EmQ-i2301

Qseven® CPU Module

User's Manual

Version 1.0

2014.08

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Revision History

Version	Release Time	Description
1.0	August, 2014	Initial release

Copyright Notice

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

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

Declaration of Conformity

CE

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

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

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

Warning

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

FCC Class A

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

(1)This device may not cause harmful interference, and

(2)This device must accept any interference received, including interference that may cause undesired operation.

NOTE:

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

RoHS

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

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

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

SVHC / REACH

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

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

Warning

Single Board Computers and their components contain very delicate Integrated Circuits (IC). To protect the Single Board Computer and its components against damage from static electricity, you should always follow the following precautions when handling it:

1. Disconnect your Single Board Computer from the power source when you want to work on the inside.
2. Hold the board by the edges and try not to touch the IC chips, leads or circuitry.
3. Use a grounded wrist strap when handling computer components.
4. Place components on a grounded antistatic pad or on the bag that comes with the Single Board Computer, whenever components are separated from the system.

Replacing the Lithium Battery

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

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

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

Technical Support

If you have any technical difficulties, please do not hesitate to call or e-mail our customer service.

http://www.arbor.com.tw

E-mail:info@arbor.com.tw

Warranty

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

Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, or inability to use this product. Vendor will not be liable for any claim made by any other related party. Vendors disclaim all other warranties, either expressed or implied, including but not limited to implied warranties of merchantability and fitness for a

particular purpose, with respect to the hardware, the accompanying product's manual(s) and written materials, and any accompanying hardware. This limited warranty gives you specific legal rights.

Return authorization must be obtained from the vendor before returned

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

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Chapter 1

Introduction

1.1. The Product

• Fanless Design
• Soldered Onboard Intel® Atom™ Processor E3800 family
• Intel® i210IT PCIe GbE controller
• Dual Channels 24-bit LVDS, DDI Port
• Extended Operating Temp.: -20 ~ 70ºC

1.2. About this Manual

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

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

1.3. Specifications

Form Factor	Qseven® CPU Module
CPU	Soldered onboard Intel® Atom™ Processor E3825 dual-core 1.33GHz or E3845 quadcore 1.91GHz
System Memory	Soldered onboard 2GB / 4GB DDR3L SDRAM
VGA/ LCD Controller	SoC Integrated Intel® Gen7 graphic
Ethernet controller	1 x Intel® i210IT PCIe GbE controller
Audio	HD Audio Link
BIOS	Insyde UEFI BIOS
Serial ATA	2 x Serial ATA ports w/ 300MB/s HDD transfer rate
Universal Serial Bus	8 x USB 2.0 ports
Storage	Soldered onboard 16GB eMMC (Optional)
Graphics Interface	LCD: Dual Channels 24-bit LVDS, resolution up to 1920x1200
	Analog RGB signals (via Qseven® GF reserved pin)
	1 x DDI port
Expansion Bus	3 x PCIe x1 lanes, SDIO, I2C
Operating Temp.	-20ºC ~ 70ºC (-4ºF ~ 158ºF) for EmQ-i2301
Watchdog Timer	1~ 255 levels Reset
Dimension (L x W)	70 x 70 mm (2.76” x 2.76”)

1.4. Inside the Package

Before starting with the installation, make sure the following items are shipped. If any of the items is missing or appears damaged, contact your local dealer or distributor.

1 x EmQ-i2301 Qseven® CPU Module

1 x Driver CD

1 x Quick Installation Guide

1.5. Ordering Information

EmQ-i2301-E3825-2G	Intel® Atom™ Processor Bay Trail-I E3825 Qseven® CPU module w / 2GB memory soldered on module
EmQ-i2301-E3845-2G	Intel® Atom™ Processor Bay Trail-I E3845 Qseven® CPU module w / 2GB memory soldered on module
EmQ-i2301-E3825-4G(BTO)	Intel® Atom™ Processor Bay Trail-I E3825 Qseven® CPU module w / 4GB memory soldered on module
EmQ-i2301-E3845-4G(BTO)	Intel® Atom™ Processor Bay Trail-I E3845 Qseven® CPU module w / 4GB memory soldered on module
EmQ-i2301D-E3825-2G(BTO)	Intel® Atom™ Processor Bay Trail-I E3825 Qseven® CPU module w / eMMC16GB and 2GB memory soldered on module
EmQ-i2301D-E3845-2G(BTO)	Intel® Atom™ Processor Bay Trail-I E3845 Qseven® CPU module w / eMMC16GB and 2GB memory soldered on module
EmQ-i2301D-E3825-4G(BTO)	Intel® Atom™ Processor Bay Trail-I E3825 Qseven® CPU module w / eMMC16GB and 4GB memory soldered on module
EmQ-i2301D-E3845-4G(BTO)	Intel® Atom™ Processor Bay Trail-I E3845 Qseven® CPU module w / eMMC16GB and 4GB memory soldered on module
HS-0662-F1	Heat spreader
HS-0000-W3	Universal evaluation Heatsink for Qseven® CPU module
PBQ-3000	Qseven® EPIC evaluation board
CBK-06-3000-00	Cable kit 1 x USB cable 1 x USB2 cable 2 x Serial port cables 1 x SATA cable 1 x SATA power cable

1.6. Driver Installation Note

The CPU board supports Windows 7 and Windows 8/8.1. Find the necessary drivers on the CD that comes with your purchase. For different OS, the driver/ utility installation may vary slightly, but generally they are similar.

