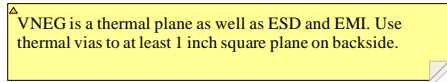


Title DM1097			Luxonis Holding 1925 Harmony Park Drive Westminster, CO 80234 United States	
Size: Tabloid	Number: D0000200	Revision: R1M1E1	Cannot open file C:\Users\BrianLuxonis\	
Date: 04/05/2021	Time: 18:54:42	Sheet2 of 17		
Drawn by: David Malovrh				

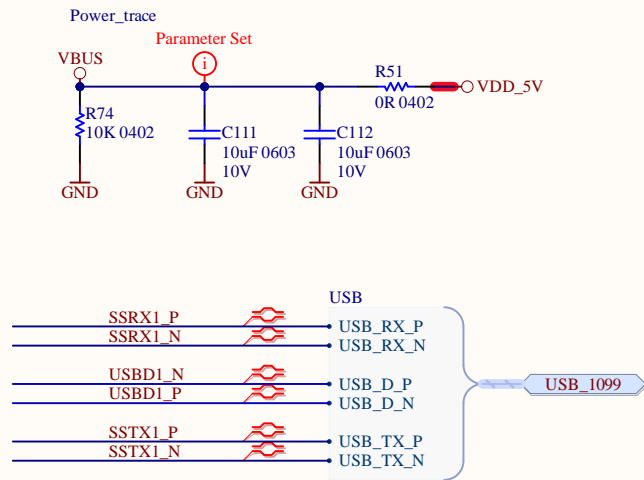
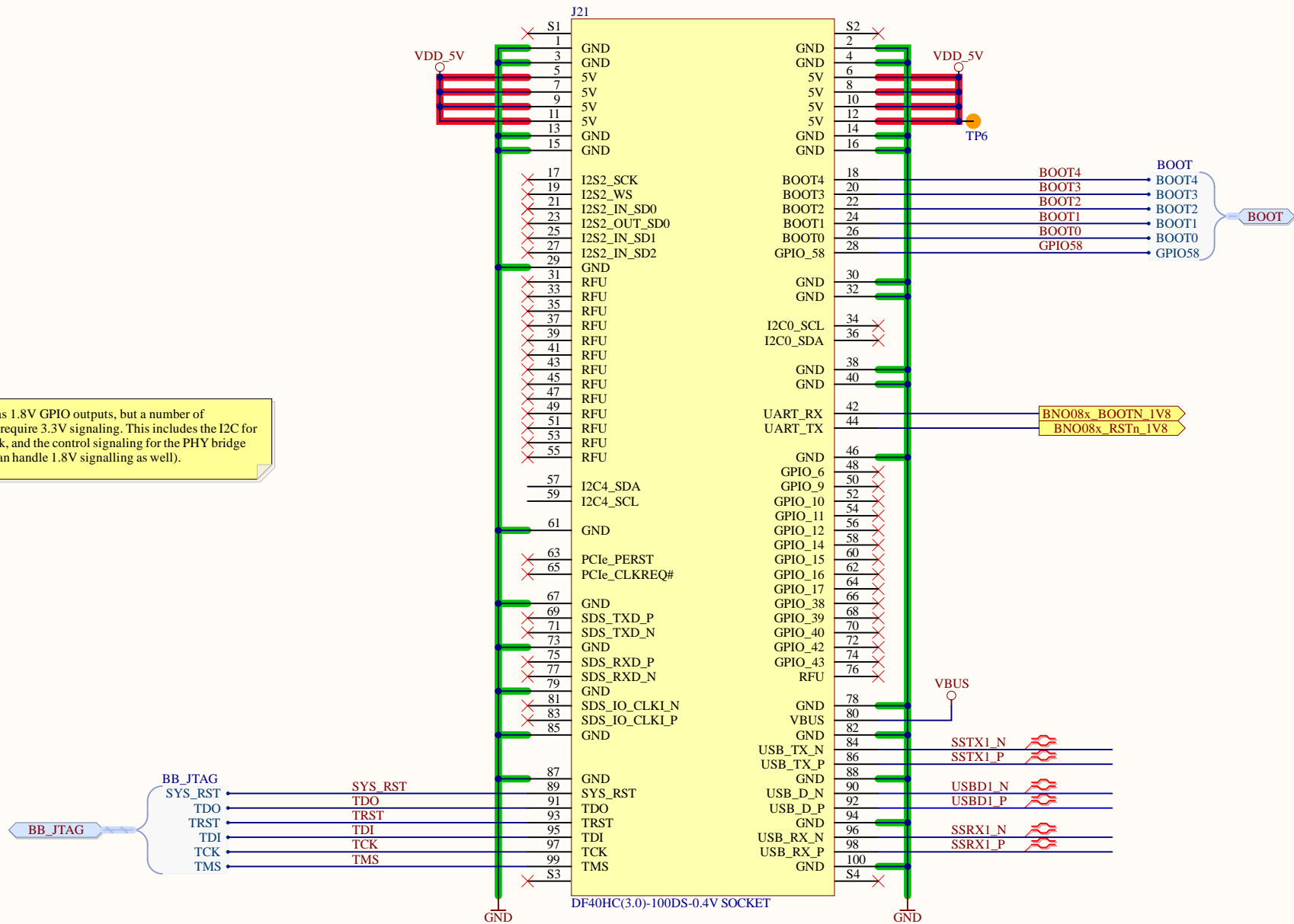


