AXIOMTEK

Q7M100 and Q7B100

Freescale i.MX28 Series ARM-based Qseven System-on-Module and Baseboard

Hardware User's Manual

RoHS

Disclaimers

This manual has been carefully checked and believed to contain accurate information. Axiomtek Co., Ltd. assumes no responsibility for any infringements of patents or any third party's rights, and any liability arising from such use.

Axiomtek does not warrant or assume any legal liability or responsibility for the accuracy, completeness or usefulness of any information in this document. Axiomtek does not make any commitment to update the information in this manual.

Axiomtek reserves the right to change or revise this document and/or product at any time without notice.

No part of this document may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of Axiomtek Co., Ltd.

CAUTION

If you replace wrong batteries, it causes the danger of explosion. It is recommended by the manufacturer that you follow the manufacturer's instructions to only replace the same or equivalent type of battery, and dispose of used ones.

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.

Trademarks Acknowledgments

Axiomtek is a trademark of Axiomtek Co., Ltd.

IBM, PC/AT, PS/2, VGA are trademarks of International Business Machines Corporation.

ARM is a trademark of ARM Ltd.

Other brand names and trademarks are the properties and registered brands of their respective owners.
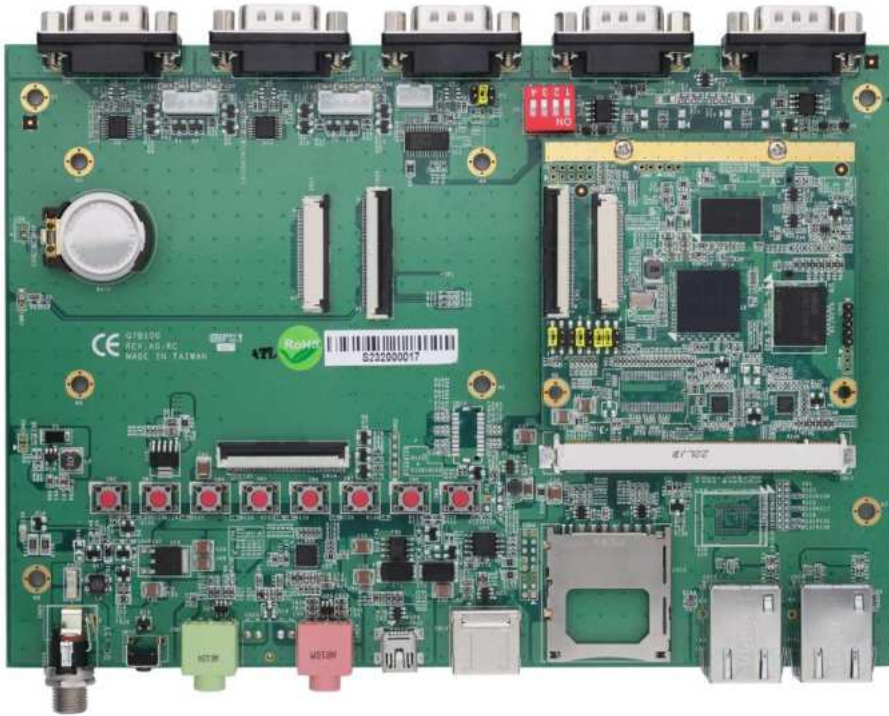
Table of Contents

This page is intentionally left blank.

Chapter 1
Introduction

The Q7M100 is a new Qseven module to support Freescale i.MX28 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 Q7M100 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.MX28 family SoC information:

Feature	i.MX283	i.MX286	i.MX287
On-chip RAM	128KB	128KB	128KB
Memory I/F	NAND Flash, DDR2, mDDR, LV-DDR2	NAND Flash, DDR2, mDDR, LV-DDR2	NAND Flash, DDR2, mDDR, LV-DDR2
LCD Interface	Yes	Yes	Yes
Touchscreen	Yes	Yes	Yes
Ethernet	x1	x1	x2
L2 Switch	-	-	Yes
CAN	-	x2	x2
12-bit ADC	x8	x8	x8
High Speed ADC	x1	x1	x1
USB 2.0	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
SDIO	x1	x1	x1
SPI	x1	x1	x1
UART	x4	x4	x4
PWM	Built-in	Built-in	Built-in
S/PDIF Tx	-	Yes	Yes
Package	14x14 0.8mm 289 BGA	14x14 0.8mm 289 BGA	14x14 0.8mm 289 BGA

● Onboard DDR2-667 memory supports up to 128MB capacity
● Onboard eMMC flash as booting device
● 24-bit TTL LCD
● 2 USB 2.0 ports
● 2 100/10 Base-T Ethernet
● IIS Audio

1.2   Specifications

- **CPU**
    - Freescale i.MX28 series SoC; default is i.MX287.
    - ARM926EL-S CPU running at 454MHz.
    - 128KB integrated low power on-chip SRAM.
    - 128KB integrated mask-programmable on-chip ROM.
    - 1280 bits of on-chip one-time-programmable (OCOTP) ROM.

- **Boot ROM**
    - Linux kernel 2.6.35 and Windows CE 6.0.
      (Please contact your agent for detail shipping content).

- **System Memory**
    - Maximum up to 128MB DDR2-667 memory.

- **USB Interface**
    - Two USB 2.0 ports comply with USB Spec. Rev. 2.0.
    - One USB port OTG client controller and PHY; and one USB 2.0 host controller and PHY.

- **Storage Interface**
    - One eMMC flash chip on module with up to 20-bit BCH ECC; default is 4GB.

- **Display**
    - Controller integrated into Freescale i.MX28 SoC.
    - Support LCD output interface as maximum 24-bit RGB (DOTCK) modes and 24-bit system-mode TTL LCD.
    - Pixel-processing pipeline (PXP) supports full path from color-space conversion, scaling, alpha-blending to rotation without intermediate memory access.

- **Ethernet**
    - Two 100/10 Base-T with Freescale i.MX28 integrated MAC and SMSC LAN8720A PHY.
    - Compatible with IEEE std 802.3.
    - Support IEEE std 1588-compatible hardware timestamp.
    - Support 50MHz/25MHz clock output for external PHY.

- **Audio**
    - Freescale IIS SGTL5000 codec for MIC-in/headphone via Qseven MXM interface.

