



***AXIOMTEK***

## **Q7M120 and Q7B120**

**Freescale i.MX6 Series ARM-based  
Qseven System-on-Module and  
Baseboard**

**Hardware User's Manual**



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## **ESD Precautions**

Computer boards have integrated circuits sensitive to static electricity. To prevent chipsets from electrostatic discharge damage, please take care of the following jobs with precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.
- Before holding the board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. It discharges static electricity from your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components.

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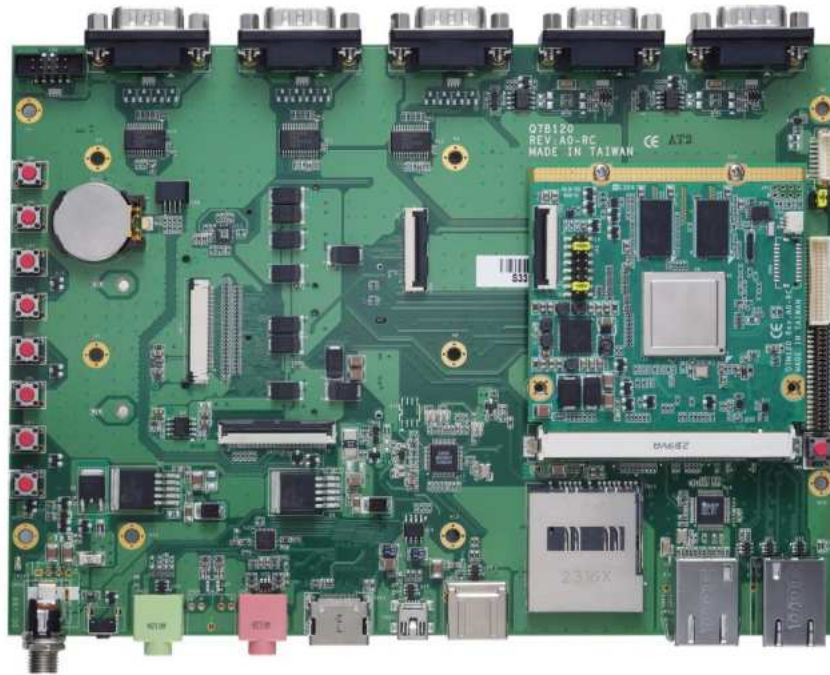
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# Chapter 1

## Introduction



The Q7M120 is a new Qseven module to support Freescale i.MX6 series SoCs. It integrates system memory, storage as eMMC/SDHC socket, TTL LCD, audio, USB host/client, UARTs, CANBus and various I/O features. Taking the low power consumption advantages of ARM RISC architecture, the Q7M120 is extremely suitable to be deployed in the deeply embedded applications; such as HMI, data logger, extended temperature embedded controllers, etc.

## 1.1 Features

- Freescale i.MX6 family SoC information:

Feature	i.MX6Quad(1.2GHz)	i.MX6DualLite(800MHz)	i.MX6Solo(800MHz)
<b>On-chip RAM</b>	DDR3 1066MHz 1GB	DDR3 800MHz 1GB	DDR3 800MHz 512MB
<b>Memory I/F</b>	eMMC NAND Flash 1GB	eMMC NAND Flash 1 GB	eMMC NAND Flash 1 GB
<b>Touchscreen</b>	No	No	No
<b>Ethernet</b>	x1	x1	x1
<b>Display</b>	LVDS x1 24-bit TTL LCD HDMI x1	LVDS x1 24-bit TTL LCD HDMI x1	LVDS x1 24-bit TTL LCD HDMI x1
<b>Storage</b>	SATA x1 SD/SDHC x2	SD/SDHC x2	SD/SDHC x2
<b>USB 2.0</b>	OTG HS with HS PHY x1 HS Host with HS PHY x1	OTG HS with HS PHY x1 HS Host with HS PHY x1	OTG HS with HS PHY x1 HS Host with HS PHY x1
<b>CAN</b>	x2	x2	x2
<b>JTAG</b>	x1	x1	x1
<b>SPI</b>	x1	x1	x1
<b>I2C</b>	x3	x3	x3
<b>UART</b>	RS-232 x4	RS-232 x4	RS-232 x4
<b>GPIO (w/ LED)</b>	x8	x8	x8
<b>Audio</b>	Earphone x1 Line out x1 Mic-in x1	Earphone x1 Line out x1 Mic-in x1	Earphone x1 Line out x1 Mic-in x1
<b>System Control</b>	Buttons x2 (Power,Reset,) Touch Panel Wafer x1	Buttons x2 (Power,Reset,) Touch Panel Wafer x1	Buttons x2 (Power,Reset,) Touch Panel Wafer x1

- Onboard DDR3-1066 memory 1GB ,supports up to 2GB capacity
- Onboard eMMC flash as booting device
- One USB 2.0 ports and One MicroUSB OTG port
- 24-bit TTL LCD
- 2 100/10 Base-T Ethernet(One with Wake-On-LAN function)
- IIS Audio



## 1.2 Specifications

- **CPU**
  - Freescale i.MX6 series SoC; default is i.MX6Q
  - ARM Cortex A9™ CPU running at 1.2GHz.
  - 256KB integrated low power on-chip SRAM.
  - 64KB integrated mask-programmable on-chip ROM.
- **Boot ROM**
  - Linux kernel 3.0.35 compliant Android 4.3.1  
(Please contact your agent for detail shipping content).
- **System Memory**
  - 1GB Maximum up to 2GB DDR3-1066 memory.
- **USB Interface**
  - One USB 2.0 ports and One MicroUSB OTG port OTG comply with USB Spec. Rev. 2.0.
- **Storage Interface**
  - One eMMC NAND flash chip on module; default is 4GB.
  - One SATA Connector on base serial-ATA to interface with hard disk drives.
  - One SD/SDHC Connector on base with up to 32GB capacity.
  - One Micro SD Connector on base with up to 32GB capacity
- **Display**
  - Two LVDS channels, connectivity to displays with LVDS interface.
  - One parallel display ports, RGB Data of 18 or 24 bits.
  - One HDMI with up to 1920x1080 resolution.
- **Ethernet**
  - One 10/100/1000 Base-T with Freescale i.MX6 integrated MAC and Atheros AR8031 PHY, support IEEE std 1588-compatible hardware timestamp.
  - One 10/100 Base-T with AX88772B
  - Compatible with IEEE std 802.3.
- **Audio**
  - Freescale IIS SGTL5000 codec for MIC-in/headphone via Qseven MXM interface.
- **Serial Port**
  - Four RS-232, with 4-wire
- **CANBus**
  - Two 2.0B protocol-compatible Controller Area Network (CAN) via Qseven MXM interface.
- **I<sup>2</sup>C**
  - Three I<sup>2</sup>C Master/Slave interfaces (up to 400kbps) connected to Qseven MXM interface.

- **SPI**
  - One SPI channel for 2 chip select via Qseven MXM interface.
- **GPIO**
  - Eight GPIO interfaces (up to 400kbps) via Qseven MXM interface with buttons.
- **Power**
  - +5V ± 5% DC-in.
- **Form Factor**
  - 70mm x 70mm.
  - Thickness as 1.2mm ± 0.1mm.
  - Qseven specifications v2.0 compliant.
- **Environments**
  - Operating temperature with Imx6: -40 ~ 85°C
  - Operating humidity: 10% RH ~ 85% RH relative humidity, non-condensing.