Find the drivers on CD by the following paths:

Windows 8.1

Driver	Path
Audio	\Audio\32 bit
	\Audio\64 bit
Chipset	\Chipset\32bit\Chipset Kit 57833 _32
	\Chipset\64bit\Chipset Kit 57833 _64
Ethernet	\Ethernet\Intel\32bit\LAN 18.8.1 _32
	\Ethernet\Intel\64bit\LAN 18.8.1 _64
GPIO	\GPIO\Kit 100882 20140211 windows 8.1 64\GPIO
I2C	\I2C\Kit 100882 20140211 windows 8.1 64\I2C
Graphics	\Graphic\Win8.1\32bit\Kit 57832_win8_32bit_2013-1202\Win32
	\Graphic\Win8.1\64bit\Kit 5783364_win8_8.1 _64_2013-1202\win64
MBI	\MBI\MBI Kit 58443 20140106_windows 8_8.132_64
TXE	\TXE\TXE Kit 100885

Windows 8

Driver	Path
Audio	\Audio\32 bit
	\Audio\64 bit
Chipset	\Chipset\32bit\Chipset Kit 57833 _32
	\Chipset\64bit\Chipset Kit 57833 _64
Ethernet	\Ethernet\Intel\32bit\LAN 18.8.1 _32
	\Ethernet\Intel\64bit\LAN 18.8.1 _64
Graphics	\Graphic\Win8.1\32bit\Kit 57832_win8_32bit_2013-1202\Win32
	\Graphic\Win8.1\64bit\Kit 5783364_win8_8.1 _64_2013-1202\win64
MBI	\MBI\MBI Kit 58443 20140106_windows 8_8.132_64
TXE	\TXE\TXE Kit 100885
WINUSB	\WINUSB Driver

Windows 7

Driver	Path
Audio	\Audio\32 bit
	\Audio\64 bit
Chipset	\Chipset\32bit\Chipset Kit 57833 _32
	\Chipset\64bit\Chipset Kit 57833 _64
Ethernet	\Ethernet\Intel\32bit\LAN 18.8.1 _32
	\Ethernet\Intel\64bit\LAN 18.8.1 _64
Graphics	\Graphic\win 7\Kit 101116 20140402 32bit\Intel_EMGD.WIN7_PC_ Version_36_15_0_1073
	\Graphic\win 7\KIT 101117 20140402 64bit\Intel_EMGD.WIN7_PC_ Version_37_15_0_1073
GPIO	\GPIO\windows 7 32_64\Intel Atom E3800 Win7 IO Drivers_Gold_ v1.0 package 501232_ 20140211
I2C	\I2C\windows 7 32_64\Intel Atom E3800 Win7 IO Drivers_Gold_v1.0 package 501232_ 20140211
TXE	\TXE\TXE Kit 100885
USB3.0	\USB3.0\SetupUSB3
WINUSB	\WINUSB Driver

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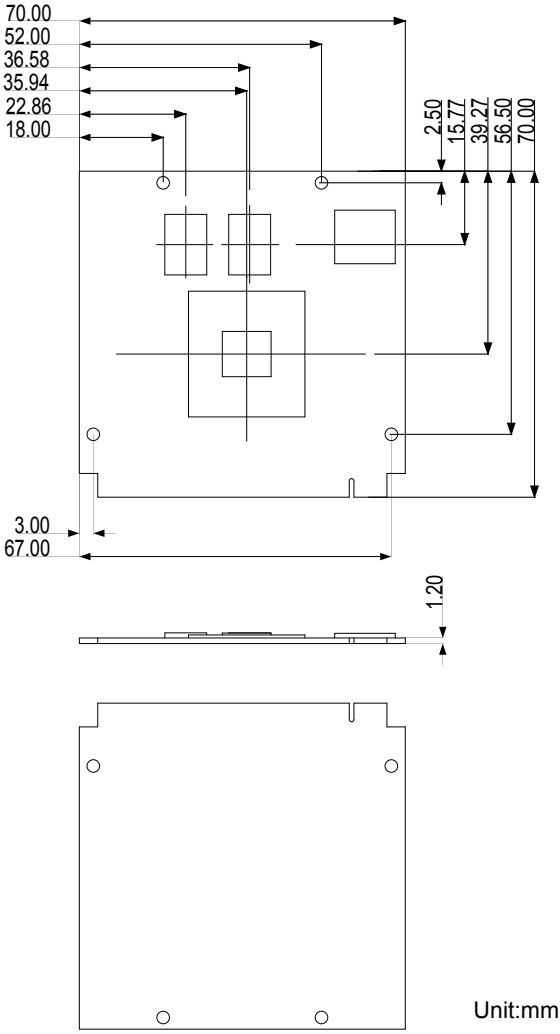
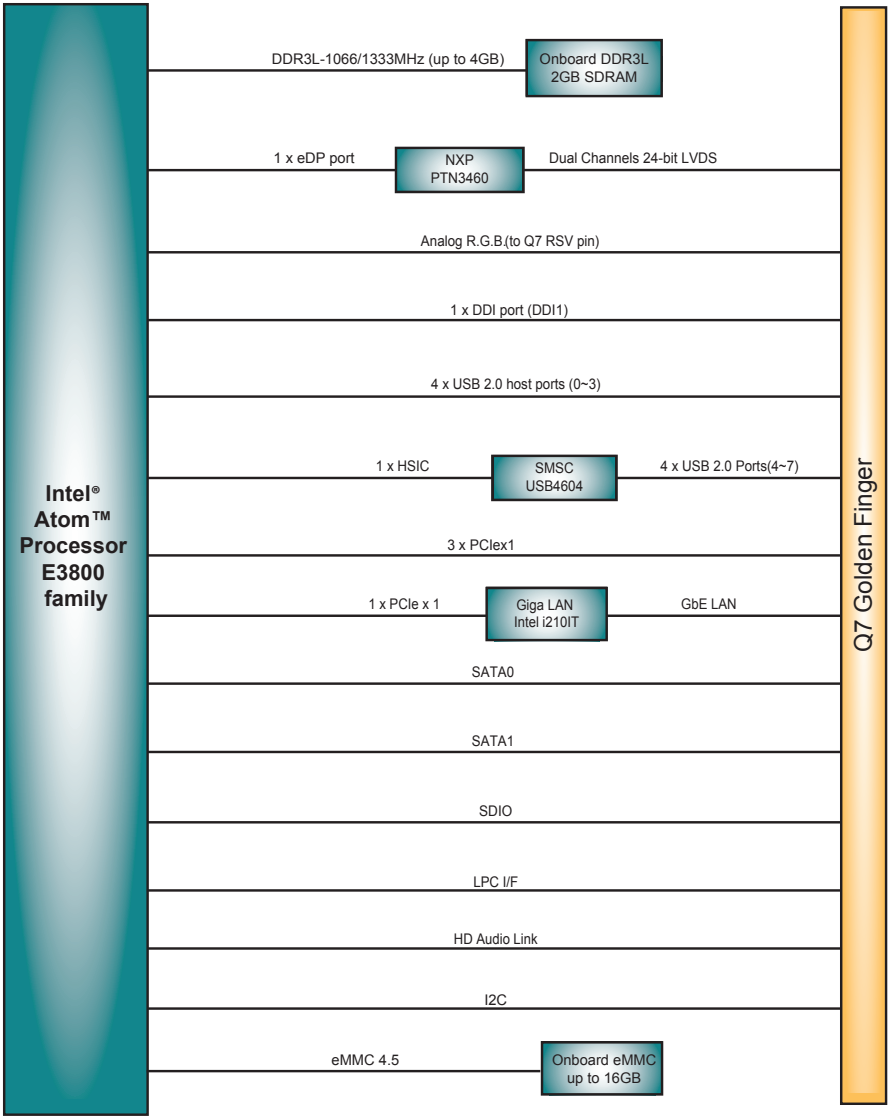
Chapter 2

