Symphony-Board

Variscite

CONTENT

Disclaimer:

SchematicS are for reference only.
Variscite LTD provides no warranty for the use of these schematics.
Schematics are subject to change without notice.

Revision History

Document	Carrier	
1.0	1.0	Initial
1.1	1.1	Released
1.2	1.1	Updated Block Diagrams Added SH1 wire short symbol Updated Compatability value for SOM pins 68,69,176 Updated SOM pin 22 net name Fixed U22.B1, C113.1 net name Fixed R1-R2,R35-R38 net name
1.3	1.2	Removed SH1 wire short, J1.68 routed to capacitive touch Changed R29 to C185 Changed R123,R127 to N.C. Added resistors R130-132 Removed ADC_INxx alternate function from VAR-SOM-MX8 Symbol Updated PCIe resistor assembly note
1.4	1.2	Updated Parallel Camera/HDMI/DP Note Fixed ETH pin names VAR-SOM-MX8X Symbol
1.5	1.2A	Disconnected R129
1.6	1.2A	Added VAR-SOM-MX8M-MINI Block Diagram and Symbol PRE-RELEASE VERSION !!!!! Subject to change without notice
1.7	1.2B	Fixed VAR-SOM-MX8M-MINI Symbol Changed U29,U30,U31 to P/N: FPF2193 Changed R60 to 47K
1.8	1.2C	Update VAR-SOM-MX8M-MINI Symbol to V1.1 with side notes for v1.0B(Early access customers) Update VAR-SOM-MX8M-MINI Block Diagram POR circuitry fed by VCC_SOM: see U7 R60 R61 R40 R60 D5 Removed
1.9	1.2D	Raise VCC_3V3 to Nominal 3.39V for VAR-SOM-MX8M-MINI/NANO power up threshold voltage requirement of >3.35V
1.10	1.2E	* Added x2 studs for heat plate support * Base_per_3v3 added slew rate limit * U7 (Base POR circuit) added CB_WDOG resistor assmbly options * U29 U30 U31 - Added assembly note * VAR-SOM-MX8M-NANO pages added with symbol pinout * VAR-SOM-MX6 Connector update - added NC on /*/ assembly options * Power switch in OFF position discharge of Custom rails added * Ethernet magnetics - support two Manf: Pulse & UDE; Base RJ45 LEDs matched to SOM behaviour;

VPC1
PCB
VPC0342

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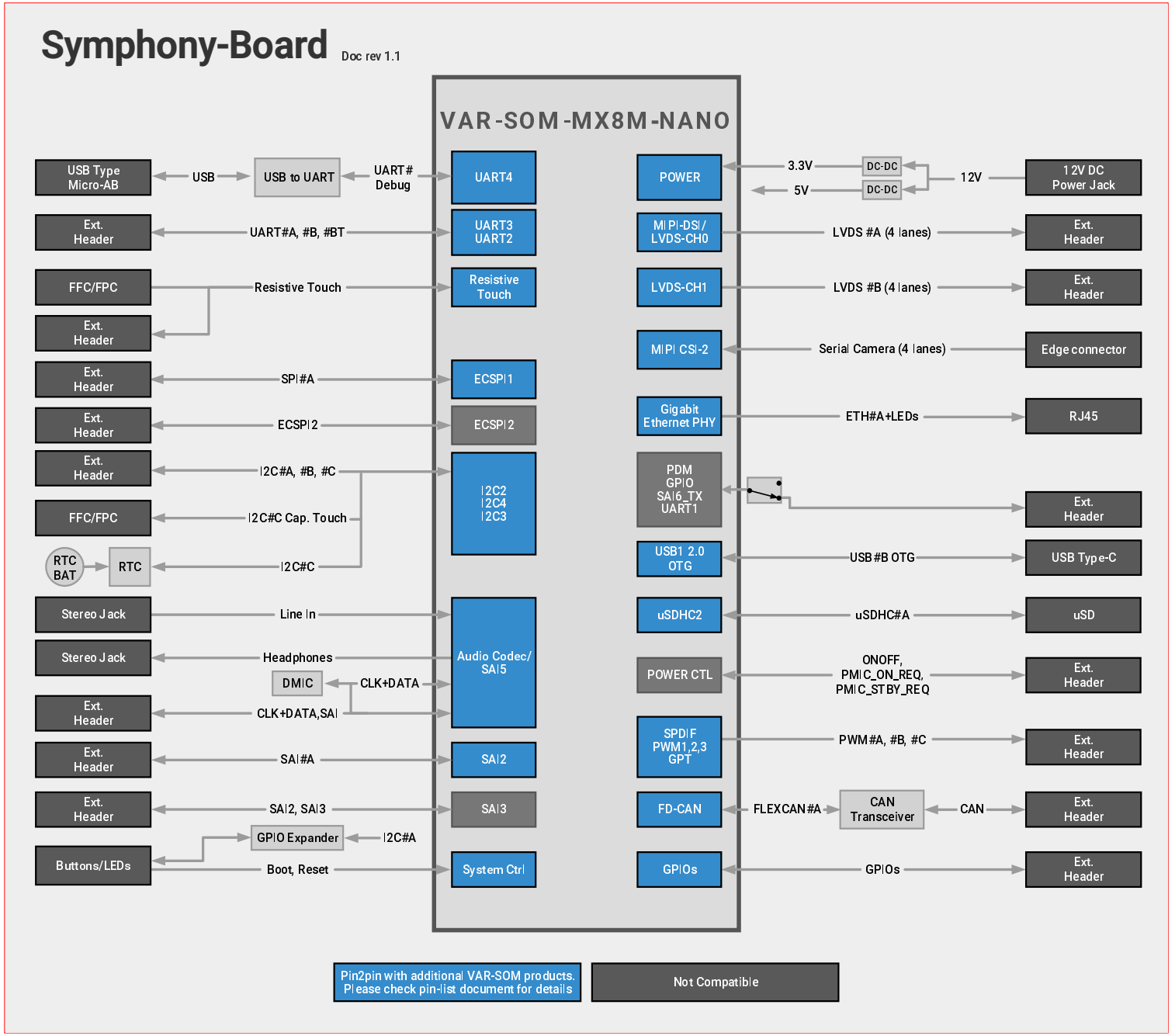
Title: 01. Cover			
Size: A3	Document Number: Symphony-Board	Project: Symphony-Board	Rev: 1.2E_R1.10
Designer: Aviad H.		Approved By:	
Date: Tuesday, March 03, 2020		Sheet 1 of 14	

02. Block Diagram VAR-SOM-MX8M-NANO



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Title: 02. Block Diagram VAR-SOM-MX8M-MINI			
Size: A3	Document Number: Symphony-Board	Project: Symphony-Board	Rev: 1.2E_R1.10
Designer: Aviad H.		Approved By:	
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03. SOM

OFF Page connector index:
1. Function# :Interface common to ALL SOMs
2. J1.xxx-Function :Interface common to certains SOMs or Used for carrier board common function
3. J1.xxx :No common interface

Compatability list
Describes the ALT per SOM for compatibility.
Order of names: (MX6/MX8/MX8X/MX8MM)

CustomBoard ALT
Describes ALT which can be demonstrated on CustomBoard.
'/*/' - denotes special SOM assembly option
Order of names: [MX6/MX8/MX8X/MX8MM]

For cross probing between SOM symbol and the specific SOM Connector used, set the "Implementation" property value in SOM port symbol to one of the following:

1. VAR-SOM-MX6
2. VAR-SOM-MX8
3. VAR-SOM-MX8X
4. VAR-SOM-MX8M-MINI
5. VAR-SOM-MX8M-NANO

Implementation = VAR-SOM-MX8M-NANO

Optional remove for conneting LICELL

Optional remove for connecting 1588

Assemble to support VAR-SOM-6UL BOOT

Optional remove for TAMPER interfacing

In case using MX8X SOMs assembled without Touch screen controller, Optional Remove to prevent stubs on High speed lines

MECHANICS

HEATPLATE SUPPORT STANDOFF

SOM MOUNTING STANDOFF

Fiducial

Variscite_PN = VCN0262

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Title: 03. SOM			
Size: A2	Document Number: Symphony-Board	Project: Symphony-Board	Rev: 1.2E_R1.10
Designer: Aviad H.		Approved By:	
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04. VAR-SOM-MX8M-NANO Connector