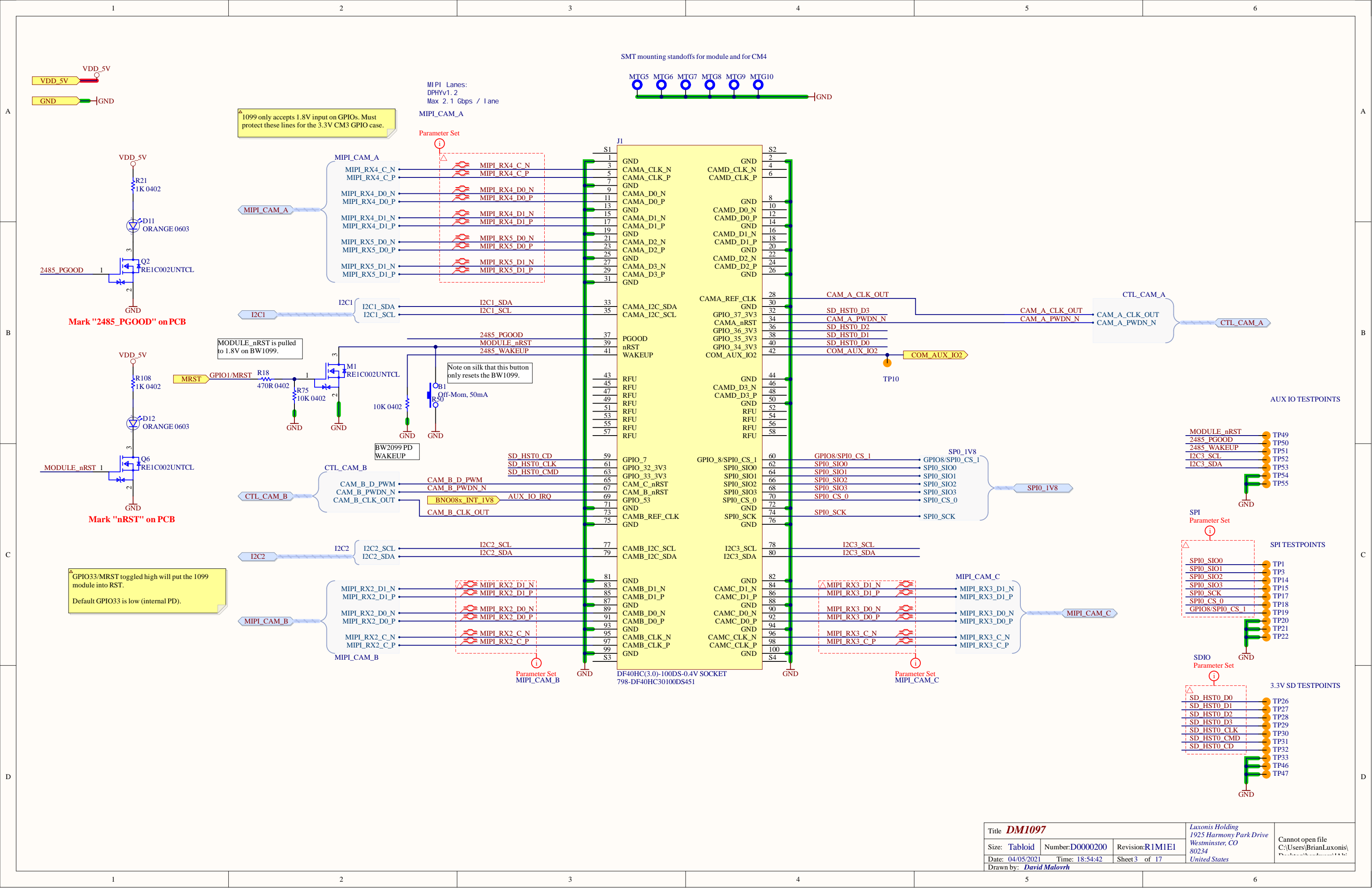
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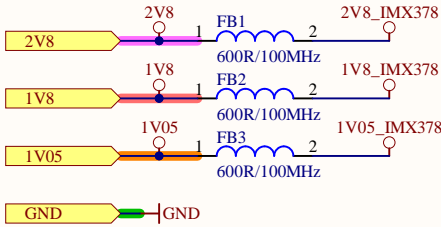


BW2099 CONNECTOR B

^A The Myriad X (MX) has 1.8V GPIO outputs, but a number of PCIe-related functions require 3.3V signaling. This includes the I2C for the PCIe reference clock, and the control signaling for the PHY bridge (though RTL8111HS can handle 1.8V signalling as well).







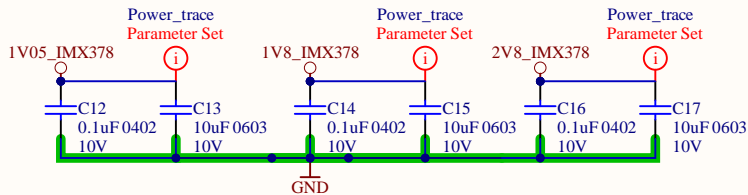
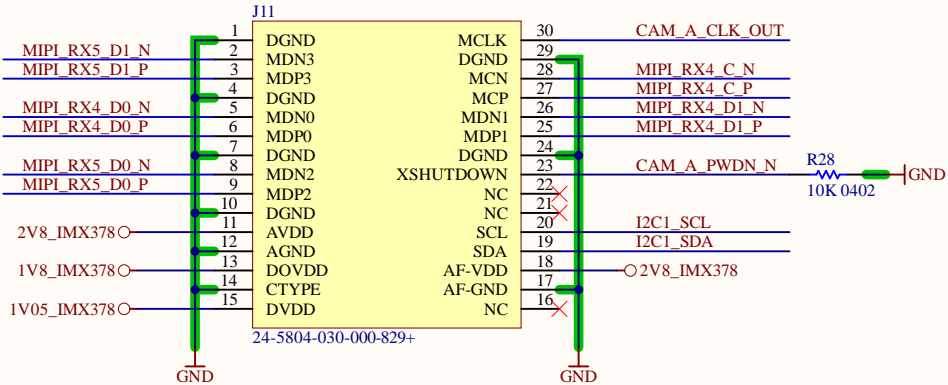
Place FBs and caps close to their associated camera connector.

On the BW1097, the IMX378 camera module is hardwired into the "Cam-A" logical position. This means the logic which used to be required to support the module being plugged into different physical connectors (and different logical positions) is no longer needed and can be removed.

Note: It is still a limitation that the clock source for the cameras must be shared between CAMA/C and CAMB/D.

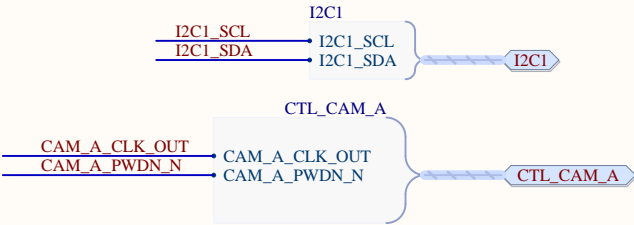
IMX378 MODULE CONNECTOR

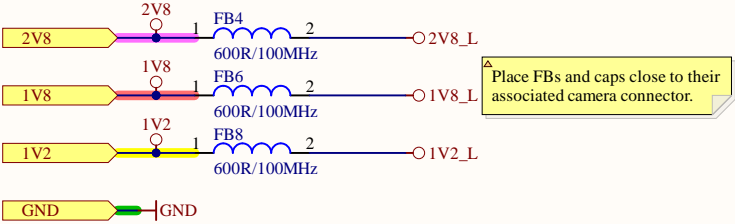
MODULE & SENSOR INFORMATION			
MODULE	A12N02A-201	I2C Clock Rate	1000 kHz Max
SENSOR	IMX378-AAQH5-C 12.3 Mega pixel CMOS 1/2.3 inch	I2C Address (8 bits)	0x34 (Sensor)
			0x18 (VCM driver)
			0xA0 (EEPROM driver)
MAX RESOLUTION	4056x3040	Sensor Clock Input	6 - 27 MHz



Supply Information

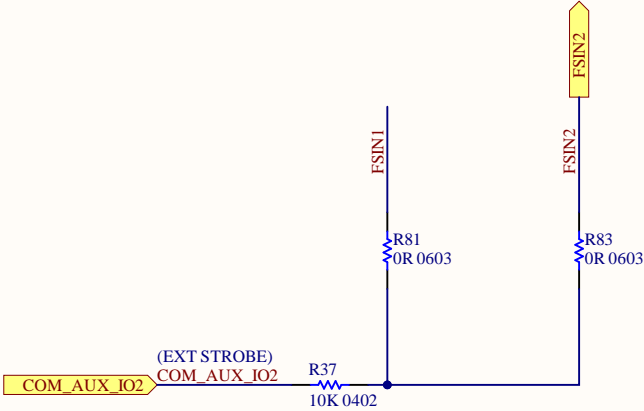
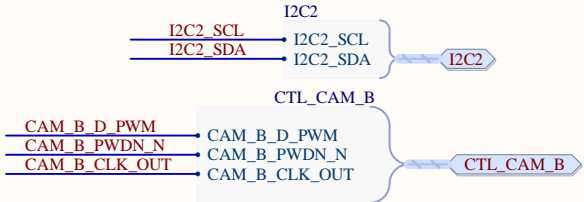
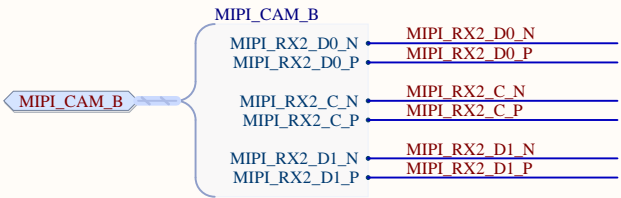
Supply Name	Sensor	Voltage	Max Current
AVDD	VANA	C_2.8V ± 0.1	55mA
DOVDD	VIF	C_1.8V ± 0.1	2.5mA
DVDD	VDIG	C_1.05V ± 0.1	446mA





