

# REV-Q703

Mini-ITX Qseven Carrier Board

## User's Manual

---

1<sup>st</sup> Ed – 20 October 2015

## 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.

## Notice

This guide is designed for experienced users to setup the system within the shortest time. For detailed information, please always refer to the electronic user's manual.

## Copyright Notice

Copyright © 2015 ALL RIGHTS RESERVED.

No part of this document may be reproduced, copied, translated, or transmitted in any form or by any means, electronic or mechanical, for any purpose, without the prior written permission of the original manufacturer.

## Trademark Acknowledgement

Brand and product names are trademarks or registered trademarks of their respective owners.

## Disclaimer

We reserve the right to make changes, without notice, to any product, including circuits and/or software described or contained in this manual in order to improve design and/or performance. We assume no responsibility or liability for the use of the described product(s), conveys no license or title under any patent, copyright, or masks work rights to these products, and makes no representations or warranties that

these products are free from patent, copyright, or mask work right infringement, unless otherwise specified. Applications that are described in this manual are for illustration purposes only. We make no representation or warranty that such application will be suitable for the specified use without further testing or modification.

### **Life Support Policy**

OUR PRODUCTS ARE NOT FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE PRIOR WRITTEN APPROVAL.

As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into body, or (b) support or sustain life and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

### **A Message to the Customer**

#### ***Customer Services***

Each and every our product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new device is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation.

Your satisfaction is our primary concern. Here is a guide to our customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

#### ***Technical Support***

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.

# Contents

<b>1. Getting Started.....</b>	<b>5</b>
1.1 Safety Precautions.....	5
1.2 Packing List.....	5
1.3 Document Amendment History .....	6
1.4 Manual Objectives .....	7
1.5 System Specifications .....	8
1.6 Architecture Overview—Block Diagram .....	10
<b>2. Hardware Configuration .....</b>	<b>11</b>
2.1 Product Overview .....	12
2.2 Jumper and Connector List.....	13
2.3 Setting Jumpers & Connectors .....	15
2.3.1 Module/Carrier BIOS selector (JBIOS) .....	15
2.3.2 USB Port selector (JUSBFUNC1) .....	15
2.3.3 AT/ATX mode/ Platform/ PCI-e channel selector (JFUNC_SEL).....	16
2.3.4 Clear CMOS (JCMOS1) .....	17
2.3.5 CPU fan connector (JCPUFAN1) .....	17
2.3.6 Miscellaneous setting connector (JFP1) .....	18
2.3.7 USB connector 2 (JUSB2) .....	18
2.3.8 USB connector 3 (JUSB3) .....	19
2.3.9 USB connector 4 (JUSB4) .....	19
2.3.10 Power connector (JPWR2) .....	20
2.3.11 Carrier board SPI FLASH programming (JSPIC1).....	20
2.3.12 LPC port Connector (JLPC1).....	21
2.3.13 General Purpose I/O connector (JDIO1).....	21
2.3.14 LCD Inverter connector (JBKLT1) .....	22
2.3.14.1 Signal Description – LCD Inverter connector (JBKLT).....	22
2.3.15 Customer I2C connector (JI2C1).....	23
2.3.16 HD Power connector 1/2 (HD_PWR1/2) .....	23
2.3.17 LVDS connector (JLVDS1).....	24
2.3.18 CAN Bus connector (JCAN1).....	25
2.3.19 Battery connector (BAT-1).....	25
<b>4. Mechanical Drawing .....</b>	<b>26</b>

# 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

Before you begin installing your single board, please make sure that the following materials have been shipped:

- 1 x REV-Q703 Mini-ITX Qseven Carrier Board
- 4 x Screw



---

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

---

**1.3 Document Amendment History**

Revision	Date	By	Comment
1 <sup>st</sup>	October 2015		Initial Release

## 1.4 Manual Objectives

This manual describes in details REV-Q703 QSeven Module.

We have tried to include as much information as possible but we have not duplicated information that is provided in the standard IBM Technical References, unless it proved to be necessary to aid in the understanding of this board.

We strongly recommend that you study this manual carefully before attempting to set up REV-Q703 QSeven Module or change the standard configurations. Whilst all the necessary information is available in this manual we would recommend that unless you are confident, you contact your supplier for guidance.

Please be aware that it is possible to create configurations within the CMOS RAM that make booting impossible. If this should happen, clear the CMOS settings, (see the description of the Jumper Settings for details).

If you have any suggestions or find any errors regarding this manual and want to inform us of these, please contact our Customer Service department with the relevant details.

## 1.5 System Specifications

<b>I/O</b>	
<b>USB</b>	2 x USB 2.0 (5 x 2) Header 1 x USB 2.0 (5 x 1) wafer box
<b>GPIO</b>	1 x GPIO (10 x 2) Header
<b>Display</b>	
<b>LCD Interface</b>	1 x LVDS connector 1 x Back light connector
<b>Audio</b>	
<b>AC97 Codec</b>	I2S/ HDA switch onboard for different Audio codec
<b>Audio Amp</b>	Line out/Line in/MIC in interface X86 platform => ALC892 ARM platform => WM8962
<b>Internal I/O Connector</b>	
<b>Fan</b>	1 x PWM CPU Fan (4 x 1) Header
<b>Power ON</b>	1 x 4P PWR Header
	1 x PCIe x1 1 x mPCIe x1 2 x SATA w/ PWR 1 x SPI 1 x CAN 1 x LPC 1 x JFP (Miscellaneous Setting Connector)
<b>Rear I/O Connector</b>	
<b>USB</b>	1 x USB 2.0 1 x USB 3.0
<b>LAN</b>	1 x Ethernet
<b>HDMI</b>	1 x HDMI
	1 x COM 1 x DP 1 x OTG (Mini USB OTG) 1 x SD socket 3 x Audio phone jack
<b>Mechanical &amp; Environmental</b>	
<b>Power Requirement</b>	12V DC
<b>Power Type</b>	2.5 mm DC Jack



