Embedded Board

BNX-M67



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User Manual

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FCC and DOC Statement on Class A

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 residential installation. 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. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio TV technician for help.

Notice:

1. The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
2. Shielded interface cables must be used in order to comply with the emission limits.

Warranty

1. Warranty does not cover damages or failures that are raised from misuse of the product, inability to use the product, unauthorized replacement or alteration of components and product specifications.
2. The warranty is void if the product has been subject to physical abuse, improper installation, modification, accidents or unauthorized repair of the product.
3. Unless otherwise instructed in this user's manual, the user may not, under any circumstances, attempt to perform service, adjustments or repairs on the product, whether in or out of warranty. It must be returned to the purchase point, factory or authorized service agency for all such work.
4. We will not be liable for any indirect, special, incidental or consequential damages to the product that has been modified or altered.

Static Electricity Precautions

It is quite easy to inadvertently damage your PC, system board, components or devices even before installing them in your system unit. Static electrical discharge can damage computer components without causing any signs of physical damage. You must take extra care in handling them to ensure against electrostatic build-up.

1. To prevent electrostatic build-up, leave the system board in its anti-static bag until you are ready to install it.
2. Wear an antistatic wrist strap.
3. Do all preparation work on a static-free surface.
4. Hold the device only by its edges. Be careful not to touch any of the components, contacts or connections.
5. Avoid touching the pins or contacts on all modules and connectors. Hold modules or connectors by their ends.



Important:

Electrostatic discharge (ESD) can damage your processor, disk drive and other components. Perform the upgrade instruction procedures described at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.

Safety Measures

To avoid damage to the system:
• Use the correct AC input voltage range.

To reduce the risk of electric shock:
• Unplug the power cord before removing the system chassis cover for installation or servicing. After installation or servicing, cover the system chassis before plugging the power cord.

Battery:
• Danger of explosion if battery incorrectly replaced.
• Replace only with the same or equivalent type recommend by the manufacturer.
• Dispose of used batteries according to local ordinance.

Before Using the

Before using the system, prepare basic system components.

If the system comes as a barebone; that is, none of the key components, including processor, memory, and hard drive has been pre-installed as part of your purchase, you will need to at least ensure a compatible counterpart is located and installed.

You will also need a few external system peripherals intended for the use of the system, a common pool with at least a keyboard, a mouse, and a monitor is thus suggested.

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Chapter 1
General Information

1.1 Main Feature

Micro-ATX System Board

BNX-M67 is a standard Micro-ATX motherboard featuring Intel® Q67 PCH chipset supports Intel® Gen-2 Core™ processor and four Dual Channel DDR3 DIMM slots up to 16GB DDR3 1066/1333MHz SDRAM with Non-ECC support and integrated HD graphic controller.

- Intel® Gen-2 LGA1155 Sandybridge Processor
- Four DDR3 RAM Slots up to 16GB
- Eight SATA Ports: 6* SATA 2.0 + 2* SATA 3.0
- Support Intel® RAID-0/1/5/10 Function
- Three Display Ports: DB15 VGA, DVI-D, and HDMI
- Two Series Ports: One supporting RS-232/422/485
- Ten USB 2.0 ports: Four Edge Ports + Six Internal Ports
- Two Intel® GbE LAN Ports
- 1* PCIe X16 2.0 Slot
- 1* full-sized miniPCIe Slot

1.2 Specifications

Core Engine	Chipset	Intel® Q67 PCH
	Processor	Support Intel® Gen-2 Core i3, i5, i7, Pentium®, Celeron® Processor Single LGA1155 Processor Socket
	Memory	4x DDR3 1066/1333 DIMM Slots, up to 16GB, Non-ECC/Non-Buffered Memory Module
	Display	Intel® HD Graphics 2000
Ethernet	Controller	Onboard 1x Intel® 82579LM and 1x Intel® 82583V PCIe GbE Controllers 2x LAN LED Pin Headers
Storage	SATA	6x SATA2 + 2x SATA3 Ports, support RAID-0/1/5/10
Expansion	PCIe X16	1x
	miniPCIe	1x Full-sized
Edge I/O	Display	1x DB15 VGA + 1x DVI-D + 1x HDMI
	USB	4x USB 2.0
	LAN	2x RJ45 GbE
	Audio	3x Audio Jacks
Internal I/O	Front Panel	1x Front Panel Switch/LED Header
	COM	1x RS-232 + 1x RS-232/422/485 Pin Header
	USB	6x USB 2.0 Pin Headers
	GPIO	8x 5V TTL GPIO Pin Header
	LED	2x LAN LED
	Fan	3x Fan Connectors
Other	H/W Monitoring	Monitor temperature, voltage, and fan speed, auto-throttling control at CPU overheat
	WDT	1 min increment from 1 to 255 min, 1 sec increment from 1 to 255 sec
Environment	Operating Temp.	0ºC ~ 60ºC
	Storage Temp.	-20ºC ~ 70ºC
	Humidity	10% ~ 90% (Non-Condensing)
Mechanical	Dimension	244mm (W) x 244mm (D)

1.3 Board Layout

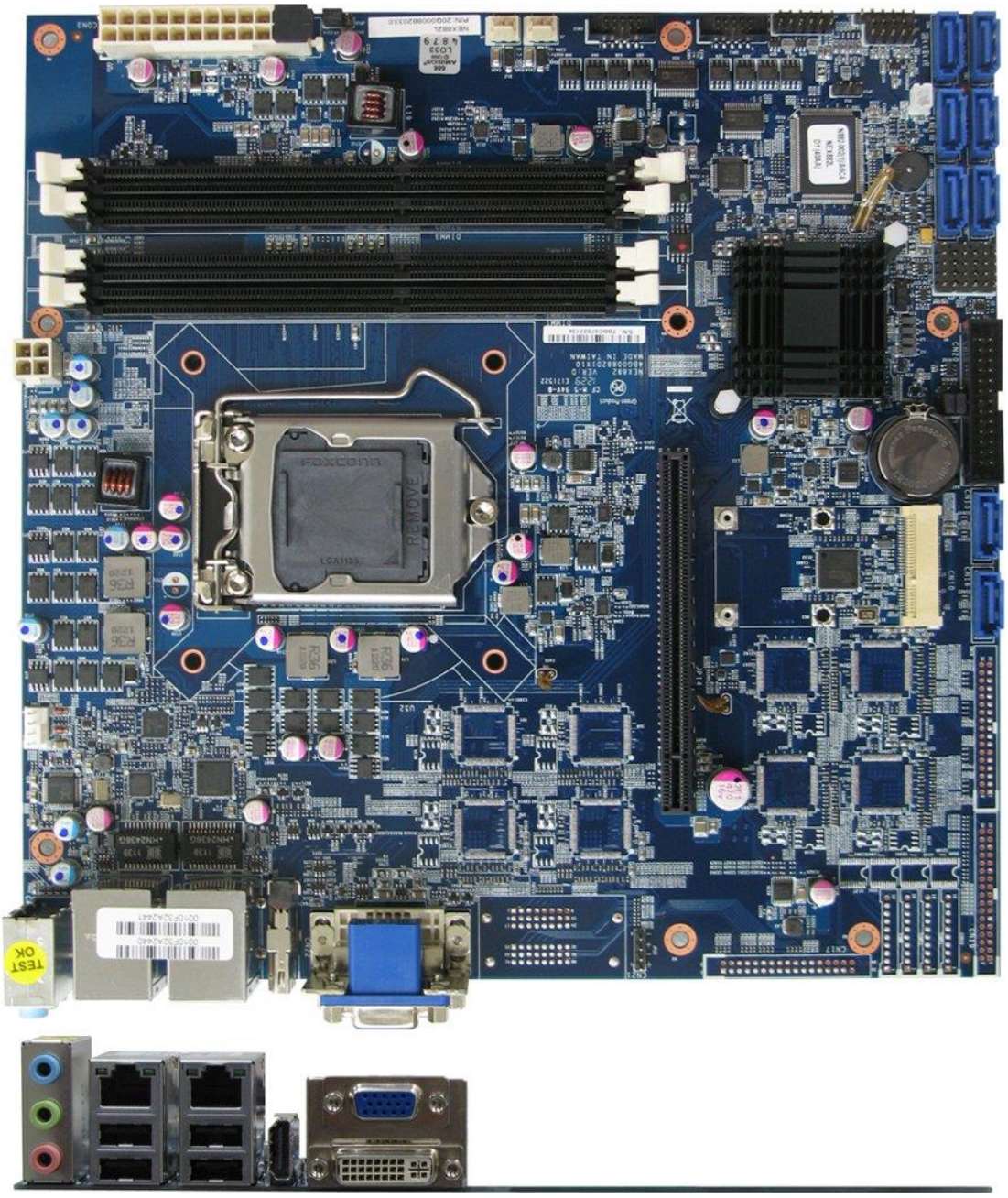


Figure 1.1: Board Layout of BNX-M67

Chapter 2
Preparation

2.1 Before You Begin

A stable and clean working environment are essential. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.
Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:

- A Philips screwdriver
- A flat-tipped screwdriver
- A set of jewelers Screwdrivers
- A grounding strap
- An anti-static pad

Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nosed pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

Before working on internal components, make sure that the power is off. Ground yourself before touching any internal components, by touching a metal object. Static electricity can damage many of the electronic components. Humid environment tend to have less static electricity than dry environments. A grounding strap is warranted whenever danger of static electricity exists.

2.2 Precautions

Computer components and electronic circuit boards can be damaged by discharges of static electricity. Working on the computers that are still connected to a power supply can be extremely dangerous. Follow the guidelines below to avoid damage to your computer or yourself:

- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.
- Hold electronic circuit boards by the edges only. Never touch the components on the board unless it is necessary to do so. Do not flex or stress the circuit board.
- Leave all components inside the static-proof packaging that they shipped with until they are ready for installation.
- Use correct screws and do not over tighten screws.

