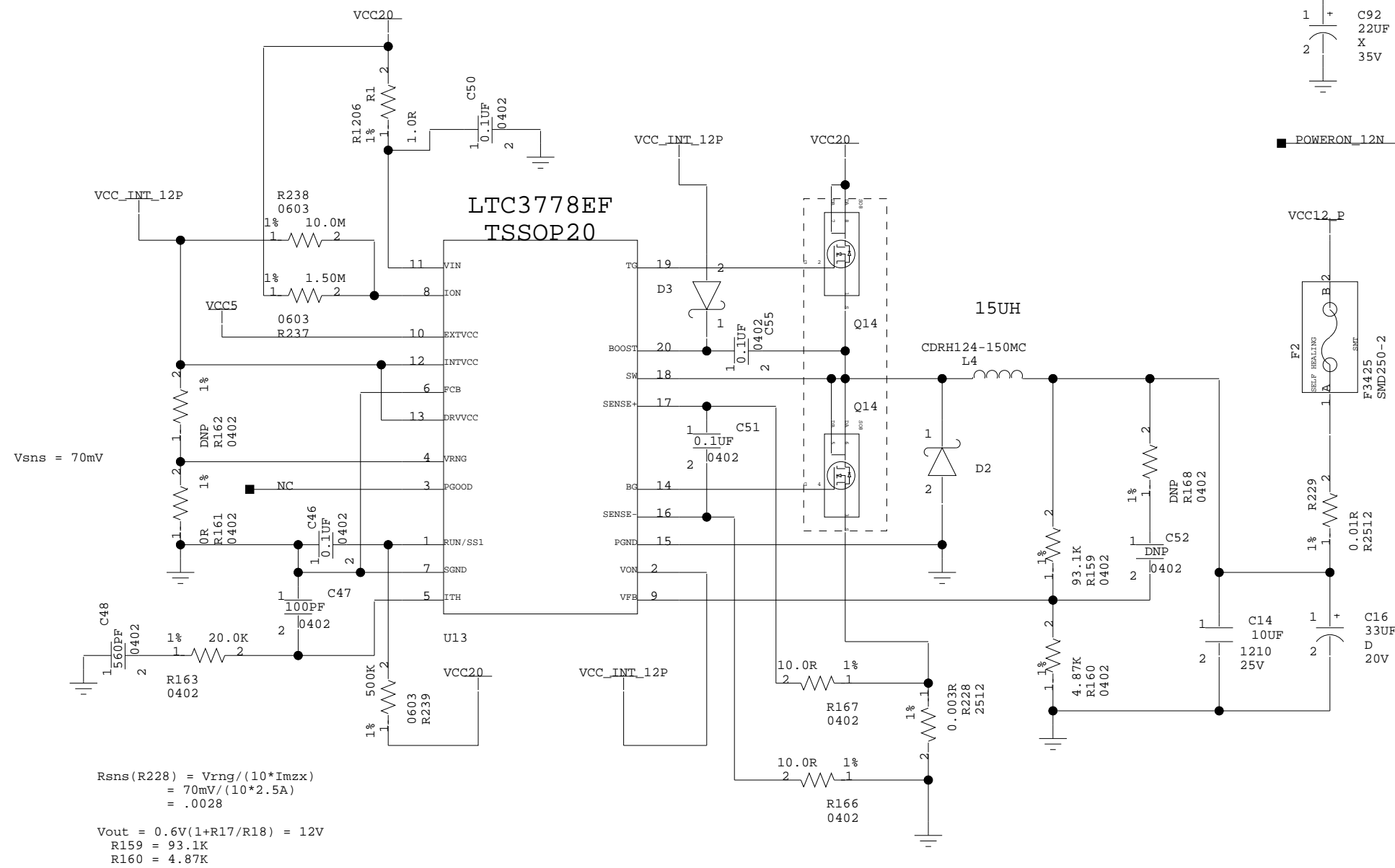
|   |             |
|---|-------------|
| Title: ML300_PWR_IO<br>GPIO2/Test Port LEDs and Headers |             |
| Date: October 17th, 2002                                | Ver: 1.00   |
| Sheet Size: B   | Rev: A      |
| Sheet 19 of 28  | Drawn By BF |



|  |             |   |
|--|-------------|---|
| Title: ML300_PWR_IO<br>Power Supply Stand-By Logic |             | PCB 1280286<br>ASM 0431195<br>SCH 0381136 |
| Date: October 17th, 2002                           | Ver: 1.00   |   |
| Sheet Size: B                                      | Rev: A      |   |
| Sheet 20 of 28                                     | Drawn By BF |   |

