S7056/S7056-HE

Version 1.1b

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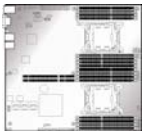
Contents

Before you begin…

Check the box contents!

The retail motherboard package should contain the following:

	1 x S7056 Motherboard
	2 x SATA Single Cable
	1 x Mini-SAS Cable
	1 x IO shielding
	1 x S7056 Quick Installation Guide
	1 x TYAN® Driver CD

IMPORTANT NOTE:
Sales samples may not come with any of the accessories listed above.
If you have ordered a sales sample and you are missing any of the above items, please contact your sales representative to help order accessories.

NOTE: The SATA Single Cables, Mini-SAS Cable and IO Shielding are not included in bulk packing.

Chapter 1: Instruction

1.1 Congratulations

You have purchased the powerful TYAN® S7056 motherboard, based on the Intel® Patsburg chipset. The S7056 is designed to support dual Intel® Xeon E5-2600/E5-2600 v2 Series processors, and up to 512GB RDIMM, 128GB UDIMM and 512GB LRDIMM DDR3 memory. Leveraging advanced technology from Intel®, the S7056 is capable of offering scalable 32 and 64-bit computing, high-bandwidth memory design, and lightning-fast PCI-E bus implementation.

The S7056 not only empowers you in today's demanding IT environment but also offers a smooth path for future application upgradeability. All of these rich feature sets provide the S7056 with the power and flexibility to meet demanding requirements for today's IT environments.

Remember to visit the TYAN® website at **http://www.tyan.com**. There you can find all the information on all TYAN® products as well as all the supporting documentation, FAQs, Drivers and BIOS upgrades.

1.2 Hardware Specifications

TYAN S7056 (S7056GM3NR)

Processor	**Supported CPU Series**	Intel Xeon Processor E5-2600/E5-2600 v2 Series
	Socket Type / Q'ty	LGA2011 / (2)
	Thermal Design Power (TDP) wattage	Max up to 95W
	System Bus	Up to 8.0/ 7.2/ 6.4 GT/s with Intel QuickPath Interconnect (QPI) support
Chipset	**PCH**	Intel C602
Memory	**Supported DIMM Qty**	(8)+(8) DIMM slots
	DIMM Type / Speed	UDIMM/RDIMM/LRDIMM ECC 1066 / 1333 / 1600 / 1866 *Speed 1866 only for 1 slot per channel 1.5V (Blue color DIMM slot)
	Capacity	up to 128GB UDIMM / 512GB RDIMM / 512GB LRDIMM
	Memory channel	4 Channels per CPU / Support 2 R/LR-DIMMs or 2 UDIMMs per channel
	Memory voltage	1.5V or 1.35V

Expansion Slots	**PCI-E**		(2) sets of the following expansion combination: (1) PCI-E x16 slot in-lined with / (1) PCI-E x4 slot (routed to PCI-E x8 bus) recommended to use TYAN riser card
	Recommended TYAN Riser Card		M7056-L24-3F, PCI-E x16 2U riser card (left) / M7056-R24-3F, PCI-E x16 2U riser card (right)
Recommended Barebone / Chassis	**2U Barebone**		GN70-B7056
LAN	**Port Q'ty**		(3) GbE ports
	Controller		Intel 82574L / Intel I350BT2
Storage	**SATA**	**Connector**	(10) SATA
		Controller	Intel C602
		Speed	(2) 6.0 Gb/s (blue color), (8) 3.0 Gb/s (2 x mini-SAS connector)
		RAID	RAID 0/1/10/5 (Intel RST)
Graphic	**Connector type**		D-Sub 15-pin
	Resolution		Up to 1920x1200
	Chipset		Aspeed AST2300
Input /Output	**USB**		(7) USB2.0 ports (2 at rear, 4 via cable, 1 type A onboard)
	COM		(1) header / (1) port (rear)
	VGA		(1) D-Sub 15-pin VGA port
	RJ-45		(3) GbE ports
	Power		SSI 24-pin + 8-pin + 8-pin power connectors / SSI EEB spec. 2008
	Front Panel		(1) 2x12-pin SSI front panel header
	SATA		(2) SATA-III connectors + (2) Mini-SAS (4-in-1) connectors
System Monitoring	**Chipset**		Nuvoton 83773G
	Voltage		Monitors voltage for CPU, memory, chipset & power supply
	Fan		Total (7) 4-pin headers
	Temperature		Monitors temperature for CPU & system environment
	Others		Watchdog timer support
Server Management	**Onboard Chipset**		Onboard Aspeed AST2300
	AST2300 IPMI Feature		IPMI 2.0 compliant baseboard management controller (BMC) / Supports storage over IP and remote platform-flash / USB 2.0 virtual hub
	AST2300 iKVM Feature		24-bit high quality video compression / 10/100 Mb/s MAC interface
BIOS	**Brand / ROM size**		AMI / 8MB
	Feature		Plug and Play (PnP) /PCI2.3 /WfM2.0 /SMBIOS2.3

		/PXE boot / ACPI 2.0 power management /Power on mode after power recovery / User-configurable H/W monitoring / Auto-configurable of hard disk types
Physical Dimension	**Form Factor**	EATX
	Board Dimension	12"x13" (305x330mm)
Operating System	**OS supported list**	Please visit our Web site for the latest update.
Regulation	**FCC (DoC)**	Class A
	CE (DoC)	Yes
Operating Environment	**Operating Temp.**	10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity	90%, non-condensing at 35° C
RoHS	**RoHS 6/6 Compliant**	Yes
Package Contains	**Motherboard**	(1) S7056 Motherboard
	Manual	(1) Quick Installation Guide
	Installation CD	(1) TYAN installation CD
	I/O Shield	(1) I/O Shield
	Cable SATA	(2) SATA signal cables / (1) Mini-SAS cable to 4 x SATA cables

TYAN S7056 (S7056WGM3NR)