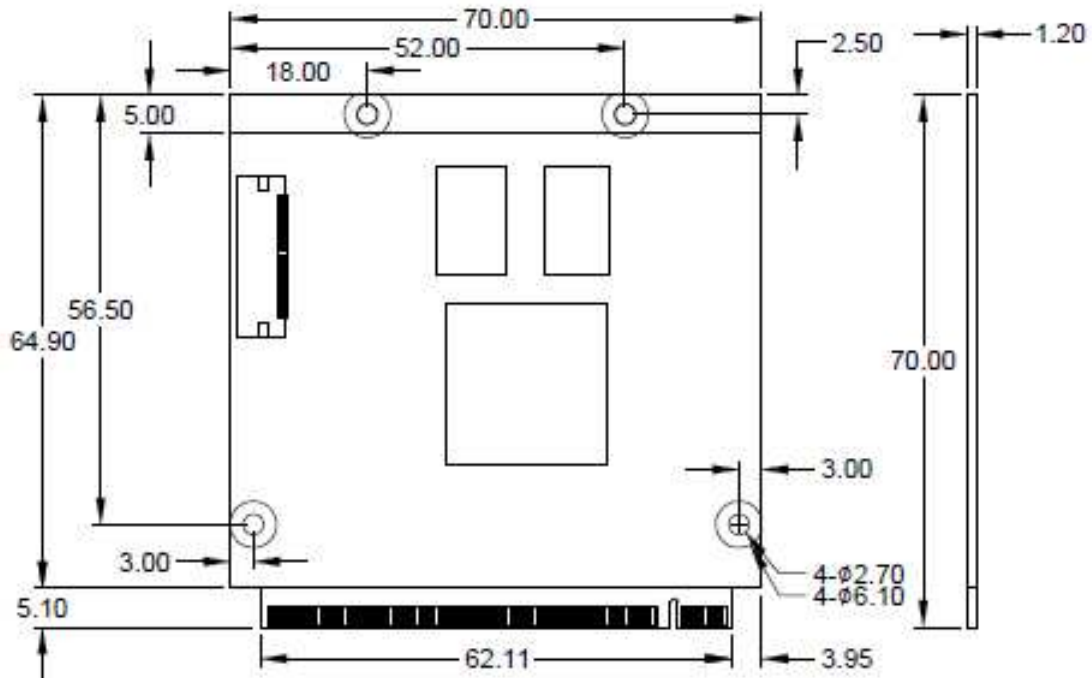


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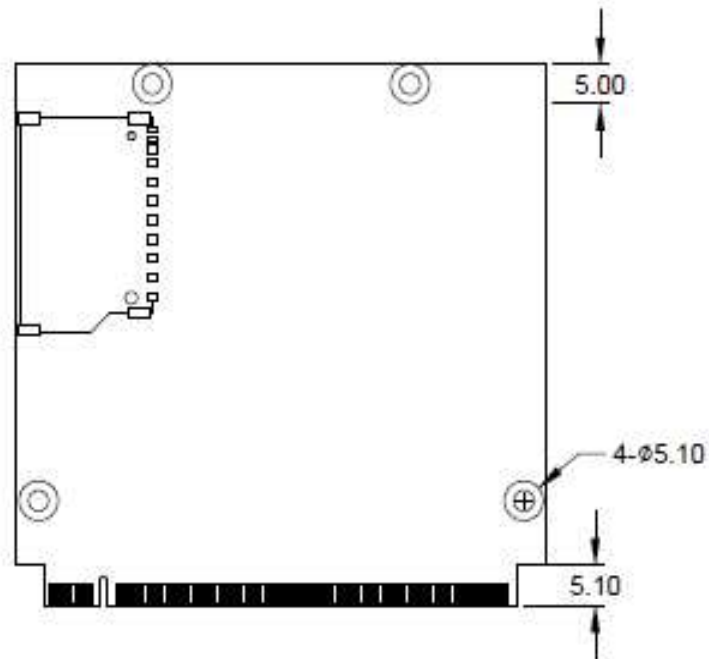
# Chapter 2

## Board and Pin Assignments

### 2.1 Board Dimensions and Fixing Holes

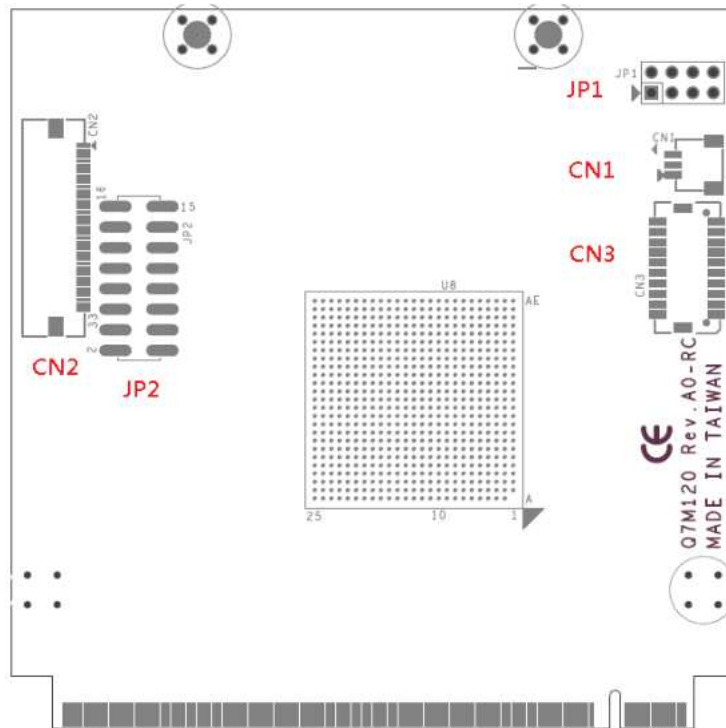


Top View

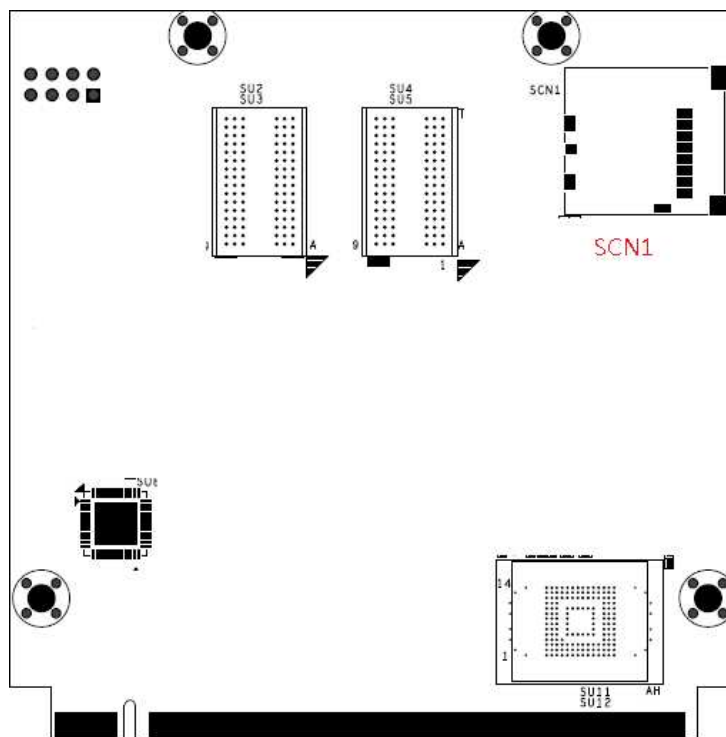


Bottom View

## 2.2 Board Layout



Top View



Bottom View

## **2.3 Installing Heatsink & Heatspreader**

For thermal dissipation, the heatsink & heatspreader enable the Q7M120 components to dissipate heat efficiently. All heat generating components are thermally conducted to the heatsink or heatspreader in order to avoid hot spots. Below procedures illustrate how to install the heatsink and heatspreader on Q7M120.

