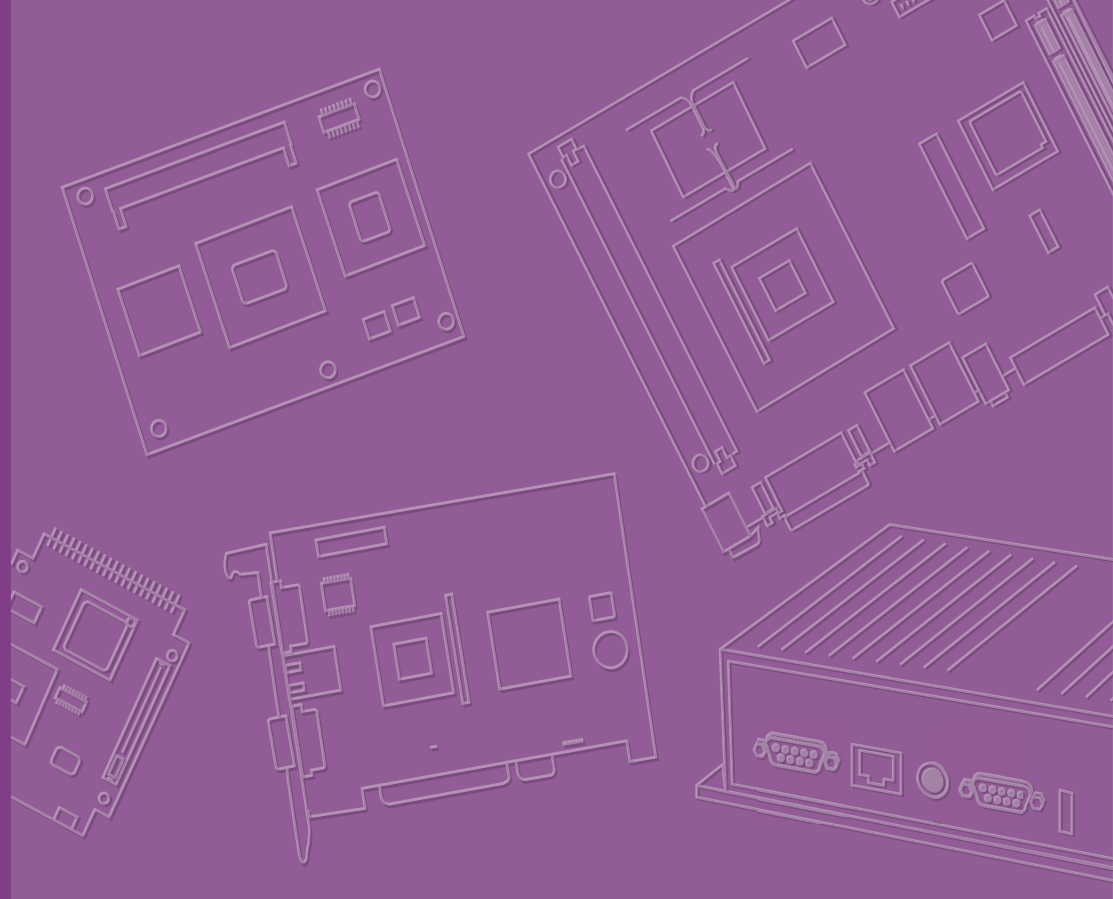


User Manual



SOM-DB2500



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.

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 on-screen 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 merchandise 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

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
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Packing List

Part No.	Description	Quantity
1700008941	M Cable SATA 7P/SATA 7P 32CM C=R 180/18	1
1700018785	A CABLE SATA 15P/1*4P-2.5 35cm for AIMB	1
1701200220	F Cable 2*10P-2.0/D-SUB 9P(M)*2 22CM	3
1960090424T001	IO BRACKET FOR AIMB-286	1

Pin Description

Advantech provides useful checklists for schematic design and layout routing. The schematic checklist details the pin's electrical properties and connection instructions for different user scenarios. The user checklist specifies the layout constraints and recommendations for trace length, impedance, and other relevant information during design.

Please contact the nearest Advantech branch office for access to design documents and further advance support.

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 over-voltage.
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.

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Chapter 1

General Information

This chapter details background information on the SOM-DB2500 Development Board for SMARC.

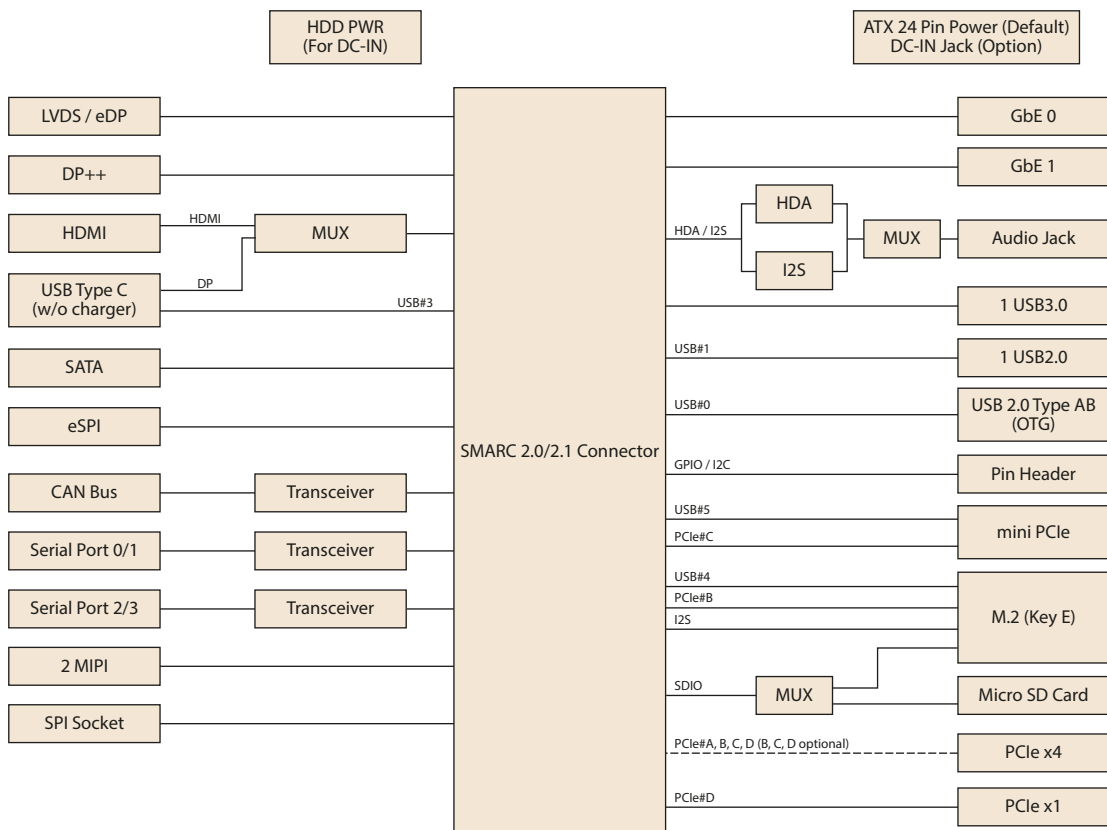
Sections include:

- Introduction
- Functional Block Diagram
- Product Specification

1.1 Introduction

SOM-DB2500 is the development carrier board for SMARC form-factor modules. It supports SMARC 2.0 modules and SMARC 2.1 modules. SOM-DB2500 uses 314-pin gold finger connectors and support several types of display (LVDS, eDP, DP++, HDMI), USB type (USB 3.0 Type A & Type C). It also supports M.2 E-Key connector, HD audio or I2S interface options for audio. It can fulfill multiple applications for end customers and can emulate required functions as a reference design board. Customers can integrate the SOM-DB2500 directly into their product as an application board.

1.2 Functional Block Diagram



1.3 Pin Description

Advantech provides useful checklists for schematic design and layout routing. The schematic checklist will specify details about each pin's electrical properties and how to connect them for different purposes. The layout checklist will specify layout constraints and recommendations for trace length, impedance, and other necessary information during design. Please contact your nearest Advantech branch office or call to get your hands on the design documents and further advanced support.

