

EMS-CDV

Fanless Intel® Atom™ D2550 Rugged Embedded
System with Intel® NM10 Express Chipset

Quick Reference Guide

3rd Ed –25 July 2013

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Part No. E20178201A2R

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 EMS-CDV Fanless Intel® Atom™ D2550 Rugged Embedded System with Intel® NM10 Express Chipset
- 1 x Quick Reference Guide
- 1 x DVD-ROM contains the followings:
 - User's Manual (this manual in PDF file)
 - Ethernet driver and utilities
 - VGA drivers and utilities
 - Audio drivers and utilities
- Other major components include the followings:
 - 44 Pin Multi I/O Cable
 - Wall Mount Kit
 - Adapter
 - Power Cord



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

1.3 System Specifications

System	
CPU	<ul style="list-style-type: none"> Intel® D2550 1.86GHz CPU
BIOS	<ul style="list-style-type: none"> AMI uEFI BIOS, 16Mbit SPI Flash ROM
System Chipset	<ul style="list-style-type: none"> Intel NM10
I/O Chip	<ul style="list-style-type: none"> Nuvoton W83627DHG-P
System Memory	<ul style="list-style-type: none"> 1 x 204-pin SODIMM Up to 4GB DDR3 1066 SDRAM
Storage	<ul style="list-style-type: none"> Front Access Swappable 2.5" Drive Bay and mSATA on 1st Mini PCIe Socket
Watchdog Timer	<ul style="list-style-type: none"> Reset: 1sec. ~ 65535sec./min. and 1sec. or 1min./step
H/W Status Monitor	<ul style="list-style-type: none"> Monitoring System Temperature and Voltage with Auto Throttling Control
TPM	<ul style="list-style-type: none"> Nuvoton NPCT420AA0WX
Battery	<ul style="list-style-type: none"> Horizontal battery socket for CR-2032
Expansion	<ul style="list-style-type: none"> IET interface(1 x DP, 4 x PCIe1, 3 x USB, 1 x LPC, 1 x Line-Out(R/L), 1 x SMBus) 2 x mini-PCIe
External I/O	
Front Side External I/O Connector	<ul style="list-style-type: none"> 1 x Swappable 2.5" Drive Bay and SIM Card 1 x USB 2.0 1 x Power on/off Button with LED indicator 1 x Reset button 1 x Green LED for Data Access Indication 1 x Green LED for LAN Active 1 x Dual Color LED for LAN Speed/Link Indication
Rear Side External I/O Connector	<ul style="list-style-type: none"> 1 x Lockable Jack for DC Power Input 1 x VGA 1 x COM1 supports RS-232/422/485 selected by BIOS 1 x RJ45 for GbE 2 x USB 2.0 1 x Multi-Function Port for the following I/Os: COM2 supports RS-232/422/485 selected by BIOS PS/2 for KB and MS SMBus 12-Bit GPIO Line-In, Line-Out, Mic-In 2 x Knockouts for Antenna Mounting
PCIe Switch	

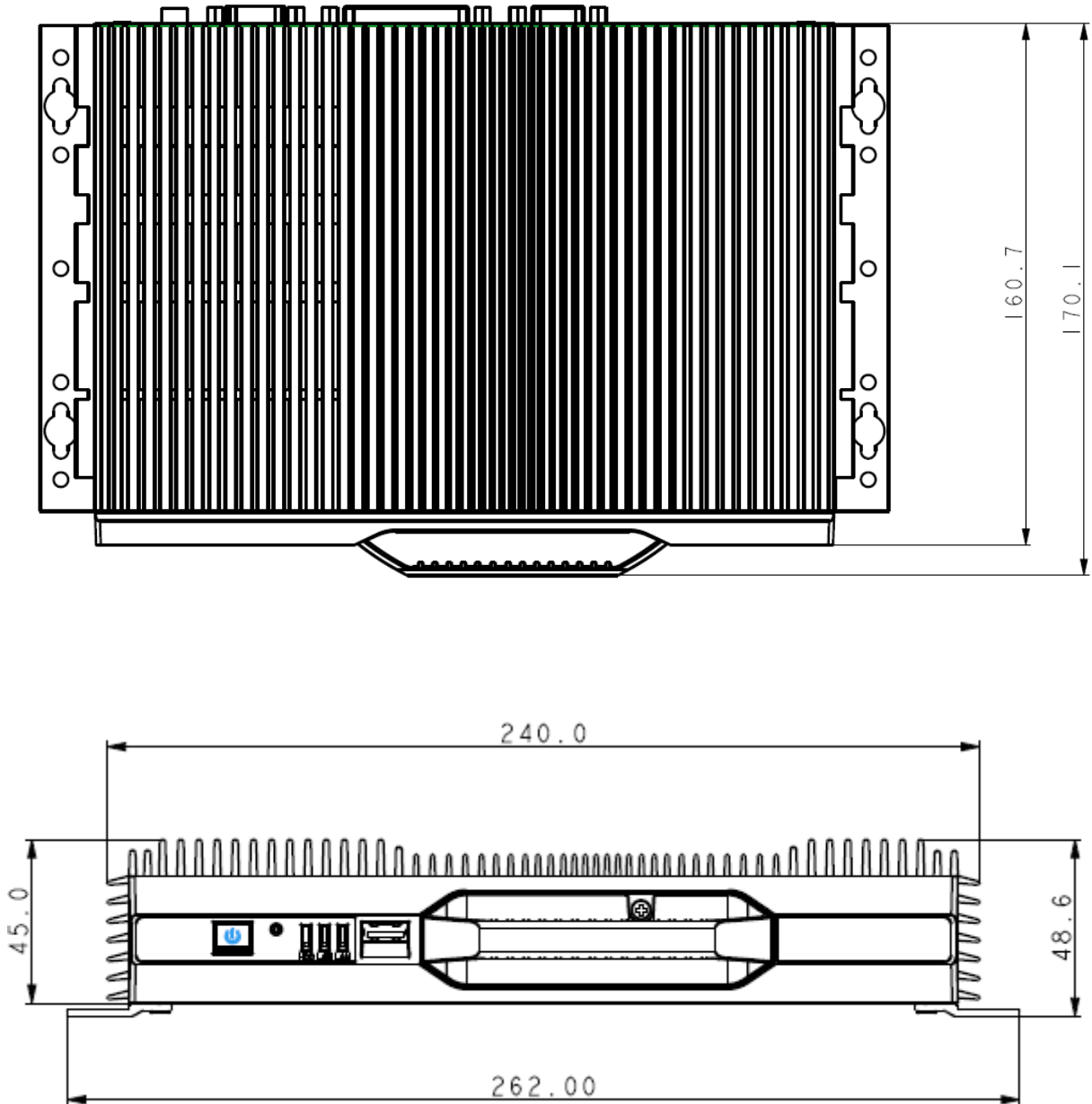
EMS-CDV

Chipset	<ul style="list-style-type: none"> • IDT IDT89HPES5T5ZBBCG PCIe switch
Interface	<ul style="list-style-type: none"> • 5-Port/5-lane(for MI/Oe)
Display	
Chipset	<ul style="list-style-type: none"> • Cedarview integrated
Resolution	<ul style="list-style-type: none"> • VGA: 1920x1200
Ethernet	
Chipset	<ul style="list-style-type: none"> • 1 x Intel 82574L GbE controller
Ethernet Interface	<ul style="list-style-type: none"> • 10/100/1000 Base-Tx GbE compatible
Audio	
Chipset	<ul style="list-style-type: none"> • Realtek ALC892 HD codec
Audio Interface	<ul style="list-style-type: none"> • Mic-In, Line-In and Line-Out
Mechanical & Environmental	
Power Requirement	<ul style="list-style-type: none"> • +12 ~ +26Vdc
ACPI	<ul style="list-style-type: none"> • Single Power ATX Support S0, S3, S4, S5 • ACPI 3.0 Compliant
Power Mode	<ul style="list-style-type: none"> • AT/ATX (ATX is The Default Setting)
Operating Temp.	<ul style="list-style-type: none"> • -10°C ~ 60°C (w/ mSATA and 2.5" SSD), Ambient w/ Air Flow
Storage Temp.	<ul style="list-style-type: none"> • -40°C ~ 75°C (-40 ~ 167°F)
Relative Humidity	<ul style="list-style-type: none"> • 0% ~ 90% Relative Humidity, Non-condensing
Vibration Protection	<ul style="list-style-type: none"> • With mSATA/ SSD : 5Grms, IEC 60068-2-64, Random, 10 ~ 500Hz, 1hr/axis
Shock Protection	<ul style="list-style-type: none"> • With mSATA/ SDD : 50G, IEC 60068-2-27, Half Sine, 11ms
Certification	<ul style="list-style-type: none"> • CE, FCC Class B
Dimension (W x H x D)	<ul style="list-style-type: none"> • 240mm x 170mm x 45mm
Weight	<ul style="list-style-type: none"> • 4.4 lbs (2 Kgs)

