



USER MANUAL

# VIA SOM-7000

Fanless and low-power Edge AI platform with  
MediaTek Genio 1200 Octa-Core processor



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## Regulatory Compliance

### FCC-A Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his personal expense.

#### Notice 1

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

#### Notice 2

Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

#### Notice 3

The product described in this document is designed for general use, VIA Technologies assumes no responsibility for the conflicts or damages arising from incompatibility of the product. Check compatibility issue with your local sales representatives before placing an order.



## Battery Recycling and Disposal

- Only use the appropriate battery specified for this product.
- Do not re-use, recharge, or reheat an old battery.
- Do not attempt to force open the battery.
- Do not discard used batteries with regular trash.
- Discard used batteries according to local regulations.



## Safety Precautions

- Always read the safety instructions carefully.
- Keep this document for future reference.
- All cautions and warnings on the equipment should be noted.
- Keep this equipment away from humidity.
- Put this equipment on a reliable flat surface before setting it up.
- Check the voltage of the power source and adjust to 110/220V before connecting the equipment to the power inlet.
- Do not place the power cord where people will step on it.
- Always unplug the power cord before inserting any add-on card or module.
- If any of the following situations arise, get the equipment checked by authorized service personnel:
  - The power cable is damaged.
  - Liquid has entered into the equipment.
  - The equipment has been exposed to moisture.
  - The equipment is faulty or you cannot get it work according to User's Manual.
  - The equipment has been dropped and damaged.
  - The equipment has an obvious sign of breakage.
- Do not leave this equipment in extreme temperatures or in a storage temperature above 60°C (140°F). The equipment may be damaged.
- Do not leave this equipment in direct sunlight.
- Never pour any liquid into the opening. Liquid can cause damage or electrical shock.
- Do not place anything over the power cable.
- Do not cover the ventilation holes. The openings on the enclosure protect the equipment from overheating.

## Packing List

### Items for STK-SOM700-00A0

- 1 x VIA SOM-7000 module
- 1 x VIA SOMDB7 carrier board
- 1 x 7" MIPI LCD and touch panel
- 3 x Wi-Fi antennas
- 1 x 5MP CMOS sensor camera module
- 1 x Heatsink
- 1 x Audio cable
- 1 x Power cable
- 1 x Debug console cable
- 1 x 12V AC power adapter

## Ordering Information

| Part Number     | SoC Frequency                                     | Description                                                                                                                                                                     |
|-----------------|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10GPZ22M30020   | MediaTek Genio 1200 Octa-Core SoC @ 2.2GHz/2.0GHz | VIA SOM-7000 module with 2.2/2.0GHz MediaTek Genio 1200 Octa-Core SoC, 16GB eMMC, 8GB LPDDR4X SDRAM, CSI, audio (headphone out and MIC-in), Wi-Fi 6, 3 antenna I-PEX connectors |
| STK-SOM700-00A0 |                                                   | VIA SOM-7000 Evaluation Kit with VIA SOM-7000 module, VIA SOMDB7 reference carrier board and accessory kit                                                                      |

## Optional Accessories

### Wireless Module Options

| Part Number    | Description                                                       |
|----------------|-------------------------------------------------------------------|
| EMIO-2576-00A0 | 4G LTE mobile broadband M.2 module with two antennas and assembly |

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# 1. Product Overview

Accelerate your time-to-market for groundbreaking Edge AI devices with the feature-rich VIA SOM-7000 Edge AI module. Propelled by four powerful ARM Cortex® A78 cores (up to 2.2GHz) and four ultra-efficient ARM Cortex® A55 cores (up to 2.0GHz) of the MediaTek Genio 1200 premium IoT SoC, the VIA SOM-7000 module delivers exceptional seamless computing, networking, graphics and AI processing performance, plus multiple 4K display support and I/O peripheral integration capabilities on a fanless module. A highly responsive and low energy AI processor and HiFi audio DSP are also integrated in the SoC for demanding deep learning, neural network acceleration, computer vision, digital assistant, and intelligent speech/audio applications.

With SMARC 2.11 dimensions of just 8.2cm x 8cm (3.22" x 3.15"), the VIA SOM-7000 Edge AI module features onboard 8GB LPDDR4X SDRAM and 16GB eMMC flash memory. Multimedia capabilities include hardware-accelerated H.265/H.264 4K video processing, and support for capacitive touch panels, MIPI DSI/LVDS/HDMI displays, and MIPI CSI cameras – making it the ideal solution for an unlimited array of smart home, interactive retail, industrial, commercial, and educational applications.

High-speed network connectivity is delivered through integrated dual-band Wi-Fi 6. With the VIA SOMDB7 carrier board, the VIA SOM-5000 module also supports Gigabit Ethernet, 4G LTE/5G mobile broadband, a PCIe card, USB 3.1 hosts, I/O expansion (through ADC and GPIO pins), and a MicroSD card.

To boost Edge AI application development, the VIA SOM-7000 module comes with a Linux BSP that supports the Android 13.0, Yocto 4.0, and Debian 12 operating systems. Other features of the BSP include a toolchain to make adjustments to the kernel, and to support the VIA SOMDB7 carrier board I/O and other hardware features.

## 1.1 Key Features

- Powerful and ultra-efficient 2.2GHz/2.0GHz MediaTek Genio 1200 Octa-Core Premium IoT SoC
- Highly responsive and low energy AI processor and audio DSP for demanding deep learning, neural network acceleration, computer vision, intelligent speech/audio applications
- SMARC 2.11 form factor
- Onboard 8GB LPDDR4X SDRAM and 16GB eMMC flash memory
- Dual-band Wi-Fi 6
- Hardware accelerated H.265/H.264 4K video processing with high frame rates
- Supports audio devices, capacitive touch panels, MIPI DSI/LVDS/HDMI displays, MIPI CSI cameras
- Carrier Board available to support Gigabit Ethernet and 4G LTE/5G mobile broadband, a PCIe card, USB 3.1 hosts, I/O expansion (through ADC and GPIO pins), MicroSD card
- Supports the Android 13, Yocto 4.0, and Debian 12 operating systems
- Suitable for portable applications

## 1.2 Product Specifications

### Processor

- MediaTek Genio 1200 Octa-Core SoC
  - Four Cortex-A78 @ 2.2GHz
  - Four Cortex A55 @ 2.0GHz

### System Memory

- 8GB LPDDR4X SDRAM (2 x LPDDR4X)

### Storage

- 16GB eMMC Flash Memory

### Graphics

- ARM Mali-G57 MC5 High Performance GPU
- 3D graphics accelerator capable of processing 17600M pixel/sec @ 880MHz
- Graphics engine supporting OpenGL® ES 3.2, OpenCL ES 2.0, and Vulkan 1.1 hardware acceleration
- Supports H.265 and H.264 video decoding up to 4K@90fps and video encoding up to 4K@60fps

### AI Processor

- 2 x MediaTek Deep Learning Accelerators (MDLA) 3.0 and 2 x Cadence® Tensilica® Vision P6 NPUs (supports up to 4.8 TOPS)

### Audio

- Cadence® Tensilica® HiFi 4 DSP
- MediaTek MT6365

### Wireless Connectivity

- MediaTek MT7921
  - Dual-band Wi-Fi 6 with MU-MIMO

### Ethernet

- Realtek RTL8211F(I)-CG Gigabit Ethernet Transceiver

### HDMI

- Integrated HDMI 2.0 Transmitter

### Supported I/O

- 2 x 4-Lane MIPI DSI
- 1 x HDMI 2.0
- 1 x Display Port
- 2 x MIPI CSI-2 (1 x 4-Lane, 1 x 2-Lane)
- 1 x USB 3.1
- 3 x USB 2.0
- 1 x GLAN
- 1 x SPI
- 1 x I2S
- 6 x I2C (including I2C for HDMI)
- 2 x UART
- 1 x PCIe (2-Lane)
- 1 x SDIO
- 12 x GPIO
- 1 x 5V DC-in

### Onboard I/O

- 1 x 4-Lane MIPI CSI-2 connector
- 3 x I-PEX connectors for antennas
- Audio connector for Headphone out and MIC-in

### Operating System

- Android 13, Yocto 4.0, Debian 12

### System Monitoring and Management

- Watchdog Timer, System Management, Boot Select

### Operating Temperature

- 0°C ~ 60°C

### Operating Humidity

- 0% ~ 95% (relative humidity ; non-condensing)

### Form Factor

- SMARC 2.11 (82mm x 80mm, 3.22" x 3.15")

### Compliance

- CE, FCC, TELEC, UKCA



#### Notes:

1. As the operating temperature provided in the specifications is a result of testing performed in a testing chamber, and a number of variables can influence this result. Please note that the working temperature may vary depending on the actual situation and environment. It is highly recommended to execute a solid testing program and take all variables into consideration when building the system. Please ensure that the system is stable under the required operating temperature in terms of the target application.
2. Please note that the lifespan of the onboard eMMC memory chip may vary depending on the amount of access. More frequent and larger data access on the eMMC memory will shorten its lifespan. It is highly recommended to use a replaceable external storage (e.g., MicroSD card) for large data access.

## 1.3 Layout Diagram

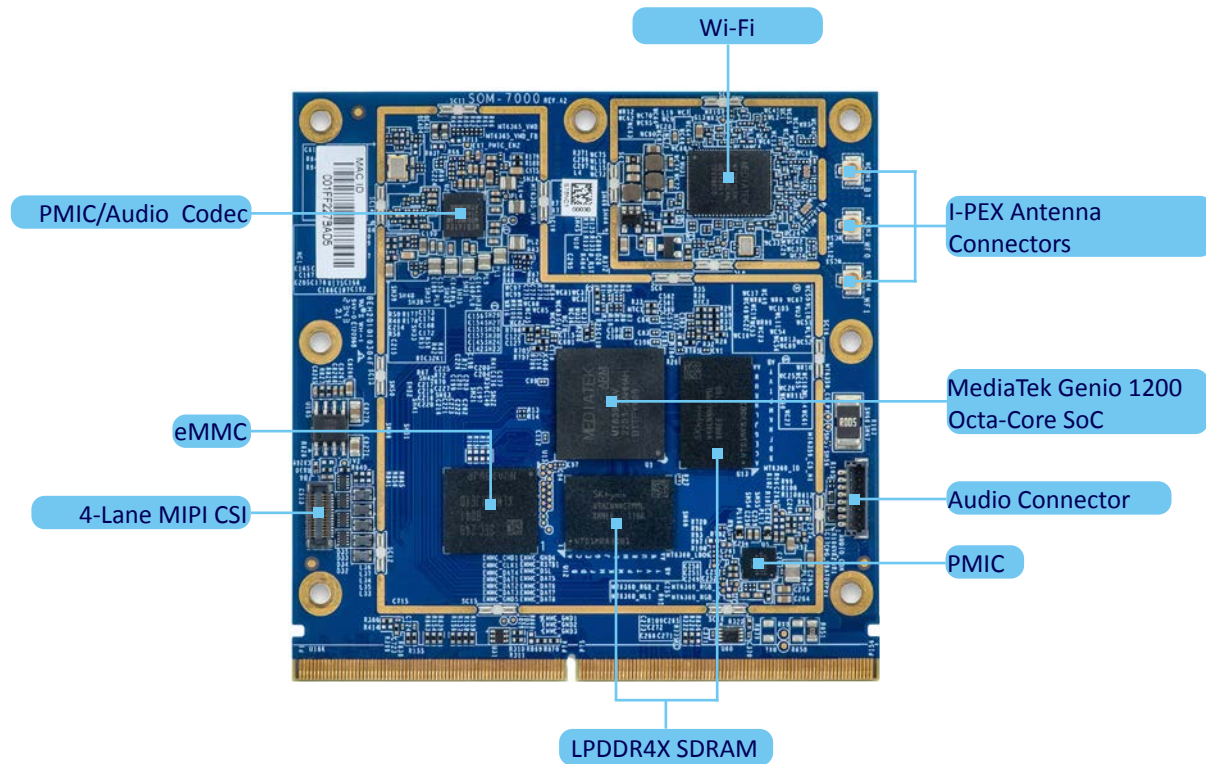


Figure 01: VIA SOM-7000 module top I/O

## 1.4 Product Dimensions

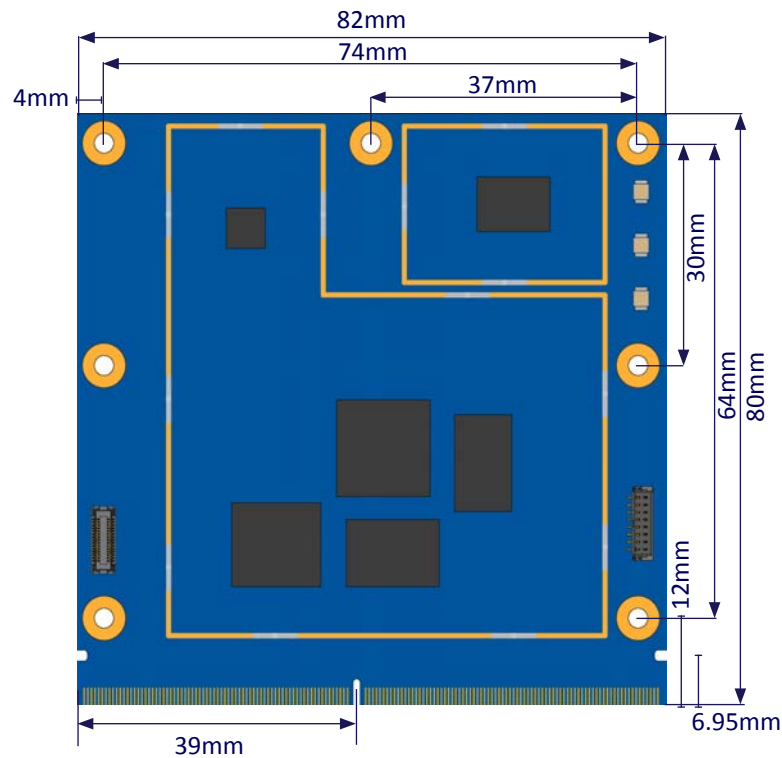


Figure 02: Dimensions of the VIA SOM-7000 module (top I/O)

## 2. Onboard I/O Connectors

### 2.1 4-Lane MIPI CSI Connector

The VIA SOM-7000 module is equipped with a 4-lane MIPI CSI connector labeled 'CSI3', which can be used for connecting a 2-lane or 4-lane MIPI CSI camera. The pinouts of the MIPI CSI connector are shown below.

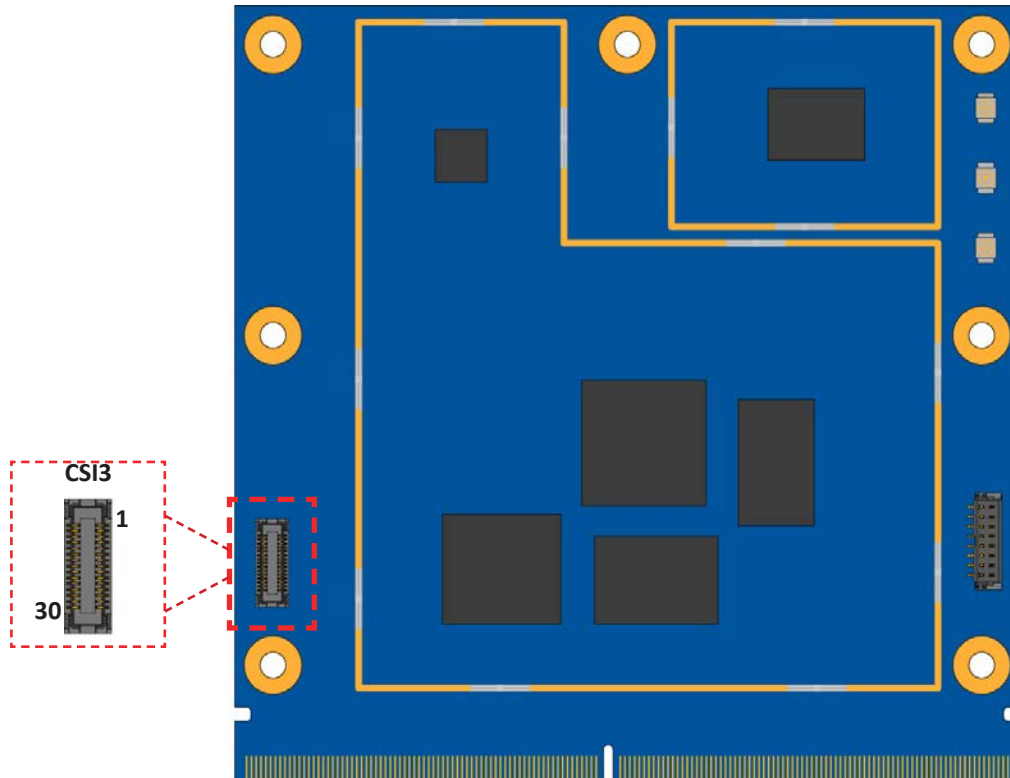


Figure 03: MIPI CSI connector 'CSI3'



**Note:**

The 4-lane MIPI CSI connector currently only supports the SONY IMX258 CMOS Image Sensor.

| CSI3 |           |     |            |     |              |
|------|-----------|-----|------------|-----|--------------|
| Pin  | Signal    | Pin | Signal     | Pin | Signal       |
| 1    | XCLK      | 11  | DGND       | 21  | AF AVDD 2.8V |
| 2    | DGND      | 12  | MDP3       | 22  | MDN0         |
| 3    | Reset     | 13  | SCL        | 23  | AFGND        |
| 4    | MDN2      | 14  | DGND       | 24  | MDP0         |
| 5    | NC        | 15  | SDA        | 25  | DVDD 1.2V    |
| 6    | MDP2      | 16  | MCN        | 26  | DGND         |
| 7    | DOVDD1.8V | 17  | DGND       | 27  | NC           |
| 8    | DGND      | 18  | MCP        | 28  | MDN1         |
| 9    | AGND      | 19  | PAVDD 2.8V | 29  | DGND         |
| 10   | MDN3      | 20  | DGND       | 30  | MDP1         |

Table 01: MIPI CSI connector 'CSI3' pinouts

## 2.2 I-PEX Antenna Connectors

The VIA SOM-7000 module comes with three I-PEX antenna connectors, labeled 'WCON1 BT', 'WCON3 WF0', and 'WCON4 WF1'. The diagram of the I-PEX antenna connectors is shown below.