**NOTES:**

1. Tabs on TO-220 are not ground, so need non-conductive sinks
2. SoftStart based on C25 and is  $1.25s/UF = 0.125$  Seconds
3. VIN Caps should be immediately adjacent to ground pin on MOSFETs for 12V



Vs<sub>sns</sub> = 70mV

$$R_{sns}(R228) = V_{r\text{vng}} / (10 * I_{m\text{z}\text{x}})$$

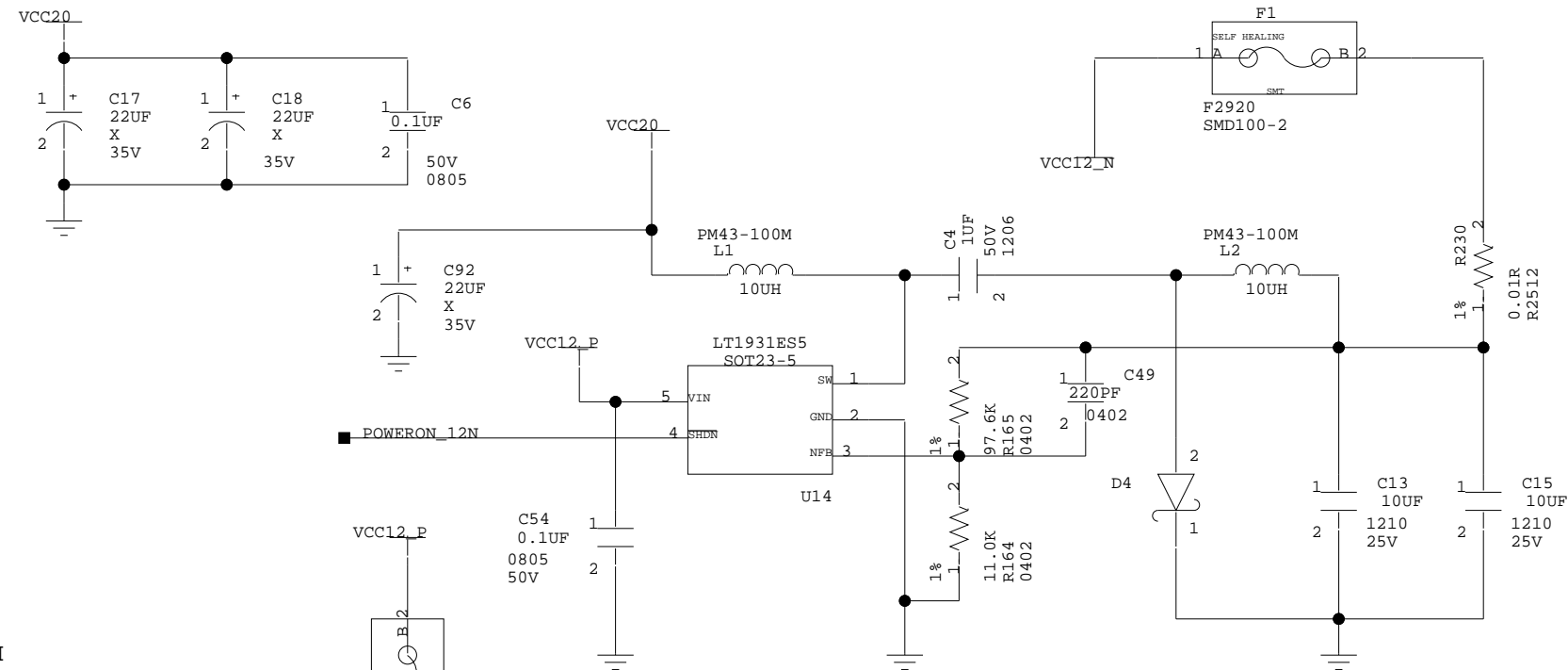
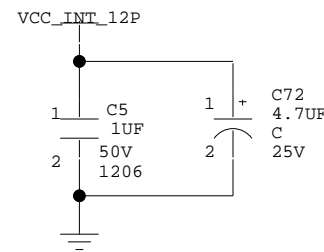
$$= 70\text{mV} / (10 * 2.5\text{A})$$

