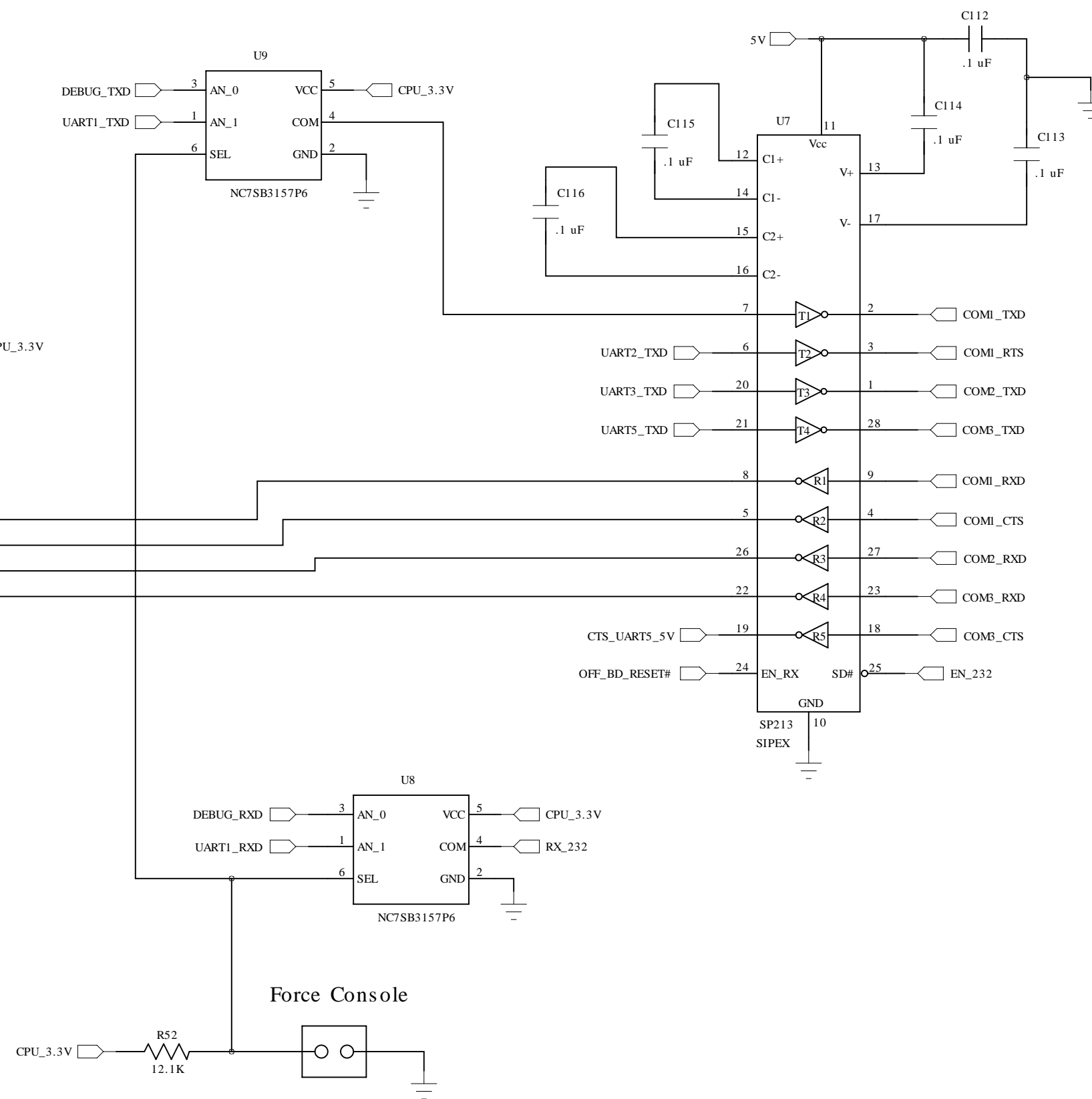
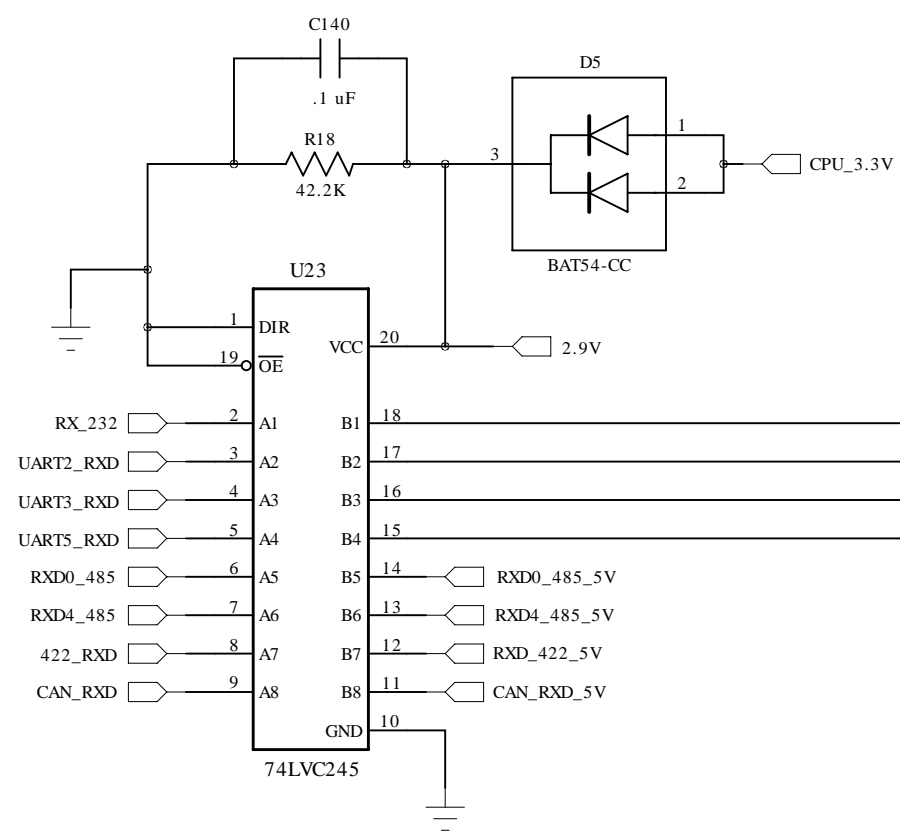
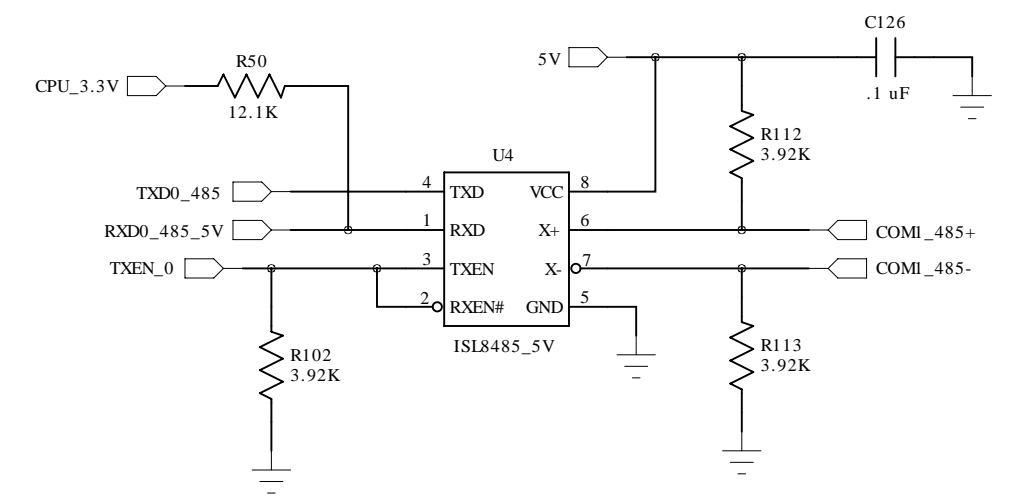


