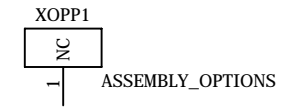


TS-7553-V2 Rev.D

Standard Options



| | | |
|----------|------------------|---|
| Option 1 | TS-7553-V2-SMN2I | NXP i.MX6UL 698MHz ARM A7, 512MB DDR3, 4GB eMMC, Relay, Nimbelinek/Xbee socket, (-40C to 85C) |
| Option 2 | TS-7553-V2-SMW3I | NXP i.MX6UL 698MHz ARM A7, 512MB DDR3, 4GB eMMC, Relay, Nimbelinek/Xbee Socket, FRAM, LCD/Keypad, WiFi/Bluetooth (-40C to 85C) |
| Option 3 | TS-7553-V2-SMW5I | NXP i.MX6UL 698MHz ARM A7, 512MB DDR3, 4GB eMMC, Relay, Nimbelinek/Xbee Socket, FRAM, Gyro, TS-SILO, LCD/Keypad, WiFi/Bluetooth (-40C to 85C) |
| Option 4 | TS-7553-V2-SMW7I | NXP i.MX6UL 698MHz ARM A7, 512MB DDR3, 4GB eMMC, Relay, Nimbelinek/Xbee Socket, FRAM, Gyro, TS-SILO, LCD/Keypad, WiFi/Bluetooth (-40C to 85C) |

Based on NXP i.MX6UL CPU

LCD and Keypad Option:

Included Only on xxx3x, xxx5x, & xxx7x Standard Options

Add: CN1, CN2, and HD4

WiFi/Bluetooth Option

w/ Chip Antenna

U.FL available on request

Included Only on xxx3x, xxx5x & xxx7x Standard Options

ADD: X1 and K2 (chip antenna)

(alternate: U.FL antenna connector)

Gyro-Accelerometer Option

Included Only on xxx7x Standard Option

Add: U18

TS-SILO Option:

Super Cap Hold Up

Included Only on xxx5x & xxx7x Standard Options

Add: U9, U16, L3, L5, D3, C98 and C99

FRAM Option

Included Only on xxx3x, xxx5x, & xxx7x Standard Options

Add: U8

Web Schematic: Some proprietary information has been withheld.

| | | |
|---------------------|----------|---------------|
| Technologic Systems | Date | Oct. 11, 2017 |
| Title: TS-7553-V2 | | |
| Rev: D | Designer | Sheet 1 of 23 |

Console = UART 1
RS-485 = UART 2
BlueTooth = UART 3
RS-232 = UART 4, 5, 6
HD1 = UART 7
XBEE = UART 8

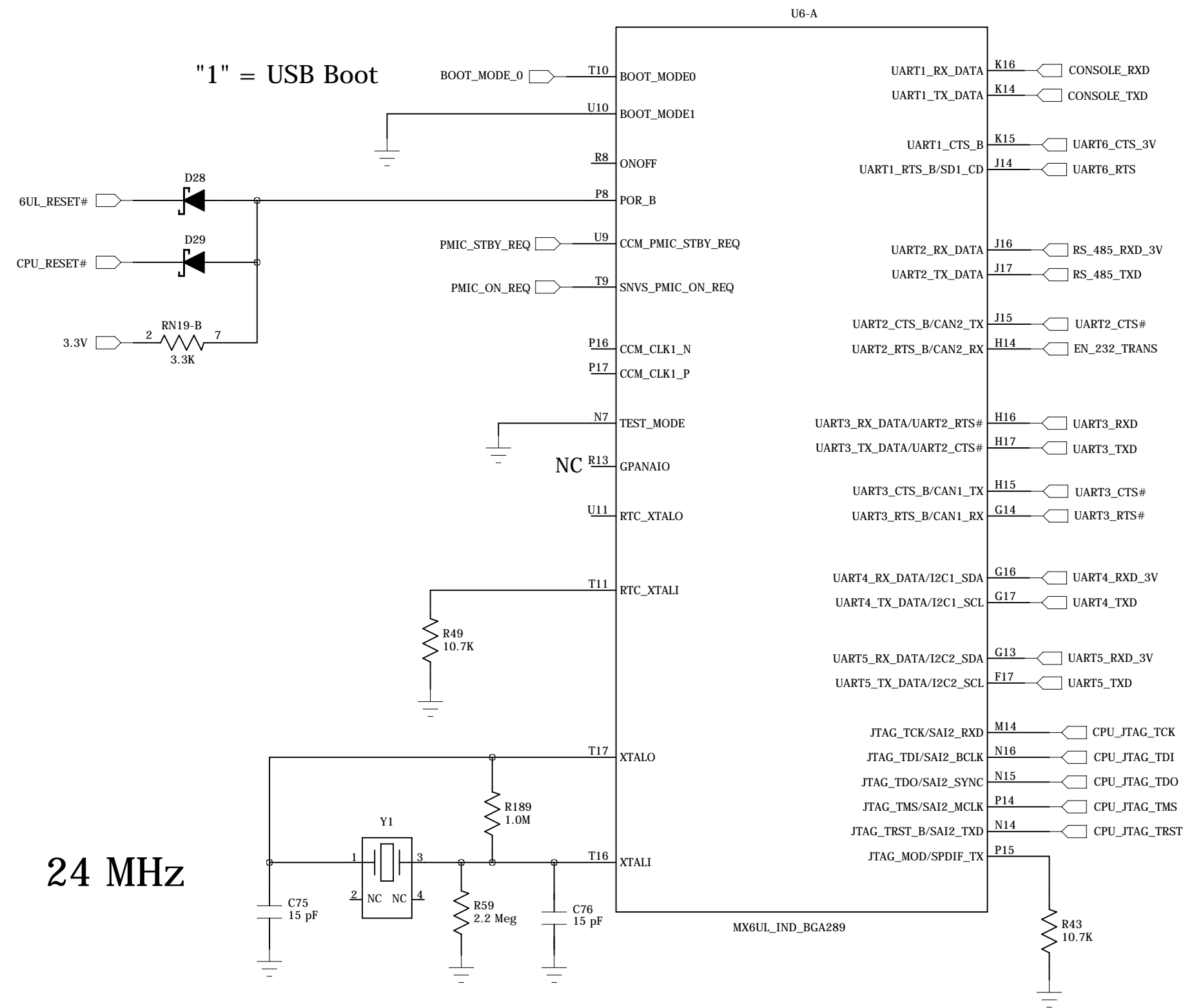
Rev.B to Rev.C Changes:

Remove external 32 KHz clock to 6UL pin T11
Add ferrite bead to 6UL core and 3.3V rails
Add 485 to COM header
USB MUX (U10, U11) powered via USB 5V
CAN Enable connected to DIO
FB18 and FB19 changed to 5A
Separate 6UL 3.3V power
Added support to switch power to eMMC
Change to new 32 KHz Osc. for BlueTooth
Add SPI FRAM
BlueTooth CTS and RTS swapped
Add common mode choke to power Input
Add GND on touch cable

Rev.C to Rev.D Changes:

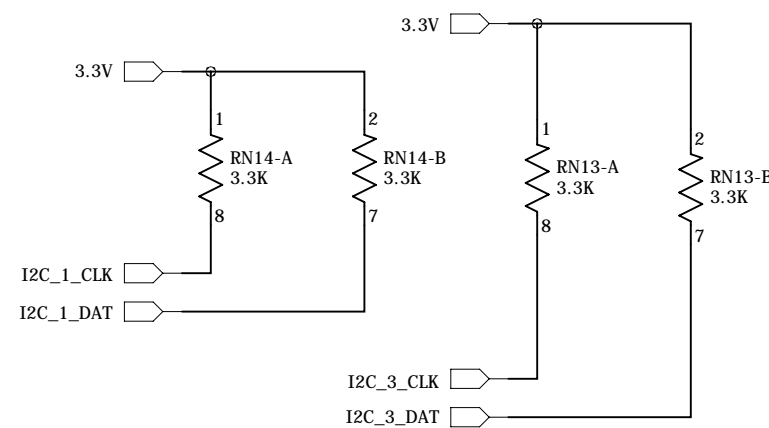
Gyro (U18) changed to use DIO for I2C - conflict avoided
Added FETs (Q19) to Xbee socket (CN5) USB bus
USB Hub was holding CN5 pin 8 low (800 mV)
Some Xbee radios would not work
C43 changed to 1000 pF - makes 5V Reg quieter
eMMC 3.3V now switched using U31 - pulls rail low
eMMC 3.3V not going low enough
R51 changed to 4.99K - allows lower charge current
Added C133 = 10 uF - not enough C after FB5
we saw huge ripple (800 mV)

6UL UART and Control

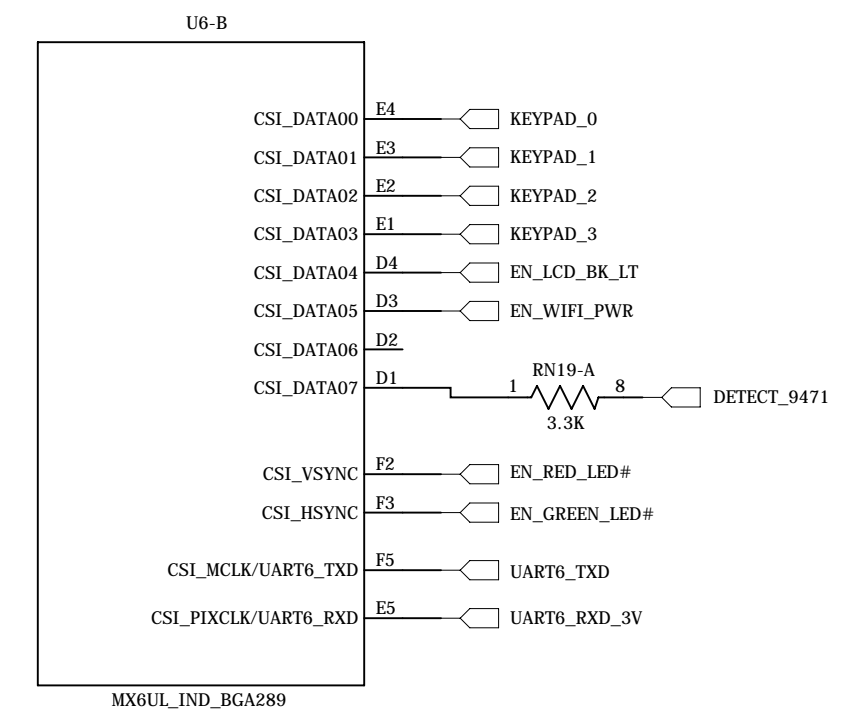


24 MHz

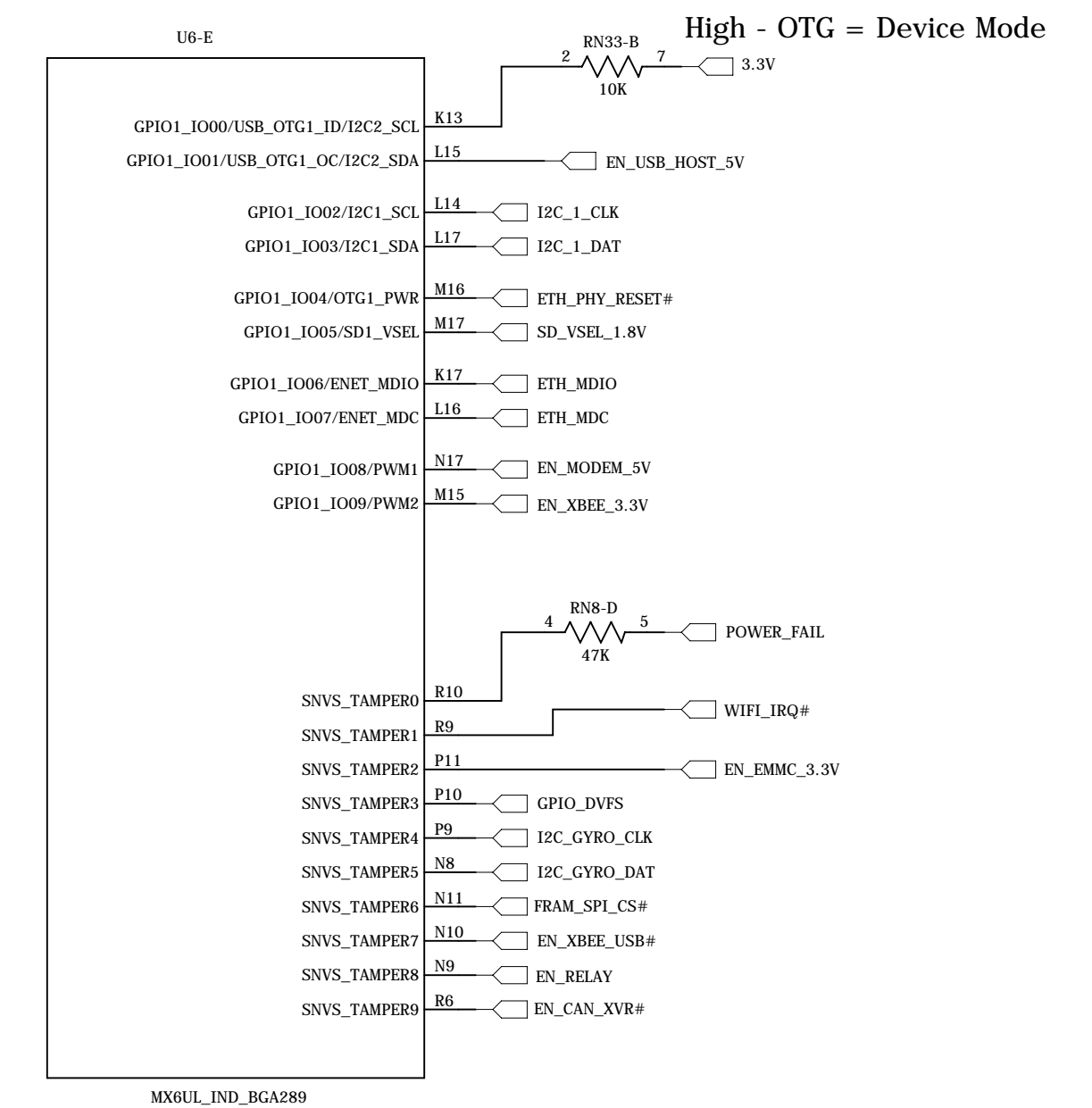
I2C PU Res.