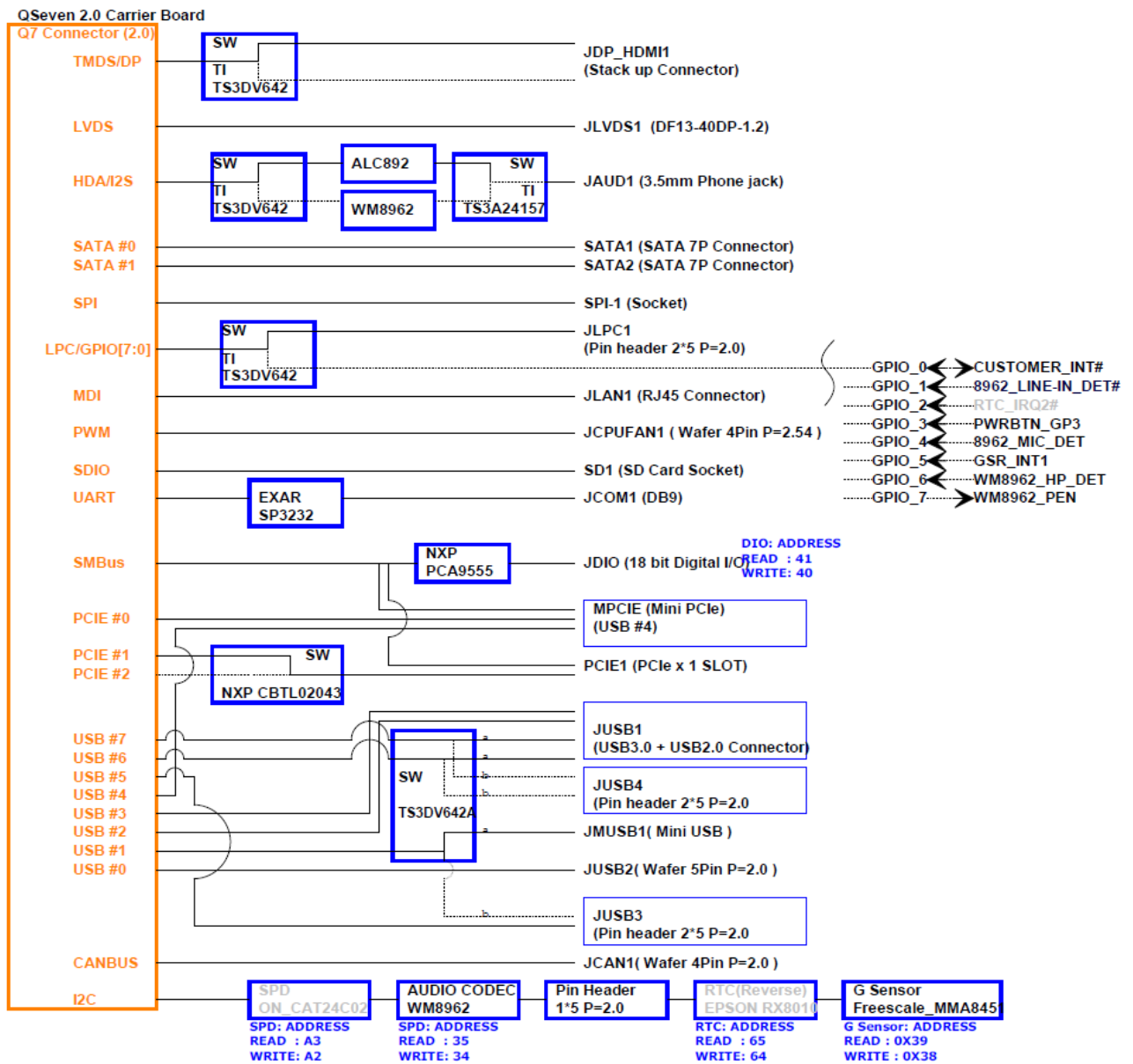
<b>Operating Temp.</b>	-40°C ~ 85°C
<b>Storage Temp.</b>	-40°C ~ 85°C
<b>Operating Humidity</b>	0% ~ 90% Relative Humidity, Non-condensing
<b>Size (L x W)</b> (Please consult product engineers for the production feasibility if the size is larger than 410 x 360mm or smaller than 80 x 70mm)	170mm x 170mm
<b>Weight</b>	TBD



**Note:** Specifications are subject to change without notice.

## 1.6 Architecture Overview—Block Diagram

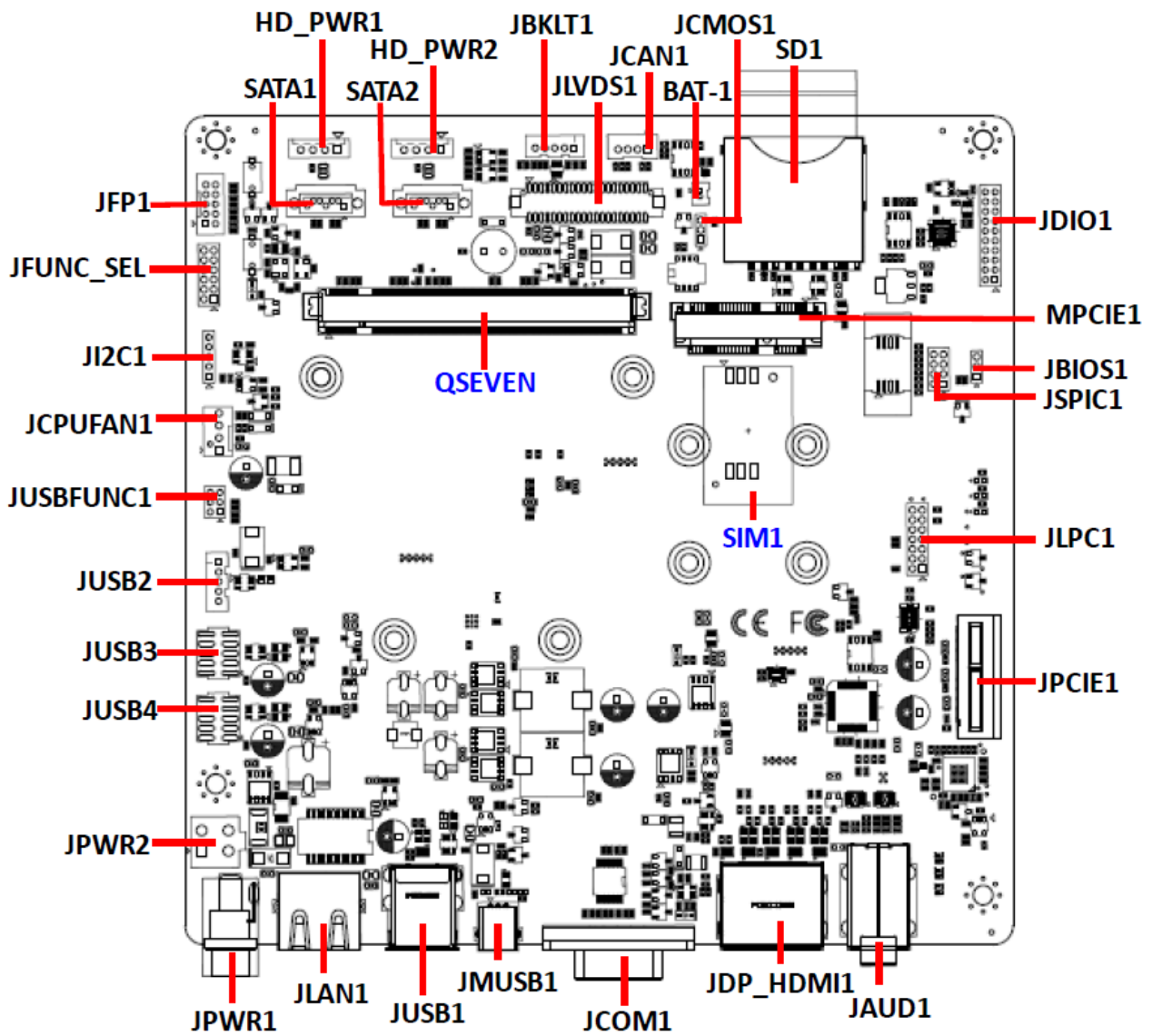
The following block diagram shows the architecture and main components of REV-Q703 QSeven Module.