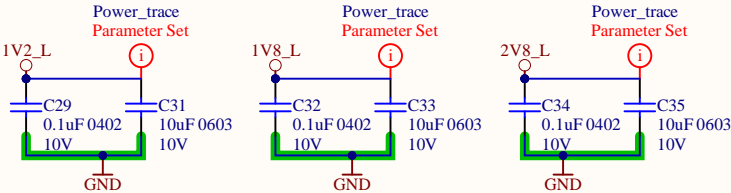
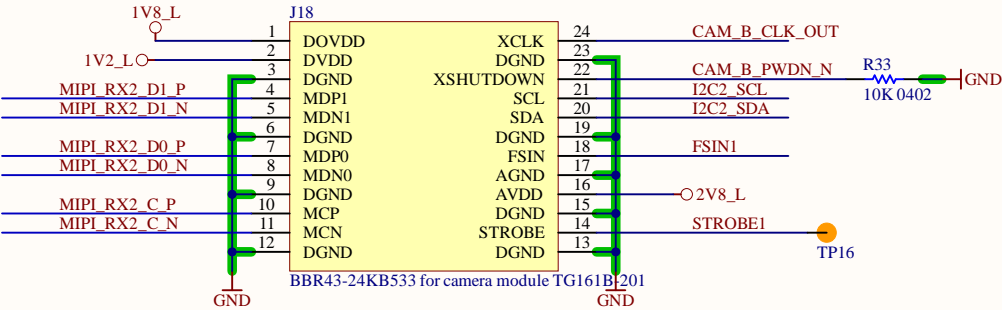
MODULE & SENSOR INFORMATION			
MODULE	TG161B-201 OR AN01V32-0JG	I2C Clock Rate	400 kHz Max
SENSOR	OV09282-GA4A B&W 1 Mega pixel CMOS 1/4 inch	I2C Address (8 bits)	0xC0(W) 0xC1(R)
MAX RESOLUTION	1280X800	Sensor Clock Input	6 - 64 MHz (24 MHz typ.)

Supply Information			
Supply Name	Module	Sensor	
DOVDD	VDD-I0	1.8V	2.5mA
DVDD	VDD-D	1.2V	52mA
AVDD	VDD-A	2.8V	24mA



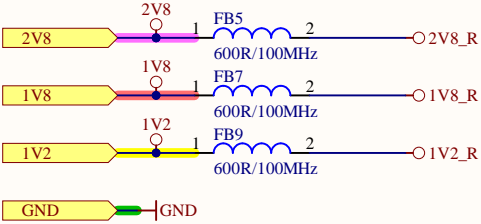
Camera timing Sync Option

Mark "LEFT" on PCB
Place so that is the module's left camera.



CAMERA CONNECTOR RESET CONNECTION TABLE			
CAMERA CONNECTOR			
	CAM_B	CAM_C	CAM_D
CAM_PWDN	CAM_PWDN	CAM_PWDN	CAM_PWDN
CAM_PWM	CAM_AUX_I01	CAM_AUX_I01	

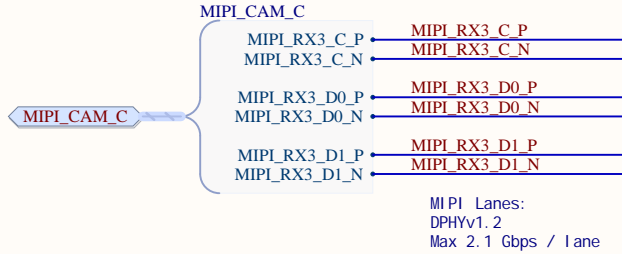
Title	DM1097		Luxonis Holding 1925 Harmony Park Drive Westminster, CO 80234 United States		Cannot open file C:\Users\BrianLuxonis\
Size:	Tabloid	Number:D0000200	Revision:R1M1E1		
Date:	04/05/2021	Time: 18:54:42	Sheet5 of 17		
Drawn by:	David Malovrh				



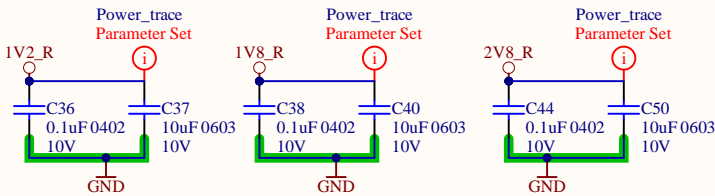
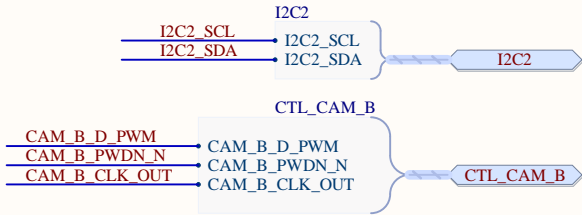
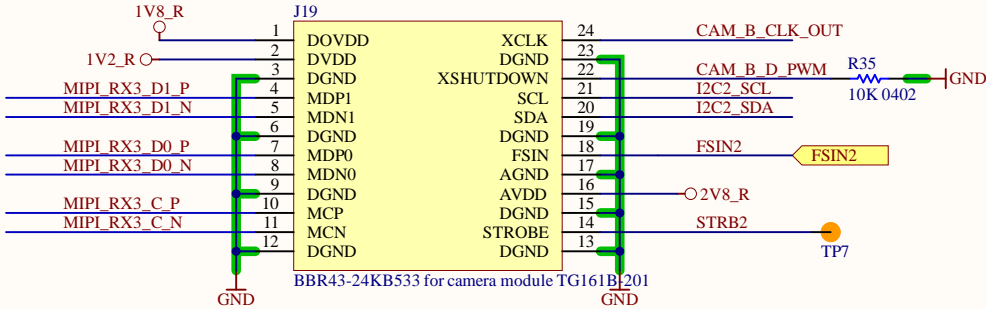
Place FBs and caps close to their associated camera connector.

MODULE & SENSOR INFORMATION			
MODULE	TG161B-201 OR AN01V32-QJG	I2C Clock Rate	400 kHz Max
SENSOR	OV09282-GA4A B&W 1 Mega pixel CMOS 1/4 inch	I2C Address (8 bits)	0xC0(W) 0xC1(R)
MAX RESOLUTION	1280X800	Sensor Clock Input	6 - 64 MHz (24 MHz typ.)

