User Manual

SOM-DB3520

Qseven Development Board

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Product Warranty (2 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.

2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.

3. If your product is diagnosed as defective, obtain an RMA (return merchandize authorization) number from your dealer. This allows us to process your return more quickly.

4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.

5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class B

Note: 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.

FM

This equipment has passed the FM certification. According to the National Fire Protection Association, work sites are classified into different classes, divisions and groups, based on hazard considerations. This equipment is compliant with the specifications of Class I, Division 2, Groups A, B, C and D indoor hazards.

Technical Support and Assistance

1. Visit the Advantech website at http://support.advantech.com where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
   - Product name and serial number
   - Description of your peripheral attachments
   - Description of your software (operating system, version, application software, etc.)
   - A complete description of the problem
   - The exact wording of any error messages

Warnings, Cautions and Notes

Warning! *Warnings indicate conditions, which if not observed, can cause personal injury!*

Caution! *Cautions are included to help you avoid damaging hardware or losing data. e.g.*

There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Note! *Notes provide optional additional information.*

Document Feedback

To assist us in making improvements to this manual, we would welcome comments and constructive criticism. Please send all such - in writing to: support@advantech.com

Selection Guide w/ P/N

Part No.	Description
SOM-DB3520-00A1E	Qseven Development Board

Packing List

Before setting up the system, check that the items listed below are included and in good condition. If any item does not accord with the table, please contact your dealer immediately.

Part No.	Description	Quantity
-	SOM-DB3520 development board	1
SOM-EA10	SOM-EA10 A1 01, a PCIe card with 4 PCIe (*1) slot	1
1960075990N000	IO BRACKET SOM-DB3520	1
1700001788	F CABLE D-SUB 9P(M)/IDE#3 10P-2.54 30CM	1
1700008941	M Cable SATA 7P/SATA 7P 32CM C=R 180/180D W/Lock	1
1700018785	A CABLE SATA 15P/1*4P-2.5 35cm for AIMB-213	1
1700100170	A Cable 2*5P-2.54/USB-A(F)*2 17.5cm W/BKT F/9	1

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
    - The power cord or plug is damaged.
    - Liquid has penetrated into the equipment.
    - The equipment has been exposed to moisture.
    - The equipment does not work well, or you cannot get it to work according to the user's manual.
    - The equipment has been dropped and damaged.
    - The equipment has obvious signs of breakage.
15. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.
16. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
- Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

Acronyms

Term	Define
AC'97	Audio CODEC (Coder-Decoder)
ACPI	Advanced Configuration Power Interface – standard to implement power saving modes in PC-AT systems
BIOS	Basic Input Output System – firmware in PC-AT system that is used to initialize system components before handing control over to the operating system
CAN	Controller-area network (CAN or CAN-bus) is a vehicle bus standard designed to allow micro controllers to communicate with each other within a vehicle without a host computer
DDI	Digital Display Interface – containing DisplayPort, HDMI/DVI, and SDVO
EAPI	Embedded Application Programmable Interface Software interface for COM Express® specific industrial function ■ System information ■ Watchdog timer ■ I2C Bus ■ Flat Panel brightness control ■ User storage area ■ GPIO
GbE	Gigabit Ethernet
GPIO	General purpose input output
HDA	Intel High Definition Audio (HD Audio) refers to the specification released by Intel in 2004 for delivering high definition audio that is capable of playing back more channels at higher quality than AC'97
I2C	Inter Integrated Circuit – 2 wire (clock and data) signaling scheme allowing communication between integrated circuit, primarily used to read and load register values
ME	Management Engine
PC-AT	"Personal Computer – Advanced Technology" – an IBM trademark term used to refer to Intel based personal computer in 1990s
PEG	PCI Express Graphics
RTC	Real Time Clock – battery backed circuit in PC-AT systems that keeps system time and date as well as certain system setup parameters
SPD	Serial Presence Detect – refers to serial EEPROM on DRAMs that has DRAM Module configuration information
TPM	Trusted Platform Module, chip to enhance the security features of a computer system
UEFI	Unified Extensible Firmware Interface
WDT	Watch Dog Timer

Contents

Chapter 1

General Information

This chapter gives background information on SOM-DB3520 Qseven Development Board.

Sections include:

- Introduction
- Functional Block Diagram

1.1 Introduction

SOM-DB3520 is a new, Qseven Rev2.1 development board. In a Mini-ITX (170 x 170 mm) form factor, it features compatibility with Qseven 2.1 modules, and assists customers in emulating functions while developing their own carrier boards.

SOM-DB3520 has multiple expansion interface to meet various customer requirements, such as 1 PCIe x4 slot (may be used for PCIex1 via a riser card), 1 Mini-PCIe slot, 1 GbE, 1 SATA, 1 mSATA, 3 USB 3.0, 8 USB 2.0, 2 COM ports, 1 SD socket, TPM, CAN Bus, and HD audio. SOM-DB3520 also provides flexible alternative power options, such as standard ATX power supply and 12V DC-in adapter to satisfy diverse application scenarios.