$$= .0028$$

$$V_{out} = 0.6V(1 + R17/R18) = 12V$$

$$R159 = 93.1K$$

$$R160 = 4.87K$$

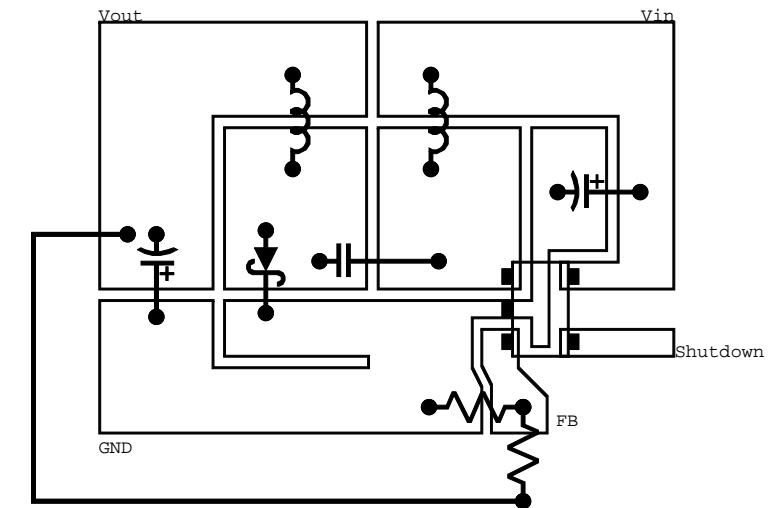


$$V_{out} = -1.255V(1 + R19/R20) + R19 * (4 * 10^{-6}) = -12V$$

$$R165 = 97.6K$$

$$R164 = 11.0K$$

Please refer to the Layout description on page 8 of the LT1931/LT1931A datasheet. Shown replicated below. Please note the Shape of the GND plane for diode - This is important for low noise operation.