Processor	**Supported CPU Series**		Intel Xeon Processor E5-2600/E5-2600 v2 Series
	Socket Type / Q'ty		LGA2011 / (2)
	Thermal Design Power (TDP) wattage		Max up to 95W
	System Bus		Up to 8.0/ 7.2/ 6.4 GT/s with Intel QuickPath Interconnect (QPI) support
Chipset	**PCH**		Intel C602 with upgrade ROM module
Memory	**Supported DIMM Qty**		(8)+(8) DIMM slots
	DIMM Type / Speed		UDIMM/RDIMM/LRDIMM ECC 1066 / 1333 / 1600 / 1866 *Speed 1866 only for 1 slot per channel 1.5V (Blue color DIMM slot)
	Capacity		up to 128GB UDIMM / 512GB RDIMM / 512GB LRDIMM
	Memory channel		4 Channels per CPU / Support 2 R/LR-DIMMs or 2 UDIMMs per channel
	Memory voltage		1.5V or 1.35V
Expansion Slots	**PCI-E**		(2) sets of the following expansion combination: (1) PCI-E x16 slot in-lined with / (1) PCI-E x4 slot (routed to PCI-E x8 bus) recommended to use TYAN riser card
	Recommended TYAN Riser Card		M7056-L24-3F, PCI-E x16 2U riser card (left) / M7056-R24-3F, PCI-E x16 2U riser card (right)
Recommended Barebone / Chassis	**2U Barebone**		GN70-B7056
LAN	**Port Q'ty**		(3) GbE ports
	Controller		Intel 82574L / Intel I350BT2
Storage	**SAS**	**Connector**	(8) SAS
		Controller	Intel C602 with TRK-5 upgrade ROM module
		Speed	3.0 Gb/s (mini-SAS connector)
		RAID	RAID 0/1/10 (Intel Integrated RAID upgrade ROM 5)
	SATA	**Connector**	(6) SATA
		Controller	Intel C602
		Speed	(2) 6.0 Gb/s (blue color), (4) 3.0 Gb/s (mini-SAS connector)
		RAID	RAID 0/1/10/5 (Intel RST)
Graphic	**Connector type**		D-Sub 15-pin
	Resolution		Up to 1920x1200
	Chipset		Aspeed AST2300

Input /Output	**USB**	(7) USB2.0 ports (2 at rear, 4 via cable, 1 type A onboard)
	COM	(1) header / (1) port (rear)
	SAS	(2) Mini-SAS (4-in-1) connectors
	VGA	(1) D-Sub 15-pin VGA port
	RJ-45	(3) GbE ports
	Power	SSI 24-pin + 8-pin + 8-pin power connectors / SSI EEB spec. 2008
	Front Panel	(1) 2x12-pin SSI front panel header
	SATA	(1) Mini-SAS connector & (2) SATA-III connectors
System Monitoring	**Chipset**	Nuvoton 83773G
	Voltage	Monitors voltage for CPU, memory, chipset & power supply
	Fan	Total (7) 4-pin headers
	Temperature	Monitors temperature for CPU & system environment
	Others	Watchdog timer support
Server Management	**Onboard Chipset**	Onboard Aspeed AST2300
	AST2300 IPMI Feature	IPMI 2.0 compliant baseboard management controller (BMC) / Supports storage over IP and remote platform-flash / USB 2.0 virtual hub
	AST2300 iKVM Feature	24-bit high quality video compression / 10/100 Mb/s MAC interface
BIOS	**Brand / ROM size**	AMI / 8MB
	Feature	Plug and Play (PnP) /PCI2.3 /WfM2.0 /SMBIOS2.3 /PXE boot / ACPI 2.0 power management /Power on mode after power recovery / User-configurable H/W monitoring / Auto-configurable of hard disk types
Physical Dimension	**Form Factor**	EATX
	Board Dimension	12”x13” (305x330mm)
Operating System	**OS supported list**	Please visit our Web site for the latest update.
Regulation	**FCC (DoC)**	Class A
	CE (DoC)	Yes
Operating Environment	**Operating Temp.**	10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity	90%, non-condensing at 35° C
RoHS	**RoHS 6/6 Compliant**	Yes
Package Contains	**Motherboard**	(1) S7056 Motherboard
	Manual	(1) Quick Installation Guide
	Installation CD	(1) TYAN installation CD
	I/O Shield	(1) I/O Shield

	Cable	**SATA**	(2) SATA signal cables / (1) Mini-SAS cable to 4 x SATA cables

TYAN S7056 (S7056WGM3NR-2T)

Processor	**Supported CPU Series**		Intel Xeon Processor E5-2600/E5-2600 v2 Series
	Socket Type / Q'ty		LGA2011 / (2)
	Thermal Design Power (TDP) wattage		Max up to 95W
	System Bus		Up to 8.0/ 7.2/ 6.4 GT/s with Intel QuickPath Interconnect (QPI) support
Chipset	**PCH**		Intel C602 with upgrade ROM module
Memory	**Supported DIMM Qty**		(8)+(8) DIMM slots
	DIMM Type / Speed		UDIMM/RDIMM/LRDIMM ECC 1066 / 1333 / 1600 / 1866 *Speed 1866 only for 1 slot per channel 1.5V (Blue color DIMM slot)
	Capacity		up to 128GB UDIMM / 512GB RDIMM / 512GB LRDIMM
	Memory channel		4 Channels per CPU / Support 2 R/LR-DIMMs or 2 UDIMMs per channel
	Memory voltage		1.5V or 1.35V
Expansion Slots	**PCI-E**		(2) sets of the following expansion combination: (1) PCI-E x16 slot in-lined with / (1) PCI-E x4 slot (routed to PCI-E x8 bus) recommended to use TYAN riser card
	Recommended TYAN Riser Card		M7056-L24-3F, PCI-E x16 2U riser card (left) / M7056-R24-3F, PCI-E x16 2U riser card (right)
Recommended Barebone / Chassis	**2U Barebone**		GN70-B7056
LAN	**Port Q'ty**		(1) GbE port, (2) 10 GbE ports
	Controller		Intel 82574L / Intel X540-AT2
Storage	**SAS**	**Connector**	(8) SAS
		Controller	Intel C602 with TRK-5 upgrade ROM module
		Speed	3.0 Gb/s (mini-SAS connector)
		RAID	RAID 0/1/10 (Intel Integrated RAID upgrade ROM 5)
	SATA	**Connector**	(6) SATA
		Controller	Intel C602
		Speed	(2) 6.0 Gb/s (blue color), (4) 3.0 Gb/s (mini-SAS connector)
		RAID	RAID 0/1/10/5 (Intel RST)
Graphic	**Connector type**		D-Sub 15-pin
	Resolution		Up to 1920x1200