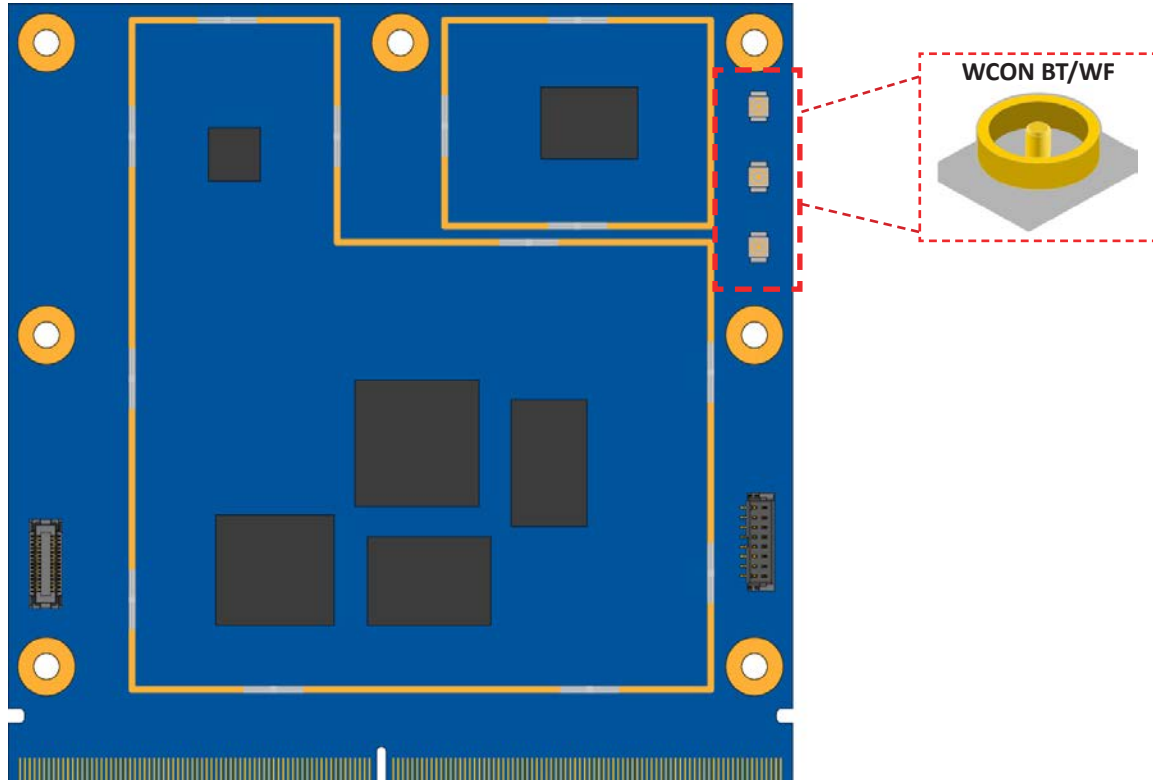


Figure 04: I-PEX antenna connectors

## 2.3 Audio-Out Connector

The VIA SOM-7000 module is equipped with a stereo audio-out connector labeled 'AUDIO\_CON'. The audio cable provided in the VIA SOM-7000 Evaluation Kit is plugged into this connector and the VIA SOMDB7 reference carrier board's audio-in connector.


**Note:**

See [Appendix section A.6.2](#) for information on the VIA SOMDB7 reference carrier board's audio-in connector.

The pinouts of the audio-out connector are shown below.

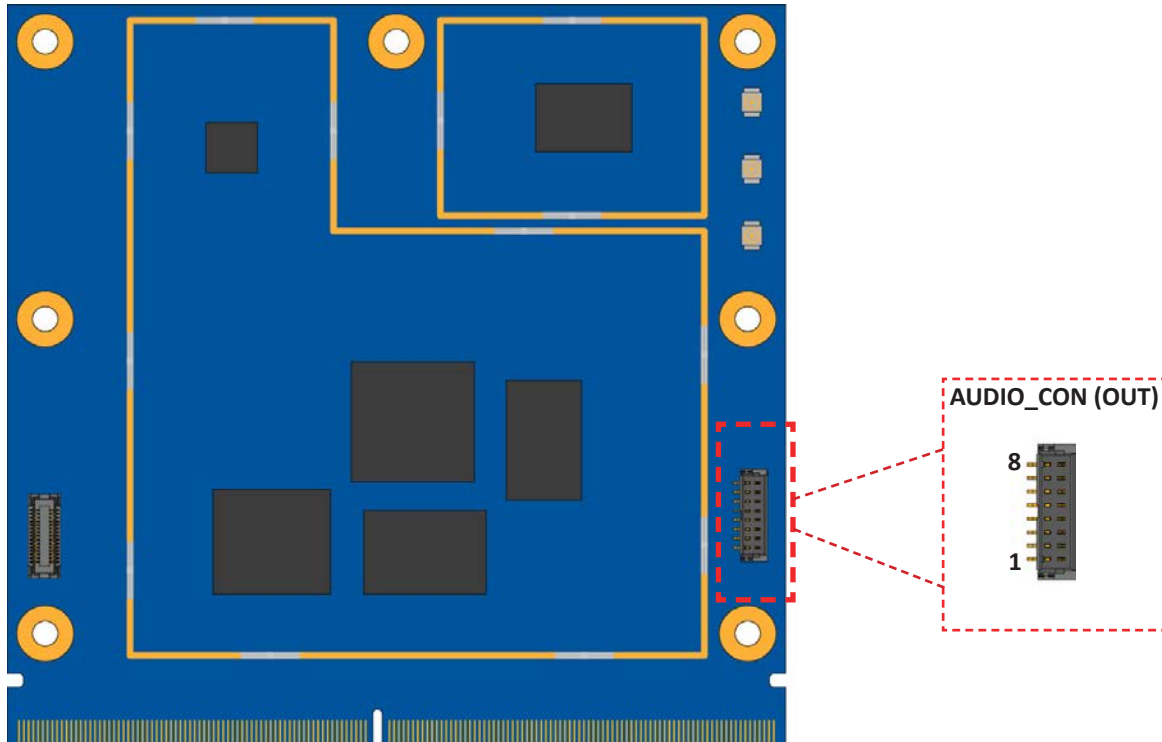


Figure 05: Audio-out connector 'AUDIO\_CON'

| AUDIO_CON (OUT) |            |
|-----------------|------------|
| Pin             | Signal     |
| 1               | AVSS30_AUD |
| 2               | EAR_MIC_N  |
| 3               | EAR_MIC_P  |
| 4               | D_GND      |
| 5               | AU_HP_R    |
| 6               | AU_REFN    |
| 7               | AU_HP_L    |
| 8               | HP_EINT    |

Table 02: Audio-out connector 'AUDIO\_CON' pinouts



## 3. Hardware Installation

### 3.1 Installing the VIA SOM-7000 Module on the Carrier Board

#### Step 1

Align the VIA SOM-7000 module's notch with the notch of the MXM 3.0 connector on the VIA SOMDB7 carrier board, and insert the VIA SOM-7000 module at a 30° angle.

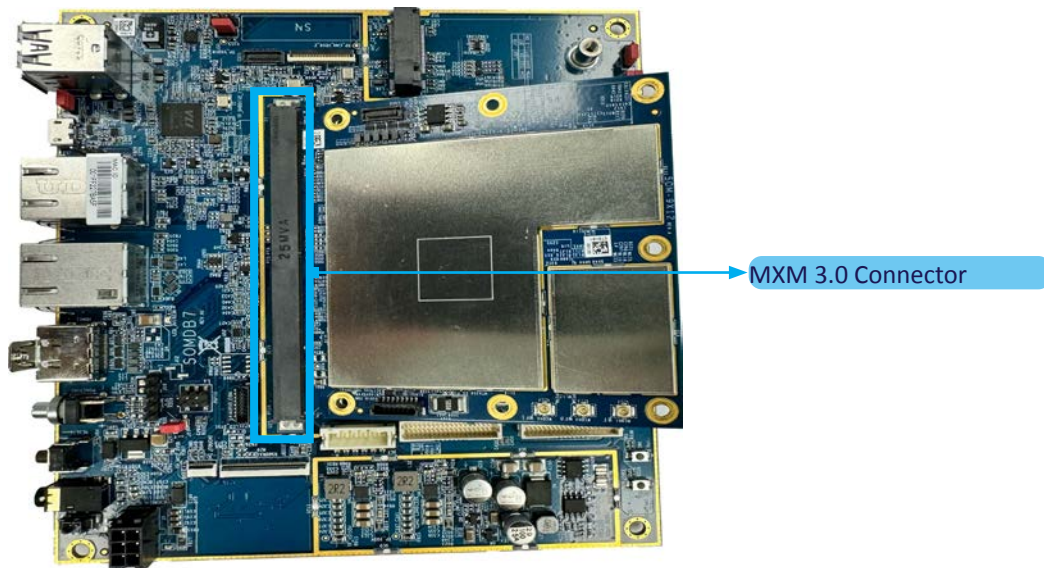


Figure 06: Inserting the VIA SOM-7000 module into the VIA SOMDB7 carrier board

#### Step 2

Once the VIA SOM-7000 module has been fully inserted, gently push down the module until its standoff holes align with the carrier board's screw holes, and then secure the module with the six M2\*4 mm screws provided.

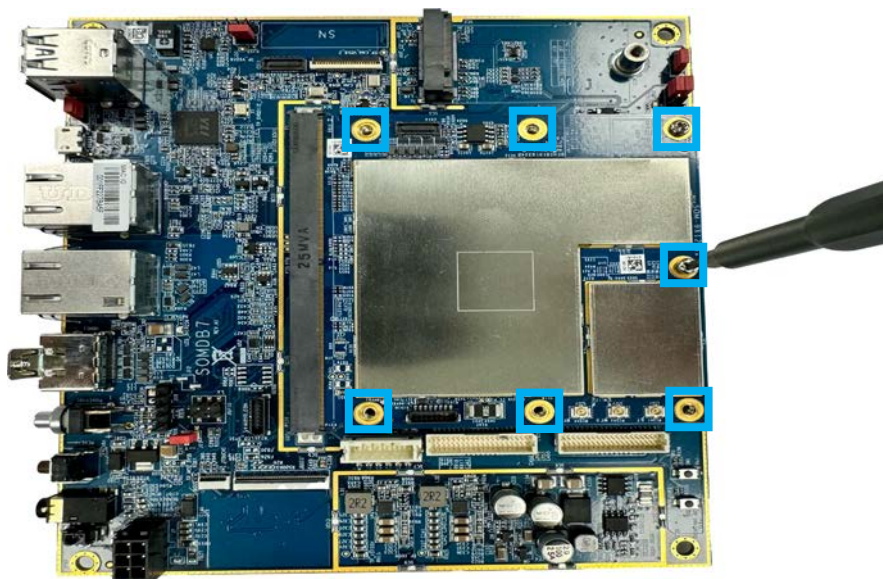


Figure 07: Securing the VIA SOM-7000 module on the VIA SOMDB7 carrier board

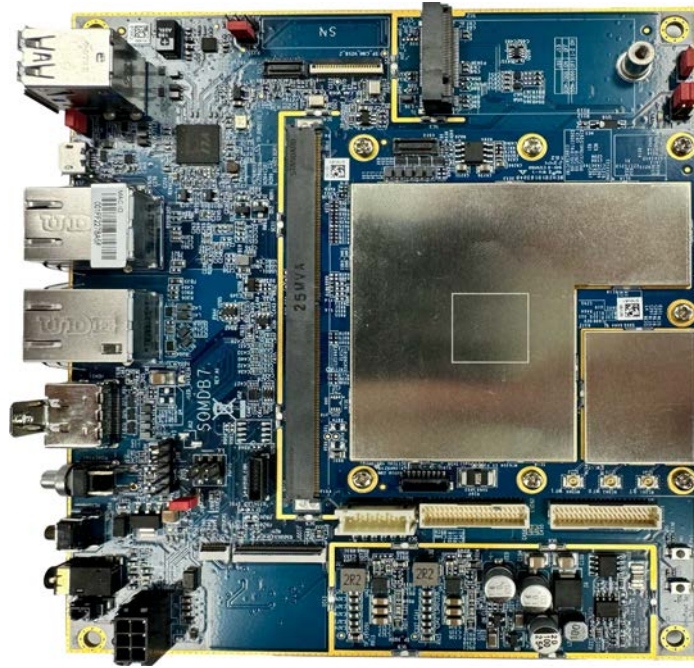


Figure 08: Secured VIA SOM-7000 module on the VIA SOMDB7 carrier board



**Note:**

It is recommended to apply thermal grease and install a heat sink on the VIA SOM-7000 module for maximum heat dissipation.

## 4. Software and Technical Support

### 4.1 Android/Yocto/Debian Support

The VIA SOM-7000 comes with complete software evaluation images for the Android 13, Yocto 4.0, and Debian 12 operating systems.

### 4.2 Technical Support and Assistance

- For utilities downloads and the latest documentation and information about the VIA SOM-7000, please visit our website at <https://www.viatech.com/en/edge/som-7000/>.
- For technical support and additional assistance, always contact your local sales representative or VIA SOM-7000 distributor, or go to <https://www.viatech.com/en/support/drivers/> for technical support.
- For OEM clients and system integrators developing a product for long-term production, other code and resources may also be made available. Please visit our website at <https://www.viatech.com/en/about/contact/> to submit a request.

# Appendix A VIA SOMDB7 Carrier Board Reference

## A.1 SOMDB7 Specifications

### LVDS

- Chrontel CH7515 eDP/DP to LVDS Converter

### Ethernet

- Realtek RTL8153 GbE USB 3.0 Ethernet Network Interface Controller

### MCU

- STMicroelectronics STM32L011F4P6 32-bit MCU

### Onboard I/O

- 2 x 4-Lane MIPI-DSI connectors (One by ODM request)
- 2 x LVDS dual-channel connectors (up to QXGA 2560x2048@60Hz)
- 2 x MIPI CSI-2 connectors (1 x 4-Lane, 1 x 2-Lane)
- 1 x Capacitive touch panel connector
- 1 x LVDS backlight connector
- 1 x SIM card slot
- 1 x M.2 B-key slot (supports USB 3.1/USB 2.0/USIM)
- 1 x M.2 E-key slot (supports PCIe x1)
- 1 x ADC/GPIO pin header (for multiplexed Analog inputs/GPIOs)
- 1 x RTC battery connector
- 1 x Debug console connector
- 1 x 12V DC-in power connector

### Front I/O

- 1 x Download/Volume+ button
- 1 x Volume- button
- 1 x MicroSD card slot

### Back I/O

- 1 x HDMI port
- 2 x USB 3.1 ports
- 1 x Micro USB 2.0 port (for image download)
- 2 x GLAN ports
- 1 x 3.5mm phone jack (supports Headphone-out and MIC-in)
- 1 x Reset button
- 1 x Power button with LED

### Power Supply

- 12V DC-in

### Operating Temperature

- 0°C ~ 60°C

### Operating Humidity

- 0% ~ 95% (relative humidity ; non-condensing)

### Form Factor

- 15.1cm x 13.4cm (5.94" x 5.28")

