

EQM-BSW

Intel® Pentium® and Celeron® N3000 Series SoC Processors
Qseven Module

User's Manual

1st Ed – 05 November 2015

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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 EQM-BSW Qseven Module
- 1 x Driver/Utility DVD-ROM



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

1.3 Document Amendment History

Revision	Date	By	Comment
1 st	November 2015	Avalue	Initial Release

1.4 Manual Objectives

This manual describes in details Avalue Technology EQM-BSW QSeven Module.

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

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

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

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

1.5 System Specifications

System	
CPU	Intel® Atom™ Braswell Platform
BIOS	Insyde 64M -bit SPI BIOS
System Chipset	Braswell SoC integrated
I/O Chipset	EC: NPCCE388NA0DX
System Memory	Onboard DDR3L 1600, up to 4GB
eMMC	Optional On board 4GB up to 64GB
Watchdog Timer	Reset: 1 sec.~65535 sec. and 1 sec. step
H/W Status Monitor	Monitoring system temperature, voltage. Auto trotting control when CPU CPU temperature monitoring V-Core Voltages monitoring 5V Voltage monitoring
Expansion	3 PCIe x 1 Supported* 1 PCIe x 1/1 PCIe x 2 Supported *When user needs PCIe#1, 2, 3, make sure PCIe#2 is activated.
I/O	
MIO	2 x SATA ports to baseboard
USB	5 x USB 2.0 and 1 x USB3.0 to baseboard
SD	SDIO Support
eMMC	eMMC 64GB optional
Others	LPC, SMBus, I2C (Chip) UART CAN Bus
External I/O Connector	Qseven spec 2.0 connector for expansions
Display	
Chipset	Braswell SoC integrated Graphics
Resolution	HDMI :2560 x 1600 @60 Hz LVDS mode: 1920 x 1080 @60Hz
Multiple Display	HDMI (or DP) + LVDS
LCD Interface	Dual channel 24-bit LVDS
Audio	
Audio interface	HD audio I/F
Ethernet	
LAN Chip	RealTek RTL8119
Ethernet Interface	10/100/1000 Base-Tx Compatible
Mechanical &	

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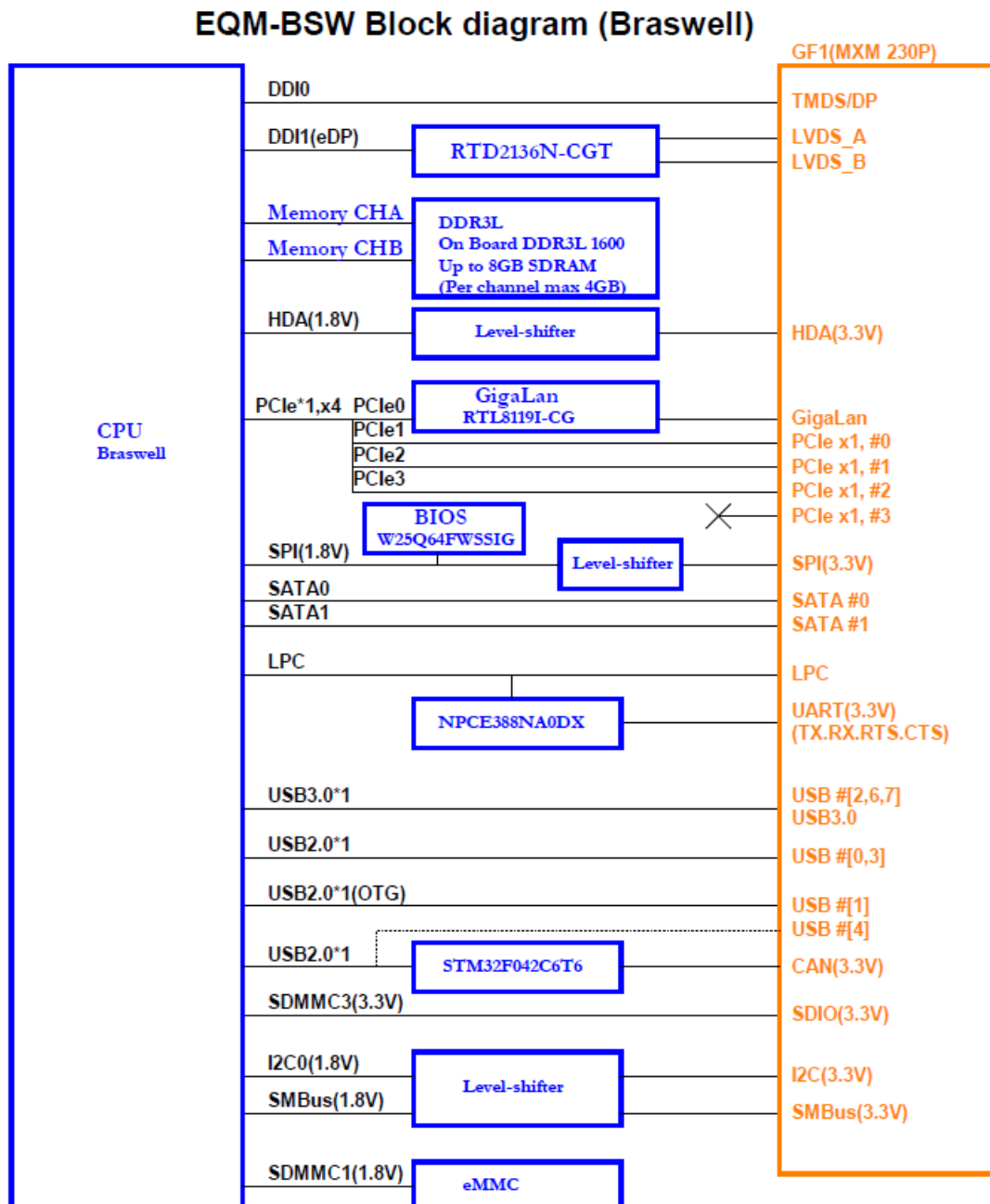
Environmental	
Power Requirement	+5V
ACPI	Single Power ATX Support S0, S3, S4, S5 ACPI 3.0 Compliant
Power Type	Qseven Power Spec
Operating Temp.	Standard: 0 to 60 deg C
Storage Temp.	-20°C to 85°C
Operating Humidity	0% ~ 90% Relative Humidity, Non-condensing
Size (L x W)	70mm x 70mm
Weight	0.041 lbs (0.03 Kg)
OS Support	Windows 8.1 / Windows 7 / Linux Yocto



Note: Specifications are subject to change without notice.

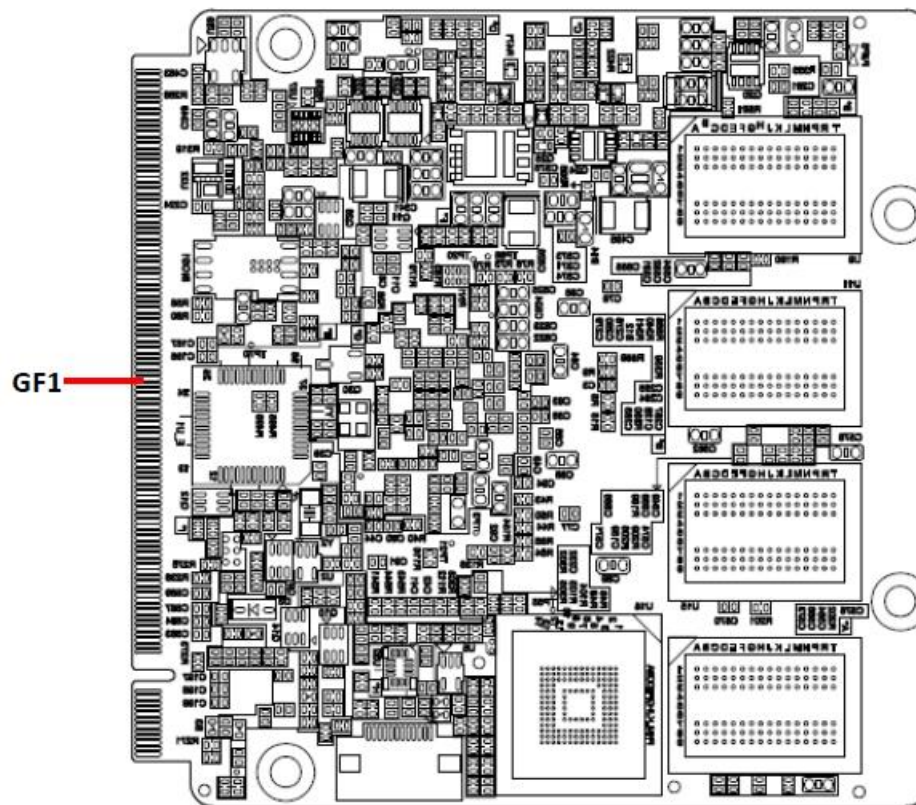
1.6 Architecture Overview—Block Diagram

The following block diagram shows the architecture and main components of EQM-BSW QSeven Module.



