USER MANUAL

SOM-6X50

Compact cost-effective solution for HMI applications with rapid time-to-market

1.03-01302019-112700

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.

Tested To Comply
With FCC Standards
FOR HOME OR OFFICE USE

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 User's Manual 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 cord or plug 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 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

Items for STK-SOM6X50-00A1

- 1 x SOM-6X50 module
- 1 x SOMDB1 carrier board
- 1 x 7” LCD touch panel
- 2 x USB cables
- 1 x COM cable
- 1 x speaker

Ordering Information

Part Number	Description
00GJQ10E00020	SOM module with 800MHz VIA Cortex-A9 SoC, 8GB eMMC, 512KB SPI ROM, 512MB DDR3 SDRAM, 1 HDMI or Single-Channel LVDS or DVO, CSI, 3 USB 2.0, 6 UART, GPIO, 10/100Mbps Ethernet
STK-SOM6X50-00A1	SOM-6X50 starter kit

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1. Product Overview

The VIA SOM-6X50 is an ARM-based system-on-module powered by a 800MHz VIA Cortex-A9 SoC which delivers the perfect balance of performance and rich multimedia features in an ultra-compact, highly-flexible package for a wide range of IoT automation and HMI applications such as transportation, retail and medical.

Measuring a mere 67.6mm x 48mm, the ultra-compact VIA SOM-6X50 module features 8GB eMMC Flash memory and 512MB DDR3 SDRAM onboard. The module offers rich I/O and display expansion options including three USB 2.0 ports, one HDMI port or one single-channel 18/24-bit LVDS panel, six UART, one CSI camera input, 10/100Mbps Ethernet, nine GPIO, and one Micro SD Card slot.

The VIA SOM-6X50 features a Linux BSP which includes the kernel (3.4.5) and bootloader source codes. Other features include a Tool Chain to help make adjustments to the kernel and to support the VIA SOMDB1 carrier board I/O and other hardware features.

1.1 Key Features

- Powered by a 800MHz VIA Cortex-A9 SoC
- Supports two integrated, independent 3D/2D graphics processing units
- Supports MPEG-2 and H.264 video decoding up to 1080p
- Supports HDMI, 18/24-bit Single-Channel LVDS, 10/100Mbps Ethernet and CSI camera input
- Supports Line-in, Line-out and Mic-in
- Supports up to six UART and three USB 2.0
- Fanless and ultra-low power consumption
- 8GB onboard eMMC Flash memory
- 512MB DDR3 SDRAM onboard
- Linux Kernel 3.4.5 operating system
- Reference carrier board available

1.2 Product Specifications

Processor

- 800MHz VIA Cortex-A9 SoC

System Memory

- 512MB DDR3 SDRAM

Storage

- 8GB eMMC Flash Memory

Boot Loader

- 512KB SPI Flash ROM

Graphics

- Mali-400 SP GPU
  * Two integrated, independent 3D/2D graphics processing units
  * Graphics engine supporting OpenGL® ES 2.0 hardware acceleration
  * Supports MPEG-2 and H.264 video decoding up to 1080p

LAN

- Realtek RTL8201 10/100 base-TX PHY chip

Audio

- Wolfsen WM8960 I2S Audio Codec

HDMI

- Integrated HDMI 1.4 Transmitter

USB to UART

- CP2108-B02-GM USB to UART 4-port controller

Supported I/O

- 1 x HDMI or 1 Single-Channel LVDS
- 1 x DVO
- 1 x CSI
- 3 x USB 2.0 ports
- 6 x UART (5 TX/RX, RTS/CTS, 1 Debug TX/RX)
- 9 x GPIO
- 1 x 10/100Mbps Ethernet port
- 3 x I^2C
- 1 x SDIO
- 1 x SD Card slot
- 2 x SPI
- 4 x PWM
- 1 x Line-in, Line-out, Mic-in
- 1 x Headphone-out

Operating System

- Linux Kernel 3.4.5

Operating Temperature

- 0°C ~ 60°C

Operating Humidity

- 0% ~ 95% (non-condensing)

Form Factor

- 67.6mm x 48mm (2.66” x 1.89”)

Notes:

1. As the operating temperature provided in the specifications is a result of the test performed in VIA’s 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 the variables into consideration when building the system. Please ensure that the system runs well under the 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 the 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

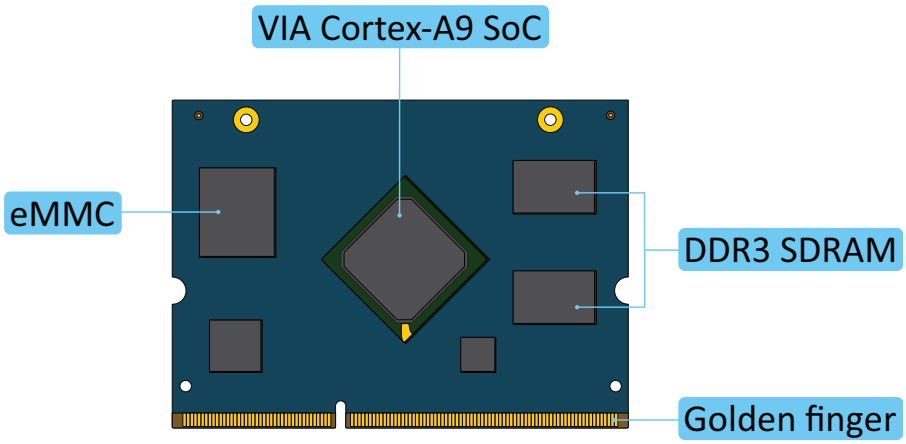

Figure 1: Layout diagram of the SOM-6X50 module (top side)

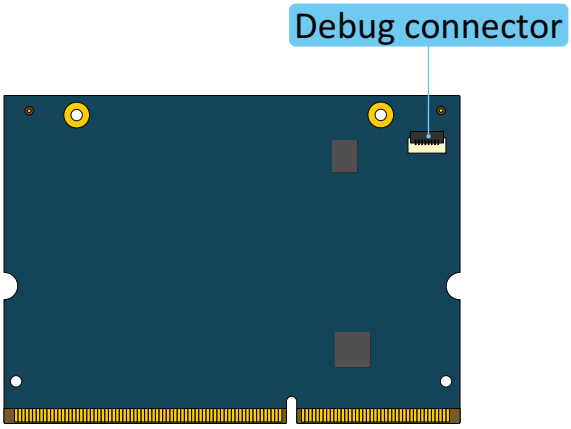

Figure 2: Layout diagram of the SOM-6X50 module (bottom side)

1.4 Product Dimensions

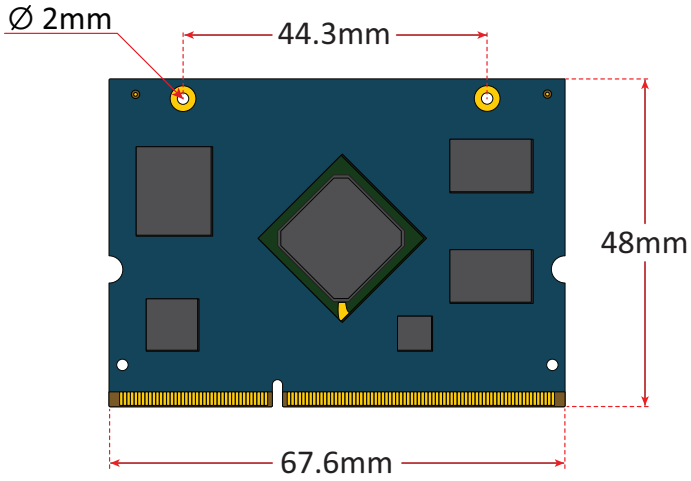

Figure 3: Dimensions of the SOM-6X50 module (top view)

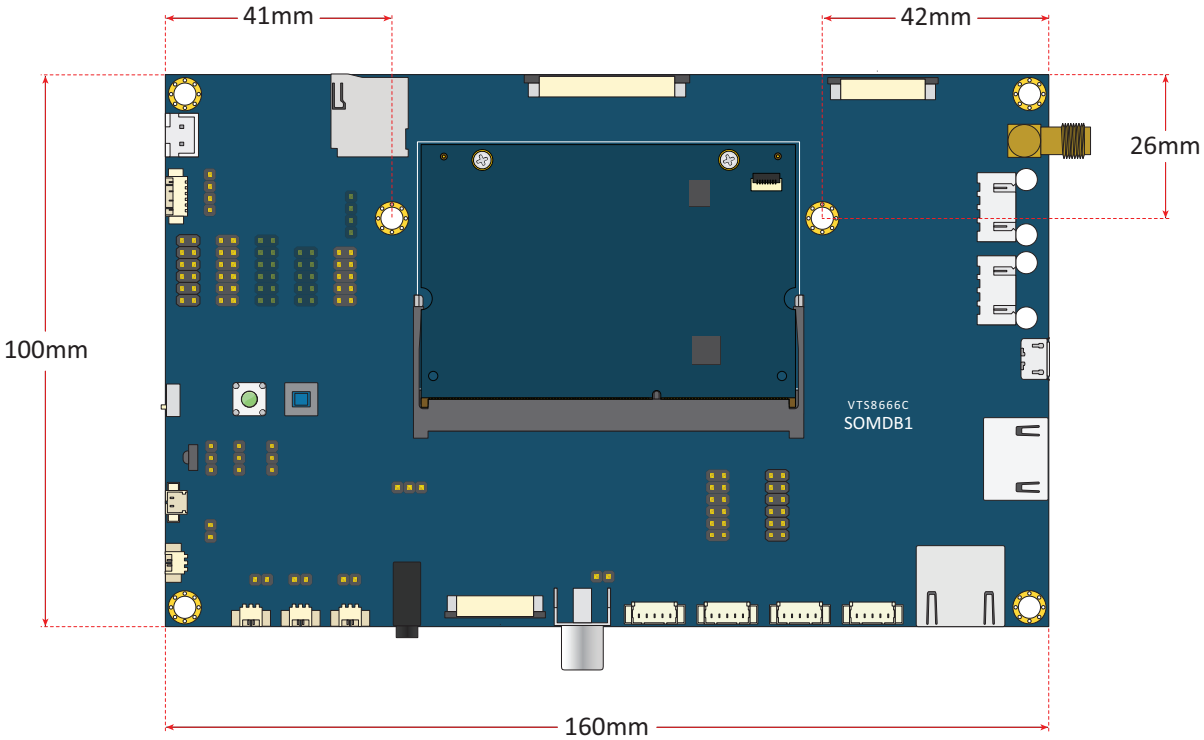

Figure 4: Dimensions of the SOMDB1 carrier board with the SOM-6X50 module installed

2. Onboard I/O Connector

This chapter provides information about the SOM-6X50's onboard I/O connector and its functionality.