### **2.3.1 Heatsink**

1. The heatsink is designed for the Q7M120 module. Before installing the heatsink to the CPU module, please ensure that the surface of the processor is clean and free of dust and finger oil. This is especially critical for Q7M120 module that is with high CPU speed to ensure that the heatsink acts as a proper thermal interface for cooling solutions.
2. Please tear the sticker protector, place the heatsink on top of the processor chip. It makes even contact all around



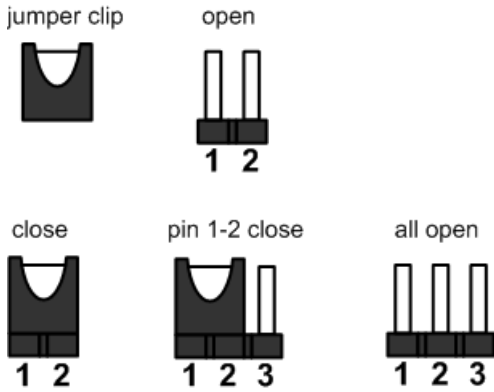
### **2.3.2 Heatspreader**

1. The heatspreader is designed for the Q7M120 module. The thermal pad on the heatspreader is designed to make contact with the necessary components on the Q7M120 module. When mounting the heatspreader you must make sure that the thermal pads on the heatspreader make complete contact (no space between thermal pad and component) with the corresponding components on the Q7M120 module. This is especially critical for Q7M120 module that is with high CPU speed to ensure that the heat spreader acts as a proper thermal interface for cooling solutions.
2. This CPU module has four assembly holes for installing heat spreader plate. Use the four screws to secure the heat spreader plate to the Q7M120. Be careful not to over-tighten the screws



## 2.4 Connectors

Jumper is a small component consisting of jumper clip and jumper pins. Install jumper clip on 2 jumper pins to close. And remove jumper clip from 2 jumper pins to open. The following illustration shows how to set up jumper.



Below you can find a summary table of all jumpers and onboard default settings.

### 2.4.1 Boot Mode Selection (JP2)

These jumpers are for boot mode selection.

Function	Setting
Copy image to eMMC	JP2 9-10, 11-12 Close
Boot to OS (Q7M120 eMMC) (Default)	JP2 1-2, 3-4 Close JP2 7-8, 11-12 Close JP2 13-14 Close
Boot to OS (Q7B120 SD Card)	JP2 3-4, 5-6, 13-14 Close



## 2.5 Connectors

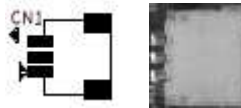
Signals go to other parts of the system through connectors. Loose or improper connection might cause problems, please make sure all connectors are properly and firmly connected. Here is a summary table which shows all connectors on the hardware.

Connector	Description
CN1	Debug Port Connector
CN2	33-pin ZIF Connector

### 2.5.1 Debug Port Connector (CN1)

The CN1 is a 3-pin wafer connector for TX/RX debug UART port, see table below.

Pin	Signal
1	Debug TX
2	Debug RX
3	GND



### 2.5.2 33-pin ZIF Connector (CN2)

This board has a 33-pin ZIF connector (CN2) for interfacing TTL LCD to baseboard.

Pin	Signal	Pin	Signal
1	GND	2	DISP0_DAT16
3	DISP0_DAT17	4	DISP0_DAT18
5	DISP0_DAT19	6	DISP0_DAT20
7	DISP0_DAT21	8	DISP0_DAT22
9	DISP0_DAT23	10	DISP0_DAT8
11	DISP0_DAT9	12	DISP0_DAT10
13	DISP0_DAT11	14	DISP0_DAT12
15	DISP0_DAT13	16	DISP0_DAT14
17	DISP0_DAT15	18	DISP0_DAT0
19	DISP0_DAT1	20	DISP0_DAT2
21	DISP0_DAT3	22	DISP0_DAT4
23	DISP0_DAT5	24	DISP0_DAT6
25	DISP0_DAT7	26	GND
27	DISP0_CLK	28	DISP0_CNTRST
29	DISP0_HSYNCH	30	DISP0_VSYNCH
31	DISP0_DRDY	32	GND
33	GND		



### **2.5.3 JTAG Connector (JP1)**

This board has a JTAG Connector (JP1) for interfacing JTAG ICE TOOL.

Pin	Signal	Pin	Signal
1	GEN_3V3	2	JTAG_TMS
3	JTAG_nTRST	4	JTAG_TCK
5	JTAG_TDI	6	JTAG_TDO
7	GND	8	POR_B

### **2.5.4 20-pin Connector (CN3)**

This board has a 20-pin connector (CN3) for interfacing to MIPI camera module.

Pin	Signal	Pin	Signal
1	GPIO_0_CLKO	2	PMIC_5V
3	CSI_RST_B	4	GND
5	INC_CSI_D2M	6	CSI_D1P
7	INC_CSI_D2P	8	CSI_D1M
9	GND	10	GND
11	INC_CSI_D3M	12	CSI_D0P
13	INC_CSI_D3P	14	CSI_D0M
15	GND	16	GND
17	I2C2_SCL	18	CSI_CLK0P
19	I2C2_SDA	20	CSI_CLK0M
21	NC	22	NC
23	NC	24	NC



# Chapter 3

## Q7B120 Baseboard

The Q7B120 is a baseboard for Q7M120 SoM. Connect this baseboard properly to J36 of Q7M120. Its specifications and detailed information are given in this chapter.