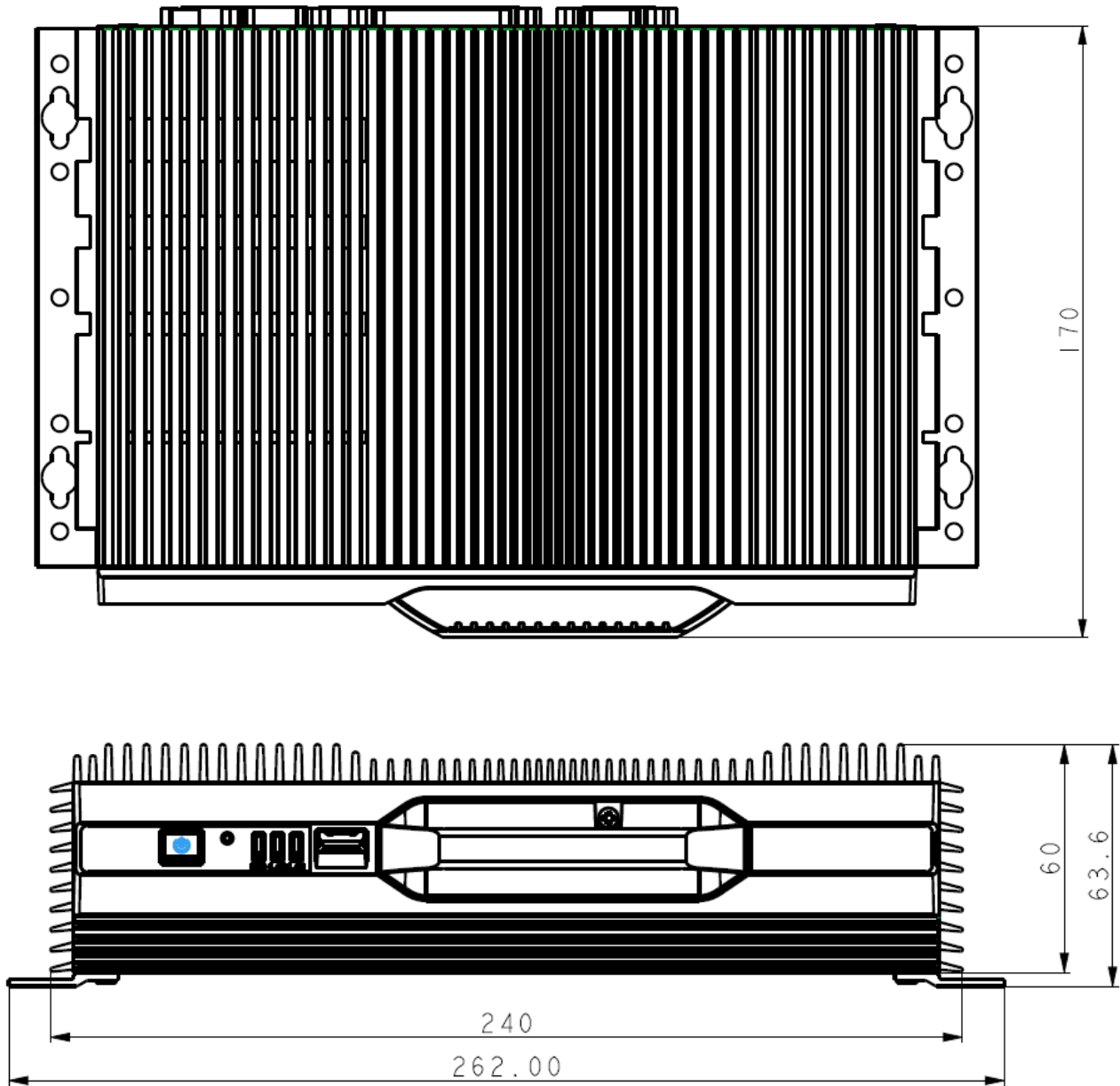
1.4 System Overview

1.4.1 Front & Top View

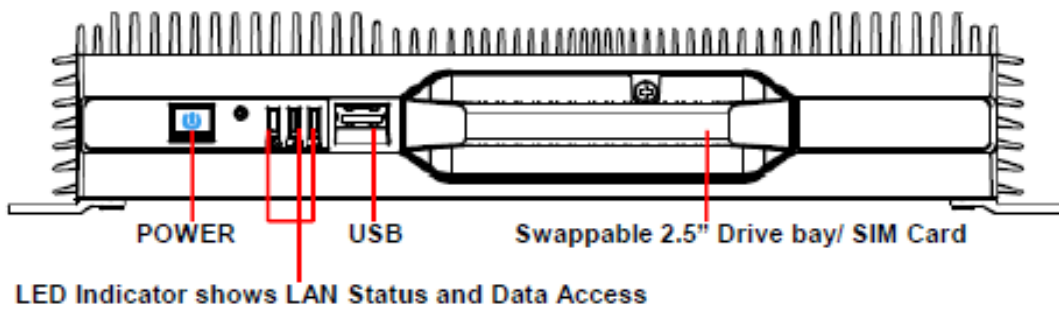
EMS-CDV-255-A1-1R



EMS-CDV-255-A1-2R/3R

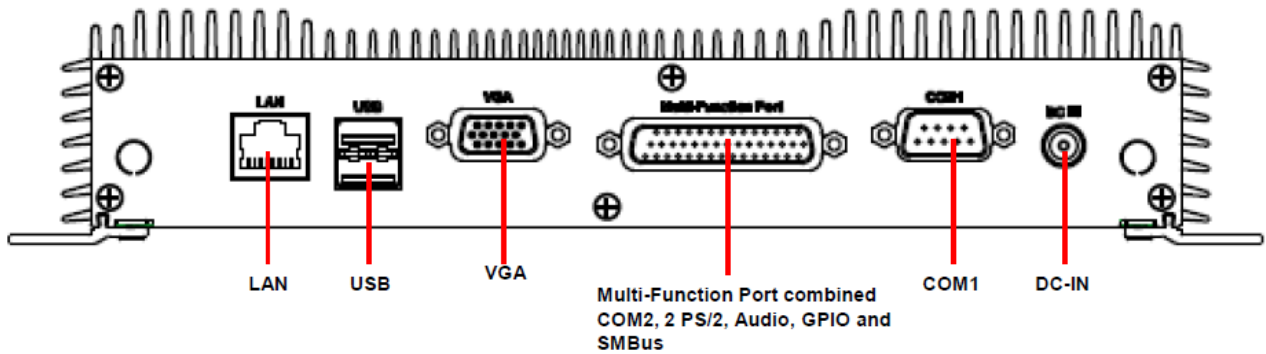


1.4.2 Front View

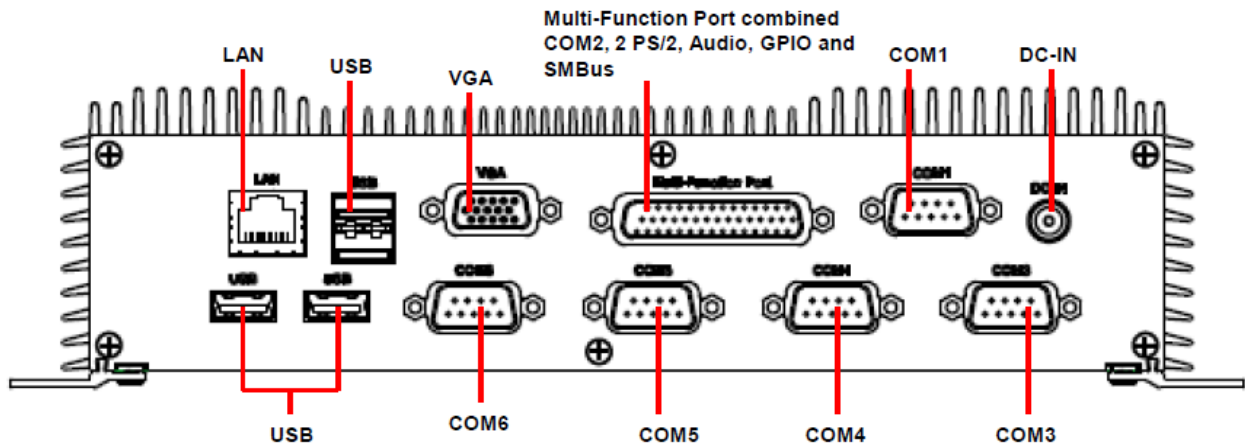


1.4.3 Rear View

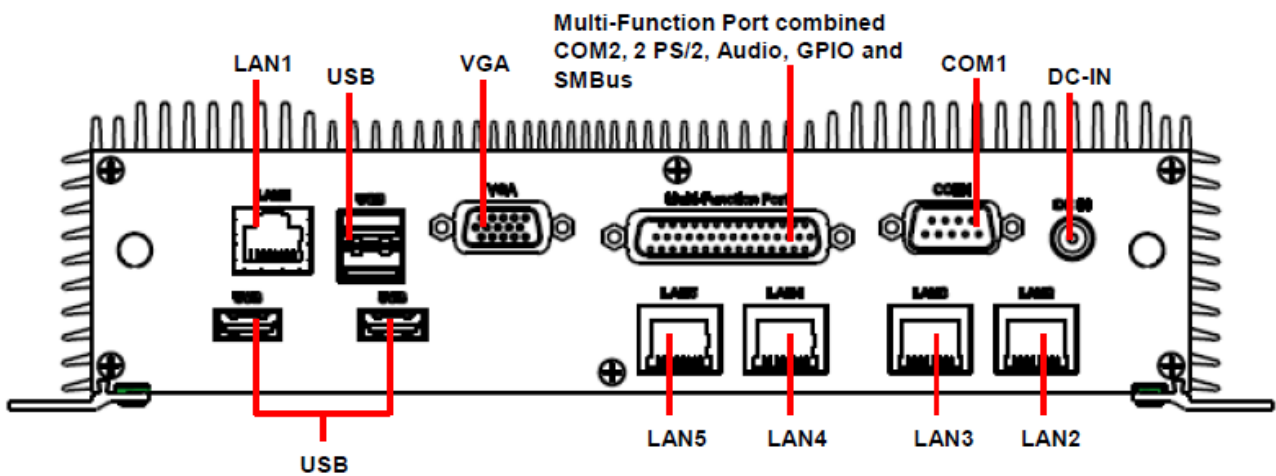
EMS-CDV-255-A1-1R



EMS-CDV-255-A1-2R



EMS-CDV-255-A1-3R



EMS-CDV

EMS-CDV-255-A1-1R

Connectors

Label	Function	Note
COM1	Serial port connector 1	
DC-IN	DC power-in connector	
LAN1	RJ-45 Ethernet 1	
Multi-function port	Multi-Function Port combined COM2, 2 PS/2, Audio, GPIO and SMBus	
USB1~3	USB connector 1~3	
VGA	VGA connector	
Swappable Drawer	2.5" Driver Bay and SIM Card	