- **Serial Port**
    - Support up to four (two as TX/RX/RTS/CTS and two as TX/RX) UARTs up to 3.25Mbps (RS-422/485 only) with hardware flow control.
    - Two RS-232 and one RS-422/485, one TX/RX 3.3V TTL to be transmitted on the baseboard.

- **CANBus**
    - Two 2.0B protocol-compatible Controller Area Network (CAN) interfaces.
    - One via Qseven MXM interface, one via Axiomtek ZIF connector.

- **I²C**
    - Two I²C 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) wired to Axiomtek ZIF connector.

- **Other I/Os**
  - 6-channel low resolution A/D converter (LRADC), touch screen signals (4/5-wire touchscreen controller) included via Axiomtek ZIF connector.
  - Eight keypad matrix with button-detect circuit routed to Axiomtek ZIF connector.

- **Power**
  - +5V ± 5% DC-in.

- **Form Factor**
  - 70mm x 70mm.
  - Thickness as 1.2mm ± 0.1mm.
  - Qseven specifications v1.2 compliant.

- **Environments**
  - Operating temperature: -40 ~ 85ºC (system with 20cm/sec airflow in the surface).
  - Operating humidity: 10% RH ~ 95% RH relative humidity, non-condensing.

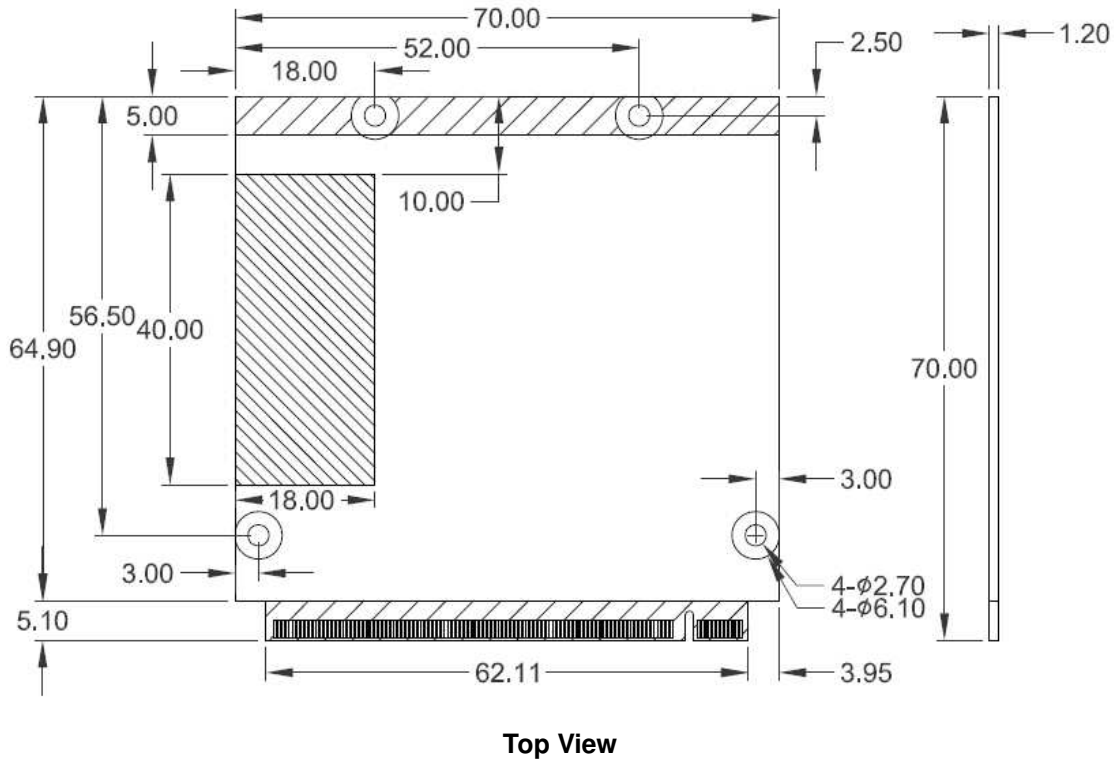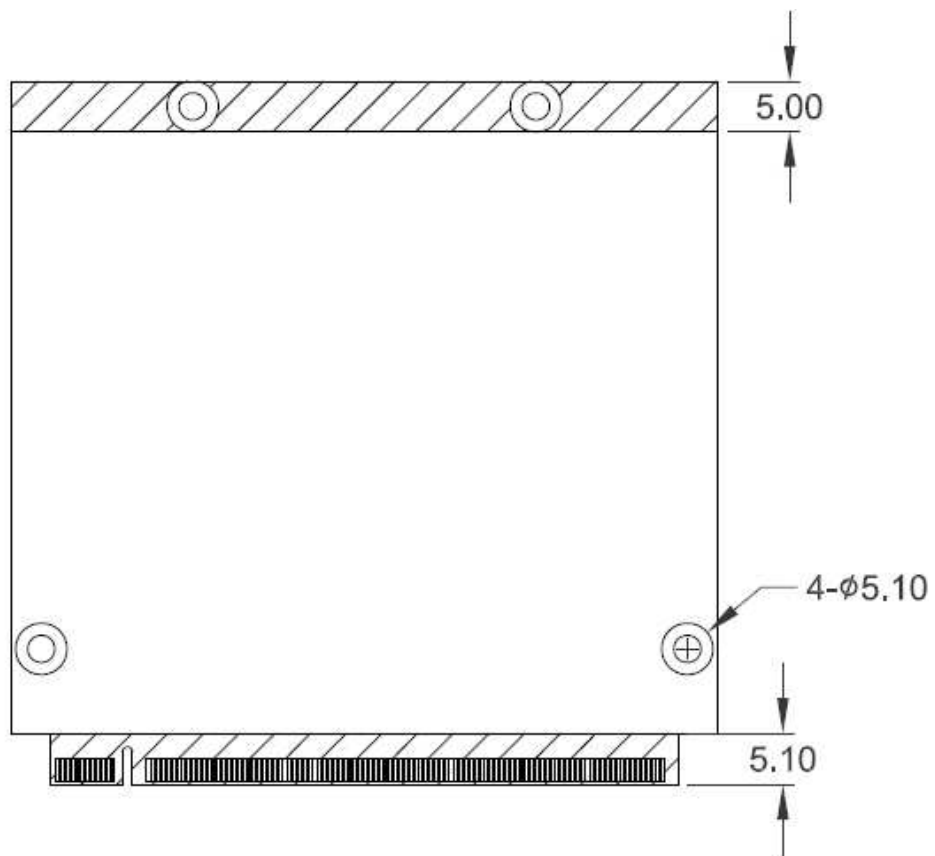*Note: All specifications and images are subject to change without notice.*

