

EPS-BYT

Intel® BayTrail Celeron® SoC Processor Fanless Rugged
Embedded System

Quick Reference Guide

1st Ed – 05 February 2015

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FCC Statement



THIS DEVICE COMPLIES WITH PART 15 FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:

- (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE.
- (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRE OPERATION.

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.

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We want you to get the maximum performance from your products. So if you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in your product documentation. These answers are normally a lot more detailed than the ones we can give over the phone. So please consult the user's manual first.

To receive the latest version of the user's manual; please visit our Web site at:

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Content

1. Getting Started	5
1.1 Safety Precautions	5
1.2 Packing List	5
1.3 System Specifications	6
1.4 System Overview.....	8
1.4.1 Rear View.....	8
1.5 System Dimensions.....	10
1.5.1 Front & Top view.....	10
2. Hardware Configuration.....	11
2.1 EPS-BYT connector mapping.....	12
2.1.1 External Serial Port 1 connector (COM1)	12
2.1.2 External Serial Port 3/4/5/6 connector (COM3/4/5/6)	12
2.1.3 VGA connector (VGA).....	13
2.1.4 Multi-Function Port combined COM2, 2 PS/2, Audio, GPIO and SMBus (Multi-function port) .	13
2.1.4.1 GPIO+SMBUS	14
2.1.4.2 COM2	14
2.2 EBM-BYTS, AUX-M01, AUX-M02, AUX-M05 and AUX-M06 Overviews.....	15
2.2.1 EBM-BYTS.....	15
2.2.2 AUX-M01.....	16
2.2.3 AUX-M02.....	16
2.2.4 AUX-M05.....	17
2.2.5 AUX-M06.....	17
2.3 EBM-BYTS Jumper & Connector list	18
2.4 EBM-BYTS Jumpers & Connectors settings	20
2.4.1 Clear CMOS (JCMOS1).....	20
2.4.2 COM 1/2 pin 9 signal select (JRI1/2)	20
2.4.3 AT/ ATX Input power select (JAT1)	21
2.4.4 LCD backlight brightness adjustment (JVR1)	21
2.4.5 IET interface DP mode select (JDDI1).....	22
2.4.6 UIM Switch select (JUIM1).....	22
2.4.7 Serial port 1/ 2 – RS485 mode select (SW1).....	23
2.4.8 LPC port connector (JLPC1).....	23
2.4.9 LCD inverter connector (JBKL1)	24
2.4.10 SPI connector (SPI1).....	24
2.4.11 Front Panel Connector 1 (CN1).....	25

EPS-BYT

2.4.12	Front Panel Connector 2 (CN2).....	25
2.4.13	DC Output connector (DCOUT_S1)	26
2.4.14	EC Debug connector (JEC_ROM1).....	26
2.4.15	On-board header for USB2.0 (JUSB1)	27
2.4.16	LVDS connector (JLVDS1).....	27
2.5	AUX-M01, AUX-M02, AUX-M05, AUX-M06 Jumper & Connector list	28
2.6	AUX-M01 Jumpers & Connectors settings	29
2.6.1	COM 3/4/5/6 pin 9 signal select (JRI3/4/5/6)	29
2.6.2	USB connector (USB3)	29
2.6.3	USB connector (JUSB3)	30
2.6.4	SMBUS of TCA9555 address setting (PJP1)	30
2.7	AUX-M02 Connectors settings	31
2.7.1	LAN ACT/LNK/SPD LED (JLANLED)	31
2.7.2	Normal/Bypass mode LED (JLANMODE)	31
2.8	AUX-M06 Connectors settings	32
2.8.1	Power connector (NJPWR1).....	32
2.9	Installing PCI devices (EPS-BYT).....	33
2.10	Installing Hard Disk & Memory (EPS-BYT).....	34
2.11	Installing Mounting Brackets (EPS-BYT)	36

1. Getting Started

1.1 Safety Precautions

Warning!



Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

Caution!



Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

1.2 Packing List

- 1 x EPS-BYT Intel® BayTrail Celeron® SoC Processor Fanless Rugged Embedded System
- 1 x DVD-ROM contains the followings:
 - QRG in PDF file
 - Ethernet driver and utilities
 - VGA drivers and utilities
 - Audio drivers and utilities
- Other major components include the followings:
 - Adapter
 - Power Cord
 - Screw kit for 2.5" Drive bay/Mini Card
 - 44-Pin Multiple Function Cable
 - Wall Mount Kit



If any of the above items is damaged or missing, contact your retailer.

1.3 System Specifications

System		
Model	EPS-BYT-J19-A1-1R	EPS-BYT-J19-A1-2R
Board	EBM-BYTS + AUX-M01 + AUX-M05 + AUX-M06	EBM-BYTS + AUX-M02 + AUX-M05 + AUX-M06
CPU	Intel® Celeron® J1900 2.0GHz Processor	
BIOS	AMI uEFI BIOS, 64Mbit SPI Flash ROM	
System Chipset	Intel® Valleyview SoC	
I/O Chipset	EC ITE IT8528E	
System Memory	1 x 204-Pin DDR3L 1333MHz SO-DIMM Socket Up to 8GB	
Watchdog Timer	H/W Reset, 1sec. ~ 65535sec./min. and 1sec. or 1min. step	
H/W Status Monitor	Monitoring CPU & System Temperature and Voltage	
Storage		
Solid State Drive	1 x 2.5” Drive Bay, 1 x mSATA	
External I/O		
COM Port	6 x RS-232 (Can be Set as 422/ 485 by BIOS, +5V and 12V Support on Pin-9 (Selected by Jumper)	2 x RS-232 (Can be Set as 422/ 485 by BIOS, +5V and 12V Support on Pin-9 (Selected by Jumper)
USB Port	4 x USB	
Video Port	1 x VGA	
Audio Port	1 x Mic-In, 1 x Line-Out, 1 x Line-In	
LAN Port	1 x RJ45	5 x RJ45
GPIO	6-bit GPI & 6-Bit GPO	
Switch	1 x Power on/off	
Indicator Light	1 x Power on/off LED 1 x Storage LED	
Expansion Slots	1 x Mini PCIe (mSATA supported), 2 x PCI	
Display		
Chipset	Intel® Valleyview SoC integrated Graphics	
Multiple Display	VGA	
Resolution	VGA Mode: 2560 x 1600 @ 60Hz	
Audio		
HD Codec	Realtek ALC892	
Audio Interface	Mic-in, Line-in, Line-out	
Ethernet		
Chipset	Intel® I211AT Gigabit Ethernet Controller	

Ethernet Interface	10/100/1000 Base-Tx Gigabit Ethernet Compatible
Mechanical	
Power Type	+12 ~ 26Vdc (Lockable DC Jack)
ACPI	Single Power ATX Support S0, S3, S4, S5 ACPI 5.0 Compliant
Power Mode	AT/ATX (ATX is the default setting)
Operating Temperature	-15°C ~ 60°C (5°F ~ 140°F) (w/CF & SSD), Ambient w/Air Flow
Storage Temperature	-40 ~ 75°C (-40 ~ 167°F)
Relative Humidity	0% ~ 90% Relative Humidity, Non-condensing
Vibration Protection	With CF/SSD: 5Grms, IEC 60068-2-64, Random, 10 ~ 500Hz, 1hr/axis
Shock Protection	With CF/SSD: 50G, IEC 60068-2-27, Half Sine, 11ms
Certification	CE, FCC Class B
Dimension (W x H x D)	220mm x 215mm x 147mm
Weight	3.5kgs
Color	Silver and Black
Fanless	YES
Reliability	
IP Rating	IP 30

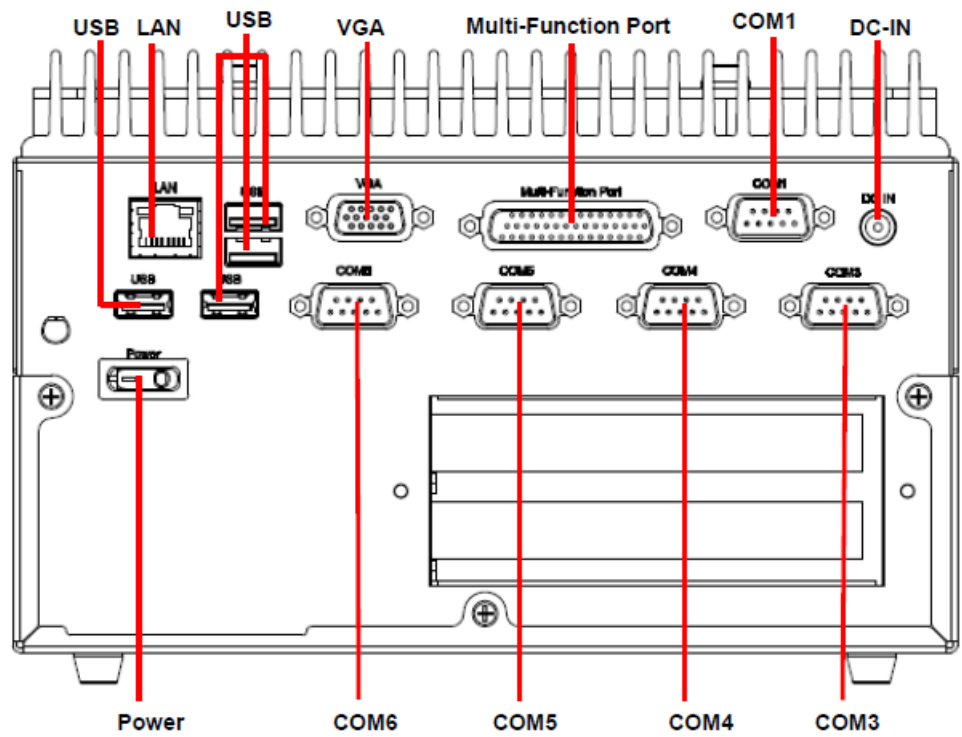


Note: Specifications are subject to change without notice.

