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# **ARES-1970**

**Fan-Less Embedded Controller with 6th  
Generation Intel® Core™ Processors**

## **User's Manual**

**Version 1.0**

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## Revision History

Version	Date	Description
1.0	2017.07	Initial release

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## Copyright Notice

All Rights Reserved.

The information in this document is subject to change without prior notice in order to improve the reliability, design and function. It does not represent a commitment on the part of the manufacturer.

Under no circumstances will the manufacturer be liable for any direct, indirect, special, incidental, or consequential damages arising from the use or inability to use the product or documentation, even if advised of the possibility of such damages.

This document contains proprietary information protected by copyright. All rights are reserved. No part of this document may be reproduced by any mechanical, electronic, or other means in any form without prior written permission of the manufacturer.

## Declaration of Conformity

### CE

The CE symbol on your product indicates that it is in compliance with the directives of the Union European (EU). A Certificate of Compliance is available by contacting Technical Support.

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

### Warning

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

### FCC Class A

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

### NOTE:

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

### RoHS

ARBOR Technology Corp. certifies that all components in its products are in compliance and conform to the European Union's Restriction of Use of Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive 2002/95/EC.

The above mentioned directive was published on 2/13/2003. The main purpose of the directive is to prohibit the use of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE) in electrical and electronic products. Member states of the EU are to enforce by 7/1/2006.

ARBOR Technology Corp. hereby states that the listed products do not contain unintentional additions of lead, mercury, hex chrome, PBB or PBDB that exceed a maximum concentration value of 0.1% by weight or for cadmium exceed 0.01% by weight, per homogenous material. Homogenous material is defined as a substance or mixture of substances with uniform composition (such as solders, resins, plating, etc.). Lead-free solder is used for all terminations (Sn(96-96.5%), Ag(3.0-3.5%) and Cu(0.5%)).

### SVHC / REACH

To minimize the environmental impact and take more responsibility to the earth we live, Arbor hereby confirms all products comply with the restriction of SVHC (Substances of Very High Concern) in (EC) 1907/2006 (REACH --Registration, Evaluation, Authorization, and Restriction of Chemicals) regulated by the European Union.

All substances listed in SVHC < 0.1 % by weight (1000 ppm)

## **Important Safety Instructions**

Read these safety instructions carefully

1. Read all cautions and warnings on the equipment.
2. Place this equipment on a reliable surface when installing. Dropping it or letting it fall may cause damage
3. Make sure the correct voltage is connected to the equipment.
4. For pluggable equipment, the socket outlet should be near the equipment and should be easily accessible.
5. Keep this equipment away from humidity.
6. The openings on the enclosure are for air convection and protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
7. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
8. Never pour any liquid into opening. This may cause fire or electrical shock.
9. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
10. If one of the following situations arises, get the equipment checked by service personnel:
  - a. The power cord or plug is damaged.
  - b. Liquid has penetrated into the equipment.
  - c. The equipment has been exposed to moisture.
  - d. The equipment does not work well, or you cannot get it to work according to the user's manual.
  - e. The equipment has been dropped or damaged.
  - f. The equipment has obvious signs of breakage.
11. Keep this User's Manual for later reference.

## **Warning**

The Box PC and its components contain very delicately Integrated Circuits (IC). To protect the Box PC and its components against damage caused by static electricity, you should always follow the precautions below when handling it:

1. Disconnect your Box PC from the power source when you want to work on the inside.
2. Use a grounded wrist strap when handling computer components.
3. Place components on a grounded antistatic pad or on the bag that came with the Box PC, whenever components are separated from the system.

## **Lithium Battery Replacement**

Incorrect replacement of the lithium battery may lead to a risk of explosion.

The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer.

Do not throw lithium batteries into the trash can. It must be disposed of in accordance with local regulations concerning special waste.

## **Technical Support**

If you have any technical difficulties, please consult the user's manual first at:  
<http://www.arbor.com.tw>

Please do not hesitate to call or e-mail our customer service when you still cannot find out the answer.

<http://www.arbor-technology.com>

E-mail:[info@arbor.com.tw](mailto:info@arbor.com.tw)

## **Warranty**

This product is warranted to be in good working order for a period of one year from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster.

Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, or inability to use this product. Vendor will not be liable for any claim made by any other related party.

Vendors disclaim all other warranties, either expressed or implied, including but not limited to implied warranties of merchantability and fitness for a particular purpose, with respect to the hardware, the accompanying product's manual(s) and written materials, and any accompanying hardware. This limited warranty gives you specific legal rights.

Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.

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# Chapter 1

## Introduction

## 1.1. The Computer

### Product Highlights

- 6th generation Intel® SkyLake-U platform
- Compact & fan-less design
- 4 x USB3.0 combo ports
- Dual Gbe Ethernet LANs connectivity
- Multi COMs: support 4 x RS232/422/485, 4 x RS232/485
- Support Dual-display for 1 x VGA and 1 x HDMI
- Support HDMI1.4 with max. resolution 4096x2304@24Hz



### 1.2. About this Manual

This manual is meant for the experienced users and integrators with hardware knowledge of personal computers. If you are not sure about the description in this manual, consult your vendor before further handling.

We recommend that you keep one copy of this manual for the quick reference for any necessary maintenance in the future. Thank you for choosing ARBOR products.



### 1.3. Specifications

<b>System</b>	
CPU	Soldered onboard Intel® Core™ i5-6300U , 2.4GHz 3M L2 Cache, 15W TDP Soldered onboard Intel® Core™ i7-6600U , 2.6GHz 4M L2 Cache, 15W TDP Soldered onboard Intel® Core™ i3-6100U , 2.3GHz 3M L2 Cache, 15W TDP
Memory	1 x 260-pin DDR4 SO-DIMM socket, supporting 2133MHz SDRAM up to 8GB, (4GB DDR4 SO-DIMM Pre-installed)
Chipset	Intel® SoC
Graphics	Integrated Intel® HD Graphics 520
LAN Chipset	1 x Intel® i219LM PCIe controller w/ iAMT 11.0 (except i3-6100U)
	1 x Intel® i210IT PCIe controller
Watchdog Timer	1~255 levels reset
<b>I/O</b>	
Serial Port	4 x RS232/422/485 ports
	4 x RS232/485 ports
USB Port	4 x USB3.0/2.0 ports
	2 x USB2.0 Ports
Video Port	1 x HDMI, up to 4K (UHD)
	1 x VGA
Audio	Mic-in / Line-out
Expansion Bus	1 x mSATA (SATA, Full Size) 1 x mPCIe (PCIex1+USB2.0, Full Size) 1 x mPCIe (PCIex1+USB2.0, Half Size) 1 x Mini-card socket interconnected with SIM card socket for optional Wi-Fi or HSUPA/LTE module
<b>Environmental</b>	
Operating Temp.	-20 ~ 70°C (-4 ~ 158°F)
Storage Temp.	-40 ~ 85°C (-40 ~ 185°F)
Operating Humidity	10 ~ 95% @ 70°C (non-condensing)
Vibration	5~500Hz 3G rms X,Y,Z axis w/mSATA, according to IEC 68-2-64

## Introduction

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Shock & Crash	10G peak acceleration (11 m sec. duration), operation
	30G peak acceleration (11 m sec. duration), non operation
	According to IEC 68-2-27
<b>Qualification</b>	
Certification	CE, FCC Class A
<b>Power Requirement</b>	
Power Input	DC 12~28 Input
Power Consumption	Max. 30W (w/o I/O card)
<b>Storage</b>	
Type	1 x mSATA
<b>Mechanical</b>	
Construction	Aluminum alloy
Mounting	Wall-mount//DIN-rail
Weight	1.66kg (3.66lb)
Dimensions (W x D x H)	265 x 141 x 62 mm (10.43" x 5.55" x 2.44")
<b>OS Support</b>	
Windows 7 / Windows 8.1 / Windows 10 / Linux: Ubuntu (Kernel: 4.X)	
Ordering Information	

\*For Windows 7, only system image is available.

## 1.4. Inside the Package

Upon opening the package, carefully inspect the contents. If any of the items is missing or appears damaged, contact your local dealer or distributor. The package should contain the following items:



1 x ARES-1970



1 x **Accessory Box** that contains the following items:

- Driver DVD
- User's manual
- Screws/cable
- 3-pin plug for terminal block

## 1.5. Ordering Information

ARES-1970-6300U (STD)	ARES-1970 w/6th Intel® Core i5-6300U and 4GB memory, w/o storage
ARES-1970-6600U (BTO)	ARES-1970 w/6th Intel® Core i7-6600U and 4GB memory, w/o storage
ARES-1970-6100U (BTO)	ARES-1970 w/6th Intel® Core i3-6100U and 4GB memory, w/o storage

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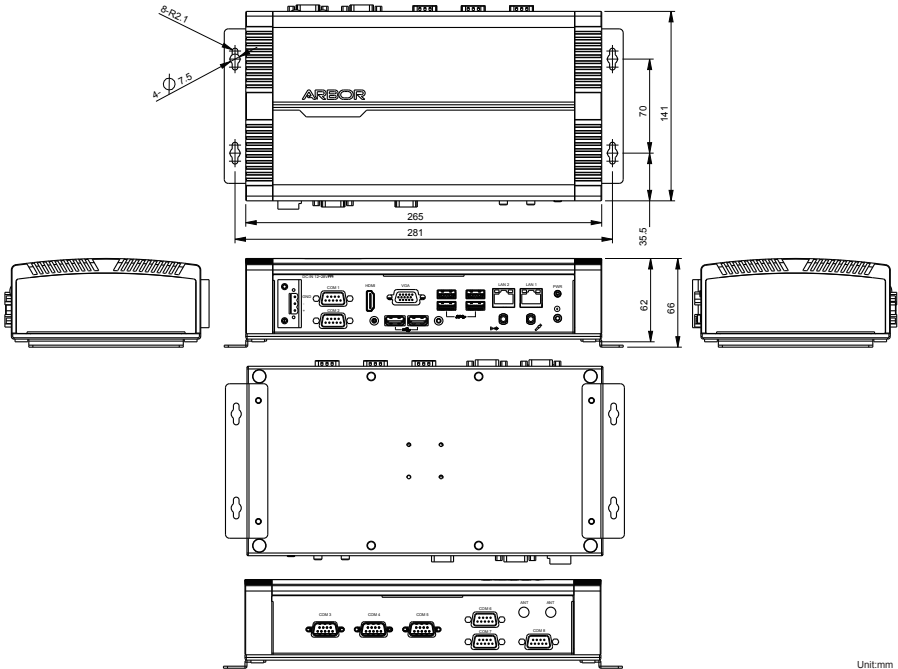
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# Chapter 2

## Getting Started

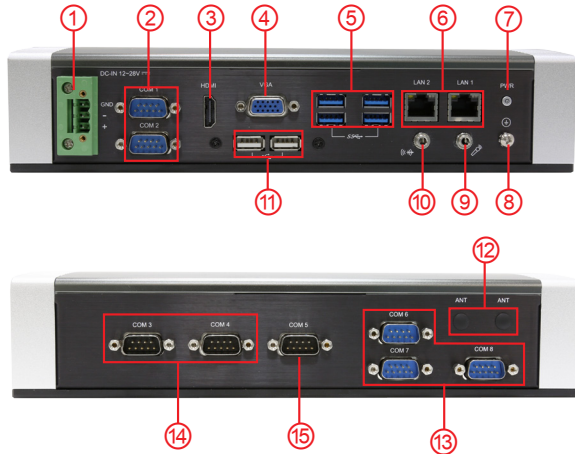
## 2.1. Dimensions



Unit:mm

## 2.2. Tour the Computer

Take a look around the computer and find the external controls and connectors.



No.	Description
①	DC 12~28 Input (3-PIN Terminal Block)
②	COM1, 2 (RS-232/422/485 selectable serial port)
③	HDMI port
④	VGA port
⑤	4 x Type-A USB 3.0/2.0 ports
⑥	2 x RJ-45 GbE ports
⑦	Power button
⑧	Ground screw
⑨	Mic-in
⑩	Line-out
⑪	2 x Type-A USB 2.0 ports
⑫	Wireless antenna holes
⑬	COM6, 7, 8 (RS-232/485 selectable serial port)
⑭	COM3, 4 (RS-232/422/485 selectable serial port)
⑮	COM5 (RS-232/485 selectable serial port)

### 2.3. Driver Installation Note

The computer supports the operating systems Windows 8.1 and Windows 10. Find the necessary device drivers on the CD that comes with your purchase. Always follow the sequence below to install all drivers to prevent errors:

Chipset → Serial I/O → Audio → Ethernet → Graphics → ME → RAID

#### Windows 8.1

Device	Driver Path
Chipset	\\Chipset_INF\Chipset_10.1.1.14_Public\SetupChipset.exe
Serial I/O	\\Serial IO\Setup_x64.exe
Audio	\\Audio\64bit\0006-64bit_Win7_Win8_Win81_Win10_R279.exe
Ethernet	\\Ethernet\Win8.1\PROWin64.exe
Graphics	\\Graphic\64bit\win64_154025.4463.exe
ME	\\ME_11.0_Corporate_11.0.0.1177\SetupME.exe
RAID	\\Intel Rapid Storage Technology Driver (for RAID)\Intel Rapid Storage Technology Driver 14.8.0.1042\SetupRST.exe

#### Windows 10

Device	Driver Path
Chipset	\\Chipset_INF\Chipset_10.1.1.14_Public\SetupChipset.exe
Serial I/O	\\Serial IO\Setup_x64.exe
Audio	\\Audio\64bit\0006-64bit_Win7_Win8_Win81_Win10_R279.exe
Ethernet	\\Ethernet\Win10\PROWin64.exe
Graphics	\\Graphic\64bit\win64_154025.4463.exe
ME	\\ME_11.0_Corporate_11.0.0.1177\SetupME.exe
RAID	\\Intel Rapid Storage Technology Driver (for RAID)\Intel Rapid Storage Technology Driver 14.8.0.1042\SetupRST.exe



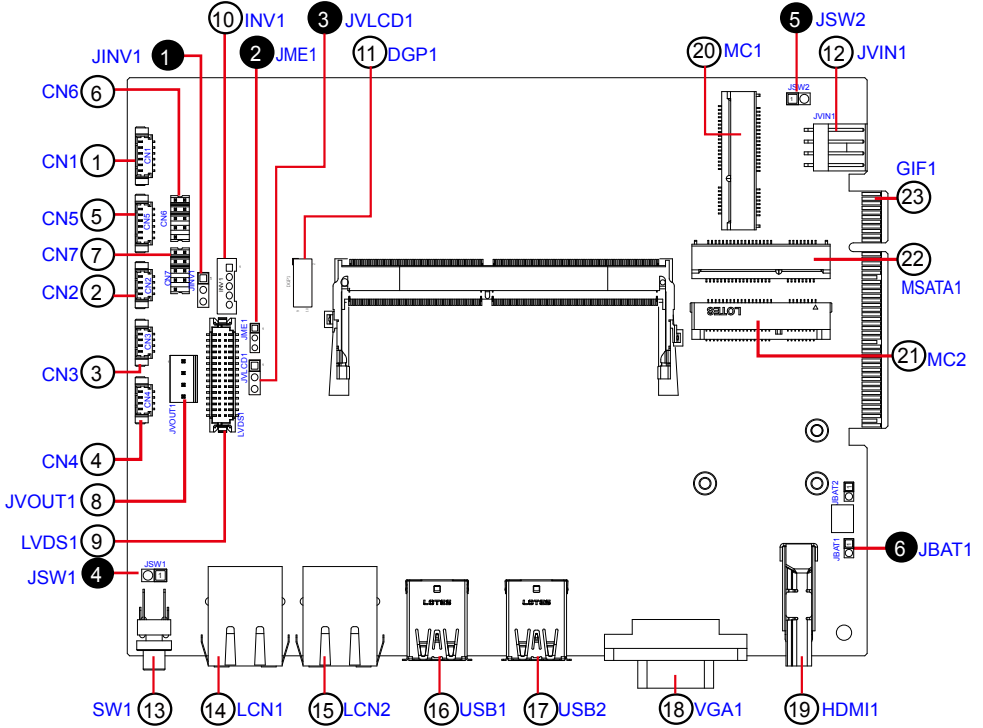
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# Chapter 3

## Engine of the Computer

### 3.1. Board Layout

Main Board (FMB-i89U1)



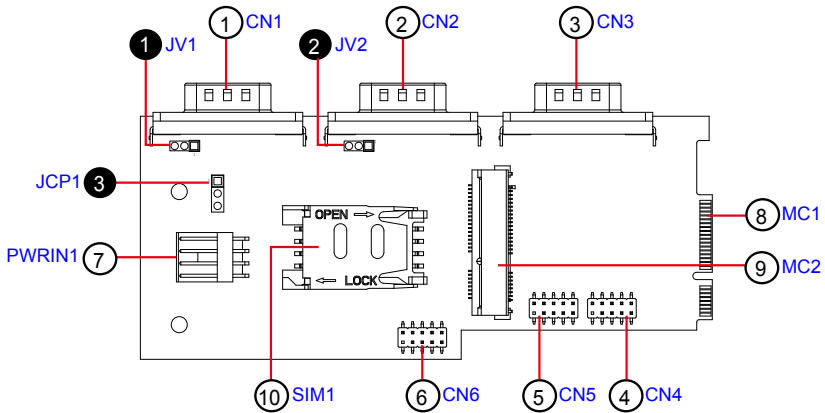
## Jumpers

Label	Description
① JINV1	LVDS Inverter Voltage Select Jumper
② JME1	ME FLASH Select Jumper
③ JVLCD1	LVDS VDD Voltage Select Jumper
④ JSW1	Power Button
⑤ JSW2	Reset Button
⑥ JBAT1	CMOS Settings

