Project: ***DM1098EMB***
Current Revision: ***R0M0E0***

DM1098EMB Revision History:

Date	Revision	Reason for Change	Changes Implemented
10/29/2019	R0M0E0 -> R1M1E1	1) We want to standardize to oppostie-side flex cable orientation across product line, and the 26-pin bottom-mount FFC connector on this board is incompatible with that when interfacing with the BG0249. 2) Standardize FFC connector alignment with edge of board when connector is closed.	1) Changed 26pin connector from bottom contact (54548-2671) to top contact (54550-2671). No change to footprint, only 3D component model and flex cable compatibility. 2) Moved each of the FFC connectors toward the board edge so that they are flush with edge when closed. 3) Updated schematic and component information to align with LuxonisMaster library system
11/8/2019	Lineage: BW1098FFC_R1M1E1 -> BW1098UBO_R0M0E0	1) 1098 board to go with 1099	1) Repurposed fan header to be power input, removed 5V barrel jack, added 3x Picoblade headers to allow SPI1, SPI2, and AUX signals out. Also added 1.8V to 3.3V bidirectional level translator to go between SPI1 and the 3.3V IO. Added 1.8V LDO, derived from 3.3V LDO, to supply the 1.8V side level shifting rail. Tuned SPI lanes to +/-100mil.
01/29/2020	BW1098UBO_R0M0E0 -> BW1098UBO_R1M1E1	1) 3.3V interface could not pull MX reset due to series diode preventing voltage from being pulled low enough 2) Access is required by customer to AUX_IO header 3) Some overlay text too small or didn't exist.	1) Removed diode D5 and replaced with non-inverting FET solution (2 NFET) to allow a 3.3V external GPIO to activate the 1.8V nRST for MX 2) Populated the AUX_IO picoblade and added a picoblade cable 3) Added "AUX_IO" overlay text, and made PWR connector polarity markings larger
02/24/2020	BW1098UBO_R1M1E1 -> BW1098UBO_R2M2E2	1) Updated revision number to avoid confusion	1) Updated documents with updated revision.
03/06/2020	BW1098UBO_R2M2E2 -> BW1098UBO_R2M2E3	1) 3.3V RST cannot be driven low by another TXB level shifter output (one unit driving another) 2) Added 5mil overlay-to-exposed-copper rule, to improve DFM.	1) Changed R17 value from 10k ohm to 56kohm to allow 4kohm TXB output driver to hold low enough for RE1C002UN transistor to turn off. 2) Moved some overlay text items by a few mils to meet new 5mil rule.
06/23/2020	BW1098UBO_R2M2E3 -> BW1098EMB_R0M0E0	1) Naming conventions were not aligned with SoM 2) Diff pair tunings and trace/space updated in AD20 (new impedance solver & delay tuning) 3) Old library references and symbols that have been validated updated to LuxonisMaster	1) Updated naming conventions to be more clear and consistent with BW1099EMB, and included GPIO function muxing table for exposed empoints. 2) Re-tuned the differential pairs, USB, and MIPI with improved AD tools. No change to stackup, and only sub-mil differences in trace/space. 3) Pointed symbols and footprints to LuxonisMaster
10/29/2020	BW1098EMB_R0M0E0 -> BW1098EMB_R1M0E1	1) TXB level shifter causing problems with 1k PU on SoM NOR CS 2) Debug access to allow power from USB requested 3) Aux reset circuitry no longer needed 4) Lack of silk screen makes debug or mods more difficult 5) SI improvements on differential pairs	1) TXB level shifters exchanged for TXS level shifter. Removed module RSTn discrete level shifter as the TXS level shifter can handle open drain. 2) Added diode OR power input circuit, as on 1092 and 1098OAK 3) Aux RST circuitry removed from design 4) Updated silk screen and improved readability 5) Removed unused pads on all differential PTHs and increased plane pull-back from 15mil to 20mil to reduce losses.
60/06/2021	BW1098EMB_R1M0E1 -> DM1098EMB_R0M0E0	1) ESD protection 2) FFC connector stronger mechanics 3) Updating board with overvoltage protection 4) Unused strobe configuration resistors 5) Add USB boot option for recovery mode 6) Connect AUX_IOs on RGB connector to SoM for optional use in future	1) Added protection diodes to MIPI lines 2) Changed FFC with Molex 505278 series 3) Added zener diode for protection 4) Deleted strobe configuration resistors with coresponding silk and tracks 5) Added BOOT_SEL button implementing option for recovery mode 6) Connected AUX_IOs on RGB connector to SoM GPIO7 and GPIO53 over 0R0 603 resistors for optional use in future