PIN NAMING MNEMONICS:

"/" - Prefix number of "/" denotes alternate function number; none is ALT0=PAD name
"/*/" - Prefix denotes pin connected to a configurable module on SOM;
E.g. with "EC" pin ENET_TD3/////GPIO1_IO18/*/ETH_TRX0_P source is Ethernet PHY
"~" - Prefix points to an alternate function optionally used or shared on SOM;
Verify with SOM datasheet before using this pin;

SETUP NOTES FOR VAR-SOM-MX8M-MINI:

EXP_ENET_SEL - Set to Header
Pin 71, 80 IO levels running from NVCC_SD2 set on SOM;

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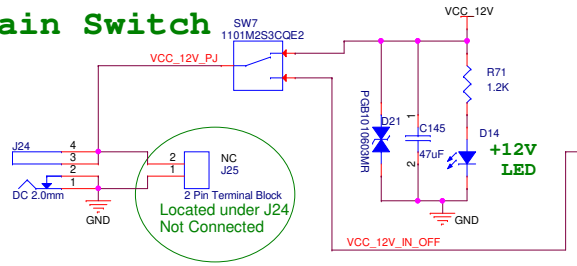
Title: 04. VAR-SOM-MX8M-MINI Connector

Size	Document Number	Project	Rev
A2	Symphony-Board	Symphony-Board	1.2E_R.10

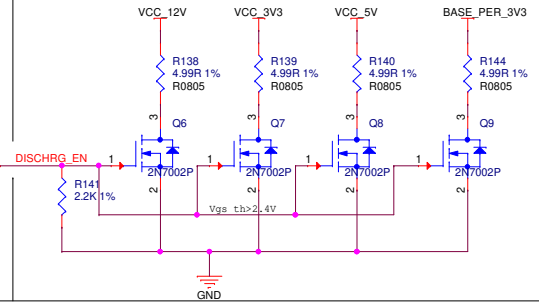
Designer: Aviad H. Approved By:
Date: Tuesday, February 25, 2020 Sheet 4 of 14

05. Power,Reset,Boot,RTC,EEPROM

12VDC INPUT
Main Switch



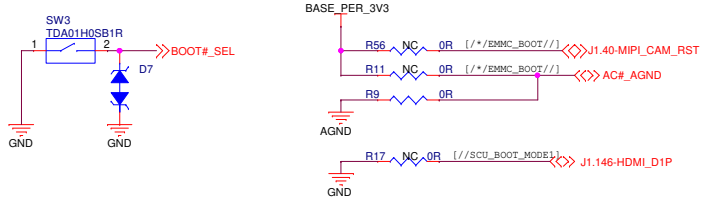
POWER DISCHARGE



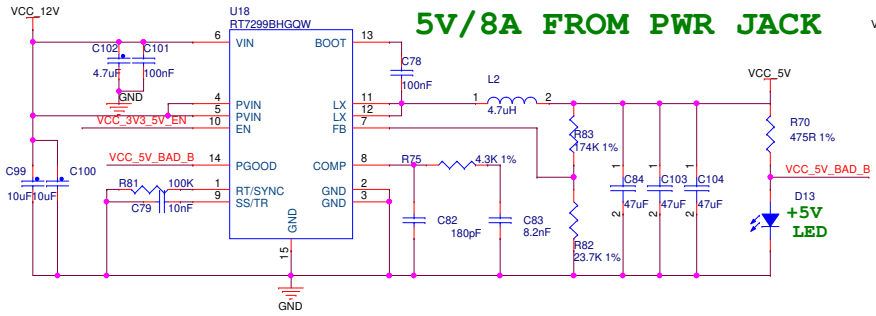
SOM BOOTSTRP

Boot Options:
OFF : MX8/MX8X-eMMC ; MX6-NAND
ON : SD

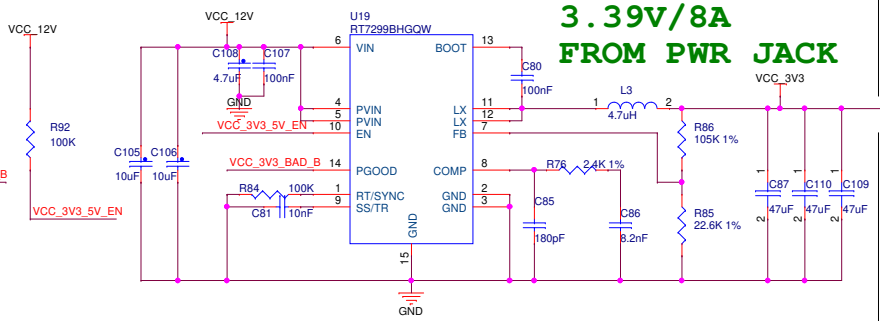
For supporting MX6 SOMs with eMMC boot option:
Remove R9
Place R56,R11



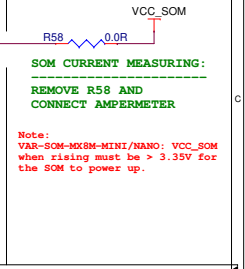
5V/8A FROM PWR JACK



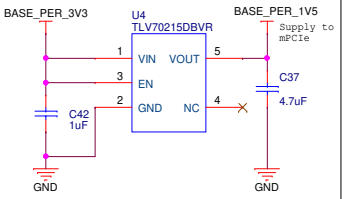
3.39V/8A FROM PWR JACK



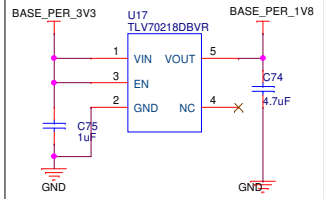
SOM PWR



1.5V BASE

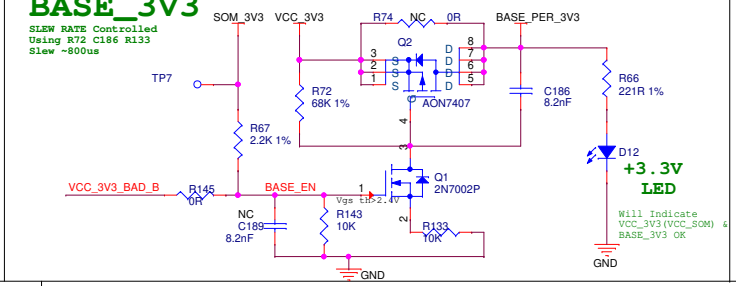


1.8V BASE

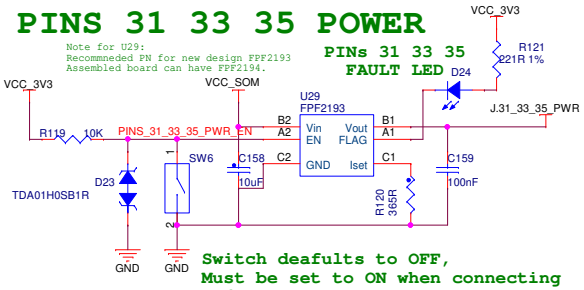


BASE_3V3

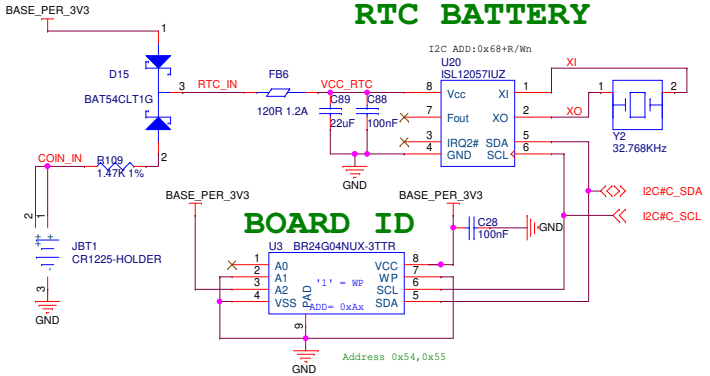
SLEW RATE Controlled
Using R72 C186 R133
Slew ~800us



