

# User Manual

## 無線音頻模組 Wireless Audio Module

Brand Name: InnoComm

Model Name: WB17

依據低功率射頻器材技術規範

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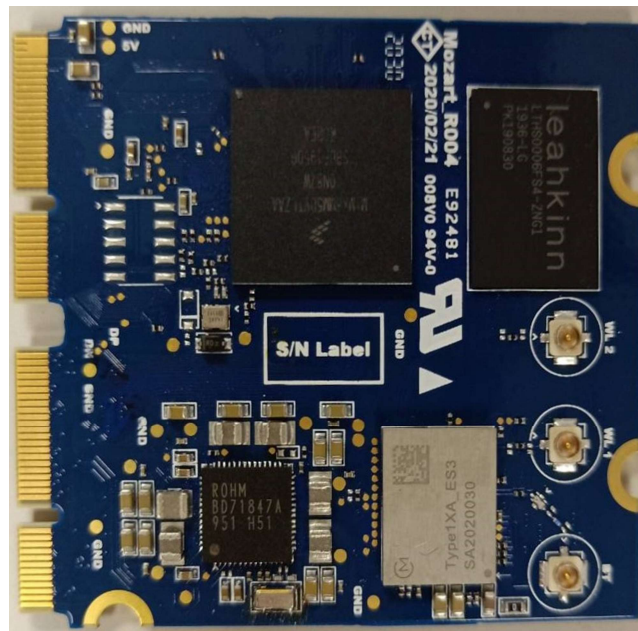
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# WB17

## User Guide



*Copyright and third-party information as required*



## Revisions History

Date	Version Number	Document Changes
2021/06/22	0.0	Initial Draft
2021/08/09	0.1	Statement update

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# 1 Overview

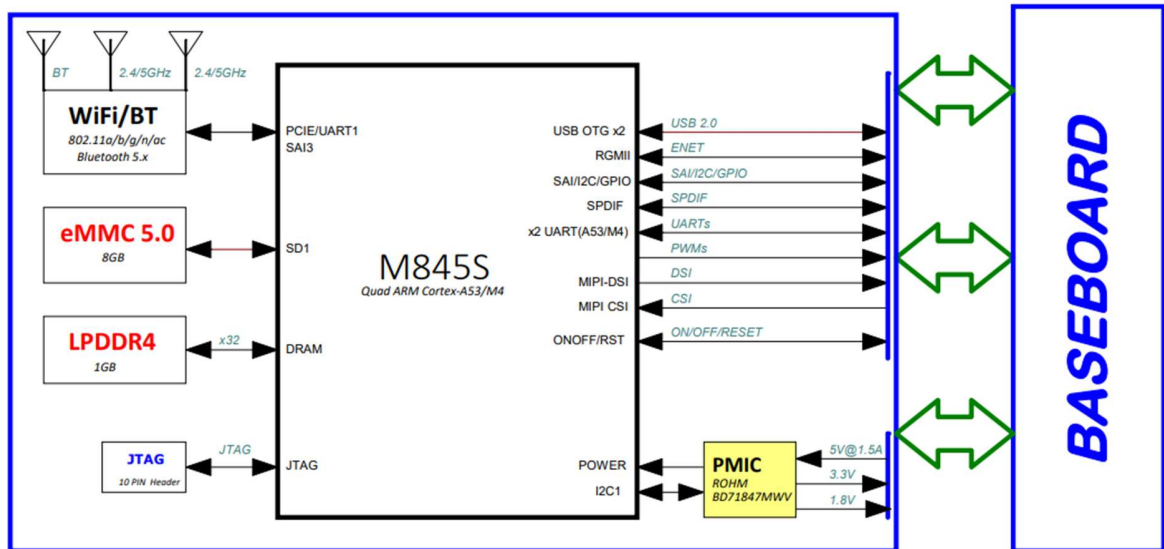
## 1.1 General Information

WB17 i.MX8M Mini SOM is a high-performance System on Module(SOM) which is designed based on NXP®i.MX8MMini processor. i.MX8MMini integrate four ARM® Cortex-A53up to 1.8GHz and oneCortex-M4 core processor for low power processing to provide industry-leading audio voice processing for applications that scale from consumer home audio to voice assistance. It supports 1080p video encode and decode.

WB17 i.MX8M Mini SOM offers a wide range of interfaces - GPIOs,I2C, SPI, DSI,CSI, UART, USB, RGMII and synchronous audio interface (SAI) that supports full duplex serial interfaces with frame synchronization, such as I2S, AC97, TDM, and codec/DSP interfaces.

