
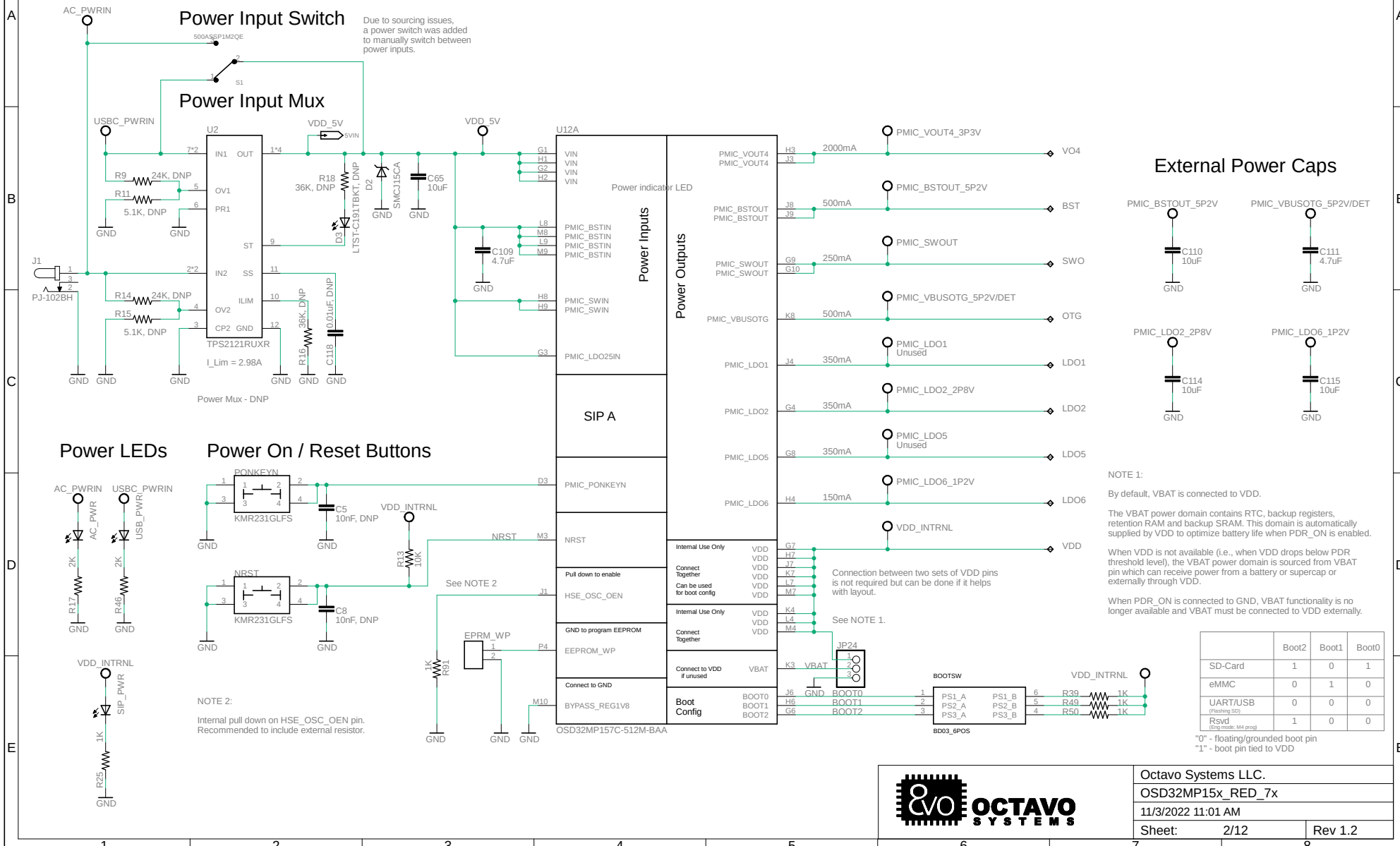
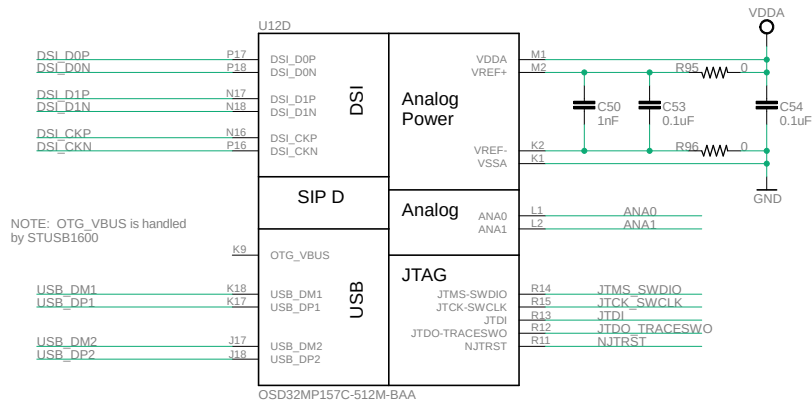


