AXIOMTEK

Q7B300

Qseven Module Development Board

User's Manual

RoHS

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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.

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Chapter 1
Introduction

The Q7B300 is a new development baseboard for embedded Qseven Module and fully compliant with the Qseven Specification 2.0 standard. The Qseven is an open industry standard for Qseven modules, designed to be future proof and to provide a smooth transition path from legacy parallel interfaces to LVDS interfaces. In addition to the standard output signals for converting, Q7B300 provides one PCI-Express Mini Card socket and one SD card slot for expansion purposes.

This board supports various I/O features: display interfaces (DP/eDP and LVDS), one Gigabit/Fast Ethernet, HD audio codec, two SATA-600, two USB 3.0 and two RS-232 connectors.

With Q7B300, customers can develop their own applications and upgrade the system configuration in advance to meet faster time-to-market.

1.1   Features

- 1 Gigabit Ethernet port
- 2 SATA connectors
- 2 RS-232/422/485,1 RS-232
- 3 PCIe x1 slots
- 3 USB 3.0 ports / 1 micro USB 2.0 port (Optional)
- 1 mini PCI-Express slot (PCIe+USB+SMBus)
- 1 SD card slot
- LVDS or eDP/DP connector

1.2   Specifications

● **CPU**
  ■ On the Qseven module.

● **System Chipset**
  ■ On the Qseven module.

● **BIOS**
  ■ On the Qseven module.

● **System Memory**
  ■ On the Qseven module.

● **Onboard Multi I/O**
  ■ Two RS-232/422/485.
  ■ One RS232 (RX/TX/RTS/CTS).

● **Serial ATA**
  ■ Two SATA-600 connectors.

● **Ethernet**
  ■ LAN chip on Qseven module.
  ■ 1000/100/10Mbps Gigabit/Fast Ethernet interface (depend on module).

● **Audio**
  ■ HD audio with line-in/line-out/MIC-in.

● **USB Interface**
  ■ One micro USB 2.0 connector (Optional).
  ■ Three USB 3.0 connectors (USB 2.0 compliant).

● **SPI**
  ■ Not supported.

● **I2C**
  ■ Supported.

● **Digital I/O**
  ■ Four inputs and four outputs.

● **Fan**
  ■ Make sure you use the matching Q7B300 heatsink (P/N:7118Q311000E) or heatspreader (P/N : 7128Q311000E) for connecting to Axiomtek Qseven module.

- **Display**
  - One 40-pin connector for 18/24-bit single/dual channel LVDS and one 8-pin inverter connector.
  - One eDP connector (switchable to LVDS with jumper setting).
  - One DisplayPort.

- **Expansion Interface**
  - Full-size PCI-Express Mini Card socket which comply with PCI-Express Mini Card Spec. V1.2.

- **Battery**
  - Lithium 3V/220mAH.

- **Size**
  - 293.4 x 171.5mm.

- **Board Thickness**
  - 1.6mm.

- **Operation Temperature**
  - -20°C ~ +70°C.

- **Operation Humidity**
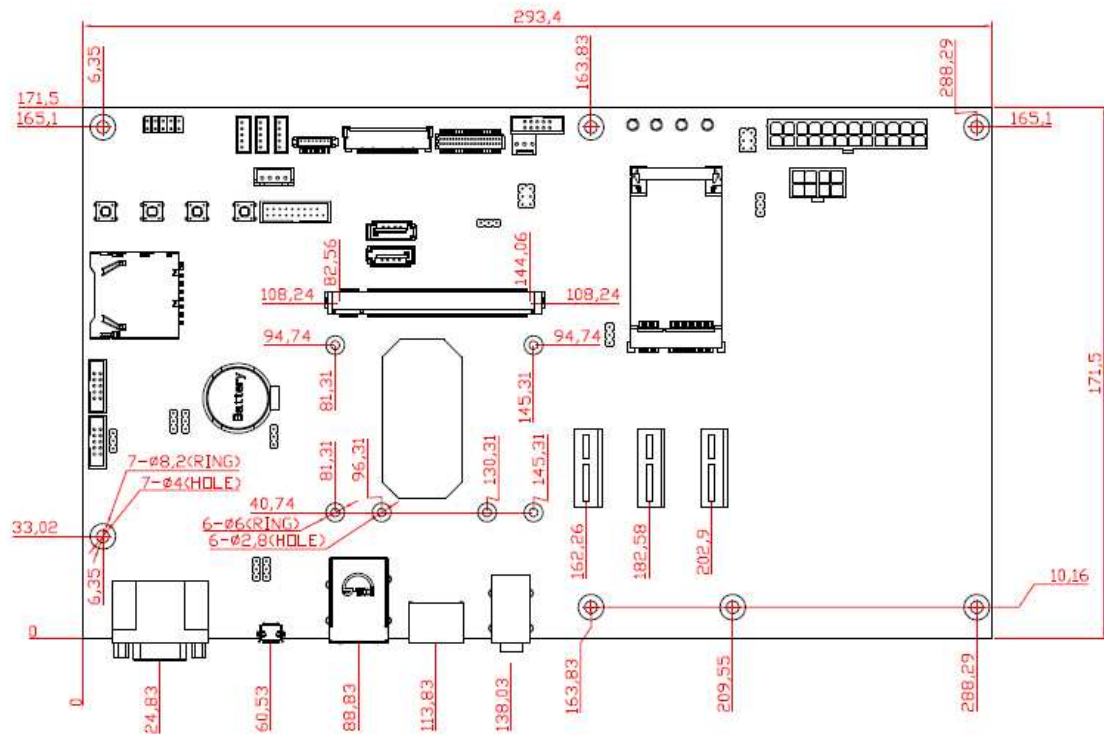 - 10% ~ 95% relative humidity, non-condensing.

All specifications and images are subject to change without notice.

