EMS-BYT/BYTC1 Series

Fanless Intel® Celeron®/Atom™ SoC Rugged Embedded System

Quick Reference Guide

4th Ed –07 May 2021

Part No. E20178209A5R

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 UNDESIRED 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 INSTATLLED 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.

A Message to the Customer

Avalue Customer Services

Each and every Avalue's 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 Avalue 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 for which the name Avalue has come to be known.

Your satisfaction is our primary concern. Here is a guide to Avalue's 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.

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

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

Content

1. Getting Started

1.1 Safety Precautions

Warning!

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

Caution!

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

1.2 Packing List

- 1 x EMS-BYT/BYTC1 Fanless Intel® Celeron®/Atom™ SoC Rugged Embedded System
- Other major components include the followings:
  - 44 Pin Multi I/O Cable
  - Wall Mount Kit
  - Adapter
  - Power Cord

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

1.3 System Specifications

System	
Board	• EBM-BYTS **(EMS-BYT)** • EBM-BYTS + AUX-M01 **(EMS-BYT-6COM)** • EBM-BYTS + AUX-M02 **(EMS-BYT-5LAN)** • EBM-BYTS + AUX-M07 **(EMS-BYT-4COM Isolation)** • EBM-BYTS + AUX-M04 **(EMS-BYT-PSE)** • EBM-BYTS + EBM-BYTS DB-A **(EMS-BYT-HDMI)** • EBM-BYTS + EBM-CDVS DB-A **(EMS-BYT-DVI)** • EBM-BYTS + EBM-CDVS DB-E **(EMS-BYT-USB)**
CPU	• Intel® Celeron® Processor J1900 Family • Intel® Atom™ Processor E3800 Family
BIOS	• AMI uEFI BIOS, 64Mbit SPI Flash ROM
System Chipset	• Valleyview-D/I SoC Integrated
I/O Chip	• EC ITE IT8528E
System Memory	• One 204-pin SODIMM Socket Up to 8GB DDR3L 1066/1333MHz SDRAM
Storage	• 1 x 2.5” Drive Bay, 1 x mSATA
Watchdog Timer	• H/W Reset, 1sec. ~ 65535sec.
H/W Status Monitor	• CPU & System Temperature Monitoring and Voltages Monitoring
Expansion Interface	• IET Interface (1 x DP, 4 x PCIex1, 3 x USB, 1 x LPC, 1 x Line-Out (R/L), 1 x SMBus) • 2 x Mini PCIe Socket (mSATA and SIM Card Supported)
External I/O	
COM	• 2 x COM (Can be set as RS-232/422/485 by BIOS) **(EMS-BYT, EMS-BYT-5LAN, EMS-BYT-PSE, EMS-BYT-DVI)** • 6 x COM (Can be set as RS-232/422/485 by BIOS) **(EMS-BYT-6COM)** • 6 x COM (Can be set as RS-232/422/485 by BIOS; COM3 ~ COM6 Supported 2.5kv Isolation) **(EMS-BYT-4COM Isolation)** • 4 x COM (Can be set as RS-232/422/485 by BIOS) **(EMS-BYT-HDMI)**
LAN	• 1 x RJ45 **(EMS-BYT, EMS-BYT-6COM, EMS-BYT-4COM Isolation, EMS-BYT-DVI)** • 5 x LAN Supports 2-pair LAN Bypass **(EMS-BYT-5LAN)** • 5 x RJ45 (4-port Gigabit Powered LAN (IEEE802.3af 12.95W per port)) **(EMS-BYT-PSE)** • 3 x RJ45 **(EMS-BYT-HDMI)**
Display Output	• 1 x VGA **(EMS-BYT, EMS-BYT-6COM, EMS-BYT-5LAN,**

	EMS-BYT-4COM Isolation, EMS-BYT-PSE) • 1 x VGA, 1 x HDMI **(EMS-BYT-HDMI)** • 1 x VGA, 1 x DVI **(EMS-BYT-DVI)**
Audio Port	• Mic-in, Line-in, Line-out
GPIO	• 6-bit GPI and 6-bit GPO
USB Port	• 3 x USB 2.0 (Rear 2; Front 1) **(EMS-BYT)** • 5 x USB 2.0 (Rear 4; Front 1) **(EMS-BYT-6COM, EMS-BYT-5LAN, EMS-BYT-4COM Isolation, EMS-BYT-PSE, EMS-BYT-HDMI, EMS-BYT-DVI)** • 6 x USB 2.0, 4 x USB 3.0 (Rear 9; Front 1) **(EMS-BYT-USB)**
PS/2	• 2 x PS/2 for KB & MS
SIM	• 1 x SIM Card Slot
SMBUS	• 1 x SMBUS
Antenna	• 2 Knockouts for Antenna Mounting (Options to Add WiFi & 3G)
Audio	
Audio Chipset	• Realtek ALC888S HD codec
Audio Interface	• Line-in, Line-out and Mic-in
Ethernet	
LAN Chip	• 1 x Intel® I211AT Gigabit Controller
Ethernet Interface	• 10/100/1000 Base-Tx Gigabit Ethernet Compatible
Mechanical & Environmental	
Power Requirement	• DC +12V ~ +26V, Wide Voltage Single Power Input • TVS Component for Surge Protection • Reverse Current/Voltage Protection
ACPI	• Single Power ATX Support S0, S3, S4, S5 • ACPI 5.0 Compliant
Power Mode	• AT/ATX (ATX is The Default Setting)
Operating Temp.	• For Valleyview-D SoC, -15°C ~ 60°C (w/SSD, mSATA) Ambient w/Air Flow; 0°C ~ 45°C (w/HDD) Ambient w/Air Flow **(EMS-BYT, EMS-BYT-6COM, EMS-BYT-5LAN, EMS-BYT-4COM Isolation, EMS-BYT-HDMI, EMS-BYT-DVI, EMS-BYT-USB)** • For Valleyview-I SoC, -40°C ~ 75°C (w/SSD, mSATA) Ambient w/Air Flow **(EMS-BYT, EMS-BYT-6COM, EMS-BYT-5LAN, EMS-BYT-4COM Isolation, EMS-BYT- HDMI, EMS-BYT-DVI, EMS-BYT-USB)** • For Valleyview-D SoC, -15°C ~ 50°C (w/SSD, mSATA) Ambient w/Air Flow; 0°C ~ 45°C (w/HDD) Ambient w/Air Flow **(EMS-BYT-PSE)** • For Valleyview-I SoC, -40°C ~ 65°C (w/SSD, mSATA) Ambient w/Air Flow **(EMS-BYT-PSE)**
Storage Temp.	• -40 ~ 75°C (-40 ~ 167°F)

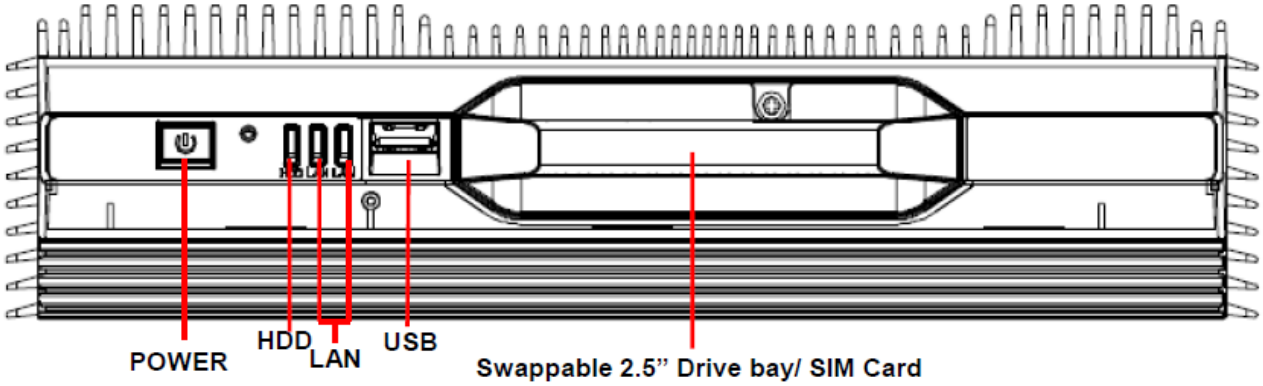
Relative Humidity	• 0% ~ 90% Relative Humidity, Non-condensing
Vibration Protection	• With mSATA/SSD: 5Grms, IEC 60068-2-64, Random, 10 ~ 500Hz, 1hr/axis
Shock Protection	• With mSATA/SSD: 50G, IEC 60068-2-27, Half Sine, 11ms
Certification	• CE, FCC Class B **(EMS-BYT, EMS-BYT-6COM, EMS-BYT-5LAN, EMS-BYT-4COM Isolation, EMS-BYT-HDMI, EMS-BYT-DVI, EMS-BYT-USB)** • CE, FCC Class A **(EMS-BYT-PSE)**
Dimension (W x H x D)	• 240mm x 170mm x 45mm **(EMS-BYT)** • 240mm x 170mm x 60mm **(EMS-BYT-6COM, EMS-BYT-5LAN, EMS-BYT-4COM Isolation, EMS-BYT-PSE, EMS-BYT-HDMI, EMS-BYT-DVI, EMS-BYT-USB)**
Weight	• 4.4 lbs (2 Kgs)

Note: Specifications are subject to change without notice.

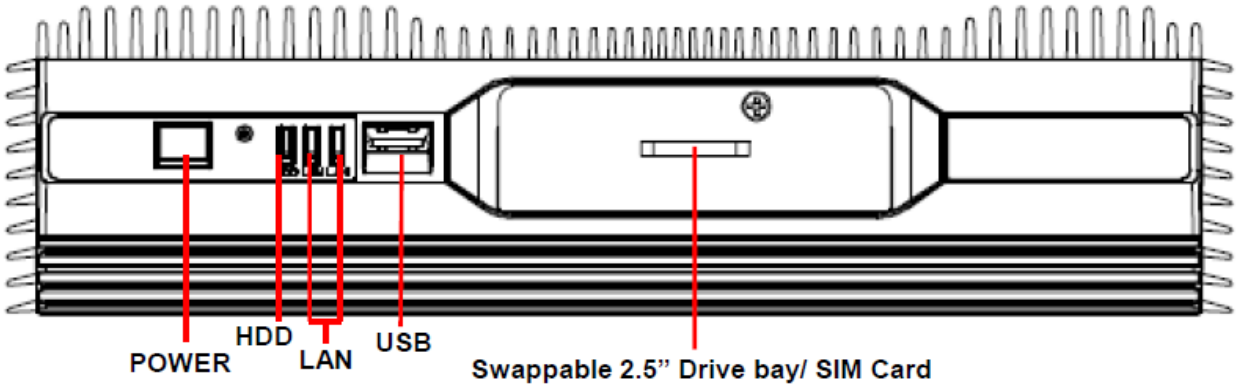
1.4 System Overview

1.4.1 Front View

EMS-BYT Series

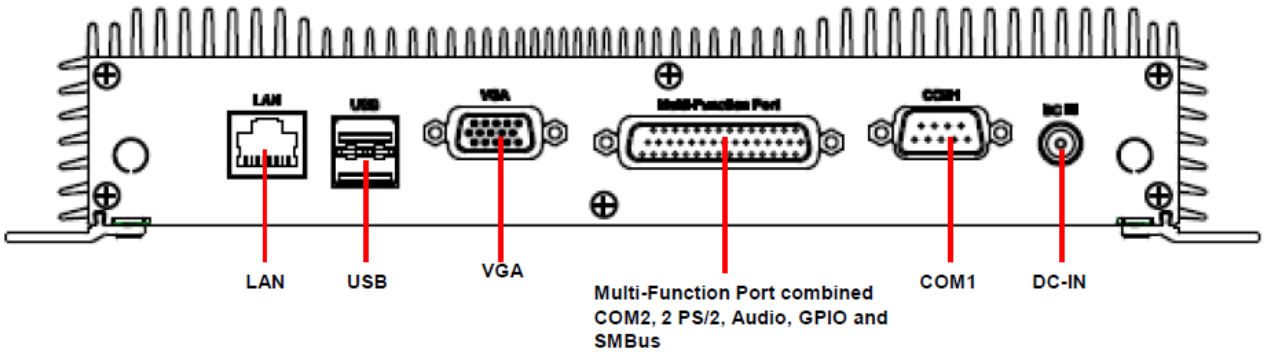


EMS-BYTC1

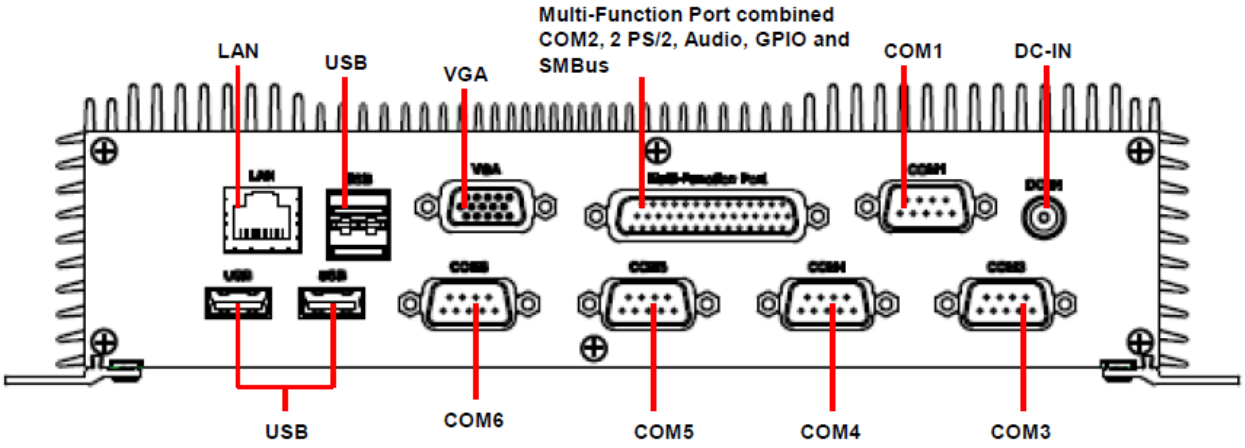


1.4.2 Rear View

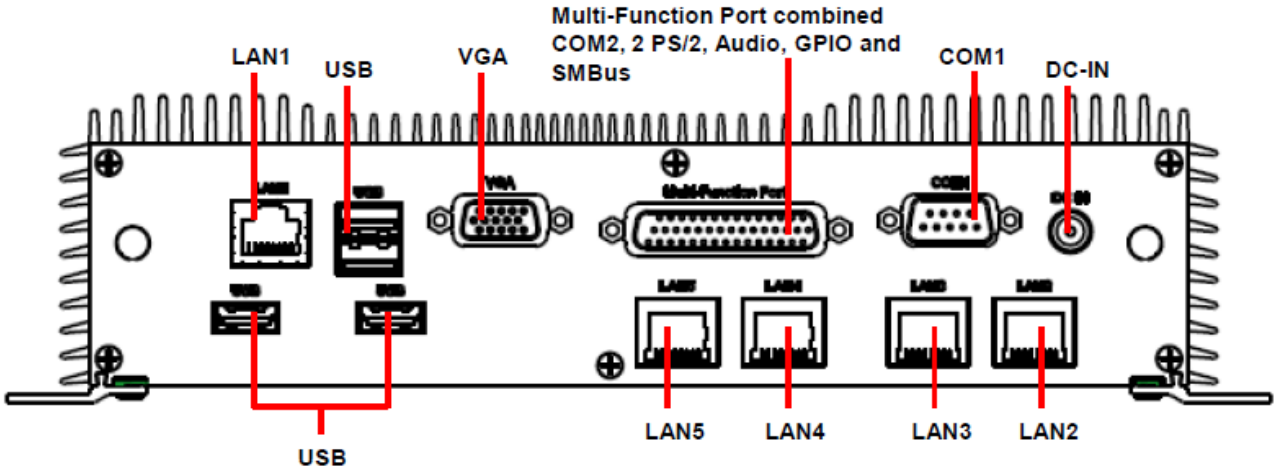
EMS-BYT



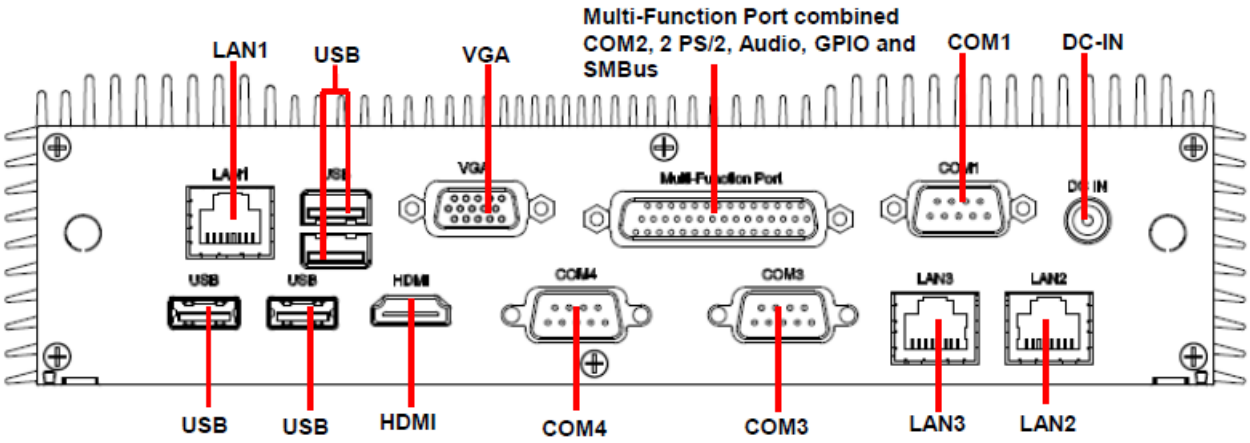
EMS-BYT-6COM/4COM Isolation



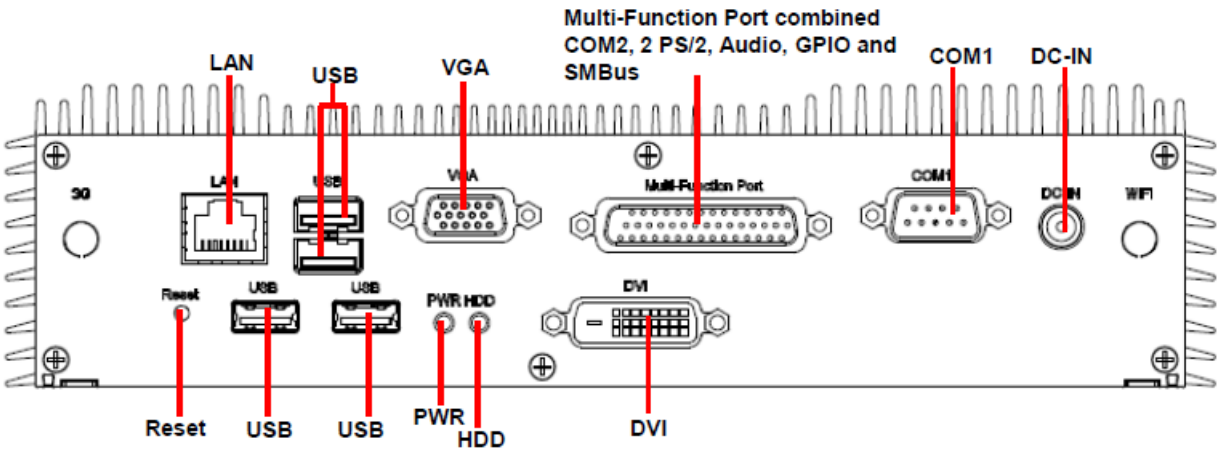
EMS-BYT-5LAN/PSE



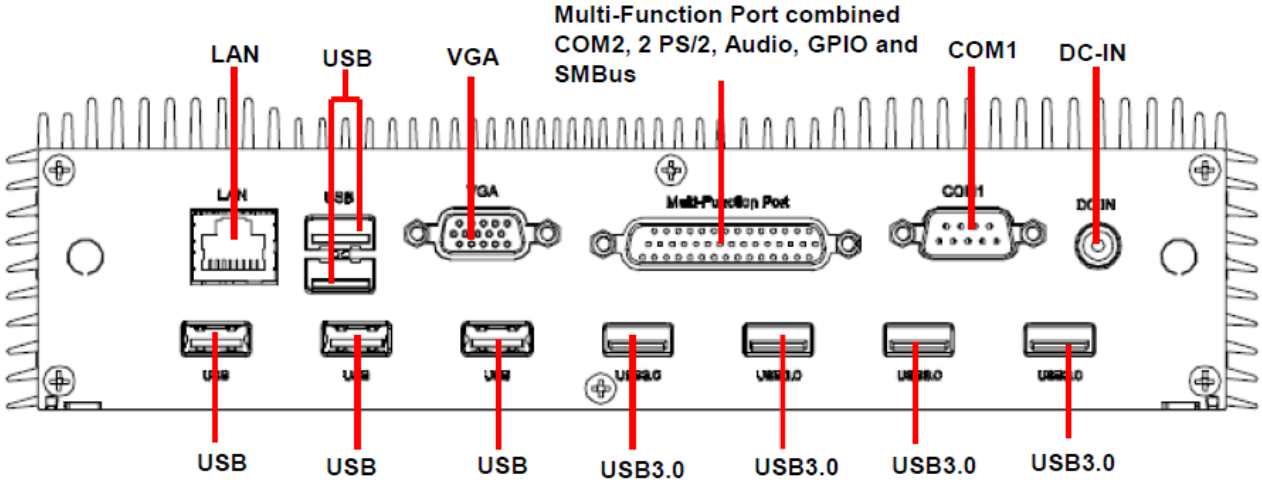
EMS-BYT-HDMI



EMS-BYT-DVI



EMS-BYT-USB



EMS-BYT

Connectors

Label	Function	Note
COM1	Serial port connector 1	
DC-IN	DC power-in connector	
LAN1	RJ-45 Ethernet 1	
Multi-function port	Multi-Function Port combined COM2, 2 PS/2, Audio, GPIO and SMBus	
USB	3 x USB2.0 connector	
VGA	VGA connector	
Swappable Drawer	2.5” Driver Bay and SIM Card	
HDD	HDD indicator	

EMS-BYT-6COM/4COM Isolation

Connectors

Label	Function	Note
COM1	Serial port connector 1	
COM3~6	Serial port connector3~6	
DC-IN	DC power-in connector	
LAN1	RJ-45 Ethernet 1	
Multi-function port	Multi-Function Port combined COM2, 2 PS/2, Audio, GPIO and SMBus	
USB	5 x USB2.0 connector	
VGA	VGA connector	
Swappable Drawer	2.5” Driver Bay and SIM Card	
HDD	HDD indicator	

EMS-BYT-5LAN/PSE

Connectors

Label	Function	Note
COM1	Serial port connector 1	
DC-IN	DC power-in connector	
LAN1~5	RJ-45 Ethernet 1~5	
Multi-function port	Multi-Function Port combined COM2, 2 PS/2, Audio, GPIO and SMBus	
USB	5 x USB2.0 connector	
VGA	VGA connector	
Swappable Drawer	2.5” Driver Bay and SIM Card	
HDD	HDD indicator	

EMS-BYT-HDMI

Connectors

Label	Function	Note
COM1	Serial port connector 1	
COM3~4	Serial port connector 3~4	
DC-IN	DC power-in connector	
LAN1~3	RJ-45 Ethernet 1~3	
Multi-function port	Multi-Function Port combined COM2, 2 PS/2, Audio, GPIO and SMBus	
USB	5 x USB2.0 connector	

VGA	VGA connector
Swappable Drawer	2.5” Driver Bay and SIM Card
HDD	HDD indicator
HDMI	HDMI connector

EMS-BYT-DVI

Connectors

Label	Function	Note
COM1	Serial port connector1	
DC-IN	DC power-in connector	
LAN1	RJ-45 Ethernet 1	
Multi-function port	Multi-Function Port combined COM2, 2 PS/2, Audio, GPIO and SMBus	
USB	5 x USB2.0 connector	
VGA	VGA connector	
Swappable Drawer	2.5” Driver Bay and SIM Card	
PWR	System power indicator	
HDD	HDD indicator	
Reset	Reset button	
DVI	DVI connector	

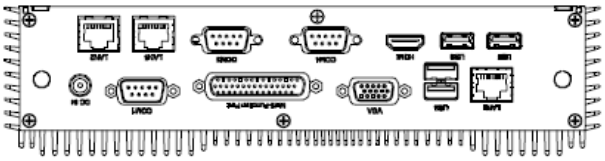
EMS-BYT-USB

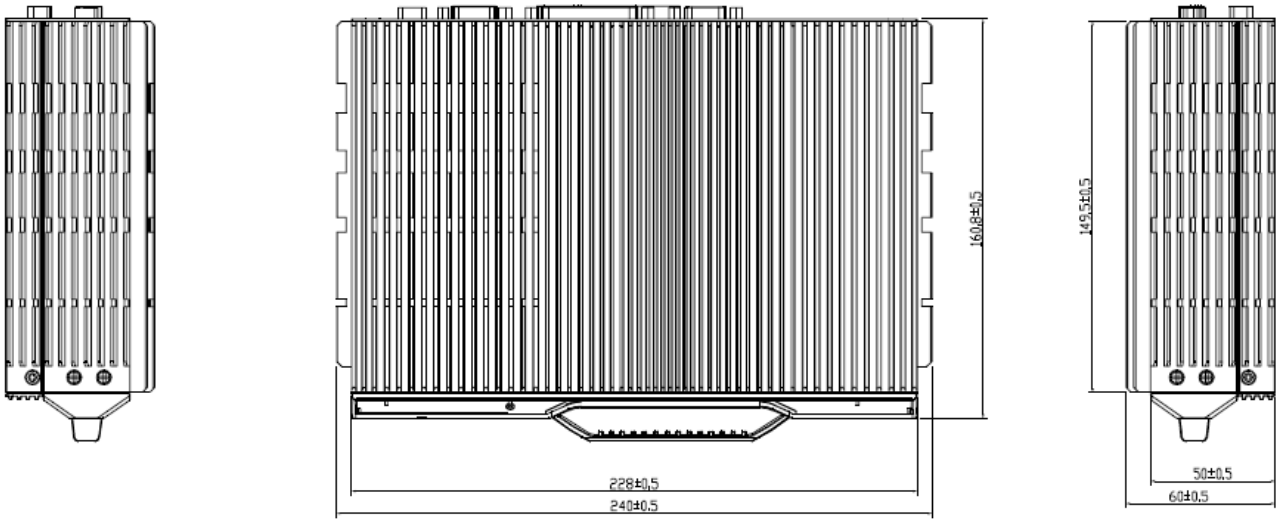
Connectors

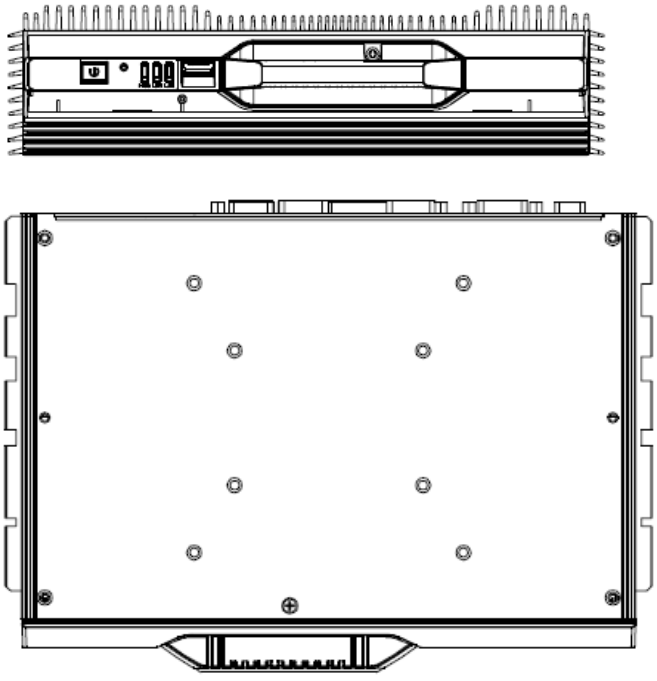
Label	Function	Note
COM1	Serial port connector1	
DC-IN	DC power-in connector	
LAN	RJ-45 Ethernet	
Multi-function port	Multi-Function Port combined COM2, 2 PS/2, Audio, GPIO and SMBus	
USB	6 x USB2.0 connector 4 x USB3.0 connector	
VGA	VGA connector	
Swappable Drawer	2.5” Driver Bay and SIM Card	
PWR	System power indicator	
HDD	HDD indicator	
Reset	Reset button	