	1	2	3	4	5	6	7	8	
A	<div><div>Table of Contents</div><div>Sheet 1: Title</div><div>Sheet 2: OSD32MP15x Power & Reset</div><div>Sheet 3: OSD32MP15x USB, Analog & I/O</div><div>Sheet 4: Configuration Options</div><div>Sheet 5: GND, Misc, Mechanicals</div><div>Sheet 6: eMMC, SD, JTAG, LEDs/BTNs</div><div>Sheet 7: USB Host, CAN FD, UART4, ADC/DAC</div><div>Sheet 8: HDMI, Camera</div><div>Sheet 9: Ethernet</div><div>Sheet 10: USB-C, DSI LCD Headers</div><div>Sheet 11: Wireless Module, Motor Control Header</div><div>Sheet 12: RPi Header, Click Header, Notes</div></div>				<div><div>Octavo Systems OSD32MP15x RED Platform</div><div>(c) Copyright, Octavo Systems LLC, 2019 - 2022. All Rights Reserved.</div><div>THERE IS NO WARRANTY FOR THIS DESIGN, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE DESIGN *AS IS* WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS A FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE DESIGN IS WITH YOU. SHOULD THE DESIGN PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.</div></div>				A
B									B
C					<div><div>OSD32MP15x-RED Platform</div><div>Reference - Evaluation - Development</div></div>				C
D					<div><div>Revision 1.2</div></div>				D
E	<div><div>To Print: Use 8.5"x11" paper in landscape; 0.68 scaling factor.</div><div><div>OCTAVO SYSTEMS</div><div><div>Octavo Systems LLC.</div><div>OSD32MP15x_RED_7x</div><div>11/3/2022 11:01 AM</div><div><div>Sheet: 1/12</div><div>Rev 1.2</div></div></div></div></div>								E
	1	2	3	4	5	6	7	8	

