



USER MANUAL

VIA SOM-6X80

Ultra-compact low-power
solution for HMI applications
with rapid time-to-market



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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



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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.
- 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 penetrated 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 dropped and damaged.
 - The equipment has 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-SOM6X80-00A2

- 1 x VIA SOM-6X80 module
- 1 x SOMDB3 carrier board
- 1 x 7" LCD touch panel
- 1 x AC power adapter
- 1 x Power cord US type

Items for STK-SOM6X80-01A1

- 1 x VIA SOM-6X80 module
- 1 x SOMDB3 carrier board
- 1 x 10.1" LCD touch panel
- 1 x AC power adapter
- 1 x Power cord US type

Ordering Information

Part Number	Description
15GKY126000-10	SOM module with 1.0GHz VIA Cortex-A9 dual-core SoC, 8GB eMMC, 512 SPI ROM, 2GB DDR3 SDRAM, HDMI , Single-channel LVDS, 3 USB 2.0, 6 UART, 9 GPIO, 10/100Mbps Ethernet
STK-SOM6X80-00A2	VIA SOM-6X80 starter kit with 7" Touch panel
STK-SOM6X80-01A1	VIA SOM-6X80 starter kit with 10.1" Touch panel

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1. Product Overview

The VIA SOM-6X80 module combines advanced compute and multimedia performance with rich I/O and display connectivity options in an ultra-compact low-power package that enables the rapid development and deployment of a wide array of automated ticketing, signage, and kiosk systems for retail, transportation, industrial, and other environments.

The VIA SOM-6X80 is powered by a 1.0GHz VIA Cortex-A9 dual-core SoC and measures just 6.76cm x 6.3cm. In addition to featuring 8GB eMMC Flash memory and 2GB DDR3 SDRAM onboard, the module offers a wealth of I/O and display expansion options, including three USB 2.0 ports, one HDMI port, one single-channel 18/24-bit LVDS panel, six UART, one camera input, 10/100Mbps Ethernet, nine GPIO, and one Micro SD card slot.

The VIA SOM-6X80 features a Linux BSP which includes the kernel (4.4.26) and bootloader source codes. Other features include a Tool Chain to help make adjustments to the kernel and to support the SOMDB3 carrier board I/O and other hardware features.

1.1 Key Features

- Powered by a 1.0GHz VIA Cortex-A9 dual-core 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 camera input
- Supports Line-in, Line-out and Mic-in
- Supports up to six UART and three USB 2.0
- Supports 2GB DDR3 SDRAM
- Onboard 8GB eMMC Flash memory
- Fanless and ultra-low power consumption
- Yocto 2.1 (Linux Kernel 4.4.26) operating system
- Carrier board available

1.2 Product Specifications

Processor

- 1.0GHz VIA Cortex-A9 dual-core SoC

System Memory

- 2GB 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

- ASIX AX88772CLF USB to LAN

Audio

- Wolfson WM8960 I2S Audio Codec

HDMI

- Integrated HDMI 1.4 Transmitter

USB

- Genesys GL852GT USB hub 4-port controller

USB to UART

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

Supported I/O

- 1 x HDMI
- 1 x Single-channel LVDS
- 3 x USB 2.0 ports
- 6 x UART (4 TX/RX, RTS/CTS, 1 RS-485, 1 Debug TX/RX)
- 9 x GPIO
- 1 x 10/100Mbps Ethernet port
- 3 x I²C
- 1 x Micro SD card slot
- 2 x SPI
- 1 x Line-in, Line-out, Mic-in
- 1 x Headphone-out

Onboard I/O

- Debug connector

Operating System

- Yocto 2.1 (Linux Kernel 4.4.26)

Operating Temperature

- 0°C ~ 60°C

Operating Humidity

- 0% ~ 90% (non-condensing)

Form Factor

- 6.76cm x 6.3cm (2.66" x 2.48")

**Notes:**

1. As the operating temperature provided in the specifications are a result of tests performed under controlled conditions. Please note that the working temperature may vary depending on the specific implementation and operational environment. It is highly suggested to execute a solid testing program that considers all environmental variables when designing and building the system.
2. The lifespan of the onboard eMMC memory chip may vary depending on the frequency of access, especially write and erase cycles. More frequent access to larger data access will shorten lifespan. We highly recommended using a removable external storage (e.g., MicroSD card) for applications that require frequent access to larger data sets.

1.3 Layout Diagram

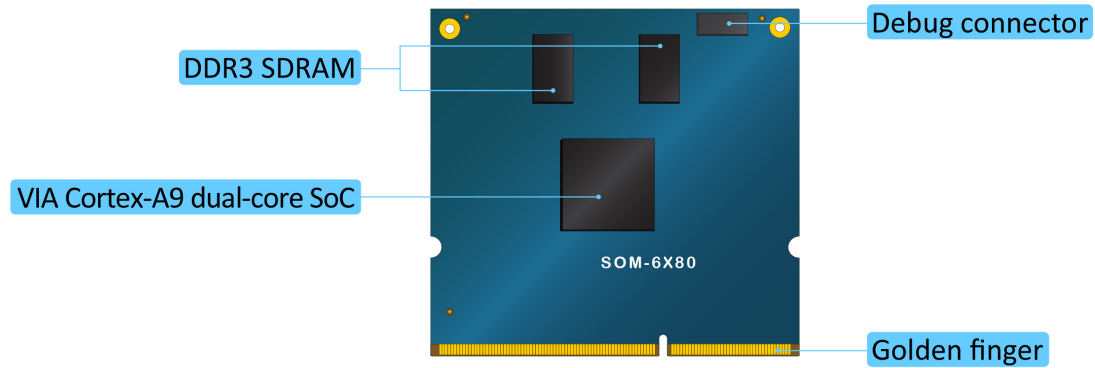


Figure 1: Layout diagram of the VIA SOM-6X80 module (top side)

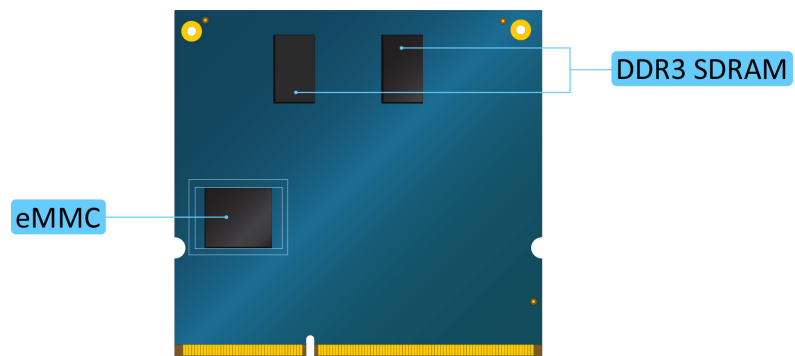


Figure 2: Layout diagram of the VIA SOM-6X80 module (bottom side)

1.4 Product Dimensions

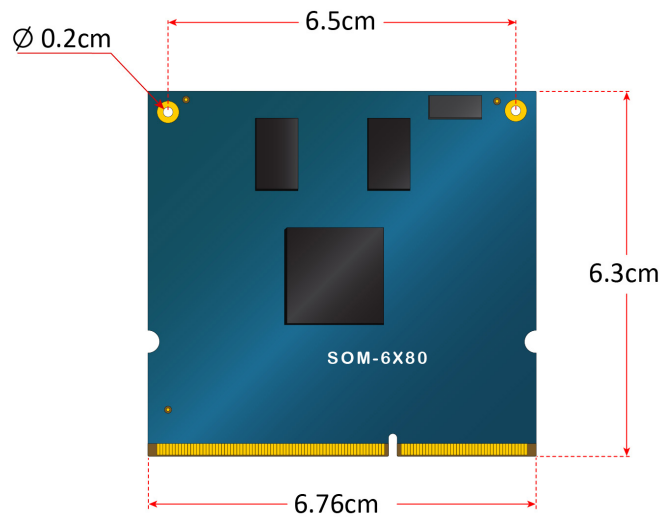


Figure 3: Dimensions of the VIA SOM-6X80 module (top view)

