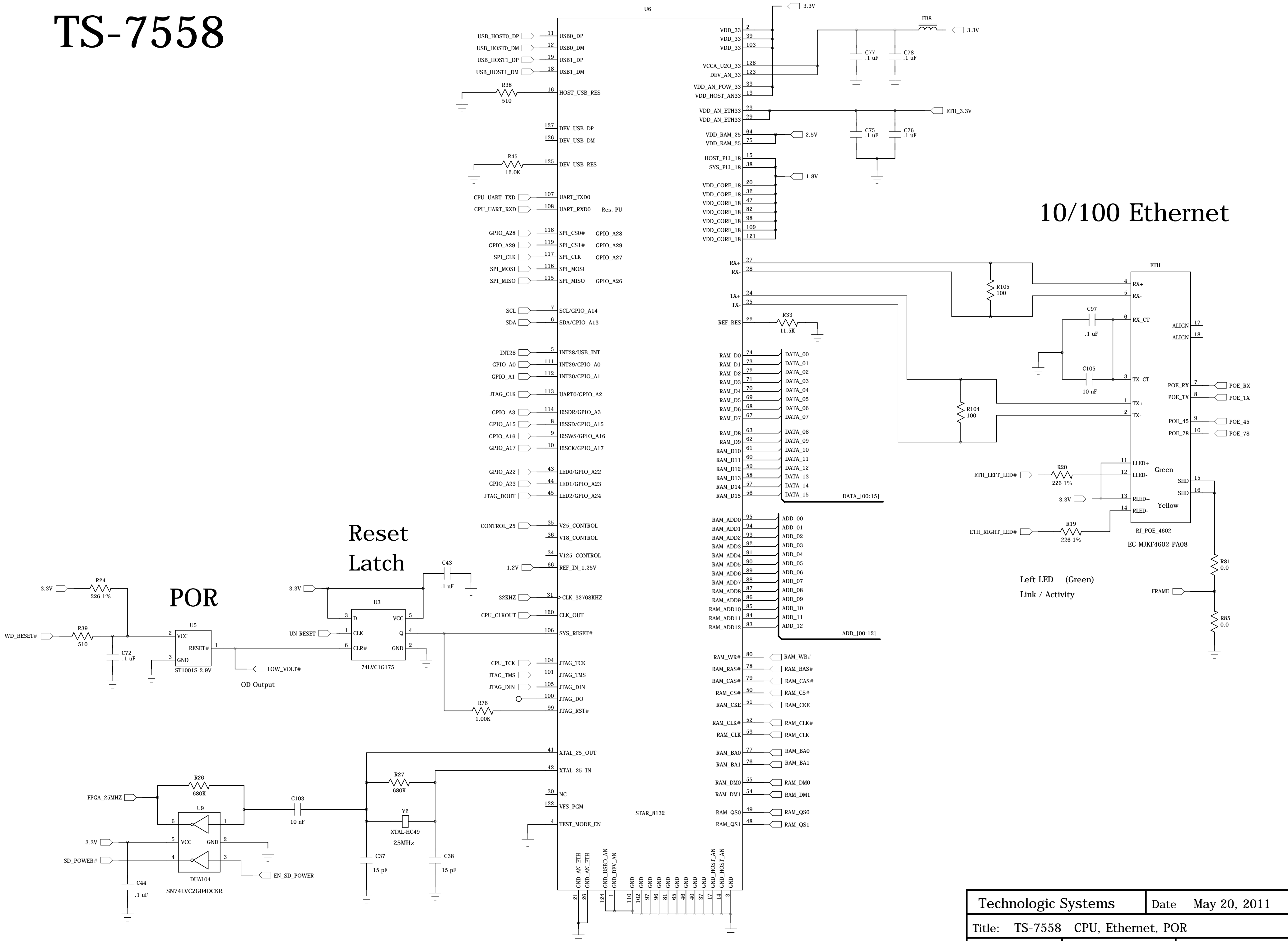


TS-7558

10/100 Ethernet

Reset Latch

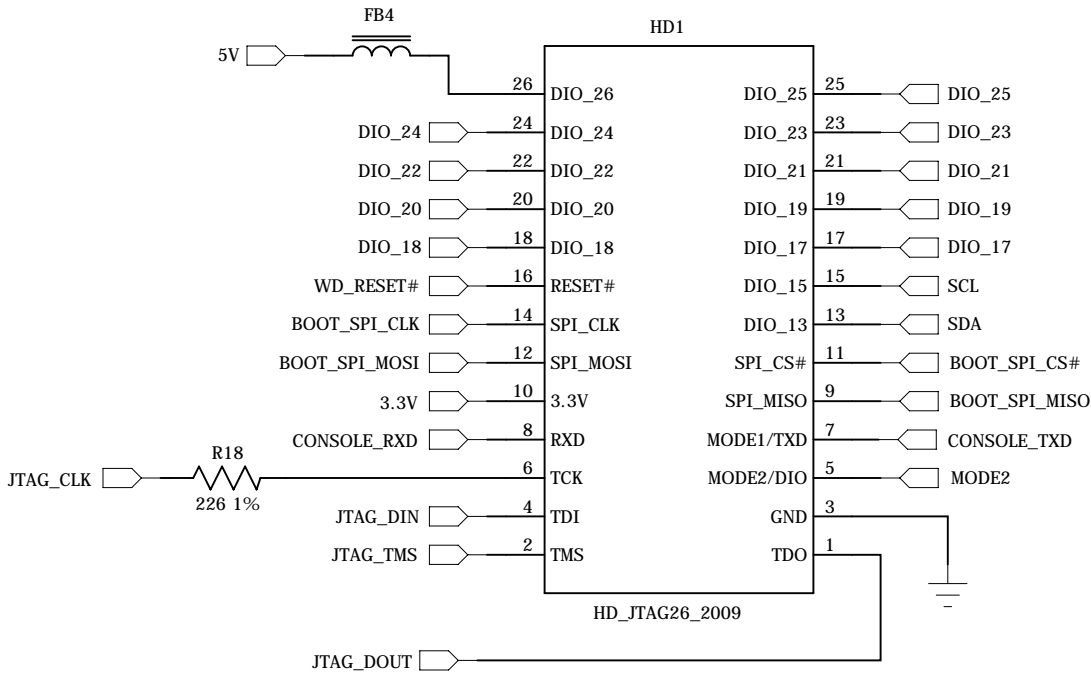
POR



JTAG 26-pin Header

FPGA with 5000 LUTs

XP2-5 has:
5K LUTs 2 PLLs
9 blocks of 1Kx18 Block RAM
12 18x18 Multipliers
100 I/O with 144 pin package
"instant ON" = about 1.5 mS
input PLL clock = 10 MHz min



Mode 1	Mode 2	Boots from
1	1	NAND Flash
1	0	SD Card
0	1	Off-board Flash
0	0	Off-board Flash

MODE1 and MODE2 states are latched when CPU_RESET# is deasserted

MODE1 and MODE2 have 4.7K resistor pull-ups on WM-7550

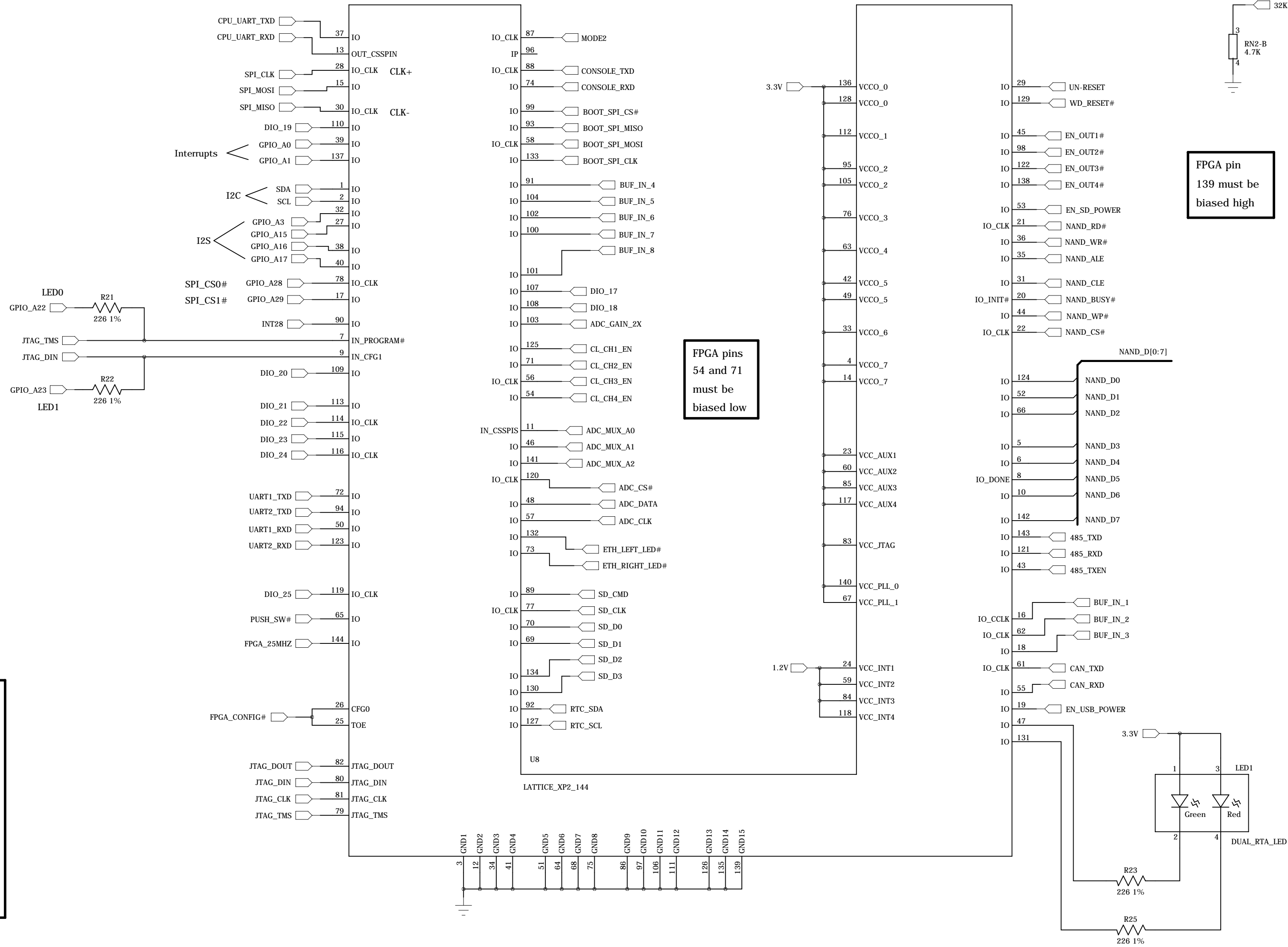
Console always is enabled

Use 680 ohm resistor to GND to set low

Board ID bits

	Pin 54 (weak PU)	Pin 138 (weak PD)	Pin 71	Pin 37	Hex
TS-7500	1	1	1	1	F
TS-7550	1	1	0	1	B
WM-7551	0	0	1	1	C
TS-7552	1	0	1	1	D
TS-7553	1	0	0	1	9
TS-7554	0	0	0	1	8
TS-7558	0	1	0	1	A
TS-4500	0	0	0	0	0