RS-232 Transceiver

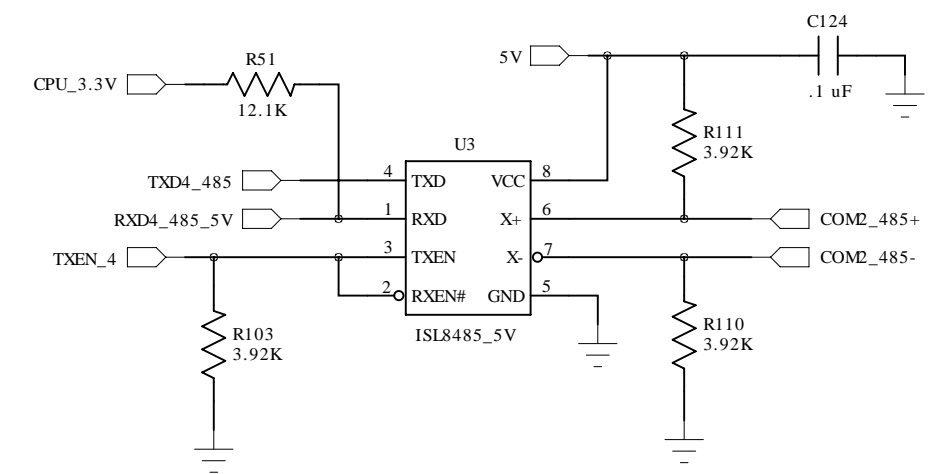
2.9V <-- 5V
Level shifter



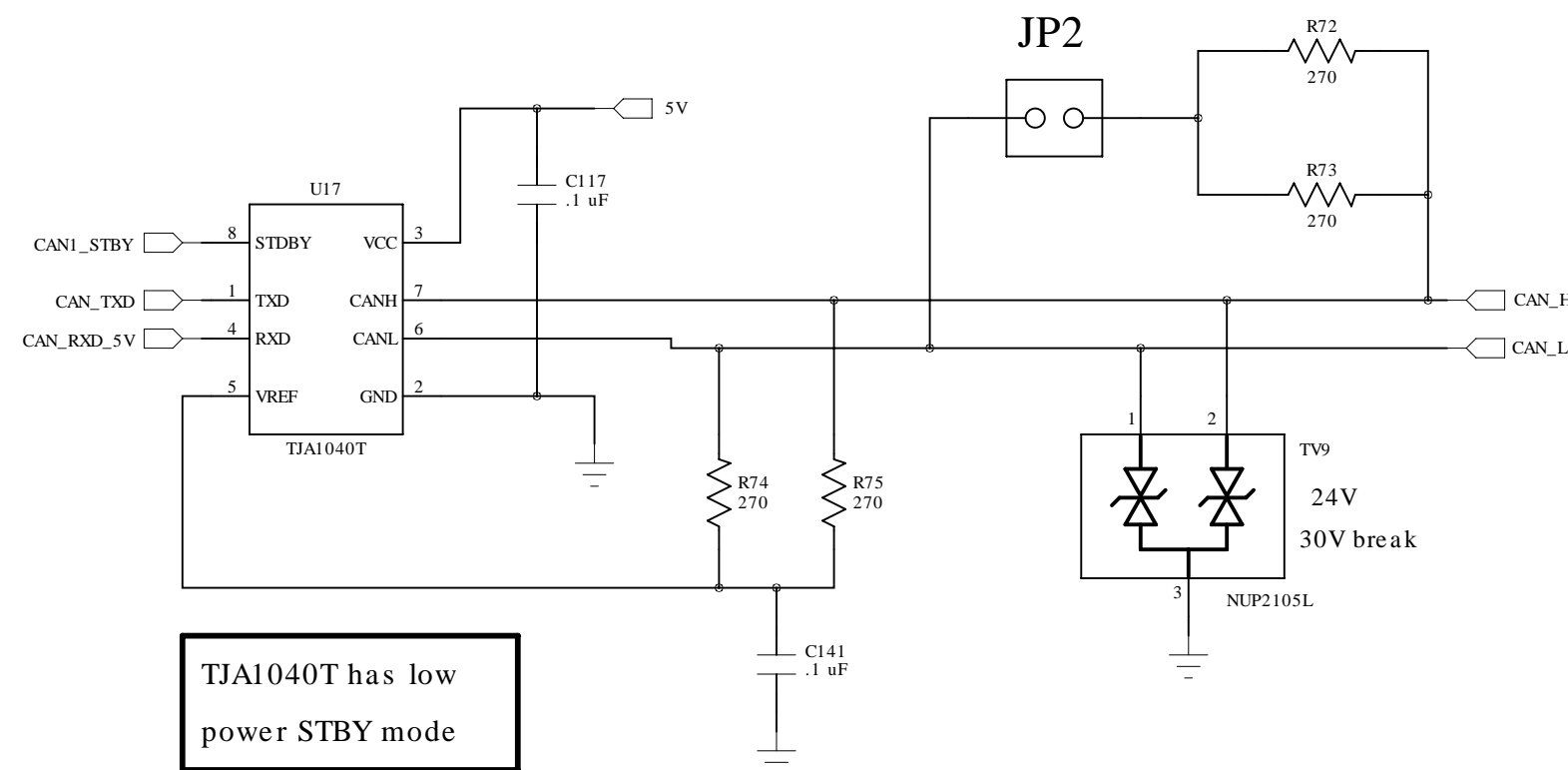
COM1 RS-485 Driver



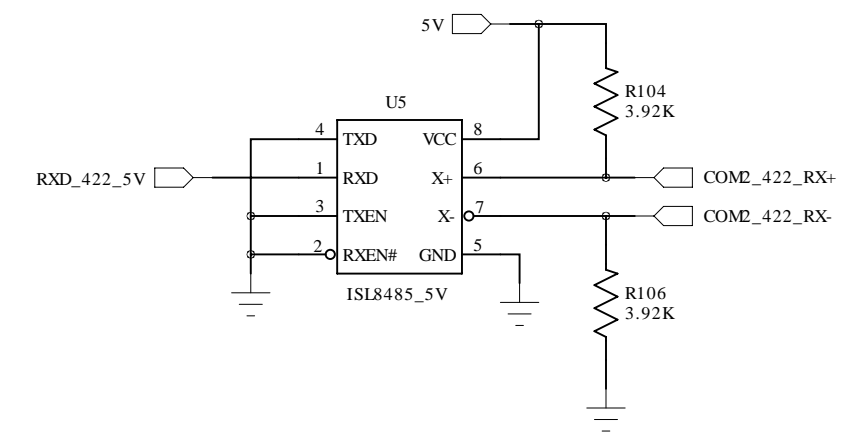
COM2 RS-485 Driver



CAN1 Transceiver

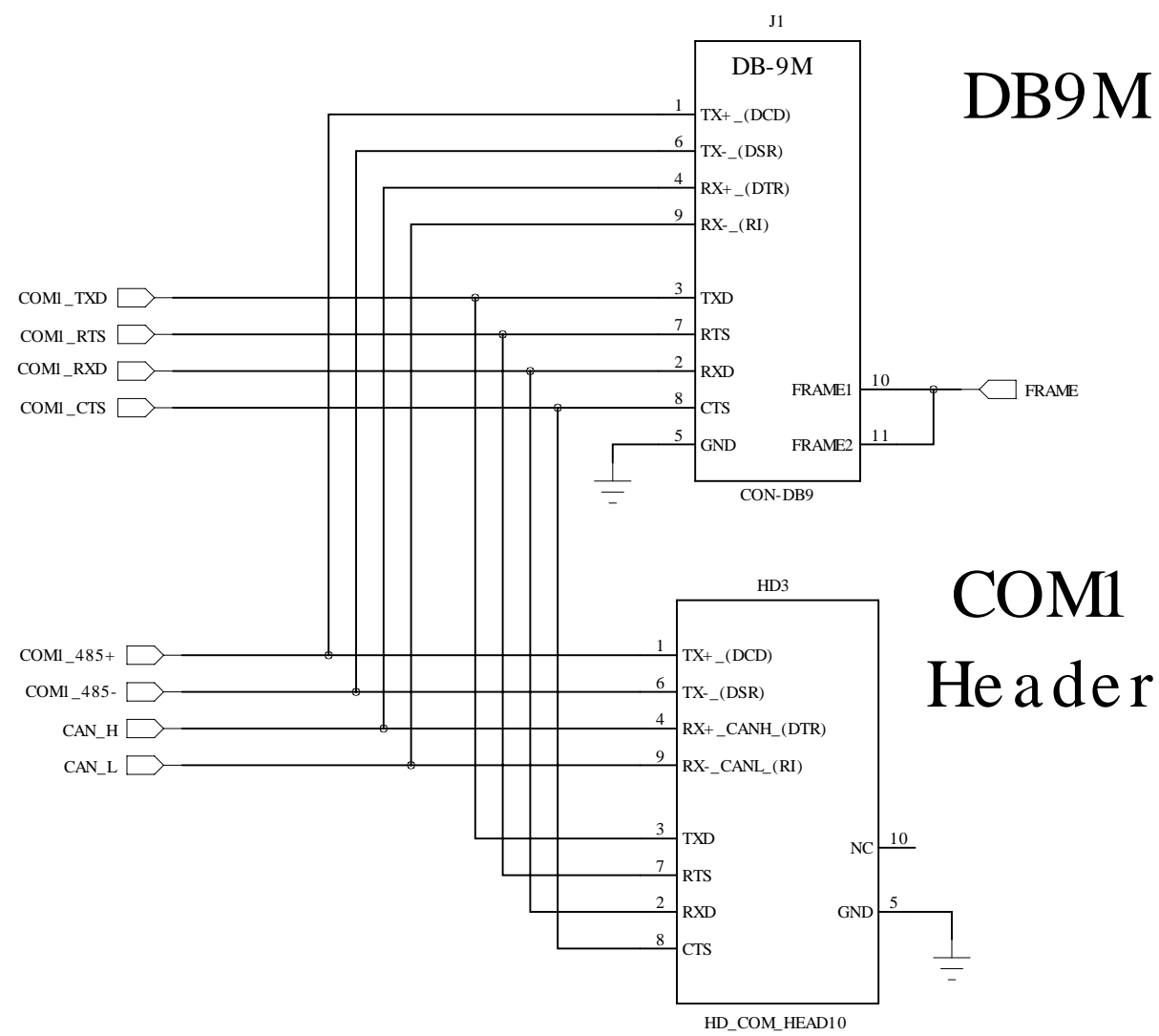


COM2 RS-422 Receiver

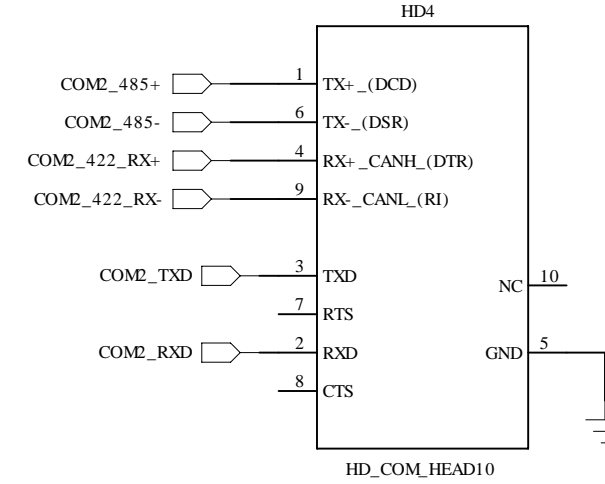


COM Connectors and Headers

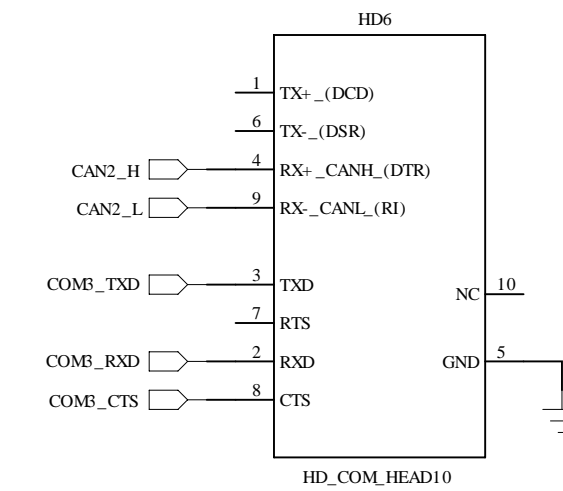
