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# **EmETXe-i2905**

## **COM Express® Compact Type 2 CPU Module**

# **User's Manual**

## **Version 1.0**

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<b>Contents</b>	
<b>Chapter 1 - General Information</b> .....	<b>1</b>
1.1. Introduction .....	2
1.2. Packing List .....	2
1.3. Ordering Information .....	3
1.4. CD Driver Paths .....	3
1.5. Specifications .....	4
1.6. Board Dimensions .....	5
<b>Chapter 2 - Installation</b> .....	<b>7</b>
2.1. What Is “COM Express®”? .....	8
2.2. Major Components .....	9
2.3. Jumper and Connectors .....	10
2.4. Block Diagram .....	11
2.5. Connector Pin Description .....	12
<b>Chapter 3 - BIOS</b> .....	<b>15</b>
3.1. Main .....	17
3.2. Advanced .....	19
3.2.1. CPU Configuration .....	20
3.2.2. IDE Configuration .....	21
3.2.3. Floppy Configuration .....	25
3.2.4. Super IO Configuration .....	26
3.2.5. Hardware Health Configuration .....	28
3.2.6. AHCI Configuration .....	29
3.2.7. USB Configuration .....	30
3.2.8. Power Type Select .....	32
3.3. Chipset .....	33
3.3.1. North Bridge Configuration .....	34
3.3.2. South Bridge Configuration .....	36
3.4. Boot .....	37
3.4.1. Boot Settings Configuration .....	38
3.4.2. Boot Device Priority .....	39
3.4.3. Removable Drives .....	40
3.5. Security .....	41
3.6. Save & Exit .....	42
<b>Appendix</b> .....	<b>45</b>
<b>A: Interrupt Channel Assignments</b> .....	<b>46</b>
<b>B: Memory Map</b> .....	<b>46</b>
<b>C: I/O Address Map</b> .....	<b>47</b>
<b>D: DMA Channel Assignments</b> .....	<b>47</b>

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## Copyright Notice

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## 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)

### **About This User's Manual**

This user's manual provides general information and installation instructions about the product. It 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.

### **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, 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 without touching 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](mailto: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

## General Information

## 1.1. Introduction

The EmETXe-i2905 is a space-conscious CPU board of 95 mm x 95 mm to take up only small footprint in your system. By the architecture of type 2, the board has two high-performance connectors to promise stable data passing rate. The soldered onboard 2GB DDR3 SDRAM and graphics controller on the other hand bring the LVDS and VGA solution for most LCD video panels and CRT monitors.

The board comes with 3 SATA ports, 8 USB 2.0 ports and one Gigabit Ethernet port. The Intel® ICH8M chipset provides controllers for the I/O Hub (PCH). Hyper-Threading Technology is supported with 2-threads per core, allowing the LPC to provide excellent performance for multi-tasking applications. For system configuration, the board is supported by AMI PnP Flash BIOS. EmETXe-i2905 is an ideal choice for some demanding industrial control and data communications by its significant processing performance, increased I/O function and low power consumption.

## 1.2. Packing List

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



1 x EmETXe-i2905 COM Express® CPU Module

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1 x Driver CD

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1 x Quick Installation Guide

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

### 1.3. Ordering Information

<b>EmETXe-i2905-N4-TW</b>	Intel® Atom™ N455 COM Express® Compact CPU Module
<b>EmETXe-i2905-D5-TW</b>	Intel® Atom™ D525 COM Express® Compact CPU Module
<b>HS-2905-F1</b>	Heat Spreader (95 x 95 x 11 mm)
<b>PBE-1700 R1.3</b>	COM Express® type 2 evaluation board in ATX form factor w/ W83627 Super IO
<b>CBK-04-1700-00</b>	Cable kit 1 x SATA cable 1 x COM Port cable 1 x FDD cable 1 x IDE cable

### 1.4. CD Driver Paths

#### Windows XP

Driver	Path
Chipset	\CHIPSET\INF 9.11
VGA	\GRAPHICS\INTEL_2K_XP_32\5182
LAN	\ETHERNET\INTEL\82574IT\WINXP_32_155 \ETHERNET\INTEL\82574IT\WINXP_64_155
Audio	\AUDIO\REALTEK_HD\WIN2K_XP_x86x64_R252

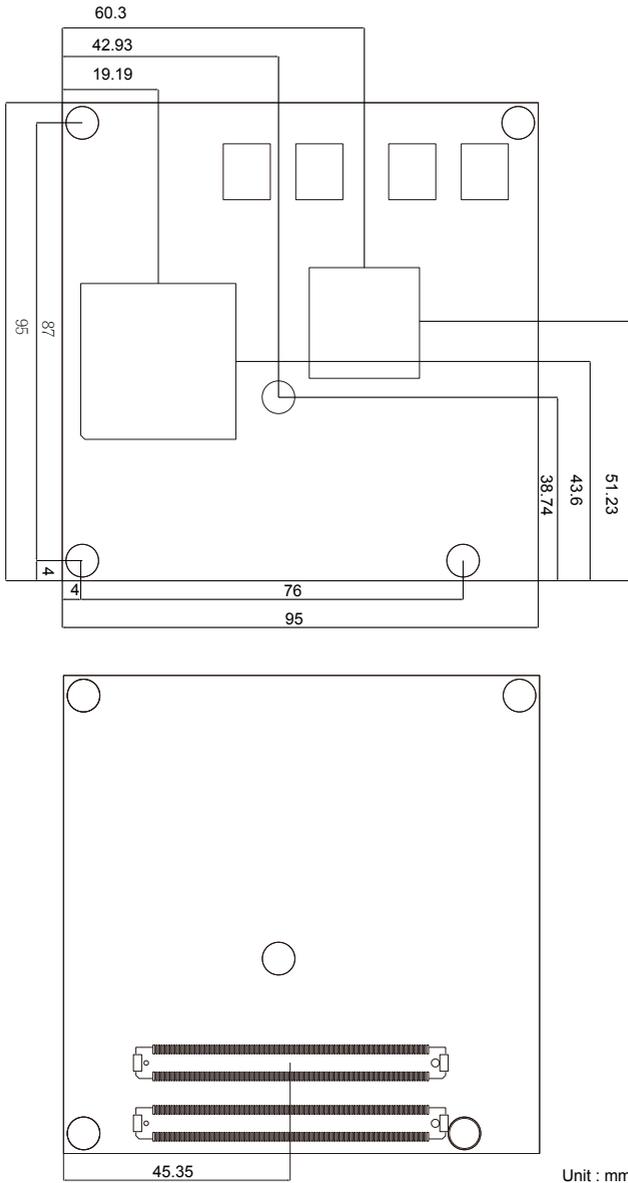
#### Windows 7

Driver	Path
Chipset	\CHIPSET\INF 9.11
VGA	\GRAPHICS\INTEL_WIN7_32\2230 \GRAPHICS\INTEL_WIN7_64\2214
LAN	\ETHERNET\INTEL\82574IT\WIN7_32 \ETHERNET\INTEL\82574IT\WIN7_64
Audio	\AUDIO\REALTEK_HD\Win7_R252

## 1.5. Specifications

<b>Form Factor</b>	COM Express® Compact Type 2 CPU Module
<b>CPU</b>	Soldered onboard Intel® Atom™ N455 at 1.66GHz or D525 at 1.8GHz processor
<b>Chipset</b>	Intel® ICH8M
<b>BIOS</b>	AMI PnP Flash BIOS
<b>System Memory</b>	Soldered onboard 2GB DDR3 SDRAM
<b>VGA/LCD Controller</b>	Intel® Graphics Media Accelerator 3150 graphics core w/ Analog RGB and Single Channel 18/24-bit LVDS (Dual independent displays)
<b>Ethernet controller</b>	1 x Intel 82574L PCIe Gigabit Ethernet
<b>Storage</b>	3 x Serial ATA ports w/ 300MB/s HDD transfer rate 1 x Ultra ATA, supporting 2 IDE devices
<b>Universal Serial Bus</b>	8 x USB 2.0 ports
<b>Expansion Interface</b>	5 x PCIe x1 lanes 4 x PCI masters LPC (Low Pin Count) interface
<b>Operating Temp.</b>	-20°C ~ 70°C (-4°F ~ 158°F)
<b>Watchdog Timer</b>	1~255 levels Reset
<b>Dimension (L x W)</b>	95 x 95 mm (3.7" x 3.7")

## 1.6. Board Dimensions



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# Chapter 2

# Installation

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## 2.1. What Is “COM Express®”?

With more and more demands on small and embedded industrial boards, a multi-functional COM (Computer-on-Module) surfaces as a great solution.

The COM Express® comes with two 220-pin rows of connectors for board-to-board connection.

Row AB, which is required, provides pins for PCI Express, SATA, LVDS, LCD channel, LPC bus, system and power management, VGA, LAN, and power and ground interfaces.

Row CD, which is optional, provides SDVO and legacy PCI and IDE signals next to additional PCI Express, LAN and power and ground signals.

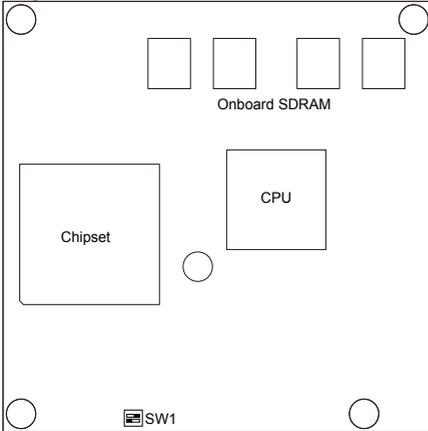
The COM targets the following applications:

- Retail & Advertising
- Medical
- Test & Measurement
- Gaming & Entertainment
- Industrial & Automation
- Military & Government
- Security

## 2.2. Major Components

This section will guide you to the major components soldered on the top side of the CPU board.