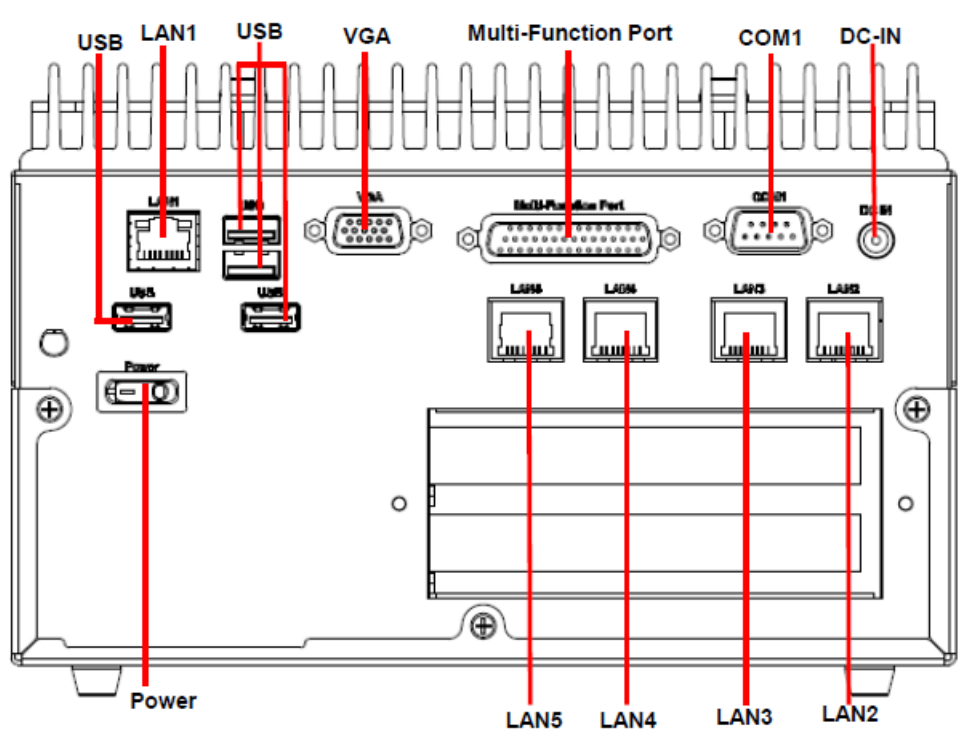
1.4 System Overview

1.4.1 Rear View

EPS-BYT-J19-A1-1R



EPS- BYT-J19-A1-2R



EPS-BYT-J19-A1-1R**Connectors**

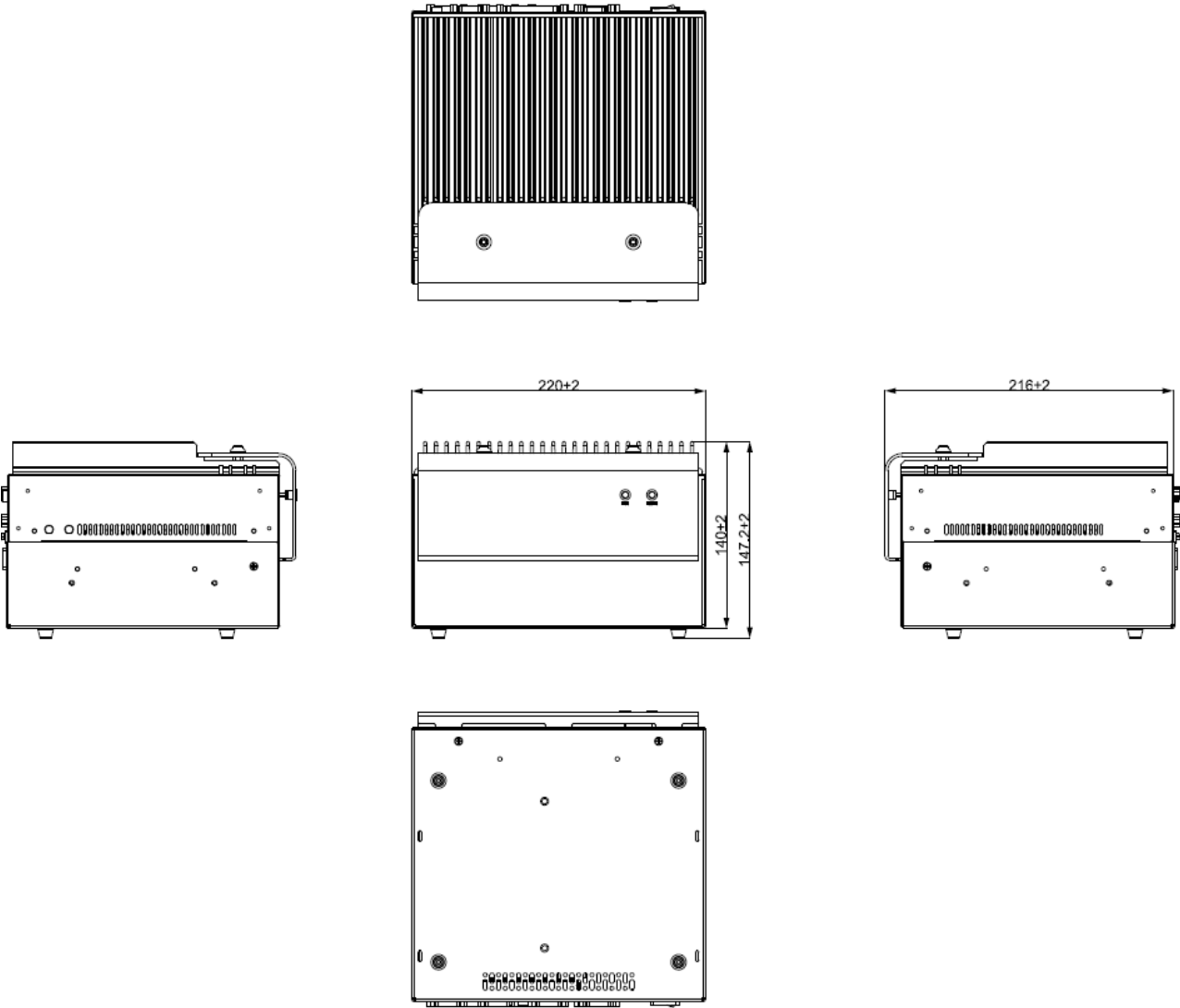
Label	Function	Note
COM1	Serial port connector 1	
COM3~6	Serial port connector 3~6	
DC-IN	DC power-in connector	
LAN	RJ-45 Ethernet	
Multi-function port	Multi-Function Port combined COM2, 2 PS/2, Audio, GPIO and SMBus	
USB	USB connector	
VGA	VGA connector	
Power	Power connector	

EPS-BYT-J19-A1-2R**Connectors**

Label	Function	Note
COM1	Serial port connector 1	
DC-IN	DC power-in connector	
LAN1~5	RJ-45 Ethernet 1~5	
Multi-function port	Multi-Function Port combined COM2, 2 PS/2, Audio, GPIO and SMBus	
USB	USB connector	
VGA	VGA connector	
Power	Power connector	

1.5 System Dimensions

1.5.1 Front & Top view



(Unit: mm)

2. Hardware Configuration

Jumper and Connector Setting, Driver and BIOS Installing

For advanced information, please refer to:

- 1- EBM-BYTS, AUX-M01, AUX-M02, AUX-M05 and AUX-M06 included in this manual.

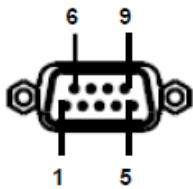
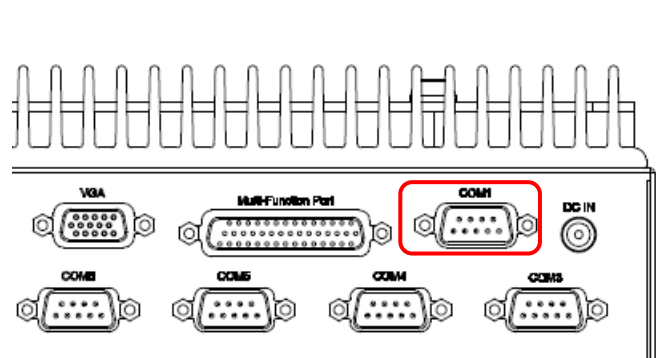


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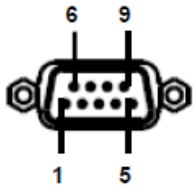
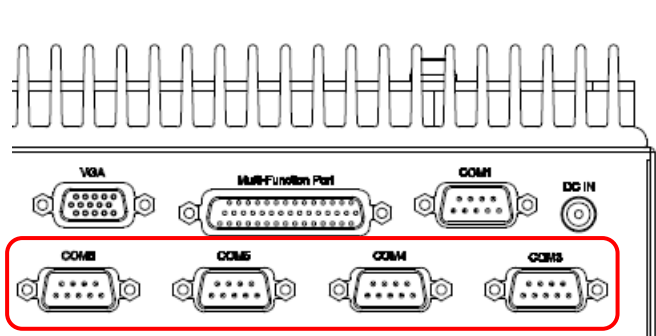
2.1 EPS-BYT connector mapping

2.1.1 External Serial Port 1 connector (COM1)



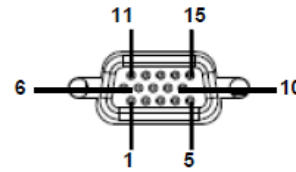
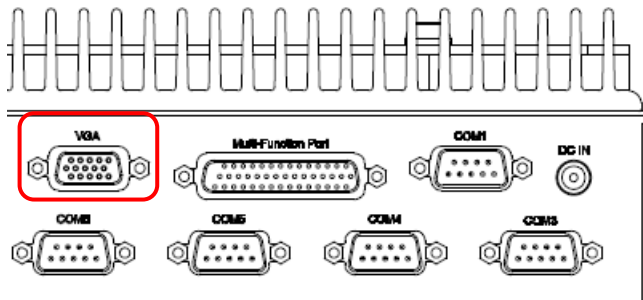
Pin	RS-232	RS-485	RS-422
1	DCD	TXD-/RXD-	TXD-
2	RXD	TXD+/RXD+	TXD+
3	TXD		RXD+
4	DTR		RXD-
5	GND	GND	GND
6	DSR		
7	RTS		
8	CTS		
9	RI		

2.1.2 External Serial Port 3/4/5/6 connector (COM3/4/5/6)



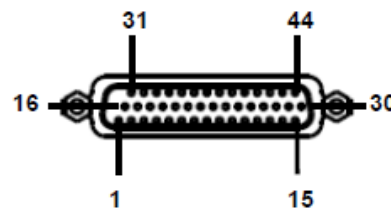
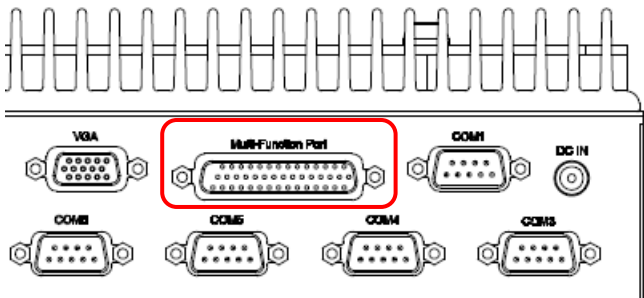
Pin	RS-232	RS-485	RS-422
1	DCD	TXD-/RXD-	TXD-
2	RXD	TXD+/RXD+	TXD+
3	TXD		RXD+
4	DTR		RXD-
5	GND	GND	GND
6	DSR		
7	RTS		
8	CTS		
9	RI		

