EmNANO-i2300

COM Express® Mini Type 10 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

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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 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.

Chapter 1

Introduction

1.1. The Product

- Soldered onboard Intel® Atom E3800 series SoC processor
- Integrated Gigabit Ethernet
- 1 x DDI port, 1 x LVDS port
- 1 x USB 3.0 port, 8 x USB 2.0 ports, 1 x Serial port
- Support Dual Independent Displays
- **Extended Operating Temp.: -20 ~ 70°C**

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	COM Express® Mini Type 10 CPU Module
CPU	Intel® Atom E3825 1.33GHz or E3845 1.91GHz processor
	Intel® Atom E3826 1.46GHz or E3827 1.75GHz processor (BTO)
System Memory	Soldered onboard 2GB DDR3L SDRAM
Audio	HD audio link
VGA/LCD controller	Integrated Intel® Gen 7 Graphics
	1 x Analog RGB supports by FPC connector on CPU module (Optional) 1 x DDI port 1 x Single Channel 24-bit LVDS port
Ethernet	1 x Intel i210IT GbE controller
BIOS	Insyde UEFI BIOS
Storage	2 x Serial ATA ports
USB Port	1 x USB 3.0 ports
	8 x USB 2.0 ports (one is shared with USB 3.0.)
Expansion Interface	3 x PCIe x1 Gen2 lanes
	SPI, and LPC (Low Pin Count) interface
SDIO	SDIO Supported
I2C	I2C Supported
Power Requirement	+5VSB, +12V
	BOM option for Power input 5V or 12V.
Power Consumption	1.05A@+12V with E3825 (Typical)
Power States	Supports S0, S3, S4, S5
Operating Temp.	-20ºC ~ 70ºC (-4ºF ~ 158ºF)
Humidity	0 ~ 90%(non-condensing)
Dimension (L x W)	84 x 55 mm (3.30" x 2.16")

1.4. Inside the Package

Before starting to install the single board, make sure the following items are shipped:

	1 x EmNANO-i2300 COM Express® Mini CPU Module
	1 x Driver CD
	1 x Quick Installation Guide

If any of the aforelisted items is damaged or missing, contact your vendor immediately.

1.5. Ordering Information

EmNANO-i2300-E3825	Intel Atom E3825 COM Express Type 10 CPU module
EmNANo-i2300-E3845	Intel Atom E3845 COM Express Type 10 CPU module
EmNANO-i2300-E3826(BTO)	Intel Atom E3826 COM Express Type 10 CPU module
EmNANO-i2300-E3827(BTO)	Intel Atom E3827 COM Express Type 10 CPU module
HS-0660-F1	Heat spreader
PBN-9007	COM Express® Mini evaluation carrier board (EPIC form factor)
CBK-05-9007-00	Cable Kit 1 x USB cable 1 x serial port cable 1 x SATA cable 1 x SATA power cable 1 x PS/2 cable

Chapter 2

Getting Started

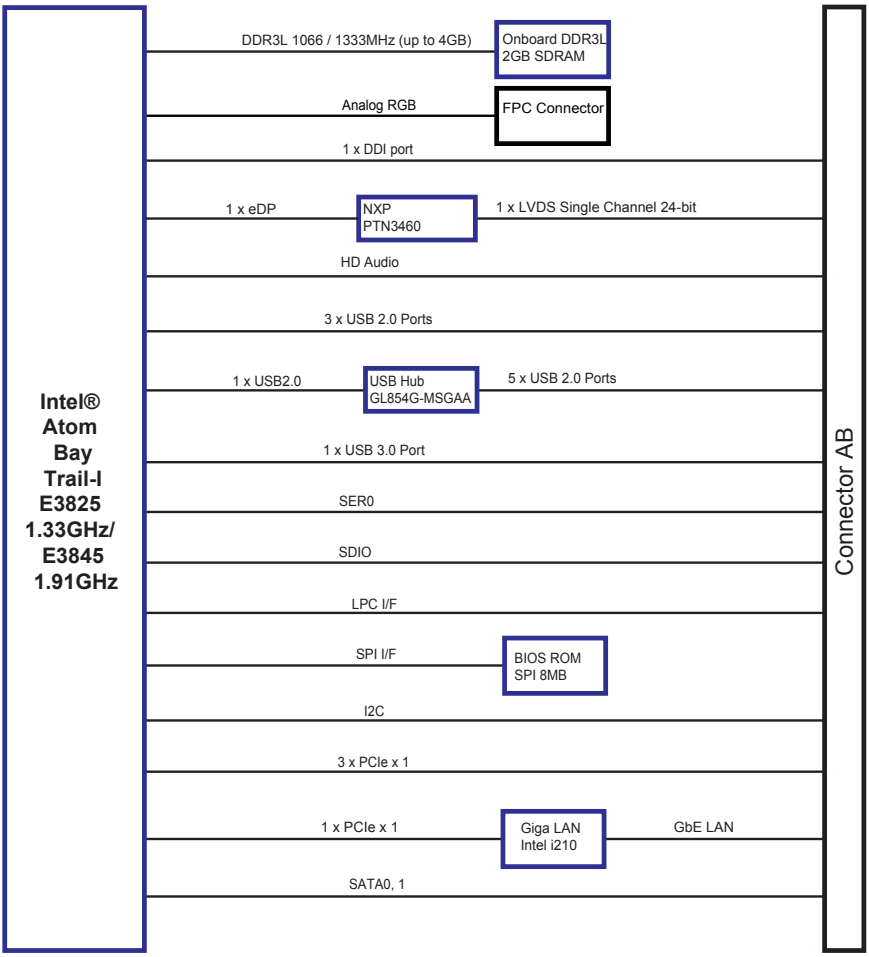
2.1. The Ultra-small COM Express® Mini Module

