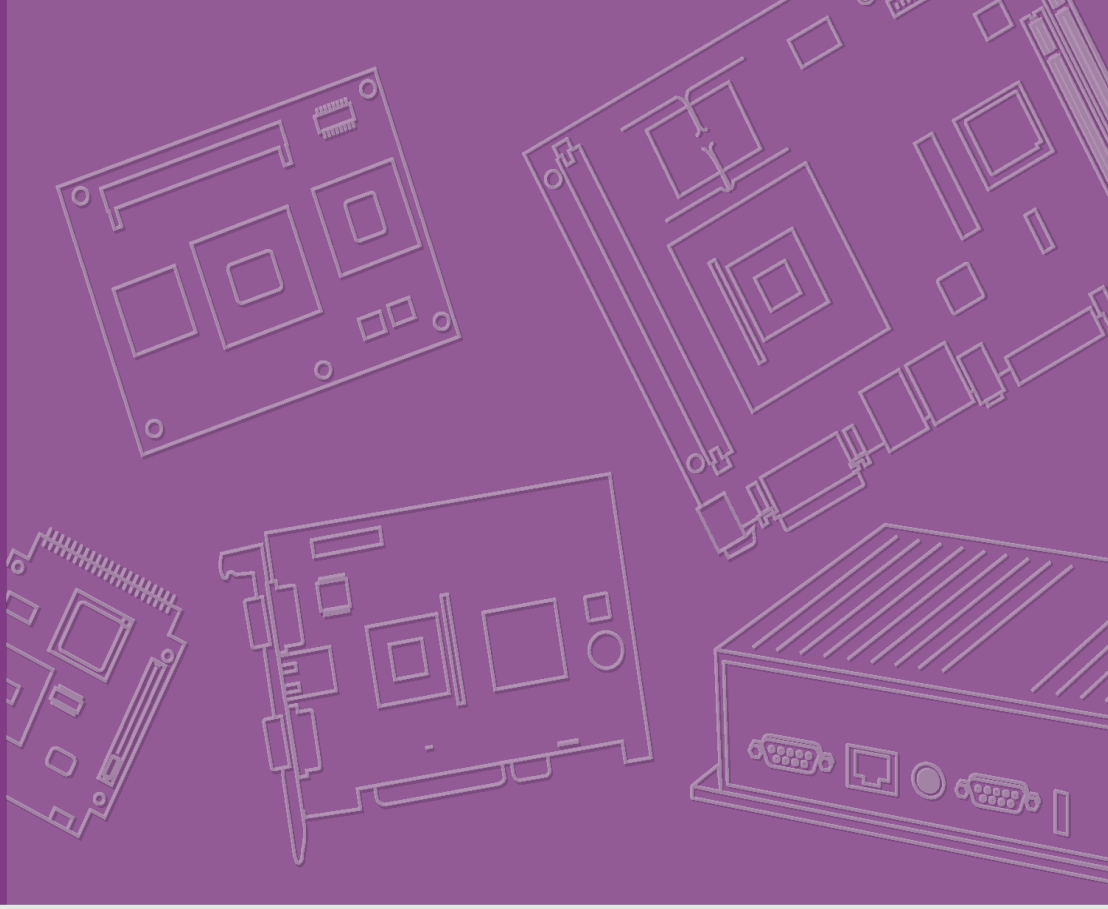

User Manual

SOM-DB5800

Development Board for COM Express Type 6 Pin-out Modules

ADVANTECH

Enabling an Intelligent Planet

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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.

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

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Declaration of Conformity

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from Advantech. Please contact your local supplier for ordering information.

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 A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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.

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

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.

- 1 SOM-DB5800-00A1E
- 1 SOM-EA20 (9696EA2000E) HDMI/DP Riser Card
- 1 Serial ATA Cable 7P/7P 30 cm
- 1 Flat COM Port Cable
- 1 I/O Shield Bracket

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.