	Pin	Pin Name	SOM-DB2500
LVDS / eDP	S125	LVDS0_0+ / eDP0_TX0+	v/v
	S126	LVDS0_0- / eDP0_TX0-	v/v
	S128	LVDS0_1+ / eDP0_TX1+	v/v
	S129	LVDS0_1- / eDP0_TX1-	v/v
	S131	LVDS0_2+ / eDP0_TX2+	v/v
	S132	LVDS0_2- / eDP0_TX2-	v/v
	S137	LVDS0_3+ / eDP0_TX3+	v/v
	S138	LVDS0_3- / eDP0_TX3-	v/v
	S134	LVDS0_CK+ / eDP0_AUX+	v/v
	S135	LVDS0_CK- / eDP0_AUX-	v/v
	S111	LVDS1_0+ / eDP1_TX0+	v/-
	S112	LVDS1_0- / eDP1_TX0-	v/-
	S114	LVDS1_1+ / eDP1_TX1+	v/-
	S115	LVDS1_1- / eDP1_TX1-	v/-
	S117	LVDS1_2+ / eDP1_TX2+	v/-
	S118	LVDS1_2- / eDP1_TX2-	v/-
	S120	LVDS1_3+ / eDP1_TX3+	v/-
	S121	LVDS1_3- / eDP1_TX3-	v/-
	S108	LVDS1_CK+ / eDP1_AUX+	v/-
	S109	LVDS1_CK- / eDP1_AUX-	v/-
	S139	I2C_LCD_CK	v
	S140	I2C_LCD_DAT	v
	S133	LCD0_VDD_EN	v
	S116	LCD1_VDD_EN	-
	S127	LCD0_BKLT_EN	v
	S107	LCD1_BKLT_EN	-
	S141	LCD0_BKLT_PWM	v
	S122	LCD1_BKLT_PWM	-
	S144	EDP0_HPD	v
	S113	EDP1_HPD	-

DP++ over HDMI	P92	DP1_LANE0+ / HDMI_D2+	v
	P93	DP1_LANE0- / HDMI_D2-	v
	P95	DP1_LANE1+ / HDMI_D1+	v
	P96	DP1_LANE1- / HDMI_D1-	v
	P98	DP1_LANE2+ / HDMI_D0+	v
	P99	DP1_LANE2- / HDMI_D0-	v
	P101	DP1_LANE3+ / HDMI_CK+	v
	P102	DP1_LANE3- / HDMI_CK-	v
	P104	DP1_HPD / HDMI_HPD	v
	P105	DP1_AUX- / HDMI_CTRL_DAT	v
	P106	DP1_AUX+ / HDMI_CTRL_CK	v
	P107	DP1_AUX_SEL	v
	DP++	S102	DP0_LANE3+
S103		DP0_LANE3-	v
S99		DP0_LANE2+	v
S100		DP0_LANE2-	v
S96		DP0_LANE1+	v
S97		DP0_LANE1-	v
S93		DP0_LANE0+	v
S94		DP0_LANE0-	v
S105		DP0_AUX+	v
S106		DP0_AUX -	v
S98		DP0_HPD	v
S95	DP0_AUX_SEL	v	

	P108	GPIO0 / CAM0_PWR#	v
	P109	GPIO1 / CAM1_PWR#	v
	P110	GPIO2 / CAM0_RST#	v
	P111	GPIO3 / CAM1_RST#	v
	S7	I2C_CAM0_DAT	v
	S5	I2C_CAM0_CK	v
	S2	I2C_CAM1_DAT	v
	S1	I2C_CAM1_CK	v
	S11	CSI0_RX0+	v
	S12	CSI0_RX0-	v
	S14	CSI0_RX1+	v
	S15	CSI0_RX1-	v
CSI	P7	CSI1_RX0+	v
	P8	CSI1_RX0-	v
	P10	CSI1_RX1+	v
	P11	CSI1_RX1-	v
	P13	CSI1_RX2+	v
	P14	CSI1_RX2-	v
	P16	CSI1_RX3+	v
	P17	CSI1_RX3-	v
	S8	CSI0_CK+	v
	S9	CSI0_CK-	v
	P3	CSI1_CK+	v
	P4	CSI1_CK-	v
	S6	CAM_MCK	v
	P39	SDIO_D0	v
	P40	SDIO_D1	v
	P41	SDIO_D2	v
	P42	SDIO_D3	v
SDIO Card	P33	SDIO_CMD	v
	P36	SDIO_CK	v
	P34	SDIO_WP	v
	P35	SDIO_CD#	v
	P37	SDIO_PWR_EN	v
	P43	SPI0_CS0#	v
	P31	SPI0_CS1#	v
SPI0	P44	SPI0_CK	v
	P45	SPI0_DIN	v
	P46	SPI0_DO	v

eSPI/SPI1	P56	ESPI_CK	v
	P54	ESPI_CS0#	v
	P55	ESPI_CS1#	v
	P57	ESPI_IO_0	v
	P58	ESPI_IO_1	v
	S56	ESPI_IO_2	v
	S57	ESPI_IO_3	v
	S58	ESPI_RESET#	v
	S43	ESPI_ALERT0#	v
	S44	ESPI_ALERT1#	v
I2S	S38	I2S0_LRCK	v
	S40	I2S0_SDOUT	v
	S41	I2S0_SDIN	v
	S42	I2S0_CK	v
HDA / I2S	S38	AUDIO_MCK	v
	S50	HDA_SYNC	v
	S51	HDA_SDO	v
	S52	HDA_SDI	v
	S53	HDA_CK	v
I2C Interfaces	P112	HDA_RST#	v
	S48	I2C_GP_CK	v
	S49	I2C_GP_DAT	v
Serial Ports	P129	SER0_TX	v
	P130	SER0_RX	v
	P134	SER1_TX	v
	P135	SER1_RX	v
	P136	SER2_TX	v
	P137	SER2_RX	v
	P140	SER3_TX	v
	P141	SER3_RX	v
	P131	SER0_RTS#	v
	P132	SER0_CTS#	v
	P138	SER2_RTS#	v
P139	SER2_CTS#	v	
CAN Bus	P143	CAN0_TX	v
	P145	CAN1_TX	v
	P144	CAN0_RX	v
	P146	CAN1_RX	v

	P60	USB0+	v
	P61	USB0-	v
	P65	USB1+	v
	P66	USB1-	v
	P69	USB2+	v
	P70	USB2-	v
	S68	USB3+	v
	S69	USB3-	v
	S35	USB4+	v
	S36	USB4-	v
	S59	USB5+	v
	S60	USB5-	v
	P62	USB0_EN_OC#	v
	P67	USB1_EN_OC#	v
	P71	USB2_EN_OC#	v
	P74	USB3_EN_OC#	v
	P76	USB4_EN_OC#	v
	S55	USB5_EN_OC#	v
	P63	USB0_VBUS_DET	v
	S37	USB3_VBUS_DET	v
	P64	USB0_OTG_ID	v
	S104	USB3_OTG_ID	v
	S75	USB2SSRX-	v
	S74	USB2SSRX+	v
	S66	USB3SSRX-	v
	S65	USB3SSRX+	v
	S72	USB2SSTX-	v
	S71	USB2SSTX+	v
	S63	USB3SSTX-	v
	S62	USB3SSTX+	v