EmNANO-i2300 is a COM Express® Mini Type 10 module. 55 mm x 84 mm is the smallest in ARBOR's COM Express® product lineup, next to the Basic size (125 mm x 95 mm) and Compact size (95mm x 95mm) form factors.

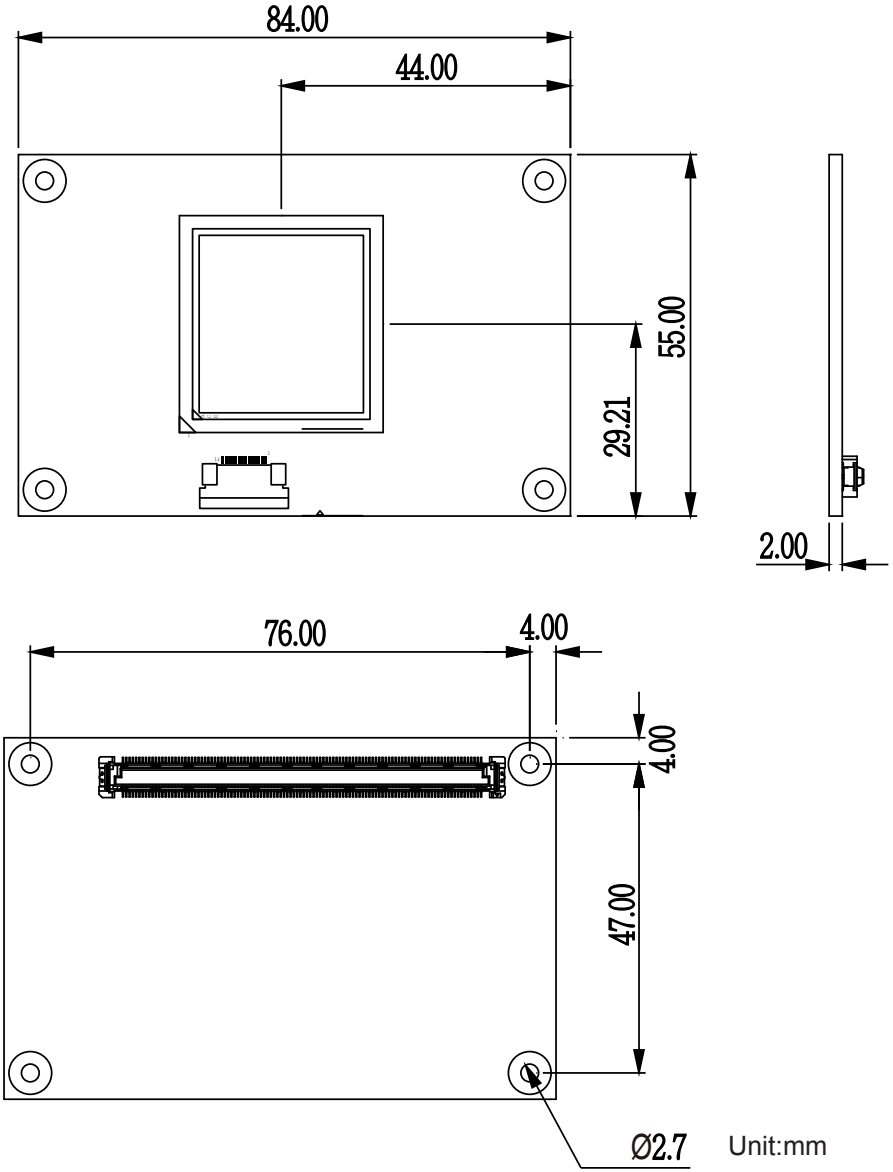
The connector difference between Standard COM Express Mini type 10 and EmNANO-i2300 is tabulated as below:

Module Type	Type 10	EmNANO-i2300
Connectors	1	1
Connector Rows	A, B	A, B
PCIe Lanes (max)	4	3
LAN (Max)	1	1
Serial Ports (Max)	2	1
DDI0 (Max)	1	1
LVDS Channel A	1	1
USB 2.0 Ports (Max)	8	8
USB 3.0 Ports (Max)	2	1

2.2. Block Diagram



2.3 Board Dimensions



2.4 COM Express® Mini Type 10 AB Connector

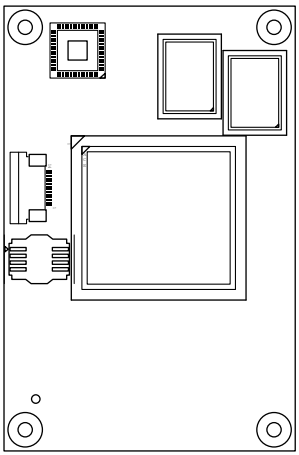
Note: A pin with a remark "(N/C)" is a pin that the signal isn't available on this board while the remark beyond the bracket delivers the consortium-specified definition.

B1	GND	GND	A1
B2	GBE0_ACT#	GBE0_MDI3-	A2
B3	LPC_FRAME#	GBE0_MDI3+	A3
B4	LPC_AD0	GBE0_LINK100#	A4
B5	LPC_AD1	GBE0_LINK1000#	A5
B6	LPC_AD2	GBE0_MDI2-	A6
B7	LPC_AD3	GBE0_MDI2+	A7
B8	LPC_DRQ0#(N/C)	GBE0_LINK# (N/C)	A8
B9	LPC_DRQ1# (N/C)	GBE0_MDI1-	A9
B10	LPC_CLK	GBE0_MDI1+	A10
B11	GND	GND	A11
B12	PWRBTN#	GBE0_MDI0-	A12
B13	SMB_CK	GBE0_MDI0+	A13
B14	SMB_DAT	GBE0_CTREF (N/C)	A14
B15	SMB_ALRERT#	SUS_S3#	A15
B16	SATA1_TX+	SATA0_TX+	A16
B17	SATA1_TX-	SATA0_TX-	A17
B18	SUS_STAT#	SUS_S4#	A18
B19	SATA1_RX+	SATA0_RX+	A19
B20	SATA1_RX-	SATA0_RX-	A20
B21	GND	GND	A21
B22	USB_SSTX0-	USB_SSRX0-	A22
B23	USB_SSTX0+	USB_SSRX0+	A23
B24	PWR_OK	SUS_S5#	A24
B25	USB_SSTX1- (N/C)	USB_SSRX1- (N/C)	A25
B26	USB_SSTX1+ (N/C)	USB_SSRX1+ (N/C)	A26
B27	WDT (N/C)	BATLOW#	A27
B28	AC_SDIN2 (N/C)	ATA_ACT#	A28
B29	AC_SDIN1	AC_SYNC	A29
B30	AC_SDIN0	AC_RST#	A30
B31	GND	GND	A31
B32	SPKR	AC_BITCLK	A32
B33	I2C_CK	AC_SDOUT	A33
B34	I2C_DAT	BIOS_DIS0#	A34
B35	THRM#	THRMTRIP#	A35
B36	USB7-	USB6-	A36
B37	USB7+	USB6+	A37
B38	USB_4_5_OC# (N/C)	USB_6_7_OC# (N/C)	A38
B39	USB5-	USB4-	A39
B40	USB5+	USB4+	A40
B41	GND	GND	A41
B42	USB3-	USB2-	A42
B43	USB3+	USB2+	A43
B44	USB_0_1_OC# (N/C)	USB_2_3_OC# (N/C)	A44
B45	USB1-	USB0-	A45
B46	USB1+	USB0+	A46
B47	EXCD1_PERST#	VCC_RTC	A47
B48	EXCD1_CPPE#	EXCD0_PERST#	A48
B49	SYS_RESET#	EXCD0_CPPE#	A49
B50	CB_RESET#	LPC_SERIRQ	A50
B51	GND	GND	A51
B52	RSVD (N/C)	RSVD (N/C)	A52
B53	RSVD (N/C)	RSVD (N/C)	A53
B54	SD_CMD	SD_DATA0	A54
B55	RSVD (N/C)	RSVD (N/C)	A55