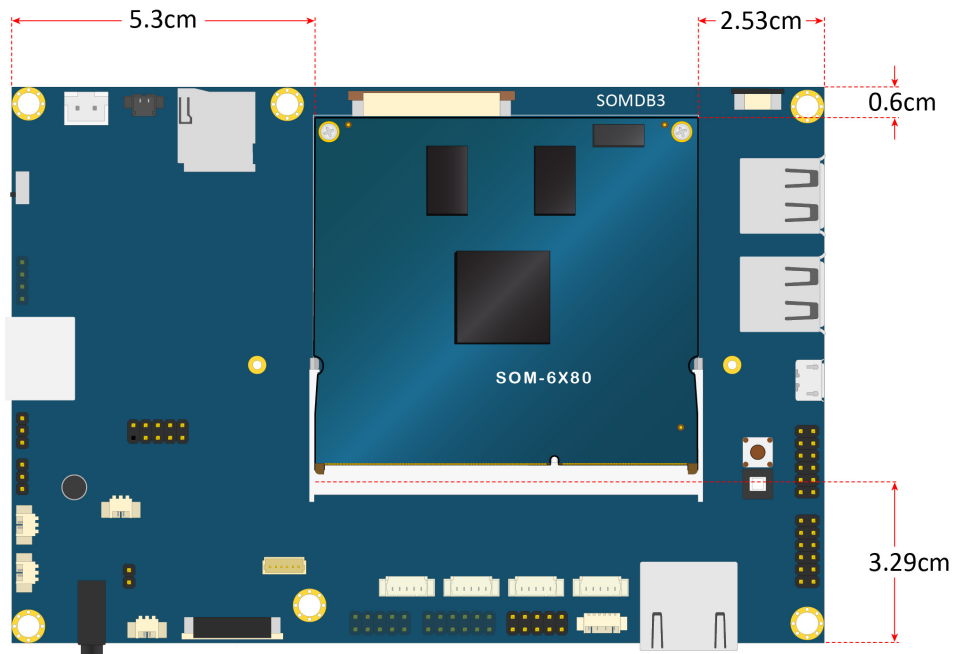


Figure 4: VIA SOM-6X80 module placement on the SOMDB3 carrier board

2. Onboard I/O Connector

This chapter provides information about the VIA SOM-6X80's onboard I/O connector and its functionality.

2.1 Debug Connector

The VIA SOM-6X80 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	SFCLK
4	GND
5	SFDO
6	SFDI
7	SFCS0-
8	VCC33_SF

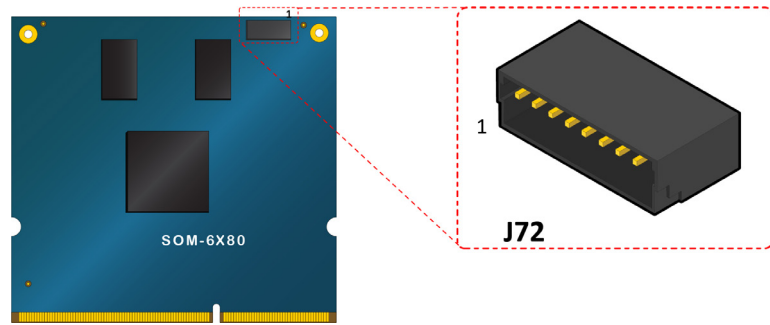


Figure 5: Debug connector diagram

Table 1: Debug connector pinouts

3. Hardware Installation

This chapter provides information about the hardware installation procedures.

3.1 Installing the VIA SOM-6X80 Module on the SOMDB3 Carrier Board

Step 1

Align the notch on the VIA SOM-6X80 module with the counterpart on the SOM DDR3 SODIMM slot on the SOMDB3 carrier board then insert the module at a 30° angle.

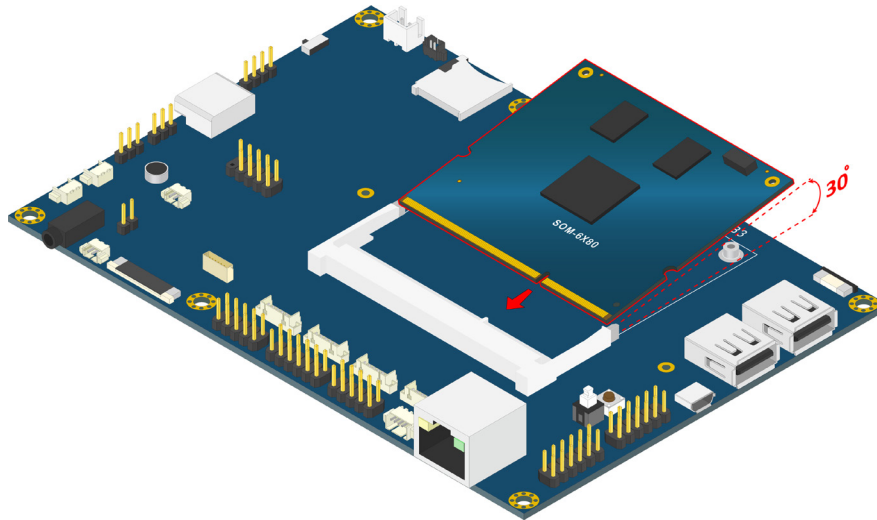


Figure 6: Inserting the VIA SOM-6X80 module

Step 2

Once the VIA SOM-6X80 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.

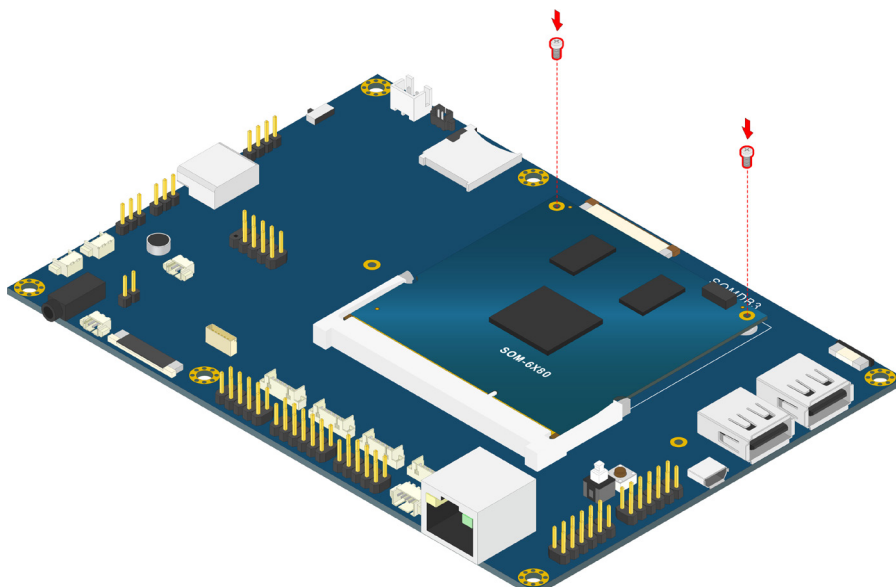


Figure 7: Securing the VIA SOM-6X80 module

4. Software and Technical Support

4.1 Linux Support

The VIA SOM-6X80 features a complete software evaluation image featuring the Yocto 2.1 (Linux Kernel 4.4.26) operating system.

4.2 Technical Support and Assistance

- For utilities downloads and the latest documentation and information about the VIA SOM-6X80, please visit our website at <https://www.viatech.com/en/boards/modules/som-6x80/>
- 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. SOMDB3 Carrier Board Reference

A.1. SOMDB3 Specifications

Onboard I/O

- 1 x LCD panel connector
- 1 x Touch connector
- 1 x Camera connector
- 4 x COM connectors (RS-232)
- 1 x COM pin header (RS-485)
- 1 x GPIO pin header (9 GPIO)
- 1 x I²C pin header (3 I²C)
- 1 x SPI pin header
- 1 x USB WLAN connector
- 2 x Line-in pin headers
- 3 x Line-out connectors (for Mono, Right & Left channel speakers)
- 1 x Audio mono out signal pin header
- 1 x Mic-in connector
- 1 x Microphone
- 1 x Debug connector
- 1 x System wake up button
- 1 x Watchdog timer switch
- 1 x Power button
- 1 x RTC battery connector
- 1 x DC-in connector
- 1 x MiniPCIe slot (with USB 2.0 signal only)
- 1 x SIM card slot

Front Panel I/O

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

Back Panel I/O

- 1 x Micro SD Card slot

Right Panel I/O

- 2 x USB 2.0 ports
- 1 x Micro USB 2.0 OTG port

Left Panel I/O

- 1 x HDMI port

Power Supply

- 12V ~ 24V DC-in

Operating Temperature

- 0°C ~ 60°C

Operating Humidity

- 0% ~ 90% (non-condensing)

Form Factor

- 3.5" carrier board (14.6cm x 10.2cm) (5.74" x 4.01")

