



USER MANUAL

VIA QSM-8Q60

Qseven™ ARM module with
NXP i.MX 6QuadPlus or
i.MX 6DualLite Cortex-A9 SoC
for industrial automation applications



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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

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Notice 2

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Notice 3

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Tested To Comply
With FCC Standards
FOR HOME OR OFFICE USE



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- 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 User's Manual for future reference.
- All cautions and warnings on the equipment should be noted.
- Keep this equipment away from humidity.
- Lay this equipment on a reliable flat surface before setting it up.
- Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
- Place the power cord in such a way that people cannot step on it.
- Always unplug the power cord before inserting any add-on card or module.
- If any of the following situations arises, get the equipment checked by authorized service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated into the equipment.
 - The equipment has been exposed to moisture.
 - The equipment has not worked well or you cannot get it work according to User's Manual.
 - The equipment has dropped and damaged.
 - The equipment has obvious sign of breakage.
- Do not leave this equipment in an environment unconditioned or in a storage temperature above 70°C (158°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 cord.
- Do not cover the ventilation holes. The openings on the enclosure protect the equipment from overheating

Box Contents

QSM-8Q60-QP SKU

- 1 x QSM-8Q60 Qseven™ module (with 1.0GHz NXP i.MX 6QuadPlus Cortex-A9 quad-core SoC)
- 1 x QSM-8Q60 evaluation carrier board (QSMDB2)
- 1 x DC power cable
- 1 x CAN bus cable

QSM-8Q60 SKU

- 1 x QSM-8Q60 Qseven™ module (with 1.0GHz NXP i.MX DualLite Cortex-A9 dual-core SoC)
- 1 x QSM-8Q60 evaluation carrier board (QSMDB2)
- 1 x DC power cable
- 1 x CAN bus cable

Ordering Information

Part Number	Description
10GEC10H40020	Qseven™ module with 1.0GHz NXP i.MX 6QuadPlus Cortex-A9, 4GB eMMC, 4MB SPI ROM, 2GB DDR3 SDRAM, HDMI, 4 x USB 2.0, USB OTG client, LVDS, 3 x COM (TX/RX), Gigabit Ethernet, 10/100Mbps Ethernet, 2 x CAN bus, PCIe x1, Micro SD card slot
10GEC10700020	Qseven™ module with 1.0GHz NXP i.MX 6DualLite Cortex-A9, 4GB eMMC, 4MB SPI ROM, 2GB DDR3 SDRAM, HDMI, 4 x USB 2.0, USB OTG client, LVDS, 3 x COM (TX/RX), Gigabit Ethernet, 10/100Mbps Ethernet, 2 x CAN bus, PCIe x1, Micro SD card slot
10GFL00000020	QSM-8Q60 evaluation carrier board (QSMDB2) with CAN bus cable and DC power cable

Optional Accessories

Wireless Modules

Part Number	Description
00GO27100BU2B0D0	VNT9271BU0DB IEEE 802.11b/g/n USB Wi-Fi dongle
EMIO-2531-00A1	VAB-820-W-M IEEE 802.11b/g/n miniPCIe Wi-Fi & Bluetooth module with assembly kit and antenna

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1. Product Overview

The VIA QSM-8Q60 is an ARM-based Qseven™ form factor module powered by a 1.0GHz NXP i.MX 6QuadPlus (or i.MX 6DualLite) Cortex-A9 SoC that delivers high performance and rich multimedia features in an ultra-compact package for a wide range of embedded system applications such as industrial automation, transportation, medical and infotainment.

Measuring 70mm x 70mm, the VIA QSM-8Q60 is fully compliant with the Qseven™ Rev. 2.0 embedded form factor standard adopted by the Standardization Group for Embedded Technologies e.V. (SGeT). Supporting a wide operating temperature of -20°C ~ 70°C, the VIA QSM-8Q60 is designed for optimum flexibility in the harshest environments.

The VIA QSM-8Q60 supports an onboard Micro SD card slot, 4GB eMMC Flash memory and 2GB DDR3 SDRAM, the module also offers rich I/O and display expansion options including four USB 2.0 ports, HDMI port, dual-channel 18/24-bit LVDS panel, three COM ports (TX/RX), Gigabit Ethernet, two CAN bus and PCIe x1.

The VIA QSM-8Q60 features a Linux BSP which includes the kernel and bootloader source codes. Other features include a Tool Chain to help make adjustments to the kernel and to support the QSMDB2 carrier board I/O and other hardware features.

1.1. Key Features

- Powered by 1.0GHz NXP i.MX 6QuadPlus or i.MX 6DualLite Cortex-A9 SoC
- Qseven™ Rev. 2.0 compliant
- Supports one 18/24-bit dual-channel LVDS panel
- Supports four USB 2.0 ports
- Supports one Micro SD card slot
- 4GB onboard eMMC Flash memory
- Wide operating temperature range: -20°C ~ 70°C
- 3.5" form factor carrier options
- 7-year longevity support

1.2. Product Specifications

Processor

- 1.0GHz NXP i.MX 6QuadPlus Cortex-A9 quad-core SoC (QSM-8Q60-QP SKU)
- 1.0GHz NXP i.MX 6DualLite Cortex-A9 dual-core SoC (QSM-8Q60 SKU)

System Memory

- 2GB DDR3 SDRAM

Storage

- 4GB eMMC Flash memory

Boot Loader

- 4MB SPI Flash ROM

Graphics

- Vivante GC2000+ GPU (QSM-8Q60-QP SKU)
 - Three Independent, integrated 3D/2D graphics processing units
 - Graphics engines support OpenGL[®] ES 2.0, OpenCL and OpenVG[™] 1.1 hardware acceleration
 - Supports MPEG-2, VC1 and H.264 video decoding up to 1080p
 - Supports SD encoding
- Vivante GC880 GPU (QSM-8Q60 SKU)
 - Two Independent, integrated 3D/2D graphics processing units
 - Graphics engines support OpenGL[®] ES 2.0, OpenVG[™] 1.1 hardware acceleration
 - Supports MPEG-2, VC1 video decoding up to 1080p

LAN

- Micrel KSZ9031RNX Gigabit Ethernet Transceiver with RGMII support

Audio

- I2S Audio Interface

HDMI

- Integrated HDMI Transmitter

USB

- SMSC USB2514 USB 2.0 High Speed 4-port hub controller

Supported Expansion I/O

- 1 x PCIe x1

Supported I/O

- 4 x USB 2.0 ports
- 1 x USB OTG client
- 1 x HDMI port
- 1 x Dual-channel 18/24-bit LVDS panel connector
- 1 x PWM
- 3 x COM (TX/RX) ports
- 1 x Gigabit Ethernet port
- 2 x CAN bus
- 1 x I2S
- 1 x SPI
- 1 x SDIO/GPIO
- 1 x I²C

Onboard I/O

- 1 x Micro SD card slot (supports up to 32GB)

Onboard Jumper

- 1 x Micro SD/SPI boot select jumper

Operating Temperature

- -20°C ~ 70°C

Operating Humidity

- 0% ~ 95% (non-condensing)

Form Factor

- 70mm x 70mm (2.76" x 2.76")

Compliance

- Qseven™ Rev. 2.0 module

Operating System

- Linux Kernel 4.1.15

**Notes:**

1. As the operating temperature provided in the specifications is a result of testing performed in a testing chamber, 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 at the required operating temperature in terms of 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 eMMC memory makes its lifespan shorter. Therefore, it is highly recommended to use a replaceable external storage (e.g., Micro SD card) for large data access.

1.3. Layout Diagram

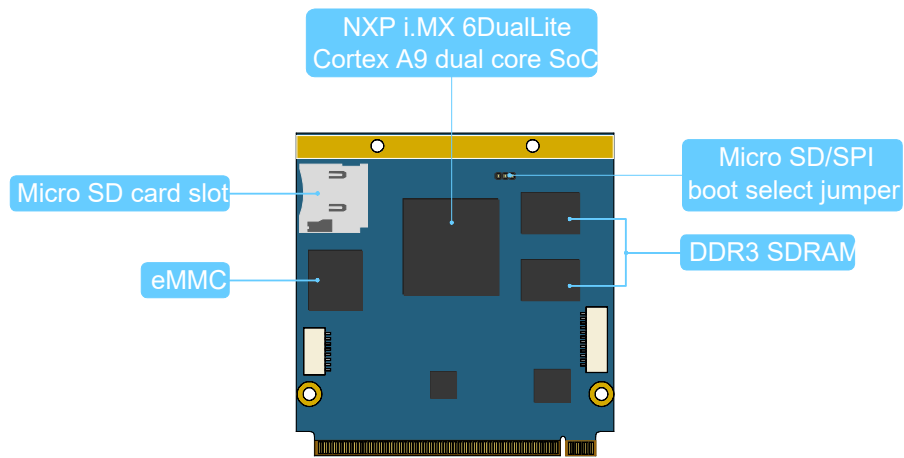


Figure 1: Layout diagram of the VIA QSM-8Q60 (top side)

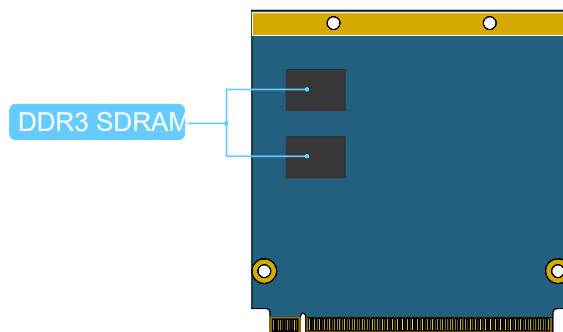


Figure 2: Layout diagram of the VIA QSM-8Q60 (bottom side)

1.4. Product Dimensions

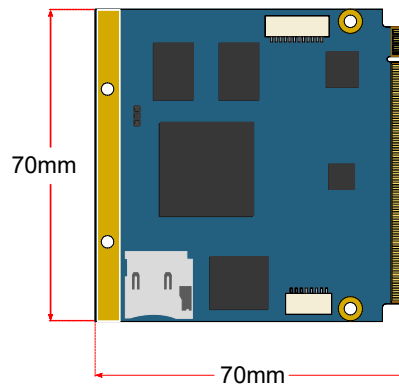


Figure 3: Dimensions of the VIA QSM-8Q60 module (top view)

