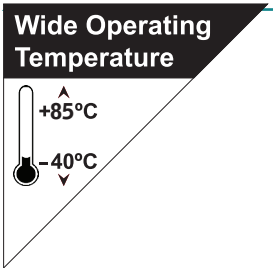

EmNANO-i230V

COM Express® Mini Type 10 CPU Module

User's Manual

Version 1.0

2019.06

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Revision History

Version	Release Time	Description
1.0	2019.06	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.

https://www.arbor-technology.com

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

- Fanless design
- Soldered onboard Intel® Atom™ E3800 family
- Integrated Gigabit Ethernet
- Single channel 24-bit LVDS and DDI port
- 1 x USB 3.0 port, 8 x USB 2.0 ports, 2 x serial ports
- Supports dual independent displays
- **Wide Range Operating Temp.: -40~ 85°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	Soldered onboard Intel® Atom E3825 1.33GHz or E3845 1.91GHz processor
Memory	Soldered onboard 4GB DDR3L SDRAM
BIOS	Insyde UEFI BIOS
Serial Port	2 x serial ports (RX/TX only, via LPC to UART EXAR XR28V382)
USB Port*	8 x USB 2.0 ports
	1 x USB 3.0 port
Expansion Interface	3 x PCIe x1 Gen2 lanes, SDIO, SMBus, I2C
	SPI, and LPC (Low Pin Count) interface
Storage	2 x Serial ATA ports with 300MB/s HDD transfer rate
Ethernet Chipset	1 x Intel® i210IT GbE controller
Audio Interface	HD audio link
Graphics Interface	Integrated Intel® Gen 7 Graphics
	1 x Single Channel 24-bit LVDS port 1 x DDI port
OS Support	Windows 7 32-bit/ 64-bit Windows 10 32-bit/ 64-bit Linux: Ubuntu
Power Requirement	Power Input 12V/ 5V auto detect (±5%)
Power Consumption	1.05A@+12V with E3825 (Typical, with PBN-9007)
Operating Temp.	-40 ~ 85°C (-40 ~ 185°F)
Humidity	10~ 95%@85°C (non-condensing)
Dimension (L x W)	84 x 55 mm (3.30" x 2.17")

1.4. Inside the Package

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

1 x EmNANO-i230V COM Express® Mini CPU Module

1 x Quick Installation Guide

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

1.5. Ordering Information

EmNANO-i230V-WT-E3825-4G	Intel® Atom™ processor WT E3825 COM Express Type 10 CPU module with 4GB memory soldered on CPU module
EmNANO-i230V-WT-E3845-4G	Intel® Atom™ processor WT E3845 COM Express Type 10 CPU module with 4GB memory soldered on CPU module
EmNANO-i230V-WT-E3825-2G	Intel® Atom™ processor WT E3825 COM Express Type 10 CPU module with 2GB memory soldered on CPU module
EmNANO-i230V-WT-E3845-2G	Intel® Atom™ processor WT E3845 COM Express Type 10 CPU module with 2GB memory soldered on CPU module

1.6. Optional Accessories

HS-230V-F1-T	Heat spreader with threaded standoffs 84x55x11mm
HS-230V-F1-NT	Heat spreader without threaded standoffs 84x55x11mm
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

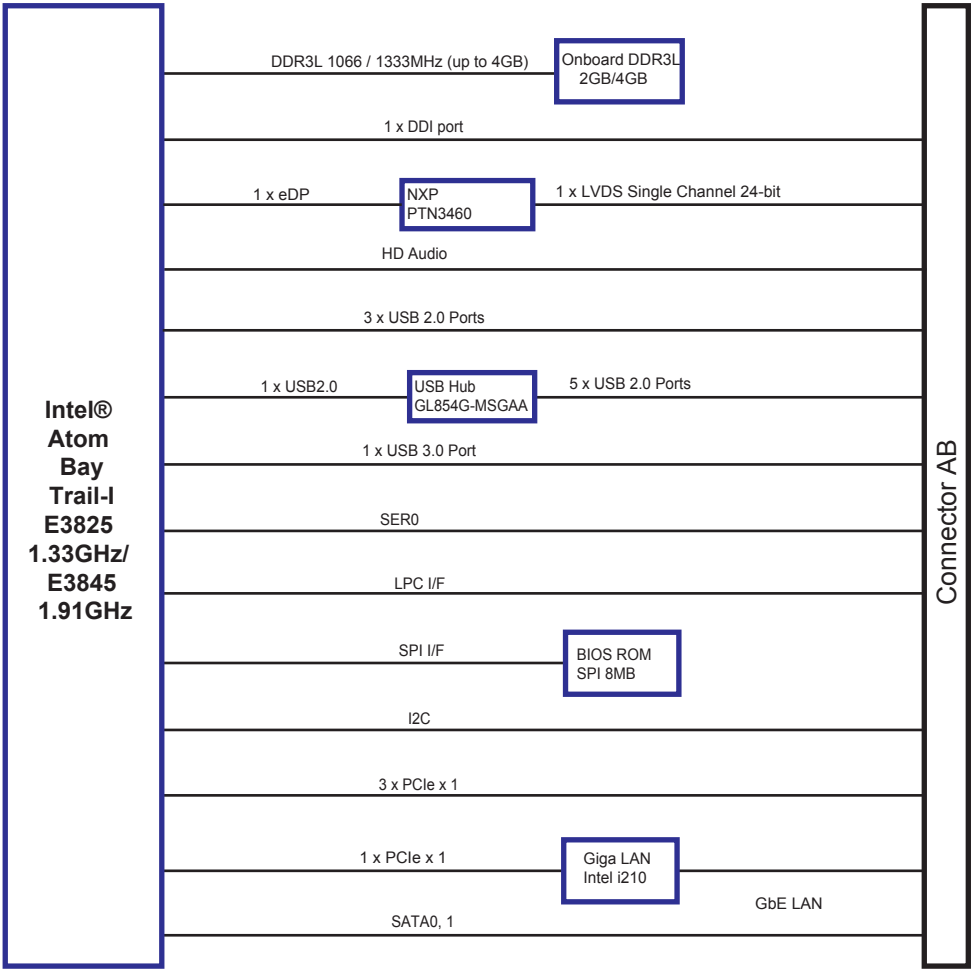
2.1. The Ultra-small COM Express® Mini Module