A.2. SOMDB3 Layout Diagram

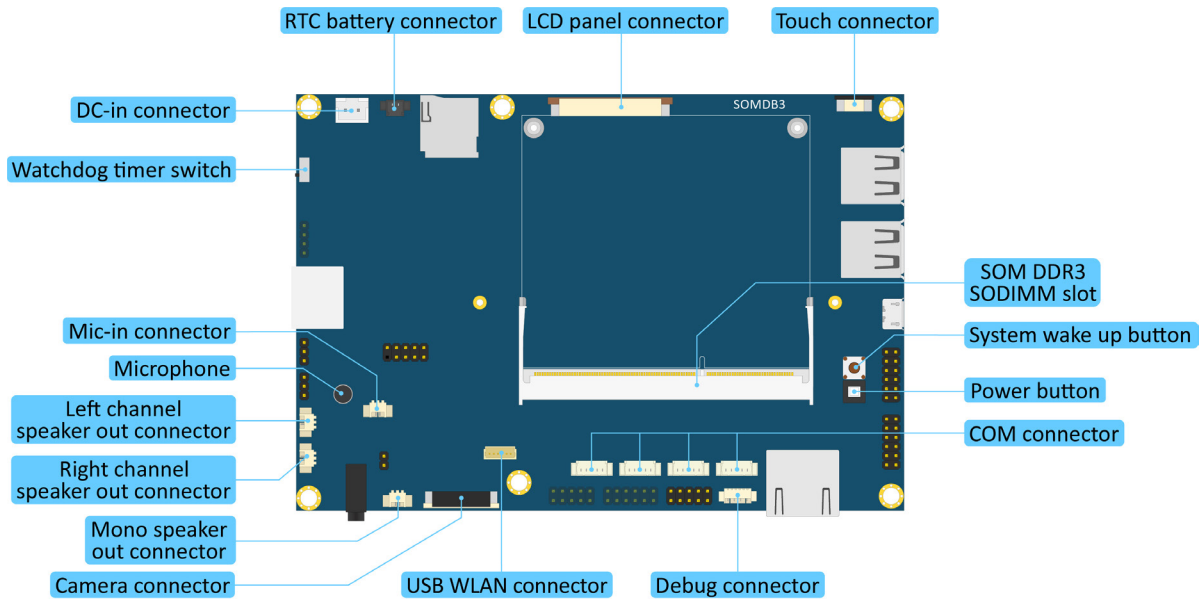


Figure 8: Layout diagram of the SOMDB3 switch, connectors, and buttons (top side)



Figure 9: Layout diagram of the SOMDB3 pin headers (top side)

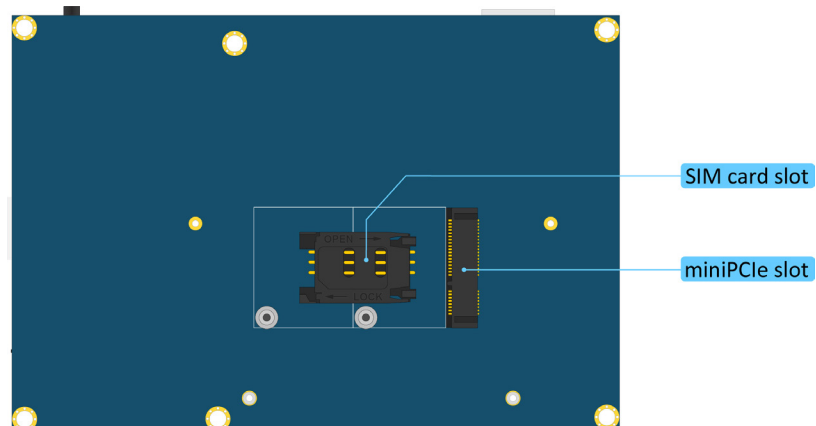


Figure 10: Layout diagram of the SOMDB3 slots (bottom side)



Figure 11: Layout diagram of the SOMDB3 front panel I/O



Figure 12: Layout diagram of the SOMDB3 back panel I/O



Figure 13: Layout diagram of the SOMDB3 right panel I/O



Figure 14: Layout diagram of the SOMDB3 left panel I/O

A.3. SOMDB3 Onboard I/O

A.3.1. LCD Panel Connector

The SOMDB3 carrier board provides a 18/24-bit single-channel LCD panel connector labeled as “LVDS1” which is used for connecting the RGB LCD display. The pinouts of the LCD panel connector are shown below.

Pin	Signal	Pin	Signal
1	VCOM	21	LVDS_3+
2	LCDVDD	22	GND
3	LCDVDD	23	NC
4	NC	24	NC
5	nRST	25	GND
6	STBYB	26	NC
7	GND	27	NC
8	LVDS_0-	28	SELB
9	LVDS_0+	29	AVDD
10	GND	30	GND
11	LVDS_1-	31	VLED-
12	LVDS_1+	32	VLED-
13	GND	33	LR
14	LVDS_2-	34	UD
15	LVDS_2+	35	VGL
16	GND	36	CABC1
17	LVDS_CLK-	37	CABC0
18	LVDS_CLK+	38	VGH
19	GND	39	VLED+
20	LVDS_3-	40	VLED+

Table 2: LCD panel connector pinouts

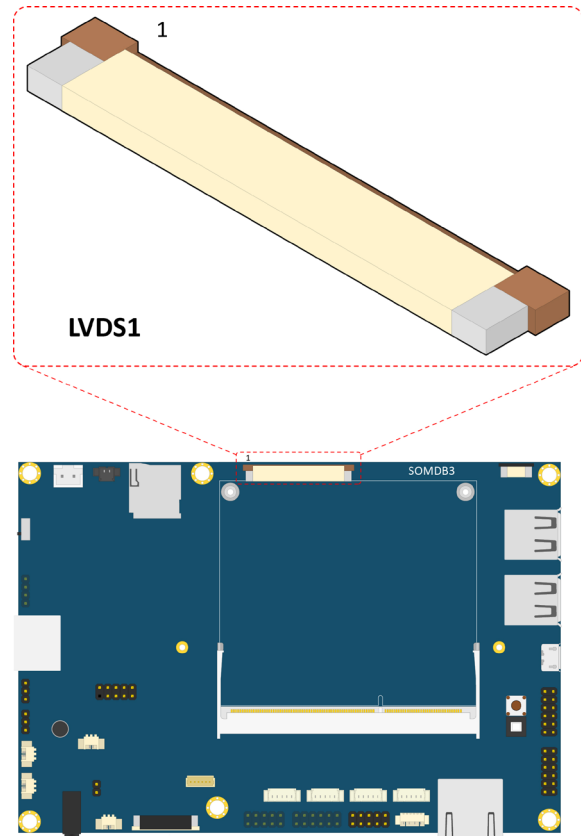


Figure 15: LCD panel connector diagram

A.3.2. Touch Connector

The SOMDB3 carrier board comes with a touch connector labeled as “J60” which is used for connecting the touch controller panel. The pinouts of the touch panel connector are shown below.

Pin	Signal
1	TP_SDA
2	TP_SCL
3	TP_INT
4	TP_RESET
5	TP_VCC33
6	GND

Table 3: Touch connector pinouts

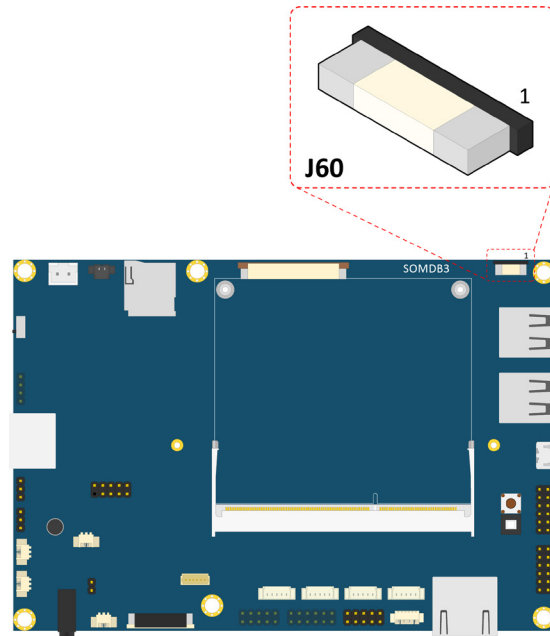


Figure 16: Touch connector diagram

A.3.3. USB WLAN Connector

The SOMDB3 carrier board comes with a USB WLAN connector labeled as “JWLAN1” which is used for connecting the USB Wi-Fi module (e.g. VIA EMIO-5531 module). The pinouts of the USB WLAN connector are shown below.

