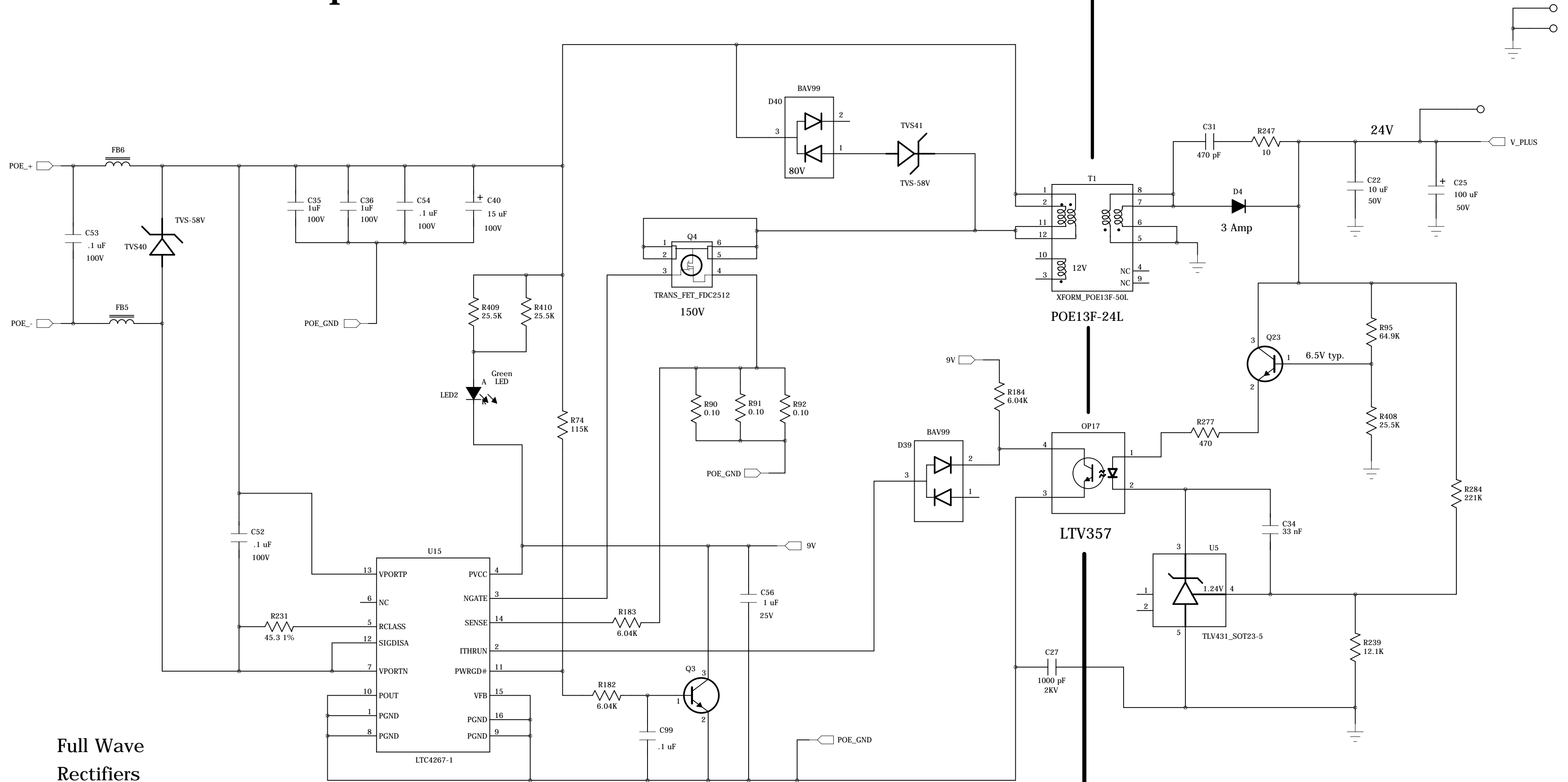


TS-8820 Rev C

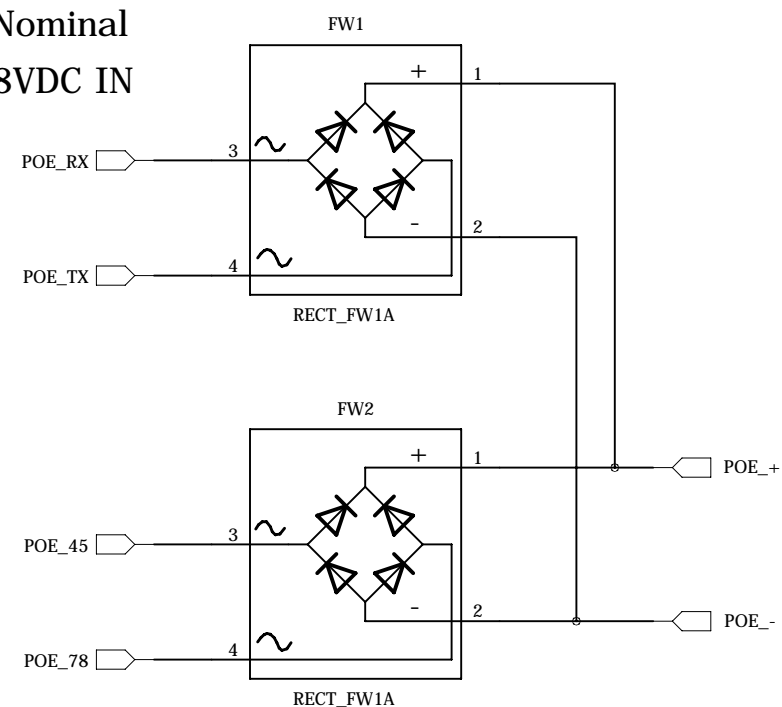
POE Side
48V DC Input

Reg. 24V Out



Full Wave Rectifiers

Nominal
48VDC IN

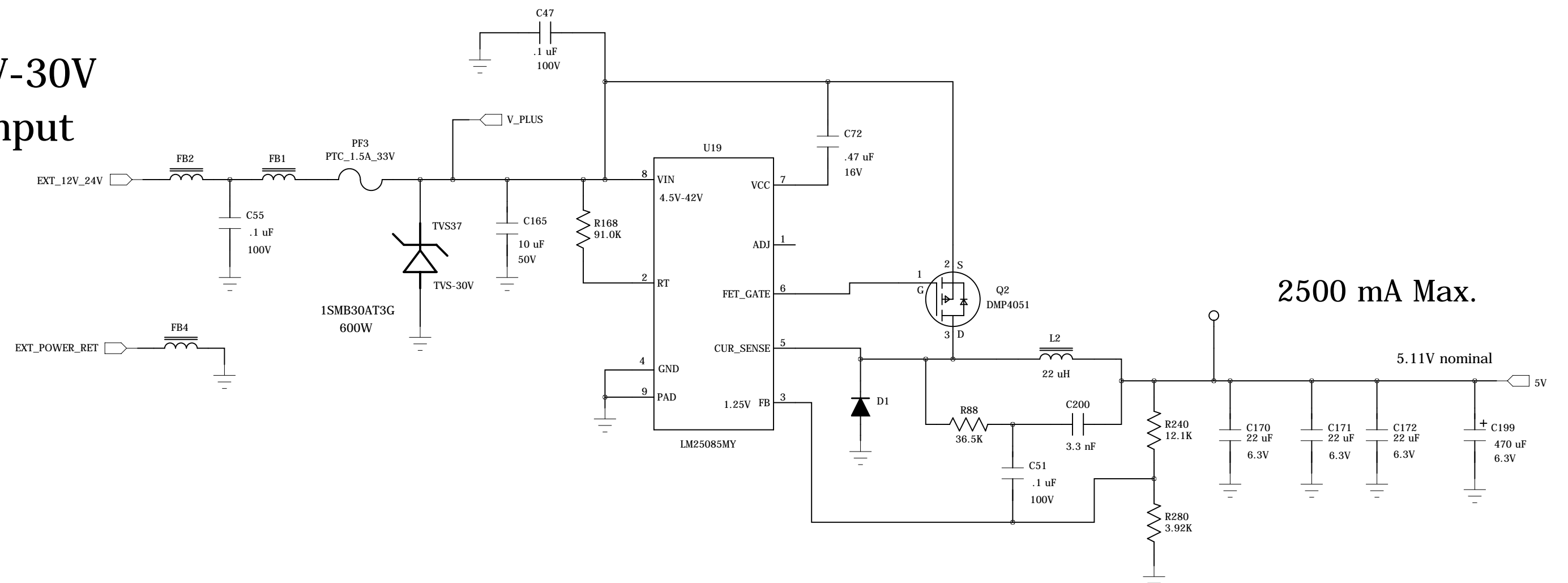


Web Schematic: Some proprietary information has been withheld.

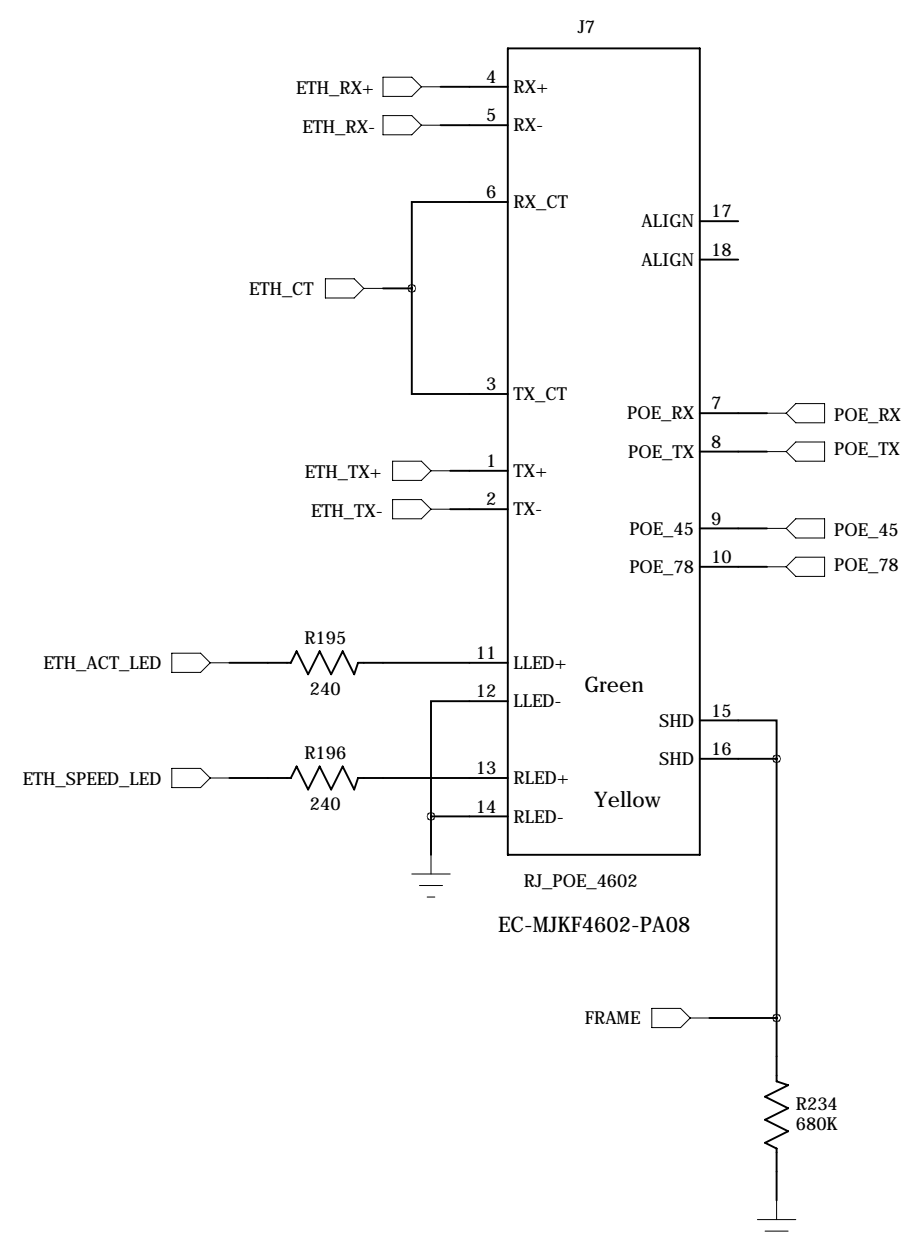
Technologic Systems	Aug. 4, 2013
Title: TS-8820 POE	
Rev: C	Designer
Sheet 1 of 18	

Non-isolated 5V Power Supply

10V-30V
Input



10/100 Ethernet Transformer

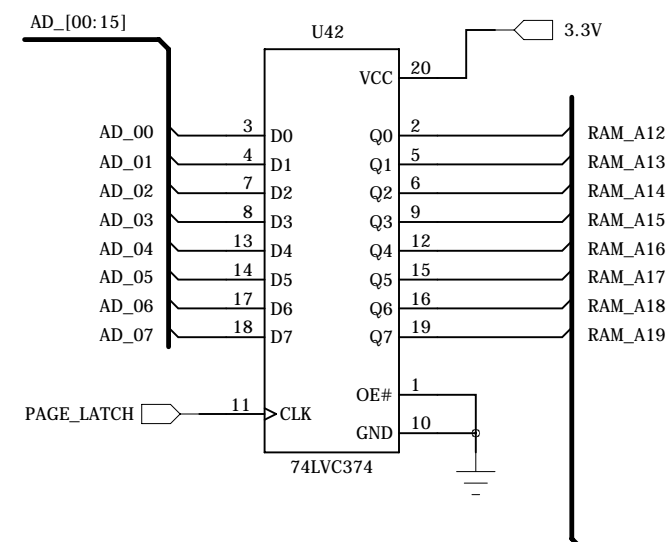


Technologic Systems	Aug. 4, 2013
Title: TS-8820 Ethernet and 5V Power	
Rev: C	Designer
Sheet 2 of 18	

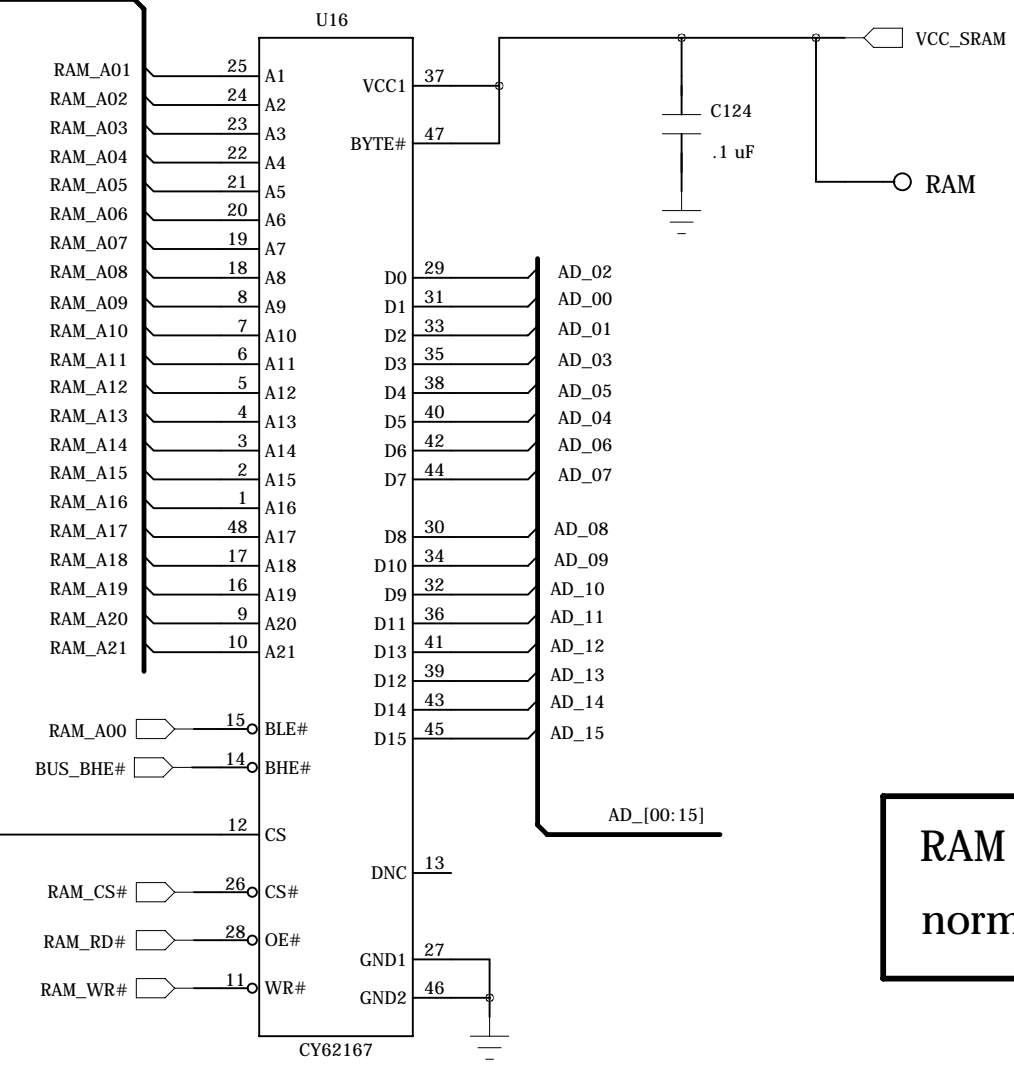
Battery-Backed SRAM

NV_RAM
Page Reg.

1MB
2MB or 4MB
NV_RAM



RAM_A[00:21]