2.1.3 VGA connector (VGA)

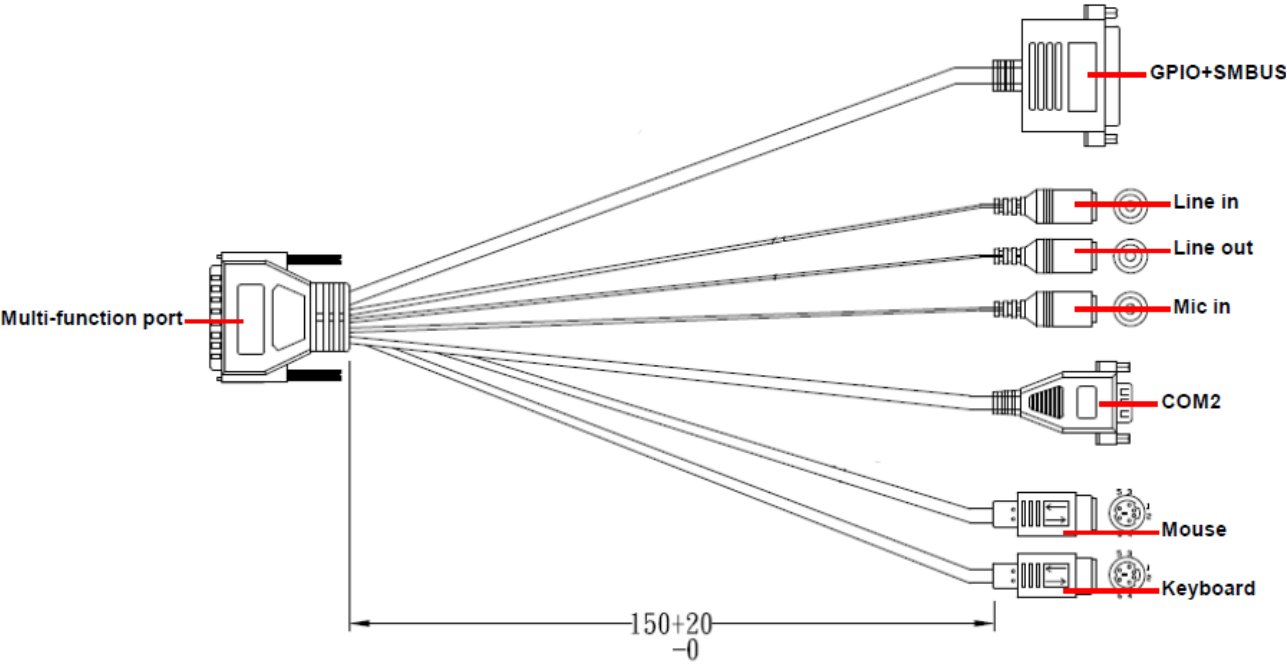


PIN	Signal	PIN	Signal	PIN	Signal
1	RED	6	GND	11	NC
2	GREEN	7	GND	12	DDCDAT
3	BLUE	8	GND	13	HSYNC
4	NC	9	+5V	14	VSYSN
5	GND	10	GND	15	DDCCLK

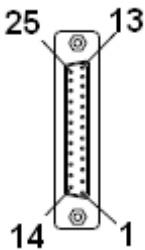
2.1.4 Multi-Function Port combined COM2, 2 PS/2, Audio, GPIO and SMBus (Multi-function port)



PIN	Signal	PIN	Signal	PIN	Signal
1	LINE1_JD	16	FRONT_JD	31	LINE1_RIN
2	MIC1_JD	17	LINEOUT_R	32	GND
3	MIC_RIN	18	GND	33	LINE1_LIN
4	GND	19	LINEOUT_L	34	+5V
5	MIC_LIN	20	GND	35	DO3
6	DO5	21	DO4	36	DO0
7	DO2	22	DO1	37	DI3
8	DI5	23	DI4	38	DI0
9	DI2	24	DI1	39	SMB_CLK
10	MSCK	25	SMB_DATA	40	NRIB#
11	GND	26	GND	41	NRTSB#
12	MSDA	27	NCTSB#	42	COM2_GND
13	KBDA	28	NDSRB#	43	NTXDB_485RXP
14	VCC_PS2	29	NDTRB#_485RXN	44	NDCDB#_485TXN
15	KBCK	30	NRXDB_485TXP		

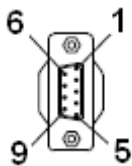


2.1.4.1 GPIO+SMBUS



Signal	PIN	PIN	Signal
	25	13	
	24	12	
	23	11	
	22	10	
SMBUS_DATA	21	9	
SMBUS_CLK	20	8	GND
GPI-D5	19	7	5V
GPI-D4	18	6	GPO-D5
GPI-D3	17	5	GPO-D4
GPI-D2	16	4	GPO-D3
GPI-D1	15	3	GPO-D2
GPI-D0	14	2	GPO-D1
		1	GPO-D0

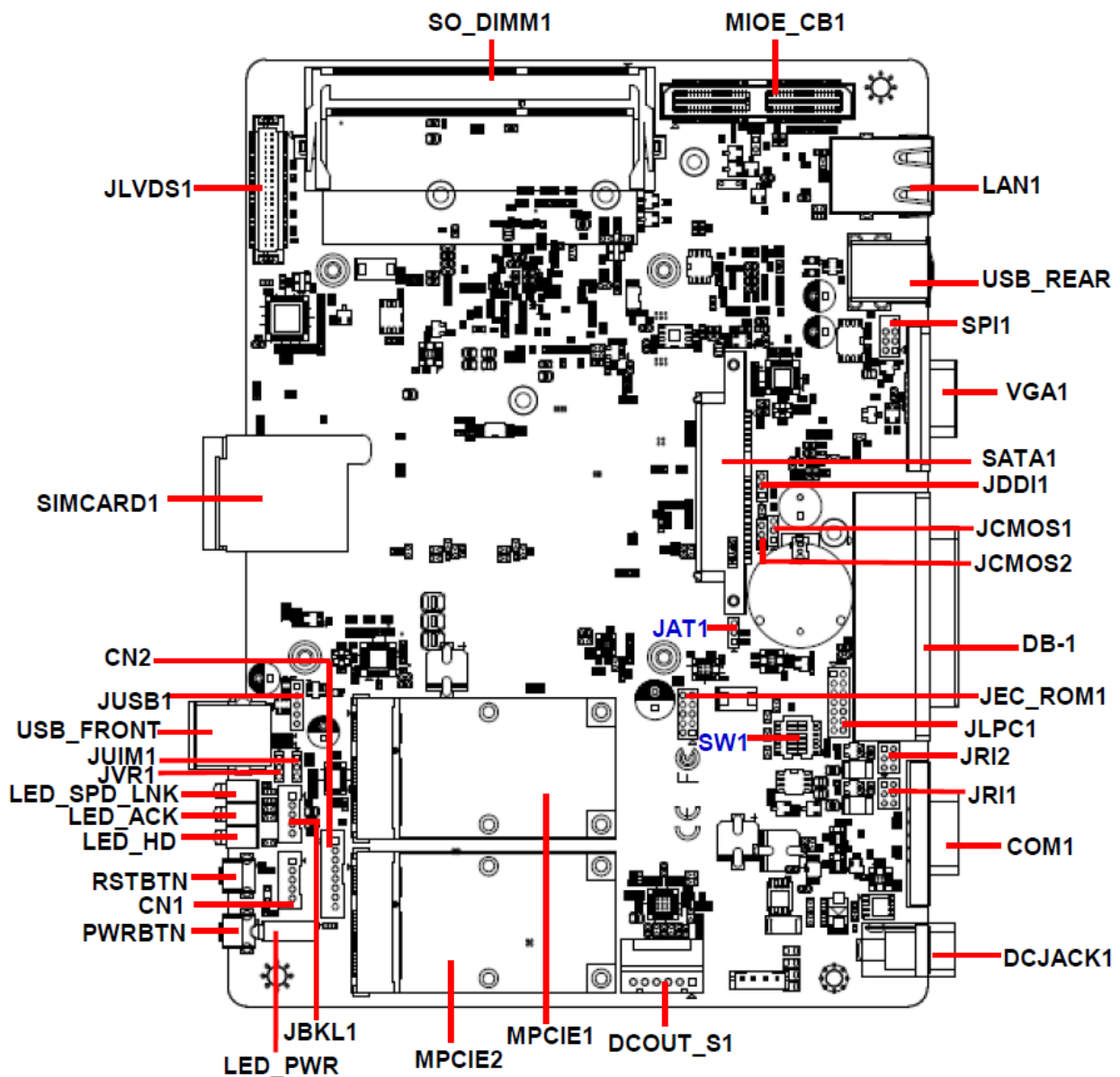
2.1.4.2 COM2



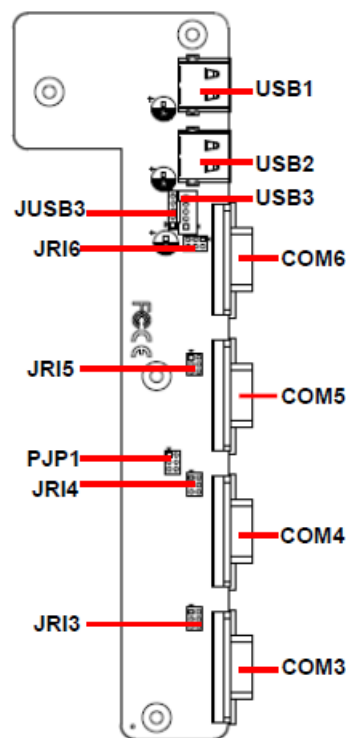
Pin	RS-232	RS-485	RS-422
1	DCD	TXD-/RXD-	TXD-
2	RXD	TXD+/RXD+	TXD+
3	TXD		RXD+
4	DTR		RXD-
5	GND	GND	GND
6	DSR		
7	RTS		
8	CTS		
9	RI		