6UL Camera

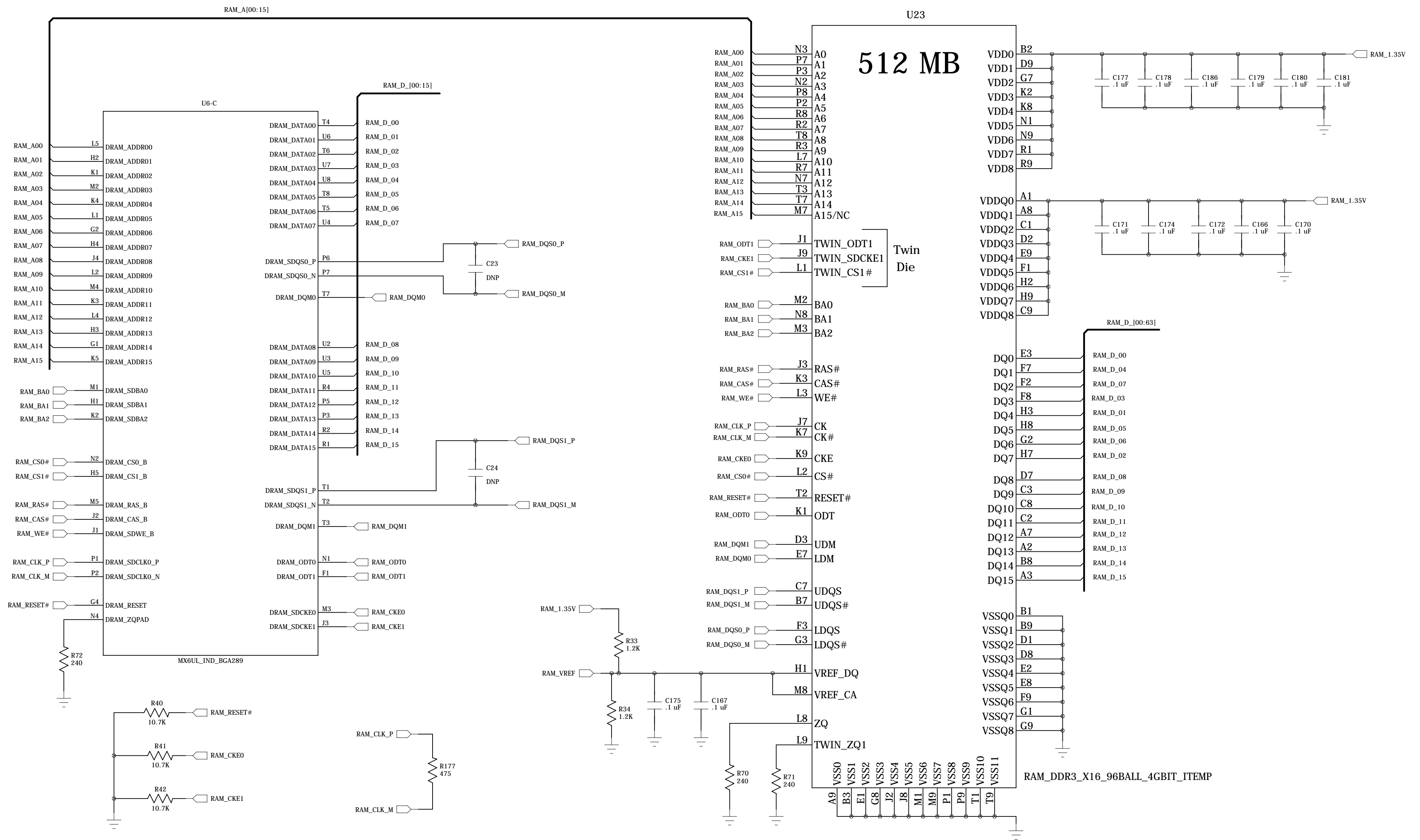


6UL DIO

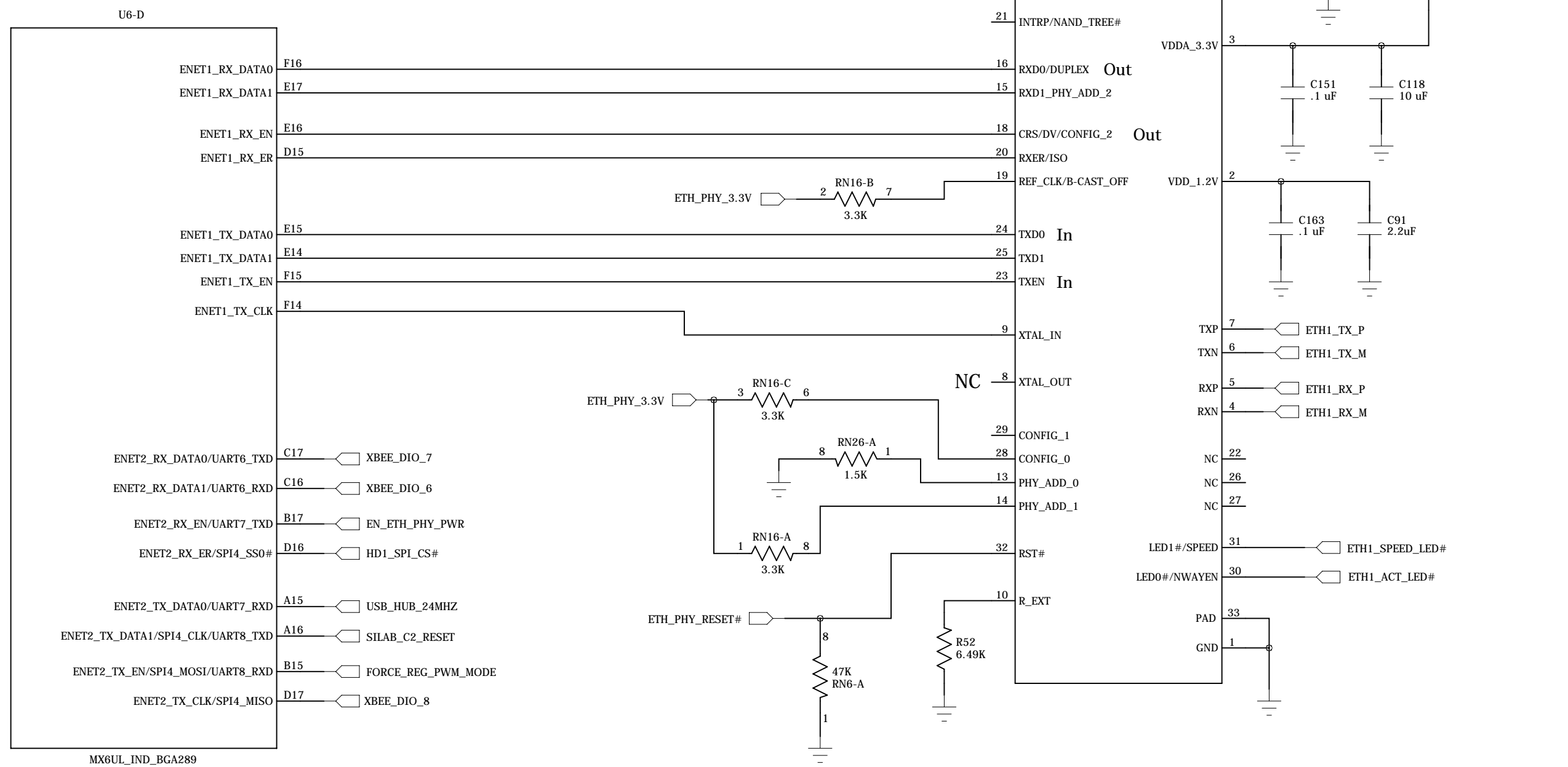


6UL RAM Interface

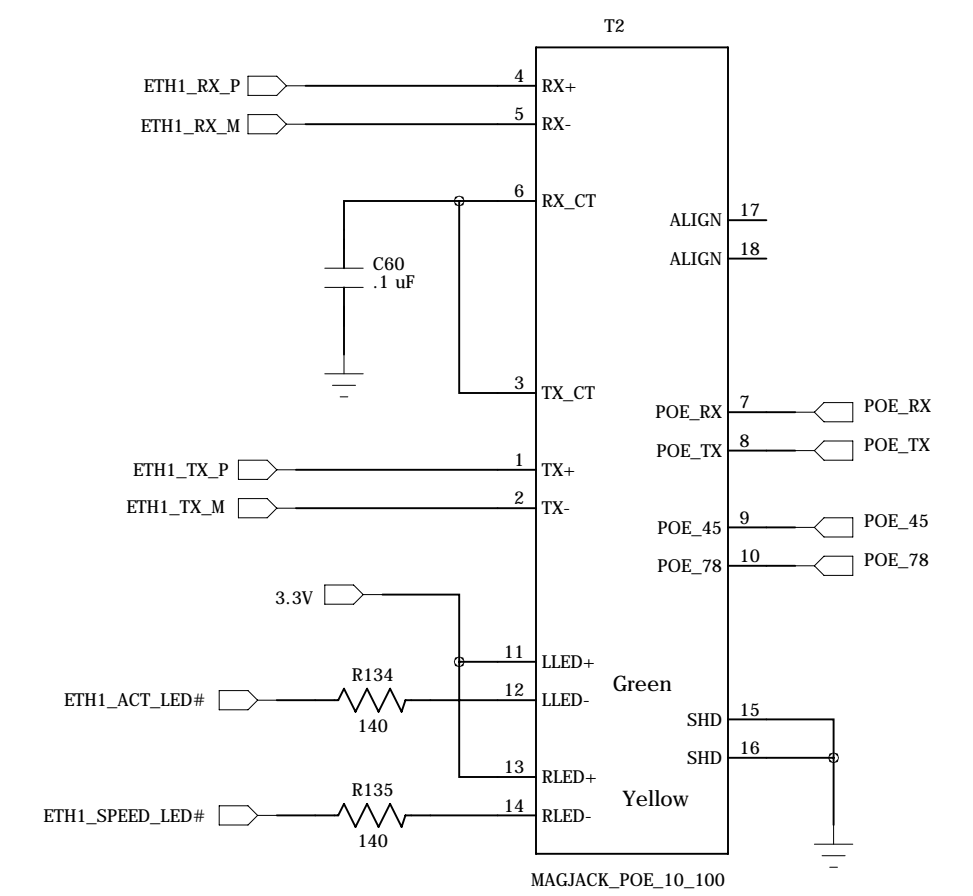
DDR3 RAM



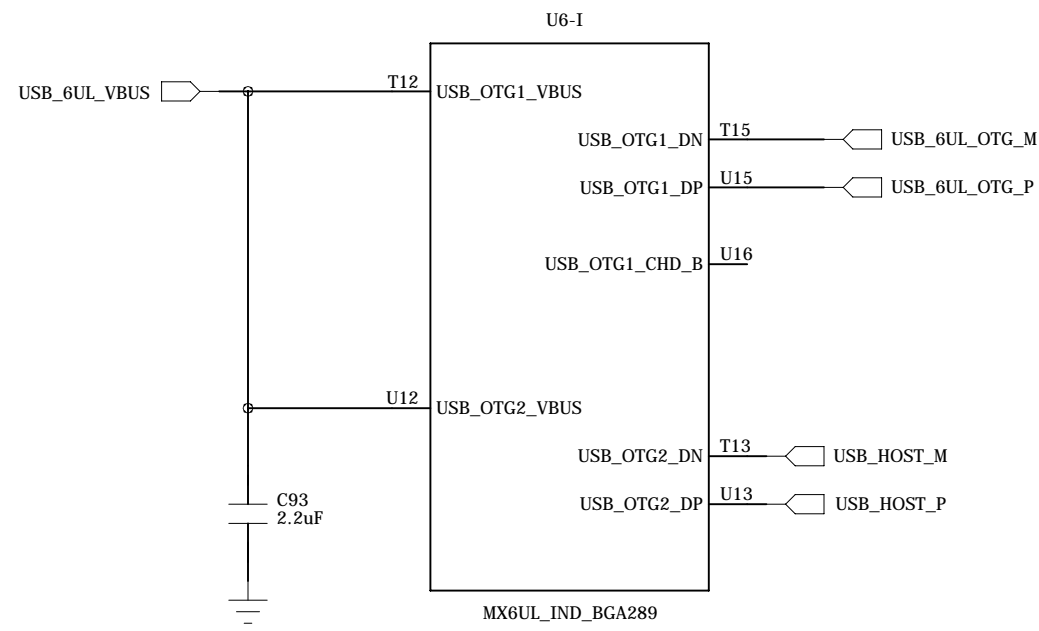
6UL Ethernet



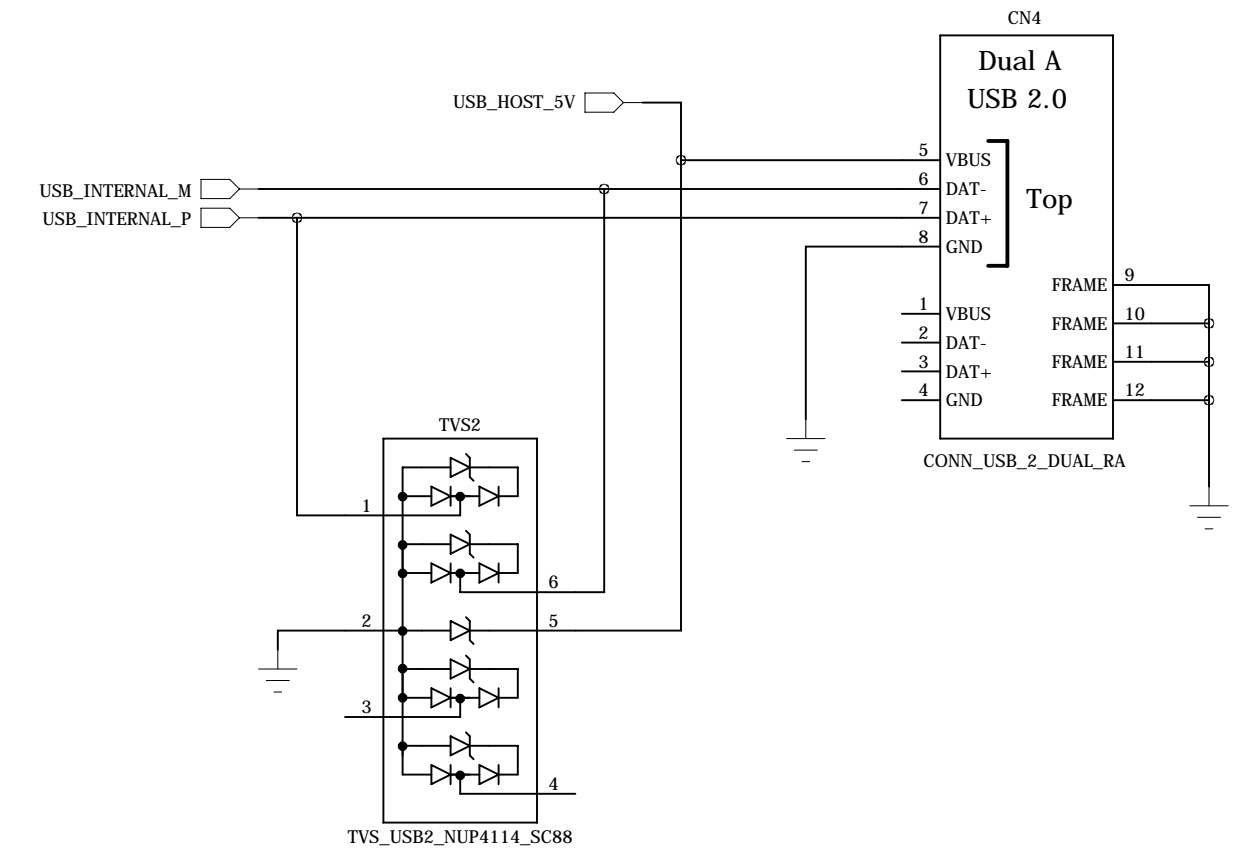
10/100 MagJack



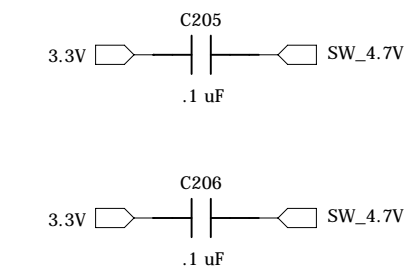
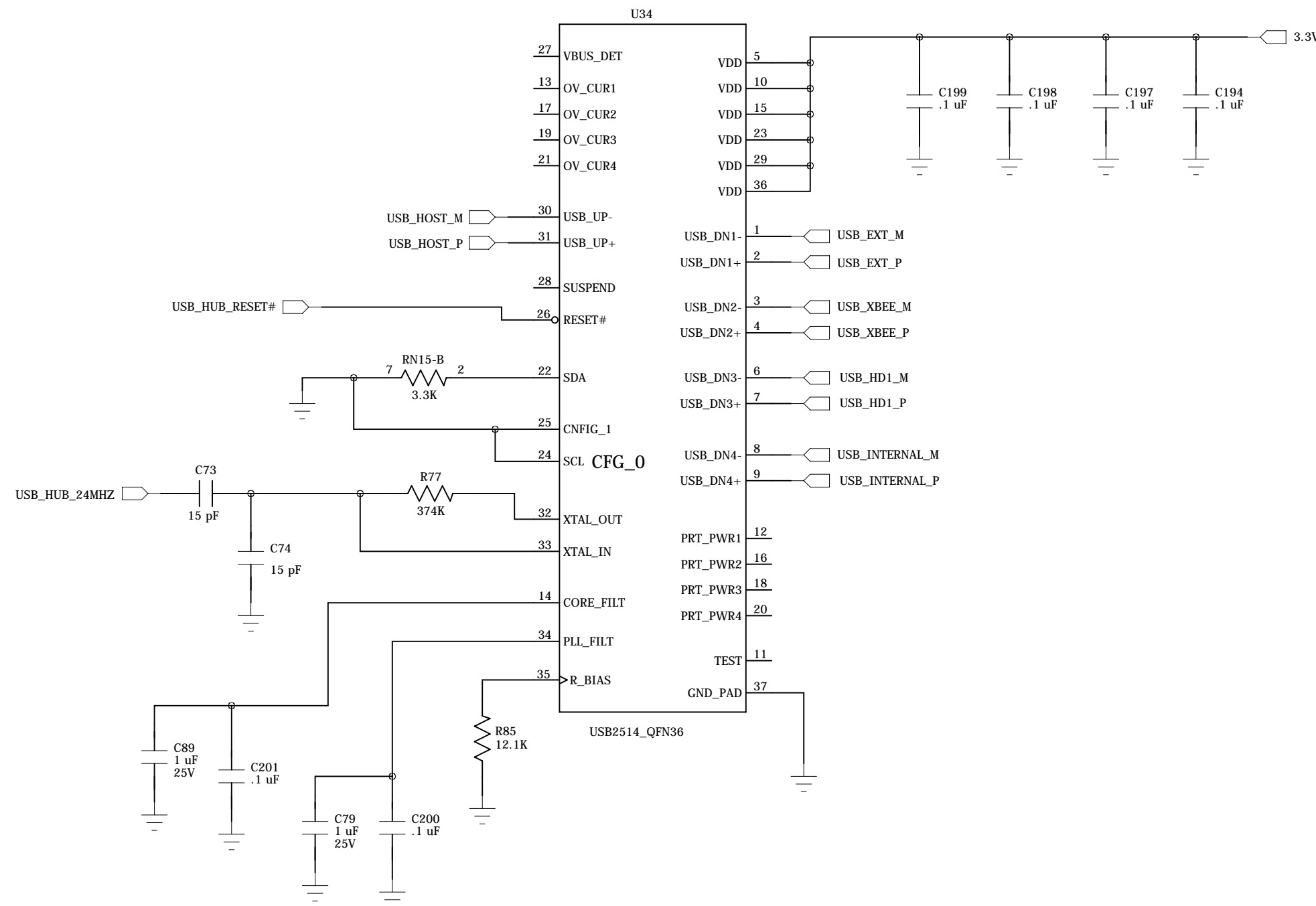
6UL USB Ports



Internal Host USB

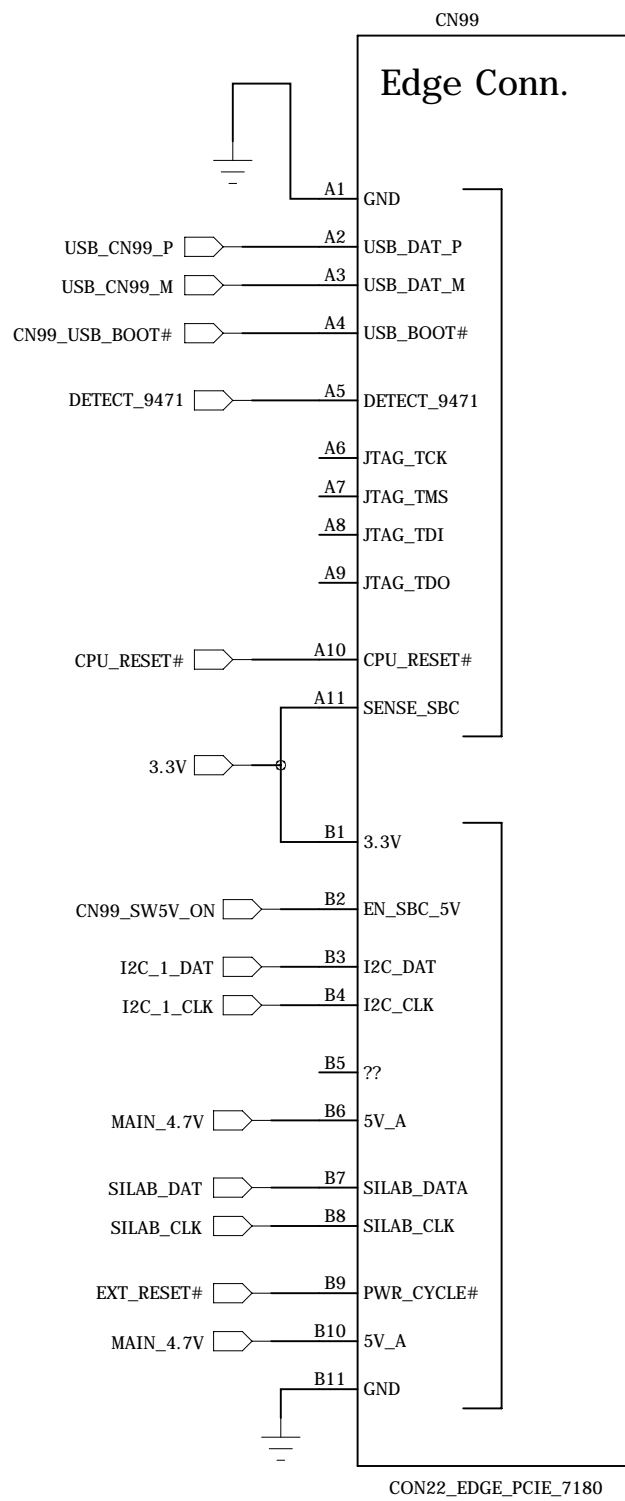


SMSC USB Hub

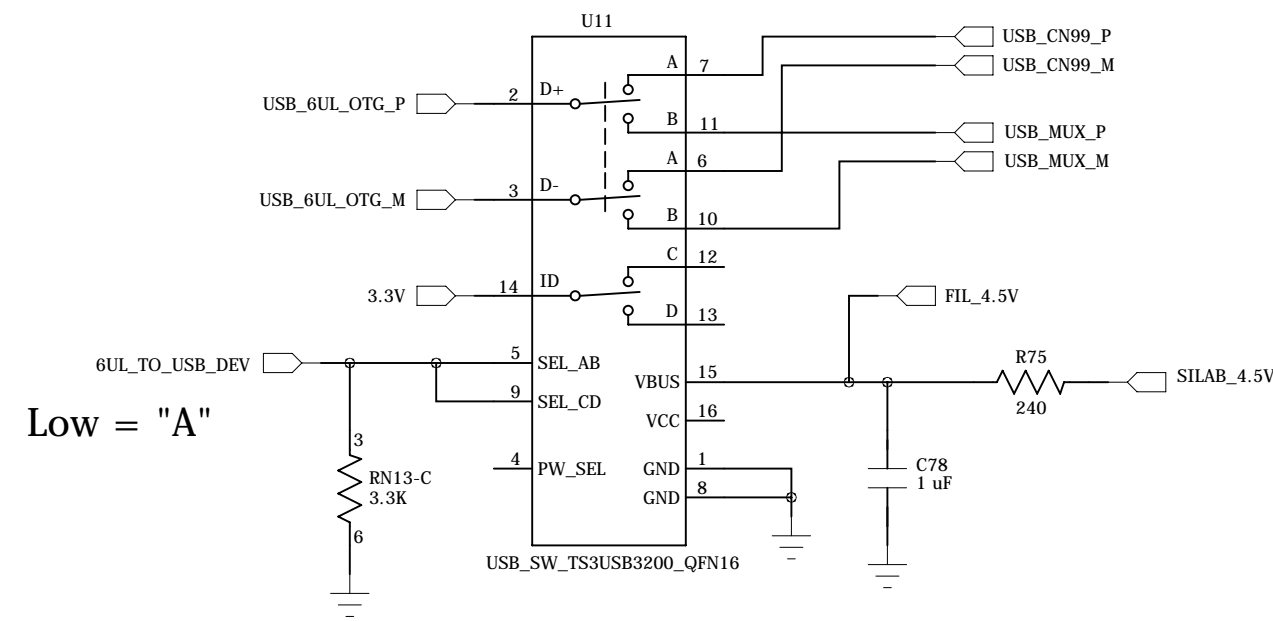


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|---------------------|--------------------|
| Technologic Systems | Date Oct. 11, 2017 |
| Title: TS-7553-V2 | |
| Rev: D | Designer |
| Sheet 9 of 23 | |