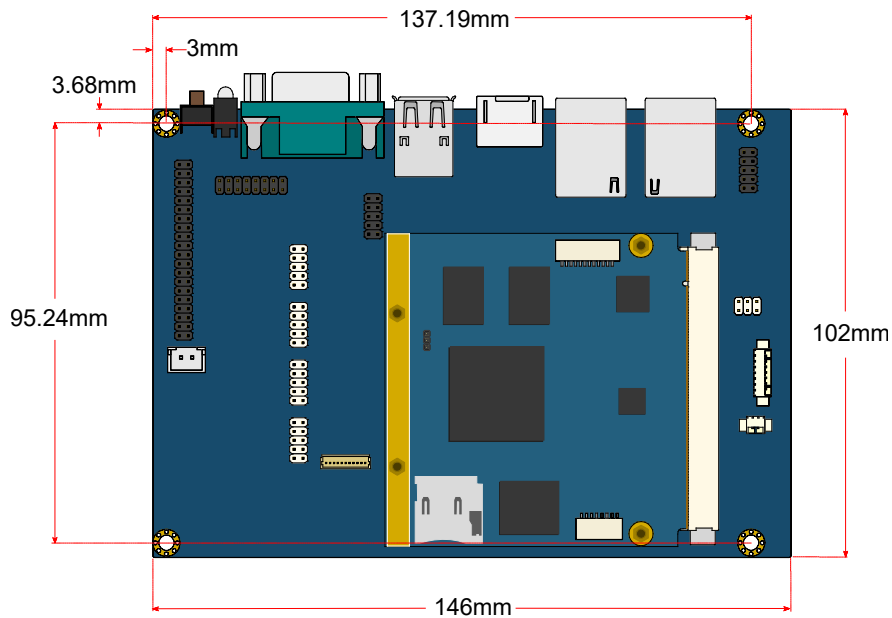


Figure 4: Dimensions of the VIA QSM-8Q60 attached to the carrier board (top view)

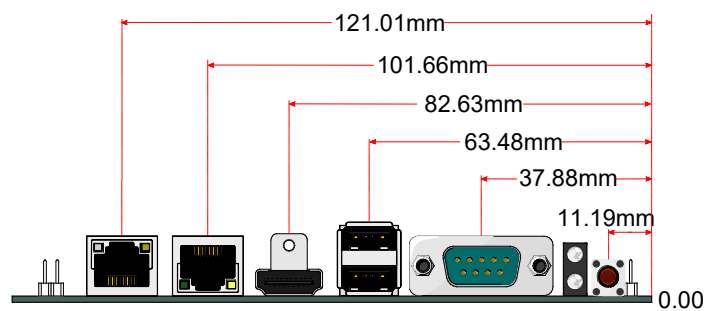


Figure 5: Dimensions of the QSMDB2 external I/O

2. Onboard Slot

This chapter provides information about the VIA QSM-8Q60's onboard slot.

2.1. Micro SD Card Slot

The VIA QSM-8Q60 module comes with a Micro SD card slot. The Micro SD card slot offers expandable storage of Micro SD card memory up to 32GB capacity. The pinouts of the Micro SD card slot are shown below.

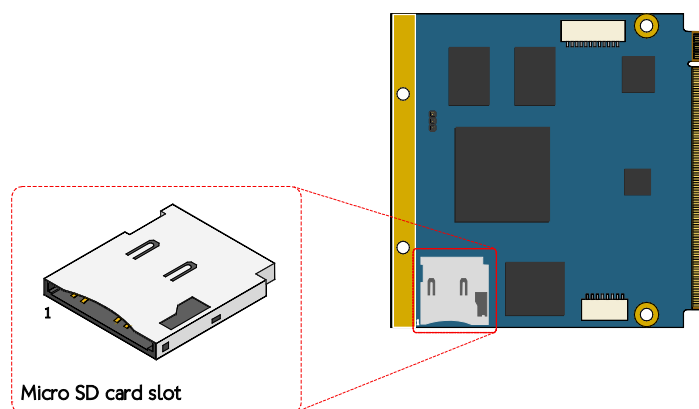


Figure 6: Micro SD card slot diagram

Pin	Signal
1	SD0DATA2
2	SD0DATA3
3	SD0CMD
4	VDD (3.3V)
5	SD0CLK
6	GND
7	SD0DATA0
8	SD0DATA1
9	SD0_CD

Table 1: Micro SD card slot pinouts

3. Onboard Jumpers

This section will explain how to configure the VIA QSM-8Q60 to match the needs of your application by setting the jumpers.

Jumper Description

A jumper consists of pair conductive pins used to close in or bypass an electronic circuit to set up or configure 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.

Basic Jumper Configuration

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 jumper size is small or mounted on the crowded location on the board that makes it difficult to access. Therefore, using a long-nose pliers in installing and removing the jumper cap is very helpful.

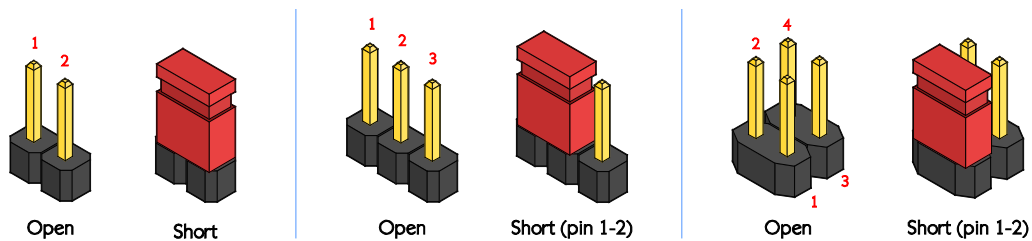


Figure 7: Jumper settings example



Caution:

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

3.1. Micro SD/SPI Boot Select Jumper

The Micro SD/SPI boot select jumper labeled as “J11” is set to specify the boot device. The default setting is the Micro SD. The jumper settings are shown below.

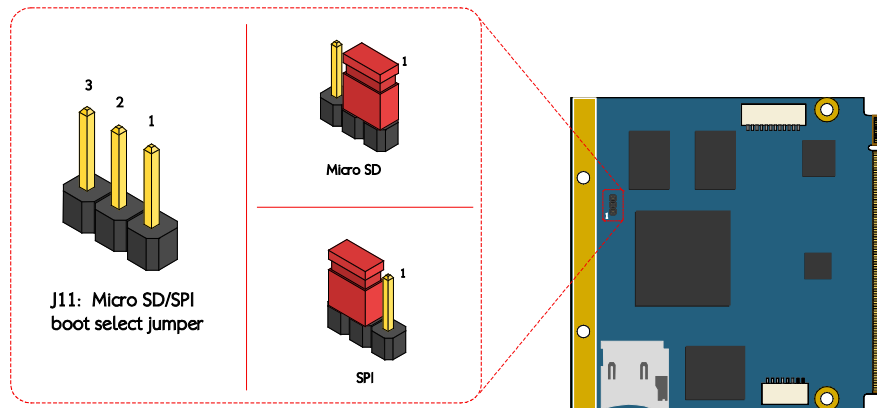


Figure 8: Micro SD/SPI boot select jumper diagram

Setting	Pin 1	Pin 2	Pin 3
Micro SD (default)	Short	Short	Open
SPI	Open	Short	Short

Table 2: Micro SD/SPI boot select jumper settings

4. Hardware Installation

This chapter provides information about hardware installation procedures.

4.1. Installing the VIA QSM-8Q60 Module on the QSMDB2 Carrier Board

Step 1

Locate the mounting points and the Qseven MXM slot on the QSMDB2 carrier board.

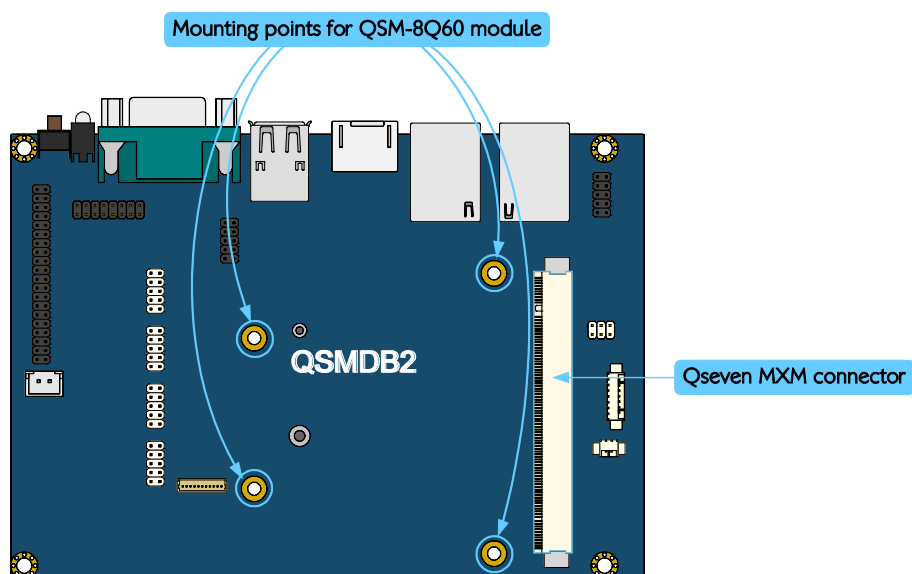


Figure 9: Mounting points and Qseven MXM connector

Step 2

Install four 5mm hex spacers on the carrier board. From the bottom of the carrier board, tighten the hex spacers by using the M2.5x4mm screws.

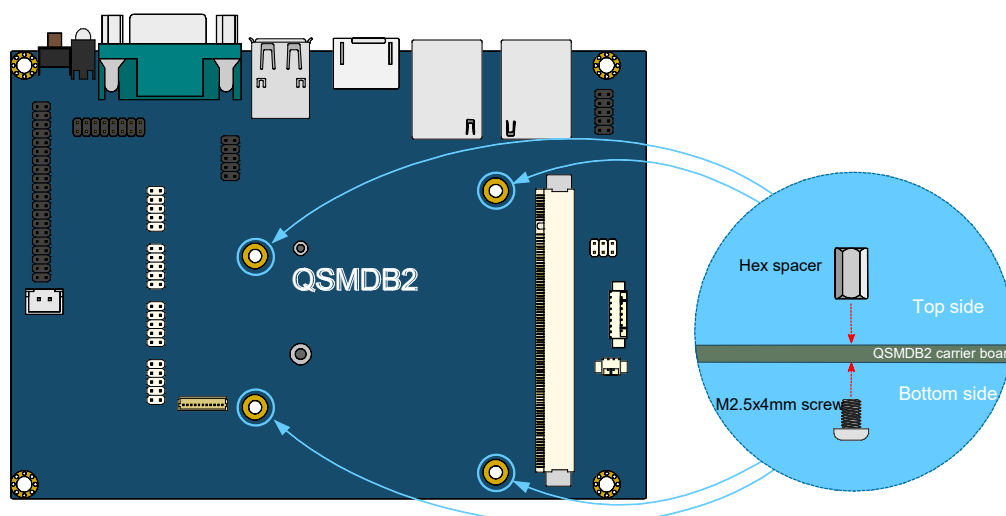


Figure 10: Installing the hex spacers on the QSMDB2 carrier board

Step 3

Align the notch on the VIA QSM-8Q60 module with the protruding wedge on the Qseven™ MXM connector then insert the module at 30° angle. Once the module has been inserted, push down the module until the screw holes align with the hole of hex spacers.