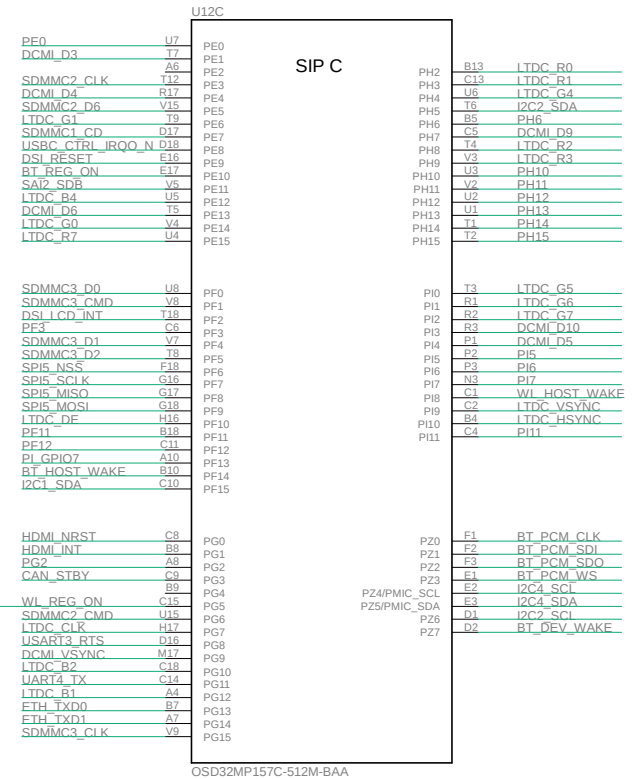
Power & Reset



USB, Analog & I/O



NOTE:
VDDA is a power output (LDO5).
VREF+ can be connected to another
voltage reference if desired to change
ADC voltage range.
If unused, leave VDDA floating;
connect VREF+ to VREF- to VSSA.



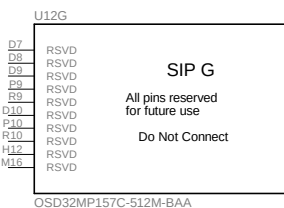
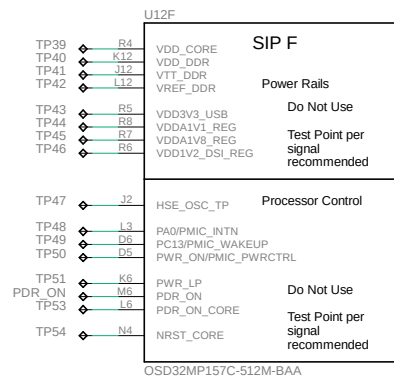
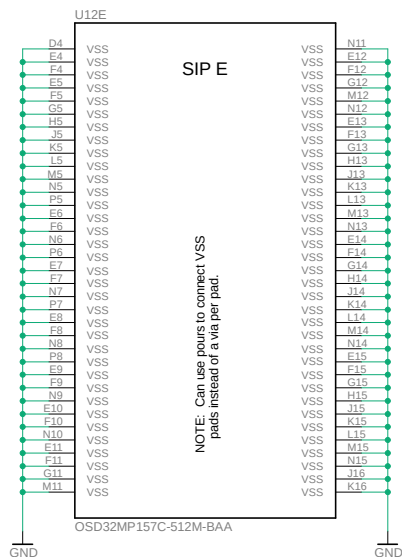
A
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B

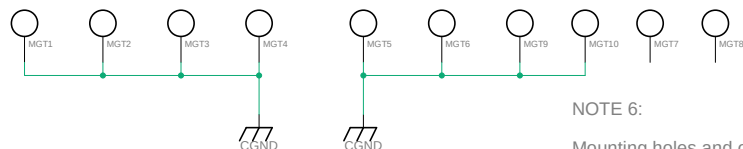


6	7	8
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SiP GND & Misc

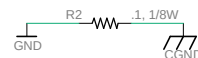


Mounting Holes



NOTE 6:

Mounting holes and other connector shields are part of a ground ring, CGND. This ring is connected to ground via a low ohm, high watt resistor.