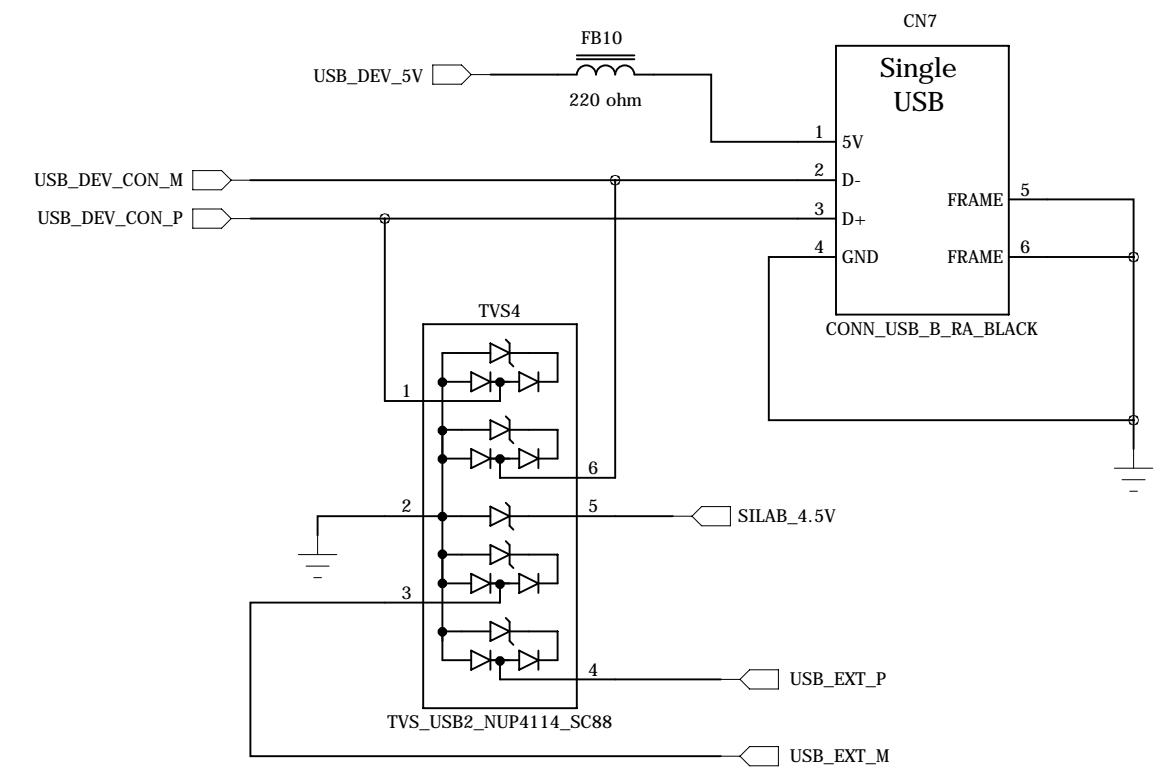
CN99 Factory Test



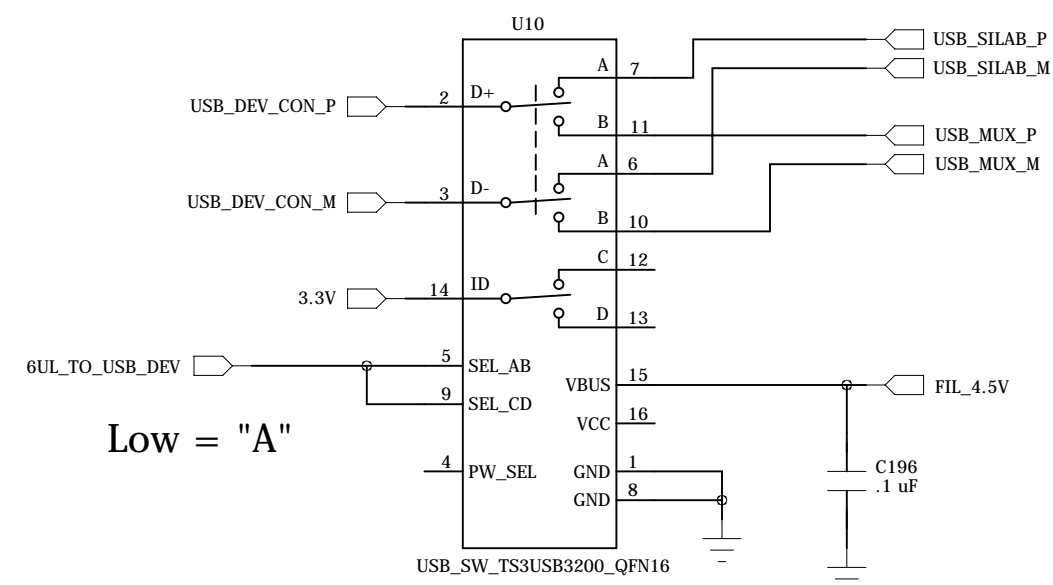
6UL OTG MUX To Dev Conn or CN99



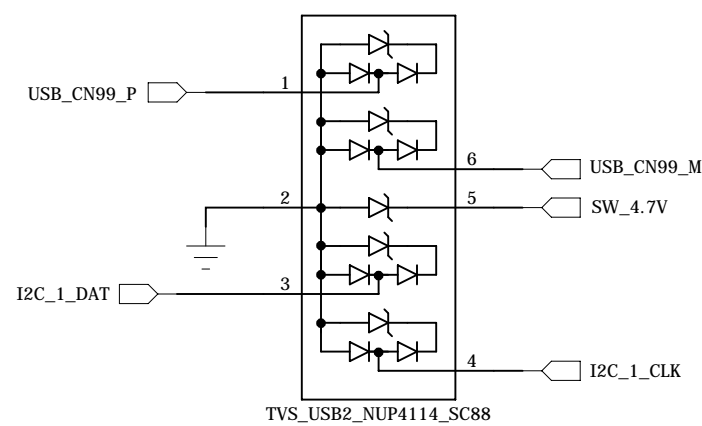
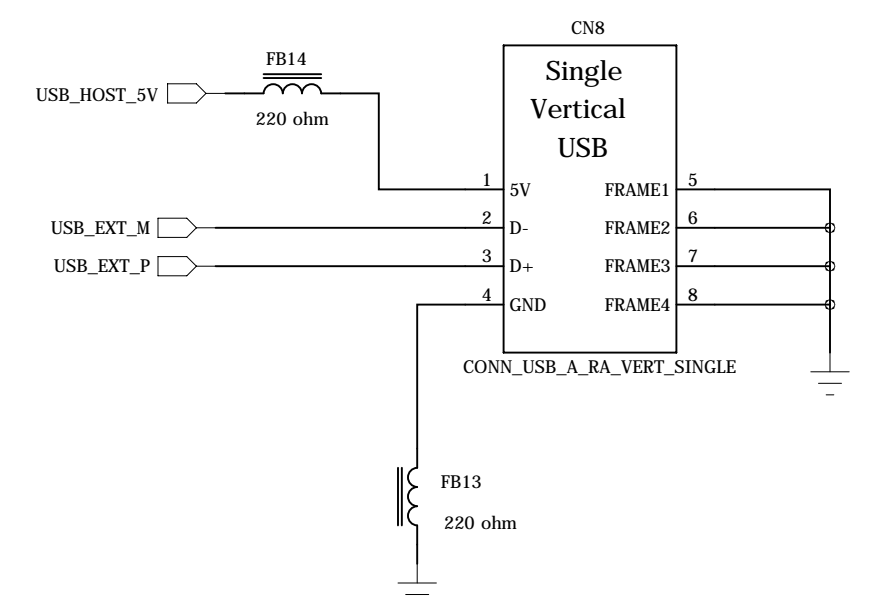
USB Device



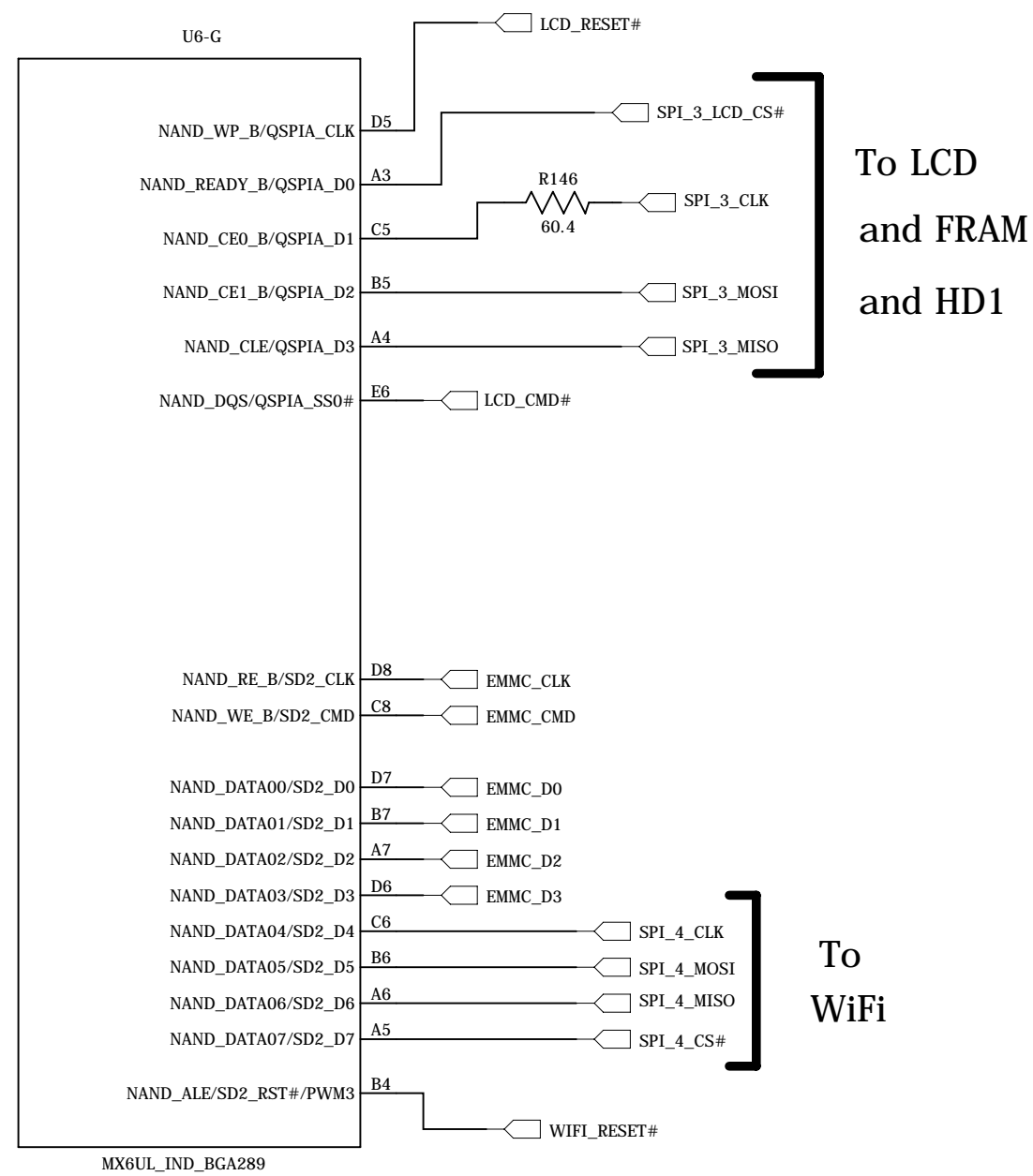
USB Dev Conn MUX To SiLab or 6UL



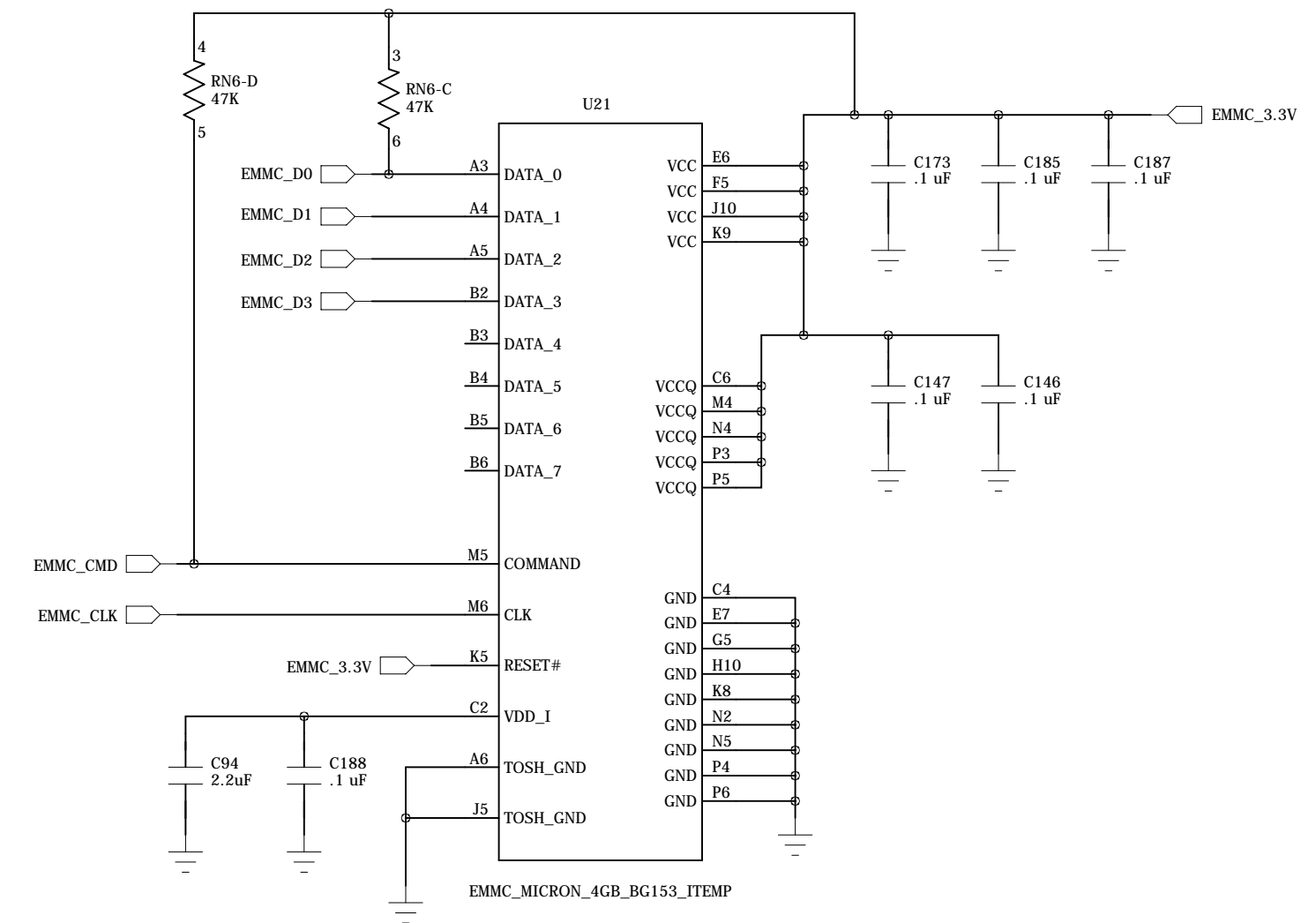
Ext. Host USB



6UL Flash

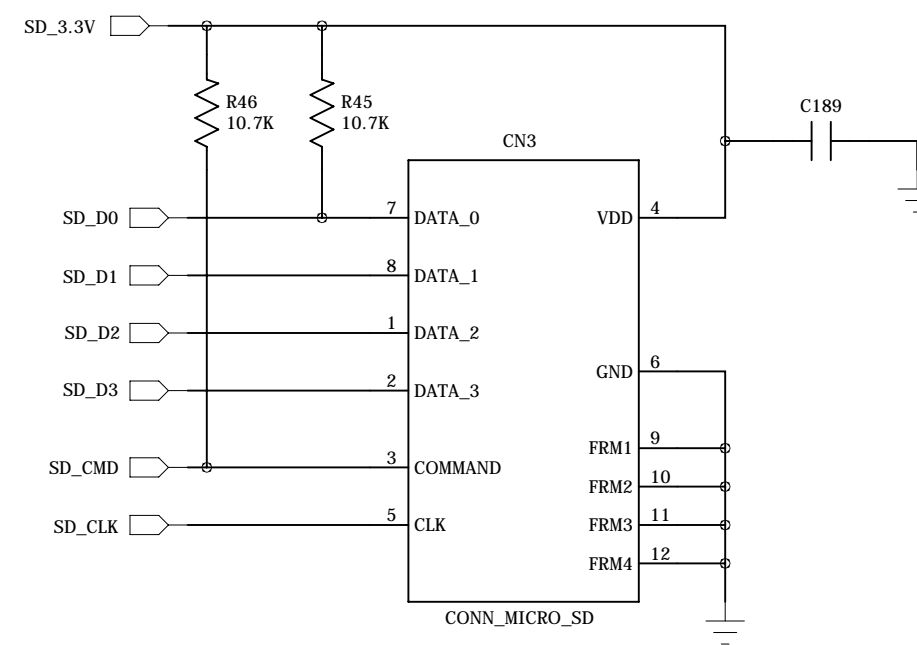
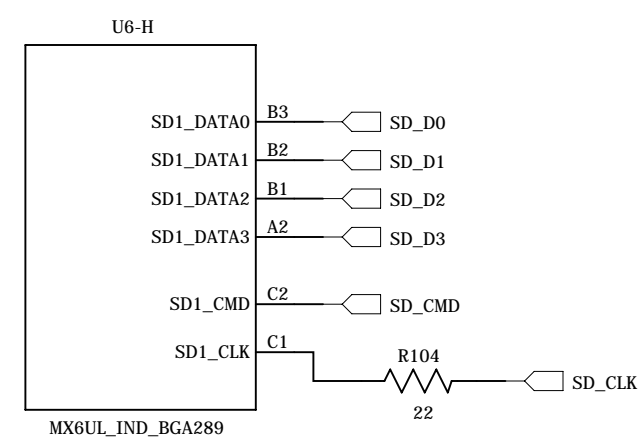