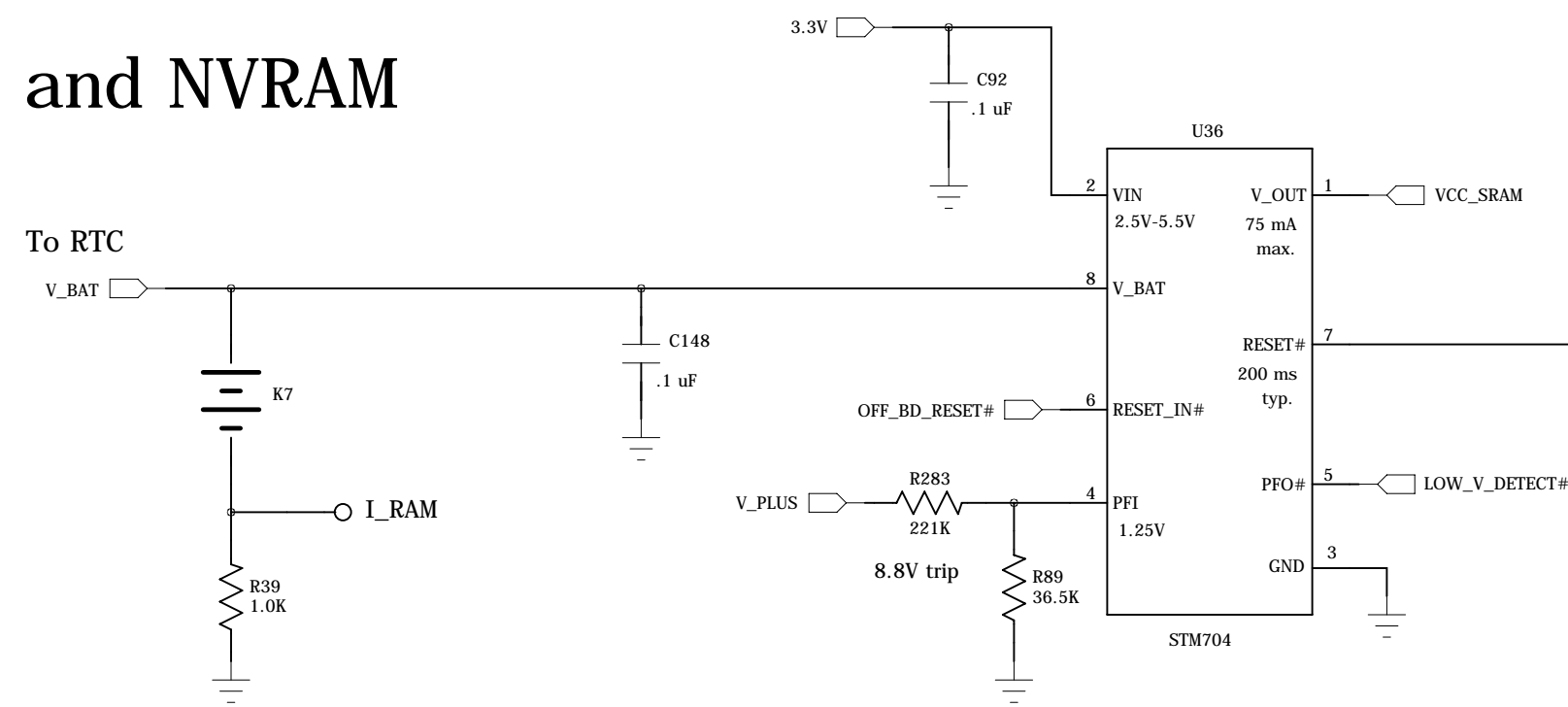


CY62167DV30LL-55Z = TSOP 1M x 16

CY62177 = 2Meg x 16

Battery
for RTC
and NVRAM

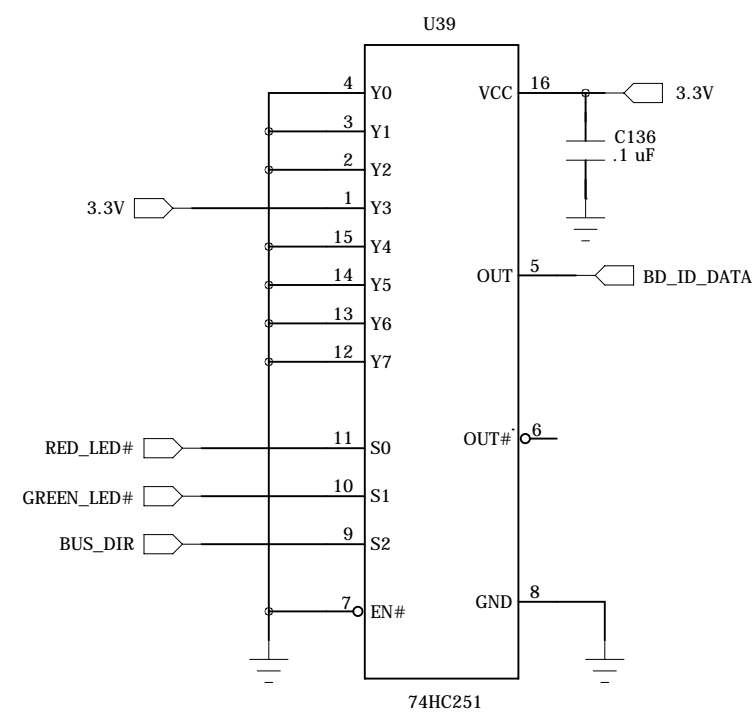
To RTC



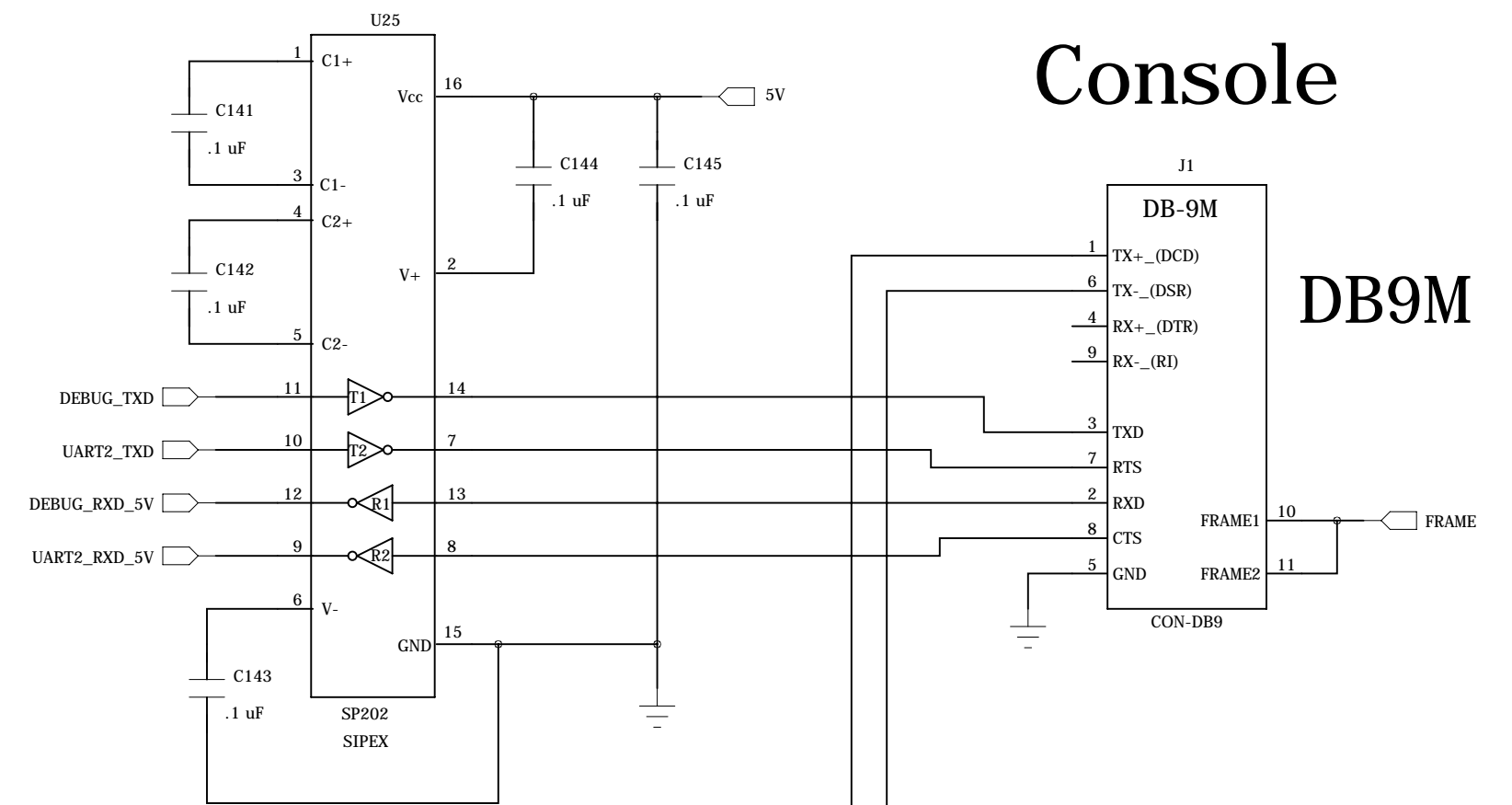
RESET# guaranteed low
even when VIN = 0

RAM chip is not
normally populated

Board ID = 8



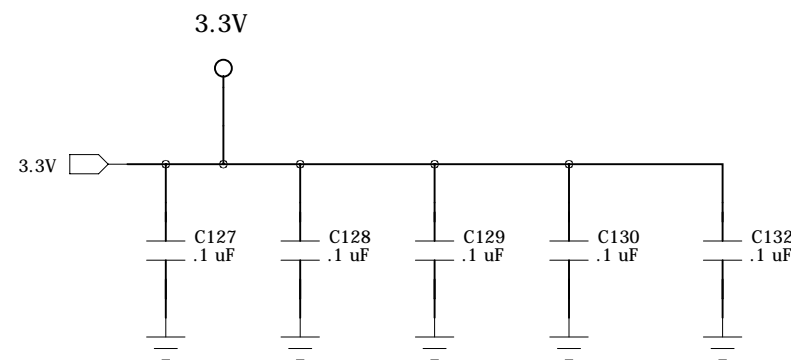
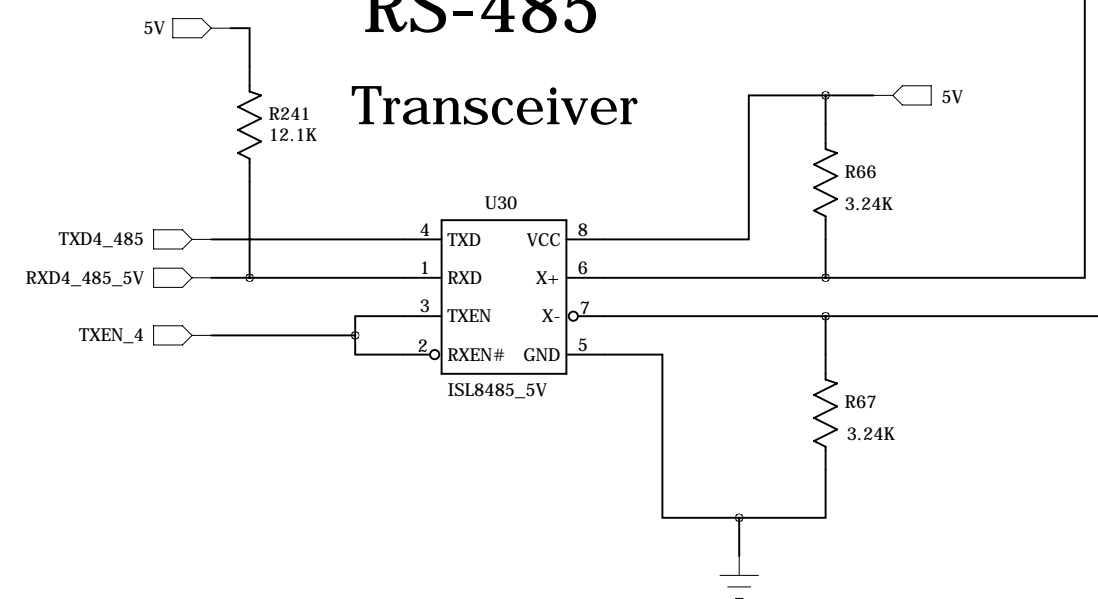
RS-232 Transceiver



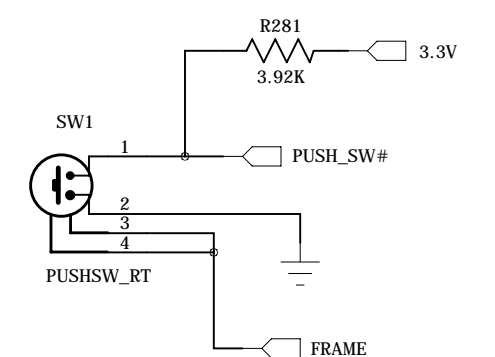
Console

DB9M

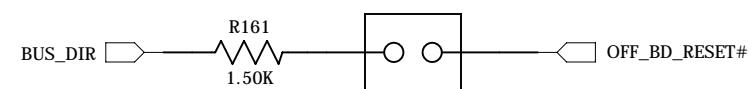
RS-485 Transceiver



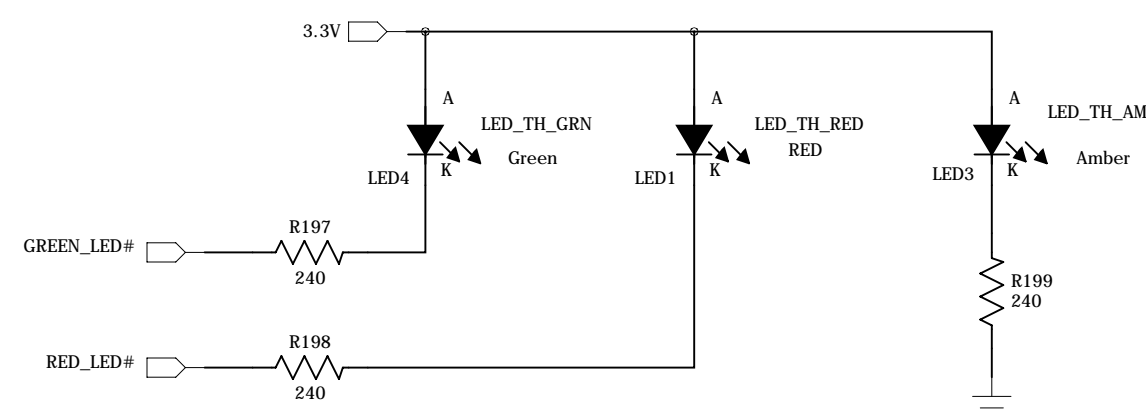
Right Angle Push Switch



Force Boot to SD card



LEDs

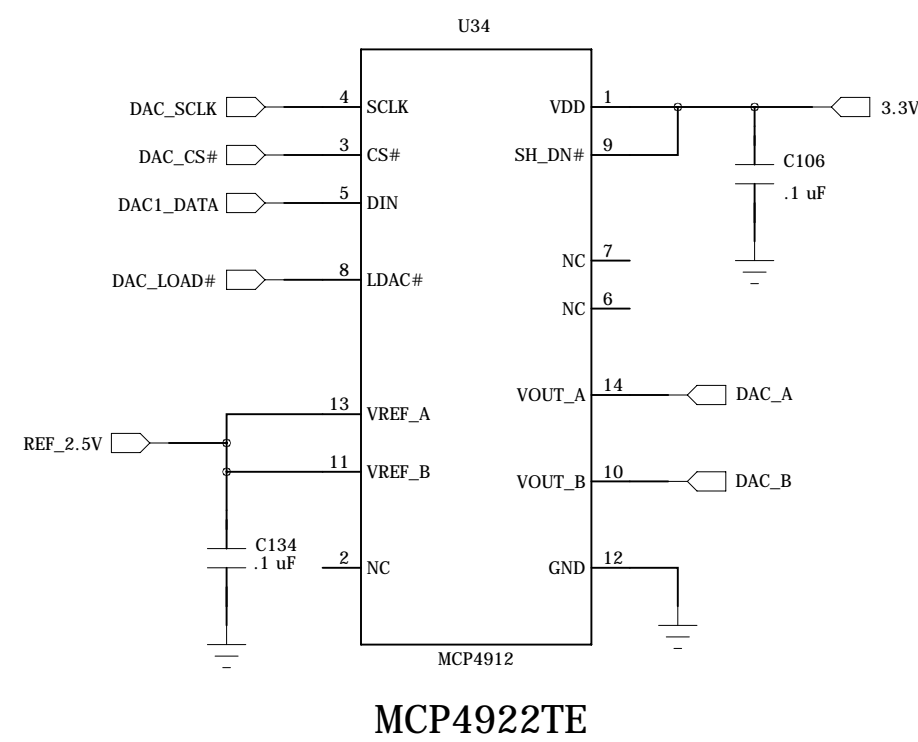


Technologic Systems	Aug. 4, 2013
Title: TS-8820 Console, RS-485, Board ID	
Rev: C	Designer RLM
Sheet 4 of 18	

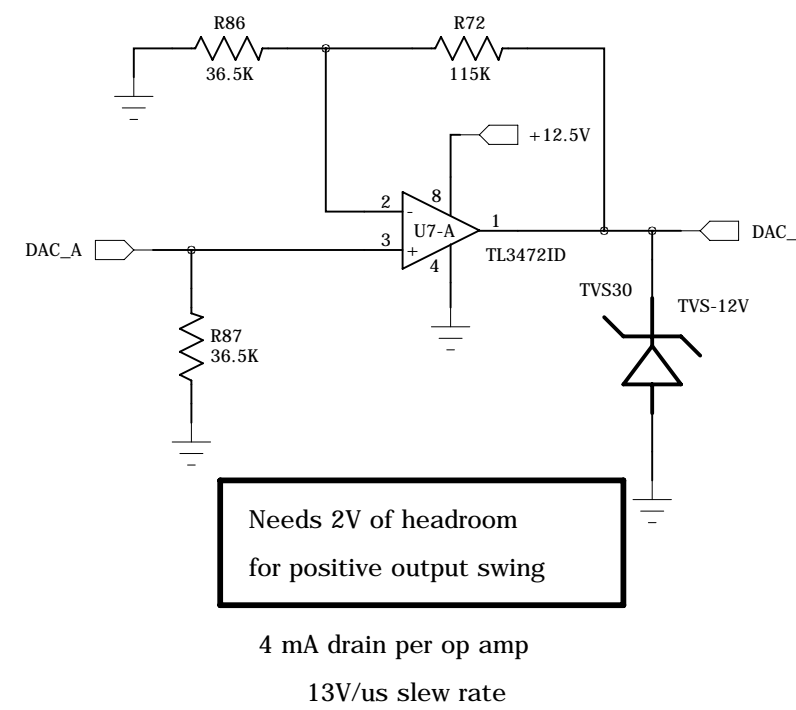
Four 12-bit DAC channels (0-10V Range)

12-bit DAC

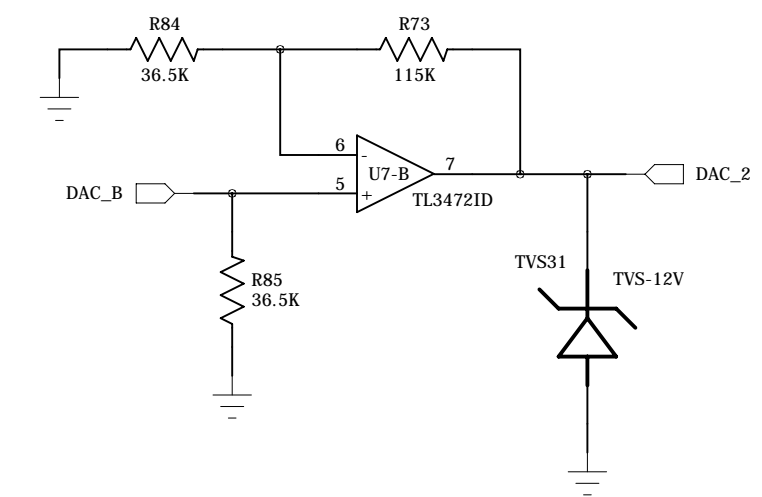
0 to 2.5V levels



Gain = 4.15

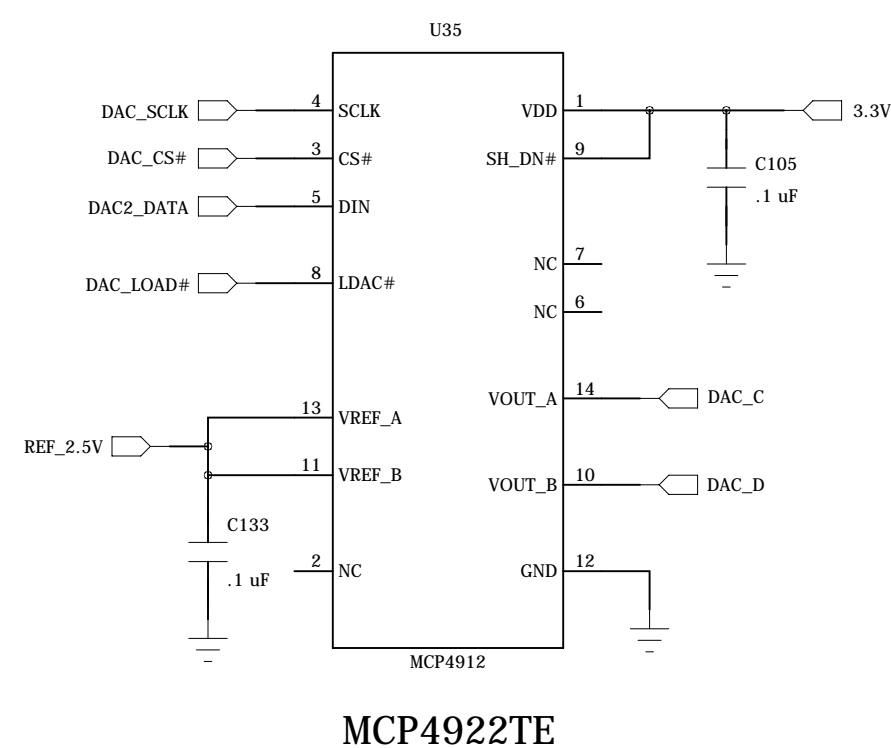


Gain = 4.15

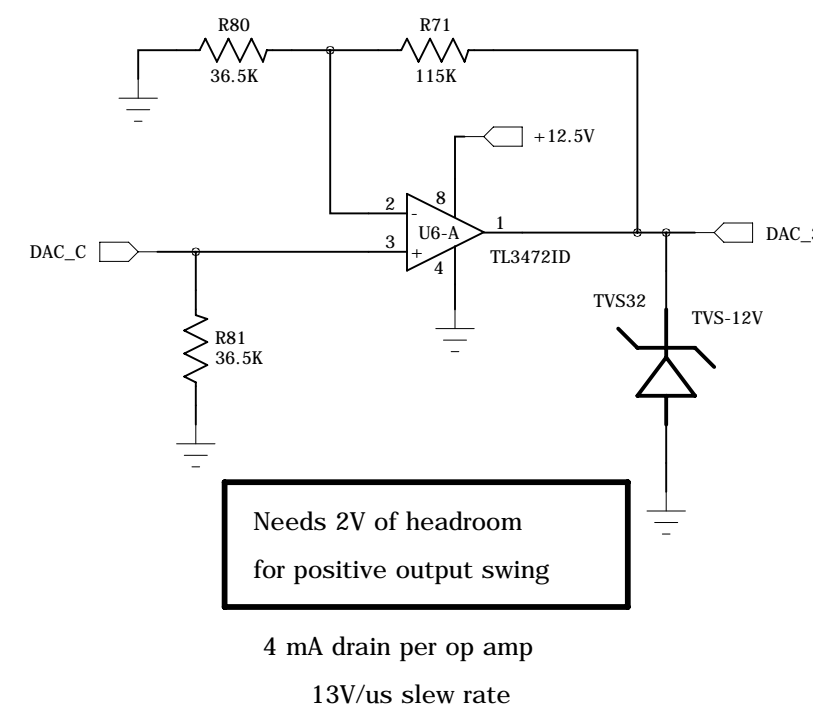


12-bit DAC

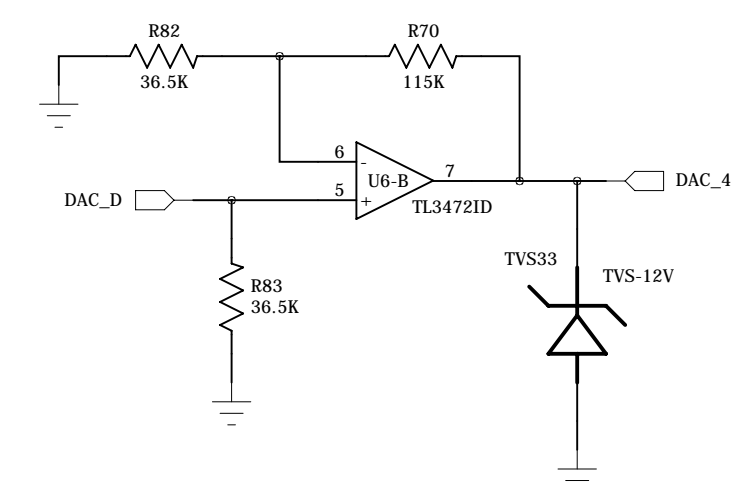
0 to 2.5V levels



Gain = 4.15



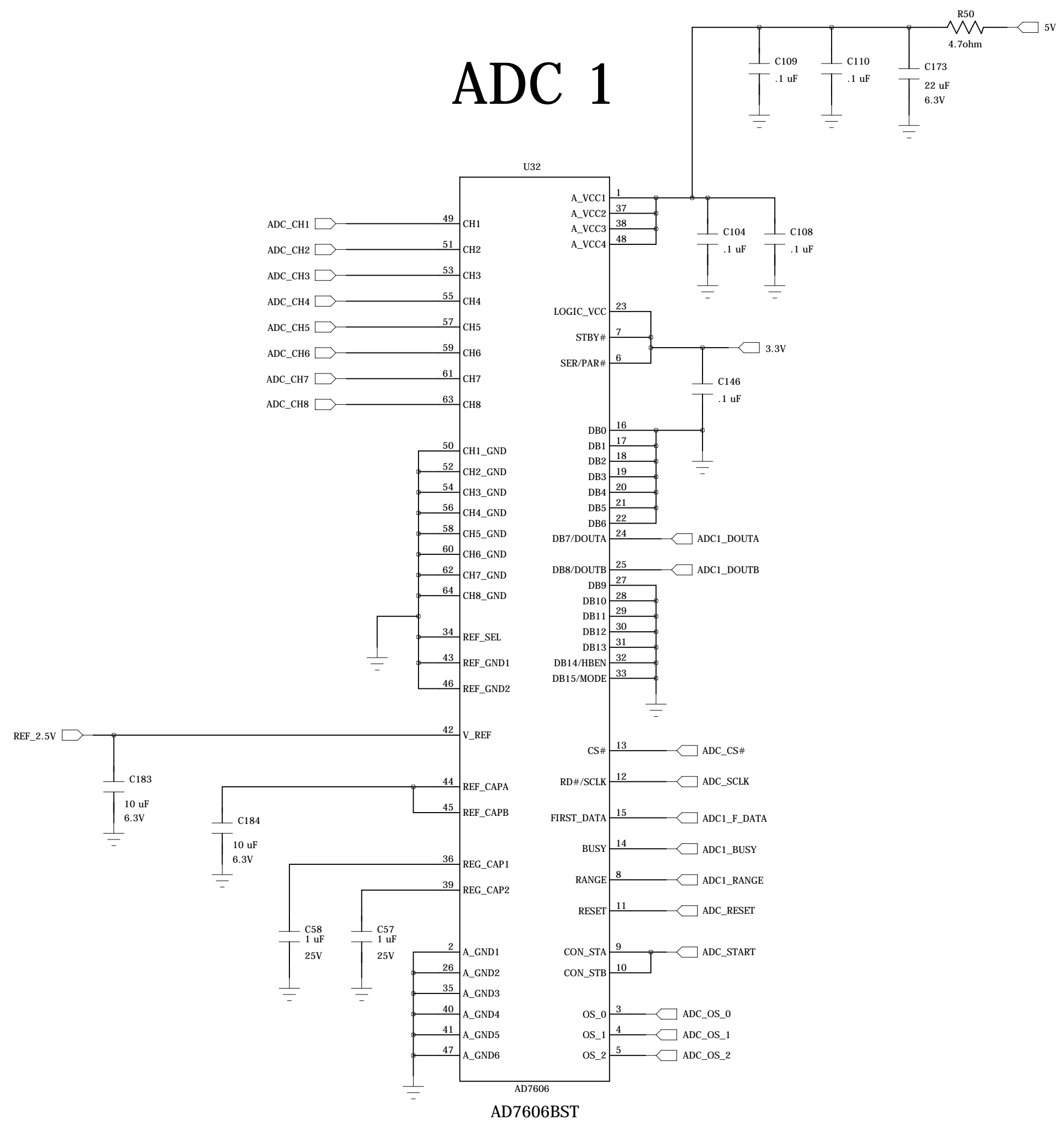
Gain = 4.15



Technologic Systems	Aug. 4, 2013
Title: TS-8820 DAC and Op Amps	
Rev: C	Designer
Sheet 5 of 18	