1.5 System Dimensions

1.5.1 EMS-BYT Series Front & Top View

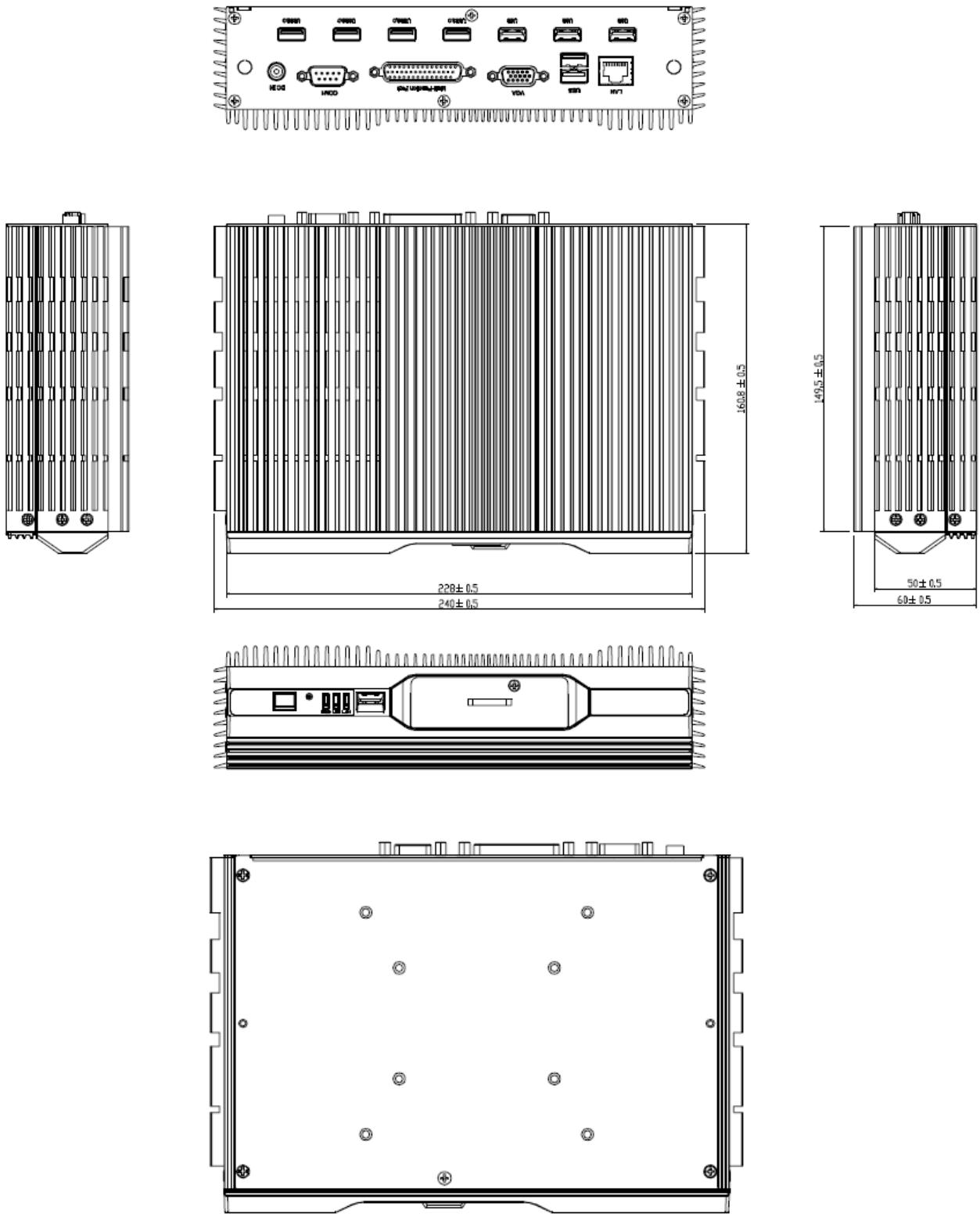






(Unit: mm)

1.5.2 EMS-BYTC1 Front & Top View



(Unit: mm)

2. Hardware Configuration

Jumper and Connector Setting, Driver and BIOS Installing

For advanced information, please refer to:

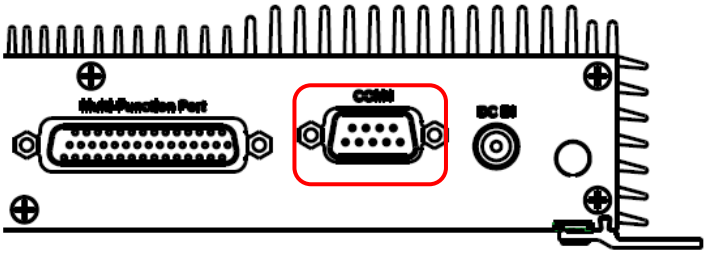
1- EBM-BYTS, AUX-M01, AUX-M02, AUX-M04, AUX-M07, EBM-BYTS DB-A, EBM-CDVS DB-A and EBM-BYTS DB-E included in this manual.

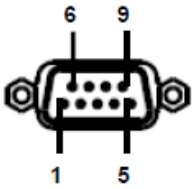
Note: If you need more information, please visit our website:

http://www.avalue.com.tw

2.1 EMS-BYT/BYTC1 connector mapping

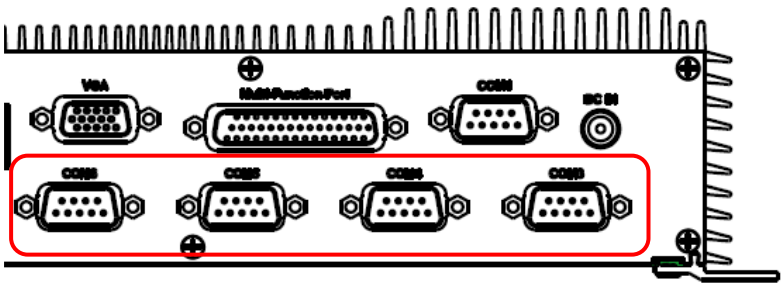
2.1.1 External Serial Port 1 connector (COM1)

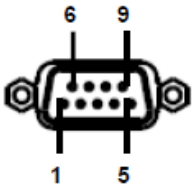




Pin	RS-232	RS-485	RS-422
1	DCD	TXD-/RXD-	TXD-
2	RXD	TXD+/RXD+	TXD+
3	TXD		RXD+
4	DTR		RXD-
5	GND	GND	GND
6	DSR		
7	RTS		
8	CTS		
9	RI		

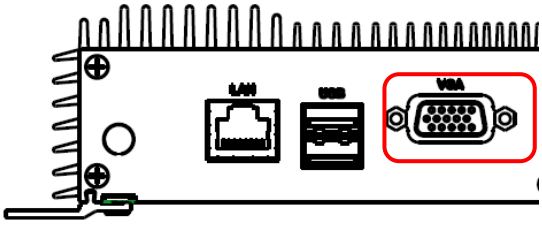
2.1.2 External Serial Port 3/4/5/6 connector (COM3/4/5/6)

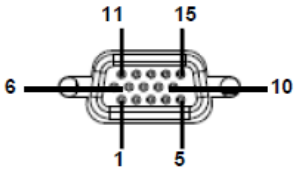




Pin	RS-232	RS-485	RS-422
1	DCD	TXD-/RXD-	TXD-
2	RXD	TXD+/RXD+	TXD+
3	TXD		RXD+
4	DTR		RXD-
5	GND	GND	GND
6	DSR		
7	RTS		
8	CTS		
9	RI		

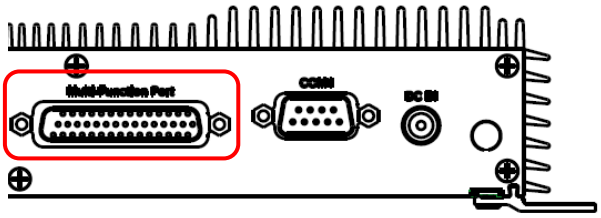
2.1.3 VGA connector (VGA)

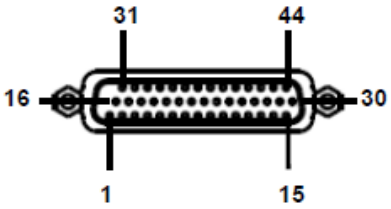




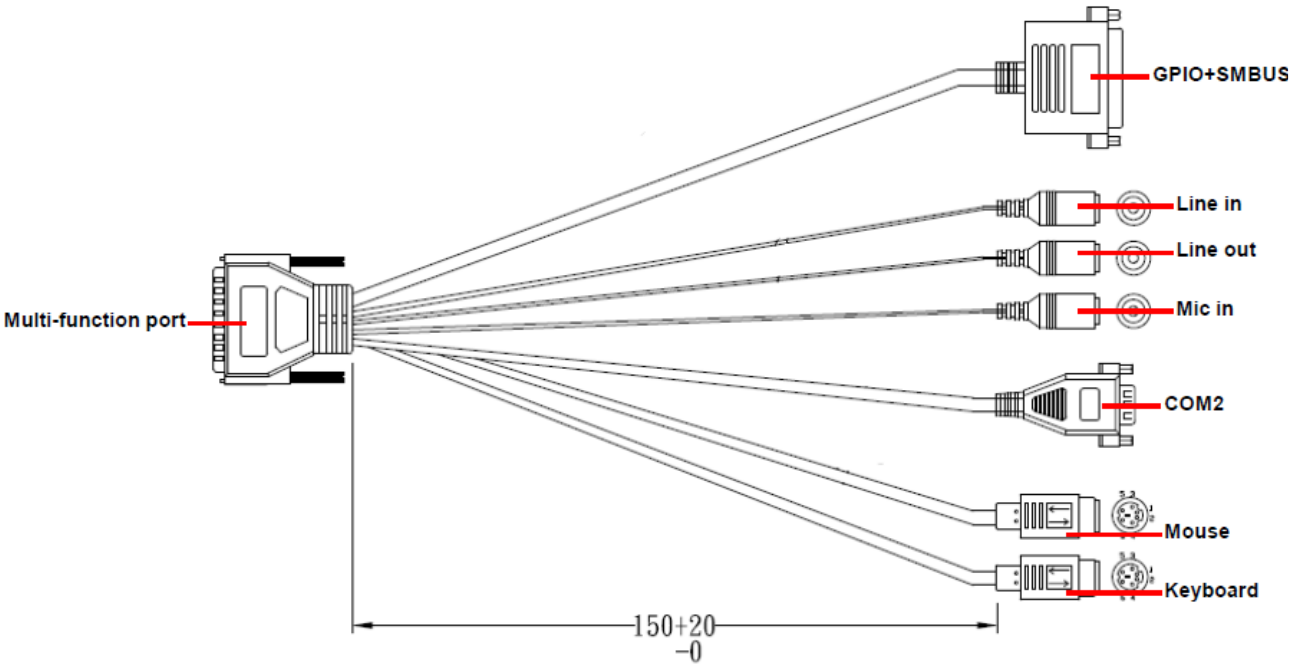
PIN	Signal	PIN	Signal	PIN	Signal
1	RED	6	GND	11	NC
2	GREEN	7	GND	12	DDCDAT
3	BLUE	8	GND	13	HSYNC
4	NC	9	+5V	14	VSYNS
5	GND	10	GND	15	DDCCLK

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

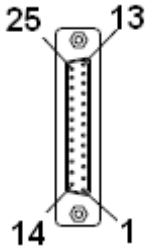




PIN	Signal	PIN	Signal	PIN	Signal
1	LINE1_JD	16	FRONT_JD	31	LINE1_RIN
2	MIC1_JD	17	LINEOUT_R	32	GND
3	MIC_RIN	18	GND	33	LINE1_LIN
4	GND	19	LINEOUT_L	34	+5V
5	MIC_LIN	20	GND	35	DO3
6	DO5	21	DO4	36	DO0
7	DO2	22	DO1	37	DI3
8	DI5	23	DI4	38	DI0
9	DI2	24	DI1	39	SMB_CLK
10	MSCK	25	SMB_DATA	40	NRIB#
11	GND	26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

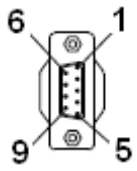


2.1.4.1 GPIO+SMBUS



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

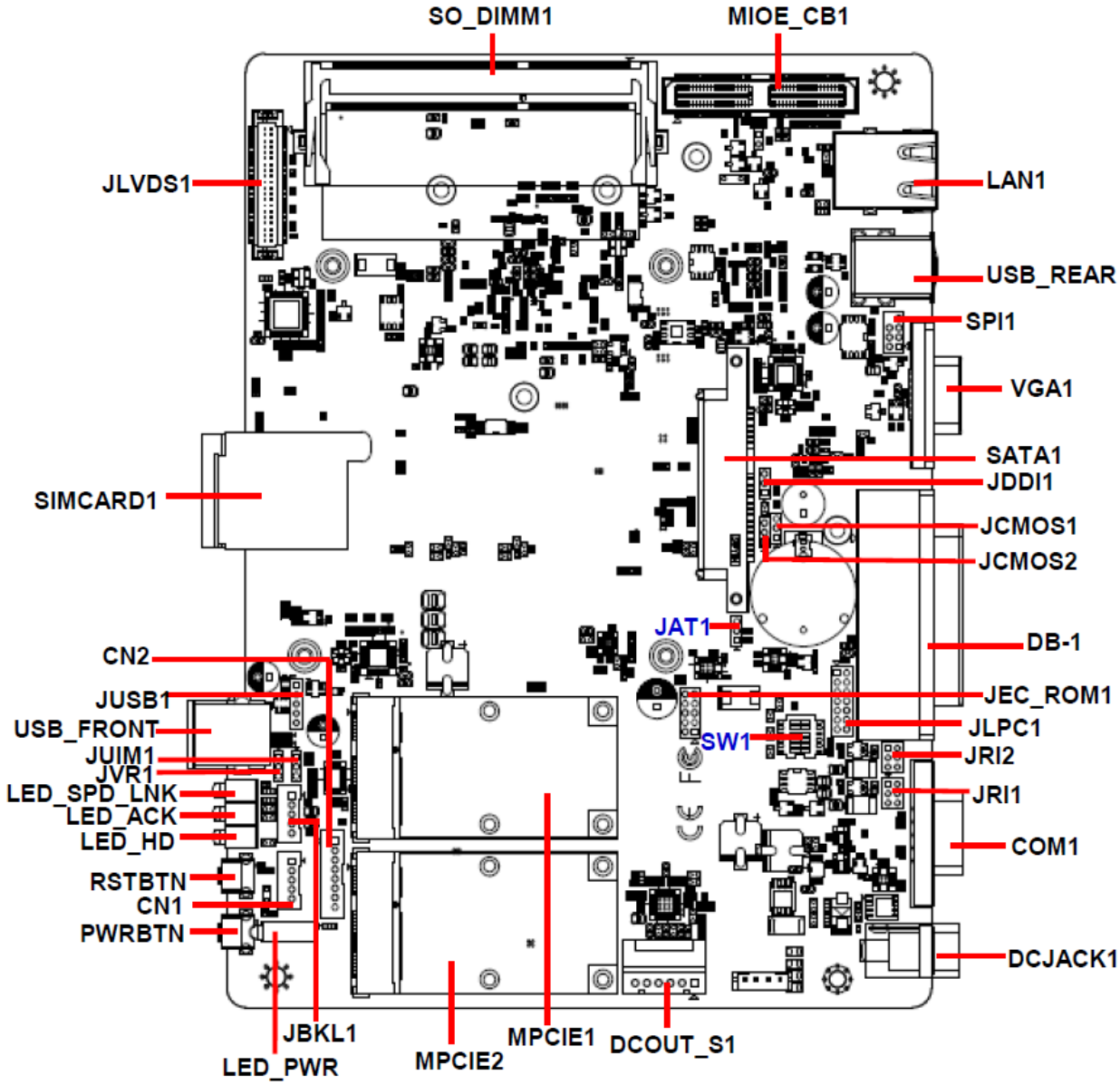
2.1.4.2 COM2



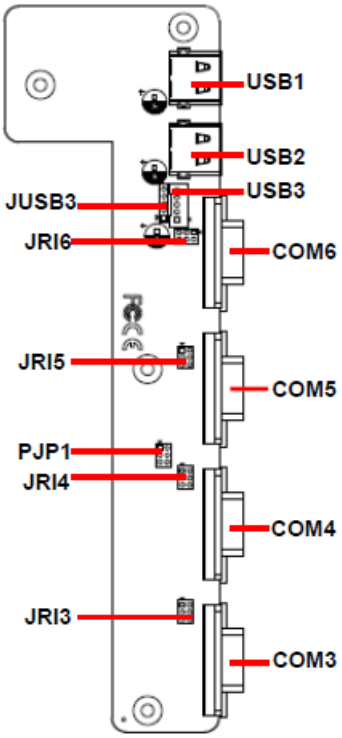
Pin	RS-232	RS-485	RS-422
1	DCD	TXD-/RXD-	TXD-
2	RXD	TXD+/RXD+	TXD+
3	TXD		RXD+
4	DTR		RXD-
5	GND	GND	GND
6	DSR		
7	RTS		
8	CTS		
9	RI		

2.2 EBM-BYTS, AUX-M01, AUX-M02, AUX-M04, AUX-M07, EBM-BYTS DB-A, EBM-CDVS DB-A and EBM-BYTS DB-E Overviews

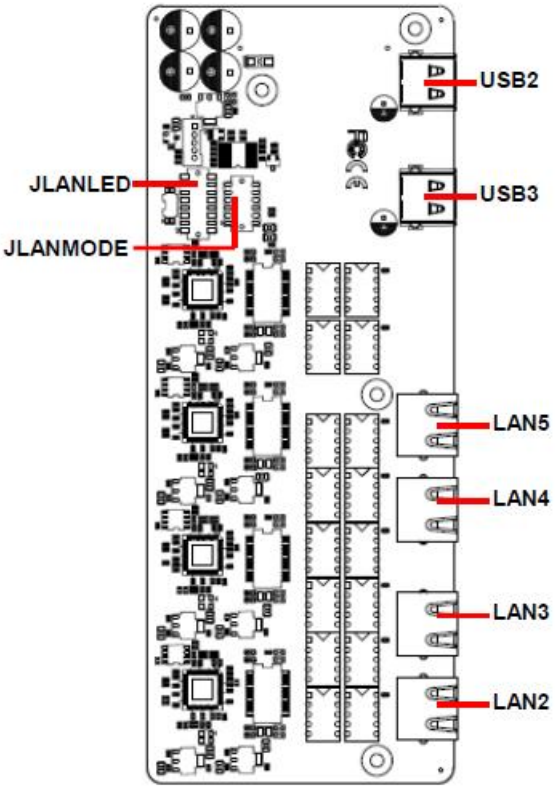
2.2.1 EBM-BYTS



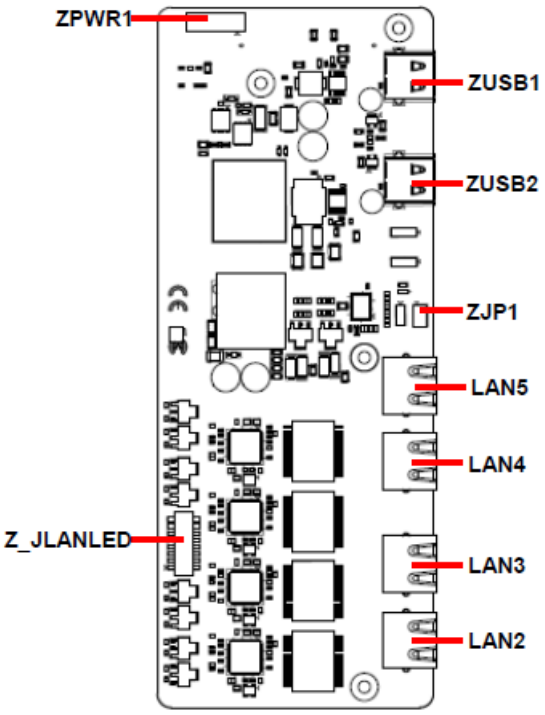
2.2.2 AUX-M01



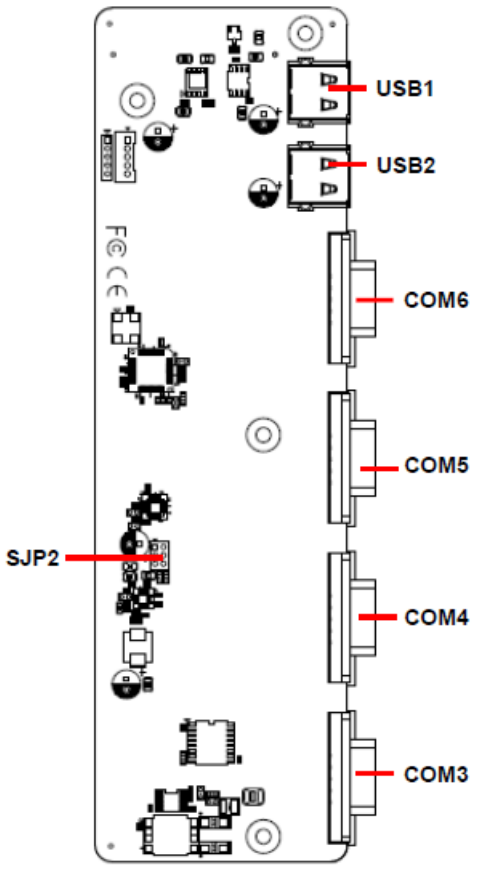
2.2.3 AUX-M02



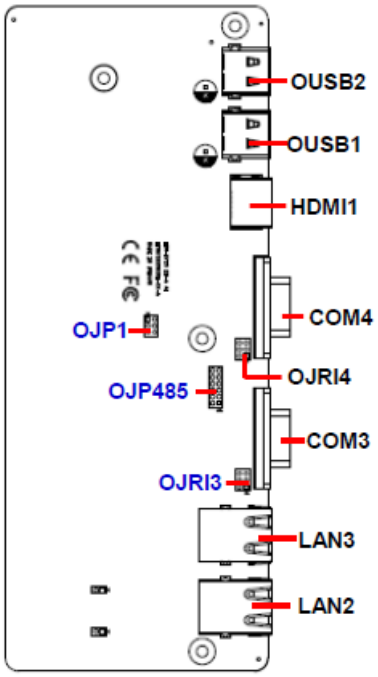
2.2.4 AUX-M04



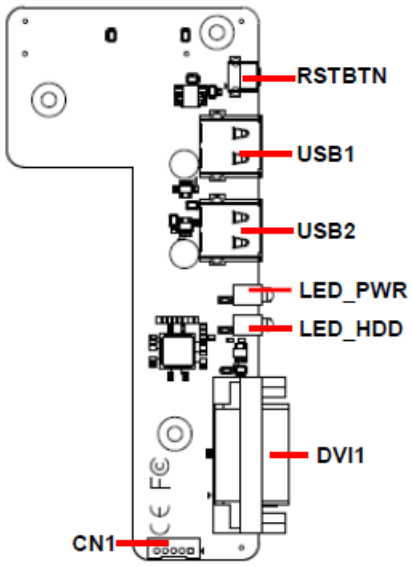
2.2.5 AUX-M07



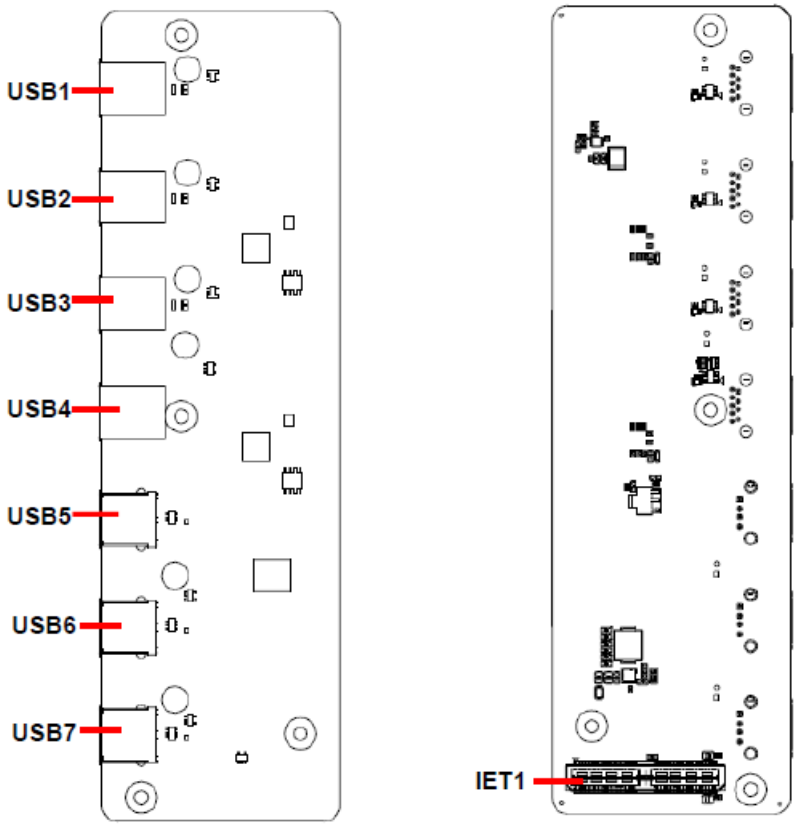
2.2.6 EBM-BYTS DB-A



2.2.7 EBM-CDVS DB-A



2.2.8 EBM-BYTS DB-E



2.3 EBM-BYTS Jumper & Connector list

Jumpers

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

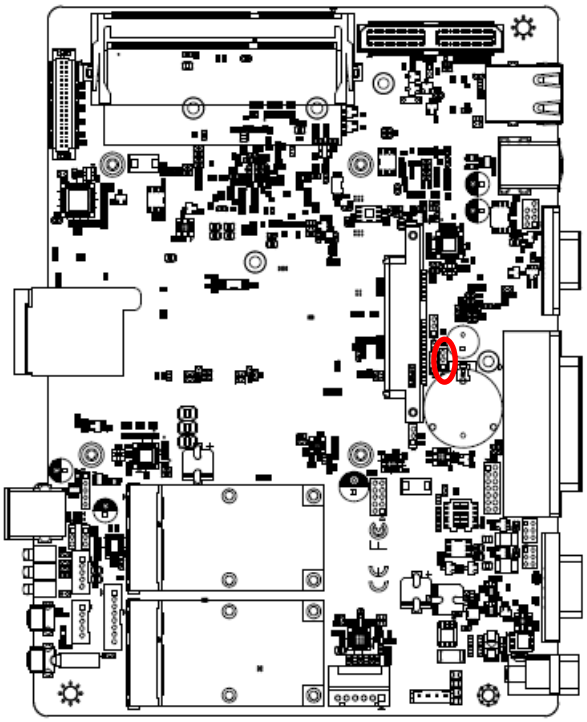
Connectors

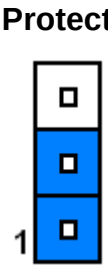
Label	Function	Note
USB_REAR	USB connector	
USB_FRONT	USB connector	
JUSB1	On-board header for USB2.0	5 x 1 header, pitch 2.00 mm
LAN1	LAN connector	
VGA1	VGA connector	
DB-1	Multi-function port	1. COM2 2. Audio(line-in, line-out, mic-in) 3. 2 x PS/2 for KB/MS 4. 12 bit GPIO/SMBUS
COM1	Serial port connector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