1.2 Functional Block Diagram
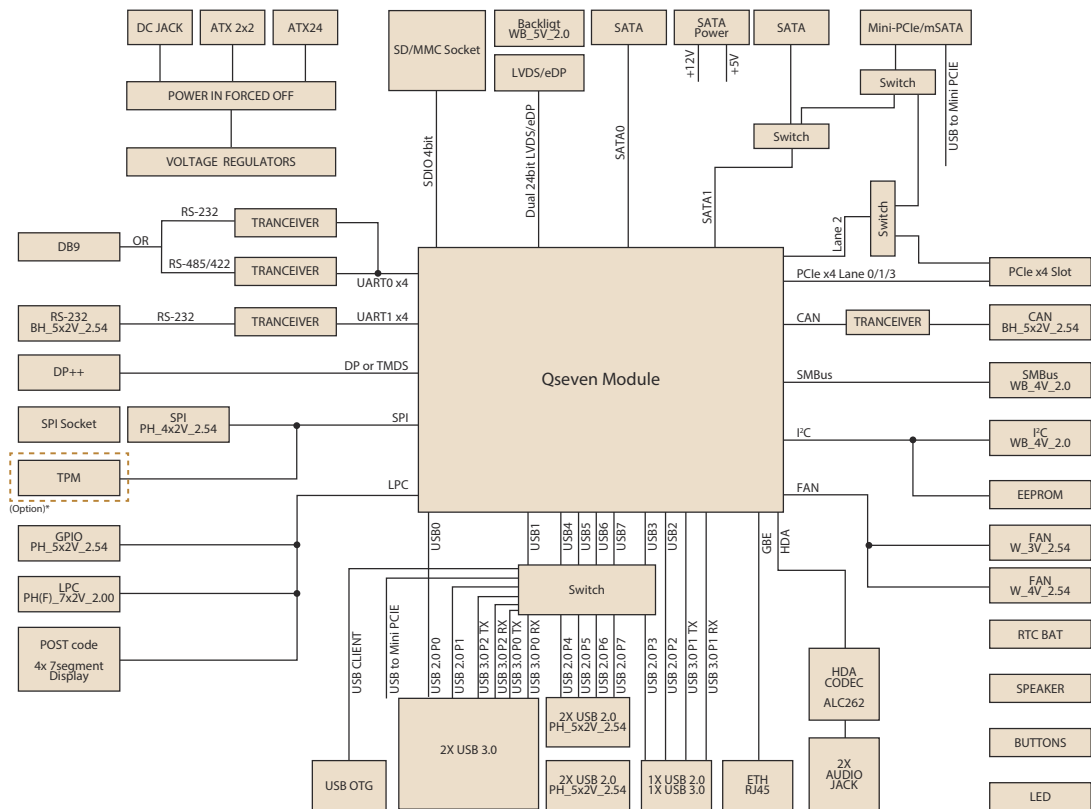
*- TPM function - depends on CPU platform, please confirm with PM/sales first.

1.2.1 Development Board

Part No.	Description
SOM-DB3520-00A1E	Qseven Development Board

1.2.2 Accessories

Panel	
96LEDK-A084SV45NB2	8.4" LED PANEL 450N 800X600(G) G084SN05 V9 (V901)

Cable	
96CB-L2040PAB4	LVDS CABLE 20-40PIN 50CM AB4 TYPE(G) (18BIT)
96CB-E0405PIB3	LED CABLE 4-5PIN 50CM IB3 TYPE(G)

Panel	
IDK-2121WN-K2FHA2E	21.5" LED panel 1200N 1920x1080(G)

Cable	
96CB-L3040PAF5	LVDS CABLE 30-40PIN 50CM AF5 TYPE(G)
96CB-E0605HAB1	LED CABLE 6-5PIN 50CM AB1 TYPE(G)

1.2.3 Pin Description

Advantech provides useful checklists for schematic design and layout routing. In the schematic checklist, it will specify details about each pin's electrical properties and how to connect for different uses. The layout checklist will specify the layout constraints and recommendations for tracing length, impedance, and other necessary information during design.

Please contact your nearest Advantech branch office or call for design documents and further support.

Chapter 2

Mechanical Information

This chapter gives mechanical information on SOM-DB3520 Qseven Development Board.

Sections include:
- Board Information
- Mechanical Drawing
- Assembly Drawing

2.1 Board Information

The figures below indicate the main component chips on SOM-DB3520's Qseven Development Board. Be aware of these positions while designing your carrier board to avoid mechanical and thermal problems.
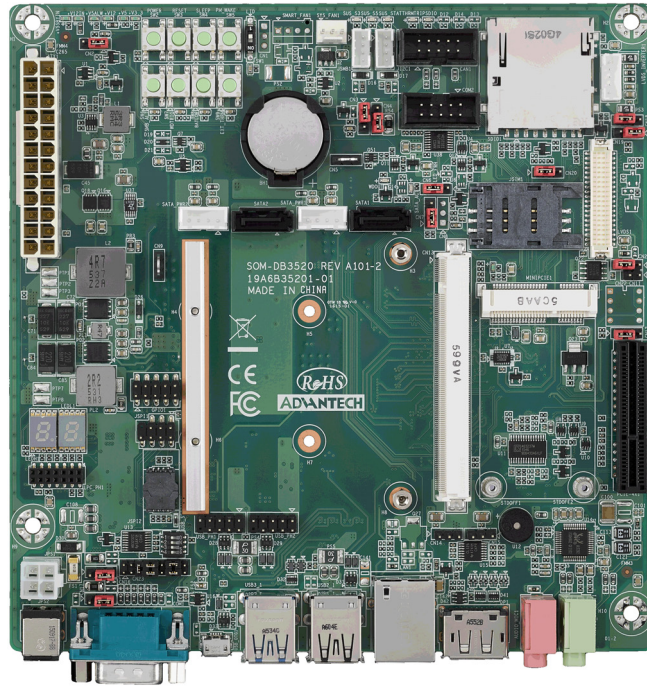
Figure 2.1 Board components - Front
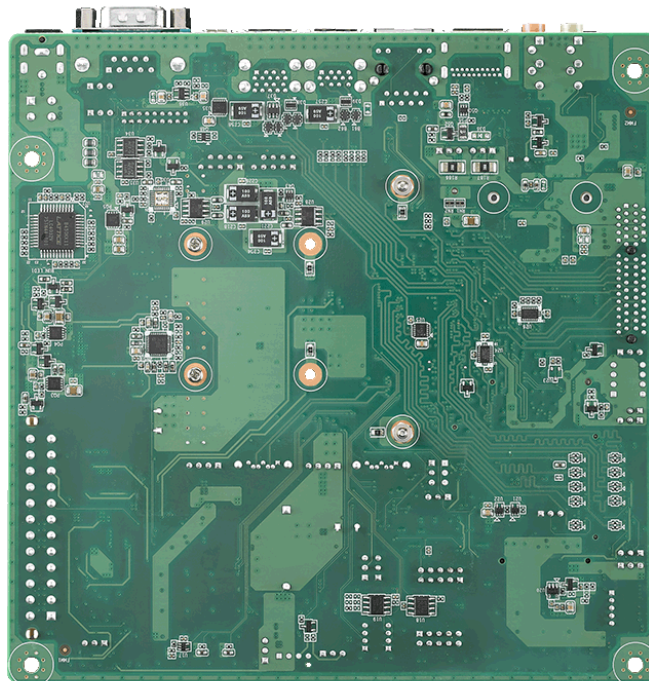
Figure 2.2 Board components - Back

2.2 Mechanical Drawing

For more details about 2D/3D models, please visit Advantech's COM support service website http://com.advantech.com.