## 2. Hardware Configuration

---

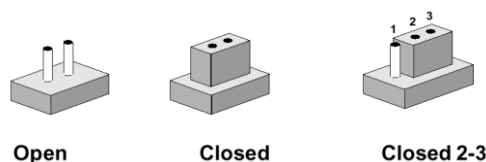
## 2.1 Product Overview



## 2.2 Jumper and Connector List

You can configure your board to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch.

It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip. To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case, you would connect either two pins.



The jumper settings are schematically depicted in this manual as follows:



A pair of needle-nose pliers may be helpful when working with jumpers.

Connectors on the board are linked to external devices such as hard disk drives, a keyboard, or floppy drives. In addition, the board has a number of jumpers that allow you to configure your system to suit your application.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

The following tables list the function of each of the board's jumpers and connectors.

### Jumpers

Label	Function	Note
	AT/ ATX Mode selector	
<b>JFUNC_SEL</b>	Platform selector PCI-e channel selector	6 x 2 header, pitch 2.00mm
<b>JCMOS1</b>	Clear CMOS	3 x 1 header, pitch 2.00mm
<b>JBIOS1</b>	Module/Carrier BIOS selector	3 x 1 header, pitch 2.00mm
<b>JUSBFUNC1</b>	USB Port selector	3 x 2 header, pitch 2.00mm

### Connectors

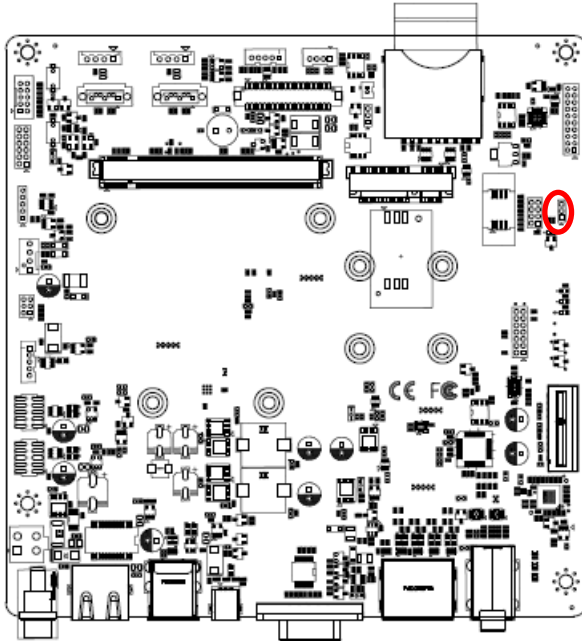
Label	Function	Note
<b>SD1</b>	SD card slot	
<b>JCPUFAN1</b>	CPU fan connector	4 x 1 wafer, pitch 2.54mm
<b>HD_PWR1/2</b>	HD Power connector 1/2	4 x 1 wafer, pitch 2.50mm

**REV-Q703**

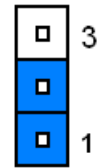
<b>BAT-1</b>	Battery connector	
<b>JFP1</b>	Miscellaneous setting connector	5 x 2 wafer, pitch 2.00mm
<b>JBKLT1</b>	LCD inverter connector	5 x 1 wafer, pitch 2.00mm
<b>JCOM1</b>	Serial Port 1 connector	D Sub 9 pin male
<b>JDIO1</b>	General purpose I/O connector	10 x 2 header, pitch 2.00mm
<b>JDP_HDMI1</b>	DP connector HDMI connector	
<b>JLAN1</b>	LAN port connector	
<b>JLVDS1</b>	LVDS connector	20 x 2 wafer, pitch 1.25mm
<b>JLPC1</b>	LPC port connector	7 x 2 header, pitch 2.00mm
<b>MPCIE1</b>	Mini-PCI connector 1	
<b>JPCIE1</b>	PCIE connector	
<b>JPWR1</b>	DC Power-in connector	
<b>JPWR2</b>	Power connector	2 x 2 wafer, pitch 4.20mm
<b>QSEVEN</b>	Qseven connector	
<b>SIM1</b>	SIM card connector	
<b>JSPIC1</b>	Carrier board SPI FLASH programming	4 x 2 header, pitch 2.00mm
<b>SATA1/2</b>	SATA connector 1/2	
<b>JAUD1</b>	Audio connector	
<b>JUSB1</b>	USB connector 1	
<b>JUSB2</b>	USB connector 2	5 x 1 wafer, pitch 2.00mm
<b>JUSB3</b>	USB connector 3	5 x 2 header, pitch 2.00mm
<b>JUSB4</b>	USB connector 4	5 x 2 header, pitch 2.00mm
<b>JMUSB1</b>	Mini USB connector	
<b>JCAN1</b>	CAN Bus connector	4 x 1 wafer, pitch 2.00mm
<b>JI2C1</b>	Customer I2C connector	5 x 1 header, pitch 2.00mm

## 2.3 Setting Jumpers & Connectors

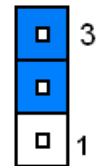
### 2.3.1 Module/Carrier BIOS selector (JBIOS)



#### Q7 Module BIOS\*

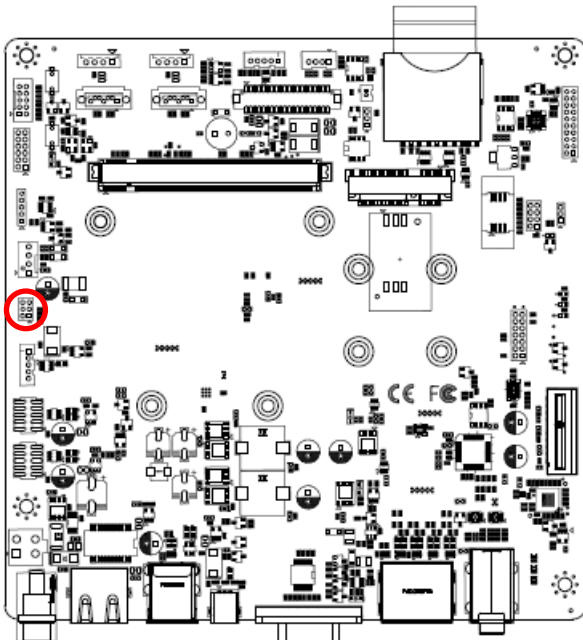


#### Carrier board BIOS

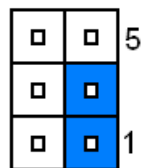


\*Default

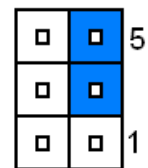
### 2.3.2 USB Port selector (JUSBFUNC1)