eMMC 4GB Optionally up to 64GB



Micro SD Card Socket

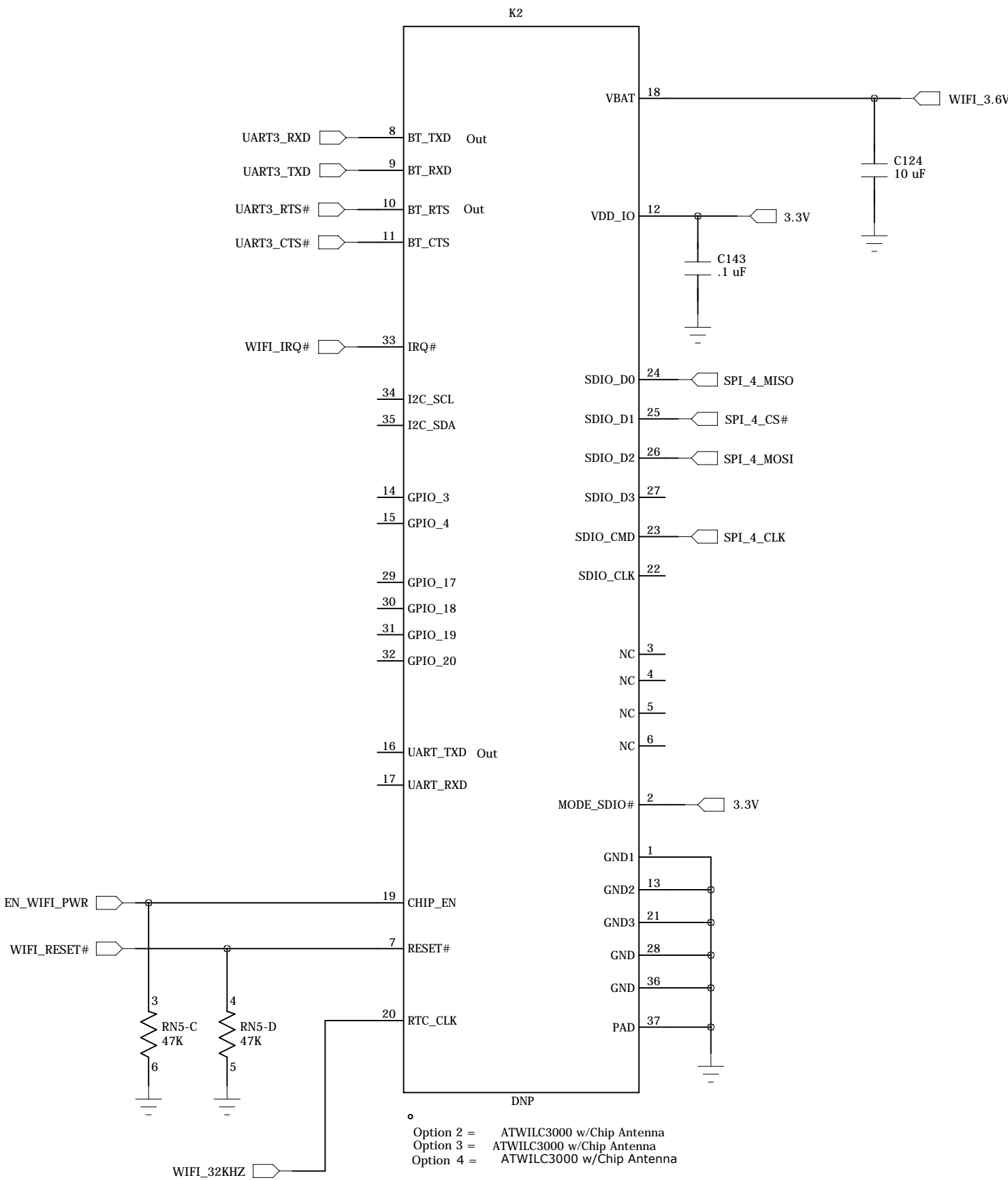
6UL SDIO



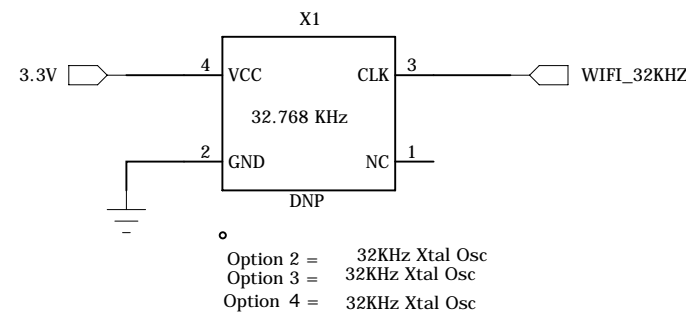
| | |
|---------------------|--------------------|
| Technologic Systems | Date Oct. 11, 2017 |
| Title: TS-7553-V2 | |
| Rev: D | Designer |
| Sheet 11 of 23 | |

WiFi / Bluetooth Radio

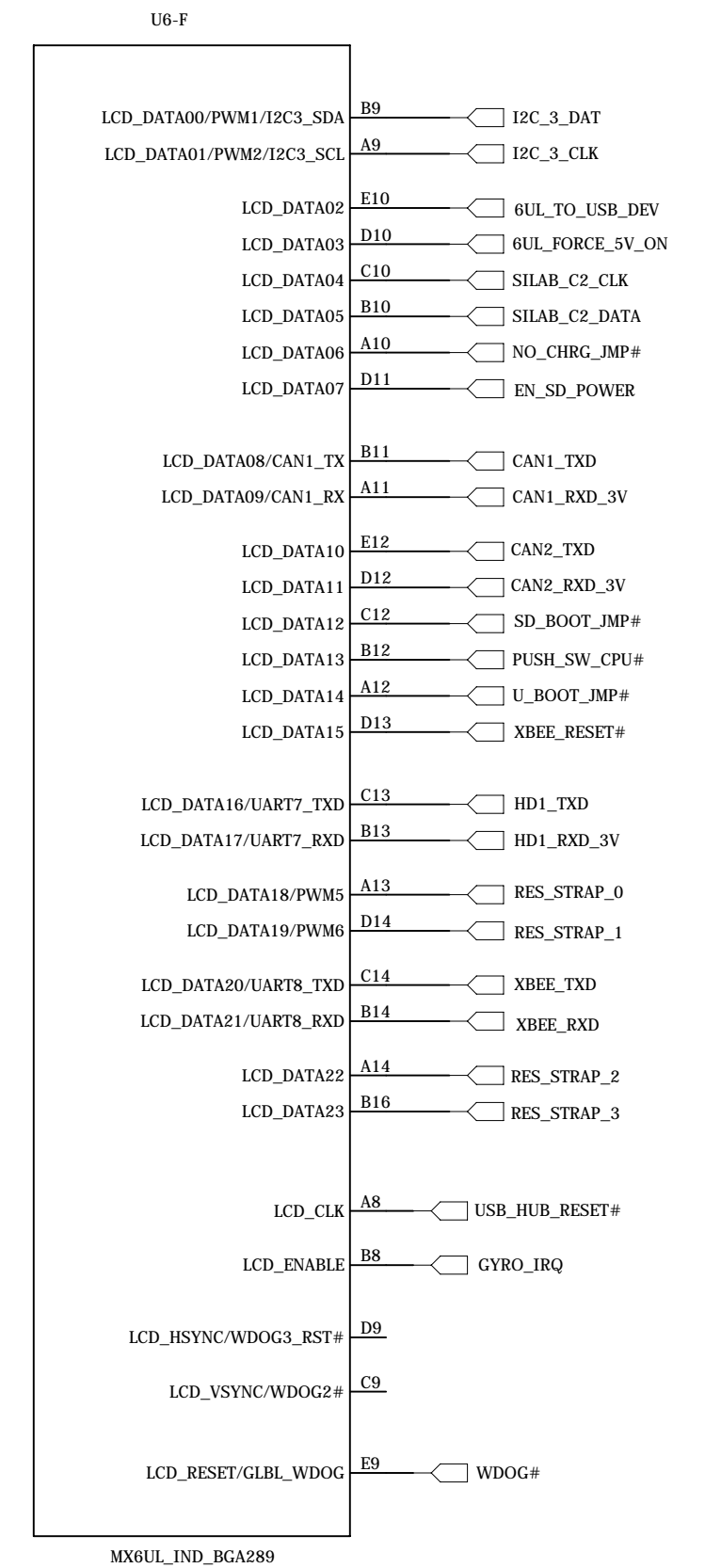
Console = UART 1
 RS-485 = UART 2
 BlueTooth = UART 3
 RS-232 = UART 4, 5, 6
 HD1 = UART 7
 XBEE = UART 8



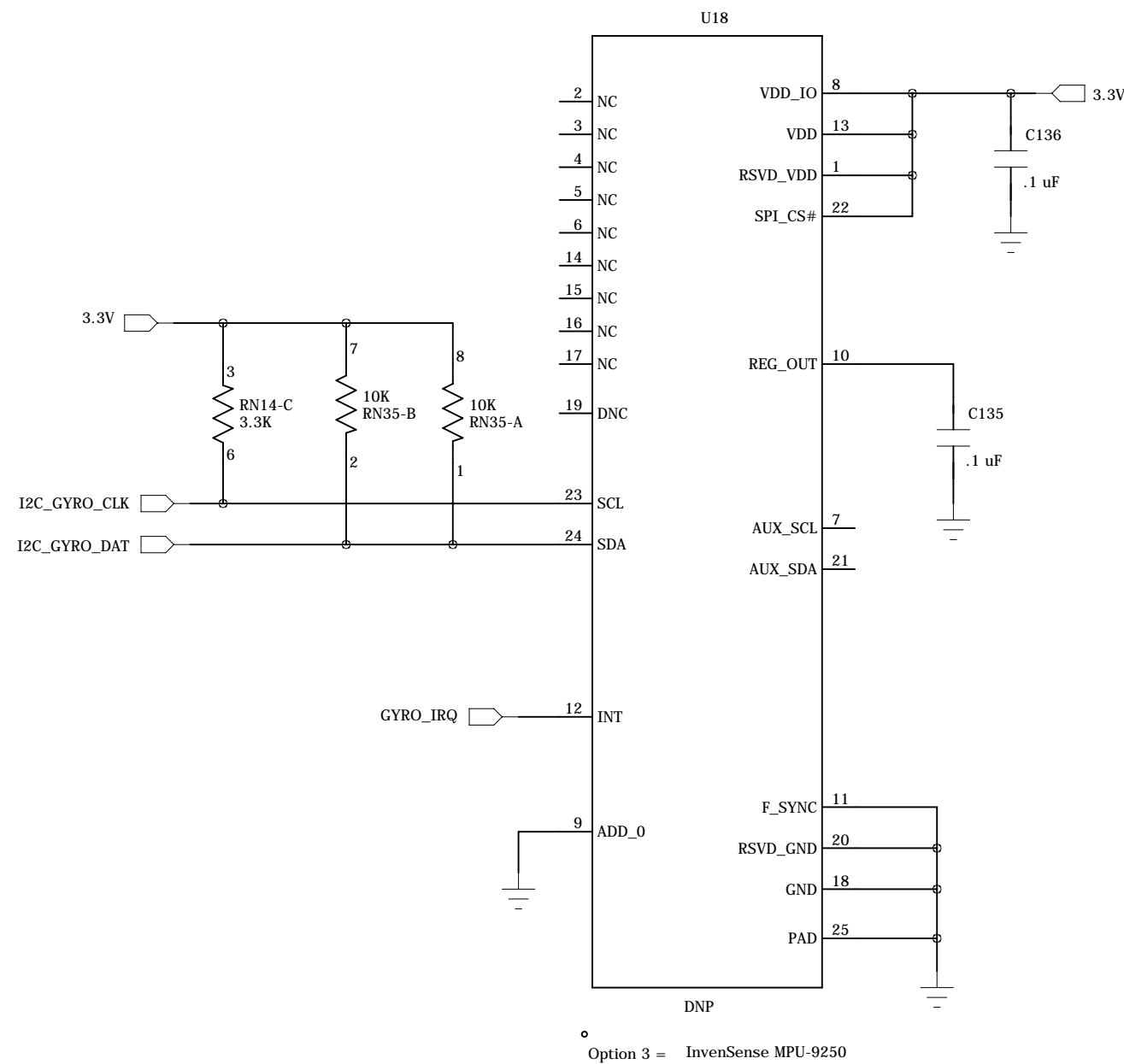
BlueTooth 32KHz Osc.



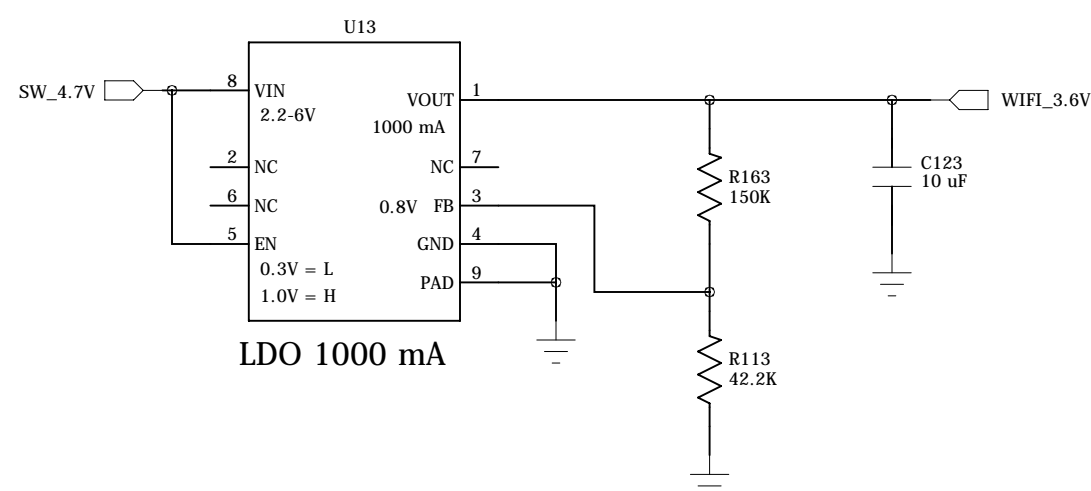
6UL LCD



Gyro-Accelerometer Included only on xxx7x Standard Option

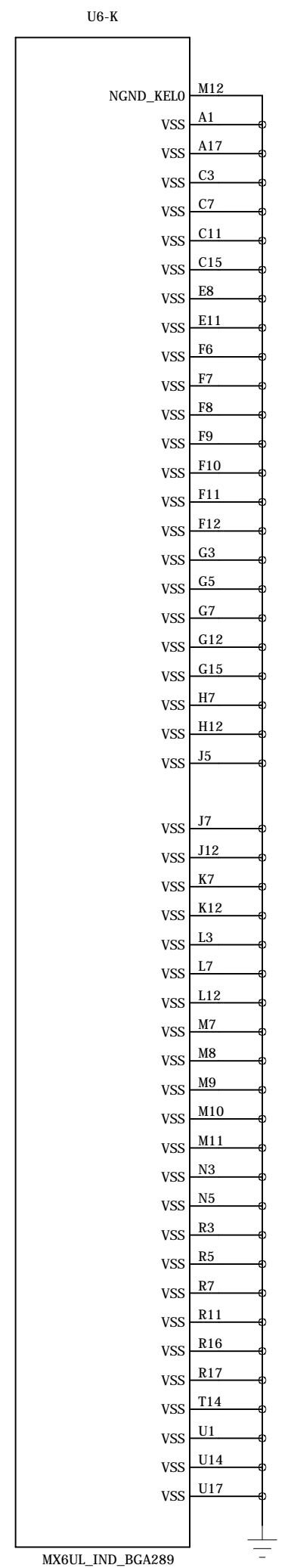
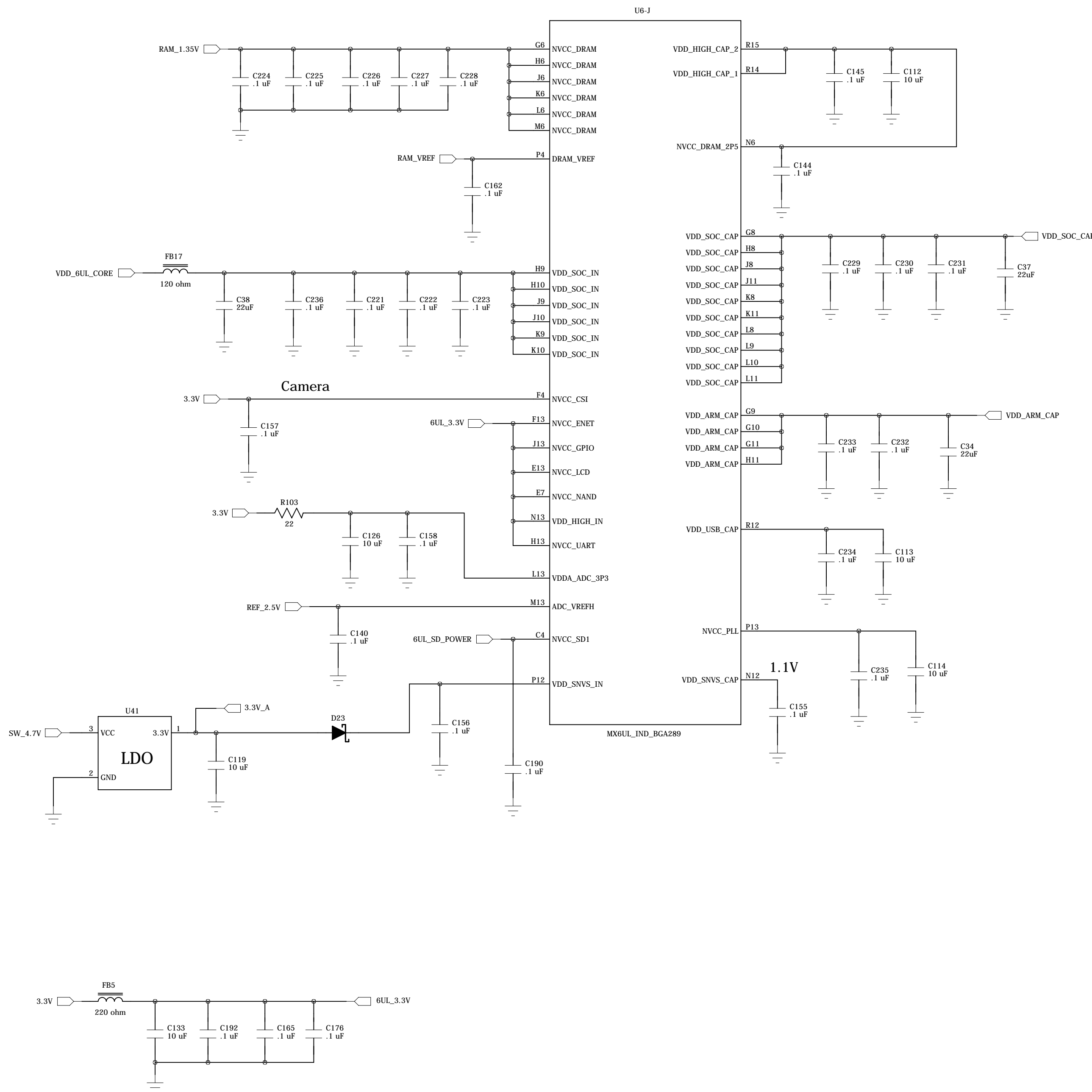


WiFi 3.6V Reg.