Supply Information		Voltage	Max Current
Supply Name	Sensor		
DOVDD	VDD-I/O	1.8V	2.5mA
DVDD	VDD-D	1.2V	52mA
AVDD	VDD-A	2.8V	24mA



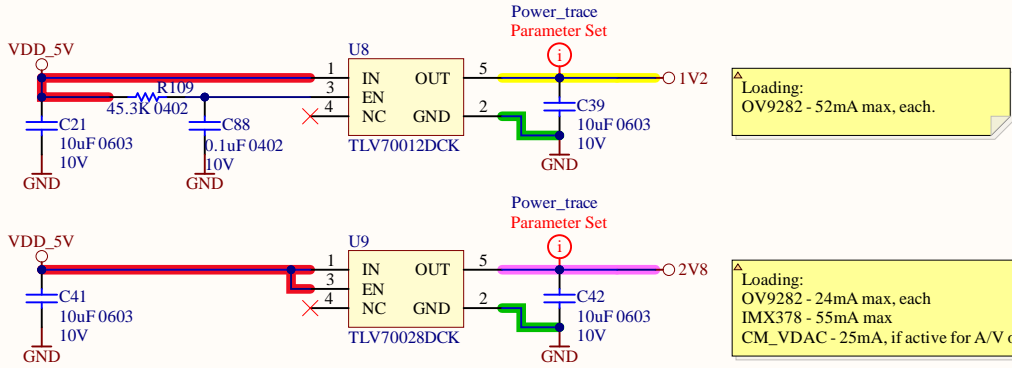
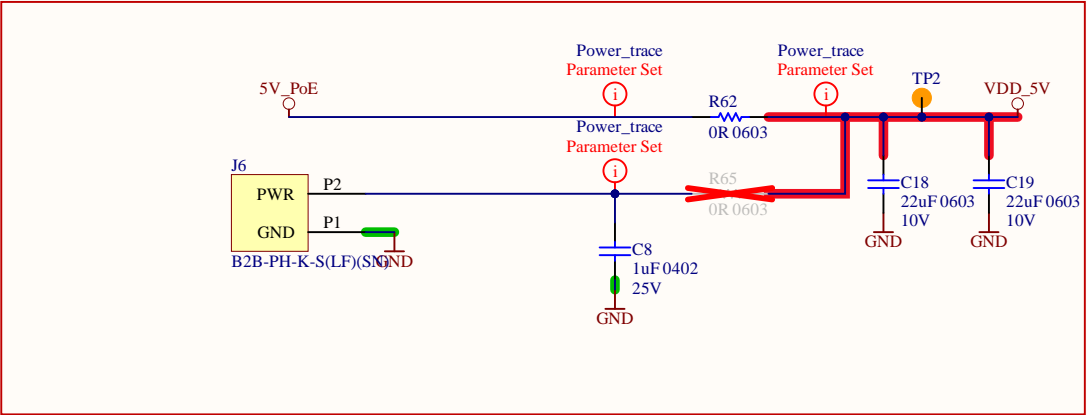
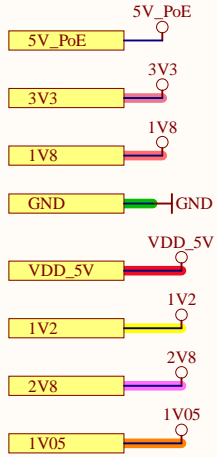
Mark "RIGHT" on PCB
Place so that is the module's right camera.



Title	DM1097		Luxonis Holding 1925 Harmony Park Drive Westminster, CO 80234 United States	
Size:	Tabloid	Number:	D0000200	Revision:R1M1E1
Date:	04/05/2021	Time:	18:54:42	Sheet 6 of 17
Drawn by:	David Malovrh			

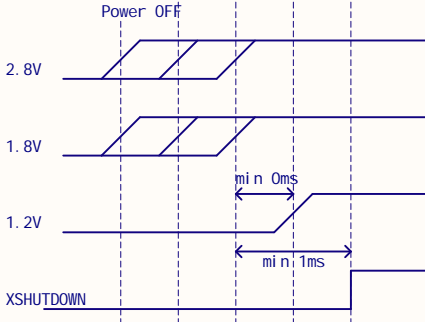
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Desktop\dm1097\

POWER INPUT



Placed RC timing circuit for EN pins in order to obtain the appropriate power supply sequencing if necessary

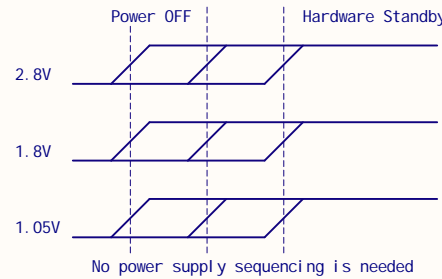
OV9282 POWER REQUIREMENTS



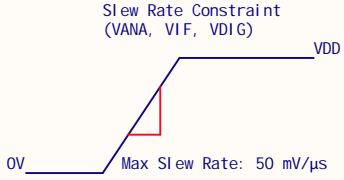
Supply Information		Vol tage	Max Current
Supply Name	Sensor		
DOVDD	VDD-I/O	1.8V	2.5mA
DVDD	VDD-D	1.2V	52mA
AVDD	VDD-A	2.8V	24mA

1. AVDD rising can occur before or after DOVDD rising as long as they are rising before XSHUTDOWN rising
2. XSHUTDOWN is pulled up after AVDD and DOVDD are stable
3. DVDD rises after DOVDD, but before XSHUTDOWN is pulled high

IMX378 POWER REQUIREMENTS



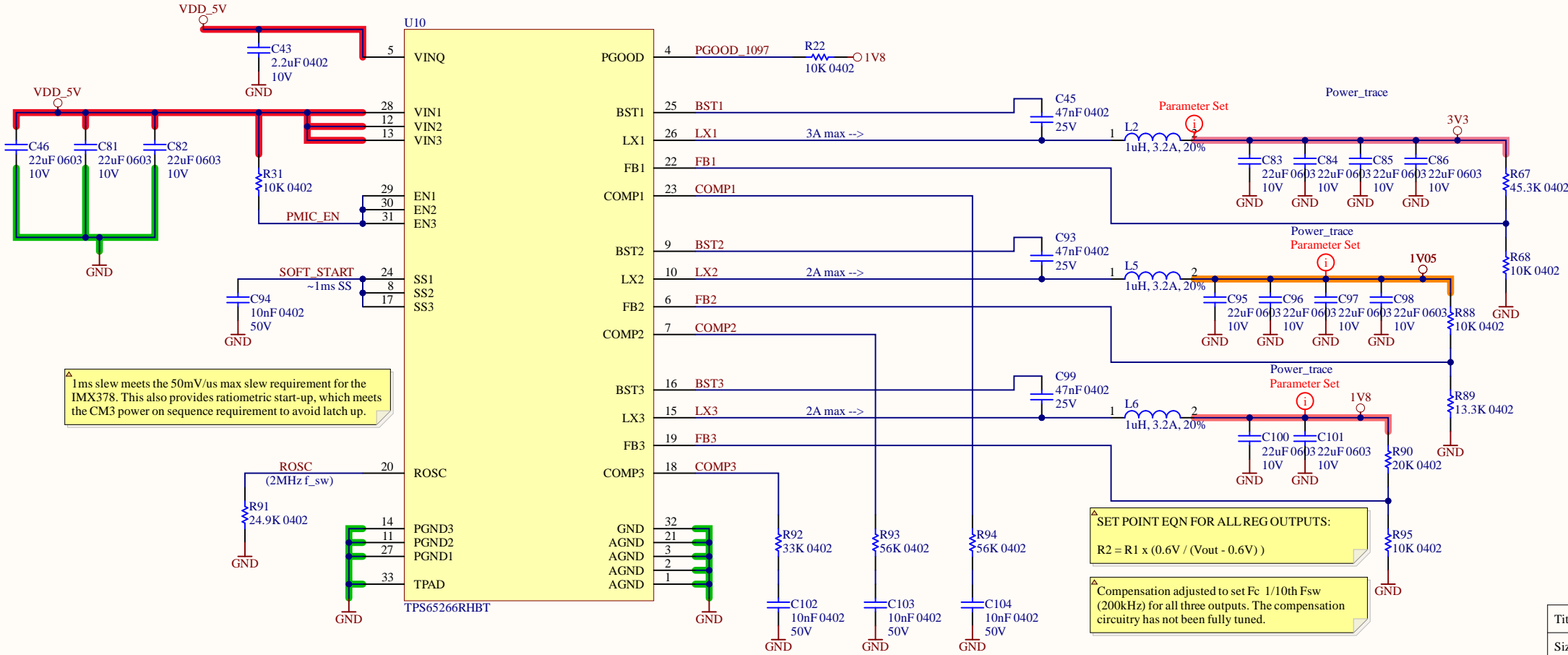
Supply Information		Vol tage	Max Current
Supply Name	Sensor		
AVDD	VANA	2.8V ± 0.1	55mA
DOVDD	VIF	1.8V ± 0.1	2.5mA
DVDD	VDI G	1.05V ± 0.1	446mA