EMS-CDV-255-A1-2R

Connectors

Label	Function	Note
COM1	Serial port connector 1	
COM3~6	Serial port connector3~6	
DC-IN	DC power-in connector	
LAN1	RJ-45 Ethernet 1	
Multi-function port	Multi-Function Port combined COM2, 2 PS/2, Audio, GPIO and SMBus	
USB1~5	USB connector 1~5	
VGA	VGA connector	
Swappable Drawer	2.5" Driver Bay and SIM Card	

EMS-CDV-255-A1-3R

Connectors

Label	Function	Note
COM1	Serial port connector1	
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	
USB1~5	USB connector 1~5	
VGA	VGA connector	
Swappable Drawer	2.5" Driver Bay and SIM Card	

2. Hardware Configuration

Jumper and Connector Setting, Driver and BIOS Installing

For advanced information, please refer to:

- 1- EBM-CDVS, AUX-M01 and AUX-M02 included in this manual.

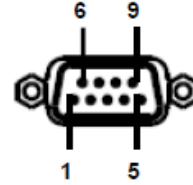
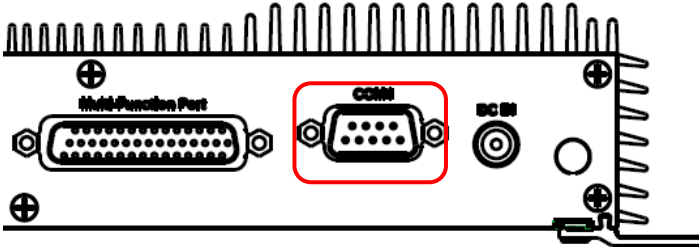


Note: If you need more information, please visit our website:

<http://www.avalue.com.tw>

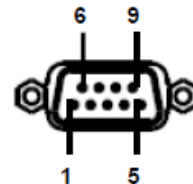
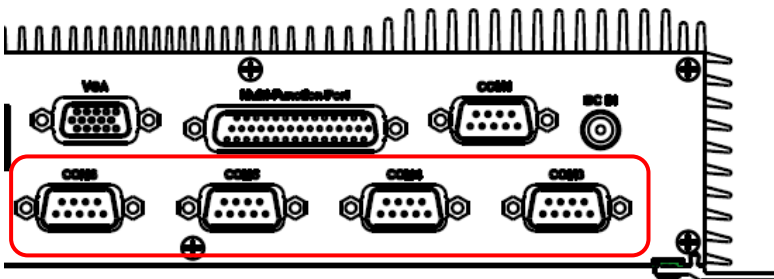
2.1 EMS-CDV connector mapping

2.1.1 External Serial Port 1 connector (COM1)



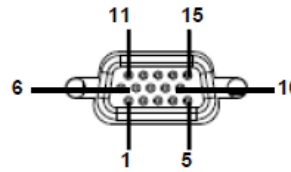
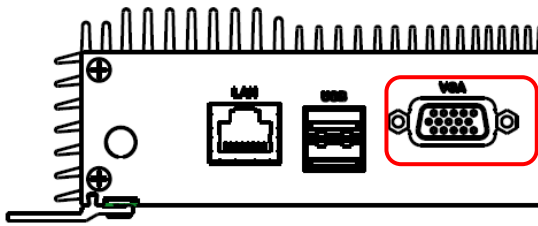
Signal	PIN	PIN	Signal
NDCDA#_485TXN	1	6	NDSRA#
NRXDA#_485TXP	2	7	NRTSA#
NTXDA#_485RXP	3	8	NCTSA#
NDTRA#_485RXN	4	9	NRIA#
GND	5		

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



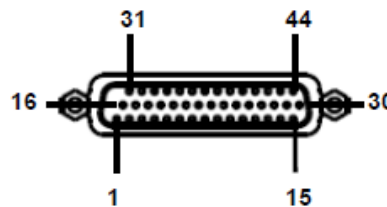
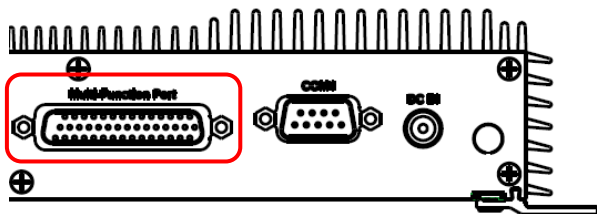
Signal	PIN	PIN	Signal
DCD1#_485TXN	1	6	DSR1#
RXD1_485TXP	2	7	RTS1#
TXD1_485RXP	3	8	CTS1#
DTR1#_485RXN	4	9	RI1#
GND	5		

2.1.3 VGA connector (VGA)



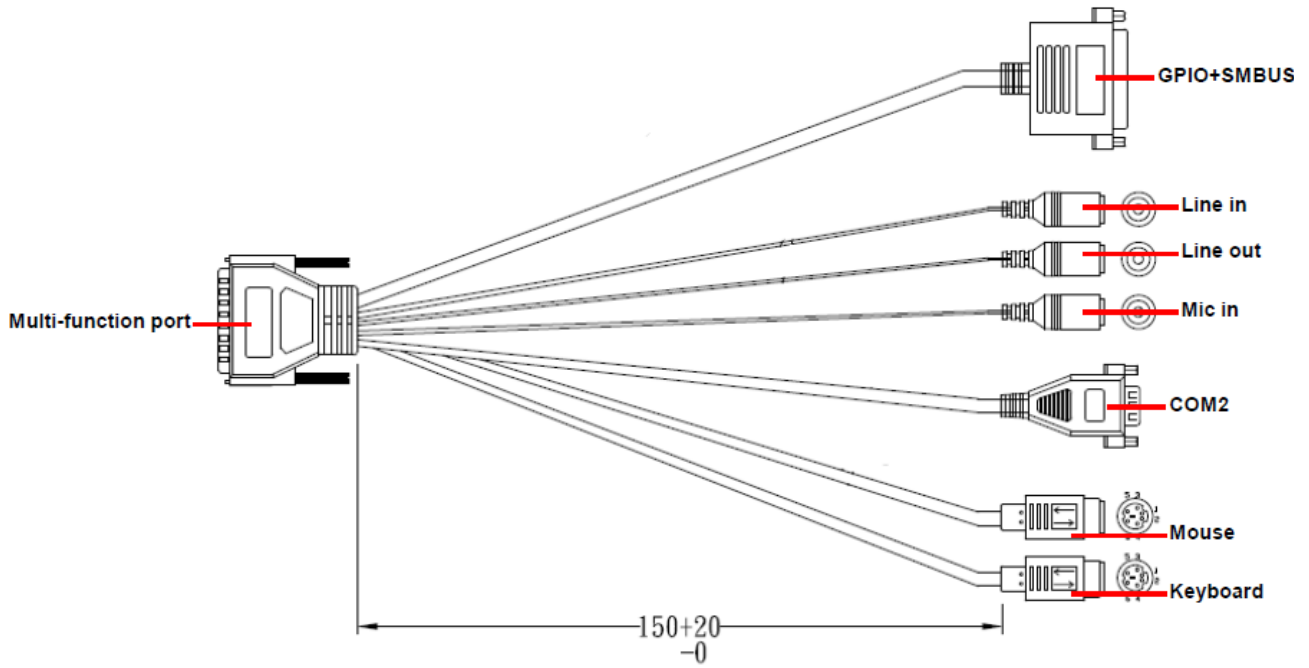
PIN	Signal	PIN	Signal	PIN	Signal
1	RED	6	GND	11	NC
2	GREEN	7	GND	12	SDT_DDC
3	BLUE	8	GND	13	VGA_HS
4	NC	9	+5V	14	VGA_VS
5	GND	10	GND	15	SCK_DDC

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

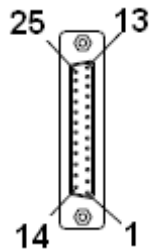


PIN	Signal	PIN	Signal	PIN	Signal
1	LINE1_JD	16	FRONT_JD	31	LINE1_RIN
2	MIC1_JD	17	LINEOUT_R	32	GND
3	MIC_RIN	18	GND	33	LINE1_LIN
4	GND	19	LINEOUT_L	34	+5V
5	MIC_LIN	20	GND	35	DO3
6	DO5	21	DO4	36	DO0
7	DO2	22	DO1	37	DI3
8	DI5	23	DI4	38	DI0
9	DI2	24	DI1	39	SMB_CLK
10	MSCK	25	SMB_DATA	40	NRIB#
11	GND	26	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		