EmNANO-i230V 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.

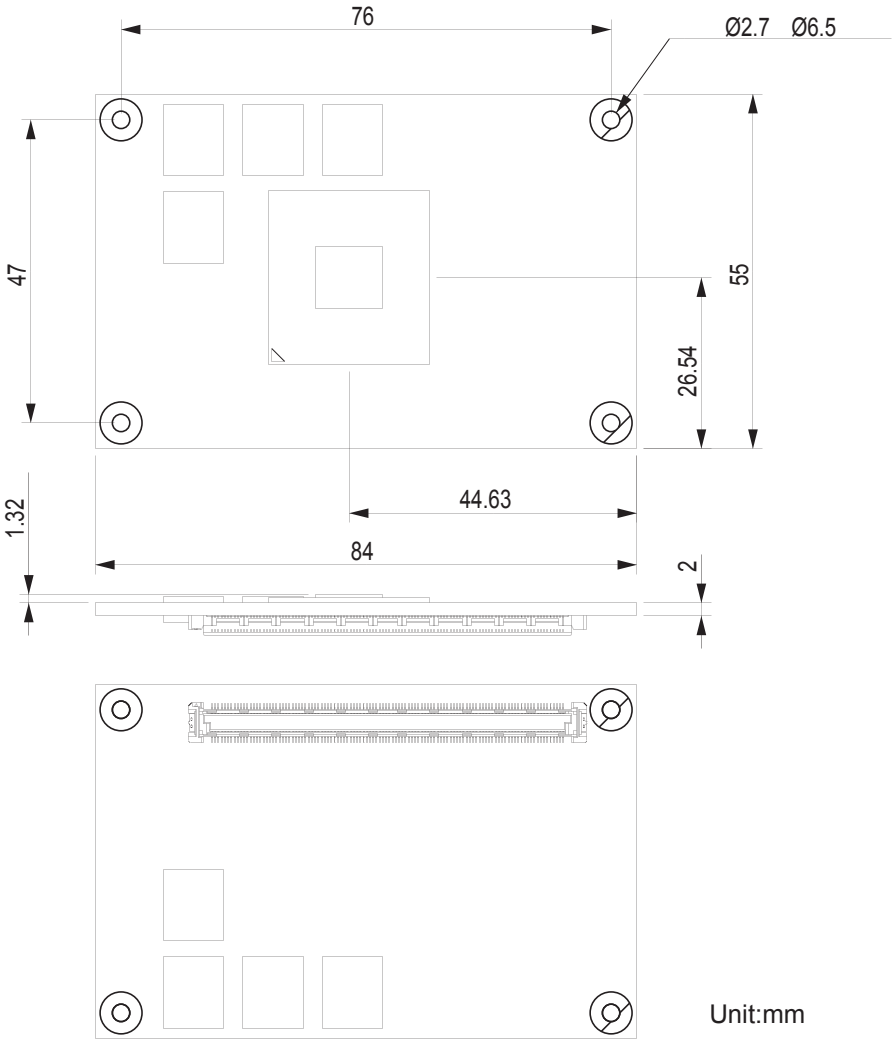
The connector difference between Standard COM Express Mini type 10 and EmNANO-i230V is tabulated as below:

Module Type	Type 10	EmNANO-i230V
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 Connector Pin Assignment

