

RP-113
Carrier Board for SMARC2.2
RM-N95/RM-N8MP(L)/RM-N8MMI/
CPU Module

User Manual

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Green IBASE

This product complies with RoHS 2 restrictions, which prohibit the use of certain hazardous substances in electrical and electronic equipment. The following substances must not exceed the specified concentrations:

- Hexavalent chromium: 1,000 ppm
- Poly-brominated biphenyls (PBBs): 1,000 ppm
- Poly-brominated diphenyl ethers (PBDEs): 1,000 ppm
- Cadmium: 100 ppm
- Mercury: 1,000 ppm
- Lead: 1,000 ppm
- Bis(2-ethylhexyl) phthalate (DEHP): 1,000 ppm
- Butyl benzyl phthalate (BBP): 1,000 ppm
- Dibutyl phthalate (DBP): 1,000 ppm
- Diisobutyl phthalate (DIBP): 1,000 ppm

Important Safety Information

 WARNING	
• INGESTION HAZARD: This product contains a coin/button cell battery (CR2032). • DEATH or serious injury can occur if ingested. • A swallowed button cell or coin battery can cause internal chemical burns in as little as 2 hours. • KEEP new and used batteries OUT OF REACH OF CHILDREN. • Seek immediate medical attention if a battery is swallowed or suspected to be swallowed or inserted into any part of the body.	

BATTERY SAFETY INSTRUCTIONS

- Remove and immediately recycle or dispose of used batteries in accordance with local regulations and keep them away from children. Do NOT dispose of batteries in household trash or incinerate.
- Even used batteries may cause severe injury or death.
- Call a local poison control center for treatment information if battery ingestion is suspected.
- Compatible Battery Models/Types: **CR2032 or equivalent lithium coin cell. Nominal Voltage: 3V.**
- Non-rechargeable batteries are not to be recharged.
- Do not force discharge, recharge, disassemble, or expose to temperatures outside the specified range, or incinerate. Doing so may result in injury due to venting, leakage, or explosion resulting in chemical burns.
- Ensure the battery is installed correctly according to polarity (+ and -).
- Do not mix old and new batteries, or different brands or types of batteries.
- Remove and immediately recycle or dispose of batteries from equipment not used for an extended period of time in accordance with local regulations.
- Always securely close the battery compartment. If the battery compartment does not close securely, stop using the product, remove the batteries, and keep them away from children. Battery replacement shall only be performed by qualified service personnel.

CAUTION:

- Lithium Battery Caution: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type. Dispose of batteries according to the manufacturer's instructions.
- Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery, may result in an explosion.
- Leaving a battery in an extremely high temperature environment may result in an explosion or leakage of flammable liquid or gas.
- A battery subjected to extremely low air pressure may result in an explosion or leakage of flammable liquid or gas.

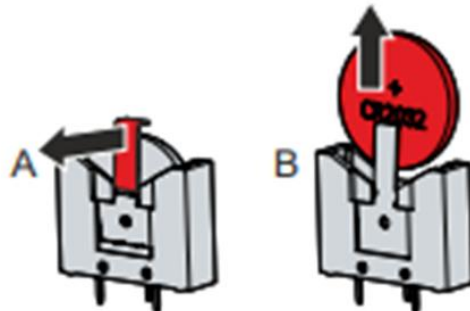
ATTENTION:

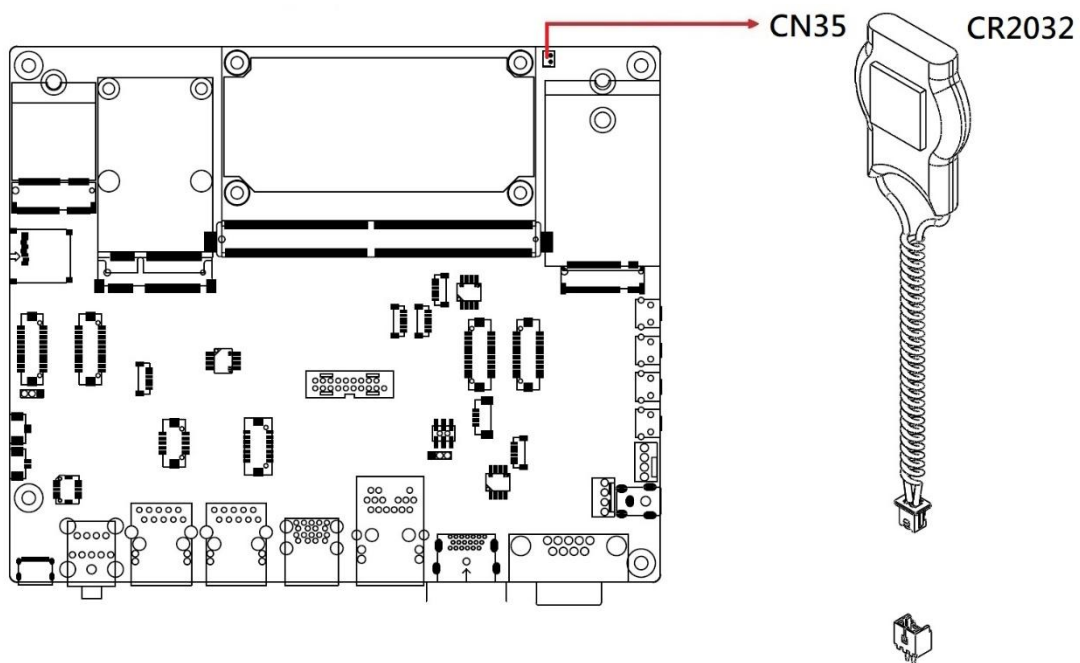
Risque d'explosion si la batterie est remplacée par un type incorrect. Mettre au rebut les batteries usagées selon les instructions.

BATTERY REPLACEMENT INSTRUCTIONS (For Qualified Service Personnel Only)

- Battery replacement shall only be performed by qualified service personnel.

1. Bend the hook on the battery holder slightly outward (Section A).
2. Remove the battery from the holder using needle-nose pliers (Section B).
3. Insert a new CR2032 (or equivalent) lithium coin cell into the battery holder with the correct polarity (+/-).
4. Ensure the battery is securely seated in the holder before operating the system.





Warranty Policy

- **IBASE standard products:**

24-month (2-year) warranty from the date of shipment. If the date of shipment cannot be ascertained, the product serial numbers can be used to determine the approximate shipping date.

- **Third-party parts:**

12-month (1-year) warranty from delivery for the third-party parts that are not manufactured by IBASE, such as CPU, memory, HDD, power adapter, panel and touchscreen.

* PRODUCTS THAT FAIL DUE TO MISUSE, ACCIDENT, IMPROPER INSTALLATION, OR UNAUTHORIZED REPAIR SHALL BE TREATED AS OUT OF WARRANTY, AND CUSTOMERS SHALL BE BILLED FOR REPAIR AND SHIPPING CHARGES.

Technical Support & Services

1. Visit the IBASE website at <https://www.ibase.com.tw> to find the latest information about the product.
2. If you need any further assistance from your distributor or sales representative, prepare the following information of your product and elaborate upon the problem.
 - Product model name
 - Product serial number
 - Detailed description of the problem
 - The error messages in text or in screenshots if there is any
 - The arrangement of the peripherals
 - Software in use (such as OS and application software, including the version numbers)
3. If repair service is required, you can download and fill the RMA form from the IBASE website, and contact your distributor or sales representative.

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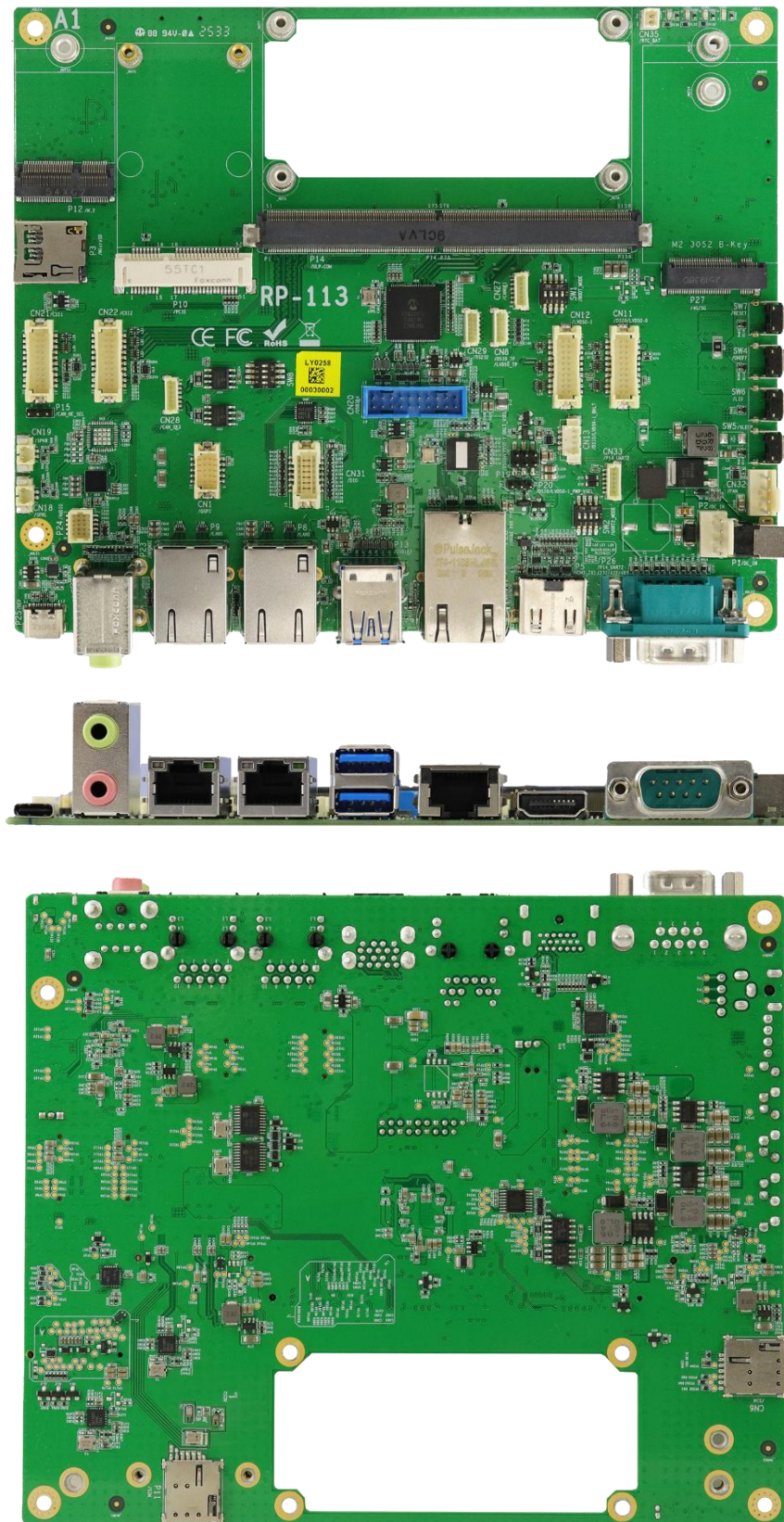
Chapter 1

Introduction

The information provided in this chapter includes:

- 1.1 Product View
- 1.2 IBASE i.MX 9 and i.MX 8 Series SMARC Solution
- 1.3 SMARC Modules and RP-113 Carrier Board
- 1.4 Board Dimensions
- 1.5 I/O View
- 1.6 Installing the SMARC

1.1. Product View



1.2. IBASE i.MX 9 and i.MX 8 Series SMARC Solution

SMARC ('Smart Mobility ARChitecture') is a specification published by the Standardization Group for Embedded Technologies e.V. (SGeT) for Computer-on-Modules (COMs). SMARC Computer-on-Modules are specifically designed for the development of compact low-power systems. Generally, SMARC modules are based on Arm processors and other low-power SoC architectures. Measuring 82mm x 50mm, the RM-N95/RM-N8MP(L)/RM-N8MMI SMARC module integrates the i.MX 95/i.MX 8M Plus/i.MX 8M Mini processor.

The RP-113 carrier board is backward compatible with SMARC 2.0 / 2.1 / 2.1.1 / 2.2 modules. Measuring 170mm x 140mm, the RP-113 is compatible with 82mm x 50mm standard SMARC form factors. Engineers can choose the required I/Os to verify developed software applications.

1.3. SMARC Modules and RP-113 Carrier Board

1.3.1. Features of RM-N95

- 6x Arm Cortex-A55, 1x Cortex-M33 and 1x Cortex-M7
- NPU 2.0 TOPS
- Onboard 8GB LPDDR5, 16GB eMMC (expandable to 256GB)
- 1x HDMI, 1x Dual-channel LVDS, 1x 4-lanes MIPI-DSI (optional)
- 1x 10 GbE, 2x Gigabit LAN, 1x USB 3.0 Type-C, 1x USB 2.0, 2x PCIe 3.0 x 1-lane
- CRA / TPM Support
- Validated with Yocto 5.0
- Wide-range operating temperature from -40°C to +85°C

1.3.2. Specifications of RM-N95

Product Name	RM-N95
Form Factor	SMARC 2.2 - 82 mm × 50 mm
Processor	NXP i.MX 95 with Cortex-A55, six cores, 2.0 GHz (industrial grade); supports 64-bit Arm v8.2 architecture
System Memory	8GB LPDDR5 6400 MT/s onboard (optional 4 GB or 16 GB)
Neural Processing Unit (NPU)	Up to 2.0 TOPS AI performance
Display	• 1x 4-lanes MIPI-DSI (4kp30 or 3840 x 1440p60, BOM selectable) • 1x 8-lanes or 2x 4-lanes LVDS (up to 1080p or 1920 x 1200 or dual 720P) • 1x HDMI interface (up to 4kp30 or 3840 x 1440p60)
Video Processing Unit	• Decoder: H.265, H.264, 4Kp30 • Encoder: H.265, H.264, 4Kp30
Graphics	Arm Mali-G310 V2 Graphics Processing Unit (GPU) • OpenGL ES 3.2 • Vulkan 1.3 • OpenCL 3.0
I/O Ports	
Audio Interface	2x I2S
USB	• 1x USB 3.0 Type-C with PHY • 1x USB 2.0 with PHY
Image Capture Interface	• 1x MIPI CSI-2 2-lanes (BOM selectable) • 1x MIPI CSI-2 4-lanes
Serial Interface	• 2x 4-wire UART and 2x 2-wire UART • 1x SPI interface • 1x XSPI interface
Media Interface	1x 4-bit high-speed SDIO
LAN	• 1x 10GbE • 2x GbE
PCIe	2x PCIe 3.0 x 1-lane
GPIO	14x GPIO
I²C	4x I ² C
Others	• Security: CRA / TPM Support • RTC: Yes • Watchdog timer: 1~128s, power on/off 4s • 1x Green LED for power status
CAN Bus	2x CAN FD
OS Support	Yocto 5.0 (other OS by request)
Certification	CE / FCC Class B

**This specification is subject to change without prior notice.*

1.3.3. Features of RM-N8MP(L)

- NXP Cortex-A53 i.MX 8M Plus(Lite) Quad Core 1.6 GHz Industrial Grade SOC
Support of 64-bit Arm v8-A architecture
- Cortex-M7 CPU operating up to 800 MHz
- 3GB LPDDR4, 16GB eMMC on board
- Rich peripheral I/O support
- Validated with Yocto 4.2 (kernel 6.1.55) / Android 11
- Long-term supply support with NXP
- Compliant with SMARC 2.1