Contents

Chapter 1

General Information

1.1 Introduction

SOM-DB5800 is a development board for COM-Express Type 6 pin-out module that fully complies with the PCI Industrial Computer Manufacture's PICMG COM Express standard. It is suitable for different form factor modules including COM-Basic, COM-Compact, and COM-Ultra. All functions provided by COM-Express type 6 pin-outs are implemented on SOM-DB5800 with the most popular interfaces or connectors for developers ease of use. Additional accessories help customers to do more diverse application evaluations, such as DDI card that provides an extended function on HDMI/Displayport, a PCIe riser card extends PCIe x4 to PCIe x1, and a middle board to make SOM-DB5800 comply with type 10 pin-out. This board provides a reliable testing platform and flexibility for vertical marketing application pre-study.

1.2 Connectors and Jumper Setting

1.2.1 SOM-DB5800 Connector Location

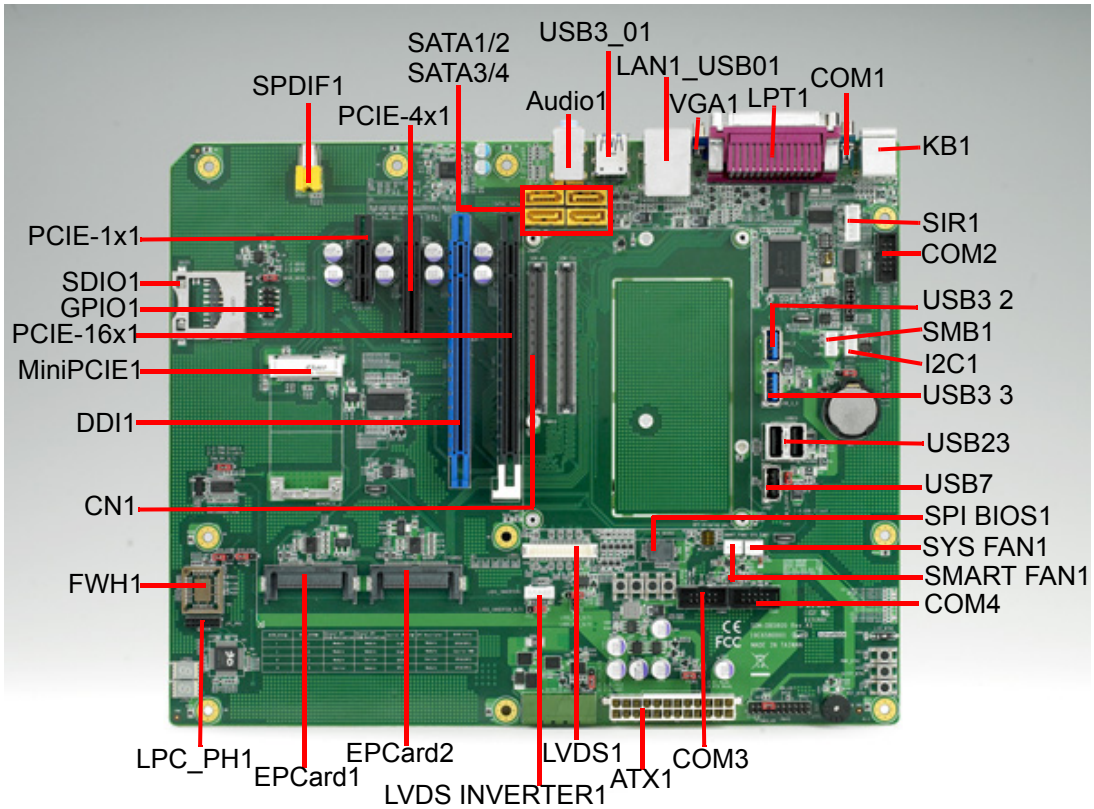