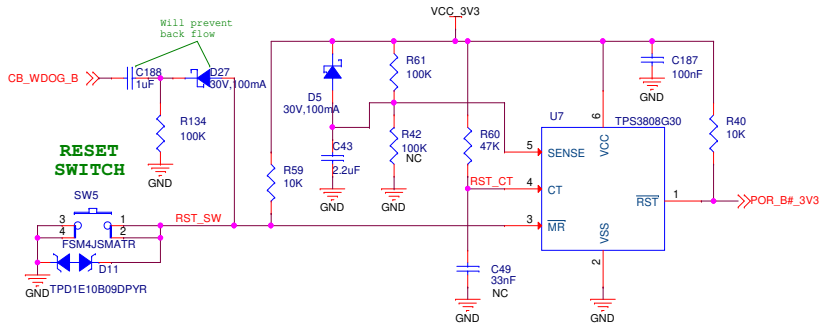
PINS 31 33 35 POWER



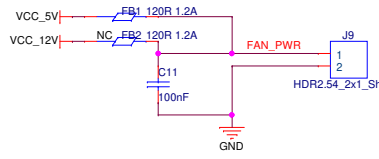
RTC BATTERY



RESET CIRCUITRY



FAN PWR



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Title: 05. Power,Reset,Boot,RTC,EEPROM			
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Designer: Aviad H.		Approved By:	
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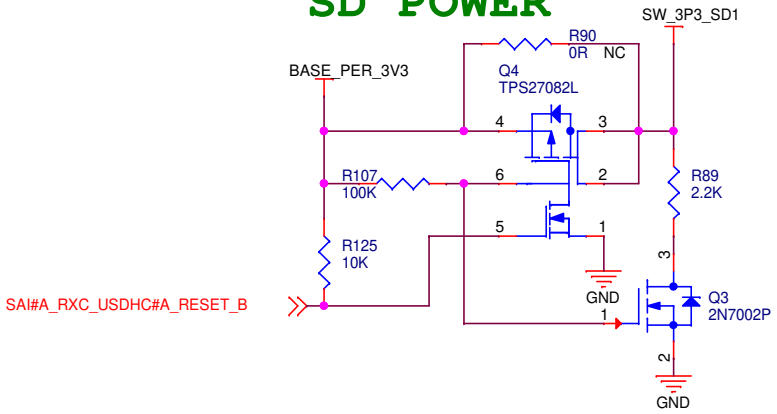
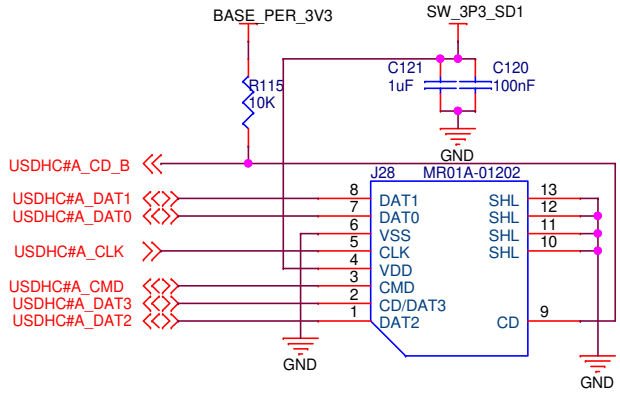
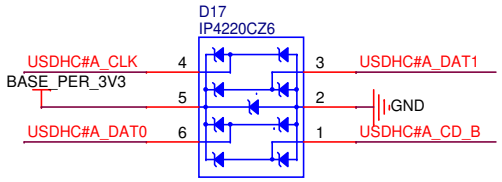
06. uSD, Audio,CAN