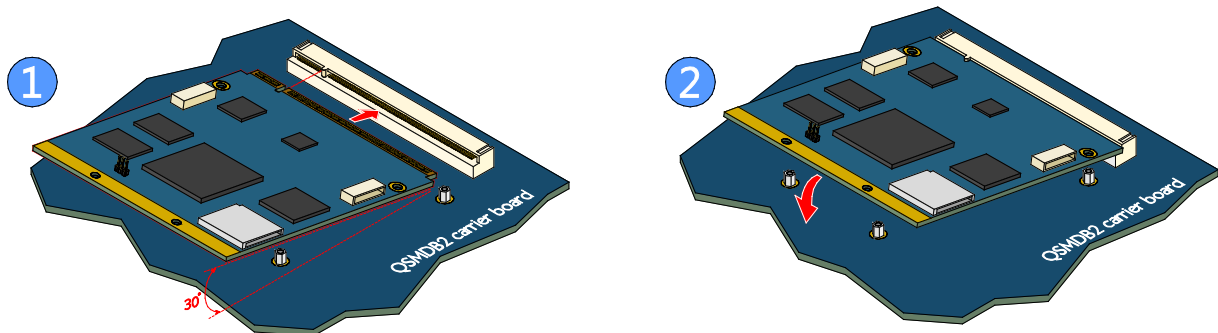


Figure 11: Installing VIA QSM-8Q60 module

Step 4

Secure the VIA QSM-8Q60 module with four 7mm hex spacer screws.

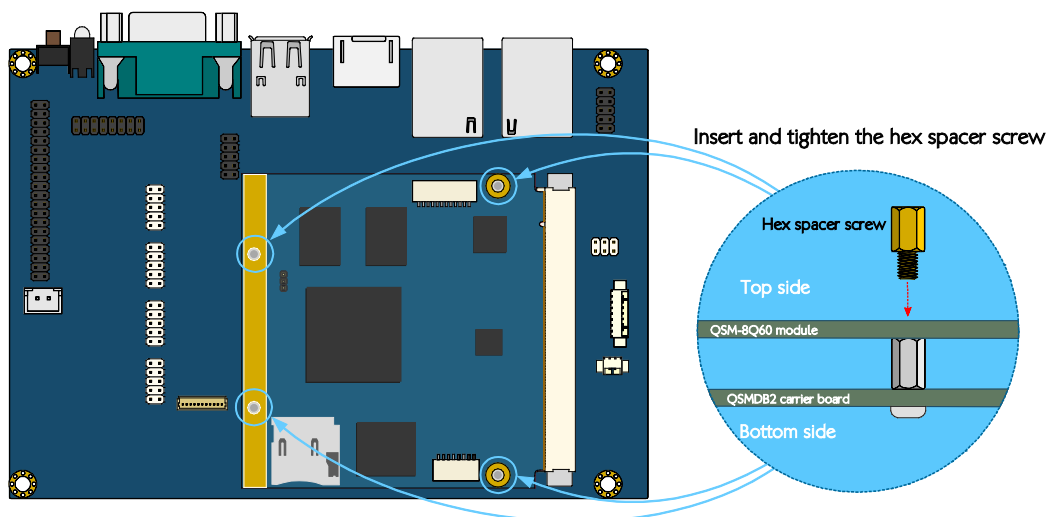


Figure 12: Securing the VIA QSM-8Q60 module

Step 5

Install the heatsink on the VIA QSM-8Q60 module.

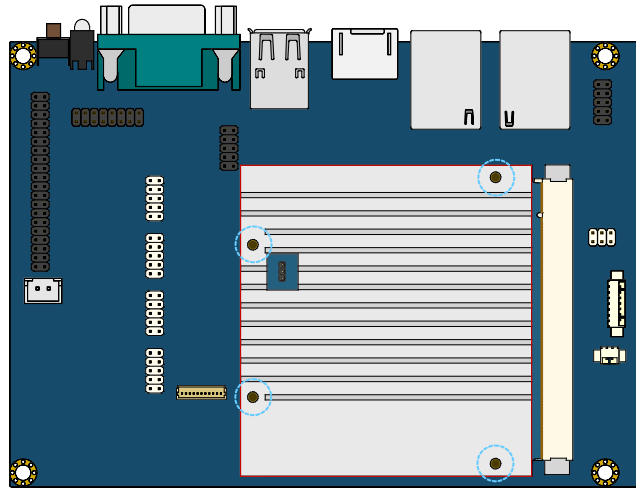


Figure 13: Installing the heatsink

Step 6

Secure the heatsink with M2.5x4mm screws.

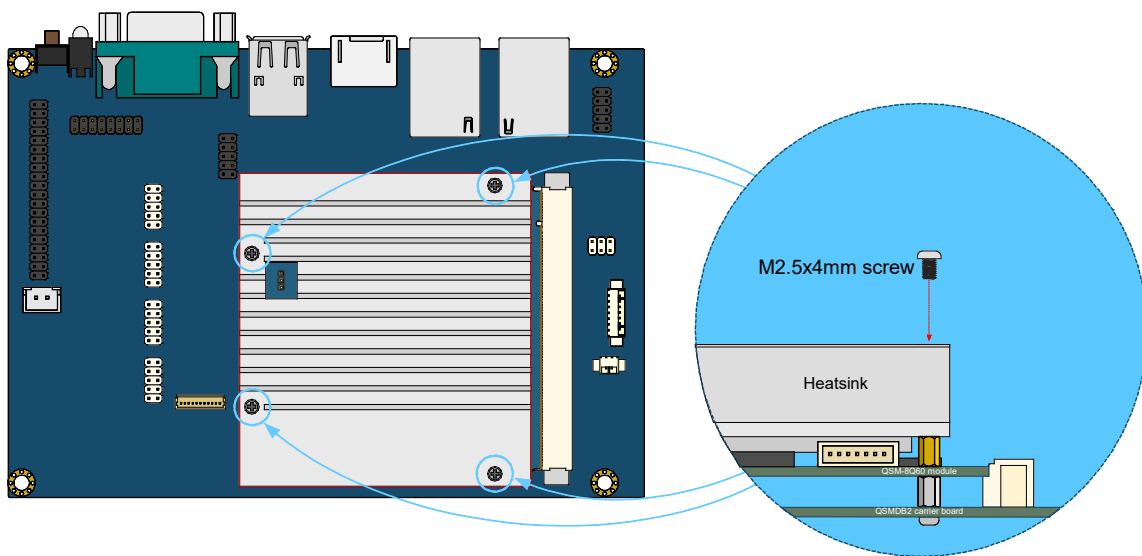


Figure 14: Securing the heatsink

5. Software and Technical Support

5.1. Linux Support

The VIA QSM-8Q60 module is highly compatible with Linux Kernel 4.1.15 operating system.

5.1.1. Driver Installation

Linux Driver Support

Linux drivers are provided through various methods including:

- Drivers provided by VIA
- Using a driver built into a distribution package
- Visiting www.viatech.com for the latest updated drivers
- Installing a third party driver (such as the ALSA driver from the Advanced Linux Sound Architecture project for integrated audio)

5.2. Technical Support and Assistance

- For utilities downloads, latest documentation and new information about the VIA QSM-8Q60, go to <http://www.viatech.com/en/boards/modules/qsm-8q60/>
- For technical support and additional assistance, always contact your local sales representative or board distributor, or go to <http://www.viatech.com/en/about/contact/> to fill up the form request.
- For OEM clients and system integrators developing a product for long term production, other code and resources may also be made available. Contact VIA to submit a request.

Appendix A. QSMDB2 Carrier Board Reference

A.1. Board Specifications

Qseven™ Rev. 2.0 compliant

- Supports VIA QSM-8Q60 module

Audio

- NXP SGTL5000 low power stereo codec

Front Panel I/O

- 2 x USB 2.0 ports
- 1 x HDMI port
- 1 x COM port (TX/RX for debug)
- 1 x Gigabit Ethernet LAN port
- 1 x 10/100Mbps Ethernet port
- 1 x Power LED indicator
- 1 x Wi-Fi activity LED indicator
- 1 x Reset button

Onboard connectors and pin headers

- 1 x Qseven™ MXM connector
- 1 x GPIO pin header (16 GPI + 16 GPO)
- 1 x CAN bus connector (supports two CAN bus)
- 4 x COM pin headers (RS-232/RS-422/RS-485)
- 1 x Serial and I²C pin header (supports two COM ports for TX/RX, and one I²C)
- 1 x Audio pin header (for Line-in, Line-out and Mic-in)
- 1 x Touch panel connector
- 1 x RTC battery connector
- 1 x DC-in connector
- 1 x Dual-channel 18/24-bit LVDS panel connector
- 1 x LVDS inverter connector
- 1 x MiniPCIe slot
- 1 x SIM card slot

Onboard Jumper

- 1 x Backlight and Panel power select jumper

Power Supply

- 15V ~ 24V DC-in

Form Factor and Dimension

- 3.5" Form Factor 14.6cm x 10.2cm (5.75" x 4.01")

Operating Temperature

- -20°C ~ 70°C

Operating Humidity

- 0% ~ 95% (non-condensing)

A.2. QSMDB2 External I/O Connectors

The QSMDB2 carrier board has a wide selection of interfaces. It includes a selection of frequently used ports as part of the external I/O coastline.