Figure 1.1 SOM-DB5800 Connector Location

1.2.2 SOM-DB5800 Default Jumper Setting

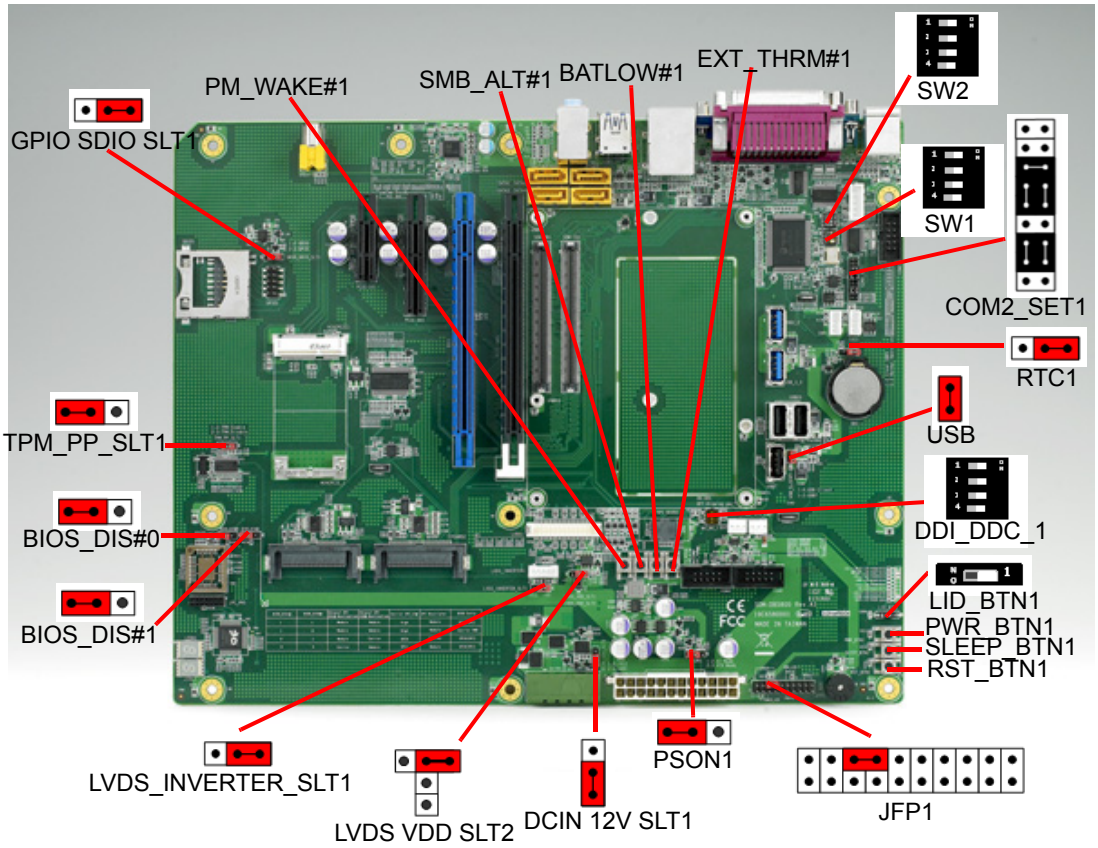


Figure 1.2 SOM-DB5800 Default Jumper Setting

1.2.2.1 Connector List

Table 1.1: Connector List

Connector	Description
CN1*	COM Express Connector
KB1*	PS/2 KB and MS Connector
LPT1*	Print port Connector
COM1*	COM Connector
VGA1*	CRT Connector
LAN1_USB01*	LAN1, USB0 and USB1 Connector
USB3_01*	USB3.0 Port0 and Port1 Connector
Audio1*	Line-in, Line-out and MIC Connector
SATA1*	SATA1 Connector
SATA2*	SATA2 Connector
SATA3*	SATA3 Connector
SATA4*	SATA4 Connector
SPDIF1*	SPDIF Connector
PCIE-16X1*	PCIEx16 Connector
DDI1	Digital Display Interface Connector
PCIE-4X1*	PCIEx4 Connector
PCIE-1X1*	PCIEx1 Connector
SDIO1*	SDIO Connector
GPIO1	GPIO Pin Header

Table 1.1: Connector List	
FWH1*	FWH Connector
LPC_PH1	LPC Pin Header
MiniPCIE1*	MiniPCIE Connector

* Items use general interface and not described in this document.