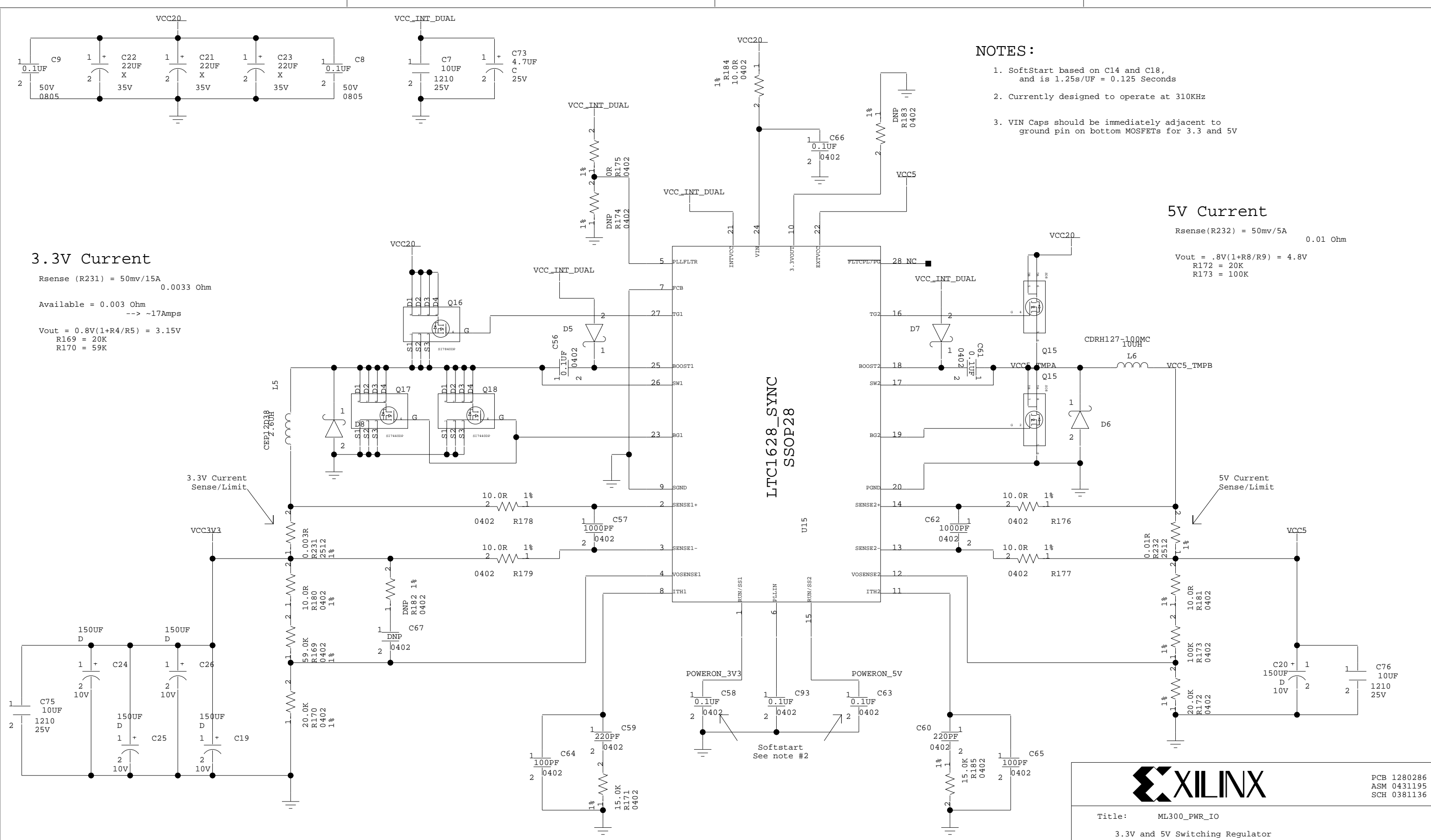
PCB 1280286  
ASM 0431195  
SCH 0381136

|   |                  |
|---|------------------|
| Title: ML300_PWR_IO<br>+12V and -12V Switching Regulators |                  |
| Date: October 17th, 2002                                  | Ver: 1.00        |
| Sheet Size: B   | Rev: A           |
| Sheet 21 of 28  | Drawn By BP & BF |

**ML300\_PWR\_IO Board**

**+12V and -12V Switching Regulators**

[www.BDTIC.com/XILINX](http://www.BDTIC.com/XILINX)



**NOTES:**

1. SoftStart based on C14 and C18, and is  $1.25s/UF = 0.125$  Seconds
2. Currently designed to operate at 310KHz
3. VIN Caps should be immediately adjacent to ground pin on bottom MOSFETs for 3.3 and 5V

**3.3V Current**

Rsense (R231) = 50mv/15A  
0.0033 Ohm

Available = 0.003 Ohm  
--> ~17Amps

$V_{out} = 0.8V(1+R4/R5) = 3.15V$   
R169 = 20K  
R170 = 59K

**5V Current**

Rsense(R232) = 50mv/5A  
0.01 Ohm

$V_{out} = .8V(1+R8/R9) = 4.8V$   
R172 = 20K  
R173 = 100K

LTC1628\_SYNC  
SSCP28

**ML300\_PWR\_IO Board**

**3.3V and 5V Switching Regulator**

[www.BDTIC.com/XILINX](http://www.BDTIC.com/XILINX)