## Connectors

Label	Description
① CN1	Audio Connector
② ③ ④ CN2, 3, 4	USB 2.0 Connector
⑤ CN5	PS2 Connector
⑥ ⑦ CN6, 7	COM1, 2 (RS-232/422/485 Selectable)
⑧ JVOUT1	Power Output
⑨ LVDS1	LVDS Connector
⑩ INV1	LVDS BL Connector
⑪ DGP1	Debug Port
⑫ JVIN1	Power Input
⑬ SW1	Power Button
⑭ ⑮ LCN1, 2	RJ-45 Ethernet Connectors
⑯ ⑰ USB1, 2	USB 3.0/2.0 Connectors
⑱ VGA1	VGA Connector
⑲ HDMI1	HDMI Connector
⑳ ㉑ MC1, 2	PCI Express Mini-card Full/Half Size Socket
㉒ MSATA1	mSATA Socket
㉓ GIF1	PCIe Gold Finger Connector

Daughter Board - SCDB-1314



Jumpers

Label	Description
①②JV1, 2	RI/5V/12V (Pin 9) Selection For Com Port
③JCP1	COM Port Power Selection

Connectors

Label	Description
①②CN1, 2	COM3, 4 (RS-232/422/485 Selectable Serial Port)
③CN3	COM5 (RS232/RS485 Selectable Serial Port)
④⑤⑥CN4, 5, 6	COM6, 7, 8 (RS232/RS485 Selectable Pin Header)
⑦PWRIN1	DC Power Input
⑧MC1	Mini PCIe Golden Finger Connector
⑨MC2	PCI Express Mini-card Full Size Socket
⑩SIM1	HSUPA/LTE SIM Card Socket

## 3.2. Jumpers and Connectors

### 3.2.1. Main Board - FMB-i89U1

#### 3.2.1.1. Jumpers

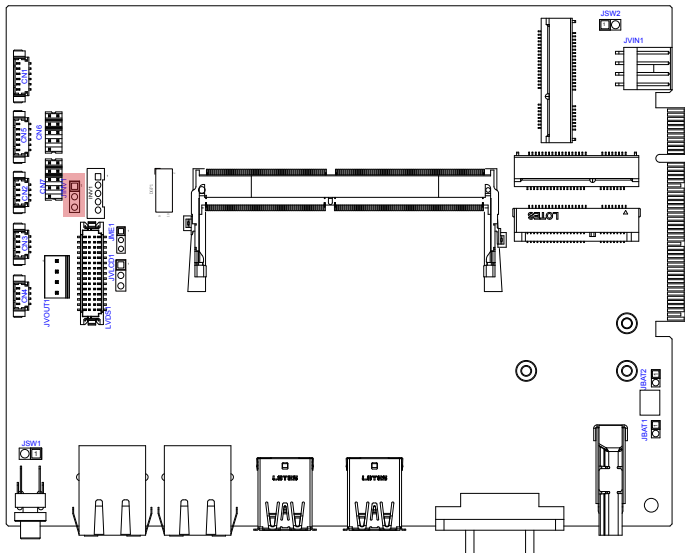
##### ① JINV1

**Function:** Sets LVDS inverter voltage. (This jumper sets the voltage of LVDS connector INV1, which means this jumper decides the pin 1 of the LVDS connector INV1.)

**Jumper Type:** 2.54mm pitch, 1x3-pin header

**Setting:**

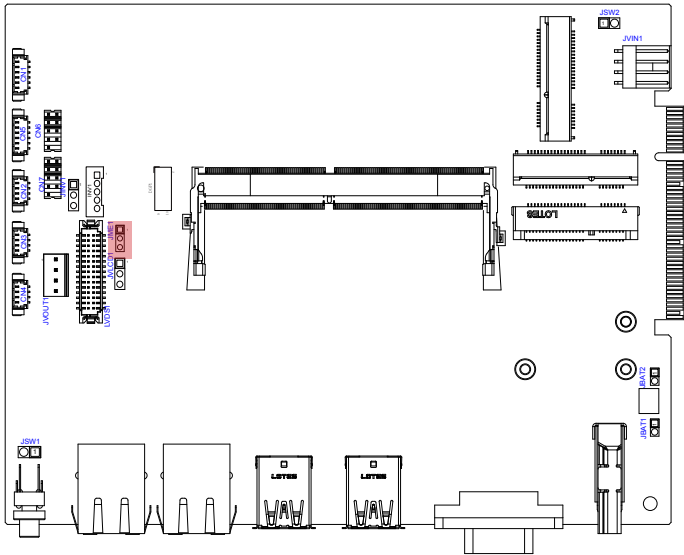
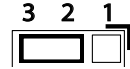
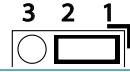
Pin	Description
1-2	+12V (default)
2-3	+5V



## ② JME1

**Function:** ME Flash Select Jumper  
**Jumper Type:** 2.00mm pitch, 1x3-pin header  
**Setting:**

Pin	Description
1-2	ME Flash disable (Default)
2-3	ME Flash enable



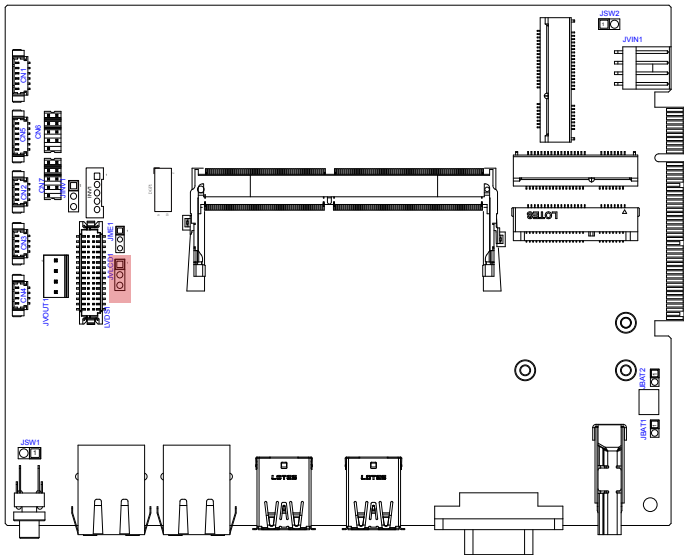
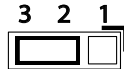
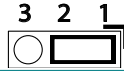
### ③ JVLCD1

**Function:** LVDS VDD Voltage Select Jumper

**Jumper Type:** 2.54mm pitch, 1x3-pin header

**Setting:**

Pin	Description
1-2	+3V (default)
2-3	+5V



### ④ JSW1

**Function:** DC Adapter Power Input  
**Connector Type:** 2.54 mm pitch 1x2-pin header  
**Setting:**

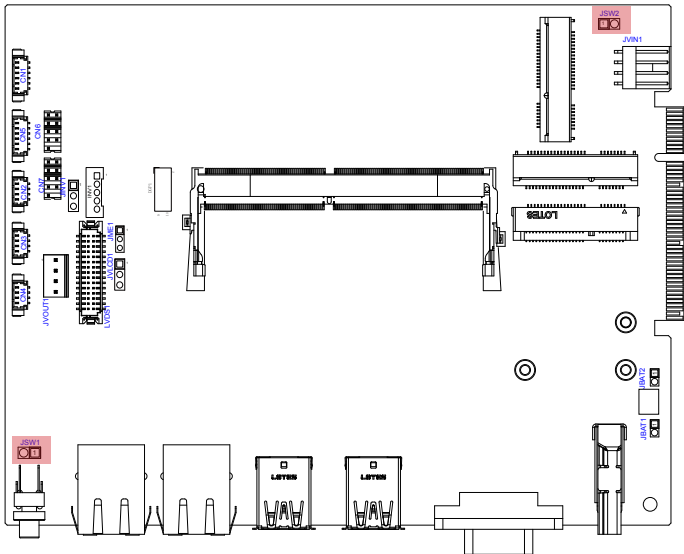
Pin	Desc.
1	PWR_IN_SW#
2	GND



### ⑤ JSW2

**Function:** Reset Button  
**Connector Type:** 2.54 mm pitch 1x2-pin header  
**Setting:**

Pin	Desc.
1	RST_SW#
2	GND

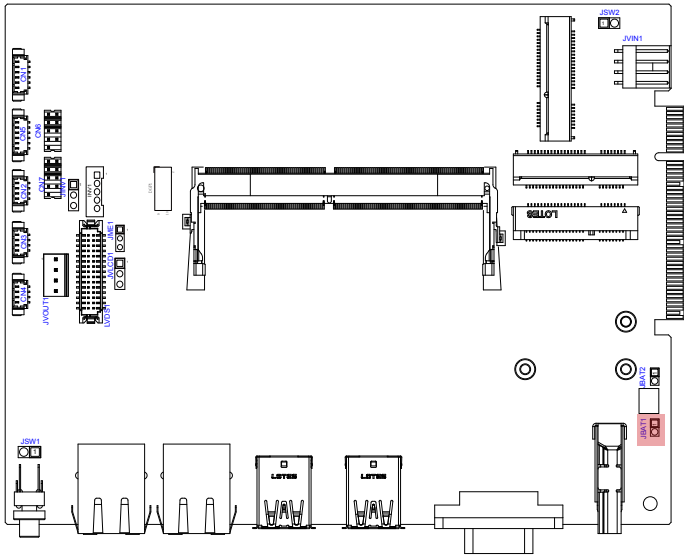




## ⑥ JBAT1

**Function:** Clears/keeps CMOS  
**Jumper Type:** 2.00 mm pitch 1x2-pin header  
**Setting:**

Pin	Description
<b>Short</b> 1 2	Clears CMOS
<b>Open</b> 1 2	Keeps CMOS (default)

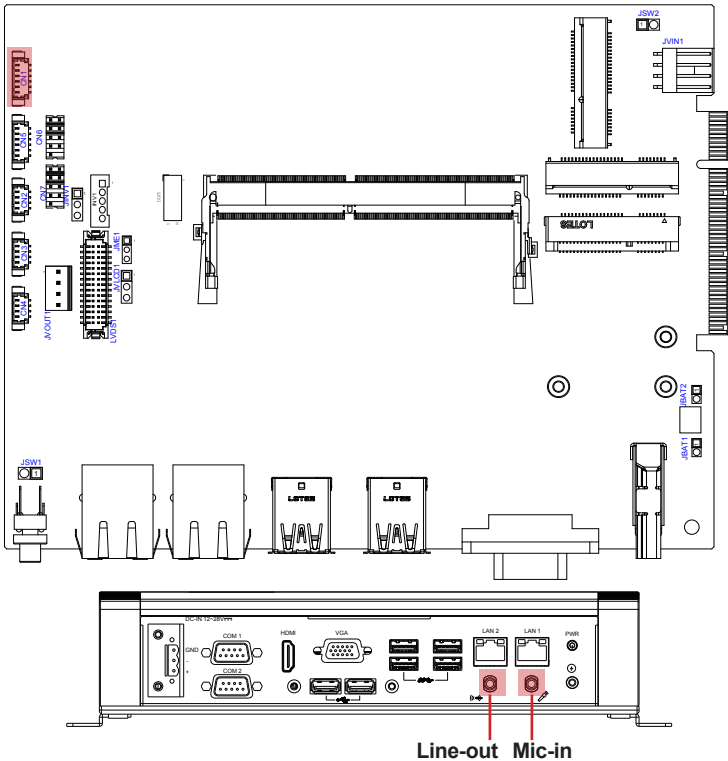
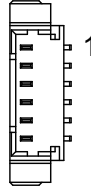


### 3.2.1.2. Connectors

#### ① CN1

**Function:** Audio Connector  
**Connector Type:** 1.25mm pitch 1x6 wire to board connector  
**Pin Assignment:**

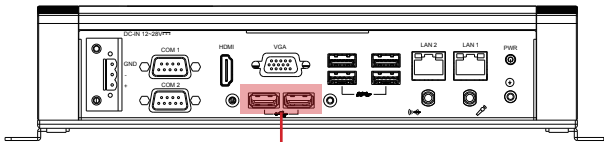
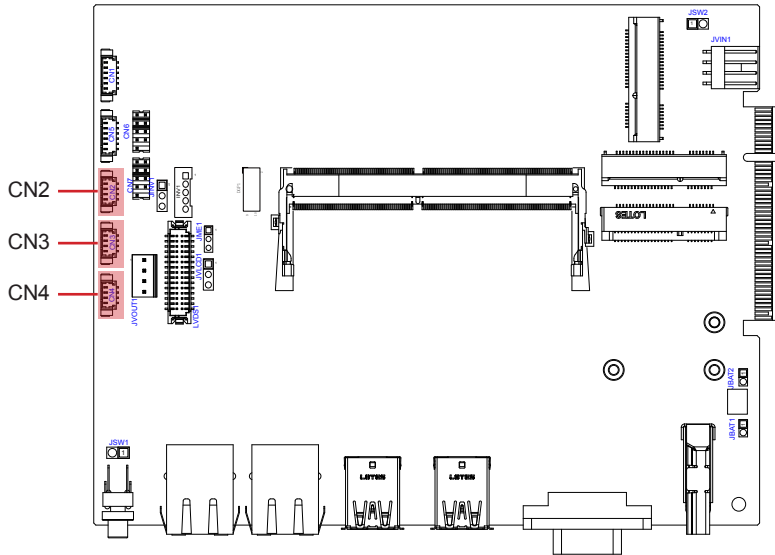
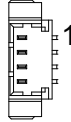
Pin	Desc.
1	MIC_L
2	MIC_R
3	GND
4	GND
5	Line Out_L
6	Line Out_R



②③④ CN2, 3, 4

**Function:** USB 2.0 Connector  
**Connector Type:** 1.25mm pitch 1x4 wire to board connector  
**Pin Assignment:**

Pin	Desc.
1	VCC5
2	DATA-
3	DATA+
4	GND



USB 2.0 (CN2, 3)

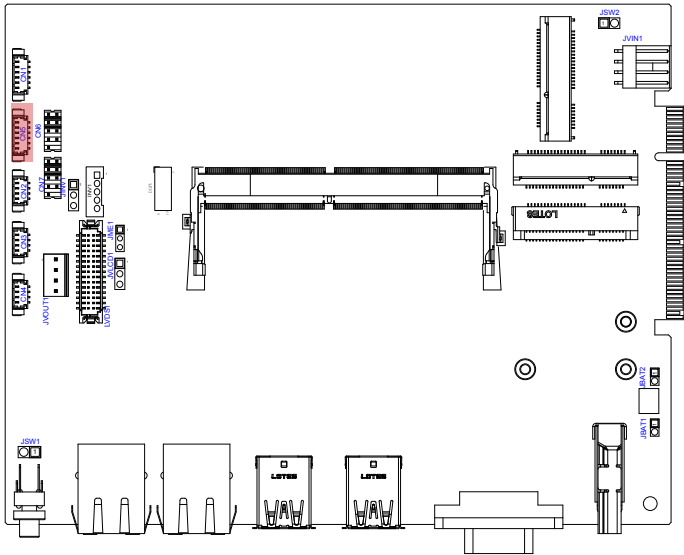
⑤ CN5

**Function:** PS2 Connector

**Connector Type:** 1.25mm pitch 1x6 wire to board connector

**Pin Assignment:**

Pin	Desc.
1	KDATA
2	GND
3	MDATA
4	KCLK
5	VCC5
6	MCLK



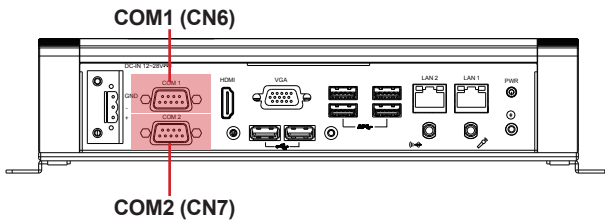
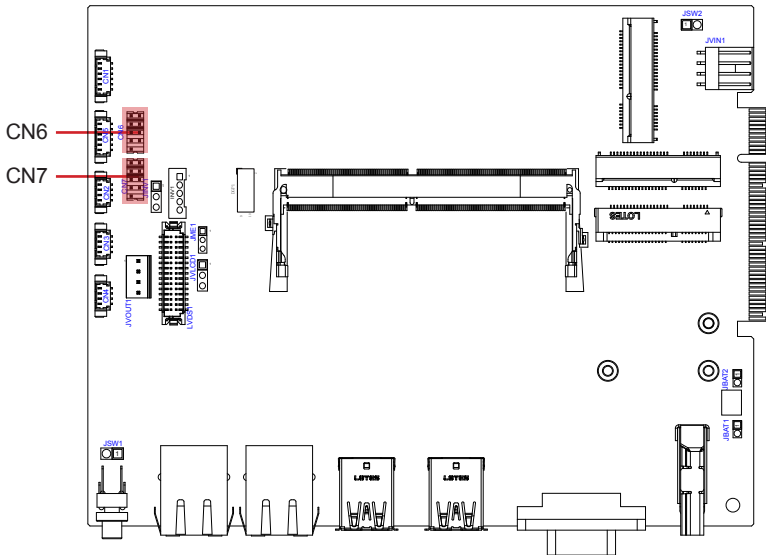
⑥ ⑦ **CN6, CN7 (COM1, COM2)**