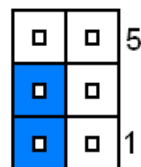
#### Port 1, 6, 7 to JUSB1 (Mini USB & USB3.0)\*



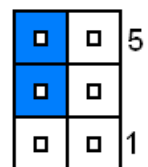
#### Port 1, 6, 7 to JUSB3 (USB2.0 & USB2.0)



#### Standby power to USB\*

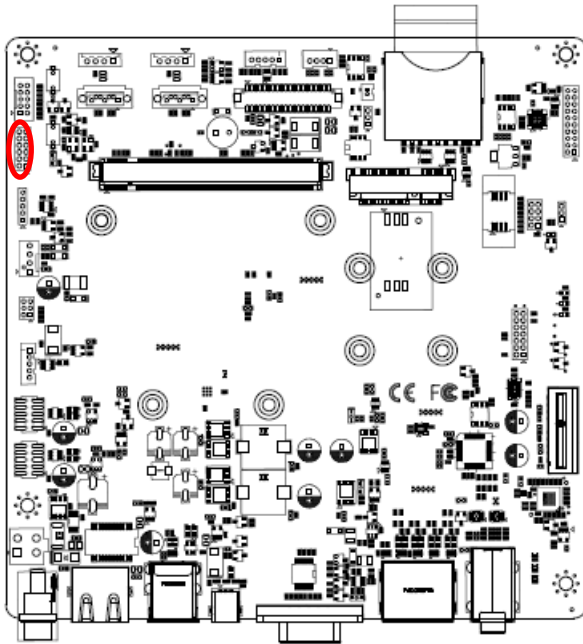


#### USB power when main power ok



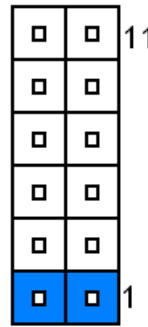
\*Default

2.3.3 AT/ATX mode/ Platform/ PCI-e channel selector (JFUNC\_SEL)

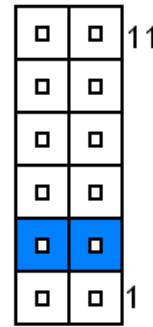


\*Default

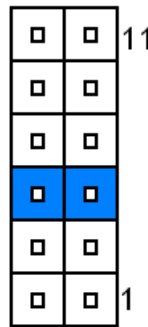
AT MODE\*



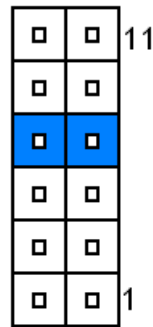
ATX MODE\*



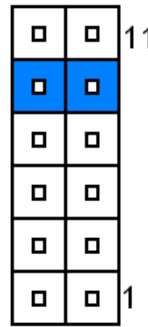
Intel platform



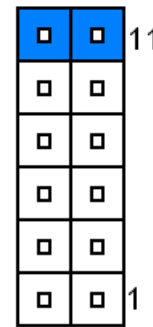
Freescaler platform



PCIe1

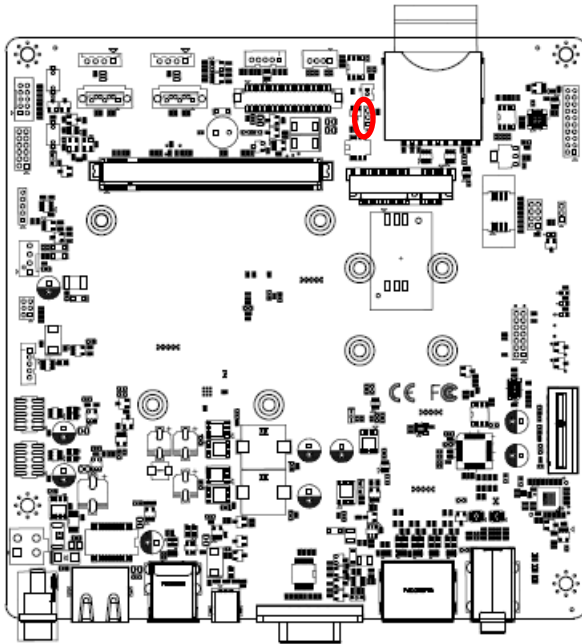


PCIe2

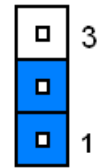




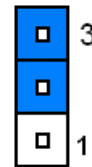
### 2.3.4 Clear CMOS (JCMOS1)



Normal\*

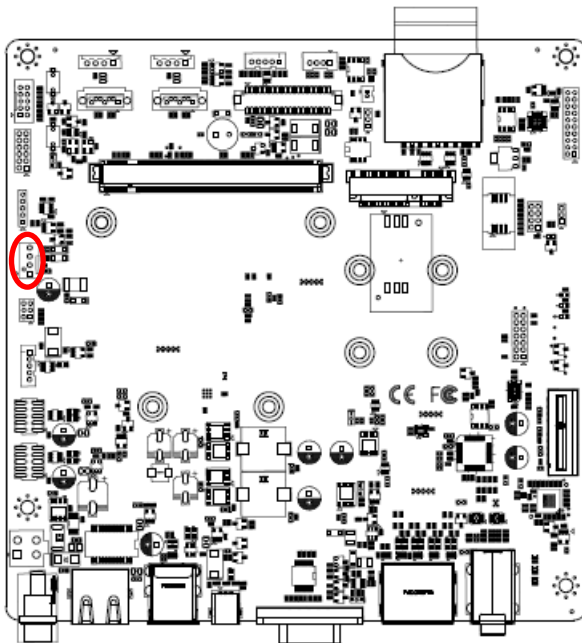


Clear CMOS



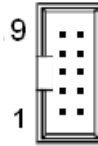
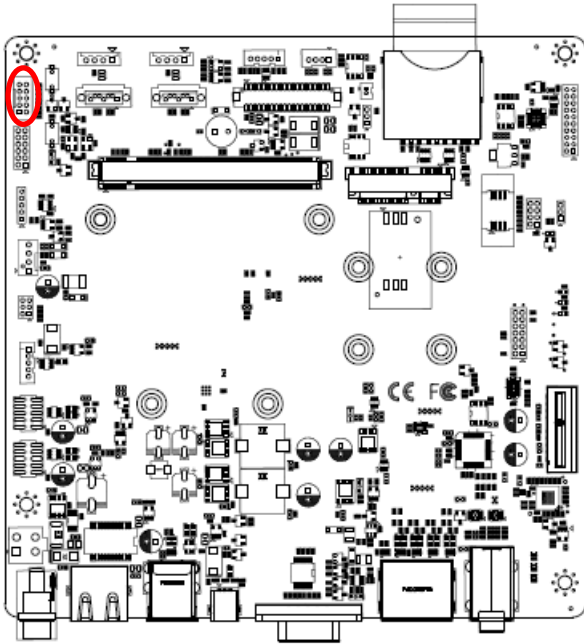
\*Default