	Chipset	Aspeed AST2300
Input /Output	**USB**	(7) USB2.0 ports (2 at rear, 4 via cable, 1 type A onboard)
	COM	(1) header / (1) port (rear)
	SAS	(2) Mini-SAS (4-in-1) connectors
	VGA	(1) D-Sub 15-pin VGA port
	RJ-45	(1) GbE port / (2) 10Gbe Ports
	Power	SSI 24-pin + 8-pin + 8-pin power connectors / SSI EEB spec. 2008
	Front Panel	(1) 2x12-pin SSI front panel header
	SATA	(1) Mini-SAS connector & (2) SATA-III connectors
System Monitoring	**Chipset**	Nuvoton 83773G
	Voltage	Monitors voltage for CPU, memory, chipset & power supply
	Fan	Total (7) 4-pin headers
	Temperature	Monitors temperature for CPU & system environment
	Others	Watchdog timer support
Server Management	**Onboard Chipset**	Onboard Aspeed AST2300
	AST2300 IPMI Feature	IPMI 2.0 compliant baseboard management controller (BMC) / Supports storage over IP and remote platform-flash / USB 2.0 virtual hub
	AST2300 iKVM Feature	24-bit high quality video compression / 10/100 Mb/s MAC interface
BIOS	**Brand / ROM size**	AMI / 8MB
	Feature	Plug and Play (PnP) /PCI2.3 /WfM2.0 /SMBIOS2.3 /PXE boot / ACPI 2.0 power management /Power on mode after power recovery / User-configurable H/W monitoring / Auto-configurable of hard disk types
Physical Dimension	**Form Factor**	EATX
	Board Dimension	12”x13” (305x330mm)
Operating System	**OS supported list**	Please visit our Web site for the latest update.
Regulation	**FCC (DoC)**	Class A
	CE (DoC)	Yes
Operating Environment	**Operating Temp.**	10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity	90%, non-condensing at 35° C
RoHS	**RoHS 6/6 Compliant**	Yes
Package	**Motherboard**	(1) S7056 Motherboard

Contains	**Manual**	(1) Quick Installation Guide
	Installation CD	(1) TYAN installation CD
	I/O Shield	(1) I/O Shield
	Cable SATA	(2) SATA signal cables / (1) Mini-SAS cable to 4 x SATA cables

TYAN S7056 (S7056WGM3NR5 [BTO])

Processor	**Supported CPU Series**		Intel Xeon Processor E5-2600/E5-2600 v2 Series
	Socket Type / Q'ty		LGA2011 / (2)
	Thermal Design Power (TDP) wattage		Max up to 95W
	System Bus		Up to 8.0/ 7.2/ 6.4 GT/s with Intel QuickPath Interconnect (QPI) support
Chipset	**PCH**		Intel C602 with upgrade ROM module
Memory	**Supported DIMM Qty**		(8)+(8) DIMM slots
	DIMM Type / Speed		UDIMM/RDIMM/LRDIMM ECC 1066 / 1333 / 1600 / 1866 *Speed 1866 only for 1 slot per channel 1.5V (Blue color DIMM slot)
	Capacity		up to 128GB UDIMM / 512GB RDIMM / 512GB LRDIMM
	Memory channel		4 Channels per CPU / Support 2 R/LR-DIMMs or 2 UDIMMs per channel
	Memory voltage		1.5V or 1.35V
Expansion Slots	**PCI-E**		(2) sets of the following expansion combination: (1) PCI-E x16 slot in-lined with / (1) PCI-E x4 slot (routed to PCI-E x8 bus) recommended to use TYAN riser card
	Recommended TYAN Riser Card		M7056-L24-3F, PCI-E x16 2U riser card (left) / M7056-R24-3F, PCI-E x16 2U riser card (right)
Recommended Barebone / Chassis	**2U Barebone**		GN70-B7056
LAN	**Port Q'ty**		(3) GbE ports
	Controller		Intel 82574L / Intel I350BT2
Storage	**SAS**	**Connector**	(8) SAS
		Controller	Intel C602 with TRK-6 upgrade ROM module
		Speed	3.0 Gb/s (mini-SAS connector)
		RAID	RAID 0/1/10/5 (Intel Integrated RAID upgrade ROM 6)
	SATA	**Connector**	(6) SATA
		Controller	Intel C602
		Speed	(2) 6.0 Gb/s (blue color), (4) 3.0 Gb/s (mini-SAS connector)
		RAID	RAID 0/1/10/5 (Intel RST)
Graphic	**Connector type**		D-Sub 15-pin
	Resolution		Up to 1920x1200
	Chipset		Aspeed AST2300

Input /Output	**USB**	(7) USB2.0 ports (2 at rear, 4 via cable, 1 type A onboard)
	COM	(1) header / (1) port (rear)
	SAS	(2) Mini-SAS (4-in-1) connectors
	VGA	(1) D-Sub 15-pin VGA port
	RJ-45	(3) GbE ports
	Power	SSI 24-pin + 8-pin + 8-pin power connectors / SSI EEB spec. 2008
	Front Panel	(1) 2x12-pin SSI front panel header
	SATA	(1) Mini-SAS connector & (2) SATA-III connectors
System Monitoring	**Chipset**	Nuvoton 83773G
	Voltage	Monitors voltage for CPU, memory, chipset & power supply
	Fan	Total (7) 4-pin headers
	Temperature	Monitors temperature for CPU & system environment
	Others	Watchdog timer support
Server Management	**Onboard Chipset**	Onboard Aspeed AST2300
	AST2300 IPMI Feature	IPMI 2.0 compliant baseboard management controller (BMC) / Supports storage over IP and remote platform-flash / USB 2.0 virtual hub
	AST2300 iKVM Feature	24-bit high quality video compression / 10/100 Mb/s MAC interface
BIOS	**Brand / ROM size**	AMI / 8MB
	Feature	Plug and Play (PnP) /PCI2.3 /WfM2.0 /SMBIOS2.3 /PXE boot / ACPI 2.0 power management /Power on mode after power recovery / User-configurable H/W monitoring / Auto-configurable of hard disk types
Physical Dimension	**Form Factor**	EATX
	Board Dimension	12”x13” (305x330mm)
Operating System	**OS supported list**	Please visit our Web site for the latest update.
Regulation	**FCC (DoC)**	Class A
	CE (DoC)	Yes
Operating Environment	**Operating Temp.**	10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity	90%, non-condensing at 35° C
RoHS	**RoHS 6/6 Compliant**	Yes
Package Contains	**Motherboard**	(1) S7056 Motherboard
	Manual	(1) Quick Installation Guide
	Installation CD	(1) TYAN installation CD
	I/O Shield	(1) I/O Shield

	Cable	**SATA**	(2) SATA signal cables / (1) Mini-SAS cable to 4 x SATA cables

TYAN S7056 (S7056GM3NR-HE)