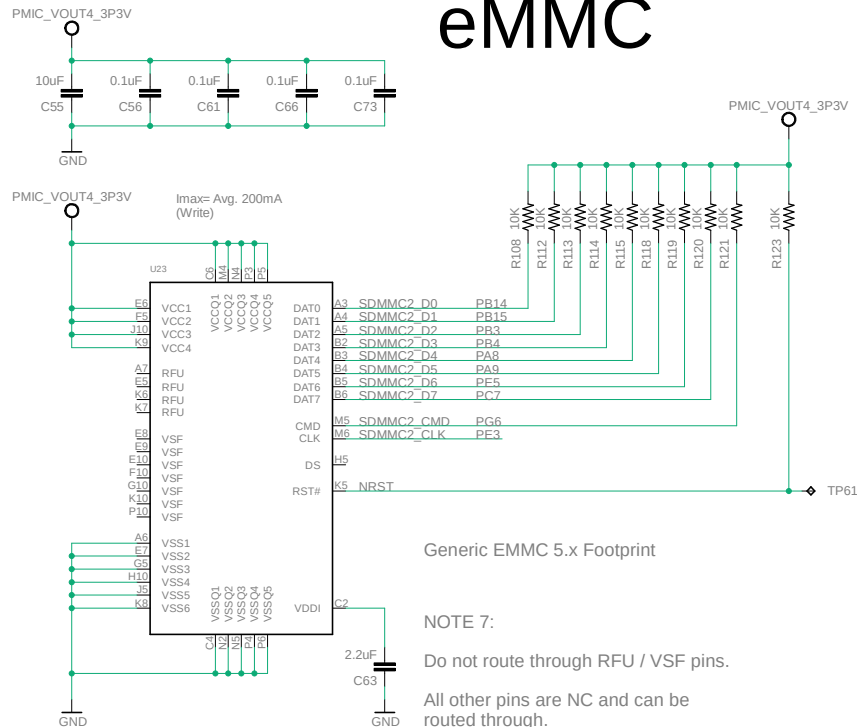


Fiducials

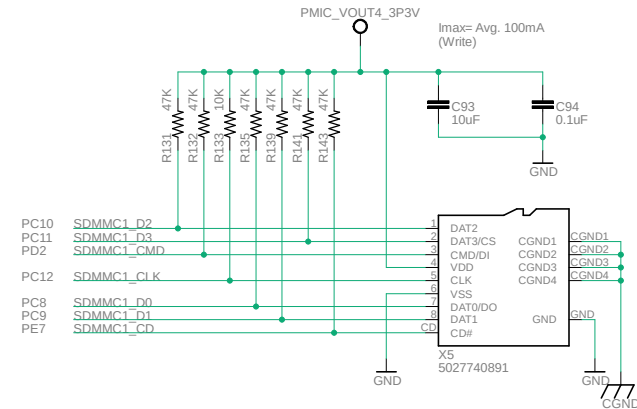


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11/3/2022 11:01 AM	
Sheet: 5/12	Rev 1.2