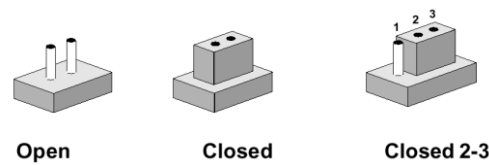
2. Hardware Configuration

2.1 Product Overview



2.2 Connector List

You can configure your board to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip. To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case, you would connect either two pins.



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



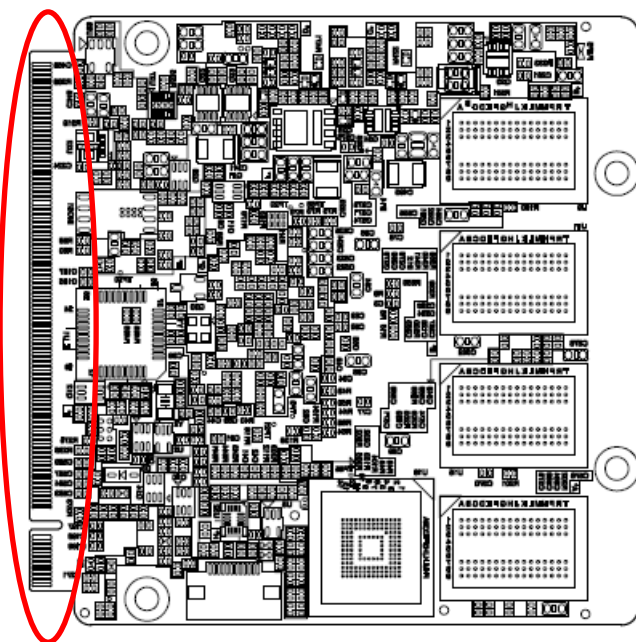
A pair of needle-nose pliers may be helpful when working with jumpers. Connectors on the board are linked to external devices such as hard disk drives, a keyboard, or floppy drives. In addition, the board has a number of jumpers that allow you to configure your system to suit your application. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

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

Connectors		
Label	Function	Note
GF1	QSeven connector	

2.3 Setting Connectors

2.3.1 QSeven connector (GF1)



*Default

Signal	PIN	PIN	Signal
GND	1	2	GND
GBE_MDI3-	3	4	GBE_MDI2-
GBE_MDI3+	5	6	GBE_MDI2+
GBE_LINK100#	7	8	GBE_LINK1000#
GBE_MDI1-	9	10	GBE_MDI0-
GBE_MDI1+	11	12	GBE_MDI0+
GBE_LINK#	13	14	GBE_ACT#
GBE_CTREF	15	16	SUS_S5#
WAKE#	17	18	SUS_S3#
SUS_STAT#	19	20	PWRBTN#
NC	21	22	NC
GND	23	24	GND
GND	25	26	PWGIN
BATLOW#	27	28	RSTBTN#
SATA0_TX+	29	30	SATA1_TX+
SATA0_TX-	31	32	SATA1_TX-
SATA_ACT#	33	34	GND
SATA0_RX+	35	36	SATA1_RX+
SATA0_RX-	37	38	SATA1_RX-

Signal	PIN	PIN	Signal
GND	39	40	GND
BIOS_DISABLE#	41	42	SDIO_CLK#
SDIO_CD#	43	44	NC
SDIO_CMD	45	46	SDIO_WP
SDIO_PWR#	47	48	SDIO_DAT1
SDIO_DAT0	49	50	SDIO_DAT3
SDIO_DAT2	51	52	NC
NC	53	54	NC
NC	55	56	RSVD56
GND	57	58	GND
HDA_SYNC	59	60	SMB_CLK
HDA_RST#	61	62	SMB_DAT
HDA_BCLK	63	64	SMB_ALERT#
HDA_SDI	65	66	I2C_CLK
HDA_SDO	67	68	I2C_DAT
THRM#	69	70	WDTRIG#
THRMTRIP#	71	72	WDOUT
GND	73	74	GND
SS_USB_TXN	75	76	SS_USB_RXN
SS_USB_TXP	77	78	SS_USB_RXP
USB_6_7_OC#	79	80	USB_4_5_OC#
NC	81	82	USB_P4-
NC	83	84	USB_P4+
USB_2_3_OC#	85	86	USB_0_1_OC#
USB_P3-	87	88	USB_P2-
USB_P3+	89	90	USB_P2+
NC	91	92	NC
USB_P1-	93	94	USB_P0-
USB_P1+	95	96	USB_P0+
GND	97	98	GND
LVDS_A0+	99	100	LVDS_B0+
LVDS_A0-	101	102	LVDS_B0-
LVDS_A1+	103	104	LVDS_B1+

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Signal	PIN	PIN	Signal
LVDS_A1-	105	106	LVDS_B1-
LVDS_A2+	107	108	LVDS_B2+
LVDS_A2-	109	110	LVDS_B2-
LVDS_PPEN	111	112	LVDS_BLEN
LVDS_A3+	113	114	LVDS_B3+
LVDS_A3-	115	116	LVDS_B3-
GND	117	118	GND
LVDS_A_CLK+	119	120	LVDS_B_CLK+
LVDS_A_CLK-	121	122	LVDS_B_CLK-
LVDS_BLT_CTRL	123	124	NC
LVDS_DID_DAT	125	126	NC
LVDS_DID_CLK	127	128	NC
CAN_TX	129	130	CAN_RX
DP_L3+_TMDS_CLK+	131	132	NC
DP_L3+_TMDS_CLK-	133	134	NC
GND	135	136	GND
DP_L1+_TMDS_L1+	137	138	DP_AUXP
DP_L1-_TMDS_L1-	139	140	DP_AUXN
GND	141	142	GND
DP_L2+_TMDS_L0+	143	144	NC
DP_L2-_TMDS_L0-	145	146	NC
GND	147	148	GND
DP_L0+_TMDS_L2+	149	150	HDMI_DDC_SDA
DP_L0-_TMDS_L2-	151	152	HDMI_DDC_SCL
DP_HDMI_HPD#	153	154	DP_HPD#
PCIE_CLK_REF+	155	156	PCIE_WAKE#
PCIE_CLK_REF-	157	158	PCIE_RST#
GND	159	160	GND
NC	161	162	NC
NC	163	164	NC
GND	165	166	GND
PCIE_TXP_1	167	168	PCIE_RXP_1
PCIE_TXN_1	169	170	PCIE_RXN_1

Signal	PIN	PIN	Signal
UART_TXD	171	172	UART_RTS#
PCIE_TXP_3	173	174	PCIE_RXP_3
PCIE_TXN_3	175	176	PCIE_RXN_3
UART_RXD	177	178	UART_CTS#
PCIE_TXP_2	179	180	PCIE_RXP_2
PCIE_TXN_2	181	182	PCIE_RXN_2
GND	183	184	GND
LPC_AD0	185	186	LPC_AD1
LPC_AD2	187	188	LPC_AD3
LPC_CLK	189	190	LPC_FRAME#
SERIRQ	191	192	LPC_LDRQ#
VCC_RTC	193	194	SPKR
FAN_TACHOIN	195	196	FAN_PWMOUT
GND	197	198	GND
SPI_MOSI	199	200	SPI_CS0#
SPI_MISO	201	202	RSVD202
SPI_CLK	203	204	NC
VCC_5V_SB1	205	206	VCC_5V_SB2
NC	207	208	NC
NC	209	210	NC
VCC1	211	212	VCC2
VCC3	213	214	VCC4
VCC5	215	216	VCC6
VCC7	217	218	VCC8
VCC9	219	220	VCC10
VCC11	221	222	VCC12
VCC13	223	224	VCC14
VCC15	225	226	VCC16
VCC17	227	228	VCC18
VCC19	229	230	VCC20

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

Insyde 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 <F2> immediately after switching the system on, or

By pressing the <F2> key when the following message appears briefly at the left-top of the screen during the POST (Power On Self Test).

Press <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.

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
F9 key	Optimized defaults
F10 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 Insyde BIOS supports an override to the NVRAM settings which resets your system to its defaults.