1.3.4. Specifications of RM-N8MP(L)

Product Name	RM-N8MP(L)
Form Factor	SMARC 2.1 82mm x 50 mm
System	
Operating System	• Android 11 • Yocto 4.2 (kernel 6.1.55) • Other OS (by request)
CPU Type	NXP Cortex-A53 i.MX 8M Plus(Lite) Quad Core 1.6 GHz Industrial Grade SOC Supports 64-bit Arm v8-A architecture
MCU Type	Cortex-M7 CPU operating up to 800 MHz
Neural Processing Unit (NPU) (8M Plus Only)	2.3 TOPS Neural Network performance • Keyword detect, noise reduction, beamforming • Speech recognition (i.e. Deep Speech 2) • Image recognition (i.e. ResNet-50)
Memory	System memory: 3 GB LPDDR4 (optional 2GB or 4GB available) Data Memory: 16 GB eMMC (optional up to 64GB available)
On-chip Memory	Boot ROM (256 KB) On-chip RAM (768 KB)
Video Processing Unit (8M Plus Only)	Video Decode: • 1080p60 HEVC/H.265 Main, Main 10 (up to level 5.1) (VPU G2) • 1080p60 VP9 Profile 0, 2 (VPU G2) • 1080p60 VP8 (VPU G1) • 1080p60 AVC/H.264 Baseline, Main, High decoder (VPU G1) Video Encode: • 1080p60 AVC/H.264 encoder • 1080p60 HEVC/H.265 encoder
Graphic Processing Unit	GC7000UL with OpenCL and Vulkan support • 2 shader • 166 million triangles/sec • 1.0 giga pixel/sec • 16 GFLOPs 32-bit • Supports OpenGL ES 1.1, 2.0, 3.0, OpenCL 1.2, Vulkan • Core clock frequency of 1000 MHz • Shader clock frequency of 1000 MHz • GC520L for 2D acceleration

	Render target compatibility between 3D and 2D GPU (super tile status buffer)
RTC	Yes
Watchdog Timer	Yes (256 segments, 0, 1, 2...128 secs)
Dimensions	82 x 50 mm (3.23" x 1.97")
Certification	CE, FCC Class B
I/O Ports	
HDMI 2.0a Tx	1x HDMI2.0a - Resolutions of: 720 x 480p60, 1280 x 720p60, 1920 x 1080p60, 1920 x 1080p120, 3840 x 2160p30; Pixel clock up to 297 MHz - Audio support: 32-channel audio output support; 1 SPDIF audio eARC input support
MIPI DSI	1x MIPI DSI (Support up to 1920x1200p60)
LVDS	2x LVDS (Support up to 1920x1200p60)
MIPI CSI	2x MIPI CSI (2x ISP supporting 375 megapixels/s aggregate performance and up to 3-exposure HDR processing). - When one camera is used, support up to 12MP@30fps or 4kp45 - When two cameras are used, each supports up to 1080p80)
PCIe	1x PCIe (supporting PCIe Gen3)
CSPI	1x CSPI
QSPI	1x QSPI
SDIO	1x SDIO
CAN	2x CAN
I2C	4x I2C
UART	4x UART
AUDIO	2x I2S
LAN	2x GbE LAN (Two Ethernet controllers (both capable of simultaneous operation)
USB	2x USB 3.0 with OTG interface
GPIO	12x GPIO
Environment	
Operating Temperature	-40°C~ 85°C (-40°F~185°F) with heat sink or through housing design -40°C~ 65°C (-40°F~149°F) without heatsink
Storage Temperature	-40°C to 85°C(-40°F~185°F)
Relative Humidity	0%~90% RH at 60°C (non-condensing)

1.3.5. Features of RM-N8MMI

- With NXP Cortex-A53 i.MX 8M Mini Quad 1.6GHz industrial-grade processors
- 2GB LPDDR4, 8GB eMMC on board
- Wide-range operating temperature from -40°C to 85°C
- Rich peripheral I/O support
- Validated with Yocto v2.5 and Android 9.0 (legacy support)
- Long-term supply with NXP
- Compliant with SGeT standard SMARC V2.0

1.3.6. Specifications of RM-N8MMI

Product Name	RM-N8MMI
Form Factor	SMARC 2.0 - 82 mm × 50 mm
Processor	NXP i.MX 8M Mini Quad Cortex-A53 and Cortex-M4
System Memory	2GB LPDDR4, 8GB eMMC
Video Codec	• 1080p60 VP9 • 1080p60 HEVC/H.265 decoder • 1080p60 AVC/H.264 Baseline, Main, High decoder • 1080p60 VP8 • 1080p60 AVC/H.264 encoder • 1080p60 VP8 • TrustZone support
Graphics	Vivante GC320
I/O Ports	
Audio Interface	2x I2S, 1x SPDIF
USB	2x USB2.0 with OTG interface
Display	1x MIPI-DSI 4-lanes
Image Capture Interface	1x MIPI-CSI2 4-lanes
Serial Interface	4x UART 2x SPI Interface
Media Interface	2x High-speed MMC/SDIO (MMC 8-bit, SDIO 4-bit)
LAN	1x GbE LAN
PCIe	1x PCIe x 1-lane Gen2
GPIO	12x GPIO
I²C	4x I ² C
Others	• RTC: Yes • Watchdog timer: 1~128s, power on/off 4s • 1x Green LED for power status • Wireless WCN3980 (option)
CAN Bus	N/A
OS Support	Yocto 2.5 / Android 9 (legacy support)
Certification	CE / FCC Class B

Dimensions	
PCB Dimensions	82mm x 50mm (3.23" x 1.97")
	Max component height - Top Side: 3.0mm - Bottom Side: 1.3mm Thickness: 1.2mm - Golden Finger: 45° chamfer (0.18mm)
Environment	
Temperature	Operating: -40°C to +85°C (-40°F~185°F) (Industrial grade, with heat-sink)
	Storage: -40°C to 85°C (-40°F~185°F)
Relative Humidity	0%~90% RH at 60°C (non-condensing)

1.3.7. Features of RP-113

- Designed for SMARC V2.2 modules
- Supports 19 ~ 24V DC-in, reset, power, RTC function
- Supports 10GbE LAN, Gigabit LAN, audio, USB 3.0, COM (RS232/422/485)
- With Micro SD socket, Mini PCIe with USB, SIM socket on board
- With M.2 E-Key 2230 for Wi-Fi/BT, M.2 B-Key 3042/3052 for 4G/5G
- Supports up to 4x CAN, support TTL, LVDS, HDMI, MIPI-CSI camera

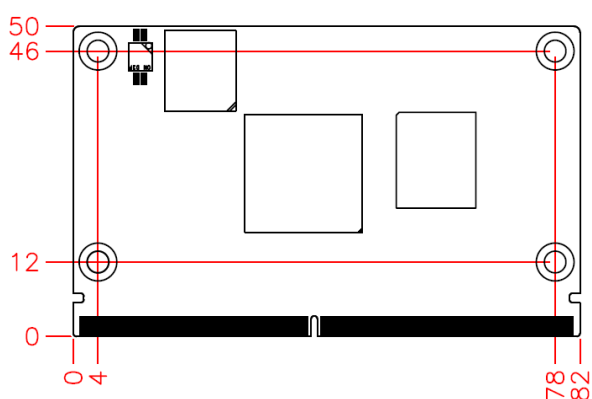
1.3.8. Specifications of RP-113

Product Name	RP-113
Form Factor	SMARC Carrier Board
Edge I/O	
Power Input	1x DC-in Jack (19V~24V)
USB	2x Type-A USB 3.0 1x Type-C USB 2.0
Display	1x HDMI
LAN	1x RJ45 10 GbE LAN 2x RJ45 GbE LAN
Audio Interface	1x Headphone & MIC Jack
COM	1x RS232/422/485
Media Interface	1x MicroSD Slot 2x Nano SIM Slot
Internal I/O	
Audio Interface	1x I2S, 1x SPDIF
	1x Speaker R and L
	1x Stereo Line-in and Line-out
USB	2x USB 3.0 (pin header)

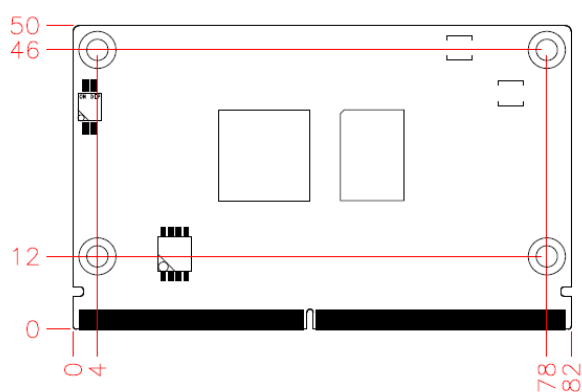
CAN	2x CAN bus 2.0B (Port 0/1) 2x CAN bus by SPI (Port 2/3)
Fan	1x PWM FAN I/F
Display	1x 3.3V / 5V / 12V backlight wafer 1x MIPI display power (3.3V/5V) 1x MIPI-DSI/LVDS 4-lanes 1x LVDS 4-lanes
Image Capture Interface	1x MIPI-CSI2 2-lanes 1x MIPI-CSI2 4-lanes
Serial Interface	2x RS232 (RX/TX) 1x QSPI
PCIe	1x mPCIe Slot (PCIe, USB2.0, PCM)
M.2	1x M.2 E-Key 2230 Slot (PCIe, SDIO, UART, USB2.0) 1x M.2 B-Key 3042/3052 Slot (USB 3.0 only)
GPIO	12x GPIO
I²C	1x I ² C for Capacitive Touch Panel
LED	1x Power on/off by Hardware 1x System standby state 1x WLAN state 1x 4G/5G state
Others	• RTC: Yes • Watchdog timer: 1~128s, power on/off 4s • Wireless WCN3980 (option)
Certification	CE / FCC Class B
Dimensions	
PCB Dimensions	170mm x 140mm (6.7" x 5.5") Thickness: 1.6mm
Environment	
Temperature	Operating / Storage: -40°C to 85°C (-40°F~185°F)
Relative Humidity	0%~90% RH at 60°C (non-condensing)

1.4. Board Dimensions

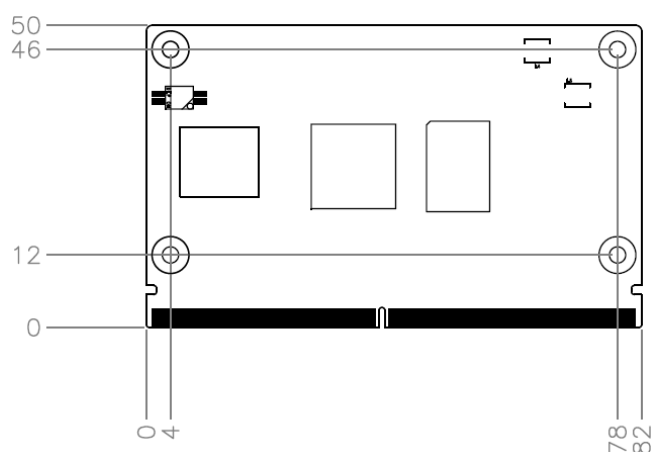
1.4.1. RM-N95 Dimensions



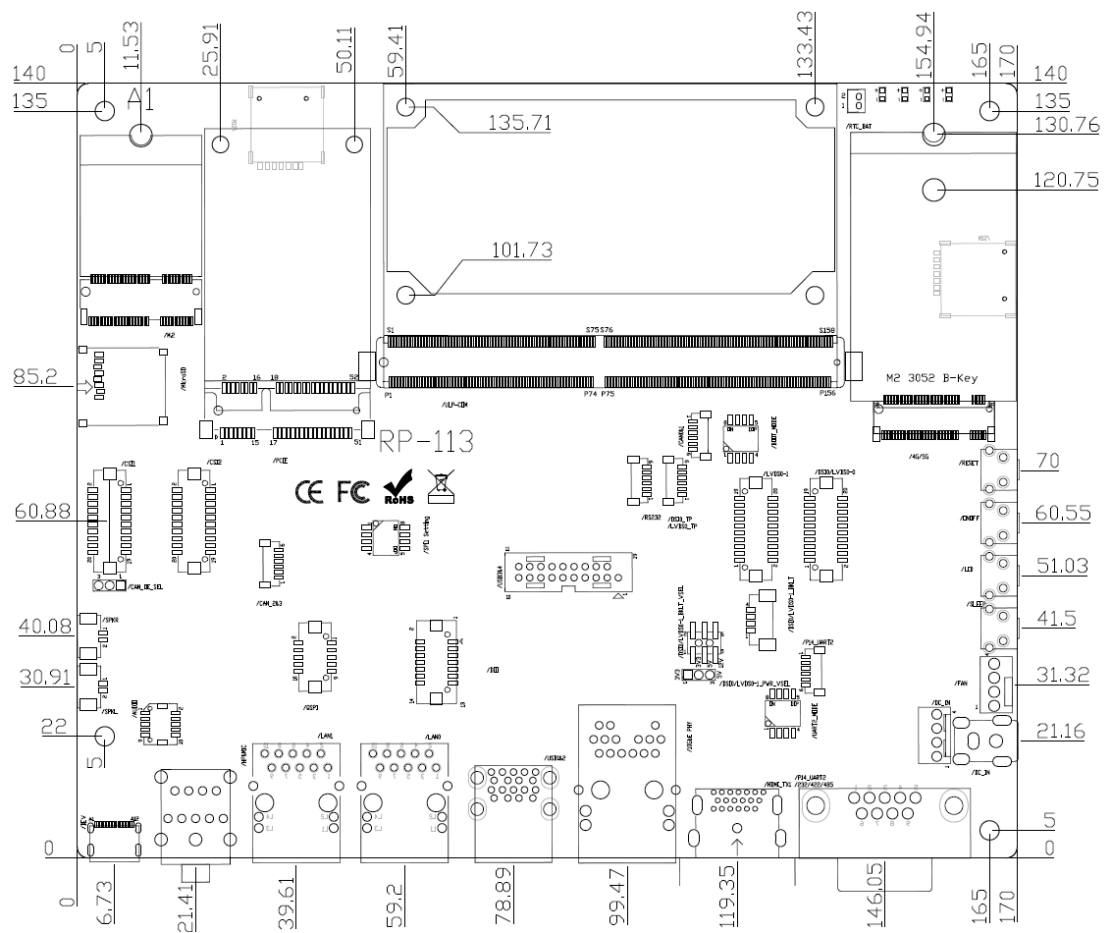
1.4.2. RM-N8MP(L) Dimensions



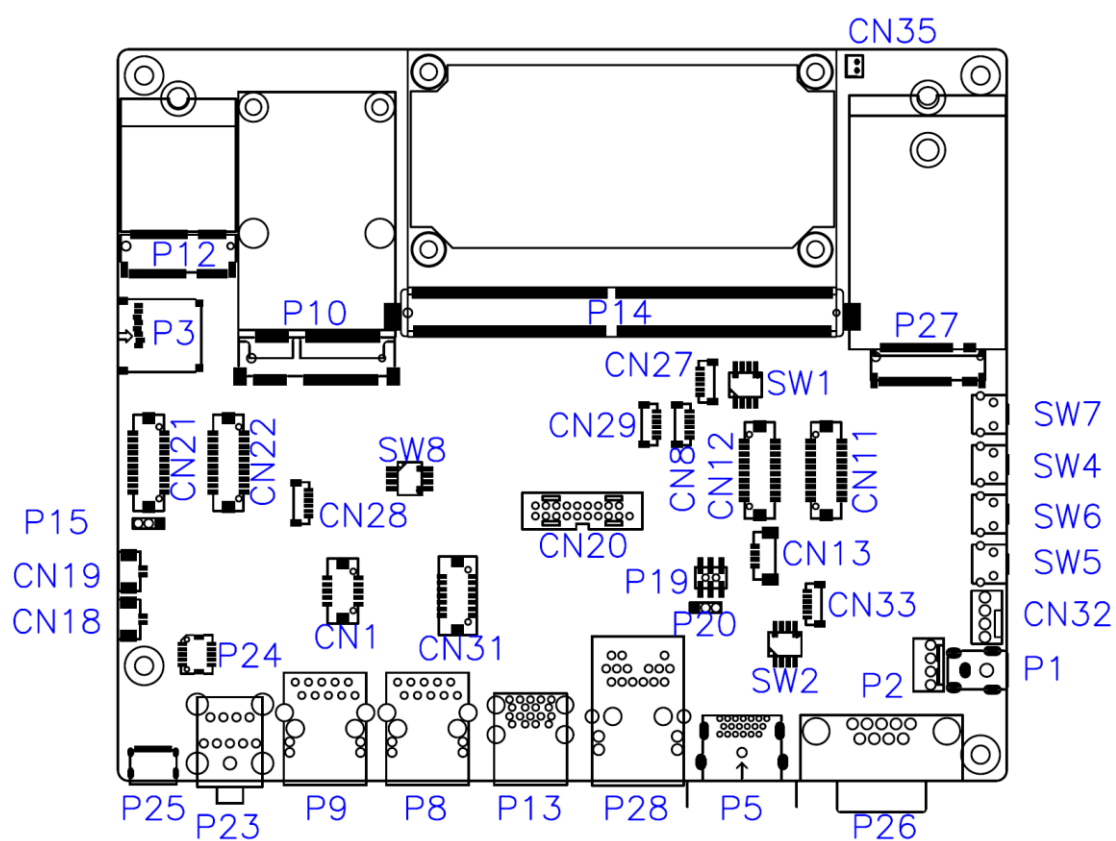
1.4.3. RM-N8MMI Dimensions



1.4.4. RP-113 Dimensions



1.5. I/O View



1.6. Installing the SMARC

The MXM3.0 connector on the RP-113 supports the SMARC form factor (82mm x 50mm).