2.3 Assembly Drawing

These figures demonstrate the assembly order from the thermal module, the Qseven module, to the carrier board. The diagrams below show the locations of the main-board, screws, and accessories. Diagrams marked in gray are not included in the SOM-DB3520 kits, and are for reference only.
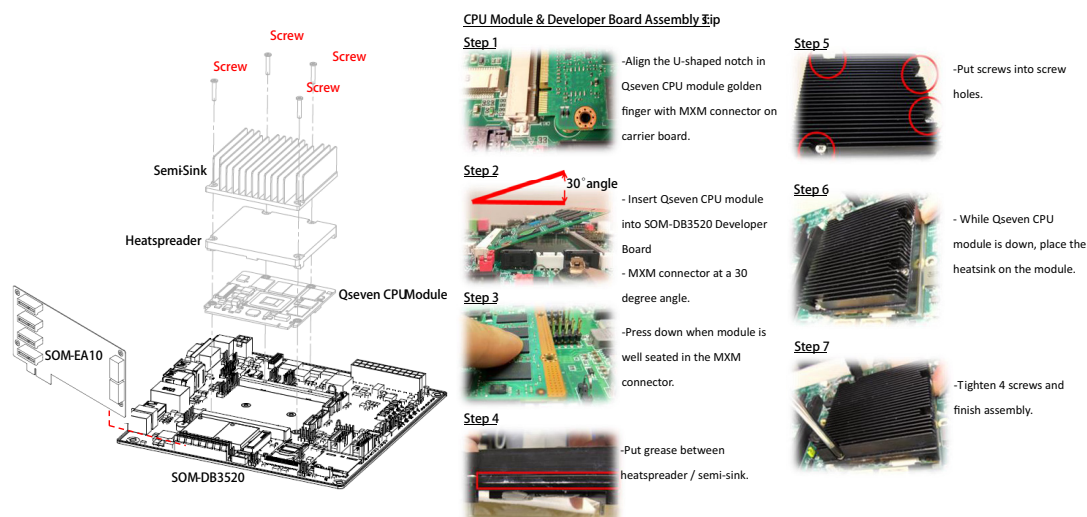
Product information for COM design support documents can be searched for by product module name via this link: http://www.advantech.com

Chapter 3

Connectors and Jumper Settings

This chapter info connectors and jumper settings on SOM-DB3520 Qseven Development Board.

3.1 SOM-DB3520 Connectors and Jumper Settings

3.1.1 SOM-DB3520 Connector Location
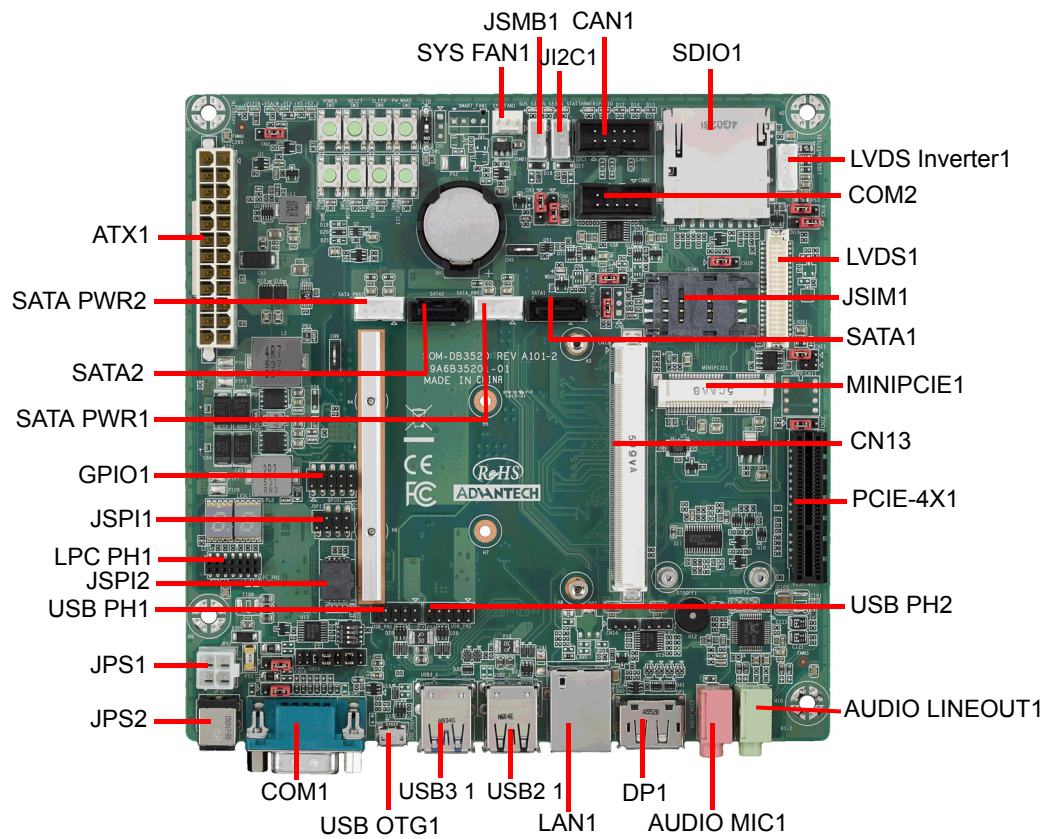
3.1.2 I/O Connector Location
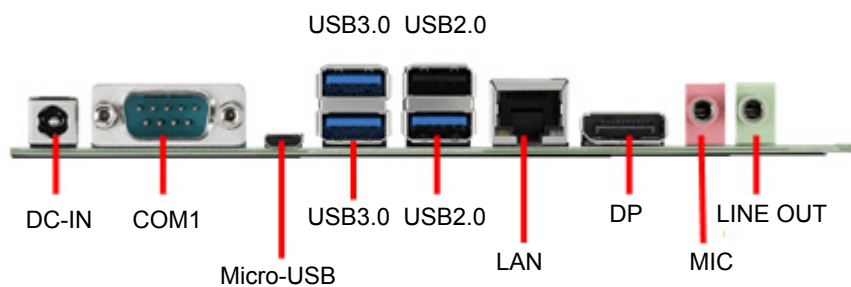
3.1.3 Button Location
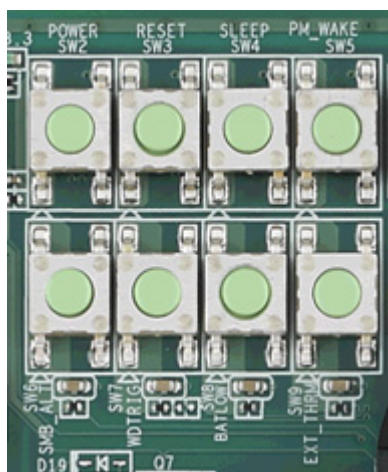
SW2	SW3	SW4	SW5
Power	Reset	SLEEP	PM_WAKE
SW6	**SW7**	**SW8**	**SW9**
SMB_ALT	WDTRIG	BATLOW	EXT_THRM