2.2 EBM-BYTS, AUX-M01, AUX-M02, AUX-M05 and AUX-M06 Overviews

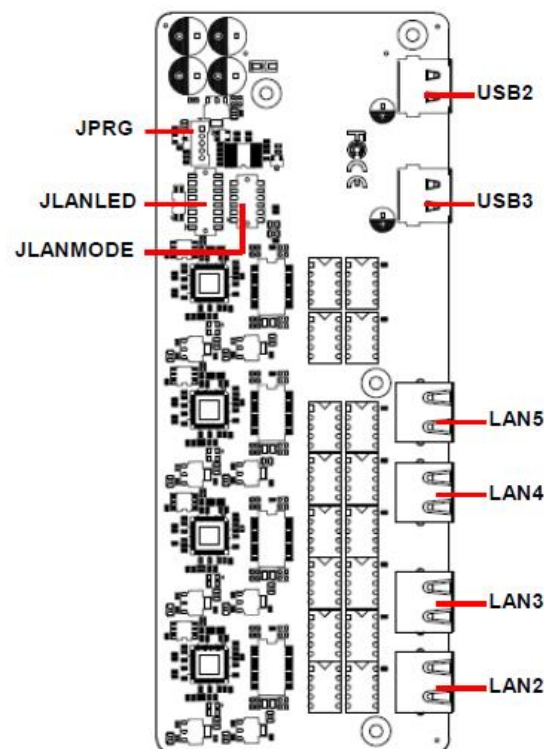
2.2.1 EBM-BYTS



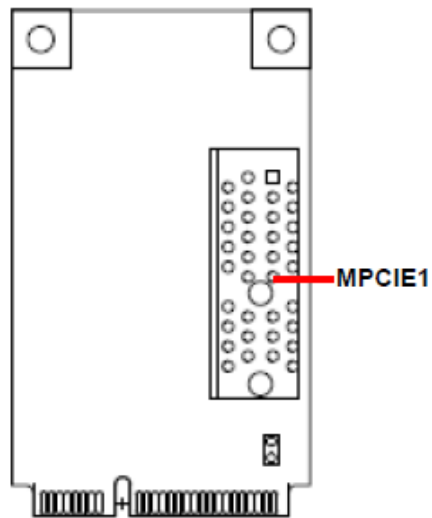
2.2.2 AUX-M01



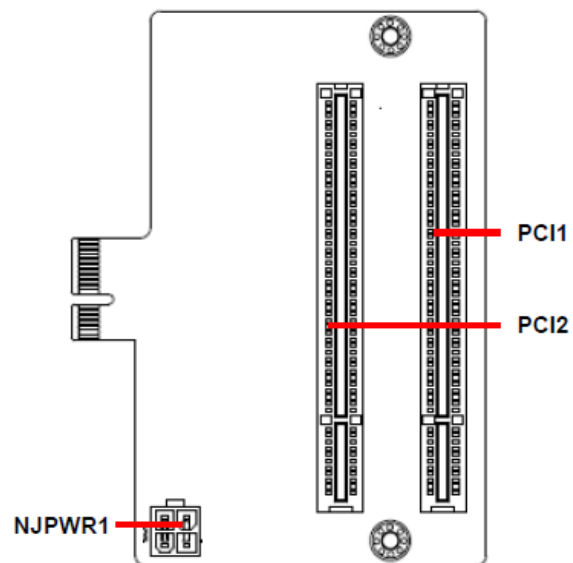
2.2.3 AUX-M02



2.2.4 AUX-M05



2.2.5 AUX-M06



2.3 EBM-BYTS Jumper & Connector list

Jumpers

Label	Function	Note
JCMOS1	Clear CMOS	3 x 1 header, pitch 2.54mm
JCMOS2	Clear CMOS (Reserved)	3 x 1 header, pitch 2.54 mm
JRI1/2	COM 1/2 pin 9 signal select	3 x 2 header, pitch 2.00 mm
JAT1	AT/ ATX Input power select	3 x 1 header, pitch 2.00 mm
SW1	Serial port 1/ 2 – RS485 mode select DIP switch 6pin	
JUIM1	UIM Switch select	3 x 1 header, pitch 2.00 mm
JVR1	LCD backlight brightness adjustment	3 x 1 header, pitch 2.00 mm
JDDI1	IET interface DP mode select	3 x 1 header, pitch 2.00 mm

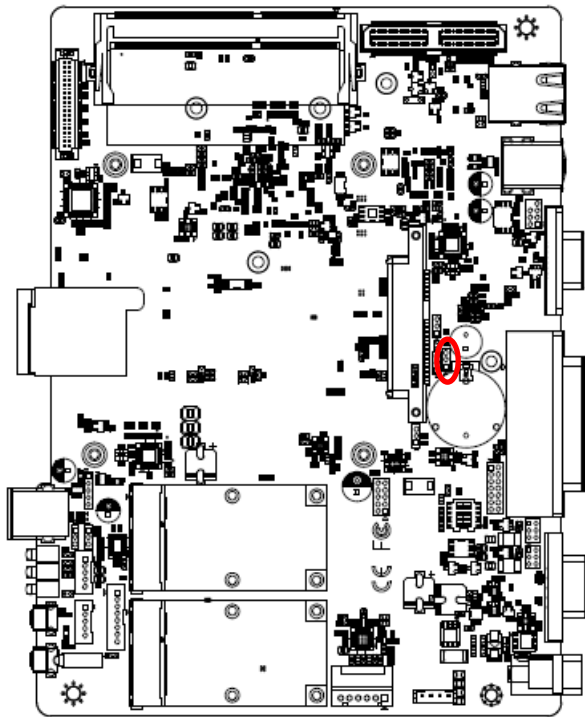
Connectors

Label	Function	Note
USB_REAR	USB connector	
USB_FRONT	USB connector	
JUSB1	On-board header for USB2.0	5 x 1 header, pitch 2.00 mm
LAN1	LAN connector	
VGA1	VGA connector	
DB-1	Multi-function port	1. COM2 2. Audio(line-in, line-out, mic-in) 3. 2 x PS/2 for KB/MS 4. 12 bit GPIO/SMBUS
COM1	Serial port connector 1	
DCJACK1	DC-IN connector	
MPCIE1/2	Mini PCI Express connector 1/2	52 pin
PWRBTN	Power button	
RSTBTN	Reset button	
LED_PWR	LED Power	
LED_HD	LED HDD	
LED_ACK	LED LAN	
LED_SPD_LNK	LED LAN	
SIMCARD1	SIM card slot	
JLVDS1	LVDS connector	20 x 2 wafer, pitch 1.25 mm
SO_DIMM1	DDR3 SODIMM connector	

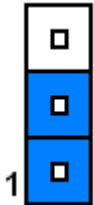
MIOE_CB1	IET Expansion slot	
JLPC1	LPC port connector	7 x 2 header, pitch 2.00 mm
SPI1	SPI connector	4 x 2 header, pitch 2.00 mm
JBKL1	LCD inverter connector	5 x 1 wafer, pitch 2.00 mm
SATA1	Serial ATA connector 1	
CN1	Front Panel connector 1	5 x 1 wafer, pitch 2.00 mm
CN2	Front Panel connector 2	8 x 1 wafer, pitch 2.00 mm
DCOUT_S1	DC Output connector	6 x 1 wafer, pitch 2.00 mm
JEC_ROM1	EC Debug connector	5 x 2 header, pitch 2.00 mm

2.4 EBM-BYTS Jumpers & Connectors settings

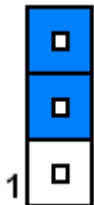
2.4.1 Clear CMOS (JCMOS1)



Protect*

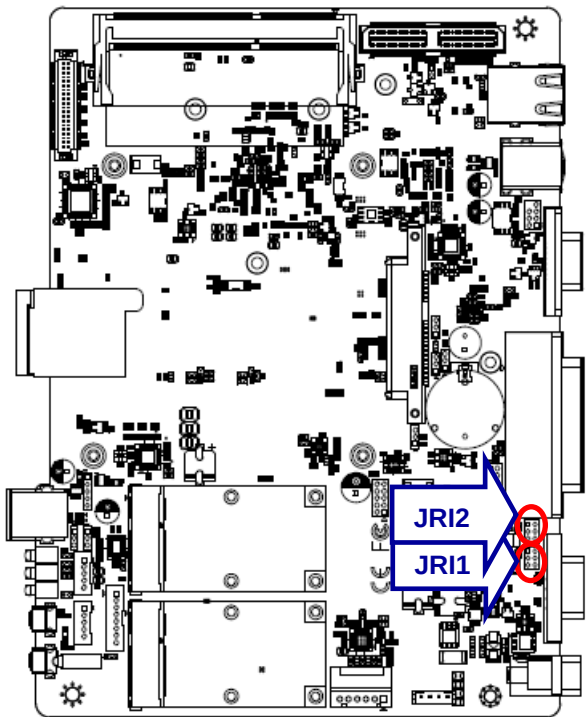


Clear CMOS

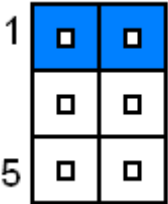


*Default

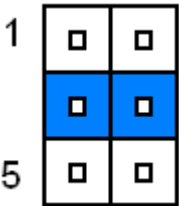
2.4.2 COM 1/2 pin 9 signal select (JRI1/2)