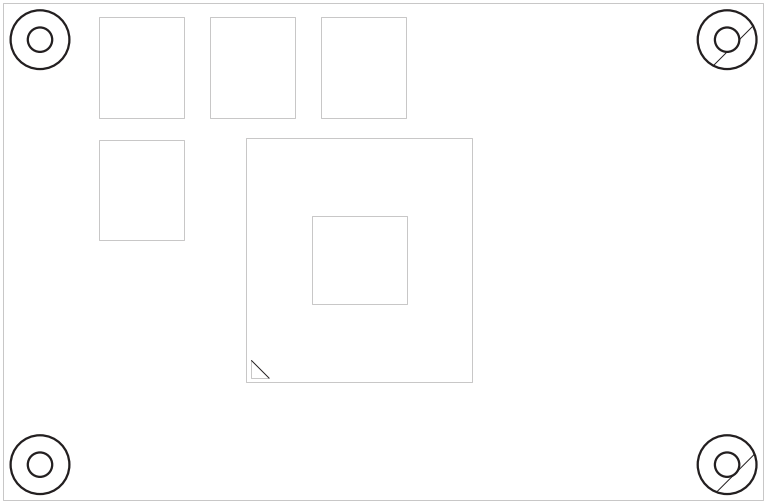
Note: A pin with a remark “(N/C)“ is a pin that the signal isn’t available on this board while the remark beyond the bracket delivers the consortium-specified definition.

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 (N/C)	SD_DATA0 (N/C)	A54
B55	RSVD (N/C)	RSVD (N/C)	A55

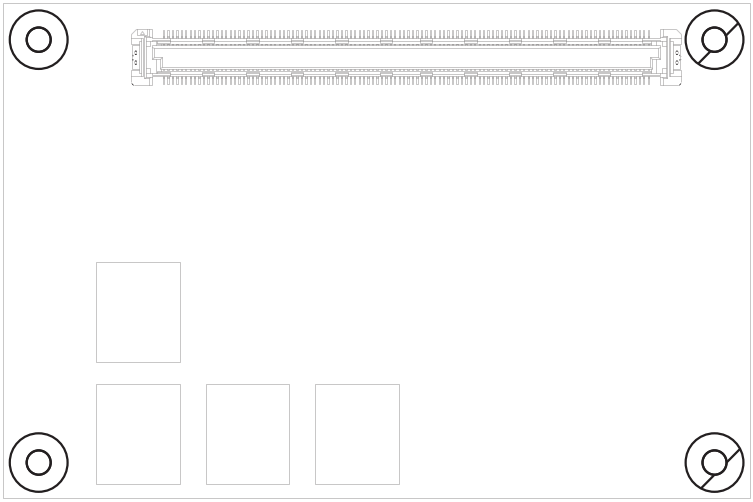
B56	RSVD (N/C)	RSVD (N/C)	A56
B57	SD_WP (N/C)	GND	A57
B58	PCIE_RX3+ (N/C)	PCIE_TX3+ (N/C)	A58
B59	PCIE_RX3- (N/C)	PCIE_TX3- (N/C)	A59
B60	GND	GND	A60
B61	PCIE_RX2+	PCIE_TX2+	A61
B62	PCIE_RX2-	PCIE_TX2-	A62
B63	SD_CD# (N/C)	SD_DATA1 (N/C)	A63
B64	PCIE_RX1+	PCIE_TX1+	A64
B65	PCIE_RX1-	PCIE_TX1-	A65
B66	WAKE0#	GND	A66
B67	WAKE1#	SD_DATA2 (N/C)	A67
B68	PCIE_RX0+	PCIE_TX0+	A68
B69	PCIE_RX0-	PCIE_TX0-	A69
B70	GND	GND	A70
B71	DDI0_PAIR0+	LVDS_A0+ / eDP_TX2+	A71
B72	DDI0_PAIR0-	LVDS_A0- / eDP_TX2-	A72
B73	DDI0_PAIR1+	LVDS_A1+ / eDP_TX1+	A73
B74	DDI0_PAIR1-	LVDS_A1- / eDP_TX1-	A74
B75	DDI0_PAIR2+	LVDS_A2+ / eDP_TX0+	A75
B76	DDI0_PAIR2-	LVDS_A2- / eDP_TX0-	A76
B77	DDI0_PAIR4+ (N/C)	LVDS_VDD_EN / eDP_VCC_EN	A77
B78	DDI0_PAIR4- (N/C)	LVDS_A3+	A78
B79	LVDS_BKLT_EN/ eDP_BKLT_EN	LVDS_A3-	A79
B80	GND	GND	A80
B81	DDI0_PAIR3+	LVDS_A_CK+ / eDP_TX3+	A81
B82	DDI0_PAIR3-	LVDS_A_CK- / eDP_TX3-	A82
B83	CKLVDS_BKLT_CTRL / DP_BKLT_CTRL	LVDS_I2C_CK / eDP_AUX+	A83
B84	VCC_5V_SBY	LVDS_I2C_DAT / eDP_AUX-	A84
B85	VCC_5V_SBY	SD_DATA3 (N/C)	A85
B86	VCC_5V_SBY	RSVD (N/C)	A86
B87	VCC_5V_SBY	RSVD / eDP_HPD(NC)	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 (N/C)	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	A101
B102	FAN_TACHIN(N/C)	SER1_RX	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 (7.0A) Installation Notes

The CPU module supports Windows 7 and 10. To install the drivers, please go to our website at **www.arbor-technology.com** and download the driver pack from the product page. If you need driver DVD, please contact your ARBOR sales representative.