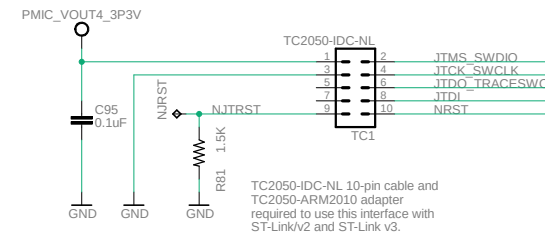
eMMC



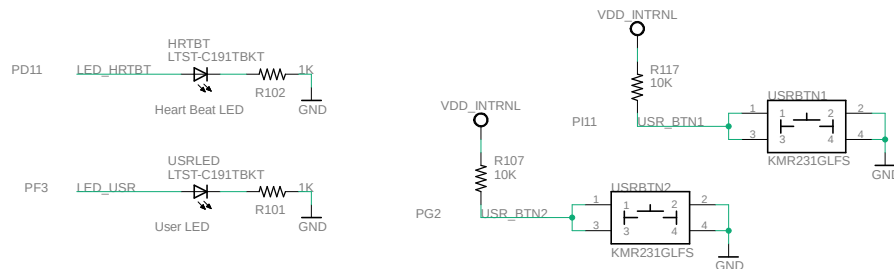
Micro SD card



JTAG Header

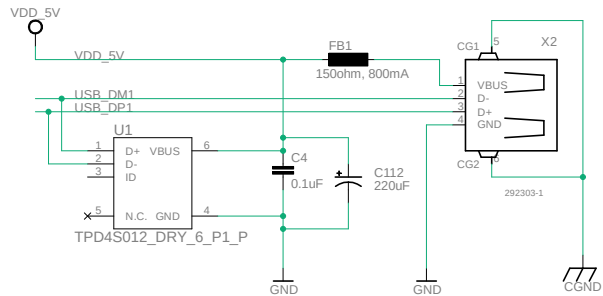


User LEDs and Buttons

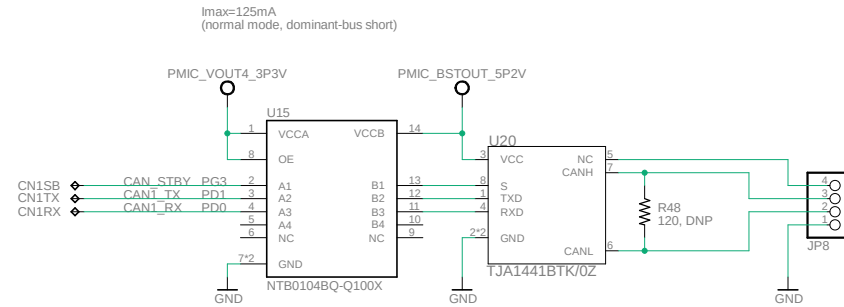


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OSD32MP15x_RED_7x	
11/3/2022 11:01 AM	
Sheet:	6/12
Rev 1.2	

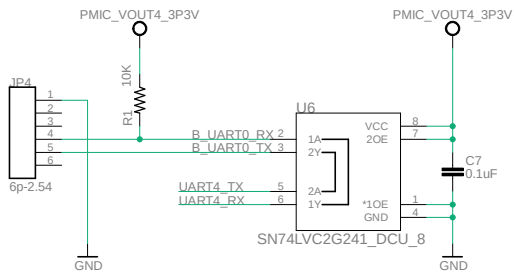
USB Host



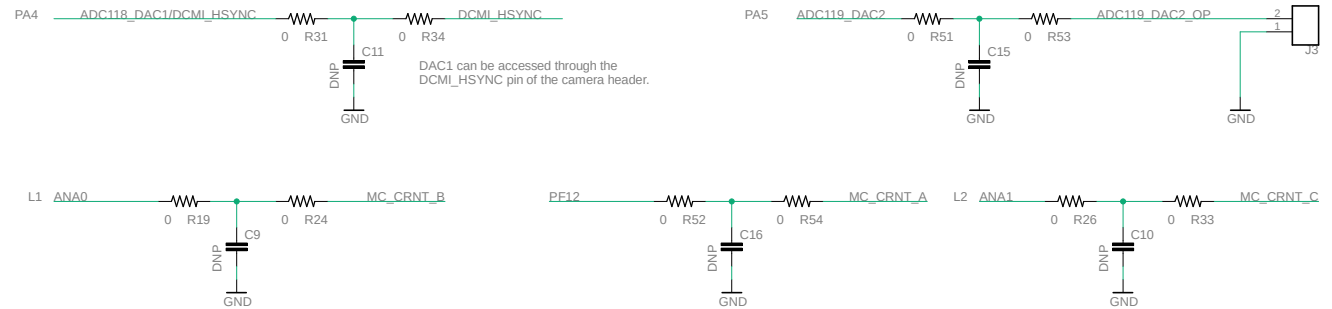
CAN FD



UART4



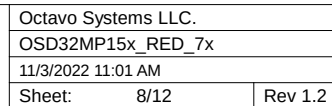
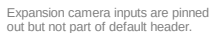
ADC/DAC