### Top View of the Board

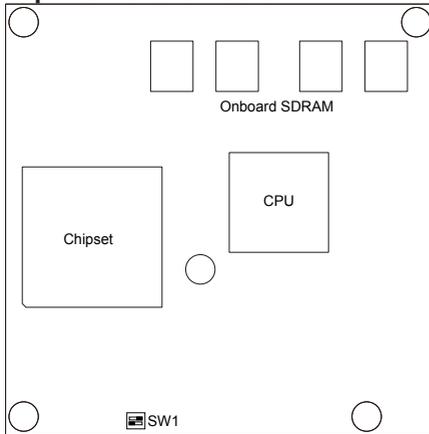


Component	Description
<b>CPU</b>	The Central Processing Unit, which is an Intel® Atom™ N455 or D525. The N455 is based on 45 nanometer technology with main frequency of 1.66 GHz while the D525 has the frequency of 1.8 GHz. Both N455 and D525 support Hyper-Threading technology and DDR2 and DDR3 and also low power consumption.
<b>Chipset</b>	The chipset is an ICH8-M (I/O Controller Hub 8) produced by Intel®. ICH8 was launched by Intel® in 2006 as the new generation to improve the function of the previous ICH7. The ICH8 brought some standard I/O functions by increasing USB interface from 8 to 10 and SATA2 interface from 4 to 6. It also introduced the active management technology and the built-in Gigabit Ethernet networking.

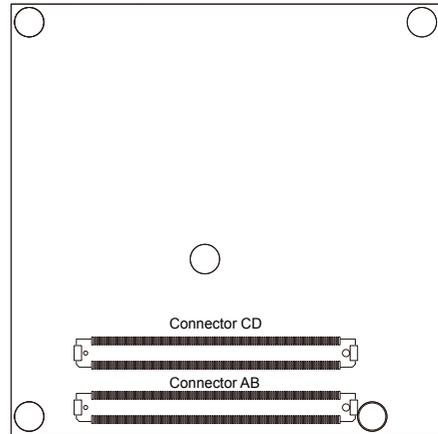
## 2.3. Jumper and Connectors

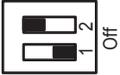
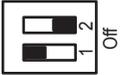
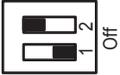
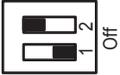
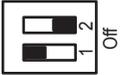
Being a most commonly-used type 2, the EmETXe-i2905 features one DIP switch and two board-to-board connectors, each comprising of 220 pins. Their functions can be summarized as follows:

**Top View of the Board**

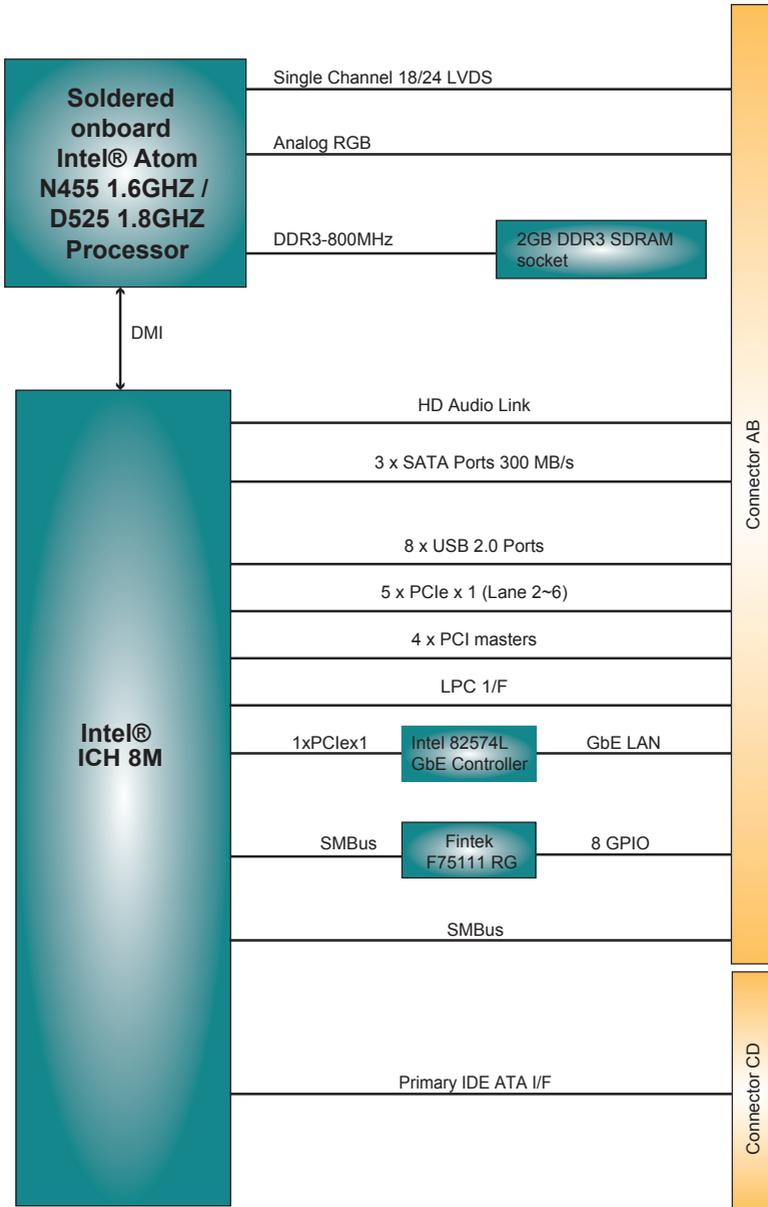


**Bottom View**



DIP Switch/Conn.	Description								
SW1	Sets the power supply to AT or ATX mode (default).								
	<table border="1"> <thead> <tr> <th>Mode</th> <th>Toggle Position</th> <th>Setting</th> </tr> </thead> <tbody> <tr> <td>AT</td> <td>Toggle 1 to “off” position. Toggle 2 to “on” position.</td> <td></td> </tr> <tr> <td>ATX (default)</td> <td>Toggle 1 to “on” position. Toggle 2 to “off” position.</td> <td></td> </tr> </tbody> </table> <p>► Note this setting should be consistent with BIOS' <b>Power Type Select</b> setting to prevent possible conflict. (See <a href="#">3.2.8. Power Type Select</a> on page <a href="#">32</a> for BIOS' <b>Power Type Select</b> setting.)</p>	Mode	Toggle Position	Setting	AT	Toggle 1 to “off” position. Toggle 2 to “on” position.		ATX (default)	Toggle 1 to “on” position. Toggle 2 to “off” position.
Mode	Toggle Position	Setting							
AT	Toggle 1 to “off” position. Toggle 2 to “on” position.								
ATX (default)	Toggle 1 to “on” position. Toggle 2 to “off” position.								
Connector AB	Provides the pins for PCI Express, SATA, LVDS, LCD channel, LPC bus, VGA, LAN, power management and ground interfaces.								
Connector CD	Provides the board with the signals of SDVO, legacy PCI, IDE, the additional PCI Express, LAN and grounding.								

## 2.4. Block Diagram



## 2.5. Connector Pin Description

### AB Connector (bottom side)

B1	GND	GND	A1	PCIE_RX4-	PCIE_TX4-	A56	
B2	GBE0_ACT#	GBE0_MDI3-	A2	GPO2	GND	A57	
B3	LPC_FRAME#	GBE0_MDI3+	A3	B58	PCIE_TX3+	A58	
B4	LPC_AD0	GBE0_LINK100#	A4	B59	PCIE_TX3-	A59	
B5	LPC_AD1	GBE0_LINK1000#	A5	B60	GND	A60	
B6	LPC_AD2	GBE0_MDI2-	A6	B61	PCIE_RX2+	PCIE_TX2+	A61
B7	LPC_AD3	GBE0_MDI2+	A7	B62	PCIE_RX2-	PCIE_TX2-	A62
B8	LPC_DRQ0#	GBE0_LINK#	A8	B63	GPO3	GPI1	A63
B9	LPC_DRQ1#	GBE0_MDI1-	A9	B64	PCIE_RX1+	PCIE_TX1+	A64
B10	LPC_CLK	GBE0_MDI1+	A10	B65	PCIE_RX1-	PCIE_TX1-	A65
B11	GND	GND	A11	B66	WAKE0#	GND	A66
B12	PWRBTN#	GBE0_MDI0-	A12	B67	WAKE1#	GPI2	A67
B13	SMB_CK	GBE0_MDI0+	A13	B68	PCIE_RX0+	PCIE_TX0+	A68
B14	SMB_DAT	GBE0_CTREF	A14	B69	PCIE_RX0-	PCIE_TX0-	A69
B15	SMB_ALERT#	SUS_S3#	A15	B70	GND	GND	A70
B16	SATA1_TX+	SATA0_TX+	A16	B71	LVDS_B0+	LVDS_A0+	A71
B17	SATA1_TX-	SATA0_TX-	A17	B72	LVDS_B0-	LVDS_A0-	A72
B18	SUS_STAT#	SUS_S4#	A18	B73	LVDS_B1+	LVDS_A1+	A73
B19	SATA1_RX+	SATA0_RX+	A19	B74	LVDS_B1-	LVDS_A1-	A74
B20	SATA1_RX-	SATA0_RX-	A20	B75	LVDS_B2+	LVDS_A2+	A75
B21	GND	GND	A21	B76	LVDS_B2-	LVDS_A2-	A76
B22	SATA3_TX+	SATA2_TX+	A22	B77	LVDS_B3+	LVDS_VDD_EN	A77
B23	SATA3_TX-	SATA2_TX-	A23	B78	LVDS_B3-	LVDS_A3+	A78
B24	PWR_OK	SUS_S5#	A24	B79	LVDS_BKLT_EN	LVDS_A3-	A79
B25	SATA3_RX+	SATA2_RX+	A25	B80	GND	GND	A80
B26	SATA3_RX-	SATA2_RX-	A26	B81	LVDS_B_CK+	LVDS_A_CK+	A81
B27	WDT	BATLOW#	A27	B82	LVDS_B_CK-	LVDS_A_CK-	A82
B28	AC_SDIN2	ATA_ACT#	A28	B83	CKLVDS_BKLT_CTRL	LVDS_I2C_CK	A83
B29	AC_SDIN1	AC_SYNC	A29	B84	VCC_5V_SBY	LVDS_I2C_DAT	A84
B30	AC_SDINO	AC_RST#	A30	B85	VCC_5V_SBY	GPI3	A85
B31	GND	GND	A31	B86	VCC_5V_SBY	KBD_RST#	A86
B32	SPKR	AC_BITCLK	A32	B87	VCC_5V_SBY	KBD_A20GATE	A87
B33	I2C_CK	AC_SDOOUT	A33	B88	RSVD5	PCIE0_CK_REF+	A88
B34	I2C_DAT	BIOS_DISABLE#	A34	B89	VGA_RED	PCIE0_CK_REF-	A89
B35	THRM#	THRMTRIP#	A35	B90	GND	GND	A90
B36	USB7-	USB6-	A36	B91	VGA_GRN	RSVD1	A91
B37	USB7+	USB6+	A37	B92	VGA_BLU	RSVD2	A92
B38	USB_4_5_OC#	USB_6_7_OC#	A38	B93	VGA_HSYNC	GPO0	A93
B39	USB5-	USB4-	A39	B94	VGA_VSYNC	RSVD3	A94
B40	USB5+	USB4+	A40	B95	VGA_I2C_CK	RSVD4	A95
B41	GND	GND	A41	B96	VGA_I2C_DAT	GND	A96
B42	USB3-	USB2-	A42	B97	TV_DAC_A	TYPE10#	A97
B43	USB3+	USB2+	A43	B98	TV_DAC_B	RSVD6	A98
B44	USB_0_1_OC#	USB_2_3_OC#	A44	B99	TV_DAC_C	RSVD7	A99
B45	USB1-	USB0-	A45	B100	GND	GND	A100
B46	USB1+	USB0+	A46	B101	RSVD11	RSVD8	A101
B47	EXCD1_PERST#	VCC_RTC	A47	B102	RSVD12	RSVD9	A102
B48	EXCD1_CPPE#	EXCD0_PERST#	A48	B103	RSVD13	RSVD10	A103
B49	SYS_RESET#	EXCD0_CPPE#	A49	B104	VCC_12V	VCC_12V	A104
B50	CB_RESET#	LPC_SERIRQ	A50	B105	VCC_12V	VCC_12V	A105
B51	GND	GND	A51	B106	VCC_12V	VCC_12V	A106
B52	PCIE_RX5+	PCIE_TX5+	A52	B107	VCC_12V	VCC_12V	A107
B53	PCIE_RX5-	PCIE_TX5-	A53	B108	VCC_12V	VCC_12V	A108
B54	GPO1	GPI0	A54	B109	VCC_12V	VCC_12V	A109
B55	PCIE_RX4+	PCIE_TX4+	A55	B110	GND	GND	A110