7552 and 7553 FPGA pin 93 = MISO

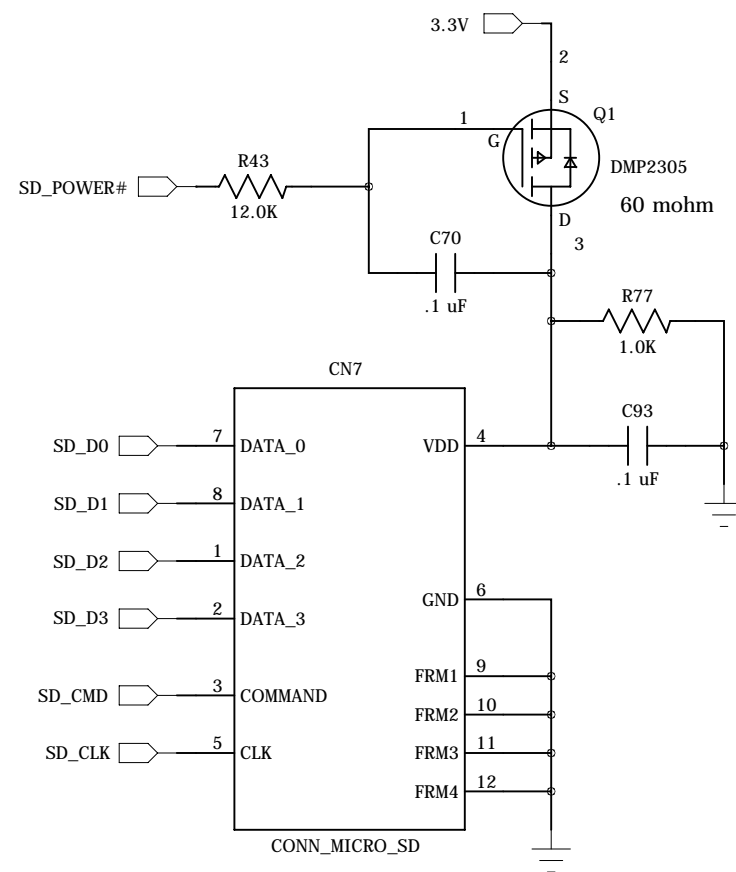


Set CONFIG_MODE to NONE
This allows all pins to be used

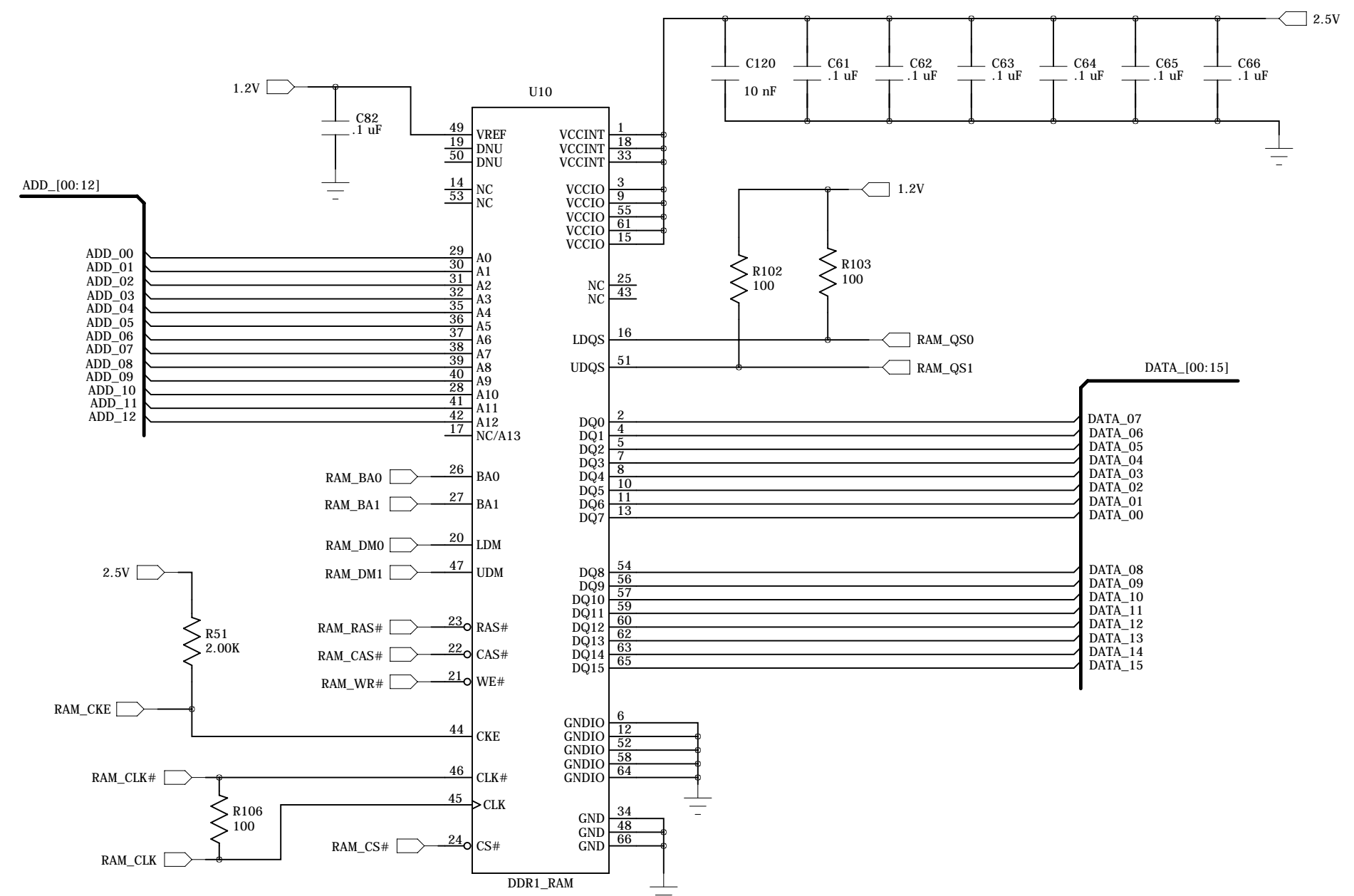
Page 37 of Data Sheet (Hot Socketing)
Power Supplies can be sequenced in any order but must be monotonic
All I/O lines are tri-stated during power cycling

Pull-up and pull-down resistors are 6 to 30K ohms

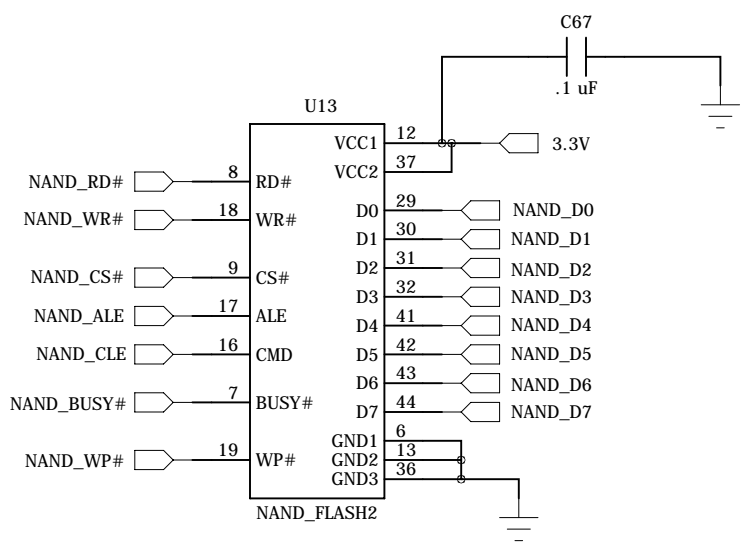
Micro SD Card Socket



64 Mbyte DDR1 SDRAM



512 Mbyte NAND Flash



DDR RAM Notes

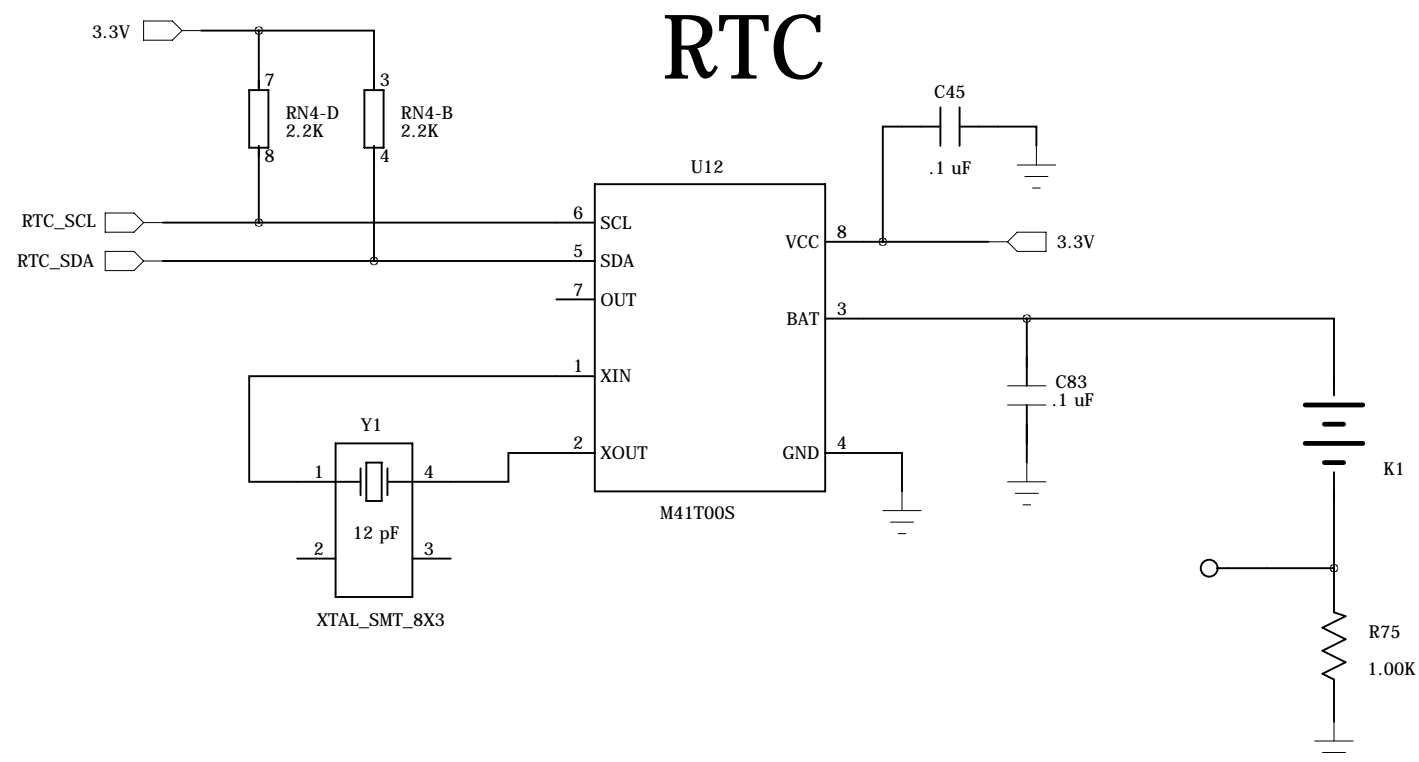
The DDR clock differential pair is the most critical trace on the entire board

The data lines in each byte lane can be swapped on the RAM chip for optimal layout
Example: D0 and D5 can be swapped, but not D7 and D8

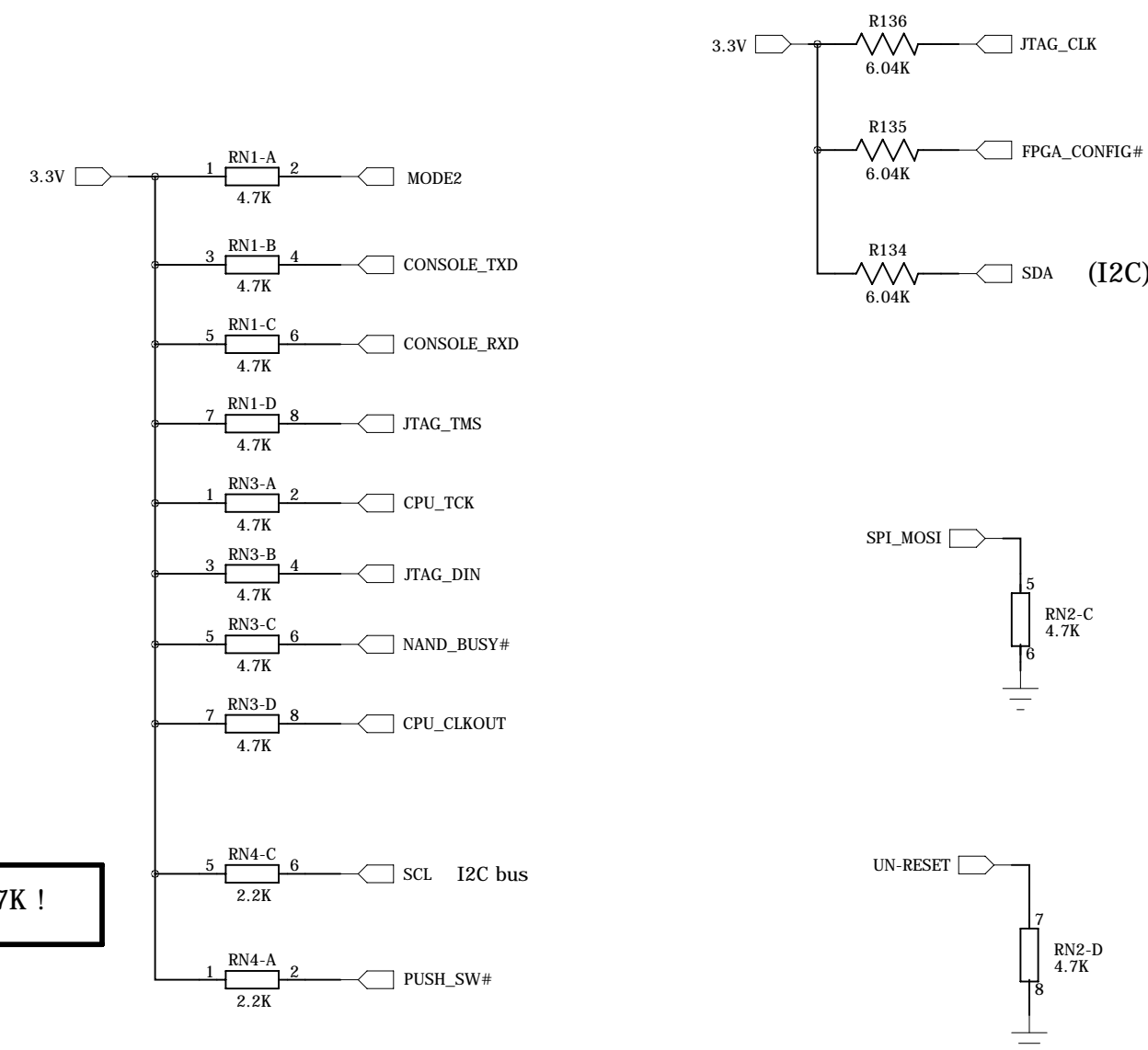
The trace length of each data line (in a single byte lane) and the respective QS and DM signals must be matched to within 2.5 mm

Address and Command signals can be grouped together, but must be isolated from data and M_DSQ and M_DM signals (by at least .5 mm)
Or run them on different layer