POWER SEQUENCING REQUIREMENTS:

The BW2099 module handles it's own power sequencing on-board. (TBC)

The camera modules have their own power sequencing requirements. The OV9282 have requirements for sequencing, and the IMX378 has a max slew rate requirement. See above.



1ms slew meets the 50mV/us max slew requirement for the IMX378. This also provides ratiometric start-up, which meets the CM3 power on sequence requirement to avoid latch up.

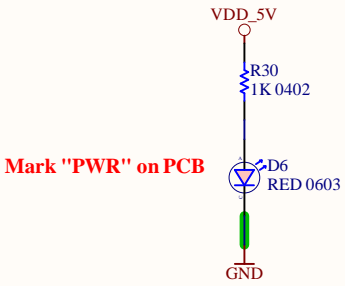
SET POINT EQN FOR ALL REG OUTPUTS:
 $R2 = R1 \times (0.6V / (V_{out} - 0.6V))$

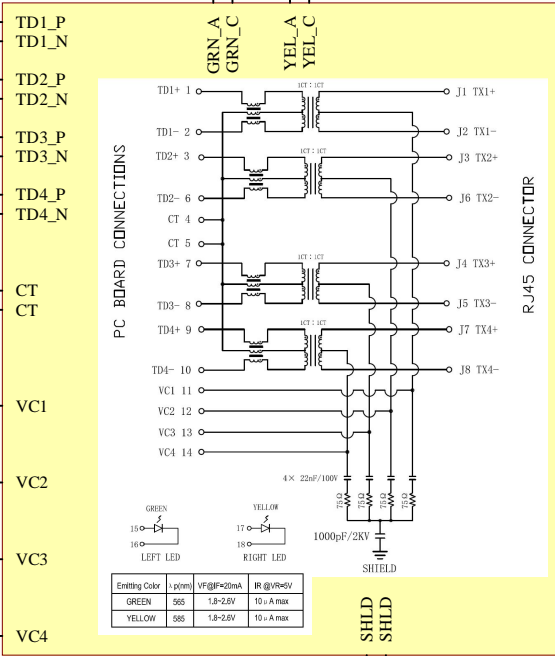
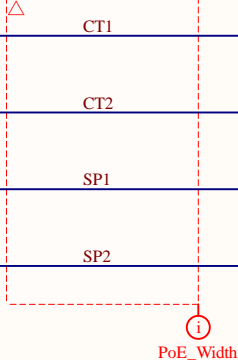
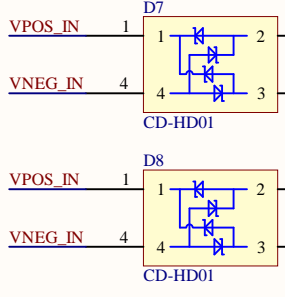
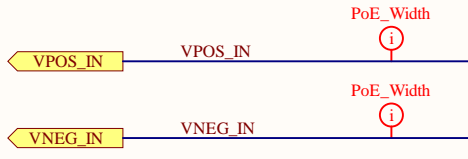
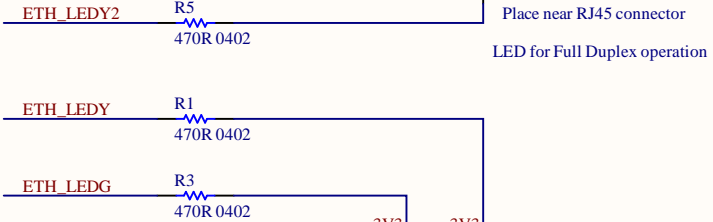
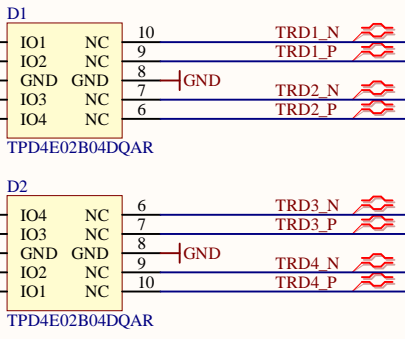
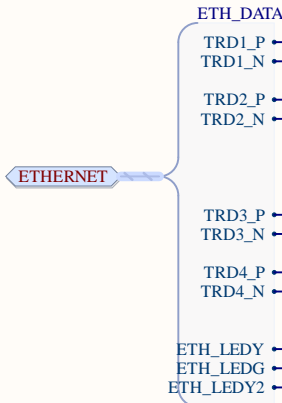
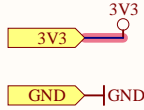
Compensation adjusted to set $F_c = 1/10th F_{sw}$ (200kHz) for all three outputs. The compensation circuitry has not been fully tuned.