2.1 Debug Connector

The SOM-6X50 comes with a debug connector which is used for debugging purposes. It supports TX/RX. The pinouts of the debug connector are shown below.

Pin	Signal
1	UART0TXD
2	UART0RXD
3	GND
4	SFCLK
5	SFDO
6	SFDI
7	SFCS0-
8	VCC33_SF

Table 1: Debug connector pinouts

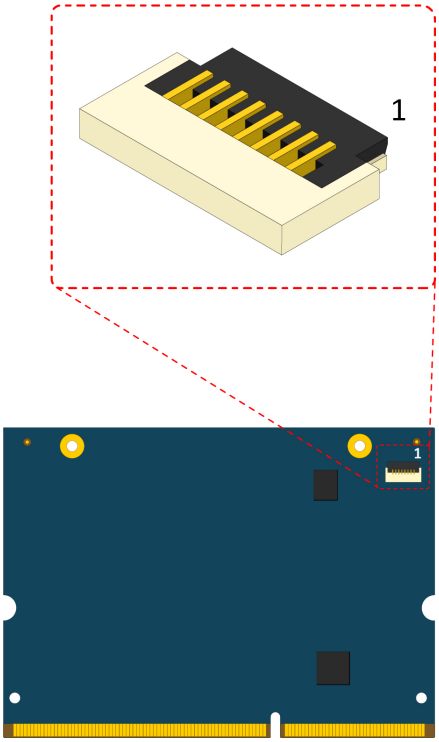

Figure 5: Debug connector diagram

3. Hardware Installation

This chapter provides information about the hardware installation procedures.

3.1 Installing the SOM-6X50 Module on the SOMDB1 Carrier Board

Step 1

Install the thermal pad on the top of the processor on the SOM-6X50 module then flip over the module.

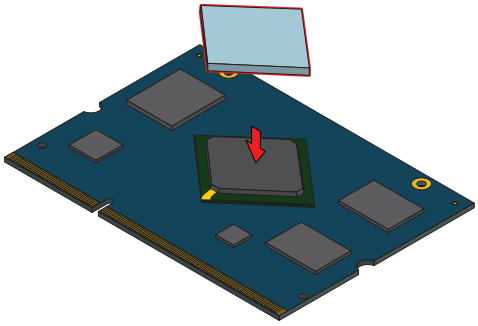

Figure 6: Installing the thermal pad

Step 2

Align the notch on the SOM-6X50 module with the counterpart on the SOM DDR3 SODIMM slot on the SOMDB1 carrier board then insert the module at a 30° angle.

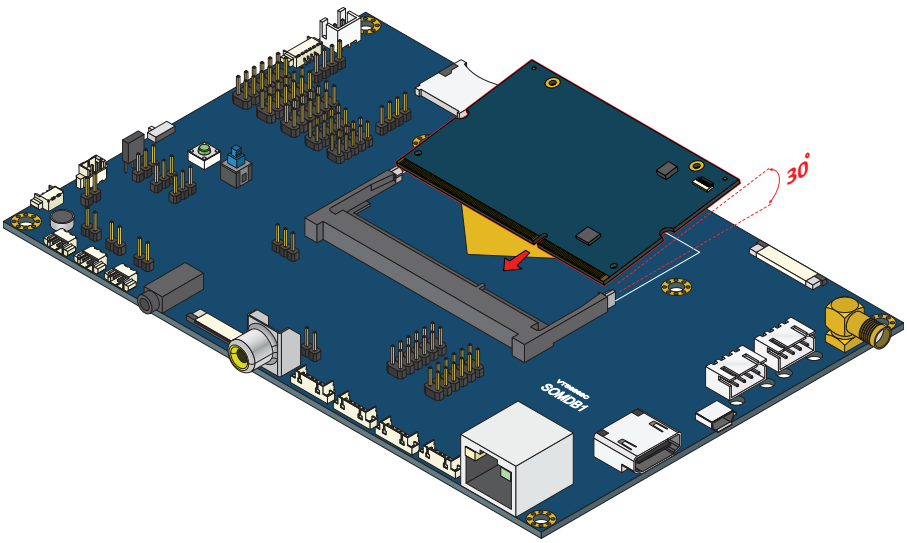

Figure 7: Installing the SOM-6X50 module

Step 3

Once the SOM-6X50 module has been fully inserted, push down the module until the standoff holes align with the screw holes and then secure the module with the provided screws.

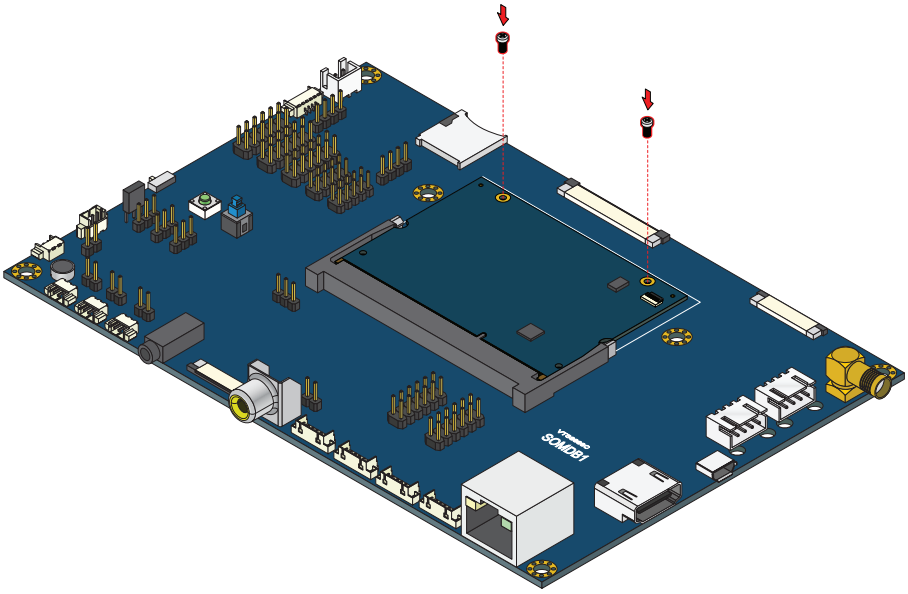

Figure 8: Securing the SOM-6X50 module

4. Software and Technical Support

4.1 Linux Support

The SOM-6X50 features a complete software evaluation image featuring the Linux Kernel 3.4.5 operating system.

4.2 Technical Support and Assistance

- For utilities downloads and the latest documentation and information about the SOM-6X50, please visit our website at **https://www.viatech.com/en/boards/modules/som-6x50/**
- For technical support and additional assistance, always contact your local sales representative or board distributor, or go to **https://www.viatech.com/en/support/driver-support-fag/technical-support/** 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. SOMDB1 Carrier Board Reference

A.1. Board Specifications

Onboard I/O

- 1 x LCD panel connector
- 1 x Touch connector
- 2 x USB 2.0 connectors
- 4 x COM connectors
- 2 x UART pin headers
- 1 x Debug connector & pin header
- 1 x Camera connector
- 1 x GPIO pin header (9 GPIO)
- 1 x I^2C pin header (3 x I^2C)
- 1 x SPI pin header (2 x SPI)
- 1 x IR Receiver sensor & pin header
- 2 x Line-in pin headers
- 3 x Line-out connectors & pin headers (for Mono, Right & Left channel speakers)
- 1 x Audio mono out signal pin header
- 1 x Mic-in connector
- 1 x Headphone pin header
- 1 x RCA pin header
- 1 x System recovery button
- 1 x Watchdog timer switch
- 1 x Power button
- 1 x RTC battery connector
- 1 x DC-in connector

Front Panel I/O

- 1 x Composite RCA jack
- 1 x 10/100Mbps Ethernet port
- 1 x Headphone jack

Back Panel I/O

- 1 x Micro SD card slot

Right Panel I/O

- 1 x HDMI port
- 1 x Micro USB 2.0 OTG port

Power Supply

- 5V ~ 19V DC-in

Operating Temperature

- 0°C ~ 60°C

Operating Humidity

- 0% ~ 95% (non-condensing)

Form Factor

- 160mm x 100mm (6.3” x 3.94”)

