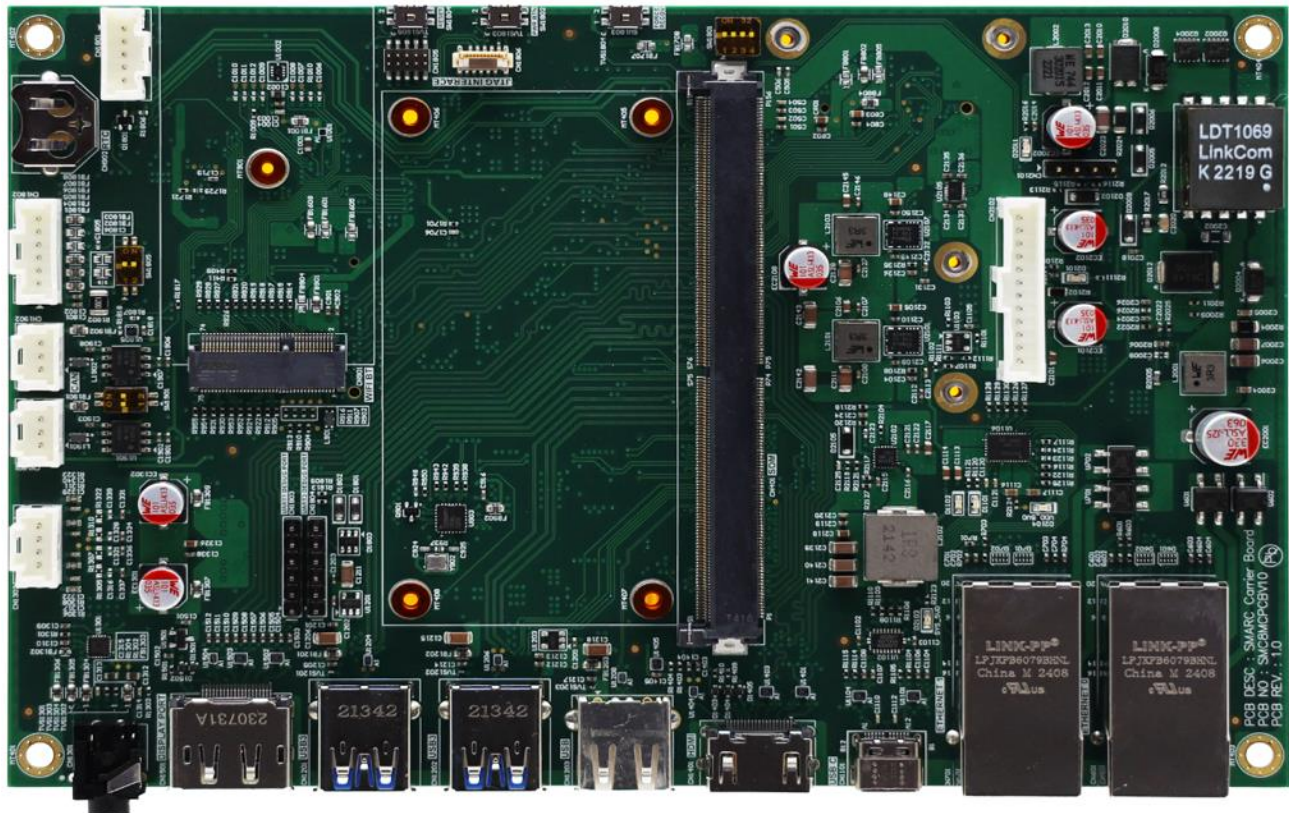


SMARC i.MX 8M Carrier Board Hardware Reference Manual for Plus, Mini and Nano

VEST-i.MX 8M-CARRIER-USG-001, REV C



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LIST OF ABBREVIATIONS

Acronyms	Abbreviations
VEST	Venture Embedded Solutions Technology
APC	Advanced Products Corporation Private Limited
ISO	International Organization for Standardization
V*EST	Venture Embedded Solutions Technology “The Logo”
eMMC	embedded Multimedia Card (MMC)
ARM	Advanced RISC Machine
CAN	Controller Area Network
SOC	System-on-a-Chip
GPIO	General Purpose Input Output
I2C	Inter-Integrated Circuit
LVDS	Low Voltage Differential Signal
NC	Not Connected
PWM	Pulse Width Modulation
UART	Universal Asynchronous Receiver/Transmitter
USB	Universal Serial Bus
USB OTG	Universal Serial Bus on the Go

Table 1-1 List of Abbreviations

REFERENCE DOCUMENTS

- [Smart Mobility Architecture \(SMARC\) Hardware Specification](#)
- [Smart Mobility Architecture \(SMARC\) Design Guide](#)

1 OVERVIEW

1.1 GENERAL INFORMATION

The VEST Universal SMARC carrier board was designed to use the VEST i.MX 8M SMARC SOM family that features the i.MX 8M Plus, Mini and Nano application processors. The VEST Universal SMARC carrier board is compliant with the SMARC 2.1.1 specification. Together the carrier board and selected SMARC SOM enable a smooth transition from conventional Human Machine Interface (HMI) to an advanced interactive user interface that enables multimedia, touch, wireless connectivity, machine learning and more. Two views of the carrier board are shown below.

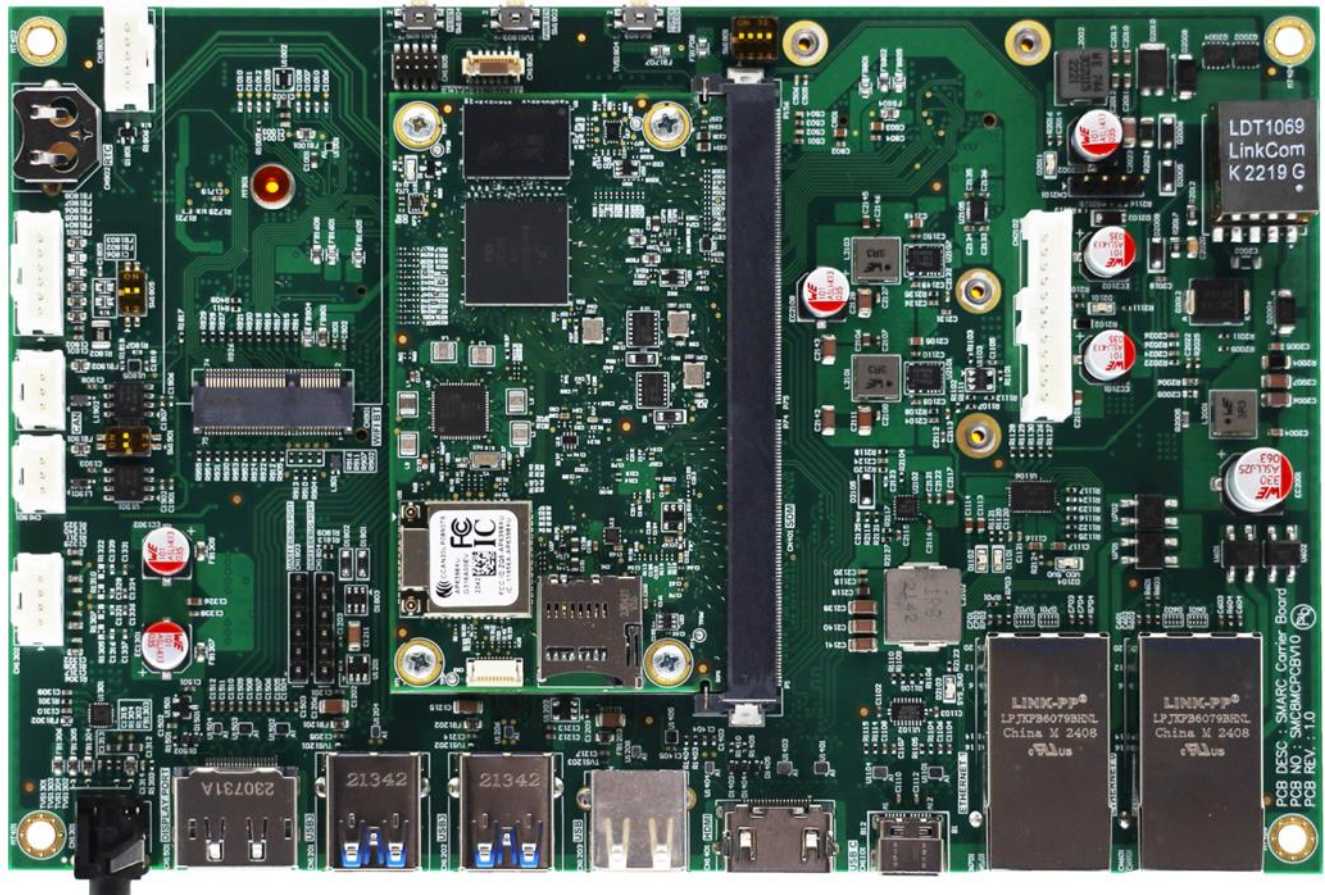


Figure 1-1 Carrier Board Top Side View with SMARC SOM installed.

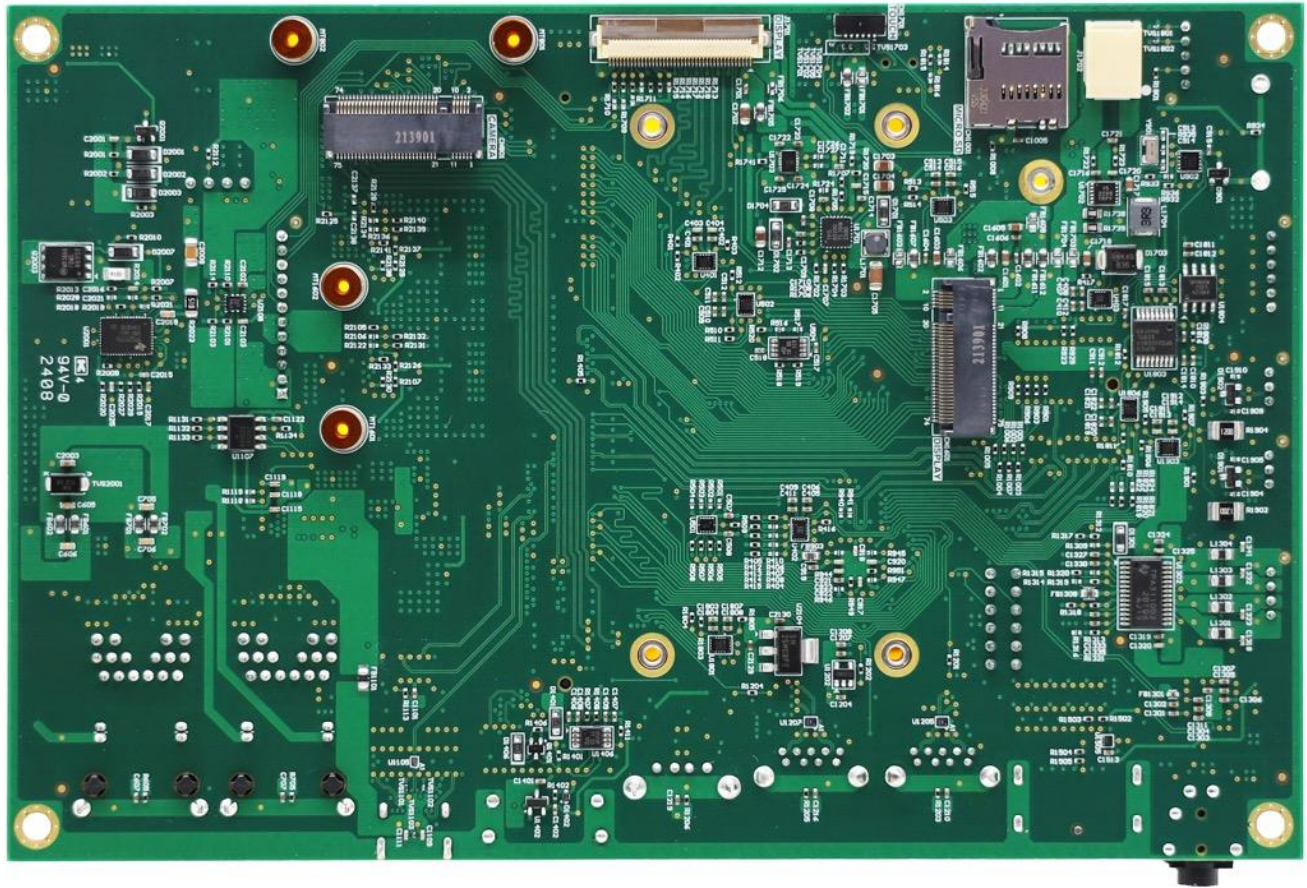


Figure 1-2 Carrier Board Back Side View

The SMARC SOM PCBs front and back sides of the Plus, Mini and Nano, are shown below.

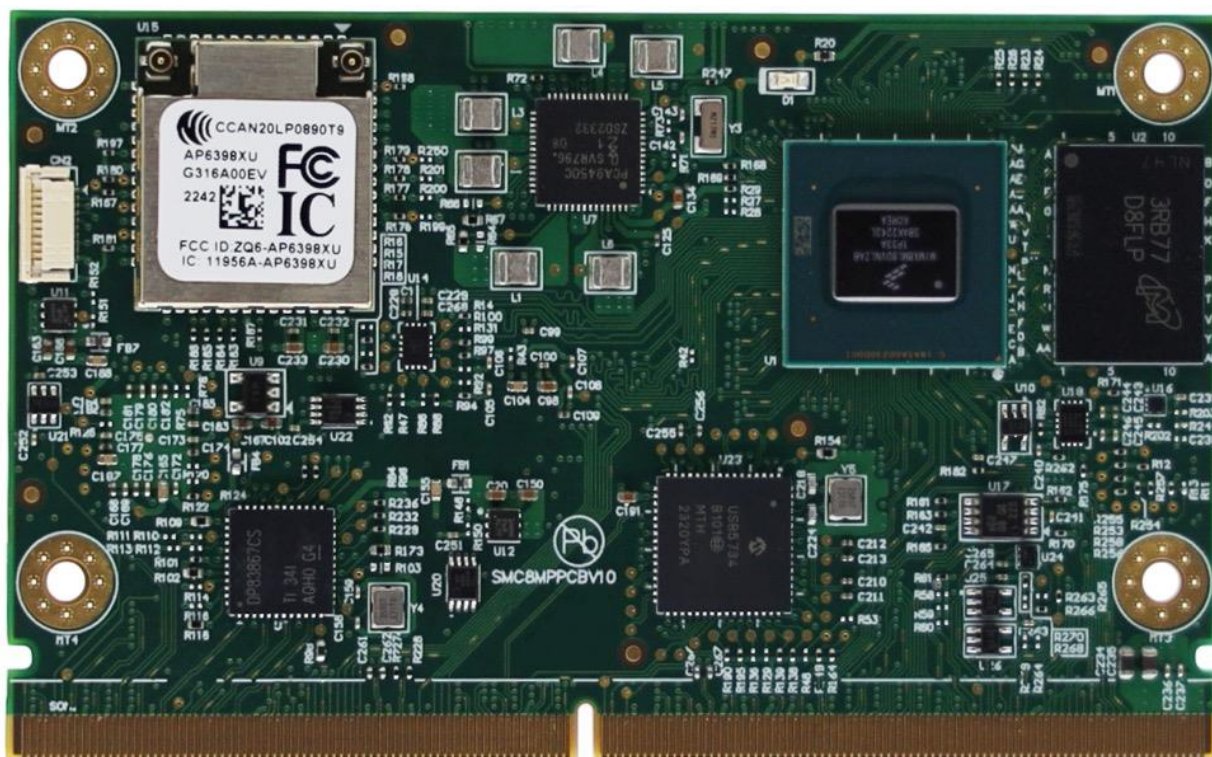


Figure 1-3 VEST i.MX 8M Plus SOM front Side View

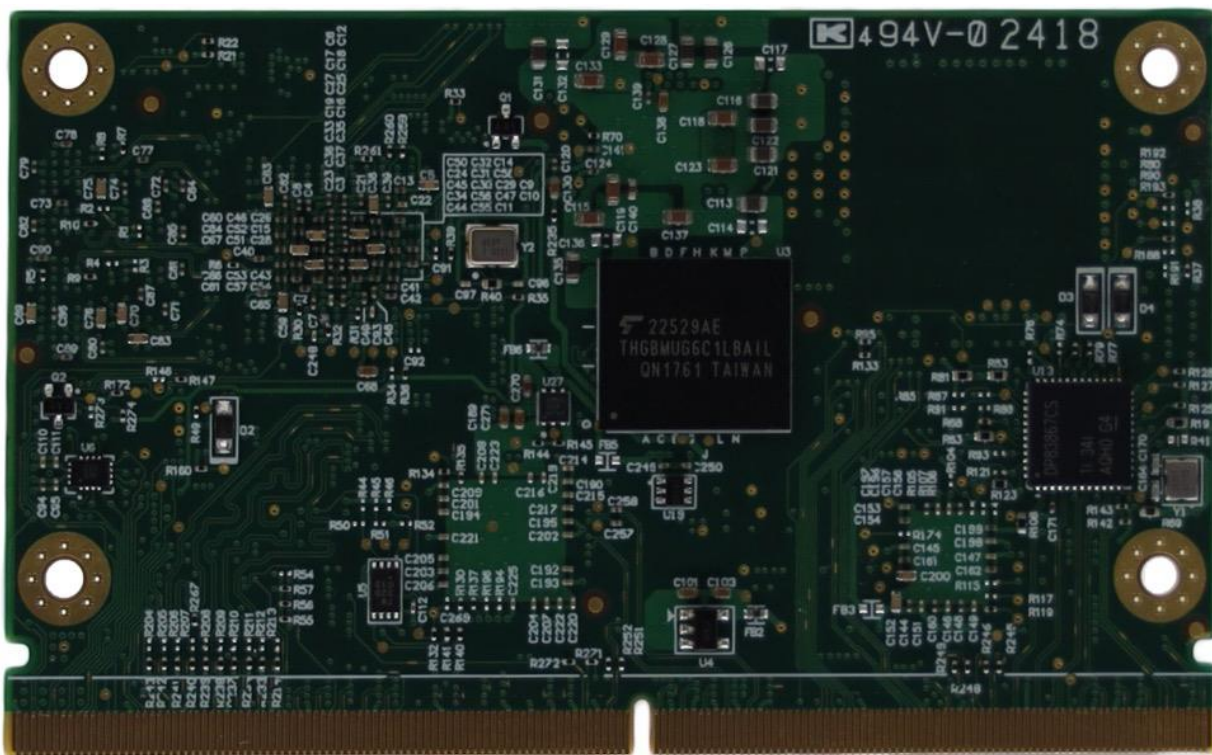


Figure 1-4 VEST i.MX 8M Plus SOM Back Side View



Figure 1-5 VEST i.MX 8M Mini SOM Front Side View



Figure 1-6 VEST i.MX 8M Nano SOM Front Side View

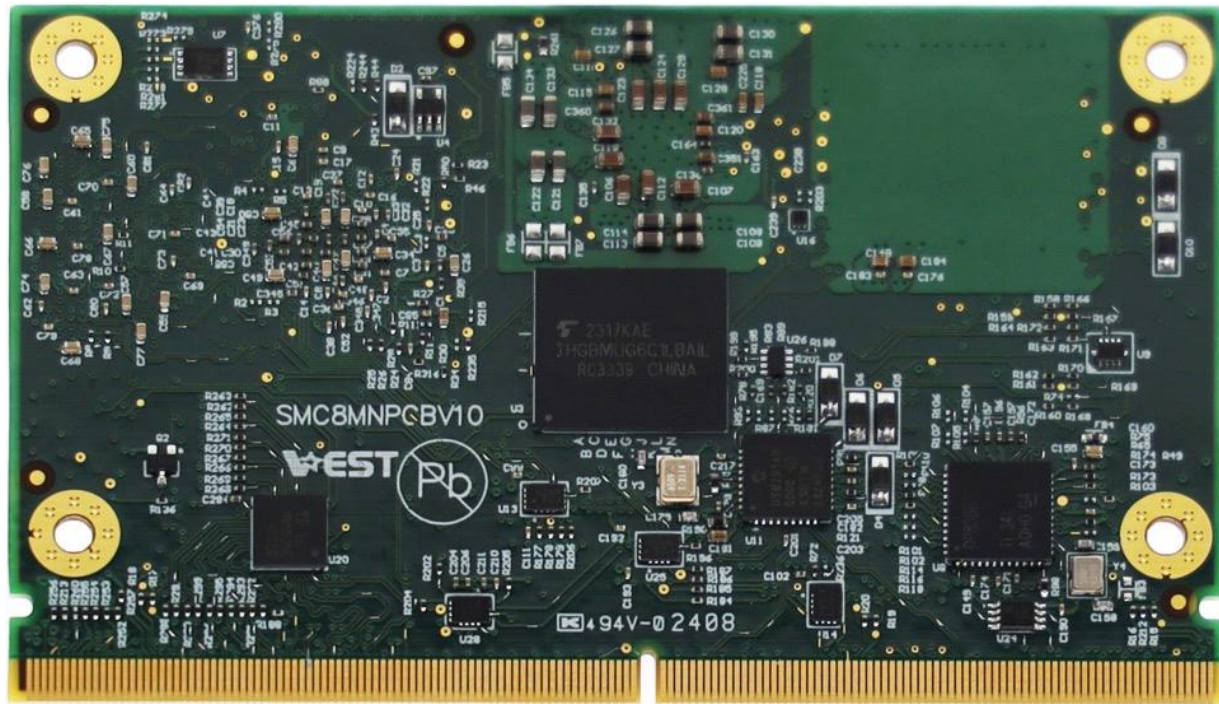


Figure 1-7 VEST i.MX 8M Mini, Nano Back Side View

The VEST carrier board runs on the following Operating System:

- Yocto Linux

1.2 FEATURE SUMMARY

- Compliant with SMARC 2.1.1.
- The VEST carrier board has a 314 pin 0.5mm SMARC socket (CN401) for the iMX8M Plus, Mini and Nano SMARC SOM boards.
- 2X 10/100/1000Mbps PoE Ethernet RJ45 (CN601, CN701)
- M.2 Key B Camera Expansion Daughter Board Socket with 4-lane MIPI CSI x2, up to 2x SPI, 2x I2C, 2x UART, and GPIOs. (CN801)
- M.2 Key E Daughter Board Socket (CN901) with single-lane PCIe, USB, SDIO, UART, PCM, I2C
- External RTC with CR1220 Coin Battery Holder (CN902)
- Micro SD Socket (CN1001)
- USB 3.0 OTG Type C with PD (CN1101)
- 2 x USB 3.0 Host Type A (CN1201, CN1202)
- 1 x USB 2.0 Host Type A (CN1203)