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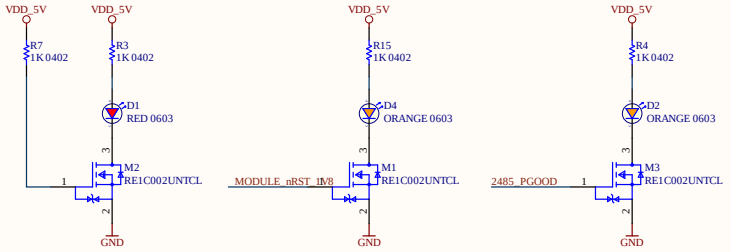
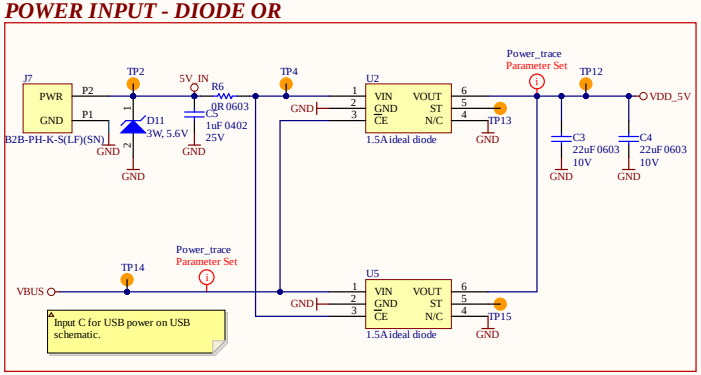
Size: Tabloid	Number: D1098EMB	Revision: R0M0E0		
Date: 26/01/2021	Time: 08:43:28	Sheet 1 of 6		
Drawn by: ***Brian Weinstein***				

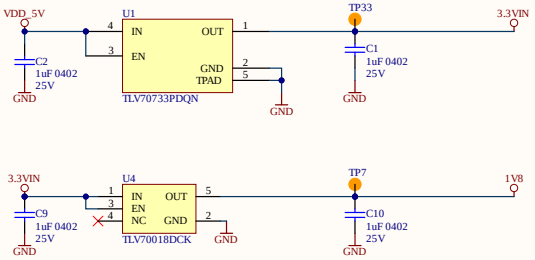


2485_PGOOD and MODULE_nRST both have pull ups to 1.8V on 1099 module. 2485_PGOOD is held low by open-drain output on 1099 PMIC until power is good. MODULE_nRST rises with 1.8V at POR, but can be held low by user button or 1099 JTAG.

POWER INPUT - DIODE OR



POWER REGULATION



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BW1098EMB_Connector
DM1098EMB_Connector.SchDoc

BW1098EMB_MIPI_CAM
DM1098EMB_MIPI_CAM.SchDoc

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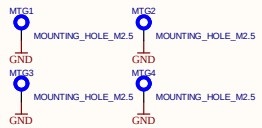
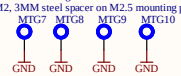
Standard M2.5x4 mounting for 1098