A.2. SOMDB1 Layout Diagram

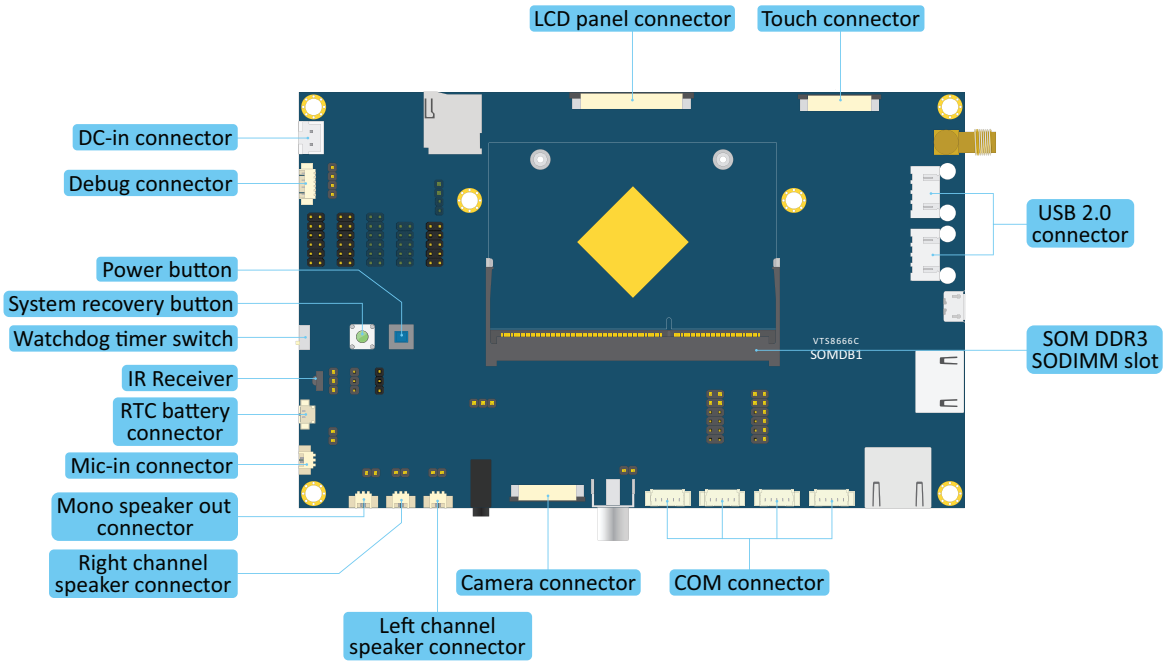

Figure 9: Layout diagram of the SOMDB1 connectors, slot, buttons, switch (top side)

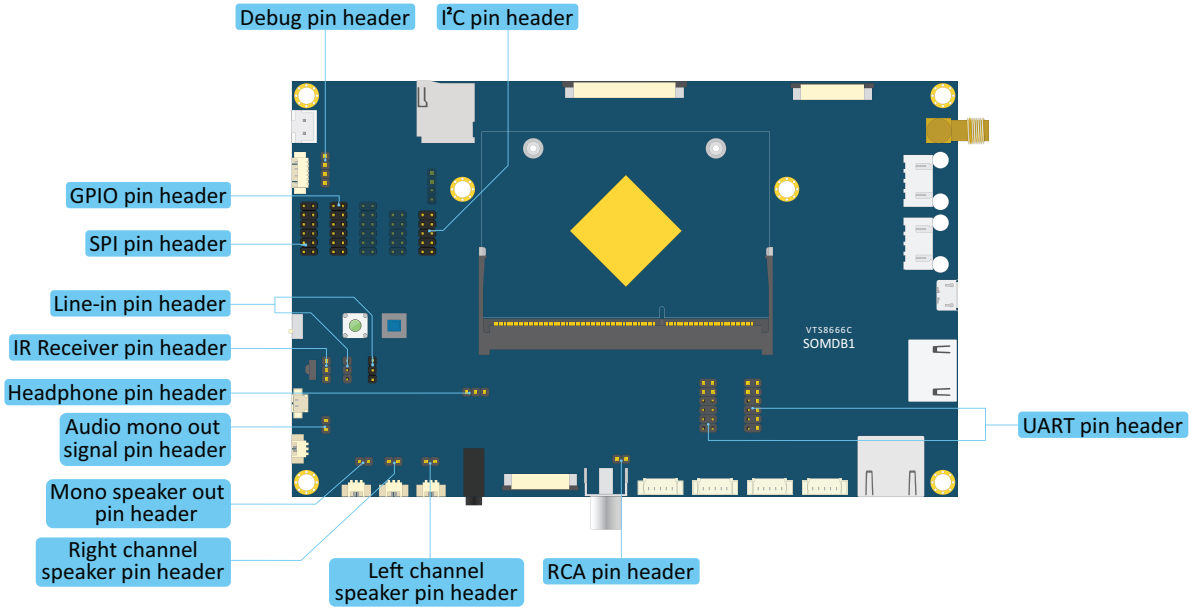

Figure 10: Layout diagram of the SOMDB1 pin headers (top side)

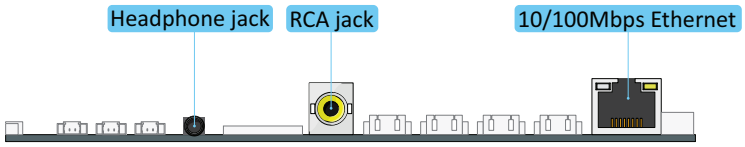

Figure 11: SOMDB1 front panel I/O

Figure 12: SOMDB1 back panel I/O

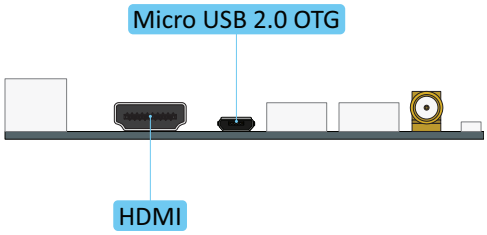

Figure 13: SOMDB1 right panel I/O

A.2.1. SOMDB1 Onboard I/O

A.2.1.1. LCD Panel Connector

The SOMDB1 carrier board provides a 18/24-bit single-channel LCD panel connector labeled as “J34” which is used for connecting the RGB LCD display. The pinouts of the LCD panel connector are shown below.

Pin	Signal	Pin	Signal
1	LCM_LEDA	26	LCD_G1
2	LCM_LEDA	27	LCD_G0
3	LCM_LEDK	28	LCD_R7
4	LCM_LEDK	29	LCD_R6
5	GND	30	LCD_R5
6	VCOM	31	LCD_R4
7	VCC33	32	LCD_R3
8	MODE	33	LCD_R2
9	LCD_EN	34	LCD_R1
10	LCD_VSYNC	35	LCD_R0
11	LCD_HSYNC	36	GND
12	LCD_B7	37	LCD_PCLK
13	LCD_B6	38	GND
14	LCD_B5	39	SHLR
15	LCD_B4	40	UPDN
16	LCD_B3	41	VGH
17	LCD_B2	42	VGL
18	LCD_B1	43	AVDD
19	LCD_B0	44	RESET
20	LCD_G7	45	NC
21	LCD_G6	46	VCOM
22	LCD_G5	47	DITH
23	LCD_G4	48	GND
24	LCD_G3	49	NC
25	LCD_G2	50	NC

Table 2: LCD panel connector pinouts

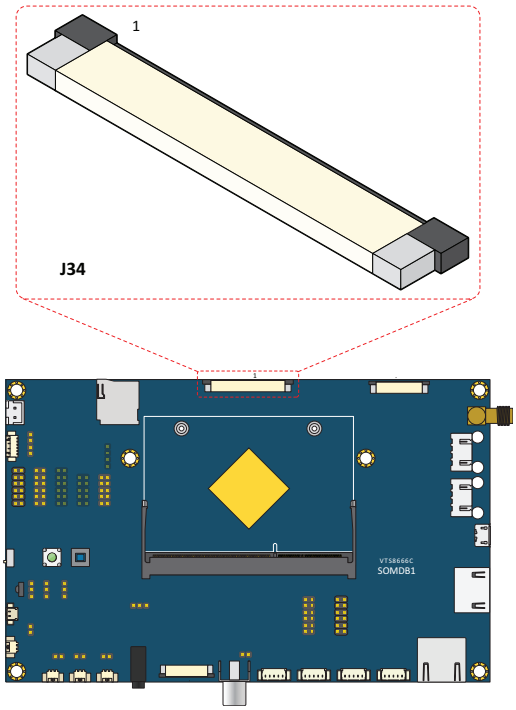

Figure 14: LCD panel connector diagram

A.2.1.2. Touch Connector

The SOMDB1 carrier board comes with a touch connector labeled as “J35” which is used for connecting the touch controller panel. The pinouts of the touch panel connector are shown below.