Note
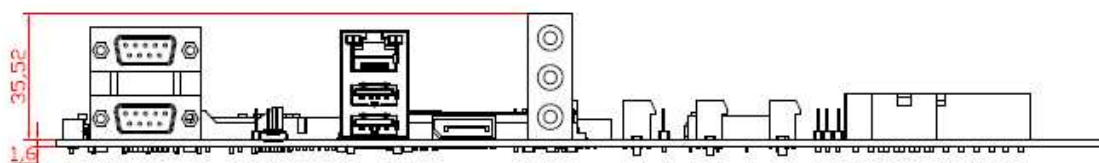
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Chapter 2
Board and Pin Assignments

2.1   Board Dimensions and Fixing Holes

Top View

Front View

2.2 Board Layout
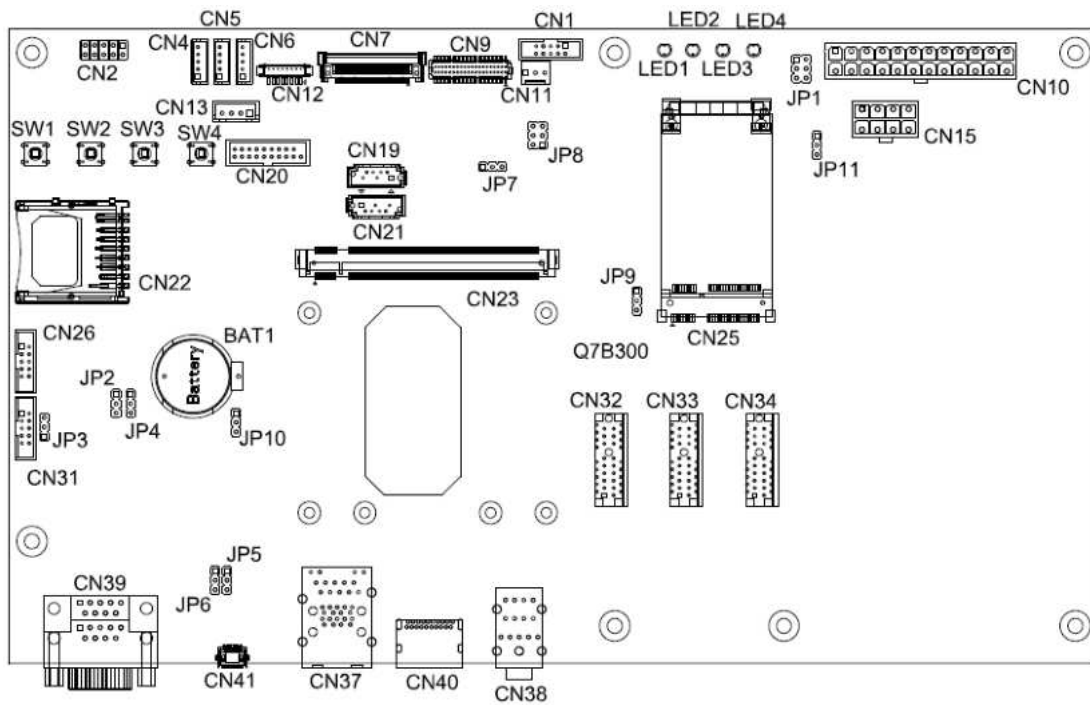
Top View
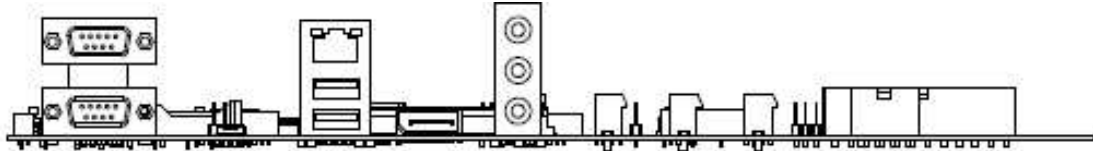
Front View

2.3   Installing Qseven Module and Thermal Solution

For thermal dissipation, a heatsink enables the components on the Qseven module to dissipate heat efficiently. All heat generating components are thermally conducted to the heatsink in order to avoid hot spots. Below images illustrate how to install the heatsink.

1.   There is a protective plastic covering on the thermal pads. This must be removed before the heatsink can be mounted.

2.   Each heatsink is designed for a specific Qseven module. The thermal pads on the heatsink are designed to make contact with the necessary components on the Qseven module. When mounting the heatsink you must make sure that the thermal pads on the heatsink make complete contact (no space between thermal pad and component) with the corresponding components on the Qseven module. This is especially critical for Qseven modules that have higher CPU speeds (for example 1.46GHz or more) to ensure that the heatsink acts as a proper thermal interface for cooling solutions.

3.   This CPU module has four assembly holes for installing heatsink plate. Fix the heatsink plate to the Qseven module and install to carrier board. Be careful not to over-tighten the screws.