## 1.2 Architecture and Block Diagram

Figure 1-1 WB17 SOM Block Diagram

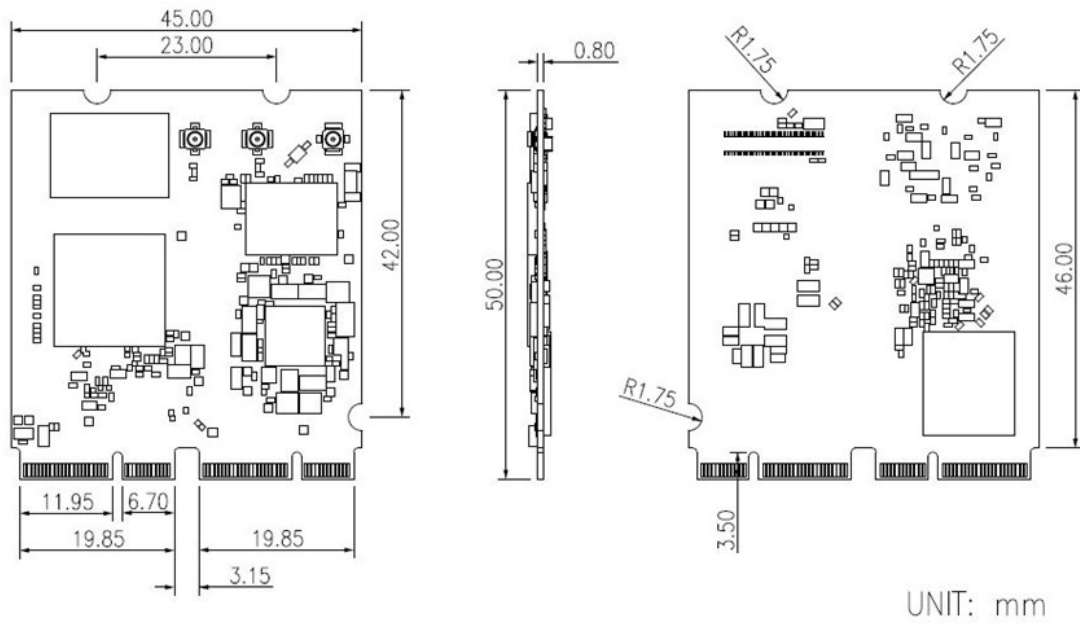


## 1.3 Feature Summary

- NXP i.MX8M Mini CPU
- 1GB LPDDR4 RAM
- 8GB eMMC
- 1 x MIPI DSI
- 1 x MIPI CSI
- Wi-Fi 802.11 a/b/g/n/ac, 2x2 MIMO
- Bluetooth 5.x
- 1 x USB 2.0 OTG
- 1 x USB 2.0 Host
- 1x RGMII interface
- 1 x SD/MMC
- Serial interfaces (2 x I2C, 3 x UART, 1 x SPI, 3 x SAI)
- 9 x GPIOs
- 1x PDM
- 1x SPDIF

## 1.4 Dimension

The dimension of WB17 i.MX8M Mini SOM is 45mm x 42mm x 0.8mm.





## 1.5 Electrical Specification

Symbol	Parameter	Minimum	Maximum	Unit
VSYS_5V5V input		2.7	5.5	V
NVCC_ENET_2V5	NVCC_ENET input	2.25	2.75	V

Table 1: Input Power Absolute Maximum Ratings

Symbol	Parameter	Minimum	Maximum	Unit
VDD_3V3	VDDIO_3V3	3.267	3.333	V
VDD_1V8	VDDIO_1V8	1.782	1.818	V

Table 2: Output Power Absolute Maximum Ratings

Symbol	Parameter	Typical	Maximum	Unit
I <sub>VSYS_5V</sub>	5V Current	260	850	mA

Table 3: Input Current Absolute Maximum Ratings

## 2 Main Hardware Components

WB17 i.MX8M Mini SOM has two 75-pin M.2 E-key golden finger. It integrates the NXP® i.MX8M Mini, LPDDR4 Memory, eMMC, Power Manage IC (PMIC), and Wi-Fi/Bluetooth on the module.



Figure 2-1 – Top side of WB17 SOM

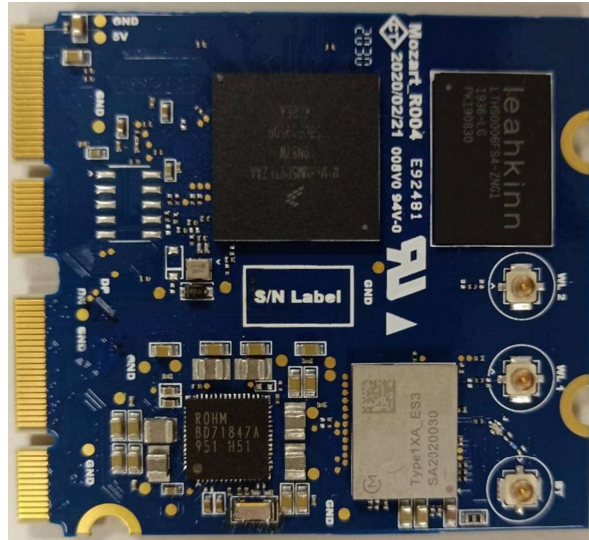
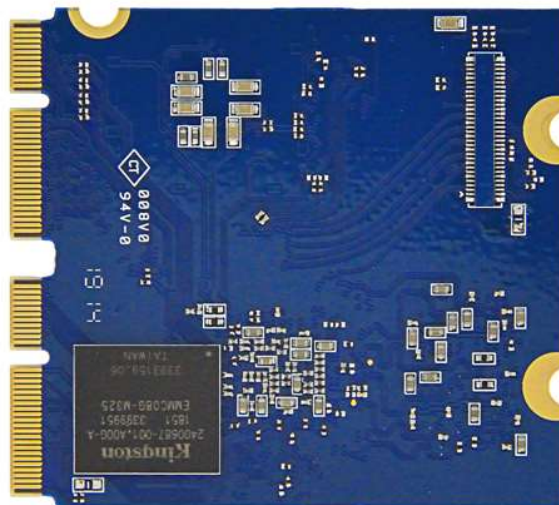


Figure 2-2 – Bottom side of WB17 SOM





## 2.1 CPU

The i.MX8M Mini processor integrates four ARM® Cortex-A53 up to 1.8GHz and one Cortex-M4 cores to provide industry-leading audio, voice and video processing for applications.