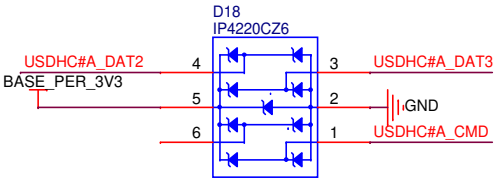
SD POWER



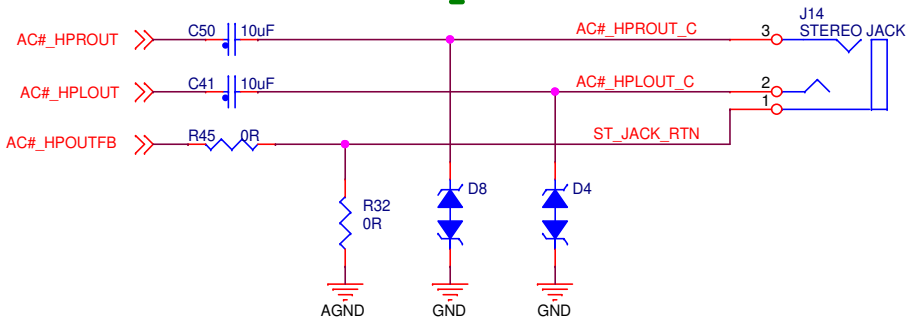
uSD CARD



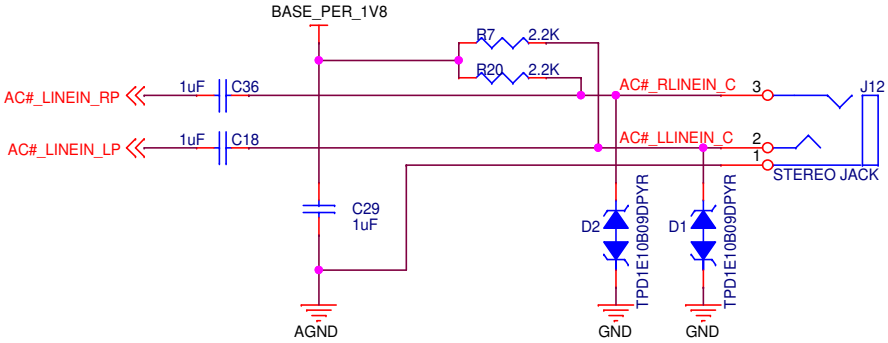




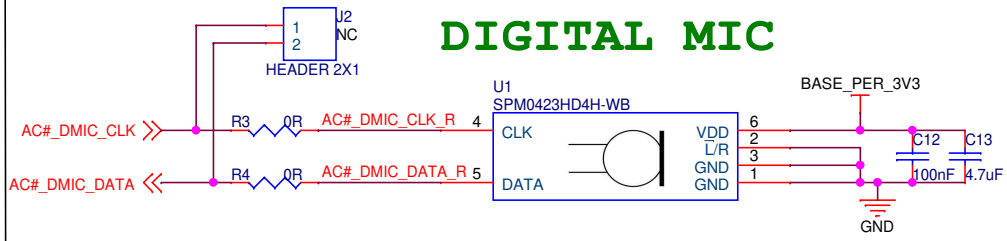
Headphones



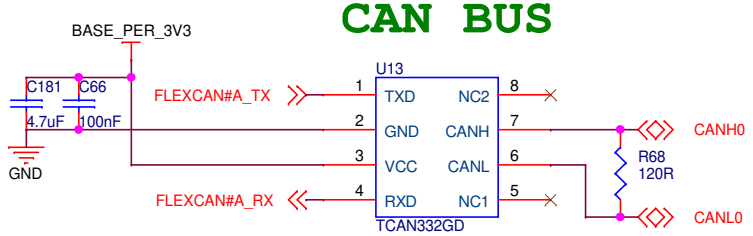
Line In



DIGITAL MIC



CAN BUS

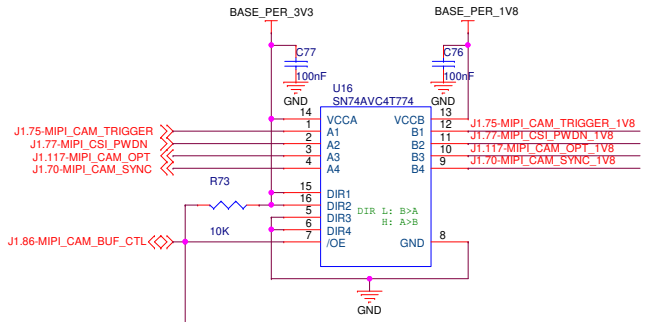


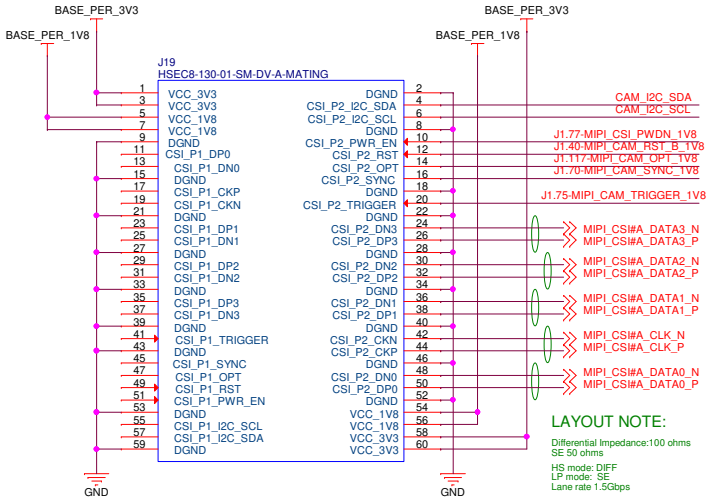
Variscite

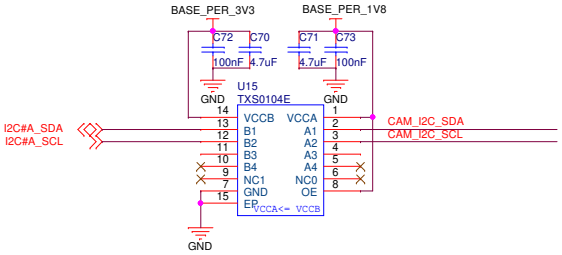
Title: 06. uSD, Audio,CAN			
Size: A4	Document Number: Symphony-Board	Project: Symphony-Board	Rev: 1.2E_R1.1
Designer: Aviad H.		Approved By:	
Date: Tuesday, February 25, 2020		Sheet 6 of 14	

07. Camera, HDMI, DP

MIPI-CSI



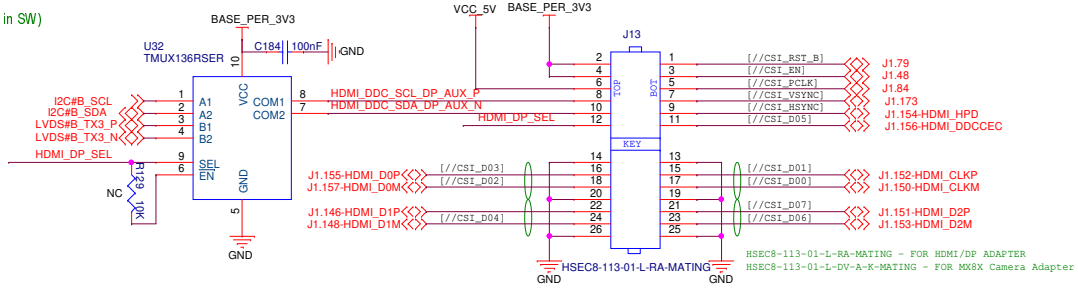




Note:
U32 switch is to enable support for: Parallel camera, HDMI, DP adaptor boards.
Switch chooses between:
1)I2C#B which can export
on VAR-SOM-MX8X: I2C3 Used by parallel camera
on VAR-SOM-MX8: HDMI DDC Used by HDMI (GPIO1_22 in should be set High in SW)
and between
2) VAR-SOM-MX8(DP assembly option): HDMI AUX used by DP

Switch can be omitted when designing for only one of the the above interfaces.

MX6/MX8-HDMI, MX8-DP, MX8X-CSI

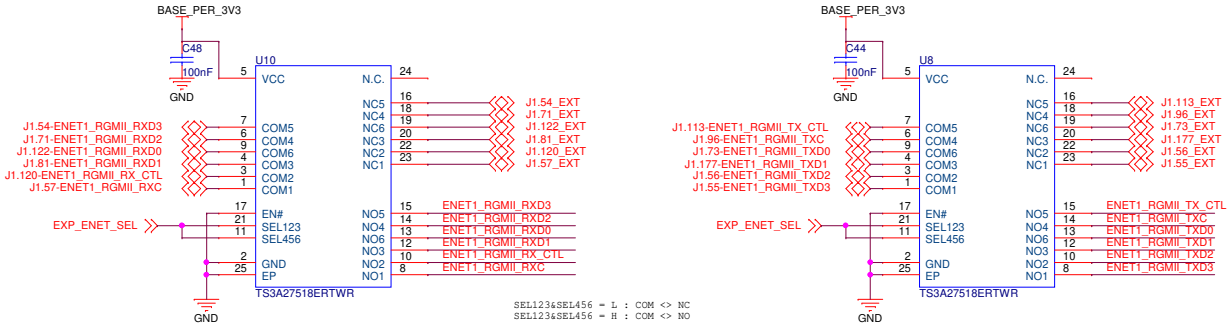


Variscite

Title: 07. Camera, HDMI, DP			
Size: A3	Document Number: Symphony-Board	Project: Symphony-Board	Rev: 1.2E_R1.10
Designer: Aviad H.		Approved By: <Approved By>	
Date: Tuesday, February 25, 2020		Sheet 7 of 14	

08. Ethernet

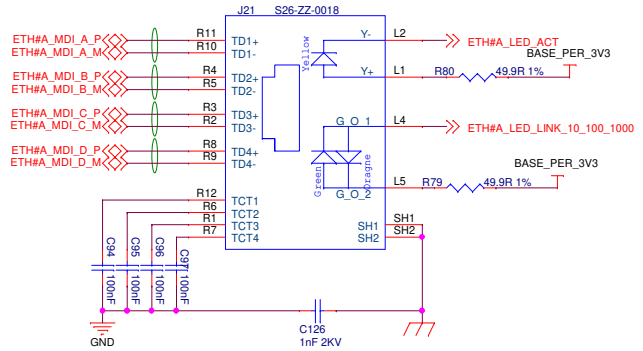
Gigabit Ethernet (External) / Header selection



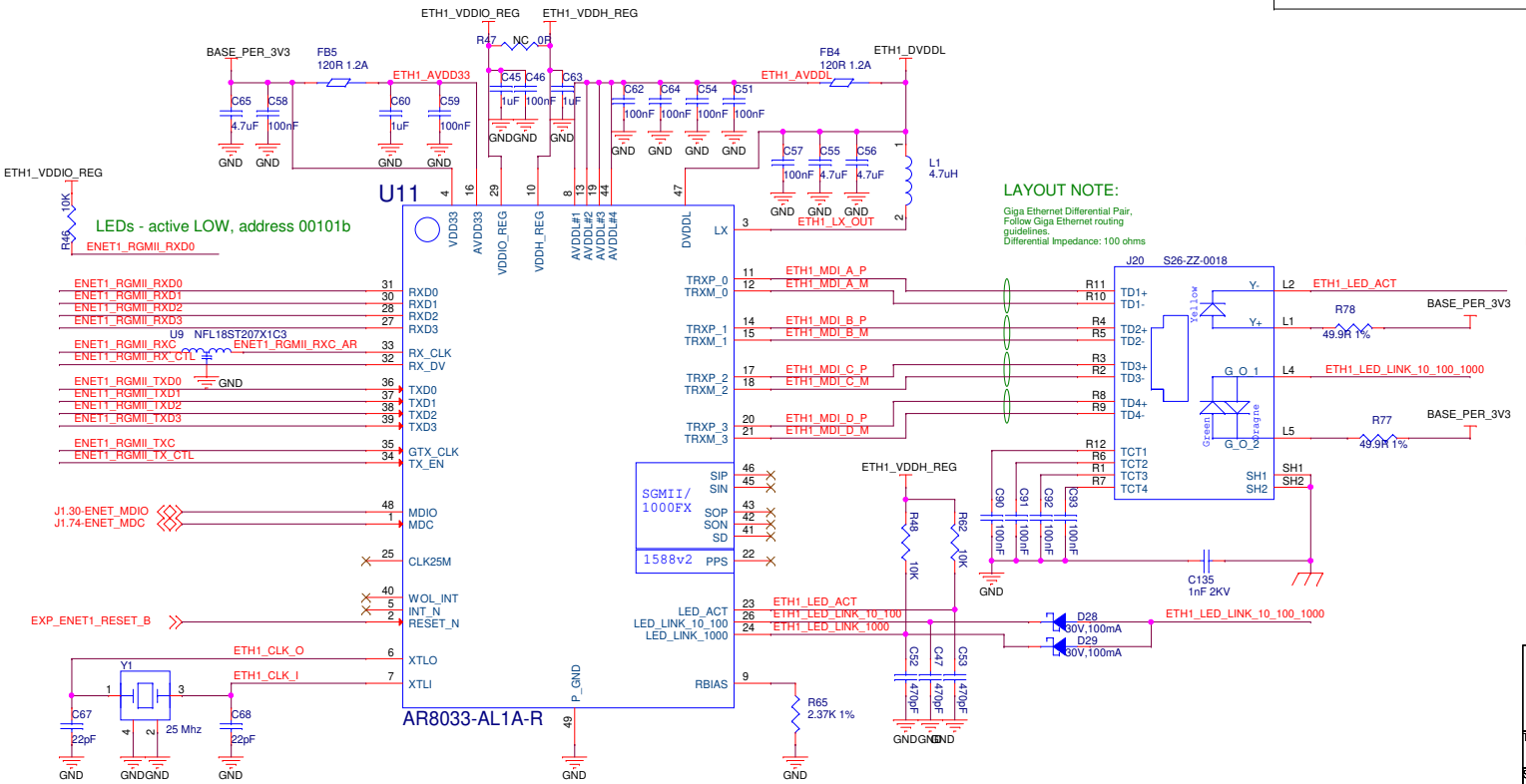
Gigabit Ethernet (Internal)