Processor	**Supported CPU Series**		Intel Xeon Processor E5-2600/E5-2600 v2 Series
	Socket Type / Q'ty		LGA2011 / (2)
	Thermal Design Power (TDP) wattage		Max up to 150W
	System Bus		Up to 8.0/ 7.2/ 6.4 GT/s with Intel QuickPath Interconnect (QPI) support
Chipset	**PCH**		Intel C602
Memory	**Supported DIMM Qty**		(8)+(8) DIMM slots
	DIMM Type / Speed		UDIMM/RDIMM/LRDIMM ECC 1066 / 1333 / 1600 / 1866 *Speed 1866 only for 1 slot per channel 1.5V (Blue color DIMM slot)
	Capacity		up to 128GB UDIMM / 512GB RDIMM / 512GB LRDIMM
	Memory channel		4 Channels per CPU / Support 2 R/LR-DIMMs or 2 UDIMMs per channel
	Memory voltage		1.5V or 1.35V
Expansion Slots	**PCI-E**		(2) sets of the following expansion combination: (1) PCI-E x16 slot in-lined with / (1) PCI-E x4 slot (routed to PCI-E x8 bus) recommended to use TYAN riser card
	Recommended TYAN Riser Card		M7056-L24-3F, PCI-E x16 2U riser card (left) / M7056-R24-3F, PCI-E x16 2U riser card (right)
Recommended Barebone / Chassis	**2U Barebone**		GN70-B7056
LAN	**Port Q'ty**		(3) GbE ports
	Controller		Intel 82574L / Intel I350BT2
Storage	**SATA**	**Connector**	(10) SATA
		Controller	Intel C602
		Speed	(2) 6.0 Gb/s (blue color), (8) 3.0 Gb/s (2 x mini-SAS connector)
		RAID	RAID 0/1/10/5 (Intel RST)
Graphic	**Connector type**		D-Sub 15-pin
	Resolution		Up to 1920x1200
	Chipset		Aspeed AST2300
Input /Output	**USB**		(7) USB2.0 ports (2 at rear, 4 via cable, 1 type A onboard)
	COM		(1) header / (1) port (rear)
	VGA		(1) D-Sub 15-pin VGA port
	RJ-45		(3) GbE ports

	Power	SSI 24-pin + 8-pin + 8-pin power connectors / SSI EEB spec. 2008
	Front Panel	(1) 2x12-pin SSI front panel header
	SATA	(2) SATA-III connectors + (2) Mini-SAS (4-in-1) connectors
System Monitoring	**Chipset**	Nuvoton 83773G
	Voltage	Monitors voltage for CPU, memory, chipset & power supply
	Fan	Total (7) 4-pin headers
	Temperature	Monitors temperature for CPU & system environment
	Others	Watchdog timer support
Server Management	**Onboard Chipset**	Onboard Aspeed AST2300
	AST2300 IPMI Feature	IPMI 2.0 compliant baseboard management controller (BMC) / Supports storage over IP and remote platform-flash / USB 2.0 virtual hub
	AST2300 iKVM Feature	24-bit high quality video compression / 10/100 Mb/s MAC interface
BIOS	**Brand / ROM size**	AMI / 8MB
	Feature	Plug and Play (PnP) /PCI2.3 /WfM2.0 /SMBIOS2.3 /PXE boot / ACPI 2.0 power management /Power on mode after power recovery / User-configurable H/W monitoring / Auto-configurable of hard disk types
Physical Dimension	**Form Factor**	EATX
	Board Dimension	12”x13” (305x330mm)
Operating System	**OS supported list**	Please visit our Web site for the latest update.
Regulation	**FCC (DoC)**	Class A
	CE (DoC)	Yes
Operating Environment	**Operating Temp.**	10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity	90%, non-condensing at 35° C
RoHS	**RoHS 6/6 Compliant**	Yes
Package Contains	**Motherboard**	(1) S7056 Motherboard
	Manual	(1) Quick Installation Guide
	Installation CD	(1) TYAN installation CD
	I/O Shield	(1) I/O Shield
	Cable SATA	(2) SATA signal cables / (1) Mini-SAS cable to 4 x SATA cables

TYAN S7056 (S7056WGM3NR-HE)

Processor	**Supported CPU Series**		Intel Xeon Processor E5-2600/E5-2600 v2 Series
	Socket Type / Q'ty		LGA2011 / (2)
	Thermal Design Power (TDP) wattage		Max up to 150W
	System Bus		Up to 8.0/ 7.2/ 6.4 GT/s with Intel QuickPath Interconnect (QPI) support
Chipset	**PCH**		Intel C602 with upgrade ROM module
Memory	**Supported DIMM Qty**		(8)+(8) DIMM slots
	DIMM Type / Speed		UDIMM/RDIMM/LRDIMM ECC 1066 / 1333 / 1600 / 1866 *Speed 1866 only for 1 slot per channel 1.5V (Blue color DIMM slot)
	Capacity		up to 128GB UDIMM / 512GB RDIMM / 512GB LRDIMM
	Memory channel		4 Channels per CPU / Support 2 R/LR-DIMMs or 2 UDIMMs per channel
	Memory voltage		1.5V or 1.35V
Expansion Slots	**PCI-E**		(2) sets of the following expansion combination: (1) PCI-E x16 slot in-lined with / (1) PCI-E x4 slot (routed to PCI-E x8 bus) recommended to use TYAN riser card
	Recommended TYAN Riser Card		M7056-L24-3F, PCI-E x16 2U riser card (left) / M7056-R24-3F, PCI-E x16 2U riser card (right)
Recommended Barebone / Chassis	**2U Barebone**		GN70-B7056
LAN	**Port Q'ty**		(3) GbE ports
	Controller		Intel 82574L / Intel I350BT2
Storage	**SAS**	**Connector**	(8) SAS
		Controller	Intel C602 with TRK-5 upgrade ROM module
		Speed	3.0 Gb/s (mini-SAS connector)
		RAID	RAID 0/1/10 (Intel Integrated RAID upgrade ROM 5)
	SATA	**Connector**	(6) SATA
		Controller	Intel C602
		Speed	(2) 6.0 Gb/s (blue color), (4) 3.0 Gb/s (mini-SAS connector)
		RAID	RAID 0/1/10/5 (Intel RST)
Graphic	**Connector type**		D-Sub 15-pin
	Resolution		Up to 1920x1200
	Chipset		Aspeed AST2300