**Function:** RS-232/422/485 Selectable pin header

**Connector Type:** 2.0mm pitch 2x5-pin header

**Pin Assignment:**

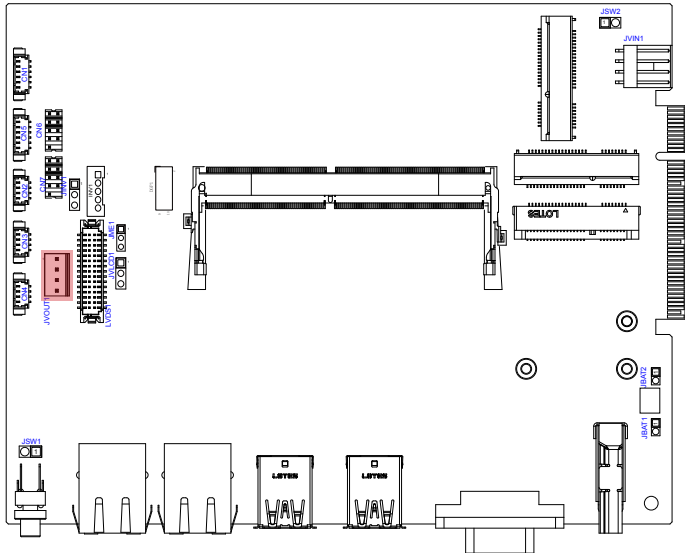
Pin	Desc.	Pin	Desc.
1	DCD RS-485(D-) RS-422(TX-)	2	RXD RS-485(D+) RS-422(TX+)
3	TXD	4	DTR RS-422(RX+)
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	N/C



### ⑧ JVOUT1

**Function:** Power output  
**Connector Type:** 2.54mm pitch 1x4-pin one-wall connector  
**Pin Assignment:**

Pin	Desc.
1	VCC5
2	GND
3	GND
4	VCC12



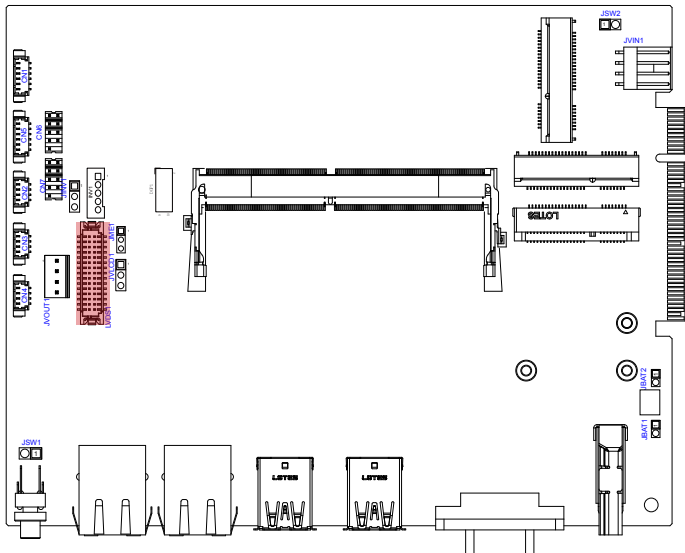
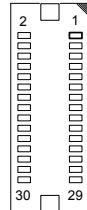
## ⑨ LVDS1

**Function:** LVDS Connector

**Connector Type:** Onboard 30-pin header

**Pin Assignment:**

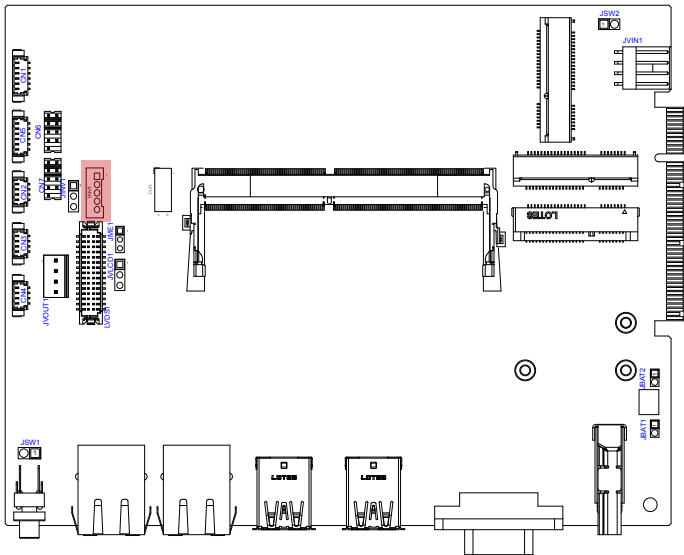
Pin	Desc.	Pin	Desc.
2	VCC_LCD	1	VCC_LCD
4	LVDS_B_CLK+	3	LVDS_A_CLK+
6	LVDS_B_CLK-	5	LVDS_A_CLK-
8	GND	7	GND
10	LVDS_B0+	9	LVDS_A0+
12	LVDS_B0-	11	LVDS_A0-
14	GND	13	GND
16	LVDS_B1+	15	LVDS_A1+
18	LVDS_B1-	17	LVDS_A1-
20	GND	19	GND
22	LVDS_B2+	21	LVDS_A2+
24	LVDS_B2-	23	LVDS_A2-
26	GND	25	GND
28	LVDS_B3+	27	LVDS_A3+
30	LVDS_B3-	29	LVDS_A3-



⑩ INV1

**Function:** LVDS BL Connector  
**Connector Type:** 2.00mm pitch 1x5-pin one-wall connector  
**Pin Assignment:**

Pin	Description
1	VCC_INV
2	GND
3	LVDS_BKLT_EN
4	LVDS_BKLTCTL
5	GND

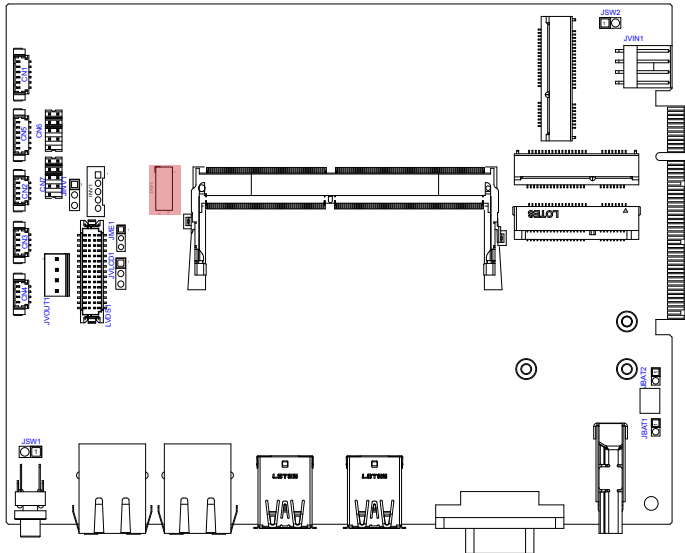
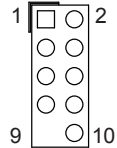




⑪ DGP1

**Function:** Debug port  
**Connector Type:** 2.00mm-pitch 2x5-pin header  
**Pin Assignment:**

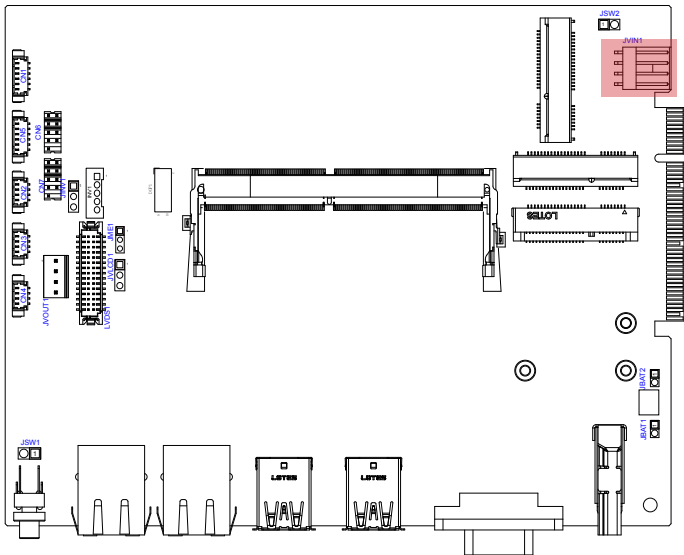
Pin	Description	Pin	Description
1	24MHz Clock	2	GND
3	LPC_FRAME#	4	LPC_LAD0
5	PLTRST#	6	N.C
7	LPC_LAD3	8	LPC_LAD2
9	VCC3	10	LPC_LAD1



⑫ JVIN1

**Function:** Power Input Connector  
**Connector Type:** 2.54mm pitch 1x4-pin wafer connector  
**Pin Assignment:**

Pin	Desc.
1	VCC
2	VCC
3	GND
4	GND



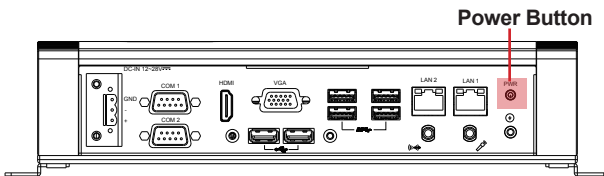
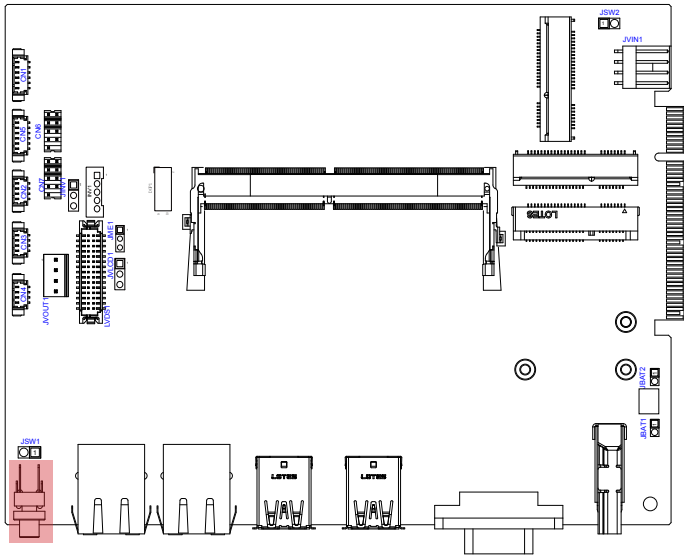
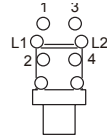
⑬ SW1

**Function** Power Button

**Connector Type:** LED tact switch with green and red colors

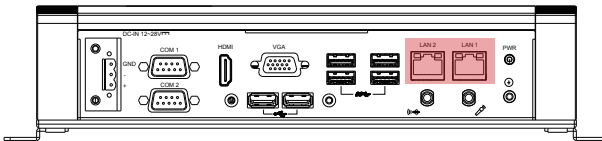
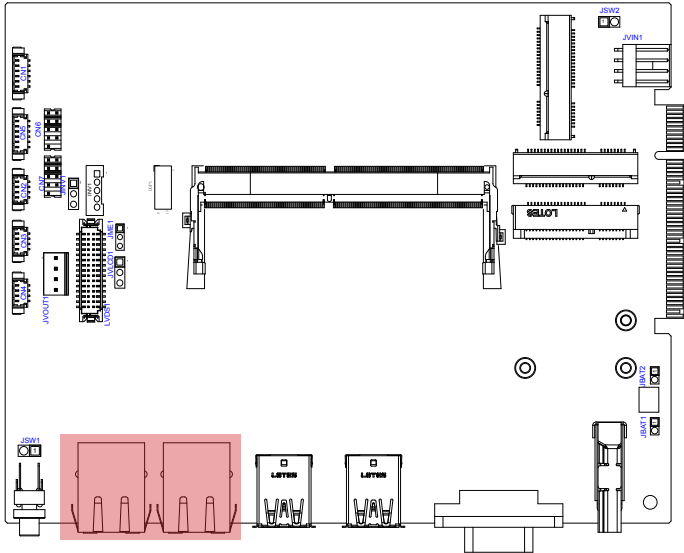
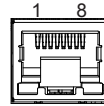
**Pin Assignment:**

Pin	Description	Pin	Description
1	GND	2	N/A
3	BTN	4	N/A
L1	SW1_LED_N	L2	SW1_LED_P



⑭ ⑮ LCN1, 2

**Function:** RJ-45 Ethernet connectors  
**Connector Type:** RJ-45 connector that supports 10/100/1000Mbps fast Ethernet  
**Pin Assignment:** The pin assignments conform to the industry standard.

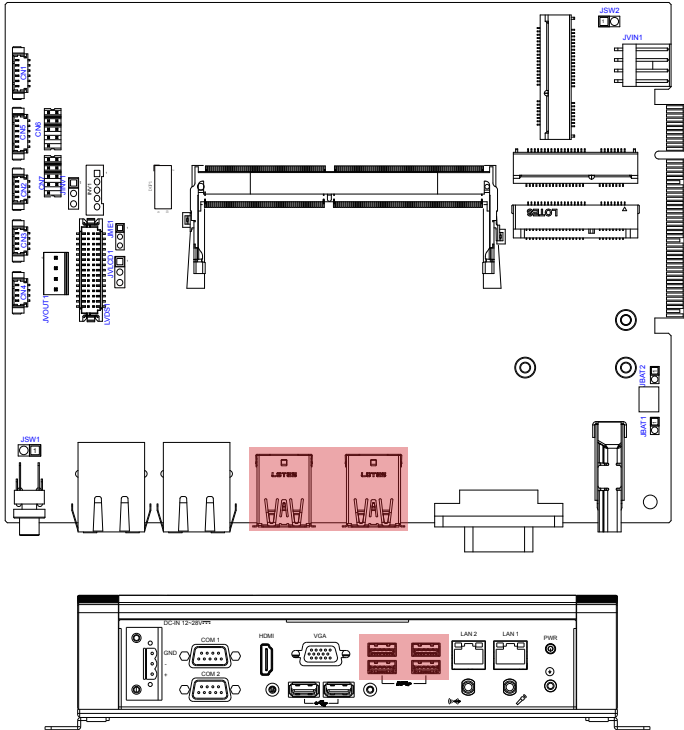


⑩ ⑰ **USB1, 2**

**Function:** USB 3.0/2.0 Connectors

**Connector Type:** Double-stacked Type-A USB connectors

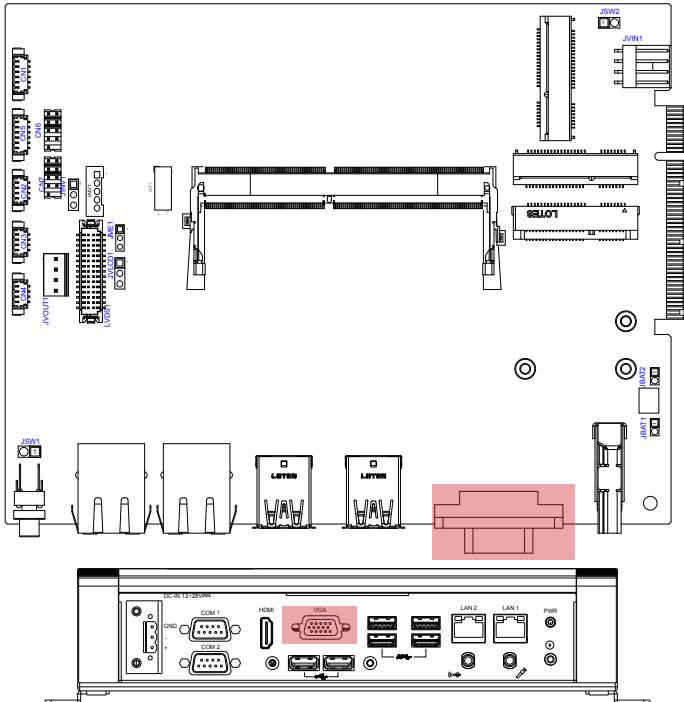
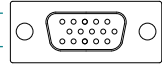
**Pin Assignment:** The pin assignments conform to the industry standard.



⑱ VGA1

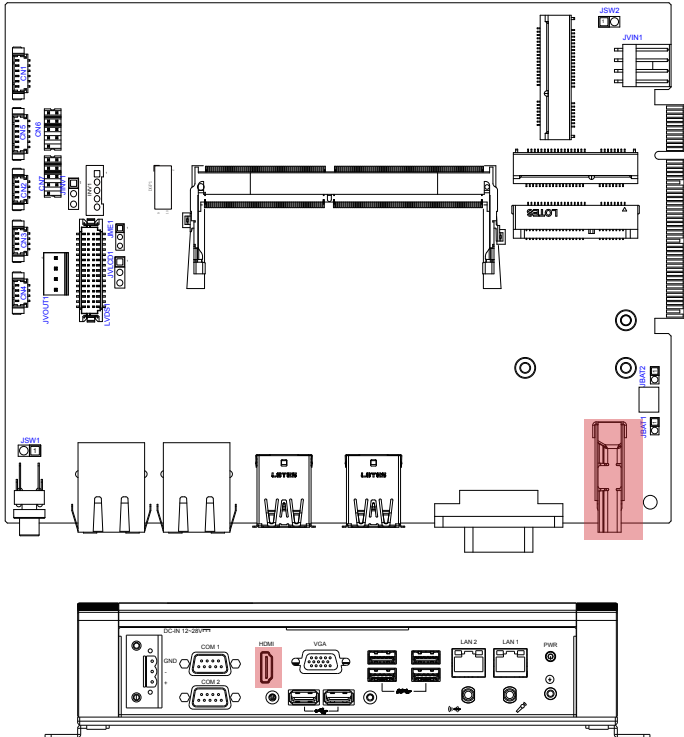
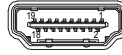
**Function:** VGA Connector  
**Connector Type:** D-Sub 15-pin female connector  
**Pin Assignment:**

Pin	Description	Pin	Description
1	RED	9	5V
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	D-DATA
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	D-DCLK
8	GND		



19 HDMI1

**Function:** HDMI connector  
**Connector Type:** 19-pin HDMI connector with flange  
**Pin Assignment:** The pin assignments conform to the industry standard.

