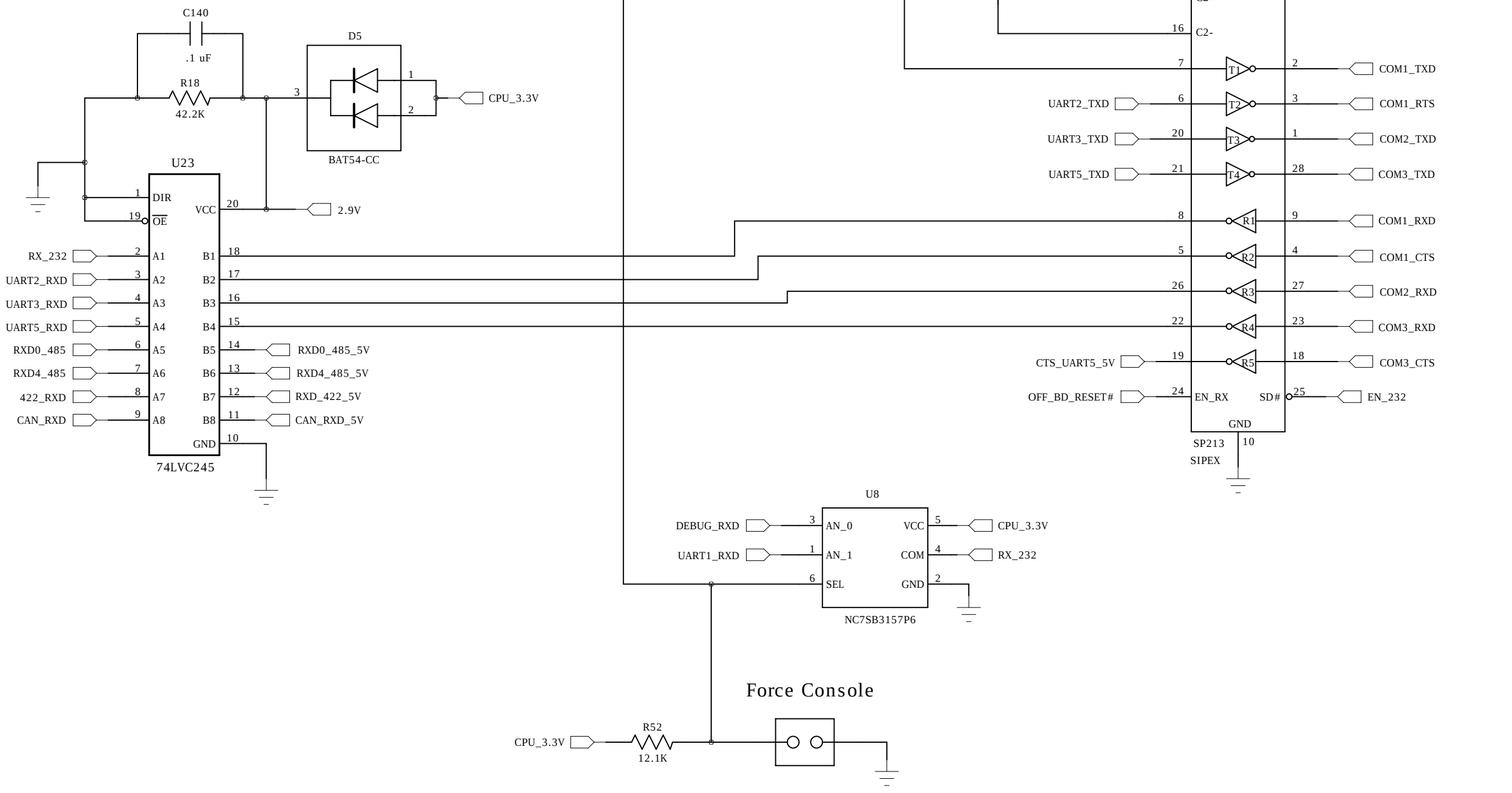
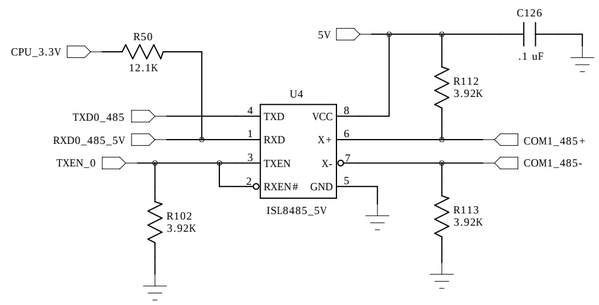
RS-232 Transceiver