COM1



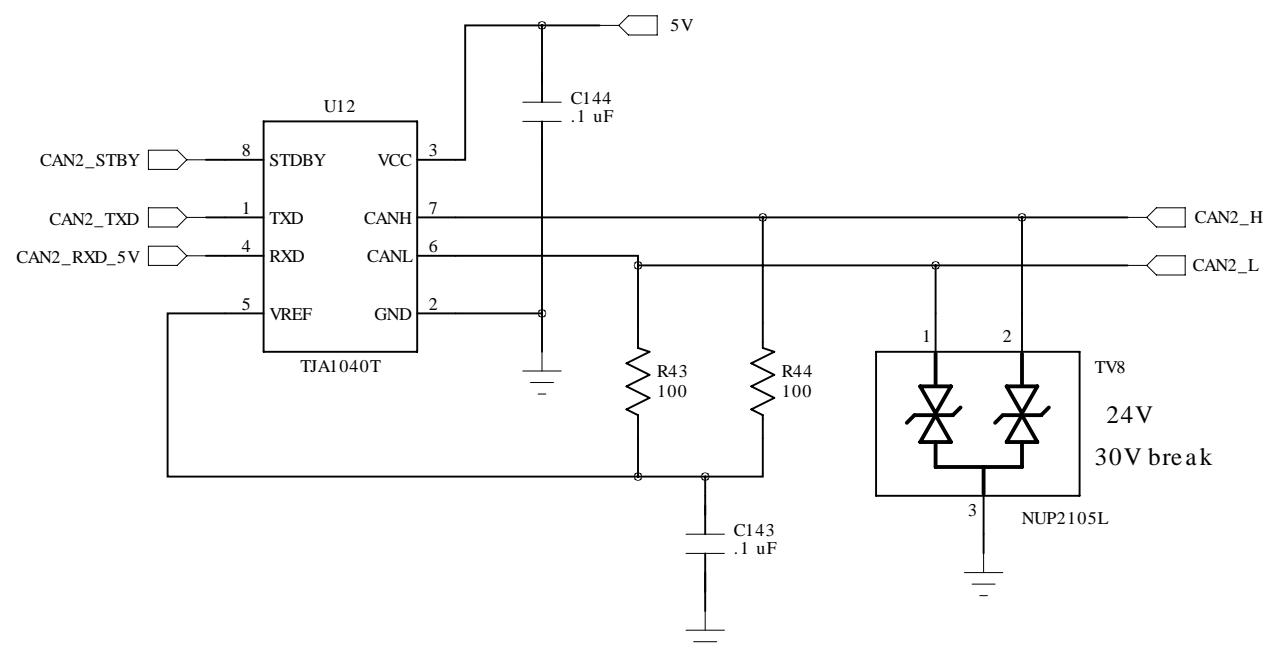
COM2 Header



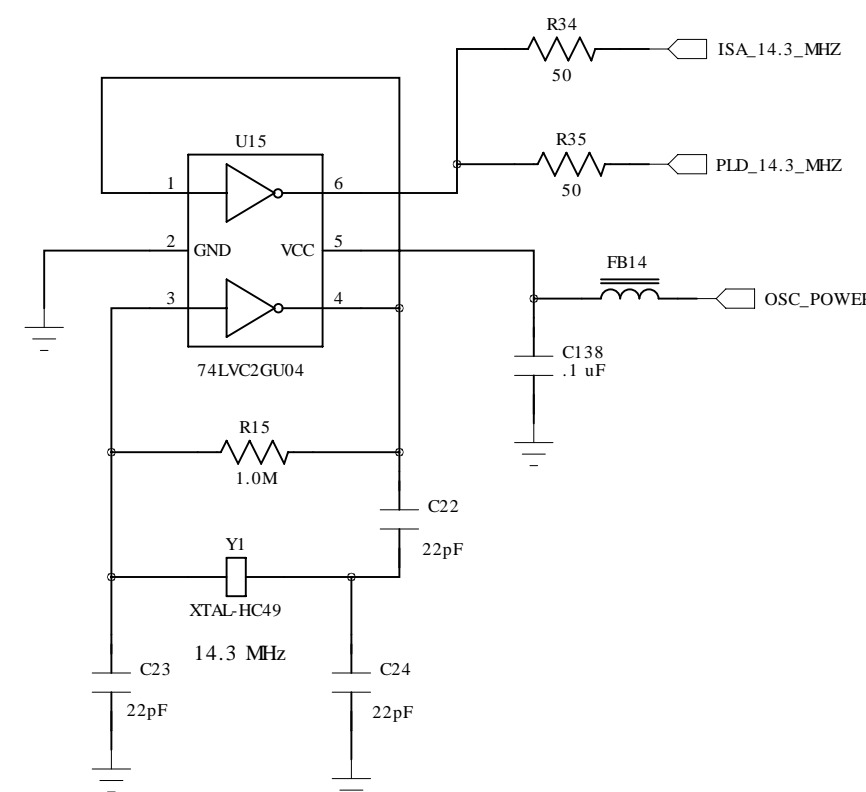
COM3 Header



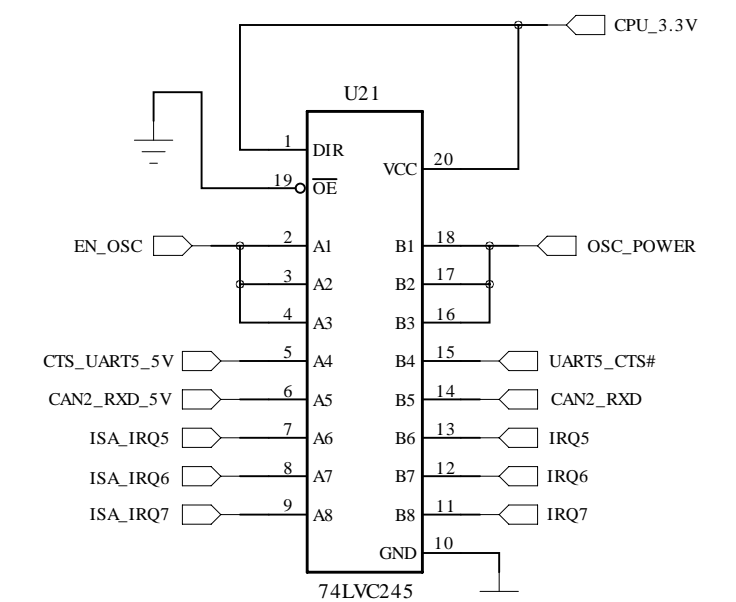
CAN Transceiver



14.3 MHz Osc.



5V --> 3.3V

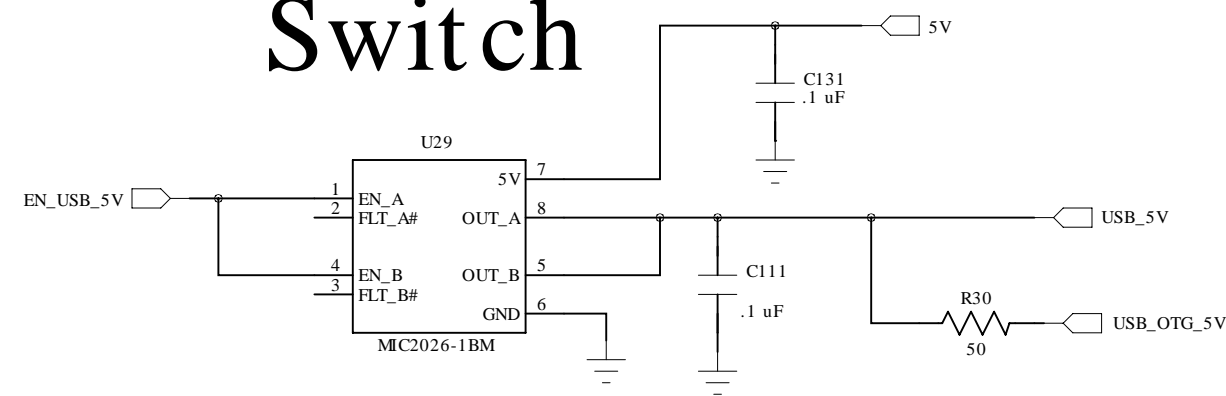


Provides 5V Tolerance

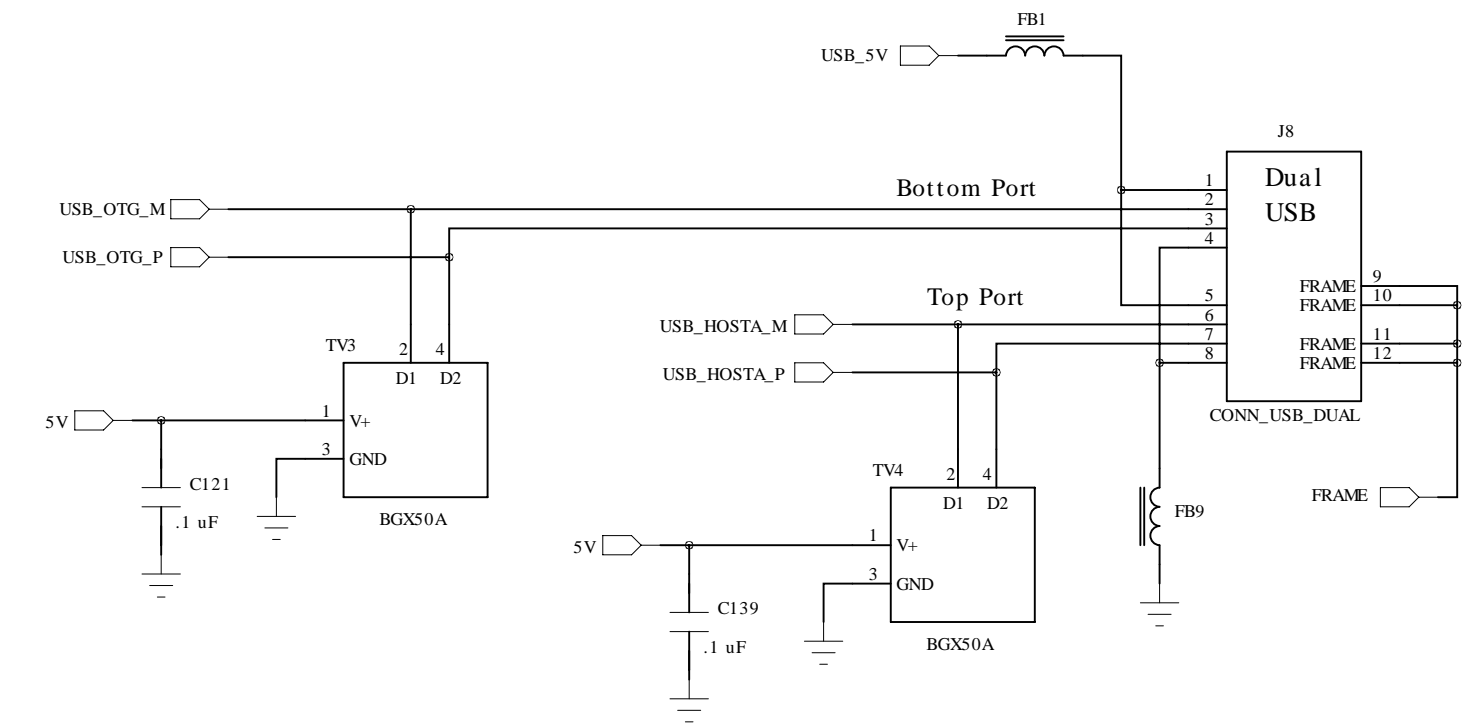
Technologic Systems	Nov. 3, 2010
Title: TS-8160 DB9, COM Headers	
Rev:	Designer
Sheet 2 of 10	