SMT mounting standoffs for module
M2, 3MM steel spacer on M2.5 mounting pad



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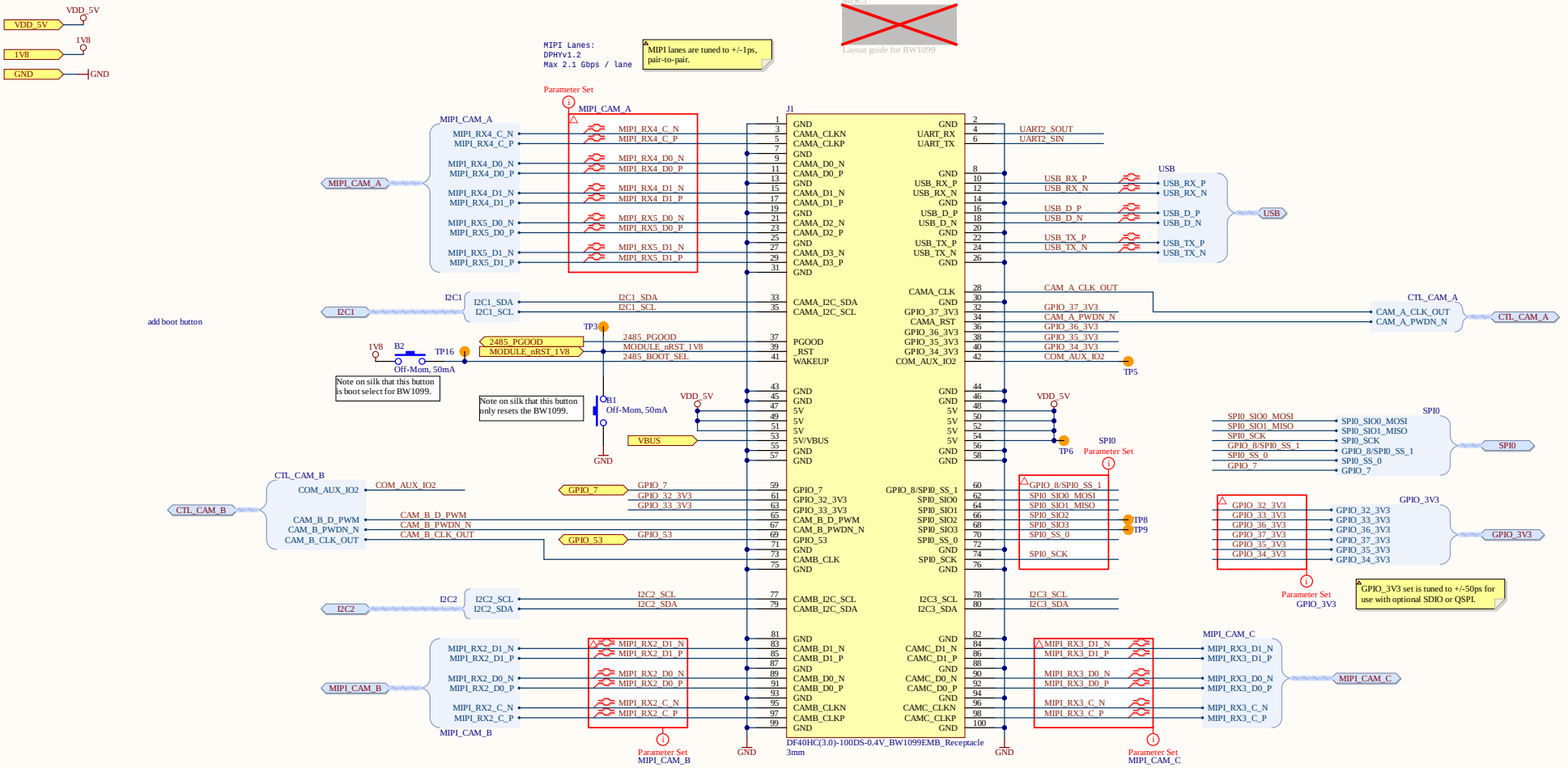
Date: 26/01/2021	Time: 08:43:28	Sheet 2 of 6	
Drawn by: Brian Weinstein			