Pin	Signal
1	EN_USBWIFI
2	NC
3	GND
4	USBH_T2+
5	USBH_T2-
6	VUSB2

Table 4: USB WLAN connector pinouts

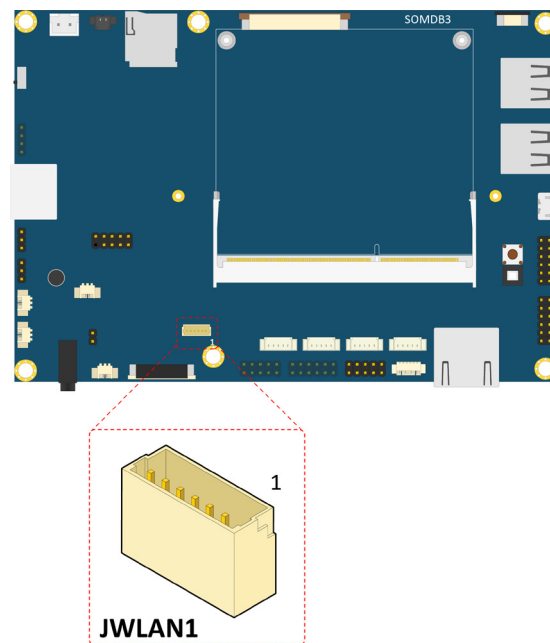


Figure 17: USB WLAN connector diagram

A.3.4. Camera Connector

The SOMDB3 carrier board has a camera connector labeled as “J36” which is used to connect the camera. 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

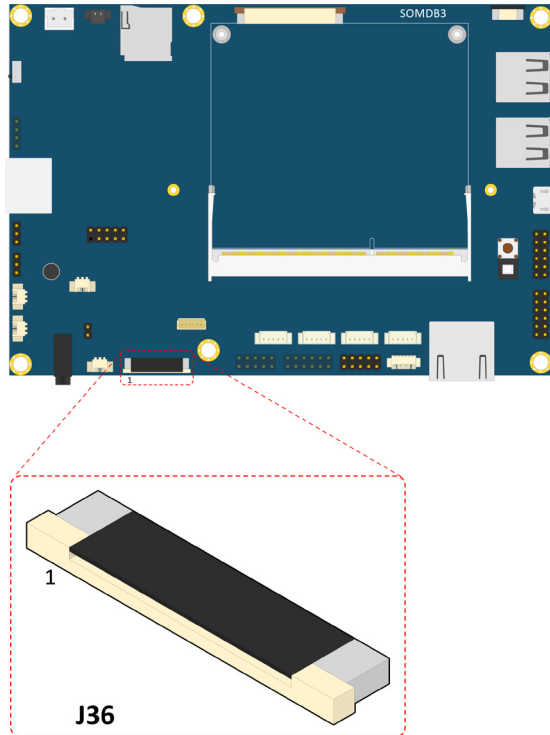


Figure 18: Camera connector diagram

A.3.5. COM Connectors and Pin Header

The SOMBD3 carrier board is equipped with four COM connectors and one COM pin header. The COM connectors are labeled as “J55”, “J57”, “J58” & “J59”, and COM pin header is labeled as “J66”. The COM connectors support RS-232 mode while the COM pin header supports RS-485 mode. The pinouts of COM connectors and pin header are shown below.

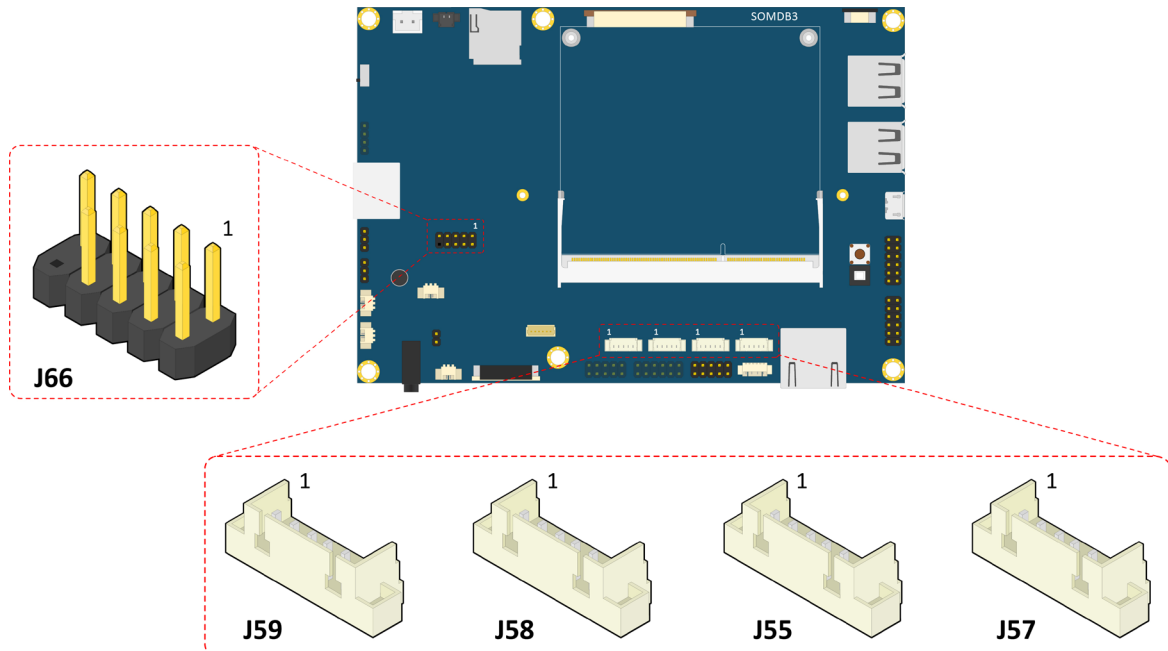


Figure 19: COM connectors and pin header diagram

J55		J57		J58		J59	
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	COM_A_RX	1	COM_B_RX	1	COM_C_RX	1	COM_D_RX
2	COM_A_TX	2	COM_B_TX	2	COM_C_TX	2	COM_D_TX
3	GND	3	GND	3	GND	3	GND
4	COM_A_RTS	4	COM_B_RTS	4	COM_C_RTS	4	COM_D_RTS
5	COM_A_CTS	5	COM_B_CTS	5	COM_C_CTS	5	COM_D_CTS

Table 6: COM connectors pinouts

J66			
Pin	Signal	Pin	Signal
1	RS485-	2	RS485+
3	NC	4	NC
5	GND	6	NC
7	NC	8	NC
9	NC		

Table 7: COM pin header pinouts

A.3.6. GPIO Pin Header

The SOMBD3 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	GPIO4
5	GPIO0	6	GPIO5
7	GPIO1	8	GPIO6
9	GPIO2	10	GPIO7
11	GPIO3	12	GPIO8

Table 8: GPIO pin header pinouts

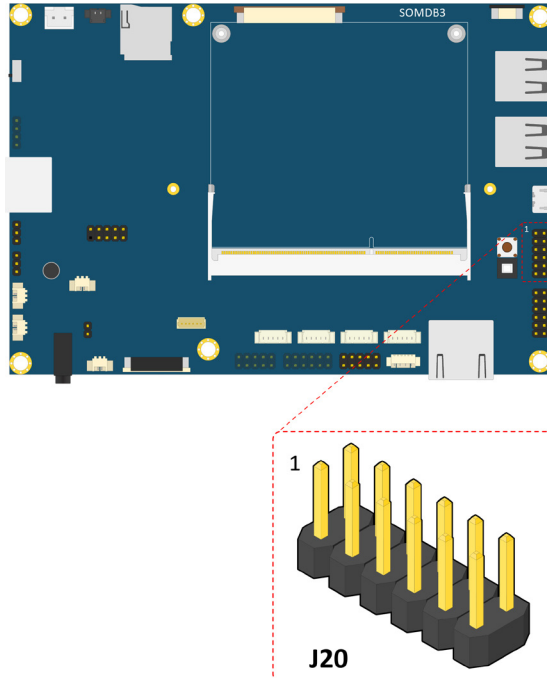


Figure 20: GPIO pin header diagram

A.3.7. SPI Pin Header

The SOMBD3 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	SPIOCLK	4	SPI1CLK
5	SPI0MOSI	6	SPI1MOSI
7	SPI0MISO	8	SPI1MISO
9	SPI0SS0-	10	SPI1SS0-
11	GND	12	GND

Table 9: SPI pin header pinouts

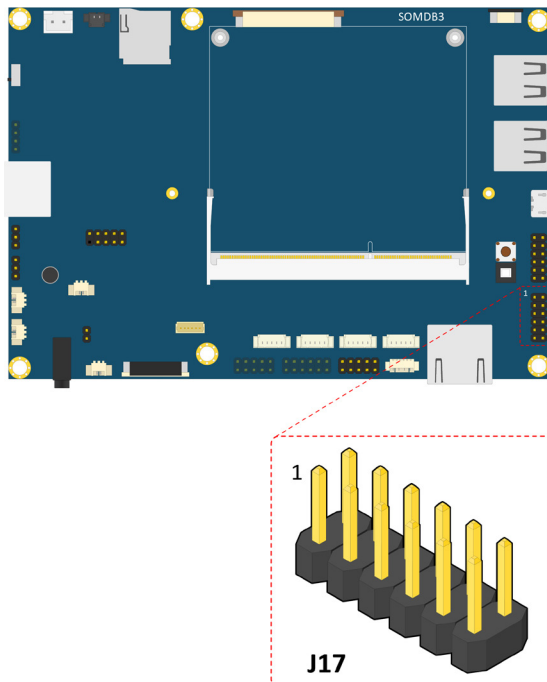


Figure 21: SPI pin header diagram

A.3.8. Mic-In Connector

The SOMDB3 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 10: Mic-in connector pinouts

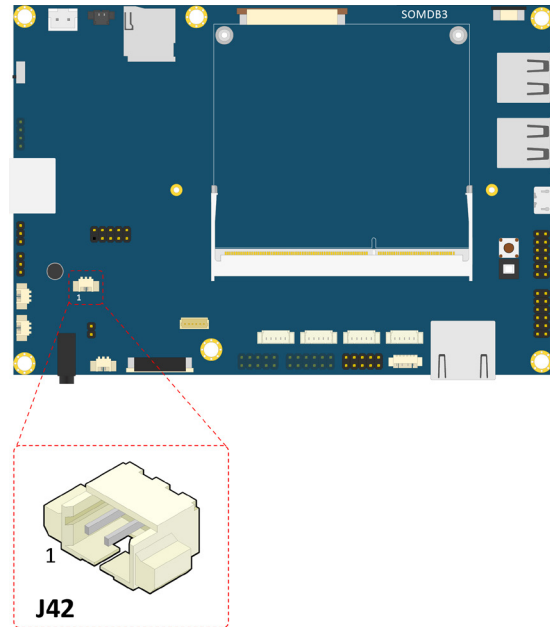


Figure 22: Mic-in connector diagram

A.3.9. Mono Speaker Out Connector

The SOMDB3 carrier board is equipped with a mono speaker out connector which is used for connecting the mono speaker. The mono speaker out connector is labeled as “J26”. The pinouts of the mono speaker out connector are shown below.