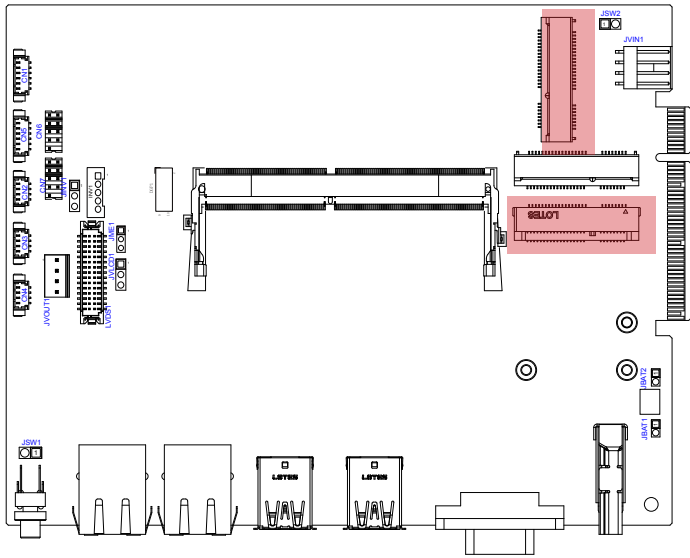
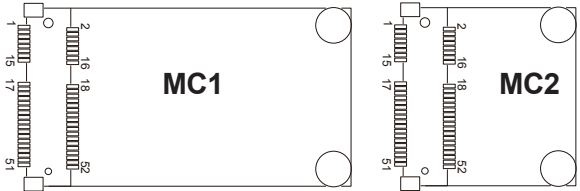


⑩⑪ MC1, 2

**Function:** MC1: PCI Express Mini-card Full Size socket  
MC2: PCI Express Mini-card Half Size socket

**Connector Type:** Onboard 0.8mm pitch 52-pin edge card connector

**Pin Assignment:** The pin assignments conform to the industry standard.



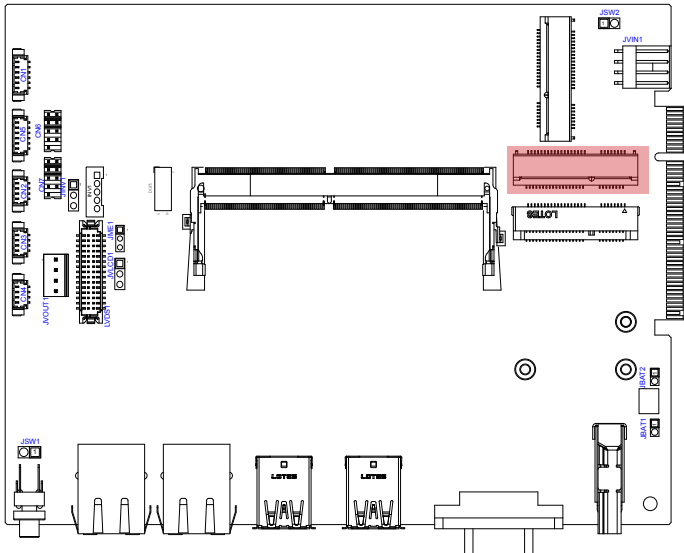
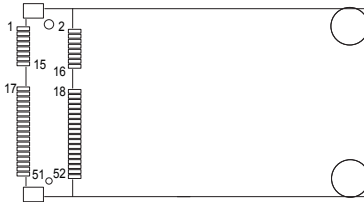


22 MSATA1

**Function:** mSATA socket

**Connector Type:** Onboard 0.8mm pitch 52-pin edge card connector

**Pin Assignment:** The pin assignments conform to the industry standard.



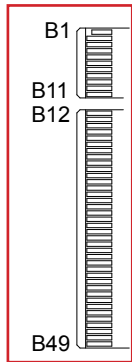
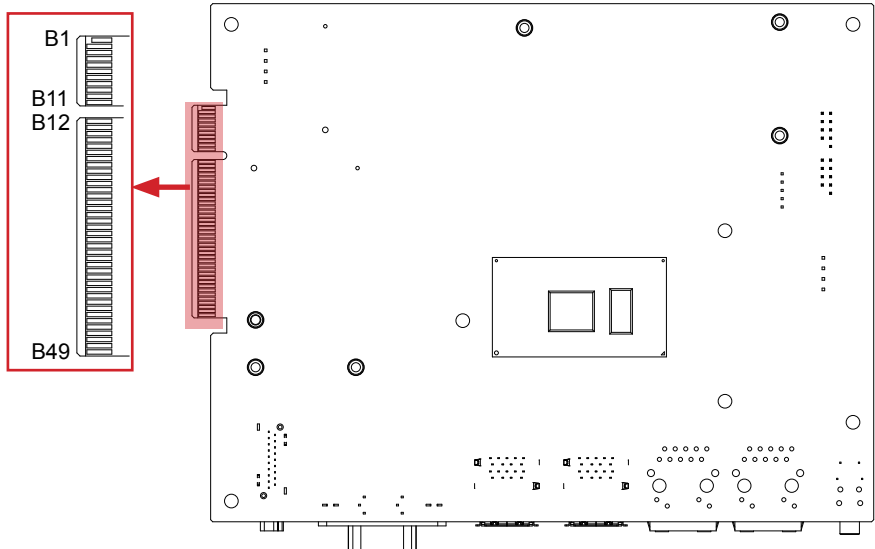
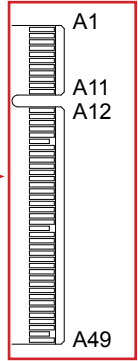
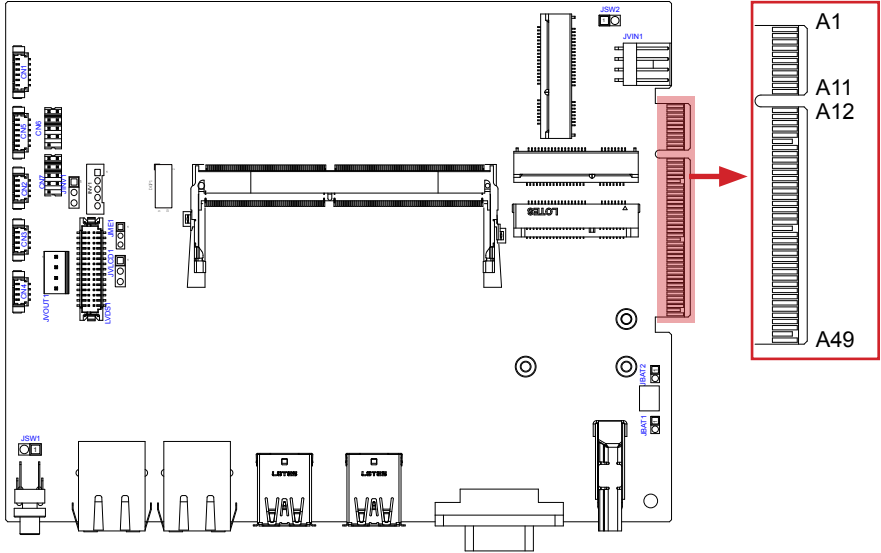
23 **GIF1**

**Function:** PCIe Gold Finger Connector

**Connector Type:** Onboard 49-pin PCI Express edge connector

**Pin Assignment:**

Pin	Desc.	Pin	Desc.	Pin	Desc.	Pin	Desc.
A1	NC	A26	NC	B1	+12VAUX	B26	GND
A2	+12VAUX	A27	GND	B2	+12VAUX	B27	NC
A3	+12VAUX	A28	GND	B3	+12VAUX	B28	NC
A4	GND	A29	NC	B4	GND	B29	GND
A5	LPC_LAD0	A30	NC	B5	SMBCLK_PCIE	B30	NC
A6	LPC_LAD1	A31	GND	B6	SMBDATA_PCIE	B31	NC
A7	LPC_LAD2	A32	NC	B7	GND	B32	GND
A8	LPC_LAD3	A33	NC	B8	NC	B33	NC
A9	NC	A34	GND	B9	LPC_FRAME#	B34	NC
A10	NC	A35	NC	B10	NC	B35	GND
A11	BUF_PLTRST#	A36	NC	B11	PCIE_WAKE#	B36	GND
A12	GND	A37	GND	B12	LPC_SERIRQ	B37	SATA0_TX+
A13	NC	A38	GND	B13	GND	B38	SATA0_TX-
A14	NC	A39	SATA1_TX+	B14	NC	B39	GND
A15	GND	A40	SATA1_TX-	B15	NC	B40	GND
A16	NC	A41	GND	B16	GND	B41	SATA0_RX+
A17	NC	A42	GND	B17	NC	B42	SATA0_RX-
A18	GND	A43	SATA1_RX+	B18	GND	B43	GND
A19	CLK_24M_GF	A44	SATA1_RX-	B19	NC	B44	GND
A20	GND	A45	GND	B20	NC	B45	USB2_1+
A21	NC	A46	GND	B21	GND	B46	USB2_1-
A22	NC	A47	NC	B22	GND	B47	GND
A23	GND	A48	NC	B23	NC	B48	PS_ON#
A24	GND	A49	GND	B24	NC	B49	GND
A25	NC			B25	GND		



### 3.2.2. Daughter Board - SCDB-1314

#### 3.2.2.1. Jumpers

##### ①② JV1, 2

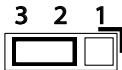
**Function:** RI/5V/12V (Pin 9) Selection for COM Port

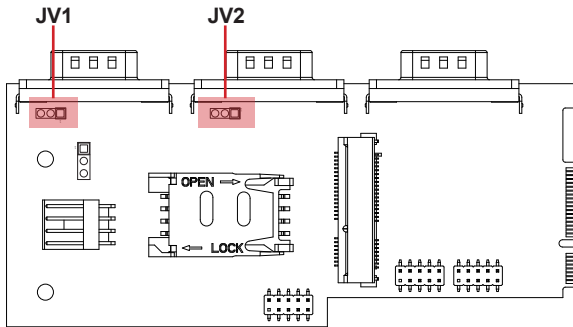
**Jumper Type:** 2.00mm pitch, 1x3-pin header

**Setting:**

Pin	Description
-----	-------------

1-2	RI (default)	
-----	--------------	---

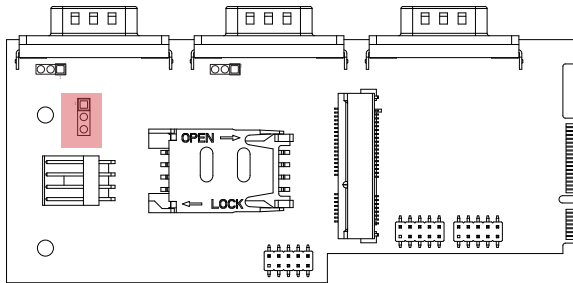
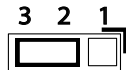
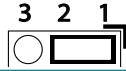
2-3	5V or 12V (depends on JCP1)	
-----	-----------------------------	---



### ③ JCP1

**Function:** COM Port Power Selection  
**Jumper Type:** 2.54mm pitch, 1x3-pin header  
**Setting:**

Pin	Description
1-2	+5V (default)
2-3	+12V



### 3.2.2.2. Connectors

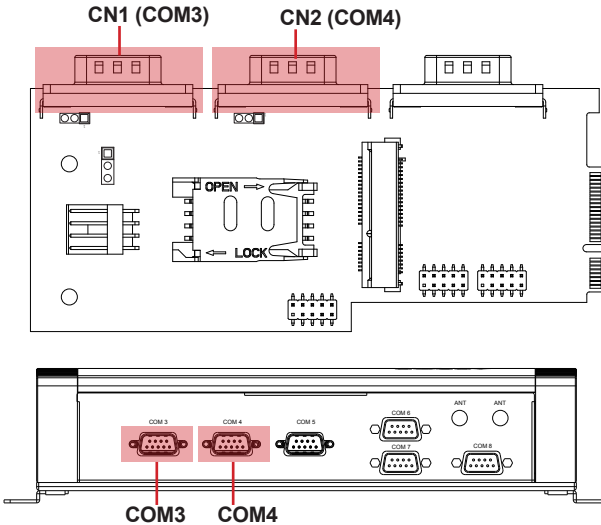
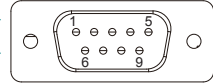
#### ① ② CN1, 2 (COM3, 4)

**Function:** RS-232/422/485 Selectable Serial Port

**Connector Type:** External 9-pin D-sub male connector

**Pin Assignment:**

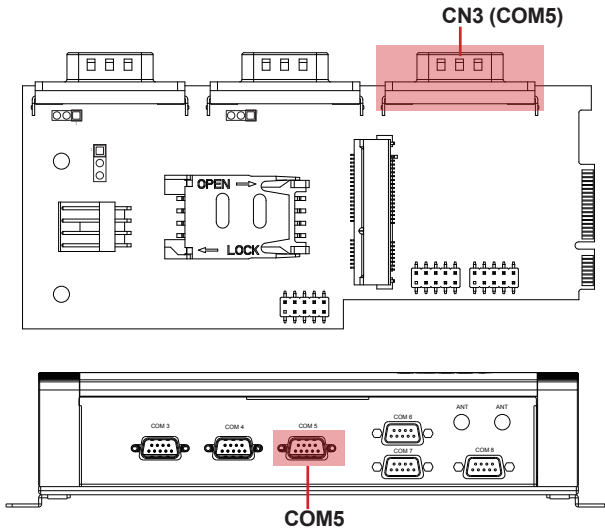
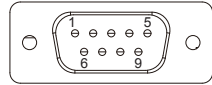
	Pin	Desc.	Pin	Desc
<b>RS232</b>	1	DCD	6	DSR
	2	RXD	7	RTS
	3	TXD	8	CTS
	4	DTR	9	RI
	5	GND		
<b>Pin Description</b>				
<b>RS422</b>	1	COM_422 TX-		
	2	COM_422 TX+		
	3	COM_422 RX+		
	4	COM_422 RX-		
	5	GND		
<b>Pin Description</b>				
<b>RS485</b>	1	COM_485 D-		
	2	COM_485 D+		
	5	GND		



### ③ CN3 (COM5)

**Function:** RS-232/485 Selectable Serial Port  
**Connector Type:** External 9-pin D-sub male connector  
**Pin Assignment:**

	Pin	Desc.	Pin	Desc
RS232	1	DCD	6	DSR
	2	RXD	7	RTS
	3	TXD	8	CTS
	4	DTR	9	RI
	5	GND		
<b>Pin Description</b>				
RS485	1	COM_485 D-		
	2	COM_485 D+		
	5	GND		



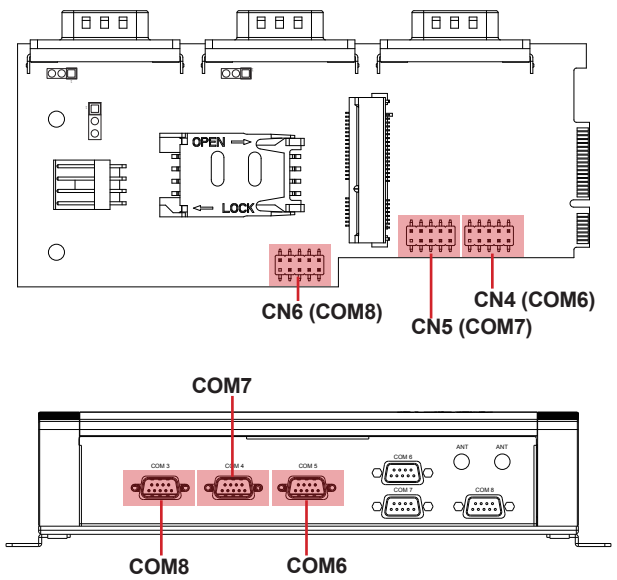
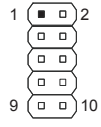
④ ⑤ ⑥ CN4, 5, 6 (COM6, 7, 8)

**Function:** RS-232/485 Selectable Serial Port

**Connector Type:** 2.00mm-pitch 2x5-pin header

**Pin Assignment:**

	Pin	Desc.	Pin	Desc.
<b>RS232</b>	1	DCD	6	DSR
	2	RXD	7	RTS
	3	TXD	8	CTS
	4	DTR	9	RI
	5	GND		
<b>Pin Description</b>				
<b>RS485</b>	1	COM_485 D-		
	2	COM_485 D+		
	5	GND		