A.2.1. Front Panel I/O

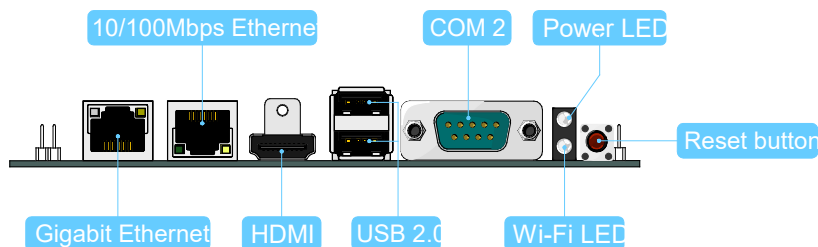


Figure 15: QSMDB2 front panel I/O

A.3. QSMDB2 Layout Diagram

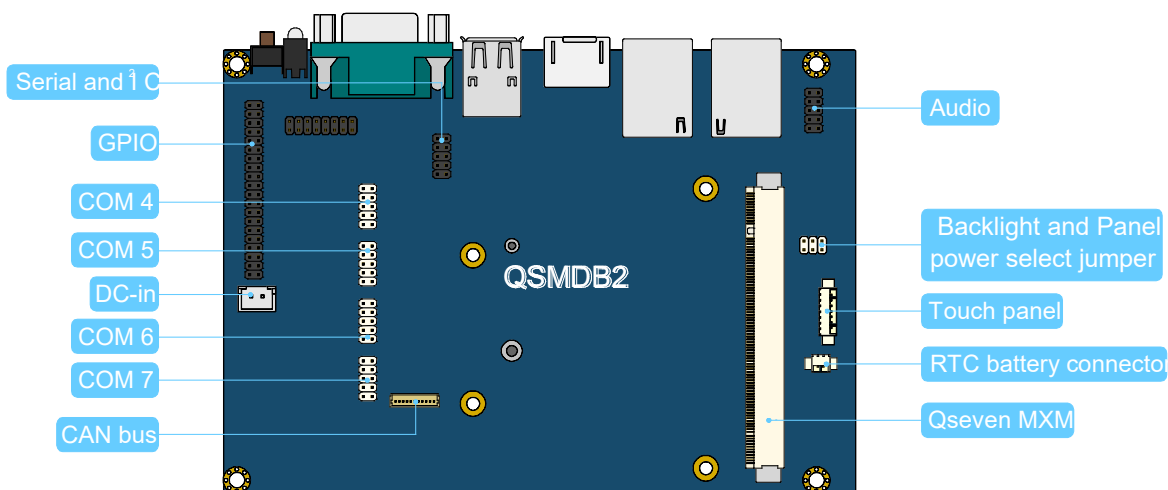


Figure 16: QSMDB2 layout label (top side)

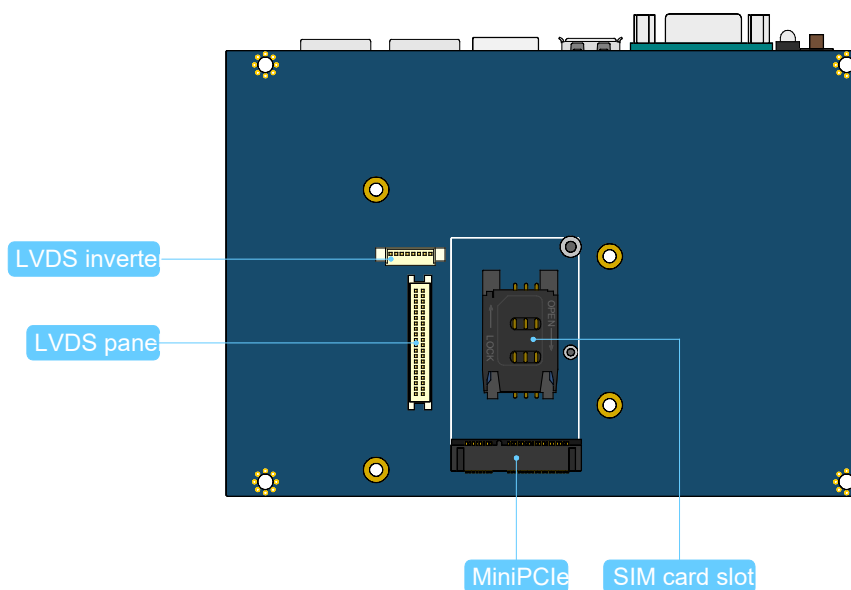


Figure 17: QSMDB2 layout label (bottom side)

A.3.1. QSMDB2 Onboard Connectors, Slots and Pin Headers

A.3.1.1. Qseven MXM Connector

The Qseven MXM connector labeled as "J2" is an onboard connector for connecting the Qseven™ modules (e.g. VIA QSM-8Q60 module) to the carrier board. The Qseven MXM connector consists of 230-pins. The pinouts of the Qseven MXM connector are shown below.

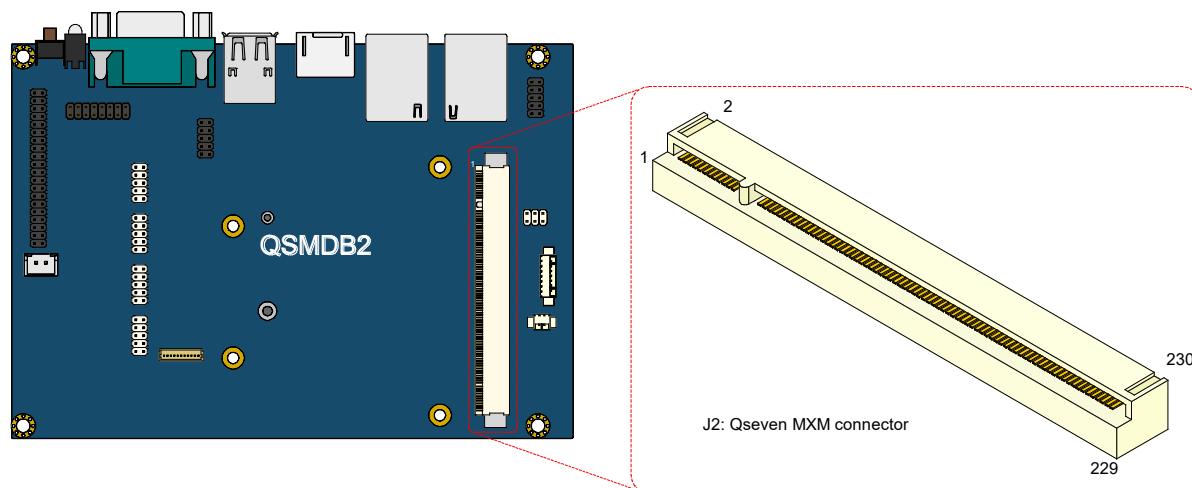


Figure 18: Qseven MXM connector diagram

Pin	Signal	Pin	Signal
1	GND	2	GND
3	TXRXM_D	4	TXRXM_C
5	TXRXP_D	6	TXRXP_C
7	NC	8	NC
9	TXRXM_B	10	TXRXM_A
11	TXRXP_B	12	TXRXP_A
13	LED2_LINK-	14	LED1_ACT-
15	NC	16	GPIO_19_PLED
17	NC	18	USB_OTG_PWR_EN
19	NC	20	NC
21	NC	22	NC
23	GND	24	GND
25	GND	26	NC
27	NC	28	RESET_N
29	SATA0_TX+	30	UART3_RX
31	SATA0_TX-	32	UART3_TX
33	SATA_ACT-	34	GND
35	SATA0_RX+	36	UART3_-CTS
37	SATA0_RX-	38	UART3_-RTS
39	GND	40	GND
41	NC	42	SD1_CLK
43	SD1_CD-	44	SD1_LED
45	SD1_CMD	46	SD1_WP
47	SD1_PWR-	48	SD1_DATA1
49	SD1_DATA0	50	SD1_DATA3
51	SD1_DATA2	52	SD1_DATA5
53	SD1_DATA4	54	SD1_DATA7
55	SD1_DATA6	56	NC

57	GND	58	GND
59	AUD4_TXFS	60	UART2_RX
61	GPIO_0_CLKO	62	UART2_TX
63	AUD4_TXC	64	NC
65	AUD4_TXD	66	I2C3_SCL
67	AUD4_RXD	68	I2C3_SDA
69	NC	70	NC
71	NC	72	WDOG_B
73	GND	74	GND
75	NC	76	NC
77	NC	78	NC
79	NC	80	USB_4_OC
81	NC	82	USBD_T4-
83	NC	84	USBD_T4+
85	USB_2_3_OC	86	USB_0_OTG_OC
87	USBD_T3-	88	USBD_T2-
89	USBD_T3+	90	USBD_T2+
91	NC	92	USBD_OTG_ID
93	OTG_USBD_T1-	94	USBD_T0-
95	OTG_USBD_T1+	96	USBD_T0+
97	GND	98	GND
99	LVDS0_TX0_P	100	LVDS1_TX0_P
101	LVDS0_TX0_N	102	LVDS1_TX0_N
103	LVDS0_TX1_P	104	LVDS1_TX1_P
105	LVDS0_TX1_N	106	LVDS1_TX1_N
107	LVDS0_TX2_P	108	LVDS1_TX2_P
109	LVDS0_TX2_N	110	LVDS1_TX2_N
111	LVDS_PPEN	112	LVDS_BLEN
113	LVDS0_TX3_P	114	LVDS1_TX3_P
115	LVDS0_TX3_N	116	LVDS1_TX3_N
117	GND	118	GND
119	LVDS0_CLK_P	120	LVDS1_CLK_P
121	LVDS0_CLK_N	122	LVDS1_CLK_N
123	LVDS_PWM2	124	NC
125	I2C1_SDA	126	USB_0_2_3_4_EN
127	I2C1_SCL	128	HDMI_CEC_IN
129	CAN_TX1	130	CAN_RX1
131	HDMI_CLKP	132	TP_2
133	HDMI_CLKM	134	TP_3
135	GND	136	GND
137	HDMI_D1P	138	NC
139	HDMI_D1M	140	NC
141	GND	142	GND
143	HDMI_D0P	144	NC
145	HDMI_D0M	146	NC
147	GND	148	GND
149	HDMI_D2P	150	I2C2_SDA
151	HDMI_D2M	152	I2C2_SCL
153	HDMI_HPD	154	GND
155	PCIe_CREFCLKP	156	PCIE_WAKE_B
157	PCIe_CREFCLKM	158	PCIE_RST_B
159	GND	160	GND
161	NC	162	NC

163	NC	164	NC
165	GND	166	GND
167	NC	168	NC
169	NC	170	NC
171	UART1_TX	172	UART1_-RTS
173	NC	174	CAN_TX2
175	NC	176	CAN_RX2
177	UART1_RX	178	UART1_CTS
179	PCIe_CTXP	180	PCIe_CRXP
181	PCIe_CTXM	182	PCIe_CRXM
183	GND	184	GND
185	GPIO6_IO11	186	GPIO_7
187	GPIO_2	188	GPIO_8
189	GPIO6_IO14	190	GPIO6_IO7
191	GPIO_5	192	GPIO6_IO16
193	VDD_RTC_IN	194	NC
195	NC	196	PWM_OUT1
197	GND	198	GND
199	CSPI3_MOSI	200	CSPI3_CS0
201	CSPI3_MISO	202	CSPI3_CS1
203	CSPI3_CLK	204	NC
205	NC	206	NC
207	NC	208	NC
209	NC	210	NC
211	5VIN	212	NC
213	5VIN	214	5VIN
215	5VIN	216	5VIN
217	5VIN	218	5VIN
219	5VIN	220	5VIN
221	5VIN	222	5VIN
223	5VIN	224	5VIN
225	5VIN	226	5VIN
227	5VIN	228	5VIN
229	5VIN	230	5VIN

Table 3: Qseven MXM connector pinouts

A.3.1.2. Audio Pin Header

The QSMDB2 carrier board has an Audio pin header for Line-in, Line-out and and Mic-in. The pin header is labeled as "AUDIO1". The pinouts of the Audio pin header are shown below.