Input /Output	**USB**	(7) USB2.0 ports (2 at rear, 4 via cable, 1 type A onboard)
	COM	(1) header / (1) port (rear)
	SAS	(2) Mini-SAS (4-in-1) connectors
	VGA	(1) D-Sub 15-pin VGA port
	RJ-45	(3) GbE ports
	Power	SSI 24-pin + 8-pin + 8-pin power connectors / SSI EEB spec. 2008
	Front Panel	(1) 2x12-pin SSI front panel header
	SATA	(1) Mini-SAS connector & (2) SATA-III connectors
System Monitoring	**Chipset**	Nuvoton 83773G
	Voltage	Monitors voltage for CPU, memory, chipset & power supply
	Fan	Total (7) 4-pin headers
	Temperature	Monitors temperature for CPU & system environment
	Others	Watchdog timer support
Server Management	**Onboard Chipset**	Onboard Aspeed AST2300
	AST2300 IPMI Feature	IPMI 2.0 compliant baseboard management controller (BMC) / Supports storage over IP and remote platform-flash / USB 2.0 virtual hub
	AST2300 iKVM Feature	24-bit high quality video compression / 10/100 Mb/s MAC interface
BIOS	**Brand / ROM size**	AMI / 8MB
	Feature	Plug and Play (PnP) /PCI2.3 /WfM2.0 /SMBIOS2.3 /PXE boot / ACPI 2.0 power management /Power on mode after power recovery / User-configurable H/W monitoring / Auto-configurable of hard disk types
Physical Dimension	**Form Factor**	EATX
	Board Dimension	12”x13” (305x330mm)
Operating System	**OS supported list**	Please visit our Web site for the latest update.
Regulation	**FCC (DoC)**	Class A
	CE (DoC)	Yes
Operating Environment	**Operating Temp.**	10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity	90%, non-condensing at 35° C
RoHS	**RoHS 6/6 Compliant**	Yes
Package Contains	**Motherboard**	(1) S7056 Motherboard
	Manual	(1) Quick Installation Guide
	Installation CD	(1) TYAN installation CD
	I/O Shield	(1) I/O Shield

	Cable	**SATA**	(2) SATA signal cables / (1) Mini-SAS cable to 4 x SATA cables

TYAN S7056 (S7056WGM3NR-2T-HE)

Processor	**Supported CPU Series**		Intel Xeon Processor E5-2600/E5-2600 V2 Series
	Socket Type / Q'ty		LGA2011 / (2)
	Thermal Design Power (TDP) wattage		Max up to 150W
	System Bus		Up to 8.0/ 7.2/ 6.4 GT/s with Intel QuickPath Interconnect (QPI) support
Chipset	**PCH**		Intel C602 with upgrade ROM module
Memory	**Supported DIMM Qty**		(8)+(8) DIMM slots
	DIMM Type / Speed		UDIMM/RDIMM/LRDIMM ECC 1066 / 1333 / 1600 / 1866 *Speed 1866 only for 1 slot per channel 1.5V (Blue color DIMM slot)
	Capacity		up to 128GB UDIMM / 512GB RDIMM / 512GB LRDIMM
	Memory channel		4 Channels per CPU / Support 2 R/LR-DIMMs or 2 UDIMMs per channel
	Memory voltage		1.5V or 1.35V
Expansion Slots	**PCI-E**		(2) sets of the following expansion combination: (1) PCI-E x16 slot in-lined with / (1) PCI-E x4 slot (routed to PCI-E x8 bus) recommended to use TYAN riser card
	Recommended TYAN Riser Card		M7056-L24-3F, PCI-E x16 2U riser card (left) / M7056-R24-3F, PCI-E x16 2U riser card (right)
Recommended Barebone / Chassis	**2U Barebone**		GN70-B7056
LAN	**Port Q'ty**		(1) GbE port, (2) 10 GbE ports
	Controller		Intel 82574L / Intel X540-AT2
Storage	**SAS**	**Connector**	(8) SAS
		Controller	Intel C602 with TRK-5 upgrade ROM module
		Speed	3.0 Gb/s (mini-SAS connector)
		RAID	RAID 0/1/10 (Intel Integrated RAID upgrade ROM 5)
	SATA	**Connector**	(6) SATA
		Controller	Intel C602
		Speed	(2) 6.0 Gb/s (blue color), (4) 3.0 Gb/s (mini-SAS connector)
		RAID	RAID 0/1/10/5 (Intel RST)
Graphic	**Connector type**		D-Sub 15-pin
	Resolution		Up to 1920x1200

	Chipset	Aspeed AST2300
Input /Output	**USB**	(7) USB2.0 ports (2 at rear, 4 via cable, 1 type A onboard)
	COM	(1) header / (1) port (rear)
	SAS	(2) Mini-SAS (4-in-1) connectors
	VGA	(1) D-Sub 15-pin VGA port
	RJ-45	(1) GbE port / (2) 10Gbe Ports
	Power	SSI 24-pin + 8-pin + 8-pin power connectors / SSI EEB spec. 2008
	Front Panel	(1) 2x12-pin SSI front panel header
	SATA	(1) Mini-SAS connector & (2) SATA-III connectors
System Monitoring	**Chipset**	Nuvoton 83773G
	Voltage	Monitors voltage for CPU, memory, chipset & power supply
	Fan	Total (7) 4-pin headers
	Temperature	Monitors temperature for CPU & system environment
	Others	Watchdog timer support
Server Management	**Onboard Chipset**	Onboard Aspeed AST2300
	AST2300 IPMI Feature	IPMI 2.0 compliant baseboard management controller (BMC) / Supports storage over IP and remote platform-flash / USB 2.0 virtual hub
	AST2300 iKVM Feature	24-bit high quality video compression / 10/100 Mb/s MAC interface
BIOS	**Brand / ROM size**	AMI / 8MB
	Feature	Plug and Play (PnP) /PCI2.3 /WfM2.0 /SMBIOS2.3 /PXE boot / ACPI 2.0 power management /Power on mode after power recovery / User-configurable H/W monitoring / Auto-configurable of hard disk types
Physical Dimension	**Form Factor**	EATX
	Board Dimension	12”x13” (305x330mm)
Operating System	**OS supported list**	Please visit our Web site for the latest update.
Regulation	**FCC (DoC)**	Class A
	CE (DoC)	Yes
Operating Environment	**Operating Temp.**	10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity	90%, non-condensing at 35° C
RoHS	**RoHS 6/6 Compliant**	Yes

Package Contains	**Motherboard**	(1) S7056 Motherboard
	Manual	(1) Quick Installation Guide
	Installation CD	(1) TYAN installation CD
	I/O Shield	(1) I/O Shield
	Cable SATA	(2) SATA signal cables / (1) Mini-SAS cable to 4 x SATA cables