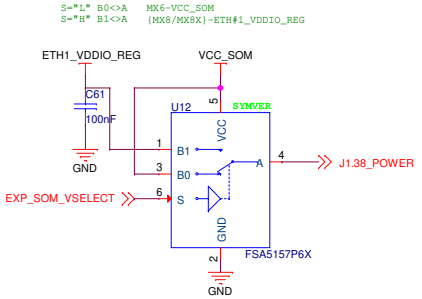
LAYOUT NOTE:

Giga Ethernet Differential Pair, Follow Giga Ethernet routing guidelines. Differential Impedance: 100 ohms



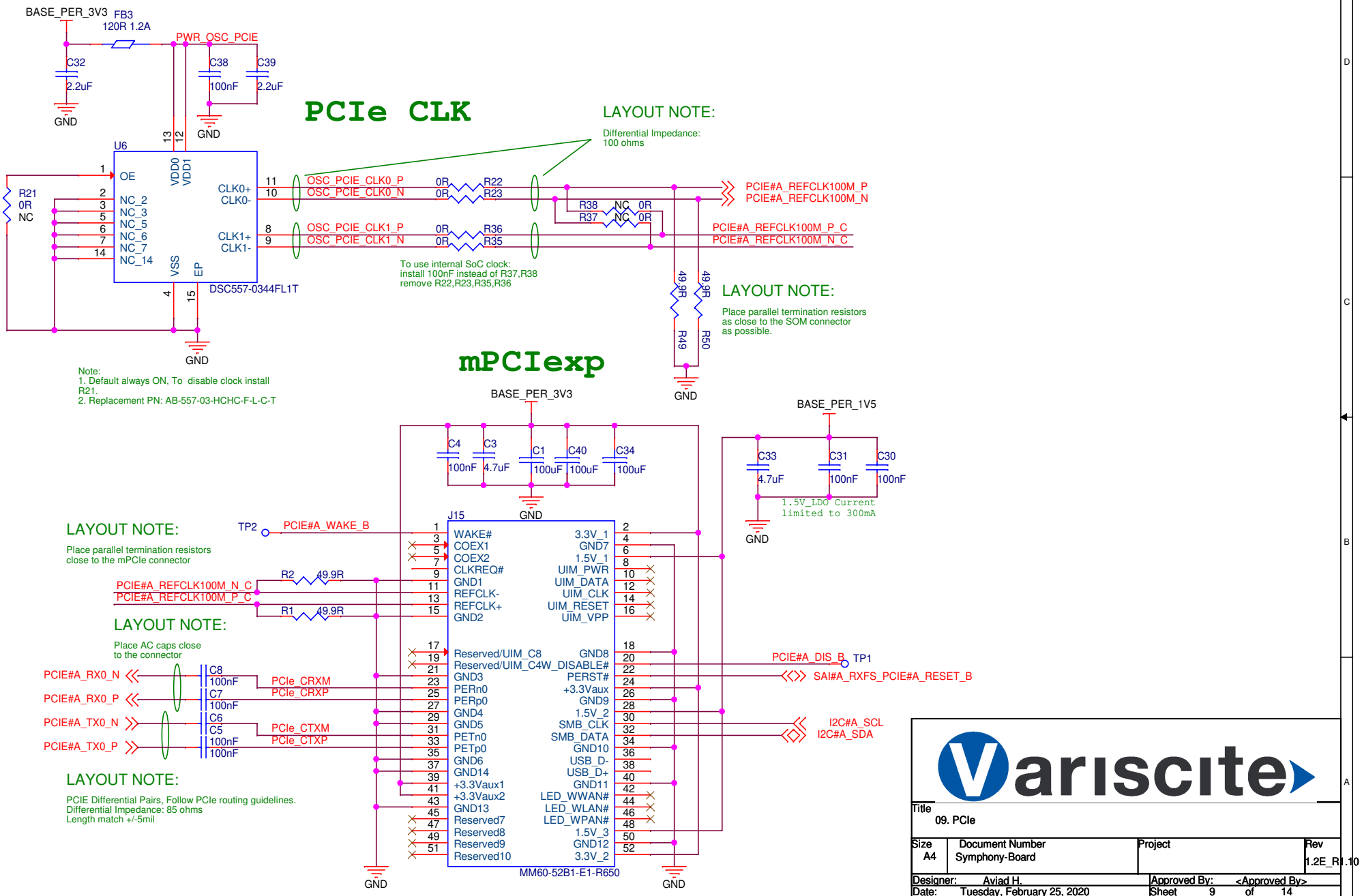
MX8/MX8X- Gigabit Ethernet (External)





Title: 08. Ethernet			
Size: A3	Document Number: Symphony-Board	Project: Symphony-Board	Rev: 1.2E_R1.10
Designer: Aviad H.		Approved By:	<Approved By>
Date: Tuesday, February 25, 2020		Sheet 8 of 14	