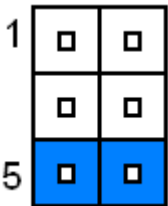
Ring*



+5V



+12V



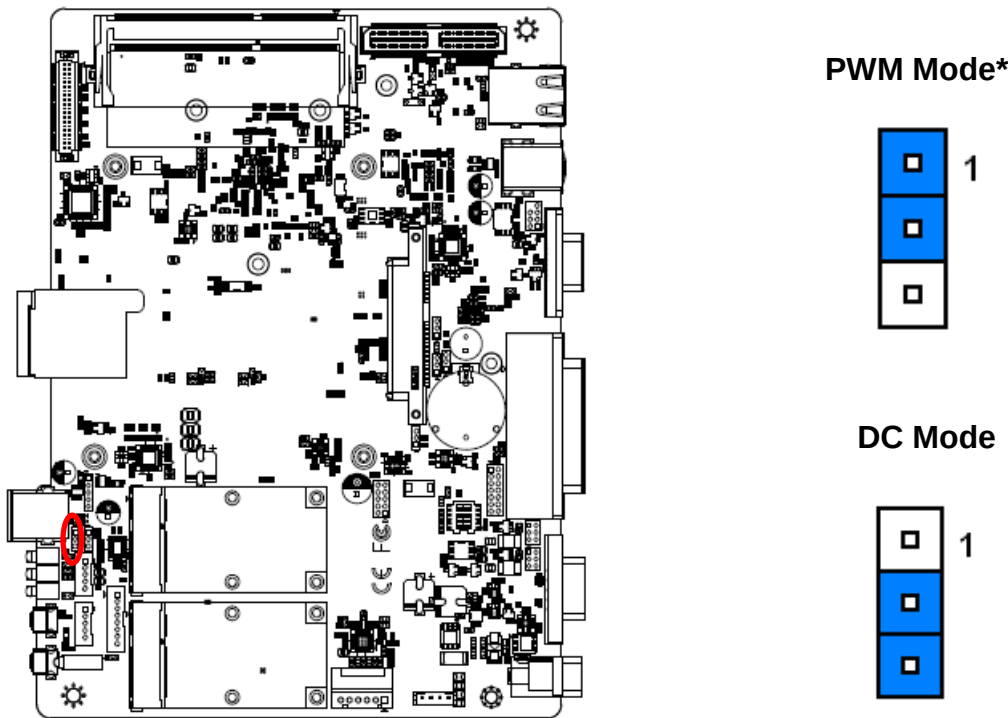
* Default

2.4.3 AT/ ATX Input power select (JAT1)



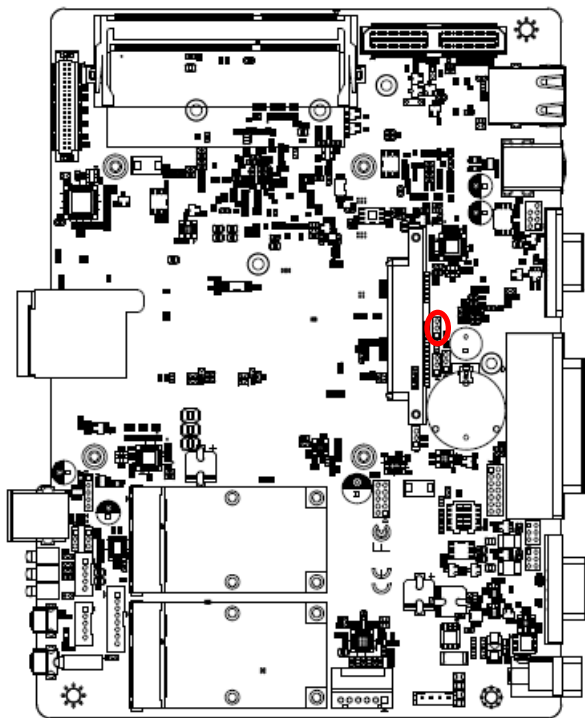
*Default

2.4.4 LCD backlight brightness adjustment (JVR1)

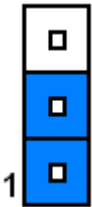


* Default

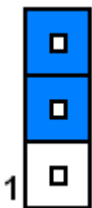
2.4.5 IET interface DP mode select (JDDI1)



HDMI/DVI

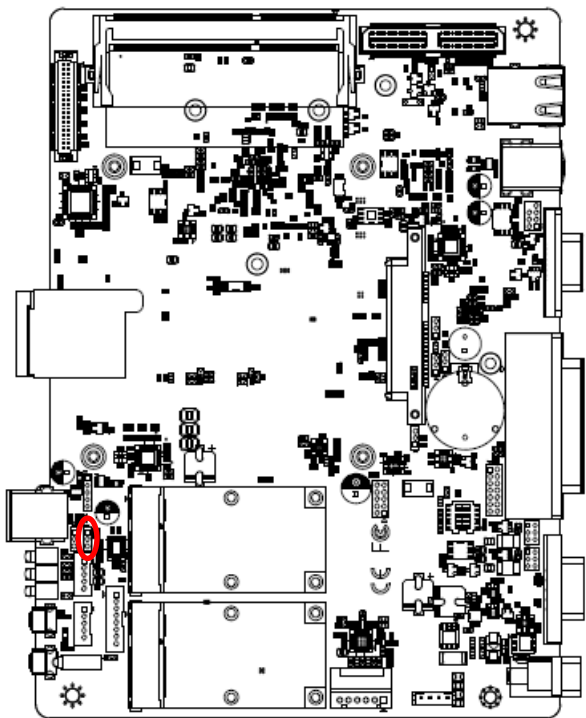


Display Port*

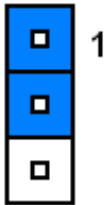


*Default

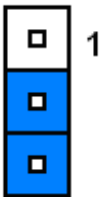
2.4.6 UIM Switch select (JUIM1)



UIM on MPCIE1

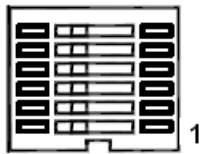
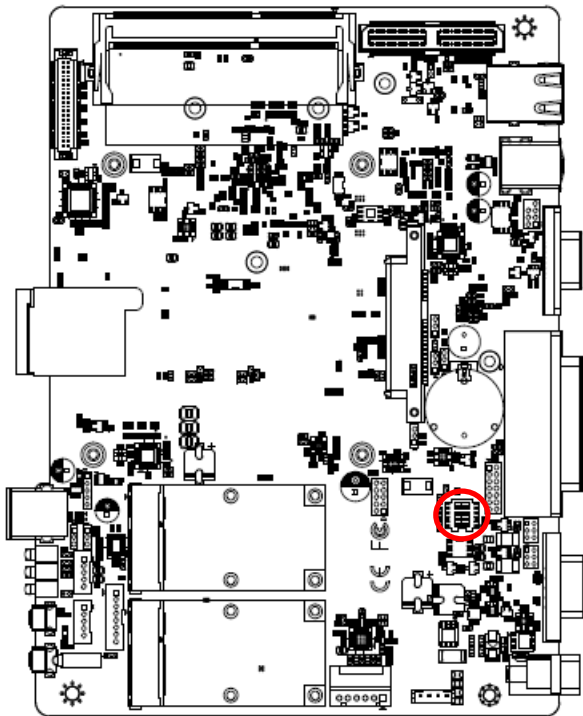


UIM on MPCIE2*



* Default

2.4.7 Serial port 1/ 2 – RS485 mode select (SW1)



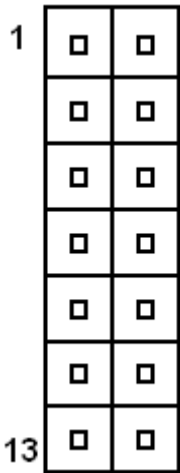
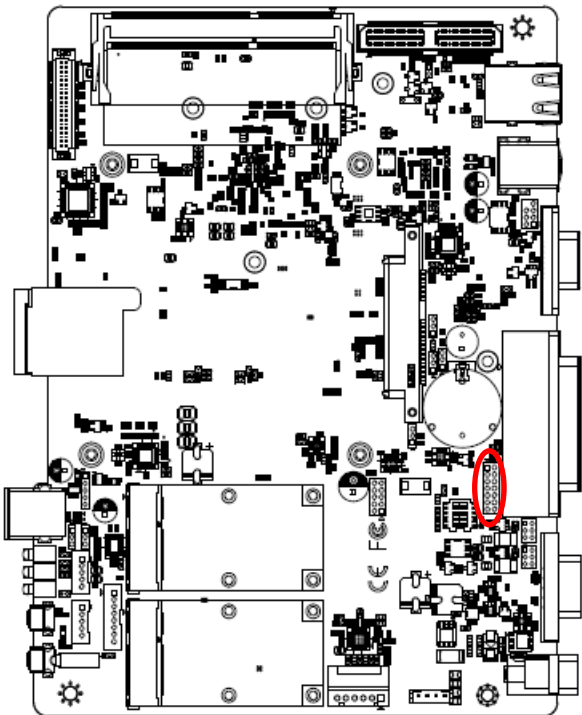
In Serial Port 1 mode

	ON	OFF
1	Auto Direction	RTS# Control*
2	485TXP external biasing resistor	OPEN*
3	485TXN external biasing resistor	OPEN*

In Serial Port 2 mode

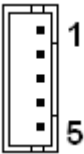
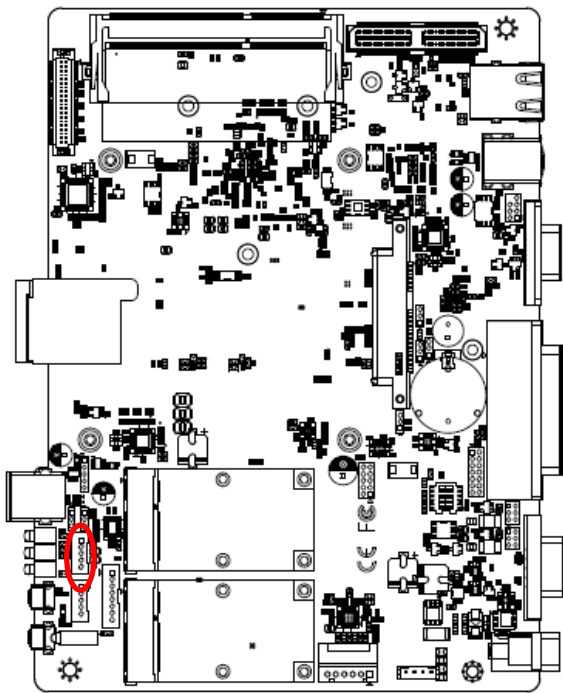
	ON	OFF
4	Auto Direction	RTS# Control*
5	485TXP external biasing resistor	OPEN*
6	485TXN external biasing resistor	OPEN*

2.4.8 LPC port connector (JLPC1)



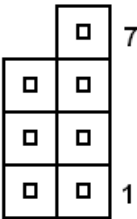
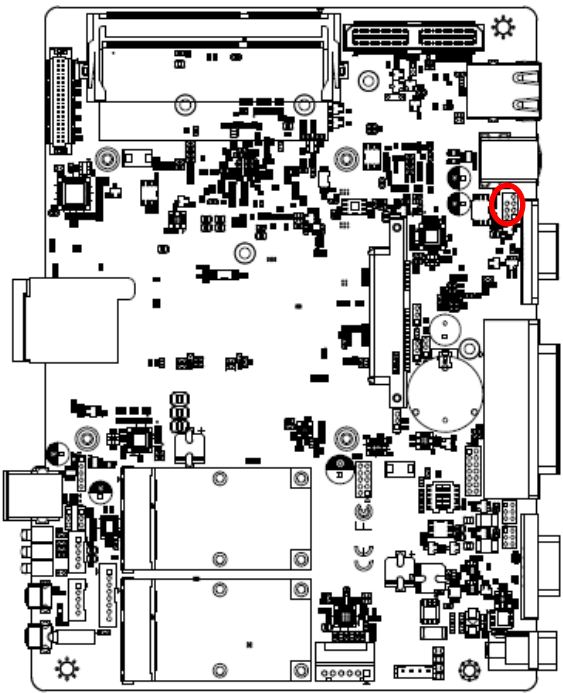
Signal	PIN	PIN	Signal
LPC_AD0	1	2	+3.3V
LPC_AD1	3	4	LPC_PORT80_RST#
LPC_AD2	5	6	LPC_FRAME#
LPC_AD3	7	8	LPC1_PORT80_CLK
SERIRQ	9	10	GND
+5V	11	12	GND
+5VSB	13	14	NC