Windows 7

Driver	Path
Audio	\EmNANO-i230V\Win7\Audio\32bit_Win7_R273
	\EmNANO-i230V\Win7\Audio\64bit_Win7_R273
Chipset	\EmNANO-i230V\Win7\Chipset
Graphics	\EmNANO-i230V\Win7\Graphics\win32_153339
	\EmNANO-i230V\Win7\Graphics\win64_153339
LAN	\EmNANO-i230V\Win7\LAN
Processor IO	\EmNANO-i230V\Win7\Processor IO\Win7_IO_Drivers
TXE Patch	\EmNANO-i230V\Win7\TXE Patch
USB3.0	\EmNANO-i230V\Win7\USB3.0

Windows 10

Driver	Path
Audio	\EmNANO-i230V\win10\Audio\Win10_WHQLx64
GPIO	\EmNANO-i230V\win10\GPIO\GPIO
	\EmNANO-i230V\win10\GPIO\I2C
Graphics	\EmNANO-i230V\win10\Graphic
INF	\EmNANO-i230V\win10\INF
LAN	\EmNANO-i230V\win10\LAN
TXE Patch	\EmNANO-i230V\win10\TXE\11.07

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.

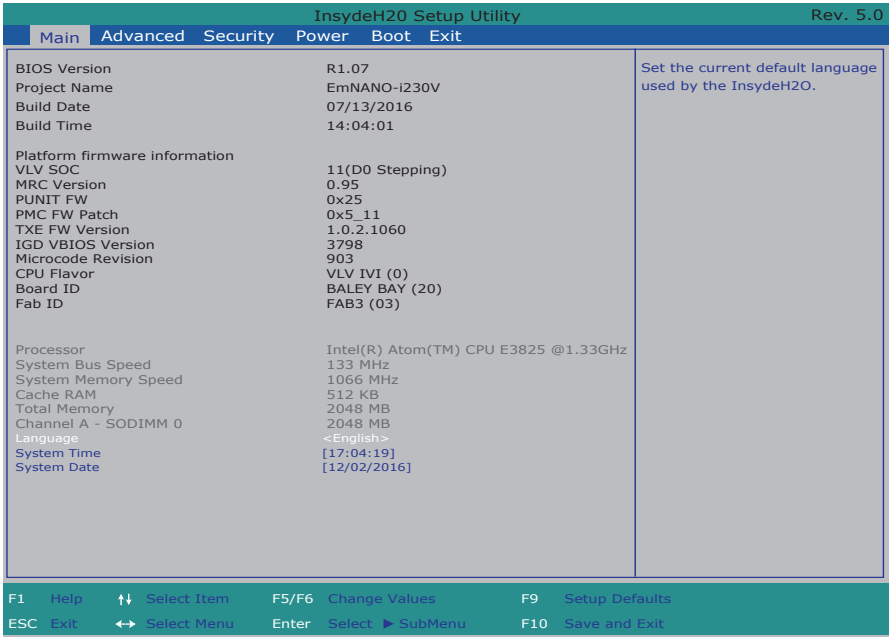
After entering the utility, use the left/right arrow keys to navigate between the top menus and use the down arrow key to access one.

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 24.
Power	See 3.4. Power on page 25.
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:

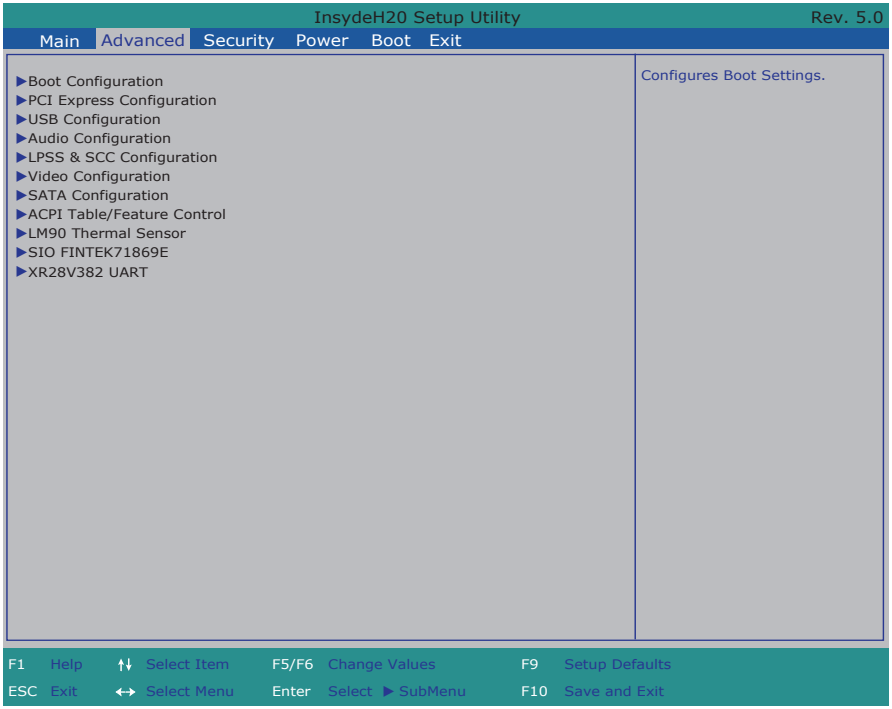
Info Item	Description
BIOS Version	Delivers the computer's BIOS version.
Project name	Delivers the name of the project
Build Date and Time	Delivers the date and time when the BIOS Setup utility was created/ updated.
Platform firmware Information	Delivers the Platform firmware Information