EMS-CDV

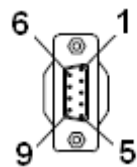


2.1.4.1 GPIO+SMBUS



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

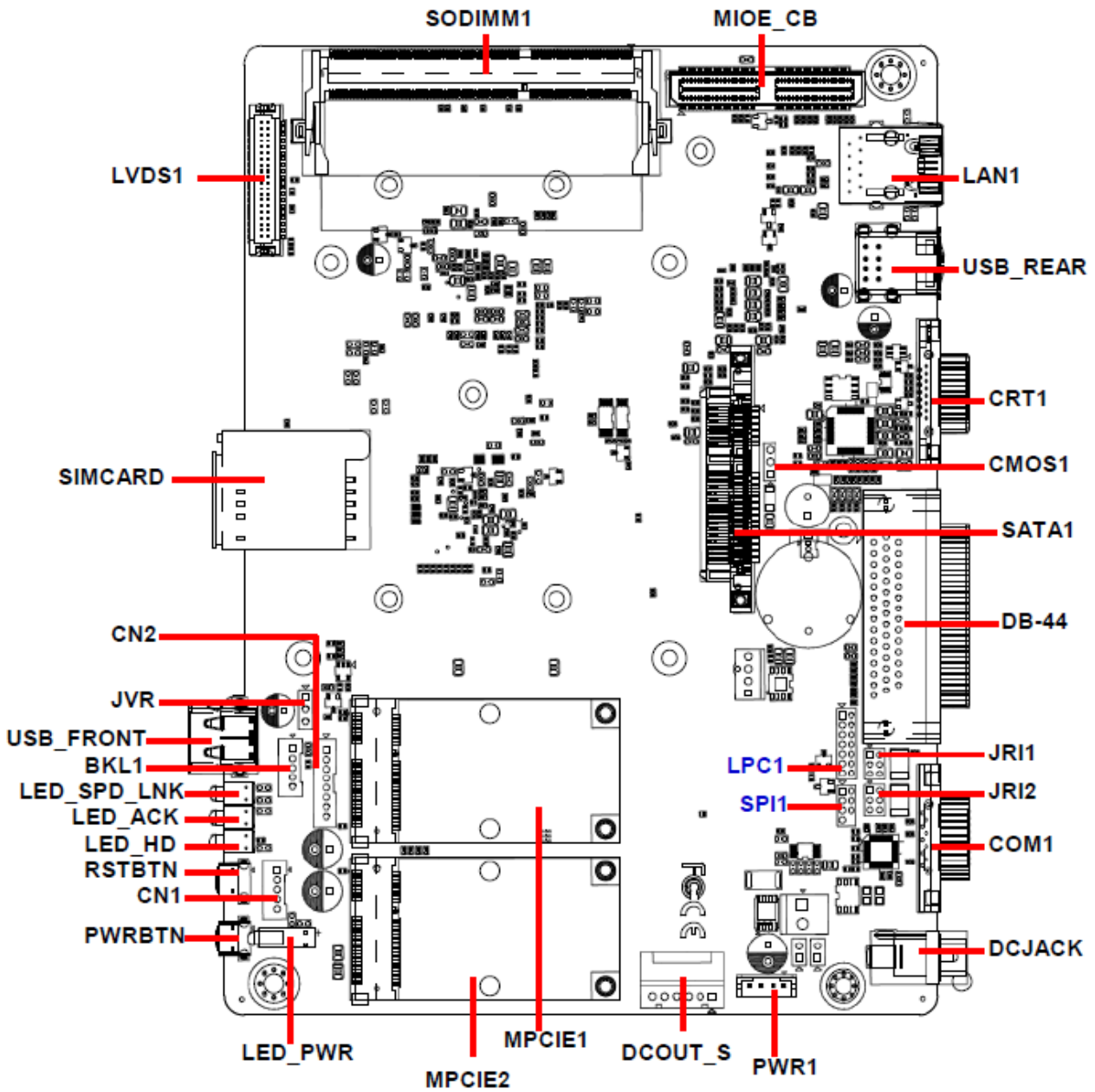
2.1.4.2 COM2

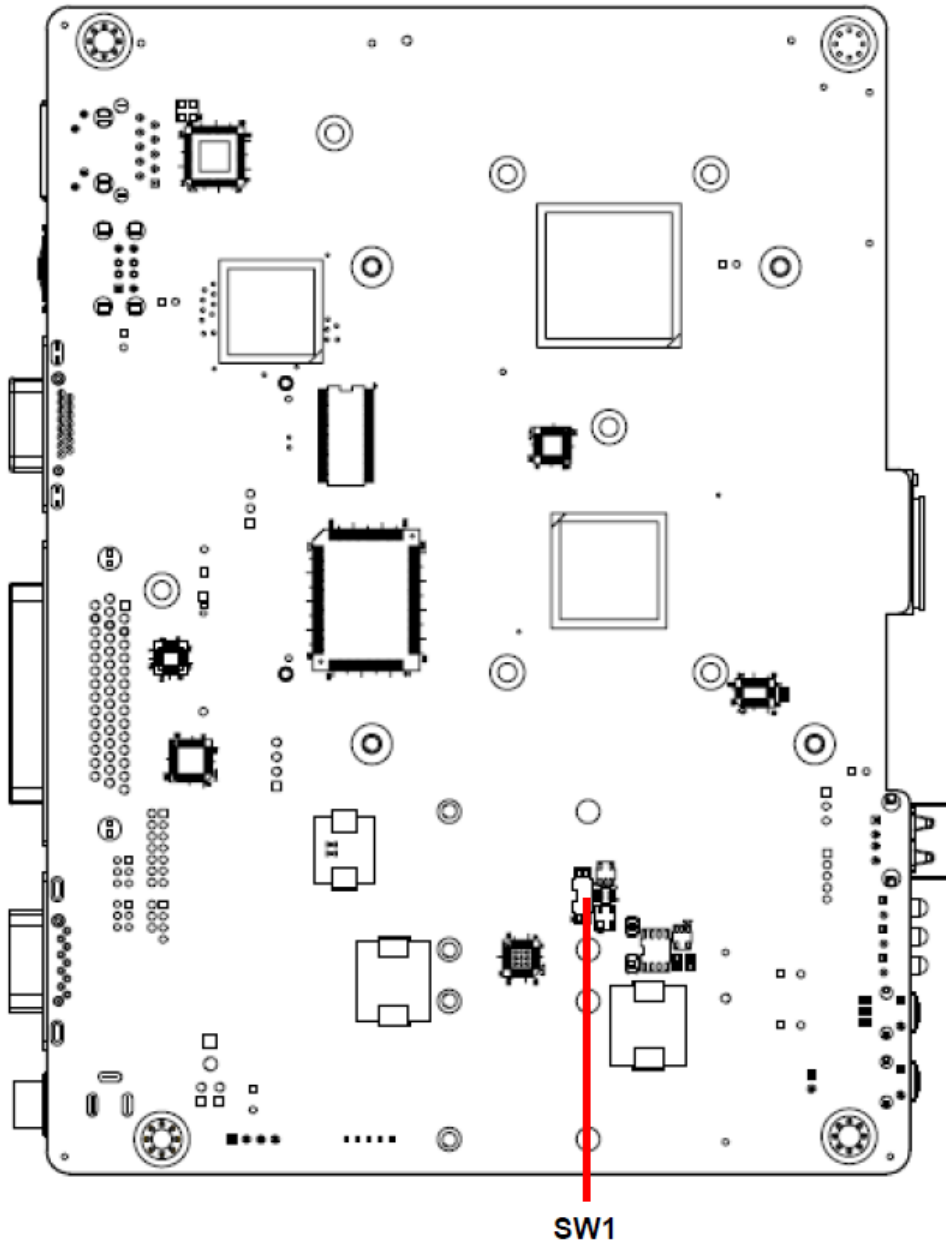


Signal	PIN	PIN	Signal
DSR	6	1	DCD
RTS	7	2	RxD
CTS	8	3	TxD
RI	9	4	DTR
		5	GND

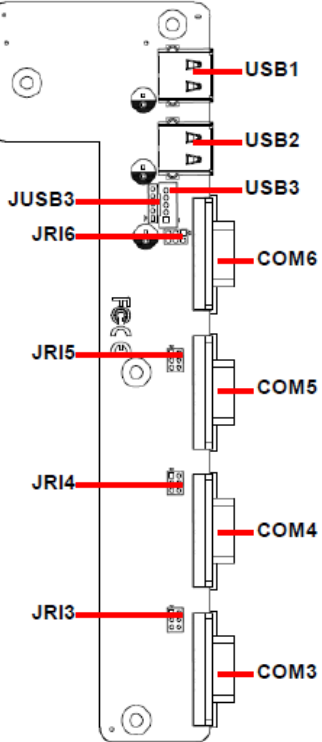
2.2 EBM-CDVS,AUX-M01 and AUX-M02 Overviews