To install SMARC modules to the MXM slot on the board, please perform the following steps:

- Hold the SMARC module so that the edge fingers of the SMARC module align with the MXM connector.
- Gently push the SMARC module to the MXM connector until the edge fingers of the SMARC module completely touch the bottom of the slot.
- Gently press the SMARC module down and fix it with four screws.

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Chapter 2

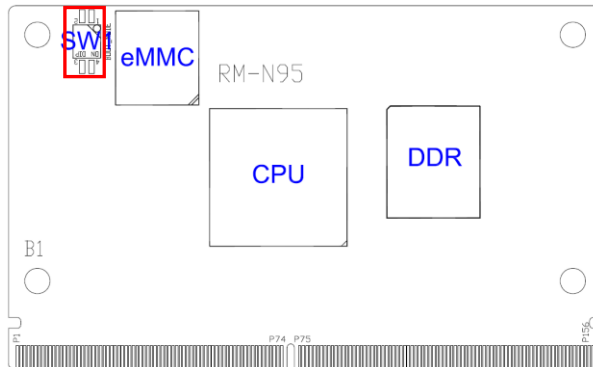
Jumpers and Connectors on the Carrier Board

The information provided in this chapter includes:

- Switch on RM-N95
- Switch on RM-N8MP(L)
- Switch on RM-N8MMI
- Connectors on RP-113
- Connector functions on different SMARC module

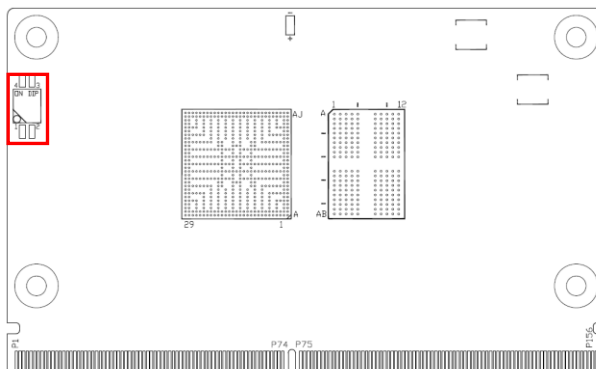
[Important] Please check the jumpers, DIP, buttons and switches on RP-113 before doing the panel connection and boot up.

2.1. Switch on RM-N95



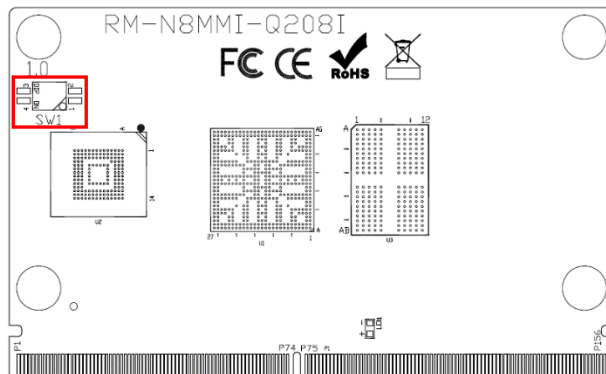
Mode	Switch Settings	
	SW1_1-4	SW1_2-3
Normal Boot	ON	OFF
SD Boot	ON	ON
USB Download	OFF	ON

2.2. Switch on RM-N8MP(L)



Mode	Switch Settings	
	SW1_1-4	SW1_2-3
Normal Boot	OFF	OFF
Auto Test	OFF	ON
USB Download	ON	x

2.3. Switch on RM-N8MMI



Mode	Switch Settings	
	SW1_1-4	SW1_2-3
Normal Boot	OFF	OFF
Auto Test	OFF	ON
USB Download	ON	x

2.4. Connectors on the RP-113

P1	DC-in	CN1	QSPI/XSPI
P2	Internal DC-in	CN6	5G Nano SIM Slot
P3	MicroSD Slot	CN8	DSIO/LVDS0 CTP
P5	HDMI TX1	CN11	DSIO/LVDS0 ch0
P8	GbE LAN0	CN12	LVDS0 ch1
P9	GbE LAN1	CN13	LVDS0 Backlight
P10	mPCIe Slot	CN18	Speaker L
P11	SIM Slot	CN19	Speaker R
P12	M.2 E-Key 2230 Slot	CN20	USB Port 3/4
P13	USB1/2	CN21	MIPI CSI1
P14	MXM3 Slot	CN22	MIPI CSI2
P15	CAN Select	CN27	CAN Port 0/1
P19	DSIO/LVDS0 Backlight Power Select	CN28	CAN Port 2/3 (SPI to CAN)
P20	DSIO/LVDS0 LCD Power Select	CN29	COM Port 1/3
P23	Headphone & MIC	CN31	DIO
P24	Line In/Out	CN32	FAN
P25	USB Type-C	CN33	UART(4-wire)
P26	RS232/422/485	CN35	RTC BAT
P27	M.2 B-Key 3042/3052 Slot	SW4	Power ON/OFF Button
P28	10GbE LAN	SW5	Sleep Button
SW1	Boot Mode Select	SW6	LID Button
SW2	UART Mode Select	SW7	Reset Button
SW8	SPI1 Select		

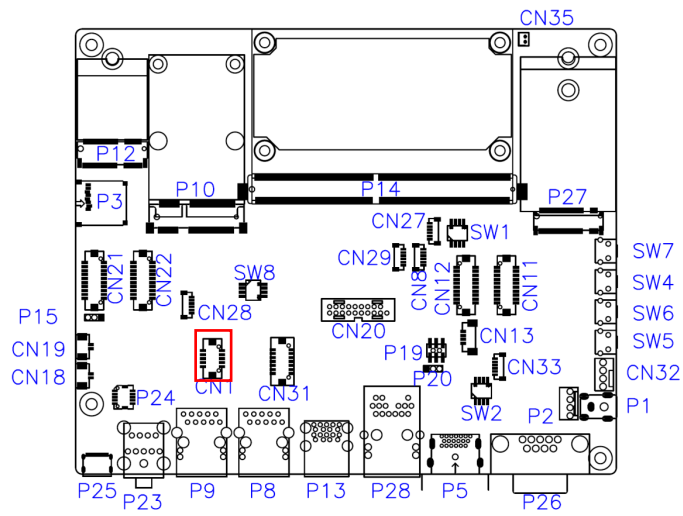
2.5. Connector functions on different SMARC module

CONN	Function	RM-N8MMI Series	RM-N8MP Series	RM-N95 Series	Remark
P1	DC-in	Yes	Yes	Yes	
P2	Internal DC-in	Yes	Yes	Yes	
P3	MicroSD Slot	Yes	Yes	Yes	
P5	HDMI TX1	No	Yes	Yes	
P8	GbE LAN0	Yes	Yes	Yes	
P9	GbE LAN1	No	Yes	Yes	
P10	mPCIe Slot	Yes	Yes	Yes	
P11	NanoSIM Slot	Yes	Yes	Yes	
P12	M.2 E-Key 2230 Slot	Yes	Yes	Yes	
P13	USB1/2	Yes	Yes	Yes	
P14	MXM3 Slot	Yes	Yes	Yes	Gold Finger
P15	CAN Select	Yes	Yes	Yes	

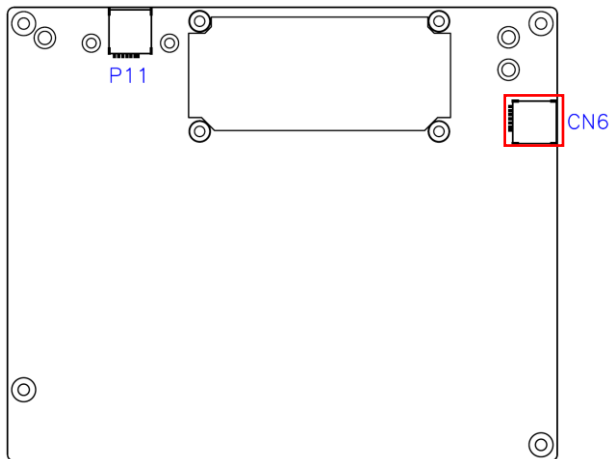
Settings on the Carrier Board

CONN	Function	RM-N8MMI Series	RM-N8MP Series	RM-N95 Series	Remark
P19	DSI0/LVDS0 Backlight Power Select	Yes	Yes	Yes	
P20	DSI0/LVDS0 LCD Power Select	Yes	Yes	Yes	
P23	Headphone & MIC	Yes	Yes	Yes	
P24	Line In/Out	Yes	Yes	Yes	
P25	USB Type-C	Yes	Yes	Yes	
P26	RS232/422/485	Yes	Yes	Yes	
P27	M.2 B-Key 3042/3052 Slot	Yes	Yes	Yes	
P28	10GbE LAN	No	No	Yes	Only for RM-N95
CN1	QSPI/XSPI	Yes	Yes	Yes	
CN6	5G Nano SIM Slot	Yes	Yes	Yes	
CN8	DSI0/LVDS0 CTP	Yes	Yes	Yes	
CN11	DSI0/LVDS0 ch0	No	Yes	Yes	
CN12	LVDS0 ch1	No	Yes	Yes	
CN13	LVDS0 Backlight	Yes	Yes	Yes	
CN18	Speaker L	Yes	Yes	Yes	
CN19	Speaker R	Yes	Yes	Yes	
CN20	USB Port 3/4	Yes	Yes	Yes	RM-N8MMI support USB 2.0 only
CN21	MIPI CSI1	No	Yes	No/Yes	RM-N95 support by BOM selectable
CN22	MIPI CSI2	Yes	Yes	Yes	
CN27	CAN Port 0/1	No	Yes	Yes	
CN28	CAN Port 2/3 (SPI to CAN)	Yes	Yes	Yes	
CN29	COM Port 1/3	Yes	Yes	Yes	
CN31	DIO	Yes	Yes	Yes	
CN32	FAN	No	No	Yes	
CN33	UART (4-wire)	Yes	Yes	Yes	
CN35	RTC BAT	Yes	Yes	Yes	
SW1	Boot Mode Select	Yes	Yes	Yes	
SW2	UART Mode Select	Yes	Yes	Yes	
SW4	Power ON/OFF Button	Yes	Yes	Yes	
SW5	Sleep Button	Yes	Yes	Yes	
SW6	LID Button	Yes	Yes	Yes	
SW7	Reset Button	Yes	Yes	Yes	
SW8	SPI1 Select	Yes	Yes	Yes	

CN1: QSPI

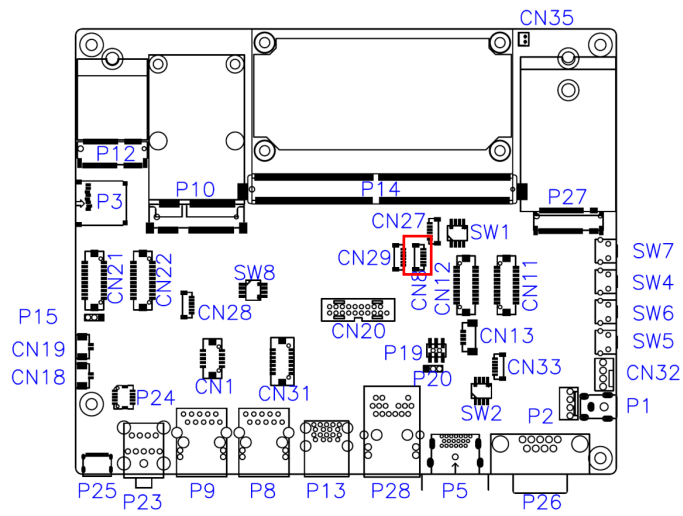


Pin #	Signal Name	Pin #	Signal Name
1	1V8	2	QSPI_IO_3
3	QSPI_CS0_B	4	QSPI_SCLK
5	QSPI_CS1_B	6	QSPI_IO_0
7	QSPI_RST_B	8	QSPI_IO_1
9	QSPI_IO_2	10	GND

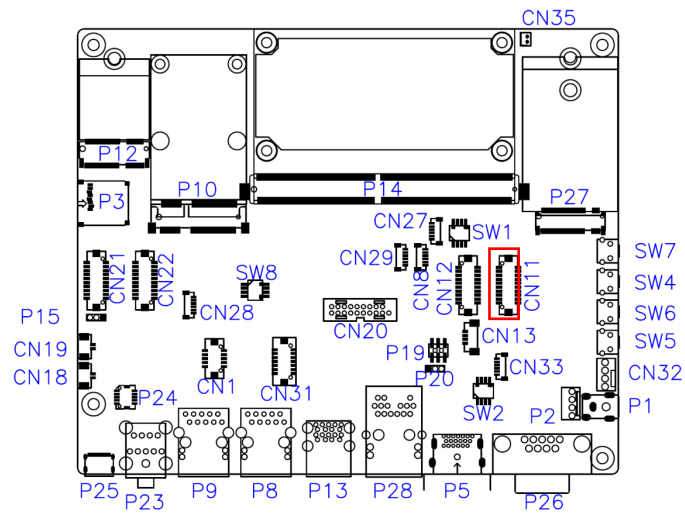
CN6: 5G Nano SIM Slot

Pin #	Signal Name	Pin #	Signal Name
C1	VCC	C5	GND
C2	RST	C6	VPP
C3	CLK	C7	I/O
CD	Card Detect		

CN8: DSI0/LVDS0 CTP

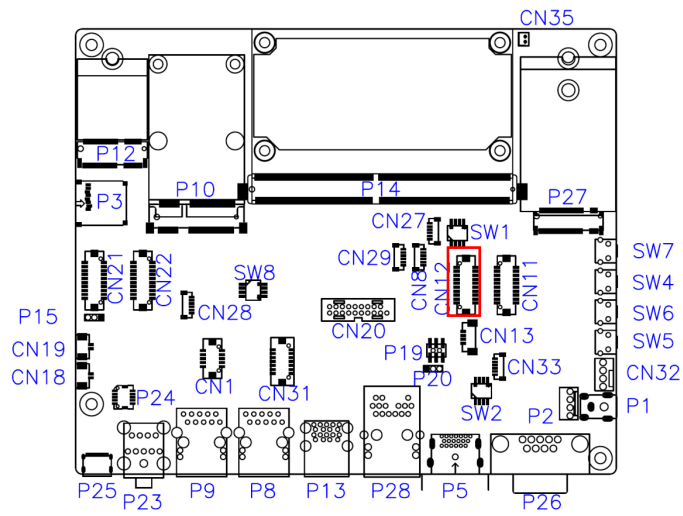


Pin #	Signal Name
1	1V8
2	TP_INT_B
3	TP_RST_B
4	LVDS0_TS_SCL
5	LVDS0_TS_SDA
6	GND

CN11: DSI0/LVDS0 ch0

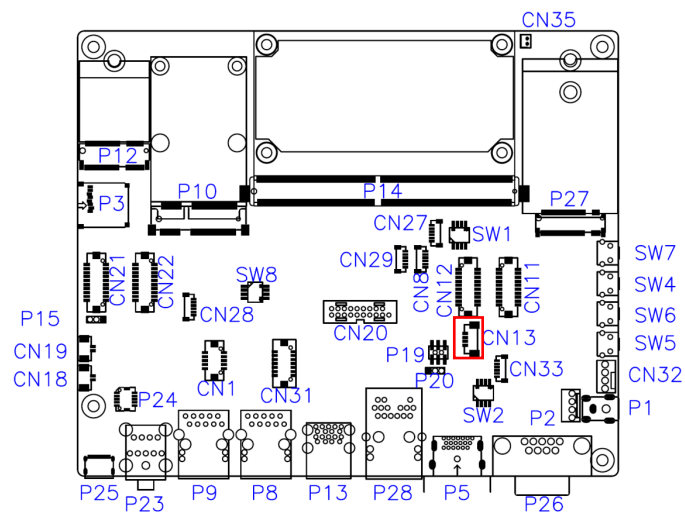
Pin #	Signal Name	Pin #	Signal Name
2	LVDS0_0_TX0_N	1	LVDS0_0_TX0_P
4	GND	3	GND
6	LVDS0_0_TX1_N	5	LVDS0_0_TX1_P
8	LVDS0_VLCD	7	GND
10	LVDS0_0_TX3_N	9	LVDS0_0_TX3_P
12	LVDS0_0_TX2_N	11	LVDS0_0_TX2_P
14	SPDIF_TX0	13	HDMI_INT
16	LVDS0_0_CLK_N	15	LVDS0_0_CLK_P
18	LVDS0_VLCD	17	LVDS0_TS_SCL
20	LVDS0_BKLT	19	LVDS0_TS_SDA