2.4.9 LCD inverter connector (JBKL1)



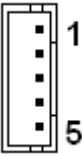
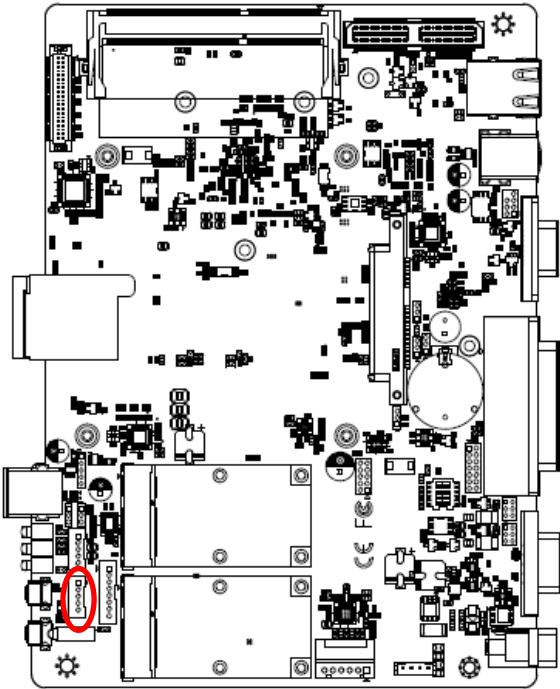
Signal	PIN
+12V	1
GND	2
BKLEN	3
VBRIGHT	4
+5V	5

2.4.10 SPI connector (SPI1)



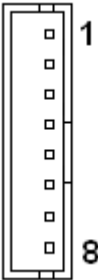
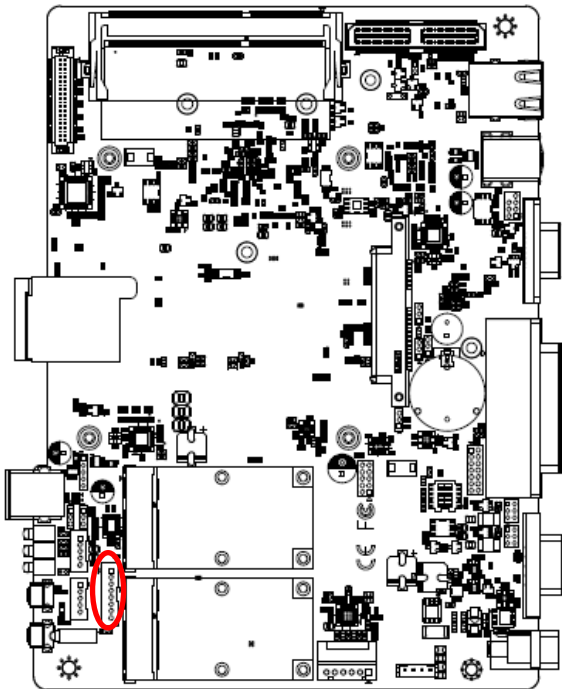
Signal	PIN	PIN	Signal
		7	SPI_HOLD#
SPI_ROM_MOSI	6	5	SPI_ROM_MISO_R
SPI_ROM_CLK	4	3	SPI_ROM_CS#
GND	2	1	+VSPI_BIOS

2.4.11 Front Panel Connector 1 (CN1)



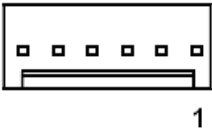
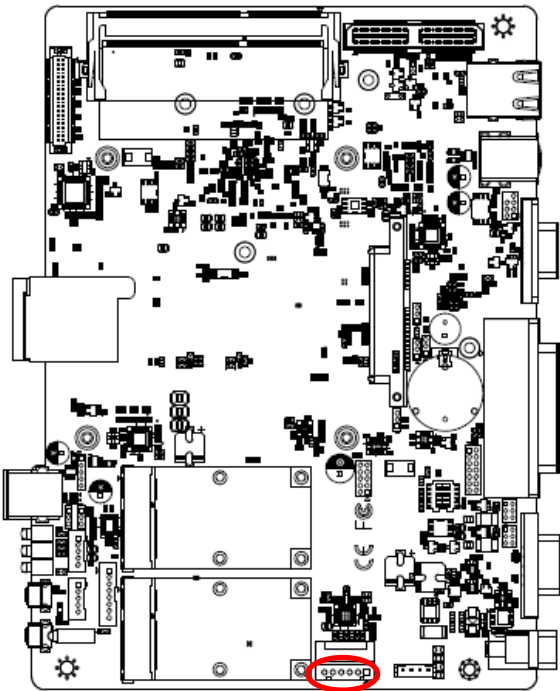
Signal	PIN
PWR_BTN_IN#	1
SYSRST#	2
GND	3
+5VSB	4
PWR_LED-	5

2.4.12 Front Panel Connector 2 (CN2)



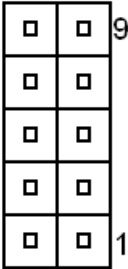
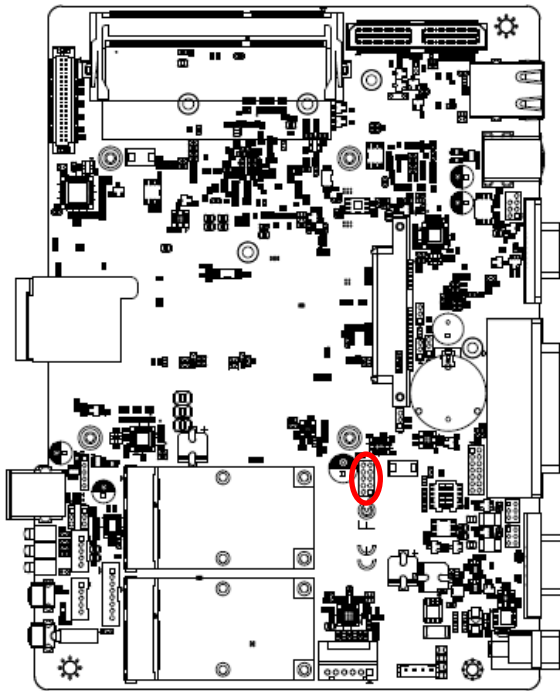
Signal	PIN
+3.3V	1
SATA_5V_LED#	2
+3.3VSB	3
LAN1_LED_ACT_n	4
+3.3VSB	5
LAN1_LED_100#_n	6
+3.3VSB	7
LAN1_LED_1000#_n	8

2.4.13 DC Output connector (DCOUT_S1)



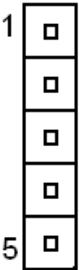
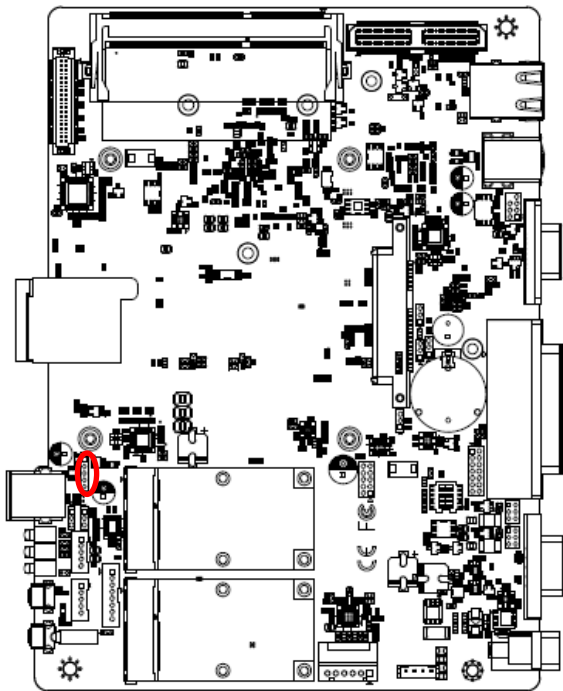
Signal	PIN
DC_OUT	1
DC_OUT	2
DC_OUT	3
GND	4
GND	5
GND	6

2.4.14 EC Debug connector (JEC_ROM1)



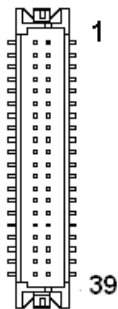
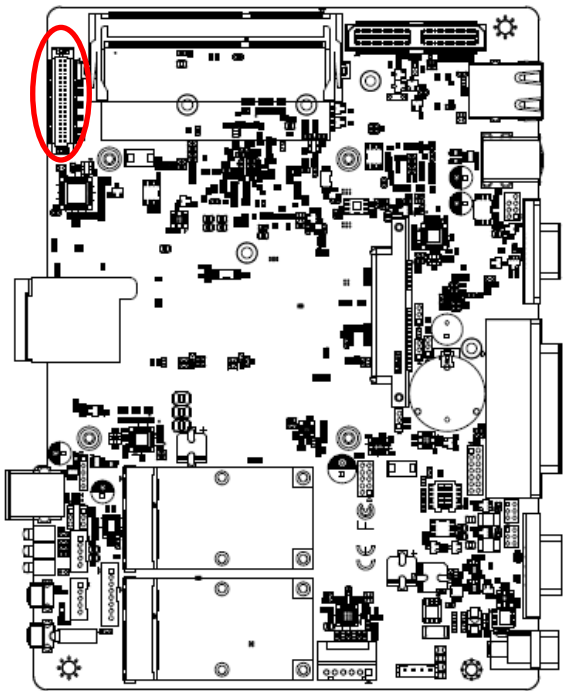
Signal	PIN	PIN	Signal
EC_SMDAT_DE BUG	10	9	EC_SMCLK_D EBUG
NC	8	7	EC_HOLD#
EC_FMOSI	6	5	EC_FMISO
EC_FSCK	4	3	EC_FSCE#
GND	2	1	+VSPI_EC

2.4.15 On-board header for USB2.0 (JUSB1)



Signal	PIN
USBVCC_HEADER	1
USB_HUB2_DN_1	2
USB_HUB2_DP_1	3
GND	4
GND	5

2.4.16 LVDS connector (JLVDS1)



Signal	PIN	PIN	Signal
+5V	2	1	+3.3V
+5V	4	3	+3.3V
NC	6	5	NC
GND	8	7	GND
LVDS_DATA0_P	10	9	LVDS_DATA1_P
LVDS_DATA0_N	12	11	LVDS_DATA1_N
GND	14	13	GND
LVDS_DATA2_P	16	15	LVDS_DATA3_P
LVDS_DATA2_N	18	17	LVDS_DATA3_N
GND	20	19	GND
LVDS_DATA4_P	22	21	LVDS_DATA5_P
LVDS_DATA4_N	24	23	LVDS_DATA5_N
GND	26	25	GND
LVDS_DATA6_P	28	27	LVDS_DATA7_P
LVDS_DATA6_N	30	29	LVDS_DATA7_N
GND	32	31	GND
LVDS_CLK1_P	34	33	LVDS_CLK2_P
LVDS_CLK1_N	36	35	LVDS_CLK2_N
GND	38	37	GND
+12V	40	39	+12V