- 3.5 mm (CTIA) Headphone output and Microphone input connector (CN1301)
- Stereo Speaker Output: 10W per channel into an 8 Ω load (CN1302)
- On board HDMI Type A connector (CN1401)
- On Board DisplayPort Connector (CN1501)
- M.2 Key B Display Expansion Daughter Board Socket with, Dual Channel LVDS, I2C x 1, PWM x 3, GPIOs, and Backlight. (CN1601)
- On Board I2C Touch connector (CN1701)
- On Board 7" and 10" LVDS LCD Connector (J1701)
- On Board LCD Backlight Connector (J1702)
- Power Control Header: on/off, system reset, LED Control (CN1801)
- Boot Mode Selection Dip Switches (SW1801)
- Half-Duplex RS485 or RS232 Header (CN1802) Default is RS485
- 2 x UART Debug Pin Headers (CN1803, CN1804)
- Power Control Header on/off, system reset, LED Control (CN1801)
- JTAG Headers (CN1805, CN1806)
- 2X CAN V2.0B at 1Mb/s Bus connectors (CN1901, CN1902)
- Jumper for USB type C or RJ45 PoE power Source Selection, Default is USB Type C (CN2101)
- External Battery Header (CN2102)
- LED Green indicators: D2011 for PoE, D2103 for SYS_5V0, and D2104 for VDD_5V0.
- LED Orange indicator: D1101 for USB Type C Output Power
- LED Yellow: indicator D1102 for USB Type C Input Power for VDD_3V3
- Boot Mode Selection Dip Switch (SW1801)
- Reset Button (SW1804)
- Power Button (SW1802)
- Force Recovery button (SW1803)
- RS485 Bus 120 Ω Terminal Resistor Select Switch (SW1805)
- CAN Bus 120 Ω Terminal Resistor Select Switch (SW1901)
- 180 mm x 120 mm Form Factor

1.3 BLOCK DIAGRAM

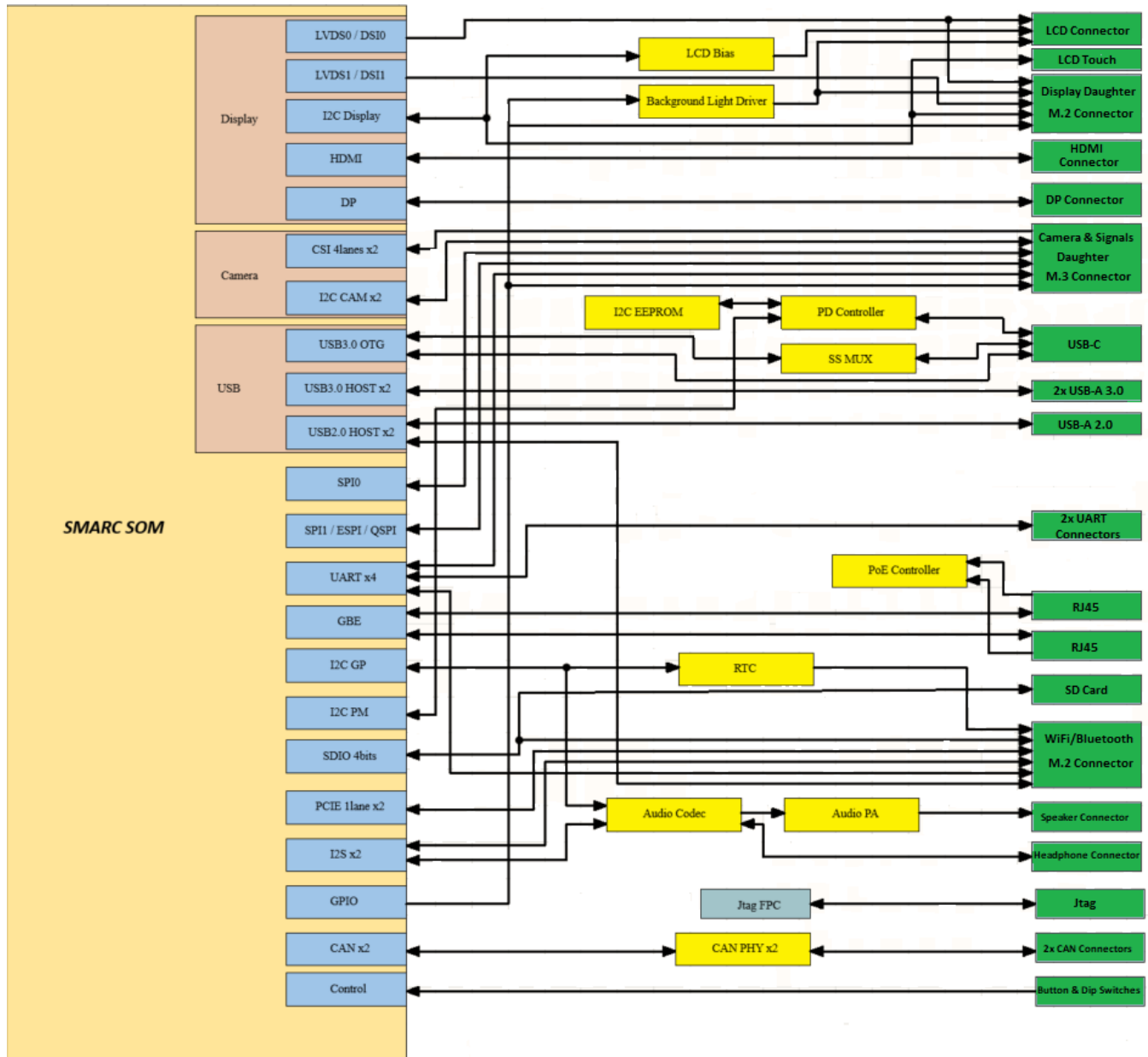


Figure 1-8 SMARC Block Diagram

Figure 1-9 Topside Connectors, Switches and Diode Locations

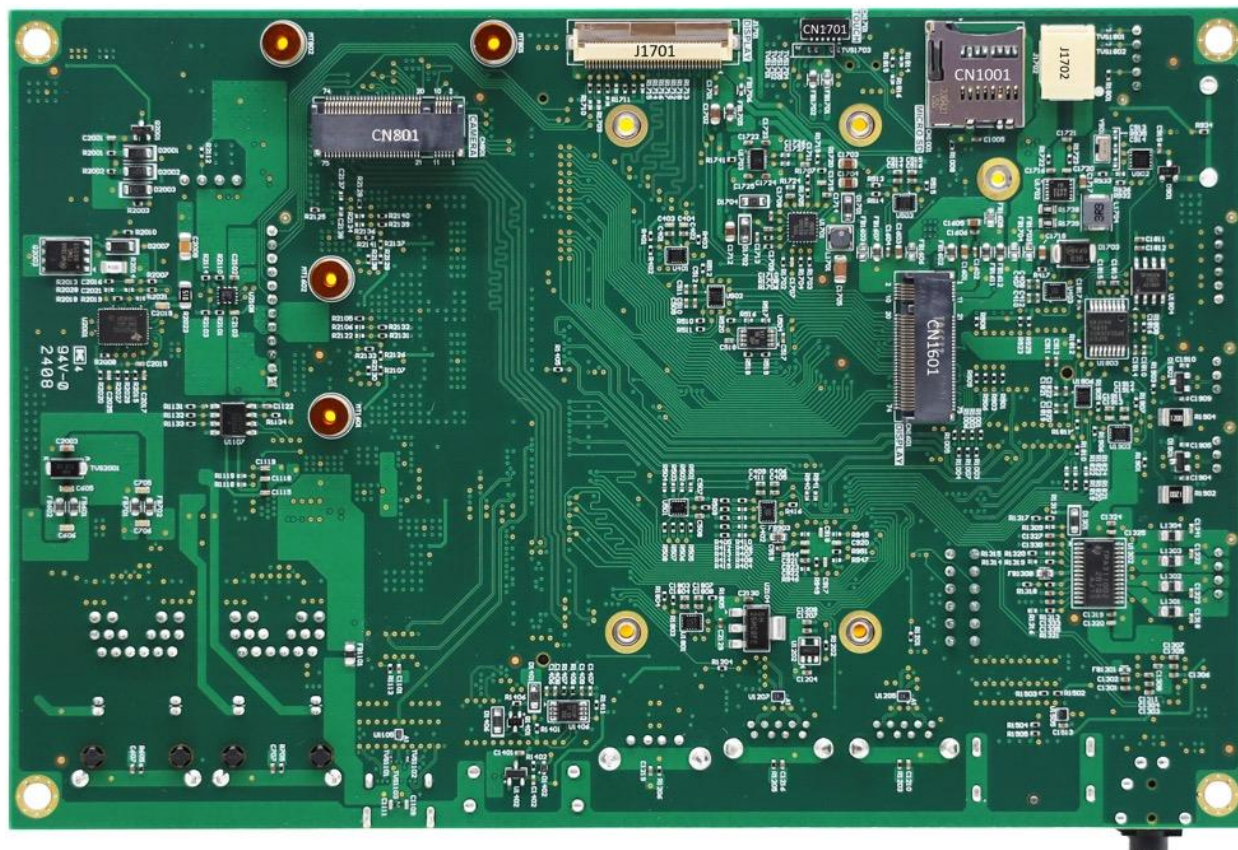
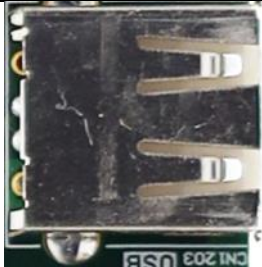
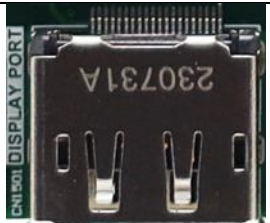


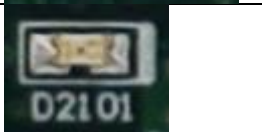
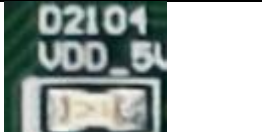
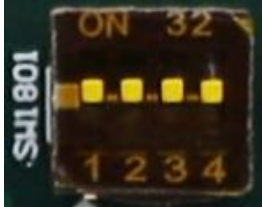
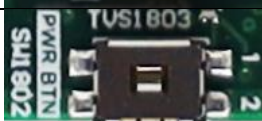
Figure 1-10 backside Connector locations.

The table below lists the user accessible connectors, switches, and LEDs on the VEST SMARC carrier Board.

Reference	Function	Type	Pin 1 Location
CN401	SMARC Socket	CONN MXM 3.0 FEMALE 314 POS 0.5mm pitch	
CN601 CN701	10/100/1000Mb Ethernet, POE RJ45	10/100/1000 Base-T PoE++ RJ45 Female	
CN801	M.2 Key B Camera Expansion Daughter Board Socket: - 4-lane MIPI CSI x 2 - Up to 2x SPI - I2C x 2 - 2 x UART - GPIOs	M.2 Key B 67 position, 0.5mm pitch, 0.5A per pin	
CN901	M.2 Key E Daughter board Socket	CONN M.2 Key E FEMALE 67POS 0.020	

CN902	Coin Battery holder	CR1220 BATTERY	
CN1001	MicroSD 3.0 socket	CONN MICRO SD CARD PUSH-PUSH	
CN1101	USB 3.0 Type C	CONN RCP USB3.0 TYPE C 24P R/A	
CN1201 CN1202	USB 3.0 Host Type A	CONN RCPT USB3.0 TYPE A 9POS R/A	
CN1203	USB 2.0 Host Type A	CONN RCPT USB2.0 TYPE A 4POS R/A	
CN1301	Headphone out, Mic in	CONN JACK 4 COND 3.5MM R/A	
CN1302	Speaker output	Connector Header 4 POS 2.00mm Pitch	
CN1401	HDMI Type A	CONN RCPT 1.4 HDMI 19POS R/A	

CN1501	Display Port	CONN RCPT DISPLAYPORT 20P R/A	
CN1601	M.2 Key B Display Daughter Board Socket: - Dual Channel LVDS - I2C Touch - up to 4x PWM - GPIOs	67 position, 0.5mm pitch, 0.5A per Pin M.2 Key B Connector	
CN1701	I2C Touch Connector	6 Position Socket Connector 0.031" (0.80mm), R/A	
J1701	7" or 10" LCD Connector	CONN FFC BOTTOM 40 POS 0.5MM	
J1702	7" LCD backlight Connector	CONN HEADER SMD R/A 2POS 3.5MM	
CN1801	Power Control, on/off POR, GND, LED Control	5 pin Vertical connector 2.0mm pitch	
CN1802	RS485 (Default) or RS232	Connector 6 position (2.00mm)	
CN1803 CN1804	UART Debug Pin Headers	Connector 6 position 0.100"	
CN1805	JTAG Interface	CONN HEADER SMD 10POS 1.27MM	
CN1806	JTAG	CONN FFC VERT 10POS 0.5MM	

CN1901 CN1902	CAN Bus Headers	Vertical, 3pins, 2mm pitch	
CN2101	USB Type C Output Power RJ45 PoE Power Source Select	Jumper 4 POS, 2.54 MM	
CN2102	External Battery Connector	CONN HEADER VERT 12POS 2MM	
D1101 D1102	LED Orange USB Type C Output LED Yellow USB Type C Input	Orange LED 30mA 2.4V 0603 Yellow LED 30mA 2.4V 0603	
D2101	LED Green POE Selected	Green LED 30mA 2.4V 0603	
D2103	LED Green SYS_5V0 ON	Green LED 30mA 2.4V 0603	
D2104	LED Green VDD_5V0 ON	Green LED 30mA 2.4V 0603	
D2011	LED Green PoE_VOUT	Green LED 30mA 2.4V 0603	
SW1801	Boot Select ON=0 1-8 Boot_Sel_0 2-7 Boot_Sel_1 3-6 Boot_Sel_2 4-5 No connection	SWITCH SLIDE DIP SPST 0.025A 24V	
SW1802	Power Button	SWITCH TACTILE SPST-NO 0.05A 12V	
SW1803	Force Recovery	SWITCH TACTILE SPST-NO 0.05A 12V	
SW1804	System Reset	SWITCH TACTILE SPST-NO 0.05A 12V	

SW1805	RS485 120 Ω Termination On is termination on. Pins 1, 4 termination Pins 2, 3 No Connection	SLIDE DIP SWITCH SPST 0.025A 24V	
SW1901	CAN 120 Ω Termination On is termination on. Pins 1, 4 CN1901 termination Pins 2, 3 CN1902 termination	SLIDE DIP SWITCH SPST 0.025A 24V	

Table 1-1 VEST SMARC Carrier Board User Accessible Connector and Jumper List

2 VEST i.MX 8M SMARC SOM FEATURE MATRIX

The VEST SMARC Carrier Board was designed to support different SOM plug in cards. Each of the SOM plug in cards has a different NXP iMX 8M processor, and each processor has a different set of features. The table below shows what carrier board features are available with each type of SOM.

Available Features of the VEST i.MX 8M SMARC SOM Family						
			Default Number of Cores			
			Plus	Mini	Nano	Nano SoloLite
			4*	4*	4*	1*
Item	Feature List	Designation				
1	RJ45 with PoE	CN601	Yes (with TSN)	Yes		
2	RJ45 with PoE	CN701	Yes	No		
3	M.2 Key B Camera Expansion Daughter Board Socket					
	CSI0	CN801	Yes	No		
	CSI1		Yes			
	SPI0 & SPI1		Yes	Yes (Shared with on-SOM SPI-CAN converter, use chip-select to multiplex)		
	UART1 & UART3		Yes (Shared with UART debug header)			
	I2C0		Yes	No		
	I2C1		Yes			
4	M.2 Key E					
	USB	CN901	Yes		No	
	SDIO		Yes (Shared with MicroSD 3.0 Socket CN1001)			
	PCIe A		Yes		No	
	PCIe B		No			
	I2S		Yes		No	
	UART		Yes			
5	MicroSD 3.0 Socket	CN1001	Yes (Shared with M.2 Key E CN901)			
6	USB 3.0/2.0 Type C with PD	CN1101	Yes (USB 3.0)	Yes (USB 2.0)		
7	USB 3.0/2.0 Host Type A	CN1201	Yes (USB 3.0)	Yes (USB 2.0)	No	
8	USB 3.0/2.0 Host Type A	CN1202	Yes (USB 3.0)	Yes (USB 2.0)	No	
9	USB 2.0 Host Type A	CN1203	Yes		No	
10	3.5mm Audio Jack with Mic In	CN1301	Yes			
11	L & R Speaker Output	CN1302	Yes			
12	HDMI Type A	CN1401	Yes	No		
13	Display Port	CN1501	No			
14	M.2 Key B Display Daughter Board Socket					
	LVDS0	CN1601	Yes			
	LVDS1		Yes			
	Touch		Yes			
15	7" or 10" LCD Connector	J1701	Yes			
16	7" LCD Backlight Connector	J1702	Yes			
17	I2C Touch Connector	CN1701	Yes			
18	JTAG	CN1805, CN1806	Yes			
19	Boot Mode Dip Switch	SW1801	Yes			
20	RS485 or RS232 Connector	CN1802	Yes (i.MX8M UART bus shared with SOM onboard WiFi/BT Module, Mutually-exclusive)			
21	UART 1 Debug Header	CN1803	Yes (Shared with M.2 Key B CN801)			
22	UART 3 Debug Header	CN1804	Yes (Shared with M.2 Key B CN801)			
23	CAN 1	CN1901	Yes	Yes (SPI-CAN converted. SPI bus shared with M.2 Key B CN801, use chip select to multiplex)		
24	CAN 2	CN1902	Yes	Yes (SPI-CAN converted. SPI bus shared with M.2 Key B CN801, use chip select to multiplex)		

* The default number of cores is shown for each SKU. Custom configurations are available, please contact VEST for more information.

Table 2-1 iMX 8M SOM Feature Matrix

3 VEST SMARC CARRIER BOARD EXTERNAL CONNECTOR INFORMATION

2.1 GENERAL INFORMATION

This chapter describes the VEST SMARC carrier Board external interfaces in detail.

Pin No.:	Pin number on the connector.
Signal Name:	Signal name on the connector.
Signal Type:	Signal type of this pin I – Input O – Output I/O – Input/ Output
Voltage Level:	Voltage level of this pin
Description:	Short pin functionality description

2.2 VEST SMARC I.MX 8M SOM SOCKET (CN401)

The board provides 314 Position Female Connector MXM 3.0 Gold 0.020" (0.50mm) for VEST i.MX 8M Plus, Mini and Nano SOMs.

Manufacturer: JAE Electronics, Manufacturer Part Number MM70-314B1-2-R300

The following table describes the pin-out of CN401:

Pin No.	SMARC Pin Name	Signal name	Signal Type	Voltage Level	Description
P1	SMB_ALERT#	SMB_ALERT#_1V8	I	1V8	SMBus Alert Signal active low
P2	GND	GND	Ground	Ground	Ground
P3	CSI1_CK+	CSI1_CK_P	I	Differential	CSI1 Differential Clock+
P4	CSI1_CK-	CSI1_CK_N	I	Differential	CSI1 Differential Clock-
P5	GBE1_SDP	ENET1_CLKI25_3V3	O	3V3	IEEE 1588 Trigger Signal for Hardware Implementation of Precision Time Protocol (PTP)
P6	GBE0_SDP	ENET0_CLKI25_3V3	O	3V3	IEEE 1588 Trigger Signal for Hardware Implementation of Precision Time Protocol (PTP)
P7	CSI1_RX0+	CSI1_D0_P	I	Differential	CSI1_RX0+ Differential input
P8	CSI1_RX0-	CSI1_D0_N	I	Differential	CSI1_RX0- Differential input
P9	GND	GND	Ground	Ground	Ground
P10	CSI1_RX1+	CSI1_D1_P	I	Differential	CSI1_RX1+ Differential input
P11	CSI1_RX1-	CSI1_D1_N	I	Differential	CSI1_RX1- Differential input
P12	GND	GND	Ground	Ground	Ground
P13	CSI1_RX2+	CSI1_D2_P	I	Differential	CSI1_RX2+ Differential input
P14	CSI1_RX2-	CSI1_D2_N	I	Differential	CSI1_RX2- Differential input
P15	GND	GND	Ground	Ground	Ground
P16	CSI1_RX3+	CSI1_D3_P	I	Differential	CSI1_RX3+ Differential input
P17	CSI1_RX3-	CSI1_D3_N	I	Differential	CSI1_RX3- Differential input
P18	GND	GND	Ground	Ground	Ground
P19	GBE0_MDI3-	ETH0_TRX3_N	I/O	Differential	Gigabit Ethernet 0 MDI3+
P20	GBE0_MDI3+	ETH0_TRX3_P	I/O	Differential	Gigabit Ethernet 0 MDI3-