Signal Name	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F	Alt G	BW1099EMB PU/PD	Other Notes
gpio_0	spi0_dio_0_mosi			sd_hst1_clk	sd_hst0_pwr_a			none	
gpio_1	spi0_dio_1_miso			sd_hst1_cmd	sd_hst0_pwr_b			none	
gpio_4	spi0_sclk			sd_hst1_dat_2	sd_hst0_cd			none	
gpio_5	spi0_ss_0			sd_hst1_dat_3	sd_hst0_wp			none	Selects NOR flash on BW1099EMB
gpio_7	spi1_dio_1_miso				sd_hst0_mmc_rstn			40.2k PU (1.8V)	
gpio_8	spi1_dio_2				spi0_ss_1	uart0_rts_n		none	Selects MX as slave on SPI0
gpio_24	i2c3_scl	spi0_sclk		spi2_ss_1				2.2k PU (1.8V)	
gpio_25	i2c3_sda	spi0_ss_0		spi2_ss_2				2.2k PU (1.8V)	
gpio_32	sd_hst0_clk			spi2_dio_0_mosi		i2c2_sda		40.2k PU (3.3V)	
gpio_33	sd_hst0_cmd		i2c3_scl	spi2_dio_1_miso				40.2k PU (3.3V)	
gpio_34	sd_hst0_dat_0	pwm_0	i2c3_sda	spi2_dio_2		uart3_sout	spi2_sclk	40.2k PU (3.3V)	
gpio_35	sd_hst0_dat_1	i2c2_scl	uart1_cts_n	spi2_dio_3		uart3_sin	spi2_ss_0	40.2k PU (3.3V)	
gpio_36	sd_hst0_dat_2	i2c2_sda	uart1_rts_n	spi2_sclk		i2c0_scl		40.2k PU (3.3V)	
gpio_37	sd_hst0_dat_3	pwm_3	uart3_sout	spi2_ss_0		i2c0_sda		300k PD	
gpio_45	sd_hst1_cmd		pwm_2	uart2_sout				none	
gpio_46	sd_hst1_dat_0		pwm_3	uart2_sin				none	
gpio_53								none	
Default setting									
3.3V Signaling									
1.8V Signaling									