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.



The featured submenus are:

Submenu	Description
Boot Configuration	See 3.2.1. Boot Configuration on page 17.
PCI Express Configuration	See 3.2.2. PCI Express Configuration on page 21
USB Configuration	See 3.2.3. USB Configuration on page 18.
Audio Configuration	See 3.2.4. Audio Configuration on page 18.
LPSS & SCC Configuration	See 3.2.5. LPSS & SCC Configuration on page 19.
Video Configuration	See 3.2.6. Video Configuration on page 20.
SATA Configuration	See 3.2.7. SATA Configuration on page 21.
ACPI Table/Feature Control	See 3.2.8. ACPI Table/Feature Control on page 21.
LM90 Thermal Sensor	See 3.2.9. LM90 Thermal Sensor on page 22.
SIO FINTEK71869E	See 3.2.10. SIO FINTEK71869E on page 22.
XR28V382 UART	See 3.2.11. XR28V382 UART on page 23.

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 1/2/3/4	▸ PCI Express Root Port Enables/disables this PCIe port. ▸ PCIe Port Speed Options are: Auto (default), Gen 1, Gen 2 ▸ PCIe Port ASPM (default) 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

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 Default: Enabled
xHCI Mode	Set the mode of operation of xHCI controller Options are Disabled/Enabled/Auto/Smart Auto(default)
XCHI Controller	Enables/disables XHCI controller Default: Enabled
USB2 Link Power Management	Enables/disables USB2 Link Power Management. Default: Enabled
XCHI Streams	Enables/disables XHCI Stream Default: Disabled
EHCI Controller	Enables/disables EHCI controller Default: Enabled
USB RMH Mode	Enables/disables PCH USB rate matching hubs mode Default: Enabled
USB EHCI debug	Enables/disables PCH EHCI debug capability Default: Disabled
USB Per-Port Control	Enabes/disables USB Per-port control Default: Enabled

3.2.4. Audio Configuration

The featured settings are:

Setting	Description
LPE Audio Support	Enables/disables LPE audio support Default: Disabled
Audio Controller	Control detection of the Azalia device. Disabled: Azalia will be unconditionally disabled. Enabled (default): Azalia will be unconditionally enabled. Auto: Azalia will be enabled if present, disabled otherwise.
Azalia VCi Enable	Enables/disables virtual channel 1 of audio controller Default: Enabled
Azalia HDMI Codec	Enables/disables internal HDMI codec for Azalia. Default: Enabled

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
LPSS & SCC Auto Switch	Set whether to auto Switch LPSS & SCC devices from ACPI mode to PCI mode when OS not support ACPI mode. Default: Enabled
Hide Unsupported LPSS devices	Hide unsupported LPSS devices when in ACPI mode. Default: Enabled
OS Selection	Set the mode of OS Selection Options are Windows(default)/Android
DDR50 Capability Support	Enables/disabled DDR50 capability support. Default: Enabled
HS200 Capability Support	Enables/disabled HS200 capability support. Default: Disabled
Re Tune Timer Value	Set Re tuner timer value.
LPSS DMA #1/2 Support	Enables/disables LPSS DMA #1/2 Support Default: Enabled
LPSS I2C #1 Support	Enables/disables LPSS I2C #1 Support Default: Enabled

3.2.6. Video Configuration

3.2.6.1 Video Configuration

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

3.2.6.2 VBT Hook Configuration

Setting	Description
Configure DDI0 as	Set the hardware DDI0 configuration. Options are Default/DisplayPort/ HDMI/DVI /DisplayPort with HDMI/ DVI Compatible (default) / No Device
Configure DDI1 as	Set the hardware DDI1 configuration. Options are eDP (default)/ No Device
Configure eDP Panel Number as	Set the eDP Panel Number. Options are 1~16. Default: 3
LFP EDID Support	Enables/Disables LFP EDID support. Default: Enabled
EFP EDID Support	Enables/Disables EFP EDID support. Default: Enabled

3.2.6.3 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) (default) / (10) JEIDA (24bpp) / (11) JEIDA (24bpp)
PTN3460 EDID Table	Set the EDID Table of PTN3460. Options are: (0) 640 x 480 @60Hz (1) 800 x 600 @60Hz (2) 1024 x 768 @60Hz (default) (3) 1366 x 768 @60Hz (4) 1280 x 1024 @60Hz (5) 1920 x 1080 @60Hz (6) 1920 x 1080 @60Hz

3.2.6.4 GOP Configuration

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

3.2.7. SATA Configuration

Select this submenu to configure the SATA controller and HD.