2.3 Setting Jumpers

A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is SHORT. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is OPEN. Please see the following illustrations

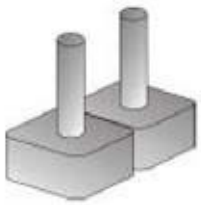
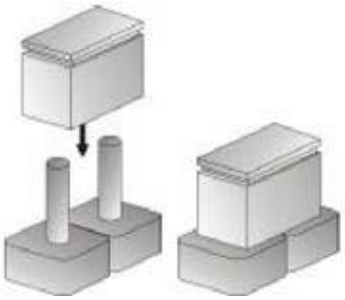
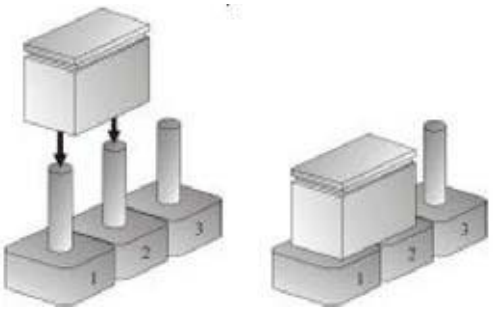
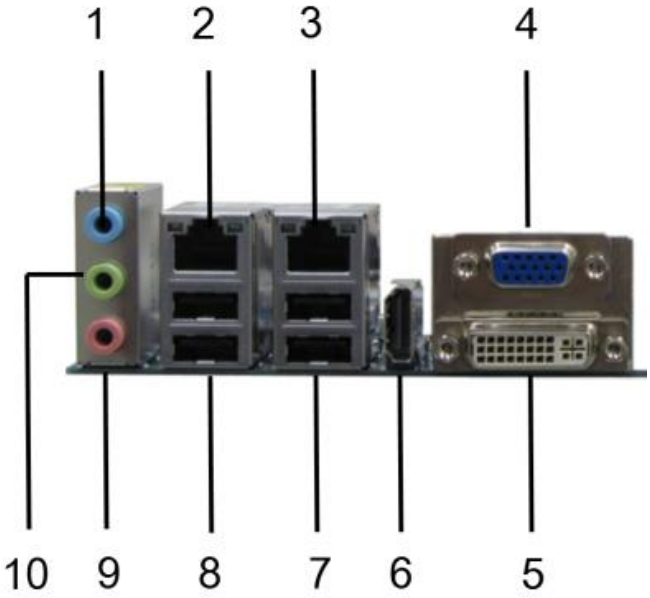
<table>
<tr><td rowspan="2">The illustrations on the right show a 2-pin jumper. When the jumper cap is placed on both pins, the jumper is SHORT. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is OPEN.</td><td></td><td></td></tr>
<tr><td>Open (Off)</td><td>Short (On)</td></tr>
<tr><td>These illustrations show a 3-pin jumper. Pins 1 and 2 are SHORT.</td><td colspan="2"></td></tr>
</table>

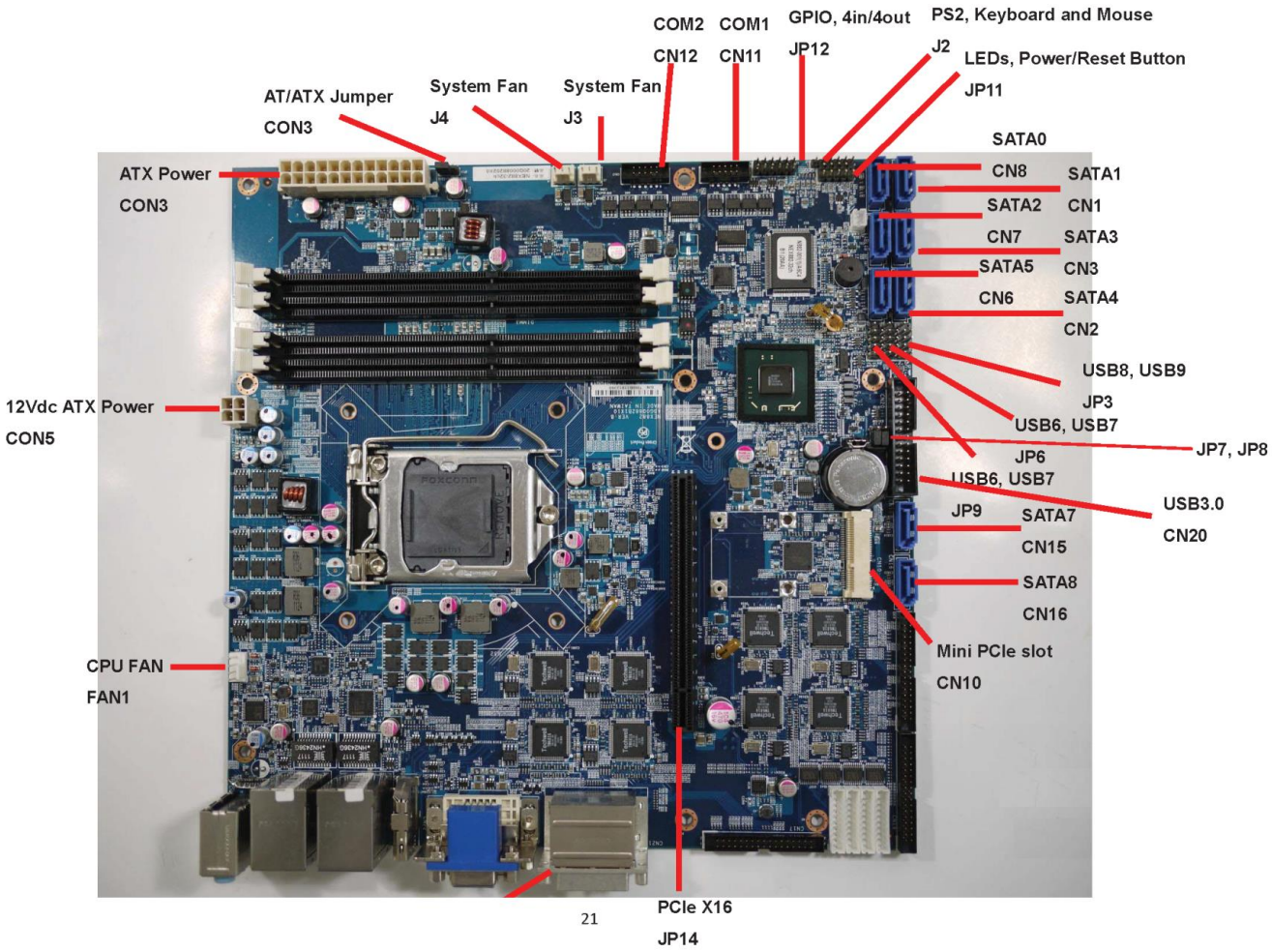
Table 2-1: Setting Jumpers

2.4 Back Panel Connectors



1. Line-In Jack
2. LAN1
3. LAN2
4. DB15 VGA
5. DVI
6. HDMI
7. 2* USB 2.0
8. 2* USB 2.0
9. Microphone Jack
10. Line-Out Jack

2.5 Locations Of Jumpers and Connectors



No.6, Ln. 229, Sec. 3, Changxing Rd., Luzhu Dist., Taoyuan City 338, Taiwan (R.O.C.)
TEL: +886-3-324-9700 | FAX: +886-3-324-9777 | EMAIL: sales@bestek-tp.com.tw

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List of Onboard Connectors

CON2	Edge LAN2 & USB2/3
CON3	24-pin ATX Power Connector
CON4	Edge LAN1 & USB0/1
CON5	2x2 +12Vdc Power Connector
Fan1	CPU Fan
J2	PS/2 Keyboard & Mouse
J3	System Fan
J4	System Fan
J5	Edge HDMI
JP3	USB8/USB9
JP6	USB6/USB7
JP7	Clear CMOS Jumper
JP8	ME Clear Jumper
JP9	USB4/USB5
JP11	Front Panel LED & Switch
JP12	4in/4out GPIO
JP14	PCIe X16 Slot
JP18	AT/ATX Jumper
CN1	SATA1 (3.0)
CN2	SATA4 (2.0)
CN3	SATA3 (2.0)
CN5	miniPCIe
CN6	SATA5 (2.0)
CN7	SATA2 (2.0)
CN8	SATA0 (3.0)
CN10	miniPCIe
CN11	COM1
CN12	COM2
CN14	Edge Audio Jack
CN15	SATA7 (2.0)
CN16	SATA8 (2.0)
CN20	USB 3.0
CN22	Edge VGA & DVI-D

2.6 Jumpers

▶ Clear CMOS Jumper JP7



Pin	Definition
1-2 On	Normal (Default)
2-3 On	Clear CMOS

▶ ME Clear Jumper JP8



Pin	Definition
1-2 On	Normal (Default)
2-3 On	Clear ME

▶ Power Mode Selection Jumper JP18



Pin	Definition
1-2 On	ATX (Default)
2-3 On	AT

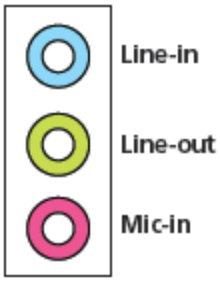
2.7 Internal Connectors

VGA + DV-D CN22



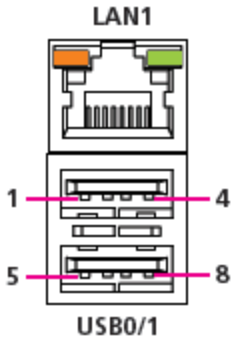
Pin	Definition	Pin	Definition
1	DVI_DATA2_N	2	DVI_DATA2_P
3	GND	4	NC
5	NC	6	DVI_CTRL_CLK
7	DVI_CTRL_DATA	8	NC
9	DVI_DATA1_N	10	DVI_DATA1_P
11	GND	12	NC
13	NC	14	DVI_PWR_S_VCC5
15	GND	16	DVI_HPDET
17	DVI_DATA0_N	18	DVI_DATA0_P
19	GND	20	NC
21	NC	22	NC
23	DVI_CLK_P	24	DVI_CLK_N
C1	NC	C2	NC
C3	NC	C4	NC
C5A	GND	C5B	GND
MH1	Chassis_GND2	MH2	Chassis_GND2
25	RED_VGA	26	GREEN_VGA
27	BLUE_VGA	28	GND
29	GND	30	GND
31	GND	32	GND
33	GND	34	GND
35	GND	36	DDC_DATA_VGA
37	HSYNC_VGA	38	VSYNC_VGA
39	DDC_CLK_VGA		
MH3	Chassis_GND2	MH4	Chassis_GND2