3.1.4 Jumper and Switch Location
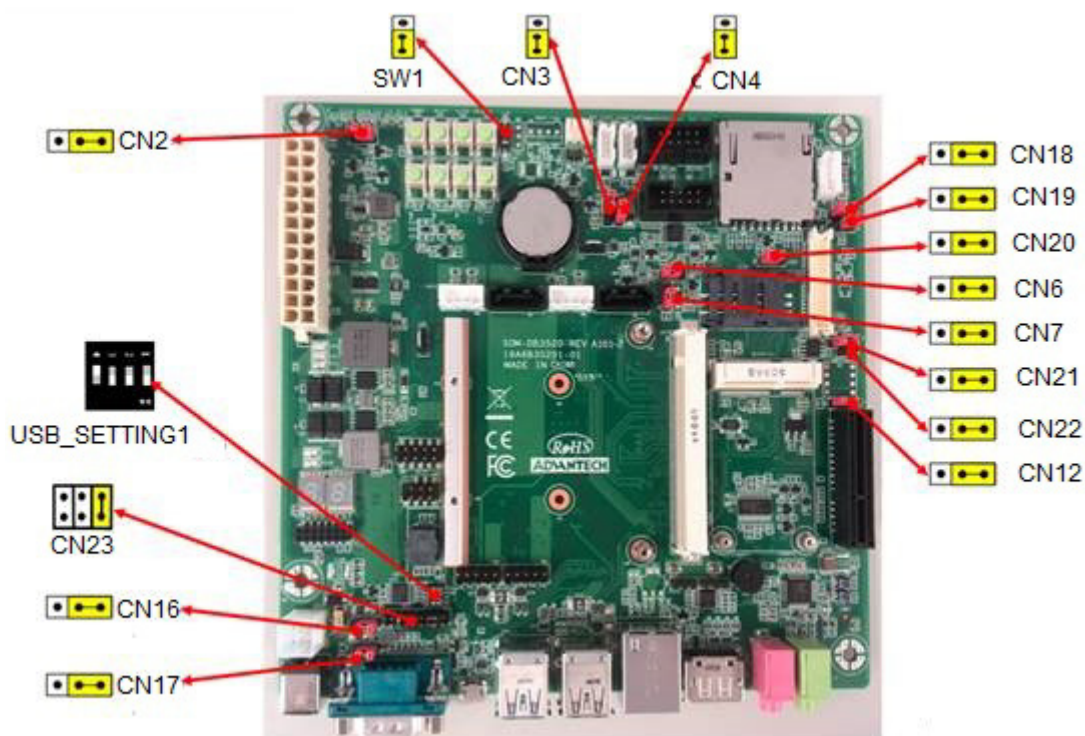
CN2	ATX/AT Mode Selection Pin Header
Pin	Function
1-2	ATX mode (Default)
2-3	AT mode

CN6	Boot Selection Pin Header
Pin	Function
1-2	Boot from Carrier board SPI Flash
2-3	Boot from Q7 module (Default)

CN18	LVDS Backlight Voltage Selection Pin Header
Pin	Function
1-2	+V5 (Default)
2-3	+V12

CN21&CN22	LVDS Voltage Selection Pin Header
Pin	Function
CN21(1-2)	+V5
CN21(2-3)	+V3.3 (Default)
CN21_2-CN22_2	+V12
CN22(1-2)	NC

CN19	LVDS or eDP0 HPD Selection Pin Header
Pin	Function
1-2	GND for LVDS (Default)
2-3	eDP0 HPD

CN20	LVDS or eDP1 HPD Selection Pin Header
Pin	Function
1-2	GND for LVDS (Default)
2-3	eDP1 HPD

COM1 :RS232/422/485
SEL. JUMPER
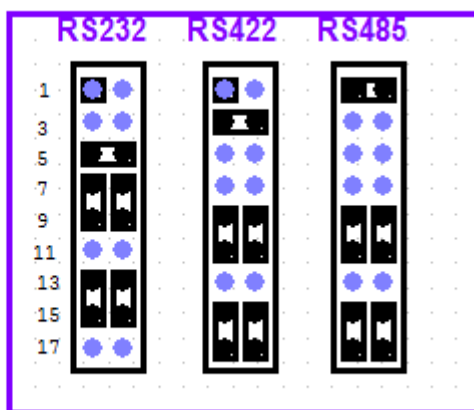
COM1 RS232/422/485 Jumper setting
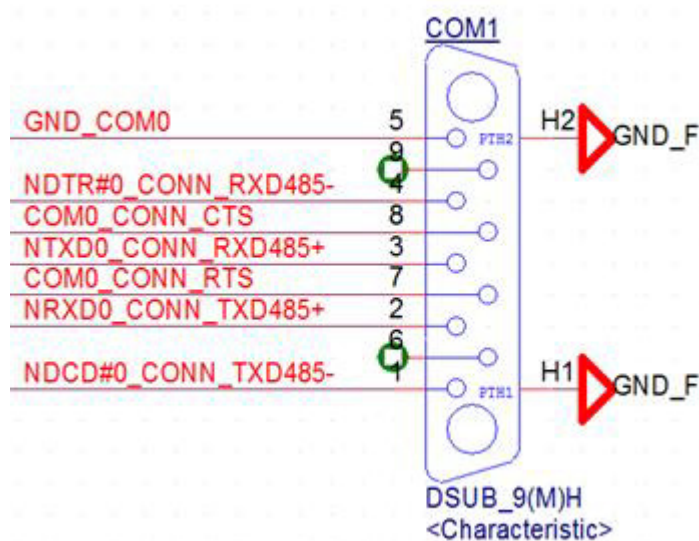
CN23	COM1 RS-232 / 485 / 422 Selection Pin Header
Pin	Function
5-6 7-9 8-10 13-15 14-16	RS-232 (Default)
3-4 9-11 10-12 15-17 16-18	RS-422
1-2 9-11 10-12 15-17 16-18	RS-485