Board Overview

2.1. Board Dimensions



2.2. Block Diagram



2.3. Connector Pin Definition

Pin	Signal	Pin	Signal
1	GND	2	GND
3	GBE_MDI3-	4	GBE_MDI2-
5	GBE_MDI3+	6	GBE_MDI2+
7	GBE_LINK100#	8	GBE_LINK1000#
9	GBE_MDI1-	10	GBE_MDI0-
11	GBE_MDI1+	12	GBE_MDI0+
13	GBE_LINK#	14	GBE_ACT#
15	GBE_CTREF	16	SUS_S5#
17	WAKE#	18	SUS_S3#
19	SUS_STAT#	20	PWRBTN#
21	SLP_BTN#	22	LID_BTN#
23	GND	24	GND
	KEY		KEY
25	GND	26	PWGIN
27	BATLOW#	28	RSTBTN#
29	SATA0_TX+	30	SATA1_TX+
31	SATA0_TX-	32	SATA1_TX-
33	SATA_ACT#	34	GND
35	SATA0_RX+	36	SATA1_RX+
37	SATA0_RX-	38	SATA1_RX-
39	GND	40	GND
41	BIOS_DISABLE#	42	SDIO_CLK#
43	SDIO_CD#	44	SDIO_LED (N/C)
45	SDIO_CMD	46	SDIO_WP
47	SDIO_PWR#	48	SDIO_DAT1
49	SDIO_DAT0	50	SDIO_DAT3
51	SDIO_DAT2	52	SDIO_DAT5 (N/C)
53	SDIO_DAT4 (N/C)	54	SDIO_DAT7 (N/C)
55	SDIO_DAT6 (N/C)	56	RSVD (N/C)
57	GND	58	GND
59	HDA_SYNC	60	SMB_CLK
61	HDA_RST#	62	SMB_DAT
63	HDA_BITCLK	64	SMB_ALERT#

Pin	Signal	Pin	Signal
65	HDA_SDI	66	I2C_CLK
67	HDA_SDO	68	I2C_DAT
69	THRM#	70	WDTRIG#
71	THRMTRIP#	72	WDOUT (N/C)
73	GND	74	GND
75	USB_P7-	76	USB_P6-
77	USB_P7+	78	USB_P6+
79	USB_6_7_OC#	80	USB_4_5_OC#
81	USB_P5-	82	USB_P4-
83	USB_P5+	84	USB_P4+
85	USB_2_3_OC#	86	USB_0_1_OC#
87	USB_P3-	88	USB_P2-
89	USB_P3+	90	USB_P2+
91	USB_HOST_PRES# (N/C)	92	USB_HC_SEL (N/C)
93	USB_P1-	94	USB_P0-
95	USB_P1+	96	USB_P0+
97	GND	98	GND
99	LVDS_A0+	100	LVDS_B0+
101	LVDS_A0-	102	LVDS_B0-
103	LVDS_A1+	104	LVDS_B1+
105	LVDS_A1-	106	LVDS_B1-
107	LVDS_A2+	108	LVDS_B2+
109	LVDS_A2-	110	LVDS_B2-
111	LVDS_PPEN	112	LVDS_BLEN
113	LVDS_A3+	114	LVDS_B3+
115	LVDS_A3-	116	LVDS_B3-
117	GND	118	GND
119	LVDS_A_CLK+	120	LVDS_B_CLK+
121	LVDS_A_CLK-	122	LVDS_B_CLK-
123	LVDS_BLT_CTRL	124	RSVD (N/C)
125	LVDS_DID_DAT	126	CRT_DDC_Data
127	LVDS_DID_CLK	128	CRT_DDC_CLK
129	CAN0_TX (N/C)	130	CAN0_RX (N/C)

Pin	Signal	Pin	Signal
131	DP1_TX3_P	132	SDVO_INT+ (N/C)
133	DP1_TX3_N	134	SDVO_INT- (N/C)
135	GND	136	GND
137	DP1_TX1_P	138	DP1_AUX_C_P
139	DP1_TX1_N	140	DP1_AUX_C_N
141	GND	142	GND
143	DP1_TX2_P	144	SDVO_TVCLKIN+ (N/C)
145	DP1_TX2_N	146	SDVO_TVCLKIN- (N/C)
147	GND	148	GND
149	DP1_TX0_P	150	DP1_AUX_N
151	DP1_TX0_N	152	DP1_AUX_P
153	HDMI_HPD#	154	DP_HPD#
155	PCIE_CLK_REF+	156	PCIE_WAKE#
157	PCIE_CLK_REF-	158	PCIE_RST#
159	GND	160	GND
161	PCIE3_TX+ (N/C)	162	PCIE3_RX+ (N/C)
163	PCIE3_TX- (N/C)	164	PCIE3_RX- (N/C)
165	GND	166	GND
167	PCIE2_TX+	168	PCIE2_RX+
169	PCIE2_TX-	170	PCIE2_RX-
171	EXCD0_PERST#	172	EXCD1_PERST#
173	PCIE1_TX+	174	PCIE1_RX+
175	PCIE1_TX-	176	PCIE1_RX-
177	EXCD0_CPPE#	178	EXCD1_CPPE#
179	PCIE0_TX+	180	PCIE0_RX+
181	PCIE0_TX-	182	PCIE0_RX-
183	GND	184	GND
185	LPC_AD0	186	LPC_AD1
187	LPC_AD2	188	LPC_AD3
189	LPC_CLK	190	LPC_FRAME#
191	SERIRQ	192	LPC_LDRQ# (N/C)
193	VCC_RTC	194	SPKR
195	FAN_TACHOIN (N/C)	196	FAN_PWMOUT (N/C)

Pin	Signal	Pin	Signal
197	GND	198	GND
199	SPI_MOSI	200	SPI_CS0#
201	SPI_MISO	202	SPI_CS1# (N/C)
203	SPI_SCLK	204	CRT_RED
205	VCC_5V_SB	206	VCC_5V_SB
207	CRT_VSYNC	208	CRT_GREEN
209	CRT_HSYNC	210	CRT_BLUE
211	+5V	212	+5V
213	+5V	214	+5V
215	+5V	216	+5V
217	+5V	218	+5V
219	+5V	220	+5V
221	+5V	222	+5V
223	+5V	224	+5V
225	+5V	226	+5V
227	+5V	228	+5V
229	+5V	230	+5V

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Chapter 3

BIOS

The BIOS Setup utility is featured by Insyde BIOS to configure the system settings stored in the system's BIOS ROM. Insyde BIOS is activated once the computer powers on.