Audio Jack CN14



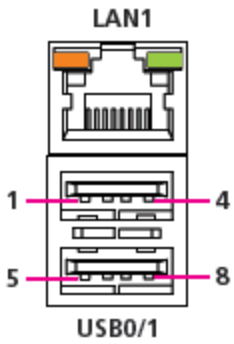
Jack	Definition
Blue	Line-In (Blue)
Green	Line-Out (Green)
Pink	Mic-In (Pink)

LAN1 & USB0/USB1 CON4



Pin	Definition	Pin	Definition
1	P5V_USB	2	USBN
3	USBP	4	GND
5	P5V_USB	6	USBN
7	USBP	8	GND
9	LANTXDP0	10	LANTXDN0
11	LANTXDP1	12	LANTXDN1
13	LANTXDP2	14	LANTXDN2
15	LANTXDP3	16	LANTXDN3
17	LAN_LED1P	18	LAN_LED_LNK#_ACT
19	LAN_LINK	20	LANLINKMIX
21	Chassis_GND1	22	Chassis_GND1
23	Chassis_GND1	24	Chassis_GND1
25	Chassis_GND1	26	Chassis_GND1
27	Chassis_GND1	28	Chassis_GND1

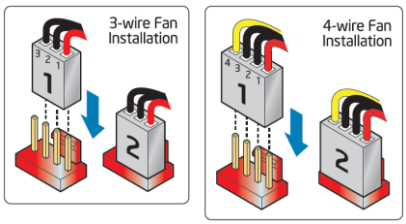
LAN2 & USB2/USB3 CON2



Pin	Definition	Pin	Definition
1	P5V_USB	2	USBN
3	USBP	4	GND
5	P5V_USB	6	USBN
7	USBP	8	GND
9	LANTXDP0	10	LANTXDN0
11	LANTXDP1	12	LANTXDN1
13	LANTXDP2	14	LANTXDN2
15	LANTXDP3	16	LANTXDN3
17	LAN_LED1P	18	LAN_LED_LNK#_ACT
19	LAN_LINK	20	LANLINKMIX
21	Chassis_GND1	22	Chassis_GND1
23	Chassis_GND1	24	Chassis_GND1
25	Chassis_GND1	26	Chassis_GND1
27	Chassis_GND1	28	Chassis_GND1

CPU Fan Connector: FAN1





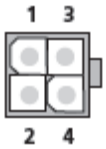
Pin	Definition	Pin	Definition
1	GND	2	+12V
3	FAN_TAC1	4	FAN_CTL1

System Fan Connector J3/J4



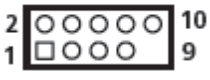
Pin	Definition
1	GND
2	+12V
3	SENSE

2x2 +12Vdc Power Connector CON5



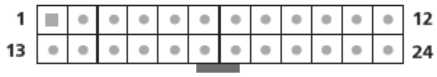
Pin	Definition
1	GND
2	GND
3	+12V
4	+12V

USB 2.0 Connector JP9 (USB4, USB5)/JP6 (USB6, USB7)/JP3 (USB8, USB9)



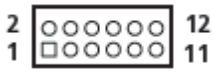
Pin	Definition	Pin	Definition
1	5VDUAL	2	5VDUAL
3	DATA0_N	4	DATA1_N
5	DATA0_P	6	DATA1_P
7	GND	8	GND
		10	NC

24-pin ATX Power Connector CON3



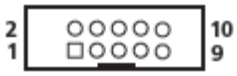
Pin	Definition	Pin	Definition
1	VCC3	2	VCC3
3	GND	4	VCC5
5	GND	6	VCC5
7	GND	8	ATXPWROK
9	5VSB	10	VCC12
11	VCC12	12	VCC3
13	VCC3	14	-12V
15	GND	16	ATX_PS_ON_N
17	GND	18	GND
19	GND	20	NA
21	VCC5	22	VCC5
23	VCC5	24	GND

GPIO Connector JP12



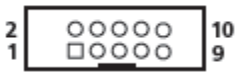
Pin	Definition	Pin	Definition
1	SIO_GPI_80	2	SIO_GPI_81
3	SIO_GPI_82	4	SIO_GPI_83
5	SIO_GPO_84	6	SIO_GPO_85
7	SIO_GPO_86	8	SIO_GPO_87
9	+3.3V	10	+3.3V
11	GND	12	GND

COM1 (RS-232) Connector CN11



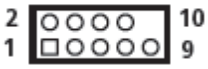
Pin	Definition	Pin	Definition
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	RXD

COM2 (RS-232/422/485) Connector CN12



Pin	Definition	Pin	Definition
1	DCD/RS422_TX-/RS485_-	2	RXD/RS422_TX+/RS485_+
3	TXD/RS422_RX+	4	DTR/RS422_RX-
5	GND	6	DSR/RS422_RTS-
7	RTS/RS422_RTS+	8	CTS/RS422_CTS+
9	RI/RS422_CTS-	10	RXD/RS422_TX+/RS485_+

Front Panel Connector JP11



Pin	Definition	Pin	Definition
1	SATA_LED_P	2	PWR_LED_P
3	SATA_LED_N	4	GND
5	GND	6	BTN_A#
7	RST_BTN_N	8	GND
9	NC		

Keyboard and Mouse Connector J2



Pin	Definition	Pin	Definition
1	+5V	4	Keyboard Data
2	Mouse Clock	5	Keyboard Clock
3	Mouse Data	6	GND

SATA3 Port Connector CN8 (SATA0)/CN1 (SATA1)



Pin	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

SATA2 Port Connector CN7 (SATA2)/CN3 (SATA3)/CN2 (SATA4)/CN6 (SATA5)



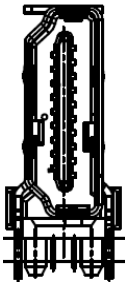
Pin	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

PCIEX1 to SATA2 Port Connector CN15 (SATA7)/CN16 (SATA8)
By Silicon Image 3132 PCIE to SATA Chip



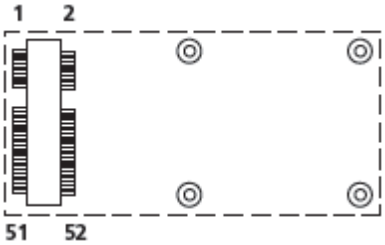
Pin	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

HDMI J5



Pin	Definition	Pin	Definition
1	HDMI_DATA2_P	2	GND
3	HDMI_DATA2_N	4	HDMI_DATA1_P
5	GND	6	HDMI_DATA1_N
7	HDMI_DATA0_P	8	GND
9	HDMI_DATA0_N	10	HDMI_CLK_P
11	GND	12	HDMI_CLK_N
13	NC	14	NC
15	HDMI_CTRL_CLK	16	HDMI_CTRL_DATA
17	GND	18	HDMI_VCC5
19	HDMI_HPD_R	MH1	Chassis_GND1
MH2	Chassis_GND1	MH3	Chassis_GND1
MH4	Chassis_GND1		

miniPCIe CN10



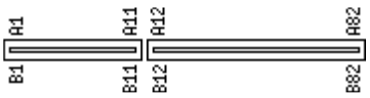
Pin	Definition	Pin	Definition
1	WAKE_N	2	3VSB_MINI1
3	NC	4	GND
5	NC	6	P1V5_MINI1
7	MINICARD1CLKREQ#	8	GND
9	GND	10	GND
11	CK_PE_100M_Mini_DN	12	GND
13	CK_PE_100M_Mini_DP	14	GND
15	GND	16	GND
17	NC	18	GND
19	NC	20	MINICARD1DIS#
21	GND	22	PLTRST_PCIE1_N
23	PCIE_RXN7_MINI	24	3VSB_MINI1
25	PCIE_RXP7_MINI	26	GND
27	GND	28	P1V5_MINI1
29	GND	30	SMB_CLK_MAIN
31	PCIE_TXN7_MINI	32	SMB_DATA_MAIN
33	PCIE_TXP7_MINI	34	GND
35	GND	36	USB_10N
37	GND	38	USB_10P
39	3VSB_MINI1	40	GND
41	3VSB_MINI1	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	P1V5_MINI1
49	NC	50	GND
51	NC	52	3VSB_MINI1
MH1	GND	MH2	GND
MH3	GND	MH4	GND
MH5	GND	MH6	GND

LAN1/LAN2 Active LED Pin Header JP20



Pin	Definition	Pin	Definition
1	LAN1_LED_LNK#_ACT	3	LAN2_LED_LNK#_ACT
2	GND	4	GND

PCIe X16 Slot JP14



Pin	Definition (B)	Definition (A)
1	+12 volt power	GND
2	+12 volt power	+12 volt power
3	+12 volt power	+12 volt power
4	Ground	Ground
5	SMBus clock	PEG_TCK
6	SMBus data	PEG_TDI
7	Ground	NC
8	+3.3 volt power	PEG_TMS
9	NC	3.3v volt power
10	3.3VSB	3.3v volt power
11	WAKE#	PE_RESEET#
12	Reserved	Ground
13	Ground	REFCLK_P
14	TXP0	REFCLK_N
15	TXN0	Ground
16	Ground	RXP0
17	PRSNT2#	RXN0
18	Ground	Ground
19	TXP1	NC
20	TXN1	Ground
21	Ground	RXP1
22	Ground	RXN1
23	TXP2	Ground
24	TXN2	Ground
25	Ground	RXP2
26	Ground	RXN2
27	TXP3	Ground
28	TXN3	Ground
29	Ground	RXP3
30	Reserved	RXN3
31	PRSNT2#	Ground
32	Ground	NC
33	TXP4	NC
34	TXN4	Ground
35	Ground	RXP4
36	Ground	RXN4
37	TXP5	Ground

Chapter 3
Operation

3.1 System Memory

BNX-M67 has Intel® Q67 chipset built-in, and supports dual channel non-ECC, un-buffered DDR3-1066/1333/1600MHz memory modules. Four DIMM slots support up to 16GB Memory Capacity.