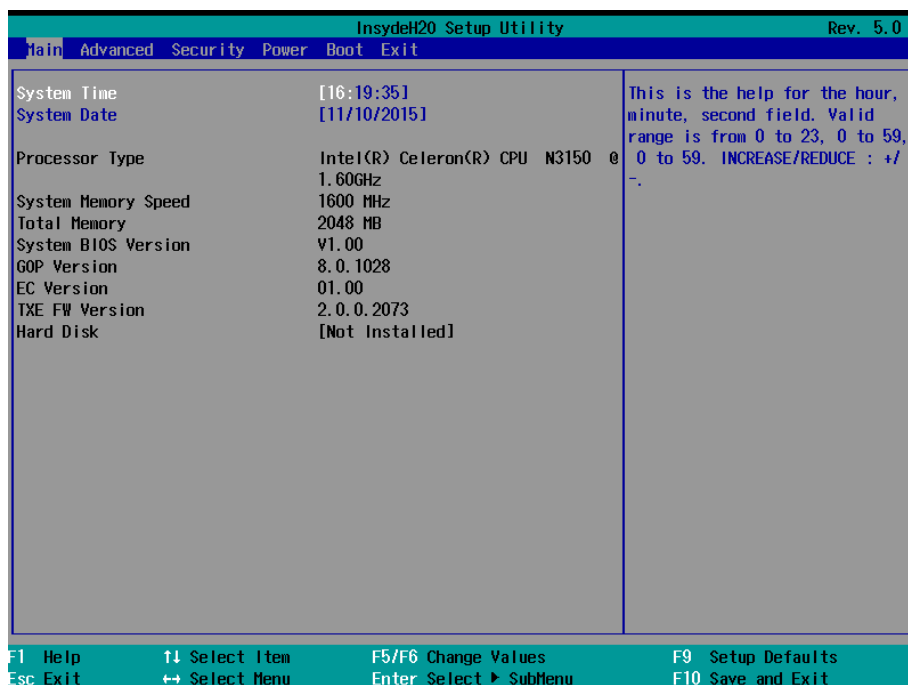
The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both BIOS Vendor and your systems manufacturer to provide the absolute maximum performance 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 InsydeH2O 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 Time

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

3.6.1.2 System Date

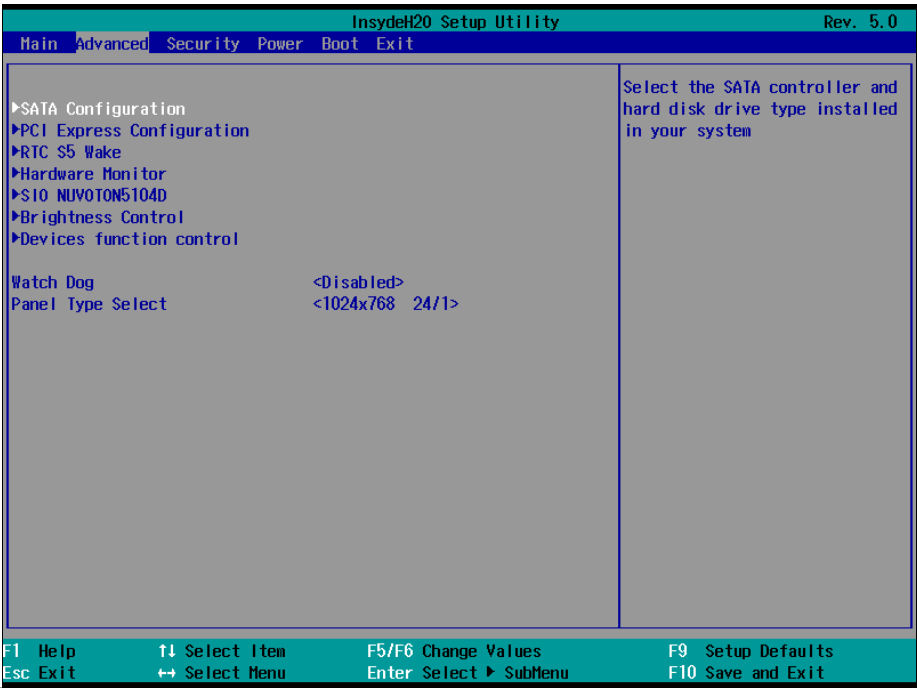
Use the system date option to set the system date. Manually enter the day, month and year.



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.

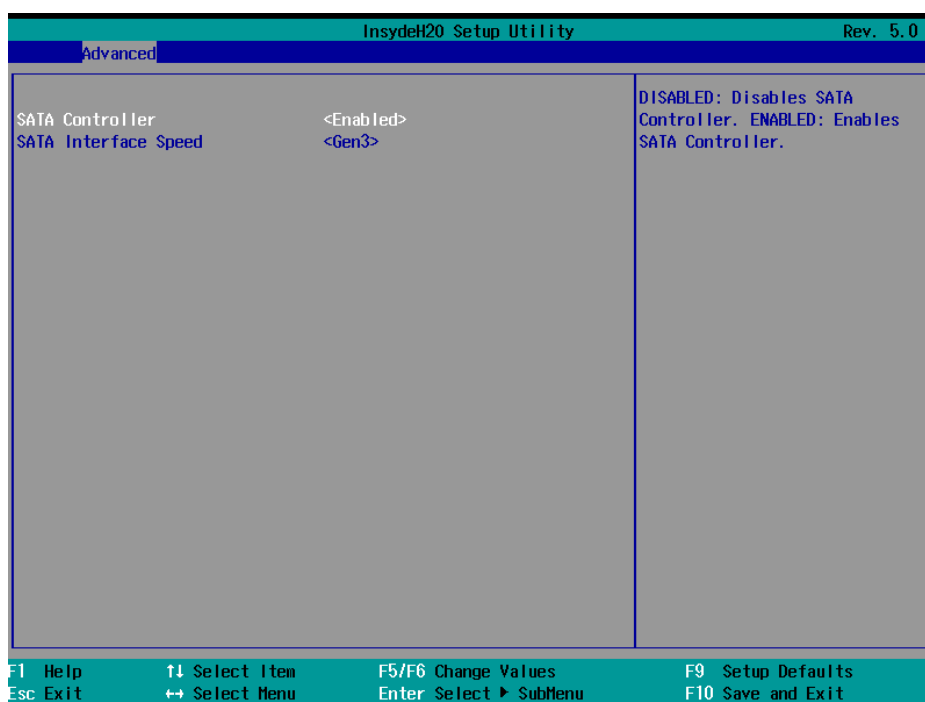
3.6.2 Advanced Menu

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



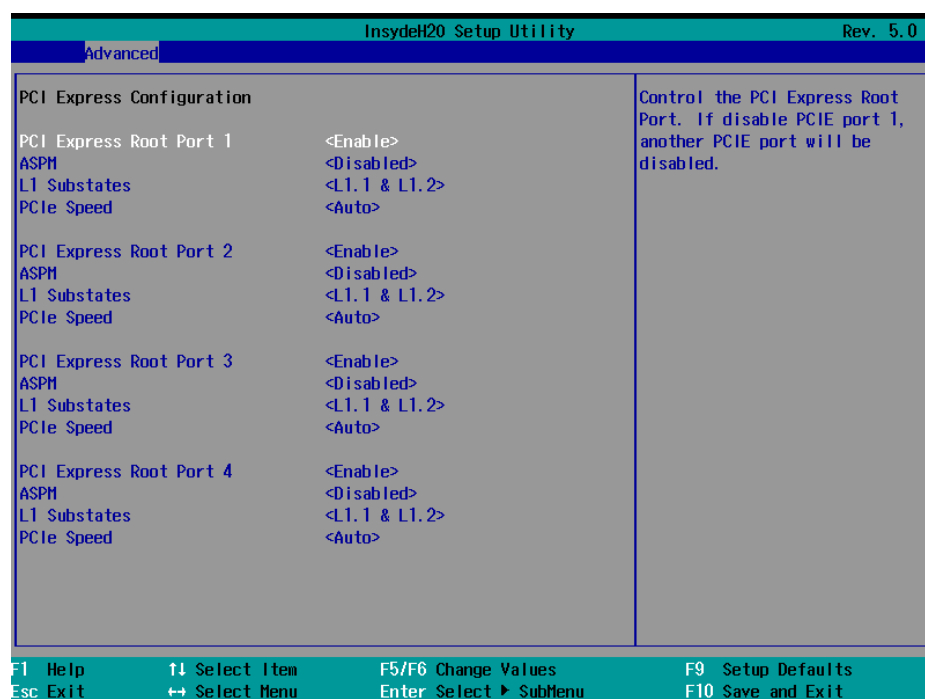
Item	Options	Description
Watch Dog	Disabled[Default], 30 sec 40 sec 50 sec 1 min 2 min 10 min 30 min	Select WatchDog items.
Panel Type Select	1024x768 24/1[Default] 800x600 18/1 1024x768 18/1 1366x768 18/1 1024x600 18/1 1280x800 18/1 1920x1200 24/2 640x480 18/1 800x480 18/1 1920x1080 18/2 1280x1024 24/2 1440x900 18/2 1600x1200 24/2 1366x768 24/1 1920x1080 24/2 1680x1050 24/2	Select Panel Type for display.

3.6.2.1 SATA Configuration



Item	Options	Description
SATA Controller	Disabled, Enabled[Default]	SATA Controller.
SATA Interface Speed	Gen1 Gen2 Gen3[Default]	Select SATA Interface Speed.