### 2.3.5 CPU fan connector (JCPUFAN1)



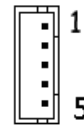
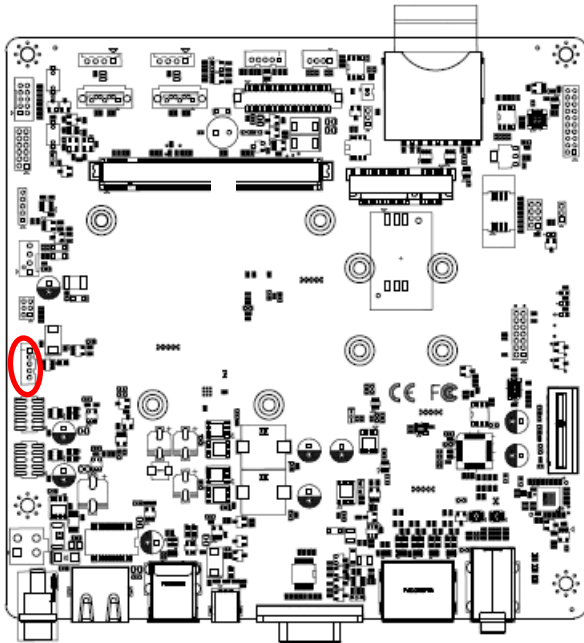
Signal	PIN
CPU_FAN_CTRL	4
FAN_TACHOIN	3
+12V	2
GND	1

2.3.6 Miscellaneous setting connector (JFP1)



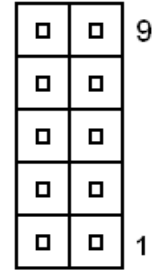
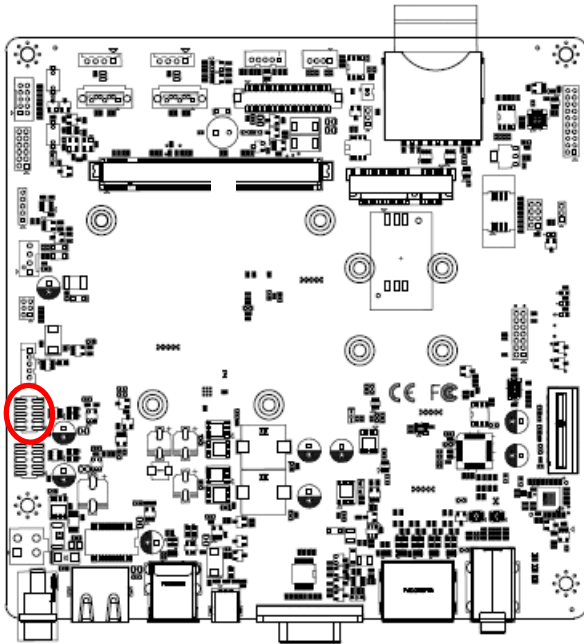
Signal	PIN
NC	10
	9
HDD-LED-	8
HDD-LED+	7
PWR-LED+	6
PWR-LED-	5
RST#	4
	3
PWBT	2
	1

2.3.7 USB connector 2 (JUSB2)



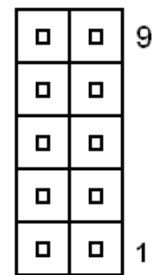
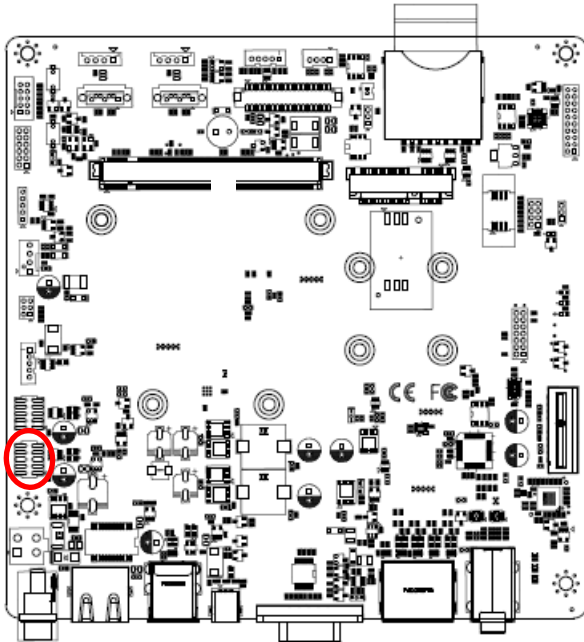
Signal	PIN
+5V	1
USB_NP0	2
USB_PP0	3
GND	4
GND	5

### 2.3.8 USB connector 3 (JUSB3)



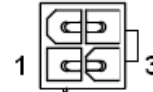
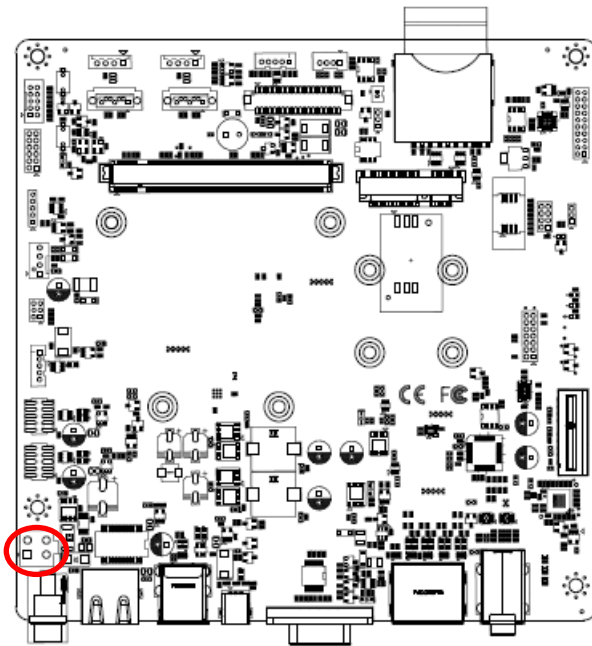
Signal	PIN	PIN	Signal
+5V	10	9	GND
USB_NP5	8	7	GND
USB_PP5	6	5	USB_PP1
GND	4	3	USB_NP1
GND	2	1	+5V

