EmETX-i2304

ETX® CPU Module

User's Manual

Version 2.0

2021.03

Revision History

Version	Date	Description
1.0	Oct, 2014	Initial release
1.1	Nov, 2014	Add P37~P45
1.2	Sep, 2020	• 1.3 Specifications: Remove IDE Interface • 1.4 Remove Driver CD • 2.1 Board Dimension/ Connector Location > Bottom View: Remove IDE from ETX4 • 2.2 Block Diagram: “MARVELL 88SE6101” removed • 2.3 Jumpers and Connectors > ET4 Connector: Revise all PIDE pins to N.C
2.0	Mar, 2021	• 1.3 Specifications: Add IDE interface • 2.1 Board Dimension/ Connector Location > Bottom View: Add IDE • 2.2 Block Diagram: Revise as "Innodisk 6DB368L048" and "IDE"

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Copyright Notice

All Rights Reserved.

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.

This document contains proprietary information protected by copyright. All rights are reserved. No part of this manual may be reproduced by any mechanical, electronic, or other means in any form without prior written permission of the manufacturer.

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 consult the user's manual first at:

http://www.arbor-technology.com

Please do not hesitate to e-mail our customer service when you still cannot find out the answer.

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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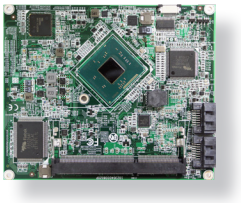
Chapter 1

Introduction

1.1 The Product



EmETX-i2304 needs another carrier board, PBE-1000, to work with to deliver best performance. The I/O cabling from boards to chassis, or the daughter boards are not needed. Money spent on these parts can be saved. Cost is substantially reduced.

Enabling easier system upgrade, EmETX-i2304 actually reduces the risk resulted from previous wrong assessment of system performance. It decreases design requirements and eases technical complexity, and therefore reduces business risk. It has these features:

- **Fanless Design**
- Soldered Onboard Intel® Atom™ E3800 Family CPU
- Support LVDS, Analog RGB and DDI Port
- Integrated 10/100base-T Ethernet
- **Extended Operating Temp.: -20 ~ 70ºC**
- **Wide Range Operating Temp.:-40°C ~ 85ºC (-40°F ~ 185ºF, WT series)**

1.2 About This Manual

This user's manual provides general information and installation instructions about the product. This User's Manual is intended for experienced users and integrators with hardware knowledge of personal computers. If you are not sure about any description in this booklet, please consult your vendor before further handling.

1.3 Specifications

Form Factor	ETX® CPU Module
CPU	Intel® Atom™ Processor E3825 dual-core 1.33GHz or E3845 quad-core 1.91GHz
Memory	1 x 204-pin SO-DIMM socket, up to 8GB DDR3L 1333 MT/s SDRAM
Graphics Chipset	SoC Integrated Intel® Gen7 graphic
Ethernet	1 x Realtek RTL8106E PCIe 10/100Mbps controller
Audio	Realtek ALC886 5.1 Channel HD Audio CODEC, Mic-in/ Line-in/Line-out
BIOS	Insyde BIOS
Serial ATA	2 x Serial ATA with 300MB/s HDD transfer rate
IDE Interface	1 x Ultra ATA port, supporting 2 IDE devices
Serial Port	2 x COM Ports
Parallel Port	SPP/EPP/ECP mode selectable
KB/MS	Support PS/2 interface Keyboard and Mouse
Universal Serial Bus	4 x USB 2.0 ports
Graphics Interface	Analog RGB that supports resolution up to 2048 x 1536
	24-bit Dual Channels LVDS supported via eDP to LVDS NXP PTN3460
	1 x DDI port connector on the module
Expansion Interface	PCI (4 x PCI masters) and ISA Bus LPC (Low Pin Count) connector (By OEM request)
Operation Temp.	-20°C ~ 70°C (-4°F ~ 158°F) -40°C ~ 85ºC (-40°F ~ 185ºF, WT series)
Watchdog Timer	1~255 level Reset
Dimension (L x W)	114 x 95 mm (4.5" x 3.7")

1.4 Inside the Package

Before you begin installing your single board, please make sure that the following materials have been shipped:

1 x EmETX-i2304 ETX® CPU Module

1 x Quick Installation Guide

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

Ordering Information

EmETX-i2304-E3825	Intel® Atom™ Processor E3825 ETX CPU module
EmETX-i2304-E3845	Intel® Atom™ Processor E3845 ETX CPU module
EmETX-i2304-WT-E3825 (BTO)	Wide-Range Temperature Intel® Atom™ Processor E3825 ETX CPU module
EmETX-i2304-WT-E3845 (BTO)	Wide-Range Temperature Intel® Atom™ Processor E3845 ETX CPU module

Optional Accessories

HS-2304-F1	Heat spreader (114 x 95 x 18 mm)
PBE-1000 R2.1	ETX® evaluation board in ATX form factor
CBK-05-1000-00	Cable kit 1 x FDD cable 3 x Serial port cables 1 x USB cable 2 x IDE cables 1 x TV-out cable