A . Q seven T herm al S o lution
B . Q sevnn M odule
C . Cool B ar
D . 2pcs, 5H *5L *M 2.5 Hex Female Copper Standoff
E . 2pcs, M 2.5*4L Screw
F . 2pcs, M 2.5 Nut
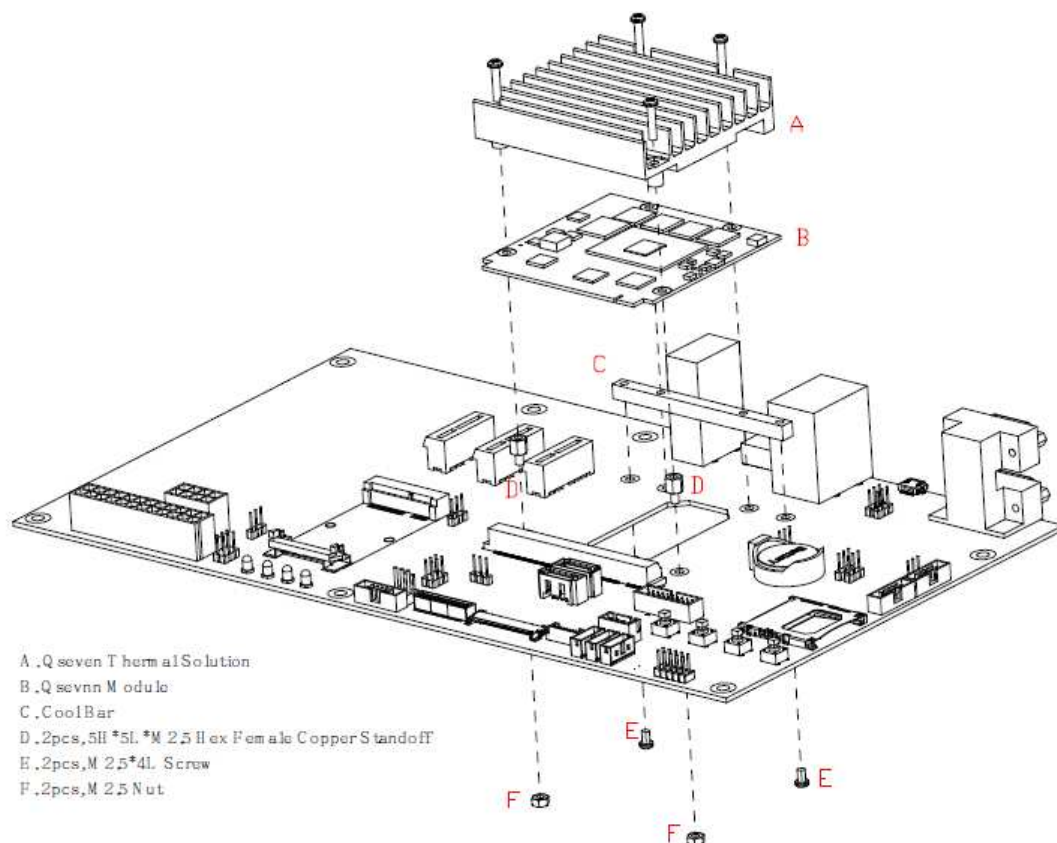
2.4   Jumper Settings

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.
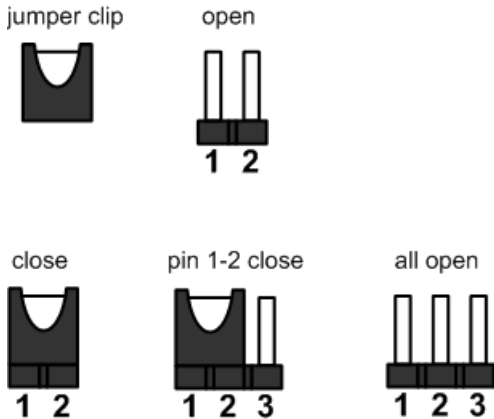
Properly configure jumper settings on the Q7B300 to meet your application purpose. Below you can find a summary table of all jumpers and onboard default settings.

Note

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

Jumper	Description	Setting
JP1	PWR_OK Signal Source Selection Default: From ATX Power	3-4 Close
JP2	LPC/GPIO Selection Default: LPC	2-3 Close
JP3	Enable/Disable COM function Default: Disable	1-2 Close
JP4	I2S/HDA Selection Default: HDA	2-3 Close
JP5	Route USB 2.0 Port 1 Signals Default: To Standard USB A Connector	2-3 Close
JP6	USB Port 1 OTG/Host Mode Selection Default: Host Mode	2-3 Close
JP7	LVDS/eDP Function Selection Default: LVDS	1-2 Close
JP8	LVDS Voltage Selection Default: +3.3V	1-2 Close
JP9	Boot BIOS Selection Default: Boot from Module BIOS	1-2 Close
JP10	Restore BIOS Optimal Defaults Default: Normal Operation	1-2 Close
JP11	AT/ATX Power Mode Setting Default: ATX Mode	2-3 Close

2.4.1 PWR_OK Signal Source Selection (JP1)

Use JP1 to select PWR_OK signal source.

Function	Setting
Pull up to signal PWR_OK	1-2 close
From ATX power (Default)	3-4 close
From carrier DC/DC circuit	5-6 close
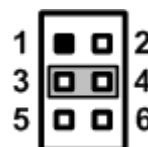
2.4.2 LPC/GPIO Selection (JP2)

Use JP2 to select LPC or GPIO.

Function	Setting
GPIO	1-2 close
LPC (Default)	2-3 close

2.4.3 Enable/Disable COM function (JP3)

Use JP3 to enable or disable COM port function from carrier board NTC5104.

Function	Setting
Disable (Default)	1-2 close
Enable	2-3 close

2.4.4 I2S/HDA Selection (JP4)

Use JP4 to select I2S or Intel HDA.

Function	Setting
I2S	1-2 close
HDA (Default)	2-3 close

2.4.5 Route USB 2.0 Port 1 Signals (JP5)

Use JP5 to route USB 2.0 port 1 to standard USB A connector or to micro AB.

Function	Setting
Route to micro AB	1-2 close
Route to standard USB A connector (Default)	2-3 close

2.4.6 USB Port 1 OTG/Host Mode Selection (JP6)

The USB port 1 supports two modes of operation: USB Host mode and OTG (On-The-Go) mode; they are selectable through jumper JP6.

Function	Setting
Set USB port 1 to OTG mode	1-2 close
Set USB port 1 to Host mode (Default)	2-3 close

2.4.7 LVDS/eDP Function Selection (JP7)

The JP7 is for LVDS or eDP function selection.

Function	Setting
LVDS (Default)	1-2 close
eDP	2-3 close

2.4.8 LVDS Voltage Selection (JP8)

The board supports voltage selection for flat panel displays. Use this jumper to set LVDS connector (CN9) pin 1~6 VCCM to +3.3V, +5V or +12V. To prevent hardware damage, before connecting please make sure that the input voltage of flat panel is correct.

Function	Setting
+3.3V (Default)	1-2 close
+5V	3-4 close
+12V	5-6 close
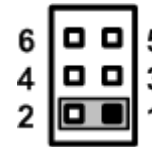
2.4.9 Boot BIOS Selection (JP9)

Use JP9 to select system to boot from module BIOS or from carrier BIOS.