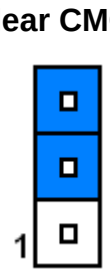
SO_DIMM1	DDR3 SODIMM connector	
MIOE_CB1	IET Expansion slot	
JLPC1	LPC port connector	7 x 2 header, pitch 2.00 mm
SPI1	SPI connector	4 x 2 header, pitch 2.00 mm
JBKL1	LCD inverter connector	5 x 1 wafer, pitch 2.00 mm
SATA1	Serial ATA connector 1	
CN1	Front Panel connector 1	5 x 1 wafer, pitch 2.00 mm
CN2	Front Panel connector 2	8 x 1 wafer, pitch 2.00 mm
DCOUT_S1	DC Output connector	6 x 1 wafer, pitch 2.00 mm
JEC_ROM1	EC Debug connector	5 x 2 header, pitch 2.00 mm

2.4 EBM-BYTS Jumpers & Connectors settings

2.4.1 Clear CMOS (JCMOS1)

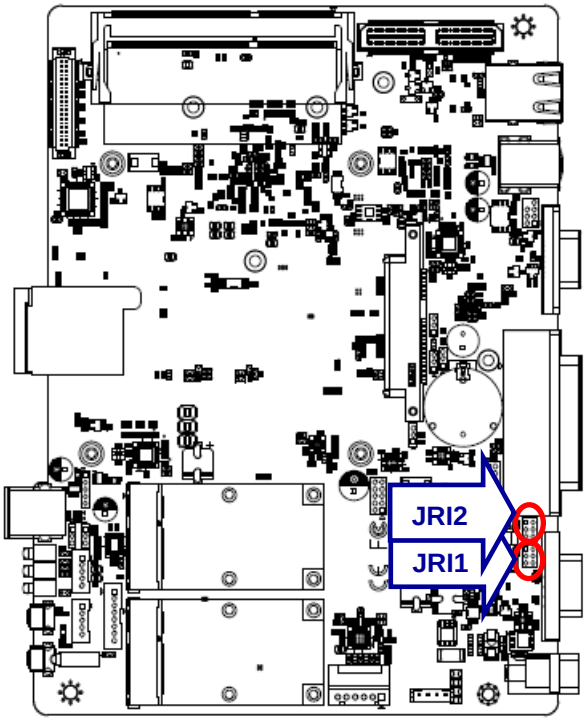


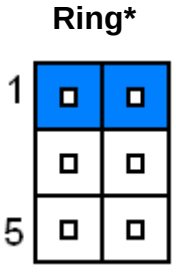


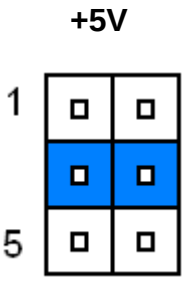


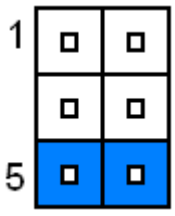
***Default**

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



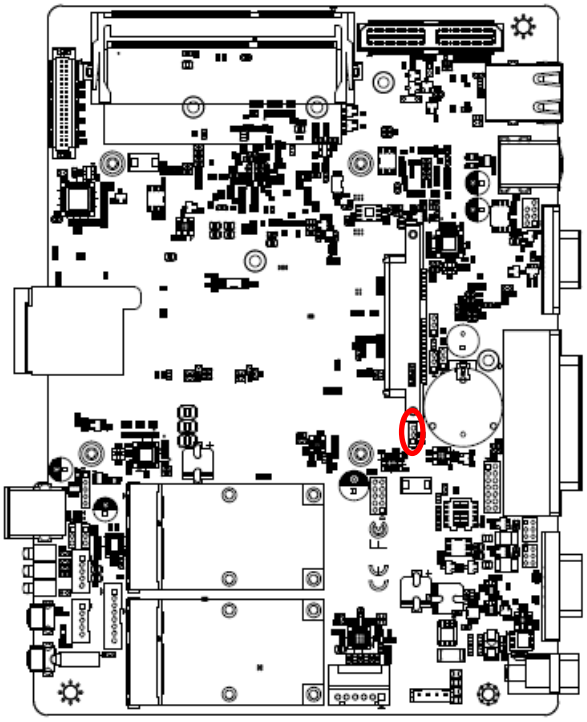




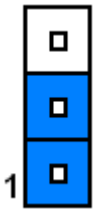


*** Default**

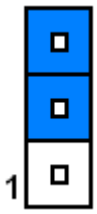
2.4.3 AT/ ATX Input power select (JAT1)



AT*

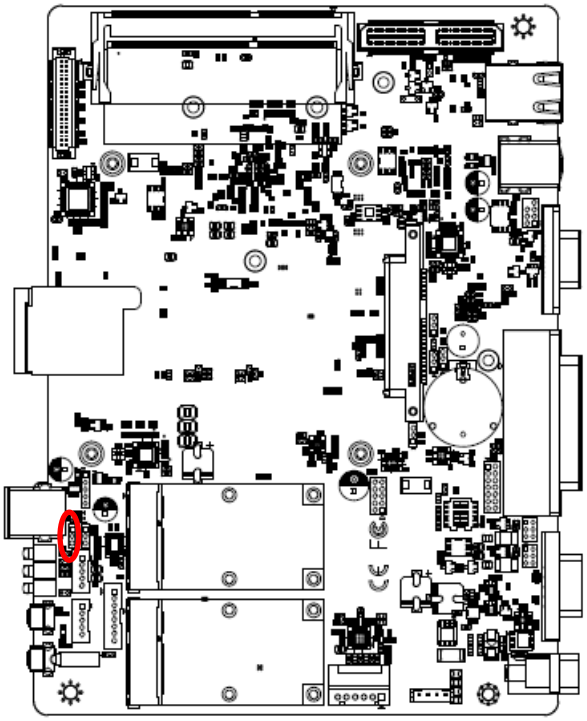


ATX

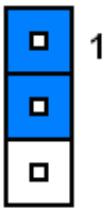


***Default**

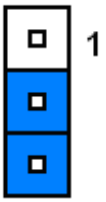
2.4.4 LCD backlight brightness adjustment (JVR1)



PWM Mode*

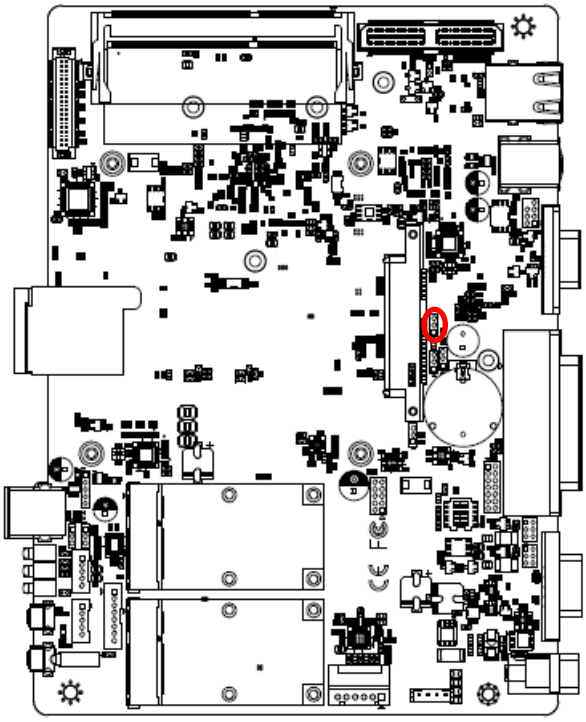


DC Mode

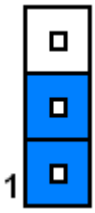


*** Default**

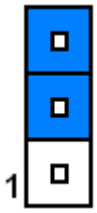
2.4.5 IET interface DP mode select (JDDI1)



HDMI/DVI

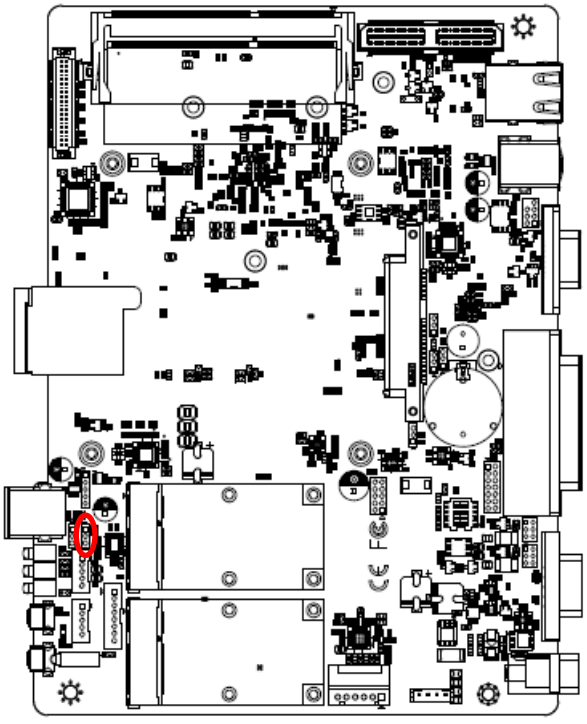


Display Port*

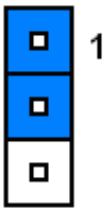


***Default**

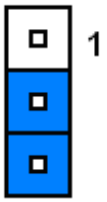
2.4.6 UIM Switch select (JUIM1)



UIM on MPCIE1

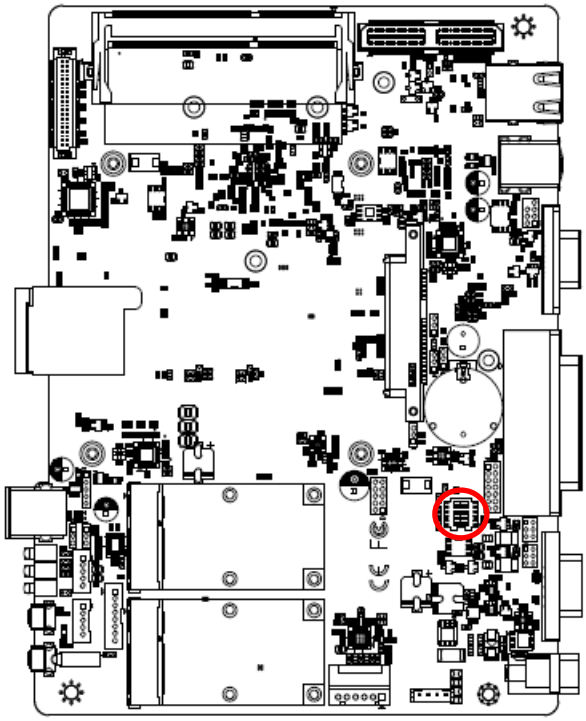


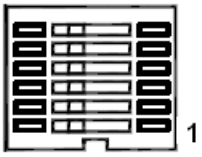
UIM on MPCIE2*



*** Default**

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





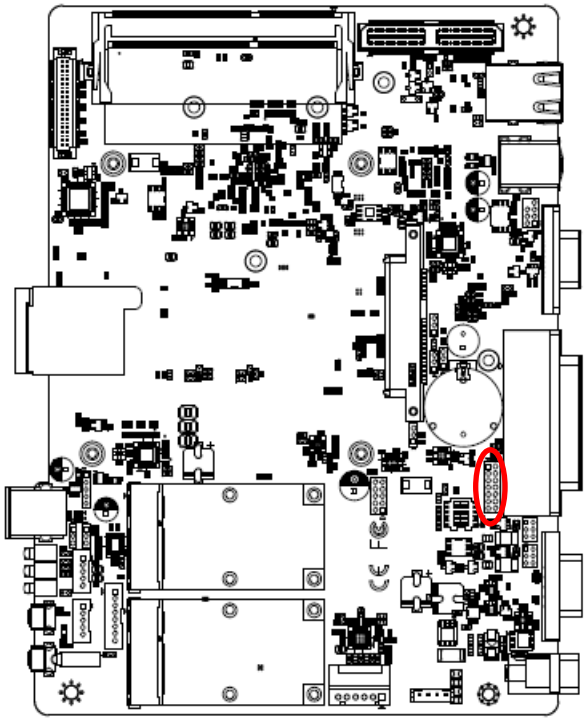
In Serial Port 1 mode

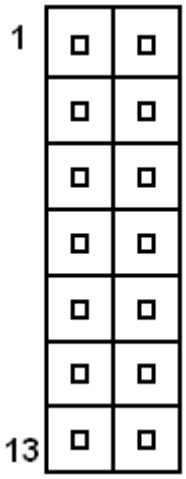
	ON	OFF
1	Auto Direction	RTS# Control*
2	485TXP external biasing resistor	OPEN*
3	485TXN external biasing resistor	OPEN*

In Serial Port 2 mode

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

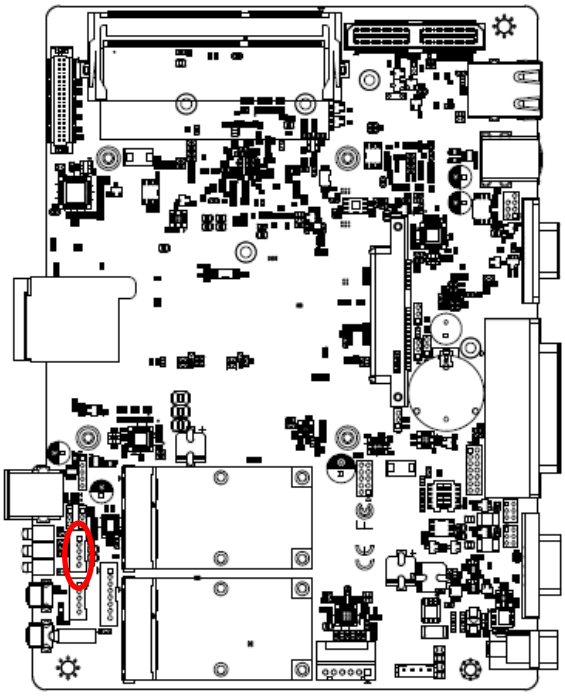
2.4.8 LPC port connector (JLPC1)

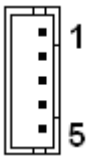




Signal	PIN	PIN	Signal
LPC_AD0	1	2	+3.3V
LPC_AD1	3	4	LPC_PORT80_RST#
LPC_AD2	5	6	LPC_FRAME#
LPC_AD3	7	8	LPC1_PORT80_CLK
SERIRQ	9	10	GND
+5V	11	12	GND
+5VSB	13	14	NC

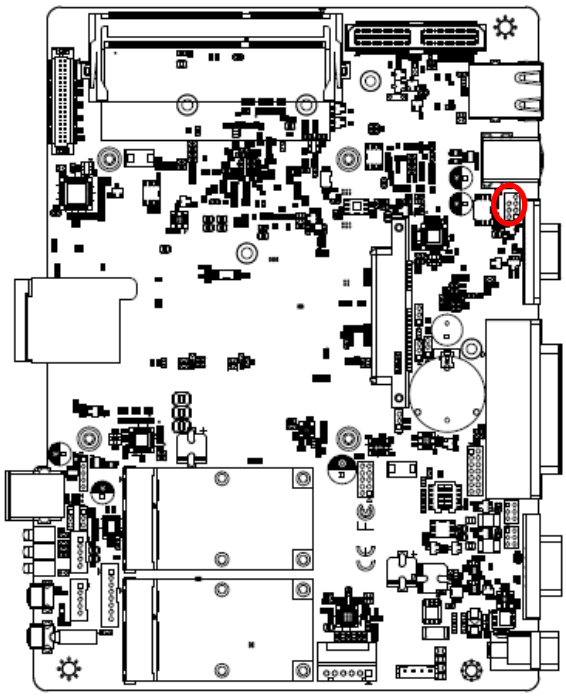
2.4.9 LCD inverter connector (JBKL1)

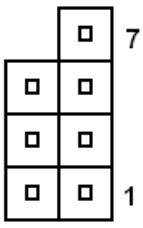




Signal	PIN
+12V	1
GND	2
BKLEN	3
VBRIGHT	4
+5V	5

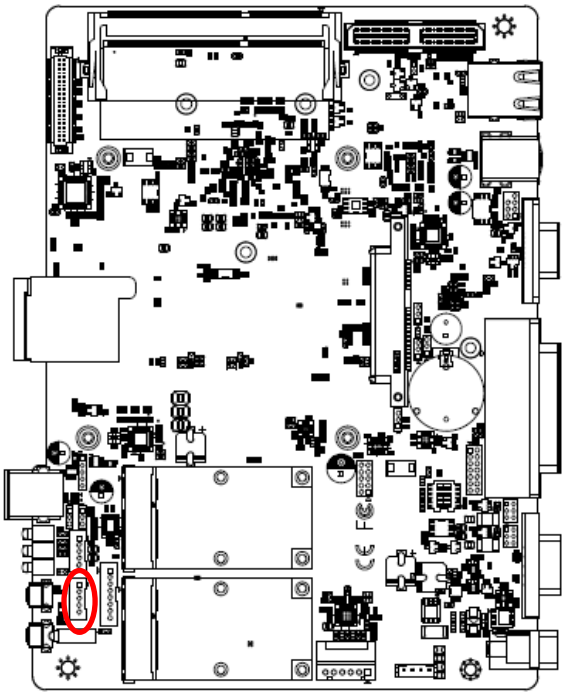
2.4.10 SPI connector (SPI1)

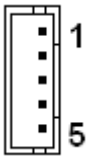




Signal	PIN	PIN	Signal
		7	SPI_HOLD#
SPI_ROM_MOSI	6	5	SPI_ROM_MISO_R
SPI_ROM_CLK	4	3	SPI_ROM_CS#
GND	2	1	+VSPI_BIOS

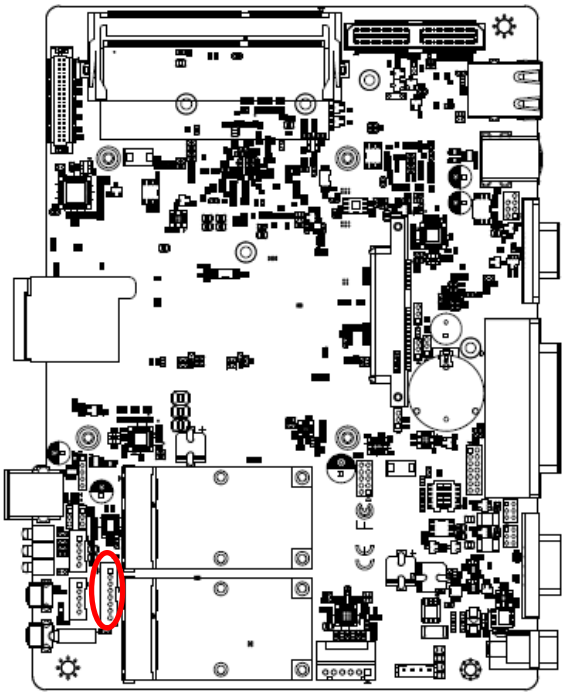
2.4.11 Front Panel Connector 1 (CN1)

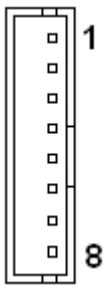




Signal	PIN
PWR_BTN_IN#	1
SYSRST#	2
GND	3
+5VSB	4
PWR_LED-	5

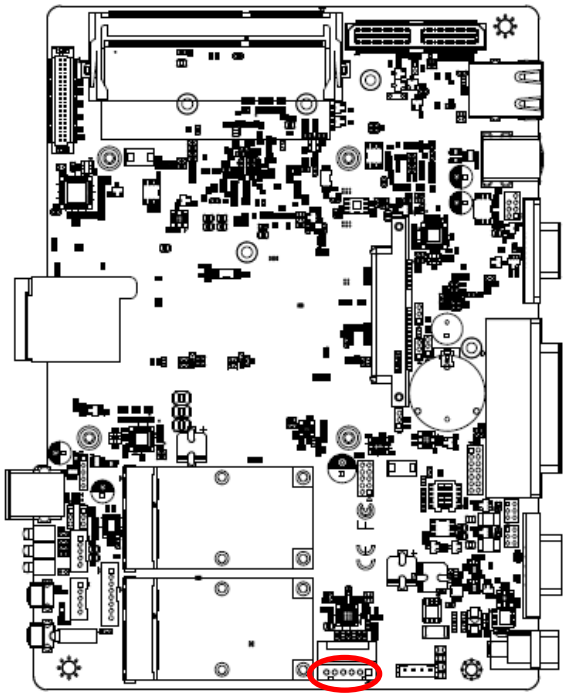
2.4.12 Front Panel Connector 2 (CN2)

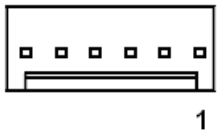




Signal	PIN
+3.3V	1
SATA_5V_LED#	2
+3.3VSB	3
LAN1_LED_ACT_n	4
+3.3VSB	5
LAN1_LED_100#_n	6
+3.3VSB	7
LAN1_LED_1000#_n	8

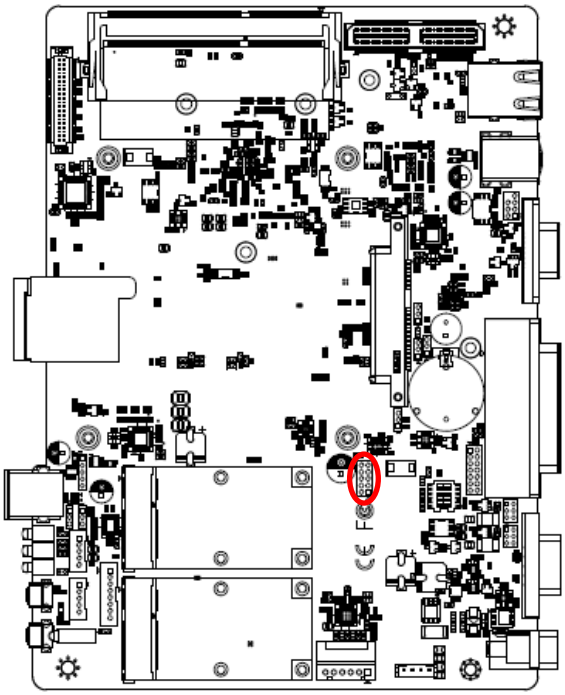
2.4.13 DC Output connector (DCOUT_S1)

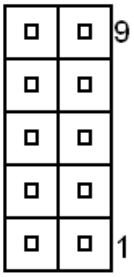




Signal	PIN
DC_OUT	1
DC_OUT	2
DC_OUT	3
GND	4
GND	5
GND	6

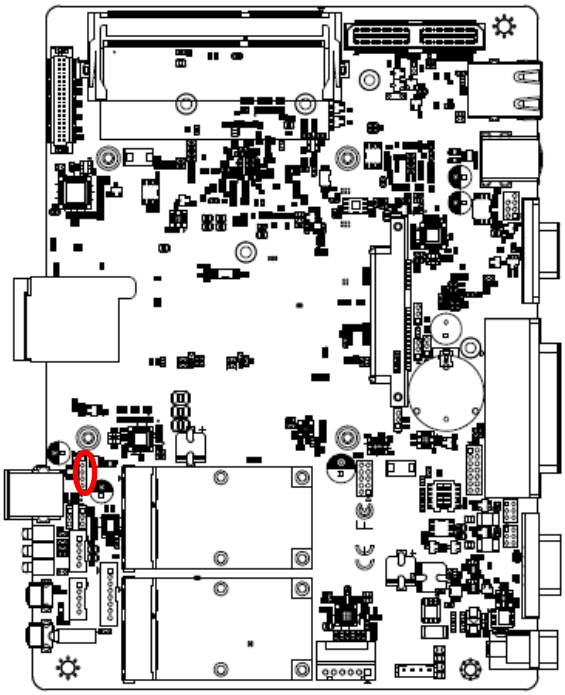
2.4.14 EC Debug connector (JEC_ROM1)