09. PCIe

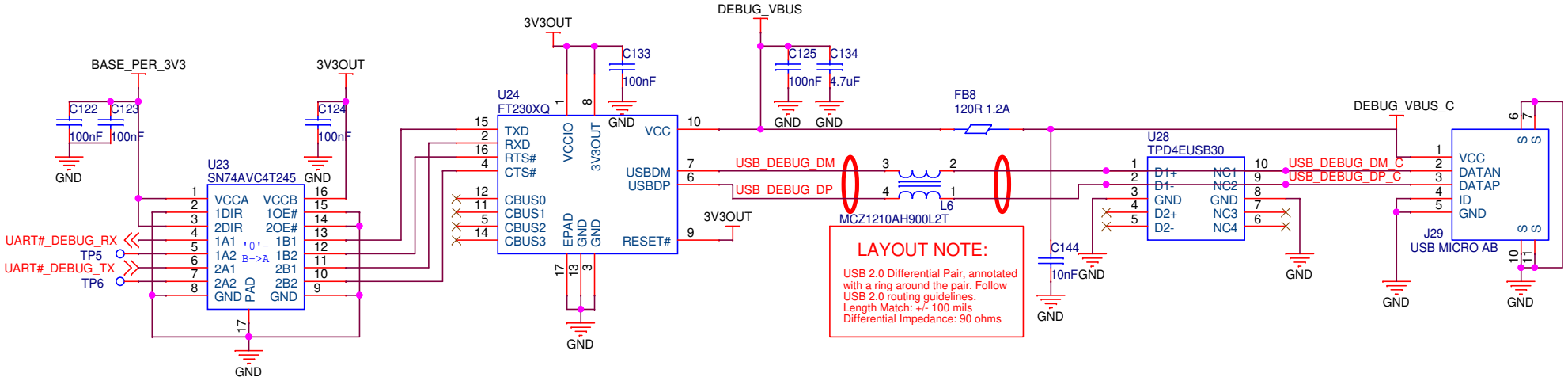


Variscite

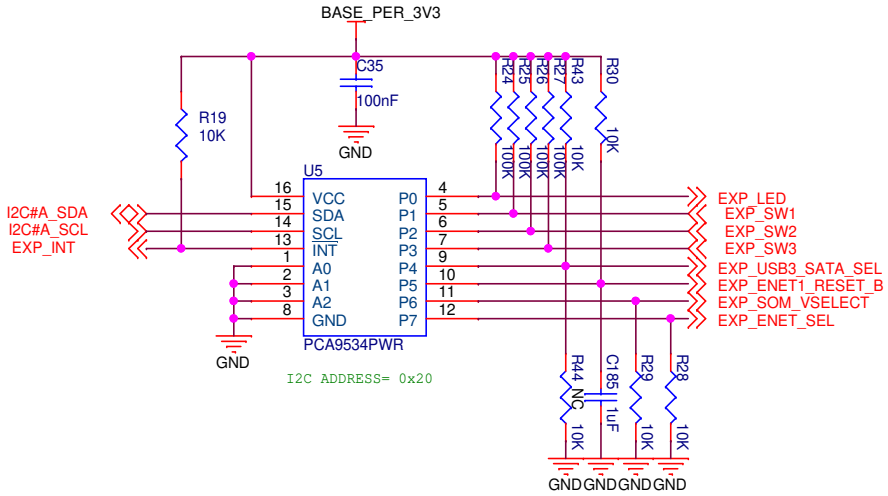
Title: 09. PCIe			
Size: A4	Document Number: Symphony-Board	Project:	Rev: 1.2E_R1.10
Designer: Aviad H.		Approved By: <Approved By>	
Date: Tuesday, February 25, 2020		Sheet 9 of 14	

10. Debug, GPIO Exp, Buttons, LED

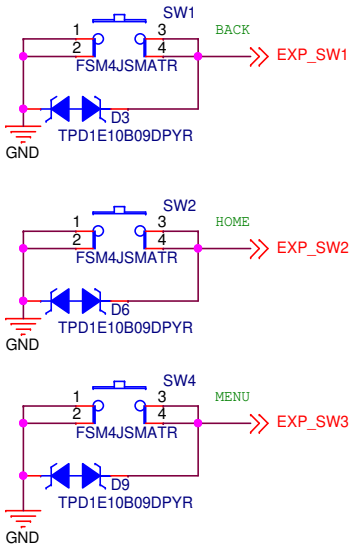
USB UART DEBUG



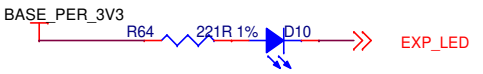
GPIO EXPANDER



GP BUTTON



GP LED

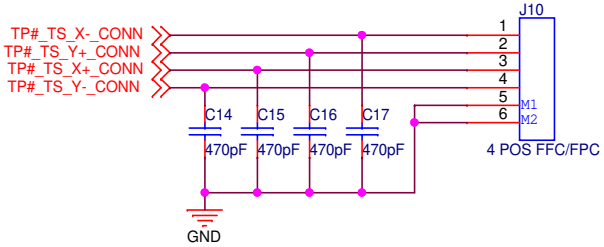


Variscite

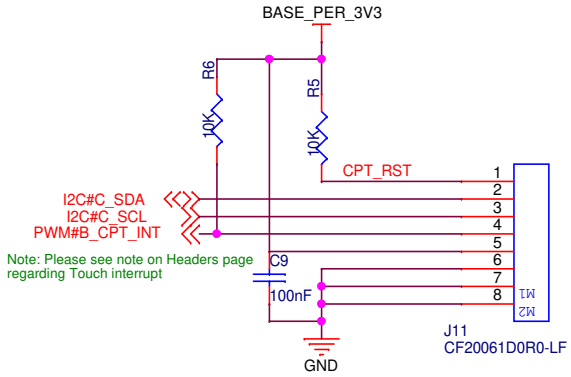
Title: 10. Debug, GPIO Exp, Buttons, LED			
Size: A4	Document Number: Symphony-Board	Project:	Rev: 1.2E_R1.10
Designer: Aviad H.		Approved By: <Approved By>	
Date: Tuesday, February 25, 2020		Sheet 10 of 14	