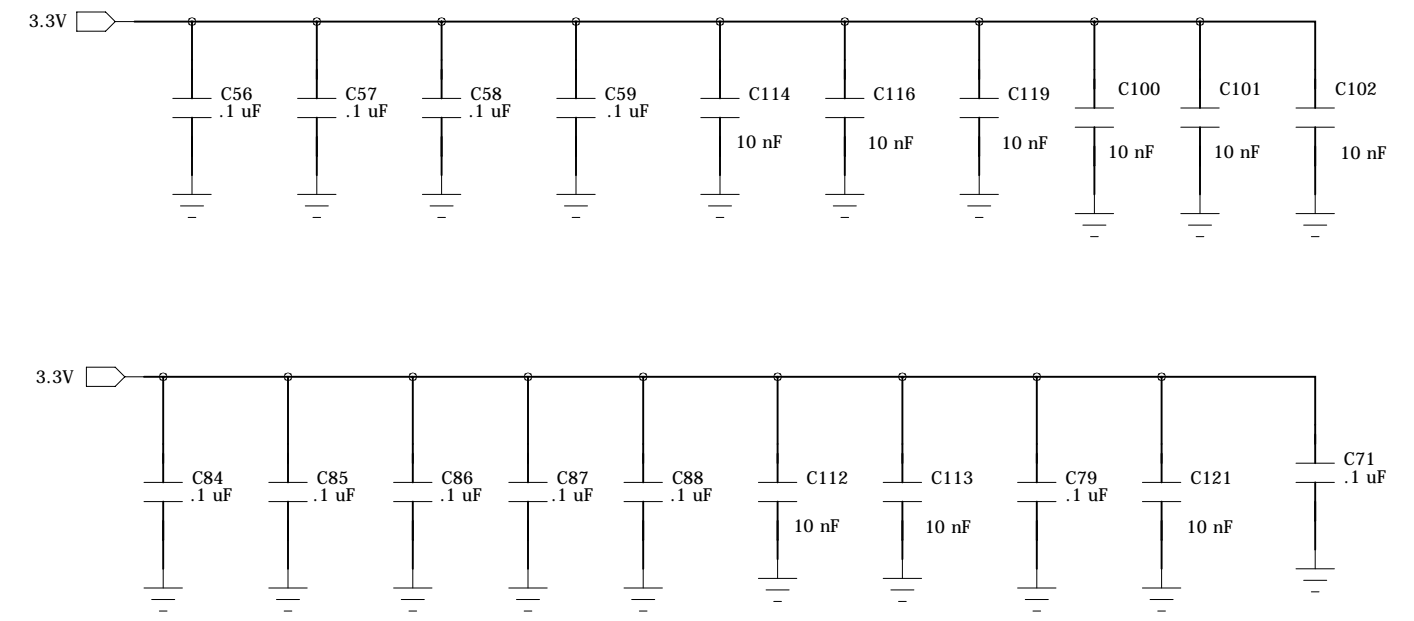
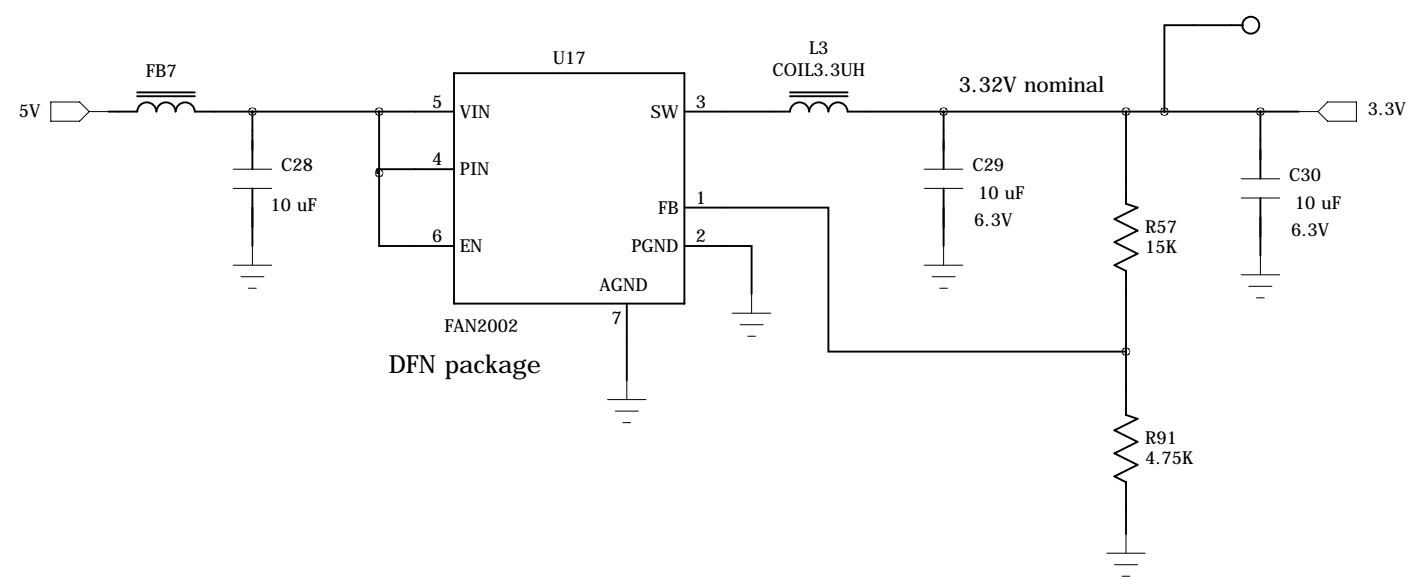
RTC



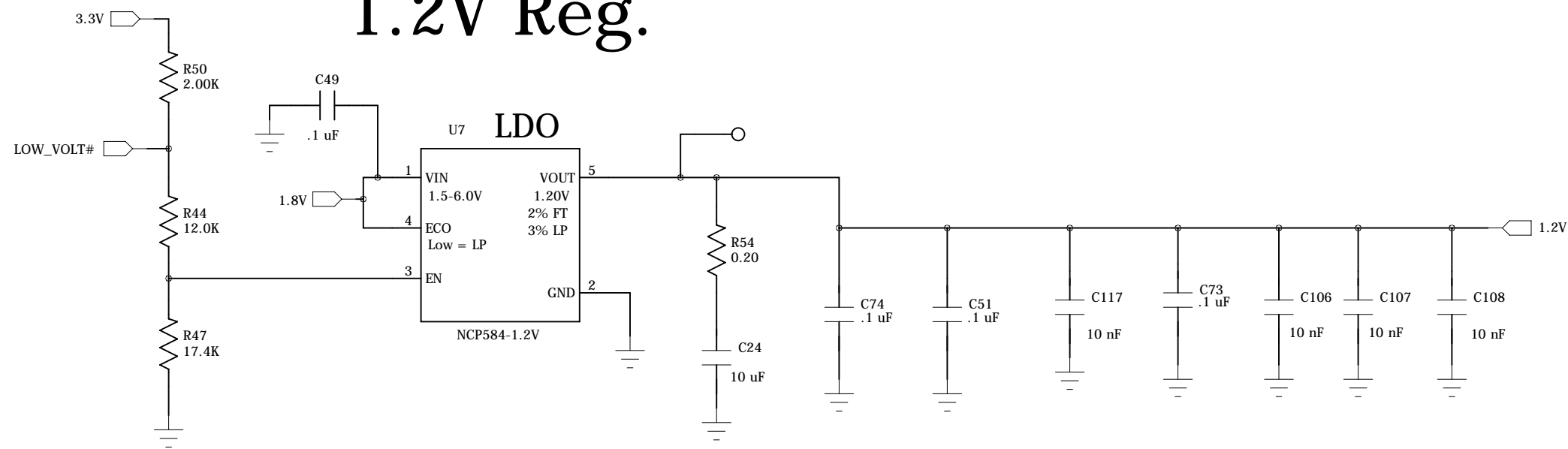
RN4 is 4.7K !



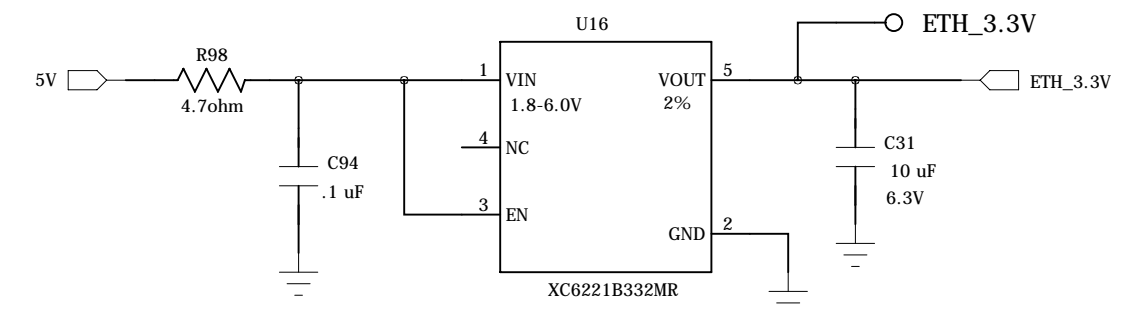
3.3V Regulator



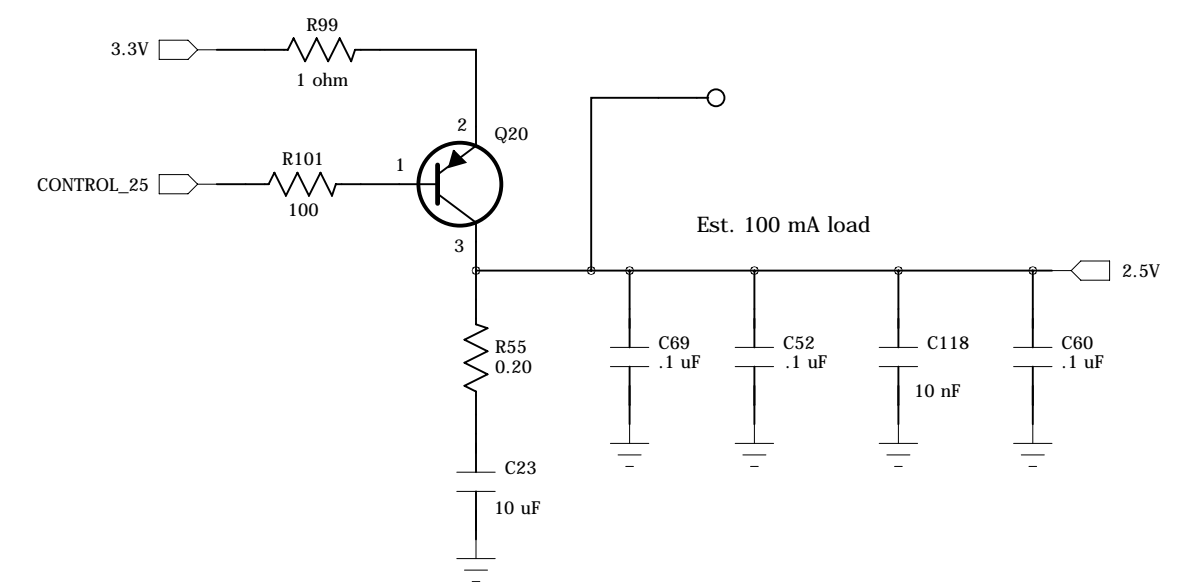
FPGA Core 1.2V Reg.



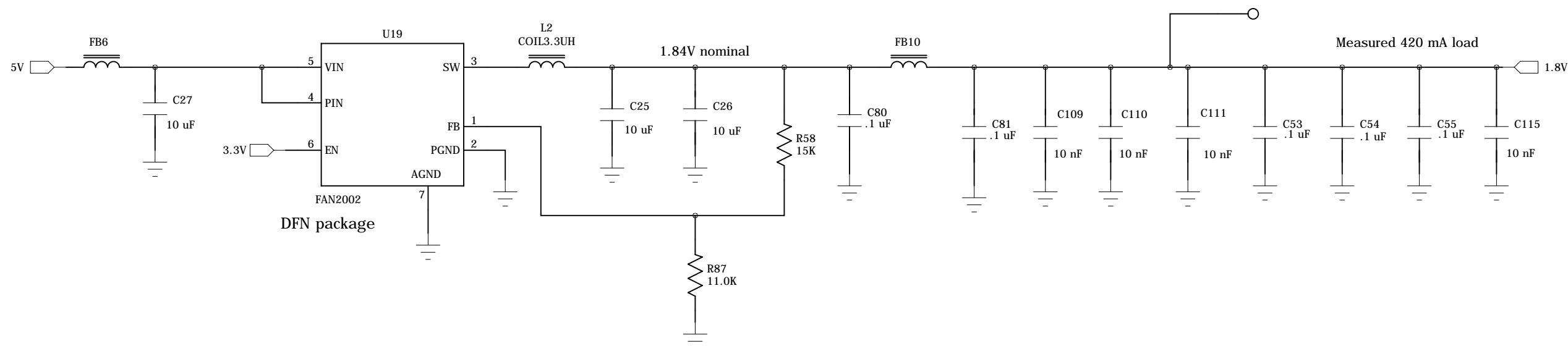
Ethernet Analog 3.3V



2.5V Regulator



1.8V Regulator

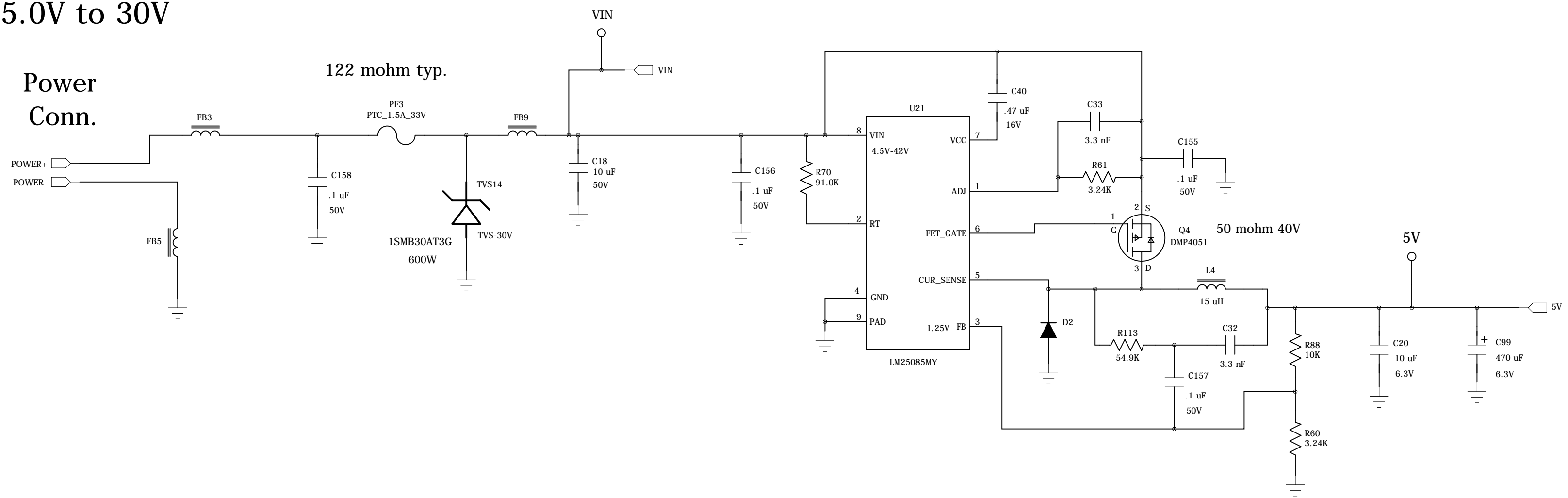


Technologic Systems	Date May 20, 2011
Title: TS-7558 Power Supplies	
Rev: A	Designer RLM Sheet 4 of 12

5V Power Supply (2.0 Amps)

Input Power

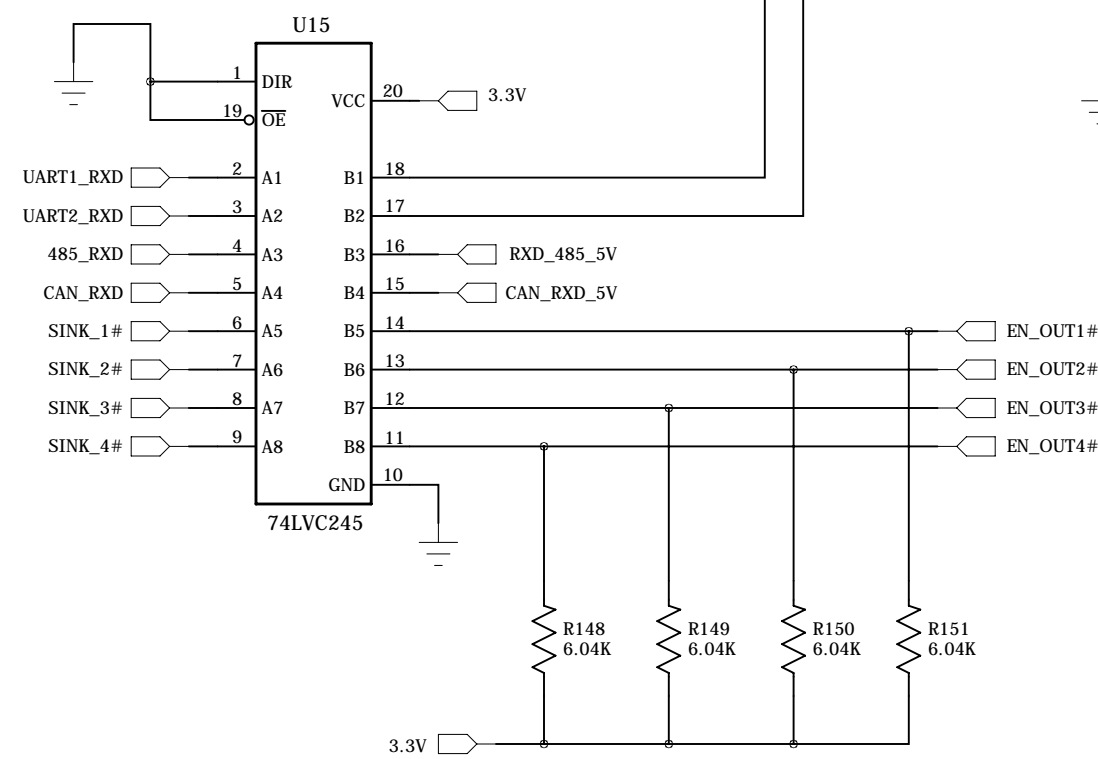
5.0V to 30V



Technologic Systems	Date: May 20, 2011	
Title: TS-7558 5V Power		
Rev: A	Designer	Sheet 5 of 12