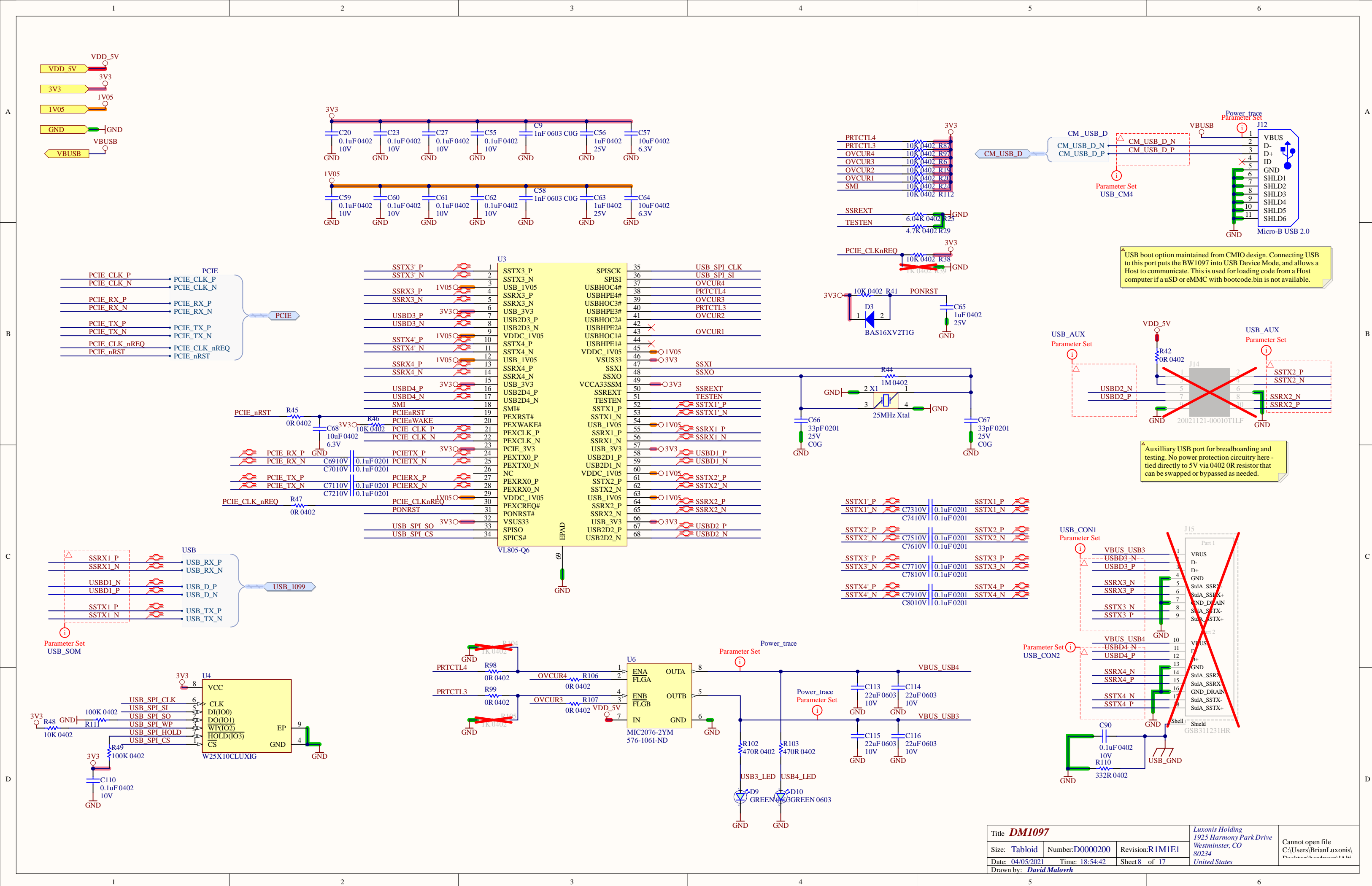
Effective capacitance targets for each rail, taking into account DC bias and other effects:
3.3V $C_{eff} = 24\mu F$
1.8V $C_{eff} = 26\mu F$
1.05V $C_{eff} = 70\mu F$

Voltage ripple and allowed voltage tolerance on all rails is +/-5%

Load step design assumptions, based on worst case rail loading:
3.3V - 2.5A step
1.8V - 1A step
1.05 - 0.5A step