CN7	mSATA & Mini PCIE Selection Pin Header
Pin	Function
1-2	Auto Detect (Default)
2-3	Force to set mSATA Mode

CN12	Mini PCIE & PCIE x 4 Selection Pin Header
Pin	Function
1-2	Auto Detect (Default)
2-3	Force to set PCIe x4 Mode

CN3	RTC Pin Header
Pin	Function
1-2	Normal operation (Default)
2-3	Clear CMOS

CN16	RS-485 Matched Resistance Selection Pin Header
Pin	Function
1-2	120ohm Matched Resistor stuff
2-3	120ohm Matched Resistor Un stuff (Default)

CN17	RS-422 Matched Resistance Selection Pin Header
Pin	Function
1-2	120ohm Matched Resistor stuff
2-3	120ohm Matched Resistor Un stuff (Default)

CN4	CAN Matched Resistance Selection Pin Header
Pin	Function
1-2	120ohm Matched Resistor stuff
2-3	120ohm Matched Resistor Un stuff (Default)

SW1	LID Button
Pin	Function
OFF	LID Untriggered (Default)
ON	LID Triggered

USB_SETTING1	USB Setting Configuration Switch	
Pin	Function	
	OFF	ON
SW1	USB 2.0 Port 3 Host Mode	USB 2.0 Port 3 for MINI PCIE
SW2	USB 2.0 Port 1 Host Mode	USB 2.0 Port 1 for OTG Mode
SW3	NC	NC
SW4	NC	NC

3.1.5 Connector List

Table 3.1: Connector List			
Label	Function	Label	Function
CN13	Q7 Connector	DP1	DP Connector
PCIE-4X1	PCIEx4 Connector	AUDIO_MIC1	Audio MIC Connector
MINIPCIE1	Mini PCIE or mSATA Connector	AUDIO_LINEOUT1	Audio Line Out Connector
JSIM1	SIM Card Connector	COM1	COM1 Connector
LVDS1	LVDS Connector	COM2	COM2 Box Header
LVDS_INVERTER1	LVDS Inverter Wafer Box	CAN1	CAN Box Header
SATA1	SATA1 Connector	LPC_PH1	LPC Pin Header
SATA2	SATA2 Connector	GPIO1	GPIO Pin Header
SATA_PWR1	SATA1 Power Connector	SYS_FAN1	System FAN Connector
SATA_PWR2	SATA2 Power Connector	JSPI1	BIOS Socket
SDIO1	SDIO Connector	JSPI2	SPI Pin Header
USB_OTG1	USB OTG Connector	JI2C1	I2C Wafer Box
USB3_1	USB0 ~ USB1 Connector	JSMB1	SMBUS Wafer Box
USB2_1	USB2 ~ USB3 Connector	ATX1	24Pin ATX Connector
USB_PH1	USB4 ~ USB5 Pin Header	JPS1	4Pin ATX Connector
USB_PH2	USB6 ~ USB7 Pin Header	JPS2	DCIN Jack
LAN1	LAN Connector		

3.1.6 Jumper, Switch and Button List

Table 3.2: Jumper, Switch and Button List	
Label	**Function**
CN2	ATX/AT Mode Selection Pin Header (Default: 1-2 ATX Mode)
CN6	SPI BIOS Boot Selection Pin Header (Default: 2-3 Boot From CPU Board)
CN18	LVDS Backlight Voltage Selection Pin Header (Default: 1-2 +5V)
CN21&CN22	LVDS Voltage Selection Pin Header (Default: CN21 2-3 +3.3V)
CN19	LVDS or eDP0 HPD Selection Pin Header (Default: 1-2 GND for LVDS)
CN20	LVDS or eDP1 HPD Selection Pin Header (Default: 1-2 GND for LVDS)
CN23	COM1 RS-232 / 485 / 422 Selection Pin Header (Default: 5-6 7-9 8-10 13-15 14-16 RS-232)
CN7	mSATA & Mini PCIE Selection Pin Header (Default: 1-2 Auto Detect)
CN12	Mini PCIE & PCIE x 4 Selection Pin Header (Default: 1-2 Auto Detect)
CN3	RTC Pin Header (Default: 1-2 BAT Connect)
CN16	RS-485 Matched Resistance Selection Pin Header (Default: 2-3Un stuff)
CN17	RS-422 Matched Resistance Selection Pin Header (Default: 2-3Un stuff)
CN4	CAN Matched Resistance Selection Pin Header (Default: 2-3 Un stuff)
USB_SETTING1	USB Setting Configuration Switch (Default: All OFF)

3.1.7 Connector Pin Definition

GF1A

GND1	GND2
GBE_MDI3-	GBE_MDI2-
GBE_MDI3+	GBE_MDI2+
GBE_LINK100	GBE_LINK1000
GBE_MDI1-	GBE_MDI0-
GBE_MDI1+	GBE_MDI0+
GBE_LINK	GBE_ACT
GBE_CTREF	SUS_S5
WAKE	SUS_S3
SUS_STAT	PWRBTN
SLP_BTN	LID_BTN
GND3	GND4