USB

	P89	PCIE_A_TX+	v
	P90	PCIE_A_TX-	v
	S90	PCIE_B_TX+	v
	S91	PCIE_B_TX-	v
	S81	PCIE_C_TX+	v
	S82	PCIE_C_TX-	v
	S29	PCIE_D_TX+	v
	S30	PCIE_D_TX-	v
	P86	PCIE_A_RX+	v
	P87	PCIE_A_RX-	v
	S87	PCIE_B_RX+	v
	S88	PCIE_B_RX-	v
PCIe	S78	PCIE_C_RX+	v
	S79	PCIE_C_RX-	v
	S32	PCIE_D_RX+	v
	S33	PCIE_D_RX-	v
	P83	PCIE_A_REFCK+	v
	P84	PCIE_A_REFCK-	v
	S84	PCIE_B_REFCK+	v
	S85	PCIE_B_REFCK-	v
	P80	PCIE_C_REFCK+	v
	P81	PCIE_C_REFCK-	v
	P75	PCIE_A_RST#	v
	S76	PCIE_B_RST#	v
S77	PCIE_C_RST#	v	
S146	PCIE_WAKE#	v	
SATA	P48	SATA_TX+	v
	P49	SATA_TX-	v
	P51	SATA_RX+	v
	P52	SATA_RX-	v
	S54	SATA_ACT#	v

	P30	GBE0_MDI0+	v
	P29	GBE0_MDI0-	v
	P27	GBE0_MDI1+	v
	P26	GBE0_MDI1-	v
	P24	GBE0_MDI2+	v
	P23	GBE0_MDI2-	v
	P20	GBE0_MDI3+	v
	P19	GBE0_MDI3-	v
	S17	GBE1_MDI0+	v
	S18	GBE1_MDI0-	v
	S20	GBE1_MDI1+	v
	S21	GBE1_MDI1-	v
Ethernet	S23	GBE1_MDI2+	v
	S24	GBE1_MDI2-	v
	S26	GBE1_MDI3+	v
	S27	GBE1_MDI3-	v
	P21	GBE0_LINK100#	v
	S19	GBE0_LINK100#	v
	P22	GBE0_LINK1000#	v
	S22	GBE1_LINK1000#	v
	P25	GBE0_LINK_ACT#	v
	s31	GBE1_LINK_ACT#	v
	P28	GBE0_CTREF	v
	S28	GBE1_CTREF	v
	P6	GBE0_SDP	v
	P5	GBE1_SDP	v
Watchdog	S145	WDT_TIME_OUT#	v
	P108	GPIO0 / CAM0_PWR#	v
	P109	GPIO1 / CAM1_PWR#	v
	P110	GPIO2 / CAM0_RST#	v
	P111	GPIO3 / CAM1_RST#	v
	P112	GPIO4 / HDA_RST#	v
GPIO	P113	GPIO5 / PWM_OUT	v
	P114	GPIO6 / TACHIN	v
	P115	GPIO7	v
	P116	GPIO8	v
	P117	GPIO9	v
	P118	GPIO10	v
	P119	GPIO11	v

	S150	VIN_PWR_BAD#	v
	S154	CARRIER_PWR_ON	v
	S153	CARRIER_STBY#	v
	P126	RESET_OUT#	v
	P127	RESET_IN#	v
	P128	POWER_BTN#	v
	S149	SLEEP#	v
Management Pins	S148	LID#	v
	S156	BATLOW#	v
	P122	I2C_PM_DAT	v
	P121	I2C_PM_CK	v
	S151	CHARGING#	v
	S152	CHARGER_PRSNT#	v
	S157	TEST#	v
	P1	SMB_ALERT_1V8#	v
	P123	BOOT_SEL0#	v
	P124	BOOT_SEL1#	v
Boot Select	P125	BOOT_SEL2#	v
	S155	FORCE_RECOV#	v
Power RTC	S147	VDD_RTC	v
	P147	VDD_IN	v
	P148	VDD_IN	v
	P149	VDD_IN	v
	P150	VDD_IN	v
Power	P151	VDD_IN	v
	P152	VDD_IN	v
	P153	VDD_IN	v
	P154	VDD_IN	v
	P155	VDD_IN	v
	P156	VDD_IN	v

	P2	GND	v
	P9	GND	v
	P12	GND	v
	P12	GND	v
	P15	GND	v
	P18	GND	v
	P32	GND	v
	P38	GND	v
	P47	GND	v
	P50	GND	v
	P53	GND	v
	P59	GND	v
	P68	GND	v
	P79	GND	v
	P82	GND	v
	P85	GND	v
	P88	GND	v
	P91	GND	v
	P94	GND	v
	P97	GND	v
	P100	GND	v
	P103	GND	v
	P120	GND	v
	P133	GND	v
GND	P142	GND	v
	S3	GND	v
	S10	GND	v
	S13	GND	v
	S16	GND	v
	S25	GND	v
	S34	GND	v
	S47	GND	v
	S61	GND	v
	S64	GND	v
	S67	GND	v
	S70	GND	v
	S73	GND	v
	S80	GND	v
	S83	GND	v
	S86	GND	v
	S89	GND	v
	S92	GND	v
	S101	GND	v
	S110	GND	v
	S119	GND	v
	S124	GND	v
	S130	GND	v
	S136	GND	v
	S143	GND	v

RSVD	P72	RSVD	NC
	P73	RSVD	NC
	P77	RSVD	NC
	P78	RSVD	NC
	S4	RSVD	NC
	S45	RSVD	NC
	S46	RSVD	NC
	S123	RSVD	NC
	S142	RSVD	NC
	S158	RSVD	NC

Chapter 2

Mechanical Information

This chapter details mechanical information on the SOM-DB2500 Carrier Board.

Sections include:

- Board Information
- Mechanical Diagrams
- Assembly Diagrams

2.1 Board Information

The figures below indicate the main SMARC module locations on this carrier board. When designing customized boards, be aware of positioning to avoid contact with thermal solutions and other components for optimal performance and heat dissipation.

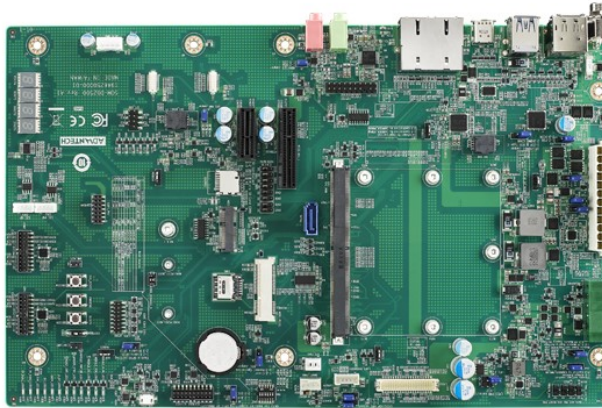


Figure 2.1 Board chips identity – Front

2.2 Mechanical Diagram

For more detail about 2D/3D models, please find on Advantech COM support service website <http://com.advantech.com>.