External Dual USB

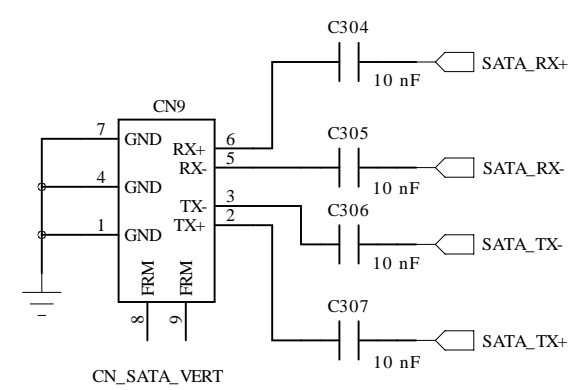
USB Power Switch



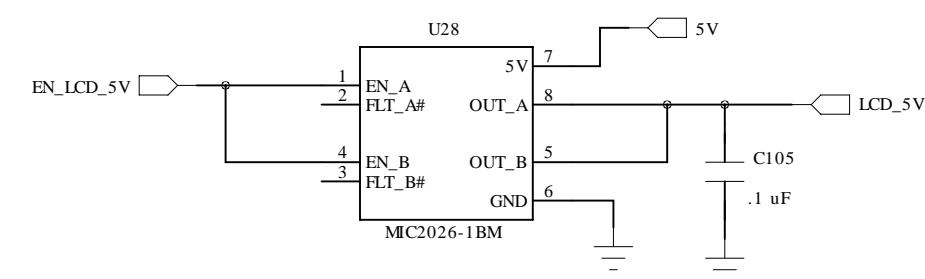
1400 mA typ. current limit



SATA Port



LCD Power Switch

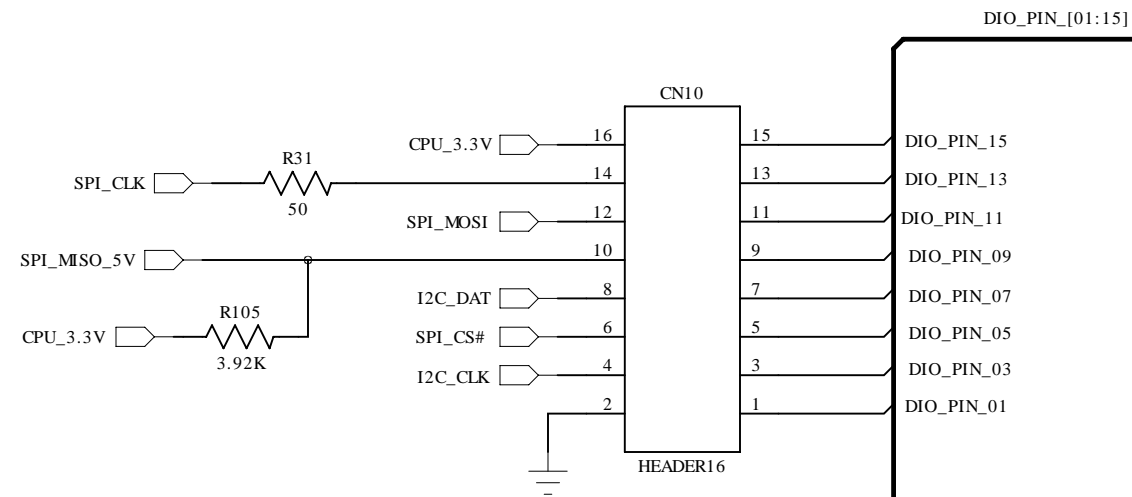


1400 mA typ. current limit

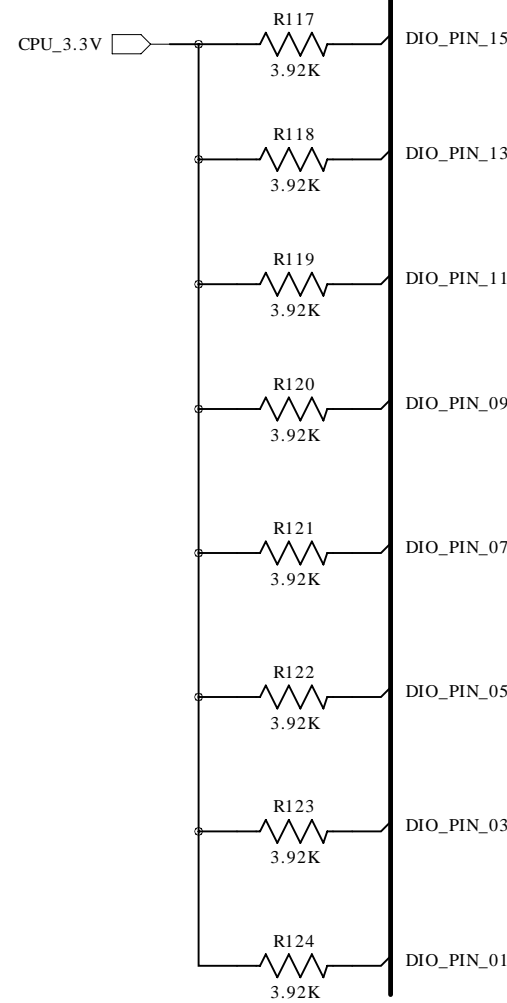
Technologic Systems	Nov. 3, 2010
Title: TS-8160 USB Hub	
Rev:	Designer
Sheet 3 of 10	

DIO and LCD and SATA

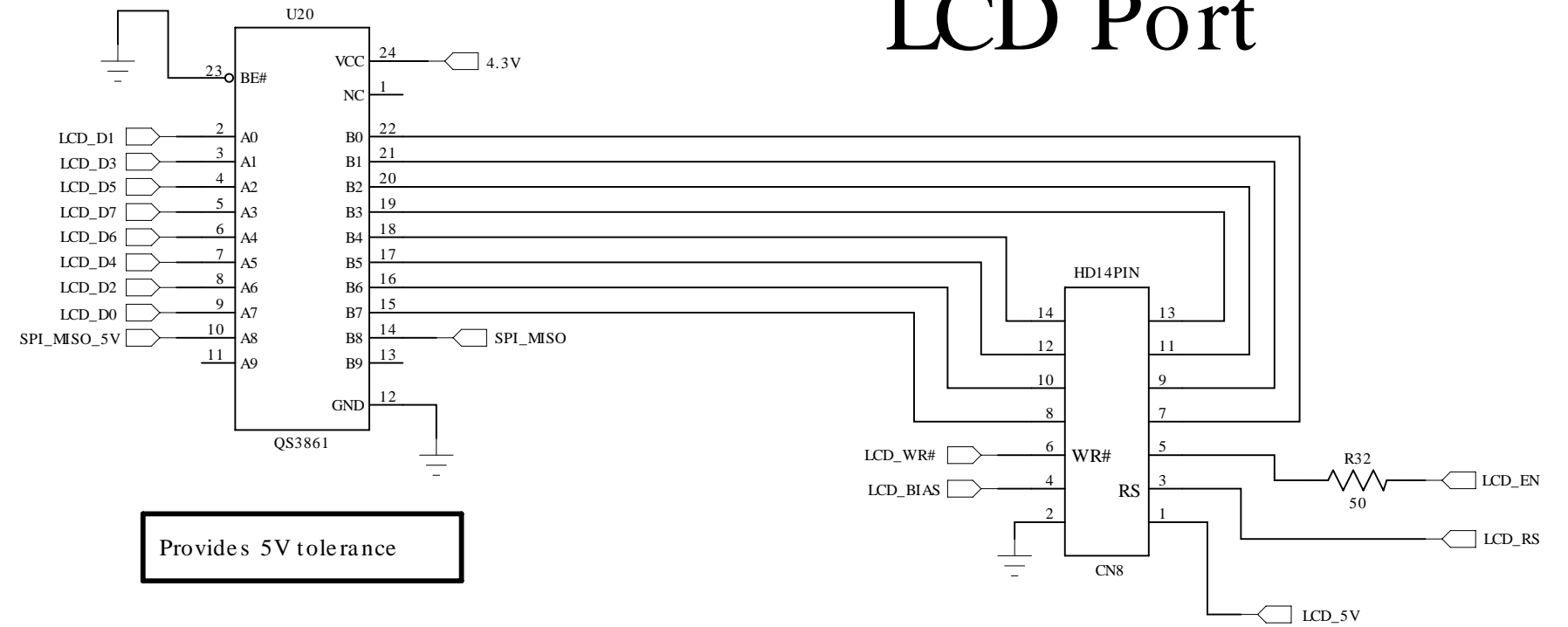
DIO Port



Warning:
DIO are not 5V tolerant !
Only SPI_MISO is 5V tolerant



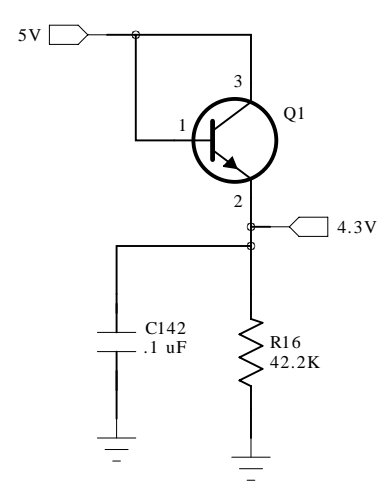
LCD Port



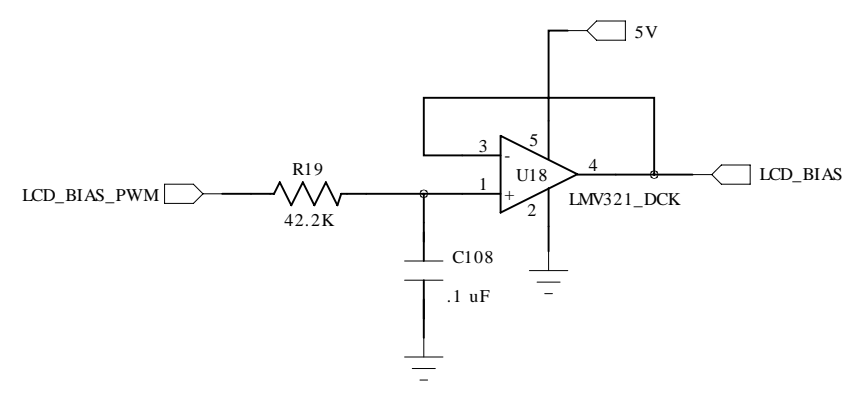
Warning:
LCD_D0 thru LCD_D7 are 5V tolerant
LCD_WR#, LCD_RS, and LCD_EN are not !

All LCD pins are
bi-directional DIO

4.3V Supply



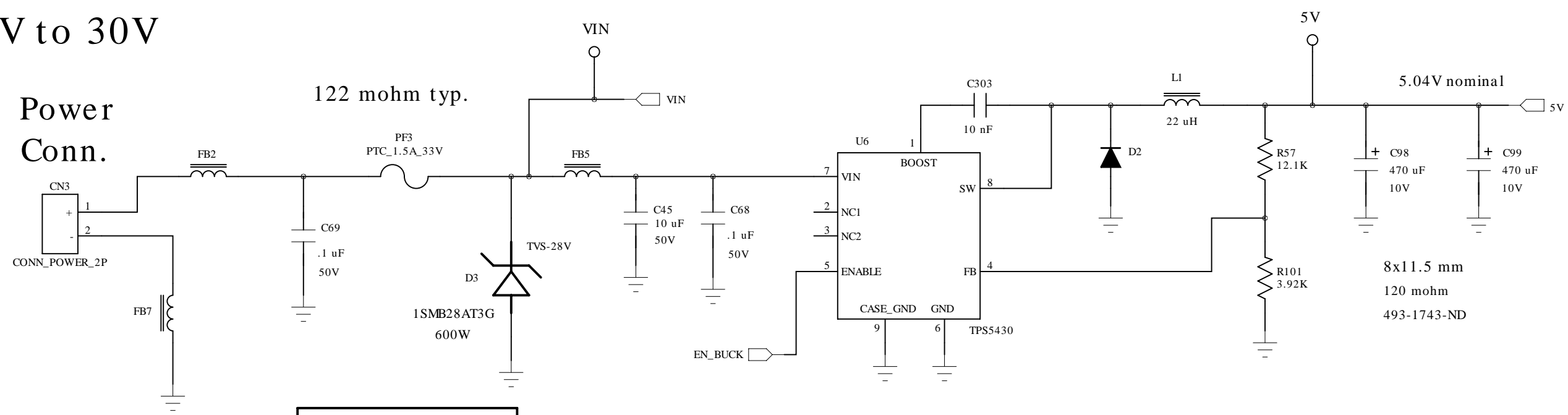
LCD PWM Filter



Input Power

4.7V to 5.4V
or
6.0V to 30V

5V Power Supply (3.0 Amps)