KEY

|	
GND5	PWGIN
BATLOW	RSTBTN
SATA0_TX+	SATA1_TX+
SATA0_TX-	SATA1_TX-
SATA_ACT	GND6
SATA0_RX+	SATA1_RX+
SATA0_RX-	SATA1_RX-
GND7	GND8
BIOS_DISABLE/BOOT_ALT	SDIO_CLK
SDIO_CD	SDIO_LED
SDIO_CMD	SDIO_WP
SDIO_PWR	SDIO_DAT1
SDIO_DAT0	SDIO_DAT3
SDIO_DAT2	SDIO_DAT5
SDIO_DAT4	SDIO_DAT7
SDIO_DAT6	USB_DRIVE_VBUS
GND9	GND10
HDA_SYNC/AC97_SYNC/I2S_WS	SMB_CLK/GP1_I2C_CLK
HDA_RST/AC97_RST/I2S_RST	SMB_DAT/GP1_I2C_DAT
HDA_BCLK/AC97_BCLK/I2S_CLK	SMB_ALERT
HDA_SDI/AC97_SDI/I2S_SDI	GP0_I2C_CLK
HDA_SDO/AC97_SDO/I2S_SDO	GP0_I2C_DAT
THRM	WDTRIG
THRMTRIP	WDOUT
GND11	GND12
USB_P7-/USB_SSTX0-	USB_P6-/USB_SSRX0-
USB_P7+/USB_SSTX0+	USB_P6+/USB_SSRX0+
USB_6_7_OC	USB_4_5_OC
USB_P5-/USB_SSTX1-	USB_P4-/USB_SSRX1-
USB_P5+/USB_SSTX1+	USB_P4+/USB_SSRX1+
USB_2_3_OC	USB_0_1_OC
USB_P3-	USB_P2-
USB_P3+	USB_P2+
USB_VBUS	USB_ID
USB_P1-	USB_P0-
USB_P1+	USB_P0+
GND13	GND14
EDP0_TX0+/LVDS_A0+	EDP1_TX0+/LVDS_B0+
EDP0_TX0-/LVDS_A0-	EDP1_TX0-/LVDS_B0-
EDP0_TX1+/LVDS_A1+	EDP1_TX1+/LVDS_B1+
EDP0_TX1-/LVDS_A1-	EDP1_TX1-/LVDS_B1-
EDP0_TX2+/LVDS_A2+	EDP1_TX2+/LVDS_B2+
EDP0_TX2-/LVDS_A2-	EDP1_TX2-/LVDS_B2-
LVDS_PPEN	LVDS_BLEN
EDP0_TX3+/LVDS_A3+	EDP1_TX3+/LVDS_B3+
EDP0_TX3-/LVDS_A3-	EDP1_TX3-/LVDS_B3-
GND15	GND16
EDP0_AUX+/LVDS_A_CLK+	EDP1_AUX+/LVDS_B_CLK+
EDP0_AUX-/LVDS_A_CLK-	EDP1_AUX-/LVDS_B_CLK-
LVDS_BLT_CTRL/GP_PWM_OUT0	GP_1-WIRE_BUS
GP2_I2C_DAT/LVDS_DID_DAT	EDP0_HPD/LVDS_BLC_DAT
GP2_I2C_CLK/LVDS_DID_CLK	EDP1_HPD/LVDS_BLC_CLK

GF-QSEVEN-V2.0

GF1B

CAN0_TX	CAN0_RX
DP_LANE3+/TMDS_CLK+	RSVD/DIFFERENTIAL-PAIR_1
DP_LANE3-/TMDS_CLK-	RSVD/DIFFERENTIAL-PAIR_2
GND17	GND18
DP_LANE1+/TMDS_LANE1+	DP_AUX+
DP_LANE1-/TMDS_LANE1-	DP_AUX-
GND19	GND20
DP_LANE2+/TMDS_LANE0+	RSVD/DIFFERENTIAL-PAIR_3
DP_LANE2-/TMDS_LANE0-	RSVD/DIFFERENTIAL-PAIR_4
GND21	GND22
DP_LANE0+/TMDS_LANE2+	HDMI_CTRL_DAT
DP_LANE0-/TMDS_LANE2-	HDMI_CTRL_CLK
DP_HDMI_HPD	DP_HPD
PCIE_CLK_REF+	PCIE_WAKE
PCIE_CLK_REF-	PCIE_RST
GND23	GND24
PCIE3_TX+	PCIE3_RX+
PCIE3_TX-	PCIE3_RX-
GND25	GND26
PCIE2_TX+	PCIE2_RX+
PCIE2_TX-	PCIE2_RX-
UART0_TX	UART0_RTS
PCIE1_TX+	PCIE1_RX+
PCIE1_TX-	PCIE1_RX-
UART0_RX	UART0_CTS
PCIE0_TX+	PCIE0_RX+
PCIE0_TX-	PCIE0_RX-
GND27	GND28
LPC_AD0/GPIO0	LPC_AD1/GPIO1
LPC_AD2/GPIO2	LPC_AD3/GPIO3
LPC_CLK/GPIO4	LPC_FRAME/GPIO5
SERIRQ/GPIO6	LPC_LDRQ/GPIO7
VCC_RTC	SPKR/GP_PWM_OUT2
FAN_TACHOIN/GP_TIMER_IN	FAN_PWMOUT/GP_PWM_OUT1
GND29	GND30
SPI_MOSI	SPI_CS0
SPI_MISO	SPI_CS1
SPI_SCK	MFG_NC4
VCC_5V_SB1	VCC_5V_SB2
MFG_NC0	MFG_NC2
MFG_NC1	MFG_NC3
VCC1	VCC2
VCC3	VCC4
VCC5	VCC6
VCC7	VCC8
VCC9	VCC10
VCC11	VCC12
VCC13	VCC14
VCC15	VCC16
VCC17	VCC18
VCC19	VCC20