CN12: LVDS0 ch1



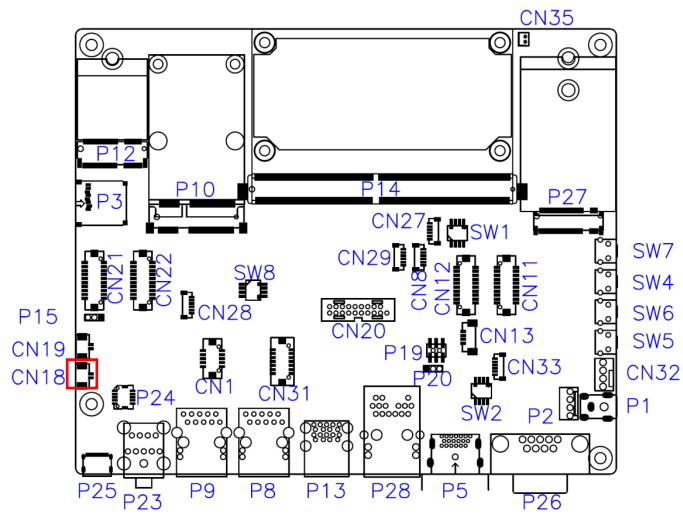
Pin #	Signal Name	Pin #	Signal Name
2	LVDS0_1_TX0_N	1	LVDS0_1_TX0_P
4	GND	3	GND
6	LVDS0_1_TX1_N	5	LVDS0_1_TX1_P
8	LVDS0_VLCD	7	GND
10	LVDS0_1_TX3_N	9	LVDS0_1_TX3_P
12	LVDS0_1_TX2_N	11	LVDS0_1_TX2_P
14	GND	13	GND
16	LVDS0_1_CLK_N	15	LVDS0_1_CLK_P
18	LVDS0_VLCD	17	LVDS0_BL_PWM
20	LVDS0_BKLT	19	LVDS0_BKLT_PWM

CN13: LVDS0 Backlight



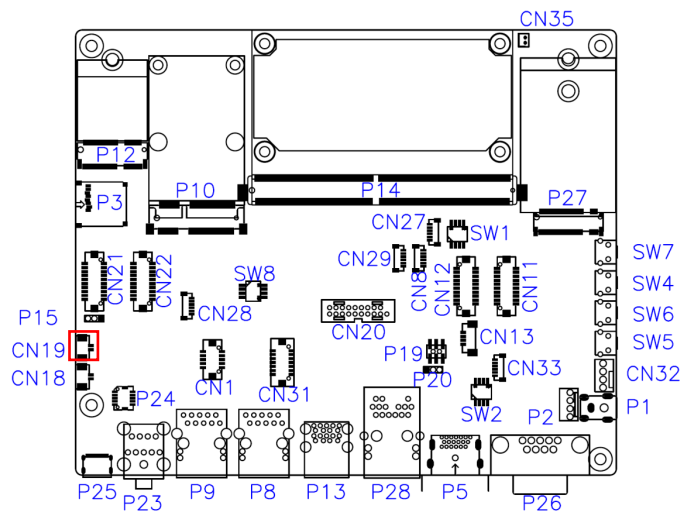
Pin #	Signal Name
1	LVDS0_BKLT
2	LVDS0_BKLT_EN
3	LVDS0_BKLT_PWM
4	GND

CN18: Speaker L

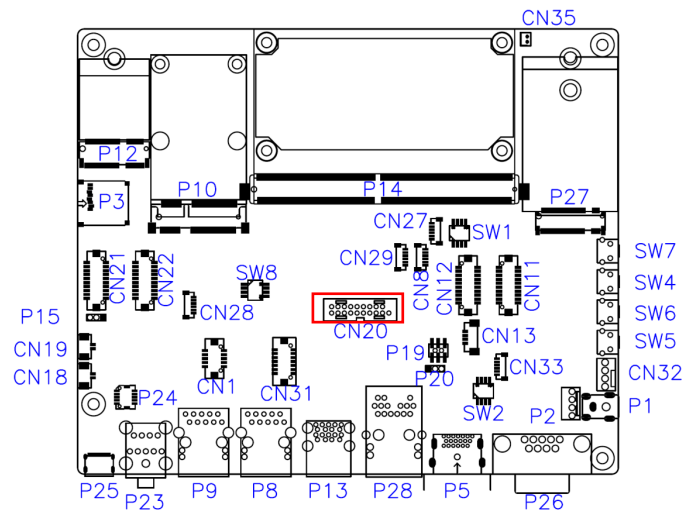


Pin #	Signal Name
1	SPK_LP
2	SPK_LN

CN19: Speaker R

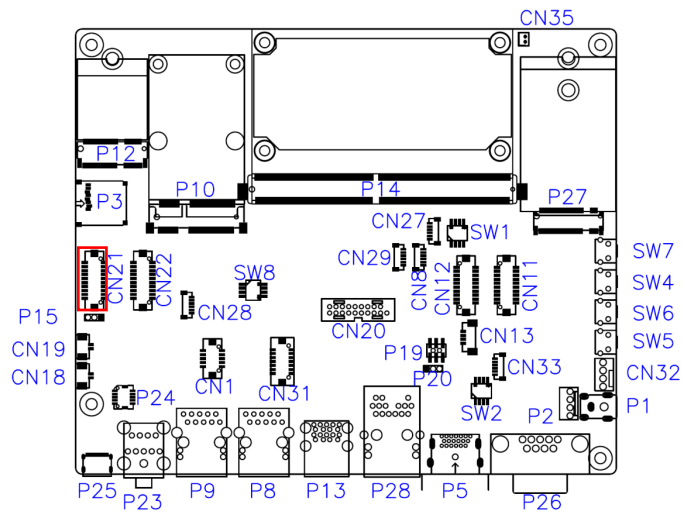


Pin #	Signal Name
1	SPK_RP
2	SPK_RN

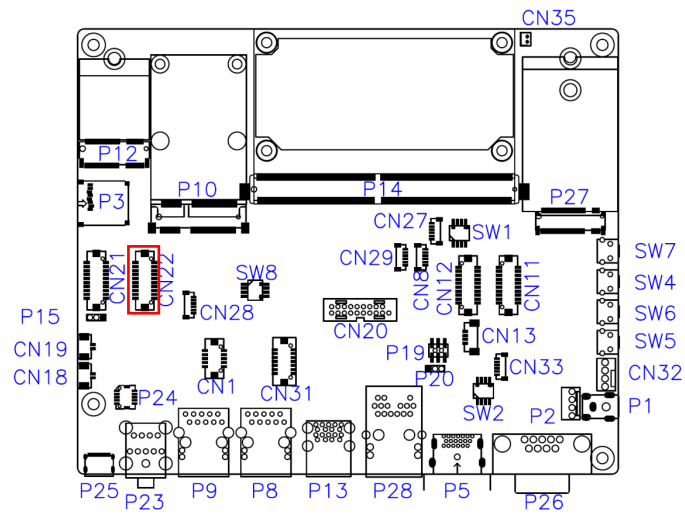
CN20: USB Port 3/4

Pin #	Signal Name	Pin #	Signal Name
1	USB_PWR_OUT3	-	-
2	RXDM3	19	USB_PWR_OUT4
3	RXDP3	18	RXDM4
4	GND	17	RXDP4
5	TXDM3	16	GND
6	TXDP3	15	TXDM4
7	GND	14	TXDP4
8	DM3	13	GND
9	DP3	12	DM4
10	N.C.	11	DP4

CN21: MIPI CSI1

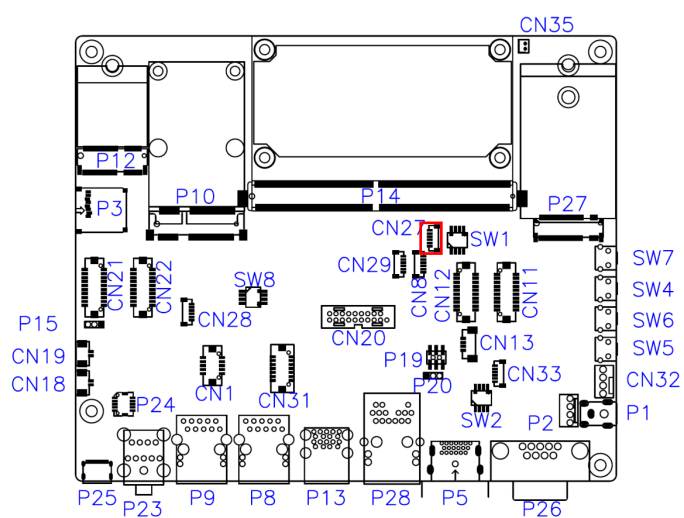


Pin #	Signal Name	Pin #	Signal Name
2	MIPI_CSI1_CKN	1	MIPI_CSI1_CKP
4	MIPI_CSI1_DN0	3	MIPI_CSI1_DP0
6	MIPI_CSI1_DN1	5	MIPI_CSI1_DP1
8	N.C.	7	N.C.
10	N.C.	9	N.C.
12	GND	11	GND
14	CSI1_SDA	13	CSI1_SCL
16	2V8	15	CSI1_RST_B
18	1V8	17	CSI1_PWEN_B
20	GND	19	CSI_MCLK

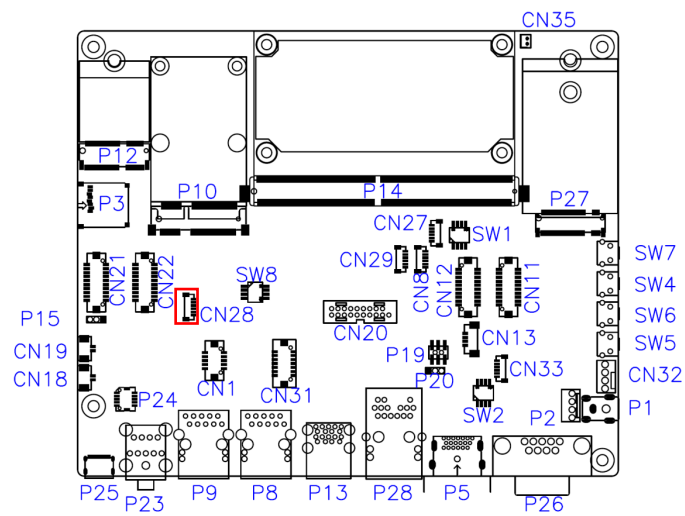
CN22: MIPI CSI2

Pin #	Signal Name	Pin #	Signal Name
2	MIPI_CSI2_CKN	1	MIPI_CSI2_CKP
4	MIPI_CSI2_DN0	3	MIPI_CSI2_DP0
6	MIPI_CSI2_DN1	5	MIPI_CSI2_DP1
8	MIPI_CSI2_DN2	7	MIPI_CSI2_DP2
10	MIPI_CSI2_DN3	9	MIPI_CSI2_DP3
12	GND	11	GND
14	CSI2_SDA	13	CSI2_SCL
16	2V8	15	CSI2_RST_B
18	1V8	17	CSI2_PWEN_B
20	GND	19	CSI_MCLK

CN27: CAN Port 0/1

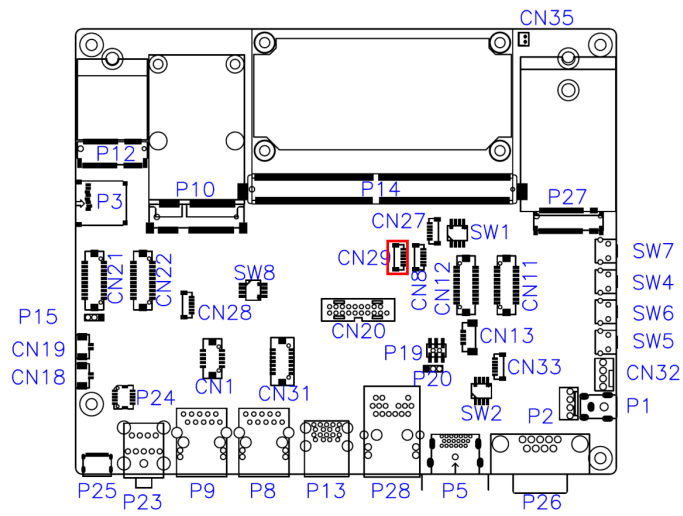


Pin #	Signal Name
1	CAN0_H
2	CAN0_L
3	GND
4	CAN1_H
5	CAN1_L
6	GND

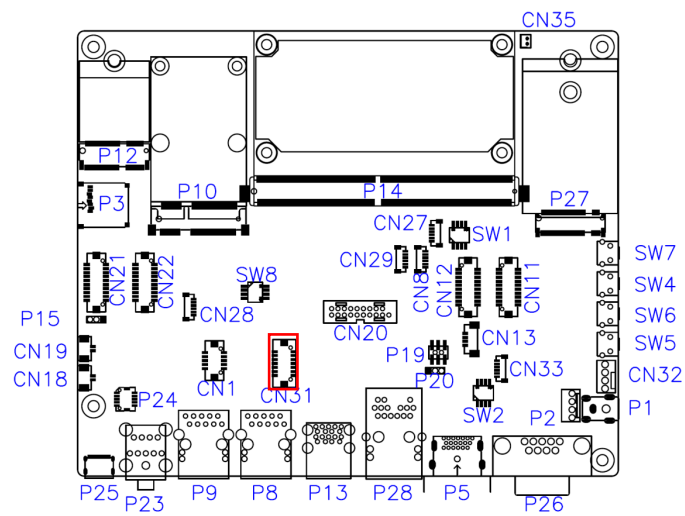
CN28: CAN Port 2/3 (SPI to CAN)

Pin #	Signal Name
1	CAN2_H
2	CAN2_L
3	GND
4	CAN3_H
5	CAN3_L
6	GND

CN29: COM Port 1/3

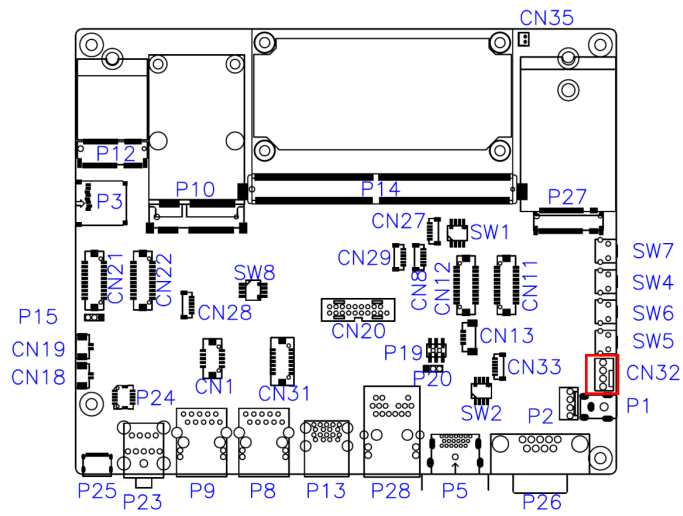


Pin #	Signal Name
1	RS232_1_TX
2	RS232_1_RX
3	GND
4	RS232_3_TX
5	RS232_3_RX
6	GND