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Size: Tabloid	Number: D1098EMB	Revision: R0M0E0	
Date: 26/01/2021	Time: 08:43:28	Sheet 3 of 6	
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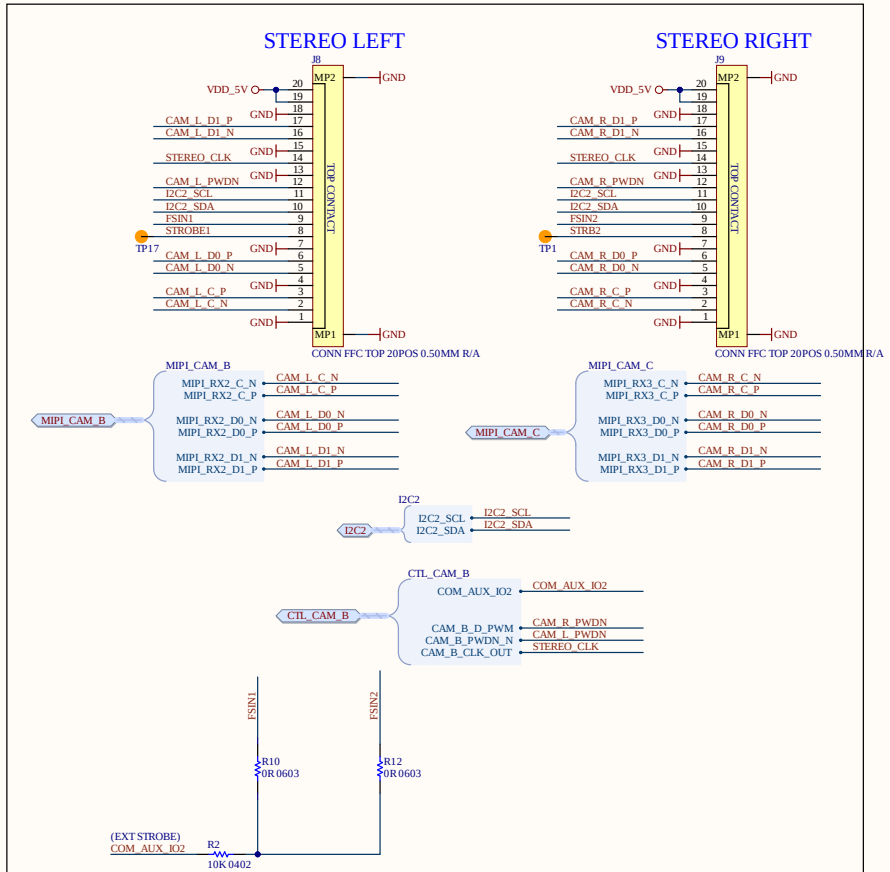
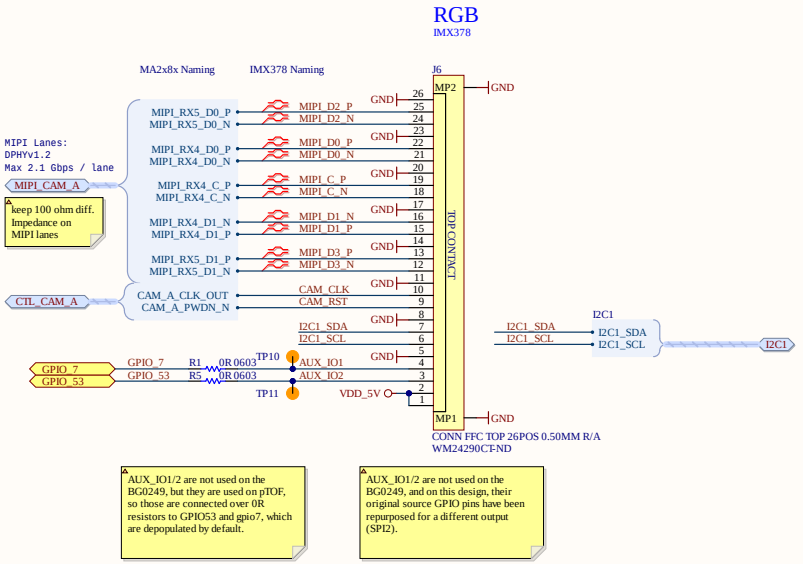
STEREO CAMERA PAIR