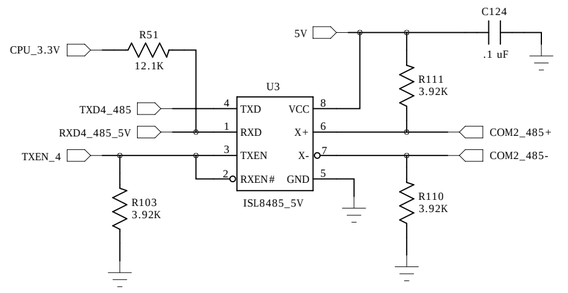
2.9V <-- 5V Level shifter



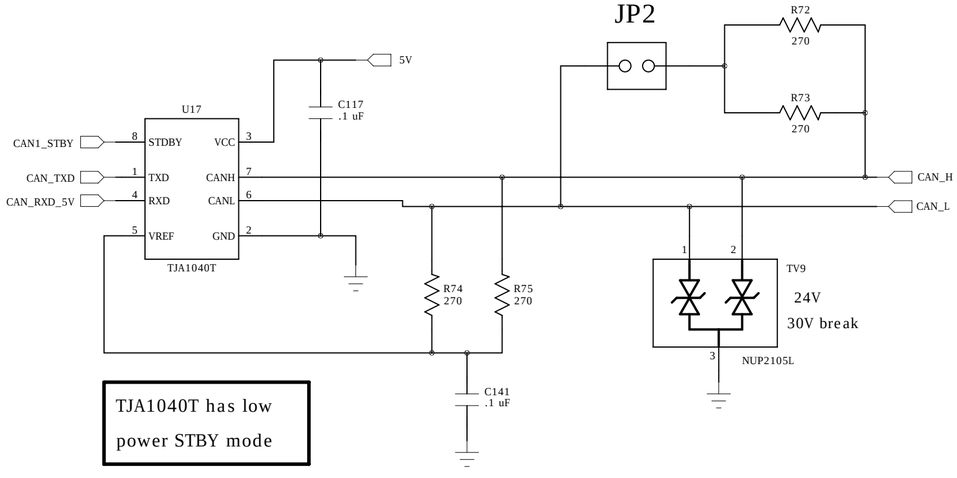
COM1 RS-485 Driver



COM2 RS-485 Driver

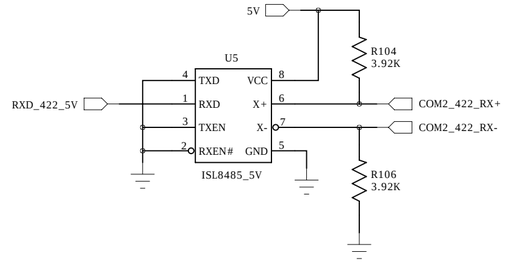


CAN1 Tranceiver



TJA1040T has low power STBY mode

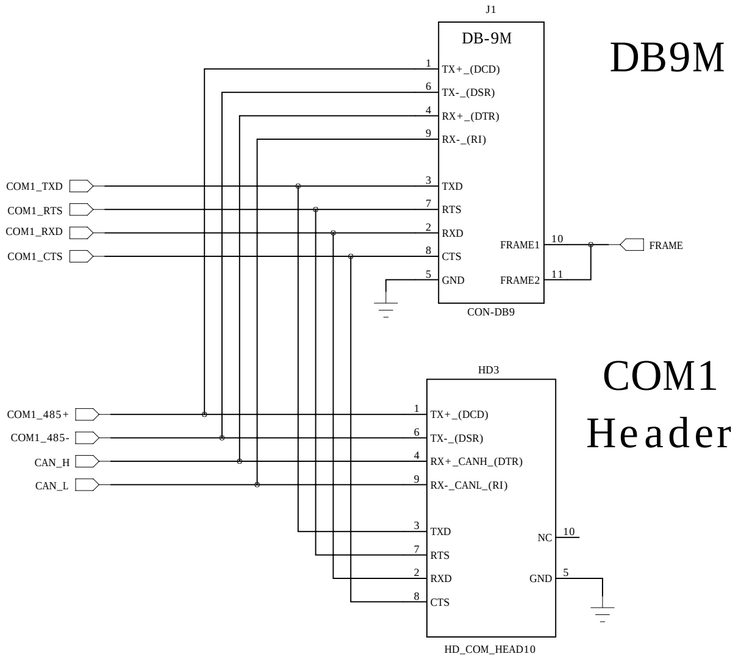
COM2 RS-422 Receiver



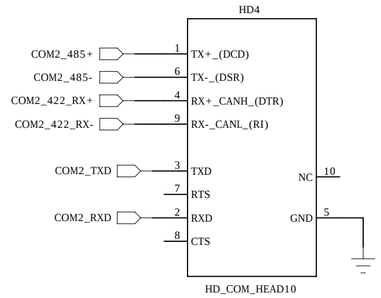
Technologic Systems		Nov. 3, 2010
Title: TS-8160 RS-232, RS-485, CAN		
Rev:	Designer	Sheet 1 of 10