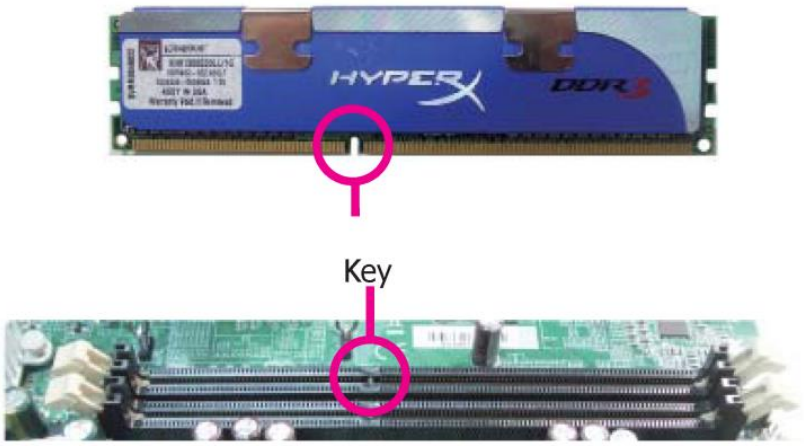
3.2 Installing Memory

To install Memory

1. Open up the two side tabs on the slot.

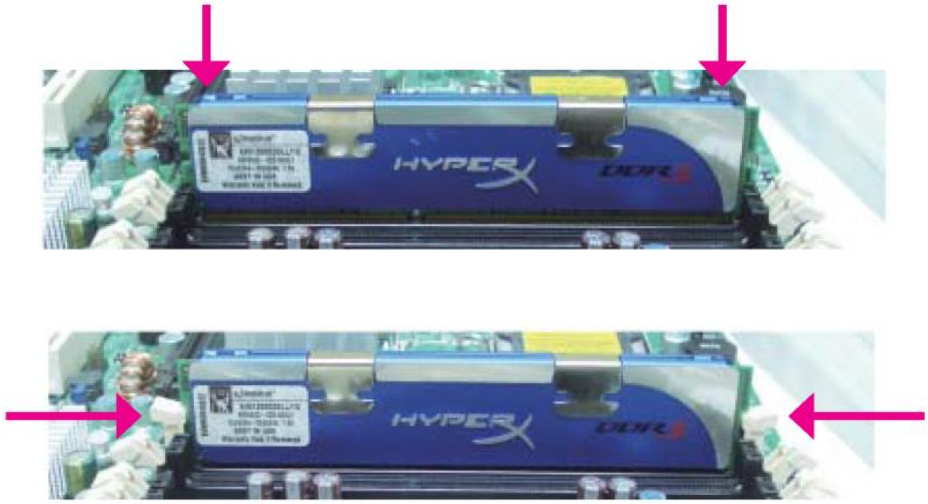


2. Make sure the “Key” on Memory module and socket are perfectly matched, and add slowly the RAM module into the socket along the plastic guides at both ends.



3. Make sure the Memory modules are perfectly snapped by the socket, and the two tabs are restored back to “close” position automatically. If not, press the tabs to “close” position.





4. To remove the Memory modules, please push the tabs outwards, and the memory modules will be automatically disengaged.

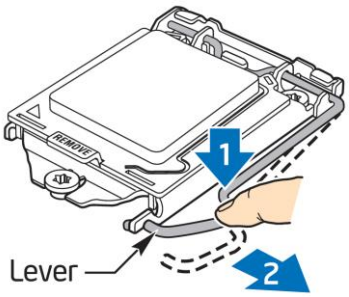
3.3 Installing LGA1155 Intel® Core-i CPU, Heatsink, and Fan

BNX-M67 supports Intel® LGA1155 Gen-2 Core-i Processor. For a reference list of supported processor, please refer to the specification section. The socket 1155 is formed up with sensitive arrays of pins, improper or careless installation may cause permanent harm to the socket pins. In some cases users may accidentally damage the socket simply by adjusting the position of the CPU.

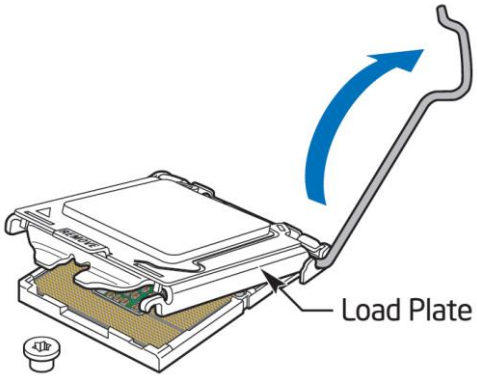
Please follow the installation instructions as shown below:

Step (A): Opening the Socket

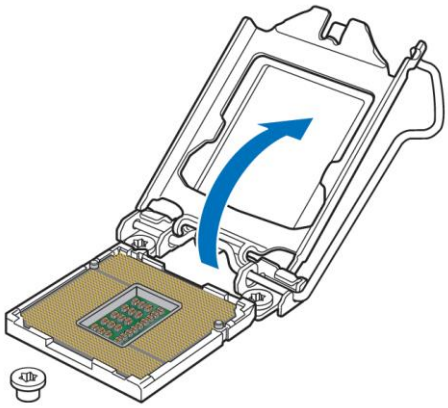
1. Push the "Socket Lever" down and away from the socket to release it.



2. Rotate the "Socket Lever" to lift the "Load Plate" away from the socket.



3. Make sure the "Load Plate" is in the fully open position, and also remove the socket cover.

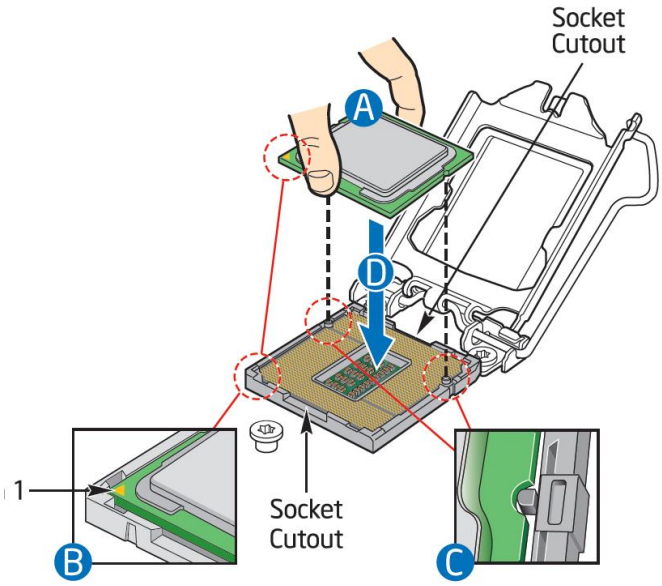


4. When opening the socket, DO NOT TOUCH the gold socket contacts.



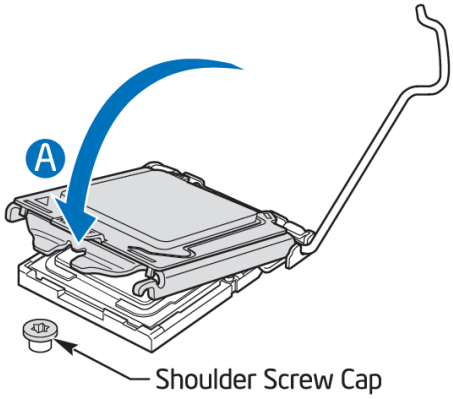
Step (B): Install the Processor

1. Hold the processor with your thumb and index finger as shown to align your fingers with the socket cutouts.
2. Make sure that the processor Pin#1 indicator (gold triangle) is aligned with the Pin#1 chamfer on the socket.
3. Make sure that the notches on the processor align with the posts on the socket.
4. Lower the processor straight down without tilting or sliding it in the socket.

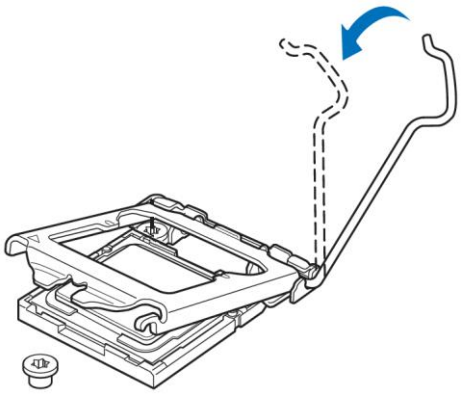


Step (C): Close the Load Plate

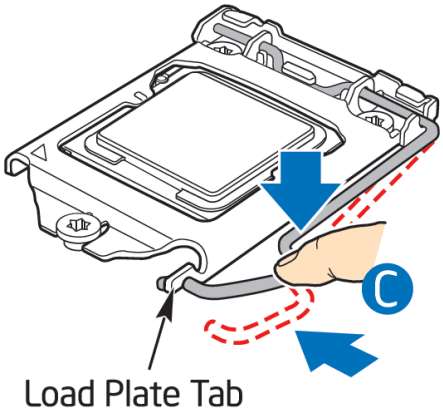
1. Carefully lower the "Load Plate" and make sure it slides under the shoulder screw cap as the lever is lowered.