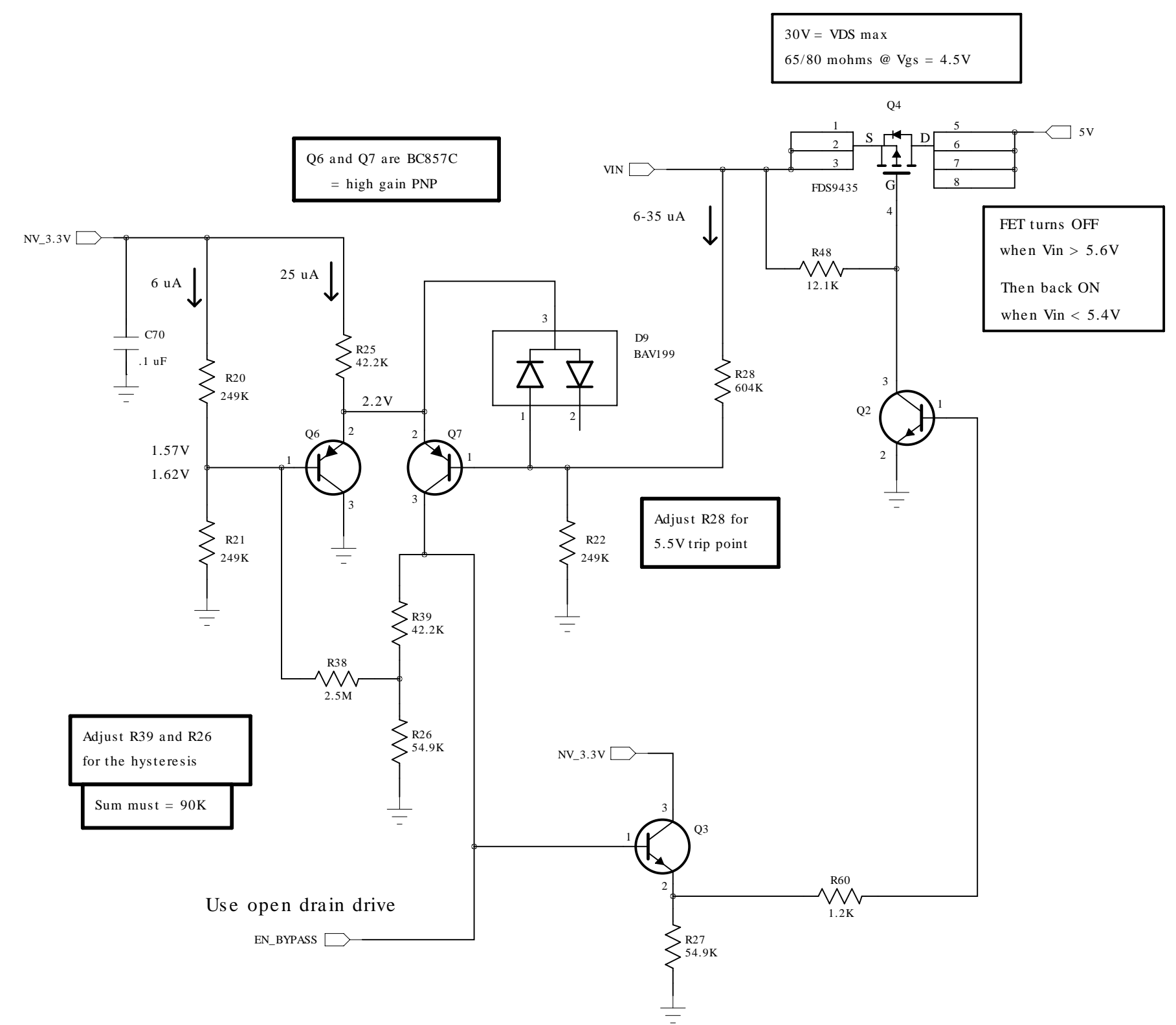


Zener knee at 31-34V
for 1 mA of current
13 Amps @ 45V

5V Regulator Bypass

Warning:

When Vin is between 5.4V and 6.0V
The 5V rail can fall below 4.5V
This means the SBC may reset



30V = VDS max
65/80 mohms @ Vgs = 4.5V

Q6 and Q7 are BC857C
= high gain PNP

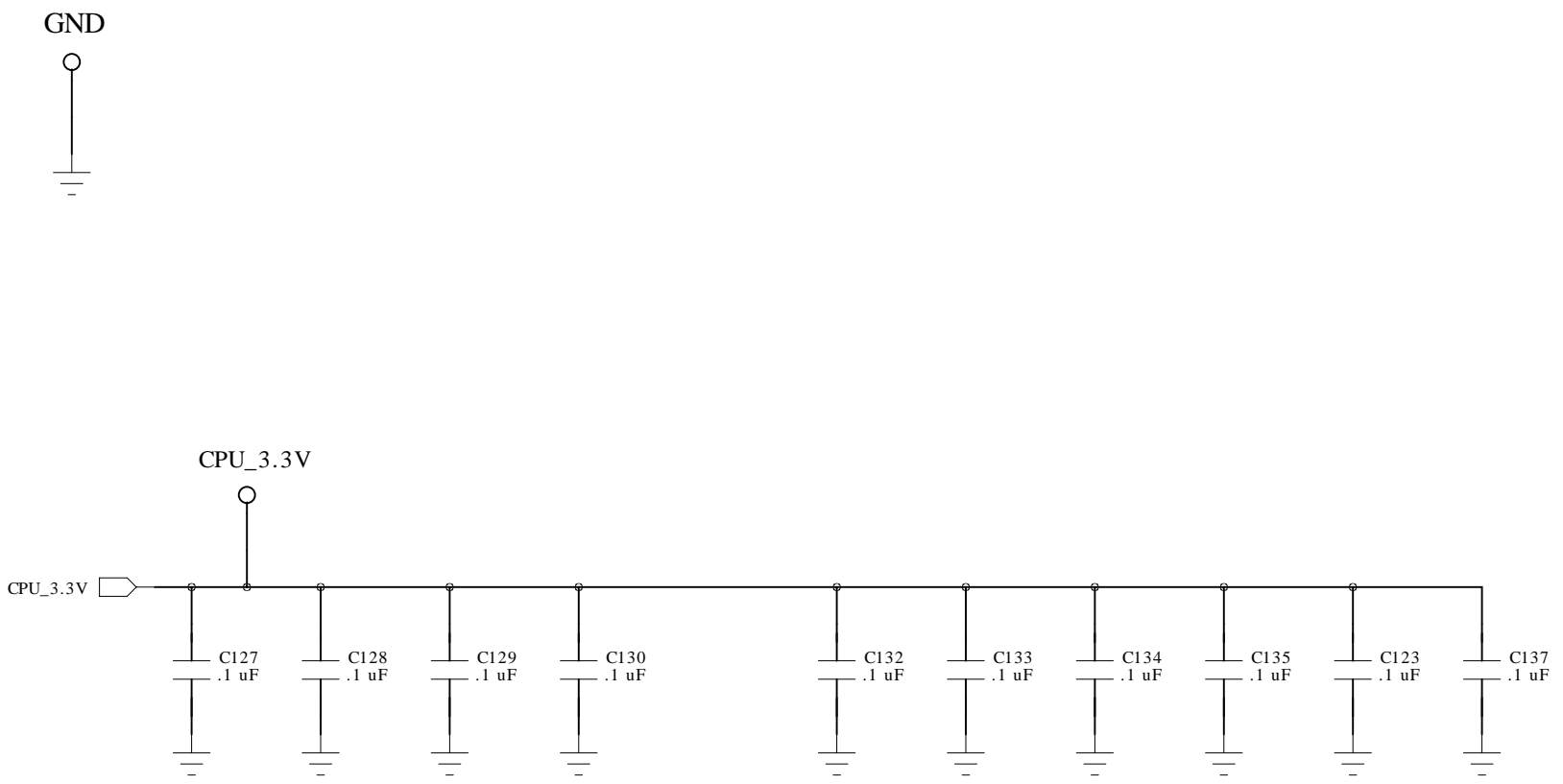
FET turns OFF
when Vin > 5.6V
Then back ON
when Vin < 5.4V

Adjust R28 for
5.5V trip point

Adjust R39 and R26
for the hysteresis
Sum must = 90K

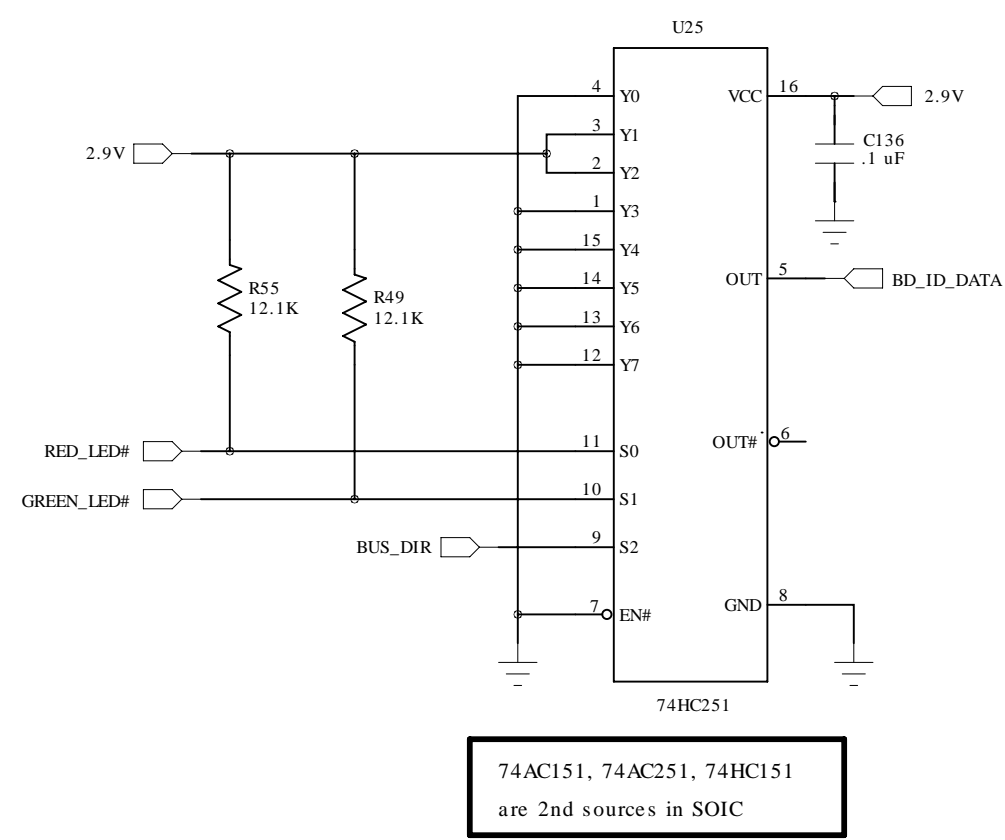
Use open drain drive

Turns P-FET (Q4) on
when Vin < 5.5V nominal



Technologic Systems	Nov. 3, 2010
Title: TS-8160 5V Power, and Bypass	
Rev:	Designer
Sheet 5 of 10	