Setting	Description
SATA Controller	Enables/disables the present SATA controller. Default: Enabled
SATA Test Mode	Enables/disables the SATA test mode. Default: Disabled
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. Default: Enabled
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. Default: Disabled
SATA Port 1 Connect to an ODD	
Serial ATA Port 0	Delivers the SATA port Media information and Security Mode.
Serial ATA Port 1	

3.2.8. 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. Default: Enabled
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 Default: Enabled
DSDT - ACPI S3	Enables/disables ACPI S3 state Default: Enabled
DSDT - ACPI S4	Enables/disables ACPI S4 state Default: Enabled
BGRT - ACPI BGRT	Enables/disables ACPI BGRT Table Default: Disabled

3.2.9. LM90 Thermal Sensor

Displays the LM90 thermal sensor information.

Setting	Description
Local Temperature	Displays Local Temperature
Remote Temperature	Displays Remote Temperature
Thermal Status	Display Thermal Status

3.2.10. 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	▸ 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
Serial Port B	▸ Serial Port Enables/disables the Serial port. ▸ RS422/485 AutoFlow Settings Setup the RS422/485 auto-flow settings Options: RS232 (default)/ RS485 ▸ Base I/O Address Setup the Base I/O Address of the Serial Port. ▸ Interrupt Setup the Interrupt of the Serial Port

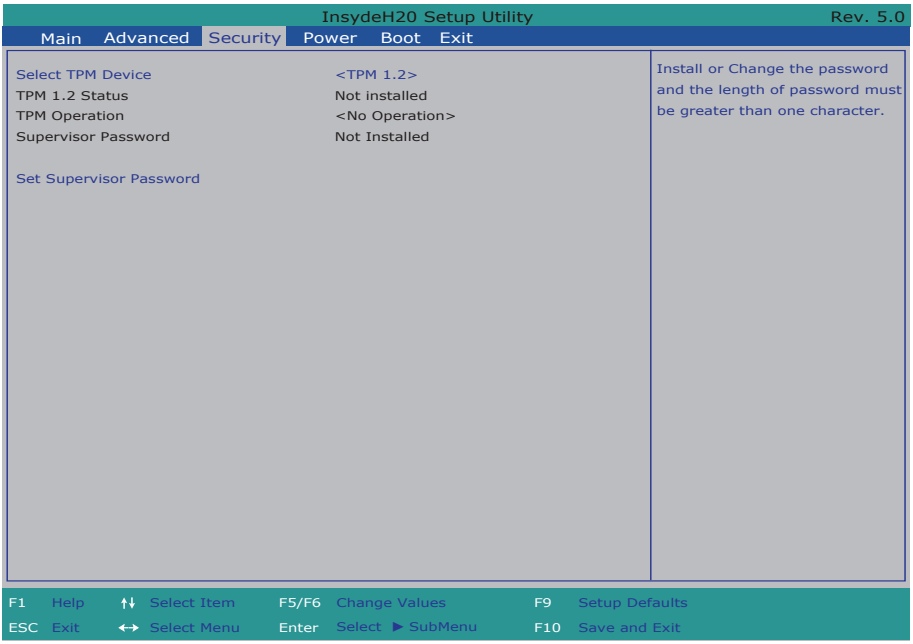
3.2.11. XR28V382 UART

Configures XR28V382 UART by the following settings:

Setting	Description
Share IRQ support	Enables/Disables share IRQ. Default: Disabled
Share IRQ Mode	Set Share IRQ model (available if “Share IRQ Support” is enabled) Options are Low (Windows) (default) / High (DOS/Linux)
Serial Port A/B	▸ Serial Port Enables/disables the Serial port. ▸ Com Port Type Setup the COM port type as RS232 (default) / RS485 ▸ Base I/O Address Setup the Base I/O Address of the Serial Port. ▸ Interrupt (available if “Share IRQ Support” is disabled_ 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.