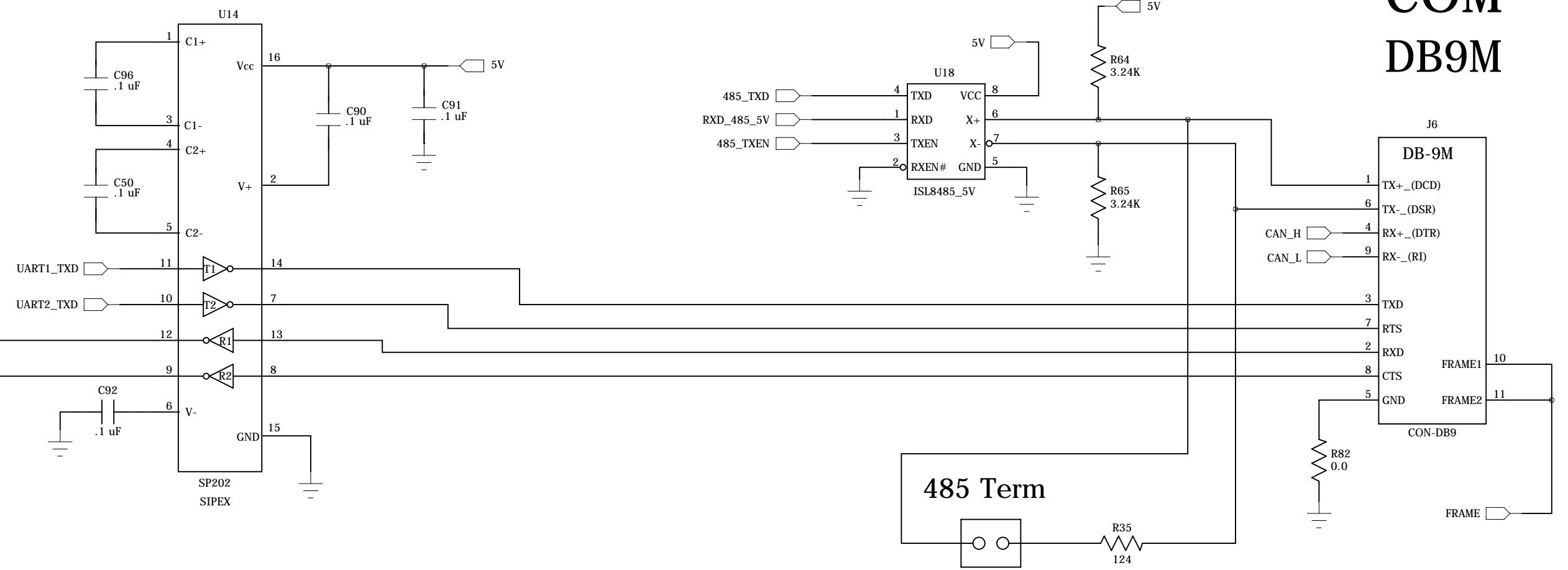
RS-232 Transceiver

3.3V ← 5V
Level shifter

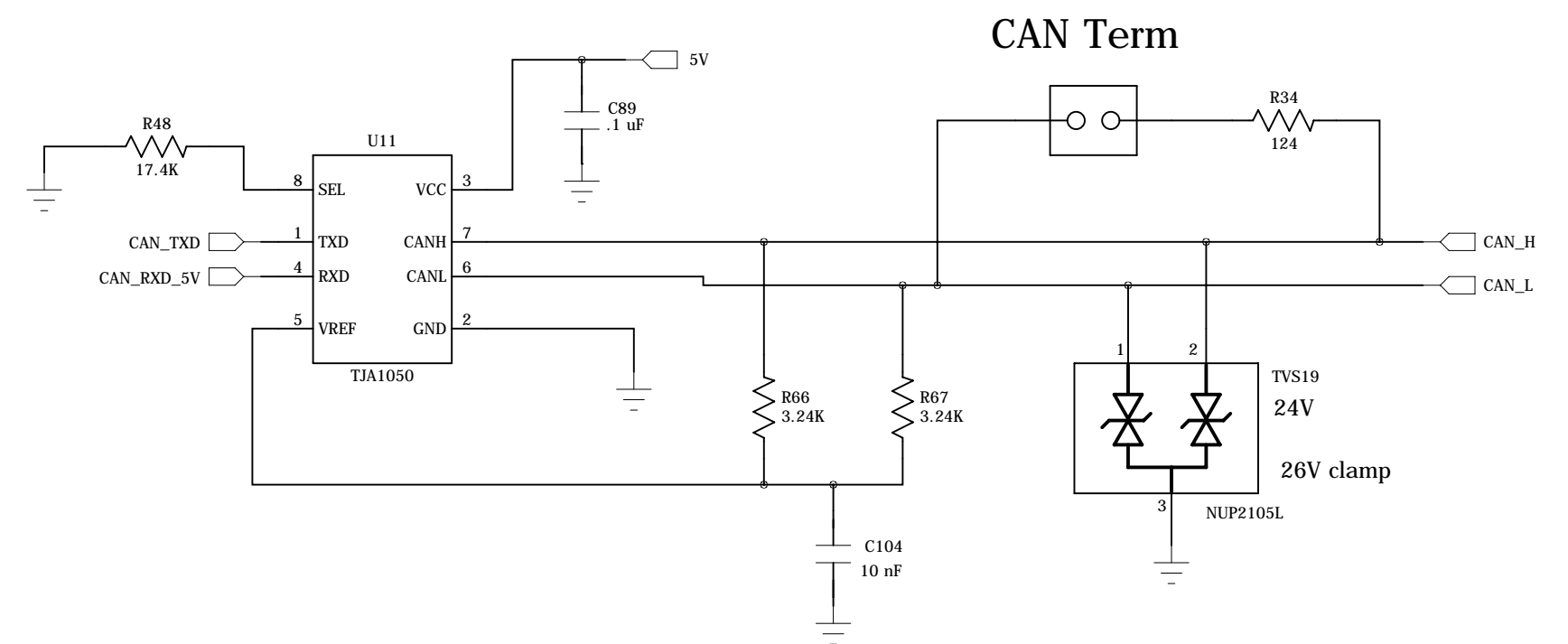


RS-485 Driver

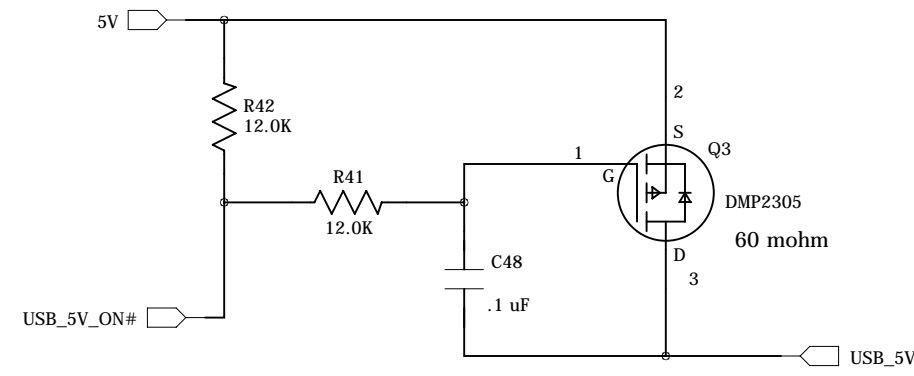
COM DB9M



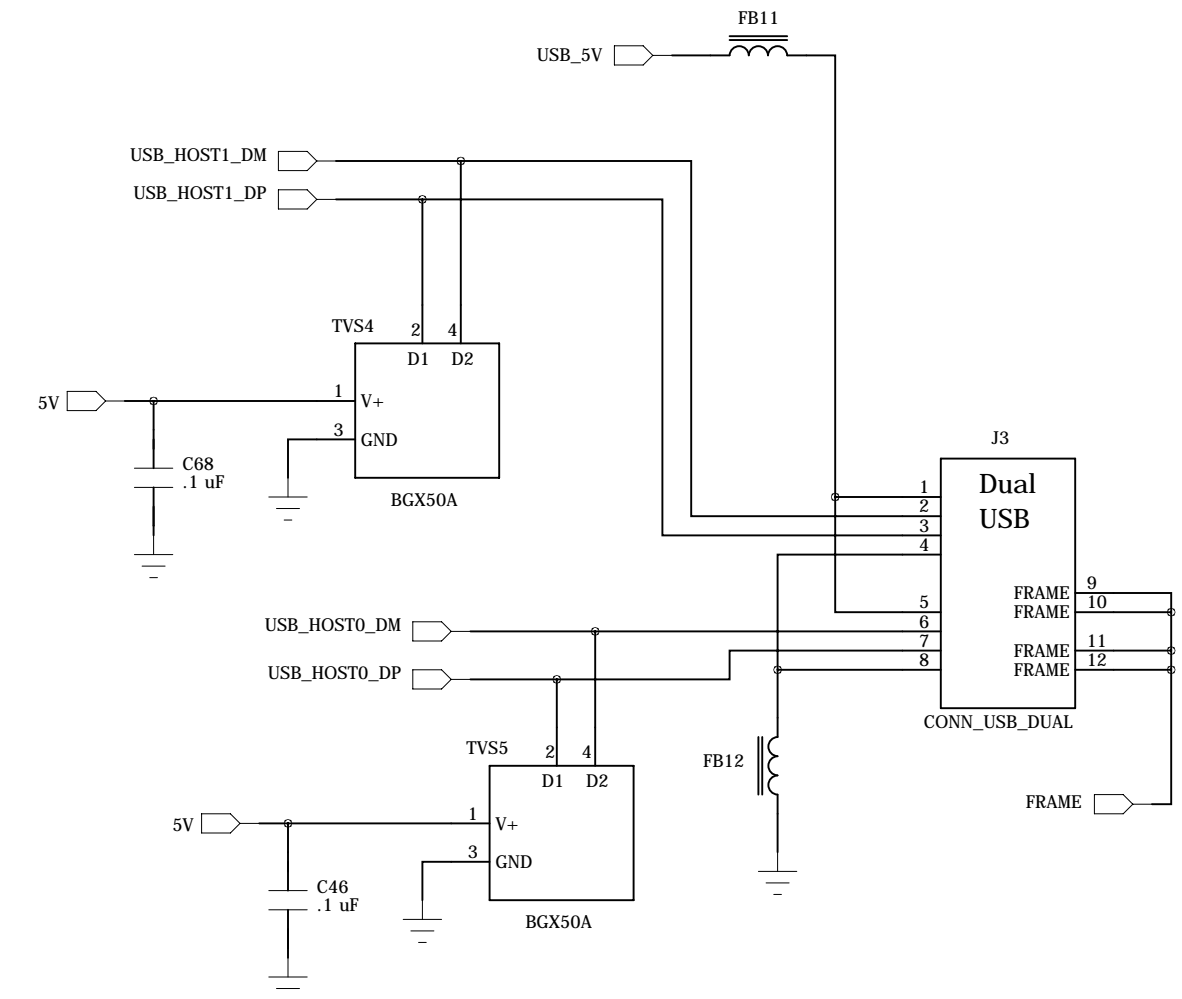
CAN Transceiver



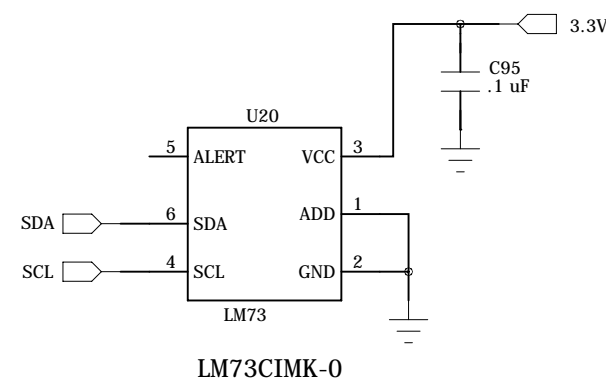
USB Power Switch



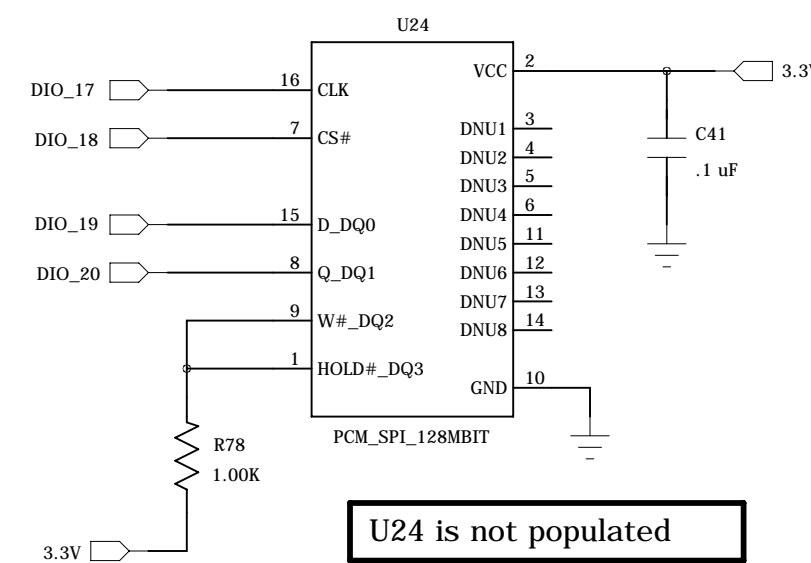
Dual USB Host



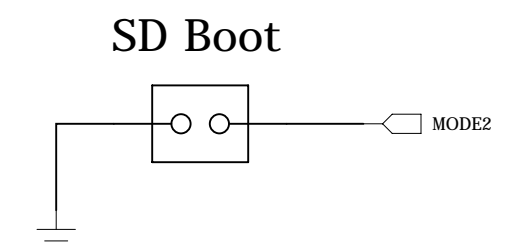
Temp Sensor



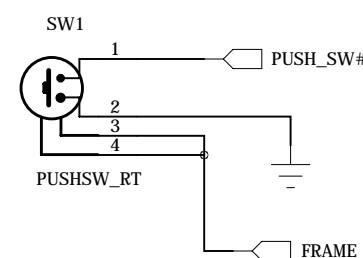
16 MB Phase Change memory



Force Boot to SD card



Push Switch

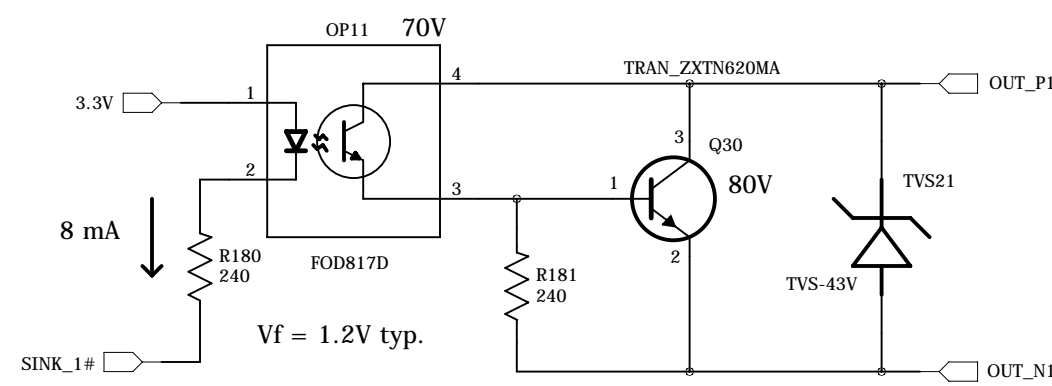