Pin	Signal
1	GND
2	DRIVE15
3	DRIVE14
4	DRIVE13
5	DRIVE12
6	DRIVE11
7	DRIVE10
8	DRIVE09
9	DRIVE08
10	DRIVE07
11	DRIVE06
12	DRIVE05
13	DRIVE04
14	DRIVE03
15	DRIVE02
16	DRIVE01
17	DRIVE00
18	GND
19	GND
20	SENSE00
21	SENSE01
22	SENSE02
23	SENSE03
24	SENSE04
25	SENSE05
26	SENSE06
27	SENSE07
28	SENSE08
29	SENSE09
30	GND

Table 3: Touch connector pinouts

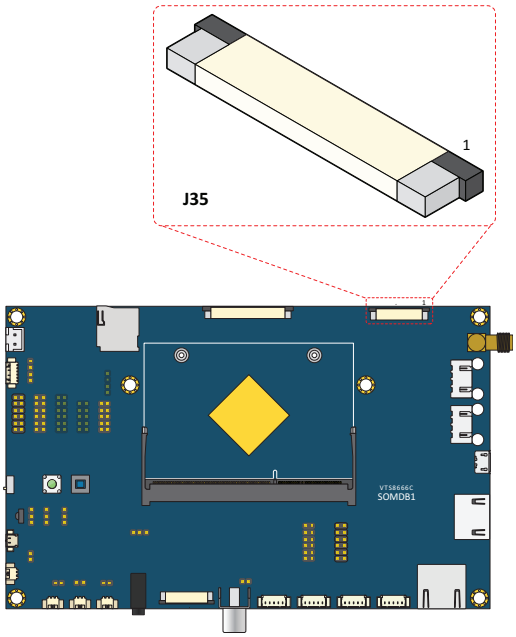

Figure 15: Touch connector diagram

A.2.1.3. USB 2.0 Connector

The SOMDB1 carrier board has two USB 2.0 connectors which are used for connecting USB devices. The connectors are labeled as “J2” and “J4”. The pinouts of the USB 2.0 connectors are shown below.

J2	
Pin	Signal
1	VBUS01
2	USBH1-
3	USBH1+
4	GND

J4	
Pin	Signal
1	VBUS01
2	USBH2-
3	USBH2+
4	GND

Table 4: USB 2.0 connectors pinouts

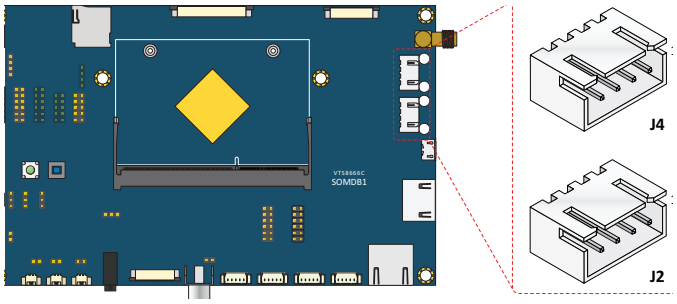

Figure 16: USB 2.0 connectors diagram

A.2.1.4. Camera Connector

The SOMDB1 carrier board has a camera connector which is used to connect the camera serial interface in order to support a wide range of imaging solutions. The connector is labeled as “J36”. The pinouts of the camera connector are shown below.

Pin	Signal
1	NC
2	GND
3	I2C2SDA
4	AVCCVID
5	I2C2SCL
6	CAMERA1_RESET
7	VVSYNC
8	CAMERA1_PWDN
9	VHSYNC
10	DVDD_CAM
11	VCCVID
12	VDIN7
13	C24MOUT
14	VDIN6
15	GND
16	VDIN5
17	VCLK
18	VDIN4
19	VDIN0
20	VDIN3
21	VDIN1
22	VDIN2
23	NC
24	NC

Table 5: Camera connector pinouts

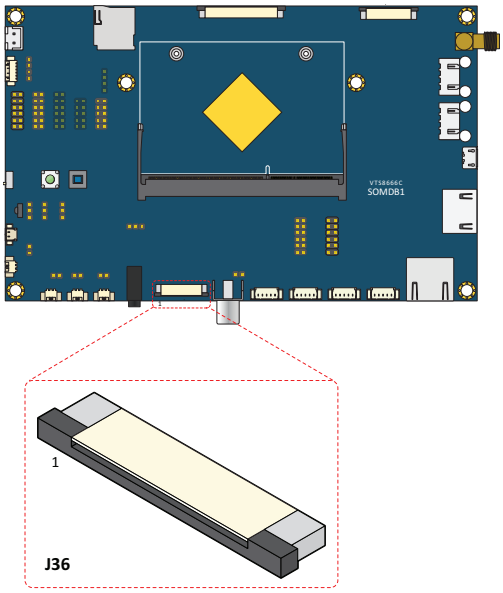

Figure 17: Camera connector diagram

A.2.1.5. COM Connector and UART Pin Header

The SOMBD1 carrier board is equipped with four COM connectors labeled as “J55”, “J57”, “J58” & “J59”, and two UART pin headers labeled as “J8” and “J9”. The COM connectors support the RS-232 standard while the UART pin headers are used to attach additional ports for serial devices that support TX/RX, RTS, CTS and debugging TX/RX. The pinouts of COM connectors and UART pin headers are shown below.

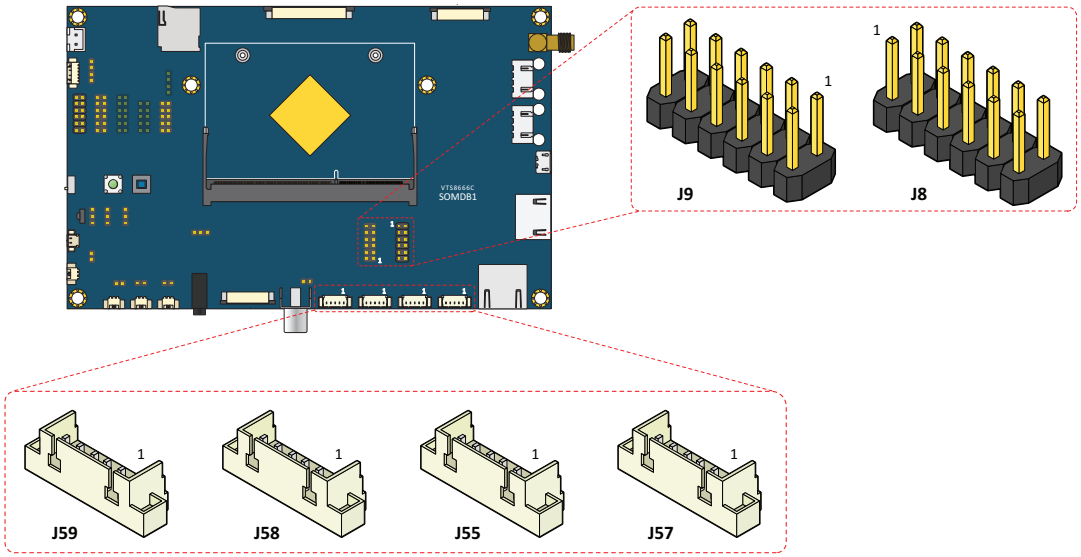

Figure 18: COM connectors and UART pin headers diagram

J55	
Pin	Signal
1	COM_A_RX
2	COM_A_TX
3	GND
4	COM_A_RTS
5	COM_A_CTS

J57	
Pin	Signal
1	COM_B_RX
2	COM_B_TX
3	GND
4	COM_B_RTS
5	COM_B_CTS

J58	
Pin	Signal
1	COM_C_RX
2	COM_C_TX
3	GND
4	COM_C_RTS
5	COM_C_CTS

J59	
Pin	Signal
1	COM_D_RX
2	COM_D_TX
3	GND
4	COM_D_RTS
5	COM_D_CTS

Table 6: COM connectors pinouts

J8			
Pin	Signal	Pin	Signal
1	VCC33_UART	2	VCC33_UART
3	UARTA_TX	4	UARTB_TX
5	UARTA_RTS	6	UARTB_RTS
7	UARTA_RX	8	UARTB_RX
9	UARTA_CTS	10	UARTB_CTS
11	GND	12	GND

J9			
Pin	Signal	Pin	Signal
1	VCC33_UART	2	VCC33_UART
3	UARTC_TX	4	UARTD_TX
5	UARTC_RTS	6	UARTD_RTS
7	UARTC_RX	8	UARTD_RX
9	UARTC_CTS	10	UARTD_CTS
11	GND	12	GND

Table 7: UART pin headers pinouts

Note:
Neither connectors nor pin headers will function simultaneously, so if the COM connectors are enabled, the UART pin headers will be disabled and vice-versa.

A.2.1.6. GPIO Pin header

The SOMBD1 carrier board comes with a GPIO pin header labeled as “J20” which supports up to 9 GPI and 9 GPO signals. The 9 inputs and 9 outputs signals can be programmed to read or control devices, with input or output defined. The pinouts of the GPIO pin header are shown below.

Pin	Signal	Pin	Signal
1	SUS_GPIO0	2	VCC33
3	SUS_GPIO1	4	GPIO5
5	GPIO0	6	GPIO6
7	GPIO1	8	GPIO7
9	GPIO3	10	GPIO8
11	GPIO4	12	GPIO9

Table 8: GPIO pin header pinouts

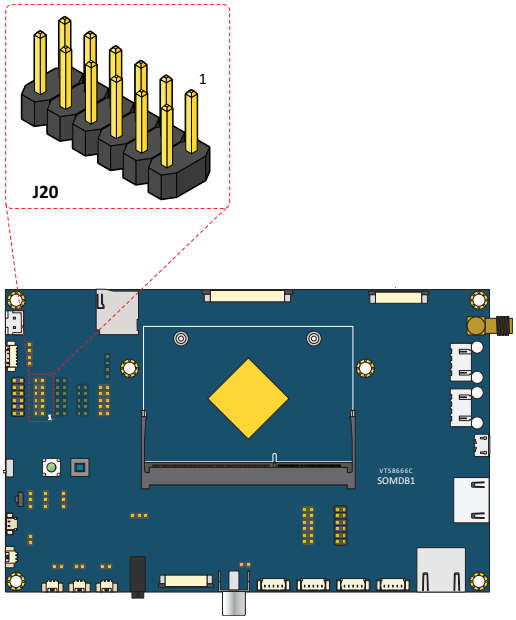

Figure 19: GPIO pin header diagram

A.2.1.7. SPI Pin Header

The SOMBD1 carrier board comes with an SPI pin header labeled as “J17” which is used to connect the SPI BIOS programming fixture. The pinouts of the SPI pin header are shown below.