2.2.1 EBM-CDVS

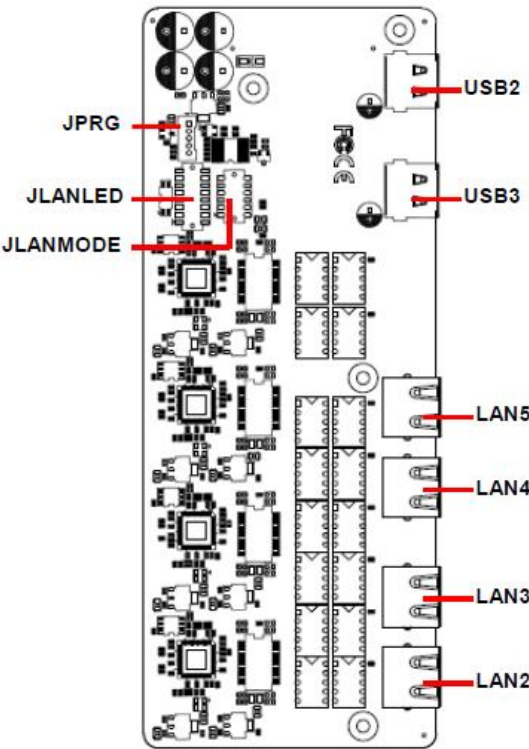




2.2.2 AUX-M01



2.2.3 AUX-M02



2.3 EBM-CDVS Jumper & Connector list

Jumpers

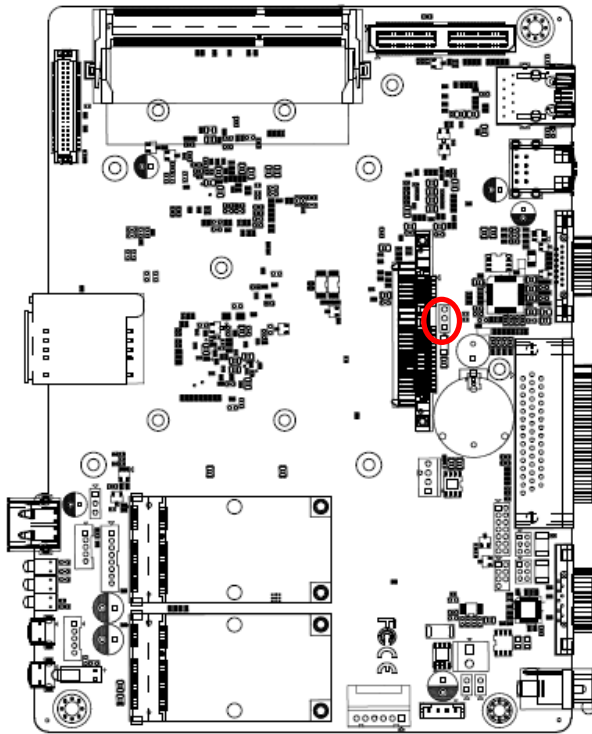
Label	Function	Note
CMOS1	Clear CMOS	3 x 1 header, pitch 2.54mm
JRI1/2	COM 1/2 pin 9 signal select	3 x 2 header, pitch 2.00mm

Connectors

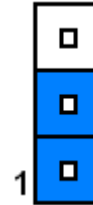
Label	Function	Note
USB_REAR	USB connector	
USB_FRONT	USB connector	
LAN1	LAN connector	
CRT1	VGA connector	
DB-44	Multi-function port	<ol style="list-style-type: none"> 1. COM2 2. Audio(line-in, line-out, mic-in) 3. 2 x PS/2 for KB/MS, 4. 12 bit GPIO/SMBUS
COM1	Serial port connector 1	
DCJACK	DC-IN connector	
MPCIE1/2	Mini PCI Express connector 1/2	52 pin
PWR1	Power connector	
PWRBTN	Power button	
RSTBTN	Reset button	
LED_PWR	LED Power	
LED_HD	LED HDD	
LED_ACK	LED LAN	
LED_SPD_LNK	LED LAN	
SIMCARD	SIM card slot	
LVDS1	LVDS connector	
SODIMM1	DDR3 SODIMM connector	
MIOE_CB	IET Expansion slot	
LPC1	Low pin count interface	7 x 2 header, pitch 2.00 mm
SPI1	SPI connector	4 x 2 header, pitch 2.00 mm
PWR1	Power connector	4 x 1 wafer, pitch 2.50 mm
BKL1	LCD inverter connector	5 x 1 wafer, pitch 2.00 mm
JVR	LCD backlight brightness adjustment	3 x 1 header, pitch 2.54 mm
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_S	DC Output connector	6 x 1 wafer, pitch 2.00 mm
SW1	AT/ATX mode selector	

2.4 EBM-CDVS Jumpers & Connectors settings

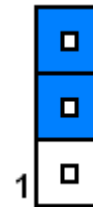
2.4.1 Clear CMOS (CMOS1)



Protect*

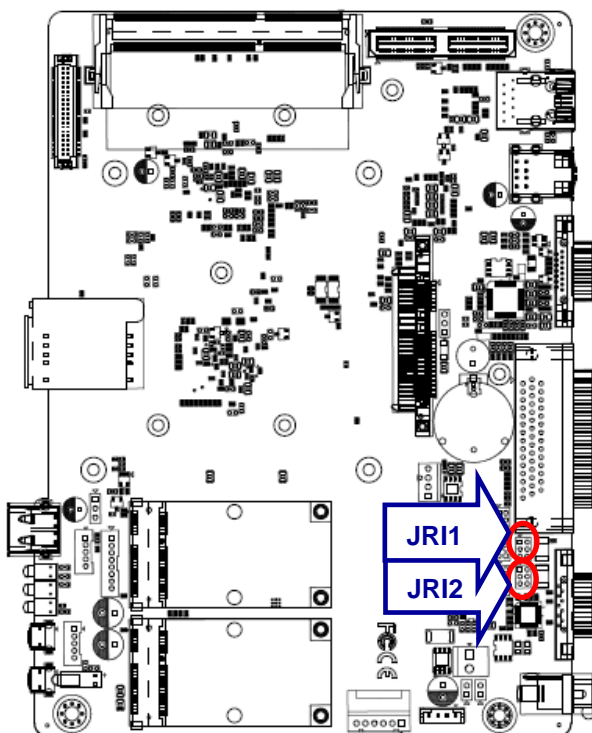


Clear CMOS

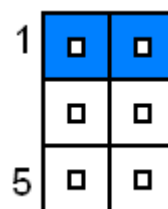


*Default

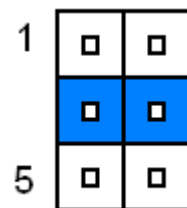
2.4.2 COM 1/2 pin 9 signal select (JRI1/2)



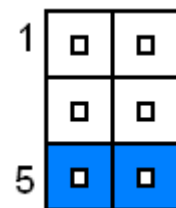
Ring*



+5V



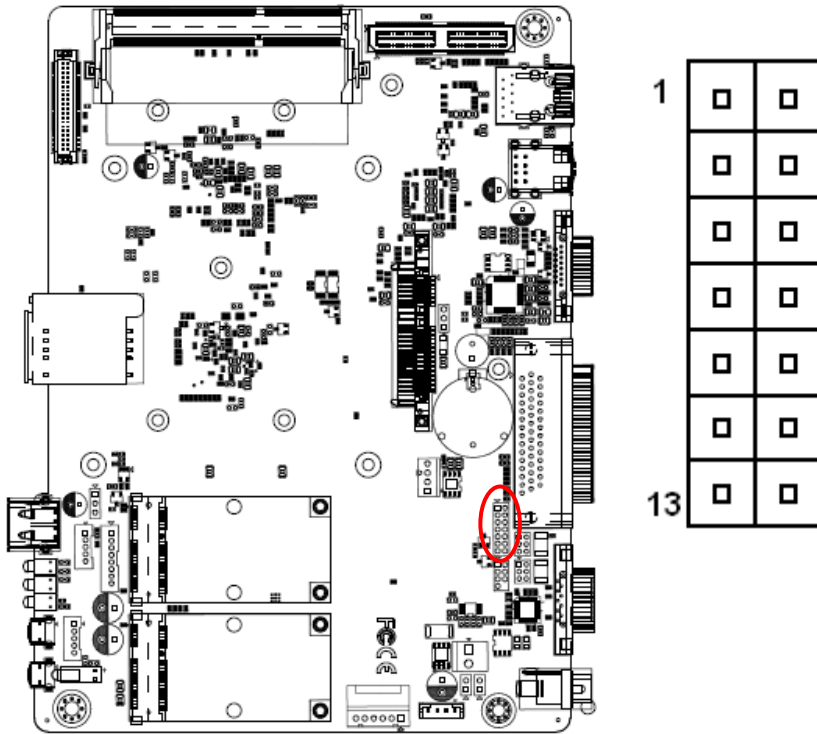
+12V



* Default

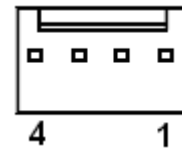
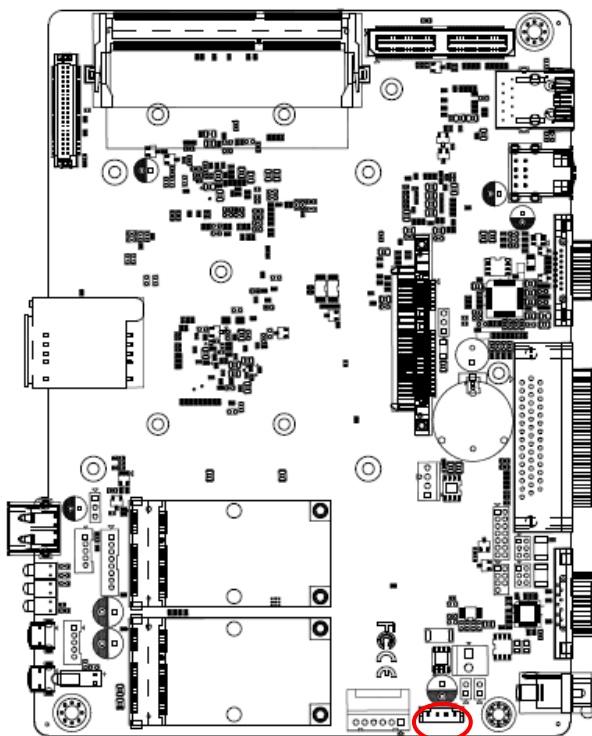
EMS-CDV