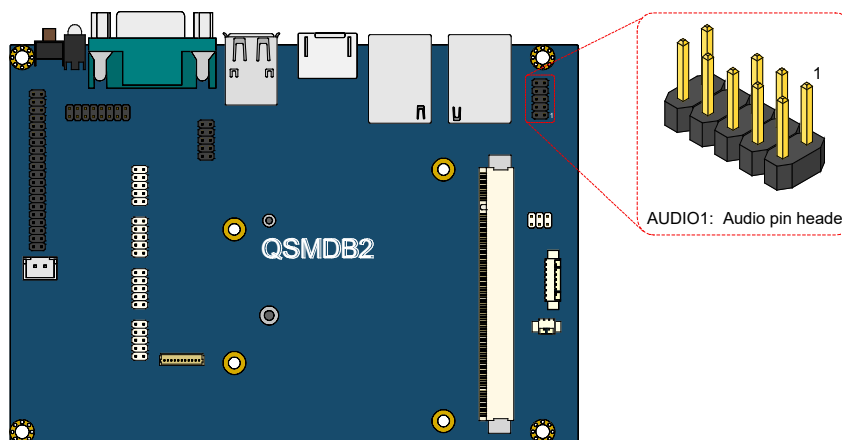


Figure 19: Audio pin header diagram

Pin	Signal	Pin	Signal
1	HEAD_RIGHT	2	HEAD_LEFT
3	LINE_IN_R	4	LINE_IN_L
5	MIC_IN	6	MIC_IN
7	—	8	NC
9	GND_ANALOG	10	GND_ANALOG

Table 4: Audio pin header pinouts

A.3.1.3. Touch Panel Connector

The Touch panel connector labeled as "TOUCH_C1" is used to connect the touch sensor controller for 5-wire/4-wire touch panel. The pinouts of the touch panel connector are shown below.

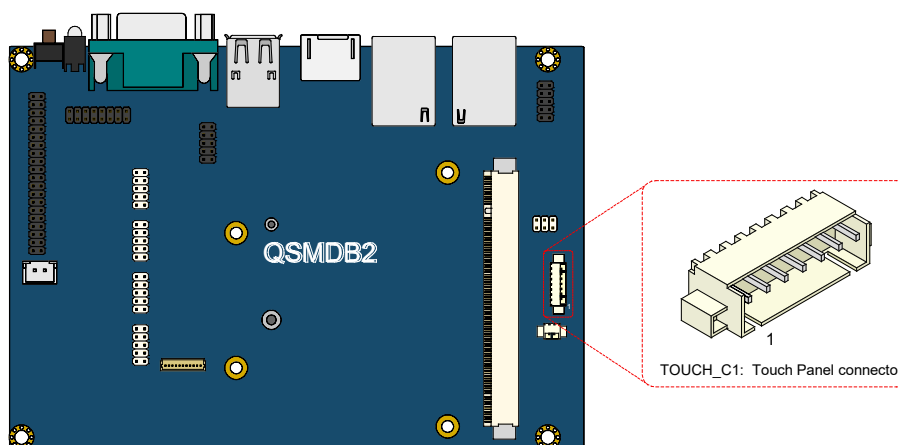


Figure 20: Touch panel connector diagram

Pin	Signal
1	GND
2	I2C1_SDA
3	I2C1_SCL
4	5VIN
5	GPIO_2
6	GPIO6_IO11
7	3P3V

Table 5: Touch panel connector pinouts

A.3.1.4. RTC Battery Connector

The QSMDB2 carrier board is equipped with onboard RTC battery connector used for connecting the external cable battery that provides power to the 32.768 KHz crystal oscillator for Real Time Clock (RTC). The RTC battery connector is labeled as “J3”. The connector pinouts are shown below.

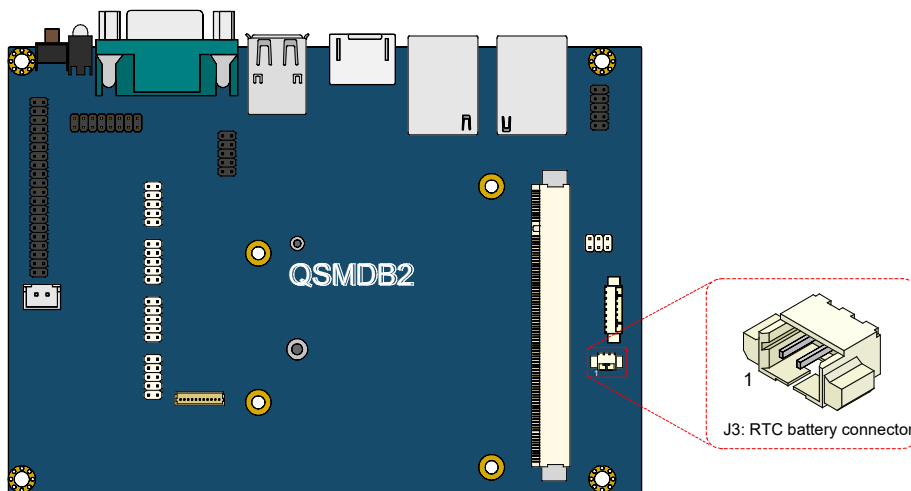


Figure 21: RTC battery connector diagram

Pin	Signal
1	VDD_RTC
2	GND

Table 6: RTC battery connector pinouts

A.3.1.5. DC-In Connector

The QSMDB2 carrier board supports DC-in connector to provide power to the system. The 2-pin DC-in connector is used to connect the DC-in power jack. The connector is labeled as “J6”. The pinouts of the DC-in connector are shown below.

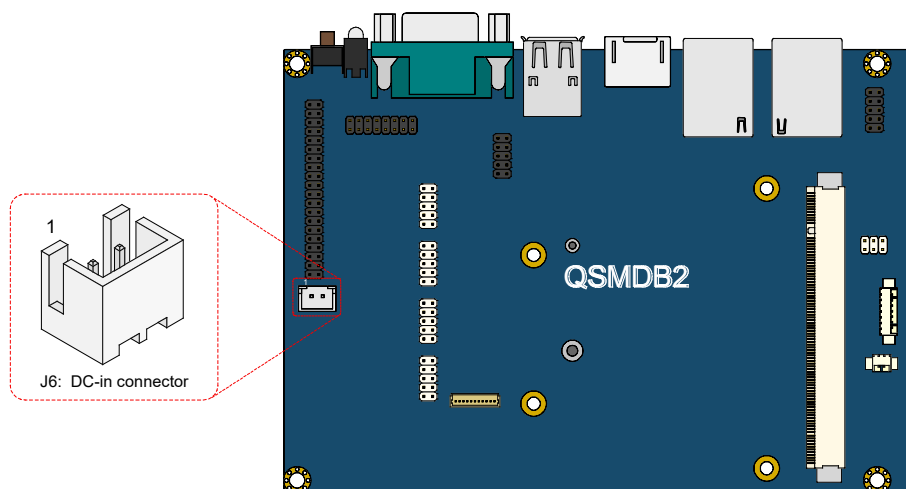


Figure 22: DC-in connector diagram

Pin	Signal
1	DCIN
2	GND

Table 7: DC-in connector pinouts

A.3.1.6. COM Pin headers

The QSMDB2 carrier board is equipped with four COM pin headers labeled as “COM4, COM5, COM6 and COM7” that supports RS-232/RS-422/RS-485 mode. The pinouts of COM pin headers are shown below.

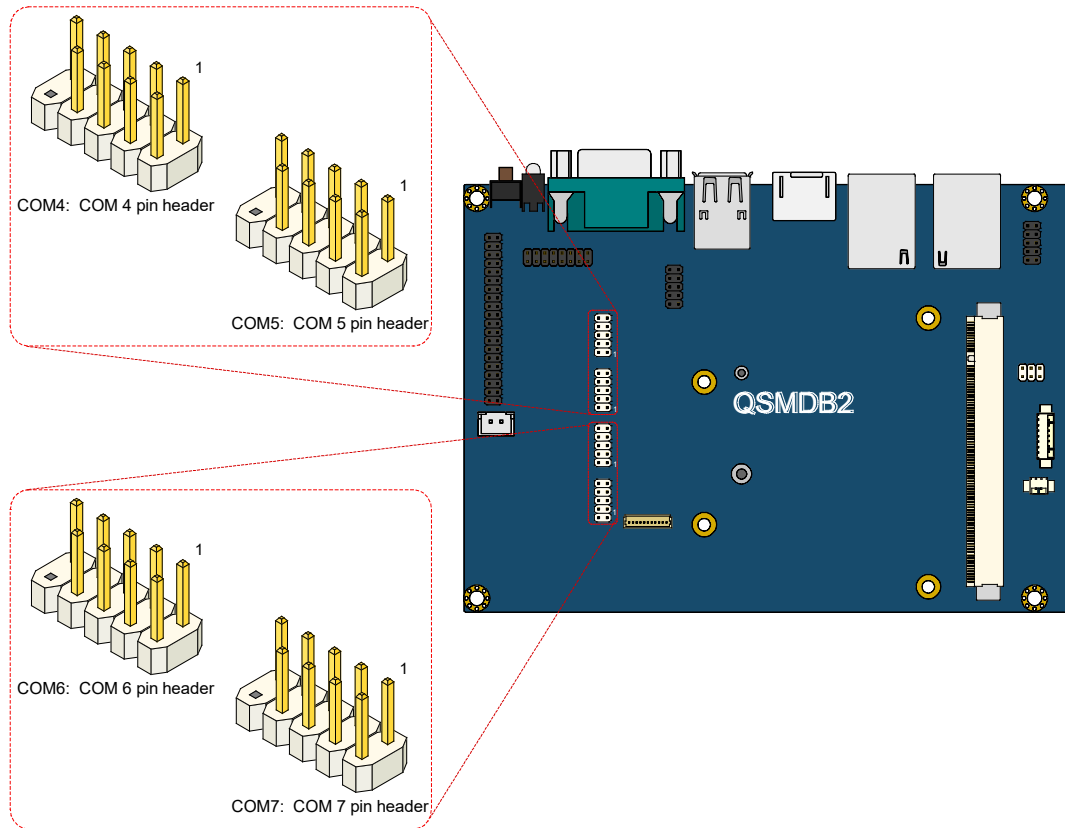


Figure 23: COM4, COM 5, COM 6 and COM 7 pin header diagram

Pin	Signal	Pin	Signal
1	IC_DCD1	2	IC_RXD1
3	IC_TXD1	4	IC_DTR1
5	GND	6	IC_DSR1
7	IC_RTS1	8	IC_CTS1
9	COM_RI1	10	—

Table 8: COM pin header pinouts

A.3.1.7. Serial and I²C Pin Header

The QSMDB2 carrier board is equipped with Serial and I²C pin header labeled as “COM1_3”. The Serial and I²C pin header can support two COM ports (COM 1 and COM 3) used for TX/RX only, and one I²C device. The pinouts of Serial and I²C pin header are shown below.