Pin	Signal
1	SPK3_P
2	SPK3_N

Table 11: Mono speaker out connector pinouts

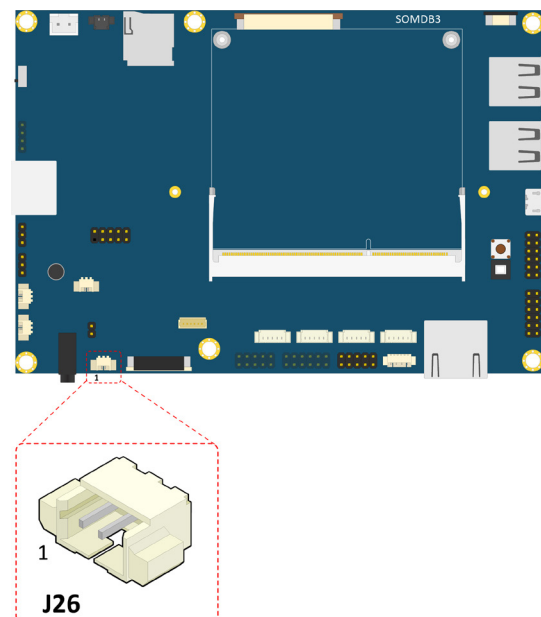


Figure 23: Mono speaker out connector diagram

A.3.10. Audio Mono Out Signal Pin Header

The SOMDB3 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 12: Audio mono out signal pin header pinouts

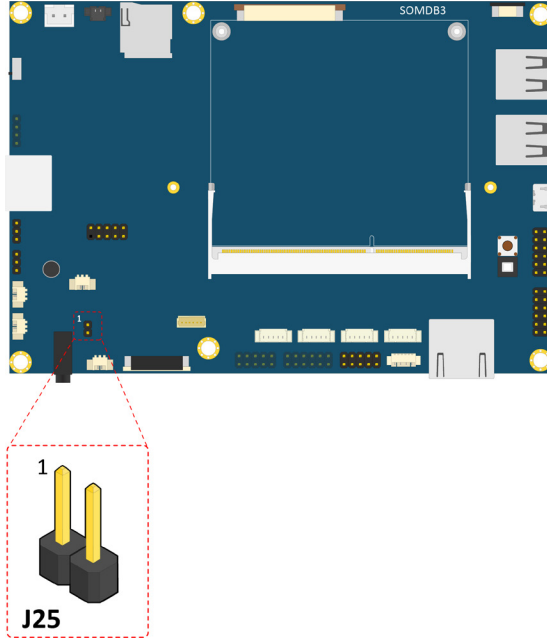


Figure 24: Audio mono out signal pin header diagram

A.3.11. Left Channel Speaker Out Connector

The SOMDB3 carrier board is equipped with a left channel speaker out connector for the left speaker. The left channel speaker out connector is labeled as “J27”. The pinouts of the left channel speaker out connector are shown below.

Pin	Signal
1	SPKL_P
2	SPKL_N

Table 13: Left channel speaker out connector pinouts

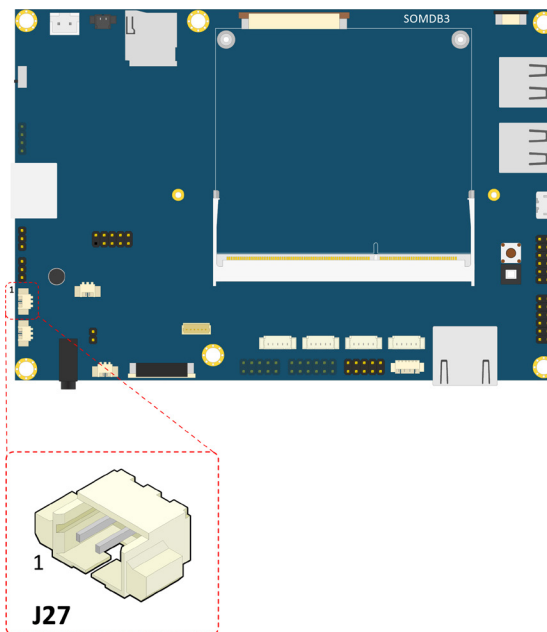


Figure 25: Left channel speaker out connector diagram

A.3.12. Right Channel Speaker Out Connector

The SOMDB3 carrier board is equipped with a right channel speaker out connector for the right speaker. The right channel speaker out connector is labeled as “J22”. The pinouts of the right channel speaker out connector are shown below.

Pin	Signal
1	SPKR_P
2	SPKR_N

Table 14: Right channel speaker out connector pinouts

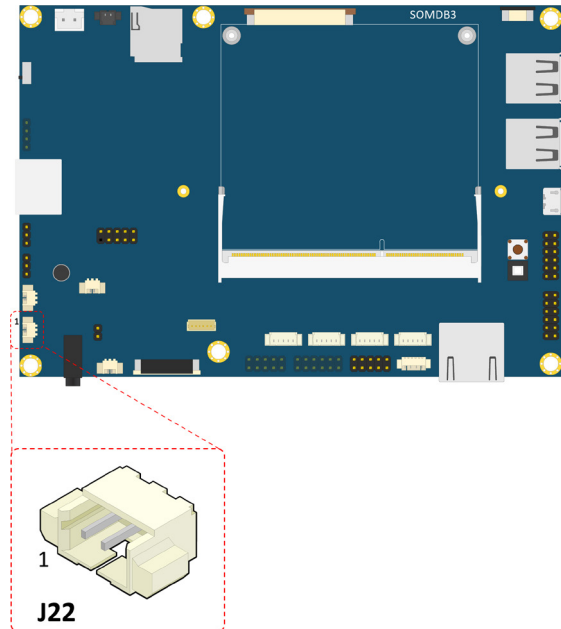


Figure 26: Right channel speaker out connector diagram

A.3.13. Line-In Pin Headers

The SOMDB3 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		J32	
Pin	Signal	Pin	Signal
1	LINPUT1	1	LINPUT2
2	GND	2	GND
3	RINPUT1	3	RINPUT2

Table 15: Line-in pin headers pinouts

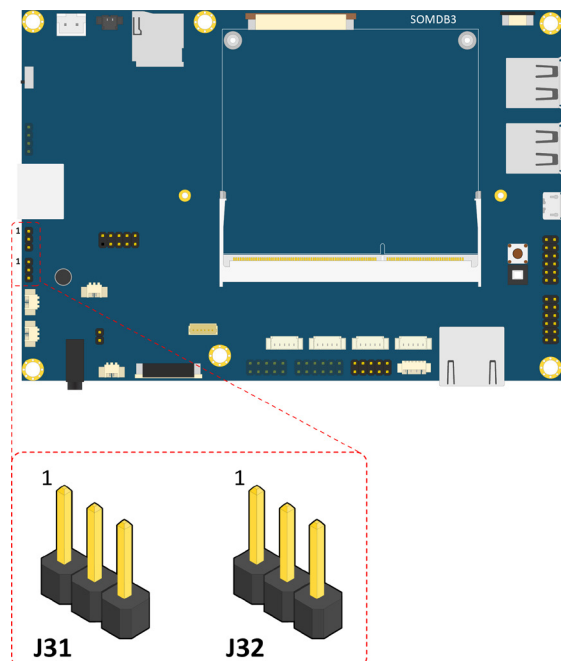


Figure 27: Line-in pin headers diagram

A.3.14. Debug Connector

The SOMDB3 carrier board comes with a debug connector which is used for debugging purposes only. It supports TX/RX. The debug connector is labeled as “J15”. The pinouts of the debug connector are shown below.