Chapter 2
Board and Pin Assignments

2.1   Board Dimensions and Fixing Holes

Top View

Bottom View

2.2 Board Layout
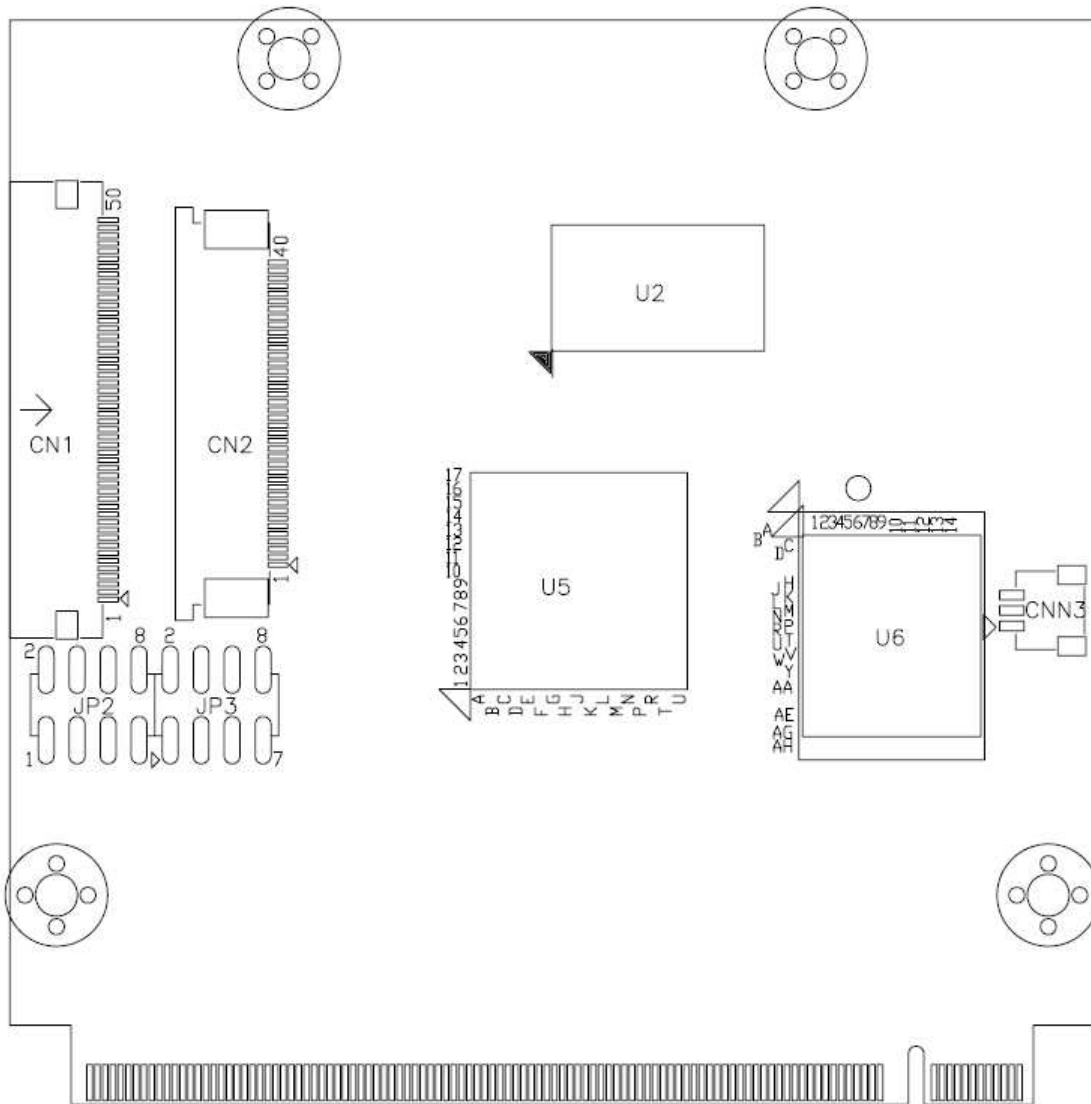
Top View
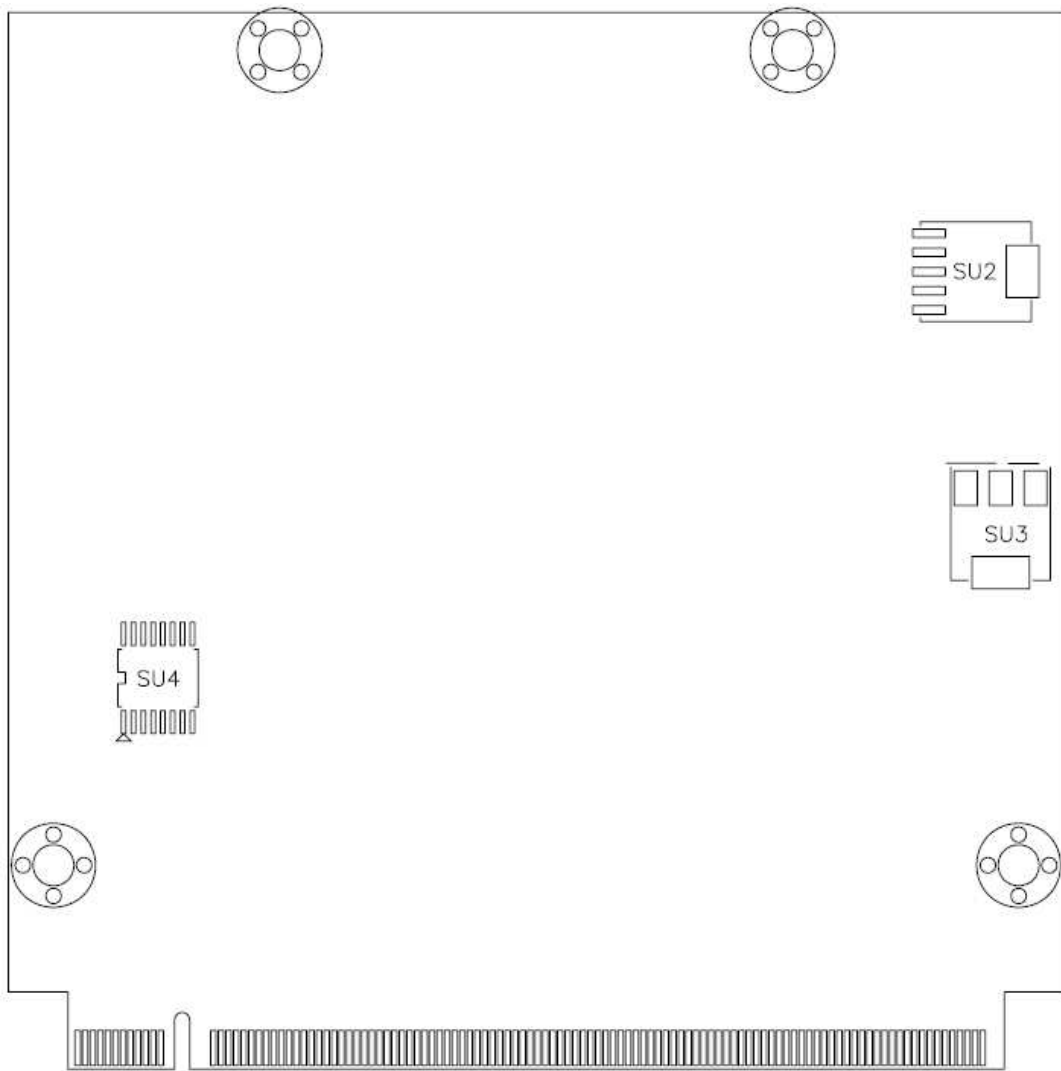
Bottom View

2.3 Jumper Settings

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. Below illustration shows how to set up jumper.
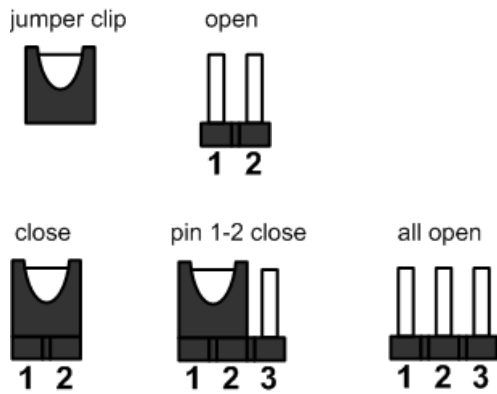
Properly configure jumpers on the Q7M100 to meet your application purpose. Below you can find a summary table of all jumpers and onboard default setting.

Note: Once the default jumper setting needs to be changed, please do it under power-off condition.

Jumper	Description	Setting
JP2	Boot Mode Selection	3-4, 7-8 Close
JP3	Default: Copy image to eMMC	3-4, 7-8 Close

2.3.1 Boot Mode Selection (JP2 and JP3)

These jumpers are for boot mode selection.

Function	Setting
Copy image to eMMC (Default)	JP2 3-4, 7-8 close JP3 3-4, 7-8 close
Boot to OS	JP2 1-2, 7-8 close JP3 3-4, 5-6 close
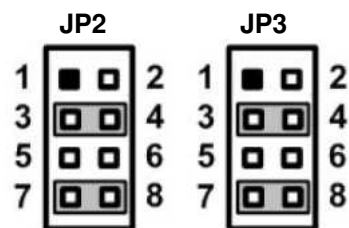
2.4 Connectors

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.

Connector	Description
CN1	50-pin ZIF Connector for Axiomtek Proprietary IO
CN2	40-pin ZIF Connector for TTL LCD
CNN3	Debug Port Connector

2.4.1 ZIF Connectors (CN1 and CN2)

This board has a 50-pin ZIF connector (CN1) for interfacing Axiomtek Proprietary IO to baseboard.