8 A/D channels

Simultaneous Sampling

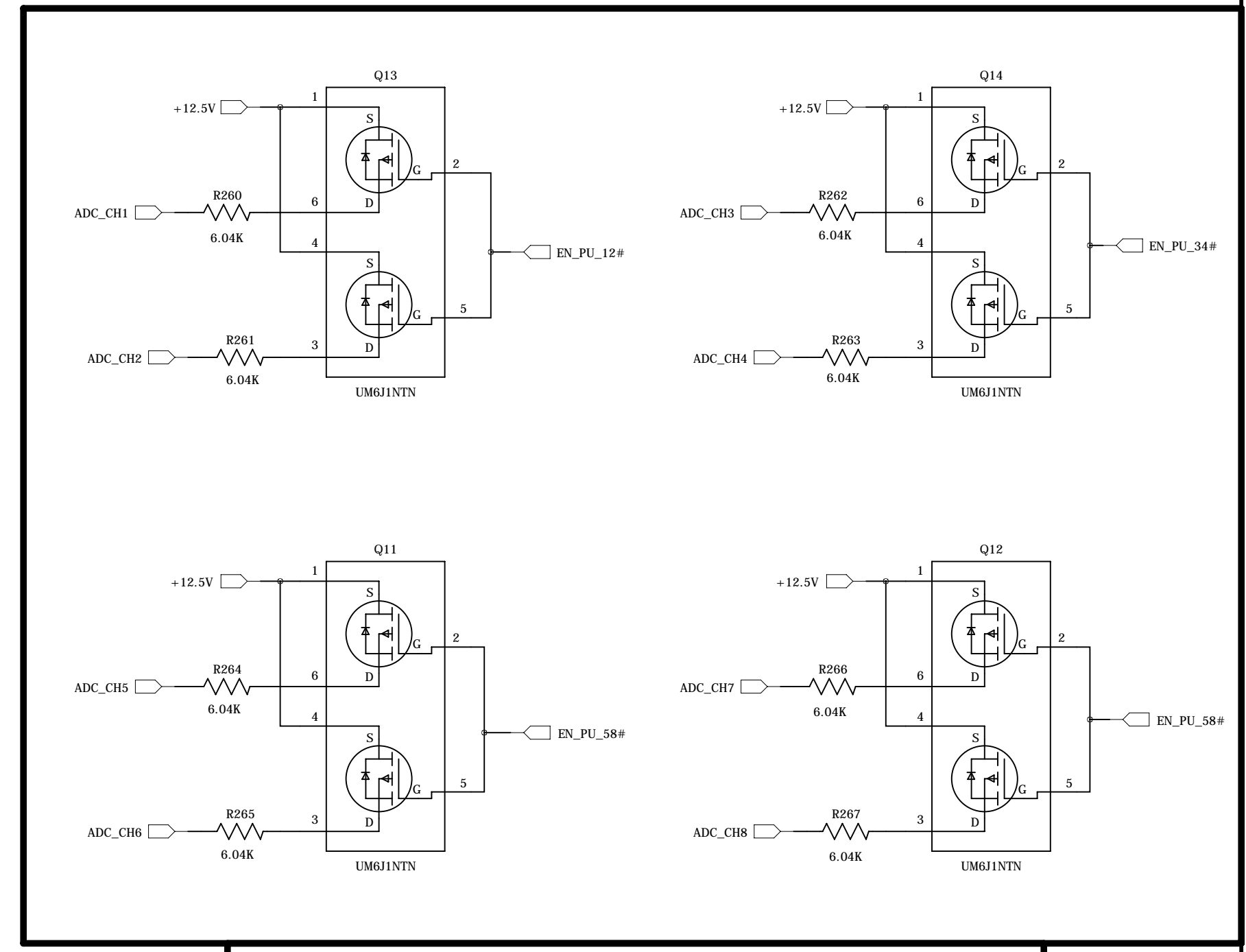


Simultaneous sampling of all 8 A/D inputs

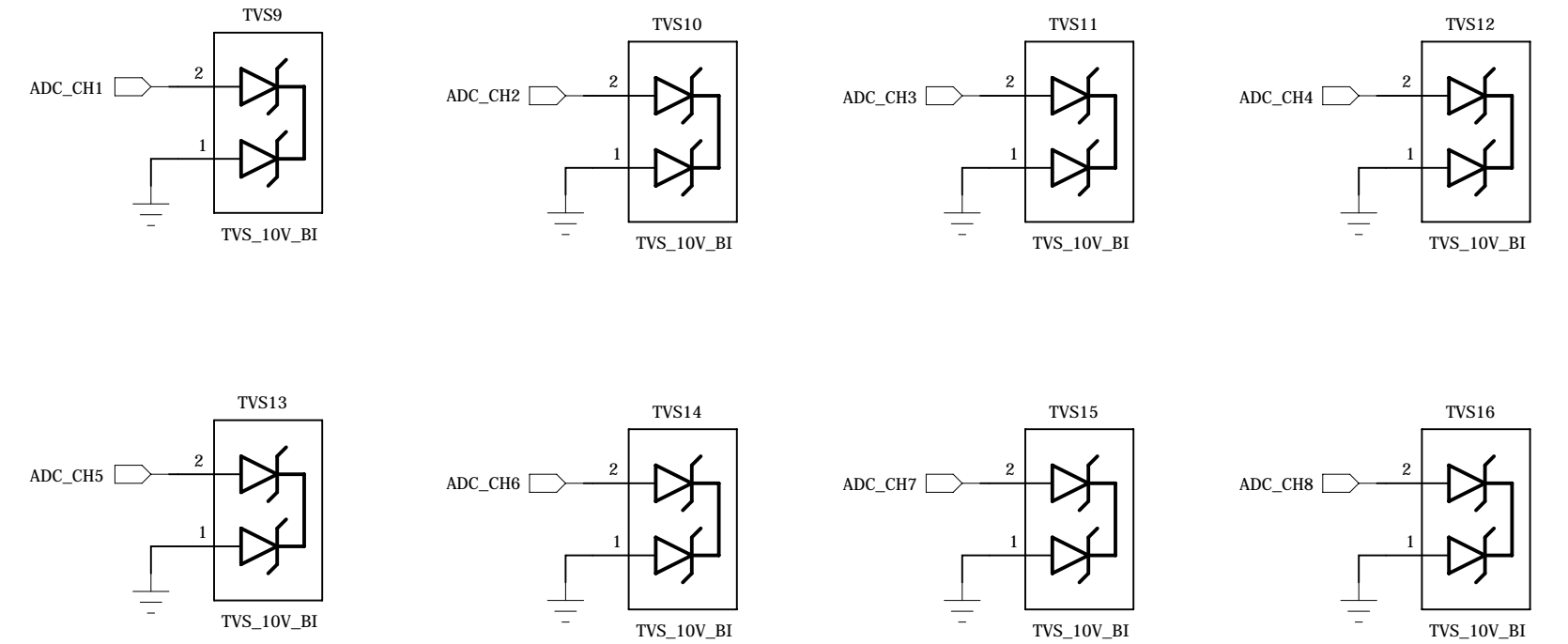
Software selectable ranges
+/-5V or +/-10V

200K samples per second

>1 Megohm input impedance



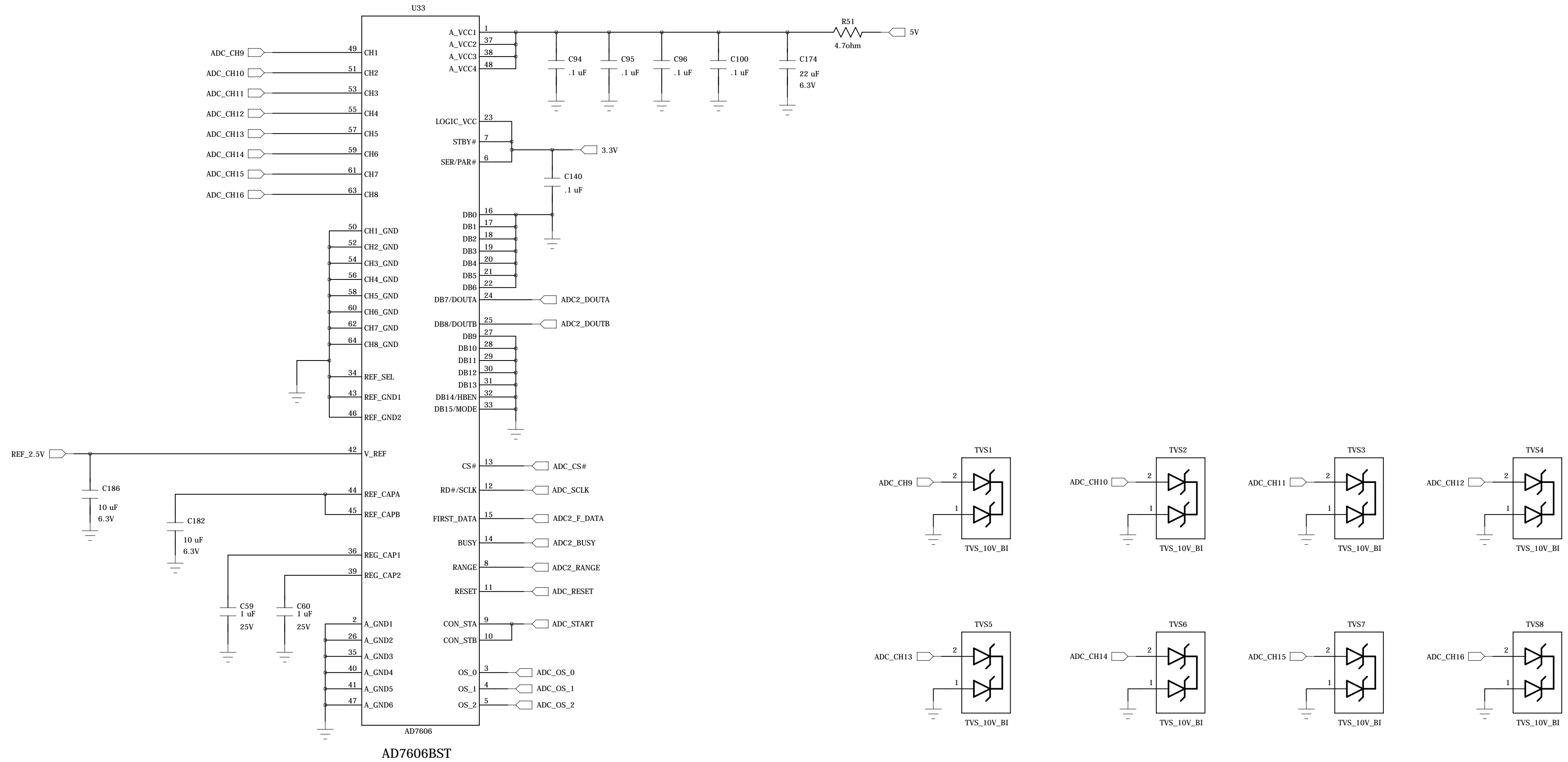
Allows up to 8 Thermistors



8 A/D channels

Simultaneous Sampling

ADC 2



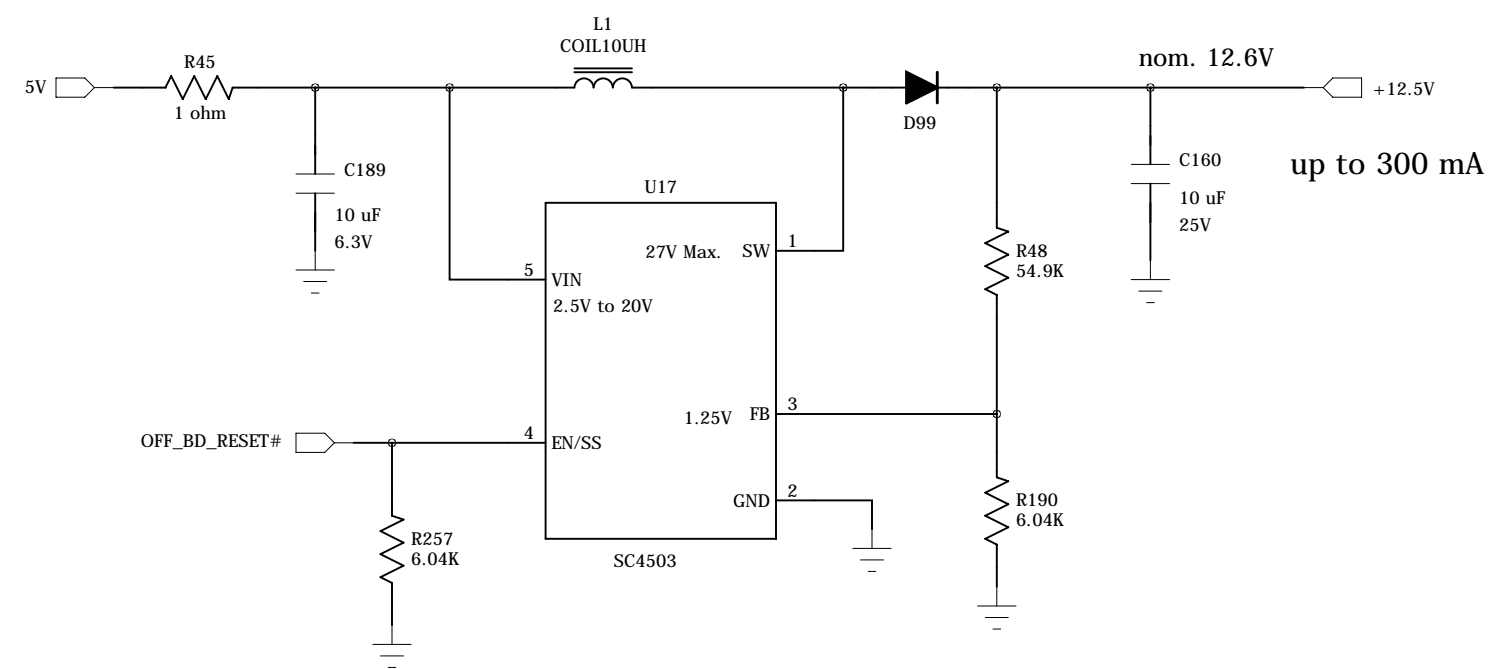
Simultaneous sampling of
all 8 A/D inputs

Software selectable ranges
+/-5V or +/-10V

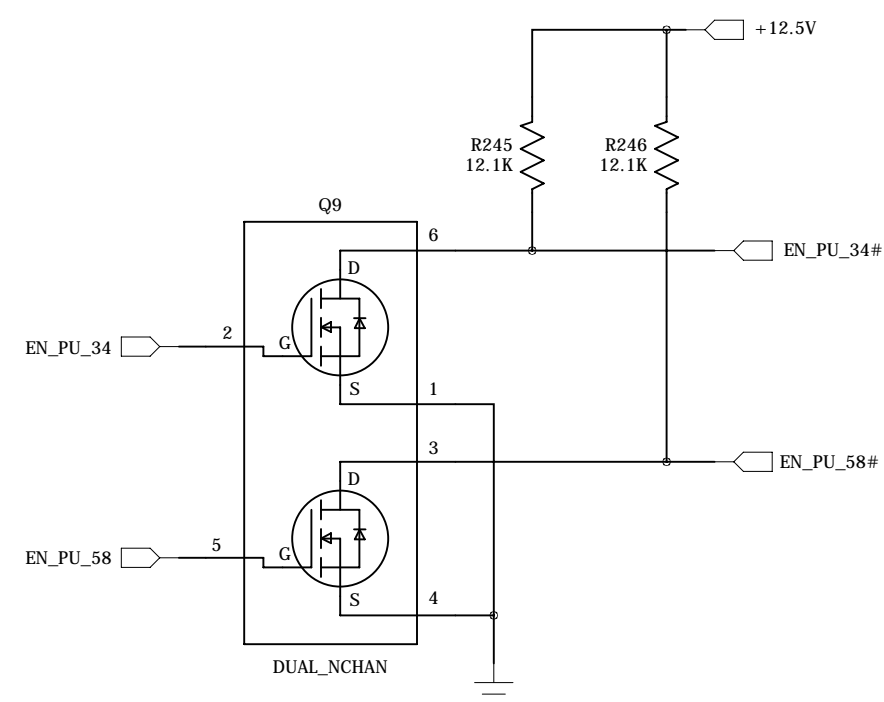
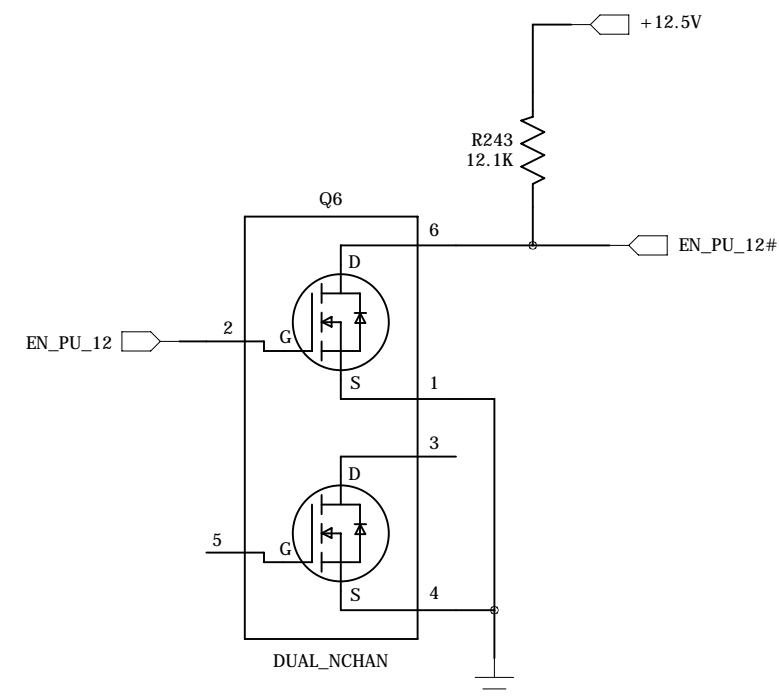
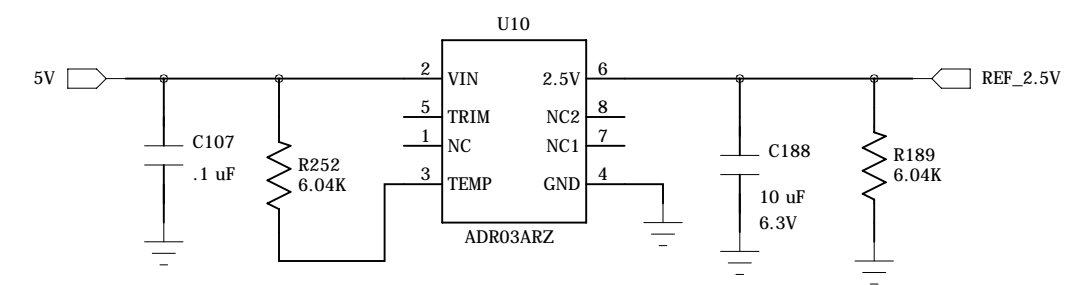
200K samples per second