2.4.3 LPC port connector (LPC1)



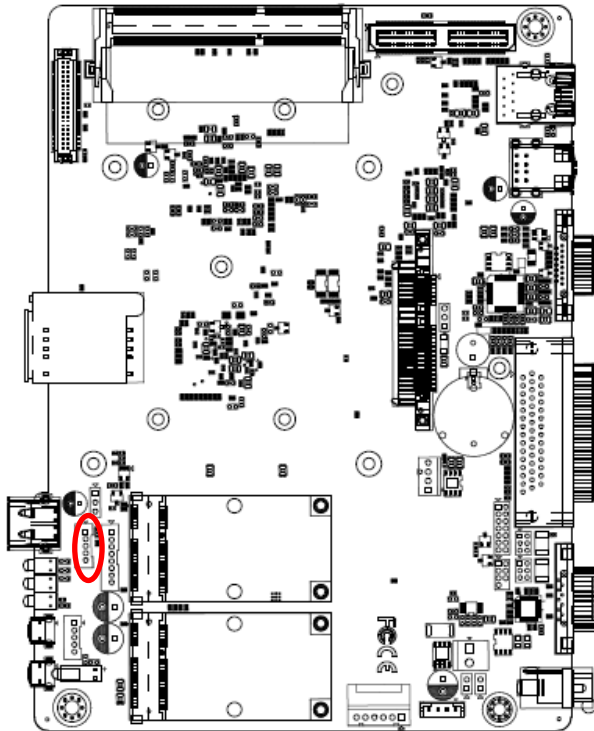
Signal	PIN	PIN	Signal
LPC_AD0	1	2	+3V
LPC_AD1	3	4	PLTRST#
LPC_AD2	5	6	LPC_LFRAME#
LPC_AD3	7	8	LPC1_PCI_CLK
SERIRQ	9	10	GND
+5V	11	12	GND
+5V	13	14	LPC_LDRQ1#

2.4.4 Power connector (PWR1)



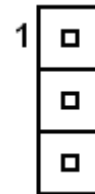
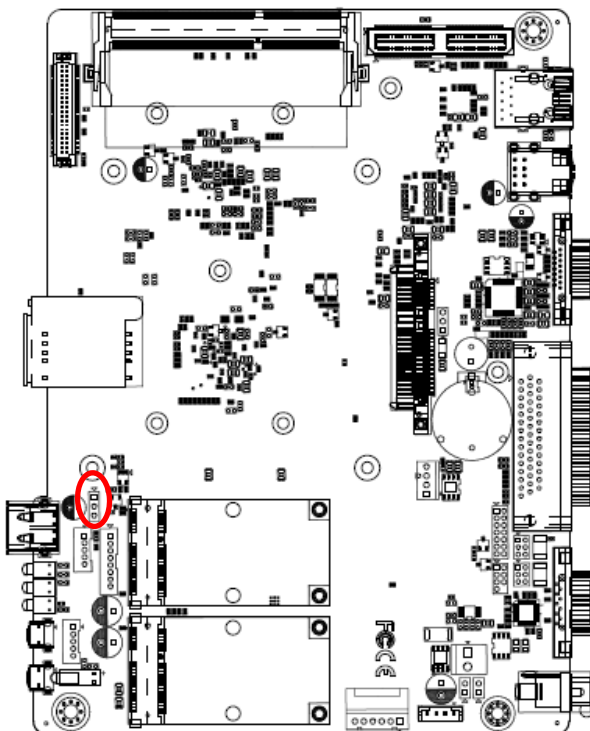
Signal	PIN
+5V	1
GND	2
GND	3
+12V	4

2.4.5 LCD inverter connector (BKL1)

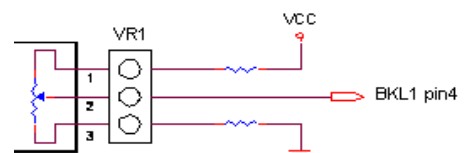


Signal	PIN
+12V	1
GND	2
LVDS_BKLTEN	3
BRIGHT	4
+5V	5

2.4.6 LCD backlight brightness adjustment (JVR)



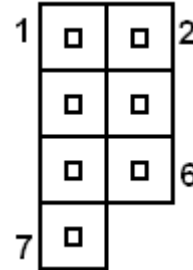
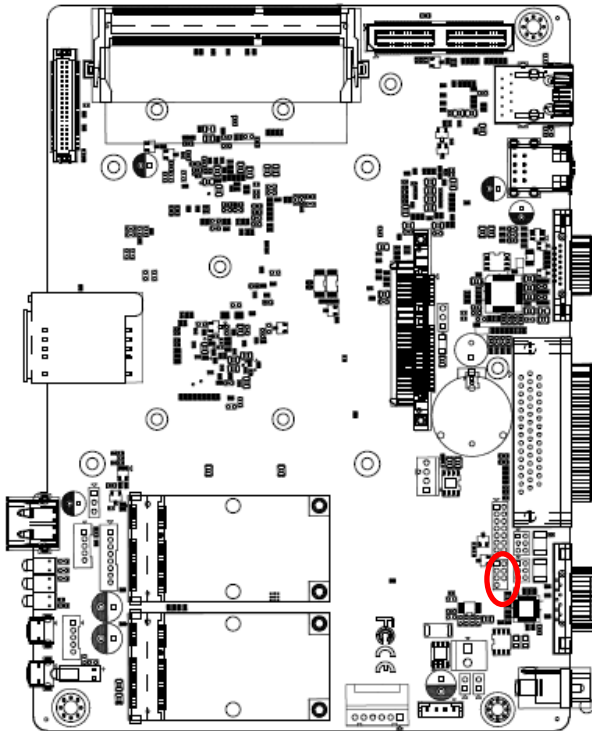
Signal	PIN
+5V	1
BRIGHT	2
GND	3



Variation Resistor

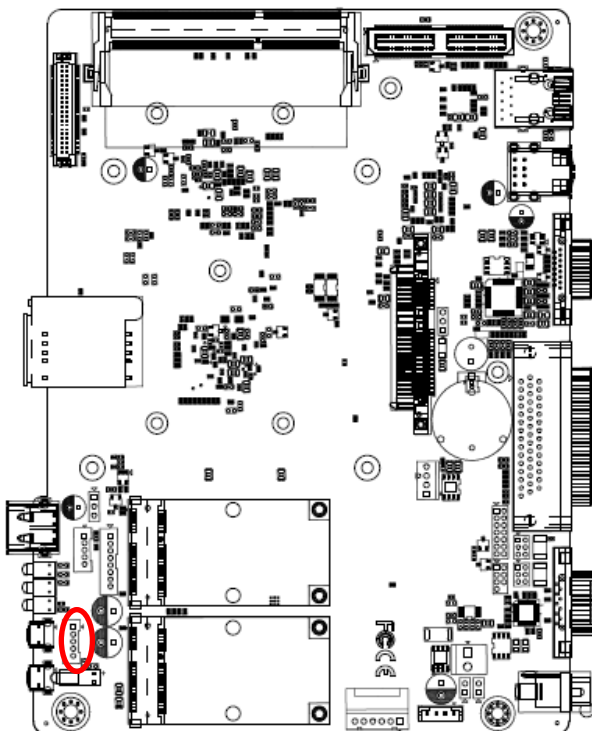
(Recommended: 4.7KΩ, >1/16W)

2.4.7 SPI connector (SPI1)



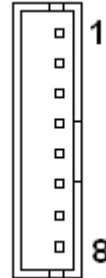
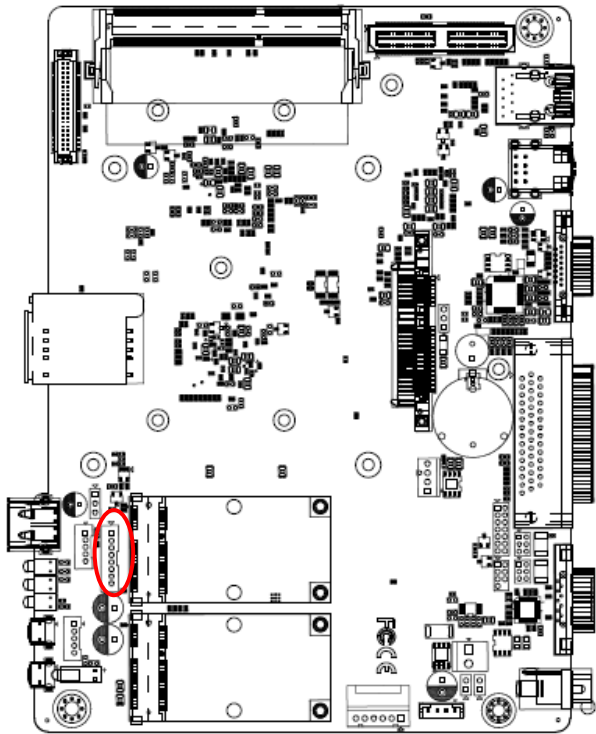
Signal	PIN	PIN	Signal
+3V	1	2	GND
SPI_CS#	3	4	SPI_CLK
SPI_SO	5	6	SPI_SI
SPI_HOLD#	7		