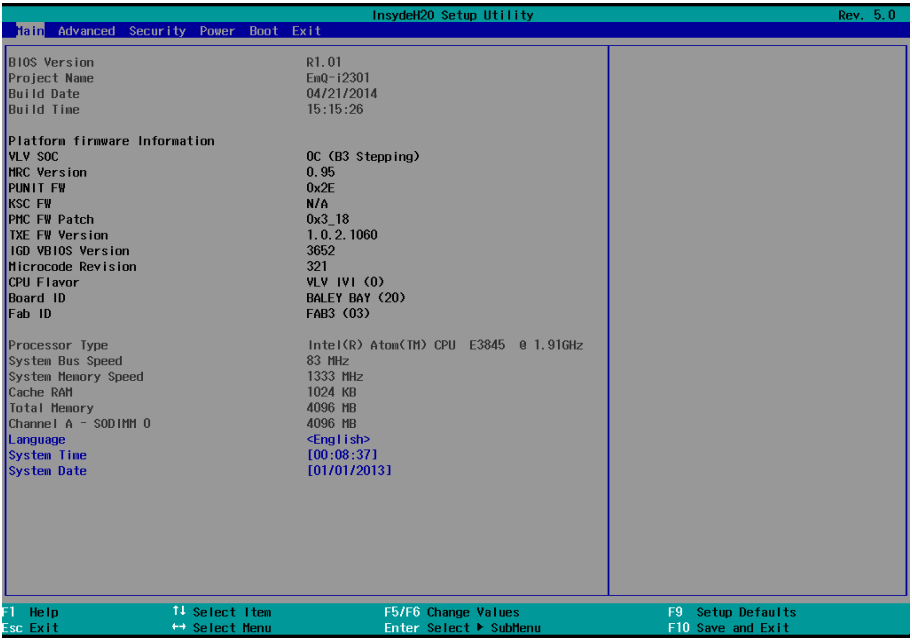
After entering the utility, use the left/right arrow keys to navigate between the top menus and use the down arrow key to access one.

Menu	Description
Main	See 3.1. Main on page 17.
Advanced	See 3.2. Advanced on page 18.
Security	See 3.3. Security on page 28.
Power	See 3.3. Security on page 28.
Boot	See 3.4. Boot on page 32.
Exit	See 3.5. Exit on page 34.

NOTE: For system stability and performance, this BIOS utility is constantly improved. The screenshots demonstrated and descriptions hereinafter are for reference only and may not exactly meet what is presented onscreen.

3.1. Main

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



The BIOS info displayed is:

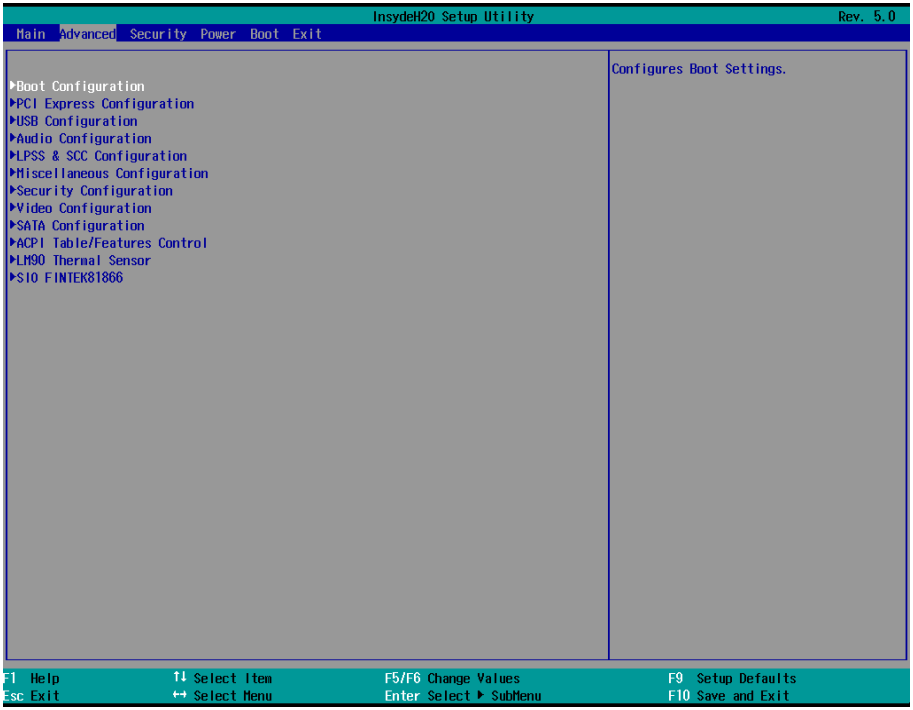
Info Item	Description
BIOS Version	Delivers the computer's BIOS version.
Project name	Delivers the name of the project
Build Date and Time	Delivers the date and time when the BIOS Setup utility was created/ updated.
Platform firmware Information	Delivers the Platform firmware Information

The featured settings are:

Setting	Description
Language	Select the current default language used by the InsydeH20
System Time	Sets system time.
System Date	Sets system date.

3.2. Advanced

The **Advanced** menu controls the system's CPU, IDE, Super IO, AHCI and USB. It also helps users monitor hardware health.