2. Continue to low the lever.



3. Latch the socket lever under the load plate tab.



Step (D): Install a Heatsink

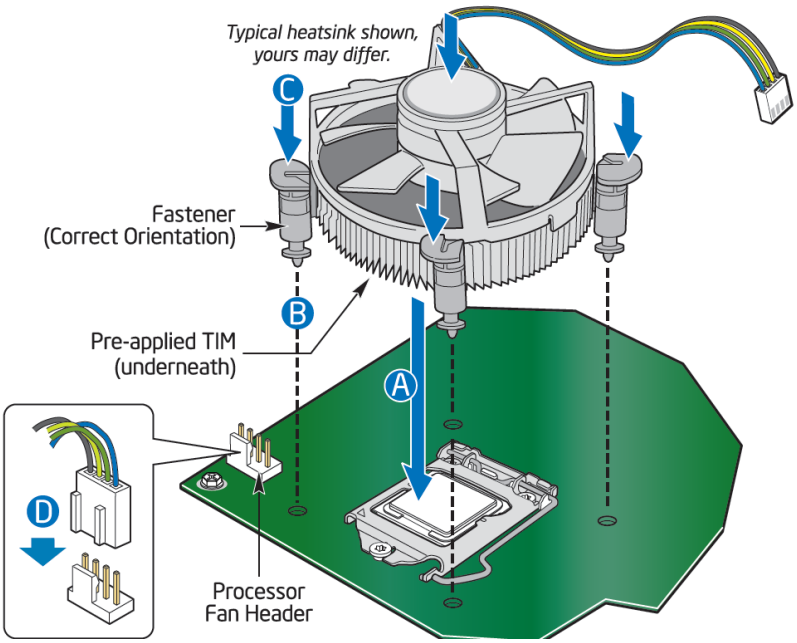
Note: Heatsinks that come with boxed Intel® processors use pre-applied Thermal Interface Material (TIM) and do not need thermal grease. If a different heatsink is used, please refer to manufacturer's instructions.

1. Place the heatsink onto the processor socket. Ensure that the fan power cable is on the side closet to the processor fan header.

2. Align the fasteners with the corresponding board holes (four of them). Ensure that the fasteners slots are pointing perpendicular to the heatsink.

3. While pressing down on the heatsink, press down on the top of the fasteners with your thumb to lock into place. Ensure that all four fasteners are secured.

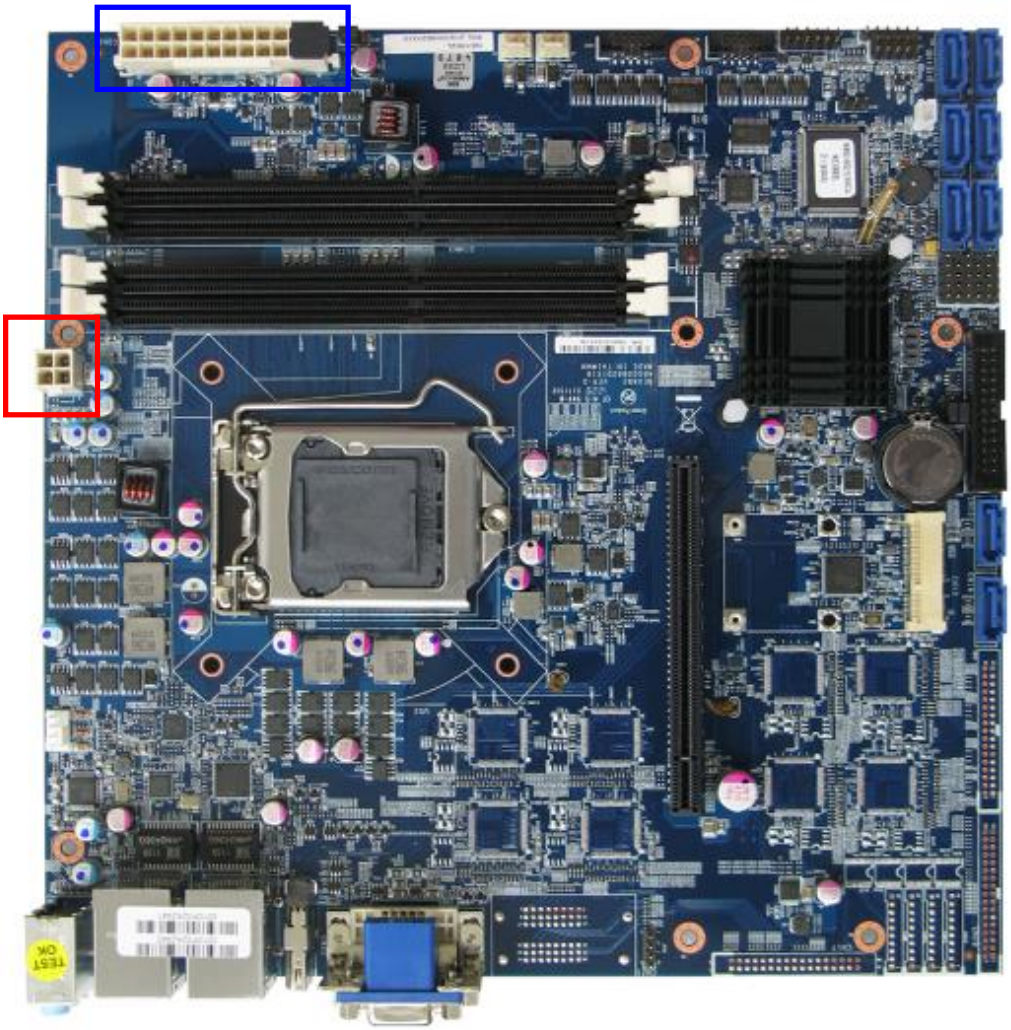
4. Connect the heatsink fan power cable to the processor fan header.



3.4 Adding Power Connectors

BNX-M67 motherboard requires correct power plan to properly support Intel® LGA1155 Gen-2 Core-i Processor. Please add the 24-pin ATX Power Connector on the blue connector, and 4-pin 12Vdc Power Connector on the red connector.

In case the 12Vdc Power Connector is not added, power supply will be triggered, but the motherboard would not boot at all. Please shutdown the system, and add the 12Vdc Power Connector back on.



3.5 Adding PCIe/PCI Cards

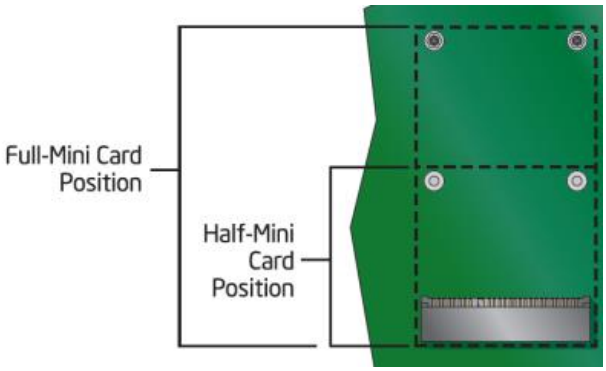
BNX-M67 motherboard comes with only one PCIe X16 Slot, and supports all different PCIe X1/X4/X8/X16 card.



(1) Shutdown the system (would be nice to cut the power) if system is running.
(2) Plug in the PCIe card and put the power back on.
(3) In some cases, the add-on PCIe card would require additional power induced directly from the power supply; that is, 6-pin +12V power connector for some graphic cards. Please refer to the user's manual of the expansion card to properly deploy additional power for correct usage and perhaps better operation performance.
(4) Please follow the application notes in the user's manual of the expansion card to load driver files or initiate the expansion card.

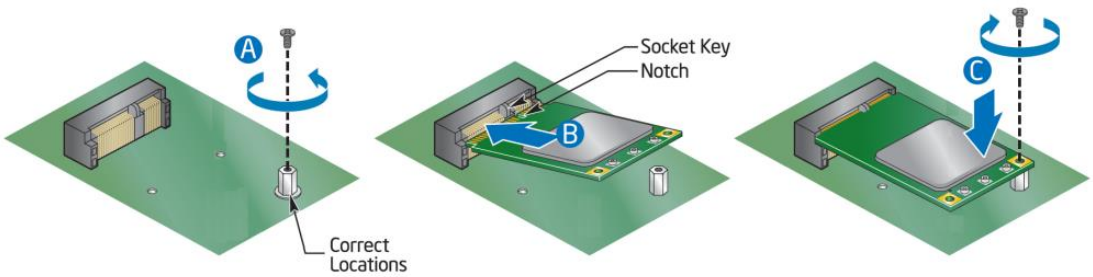
3.6 Install a PCI Express Mini Card in the Full-Mini Card Slot

The Full-Mini Card slot can only be used with a Full-sized PCI Express Mini Card.



PCI Express Full-Mini Card Installation:

(A) If a screw is found in the stand-off, please remove the screw.
(B) Align the notch in the card with the socket key and insert the card at a slightly upward angle as shown.
(C) Push down on the card and secure with one screw.



Chapter 4
BIOS Setup

About the BIOS

The BIOS (Basic Input and Output System) Setup program is a menu driven utility that enables you to make changes to the system configuration and tailor your system to suit your individual work needs. It is a ROM-based configuration utility that displays the system's configuration status and provides you with a tool to set system parameters. These parameters are stored in non-volatile battery-backed-up CMOS RAM that saves this information even when the power is turned off. When the system is turned back on, the system is configured with the values stored in CMOS.

With easy-to-use pull down menus, you can configure such items as:

- Hard drives, diskette drives, and peripherals
- Video display type and display options
- Password protection from unauthorized use
- Power management features

When to Run BIOS

This program should be executed under the following conditions:

- When changing the system configurations.
- When a configuration error is detected by the system and you are prompted to make changes to the Setup program.
- When resetting the system clock.
- When setting the CPU clock speed so that it automatically runs either fast or slow.
- When redefining the communication ports to prevent any conflicts.
- When making changes to the Power Management configuration.
- When changing the password or making other changes to the security setup.

Normally, CMOS setup is needed when the system hardware is not consistent with the information contained in the CMOS RAM, whenever the CMOS RAM loses power, or when the system features need to be changed.