>1 Megohm input impedance

+12.5V Boost Regulator



Precision 2.5V Reference

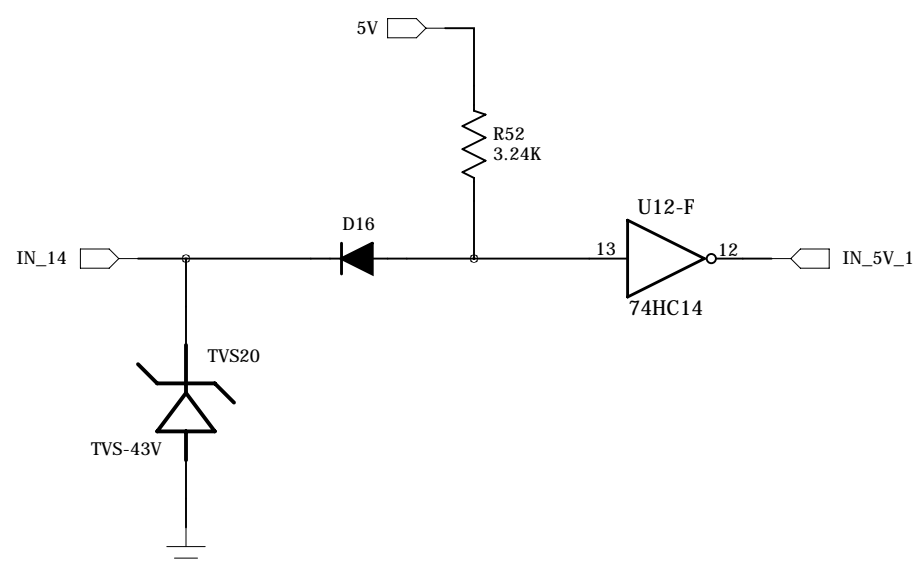
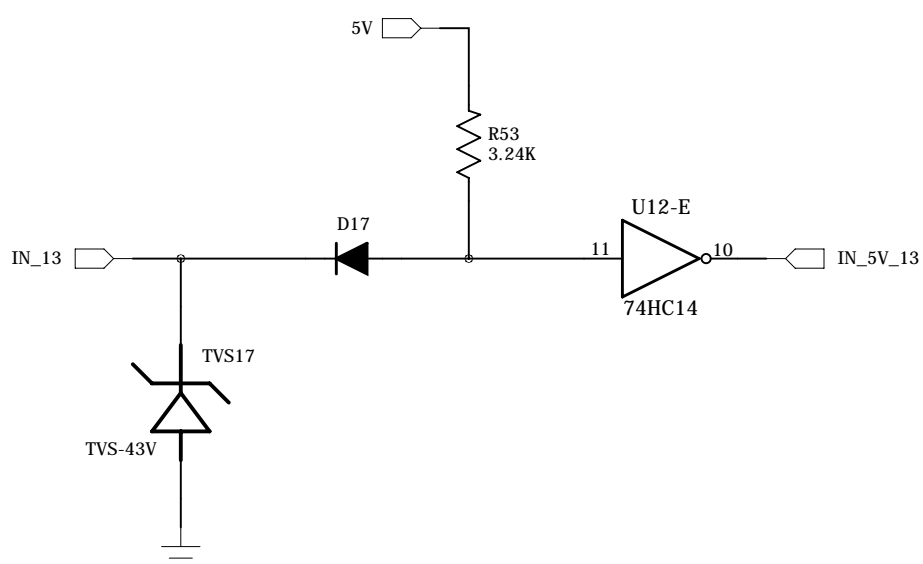
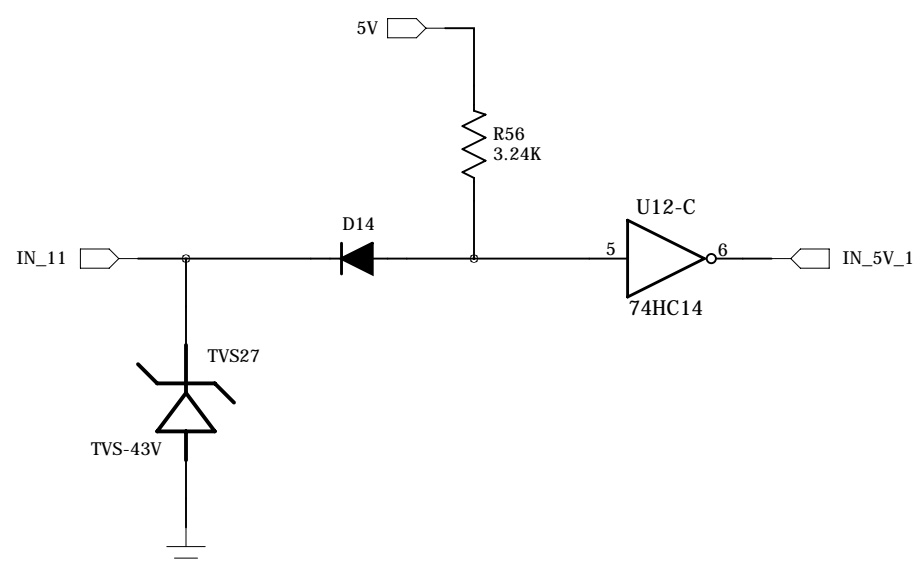
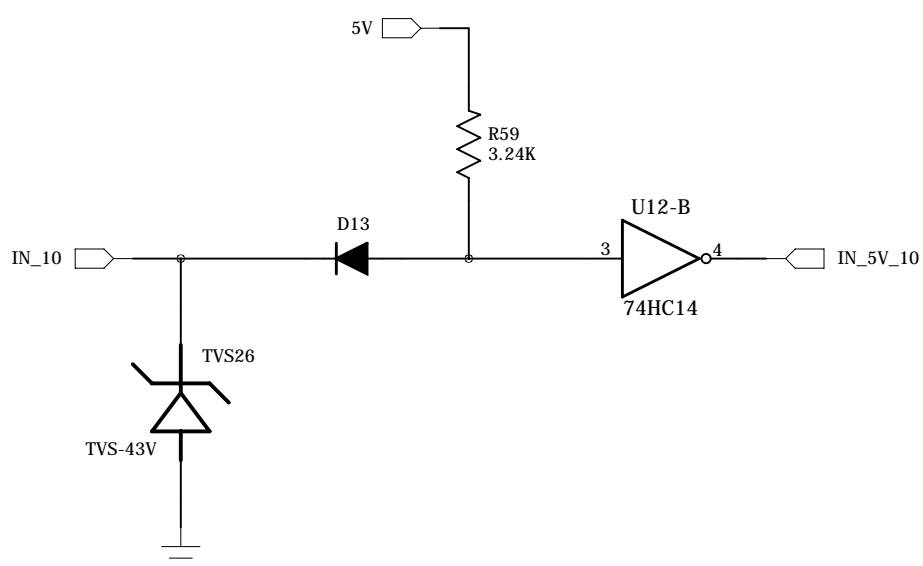
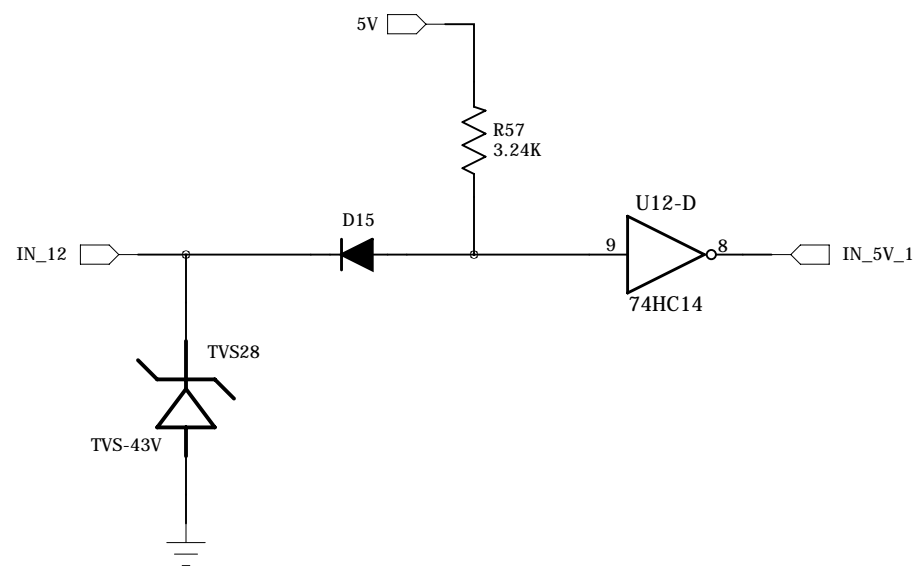
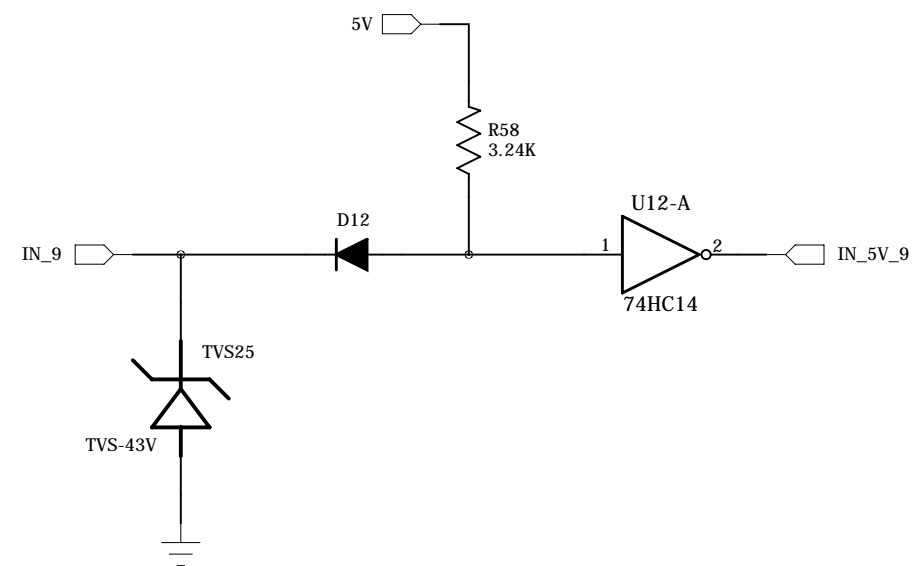


Technologic Systems	Aug. 4, 2013	
Title: TS-8820 DAC, 2.5V Ref.		
Rev: C	Designer	Sheet 8 of 18