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The featured submenus are:

Submenu	Description
Boot Configuration	See 3.2.1. Boot Configuration on page 20.
PCI Express Configuration	See 3.2.2. PCI Express Configuration on page20.
USB Configuration	See 3.2.3. USB Configuration on page 21.
Audio Configuration	See 3.2.4. Audio Configuration on page 21.
LPSS & SCC Configuration	See 3.2.5. LPSS & SCC Configuration on page 22.
Miscellaneous Configuration	See 3.2.6. Miscellaneous Configuration on page 23.
Security Configuration	See 3.2.7. Security Configuration on page 23.
Video Configuration	See 3.2.8. Video Configuration on page 24.
SATA Configuration	See 3.2.9. SATA Configuration on page 26.
ACPI Table/Feature Control	See 3.2.10. ACPI Table/Feature Control on page 26.
LM90 Thermal Sensor	See 3.2.11. LM90 Thermal Sensor on page 27.
SIO FINTEK81866	See 3.2.12. SIO FINTEK81866 on page 27.

3.2.1. Boot Configuration

Setting	Description
Numlock	Select Power-on state for Num lock

3.2.2. PCI Express Configuration

Configures PCI Express by the following settings:

Setting	Description
PCI Express Root Port 1/2/3	▸ PCI Express Root Port Enables/disables this PCIe port. ▸ PCIe Speed Options are: Auto, Gen 1, Gen 2 Auto is the default. ▸ ASPM Support Options are: Disable : disables ASPM L0s : force all links to L0s state L1 : force all links to L1 state L0sL1 : force all links to L0s+L1 state Auto : BIOS auto configure
On Board LAN Configuration	Enables/Disables On Board LAN Configuration

3.2.3. USB Configuration

Select this submenu to view the status of the USB ports and configure USB features.

The featured settings are:

Setting	Description
XHCI Pre-Boot Mode Support	Enables/Disables XHCI Pre-Boot mode support
xHCI Mode	Set the mode of operation of xHCI controller Options are Disabled/Enabled/Auto/Smart Auto(default)
XCHI Controller	Enables/Disables XHCI controller
USB2 Link Power Management	Enables/Disables USB2 Link Power Management.
XCHI Streams	Enables/disables XHCI Stream
USB OTG Support	Enables/disables USB OTG Support
USB VBUS	Turn ON/OFF USB VBUS. Turn ON in HOST mode, and turn OFF in OTG device mode.
USB Per-Port Control	Enables/Disables USB Per-port control

3.2.4. Audio Configuration

The featured settings are:

Setting	Description
Audio Controller	Enables/Disables Azalia Controller
Azalia VCi Enable	Enables/Disables Virtual Channel 1 of Audio Controller
Azalia HDMI Codec	Enables/Disables Internal HDMI codec for Azalia

3.2.5. LPSS & SCC Configuration

The featured settings are:

Setting	Description
LPSS & SCC Device Mode	Set the mode of LPSS & SCC Device Options are ACPI mode(default)/PCI mode
OS Selection	Set the mode of OS Selection Options are Windows(default)/Android
SCC eMMC Boot Controller	Set the mode of eMMC Boot mode Options are Disable/ Auto Detect(Default)/ eMMC 4.41/ eMMC 4.5
eMMC Secure Erase	Enables/disables eMMC Secure Erase
SCC SDIO Support	Enables/disables SCC SDIO Support
SCC SD Card Supprt	Enables/disables SCC SD Card Supprt
SDR25 Capability Support for SDCard	Enables/disables SDR25 Capability Support for SDCard
DDR50 Capability Support for SDCard	Enables/disables DDR50 Capability Support for SDCard
LPSS DMA #1 Support	Enables/disables LPSS DMA #1 Support
LPSS DMA #1 Support	Enables/disables LPSS DMA #2 Support
LPSS I2C #1 Support	Enables/disables LPSS I2C #1 Support

3.2.6. Miscellaneous Configuration

The featured settings are:

Setting	Description / Available Options
HPET - HPET support	Enables/Disables HPET support in Windows XP
State After G3	Set the state of System when power is re-applied after a Power failure (G3 state) Options are S0 State(default)/S5 State
Clock Spread Spectrum	Enables/Disables Clock Spread Spectrum
Exl	Enables/Disables Exl
Bios Lock	Enables/Disables BIOS SPI region write protect
PCI MMIO Size	Set the Size of PCI MMIO Options are 2G(default)/0.75G/1G/1.25G/1.5G
PCI Express Dynamic Clock Gating	Enables/Disables PCI Express Dynamic Clock Gating
Force Legacy Free	Enables/Disables Force Legacy Free (Force Disable KBC)

3.2.7. Security Configuration

The featured settings are:

Submenu/Setting	Description
TXE	Enables/Disables TXE
TXE HMRFP0	Enables/Disables TXE HMRFP0
TXE Firmware Update	Enables/Disables Firmware Update
TXE EOP Message	Enables/Disables Sending EOP Message Bofore OS
TXE Unconfiguration Perform	Enables/Disables TXE Temporary Disable function

3.2.8. Video Configuration

Configure video settings

The featured setting is:

3.2.8.1 Video Configuration

Setting	Description
Logo & SCU Resolution	Set Logo & SCU Resolution. Options are Auto/640 x480/800 x 600/1024 x 768

3.2.8.2 VBT Hook Configuration

Setting	Description
Configure CRT as	Set the option of CRT. Options are Default / CRT / No Device
CRT EDID Support	Enables/Disables CRT EDID Support
Configure DDI0 as	Set the option of DDI0. Options are Default/DisplayPort/ HDMI/DVI /DisplayPort with HDMI/DVI Compatible / No Device
Configure DDI1 as	Set the option of DDI1. Options are Default/ LVDS/ DisplayPort/ HDMI/DVI / DisplayPort with HDMI/DVI Compatible / No Device
Configure eDP Panel Number as	Set the option of VBIOS eDP Panel Number. Options are 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16.
LFP EDID Support	Enables/Disables LFP EDID Support
EFP EDID Support	Enables/Disables EFP EDID Support

3.2.8.3 PTN3460 (eDP to LVDS) Configuration

Setting	Description
PTN3460 Output Format	Set the Output Format of PTN3460. Options are (00) VESA (24bpp) / (01) VESA or JEIDA (18bpp) / (10) JEIDA (24bpp) / (11) JEIDA (24bpp)
PTN3460 EDID Table	Set the EDID Table of PTN3460.