1.6 Driver (7.8A) Installation

Windows 7

Driver	Path
AUDIO	\Audio\32bit_Win7_R273
	\Audio\64bit_Win7_R273
CHIPSET	\Chipset\Win32_64_10.1.17
Ethernet	\Ethernet\Install_Win7_7076_11222013
Graphic	\Graphic\32bit_36.15.0.1073
	\Graphic\64bit_37.15.0.1073
Processor IO	\Processor IO
TXE	\TXE Patch
USB3.0	\USB3.0

Windows 10

Driver	Path
AUDIO	\Audio\Win32
	\Audio\Win64
GPIO I^2C	\GPIO I2C\windows10 32_64
Graphic	\Graphic\Win32
	\Graphic\Win64
INF	\INF\Win32_64_10.1.17
LAN	\LAN\0023-Install_Win10_10025_03202018\Install_Win10_10025_03202018
TXE	\TXE\11.07

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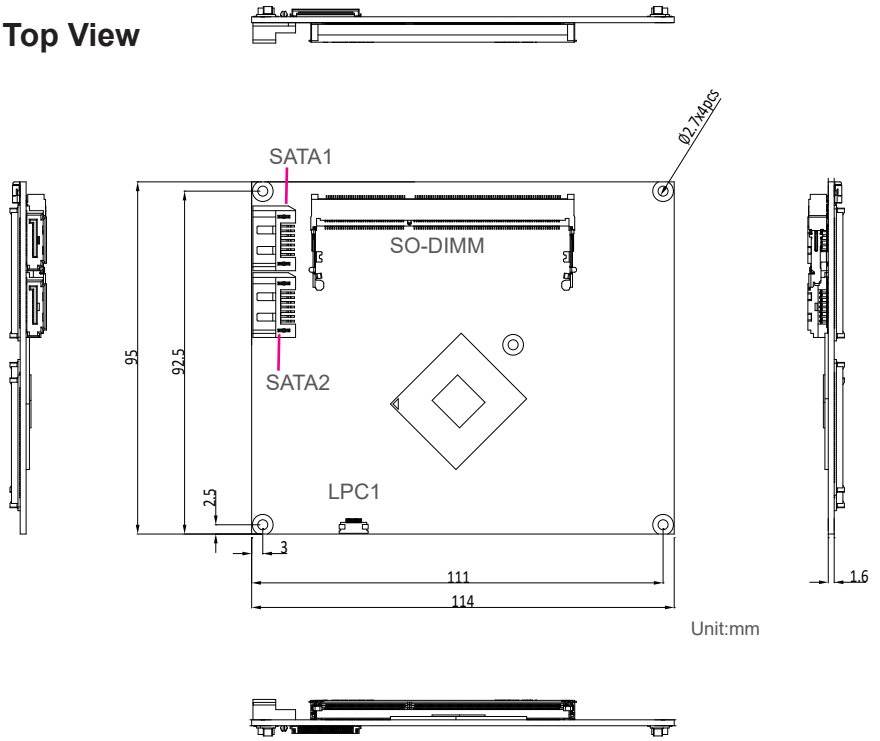
Chapter 2