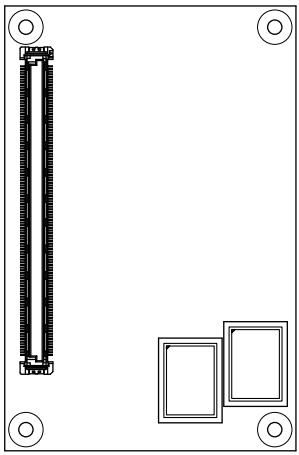
B56	RSVD (N/C)	RSVD (N/C)	A56
B57	SD_WP	GND	A57
B58	PCIE_RX3+ (N/C)	PCIE_TX3+ (N/C)	A58
B59	PCIE_RX3- (N/C)	PCIE_TX3- (N/C)	A59
B60	GND	GND	A60
B61	PCIE_RX2+	PCIE_TX2+	A61
B62	PCIE_RX2-	PCIE_TX2-	A62
B63	SD_CD#	SD_DATA1	A63
B64	PCIE_RX1+	PCIE_TX1+	A64
B65	PCIE_RX1-	PCIE_TX1-	A65
B66	WAKE0#	GND	A66
B67	WAKE1#	SD_DATA2	A67
B68	PCIE_RX0+	PCIE_TX0+	A68
B69	PCIE_RX0-	PCIE_TX0-	A69
B70	GND	GND	A70
B71	DDI0_PAIR0+	LVDS_A0+	A71
B72	DDI0_PAIR0-	LVDS_A0-	A72
B73	DDI0_PAIR1+	LVDS_A1+	A73
B74	DDI0_PAIR1-	LVDS_A1-	A74
B75	DDI0_PAIR2+	LVDS_A2+	A75
B76	DDI0_PAIR2-	LVDS_A2-	A76
B77	DDI0_PAIR4+ (N/C)	LVDS_VDD_EN	A77
B78	DDI0_PAIR4- (N/C)	LVDS_A3+	A78
B79	LVDS_BKLT_EN	LVDS_A3-	A79
B80	GND	GND	A80
B81	DDI0_PAIR3+	LVDS_A_CLK+	A81
B82	DDI0_PAIR3-	LVDS_A_CLK-	A82
B83	LVDS_BKLT_CTRL	LVDS_I2C_CK	A83
B84	VCC_5V_SBY	LVDS_I2C_DAT	A84
B85	VCC_5V_SBY	SD_DATA3	A85
B86	VCC_5V_SBY	RSVD (N/C)	A86
B87	VCC_5V_SBY	RSVD	A87
B88	BIOS_DIS1#	PCIE0_CK_REF+	A88
B89	DDI0_HPD	PCIE0_CK_REF-	A89
B90	GND	GND	A90
B91	DDIO_PAIR5+ (N/C)	SPI_POWER	A91
B92	DDIO_PAIR5- (N/C)	SPI_MSIO	A92
B93	DDIO_PAIR6+ (N/C)	SD_CLK	A93
B94	DDIO_PAIR6- (N/C)	SPI_CKL	A94
B95	DDI0_DDC_AUX_SEL	SPI_MOSI	A95
B96	USB_HOST_PRSNT (N/C)	TPM_PP (N/C)	A96
B97	SPI_CS#	TYPE10#	A97
B98	DDI0_CTRLCLK_AUX+	SER0_TX	A98
B99	DDI0_CTRLCLK_AUX-	SER0_RX	A99
B100	GND	GND	A100
B101	FAN_PWMOUT(N/C)	SER1_TX (N/C)	A101
B102	FAN_TACHIN(N/C)	SER1_RX (N/C)	A102
B103	SLEEP#	LID#	A103
B104	VCC_12V	VCC_12V	A104
B105	VCC_12V	VCC_12V	A105
B106	VCC_12V	VCC_12V	A106
B107	VCC_12V	VCC_12V	A107
B108	VCC_12V	VCC_12V	A108
B109	VCC_12V	VCC_12V	A109
B110	GND	GND	A110

2.5 Connectors Quick Reference

TOP View



Bottom View



2.6. Driver Installation Notes

The board supports Windows XP, Windows 7 and Windows 8. 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. **DO** follow the sequence below to install all drivers to prevent errors:

Chipset→Graphics→Audio→Ethernet→GPIO→MBI→TXE

Find the drivers on CD by the following paths:

Windows 7

Device	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\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
Graphic	\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
TXE	\TXE\TXE Kit 100885
USB3.0	\USB3.0\SetupUSB3

Windows 8

Device	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
Graphic	\Graphic\Win8\32bit\Kit 57832_win8_32bit_2013-1202\Win32
	\Graphic\Win8\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 8.1

Device	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
Graphic	\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

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.