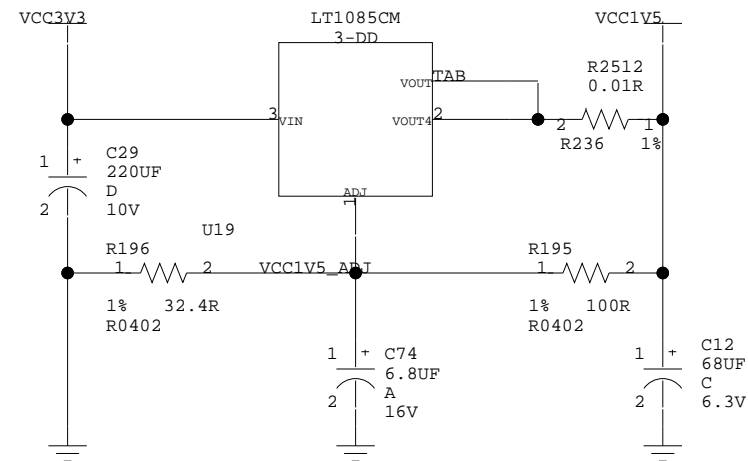


PCB 1280286  
ASM 0431195  
SCH 0381136

|  |                  |
|--|------------------|
| Title: ML300_PWR_IO<br>3.3V and 5V Switching Regulator |                  |
| Date: October 17th, 2002                               | Ver: 1.00        |