## A.2 SOMDB7 Layout Diagram

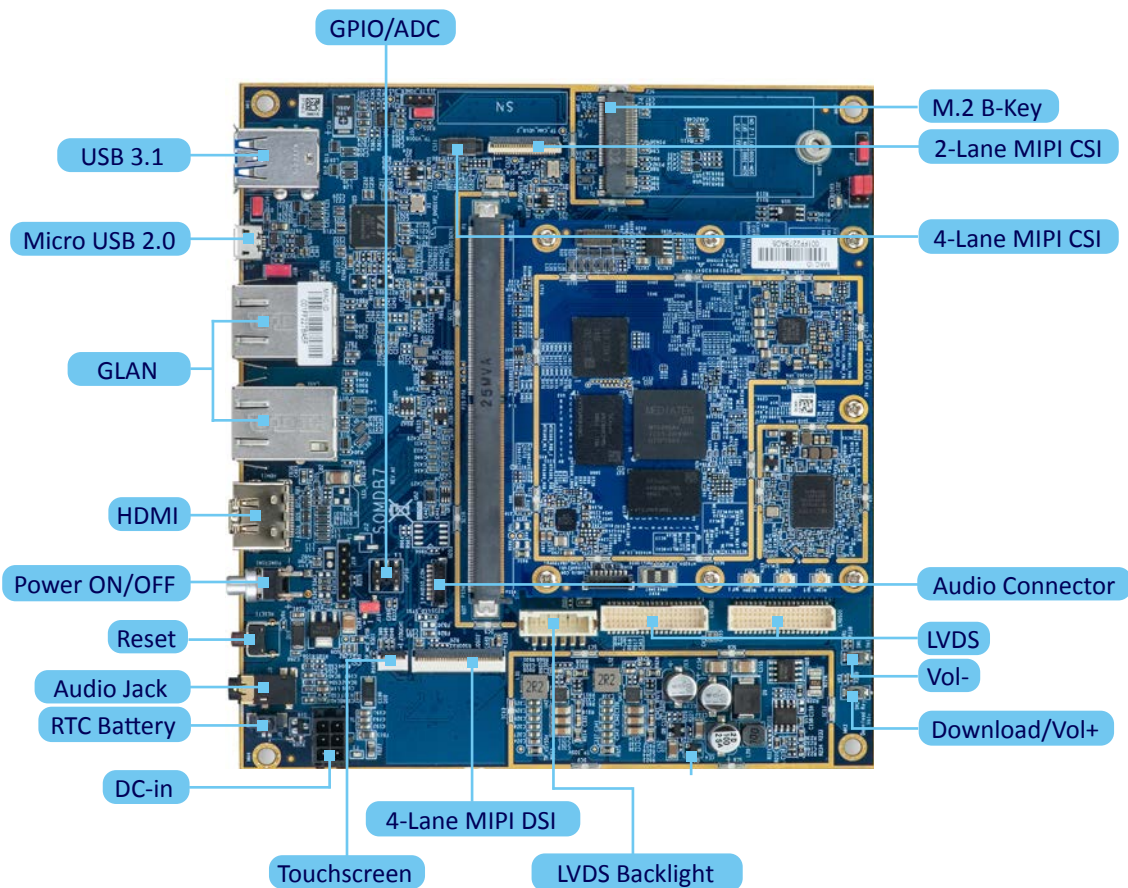


Figure 09: VIA SOMDB7 carrier board top I/O



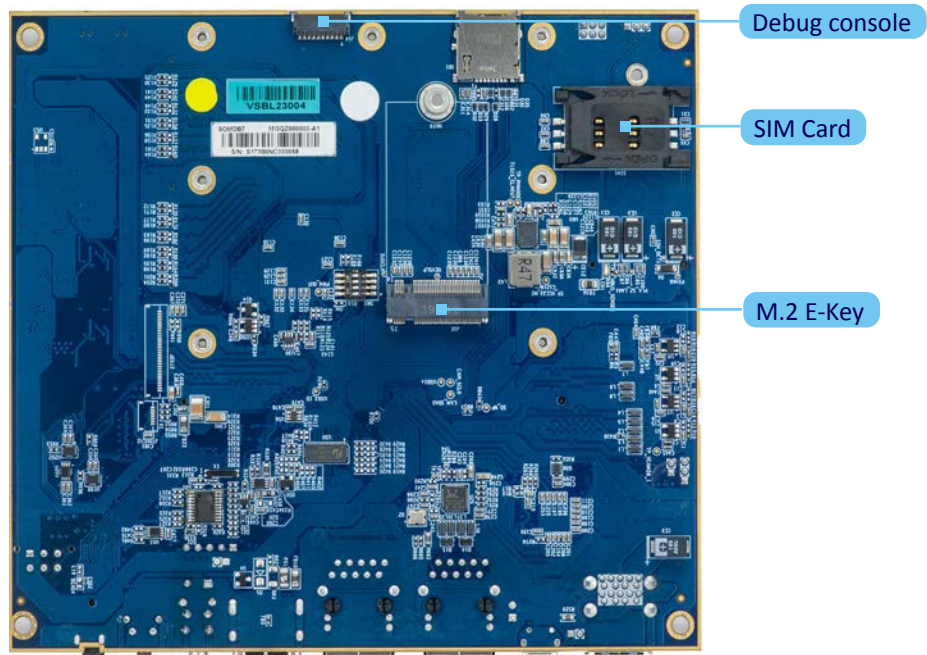


Figure 10: VIA SOMDB7 carrier board bottom I/O

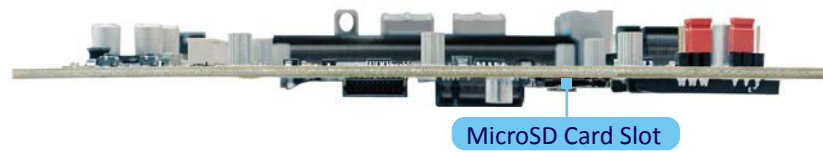


Figure 11: VIA SOMDB7 carrier board front coastline I/O

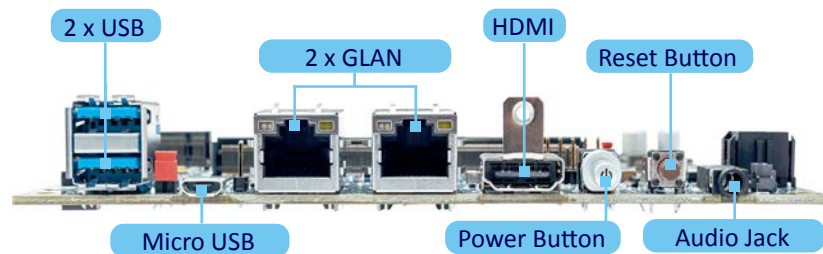


Figure 12: VIA SOMDB7 carrier board back coastline I/O

## A.3 SOMDB7 Dimensions

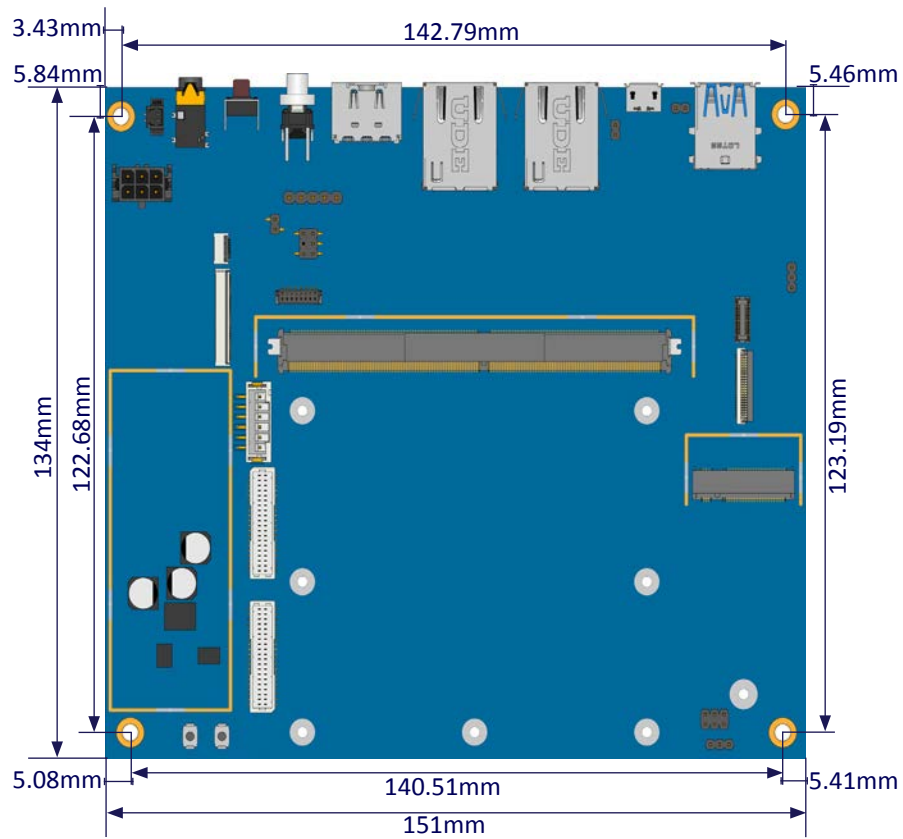


Figure 13: Dimensions of the VIA SOMDB7 carrier board (top I/O)

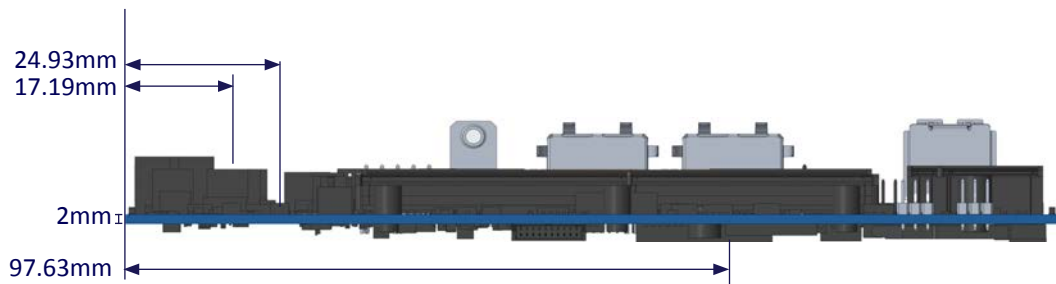


Figure 14: External I/O dimensions of the VIA SOMDB7 carrier board (front coastline I/O)

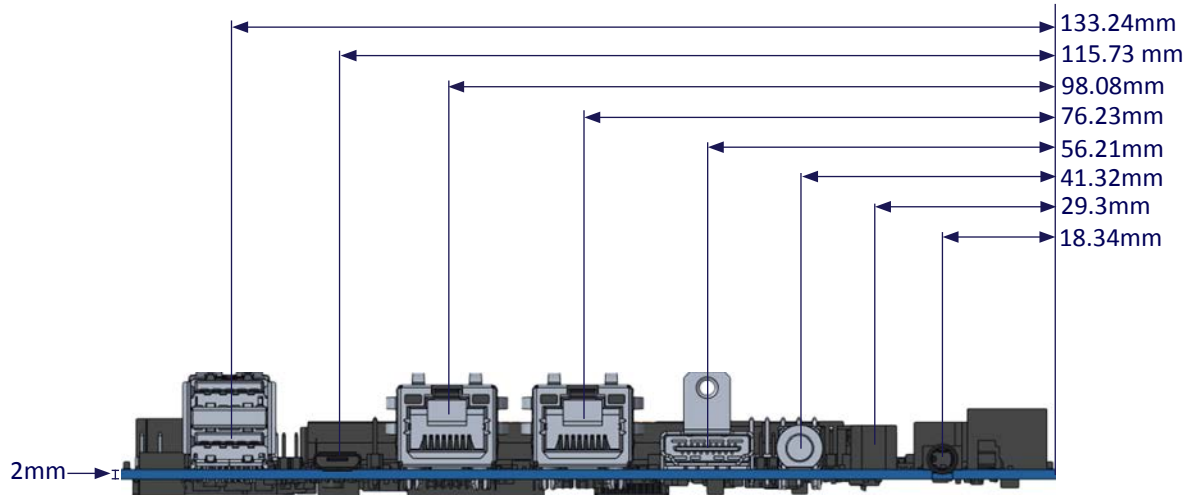


Figure 15: External I/O dimensions of the VIA SOMDB7 carrier board (back coastline I/O)

## A.4 SOMDB7 Height Distribution

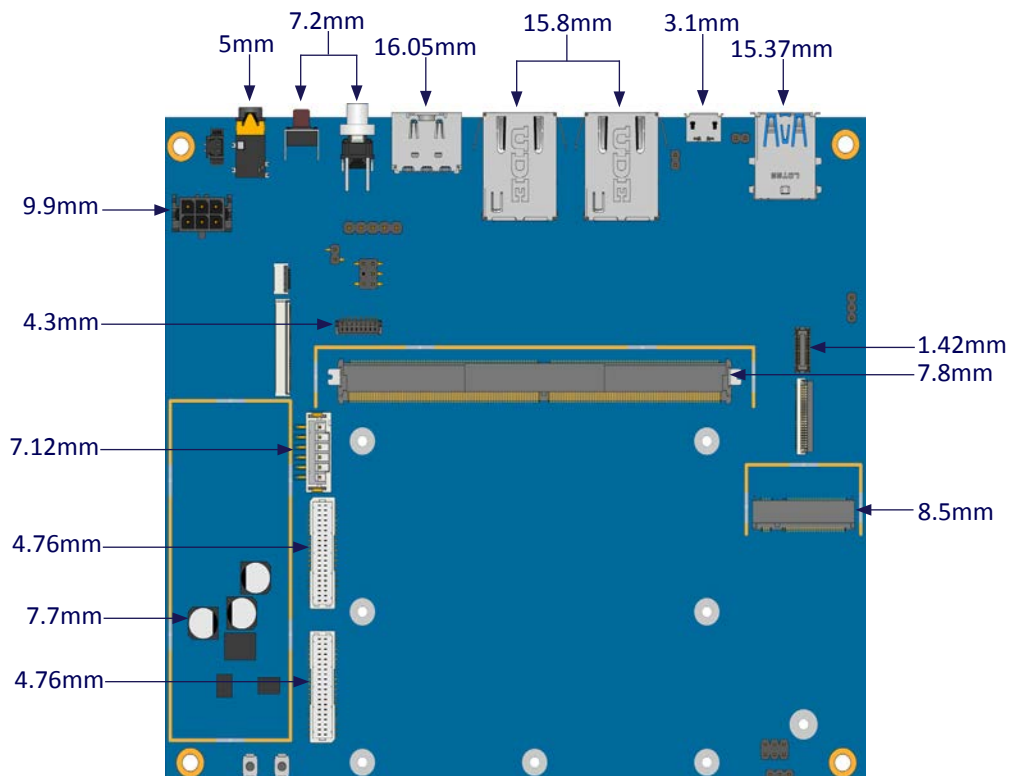


Figure 16: Height distribution of the VIA SOMDB7 carrier board (top I/O)



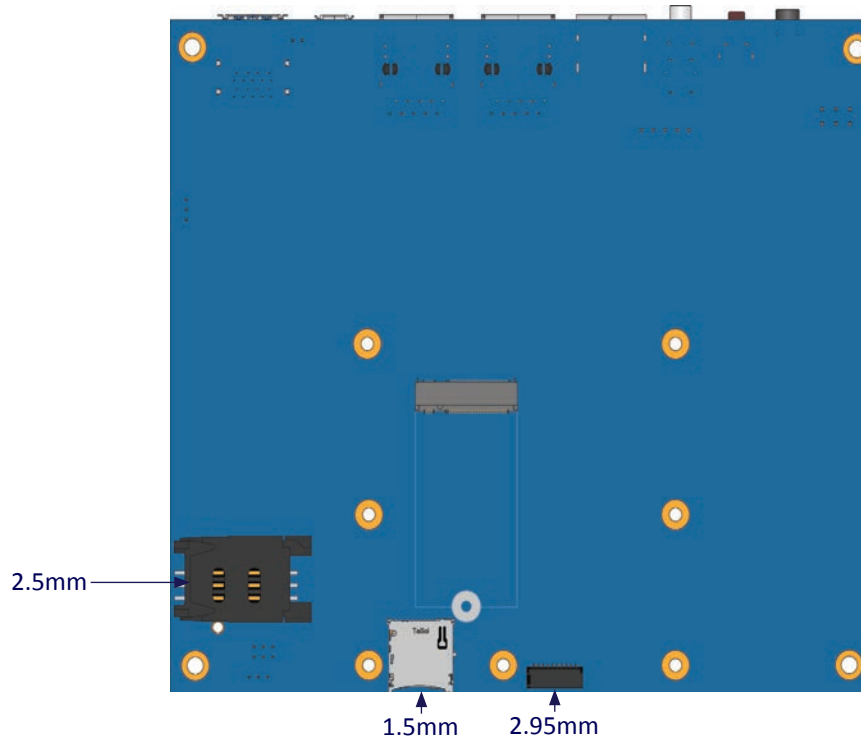


Figure 17: Height distribution of the VIA SOMDB7 carrier board (bottom I/O)

## A.5 SOMDB7 Coastline I/O Pin Descriptions and Functionality

The VIA SOMDB7 carrier board has a wide selection of interfaces, and includes a selection of frequently-used ports as part of the external I/O coastline.