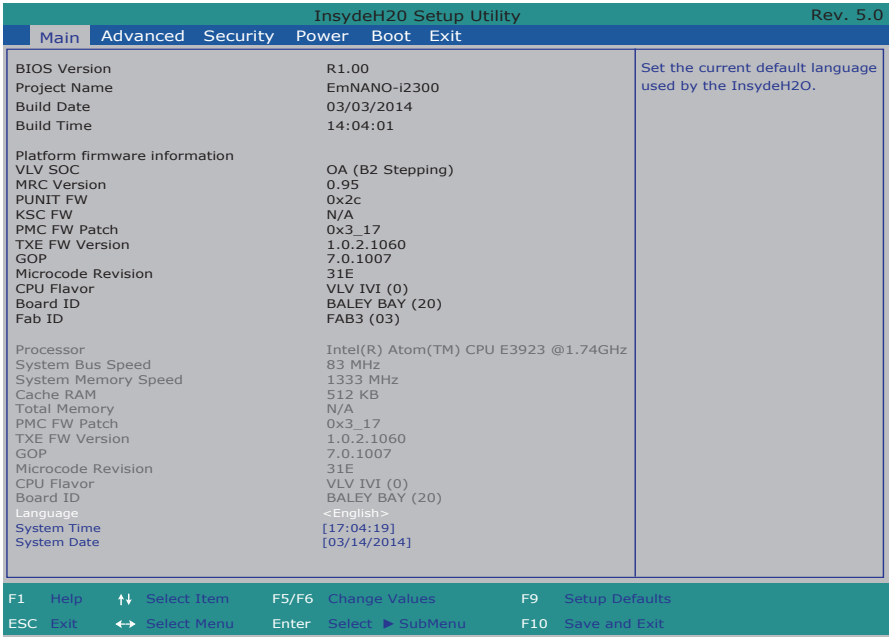
After entering the utility, use the left/right arrow keys to navigate between the top menus and use the down arrow key to access one.

Menu	Description
Main	See 3.1. Main on page 15.
Advanced	See 3.2. Advanced on page 16.
Security	See 3.3. Security on page 26.
Power	See 3.3. Security on page 26.
Boot	See 3.5. Boot on page 16.
Exit	See 3.6. Exit on page 16.

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:

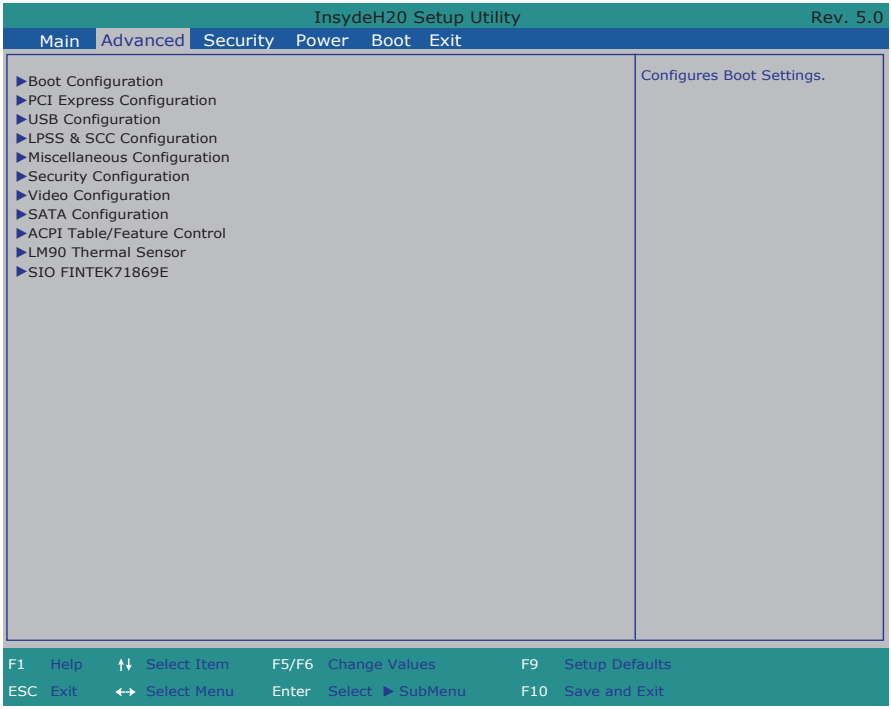
Info Item	Description
BIOS Version	Delivers the computer's BIOS version.
Project name	Delivers the name of the project
Build Date and Time	Delivers the date and time when the BIOS Setup utility was created/ updated.
Platform firmware Information	Delivers the Platform firmware Information

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 18.
PCI Express Configuration	See 3.2.2. PCI Express Configuration on page 21
USB Configuration	See 3.2.3. USB Configuration on page 19.
LPSS & SCC Configuration	See 3.2.4. LPSS & SCC Configuration on page 20.
Miscellaneous Configuration	See 3.2.5. Miscellaneous Configuration on page 21.
Security Configuration	See 3.2.6. Security Configuration on page 21.
Video Configuration	See 3.2.7. Video Configuration on page 22.
SATA Configuration	See 3.2.8. SATA Configuration on page 24.
ACPI Table/Feature Control	See 3.2.9. ACPI Table/Feature Control on page 24.
Lm90 Thermal Sensor	See 3.2.10. LM90 Thermal Sensor on page 25.
SIO FINTEK71869E	See 3.2.11. SIO FINTEK71869E on page 25.