Pin	Signal
1	VCC33
2	UART0RXD
3	UART0TXD
4	GND

Table 16: Debug connector pinouts

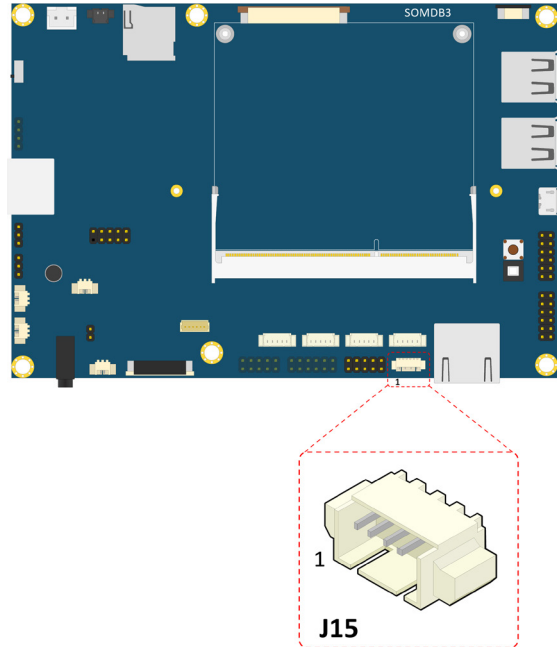


Figure 28: Debug connector diagram

A.3.15. Microphone

The SOMDB3 carrier board comes with an onboard microphone labeled as “MIC1”. The diagram of the microphone is shown below.

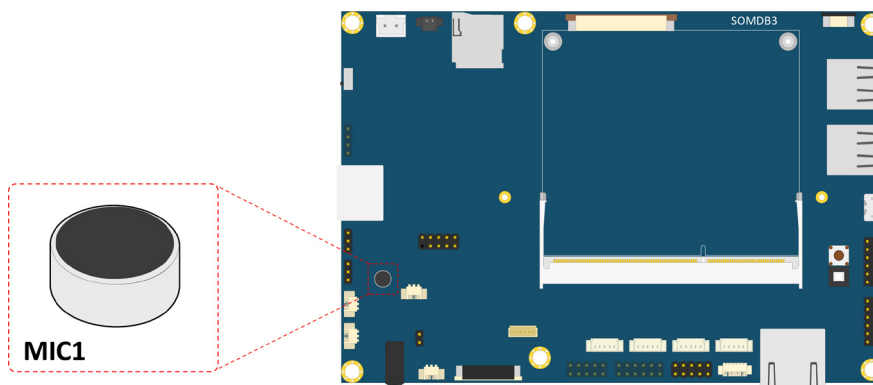


Figure 29: Microphone diagram

A.3.16. Power Button

The SOMBD3 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.

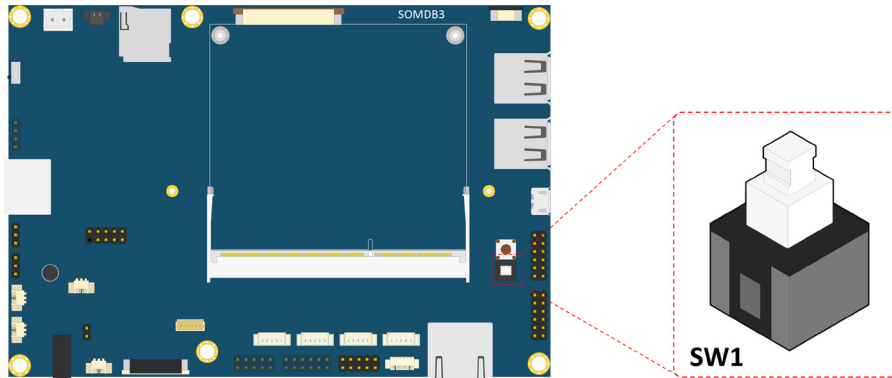


Figure 30: Power button diagram

A.3.17. System Wake Up Button

The SOMBD3 carrier board comes with a system wake up button labeled as “SW2” that wake up the system when it enter suspend mode. The diagram of the system wake up button is shown below.

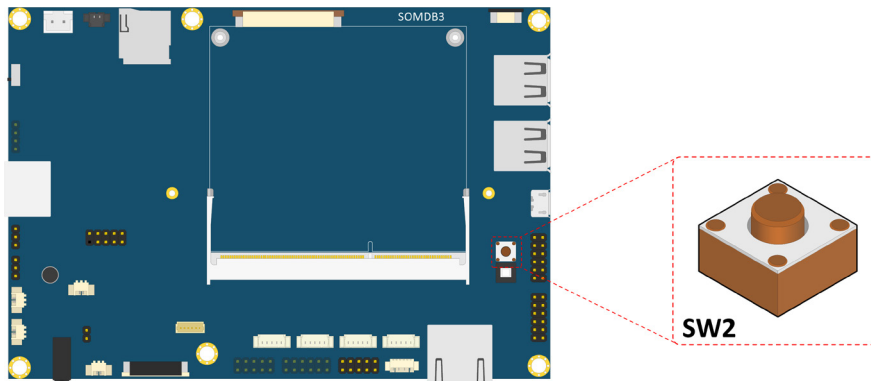


Figure 31: System wake up button diagram

A.3.18. Watchdog Timer Switch

The SOMBD3 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.

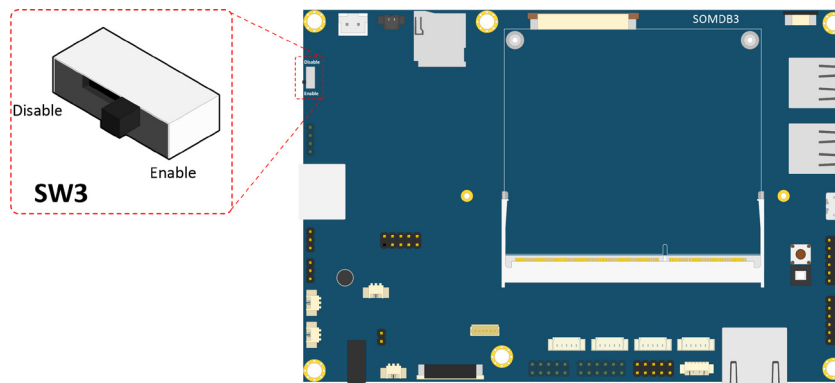


Figure 32: Watchdog timer switch diagram

A.3.19. RTC Battery Connector

The SOMDB3 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 17: RTC battery connector pinouts

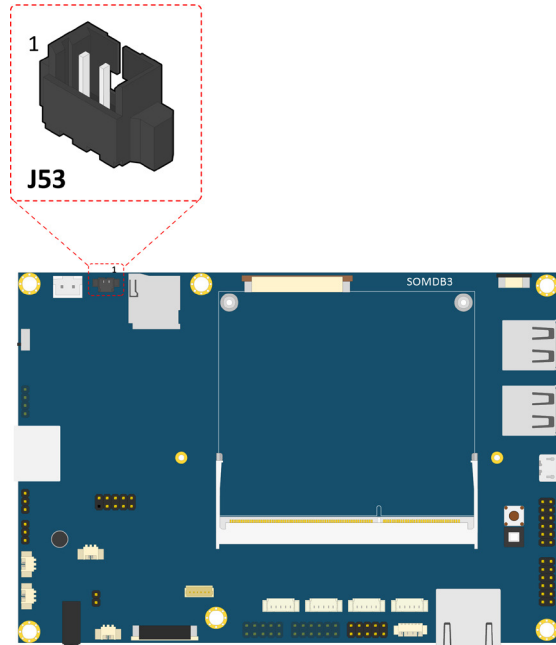


Figure 34: RTC battery connector diagram

A.3.20. DC-In Connector

The SOMDB3 carrier board comes with a DC-in connector that carries a 12V ~ 24V 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

Figure 33: DC-in connector pinouts

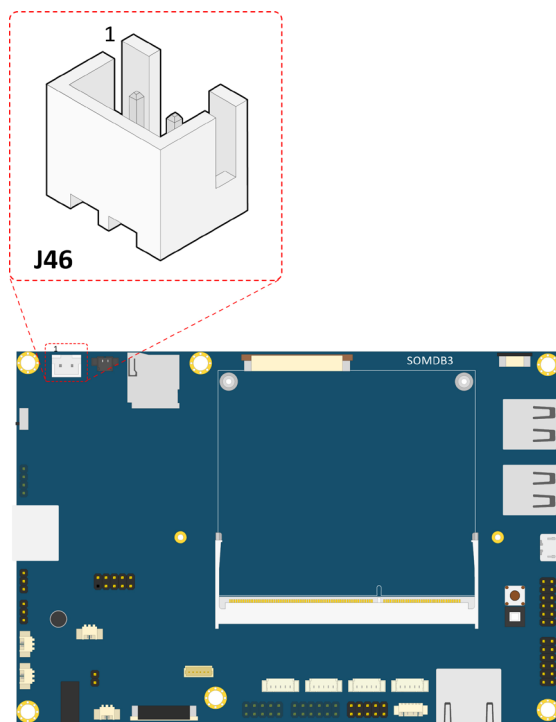


Figure 35: DC-in connector diagram

A.3.21. I²C Pin Header

The SOMDB3 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	I2C0SCL	4	I2C0SDA
5	I2C1SCL	6	I2C1SDA
7	I2C2SCL	8	I2C2SDA
9	GND	10	GND