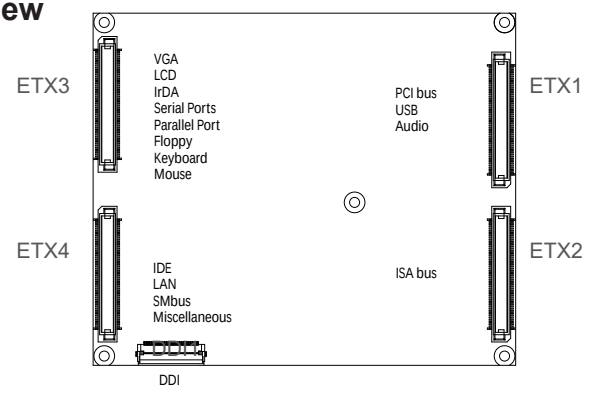
Board Overview

2.1 Board Dimension/ Connector Location

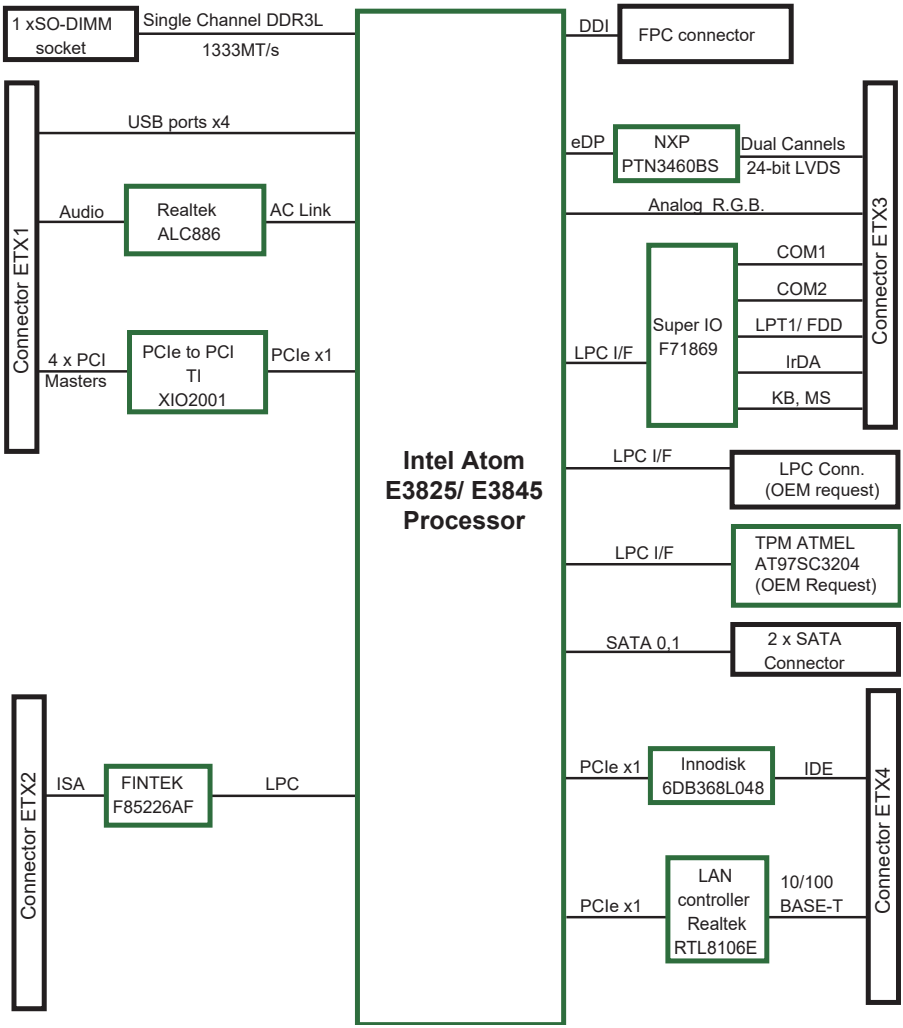
Top View



Bottom View



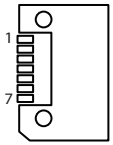
2.2 Block Diagram



2.3 Jumpers and Connectors

SATA1, SATA2 Connectors (Top side)

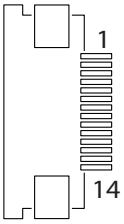
Pin	Description
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND



LPC1 Connector (Top side, by OEM request)

Connector type: FPC12-14P-P0.5 (Hirose)

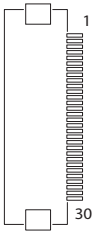
Pin	Desc.	Pin	Desc.
1	VCC3(2)	8	SER_IRQ
2	VCC3(1)	9	LFRAME#
3	GND5	10	GND1
4	GND4	11	LD3
5	LPC_CLK(33M)	12	LD2
6	GND3	13	LD1
7	LPC_RST#	14	LD0



DDI1 Connector (Bottom side)

Connector type: FH12-30S-0.5SH (Hirose)

Pin	Description	Pin	Description
1	GND	16	N/C
2	GND	17	N/C
3	GND	18	GND
4	GND	19	TXP3
5	+5VS	20	TXN3
6	+5VS	21	GND
7	+5VS	22	TXP2
8	+5VS	23	TXN2
9	HPDET#	24	GND
10	DDC_AUX_SEL	25	TXP1
11	N/C	26	TXN1
12	GND	27	GND
13	CTLDATA_AUXN	28	TXP0
14	CTLCLK_AUXP	29	TXN0
15	GND	30	GND



ETX1 Connector

A1	GND	GND	A2
A3	PCICLK3	PCICLK4	A4
A5	GND	GND	A6
A7	PCICLK1	PCICLK2	A8
A9	REQ#3	GNT#3	A10
A11	GNT#2	VCC3	A12
A13	REQ#2	GNT#1	A14
A15	REQ#1	VCC3	A16
A17	GNT#0	N.C	A18
A19	VCC	VCC	A20
A21	SERIRQ	REQ#0	A22
A23	AD0	VCC3	A24
A25	AD1	AD2	A26
A27	AD4	AD3	A28
A29	AD6	AD5	A30
A31	CBE#0	AD7	A32
A33	AD8	AD9	A34
A35	GND	GND	A36
A37	AD10	AUXAL	A38
A39	AD11	MIC	A40
A41	AD12	AUXAR	A42
A43	AD13	ASVCC	A44
A45	AD14	SNDL	A46
A47	AD15	ASGND	A48
A49	CBE#1	SNDR	A50
A51	VCC	VCC	A52
A53	PAR	SERR#	A54
A55	PERR#	N.C	A56
A57	PME#	USB2-	A58
A59	LOCK#	DEVSEL#	A60
A61	TRDY#	USB3-	A62
A63	IRDY#	STOP#	A64
A65	FRAME#	USB2+	A66
A67	GND	GND	A68
A69	AD16	CBE#2	A70
A71	AD17	USB3+	A72
A73	AD19	AD18	A74
A75	AD20	USB0-	A76
A77	AD22	AD21	A78
A79	AD23	USB1-	A80
A81	AD24	CBE#3	A82
A83	VCC	VCC	A84
A85	AD25	AD26	A86
A87	AD28	USB0+	A88
A89	AD27	AD29	A90
A91	AD30	USB1+	A92
A93	PCIRST#	AD31	A94
A95	INTR#C	INTR#D	A96
A97	INTR#A	INTR#B	A98
A99	GND	GND	A100