Function	Setting
On module SPI flash (Default)	1-2 close
Carrier SPI flash	2-3 close

2.4.10 Restore BIOS Optimal Defaults (JP10)

Put jumper clip to pin 2-3 for a few seconds then move it back to pin 1-2. Doing this procedure can restore BIOS optimal defaults.

Function	Setting
Normal (Default)	1-2 close
Restore BIOS optimal defaults	2-3 close

2.4.11 AT/ATX Power Mode Setting (JP11)

Use JP11 to select AT or ATX power mode.

Function	Setting
AT mode	1-2 close
ATX mode (Default)	2-3 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	COM Wafer Connector
CN2	Front Panel Connector
CN4	SMBus Connector
CN5	I2C Connector
CN6	CAN Connector
CN7	eDP Connector
CN9	LVDS Connector
CN10, CN15	ATX Power Connectors
CN11	Fan Connector
CN12	Inverter Connector
CN13	SATA Power Connectors
CN19, CN21	SATA Connectors
CN20	USB 3.0 Port 2 Wafer Connector
CN22	SD Card Slot
CN23	Qseven Connector
CN25	PCI-Express Mini Card Connector
CN26	I2S Connector
CN31	Digital I/O Connector
CN32~CN34	PCI-Express x1 Slots
CN37	Ethernet, USB 3.0 Port 0 and 1 Stack
CN38	Audio Jack
CN39	COM D-Sub Connector
CN40	DisplayPort Connector
CN41 (Optional)	USB 2.0 Port 1

2.5.1   COM Connectors (CN1 and CN39)

The board has three serial port connectors. The CN1 is a 2x5-pin wafer connector for RS-232 interface from module.

Pin	Signal
1	NC
2	NC
3	Receive Data (RXD)
4	Request To Send (RTS)
5	Transmit Data (TXD)
6	Clear To Send (CTS)
7	NC
8	NC
9	Ground (GND)
10	NC

CN1
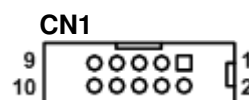
The CN39 is a double-deck DB-9 connector for RS-232/422/485 interface from carrier board. Each serial port is selectable to operate in different mode through BIOS setting.

Pin	Pin	RS-232	RS-422	RS-485
1	10	Data Carrier Detect (DCD)	TX-	Data-
2	11	Receive Data (RXD)	TX+	Data+
3	12	Transmit Data (TXD)	RX+	No use
4	13	Data Terminal Ready (DTR)	RX-	No use
5	14	Ground (GND)	No use	No use
6	15	Data Set Ready (DSR)	No use	No use
7	16	Request to Send (RTS)	No use	No use
8	17	Clear to Send (CTS)	No use	No use
9	18	Ring Indicator (RI)	No use	No use
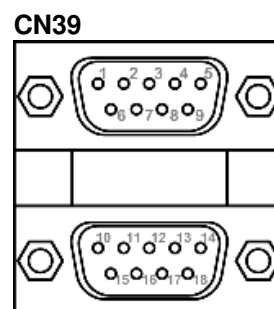
CN39

Note

Use jumper JP3 to enable or disable COM port function on CN39, see section 2.4.3.

2.5.2 Front Panel Connector (CN2)

The CN2 is a 2x5-pin connector for front panel interface.

Pin	Signal	Pin	Signal
1	GND	2	ATX_PSON#
3	PWRLED-	4	PWRLED+
5	PWRSW-	6	PWRSW+
7	HW RST-	8	HW RST+
9	HDDLED-	10	HDDLED+

ATX Power Supply ON
Short pin 1 and pin 2, ATX power supply is forcing to turn on state. Otherwise, system will control ATX power supply state.
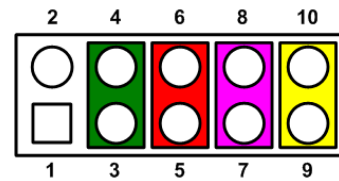
Power LED
Pin 4 connects anode(+) of LED and pin 3 connects cathode(-) of LED. The power LED lights up when the system is powered on.

Power On/Off Button
Pin 5 and 6 connect the power button on front panel to the CPU board, which allows users to turn on or off power supply.

System Reset Switch
Pin 7 and 8 connect the case-mounted reset switch that reboots your computer without turning off the power switch. It is a better way to reboot your system for a longer life of system power supply.

HDD Activity LED
This connection is linked to hard drive activity LED on the control panel. LED flashes when HDD is being accessed. Pin 9 and 10 connect the hard disk drive to the front panel HDD LED, pin 9 is assigned as cathode(-) and pin 10 is assigned as anode(+).

2.5.3 SMBus Connector (CN4)

The CN4 is a 5-pin connector for SMBus interface. The SMBus (System Management Bus) is a simple bus for the purpose of lightweight communication.

Pin	Signal
1	+3.3V
2	SMB_CLK
3	SMB_DATA
4	SMB_ALERT
5	GND
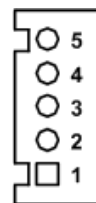
2.5.4   I2C Connector (CN5)

The CN5 is a 5-pin connector for I2C interface.

Pin	Signal
1	+3.3V
2	I2C_CLK
3	I2C_DATA
4	NC
5	GND
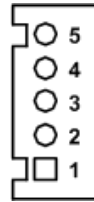
2.5.5   CAN Connector (CN6)

The CN6 is a 5-pin connector for CAN interface. Controller Area Network (CAN or CAN-bus) is a message based protocol designed specifically for automotive applications but now is also used in other areas such as industrial automation and medical equipment.

Pin	Signal
1	+3.3V
2	CAN_TX(CMOS 3.3V)
3	CAN_RX(CMOS 3.3V)
4	NC
5	GND
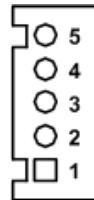
2.5.6   eDP Connector (CN7)

The eDP (embedded DisplayPort) interface is available through 40-pin connector (CN7). The eDP is a design to replace internal digital LVDS links in computer monitor panels and TV panels. You can select LVDS or eDP function with jumper JP7, see section 2.4.7. Also pin 1~4 VCCM can be set to +3.3V, +5V or +12V with jumper JP8, see section 2.4.8.