CD Connector (bottom side)

D1	GND	GND	C1	D56	PEG_TX1-	PEG_RX1-	C56
D2	IDE_D5	IDE_D7	C2	D57	TYPE2#	TYPE1#	C57
D3	IDE_D10	IDE_D6	C3	D58	PEG_TX2+	PEG_RX2+	C58
D4	IDE_D11	IDE_D3	C4	D59	PEG_TX2-	PEG_RX2-	C59
D5	IDE_D12	IDE_D15	C5	D60	GND	GND	C60
D6	IDE_D4	IDE_D8	C6	D61	PEG_TX3+	PEG_RX3+	C61
D7	IDE_D0	IDE_D9	C7	D62	PEG_TX3-	PEG_RX3-	C62
D8	IDE_REQ	IDE_D2	C8	D63	RSVD7	RSVD1	C63
D9	IDE_IOW#	IDE_D13	C9	D64	RSVD8	RSVD2	C64
D10	IDE_ACK#	IDE_D1	C10	D65	PEG_TX4+	PEG_RX4+	C65
D11	GND	GND	C11	D66	PEG_TX4-	PEG_RX4-	C66
D12	IDE_IRQ	IDE_D14	C12	D67	GND	RSVD3	C67
D13	IDE_A0	IDE_IORDY	C13	D68	PEG_TX5+	PEG_RX5+	C68
D14	IDE_A1	IDE_IOR#	C14	D69	PEG_TX5-	PEG_RX5-	C69
D15	IDE_A2	PCI_PME#	C15	D70	GND	GND	C70
D16	IDE_CS1#	PCI_GNT2#	C16	D71	PEG_TX6+	PEG_RX6+	C71
D17	IDE_CS3#	PCI_REQ2#	C17	D72	PEG_TX6-	PEG_RX6-	C72
D18	IDE_RESET#	PCI_GNT1#	C18	D73	SDVO_CLK	SDVO_DATA	C73
D19	PCI_GNT3#	PCI_REQ1#	C19	D74	PEG_TX7+	PEG_RX7+	C74
D20	PCI_REQ3#	PCI_GNT0#	C20	D75	PEG_TX7-	PEG_RX7-	C75
D21	GND	GND	C21	D76	GND	GND	C76
D22	PCI_AD1	PCI_REQ0#	C22	D77	IDE_CBLID#	RSVD4	C77
D23	PCI_AD3	PCI_RESET#	C23	D78	PEG_TX8+	PEG_RX8+	C78
D24	PCI_AD5	PCI_AD0	C24	D79	PEG_TX8-	PEG_RX8-	C79
D25	PCI_AD7	PCI_AD2	C25	D80	GND	GND	C80
D26	PCI_C/BE0#	PCI_AD4	C26	D81	PEG_TX9+	PEG_RX9+	C81
D27	PCI_AD9	PCI_AD6	C27	D82	PEG_TX9-	PEG_RX9-	C82
D28	PCI_AD11	PCI_AD8	C28	D83	RSVD9	RSVD5	C83
D29	PCI_AD13	PCI_AD10	C29	D84	GND	GND	C84
D30	PCI_AD15	PCI_AD12	C30	D85	PEG_TX10+	PEG_RX10+	C85
D31	GND	GND	C31	D86	PEG_TX10-	PEG_RX10-	C86
D32	PCI_PAR	PCI_AD14	C32	D87	GND	GND	C87
D33	PCI_SERR#	PCI_C/BE1#	C33	D88	PEG_TX11+	PEG_RX11+	C88
D34	PCI_STOP#	PCI_PERR#	C34	D89	PEG_TX11-	PEG_RX11-	C89
D35	PCI_TRDY#	PCI_LOCK#	C35	D90	GND	GND	C90
D36	PCI_FRAME#	PCI_DEVSEL#	C36	D91	PEG_TX12+	PEG_RX12+	C91
D37	PCI_AD16	PCI_IRDY#	C37	D92	PEG_TX12-	PEG_RX12-	C92
D38	PCI_AD18	PCI_C/BE2#	C38	D93	GND	GND	C93
D39	PCI_AD20	PCI_AD17	C39	D94	PEG_TX13+	PEG_RX13+	C94
D40	PCI_AD22	PCI_AD19	C40	D95	PEG_TX13-	PEG_RX13-	C95
D41	GND	GND	C41	D96	GND	GND	C96
D42	PCI_AD24	PCI_AD21	C42	D97	PEG_ENABLE#	RSVD6	C97
D43	PCI_AD26	PCI_AD23	C43	D98	PEG_TX14+	PEG_RX14+	C98
D44	PCI_AD28	PCI_C/BE3#	C44	D99	PEG_TX14-	PEG_RX14-	C99
D45	PCI_AD30	PCI_AD25	C45	D100	GND	GND	C100
D46	PCI_IRQC#	PCI_AD27	C46	D101	PEG_TX15+	PEG_RX15+	C101
D47	PCI_IRQD#	PCI_AD29	C47	D102	PEG_TX15-	PEG_RX15-	C102
D48	PCI_CLKRUN#	PCI_AD31	C48	D103	GND	GND	C103
D49	PCI_M66EN	PCI_IRQA#	C49	D104	VCC_12V	VCC_12V	C104
D50	PCI_CLK	PCI_IRQB#	C50	D105	VCC_12V	VCC_12V	C105
D51	GND	GND	C51	D106	VCC_12V	VCC_12V	C106
D52	PEG_TX0+	PEG_RX0+	C52	D107	VCC_12V	VCC_12V	C107
D53	PEG_TX0-	PEG_RX0-	C53	D108	VCC_12V	VCC_12V	C108
D54	PEG_LANE_RV#	TYPE0#	C54	D109	VCC_12V	VCC_12V	C109
D55	PEG_TX1+	PEG_RX1+	C55	D110	GND	GND	C110

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# Chapter 3

## BIOS

The BIOS Setup utility is featured by AMI BIOS to modify BIOS settings and control various system features. The system settings are stored in the system's BIOS ROM. AMI BIOS is activated once the computer powers on.

To modify BIOS settings, access it first. The following will guide you to access BIOS Setup on a VGA monitor:

1. Connect the EmETXe-i2905 to a computer.
2. Turn on the VGA monitor.
3. Supply power to the EmETXe-i2905.
4. Press and hold **Delete** key when "**Press DEL to run Setup**" is prompted onscreen.

Note: If **Quick Boot** is enabled, the prompt **Press DEL to run Setup** won't show. If this is the case, press and hold the **Delete** key once the computer powers on to enter the BIOS Setup.

Normally the **Main** menu comes into view once the BIOS Setup utility opens. Whatever menu or submenu you select then, it is presented in two panes onscreen. The left pane displays all the settings that are accessible to users while the right pane shows the setting direction. Each menu offers some settings. When a setting is selected on the left pane, it becomes highlighted in white. The settings are enclosed within brackets while the non-setting are presented in gray. The default settings are presented in bold.

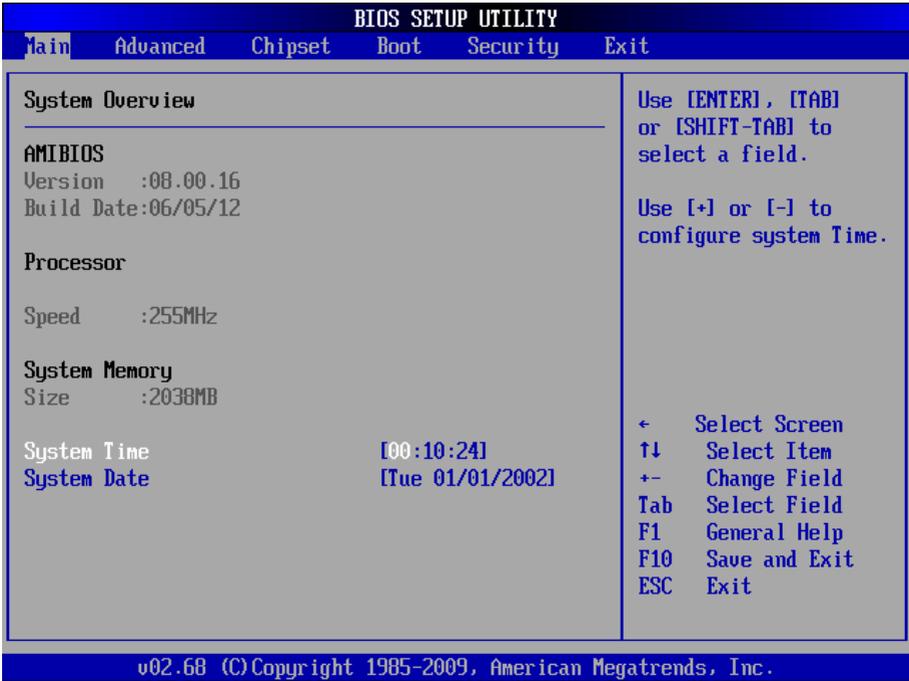
The BIOS Setup of EmETXe-i2905 has six menus:

Menu	Description
<b>Main</b>	See <a href="#">3.1. Main</a> on page <a href="#">17</a> .
<b>Advanced</b>	See <a href="#">3.2. Advanced</a> on page <a href="#">19</a> .
<b>Chipset</b>	See <a href="#">3.3. Chipset</a> on page <a href="#">33</a> .
<b>Boot</b>	See <a href="#">3.4. Boot</a> on page <a href="#">37</a> .
<b>Security</b>	See <a href="#">3.5. Security</a> on page <a href="#">41</a> .
<b>Save &amp; Exit</b>	See <a href="#">3.6. Save &amp; Exit</a> on page <a href="#">42</a> .