Pin	Signal	Pin	Signal
1	VCC33	2	VCC33
3	SPI0CLK	4	SPI1CLK
5	SPI0MOSI	6	SPI1MOSI
7	SPI0MISO	8	SPI1MISO
9	SPI0SS0-	10	SPI1SS0-
11	GND	12	GND

Table 9: SPI pin header pinouts

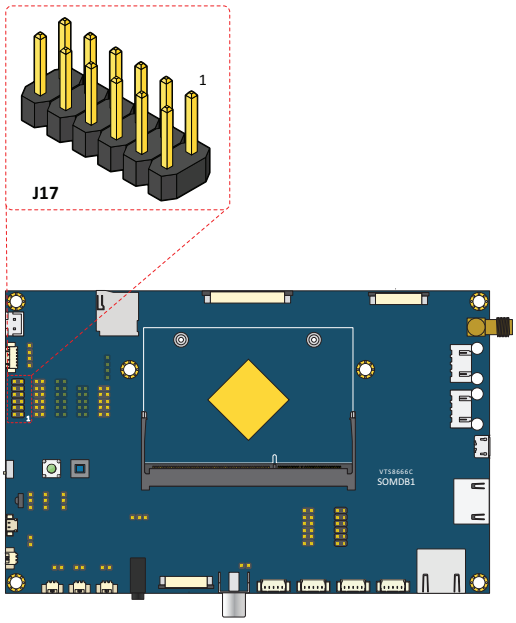

Figure 20: SPI pin header diagram

A.2.1.8. I²C Pin header

The SOMDB1 carrier board comes with an I²C pin header labeled as "J18" which is used for connecting to I²C devices. The pinouts of the I²C pin header are shown below.

Pin	Signal	Pin	Signal
1	VCC33	2	VCC33
3	I2C1SCL	4	I2C1SDA
5	I2C2SCL	6	I2C2SDA
7	I2C3SCL	8	I2C3SDA
9	GND	10	GND

Table 10: I²C pin header pinouts

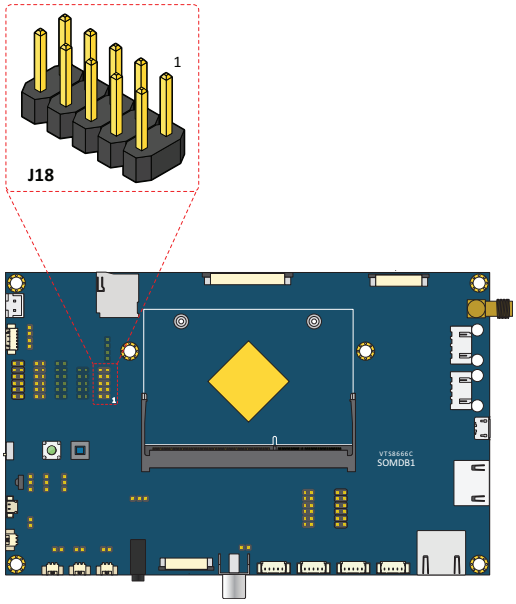

Figure 21: I²C pin header diagram

A.2.1.9. Headphone Pin Header

The SOMDB1 carrier board has a headphone pin header labeled as "J30" which provides a connection to any headphone device. The pinouts of the headphone pin header are shown below.

Pin	Signal
1	HPOUTL
2	LINPUT3
3	HPOUTR

Table 11: Headphone pin header pinouts

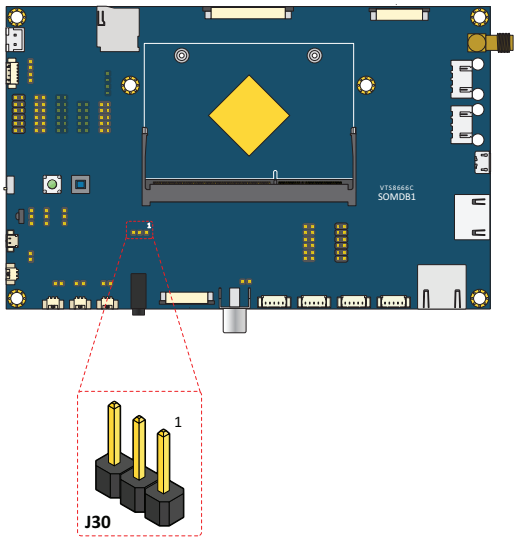

Figure 22: Headphone pin header diagram

A.2.1.10. Mic-In Connector

The SOMDB1 carrier board comes with a Mic-in connector that supports a microphone. A cable must be used to connect the devices to the connector. The Mic-in connector is labeled as “J42”. The pinouts of the Mic-in connector are shown below.

Pin	Signal
1	GND
2	MIC1

Table 12: Mic-in connector pinouts

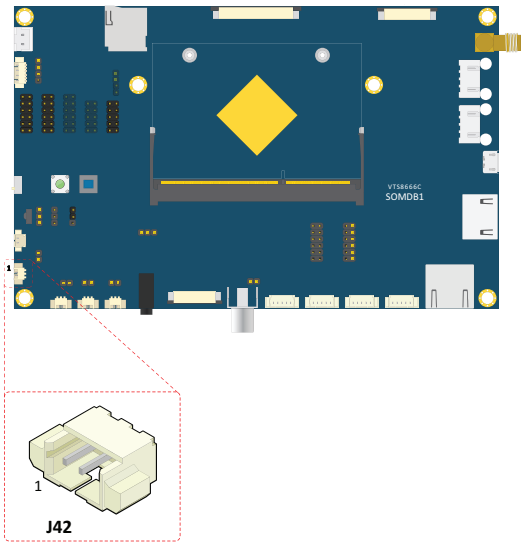

Figure 23: Mic-in connector diagram

A.2.1.11. Mono Speaker Out Connector & Pin Header

The SOMDB1 carrier board is equipped with a mono speaker out connector & pin header which are used for connecting the mono speaker. The mono speaker out connector is labeled as “J26” and the pin header as “J24”. The pinouts of the mono out speaker connector & pin header are shown below.

Pin	Signal
1	SPK3_P
2	SPK3_N

Table 13: Mono speaker out connector & pin header pinouts

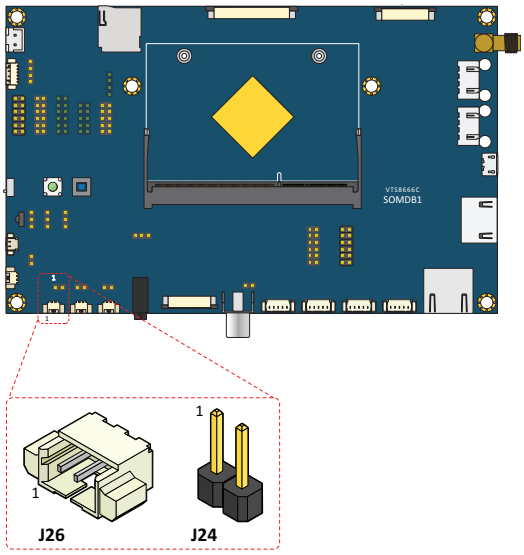

Figure 24: Mono speaker out connector & pin header diagram

A.2.1.12. Audio Mono Out Signal Pin Header

The SOMDB1 carrier board is equipped with an audio mono out signal pin header which is used for connecting external audio amplifier. The audio mono out signal pin header is labeled as "J25". The pinouts of the audio mono out signal pin header are shown below.

Pin	Signal
1	OUT3
2	GND

Table 14: Audio mono out signal pin header pinouts

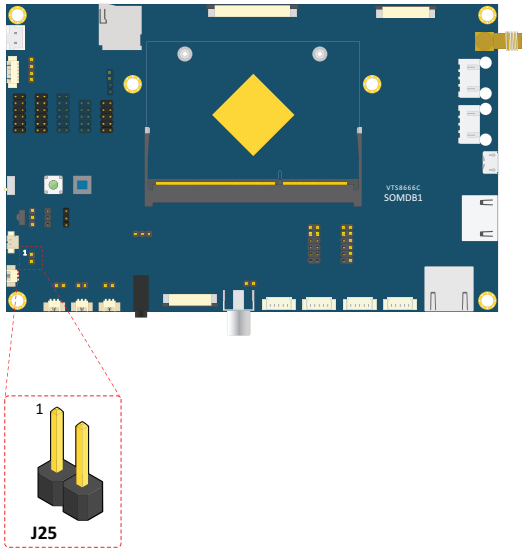

Figure 25: Audio mono out signal pin header diagram

A.2.1.13. Left Channel Speaker Connector & Pin Header

The SOMDB1 carrier board is equipped with a left channel speaker connector & pin header for the left speaker respectively. The left channel speaker connector is labeled as "J27" and the pin header as "J28". The pinouts of the left channel speaker connector & pin header are shown below.