Non-Isolated Inputs

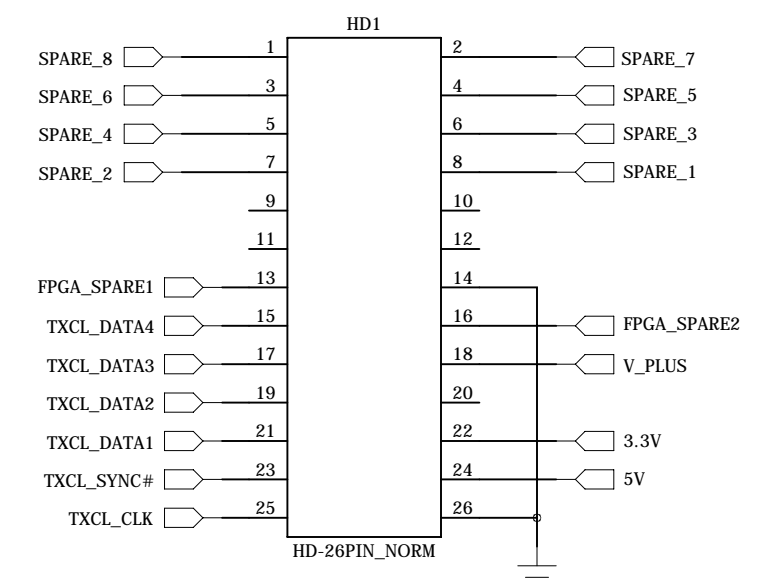
with Pull-up Resistors

+ 40V tolerant

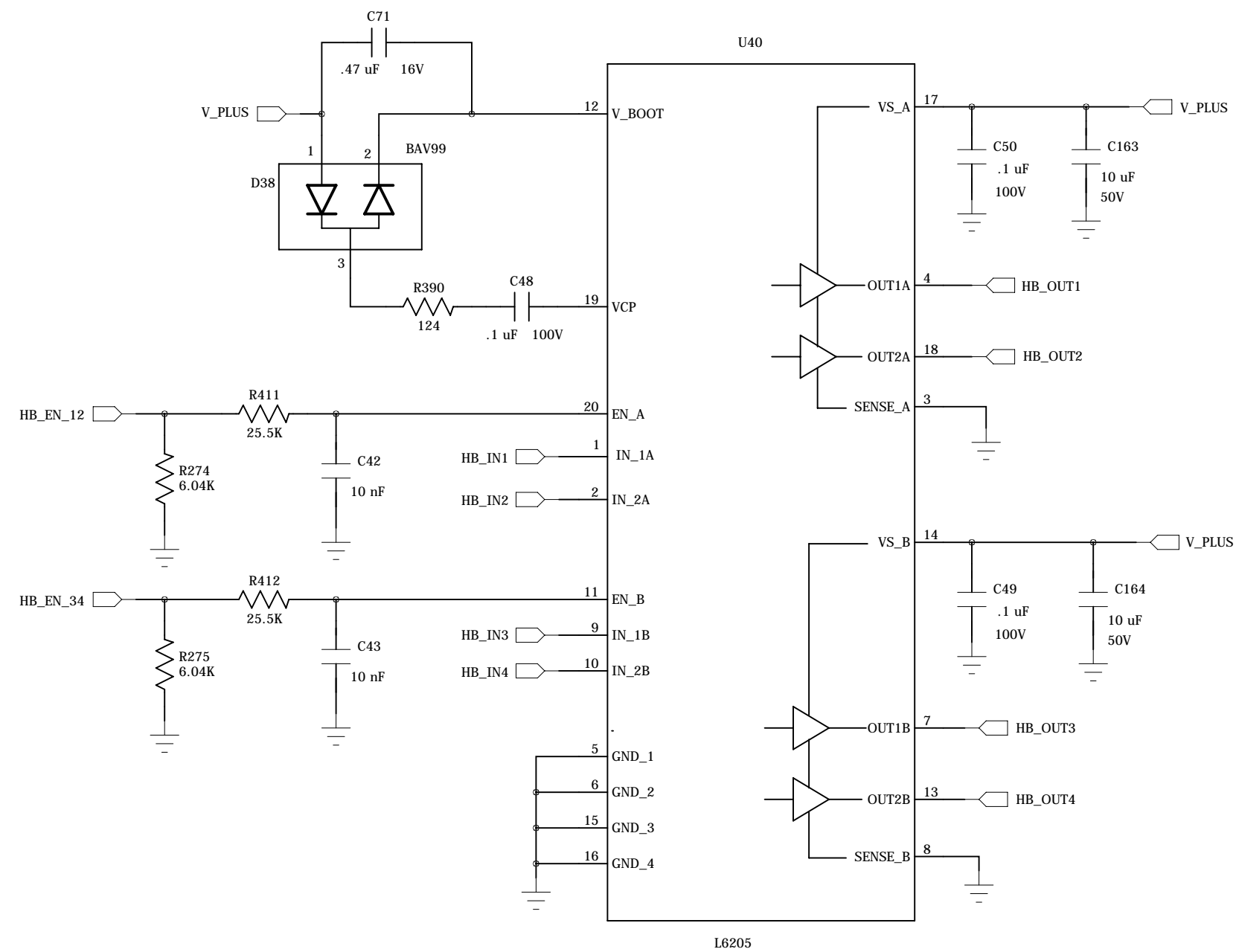


74HC14 provides 2.5V nominal thresholds

TX Current Loop Daughter Board Header

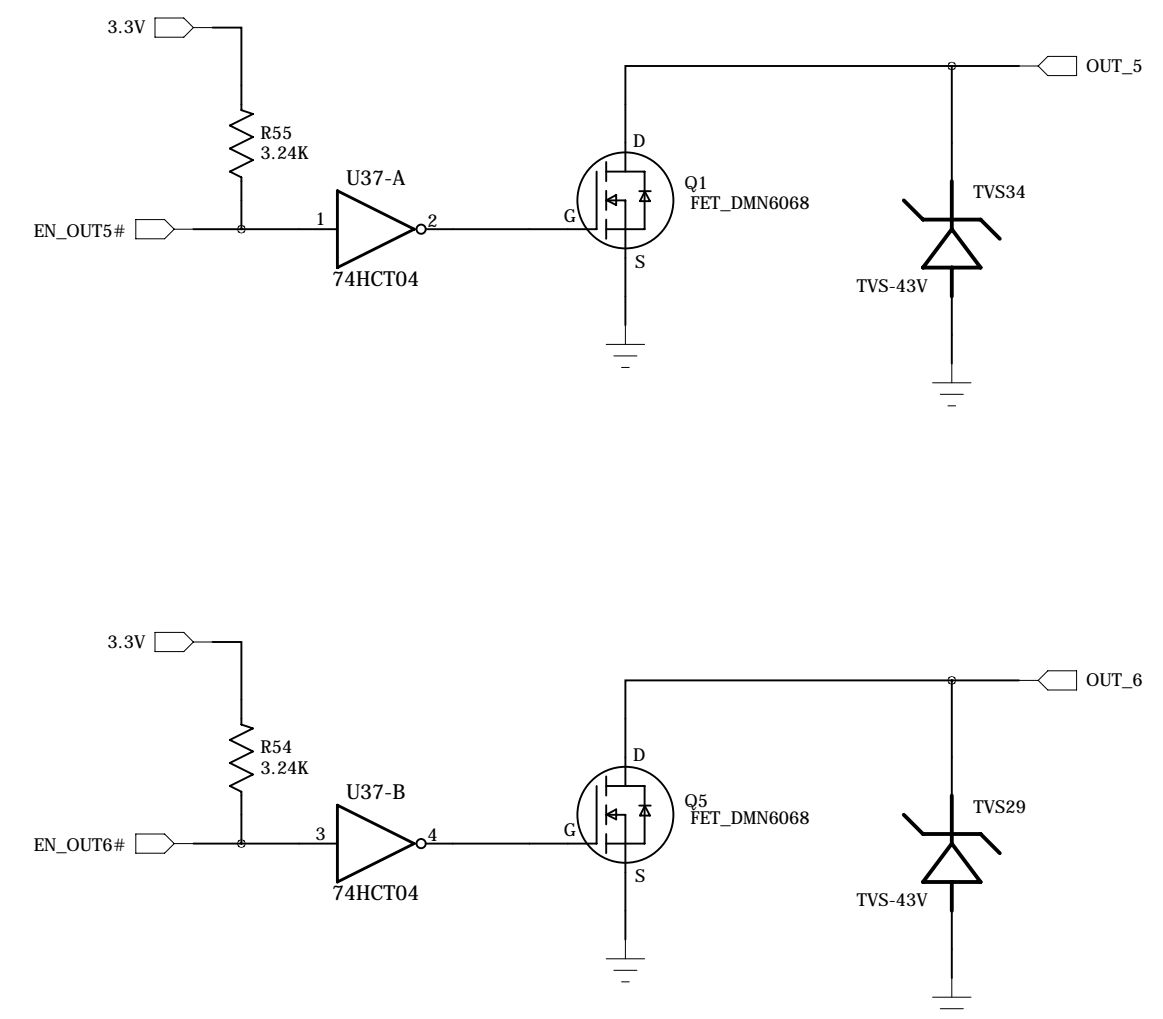


Dual H-bridge

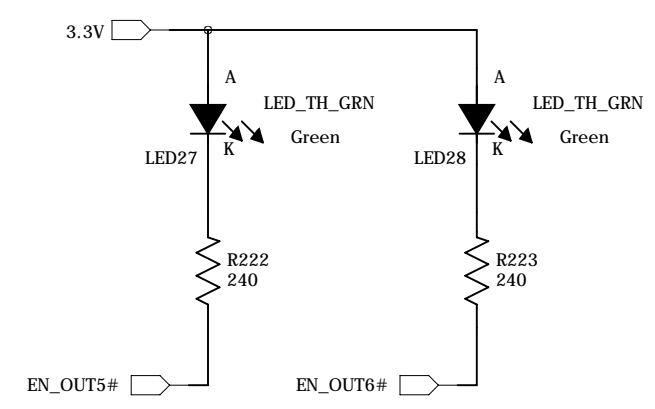


Non-Isolated Outputs

Sinks 1000 mA



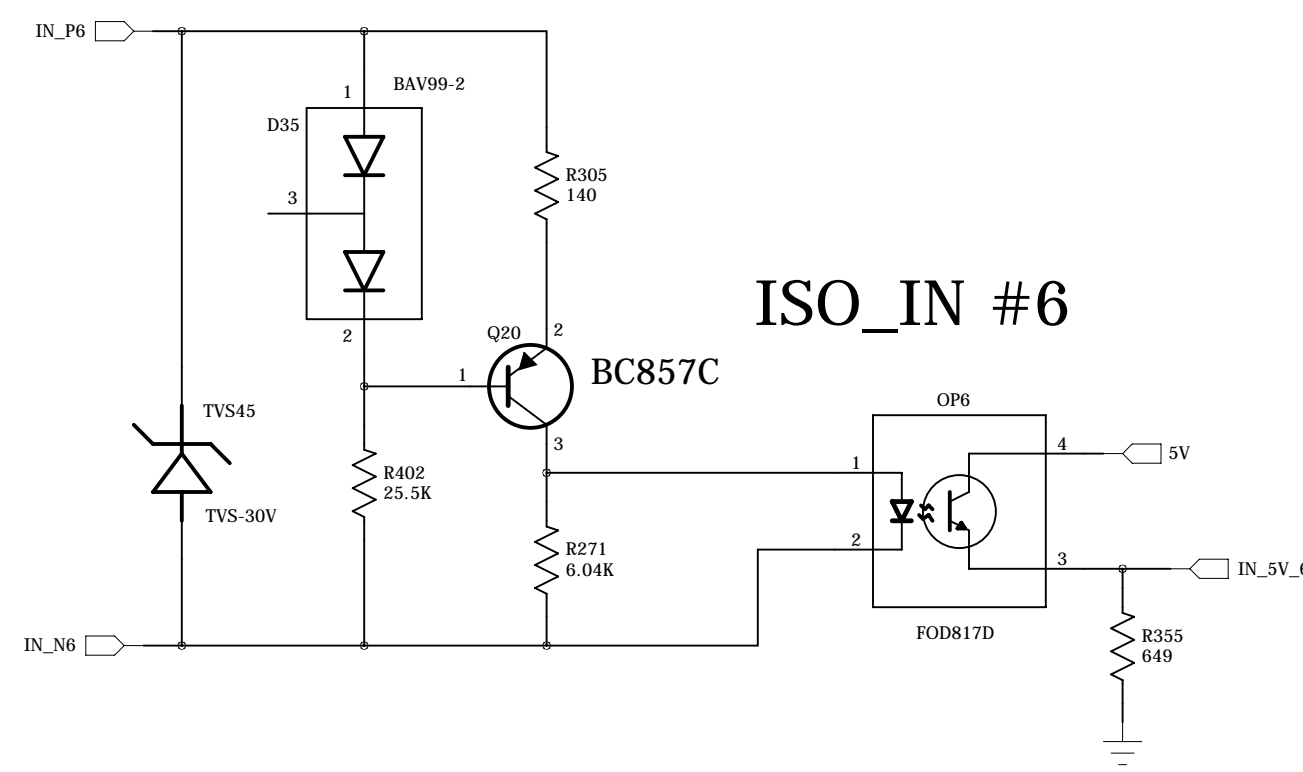
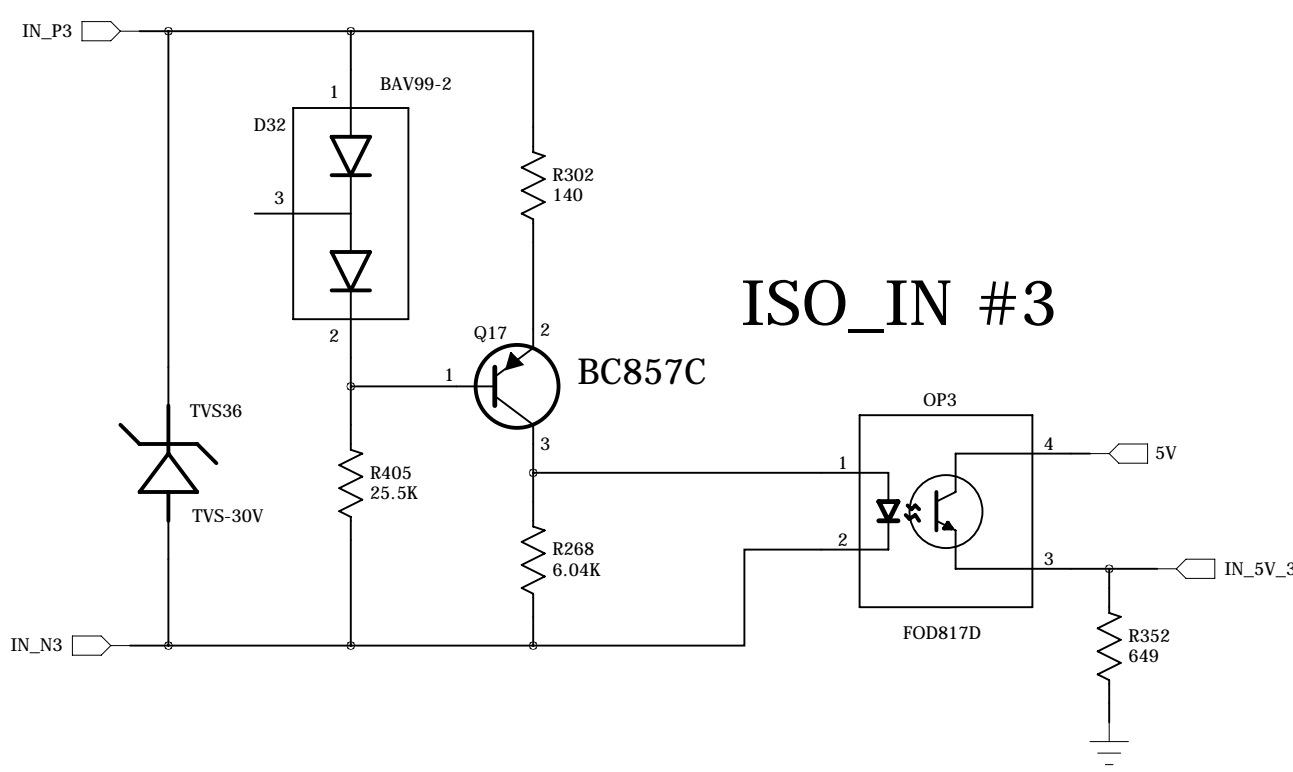
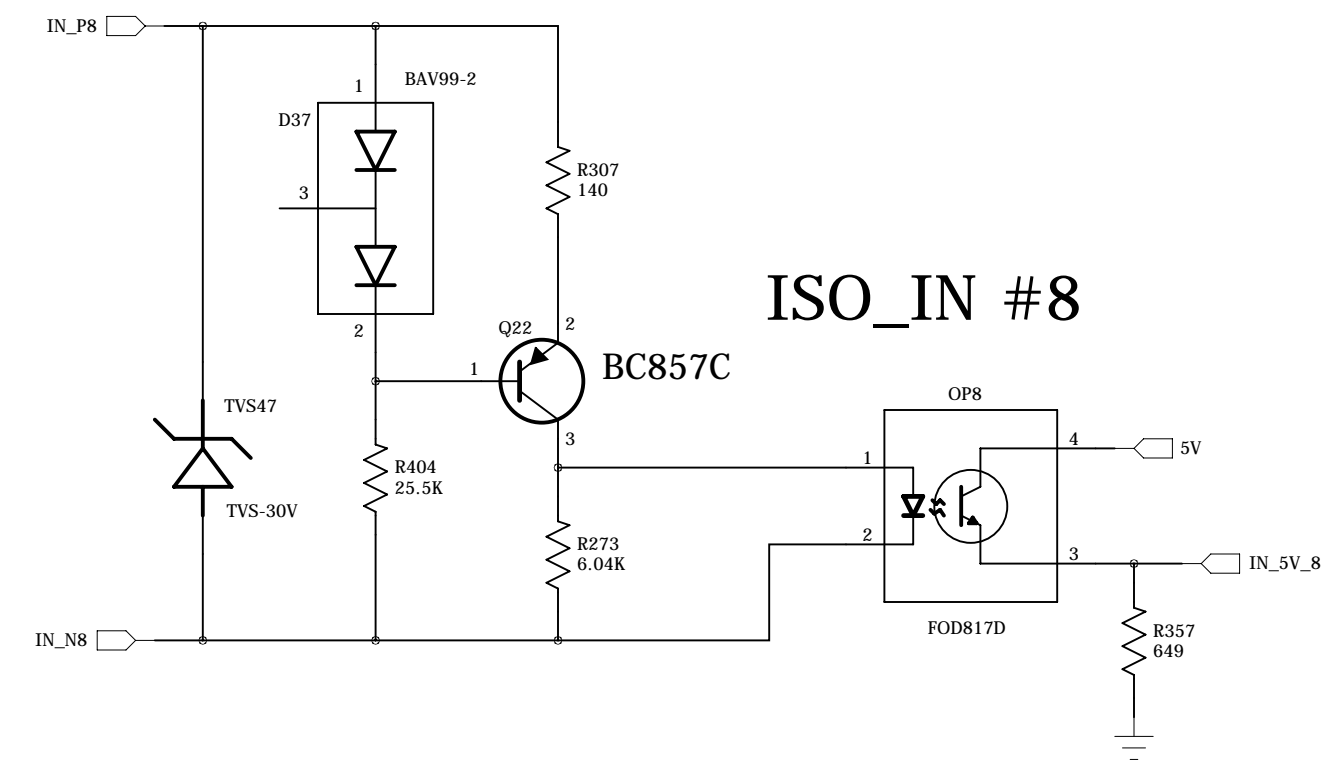
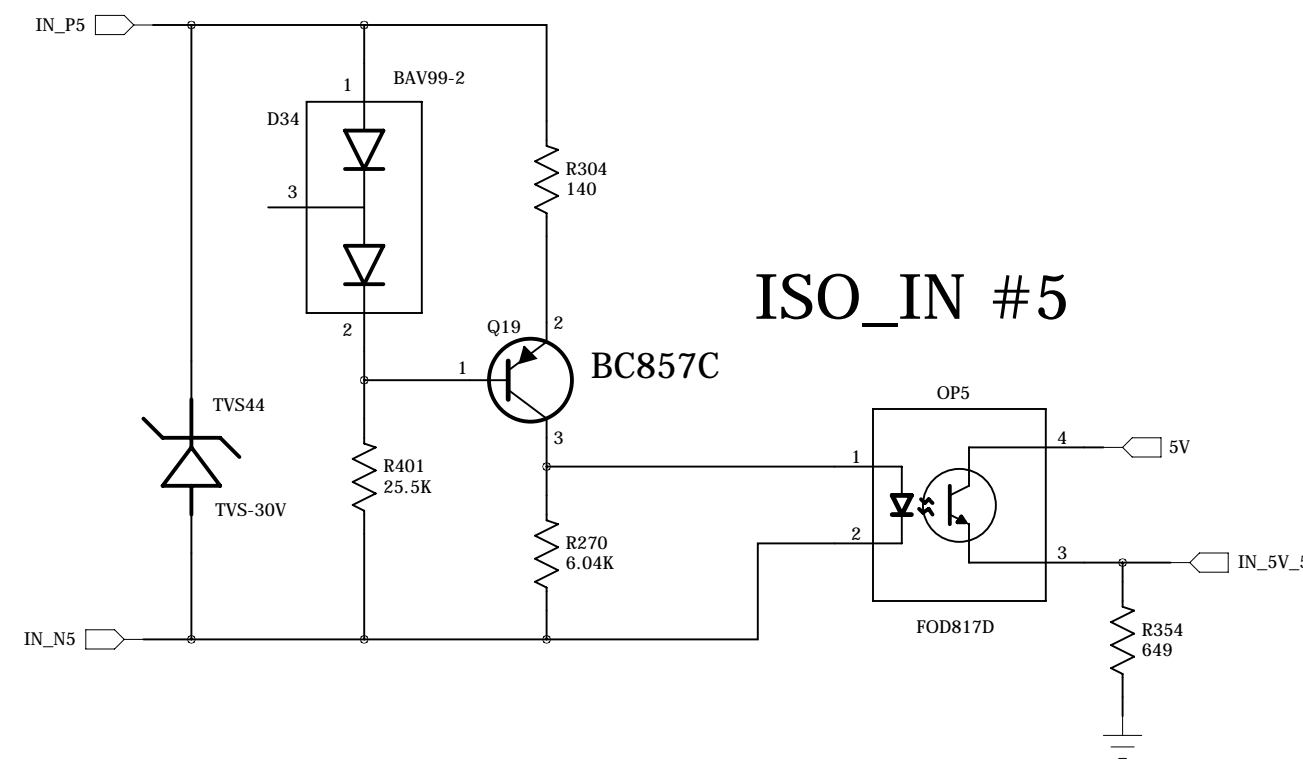
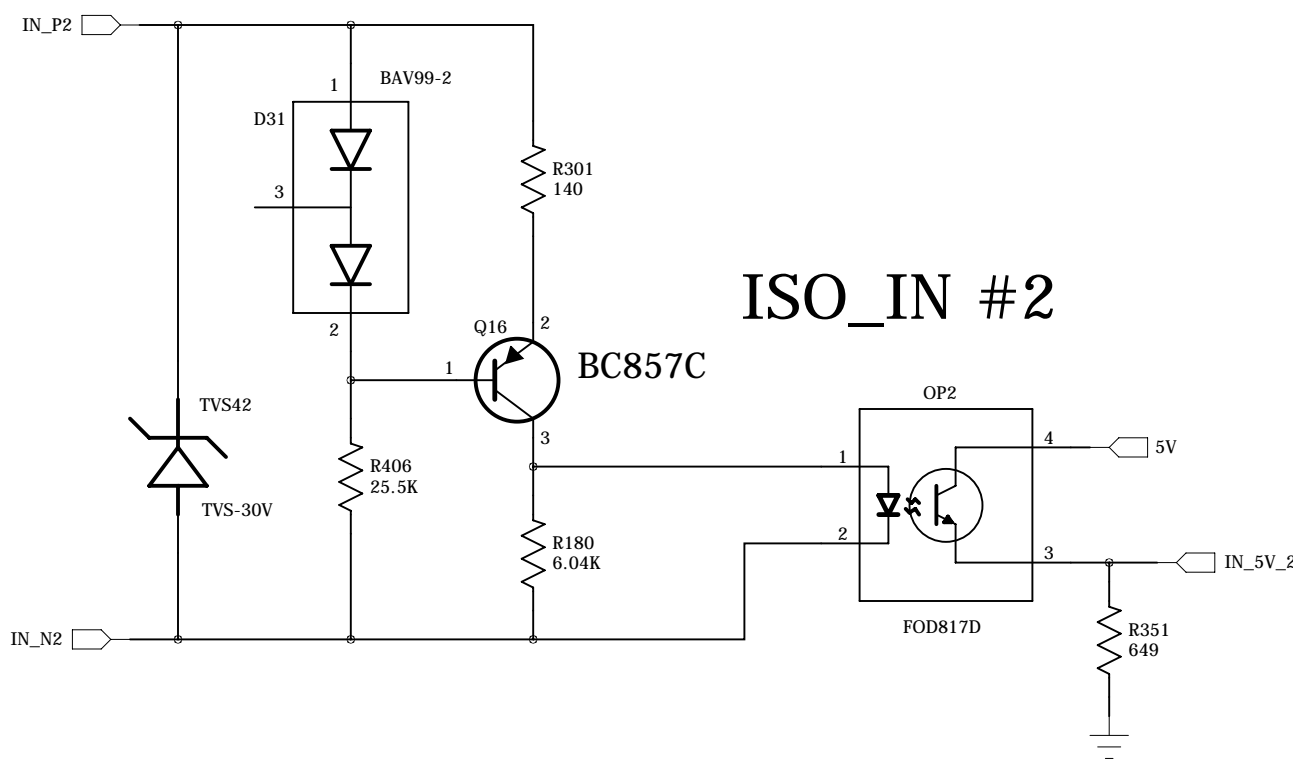
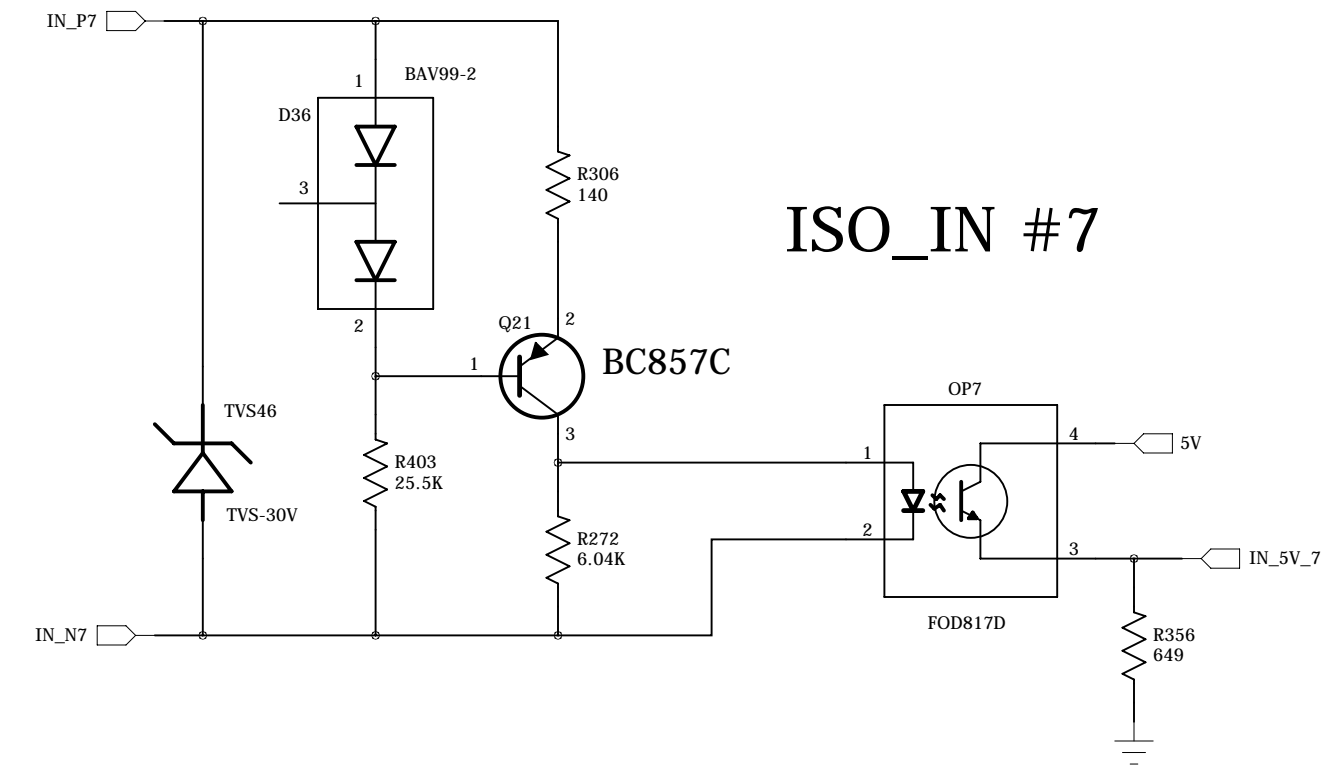
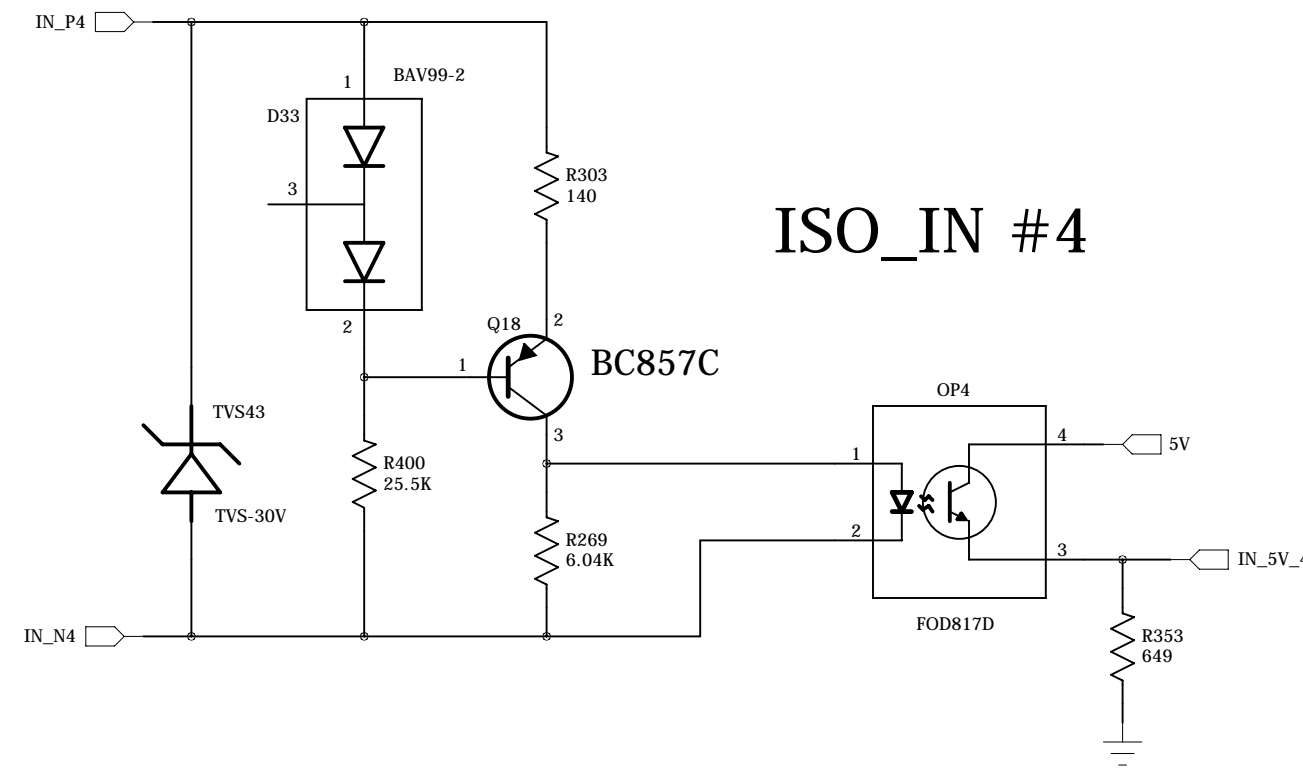
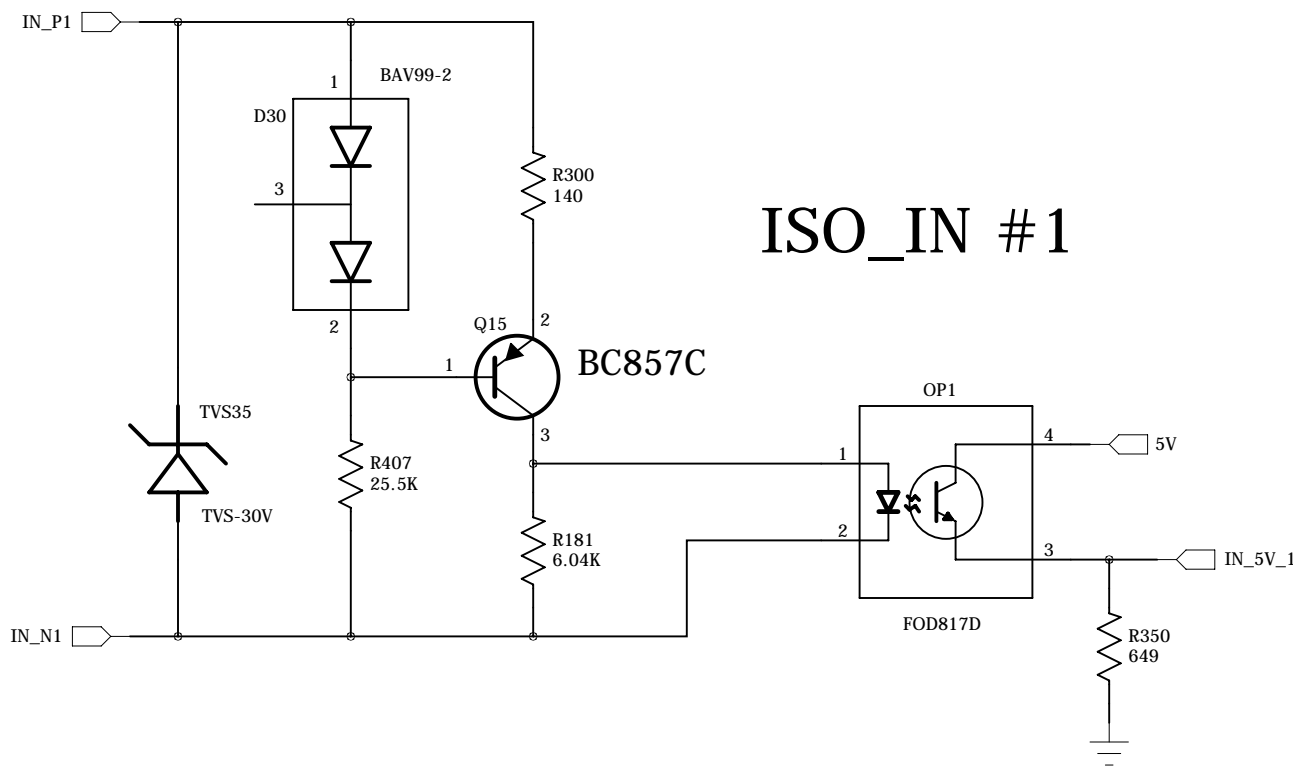
74HCT04 provides level shifting to 5V levels