Pin	Signal	Pin	Signal
1	GND	2	GPIO3_27
3	GPIO2_14	4	GPIO1_30
5	GPIO1_29	6	GPIO1_28
7	GPIO0_27	8	GPIO0_26
9	GPIO0_24	10	GPIO0_17
11	GPIO0_16	12	USB1_PWR_EN
13	USB0_PWR_EN	14	CAN_PWDN
15	GND	16	HSADC0
17	GND	18	LRADC1
19	GND	20	LRADC6
21	GND	22	LRADC3
23	GND	24	LRADC5
25	GND	26	LRADC2
27	GND	28	LRADC4
29	GND	30	CAN1_RX
31	CAN1_TX	32	GND
33	COM3_TX	34	GPIO2_26
35	COM3_RX	36	N.C.
37	GND	38	COM2_CTS
39	COM2_RX	40	COM2_RTS
41	COM2_TX	42	GND
43	COM1_CTS	44	COM1_RX
45	COM1_RTS	46	COM1_TX
47	GND	48	COM4_TX
49	COM4_RX	50	GND
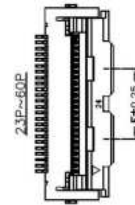
This board also has a 40-pin ZIF connector (CN2) for interfacing TTL LCD to baseboard.

Pin	Signal	Pin	Signal
1	GND	2	GND
3	N.C.	4	N.C.
5	LCD_D16	6	LCD_D17
7	LCD_D18	8	LCD_D19
9	LCD_D20	10	LCD_D21
11	LCD_D22	12	LCD_D23
13	LCD_D08	14	LCD_D09
15	LCD_D10	16	LCD_D11
17	LCD_D12	18	LCD_D13
19	LCD_D14	20	LCD_D15
21	LCD_D00	22	LCD_D01
23	LCD_D02	24	LCD_D03
25	LCD_D04	26	LCD_D05
27	LCD_D06	28	LCD_D07
29	GND	30	LCD_CLOCKIN
31	LCD_DISP	32	LCD_HSYNC
33	LCD_VSYNC	34	LCD_ENABLE
35	N.C.	36	N.C.
37	GND	38	GND
39	N.C.	40	N.C.
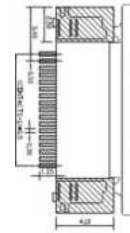
Note: **Gently connect Q7B100 baseboard to these CN1 and CN2 (see chapter 3 for information of Q7B100).**

2.4.2   Debug Port Connector (CNN3)

The CNN3 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

This page is intentionally left blank.