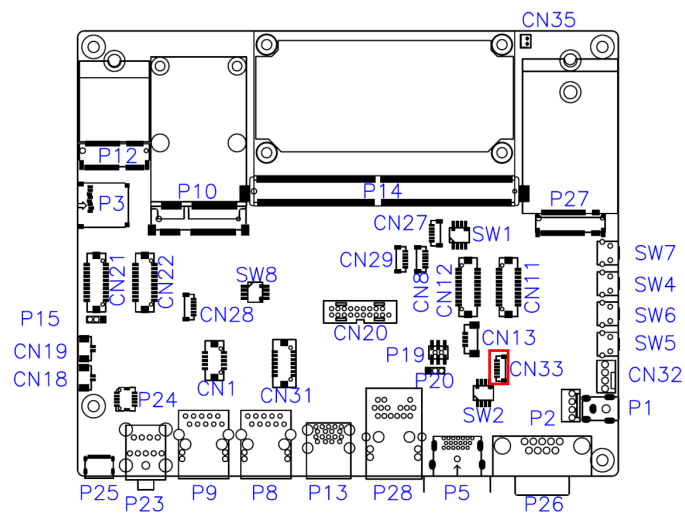
CN31: DIO

Pin #	Signal Name	Pin #	Signal Name
2	GPIO6	1	1V8
4	GPIO7	3	GPIO0
6	GPIO8	5	GPIO1
8	GPIO9	7	GPIO2
10	GPIO10	9	GPIO3
12	GPIO11	11	GPIO4
14	GND	13	GPIO5

CN32: FAN

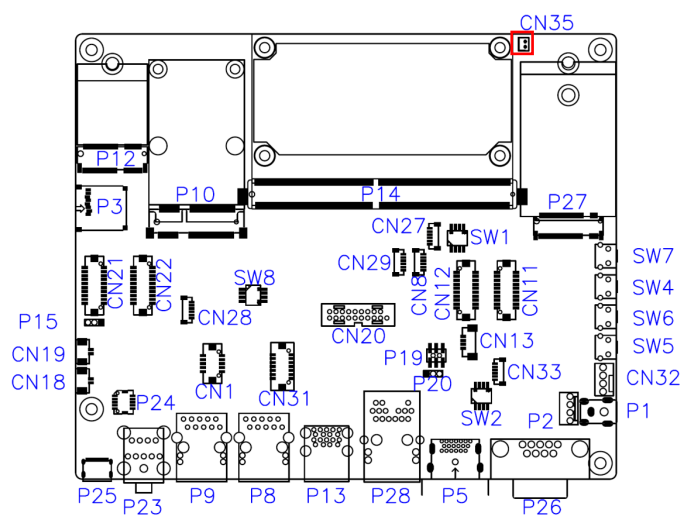


Pin #	Signal Name
1	GND
2	12V
3	FAN_FG
4	FAN_PWM

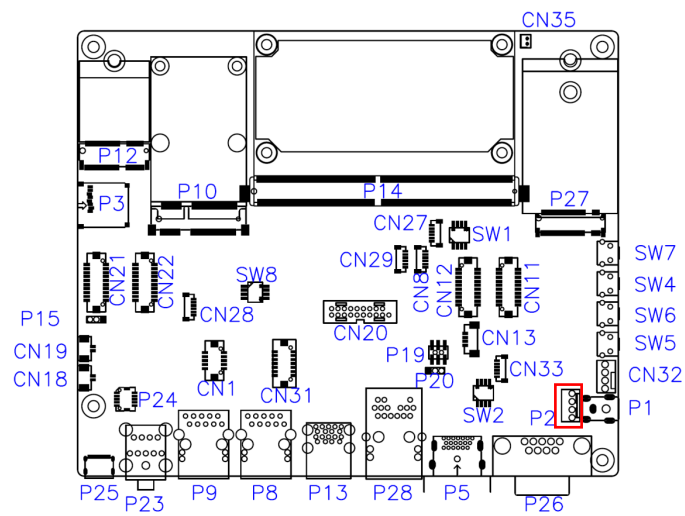
CN33: UART

Pin #	Signal Name
1	1V8
2	UART_TXD
3	UART_RXD
4	UART_RTS
5	UART_CTS
6	GND

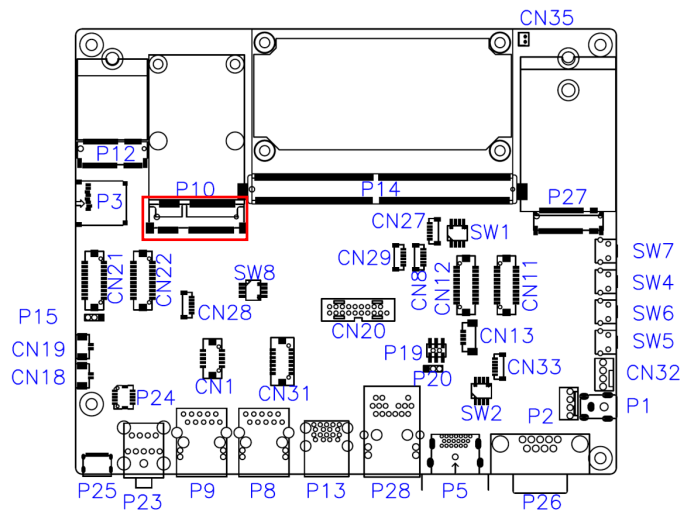
CN35: RTC BAT



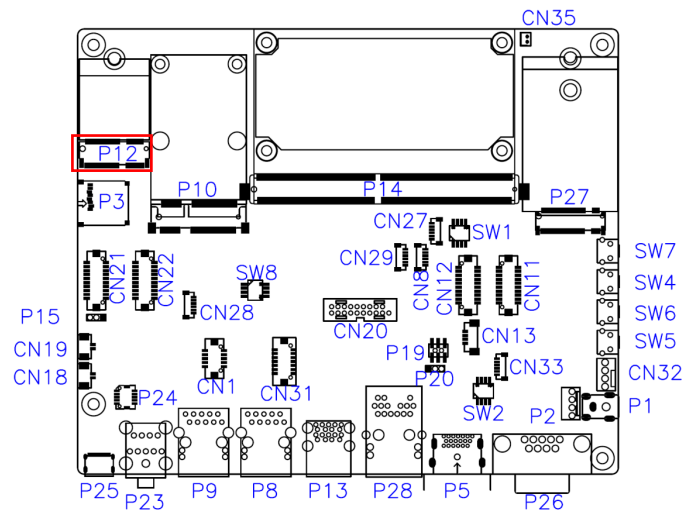
Pin #	Signal Name
1	LI_CELL
2	GND

P2: Internal DC-in

Pin #	Signal Name
1	GND
2	GND
3	DC-IN
4	DC-IN

P10: mPCIe Slot


Pin	Signal Name	Pin	Signal Name
1	PCIe_WAKE_B(I)(0/1.8V)	2	3.3V
3	N/C	4	GND
5	N/C	6	N/C[1.5V]
7	PCIe_REQ_B(I)(0/1.8V)	8	SIM_PWR
9	GND	10	SIM_DAT
11	N/C	12	SIM_CLK
13	N/C	14	SIM_RST
15	GND	16	SIM_VPP
17	N/C	18	GND
19	N/C	20	PCIe_DIS_B(O)(0/1.8V)
21	GND	22	PCIe_RST_B(O)(0/1.8V)
23	N/C	24	3.3V
25	N/C	26	GND
27	GND	28	N/C[1.5V]
29	GND	30	N/C
31	N/C	32	N/C
33	N/C	34	GND
35	GND	36	USB_D-
37	GND	38	USB_D+
39	3.3V	40	GND
41	3.3V	42	N/C
43	GND	44	N/C
45	PCM_CLK(O)(0/1.8V)	46	N/C
47	PCM_DIN(I)(0/1.8V)	48	N/C[1.5V]
49	PCM_DO(O)(0/1.8V)	50	GND
51	PCM_SYNC(O)(0/1.8V)	52	3.3V

P12: M.2 E-Key 2230 Slot

Pin	Signal Name	Pin	Signal Name
1	GND	2	3.3V
3	USB_D+	4	3.3V
5	USB_D-	6	N/C
7	GND	8	PCM_CLK(O)(0/1.8V)
9	SDIO_CLK(O)(0/1.8V)	10	PCM_SYNC(O)(0/1.8V)
11	SDIO_CMD(IO)(0/1.8V)	12	PCM_IN(I)(0/1.8V)
13	SDIO_DAT0(IO)(0/1.8V)	14	PCM_OUT(O)(0/1.8V)
15	SDIO_DAT1(IO)(0/1.8V)	16	N/C
17	SDIO_DAT2(IO)(0/1.8V)	18	GND
19	SDIO_DAT3(IO)(0/1.8V)	20	N/C[BT_WAKE#(I)(0/3.3V)]
21	SDIO_Wake#(I)(0/1.8V)	22	UART_RXD(I)(0/1.8V)
23	SDIO_Reset#(O)(0/1.8V)		Connector Key
	Connector Key		Connector Key
	Connector Key		Connector Key
	Connector Key		Connector Key
	Connector Key		Connector Key
33	GND	32	UART_TXD(O)(0/1.8V)
35	N/C	34	UART_CTS(I)(0/1.8V)
37	N/C	36	UART_RTS(O)(0/1.8V)
39	GND	38	N/C
41	N/C	40	N/C
43	N/C	42	N/C
45	GND	44	N/C
47	N/C	46	N/C
49	N/C	48	N/C
51	GND	50	SUSCLK(32kHz)(O)(0/3.3V)
53	N/C	52	PERST0#(O)(0/3.3V)
		54	BT_DISABLE#(O)(0/3.3V)

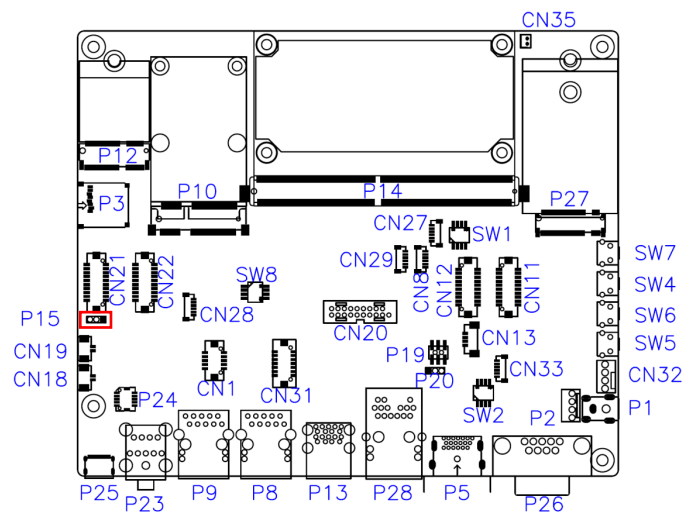
55	N/C[PE_WAKE#(I)(0/3.3V)]	56	WIFI_DISABLE#(O)(0/3.3V)
57	GND	58	I2C_DATA(IO)(0/3.3)
59	N/C	60	I2C_CLK(O)(0/3.3)
61	N/C	62	I2C_IRQ(I)(0/3.3)
63	GND	64	N/C[3.3V]
65	N/C	66	N/C
67	N/C	68	N/C
69	GND	70	N/C
71	N/C	72	3.3V
73	N/C	74	3.3V
75	GND		

Note:

“N/C” means not connected

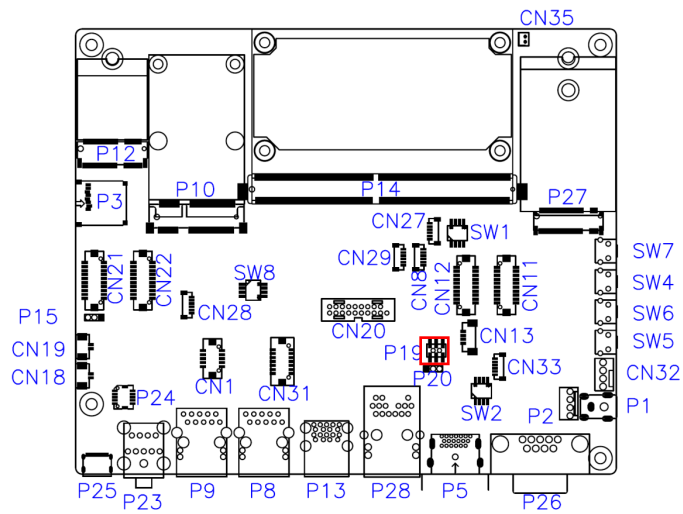
“N/C[X/XX/XXX]” means not connected and option X or XX or XXX function.

“(IO)(0/x.xV)” means “input/output” and I/O level.

P15: CAN Select

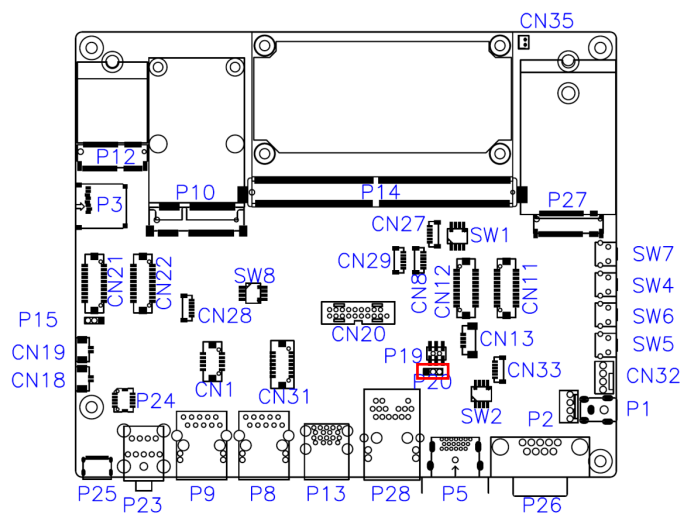
Pin #	Signal Name
1	N.C.
2	CAN_OE
3	GND

P19: DSI0/LVDS0 Backlight Power Select

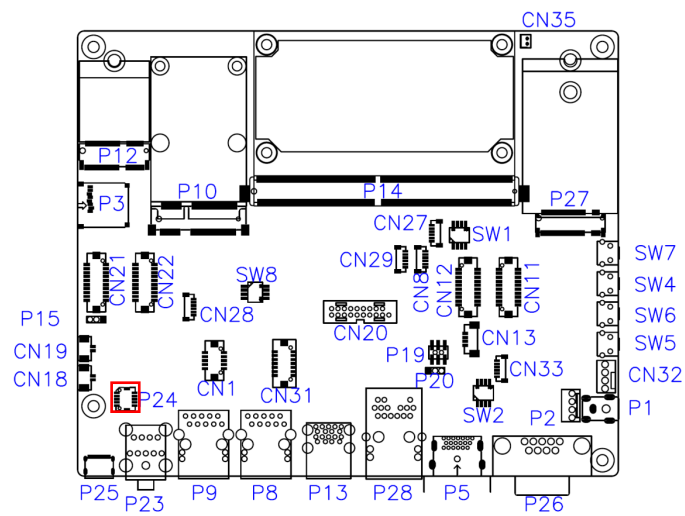


Mode	Setting
3V3	1-2:ON, 3-4:OFF, 5-6:OFF
5V	1-2:OFF, 3-4:ON, 5-6:OFF
12V	1-2:OFF, 3-4:OFF, 5-6:ON

P20: DSI0/LVDS0 LCD Power Select

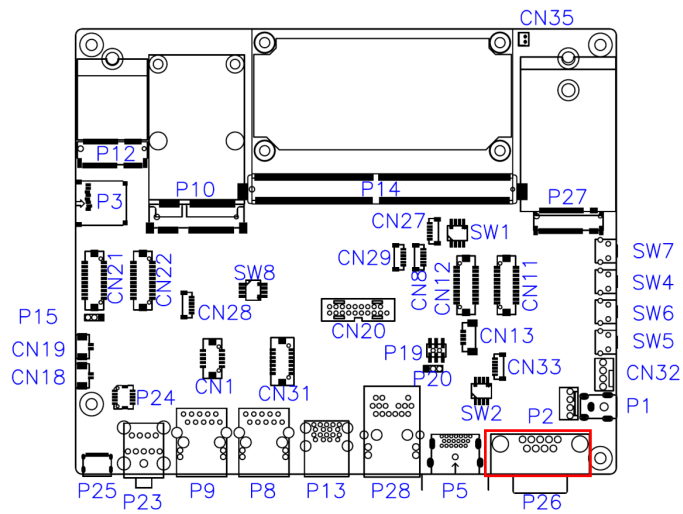


Mode	Setting
3V3	1-2:ON
5V	2-3:ON

P24: Line In/Out

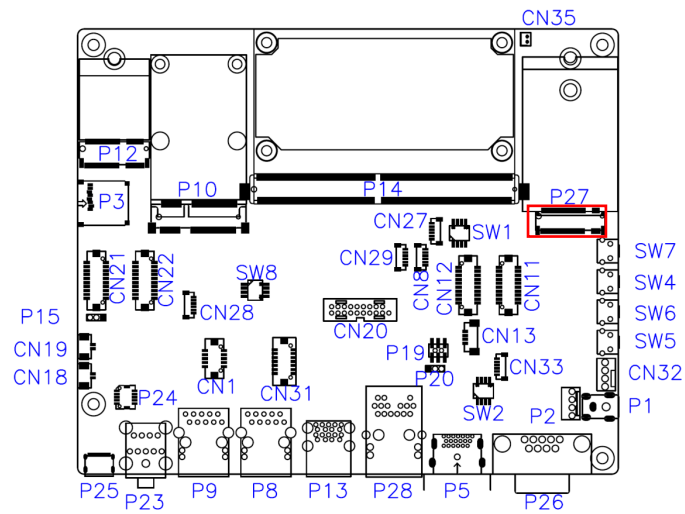
Pin #	Signal Name	Pin #	Signal Name
1	N.C.	2	Analog_GND
3	LINE_IN_R	4	Analog_GND
5	LINE_IN_L	6	Analog_GND
7	Analog_GND	8	LINE_OUT_L
9	Analog_GND	10	LINE_OUT_R