GF-QSEVEN-V2.0

MXM connector

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
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	reserved
45	SDIO_CMD	46	SDIO_WP
47	SDIO_PWR#	48	SDIO_DAT1
49	SDIO_DAT0	50	SDIO_DAT3
51	SDIO_DAT2	52	reserved
53	reserved	54	reserved
55	reserved	56	USB_OTG_PEN
57	GND	58	GND
59	HDA_SYNC / I2S_WS	60	SMB_CLK / GP1_I2C_CLK
61	HDA_RST# / I2S_RST#	62	SMB_DAT / GP1_I2C_DAT
63	HDA_BITCLK / I2S_CLK	64	SMB_ALERT#
65	HDA_SDI / I2S_SDI	66	GP0_I2C_CLK
67	HDA_SDO / I2S_SDO	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+
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+	100	eDP1_TX0+ / LVDS_B0+
101	eDP0_TX0- / LVDS_A0-	102	eDP1_TX0- / LVDS_B0-
103	eDP0_TX1+ / LVDS_ A1+	104	eDP1_TX1+ / LVDS_B1+
105	eDP0_TX1- / LVDS_A1-	106	eDP1_TX1- / LVDS_B1-
107	eDP0_ TX2+ / LVDS_A2+	108	eDP1_TX2+ / LVDS_B2+
109	eDP0_TX2- / LVDS_A2-	110	eDP1_TX2- / LVDS_B2-
111	LVDS_PPEN	112	LVDS_BLEN
113	eDP0_TX3+ / LVDS_A3+	114	eDP1_TX3+ / LVDS_B3+
115	eDP0_TX3- / LVDS_A3-	116	eDP1_TX3- / LVDS_B3-
117	GND	118	GND
119	eDP0_AUX+ / LVDS_A_CLK+	120	eDP1_AUX+ / LVDS_B_CLK+
121	eDP0_ AUX- / LVDS_A_CLK-	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+
181	PCIE0_TX-	182	PCIE0_RX-
183	GND	184	GND
185	LPC_AD0 / GPIO0	186	LPC_AD1 / GPIO1
187	LPC_AD2 / GPIO2	188	LPC_AD3 / GPIO3
189	LPC_CLK / GPIO4	190	LPC_FRAME# / GPIO5
191	SERIRQ / GPIO6	192	LPC_LDRQ# / GPIO7
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
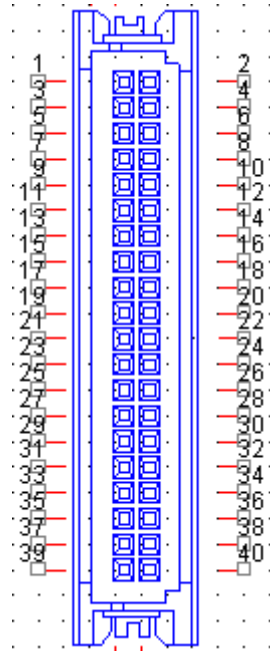
LVDS Connector

Pin	Pin Name
1	+VDD_LCD
2	+VDD_LCD
3	GND
4	GND
5	+VDD_LCD
6	+VDD_LCD
7	LVDS_A0-
8	LVDS_B0-
9	LVDS_A0+
10	LVDS_B0+
11	GND
12	GND
13	LVDS_A1-
14	LVDS_B1-
15	LVDS_A1+
16	LVDS_B1+
17	GND
18	GND
19	LVDS_A2-
20	LVDS_B2-

21	LVDS_A2+
22	LVDS_B2+
23	GND
24	GND
25	LVDS_A_CLK-
26	LVDS_B_CLK-
27	LVDS_A_CLK+
28	LVDS_B_CLK+
29	GND
30	GND
31	LVDS_DID_CLK_5V
32	LVDS_DID_DAT_5V
33	EDP_HDP_B
34	EDP_HDP_A
35	LVDS_A3-
36	LVDS_B3-
37	LVDS_A3+
38	LVDS_B3+
39	Pull Down to ground via 4.7K ohm
40	LVDS_CTRL

LVDS_INVERTER1

WB_5V_2.0mm
<Characteristic>
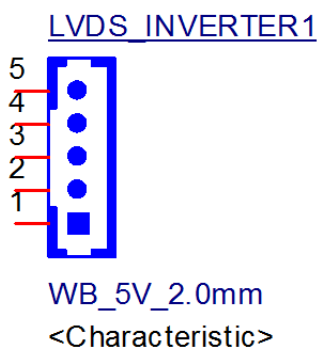
LVDS Inverter Wafer Box

Pin	Pin name
1	+VDD_BLT
2	GND
3	LVDS_BPEN#
4	LVDS1_VBR
5	+V5_BLT

PH_5x2V_2.54mm
<Characteristic>
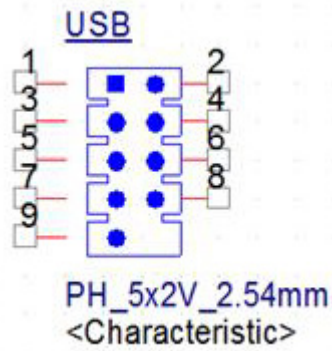
USB Pin Header

Pin	Pin name
1	+V5_USB1
2	+V5_USB2
3	USB1_D-
4	USB2_D-
5	USB1_D+
6	USB2_D+
7	GND
8	GND
9	GND
10	NC

WB_4V_2.5mm

SATA Power Connector

Pin	Pin name
1.	+V5SATA
2.	GND
3.	GND
4.	+V12SATA

COM

BH_5x2V_2.54mm
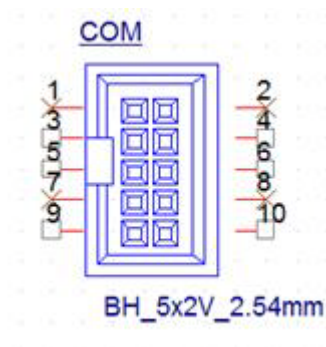
COM2 Box Header

Pin	Pin name
1	NC
2	NC
3	COM_RX
4	COM_RTS#
5	COM_TX
6	COM_CTS#
7	NC
8	NC
9	GND
10	JTAG_UART_SEL

CAN

BH_5x2V_2.54mm
<Characteristic>
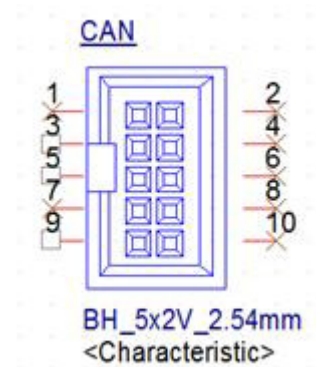
CAN Box Header