Chapter 3
Q7B100 Baseboard

The Q7B100 is a baseboard for Q7M100 SoM. Connect this baseboard properly to CN1 and CN2 of Q7M100. Its specifications and detailed information are given in this chapter.

3.1   Q7B100 Specifications

● **Size**
   ■ 140mm x 200mm

● **Features**
   ■ Support audio jack (MIC-in/headphone).
   ■ One SDHC Card socket.
   ■ One USB 2.0 Host and OTG for Client.
   ■ Two RJ-45 interfaces for 100/10 Base-T with Freescale i.MX28 integrated MAC and SMSC LAN8720A PHY.
   ■ Serial Ports: Two RS-232 and one RS-422/485, one TX/RX 3.3V TTL.
   ■ Two CANBus with 2.0B protocol compliant.
   ■ Two wafer connectors for 8 GPIOs.
   ■ User buttons for keypad and reset button.

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

3.2 Q7B100 Dimensions and Fixing Holes
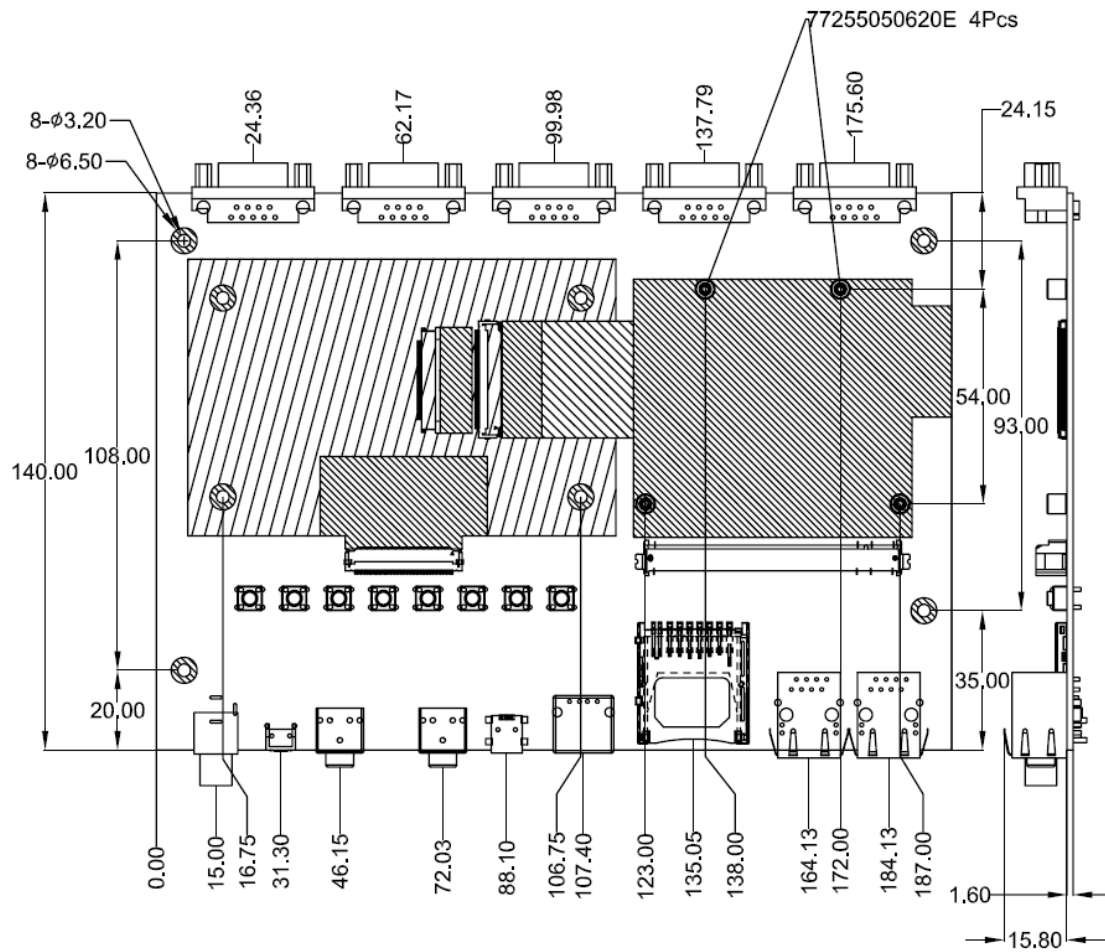
Top View

3.3 Q7B100 Board Layout
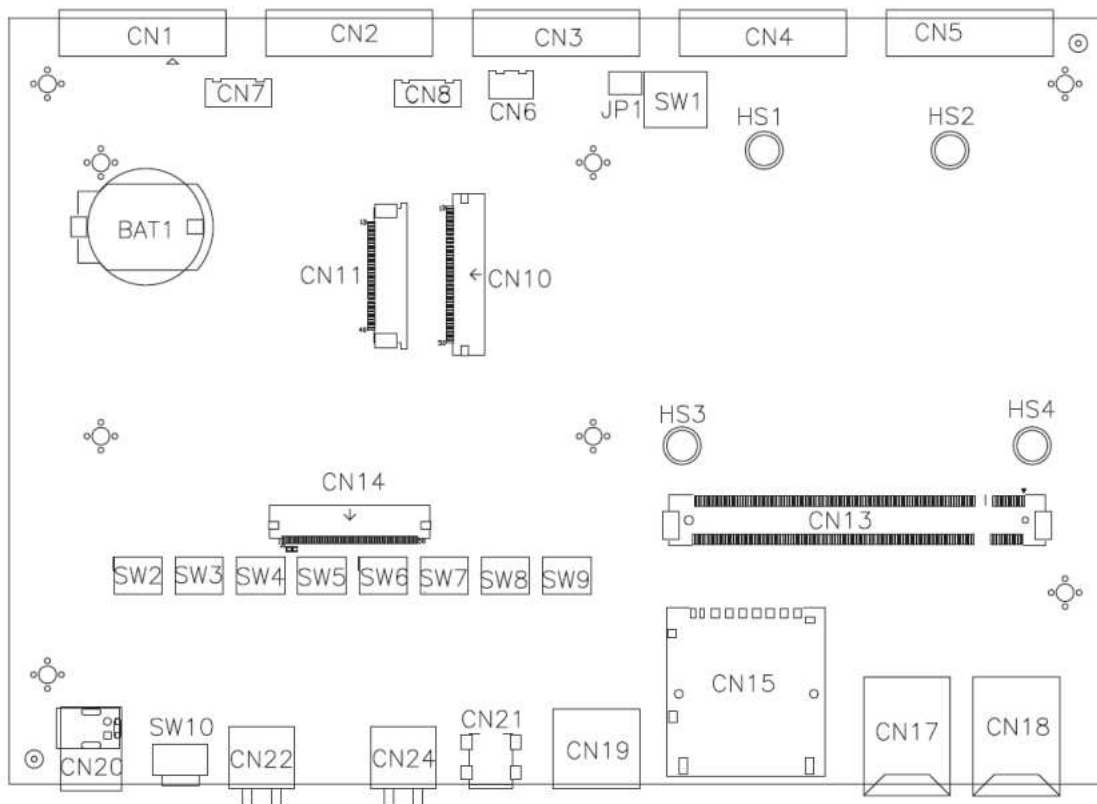
Top View

3.4 Q7B100 Jumper and Switch Settings

Properly configure jumper and switch on the Q7B100 to meet your application purpose. Below you can find a summary table and onboard default setting.

Note: Once the default setting needs to be changed, please do it under power-off condition.

Jumper	Description	Setting
JP1	COM3 RS-422/485 Mode Setting Default: RS-422	3-4 Close
SW1	Termination Resistor Switch Default: Disable all termination resistors	SW1-1, SW1-2, SW1-3, SW1-4 OFF

3.4.1 COM3 RS-422/485 Mode Setting (JP1)

Use this jumper to set COM3 port to operate as RS-422 or RS-485 communication mode.

| Function	Setting
RS-422 mode (Default)	3-4 close
RS-485 mode	3-4, 5-6 close

JP1
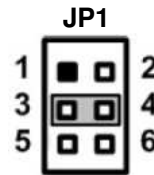
3.4.2 Termination Resistor Switch (SW1)

This is a termination resistor selection switch, see table below.

Function	Setting
Enable RS-422 termination resistor	SW1-1 ON
Disable RS-422 termination resistor (Default)	SW1-1 OFF
Enable RS-485 termination resistor	SW1-2 ON
Disable RS-485 termination resistor (Default)	SW1-2 OFF
Enable CAN0 termination resistor	SW1-3 ON