P26: RS232/422/485



Pin #	Signal Name	Pin #	Signal Name
1	DCD, Data carrier detect	6	DSR, Data set ready
2	RXD, Receive data	7	RTS, Request to send
3	TXD, Transmit data	8	CTS, Clear to send
4	DTR, Data terminal ready	9	N.C.
5	GND		

Pin #	RS-232	RS-422	RS-485
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	NC
4	DTR	RX-	NC
5	GND	GND	GND
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	NC	NC	NC

P27: M.2 B-Key 3042/3052 Slot

Pin	Signal Name	Pin	Signal Name
1	N/C[CONFIG_3]	2	3.3V
3	GND	4	3.3V
5	GND	6	POWER_OFF#(O)(0/1.8V)
7	USB_D+	8	W_DISABLE1#(O)(0/1.8V)
9	USB_D-	10	LED1#(OD)(1.8V/3.3V)
11	GND		Connector Key
	Connector Key		Connector Key
	Connector Key		Connector Key
	Connector Key		Connector Key
	Connector Key		Connector Key
21	N/C[CONFIG_0]	20	N/C[PCM_CLK(IO)(0/1.8V)/0V]
23	N/C	22	N/C[PCM_DO(IO)(0/1.8V)]
25	N/C[GPIO_12/DPR]	24	N/C[PCM_DIN(IO)(0/1.8V)/3.3V]
27	GND	26	N/C
29	USB3_Rx-	28	N/C[PCM_SYNC(IO)(0/1.8V)]
31	USB3_Rx+	30	UIM_RESET
33	GND	32	UIM_CLK
35	USB3_Tx-	34	UIM_DATA
37	USB3_Tx+	36	UIM_PWR
39	GND	38	N/C[3.3V]
41	N/C	40	N/C
43	N/C	42	N/C
45	GND	44	N/C
47	N/C	46	N/C
49	N/C	48	N/C
51	GND	50	PERST#(O)(0/3.3V)
53	N/C	52	CLKREQ#(IO)(0/1.8V)
		54	PEWAKE#(IO)(0/1.8V)

55	N/C	56	N/C
57	GND	58	N/C
59	N/C	60	N/C
61	N/C	62	N/C
63	N/C	64	N/C
65	N/C	66	SIM_DETECT
67	RESET#(O)(0/1.8V)	68	N/C[SUSCLK(32kHz) (O)(0/3.3V)/3.3V/1.8V]
69	N/C[CONFIG_1]	70	3.3V
71	GND	72	3.3V
73	GND	74	3.3V
75	N/C[CONFIG_2]		

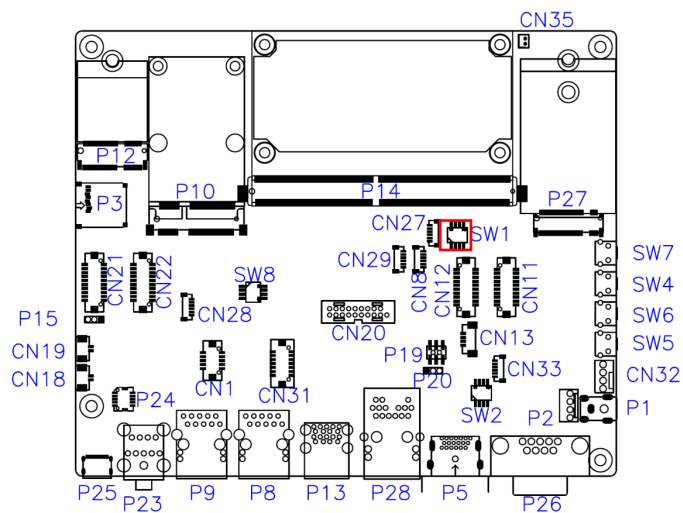
Note:

“N/C” means not connected.

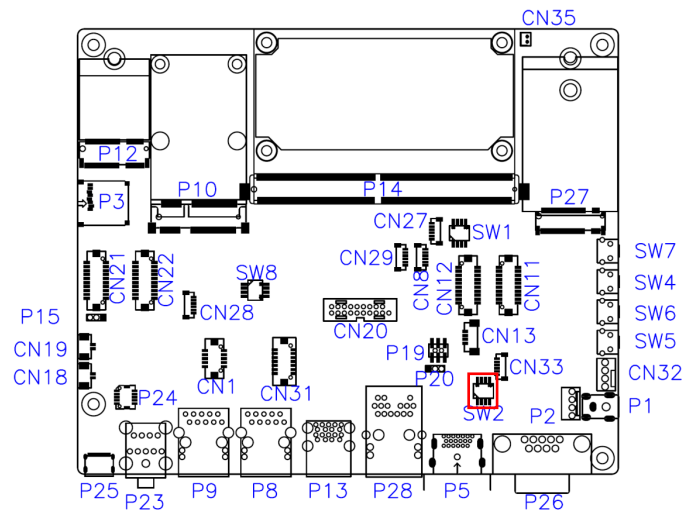
“N/C[X/XX/XXX]” means not connected and option X or XX or XXX function.

“(IO)(0/x.xV)” means “input/output” and I/O level.

SW1: Boot Mode Select

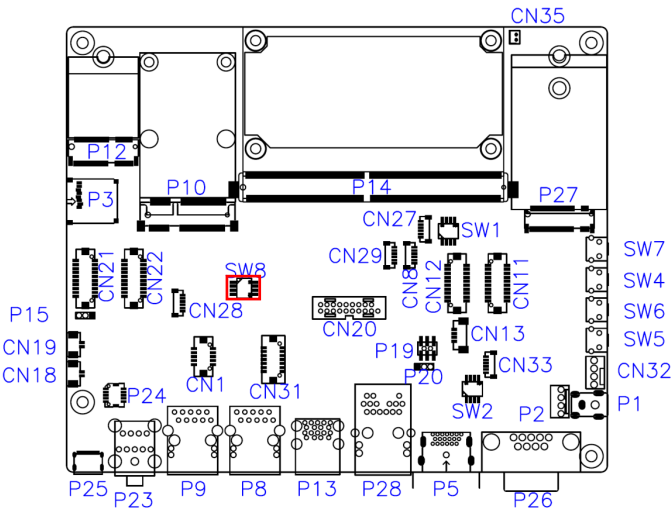


SW1				Function
1-8	2-7	3-6	4-5	
ON	ON	OFF	OFF	Reserved
OFF	ON	OFF	OFF	Reserved
ON	OFF	OFF	OFF	Reserved
OFF	OFF	OFF	OFF	Module eMMC Flash (Default)
x	x	x	ON	Force Recovery <u>(Reserved)</u>

SW2: UART Mode Select (enables P26 COM port)

SW2				Function	Status
1-8	2-7	3-6	4-5		
OFF	ON	ON	ON	RS-422 Full Duplex	1T/1R RS-422
OFF	OFF	ON	ON	Pure RS-232	3T/5R RS-232
OFF	ON	OFF	ON	RS-485 Half Duplex	1T/1R RS-485,TX Enable Low Active
OFF	OFF	OFF	ON	RS-485 Half Duplex	1T/1R RS-485,TX Enable High Active
OFF	ON	ON	OFF	RS-422 Full Duplex	1T/1R RS-422 with termination resistor
OFF	OFF	ON	OFF	Pure RS-232	1T/1R RS-232 co-exists with RS485
OFF	ON	OFF	OFF	RS-485 Half Duplex	1T/1R RS-485 with termination resistor
OFF	OFF	OFF	OFF	Low Power Shutdown	All I/O pins are High Impedance
ON	x	x	x	x	No output

SW8: SPI1 Select



SW8				Function
1-8	2-7	3-6	4-5	
OFF	ON	OFF	ON	RM-N8MMI V1.0
ON	OFF	ON	OFF	RM-N8MMI V1.1/RM-N8MP(L)/RM-N95

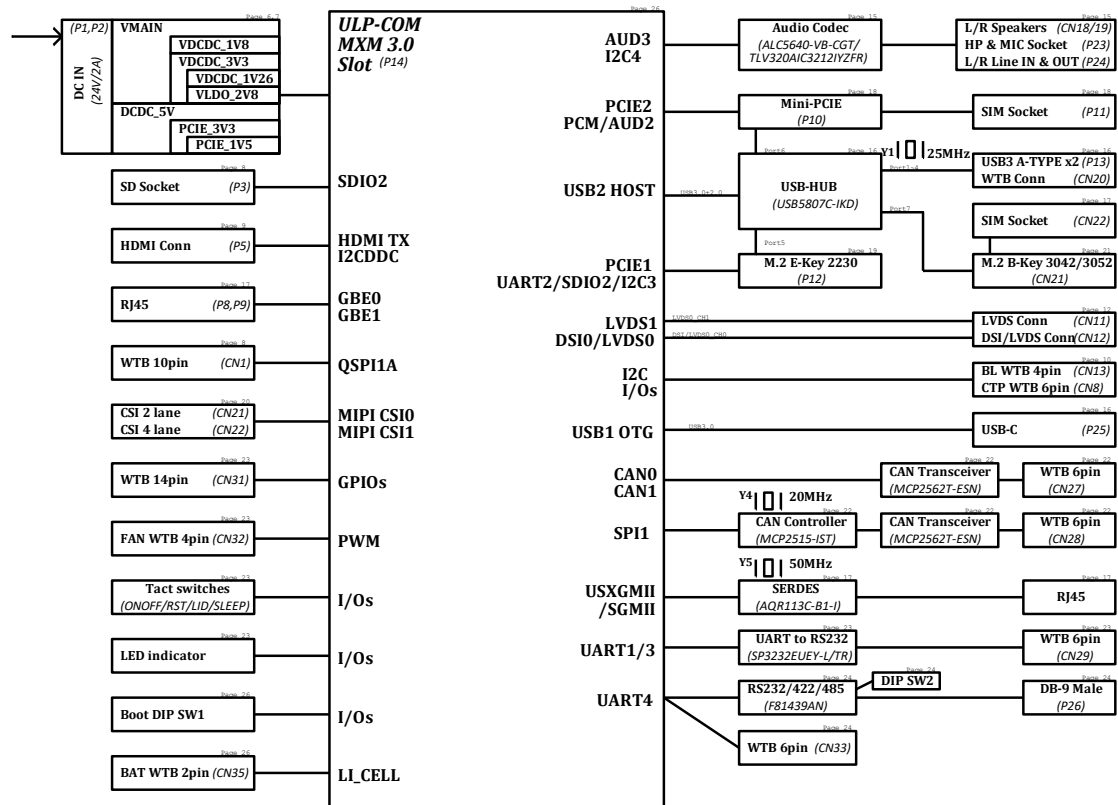
Chapter 3

Carrier Board Design Guide

This Chapter is for advanced users / hardware designers to create carrier boards (or products). Layout suggestions can also be found in the RP-113 carrier board schematic/design files. Please contact your sales representative in advance.

- Block Diagram
- SMARC Module Interfaces
- Layout recommendations

3.1. Block Diagram



3.2. Layout Recommendations

Signal impedance recommendation

Signal Group	Impedance	Layout Tolerance ($\pm$)
All signals, unless specified	50 Ω Single End	10%
PCIE_TX/RX Differential signals	85 Ω Differential	10%
USB Differential signals	90 Ω Differential	10%
Differential signals: LVDS, SATA, HDMI, DDR, PCIE_CLK, MIPI (CSI & DSI), MLB, PHY IC to Ethernet Connector	100 Ω Differential	10%

PCB stack up and trace width/space recommendation (based on the RP-113 reference board)

L1. Top signals
L2. GND
L3. Int1 signals
L4. Int2 signals
L5. Power
L6. Bottom signals

Micro strip			
Layer	Trace width/space	Single-End	Differential
1,6	5.5	50 +/- 10 %	
1,6	4.5/4/4.5		85 +/- 10 %
1,6	4/4.5/4		90 +/- 10 %
1,6	4/7/4		100 +/- 10 %

Strip line			
Layer	Trace width/space	Single-End	Differential
3,4	5.5	50 +/- 10 %	
3,4	4.5/4/4.5		85 +/- 10 %
3,4	4/4.5/4		90 +/- 10 %
3,4	4/7/4		100 +/- 10 %

Layer	Glass Style & Cu Wt.	Thickness
L1	0.5OZ plating to 1OZ	1.4
P.P	3313	3.6
L2	0.5OZ	0.65
CORE	0.102 FR-4	4
L3	0.5OZ	0.65
P.P	7628	7.1
CORE	0.71 FR-4	28
P.P	7628	7.1
L4	0.5OZ	0.65
CORE	0.102 FR-4	4
L5	0.5OZ	0.65
P.P	3313	3.6
L6	0.5OZ plating to 1OZ	1.4