Isolated Inputs

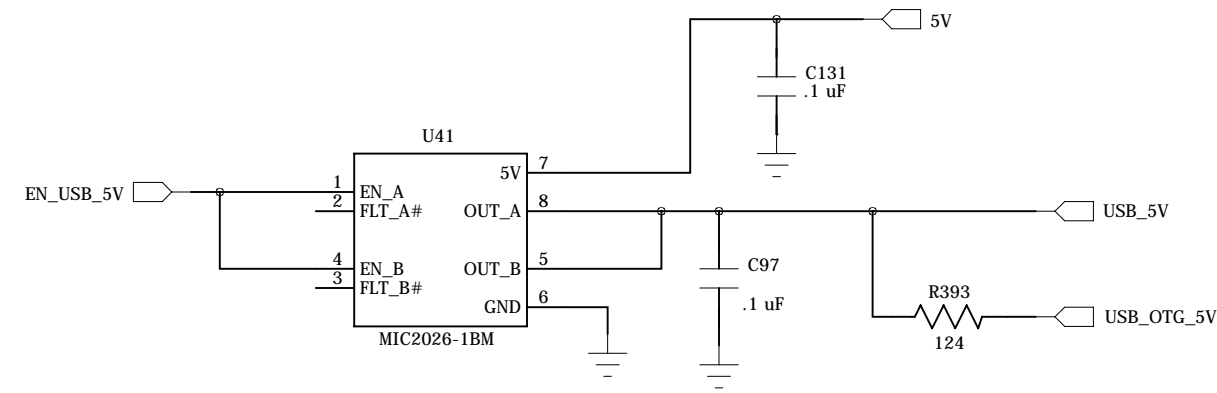
32V tolerant

50 KHz Bandwidth



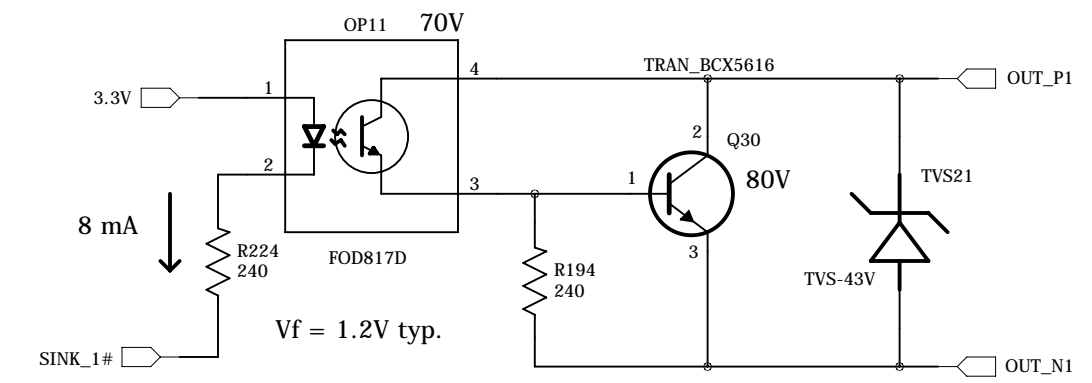
Technologic Systems		Aug. 4, 2013	
Title: TS-8820 Isolated Digital Inputs			
Rev: C	Designer	Sheet 11 of 18	

USB Power Switch

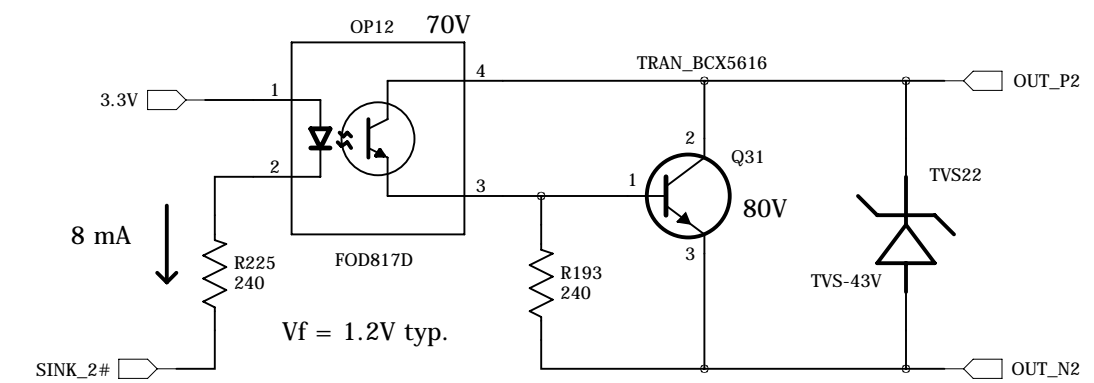


1400 mA typ. current limit

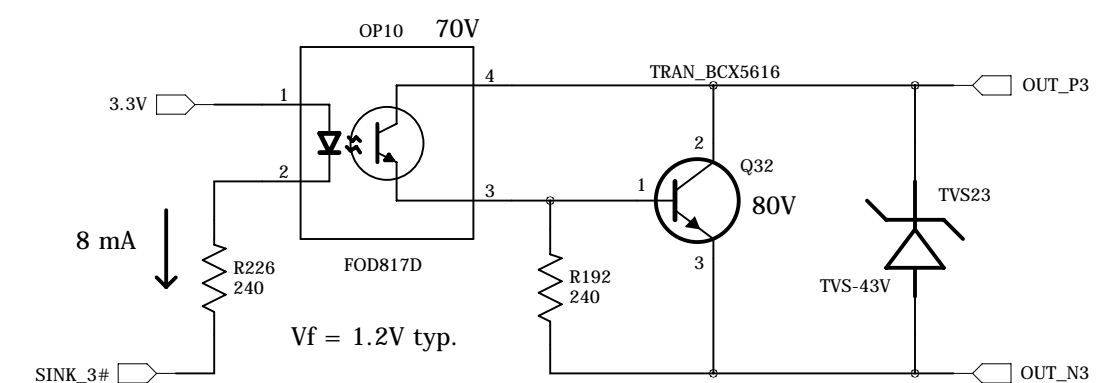
ISO_OUT #1



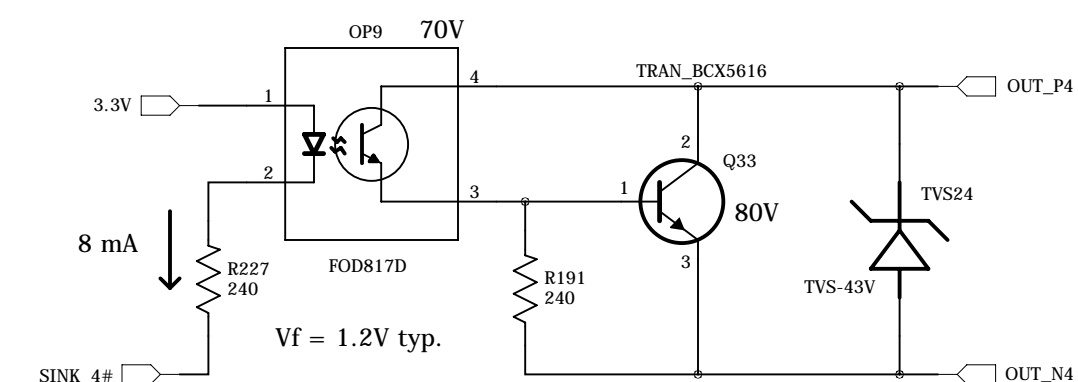
ISO_OUT #2



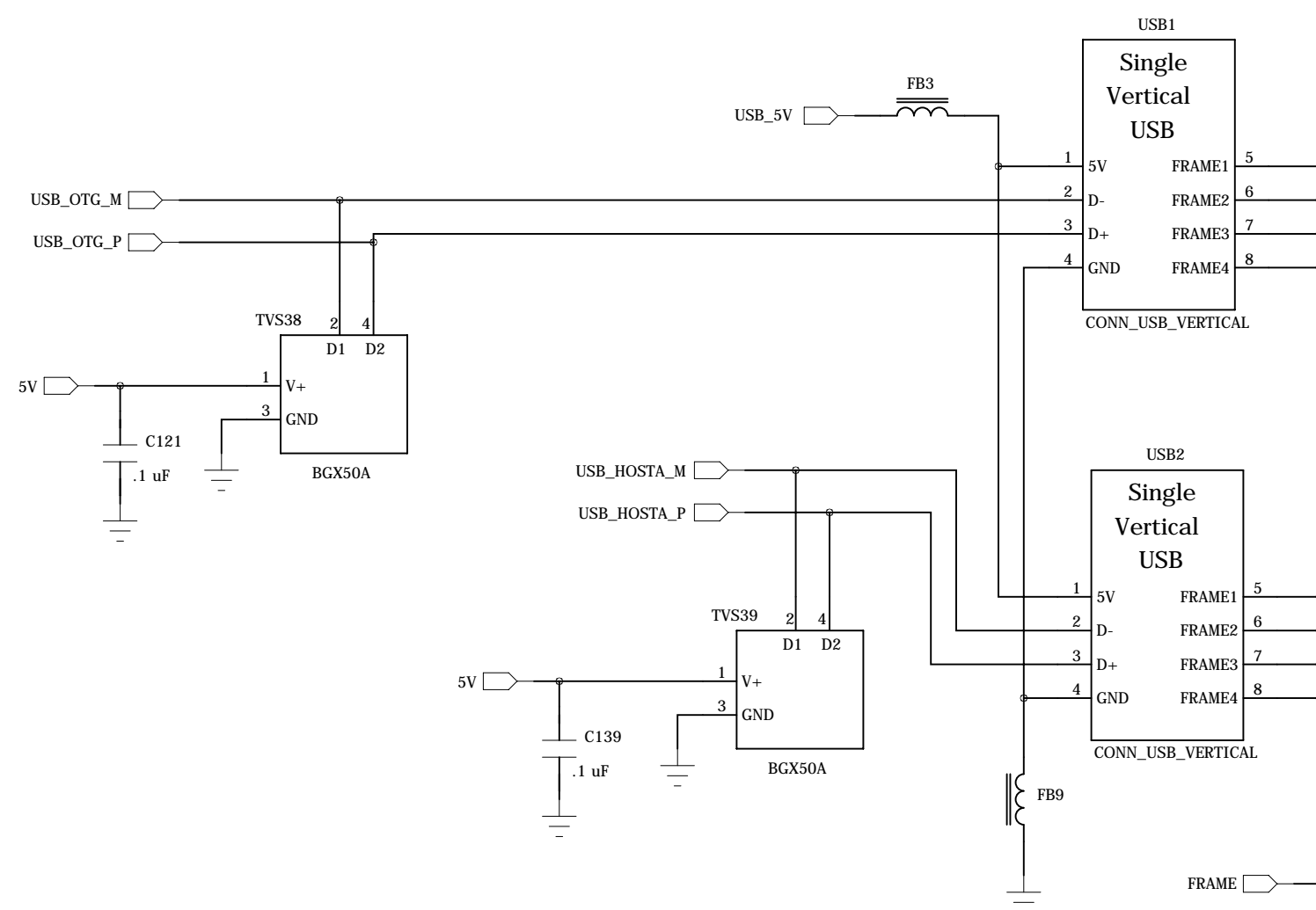
ISO_OUT #3

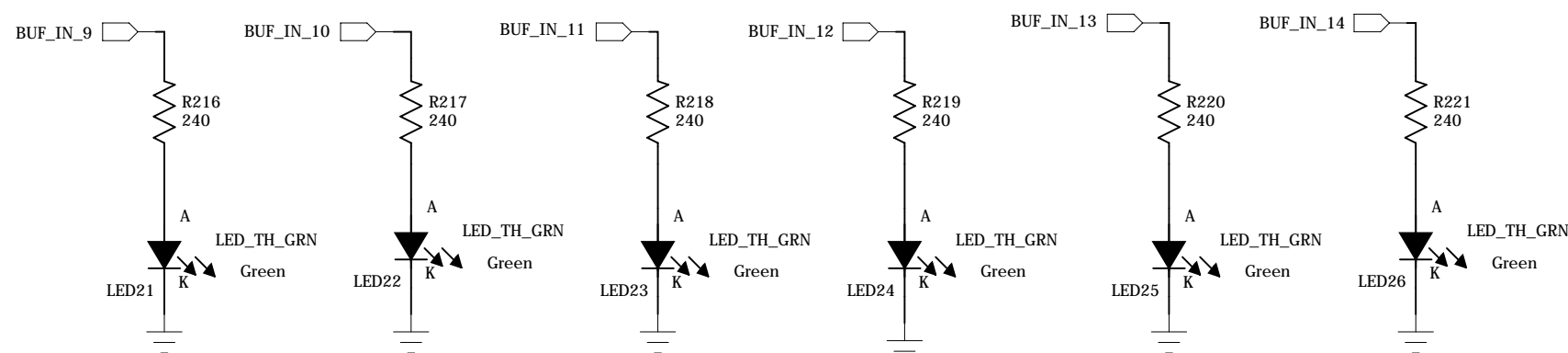
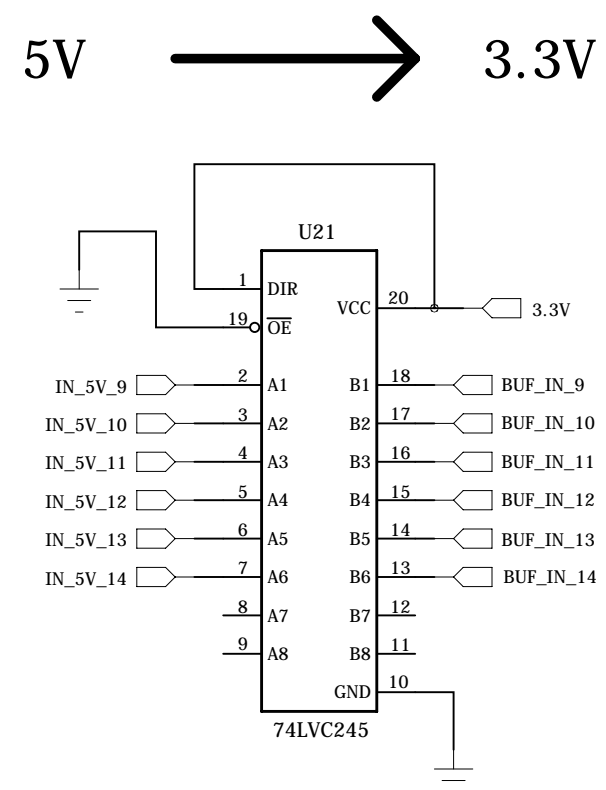
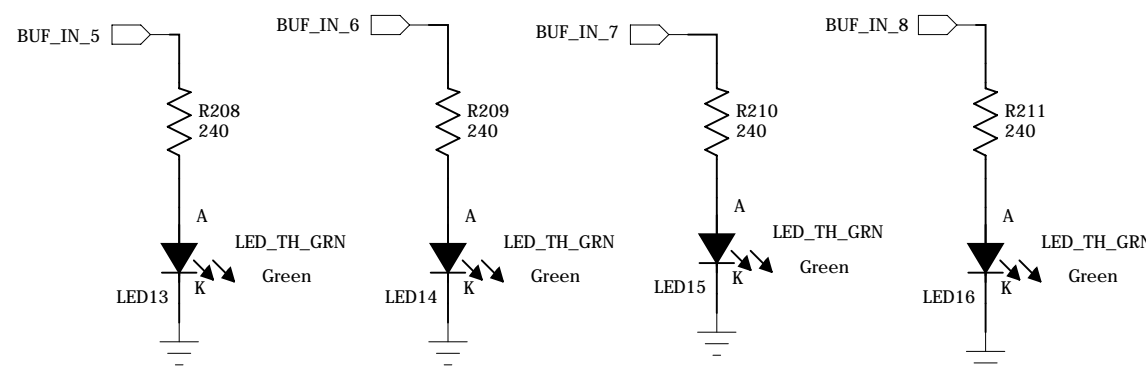
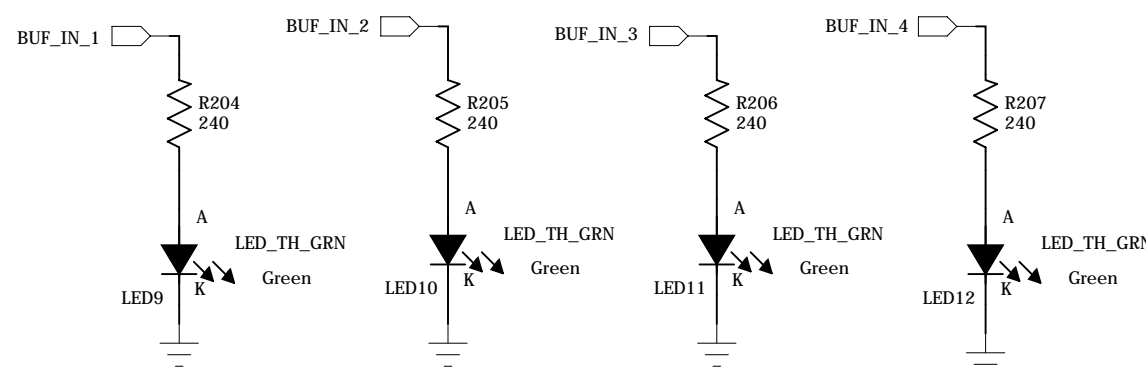
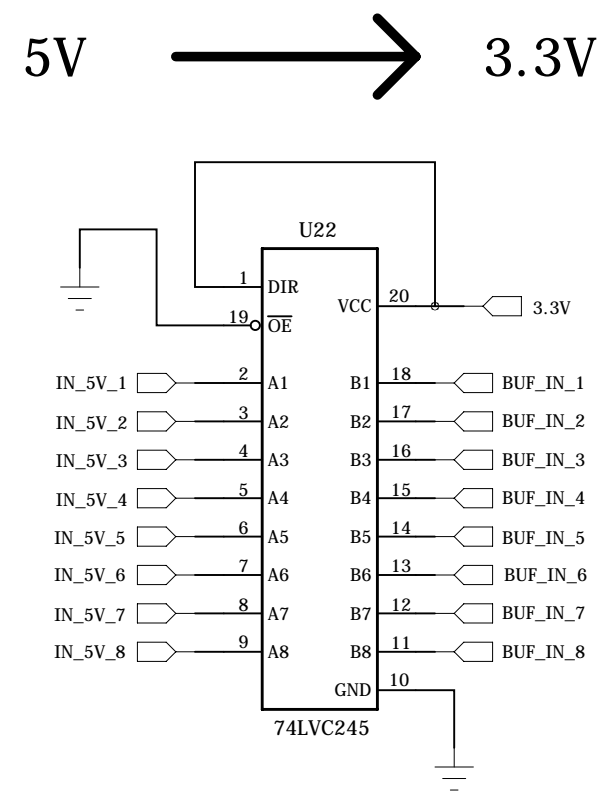
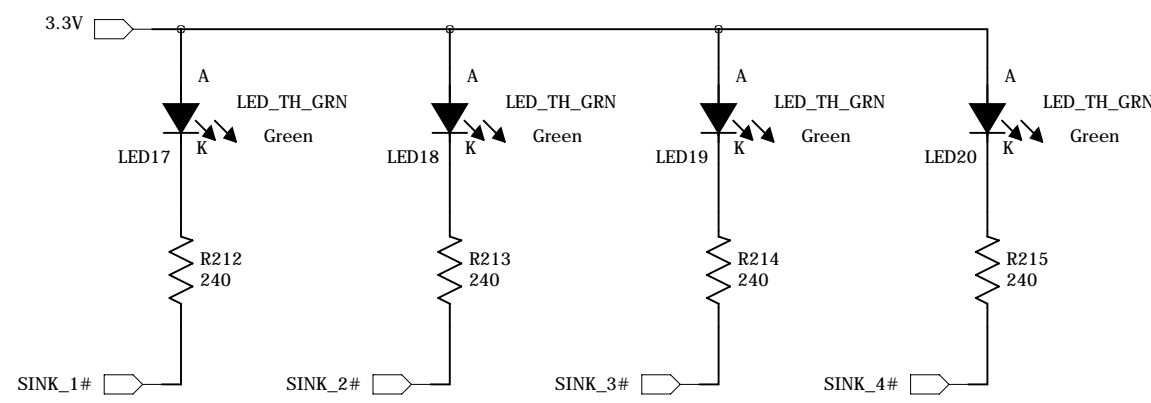
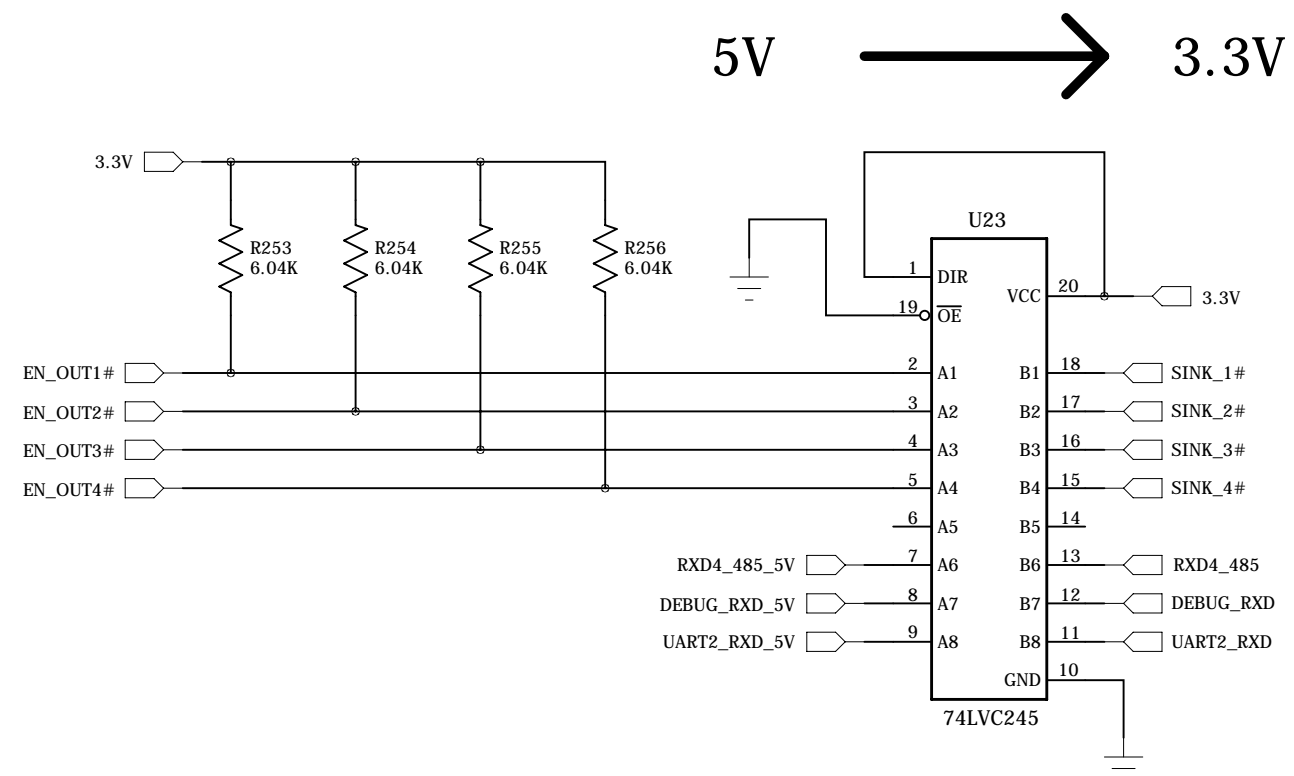