Pin No.	SMARC Pin Name	Signal name	Signal Type	Voltage Level	Description
P21	GBE0_LINK100#	ETH0_LED_10_100_3V3_OD	O OD	3V3	Link Speed Indication 100 Mbps
P22	GBE0_LINK1000#	ETH0_LED_1000_3V3_OD	O OD	3V3	Link Speed Indication 1000 Mbps
P23	GBE0_MDI2-	ETH0_TRX2_N	I/O	Differential	Gigabit Ethernet 0 MDI2+
P24	GBE0_MDI2+	ETH0_TRX2_P	I/O	Differential	Gigabit Ethernet 0 MDI2-
P25	GBE0_LINK_ACT#	ETH0_LED_ACT_3V3_OD	O OD	3V3	Link Activity Indication
P26	GBE0_MDI1-	ETH0_TRX1_N	I/O	Differential	Gigabit Ethernet 0 MDI1+
P27	GBE0_MDI1+	ETH0_TRX1_P	I/O	Differential	Gigabit Ethernet 0 MDI1-
P28	GBE0_CTREF	NC	-		No Connection
P29	GBE0_MDIO-	ETH0_TRX0_N	I/O	Differential	Gigabit Ethernet 0 MDIO+
P30	GBE0_MDIO+	ETH0_TRX0_P	I/O	Differential	Gigabit Ethernet 0 MDIO-
P31	SPI0_CS1#	NC	-		No Connection
P32	GND	GND	Ground	Ground	Ground
P33	SDIO_WP	SD2_WP	I	1V8/3V3	Input State of Write Protect Tab, Test point_TP432
P34	SDIO_CMD	SD2_CMD	I/O	1V8/3V3	SDIO Command/Response
P35	SDIO_CD#	SD2_nCD	I	1V8/3V3	SDIO Card Detect
P36	SDIO_CLK	SD2_CLK	O	1V8/3V3	SDIO Clock
P37	SDIO_PWR_EN	SD2_RESET_B	O	1V8/3V3	SDIO Power Enable
P38	GND	GND	Ground	Ground	Ground
P39	SDIO_D0	SD2_DATA0	I/O	1V8/3V3	SDIO Data 0
P40	SDIO_D1	SD2_DATA1	I/O	1V8/3V3	SDIO Data 1
P41	SDIO_D2	SD2_DATA2	I/O	1V8/3V3	SDIO Data 2
P42	SDIO_D3	SD2_DATA3	I/O	1V8/3V3	SDIO Data 3
P43	SPI0_CS0#	ECSP11_SS0_1V8	O	1V8	SPI0 Master Chip Select 0
P44	SPI0_CLK	ECSP11_SCLK_1V8	O	1V8	SPI0 Clock
P45	SPI0_DIN	ECSP11_MISO_1V8	I	1V8	SPI0 Master input/ Slave output
P46	SPI0_DO	ECSP11_MOSI_1V8	O	1V8	SPI0 Master output/ Slave input
P47	GND	GND	Ground	Ground	Ground
P48	SATA_TX+	USB1_TX_P*	O	Differential	SMARC exception, USB0 SuperSpeed Transmit+
P49	SATA_TX-	USB1_TX_N*	O	Differential	SMARC exception, USB0 SuperSpeed Transmit-
P50	GND	GND	Ground	Ground	Ground
P51	SATA_RX+	USB1_RX_P*	I	Differential	SMARC exception, USB0 SuperSpeed Receive+
P52	SATA_RX-	USB1_RX_N*	I	Differential	SMARC exception, USB0 SuperSpeed Receive-
P53	GND	GND	Ground	Ground	Ground
P54	ESPI_CS0# / SPI1_CS0# / QSPI_CS0#	ECSP12_SS0_1V8	O	1V8	SPI1 Master Chips Select 0
P55	ESPI_CS1# / SPI1_CS1# / QSPI_CS1#	NC	-		No Connection
P56	ESPI_CLK / SPI1_CLK / QSPI_CLK	ECSP12_SCLK_1V8	O	1V8	SPI1 Clock
P57	ESPI_IO_1 / SPI1_DIN / QSPI_IO_1	ECSP12_MISO_1V8	I/O	1V8	SPI1 Master input/ Slave output
P58	ESPI_IO_0 / SPI1_DO / QSPI_IO_0	ECSP12_MOSI_1V8	I/O	1V8	SPI1 Master output/ Slave input
P59	GND	GND	Ground	Ground	Ground
P60	USB0+	USB1_D_P	I/O	Differential	USB0 Data+
P61	USB0-	USB1_D_N	I/O	Differential	USB0 Data-
P62	USB0_EN_OC#	USB1_EN_OC#_3V3	I/O	3V3	USB0 Over Current
P63	USB0_VBUS_DET	USB1_VBUS_5V0	I	5V0	USB0 Host VBUS 5V0
P64	USB0_OTG_ID	USB1_ID_1V8	I	1V8	USB0 OTG Device Detect
P65	USB1+	USB_DN1_D_P	I/O	Differential	USB1 DATA+
P66	USB1-	USB_DN1_D_N	I/O	Differential	USB1 DATA-
P67	USB1_EN_OC#	USB_DN1_OC#_3V3	I/O	3V3	USB1 Over Current
P68	GND	GND	Ground	Ground	Ground
P69	USB2+	USB_DN2_D_P	I/O	Differential	USB2 DATA+
P70	USB2-	USB_DN2_D_N	I/O	Differential	USB2 DATA-
P71	USB2_EN_OC#	USB_DN2_EN_OC#_3V3	I/O	3V3	USB2 Over-Current
P72	RSVD	NC	-		No Connection
P73	RSVD	NC	-		No Connection
P74	USB3_EN_OC#	USB_DN3_EN_OC#_3V3	I/O	3V3	USB3 Over-Current
Key					
P75	PCIE_A_RST#	PCIE_RST#_3V3	O	3V3	PCIE Port A Reset Output
P76	USB4_EN_OC#	USB_DN4_EN_OC#_3V3	I/O	3V3	USB4 Over-Current
P77	PCIE_B_CKREQ#	NC	-		No Connection
P78	PCIE_A_CKREQ#	PCI_CLKREQ_B_3V3_OD	I/O OD	3V3	PCIE Port A Clock Request
P79	GND	GND	Ground	Ground	Ground

Pin No.	SMARC Pin Name	Signal name	Signal Type	Voltage Level	Description
P80	PCIE_C_REFCK+	NC	-		No Connection
P81	PCIE_C_REFCK-	NC	-		No Connection
P82	GND	GND	Ground	Ground	Ground
P83	PCIE_A_REFCK+	PCIE_CLK_P	I/O	Differential	PCle Reference Clock+ Link A
P84	PCIE_A_REFCK-	PCIE_CLK_N	I/O	Differential	PCle Reference Clock- Link A
P85	GND	GND	Ground	Ground	Ground
P86	PCIE_A_RX+	PCIE_RX_P	I	Differential	PCle link Data+ Receive Link A
P87	PCIE_A_RX-	PCIE_RX_N	I	Differential	PCle link Data- Receive Link A
P88	GND	GND	Ground	Ground	Ground
P89	PCIE_A_TX+	PCIE_TX_P	O	Differential	PCle link Data+ Transmit Link A
P90	PCIE_A_TX-	PCIE_TX_N	O	Differential	PCle link Data- Transmit Link A
P91	GND	GND	Ground	Ground	Ground
P92	HDMI_D2+ / DP1_LANE0+	HDMI_TX2_P	O	Differential	HDMI Differential Data D2+
P93	HDMI_D2- / DP1_LANE0-	HDMI_TX2_N	O	Differential	HDMI Differential Data D2-
P94	GND	GND	Ground	Ground	Ground
P95	HDMI_D1+ / DP1_LANE1+	HDMI_TX1_P	O	Differential	HDMI Differential Data D1+
P96	HDMI_D1- / DP1_LANE1-	HDMI_TX1_N	O	Differential	HDMI Differential Data D1-
P97	GND	GND	Ground	Ground	Ground
P98	HDMI_D0+ / DP1_LANE2+	HDMI_TX0_P	O	Differential	HDMI Differential Data D0+
P99	HDMI_D0- / DP1_LANE2-	HDMI_TX0_N	O	Differential	HDMI Differential Data D0-
P100	GND	GND	Ground	Ground	Ground
P101	HDMI_CK+ / DP1_LANE3+	HDMI_TXC_P	O	Differential	HDMI Differential Clock+
P102	HDMI_CK- / DP1_LANE3-	HDMI_TXC_N	O	Differential	HDMI Differential Clock-
P103	GND	GND	Ground	Ground	Ground
P104	HDMI_HPD / DP1_HPD	HDMI_HPD_1V8	I	1V8	HDMI Hot Plug detect
P105	HDMI_CTRL_CK / DP1_AUX+	HDMI_DDC_SCL_1V8	I/O OD	1V8	DDC Clock for HDMI
P106	HDMI_CTRL_DAT / DP1_AUX-	HDMI_DDC_SDA_1V8	I/O OD	1V8	DDC Data for HDMI
P107	DP1_AUX_SEL	NC	-		No Connection
P108	GPIO0 / CAM0_PWR#	CAM0_PWR#_1V8	O	1V8	Camera 0 Power Enable, Active Low
P109	GPIO1 / CAM1_PWR#	CAM1_PWR#_1V8	O	1V8	Camera 1 Power Enable, Active Low
P110	GPIO2 / CAM0_RST#	CAM0_RST#_1V8	O	1V8	Camera 0 Reset, Active Low
P111	GPIO3 / CAM1_RST#	CAM1_RST#_1V8	O	1V8	Camera 1 Reset, Active Low
P112	GPIO4 / HDA_RST#	SDIO_WAKE#_1V8	I	1V8	SDIO Wake Host
P113	GPIO5 / PWM_OUT	PWM_1_1V8	O	1V8	PWM Out 1
P114	GPIO6 / TACHIN	TOUCH_INT_1V8	I	1V8	I2C Touch INT
P115	GPIO7	TOUCH_RST_1V8	I/O	1V8	I2C Touch RST
P116	GPIO8	CAM0_SYNC_1V8	I/O	1V8	CAM0 SYNC
P117	GPIO9	CAM1_SYNC_1V8	I/O	1V8	CAM1 SYNC
P118	GPIO10	BT_WAKE_1V8	I/O	1V8	Blue Tooth Wake Host
P119	GPIO11	WL_WAKE_1V8	I/O	1V8	WiFi Wake Host
P120	GND	GND	Ground	Ground	Ground
P121	I2C_PM_CK	I2C1_SCL_1V8	I/O I/O	1V8	Power Management I2C bus Clock
P122	I2C_PM_DAT	I2C1_SDA_1V8	I/O I/O	1V8	Power Management I2C bus Data
P123	BOOT_SEL0#	BOOT_MODE0_1V8	I	1V8	Boot Select bit 0
P124	BOOT_SEL1#	BOOT_MODE1_1V8	I	1V8	Boot Select bit 1
P125	BOOT_SEL2#	BOOT_MODE2_1V8	I	1V8	Boot Select bit 2
P126	RESET_OUT#	RESET_OUT#_1V8	O	1V8	General purpose Reset to Carrier Board
P127	RESET_IN#	RESET_IN_1V8	I OD	1V8	Reset input from Carrier Board
P128	POWER_BTN#	POWER_BTN	I OD	1V8	Power Button input from carrier board
P129	SER0_TX	UART4_TXD_1V8	O	1V8	UART4 Transmit
P130	SER0_RX	UART4_RXD_1V8	I	1V8	UART4 Receive
P131	SER0_RTS#	UART4_CTS_1V8	O	1V8	UART4 Clear to Send
P132	SER0_CTS#	UART4_RTS_1V8	I	1V8	UART4 Request to Send
P133	GND	GND	Ground	Ground	Ground
P134	SER1_TX	UART1_TXD_1V8	O	1V8	UART1 Transmit
P135	SER1_RX	UART1_RXD_1V8	I	1V8	UART1 Receive
P136	SER2_TX	UART2_TXD_1V8*	O	1V8	UART2 Transmit, shared with on board WiFi/BT module, default is WiFi
P137	SER2_RX	UART2_RXD_1V8*	I	1V8	UART2 Receive, shared with on board WiFi/BT module, default is WiFi
P138	SER2_RTS#	UART2_CTS_1V8*	O	1V8	UART2 Request to Send, shared with on board WiFi/BT module, default is WiFi
P139	SER2_CTS#	UART2_RTS_1V8*	I	1V8	UART2 Clear to Send, shared with on board WiFi/BT module, default is WiFi
P140	SER3_TX	UART3_TXD_1V8	O	1V8	UART3 Transmit

Pin No.	SMARC Pin Name	Signal name	Signal Type	Voltage Level	Description
P141	SER3_RX	UART3_RXD_1V8	I	1V8	UART3 Receive
P142	GND	GND	Ground	Ground	Ground
P143	CAN0_TX	CAN1_TX_1V8	O	1V8	CAN Port 0 Transmit
P144	CAN0_RX	CAN1_RX_1V8	I	1V8	CAN Port 0 Receive
P145	CAN1_TX	CAN2_TX_1V8	O	1V8	CAN Port 1 Transmit
P146	CAN1_RX	CAN2_RX_1V8	I	1V8	CAN Port 1 Receive
P147	VDD_IN	VSYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P148	VDD_IN	VSYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P149	VDD_IN	VSYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P150	VDD_IN	VSYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P151	VDD_IN	VSYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P152	VDD_IN	VSYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P153	VDD_IN	VSYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P154	VDD_IN	VSYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P155	VDD_IN	VSYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P156	VDD_IN	VSYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
S1	CSI1_TX+ / I2C_CAM1_CK	I2C2_SCL_1V8	I/O OD	1V8	I2C Serial Clock Camera 1
S2	CSI1_TX- / I2C_CAM1_DAT	I2C2_SDA_1V8	I/O OD	1V8	I2C Serial Data Camera 1
S3	GND	GND	Ground	Ground	Ground
S4	RSVD	NC	-		No Connection
S5	CSIO_TX+ / I2C_CAM0_CK	I2C5_SCL_1V8	I/O OD	1V8	I2C Serial Data Camera 0
S6	CAM_MCK	CSI_MCLK_1V8	O	1V8	Master Clock Output
S7	CSIO_TX- / I2C_CAM0_DAT	I2C5_SDA_1V8	I/O OD	1V8	I2C Serial Clock Camera 0
S8	CSIO_CK+	CSI2_CK_P	I	Differential	CSIO Clock+
S9	CSIO_CK-	CSI2_CK_N	I	Differential	CSIO Clock-
S10	GND	GND	Ground	Ground	Ground
S11	CSIO_RX0+	CSI2_D0_P	I	Differential	CSIO_RX0+ Differential Data
S12	CSIO_RX0-	CSI2_D0_N	I	Differential	CSIO_RX0- Differential Data
S13	GND	GND	Ground	Ground	Ground
S14	CSIO_RX1+	CSI2_D1_P	I	Differential	CSIO_RX1+ Differential Data
S15	CSIO_RX1-	CSI2_D1_N	I	Differential	CSIO_RX1- Differential Data
S16	GND	GND	Ground	Ground	Ground
S17	GBE1_MDIO+	ETH1_TRX0_P	I/O	Differential	Gigabit Ethernet 1 MDIO+
S18	GBE1_MDIO-	ETH1_TRX0_N	I/O	Differential	Gigabit Ethernet 1 MDIO-
S19	GBE1_LINK100#	ETH1_LED_10_100_3V3_OD	O OD	3V3	Link Speed Indication for 100 Mbps
S20	GBE1_MDI1+	ETH1_TRX1_P	I/O	Differential	Gigabit Ethernet 1 MDI1+
S21	GBE1_MDI1-	ETH1_TRX1_N	I/O	Differential	Gigabit Ethernet 1 MDI1-
S22	GBE1_LINK1000#	ETH1_LED_1000_3V3_OD	O OD	3V3	Link Speed Indication for 1000 Mbps
S23	GBE1_MDI2+	ETH1_TRX2_P	I/O	Differential	Gigabit Ethernet 1 MDI2+
S24	GBE1_MDI2-	ETH1_TRX2_N	I/O	Differential	Gigabit Ethernet 1 MDI2-
S25	GND	GND	Ground	Ground	Ground
S26	GBE1_MDI3+	ETH1_TRX3_P	I/O	Differential	Gigabit Ethernet 1 MDI3+
S27	GBE1_MDI3-	ETH1_TRX3_N	I/O	Differential	Gigabit Ethernet 1 MDI3-
S28	GBE1_CTREF	NC	-		No Connection
S29	PCIE_D_TX+ / SERDES_O_TX+	CSI2_D2_P*	O	Differential	SMARC exception, CSIO RX2+ Differential Data
S30	PCIE_D_TX- / SERDES_O_TX-	CSI2_D2_N*	O	Differential	SMARC exception, CSIO RX2- Differential Data
S31	GBE1_LINK_ACT#	ETH1_LED_ACT*_3V3_OD	O	3V3	Link Activity Indication
S32	PCIE_D_RX+ / SERDES_O_RX+	CSI2_D3_P*	I	Differential	SMARC exception, CSIO RX3+ Differential Data
S33	PCIE_D_RX- / SERDES_O_RX-	CSI2_D3_N*	I	Differential	SMARC exception, CSIO RX3- Differential Data
S34	GND	GND	Ground	Ground	Ground
S35	USB4+	USB4_DN4_D_P	I/O	Differential	USB Data+ Port 4
S36	USB4-	USB4_DN4_D_N	I/O	Differential	USB Data- Port 4
S37	USB3_VBUS_DET	NC	-		No Connection
S38	AUDIO_MCK	SAI2_MCLK_1V8	O	1V8	Master Clock Output to I2S Codec
S39	I2S0_LRCK	SAI2_TXFS_1V8	I/O	1V8	I2S0 Left and Right Synchronization clock
S40	I2S0_SDOUT	SAI2_TXD_1V8	O	1V8	I2S0 Digital Audio Output
S41	I2S0_SDIN	SAI2_RXD_1V8	I	1V8	I2S0 Digital Audio Input
S42	I2S0_CK	SAI2_TXC_1V8	I/O	1V8	I2S0 Digital Audio Clock
S43	ESPI_ALERT0#	NC	-		No Connection
S44	ESPI_ALERT1#	NC	-		No Connection
S45	MDIO_CLK	NC	-		No Connection
S46	MDIO_DAT	NC	-		No Connection
S47	GND	GND	Ground	Ground	Ground
S48	I2C_GP_CK	I2C4_SCL_1V8	I/O	1V8	General Purpose I2C Clock

Pin No.	SMARC Pin Name	Signal name	Signal Type	Voltage Level	Description
S49	I2C_GP_DAT	I2C4_SDA_1V8	I/O	1V8	General Purpose I2C Data
S50	HDA_SYNC / I2S2_LRCK	SAI3_TXFS_1V8	I/O	1V8	I2S2 Left and Right Synchronization Clock
S51	HDA_SDO / I2S2_SDOUT	SAI3_TXD_1V8	O	1V8	I2S2 Digital Audio Output
S52	HDA_SDI / I2S2_SDIN	SAI3_RXD_1V8	I/O	1V8	I2S2 Digital Audio Input
S53	HDA_CK / I2S2_CK	SAI3_TXC_1V8	O	1V8	I2S2 Digital Audio Clock
S54	SATA_ACT#	NC	-		No Connection
S55	USB5_EN_OC#	NC	-		No Connection
S56	ESPI_IO_2 / QSPI_IO_2	NC	-		No Connection
S57	ESPI_IO_3 / QSPI_IO_3	NC	-		No Connection
S58	ESPI_RESET#	NC	-		No Connection
S59	USB5+	NC	-		No Connection
S60	USB5-	NC	-		No Connection
S61	GND	GND	Ground	Ground	Ground
S62	USB3_SSTX+	USB_DN3_SSTX_P	O	Differential	USB SuperSpeed Transmit+ Port 3
S63	USB3_SSTX-	USB_DN3_SSTX_N	O	Differential	USB SuperSpeed Transmit- Port 3
S64	GND	GND	Ground	Ground	Ground
S65	USB3_SSRX+	USB_DN3_SSRX_P	I	Differential	USB SuperSpeed Receive+ Port 3
S66	USB3_SSRX-	USB_DN3_SSRX_N	I	Differential	USB SuperSpeed Receive- Port 3
S67	GND	GND	Ground	Ground	Ground
S68	USB3+	USB_DN3_D_P	I/O	Differential	USB3 Data+ Port 3
S69	USB3-	USB_DN3_D_N	I/O	Differential	USB3 Data- Port 3
S70	GND	GND	Ground	Ground	Ground
S71	USB2_SSTX+	USB_DN2_SSTX_P	O	Differential	USB SuperSpeed Transmit+ Port 2
S72	USB2_SSTX-	USB_DN2_SSTX_N	O	Differential	USB SuperSpeed Transmit- Port 2
S73	GND	GND	Ground	Ground	Ground
S74	USB2_SSRX+	USB_DN2_SSRX_P	I	Differential	USB SuperSpeed Receive+ Port 2
S75	USB2_SSRX-	USB_DN2_SSRX_N	I	Differential	USB SuperSpeed Receive- Port 2
S76	PCIE_B_RST#	NC	-		No Connection
Key					
S77	PCIE_C_RST#	NC	-		No Connection
S78	PCIE_C_RX+ / SERDES_1_RX+	EARC_N_HPD	I/O	1V8	SMARC exception, EARC_N_HPD
S79	PCIE_C_RX- / SERDES_1_RX-	EARC_P_UTIL	I/O	1V8	SMARC exception, EARC_N_UTIL
S80	GND	GND	Ground	Ground	Ground
S81	PCIE_C_TX+ / SERDES_1_TX+	EARC_AUX	I/O	1V8	SMARC exception, EARC_AUX
S82	PCIE_C_TX- / SERDES_1_TX-	EHDMI_CEC	I/O	1V8	SMARC exception, HDMI_CEC
S83	GND	GND	Ground	Ground	Ground
S84	PCIE_B_REFCK+	NC	-		No Connection
S85	PCIE_B_REFCK-	NC	-		No Connection
S86	GND	GND	Ground	Ground	Ground
S87	PCIE_B_RX+	NC	-		No Connection
S88	PCIE_B_RX-	NC	-		No Connection
S89	GND	GND	Ground	Ground	Ground
S90	PCIE_B_TX+	NC	-		No Connection
S91	PCIE_B_TX-	NC	-		No Connection
S92	GND	GND	Ground	Ground	Ground
S93	DPO_LANE0+	NC	-		No Connection
S94	DPO_LANE0-	NC	-		No Connection
S95	DPO_AUX_SEL	NC	-		No Connection
S96	DPO_LANE1+	NC	-		No Connection
S97	DPO_LANE1-	NC	-		No Connection
S98	DPO_HPD	NC	-		No Connection
S99	DPO_LANE2+	NC	-		No Connection
S100	DPO_LANE2-	NC	-		No Connection
S101	GND	GND	Ground	Ground	Ground
S102	DPO_LANE3+	NC	-		No Connection
S103	DPO_LANE3-	NC	-		No Connection
S104	USB3_OTG_ID	NC	-		No Connection
S105	DPO_AUX+	NC	-		No Connection
S106	DPO_AUX-	NC	-		No Connection
S107	LCD1_BKLT_EN	LVDS1_BKLT_EN_1V8	O	1V8	LCD1 Backlight Enable
S108	LVDS1_CK+ / eDP1_AUX+ / DSI1_CLK+	LVDS1_CLK_P	I/O	Differential	LVDS1 Differential Clock+
S109	LVDS1_CK- / eDP1_AUX- / DSI1_CLK-	LVDS1_CLK_N	I/O	Differential	LVDS1 Differential Clock-
S110	GND	GND	Ground	Ground	Ground