### 2.3.9 USB connector 4 (JUSB4)



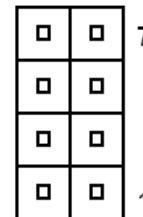
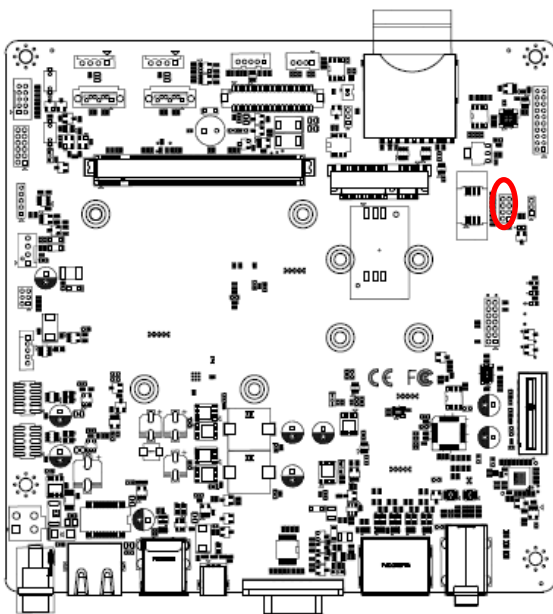
Signal	PIN	PIN	Signal
+5V	10	9	GND
USB_NP7	8	7	GND
USB_PP7	6	5	USB_PP6
GND	4	3	USB_NP6
GND	2	1	+5V

### 2.3.10 Power connector (JPWR2)



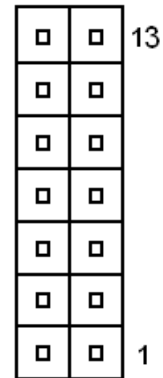
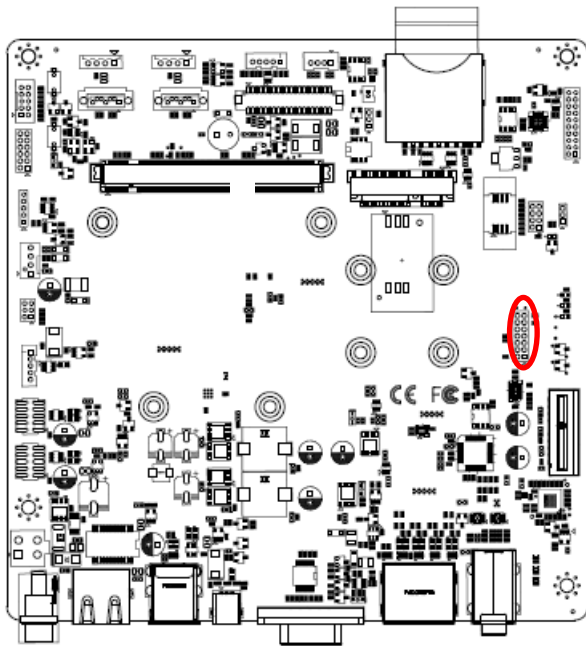
Signal	PIN	PIN	Signal
GND	2	4	+12V
GND	1	3	+12V

### 2.3.11 Carrier board SPI FLASH programming (JSPIC1)



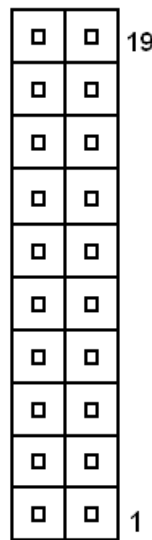
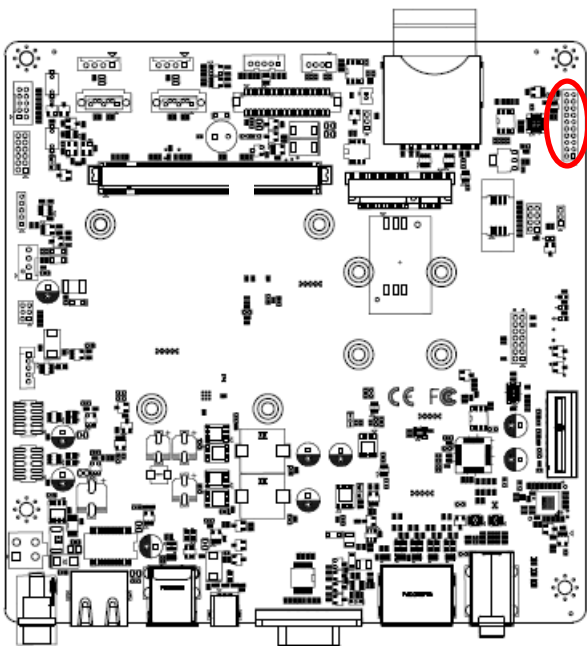
Signal	PIN	PIN	Signal
+3.3V	1	2	GND
SPI_CS#_C	3	4	SPI_CLK_C
SPI_SO_C	5	6	SPI_SI_C
SPI_HOLD#_C	7	8	NC

### 2.3.12 LPC port Connector (JLPC1)



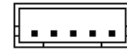
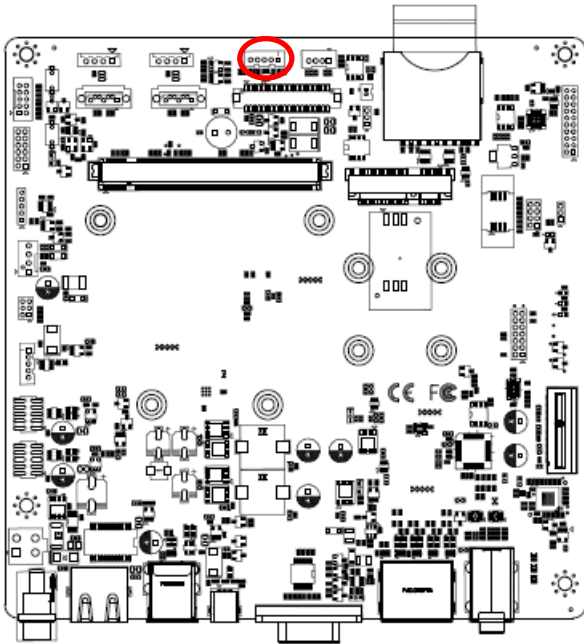
Signal	PIN	PIN	Signal
GND	14	13	+5VSB
GND	12	11	+5V
GND	10	9	SERIRQ
LPC_CLK_L	8	7	LPC_AD3
LPC_LFRAME#	6	5	LPC_AD2
PCIE_RST#	4	3	LPC_AD1
+3.3V	2	1	LPC_AD0