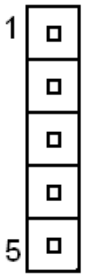




Signal	PIN	PIN	Signal
EC_SMDAT_DEBUG	10	9	EC_SMCLK_DEBUG
NC	8	7	EC_HOLD#
EC_FMOSI	6	5	EC_FMISO
EC_FSCK	4	3	EC_FSCE#
GND	2	1	+VSPI_EC

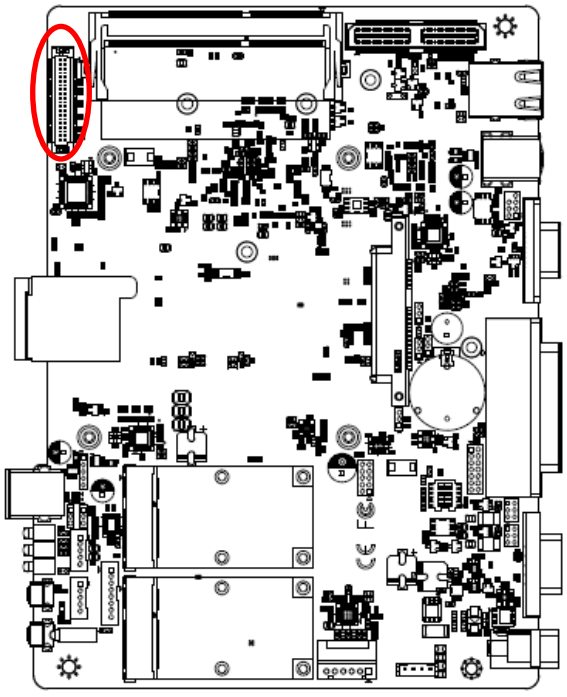
2.4.15 On-board header for USB2.0 (JUSB1)

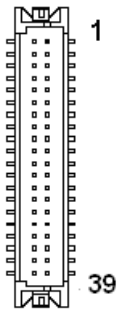




Signal	PIN
USBVCC_HEADER	1
USB_HUB2_DN_1	2
USB_HUB2_DP_1	3
GND	4
GND	5

2.4.16 LVDS connector (JLVDS1)





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

2.5 AUX-M01, AUX-M02, AUX-M04, AUX-M07, EBM-BYTS DB-A and EBM-CDVS DB-A Jumper & Connector list

2.5.1 AUX-M01

Jumpers

Label	Function	Note
JRI3/4/5/6	COM 3/4/5/6 pin 9 signal select	3 x 2 header, pitch 2.00mm

Connectors

Label	Function	Note
USB1~2	USB connector 1~2	
USB3	USB connector 3	5 x 1 wafer, pitch 2.00mm
JUSB3	USB connector 3	5 x 1 header, pitch 2.00mm
COM3~6	Serial port connector 3~6	
PJP1	SMBUS of TCA9555 address setting	3 x 2 header, pitch 2.00mm

2.5.2 AUX-M02

Connectors

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

2.5.3 AUX-M04

Jumpers

Label	Function	Note
ZJP1	Operating Modes select	3 x 2 header, pitch 2.00mm

Connectors

Label	Function	Note
ZUSB1~2	USB connector 1~2	
LAN2~5	LAN connector 2~5	
ZPWR1	Power connector	6 x 1 wafer, pitch 2.00mm
Z_JLANLED	LAN ACT/LNK/SPD LED	8 x 2 wafer, pitch 2.00mm

2.5.4 AUX-M07

Connectors

Label	Function	Note
USB1~2	USB connector 1~2	
COM3~6	Serial port connector 3~6	
SJP2	SMBUS of TCA9555 address setting	3 x 2 header, pitch 2.00mm

2.5.5 EBM-BYTS DB-A

Jumpers

Label	Function	Note
OJRI3/4	COM 3/4 pin 9 signal select	3 x 2 header, pitch 2.00mm

Connectors

Label	Function	Note
OUSB1~2	USB connector 1~2	
LAN2~3	LAN connector 2~3	
COM3~4	Serial port connector 3~4	
HDMI1	HDMI connector	3 x 2 header, pitch 2.00mm
OJP485	Serial port 1/ 2 – RS485 mode select	6 x 2 header, pitch 2.00mm
OJP1	SMBUS of TCA9555 address setting	3 x 2 header, pitch 2.00mm

2.5.6 EBM-CDVS DB-A

Connectors

Label	Function	Note
USB1~2	USB connector 1~2	
PWRBTN	Power button	
LED_PWR	LED Power	
LED_HDD	LED HDD	
CN1	Front Panel connector 1	5 x 1 wafer, pitch 2.00 mm
DVI1	DVI connector	

2.5.7 EBM-BYTS DB-E

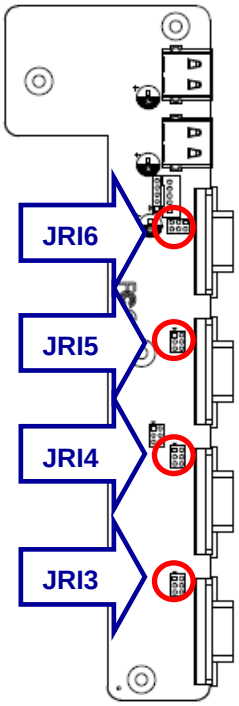
Connectors

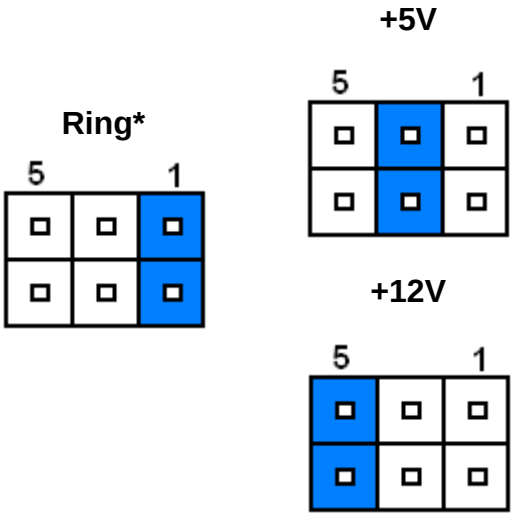
Label	Function	Note
USB1~3	3 x USB2.0 connector	

USB4~7	4 x USB3.0 connector
IET1	IET Expansion slot

2.6 AUX-M01 Jumpers & Connectors settings

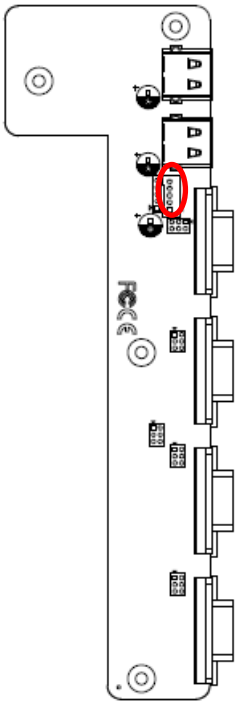
2.6.1 COM 3/4/5/6 pin 9 signal select (JRI3/4/5/6)





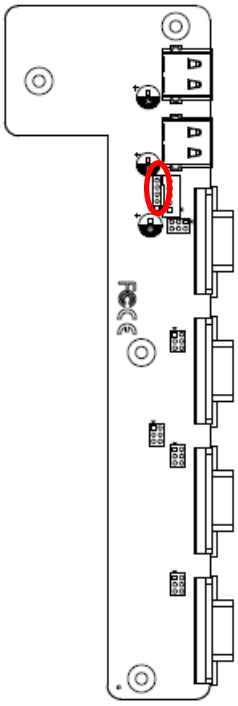
*** Default**

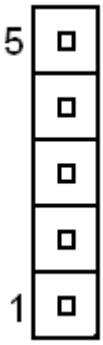
2.6.2 USB connector (USB3)



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

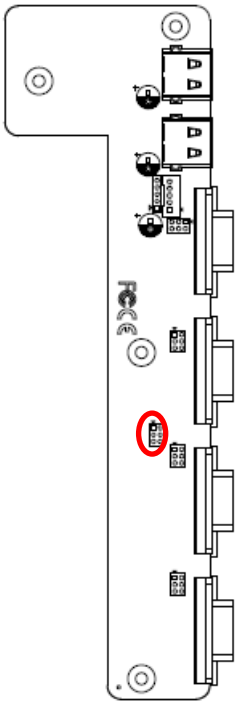
2.6.3 USB connector (JUSB3)

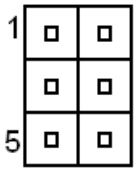




Signal	PIN
GND	5
GND	4
PUSBP3	3
PUSBN3	2
PV5A_USB3	1

2.6.4 SMBUS of TCA9555 address setting (PJP1)

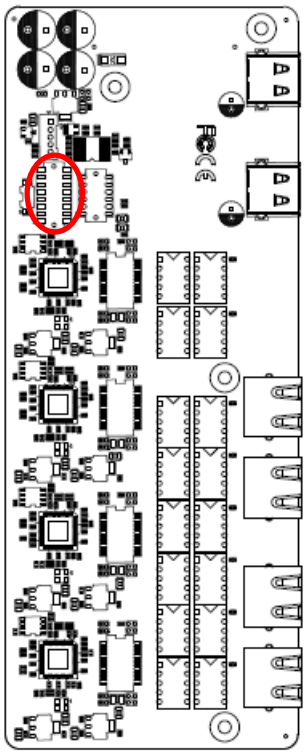


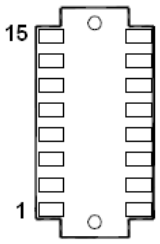


Signal	PIN	PIN	Signal
GND	1	2	MC_9555A0
GND	3	4	MC_9555A1
GND	5	6	MC_9555A2

2.7 AUX-M02 Connectors settings

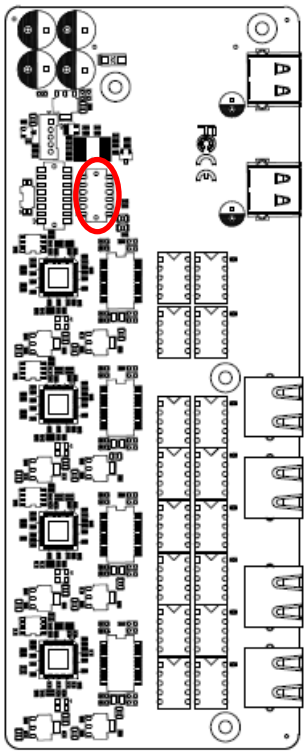
2.7.1 LAN ACT/LNK/SPD LED (JLANLED)

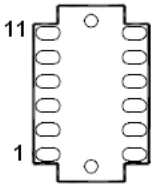




Signal	PIN	PIN	Signal
Z_LAN_LED_1000#_3	15	16	Z_LAN_LED_1000#_1
Z_LAN_LED_100#_3	13	14	Z_LAN_LED_100#_1
Z_LAN_LED_ACT_3	11	12	Z_LAN_LED_ACT_1
+3.3VSB	9	10	+3.3VSB
Z_LAN_LED_1000#_4	7	8	Z_LAN_LED_1000#_2
Z_LAN_LED_100#_4	5	6	Z_LAN_LED_100#_2
Z_LAN_LED_ACT_4	3	4	Z_LAN_LED_ACT_2
+3.3VSB	1	2	+3.3VSB

2.7.2 Normal/Bypass mode LED (JLANMODE)

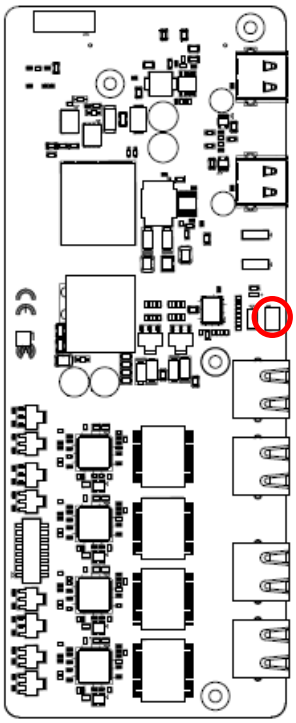


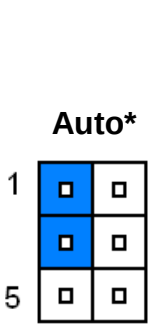


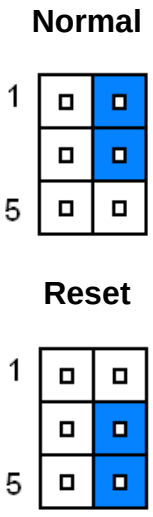
Signal	PIN	PIN	Signal
Z_RC5_LAN23-STA	11	12	Z_RC7_LAN45-STA
Z_+VLED	9	10	Z_+VLED
Z_RA4_LAN23-BYP	7	8	Z_RA1_LAN45-BYP
Z_+VLED	5	6	Z_+VLED
Z_RC6_LAN23-NOR	3	4	Z_RC4_LAN45-NOR
Z_+VLED	1	2	Z_+VLED

2.8 AUX-M04 Jumpers & Connectors settings

2.8.1 Operating Modes select (ZJP1)

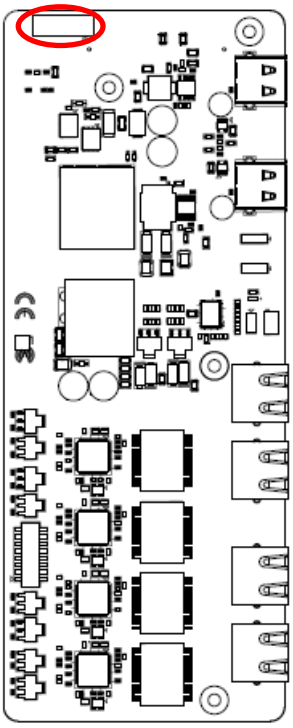


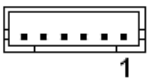




*** Default**

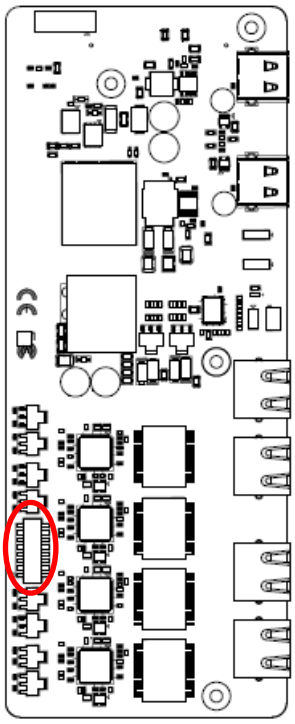
2.8.2 Power connector (ZPWR1)

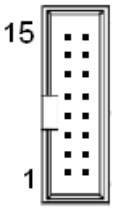




Signal	PIN
+V12-28V	1
+V12-28V	2
+V12-28V	3
GND	4
GND	5
GND	6

2.8.3 LAN ACT/LNK/SPD LED (Z_JLANLED)

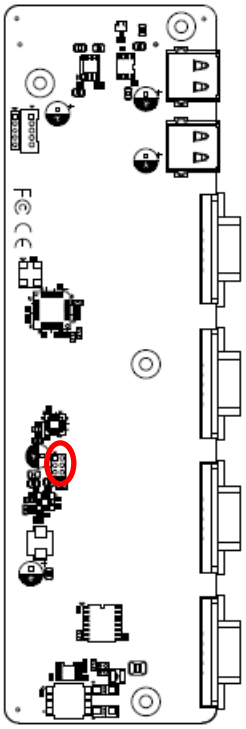


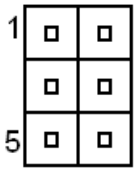


Signal	PIN	PIN	Signal
Z_LAN_LED_1000#_3	15	16	Z_LAN_LED_1000#_1
Z_LAN_LED_100#_3	13	14	Z_LAN_LED_100#_1
Z_LAN_LED_ACT_3	11	12	Z_LAN_LED_ACT_1
+3.3VSB	9	10	+3.3VSB
Z_LAN_LED_1000#_4	7	8	Z_LAN_LED_1000#_2
Z_LAN_LED_100#_4	5	6	Z_LAN_LED_100#_2
Z_LAN_LED_ACT_4	3	4	Z_LAN_LED_ACT_2
+3.3VSB	1	2	+3.3VSB

2.9 AUX-M07 Connector settings

2.9.1 SMBUS of TCA9555 address setting (SJP2)

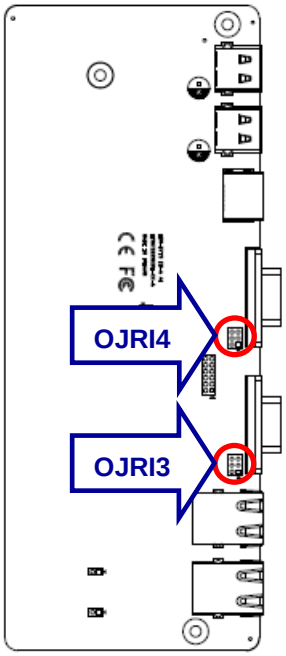


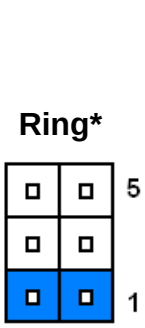


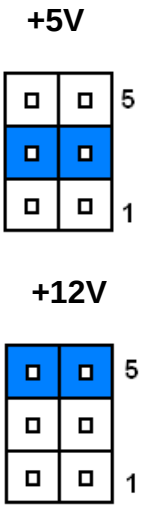
Signal	PIN	PIN	Signal
GND	1	2	SMC_9555A0
GND	3	4	SMC_9555A1
GND	5	6	SMC_9555A2

2.10 EBM-BYTS DB-A Jumpers & Connectors settings

2.10.1 COM 3/4 pin 9 signal select (OJRI3/4)

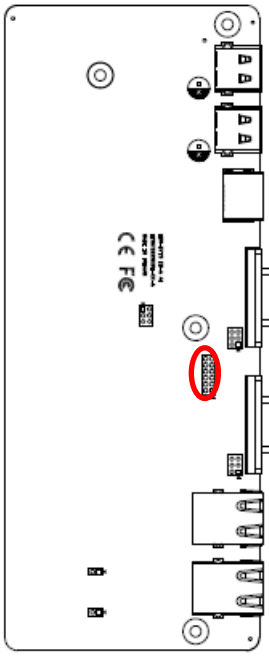


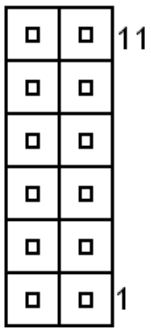




*** Default**

2.10.2 Serial port 1/ 2 – RS485 mode select (OJP485)





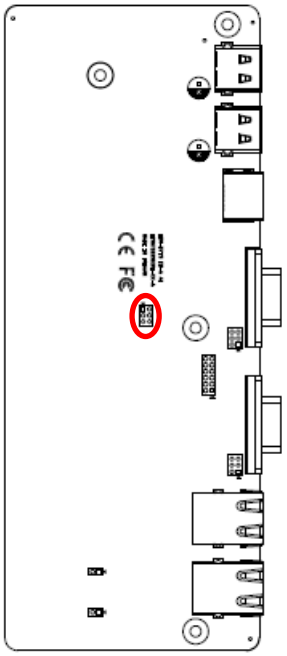
In Serial Port 1 mode

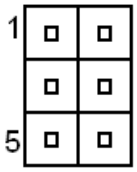
PIN	ON	NC
1-2	Auto Direction	RTS# Control*
3-4	485TXP external biasing resistor	OPEN*
5-6	485TXN external biasing resistor	OPEN*

In Serial Port 2 mode

	ON	NC
7-8	Auto Direction	RTS# Control*
9-10	485TXP external biasing resistor	OPEN*
11-12	485TXN external biasing resistor	OPEN*

2.10.3 SMBUS of TCA9555 address setting (OJP1)

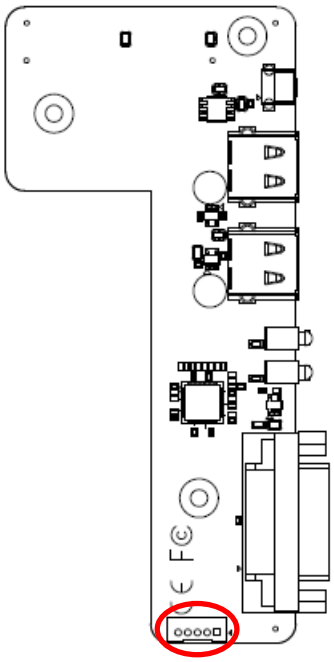


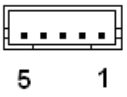


Signal	PIN	PIN	Signal
GND	1	2	MC_9555A0
GND	3	4	MC_9555A1
GND	5	6	MC_9555A2

2.11 EBM-CDVS DB-A Connector settings

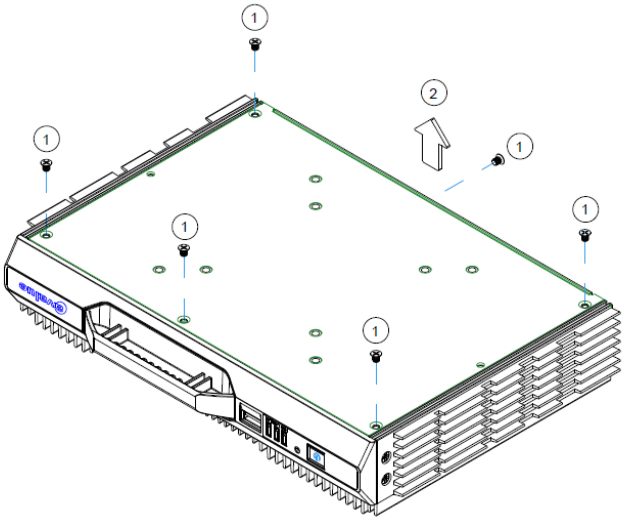
2.11.1 Front Panel Connector 1 (CN1)





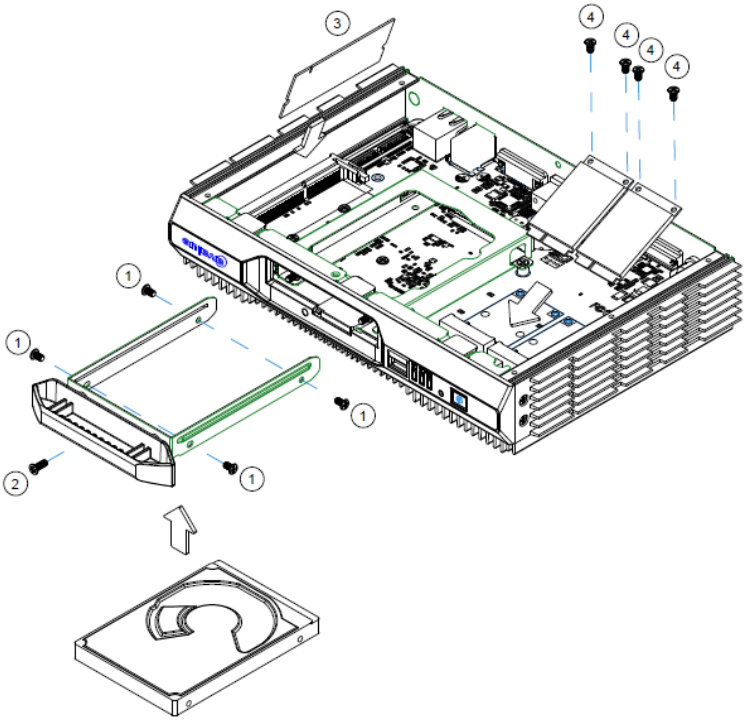
Signal	PIN
NC	1
SYSRST#	2
GND	3
SATA_LED#	4
PWRSB_LED-	5

2.12 Installing Hard Disk & Memory, PCI devices (EMS-BYT/BYTC1 Series)



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

Step 2. Remove the chassis cover.



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

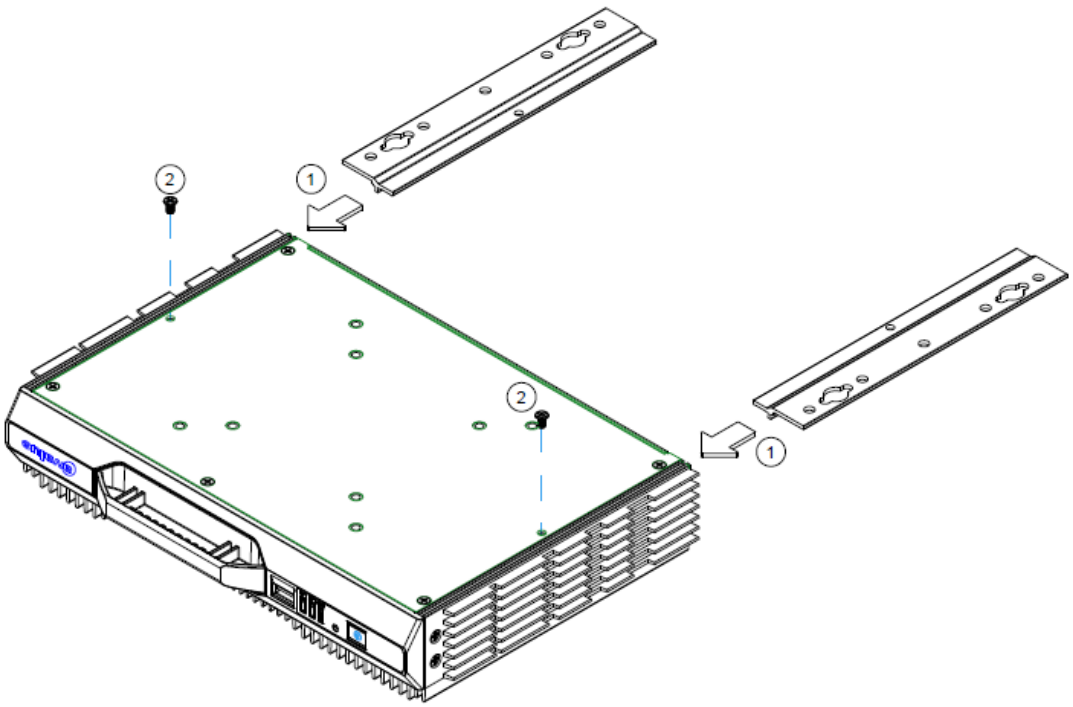
Step 2.1 Slide HDD into its bracket until properly seated.

Step 2.2 Secure HDD by means of 5 screws.

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

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

2.13 Installing Mounting Brackets (EMS-BYT/BYTC1 Series)



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

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

3.BIOS Setup

3.1 Introduction

The BIOS setup program allows users to modify the basic system configuration. In this following chapter will describe how to access the BIOS setup program and the configuration options that may be changed.