3.2.8.4 GOP Configuration

Setting	Description
GOP Brightness Level	Set the Brightness Level of GOP.
GOP Driver	Enables/Disables GOP Driver

3.2.8.5 IGD Configuration

Setting	Description
Intergrated Graphics Device	Enables/disables Intergrated Graphics Device.
Primary Display	Set IGD or PCI graphic device as the Primary Display. Options are Auto/IGD/PCie.
RC6 (Render Standby)	Enables/Disables Render standby support.
PAVC	Enables/disables Protected Audio Video control
Power Managment lock	Enables/disables Power mangement lock.
DOP CG	Enables/disables DOP Clock gating.
GTT Size	Set the GTT Size Options are 1MB/2MB
Apeture Size	Set the Aperture size Options are 128MB/256MB/512MB
IGD-DVMT Pre-Allocated	Set the DVMT5.0 Pre-Allocated (Fixed) Graphics Memory size used by the IGD.
IGD-DVMT total Gfx Mem	Set the size of DVMT 5.0 used by IGD
IGD Turbo	Enables/disables IGD Turbo
IGD Thermal	Enables/disables IGD Thermal
Spread Spectrum clock	Enables/disables Spread Spectrum clock

3.2.8.6 IGD- LCD Control

Setting	Description
Force Lid Status	Set mode of as the Primary Display. Options are ON (default) / OFF / Auto.
BIA	Set the mode of BIA. Options are Auto (default) /Disabled / Level 1 /Level 2 /Level 3 /Level 4 /Level 5.
ALS Support	Enables/Disables ALS support.
IGD Flat Panel	Set resolution of IGD Flat Panel.
IGD Boot Type	Set the Boot Type of IGD
Panel Scaling	Set the Scaling of Panel Options are Auto(default) / Centering / Stretching.
GMCH BLC Control	Set the mode of GMCH BLC Control Options are Auto(default) / PWM-Inverted / GMBus-Inverted / PWM-Normal / GMBus-Normal

3.2.9. SATA Configuration

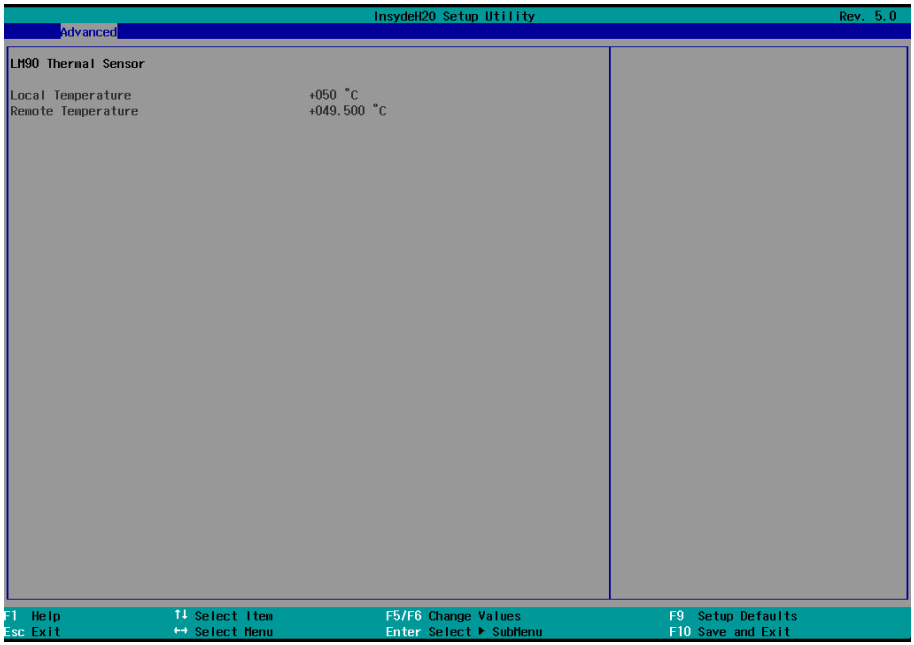
Select this submenu to configure the SATA controller and HD.

Setting	Description
SATA Controller(s)	Enables/disables the present SATA controller. ▸ **Enabled** is the default.
SATA Test Mode	Enables/disables the SATA test mode.
Configures SATA Mode	Configures how to sun the SATA drives. ▸ Options available are **AHCI** (default) and **IDE**.
SATA Port 0 Hot Plug Capability	Enables/disables hot-pluggable feature for the SATA port. ▸ **Enabled** is the default.
SATA Port 1 Hot Plug Capability	
SATA Port 0 Connect to an ODD	Enables/disables the SATA port connect to an ODD If enabled, when you connect an ODD to a SATA port. The software auto detection for media insert and tray will be enabled. ▸ **Disabled** is the default.
SATA Port 1 Connect to an ODD	
Serial ATA Port 0	Delivers the SATA port Media information and Security Mode.
Serial ATA Port 1	

3.2.10. ACPI Table/Feature Control

Setting	Description
FACP - RTC S4 Wakeup	This function will be available only when ACPI is enabled. Enables/disables S4 Wakup from RTC.
APIC - IO APIC Mode	This item is valid only for WIN2K and WINXP. Also, a fresh install of the OS must occur when APIC mode is desired. Enables/disables the APIC mode
DSDT - ACPI S3	Enables/disables ACPI S3 state
DSDT - ACPI S4	Enables/disables ACPI S4 state
BGRT - ACPI BGRT	Enables/disables ACPI BGRT Table