A

A

B

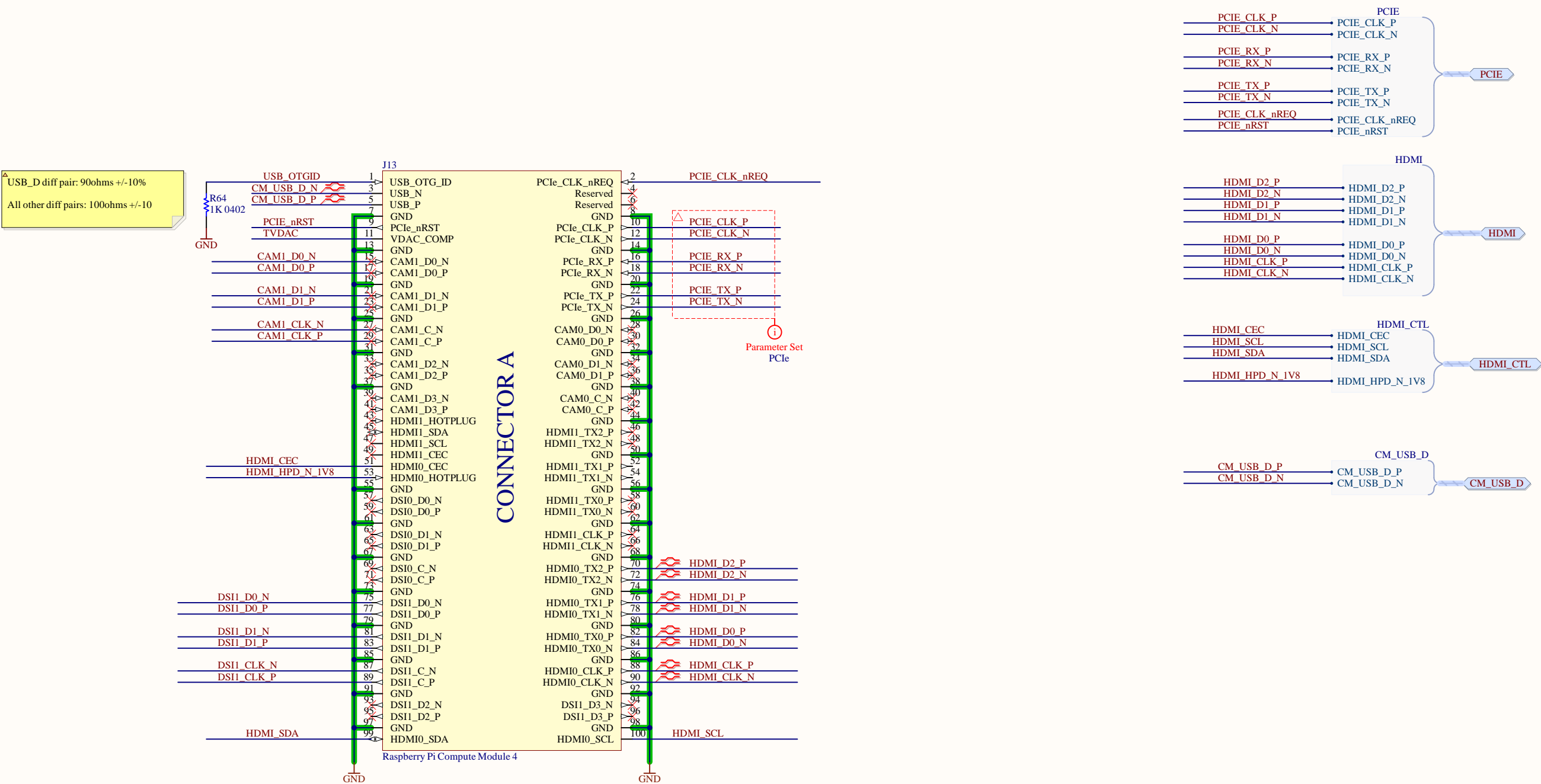
B

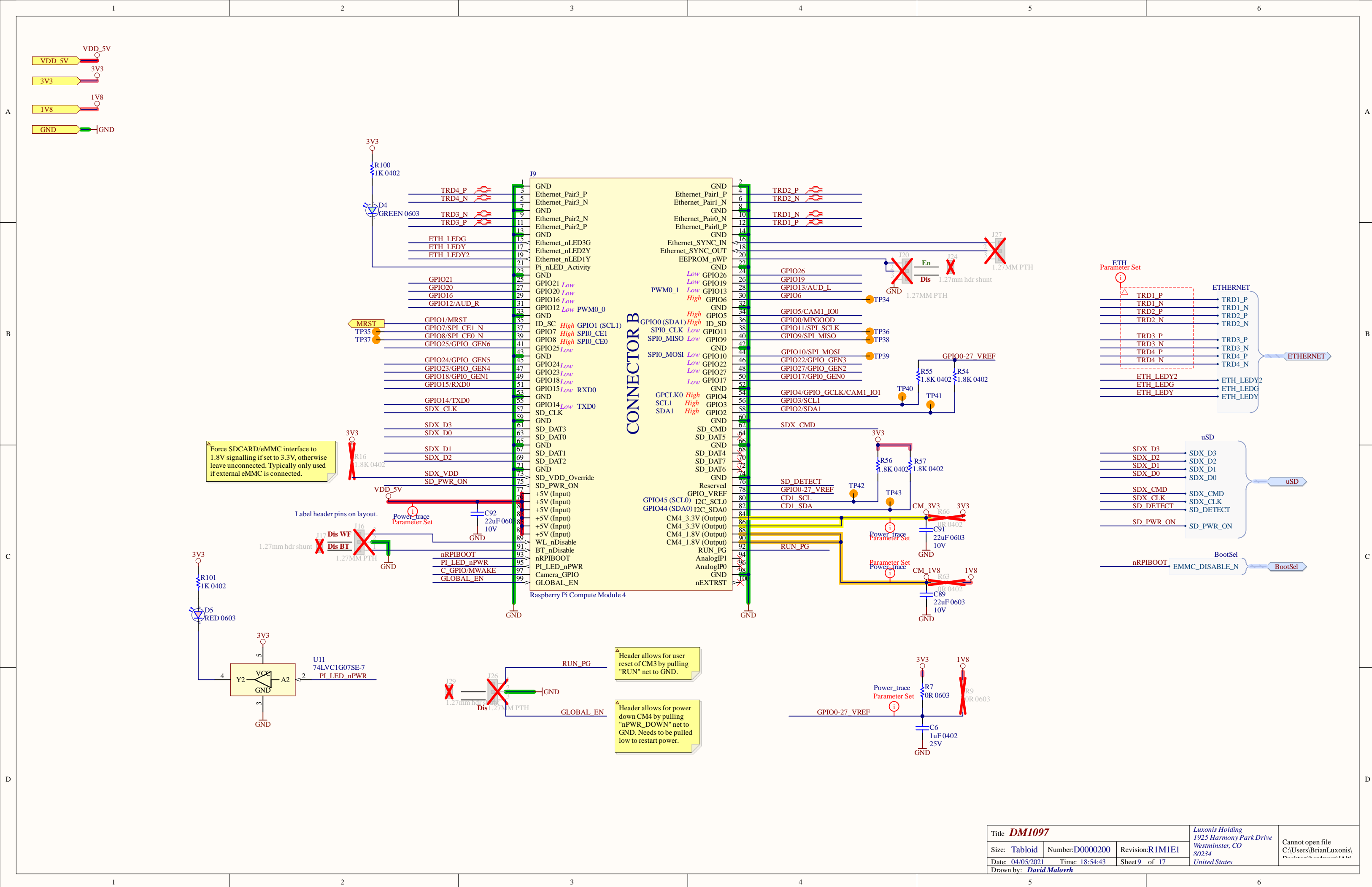
C

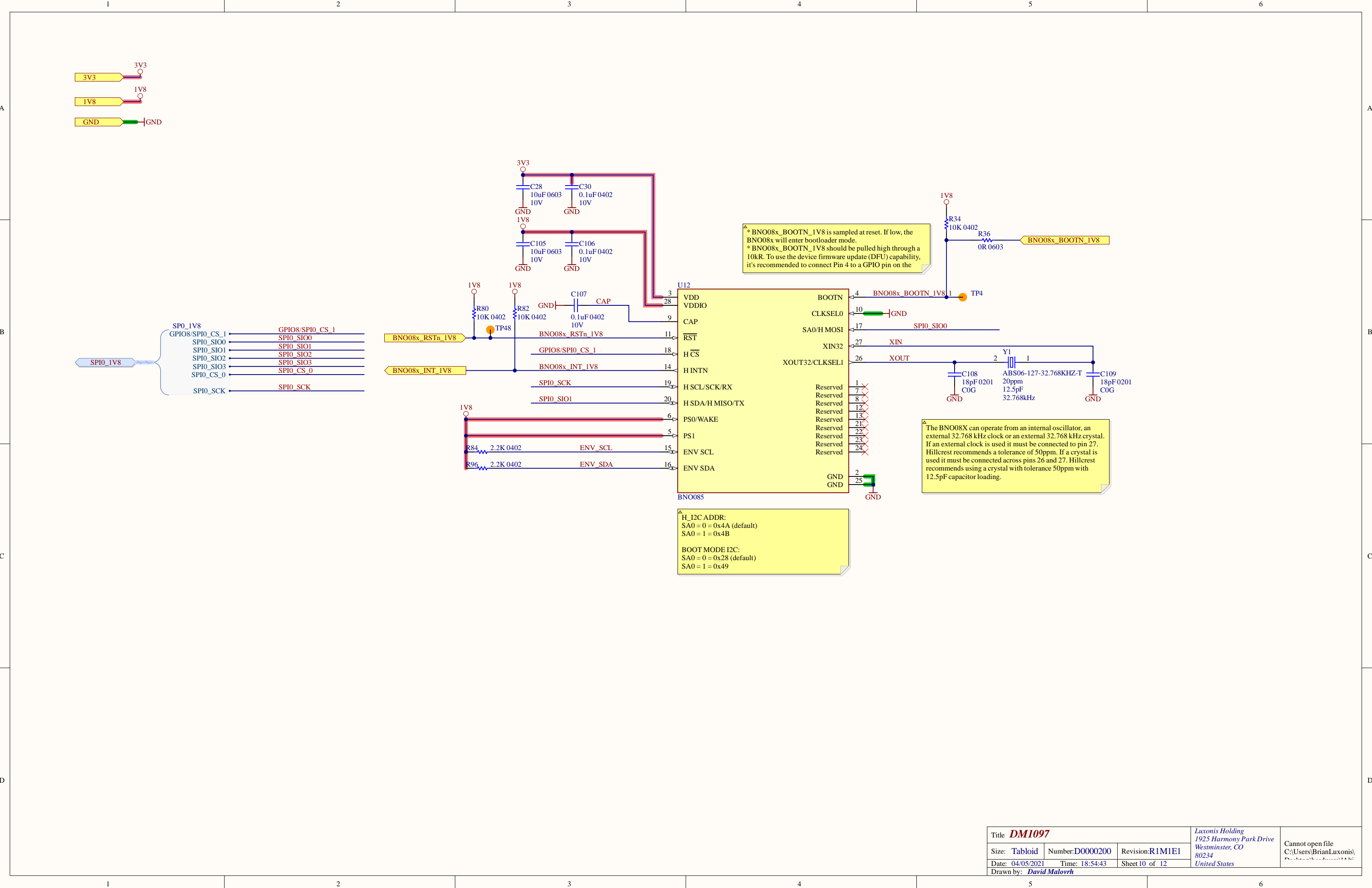
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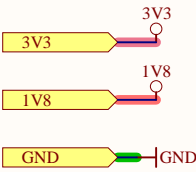
D