Disable CAN0 termination resistor (Default)	SW1-3 OFF
Enable CAN1 termination resistor	SW1-4 ON
Disable CAN1 termination resistor (Default)	SW1-4 OFF

SW1 (default setting)
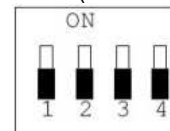
3.5   Q7B100 Connectors and Push Buttons

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 and push buttons on the hardware.

Connector	Description
CN1	COM2 Connector
CN2	COM1 Connector
CN3	COM3 Connector
CN4	CAN1 Interface Connector
CN5	CAN0 Interface Connector
CN6	COM4 Connector
CN7~CN8	Digital I/O Ports
CN10	50-pin ZIF Connector for Axiomtek Proprietary IO from SoM
CN11	40-pin ZIF Connector for TTL LCD from SoM
CN13	MXM Connector
CN14	50-pin ZIF for TTL LCD+T/S from baseboard
CN15	SDHC Card 1 Socket
CN17	Ethernet Port 0 Connector
CN18	Ethernet Port 1 Connector
CN19	USB Port 1 Host Connector
CN20	DC Jack Power Connector
CN21	Mini USB OTG Port 0 Host/Device Connector
CN22	Audio Headphone Jack
CN24	Audio MIC-in Jack
SW2~SW9	User Buttons for Keypad
SW10	Reset Button

3.5.1 COM1~COM3 Connectors (CN1~CN3)

These are 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.

CN1 (for COM2)
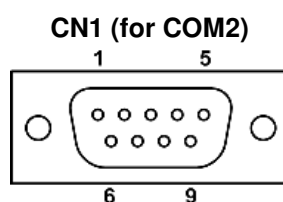
Pin	Signal
1	N.C.
2	COM1_RX
3	COM1_TX
4	N.C.
5	GND
6	N.C.
7	COM1_RTS
8	COM1_CTS
9	N.C.

CN2 (for COM1)
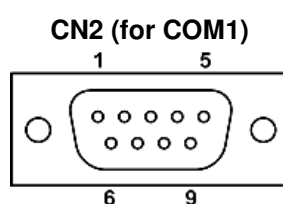
The pin assignments of RS-422/RS-485 are listed in table below. If you need COM3 port to support RS-422 or RS-485, please refer to section 3.4.1.

Pin	RS-422	RS-485
1	N.C.	N.C.
2	RX+	N.C.
3	TX+	DATA+
4	N.C.	N.C.
5	GND	GND
6	N.C.	N.C.
7	TX-	DATA-
8	RX-	N.C.
9	N.C.	N.C.

CN3 (for COM3)
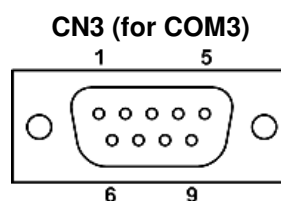
3.5.2 CAN Interface Connectors (CN4 and CN5)

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.

CN4 (for CAN1)
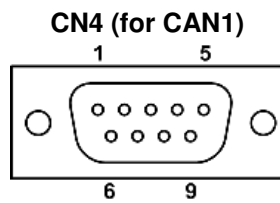
Pin	Signal
1	N.C.
2	CAN0_L
3	GND
4	N.C.
5	N.C.
6	N.C.
7	CAN0_H
8	N.C.
9	N.C.

CN5 (for CAN0)
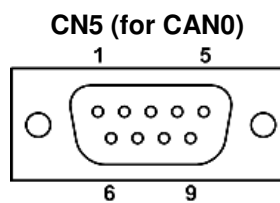
3.5.3 COM4 Connector (CN6)

This is a 3-pin wafer connector for 3.3V TTL TX/RX UART Port, see table below.