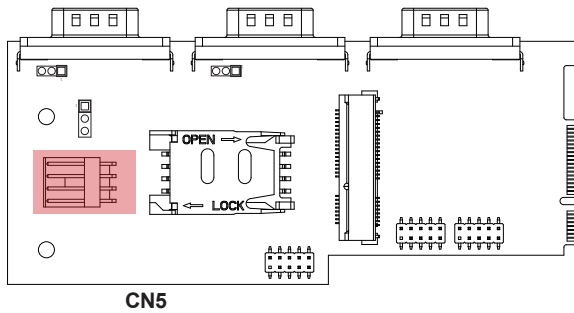
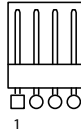




⑦ PWRIN1

**Function:** Power Input Connector  
**Connector Type:** 2.54mm pitch 1x4-pin wafer connector  
**Pin Assignment:**

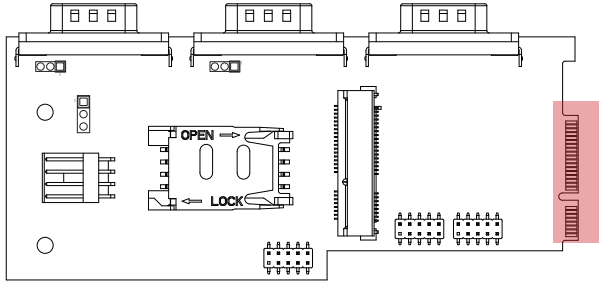
Pin	Desc.
1	VCC5
2	GND
3	GND
4	+12V



⑧ MC1

**Function:** Mini PCIe Golden Finger Connector  
**Connector Type:** Onboard 52-pin mini PCI Express edge connector  
**Pin Assignment:**

Pin	Desc.	Pin	Desc.
1	3.3AUX	27	GND
2	3.3AUX	28	+1.5VS
3	LPC_FRAME#	29	GND
4	GND	30	SMB_CLK_MAIN
5	LPC_SERIRQ	31	PCIE_TXN0
6	+1.5VS	32	SMB_DATA_MAIN
7	3.3AUX	33	PCIE_TXP0
8	NC	34	GND
9	GND	35	GND
10	NC	36	USBN3
11	PCIE_CLKN0	37	GND
12	NC	38	USBP3
13	PCIE_CLKP0	39	3.3AUX
14	NC	40	GND
15	GND	41	3.3AUX
16	NC	42	NC
17	NC	43	GND
18	GND	44	NC
19	LPC_CLK_0	45	LPC_AD3
20	NC	46	NC
21	GND	47	LPC_AD2
22	BUF_PLT_RST#	48	+1.5VS
23	PCIE_RXN0	49	LPC_AD1
24	3.3AUX	50	GND
25	PCIE_RXP0	51	LPC_AD0
26	GND	52	3.3AUX

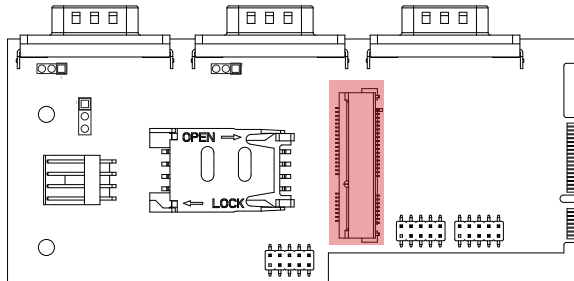
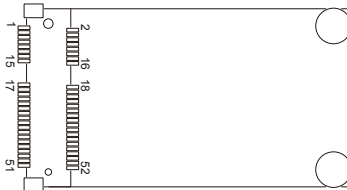


## ⑨ MC2

**Function:** PCI Express Mini-card Full Size Socket

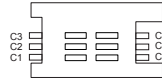
**Connector Type:** Onboard 52-pin mini PCI Express edge connector

**Pin Assignment:** The pin assignments conform to the industry standard.



⑩ SIM1

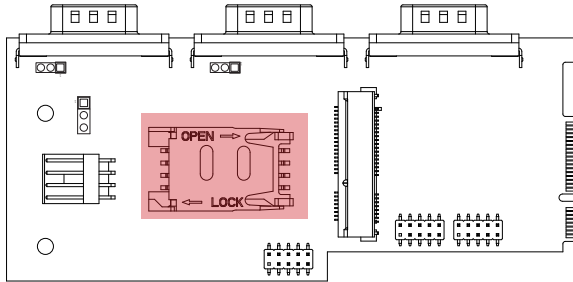
**Function:** SIM card socket  
**Connector Type:** HSUPA/LTE SIM card socket



**Pin Assignment:**

Pin	Description	Pin	Description
1	VCC	2	RST
3	CLK	5	GND
6	VPP	7	I/O

**Boar**



---

# Chapter 4

## Installation & Maintenance

## 4.1. Access the Inside of the Computer

To use onboard jumpers/connectors or to install/remove internal components, you will need to open the computer to access the inside of the computer. Follow through the guide below to disassembly the computer.

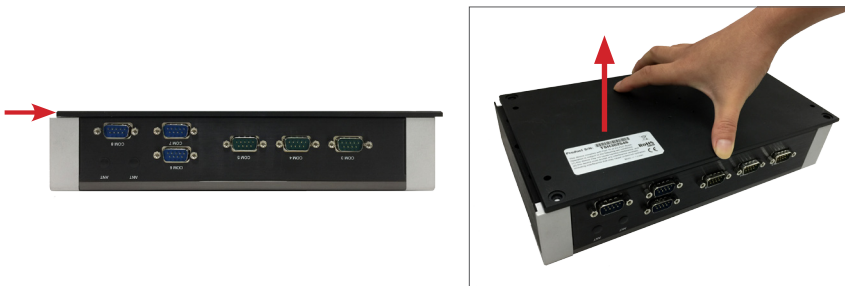
### 4.1.1. Disassembly the Computer

1. Position the computer with the bottom side facing up and remove the 4 rubber pads on the bottom cover as shown below. Then remove the four screws securing the bottom cover.

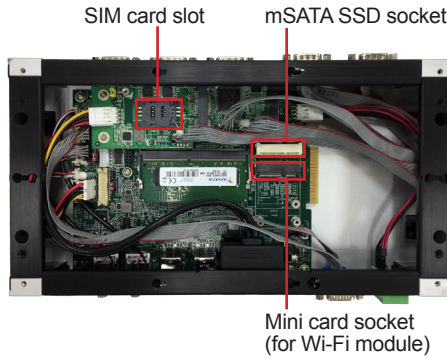


2. Position the computer with the rear panel (with 6 COM ports) towards you and slide the bottom cover to the right a little bit about 3~4mm. Then lift the bottom cover.

If you cannot lift the cover, move the cover to the right or left a little bit to try again.

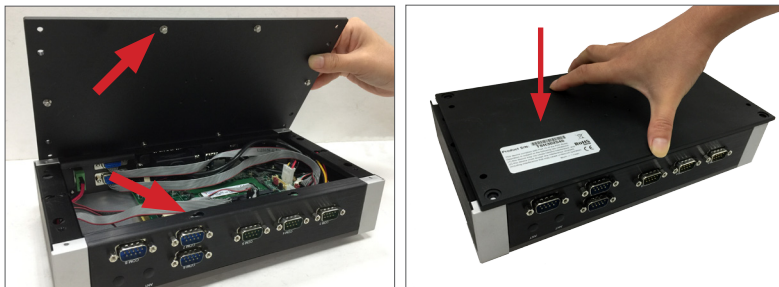


3. Then you are ready to access the components of the computer.



#### 4.1.2. Reassemble the Computer

1. After you make required jumper settings and connections, restore the bottom cover. Make sure you align the 4 screws with the 4 holes on the assembly to place back the cover.



2. Slide the bottom cover to its original position.





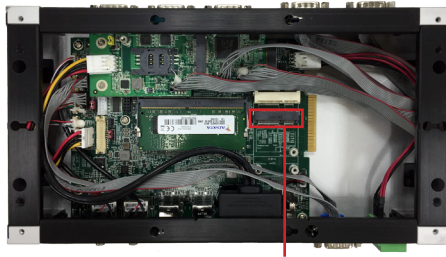


## 4.2. Install Hardware

### 4.2.1. Install Wi-Fi Module

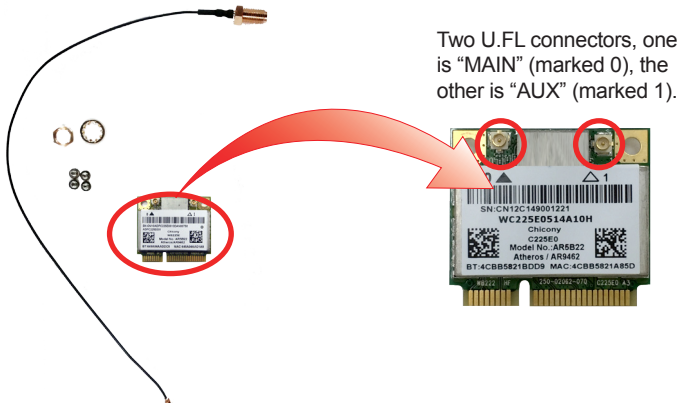
The computer comes with one Mini-card socket to load the computer with a wireless module of PCI Express Mini-card form factor. This section will guide you to install the Wi-Fi module.

1. Locate the **PCI Express Mini-card** socket for wireless module.



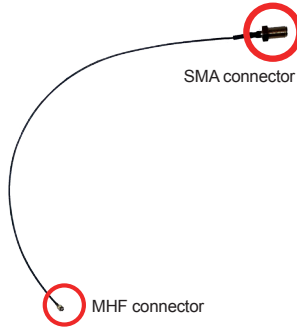
Mini card socket  
(for Wi-Fi module)

2. Prepare the Wi-Fi module kit. The module is a half-size module of **PCI Express Mini-card** form factor, with two U.FL connectors, one is “MAIN” (marked 0), and the other is “AUX”.

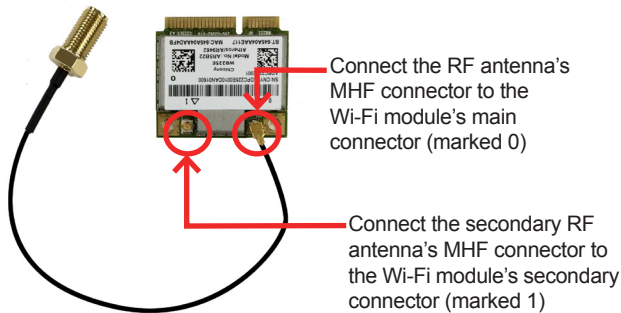


Two U.FL connectors, one is “MAIN” (marked 0), the other is “AUX” (marked 1).

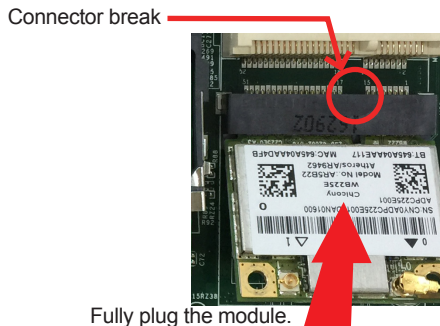
3. Have the RF antenna. The antenna has an SMA connector on one end and an MHF connector on the other.



4. Connect the RF antenna's MHF connector to the Wi-Fi module's main connector marked 0. If you are going to connect a secondary antenna, connect it to the connector marked 1.



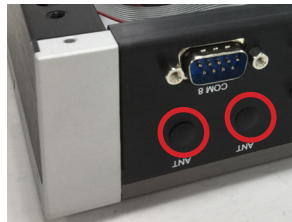
5. Plug the Wi-Fi module to the socket's connector by a slanted angle. Fully plug the module, and note the notch on the wireless module should meet the break of the connector.



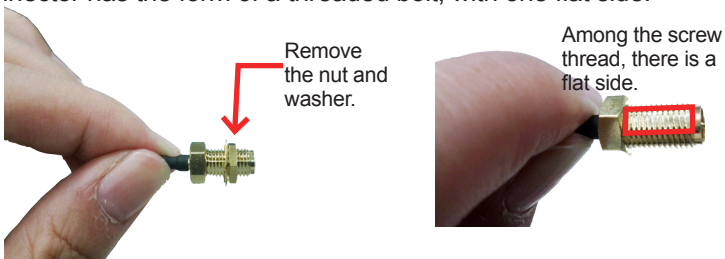
6. Press the module down and fix the module in place using a screw.



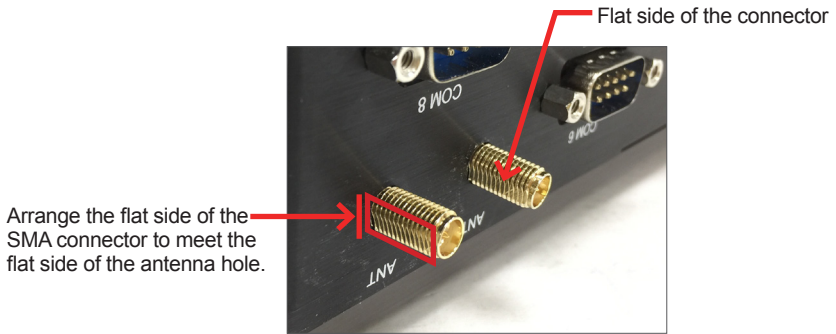
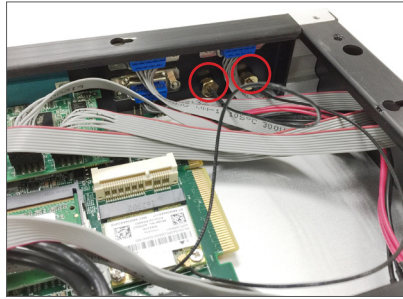
7. Remove the plastic plug(s) from the computer's top panel side to make antenna hole(s). Keep the plastic plug for any possible restoration in the future.



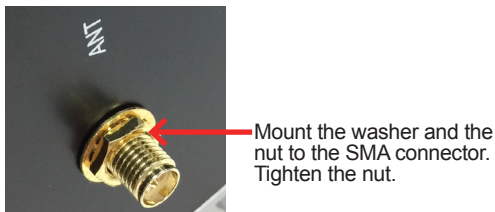
8. From the other end of the RF antenna, which is an SMA connector, remove the washer and the nut. Save the washer and nut for later use. Note the SMA connector has the form of a threaded bolt, with one flat side.



9. Pull the SMA connector through the above mentioned antenna hole. Note to meet the aforesaid flattened side with the antenna hole's flat side.



10. Mount the washer first and then the nut to the SMA connector. Make sure the nut is tightened.



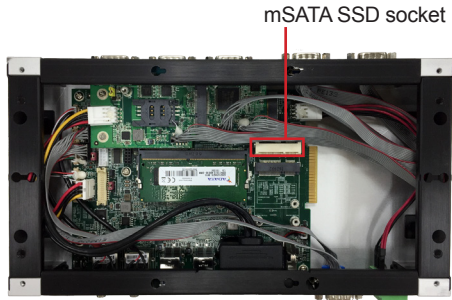
11. Have the external antenna(s). Screw and tightly fasten the antenna(s) to the SMA connector.



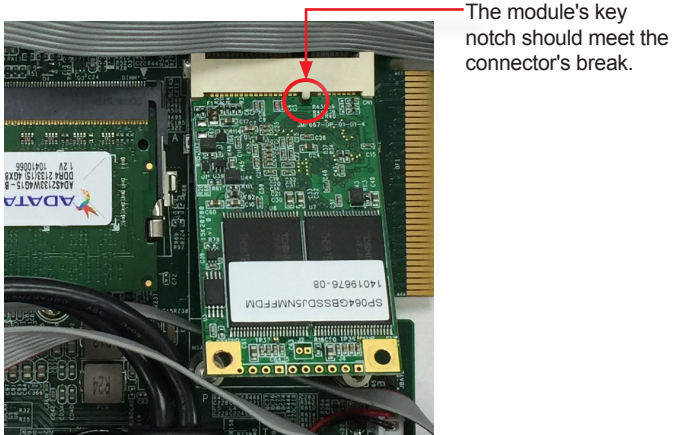
### 4.2.2. Install mSATA Module

To install an mSATA storage module to the computer:

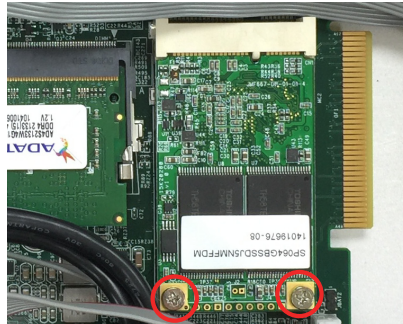
1. Locate the socket for mSATA module.



2. Confront the mSATA module's edge connector with the socket's connector. Align the module's key notch the connector's break.



3. Fully plug the module until it cannot be plugged any more. Press the module down and fix the module in place using two screws.