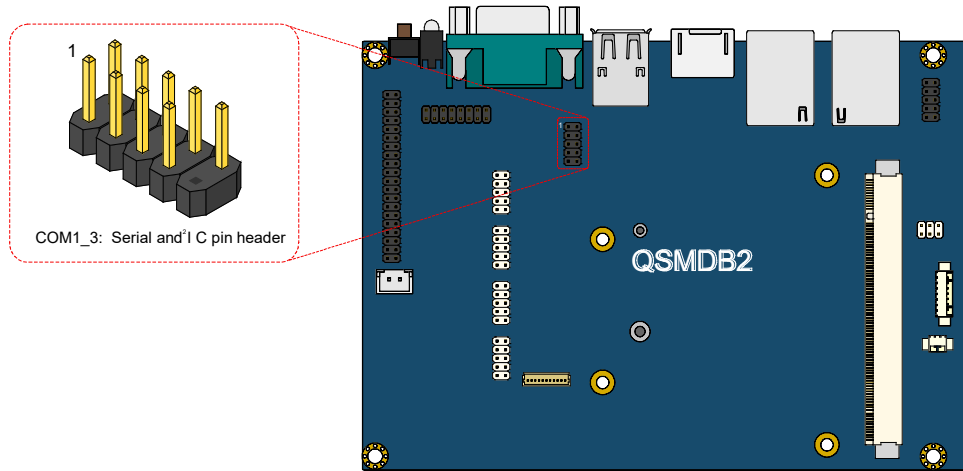


Figure 24: Serial and I²C pin header diagram

Pin	Signal	Pin	Signal
1	COM_TXD1	2	COM_TXD3
3	COM_RXD1	4	COM_RXD3
5	GND	6	GND
7	GND	8	I2C3_SDA
9	—	10	I2C3_SCL

Table 9: Serial and I²C pin header pinouts

A.3.1.8. CAN Bus Connector

The QSMDB2 carrier board provides CAN bus connector that support CAN protocol specification Version 2.0B. The onboard CAN bus connector labeled as "CANBUS" supports two CAN bus ports. The pinouts of the CAN bus connector are shown below.

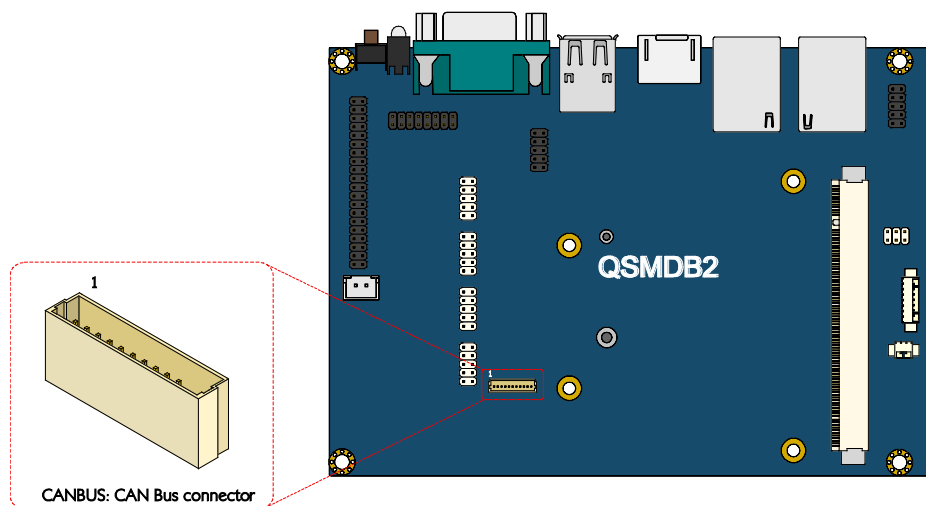


Figure 25: CAN bus connector diagram

Pin	Signal
1	NC
2	NC
3	NC
4	CANH1
5	NC
6	GND
7	CANL2
8	CANH2
9	GND
10	CANL1

Table 10: CAN bus connector pinouts

A.3.1.9. GPIO Pin Header

The QSMDB2 carrier board provides GPIO pin header labeled as “GPIO”. The 32 digital inputs and outputs can be programmed to read or control devices, with input or output defined. The GPIO pin header supports up to 16 GPI and 16 GPO signals. The pinouts of the GPIO pin header are shown below.

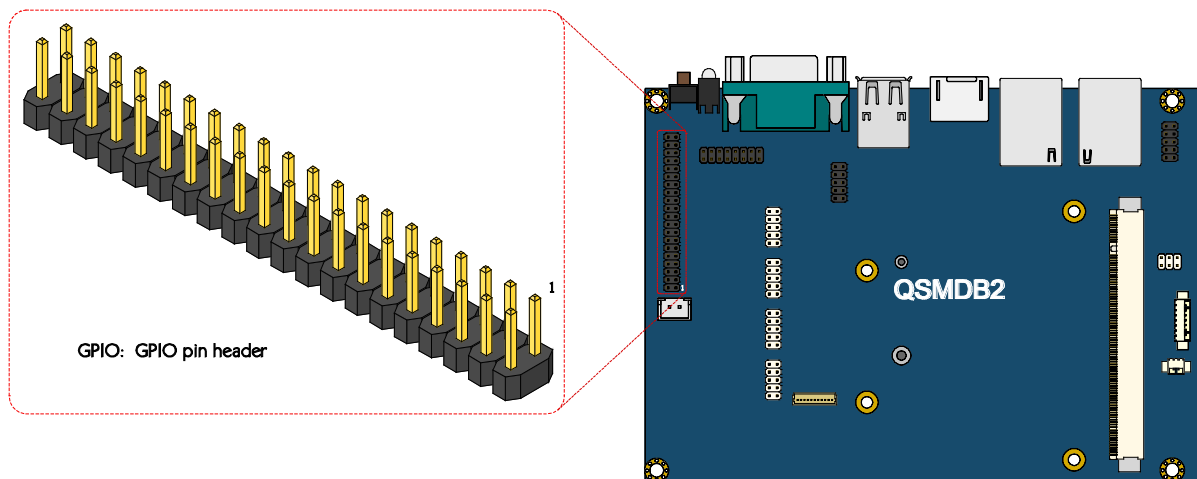


Figure 26: GPIO pin header diagram

Pin	Signal	Pin	Signal
1	GPIO0	2	GPIO4
3	GPIO1	4	GPIO5
5	GPIO2	6	GPIO6
7	GPIO3	8	GPIO7
9	GND	10	GND
11	GPIO10	12	GPIO14
13	GPIO11	14	GPIO15
15	GPIO12	16	GPIO16
17	GPIO13	18	GPIO17
19	GND	20	—
21	GPIO20	22	GPIO24
23	GPIO21	24	GPIO25
25	GPIO22	26	GPIO26
27	GPIO23	28	GPIO27
29	GND	30	GND
31	GPIO30	32	GPIO34
33	GPIO31	34	GPIO35
35	GPIO32	36	GPIO36
37	GPIO33	38	GPIO37
39	GND	40	GND

Table 11: GPIO pin header pinouts

A.3.1.10. LVDS Panel Connector

The QSMDB2 carrier board supports an onboard 40-pin LVDS connector used for connecting the panel's LVDS cable directly to support LVDS panel without any need of a daughter card. The connector is labeled as "LVDS1". The pinouts of the LVDS connector are shown below.

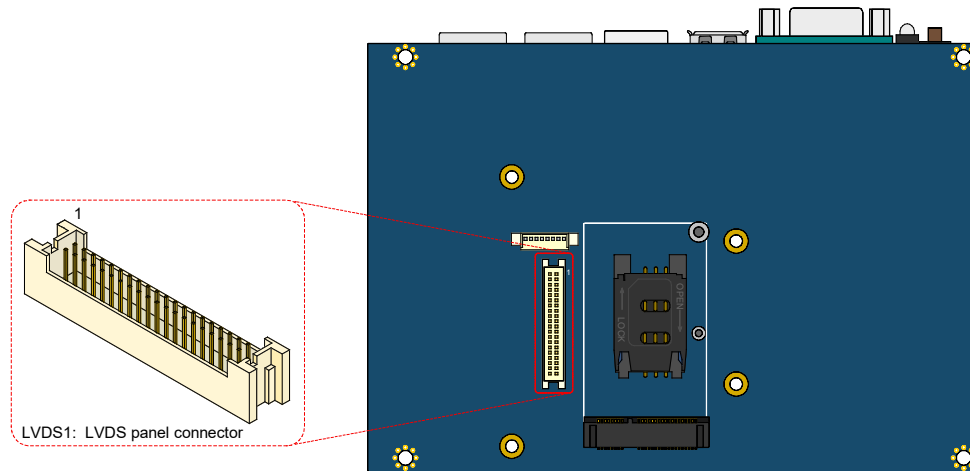


Figure 27: LVDS panel connector diagram

Pin	Signal	Pin	Signal
1	LVDS1_TX0_NC	2	PVDD
3	LVDS1_TX0_PC	4	PVDD
5	GND	6	GND
7	LVDS1_TX1_NC	8	GND
9	LVDS1_TX1_PC	10	LVDS0_TX0_NC
11	GND	12	LVDS0_TX0_PC
13	LVDS1_TX2_NC	14	GND
15	LVDS1_TX2_PC	16	LVDS0_TX1_NC
17	GND	18	LVDS0_TX1_PC
19	LVDS1_CLK_NC	20	GND
21	LVDS1_CLK_PC	22	LVDS0_TX2_NC
23	GND	24	LVDS0_TX2_PC
25	LVDS1_TX3_NC	26	GND
27	LVDS1_TX3_PC	28	LVDS0_CLK_NC
29	GND	30	LVDS0_CLK_PC
31	5VIN	32	GND
33	3P3V	34	LVDS0_TX3_NC
35	NC	36	LVDS0_TX3_PC
37	NC	38	LVDS0_EDID_SCL
39	NC	40	LVDS0_EDID_SDA

Table 12: LVDS panel connector pinouts

A.3.1.11. LVDS Inverter Connector

The QSMDB2 carrier board provides LVDS inverter connector located on the bottom side of the board for supplying power to the backlight of the LCD panel. The connector is labeled as "INVERTER1". The pinouts of the LVDS inverter connector are shown below.