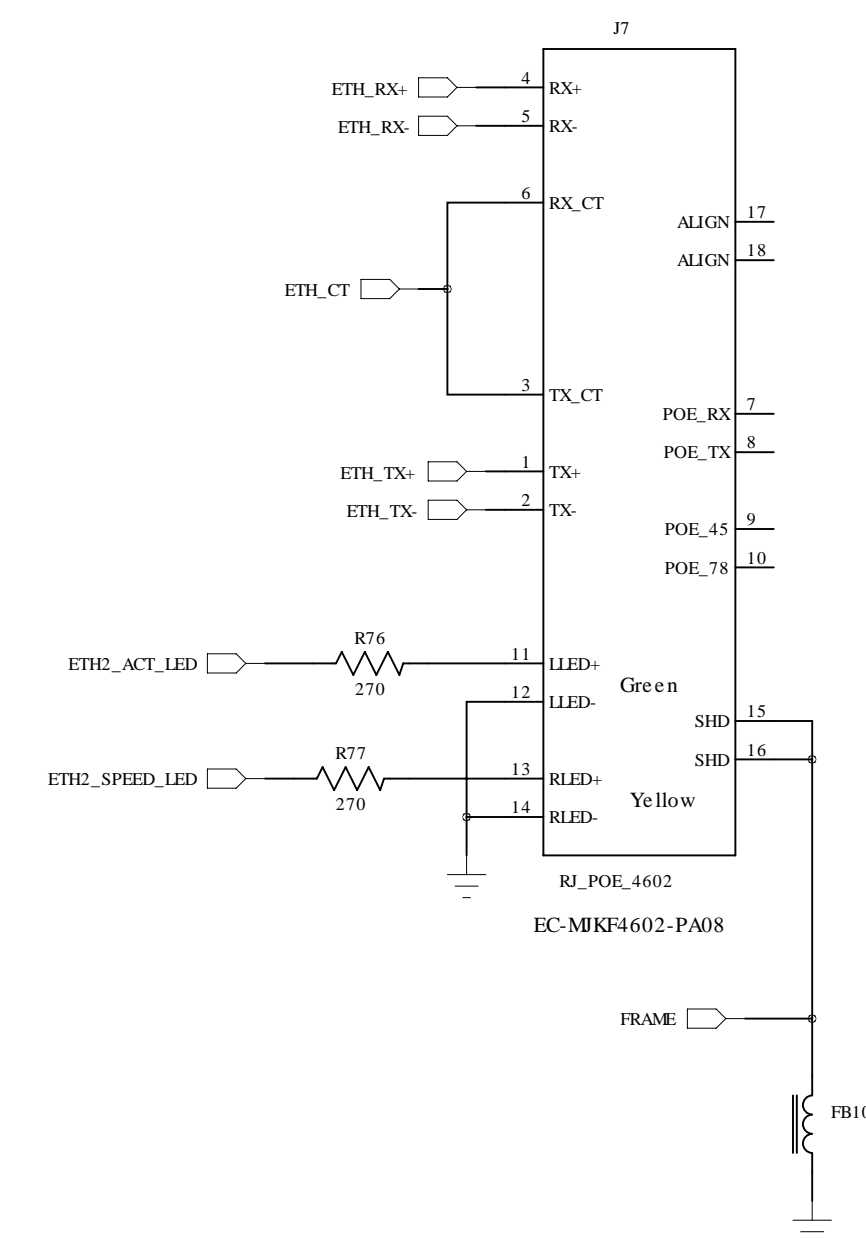
Board ID = 6



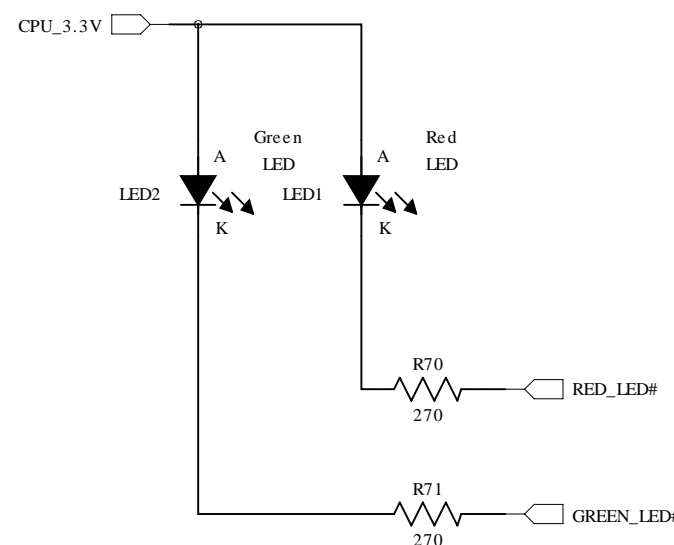
74AC151, 74AC251, 74HC151
are 2nd sources in SOIC

SBC

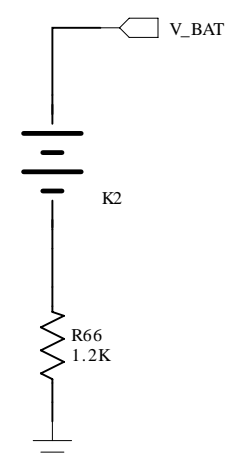
10/100 Ethernet



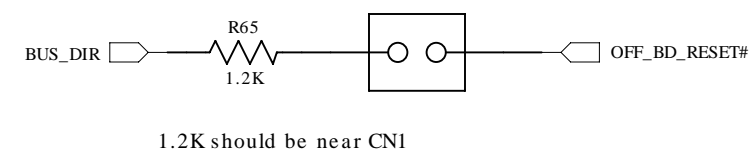
LEDs



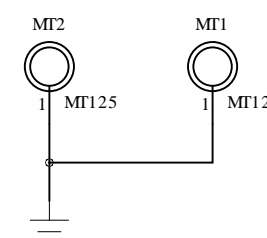
RTC Battery



Force Boot to SD card



1.2K should be near CN1



Technologic Systems	Nov. 3, 2010
Title: TS-8160 Ethernet, Battery, Board ID	
Rev:	Designer RLM Sheet 6 of 10