1.2.2.2 Jumper and Switch Setting List

Table 1.2: Jumper and Switch Setting List	
Jumper /Switch	**Description**
GPIO_SDIO_SLT1	GPIO/SDIO select Pin Header
TPM_PP_SLT1	TPM Enable/Disable Pin Header
BIOS_DIS#0	BIOS select Pin Header
BIOS_DIS#1	BIOS select Pin Header
LVDS_INVERTER_SLT1	LVDS inverter voltage select Pin Header
LVDS_VDD_SLT2	LVDS VDD Voltage select Pin Header
DCIN_12V_SLT1	DCIN/12V Voltage select Pin Header
PSON1	ATX/AT mode select Pin Header
JFP1	Front panel Pin Header
USB_CLIENT1	USB client/ USB port select Pin Header
RTC1	Normal operation/Clear COMS select Pin Header
COM2_SET1	RS232/RS422/RS485 select Pin Header
DDI_DDC_1	Digital Display Interface AUX/DDC Switch
SW1	LPC Switch
SW2	LPC Switch
PM_WAKE#1	WAKE Button
SMB_ALT#1	SMB Alert Button
BATLOW#1	Battery Low Button
EXT_THRM#1	External Thermal Button
RST_BTN1	Reset Button
SMB_ALT#1	SMB Alert Button
SLEEP_BTN1	Sleep Button
PWR_BTN1	Power Button
LID_BTN1	LID Button

1.2.2.3 Connector Pin Name Definition

Table 1.3: DDI1 Digital Display Interface Connector

Pin	Pin name
A1	NC
A2	+V12
A3	+V12
A4	GND
A5	NC
A6	NC
A7	NC
A8	NC
A9	+V3.3
A10	+V3.3
A11	PLTRST#
A12	GND
A13	NC
A14	NC
A15	GND
A16	DDI1_PAIR5+
A17	DDI1_PAIR5-
A18	GND
A19	NC
A20	GND
A21	DDI1_PAIR4+
A22	DDI1_PAIR4-
A23	GND
A24	GND
A25	DDI1_PAIR6+
A26	DDI1_PAIR6-
A27	GND
A28	GND
A29	DDI1_HPD
A30	NC
A31	GND
A32	NC
A33	NC
A34	GND
A35	DDI1_CTRLCLK_AUX+
A36	DDI1_CTRLCLK_AUX-
A37	GND
A38	GND
A39	NC
A40	NC
A41	GND
A42	GND
A43	DDI2_CTRLCLK_AUX+
A44	DDI2_CTRLCLK_AUX-

Table 1.3: DDI1 Digital Display Interface Connector	
A45	GND
A46	GND
A47	DDI2_HPD
A48	NC
A49	GND
A50	NC
A51	GND
A52	NC
A53	NC
A54	GND
A55	GND
A56	NC
A57	NC
A58	GND
A59	GND
A60	DDI3_CTRLCLK_AUX+
A61	DDI3_CTRLCLK_AUX-
A62	GND
A63	GND
A64	DDI3_HPD
A65	NC
A66	GND
A67	GND
A68	NC
A69	NC
A70	GND
A71	GND
A72	NC
A73	NC
A74	GND
A75	GND
A76	NC
A77	NC
A78	GND
A79	GND
A80	NC
A81	NC
A82	GND
B1	+V12
B2	+V12
B3	+V12
B4	GND
B5	NC
B6	NC
B7	GND
B8	+V3.3
B9	NC