E

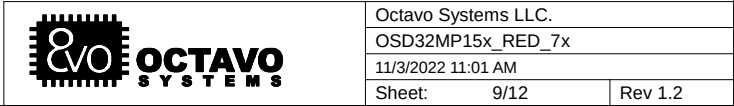


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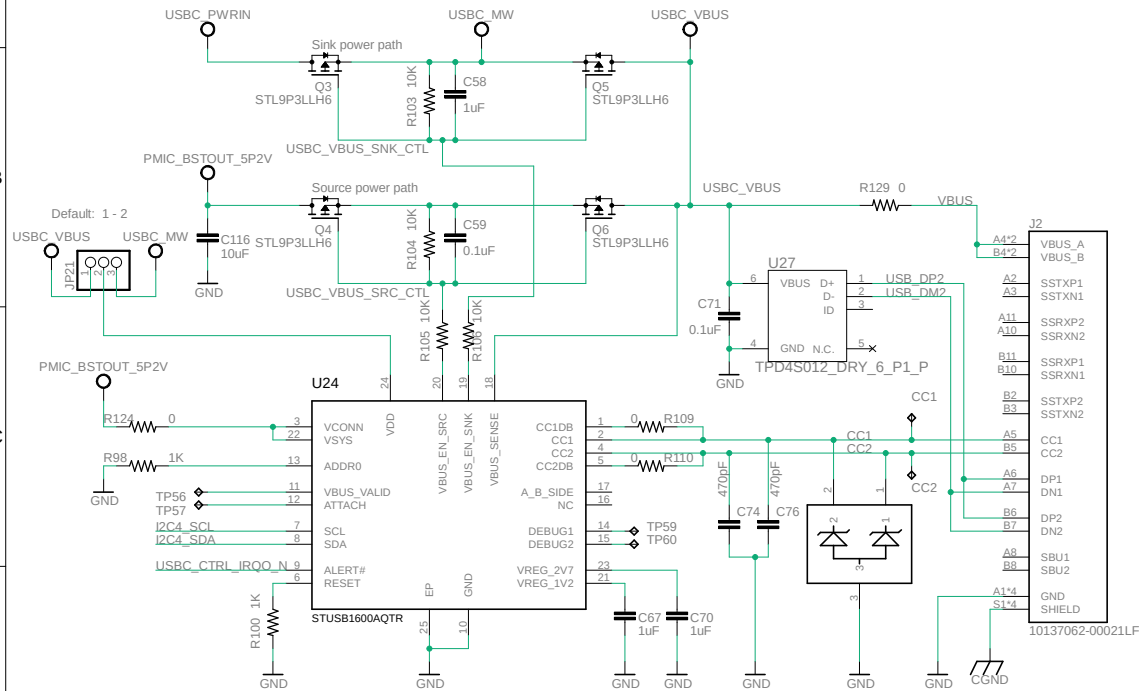


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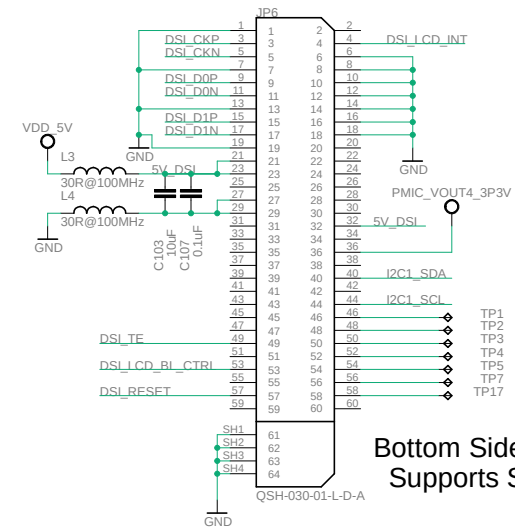
RJ45 jack connections based on discussion here:
<https://microchipsupport.force.com/s/article/Using-an-Ethernet-Gigabit-Port-for-Only-100-and-10-Mbps-Speeds>