The features of i.MX 8M Mini processors include the following:

- 4xARM Cortex-A53 plus ARM Cortex-M4
- L1 Instruction Cache
  - 32 KB L1 Instruction Cache for A53
  - 16 KB L1 Instruction Cache for M4
- L1 Data Cache (each core)
  - 32 KB L1 Data Cache (A7)
  - 16 KB L1 Data Cache (M4)
- The ARM Cortex-A53 Core complex shares
  - General interrupt controller (GIC)
  - Global timer
  - Snoop control unit (SCU)
  - Unified instruction and data (1MB)

## 2.2 Memory

WB17 SOM is available with up to 2GB of LPDDR4 memory. The default configuration is 1GB LPDDR4.

## 2.3 Power Management IC

WB17 SOM features ROHM BD71847MWV power management IC. BD71847MWV is a programmable power management IC integrates 6 buck regulators and 6 LDOs to provide all power rails required by SoC and peripherals.

For system management, it provides the following features,

- Support software shutdown or hardware power off
- External wakeup source
- Output monitor
- PWROK signal for reset or power off
- OVP, UVLO, TSD



## **2.4 eMMC Storage**

The onboard eMMC device is connected on the SD3 pins of the i.MX 8MMini processor in an 8bit width configuration.

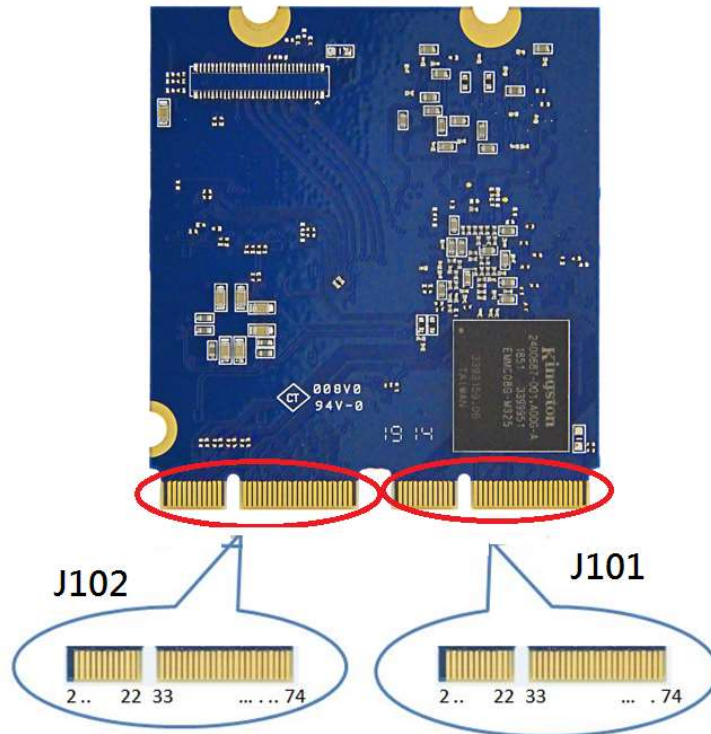
## **2.5 Wi-Fi/Bluetooth Module**

The WB17 adopts Murata SP-XV1XA-A combo module that integrates wireless local area network 802.11 a/b/g/n/ac2x2 MIMO and Bluetooth 5.x.

### 3 WB17 iMX8M Mini Interfaces and Connectors

WB17 use two M.2 E-key golden finger to connect with carrier board.

The tables below detail the pin assignment and functionality of these connectors.



#### 3.1 J101 Connector

Table 3-1 J101 Connector

J101 Pin#	Signal Name	i.MX8M Mini Pin #	Voltage	J101 Pin#	Signal Name	i.MX8M Mini Pin #	Voltage
1	PDM_DATA3	AC13	3.3V	2	SAI1_TXFS	AB19	3.3V
3	PDM_DATA1	AC14	3.3V	4	SAI1_TXD0	AG20	3.3V
5	PDM_DATA2	AD13	3.3V	6	SAI1_TXC	AC18	3.3V
7	SAI1_TXD2	AG21	3.3V	8	PDM_DATA0	AD18	3.3V
9	SAI1_TXD1	AF20	3.3V	10	GND	.	.
11	SAI1_TXD3	AF21	3.3V	12	PDM_CLK	AC15	3.3V
13	GND	.	.	14	GND	.	.
15	SAI1_MCLK	AB18	3.3V	16	SAI1_RXD1	AF15	3.3V