6UL Power

6UL GND



SD Card 1A Reg
1.8V or 3.2V

3.3V --> 6UL_SD_POWER

3.3V 2A Reg #1

SW_4.7V --> 3.3V

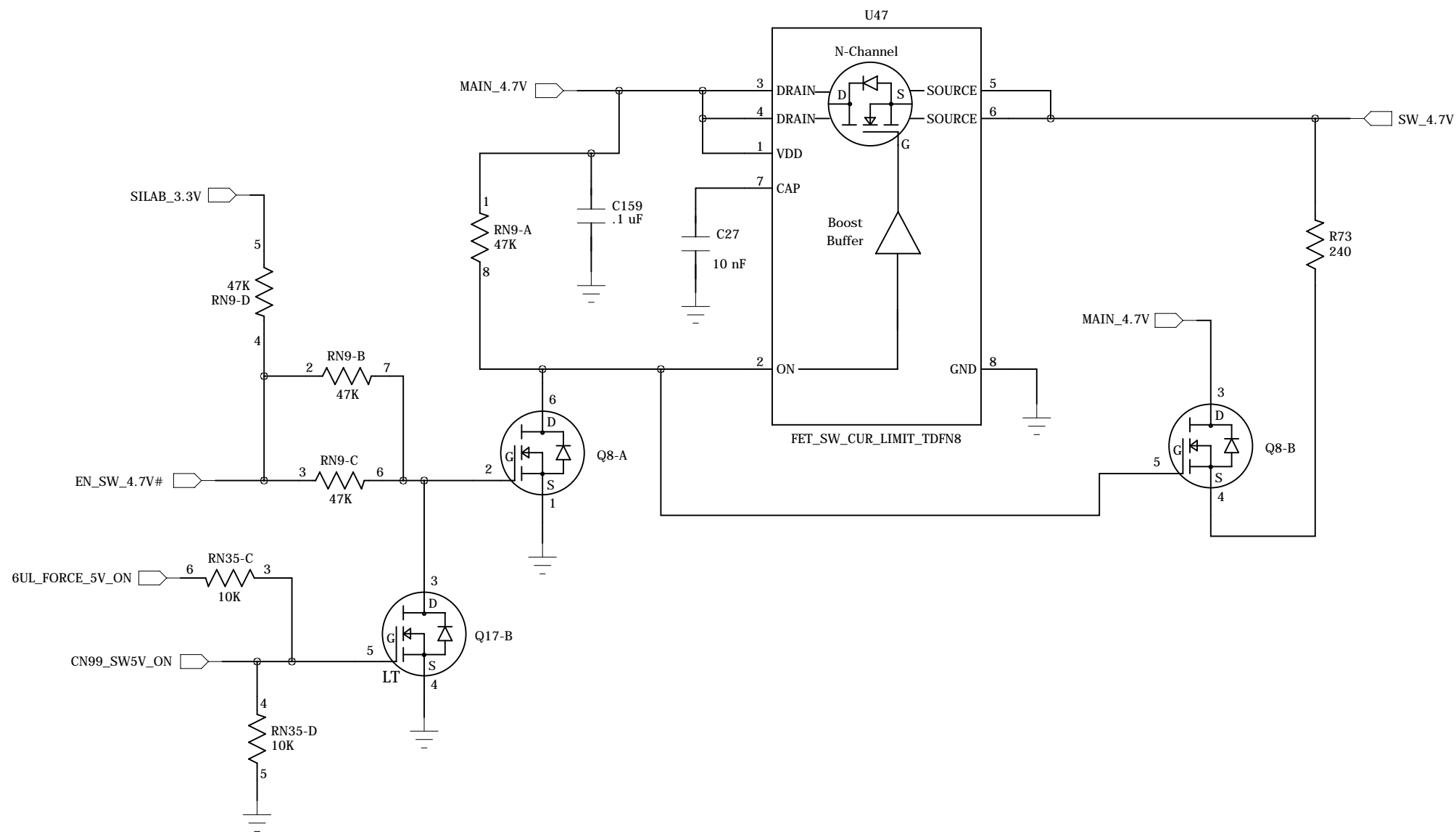
CPU Core 1A Reg #2

SW_4.7V --> DCC_6UL_CORE

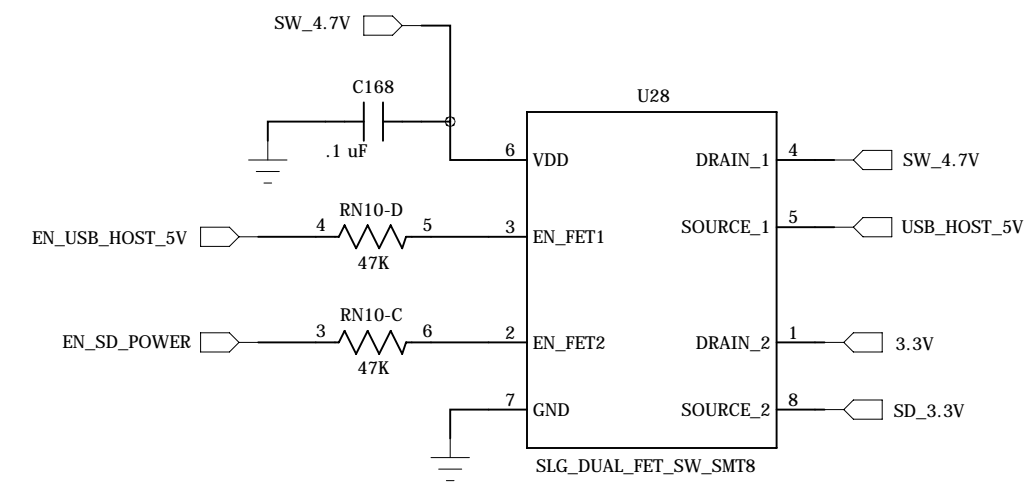
RAM 1.35V 1A Reg #2

SW_4.7V --> RAM_1.35V

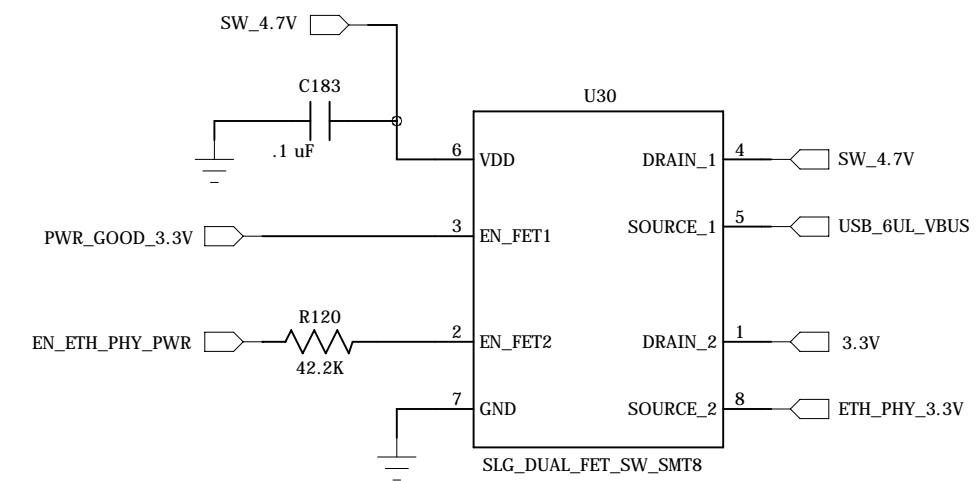
Main 5V Power Sw.



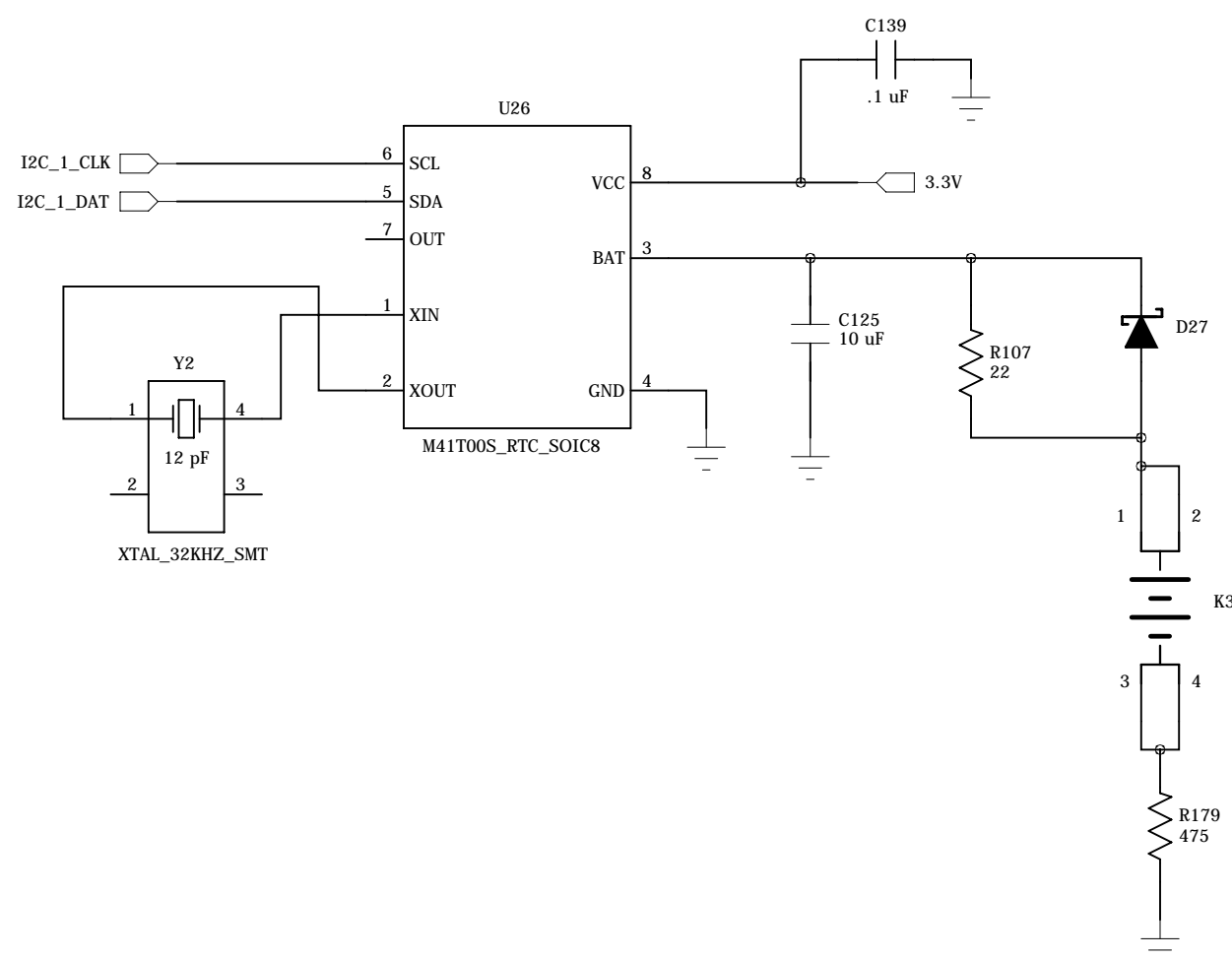
USB Host 5V and SD Card Power Sw.



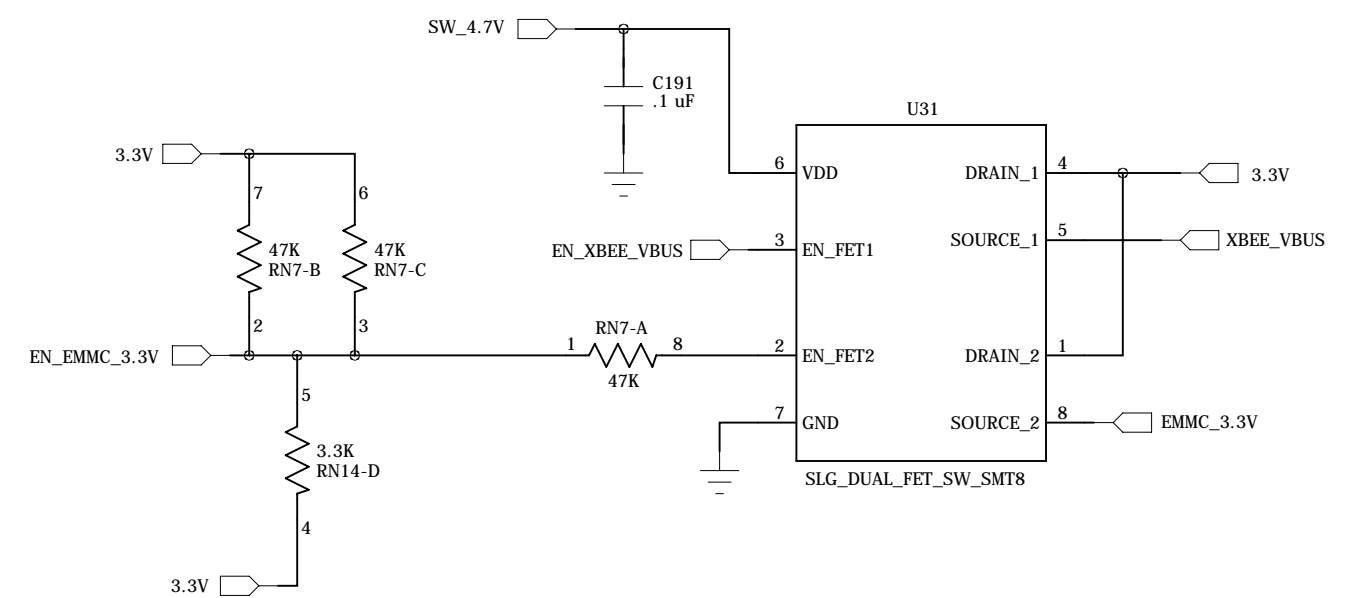
USB VBus and Eth Power Sw.



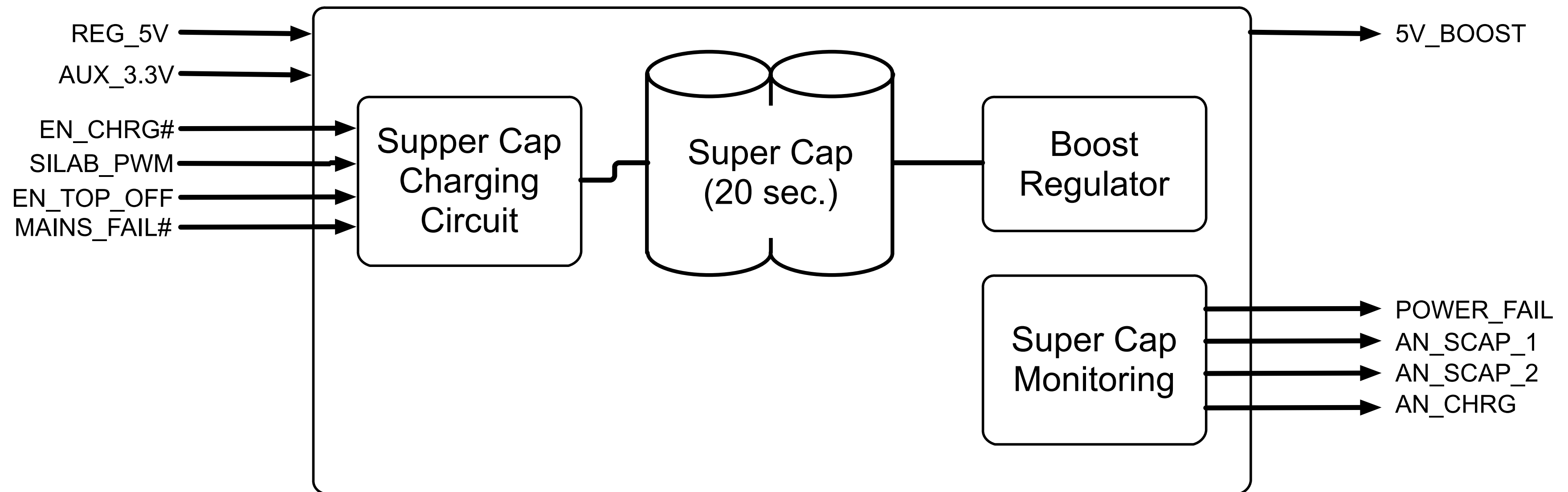
ST Micro RTC



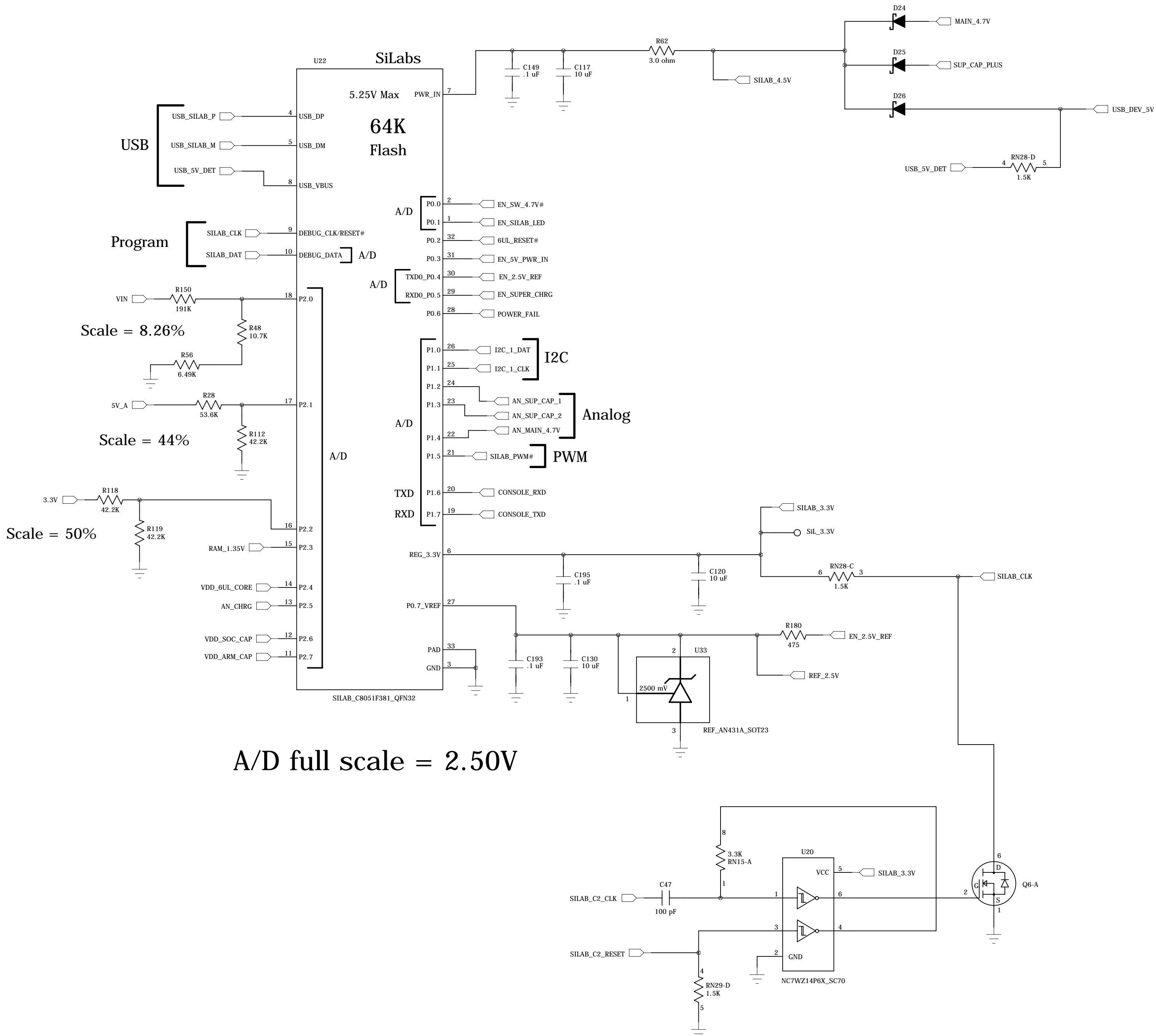
eMMC Power Sw.