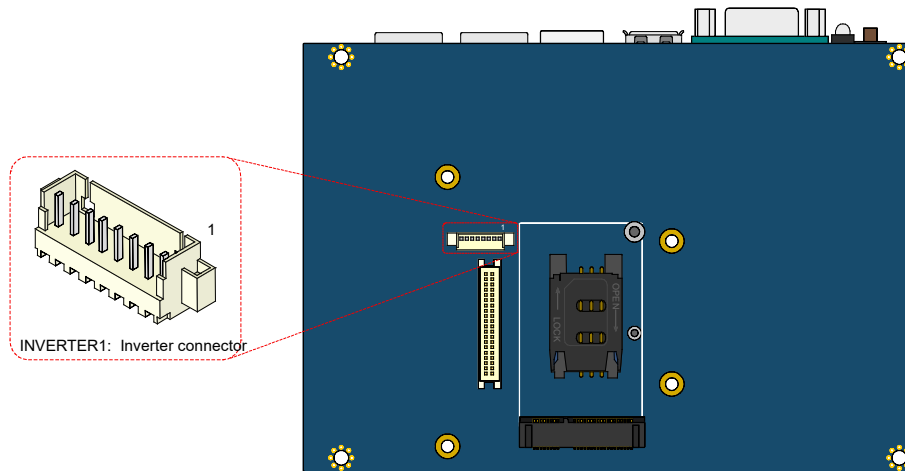


Figure 28: LVDS inverter connector diagram

Pin	Signal
1	IVDD
2	IVDD
3	LVDS_EN
4	DISP0_CONTRAST
5	LVDS_EN
6	DISP0_CONTRAST
7	GND
8	GND

Table 13: LVDS inverter connector pinouts

A.3.1.12. MiniPCle Slot

The QSMDB2 carrier board is equipped with miniPCle slot labeled as “MINIPCI1”. The miniPCle slot is for 3G module to provide a 3G function. The pinouts of the MiniPCle slot are shown below.

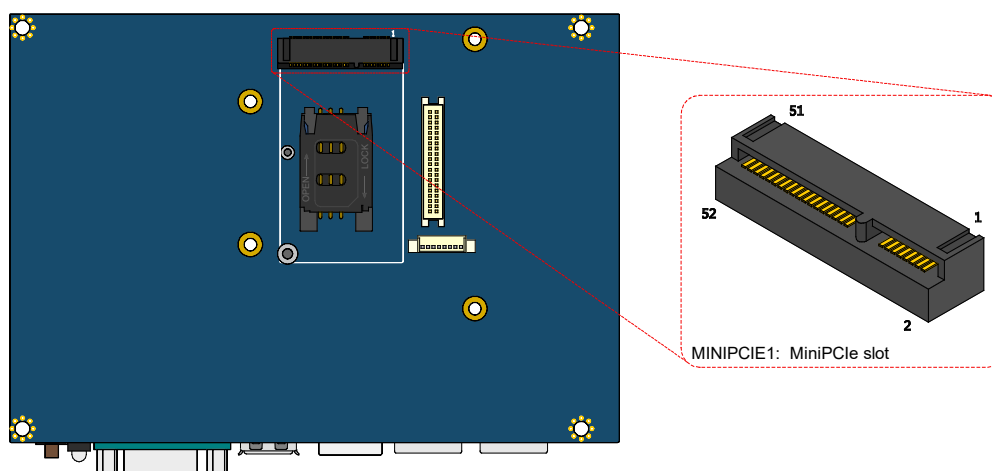


Figure 29: MiniPCle slot diagram

Pin	Signal	Pin	Signal
1	PCIE_WAKE_B	2	MPCIE_3V3
3	NC	4	GND
5	NC	6	DDR_1_5V
7	NC	8	USIM_VCC
9	GND	10	USIM_DATA
11	PCie_CREFCLKM	12	USIM_CLK
13	PCie_CREFCLKP	14	USIM_RST
15	GND	16	USIM_VCC
17	NC	18	GND
19	NC	20	NC
21	GND	22	PCIE_RST_B
23	PCie_CRXM	24	MPCIE_3V3
25	PCie_CRXP	26	GND
27	GND	28	DDR_1_5V
29	GND	30	PCie_SMB_CLK
31	PCie_CTXM	32	PCie_SMB_DATA
33	PCie_CTXP	34	GND
35	GND	36	PCIE_USB_DM
37	GND	38	PCIE_USB_DP
39	MPCIE_3V3	40	GND
41	MPCIE_3V3	42	LED_WWAN_B
43	GND	44	LED_WLAN_B
45	NC	46	LED_WPAN_B
47	NC	48	DDR_1_5V
49	NC	50	GND
51	NC	52	MPCIE_3V3

Table 14: MiniPCle slot pinouts

A.3.1.13. SIM Card Slot

The QSMDB2 carrier board is equipped with SIM card slot located on the bottom side of the board which can supports a 3G SIM card. Using the SIM card slot on QSMDB2 requires a 3G module installed in the MiniPCIe slot to enable the 3G function, otherwise the SIM card slot is disabled. The SIM card slot is labeled as "SIM1". The pinouts of the SIM card slot are shown below.

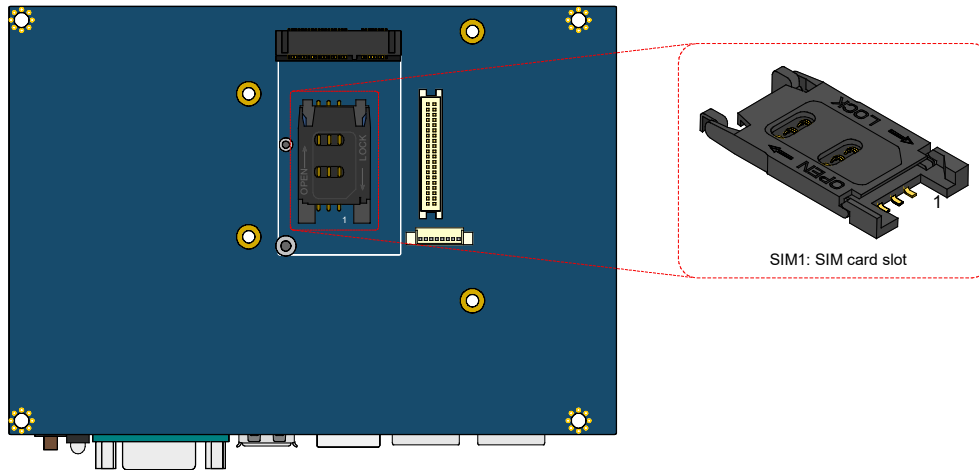


Figure 30: SIM card slot diagram

Pin	Signal
1	USIM_DATA
2	USIM_CLK
3	USIM_VCC
4	USIM_RST
5	GND
6	USIM_VCC

Table 15: SIM card slot pinouts

A.3.2. QSMDB2 Onboard Jumpers

A.3.2.1. Backlight and Panel Power Select Jumper

The power selectors for backlight and panel are controlled by the jumper labeled as "J1". It can select either +12V or +5V for backlight power and +3.3V or +5V for panel power. The jumper settings are shown below.

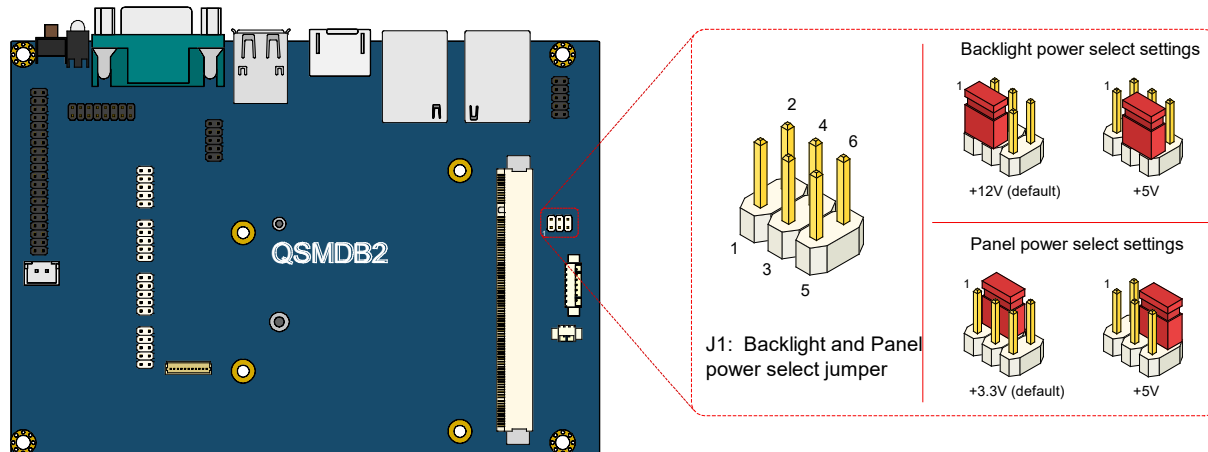


Figure 31: Backlight and Panel power select jumper diagram

Setting	Pin 1	Pin 3	Pin 5
+12V (default)	Short	Short	Open
+5V	Open	Short	Short

Table 16: Backlight power select jumper settings

Setting	Pin 2	Pin 4	Pin 6
+3.3V (default)	Short	Short	Open
+5V	Open	Short	Short

Table 17: Panel power select jumper settings

Appendix B. Installing Wireless Accessories

This section provides information on how to install the optional wireless accessories to provide wireless connection.

B.1. Inserting VNT9271 USB Wi-Fi Dongle

Step 1

Locate a USB 2.0 port on the front panel I/O of the VIA QSMDB2 carrier board.

Step 2

Insert the VIA VNT9271 dongle in one of the USB 2.0 port.