17	GND	.		18	SAI1_RXD0	AG15	3.3V
19	USB1_DN	A23		20	SAI1_RXFS	AG16	3.3V
21	USB1_DP	B23		22	SAI1_RXC	AF16	3.3V
23	GND	.		32	NVCC_ENENT_2V5	.	2.5V
33	USB1_VBUS	F23	5V	34	GND	.	
35	USB1_ID	D23		36	ENET_TXC	AG24	3.3V
37	GPIO1_IO08	AG10	3.3V	38	GND	.	
39	GPIO1_IO09	AF10	3.3V	40	ENET_TX_CTL	AF24	3.3V
41	GND	.		42	ENET_TD2	AG25	3.3V
43	ECSPI2_SCLK	E6	3.3V	44	ENET_TD3	AF25	3.3V
45	GND	.		46	ENET_TD0	AG26	3.3V
47	ECSPI2_MISO	A8	3.3V	48	ENET_TD1	AF26	3.3V
49	ECSPI2_MOSI	B8	3.3V	50	GND	.	
51	ECSPI2_SS0	A6	3.3V	52	ENET_RXC	AE26	3.3V
53	UART2_RXD	F15	3.3V	54	GND	.	
55	UART2_TXD	E15	3.3V	56	ENET_RX_CTL	AF27	3.3V
57	UART3_RXD	D6	3.3V	58	ENET_RD0	AE27	3.3V
59	UART3_TXD	B7	3.3V	60	ENET_RD2	AD26	3.3V
61	I2C2_SCL	D10	3.3V	62	ENET_RD1	AD27	3.3V
63	I2C2_SDA	D9	3.3V	64	ENET_RD3	AC26	3.3V
65	GND	.		66	GND	.	
67	SPDIF_RX	AG9	3.3V	68	ENET_MDC	AC27	3.3V
69	VDD_3V3	.		70	ENET_MDIO	AB27	3.3V
71	GND	.		72	ONOFF	A25	3.3V
73	GND	.		74	SYS_nRST	.	3.3V
75	VSYS_5V	.	5V				

### 3.2 J102 Connector

Table 3-2 J102 Connector

J102 Pin#	Signal Name	i.MX8M Mini Pin #	Voltage	J102 Pin#	Signal Name	i.MX8M Mini Pin #	Voltage
1	GND	.		2	SD2_CLK	W23	3.3V
3	PCIE_CLKN	A21	3.3V	4	GND	.	

5	PCIE_CLKP	B21	3.3V	6	SD2_nRST	AB26	3.3V
7	GND	.		8	SD2_CMD	AA27	3.3V
9	PCIE_RXN	A19	3.3V	10	SD2_DATA0	AB23	3.3V
11	PCIE_RXP	B19	3.3V	12	SD2_DATA1	AB24	3.3V
13	GND	.		14	SD2_DATA2	V24	3.3V
15	PCIE_TXN	A20	3.3V	16	SD2_DATA3	V23	3.3V
17	PCIE_TXP	B20	3.3V	18	SD2_nCD	AA26	3.3V
19	GND			20	GND	.	
21	USB2_DN	A23		22	USB2_VBUS	F23	5V
23	USB2_DP	B23		32	SPDIF_TX	AF9	3.3V
33	SAI2_RXD	AC24	3.3V	34	BOOT_MODE0	G26	3.3V
35	SAI2_RXFS	AC19	3.3V	36	BOOT_MODE1	G27	3.3V
37	SAI2_RXC	AB22	3.3V	38	UART4_RXD	F19	3.3V
39	GND	.		40	UART4_TXD	F18	3.3V
41	SAI2_MCLK	AD19	3.3V	42	I2C3_SCL	E10	3.3V
43	GND	.		44	I2C3_SDA	F10	3.3V
45	SAI2_TXD	AC22	3.3V	46	GND	.	
47	SAI2_TXFS	AD23	3.3V	48	DSI_DN3	A13	3.3V
49	SAI2_TXC	AD22	3.3V	50	DSI_DP3	B13	3.3V
51	GND	.		52	GND	.	.
53	SAI1_RXD5	AF18	3.3V	54	DSI_DN2	A12	3.3V
55	SAI1_RXD6	AG19	3.3V	56	DSI_DP2	B12	3.3V
57	SAI1_RXD4	AG18	3.3V	58	GND		.
59	GND	.		60	DSI_DN1	A10	3.3V
61	SAI3_MCLK	AD6	3.3V	62	DSI_DP1	B10	3.3V
63	GND	.		64	GND	.	.
65	SAI3_TXD	AF6	3.3V	66	DSI_DN0	A9	3.3V
67	SAI3_TXFS	AC6	3.3V	68	DSI_DP0	B9	3.3V
69	SAI3_TXC	AG6	3.3V	70	GND	.	.
71	GND	.		72	DSI_CKN	A11	3.3V
73	SAI1_TXD7	AF23	3.3V	74	DSI_CKP	B11	3.3V
75	SAI1_TXD4	AG22	3.3V				

### 3.3 Power Signals

Table 4-1 Power Signal Pins

Connector PIN#	Function	I/O	Description
J101 71, 73, 75	VSYS_5V	I	Input power 5V
J101 69	VDD_3V3	O	3.3V IO power
J101 32	NVCC_ENET_2V5	O	2.5V Ethernet Power

### 3.4 Ethernet

One RGMII interface is supported.

Table 4-3 Ethernet Signal Pins

Connector PIN#	Function	I/O	Description
J101 21	NVCC_ENET_2V5	O	Ethernet POWER
J101 36, 40, 42,44,46, 48, 52, 56, 58, 60, 62, 64, 68	RGMII interface	IO	RGMII

### 3.5 USB

The USB interface which provides high speed USB functionality conforms to the USB2.0. The OTG controller conforms to OTG2.0 specification.