Total thickness 62.8mil 1.595mm

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Appendix

- SMARC Pinout Comparison

SMARC Pinout Comparison

Pin	SMARC 1.1	SMARC 2.0	SMARC 2.1	SMARC 2.2
P1	PCAM_PXL_CK1	SMB_ALERT_1V8#	SMB_ALERT#	SMB_ALERT#
P2	GND	GND	GND	GND
P3	CSI1_CK+ / PCAM_D0	CSI1_CK+	CSI1_CK+	CSI1_CK+
P4	CSI1_CK- / PCAM_D1	CSI1_CK-	CSI1_CK-	CSI1_CK-
P5	PCAM_DE	GBE1_SDP	GBE1_SDP	GBE1_SDP
P6	PCAM_MCK	GBE0_SDP	GBE0_SDP	GBE0_SDP
P7	CSI1_D0+ / PCAM_D2	CSI1_RX0+	CSI1_RX0+	CSI1_RX0+
P8	CSI1_D0- / PCAM_D3	CSI1_RX0-	CSI1_RX0-	CSI1_RX0-
P9	GND	GND	GND	GND
P10	CSI1_D1+ / PCAM_D4	CSI1_RX1+	CSI1_RX1+	CSI1_RX1+
P11	CSI1_D1- / PCAM_D5	CSI1_RX1-	CSI1_RX1-	CSI1_RX1-
P12	GND	GND	GND	GND
P13	CSI1_D2+ / PCAM_D6	CSI1_RX2+	CSI1_RX2+	CSI1_RX2+
P14	CSI1_D2- / PCAM_D7	CSI1_RX2-	CSI1_RX2-	CSI1_RX2-
P15	GND	GND	GND	GND
P16	CSI1_D3+ / PCAM_D8	CSI1_RX3+	CSI1_RX3+	CSI1_RX3+
P17	CSI1_D3- / PCAM_D9	CSI1_RX3-	CSI1_RX3-	CSI1_RX3-
P18	GND	GND	GND	GND
P19	GBE_MDI3-	GBE0_MDI3-	GBE0_MDI3-	GBE0_MDI3-
P20	GBE_MDI3+	GBE0_MDI3+	GBE0_MDI3+	GBE0_MDI3+
P21	GBE_LINK100#	GBE0_LINK100#	GBE0_LINK100#	GBE0_LINK_MID#
P22	GBE_LINK1000#	GBE0_LINK1000#	GBE0_LINK1000#	GBE0_LINK_MAX#
P23	GBE_MDI2-	GBE0_MDI2-	GBE0_MDI2-	GBE0_MDI2-
P24	GBE_MDI2+	GBE0_MDI2+	GBE0_MDI2+	GBE0_MDI2+
P25	GBE_LINK_ACT#	GBE0_LINK_ACT#	GBE0_LINK_ACT#	GBE0_LINK_ACT#
P26	GBE_MDI1-	GBE0_MDI1-	GBE0_MDI1-	GBE0_MDI1-
P27	GBE_MDI1+	GBE0_MDI1+	GBE0_MDI1+	GBE0_MDI1+
P28	GBE_CTREF	GBE0_CTREF	GBE0_CTREF	GBE0_CTREF
P29	GBE_MDI0-	GBE0_MDI0-	GBE0_MDI0-	GBE0_MDI0-
P30	GBE_MDI0+	GBE0_MDI0+	GBE0_MDI0+	GBE0_MDI0+
P31	SPI0_CS1#	SPI0_CS1#	SPI0_CS1#	SPI0_CS1#
P32	GND	GND	GND	GND
P33	SDIO_WP	SDIO_WP	SDIO_WP	SDIO_WP
P34	SDIO_CMD	SDIO_CMD	SDIO_CMD	SDIO_CMD
P35	SDIO_CD#	SDIO_CD#	SDIO_CD#	SDIO_CD#
P36	SDIO_CK	SDIO_CK	SDIO_CK	SDIO_CK
P37	SDIO_PWR_EN	SDIO_PWR_EN	SDIO_PWR_EN	SDIO_PWR_EN
P38	GND	GND	GND	GND
P39	SDIO_D0	SDIO_D0	SDIO_D0	SDIO_D0
P40	SDIO_D1	SDIO_D1	SDIO_D1	SDIO_D1
P41	SDIO_D2	SDIO_D2	SDIO_D2	SDIO_D2
P42	SDIO_D3	SDIO_D3	SDIO_D3	SDIO_D3
P43	SPI0_CS0#	SPI0_CS0#	SPI0_CS0#	SPI0_CS0#
P44	SPI0_CK	SPI0_CK	SPI0_CK	SPI0_CK
P45	SPI0_DIN	SPI0_DIN	SPI0_DIN	SPI0_DIN
P46	SPI0_DO	SPI0_DO	SPI0_DO	SPI0_DO
P47	GND	GND	GND	GND
P48	SATA_TX+	SATA_TX+	SATA_TX+	SATA_TX+
P49	SATA_TX-	SATA_TX-	SATA_TX-	SATA_TX-
P50	GND	GND	GND	GND
P51	SATA_RX+	SATA_RX+	SATA_RX+	SATA_RX+
P52	SATA_RX-	SATA_RX-	SATA_RX-	SATA_RX-
P53	GND	GND	GND	GND
P54	SPI1_CS0#	SPI1_CS0# / <u>ESPI_CS0#</u>	SPI1_CS0# / ESPI_CS0# / <u>QSPI_CS0#</u>	SPI1_CS0# / ESPI_CS0# / <u>QSPI_CS0#</u>
P55	SPI1_CS1#	SPI1_CS1# / <u>ESPI_CS1#</u>	SPI1_CS1# / ESPI_CS1# / <u>QSPI_CS1#</u>	SPI1_CS1# / ESPI_CS1# / <u>QSPI_CS1#</u>
P56	SPI1_CK	SPI1_CK / <u>ESPI_CK</u>	SPI1_CK / ESPI_CK / <u>QSPI_CK</u>	SPI1_CK / ESPI_CK / <u>QSPI_CK</u>
P57	SPI1_DIN	SPI1_DIN / <u>ESPI_IO_1</u>	SPI1_DIN / ESPI_IO_1 / <u>QSPI_IO_1</u>	SPI1_DIN / ESPI_IO_1 / <u>QSPI_IO_1</u>
P58	SPI1_DO	SPI1_DO / <u>ESPI_IO_0</u>	SPI1_DO / ESPI_IO_0 / <u>QSPI_IO_0</u>	SPI1_DO / ESPI_IO_0 / <u>QSPI_IO_0</u>
P59	GND	GND	GND	GND
P60	USB0+	USB0+	USB0+	USB0+
P61	USB0-	USB0-	USB0-	USB0-
P62	USB0_EN_OC#	USB0_EN_OC#	USB0_EN_OC#	USB0_EN_OC#
P63	USB0_VBUS_DET	USB0_VBUS_DET	USB0_VBUS_DET	USB0_VBUS_DET
P64	USB0_OTG_ID	USB0_OTG_ID	USB0_OTG_ID	USB0_OTG_ID
P65	USB1+	USB1+	USB1+	USB1+
P66	USB1-	USB1-	USB1-	USB1-
P67	USB1_EN_OC#	USB1_EN_OC#	USB1_EN_OC#	USB1_EN_OC#
P68	GND	GND	GND	GND
P69	USB2+	USB2+	USB2+	USB2+
P70	USB2-	USB2-	USB2-	USB2-
P71	USB2_EN_OC#	USB2_EN_OC#	USB2_EN_OC#	USB2_EN_OC#
P72	PCIE_C_PRST#	RSVD	RSVD	RSVD
P73	PCIE_B_PRST#	RSVD	RSVD	RSVD
P74	PCIE_A_PRST#	USB3_EN_OC#	USB3_EN_OC#	USB3_EN_OC#
P75	PCIE_A_RST#	PCIE_A_RST#	PCIE_A_RST#	PCIE_A_RST#
P76	PCIE_C_CKREQ#	USB4_EN_OC#	USB4_EN_OC#	USB4_EN_OC#
P77	PCIE_B_CKREQ#	RSVD	PCIE_B_CKREQ#	PCIE_B_CKREQ#

Pin	SMARC 1.1	SMARC 2.0	SMARC 2.1	SMARC 2.2
P78	PCIE_A_CKREQ#	RSVD	PCIE_A_CKREQ#	PCIE_A_CKREQ#
P79	GND	GND	GND	GND
P80	PCIE_C_REFCK+	PCIE_C_REFCK+	PCIE_C_REFCK+	PCIE_C_REFCK+
P81	PCIE_C_REFCK-	PCIE_C_REFCK-	PCIE_C_REFCK-	PCIE_C_REFCK-
P82	GND	GND	GND	GND
P83	PCIE_A_REFCK+	PCIE_A_REFCK+	PCIE_A_REFCK+	PCIE_A_REFCK+
P84	PCIE_A_REFCK-	PCIE_A_REFCK-	PCIE_A_REFCK-	PCIE_A_REFCK-
P85	GND	GND	GND	GND
P86	PCIE_A_RX+	PCIE_A_RX+	PCIE_A_RX+	PCIE_A_RX+
P87	PCIE_A_RX-	PCIE_A_RX-	PCIE_A_RX-	PCIE_A_RX-
P88	GND	GND	GND	GND
P89	PCIE_A_TX+	PCIE_A_TX+	PCIE_A_TX+	PCIE_A_TX+
P90	PCIE_A_TX-	PCIE_A_TX-	PCIE_A_TX-	PCIE_A_TX-
P91	GND	GND	GND	GND
P92	HDMI_D2+	HDMI_D2+ / DP1_LANE0+	HDMI_D2+ / DP1_LANE0+	HDMI_D2+ / DP1_LANE0+
P93	HDMI_D2-	HDMI_D2- / DP1_LANE0-	HDMI_D2- / DP1_LANE0-	HDMI_D2- / DP1_LANE0-
P94	GND	GND	GND	GND
P95	HDMI_D1+	HDMI_D1+ / DP1_LANE1+	HDMI_D1+ / DP1_LANE1+	HDMI_D1+ / DP1_LANE1+
P96	HDMI_D1-	HDMI_D1- / DP1_LANE1-	HDMI_D1- / DP1_LANE1-	HDMI_D1- / DP1_LANE1-
P97	GND	GND	GND	GND
P98	HDMI_D0+	HDMI_D0+ / DP1_LANE2+	HDMI_D0+ / DP1_LANE2+	HDMI_D0+ / DP1_LANE2+
P99	HDMI_D0-	HDMI_D0- / DP1_LANE2-	HDMI_D0- / DP1_LANE2-	HDMI_D0- / DP1_LANE2-
P100	GND	GND	GND	GND
P101	HDMI_CK+	HDMI_CK+ / DP1_LANE3+	HDMI_CK+ / DP1_LANE3+	HDMI_CK+ / DP1_LANE3+
P102	HDMI_CK-	HDMI_CK- / DP1_LANE3-	HDMI_CK- / DP1_LANE3-	HDMI_CK- / DP1_LANE3-
P103	GND	GND	GND	GND
P104	HDMI_HPD	HDMI_HPD / DP1_HPD	HDMI_HPD / DP1_HPD	HDMI_HPD / DP1_HPD
P105	HDMI_CTRL_CK	HDMI_CTRL_CK / DP1_AUX+	HDMI_CTRL_CK / DP1_AUX+	HDMI_CTRL_CK / DP1_AUX+
P106	HDMI_CTRL_DAT	HDMI_CTRL_DAT / DP1_AUX-	HDMI_CTRL_DAT / DP1_AUX-	HDMI_CTRL_DAT / DP1_AUX-
P107	HDMI_CEC	DP1_AUX_SEL	DP1_AUX_SEL	DP1_AUX_SEL
P108	GPIO0 / CAM0_PWR#	GPIO0 / CAM0_PWR#	GPIO0 / CAM0_PWR#	GPIO0 / CAM0_PWR#
P109	GPIO1 / CAM1_PWR#	GPIO1 / CAM1_PWR#	GPIO1 / CAM1_PWR#	GPIO1 / CAM1_PWR#
P110	GPIO2 / CAM0_RST#	GPIO2 / CAM0_RST#	GPIO2 / CAM0_RST#	GPIO2 / CAM0_RST#
P111	GPIO3 / CAM1_RST#	GPIO3 / CAM1_RST#	GPIO3 / CAM1_RST#	GPIO3 / CAM1_RST#
P112	GPIO4 / HDA_RST#	GPIO4 / HDA_RST#	GPIO4 / HDA_RST#	GPIO4 / HDA_RST#
P113	GPIO5 / PWM_OUT	GPIO5 / PWM_OUT	GPIO5 / PWM_OUT	GPIO5 / PWM_OUT
P114	GPIO6 / TACHIN	GPIO6 / TACHIN	GPIO6 / TACHIN	GPIO6 / TACHIN
P115	GPIO7 / PCAM_FLD	GPIO7	GPIO7	GPIO7
P116	GPIO8 / CAN0_ERR#	GPIO8	GPIO8	GPIO8
P117	GPIO9 / CAN1_ERR#	GPIO9	GPIO9	GPIO9
P118	GPIO10	GPIO10	GPIO10	GPIO10
P119	GPIO11	GPIO11	GPIO11	GPIO11
P120	GND	GND	GND	GND
P121	I2C_PM_CK	I2C_PM_CK	I2C_PM_CK	I2C_PM_CK
P122	I2C_PM_DAT	I2C_PM_DAT	I2C_PM_DAT	I2C_PM_DAT
P123	BOOT_SEL0#	BOOT_SEL0#	BOOT_SEL0#	BOOT_SEL0#
P124	BOOT_SEL1#	BOOT_SEL1#	BOOT_SEL1#	BOOT_SEL1#
P125	BOOT_SEL2#	BOOT_SEL2#	BOOT_SEL2#	BOOT_SEL2#
P126	RESET_OUT#	RESET_OUT#	RESET_OUT#	RESET_OUT#
P127	RESET_IN#	RESET_IN#	RESET_IN#	RESET_IN#
P128	POWER_BTN#	POWER_BTN#	POWER_BTN#	POWER_BTN#
P129	SER0_TX	SER0_TX	SER0_TX	SER0_TX
P130	SER0_RX	SER0_RX	SER0_RX	SER0_RX
P131	SER0_RTS#	SER0_RTS#	SER0_RTS#	SER0_RTS#
P132	SER0_CTS#	SER0_CTS#	SER0_CTS#	SER0_CTS#
P133	GND	GND	GND	GND
P134	SER1_TX	SER1_TX	SER1_TX	SER1_TX
P135	SER1_RX	SER1_RX	SER1_RX	SER1_RX
P136	SER2_TX	SER2_TX	SER2_TX	SER2_TX
P137	SER2_RX	SER2_RX	SER2_RX	SER2_RX
P138	SER2_RTS#	SER2_RTS#	SER2_RTS#	SER2_RTS#
P139	SER2_CTS#	SER2_CTS#	SER2_CTS#	SER2_CTS#
P140	SER3_TX	SER3_TX	SER3_TX	SER3_TX
P141	SER3_RX	SER3_RX	SER3_RX	SER3_RX
P142	GND	GND	GND	GND
P143	CAN0_TX	CAN0_TX	CAN0_TX	CAN0_TX
P144	CAN0_RX	CAN0_RX	CAN0_RX	CAN0_RX
P145	CAN1_TX	CAN1_TX	CAN1_TX	CAN1_TX
P146	CAN1_RX	CAN1_RX	CAN1_RX	CAN1_RX
P147	VDD_IN	VDD_IN	VDD_IN	VDD_IN
P148	VDD_IN	VDD_IN	VDD_IN	VDD_IN
P149	VDD_IN	VDD_IN	VDD_IN	VDD_IN
P150	VDD_IN	VDD_IN	VDD_IN	VDD_IN
P151	VDD_IN	VDD_IN	VDD_IN	VDD_IN
P152	VDD_IN	VDD_IN	VDD_IN	VDD_IN
P153	VDD_IN	VDD_IN	VDD_IN	VDD_IN
P154	VDD_IN	VDD_IN	VDD_IN	VDD_IN
P155	VDD_IN	VDD_IN	VDD_IN	VDD_IN
P156	VDD_IN	VDD_IN	VDD_IN	VDD_IN
S1	PCAM_VSYNC	CSI1_TX+ / I2C_CAM1_CK	CSI1_TX+ / I2C_CAM1_CK	CSI1_TX+ / I2C_CAM1_CK
S2	PCAM_HSYNC	CSI1_TX- / I2C_CAM1_DAT	CSI1_TX- / I2C_CAM1_DAT	CSI1_TX- / I2C_CAM1_DAT
S3	GND	GND	GND	GND