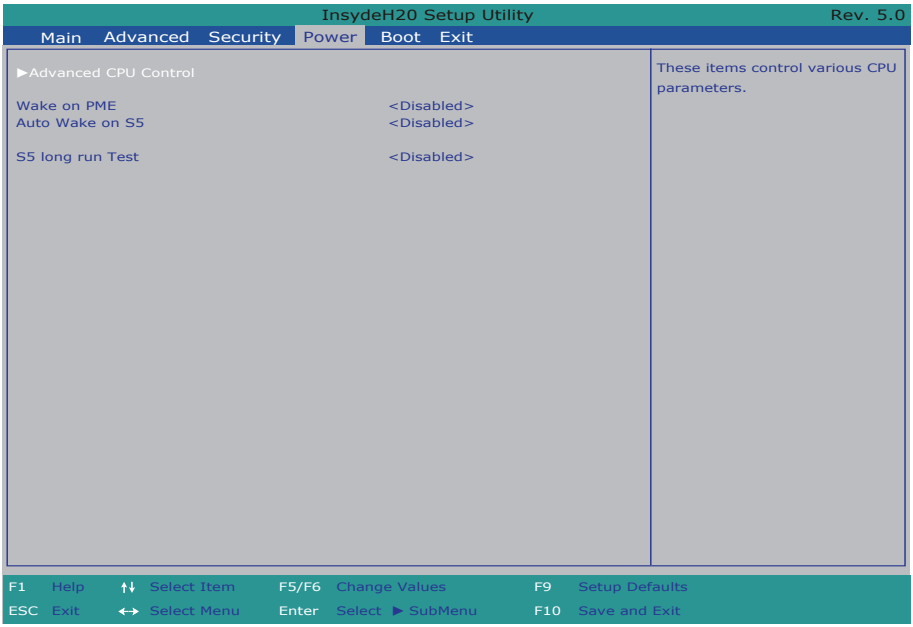


The featured setting is:

Setting	Description
Select TPM Device	Select TPM device to initialize. Default: TPM 1.2
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

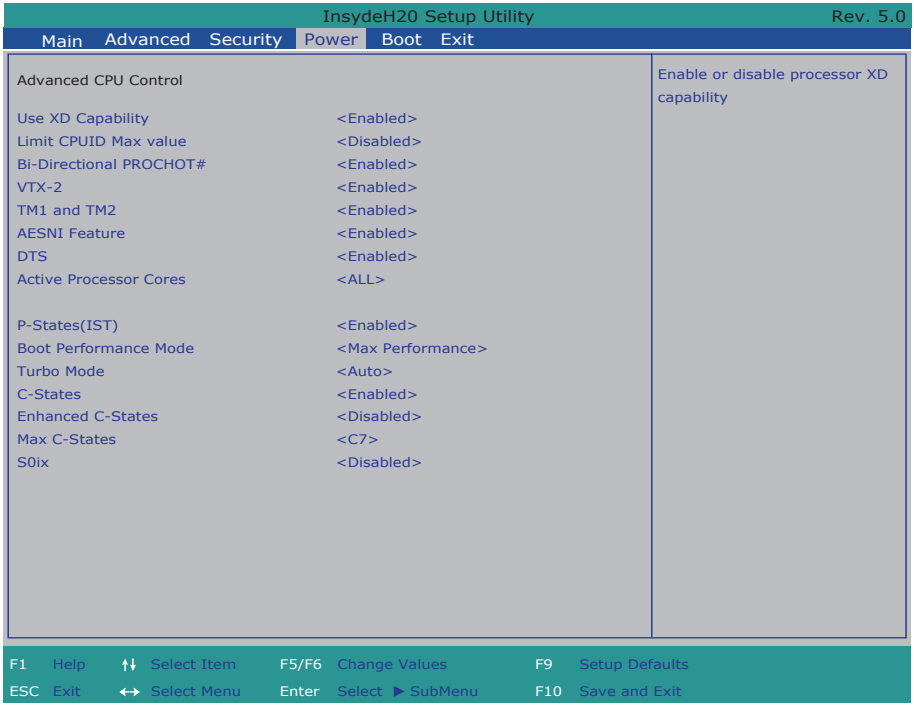
The **Power** menu sets up the power option of system



The featured setting is:

Setting	Description
Advanced CPU Control	See 3.4.1 Advanced CPU Control on page 26
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. Default: Disabled
Auto Wake on S5	Enables or diables auto wake on S5 state. Options are Disabled(default) / By Every Day / By Day of Month.
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. Default: Disabled