Pin	Signal
1	COM4_RX
2	COM4_TX
3	GND

CN6 (for COM4)
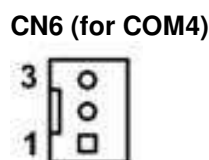
3.5.4 Digital I/O Ports (CN7 and CN8)

The board is equipped with two 4-channel digital I/O connectors that meet requirements for a system customary automation control. You may use software programming to control these digital signals.

Pin	CN7 Signal
1	GPIO1_30
2	GPIO1_29
3	GPIO1_28
4	GPIO0_27
5	GND

CN7
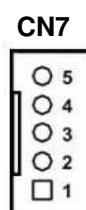
Pin	CN8 Signal
1	GPIO0_26
2	GPIO0_24
3	GPIO0_17
4	GPIO0_16
5	GND

CN8
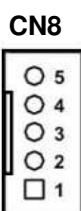
3.5.5   ZIF Connectors (CN10, CN11 and CN14)

This board has a 50-pin ZIF connector (CN10) for interfacing Axiomtek Proprietary IO from SoM.

Pin	Signal	Pin	Signal
1	GND	2	COM4_RX
3	COM4_TX	4	GND
5	COM1_TX	6	COM1_RTS
7	COM1_RX	8	COM1_CTS
9	GND	10	COM2_TX
11	COM2_RTS	12	COM2_RX
13	COM2_CTS	14	GND
15	N.C.	16	COM3_RX
17	GPIO2_26	18	COM3_TX
19	GND	20	CAN1_TX
21	CAN1_RX	22	GND
23	LDADC4	24	GND
25	LDADC2	26	GND
27	LDADC5	28	GND
29	LDADC3	30	GND
31	LDADC6	32	GND
33	LRADC1	34	GND
35	TP1	36	GND
37	CAN_PWDN	38	USB0_PWR_EN
39	USB1_PWR_EN	40	GPIO0_16
41	GPIO0_17	42	GPIO0_24
43	GPIO0_26	44	GPIO0_27
45	GPIO1_28	46	GPIO1_29
47	GPIO1_30	48	GPIO2_14
49	GPIO3_27	50	GND

CN10

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

CN11

Pin	Signal	Pin	Signal
1	N.C.	2	N.C.
3	GND	4	GND
5	N.C.	6	N.C.
7	LCD_ENABLE	8	LCD_VSYNC
9	LCD_HSYNC	10	LCD_DISP
11	LCD_CLOCKIN	12	GND
13	LCD_D07	14	LCD_D06
15	LCD_D05	16	LCD_D04
17	LCD_D03	18	LCD_D02
19	LCD_D01	20	LCD_D00
21	LCD_D15	22	LCD_D14
23	LCD_D13	24	LCD_D12
25	LCD_D11	26	LCD_D10
27	LCD_D09	28	LCD_D08
29	LCD_D23	30	LCD_D22
31	LCD_D21	32	LCD_D20
33	LCD_D19	34	LCD_D18
35	LCD_D17	36	LCD_D16
37	N.C.	38	N.C.
39	GND	40	GND
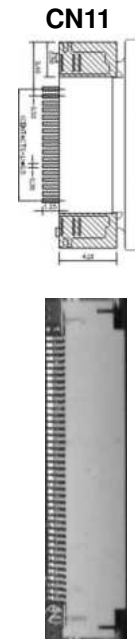
Note: **Gently connect Q7M100 SoM to these CN10 and CN11..**

This board also has a 50-pin ZIF connector (CN14) for interfacing TTL LCD and touchscreen from baseboard.

CN14

Pin	Signal	Pin	Signal
1	GND	2	GND
3	REG_3V3	4	REG_3V3
5	LCD_D16	6	LCD_D17
7	LCD_D18	8	LCD_D19
9	LCD_D20	10	LCD_D21
11	LCD_D22	12	LCD_D23
13	LCD_D08	14	LCD_D09
15	LCD_D10	16	LCD_D11
17	LCD_D12	18	LCD_D13
19	LCD_D14	20	LCD_D15
21	LCD_D00	22	LCD_D01
23	LCD_D02	24	LCD_D03
25	LCD_D04	26	LCD_D05
27	LCD_D06	28	LCD_D07
29	GND	30	LCD_CLOCKIN
31	LCD_DISP	32	LCD_HSYNC
33	LCD_VSYNC	34	LCD_ENABLE
35	N.C.	36	N.C.
37	GND	38	GND
39	TOUCH_X0	40	TOUCH_Y1
41	TOUCH_X1	42	TOUCH_Y0
43	N.C.	44	N.C.
45	N.C.	46	LEDB-
47	LEDB+	48	GND
49	GND	50	GND

3.5.6 MXM Connector (CN13)

This SMT type 0.50mm [.020"] pitch, 230-pin MXM connector is available in 2 different heights (5.5mm and 7.8mm) for maximum flexibility.
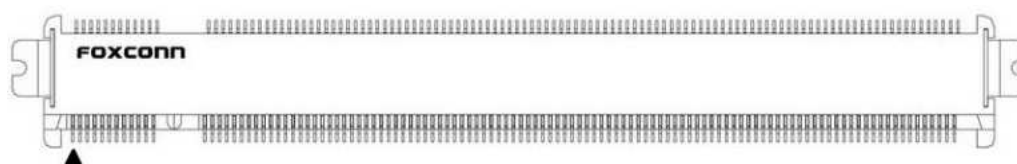
Pin	Signal	Pin	Signal
1	GND	2	GND
3	ETH1_RXN	4	ETH1_TXN
5	ETH1_RXP	6	ETH1_TXP
7	ETH0_100MLED2	8	ETH1_100MLED2
9	ETH0_RXN	10	ETH0_TXN
11	ETH0_RXP	12	ETH0_TXP
13	ETH0_LINKLED1	14	ETH1_LINKLED1
15	ETH0_CT	16	ETH1_CT
17	N.C.	18	3V3_ENABLE
19	N.C.	20	N.C.
21	N.C.	22	N.C.
23	GND	24	GND
25	GND	26	N.C.
27	N.C.	28	SW_RESET
29	N.C.	30	N.C.
31	N.C.	32	N.C.
33	N.C.	34	GND
35	N.C.	36	N.C.
37	N.C.	38	N.C.
39	GND	40	GND
41	N.C.	42	SDIO1_CLK
43	SDIO1_CD	44	N.C.
45	SDIO1_CMD	46	SDIO1_WP
47	SDIO1_PWR	48	SDIO1_D1
49	SDIO1_D0	50	SDIO1_D3
51	SDIO1_D2	52	SDIO1_D5
53	SDIO1_D4	54	SDIO1_D7
55	SDIO1_D6	56	N.C.
57	GND	58	GND
59	I2S_LRCLK	60	N.C.
61	SYS_MCLK	62	N.C.
63	I2S_SCLK	64	N.C.
65	I2S_DOUT	66	I2C1_CLK
67	I2S_DIN	68	I2C1_DAT
69	N.C.	70	N.C.
71	N.C.	72	N.C.
73	GND	74	GND
75	N.C.	76	N.C.
77	N.C.	78	N.C.
79	N.C.	80	N.C.