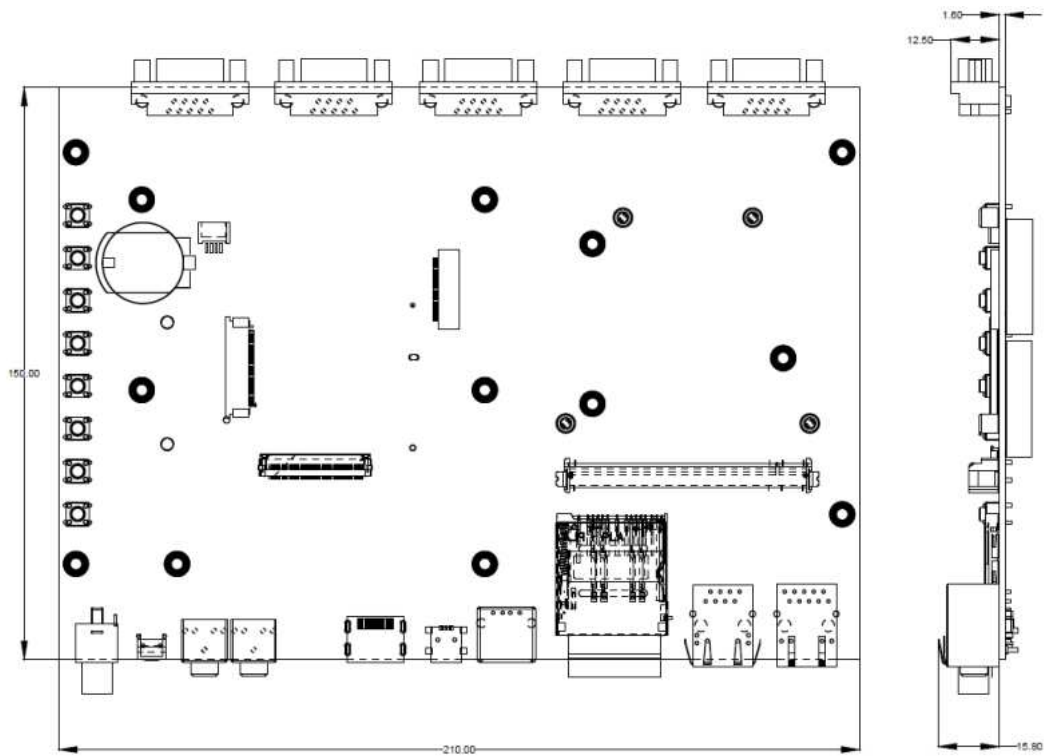
### 3.1 Q7B120 Specifications

- **Size**
  - 210mm x 150mm
- **Features**
  - Support Audio jack (MIC-in/Headphone).
  - One SDHC Card socket.
  - One USB 2.0 Host and one OTG for Client.
  - Two RJ-45 interfaces, 1000-Mbps Ethernet MAC integrated in iMX6 and PHY as Atheros AR8031, the other one for 10/100 Base-T with AX88772B.
  - Serial Ports: Four RS-232 4-wire 3.3V TTL
  - Two CAN Bus with 2.0B protocol compliant.
  - HDMI 1.4
  - SATA 2.0
  - 2 x LVDS 24bit
  - 1 x TTL 24bit
  - Extension connector with 1 x RS-232(4-wire), 2 x I2C(up to 400 kbps), 1 x SPI(2 chip select)
  - User buttons for keypad and reset button.
- **Power**
  - +5V  $\pm$  5% DC-in, over 1.7A.