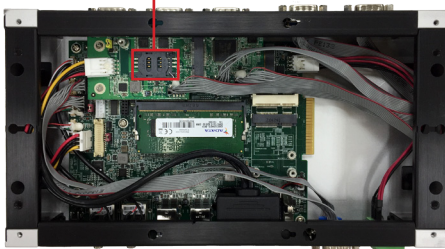


#### 4.2.3. Install SIM Card

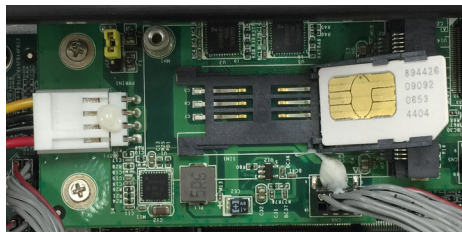
To install a SIM card to the computer:

1. Locate the SIM card slot and slide the SIM card cover to open it.

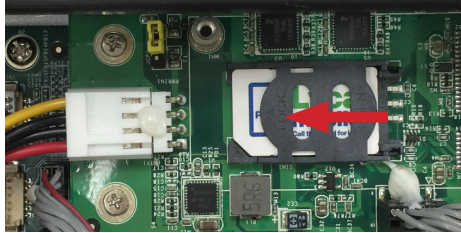
SIM card slot



2. Insert the SIM card as shown below.



3. Close the SIM card cover and slide it to the lock position.



### 4.3. Grounding the Box PC

Follow the instructions below to ground the box PC onto land. Be sure of following any grounding requirements in your place.



**Warning** Whenever installing the unit, the ground connection must always be made first of all and disconnected lastly.

---



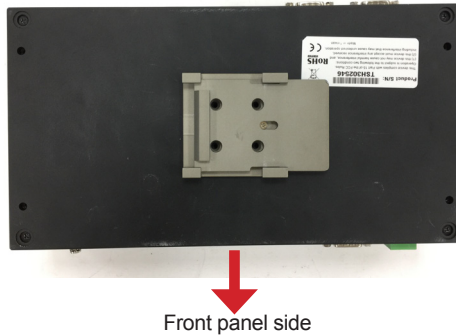
1. As the figure illustrates above, remove the ground screw located on the front panel.
2. Attach the ground wire to the rear panel with the screw.

### 4.4. DIN Rail Mounting (optional)

Prepare the DIN rail kit and a screwdriver for DIN rail mounting. Follow the instructions below:

1. Position the computer with the bottom side facing up and orient the DIN rail bracket as show below.





2. Using the 4 screws included in the DIN rail kit, fasten the DIN rail bracket to the computer's bottom cover.



3. Mount the computer to the DIN rail. Make sure the DIN rail spring is hooked over the top of the DIN rail.

#### 4.5. Wall Mounting (optional)

Prepare the wall mount kit and a screwdriver for wall mounting. Follow the instructions below:

1. Position the computer with the bottom side facing up and remove the 4 rubber pads on the bottom cover as shown below. Then remove the four screws securing the bottom cover.



2. Align the screw holes of the wall mount bracket with the ones of the main unit. Using the 2 screws included in the wall mount kit, fasten the wall mount bracket to the computer's bottom cover.



3. Repeat the step above to secure another wall mount bracket.



4. When the bracket is attached, the computer can be hung on the wall as the way you want.

---

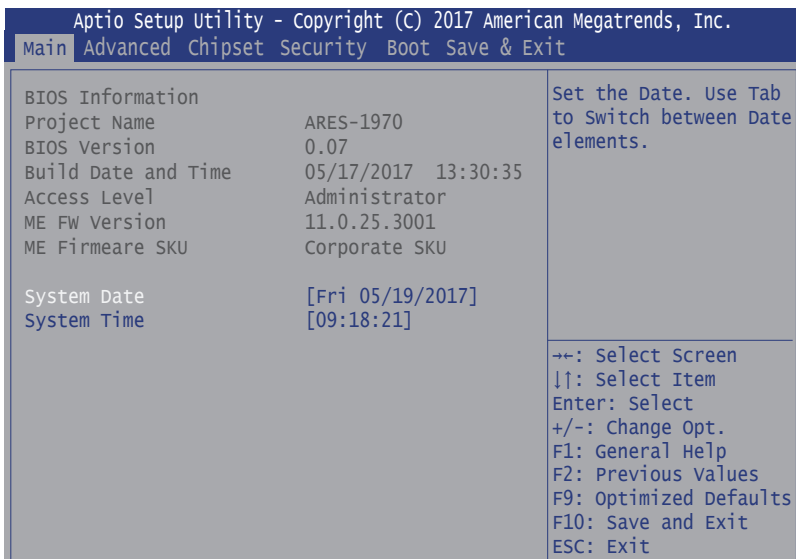
# Chapter 5

## BIOS

## BIOS

The BIOS Setup utility is featured by American Megatrends Inc to configure the system settings stored in the system's BIOS ROM. The BIOS is activated once the computer powers on. When the computer is off, the battery on the main board supplies power to BIOS RAM.

To enter the BIOS Setup utility, keep hitting the "Delete" key upon powering on the computer.



Menu	Description
Main	See <a href="#">5.1. Main</a> on page <a href="#">64</a>
Advanced	See <a href="#">5.2. Advanced</a> on page <a href="#">65</a>
Chipset	See <a href="#">5.3. Chipset</a> on page <a href="#">79</a>
Boot	See <a href="#">5.4 Security</a> on page <a href="#">84</a>
Security	See <a href="#">5.5. Boot</a> on page <a href="#">85</a>
Save & Exit	See <a href="#">5.6. Save &amp; Exit</a> on page <a href="#">86</a>

## Key Commands

The BIOS Setup utility relies on a keyboard to receive user's instructions. Hit the following keys to navigate within the utility and use the utility.

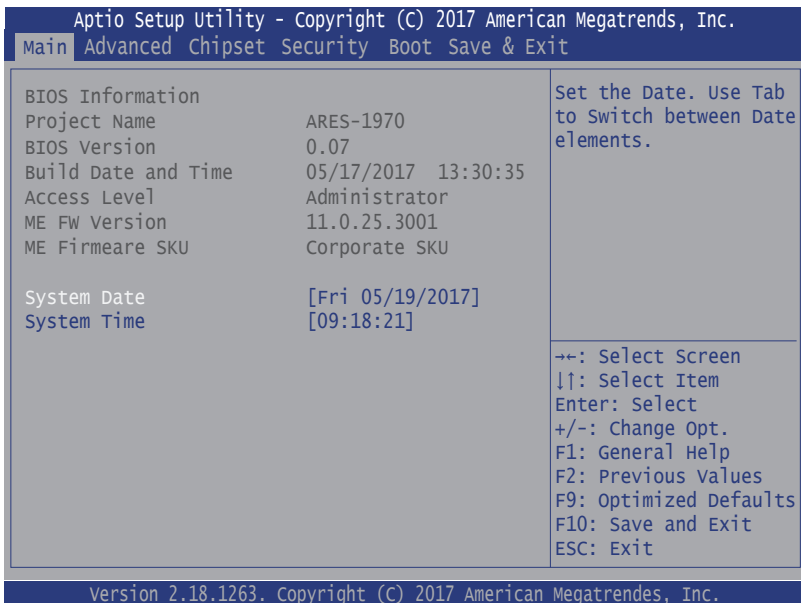
Keystroke	Function
← →	Moves left/right between the top menus.
↓ ↑	Moves up/down between highlight items.
<b>Enter</b>	Selects an highlighted item/field.
<b>Esc</b>	<ul style="list-style-type: none"> <li>▶ On the top menus: Use <b>Esc</b> to quit the utility without saving changes to CMOS. (The screen will prompt a message asking you to select <b>OK</b> or <b>Cancel</b> to exit discarding changes.</li> <li>▶ On the submenus: Use <b>Esc</b> to quit current screen and return to the top menu.</li> </ul>
<b>Page Up / +</b>	Increases current value to the next higher value or switches between available options.
<b>Page Down / -</b>	Decreases current value to the next lower value or switches between available options.
<b>F1</b>	Opens the <b>Help</b> of the BIOS Setup utility.
<b>F10</b>	Exits the utility saving the changes that have been made. (The screen then prompts a message asking you to select <b>OK</b> or <b>Cancel</b> to exit saving changes.)

Note: Pay attention to the "WARNING" that shows at the left pane onscreen when making any change to the BIOS settings.

This BIOS Setup utility is updated from time to time to improve system performance and hence the screenshots hereinafter may not fully comply with what you actually have onscreen.

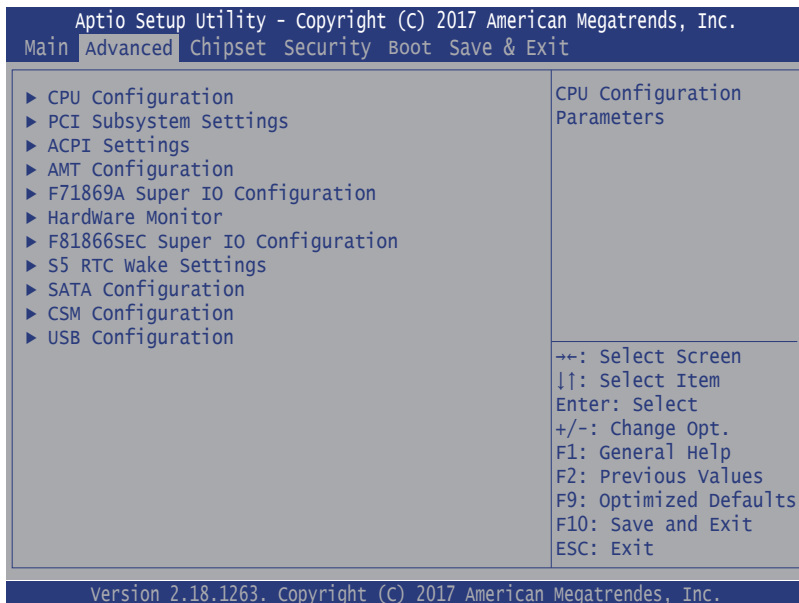
## 5.1. Main

The **Main** menu features the settings of **System Date** and **System Time** and displays some BIOS info.



Setting	Description
<b>Project Name</b>	Delivers the model name of the computer.
<b>BIOS Version</b>	Delivers the computer's BIOS version.
<b>Build Date and Time</b>	Delivers the date and time when the BIOS Setup utility was made/ updated.
<b>Access Level</b>	Delivers the level that the BIOS is being accessed at the moment.
<b>ME FW Version</b>	Delivers the version of the firmware.
<b>ME Firmware SKU</b>	Delivers the name of the firmware SKU.
<b>System Date</b>	Sets system date.
<b>System Time</b>	Sets system time.

## 5.2. Advanced



Setting	Description
<b>CPU Configuration</b>	See <a href="#">5.2.1. CPU Configuration</a> on page <a href="#">66</a>
<b>PCI Subsystem Settings</b>	See <a href="#">5.2.2. PCI Sybssystem Settings</a> on page <a href="#">67</a>
<b>ACPI Settings</b>	See <a href="#">5.2.3. ACPI Settings</a> on page <a href="#">68</a>
<b>AMT Configuration</b>	See <a href="#">5.2.4. AMT Configuration</a> on page <a href="#">69</a>
<b>F71869A Super IO Configuration</b>	See <a href="#">5.2.5. F71869A Super IO Configuration</a> on page <a href="#">70</a>
<b>Hardware Monitor</b>	See <a href="#">5.2.6. Hardware Monitor</a> on page <a href="#">72</a>
<b>F81866SEC Super IO Configuration</b>	See <a href="#">5.2.7. F81866SEC Super IO Configuration</a> on page <a href="#">73</a>
<b>S5 RTC Wake Settings</b>	See <a href="#">5.2.8. S5 RTC Wake Settings</a> on page <a href="#">74</a>
<b>SATA Configuration</b>	See <a href="#">5.2.9. SATA Configuration</a> on page <a href="#">75</a>
<b>CSM Configuration</b>	See <a href="#">5.2.10. CSM Configuration</a> on page <a href="#">76</a>
<b>USB Configuration</b>	See <a href="#">5.2.11. USB Configuration</a> on page <a href="#">77</a>

### 5.2.1. CPU Configuration

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Advanced

CPU Configuration		Enabled for windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). when Disabled only one thread per enabled core is enabled.
Intel(R) Core(TM) i5-6300U CPU @ 2.40GHz		
CPU Signature	406E3	
Microcode Patch	9E	
Max CPU Speed	2400 MHz	
Min CPU Speed	400 MHz	
CPU Speed	3200 MHz	
Processor Cores	2	
L1 Data Cache	32 KB x 2	
L1 Code Cache	32 KB x 2	
L2 Cache	256 KB x 2	
L3 Cache	4 MB	
L4 Cache	Not Present	
Hyper-threading	[Enabled]	++: Select Screen    : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save and Exit ESC: Exit
Active Processor Cores	[All]	
Intel Virtualization Technology	[Enabled]	
Intel (R) SpeedStep (tm)	[Disabled]	
CPU C states	[Disabled]	

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Setting	Description
<b>Hyper-threading</b>	<b>Enabled</b> (default) for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and <b>Disabled</b> for other OS (OS not optimized or Hyper-Threading Technology). When disabled only one thread per enabled core is enabled.
<b>Active Processor Cores</b>	Number of cores to enable in each processor package. ▶ Options: <b>All</b> (default) and <b>1</b>
<b>Intel Virtualization Technology</b>	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology ▶ Options: <b>Enabled</b> (default) or <b>Disabled</b>
<b>Intel (R) Speed Step (tm)</b>	<b>Enable / Disable</b> (default) Intel SpeedStep
<b>Turbo Mode</b>	Only available when Intel Speed Step is <b>Enabled</b> . <b>Enable</b> (default) / <b>Disable</b> Turbo Mode
<b>CPU C States</b>	<b>Enable / Disable</b> (default) CPU C States



## 5.2.2. PCI Sybsystem Settings

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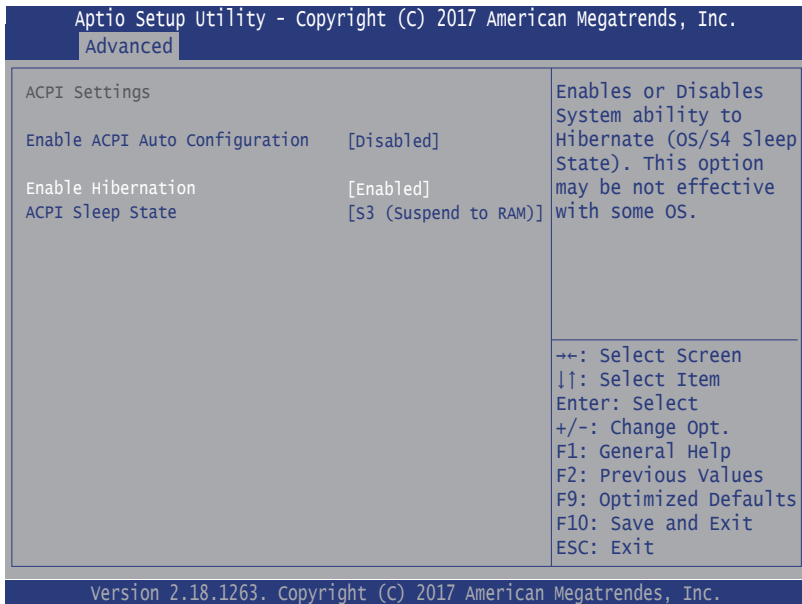
Advanced

PCI Bus Driver Version	A5.01.08	Enables or Disables 64bit capable Devices to be Decoded in Above 4G Address Space (Only if System Supports 64 bit PCI Decoding).
PCI Device Common Settings:		
PCI Latency Timer	[32 PCI Bus Clocks]	
PCI-X Latency Timer	[64 PCI Bus Clocks]	
Above 4G Decoding	[Disabled]	
		+=: Select Screen ↓↑: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save and Exit ESC: Exit

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Setting	Description
<b>PCI Latency Timer</b>	Value to be programmed into PCI Latency Timer Register. ► <b>Options: 32 (default), 64, 96, 128, 160, 192, 224 and 248 PCI Bus Clocks.</b>
<b>PCI-X Latency Timer</b>	Value to be programmed into PCI-X Latency Timer Register. ► <b>Options: 32, 64 (default), 96, 128, 160, 192, 224 and 248 PCI Bus Clocks.</b>
<b>Above 4G Decoding</b>	<b>Enable/Disable</b> (default) 64bit capable Devices to be Decoded in Above 4G Address Space (Only if System Supports 64 bit PCI Decoding).