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 Controll	Enables/Disables USB Per-port controll

3.2.4. 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
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

3.2.5. 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)

3.2.6. 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

3.2.7. Video Configuration

Configure video settings

The featured setting is:

3.2.7.1 Video Configuration

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

3.2.7.2 DDI Configuration

Setting	Description
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/DisplayPort/ HDMI/DVI /DisplayPort with HDMI/DVI Compatible / No Device
VBIOS 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.
VBIOS EFP Workaround	Enables/Disables VBIOS EFP Workaround

3.2.7.3 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.

3.2.7.4 GOP Configuration

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

3.2.7.5 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

3.2.7.6 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

3.2.8. SATA Configuration

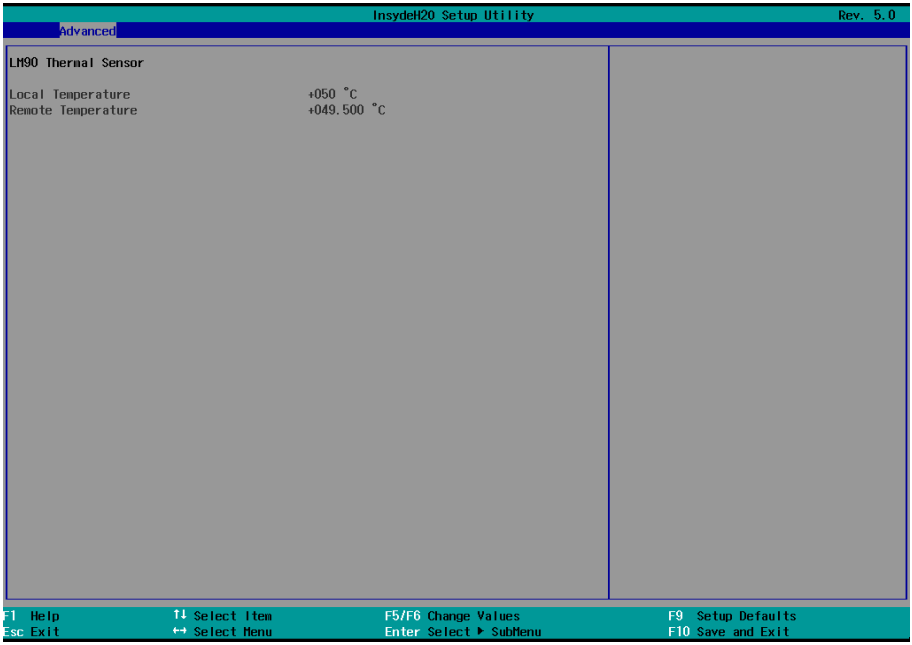
Select this submenu to configure the SATA controller and HD.

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	

3.2.9. ACPI Table/Feature Control

Setting	Description
FACP - RTC S4 Wakeup	This function will be avalible 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 frech install of the OS must occur when APIC mode is desired. Enables/disables the APIC mode
DSDT - ACPI S1	Enables/disables ACPI S1 state
DSDT - ACPI S3	Enables/disables ACPI S3 state
DSDT - ACPI S4	Enables/disables ACPI S4 state
BGRT - ACPI BGRT	Enables/disables ACPI BGRT Table