ETX2 Connector

B1	GND	GND	B2
B3	SD14	SD15	B4
B5	SD13	MASTER#	B6
B7	SD12	DREQ7	B8
B9	SD11	DACK#7	B10
B11	SD10	DREQ6	B12
B13	SD9	DACK#6	B14
B15	SD8	DREQ5	B16
B17	MEMW#	DACK#5	B18
B19	MEMR#	DREQ0	B20
B21	LA17	DACK#0	B22
B23	LA18	IRQ14	B24
B25	LA19	IRQ15	B26
B27	LA20	IRQ12	B28
B29	LA21	IRQ11	B30
B31	LA22	IRQ10	B32
B33	LA23	IO16#	B34
B35	GND	GND	B36
B37	SBHE#	M16#	B38
B39	SA0	OSC	B40
B41	SA1	BALE	B42
B43	SA2	TC	B44
B45	SA3	DACK#2	B46
B47	SA4	IRQ3	B48
B49	SA5	IRQ4	B50
B51	VCC	VCC	B52
B53	SA6	IRQ5	B54
B55	SA7	IRQ6	B56
B57	SA8	IRQ7	B58
B59	SA9	SYSCLK	B60
B61	SA10	REFCH#	B62
B63	SA11	DREQ1	B64
B65	SA12	DACK#1	B66
B67	GND	GND	B68
B69	SA13	DREQ3	B70
B71	SA14	DACK#3	B72
B73	SA15	IOR#	B74
B75	SA16	IOW#	B76
B77	SA18	SA17	B78
B79	SA19	SMEMR#	B80
B81	IOCHRDY	AEN	B82
B83	VCC	VCC	B84
B85	SD0	SMEMW#	B86
B87	SD2	SD1	B88
B89	SD3	NOWS#	B90
B91	DREQ2	SD4	B92
B93	SD5	IRQ9	B94
B95	SD9	SD7	B96
B97	IOCHK#	RSTDRV	B98
B99	GND	GND	B100

ETX3 Connector

C1	GND	GND	C2
C3	R	B	C4
C5	HSY	G	C6
C7	VSY	Analog RGB_DDC_CLK	C8
C9	DETECT#(NC)	Analog RGB_DDC_ATA	C10
C11	TX2CLK#	TX2D3#	C12
C13	TX2CLK	TX2D3	C14
C15	GND	GND	C16
C17	TX2D1	TX2D2	C18
C19	TX2D1#	TX2D2#	C20
C21	GND	GND	C22
C23	TX1D3#	TX2D0	C24
C25	TX1D3	TX2D0#	C26
C27	GND	GND	C28
C29	TX1D2#	TX1CLK	C30
C31	TX1D2	TX1CLK#	C32
C33	GND	GND	C34
C35	TX1D0	TX1D1	C36
C37	TX1D0#	TX1D1#	C38
C39	VCC	VCC	C40
C41	DDC_DATA	N.C.	C42
C43	DDC_CLK	BLON#	C44
C45	BKLTCTL	VDDEN	C46
C47	TV_DATA_COMP (N/C)	Y (N/C)	C48
C49	N.C.	C (N/C)	C50
C51	LPT/FLPY#	N.C.	C52
C53	VCC	GND	C54
C55	STB#	AFD#/DENSEL	C56
C57	N.C.	PD7/N.C	C58
C59	IRRX	ERR#/HDSEL#	C60
C61	IRTX	PD6/N.C	C62
C63	RXD2	INIT#/DIR#	C64
C65	GND	GND	C66
C67	RTS#2	PD5/N.C	C68
C69	DTR#2	SLIN#/STEP#	C70
C71	DCD#2	PD4/DSKCHG#	C72
C73	DSR#2	PD3/RDATA#	C74
C75	CTS#2	PD2/WP#	C76
C77	TXD#2	PD1/TRK0#	C78
C79	RI#2	PD0/INDEX#	C80
C81	VCC	VCC	C82
C83	RXD1	ACK#/DRV	C84
C85	RTS#1	BUSY#/MOT	C86
C87	DTR#1	PE/WDATA#	C88
C89	DCD#1	SLCT#/WGATE#	C90
C91	DSR#1	MSCLK	C92
C93	CTS#1	MSDAT	C94
C95	TXD#1	KBCLK	C96
C97	RI#1	KBDAT	C98
C99	GND	GND	C100