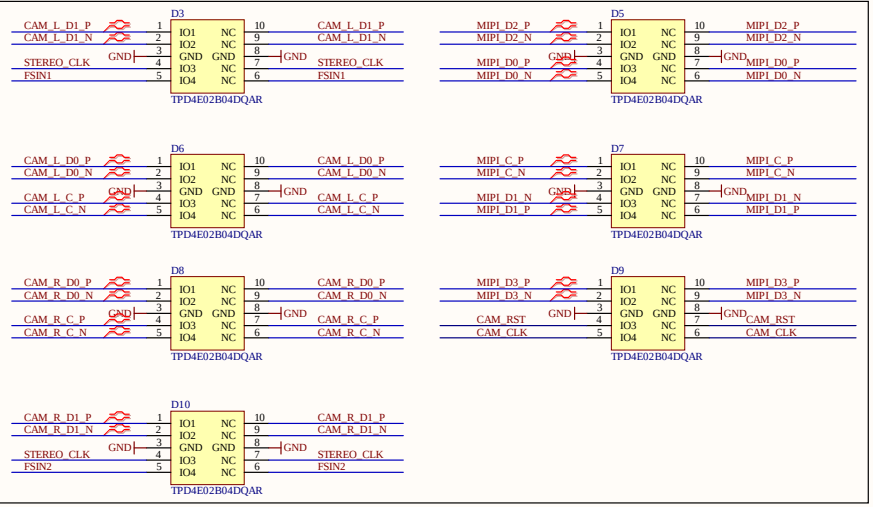


Camera timing Sync Option

RGB CAMERA



ESD PROTECTION



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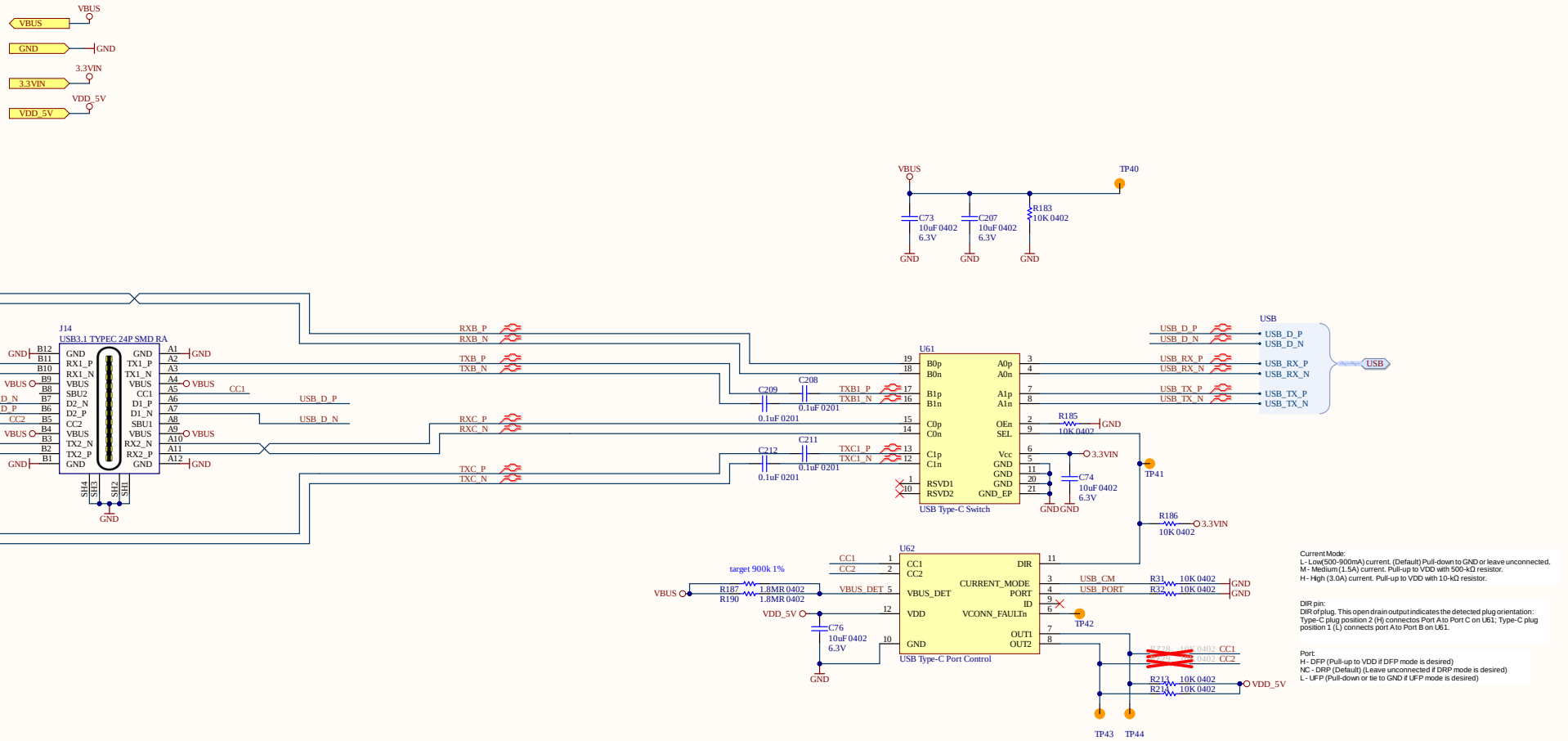