When to Update BIOS

In the event that new features are released and a BIOS update is required, you will need to update your BIOS on your own, with the help of an appropriate guide, a reference tool, and some command files for the job.

Please seek for help from your local dealer, or send your request to our technical support department.

4.1 Entering Setup

When the system is powered on, the BIOS will initiate the Power-On-Self-Test (POST) routines. These routines perform various diagnostic checks. If an error is encountered, the error will be reported in one of two different ways:

- If the error occurs before the display device is initialized, a series of beeps will be transmitted.
- If the error occurs after the display device is initialized, the screen will display the error message.

Powering on the computer and immediately pressing <**Del**> allows you to enter Setup. Another way to enter Setup is to power on the computer and wait for the following message during the POST:

TO ENTER SETUP BEFORE BOOT
PRESS <CTRL-ALT-ESC> OR <DEL> KEY

Press the <**Del**> key or press the <**Ctrl**>, <**Alt**>, and <**Esc**> keys to enter Setup.

4.2 Getting Help

The online description of the highlighted setup item is displayed at the right pane of the menu at all time. Press F1 to pop up a small help window that lists all the function keys and its use.

To exit the Help Window, press **<F1>** or **<Esc>.**

4.3 Control Keys

The table below lists all the function keys for the navigation in the BIOS setup menu.

Function Key	**Description**
Up Arrow Key	Move Up
Down Arrow Key	Move Down
Left Arrow Key	Move Left
Right Arrow Key	Move Right
Enter Key	Select
+ Key	Change value
- Key	Change Value
ESC	Exit
F1	General Help
F2	Previous Values
F3	Optimized Defaults
F4	Save & Exit Setup

To exit the Help Window, press **<F1>** or **<Esc>.**

4.4 The Main Menu

This is what pops up when BIOS Setup Menu is initiated. The main menu allows you to retrieve system information, such as BIOS version, System Memory, and System Date and Time, etc.

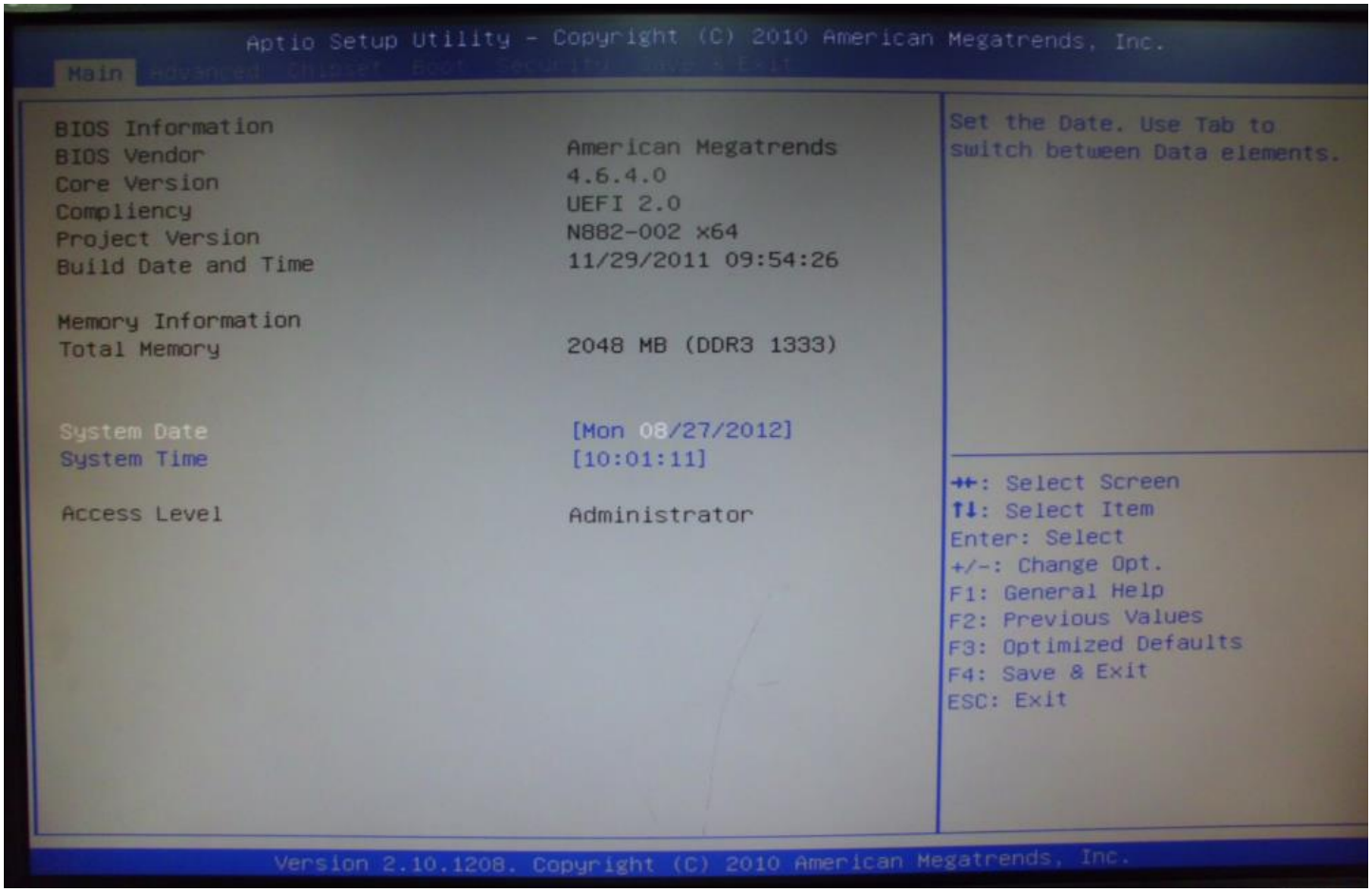
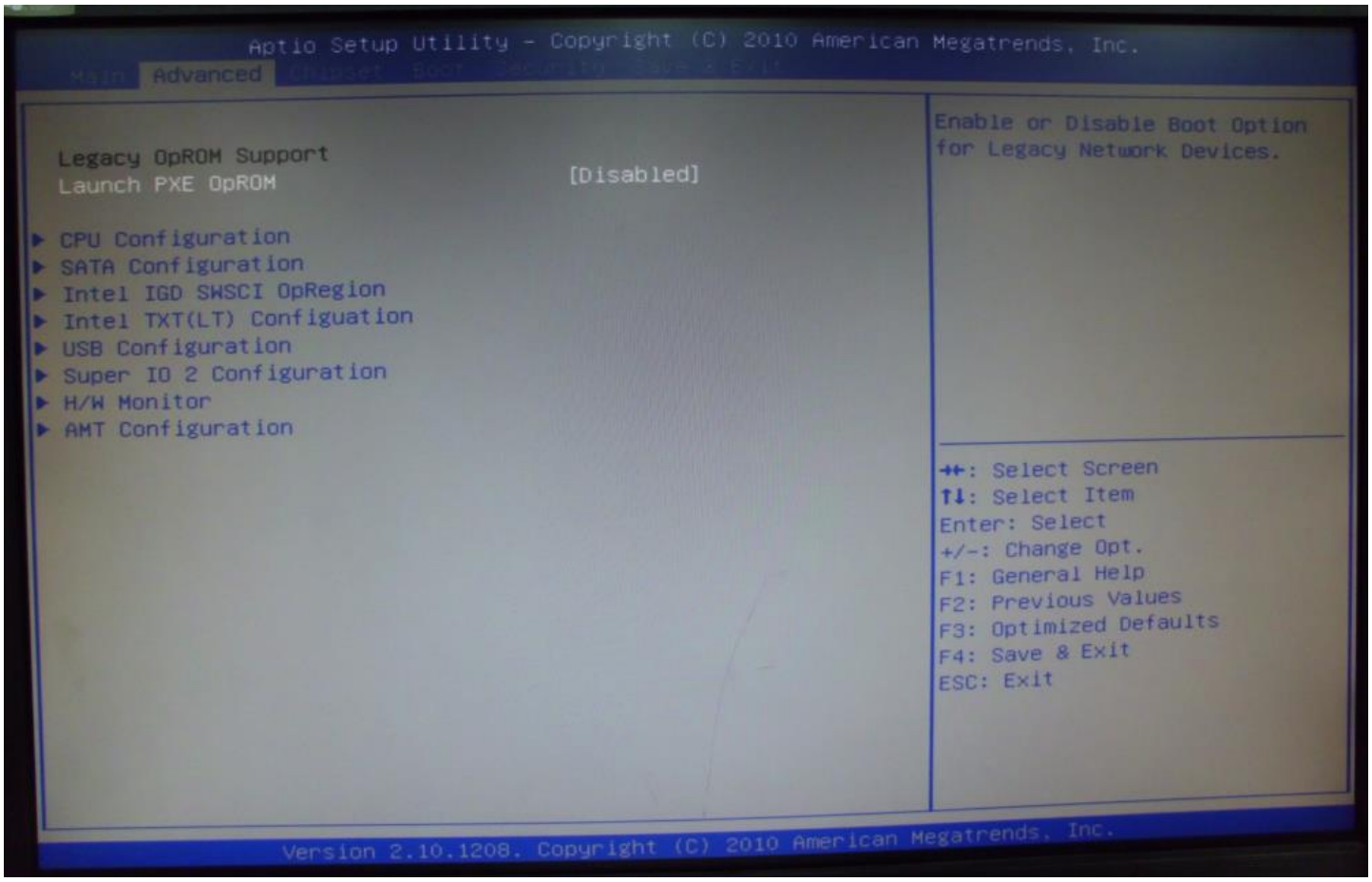


Figure 4-1: BIOS Setup Utility Main Menu

4.5 Advanced Menu

This is where to configure most of the system functions, including PXE, CPU, Storage, Display, USB, Super I/O, and Hardware Monitoring, etc.