ETX4 Connector

D1	GND	GND	D2
D3	5V_SB	PWGIN	D4
D5	PS_ON	SPEAKER	D6
D7	PWERBTN#	BATT	D8
D9	KBINH (N/C)	LILED	D10
D11	RSMRST#	ACTLED	D12
D13	N.C	SPEEDLED	D14
D15	N.C	I2CLK	D16
D17	VCC	VCC	D18
D19	OVCR#	N.C	D20
D21	EXTSMI#(N/C)	I2DAT	D22
D23	SMBCLK	SMBDAT	D24
D25	SIDE_CS1# (N/C)	SMBALRT#	D26
D27	SIDE_CS0# (N/C)	SATALED#(N/C)	D28
D29	SIDE_A2 (N/C)	PIDE_CS3#	D30
D31	SIDE_A0 (N/C)	PIDE_CS1#	D32
D33	GND	GND	D34
D35	PDIAG_S	PIDE_A2	D36
D37	SIDE_A1 (N/C)	PIDE_A0	D38
D39	SIDE_INTRQ (N/C)	PIDE_A1	D40
D41	BATLOW#	N.C	D42
D43	SIDE_ACK# (N/C)	PIDE_INTRQ	D44
D45	SIDE_RDY (N/C)	PIDE_ACK#	D46
D47	SIDE_IOR# (N/C)	PIDE_RDY	D48
D49	VCC	VCC	D50
D51	SIDE_IOW# (N/C)	PIDE_IOR#	D52
D53	SIDE_DRQ (N/C)	PIDE_IOW#	D54
D55	SIDE_D15 (N/C)	PIDE_DRQ	D56
D57	SIDE_D0 (N/C)	PIDE_D15	D58
D59	SIDE_D14 (N/C)	PIDE_D0	D60
D61	SIDE_D1 (N/C)	PIDE_D14	D62
D63	SIDE_D13 (N/C)	PIDE_D1	D64
D65	GND	GND	D66
D67	SIDE_D2 (N/C)	PIDE_D13	D68
D69	SIDE_D12 (N/C)	PIDE_D2	D70
D71	SIDE_D3 (N/C)	PIDE_D12	D72
D73	SIDE_D11 (N/C)	PIDE_D3	D74
D75	SIDE_D4 (N/C)	PIDE_D11	D76
D77	SIDE_D10 (N/C)	PIDE_D4	D78
D79	SIDE_D5 (N/C)	PIDE_D10	D80
D81	VCC	VCC	D82
D83	SIDE_D9 (N/C)	PIDE_D5	D84
D85	SIDE_D6 (N/C)	PIDE_D9	D86
D87	SIDE_D8 (N/C)	PIDE_D6	D88
D89	GPE2#	CBLID_P#	D90
D91	RXD-	PIDE_D8	D92
D93	RXD+	SIDE_D7(N/C)	D94
D95	TXD-	PIDE_D7	D96
D97	TXD+	HDRST#	D98
D99	GND	GND	D100

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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 18.
Advanced	See 3.2. Advanced on page 19.
Security	See 3.3. Security on page 27.
Power	See 3.4. Power on page 28.
Boot	See 3.5. Boot on page 31.
Exit	See 3.6. Exit on page 33.

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.

Key Commands

The BIOS Setup utility relies on a keyboard to receive user's instructions. Hit the following keys to navigate within the utility and configure the utility.

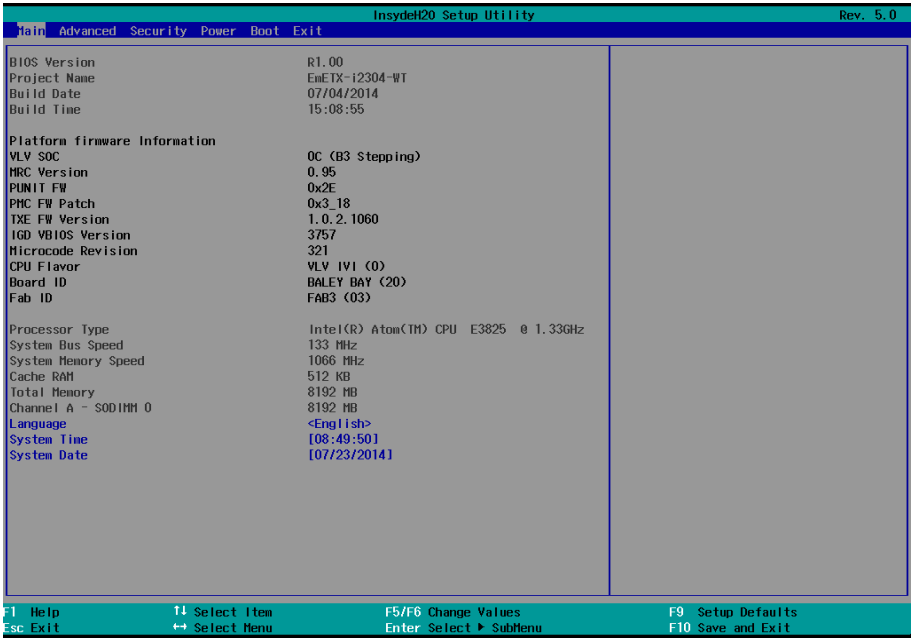
Keystroke	Function
← →	Moves left/right between the top menus.
↓ ↑	Moves up/down between highlight items.
Enter	Selects an highlighted item/field.
Esc	▸ On the top menus: Use **Esc** to quit the utility without saving changes to CMOS. (The screen will prompt a message asking you to select **OK** or **Cancel** to exit discarding changes. ▸ On the submenus: Use **Esc** to quit current screen and return to the top menu.
F5	Increases current value to the next higher value or switches between available options.
F6	Decreases current value to the next lower value or switches between available options.
F1	Opens the **Help** of the BIOS Setup utility.
F9	Restore the Setup Default (The screen then prompts a message asking you to select **OK** or **Cancel** to restore to default.)
F10	Exits the utility saving the changes that have been made. (The screen then prompts a message asking you to select **OK** or **Cancel** to exit saving changes.)

Note: Pay attention to the "WARNING" that shows at the left pane onscreen when making any change to the BIOS settings.