### A.5.1 MicroSD Slot

The VIA SOMDB7 carrier board is equipped with a MicroSD slot, to be used for storage of data, pictures, video, audio, documents and other files. The pinouts of the MicroSD slot are shown below.

| Pin | Signal      |
|-----|-------------|
| 1   | DAT2        |
| 2   | DAT3        |
| 3   | CMD         |
| 4   | VCC         |
| 5   | CLK         |
| 6   | GND         |
| 7   | DAT0        |
| 8   | DAT1        |
| 9   | Card detect |

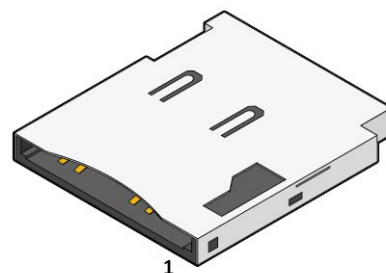


Figure 18: MicroSD card slot diagram

Table 03: MicroSD card slot pinouts

## A.5.2 USB 3.1 Ports

The VIA SOMDB7 carrier board is equipped with two USB-A 3.1 Gen 1 ports, that have a maximum data transfer rate of up to 5Gbps and are compatible with USB 2.0 specifications. These USB ports provide complete Plug and Play and hot swap capability for external devices. The pinouts of the USB 3.1 ports are shown below.

| Pin | Signal    |
|-----|-----------|
| 1   | VBUS      |
| 2   | D-        |
| 3   | D+        |
| 4   | GND       |
| 5   | SSRX-     |
| 6   | SSRX+     |
| 7   | GND_DRAIN |
| 8   | SSTX-     |
| 9   | SSTX+     |

Table 04: USB 3.1 pinouts

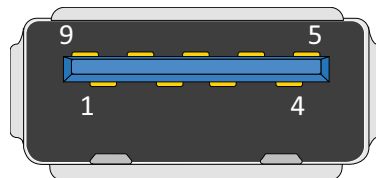


Figure 19: USB 3.1 diagram

## A.5.3 Micro USB 2.0 Port

The VIA SOMDB7 carrier board is equipped with a Micro USB 2.0 port, to be used for OS image downloading. The pinouts of the Micro USB 2.0 port are shown below.

| Pin | Signal |
|-----|--------|
| 1   | VBUS   |
| 2   | D-     |
| 3   | D+     |
| 4   | ID     |
| 5   | GND    |

Table 05: Micro USB 2.0 port pinouts



Figure 20: Micro USB 2.0 port diagram

## A.5.4 Gigabit LAN Ports

The VIA SOMDB7 carrier board comes with two Gigabit LAN ports. Each Gigabit LAN port uses an 8 Position and 8 Contact (8P8C) receptacle connector commonly known as RJ-45, which is fully compliant with the IEEE 802.3 (10BASE-T), 802.3u (100BASE-TX), and 802.3ab (1000BASE-TX) standards. The pinouts of the Gigabit LAN ports are shown below.

| LAN1 and LAN2 |          |
|---------------|----------|
| Pin           | Signal   |
| 1             | MDIO0+   |
| 2             | MDIO0-   |
| 3             | MDIO1+   |
| 4             | MDIO1-   |
| 5,6           | Not used |
| 7             | MDIO2+   |
| 8             | MDIO2-   |
| 9             | MDIO3+   |
| 10            | MDIO3-   |

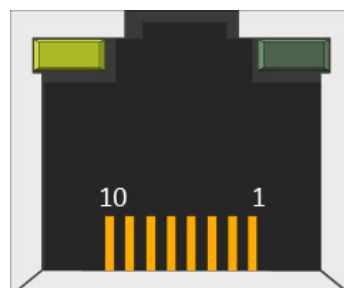


Figure 21: Gigabit LAN port diagram

Table 06: Gigabit LAN port pinouts

Each Gigabit LAN port has two individual LED indicators to show its Active/Link status and Speed status.

|                | Link LED<br>(Left LED on RJ-45 port) | Active LED<br>(Right LED on RJ-45 port) |
|----------------|--------------------------------------|-----------------------------------------|
| Link off       | LED is off                           | LED is off                              |
| Speed_10Mbit   | LED is off                           | Yellow flash                            |
| Speed_100Mbit  | Green is on                          | Yellow flash                            |
| Speed_1000Mbit | Orange is on                         | Yellow flash                            |

Table 07: Gigabit LAN port LED color definition

## A.5.5 HDMI® Port

The VIA SOMDB7 carrier board is equipped with an HDMI port, which uses an HDMI port Type A receptacle connector to connect to High Definition video and digital audio using a single cable. The port supports HDMI 2.0. The pinouts of the HDMI port are shown below.

| Pin | Signal | Pin | Signal   |
|-----|--------|-----|----------|
| 1   | D2+    | 11  | GND      |
| 2   | GND    | 12  | CLK-     |
| 3   | D2-    | 13  | CEC      |
| 4   | D1+    | 14  | NC       |
| 5   | GND    | 15  | DDC_CLK  |
| 6   | D1-    | 16  | DDC_DATA |
| 7   | D0+    | 17  | GND      |
| 8   | GND    | 18  | HDMI_5V  |
| 9   | D0-    | 19  | PLUG_DET |
| 10  | CLK+   |     |          |

Table 08: HDMI port pinouts



Figure 22: HDMI port diagram

## A.5.6 Power Button

The VIA SOMDB7 carrier board comes with a power button, which features a built-in power LED indicator (green light). The power button can support two functions: Power On/Off and System Suspend/Resume. The diagram of the power button is shown below.



Figure 23: Power button diagram

| Power Button behavior |                                                                                                                        |
|-----------------------|------------------------------------------------------------------------------------------------------------------------|
| Power On/Off          | Press the button for 2 seconds to power on. To power off, press the button for more than 8 seconds.                    |
| System Suspend/Resume | In powered on state, quickly press the power button once to suspend. In suspended state, quickly press once to resume. |

Table 09: Power button behavior description

## A.5.7 Reset Button

The VIA SOMDB7 carrier board comes with a reset button, to be used for reboots or force-resets. The diagram of the reset button is shown below.

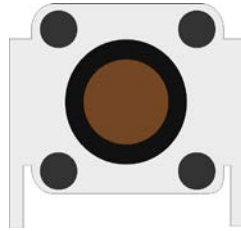


Figure 24: Reset button diagram

## A.5.8 Headphone Jack

The VIA SOMDB7 carrier board comes with a 3.5mm headphone jack, to be used for connecting external speakers or headphones. The diagram of the headphone jack is shown below.



Figure 25: Headphone jack diagram

## A.6 SOMDB7 Onboard I/O

This chapter provides information about the onboard I/O connectors and pin headers of the VIA SOMDB7 carrier board.

### A.6.1 MXM 3.0 Connector

The VIA SOMDB7 carrier board comes with one 314-pin MXM 3.0 connector labeled 'U37', to be used for connecting the VIA SOM-7000 module. The pinouts of the MXM 3.0 connector are shown below.

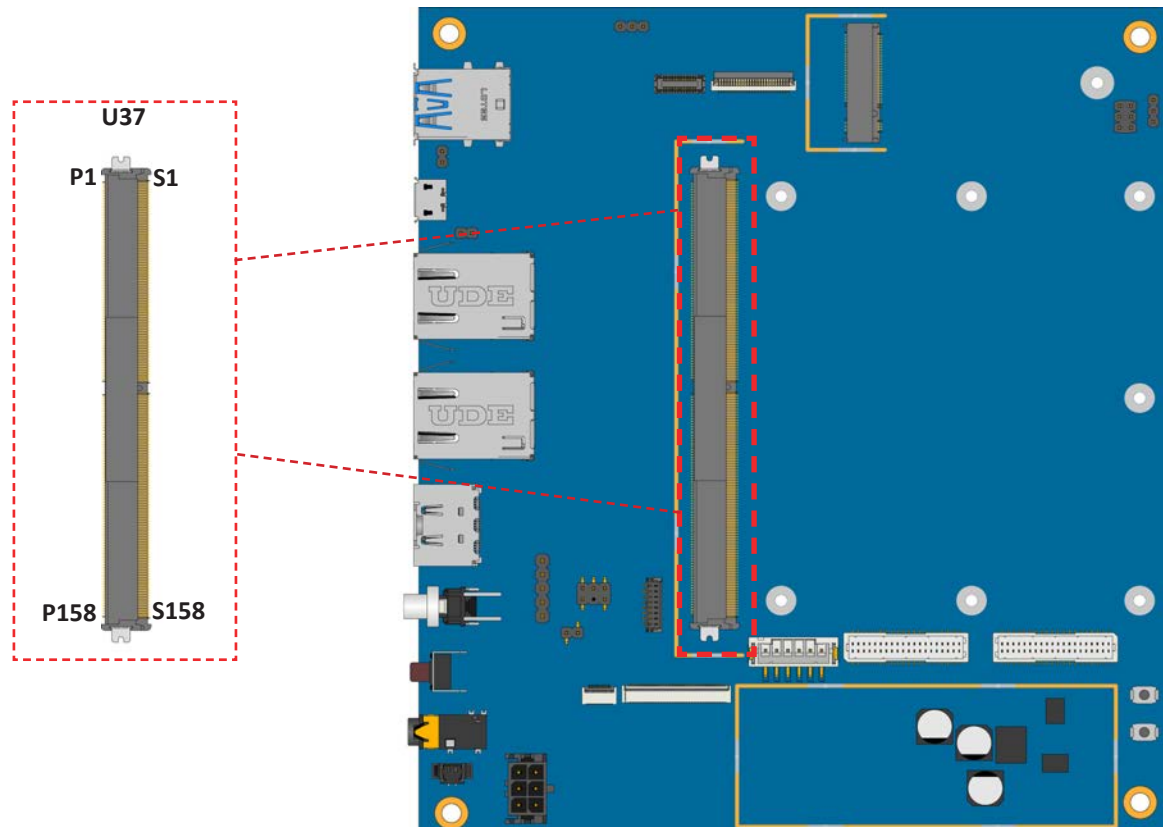


Figure 26: MXM 3.0 connector 'U37'

| U37     |           |     |                         |
|---------|-----------|-----|-------------------------|
| Pin     | Signal    | Pin | Signal                  |
| P1      | NC        | S1  | I2C_CAM1_CK             |
| P2      | GND       | S2  | I2C_CAM1_DAT            |
| P3      | CSI1_CK+  | S3  | GND                     |
| P4      | CSI1_CK-  | S4  | CMMCLK for CSI1 (CAM1)  |
| P5 - P6 | NC        | S5  | I2C_CAM0_CK             |
| P7      | CSI1_RX0+ | S6  | CAM_MCK for CSIO (CAM0) |
| P8      | CSI1_RX0- | S7  | I2C_CAM0_DAT            |
| P9      | GND       | S8  | CSIO_CK+                |
| P10     | CSI1_RX1+ | S9  | CSIO_CK-                |
| P11     | CSI1_RX1- | S10 | GND                     |
| P12     | GND       | S11 | CSIO_RX0+               |
| P13     | CSI1_RX2+ | S12 | CSIO_RX0-               |

| U37       |                |           |             |
|-----------|----------------|-----------|-------------|
| Pin       | Signal         | Pin       | Signal      |
| P14       | CSI1_RX2-      | S13       | GND         |
| P15       | GND            | S14       | CSIO_RX1+   |
| P16       | CSI1_RX3+      | S15       | CSIO_RX1-   |
| P17       | CSI1_RX3-      | S16       | GND         |
| P18       | GND            | S16 - S33 | NC          |
| P19       | GBE0_MDI3-     | S34       | GND         |
| P20       | GBE0_MDI3+     | S35 - S37 | NC          |
| P21       | GBE0_LINK100#  | S38       | AUDIO_MCK   |
| P22       | GBE0_LINK1000# | S39       | I2S0_LRCK   |
| P23       | GBE0_MDI2-     | S40       | I2S0_SDOUT  |
| P24       | GBE0_MDI2+     | S41       | I2S0_SDIN   |
| P25       | GBE0_LINK_ACT# | S42       | I2S0_CK     |
| P26       | GBE0_MDI1-     | S43 - S46 | NC          |
| P27       | GBE0_MDI1+     | S47       | GND         |
| P28       | NC             | S48       | I2C_GP_CK   |
| P29       | GBE0_MDIO-     | S49       | I2C_GP_DAT  |
| P30       | GBE0_MDIO+     | S50       | NC          |
| P31       | NC             | S51       | NC          |
| P32       | GND            | S52       | NC          |
| P33       | SDIO_WP        | S53       | I2S2_CK     |
| P34       | SDIO_CMD       | S54 - S60 | NC          |
| P35       | SDIO_CD#       | S61       | GND         |
| P36       | SDIO_CK        | S62       | USB3_SSTX+  |
| P37       | SDIO_PWR_EN    | S63       | USB3_SSTX-  |
| P38       | GND            | S64       | GND         |
| P39       | SDIO_D0        | S65       | USB3_SSRX+  |
| P40       | SDIO_D1        | S66       | USB3_SSRX-  |
| P41       | SDIO_D2        | S67       | GND         |
| P42       | SDIO_D3        | S68       | USB3+       |
| P43       | SPI0_CS0#      | S69       | USB3-       |
| P44       | SPI0_CK        | S70       | GND         |
| P45       | SPI0_DIN       | S71 - S72 | NC          |
| P46       | SPI0_DO        | S73       | GND         |
| P47       | GND            | S74 - S75 | NC          |
| P48 - P49 | NC             | Key       |             |
| P50       | GND            | S76       | PCIE_B_RST# |
| P51 - P52 | NC             | S77       | PCIE_C_RST# |
| P53       | GND            | S78       | PCIE_C_RX+  |
| P54 - P58 | NC             | S79       | PCIE_C_RX-  |
| P59       | GND            | S80       | GND         |
| P60       | USB0+          | S81       | PCIE_C_TX+  |
| P61       | USB0-          | S82       | PCIE_C_TX-  |

| U37       |               |      |               |
|-----------|---------------|------|---------------|
| Pin       | Signal        | Pin  | Signal        |
| P62 - P64 | NC            | S83  | GND           |
| P59       | GND           | S84  | PCIE_B_REFCK+ |
| P60       | USB0+         | S85  | PCIE_B_REFCK- |
| P61       | USB0-         | S86  | GND           |
| P62 - P64 | NC            | S87  | PCIE_B_RX+    |
| P65       | USB1+         | S88  | PCIE_B_RX-    |
| P66       | USB1-         | S89  | GND           |
| P67       | NC            | S90  | PCIE_B_TX+    |
| P68       | GND           | S91  | PCIE_B_TX-    |
| P69 - P71 | NC            | S92  | GND           |
| P72       | USB_TYPEC_CC1 | S93  | DPO_LANE0+    |
| P73       | USB_TYPEC_CC2 | S94  | DPO_LANE0-    |
| P74       | NC            | S95  | NC            |
| Key       |               | S96  | DPO_LANE1+    |
| P75 - P76 | NC            | S97  | DPO_LANE1-    |
| P77       | PCIE_B_CKREQ# | S98  | DPO_HPD       |
| P78       | NC            | S99  | DPO_LANE2+    |
| P79       | GND           | S100 | DPO_LANE2-    |
| P80 - P81 | NC            | S101 | GND           |
| P82       | GND           | S102 | DPO_LANE3+    |
| P83 - P84 | NC            | S103 | DPO_LANE3-    |
| P85       | GND           | S104 | NC            |
| P86 - P87 | NC            | S105 | DPO_AUX+      |
| P88       | GND           | S106 | DPO_AUX-      |
| P89 - P90 | NC            | S107 | LCD1_BKLT_EN  |
| P91       | GND           | S108 | DSI1_CLK+     |
| P92       | HDMI_D2+      | S109 | DSI1_CLK-     |
| P93       | HDMI_D2-      | S110 | GND           |
| P94       | GND           | S111 | DSI1_D0+      |
| P95       | HDMI_D1+      | S112 | DSI1_D0-      |
| P96       | HDMI_D1-      | S113 | DSI1_TE       |
| P97       | GND           | S114 | DSI1_D1+      |
| P98       | HDMI_D0+      | S115 | DSI1_D1-      |
| P99       | HDMI_D0-      | S116 | LCD1_VDD_EN   |
| P100      | GND           | S117 | DSI1_D2+      |
| P101      | HDMI_CK+      | S118 | DSI1_D2-      |
| P102      | HDMI_CK-      | S119 | GND           |
| P103      | GND           | S120 | DSI1_D3+      |
| P104      | HDMI_HPD      | S121 | DSI1_D3-      |
| P105      | HDMI_CTRL_CK  | S122 | LCD1_BKLT_PWM |
| P106      | HDMI_CTRL_DAT | S123 | GPIO13        |
| P107      | NC            | S124 | GND           |



| U37         |            |             |                             |
|-------------|------------|-------------|-----------------------------|
| Pin         | Signal     | Pin         | Signal                      |
| P108        | GPIO0      | S125        | DSIO_D0+                    |
| P109        | GPIO1      | S126        | DSIO_D0-                    |
| P110        | GPIO2      | S127        | LCD0_BKLT_EN                |
| P111        | GPIO3      | S128        | DSIO_D1+                    |
| P112        | GPIO4      | S129        | DSIO_D1-                    |
| P113        | GPIO5      | S130        | GND                         |
| P114        | GPIO6      | S131        | DSIO_D2+                    |
| P115        | GPIO7      | S132        | DSIO_D2-                    |
| P116        | GPIO8      | S133        | LCD0_VDD_EN                 |
| P117        | GPIO9      | S134        | DSIO_CLK+                   |
| P118        | GPIO10     | S135        | DSIO_CLK-                   |
| P119        | GPIO11     | S136        | GND                         |
| P120        | GND        | S137        | DSIO_D3+                    |
| P121        | I2C_PM_CK  | S138        | DSIO_D3-                    |
| P122        | I2C_PM_DAT | S139        | I2C_LCD_CK                  |
| P123 - P126 | NC         | S140        | I2C_LCD_DAT                 |
| P127        | RESET_IN#  | S141        | LCD0_BKLT_PWM               |
| P128        | POWER_BTN# | S142        | GPIO12 / HOME Key / Vol+    |
| P129 - P132 | NC         | S143        | GND                         |
| P133        | GND        | S144        | DSIO_TE                     |
| P134        | SER1_TX    | S145        | NC                          |
| P135        | SER1_RX    | S146        | PCIE_WAKE#                  |
| P136        | SER2_TX    | S147 - S153 | NC                          |
| P137        | SER2_RX    | S154        | CARRIER_PWR_ON              |
| P138 - P141 | NC         | S155 - S156 | NC                          |
| P142        | GND        | S157        | TEST# / Download Key / Vol+ |
| P143 - P146 | NC         | S158        | GND                         |
| P147 - P156 | VDD_IN     |             |                             |

Table 10: MXM 3.0 connector 'U37' pinouts

## A.6.2 Audio-In Connector

The VIA SOMDB7 carrier board is equipped with a stereo audio-in connector labeled 'AUDIO\_CON'. The audio cable bundled in the VIA SOM-7000 Evaluation Kit can be plugged into this connector and the VIA SOM-7000 module's audio-out connector.


**Note:**

See [section 2.3](#) for information on the VIA SOM-7000 module's audio-out connector.

The pinouts of the audio-in connector are shown below.