Launch PXE OpTOM

Please Enable/disable this feature to control Boot on LAN

CPU Configuration

1. Disclose details of the installed processor
2. Enable/disable CPU hyper-threading, and Intel® Virtualization Technology.

SATA Configuration

1. Configure SATA mode (Disable, IDE, AHCI, and RAID).
2. Configure SATA Controller (Disable, Enhanced, Compatible).
3. Disclose the status of all detected SATA devices

[Notice]: BNX-M67 supports eight onboard SATA ports, where six of them come from Q67 chipset (SATA0 to SATA5). Devices that are connected to these SATA ports would be listed in here, and also support both AHCI and RAID modes. The other two SATA ports (SATA7 and SATA8) are converted from PCIE X1 bus, SATA devices connected on these ports would not be listed here. However, they would still be viewable at “Boot” section.

Intel IGD SWSCI OpRegion

Configure DVMT mode used by Internal Graphics Device.

1. Configure DVMT Mode Select: Fixed Mode or DVMT Mode
2. Configure the size of DVMT Memory: 128MB, 256MB, or Maximum
3. Configure boot up display ports: CRT (VGA), DVI, HDMI, or CRT + DVI.

USB Configuration

1. Configure USB devices, including enable/disable Legacy USB support (such as USB keyboard at DOS mode).
2. Enable/disable EHCI Hand-off feature: Recommended to be enabled for Operating Systems that do not support EHCI, so this would be controlled directly by system BIOS.
3. Configure the Device reset time-out time: 10, 20, 30, and 40 sec.

Super IO Configuration

Configure serial ports supported by the super I/O chip, IT8760.

Ports #	Available Setting
Serial Port 0 (COM1)	1. enable/disable COM1 2. Change setting: I/O address and IRQ 3. Type: RS-232, RS-422, RS-485, RS-485 AUTO 4. Max. Baud Rate: 115200/921600 bps
Serial Port 1 (COM2)	1. enable/disable COM2 2. Change setting: I/O address and IRQ 3. Type: RS-232, RS-422, RS-485, RS-485 AUTO 4. Max. Baud Rate: 115200/921600 bps

H/W Monitor

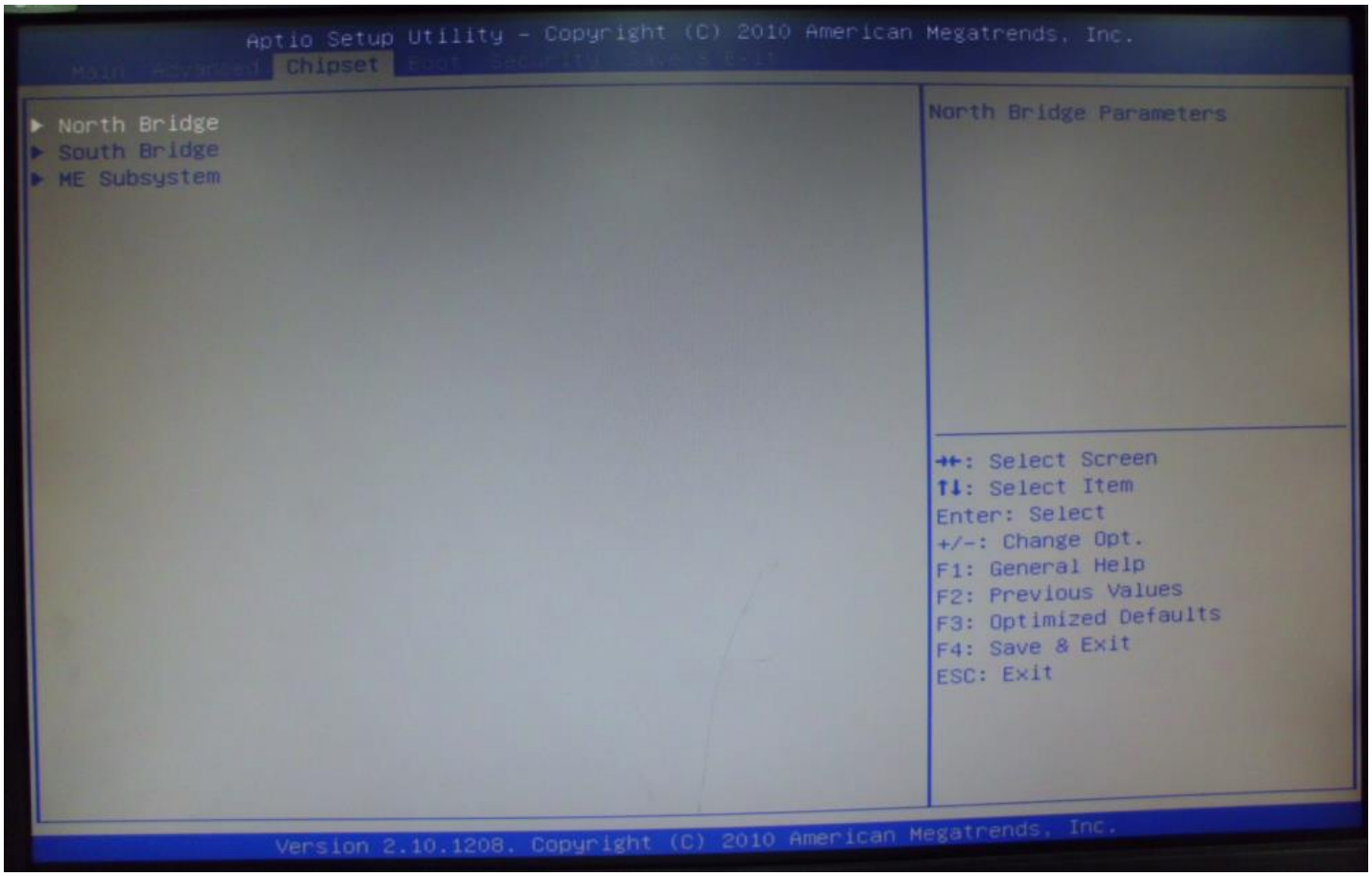
1. Configure FAN Setting: “Always Full Speed”, “Enable Smart Fan”, “Disable”.
2. With FAN Setting at “Enable Smart Fan”, users are able to set the followings:
   # Temperature to start fan
   # Temperature to run full speed
   # Fan speed percentage to start fan initially.

AMT Configuration

Configure Active Management Technology parameters.

4.6 The Chipset Menu

This is where to configure Intel® Q67 PCH feature, including I/O devices, Graphic features, and ME Subsystem.



North Bridge

1. Disclose the installed Memory.
2. Enable/disable VT-d feature
3. Select the boot up display: Internal Graphic Device (IGD) or PCI Express Graphic (PEG)

South Bridge

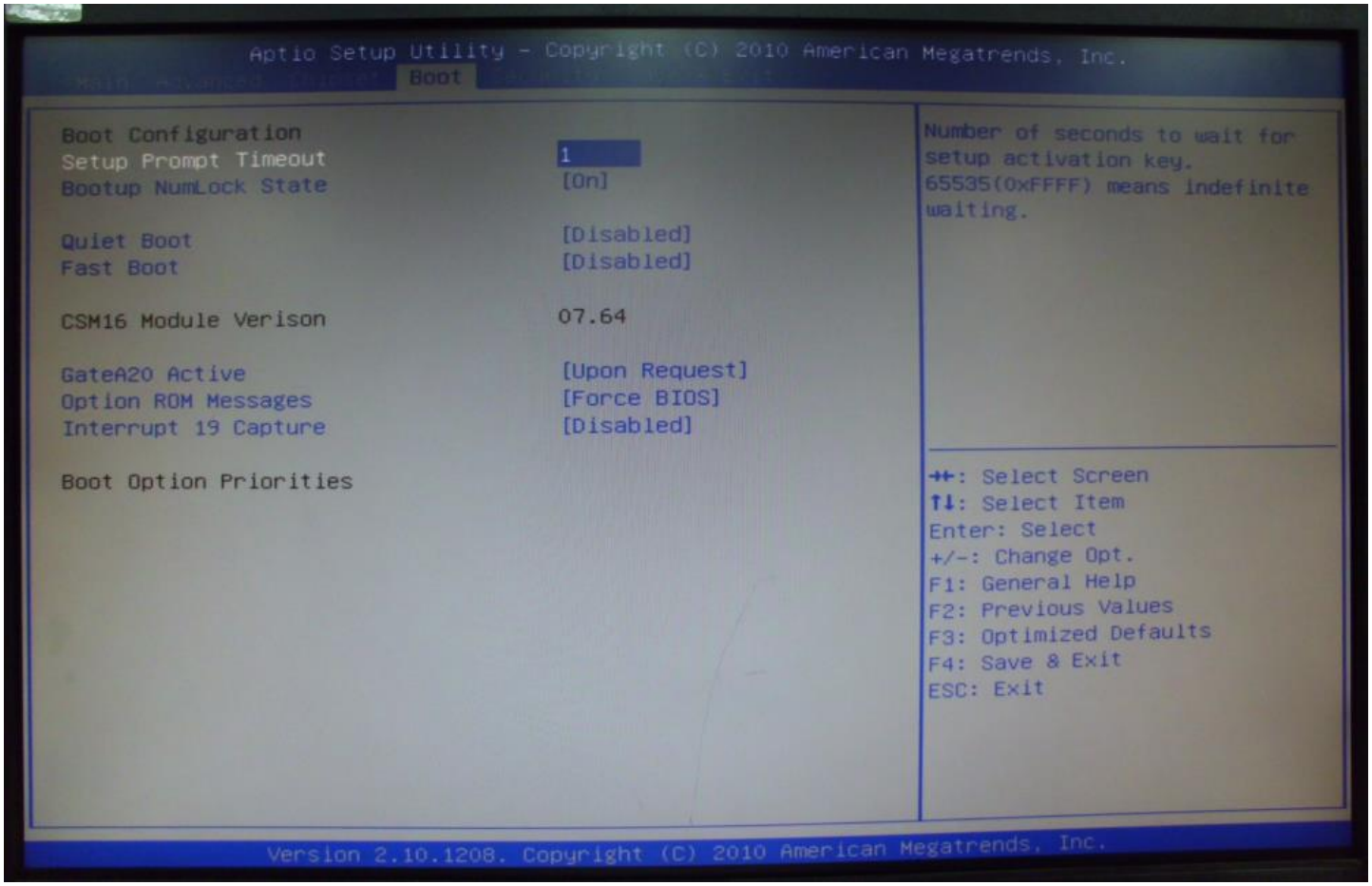
1. Enable/disable SmBus, Onboard Gigabit Controller (GbE), and Wake On LAN
2. Configure Restore AC Power Loss (Off/On/Last State), etc.
3. Enable/disable Onboard HD Audio and HDMI Codec.
4. Enable/disable High Precision Event Timer.
5. Configure USB Features: Enable/disable USB devices, and Enable/disable EHCI Controller 1/2.