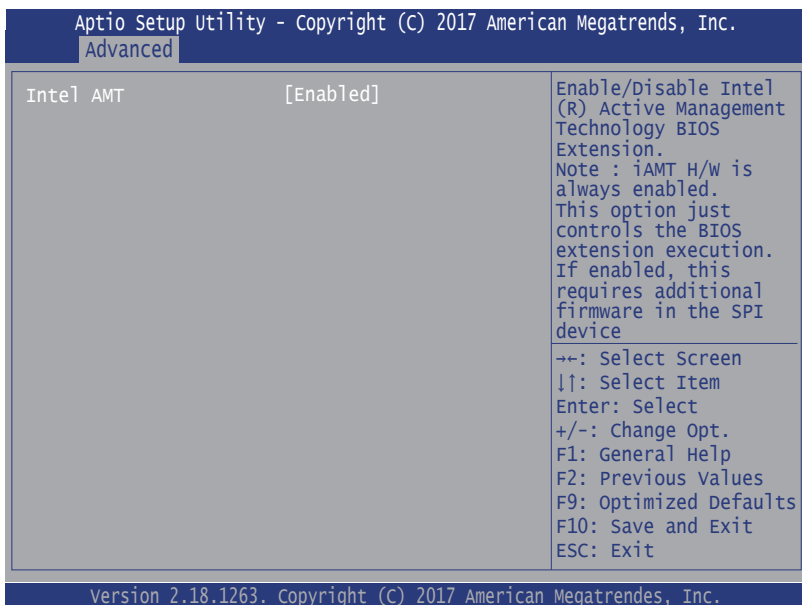
### 5.2.3. ACPI Settings



Setting	Description
<b>Enable ACPI Auto Configuration</b>	<b>Enables</b> or <b>Disables</b> (default) BIOS ACPI Auto Configuration
<b>Enable Hibernation</b>	Only available when BIOS ACPI Auto Configuration is enabled. <b>Enables</b> (default) or <b>Disables</b> System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
<b>ACPI Sleep State</b>	Only available when BIOS ACPI Auto Configuration is enabled. Select ACPI sleep state the system will enter when the SUSPEND button is pressed. ► <b>Options: Suspend Disabled</b> and <b>S3 (Suspend to RAM)</b> (default)

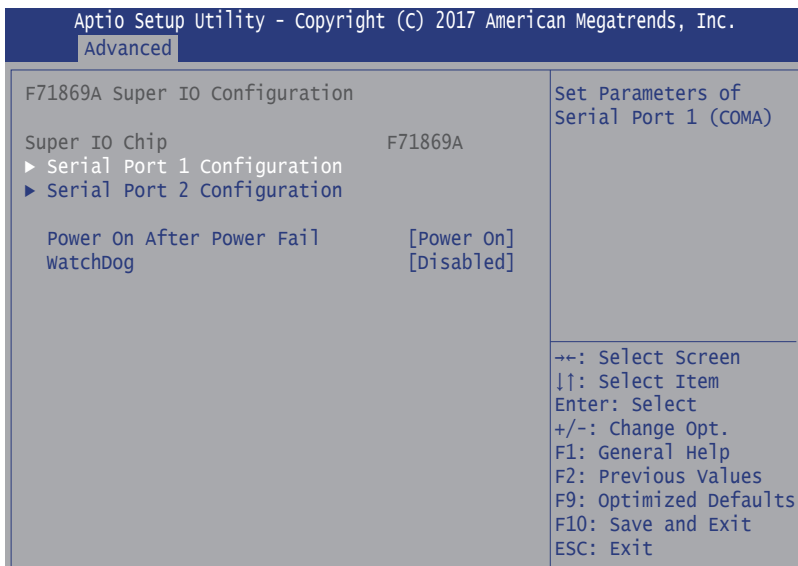
### 5.2.4. AMT Configuration

Intel® Active Management Technology (Intel® AMT) is a hardware-based solution that uses out-of-band communication for system administrators to monitor and manage the computers and other network equipment by remote control even if the hard drive is crashed, the system is turned off or the operating system is locked. This submenu features the settings of iAMT’s BIOS extension, which are required to make use of iAMT.



Setting	Description
Intel AMT	<p><b>Enables</b> (default) /<b>disables</b> Intel® Active Management Technology BIOS extensions.</p> <ul style="list-style-type: none"> <li>▶ Note iAMT hardware is always enabled.</li> <li>▶ This setting only controls the execution of BIOS extension execution.</li> <li>▶ When enabled, additional firmware is required in the SPI device.</li> </ul>

### 5.2.5. F71869A Super IO Configuration



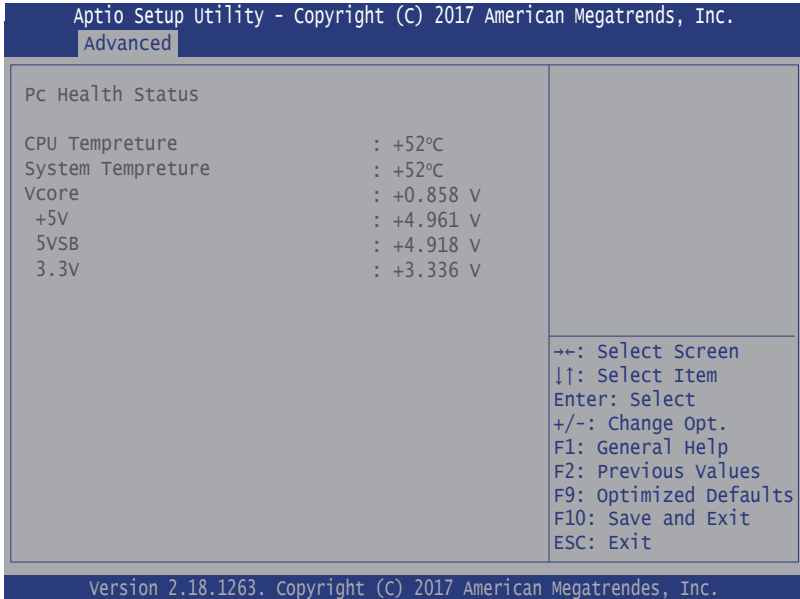
Setting	Description
<b>Serial Port 1/2 Configuration</b>	See next page.
<b>Power On After Power Fail</b>	Sets whether the system should power on or power off when the power supply resumes after an power failure. ▶ Options are <b>Power off</b> and <b>Power on</b> (default) .
<b>WatchDog</b>	<b>Enables/disables</b> (default) watchdog timer.

## Serial Port 1/2 Configuration

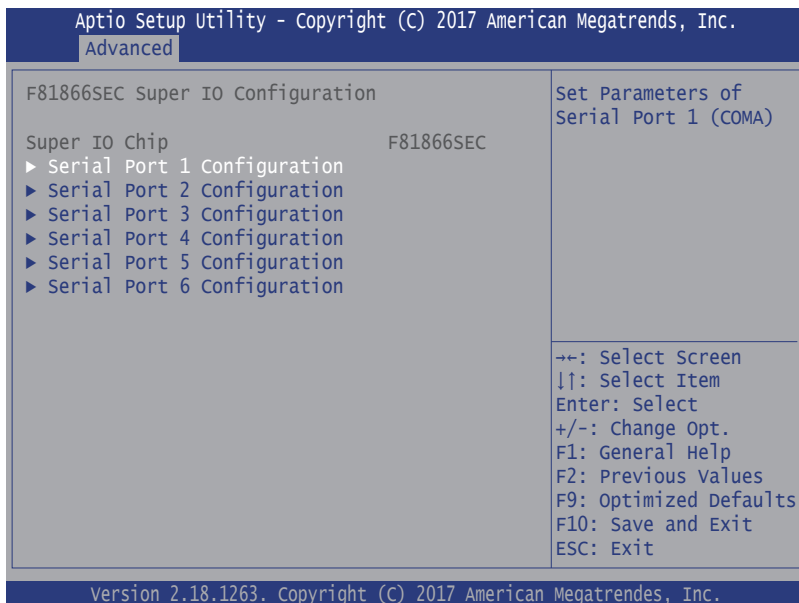
Setting	Description
Serial Port	Enable (default) or Disable Serial Port (COM).
Change Settings	<p>Select an optimal setting for Super IO device.</p> <ul style="list-style-type: none"> <li>▶ Options for Serial Port 1:           <ul style="list-style-type: none"> <li>Auto:</li> <li>IO=3F8h; IRQ=4 (default) ;</li> <li>IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;</li> <li>IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;</li> <li>IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;</li> <li>IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;</li> </ul> </li> <li>▶ Options for Serial Port 2:           <ul style="list-style-type: none"> <li>Auto</li> <li>IO=2F8h; IRQ=3 (default)</li> <li>IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;</li> <li>IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;</li> <li>IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;</li> <li>IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12</li> </ul> </li> </ul>
Mode Select	Select RS-232 (default), RS-422 or RS-485.

### 5.2.6. Hardware Monitor

Select this submenu to view the main board's hardware status. Select it to run a report of various info as depicted below:

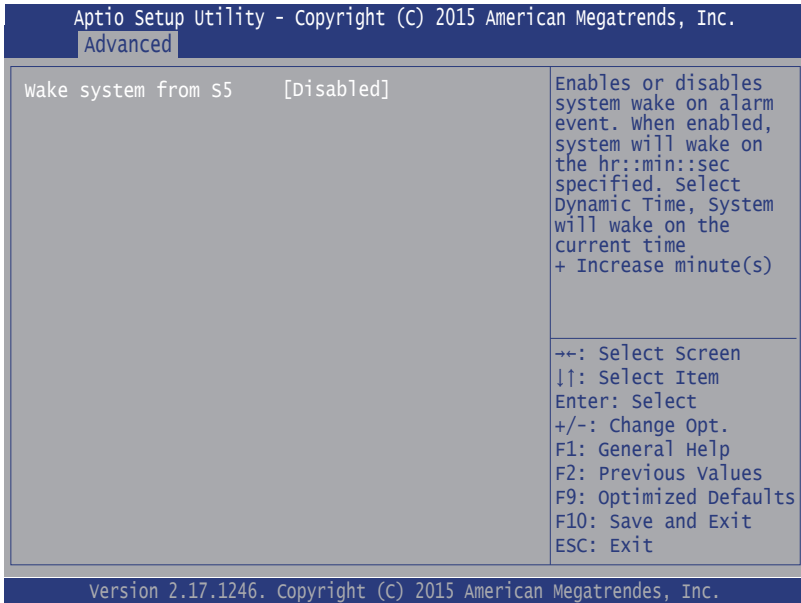


### 5.2.7. F81866SEC Super IO Configuration



Setting	Description
<b>Serial Port</b>	<b>Enable</b> (default) or <b>Disable</b> Serial Port (COM).
<b>Mode Select</b>	<ul style="list-style-type: none"> <li>▶ Select RS-232, RS-422 or RS-485 for corresponding serial port.</li> <li>For Serial Port 1/2: Select <b>RS-232</b> (default), <b>RS-422</b> or <b>RS-485</b>.</li> <li>For Serial Port 3/4/5/6: Select <b>RS-232</b> (default) or <b>RS-485</b>.</li> </ul>

### 5.2.8. S5 RTC Wake Settings



Setting	Description
Wake System from S5	<p><b>Enable</b> or <b>Disable</b> (default) system wake on alarm event.</p> <p>► Options available are:</p> <p><b>Disabled</b> (default):</p> <p><b>Fixed Time:</b> System will wake on the hr::min::sec specified.</p> <p><b>DynamicTime:</b> If selected, you need to set <b>Wake up minute increase</b> from 1 - 5. System will wake on the current time + increase minute(s).</p>



## 5.2.9. SATA Configuration

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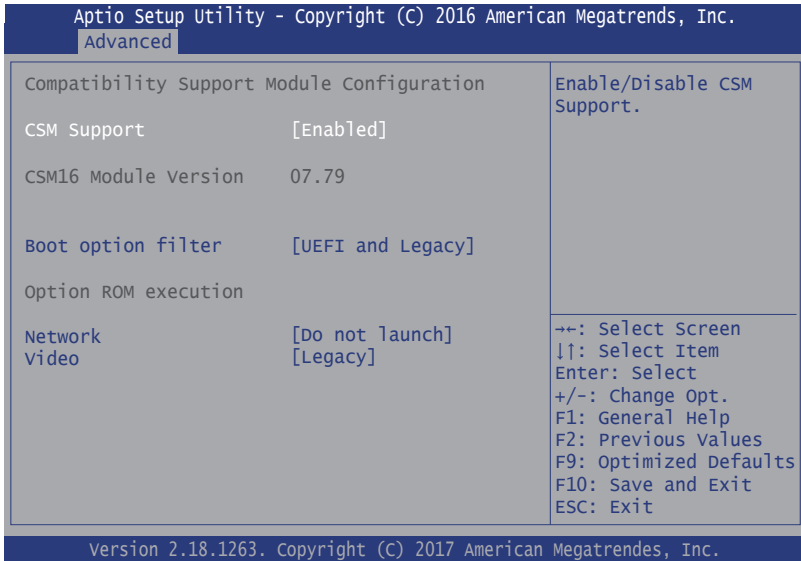
Advanced

SATA Controller(s)	[Enabled]	Enable or disable SATA Device.
SATA Mode Selection	[AHCI]	
Serial ATA Port 0	mSATA-I50 (64.0GB)	→←: Select Screen ↓ ↑: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
Software Preserve	Supported	
Port 0	[Enabled]	
Device Sleep	[Disabled]	
SATA DEVSLEP Idle Timeout Config	[Disabled]	
Serial ATA Port 1	Empty	
Software Preserve	Unknown	
Port 0	[Enabled]	
Device Sleep	[Disabled]	
SATA DEVSLEP Idle Timeout Config	[Disabled]	
Serial ATA Port 2	Empty	
Software Preserve	Unknown	
Port 0	[Enabled]	
Device Sleep	[Disabled]	
SATA DEVSLEP Idle Timeout Config	[Disabled]	

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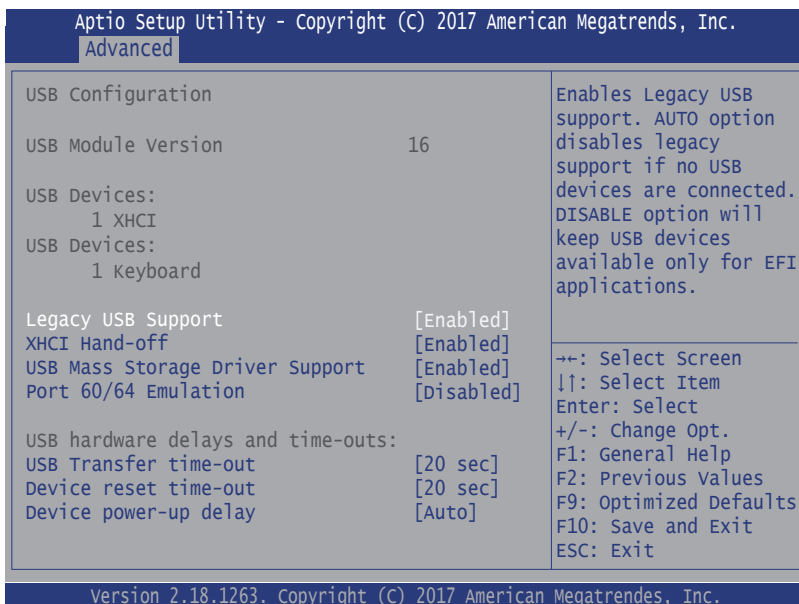
Setting	Description
<b>SATA Controller(s)</b>	<b>Enables</b> (default) / <b>disables</b> SATA device(s).
<b>SATA Mode Selection</b>	Configures how SATA controller(s) operate. ▶ Options: <b>AHCI</b> (default) and <b>RAID</b> .
<b>Serial ATA Port 0 ,1 ,2</b>	SATA device information
<b>Port 0, 1, 2</b>	<b>Enables</b> (default) / <b>disables</b> the SATA port 0, 1, 2.
<b>Device Sleep</b>	<b>Enables</b> / <b>disables</b> (default) the mSATA for RTD3.
<b>SATA DEVSLEP Idle Timeout Config</b>	<b>Enables</b> / <b>disables</b> (default) SATA DTIO config.