Pin No.	SMARC Pin Name	Signal name	Signal Type	Voltage Level	Description
S111	LVDS1_0+ / eDP1_TX0+ / DSI1_D0+	LVDS1_TX0_P	O	Differential	LVDS1 Differential Data D0+
S112	LVDS1_0- / eDP1_TX0- / DSI1_D0-	LVDS1_TX0_N	O	Differential	LVDS1 Differential Data D0-
S113	eDP1_HPD / DSI1_TE	NC	-		No Connection
S114	LVDS1_1+ / eDP1_TX1+ / DSI1_D1+	LVDS1_TX1_P	O	Differential	LVDS1 Differential Data D0+
S115	LVDS1_1- / eDP1_TX1- / DSI1_D1-	LVDS1_TX1_N	O	Differential	LVDS1 Differential Data D0-
S116	LCD1_VDD_EN	LVDS1_VDD_EN_1V8	O	1V8	LCD1 VDD Enable
S117	LVDS1_2+ / eDP1_TX2+ / DSI1_D2+	LVDS1_TX2_P	O	Differential	LVDS1 Differential Data D2+
S118	LVDS1_2- / eDP1_TX2- / DSI1_D2-	LVDS1_TX2_N	O	Differential	LVDS1 Differential Data D2-
S119	GND	GND	Ground	Ground	Ground
S120	LVDS1_3+ / eDP1_TX3+ / DSI1_D3+	LVDS1_TX3_P	O	Differential	LVDS1 Differential Data D3+
S121	LVDS1_3- / eDP1_TX3- / DSI1_D3-	LVDS1_TX3_N	O	Differential	LVDS1 Differential Data D3-
S122	LCD1_BKLT_PWM	PWM_3_1V8	O	1V8	LCD1 PWM Backlight Control
S123	GPIO13	HP_DETECT_1V8	I/O	1V8	Headphone Detect
S124	GND	GND	Ground	Ground	Ground
S125	LVDS0_0+ / eDP0_TX0+ / DSI0_D0+	LVDS0_DSI0_TX0_P	O	Differential	LVDS0, DSI0+ Differential Data D0+, default is LVDS
S126	LVDS0_0- / eDP0_TX0- / DSI0_D0-	LVDS0_DSI0_TX0_N	O	Differential	LVDS0, DSI0- Differential Data D0-, default is LVDS
S127	LVDS0_1+ / eDP0_TX1+ / DSI0_D1+	LVDS0_BKLT_EN_1V8	O	1V8	LVDS0, DSI0 Backlight Enable
S128	LVDS0_1+ / eDP0_TX1+ / DSI0_D1+	LVDS0_DSI0_TX1_P	O	Differential	LVDS0, DSI0+ Differential Data D1+, default is LVDS
S129	LVDS0_1- / eDP0_TX1- / DSI0_D1-	LVDS0_DSI0_TX1_N	O	Differential	LVDS0, DSI0- Differential Data D1-, default is LVDS
S130	GND	GND	Ground	Ground	Ground
S131	LVDS0_2+ / eDP0_TX2+ / DSI0_D2+	LVDS0_TX2_P	O	Differential	LVDS0, DSI0+ Differential Data D2+, default is LVDS
S132	LVDS0_2- / eDP0_TX2- / DSI0_D2-	LVDS0_TX2_N	O	Differential	LVDS0, DSI0- Differential Data D2-, default is LVDS
S133	LCD0_VDD_EN	LVDS0_VDD_EN_1V8	O	1V8	LCD0 VDD Enable
S134	LVDS0_CLK+ / eDP0_AUX+ / DSI0_CLK+	LVDS0_DSI0_CLK_P	O	Differential	LVDS0, DSI0+ Differential Clock+, default is LVDS
S135	LVDS0_CLK- / eDP0_AUX- / DSI0_CLK-	LVDS0_DSI0_CLK_N	O	Differential	LVDS0, DSI0- Differential Clock-, default is LVDS
S136	GND	GND	Ground	Ground	Ground
S137	LVDS0_3+ / eDP0_TX3+ / DSI0_D3+	LVDS0_DSI0_TX3_P	O	Differential	LVDS0, DSI0+ Differential Data D3+, default is LVDS
S138	LVDS0_3- / eDP0_TX3- / DSI0_D3-	LVDS0_DSI0_TX3_N	O	Differential	LVDS0, DSI- Differential Data D3-, default is LVDS
S139	I2C_LCD_CLK	I2C3_SCL_1V8	I/O	1V8	DDC Clock
S140	I2C_LCD_DAT	I2C3_SDA_1V8	I/O	1V8	DDC Data Line
S141	LCD0_BKLT_PWM	LCD0_PWM2_1V8	O	1V8	LCD0 PWM Brightness Control
S142	GPIO12	RTC_INT_1V8	I/O	1V8	RTC INT
S143	GND	GND	Ground	Ground	Ground
S144	eDP0_HPD / DSI0_TE	NC	-		No Connection
S145	WDT_TIME_OUT#	WD0G_B_1V8	O	1V8	Watch Dog Timer Output active low
S146	PCIE_WAKE#	PCIE_WAKE#_3V3	I	3V3	PCIE Wakeup interrupt to Links A, B, C, D
S147	VDD_RTC	NC	-		No Connection
S148	LID#	LID#_1V8	I	1V8	Lid Open/Close
S149	SLEEP#	SLEEP#_1V8	I	1V8	Sleep indicator from Carrier board
S150	VIN_PWR_BAD#	VIN_PWR_BAD#_1V8	I	1V8	Voltage in Power Bad on Carrier Board
S151	CHARGING#	CHARGING#_1V8	I	1V8	Charging
S152	CHARGER_PRSENT#	CHARGER_PRSENT#_1V8	I	1V8	Charger Present
S153	CARRIER_STBY#	CARRIER_STBY#_1V8	O	1V8	Carrier Standby
S154	CARRIER_PWR_ON	CARRIER_PWR_ON_1V8	O	1V8	Carrier Power On
S155	FORCE_RECOV#	FORCE_RECOV#_1V8	I	1V8	Force recover
S156	BATLOW#	BATLOW#_1V8	I	1V8	Battery low indication to Module
S157	TEST#	NC	-	-	No Connection
S158	GND	GND	GROUND	GROUND	GROUND

Table 3-1 Pinout for SMARC i.MX 8M Plus SOM(CN401)

Pin No.	SMARC Pin Name	Signal name	Signal Type	Voltage Level	Description
P1	SMB_ALERT#	SMB_ALERT#_1V8	I	1V8	SMBus Alert Signal active low
P2	GND	GND	Ground	Ground	Ground
P3	CSI1_CLK+	CSICK_P	I	Differential	CS1 Differential Clock+

Pin No.	SMARC Pin Name	Signal name	Signal Type	Voltage Level	Description
P4	CSI1_CK-	CSICK_N	I	Differential	CSI1 Differential Clock-
P5	GBE1_SDP	NC	-		No Connection
P6	GBE0_SDP	ENET_CLKI25_3V3	O	3V3	IEEE 1588 Trigger signal for hardware implementation of Precision Time Protocol (PTP)
P7	CSI1_RX0+	CSID01_P	I	Differential	CSI1_RX0+ Differential input
P8	CSI1_RX0-	CSID01_N	I	Differential	CSI1_RX0- Differential input
P9	GND	GND	Ground	Ground	Ground
P10	CSI1_RX1+	CSID1_P	I	Differential	CSI1_RX1+ Differential input
P11	CSI1_RX1-	CSID1_N	I	Differential	CSI1_RX1- Differential input
P12	GND	GND	Ground	Ground	Ground
P13	CSI1_RX2+	CSID2_P	I	Differential	CSI1_RX2+ Differential input
P14	CSI1_RX2-	CSID2_N	I	Differential	CSI1_RX2- Differential input
P15	GND	GND	Ground	Ground	Ground
P16	CSI1_RX3+	CSID3_P	I	Differential	CSI1_RX3+ Differential input
P17	CSI1_RX3-	CSID3_N	I	Differential	CSI1_RX3- Differential input
P18	GND	GND	Ground	Ground	Ground
P19	GBE0_MDI3-	ETH1_TRX3_N	I/O	Differential	Gigabit Ethernet 1 MDI3+
P20	GBE0_MDI3+	ETH1_TRX3_P	I/O	Differential	Gigabit Ethernet 1 MDI3-
P21	GBE0_LINK100#	ETH1_LED_10_100_3V3_OD	O OD	3V3	Link Speed Indication 100 Mbps
P22	GBE0_LINK1000#	ETH1_LED_1000_3V3_OD	O OD	3V3	Link Speed Indication 1000 Mbps
P23	GBE0_MDI2-	ETH1_TRX2_N	I/O	Differential	Gigabit Ethernet 1 MDI2+
P24	GBE0_MDI2+	ETH1_TRX2_P	I/O	Differential	Gigabit Ethernet 1 MDI2-
P25	GBE0_LINK_ACT#	ETH1_LED_ACT_3V3_OD	O OD	3V3	Link Activity Indication
P26	GBE0_MDI1-	ETH1_TRX1_N	I/O	Differential	Gigabit Ethernet 1 MDI1+
P27	GBE0_MDI1+	ETH1_TRX1_P	I/O	Differential	Gigabit Ethernet 1 MDI1-
P28	GBE0_CTREF	NC	-		No Connection
P29	GBE0_MDIO-	ETH1_TRX0_N	I/O	Differential	Gigabit Ethernet 1 MDIO+
P30	GBE0_MDIO+	ETH1_TRX0_P	I/O	Differential	Gigabit Ethernet 1 MDIO-
P31	SPIO_CS1#	NC	-		No Connection
P32	GND	GND	Ground	Ground	Ground
P33	SDIO_WP	SD2_WP	I	1V8/3V3	Input State of SDIO Write Protect, test point TP432, shared with onboard Micro SD Socket
P34	SDIO_CMD	SD2_CMD_SOM	I/O	1V8/3V3	SDIO2 Command/Response, shared with onboard Micro SD Socket
P35	SDIO_CD#	SD2_nCD_SOM	I	1V8/3V3	SDIO2 Card Detect, shared with onboard Micro SD Socket
P36	SDIO_CLK	SD2_CLK_SOM	O	1V8/3V3	SDIO2 Clock, shared with onboard Micro SD Socket
P37	SDIO_PWR_EN	SD2_RESET_B_SOM	O	3V3	SDIO2 Power Enable, shared with onboard Micro SD Socket
P38	GND	GND	Ground	Ground	Ground
P39	SDIO_D0	SD2_DATA0_SOM	I/O	1V8/3V3	SDIO Data 0, shared with onboard Micro SD Socket
P40	SDIO_D1	SD2_DATA1_SOM	I/O	1V8/3V3	SDIO Data 1, shared with onboard Micro SD Socket
P41	SDIO_D2	SD2_DATA2_SOM	I/O	1V8/3V3	SDIO Data 2, shared with onboard Micro SD Socket
P42	SDIO_D3	SD2_DATA3_SOM	I/O	1V8/3V3	SDIO Data 3, shared with onboard Micro SD Socket
P43	SPIO_CS0#	ECSP11_SS0_1V8_SOM	O	1V8	SPIO Master Chip Select 0, shared with SPI to CAN2 Controller
P44	SPIO_CLK	ECSP11_SCLK_1V8_SOM	O	1V8	SPIO Clock, shared with SPI to CAN2 Controller
P45	SPIO_DIN	ECSP11_MISO_1V8_SOM	I	1V8	SPIO Master input/ Slave output, shared with SPI to CAN2 Controller
P46	SPIO_DO	ECSP11_MOSI_1V8_SOM	O	1V8	SPIO Master output/ Slave input, shared with SPI to CAN2 Controller
P47	GND	GND	Ground	Ground	Ground
P48	SATA_TX+	NC	-		No Connection
P49	SATA_TX-	NC	-		No Connection
P50	GND	GND	Ground	Ground	Ground
P51	SATA_RX+	NC	-		No Connection
P52	SATA_RX-	NC	-		No Connection
P53	GND	GND	Ground	Ground	Ground

Pin No.	SMARC Pin Name	Signal name	Signal Type	Voltage Level	Description
P54	ESPI_CS0# / SPI1_CS0# / QSPI_CS0#	ECSPi3_SS0_1V8_SOM	O	1V8	SPI1 Master Chips Select 0, shared with SPI to CAN1 Controller
P55	ESPI_CS1# / SPI1_CS1# / QSPI_CS1#	NC	-		No Connection
P56	ESPI_CK / SPI1_CK / QSPI_CK	ECSPi3_SCLK_1V8_SOM	O	1V8	SPI1 Clock, shared with SPI to CAN1 Controller
P57	ESPI_IO_1 / SPI1_DIN / QSPI_IO_1	ECSPi3_MISO_1V8_SOM	I/O	1V8	SPI1 Master input/ Slave output, shared with SPI to CAN1 Controller
P58	ESPI_IO_0 / SPI1_DO / QSPI_IO_0	ECSPi3_MOSI_1V8_SOM	I/O	1V8	SPI1 Master output/ Slave input, shared with SPI to CAN1 Controller
P59	GND	GND	Ground	Ground	Ground
P60	USB0+	USB1_P	I/O	Differential	USB0 Data+
P61	USB0-	USB1_N	I/O	Differential	USB0 Data-
P62	USB0_EN_OC#	USB1_EN_OC#_3V3_OD	I/O	3V3	USB0 Over Current
P63	USB0_VBUS_DET	USB1_VBUS_5V0	I	5V0	USB0 Host Power Detection
P64	USB0_OTG_ID	USB1_ID_1V8	I	1V8	USB0 OTG Device Detection
P65	USB1+	USB_DN1_D_P	I/O	Differential	USB1 DATA+
P66	USB1-	USB_DN1_D_N	I/O	Differential	USB1 DATA-
P67	USB1_EN_OC#	USB_DN1_EN_OC#_3V3_OD	I/O	3V3	USB1 Over Current
P68	GND	GND	Ground	Ground	Ground
P69	USB2+	USB_DN2_D_P	I/O	Differential	USB2 DATA+
P70	USB2-	USB_DN2_D_N	I/O	Differential	USB2 DATA-
P71	USB2_EN_OC#	USB_DN2_EN_OC#_3V3_OD	I/O	3V3	USB2 Over-Current
P72	RSVD	NC	-		No Connection
P73	RSVD	NC	-		No Connection
P74	USB3_EN_OC#	USB_DN3_EN_OC#_3V3_OD	I/O	3V3	USB3 Over-Current
Key					
P75	PCIE_A_RST#	PCIE_RST#_3V3	O	3V3	PCie Port A Reset Output
P76	USB4_EN_OC#	USB_DN4_EN_OC#_3V3_OD	I/O	3V3	USB4 Over-Current
P77	PCIE_B_CKREQ#	NC	-		No Connection
P78	PCIE_A_CKREQ#	PCI_CLKREQ_B_3V3_OD	I/O OD	3V3	PCie Port A Clock Request
P79	GND	GND	Ground	Ground	Ground
P80	PCIE_C_REFCK+	NC	-		No Connection
P81	PCIE_C_REFCK-	NC	-		No Connection
P82	GND	GND	Ground	Ground	Ground
P83	PCIE_A_REFCK+	PCIECLK_P	I/O	Differential	PCie Reference Clock+ Link A
P84	PCIE_A_REFCK-	PCIECLK_N	I/O	Differential	PCie Reference Clock- Link A
P85	GND	GND	Ground	Ground	Ground
P86	PCIE_A_RX+	PCIERX_P	I	Differential	PCie Data+ Receive Link A
P87	PCIE_A_RX-	PCIERX_N	I	Differential	PCie Data- Receive Link A
P88	GND	GND	Ground	Ground	Ground
P89	PCIE_A_TX+	PCIE_TX_P	O	Differential	PCie Data+ Transmit Link A, AC coupled
P90	PCIE_A_TX-	PCIE_TX_N	O	Differential	PCie Data- Transmit Link A, AC coupled
P91	GND	GND	Ground	Ground	Ground
P92	HDMI_D2+ / DP1_LANE0+	NC	-	I	No Connection
P93	HDMI_D2- / DP1_LANE0-	NC	-		No Connection
P94	GND	GND	Ground	Ground	Ground
P95	HDMI_D1+ / DP1_LANE1+	NC	-		No Connection
P96	HDMI_D1- / DP1_LANE1-	NC	-		No Connection
P97	GND	GND	Ground	Ground	Ground
P98	HDMI_D0+ / DP1_LANE2+	NC	-		No Connection
P99	HDMI_D0- / DP1_LANE2-	NC	-		No Connection
P100	GND	GND	Ground	Ground	Ground
P101	HDMI_CK+ / DP1_LANE3+	NC	-		No Connection
P102	HDMI_CK- / DP1_LANE3-	NC	-		No Connection
P103	GND	GND	Ground	Ground	Ground
P104	HDMI_HPD / DP1_HPD	NC	-		No Connection
P105	HDMI_CTRL_CK / DP1_AUX+	NC	-		No Connection
P106	HDMI_CTRL_DAT / DP1_AUX-	NC	-		No Connection
P107	DP1_AUX_SEL	NC	-		No Connection
P108	GPIO0 / CAM0_PWR#	NC	-		No Connection
P109	GPIO1 / CAM1_PWR#	CAM1_PWR#_1V8	I/O	1V8	GPIO or Camera 1 Power Enable, Active Low
P110	GPIO2 / CAM0_RST#	NC	-		No Connection
P111	GPIO3 / CAM1_RST#	CAM1_RST#_1V8	I/O	1V8	GPIO or Camera 1 Reset, Active Low

Pin No.	SMARC Pin Name	Signal name	Signal Type	Voltage Level	Description
P112	GPIO4 / HDA_RST#	SDIO_WAKE#_1V8	I/O	1V8	SDIO Wake host
P113	GPIO5 / PWM_OUT	PWM_1_1V8	I/O	1V8	GPIO or PWM Out 1
P114	GPIO6 / TACHIN	TOUCH_INT_1V8	I/O	1V8	I2C Touch INT
P115	GPIO7	TOUCH_RST_1V8	I/O	1V8	I2C Touch RST
P116	GPIO8	CAM0_SYNC_1V8	I/O	1V8	Camera0 SYNC
P117	GPIO9	CAM1_SYNC_1V8	I/O	1V8	Camera1 SYNC
P118	GPIO10	BT_WAKE_1V8	I/O	1V8	Bluetooth wake host
P119	GPIO11	WL_WAKE_1V8	I/O	1V8	WiFi wake host
P120	GND	GND	Ground	Ground	Ground
P121	I2C_PM_CK	I2C1_SCL_1V8	I/O I/O	1V8	Power Management I2C bus Data, PU 4.7K
P122	I2C_PM_DAT	I2C1_SDA_1V8	I/O I/O	1V8	Power Management I2C bus Clock, PU 4.7K
P123	BOOT_SEL0#	BOOT_MODE0_1V8	I	1V8	Boot Select bit 0
P124	BOOT_SEL1#	BOOT_MODE1_1V8	I	1V8	Boot Select bit 1
P125	BOOT_SEL2#	JTAG_nTRST_1V8	I	1V8	Boot Select bit 2
P126	RESET_OUT#	EX_POR_B_1V8	O	1V8	General purpose Reset to Carrier Board
P127	RESET_IN#	RESET_IN#	I	1V8	Reset input from Carrier Board, PU 100K
P128	POWER_BTN#	POWER_BTN#	I	1V8	Power Button input from carrier board, PU 100K
P129	SER0_TX	UART4_TXD_1V8	O	1V8	UART4 Transmit
P130	SER0_RX	UART4_RXD_1V8	I	1V8	UART4 Receive
P131	SER0_RTS#	UART4_CTS_1V8	O	1V8	UART4 Clear to Send
P132	SER0_CTS#	UART4_RTS_1V8	I	1V8	UART4 Request to Send
P133	GND	GND	Ground	Ground	Ground
P134	SER1_TX	UART1_TXD_1V8	O	1V8	UART1 Transmit
P135	SER1_RX	UART1_RXD_1V8	I	1V8	UART1 Receive
P136	SER2_TX	UART2_TXD_1V8_SOM	O	1V8	UART2 Transmit, shared with onboard WiFi/BT module, default is WiFi/BT
P137	SER2_RX	UART2_RXD_1V8_SOM	I	1V8	UART2 Receive, shared with onboard WiFi/BT module, default is WiFi/BT
P138	SER2_RTS#	UART2_CTS_1V8_SOM	O	1V8	UART2 Request to Send, shared with onboard WiFi/BT module, default is WiFi/BT
P139	SER2_CTS#	UART2_RTS_1V8_SOM	I	1V8	UART2 Clear to Send, shared with onboard WiFi/BT module, default is WiFi/BT
P140	SER3_TX	UART3_TXD_1V8	O	1V8	UART3 Transmit
P141	SER3_RX	UART3_RXD_1V8	I	1V8	UART3 Receive
P142	GND	GND	Ground	Ground	Ground
P143	CAN0_TX	CAN1_TX_1V8	O	1V8	CAN Port 0 Transmit
P144	CAN0_RX	CAN1_RX_1V8	I	1V8	CAN Port 0 Receive
P145	CAN1_TX	CAN2_TX_1V8	O	1V8	CAN Port 1 Transmit
P146	CAN1_RX	CAN2_RX_1V8	I	1V8	CAN Port 1 Receive
P147	VDD_IN	SYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P148	VDD_IN	SYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P149	VDD_IN	SYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P150	VDD_IN	SYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P151	VDD_IN	SYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P152	VDD_IN	SYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P153	VDD_IN	SYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P154	VDD_IN	SYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P155	VDD_IN	SYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P156	VDD_IN	SYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
S1	CSI1_TX+ / I2C_CAM1_CK	I2C2_SCL_1V8	I/O OD	1V8	I2C Serial Clock Camera 1, PU 4.7K
S2	CSI1_TX- / I2C_CAM1_DAT	I2C2_SDA_1V8	I/O OD	1V8	I2C Serial Data Camera 1, PU 4.7K
S3	GND	GND	Ground	Ground	Ground
S4	RSVD	NC	-		No Connection
S5	CSI0_TX+ / I2C_CAM0_CK	NC	-		No Connection
S6	CAM_MCK	CSI_MCLK_1V8	O	1V8	Master Clock Output
S7	CSI0_TX- / I2C_CAM0_DAT	NC	-		No Connection
S8	CSI0_CK+	NC	-		No Connection
S9	CSI0_CK-	NC	-		No Connection
S10	GND	GND	Ground	Ground	Ground
S11	CSI0_RX0+	NC	-		No Connection