Table 1.3: DDI1 Digital Display Interface Connector	
B10	+V3.3_DUAL
B11	NC
B12	NC
B13	GND
B14	DDI1_PAIR0+
B15	DDI1_PAIR0-
B16	GND
B17	NC
B18	GND
B19	DDI1_PAIR1+
B20	DDI1_PAIR1-
B21	GND
B22	GND
B23	DDI1_PAIR2+
B24	DDI1_PAIR2-
B25	GND
B26	GND
B27	DDI1_PAIR3+
B28	DDI1_PAIR3-
B29	GND
B30	NC
B31	NC
B32	GND
B33	DDI2_PAIR0+
B34	DDI2_PAIR0-
B35	GND
B36	GND
B37	DDI2_PAIR1+
B38	DDI2_PAIR1-
B39	GND
B40	GND
B41	DDI2_PAIR2+
B42	DDI2_PAIR2-
B43	GND
B44	GND
B45	DDI2_PAIR3+
B46	DDI2_PAIR3-
B47	GND
B48	NC
B49	GND
B50	DDI3_PAIR0+
B51	DDI3_PAIR0-
B52	GND
B53	GND
B54	DDI3_PAIR1+
B55	DDI3_PAIR1-
B56	GND

Table 1.3: DDI1 Digital Display Interface Connector	
B57	GND
B58	DDI3_PAIR2+
B59	DDI3_PAIR2-
B60	GND
B61	GND
B62	DDI3_PAIR3+
B63	DDI3_PAIR3-
B64	GND
B65	GND
B66	NC
B67	NC
B68	GND
B69	GND
B70	NC
B71	NC
B72	GND
B73	GND
B74	NC
B75	NC
B76	GND
B77	GND
B78	NC
B79	NC
B80	GND
B81	NC
B82	NC

Table 1.4: GPIO1 GPIO Connector	
Pin	**Pin name**
1	GPI0
2	GPO0
3	GPI1
4	GPO1
5	GPI2
6	GPO2
7	GPI3
8	GPO3
9	GND
10	GND

Table 1.5: LPC_PH1 LPC Pin Header	
Pin	**Pin name**
1	CLK33M_PH
2	LPC_AD1
3	PLTRST#
4	LPC_AD0
5	LPC_FRAME#
6	+V3.3
7	LPC_AD3
8	GND
9	LPC_AD2
10	Pull-up via 10K ohm to +V3.3
11	SERIRQ
12	PLTRST#
13	+V5_DUAL
14	+V5

Table 1.6: LVDS1 LVDS Connector	
Pin	**Pin name**
1	+V3.3_LVDS_PANEL
2	+V3.3_LVDS_PANEL
3	GND
4	GND
5	+V3.3_LVDS_PANEL
6	+V3.3_LVDS_PANEL
7	LVDS0_Z_D0-
8	LVDS1_Z_D0-
9	LVDS0_Z_D0+
10	LVDS1_Z_D0+
11	GND
12	GND
13	LVDS0_Z_D1-
14	LVDS1_Z_D1-
15	LVDS0_Z_D1+
16	LVDS1_Z_D1+
17	GND
18	GND
19	LVDS0_Z_D2-
20	LVDS1_Z_D2-
21	LVDS0_Z_D2+
22	LVDS1_Z_D2+
23	GND
24	GND
25	LVDS0_Z_CLK-
26	LVDS1_Z_CLK-

Table 1.6: LVDS1 LVDS Connector	
27	LVDS0_Z_CLK+
28	LVDS1_Z_CLK+
29	GND
30	GND
31	LVDS_DDC_SC
32	LVDS_DDC_SD
33	GND
34	GND
35	LVDS0_Z_D3-
36	LVDS1_Z_D3-
37	LVDS0_Z_D3+
38	LVDS1_Z_D3+
39	Pull-down via 4.7K ohm to GND
40	LVDS_CTRL

Table 1.7: LVDS_INVERTER1 LVDS Inverter Wafer Box	
Pin	**Pin name**
1	+V12_Z_LVDS
2	GND
3	LVDS_BKLT_Z_EN#
4	LVDS_Z_VBR
5	+V5_LVDS

Table 1.8: DCIN1 Wide Range DCIN Connector	
Pin	**Pin name**
1	GND
2	+VDC
3	+VDC
4	GND