3.2 Starting Setup

The AMI BIOS™ is immediately activated when you first power on the computer. The BIOS reads the system information contained in the NVRAM and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of two ways:
By pressing <Del> or <F2> immediately after switching the system on, or
By pressing the <Del> or <F2> key when the following message appears briefly at the left-top of the screen during the POST (Power On Self Test).

Press <Del> or <F2> to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to.

Press F1 to Continue, DEL to enter SETUP

3.3 Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

Button	Description
↑	Move to previous item
↓	Move to next item
←	Move to the item in the left hand
→	Move to the item in the right hand
Esc key	Main Menu -- Quit and not save changes into NVRAM Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 key	Previous Values.
F3 key	Optimized defaults
F4 key	Save & Exit Setup

- **Navigating Through The Menu Bar**

  Use the left and right arrow keys to choose the menu you want to be in.

Note: Some of the navigation keys differ from one screen to another.

- **To Display a Sub Menu**

  Use the arrow keys to move the cursor to the sub menu you want. Then press <Enter>. A "➢" pointer marks all sub menus.

3.4 Getting Help

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the F1 key again.

3.5 In Case of Problems

If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the AMI BIOS supports an override to the NVRAM settings which resets your system to its defaults.

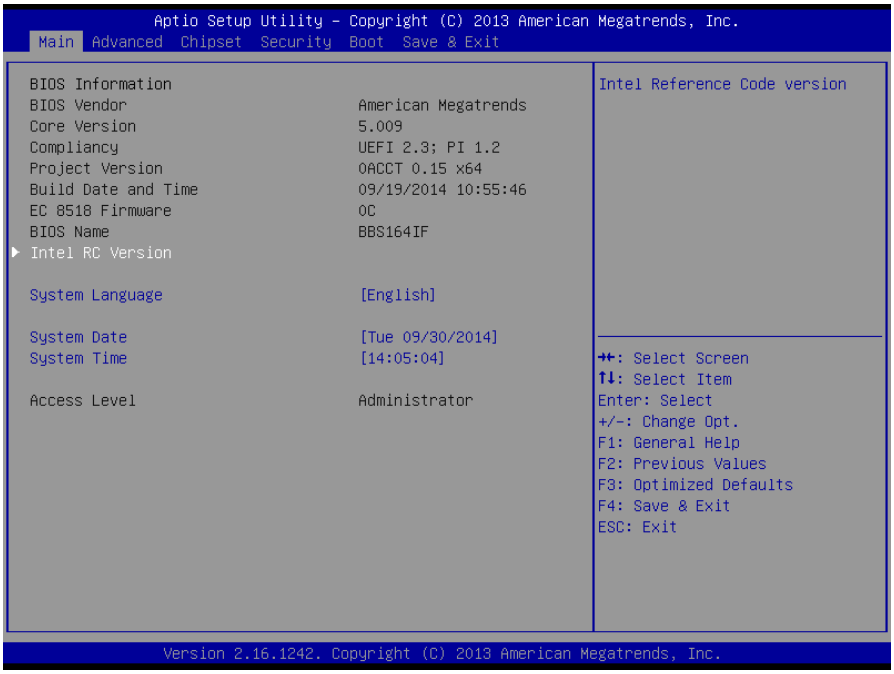
The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both BIOS Vendor and your systems manufacturer to provide the absolute maximum performance and reliability. Even a seemingly small change to the chipset setup has the potential for causing you to use the override.

3.6 BIOS setup

Once you enter the Aptio Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

3.6.1 Main Menu

This section allows you to record some basic hardware configurations in your computer and set the system clock.



3.6.1.1 System Language

This option allows choosing the system default language.

3.6.1.2 System Date

Use the system date option to set the system date. Manually enter the day, month and year.

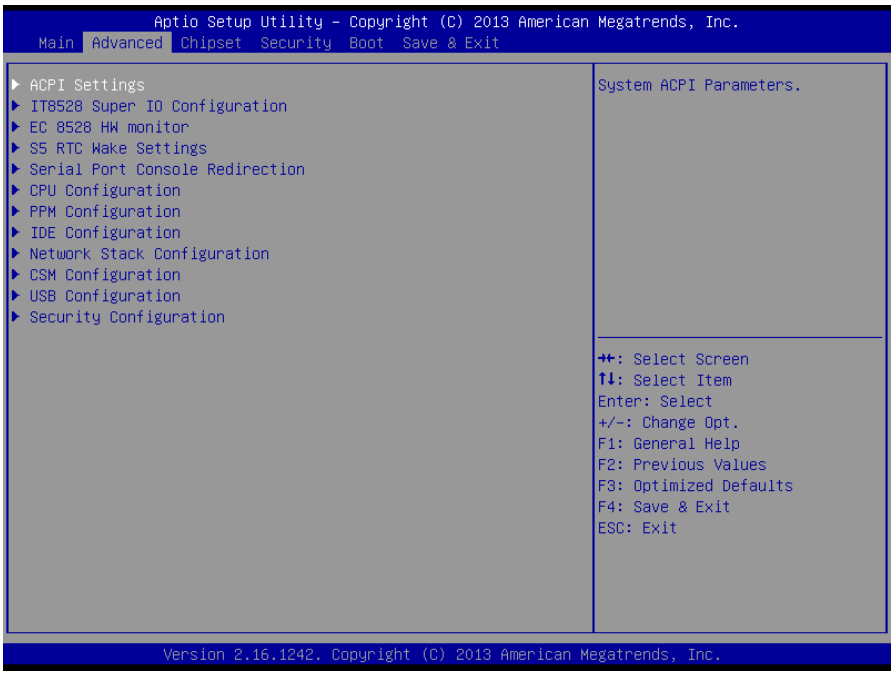
3.6.1.3 System Time

Use the system time option to set the system time. Manually enter the hours, minutes and seconds.

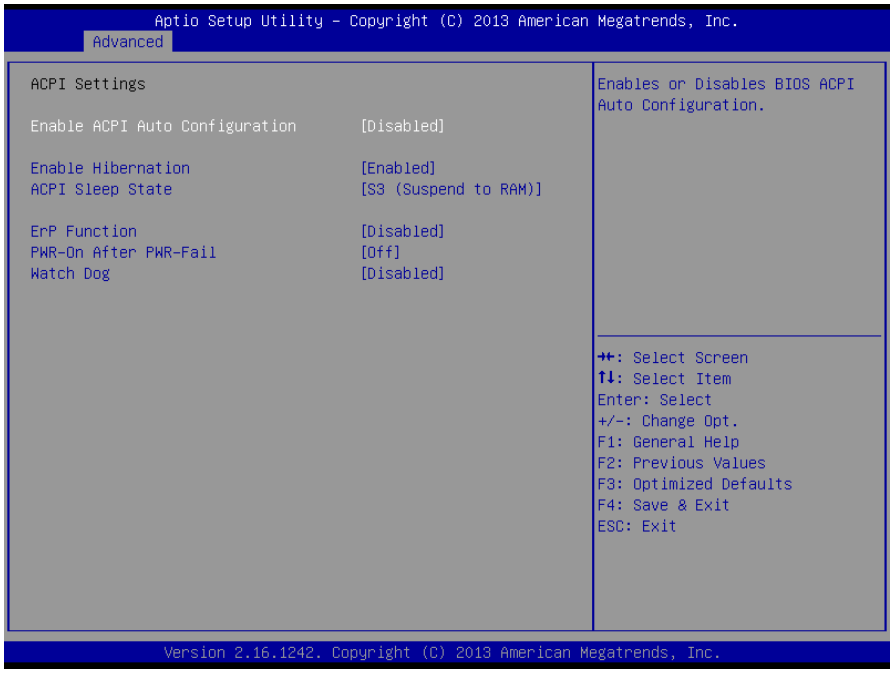
Note: The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen.
Visit the Avalue website (www.avalue.com.tw) to download the latest product and BIOS information.

3.6.2 Advanced Menu

This section allows you to configure your CPU and other system devices for basic operation through the following sub-menus.



3.6.2.1 ACPI Settings

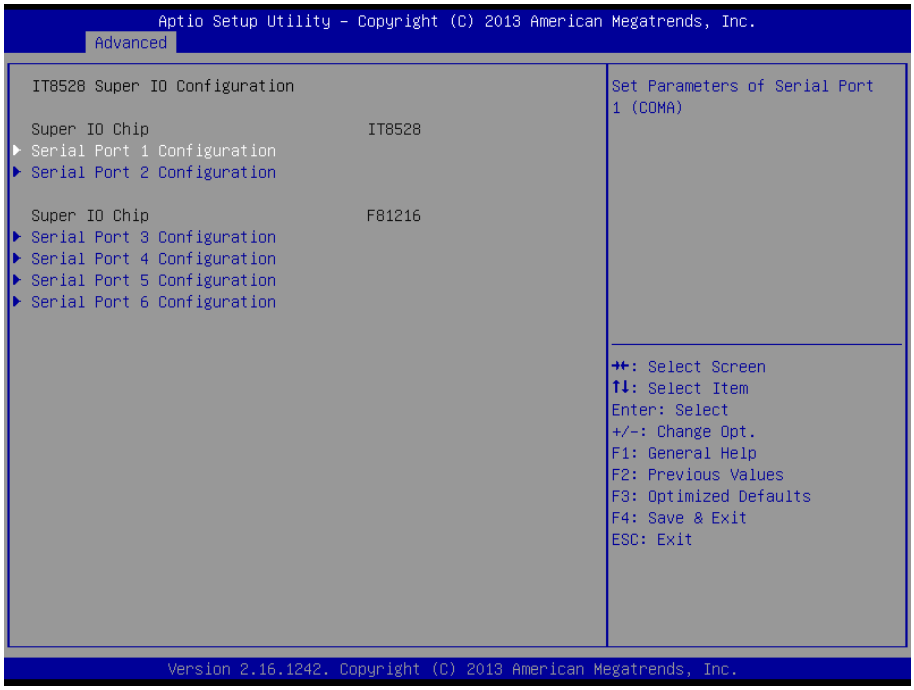


Item	Options	Description
Enable ACPI Auto Configuration	Disabled**[Default]**, Enabled	Enables or Disables BIOS ACPI Auto Configuration.
Enable Hibernation	Disabled Enabled**[Default]**,	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some

		OS.
ACPI Sleep State	Suspend Disabled, S3 (Suspend to RAM) **[Default]**	Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.
ErP Function	Disabled**[Default]**, Enabled	ErP Function (Deep S5).
PWR-On After PWR-Fail	Off**[Default]** On Last state	AC loss resume.
Watch Dog	Disabled**[Default]**, 30 sec 40 sec 50 sec 1 min 2 min 10 min 30 min	Select WatchDog.

3.6.2.2 IT8528 Super IO Configuration

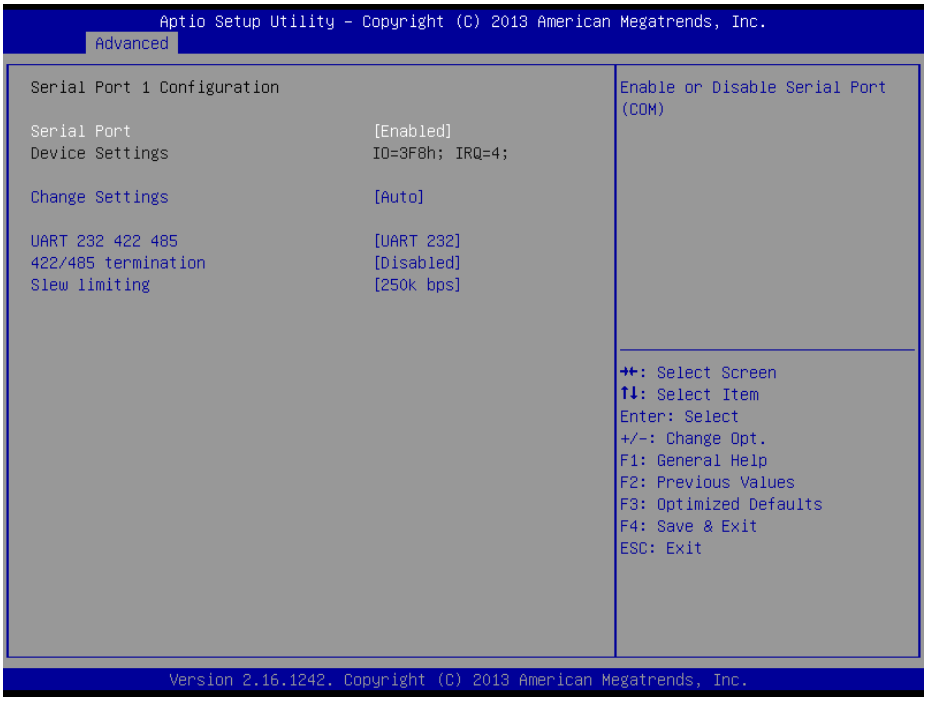
You can use this item to set up or change the IT8528 Super IO configuration for serial ports. Please refer to 3.6.2.2.1~ 3.6.2.2.6 for more information.



Item	Description
Serial Port 1 Configuration	Set Parameters of Serial Port 1 (COMA).
Serial Port 2 Configuration	Set Parameters of Serial Port 2 (COMB).
Serial Port 3 Configuration	Set Parameters of Serial Port 3 (COMC).
Serial Port 4 Configuration	Set Parameters of Serial Port 4 (COMD).

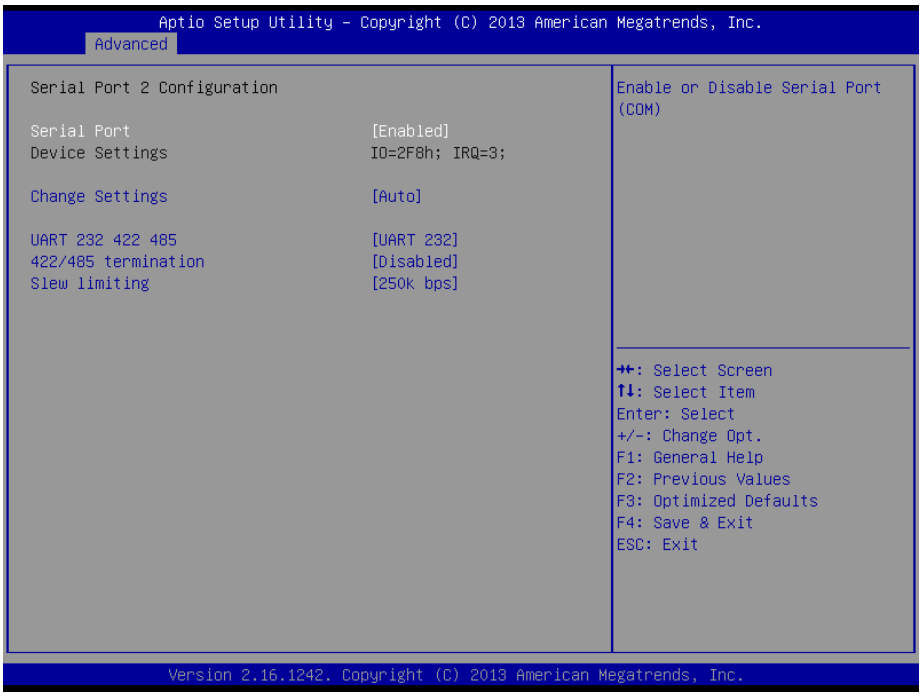
Serial Port 5 Configuration	Set Parameters of Serial Port 5 (COME).
Serial Port 6 Configuration	Set Parameters of Serial Port 6 (COMF).

3.6.2.2.1 Serial Port 1 Configuration



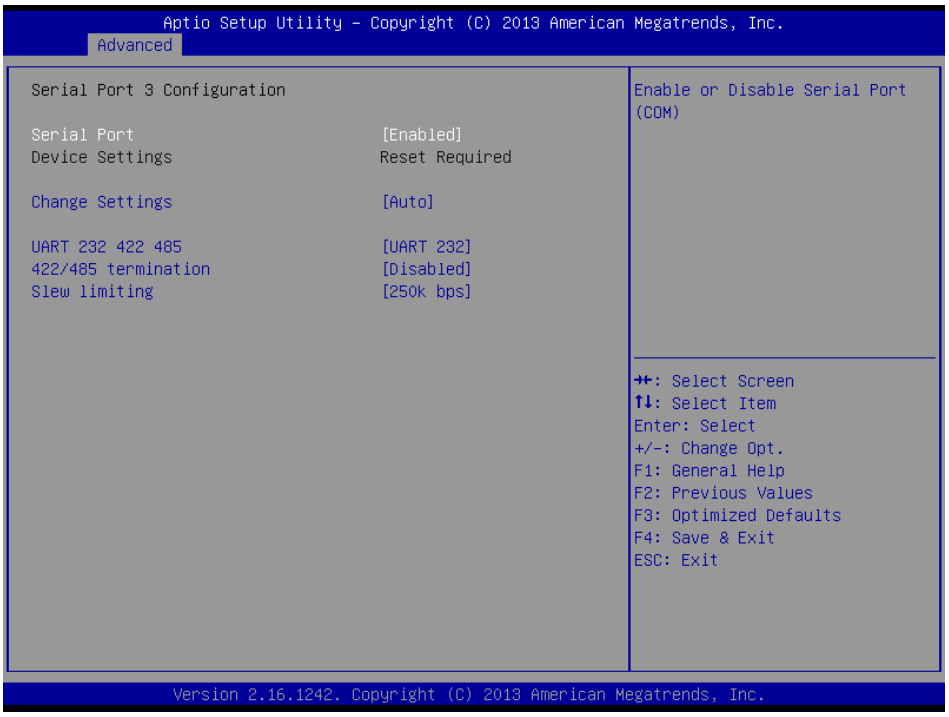
Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]** IO=3F8h; IRQ=4; IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;	Select an optimal setting for Super IO Device.
UART 232 422 485	UART 232 (LOOPBACK) UART 232**[Default]** UART 485 UART 422	Change the Serial Port as RS232/ 422/ 485
422/ 485 termination	Disabled**[Default]** Enabled	TERM from GPIO.
Slew limiting	10M bps 250k bps**[Default]**	SLEW from GPIO.

3.6.2.2.2 Serial Port 2 Configuration



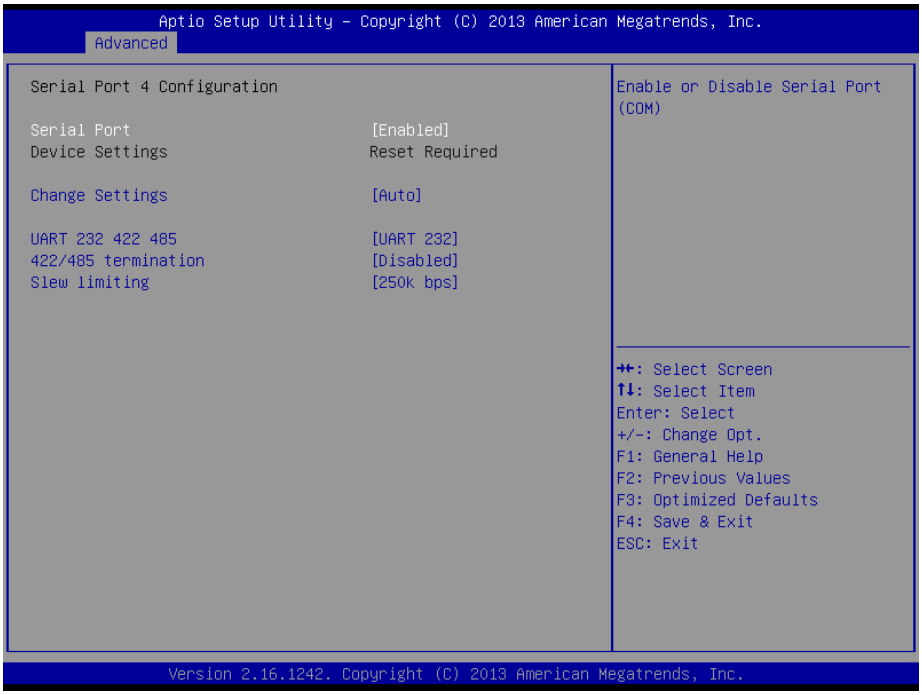
Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]** IO=2F8h; IRQ=3; IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;	Select an optimal setting for super IO device.
UART 232 422 485	UART 232 (LOOPBACK) UART 232**[Default]** UART 485 UART 422	Change the Serial Port as RS232/ 422/ 485
422/ 485 termination	Disabled**[Default]** Enabled	TERM from GPIO.
Slew limiting	10M bps 250k bps**[Default]**	SLEW from GPIO.

3.6.2.2.3 Serial Port 3 Configuration



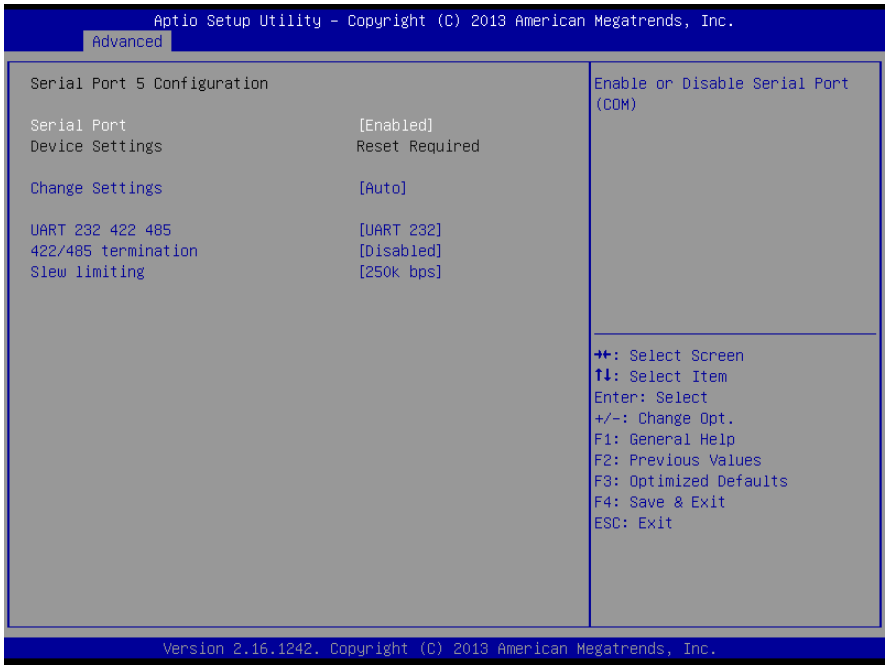
Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]** IO=3E8h; IRQ=5; IO=3F8h; IRQ=3,4,5,6,7,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,10,11,12; IO=2E8h; IRQ=3,4,5,6,7,10,11,12;	Select an optimal setting for super IO device.
UART 232 422 485	UART 232 (LOOPBACK) UART 232**[Default]** UART 485 UART 422	Change the Serial Port as RS232/ 422/ 485
422/ 485 termination	Disabled**[Default]** Enabled	TERM from GPIO.
Slew limiting	10M bps 250k bps**[Default]**	SLEW from GPIO.

3.6.2.2.4 Serial Port 4 Configuration



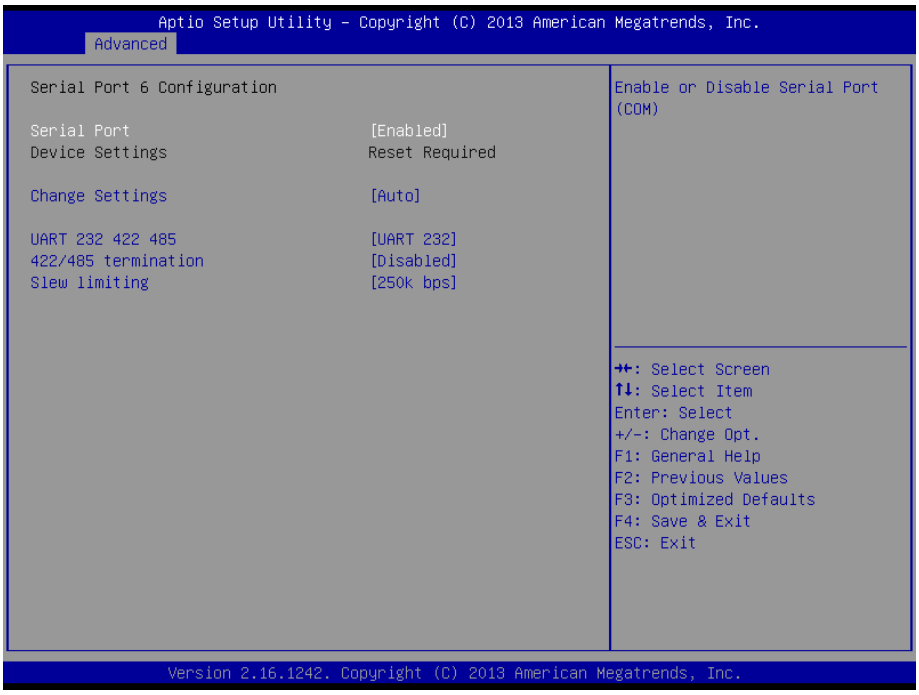
Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]** IO=2E8h; IRQ=10; IO=3F8h; IRQ=3,4,5,6,7,10,11,12; IO=2F8h; IRQ=3,4,5,6,7,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,10,11,12; IO=2E8h; IRQ=3,4,5,6,7,10,11,12;	Select an optimal setting for super IO device.
UART 232 422 485	UART 232 (LOOPBACK) UART 232**[Default]** UART 485 UART 422	Change the Serial Port as RS232/ 422/ 485
422/ 485 termination	Disabled**[Default]** Enabled	TERM from GPIO.
Slew limiting	10M bps 250k bps**[Default]**	SLEW from GPIO.