Table 18: I²C pin header pinouts

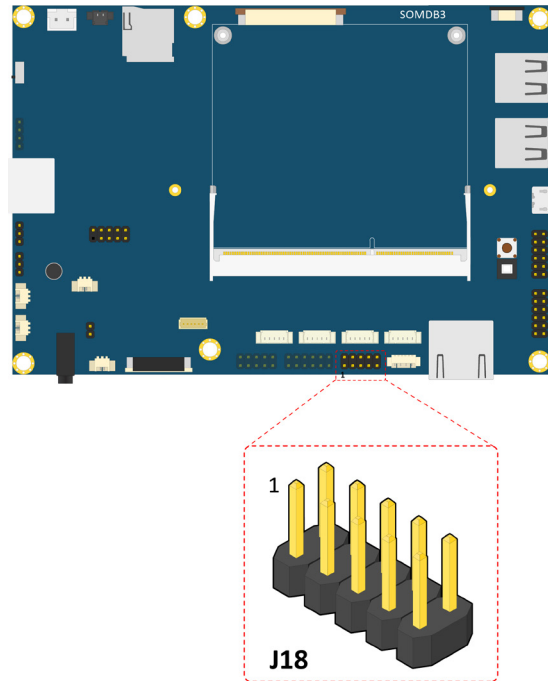


Figure 36: I²C pin header diagram

A.3.22. SOM DDR3 SODIMM Slot

The SOMDB3 carrier board comes with a SOM DDR3 SODIMM slot labeled as “J1”. The SOM DDR3 SODIMM slot is only used for installing the VIA SOM-6X80 module. The pinouts of the SOM DDR3 SODIMM memory slot are shown below.

Pin	Signal	Pin	Signal
1	GND	2	GND
3	SPK_OUT_R-	4	MICBIAS
5	SPK_OUT_R+	6	GND
7	SPK_OUT_L-	8	LINPUT2
9	SPK_OUT_L+	10	LINPUT3
11	HPOUTR	12	LINPUT1
13	OUT3	14	RINPUT2
15	HPOUTL	16	RINPUT1
17	GND	18	GND
19	GND	20	GND
21	GND	22	GND
23	I2COSCL	24	nUSBHB+
25	I2COSDA	26	nUSBHB-
27	USBSW0	28	GND
29	USBATTA0	30	nUSBHA+
31	USBID0	32	nUSBHA-
33	GND	34	GND
35	GPIO2	36	nUSBHD0-
37	M0_LINK	38	nUSBHD0+
39	M0_SPEED	40	GND
41	GPIO1	42	nUSB2+
43	GPIO5	44	nUSB2-
45	GPIO3	46	GND
47	GND	48	VCC-BAT
49	NET_RX+	50	GND
51	NET_RX-	52	SPIOMOSI
53	GND	54	SPIOCLK
55	NET_TX+	56	SPIOMISO
57	NET_TX-	58	SPIOSS0-
59	GND	60	GND
61	SUS_GPIO0	62	UART1RTS
63	WAKEUP0	64	UART1CTS
65	SUS_GPIO1	66	NC
67	NC	68	NC
69	GPIO4	70	NC
71	WAKEUP3	72	GND
73	WAKEUP2	74	GND
75	GPIO0	76	LCD1CLK-

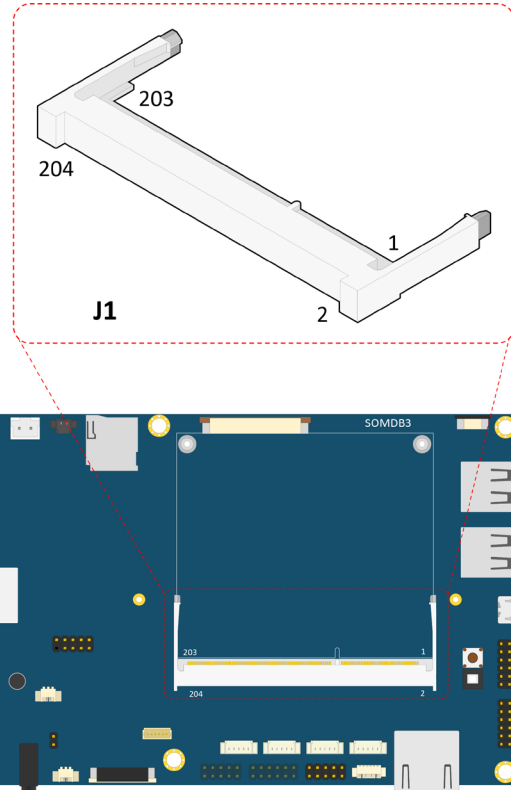


Figure 37: SOM DDR3 SODIMM slot diagram

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
77	GPIO6	78	LCD1CLK+	161	UARTD_RX	162	VDIN0
79	GND	80	GND	163	UARTD_TX	164	VDIN2
81	UART1RXD	82	LCD1DO0-	165	UARTD_CTS	166	VDIN3
83	UART1TXD	84	LCD1DO0+	167	UARTD_RTS	168	VDIN1
85	GND	86	GND	169	UARTC_CTS	170	GND
87	SPI1CLK	88	LCD1DO1-	171	UARTC_RTS	172	nHDMID2+
89	SPI1SS0-	90	LCD1DO1+	173	UARTC_RX	174	nHDMID2-
91	SPI1MISO	92	GND	175	UARTC_TX	176	GND
93	SPI1MOSI	94	LCD1DO3+	177	UARTB_CTS	178	nHDMID1+
95	GND	96	LCD1DO3-	179	UARTB_RTS	180	nHDMID1-
97	NC	98	GND	181	UARTB_RX	182	GND
99	NC	100	LCD1DO2+	183	UARTB_TX	184	nHDMID0+
101	PWRENVCC	102	LCD1DO2-	185	UARTA_CTS	186	nHDMID0-
103	PWREN_MAIN	104	GND	187	UARTA_RTS	188	GND
105	NC	106	PWMOUT1	189	UARTA_RX	190	nHDMICLK-
107	GPIO14	108	PWMOUT2	191	UARTA_TX	192	nHDMICLK+
109	GPIO10	110	PWMOUT3	193	GND	194	GND
111	GPIO8	112	PWMOUT0	195	GND	196	GND
113	RSMRST-	114	GPIO9	197	GND	198	GND
115	PWRBTN-	116	GPIO7	199	5VIN	200	5VIN
117	GND	118	GND	201	5VIN	202	5VIN
119	UART0TXD	120	UARTB_485	203	5VIN	204	5VIN
121	UART0RXD	122	UARTA_485				
123	GND	124	GND				
125	NC	126	UARTC_485				
127	SD0CD	128	UARTD_485				
129	SD0PWRSW	130	GND				
131	SD0DATA2	132	I2C1SDA				
133	GND	134	I2C1SCL				
135	SD0CLK	136	GPIO13				
137	SD0DATA3	138	GPIO12				
139	SD0DATA1	140	I2C2SDA				
141	SD0DATA0	142	I2C2SCL				
143	SD0CMD	144	GND				
145	SD0WP	146	C24MOUT				
147	GND	148	VCLK				
149	nHDMIDDCSDA	150	VVSYNC				
151	GND	152	VHSYNC				
153	nHDMIDDCSCL	154	VDIN7				
155	nHDMIHPD	156	VDIN5				
157	nHDMICEC	158	VDIN6				
159	GND	160	VDIN4				

Table 19: SOM DDR3 SODIMM slot pinouts

A.3.23. MiniPCIe Slot

The SOMDB3 carrier board comes with a miniPCIe slot for wireless networking options for 3G and 4G modules. The miniPCIe slot is labeled as “MINIPCI1” and is compatible with all PCIe 2.0 miniPCIe modules that is full-length or half-length. The pinouts of the miniPCIe slot are shown below.