Pin No.	SMARC Pin Name	Signal name	Signal Type	Voltage Level	Description
S12	CSIO_RX0-	NC	-		No Connection
S13	GND	GND	Ground	Ground	Ground
S14	CSIO_RX1+	NC	-		No Connection
S15	CSIO_RX1-	NC	-		No Connection
S16	GND	GND	Ground	Ground	Ground
S17	GBE1_MDIO+	NC	-		No Connection
S18	GBE1_MDIO-	NC	-		No Connection
S19	GBE1_LINK100#	NC	-		No Connection
S20	GBE1_MDI1+	NC	-		No Connection
S21	GBE1_MDI1-	NC	-		No Connection
S22	GBE1_LINK1000#	NC	-		No Connection
S23	GBE1_MDI2+	NC	-		No Connection
S24	GBE1_MDI2-	NC	-		No Connection
S25	GND	GND	Ground	Ground	Ground
S26	GBE1_MDI3+	NC	-		No Connection
S27	GBE1_MDI3-	NC	-		No Connection
S28	GBE1_CTREF	NC	-		No Connection
S29	PCIE_D_TX+ / SERDES_O_TX+	NC	-		No Connection
S30	PCIE_D_TX- / SERDES_O_TX-	NC	-		No Connection
S31	GBE1_LINK_ACT#	NC	-		No Connection
S32	PCIE_D_RX+ / SERDES_O_RX+	NC	-		No Connection
S33	PCIE_D_RX- / SERDES_O_RX-	NC	-		No Connection
S34	GND	GND	Ground	Ground	Ground
S35	USB4+	USB_DN4_D_P	I/O	Differential	USB Data+ Port 4
S36	USB4-	USB_DN4_D_N	I/O	Differential	USB Data- Port 4
S37	USB3_VBUS_DET	NC	-		No Connection
S38	AUDIO_MCK	SAI2_MCLK_1V8	O	1V8	Master Clock Output to I2S Codec
S39	I2S0_LRCK	SAI2_TXFS_1V8	I/O	1V8	I2S0 Left and Right Synchronization clock
S40	I2S0_SDOUT	SAI2_TXD_1V8	O	1V8	I2S0 Digital Audio Output
S41	I2S0_SDIN	SAI2_RXD_1V8	I	1V8	I2S0 Digital Audio Input
S42	I2S0_CK	SAI2_TXC_1V8	I/O	1V8	I2S0 Digital Audio Clock
S43	ESPI_ALERT0#	NC	-		No Connection
S44	ESPI_ALERT1#	NC	-		No Connection
S45	MDIO_CLK	NC	-		No Connection
S46	MDIO_DAT	NC	-		No Connection
S47	GND	GND	Ground	Ground	Ground
S48	I2C_GP_CK	I2C4_SCL_1V8	I/O	1V8	General Purpose I2C Clock, PU 4.7K
S49	I2C_GP_DAT	I2C4_SDA_1V8	I/O	1V8	General Purpose I2C Data, PU 4.7K
S50	HDA_SYNC / I2S2_LRCK	SAI1_TXFS_1V8_SOM	I/O	1V8	SAI1_TXFS
S51	HDA_SDO / I2S2_SDOUT	SAI1_TXD0_1V8_SOM	O	1V8	SAI1_TXD
S52	HDA_SDI / I2S2_SDIN	SAI1_RXD0_1V8_SOM	I/O	1V8	SAI1_RXD
S53	HDA_CK / I2S2_CK	SAI1_TXC_1V8_SOM	O	1V8	SAI1_TXC
S54	SATA_ACT#	NC	-		No Connection
S55	USB5_EN_OC#	NC	-		No Connection
S56	ESPI_IO_2 / QSPI_IO_2	NC	-		No Connection
S57	ESPI_IO_3 / QSPI_IO_3	NC	-		No Connection
S58	ESPI_RESET#	NC	-		No Connection
S59	USB5+	NC	-		No Connection
S60	USB5-	NC	-		No Connection
S61	GND	GND	Ground	Ground	Ground
S62	USB3_SSTX+	NC	-		No Connection
S63	USB3_SSTX-	NC	-		No Connection
S64	GND	GND	Ground	Ground	Ground
S65	USB3_SSRX+	NC	-		No Connection
S66	USB3_SSRX-	NC	-		No Connection
S67	GND	GND	Ground	Ground	Ground
S68	USB3+	USB_DN3_D_P	I/O	Differential	USB Data+ Port 3
S69	USB3-	USB_DN3_D_N	I/O	Differential	USB Data- Port 3
S70	GND	GND	Ground	Ground	Ground
S71	USB2_SSTX+	NC	-		No Connection
S72	USB2_SSTX-	NC	-		No Connection
S73	GND	GND	Ground	Ground	Ground
S74	USB2_SSRX+	NC	-		No Connection
S75	USB2_SSRX-	NC	-		No Connection

Pin No.	SMARC Pin Name	Signal name	Signal Type	Voltage Level	Description
S76	PCIE_B_RST#	NC	-		No Connection
Key					
S77	PCIE_C_RST#	NC	-		No Connection
S78	PCIE_C_RX+ / SERDES_1_RX+	NC	-		No Connection
S79	PCIE_C_RX- / SERDES_1_RX-	NC	-		No Connection
S80	GND	GND	Ground	Ground	Ground
S81	PCIE_C_TX+ / SERDES_1_TX+	NC	-		No Connection
S82	PCIE_C_TX- / SERDES_1_TX-	NC	-		No Connection
S83	GND	GND	Ground	Ground	Ground
S84	PCIE_B_REFCK+	NC	-		No Connection
S85	PCIE_B_REFCK-	NC	-		No Connection
S86	GND	GND	Ground	Ground	Ground
S87	PCIE_B_RX+	NC	-		No Connection
S88	PCIE_B_RX-	NC	-		No Connection
S89	GND	GND	Ground	Ground	Ground
S90	PCIE_B_TX+	NC	-		No Connection
S91	PCIE_B_TX-	NC	-		No Connection
S92	GND	GND	Ground	Ground	Ground
S93	DPO_LANE0+	NC	-		No Connection
S94	DPO_LANE0-	NC	-		No Connection
S95	DPO_AUX_SEL	NC	-		No Connection
S96	DPO_LANE1+	NC	-		No Connection
S97	DPO_LANE1-	NC	-		No Connection
S98	DPO_HPD	NC	-		No Connection
S99	DPO_LANE2+	NC	-		No Connection
S100	DPO_LANE2-	NC	-		No Connection
S101	GND	GND	Ground	Ground	Ground
S102	DPO_LANE3+	NC	-		No Connection
S103	DPO_LANE3-	NC	-		No Connection
S104	USB3_OTG_ID	NC	-		No Connection
S105	DPO_AUX+	NC	-		No Connection
S106	DPO_AUX-	NC	-		No Connection
S107	LCD1_BKLT_EN	LVDS1_BKLT_EN_1V8	O	1V8	LCD1 Backlight Enable
S108	LVDS1_CLK+ / eDP1_AUX+ / DSI1_CLK+	LVDS1_CLK_P	O	Differential	LVDS1 Differential Clock+
S109	LVDS1_CLK- / eDP1_AUX- / DSI1_CLK-	LVDS1_CLK_N	O	Differential	LVDS1 Differential Clock-
S110	GND	GND	Ground	Ground	Ground
S111	LVDS1_0+ / eDP1_TX0+ / DSI1_D0+	LVDS1_TX0_P	O	Differential	LVDS1 Differential Data D0+
S112	LVDS1_0- / eDP1_TX0- / DSI1_D0-	LVDS1_TX0_N	O	Differential	LVDS1 Differential Data D0-
S113	eDP1_HPD / DSI1_TE	NC	-		No Connection
S114	LVDS1_1+ / eDP1_TX1+ / DSI1_D1+	LVDS1_TX1_P	O	Differential	LVDS1 Differential Data D1+
S115	LVDS1_1- / eDP1_TX1- / DSI1_D1-	LVDS1_TX1_N	O	Differential	LVDS1 Differential Data D1-
S116	LCD1_VDD_EN	LVDS1_VDD_EN_1V8	O	1V8	LCD1 VDD Enable
S117	LVDS1_2+ / eDP1_TX2+ / DSI1_D2+	LVDS1_TX2_P	O	Differential	LVDS1 Differential Data D2+
S118	LVDS1_2- / eDP1_TX2- / DSI1_D2-	LVDS1_TX2_N	O	Differential	LVDS1 Differential Data D2-
S119	GND	GND	Ground	Ground	Ground
S120	LVDS1_3+ / eDP1_TX3+ / DSI1_D3+	LVDS1_TX3_P	O	Differential	LVDS1 Differential Data D3+
S121	LVDS1_3- / eDP1_TX3- / DSI1_D3-	LVDS1_TX3_N	O	Differential	LVDS1 Differential Data D3-
S122	LCD1_BKLT_PWM	LCD1_PWM_1V8	O	1V8	LCD1 PWM Backlight Control
S123	GPIO13	HP_DETECT_1V8	I/O	1V8	Headphone detect
S124	GND	GND	Ground	Ground	Ground
S125	LVDS0_0+ / eDP0_TX0+ / DSI0_D0+	LVDS0_TX0_DSI0_P	O	Differential	LVDS0, or DSI+ Differential Data D0+, default is LVDS
S126	LVDS0_0- / eDP0_TX0- / DSI0_D0-	LVDS0_TX0_DSI0_N	O	Differential	LVDS0, or DSI- Differential Data D0-, default is LVDS
S127	LVDS0_1+ / eDP0_TX1+ / DSI0_D1+	LVDS0_BKLT_EN_1V8	O	1V8	LVDS0, DSI Backlight Enable
S128	LVDS0_1+ / eDP0_TX1+ / DSI0_D1+	LVDS0_TX1_DSI1_P	O	Differential	LVDS0, or DSI+ Differential Data D1+, default is LVDS
S129	LVDS0_1- / eDP0_TX1- / DSI0_D1-	LVDS0_TX1_DSI1_N	O	Differential	LVDS0, or DSI- Differential Data D1-, default is LVDS
S130	GND	GND	Ground	Ground	Ground
S131	LVDS0_2+ / eDP0_TX2+ / DSI0_D2+	LVDS0_TX2_DSI2_P	O	Differential	LVDS0, or DSI+ Differential Data D2+, default is LVDS
S132	LVDS0_2- / eDP0_TX2- / DSI0_D2-	LVDS0_TX2_DSI2_N	O	Differential	LVDS0, or DSI- Differential Data D2-, default is LVDS

Pin No.	SMARC Pin Name	Signal name	Signal Type	Voltage Level	Description
S133	LCD0_VDD_EN	LVDS0_VDD_EN_1V8	O	1V8	LCD0 VDD Enable
S134	LVDS0_CK+ / eDP0_AUX+ / DSI0_CLK+	LVDS0_CLK_DSICK_P	O	Differential	LVDS0, or DSI0+ Differential Clock+, default is LVDS
S135	LVDS0_CK- / eDP0_AUX- / DSI0_CLK-	LVDS0_CLK_DSICK_N	O	Differential	LVDS0, or DSI0- Differential Clock-, default is LVDS
S136	GND	GND	Ground	Ground	Ground
S137	LVDS0_3+ / eDP0_TX3+ / DSI0_D3+	LVDS0_TX3_DSI3_P	O	Differential	LVDS0, or, DSI0+ Differential Data D3+, default is LVDS
S138	LVDS0_3- / eDP0_TX3- / DSI0_D3-	LVDS0_TX3_DSI3_N	O	Differential	LVDS0, or DSI0- Differential Data D3-, default is LVDS
S139	I2C_LCD_CK	I2C3_SCL_1V8	I/O	1V8	DDC Clock PU 4.7K
S140	I2C_LCD_DAT	I2C3_SDA_1V8	I/O	1V8	DDC Data Line PU 4.7K
S141	LCD0_BKLT_PWM	LCD0_PWM_1V8	O	1V8	LCD0 PWM Brightness Control
S142	GPIO12	RTC_INT_1V8	I/O	1V8	RTC INT
S143	GND	GND	Ground	Ground	Ground
S144	eDP0_HPD / DSI0_TE	NC	-		No Connection
S145	WDT_TIME_OUT#	WD0G_B_1V8	O	1V8	Watch Dog Timer Output active low
S146	PCIE_WAKE#	PCIE_WAKE#_3V3	I	3V3	PCIE Wakeup interrupt to Link A
S147	VDD_RTC	NC	-		No Connection
S148	LID#	LID#_1V8_OD	I	1V8	Lid Open/Close
S149	SLEEP#	SLEEP#_1V8_OD	I	1V8	Sleep indicator from Carrier board
S150	VIN_PWR_BAD#	RESET_IN#	I	1V8	Power bad indication from carrier board
S151	CHARGING#	CHARGING#_1V8_OD	I	1V8	Charging
S152	CHARGER_PRSENT#	CHARGER_PRSENT#_1V8_OD	I	1V8	Charger Present
S153	CARRIER_STBY#	CARRIER_STANDBY_1V8	O	1V8	Carrier Standby
S154	CARRIER_PWR_ON	CARRIER_PWR_ON_1V8	O	1V8	Carrier Power On
S155	FORCE_RECOV#	FORCE_RECOVER_1V8	I	1V8	Force recovery
S156	BATLOW#	BATLOW#_1V8_OD	I	1V8	Battery low indication to Module
S157	TEST#	NC	-		No Connection
S158	GND	GND	GROUND	GROUND	GROUND

Table 3-2 Pinout of SMARC i.MX 8M Mini SOM(CN401)

Pin No.	SMARC Pin Name	Signal name	Signal Type	Voltage Level	Description
P1	SMB_ALERT#	SMB_ALERT#_1V8	I	1V8	SMBus Alert Signal active low
P2	GND	GND	Ground	Ground	Ground
P3	CSI1_CK+	CSICK_P	I	Differential	CS1 Differential Clock+
P4	CSI1_CK-	CSICK_N	I	Differential	CS1 Differential Clock-
P5	GBE1_SDP	NC	-		No Connection
P6	GBE0_SDP	ENET_CLKI25_3V3	O	3V3	IEEE 1588 Trigger signal for hardware implementation of Precision Time Protocol (PTP)
P7	CSI1_RX0+	CSID01_P	I	Differential	CSI1_RX0+ Differential input
P8	CSI1_RX0-	CSID01_N	I	Differential	CSI1_RX0- Differential input
P9	GND	GND	Ground	Ground	Ground
P10	CSI1_RX1+	CSID1_P	I	Differential	CSI1_RX1+ Differential input
P11	CSI1_RX1-	CSID1_N	I	Differential	CSI1_RX1- Differential input
P12	GND	GND	Ground	Ground	Ground
P13	CSI1_RX2+	CSID2_P	I	Differential	CSI1_RX2+ Differential input
P14	CSI1_RX2-	CSID2_N	I	Differential	CSI1_RX2- Differential input
P15	GND	GND	Ground	Ground	Ground
P16	CSI1_RX3+	CSID3_P	I	Differential	CSI1_RX3+ Differential input
P17	CSI1_RX3-	CSID3_N	I	Differential	CSI1_RX3- Differential input
P18	GND	GND	Ground	Ground	Ground
P19	GBE0_MDI3-	ETH1_TRX3_N	I/O	Differential	Gigabit Ethernet 1 MDI3+
P20	GBE0_MDI3+	ETH1_TRX3_P	I/O	Differential	Gigabit Ethernet 1 MDI3-
P21	GBE0_LINK100#	ETH1_LED_10_100_3V3_OD	O OD	3V3	Link Speed Indication 100 Mbps
P22	GBE0_LINK1000#	ETH1_LED_1000_3V3_OD	O OD	3V3	Link Speed Indication 1000 Mbps
P23	GBE0_MDI2-	ETH1_TRX2_N	I/O	Differential	Gigabit Ethernet 1 MDI2+
P24	GBE0_MDI2+	ETH1_TRX2_P	I/O	Differential	Gigabit Ethernet 1 MDI2-
P25	GBE0_LINK_ACT#	ETH1_LED_ACT_3V3_OD	O OD	3V3	Link Activity Indication
P26	GBE0_MDI1-	ETH1_TRX1_N	I/O	Differential	Gigabit Ethernet 1 MDI1+
P27	GBE0_MDI1+	ETH1_TRX1_P	I/O	Differential	Gigabit Ethernet 1 MDI1-
P28	GBE0_CTREF	NC	-		No Connection

Pin No.	SMARC Pin Name	Signal name	Signal Type	Voltage Level	Description
P29	GBE0_MDIO-	ETH1_TRX0_N	I/O	Differential	Gigabit Ethernet 1 MDIO+
P30	GBE0_MDIO+	ETH1_TRX0_P	I/O	Differential	Gigabit Ethernet 1 MDIO-
P31	SPI0_CS1#	NC	-		No Connection
P32	GND	GND	Ground	Ground	Ground
P33	SDIO_WP	SD2_WP	I	1V8/3V3	Input State of SDIO Write Protect, test point TP432, shared with onboard Micro SD Socket
P34	SDIO_CMD	SD2_CMD_SOM	I/O	1V8/3V3	SDIO2 Command/Response, shared with onboard Micro SD Socket
P35	SDIO_CD#	SD2_nCD_SOM	I	1V8/3V3	SDIO2 Card Detect, shared with onboard Micro SD Socket
P36	SDIO_CLK	SD2_CLK_SOM	O	1V8/3V3	SDIO2 Clock, shared with onboard Micro SD Socket
P37	SDIO_PWR_EN	SD2_RESET_B_SOM	O	3V3	SDIO2 Power Enable, shared with onboard Micro SD Socket
P38	GND	GND	Ground	Ground	Ground
P39	SDIO_D0	SD2_DATA0_SOM	I/O	1V8/3V3	SDIO Data 0, shared with onboard Micro SD Socket
P40	SDIO_D1	SD2_DATA1_SOM	I/O	1V8/3V3	SDIO Data 1, shared with onboard Micro SD Socket
P41	SDIO_D2	SD2_DATA2_SOM	I/O	1V8/3V3	SDIO Data 2, shared with onboard Micro SD Socket
P42	SDIO_D3	SD2_DATA3_SOM	I/O	1V8/3V3	SDIO Data 3, shared with onboard Micro SD Socket
P43	SPI0_CS0#	ECSPI1_SS0_1V8_SOM	O	1V8	SPI0 Master Chip Select 0, shared with SPI to CAN2 Controller
P44	SPI0_CLK	ECSPI1_SCLK_1V8_SOM	O	1V8	SPI0 Clock, shared with SPI to CAN2 Controller
P45	SPI0_DIN	ECSPI1_MISO_1V8_SOM	I	1V8	SPI0 Master input/ Slave output, shared with SPI to CAN2 Controller
P46	SPI0_DO	ECSPI1_MOSI_1V8_SOM	O	1V8	SPI0 Master output/ Slave input, shared with SPI to CAN2 Controller
P47	GND	GND	Ground	Ground	Ground
P48	SATA_TX+	NC	-		No Connection
P49	SATA_TX-	NC	-		No Connection
P50	GND	GND	Ground	Ground	Ground
P51	SATA_RX+	NC	-		No Connection
P52	SATA_RX-	NC	-		No Connection
P53	GND	GND	Ground	Ground	Ground
P54	ESPI_CS0# / SPI1_CS0# / QSPI_CS0#	ECSPI3_SS0_1V8_SOM	O	1V8	SPI1 Master Chips Select 0, shared with SPI to CAN1 Controller
P55	ESPI_CS1# / SPI1_CS1# / QSPI_CS1#	NC	-		No Connection
P56	ESPI_CLK / SPI1_CLK / QSPI_CLK	ECSPI3_SCLK_1V8_SOM	O	1V8	SPI1 Clock, shared with SPI to CAN1 Controller
P57	ESPI_IO_1 / SPI1_DIN / QSPI_IO_1	ECSPI3_MISO_1V8_SOM	I/O	1V8	SPI1 Master input/ Slave output, shared with SPI to CAN1 Controller
P58	ESPI_IO_0 / SPI1_DO / QSPI_IO_0	ECSPI3_MOSI_1V8_SOM	I/O	1V8	SPI1 Master output/ Slave input, shared with SPI to CAN1 Controller
P59	GND	GND	Ground	Ground	Ground
P60	USB0+	USB1_P	I/O	Differential	USB0 Data+
P61	USB0-	USB1_N	I/O	Differential	USB0 Data-
P62	USB0_EN_OC#	USB1_EN_OC#_3V3_OD	I/O	3V3	USB0 Over Current
P63	USB0_VBUS_DET	USB1_VBUS_5V0	I	5V0	USB0 Host Power Detection
P64	USB0_OTG_ID	USB1_ID_1V8	I	1V8	USB0 OTG Device Detection
P65	USB1+	NC	NC	NC	NO CONNECTION
P66	USB1-	NC	NC	NC	NO CONNECTION
P67	USB1_EN_OC#	NC	NC	NC	NO CONNECTION
P68	GND	GND	Ground	Ground	Ground
P69	USB2+	NC	NC	NC	NO CONNECTION
P70	USB2-	NC	NC	NC	NO CONNECTION
P71	USB2_EN_OC#	NC	NC	NC	NO CONNECTION
P72	RSVD	NC	-		NO CONNECTION
P73	RSVD	NC	-		NO CONNECTION
P74	USB3_EN_OC#	NC	NC	NC	NO CONNECTION
Key					
P75	PCIE_A_RST#	NC	NC	NC	NO CONNECTION
P76	USB4_EN_OC#	NC	NC	NC	NO CONNECTION

Pin No.	SMARC Pin Name	Signal name	Signal Type	Voltage Level	Description
P77	PCIE_B_CKREQ#	NC	-		NO CONNECTION
P78	PCIE_A_CKREQ#	NC	NC	NC	NO CONNECTION
P79	GND	GND	Ground	Ground	Ground
P80	PCIE_C_REFCK+	NC	-		No Connection
P81	PCIE_C_REFCK-	NC	-		No Connection
P82	GND	GND	Ground	Ground	Ground
P83	PCIE_A_REFCK+	NC	NC	NC	NO CONNECTION
P84	PCIE_A_REFCK-	NC	NC	NC	NO CONNECTION
P85	GND	GND	Ground	Ground	Ground
P86	PCIE_A_RX+	NC	NC	NC	NO CONNECTION
P87	PCIE_A_RX-	NC	NC	NC	NO CONNECTION
P88	GND	GND	Ground	Ground	Ground
P89	PCIE_A_TX+	NC	NC	NC	NO CONNECTION
P90	PCIE_A_TX-	NC	NC	NC	NO CONNECTION
P91	GND	GND	Ground	Ground	Ground
P92	HDMI_D2+ / DP1_LANE0+	NC	-	I	No Connection
P93	HDMI_D2- / DP1_LANE0-	NC	-		No Connection
P94	GND	GND	Ground	Ground	Ground
P95	HDMI_D1+ / DP1_LANE1+	NC	-		No Connection
P96	HDMI_D1- / DP1_LANE1-	NC	-		No Connection
P97	GND	GND	Ground	Ground	Ground
P98	HDMI_D0+ / DP1_LANE2+	NC	-		No Connection
P99	HDMI_D0- / DP1_LANE2-	NC	-		No Connection
P100	GND	GND	Ground	Ground	Ground
P101	HDMI_CK+ / DP1_LANE3+	NC	-		No Connection
P102	HDMI_CK- / DP1_LANE3-	NC	-		No Connection
P103	GND	GND	Ground	Ground	Ground
P104	HDMI_HPD / DP1_HPD	NC	-		No Connection
P105	HDMI_CTRL_CK / DP1_AUX+	NC	-		No Connection
P106	HDMI_CTRL_DAT / DP1_AUX-	NC	-		No Connection
P107	DP1_AUX_SEL	NC	-		No Connection
P108	GPIO0 / CAM0_PWR#	NC	-		No Connection
P109	GPIO1 / CAM1_PWR#	CAM1_PWR#_1V8	I/O	1V8	GPIO or Camera 1 Power Enable, Active Low
P110	GPIO2 / CAM0_RST#	NC	-		No Connection
P111	GPIO3 / CAM1_RST#	CAM1_RST#_1V8	I/O	1V8	GPIO or Camera 1 Reset, Active Low
P112	GPIO4 / HDA_RST#	SDIO_WAKE_1V8	I/O	1V8	SDIO wake host
P113	GPIO5 / PWM_OUT	PWM_1_1V8	I/O	1V8	GPIO or PWM Out 1
P114	GPIO6 / TACHIN	TOUCH_INT_1V8	I/O	1V8	12C Touch INT
P115	GPIO7	TOUCH_RST_1V8	I/O	1V8	12C Touch RST
P116	GPIO8	CAM0_SYNC_1V8	I/O	1V8	CAM0 SYNC
P117	GPIO9	CAM1_SYNC_1V8	I/O	1V8	CAM1 SYNC
P118	GPIO10	BT_WAKE_1V8	I/O	1V8	Bluetooth wake host
P119	GPIO11	WL_WAKE_1V8	I/O	1V8	WiFi wake host
P120	GND	GND	Ground	Ground	Ground
P121	I2C_PM_CK	I2C1_SCL_1V8	I/O I/O	1V8	Power Management I2C bus Data, PU 4.7K
P122	I2C_PM_DAT	I2C1_SDA_1V8	I/O I/O	1V8	Power Management I2C bus Clock, PU 4.7K
P123	BOOT_SEL0#	BOOT_MODE0_1V8	I	1V8	Boot Select bit 0
P124	BOOT_SEL1#	BOOT_MODE1_1V8	I	1V8	Boot Select bit 1
P125	BOOT_SEL2#	JTAG_nTRST_1V8	I	1V8	Boot Select Bit 2
P126	RESET_OUT#	EX_POR_B_1V8	O	1V8	General purpose Reset to Carrier Board
P127	RESET_IN#	RESET_IN#	I	1V8	Reset input from Carrier Board, PU 100K
P128	POWER_BTN#	POWER_BTN#	I	1V8	Power Button input from carrier board, PU 100K
P129	SER0_TX	UART4_TXD_1V8	O	1V8	UART4 Transmit
P130	SER0_RX	UART4_RXD_1V8	I	1V8	UART4 Receive
P131	SER0_RTS#	UART4_CTS_1V8	O	1V8	UART4 Clear to Send
P132	SER0_CTS#	UART4_RTS_1V8	I	1V8	UART4 Request to Send
P133	GND	GND	Ground	Ground	Ground
P134	SER1_TX	UART1_TXD_1V8	O	1V8	UART1 Transmit
P135	SER1_RX	UART1_RXD_1V8	I	1V8	UART1 Receive
P136	SER2_TX	UART2_TXD_1V8_SOM	O	1V8	UART2 Transmit, shared with onboard WiFi/BT module, default is WiFi/BT
P137	SER2_RX	UART2_RXD_1V8_SOM	I	1V8	UART2 Receive, shared with onboard WiFi/BT module, default is WiFi/BT
P138	SER2_RTS#	UART2_CTS_1V8_SOM	O	1V8	UART2 Request to Send, shared with onboard WiFi/BT module, default is WiFi/BT