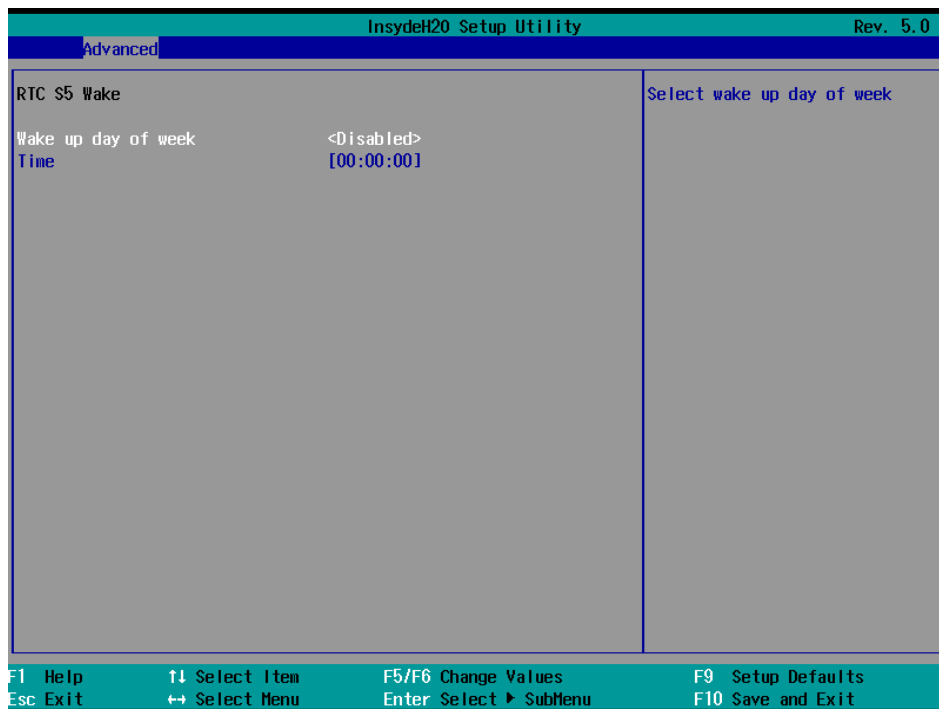
3.6.2.2 PCI Express Configuration



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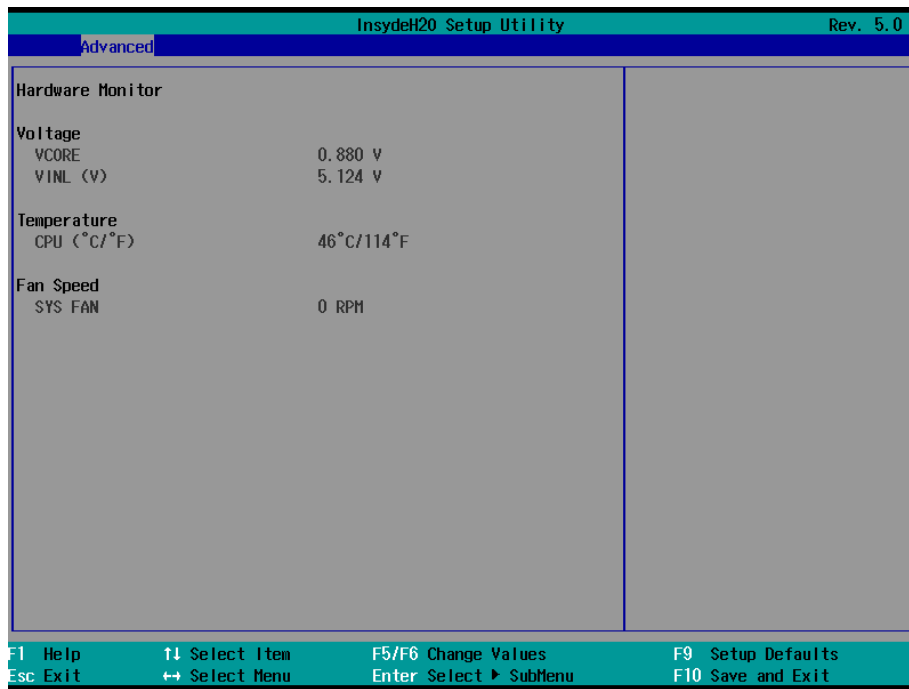
Item	Options	Description
PCI Express Root Port 1/2/3/4	Disabled Enabled[Default],	Control the PCI Express Root Port. If disable PCIE port 1, another PCIE port will be disabled.
ASPM	Disabled[Default] L0s L1 L0sL1	PCI Express Active State Power Management settings.
L1 Substates	Disabled[Default] L1.1 & L1.2 L1.1 L1.2	PCI Express L1 Substates settings.
PCIe Speed	Auto[Default] Gen 1 Gen 2	Configure PCIe Speed.

3.6.2.3 RTC S5 Wake

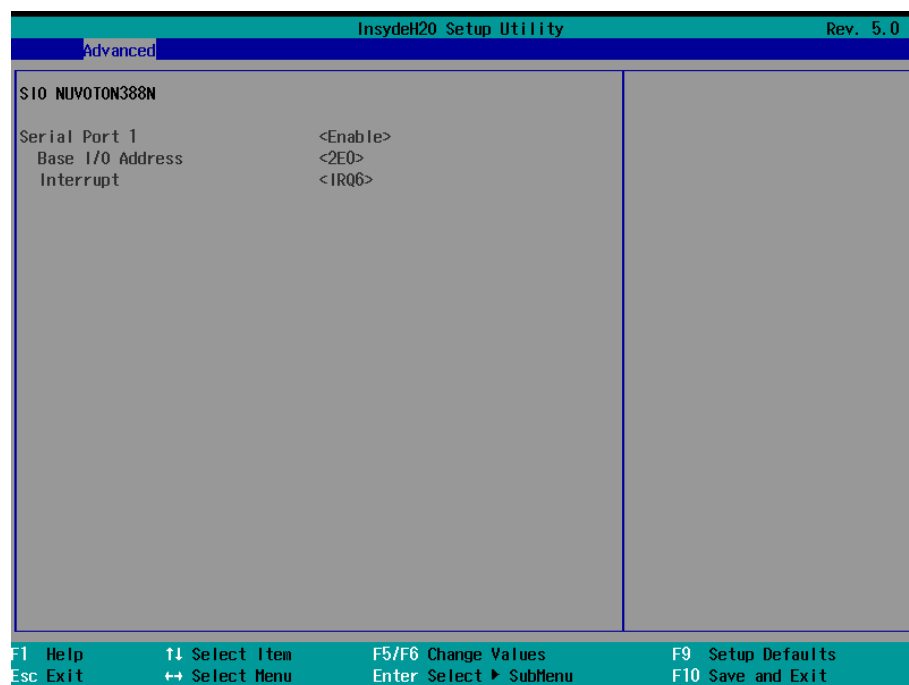


Item	Options	Description
Wake up day of week	Monday-Friday Monday-Saturday Every Day Disabled[Default]	Select wake up day of week.
Time	[00:00:00][Default]	This is the help for the hour, minute second field. Valid range is from 0 to 23, 0 to 59, 0 to 59. INCREASE/REDUCE : +/-.