Pin	Signal	Pin	Signal
1	NC	2	4G_3V3
3	NC	4	GND
5	NC	6	+1.5V
7	4G_3V3	8	USIM_VCC
9	GND	10	USIM_DATA1
11	NC	12	USIM_CLK1
13	NC	14	USIM_RST1
15	GND	16	UIM_VPP1
17	NC	18	GND
19	NC	20	NC
21	GND	22	NC
23	NC	24	4G_3V3
25	NC	26	GND
27	GND	28	+1.5V
29	GND	30	I2C1SCL
31	NC	32	I2C1SDA
33	NC	34	GND
35	GND	36	USBH_T1-
37	GND	38	USBH_T1+
39	4G_3V3	40	GND
41	4G_3V3	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	+1.5V
49	NC	50	GND
51	NC	52	4G_3V3

Table 20: MiniPCIe slot pinouts

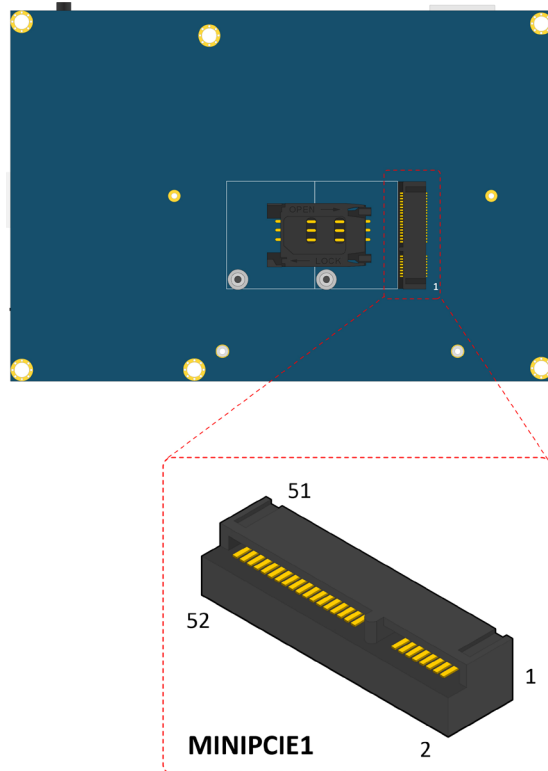


Figure 38: MiniPCIe slot diagram

A.3.24. SIM Card Slot

The SOMDB3 carrier board comes with an onboard SIM card slot that supports 3G/4G SIM cards. The SIM card slot on the SOMDB3 carrier board will only be enabled when a 3G/4G module is installed in the miniPCIe slot. The SIM card slot is labeled as “SIM1”. The pinouts of the SIM card slot are shown below.

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

Table 21: SIM card slot pinouts

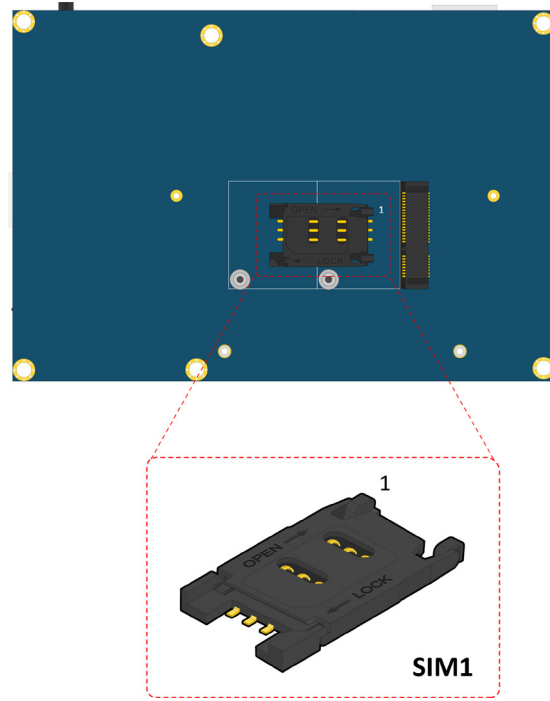


Figure 39: SIM card slot diagram



Note:

Using a miniPCIe module with a built-in SIM card slot will disable the onboard SIM card slot.

A.4. SOMDB3 External I/O

The SOMDB3 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.4.1. HDMI® Port

The SOMDB3 carrier board has an HDMI port on the left 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	HDMICKL+
11	GND	12	HDMICKL-
13	HDMI_CECIN	14	NC
15	HDMIDDCSCL	16	HDMIDDCSDA
17	GND	18	5V_HDMI
19	HDMIHPD		

Table 22: HDMI port pinouts



Figure 40: HDMI port diagram

A.4.2. Micro USB 2.0 OTG Port

The SOMDB3 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 Universal Host Controller Interface (UHCI) Rev. 2.0 with OTG functionality. The pinouts of the Micro USB 2.0 OTG port are shown below.

Pin	Signal
1	USB_VBUS
2	USB D0-
3	USB D0+
4	USB D0
5	GND

Table 23: Micro USB 2.0 OTG port pinouts



Figure 41: Micro USB 2.0 OTG port diagram

A.4.3. 10/100Mbps Ethernet Port

The SOMDB3 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

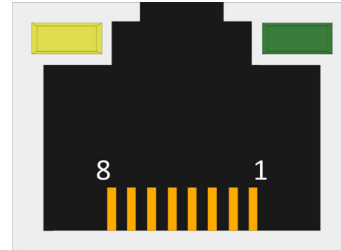


Figure 42: 10/100Mbps Ethernet port diagram

Table 24: 10/100Mbps Ethernet port pinouts

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 25: 10/100Mbps Ethernet port LED color definition

A.4.4. Headphone Jack

The SOMDB3 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.

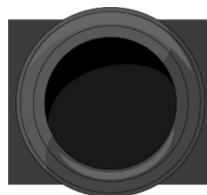


Figure 43: Headphone jack diagram

A.4.5. Micro SD Card Slot

The SOMDB3 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 26: Micro SD card slot pinouts



Figure 44: Micro SD card slot diagram

A.4.6. USB 2.0 Ports

The SOMDB3 carrier board is equipped with two USB 2.0 ports located on the right panel. Each USB 2.0 port offers complete Plug and Play and hot swap capability for external devices. The USB interface complies with USB Universal Host Controller Interface (UHCI) Rev. 2.0. The pinouts of the USB 2.0 ports are shown below.

USB 2.0 Port 1 (J2)		USB 2.0 Port 2 (J4)	
Pin	Signal	Pin	Signal
1	VBUS01	1	VBUS01
2	USBHA-	2	USBHB-
3	USBHA+	3	USBHB+
4	GND	4	GND

Table 27: USB 2.0 ports pinouts



Figure 45: USB 2.0 port diagram

A.5. SOMDB3 Dimensions

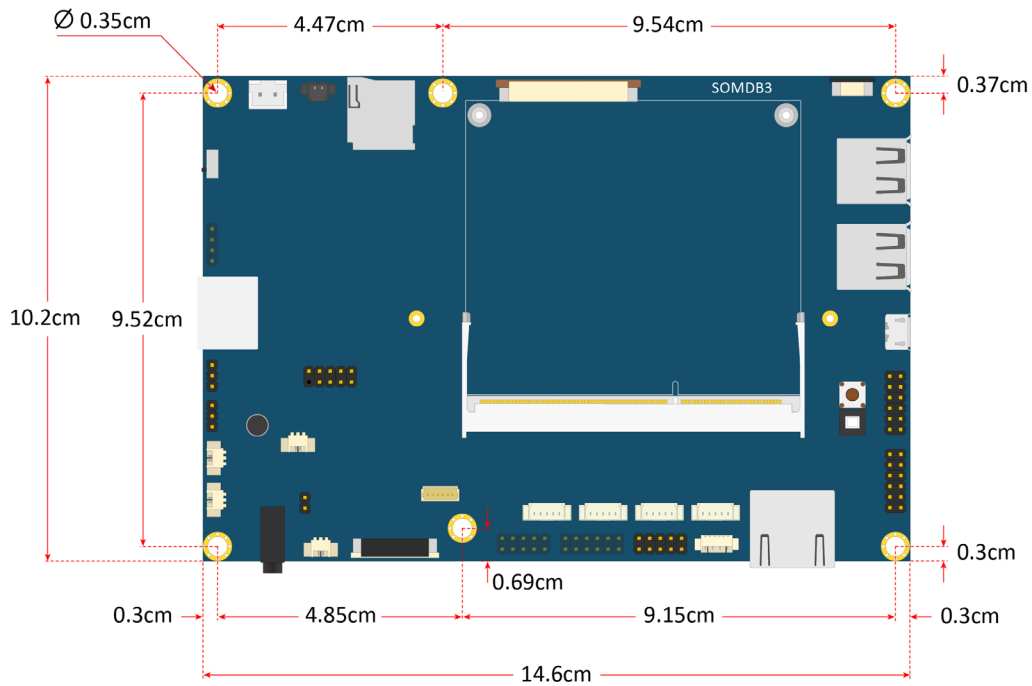


Figure 46: Dimensions of the SOMDB3 carrier board

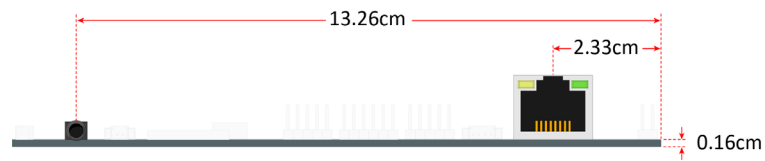


Figure 47: Dimensions of the SOMDB3 front panel I/O



Figure 48: Dimensions of the SOMDB3 back panel I/O

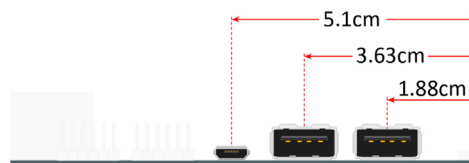


Figure 49: Dimensions of the SOMDB3 right panel I/O



Figure 50: Dimensions of the SOMDB3 left panel I/O



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