ME Subsystem

Configure ME Subsystem Parameters

4.7 The Boot Menu

This is where to configure boot features, including boot options and Hard Drive list, etc.



Setup Prompt Timeout
Set the time for boot screen to be prompted.

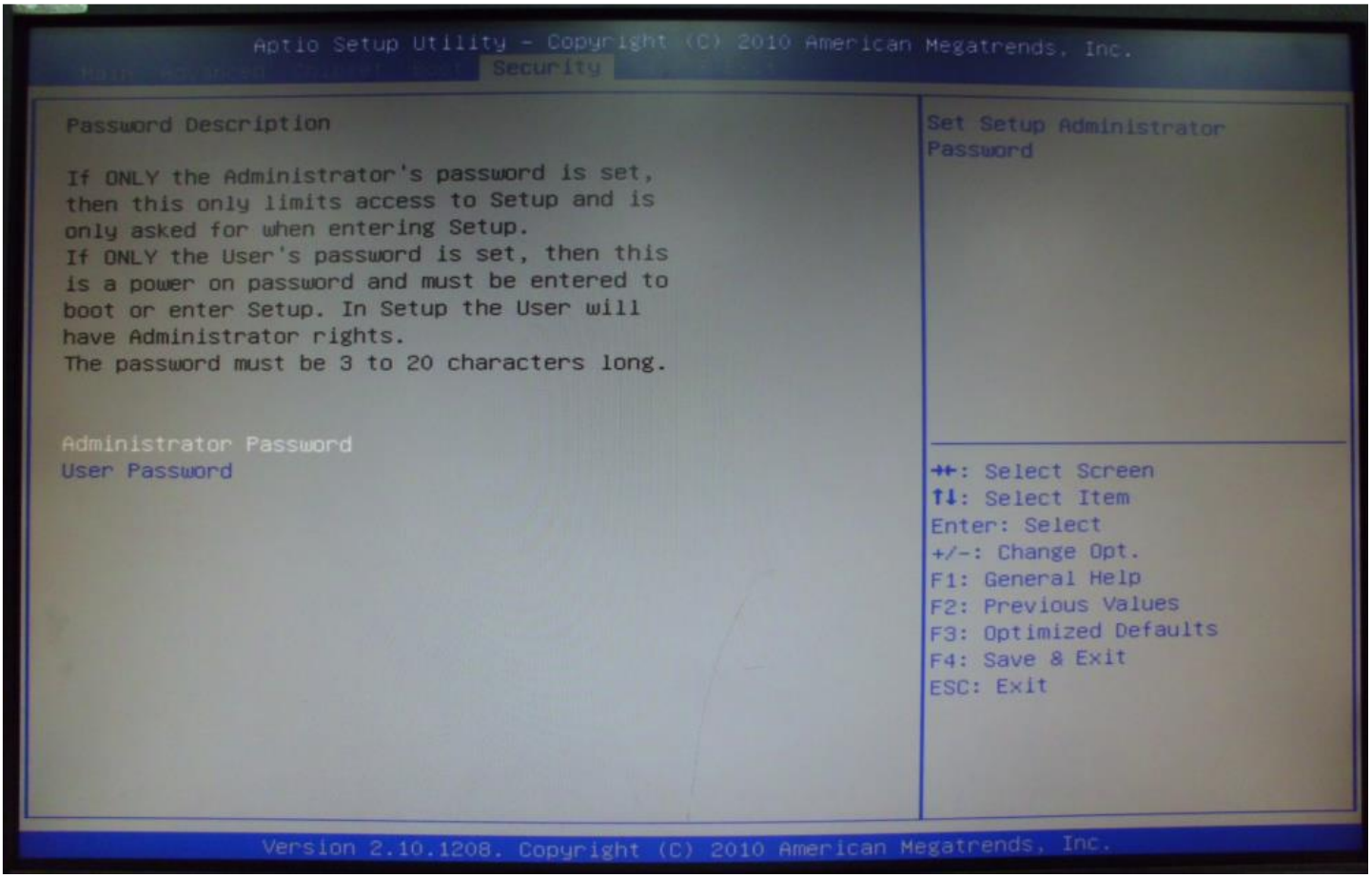
Bootup NumLock State
Set keyboard Numlock to be “On” or “Off” at boot up.

Quite Boot
Enable/Disable Quiet Boot feature.

Fast Boot
Enable/Disable boot with initialization of a minimal set of devices required to launch active boot option.

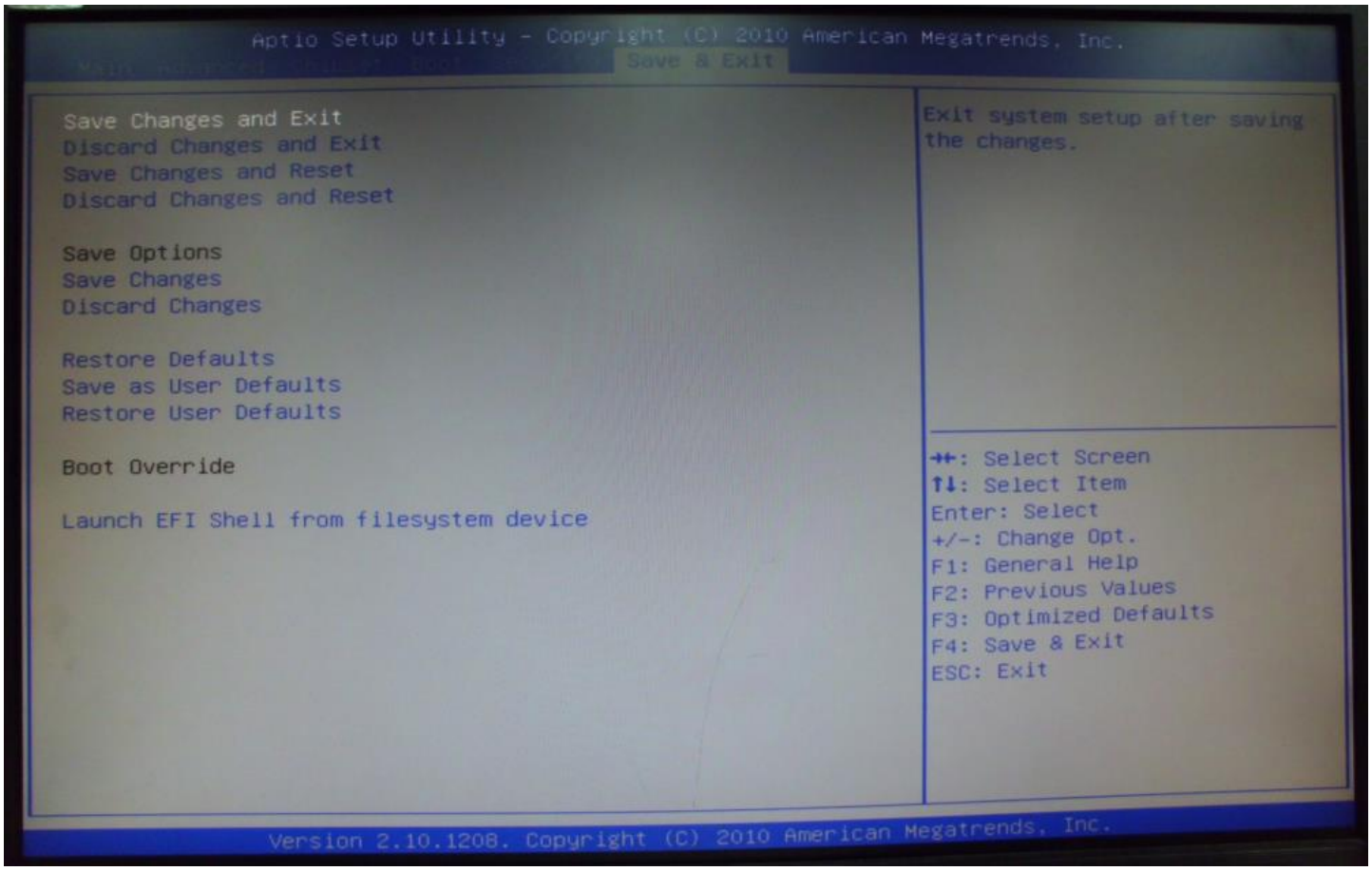
4.8 The Security Menu

This is where to configure administrator and user password.



4.9 The Save & Exit Menu

Exit BIOS setup menu by saving the changes, discard the changes, or simply restore CMOS default, etc.



Save Changes and Exit
Save all the CMOS changes made and reboot the system.

Discard Changes and Exit
Reboot the system without changing the CMOS setting.

Save Changes and Reset
Save all the CMOS changes made and reboot the system.

Discard Changes and Reset
Reboot the system without changing the CMOS setting.

Save Changes
Save changes done so far to the setup options.

Discard Changes
Discard changes done so far to the setup options.

Restore Defaults
Load/Restore Default values for all the setup options.

Save as User Defaults
Save changes done so far to User Defaults.

Restore User Defaults
Restore the User Defaults to all the setup options.