Technologic Systems	Date	May 20, 2011
Title: TS-7558 USB, Temp Sensor		
Rev: A	Designer	RLM
Sheet		7 of 12

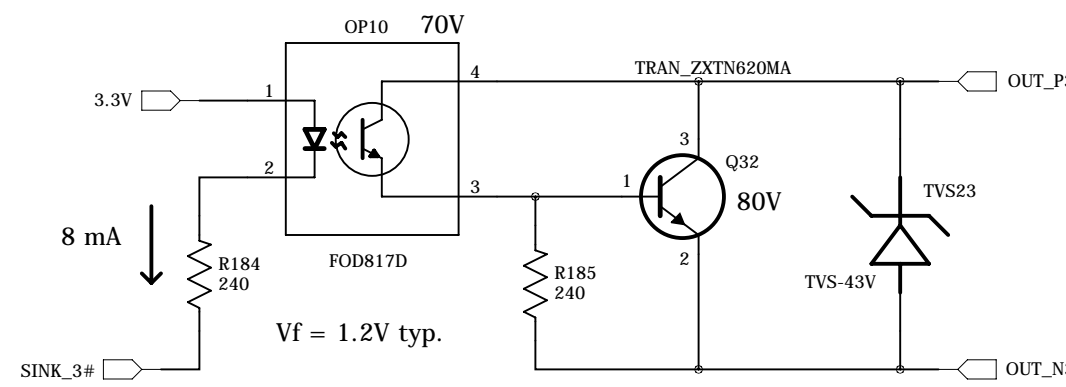
4 Isolated Outputs

Outputs rated for
200 mA at 40V max.

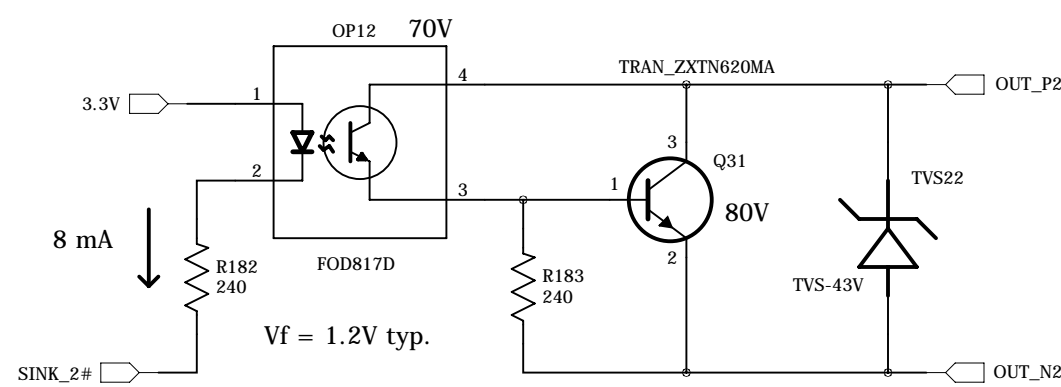
ISO_OUT #1



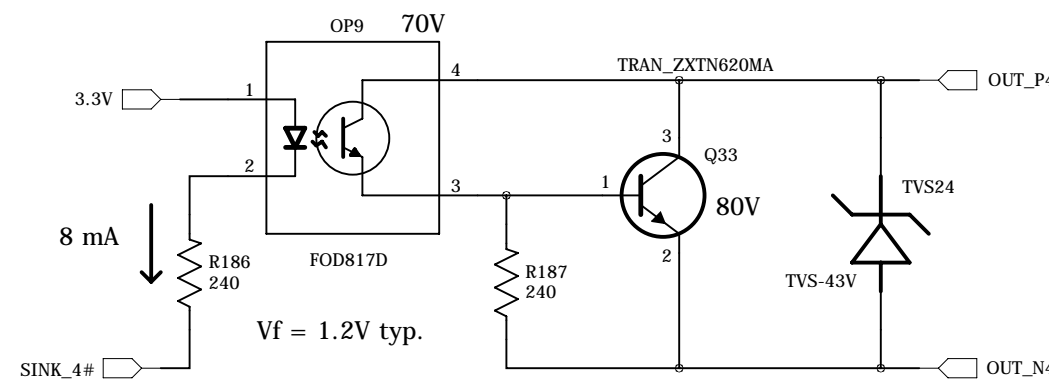
ISO_OUT #3



ISO_OUT #2

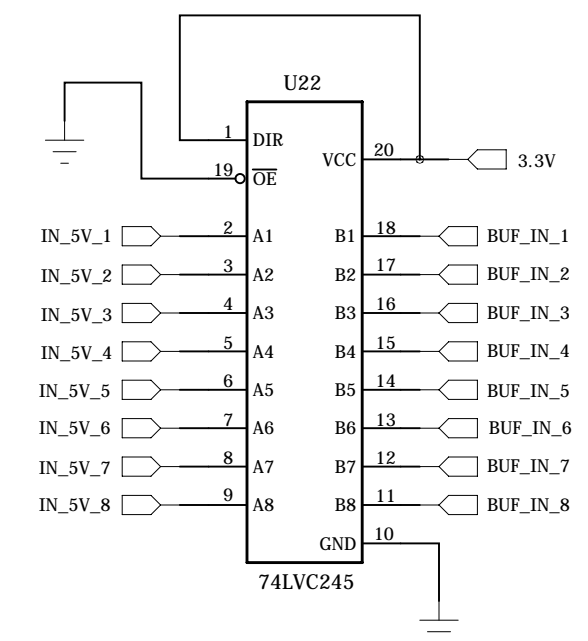


ISO_OUT #4



Buffer for Isolated Inputs

5V → 3.3V



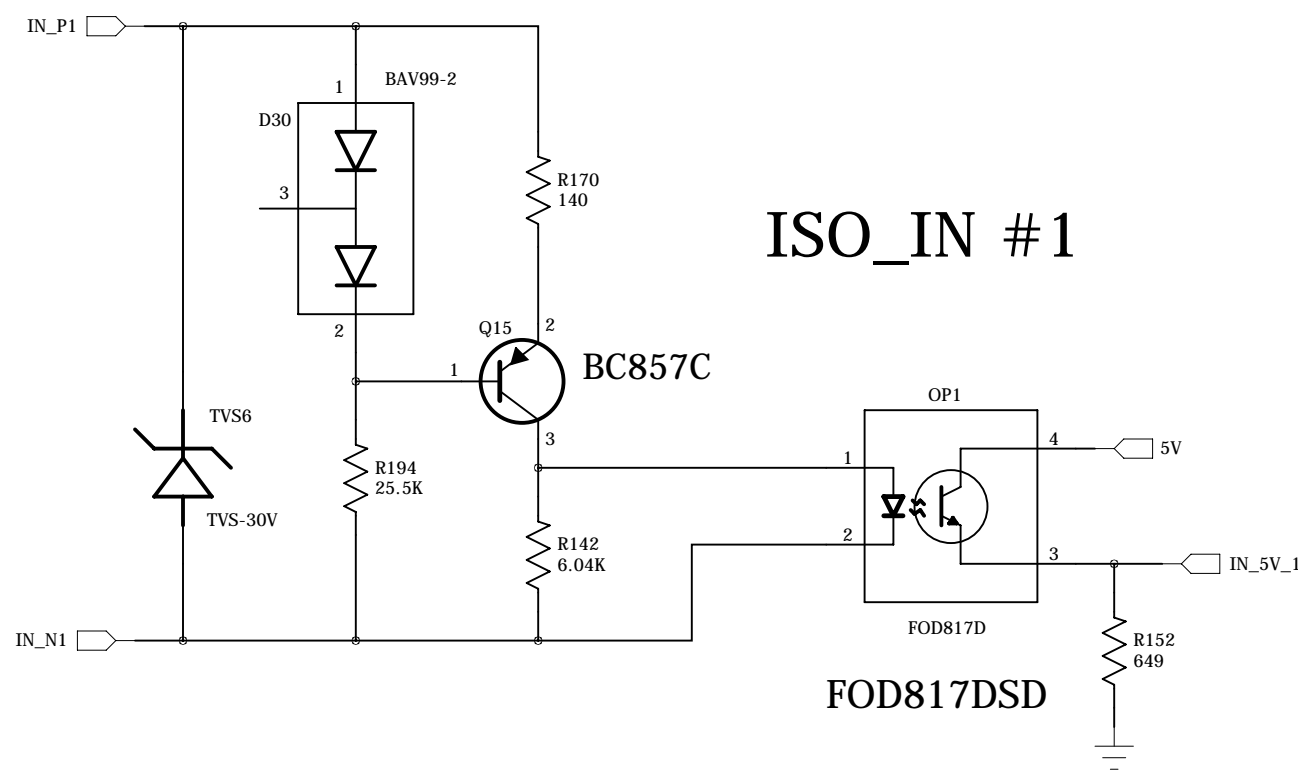
Technologic Systems	Date May 20, 2011
Title: TS-7558 Isolated Digital Outputs	
Rev: A	Designer
Sheet 8 of 12	