3.2.11. LM90 Thermal Sensor



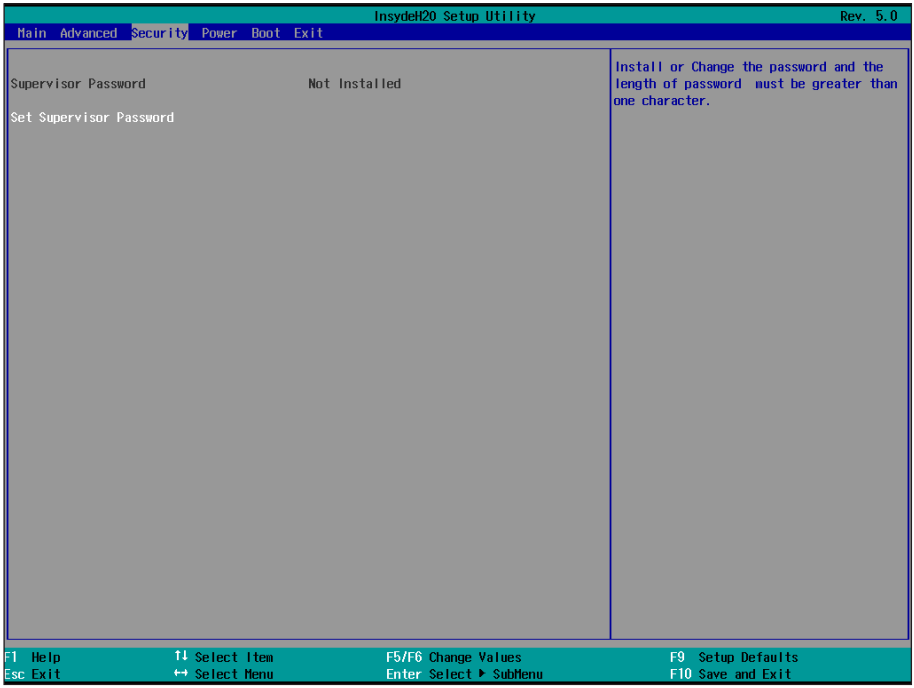
3.2.12. SIO FINTEK81866

Configures SIO by the following settings:

Setting	Description
Power Loss mode	Set the state of Power Loss mode Options are Always On(default)/Always Off
Serial Port A/B/C/D	▸ Serial Port Enables/disables the Serial port. ▸ Base I/O Address Setup the Base I/O Address of the Serial Port. ▸ Interrupt Setup the Interrupt of the Serial Port

3.3. Security

The **Security** menu sets up the password for the system's administrator account. Once the administrator password is set up, this BIOS Setup utility is limited to access and will ask for the password each time any access is attempted.

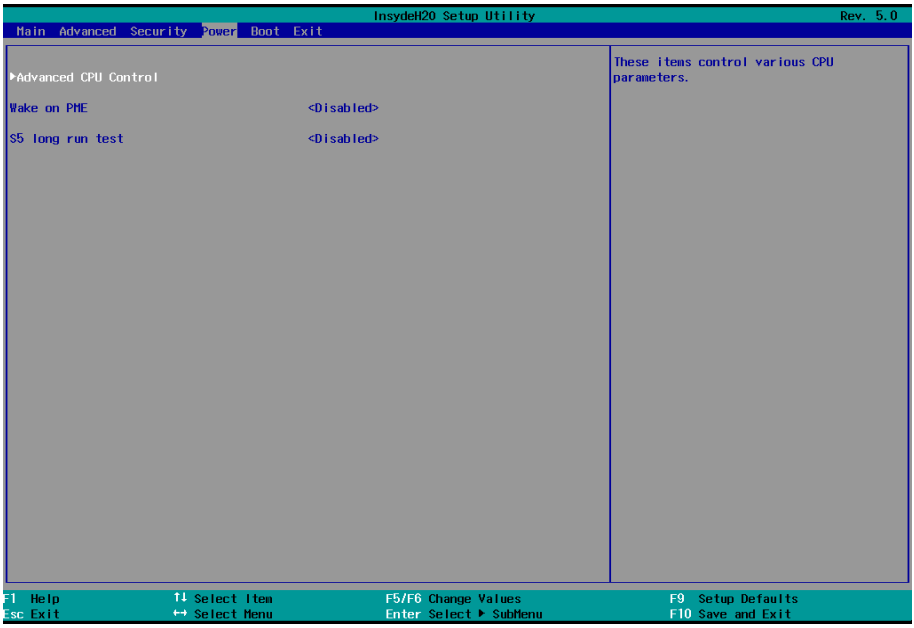


The featured setting is:

Setting	Description
Set Supervisor Password	To set up an administrator password: 1. Select **Set Supervisor Password**. An **Create New Password** dialog then pops up onscreen. 2. Enter your desired password that is no less than 3 characters and no more than 20 characters. 3. Hit [Enter] key to submit.

3.4. Power

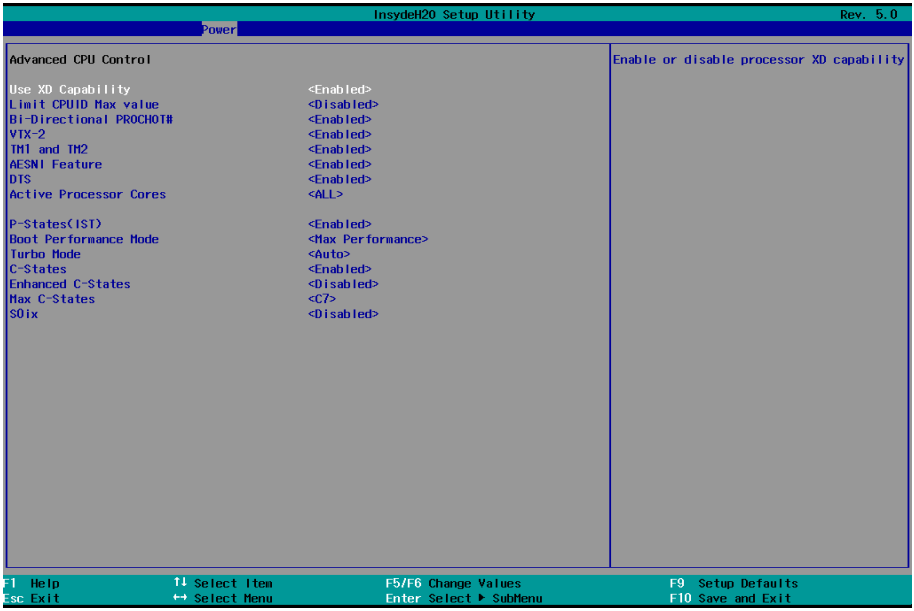
The **Power** menu sets up the power option of system



The featured setting is:

Setting	Description
Advanced CPU Control	See 3.4.1 Advanced CPU Control on page 30
Wake on PME	Enables or diables Wake on PME. Determines the action taken when the system power is off and a PCI Power Management Enable wake up event occurs.
S5 Long run test	If enabled, force the system to enable RTC S5 wake up, even if OS disable it. Support ipwrtest to do RTC S5 wakeup. Options are Enabled/Disabled.