11. LVDS, DSI, Touch

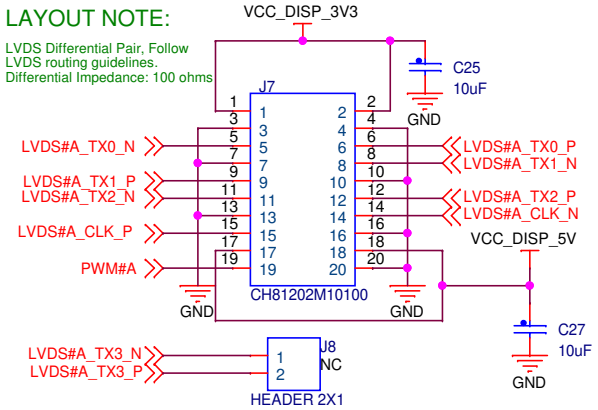
RESISTIVE TOUCH



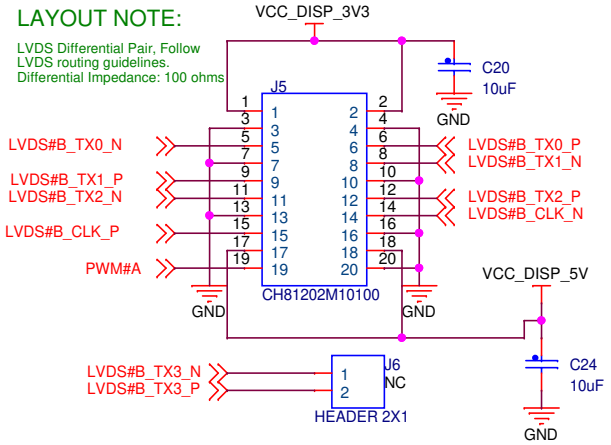
CAPACITIVE TOUCH



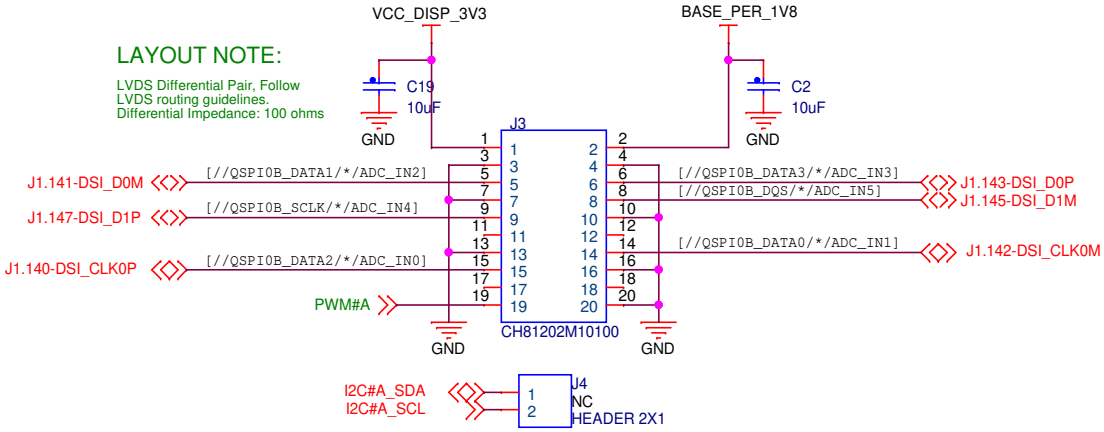
LVDS DISPLAY A



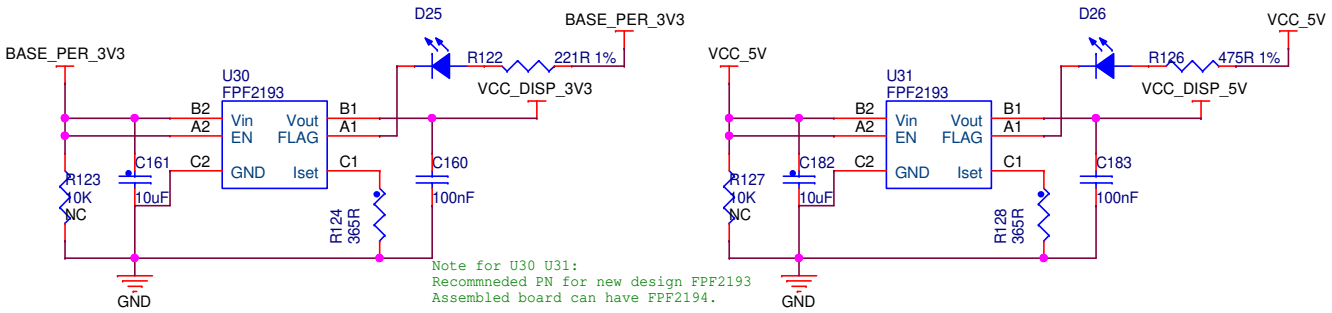
LVDS DISPLAY B



MIPI DSI DISPLAY



Short circuit protection

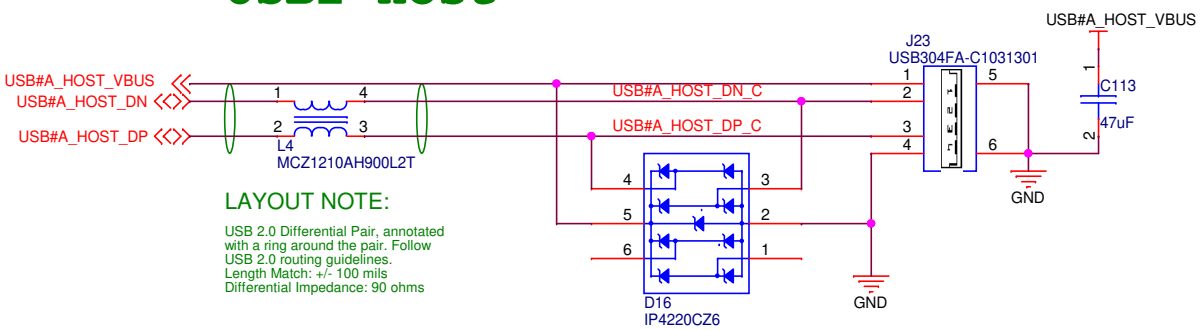


Variscite

Title: 11. LVDS, DSI, Touch			
Size: A4	Document Number: Symphony-Board	Project: Symphony-Board	Rev: 1.2E_R1.1
Designer: Aviad H.		Approved By:	
Date: Tuesday, February 25, 2020		Sheet 11 of 14	

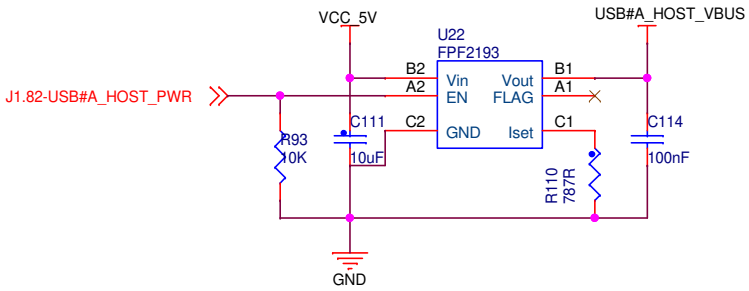
12. USB2 Host

USB2 Host



LAYOUT NOTE:

USB 2.0 Differential Pair, annotated with a ring around the pair. Follow USB 2.0 routing guidelines.
Length Match: +/- 100 mils
Differential Impedance: 90 ohms



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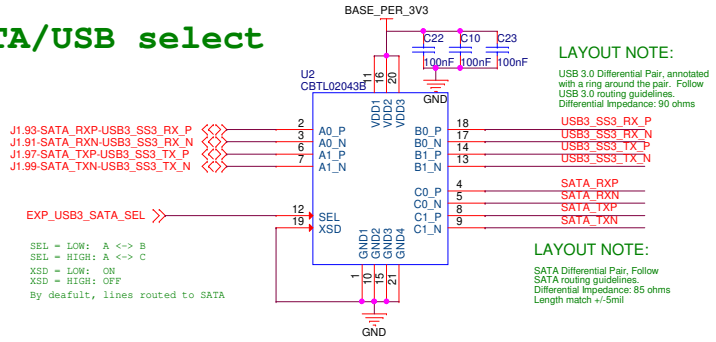
13. USB3, uSATA

SATA/USB select



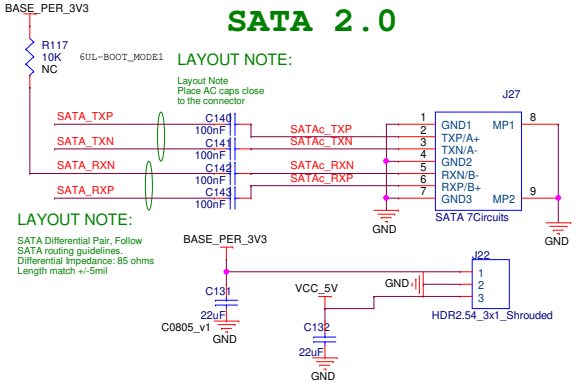
LAYOUT NOTE:

USB 3.0 Differential Pair, annotated with a ring around the pair. Follow USB 3.0 routing guidelines. Differential Impedance: 90 ohms

LAYOUT NOTE:

SATA Differential Pair, Follow SATA routing guidelines. Differential Impedance: 85 ohms Length match +/-5mil

SATA 2.0



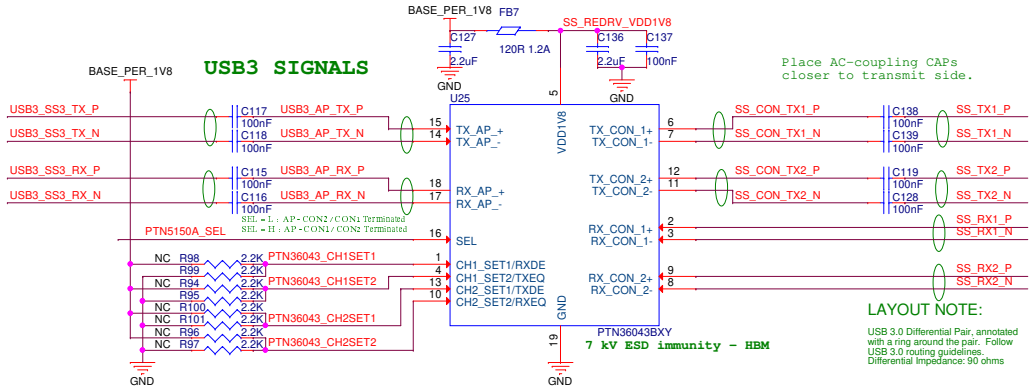
LAYOUT NOTE:

Layout Note
Place AC caps close to the connector

LAYOUT NOTE:

SATA Differential Pair, Follow SATA routing guidelines. Differential Impedance: 85 ohms Length match +/-5mil