3.6.2.2.5 Serial Port 5 Configuration



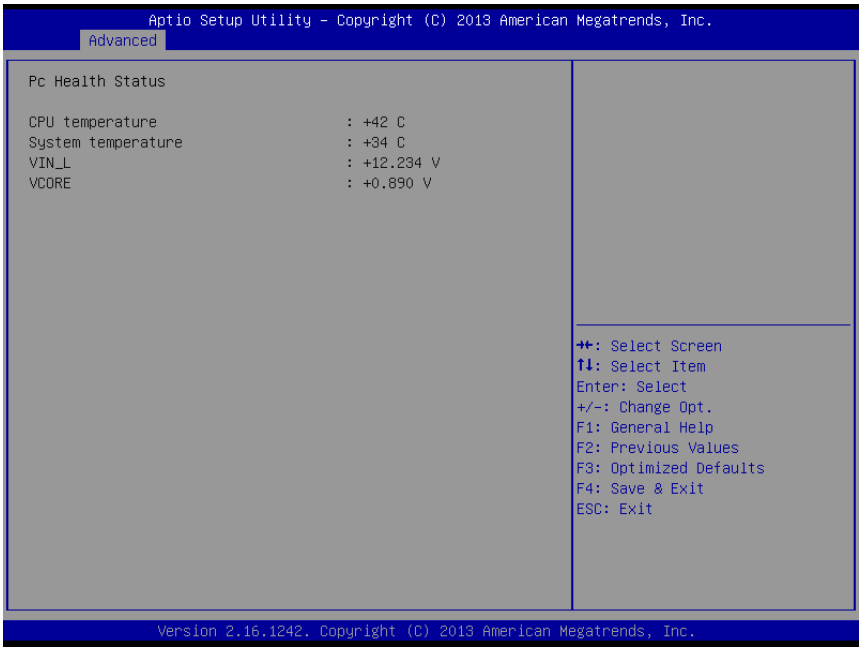
Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
Change Settings	Auto[Default] IO=200h; IRQ=5; IO=200h; IRQ=3,4,5,6,7,10,11,12; IO=208h; IRQ=3,4,5,6,7,10,11,12; IO=210h; IRQ=3,4,5,6,7,10,11,12; IO=218h; IRQ=3,4,5,6,7,10,11,12;	Select an optimal setting for super IO device.
UART 232 422 485	UART 232 (LOOPBACK) UART 232**[Default]** UART 485 UART 422	Change the Serial Port as RS232/ 422/ 485
422/ 485 termination	Disabled**[Default]** Enabled	TERM from GPIO.
Slew limiting	10M bps 250k bps**[Default]**	SLEW from GPIO.

3.6.2.2.6 Serial Port 6 Configuration

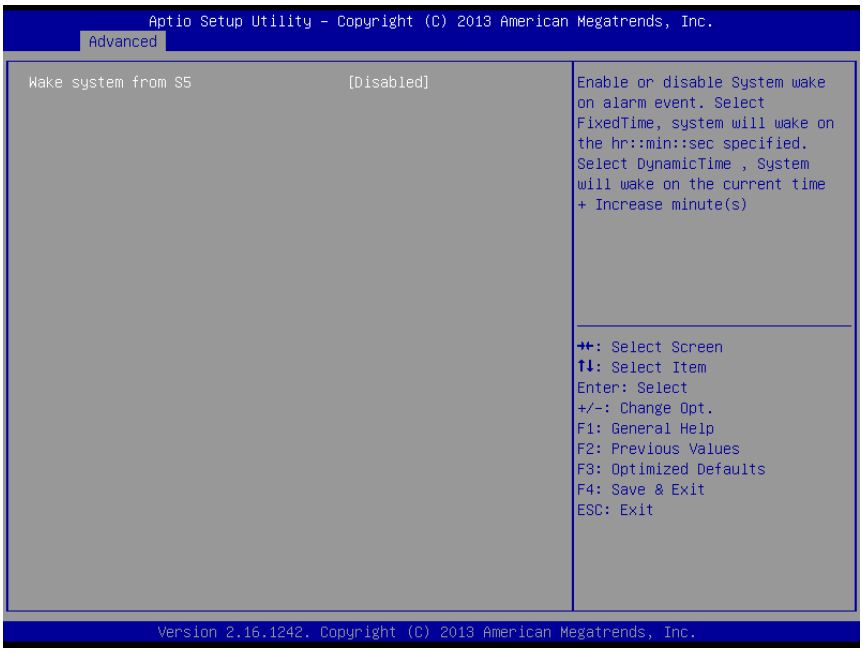


Item	Option	Description
Serial Port	Enabled**[Default]**, Disabled	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]** IO=208h; IRQ=10; IO=200h; IRQ=3,4,5,6,7,10,11,12; IO=208h; IRQ=3,4,5,6,7,10,11,12; IO=210h; IRQ=3,4,5,6,7,10,11,12; IO=218h; IRQ=3,4,5,6,7,10,11,12;	Select an optimal setting for super IO device.
UART 232 422 485	UART 232 (LOOPBACK) UART 232**[Default]** UART 485 UART 422	Change the Serial Port as RS232/ 422/ 485
422/ 485 termination	Disabled**[Default]** Enabled	TERM from GPIO.
Slew limiting	10M bps 250k bps**[Default]**	SLEW from GPIO.

3.6.2.3 EC 8528 H/W Monitor

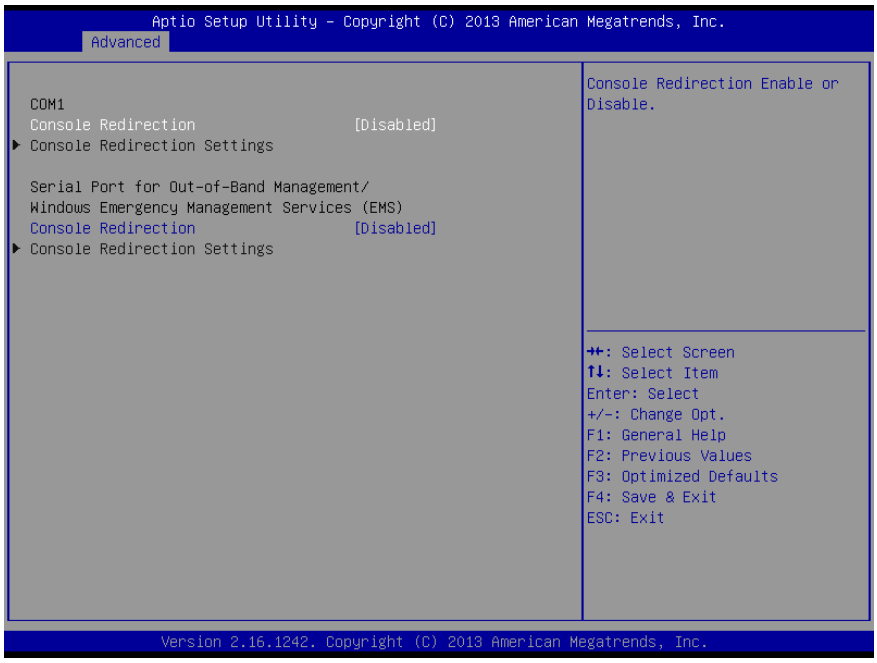


3.6.2.4 S5 RTC Wake Settings



Item	Options	Description
Wake system from S5	Disabled**[Default]**, Fixed Time Dynamic Time	Enable or disable System wake on alarm event. Select Fixed Time, system will wake on the hr::min::sec specified. Select Dynamic Time, System will wake on the current time + Increase minute(s).

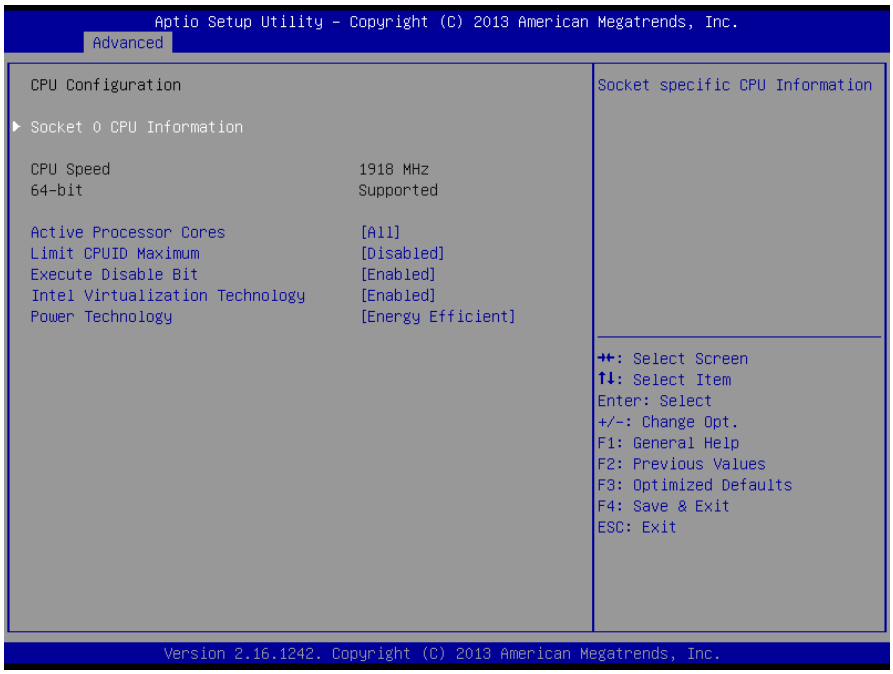
3.6.2.5 Serial Port Console Redirection



Item	Options	Description
Console Redirection	Disabled**[Default]**, Enabled	Console Redirection Enable or Disable.

3.6.2.6 CPU Configuration

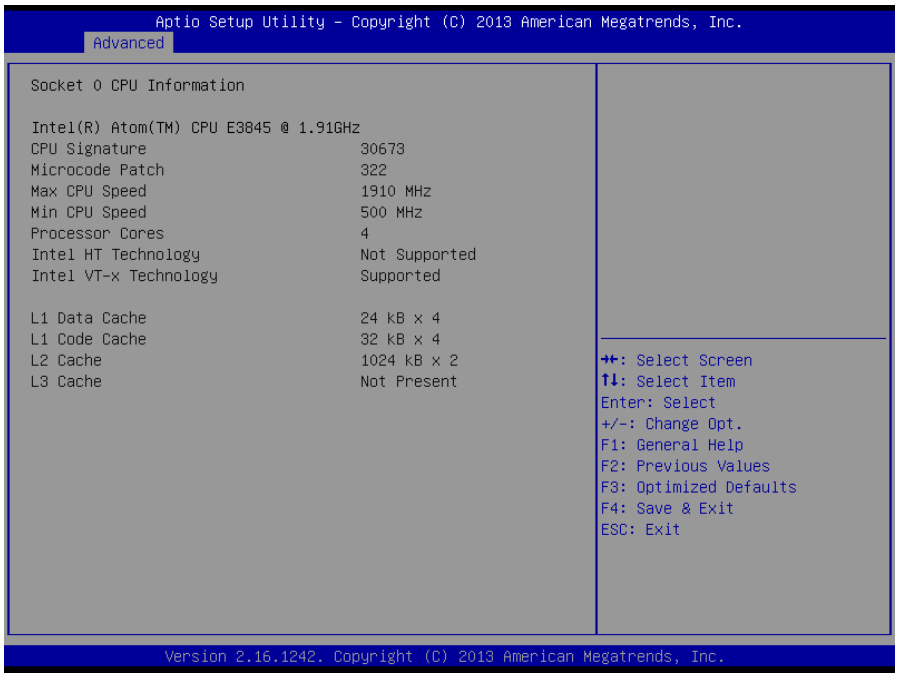
Use the CPU configuration menu to view detailed CPU specification and configure the CPU.



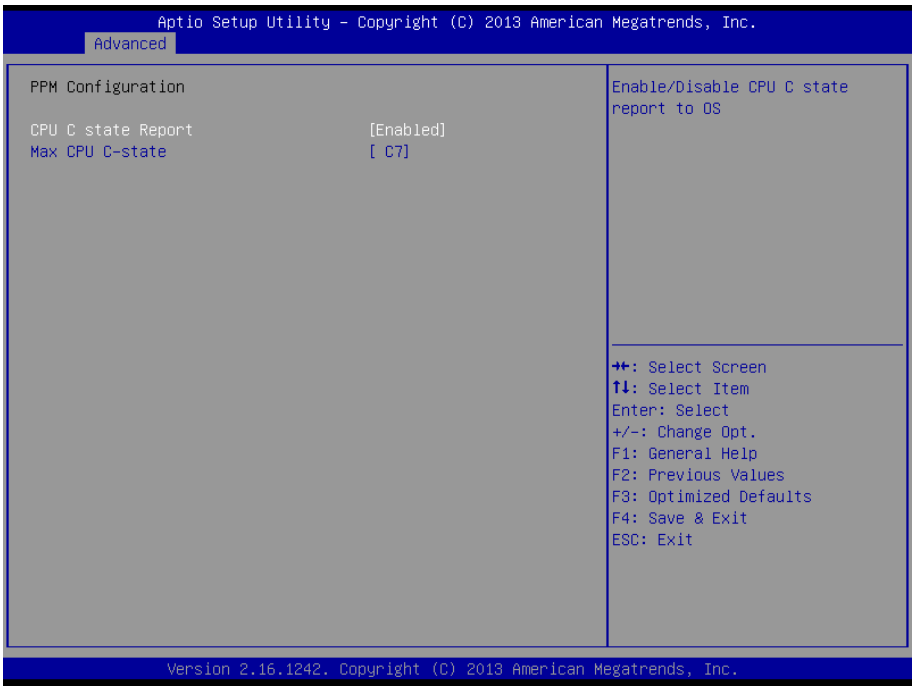
Item	Options	Description
Active Processor Cores	All**[Default]**, 1	Number of cores to enable in each processor package.

Limit CPUID Maximum	Disabled**[Default]**, Enabled	Disabled for Windows XP.
Execute Disable Bit	Disabled, Enabled**[Default]**	XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Server 2003 SP1, Windows XP SP2, SuSE Linux 9.2, RedHat Enterprise 3 Update 3.)
Intel Virtualization Technology	Disabled, Enabled**[Default]**	When enabled, a VMM can utilize the additional hardware capabilities provided by Virtualization Technology.
Power Technology	Disabled, Energy Efficient**[Default]** Custom	Enable the power management features.

3.6.2.6.1 Socket 0 CPU Information

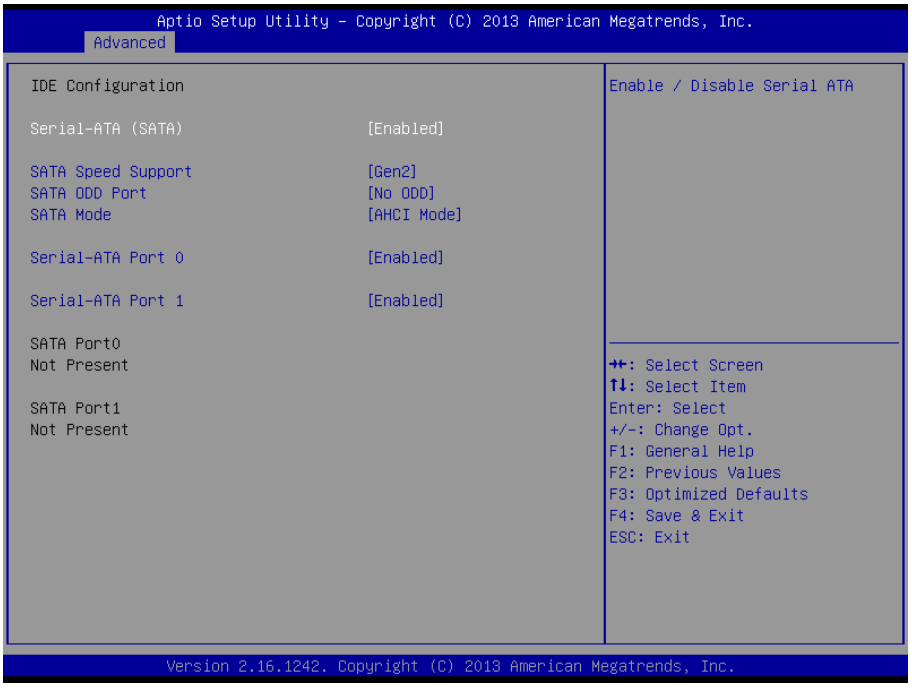


3.6.2.7 PPM Configuration



Item	Options	Description
CPU C state Report	Disabled, Enabled**[Default]**	Enable/Disable CPU C state report to OS.
Max CPU C-state	C7**[Default]** C6 C1	This option controls Max C state that the processor will support.

3.6.2.8 IDE Configuration



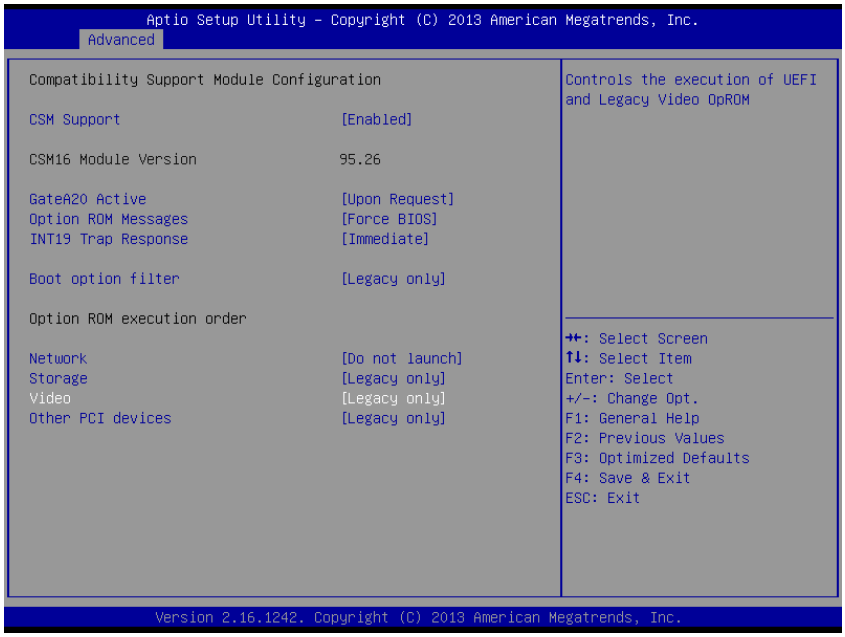
Item	Options	Description
Serial-ATA (SATA)	Enabled**[Default]** Disabled,	Enable/Disable Serial ATA.
SATA Speed Support	Gen1 Gen2**[Default]**	SATA Speed Support Gen1 or Gen2.
SATA ODD Port	Port0 ODD Port1 ODD No ODD**[Default]**	SATA ODD is Port0 or Port1.
SATA Mode	IDE Mode AHCI Mode**[Default]**	Select IDE/ AHCI.
Serial-ATA Port 0/1	Enabled**[Default]** Disabled,	Enable/Disable Serial ATA Port0/1.

3.6.2.9 Network Stack Configuration

Item	Options	Description
CSM Support	Enabled**[Default]** Disabled,	Enable/Disable CSM Support.
GateA20 Active	Upon Request**[Default]** Always	UPON REQUEST – GA20 can be disabled using BIOS services. ALWAYS – go not allow disabling GA20; this option is useful when any RT code is executed above 1MB.
Option ROM Messages	Force BIOS**[Default]** Keep Current	Set display mode for Option ROM.
INT19 Trap Response	Immediate**[Default]** Postponed	BIOS reaction on INT19 trapping by Option ROM: IMMEDIATE – execute the trap right away; POSTPONED – execute the traps during legacy boot.

Boot option filter	UEFI and Legacy Legacy only**[Default]** UEFI only	This option controls Legacy/UEFI ROMs priority.
Network	Do not launch**[Default]** UEFI only Legacy only	Controls the execution of UEFI and Legacy PXE OpROM.
Storage	Do not launch UEFI only Legacy only**[Default]**	Controls the execution of UEFI and Legacy Storage OpROM.
Video	Do not launch UEFI only Legacy only**[Default]**	Controls the execution of UEFI and Legacy Video OpROM.
Other PCI devices	UEFI only Legacy only**[Default]**,	Determines OpROM execution policy for devices other than Network, Storage, or Video.

3.6.2.10 CSM Configuration



Item	Options	Description
CSM Support	Enabled**[Default]** Disabled,	Enable/Disable CSM Support.
GateA20 Active	Upon Request**[Default]** Always	UPON REQUEST – GA20 can be disabled using BIOS services. ALWAYS – go not allow disabling GA20; this option is useful when any RT code is executed above 1MB.
Option ROM Messages	Force BIOS**[Default]** Keep Current	Set display mode for Option ROM.
INT19 Trap Response	Immediate**[Default]** Postponed	BIOS reaction on INT19 trapping by Option ROM: IMMEDIATE – execute the trap right away; POSTPONED – execute the traps during legacy boot.

Boot option filter	UEFI and Legacy Legacy only**[Default]** UEFI only	This option controls Legacy/UEFI ROMs priority.
Network	Do not launch**[Default]** UEFI only Legacy only	Controls the execution of UEFI and Legacy PXE OpROM.
Storage	Do not launch UEFI only Legacy only**[Default]**	Controls the execution of UEFI and Legacy Storage OpROM.
Video	Do not launch UEFI only Legacy only**[Default]**	Controls the execution of UEFI and Legacy Video OpROM.
Other PCI devices	UEFI only Legacy only**[Default]**,	Determines OpROM execution policy for devices other than Network, Storage, or Video.

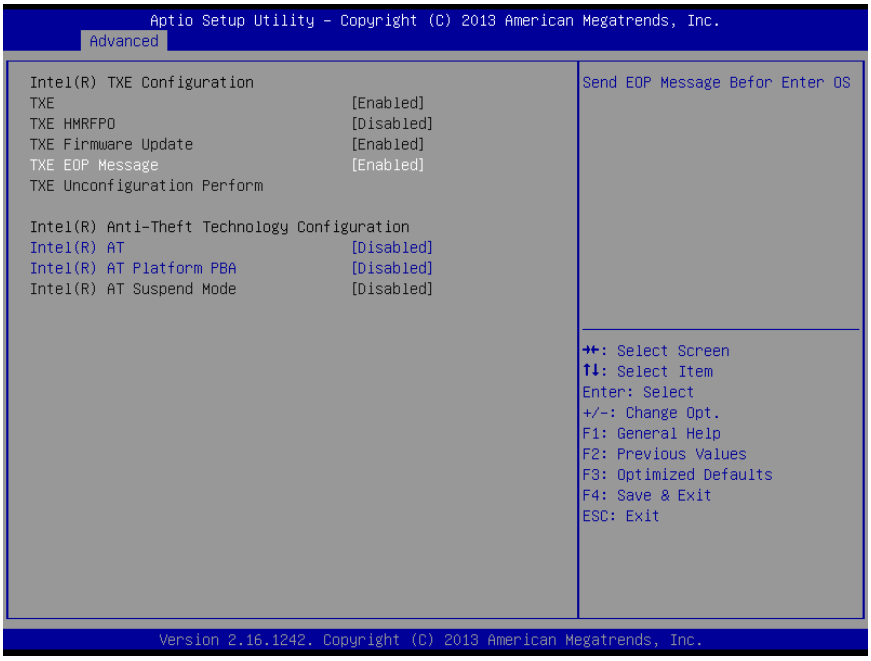
3.6.2.11 USB Configuration

The USB Configuration menu helps read USB information and configures USB settings.

Item	Options	Description
Legacy USB Support	Enabled**[Default]** Disabled Auto	Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
XHCI Hand-off	Enabled**[Default]** Disabled	This is a workaround for OSew without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
EHCI Hand-off	Enabled Disabled**[Default]**	This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.
USB Mass Storage Driver Support	Enabled**[Default]** Disabled	Enable/Disable USB Mass Storage Driver Support.

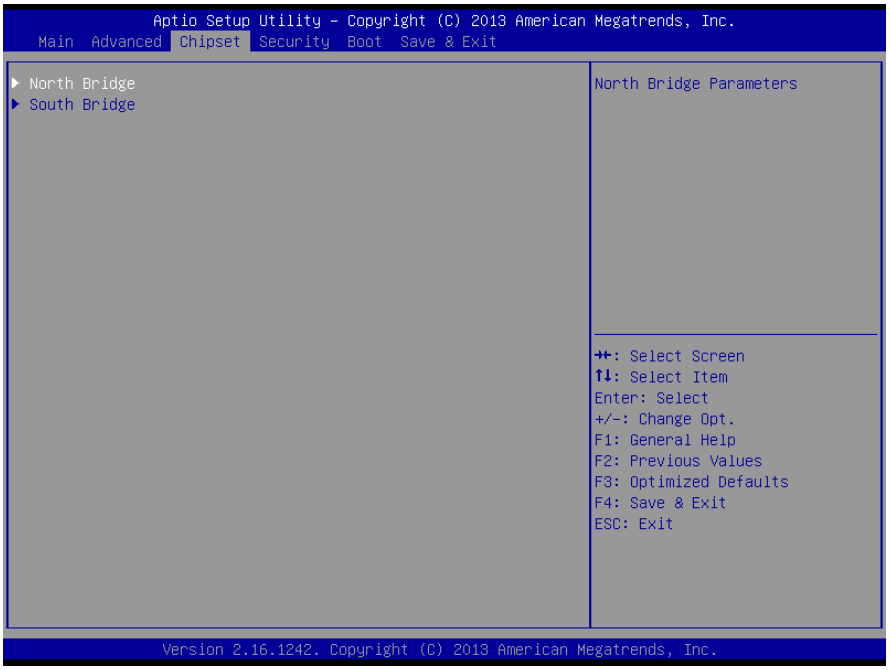
USB transfer time-out	1 sec 5 sec 10 sec 20 sec**[Default]**	The time-out value for Control, Bulk, and Interrupt transfers.
Device reset time-out	10 sec 20 sec**[Default]** 30 sec 40 sec	USB mass storage device Start Unit command time-out.
Device power-up delay	Auto**[Default]** Manual	Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100ms, for a Hub port the delay is taken form Hub descriptor.

3.6.2.12 Security Configuration

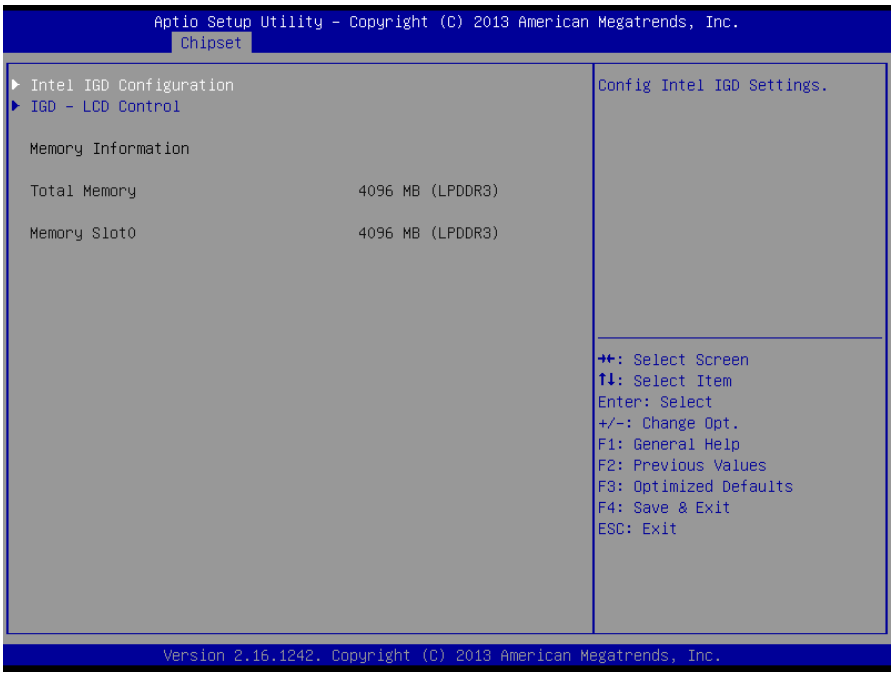


Item	Options	Description
TXE EOP Message	Disabled Enabled**[Default]**,	Send EOP Message Before Enter OS.
Intel® AT	Disabled**[Default]** Enabled,	Enable/Disable BIOS AT Code from Running.
Inter® AT Platform PBA	Disabled**[Default]**, Enabled	Enable/Disable BIOS AT Code from Running.