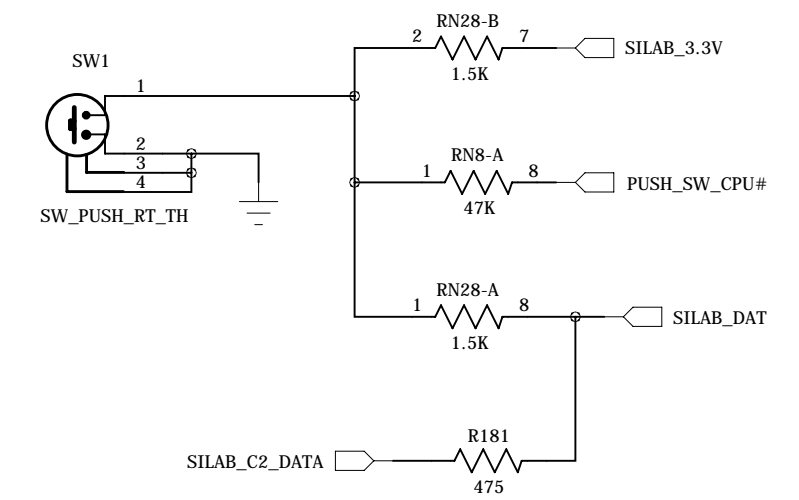
TS-SILO SuperCap 20 Second Power Hold



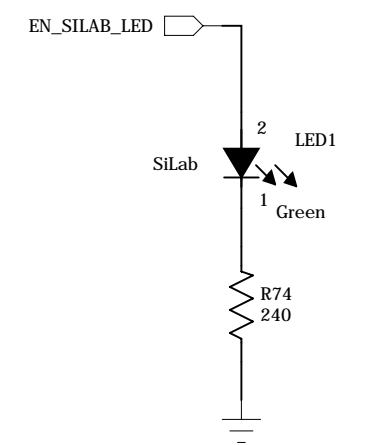
USB Device Port and SiLab uC



Push Switch



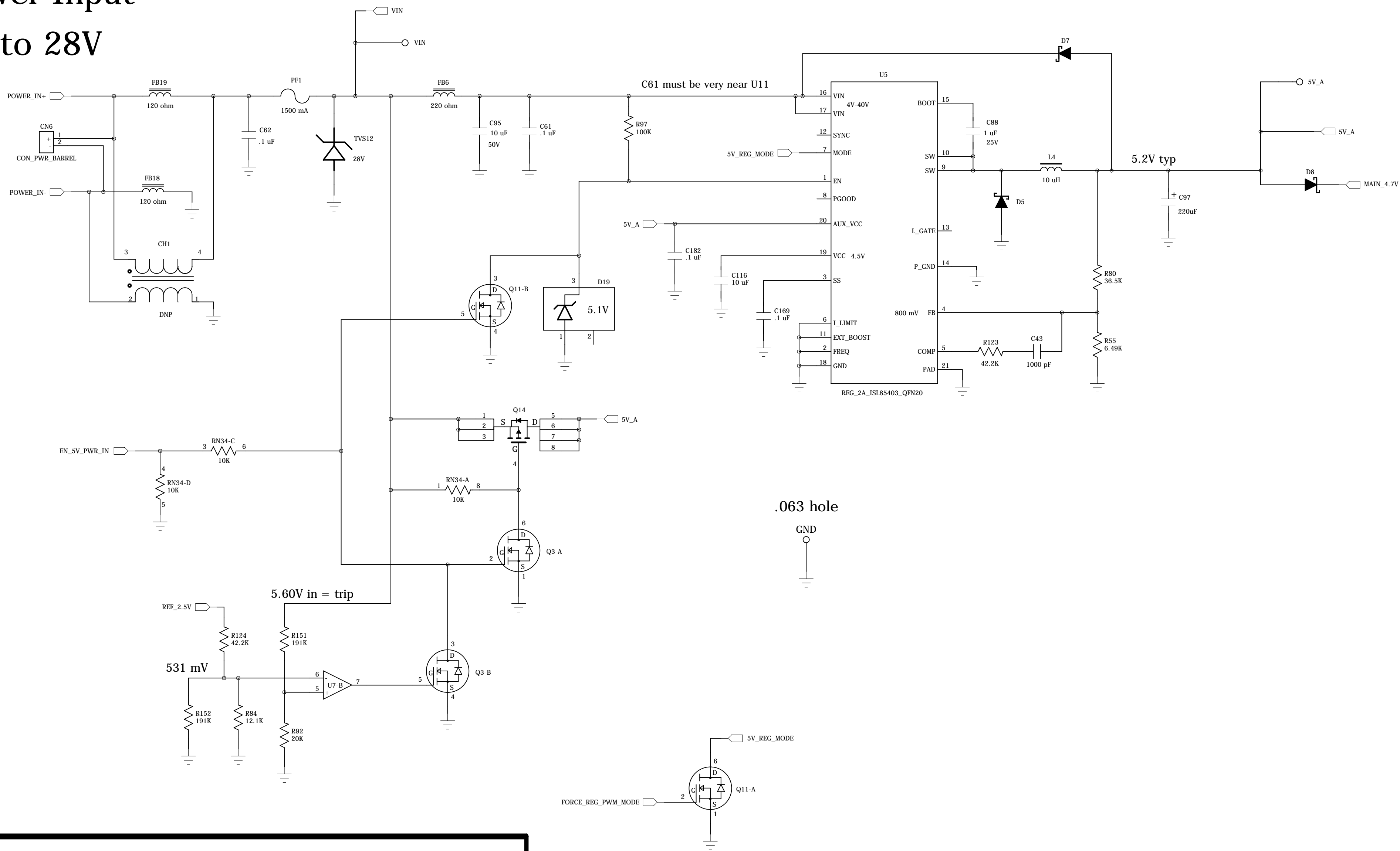
SiLab LED



| | |
|---------------------|--------------------|
| Technologic Systems | Date Oct. 11, 2017 |
| Title: TS-7553-V2 | |
| Rev: D | Designer |
| Sheet 17 of 23 | |

5V Regulator 2.5A

Power Input
5V to 28V

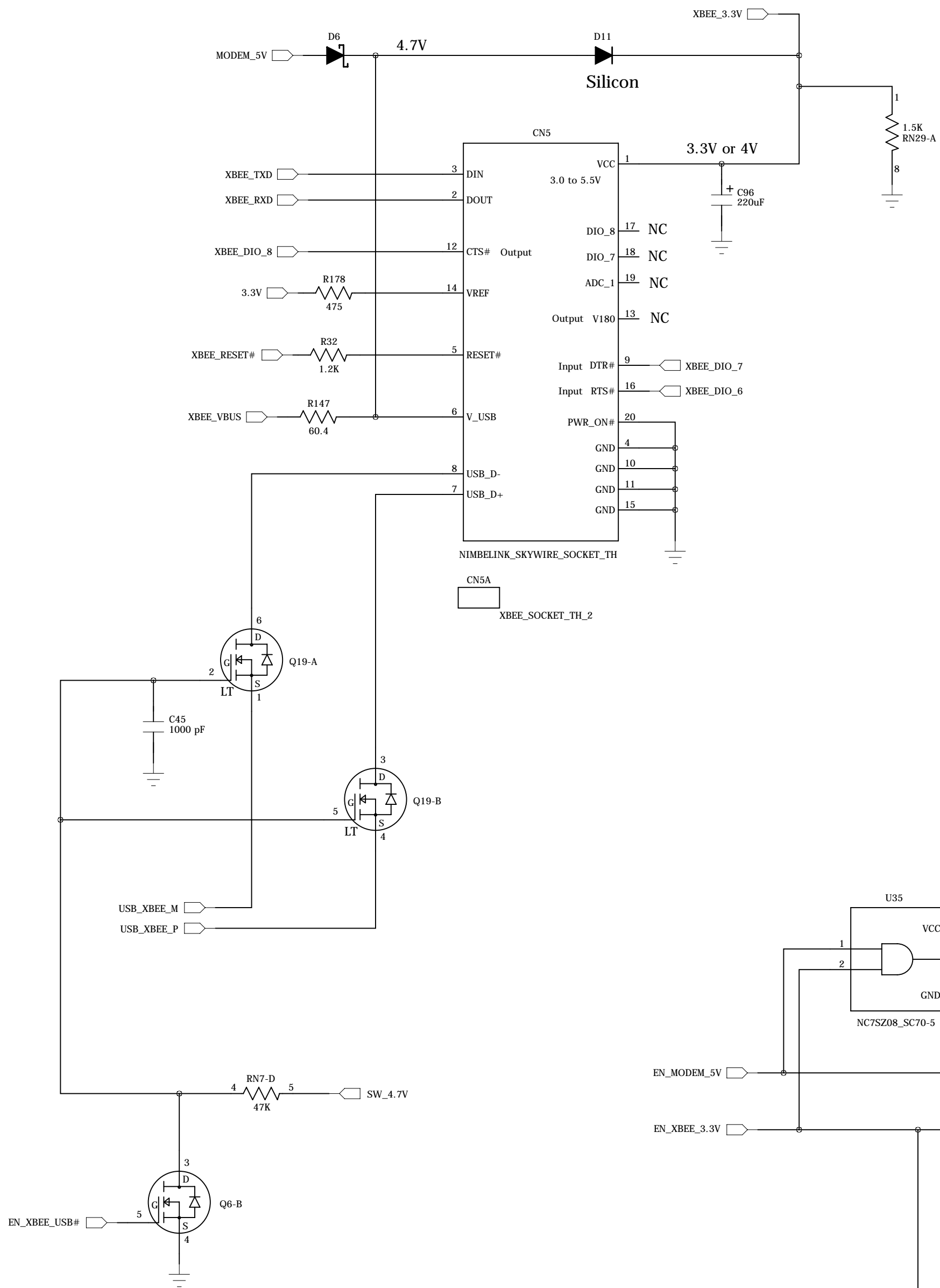


NOTE:

SBC will not work properly when power input voltage is between 5.3V and 7V

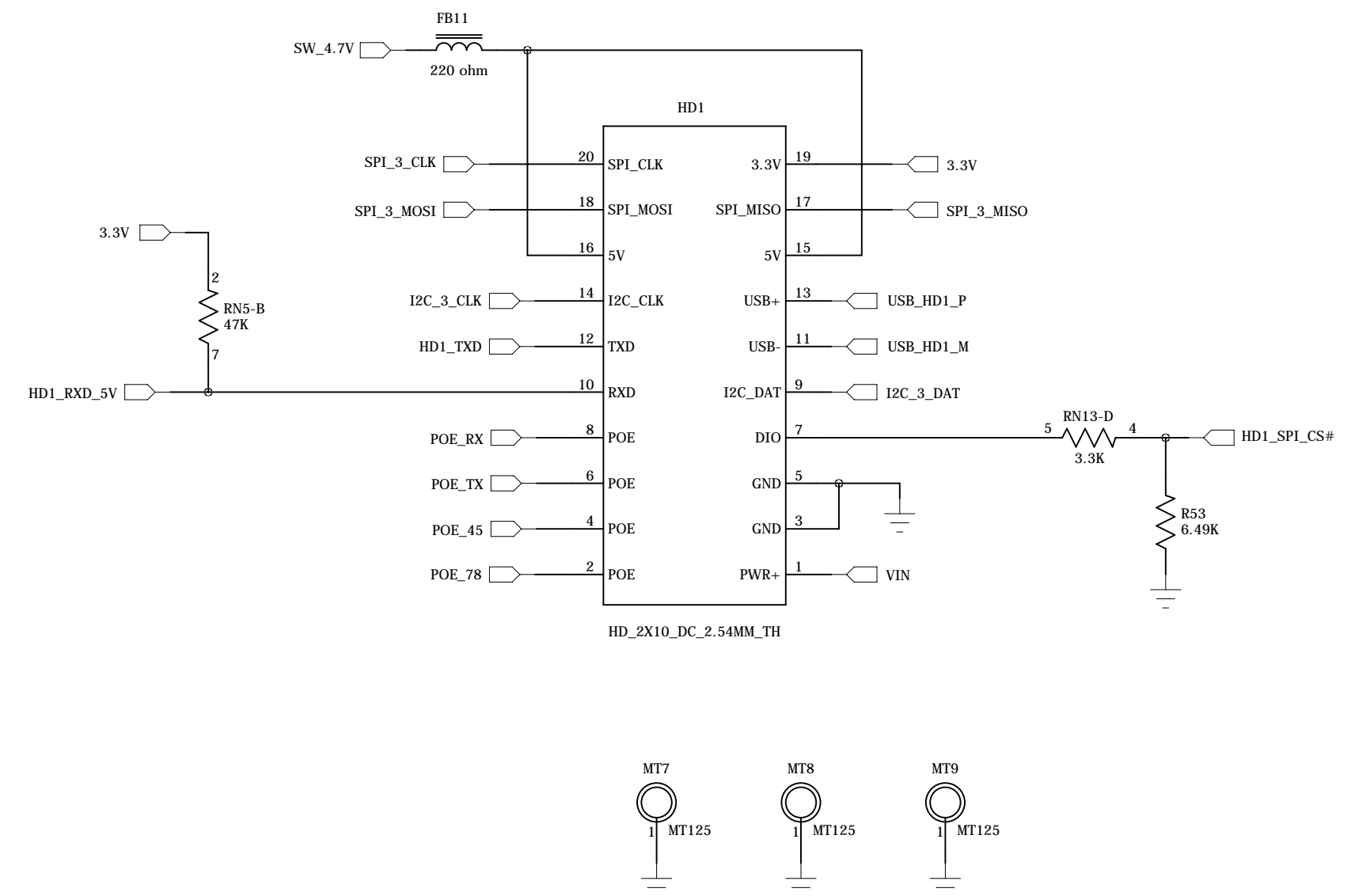
| | |
|---------------------|--------------------|
| Technologic Systems | Date Oct. 11, 2017 |
| Title: TS-7553-V2 | |
| Rev: D | Designer |
| Sheet 18 of 23 | |