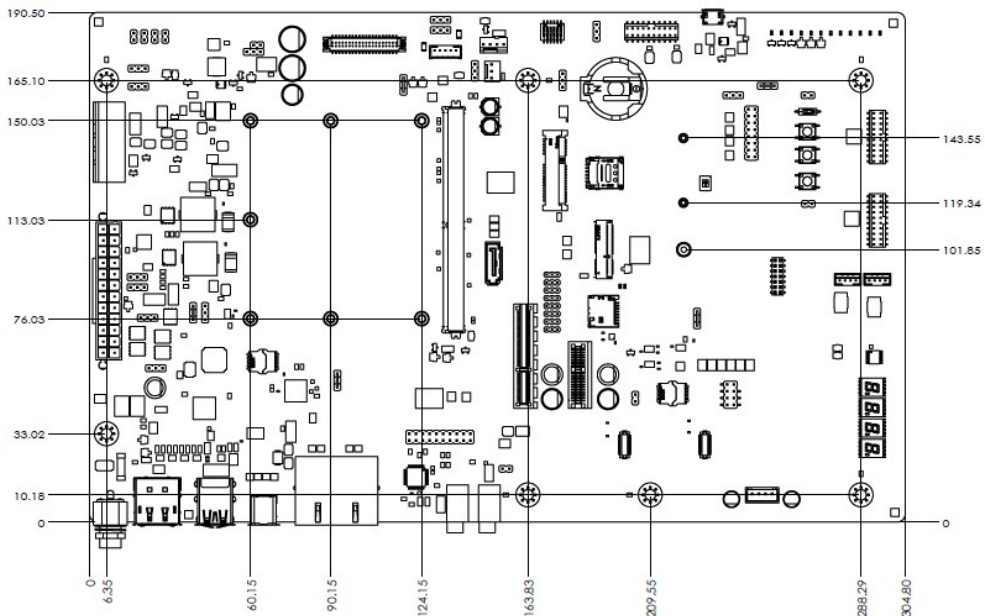


Figure 2.2 Board Mechanical Diagram – Front



Figure 2.3 SOM-DB2500 Board Mechanical Diagram - Side

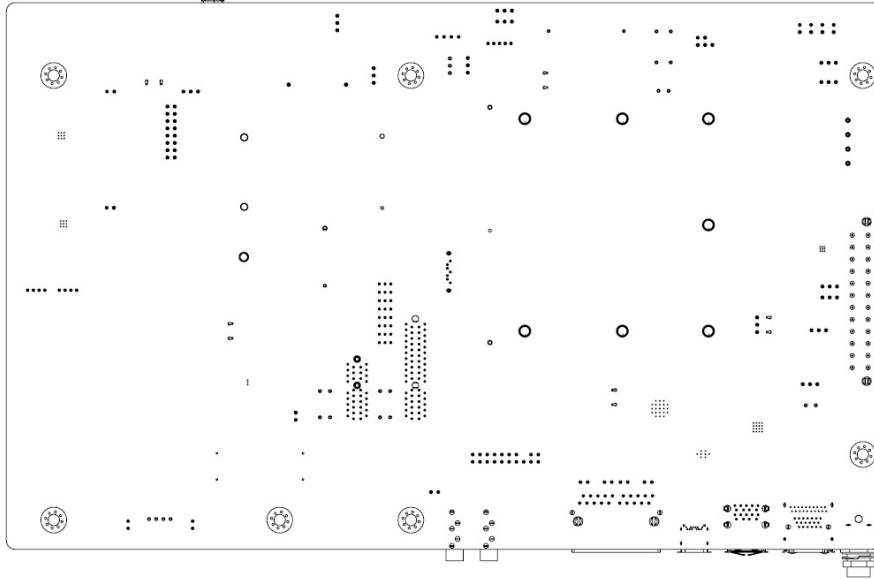


Figure 2.4 Board Mechanical Diagram – Rear

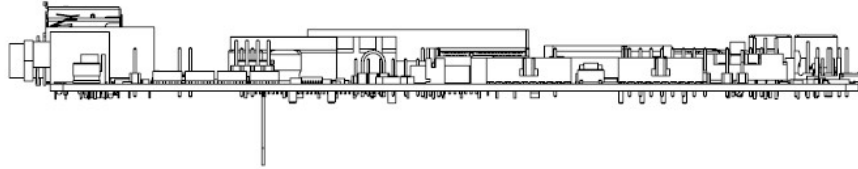


Figure 2.5 Board Mechanical Diagram – Side

2.3 Assembly Diagram

These figures demonstrate the order of assembly for the thermal module, SMARC module, and carrier board. (SOM-DB2500 does not contain SMARC board, heat spreader, or heat sink)

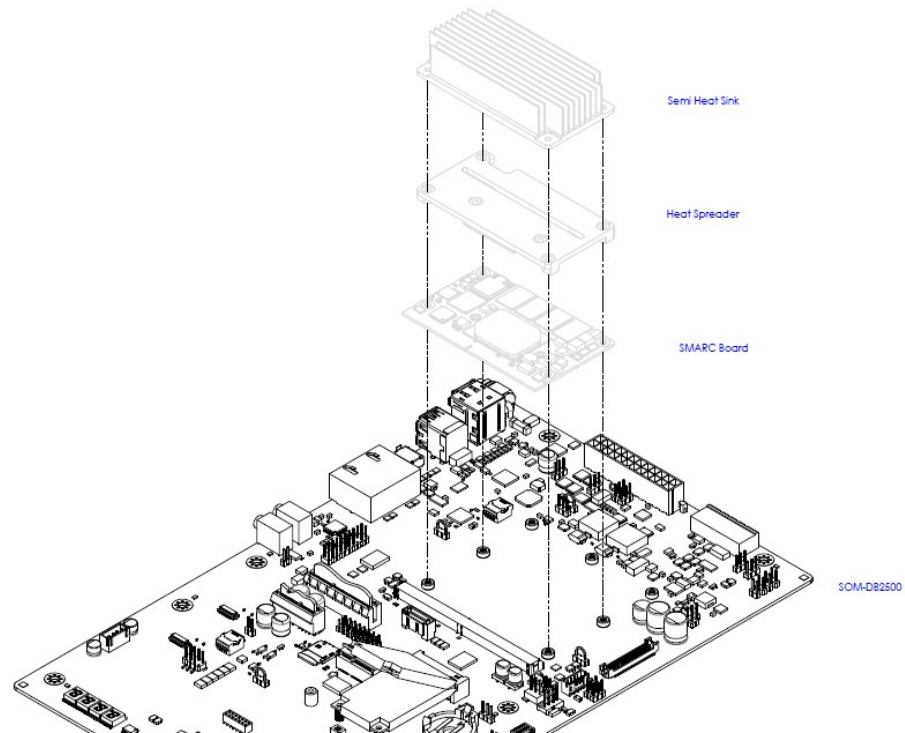


Figure 2.6 Assembly Diagram- SMARC to SOM-DB2500

There are 7 standoffs reserved for SOM-DB2500; 4 x small size (82 x 50mm/3.22 x 1.96 in) and 3 x large size (82 x 80 mm/ 3.22 x 3.14 in) standoffs.

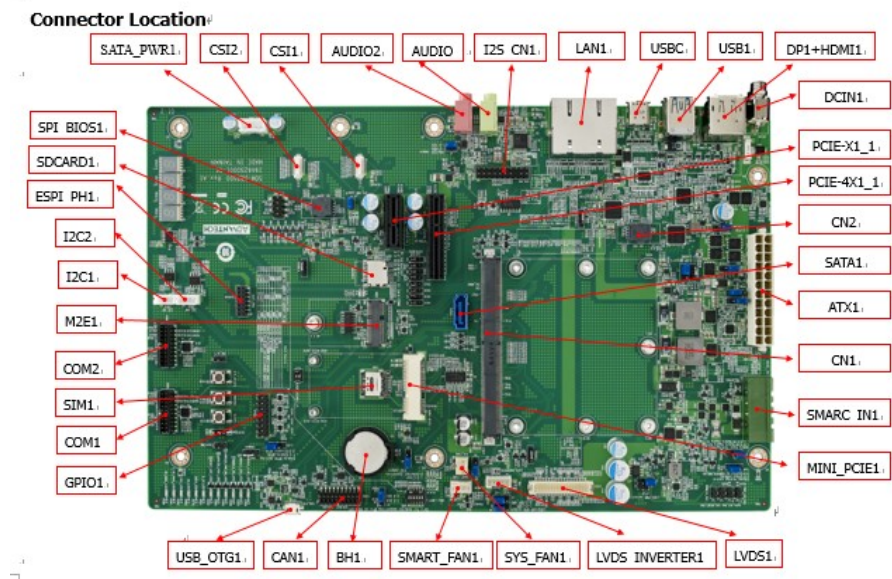
Chapter 3

Connectors and Jumper Settings

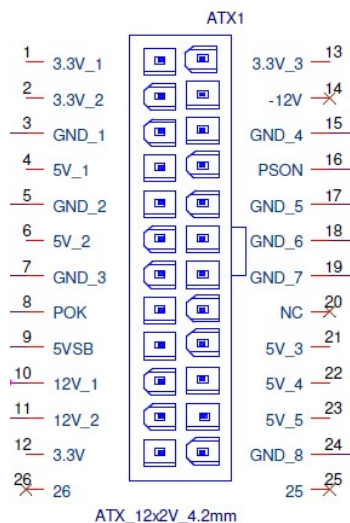
This chapter details connectors and jumper settings for the SOM-DB2500 SMARC compatible Carrier Board