This BIOS Setup utility is updated from time to time to improve system performance and hence the screenshots hereinafter may not fully comply with what you actually have 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:

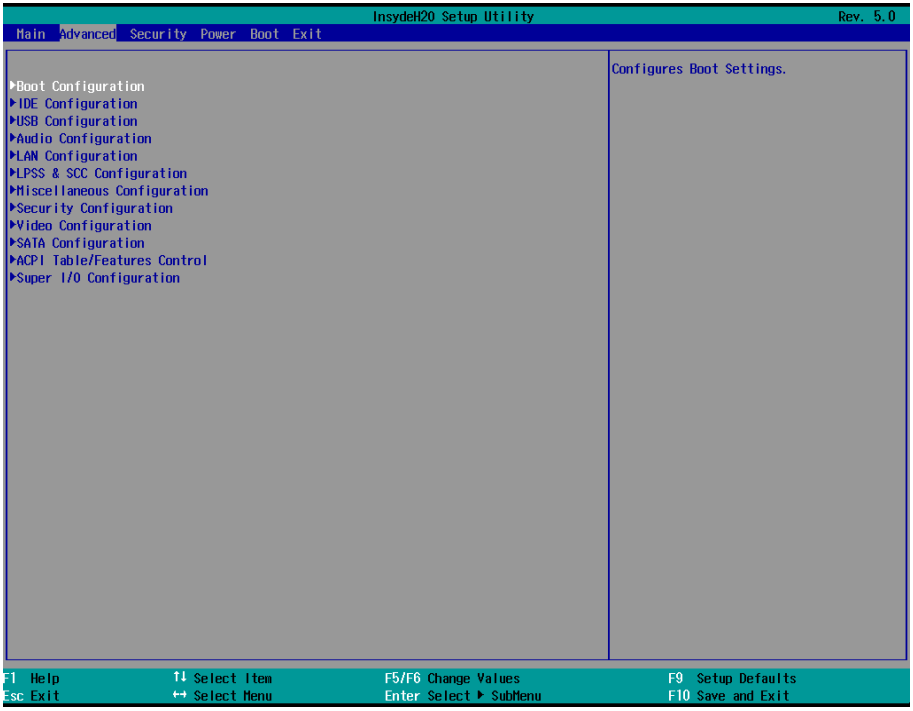
Info Item	Description
BIOS Version	Delivers the computer's BIOS version.
Project name	Delivers the name of the project
Build Date and Time	Delivers the date and time when the BIOS Setup utility was created/ updated.
Platform firmware Information	Delivers the Platform firmware Information

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.
IDE Configuration	See 3.2.2. IDE Configuration on page 20 .
USB Configuration	See 3.2.3. USB Configuration on page 20.
Audio Configuration	See 3.2.4. Audio Configuration on page 21.
LAN Configuration	See 3.2.5. LAN Configuration on the page 21
LPSS & SCC Configuration	See 3.2.6. LPSS & SCC Configuration on page 21.
Miscellaneous Configuration	See 3.2.7. Miscellaneous Configuration on page 22.
Security Configuration	See 3.2.8. Security Configuration on page 22.
Video Configuration	See 3.2.9. Video Configuration on page 23.
SATA Configuration	See 3.2.9. SATA Configuration on page 25.
ACPI Table/Feature Control	See 3.2.10. ACPI Table/Feature Control on page 23.
Super I/O Configuration	See 3.2.11. Super I/O Configuration on page 26.

3.2.1. Boot Configuration

Setting	Description
Numlock	Select Power-on state for Num lock

3.2.2. IDE Configuration

Configures IDE by the following settings:

Setting	Description
IDE Channel 1 Support	▸ IDE Channel 1 Support ▸ Enables/Disables IDE Channel 1 Support ▸ Enables/Disables Ultra DMA-66/100 Support

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
USB Per-Port Control	Enables/Disables USB Per-port control
USB Port #0123	Enables/Disables USB Port

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. LAN Configuration

The featured settings are:

Setting	Description
LAN Configuration	Enables/Disables LAN Configuration.

3.2.6. 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
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

3.2.7. 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
Bios Lock	Enables/Disables BIOS SPI region write protect
Force Legacy Free	Enables/Disables Force Legacy Free (Force Disable KBC)
Serial IRQ	Enables/Disables Serial IRQ
Serial IRQ Mode	Set the Serial IRQ Mode. Options are Quiet Mode/Continuous Mode.

3.2.8. 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

3.2.9. Video Configuration

Configure video settings

The featured setting is:

3.2.9.1 Video Configuration

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

3.2.9.2 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/ eDP/ DisplayPort/ HDMI/DVI /Display-Port 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

3.2.9.3 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 Channel Control	Set the Channel of PTN3460. Options are Single(default) / Dual.
PTN3460 EDID Table	Set the EDID Table of PTN3460.