COM Connectors and Headers

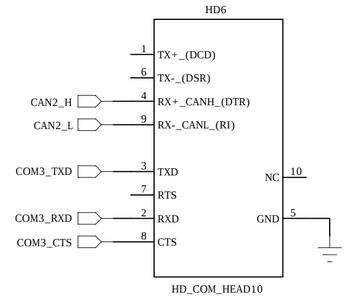
COM1



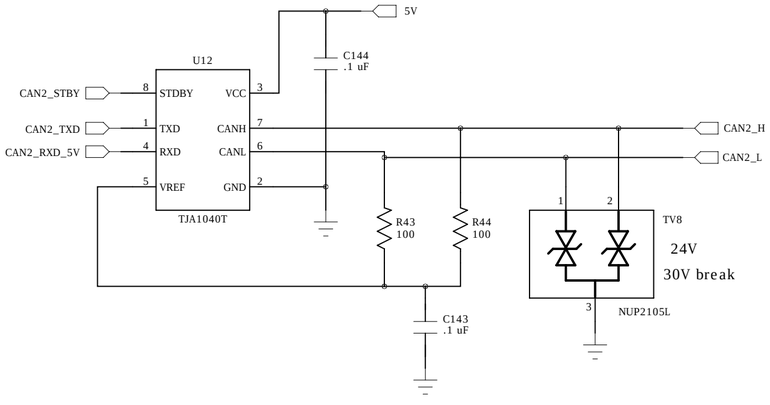
COM2
Header



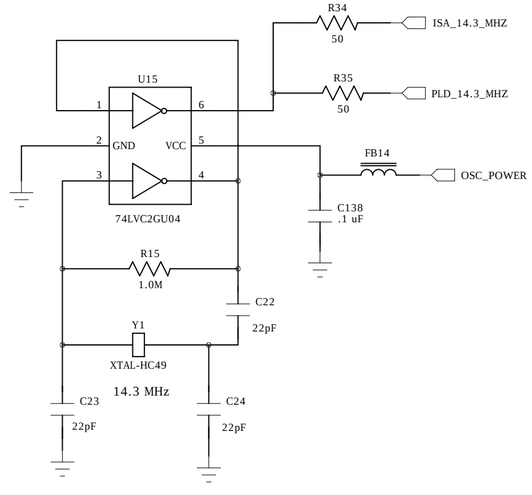
COM3
Header



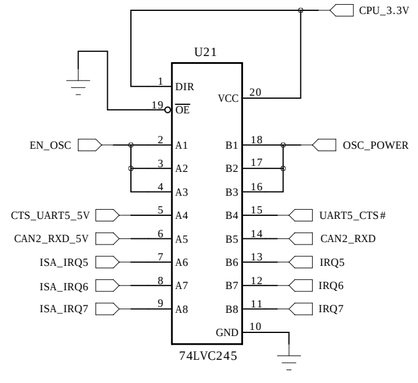
CAN Tranceiver



14.3 MHz Osc.



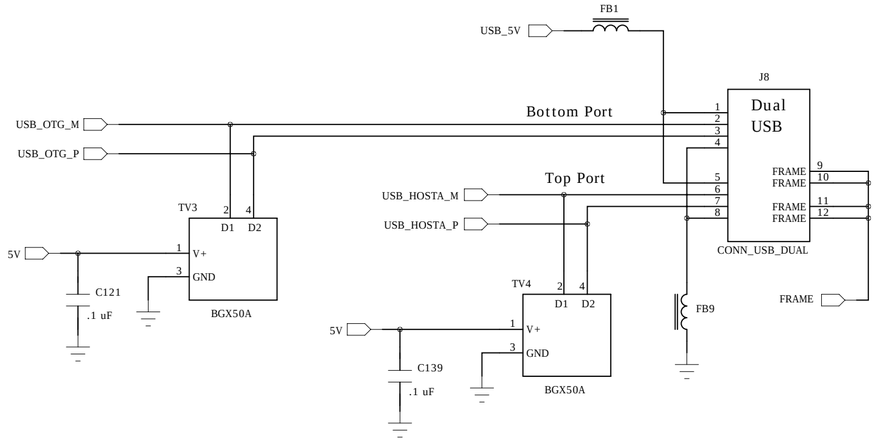
5V --> 3.3V



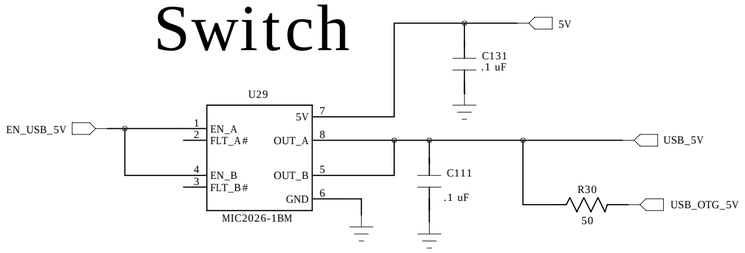
Provides 5V Tolerance

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

External Dual USB

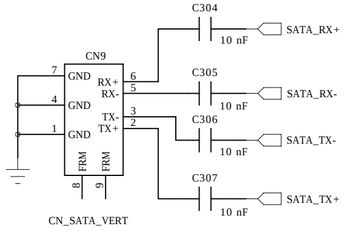


USB Power Switch

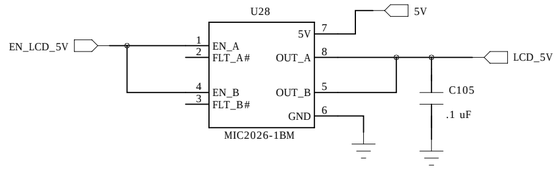


1400 mA typ. current limit

SATA Port



LCD Power Switch

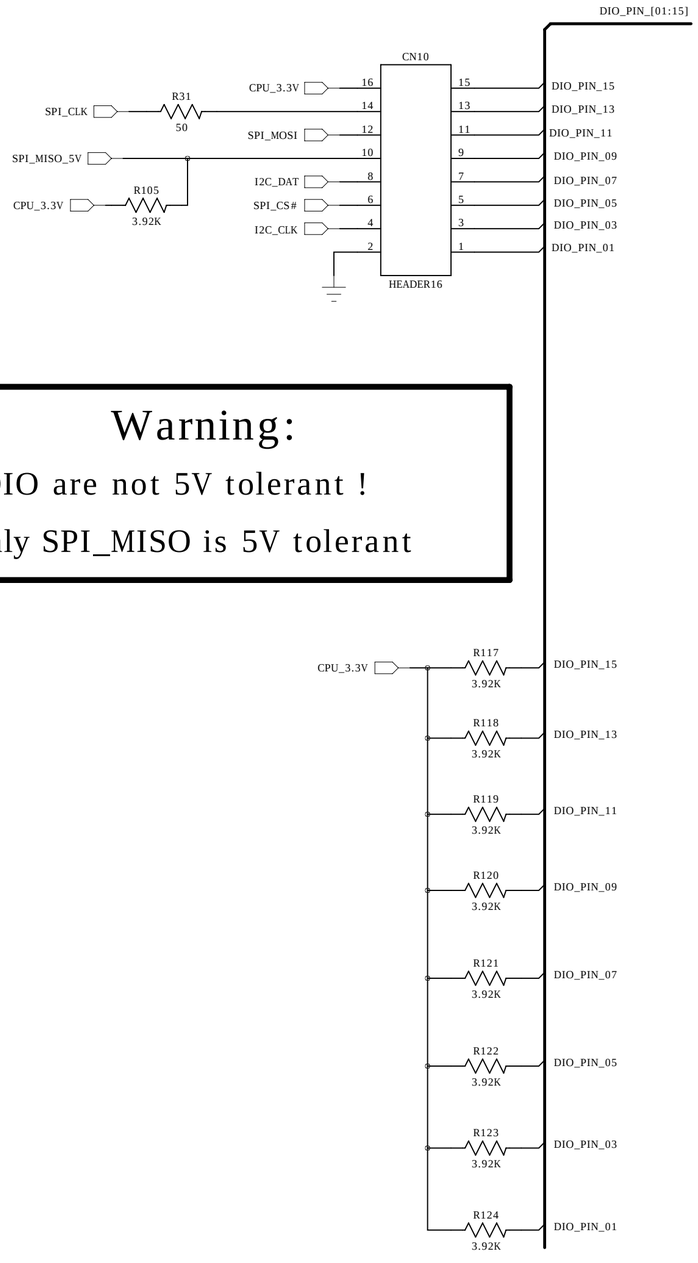


1400 mA typ. current limit

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

DIO and LCD and SATA

DIO Port

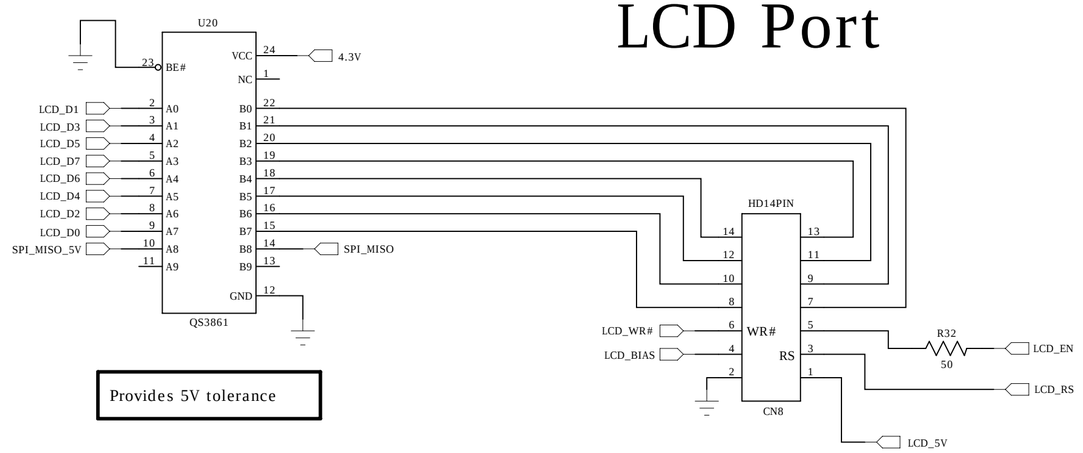


Warning:

DIO are not 5V tolerant !

Only SPI_MISO is 5V tolerant

LCD Port



Provides 5V tolerance

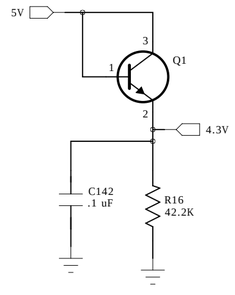
All LCD pins are bi-directional DIO

Warning:

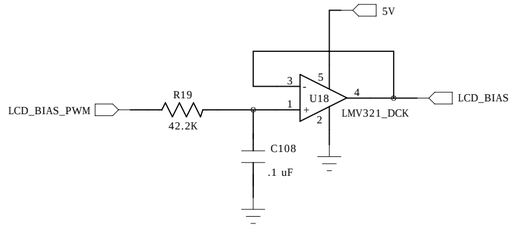
LCD_D0 thru LCD_D7 are 5V tolerant

LCD_WR#, LCD_RS, and LCD_EN are not !