3.4.1 Advanced CPU Control

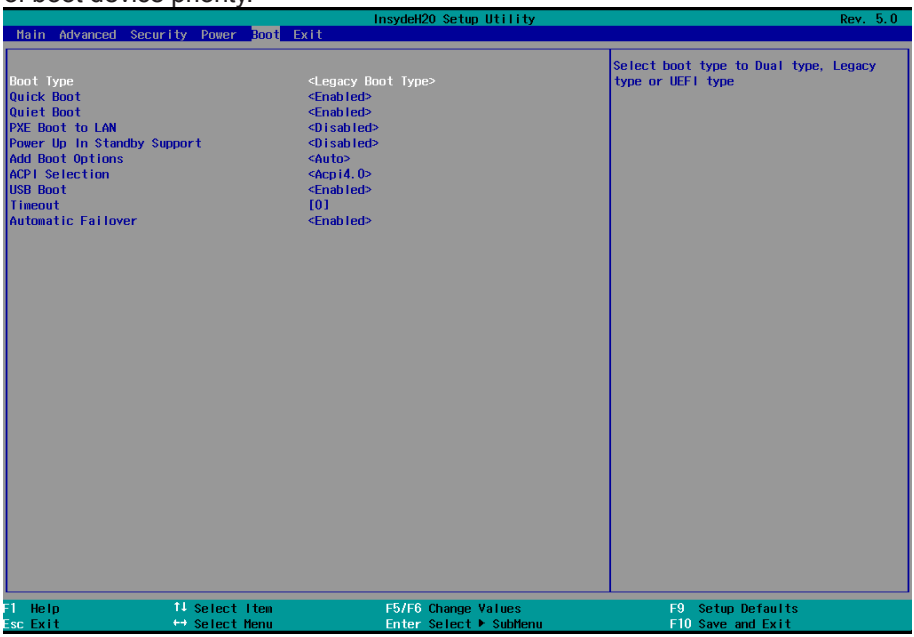


Setting	Description
Use XD Capability	Enables or disables processor XD capability.
Limit CPUID Max value	Sets whether the processor should limit the maximum CPUID input value to 03h when the operating system queries it upon startup. ▸ Select **Enabled** to allow a processor with Intel® Hyper-Threading technology to work with an operating system that doesn't support it. ▸ **Disabled** is the default.
Bi-Directional PROCHOT#	When a processor thermal sensor trips(either core), the PROCHOT# will be driven. If Bi-Directional is enable, external agents can drive PROCHOT# to throttle.
VTX-2	Enables/disables the CPU's VTX-2 function.
TM1 and TM2	Enable/disables TM1/TM2
AESNI Feature	Enable/disables AESNI
DTS	Enable/disables CPU Digital Thermal Sensor function.
Active Processor Cores	Set the Number of cores to enable in each processor package. Options are ALL/1

P-States(IST)	Enables/disables processor performance states (P-States)
Boot Performance Mode	Select the performance state that BIOS will set before OS handoff
Turbo Mode	Enables/disables processor Turbo mode (EMTTM enabled is required)
C-States	Enables/disables processor idle power saving states (C-states)
Enhanced C-States	Enables/disables P-state transitions to occur in combination with C-states.
Max C-States	Set the Max CPC state C7/C6/C1
S0ix	Enables/disables the platform to configure S0ix support.

3.4. Boot

The **Boot** menu configures how to boot up the system such as the configuration of boot device priority.



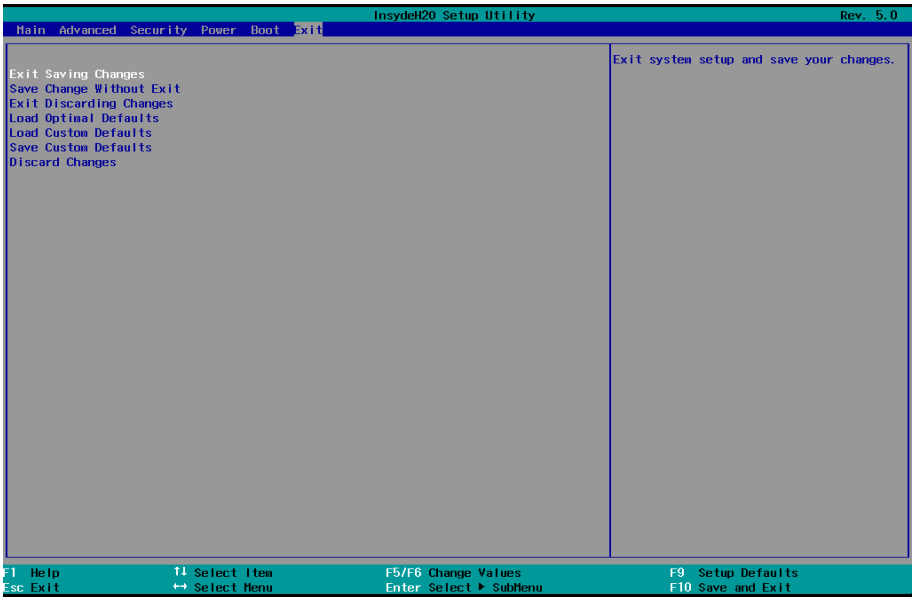
The featured settings are:

Setting	Description
Quick Boot	Allow InsydeH20 to Skip certain tests while booting . This will descrese the time need to boot the system.
Quiet Boot	Disables or enables booting in text mode.
PXE boot to LAN	Disables or enables PXE boot to LAN.
Power Up In Standby Support	Disable or enable Power Up In Standby Support.
Add Boot Option	Position in Boot Order for Shell, Network and Removables. Options are First, Last, and Auto.
APCI Selection	Select boot to Acpi 3.0/Acpi 1.0B Options are Acpi 1.0B/Acpi 3.0/Acpi 4.0/Acpi 5.0

USB Boot	Disables or enables booting to USB boot devices.
Timeout	Set the waiting seconds before booting the default boot selection
Automatic Failover	Enables/disables the Automatic Failover.

3.5. Exit

The **Save & Exit** menu features a handful of commands to launch actions from the BIOS Setup utility regarding saving changes, quitting the utility and recovering defaults.



The features settings are:

Setting	Description
Exit Saving Changes	Saves the changes and quits the BIOS Setup utility.
Save Changes Without Exit	Save Changes but does not quit the BIOS.
Exit Discard Changes	Quits the BIOS Setup utility without saving the change(s).
Load Optimal Defaults	Restores all settings to defaults. ▸ This is a command to launch an action from the BIOS Setup utility rather than a setting.
Load Custom Default	Load custome default values
Save Custom Default	Save current setting as custome default
Discard Changes	Discard all changes without Exit.