Pin	Signal	Pin	Signal
1	VCCM*	21	eDP0_TX0-
2	VCCM*	22	eDP0_TX0+
3	VCCM*	23	High Speed_GND
4	VCCM*	24	eDP0_AUX+
5	NC	25	eDP0_AUX-
6	LCD_GND	26	High Speed_GND
7	LCD_GND	27	BKLT_GND
8	LCD_GND	28	BKLT_GND
9	LCD_GND	29	BKLT_GND
10	eDP0_HPD#	30	BKLT_GND
11	High Speed_GND	31	NC
12	eDP0_TX3-	32	LVDS_BLT_CTRL
13	eDP0_TX3+	33	LVDS_BLEN
14	High Speed_GND	34	NC
15	eDP0_TX2-	35	NC
16	eDP0_TX2+	36	BKLT_VCC_12V
17	High Speed_GND	37	BKLT_VCC_12V
18	eDP0_TX2-	38	BKLT_VCC_12V
19	eDP0_TX2+	39	BKLT_VCC_12V
20	High Speed_GND	40	NC

40   **1**
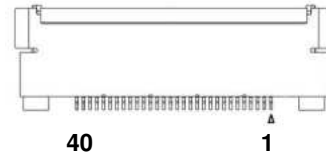
2.5.7   LVDS Connector (CN9)

This board has a 2x20-pin connector for LVDS LCD interface. It is strongly recommended to use the matching JST SHDR-40VS-B connector for LVDS interface. You can select LVDS or eDP function with jumper JP7, see section 2.4.7. Also pin 1~4 VCCM can be set to +3.3V, +5V or +12V with jumper JP8, see section 2.4.8.

Pin	Signal	Pin	Signal
1	VCCM*	2	VCC1*
3	VCCM*	4	VCCM*
5	VCCM*	6	VCCM*
7	LVDS_DID_DAT	8	LVDS_DID_CLK
9	GND	10	GND
11	LVDS_B3-	12	LVDS_B0-
13	LVDS_B3+	14	LVDS_B0+
15	GND	16	GND
17	LVDS_B_CLK-	18	LVDS_B1-
19	LVDS_B_CLK+	20	LVDS_B1+
21	GND	22	GND
23	LVDS_A0-	24	LVDS_B2-
25	LVDS_A0+	26	LVDS_B2+
27	GND	28	GND
29	LVDS_A1-	30	LVDS_A3-
31	LVDS_A1+	32	LVDS_A3+
33	GND	34	GND
35	LVDS_A2-	36	LVDS_A_CLK-
37	LVDS_A2+	38	LVDS_A_CLK+
39	GND	40	GND
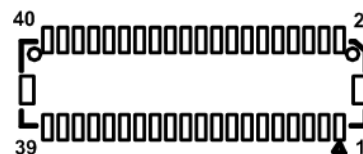
2.5.8   ATX Power Connectors (CN10 and CN15)

Steady and sufficient power can be supplied to all components on the board by connecting power connector. Please make sure all components and devices are properly installed before connecting the power connector.

External power supply plug fits into this connector in only one orientation. Properly press down power supply plug until it completely and firmly fits into this connector. Loose connection may cause system instability.

Note   ***Use jumper JP11 to select AT or ATX mode, see section 2.4.11.***

The CN10 is a 24-pin ATX power connector.

Pin	Signal	Pin	Signal
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON#
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	PWR_ON	20	N.C.
9	+5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND
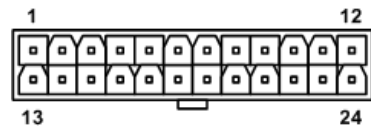
The CN15 is an 8-pin +12V ATX power connector. The Q7B300 supports AT mode when you plug only the 12V power supply into CN15.

Pin	Signal	Pin	Signal
1	GND	5	+12V
2	GND	6	+12V
3	GND	7	+12V
4	GND	8	+12V
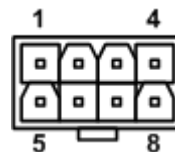
2.5.9   Fan Connector (CN11)

Fan is needed for cooling down system temperature. The system fan interface is available through 3-pin connector (CN11).

Pin	Signal
1	GND
2	FAN_PWMOUT
3	FAN_TACHOIN
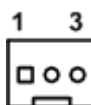
2.5.10   Inverter Connector (CN12)

The CN12 is an 8-pin connector for LVDS inverter interface. We strongly recommend you to use the matching DF13-8S-1.25C connector to avoid malfunction.

Pin	Signal
1	VBL1 (+12V)
2	VBL1 (+12V)
3	VBL2 (+5V)
4	LVDS_BLEN
5	GND
6	GND
7	GND
8	LVDS_BLT_CTRL
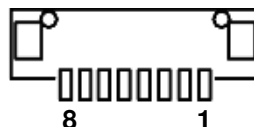
2.5.11   SATA Power Connector (CN13)

This is a 4-pin connector for interfacing to SATA 2.5" and SATA 3.5" HDD power supply which also could supply dual HDD.

Pin	Signal
1	+12V
2	GND
3	GND
4	+5V
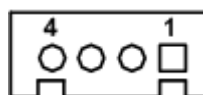
2.5.12   SATA Connectors (CN19 and CN21)

The Serial Advanced Technology Attachment (Serial ATA or SATA) connector is computer bus interface for connecting to devices such as hard disk drive.

Pin	Signal
1	GND
2	SATA_TX+
3	SATA_TX-
4	GND
5	SATA_RX-
6	SATA_RX+
7	GND
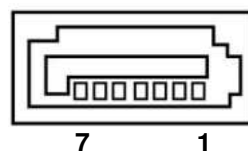
2.5.13 USB 3.0 Wafer Connector (CN20)

The CN20 is a 19-pin wafer connector for installing versatile USB peripherals such as keyboard, mouse, scanner, etc.; which is also compatible with USB 2.0 devices.