4.3V Supply



LCD PWM Filter



Technologic Systems		Nov. 3, 2010
Title: TS-8160 DIO, LCD		
Rev:	Designer	Sheet 4 of 10

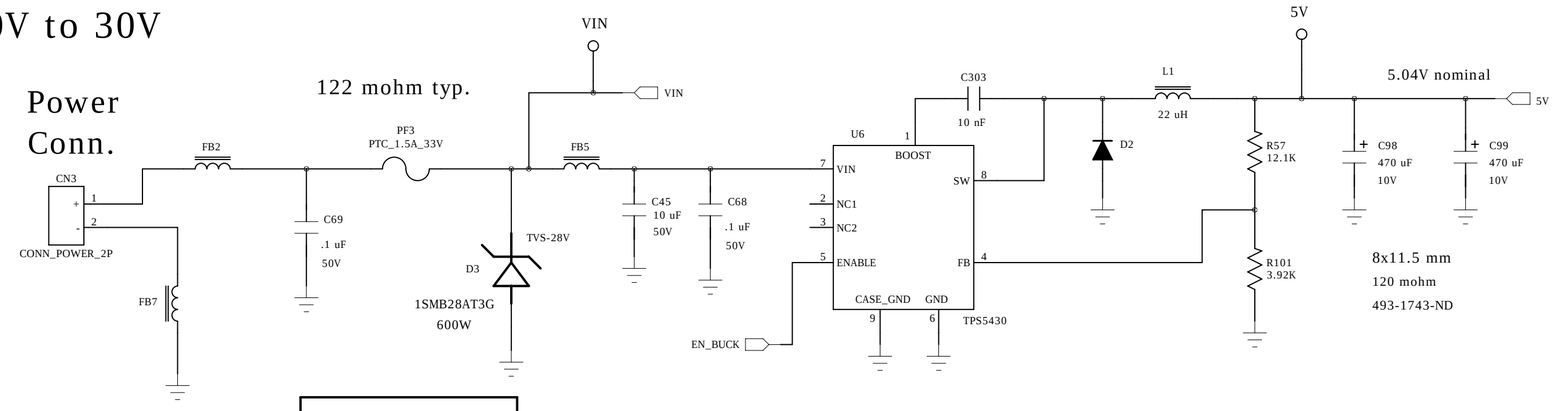
Input Power

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

Warning:

When Vin is between 5.4V and 6.0V

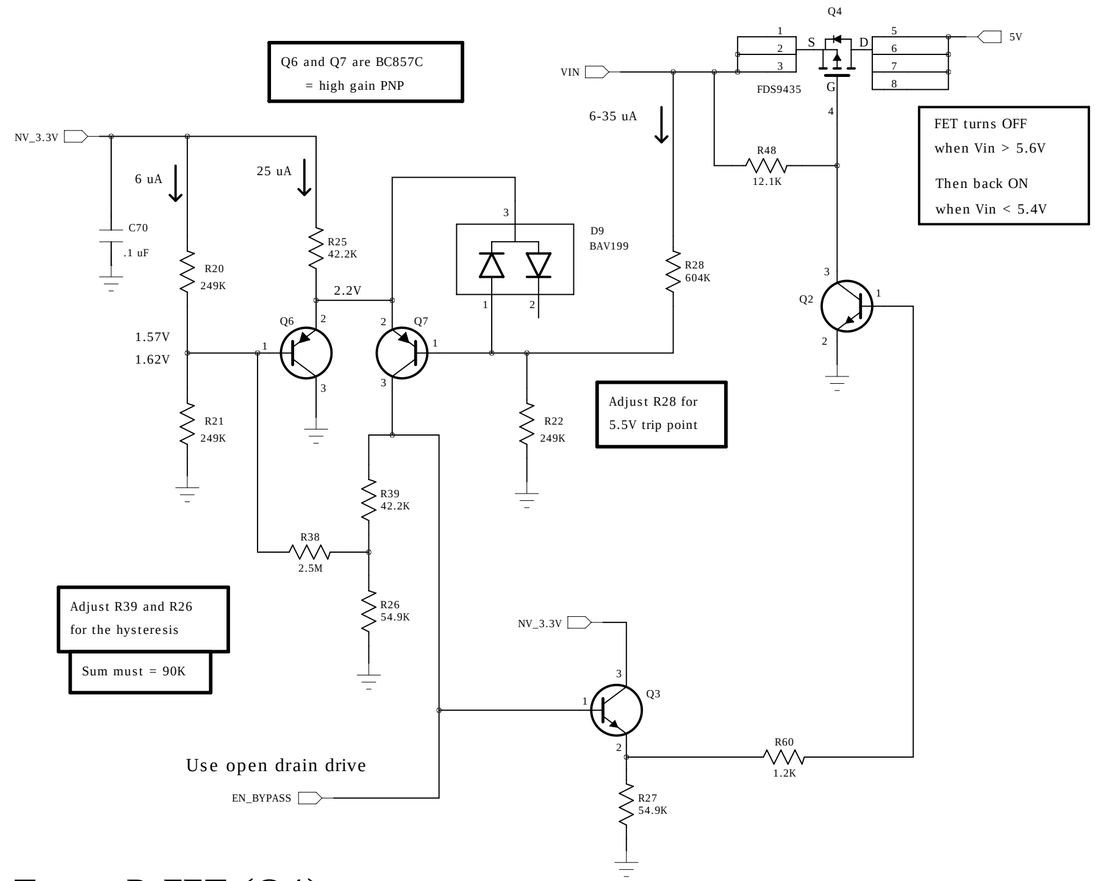
The 5V rail can fall below 4.5V

This means the SBC may reset

5V Regulator Bypass

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

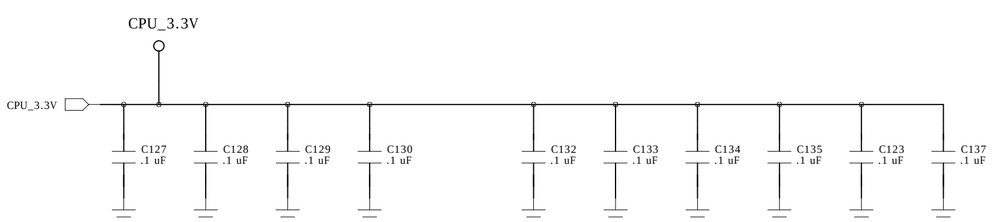
Q6 and Q7 are BC857C
= high gain PNP



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

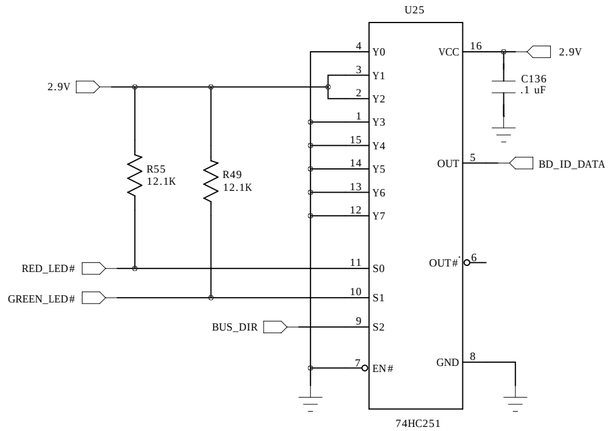
GND

CPU_3.3V



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

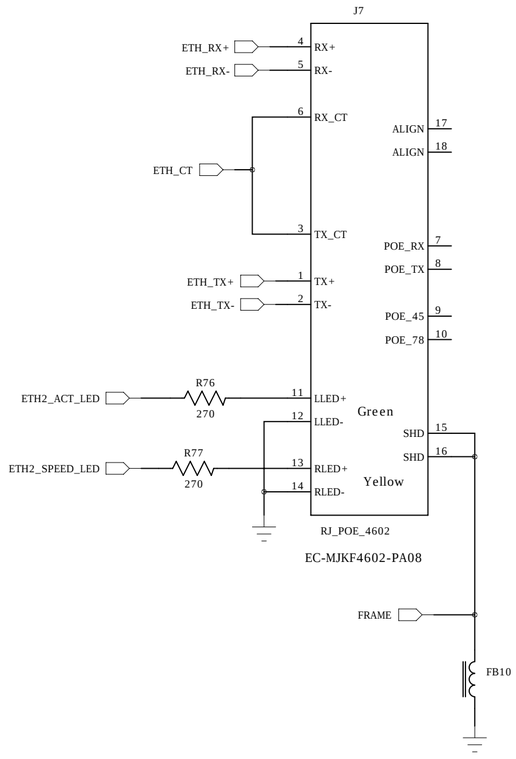
Board ID = 6



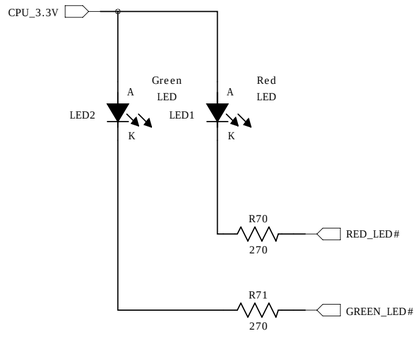
74AC151, 74AC251, 74HC151
are 2nd sources in SOIC

SBC

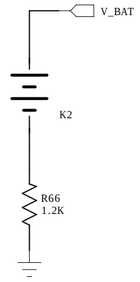
10/100 Ethernet



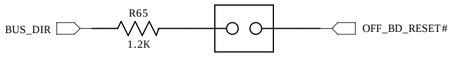
LEDs



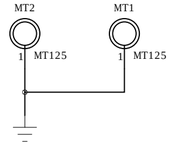
RTC Battery



Force Boot to SD card



1.2K should be near CN1

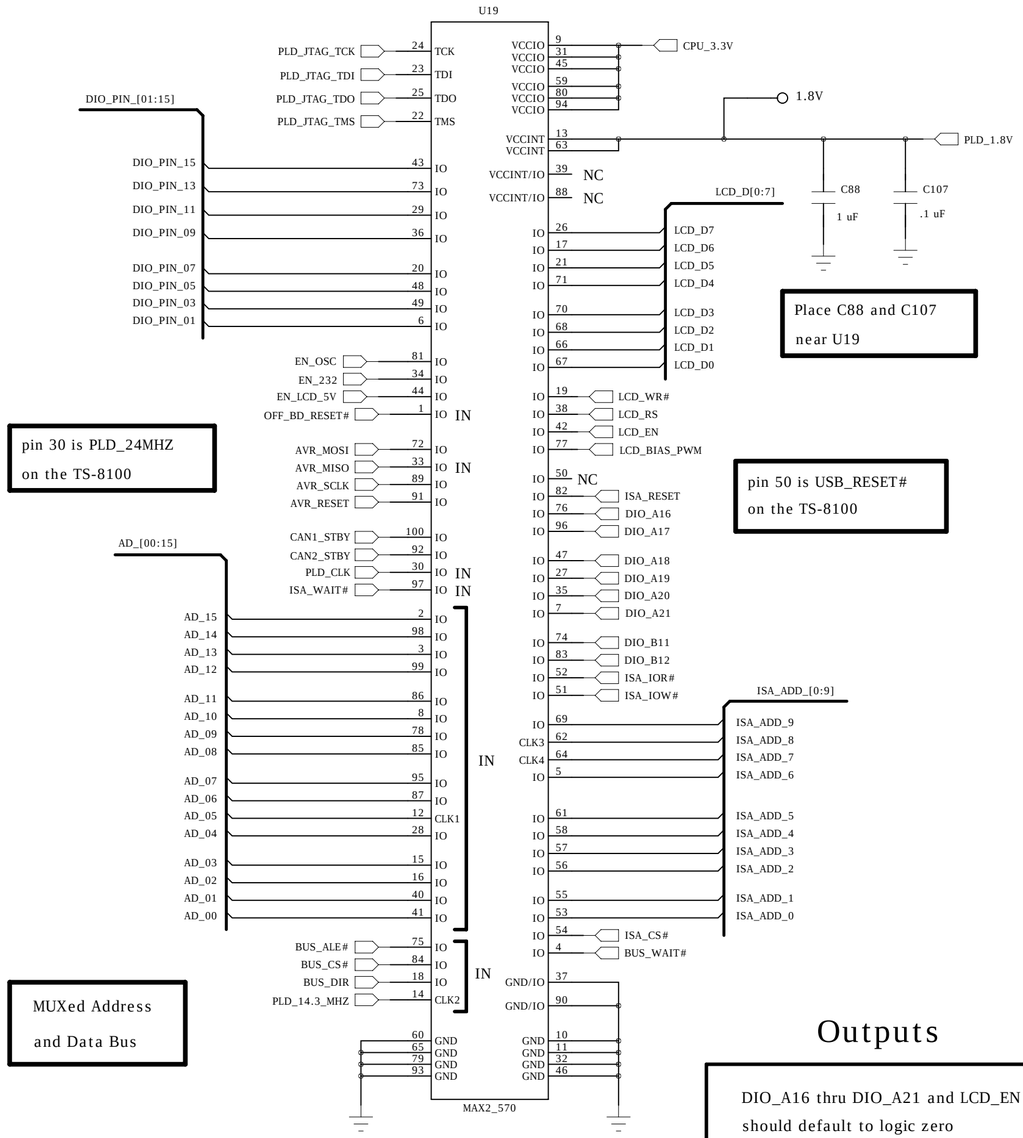


Technologic Systems		Nov. 3, 2010
Title: TS-8160 Ethernet, Battery, Board ID		
Rev:	Designer RLM	Sheet 6 of 10