Pin No.	SMARC Pin Name	Signal name	Signal Type	Voltage Level	Description
P139	SER2_CTS#	UART2_RTS_1V8_SOM	I	1V8	UART2 Clear to Send, shared with onboard WiFi/BT module, default is WiFi/BT
P140	SER3_TX	UART3_TXD_1V8	O	1V8	UART3 Transmit
P141	SER3_RX	UART3_RXD_1V8	I	1V8	UART3 Receive
P142	GND	GND	Ground	Ground	Ground
P143	CAN0_TX	CAN1_TX_1V8	O	1V8	CAN Port 0 Transmit
P144	CAN0_RX	CAN1_RX_1V8	I	1V8	CAN Port 0 Receive
P145	CAN1_TX	CAN2_TX_1V8	O	1V8	CAN Port 1 Transmit
P146	CAN1_RX	CAN2_RX_1V8	I	1V8	CAN Port 1 Receive
P147	VDD_IN	SYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P148	VDD_IN	SYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P149	VDD_IN	SYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P150	VDD_IN	SYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P151	VDD_IN	SYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P152	VDD_IN	SYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P153	VDD_IN	SYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P154	VDD_IN	SYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P155	VDD_IN	SYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
P156	VDD_IN	SYS_5V0	VDD 5V0	5V0	Power input VDD 5V0
S1	CSI1_TX+ / I2C_CAM1_CK	I2C2_SCL_1V8	I/O OD	1V8	I2C Serial Clock Camera 1, PU 4.7K
S2	CSI1_TX- / I2C_CAM1_DAT	I2C2_SDA_1V8	I/O OD	1V8	I2C Serial Data Camera 1, PU 4.7K
S3	GND	GND	Ground	Ground	Ground
S4	RSVD	NC	-		No Connection
S5	CSIO_TX+ / I2C_CAM0_CK	NC	-		No Connection
S6	CAM_MCK	CSI_MCLK_1V8	O	1V8	Master Clock Output
S7	CSIO_TX- / I2C_CAM0_DAT	NC	-		No Connection
S8	CSIO_CK+	NC	-		No Connection
S9	CSIO_CK-	NC	-		No Connection
S10	GND	GND	Ground	Ground	Ground
S11	CSIO_RX0+	NC	-		No Connection
S12	CSIO_RX0-	NC	-		No Connection
S13	GND	GND	Ground	Ground	Ground
S14	CSIO_RX1+	NC	-		No Connection
S15	CSIO_RX1-	NC	-		No Connection
S16	GND	GND	Ground	Ground	Ground
S17	GBE1_MDIO+	NC	-		No Connection
S18	GBE1_MDIO-	NC	-		No Connection
S19	GBE1_LINK100#	NC	-		No Connection
S20	GBE1_MDI1+	NC	-		No Connection
S21	GBE1_MDI1-	NC	-		No Connection
S22	GBE1_LINK1000#	NC	-		No Connection
S23	GBE1_MDI2+	NC	-		No Connection
S24	GBE1_MDI2-	NC	-		No Connection
S25	GND	GND	Ground	Ground	Ground
S26	GBE1_MDI3+	NC	-		No Connection
S27	GBE1_MDI3-	NC	-		No Connection
S28	GBE1_CTREF	NC	-		No Connection
S29	PCIE_D_TX+ / SERDES_0_TX+	NC	-		No Connection
S30	PCIE_D_TX- / SERDES_0_TX-	NC	-		No Connection
S31	GBE1_LINK_ACT#	NC	-		No Connection
S32	PCIE_D_RX+ / SERDES_0_RX+	NC	-		No Connection
S33	PCIE_D_RX- / SERDES_0_RX-	NC	-		No Connection
S34	GND	GND	Ground	Ground	Ground
S35	USB4+	NC	NC	NC	NO CONNECTION
S36	USB4-	NC	NC	NC	NO CONNECTION
S37	USB3_VBUS_DET	NC	-		No Connection
S38	AUDIO_MCK	SAI2_MCLK_1V8	O	1V8	Master Clock Output to I2S Codec
S39	I2S0_LRCK	SAI2_TXFS_1V8	I/O	1V8	I2S0 Left and Right Synchronization clock
S40	I2S0_SDOOUT	SAI2_TXD_1V8	O	1V8	I2S0 Digital Audio Output
S41	I2S0_SDIN	SAI2_RXD_1V8	I	1V8	I2S0 Digital Audio Input
S42	I2S0_CK	SAI2_TXC_1V8	I/O	1V8	I2S0 Digital Audio Clock
S43	ESPI_ALERT0#	NC	-		No Connection
S44	ESPI_ALERT1#	NC	-		No Connection
S45	MDIO_CLK	NC	-		No Connection

Pin No.	SMARC Pin Name	Signal name	Signal Type	Voltage Level	Description
S46	MDIO_DAT	NC	-		No Connection
S47	GND	GND	Ground	Ground	Ground
S48	I2C_GP_CLK	I2C4_SCL_1V8	I/O	1V8	General Purpose I2C Clock, PU 4.7K
S49	I2C_GP_DAT	I2C4_SDA_1V8	I/O	1V8	General Purpose I2C Data, PU 4.7K
S50	HDA_SYNC / I2S2_LRCK	NC	NC	NC	NO CONNECTION
S51	HDA_SDO / I2S2_SDOUT	NC	NC	NC	NO CONNECTION
S52	HDA_SDI / I2S2_SDIN	NC	NC	NC	NO CONNECTION
S53	HDA_CK / I2S2_CK	NC	NC	NC	NO CONNECTION
S54	SATA_ACT#	NC	-		No Connection
S55	USB5_EN_OC#	NC	-		No Connection
S56	ESPI_IO_2 / QSPI_IO_2	NC	-		No Connection
S57	ESPI_IO_3 / QSPI_IO_3	NC	-		No Connection
S58	ESPI_RESET#	NC	-		No Connection
S59	USB5+	NC	-		No Connection
S60	USB5-	NC	-		No Connection
S61	GND	GND	Ground	Ground	Ground
S62	USB3_SSTX+	NC	-		No Connection
S63	USB3_SSTX-	NC	-		No Connection
S64	GND	GND	Ground	Ground	Ground
S65	USB3_SSRX+	NC	-		No Connection
S66	USB3_SSRX-	NC	-		No Connection
S67	GND	GND	Ground	Ground	Ground
S68	USB3+	NC	NC	NC	NO CONNECTION
S69	USB3-	NC	NC	NC	NO CONNECTION
S70	GND	GND	Ground	Ground	Ground
S71	USB2_SSTX+	NC	-		No Connection
S72	USB2_SSTX-	NC	-		No Connection
S73	GND	GND	Ground	Ground	Ground
S74	USB2_SSRX+	NC	-		No Connection
S75	USB2_SSRX-	NC	-		No Connection
S76	PCIE_B_RST#	NC	-		No Connection
Key					
S77	PCIE_C_RST#	NC	-		No Connection
S78	PCIE_C_RX+ / SERDES_1_RX+	NC	-		No Connection
S79	PCIE_C_RX- / SERDES_1_RX-	NC	-		No Connection
S80	GND	GND	Ground	Ground	Ground
S81	PCIE_C_TX+ / SERDES_1_TX+	NC	-		No Connection
S82	PCIE_C_TX- / SERDES_1_TX-	NC	-		No Connection
S83	GND	GND	Ground	Ground	Ground
S84	PCIE_B_REFCK+	NC	-		No Connection
S85	PCIE_B_REFCK-	NC	-		No Connection
S86	GND	GND	Ground	Ground	Ground
S87	PCIE_B_RX+	NC	-		No Connection
S88	PCIE_B_RX-	NC	-		No Connection
S89	GND	GND	Ground	Ground	Ground
S90	PCIE_B_TX+	NC	-		No Connection
S91	PCIE_B_TX-	NC	-		No Connection
S92	GND	GND	Ground	Ground	Ground
S93	DPO_LANE0+	NC	-		No Connection
S94	DPO_LANE0-	NC	-		No Connection
S95	DPO_AUX_SEL	NC	-		No Connection
S96	DPO_LANE1+	NC	-		No Connection
S97	DPO_LANE1-	NC	-		No Connection
S98	DPO_HPD	NC	-		No Connection
S99	DPO_LANE2+	NC	-		No Connection
S100	DPO_LANE2-	NC	-		No Connection
S101	GND	GND	Ground	Ground	Ground
S102	DPO_LANE3+	NC	-		No Connection
S103	DPO_LANE3-	NC	-		No Connection
S104	USB3_OTG_ID	NC	-		No Connection
S105	DPO_AUX+	NC	-		No Connection
S106	DPO_AUX-	NC	-		No Connection
S107	LCD1_BKLT_EN	LVDS1_BKLT_EN_1V8	0	1V8	LCD1 Backlight Enable

Pin No.	SMARC Pin Name	Signal name	Signal Type	Voltage Level	Description
S108	LVDS1_CLK+ / eDP1_AUX+ / DSI1_CLK+	LVDS1_CLK_P	O	Differential	LVDS1 Differential Clock+
S109	LVDS1_CLK- / eDP1_AUX- / DSI1_CLK-	LVDS1_CLK_N	O	Differential	LVDS1 Differential Clock-
S110	GND	GND	Ground	Ground	Ground
S111	LVDS1_0+ / eDP1_TX0+ / DSI1_D0+	LVDS1_TX0_P	O	Differential	LVDS1 Differential Data D0+
S112	LVDS1_0- / eDP1_TX0- / DSI1_D0-	LVDS1_TX0_N	O	Differential	LVDS1 Differential Data D0-
S113	eDP1_HPD / DSI1_TE	NC	-		No Connection
S114	LVDS1_1+ / eDP1_TX1+ / DSI1_D1+	LVDS1_TX1_P	O	Differential	LVDS1 Differential Data D1+
S115	LVDS1_1- / eDP1_TX1- / DSI1_D1-	LVDS1_TX1_N	O	Differential	LVDS1 Differential Data D1-
S116	LCD1_VDD_EN	LVDS1_VDD_EN_1V8	O	1V8	LCD1 VDD Enable
S117	LVDS1_2+ / eDP1_TX2+ / DSI1_D2+	LVDS1_TX2_P	O	Differential	LVDS1 Differential Data D2+
S118	LVDS1_2- / eDP1_TX2- / DSI1_D2-	LVDS1_TX2_N	O	Differential	LVDS1 Differential Data D2-
S119	GND	GND	Ground	Ground	Ground
S120	LVDS1_3+ / eDP1_TX3+ / DSI1_D3+	LVDS1_TX3_P	O	Differential	LVDS1 Differential Data D3+
S121	LVDS1_3- / eDP1_TX3- / DSI1_D3-	LVDS1_TX3_N	O	Differential	LVDS1 Differential Data D3-
S122	LCD1_BKLT_PWM	LCD1_PWM_1V8	O	1V8	LCD1 PWM Backlight Control
S123	GPIO13	HP_DETECT_1v8	I/O	1V8	Headphone detect
S124	GND	GND	Ground	Ground	Ground
S125	LVDS0_0+ / eDP0_TX0+ / DSI0_D0+	LVDS0_TX0_DSI0_P	O	Differential	LVDS0, or DSI+ Differential Data D0+, default is LVDS
S126	LVDS0_0- / eDP0_TX0- / DSI0_D0-	LVDS0_TX0_DSI0_N	O	Differential	LVDS0, or DSI- Differential Data D0-, default is LVDS
S127	LVDS0_1+ / eDP0_TX1+ / DSI0_D1+	LVDS0_BKLT_EN_1V8	O	1V8	LVDS0, DSI Backlight Enable
S128	LVDS0_1+ / eDP0_TX1+ / DSI0_D1+	LVDS0_TX1_DSI1_P	O	Differential	LVDS0, or DSI+ Differential Data D1+, default is LVDS
S129	LVDS0_1- / eDP0_TX1- / DSI0_D1-	LVDS0_TX1_DSI1_N	O	Differential	LVDS0, or DSI- Differential Data D1-, default is LVDS
S130	GND	GND	Ground	Ground	Ground
S131	LVDS0_2+ / eDP0_TX2+ / DSI0_D2+	LVDS0_TX2_DSI2_P	O	Differential	LVDS0, or DSI+ Differential Data D2+, default is LVDS
S132	LVDS0_2- / eDP0_TX2- / DSI0_D2-	LVDS0_TX2_DSI2_N	O	Differential	LVDS0, or DSI- Differential Data D2-, default is LVDS
S133	LCD0_VDD_EN	LVDS0_VDD_EN_1V8	O	1V8	LCD0 VDD Enable
S134	LVDS0_CLK+ / eDP0_AUX+ / DSI0_CLK+	LVDS0_CLK_DSICK_P	O	Differential	LVDS0, DSI0+ Differential Clock+, default is LVDS
S135	LVDS0_CLK- / eDP0_AUX- / DSI0_CLK-	LVDS0_CLK_DSICK_N	O	Differential	LVDS0, DSI0- Differential Clock-, default is LVDS
S136	GND	GND	Ground	Ground	Ground
S137	LVDS0_3+ / eDP0_TX3+ / DSI0_D3+	LVDS0_TX3_DSI3_P	O	Differential	LVDS0, DSI0+ Differential Data D3+, default is LVDS
S138	LVDS0_3- / eDP0_TX3- / DSI0_D3-	LVDS0_TX3_DSI3_N	O	Differential	LVDS0, DSI0- Differential Data D3-, default is LVDS
S139	I2C_LCD_CLK	I2C3_SCL_1V8	I/O	1V8	DDC Clock PU 4.7K
S140	I2C_LCD_DAT	I2C3_SDA_1V8	I/O	1V8	DDC Data Line PU 4.7K
S141	LCD0_BKLT_PWM	LCD0_PWM_1V8	O	1V8	LCD0 PWM Brightness Control
S142	GPIO12	RTC_INT_1V8	I/O	1V8	RTC INT
S143	GND	GND	Ground	Ground	Ground
S144	eDP0_HPD / DSI0_TE	NC	-		No Connection
S145	WDT_TIME_OUT#	WDOG_B_1V8	O	1V8	Watch Dog Timer Output active low
S146	PCIE_WAKE#	NC	NC	NC	NO CONNECTION
S147	VDD_RTC	NC	-		No Connection
S148	LID#	LID#_1V8_OD	I	1V8	Lid Open/Close
S149	SLEEP#	SLEEP#_1V8_OD	I	1V8	Sleep indicator from Carrier board
S150	VIN_PWR_BAD#	RESET_IN#	I	1V8	Power bad indication from carrier board
S151	CHARGING#	CHARGING#_1V8_OD	I	1V8	Charging
S152	CHARGER_PRSENT#	CHARGER_PRSENT#_1V8_OD	I	1V8	Charger Present
S153	CARRIER_STBY#	CARRIER_STANDBY_1V8	O	1V8	Carrier Standby
S154	CARRIER_PWR_ON	CARRIER_PWR_ON_1V8	O	1V8	Carrier Power On
S155	FORCE_RECOV#	FORCE_RECOV#_1V8	I	1V8	Force recovery
S156	BATLOW#	BATLOW#_1V8_OD	I	1V8 to 5V0	Battery low indication to Module
S157	TEST#	NC	-		No Connection
S158	GND	GND	Ground	Ground	Ground

Table 3-3 Pinout of SMARC i.MX 8M Nano SOM (CN401)

2.3 10/100/1000Mbps ETHERNET (CN601, C701)

The board provides two 10/100/1000 Base-T PoE++ RJ45 Female Connectors.

Manufacturer: Link-PP, Manufacturer Part Number: LPJK6078AHNL

The following table describes the pin-out of CN601:

Pin No.	Signal Name	Signal Type	Voltage Level	Description
1	MDCT3			Center tap 3
2	ETH1_TRX2_N	I/O	Differential	ETH 1 transmit 2 N
3	ETH1_TRX2_P	I/O	Differential	ETH 1 transmit 2 P
4	ETH1_TRX1_P	I/O	Differential	ETH 1 transmit 1 P
5	ETH1_TRX1_N	I/O	Differential	ETH 1 transmit 1 N
6	MDCT2			Center tap 2
7	MDCT4			Center tap 4
8	ETH1_TRX3_P	I/O	Differential	ETH 1 transmit3 P
9	ETH1_TRX3_N	I/O	Differential	ETH 1 transmit3 N
10	ETH1_TRX0_N	I/O	Differential	ETH 1 transmit0 N
11	ETH1_TRX0_P	Differential	-	ETH 1 transmit0 P
12	MDCT1			Center tap 1
13	VC1+	Power	PoE	PoE Power VC1+
14	VC1-	Power	PoE	PoE Power VC1-
15	VC2+	Power	PoE	PoE Power VC2+
16	VC2-	Power	PoE	PoE Power VC2-
17	LED_ACT	I	-	LED Activity, Active low
18	VDD_3V3 YELLOW	Power	3.3V	Yellow LED 3.3V
19	10_100_1000MB ACT	I		LED LINK 10 100 Activity, Active low
20	VDD_3V3 GREEN	Power	3.3V	Green LED 3.3V
SH1	Shield 1	Ground	GND	Ground
SH2	Shield 2	Ground	GND	Ground

Table 5 10/100/1000Mbps Ethernet (CN601)

The following table describes the pin-out of CN701:

Pin No.	Signal Name	Signal Type	Voltage Level	Description
1	MDCT3			Center tap 3
2	ETH1_TRX2_N	I/O	Differential	ETH1 transmit2 N
3	ETH1_TRX2_P	I/O	Differential	ETH1 transmit2 P
4	ETH1_TRX1_P	I/O	Differential	ETH1 transmit1 P
5	ETH1_TRX1_N	I/O	Differential	ETH1 transmit1 N
6	MDCT2			center tap 2
7	MDCT4			center tap 4
8	ETH1_TRX3_P	I/O	Differential	ETH1 transmit3 P
9	ETH1_TRX3_N	I/O	Differential	ETH1 transmit3 N
10	ETH1_TRX0_N	I/O	Differential	ETH1 transmit0 N
11	ETH1_TRX0_P	I/O	Differential	ETH1 transmit0 P

12	MDCT1			Center tap 1
13	VC1+	Power	PoE	PoE Power VC1+
14	VC1-	Power	PoE	PoE Power VC1-
15	VC2+	Power	PoE	PoE Power VC2+
16	VC2-	Power	PoE	PoE Power VC2-
17	LED_ACT	I	-	LED Activity, Active low
18	VDD_3V3 YELLOW	Power	3.3V	Yellow LED 3.3V
19	10_100_1000MB ACT	I		LED LINK 10 100 Activity, Active low
20	VDD_3V3 GREEN	Power	3.3V	Green LED 3.3V
SH1	VDD_3V3	Power	3.3V	Yellow LED 3.3V
SH2	10_100_1000MB ACT	I	3V3	LED LINK 10 100 Activity, Active low

Table 6 10/100/1000 Mbps Ethernet CN701

2.4 M.2 KEY B SOCKET FOR CAMERA CSI AND EXPANSION INTERFACE (CN801)

This socket provides for an optional M.2 camera expansion daughter board.

Manufacturer: Lotes, Manufacturer Part Number APCI0049-P003BC

The following table describes the pinout of CN801.