NOTE: For system stability and performance, this BIOS Setup utility is constantly improved by the manufacturer of the CPU board. Hence the screenshots and descriptions hereinafter are for reference only and may not exactly meet what is seen onscreen.

### 3.1. Main

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



On **Main** menu, the BIOS info displayed is:

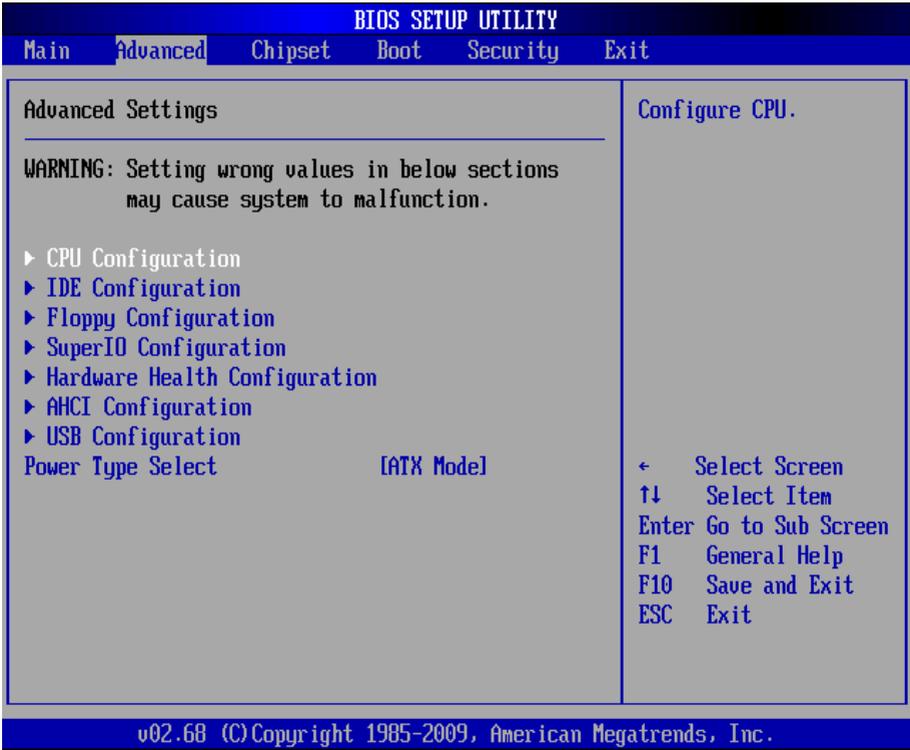
Category	Item	Description
AMIBIOS	Version	Displays BIOS version info
	Build Date	Displays the date the BIOS Setup utility was made/ updated.
Processor		Displays processor info, which includes the following: <ul style="list-style-type: none"> <li>▶ <b>Speed:</b> The processor's max speed.</li> </ul>
System Memory		Displays memory info, which includes the following: <ul style="list-style-type: none"> <li>▶ <b>Size:</b> The memory's capacity.</li> </ul>

On **Main** menu, the featured settings are:

<b>Setting</b>	<b>Description</b>
<b>System Time</b>	Sets system time.
<b>System Date</b>	Sets system date.

### 3.2. Advanced

The **Advanced** menu controls the system’s CPU, IDE, Super IO and USB.



Featured submenus are:

Setting	Description
CPU Configuration	See <a href="#">3.2.1. CPU Configuration</a> on page <a href="#">20</a> .
IDE Configuration	See <a href="#">3.2.2. IDE Configuration</a> on page <a href="#">21</a> .
Floppy Configuration	See <a href="#">3.2.3. Floppy Configuration</a> on page <a href="#">25</a> .
SuperIO Configuration	See <a href="#">3.2.4. Super IO Configuration</a> on page <a href="#">26</a> .
Hardware Health Configuration	See <a href="#">3.2.5. Hardware Health Configuration</a> on page <a href="#">28</a> .
AHCI Configuration	See <a href="#">3.2.6. AHCI Configuration</a> on page <a href="#">29</a> .
USB Configuration	See <a href="#">3.2.7. USB Configuration</a> on page <a href="#">30</a> .
Power Type Select	See <a href="#">3.2.8. Power Type Select</a> on page <a href="#">32</a> .

### 3.2.1. CPU Configuration

This submenu enables viewing the detailed CPU info. It also configures the CPU.

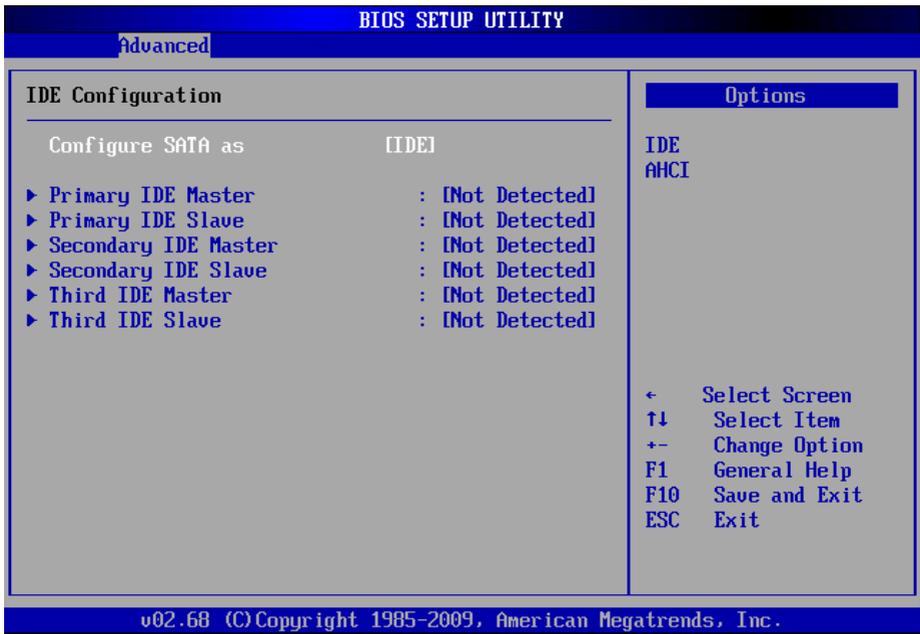


The featured settings are:

Setting	Description
<b>Hyper Threading Technology</b>	<p>Enables/disables the processor's Hyper-threading feature.</p> <ul style="list-style-type: none"> <li>▶ Select <b>Enabled</b> for Windows XP and Linux4. (These are the OS optimized for Hyper-threading Technology)</li> <li>▶ Select <b>Disabled</b> for the other OS (, which are not optimized for Hyper-threading Technology).</li> <li>▶ <b>Enabled</b> is the default.</li> <li>▶ When disabled, only one thread per enabled core is enabled.</li> </ul>

<p><b>Intel(R) SpeedStep(tm) tech</b></p>	<p>Enables/disables SpeedStep™ technology for better power saving.</p> <ul style="list-style-type: none"> <li>▶ SpeedStep™ is a technology built into some Intel® processors that allows the processor’s clock speed to be dynamically changed by software.</li> <li>▶ <b>Enabled</b> is the default.</li> </ul>
---	--

### 3.2.2. IDE Configuration



The featured settings are:

Item	Description
Configure SATA as	<p>Sets SATA as <b>IDE</b> or <b>AHCI</b>.</p> <ul style="list-style-type: none"> <li>▶ <b>IDE</b> is the default.</li> </ul>

<b>Primary IDE Master</b>	Each device features the following settings:	
	<b>Setting</b>	<b>Description</b>
<b>Primary IDE Slave</b>	<b>Type</b>	See <a href="#">3.2.2.1. Type</a> on page <a href="#">23</a> .
	<b>LBA/Large Mode</b>	See <a href="#">3.2.2.2. LBA/Large Mode</a> on page <a href="#">23</a> .
<b>Secondary IDE Master</b>	<b>Block (Multi-Sector Transfer)</b>	See <a href="#">3.2.2.3. Block (Multi-Sector Transfer)</a> on page <a href="#">23</a> .
<b>Secondary IDE Slave</b>	<b>PIO Mode</b>	See <a href="#">3.2.2.4. PIO Mode</a> on page <a href="#">23</a> .
	<b>DMA Mode</b>	See <a href="#">3.2.2.5. DMA Mode</a> on page <a href="#">24</a> .
<b>Third IDE Master</b>	<b>S.M.A.R.T.</b>	See <a href="#">3.2.2.6. S.M.A.R.T.</a> on page <a href="#">24</a> .
<b>Third IDE Slave</b>	<b>32Bit Data Transfer</b>	See <a href="#">3.2.2.7. 32Bit Data Transfer</a> on page <a href="#">24</a> .

Note: The foregoing six submenus have the same features, except **Third IDE Master** and **Third IDE Slave** don't have **Type** setting.

### 3.2.2.1. Type

Sets the type of the device connected to the system.

- ▶ Available options are: **Not Installed**, **Auto** (default), **CD/DVD**, and **ARMD**.

### 3.2.2.2. LBA/Large Mode

Enables/disables LBA Mode or leaves it on BIOS auto-detection.

- ▶ Select **Disabled** to disable LBA Mode.
- ▶ Select **Auto** to enable LBA Mode if it is supported by the device and the device isn't formatted with LBA Mode disabled.
- ▶ **Auto** is the default.

### 3.2.2.3. Block (Multi-Sector Transfer)

Sets whether the data transfer from/to the device occurs one sector or multiple sector at a time.

- ▶ Select **Disabled** to transfer data from and to the device by one sector at a time.
- ▶ Select **Auto** to transfer data from and to the device by multiple sectors at a time if supported by the device.
- ▶ **Auto** is the default.