Pin	Signal	Pin	Signal
1	+5V	11	NC
2	USB_SSRX2-	12	NC
3	USB_SSRX2+	13	NC
4	GND	14	NC
5	USB_SSTX2-	15	NC
6	USB_SSTX2+	16	NC
7	GND	17	NC
8	USB_P2-	18	NC
9	USB_P2+	19	NC
10	NC		
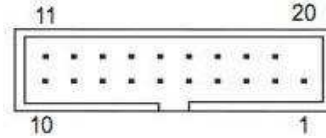
2.5.14 SD Card Slot (CN22)

The Secure Digital (SD) is a flash memory card format used in portable device including notebook and digital camera.

Pin	Signal
1	SDIO_DAT3
2	SDIO_CMD
3	GND
4	+3.3V
5	SDIO_CLK#
6	GND
7	SDIO_DAT0
8	SDIO_DAT1
9	SDIO_DAT2
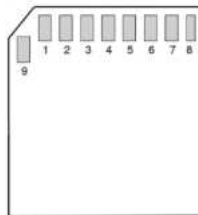
2.5.15   Qseven Connector (CN23)

The board comes with MXM 230-pin connector for Qseven interface. The MXM connector is a robust, low-cost edge connector that can handle high-speed signals.

Pin	Signal	Pin	Signal
1	GND	2	GND
3	GBE_MDI3-	4	GBE_MDI2-
5	GBE_MDI3+	6	GBE_MDI2+
7	GBE_LINK100#	8	GBE_LINK1000#
9	GBE_MDI1-	10	GBE_MDI0-
11	GBE_MDI1+	12	GBE_MDI0+
13	GBE_LINK#	14	GBE_ACT#
15	GBE_CTREF	16	SUS_S5#
17	WAKE#	18	SUS_S3#
19	GPO0	20	PWRBTN#
21	SLP_BTN# /GPII1	22	LID_BTN#/GPII0
23	GND	24	GND
	KEY		KEY
25	GND	26	PWGIN
27	BATLOW#/GPII2	28	RSTBTN#
29	SATA0_TX+	30	SATA1_TX+
31	SATA0_TX-	32	SATA1_TX-
33	SATA_ACT#	34	GND
35	SATA0_RX+	36	SATA1_RX+
37	SATA0_RX-	38	SATA1_RX-
39	GND	40	GND
41	BIOS_DISABLE#/BOOT_ALT#	42	SDIO_CLK#
43	SDIO_CD#	44	RSVD
45	SDIO_CMD	46	SDIO_WP
47	SDIO_PWR#	48	SDIO_DAT1
49	SDIO_DAT0	50	SDIO_DAT3
51	SDIO_DAT2	52	RSVD
53	RSVD	54	RSVD
55	RSVD	56	USB_OTG_PEN
57	GND	58	GND
59	HDA_SYNC/I2S_WS (Q7B300 JP4)	60	SMB_CLK/GP1_I2C_CLK
61	HDA_RST#/I2S_RST# (Q7B300 JP4)	62	SMB_DAT/GP1_I2C_DAT
63	HDA_BITCLK/I2S_CLK (Q7B300 JP4)	64	SMB_ALERT#
65	HDA_SDI/I2S_SDI (Q7B300 JP4)	66	GP0_I2C_CLK
67	HDA_SDO/I2S_SDO (Q7B300 JP4)	68	GP0_I2C_DAT
69	THRM#	70	WDTRIG#
71	THRMTRIP#	72	WDOUT
73	GND	74	GND
75	USB_P7-/USB_SSTX0-	76	USB_P6-/USB_SSRX0-
77	USB_P7+/USB_SSTX0+	78	USB_P6+/USB_SSRX0+
79	USB_6_7_OC#	80	USB_4_5_OC#
81	USB_P5-/USB_SSTX2-	82	USB_P4-/USB_SSRX2-
83	USB_P5+/USB_SSTX2+	84	USB_P4+/USB_SSRX2+
85	USB_2_3_OC#	86	USB_0_1_OC#
87	USB_P3-	88	USB_P2-
89	USB_P3+	90	USB_P2+

Pin	Signal	Pin	Signal
91	USB_VBUS	92	USB_ID
93	USB_P1-	94	USB_P0-
95	USB_P1+	96	USB_P0+
97	GND	98	GND
99	eDP0_TX0+/LVDS_A0+ (Q7B300 JP7)	100	eDP1_TX0+/LVDS_B0+
101	eDP0_TX0-/LVDS_A0- (Q7B300 JP7)	102	eDP1_TX0-/LVDS_B0-
103	eDP0_TX1+/LVDS_A1+ (Q7B300 JP7)	104	eDP1_TX1+/LVDS_B1+
105	eDP0_TX1-/LVDS_A1+ (Q7B300 JP7)	106	eDP1_TX1-/LVDS_B1-
107	eDP0_TX2+/LVDS_A2+ (Q7B300 JP7)	108	eDP1_TX2+/LVDS_B2+
109	eDP0_TX2-/LVDS_A2- (Q7B300 JP7)	110	eDP1_TX2-/LVDS_B2-
111	LVDS_PPEN	112	LVDS_BLEN
113	eDP0_TX3+/LVDS_A3+ (Q7B300 JP7)	114	eDP1_TX3+/LVDS_B3+
115	eDP0_TX3-/LVDS_A3- (Q7B300 JP7)	116	eDP1_TX3-/LVDS_B3-
117	GND	118	GND
119	eDP0_AUX+/LVDS_A_CLK+(Q7B300 JP7)	120	eDP1_AUX+/LVDS_B_CLK+
121	eDP0_AUX-/LVDS_A_CLK-(Q7B300 JP7)	122	eDP1_AUX-/LVDS_B_CLK-
123	LVDS_BLT_CTRL/GP_PWM_OUT0	124	GP_1-Wire_Bus/HDMI_CEC
125	GP2_I2C_DAT/LVDS_DID_DAT	126	eDP0_HPD#/LVDS_BLC_DAT
127	GP2_I2C_CLK/LVDS_DID_CLK	128	eDP1_HPD#/LVDS_BLC_CLK
129	CAN0_TX	130	CAN0_RX
131	DP_LANE3+/TMDS_CLK+	132	USB_SSTX1-
133	DP_LANE3-/TMDS_CLK-	134	USB_SSTX1+
135	GND	136	GND
137	DP_LANE1+/TMDS_LANE1+	138	DP_AUX+
139	DP_LANE1-/TMDS_LANE1-	140	DP_AUX-
141	GND	142	GND
143	DP_LANE2+/TMDS_LANE0+	144	USB_SSRX1-
145	DP_LANE2-/TMDS_LANE0-	146	USB_SSRX1+
147	GND	148	GND
149	DP_LANE0+/TMDS_LANE2+	150	HDMI_CTRL_DAT
151	DP_LANE0-/TMDS_LANE2-	152	HDMI_CTRL_CLK
153	HDMI_HPD#	154	DP_HPD#
155	PCIE_CLK_REF+	156	PCIE_WAKE#
157	PCIE_CLK_REF-	158	PCIE_RST#
159	GND	160	GND
161	PCIE3_TX+	162	PCIE3_RX+
163	PCIE3_TX-	164	PCIE3_RX-
165	GND	166	GND
167	PCIE2_TX+	168	PCIE2_RX+
169	PCIE2_TX-	170	PCIE2_RX-
171	UART0_TX	172	UART0_RTS#
173	PCIE1_TX+	174	PCIE1_RX+
175	PCIE1_TX-	176	PCIE1_RX-
177	UART0_RX	178	UART0_CTS#
179	PCIE0_TX+	180	PCIE0_RX+