ISO_OUT #4

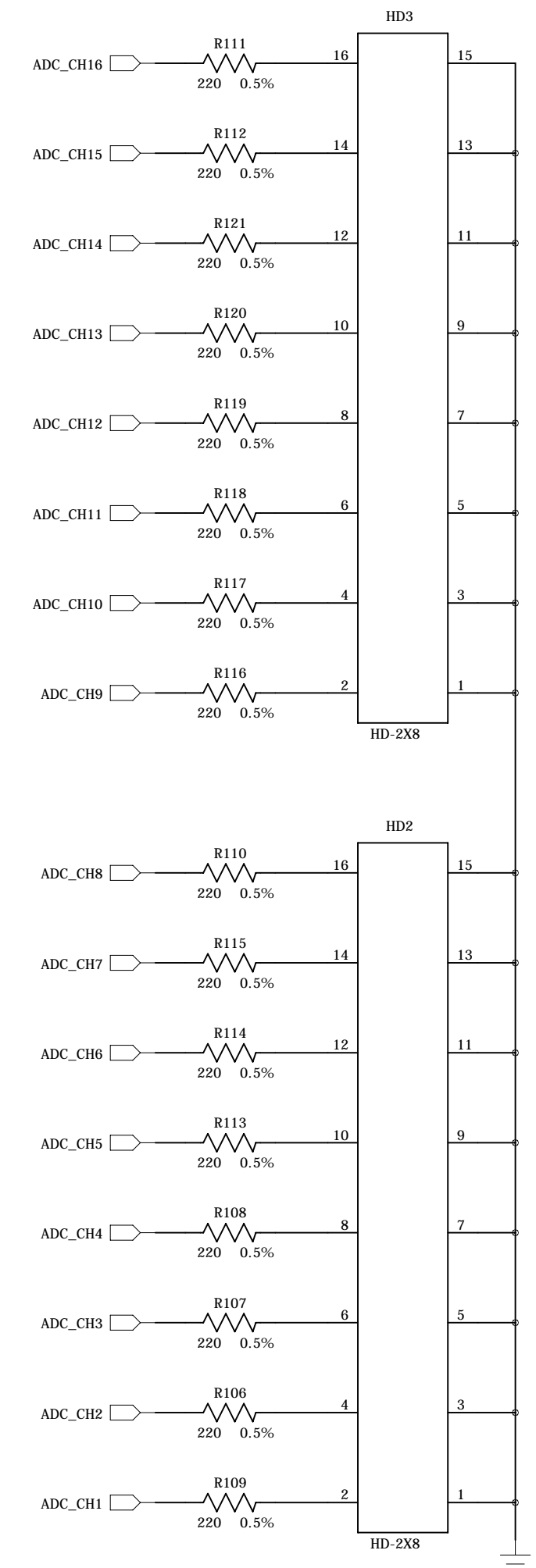


External Two USB ports

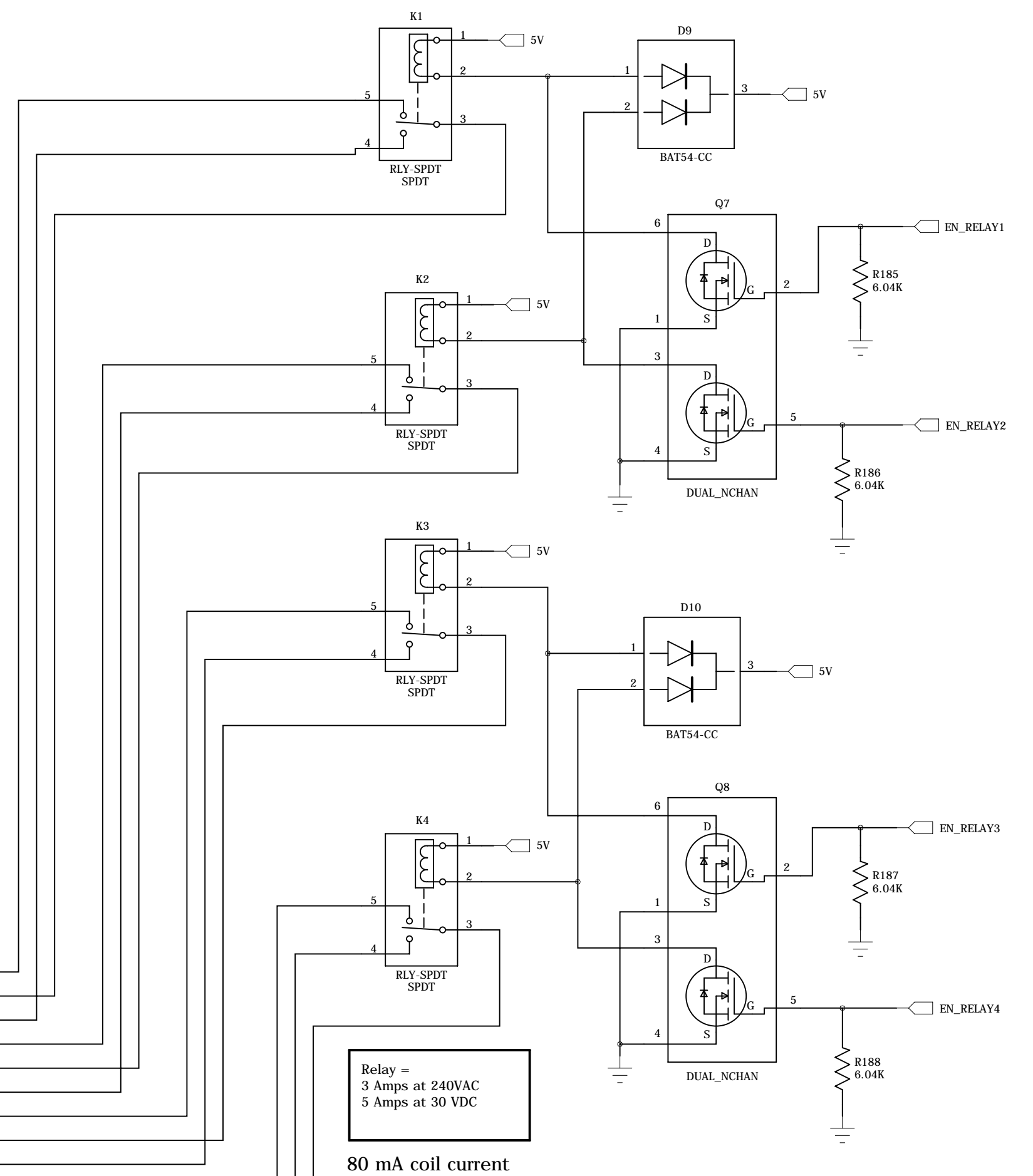
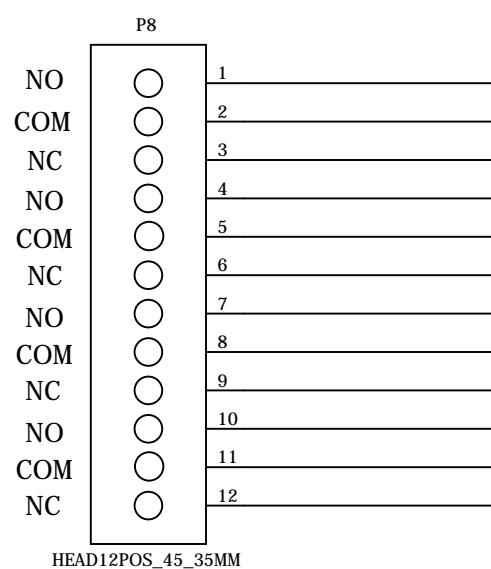
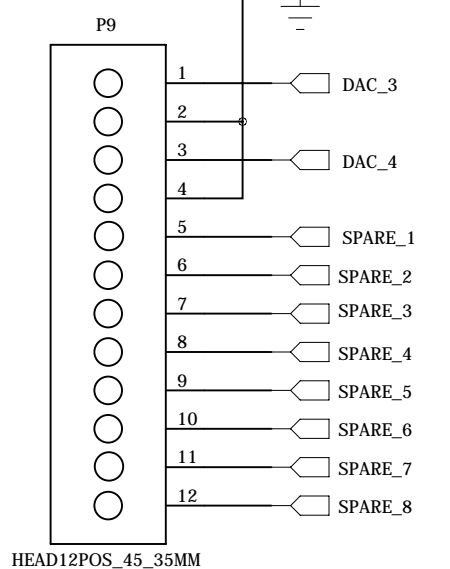
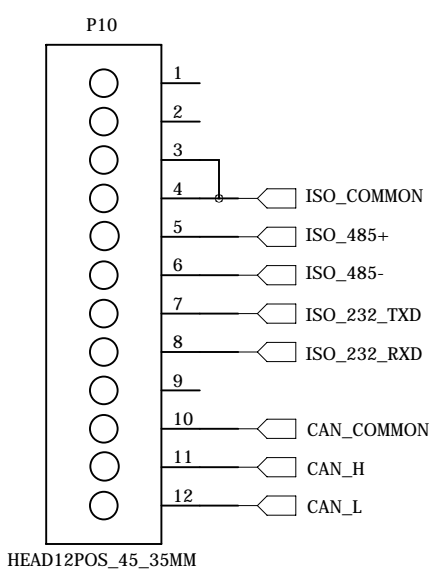
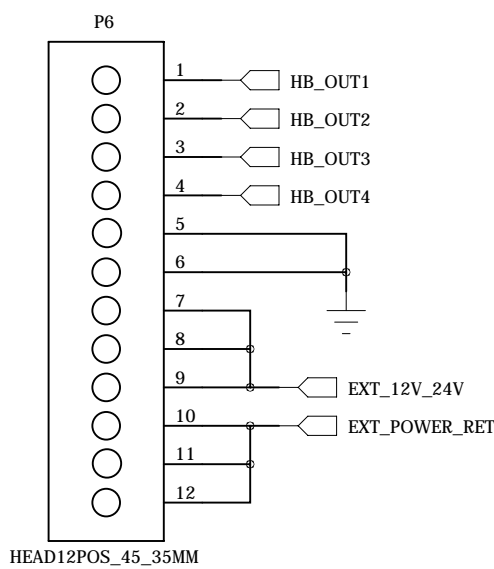
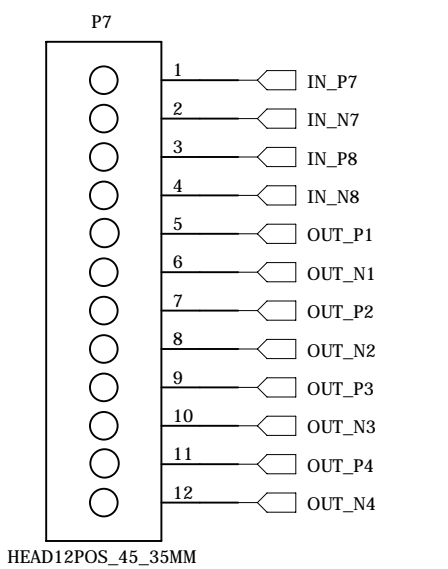
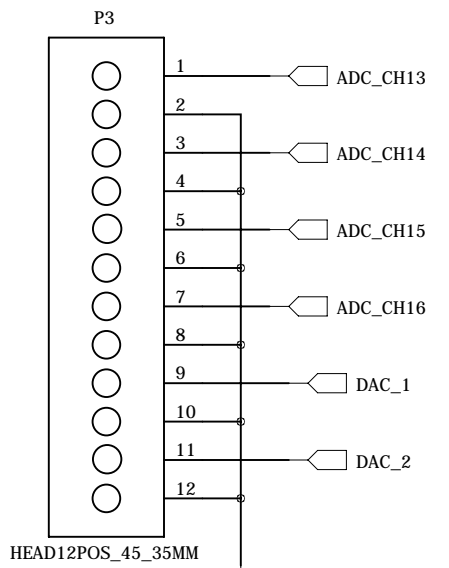
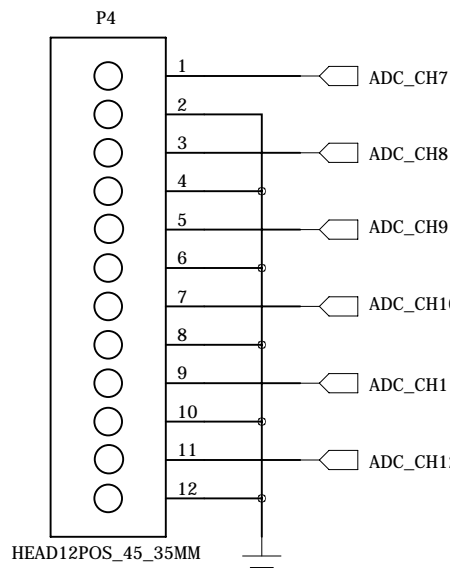
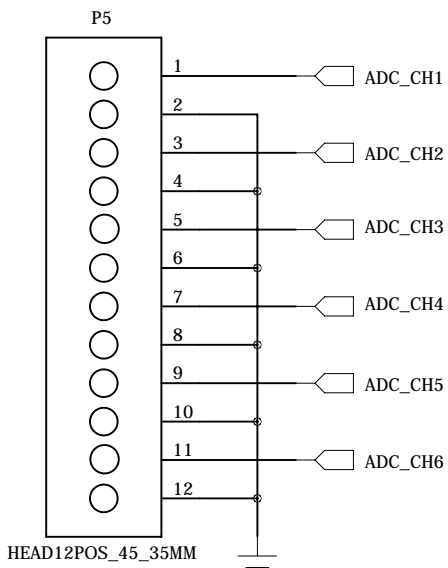
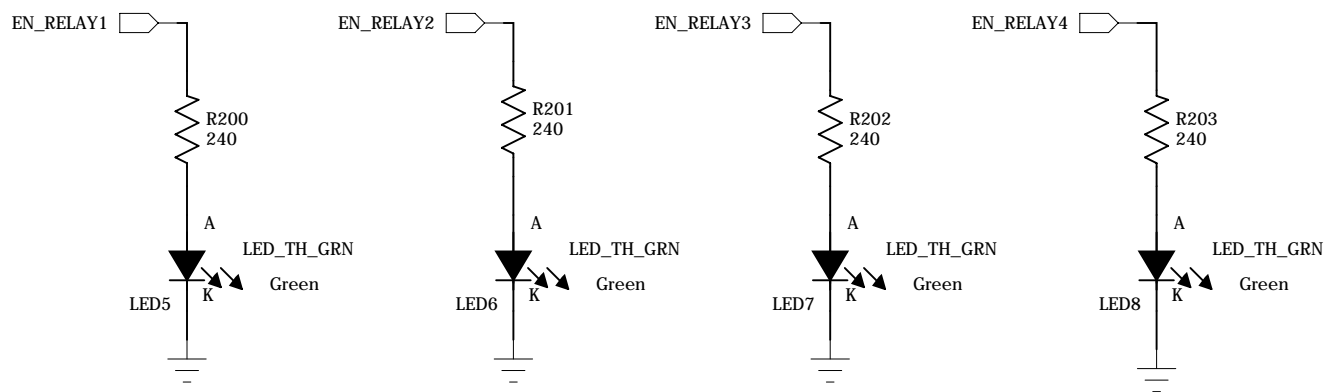
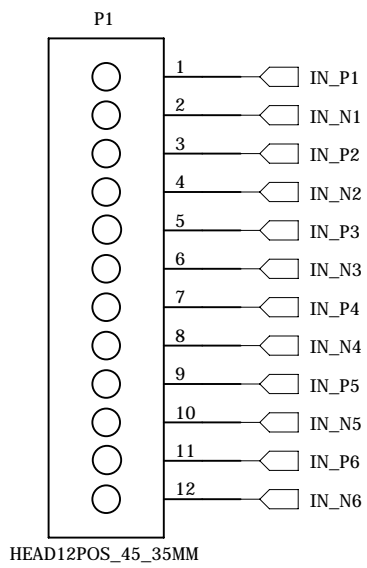
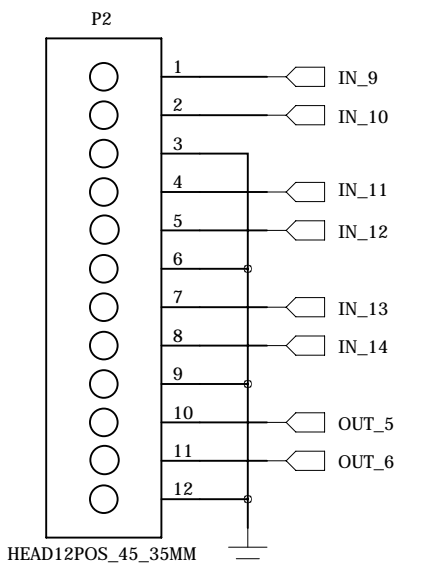