Pin	Signal
1	SPKL_P
2	SPKL_N

Table 15: Left channel speaker connector & pin header pinouts

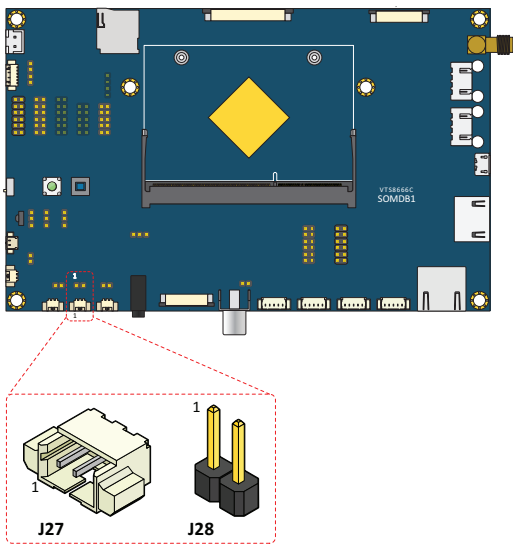

Figure 26: Left channel speaker connector & pin header diagram

A.2.1.14. Right Channel Speaker Connector & Pin Header

The SOMDB1 carrier board is equipped with a right channel speaker connector & pin header for the right speaker respectively. The right channel speaker connector is labeled as “J22” and the pin header as “J23”. The pinouts of the right channel speaker connector & pin headers are shown below.

Pin	Signal
1	SPKR_P
2	SPKR_N

Table 16: Right channel speaker connector & pin header pinouts

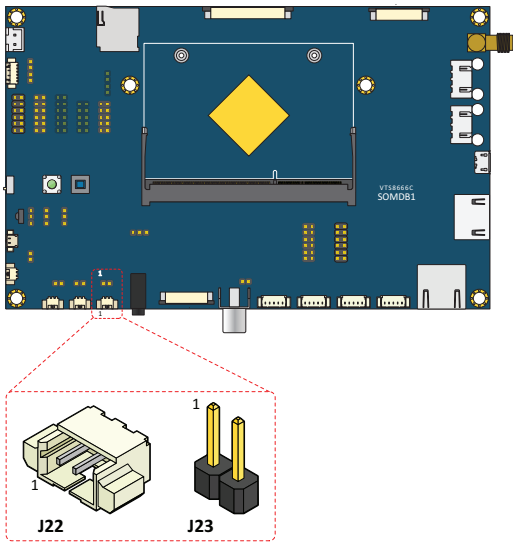

Figure 27: Right channel speaker connector & pin header diagram

A.2.1.15. Line-In Pin Header

The SOMDB1 carrier board comes with two Line-in pin headers for connecting an external audio device player. The Line-in pin headers are labeled as “J31” and “J32”. The pinouts of the Line-in pin headers are shown below.

J31	
Pin	Signal
1	LINPUT1
2	GND
3	RINPUT1

J32	
Pin	Signal
1	LINPUT2
2	GND
3	RINPUT2

Table 17: Line-in pin headers pinouts

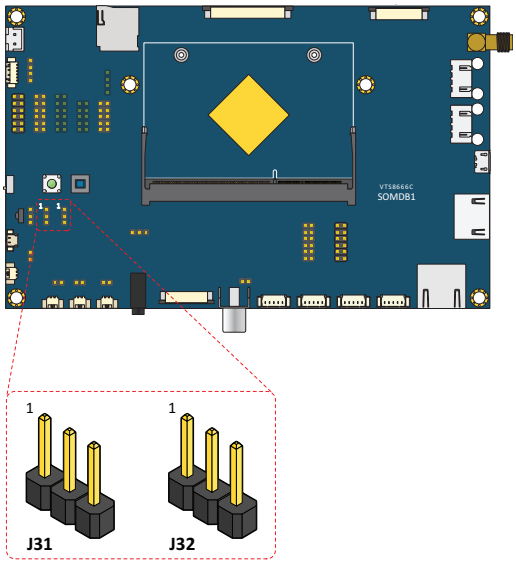

Figure 28: Line-in pin headers diagram

A.2.1.16. IR Receiver Sensor & Pin Header

The SOMDB1 carrier board is equipped with an IR receiver sensor & pin header which are used for connecting IR devices to the board. The IR receiver sensor is labeled as “IR1” and the pin header as “J16”. The pinouts of the IR receiver are shown below.

Pin	Signal
1	VSUS33
2	GND
3	VSUS33

Table 18: IR receiver sensor & pin header pinouts

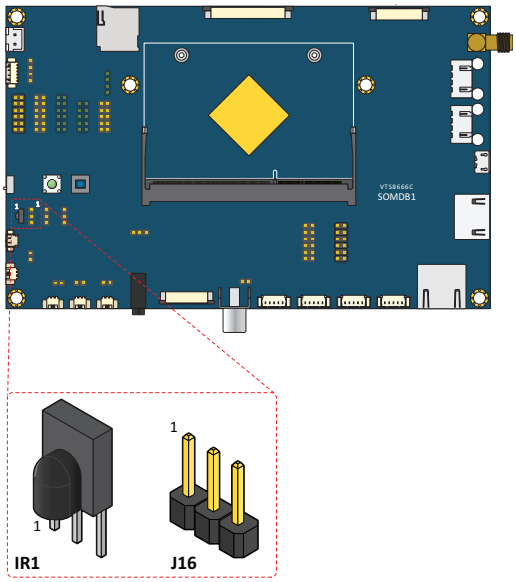

Figure 29: IR receiver sensor and pin header diagram

A.2.1.17. Debug Connector & Pin Header

The SOMDB1 carrier board comes with a debug connector & pin header which are used for debugging purposes only. The debug connector is labeled as “J15” and the pin header as “J14”. The pinouts of the Debug connector & pin header are shown below.

Pin	Signal
1	VCC33
2	UART0RXD
3	UART0TXD
4	GND

Table 19: Debug connector & pin header pinouts

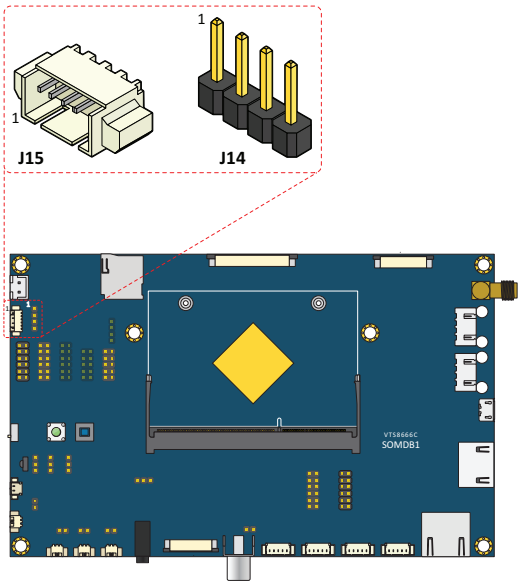

Figure 30: Debug connector & pin header diagram

A.2.1.18. Power Button

The SOMBD1 carrier board comes with a power button labeled as “SW1” which supports the on and off function of the system. The diagram of the power button is shown below.

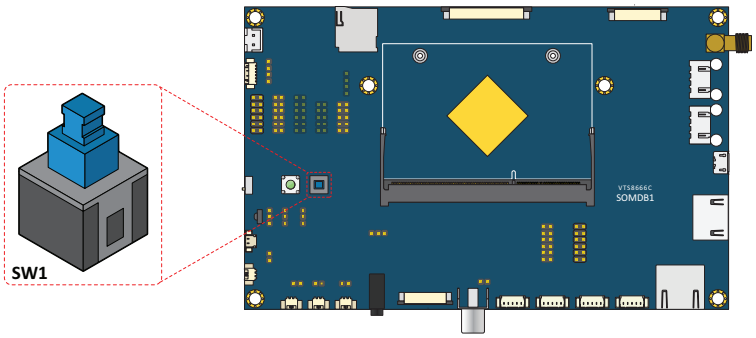

Figure 31: Power button diagram

A.2.1.19. System Recovery Button

The SOMBD1 carrier board comes with a system recovery button labeled as “SW2” which reboots and recovers the system when it crashes or turns off. The diagram of the system recovery button is shown below.

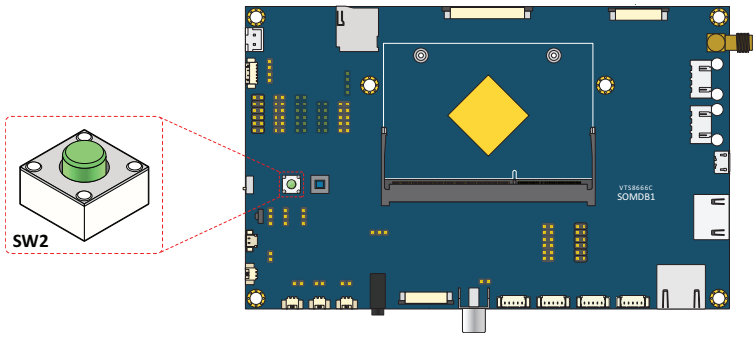

Figure 32: System recovery button diagram

A.2.1.20. Watchdog Timer Switch

The SOMDB1 carrier board comes with a watchdog timer switch labeled as “SW3” which enables and disables the watchdog function on the board. The diagram of the watchdog timer switch is shown below.