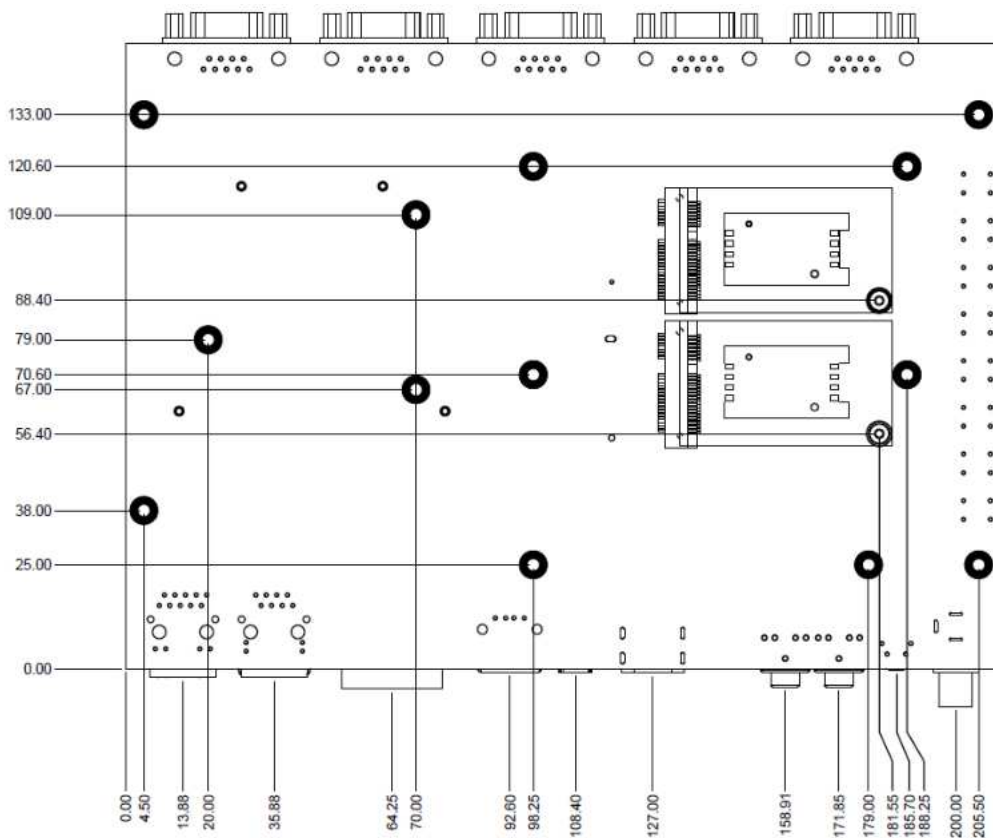


**Note:** *All specifications and images are subject to change without notice.*

### 3.2 Q7B120 Dimensions and Fixing Holes

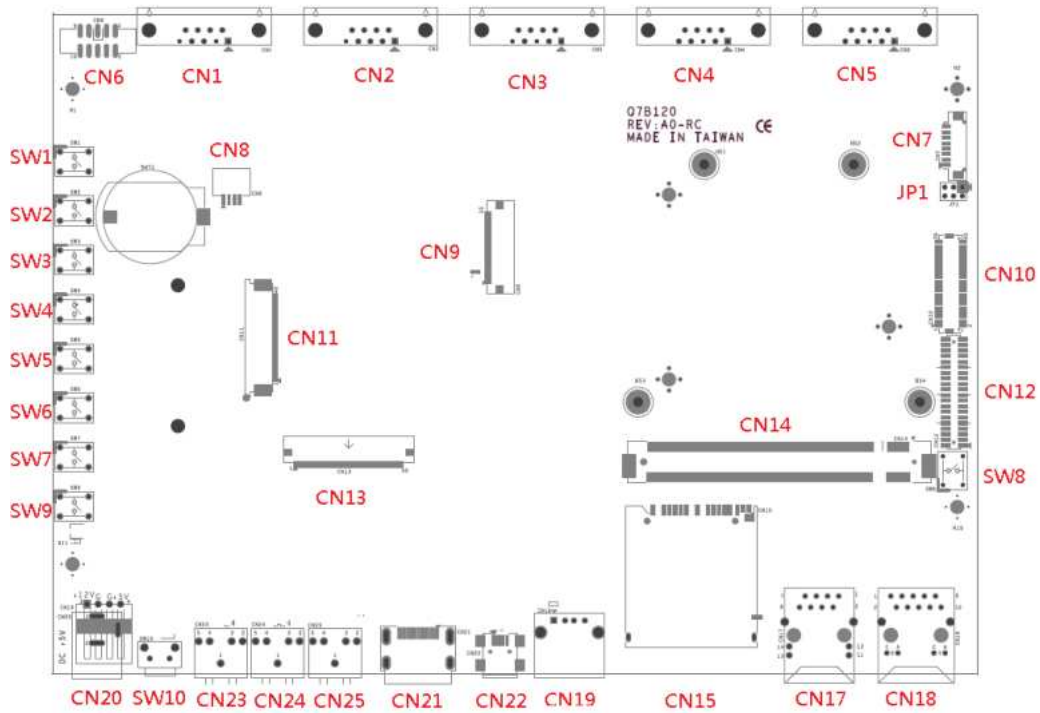


Top View

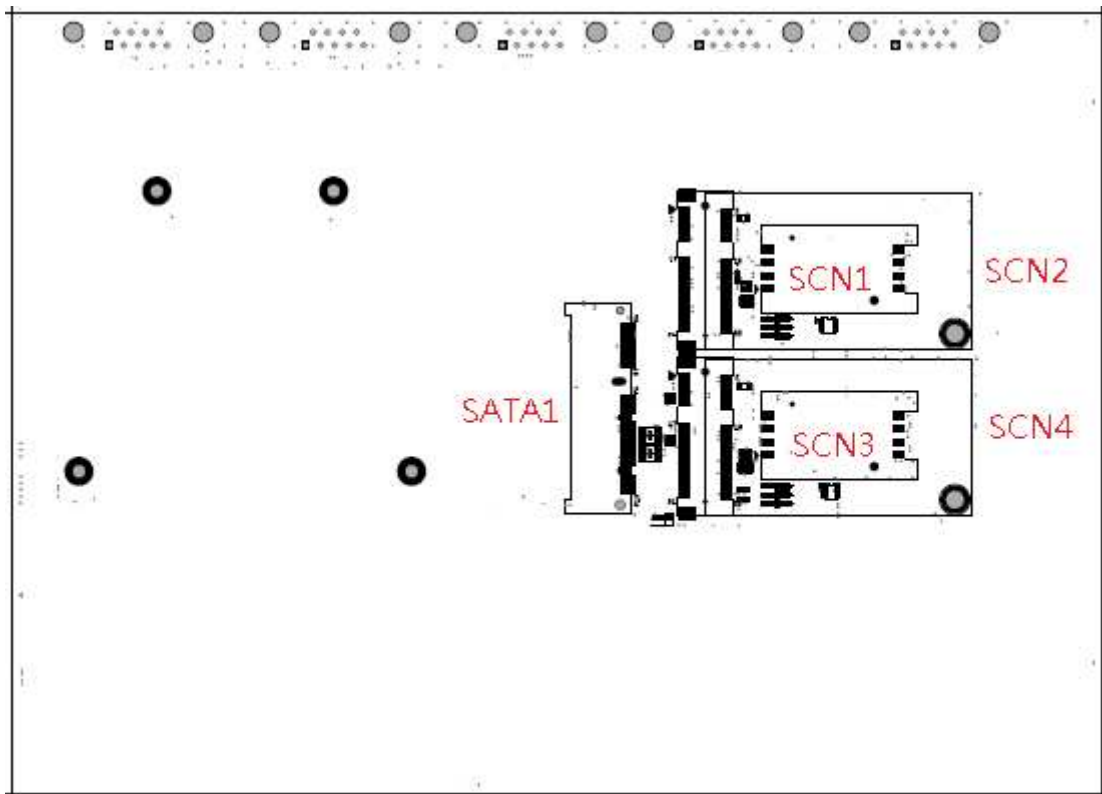


Bottom View

### 3.3 Q7B120 Board Layout

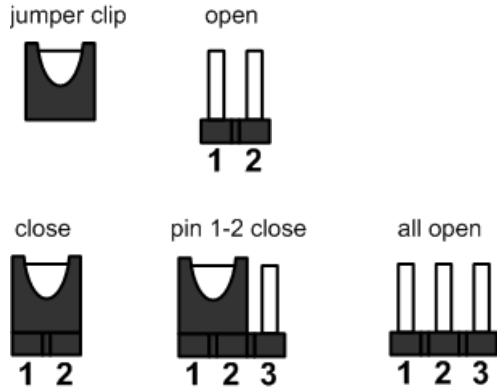


Top View



Bottom View

Jumper is a small component consisting of jumper clip and jumper pins. Install jumper clip on 2 jumper pins to close. And remove jumper clip from 2 jumper pins to open. The following illustration shows how to set up jumper.



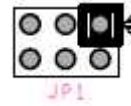
Below you can find a summary table of all jumpers and onboard default settings.

Jumper	Description	Jumper Setting
JP1	LVDS Voltage Selection Default: +3.3V	1-2 close

### 3.3.1 LVDS Voltage Selection (JP1)

The board supports voltage selection for flat panel displays. JP1 is used to set LVDS connector (CN10) pin 1~6 LCD\_PWR to +3.3V or +5V or +12V voltage level.

Function	JP2 Setting
+3.3V level (Default)	1-2 close
+5V level	3-4 open
+12V level	5-6 open



### 3.4 Connectors

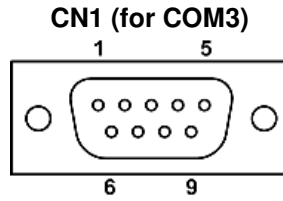
Signals go to other parts of the system through connectors. Loose or improper connection might cause problems, please make sure all connectors are properly and firmly connected. Here is a summary table which shows all connectors on the hardware.

<b>Connector</b>	<b>Description</b>
CN1	COM3 Connector
CN2	COM4 Connector
CN3	COM2 Connector
CN4	CAN1 Interface Connector
CN5	CAN2 Interface Connector
CN6	COM1 Box Header
CN7	Inverter Connector
CN8	4-pin ZIF Connector
CN9	33-pin ZIF Connector
CN10	LVDS Connector
CN11	40-pin ZIF for TTL LCD+T/S from baseboard
CN12	Expansion Connector
CN13	50-pin ZIF for TTL LCD+T/S from baseboard
CN14	MXM Connector
CN15	SDHC/MMC Card Socket
CN17	Ethernet Port 0 Connector
CN18	Ethernet Port 1 Connector
CN19	USB Port Host Connector
CN20	DC Jack Power Connector
CN21	HDMI Connector
CN22	Mini USB OTG Port Host/Device Connector
CN23	Audio Headphone Jack
CN25	Audio MIC-in Jack
SCN1	SIM Card Slot
SCN2	PCI-Express Mini Card Connector
SCN3	SIM Card Slot
SCN4	PCI-Express Mini Card Connector
SATA1	SATA & SATA Power Connector
SW1	User Button for Keypad
SW2	User Button for Keypad
SW3	User Button for Keypad
SW4	User Button for Keypad
SW5	User Button for Keypad
SW6	User Button for Keypad
SW7	User Button for Keypad
SW8	User Button for Keypad
SW9	User Button for Keypad
SW10	Reset Button

### 3.4.1 COM3 Connector (CN1)

These is standard 9-pin D-Sub connectors for interfacing to serial ports.

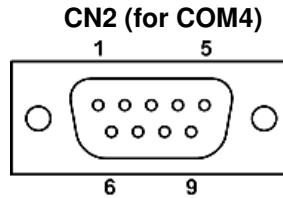
Pin	Signal
1	N.C.
2	COM3_RX
3	COM3_TX
4	N.C.
5	GND
6	N.C.
7	COM3_RTS
8	COM3_CTS
9	N.C.



### 3.4.2 COM4 Connector (CN2)

These is standard 9-pin D-Sub connectors for interfacing to serial ports.

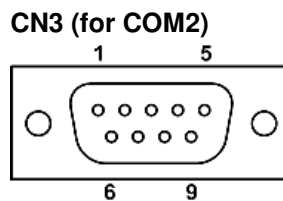
Pin	Signal
1	N.C.
2	COM4_RX
3	COM4_TX
4	N.C.
5	GND
6	N.C.
7	COM4_RTS
8	COM4_CTS
9	N.C.