20 mA Current Loop Jumpers

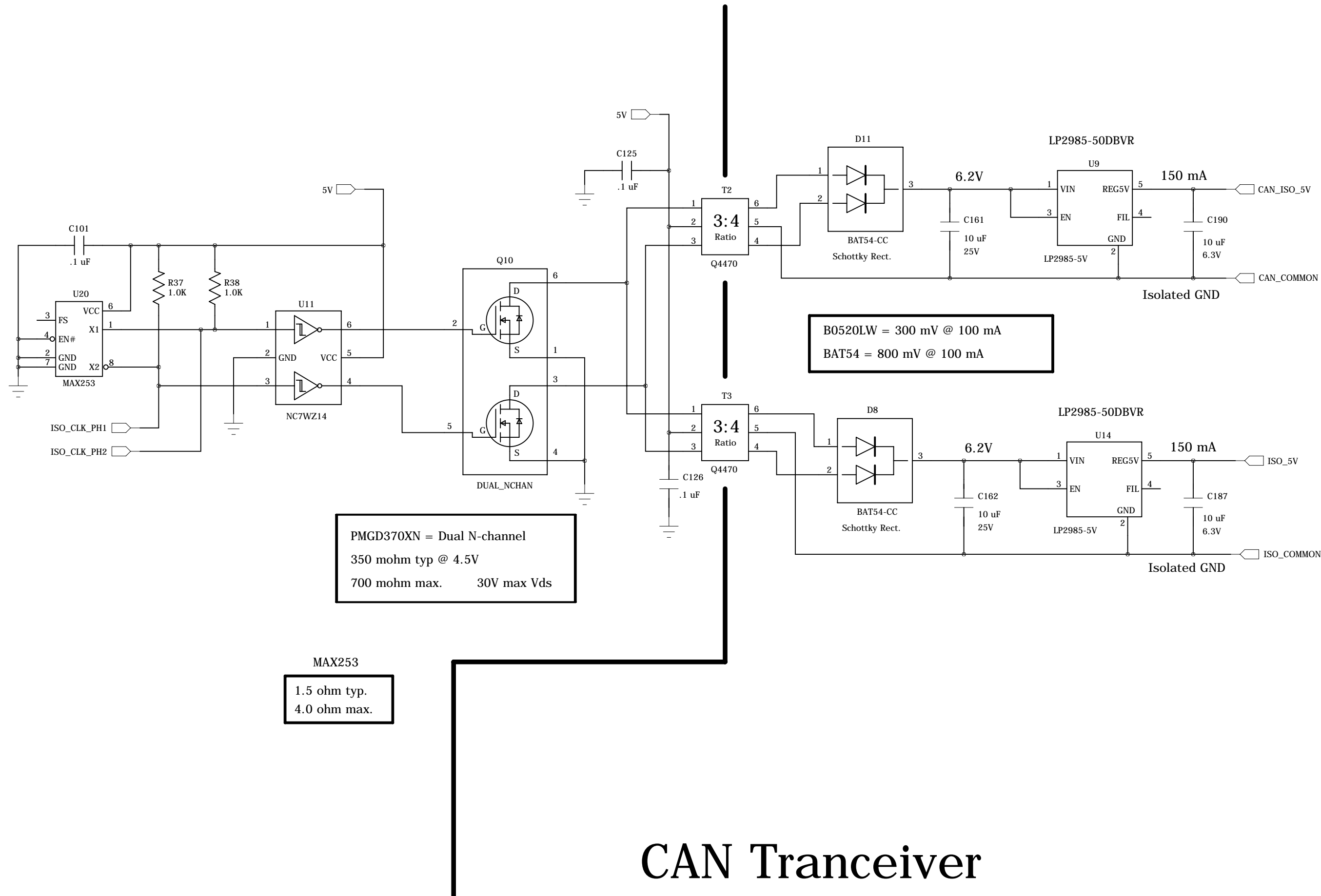


Screw Terminals + 4 Relays

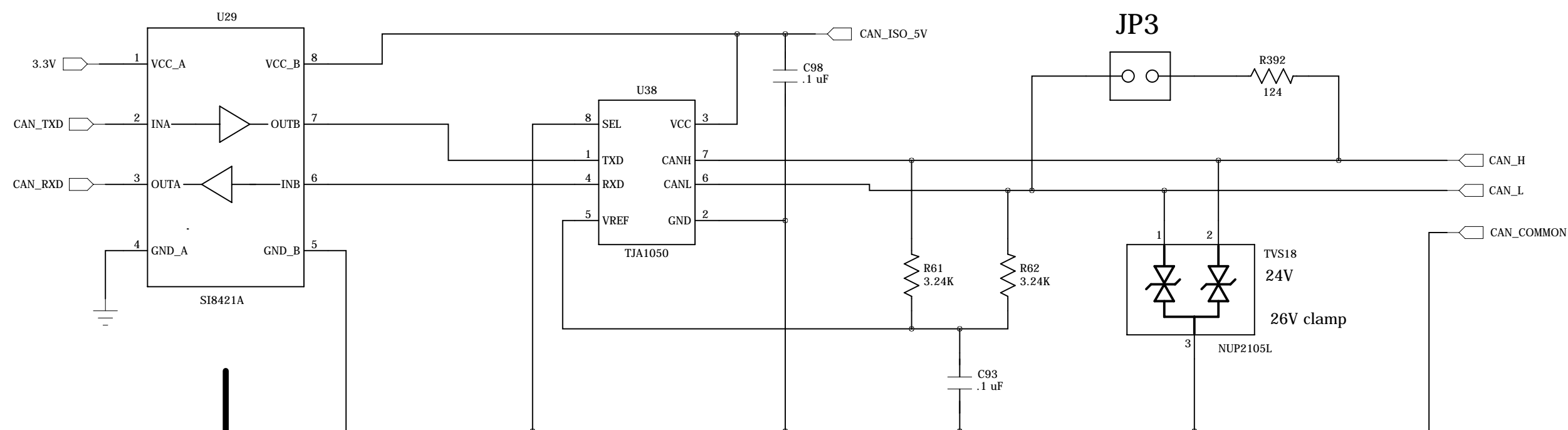


Opto-Isolated Power

and Isolated CAN

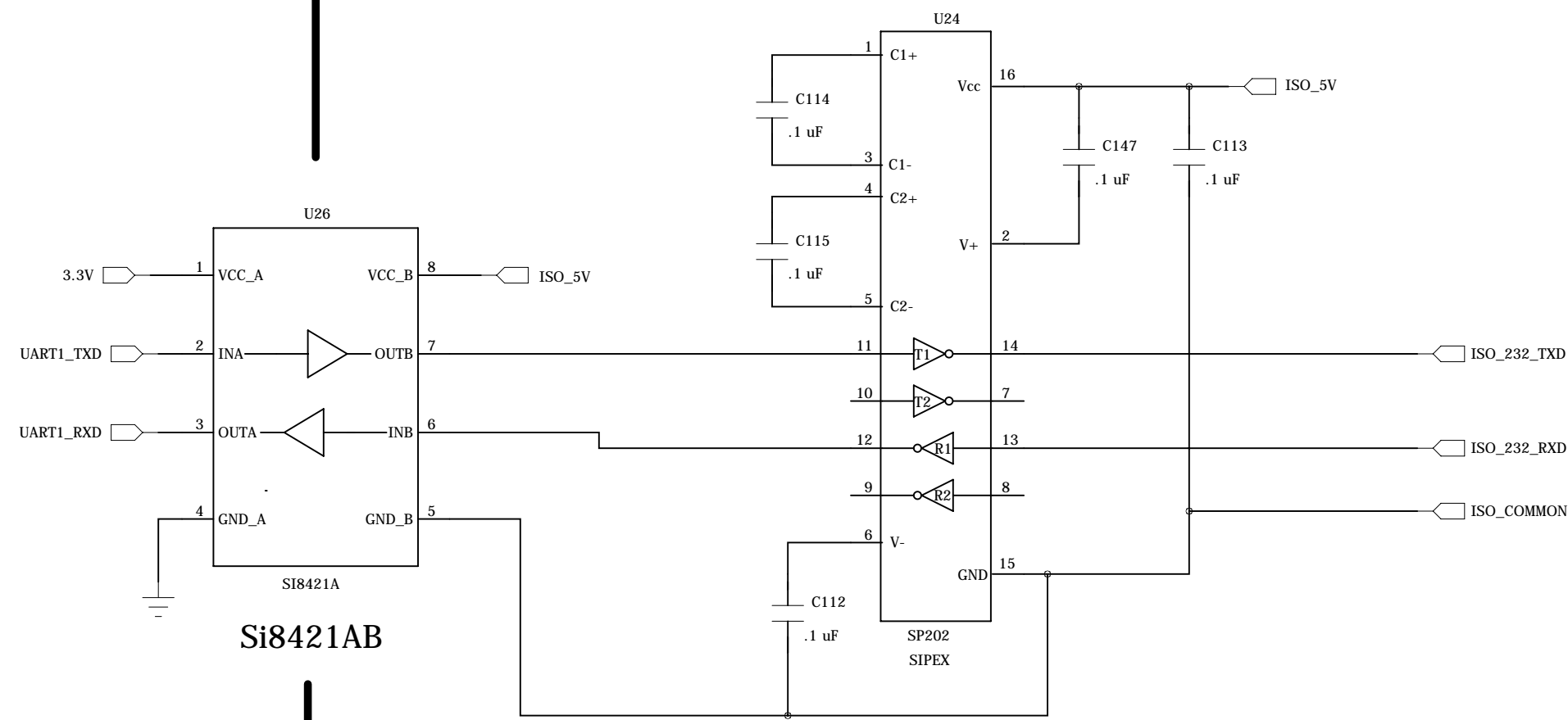


CAN Transceiver

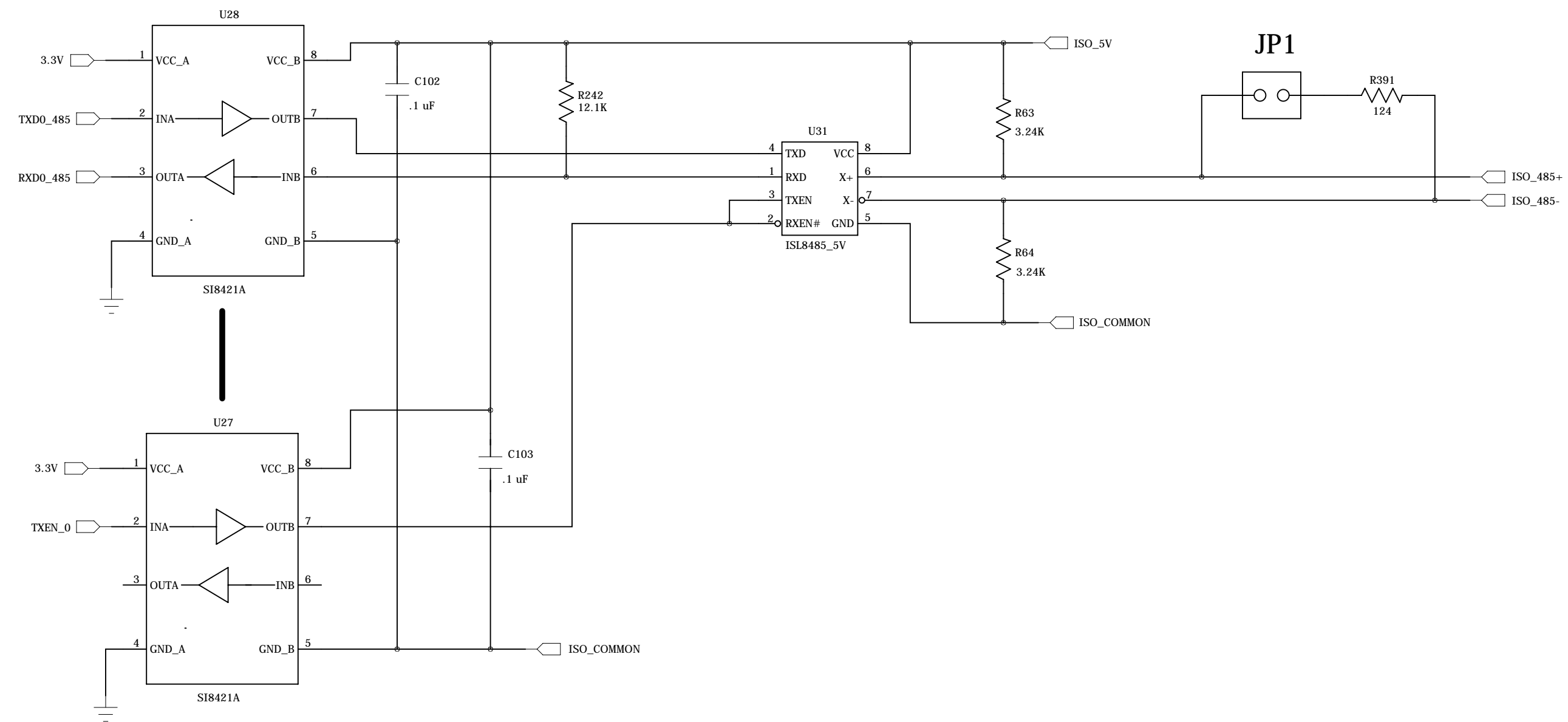


Isolated RS-232 and RS-485

RS-232 Transceiver



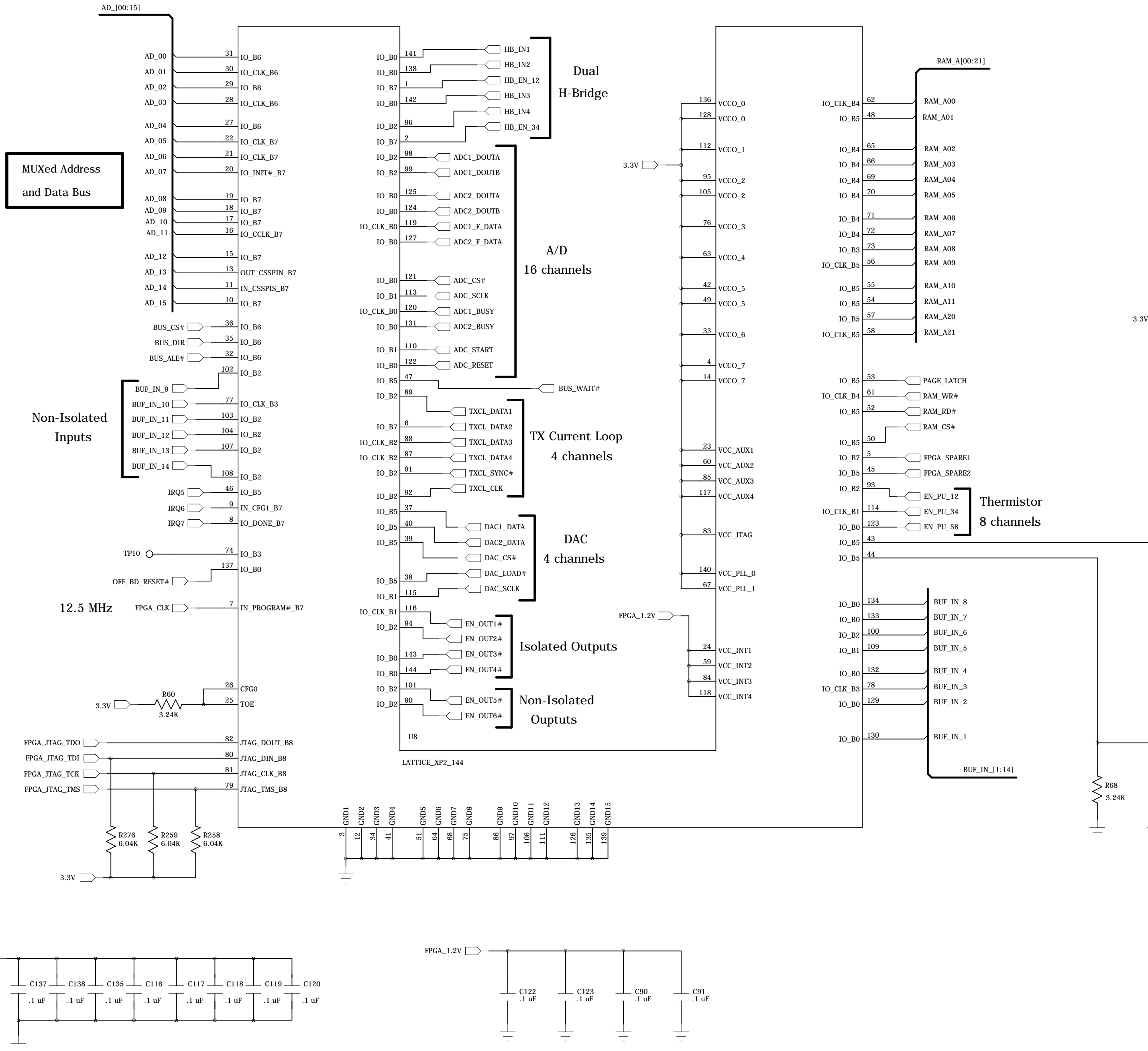
RS-485 Transceiver



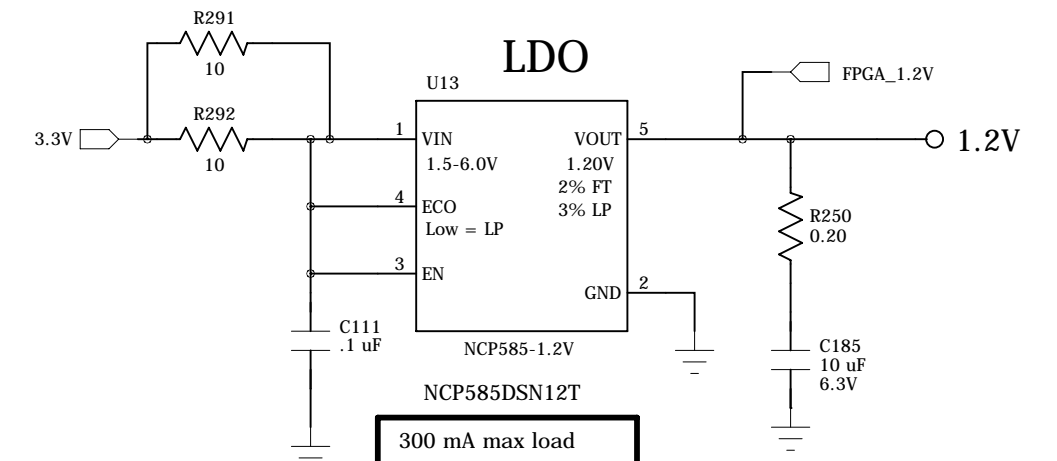
FPGA with 5000 LUTs

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

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

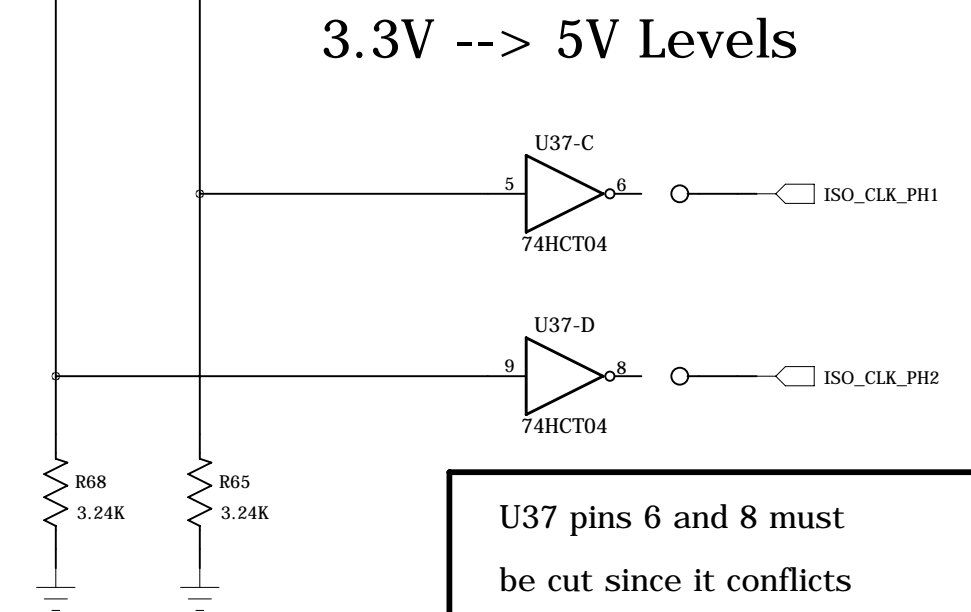


FPGA 1.2V Reg.



300 mA max load
 500 mV drop out
 25 uS Turn-on

3.3V --> 5V Levels



U37 pins 6 and 8 must
 be cut since it conflicts
 with U20

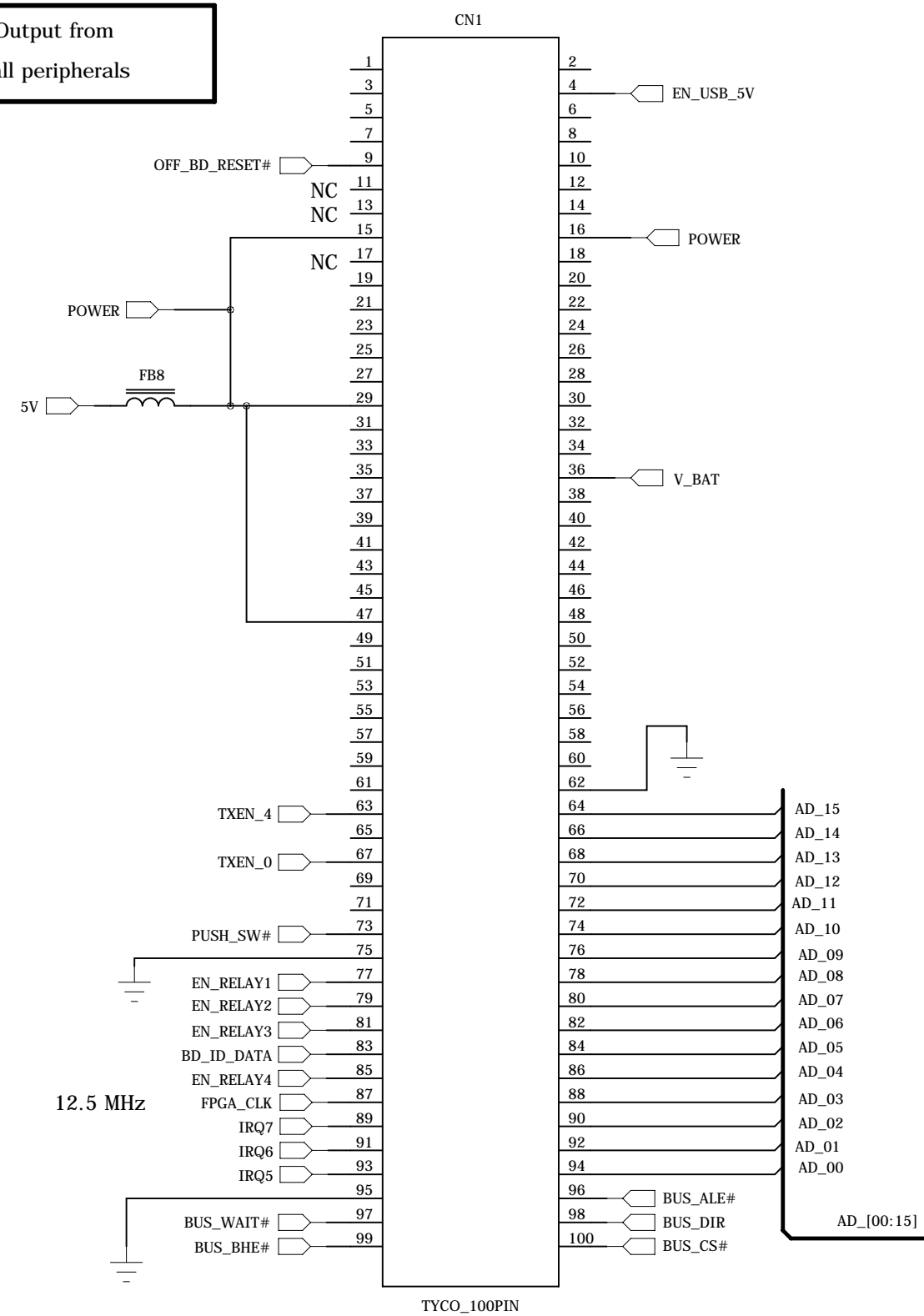
FPGA does not drive Phases

Two 100-pin Module Connectors

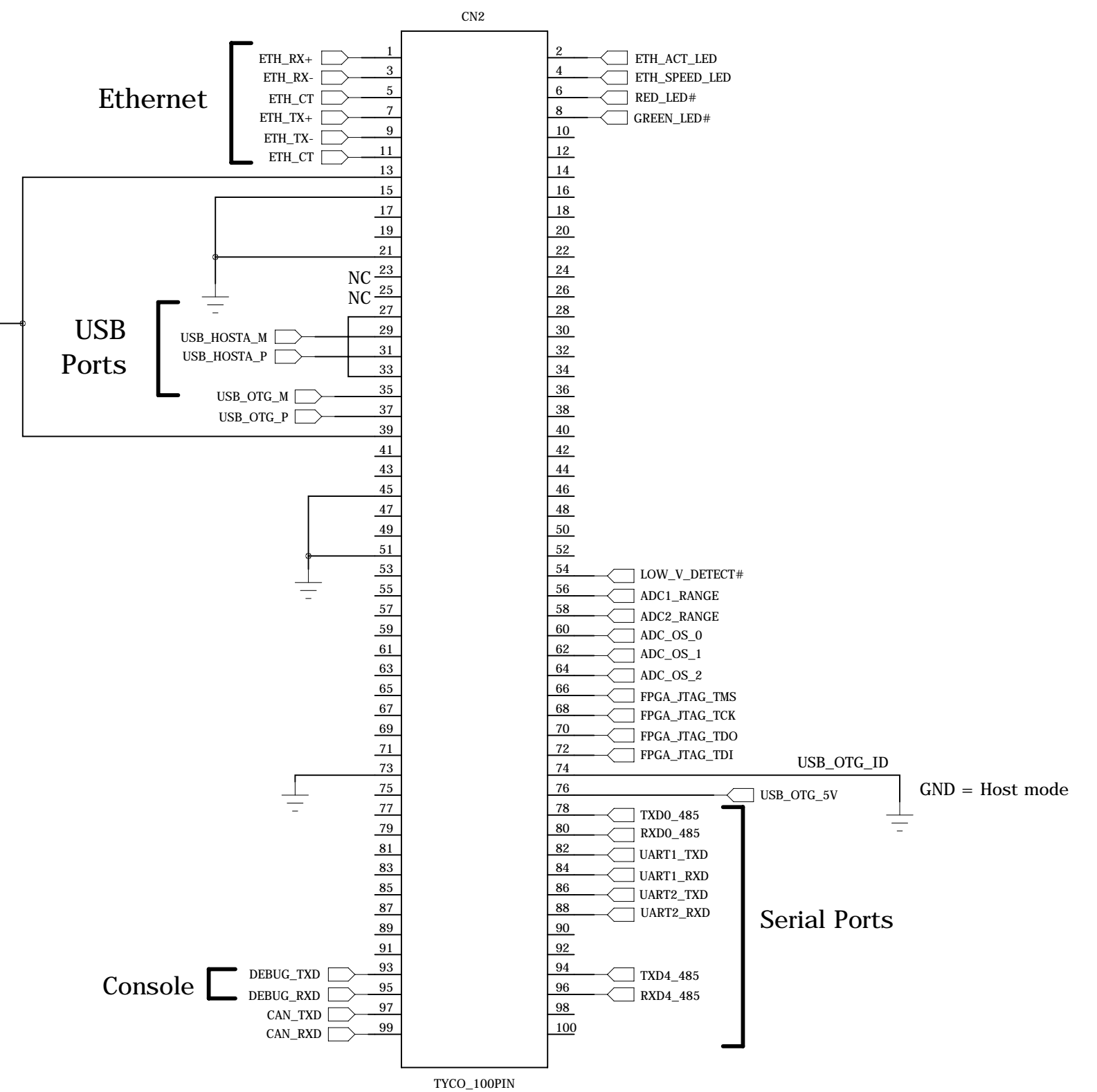
Left

Right

OFF_BD_RESET# is an Output from the SBC used to reset all peripherals



TS-8820 base board requires < 300 mA of 3.3V current



Boot Strap

BUS_DIR	SBC Boots from
1	NAND Flash
0	SD Card

BUS_DIR state is latched prior to OFF_BD_RESET# deasserted

BUS_DIR has a 12K pull-up resistor on the SBC module

Use 1.2K ohm resistor to OFF_BD_RESET# to strap logic low