3.2.10. LM90 Thermal Sensor



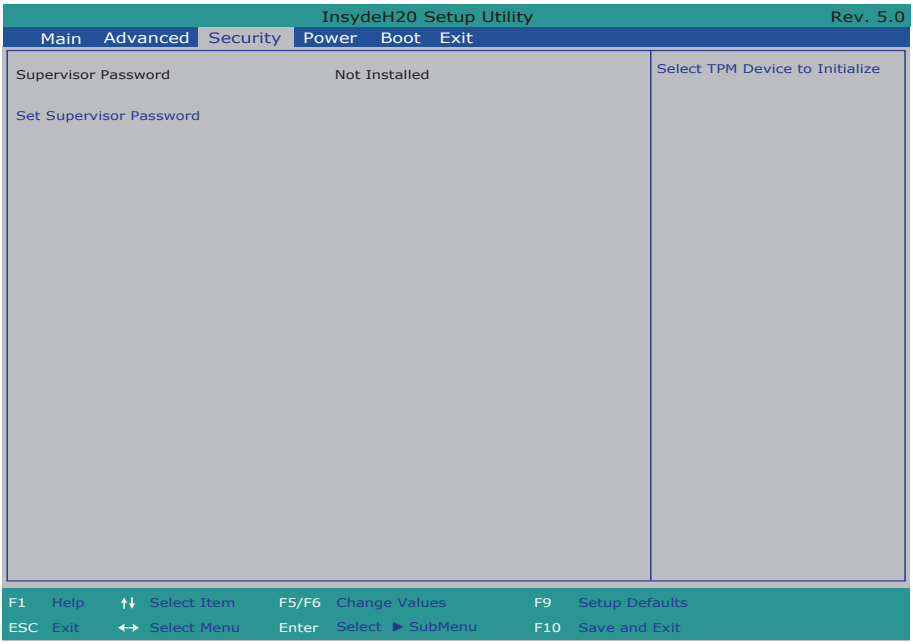
3.2.11. SIO FINTEK71869E

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.

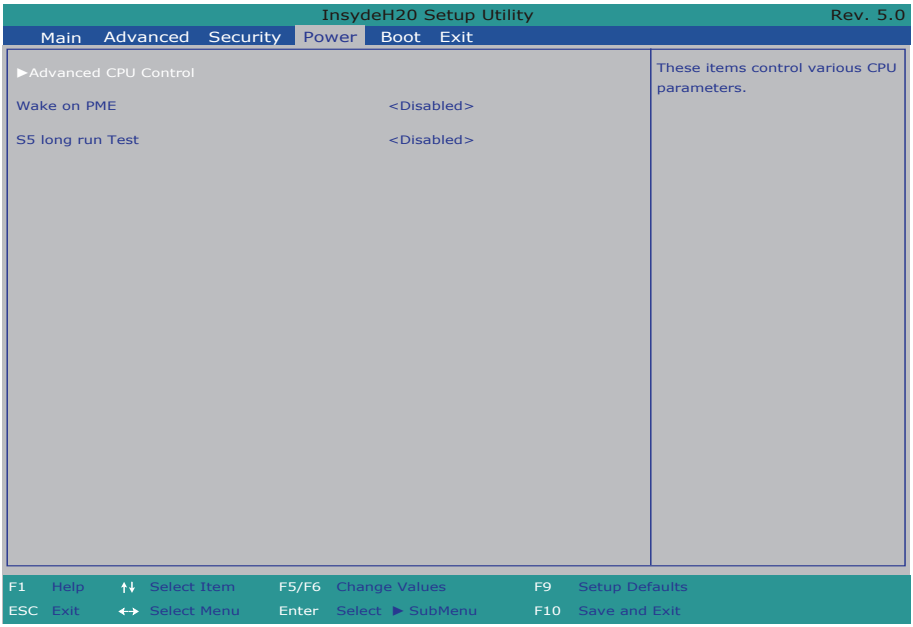


The featured setting is:

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

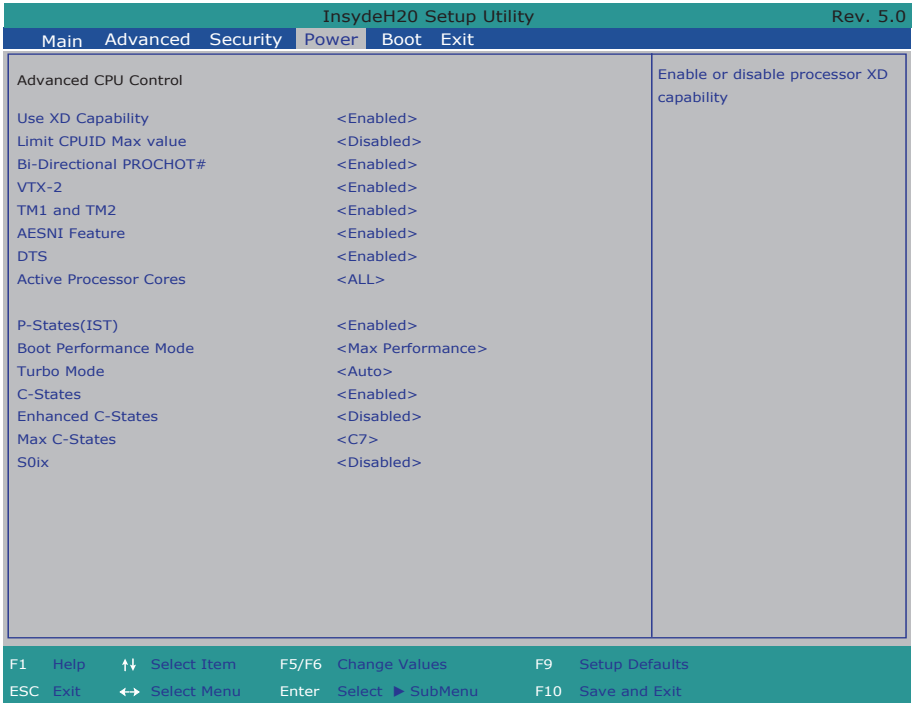
The **Power** menu sets up the power option of system