3.4.1 Advanced CPU Control

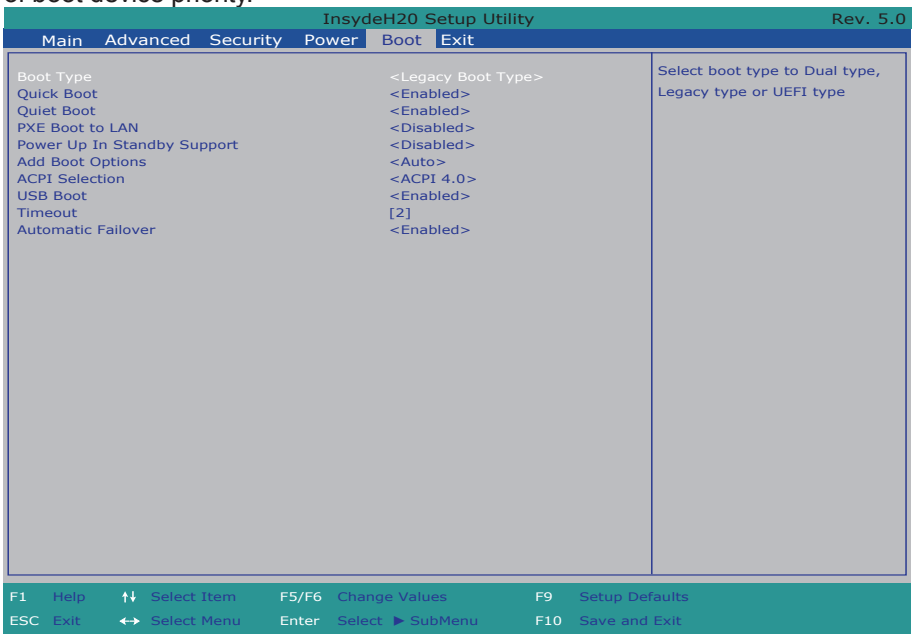


Setting	Description
Use XD Capability	Enables or disables processor XD capability. Default: Enabled
Limit CPUID Max value	Sets whether the processor should limit the maximum CPUID input value to 03h when the operating system queries it upon startup. ▸ Select **Enabled** to allow a processor with Intel® Hyper-Threading technology to work with an operating system that doesn't support it. ▸ Default: Disabled
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. Default: Enabled
VTX-2	Enables/disables the CPU's VTX-2 function. Default: Enabled
TM1 and TM2	Enable/disables TM1/TM2 Default: Enabled

AESNI Feature	Enable/disables AESNI Default: Enabled
DTS	Enable/disables CPU Digital Thermal Sensor function. Default: Enabled
Active Processor Cores	Set the Number of cores to enable in each processor package. Options are ALL (default) /1
P-States(IST)	Enables/disables processor performance states (P-States) Default: Enabled
Boot Performance Mode	Select the performance state that BIOS will set before OS handoff Options: Max Performance (default) / Max Battery
Turbo Mode	Enables/disables processor Turbo mode (EMTTM enabled is required) Default: Enabled
C-States	Enables/disables processor idle power saving states (C-states) Default: Enabled
Enhanced C-States	Enables/disables P-state transitions to occur in combination with C-states. Default: Disabled
Max C-States	Set the Max CPC state C7 (default) /C6/C1
S0ix	Enables/disables the platform to configure S0ix support. Default: Disabled

3.5. Boot

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



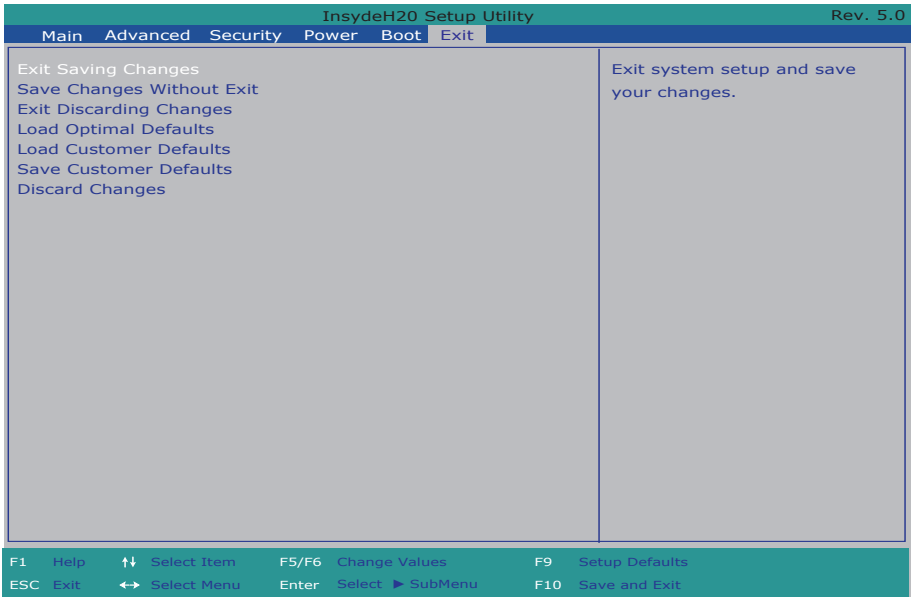
The featured settings are:

Setting	Description
Boot Type	Sets Boot Type. Options are Legacy Boot Type (default) and UEFI Boot Type.
Quick Boot	Allow InsydeH20 to Skip certain tests while booting . This will descrese the time need to boot the system. Default: Enabled
Quiet Boot	Disables or enables booting in text mode. Default: Enabled
PXE boot to LAN	Disables or enables PXE boot to LAN. Default: Disabled
Power Up In Standby Support	Disable or enable Power Up In Standby Support. Default: Disabled
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 (default) /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.

3.6. 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.