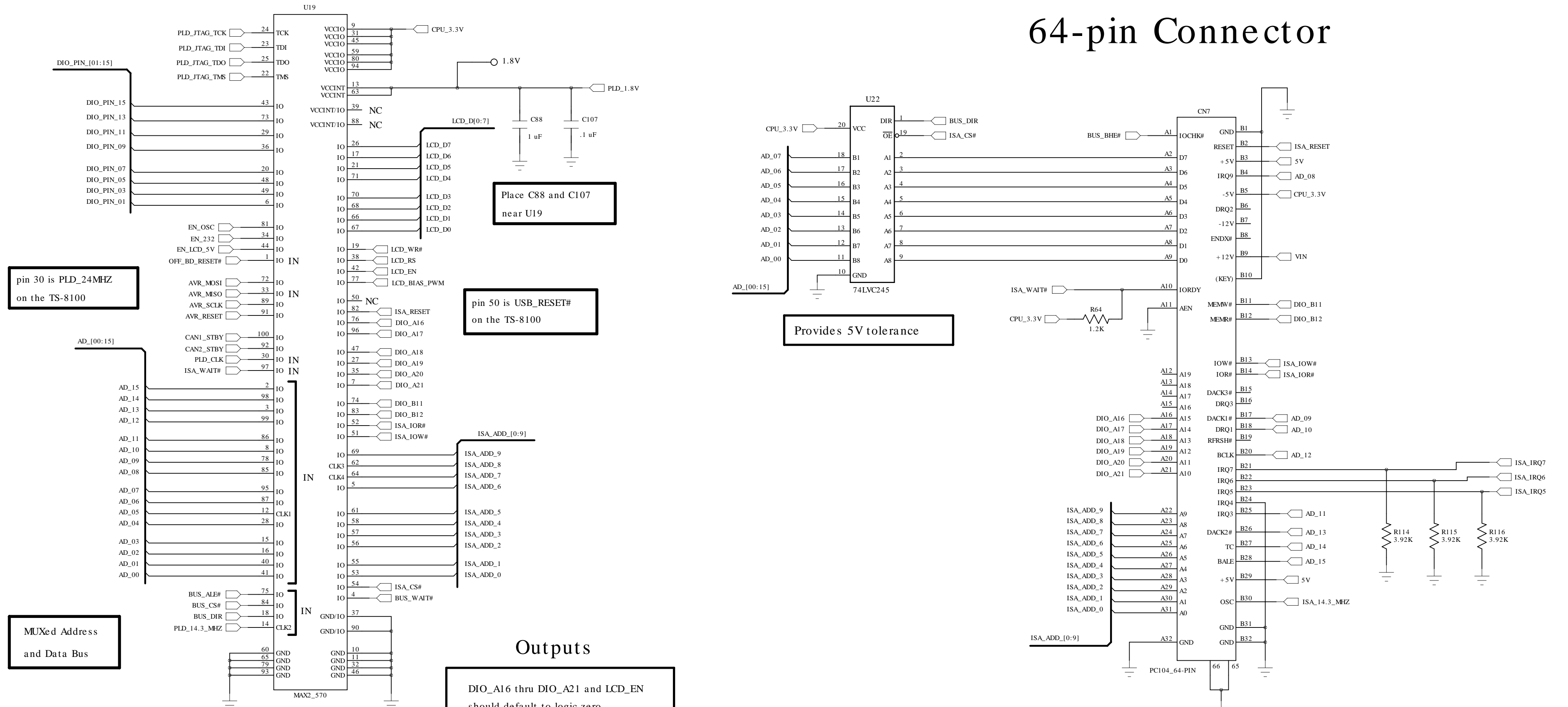
Inputs on Left

PLD

Outputs on Right

PC/104

64-pin Connector



pin 30 is PLD_24MHZ on the TS-8100

Place C88 and C107 near U19

pin 50 is USB_RESET# on the TS-8100

Provides 5V tolerance

MUXed Address and Data Bus

EPM240G

EPM240G 1.8V static current is 2mA typical
Transient turn-on is <50 mA

Outputs

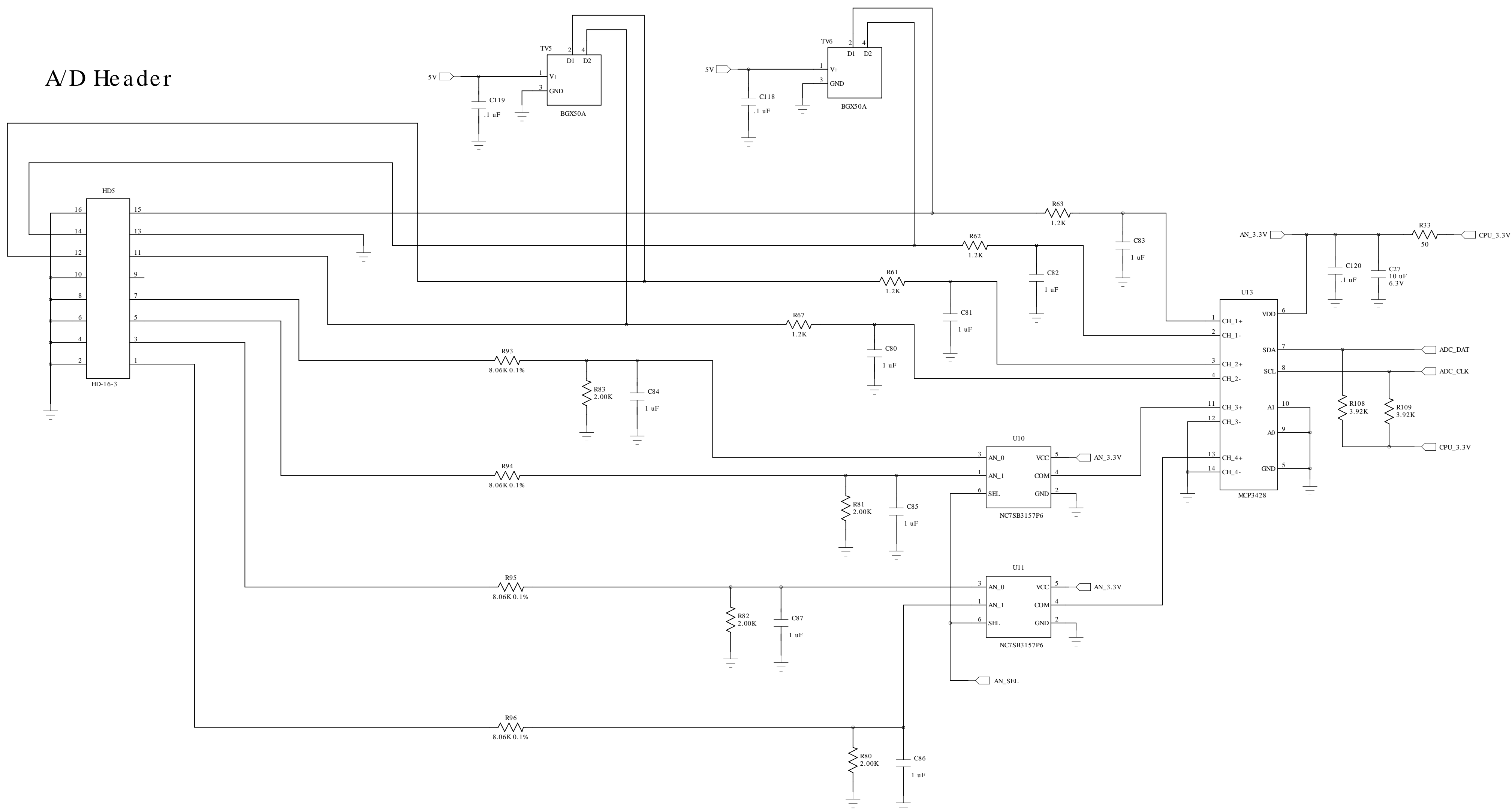
- DIO_A16 thru DIO_A21 and LCD_EN should default to logic zero
- DIO_B11 and DIO_B12 should default to logic "1"
- EN_232, EN_OSC, CAN1_STBY and CAN2_STBY must default to a logic one
- AVR SPI bus outputs:
AVR_MOSI
AVR_SCLK
AVR_RESET
must initialize to zero