Pin No.	Signal Name	Signal Type	Voltage Level	Description
1	5V0	POWER	5V0	5.0 Volt power
2	GND	GND	GND	Ground
3	5V0	POWER	5V0	5.0 Volt power
4	SPI0_CS0#_1V8	I/O	1V8	
5	5V0	POWER	5V0	5.0 Volt power
6	SPI0_CK_1V8	I/O	1V8	
7	3V3	POWER	3V3	3.0 Volt power
8	SPI0_DIN_1V8	I/O	1V8	
9	3V3	POWER	3V3	3.0 Volt power
10	SPI0_DO_1V8	I/O	1V8	
11	3V3	POWER	3V3	3.0 Volt power
20	SPI0_CS1#_1V8	I/O	1V8	
21	GND	GND	GND	Ground
22	SPI1_CS0_1V8	I/O	1V8	
23	I2C_CAM0_SCL_1V8	O	1V8	
24	SPI1_CSI_1V8	I/O	1V8	
25	I2C_CAM0_SDA_1V8	1/O	1V8	
26	SPI1_CK_1V8	O	1V8	
27	I2C_CAM1_SCL_1V8	O	1V8	
28	SPI1_DIN_1V8	I	1V8	
29	I2C_CAM1_SDA_1V8	1/O	1V8	
30	SPI1_DO_1V8	1/O	1V8	
31	GND	GND	GND	
32	CAM0_SYNC_1V8	O	1V8	
33	LID#_1V8	I	1V8	
34	CAM1_SYNC_1V8	O	1V8	

35	SLEEP#_1V8	I	1V8	
36	GND	GND	GND	
37	UART1_RX_1V8	I	1V8	
38	CAM1_PWR#_1V8	I	1V8	
39	UART1_TX_1V8	O	1V8	
40	CAM1_RST#_1V8	I	1V8	
41	UART3_RX_1V8	I	1V8	
42	CAM0_PWR#_1V8	I	1V8	
43	UART3_TX_1V8	O	1V8	
44	CAM0_RST#_1V8	I	1V8	
45	GND	GND	GND	Ground
46	GND	GND	GND	Ground
47	CAM_MCLK_1V8	O	1V8	
48	SCI1_D3_P	I/O	Differential	
49	GND	GND	GND	Ground
50	CSI1_D3_N	I/O	Differential	
51	CSI0_D0_N	I/O	Differential	
52	CSI1_D2_P	I/O	Differential	
53	CSI0_D0_P	I/O	Differential	
54	CSI1_D2_N	I/O	Differential	
55	CSI0_D1_N	I/O	Differential	
56	GND	GND	GND	Ground
57	CSI0_D1_P	I/O	Differential	
58	CSI1_CK_P	O	Differential	
59	GND	GND	GND	Ground
60	CSI1_CK_N	O	Differential	
61	CSI0_CK_N	O	Differential	
62	GND	GND	GND	Ground
63	CSI0_CK_P	O	Differential	
64	CSI1_D1_P	I/O	Differential	
65	GND	GND	GND	Ground
66	CSI1_D1_N	I/O	Differential	
67	CSI0_D2_N	I/O	Differential	
68	CSI1_D0_P	I/O	Differential	
69	CSI0_D2_P	I/O	Differential	
70	CSI1_D0_N	I/O	Differential	
71	CSI0_D3_N	I/O	Differential	
72	GND	GND	GND	Ground
73	CSI0_D3_P	Differential	-	
75	GND	GND	GND	Ground
MT1	GND	SHIELD	GND	Ground
MT2	GND	SHIELD	GND	Ground

Table 3-4 M.2 Socket for Expansion Daughter Board (CN801)

2.5 M.2 KEY E (CN901)

This socket supports an optional M.2 Key E daughter card.

Manufacturer: TE Connectivity AMP Connectors, Manufacturer Part Number 2199119-4

The following table describes the pinout of CN901.

Pin No.	Signal Name	Signal Type	Voltage Level	Description
1	GND	GND	GND	GROUND
2	3V3	POWER	3V3	WiFi_3V3
3	USB_DP	I/O	Differential	
4	3V3	POWER	3V3	WiFi_3V3
5	USB_DM	I/O	Differential	
6	LED_1#	NC	-	No Connection
7	GND	GND	GND	GROUND
8	PCM_CLK/I2S_SCK	I	1V8	
9	SDIO_CLK/SYSCLK	I	1V8	
10	PCM_SYNC/I2S_WS	I	1V8	
11	SDIO_CMD	I	1V8	
12	PCM_OUT/I2S_SD_OUT	O	1V8	
13	SDIO_DATA0	I/O	1V8	
14	PCM_IN/I2S_SD_IN	I	1V8	
15	SDI1_DATA0	I/O	1V8	
16	NC	NC	-	No Connection
17	SDI2_DATA0	I/O	1V8	
18	GND	GND	GND	GROUND
19	SDI3_DATA0	I/O	1V8	
20	UART_WAKE#	O	1V8	
21	SDIO_WAKE#	O	1V8	
22	UART_TXD	O	1V8	
23	SDIO_RESET#/TX_BLANKING	I	1V8	
24	SLOT KEY			
25				
26				
27				
28				
29				
30				
31				
32	UART_RXD	I	1V8	
33	GND	GND	GND	GROUND
34	UART_RTS_N	O	1V8	
35	PERp0	I	Differential	
36	UART_CTS_N	I	1V8	
37	PERn0	I	Differential	
38	BT_DEVWAKE_1V8	I	1V8	
39	GND	GND	GND	GROUND
40	WL_WAKE_1V8	O	1V8	
41	PETp0	O	Differential	
42	NC	NC	-	No Connection
43	PETn0	O	Differential	
44	NC	NC	-	No Connection
45	GND	GND	GND	GROUND

46	NC	NC	-	No Connection
47	REFCLKP	I	Differential	
48	NC	NC	-	No Connection
49	REFCLKN	I	Differential	
50	SUSCLK	I	3V3	
51	GND	GND	GND	GROUND
52	PERST0#	I	3V3	
53	CLK_REQ0#	O	3V3	
54	W_DISABLE2#	I	3V3	
55	PE_WAKE0	O	3V3	
56	W_DIABLE1#	I	3V3	
57	GND	GND	GND	GROUND
58	I2C_DAT	I/O	1V8	
59	PERp1	I	Differential	
60	I2C_CLK/UART_RX	I/O	1V8	
61	PERn1	I	Differential	
62	NC	NC	-	No Connection
63	GND	GND	GND	GROUND
64	NC	NC	-	No Connection
65	PETp1	O	Differential	
66	PERST1#	I	3V3	
67	PETN1	O	Differential	
68	CLK_REQ1#	I	3V3	
69	GND	GND	GND	GROUND
70	NC	NC	-	No Connection
71	REFCLKP1	I	Differential	
72	3V3	POWER	3V3	WiFi_3V3
73	REFCLKN1	I	Differential	
74	3V3	POWER	3V3	WiFi_3V3
75	GND	GND	GND	GROUND

Table 3-5 M.2 Key E Connector (CN901)

2.6 COIN BATTERY RETAINER (CN902)

This board provides a coin battery retainer for an external RTC power supply.

Manufacturer: Keystone Electronics, Manufacturer Part Number 3001

The following table describes the pinout of CN902.

Pin No.	Signal Name	Signal Type	Voltage Level	Description
1	VDD	Power	3V0	RTC Power
2	VDD	Power	3V0	RTC Power
3	GND	GND		Ground

Table 3-6 Coin Battery Retainer (CN902)

2.7 MICRO SD SOCKET (CN1001)

This board provides a Micro SD card with a Push-Push socket.

Manufacturer: Molex, Manufacturer Part Number 473521001

The following table describes the pinout of CN1001.

Pin No.	Signal Name	Signal Type	Voltage Level	Description
1	DAT2	Data	1V8/3V3	Data 2
2	CD/DAT3	Data	1V8/3V3	Data 3
3	CMD	Control	1V8/3V3	Command
4	VDD	Power	3V3	Power input
5	CLK	Clock	1V8/3V3	Clock
6	GND	GND	GND	Ground
7	DAT0	Data	1V8/3V3	Data 0
8	DAT1	Data	1V8/3V3	Data 1
9	CD_SW	O	1V8/3V3	Card Detect
10	GND	GND	GND	Ground
11	GND	GND	GND	Ground
12	GND	GND	GND	Ground
13	GND	GND	GND	Ground

Table 3-7 MicroSD Connector (CN1001)

2.8 USB 3.0 OTG TYPE C WITH PD (CN1101)

The board provides A USB 3.0 OTG Type C with PD interface.

Manufacturer: Molex, Manufacturer Part Number is 2012670005.

The following table describes the pin-out of CN1101:

Pin No.	Signal Name	Signal Type	Voltage Level	Description
A1	GND	GND	GND	Ground
A2	SS1TX_P	O	Differential	SuperSpeed transmitter Data positive
A3	SS1TX_N	O	Differential	SuperSpeed transmitter Data negative
A4	VBUS1	Power	+5-20V	Bus Power (+5 - 20V)
A5	USB1_CC1_CN	-	-	Configuration channel 1
A6	USB1_CN_D_P		Differential	USB 2.0 Data Positive
A7	USB1_CN_D_N		Differential	USB 2.0 Data Negative
A8	USB0_SBU1	-	-	Sideband Use (SBU)
A9	VBUS2	Power	+5-20V	Bus Power (+5 - 20V)
A10	SS2RX_N	I	Differential	SuperSpeed transmitter Data negative
A11	SS2RX_P	I	Differential	SuperSpeed transmitter Data positive
A12	GND	GND	GND	Ground
B1	GND	GND	GND	Ground

B2	SS2TX_P	O	Differential	SuperSpeed transmitter Data positive
B3	SS2TX_N	O	Differential	SuperSpeed transmitter Data negative
B4	VBUS4	Power	+5-20V	Bus Power (+5 - 20V)
B5	USB0_CC2_CN	-		Configuration channel 2
B6	USB1_CN_D_P		Differential	USB 2.0 Data Positive
B7	USB0_CN_D_N		Differential	USB 2.0 Data Negative
B8	USB0_SBU2	-		Sideband Use (SBU)
B9	VBUS3	Power	+5-20V	Bus Power (+5 - 20V)
B10	SS1RX_N	I	Differential	SuperSpeed transmitter N
B11	SS1RX_P	I	Differential	SuperSpeed transmitter P
B12	GND	GND	GND	Ground
SH1	SHIELD	SHIELD	GND	Ground
SH2	SHIELD	SHIELD	GND	Ground
SH3	SHIELD	SHIELD	GND	Ground
SH4	SHIELD	SHIELD	GND	Ground

Table 3-8 USB 3.0 OTG Type C (CN1101)

2.9 USB 3.0 HOST TYPE A (CN1201, CN1202)

The board provides 2 x USB 3.0 host type A connectors at locations CN1201 and CN1202.

Manufacturer: Molex, Manufacturer Part Number: 484050001

The following table describes the pinouts of CN1201 and CN1202:

Pin No.	Signal Name	Signal Type	Voltage Level	Description
1	VBUS	Power	5.0V	5V power
2	USB2.0 D-		Differential	USB 2.0 data negative
3	USB2.0 D+		Differential	USB 2.0 data positive
4	GND	GND	GND	Ground
5	SSRX N		Differential	SuperSpeed receiver data negative
6	SSRX P		Differential	SuperSpeed receiver data Positive
7	GND	GND	GND	Ground
8	SSTX N		Differential	SuperSpeed transmitter Data negative
9	SSTX P		Differential	SuperSpeed transmitter Data Positive

Table 3-9 USB 3.0 Type A pinouts (CN1201, CN1202, CN1203)

2.10 USB 2.0 HOST TYPE A (CN1203)

The board provides a USB 2.0 host type A connectors at location CN1203.

Manufacturer: FCI, Manufacturer Part Number: 87520-0010BLF

The following table describes the pinouts of CN1203:

Pin No.	Signal Name	Signal Type	Voltage Level	Description
1	VBUS	Power	5.0V	5V power
2	USB2.0 D-		Differential	USB 2.0 data negative
3	USB2.0 D+		Differential	USB 2.0 data positive
4	GND	GND	GND	Ground

Table 3-10 USB 2.0 Type A pinout (CN1203)

2.11 STEREO OUTPUT/MICROPHONE (CN1301)

The board provides a stereo headphone output and a microphone input.

Manufacturer: CUI, Manufacturer Part Number SJ-43515TS

The following table describes the pin-out of CN1301:

Pin No.	Signal Name	Signal Type	Voltage Level	Description
1	Mic	I	Mic input	Mic input
2	Left	O	Left output	Left Channel output
3	Right	O	Right output	Right channel output
4	GND	O	Ground	Ground for left, right and Mic
5	Tip switch	I	1V8	Jack insertion detection

Table 3-11 Stereo Output, Microphone input (CN1301)

2.12 SPEAKER OUT L & R (CN1302)

The board provided a vertical header for Stereo Speaker output. CN1302 provides up to 10 watts per channel into 8Ω.

Molex, Manufacturer Part Number 0559320410

The following table describes the pinout of CN1302.

Pin No.	Signal Name	Signal Type	Voltage Level	Description
1	OUTPR	Audio	-	Speaker output positive right.
2	OUTNR	Audio	-	Speaker output negative right.
3	OUTNL	Audio	-	Speaker output negative left.
4	OUTPL	Audio	-	Speaker output positive left.

Table 3-12 Speaker Out L & R (CN1302)

2.13 HDMI TYPE A RIGHT ANGLE CONNECTOR (CN1401)

The board provides a standard type A HDMI video output connector.

Manufacturer: Amphenol, Manufacturer Part Number 10029449-111RLF

Pin No.	Signal Name	Signal Type	Voltage Level	Description
1	HDMI TX 2P	O	Differential	HDMI Transmit Lane 2 Positive
2	GND	GND	GND	Ground
3	HDMI TX 2N	O	Differential	HDMI Transmit Lane 2 Negative
4	HDMI TX 1P	O	Differential	HDMI Transmit Lane 1 Positive
5	GND	GND	GND	Ground
6	HDMI TX 1N	O	Differential	HDMI Transmit Lane 1 Negative
7	HDMI TX 0P	O	Differential	HDMI Transmit Lane 0 Positive
8	GND	GND	GND	Ground
9	HDMI TX 0N	O	Differential	HDMI Transmit Lane 0 Negative
10	HDMI CLK P	O	Differential	HDMI Clock Positive
11	GND	GND	GND	Ground
12	HDMI CLK N		Differential	HDMI Clock Negative
13	HDMI CEC CN			HDMI Consumer Electronic Control
14	HDMI Utility CN	-	-	HDMI Utility CN
15	HDMI DDC SCL CN	I	5V0	HDMI Display Data Channel Clock
16	HDMI DDC SDA CN	I	5V0	HDMI Display Data Channel Data
17	GND	GND	GND	Ground
18	HDMI 5V CN	O	5V0	HDMI 5V
19	HDMI HPD	I	5V0	HDMI Hot Plug Detect
S1	SHIELD	GND	GND	Ground
S2	SHIELD	GND	GND	Ground
S3	SHIELD	GND	GND	Ground
S4	SHIELD	GND	GND	Ground

Table 3-13 HDMI Type A (CN1401)

2.14 DISPLAYPORT RIGHT ANGLE CONNECTOR (CN1501)

The board provides a standard DisplayPort video output connector.

Manufacturer: Molex, Manufacturer Part Number 0472720001

Pin No.	Signal Name	Signal Type	Voltage Level	Description
1	CN_DP_TX0_P	I	Differential	
2	GND	GND	GND	Ground
3	CN_DP_TX0_N	I	Differential	
4	CN_DP_TX1_P	I	Differential	
5	GND	GND	GND	Ground
6	CN_DP_TX1_N	I	Differential	
7	CN_DP_TX2_P	I	Differential	
8	GND	GND	GND	Ground
9	CN_DP_TX2_N	I	Differential	
10	CN_DP_TX3_P	I	Differential	

11	GND	GND	GND	Ground
12	CN_DP_TX3_N	I	Differential	
13	CONFIG1			CONFIG1 Pulled down
14	CONFIG2			CONFIG2 Pulled down
15	CN_DP_AUX_P	I/O	Differential	
16	GND	GND	GND	Ground
17	CN_DP_AUX_N	I/O	Differential	
18	DPO_HPD	I	5V0	Hot Plug Detect
19	GND	GND	GND	Ground
20	DP_3V3	POWER	3V3	DisplayPort Power 3V3
S1	SHIELD	GND	GND	Ground
S2	SHIELD	GND	GND	Ground
S3	SHIELD	GND	GND	Ground
S4	SHIELD	GND	GND	Ground

Table 3-14 DisplayPort (CN1501)

2.15 M.2 KEY B SOCKET FOR DISPLAY EXPANSION INTERFACE (CN1601)

This socket provides for an optional M.2 display daughter board.

Manufacturer: Lotes, Manufacturer Part Number: APCI0049- P003B C

The following table describes the pin-out of CN1601:

Pin No.	Signal Name	Signal Type	Voltage Level	Description
1	VDD_5V0	POWER	5V0	POWER VDD_5VD, can optionally be changed to VDD_3V3.
2	VDD_12V0	POWER	12V0	VDD POWER 12V0 can optionally be changed to SYS_3V3, VDD_3V3, VDD_5V0
3	VDD_5V0	POWER	5V0	POWER VDD_5V0, can optionally be changed to VDD_3V3.
4	VDD_12V0	POWER	12V0	VDD POWER 12V0 can optionally be changed to SYS_3V3, VDD_3V3, VDD_5V0
5	VDD_5V0	POWER	5V0	POWER VDD_5V0, can optionally be changed to VDD_3V3.
6	VDD_12V0	POWER	12V0	VDD POWER 12V0 can optionally be changed to SYS_3V3, VDD_3V3, VDD_5V0
7	VDD_3V3	POWER	3V3	VDD POWER 3V3 can optionally be changed to VDD_5V0
8	GND	GND	GND	GROUND
9	VDD_3V3	POWER	3V3	VDD POWER 3V3 can optionally be changed to VDD_5V0
10	LCD0_RESET_3V3	O	3V3	LCD Reset
11	VDD_3V3	POWER	3V3	VDD POWER 3V3 can optionally be changed to VDD_5V0
12				

13	SLOT			
14				
15				
16				
17				
18				
19				
20	LCD0_VDD_EN_3V3	O	3V3	LCD Enable
21	VDD_3V3	POWER	3V3	VDD POWER 3V3 can optionally be changed to VDD_5V0
22	LCD1_VDD_EN_3V3	O	3V3	LCD1 VDD enable
23	GND	GND	GND	GROUND
24	PWM_OUT_3V3	O	3V3	PWM backlight control
25	LVDS0_DSI0_TX3_N	O	Differential	
26	LCE0_VDD_EN_3V3	O	3V3	LCD0 VDD Enable
27	LVDS0_DSI0_TX3_P	O	Differential	
28	LCD1_BKLT_EN_3V3	O	3V3	LCD1 backlight enable
29	LVDS0_DSI0_TX3_N	O	Differential	
30	LCD0_BKLT_EN_3V3	O	3V3	LCD0 backlight enable
31	LVDS0_DSI0_TX3_P	O	Differential	
32	LCD1_BKLT_PWM_3V3	O	3V3	LCD1 backlight control
33	GND	GND	GND	GROUND
34	LCD0_BKLT_PWM_3V3	O	3V3	LCD0 backlight control
35	LVDS0_DSI0_CLK_N	O	Differential	
36	GND	GND	GND	GROUND
37	LVDS0_DSI0_CLK_P	O	Differential	
38	TOUCH_RST_3V3	O	3V3	Touchscreen reset
39	GND	GND	GND	GROUND
40	TOUCH_INT_3V3	I	3V3	Touch interrupt Input
41	LVDS0_DSI0_TX1_N	O	Differential	
42	I2C_LCD_DAT_3V3	I/O	3V3	I2C LCD data I/O
43	LVDS0_DSI0_TX1_P	O	Differential	
44	I2C_LCD_CLK_3V3	I/O	3V3	I2C LCD clock I/O
45	LVDS0_DSI0_TX0_N	O	Differential	
46	GND	GND	GND	GROUND
47	LVDS0_DSI0_TX0_P	O	Differential	
48	EX_24_3V3	I/O	3V3	
49	GND	GND	GND	GROUND
50	EX_25_3V3	I/O	3V3	
51	LVDS1_DSI1_TX3_N	O	Differential	
52	EX_26_3V3	I/O	3V3	
53	LVDS1_DSI1_TX3_P	O	Differential	
54	EX_27_3V3	I/O	3V3	
55	LVDS1_DSI1_TX2_N	O	Differential	
56	GND	GND	GND	GROUND
57	LVDS1_DSI1_TX2_P	O		
58	NC	NC	NC	NO CONNECTION
59	GND	GND	GND	GROUND
60	NC	NC	NC	NO CONNECTION
61	LVDS1_DSI1_CLK_N	O	Differential	

62	GND	GND	GND	GROUND
63	LVDS1_DSI1_CLK_P	O	Differential	
64	MDIO_CLK_1V8	I/O	1V8	
65	GND	GND	GND	GROUND
66	MDIO_DAT_1V8	I/O	1V8	
67	LVDS1_DSI1_TX1_N	O	Differential	
68	QSPI_IO2_1V8	I/O	1V8	
69	LVDS1_DSI1_TX1_P	O	Differential	
70	QSPI_IO3_1V8	I/O	1V8	
71	LVDS1_DSI1_TX0_N	O	Differential	
72	GND	GND	GND	GROUND
73	LVDS1_DSI1_TX0_P	O	Differential	
75	GND	GND	GND	GROUND
S1	SHIELD	GND	GND	Ground
S2	SHIELD	GND	GND	Ground

Table 3-15 Display Expansion Interface (CN1601)

2.16 I2C TOUCH HEADER (CN1701)

The board provides 6 Position Right Angle FPC Connector (0.80mm) for I2C touch; this interface is driven by SOC I2C2 interface.

Manufacturer: Hirose Electric Co Ltd, Manufacturer Part Number: CN1701 DF52-6S-0.8H(21)

The following table describes the pin-out of CN1701:

Pin No.	Signal Name	Signal Type	Voltage Level	Description
1	GND	Ground	GND	Ground
2	I2C_LCD_DAT_3V3	I/O	3V3	I2C_SDA
3	I2C_LCD_CK_3V3	I/O	3V3	I2C_SCL
4	VDD_3V3	POWER	3V3	VDD 3V3 or optionally connected to SYS_3V3
5	TOUCH_INT_3V3	O	3.3V	INTB
6	TOUCH_RST_3V3	I	3V3	RSTB
SH1	GND	Ground	GND	Ground
SH2	GND	Ground	GND	Ground
S1	Shield 1	Ground	Ground	Ground
S2	Shield 2	Ground	Ground	Ground

Table 3-16 I2C Touch Header (CN1701)

2.17 LVDS INTERFACE WITH BACKLIGHT HEADER (J1701)

The board provides support for LVDS and backlight FPC connector (0.5mm pitch).