2.5 AUX-M01, AUX-M02, AUX-M05, AUX-M06 Jumper & Connector list

2.5.1 AUX-M01

Jumpers

Label	Function	Note
JRI3/4/5/6	COM 3/4/5/6 pin 9 signal select	3 x 2 header, pitch 2.00mm
PJP1	SMBUS of TCA9555 address setting	3 x 2 header, pitch 2.00mm

Connectors

Label	Function	Note
USB1~2	USB connector 1~2	
USB3	USB connector 3	5 x 1 wafer, pitch 2.00mm
JUSB3	USB connector 3	5 x 1 header, pitch 2.00mm
COM3~6	Serial port connector 3~6	

2.5.2 AUX-M02

Connectors

Label	Function	Note
USB2~3	USB connector 2~3	
LAN2~5	LAN connector 2~5	
JLANLED	LAN ACT/LNK/SPD LED	8 x 2 wafer, pitch 2.00mm
JLANMODE	Normal/Bypass mode LED	6 x 2 wafer, pitch 2.00mm

2.5.3 AUX-M05

Connectors

Label	Function	Note
MPCIE1	Mini PCI Express connector 1	

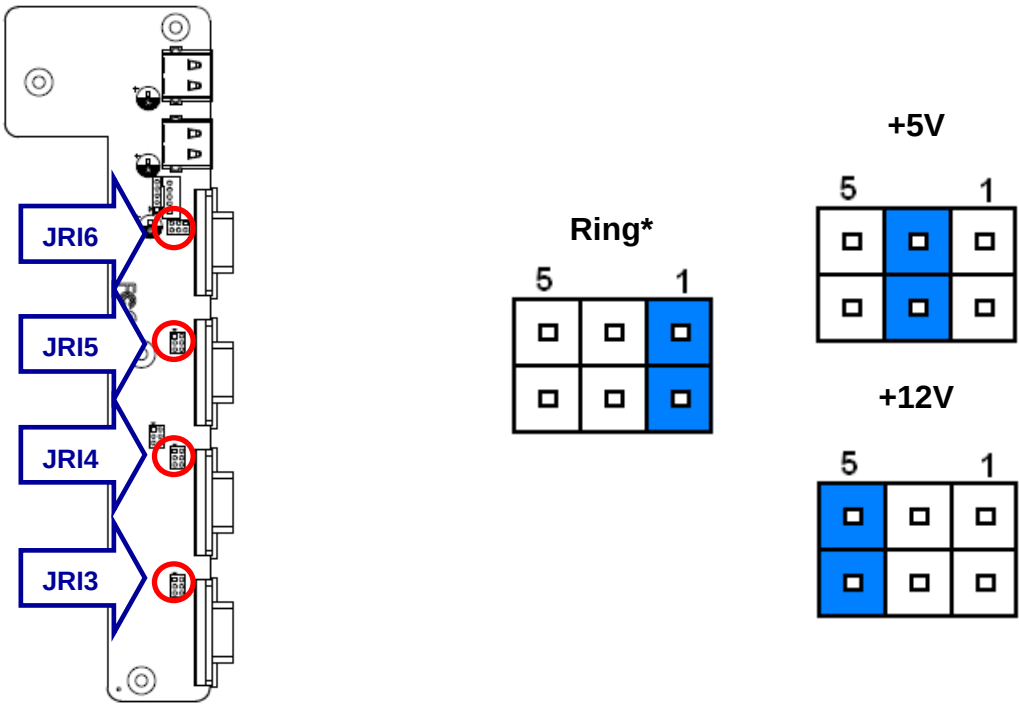
2.5.4 AUX-M06

Connectors

Label	Function	Note
PCI1/2	PCI connector 1/2	PCI slot
NJPWR1	Power connector	2 x 2 wafer, pitch 4.20mm

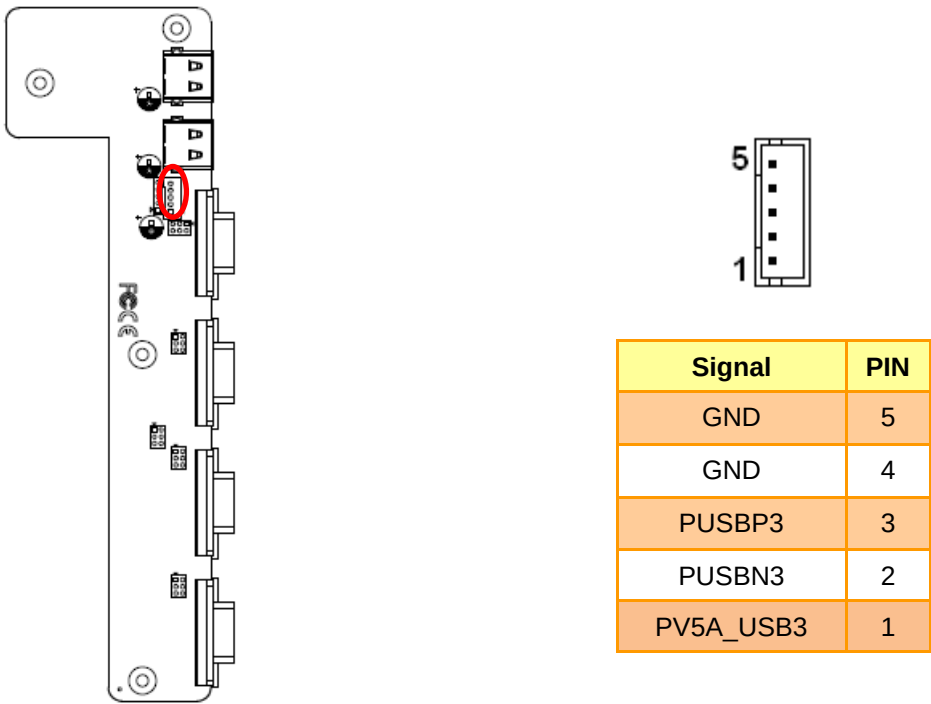
2.6 AUX-M01 Jumpers & Connectors settings

2.6.1 COM 3/4/5/6 pin 9 signal select (JRI3/4/5/6)

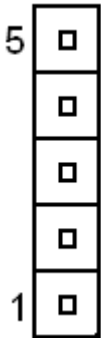
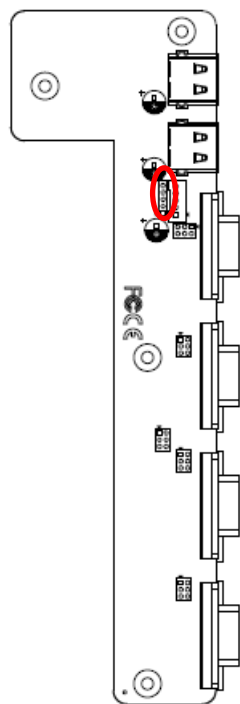


* Default

2.6.2 USB connector (USB3)

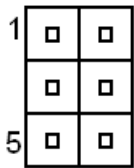
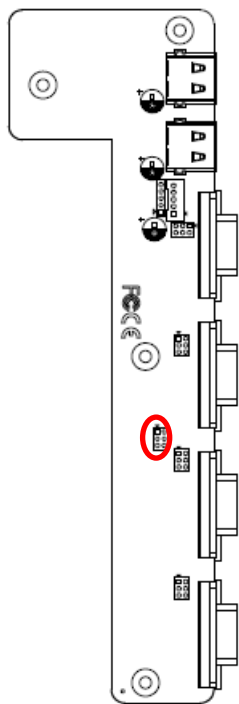


2.6.3 USB connector (JUSB3)



Signal	PIN
GND	5
GND	4
PUSBP3	3
PUSBN3	2
PV5A_USB3	1

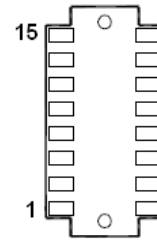
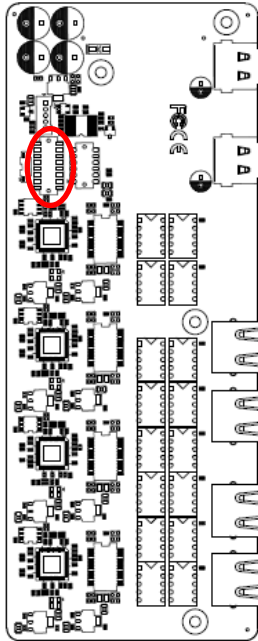
2.6.4 SMBUS of TCA9555 address setting (PJP1)



Signal	PIN	PIN	Signal
GND	1	2	MC_9555A0
GND	3	4	MC_9555A1
GND	5	6	MC_9555A2

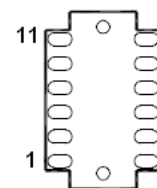
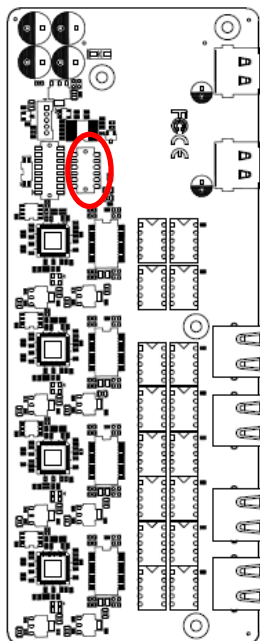
2.7 AUX-M02 Connectors settings

2.7.1 LAN ACT/LNK/SPD LED (JLANLED)



Signal	PIN	PIN	Signal
LAN3_LNK1000	15	16	LAN5_LNK1000
LAN3_LNK100	13	14	LAN5_LNK100
LAN3_ACT-	11	12	LAN5_ACT-
LAN3_ACT+	9	10	LAN5_ACT+
LAN2_LNK1000	7	8	LAN4_LNK1000
LAN2_LNK100	5	6	LAN4_LNK100
LAN2_ACT-	3	4	LAN4_ACT-
LAN2_ACT+	1	2	LAN4_ACT+

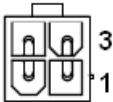
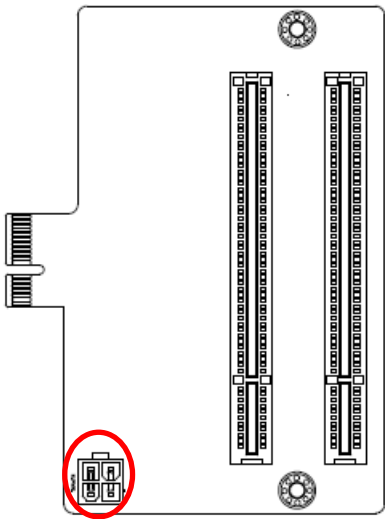
2.7.2 Normal/Bypass mode LED (JLANMODE)