Isolated Inputs

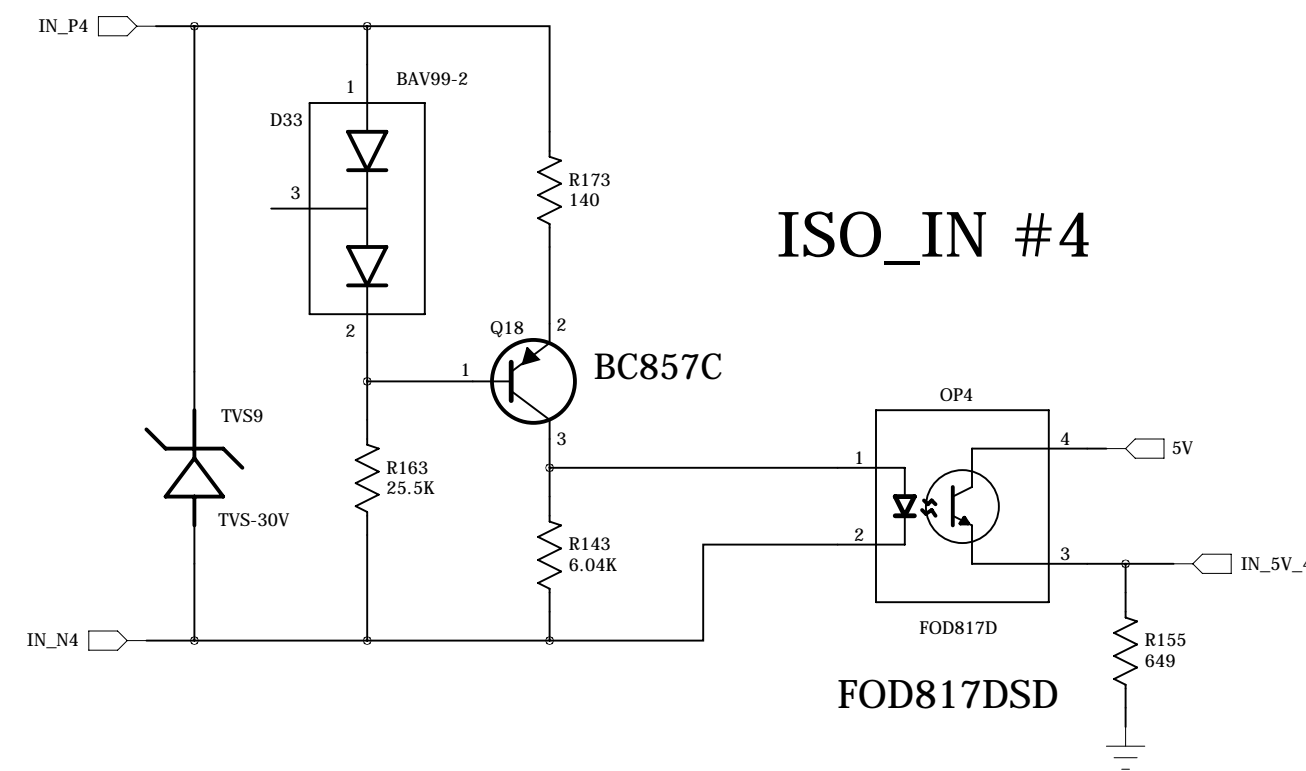
32V tolerant

50 KHz Bandwidth

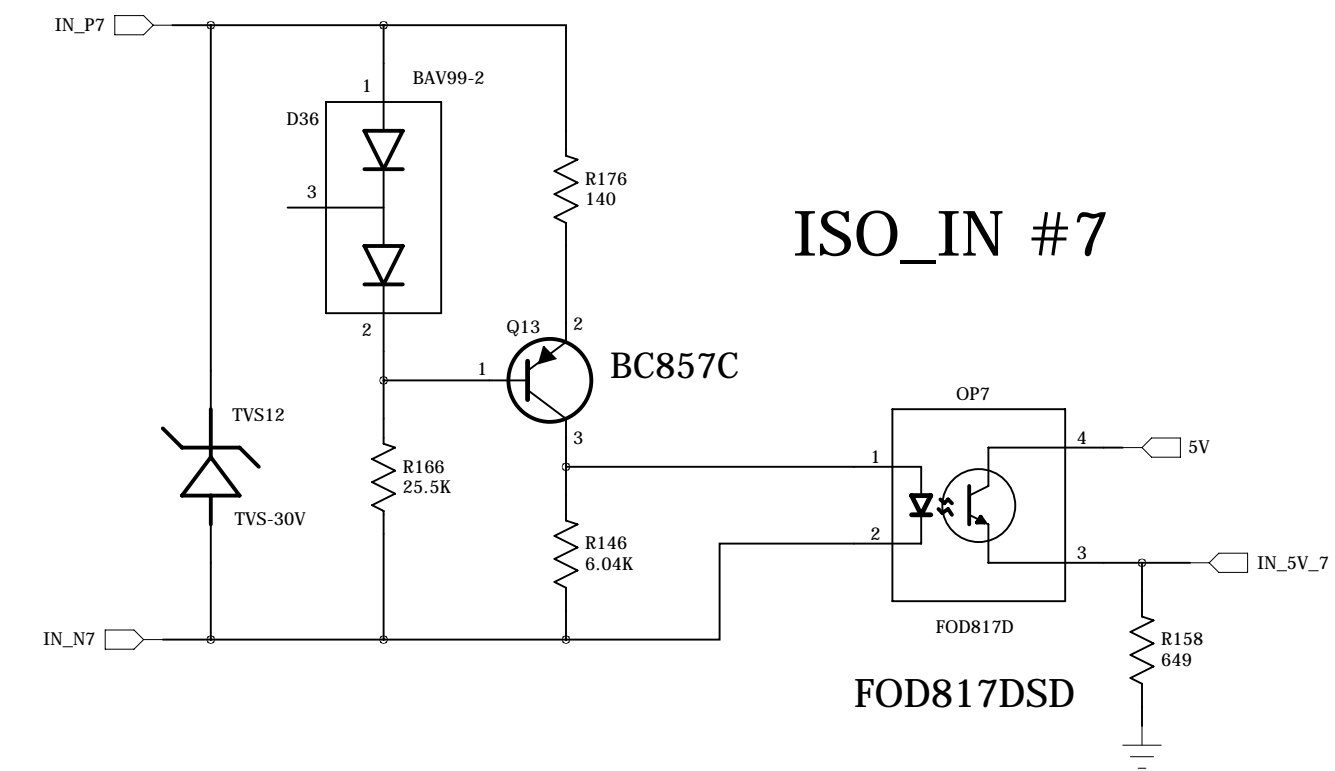
Logic high = 3V-30V



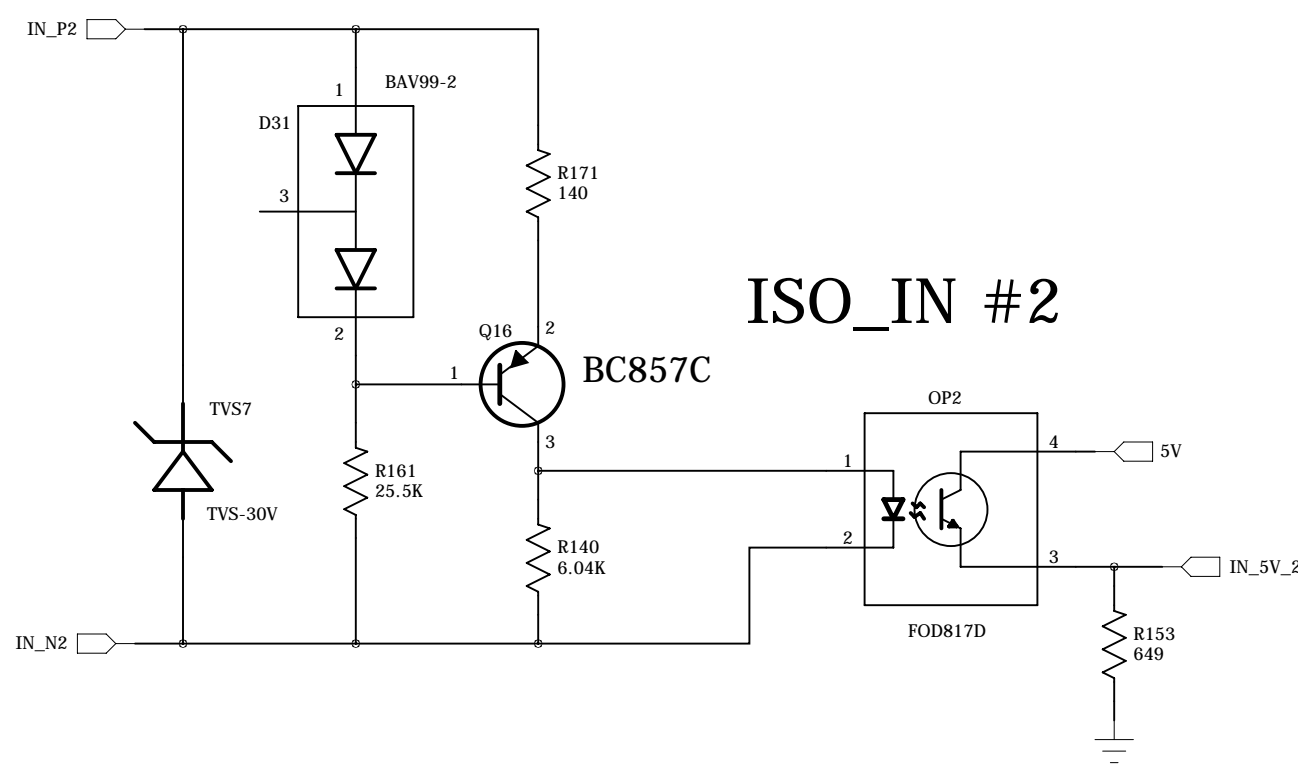
ISO_IN #1



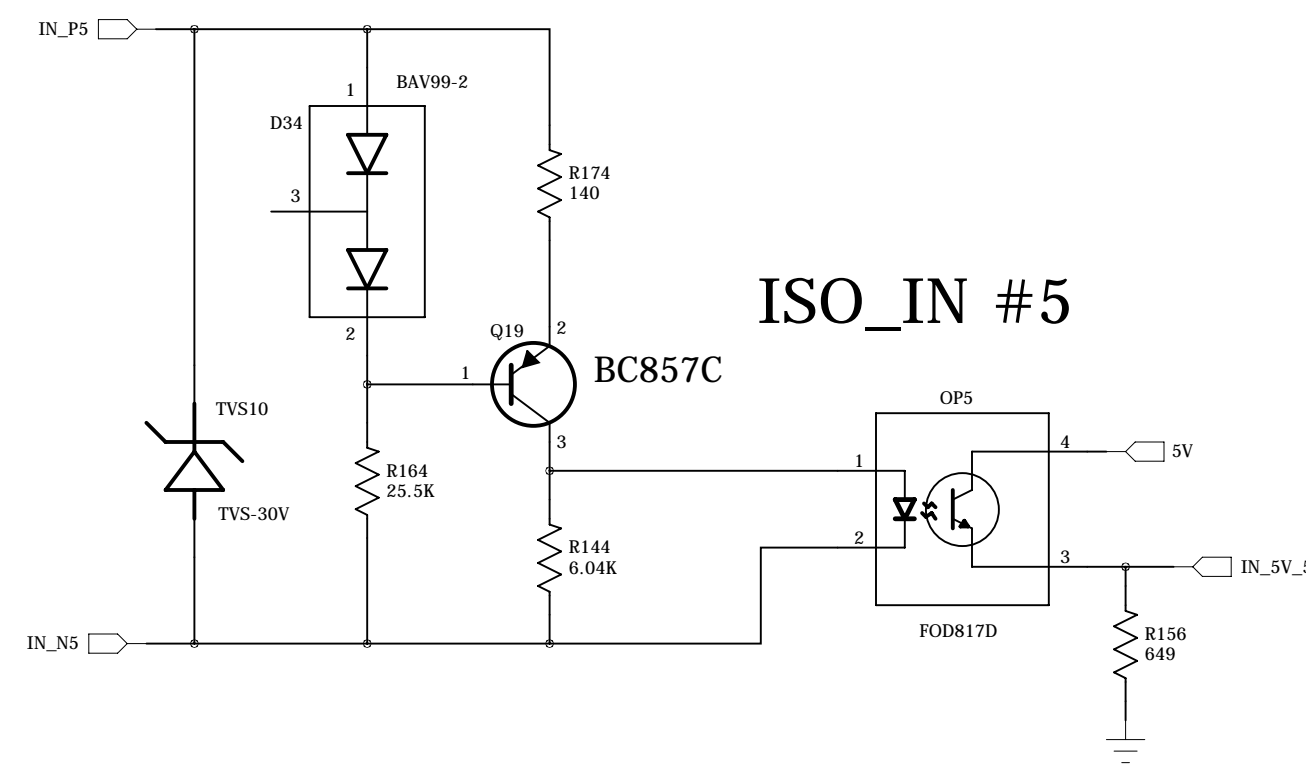
ISO_IN #4



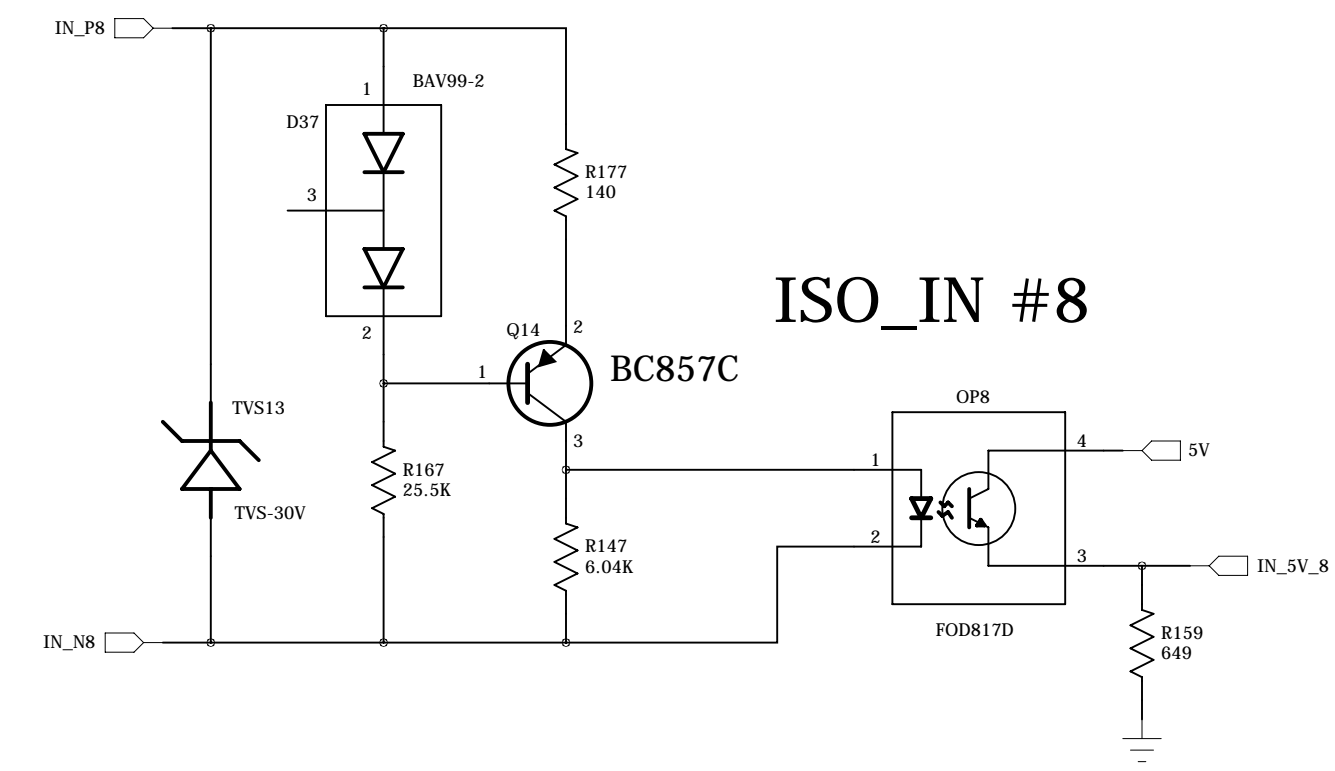
ISO_IN #7



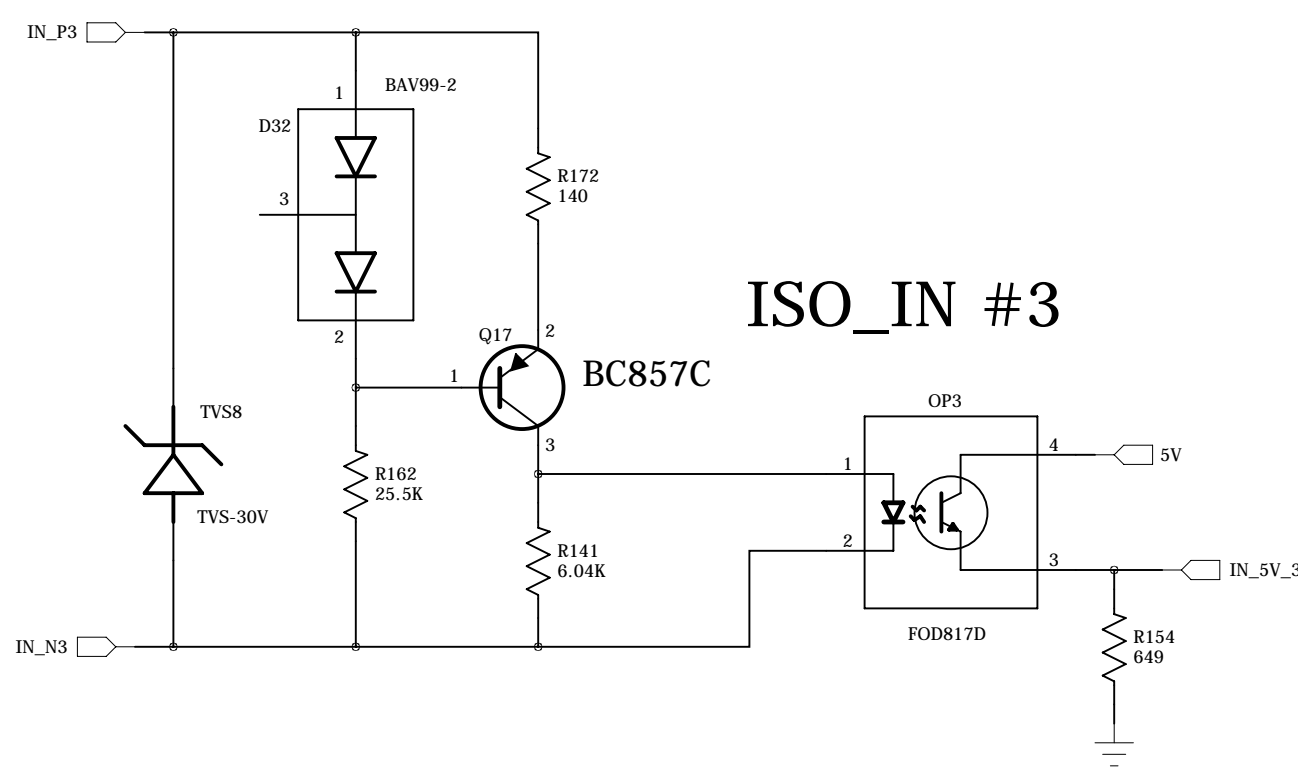
ISO_IN #2



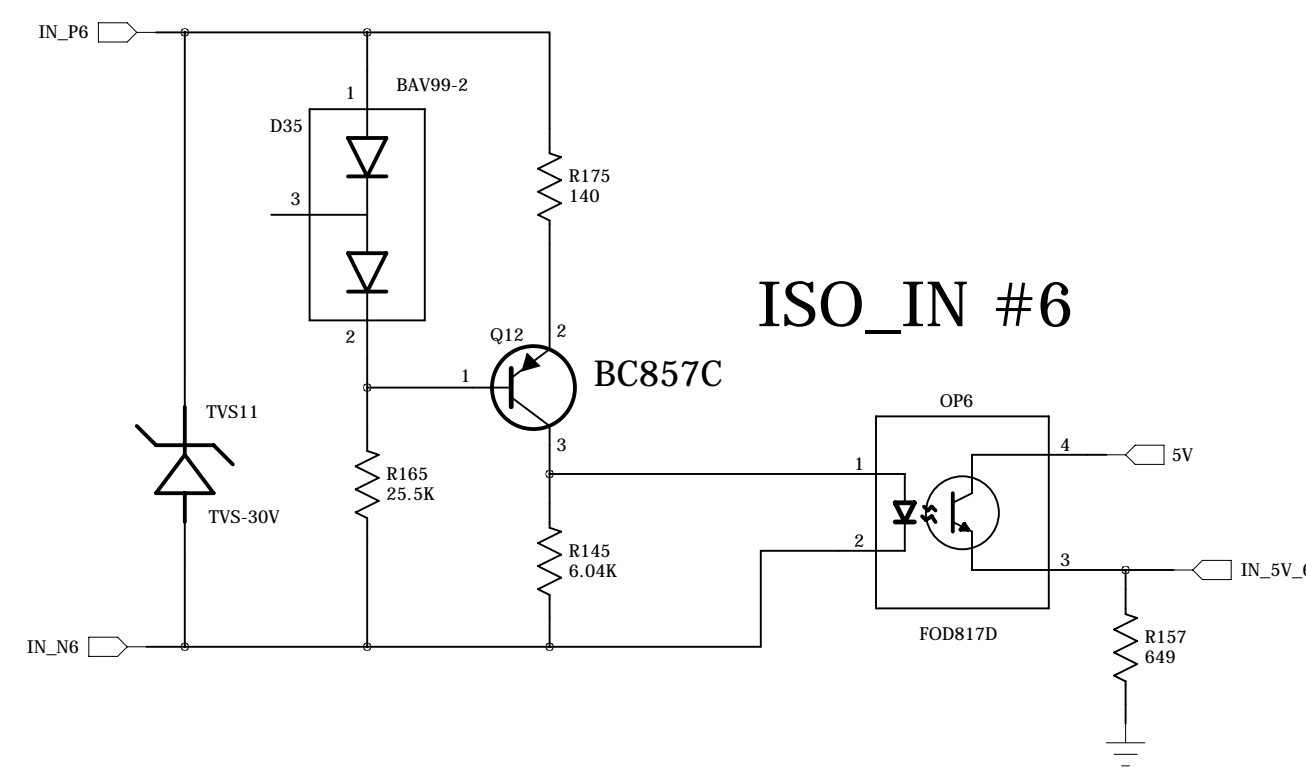