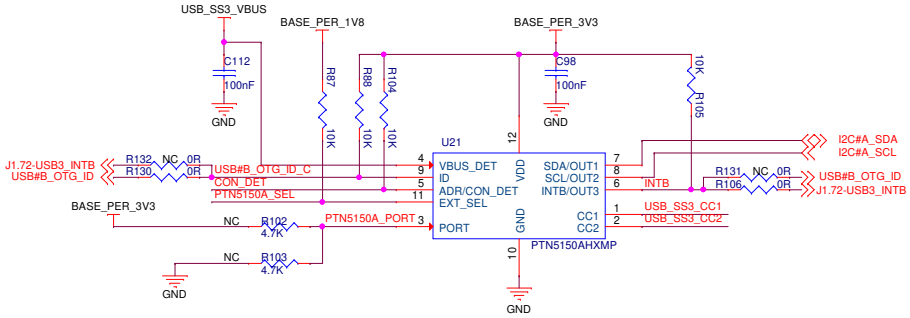
USB TYPE C Circuitry



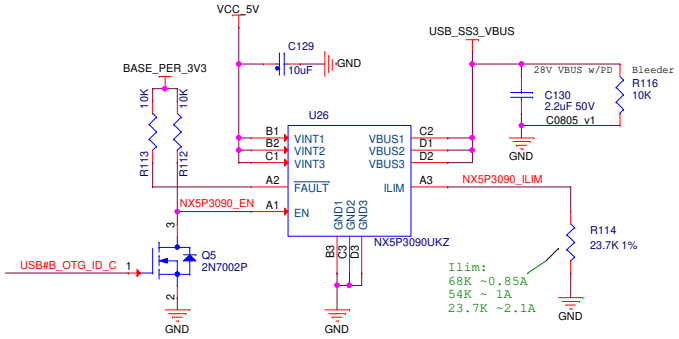
LAYOUT NOTE:

USB 3.0 Differential Pair, annotated with a ring around the pair. Follow USB 3.0 routing guidelines. Differential Impedance: 90 ohms

Config Channel Logic Detection & Indication of Plug Orientation

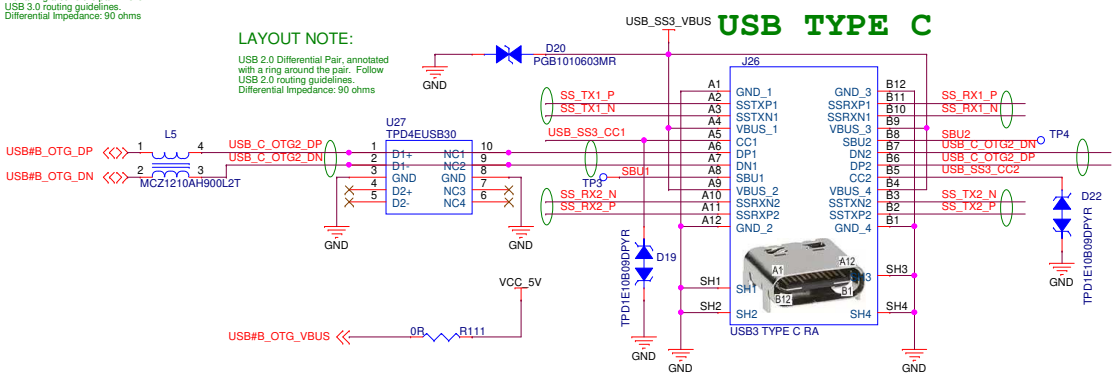


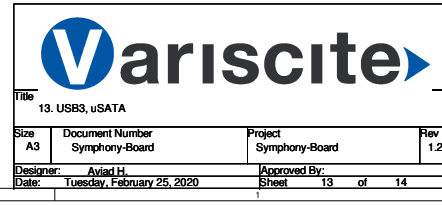
5V Source Load Switch



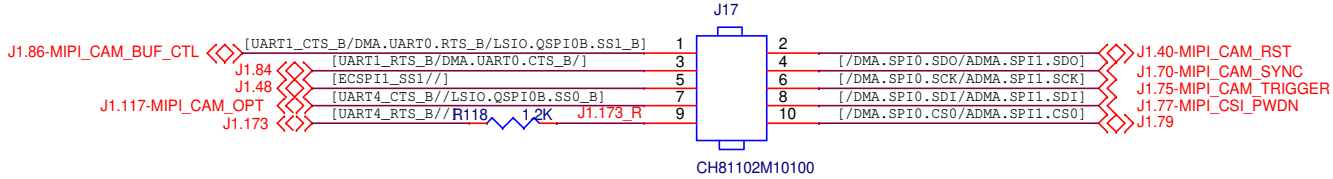
USB Profile 1 = 5 V @ 2.1 A

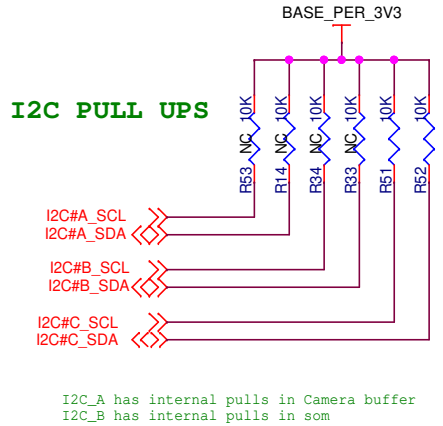
USB TYPE C

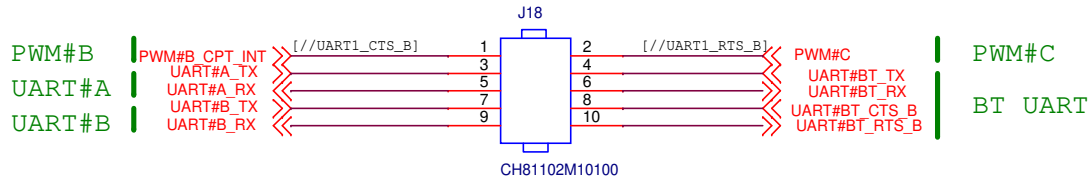


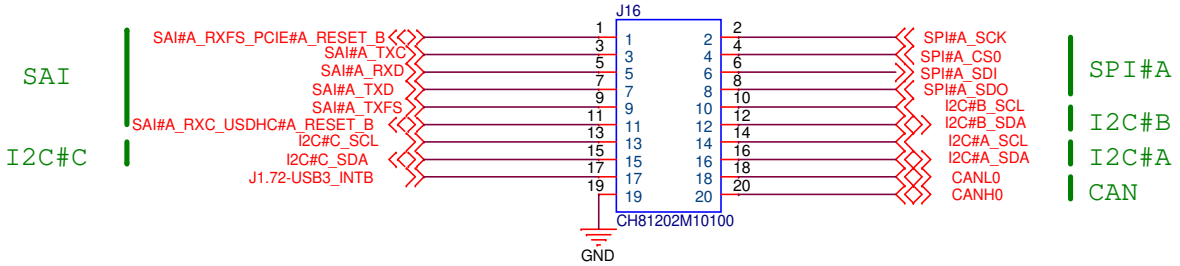


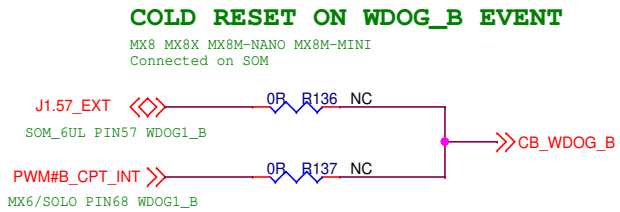
14. Headers

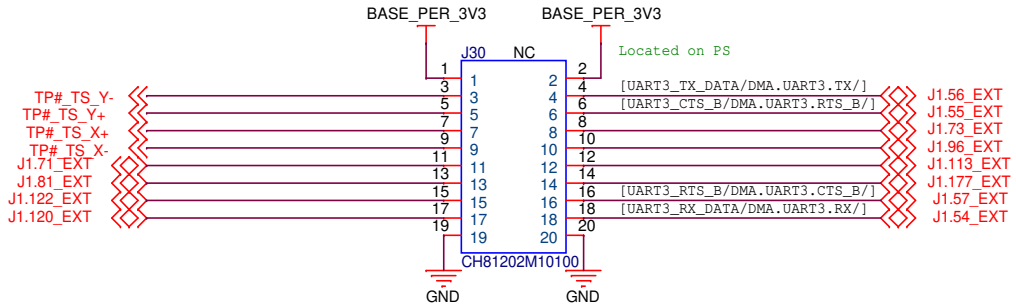












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