### 3.4.3 COM2 Connector (CN3)

These is standard 9-pin D-Sub connectors for interfacing to serial ports.

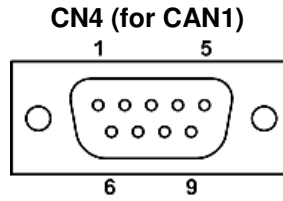
Pin	Signal
1	N.C.
2	COM2_RX
3	COM2_TX
4	N.C.
5	GND
6	N.C.
7	COM2_RTS
8	COM2_CTS
9	N.C.



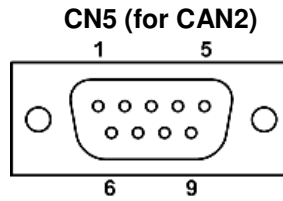
### 3.4.4 CAN Interface Connectors (CN4 and CN5)

These are standard 9-pin D-Sub connectors for interfacing to CAN network.

Pin	Signal
1	N.C.
2	CAN1_L
3	GND
4	N.C.
5	N.C.
6	N.C.
7	CAN1_H
8	N.C.
9	N.C.



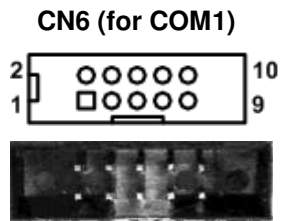
Pin	Signal
1	N.C.
2	CAN2_L
3	GND
4	N.C.
5	N.C.
6	N.C.
7	CAN2_H
8	N.C.
9	N.C.



### 3.4.5 COM1 Box Header (CN6)

This is a 2x5 pin 2.0 pitch box header for interfacing to serial ports.

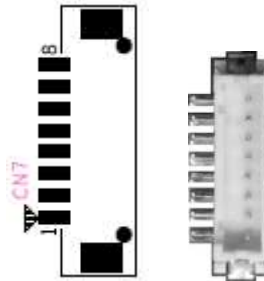
Pin	Signal
1	N.C.
2	N.C.
3	COM1_RX
4	COM1_RTS
5	COM1_TX
6	COM1_CTS
7	N.C.
8	N.C.
9	GND
10	N.C.



### 3.4.6 Inverter Connector (CN7)

The CN7 is a DF13-8S-1.25V 8-pin connector for inverter. We strongly recommend you to use the matching DF13-8S-1.25C connector to avoid malfunction.

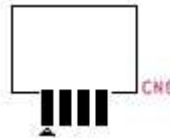
Pin	Signal
1	VBL1 (+12V level)
2	VBL1 (+12V level)
3	VBL2 (+5V level)
4	N.C.
5	GND
6	GND
7	GND
8	VBL Brightness Control



### 3.4.7 4-pin ZIF Connector (CN8)

This board has a 4-pin ZIF connector (CN8) for interfacing touch panel signal.

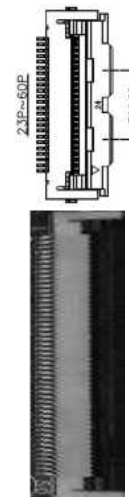
Pin	Signal
1	TS_XN
2	TS_YP
3	TS_XP
4	TS_YN



### 3.4.8 33-pin ZIF Connector (CN9)

This board also has a 33-pin ZIF connector (CN9) for interfacing TTL LCD from SoM.

Pin	Signal	Pin	Signal
1	GND	2	GND
3	DISP0_DRDY	4	DISP0_VSYNCH
5	DISP0_HSYNCH	6	DISP0_CNTRST
7	DISP0_CLK	8	GND
9	DISP0_DAT7	10	DISP0_DAT6
11	DISP0_DAT5	12	DISP0_DAT4
13	DISP0_DAT3	14	DISP0_DAT2
15	DISP0_DAT1	16	DISP0_DAT0
17	DISP0_DAT15	18	DISP0_DAT14
19	DISP0_DAT13	20	DISP0_DAT12
21	DISP0_DAT11	22	DISP0_DAT10
23	DISP0_DAT9	24	DISP0_DAT8
25	DISP0_DAT23	26	DISP0_DAT22
27	DISP0_DAT21	28	DISP0_DAT20
29	DISP0_DAT19	30	DISP0_DAT18
31	DISP0_DAT17	32	DISP0_DAT16
33	GND		

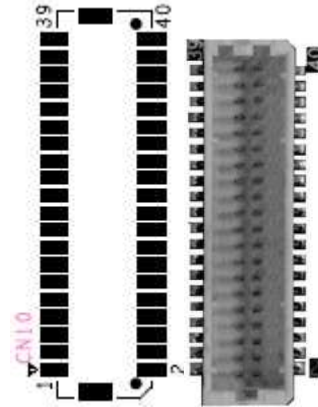




### 3.4.9 LVDS Connector (CN10)

This board has a 40-pin connector for LVDS LCD interface. It is strongly recommended to use the matching JST SHDR-40VS-B 40-pin connector for LVDS interface. Pin 1~6 VCCM can be set to +3.3V, +5V or +12V level by setting JP2 (see section 2.3.2).

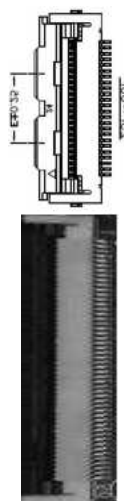
Pin	Signal	Pin	Signal
1	LCMVDD	2	LCMVDD
3	LCMVDD	4	LCMVDD
5	LCMVDD	6	LCMVDD
7	I2C2_SDA	8	I2C2_SCL
9	GND	10	GND
11	LVDSB_DATA3-	12	LVDSB_DATA0-
13	LVDSB_DATA3+	14	LVDSB_DATA0+
15	GND	16	GND
17	LVDSB_CLK-	18	LVDSB_DATA1-
19	LVDSB_CLK+	20	LVDSB_DATA1+
21	GND	22	GND
23	LVDSA_DATA0-	24	LVDSB_DATA2-
25	LVDSA_DATA0+	26	LVDSB_DATA2+
27	GND	28	GND
29	LVDSA_DATA1-	30	LVDSA_DATA3-
31	LVDSA_DATA1+	32	LVDSA_DATA3+-
33	GND	34	GND
35	LVDSA_DATA2-	36	LVDSA_CLK-
37	LVDSA_DATA2+	38	LVDSA_CLK+
39	GND	40	GND



### 3.4.10 40-pin ZIF Connector (CN11)

This board also has a 40-pin ZIF connector (CN11) for interfacing TTL LCD from baseboard.

Pin	Signal	Pin	Signal
1	Up or Down Display Control	2	N.C.
3	HSYNC	4	LCMVDD
5	LCMVDD	6	LCMVDD
7	GEN_3V3	8	VSYNC
9	Data Enable	10	GND
11	GND	12	Brightness Control
13	B5	14	B4
15	B3	16	GND
17	B2	18	B1
19	B0	20	GND
21	G5	22	G4
23	G3	24	GND
25	G2	26	G1
27	G0	28	GND
29	R5	30	R4
31	R3	32	GND
33	R2	34	R1
35	R0	36	GND
37	GND	38	CLOCK
39	GND	40	Left or Right Display Control



### **3.4.11 Expansion Connector (CN12)**

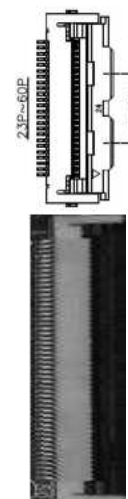
This board also has a expansion connector (CN12) from baseboard.