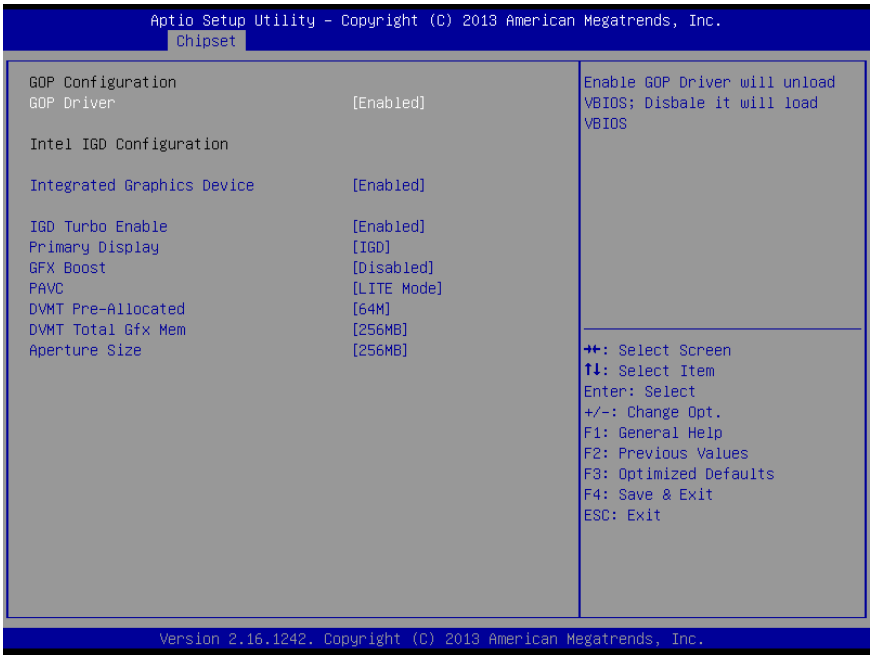
3.6.3 Chipset



3.6.3.1 North Bridge

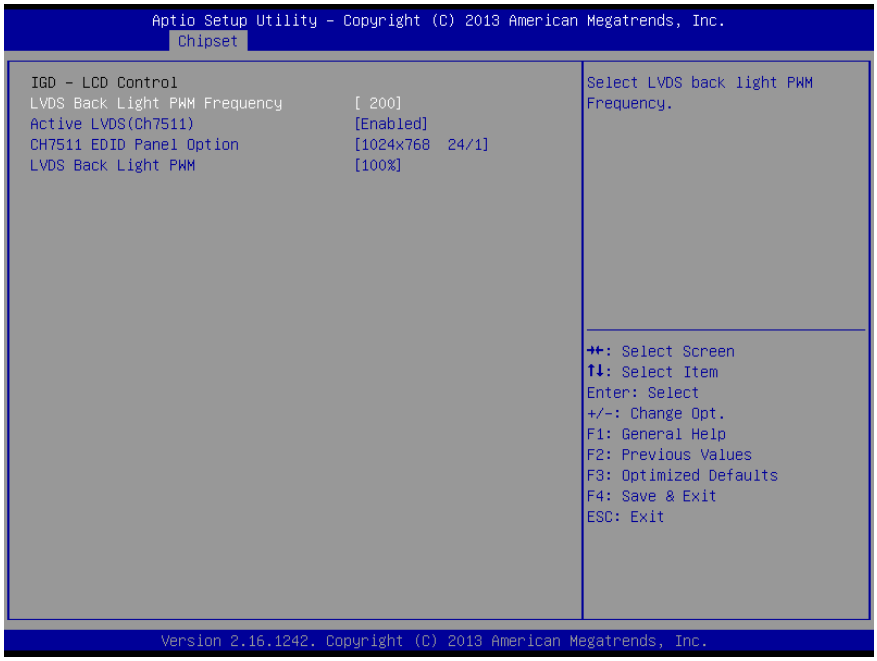


3.6.3.1.1 Intel IGD Configuration



Item	Option	Description
GOP Driver	Enabled**[Default]**, Disabled	Enable GOP Driver will unload VBIOS; Disable it will load VBIOS.
Integrated Graphics Device	Enabled**[Default]**, Disabled	Enable: Enable Integrated Graphics Device (IGD) when selected as the Primary Video Adaptor. Disable: Always disable IGD.
IGD Turbo Enable	Enabled**[Default]**, Disabled	Enable: Enable IGD Turbo Enable. Disable: IGD Turbo Disable.
Primary Display	Auto IGD**[Default]** PCIe	Select which of IGD/PCI Graphics device should be Primary Display.
GFX Boost	Enabled, Disabled**[Default]**	Enable/Disable GFX Boost.
PAVC	Disabled LITE Mode**[Default]** SERPENT Mode	Enable/Disable Protected Audio Video Control.
DVMT Pre-Allocated	64M**[Default]**/96M128M/160M/192M/ 224M/256M/288M/320M/352M/ 384M/416M/448M/ 480M/512M	Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.
DVMT Total Gfx Mem	128MB 256MB**[Default]** Max	Select DVMT 5.0 Total Graphics Memory size used by the Internal Graphics Device.
Aperture Size	128MB 256MB**[Default]**	Select the Aperture Size.

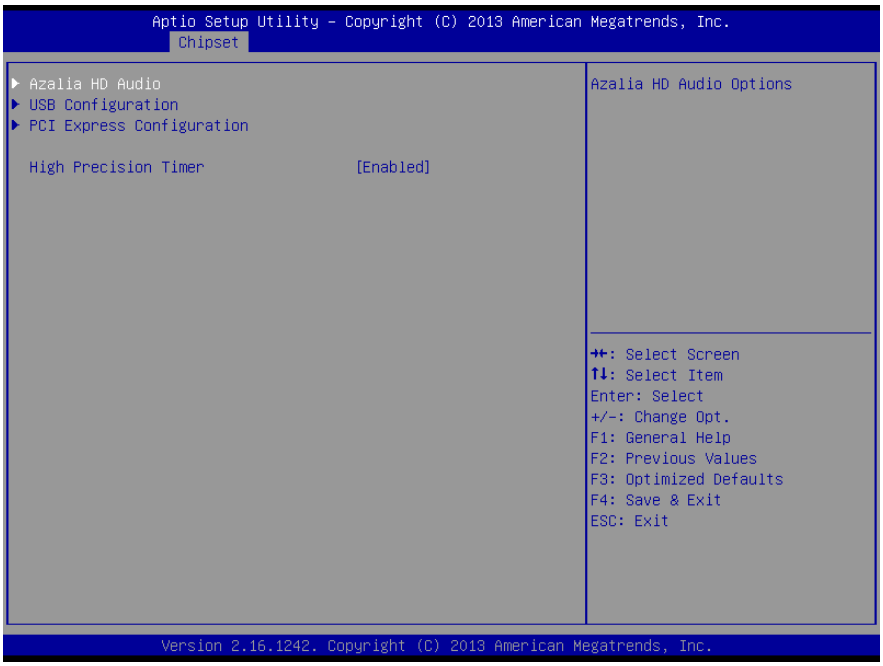
3.6.3.1.2 IGD - LCD Control



Item	Option	Description
LVDS Back Light PWM Frequency	200**[Default]** 300 400 500 700 1k 2k 3k 5k 10k 20k	Select LVDS back light PWM Frequency.
Active LVDS (Ch7511)	Enabled**[Default]** Disabled	Active Internal LVDS (eDP->Ch7511-to –LVDS).
CH7511 EDID Panel Option	1024x768 24/1**[Default]** 800x600 18/1 1024x768 18/1 1366x768 18/1 1024x600 18/1 1280x800 18/1 1920x1200 24/2 640x480 18/1 800x400 18/1 1920x1080 18/2 1280x1024 24/2 1440x900 18/2 1600x1200 24/2 1366x768 24/1 1920x1080 24/2	Port1-EDP to LVDS (Chrotel 7511) Panel EDID Option.

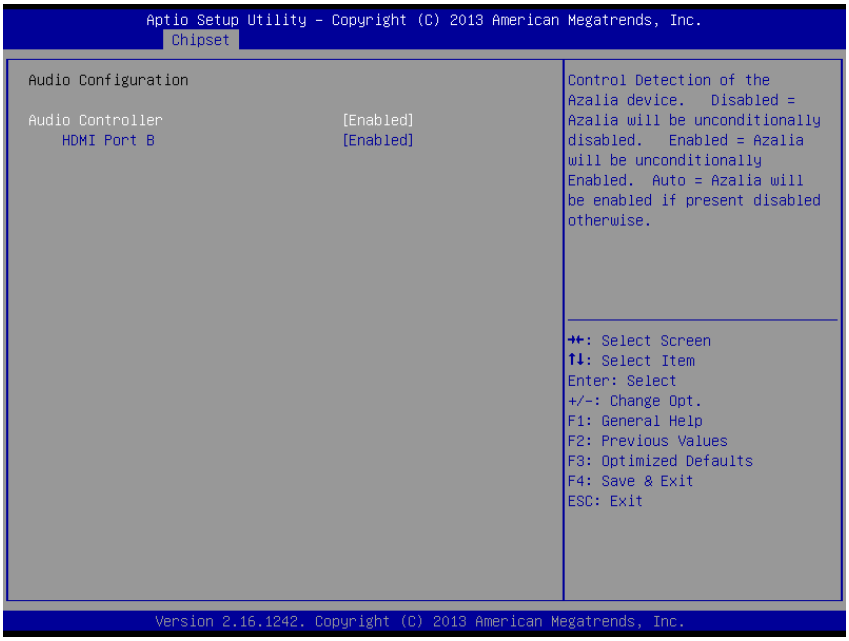
	1680x1050 24/2	
LVDS Back Light PWM	00% 25% 50% 75% 100%**[Default]**	Select LVDS back light PWM duty.

3.6.3.2 South Bridge



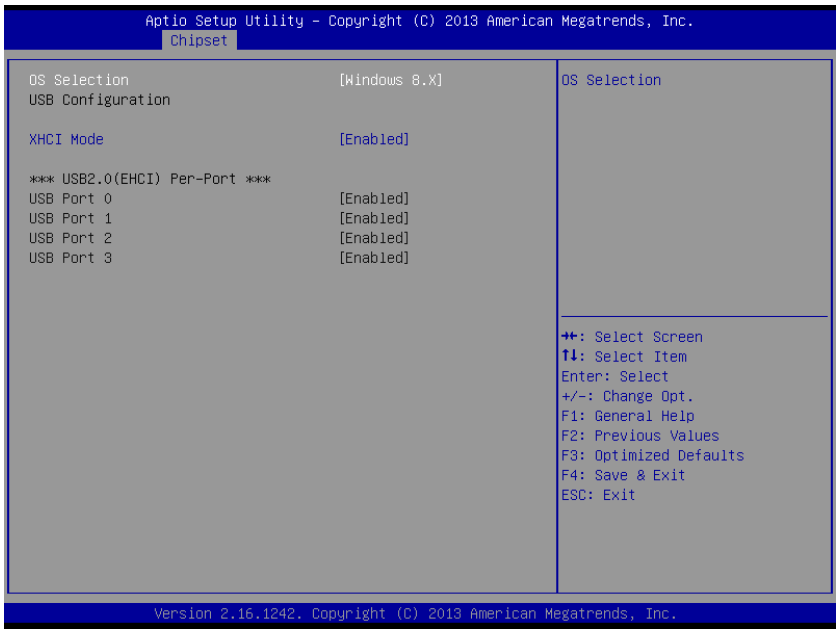
Item	Option	Description
High Precision Timer	Disabled Enabled**[Default]**	Enable or Disable the High Precision Event Timer.

3.6.3.2.1 Azalia HD Audio



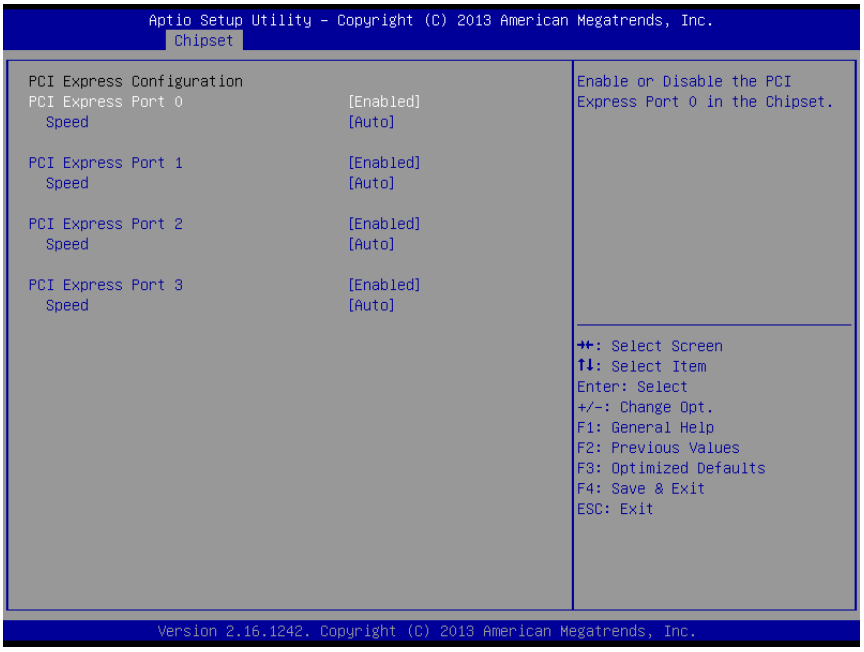
Item	Option	Description
Audio Controller	Enabled**[Default]**, Disabled	Control Detection of the Azalia device. Disabled = Azalia will be unconditionally disabled. Enabled = Azalia will be unconditionally Enabled. Auto = Azalia will be enabled if present disabled otherwise.
HDMI Port B	Enabled**[Default]**, Disabled	Enable/Disable HDMI Port B.

3.6.3.2.2 USB Configuration



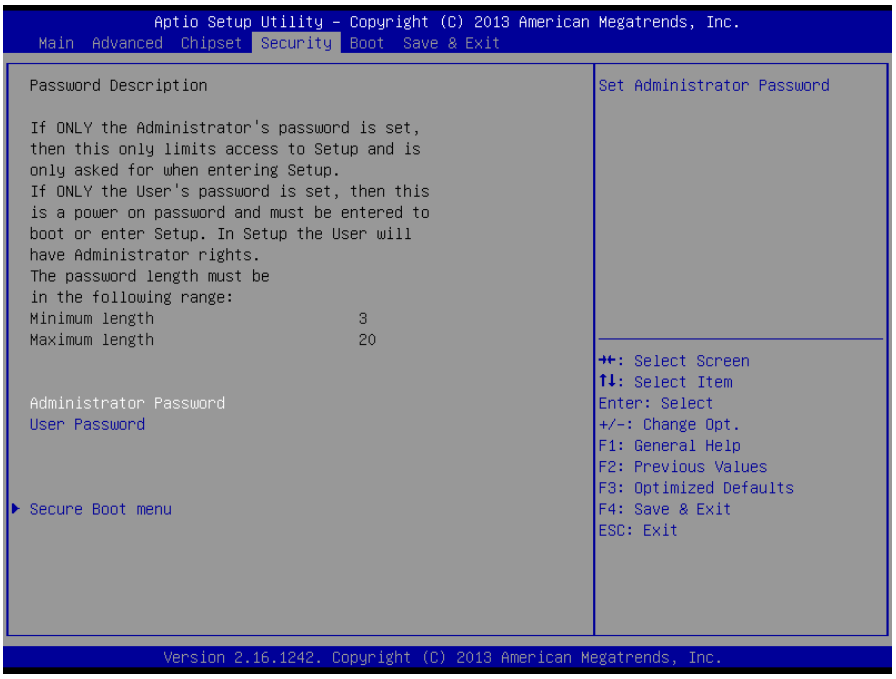
Item	Option	Description
OS Selection	Windows 8.X**[Default]** Android Windows 7	Please select the corresponding type of Windows for OS installation. Please change the item of OS selection to Windows 7 if you intend to install Windows 7 OS; Please change the item of OS selection to Windows 8.X if you intend to install Windows 8 OS.
XHCI Mode	Enabled**[Default]**, Disabled Auto Smart Auto	Mode of operation of xHCI controller.

3.6.3.2.3 PCI Express Configuration



Item	Option	Description
PCI Express Port 0/1/2/3	Enabled**[Default]**, Disabled	Enable or Disable the PCI Express Port 0/1/2/3 in the Chipset.
Speed	Auto**[Default]** Gen 2 Gen 1	Configure PCIe Port Speed.

3.6.4 Security



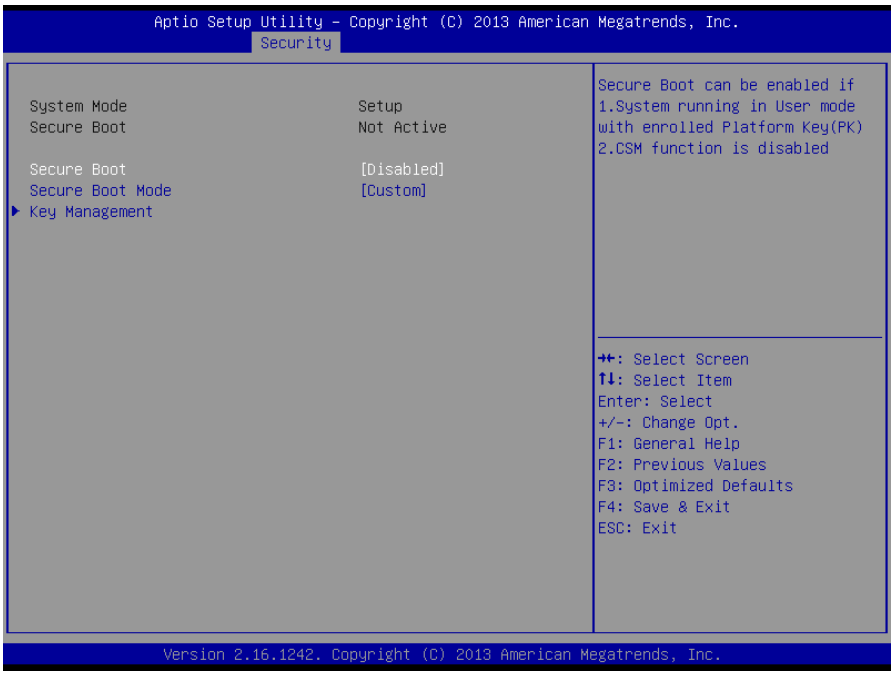
- **Administrator Password**

Set setup Administrator Password

- **User Password**

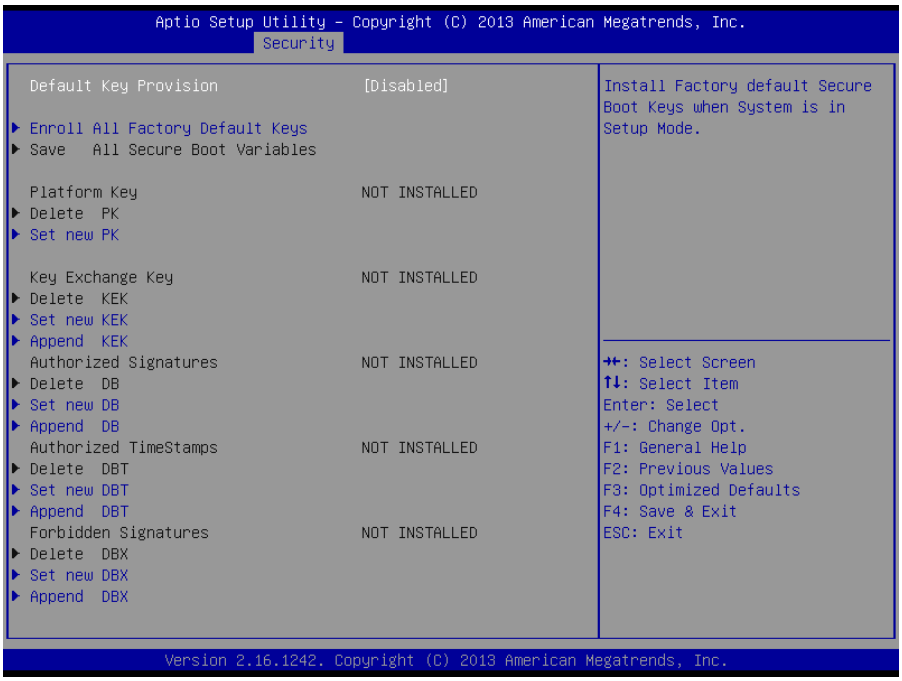
Set User Password

3.6.4.1 Secure Boot menu



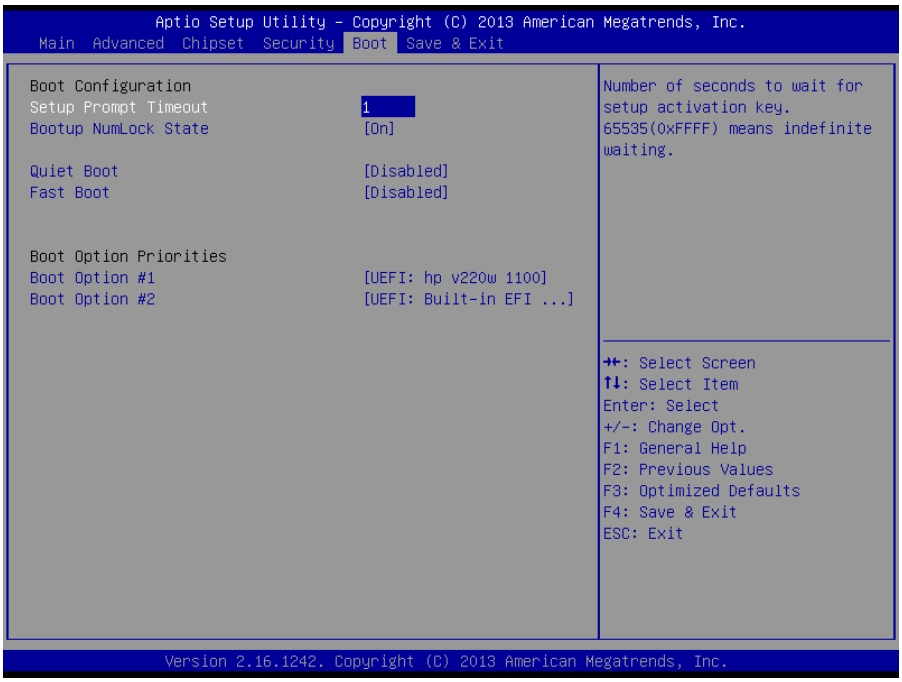
Item	Option	Description
Secure Boot	Disabled**[Default]** Enabled	Secure Boot can be enabled if 1.System running in User mode with enrolled Platform Key(PK) 2.CSM function is disabled.
Secure Boot Mode	Standard Custom**[Default]**	Secure Boot mode selector. 'Custom' Mode enables users to change Image Execution policy and manage Secure Boot Keys.

3.6.4.1.1 Key Management



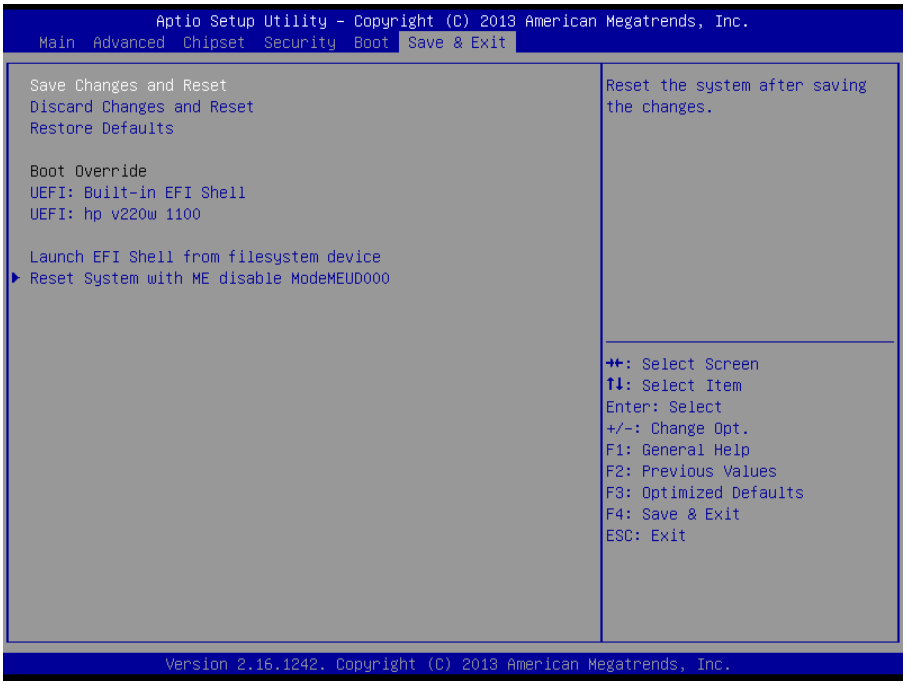
Item	Option	Description
Default Key Provision	Enabled, Disabled**[Default]**	Install Factory default Secure Boot Keys when System is in Setup Mode.