3.1 SOM-DB2500 Connectors and Jumper Settings

3.1.1 SOM-DB2500 Connector Location

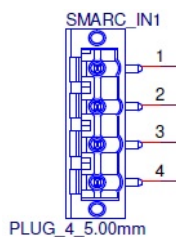


3.1.2 SOM-DB2500 Connector Pin Definition



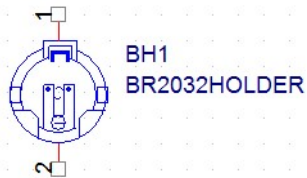
Pin	Signal	Pin	Signal
1	NC	13	NC
2	NC	14	NC
3	GND	15	GND
4	NC	16	PSON#
5	GND	17	GND
6	NC	18	GND
7	GND	19	GND
8	PWR_OK	20	NC
9	+V5SB	21	NC
10	+V12_ATX	22	NC
11	+V12_ATX	23	NC
12	NC	24	GND
26	NC	25	NC

Figure 3.1 ATX1 Pin Connector



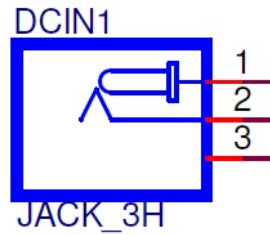
Pin	Signal
1	GND
2	+V12
3	SYS_FAN_SENSE
4	GND

Figure 3.2 SMARC_IN1 Pin Connector



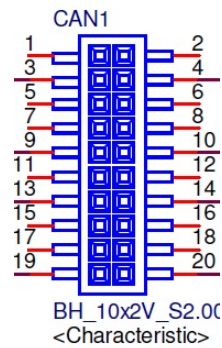
Pin	Signal
1	+VBAT_BH
2	GND

Figure 3.3 BH1 RTC Battery Connector



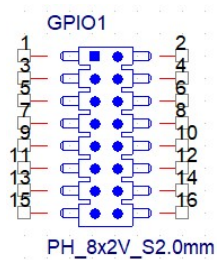
Pin	Signal
1	+VDCIN_ADAP_IN
2	GND
3	GND

Figure 3.4 DCIN1 DC-IN Power Connector



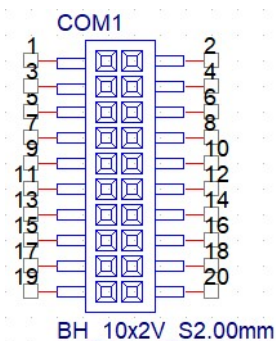
Pin	Signal	Pin	Signal
1	NC	2	NC
3	CAN0_R_D-	4	CAN0_R_D+
5	NC	6	NC
7	NC	8	NC
9	GND	10	GND
11	NC	12	NC
13	CAN1_R_D-	14	CAN1_R_D+
15	NC	16	NC
17	NC	18	NC
19	GND	20	GND

Figure 3.5 CAN1 CAN Bus Connector



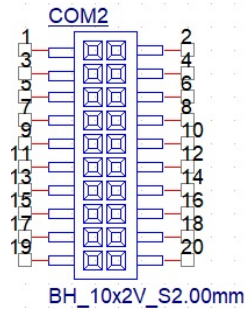
Pin	Signal	Pin	Signal
1	+V3.3	2	+V3.3
3	GPIO0_3V3	4	GPIO6_3V3
5	GPIO1_3V3	6	GPIO7_3V3
7	GPIO2_3V3	8	GPIO8_3V3
9	GPIO3_3V3	10	GPIO9_3V3
11	GPIO4_3V3	12	GPIO10_3V3
13	GPIO5_3V3	14	GPIO11_3V3
15	GND	16	GND

Figure 3.6 GPIO1 Header



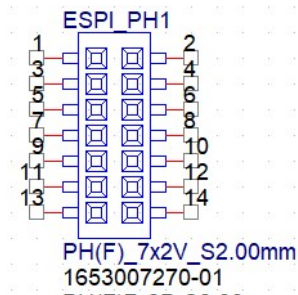
Pin	Signal	Pin	Signal
1	NC	2	NC
3	COM0_z_RXD	4	COM0_z_RTS#
5	COM0_z_TXD	6	COM0_z_CTS#
7	GND	8	NC
9	NC	10	GND
11	NC	12	NC
13	COM1_RX	14	NC
15	COM1_TX	16	NC
17	NC	18	NC
19	GND	20	GND

Figure 3.7 COM1 COM Port 0 and 1 Connector



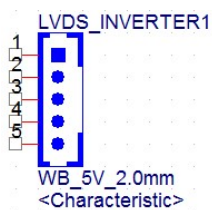
Pin	Signal	Pin	Signal
1	NC	2	NC
3	COM2_z_RXD	4	COM2_z_RTS#
5	COM2_z_TXD	6	COM2_z_CTS#
7	GND	8	NC
9	NC	10	GND
11	NC	12	NC
13	COM3_RX	14	NC
15	COM3_TX	16	NC
17	NC	18	NC
19	GND	20	GND

Figure 3.8 COM2 COM Port2 and 3 Connector



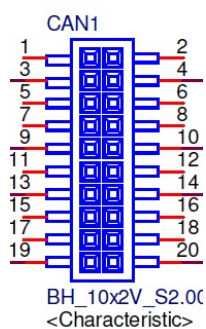
Pin	Signal	Pin	Signal
1	ESPI_CLK_1.8	2	ESPI_IO1_1.8
3	ESPI_RST#_1.8	4	ESPI_IO0_1.8
5	ESPI_CS0#_1.8	6	+V3.3
7	ESPI_IO3_1.8	8	GND
9	ESPI_IO2_1.8	10	+V1.8
11	ESPI_ALERT0#_1.8	12	ESPI_RST#_1.8
13	+V5_DUAL	14	+V5

Figure 3.9 ESPI_PH1 Header



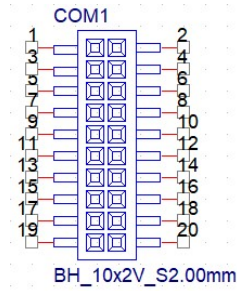
Pin	Signal
1	+V12_Z_LVDS
2	GND
3	LVDS_BKLT_Z_EN#
4	LVDS_Z_VBR
5	+V5_LVDS

Figure 3.10 LVDS_INVERTER1 LVDS INVERTER Connector



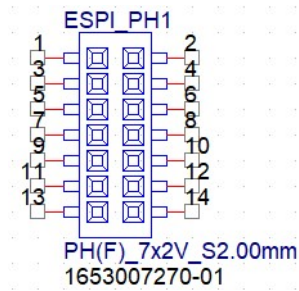
Pin	Signal	Pin	Signal
1	NC	2	NC
3	CAN0_R_D-	4	CAN0_R_D+
5	NC	6	NC
7	NC	8	NC
9	GND	10	GND
11	NC	12	NC
13	CAN1_R_D-	14	CAN1_R_D+
15	NC	16	NC
17	NC	18	NC
19	GND	20	GND

Figure 3.11 CAN1 CAN Bus Connector



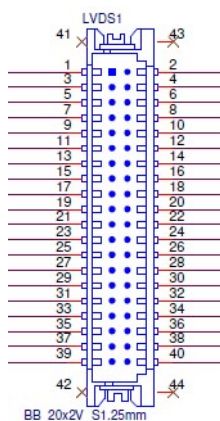
Pin	Signal	Pin	Signal
1	NC	2	NC
3	COM0_z_RXD	4	COM0_z_RTS#
5	COM0_z_TXD	6	COM0_z_CTS#
7	GND	8	NC
9	NC	10	GND
11	NC	12	NC
13	COM1_RX	14	NC
15	COM1_TX	16	NC
17	NC	18	NC
19	GND	20	GND

Figure 3.12 COM1 COM Port0&1 Connector



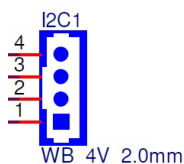
Pin	Signal	Pin	Signal
1	ESPI_CLK_1.8	2	ESPI_IO1_1.8
3	ESPI_RST#_1.8	4	ESPI_IO0_1.8
5	ESPI_CS0#_1.8	6	+V3.3
7	ESPI_IO3_1.8	8	GND
9	ESPI_IO2_1.8	10	+V1.8
11	ESPI_ALERT0#_1.8	12	ESPI_RST#_1.8
13	+V5_DUAL	14	+V5