The featured setting is:

Setting	Description
Advanced CPU Control	See 3.4.1 Advanced CPU Control on page 28
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

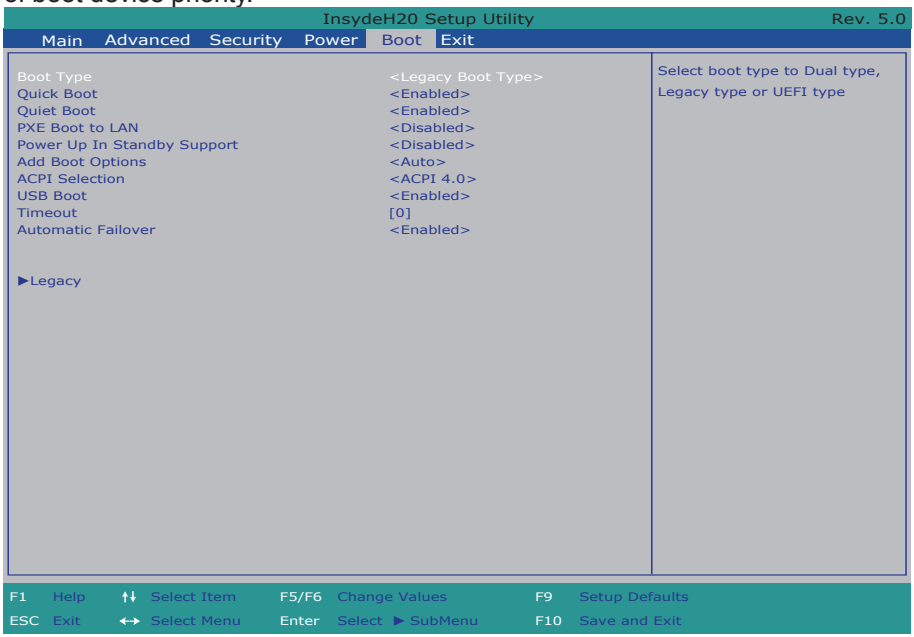


Setting	Description
Use XD Capability	Enables or disables processor XD capability.
Limit CPUID Max value	Sets whether the processor should limit the maximum CPUID input value to 03h when the operating system queries it upon startup. ▸ Select **Enabled** to allow a processor with Intel® Hyper-Threading 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.

3.5. Boot

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



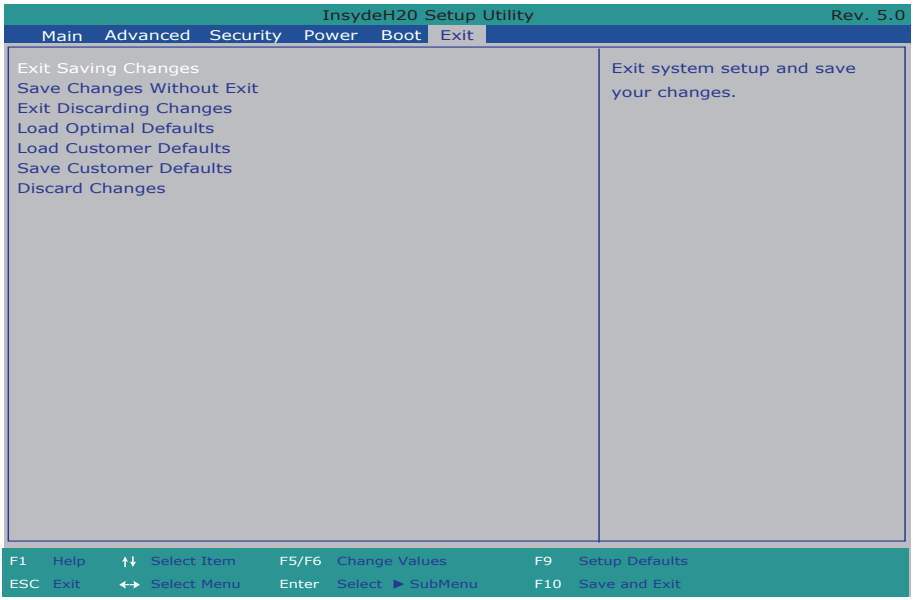
The featured settings are:

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.
Legacy	**Boot Device Priority** **Normal Boot Menu** Select Normal boot option priority or Advance boot option Priority. **Boot type order** Change boot type order **Hard Disk Drive** Change CD/DVD-ROM Drive Boot order

3.6. 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.

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