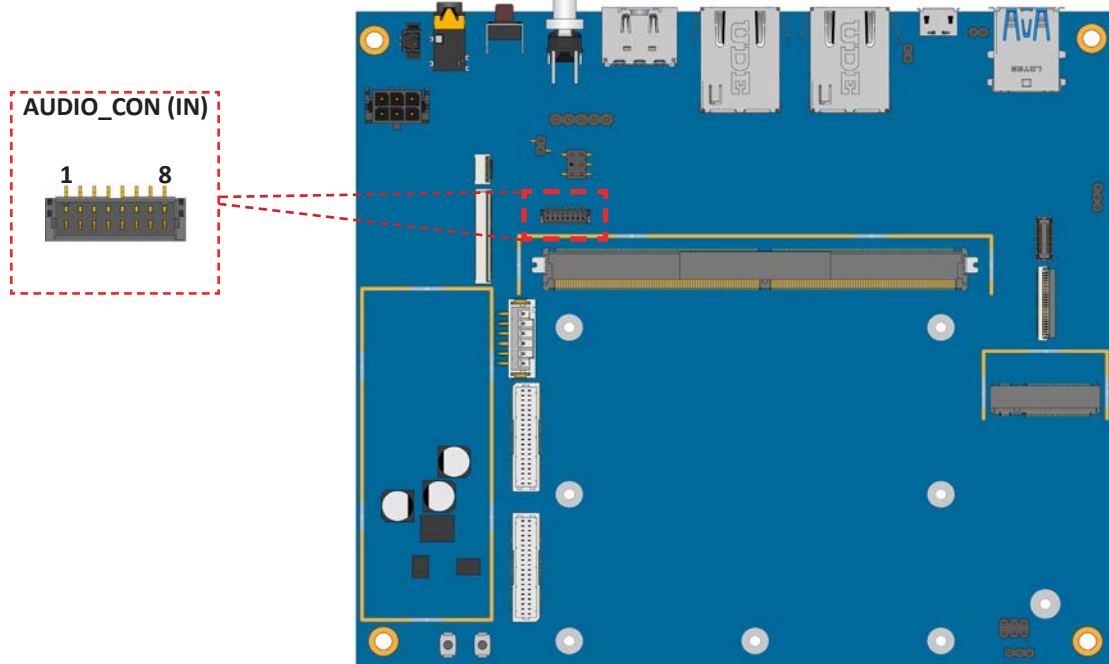


Figure 27: Audio-in connector 'AUDIO\_CON'

| AUDIO_CON (IN) |                   |
|----------------|-------------------|
| Pin            | Signal            |
| 1              | AVSS30_AUD        |
| 2              | EAR_MIC_N_to_jack |
| 3              | EAR_MIC_P_to_jack |
| 4              | D_GND             |
| 5              | AU_HP_R           |
| 6              | AU_REFN           |
| 7              | AU_HP_L           |
| 8              | HP_EINT           |

Table 11: Audio-in connector 'AUDIO\_CON' pinouts

## A.6.3 LVDS Connectors

The VIA SOMDB7 carrier board is equipped with two dual-channel LVDS connectors labeled 'LVDS1' and 'LVDS2' to support upto 8 lanes of data transfer to a connected QSXGA 60Hz LVDS display. The connectors are located. The pinouts of the LVDS connectors are shown below.

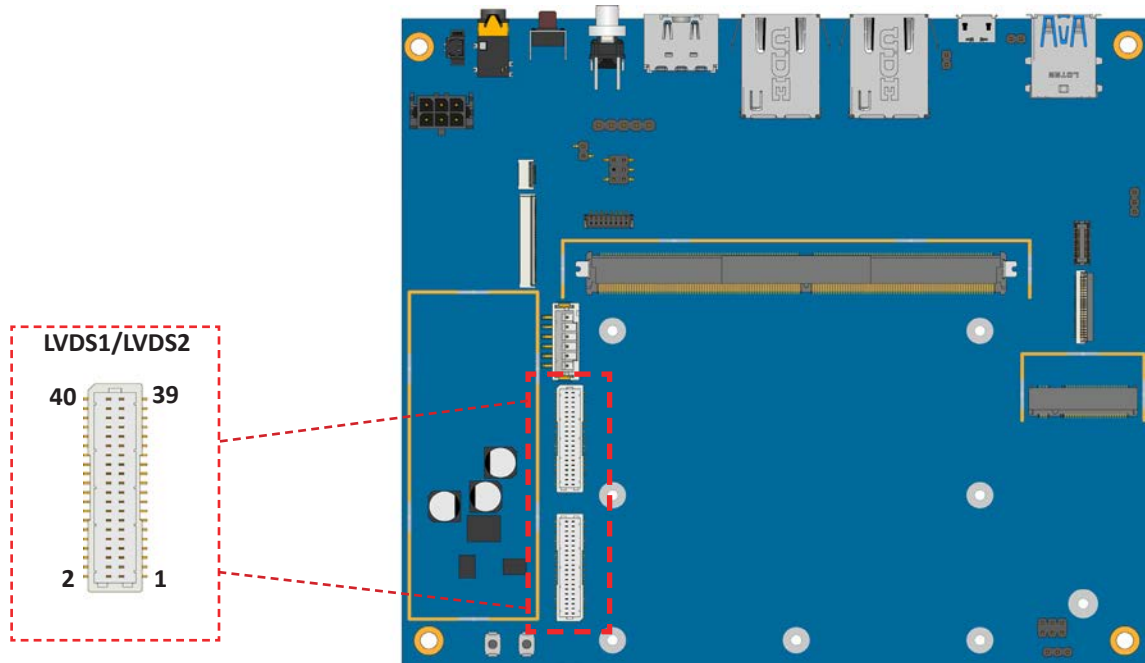


Figure 28: LVDS connectors 'LVDS1' and 'LVDS2'

| LVDS1   |        |         |        |         |        |
|---------|--------|---------|--------|---------|--------|
| Pin     | Signal | Pin     | Signal | Pin     | Signal |
| 1 - 4   | VDD    | 19      | TXC1N  | 33      | TXD1P  |
| 5 - 6   | GND    | 20      | TXC0N  | 34      | TXD0P  |
| 7       | TXA1N  | 21      | TXC1P  | 35 - 36 | GND    |
| 8       | TXA0N  | 22      | TXC0P  | 37      | TXE1N  |
| 9       | TXA1P  | 23 - 24 | GND    | 38      | TXE0N  |
| 10      | TXA0P  | 25      | TXCK1N | 39      | TXE1P  |
| 11 - 12 | GND    | 26      | TXCK0N | 40      | TXE0P  |
| 13      | TXB1N  | 27      | TXCK1P |         |        |
| 14      | TXB0N  | 28      | TXCK0P |         |        |
| 15      | TXB1P  | 29 - 30 | GND    |         |        |
| 16      | TXB0P  | 31      | TXD1N  |         |        |
| 17 - 18 | GND    | 32      | TXD0N  |         |        |

Table 12: 'LVDS1' connector pinouts

| LVDS2   |        |         |        |         |        |
|---------|--------|---------|--------|---------|--------|
| Pin     | Signal | Pin     | Signal | Pin     | Signal |
| 1 - 4   | VDD    | 19      | TXC3N  | 33      | TXD3P  |
| 5 - 6   | GND    | 20      | TXC2N  | 34      | TXD2P  |
| 7       | TXA3N  | 21      | TXC3P  | 35 - 36 | GND    |
| 8       | TXA2N  | 22      | TXC2P  | 37      | TXE3N  |
| 9       | TXA3P  | 23 - 24 | GND    | 38      | TXE2N  |
| 10      | TXA2P  | 25      | TXCK3N | 39      | TXE3P  |
| 11 - 12 | GND    | 26      | TXCK2N | 40      | TXE2P  |
| 13      | TXB3N  | 27      | TXCK3P |         |        |
| 14      | TXB2N  | 28      | TXCK2P |         |        |
| 15      | TXB3P  | 29 - 30 | GND    |         |        |
| 16      | TXB2P  | 31      | TXD3N  |         |        |
| 17 - 18 | GND    | 32      | TXD2N  |         |        |

Table 13: 'LVDS2' connector pinouts

## A.6.4 LVDS Backlight Connector

The VIA SOMDB7 carrier board is equipped with an LVDS backlight connector labeled 'J6', to support the powering of a connected LVDS display's backlight. The pinouts of the LVDS backlight connector are shown below.

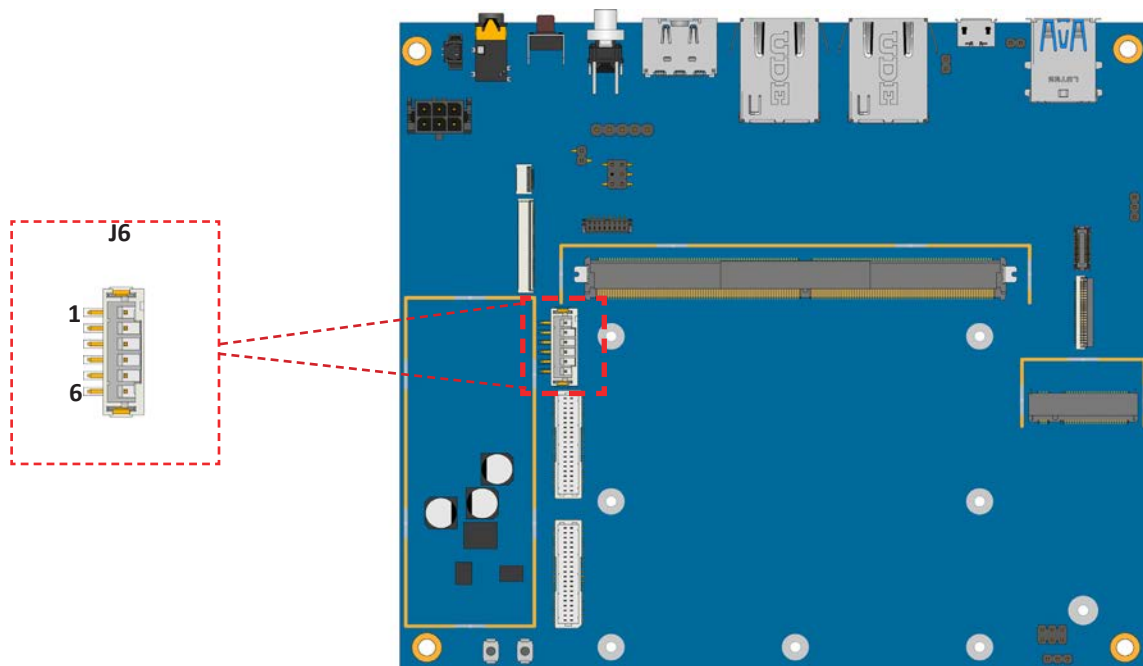


Figure 29: LVDS backlight connector 'J6'

| J6    |        |
|-------|--------|
| Pin   | Signal |
| 1 - 2 | VLED-  |
| 3 - 4 | VLED+  |
| 5 - 6 | VLED-  |

Table 14: LVDS backlight connector 'J6' pinouts

## A.6.5 4-Lane MIPI DSI Connector

The VIA SOMDB7 carrier board is equipped with a 4-lane MIPI DSI panel connector labeled 'JDSI1', to be used for connecting a MIPI DSI LCD display. The pinouts of the MIPI DSI connector are shown below.

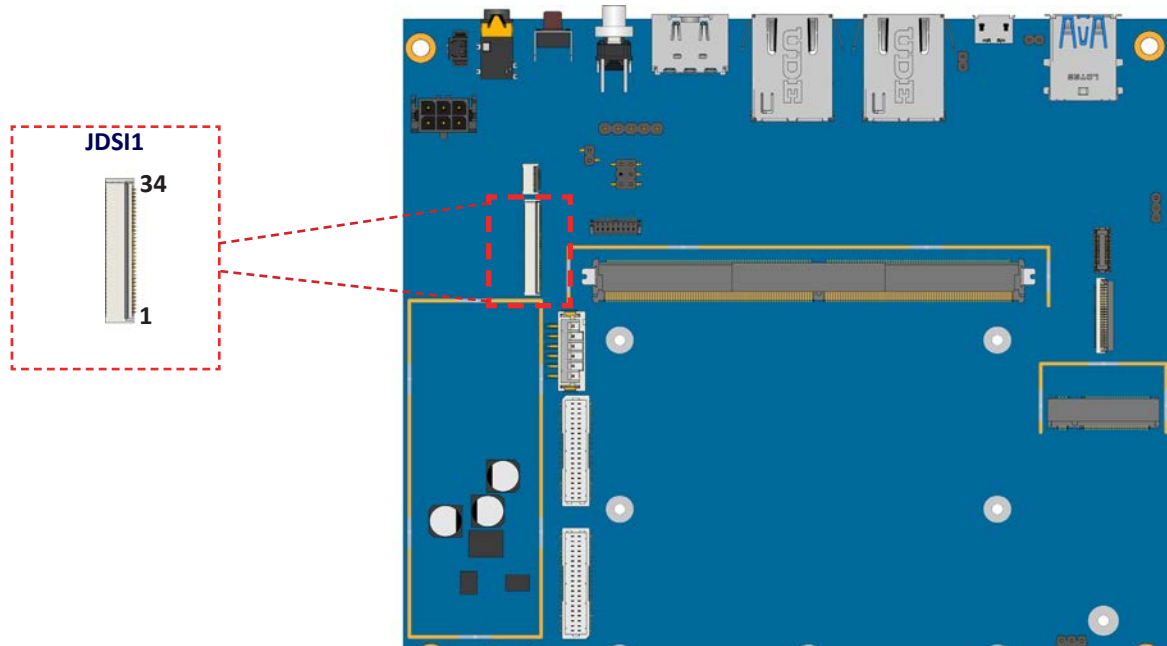


Figure 30: MIPI DSI connector 'JDSI1'

| Pin | Signal        | Pin | Signal          |
|-----|---------------|-----|-----------------|
| 1   | 3.3V          | 18  | GND             |
| 2   | 3.3V          | 19  | DSI_D0P         |
| 3   | NC            | 20  | DSI_D0N         |
| 4   | LCD VDDEN     | 21  | GND             |
| 5   | Backlight_PWM | 22  | DSI_D3P         |
| 6   | I2C_DATA      | 23  | DSI_D3N         |
| 7   | I2C_CLK       | 24  | GND             |
| 8   | NC            | 25  | GND             |
| 9   | GND           | 26  | GND             |
| 10  | DSI_D2P       | 27  | GND             |
| 11  | DSI_D2N       | 28  | NC              |
| 12  | GND           | 29  | AGING           |
| 13  | DSI_D1P       | 30  | NC              |
| 14  | DSI_D1N       | 31  | Backlight power |
| 15  | GND           | 32  | Backlight power |
| 16  | DSI_CKP       | 33  | Backlight power |
| 17  | DSI_CKN       | 34  | Backlight power |

Table 15: MIPI DSI connector 'JDSI1' pinouts



**Note:**

The 4-lane MIPI DSI connector is of the top contact type.

## A.6.6 4-Lane MIPI CSI Connector

The VIA SOMDB7 reference carrier board is equipped with a 4-lane MIPI CSI connector labeled 'CSI1', to be used for connecting a 2-lane or 4-lane MIPI CSI camera. The pinouts of the MIPI CSI connector are shown below.

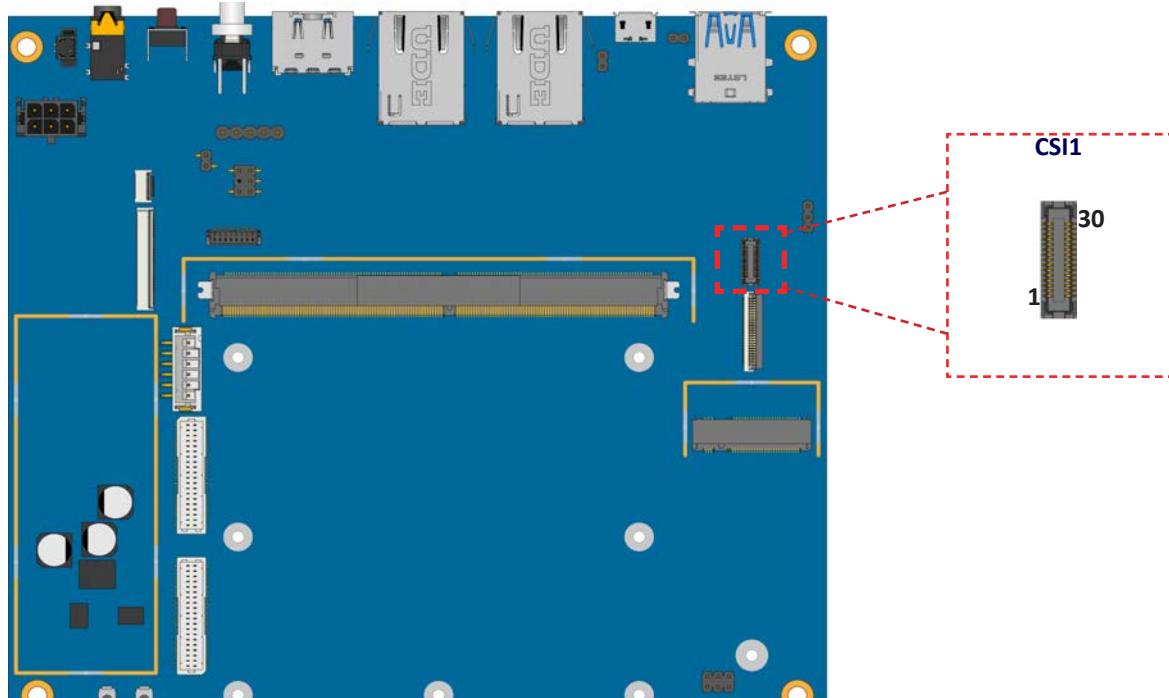


Figure 31: MIPI CSI connector 'CSI1'



**Note:**

The 4-lane MIPI CSI connector currently only supports the SONY IMX258 CMOS Image Sensor.

| CSI1 |           |     |              |
|------|-----------|-----|--------------|
| Pin  | Signal    | Pin | Signal       |
| 1    | XCLK      | 16  | MCN          |
| 2    | DGND      | 17  | DGND         |
| 3    | Reset     | 18  | MCP          |
| 4    | MDN2      | 19  | PAVDD 2.8V   |
| 5    | NC        | 20  | DGND         |
| 6    | MDP2      | 21  | AF AVDD 2.8V |
| 7    | DOVDD1.8V | 22  | MDN0         |
| 8    | DGND      | 23  | AFGND        |
| 9    | AGND      | 24  | MDP0         |
| 10   | MDN3      | 25  | DVDD 1.2V    |
| 11   | DGND      | 26  | DGND         |
| 12   | MDP3      | 27  | NC           |
| 13   | SCL       | 28  | MDN1         |
| 14   | DGND      | 29  | DGND         |
| 15   | SDA       | 30  | MDP1         |

Table 16: MIPI CSI connector 'CSI1' pinouts

## A.6.7 2-Lane MIPI CSI Connector

The VIA SOMDB7 carrier board comes with a 2-lane MIPI CSI connector labeled 'CSI2', to be used for connecting a 2-lane MIPI CSI camera. The pinouts of the connector are shown below.