TYAN S7056 (S7056WGM3NR5-HE [BTO])

Processor	**Supported CPU Series**		Intel Xeon Processor E5-2600/E5-2600 V2 Series
	Socket Type / Q'ty		LGA2011 / (2)
	Thermal Design Power (TDP) wattage		Max up to 150W
	System Bus		Up to 8.0/ 7.2/ 6.4 GT/s with Intel QuickPath Interconnect (QPI) support
Chipset	**PCH**		Intel C602 with upgrade ROM module
Memory	**Supported DIMM Qty**		(8)+(8) DIMM slots
	DIMM Type / Speed		UDIMM/RDIMM/LRDIMM ECC 1066 / 1333 / 1600 / 1866 *Speed 1866 only for 1 slot per channel 1.5V (Blue color DIMM slot)
	Capacity		up to 128GB UDIMM / 512GB RDIMM / 512GB LRDIMM
	Memory channel		4 Channels per CPU / Support 2 R/LR-DIMMs or 2 UDIMMs per channel
	Memory voltage		1.5V or 1.35V
Expansion Slots	**PCI-E**		(2) sets of the following expansion combination: (1) PCI-E x16 slot in-lined with / (1) PCI-E x4 slot (routed to PCI-E x8 bus) recommended to use TYAN riser card
	Recommended TYAN Riser Card		M7056-L24-3F, PCI-E x16 2U riser card (left) / M7056-R24-3F, PCI-E x16 2U riser card (right)
Recommended Barebone / Chassis	**2U Barebone**		GN70-B7056
LAN	**Port Q'ty**		(3) GbE ports
	Controller		Intel 82574L / Intel I350BT2
Storage	**SAS**	**Connector**	(8) SAS
		Controller	Intel C602 with TRK-6 upgrade ROM module
		Speed	3.0 Gb/s (mini-SAS connector)
		RAID	RAID 0/1/10/5 (Intel Integrated RAID upgrade ROM 6)
	SATA	**Connector**	(6) SATA
		Controller	Intel C602
		Speed	(2) 6.0 Gb/s (blue color), (4) 3.0 Gb/s (mini-SAS connector)
		RAID	RAID 0/1/10/5 (Intel RST)
Graphic	**Connector type**		D-Sub 15-pin
	Resolution		Up to 1920x1200
	Chipset		Aspeed AST2300

Input /Output	**USB**	(7) USB2.0 ports (2 at rear, 4 via cable, 1 type A onboard)
	COM	(1) header / (1) port (rear)
	SAS	(2) Mini-SAS (4-in-1) connectors
	VGA	(1) D-Sub 15-pin VGA port
	RJ-45	(3) GbE ports
	Power	SSI 24-pin + 8-pin + 8-pin power connectors / SSI EEB spec. 2008
	Front Panel	(1) 2x12-pin SSI front panel header
	SATA	(1) Mini-SAS connector & (2) SATA-III connectors
System Monitoring	**Chipset**	Nuvoton 83773G
	Voltage	Monitors voltage for CPU, memory, chipset & power supply
	Fan	Total (7) 4-pin headers
	Temperature	Monitors temperature for CPU & system environment
	Others	Watchdog timer support
Server Management	**Onboard Chipset**	Onboard Aspeed AST2300
	AST2300 IPMI Feature	IPMI 2.0 compliant baseboard management controller (BMC) / Supports storage over IP and remote platform-flash / USB 2.0 virtual hub
	AST2300 iKVM Feature	24-bit high quality video compression / 10/100 Mb/s MAC interface
BIOS	**Brand / ROM size**	AMI / 8MB
	Feature	Plug and Play (PnP) /PCI2.3 /WfM2.0 /SMBIOS2.3 /PXE boot / ACPI 2.0 power management /Power on mode after power recovery / User-configurable H/W monitoring / Auto-configurable of hard disk types
Physical Dimension	**Form Factor**	EATX
	Board Dimension	12”x13” (305x330mm)
Operating System	**OS supported list**	Please visit our Web site for the latest update.
Regulation	**FCC (DoC)**	Class A
	CE (DoC)	Yes
Operating Environment	**Operating Temp.**	10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity	90%, non-condensing at 35° C
RoHS	**RoHS 6/6 Compliant**	Yes
Package Contains	**Motherboard**	(1) S7056 Motherboard
	Manual	(1) Quick Installation Guide
	Installation CD	(1) TYAN installation CD
	I/O Shield	(1) I/O Shield

	Cable	**SATA**	(2) SATA signal cables / (1) Mini-SAS cable to 4 x SATA cables

1.3 Software Specifications

For the latest OS (operation system) support, please visit the Tyan's Web site for information.

NOTE

Chapter 2: Board Installation

You are now ready to install your motherboard.

How to install our products right… the first time

The first thing you should do is read this user's manual. It contains important information that will make configuration and setup much easier. Here are some precautions you should take when installing your motherboard:

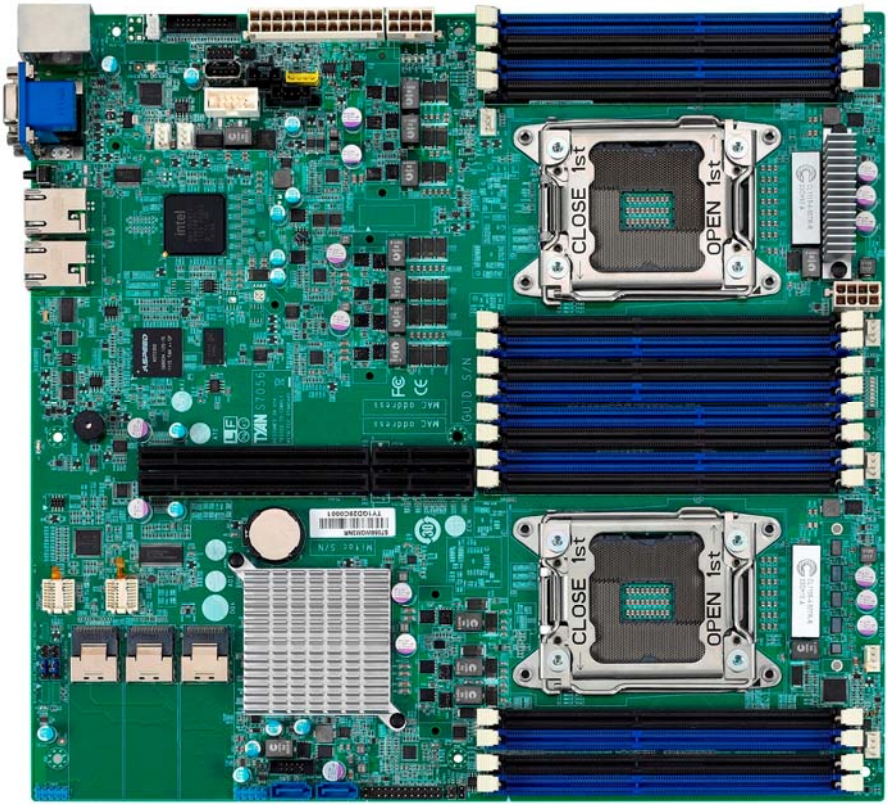
(1) Ground yourself properly before removing your motherboard from the antistatic bag. Unplug the power from your computer power supply and then touch a safely grounded object to release static charge (i.e. power supply case). For the safest conditions, MiTAC recommends wearing a static safety wrist strap.
(2) Hold the motherboard by its edges and do not touch the bottom of the board, or flex the board in any way.
(3) Avoid touching the motherboard components, IC chips, connectors, memory modules, and leads.
(4) Place the motherboard on a grounded antistatic surface or on the antistatic bag that the board was shipped in.
(5) Inspect the board for damage.