NimbeLink Modem and XBee Socket

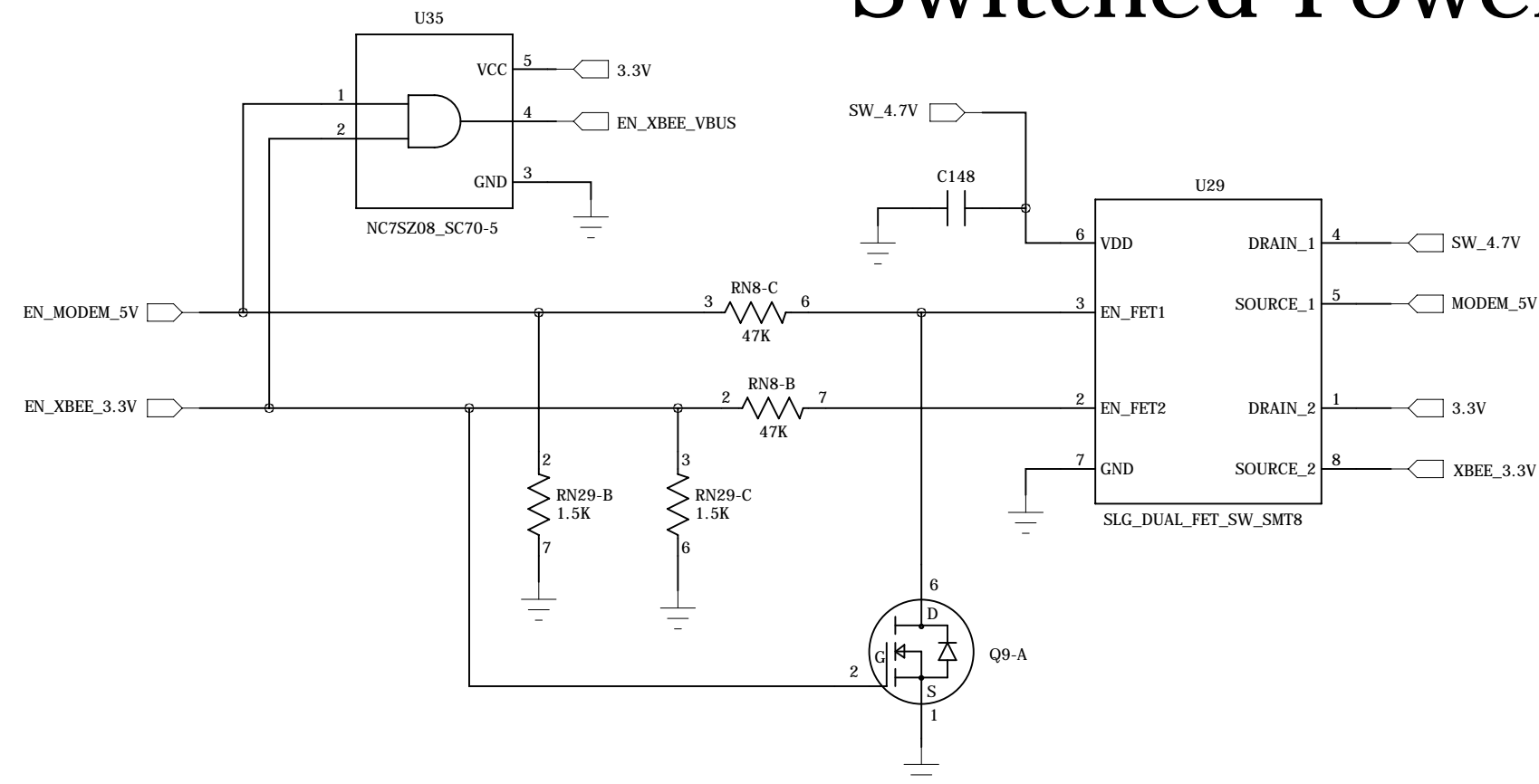


Daughter Card Interface

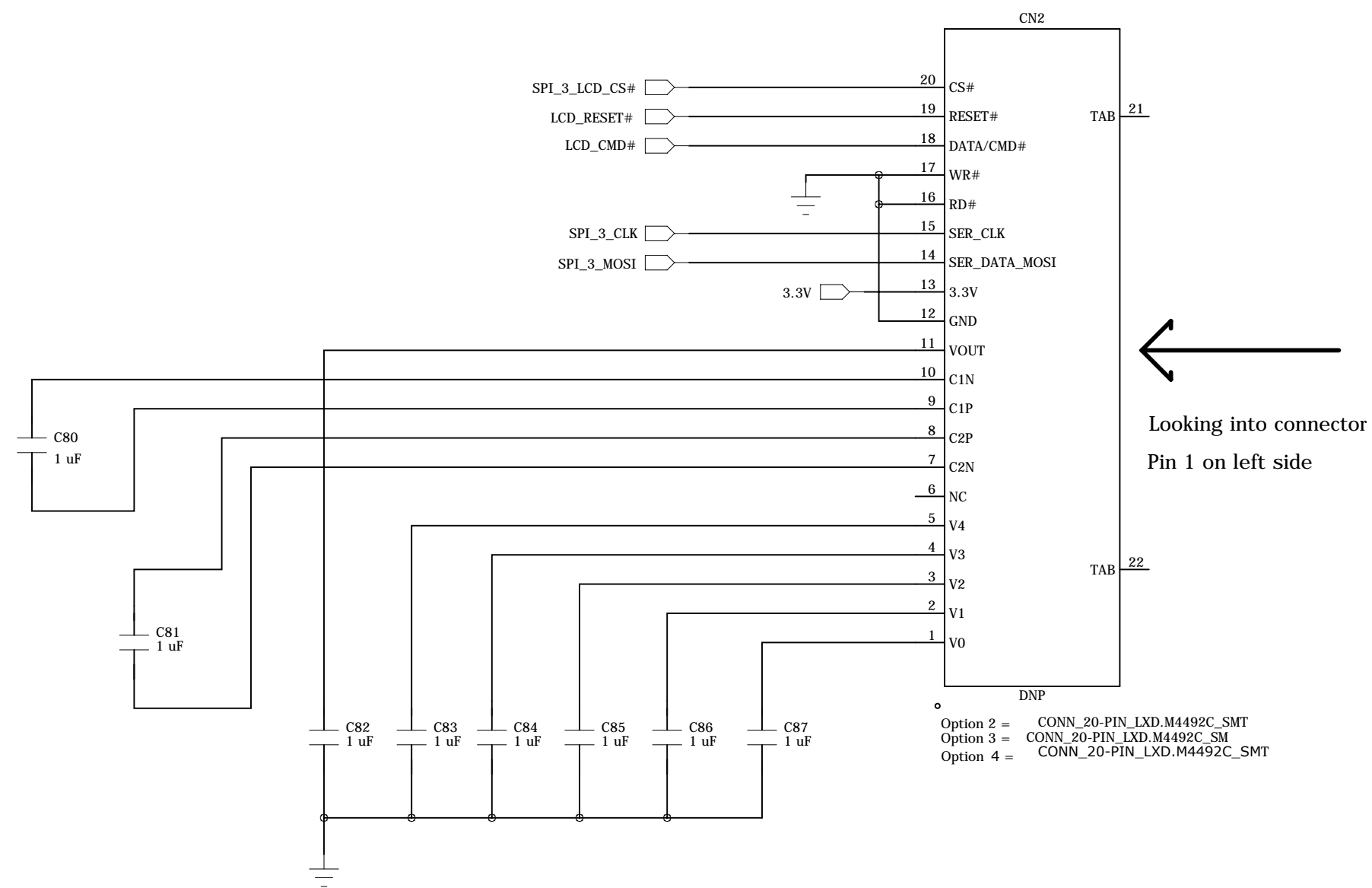
Not compatible w/ enclosure



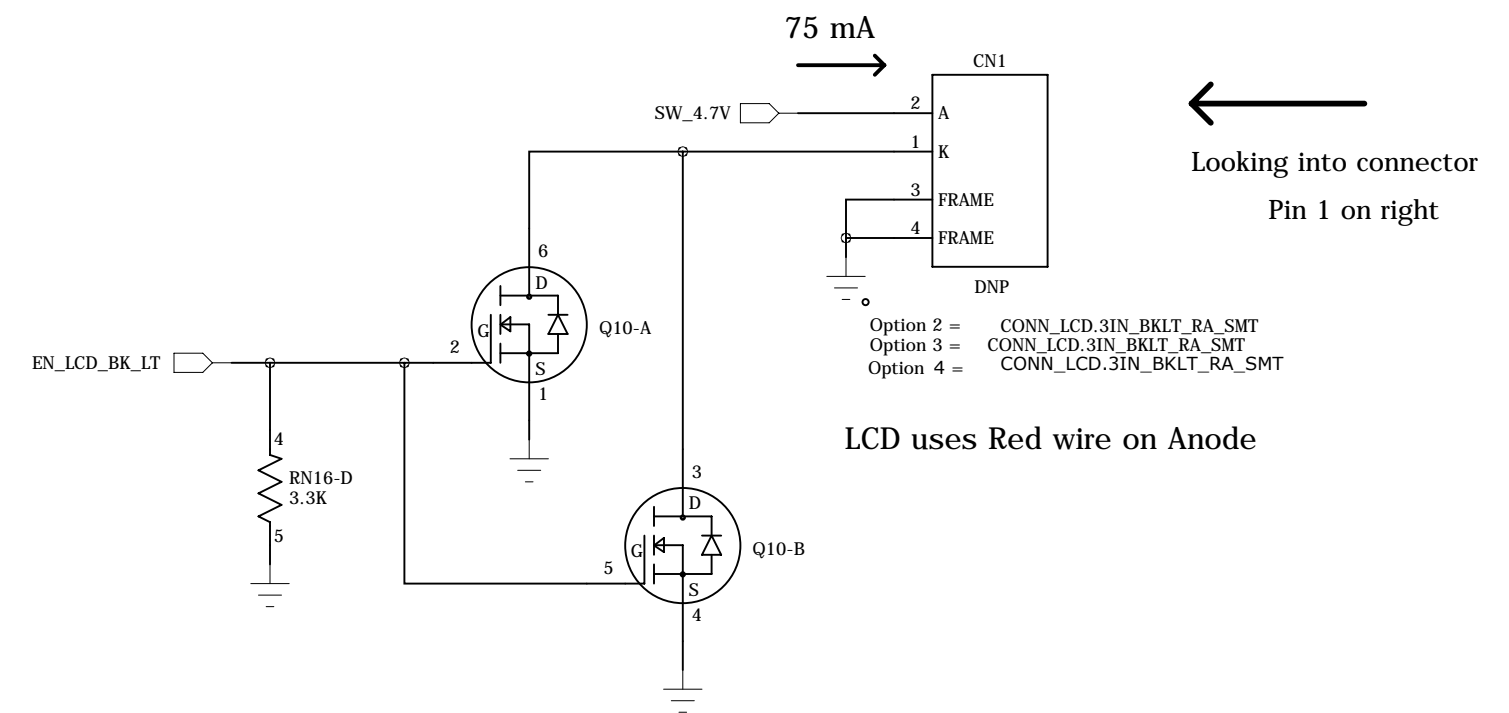
NimbeLink and Xbee Switched Power



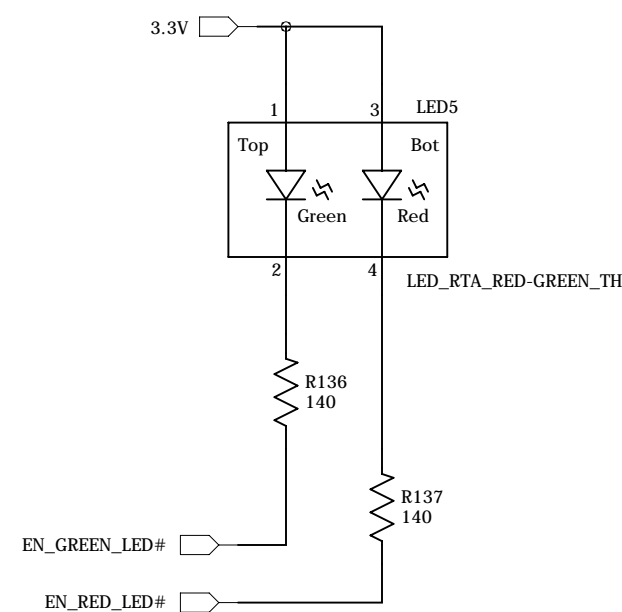
Monochrome 128 x 64 LCD Conn.



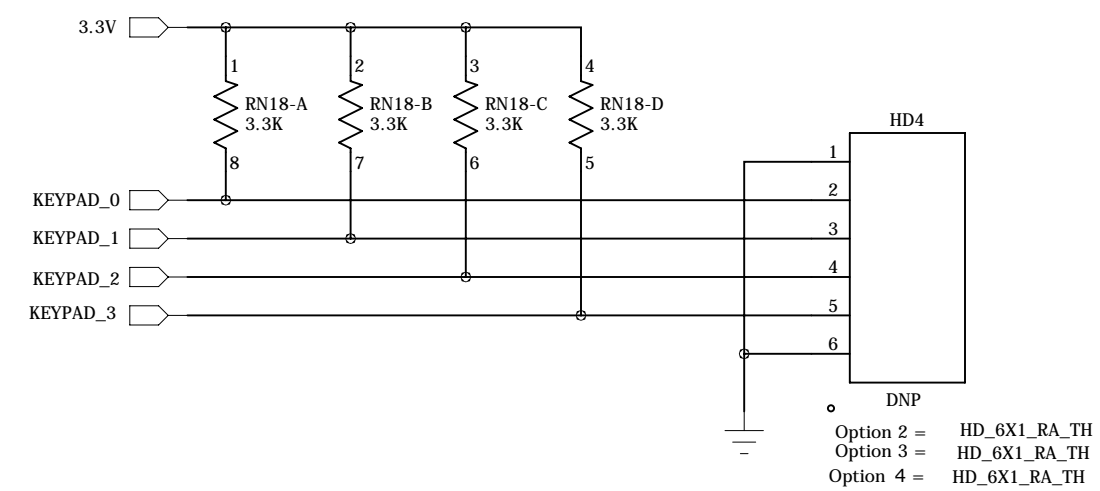
LCD Back Light Connector



Red - Green LEDs

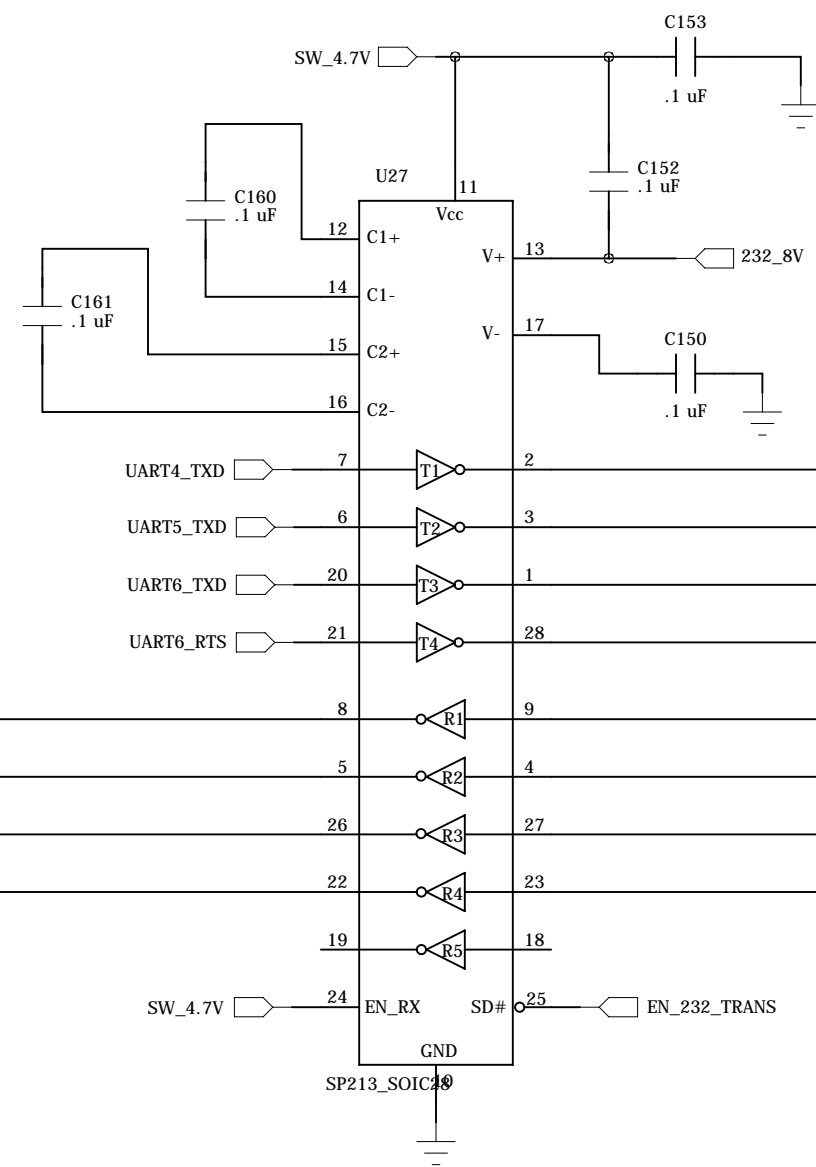


Membrane Switches

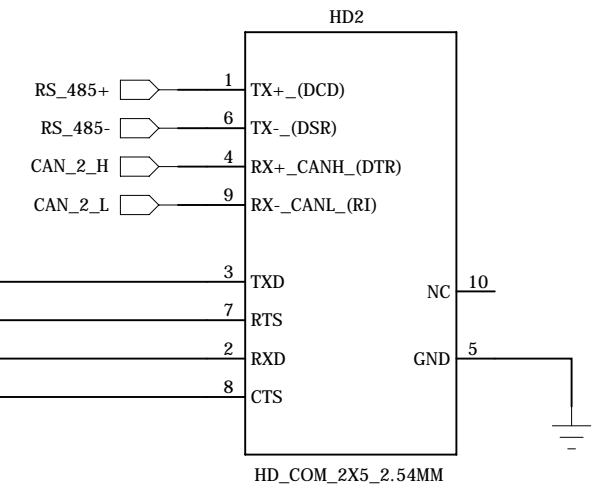


Console = UART 1
 RS-485 = UART 2
 BlueTooth = UART 3
 RS-232 = UART 4, 5, 6
 HD1 = UART 7
 XBEE = UART 8