D

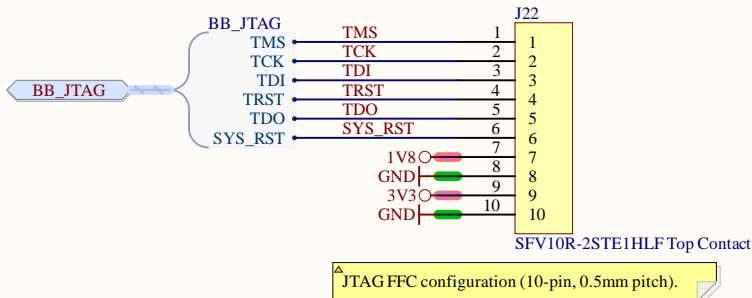




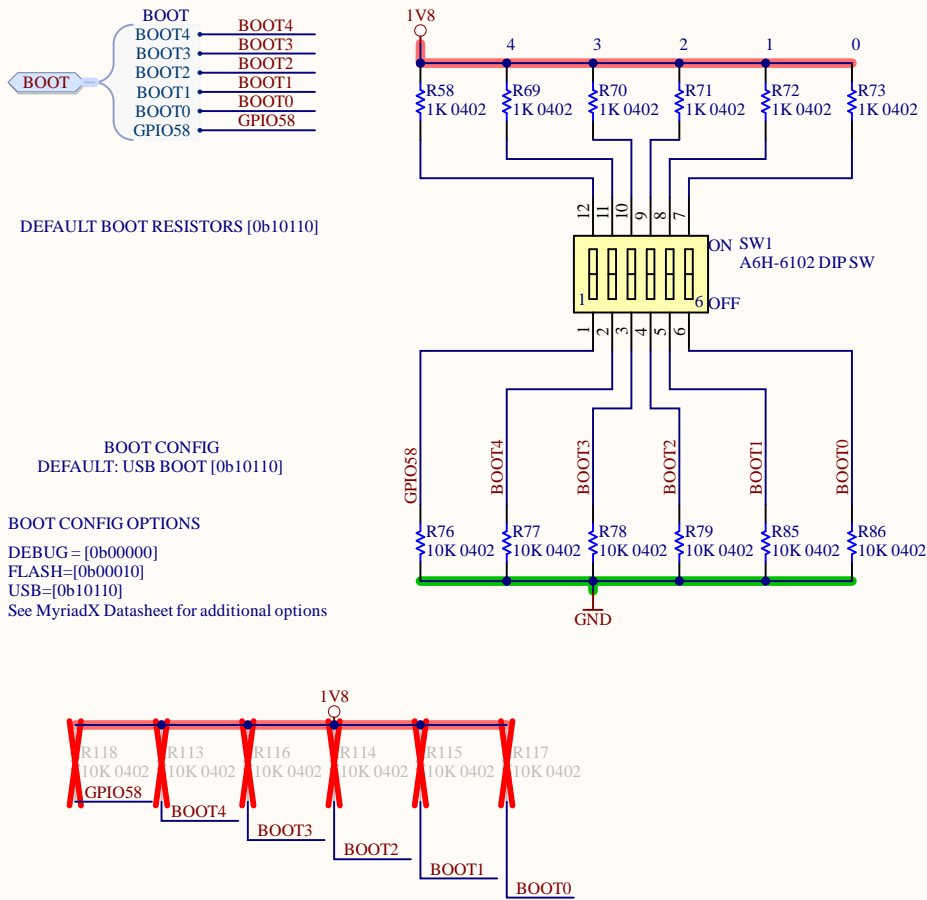




JTAG CONNECTOR

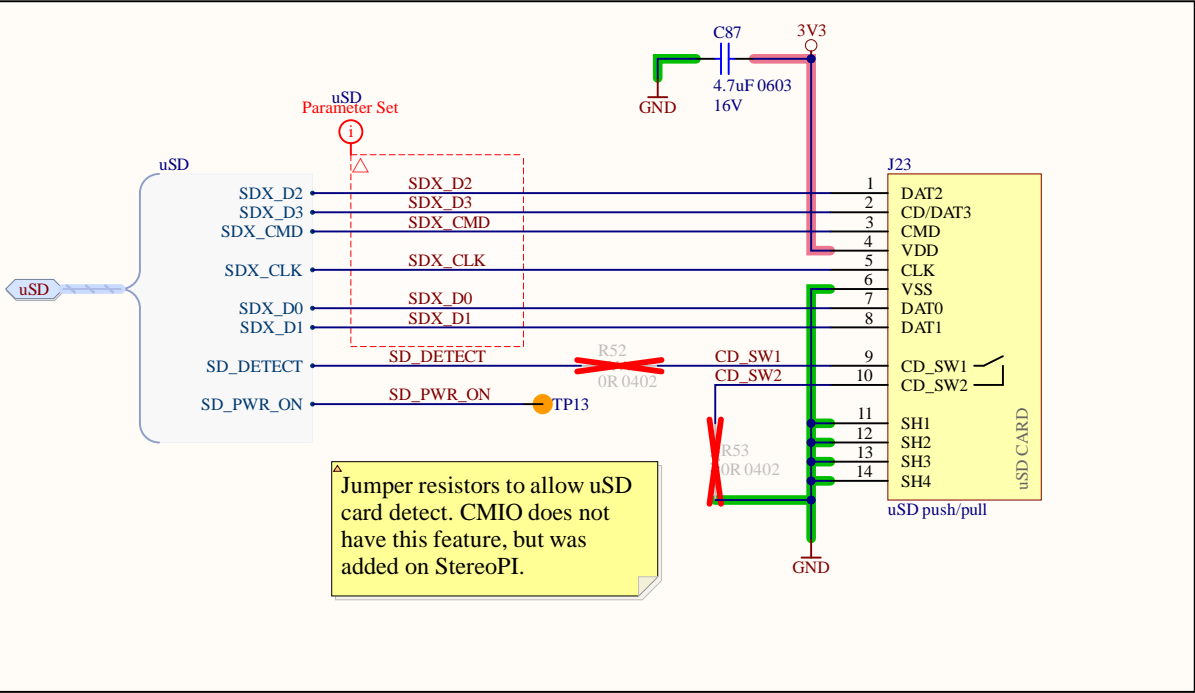


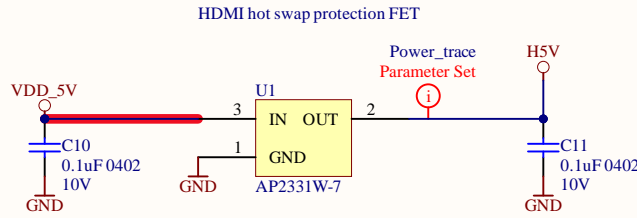
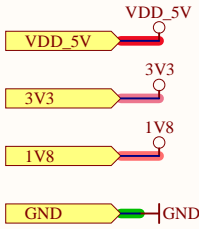
BOOT MODES



CMIO Note:
uSD is only used for modules with no on-board Flash (eMMC)

uSD





Basic onboard ESD protection is provided for the I2C EDID signals and the CEC signals, internal pullup and down resistors are also provided. On the {rpi4} the HDMI signals don't have any extra ESD protection, depending on the application extra ESD protection maybe required.