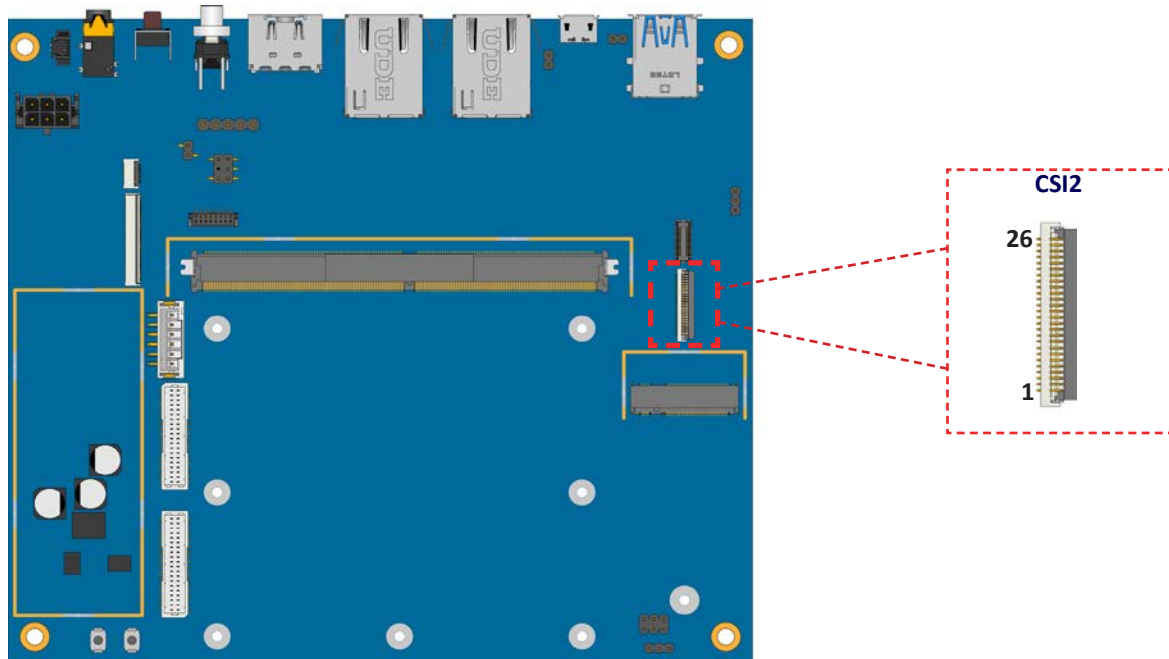


Figure 32: MIPI CSI connector 'CSI2'

| CSI2    |        |         |                               |
|---------|--------|---------|-------------------------------|
| Pin     | Signal | Pin     | Signal                        |
| 1       | MDP0   | 15      | GND                           |
| 2       | MDN0   | 16      | CMMCLK2_con (Camera Main CLK) |
| 3       | GND    | 17      | 2ND_CAM_XVS (PDN of Camera)   |
| 4       | MDP1   | 18      | 2ND_CAM_RESET_con             |
| 5       | MDN1   | 19      | CAM_SDA_2ND                   |
| 6       | GND    | 20      | CAM_SCL0_2ND                  |
| 7 - 8   | NC     | 21      | VCAMIO3_PMU                   |
| 9       | GND    | 22      | 2ND_DVDD12                    |
| 10 - 11 | NC     | 23      | 2ND_AVDD28                    |
| 12      | GND    | 24      | AVDD28_CSI2                   |
| 13      | MCP    | 25 - 26 | GND                           |
| 14      | MCN    |         |                               |

Table 17: MIPI CSI connector 'CSI2' pinouts



**Note:**

The 2-lane MIPI CSI connector is of the top contact type and supports the Omnivision OV5648 CMOS image sensor.

## A.6.8 Touchscreen Panel Connector

The VIA SOMDB7 carrier board comes with a touchscreen panel connector labeled 'JTOUCH1', which supports the I2C interface, and can be used to connect a touchscreen panel. The pinouts of the touchscreen connector are shown below.

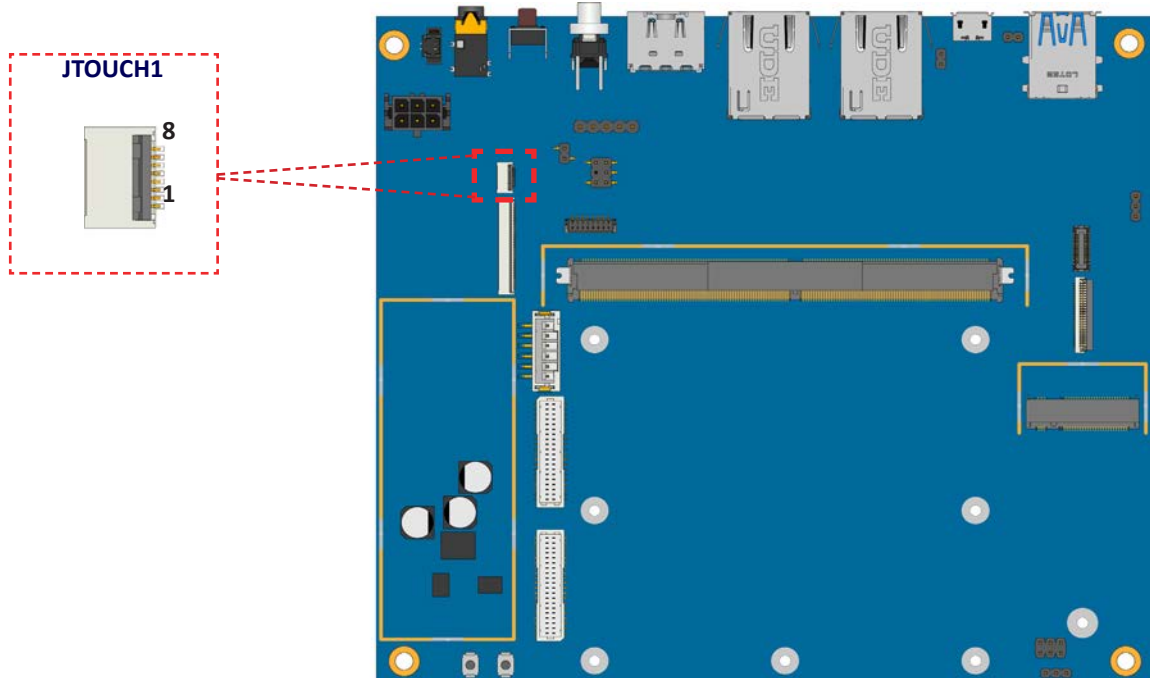


Figure 33: Touchscreen panel connector 'JTOUCH1'

| JTOUCH1 |        |
|---------|--------|
| Pin     | Signal |
| 1       | D_GND  |
| 2 - 3   | NC     |
| 4       | INT    |
| 5       | SCK    |
| 6       | DAT    |
| 7       | 3.3V   |
| 8       | Reset  |

Table 18: Touchscreen panel connector 'JTOUCH1' pinouts



## A.6.9 Volume Buttons

The VIA SOMDB7 carrier board comes with volume-up and volume-down buttons labeled as 'SW2' and 'SW1' respectively. The volume-up button 'SW2' is also the download key, which can be pressed to start an OS image download. The button is to be kept pressed till the OS image download begins.



**Note:**  
Refer to the Readme file in the OS image package for detailed instructions.

The diagram of the volume buttons is shown below.

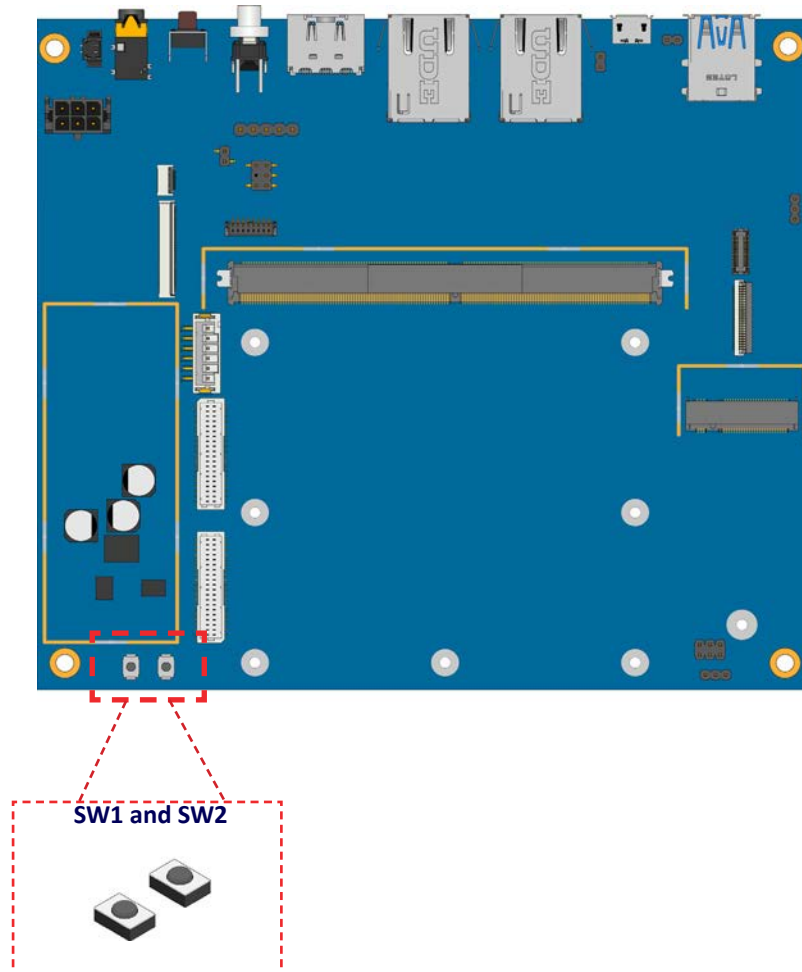


Figure 34: Volume buttons 'SW1' and 'SW2'

## A.6.10 DC-in Power Connector

The VIA SOMDB7 carrier board comes with a DC-in power connector labeled 'J7'. The power cable plugged into this connector can be connected to a 12V 3A power adapter. The pinouts of the DC-in power connector are shown below.

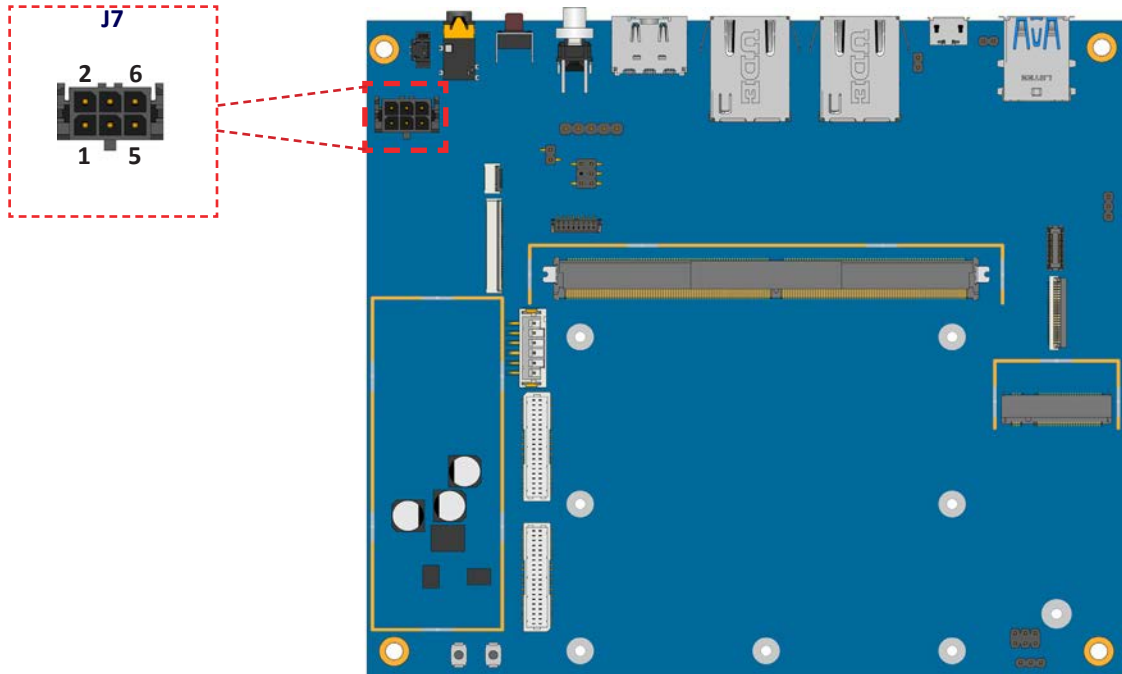


Figure 35: DC-in power connector 'J7'

| J7  |        |
|-----|--------|
| Pin | Signal |
| 1   | 12V    |
| 2   | GND    |
| 3   | 12V    |
| 4   | GND    |
| 5   | 12V    |
| 6   | GND    |

Table 19: DC-in power connector 'J7' pinouts

## A.6.11 GPIO/ADC Expansion Header

The VIA SOMDB7 carrier board comes with a GPIO/ADC expansion header labeled as 'JGPIO', which supports three GPIO pins 'GPIO1', 'GPIO2', and 'GPIO3'. Pins 'GPIO1' and 'GPIO2' can be used for ADC in the 0V ~ 3.3V analog range. Pin 'GPIO3' can be used for a pure digital signal at the 3.3V level. The pinouts of the GPIO/ADC expansion header are shown below.

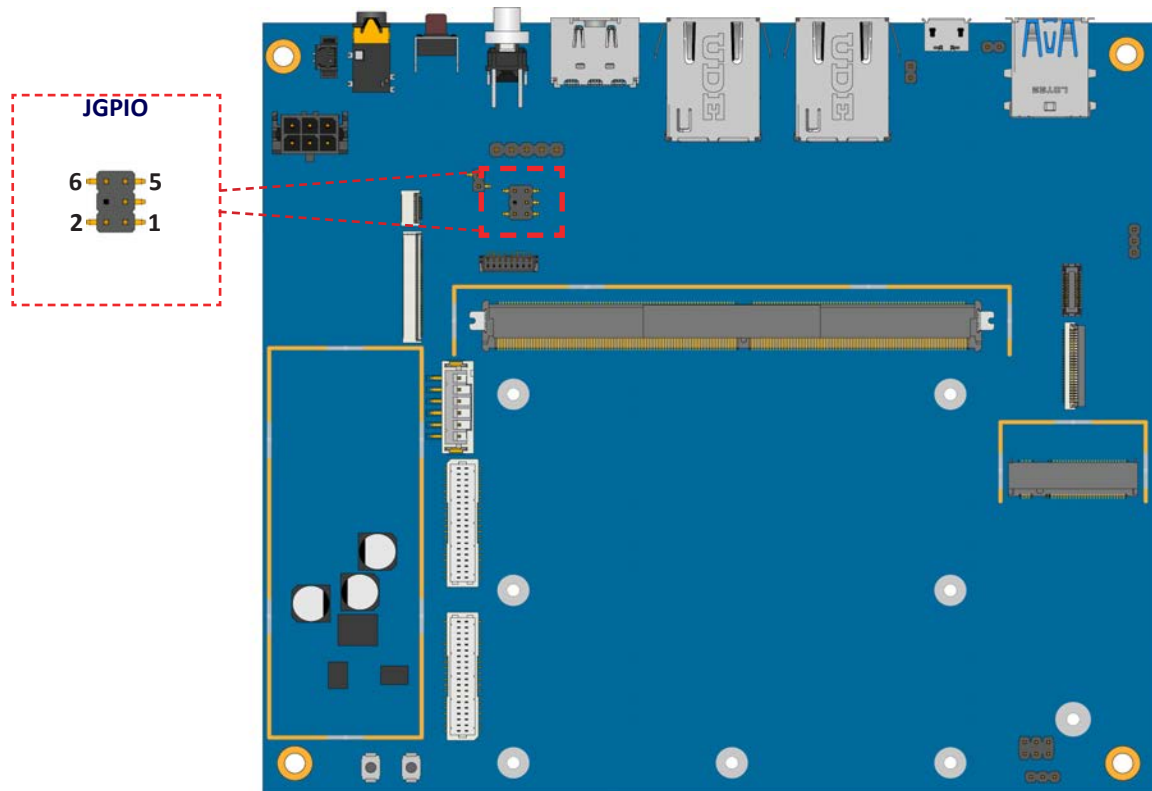


Figure 36: GPIO/ADC header 'JGPIO'

| JGPIO |           |
|-------|-----------|
| Pin   | Signal    |
| 1     | ADC_GPIO1 |
| 2     | ADC_GPIO2 |
| 3     | GPIO3     |
| 4     | N/A       |
| 5 - 6 | GND       |

Table 20: GPIO/ADC header 'JGPIO' pinouts

## A.6.12 RTC Battery Connector

The VIA VAB-935 carrier board comes with an RTC battery connector labeled 'J9', and supports 3.0V 240mAh dioxide lithium batteries. It provides power to the MCU to maintain the real time clock while the DC adapter and lithium-ion polymer battery are both absent. The pinouts of the RTC battery connector are shown below.