| Sheet Size: B  | Rev: A           |
| Sheet 22 of 30   | Drawn By BP & BF |



### VCC 1.5V A



$V_{out} = 1.25V (1 + R_{15}/R_{16})$   
 $V_{1.65} = 1.25V (1 + 32.4/100)$



PCB 1280286  
 ASM 0431195  
 SCH 0381136

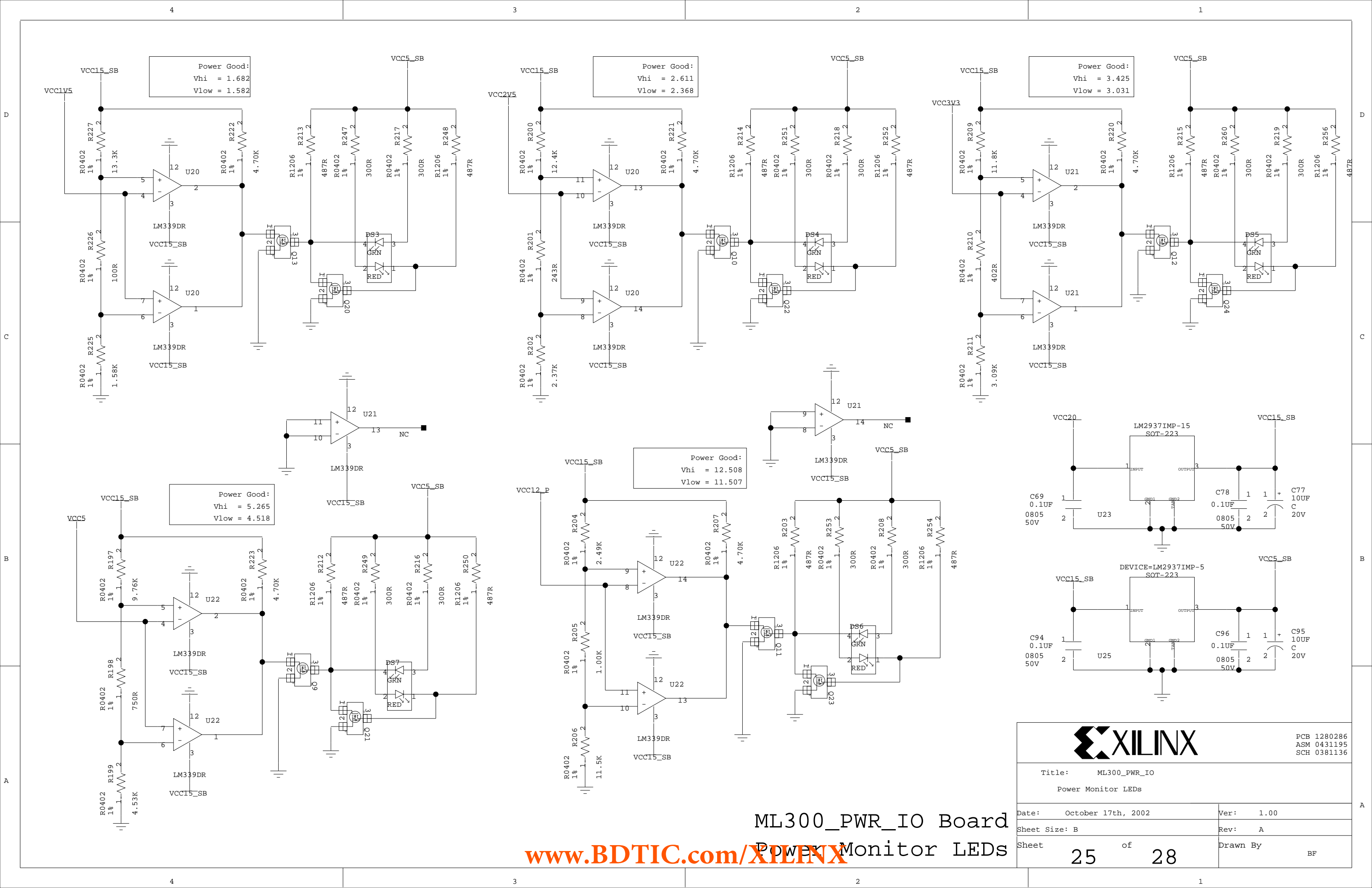
Title: ML300\_PWR\_IO  
 1.5 V Linear Regulator