### 2.3.13 General Purpose I/O connector (JDIO1)



Signal	PIN	PIN	Signal
DIO_VDD5	20	19	GND
DIO_SMB_DATA	18	17	DIO_SMB_CLK
DO7	16	15	DI7
DO6	14	13	DI6
DO5	12	11	DI5
DO4	10	9	DI4
DO3	8	7	DI3
DO2	6	5	DI2
DO1	4	3	DI1
DO0	2	1	DI0

2.3.14 LCD Inverter connector (JBKLT1)

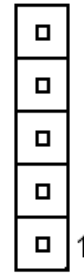
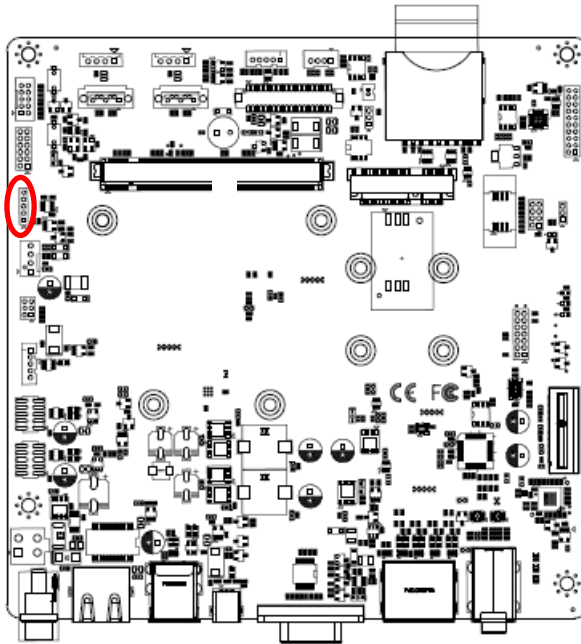


Signal	PIN
+12V (max 300mA)	1
GND	2
LVDS_BPEN	3
LVDS_BKLTCTL	4
+5V (max 400mA)	5

2.3.14.1 Signal Description – LCD Inverter connector (JBKLT)

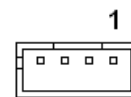
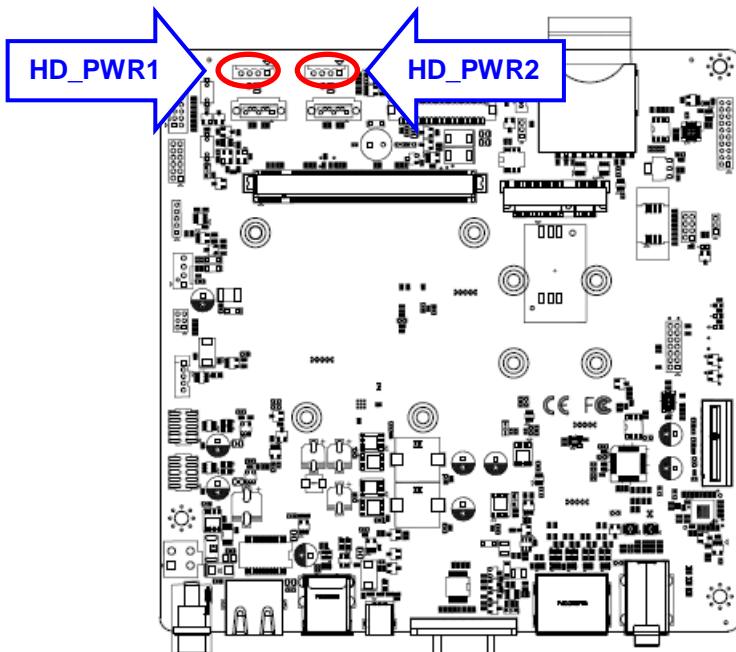
Signal	Signal Description
LVDS_BKLTCTL	LVDS backlight PWM control
LVDS_BPEN	LCD backlight Enable/Disable control signal
LVDS_EN level	selectable resistor to 5V or 3.3V (Default 5V level)

### 2.3.15 Customer I2C connector (JI2C1)



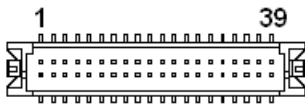
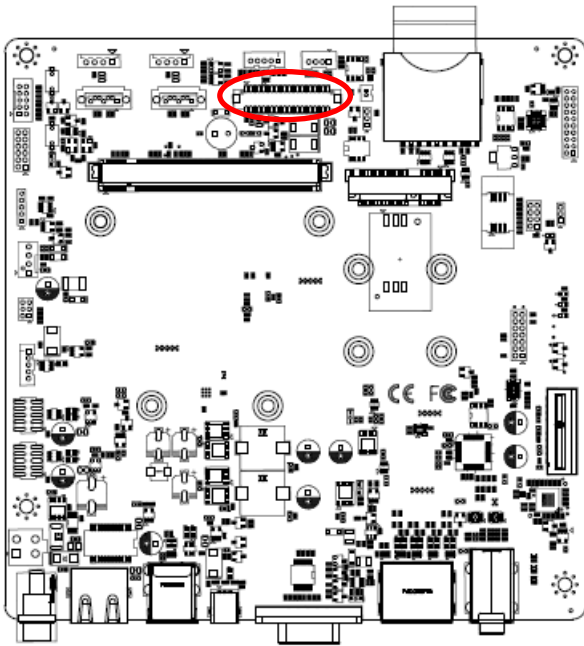
Signal	PIN
GND	5
CS_DAT	4
CS_CLK	3
CS_INT#	2
+3.3V	1

### 2.3.16 HD Power connector 1/2 (HD\_PWR1/2)



Signal	PIN
GND	1
GND	2
+5V (Max 1000Ma)	3
	4

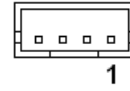
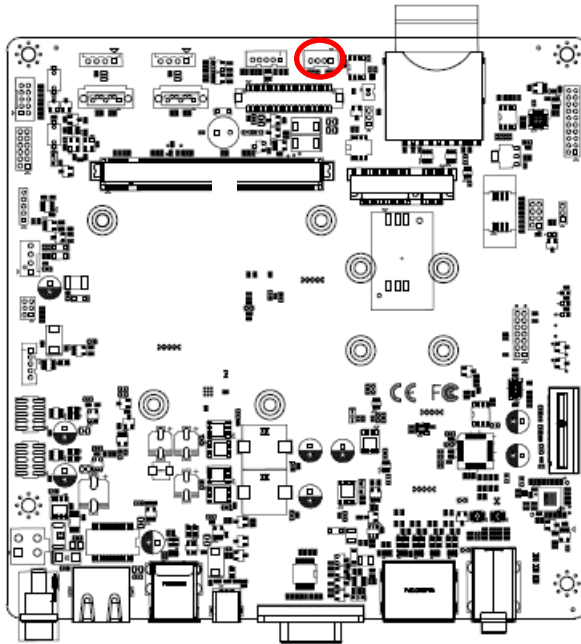
2.3.17 LVDS connector (JLVDS1)