<b>Pin</b>	<b>Signal</b>	<b>Pin</b>	<b>Signal</b>
1	AUX_5V	2	AUX_5V
3	AUX_5V	4	AUX_5V
5	AUX_5V	6	AUX_5V
7	GND	8	GND
9	GEN_3V3	10	GEN_3V3
11	GEN_3V3	12	GEN_3V3
13	GEN_3V3	14	GEN_3V3
15	GND	16	GND
17	CHG_UART5_TXD	18	I2C1_SDA
19	CHG_UART5_RTS	20	I2C1_SCL
21	CHG_UART5_CTS	22	GND
23	CHG_UART5_RXD	24	I2C3_SDA
25	GND	26	I2C3_SCL
27	CSPI1_CS1	28	GND
29	CSPI1_CS0	30	N.C.
31	CSPI1_MISO	32	N.C.
33	CSPI1_MOSI	34	N.C.
35	CSPI1_CLK	36	N.C.
37	GND	38	GND
39	GND	40	GND

### 3.4.12 50-pin ZIF Connector (CN13)

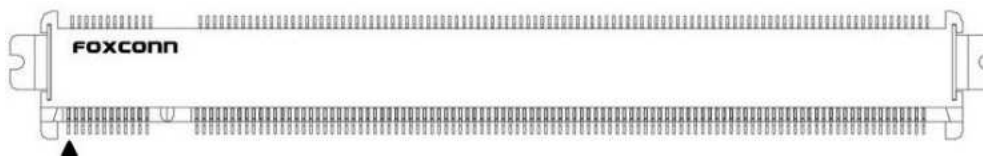
This board also has a 50-pin ZIF connector (CN13) for interfacing TTL LCD and touch screen from baseboard.

Pin	Signal	Pin	Signal
1	GND	2	GND
3	GEN_3V3	4	GEN_3V3
5	DISP0_DAT16	6	DISP0_DAT17
7	DISP0_DAT18	8	DISP0_DAT19
9	DISP0_DAT20	10	DISP0_DAT21
11	DISP0_DAT22	12	DISP0_DAT23
13	DISP0_DAT8	14	DISP0_DAT9
15	DISP0_DAT10	16	DISP0_DAT11
17	DISP0_DAT12	18	DISP0_DAT13
19	DISP0_DAT14	20	DISP0_DAT15
21	DISP0_DAT0	22	DISP0_DAT1
23	DISP0_DAT2	24	DISP0_DAT3
25	DISP0_DAT4	26	DISP0_DAT5
27	DISP0_DAT6	28	DISP0_DAT7
29	GND	30	DISP0_CLK
31	DISP0_CNTRST	32	DISP0_HSYNCH
33	DISP0_VSYNCH	34	DISP0_DRDY
35	N.C.	36	N.C.
37	GND	38	GND
39	TS_XP	40	TS_YN
41	TS_XN	42	TS_YP
43	N.C.	44	N.C.
45	N.C.	46	LEDB-
47	LEDB+	48	GND
49	GND	50	GND



### 3.4.13 MXM Connector (CN14)

This SMT type 0.50mm [0.020"] pitch, 230-pin MXM connector is available in 2 different heights (5.5mm and 7.8mm) for maximum flexibility.



Pin	Signal	Pin	Signal
1	GND	2	GND
3	Q7_MDI_3N	4	Q7_MDI_2N
5	Q7_MDI_3P	6	Q7_MDI_2P
7	RGMII_LED_10_100_N	8	RGMII_LED_1000_N
9	Q7_MDI_1N	10	Q7_MDI_0N
11	Q7_MDI_1P	12	Q7_MDI_0P
13	N.C.	14	RGMII_LED_ACT_N
15	N.C.	16	N.C.
17	N.C.	18	3V3_ENABLE
19	N.C.	20	Q7_PWRBTN_N
21	N.C.	22	CPU_PIN_C18
23	GND	24	GND
25	GND	26	N.C.
27	N.C.	28	PWRON
29	Q7_SATA_TXP	30	N.C.
31	Q7_SATA_TXN	32	N.C.
33	SATA_DEVSLP	34	GND
35	Q7_SATA_RXP	36	N.C.
37	Q7_SATA_RXN	38	N.C.
39	GND	40	GND
41	N.C.	42	Q7_SD3_CLK
43	SD3_CD_B	44	CPU_PIN_E17
45	SD3_CMD	46	SD3_WP
47	N.C.	48	SD3_DATA1
49	SD3_DATA0	50	SD3_DATA3
51	SD3_DATA2	52	SD3_DATA5
53	SD3_DATA4	54	SD3_DATA7
55	SD3_DATA6	56	CHG_KEY_F
57	GND	58	GND
59	AUD3_TXFS	60	I2C3_SCL
61	AUD_MCLK	62	I2C3_SDA
63	Q7_AUD3_TXC	64	CPU_PIN_E15
65	AUD3_RXD	66	I2C1_SCL
67	AUD3_TXD	68	I2C1_SDA
69	N.C.	70	N.C.
71	N.C.	72	Q7_WDOG_B
73	GND	74	GND
75	CHG_UART4_TXD	76	CHG_UART2_TX
77	CHG_UART4_RTS	78	CHG_UART2_RTS
79	N.C.	80	N.C.

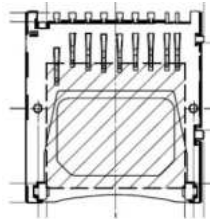
Pin	Signal	Pin	Signal
81	CHG_UART4_RXD	82	CHG_UART2_RX
83	HG_UART4_CTS	84	CHG_UART2_CTS
85	USB_H1_OC	86	USB_OTG_OC
87	HG_UART5_TXD	88	USB_HOST_DN
89	CHG_UART5_RTS	90	USB_HOST_DP
91	OTG_VBUS	92	USB_OTG_ID
93	USB_OTG_DN	94	CHG_UART5_CTS
95	USB_OTG_DP	96	CHG_UART5_RXD
97	GND	98	GND
99	LVDS0_TX0_P	100	LVDS1_TX0_P
101	LVDS0_TX0_N	102	LVDS1_TX0_N
103	VDS0_TX1_P	104	LVDS1_TX1_P
105	LVDS0_TX1_N	106	LVDS1_TX1_N
107	LVDS0_TX2_P	108	LVDS1_TX2_P
109	LVDS0_TX2_N	110	LVDS1_TX2_N
111	DISP0_PWR_EN	112	CSI0_PWM
113	INC_LVDS0_TX3_P	114	INC_LVDS1_TX3_P
115	INC_LVDS0_TX3_N	116	INC_LVDS1_TX3_N
117	GND	118	GND
119	LVDS0_CLK_P	120	LVDS1_CLK_P
121	LVDS0_CLK_N	122	LVDS1_CLK_N
123	DISP0_PWM	124	CHG_KEY_E
125	I2C2_SDA	126	CHG_KEY_D
127	I2C2_SCL	128	CHG_KEY_C
129	CAN1_TX	130	CAN1_RX
131	HDMI_CLKP	132	KEY_COL4
133	HDMI_CLKM	134	KEY_ROW4
135	GND	136	GND
137	HDMI_D1P	138	CHG_KEY_B
139	HDMI_D1M	140	CHG_KEY_A
141	GND	142	GND
143	HDMI_D0P	144	KEY_VOL_DN
145	HDMI_D0M	146	KEY_VOL_UP
147	GND	148	GND
149	HDMI_D2P	150	HDMI_DDC_DAT_IN
151	HDMI_D2M	152	HDMI_DDC_CLK_IN
153	HDMI_HPD	154	MICROPHONE_DET
155	Q7_CLK1_P	156	PCIE_WAKE_B
157	Q7_CLK1_N	158	PCIE_RST_B
159	GND	160	GND
161	N.C.	162	N.C.
163	N.C.	164	N.C.
165	GND	166	GND
167	N.C.	168	N.C.
169	N.C.	170	N.C.
171	Q7_UART1_TX	172	CHG_UART1_RTS
173	N.C.	174	N.C.
175	N.C.	176	N.C.
177	Q7_UART1_RX	178	CHG_UART1_CTS
179	Q7_PCIE_TXP	180	PCIE_RXP