RS-232 Transceiver

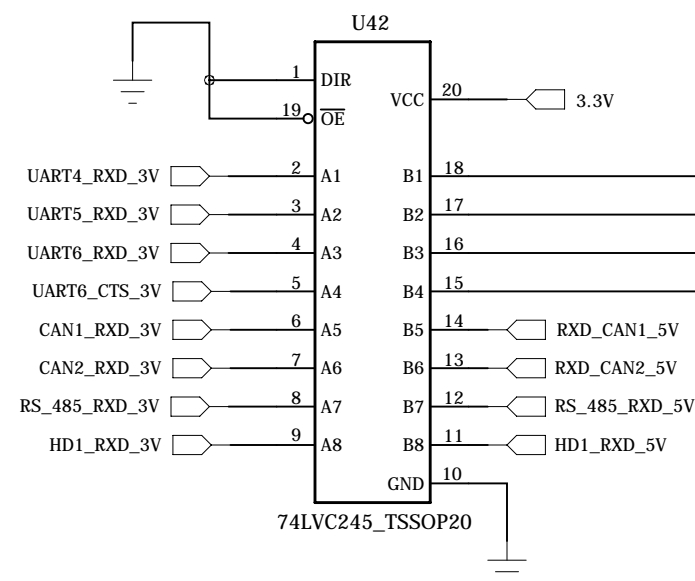


COM Header

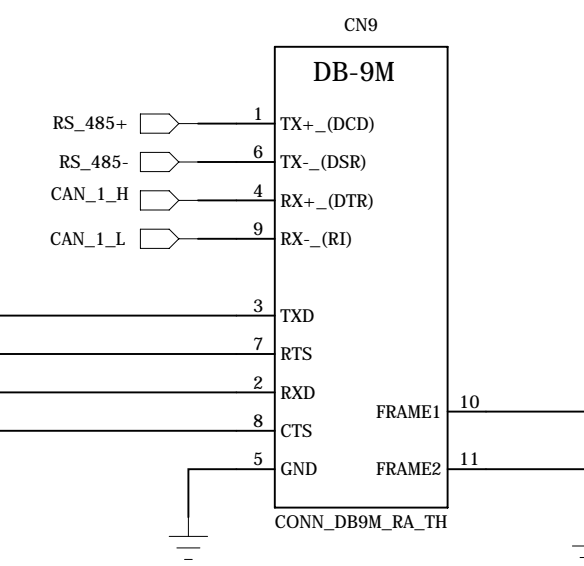


3.3V <-- 5V

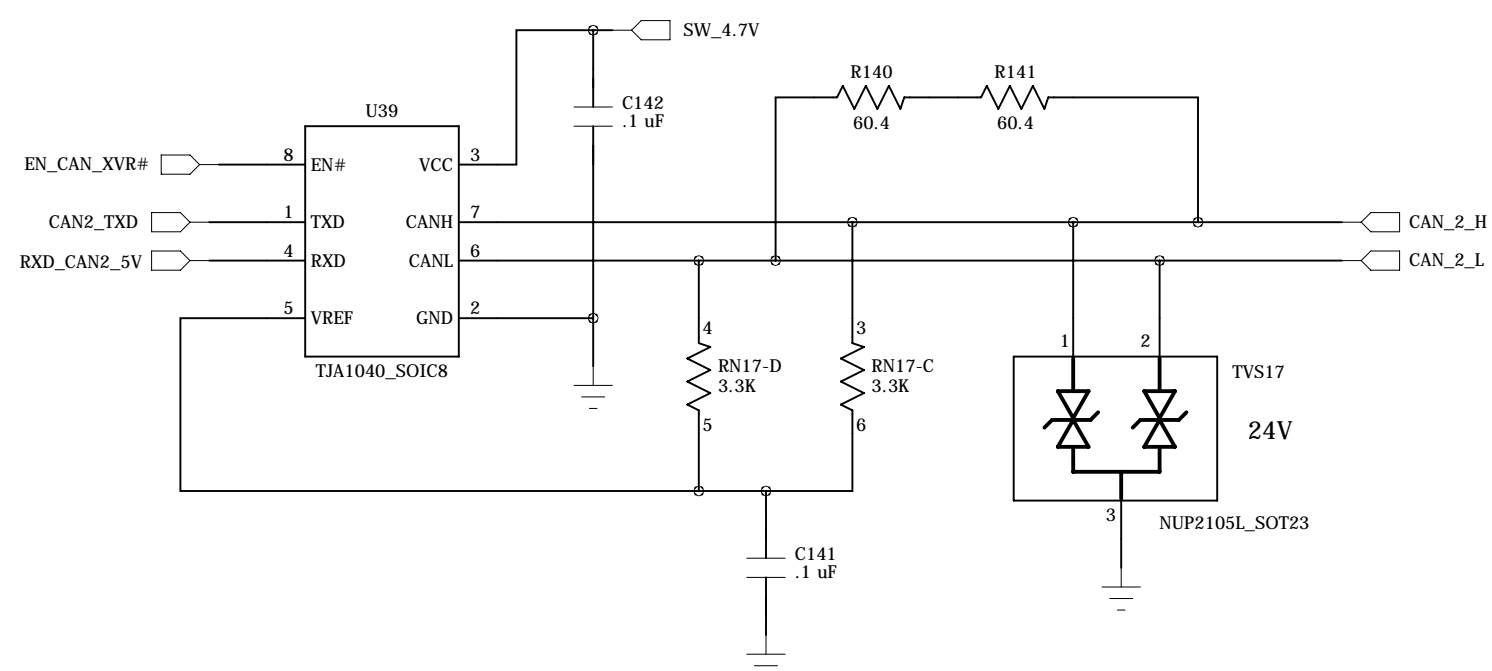
Level shifter



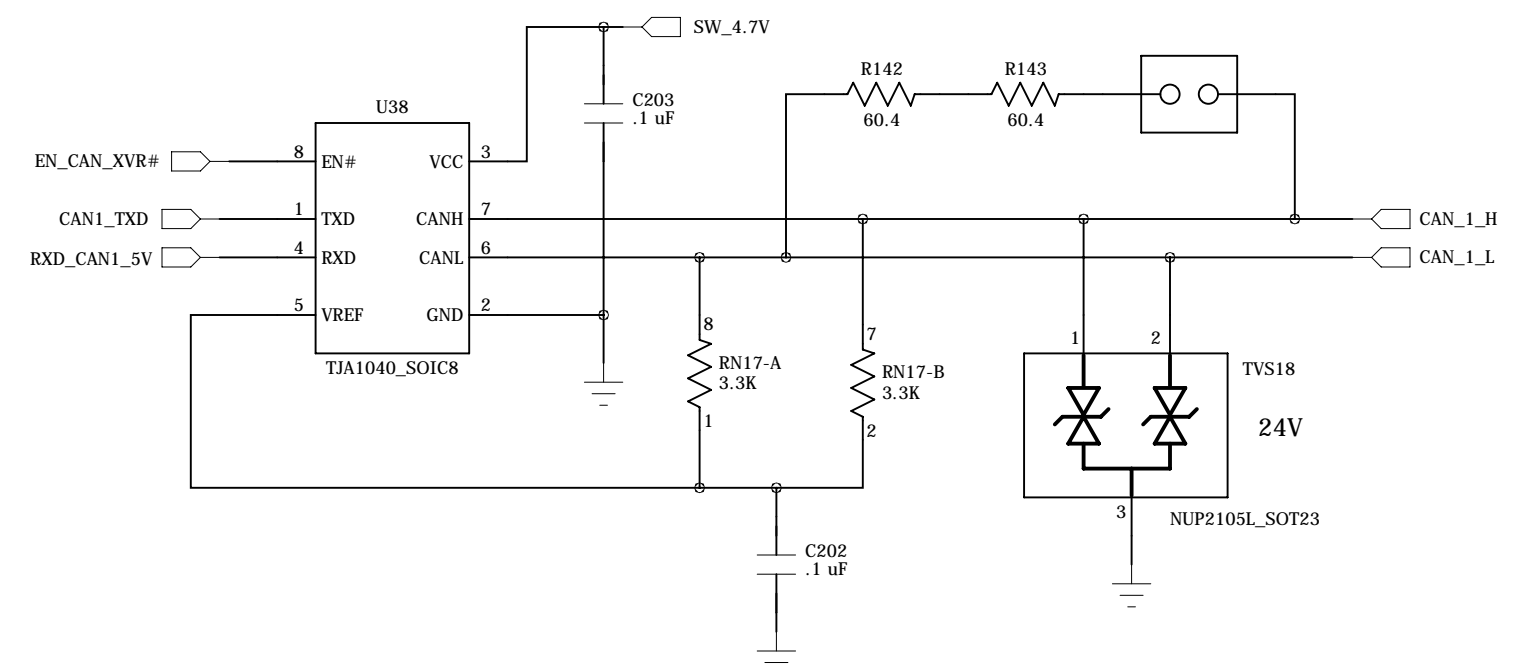
DB-9 Male



CAN2 Tranceiver

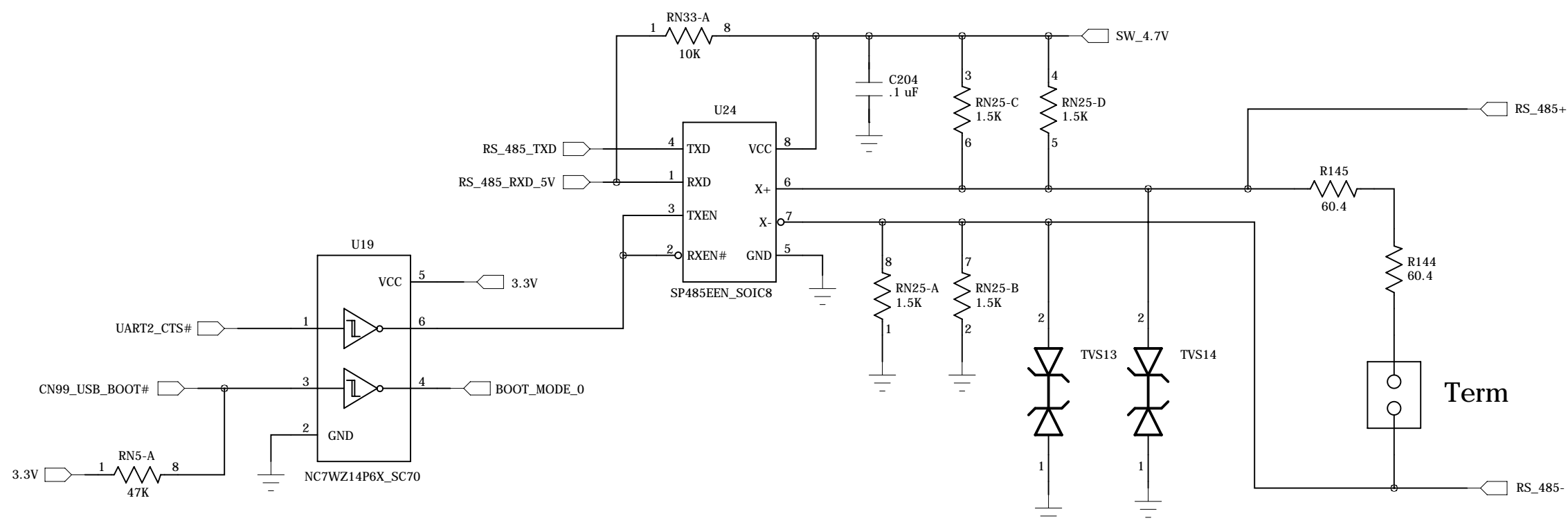


CAN1 Tranceiver

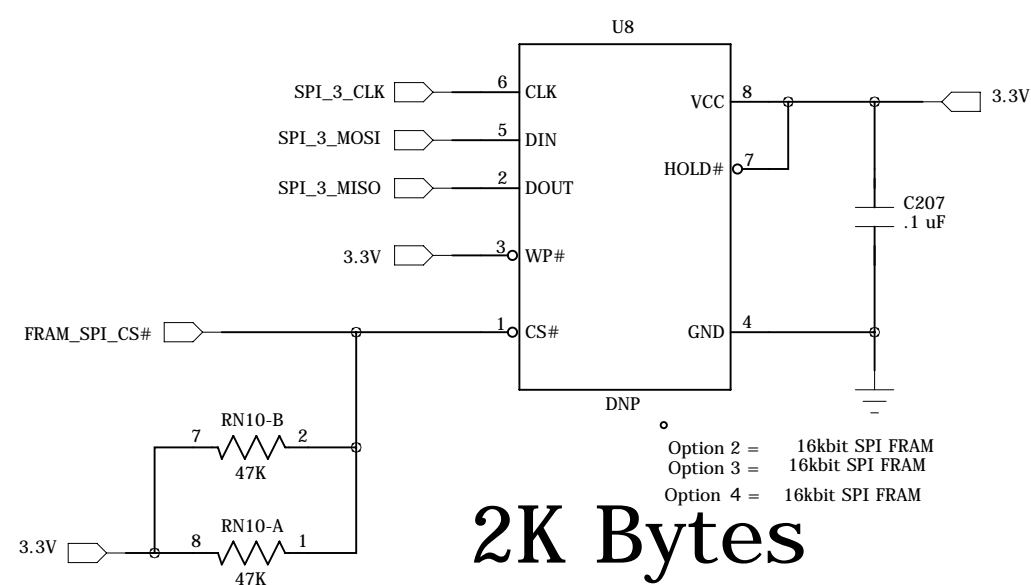


| | |
|---------------------|--------------------|
| Technologic Systems | Date Oct. 11, 2017 |
| Title: TS-7553-V2 | |
| Rev: D | Designer |
| Sheet 21 of 23 | |

RS-485 Driver

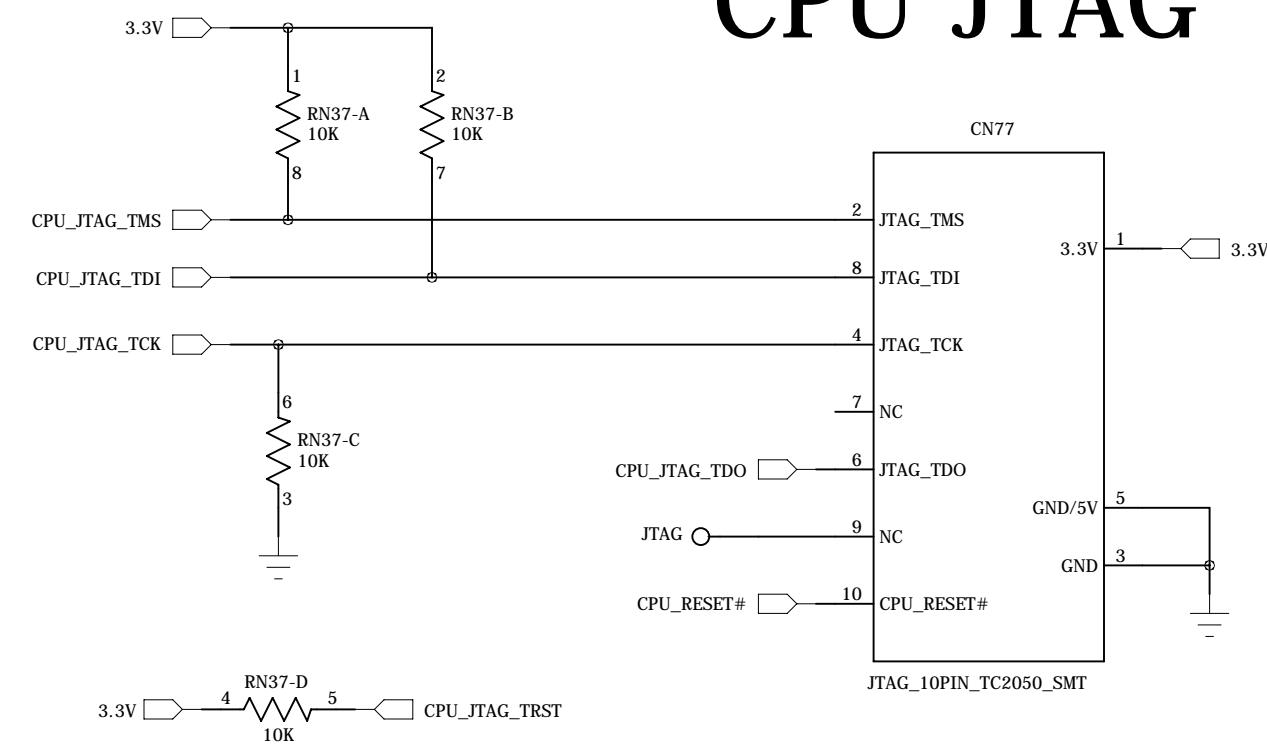


FRAM Memory



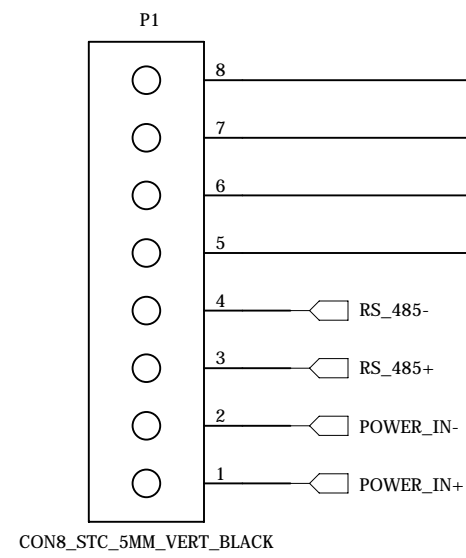
2K Bytes

CPU JTAG

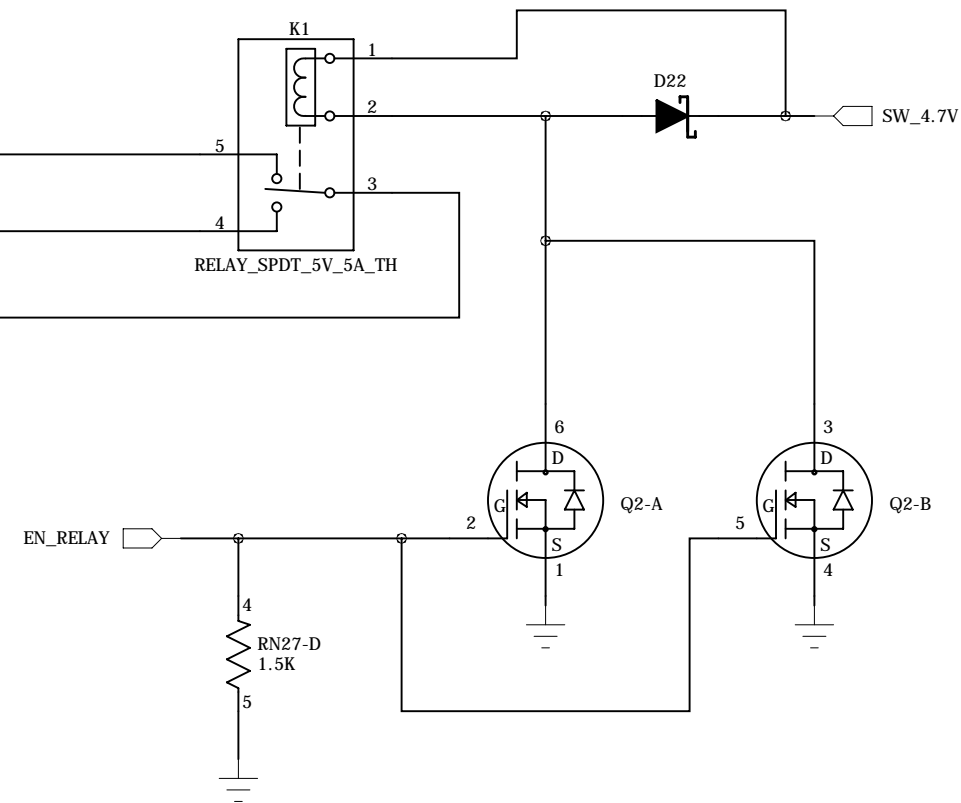


Tag-Connect

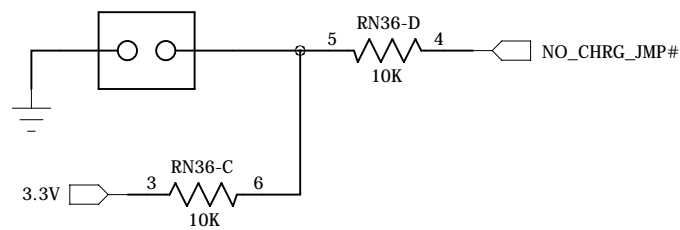
Screw Term. Conn.



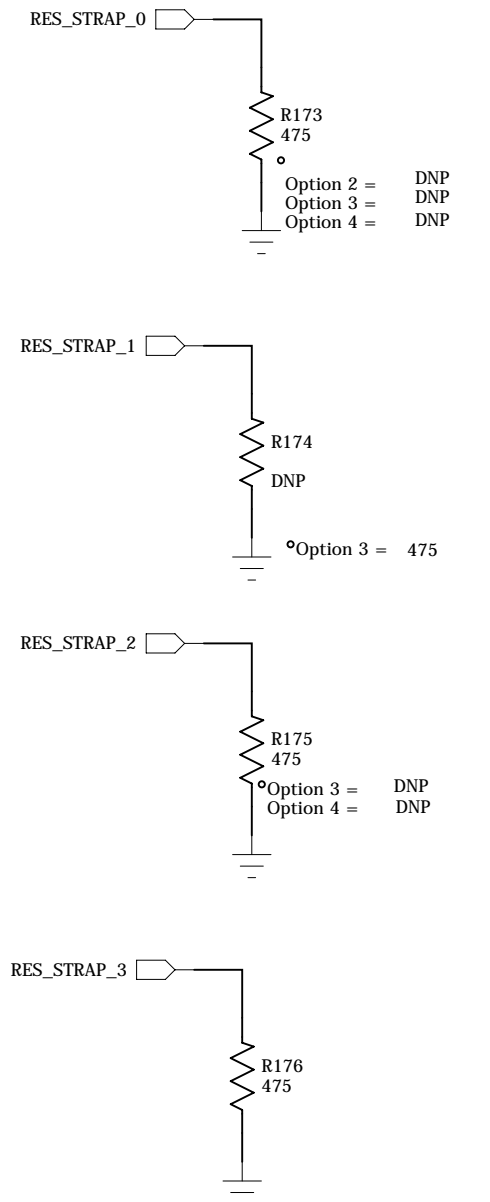
Relay



No Chrg Jumper



Resistor Straps

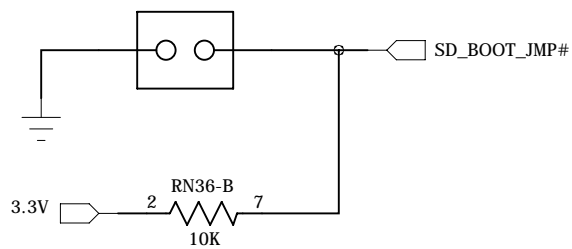


Resistor Strapping Table

0 = POP, 1 = DNP

| | R176 | R175 | R174 | R173 | | |
|------------|------|------|------|------|----------|------------------|
| | 0 | 0 | 1 | 0 | Option 1 | TS-7553-V2-SMN2I |
| | 0 | 0 | 1 | 1 | Option 2 | TS-7553-V2-SMN3I |
| | 0 | 1 | 0 | 1 | Option 3 | TS-7553-V2-SMN5I |
| | 0 | 1 | 1 | 1 | Option 4 | TS-7553-V2-SMW7I |
| MSB | | | | | | LSB |

Boot to SD



U-Boot Stop