Pin	Pin name
1	NC
2	NC
3	CAN_D-
4	NC
5	CAN_D+
6	NC
7	NC
8	NC
9	GND
10	NC

LPC_PH

PH(F)_7x2V_S2.00mm
<Characteristic>
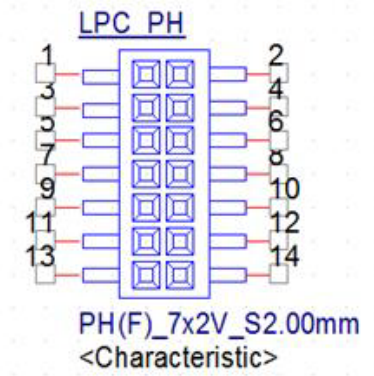
LPC Pin Header

Pin	Pin name
1	LPC_CLK_PH
2	LPC_AD1_PH
3	LPC_RST#_PH
4	LPC_AD0_PH
5	LPC_FRAME#_PH
6	+V3.3
7	LPC_AD3_PH
8	GND
9	LPC_AD2_PH
10	Pull high 10K to +V3.3
11	SERIRQ_PH
12	LPC_RST#_PH
13	+V5_ALW
14	+V5

GPIO

PH_5x2V_S2.54mm
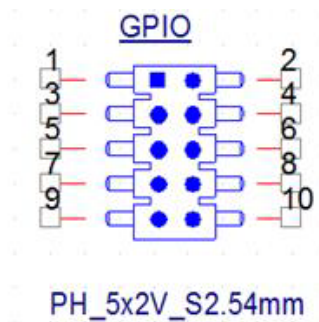
GPIO Pin Header

Pin	Pin name
1.	GPIO0
2.	GPIO4
3.	GPIO1
4.	GPIO5
5.	GPIO2

6.	GPIO6
7.	GPIO3
8.	GPIO7
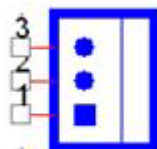
System FAN Connector

Pin	Pin name	#: low active
1	GND	
2	+VDD_SYSFAN	
3	NC	
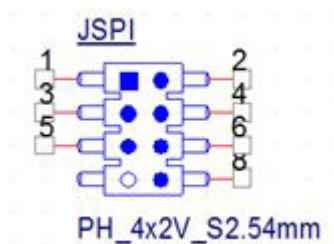
SPI Pin Header

Pin	Pin name
1	+V3.3_SPI
2	GND
3	SPI_CS#
4	SPI_CLK
5	SPI_MISO
6	SPI_MOSI
7	NC
8	SPI_CS1#

I2C

WB_4V_2.0mm
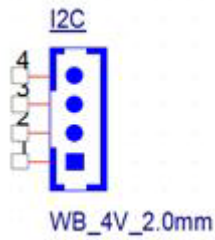
I2C Wafer Box

Pin	Pin name
1.	+V3.3_ALW
2.	I2C_CLK
3.	I2C_DAT
4.	GND

JSMB2

WB_4V_2.0mm
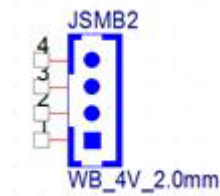
SMBUS Wafer Box

Pin	Pin name
1.	+V3.3_ALW
2.	SMB_CLK
3.	SMB_DAT
4.	GND
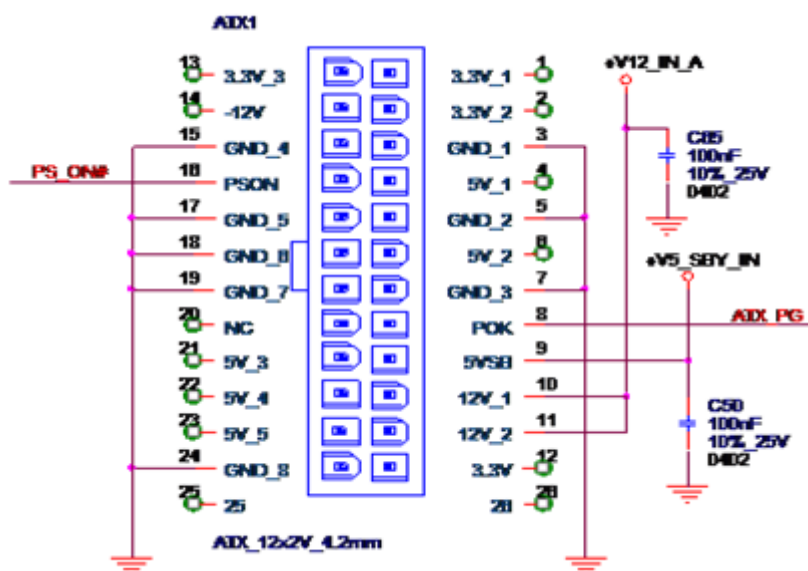
ATX1 24 pins ATX Standard Connector

Pin	Pin name
1.	+V3.3
2.	+V3.3
3.	GND
4.	+5V
5.	GND
6.	+V5
7.	GND
8.	ATX_PWROK
9.	+V5SB
10.	+V12
11.	+V12
12.	+V3.3
13.	+V3.3
14.	NC
15.	GND
16.	PSON
17.	GND
18.	GND
19.	GND
20.	NC
21.	+V5
22.	+V5
23.	+V5
24.	GND

Note!   *For Power input, please choose either one: ATX Power 4 PIN or ATX Power 20 PIN, or DC-IN.*

JPS1

ATX_2x2V_4.2mm
<Characteristic>
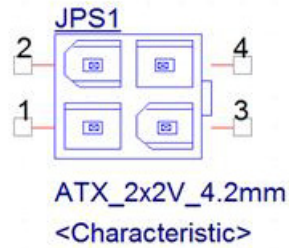
4Pin ATX Power

Pin	Pin name
1	GND
2	GND
3	+12V
4	+12V

Note! *For Power input, please choose either one: ATX Power 4 PIN or ATX Power 20 PIN, or DC-IN.*

JPS2
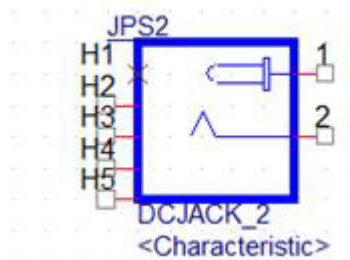
DCJACK_2
<Characteristic>

DC JACK IN

Pin	Pin name
1.	+12V
2.	GND

Note! *For Power input, please choose either one: ATX Power 4 PIN or ATX Power 20 PIN, or DC-IN.*

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