ISO_IN #5



ISO_IN #8



ISO_IN #3



ISO_IN #6

Technologic Systems	Date: May 20, 2011
Title: TS-7558 Isolated Digital Inputs	
Rev: A	Designer
Sheet 9 of 12	

4 Channels of 12-bit A/D

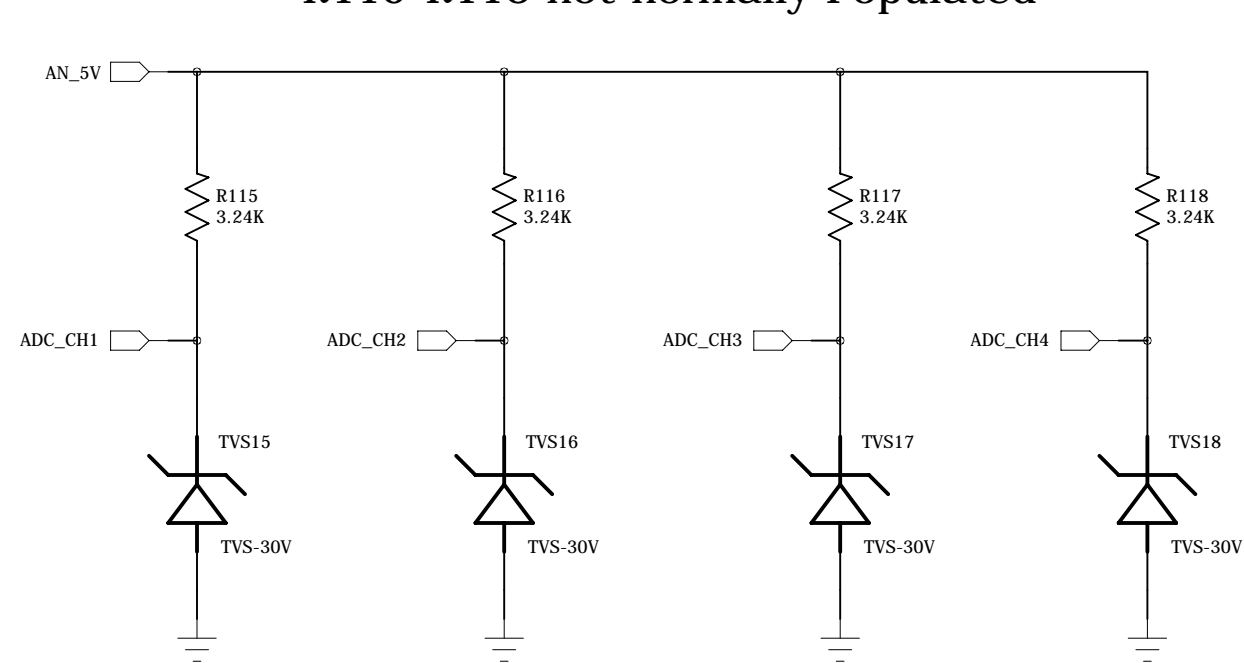
ADC notes

Input Imedance = 70 Kohm
TVS adds 1000-3000 pF

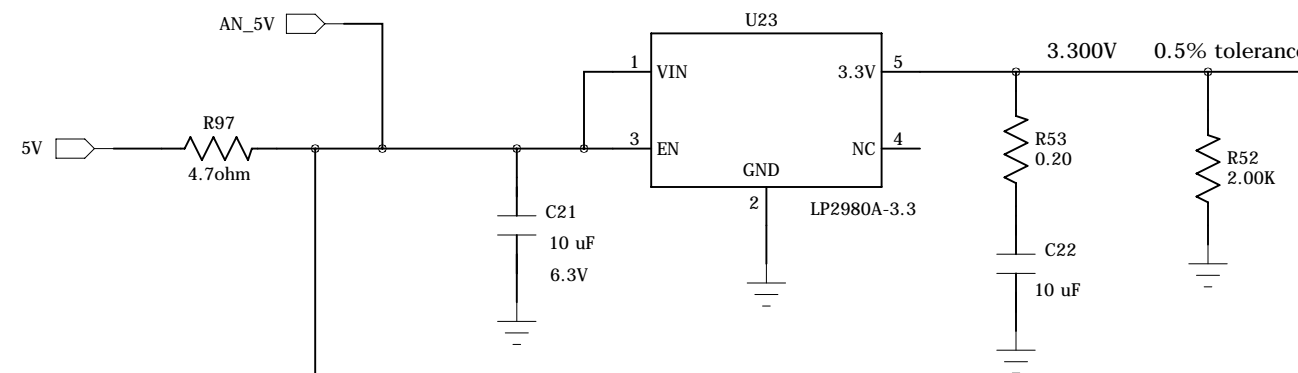
typ. MUX ON resistance = 120 ohm
typ. Delta between chan = 10 ohm