Table 1.9: COM3 COM3 Connector	
Pin	**Pin name**
1	NC
2	NC
3	RS1_RX
4	NC
5	RS1_TX
6	NC
7	NC
8	NC
9	GND
10	NC

Table 1.10: COM4 COM4 Connector	
Pin	**Pin name**
1	NC
2	NC
3	RS2_RX
4	NC
5	RS2_TX
6	NC
7	NC
8	NC
9	GND
10	NC

Table 1.11: SYS_FAN1 System FAN Connector	
Pin	**Pin name**
1	GND
2	+V12
3	SYSFAN_IN

Table 1.12: SMART_FAN1 Smart FAN Connector	
Pin	**Pin name**
1	GND
2	+V_FAN
3	FANTACH_R1

Table 1.13: SMB1 SMB Wafer Box	
Pin	**Pin name**
1	GND
2	SMB_DAT
3	SMB_CLK
4	+V3.3_DUAL

Table 1.14: I2C1 I2C Wafer Box	
Pin	**Pin name**
1	GND
2	I2C_DAT
3	I2C_CLK
4	+V3.3_DUAL

Table 1.15: SIR1 SIR Wafer Box	
Pin	**Pin name**
1	+V5
2	NC
3	IRRX
4	GND
5	IRTX

Table 1.16: COM2 COM2 Connector	
Pin	**Pin name**
1	NDCD#2_TXD485-
2	COM2_DSR#
3	NRXD2_TXD485+
4	COM2_RTS#
5	NTXD2_RXD485+
6	COM2_CTS#
7	NDTR#2_RXD485-
8	COM2_RI#
9	GND
10	NC

1.2.2.4 Jumper Setting

Table 1.17: GPIO_SDIO_SLT1 GPIO/SDIO select Pin Header	
Pin	**Function**
1-2	SDIO
2-3	GPIO

Table 1.18: TPM_PP_SLT1 TPM Enable/Disable Pin Header	
Pin	**Function**
1-2	TPM Enable
2-3	TPM Disable

BIOS_DIS#0 BIOS select Pin Header
BIOS_DIS#1 BIOS select Pin Header
Jumper setting truth table

BIOS_DIS1#	BIOS_DIS0#	Chipset SPI CS1# Destination	Chipset SPI CS0# Destination	Carrier SPI_CS#	SPI Descriptor	BIOS Entry
1	1	Module	Module	High	Module	SPI0/SPI1
1	0	Module	Module	High	Module	Carrier FWH
0	1	Module	Carrier	SPI0	Carrier	SPI0/SPI1
0	0	Carrier	Module	SPI1	Module	SPI0/SPI1

Table 1.19: LVDS_INVERTER_SLT1 LVDS inverter voltage select Pin Header	
Pin	**Function**
1-2	+V5
2-3	+V12

Table 1.20: LVDS_VDD_SLT2 LVDS VDD Voltage select Pin Header	
Pin	**Function**
1-2	+V5
2-3	+V3.3
2-2	+V12

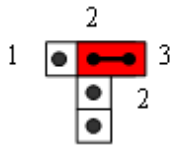


Table 1.21: DCIN_12V_SLT1 DCIN/12V Voltage select Pin Header	
Pin	**Function**
1-2	+V12
2-3	+VDC

Table 1.22: PSON1 ATX/AT mode select Pin Header	
Pin	**Function**
1-2	AT mode
2-3	ATX mode

Table 1.23: JFP1 Front panel Pin Header	
Pin	**Function**
3-5	Power LED. Pin1 is positive
6-8	Buzzer Enable
12-14	HD LED. Pin14 is positive
11-13	Power Button
18-20	Reset Button

Table 1.24: USB_CLIENT1 USB client/ USB port select Pin Header	
Pin	**Function**
1-2	Normal USB port
1-X	USB Client