2.4.8 Front Panel Connector 1 (CN1)



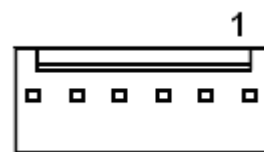
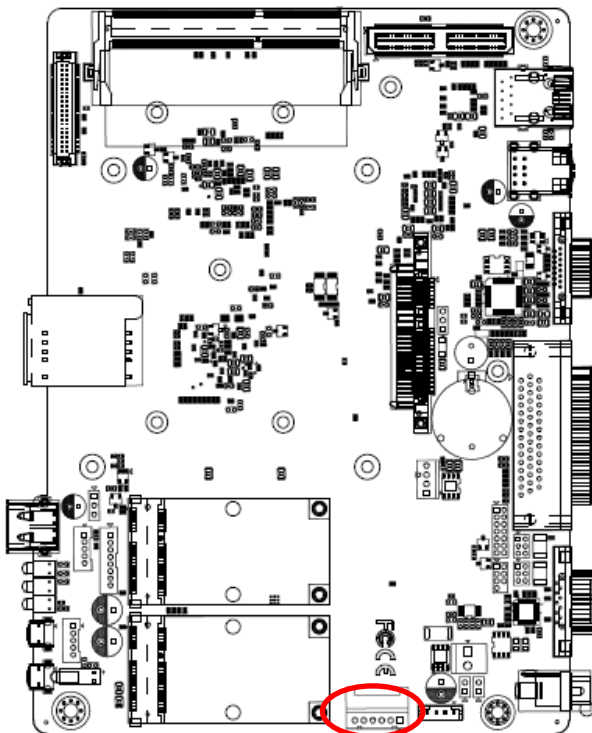
Signal	PIN
PWRBTN#	1
RESET#	2
GND	3
POWER LED+	4
POWER LED-	5

2.4.9 Front Panel Connector 2 (CN2)



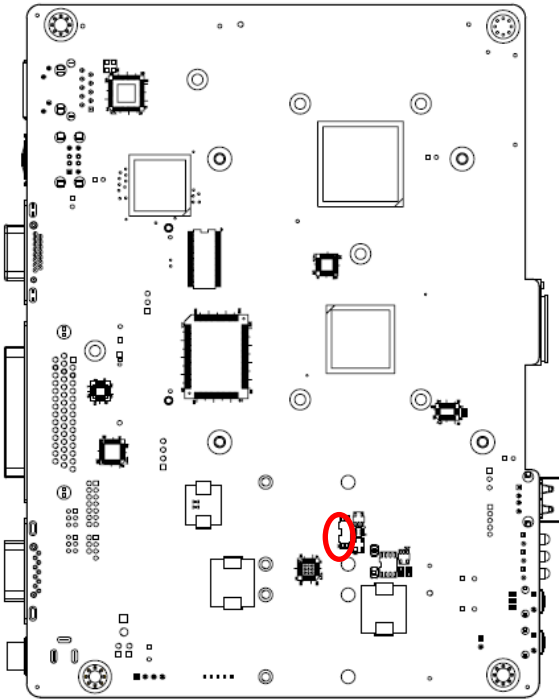
Signal	PIN
SATA_LED+	1
SATA_LED-	2
LAN ACT LED+	3
LAN ACT LED-	4
LAN LINK100+	5
LAN LINK100-	6
LAN LINK1000+	7
LAN LINK1000-	8

2.4.10 DC Output connector (DCOUT_S)



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

2.4.11 AT/ATX mode selector (SW1)

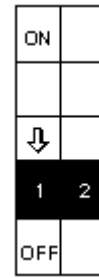
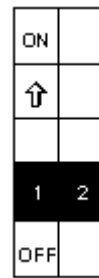


AT/ATX mode





AT mode

ATX mode*



*Default

2.4.11.1 Signal Description –AT/ATX mode selection

AT/ATX mode	Description
<p>AT mode</p> 	<p>This Mode supports AT power supply, no need to press Power button to enable power on/off</p>
<p>ATX mode</p> 	<p>This Mode supports ATX power supply. Press the ATX power button to enable power on/off</p>

2.5 AUX-M01,AUX-M02 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

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	

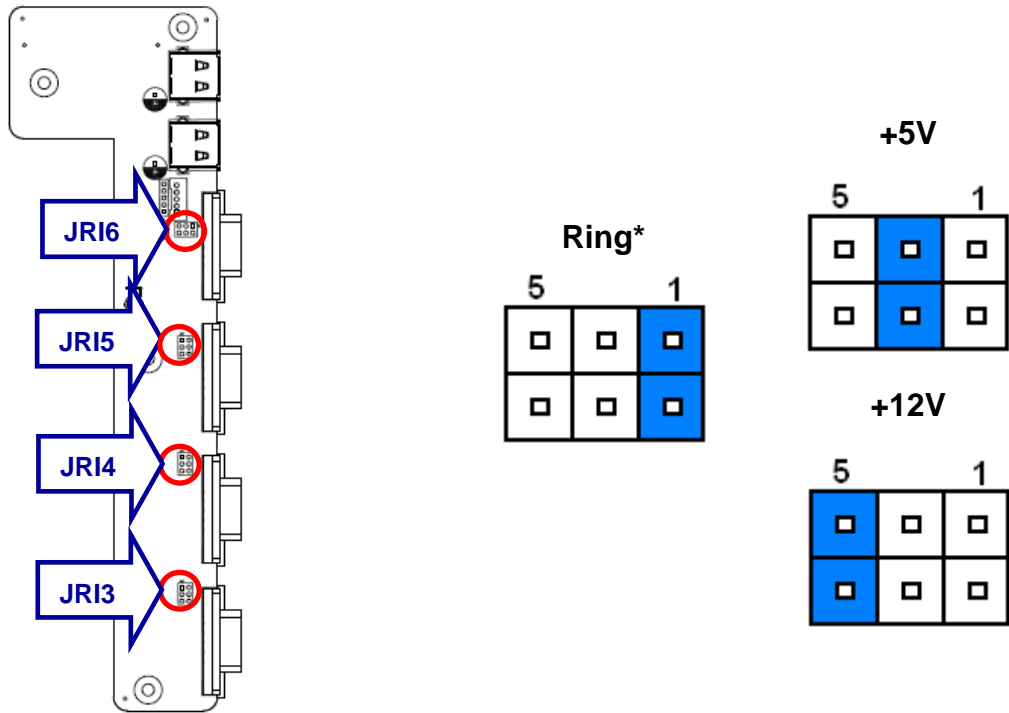
2.5.2 AUX-M02

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

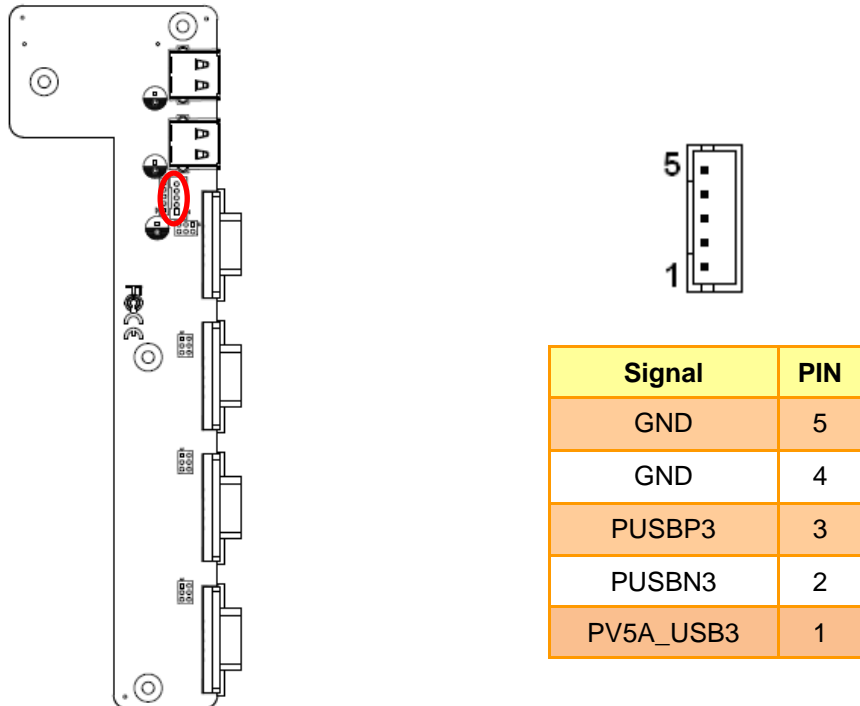
2.6 AUX-M01 Jumpers & Connectors settings