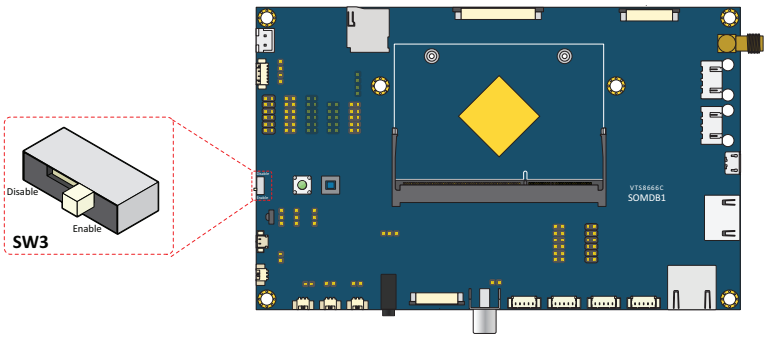

Figure 33: Watchdog timer switch diagram

A.2.1.21. RCA Pin Header

The SOMBD1 carrier board comes with a RCA pin header which is used for connecting the display using component video signals. The RCA pin header is labeled as “J45”. The pinouts of the RCA pin header are shown below.

Pin	Signal
1	CVBS_IN
2	GND

Table 20: RCA pin header pinouts

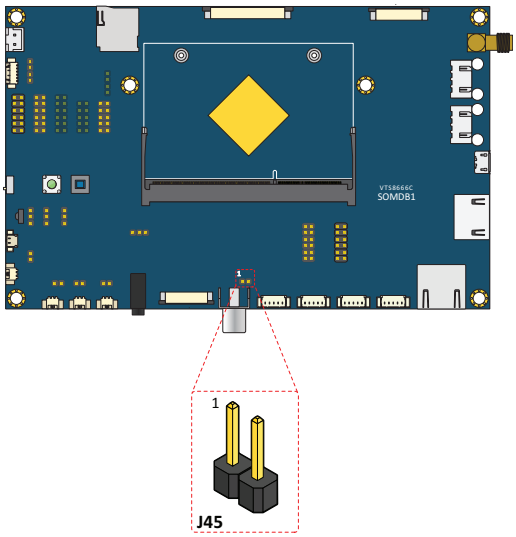

Figure 34: RCA pin header diagram

A.2.1.22. RTC Battery Connector

The SOMDB1 carrier board is equipped with an onboard RTC battery connector which is used for connecting the external cable battery that provides power to the 32.768KHz crystal oscillator for Real Time Clock (RTC). The RTC battery connector is labeled as “J53”. The pinouts of the RTC battery connector are shown below.

Pin	Signal
1	VCC-BAT
2	GND

Table 21: RTC battery connector pinouts

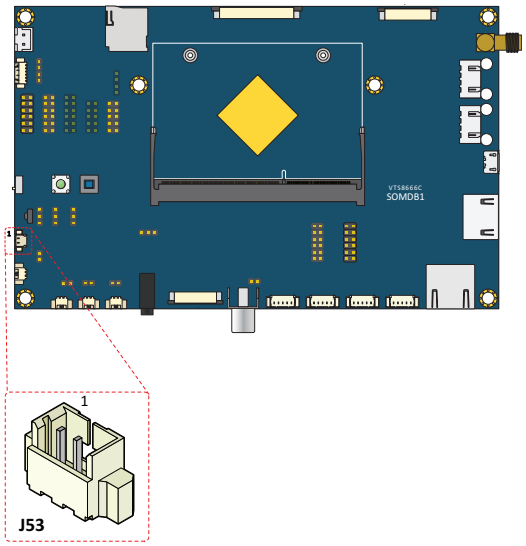

Figure 35: RTC battery connector diagram

A.2.1.23. DC-In Connector

The SOMDB1 carrier board comes with a DC-in connector that carries a 5V ~ 19V DC which provides power to the board. The connector is labeled as “J46”. The pinouts of power DC-in connector are shown below.

Pin	Signal
1	Power+
2	GND

Table 22: DC-in connector pinouts

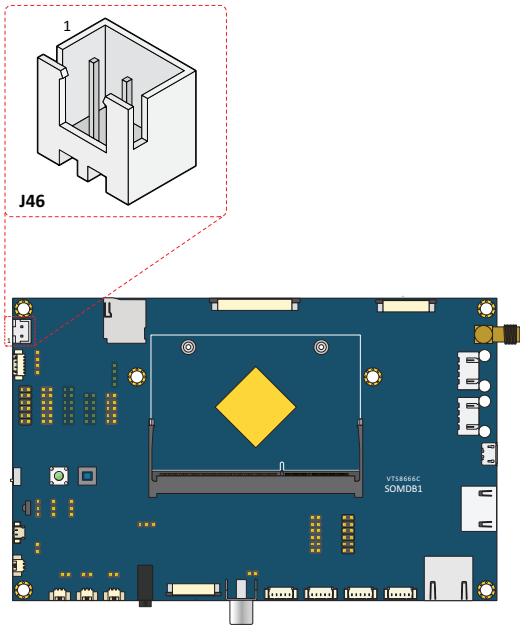

Figure 36: DC-in connector diagram

A.2.1.24. SOM DDR3 SODIMM Slot

The SOMDB1 carrier board comes with a SOM DDR3 SODIMM slot labeled as "J1". The SOM DDR3 SODIMM slot is only used for installing the SOM-6X50 module. The pinouts of the SOM DDR3 SODIMM memory slot are shown below.

Pin	Signal	Pin	Signal
1	USBATTA0	2	GND
3	USBID0	4	nUSBH2+
5	USBSW0	6	nUSBH2-
7	GND	8	GND
9	SPI0MISO	10	nUSBH1+
11	SPI0MOSI	12	nUSBH1-
13	SPI0CLK	14	GND
15	SPI0SS0-	16	nUSBHD0+
17	GND	18	nUSBHD0-
19	SD0CLK	20	GND
21	SD0DATA1	22	UARTB_CTS
23	SD0WP	24	UARTB_RTS
25	SD0DATA0	26	UARTB_RX
27	SD0CMD	28	UARTB_TX
29	SD0DATA2	30	UARTA_CTS
31	SD0DATA3	32	UARTA_RTS
33	SD0PWRSW	34	UARTA_RX
35	SD0CD	36	UARTA_TX
37	M0_LINK	38	UARTC_RTS
39	M0_SPEED	40	UARTC_RX
41	PWMOUT0	42	UARTC_TX
43	PWMOUT1	44	UARTC_CTS
45	GND	46	UARTD_RTS
47	NET_RX-	48	UARTD_CTS
49	NET_RX+	50	UARTD_TX
51	GND	52	UARTD_RX
53	NET_TX-	54	VDHSYNC
55	NET_TX+	56	VDVSYNC
57	GND	58	VDDEN
59	nHDMIHPD	60	VDCLK
61	nHDMICEC	62	VDOUT0
63	nHDMIDDCSDA	64	VDOUT8
65	nHDMIDDCSCL	66	VDOUT1
67	GND	68	VDOUT10
69	nLCD1DO3+	70	VDOUT3
71	nLCD1DO3-	72	VDOUT2
73	GND	74	VDOUT5
75	nLCD1CLK+	76	VDOUT4

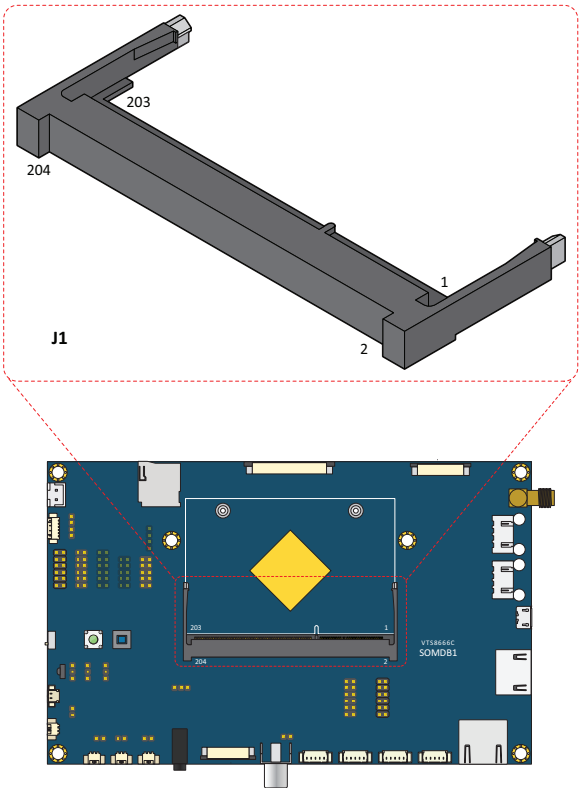

Figure 37: SOM DDR3 SODIMM slot diagram

Pin	Signal	Pin	Signal
77	nLCD1CLK-	78	VDOUT6
79	GND	80	VDOUT13
81	nLCD1DO0+	82	VDOUT9
83	nLCD1DO0-	84	VDOUT7
85	GND	86	VDOUT15
87	nLCD1D01+	88	VDOUT11
89	nLCD1DO1-	90	VDOUT12
91	GND	92	VDOUT19
93	nLCD1DO2+	94	VDOUT14
95	nLCD1DO2-	96	VDOUT18
97	GND	98	VDOUT17
99	VDIN0	100	VDOUT20
101	VDIN1	102	VDOUT21
103	VDIN2	104	VDOUT16
105	VDIN4	106	VDOUT23
107	VDIN3	108	VDOUT22
109	VCLK	110	UART1RXD
111	GND	112	UART1TXD
113	VDIN6	114	UART1RTS
115	C24MOUT	116	UART1CTS
117	VDIN5	118	UART0RXD
119	VDIN7	120	UART0TXD
121	VVSYNC	122	SD3CMD
123	VHSYNC	124	SD3CLK
125	GPIO12	126	SD3DATA0
127	GPIO13	128	SD3DATA3
129	GND	130	SD3DATA2
131	SPK_OUT_R-	132	SD3DATA1
133	SPK_OUT_R+	134	SD3PWRSW
135	GND	136	SD3WP
137	SPK_OUT_L-	138	I2CSDA
139	SPK_OUT_L+	140	I2C1SCL
141	GND	142	I2C2SCL
143	HPOUTR	144	I2C2SDA
145	OUT3	146	I2C3SDA
147	HPOUTL	148	I2C3SCL
149	MICBIAS	150	SUS_GPIO0
151	GND	152	PWRGD
153	LINPUT3	154	WAKEUP0
155	LINPUT2	156	SPI1MOSI
157	LINPUT1	158	GND
159	GND	160	SPI1CLK