Figure 3.13 ESPI_PH1 Header



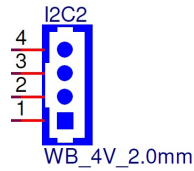
Pin	Signal	Pin	Signal
1	+VLVDS_PANEL_PWR	2	+VLVDS_PANEL_PWR
3	GND	4	GND
5	+VLVDS_PANEL_PWR	6	+VLVDS_PANEL_PWR
7	LVDS0_Z_D0-	8	LVDS1_Z_D0-
9	LVDS0_Z_D0+	10	LVDS1_Z_D0+
11	GND	12	GND
13	LVDS0_Z_D1-	14	LVDS1_Z_D1-
15	LVDS0_Z_D1+	16	LVDS1_Z_D1+
17	GND	18	GND
19	LVDS0_Z_D2-	20	LVDS1_Z_D2-
21	LVDS0_Z_D2+	22	LVDS1_Z_D2+
23	GND	24	GND
25	LVDS0_Z_CLK-	26	LVDS1_Z_CLK-
27	LVDS0_Z_CLK+	28	LVDS1_Z_CLK+
29	GND	30	GND
31	LVDS_Z_DDC_CLK_Edp_AUX+	32	LVDS_Z_DDC_DAT_eDP_AUX-
33	GND	34	EDP_HDP_A
35	LVDS0_Z_D3-	36	LVDS1_Z_D3-
37	LVDS0_Z_D3+	38	LVDS1_Z_D3+
39	Pull-low via 4.7Kohm to GND	40	LVDS1_CTRL

Figure 3.14 LVDS1 LVDS Connector



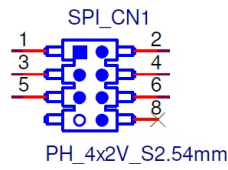
Pin	Signal
1	GND
2	I2C_GP_DAT_3.3
3	I2C_GP_CK_3.3 I2C_GP_A1
4	+V3.3

Figure 3.15 I2C1 I2C_GP Connector

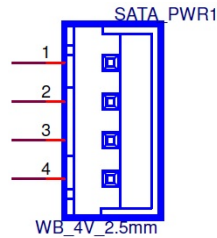


Pin	Signal
1	GND
2	I2C_M_DAT_3V3S
3	I2C_M_CLK_3V3S
4	+V3.3

Figure 3.16 I2C2 I2C_PM Connector

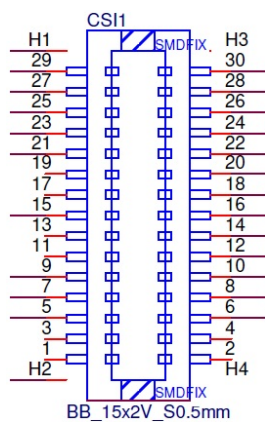


Pin	Signal	Pin	Signal
1	+V1.8M_SPI_J	2	GND
3	Q_SPI_PH_CS#	4	Q_SPI_PH_CLK
5	Q_SPI_PH_MISO	6	Q_SPI_PH_MOSI
7	NC	8	NC



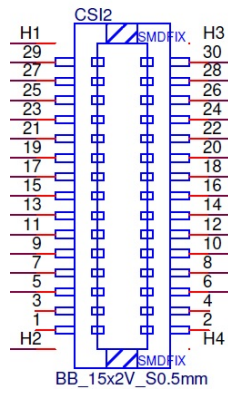
Pin	Signal
1	+V5
2	GND
3	GND
4	+V12

Figure 3.17 SATA_PWR1 Connector



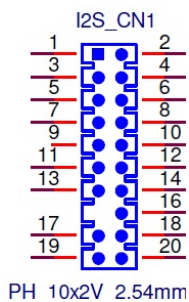
Pin	Signal	Pin	Signal
1	NC	2	NC
3	NC	4	NC
5	MCSI_0_PWR#_1.8	6	GND
7	MCSI_0_RST#_1.8	8	I2C_CSI0_DAT
9	GND	10	I2C_CSI0_CK
11	NC	12	GND
13	NC	14	CSI0_X_CK+
15	GND	16	CSI0_X_CK-
17	NC	18	GND
19	NC	20	CSI0_X_D1+
21	GND	22	CSI0_X_D1-
23	MCSI_MCK_1.8	24	GND
25	+V3_CAMAF_A	26	CSI0_X_D0+
27	+V3_CAMAF_A	28	CSI0_X_D0-
29	+V3_CAMAF_A	30	GND

Figure 3.18 CS11 Connector



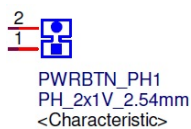
Pin	Signal	Pin	Signal
1	NC	2	NC
3	NC	4	NC
5	MCSI_1_PWR#_1.8	6	GND
7	MCSI_1_RST#_1.8	8	I2C_CSI1_DAT
9	GND	10	I2C_CSI1_CK
11	CSI1_X_D3+	12	GND
13	CSI1_X_D3-	14	CSI1_X_CK+
15	GND	16	CSI1_X_CK-
17	CSI1_X_D2+	18	GND
19	CSI1_X_D2-	20	CSI1_X_D1+
21	GND	22	CSI1_X_D1-
23	CAM1_X_MCK	24	GND
25	+V3_CAMAF_B	26	CSI1_X_D0+
27	+V3_CAMAF_B	28	CSI1_X_D0-
29	+V3_CAMAF_B	30	GND

Figure 3.19 CSI2 Connector



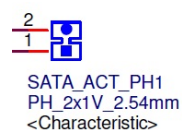
Pin	Signal	Pin	Signal
1	AUDIO_VDDA	2	GND
3	AUDIO_VDDA	4	I2S2_SDIN_C
5	I2S2_SDOUT_C	6	I2S2_LRCK_C
7	I2S2_CK_C	8	AUDIO_MCK_C
9	NC	10	GND
11	AUDIO_I2C_CK	12	MIC_BIAS
13	AUDIO_I2C_DAT	14	GND
15	N/A	16	HP_R
17	MIC_IN	18	GND
19	GND	20	HP_L

Figure 3.20 I2S_CN1 Connector



Pin	Signal
1	GND
2	PWRBTN#

Figure 3.21 PWRBTN_PH1 PWRBTN Pin Header



Pin	Signal
1	SATA_LED#_3.3
2	HDD_LED(Pull-up via 330 ohm to +V3.3)

Figure 3.22 SATA_ACT_PH1 SATA ACT# Pin Header



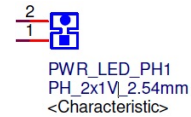
Pin	Signal
1	GND
2	BATLOW#_1.8

Figure 3.23 BATLOW1 BATLOW Pin Header



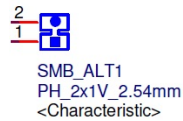
Pin	Signal
1	GND
2	RESET_IN#_1.8

Figure 3.24 SYS_RESET_PH1 SYS RESET Pin Header



Pin	Signal
1	GND
2	PWR_LED (Pull-up via 330 ohm to +V5)

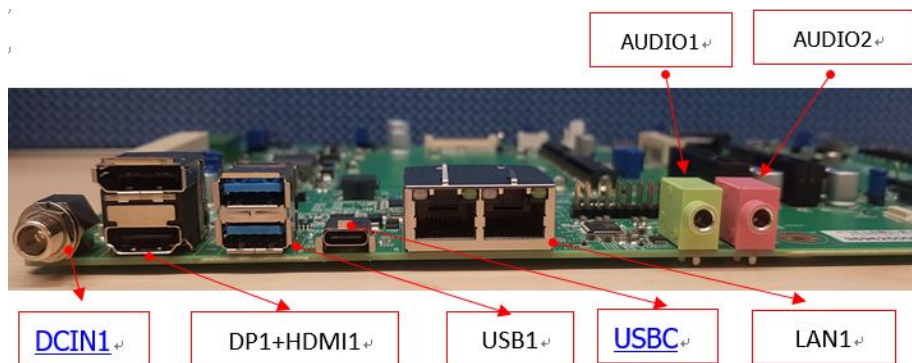
Figure 3.25 PWR_LED_PH1 Power LED Pin Header