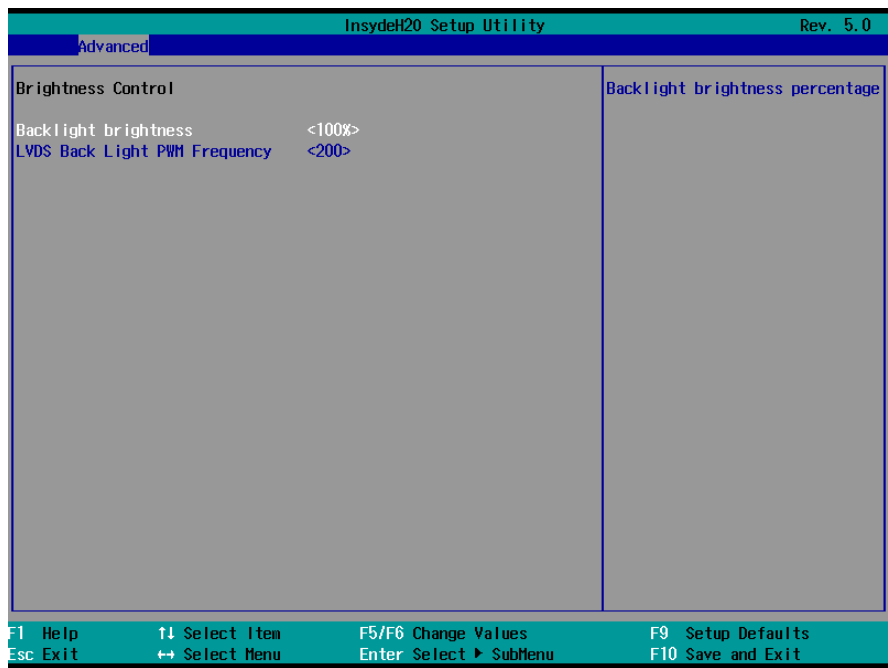
3.6.2.4 Hardware Monitor



3.6.2.5 SIO NUVOTON5104D

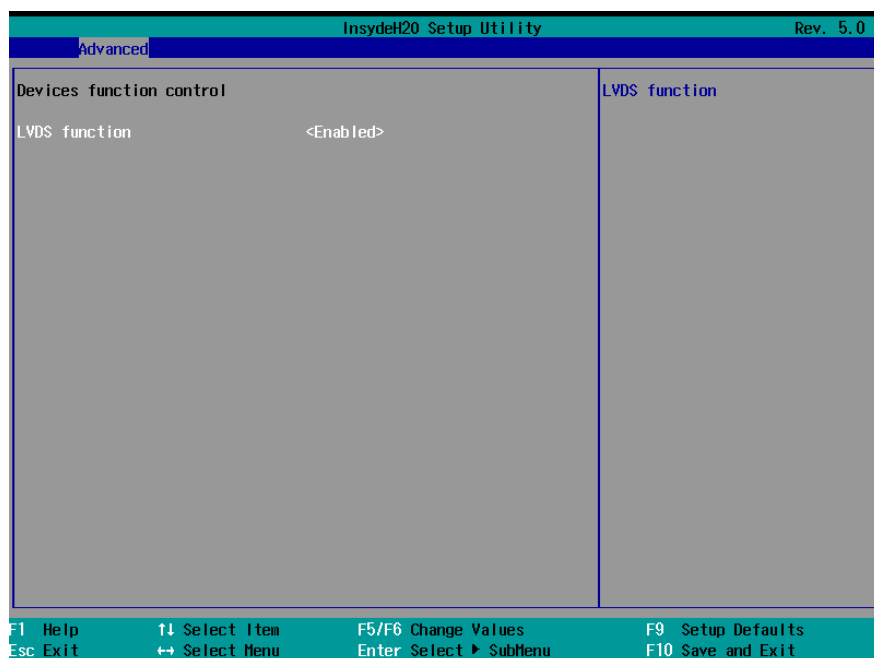


3.6.2.6 Brightness Control



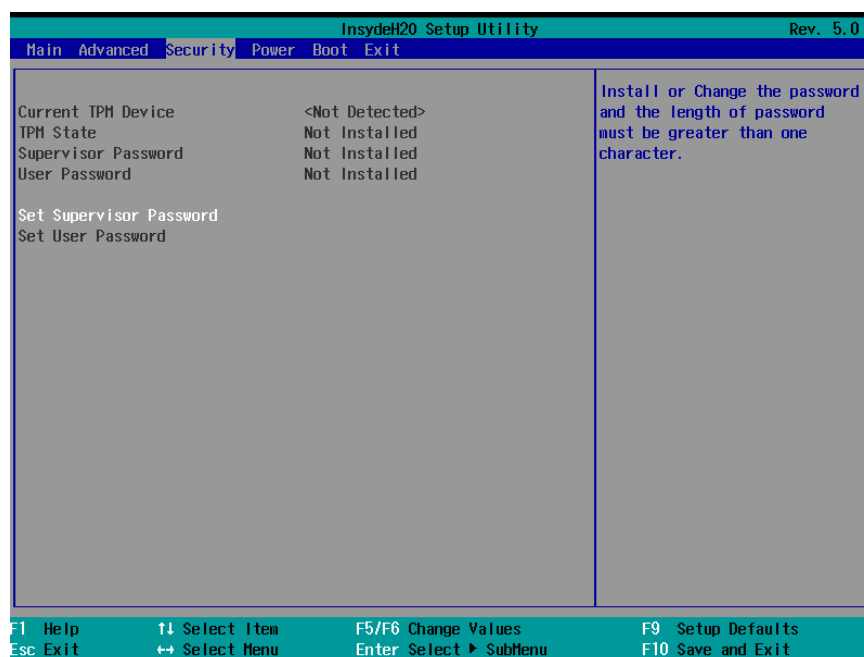
Item	Options	Description
Backlight brightness	0% 25% 50% 75% 100%[Default]	Backlight brightness percentage.
LVDS Back Light PWM Frequency	200[Default] 300 400 500 700 1k 2k 3k 5k 10k 20k	LVDS Back Light PWM Frequency.

3.6.2.7 Device function Control



Item	Options	Description
LVDS function	Enabled[Default] Disabled	Enable or Disable LVDS panel display function.

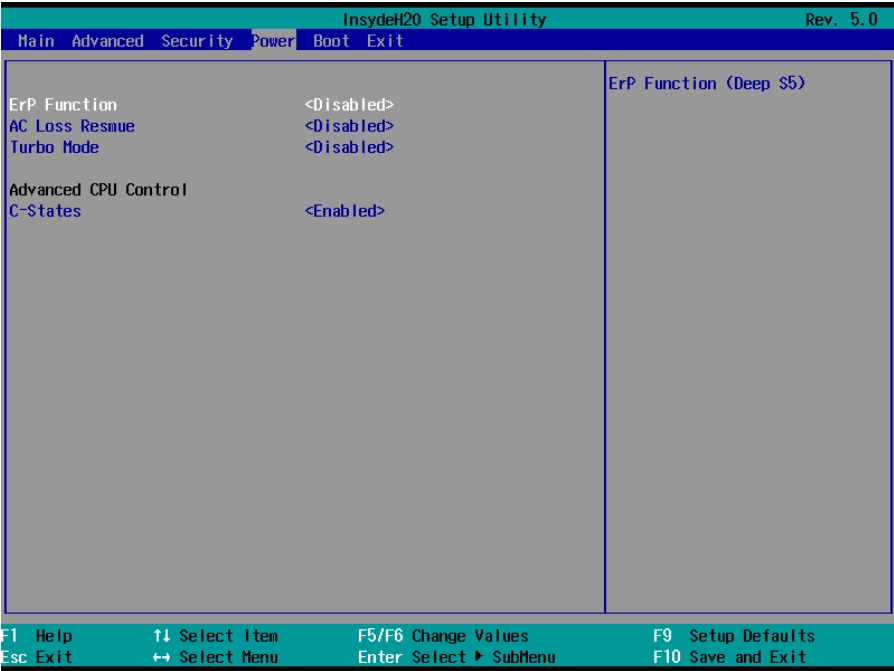
3.6.3 Security



Item	Description
Set Supervisor Password	Set Supervisor Password. Install or Change the password and the length of password must be greater than on character

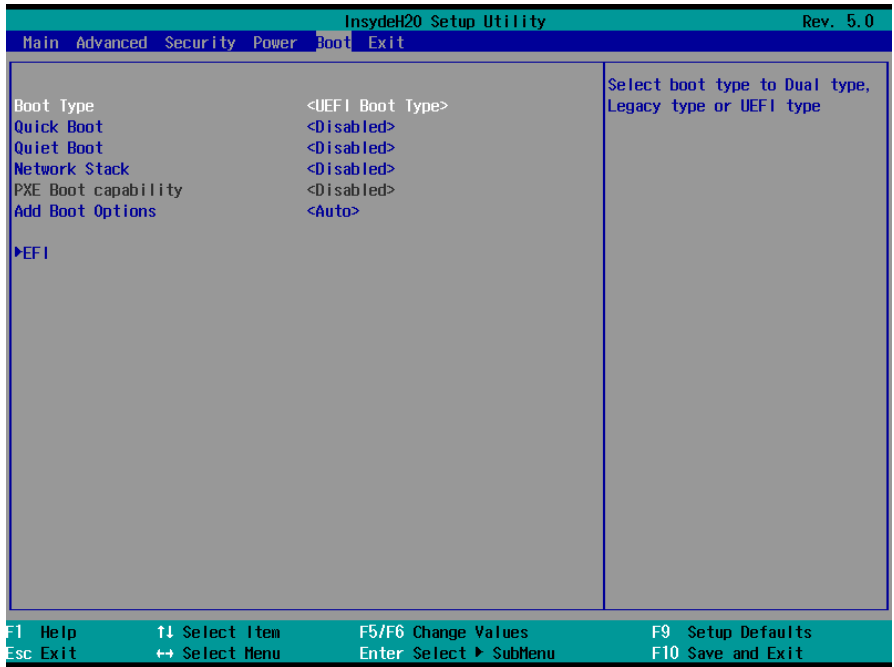
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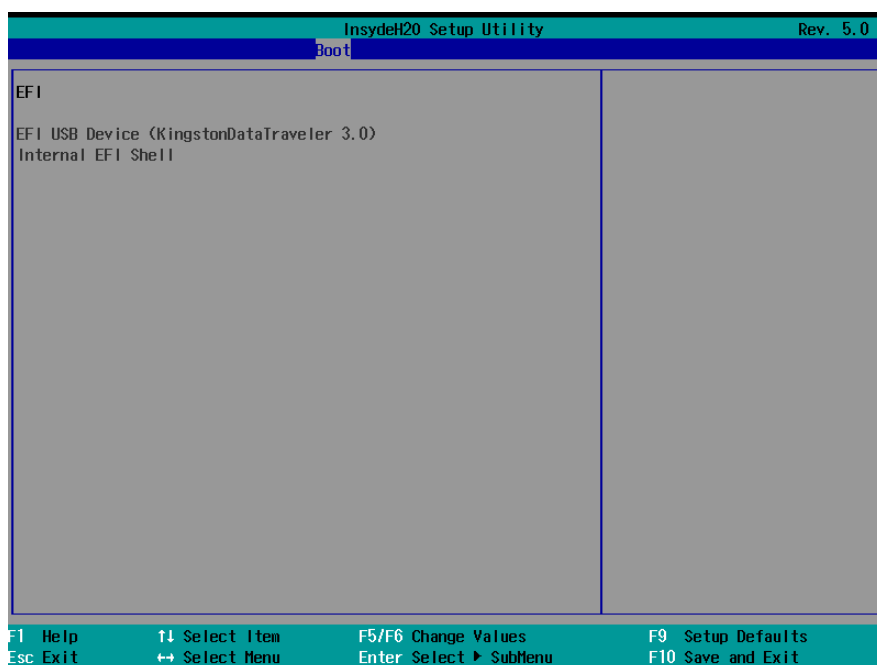
3.6.4 Power