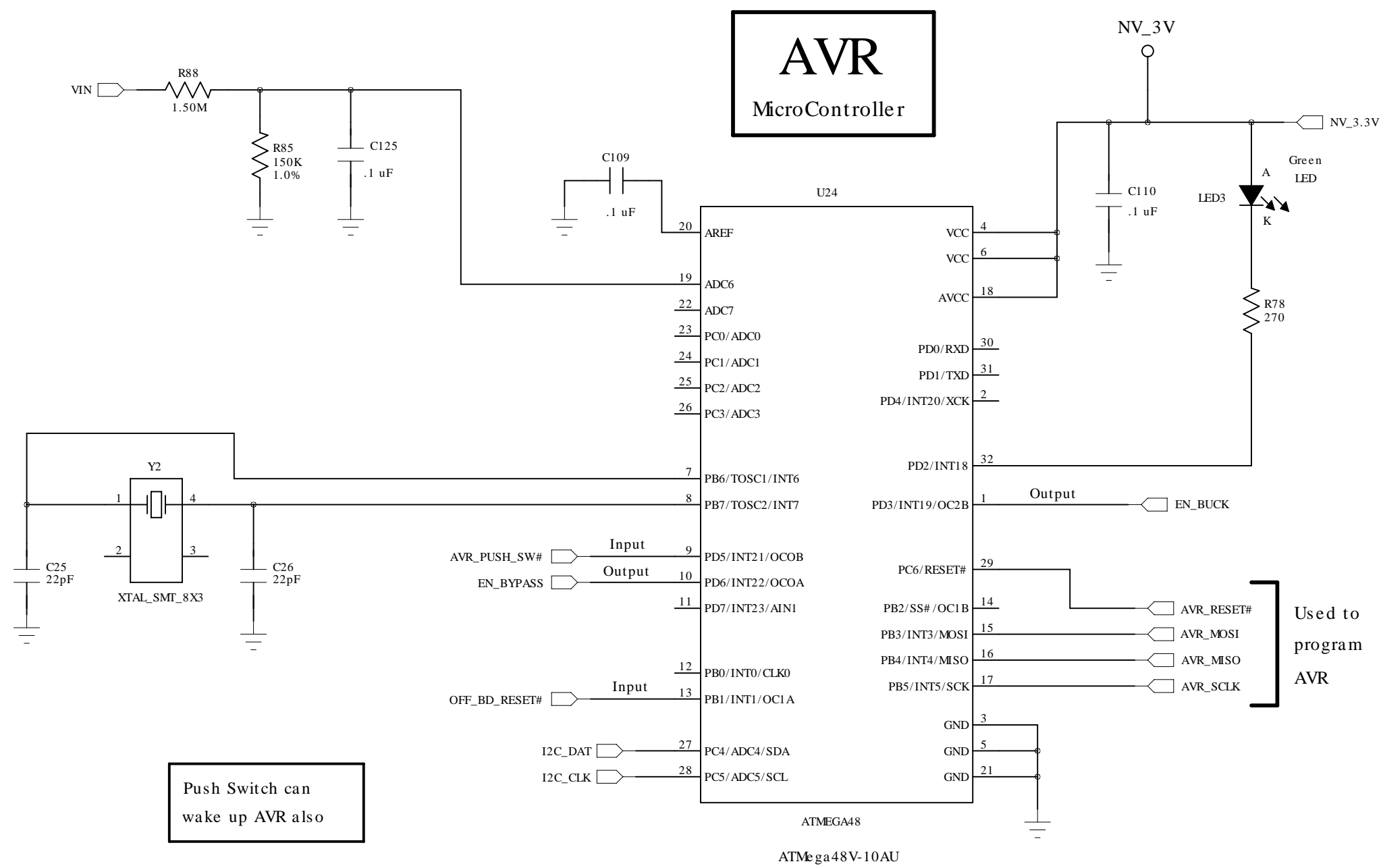
16-bit A/D Converter

Four single-ended 0-10V Inputs

Two differential pairs 0-2V range

A/D Header



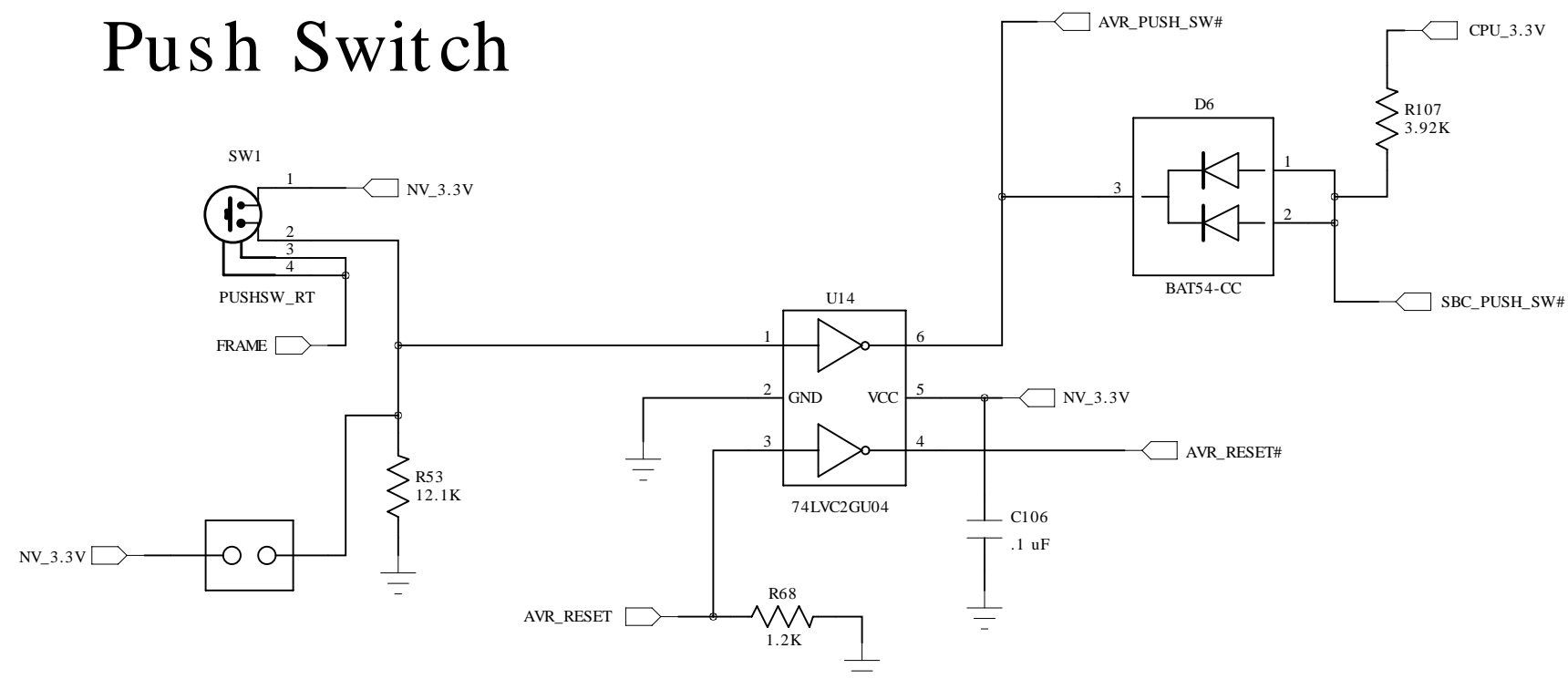


Push Switch can wake up AVR also

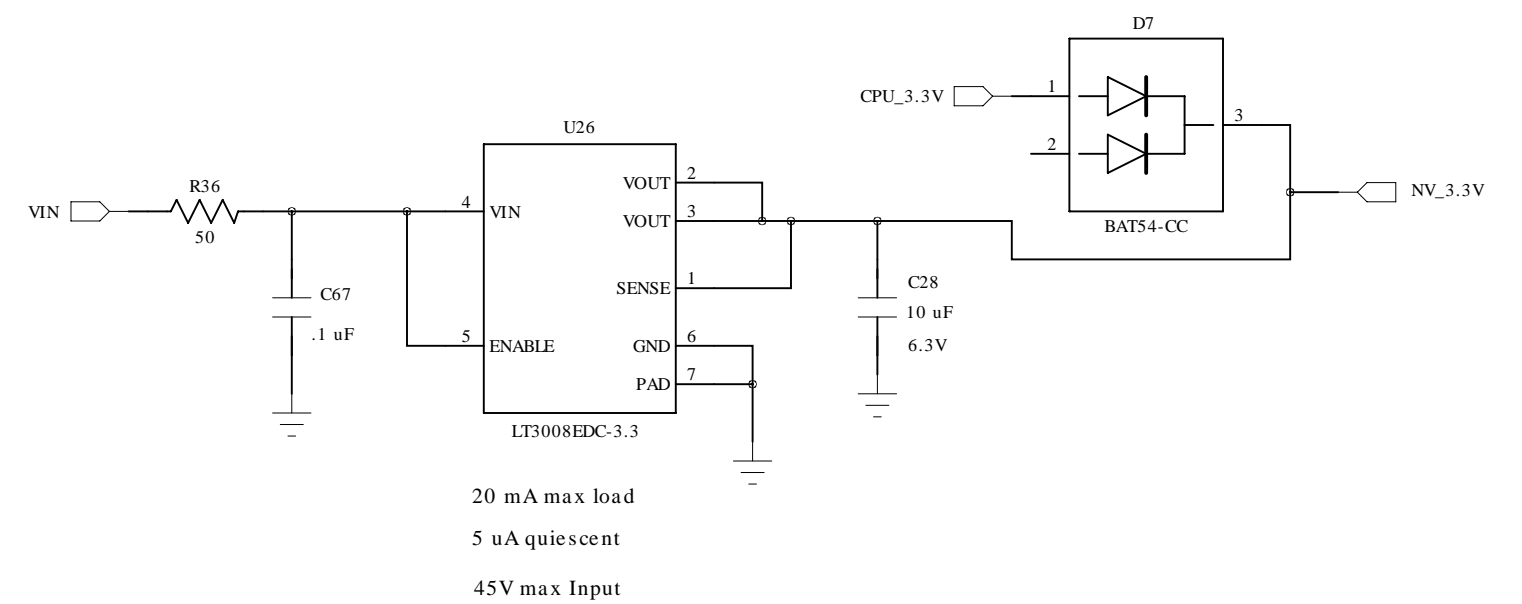
Drive EN_BYPASS and EN_BUCK low to go into Sleep mode
Current drain should be < 150 uA

Used to program AVR

Push Switch



NV 3.3V Regulator for AVR

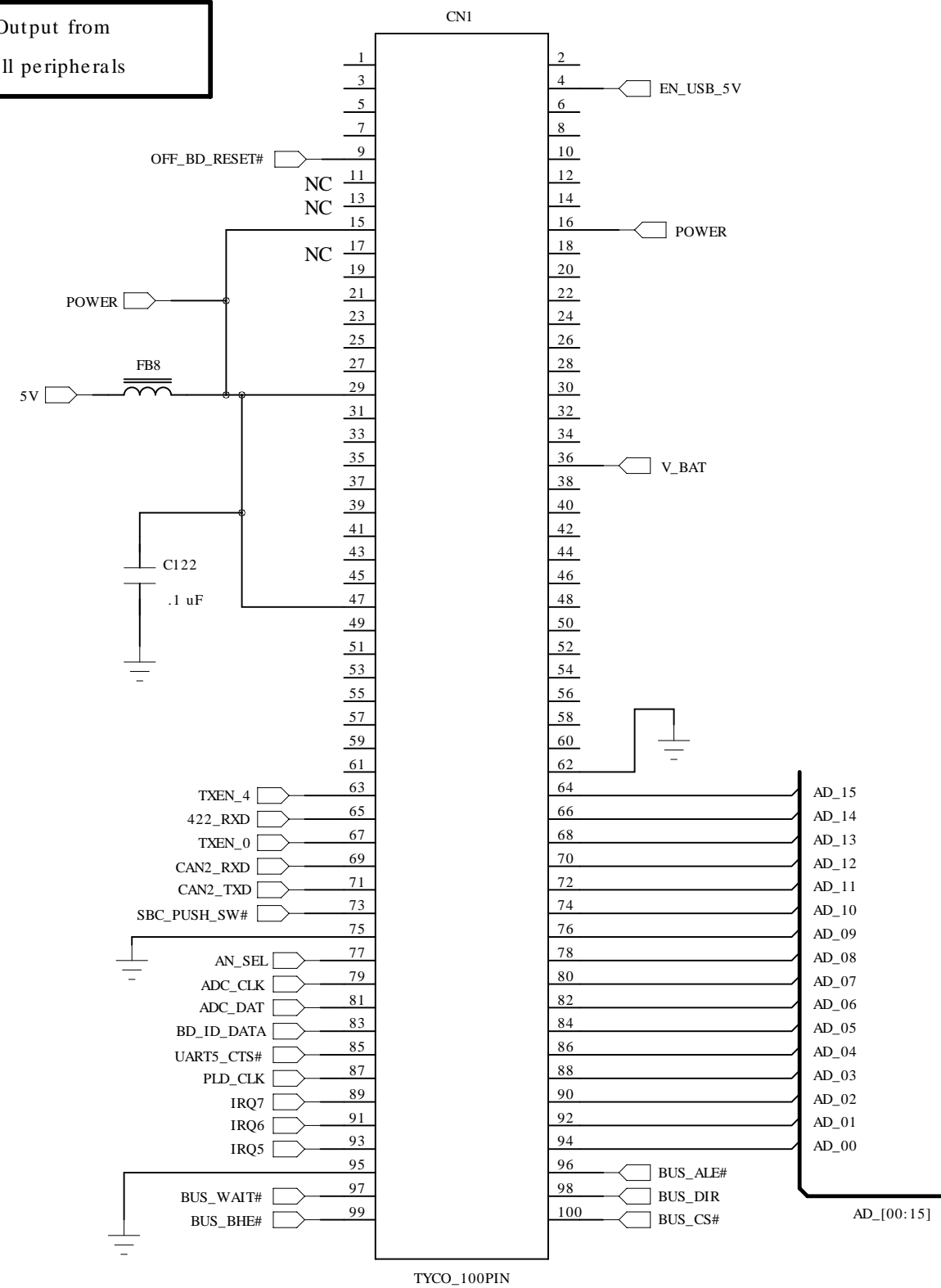


Two 100-pin Module Connectors

Left

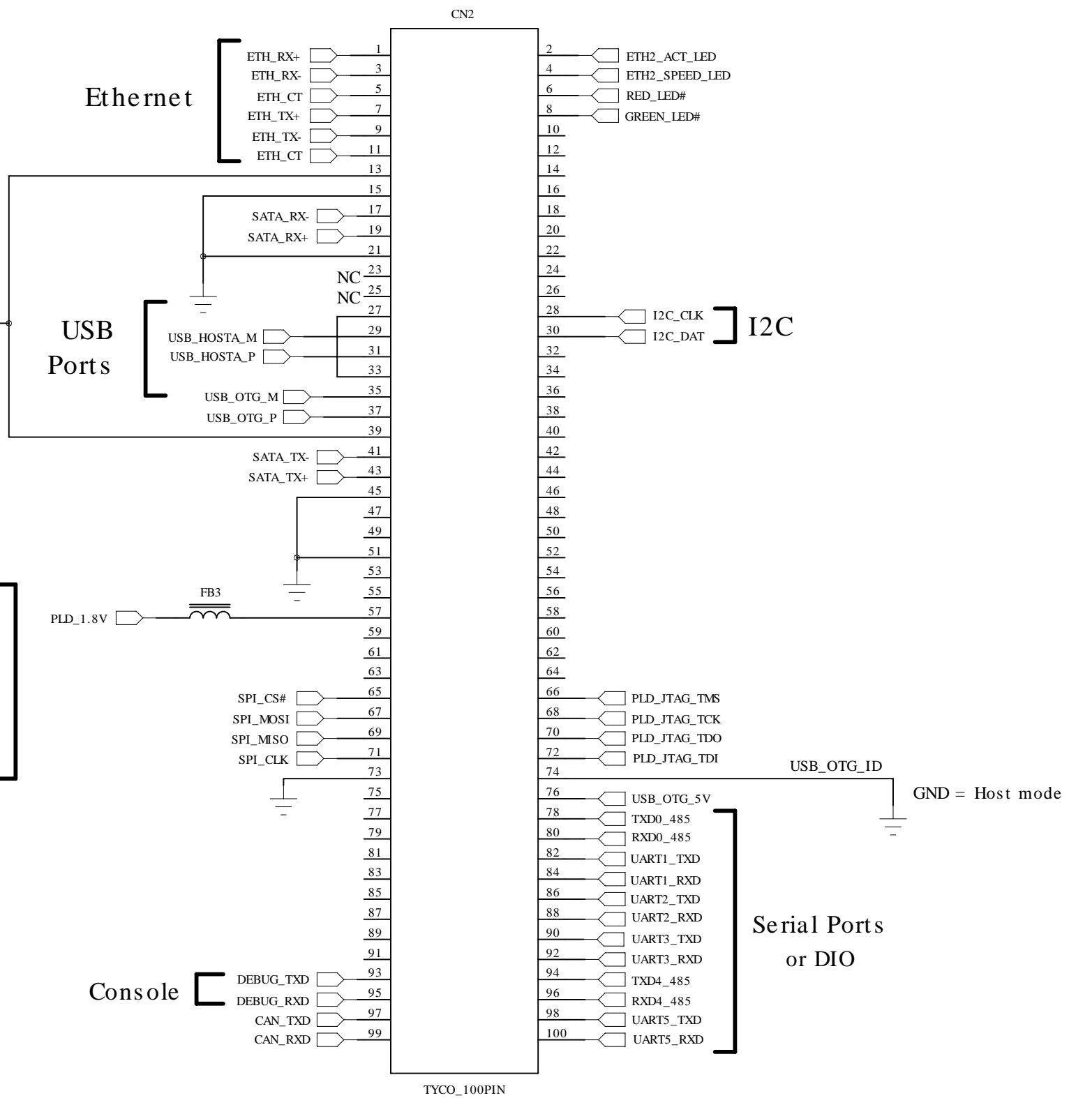
Right

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



TS-8160 base board requires < 50 mA of CPU_3.3V current

TS-8160 base board requires < 50 mA of 1.8V current transient at power on < 10 mA steady state



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