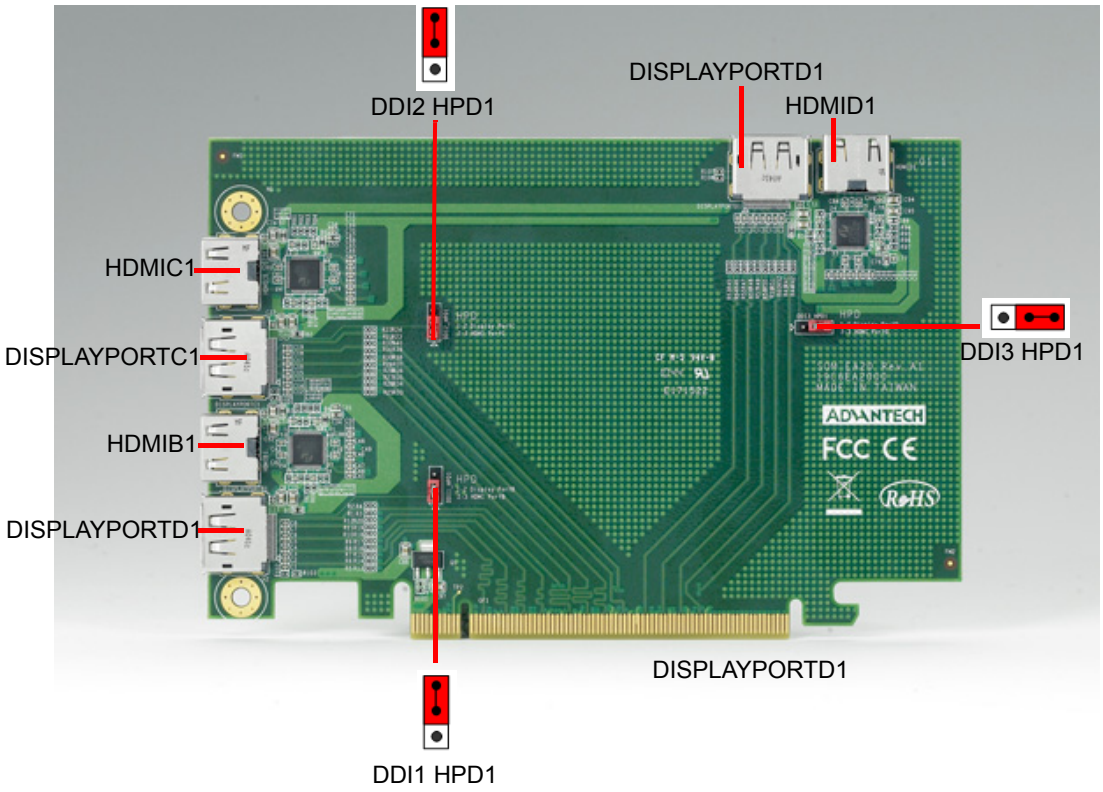
Table 1.25: RTC1 Normal operation/Clear COMS select Pin Header	
Pin	**Function**
1-2	Clear CMOS
2-3	Normal Operation

Table 1.26: COM2_SET1 RS232/RS422/RS485 select Pin Header	
Pin	**Function**
5-6/7-9/8-10/13-15/14-16	RS232
3-4/9-11/10-12/15-17/16-18	RS422
1-2/9-11/10-12/15-17/16-18	RS485

Table 1.27: DDI_DDC_1 Digital Display Interface AUX/DDC Switch	
Pin	**Function**
1-8 ON	SOM connector Pin D15 and Pin D16 are configured as DDC of DDI Port1
1-8 OFF	SOM connector Pin D15 and Pin D16 are configured as AUX of DDI Port1
2-7 ON	SOM connector Pin C32 and Pin C33 are configured as DDC of DDI Port2
2-7 OFF	SOM connector Pin C32 and Pin C33 are configured as AUX of DDI Port2
3-6 ON	SOM connector Pin C36 and Pin C37 are configured as DDC of DDI Port3
3-6 OFF	SOM connector Pin C36 and Pin C37 are configured as AUX of DDI Port3