Table 4-4 USB Signal Pins

Connector PIN#	Function	I/O	Description
J101 33	USB1_VBUS	I	USB1_VBUS
J101 35	USB1_ID	I	USB1_ID
J102 22	USB2_VBUS	I	USB2_VBUS
J101 21	USB1_DP	IO	USB1_DP
J101 19	USB1_DN	IO	USB1_DN
J102 23	USB2_DP	IO	USB2_DP
J102 21	USB2_DN	IO	USB2_DN

### 3.6 UARTs

Each of the UART interface support the following serial data transmit/receive protocols and configurations:

- 7- or 8-bit data words, 1 or 2 stop bits, programmable parity (even, odd or none)
- Programmable baud rates up to 4 Mbps. This is a higher max baud rate relative to the 1.875 MHz, which is stated by the TIA/EIA-232-F standard.
- 32-byte FIFO on Tx and 32 half-word FIFO on Rx supporting auto-baud

Table 4-5 UART Signal Pins

Connector PIN#	Function	I/O	Description
J101 55	UART2_TXD	O	UART2_TXD
J101 53	UART2_RXD	I	UART2_RXD
J102 40	UART4_TXD	O	UART4_TXD
J101 38	UART4_RXD	I	UART4_RXD
J101 59	UART3_TXD	O	UART3_TXD
J101 57	UART3_RXD	I	UART3_RXD

### 3.7 I2Cs

WB17 has TWO I2C interfaces which provide serial interface for external devices. Data rates of up to 400 kbps are supported.

Table 4-6 I2C Signal Pins

Connector PIN#	Function	I/O	Description
J102 44	I2C3_SDA	IO	I2C3_SDA
J102 42	I2C3_SCL	IO	I2C3_SCL
J101 61	I2C2_SCL	IO	I2C2_SCL
J101 63	I2C2_SDA	IO	I2C2_SDA



### 3.8 ECSPi

WB17 supports one full-duplex Enhanced Configurable Serial Peripheral Interface (ECSPi).

The ECSPi contain a 64x32 receive buffer and a 64x32 transmit buffer.

Table 4-7eSPi Signal Pins

Connector PIN#	Function	I/O	Description
J101 49	ECSPi2_MOSI	O	ECSPi2_MOSI
J101 47	ECSPi2_MISO	I	ECSPi2_MISO
J101 43	ECSPi2_SCLK	O	ECSPi2_SCLK
J101 51	ECSPi2_SS0	O	ECSPi2_SS0

### 3.9 DSI Interface

WB17 provides a 4-lanes MIPI display interface operating up to 1080p60 resolution.

Table 4-8 DSI Signal Pins

Connector PIN#	Function	I/O	Description
J102 74	DSI_CLKP	O	DSI_CLKP
J102 72	DSI_CLKM	O	DSI_CLKM
J102 68	DSI_D0P	O	DSI_D0P
J102 66	DSI_D0M	O	DSI_D0M
J102 62	DSI_D1P	O	DSI_D1P
J102 60	DSI_D1M	O	DSI_D1M
J102 56	DSI_D2P	O	DSI_D2P
J102 54	DSI_D2M	O	DSI_D2M
J102 50	DSI_D3P	O	DSI_D3P
J102 48	DSI_D3M	O	DSI_D3M

### 3.10 SD/MMC

Fully compatible with MMC command/response set and Physical Layer as defined in the Multimedia Card System Specification, v5.0/v4.4/v4.41/v4.4/v4.3/v4.2.

- Fully compatible with SD command/response sets and Physical Layer as defined in the SD Memory Card Specifications v 3.0 including high-capacity SDXC cards up to 2 TB.
- Fully compatible with SDIO command/response sets and interrupt/Read-Wait mode as defined in the SDIO Card Specification, Part E1, v. 3.0

Table 4-11 SD/MMC Signal Pins

Connector PIN#	Function	I/O	Description
J102 6	SD2_nRST	O	SD2 Rest
J102 8	SD2_CMD	O	SD2_CMD
J102 18	SD2_nSDCD	I	SD2 Card detection
J102 10	SD2_DATA0	IO	SD2_DATA0
J102 12	SD2_DATA1	IO	SD2_DATA1
J102 14	SD2_DATA2	IO	SD2_DATA2
J102 16	SD2_DATA3	IO	SD2_DATA3

### 3.11 SAIs

The SAI interface provides a synchronous audio interface (SAI) that supports full duplex serial interfaces with frame synchronization, such as I2S, AC97, TDM and codec/DSP interfaces.