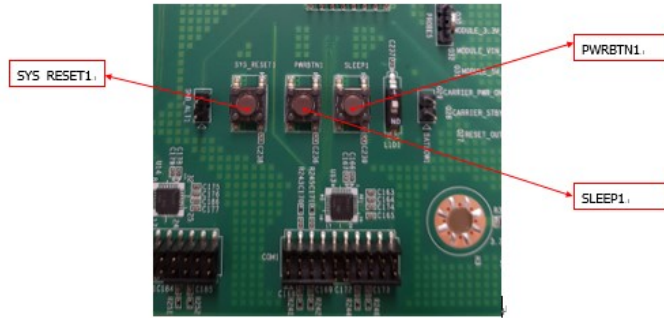
Pin	Signal
1	GND
2	SMB_ALERT#_1.8

Figure 3.26 SMB_ALT1 Power LED Pin Header

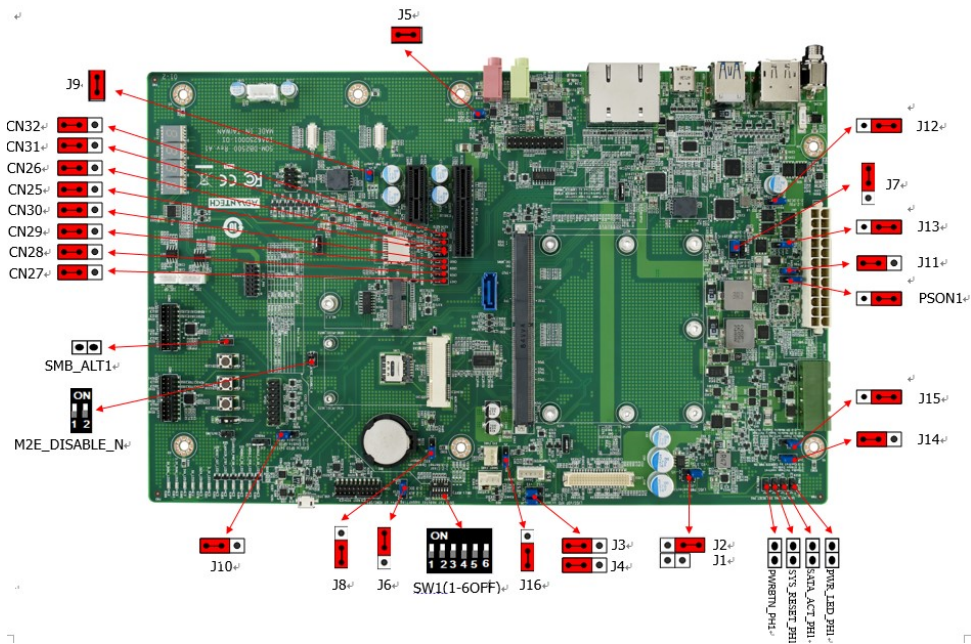
3.1.3 I/O Connector Location



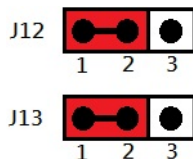
3.1.4 Button Location



3.1.5 Jumper and Switch Location

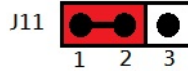


3.1.5.1 Jumper Setting



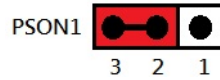
Pin	Function
J12 1-2 J13 1-2	Supply ATX (+V12) to VIN [Default]
J12 2-3 J13 2-3	Supply DCIN (+VDC) to VIN

Figure 3.27 J12,J13 Voltage Input (VIN) Selection



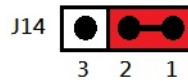
Pin	Function
1-2	Control By CARRIER_STBY#_3.3 [Default]
2-3	Control By CARRIER_PWR_ON_3.3

Figure 3.28 J11 Core Power Control



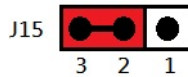
Pin	Function
1-2	AT Mode
2-3	ATX Mode [Default]

Figure 3.29 PSON1 ATX / AT Mode Selection



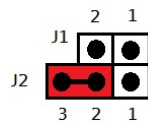
Pin	Function
1-2	Always Enable [Default]
3-4	Control by CARRIER_PWR_ON

Figure 3.30 J14 Standby Power Control



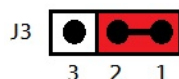
Pin	Function
1-2	3.3V Module Supply Voltage
2-3	5V Module Supply Voltage [Default]

Figure 3.31 J15 Module Power Setting



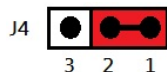
Pin	Function
J2 2-3	LVDS_PWR is +V3.3 [Default]
J2 1-2	LVDS_PWR is +V5
J1 2 – J2 2	LVDS_PWR is +V12

Figure 3.32 J1,J2 LVDS Power Selection



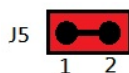
Pin	Function
1-2	LVDS Inverter PWR is +V5 [Default]
2-3	LVDS Inverter PWR is +V12

Figure 3.33 J3 LVDS Inverter Power Selection



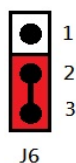
Pin	Function
1-2	LVDS [Default]
2-3	eDP_HPDP

Figure 3.34 J4 EDP / LVDS HPD Selection



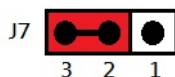
Pin	Function
1-2	HDA [Default]
1-X	I2S

Figure 3.35 J5 HDA/I2S Selection



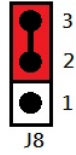
Pin	Function
1-2	AUX
2-3	DDC [Default]

Figure 3.36 J6 DDI1 AUX/DDC Selection



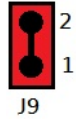
Pin	Function
1-2	DP @ USB Type C
2-3	HDMI CONN [Default]

Figure 3.37 J7 DP1/HDMI1 Selection



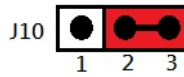
Pin	Function
1-2	Clear CMOS
2-3	Normal Operation [Default]

Figure 3.38 J8 Clear CMOS



Pin	Function
1-2	+V1.8M_SPI for SPI_CN1 [Default]
1-X	No Power

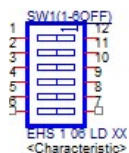
Figure 3.39 J9 +V1.8M_SPI Power Jumper



Pin	Function
1-2	Enable GPIO
2-3	Disable GPIO [Default]

Figure 3.40 J10 GPIO Setting

3.1.5.2 Switch Setting



Dip Switch	1-12	2-11	3-10	4-9	5-8	6-7	Function
SW1(1-6OFF)	ON	ON	ON	---	---	NC	Carrier SATA
	OFF	ON	ON	---	---	NC	Carrier SD Card
	ON	OFF	ON	---	---	NC	Carrier eSPI(CS0#)
	OFF	OFF	ON	---	---	NC	Carrier SPI(CS0#)
	ON	ON	OFF	---	---	NC	Module Device(NAND, NOR)-vendor specific
	OFF	ON	OFF	---	---	NC	Remote Boot (GBE, Serial)--vendor specific
	ON	OFF	OFF	---	---	NC	Module eMMC Flash
	OFF	OFF	OFF	---	---	NC	Module SPI [Default]
	---	---	---	ON	---	NC	Force Recovery Enable
	---	---	---	OFF	---	NC	Force Recovery Disable [Default]
	---	---	---	---	ON	NC	Specific Test Function Enable
	---	---	---	---	OFF	NC	Specific Test Function Disable [Default]

Figure 3.41 SW1(1-6OFF) Boot Select/Force Recovery/Test Switch

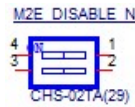
Note! “---” means Not Applicable..