Item	Option	Description
Erp Function	Disabled[Default] Enabled	ErP Function (Deep S5).
AC Loss Resume	Disabled[Default] Enabled	AC Loss Resume setting.
Turbo Mode	Disabled[Default] Enabled	Enable processor Turbo Mode(requires EMTTM enabled too).
C-States	Disabled Enabled[Default]	Enable processor idle power saving states (C-States).

3.6.5 Boot

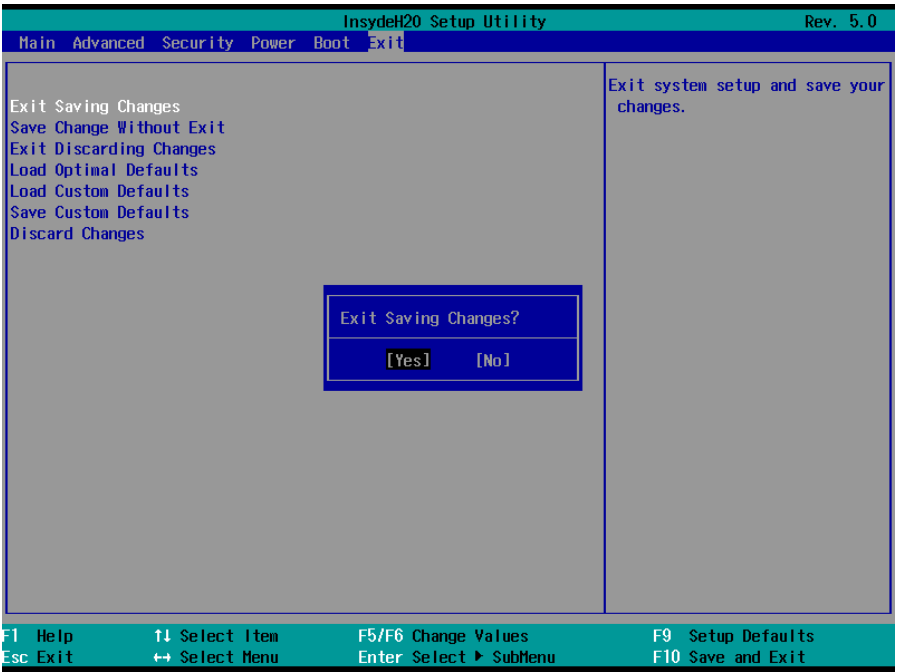
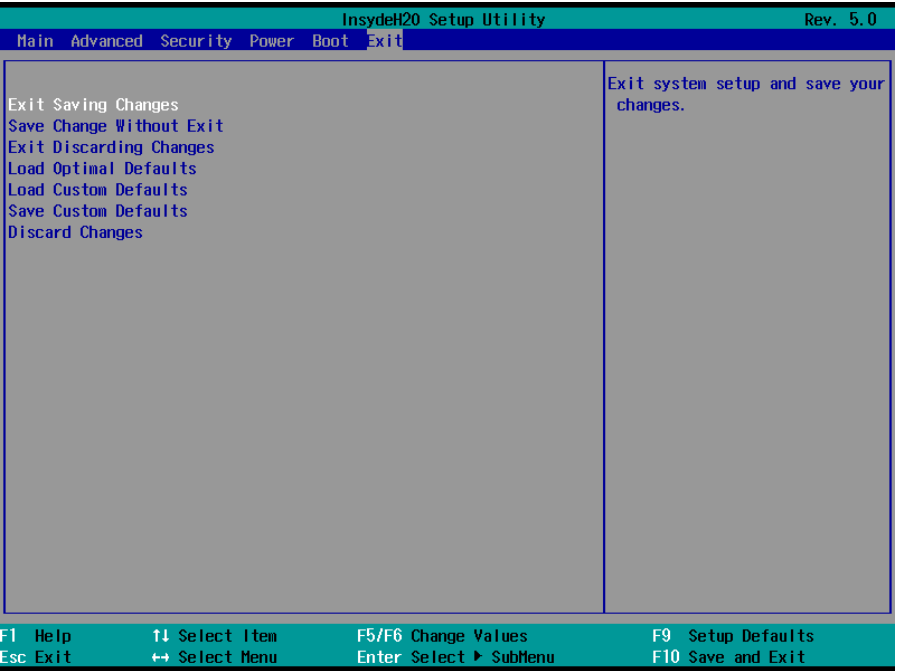




Item	Option	Description
Boot Type	Legacy Boot Type UEFI Boot Type[Default]	Select boot type to Legacy type or UEFI type.
Quick Boot	Disabled[Default] Enabled	Allows InsydeH20 to skip certain tests while booting. This will decrease the time needed to boot the system.
Quiet Boot	Disabled[Default] Enabled	Disables or enables booting in Text Mode.
Network Stack	Disabled[Default] Enabled	Network Stack Support: Windows 8 BitLocker Unlock UEFI IPv4/ IPv6 PXE Legacy PXE OPROM.
Add Boot Options	First Auto[Default]	Position in Boot Order for Shell, Network and Removables.

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3.6.6 Exit



3.6.6.1 Exit Saving Changes

Exit system setup and save your changes.

3.6.6.2 Save Change Without Exit

Save your changes and without exiting system.

3.6.6.3 Exit Discarding Changes

Exit system setup and without saving your changes.

3.6.6.4 Load Optimal Defaults

Load Optimal Defaults.

3.6.6.5 Load Custom Defaults

Load Custom Defaults.

3.6.6.6 Save Custom Defaults

Save Custom Defaults.

3.6.6.7 Discard Changes

Discard Changes.

4. Drivers Installation



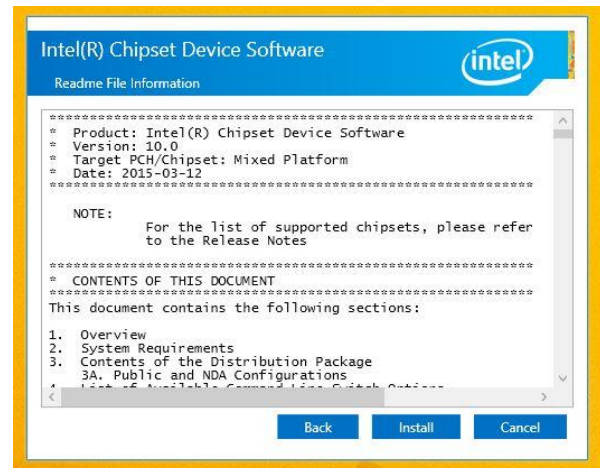
Note: Installation procedures and screen shots in this section are for your reference and may not be exactly the same as shown on your screen.

4.1 Install Chipset Driver

Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left, or link to `\Driver_Chipset\Intel\EQM-BSW`.



Note: The installation procedures and screen shots in this section are based on Windows 8.1 operation system. If the warning message appears while the installation process, click Continue to go on.



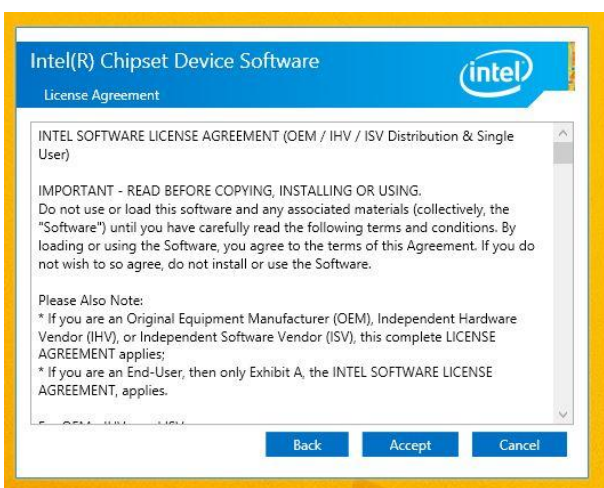
Step 3. Click Install.



Step1. Click Next.



Step 4. Click Finish to complete setup.



Step 2. Click Accept.