|                          |             |
|--------------------------|-------------|
| Date: October 17th, 2002 | Ver: 1.00   |
| Sheet Size: B            | Rev: A      |
| Sheet 24 of 30           | Drawn By BP |

ML300\_PWR\_IO Board

www.BDTIC.com/1.5V Linear Regulator





Power Good:  
Vhi = 1.682  
Vlow = 1.582

Power Good:  
Vhi = 2.611  
Vlow = 2.368

Power Good:  
Vhi = 3.425  
Vlow = 3.031

Power Good:  
Vhi = 5.265  
Vlow = 4.518

Power Good:  
Vhi = 12.508  
Vlow = 11.507

ML300\_PWR\_IO Board

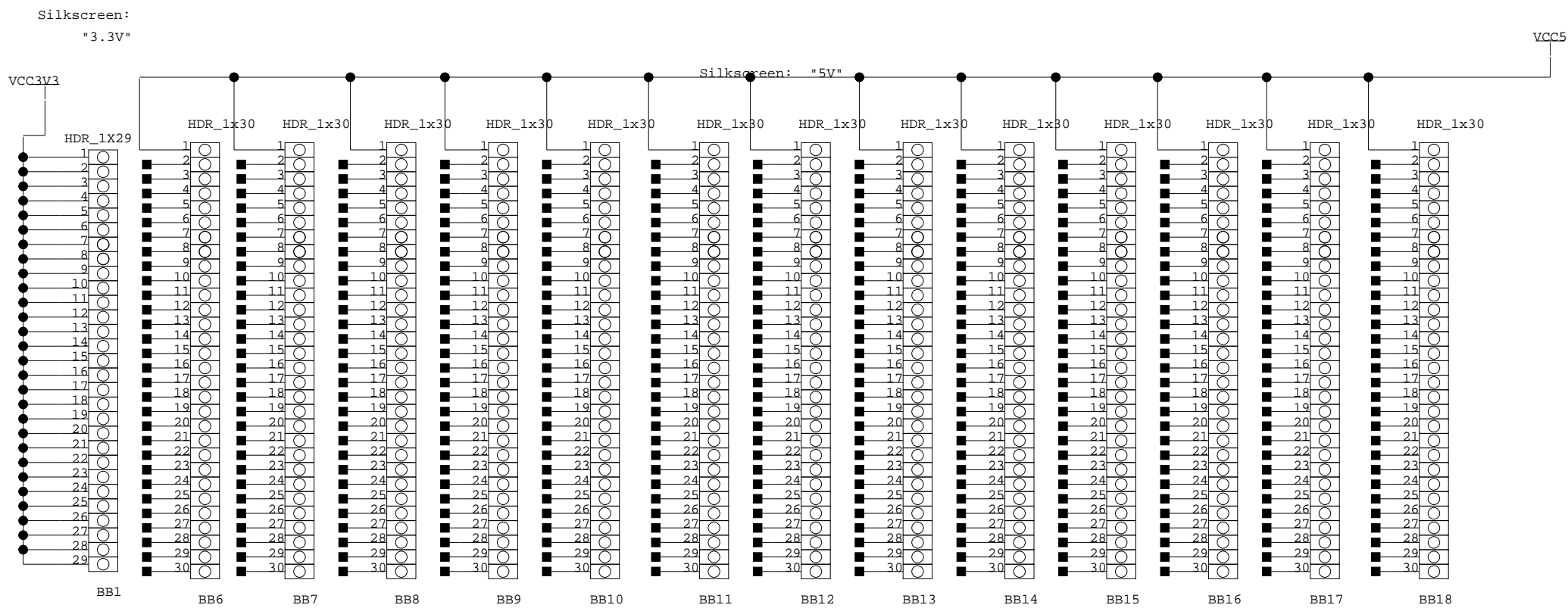
Power Monitor LEDs

[www.BDTIC.com/XILINX](http://www.BDTIC.com/XILINX)



PCB 1280286  
ASM 0431195  
SCH 0381136

|   |             |
|---|-------------|
| Title: ML300_PWR_IO<br>Power Monitor LEDs |             |
| Date: October 17th, 2002                  | Ver: 1.00   |
| Sheet Size: B                             | Rev: A      |
| Sheet 25 of 28                            | Drawn By BF |



PCB 1280286  
 ASM 0431195  
 SCH 0381136

Title: ML300\_PWR\_IO  
 Prototyping Area (1 of 2)

|                          |             |
|--------------------------|-------------|
| Date: October 17th, 2002 | Ver: 1.00   |
| Sheet Size: B            | Rev: A      |
| Sheet 26 of 30           | Drawn By BF |