Dip Switch	1-2	Function
LID1	ON	LID# Enable
	OFF	LID# Disable [Default]

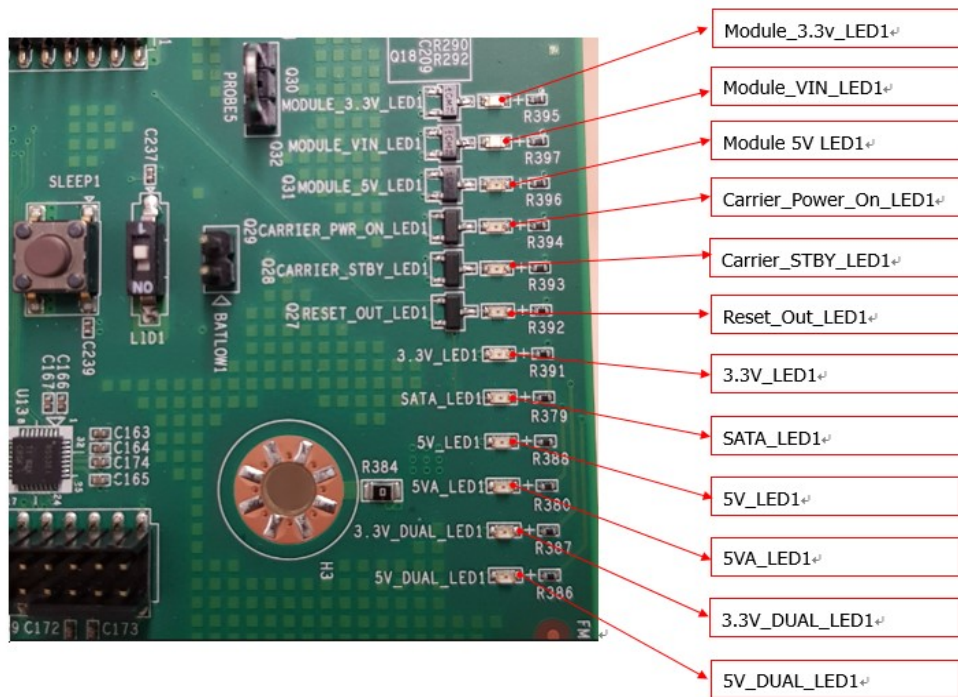
Figure 3.42 LID1 LID Button Enable/Disable Switch



Dip Switch	1-4	2-3	Function
M2E_DISABLE_N	ON		M.2 Wireless Disable-2
	OFF		M.2 Wireless Enable-2
		ON	M.2 Wireless Disable-1
		OFF	M.2 Wireless Enable-1

Figure 3.43 M2E_DISABLE_N M.2 Wireless Disable Switch

3.1.6 LED Location



3.1.7 LED Function List

Location	Function
MODULE_3.3V_LED1	Carrier Board +V3.3A Indicate.
MODULE_VIN_LED1	Carrier Board +V_MOD_IN Indicate.
MODULE_5V_LED1	Carrier Board +V5A Indicate.
CARRIER_PWR_ON_LED1	CARRIER_PWR_ON_1.8 Indicate.
CARRIER_STBY_LED1	CARRIER_STBY# Indicate.
RESET_OUT_LED1	Module Board Reset Indicate.
3.3V_LED1	Carrier Board +V3.3 Indicate.
SATA_LED1	SATA Signal Connect Indicate.
5V_LED1	Carrier Board +V5 Indicate.
5VA_LED1	Carrier Board +V5A Indicate.
3.3V_DUAL_LED1	Carrier Board +V3.3_DUAL Indicate.
5V_DUAL_LED1	Carrier Board +V5_DUAL Indicate.

3.1.8 Connector List

Label	Function
<u>ATX1</u>	<u>ATX Connector</u>
<u>SMARC_IN1</u>	<u>Wide Range Input Power Connector</u>
<u>DCIN1</u>	<u>DCIN connector</u>
<u>DP1+HDMI1</u>	<u>DP & HDMI Connector</u>
<u>USB1</u>	<u>USB2.0 port1~2 & USB3.0 port0 Connector</u>
<u>USBC</u>	<u>Type-C Connector</u>
<u>LAN1</u>	<u>LAN0 & LAN1 Connector</u>
<u>AUDIO1</u>	<u>Line Out Connector</u>
<u>AUDIO2</u>	<u>MIC Connector</u>
<u>CN1</u>	<u>SMARC Connector</u>
<u>PCIE_4X1_1</u>	<u>PCIe x4 Connector</u>
<u>SATA1</u>	<u>SATA Port0 Connector</u>
<u>PCIE_X1_1</u>	<u>PCIe x1 Connector</u>
<u>M2E1</u>	<u>M.2 Key-E Connector</u>
<u>MINI_PCIE1</u>	<u>Mini PCIe Connector</u>
<u>SIM1</u>	<u>SIM card Connector</u>
<u>LVDS1</u>	<u>LVDS Connector</u>
<u>LVDS_INVERTER1</u>	<u>LVDS Inverter Connector</u>
<u>SMART_FAN1</u>	<u>Smart Fan Connector</u>
<u>SYS_FAN1</u>	<u>System Fan Connector</u>
<u>CAN1</u>	<u>CAN Bus Connector</u>
<u>USB_OTG1</u>	<u>USB OTG Connector</u>
<u>COM1</u>	<u>COM Port Port1,2 Connector</u>
<u>COM2</u>	<u>COM Port Port3,4 Connector</u>
<u>I2C_PM</u>	<u>I2C connector</u>
<u>I2C_GP</u>	<u>I2C Connector</u>
<u>ESPI_PH1</u>	<u>eSPI Pin Header</u>
<u>SATA_PWR1</u>	<u>SATA Power Connector</u>
<u>CSI1</u>	<u>MIPI Connector for 2M Camera</u>
<u>CSI2</u>	<u>MIPI Connector for 8M & 13M Camera</u>
<u>SPI_BIOS1</u>	<u>Carrier Board BIOS Socket</u>
<u>SDCARD1</u>	<u>SD Card Connector</u>

3.1.9 Jumper, Switch, and Button List

Label	Function
<u>SLEEP1</u>	<u>Sleep Button</u>
<u>PWRBTN1</u>	<u>Power Button</u>
<u>SYS_RESET1</u>	<u>Reset Button</u>
<u>SW1</u>	<u>BOOT SELECT Switch</u>
<u>LID1</u>	<u>LID Button</u>
<u>BATTLOW1</u>	<u>Enable Battery Low# Header</u>
<u>M2E_DISABLE_N</u>	<u>M.2 Wireless Disable</u>
<u>SMB_ALT1</u>	<u>SMB Alert Enable Header</u>
<u>GPIO1</u>	<u>Header For GPIO Test</u>
<u>J1</u>	<u>LVDS Power Selection Header-1</u>
<u>J2</u>	<u>LVDS Power Selection Header-2</u>
<u>J3</u>	<u>LVDS Inverter Power Selection Header</u>
<u>J4</u>	<u>EDP / LVDS Hot-Plug Detect Selection Header</u>
<u>J5</u>	<u>HAD / I2S Selection Header</u>
<u>J6</u>	<u>DDI1 DDC/AUX Selection Header</u>
<u>J7</u>	<u>DP1@Type-C / HDMI Selection</u>
<u>J8</u>	<u>Clear CMOS Header</u>
<u>J9</u>	<u>SPI Power Header</u>
<u>J10</u>	<u>Enable GPIO Test Header</u>
<u>J11</u>	<u>Core Power Voltage Control Header</u>
<u>J12</u>	<u>PSU / DC-IN Selection Header-1</u>
<u>J13</u>	<u>PSU / DC-IN Selection Header-2</u>
<u>J14</u>	<u>Standby Voltage Control Header</u>
<u>J15</u>	<u>Module +3.3V/+5V Power Selection Header</u>
<u>PSON1</u>	<u>AT / ATX Selection Header</u>
<u>SPI_CN1</u>	<u>SPI Connector</u>
<u>I2S_CN1</u>	<u>I2S Connector</u>

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