4.2 Install TXE Driver

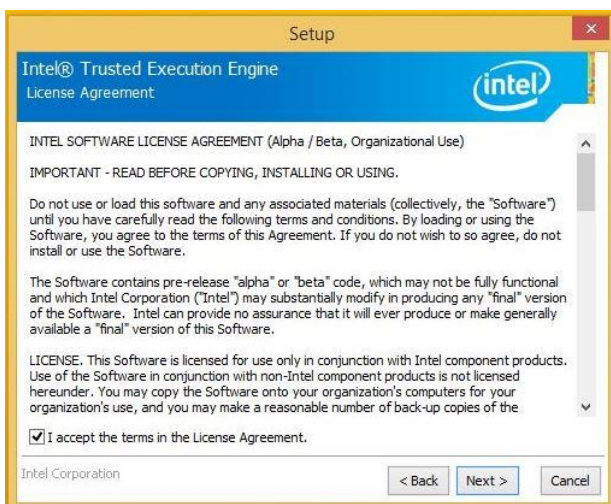
Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left, or link to \Utility\EQM-BSW_TXE.



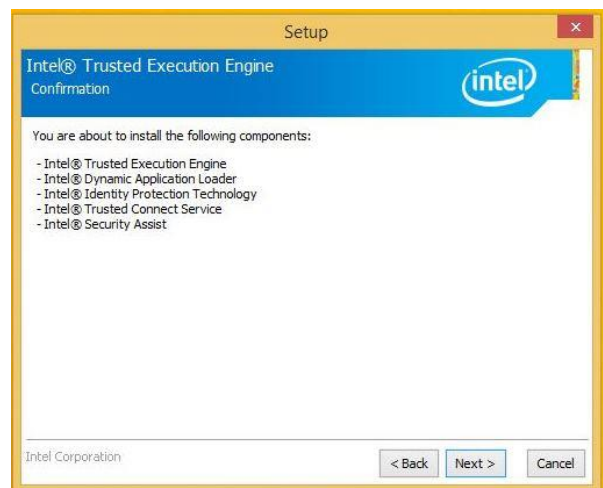
Note: The installation procedures and screen shots in this section are based on Windows 8.1 operation system. If the warning message appears while the installation process, click Continue to go on.



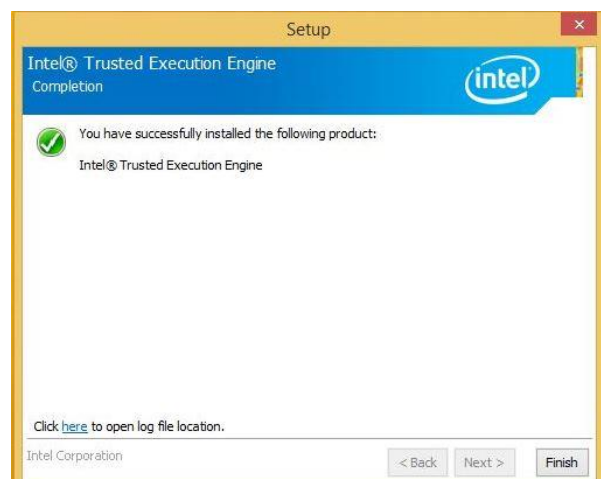
Step1. Click **Next** to start installation.



Step 2. Click **Next**.



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



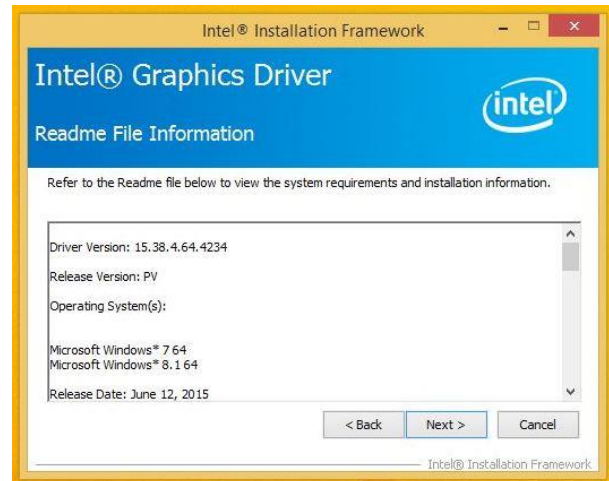
Step 4. Click **Finish** to complete setup.

4.3 Install VGA Driver

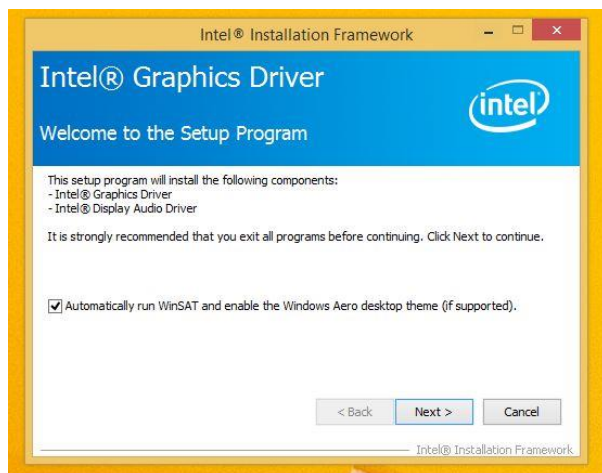
Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left, or link to **IVGAIEQM-BSW**.



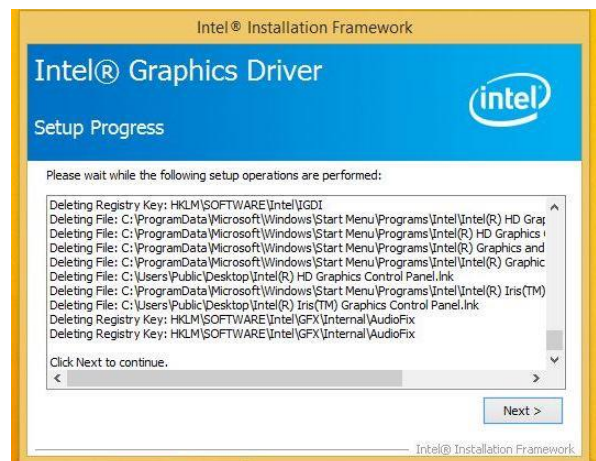
Note: The installation procedures and screen shots in this section are based on Windows 8.1 operation system.



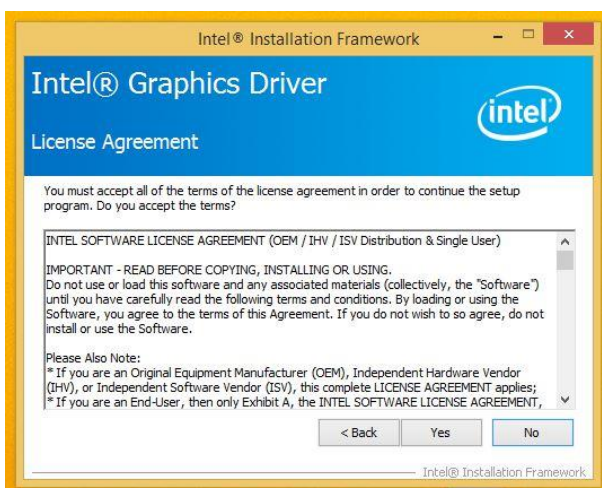
Step 3. Click Next.



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

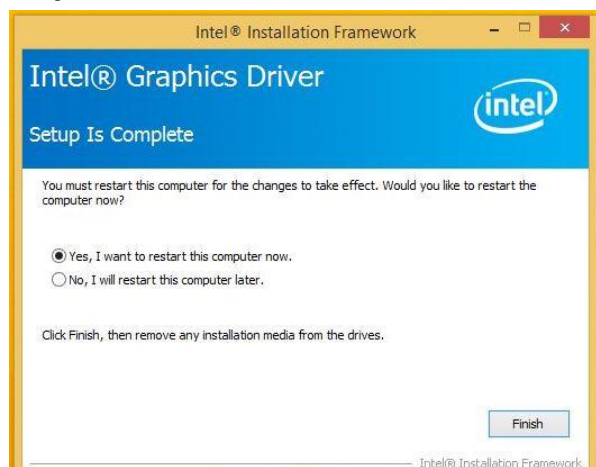


Step 4. Click Next.



Step 2.

Click **Yes** to accept license agreement.



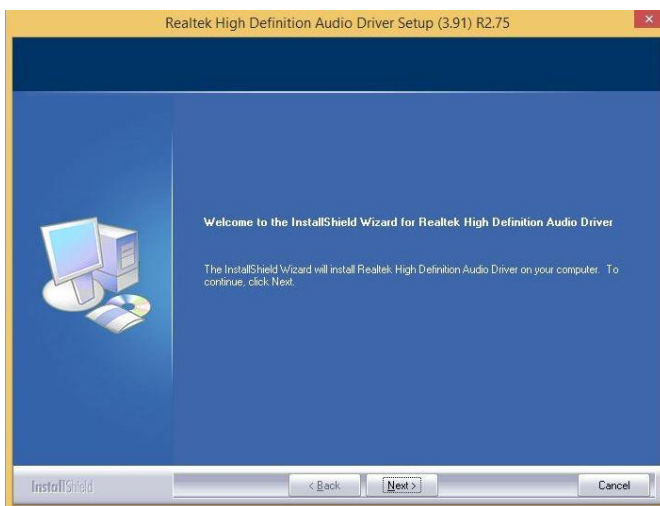
Step 5. Click **Finish** to complete setup.