Pin	Signal	Pin	Signal
181	PCIE0_TX-	182	PCIE0_RX-
183	GND	184	GND
185	LPC_AD0/GPIO0(Q7B300 JP2)	186	LPC_AD1/GPIO1(Q7B300 JP2)
187	LPC_AD2/GPIO2(Q7B300 JP2)	188	LPC_AD3/GPIO3(Q7B300 JP2)
189	LPC_CLK/GPIO4(Q7B300 JP2)	190	LPC_FRAME#/GPIO5(Q7B300 JP2)
191	SERIRQ/GPIO6(Q7B300 JP2)	192	LPC_LDRQ#/GPIO7(Q7B300 JP2)
193	VCC_RTC	194	SPKR/GP_PWM_OUT2
195	FAN_TACHOIN/GP_TIMER_IN	196	FAN_PWMOUT/GP_PWM_OUT1
197	GND	198	GND
199	SPI_MOSI	200	SPI_CS0#
201	SPI_MISO	202	SPI_CS1#
203	SPI_SCK	204	MFG_NC4
205	VCC_5V_SB	206	VCC_5V_SB
207	MFG_NC0	208	MFG_NC2
209	MFG_NC1	210	MFG_NC3
211	NC	212	NC
213	NC	214	NC
215	NC	216	NC
217	NC	218	NC
219	VCC	220	VCC
221	VCC	222	VCC
223	VCC	224	VCC
225	VCC	226	VCC
227	VCC	228	VCC
229	VCC	230	VCC

2.5.16   PCI-Express Mini Card Connector (CN25)

The CN25 is a PCI-Express Mini Card connector supporting PCI-Express x1 link and USB 2.0 link. The PCI-Express Mini Card can be applied to either PCI-Express or USB 2.0.

Pin	Signal	Pin	Signal
1	WAKE#	2	+3.3VSB
3	No use	4	GND
5	No use	6	+1.5V
7	CLKREQ#	8	No use
9	GND	10	No use
11	REFCLK-	12	No use
13	REFCLK+	14	No use
15	GND	16	No use
17	No use	18	GND
19	No use	20	No use
21	GND	22	PERST#
23	PCIE_RX0-	24	+3.3VSB
25	PCIE_RX0+	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PCIE_TX0-	32	SMB_DATA
33	PCIE_TX0+	34	GND
35	GND	36	USB_P3-
37	GND	38	USB_P3+
39	No use	40	GND
41	No use	42	No use
43	No use	44	No use
45	No use	46	No use
47	No use	48	+1.5V
49	No use	50	GND
51	No use	52	+3.3VSB
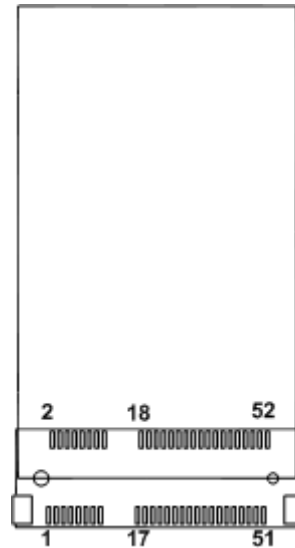
2.5.17   I2S Connector (CN26)

The CN26 is a 2x5-pin connector for I2S (Integrated Interchip Sound) interface. The I2S is an electrical serial bus interface standard used for connecting digital audio devices. You can select I2S or HDA support with jumper JP4, see section 2.4.4.
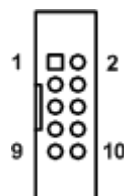
Pin	Signal
1	I2S_WS
2	+3.3V
3	I2S_CLK
4	SMB_DATA
5	I2S_SDO
6	SMB_CLK
7	I2S_SDI
8	NC
9	I2S_RST#
10	GND
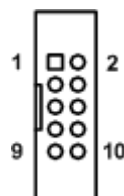
2.5.18   Digital I/O Connector (CN31)

The board is equipped with a 2x5-pin digital I/O connector (CN31) that meets requirements for a system customary automation control. The digital I/O can be configured to control cash drawers and sense warning signals from an Uninterrupted Power System (UPS), or perform store security control. The digital I/O is controlled via software programming.

| Pin	Signal
1	GPIO4
2	GPIO0
3	GPIO5
4	GPIO1
5	GPIO6
6	GPIO2
7	GPIO7
8	GPIO3
9	+3.3V
10	GND

Note

Use jumper JP2 to select LPC or GPIO function, see section 2.4.2.