### 3.2.2.4. PIO Mode

Sets PIO (Programmed I/O) mode for the IDE drive or leaves it on BIOS auto-detection.

- ▶ Available options are **Auto** (default), **0**, **1**, **2**, **3**, and **4**.
- ▶ Select **Auto** to let the BIOS auto-detect the IDE drive's maximum supported PIO mode
- ▶ **Auto** is the default.

### 3.2.2.5. DMA Mode

Sets **DMA** (Direct Memory Access) mode.

- ▶ This setting is set to **Auto** by default.

### 3.2.2.6. S.M.A.R.T.

Enables/disables S.M.A.R.T. (Self-Monitoring Analysis and Reporting Technology) or leaves it on BIOS auto-detection.

- ▶ S.M.A.R.T. is a utility to monitor the disk status to predict hard disk failure.
- ▶ Available options are **Auto** (default), **Disabled** and **Enabled**.

### 3.2.2.7. 32Bit Data Transfer

Enables/disables 32-bit to maximize the IDE hard disk data transfer rate.

- ▶ **Enabled** is the default.

### 3.2.3. Floppy Configuration

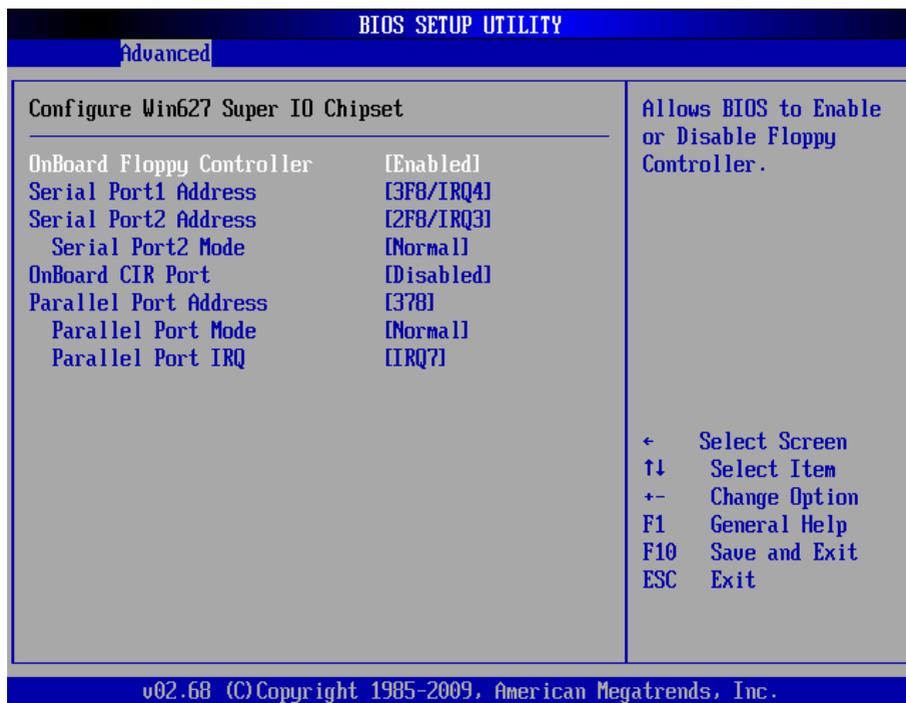


The featured setting is:

Setting	Description
Floppy A	<p>Sets the type of the floppy drive connected to the system.</p> <ul style="list-style-type: none"> <li>▶ Options available are:                             <ul style="list-style-type: none"> <li><b>Disabled</b> (default)</li> <li><b>360 KB 5.25"</b></li> <li><b>1.2 MB 5.25"</b></li> <li><b>720 KB 3.5"</b></li> <li><b>1.44 MB 3.5"</b></li> <li><b>2.88 MB 3.5"</b></li> </ul> </li> </ul>

### 3.2.4. Super IO Configuration

This submenu opens in context with the board's serial ports, CIR (consumer infrared) port and parallel port to configure the Super IO chipset Win627.



The featured settings are:

Setting	Description
<b>OnBoard Floppy Controller</b>	Enables/disables the onboard floppy controller. ▶ <b>Enabled</b> is the default.
<b>Serial Port1 Address</b>	Options available are: <b>Disabled</b> , <b>3F8/IRQ4</b> , <b>3E8/IRQ4</b> and <b>2E8/IRQ3</b> . ▶ <b>3F8/IRQ4</b> is the default.
<b>Serial Port2 Address</b>	Options available are: <b>Disabled</b> , <b>2F8/IRQ3</b> , <b>3E8/IRQ4</b> and <b>2E8/IRQ3</b> . ▶ <b>2F8/IRQ3</b> is the default.

<b>Serial Port2 Mode</b>	Options available are: <b>Normal, IrDA</b> and <b>ASK IR</b> . ▶ <b>Normal</b> is the default.
<b>OnBoard CIR Port</b>	Sets the onboard consumer infrared port. ▶ Options available are: <b>Disabled, 3E0</b> and <b>2E0</b> . ▶ <b>Disabled</b> is the default.
<b>Parallel Port Address</b>	Options available are: <b>Disabled, 378, 278</b> and <b>3BC</b> . ▶ <b>378</b> is the default.
<b>Parallel Port Mode</b>	Options available are: <b>Normal, Bi-Directional, ECP, EPP</b> and <b>ECP &amp; EPP</b> . ▶ <b>Normal</b> is the default.
<b>Parallel Port IRQ</b>	Options available are: <b>IRQ5</b> and <b>IRQ7</b> . ▶ <b>IRQ7</b> is the default.

### 3.2.5. Hardware Health Configuration

This submenu enables viewing the system's hardware health status. It also features one setting to enable/disable hardware health monitoring function.

BIOS SETUP UTILITY	
Advanced	
<b>Hardware Health Configuration</b>	
H/W Health Function	[Enabled]
<b>Hardware Health Event Monitoring</b>	
System Temperature	:28°C/82°F
CPU Temperature	:51°C/123°F
CPU Fan Speed	:N/A
System Fan Speed	:N/A
+3.3Vin	:3.403 V
+5Vin	:5.160 V
+12Vin	:11.856 V
+5USB	:5.116 V
← Select Screen ↑↓ Select Item +- Change Option F1 General Help F10 Save and Exit ESC Exit	
v02.68 (C) Copyright 1985-2009, American Megatrends, Inc.	

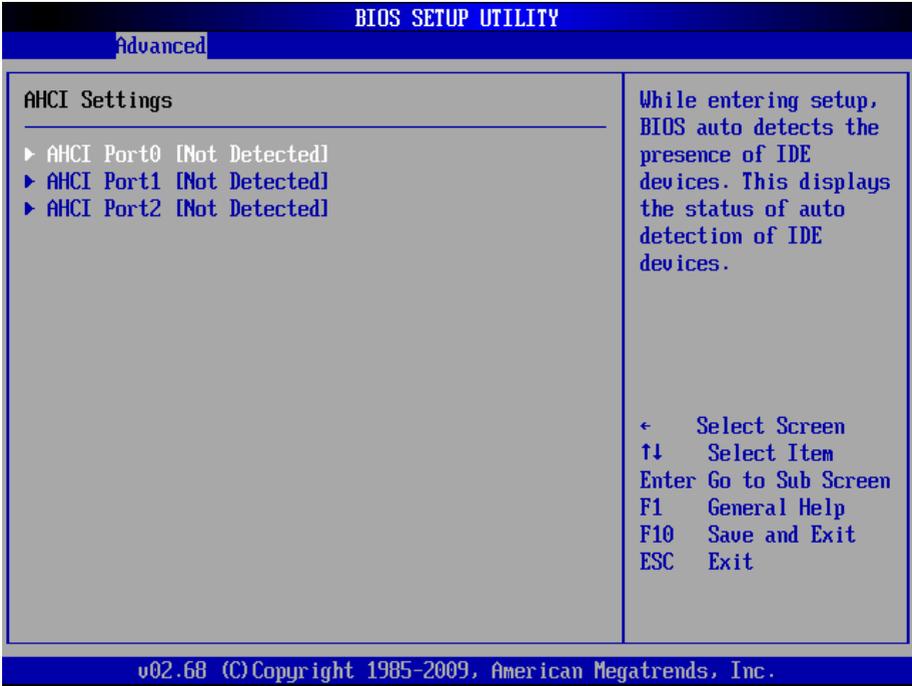
The featured setting is:

Setting	Description
H/W Health Function	Enables/disables the hardware health monitoring device.

### 3.2.6. AHCI Configuration

Select **AHCI Configuration** to view the IDE device(s) present in the system. The presence is auto-detected by the BIOS SETUP utility once the utility is accessed

On **AHCI Settings** screen, select an item to set the device type.

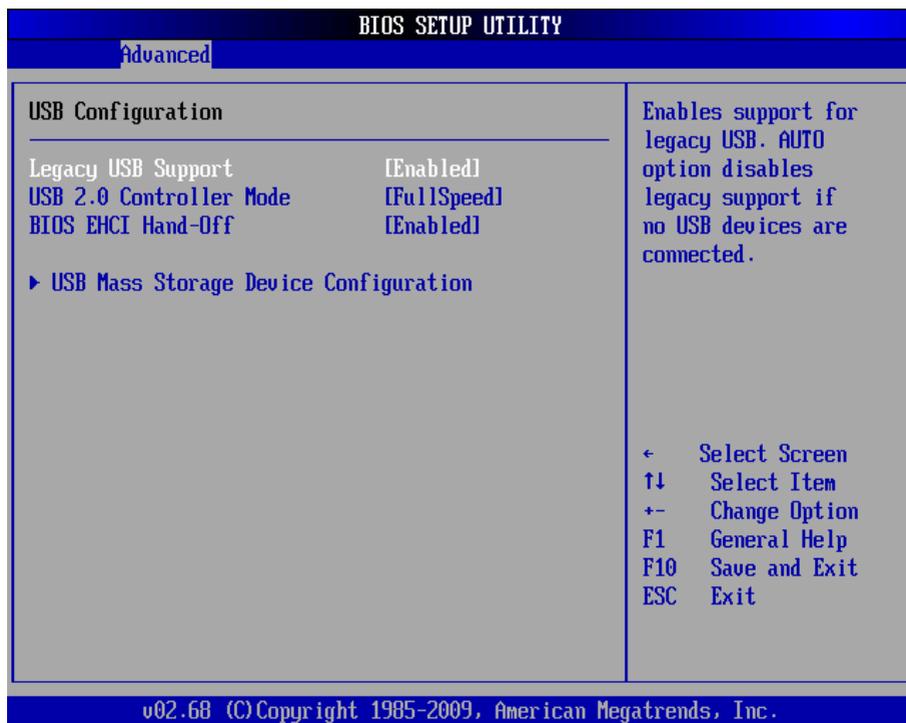


The featured settings are:

Setting	Description
AHCI Port0	Sets the type of the devices connected to the system or leaves it on BIOS auto-detection.
AHCI Port1	
AHCI Port2	▶ Options available are <b>Auto</b> (default) and <b>Not Installed</b> .