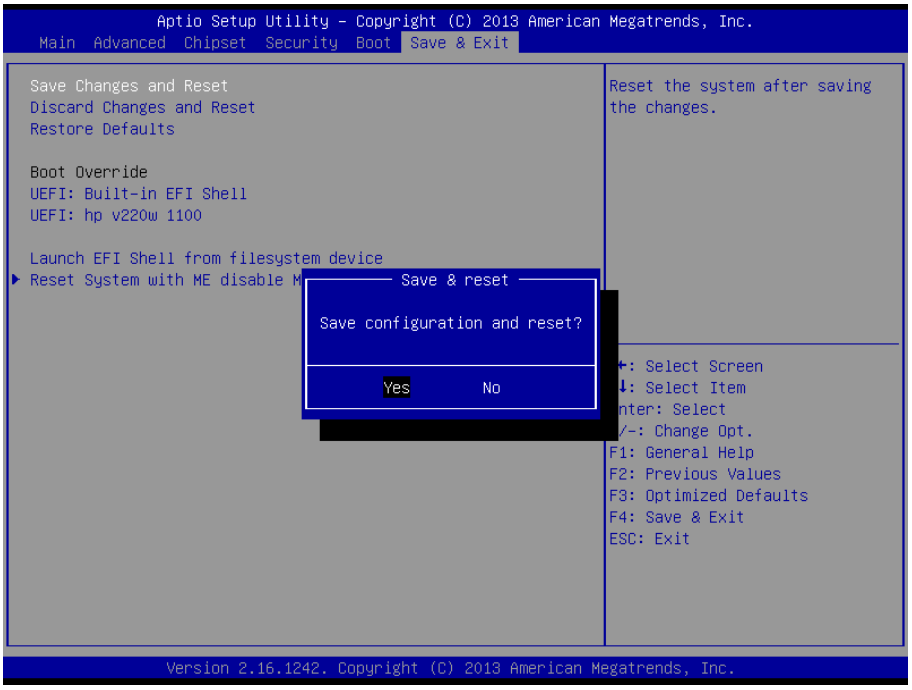
3.6.5 Boot



Item	Option	Description
Setup Prompt Timeout	1~ 65535	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
Bootup NumLock State	On**[Default]** Off	Select the Keyboard NumLock state
Quiet Boot	Disabled**[Default]** Enabled	Enables or disables Quiet Boot option
Fast Boot	Disabled**[Default]** Enabled	Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.
Boot Option #1/2	Set the system boot order.	

3.6.6 Save and exit





3.6.6.1 Save Changes and Reset

Reset the system after saving the changes.

3.6.6.2 Discard Changes and Reset

Any changes made to BIOS settings during this session of the BIOS setup program are

discarded. The setup program then exits and reboots the controller.

3.6.6.3 Restore Defaults

This option restores all BIOS settings to the factory default. This option is useful if the controller exhibits unpredictable behavior due to an incorrect or inappropriate BIOS setting.

3.6.6.4 Launch EFI Shell from filesystem device

Attempts to Launch EFI Shell application (Shellx64.efi) from one of the available filesystem devices.

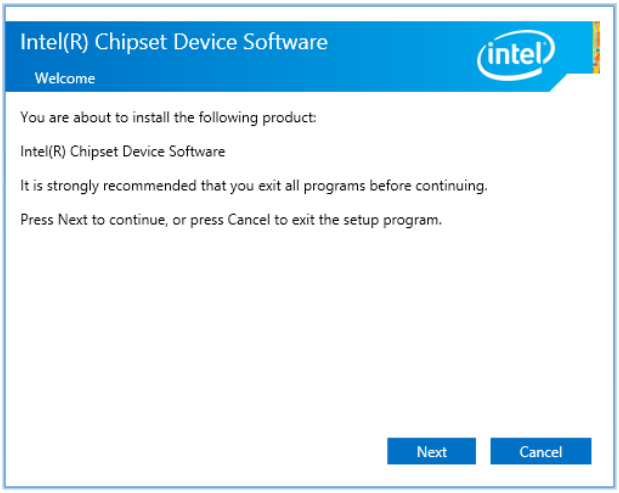
4. Drivers Installation

Note: Installation procedures and screen shots in this section are for your reference and may not be exactly the same as shown on your screen.

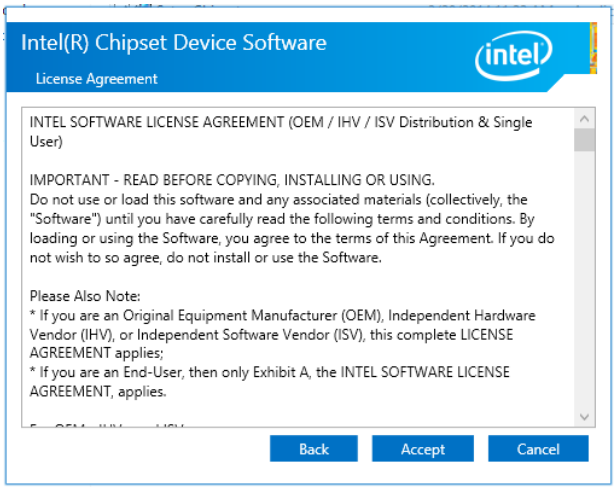
4.1 Install Chipset Driver

All drivers can be found on the Avalue Official Website: http://www.avalue.com.tw.

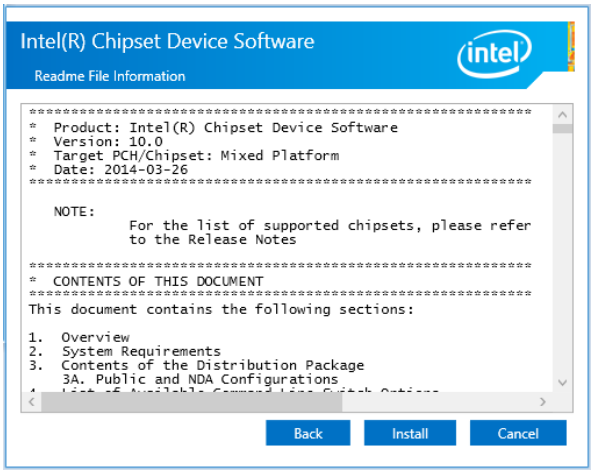
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



Step1. Click **Next**.



Step 2. Click **Accept**.



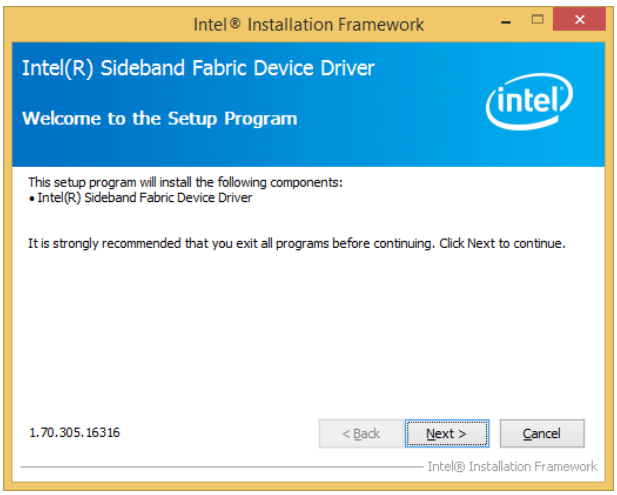
Step 3. Click **Install**.

Step 4. Click **Finish** to complete setup.

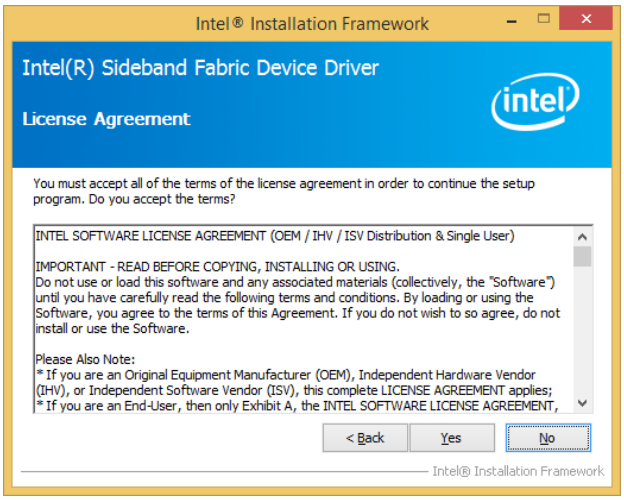
4.2 Install MBI Driver

All drivers can be found on the Avalue Official Website: http://www.avalue.com.tw.

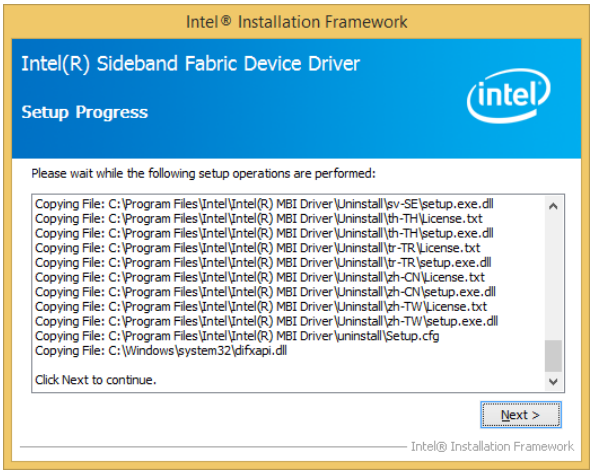
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



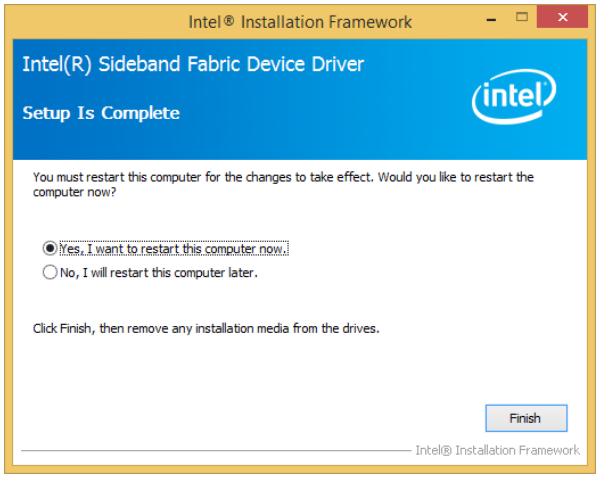
Step1. Click **Next** to start installation.



Step 2. Click **Yes** to accept license agreement.



Step 3. Click **Next** to proceed setup.

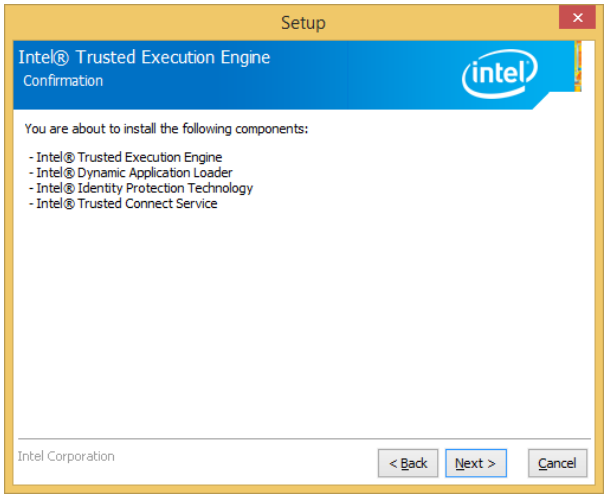


Step 4. Click **Finish** to complete setup.

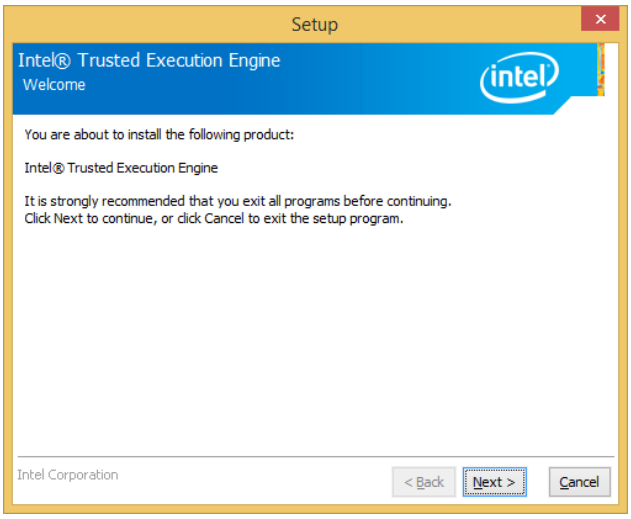
4.3 Install TXE Driver

All drivers can be found on the Avalue Official Website: http://www.avalue.com.tw.

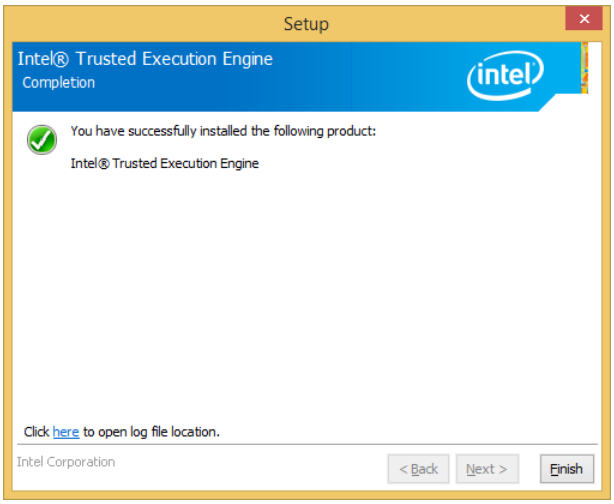
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



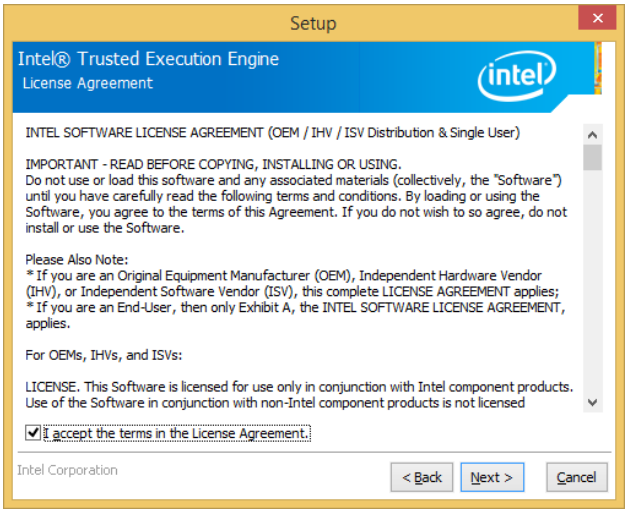
Step 3. Click **Next** to continue installation.



Step1. Click **Next** to start installation.



Step 4. Click **Finish** to complete setup.

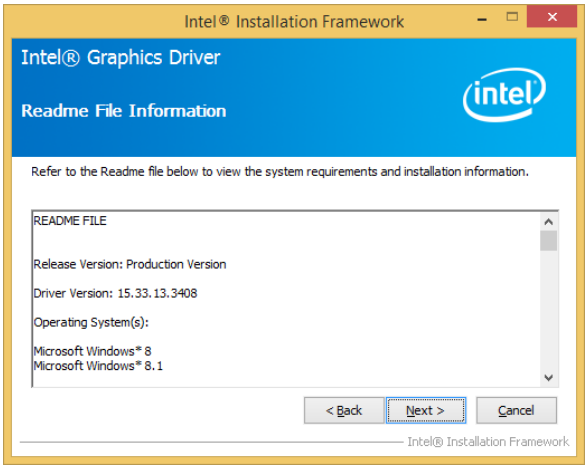


Step 2. Click **Next**.

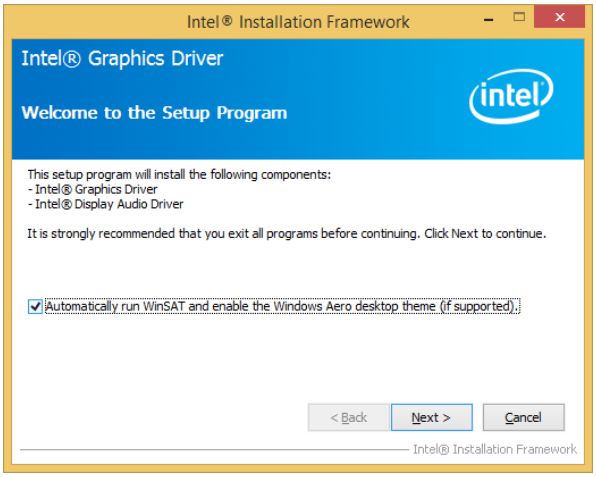
4.4 Install VGA Driver

All drivers can be found on the Avalue Official Website:
http://www.avalue.com.tw.

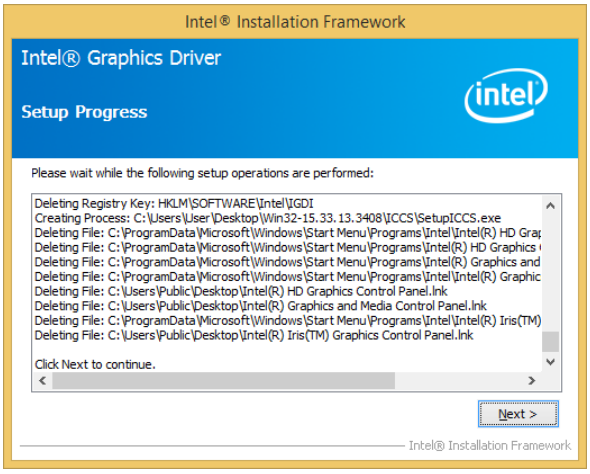
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



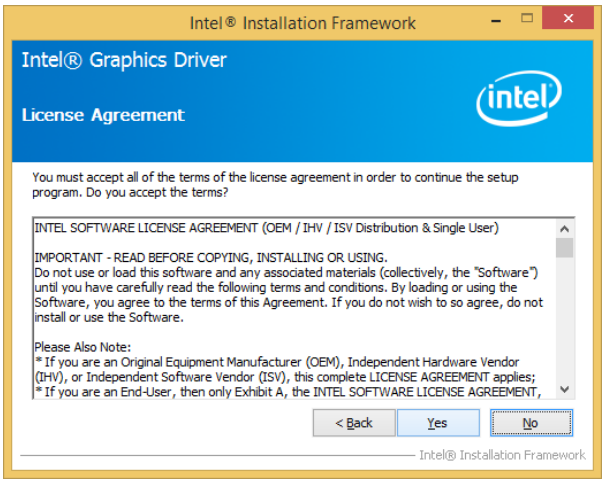
Step 3. Click **Next.**



Step 1. Click **Next** to continue installation.

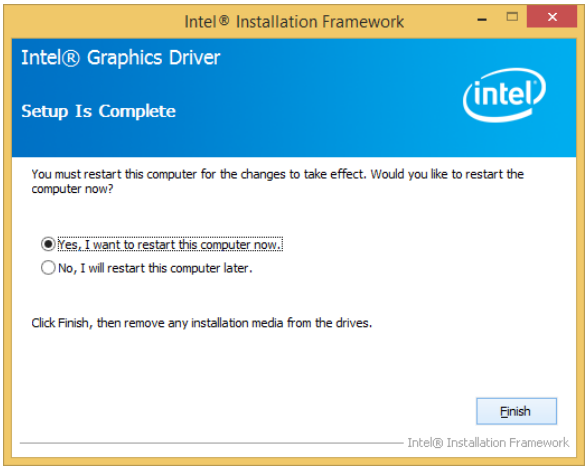


Step 4. Click **Next**.



Step 2.

Click **Yes** to accept license agreement.



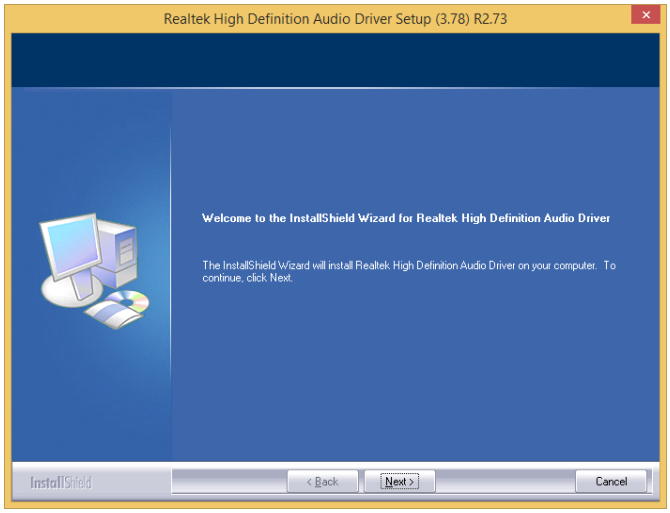
Step 5. Click **Finish** to complete setup.

4.5 Install Audio Driver (For Realtek ALC888S)

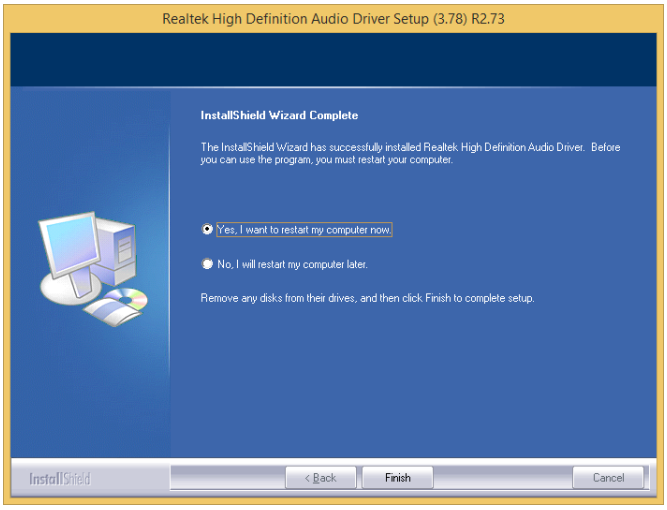
All drivers can be found on the Avalue Official Website:

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

Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



Step 1. Click **Next** to continue setup.



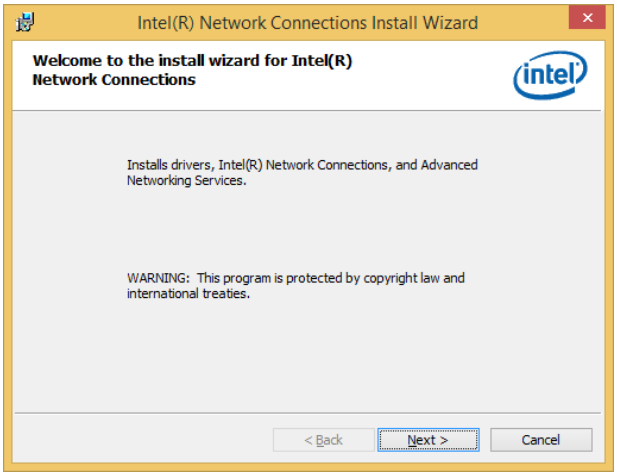
Step 2. Click **Finish** to complete the setup.

4.6 Install Ethernet Driver

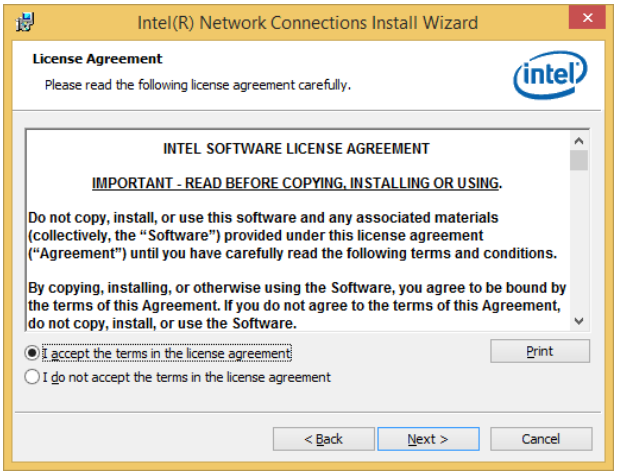
All drivers can be found on the Avalue Official Website:

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

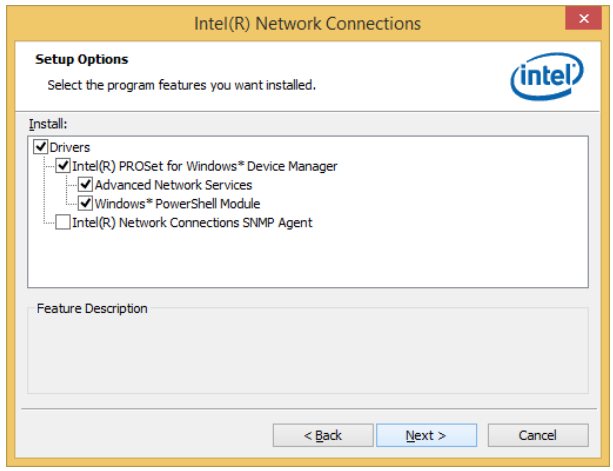
Note: The installation procedures and screen shots in this section are based on Windows 10 operation system.



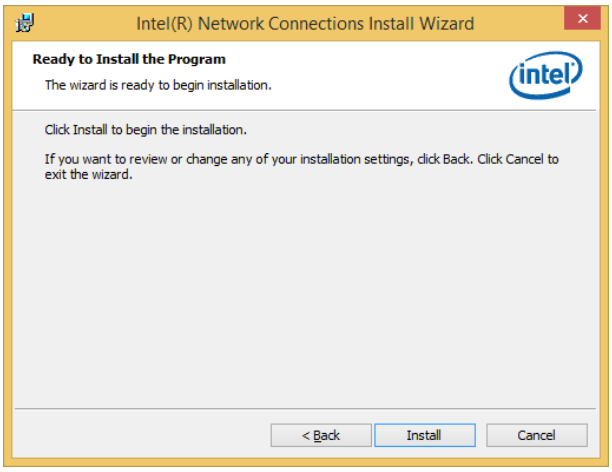
Step 1. Click **Next**.



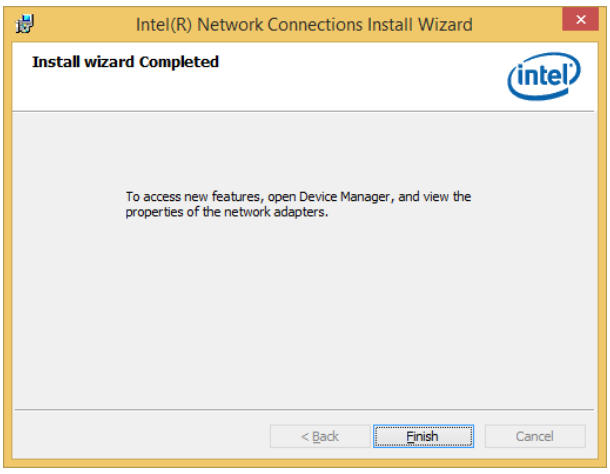
Step 2. Click **Next** to accept license agreement.



Step 3. Click **Next**.



Step 4. Click **Install** to proceed.



Step 5. Click **Finish** to complete the setup