The following pages include details on how to install your motherboard into your chassis, as well as installing the processor, memory, disk drives and cables.

Caution!

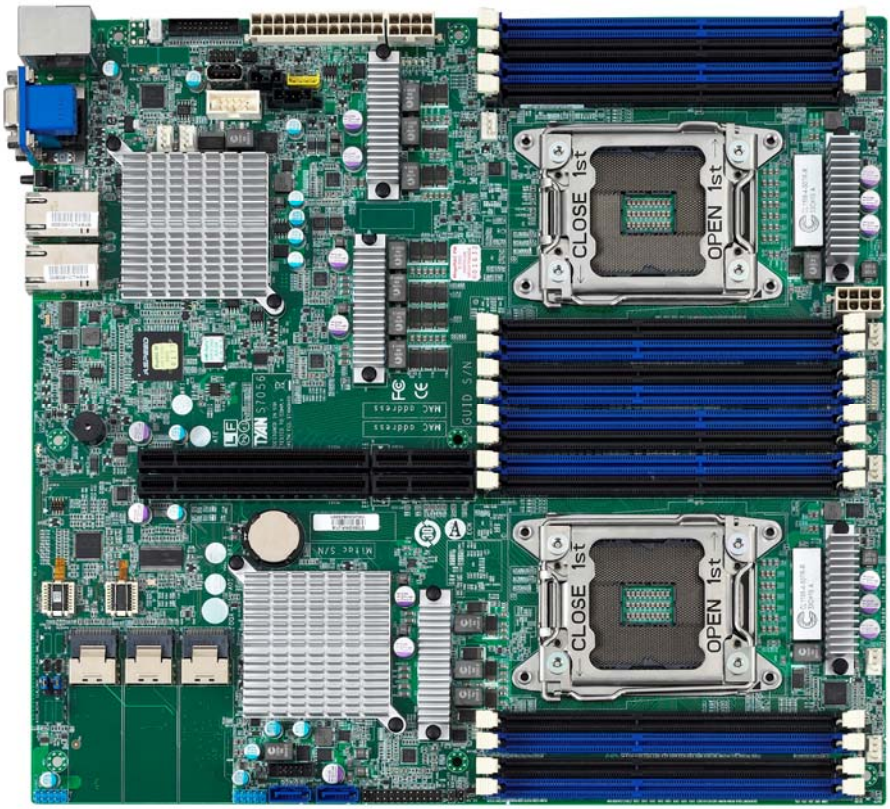
1. To avoid damaging the motherboard and associated components, do not use torque force greater than 7kgf/cm (6.09 lb/in) on each mounting screw for motherboard installation.
2. Do not apply power to the board if it has been damaged.

2.1 Board Image



S7056

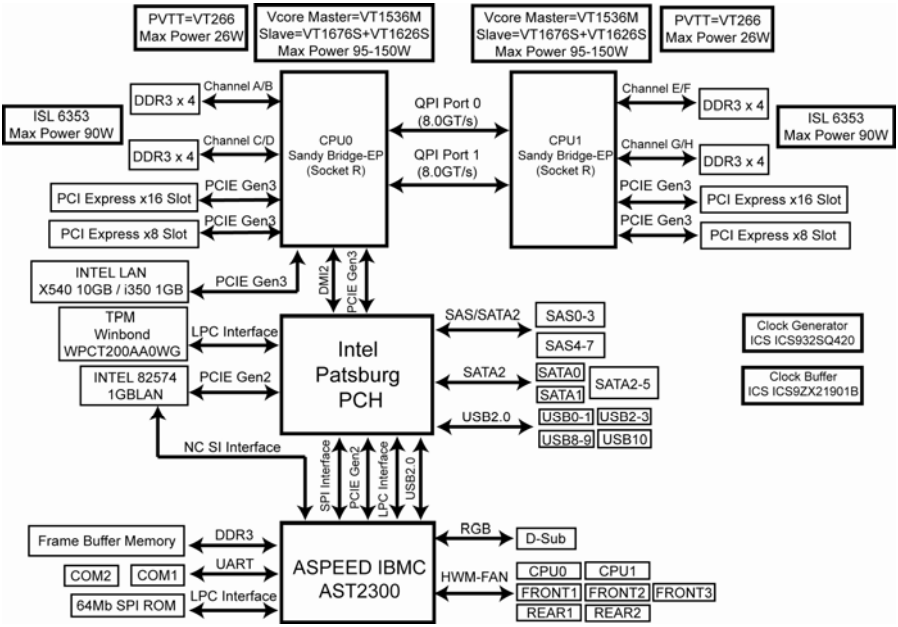
This picture is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above picture.