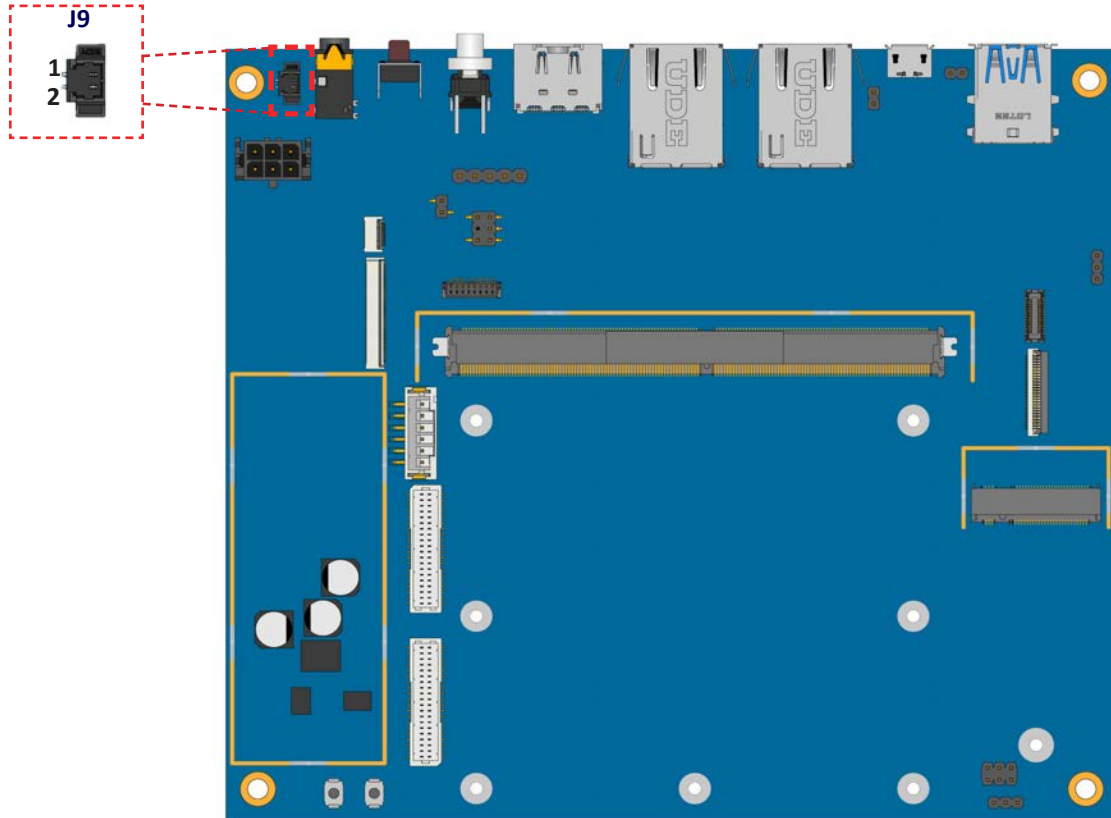


Figure 37: RTC battery connector

| Pin | Signal  |
|-----|---------|
| 1   | BAT_RTC |
| 2   | GND     |

Table 21: RTC battery connector pinouts

## A.6.13 M.2 B-Key Slot

The VIA SOMDB7 carrier board is equipped with an M.2 format 3042 key B slot labeled 'J2', to be used for adding a wireless networking option such as a 4G LTE/5G M.2 module. The interface is based on USB 2.0, USB 3.1, and SIM. The pinouts of the M.2 slot are shown below.

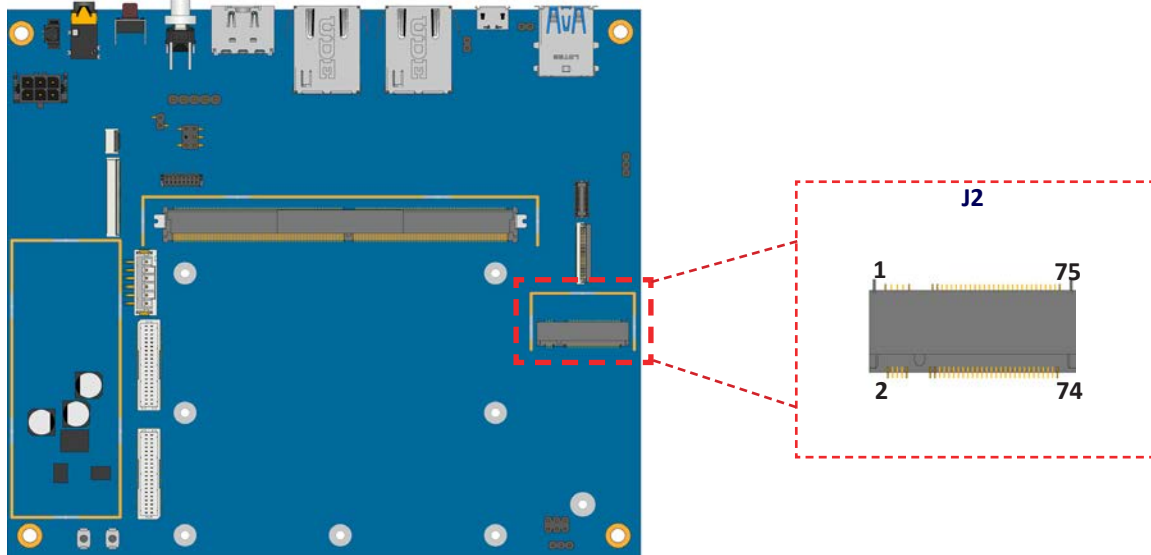


Figure 38: M.2 B-key slot 'J2'

| J2      |                      |     |                           |     |               |     |             |
|---------|----------------------|-----|---------------------------|-----|---------------|-----|-------------|
| Pin     | Signal               | Pin | Signal                    | Pin | Signal        | Pin | Signal      |
| 1       | NC                   | 25  | DPR                       | 42  | NC            | 59  | ANTCTL0     |
| 2       | 3.3 V                | 26  | GPIO_10                   | 43  | SATA-B-/PERp0 | 60  | NC          |
| 3       | GND                  | 27  | GND                       | 44  | NC            | 61  | ANTCTL1     |
| 4       | 3.3 V                | 28  | GPIO_8                    | 45  | GND           | 62  | NC          |
| 5       | GND                  | 29  | PERn1 / USB RX-/SSIC-RxN  | 46  | NC            | 63  | ANTCTL2     |
| 6       | FULL_CARD_POWER_OFF# | 30  | UIM-RESET                 | 47  | SATA-A-/PETn0 | 64  | NC          |
| 7       | USB_D+               | 31  | PERp1 / USB RX+/ SSIC-RxP | 48  | NC            | 65  | ANTCTL3     |
| 8       | W_DISABLE#           | 32  | UIM-CLK                   | 49  | SATA-A+/PETp0 | 66  | SIM DETECT  |
| 9       | USB D-               | 33  | GND                       | 50  | PERST#        | 67  | RESET#      |
| 10      | GPIO_9/DAS/DSS       | 34  | UIM-DATA                  | 51  | GND           | 68  | SUSCLK      |
| 11      | GND                  | 35  | PETn1 / USB TX-/SSIC-TxN  | 52  | CLKREQ#       | 69  | NC          |
| 12 - 19 | Key                  | 36  | UIM-PWR                   | 53  | REFCLKN       | 70  | 3.3V / VBAT |
| 20      | GPIO_5               | 37  | PETp1 / USB TX+/SSIC-TxP  | 54  | PEWAKE#       | 71  | GND         |
| 21      | NC                   | 38  | DEVSLP                    | 55  | REFCLKP       | 72  | 3.3V / VBAT |
| 22      | GPIO_6               | 39  | GND                       | 56  | NC            | 73  | GND         |
| 23      | GPIO_11              | 40  | NC                        | 57  | GND           | 74  | 3.3V / VBAT |
| 24      | GPIO_7               | 41  | SATA-B+/PERn0             | 58  | NC            | 75  | NC          |

Table 22: M.2 B-key slot 'J2' pinouts

## A.6.14 SIM Card Slot

The VIA SOMDB7 carrier board is equipped with a SIM card slot labeled 'SIM1', which supports 4G LTE/5G SIM cards. SIM card usage requires that a 4G LTE M.2 module be installed in the M.2 slot described in the previous section A.6.12. The SIM card slot is designed for use with 4G LTE/5G modules that do not support built-in SIM card slots. The pinouts of the SIM card slot are shown below.

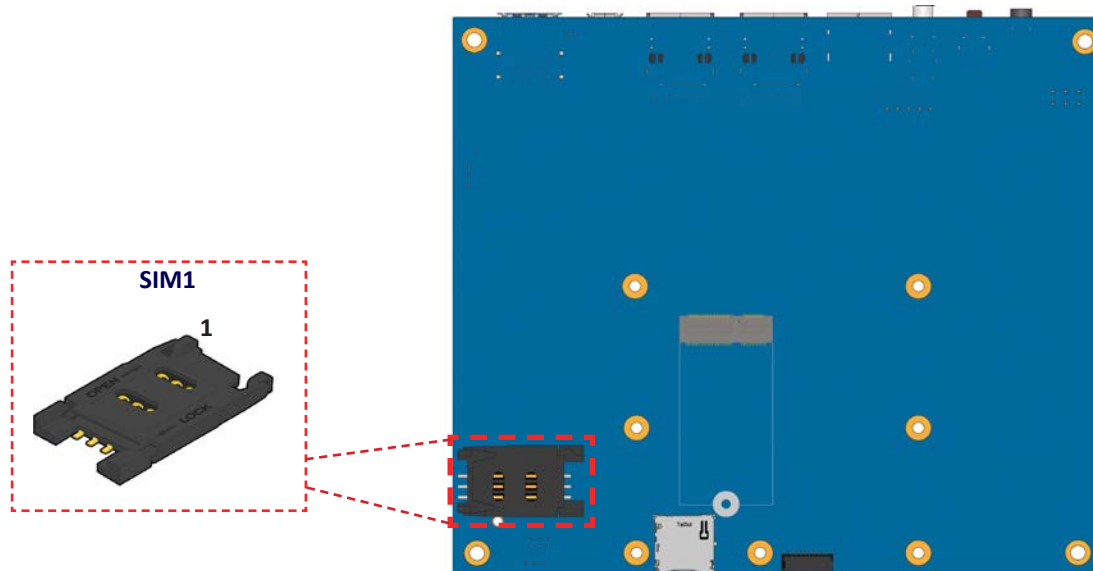


Figure 39: SIM card slot 'SIM1'

| Pin | Signal     |
|-----|------------|
| 1   | USIM_VCC   |
| 2   | USIM_RST1  |
| 3   | USIM_CLK1  |
| 4   | N/A        |
| 5   | GND        |
| 6   | UIM_VPP1   |
| 7   | USIM_DATA1 |

Table 23: SIM card slot 'SIM1' pinouts



**Note:**

Refer to [Appendix section C.1](#) for installing the optional 4G LTE M.2 wireless module kit and an activated 4G SIM card.

## A.6.15 M.2 E-Key Slot

The VIA SOMDB7 carrier board is equipped with an M.2 format 3042 key E slot labeled 'J32', to be used for adding a wireless networking option such as a Wi-Fi M.2 module. The interface is based on USB 2.0 and PCIe. The pinouts of the M.2 slot are shown below.



**Note:**

It is recommended to keep the VIA SOM-7000 module's Wi-Fi functionality disabled if a Wi-Fi M.2 module is installed.

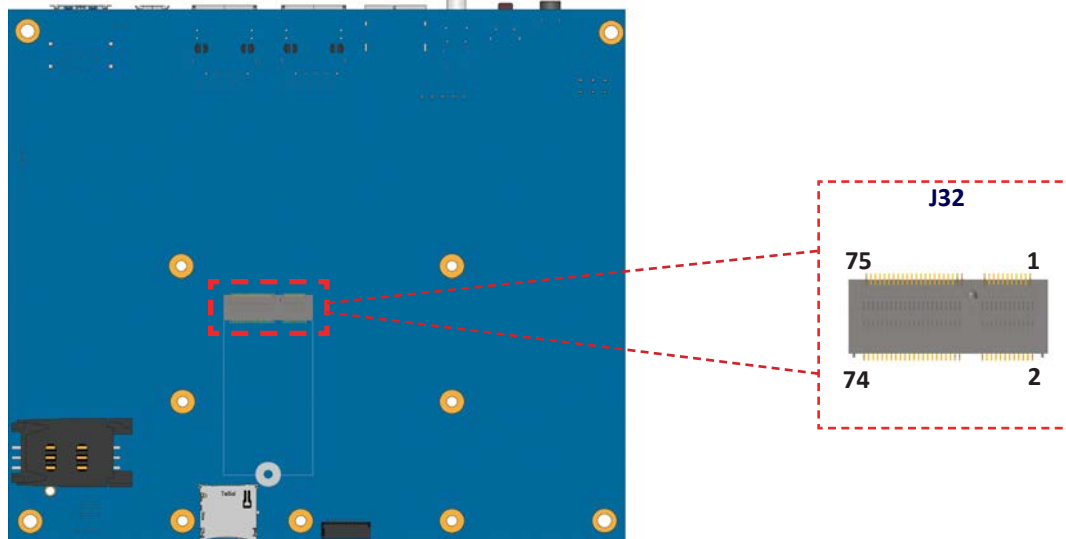


Figure 40: M.2 E-key slot 'J32'

| J32     |        |     |          |     |             |         |             |
|---------|--------|-----|----------|-----|-------------|---------|-------------|
| Pin     | Signal | Pin | Signal   | Pin | Signal      | Pin     | Signal      |
| 1       | GND    | 36  | NC       | 53  | CLKREQ0     | 70 - 71 | NC          |
| 2       | 3.3 V  | 37  | PETn0    | 54  | W_DISABLE#2 | 72      | 3.3V / VBAT |
| 3       | USB_D+ | 38  | NC       | 55  | PEWake0     | 73      | NC          |
| 4       | 3.3 V  | 39  | GND      | 56  | W_DISABLE#1 | 74      | 3.3V / VBAT |
| 5       | USB_D- | 40  | NC       | 57  | GND         | 75      | GND         |
| 6       | LED1   | 41  | PERp0    | 58  | NC          |         |             |
| 7       | GND    | 42  | NC       | 59  | RETp1       |         |             |
| 8 - 15  | NC     | 43  | PERn0    | 60  | NC          |         |             |
| 16      | LED2   | 44  | NC       | 61  | RETn1       |         |             |
| 17      | NC     | 45  | GND      | 62  | NC          |         |             |
| 18      | GND    | 46  | NC       | 63  | GND         |         |             |
| 19 - 23 | NC     | 47  | REFCLKp0 | 64  | NC          |         |             |
| 24 - 31 | Key    | 48  | NC       | 65  | RERp1       |         |             |
| 32      | NC     | 49  | REFCLKn0 | 66  | NC          |         |             |
| 33      | GND    | 50  | SUSCLK   | 67  | RERn1       |         |             |
| 34      | NC     | 51  | GND      | 68  | NC          |         |             |
| 35      | PETp0  | 52  | Perst0#  | 69  | GND         |         |             |

Table 24: M.2 E-key slot 'J32' pinouts

## A.6.16 Debug Console Connector

The VIA SOMDB7 carrier board is equipped with a debug console connector labeled 'J14'. The debug console cable bundled in the VIA SOM-7000 Evaluation Kit can be plugged into this connector and a developer PC to perform software debugging. The pinouts of the debug console connector are shown below.

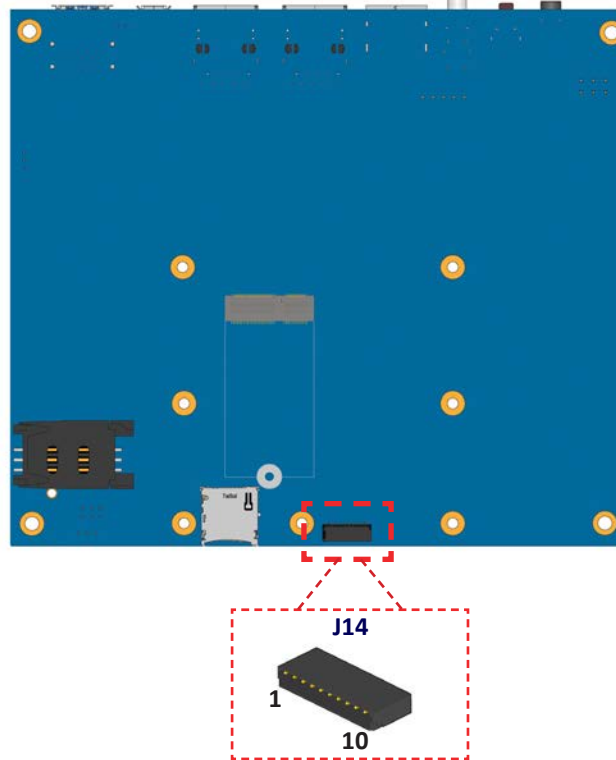


Table 25: Debug console connector 'J14'

| J14    |                         |
|--------|-------------------------|
| Pin    | Signal                  |
| 1      | NC                      |
| 2      | RS232_RXD ( PC to SOC ) |
| 3      | RS232_TXD ( SOC PC )    |
| 4      | MDN2                    |
| 5      | NC                      |
| 6      | GND                     |
| 7 - 10 | NC                      |

Table 26: Debug console connector 'J14' pinouts



## A.7 SOMDB7 Onboard Jumpers

### Jumper Description

A jumper consists of a pair of conductive pins used to close in or bypass an electronic circuit to set up or configure a particular feature using a jumper cap. The jumper cap is a small metal clip covered by plastic. It performs like a connecting bridge to short (connect) the pair of pins. The usual colors of the jumper cap are black/red/blue/white/yellow.