Pin	Signal	Pin	Signal
161	RINPUT1	162	SPI1SS0-
163	RINPUT2	164	SPI1MISO
165	GND	166	GPIO1
167	WAKEUP3	168	GPIO0
169	PWRENVCC	170	GPIO6
171	WAKEUP2	172	GPIO3
173	CIRIN	174	GPIO4
175	PWRENMEM	176	GPIO5
177	PWRENVDD	178	GPIO9
179	SUS_GPIO1	180	GPIO7
181	PWRBTN-	182	GPIO8
183	RSMRST-	184	VSUS33
185	PWMOUT3	186	VSUS33
187	PWMOUT2	188	VCC33
189	PWREN_MAIN	190	VCC33
191	VCC-BAT	192	VCC33
193	NC	194	NC
195	5VIN	196	GND
197	5VIN	198	GND
199	5VIN	200	GND
201	5VIN	202	GND
203	5VIN	204	GND

Table 23: SOM DDR3 SODIMM slot pinouts

A.2.2. SOMDB1 External I/O

The SOMDB1 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.2.2.1. HDMI® Port

The SOMDB1 carrier board has an HDMI port on the right panel. The HDMI port uses a Type A receptacle connector to connect high definition video and digital audio using a single cable. The pinouts of the HDMI port are shown below.

Pin	Signal	Pin	Signal
1	HDMID2+	2	GND
3	HDMID2-	4	HDMID1+
5	GND	6	HDMID1-
7	HDMID0+	8	GND
9	HDMID0-	10	HDMICLK+
11	GND	12	HDMICLK-
13	HDMI_CECIN	14	NC
15	HDMIDDCSCL	16	HDMIDDCSDA
17	GND	18	5V_HDMI
19	HDMIHPD		

Table 24: HDMI port pinouts

Figure 38: HDMI port diagram

A.2.2.2. Micro USB 2.0 OTG Port

The SOMDB1 carrier board is equipped with a Micro USB 2.0 OTG port on the right panel which gives complete Plug and Play and hot swap capability for external devices. The USB interface complies with USB UHCI, Rev. 2.0 and it supports the OTG function. The pinouts of the Micro USB 2.0 OTG port are shown below.

Pin	Signal
1	USB_VBUS
2	USBHD0-
3	USBHD0+
4	USBID0
5	GND

Table 25: Micro USB 2.0 OTG port pinouts

Figure 39: Micro USB 2.0 OTG port diagram

A.2.2.3. 10/100Mbps Ethernet Port

The SOMDB1 carrier board comes with a 10/100Mbps Ethernet port which uses an 8 Position 8 Contact (8P8C) receptacle connector commonly referred to as RJ-45. It is fully compliant with IEEE 802.3 (10BASE-T) and 802.3u (100BASE-TX). The pinouts of the 10/100Mbps Ethernet port are shown below.

Pin	Signal
1	TX+
2	TX-
3	RX+
4	NC
5	NC
6	RX-
7	NC
8	NC

Table 26: 10/100Mbps Ethernet port pinouts

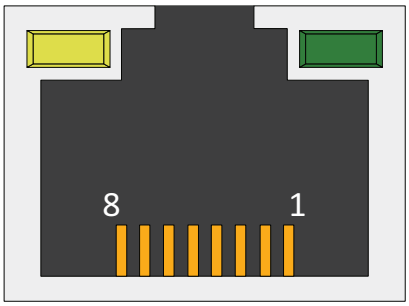

Figure 40: 10/100Mbps Ethernet port diagram

The 10/100Mbps Ethernet port (RJ-45) is equipped with two LED indicators on the front side to show its Active/ Link status and Speed status.

	Link LED (Left LED on RJ-45 port)	Active LED (Right LED on RJ-45 port)
Link off	LED is off	LED is off
Speed_10Mbit	The orange LED is off	Green flash
Speed_100Mbit	The orange LED is on	Green flash

Table 27: 10/100Mbps Ethernet port LED color definition

A.2.2.4. Headphone Jack

The SOMDB1 carrier board comes with a headphone jack which offers High Definition Audio sounds through the 3.5mm Tip Ring Sleeve (TRS) connector to enable connections to Line-out. The headphone jack is for connecting to external speakers or headphones. The diagram of the headphone jack is shown below.

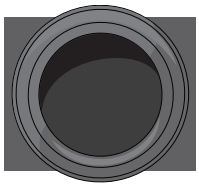

Figure 41: Headphone jack diagram

A.2.2.5. Micro SD Card Slot

The SOMDB1 carrier board comes with a Micro SD card slot located on the back panel with support for a maximum storage capacity of 32GB. The pinouts of the Micro SD card slot are shown below.

Pin	Signal
1	SD0DATA2
2	SD0DATA3
3	SD0CMD
4	VCC33
5	SD0CLK
6	GND
7	SD0DATA0
8	SD0DATA1
9	SD0CD

Table 28: Micro SD card slot pinouts

Figure 42: Micro SD card slot diagram

A.2.2.6. RCA Jack

The SOMDB1 carrier board comes with a RCA jack which is used for connecting display component video signals using the yellow composite video jack.

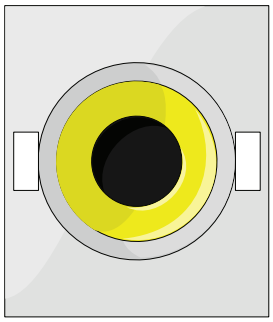

Figure 43: RCA jack diagram

A.3. SOMDB1 Dimensions

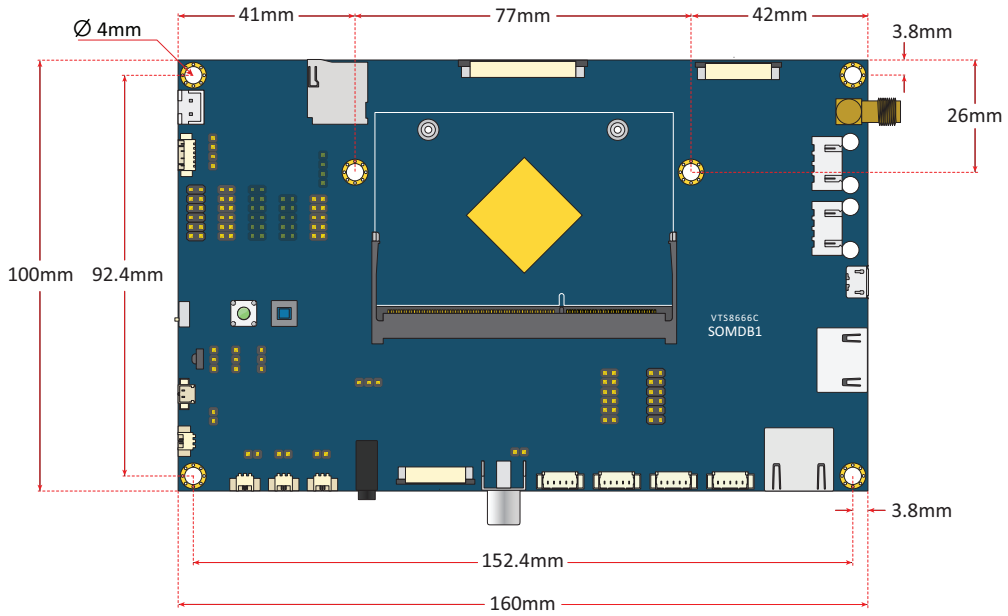

Figure 44: Dimensions of the SOMDB1 carrier board

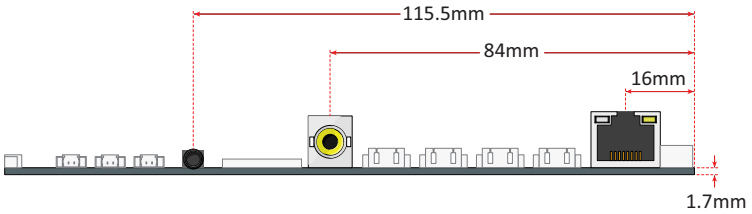

Figure 45: Dimensions of the SOMDB1 front panel I/O

Figure 46: Dimensions of the SOMDB1 back panel I/O

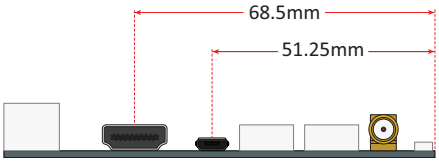

Figure 47: Dimensions of the SOMDB1 right panel I/O

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