### 5.2.10. CSM Configuration



Setting	Description
<b>CSM Support</b>	<b>Enable</b> (default) or <b>Disable</b> CSM Support.
<b>Boot option filter</b>	Control the Legacy/UEFI ROMs priority. ▶ Options: <b>UEFI and Legacy</b> (default), <b>Legacy only</b> , <b>UEFI only</b>
<b>Network</b>	Control the execution of UEFI and Legacy PXE OpROM ▶ Options: <b>Do not launch</b> (default) and <b>Legacy</b>
<b>Video</b>	Control the execution of UEFI and Legacy Video OpROM ▶ Options: <b>UEFI and Legacy</b> (default)

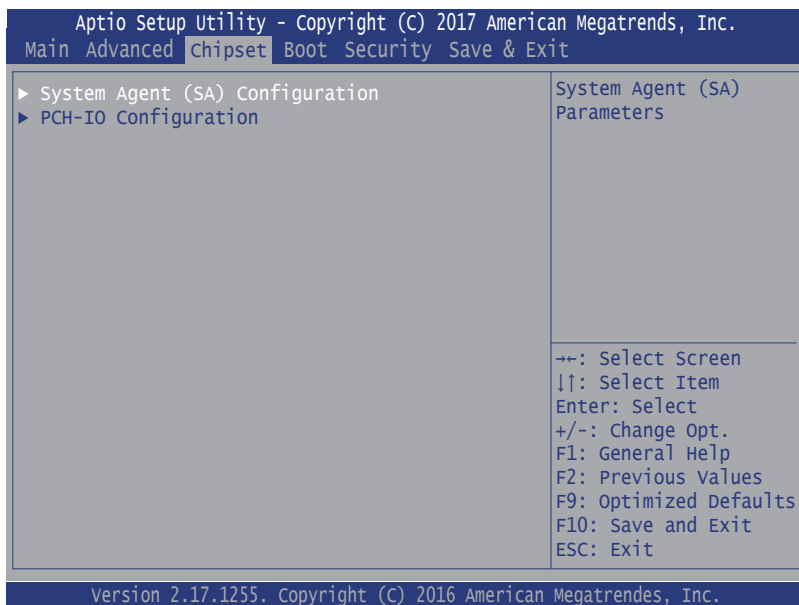
## 5.2.11. USB Configuration



Setting	Description
<b>Legacy USB Support</b>	<p>Enables/disables legacy USB support.</p> <ul style="list-style-type: none"> <li>▶ Options available are <b>Enabled</b> (default), <b>Disabled</b> and <b>Auto</b>.</li> <li>▶ Select <b>Auto</b> to disable legacy support if no USB device are connected.</li> <li>▶ Select <b>Disabled</b> to keep USB devices available only for EFI applications.</li> </ul>
<b>XHCI Hand-off</b>	<p>This is a workaround for Oses without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.</p> <ul style="list-style-type: none"> <li>▶ The optional settings are: <b>Enabled</b> (default) / <b>Disabled</b>.</li> </ul>
<b>USB Mass Storage Driver Support</b>	<p>Enables/disables USB Mass Storage Driver Support.</p> <ul style="list-style-type: none"> <li>▶ The optional settings are: <b>Enabled</b> (default) / <b>Disabled</b>.</li> </ul>
<b>USB hardware delay and time-out</b>	
<b>Port 60/64 Emulation</b>	<b>Enables / Disables</b> (default) I/O port 60/64h emulation support.
<b>USB Transfer time-out</b>	<p>Use this item to set the time-out value for control, bulk, and interrupt transfers.</p> <ul style="list-style-type: none"> <li>▶ Options: <b>1 sec</b>, <b>5 sec</b>, <b>10 sec</b>, <b>20 sec</b> (default)</li> </ul>

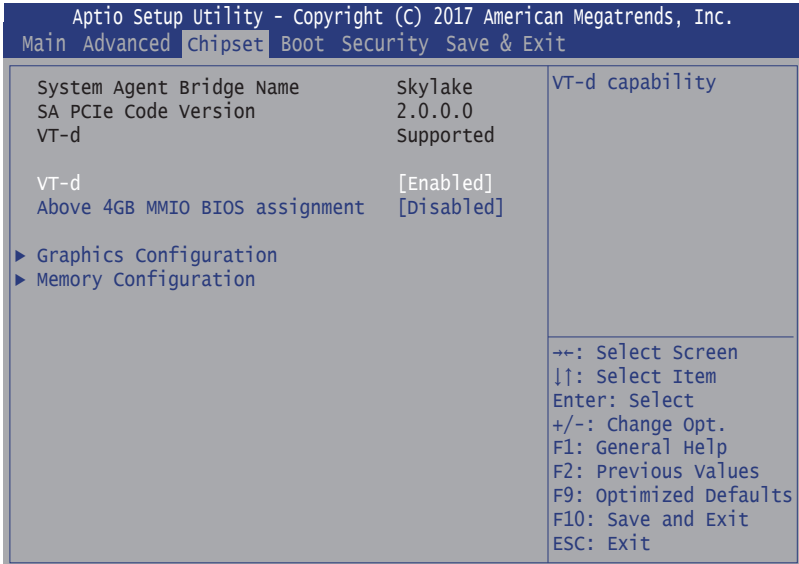
<b>Device reset time-out</b>	Use this item to set USB mass storage device start unit command time-out. ▶ Options available are: <b>10 sec, 20 sec (default), 30 sec, 40 sec</b>
<b>Device power-up delay</b>	Use this item to set maximum time the device will take before it properly reports itself to the host controller. 'Auto' uses default value: for a root port it is 100 ms, for a hub port the delay is taken from hub descriptor. ▶ Options available are: <b>Auto:</b> Default <b>Manual:</b> Select <b>Manual</b> you can set value for the following sub-item: 'Device Power-up delay in seconds', the delay range in from 1 to 40 seconds, in one second increments.

### 5.3. Chipset



Submenu	Description
<b>System Agent (SA) Configuration</b>	See <a href="#">5.3.1. System Agent (SA) Configuration</a> on page <a href="#">80</a>
<b>PCH-IO Configuration</b>	See <a href="#">5.3.2. PCH-IO Configuration</a> on page <a href="#">82</a>

### 5.3.1. System Agent (SA) Configuration



Submenu	Description
<b>VT-d</b>	<b>Enable</b> (default) or <b>Disable</b> VT-d function
<b>Above 4GB MMIO BIOS assignment</b>	<b>Enable</b> or <b>Disable</b> (default) Above 4GB MMIO BIOS assignment
<b>System Agent (SA) Configuration</b>	
<b>Graphics Configuration</b>	See <a href="#">5.3.1.1. Graphics Configuration</a> on page 81
<b>Memory Configuration</b>	See <a href="#">5.3.1.2. Memory Configuration</a> on page 81

### 5.3.1.1. Graphics Configuration

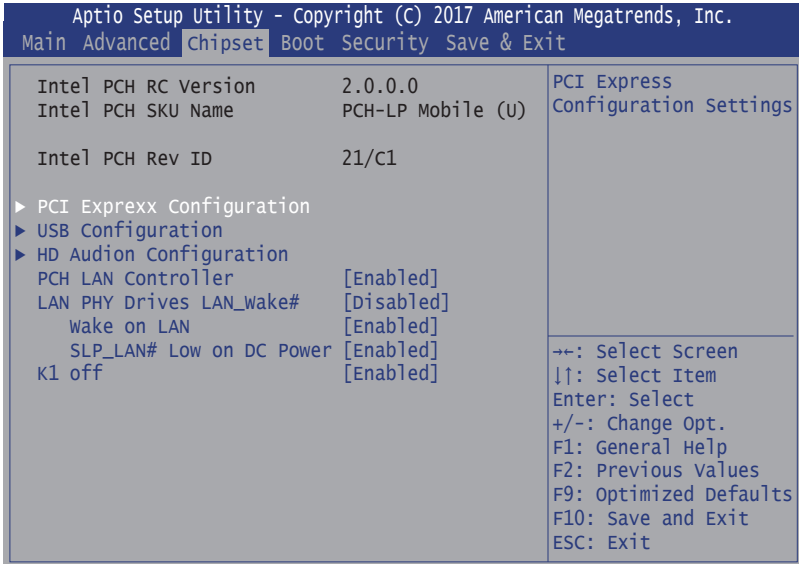
Setting	Description
<b>IGFX VBIOS Version</b>	Display the IGFX(internal VGA) VBIOS version.
<b>Graphics Turbo IMON Current</b>	Sets the graphics turbo IMON current values. ▶ Options available are <b>14</b> to <b>31</b> . <b>31</b> is the default.
<b>DVMT Pre-Allocated</b>	Select the DVMT 5.0 Pre-allocated (Fixed) Graphic Memory size used by the Internal Graphic Device. ▶ 32M is the default.
<b>DVMT Total Gfx Mem</b>	Select the DVMT 5.0 Total Graphic Memory size used by the Internal Graphic Device. ▶ Options: <b>128MB</b> , <b>256MB</b> (default) and <b>Max</b> .

### 5.3.1.2. Memory Configuration

Access this submenu to view the memory configuration.

Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.	
Chipset	
Memory Information	
Memory RC Version	1.9.0.0
Memory Frequency	2133 Mhz
Total Memory	8192 MB
VDD	1200
DIMM#0	Not Present
DIMM#1	8192 MB
Memory Timings (tCL-tRCD-tRP-tRAS)	15-36
++: Select Screen ↓↑: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save and Exit ESC: Exit	
Version 2.18.1263. Copyright (C) 2017 American Megatrendes, Inc.	

### 5.3.2. PCH-IO Configuration



Setting	Description
<b>PCI Express Configuration</b>	See <a href="#">5.3.2.1. PCI Express Configuration</a> on page <a href="#">83</a>
<b>USB Configuration</b>	See <a href="#">5.3.2.2. USB Configuration</a> on page <a href="#">83</a>
<b>HD Audio Configuration</b>	<ul style="list-style-type: none"> <li>▶ Control Detection of the HD-Audio device. Options available are: <b>Disabled:</b> HDA will be unconditionally disabled <b>Enabled:</b> HDA will be unconditionally Enabled <b>Auto</b> (default) = HDA will be enabled if present, disabled otherwise.</li> <li>▶ USB Audio Device Enable (default) or disable USB Audio Device.</li> </ul>
<b>PCH LAN Controller</b>	<b>Enabled</b> (default) / <b>disabled</b> onboard NIC. If enabled, "Wake on LAN" option will be available to enable (default) / disable integrated LAN to wake the system. (The Wake On LAN cannot be disabled if ME is on at Sx state.)



<b>LAN PHY Drives LAN-WAKE#</b>	<p><b>Enable</b> or <b>disable</b> (default) LAN Phy driving LAN-WAKE# else platform drives LAN_WAKE#.</p> <ul style="list-style-type: none"> <li>▶ Wake on LAN <b>Enable</b> (default) or <b>disable</b> integrated LAN to wake the system. (The Wake On LAN cannot be disabled if ME is on at Sx state)/</li> <li>▶ SLP_LAN# Low on DC Power <b>Enable</b> (default) or <b>disable</b> SLP_LAN# Low on DC Power</li> </ul>
<b>K1 Off</b>	<b>Enable</b> (default) or <b>disable</b> K1 off feature (CLKREQ).

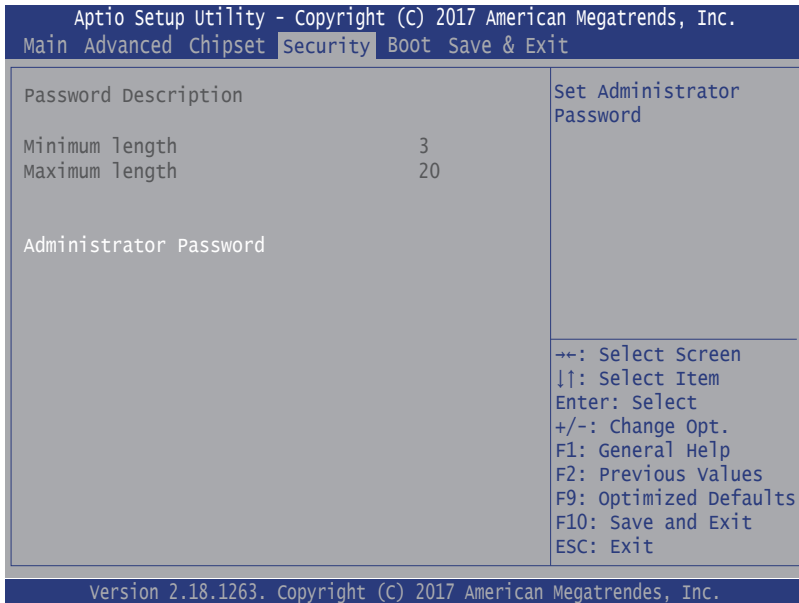
### 5.3.2.1. PCI Express Configuration

Setting	Description
<b>PCI Express Root Port 1/5/6/10</b>	<b>Enable</b> (default) or disable PCI Express Port.
<b>ASPM Support</b>	<p>Disable or set the ASPM level. Force L0s will force all inks to L0s state. "Auto" will allow BIOS to auto configure."Disable" will disable ASPM.</p> <ul style="list-style-type: none"> <li>▶ Options: <b>Disabled</b> (default), <b>L0s</b>, <b>L1</b>, <b>L0sL1</b> and <b>Auto</b>.</li> </ul>
<b>L1 Substates</b>	<p>PCI Express L1 Substates settings.</p> <ul style="list-style-type: none"> <li>▶ Options: <b>Disabled</b>, <b>L1.1</b>, <b>L1.2</b> and <b>L1.1 &amp; L1.2</b> (default).</li> </ul>
<b>PCIe Speed</b>	<p>Select PCI Express port speed.</p> <ul style="list-style-type: none"> <li>▶ Options: <b>Auto</b> (default), <b>Gen1</b>, <b>Gen2</b> and <b>Gen3</b></li> </ul>

### 5.3.2.2. USB Configuration

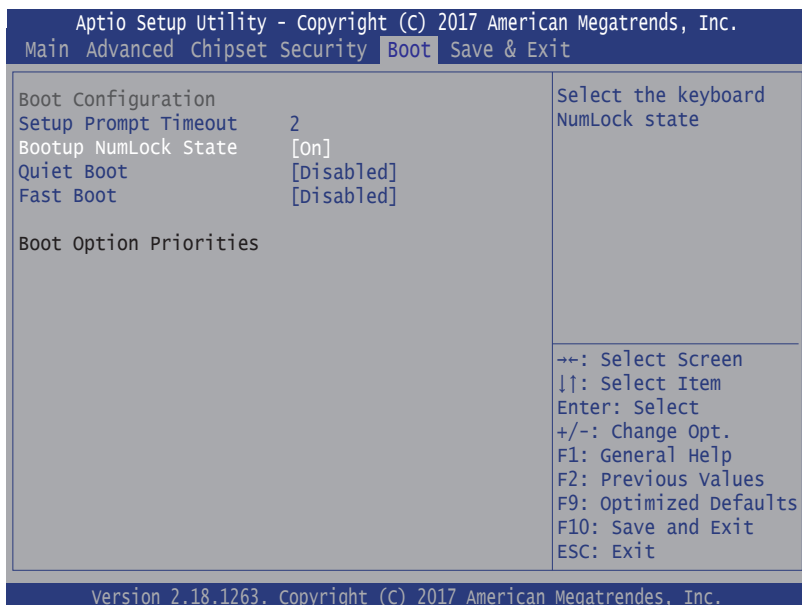
Setting	Description
<b>USB Precondition</b>	<p>Precondition work on USB host controller and root ports for faster enumeration.</p> <ul style="list-style-type: none"> <li>▶ Options: <b>Enable/Disable</b> (default).</li> </ul>
<b>XHCI Disable Compliance Mode</b>	<p>Options to disable Compliance Mode. Default is <b>FALSE</b> (default) to not disable Compliance Mode. Set <b>TRUE</b> to disable Compliance Mode.</p>
<b>xDCI Support</b>	<b>Enable/disable</b> (default) xDCI (USB OTG Device).
<b>USB Port Disable Override</b>	Selectively <b>enable/disable</b> (default) the corresponding USB port from reporting a Device Connection to the controller.

## 5.4 Security



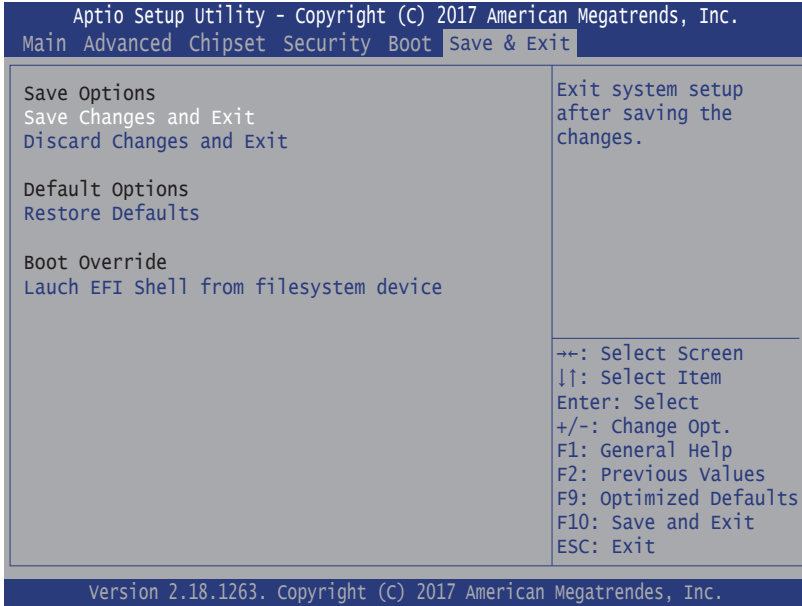
Setting	Description
<b>Administrator Password</b>	<p>To set up an administrator password:</p> <ol style="list-style-type: none"> <li>1. Select <b>Administrator Password</b>.</li> <li>2. An <b>Create New Password</b> dialog then pops up onscreen.</li> <li>3. Enter your desired password that is no less than 3 characters and no more than 20 characters.</li> <li>4. Hit [Enter] key to submit.</li> </ol>

## 5.5. Boot



Setting	Description
<b>Setup Prompt Timeout</b>	Set how long to wait for the prompt to show for entering BIOS Setup. <ul style="list-style-type: none"> <li>▶ The default setting is <b>2</b> (sec).</li> <li>▶ Set it to <b>65535</b> to wait indefinitely.</li> </ul>
<b>Bootup NumLock State</b>	Sets whether to enable or disable the keyboard's NumLock state when the system starts up. <ul style="list-style-type: none"> <li>▶ Options available are <b>On</b> (default) and <b>Off</b>.</li> </ul>
<b>Quiet Boot</b>	Sets whether to display the POST (Power-on Self Tests) messages or the system manufacturer's full screen logo during booting. <ul style="list-style-type: none"> <li>▶ Select <b>Disabled</b> to display the normal POST message, which is the default.</li> </ul>
<b>Fast Boot</b>	Enables or disables (default) boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.

## 5.6. Save & Exit



Setting	Description
<b>Save Changes and Reset</b>	Saves the changes and quits the BIOS Setup utility.
<b>Discard Changes and Exit</b>	Quits the BIOS Setup utility without saving the change(s).
<b>Restore Defaults</b>	Restores all settings to defaults. ► This is a command to launch an action from the BIOS Setup utility.
<b>Boot Override</b>	<b>Boot Override</b> presents a list in context with the boot devices in the system. ► <b>P0</b> : Select the device to boot up the system regardless of the currently configured boot priority. ► <b>Launch EFI Shell from filesystem device</b> : Attempts to launch EFI Shell Application (Shell.efi) from one of the available filesystem devices.