### Jumper Setting

There are two settings of the jumper pin: 'Short' and 'Open'. The pins are 'Short' when a jumper cap is placed on the pair of pins. The pins are 'Open' if the jumper cap is removed.

In addition, there are jumpers that have three or more pins, and some pins are arranged in series. In case of a jumper with three pins, place the jumper cap on pin 1 and pin 2 or pin 2 and 3 to Short it.

Some jumpers' sizes are small or mounted on a crowded location on the VIA SOMDB7 carrier board that makes it difficult to access. Therefore, using a long-nose plier in installing and removing the jumper cap is very helpful.

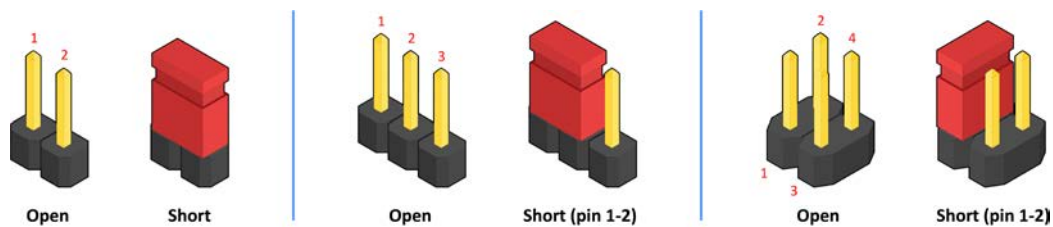


Figure 41: Jumper settings example



**Caution:**

Make sure to install the jumper cap on the correct pins. Installing it on the wrong pins might cause damage and malfunction.

## A.7.1 Watchdog Jumper

The VIA SOMDB7 carrier board comes with a watchdog jumper labeled as 'J11', to be used for enabling or disabling the watchdog function on the VIA SOMDB7 carrier board. The watchdog jumper settings are shown below.

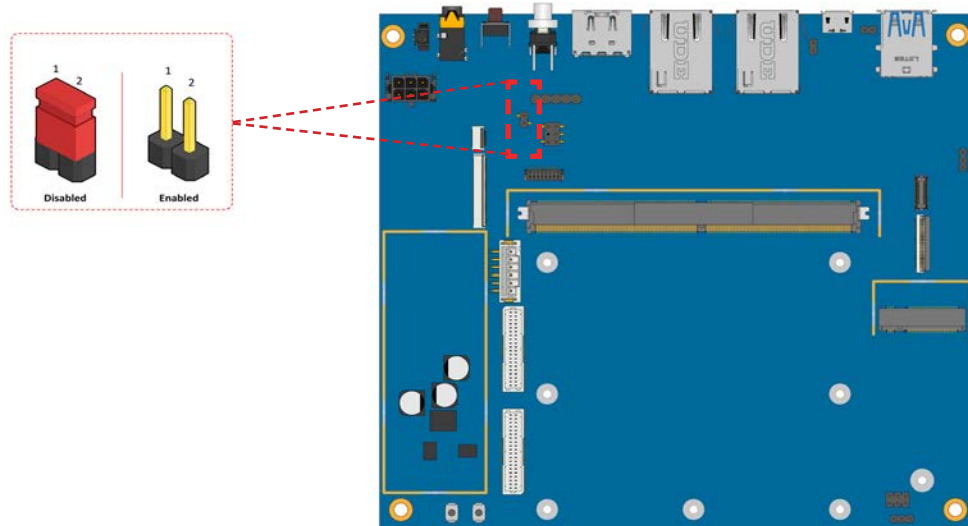


Figure 42: Watchdog jumper diagram

| Settings           | Pin 1 | Pin 2 |
|--------------------|-------|-------|
| Disabled (default) | Short | Short |
| Enabled            | Open  | Open  |

Table 27: Watchdog jumper settings

## Appendix B Recommended Mating/Unmating Jig

This chapter describes how to use the recommended mating/unmating jig for fixing the:

- MHF - I mating/unmating jig for fixing the provided antennas' plug connectors on the micro-miniature RF antenna connectors (I-PEX) located on the VIA SOM-7000 module as described in [section 2.2](#).
- MHF - 4 mating/unmating jig for fixing the 4G LTE antennas' plug connectors on the micro-miniature RF antenna connectors (I-PEX) located on the optional 4G LTE Wireless Module as described in [Appendix section C.1](#).



**Note:**

4G LTE antennas are provided with the optional 4G LTE Wireless Module.

### B.1 Jig Dimensions

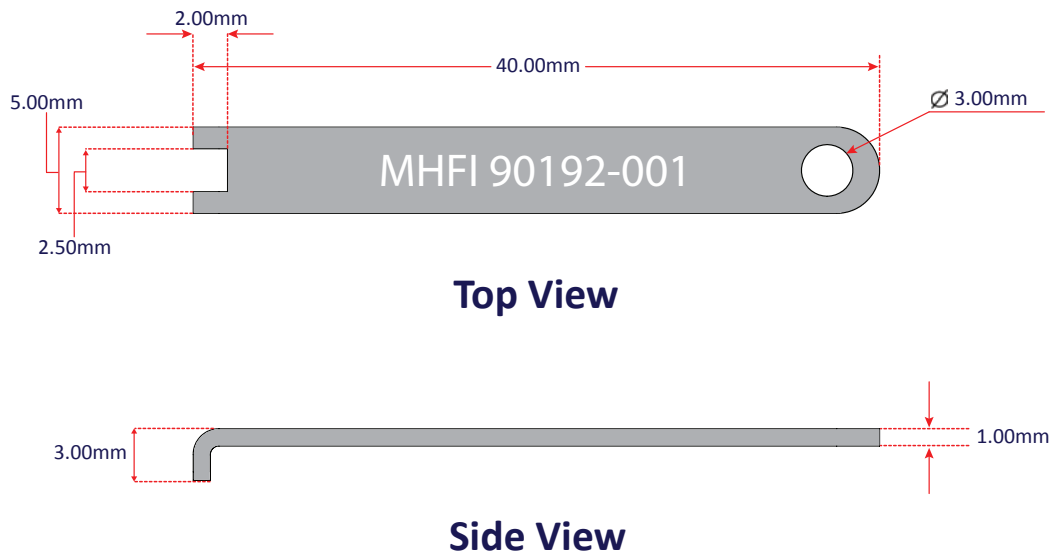


Figure 43: MHF - I mating/unmating jig dimensions

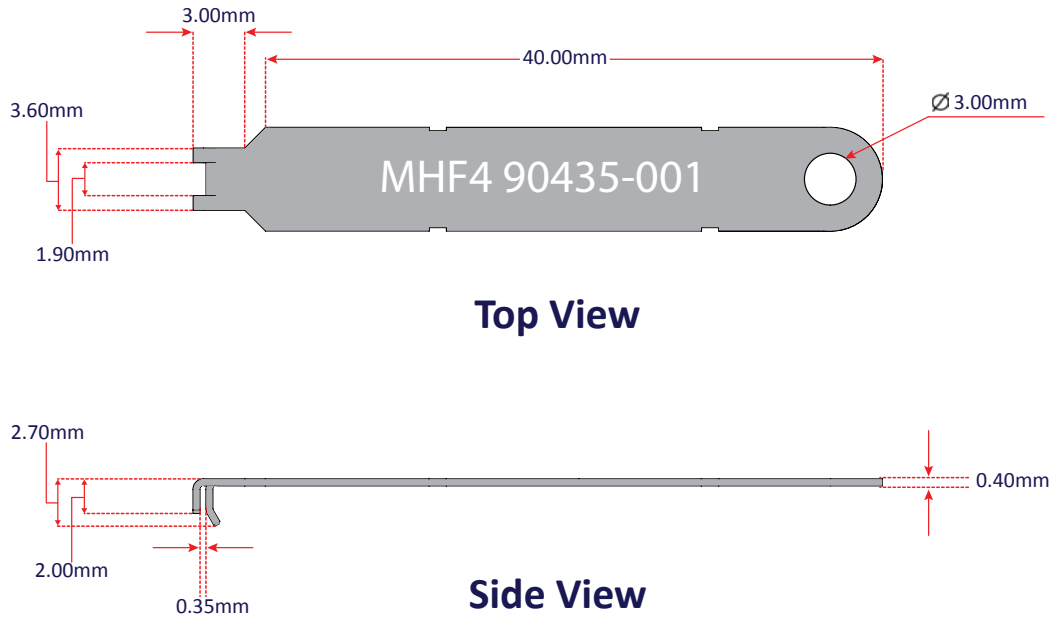


Figure 44: MHF - 4 mating/unmating jig dimensions

## B.2 Mating Method of Plug Connector

Using the jig, align the plug connector with the micro-miniature RF antenna connector (I-PEX). Then push down gently until the plug connector is fully connected. The recommended force is 30N (maximum).

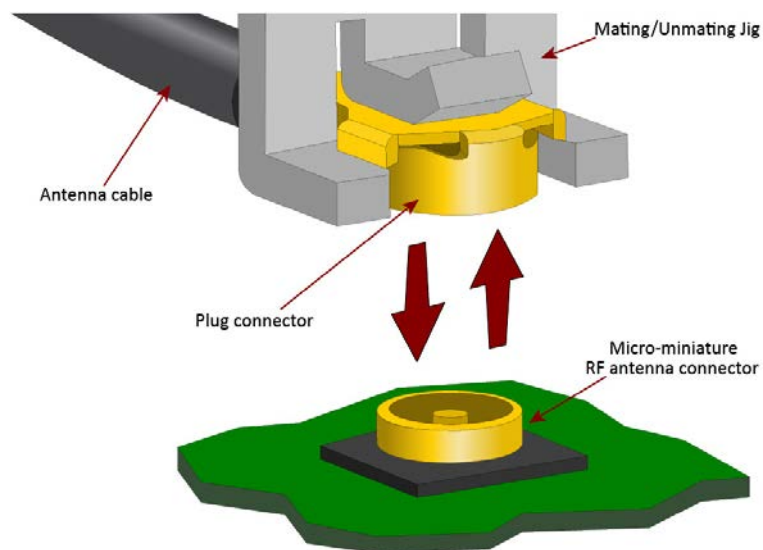


Figure 45: Mating the plug connector with the I-PEX connector

## Appendix C Optional Accessories

This chapter describes how to install or connect optional accessories on the VIA SOMDB7 carrier board.

**Note:**

It is recommended to use a grounded wrist strap before handling computer components. Electrostatic discharge (ESD) can damage some components.

### C.1 4G LTE M.2 Wireless Module Kit

An optional 4G LTE wireless module accessory kit is available to provide cellular connectivity to the VIA SOMDB7 carrier board (SIM card not provided). The 4G LTE wireless module accessory kit includes a 4G LTE M.2 module, two antennas, and an M3 screw.

Follow the instructions described below to install the 4G LTE wireless module and the antennas provided with it:

**Step 1**

Follow the instructions below to install an activated 4G LTE SIM card:

1. Firmly push back to unlock the SIM card slot located on the VIA SOMDB7 carrier board.
2. Pull up the slot and slide in the SIM card, ensuring that the correct end goes in.
3. Push down the slot.
4. Gently slide back the SIM card slot to lock it.

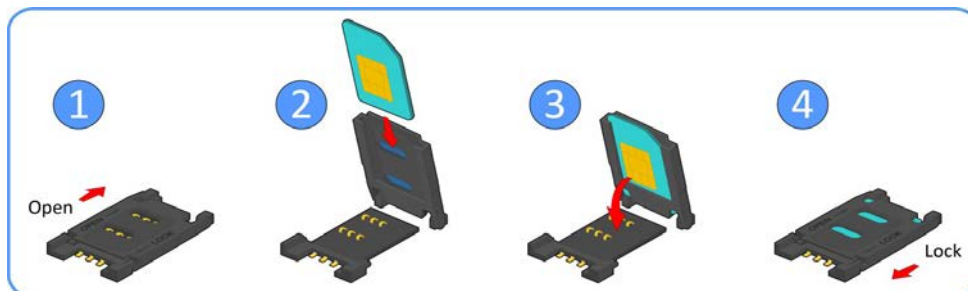


Figure 46: Installing the SIM card

## Step 2

Align the 4G LTE module's notch with the notch of the M.2 B-Key slot on the VIA SOMDB7 carrier board, then insert the 4G LTE module at a 30° angle.

## Step 3

Once the 4G LTE module is fully inserted, gently push down the module until its standoff hole aligns with the screw hole of the VIA SOMDB7 carrier board, then secure the module with the provided M3 screw.

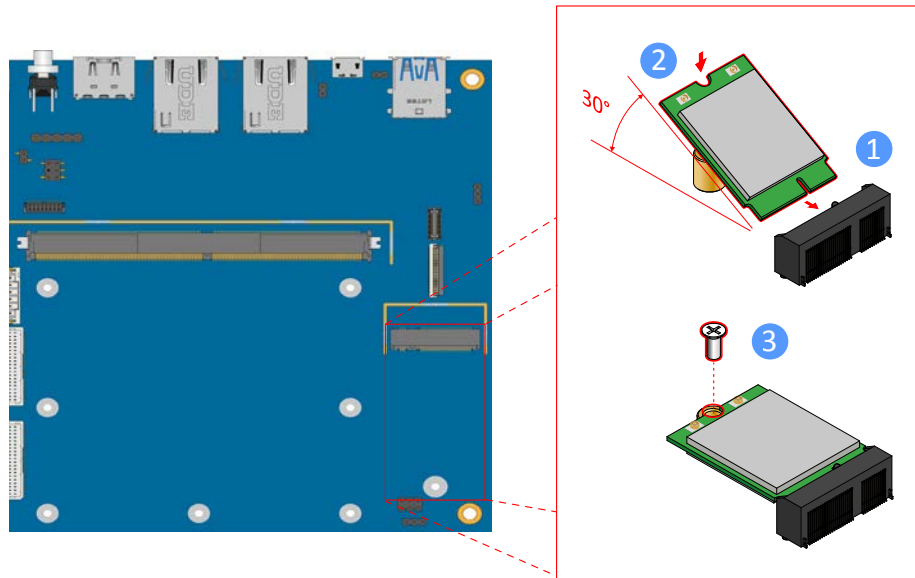


Figure 47: Installing and securing the 4G LTE module

## Step 4

Insert each antenna cable into an antenna holes from the inside of the back panel plate. Insert the washer, fasten it with the nut, and install the antenna.

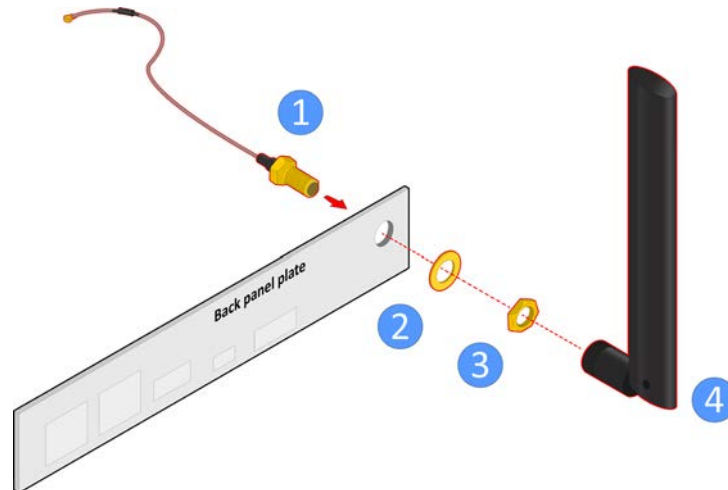


Figure 48: Installing an antenna cable with antenna

## Step 5

Connect the other ends of the antenna cables to the micro-RF (IPEX) connectors labeled 'M' and 'D/G' on the 4G LTE module.

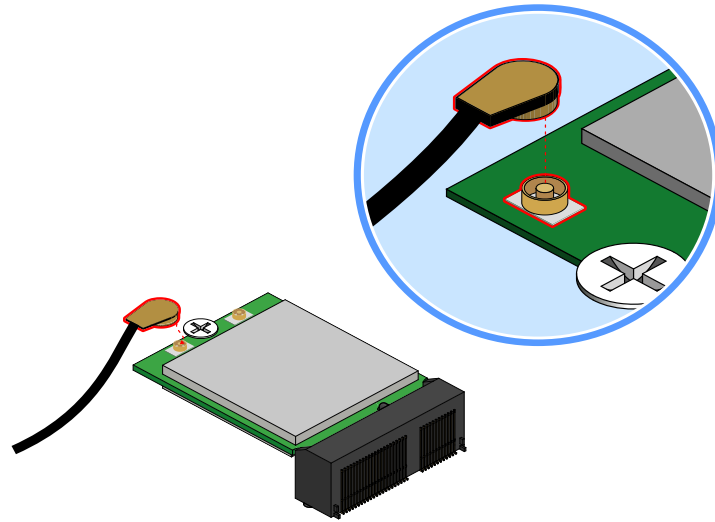


Figure 49: Connecting an antenna cable to the 4G LTE module



### Note:

Using an MHF - 4 mating/unmating jig is recommended for connecting the antennas to the I-PEX connectors on the 4G LTE module. Refer to [Appendix B](#) for more information.



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