PLD

Inputs on Left

Outputs on Right



Place C88 and C107 near U19

pin 30 is PLD_24MHZ on the TS-8100

pin 50 is USB_RESET# on the TS-8100

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

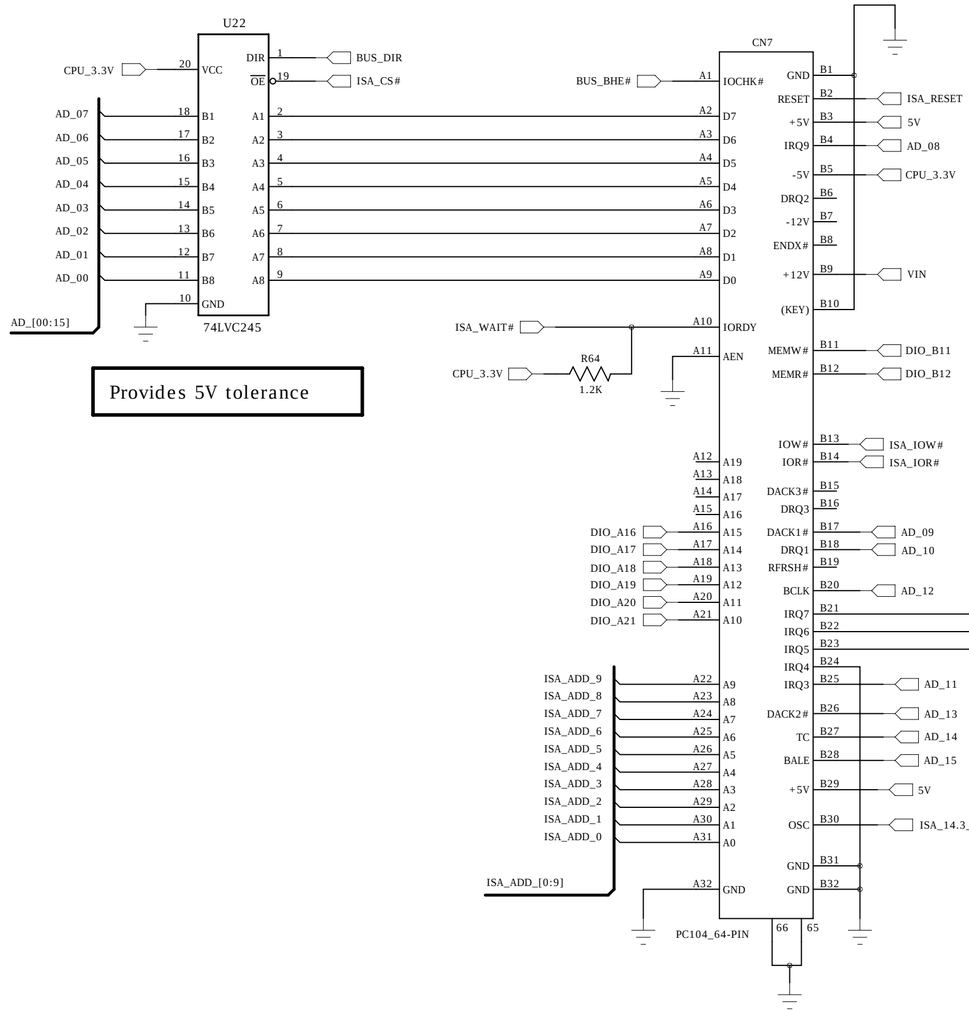
AVR SPI bus outputs:

- AVR_MOSI
- AVR_SCLK
- AVR_RESET

must initialize to zero

PC/104

64-pin Connector



Provides 5V tolerance

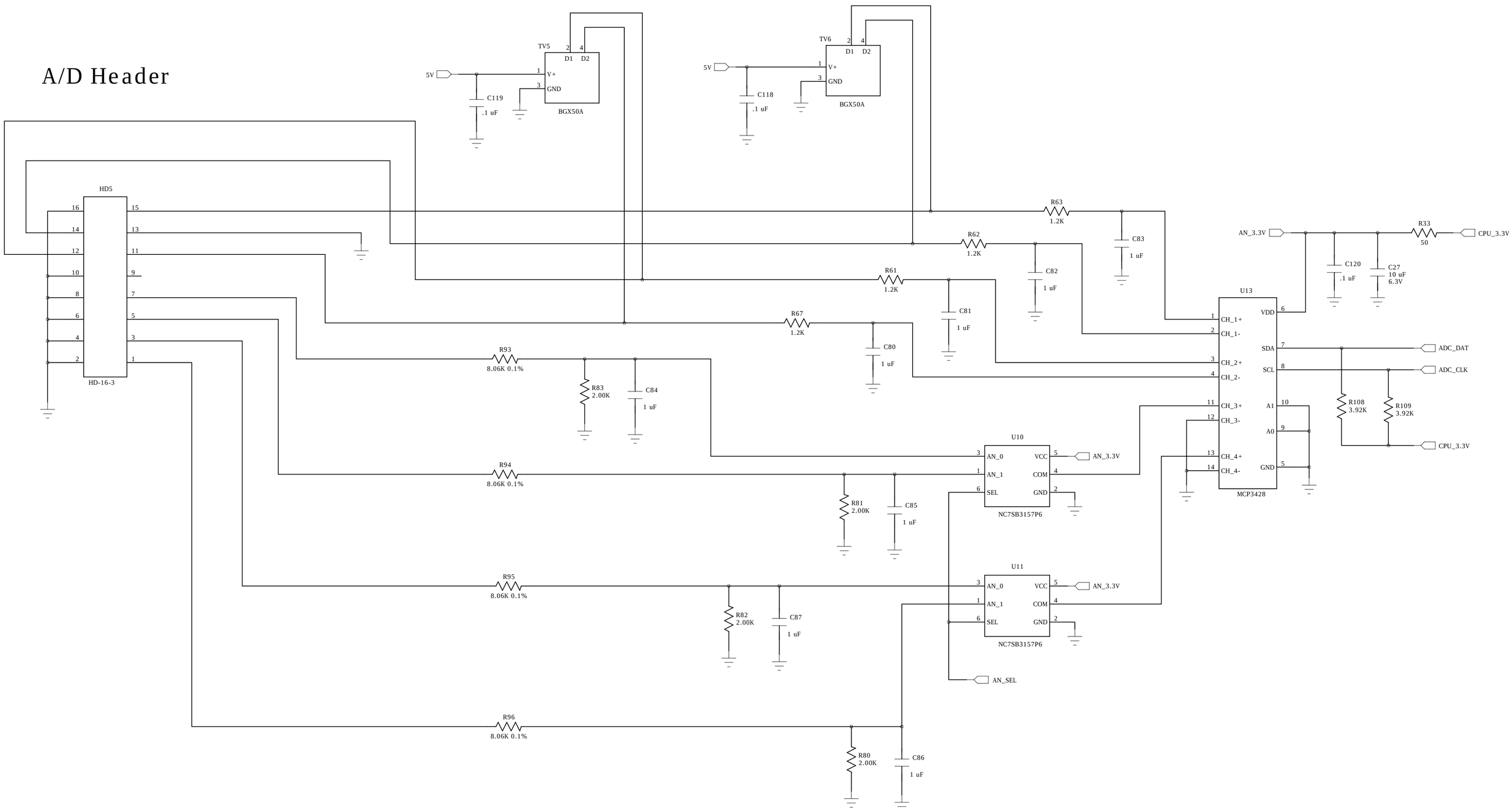
Technologic Systems		Nov. 3, 2010
Title: TS-8160 PLD, PC/104 bus		
Rev:	Designer	Sheet 7 of 10