Signal	PIN	PIN	Signal
+3V	1	2	+5V
+3V	3	4	+5V
QC_LVDS_DDC_CLK	5	6	QC_LVDS_DDC_DATA
GND	7	8	GND
LVDS_A1+	9	10	LVDS_A0+
LVDS_A1-	11	12	LVDS_A0-
GND	13	14	GND
LVDS_A3+	15	16	LVDS_A2+
LVDS_A3-	17	18	LVDS_A2-
GND	19	20	GND
LVDS_B1+	21	22	LVDS_B0+
LVDS_B1-	23	24	LVDS_B0-
GND	25	26	GND
LVDS_B3+	27	28	LVDS_B2+
LVDS_B3-	29	30	LVDS_B2-
GND	31	32	GND
LVDS_B_CLK+	33	34	LVDS_A_CLK+
LVDS_B_CLK-	35	36	LVDS_A_CLK-
GND	37	38	GND
+12V	39	40	+12V

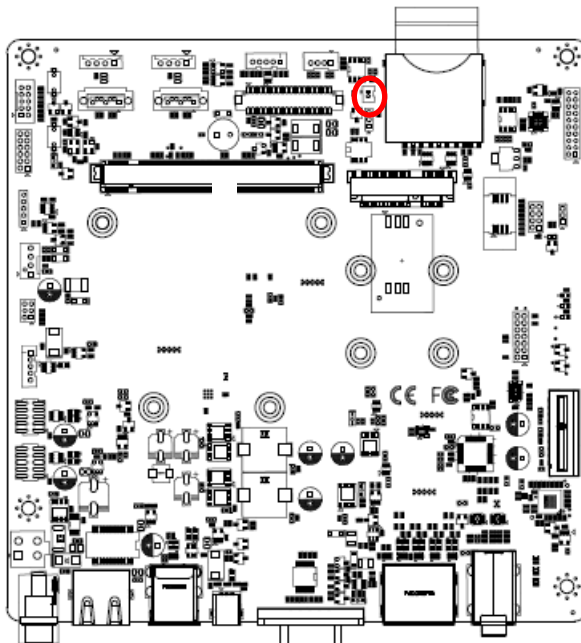


### 2.3.18 CAN Bus connector (JCAN1)



Signal	PIN
CAN0_H	1
GND	2
CAN0_L	3
GND	4

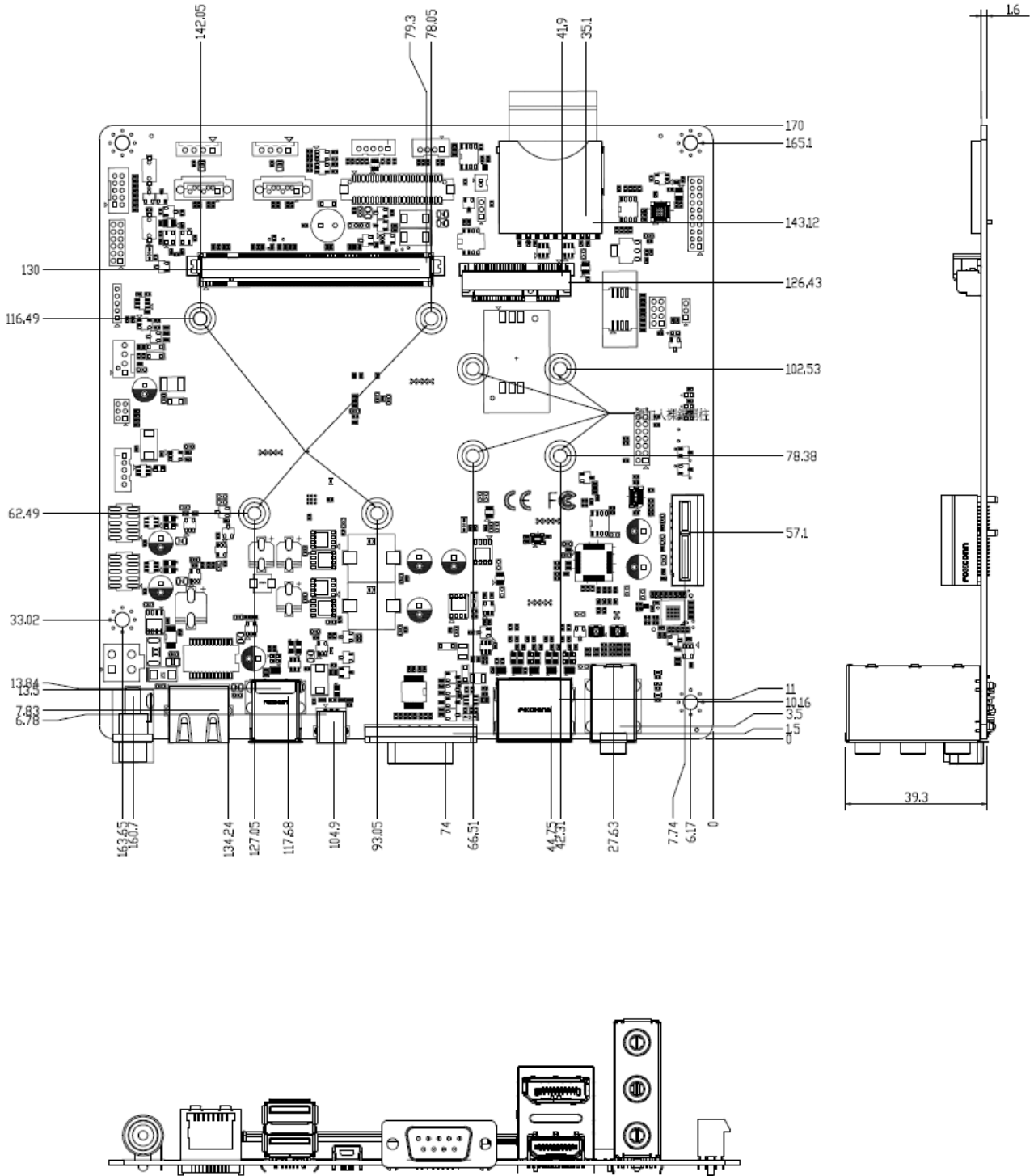
### 2.3.19 Battery connector (BAT-1)



Signal	PIN
+3.3V	1
GND	2

# 4. Mechanical Drawing

---



Unit: mm