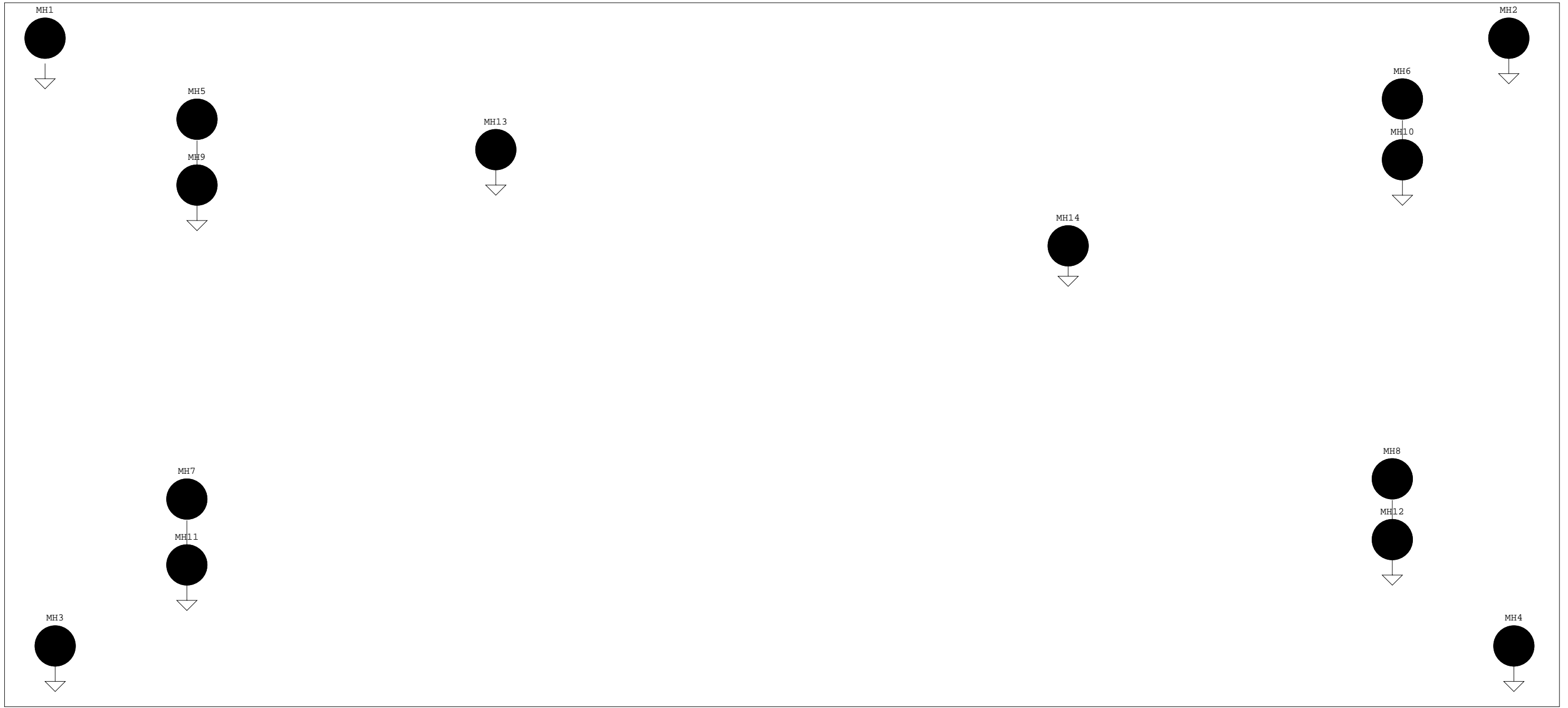
ML300\_PWR\_IO Board

Prototyping Area (1 of 2)

[www.BDTIC.com/XILINX](http://www.BDTIC.com/XILINX)



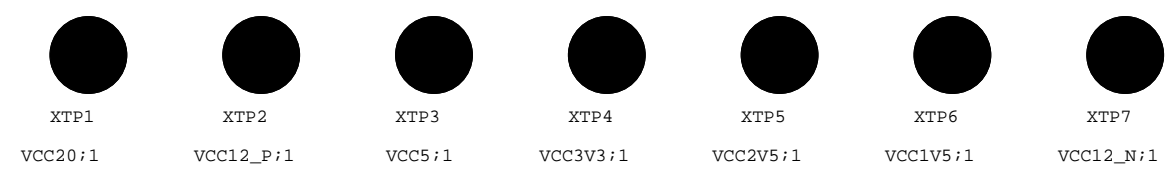
Refer to Mechanical Drawing for Placement and Dimensions



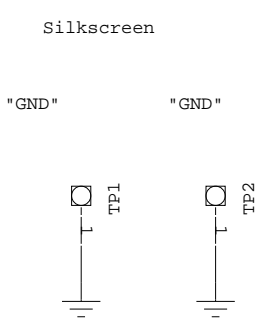
Fiducials



Voltage Testpoints



Ground Turrets



PCB 1280286  
 ASM 0431195  
 SCH 0381136

|   |             |
|---|-------------|
| Title: ML300_PWR_IO<br>Fiducials, Mounting Holes,<br>Ground Turrets |             |
| Date: October 17th, 2002  | Ver: 1.00   |
| Sheet Size: B   | Rev: A      |
| Sheet 28 of 28  | Drawn By BF |

ML300\_PWR\_IO Board - Fiducials,  
 Mounting Holes, Ground Turrets  
[www.BDTIC.com/XILINX](http://www.BDTIC.com/XILINX)