Pin	SMARC 1.1	SMARC 2.0	SMARC 2.1	SMARC 2.2
S4	PCAM_PXL_CK0	RSVD	RSVD	RSVD
S5	I2C_CAM_CK	I2C_CAM0_CK / CSIO_TX+	I2C_CAM0_CK / CSIO_TX+	I2C_CAM0_CK / CSIO_TX+
S6	CAM_MCK	CAM_MCK	CAM_MCK	CAM_MCK
S7	I2C_CAM_DAT	I2C_CAM0_DAT / CSIO_TX-	I2C_CAM0_DAT / CSIO_TX-	I2C_CAM0_DAT / CSIO_TX-
S8	CSIO_CK+ / PCAM_D10	CSIO_CK+	CSIO_CK+	CSIO_CK+
S9	CSIO_CK- / PCAM_D11	CSIO_CK-	CSIO_CK-	CSIO_CK-
S10	GND	GND	GND	GND
S11	CSIO_D0+ / PCAM_D12	CSIO_RX0+	CSIO_RX0+	CSIO_RX0+
S12	CSIO_D0- / PCAM_D13	CSIO_RX0-	CSIO_RX0-	CSIO_RX0-
S13	GND	GND	GND	GND
S14	CSIO_D1+ / PCAM_D14	CSIO_RX1+	CSIO_RX1+	CSIO_RX1+
S15	CSIO_D1- / PCAM_D15	CSIO_RX1-	CSIO_RX1-	CSIO_RX1-
S16	GND	GND	GND	GND
S17	AFB0_OUT	GBE1_MDI0+	GBE1_MDI0+	GBE1_MDI0+
S18	AFB1_OUT	GBE1_MDI0-	GBE1_MDI0-	GBE1_MDI0-
S19	AFB2_OUT	GBE1_LINK100#	GBE1_LINK100#	GBE1_LINK_MID#
S20	AFB3_IN	GBE1_MDI1+	GBE1_MDI1+	GBE1_MDI1+
S21	AFB4_IN	GBE1_MDI1-	GBE1_MDI1-	GBE1_MDI1-
S22	AFB5_IN	GBE1_LINK1000#	GBE1_LINK1000#	GBE1_LINK_MAX#
S23	AFB6_PTIO	GBE1_MDI2+	GBE1_MDI2+	GBE1_MDI2+
S24	AFB7_PTIO	GBE1_MDI2-	GBE1_MDI2-	GBE1_MDI2-
S25	GND	GND	GND	GND
S26	SDMMC_D0	GBE1_MDI3+	GBE1_MDI3+	GBE1_MDI3+
S27	SDMMC_D1	GBE1_MDI3-	GBE1_MDI3-	GBE1_MDI3-
S28	SDMMC_D2	GBE1_CTREF	GBE1_CTREF	GBE1_CTREF
S29	SDMMC_D3	PCIE_D_TX+	PCIE_D_TX+ / SERDES_0_T X+	PCIE_D_TX+ / SERDES_0_TX+
S30	SDMMC_D4	PCIE_D_TX-	PCIE_D_TX- / SERDES_0_T X-	PCIE_D_TX- / SERDES_0_TX-
S31	SDMMC_D5	GBE1_LINK_ACT#	GBE1_LINK_ACT#	GBE1_LINK_ACT#
S32	SDMMC_D6	PCIE_D_RX+	PCIE_D_RX+ / SERDES_0_RX+	PCIE_D_RX+ / SERDES_0_RX+
S33	SDMMC_D7	PCIE_D_RX-	PCIE_D_RX- / SERDES_0_RX-	PCIE_D_RX- / SERDES_0_RX-
S34	GND	GND	GND	GND
S35	SDMMC_CK	USB4+	USB4+	USB4+
S36	SDMMC_CMD	USB4-	USB4-	USB4-
S37	SDMMC_RST#	USB3_VBUS_DET	USB3_VBUS_DET	USB3_VBUS_DET
S38	AUDIO_MCK	AUDIO_MCK	AUDIO_MCK	AUDIO_MCK
S39	I2S0_LRCK	I2S0_LRCK	I2S0_LRCK	I2S0_LRCK
S40	I2S0_SDOUT	I2S0_SDOUT	I2S0_SDOUT	I2S0_SDOUT
S41	I2S0_SDIN	I2S0_SDIN	I2S0_SDIN	I2S0_SDIN
S42	I2S0_CK	I2S0_CK	I2S0_CK	I2S0_CK
S43	I2S1_LRCK	ESPI_ALERT0#	ESPI_ALERT0#	ESPI_ALERT0#
S44	I2S1_SDOUT	ESPI_ALERT1#	ESPI_ALERT1#	ESPI_ALERT1#
S45	I2S1_SDIN	RSVD	MDIO_CLK	MDIO_CLK
S46	I2S1_CK	RSVD	MDIO_DAT	MDIO_DAT
S47	GND	GND	GND	GND
S48	I2C_GP_CK	I2C_GP_CK	I2C_GP_CK	I2C_GP_CK
S49	I2C_GP_DAT	I2C_GP_DAT	I2C_GP_DAT	I2C_GP_DAT
S50	I2S2_LRCK	I2S2_LRCK / HDA_SYNC	I2S2_LRCK / HDA_SYNC	I2S2_LRCK / HDA_SYNC / SNDW_CLK1
S51	I2S2_SDOUT	I2S2_SDOUT / HDA_SDO	I2S2_SDOUT / HDA_SDO	I2S2_SDOUT / HDA_SDO / SNDW_DAT1
S52	I2S2_SDIN	I2S2_SDIN / HDA_SDI	I2S2_SDIN / HDA_SDI	I2S2_SDIN / HDA_SDI / SNDW_DAT0
S53	I2S2_CK	I2S2_CK / HDA_CK	I2S2_CK / HDA_CK	I2S2_CK / HDA_CK / SNDW_CLK0
S54	SATA_ACT#	SATA_ACT#	SATA_ACT#	SATA_ACT#
S55	AFB8_PTIO	USB5_EN_OC#	USB5_EN_OC#	USB5_EN_OC#
S56	AFB9_PTIO	ESPI_IO_2	ESPI_IO_2 / QSPI_IO_2	ESPI_IO_2 / QSPI_IO_2
S57	PCAM_ON_CSI0#	ESPI_IO_3	ESPI_IO_3 / QSPI_IO_3	ESPI_IO_3 / QSPI_IO_3
S58	PCAM_ON_CSI1#	ESPI_RESET#	ESPI_RESET#	ESPI_RESET#
S59	SPDIF_OUT	USB5+	USB5+	USB5+
S60	SPDIF_IN	USB5-	USB5-	USB5-
S61	GND	GND	GND	GND
S62	AFB_DIFF0+	USB3_SSTX+	USB3_SSTX+	USB3_SSTX+
S63	AFB_DIFF0-	USB3_SSTX-	USB3_SSTX-	USB3_SSTX-
S64	GND	GND	GND	GND
S65	AFB_DIFF1+	USB3_SSRX+	USB3_SSRX+	USB3_SSRX+
S66	AFB_DIFF1-	USB3_SSRX-	USB3_SSRX-	USB3_SSRX-
S67	GND	GND	GND	GND
S68	AFB_DIFF2+	USB3+	USB3+	USB3+
S69	AFB_DIFF2-	USB3-	USB3-	USB3-
S70	GND	GND	GND	GND
S71	AFB_DIFF3+	USB2_SSTX+	USB2_SSTX+	USB2_SSTX+
S72	AFB_DIFF3-	USB2_SSTX-	USB2_SSTX-	USB2_SSTX-
S73	GND	GND	GND	GND
S74	AFB_DIFF4+	USB2_SSRX+	USB2_SSRX+	USB2_SSRX+
S75	AFB_DIFF4-	USB2_SSRX-	USB2_SSRX-	USB2_SSRX-
S76	PCIE_B_RST#	PCIE_B_RST#	PCIE_B_RST#	PCIE_B_RST#
S77	PCIE_C_RST#	PCIE_C_RST#	PCIE_C_RST#	PCIE_C_RST#
S78	PCIE_C_RX+	PCIE_C_RX+	PCIE_C_RX+ / SERDES_1_RX+	PCIE_C_RX+ / SERDES_1_RX+

Pin	SMARC 1.1	SMARC 2.0	SMARC 2.1	SMARC 2.2
S79	PCIE_C_RX-	PCIE_C_RX-	PCIE_C_RX- / SERDES 1 R X-	PCIE_C_RX- / SERDES 1 RX-
S80	GND	GND	GND	GND
S81	PCIE_C_TX+	PCIE_C_TX+	PCIE_C_TX+ / SERDES 1 T X+	PCIE_C_TX+ / SERDES 1 TX+
S82	PCIE_C_TX-	PCIE_C_TX-	PCIE_C_TX- / SERDES 1 T X-	PCIE_C_TX- / SERDES 1 TX-
S83	GND	GND	GND	GND
S84	PCIE_B_REFCK+	PCIE_B_REFCK+	PCIE_B_REFCK+	PCIE_B_REFCK+
S85	PCIE_B_REFCK-	PCIE_B_REFCK-	PCIE_B_REFCK-	PCIE_B_REFCK-
S86	GND	GND	GND	GND
S87	PCIE_B_RX+	PCIE_B_RX+	PCIE_B_RX+	PCIE_B_RX+
S88	PCIE_B_RX-	PCIE_B_RX-	PCIE_B_RX-	PCIE_B_RX-
S89	GND	GND	GND	GND
S90	PCIE_B_TX+	PCIE_B_TX+	PCIE_B_TX+	PCIE_B_TX+
S91	PCIE_B_TX-	PCIE_B_TX-	PCIE_B_TX-	PCIE_B_TX-
S92	GND	GND	GND	GND
S93	LCD_D0	DP0_LANE0+	DP0_LANE0+	DP0_LANE0+
S94	LCD_D1	DP0_LANE0-	DP0_LANE0-	DP0_LANE0-
S95	LCD_D2	DP0_AUX_SEL	DP0_AUX_SEL	DP0_AUX_SEL
S96	LCD_D3	DP0_LANE1+	DP0_LANE1+	DP0_LANE1+
S97	LCD_D4	DP0_LANE1-	DP0_LANE1-	DP0_LANE1-
S98	LCD_D5	DP0_HPD	DP0_HPD	DP0_HPD
S99	LCD_D6	DP0_LANE2+	DP0_LANE2+	DP0_LANE2+
S100	LCD_D7	DP0_LANE2-	DP0_LANE2-	DP0_LANE2-
S101	GND	GND	GND	GND
S102	LCD_D8	DP0_LANE3+	DP0_LANE3+	DP0_LANE3+
S103	LCD_D9	DP0_LANE3-	DP0_LANE3-	DP0_LANE3-
S104	LCD_D10	USB3_OTG_ID	USB3_OTG_ID	USB3_OTG_ID
S105	LCD_D11	DP0_AUX+	DP0_AUX+	DP0_AUX+
S106	LCD_D12	DP0_AUX-	DP0_AUX-	DP0_AUX-
S107	LCD_D13	LCD1_BKLT_EN	LCD1_BKLT_EN	LCD1_BKLT_EN
S108	LCD_D14	LVDS1_CK+ / eDP1_AUX+ / DS11_CLK+	LVDS1_CK+ / eDP1_AUX+ / DS11_CLK+	LVDS1_CK+ / eDP1_AUX+ / DS11_CLK+
S109	LCD_D15	LVDS1_CK- / eDP1_AUX- / DS11_CLK-	LVDS1_CK- / eDP1_AUX- / DS11_CLK-	LVDS1_CK- / eDP1_AUX- / DS11_CLK-
S110	GND	GND	GND	GND
S111	LCD_D16	LVDS1_0+ / eDP1_TX0+ / DS11_D0+	LVDS1_0+ / eDP1_TX0+ / DS11_D0+	LVDS1_0+ / eDP1_TX0+ / DS11_D0+
S112	LCD_D17	LVDS1_0- / eDP1_TX0- / DS11_D0-	LVDS1_0- / eDP1_TX0- / DS11_D0-	LVDS1_0- / eDP1_TX0- / DS11_D0-
S113	LCD_D18	eDP1_HPD	eDP1_HPD / DS11_TE	eDP1_HPD / DS11_TE
S114	LCD_D19	LVDS1_1+ / eDP1_TX1+ / DS11_D1+	LVDS1_1+ / eDP1_TX1+ / DS11_D1+	LVDS1_1+ / eDP1_TX1+ / DS11_D1+
S115	LCD_D20	LVDS1_1- / eDP1_TX1- / DS11_D1-	LVDS1_1- / eDP1_TX1- / DS11_D1-	LVDS1_1- / eDP1_TX1- / DS11_D1-
S116	LCD_D21	LCD1_VDD_EN	LCD1_VDD_EN	LCD1_VDD_EN
S117	LCD_D22	LVDS1_2+ / eDP1_TX2+ / DS11_D2+	LVDS1_2+ / eDP1_TX2+ / DS11_D2+	LVDS1_2+ / eDP1_TX2+ / DS11_D2+
S118	LCD_D23	LVDS1_2- / eDP1_TX2- / DS11_D2-	LVDS1_2- / eDP1_TX2- / DS11_D2-	LVDS1_2- / eDP1_TX2- / DS11_D2-
S119	GND	GND	GND	GND
S120	LCD_DE	LVDS1_3+ / eDP1_TX3+ / DS11_D3+	LVDS1_3+ / eDP1_TX3+ / DS11_D3+	LVDS1_3+ / eDP1_TX3+ / DS11_D3+
S121	LCD_VS	LVDS1_3- / eDP1_TX3- / DS11_D3-	LVDS1_3- / eDP1_TX3- / DS11_D3-	LVDS1_3- / eDP1_TX3- / DS11_D3-
S122	LCD_HS	LCD1_BKLT_PWM	LCD1_BKLT_PWM	LCD1_BKLT_PWM
S123	LCD_PCK	RSVD	GPIO13	GPIO13
S124	GND	GND	GND	GND
S125	LVDS0+	LVDS0_0+ / eDP0_TX0+ / DS10_D0+	LVDS0_0+ / eDP0_TX0+ / DS10_D0+	LVDS0_0+ / eDP0_TX0+ / DS10_D0+
S126	LVDS0-	LVDS0_0- / eDP0_TX0- / DS10_D0-	LVDS0_0- / eDP0_TX0- / DS10_D0-	LVDS0_0- / eDP0_TX0- / DS10_D0-
S127	LCD_BKLT_EN	LCD0_BKLT_EN	LCD0_BKLT_EN	LCD0_BKLT_EN
S128	LVDS1+	LVDS0_1+ / eDP0_TX1+ / DS10_D1+	LVDS0_1+ / eDP0_TX1+ / DS10_D1+	LVDS0_1+ / eDP0_TX1+ / DS10_D1+
S129	LVDS1-	LVDS0_1- / eDP0_TX1- / DS10_D1-	LVDS0_1- / eDP0_TX1- / DS10_D1-	LVDS0_1- / eDP0_TX1- / DS10_D1-
S130	GND	GND	GND	GND
S131	LVDS2+	LVDS0_2+ / eDP0_TX2+ / DS10_D2+	LVDS0_2+ / eDP0_TX2+ / DS10_D2+	LVDS0_2+ / eDP0_TX2+ / DS10_D2+
S132	LVDS2-	LVDS0_2- / eDP0_TX2- / DS10_D2-	LVDS0_2- / eDP0_TX2- / DS10_D2-	LVDS0_2- / eDP0_TX2- / DS10_D2-
S133	LCD_VDD_EN	LCD0_VDD_EN	LCD0_VDD_EN	LCD0_VDD_EN
S134	LVDS_CK+	LVDS0_CK+ / eDP0_AUX+ / DS10_CLK+	LVDS0_CK+ / eDP0_AUX+ / DS10_CLK+	LVDS0_CK+ / eDP0_AUX+ / DS10_CLK+
S135	LVDS_CK-	LVDS0_CK- / eDP0_AUX- / DS10_CLK-	LVDS0_CK- / eDP0_AUX- / DS10_CLK-	LVDS0_CK- / eDP0_AUX- / DS10_CLK-
S136	GND	GND	GND	GND
S137	LVDS3+	LVDS0_3+ / eDP0_TX3+ / DS10_D3+	LVDS0_3+ / eDP0_TX3+ / DS10_D3+	LVDS0_3+ / eDP0_TX3+ / DS10_D3+
S138	LVDS3-	LVDS0_3- / eDP0_TX3- / DS10_D3-	LVDS0_3- / eDP0_TX3- / DS10_D3-	LVDS0_3- / eDP0_TX3- / DS10_D3-
S139	I2C_LCD_CK	I2C_LCD_CK	I2C_LCD_CK	I2C_LCD_CK
S140	I2C_LCD_DAT	I2C_LCD_DAT	I2C_LCD_DAT	I2C_LCD_DAT

Pin	SMARC 1.1	SMARC 2.0	SMARC 2.1	SMARC 2.2
S141	LCD BKLT PWM	LCD0 BKLT PWM	LCD0 BKLT PWM	LCD0 BKLT PWM
S142	RSVD	RSVD	GPIO12	GPIO12
S143	GND	GND	GND	GND
S144	RSVD / EDP HPD	eDP0 HPD	eDP0 HPD / DSI0 TE	eDP0 HPD / DSI0 TE
S145	WDT_TIME_OUT#	WDT_TIME_OUT#	WDT_TIME_OUT#	WDT_TIME_OUT#
S146	PCIE_WAKE#	PCIE_WAKE#	PCIE_WAKE#	PCIE_WAKE#
S147	VDD_RTC	VDD_RTC	VDD_RTC	VDD_RTC
S148	LID#	LID#	LID#	LID#
S149	SLEEP#	SLEEP#	SLEEP#	SLEEP#
S150	VIN_PWR_BAD#	VIN_PWR_BAD#	VIN_PWR_BAD#	VIN_PWR_BAD#
S151	CHARGING#	CHARGING#	CHARGING#	CHARGING#
S152	CHARGER_PRSENT#	CHARGER_PRSENT#	CHARGER_PRSENT#	CHARGER_PRSENT#
S153	CARRIER_STBY#	CARRIER_STBY#	CARRIER_STBY#	CARRIER_STBY#
S154	CARRIER_PWR_ON	CARRIER_PWR_ON	CARRIER_PWR_ON	CARRIER_PWR_ON
S155	FORCE_RECOV#	FORCE_RECOV#	FORCE_RECOV#	FORCE_RECOV#
S156	BATLOW#	BATLOW#	BATLOW#	BATLOW#
S157	TEST#	TEST#	TEST#	TEST#
S158	GND	GND	GND	GND