Signal	PIN	PIN	Signal
LAN23_WDT-	11	12	LAN45_WDT-
LAN23_WDT+	9	10	LAN45_WDT+
LAN23_BYPASS-	7	8	LAN45_BYPASS-
LAN23_BYPASS+	5	6	LAN45_BYPASS+
LAN23_NORMAL-	3	4	LAN45_NORMAL-
LAN23_NORMAL+	1	2	LAN45_NORMAL+

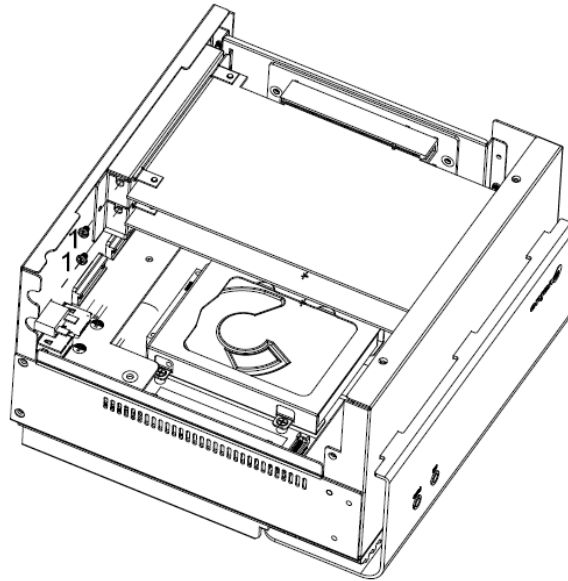
2.8 AUX-M06 Connectors settings

2.8.1 Power connector (NJPWR1)



Signal	PIN	PIN	Signal
+12V-26V	4	3	+12V-26V
GND	2	1	GND

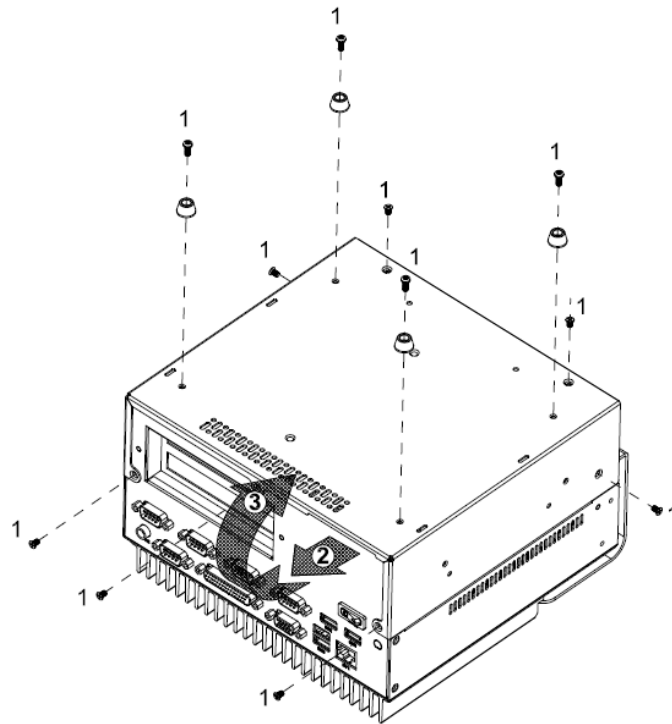
2.9 Installing PCI devices (EPS-BYT)



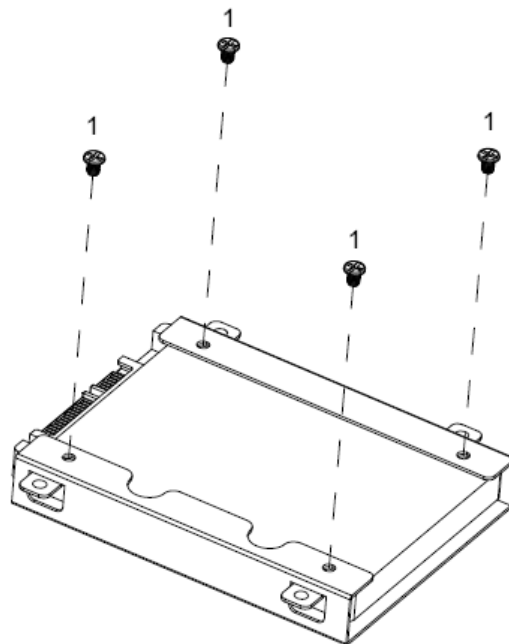
Step1. Remove 2 screws to release the retention clip.

Step2. The retention clip can now be removed to open slot cover for PCI installation.

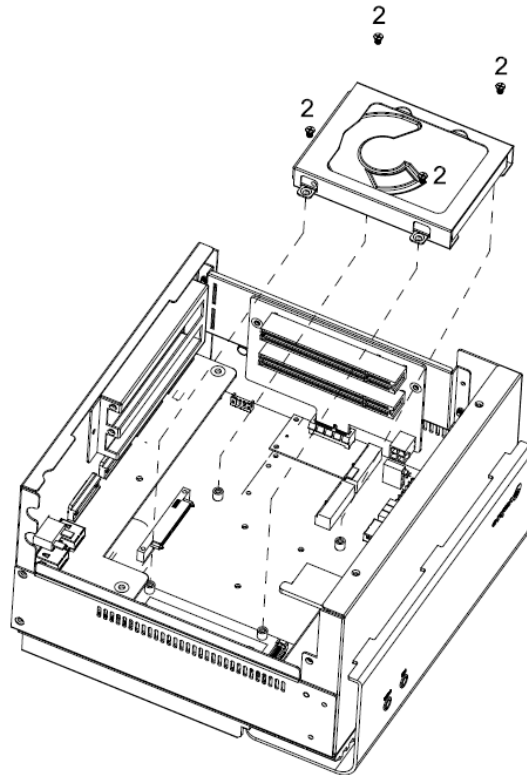
2.10 Installing Hard Disk & Memory (EPS-BYT)



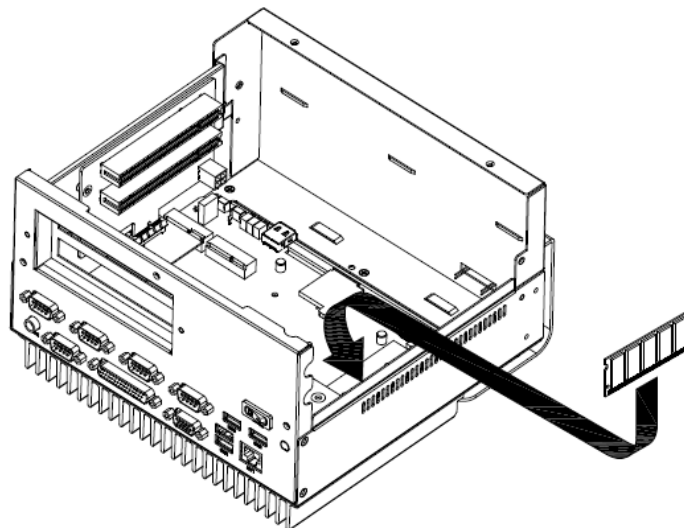
Step 1. Remove all screws maintaining bottom enclosure, slide enclosure inward (2) and pull upward (3) to complete disassembly.



Step 2. Secure HDD by means of 4 screws.

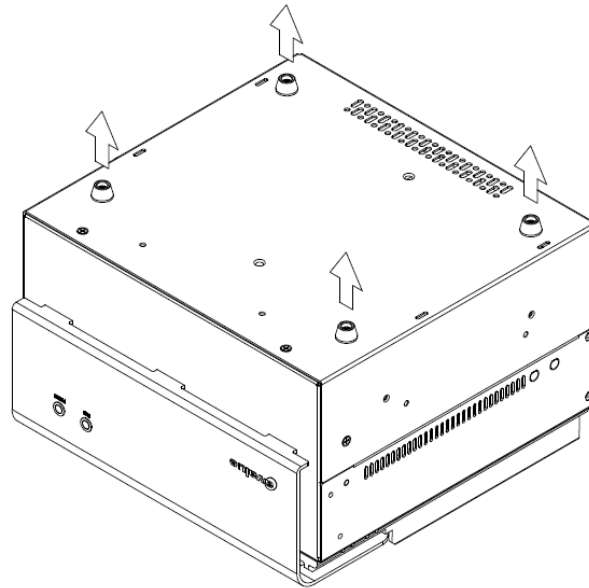


Step 3. Assemble HDD bracket by means of 4 screws as shown above.

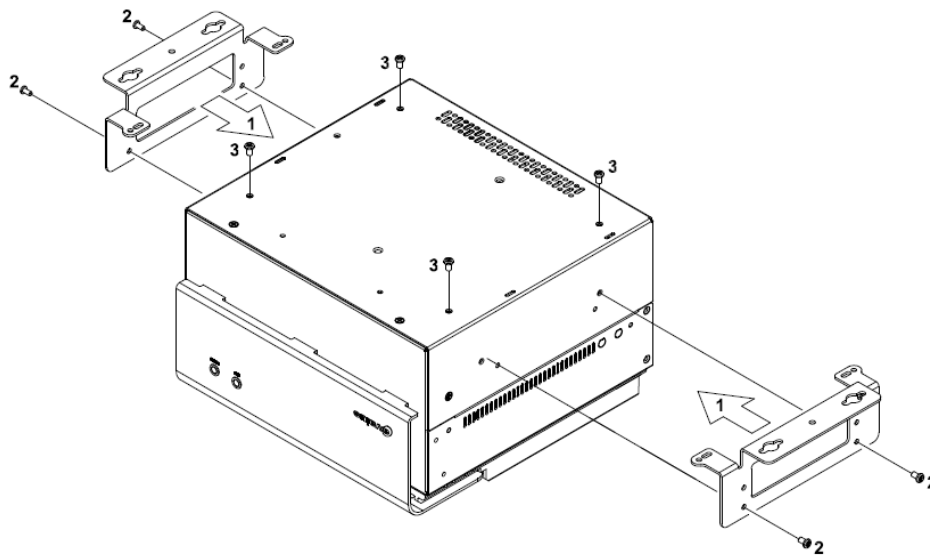


Step 4. Properly install the memory module and press until properly seated.

2.11 Installing Mounting Brackets (EPS-BYT)



Step 1. Remove 4 screws from the bottom of your system.



Step 2. Locate brackets on both sides, matching the holes on the system.

Step 3. Insert and fasten 2 screws on each side of the system to secure Mounting brackets.

Step 4. Reposition the 4 screws on the bottom of your system and fasten to complete assembly.