Table 4-12 SAI1 Signal Pins

Connector PIN#	Function	I/O	Description
J101 15	SAI1_MCLK	O	SAI1_MCLK
J101 22	SAI1_RXC	I	SAI1_RXC
J101 20	SAI1_RXFS	I	SAI1_RXFS
J101 18	SAI1_RXD0	I	SAI1_RXD0
J101 16	SAI1_RXD1	I	SAI1_RXD1
J102 3	SAI1_RXD2	I	SAI1_RXD2
J102	SAI1_RXD3	I	SAI1_RXD3

5			
J102 57	SAI1_RXD4	I	SAI1_RXD4
J102 53	SAI1_RXD5	I	SAI1_RXD5
J102 55	SAI1_RXD6	I	SAI1_RXD6
J101 2	SAI1_TXFS	O	SAI1_TXFS
J101 6	SAI1_TXC	O	SAI1_TXC
J101 4	SAI1_TXD0	O	SAI1_TXD0
J101 9	SAI1_TXD1	O	SAI1_TXD1
J101 7	SAI1_TXD2	O	SAI1_TXD2
J101 11	SAI1_TXD3	O	SAI1_TXD3
J102 75	SAI1_TXD4	O	SAI1_TXD4
J102 73	SAI1_TXD7	O	SAI1_TXD7

Table 4-13 SAI2,3,5 Signal Pins

Connector PIN#	Function	I/O	Description
J102 41	SAI2_MCLK	O	SAI2_MCLK
J102 37	SAI2_RXC	I	SAI2_RXC
J102 35	SAI2_RXFS	I	SAI2_RXFS
J102 338	SAI2_RXD	I	SAI2_RXD
J102 49	SAI2_TXC	O	SAI2_TXC
J102 47	SAI2_TXFS	O	SAI2_TXFS
J102 45	SAI2_TXD	O	SAI2_TXD
J102 61	SAI3_MCLK	O	SAI3_MCLK
J102 69	SAI3_TXC	O	SAI3_TXC
J102 67	SAI3_TXFS	O	SAI3_TXFS
J102 65	SAI3_TXD	O	SAI3_TXD

### 3.12 SPDIF

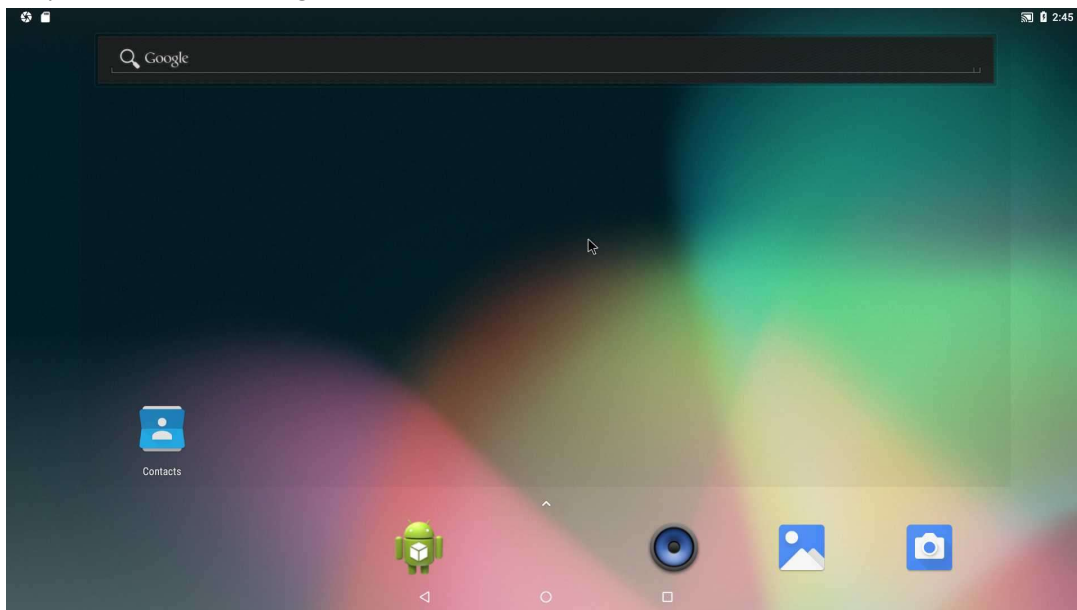
WB17 SOM supports Sony/Philips Digital Interface with 24-bit data width.

Table 4-15 SPDIF Signal Pins

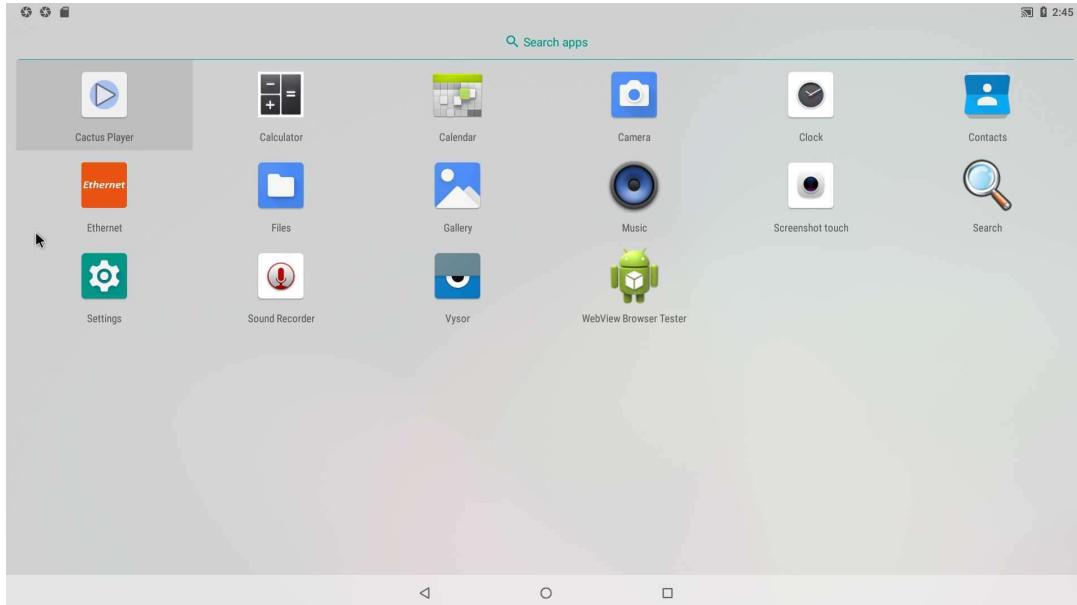
Connector PIN#	Function	I/O	Description
J101 67	SPDIF_RX	I	SPDIF_RX
J102 32	SPDIF_TX	O	SPDIF_TX