### 3.2.7. USB Configuration

Select this submenu to view the USB module's version and the USB device(s) enabled in the system. It also sets USB-related features.



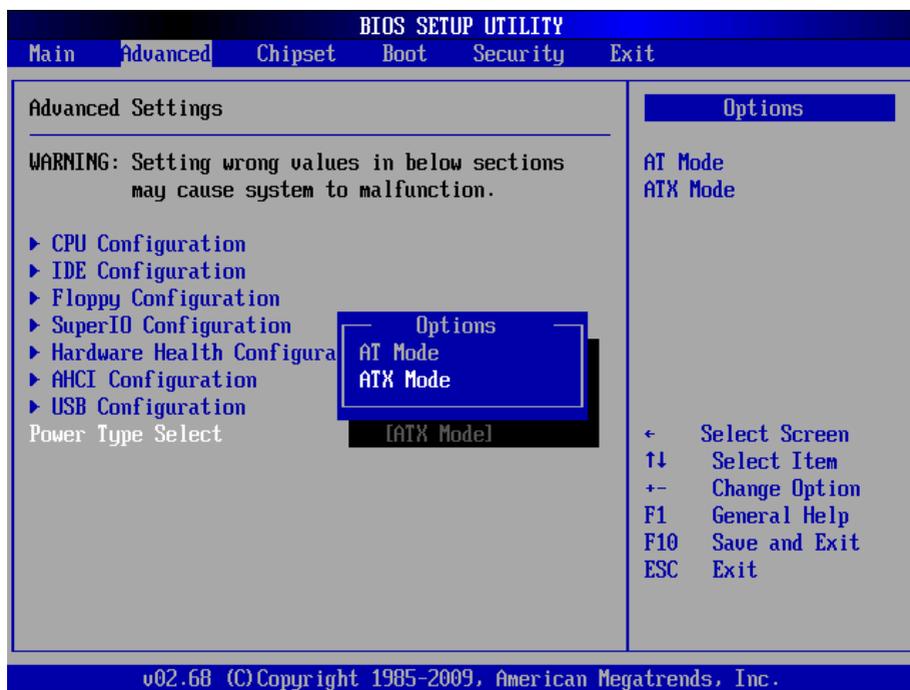
Featured settings are:

Setting	Description
<b>Legacy USB Support</b>	Enables/disables legacy USB support. <ul style="list-style-type: none"> <li>▶ Options available are <b>Disabled</b>, <b>Enabled</b> (default) and <b>Auto</b>.</li> <li>▶ Select <b>Auto</b> to disable legacy support when no USB devices are connected.</li> </ul>
<b>USB 2.0 Controller Mode</b>	Sets the USB 2.0 controller to <b>HiSpeed</b> (480Mbps) or <b>FullSpeed</b> (12Mbps). <ul style="list-style-type: none"> <li>▶ <b>FullSpeed</b> is the default.</li> </ul>

<b>BIOS EHCI Hand-Off</b>	Enables/disables a workaround for the operating systems that has no EHCI hand-off support. ▶ <b>Enabled</b> is the default.
<b>USB Mass Storage Device Configuration</b>	Accesses the following settings: ▶ <b>USB Mass Storage Reset Delay</b> Sets the maximum time that BIOS waits for USB storage device to initialize. <ul style="list-style-type: none"><li>Options available are <b>10 Sec</b>, <b>20 Sec</b> (default), <b>30 Sec</b> and <b>40 Sec</b>.</li></ul> ▶ <b>Emulation Type</b> <ul style="list-style-type: none"><li>Options available are <b>Auto</b> (default), <b>Floppy</b>, <b>Forced FDD</b>, <b>Hard Disk</b> and <b>CDROM</b>.</li><li>Select <b>Auto</b> to treat the USB storage less than 530MB as floppy and the others as hard drives.</li><li>Select <b>Forced FDD</b> to force a HDD formatted drive to boot as a floppy disk drive (Ex. ZIP drive).</li></ul>

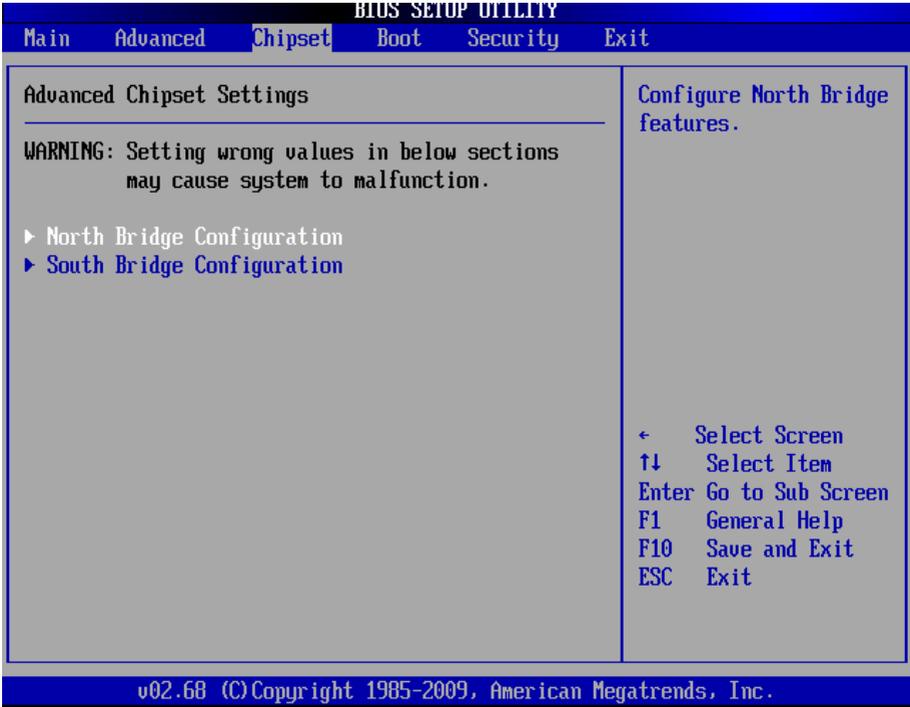
### 3.2.8. Power Type Select

**Power Type Select** helps users set the power supply to **AT** or **ATX** mode. Note the setting here should be consistent with the onboard DIP switch setting to prevent possible conflict. (See [2.3. Jumper and Connectors](#) on page [10](#) for the DIP switch setting.)



### 3.3. Chipset

This menu configures the system's chipset-specific features that cover bus speed management and the access to the system memory resources such as DRAM. The chipset also coordinates the communications with the PCI bus.



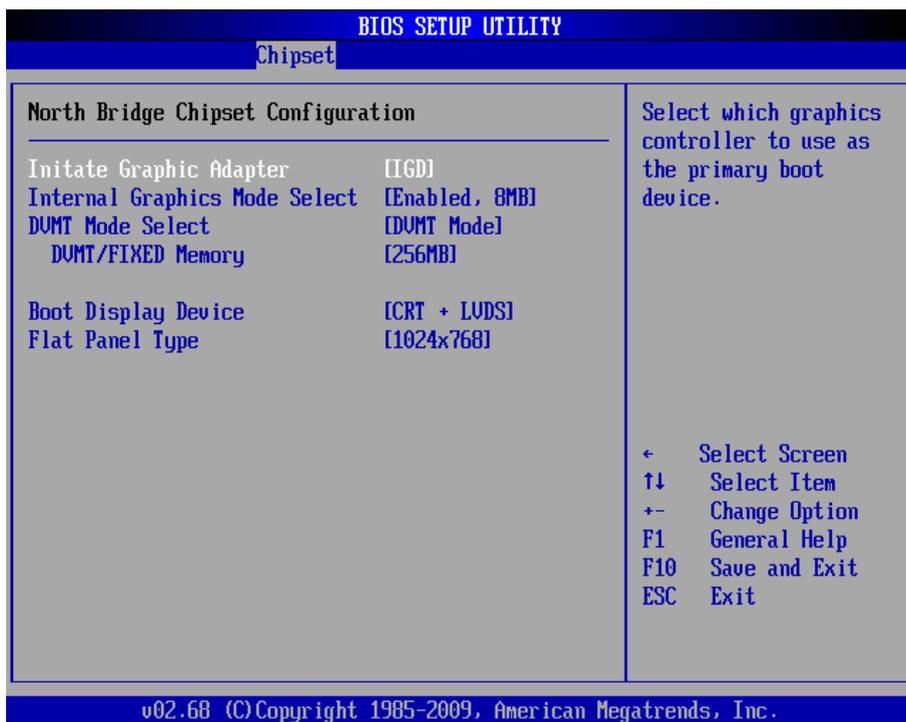
Featured submenus are **North Bridge Configuration** and **South Bridge Configuration** which are explicated in the following of this section.

Submenu	Description
<b>North Bridge Configuration</b>	Configures north bridge features. See <a href="#">3.3.1. North Bridge Configuration</a> on page 34.
<b>South Bridge Configuration</b>	Configures south bridge features. See <a href="#">3.3.2. South Bridge Configuration</a> on page 36.