Pin	Signal	Pin	Signal
81	N.C.	82	N.C.
83	N.C.	84	N.C.
85	USB1_OC	86	USB0_OC
87	N.C.	88	USB1_DM
89	N.C.	90	USB1_DP
91	N.C.	92	USB0_ID
93	N.C.	94	USB0_DM
95	N.C.	96	USB0_DP
97	GND	98	GND
99	N.C.	100	N.C.
101	N.C.	102	N.C.
103	N.C.	104	N.C.
105	N.C.	106	N.C.
107	N.C.	108	N.C.
109	N.C.	110	N.C.
111	N.C.	112	N.C.
113	N.C.	114	N.C.
115	N.C.	116	N.C.
117	GND	118	GND
119	N.C.	120	N.C.
121	N.C.	122	N.C.
123	BACKLIGHT_PWM	124	N.C.
125	I2C0_DAT	126	N.C.
127	I2C0_CLK	128	N.C.
129	CAN0_TX	130	CAN0_RX
131	N.C.	132	N.C.
133	N.C.	134	N.C.
135	GND	136	GND
137	N.C.	138	N.C.
139	N.C.	140	N.C.
141	GND	142	GND
143	N.C.	144	N.C.
145	N.C.	146	N.C.
147	GND	148	GND
149	N.C.	150	N.C.
151	N.C.	152	N.C.
153	N.C.	154	N.C.
155	N.C.	156	N.C.
157	N.C.	158	N.C.
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	N.C.	172	N.C.
173	N.C.	174	N.C.
175	N.C.	176	N.C.
177	N.C.	178	N.C.

Pin	Signal	Pin	Signal
179	N.C.	180	N.C.
181	N.C.	182	N.C.
183	GND	184	GND
185	N.C.	186	N.C.
187	N.C.	188	N.C.
189	N.C.	190	N.C.
191	N.C.	192	N.C.
193	VCC_RTC	194	N.C.
195	N.C.	196	N.C.
197	GND	198	GND
199	SPI_MOSI	200	SPI_CS0#
201	SPI_MISO	202	SPI_CS1#
203	SPI_SCK	204	N.C.
205	N.C.	206	N.C.
207	N.C.	208	N.C.
209	N.C.	210	N.C.
211	WALL_5V_IN	212	WALL_5V_IN
213	WALL_5V_IN	214	WALL_5V_IN
215	WALL_5V_IN	216	WALL_5V_IN
217	WALL_5V_IN	218	WALL_5V_IN
219	WALL_5V_IN	220	WALL_5V_IN
221	WALL_5V_IN	222	WALL_5V_IN
223	WALL_5V_IN	224	WALL_5V_IN
225	WALL_5V_IN	226	WALL_5V_IN
227	WALL_5V_IN	228	WALL_5V_IN
229	WALL_5V_IN	230	WALL_5V_IN

### 3.5.7 SDHC Card 1 Socket (CN15)

This board has a SDHC Card 1 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)
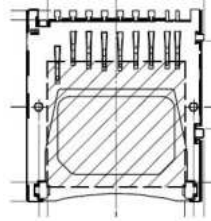
3.5.8 Ethernet Port Connectors (CN17 and CN18)

This board has two RJ-45 connectors for Ethernet connection; CN17 for Ethernet port 0 and CN18 for Ethernet port 1. Just plug in one end of the Ethernet 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)

CN17/CN18
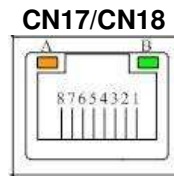
### 3.5.9 USB Port 1 Host Connector (CN19)

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	Signal
1	USB1_VBUS (+5V level)
2	USB1_DM
3	USB1_DP
4	GND
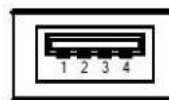
3.5.10   DC Jack Power Connector (CN20)

This is a DC power jack with lock. Firmly insert at least 25W adapter into this connector. Loose connection may cause system instability and make sure all components/devices are properly installed before connecting this power jack.
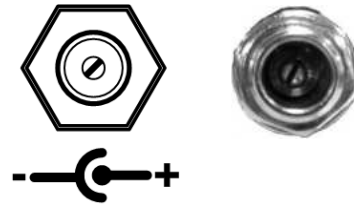
3.5.11   Mini USB OTG Port 0 Host/Device Connector (CN21)

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	Signal
1	USB0_VBUS (+5V level)
2	USB0_DM
3	USB0_DP
4	USB0_ID
5	GND
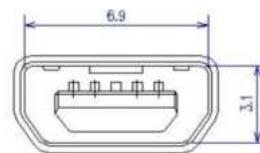
3.5.12   Audio Headphone Jack (CN22)

The board comes with one audio headphone jack.

Pin Color	Signal
Green	Headphone

3.5.13   Audio MIC-in Jack (CN24)

The board comes with one audio MIC-in jack.

Pin Color	Signal
Pink	MIC IN

3.5.14   User Buttons for Keypad (SW2~SW9)

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

Push Button	Description
SW2	KEY1
SW3	RIGHT
SW4	KEY2
SW5	LEFT
SW6	UP
SW7	KEY3
SW8	DOWN
SW9	SELECT

SW2/SW3/SW4/SW5/SW6/SW7/SW8/SW9

3.5.15   Reset Button (SW10)

This is the reset button for rebooting your system.

Push Button	Description
SW10	Reboot system