## 4 User interface Getting start

The SOM can function power on 5V DC input, once system start, WB17 can use EVB HDMI output or use USB sharing to external monitor for control.



You can use App for any application like play video, music etc.



## 5 Reference Documents

1. i.MX 8M Family of Applications Processors Datasheet
2. i.MX 8MMini Applications Processor Reference Manual
3. BD71847MWV Data sheet
4. Murata SP-XV1XA-A Combo Wi-Fi Module Datasheet



## Federal Communication Commission Interference Statement

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### 15.19

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

### 15.105

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### 15.21

Any changes or modifications not expressly approved by the party responsible for compliance could void the authority to operate equipment.

This device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

End-users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible

### FCC RF Radiation Exposure Statement:

This module is intended for OEM integrator. The OEM integrator is still responsible for the FCC compliance requirement of the end product, which integrates this module. 20cm minimum distance has to be able to be maintained between the antenna and the users for the host this module is integrated into. Under such configuration, the FCC radiation exposure limits set forth for a population/uncontrolled environment can

be satisfied.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

This device meets all the other requirements specified in Part 15E, Section 15.407 of the FCC Rules.

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This module is intended for OEM integrators only. Per FCC KDB 996369 D03 OEM Manual v01 guidance, the following conditions must be strictly followed when using this certified module:

KDB 996369 D03 OEM Manual v01 rule sections:

## **2.2 List of applicable FCC rules**

This module has been tested for compliance to FCC Part 15

## **2.3 Summarize the specific operational use conditions**

The module is tested for standalone mobile RF exposure use condition. Any other usage conditions such as co-location with other transmitter(s) or being used in a portable condition will need a separate reassessment through a class II permissive change application or new certification.

## **2.4 Limited module procedures**

Not applicable.

## **2.5 Trace antenna designs**

Not applicable.

## **2.6 RF exposure considerations**

This equipment complies with FCC mobile radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator & your body. If the module is installed in a portable host, a separate SAR evaluation is required to confirm compliance with relevant FCC portable RF exposure rules.

## **2.7 Antennas**

The following antennas have been certified for use with this module; antennas of the same type with equal or lower gain may also be used with this module. The antenna must be installed such that 20 cm can be maintained between the antenna and users.

### **Antenna Type & Antenna Connector:**

Antenna Set	RF Chain No.	Antenna Net Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connector Type	Cable Length (mm)
Ant. Set 1	0	5.26	2.4~2.4835GHz	PCB	i-pex(MHF)	172
		6.27	5.15~5.85GHz			
	1	5.26	2.4~2.4835GHz	PCB	i-pex(MHF)	172
		6.27	5.15~5.85GHz			
	BT	5.26	2.4~2.4835GHz	PCB	i-pex(MHF)	172
Ant. Set 2	0	5	2.4~2.4835GHz	Dipole	i-pex(MHF)	NA
		5	5.15~5.85GHz			
	1	5	2.4~2.4835GHz	Dipole	i-pex(MHF)	NA
		5	5.15~5.85GHz			
	BT	5	2.4~2.4835GHz	PCB	i-pex(MHF)	NA
Ant. Set 3	0	-0.96	2.4~2.4835GHz	PCB	i-pex(MHF)	520
		-1.35	5.15~5.85GHz			
	1	-0.96	2.4~2.4835GHz	PCB	i-pex(MHF)	520
		-1.35	5.15~5.85GHz			
	BT	-0.96	2.4~2.4835GHz	PCB	i-pex(MHF)	520
Ant. Set 4	0	4.56	2.4~2.4835GHz	PCB	i-pex(MHF)	210
		2.09	5.15~5.85GHz			
	1	4.56	2.4~2.4835GHz	PCB	i-pex(MHF)	210
		2.09	5.15~5.85GHz			
	BT	4.56	2.4~2.4835GHz	PCB	i-pex(MHF)	210
Ant. Set 5	0	2.9	2.4~2.4835GHz	PCB	i-pex(MHF)	250
		2.77	5.15~5.85GHz			
	1	2.9	2.4~2.4835GHz	PCB	i-pex(MHF)	250
		2.77	5.15~5.85GHz			
	BT	2.9	2.4~2.4835GHz	PCB	i-pex(MHF)	250
Ant. Set 6	0	0.94	2.4~2.4835GHz	PCB	i-pex(MHF)	300
		2.91	5.15~5.85GHz			
	1	0.94	2.4~2.4835GHz	PCB	i-pex(MHF)	300
		2.91	5.15~5.85GHz			
	BT	0.94	2.4~2.4835GHz	PCB	i-pex(MHF)	300
Ant. Set 7	0	4.42	2.4~2.4835GHz	PCB	i-pex(MHF)	387
		3.76	5.15~5.85GHz			
	1	4.42	2.4~2.4835GHz	PCB	i-pex(MHF)	387
		3.76	5.15~5.85GHz			
	BT	4.42	2.4~2.4835GHz	PCB	i-pex(MHF)	387
Ant. Set 8	0	2.76	2.4~2.4835GHz	PCB	i-pex(MHF)	245
		-	5.15~5.85GHz			
	1	2.76	2.4~2.4835GHz	PCB	i-pex(MHF)	24
		-	5.15~5.85GHz			
	BT	2.66	2.4~2.4835GHz	PCB	i-pex(MHF)	245
Ant. Set 9	0	5.13	2.4~2.4835GHz	PCB	i-pex(MHF)	228
		-	5.15~5.85GHz			
	1	5.13	2.4~2.4835GHz	PCB	i-pex(MHF)	228
		-	5.15~5.85GHz			
	BT	5.13	2.4~2.4835GHz	PCB	i-pex(MHF)	228