Table 1.28: SW1 LPC Switch SW2 LPC Switch	
Pin	**Function**
1-8 ON, 2-7ON, 3-6ON, 4-5ON	SIO Enable
1-8 OFF, 2-7OFF, 3-6OFF, 4-5OFF	SIO Disable

1.3 SOM-EA20 Connector Location and Default Jumper Setting



1.3.0.1 Connector List

Table 1.29: Connector List

Connector	Description
DISPLAYPORTB1*	Display Port B Connector
HDMIB1*	HDMI Port B Connector
DISPLAYPORTC1*	Display Port C Connector
HDMIC1*	HDMI Port C Connector
DISPLAYPORTD1*	Display Port D Connector
HDMID1*	HDMI Port D Connector

* Items use general interface and not described in this document.

1.3.0.2 Jumper Setting List

Table 1.30: Jumper Setting List

Jumper/Switch	Description
DDI1_HPD1	Display Port B/HDMI Port B HPD select Pin Header
DDI2_HPD1	Display Port C/HDMI Port C HPD select Pin Header
DDI3_HPD1	Display Port D/HDMI Port D HPD select Pin Header

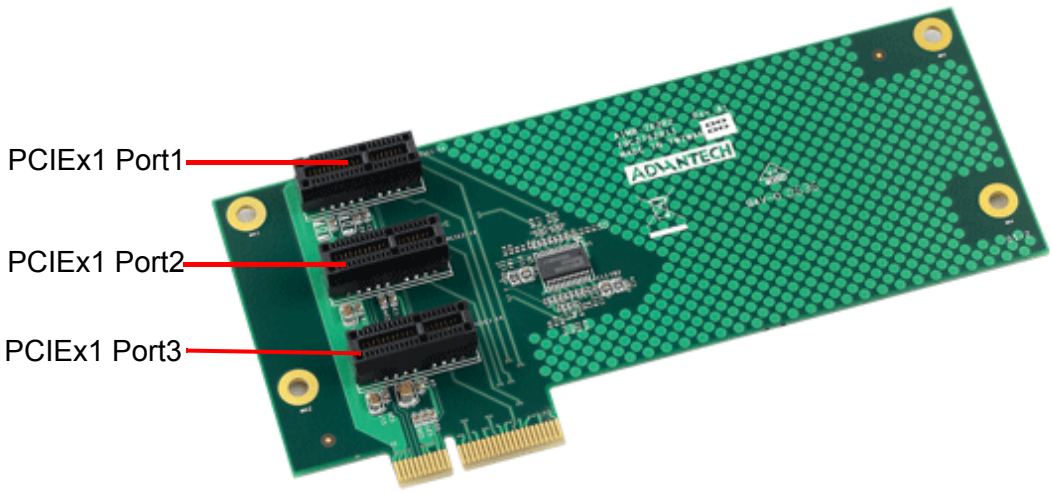
1.3.0.3 Jumper Setting

Table 1.31: DDI1_HPD1 Display Port B/HDMI Port B HPD select Pin Header	
Pin	**Function**
1-2	Display Port B HPD
2-3	HDMI Port B HPD

Table 1.32: DDI2_HPD1 Display Port C/HDMI Port C HPD select Pin Header	
Pin	**Function**
1-2	Display Port C HPD
2-3	HDMI Port C HPD

Table 1.33: DDI3_HPD1 Display Port D/HDMI Port D HPD select Pin Header	
Pin	**Function**
1-2	Display Port D HPD
2-3	HDMI Port D HPD

1.4 AIMB-4301 Connector Location (Optional)



1.4.0.1 Connector List

Table 1.34: Connector List	
Connector	**Description**
PCIEx1 Port 3*	PCIEx1 Port 3 Connector
PCIEx1 Port 2*	PCIEx1 Port 2 Connector
PCIEx1 Port 1*	PCIEx1 Port 1 Connector

* Items use general interface and not described in this document.

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