2.5.19   PCI-Express x1 Slots (CN32~CN34)

The Q7B300 supports up to four PCI-Express x1: PCIe 0~3. The PCIe 0 is routed to CN25, and the PCIe 1~3 are routed to CN32~CN34.

Pin	Signal	Pin	Signal
B1	+12V	A1	PRSNT1#
B2	+12V	A2	+12V
B3	+12V	A3	+12V
B4	GND	A4	GND
B5	SMCLK	A5	JTAG2
B6	SMDAT	A6	JTAG3
B7	GND	A7	JTAG4
B8	+3.3V	A8	JTAG5
B9	JTAG1	A9	+3.3V
B10	3.3Vaux	A10	+3.3V
B11	WAKE#	A11	PWRGD
	KEY		KEY
B12	RSVD	A12	GND
B13	GND	A13	REFCLK+
B14	PCIE_TX+	A14	REFCLK-
B15	PCIE_TX-	A15	GND
B16	GND	A16	PCIE_RX+
B17	PRSNT2#	A17	PCIE_RX-
B18	GND	A18	GND

**A18**   **B18**

A1   **B1**
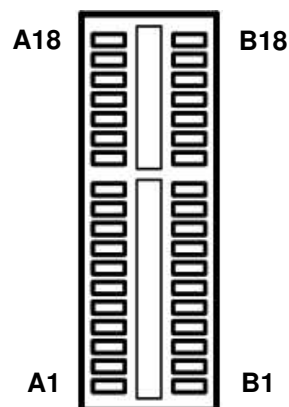
2.5.20 Ethernet and USB 3.0 Ports (CN37 and CN41)

The board is equipped with high performance plug and play Ethernet interface fully compliant with the IEEE 802.3 standard. The Ethernet port uses RJ-45 connector. Connection can be established by plugging one end of the Ethernet cable into this RJ-45 connector and the other end to a 1000/100/10-Base-T hub.

The lower double-deck USB connector is USB 3.0 and USB 2.0 compliant for connecting to any USB peripheral, such as keyboard, mouse or scanner.
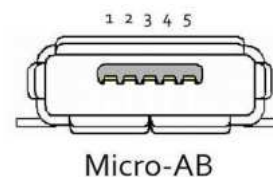
CN37:

Pin	LAN Signal	Pin	LAN Signal
L1	GBE_MDI0+	L5	GBE_MDI2-
L2	GBE_MDI0-	L6	GBE_MDI1-
L3	GBE_MDI1+	L7	GBE_MDI3+
L4	GBE_MDI2+	L8	GBE_MDI3-
A	Activity link LED OFF: No link Blinking: Link established; data activity detected		
B	Speed LED Orange: 1GMbps data rate Green: 100Mbps data rate OFF: 10Mbps data rate		

LAN

USB
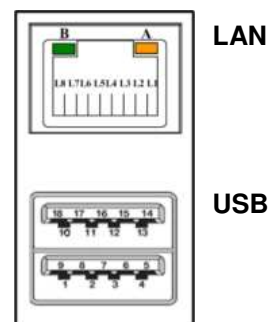
Pin	USB Signal	Pin	USB Signal
1	+5V	10	+5V
2	USB_P0-	11	USB_P1-
3	USB_P0+	12	USB_P1+
4	GND	13	GND
5	USB_SSRX0-	14	USB_SSRX1-
6	USB_SSRX0+	15	USB_SSRX1+
7	GND	16	GND
8	USB_SSTX0-	17	USB_SSTX1-
9	USB_SSTX0+	18	USB_SSTX1+

The USB 2.0 port 1 signals on CN41:

Pin	USB Signal	Pin	USB Signal
1	+5V	4	ID
2	USB_P1-	5	GND
3	USB_P1+		

1 2 3 4 5

Micro-AB

Note

1. *Select to route USB_P1 to CN37 or to CN41 with jumper JP5, see section 2.4.5.*
2. *Select operation mode (Host mode or OTG mode) supported by USB port 1 with jumper JP6, see section 2.4.6.*

2.5.21   Audio Jack (CN38)

The Q7B300 comes equipped with codec AL662. Install audio driver, then attach audio devices to CN38.

| Pin Color	Signal
Blue	LINE IN
Green	LINE OUT
Pink	MIC

Note — ***Use jumper JP4 to select   I2S or HDA function, see section 2.4.4.***

2.5.22   DisplayPort Connector (CN40)

The DisplayPort interface is available through connector CN40. DisplayPort is a standard designed to replace digital (DVI) and analog component video (VGA) connectors in computer monitors and video cards, as well as replace internal digital LVDS links in computer monitor panels and TV panels.
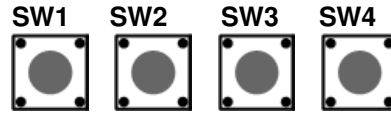
Pin	Signal
1	DP_LANE0+
2	GND
3	DP_LANE0-
4	DP_LANE1+
5	GND
6	DP_LANE1-
7	DP_LANE2+
8	GND
9	DP_LANE2-
10	DP_LANE3+
11	GND
12	DP_LANE3-
13	DP3_AUX_SEL
14	GND
15	DP_AUX+
16	GND
17	DP_AUX-
18	DP_HDMI_HPD#
19	GND
20	+3.3V
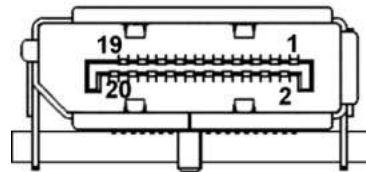
2.6   Push Buttons

The board has four push buttons, see table below.

Push Button	Description
SW1	Sleep button
SW2	Power button
SW3	Reset button
SW4	LID button

SW1   SW2   SW3   SW4

2.7   LED Indicators

The board has four LEDs and one dual 7-segment LED display. See table below for detailed information.

LED	Description
Power LED	Power state LED indicators for +12V ,+5V, +5V_SBY and +3.3V
7-segment LED	Dual 7-segment LED. Displays BIOS codes pushed out to LPC Port 80 during boot up process; which is very handy for debugging.

Power LED

7-segment LED