Note: Antenna Set. 1 & 2 was selected for final test.

## 2.8 Label and compliance information

The final end product must be labeled in a visible area with the following: "Contains FCC ID: **YAIWB17**". The grantee's FCC ID can be used only when all FCC compliance requirements are met.

## 2.9 Information on test modes and additional testing requirements





This transmitter is tested in a standalone mobile RF exposure condition and any co-located or simultaneous transmission with other transmitter(s) or portable use will require a separate class II permissive change re-evaluation or new certification.

## **2.10 Additional testing, Part 15 Subpart B disclaimer**

This transmitter module is tested as a subsystem and its certification does not cover the FCC Part 15 Subpart B (unintentional radiator) rule requirement applicable to the final host. The final host will still need to be reassessed for compliance to this portion of rule requirements if applicable.

As long as all conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

### **IMPORTANT NOTE:**

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

### **USERS MANUAL OF THE END PRODUCT:**

In the users manual of the end product, the end user has to be informed to keep at least 20cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the FCC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied. The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

### **Manual Information To the End User**

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

### **OEM/Host manufacturer responsibilities**

OEM/Host manufacturers are ultimately responsible for the compliance of the Host and Module. The final product must be reassessed against all the essential requirements of the FCC rule such as FCC Part 15 Subpart B before it can be placed on the US market. This includes reassessing the transmitter module for compliance with the Radio and EMF essential requirements of the FCC rules. This module must not be incorporated into any other device or system without retesting for compliance as multi-radio and combined equipment



### **Industry Canada statement:**

This device complies with ISED's licence-exempt RSSs. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'ISED applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

### **Industry Canada ICES-003 Compliance Label:**

*CAN ICES-3 (B)/NMB-3(B)*

### **Co-located**

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

The transmitter may not be co-located with any other transmitter or antenna

- (i) the device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems; f
- (ii) or devices with detachable antenna(s), the maximum antenna gain permitted for devices in the band 5725-5850 MHz shall be such that the equipment still complies with the e.i.r.p. limits specified for point-to-point and non-point-to-point operation as appropriate; and
- (iii) the worst-case tilt angle(s) necessary to remain compliant with the e.i.r.p. elevation mask requirement set forth in Section 6.2.2(3) shall be clearly indicated.

### **Co-situé**

Cet appareil et son antenne (s) ne doivent pas être situés ou fonctionner en conjonction avec une autre antenne ou émetteur.

Le émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.

- (i) l'appareil pour fonctionner dans la bande 5150-5250 MHz est réservé à une utilisation en intérieur afin de réduire les risques d'interférences nuisibles à la co-canal systèmes mobiles par satellite;
- (ii) pour les appareils avec antenne (s) détachable, le gain d'antenne maximal autorisé pour les appareils dans la bande 5725-5850 MHz doit être telle que l'équipement satisfait encore la pire limites spécifiées pour le point-à-point et non point-à-point, le cas échéant; opération et
- (iii) l'angle d'inclinaison du pire (s) nécessaire pour rester conforme à la pire exigence de masque d'élévation énoncées dans la section 6.2.2 (3) doit être clairement indiqué.



**Radiation Exposure Statement:**

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with greater than 20cm between the radiator & your body.

**Déclaration d'exposition aux radiations:**

Cet équipement est conforme aux limites d'exposition aux rayonnements ISED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à plus de 20 cm entre le radiateur et votre corps.



**This device is intended only for OEM integrators under the following conditions:**

- 1) The antenna must be installed and operated with greater than 20cm between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna.

As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

**Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes: (Pour utilisation de dispositif module)**

- 1) L'antenne doit être installée et exploitée avec plus de 20 cm entre l'antenne et les utilisateurs, et
- 2) Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.

Tant que les 2 conditions ci-dessus sont remplies, des essais supplémentaires sur l'émetteur ne seront pas nécessaires. Toutefois, l'intégrateur OEM est toujours responsable des essais sur son produit final pour toutes exigences de conformité supplémentaires requis pour ce module installé.