16-bit A/D Converter

Four single-ended 0-10V Inputs

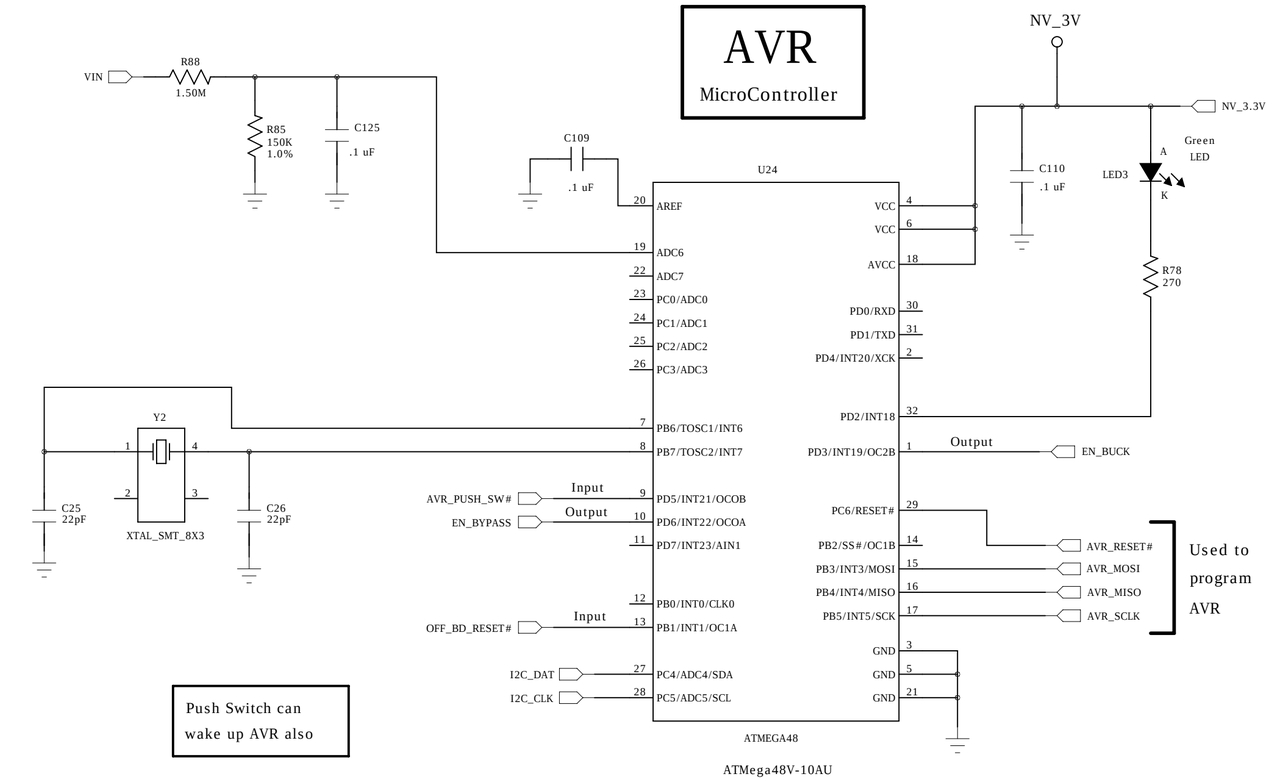
Two differential pairs 0-2V range

A/D Header



Technologic Systems		Nov. 3, 2010
Title: TS-8160 Analog		
Rev:	Designer	Sheet 8 of 10