3.2.9.4 GOP Configuration

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

3.2.9.5 IGD Configuration

Setting	Description
Integrated 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 Management 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

3.2.9.6 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 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 S3	Enables/disables ACPI S3 state
DSDT - ACPI S4	Enables/disables ACPI S4 state
BGRT - ACPI BGRT	Enables/disables ACPI BGRT Table

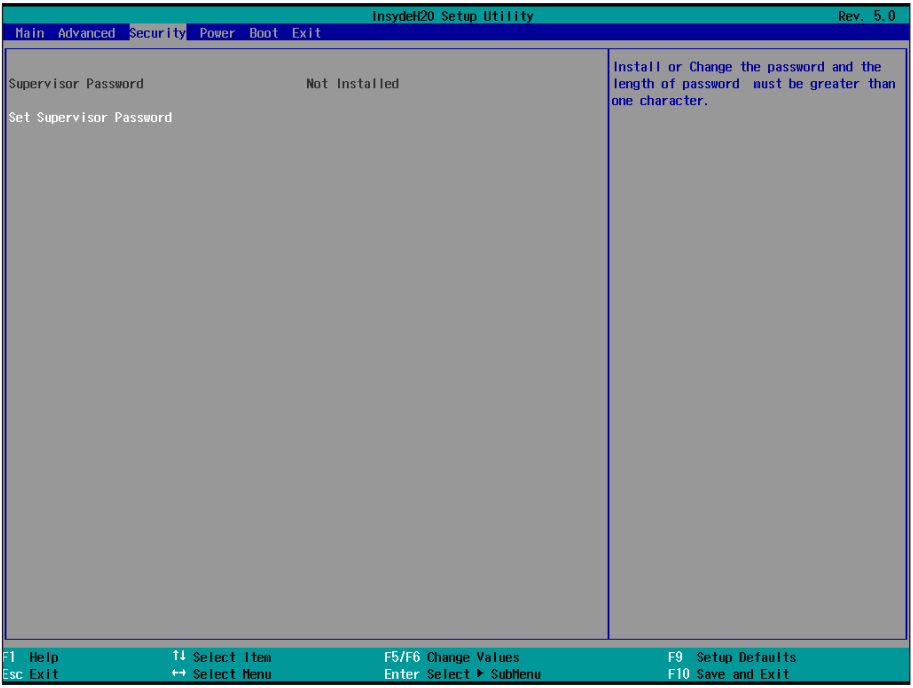
3.2.11. Super I/O Configuration

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 1/3/4	▸ 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 2	▸ Serial Port 2 Enables/disables the Serial port. ▸ RS-232/RS-485 Setting Set the mode of Serial port. Options are 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
LPT Port 2	▸ LPT Port Enables/disables the LPT port. ▸ Base I/O Address Setup the Base I/O Address of the LPT Port. ▸ Interrupt Setup the Interrupt of the LPT 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.

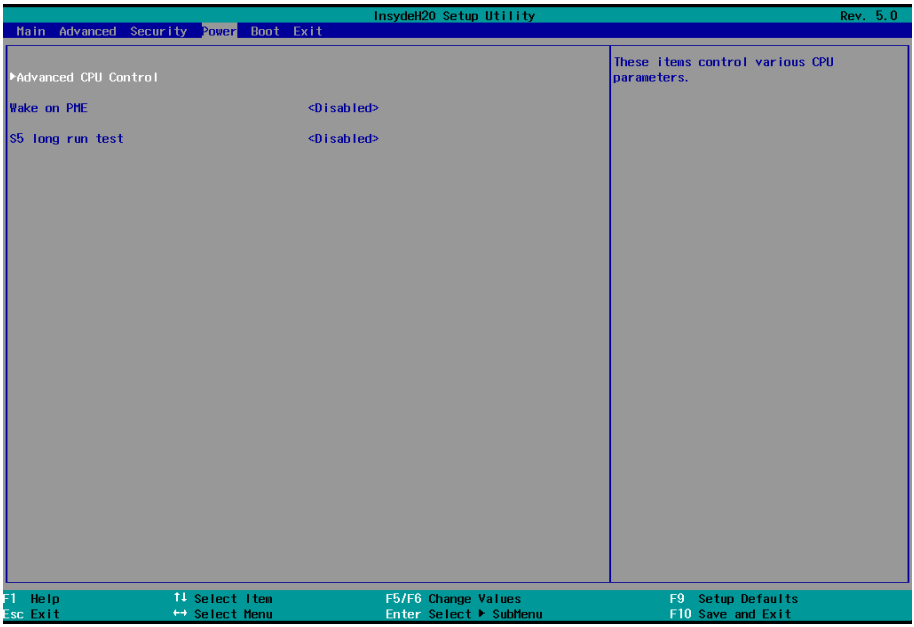


The featured setting is:

Setting	Description
Set Supervisor Password	To set up an administrator password: 1. Select **Set Supervisor Password**. An **Create New Password** dialog then pops up on-screen. 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

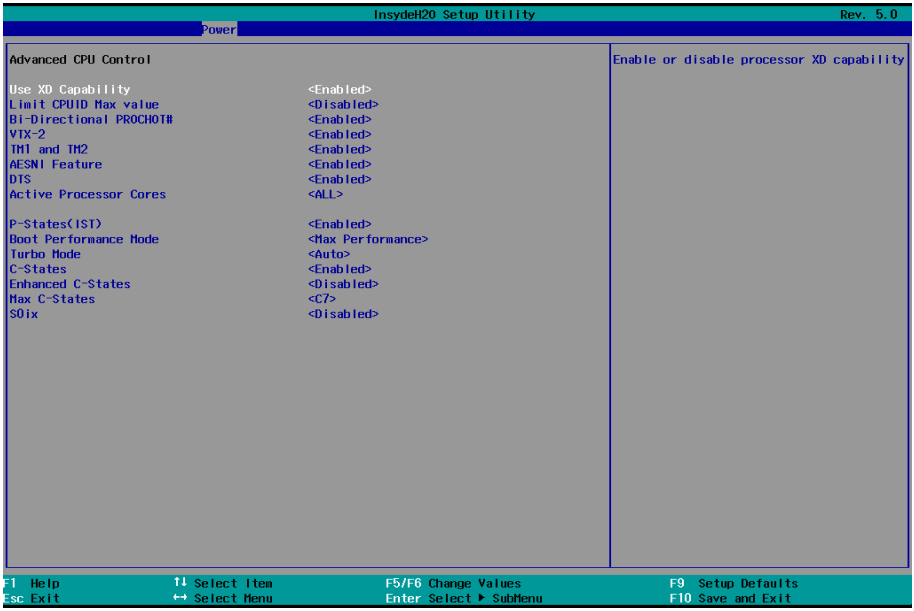
The **Power** menu sets up the power option of system