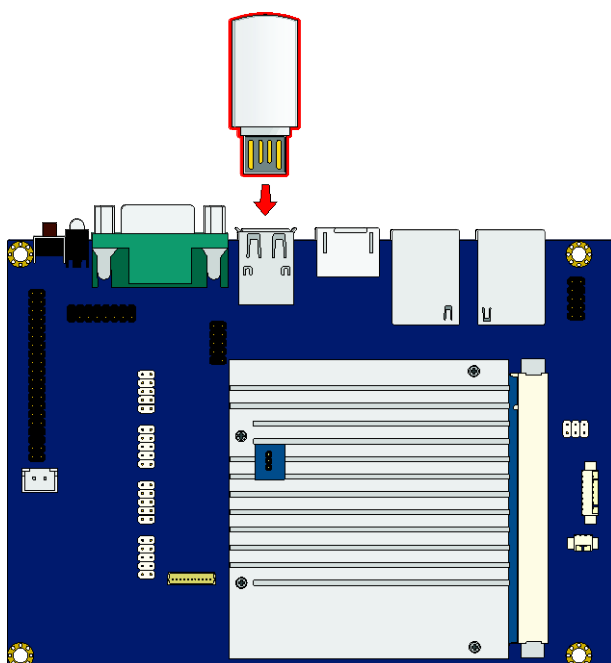


Figure 32: Inserting VIA VNT9271 USB Wi-Fi dongle

B.2. Installing VIA EMIO-2531 miniPCle Wi-Fi + Bluetooth Module

Step 1

Take off the screw and nut on the VIA EMIO-2531 as shown in the illustration.

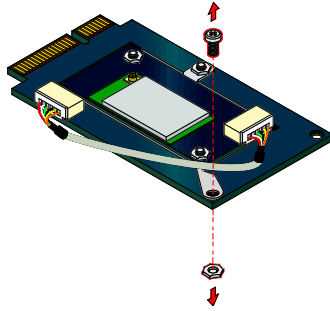


Figure 33: Removing screw on the VIA EMIO-2531 module

Step 2

Align the notch on the VIA EMIO-2531 module with the protruding wedge on the miniPCle slot then insert the module at 30° angle.

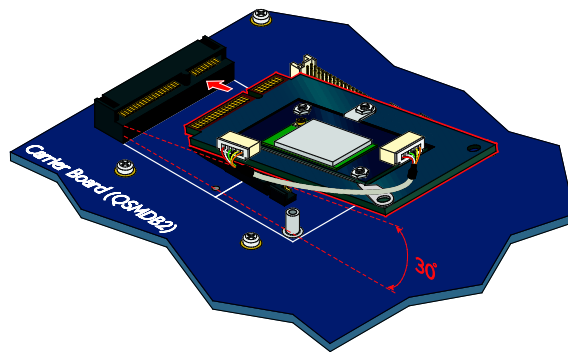


Figure 34: Installing VIA EMIO-2531 module

Step 3

Once the module has been inserted, push down the module until the screw hole align with the mounting hole on the standoff. Reinstall the screw to secure the module to the standoff.

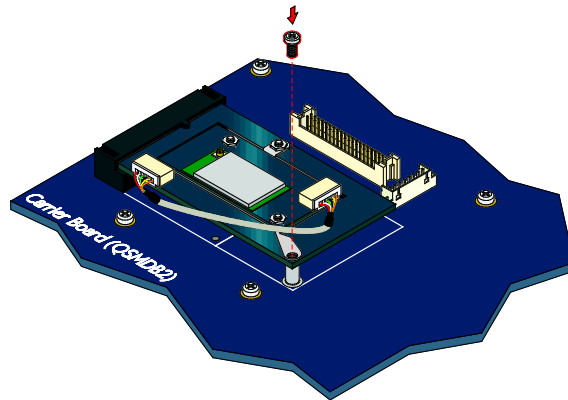


Figure 35: Securing VIA EMIO-2531 module

Step 4

Insert the Wi-Fi antenna cable into the antenna hole from inside of the chassis. Insert the washer, fasten it with the nut and install the external antenna.

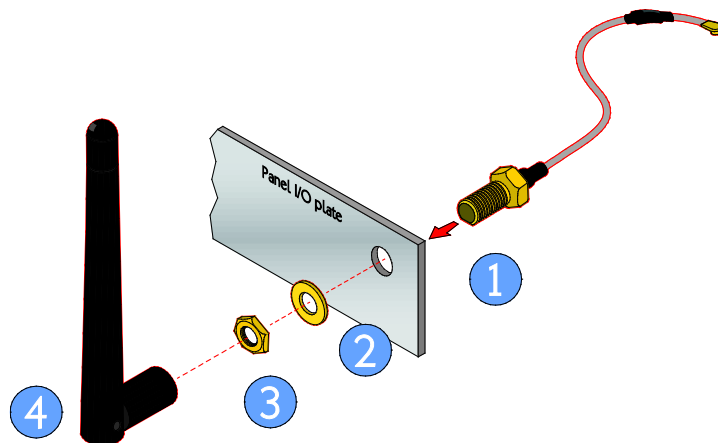


Figure 36: Installing Wi-Fi antenna of VIA EMIO-2531 module

Step 5

Gently connect the other end of the Wi-Fi antenna cable to the micro-RF connector labeled "MH2" on the EMIO-2531 module.

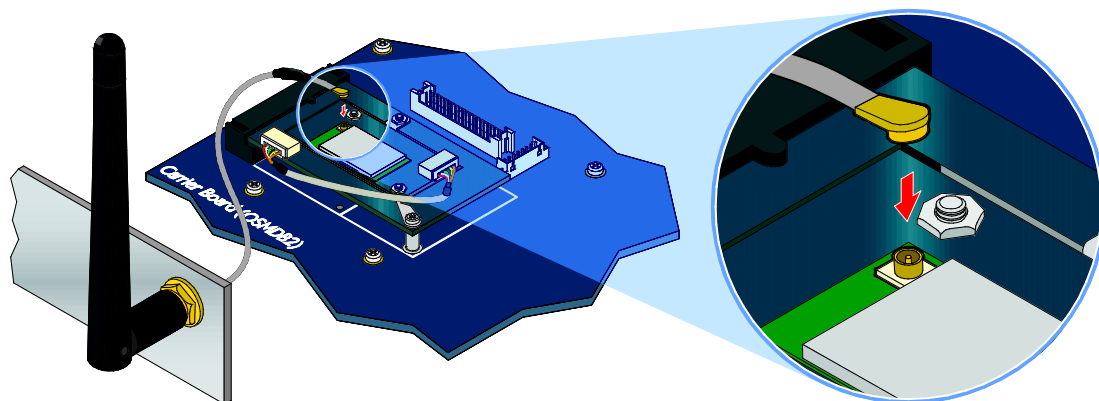


Figure 37: Connecting Wi-Fi antenna cable to the VIA EMIO-2531 module

Appendix C. Inserting SIM Card

This section provides information on how to insert the SIM card on the QSMDB2 carrier board.

Step 1

Push back firmly the SIM card slot to unlock the opening.

Step 2

Pull up the slot and place the SIM card inside the slot. Ensure the angled corner of the SIM card is placed in the correct way before closing the slot.

Step 3

Gently close the slot by pulling down the SIM slot.

Step 4

Lock the SIM slot by sliding back the slot.

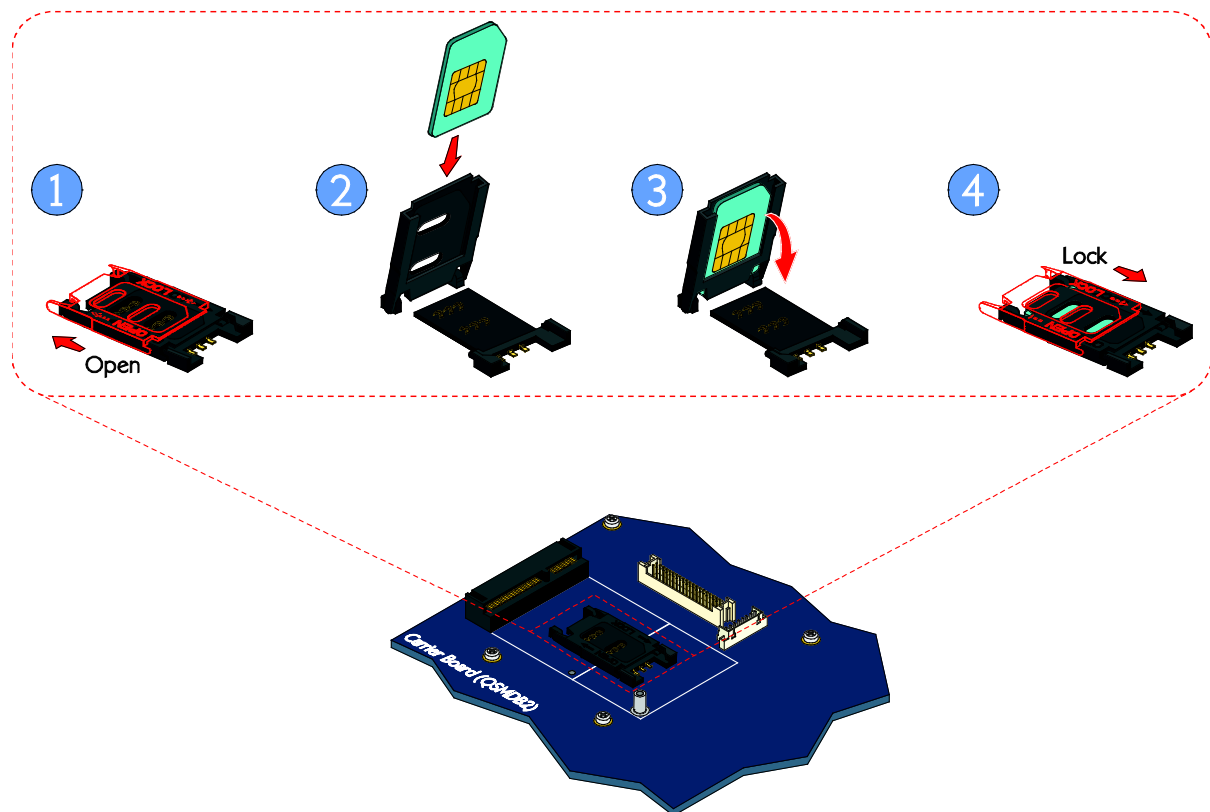


Figure 38: Inserting SIM card on QSMDB2 carrier board



 **Taiwan Headquarters**
1F, 531 Zhong-zheng Road,
Xindian Dist., New Taipei City 231
Taiwan

Tel: 886-2-2218-5452
Fax: 886-2-2218-9860
Email: embedded@via.com.tw

 **USA**
940 Mission Court
Fremont, CA 94539,
USA


Tel: 1-510-687-4688
Fax: 1-510-687-4654
Email: embedded@viatech.com

 **Japan**
3-15-7 Ebisu MT Bldg. 6F,
Higashi, Shibuya-ku
Tokyo 150-0011
Japan

Tel: 81-3-5466-1637
Fax: 81-3-5466-1638
Email: embedded@viatech.co.jp

 **China**
Tsinghua Science Park Bldg. 7
No. 1 Zongguancun East Road,
Haidian Dist., Beijing, 100084
China

Tel: 86-10-59852288
Fax: 86-10-59852299
Email: embedded@viatech.com.cn

 **Europe**
Email: embedded@via-tech.eu