2.6.1 COM 3/4/5/6 pin 9 signal select (JR13/4/5/6)

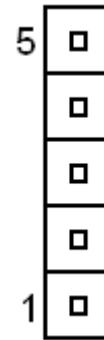
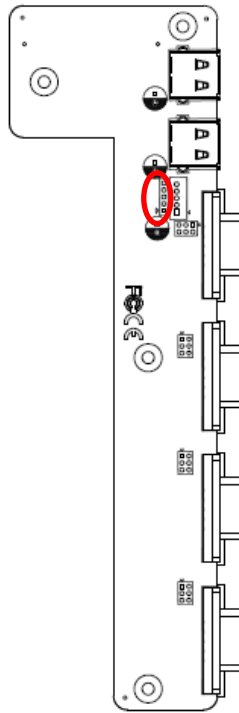


* Default

2.6.2 USB connector (USB3)



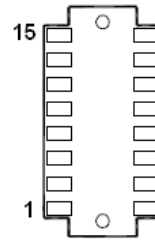
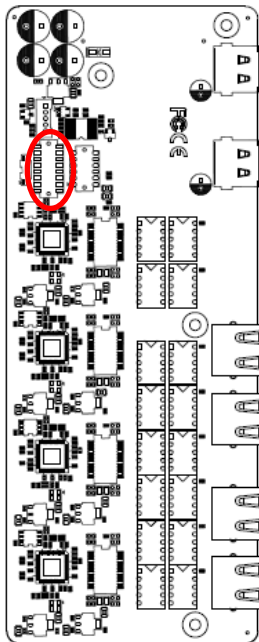
2.6.3 USB connector (JUSB3)



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

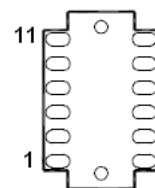
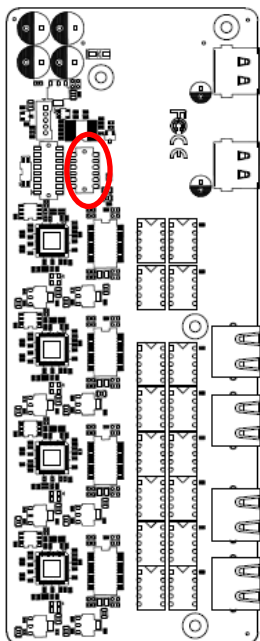
2.7 AUX-M02 Jumpers & Connectors settings

2.7.1 LAN ACT/LNK/SPD LED (JLANLED)



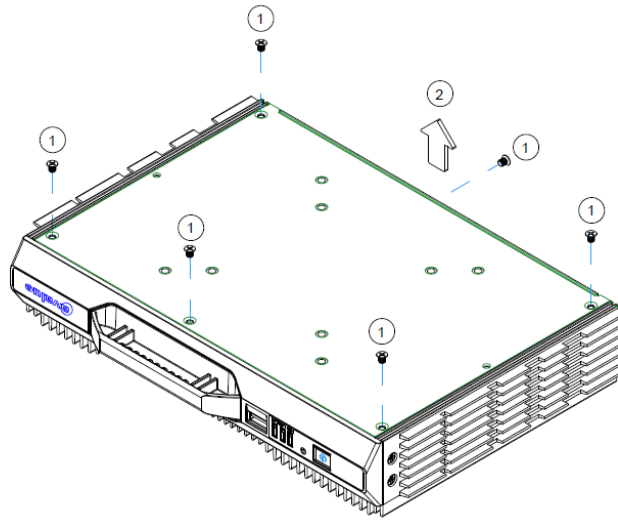
Signal	PIN	PIN	Signal
LAN3_LNK1000	15	16	LAN5_LNK1000
LAN3_LNK100	13	14	LAN5_LNK100
LAN3_ACT-	11	12	LAN5_ACT-
LAN3_ACT+	9	10	LAN5_ACT+
LAN2_LNK1000	7	8	LAN4_LNK1000
LAN2_LNK100	5	6	LAN4_LNK100
LAN2_ACT-	3	4	LAN4_ACT-
LAN2_ACT+	1	2	LAN4_ACT+

2.7.2 Normal/Bypass mode LED (JLANMODE)



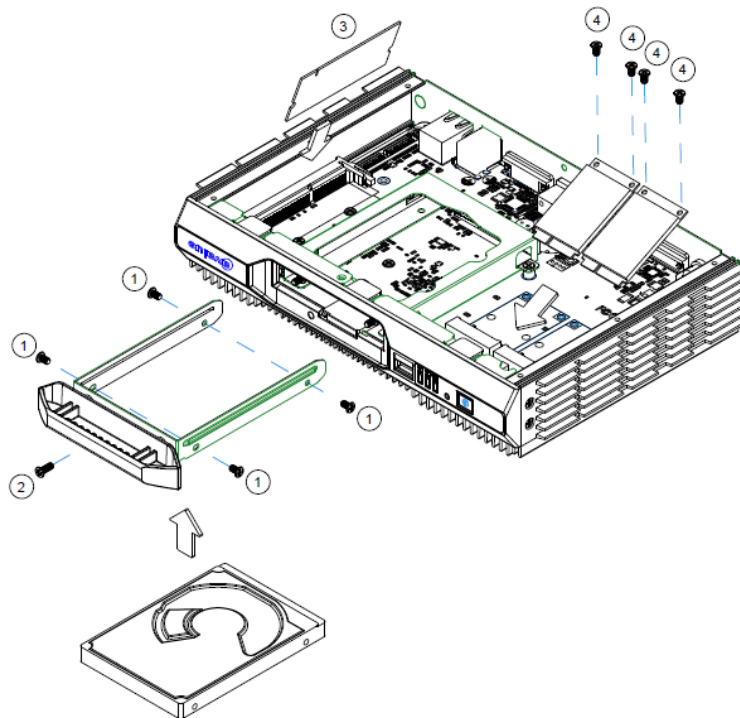
Signal	PIN	PIN	Signal
LAN23_WDT-	11	12	LAN45_WDT-
LAN23_WDT+	9	10	LAN45_WDT+
LAN23_BYPASS-	7	8	LAN45_BYPASS-
LAN23_BYPASS+	5	6	LAN45_BYPASS+
LAN23_NORMAL-	3	4	LAN45_NORMAL-
LAN23_NORMAL+	1	2	LAN45_NORMAL+

2.8 Installing Hard Disk & Memory, PCI devices (EMS-CDV)



Step 1. Remove 6 screws from the bottom of your system.

Step 2. Remove the chassis cover.



Step 1. Remove 5 screws to release the HDD bracket.

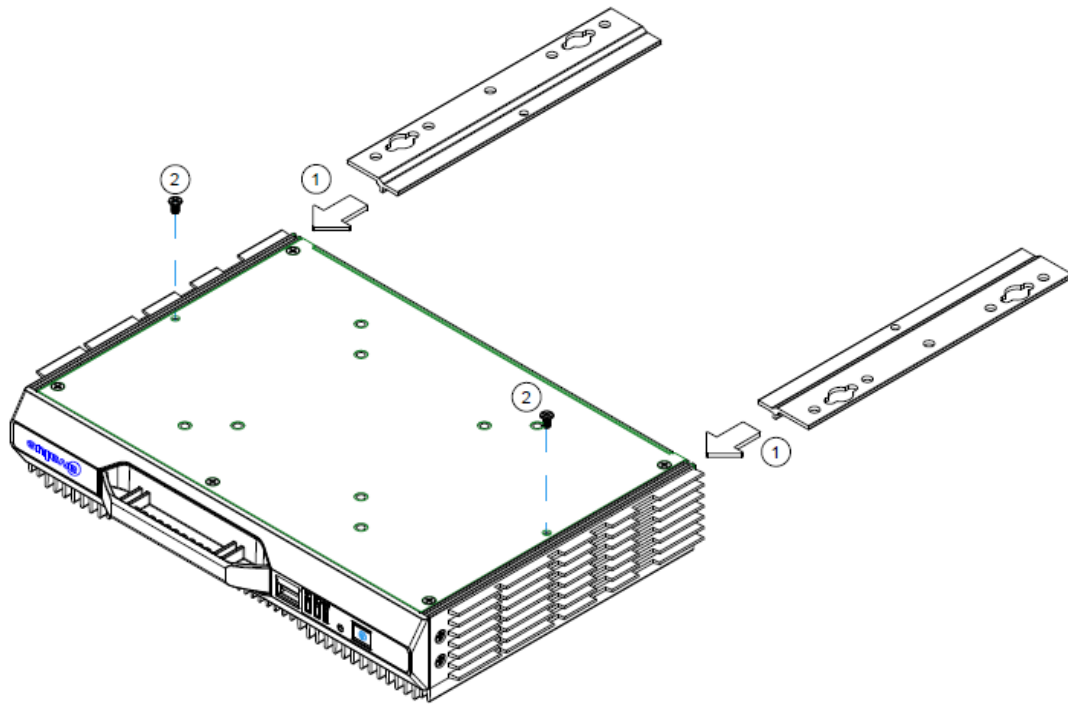
Step 2.1. Slide HDD into its bracket until properly seated.

Step 2.2. Secure HDD by means of 5 screws.

Step 3. Slide the DDR3 SODIMM into the memory socket and press it down until properly seated.

Step 4. Insert MPCIE cards into designated locations and fasten with four screws to complete MPCIE installation.

2.9 Installing Mounting Brackets (EMS-CDV)



Step 1. Position brackets on both sides, matching the holes on the system.

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