Manufacturer: Hirose, Manufacturer Part Number: FH12S-40S-0.SSH

The following table describes the pin-out of J1701:

Pin No.	Signal Name	Signal Type	Voltage Level	Description
1	LCD_VCOM	POWER	4V2	
2	LCD_3V3	POWER	3V3	LCD POWER 3V3
3	LCD_3V3	POWER	3V3	LCD POWER 3V3
4	NC	NC	-	NO CONNECTION
5	LCD0_RESET_3V3	O	3V3	LCD0 RESET
6	LCD0_EN_3V3	O	3V3	LCD0 ENABLE
7	GND	GND	GND	GROUND
8	LVDS0_DSI0_TX0_N	O	Differential	
9	LVDS0_DSI0_TX0_P	O	Differential	
10	GND	GND	GND	GROUND
11	LVDS0_DSI0_TX1_N	O	Differential	
12	LVDS0_DSI0_TX1_P	O	Differential	
13	GND	GND	GND	GROUND
14	LVDS0_DSI0_TX2_N	O	Differential	
15	LVDS0_DSI0_TX2_P	O	Differential	
16	GND	GND	GND	GROUND
17	LVDS0_DSI0_CLK_N	O	Differential	
18	LVDS0_DSI0_CLK_P	O	Differential	
19	GND	GND	GND	GROUND
20	LVDS0_DSI0_TX3_N	O	Differential	
21	LVDS0_DSI0_TX3_P	O	Differential	
22	GND	GND	GND	GROUND
23	NC	NC	-	NO CONNECTION
24	NC	NC	-	NO CONNECTION
25	GND	GND	GND	GROUND
26	NC	NC	-	NO CONNECTION
27	TP1716			Test point DIM0
28	LCD_SELB			See Figure 2.1
29	LCD_AVDD	POWER	11V0	
30	GND	GND	GND	GROUND
31	LCD_LED-			Optional, To J1702
32	LCD_LED-			
33	LCD_SHLR			See Figure 2.1
34	LCD_UPDN			See Figure 2.1
35	LCD_VGL	Power	-7V0	
36	LCD_CABCEN1			See Figure 2.1
37	LCD_CABCEN0			See Figure 2.1
38	LCD_VGH	Power	17V0	
39	LCD_LED+			Optional To J1702
40	LCD_LED+			
S1	SHIELD	GND	GND	Ground
S2	SHIELD	GND	GND	Ground

Table 3-17 LVDS Interface with Backlight Header (J1701)

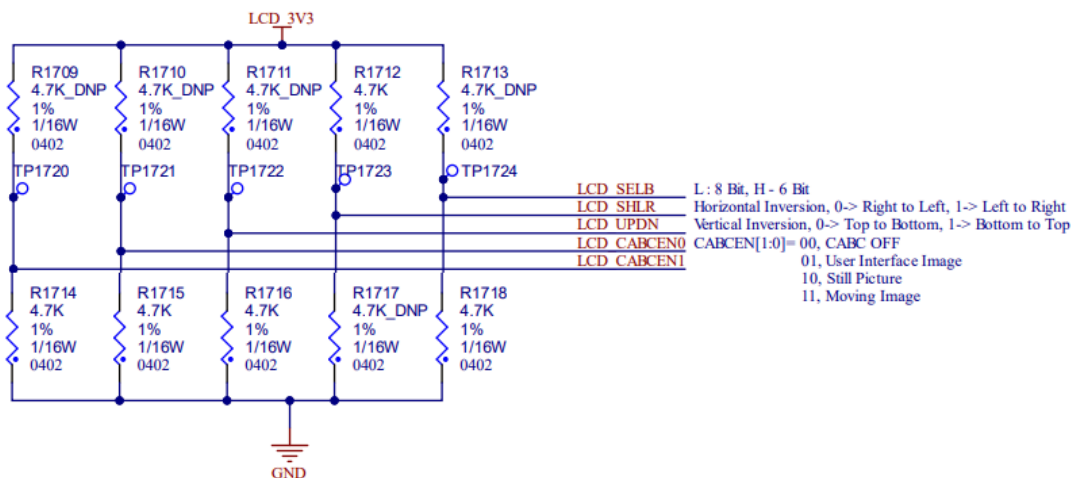


Table 3-18 LCD resistor setup selection.

2.18 LCD LED POWER HEADER (J1702)

The board provides a connector for the 9.6V 400mA LCD LED backlight power.

Manufacturer: JST Sales America Inc., Manufacturer Part Number: SM02B-BHSS-1-TB(LF)(SN)

The following table describes the pin-out of J1702:

Pin No.	Signal Name	Signal Type	Voltage Level	Description
1	LCD_LED+			LCD POWER+
2	LCD_LED-			LCD POWER-

Table 3-19 LCD LED POWER (J1702)

2.19 POWER CONTROL (CN1801)

The board provides a power control header for On/Off, POR, LED Control and GND

Manufacturer: Molex, Manufacturer Part Number 55932-0510

The following table describes the pinout of CN1801.

Pin No.	Signal Name	Signal Type	Voltage Level	Description
1	POWER_BTN	I	1V8	On Off
2	RESET_IN_B	I	1V8	Reset active low
3	GND	GND	GND	Ground
4	LED Anode	3V3 Pull up through a 270 Ω . Resistor.	3.3V	LED Anode
5	LED Cathode	Led Cathode	-	LED Cathode

Table 3-20 Power Control Header (CN1801)

2.20 RS485, RS232 HEADER (CN1802)

The board provides a Half duplex RS485 (DEFAULT) OR a RS232.

Manufacturer: Molex, Manufacturer Part Number: 55932-0610

The following table describes the pin-out of CN1802 in RS485 mode (default):

Pin No.	Signal Name	Signal Type	Voltage Level	Description
1	VDD_3V3	Power	3V3	3.3V power
2	485_P (Default) RS_232_TXD	I/O	Differential	Inverting driver output/receiver Input
3	485_N (Default)	I/O	Differential	Non-inverting driver output/ receiver
4	NC	NC	NC	NO CONNECTION
5	NC	NC	NC	NO CONNECTION
6	GND	GND	GND	Ground

Table 3-21 RS485 (Default) Header (CN1802)

The following table describes the pin-out of CN1802 in the optional RS232 mode:

Pin No.	Signal Name	Signal Type	Voltage Level	Description
1	VDD_3V3	Power	3V3	3.3V power
2	RS232_TXD	O	RS232	RS232 TXD
3	RS232_RXD	I	RS232	RS232 RXD
4	RS232_CTS	O	RS232	RS232 CTS
5	RS232_RTS	I	RS232	RS232 TXD
6	GND	GND	GND	Ground

Table 3-22 RS232 (optional) Header (CN1802)

An optional on-board RS485 termination resistor is selectable with SW1805.

The following table describes the dip switch SW1805 setting for RS485:

SW2 Mode Setting	Description	SW1 Pin 1-4	SW1 Pin 2-3
RS485 120Ω termination resistor enabled	120 Ω termination resistor from RS485+ to RS485- is connected.	On	Don't care
RS485 120Ω termination resistor open	Open	Off	Don't care

Table 3-23 RS485/RS232 Mode Select Dip Switch (SW1805)

2.21 UART DEBUG HEADER (CN1803, CN1804)

The board provides support for 2 x UART debug headers; CN1803 is for Cortex-A53 core, and CN1804 is for Cortex-M4 core debug. The UART debug headers are driven by UART1 and UART3. They can mate to a TTL-232R-3V3 USB to UART cable for debugging.

Manufacturer: Harwin, Manufacturer Part Number: M20-9990645

The following table describes the pin-out of UART1 (CN1803)

Pin No.	Signal Name	Signal Type	Voltage Level	Description
1	GND	GND	GND	Ground
2	NC	NC	NC	No Connection
3	NC	NC	NC	No Connection
4	UART1_RX	I	3.3V	UART1 RXD
5	UART1_TX	O	3.3V	UART1 TXD
6	NC	NC	NC	No Connection

Table 3-24 UART1 Debug Header (CN1803)

The following table describes the pin-out of UART3 CN1804:

Pin No.	Signal Name	Signal Type	Voltage Level	Description
1	GND	GND	GND	Ground
2	NC	NC	NC	No Connect
3	NC	NC	NC	No Connect
4	UART3_RX	I	3.3V	UART3 RXD
5	UART3_TX	O	3.3V	UART3 TXD
6	NC	NC	NC	No Connect

Table 3-25 UART3 Debug Header (CN1804)

2.22 JTAG INTERFACE HEADER (CN1805)

The board provides support for a JTAG header.

Manufacturer: Harwin Inc, Manufacturer Part Number M50-3600542

The following table describes the pin-out of CN1805:

Pin No.	Signal Name	Signal Type	Voltage Level	Description
1	VDD_1V8	Power	1V8	1V8 Power
2	JTAG_TMS	O	1V8	JTAG test mode select
3	GND	GND	GND	Ground
4	JTAG_TCK	O	1V8	JTAG test clock
5	GND	GND	GND	Ground
6	JTAG_TDO	O	1V8	JTAG data out
7	NC	NC	NC	NC
8	JTAG_TDI	I	1V8	JTAG data in
9	GND	GND	GND	Ground
10	POR_B_1V8	I	1V8	System Reset

Table 3-26 JTAG Header (CN1805)

2.23 JTAG HEADER (CN1806)

The board provides support for a FFC JTAG header connector that can mate to the SMARC SOM's FFC connector.

Manufacturer: Hirose Electric Co Ltd, Manufacturer Part Number FH12-10S-0.5SVA(54)

The following table describes the pin-out of CN1806:

Pin No.	Signal Name	Signal Type	Voltage Level	Description
1	GND	GND	GND	GROUND
2	MFG_MODE#	I	1V8	Manufacturing mode active low
3	JTAG_RESET_IN	I	1V8	Reset input
4	NC	NC	NC	NO CONNECTION
5	JTAG_TCK	I	1V8	JTAG test clock
6	JTAG_TDI	O	1V8	JTAG data in
7	JTAG_TDO	I	1V8	JTAG data out
8	JTAG_TMS	I	1V8	Test mode select
9	JTAG_RESET	I	1V8	JTAG reset
10	JTAG_VDD	POWER	1V8	1V8 POWER
S1	GND	GND	GND	GROUND
S2	GND	GND	GND	GROUND

Pin No.	Signal Name	Signal Type	Voltage Level	Description
S3	GND	GND	GND	GROUND
S4	GND	GND	GND	GROUND

Table 3-27 JTAG Header (CN1806)

2.24 CAN BUS HEADER (CN1901, CN1902)

The board provides vertical headers for 2 CAN bus interfaces.

Manufacturer: Molex, Manufacturer Part Number 55932-0310

The following table describes the pin-out of CN1901, CN1902:

Pin No.	Signal Name	Signal Type	Voltage Level	Description
1	CANH		Differential	CAN bus data signal
2	CANL		Differential	CAN bus data signal
3	GND	GND	GND	Ground

Table 3-28 CAN Bus Header (CN1901, CN1902)

Optional on-board termination resistors are selectable for CN1901 and CN1902.

The following table describes the dip switch SW1901 setting for CN1901 and CN1902.

SW2 Mode Setting	Description	SW1 Pin 1-4	SW1 Pin 2-3
A CAN 120Ω termination resistor is connected on CN1901.	A 120 Ω termination resistor is connected across CANH and CANL on CN1901.	On	Don't care
A 120Ω termination resistor is open on CN1901.	No termination resistor on CN1901, and CN1902.	Off	Don't care
A CAN 120Ω termination resistor is connected on CN1902.	A 120 Ω termination resistor is connected across CANH and CANL on CN1902.	Don't care	On
A 120Ω termination resistor is open on CN1902.	No termination resistor on CN1902	Don't care	OFF

Table 3-29 CAN BUS Termination Select Dip Switch (SW1901)

2.25 POWER MUX HEADER (CN2101)

The board provides a 4 position 0.100 Jumper for power source selection.

Manufacturer: Molex, Manufacturer Part Number 90120-0924

The following table describes the pin-out of CN2101:

Pin No.	Signal Name	Description
1	PRI_UP	If 1 to 2 are shorted or 1 to 2 and 3 to 4 are open, Then the power source is USB Type C
2	PRI	
3	CP2_UP	If 3 to 4 are shorted, the power source is PoE
4	CP2	

Table 3-30 Power Mux Header (CN2101)

2.26 BATTERY HEADER (CN2102)

The board provides a vertical header for a Battery.

Manufacturer: Molex, Manufacturer Part Number 55932-1210

The following table describes the pin-out of CN2102:

Pin No.	Signal Name	Signal Type	Voltage Level	Description
1	Battery Charging	O		Current to charge battery
2				
3	GND	GND	GND	GROUND
4				
5	Battery discharging	I		Current out of battery
6				
7	BATTLOW#_1V8	O	1V8	Battery Low signal to SMARC
8	CHARGING#_1V8	O	1V8	Charging signal to SMARC
9	CHARGING_PRSENT#_1V8	O	1V8	Charger Present to SMARC
10	I2C_PM_CK_1V8	I/O	1V8	I2C Clock charger to SMARC
11	I2C_PM_DAT_1V8	I/O	1V8	I2C Data charger to SMARC
12	CHARGER_INT_3V3	O	3V3	Charger interrupt to SMARC

Table 3-31 Battery Header (CN2102)

2.27 BOOT SELECT (SW1801)

The board provides a 4 Position DIP switch to select the boot location.

The following table describes the function of SW1801:

Position	Name	Description
1	BOOT_SEL0#	Boot select 0 active low. The ON position is low.
2	BOOT_SEL1#	Boot select 1 active low. The ON position is low.
3	BOOT_SEL2#	Boot select 2 active low. The ON position is low.
7	NO CONNECTION	NO CONNECTION

Table 3-32 Boot Select (SW1801)

2.28 POWER BUTTON (SW1802)

The board provides a side push tactile switch for turning the board on/off.

The following table describes the function of SW1802:

Reference	Description
SW1802	Power button is located at the edge of the PCB to turn on/off the board, active low.

Table 3-33 Power Button (SW1802)

2.29 FORCE RECOVERY (SW1803)

The board provides a side push tactile switch for resetting the board.

Manufacturer: E-Switch, Manufacturer Part Number: TL1014BF160QG

The following table describes the function of SW1803:

Reference	Description
SW1803	Force Recovery is located at the edge of the PCB to force a recovery, active low.

Table 3-34 Force Recovery Button (SW1803)

2.30 RESET BUTTON (SW1804)

The board provides a side push tactile switch for resetting the board.

Manufacturer: E-Switch, Manufacturer Part Number: TL1014BF160QG

The following table describes the function of SW1804:

Reference	Description
SW1804	Reset button is located at the edge of the PCB to reset the board, active low.

Table 3-35 Reset Button (SW1804)

2.31 RS486 TERMINATION RESISTOR SELECTION SWITCH (SW1805).

See CN1802 for details of SW1805 description and operation.

2.32 CAN BUS TERMINATION SELECTION SWITCH (SW1901).

See CN1901 and CN1902 for details of SW1901 description and operation.

2.33 LED (D1101).

ORANGE: USB Type C output power.

2.34 LED (D1102).

YELLOW: USB Type C input power

2.35 LED (D2011).

GREEN: PoE_VOUT

2.36 LED (D2101).

GREEN: PoE Selected

2.37 LED (D2103).

GREEN: SYS_5V0

2.38 LED (D2104).

GREEN: VDD_5V0

4 ELECTRICAL SPECIFICATION

The VEST SMARC Carrier Board was designed to support up to 24VDC power input.

3.1 ABSOLUTE MAXIMUM CHARACTERISTICS

Power Supply Input	Minimum	Maximum
Main Power Supply, DC-IN	-0.3	24 VDC

Table 4-1 Absolute Maximum Characteristics

3.2 RECOMMENDED POWER SUPPLY CHARACTERISTICS

Power Supply Input	Minimum	Typical	Maximum	Unit
Voltage of Input Power	5	20	24	V
Current of Input Power		2		A

Table 4-2 Recommended Power Supply Characteristics

5 ENVIRONMENTAL SPECIFICATION

5.1 STORAGE TEMPERATURE SPECIFICATION

The VEST SMARC Carrier Board can be stored in a temperature ranging from 5°C to 50°C.

5.2 OPERATION TEMPERATURE SPECIFICATION

The VEST SMARC Carrier Board can operate in a temperature ranging from 5°C to 50°C.

5.3 HUMIDITY

- Operating: 10% to 90% (non-condensing)
- Non-operating: 5% to 95% (non-condensing)

6 MECHANICAL SPECIFICATION

6.1 MECHANICAL DIMENSION

- 180 mm x 120 mm

6.2 CAD MECHANICAL DRAWINGS

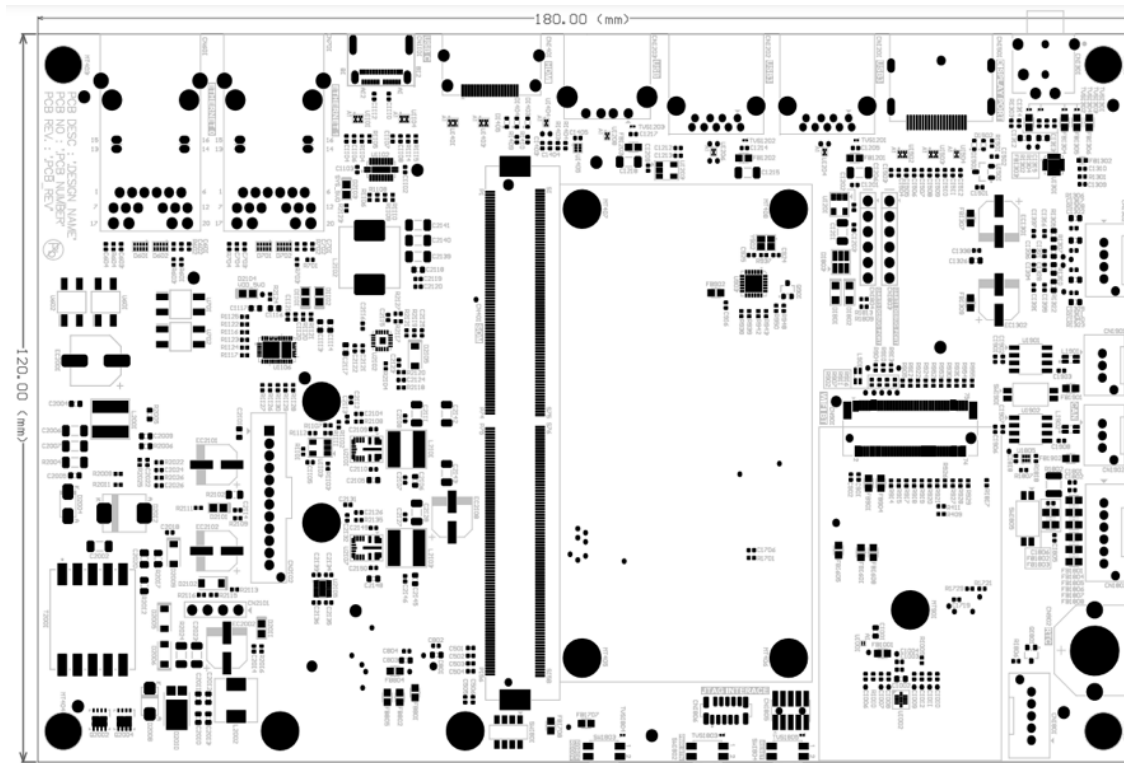


Figure 6-1 Topside.

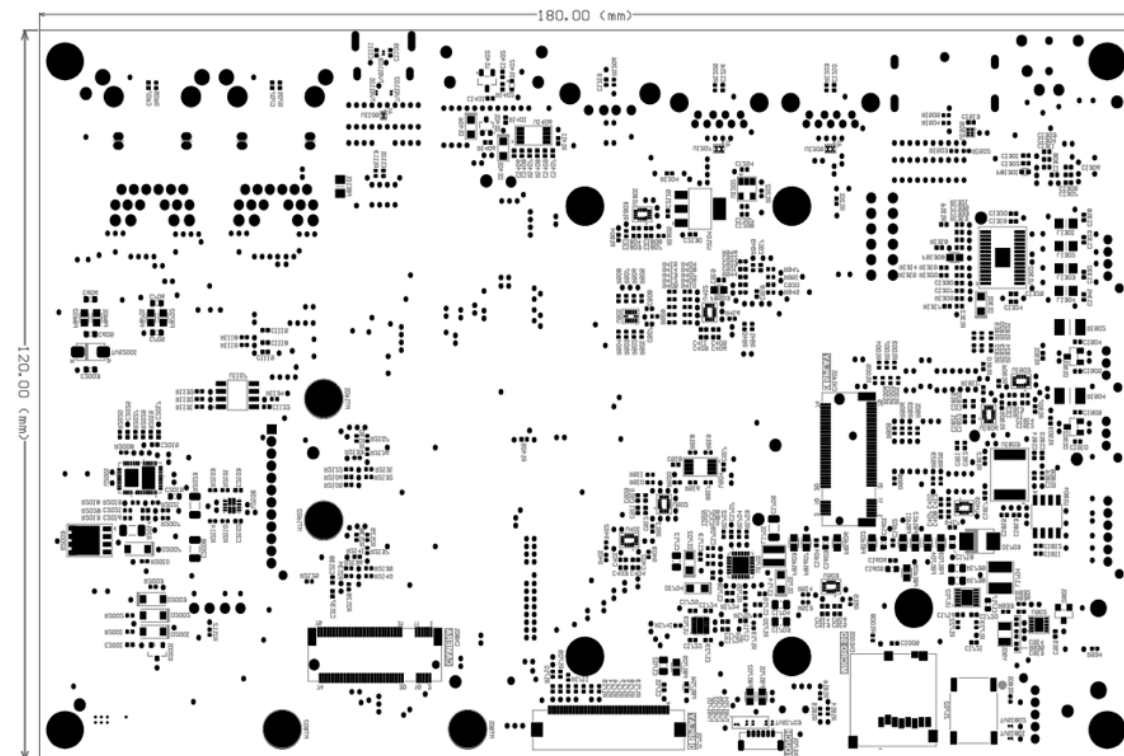


Figure 6-2 Backside.

7 REVISION HISTORY

Version	Date Released	Changes
REV A	03/22/2024	Initial Release
REV B	06/06/2024	Updated Plus SOM photos, and document number
REV C	08/16/2024	Minor corrections

8 LEGAL NOTICES

The signed agreement between Purchaser and VEST will govern the sale and purchase of Venture Embedded Solutions Technology (“VEST”) products (“Products”). In the event that no agreement has been concluded, VEST’s terms and conditions of supply will apply.

Testing and other quality control techniques are used to the extent that VEST deems necessary to support its warranty.

Except where required by law, specific testing of all parameters of each Product is not necessarily performed.

Purchaser must provide adequate design and operating safeguards to minimize inherent or procedural and technical risks associated with Purchaser products and applications. Purchaser is solely responsible for its selection and use of VEST Products. VEST assumes no liability for applications assistance, Purchaser product design or any incompatibility of the Product with Purchaser product.

Products supplied by VEST are not designed, intended or authorized for use in life support, life sustaining, medical systems or devices, aircraft navigation, nuclear, or other applications, including, but not limited to, public transportation operating systems, in which the failure of such Products could reasonably be expected to result in personal injury, loss of life or severe property or environmental damage. Purchaser acknowledges that use of VEST’s Products in such product applications is understood to be fully at the risk of Purchaser and that Purchaser is responsible for verification and validation of the suitability of VEST’s Products in such applications. Purchaser agrees that VEST is not and shall not be liable, in whole or in part, for any claim or damage arising from use in such applications. Purchaser agrees to indemnify, defend and hold VEST harmless from and against any and all claims, damages, losses, costs, expenses and liabilities arising out of or in connection with any such use or application.

VEST retains all rights to all proprietary intellectual property in the Products and associated manufacturing processes and has the right to file for and obtain intellectual property protection for same.