Pin	Signal	Pin	Signal
181	Q7_PCIE_TXM	182	PCIE_RXM
183	GND	184	GND
185	UART3_TXD	186	CHG_UART3_RTS
187	UART3_RXD	188	CHG_UART3_CTS
189	EIM_EB3	190	HEADPHONE_DET
191	TS_INT	192	HDMI_CEC_IN
193	VCC_RTC	194	PWM_OUT
195	N.C.	196	CSI_PWM
197	GND	198	GND
199	CSPI1_MOSI	200	CSPI1_CS0
201	SPI1_MISO	202	CSPI1_CS1
203	CSPI1_CLK	204	AUX_5V_EN
205	N.C.	206	N.C.
207	CAN_STBY	208	PCIE_PWR_EN
209	CODEC_PWR_EN	210	PCIE_DIS_B
211	5V_IN	212	5V_IN
213	5V_IN	214	5V_IN
215	5V_IN	216	5V_IN
217	5V_IN	218	5V_IN
219	5V_IN	220	5V_IN
221	5V_IN	222	5V_IN
223	5V_IN	224	5V_IN
225	5V_IN	226	5V_IN
227	5V_IN	228	5V_IN
229	5V_IN	230	5V_IN

### 3.4.14 SDHC/MMC Card Socket (CN15)

This board has a SDHC/MMC Card Socket.

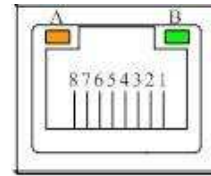
Pin	Signal
1	SDIO1_D3
2	SDIO1_CMD
3	GND
4	VDDIO_SD1
5	SDIO1_CLK
6	GND
7	SDIO1_D0
8	SDIO1_D1
9	SDIO1_D2
10	SDIO1_WP
11	SDIO1_CD
12	GND
13	GND (SHELL)
14	GND (SHELL)



### 3.4.15 Ethernet Port 0 Internal LEDs Connector (CN17)

CN17 is the RJ-45 connector is for Ethernet. Just plug in one end of the cable and connect the other end to a 100/10-Base-T hub.

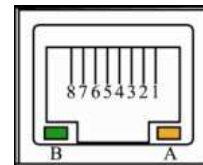
Pin	Signal
1	TX+ (Data transmission positive)
2	TX- (Data transmission negative)
3	RX+ (Data reception positive)
4	RJ45 termination
5	RJ45 termination
6	RX- (Data reception negative )
7	RJ45 termination
8	RJ45 termination
A	Active LED (Yellow)
B	100 LAN LED (Green)



### 3.4.16 Ethernet Port 1 Internal LEDs Connector (CN18)

CN18 is the RJ-45 connector is for Ethernet. Just plug in one end of the cable and connect the other end to a 1000/100/10-Base-T hub.

Pin	Signal
1	MDI0+
2	MDI0-
3	MDI1+
4	MDI1-
5	MDI2+
6	MDI2-
7	MDI3+
8	MDI3-
A	Active LED (Yellow)
B	100 LAN LED (Green)/1000 LAN LED (Orange)



### 3.4.17 USB Port Host Connector (CN19)

The board comes with one Universal Serial Bus (compliant with USB 2.0 (480Mbps)) connector which is for adapting to USB peripherals such as keyboard, mouse, etc.

Pin	USB Port Host
1	USB_HOST_VBUS (+5V level)
2	USB_HOST_DN
3	USB_HOST_DP
4	GND





### 3.4.18 DC Jack Power Connector (CN20)

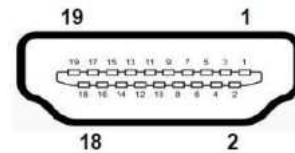
This is a DC power jack with lock. Firmly insert at least 40W adapter into this connector. Loose connection may cause system instability and make sure all components/devices are properly installed before connecting the power jack.



### 3.4.19 HDMI Connector (CN21)

The HDMI (High-Definition Multimedia Interface) is a compact digital interface which is capable of transmitting high-definition video and high-resolution audio over a single cable. Its interface is available through connector CN21.

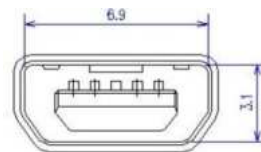
Pin	Signal	Pin	Signal
1	HDMI DATA2+	2	GND
3	HDMI DATA2-	4	HDMI DATA1+
5	GND	6	HDMI DATA1-
7	HDMI DATA0+	8	GND
9	HDMI DATA0-	10	HDMI Clock+
11	GND	12	HDMI Clock-
13	N.C.	14	N.C.
15	HDMI SCL	16	HDMI SDA
17	GND	18	+5V
19	HDMI_HTPLG		



### 3.4.20 Mini USB OTG Port Host/Device Connector (CN22)

USB On-The-Go, often abbreviated USB OTG, is a specification that allows USB devices such as digital audio players or mobile phones to act as a host, allowing other USB devices like a USB flash drive, mouse, or keyboard to be attached to them. Unlike conventional USB systems, USB OTG systems can drop the hosting role and act as normal USB devices when attached to another host.

Pin	USB Port Host/Device
1	USB_OTG_VBUS (+5V level)
2	USB_OTG_DN
3	USB_OTG_DP
4	USB_OTG_ID
5	GND



### 3.4.21 Audio Headphone Jack (CN23)

The board comes with one audio headphone jack.

Pin Color	Signal
Green	Headphone



### 3.4.22 Audio Line-out Jack (CN24)

The board comes with one audio MIC-in jack.

Pin Color	Signal
Pink	MIC IN



### 3.4.23 Audio MIC IN Jack (CN25)

The board comes with one audio MIC-in jack.

Pin Color	Signal
Pink	MIC IN



### 3.4.24 User Button for Keypad (SW1~SW9)

The board comes with eight push buttons for keypad, see table below.  
SW1

Push Button	Description
SW1	KEY_VOL_UP
SW2	KEY_VOL_DN
SW3	CHG_KEY_A
SW4	CHG_KEY_B
SW5	CHG_KEY_C
SW6	CHG_KEY_D
SW7	CHG_KEY_E
SW8	Q7_PWRBTN_N
SW9	CHG_KEY_F



### 3.4.25 Reset Button (SW10)

The SW10 is the reset button that reboot your system.

Reset Button	Description
SW10	Reboot system