4.4 Install Audio Driver (For Realtek ALC233)

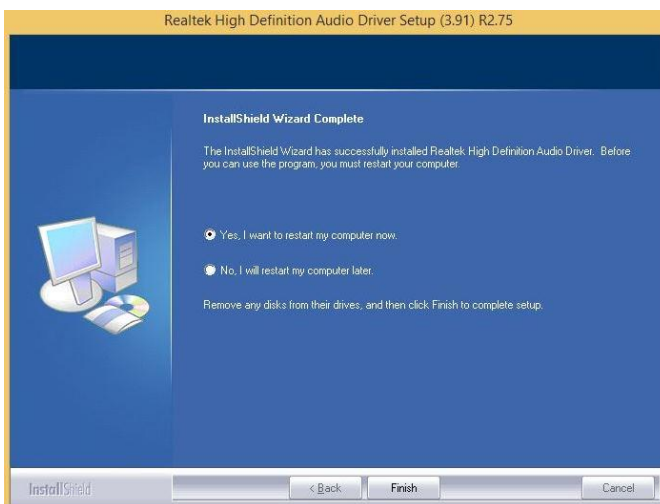
Insert the Supporting CD-ROM to CD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left, or link to **\\Driver_Audio\\Realtek\\ALC233\\EQM-BSW_Audio**.



Note: The installation procedures and screen shots in this section are based on Windows 8.1 operation system.



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



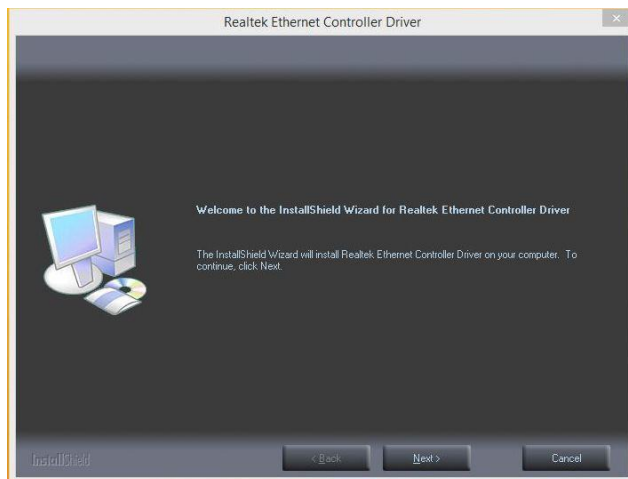
Step 2. Click **Finish** to complete the setup.

4.5 Install Ethernet Driver

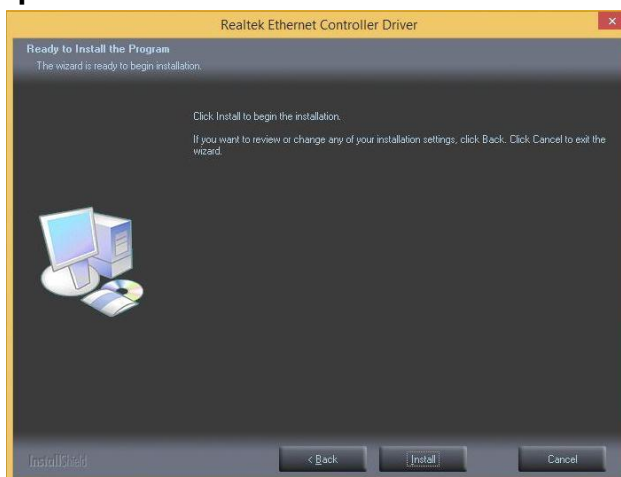
Insert the Supporting DVD-ROM to DVD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left, or link to
\\Driver_Gigabit\\Realtek\\RTL8119\\EQM-BSW_LAN.



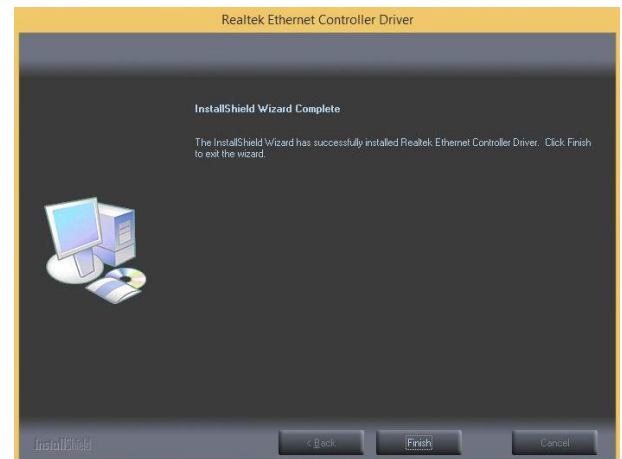
Note: The installation procedures and screen shots in this section are based on Windows 8.1 operation system.



Step 1. Click Next.



Step 2. Click Install to proceed.



Step 3. Click Finish to complete the setup.

4.6 Install Serial IO Driver

Insert the Supporting CD-ROM to CD-ROM drive, and it should show the index page of Avalue's products automatically. If not, locate Index.htm and choose the product from the menu left, or link to **Utility\EQM-BSW_Serial IO**.



Note: The installation procedures and screen shots in this section are based on Windows 8.1 operation system.

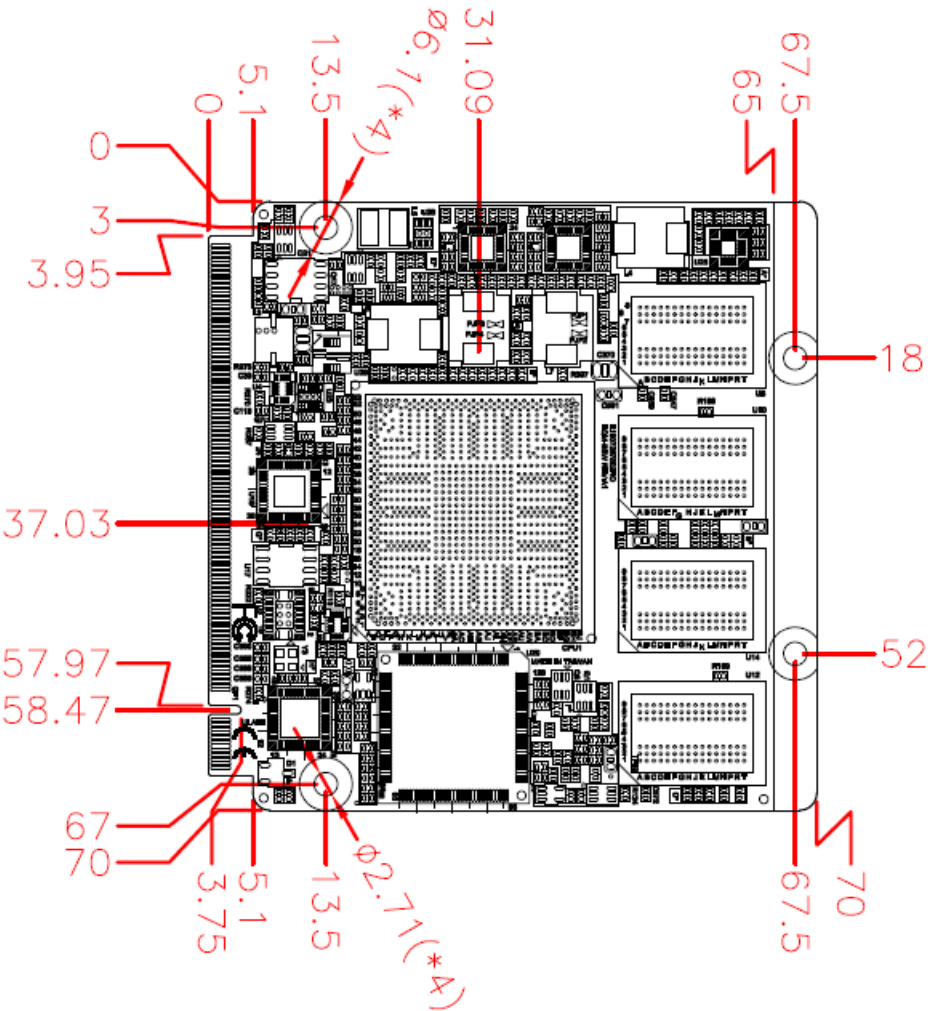


Step 1. Click **Next** to continue setup.



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

5. Mechanical Drawing



Unit: mm