Reading channel 0 allows
calibrating out most error

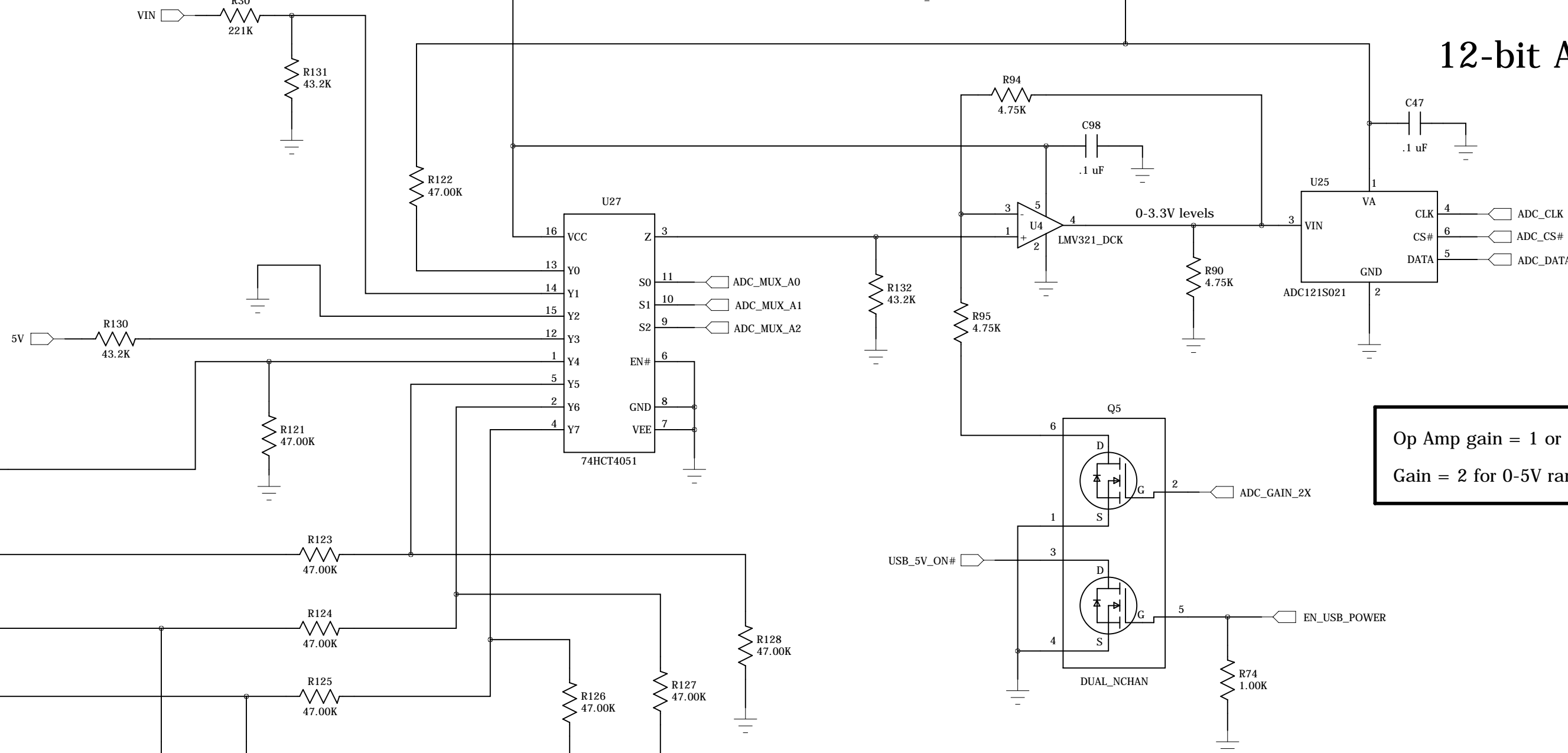
R115-R118 not normally Populated



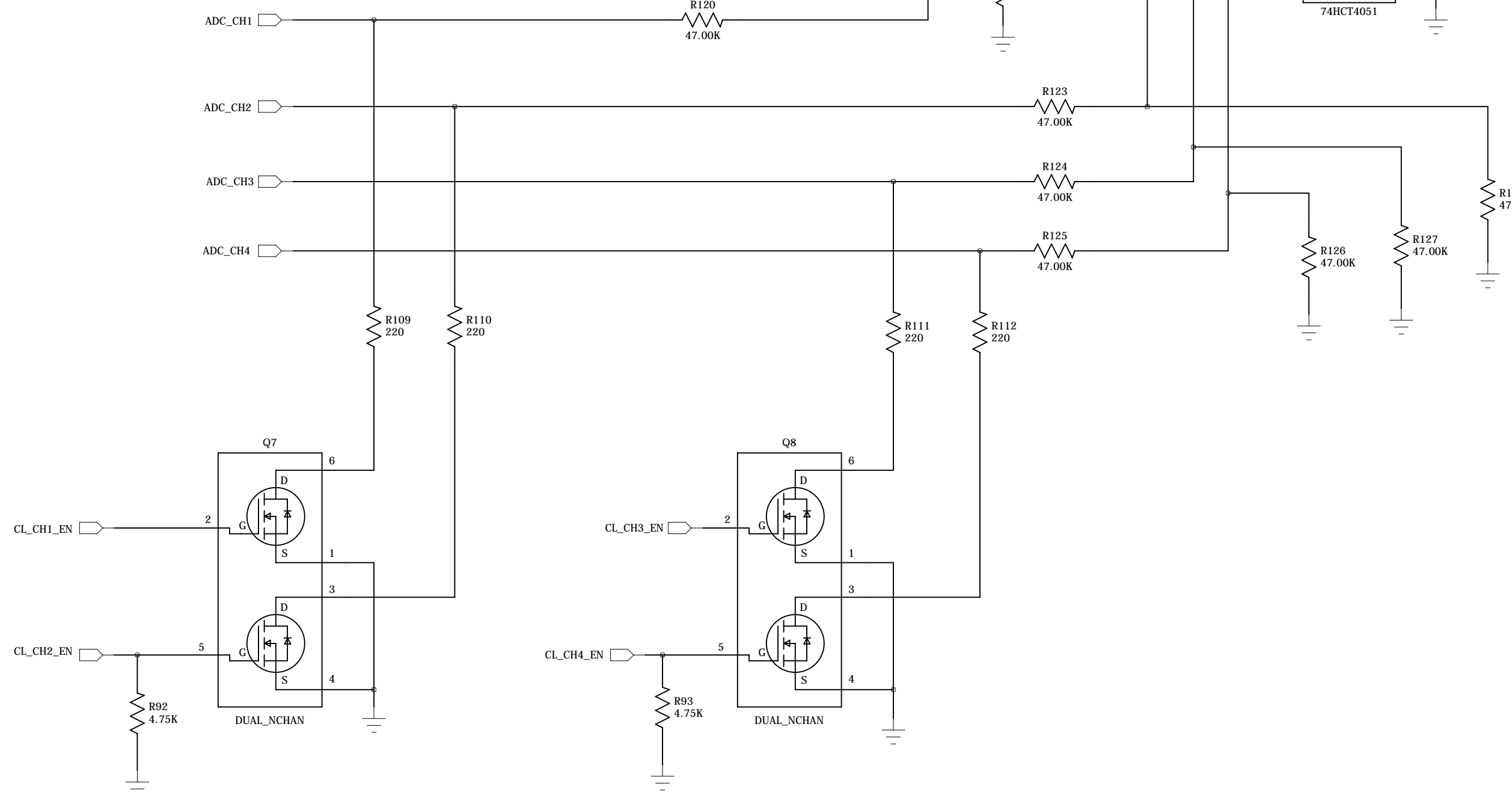
Precision 3.3V Reg.



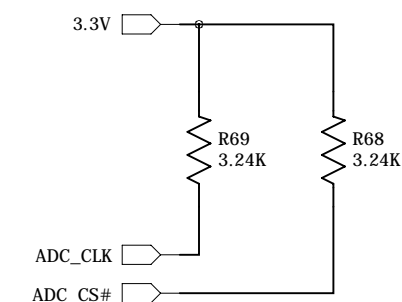
12-bit ADC



Op Amp gain = 1 or 2
Gain = 2 for 0-5V range

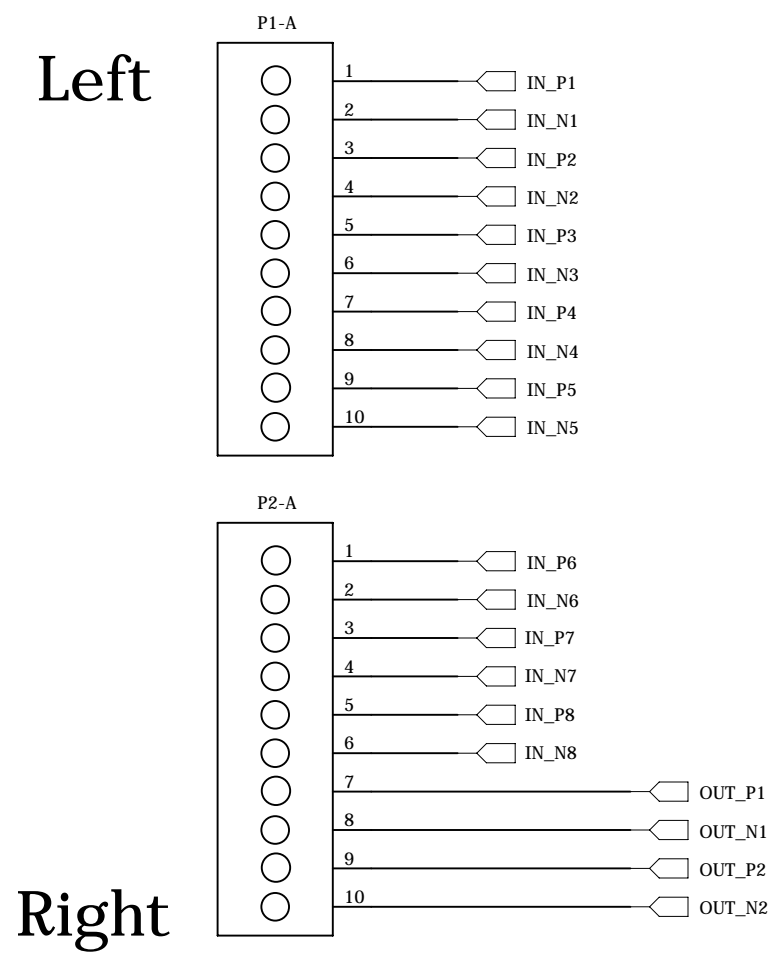


For I2C ADC

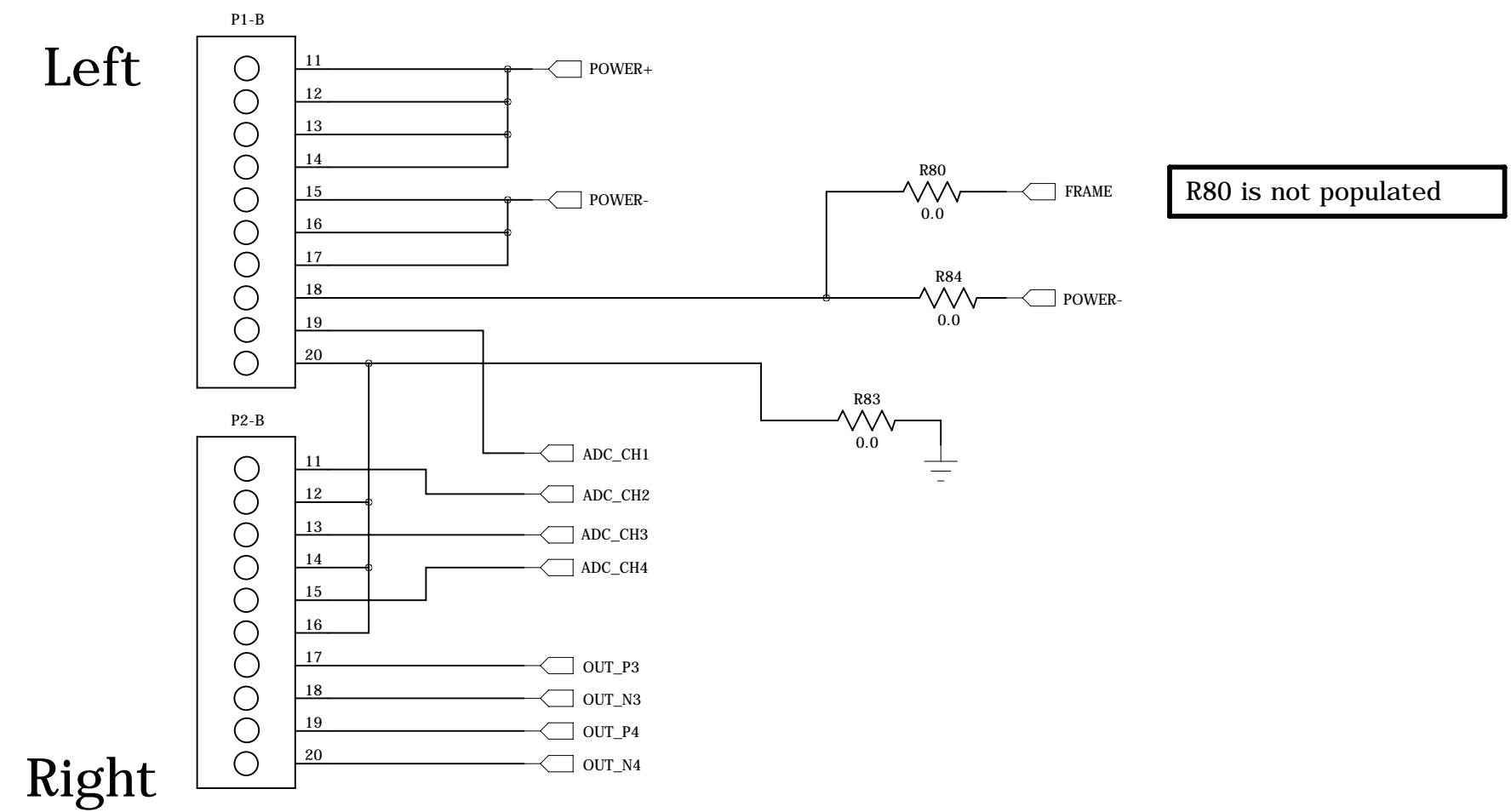


2x20 positions of Screw Terminals

Top Row

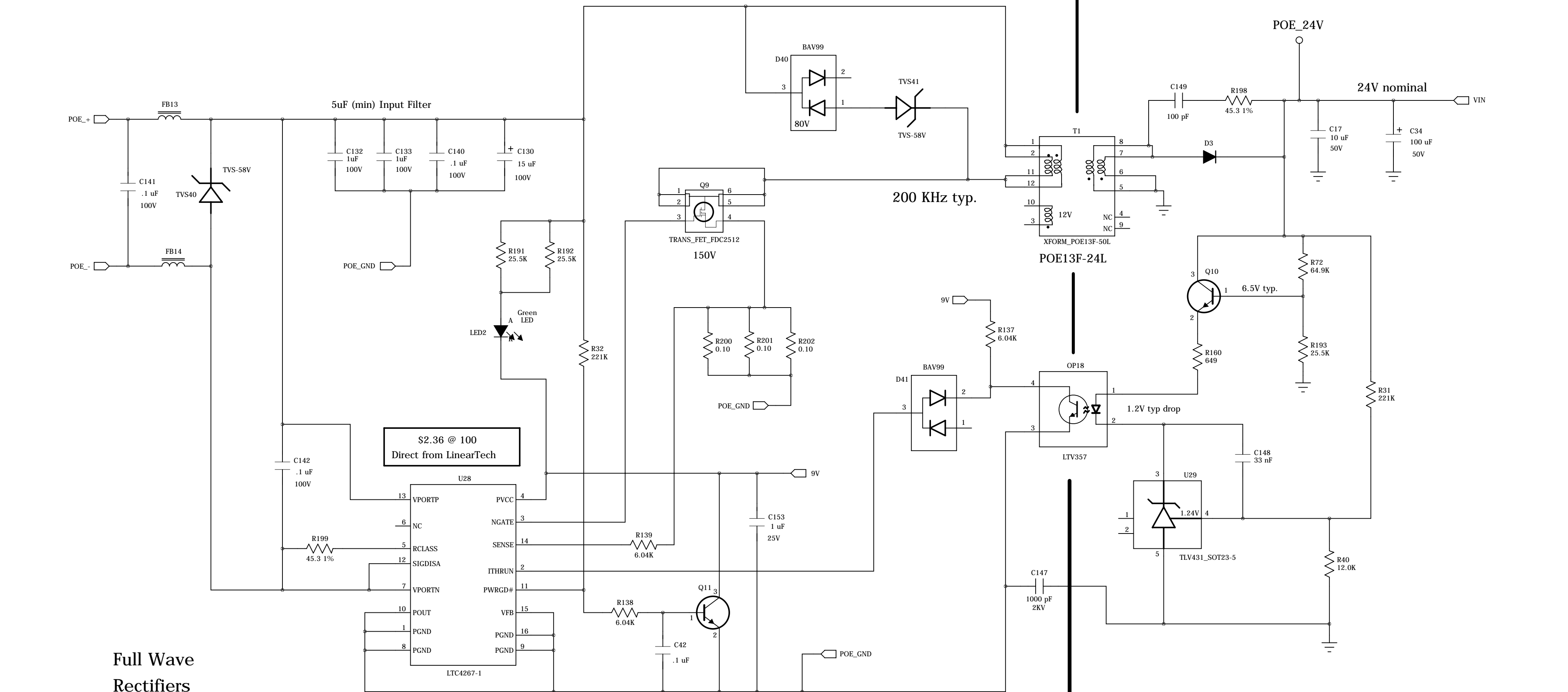


Bottom Row

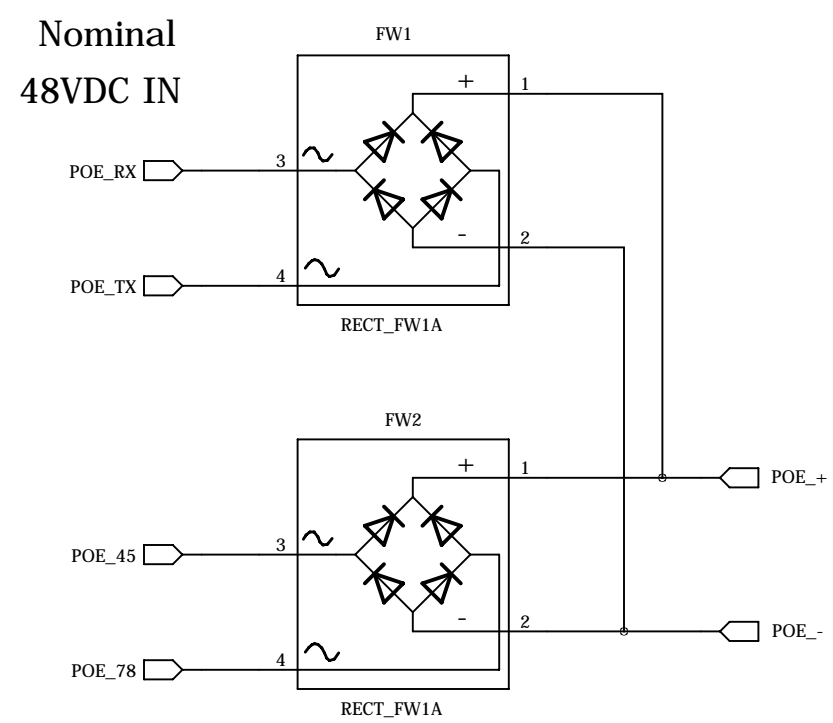


POE Side 48V DC Input

Isolated 24V Out



Full Wave Rectifiers



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Title: TS-7558 POE		
Rev: A	Designer	Sheet 12 of 12