USB-C

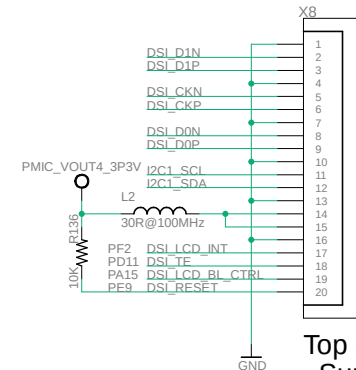


DSI LCD interface



Bottom Side Connector Supports ST B-LCD40-DSI1

I_{max} = estd. ~150mA
(panel+backlight+on board logic)



Top Side Connector Supports DK2 Screen



Octavo Systems LLC.		
OSD32MP15x_RED_7x		
11/3/2022 11:01 AM		
Sheet:	10/12	Rev 1.2

lmax = 430ma
(Wifi 802.11b Tx + BLE Tx, Rx in DH5)

PMIC_VOUT4_3P3V

C1 2.2uF

C2 2.2uF

C3 2.2uF

U7 971533A/H4-D14-92-7080

VDD_CLK_OUT

NC

GND

TP6

LPO_IN

VBAT_VIO

LPO_IN(32KHZ)

WL_REG_ON

WL_HOST_WAKE

WL_GPIO_1

WL_GPIO_2

WL_GPIO_4

D8

PG5

PI8

R12 1.5K

GND

PMIC_VOUT4_3P3V

PG15

SDMMC3_CLK

PF1

SDMMC3_CMD

PF0

SDMMC3_D0

PF4

SDMMC3_D1

PF5

SDMMC3_D2

PD7

SDMMC3_D3

U13

ANT

SR_VLX

VIN_LDO

BT_UART_TXD

BT_UART_RXD

BT_UART_CTS_N

BT_UART_RTS_N

BT_PCM_IN

BT_PCM_OUT

BT_PCM_CLK

BT_PCM_SYNC

BT_REG_ON

BT_HOST_WAKE

BT_DEV_WAKE

BT_I2S_DO

BT_GPIO_3

BT_GPIO_4

BT_GPIO_5

GND_(SR_PVSS)

GND

L1 2.2uH

VIN_LDO

TP10

PD6

USART2_RX

USART2_TX

TP11

PD4

USART2_RTS

USART2_CTS

P22

BT_PCM_SDO

PZ1

BT_PCM_SDI

PZ0

BT_PCM_CLK

PZ3

BT_PCM_WS

PE10

BT_REG_ON

PF14

BT_HOST_WAKE

PZ7

BT_DEV_WAKE

TP12

TP13

TP14

TP15

C12 2.2uF

C13 2.2uF

GND

GND

C14 330pF, DNP

C17 10uF, 10V

ANT1

GND1

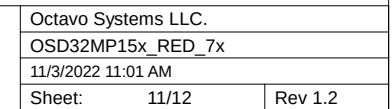
GND2

GND

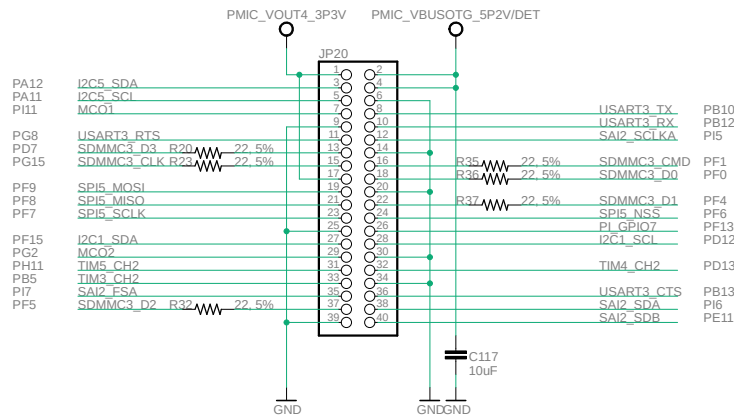
LBEESK1DX-TEMP

The schematic diagram illustrates the internal connections of the MC9S08KB64 microcontroller board. The central component is the 3P19 connector, which interfaces with various external components and the microcontroller's pins. The connections are as follows:

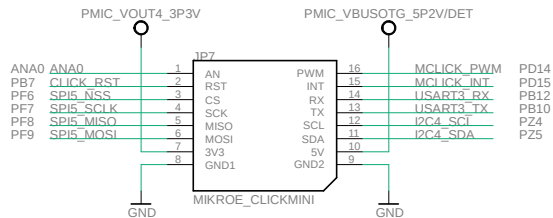
- MC9S08KB64 Pins:**
 - PA6: MC_EMRGY_STP
 - PF12: MC_CRNT_A
 - ANA0: MC_CRNT_B
 - ANA1: MC_CRNT_C
 - PE0: MC_PEC_SYNC2
 - PB7: MC_PEC_SYNC1
 - PH15: MC_WI
 - PH14: MC_WH
 - PH13: MC_VI
 - PH12: MC_VH
 - PH11: MC_UL
 - PH10: MC_UH
 - PH9: MC_DISS_BRK
 - PH8: MC_PEC_PWM
 - PH7: MC_EN_A
 - PH6: MC_EN_B
 - PH5: MC_NTC
 - PH4: MC_VBUSOTG_5P2V/DET
- External Components:**
 - Capacitors:** C20, C21, C22 (DNP), C29 (DNP), C30 (DNP), C31 (1nF), C34 (DNP), C35 (DNP), C36 (DNP), C47 (DNP), C51 (0.1uF), C52 (0.1uF).
 - Resistors:** R35 (0 DNP), R92 (100K).
- Connectors and Signals:**
 - 3P19 Connector:** A 3-pin connector with pins 1, 2, and 3. Pin 1 is connected to MC_CRNT_A, Pin 2 to MC_CRNT_B, and Pin 3 to MC_CRNT_C.
 - MC_BUS_VLTG:** Connected to PA3.
 - MC-HTSNK:** Connected to PF11.
 - MC_ENC_IND:** Connected to PH12.



RPi header



Mikro Click Header



Notes

Rev 1:

- 1) Initial release for OSD32MP15x RED design

Rev 1.1:

- 1) Modified ETH_RST / HDMI_RST. Due to power sequencing issues, the HDMI PHY needed reset controlled by processor.
- 2) Updated U26 to use the VDD_CAM power instead of PMIC_LDO_2P8V.
- 3) Added capacitance to HDMI port power and zero ohm resistor that can be modified to prevent back-current.
- 4) Swapped solder jumpers for USB-C and CAN I/O power for 3-pin headers; Changed BATIN test point to be larger.

Rev 1.2:

- 1) Updated BOOTSW to BD03.
- 2) Updated X2 (USB Host Port) to 292303-1.
- 3) Updated Y1 (Eth clock crystal) to ECS-250-12-30-GM-TR.
- 4) Updated U20 (CAN IC) to TJA1441BTK/0Z.
- 5) Added U15 (3.3V <-> 5V bidirectional voltage translator) NTB0104BQ-Q100X.
- 6) Updated U10 (Ethernet PHY) to KSZ8051RNL.
- 7) Removed USB LED from U2 (Power Input Mux).
- 8) Added VBAT header JP24.
- 9) Updated X5 (uSD slot) to 5027740891.
- 10) Updated OSC32 from SIT1533AI-H4-D14-32.768G to SIT1533AI-H4-DCC-32.768E.
- 11) Added AC_PWR and USB_PWR LEDs.
- 12) Updated R103, R106 to 10K. Updated C58 to 1uF.
- 13) DNP power mux due to sourcing issues; added power switch
- 14) Updated resistor values for USB-C power paths to slow turn on of transistors to prevent in-rush issues



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OSD32MP15x_RED_7x	
11/3/2022 11:01 AM	
Sheet:	12/12
Rev 1.2	