AVR
MicroController

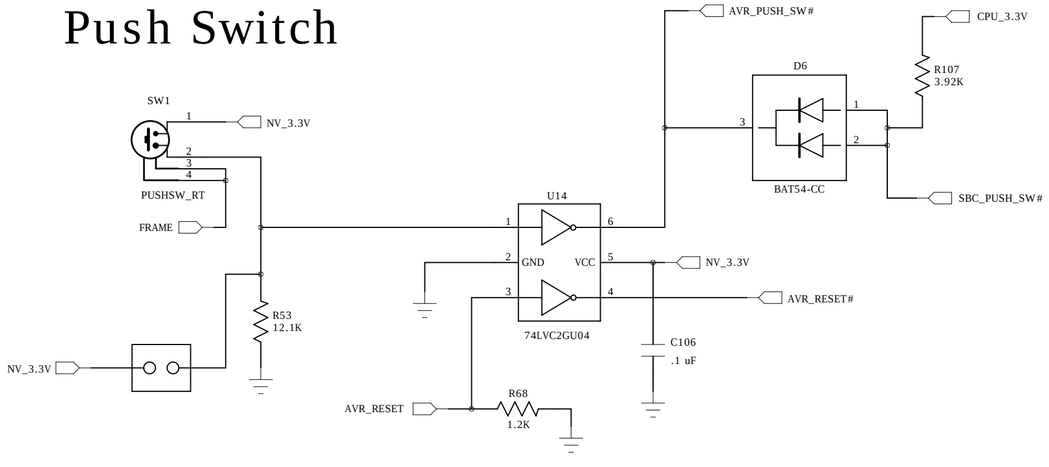


Drive EN_BYPASS and EN_BUCK low to go into Sleep mode

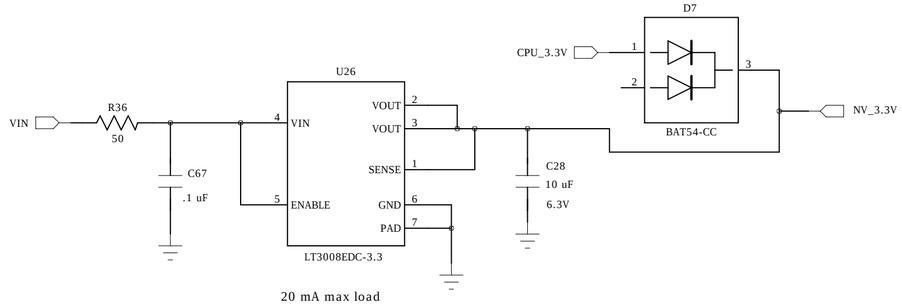
Current drain should be < 150 uA

Push Switch can wake up AVR also

Push Switch



NV 3.3V Regulator for AVR



20 mA max load

5 uA quiescent

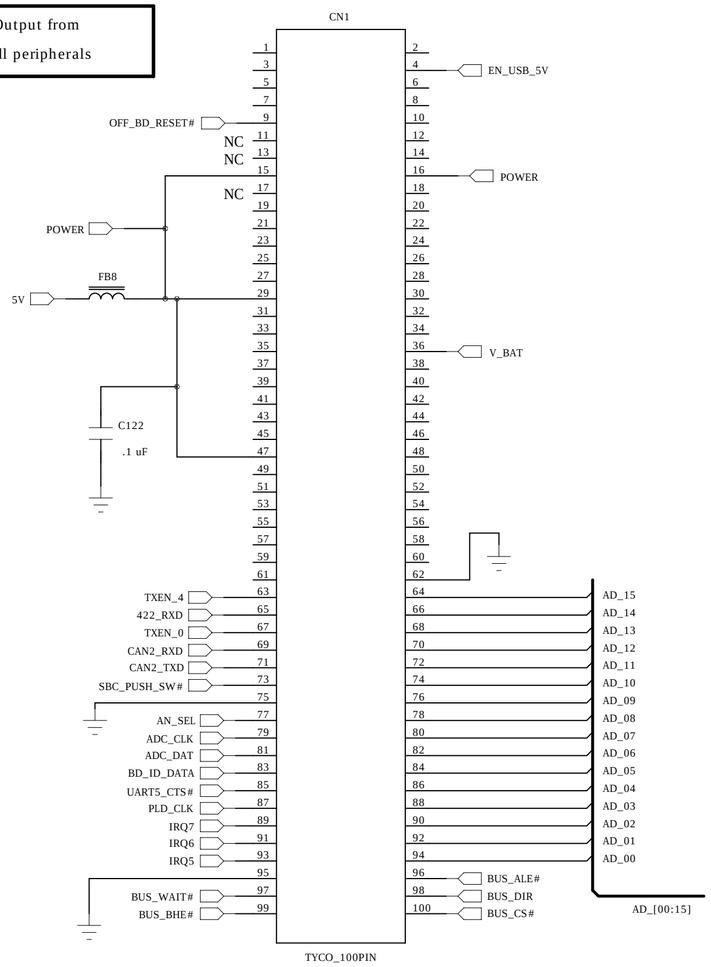
45V max Input

Technologic Systems		Nov. 3, 2010
Title: TS-8160 AVR and Push Switch		
Rev:	Designer	Sheet 9 of 10

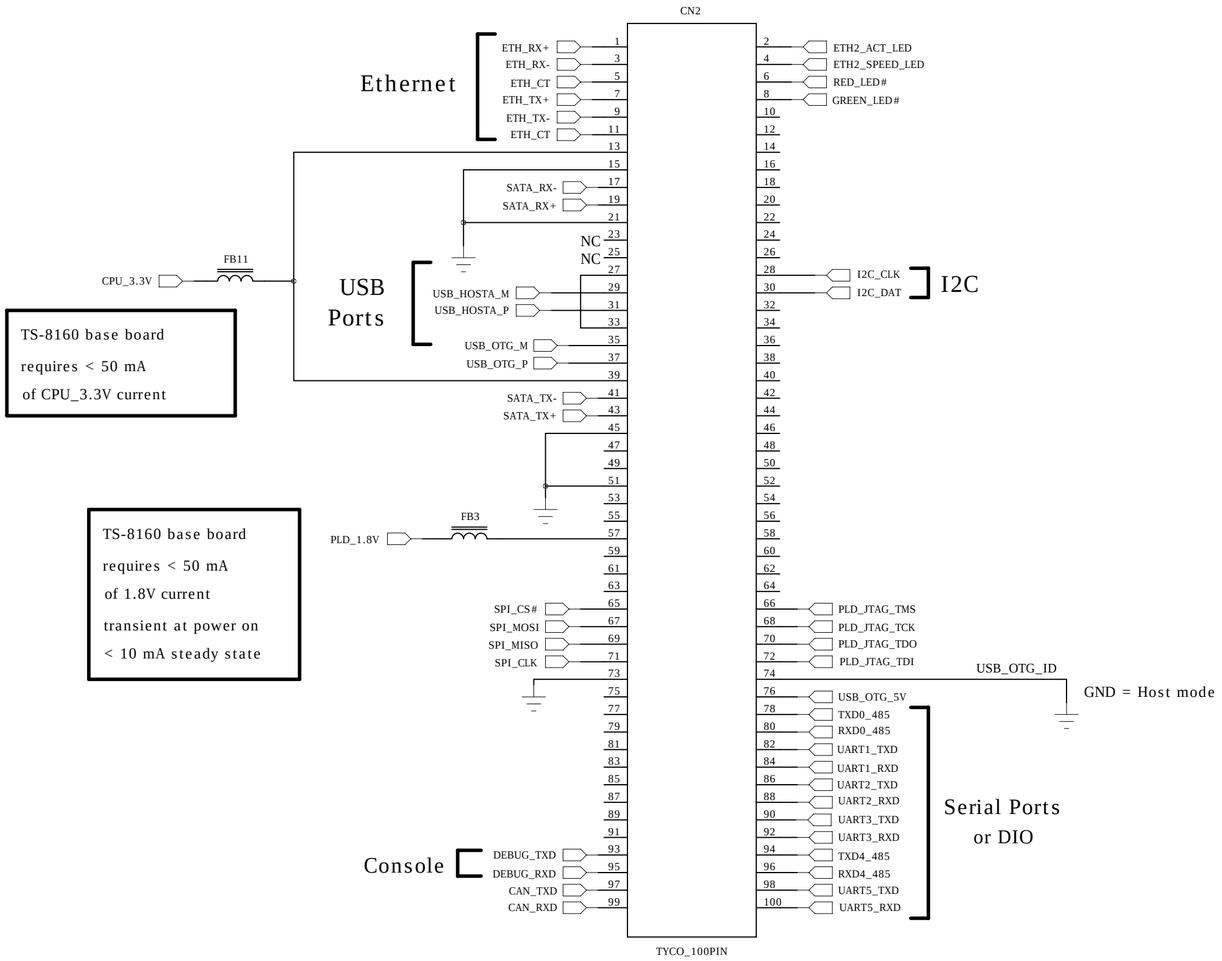
Two 100-pin Module Connectors

Left

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



Right



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

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