The featured setting is:

Setting	Description
Advanced CPU Control	See 3.4.1 Advanced CPU Control on page 29
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

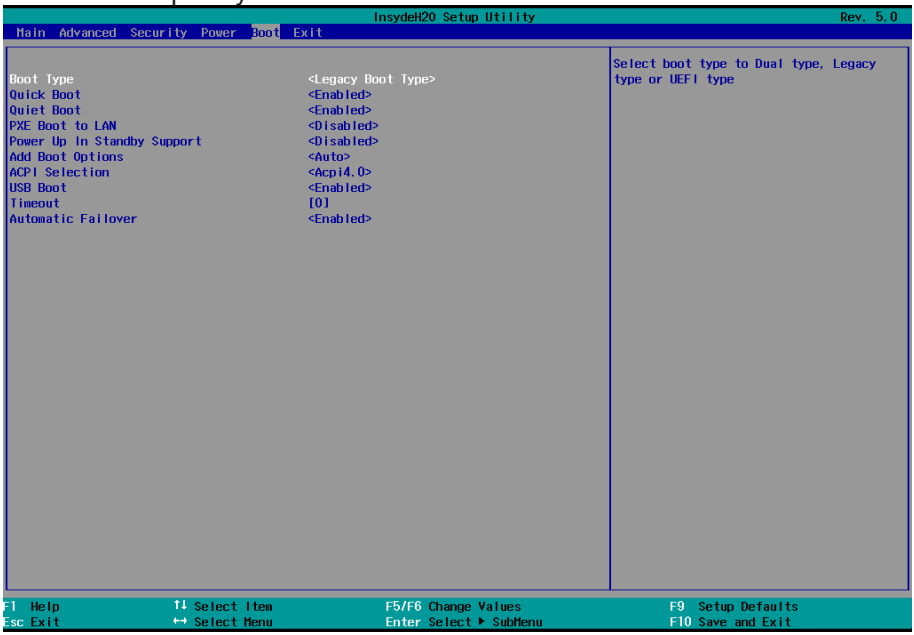


Setting	Description
Use XD Capability	Enables or disables processor XD capability.
Limit CPUID Max value	Sets whether the processor should limit the maximum CPUID input value to 03h when the operating system queries it upon startup. ▸ Select **Enabled** to allow a processor with Intel® Hyper-Threading 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
Boot type	Set the boot type. Options are Legacy Boot Type.
Quick Boot	Allow InsydeH20 to Skip certain tests while booting . This will decrease 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

Setting	Description
Normal Boot Menu	Set the boot Menu. Options are Normal / Advance.
Boot Type Order	Set the boot type order. Options are USB / Hard Disk Drive / Floppy Drive / CD/DVD-ROM Drive / Others.

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 custom default values
Save Custom Default	Save current setting as custom default
Discard Changes	Discard all changes without Exit.

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Appendix

Appendix A. Watchdog Timer (WDT) Setting

The application software depends on its requirement to trigger WDT with adequate timer setting. Before WDT timeout, the functional normal system will reload the WDT. The WDT never time-out for a normal system. The WDT will not be reloaded by an abnormal system, then WDT will time-out and auto-reset the system to avoid abnormal operation.

This computer supports 255 levels watchdog timer by software programming I/O ports.

Below is an program example to disable and load WDT.

Sample Codes:

```
#include “math.h”
#include “stdio.h”
#include “dos.h”

#define SIO_INDEX      0x2E          /* or index = 0x4E */
#define SIO_DATA       0x2F          /* or data  = 0x4F */

void main()
{
        outportb(sioIndex, 0x87);                    /* Enable Super I/O */
        outportb(sioIndex, 0x87);

        outportb(sioIndex, 0x07);                    /* Select logic device – WDT */
        outportb(sioData,  0x07);

        outportb(sioIndex, 0x30);                    /* Enable WDT */
        outportb(sioData,  0x01);

        outportb(sioIndex, 0xF0);                    /* Enable WDTRST# Output */
        outportb(sioData,  0x80);

        outportb(sioIndex, 0xF6);                    /* Set WDT Timeout value */
        outportb(sioData,  0x05);

        outportb(sioIndex, 0xF5);                    /* Set Configure and Enable WDT
timer, Start countdown */
        outportb(sioData,  0x32);

        outportb(sioIndex, 0xAA);                    /* Disable Super I/O */
}
```