**Warning:** *Wrong settings for this menu may cause system malfunction.*

### 3.3.1. North Bridge Configuration

This submenu configures north bridge features by the following settings:



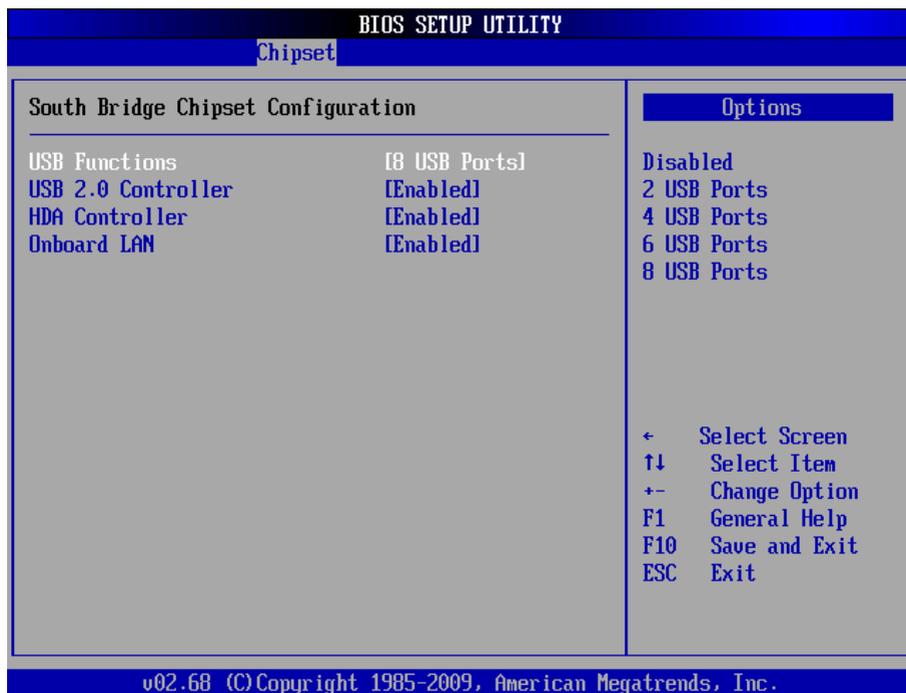
Featured settings are:

Setting	Description
<b>Initiate Graphic Adapter</b>	Sets which graphics controller to use as the primary boot device. ▶ Options available are: <b>IGD</b> (default) and <b>PCI/IGD</b> .
<b>Internal Graphics Mode Select</b>	Sets the amount of system memory used by the internal graphics device. ▶ It is enabled by default and set to <b>8MB</b> .

<p><b>DVMT Mode Select</b></p>	<p>Sets how to allocate system memory to the CPU and graphics processor. Available options are:</p> <ul style="list-style-type: none"> <li>▶ <b>Fixed Mode:</b> A fixed portion of graphics memory is reserved as graphics memory.</li> <li>▶ <b>DVMT Mode:</b> The default. Graphics memory is dynamically allocated according to system and graphics needs. (This is the default setting.)</li> </ul>
<p><b>DVMT/FIXED Memory</b></p>	<p>Sets the maximum amount of system memory that can be allocated as graphics memory.</p> <ul style="list-style-type: none"> <li>▶ Available options are: <b>128MB, 256MB</b> (default) and <b>Maximum DVMT</b>.</li> </ul>
<p><b>Boot Display Device</b></p>	<p>Sets the display device during booting.</p> <ul style="list-style-type: none"> <li>▶ Options available are: <b>CRT</b> (default), <b>LVDS</b> and <b>CRT+LVDS</b>.</li> </ul>
<p><b>Flat Panel Type</b></p>	<p>Sets the type of the LCD panel connected to the motherboard's built-in graphics chip</p> <ul style="list-style-type: none"> <li>▶ Available options are: <b>640*480, 800*600, 1024*768</b> (default), <b>1280*768</b> and <b>1280*800</b>.</li> </ul>

### 3.3.2. South Bridge Configuration

This submenu configures south bridge features.

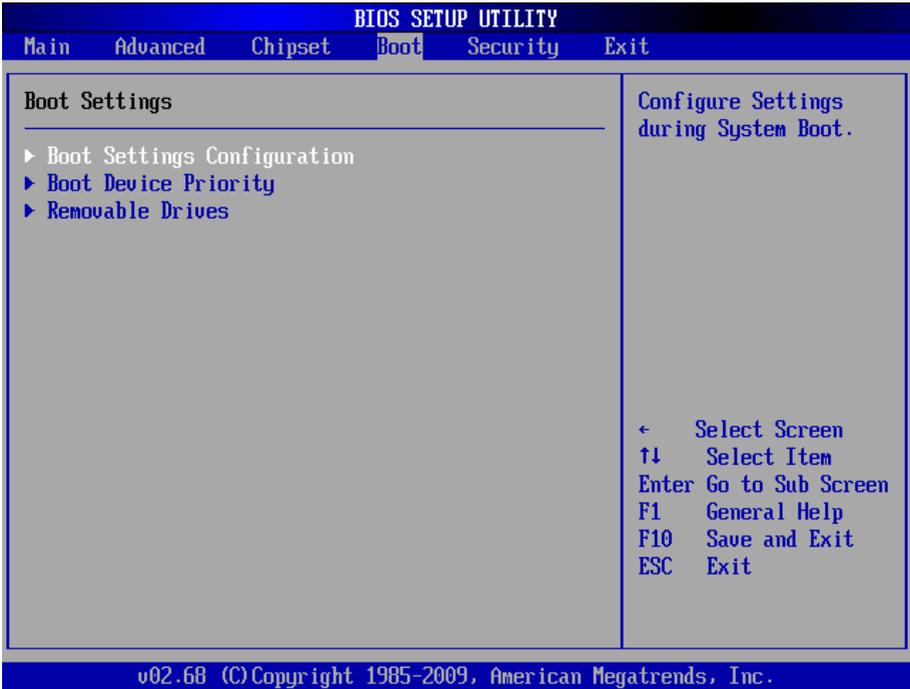


Featured settings are:

Setting	Description
<b>USB Functions</b>	Sets how many USB ports to enable. ▶ Options available are <b>2 USB Ports</b> , <b>4 USB Ports</b> , <b>6 USB Ports</b> and <b>8 USB Ports</b> (default).
<b>USB 2.0 Controller</b>	Enables/disables USB 2.0 controller. ▶ <b>Enabled</b> is the default.
<b>HDA Controller</b>	Enables/disables the high definition audio controller. ▶ <b>Enabled</b> is the default.
<b>Onboard LAN</b>	Enables/disables onboard LAN controller. ▶ <b>Enabled</b> is the default.

### 3.4. Boot

The **Boot** menu helps users change system boot settings.

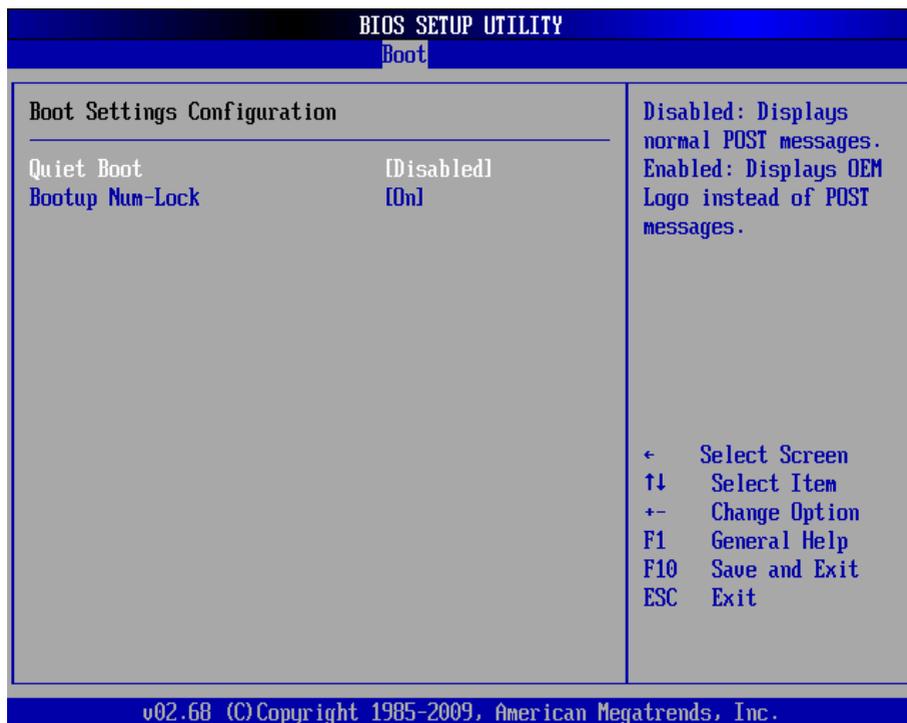


Featured submenu are:

Setting	Description
<b>Boot Settings Configuration</b>	See <a href="#">3.4.1. Boot Settings Configuration</a> on page <a href="#">38</a> .
<b>Boot Device Priority</b>	See <a href="#">3.4.2. Boot Device Priority</a> on page <a href="#">39</a> .
<b>Removable Drives</b>	See <a href="#">3.4.3. Removable Drives</a> on page <a href="#">40</a> .

### 3.4.1. Boot Settings Configuration

This submenu enables/disables some of the system's features during booting.

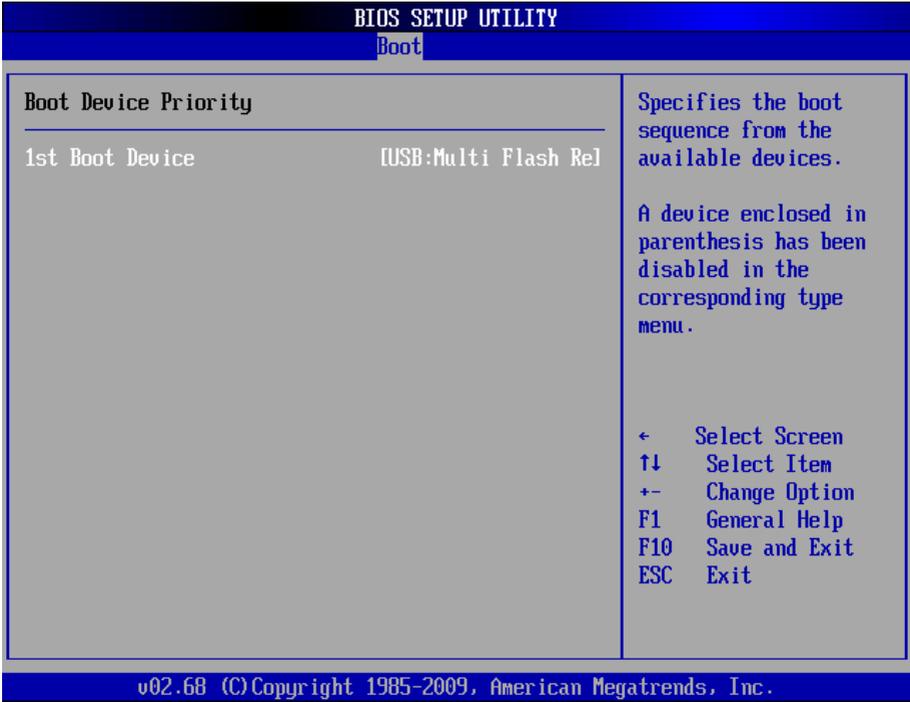


Featured settings are:

Setting	Description
<b>Quiet Boot</b>	Sets whether to display the POST (power on self tests) messages or the system manufacturer's full screen logo during booting. <ul style="list-style-type: none"> <li>▶ Select <b>Disabled</b> to display the normal POST messages, which is the default setting.</li> </ul>
<b>Bootup Num-Lock</b>	Turns on/off keyboard Num-Lock during boot. <ul style="list-style-type: none"> <li>▶ <b>On</b> is the default.</li> </ul>

### 3.4.2. Boot Device Priority

This submenu opens in context of the bootable add-in devices in the system. Define the booting sequence by the featured settings:



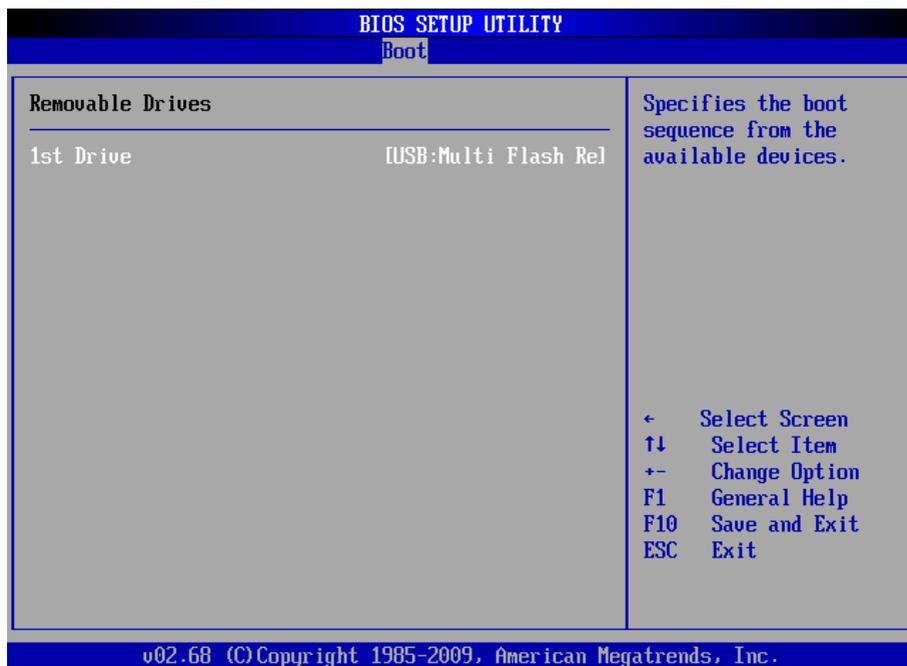
Featured settings are:

Setting	Description
<b>1st Boot Device</b>	Sets the 1st priority of system booting device. ► Options available are: <b>USB: Multi Flash Reader</b> (default) and <b>Disabled</b> .

Note: The number of devices that shows onscreen depends on how many devices are actually installed in the system

### 3.4.3. Removable Drives

This submenu features one setting to define the booting sequence from the bootable removable device(s) that is/are connected to the system.

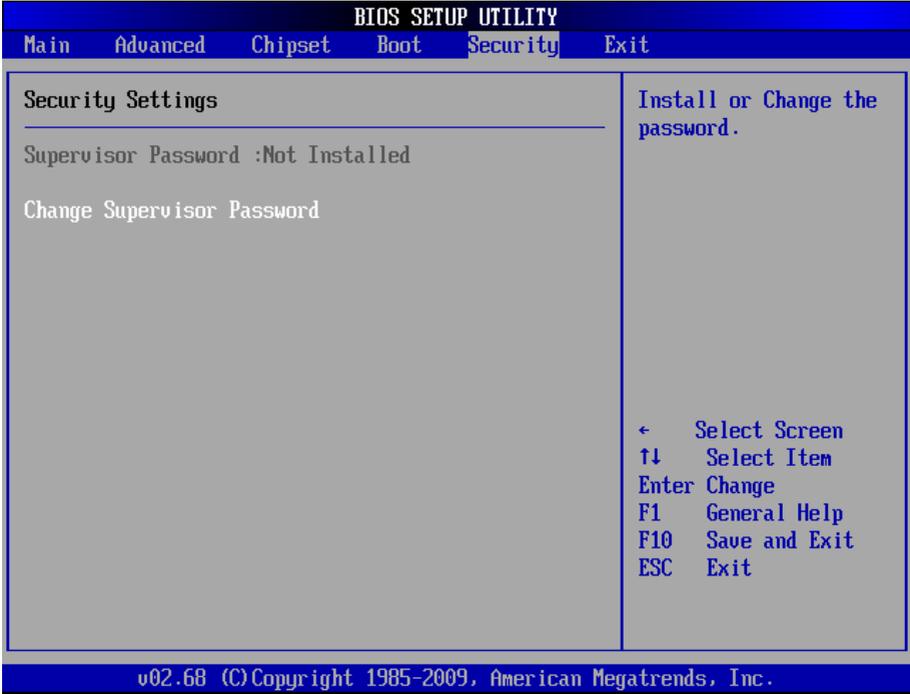


The featured setting is:

Setting	Description
<b>1st Drive</b>	Defines the boot sequence from the available devices. <ul style="list-style-type: none"> <li>▶ Options available are: <b>USB: Multi Flash Reader</b> (default) and <b>Disabled</b>.</li> </ul>

### 3.5. Security

Access **Security** menu to view the current security setting used in the system. This menu also enables users to set up or change the security setting.

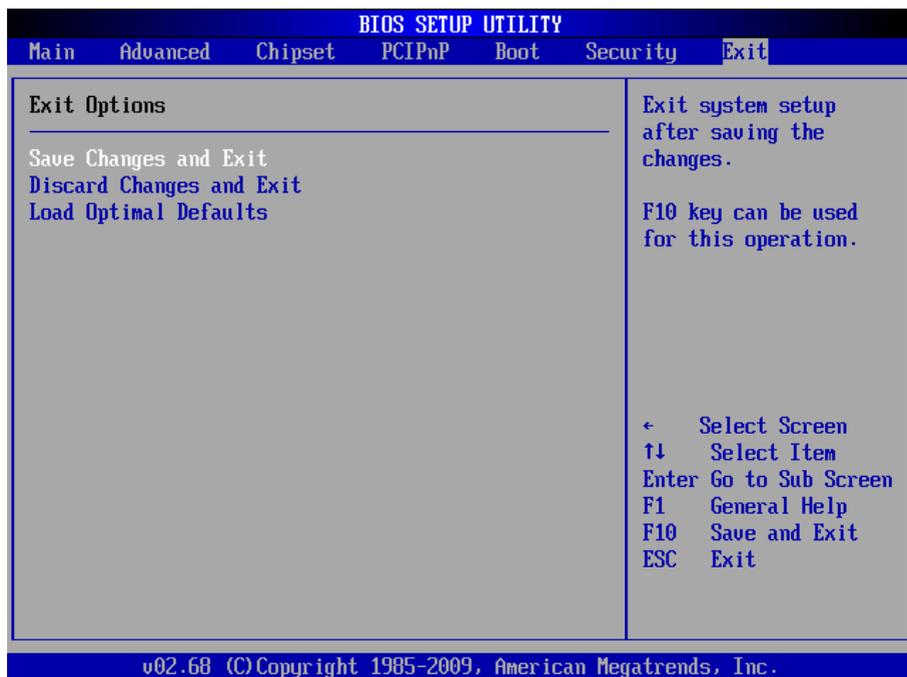


The featured setting is:

Setting	Description
<b>Change Supervisor Password</b>	Sets up or changes Supervisor password. ► Supervisor is a super user of the system who is able to administrate the system.

### 3.6. Save & Exit

The **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 featured settings are:

Setting	Description
<b>Save Changes and Exit</b>	<p>Saves the changes and quits the BIOS Setup utility.</p> <ul style="list-style-type: none"> <li>▶ This is a command to launch an action from the BIOS Setup utility.</li> <li>▶ When prompted for confirmation, select <b>OK</b> to save the changes and quit the BIOS Setup, or select <b>Cancel</b> to return to BIOS Setup.</li> </ul>

<b>Discard Changes and Exit</b>	<p>Discards the changes and quits the BIOS Setup utility.</p> <ul style="list-style-type: none"><li>▶ This is a command to launch an action from the BIOS Setup utility.</li><li>▶ When prompted for confirmation, select <b>OK</b> to quit BIOS Setup without saving the change(s), or select <b>Cancel</b> to return to the BIOS setup.</li></ul>
<b>Load Optimal Defaults</b>	<p>Loads the optimized defaults.</p> <ul style="list-style-type: none"><li>▶ This is a command to launch an action from the BIOS Setup utility.</li></ul>

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# Appendix

## A: Interrupt Channel Assignments

Interrupt Channel Assignments	
Interrupt#	Interrupt source
IRQ0	Interval timer
IRQ1	Keyboard
IRQ2	Interrupt from controller 2 (cascade)
IRQ3	COM2
IRQ4	COM1
IRQ5	Reserved
IRQ6	Reserved
IRQ7	Reserved
IRQ8	RTC
IRQ9	Reserved
IRQ10	Reserved
IRQ11	Reserved
IRQ12	PS/2 mouse
IRQ13	Math coprocessor
IRQ14	Primary IDE
IRQ14	Secondary IDE

## B: Memory Map

Memory Map	
Addr. range (Hex)	Device
F0000h - FFFFFh	System ROM
*CC000h - EFFFFh	Unused (reserved for Ethernet ROM)
C0000h - CBFFFh	Expansion ROM (for VGA BIOS)
B8000h - BFFFFh	CGA/EGA/VGA text
B0000h - B7FFFh	Unused
A0000h - AFFFFh	EGA/VGA graphics
00000h - 9FFFFh	Base memory

## C: I/O Address Map

Address Map	
Addr. range(Hex)	Device
000-01F	DMA Controller
20h-2Dh	Interrupt Controller
50h-52h	Timer/Counter
060-06F	8042 (keyboard controller)
070-07F	Real-time clock, non-maskable interrupt (NMI) mask
080-09F	DMA page register
0A0-0BF	0A0-0BF
0C0-0DF	DMA controller
170h-177h	IDE Controller
1F0h-1F7h	IDE Controller
2F8-2FF	Serial port 2
3F8-3FF	Serial port 1

## D: DMA Channel Assignments

DMA Channel Assignments	
Channel	Function
0	Available
1	Available(audio)
2	Floppy disk (8-bit transfer)
3	Available(parallel port)
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available