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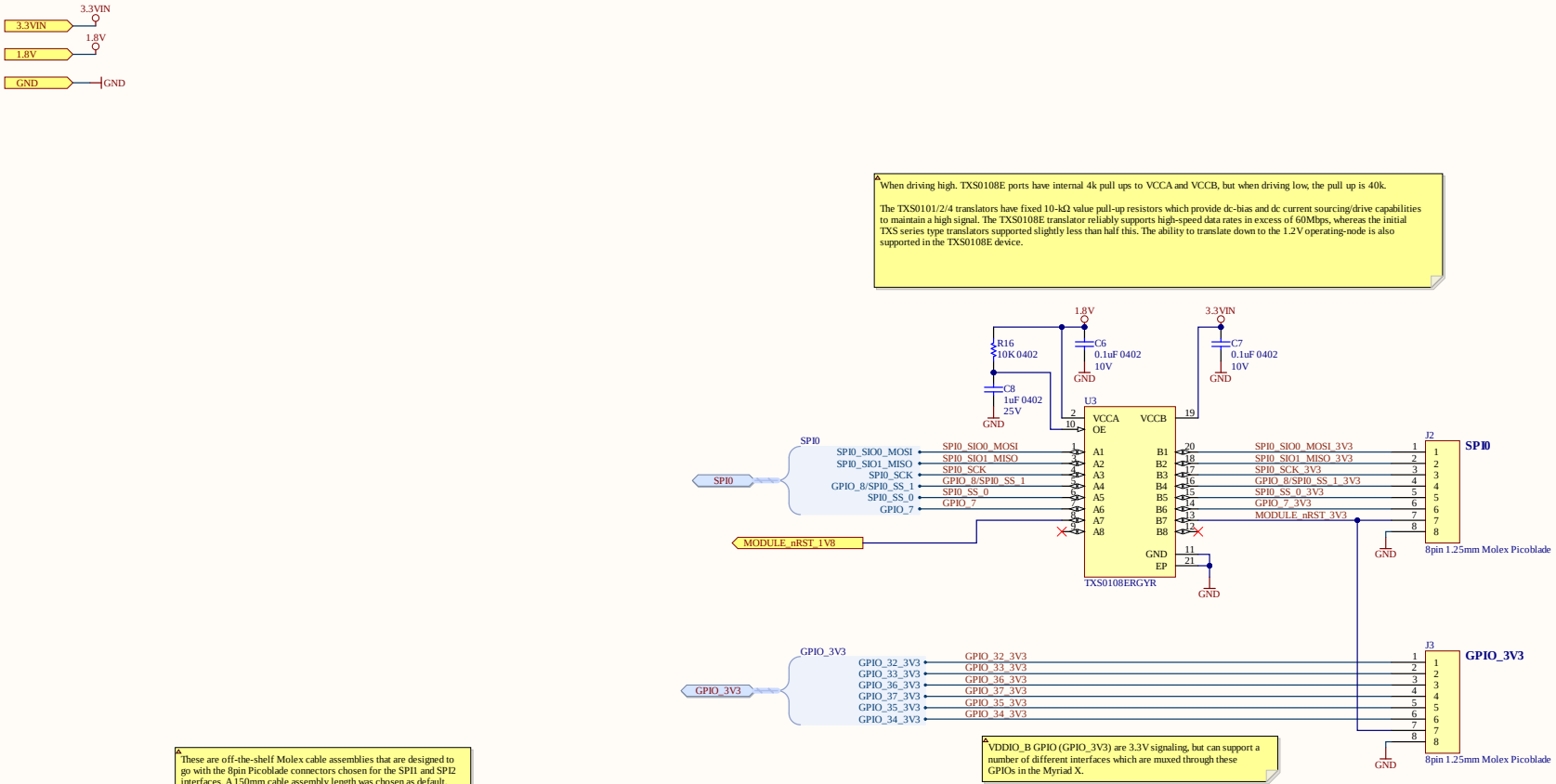

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