S7056-2T

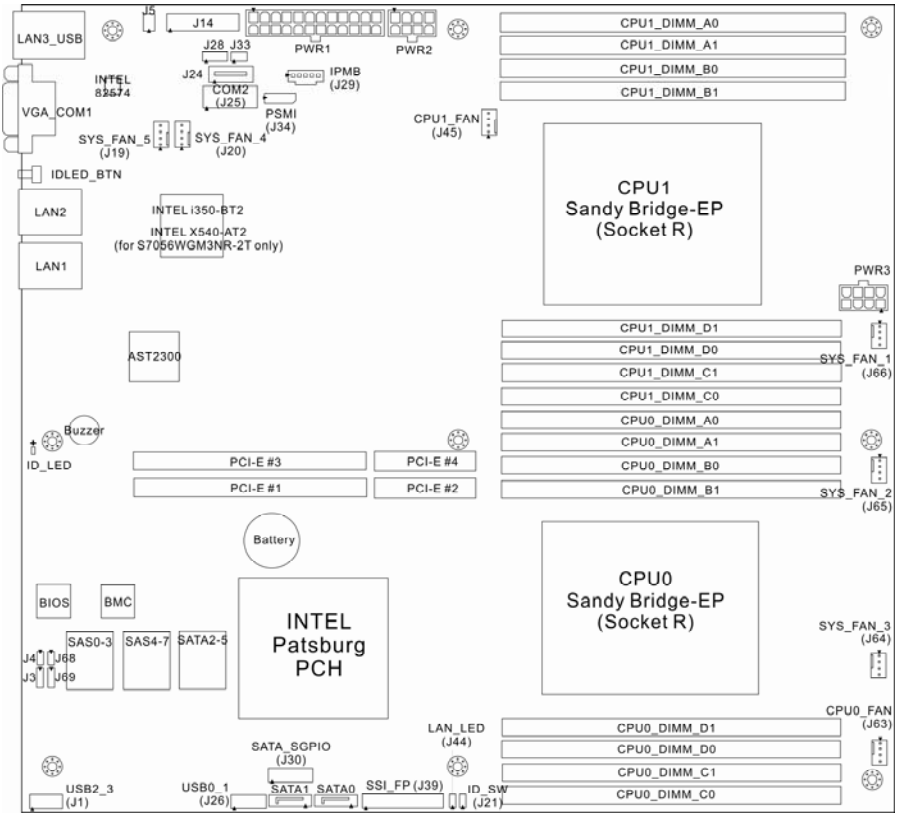
This picture is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above picture.

2.2 Block Diagram



S7056 Block Diagram

2.3 Board Parts, Jumpers and Connectors



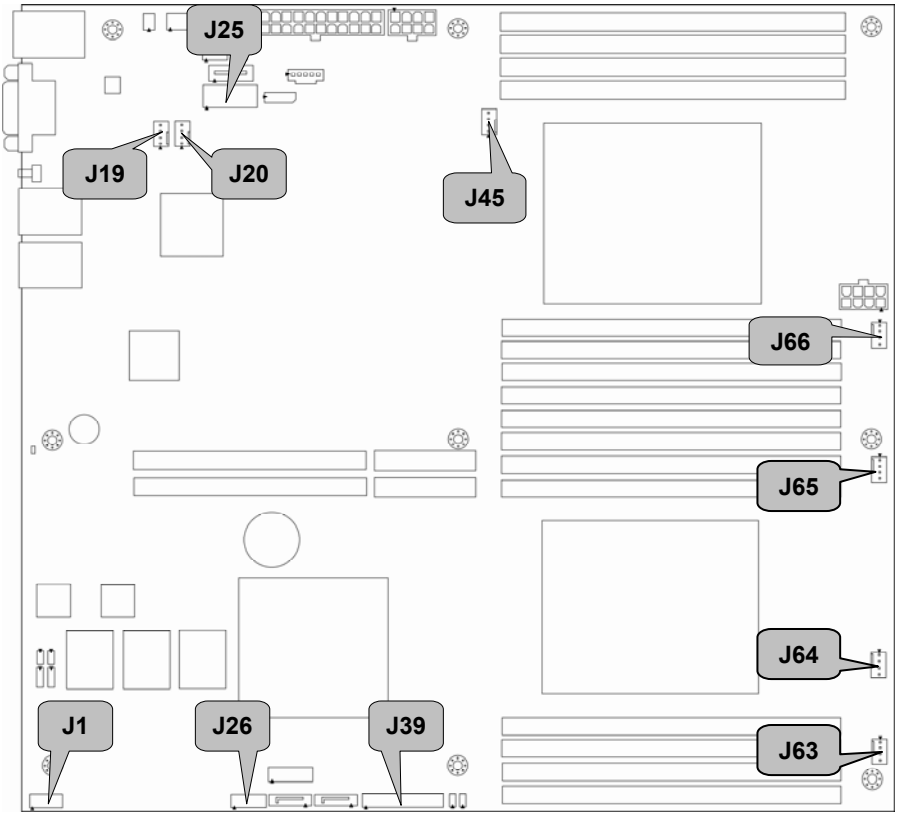
This diagram is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above diagram. The DIMM slot numbers shown above can be used as a reference when reviewing the DIMM population guidelines shown later in the manual. For the latest board revision, please visit our web site at http://www.tyan.com.

Jumpers & Connectors

Jumper/Connector	Function
J1/J26	USB Front Panel Header (blue)
J3	Clear CMOS Jumper
J4	Chassis Intrusion Header
J5	PCH SKU Upgrade ROM Module Header
J14	Front Fan Connector
J21 (ID_SW)	ID LED SW Connector
J24	Type-A USB Connector
J25 (COM2)	COM2 Header
J27 (PWR1)	ATX 24-pin Power Connector
J28	Port 80 Header
J29	IPMB Connector
J30 (SATA_SGPIO)	SATA SGPIO Header
J33	SAS SMB Header
J34	PSMI Connector
J39 (SSI_FP)	Front Panel Connector
J43 (PWR2)	SSI 8-pin CPU Power Connector
J44 (LAN_LED)	LAN3 LED Header
J62 (PWR3)	SSI 8-pin DIMM Power Connector
J68	Flash Security Override Header
J69	ME Firmware Update Jumper
IDLED_BTN	ID LED Button
ID_LED	ID LED
SATA0/SATA1	Serial ATA Connector
J19/J20/J64/J65/J66	4-pin Fan Power Connector
J45/J63	4-pin CPU1/CPU0 Fan Power Connector

Jumper Legend

	**OPEN - Jumper OFF**	Without jumper cover
	**CLOSED - Jumper ON**	With jumper cover


J25
J19
J20
J45
J66
J65
J64
J1
J26
J39
J63

J19/J20//J45/J63/J64/J65/J66: 4-Pin FAN Connector

Pin	1	2	3	4
Signal	GND	+12V	Sensor	Control

Use this header to connect the cooling fan to your motherboard to keep the system stable and reliable.

Note: A 4-pin fan is required for fan speed control.

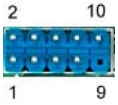
J25: COM2 Header

Signal	Pin	Pin	Signal
DCD	1	2	DSR
SIN	3	4	RTS
SOUT	5	6	CTS
DTR	7	8	RI
GND	9	10	KEY

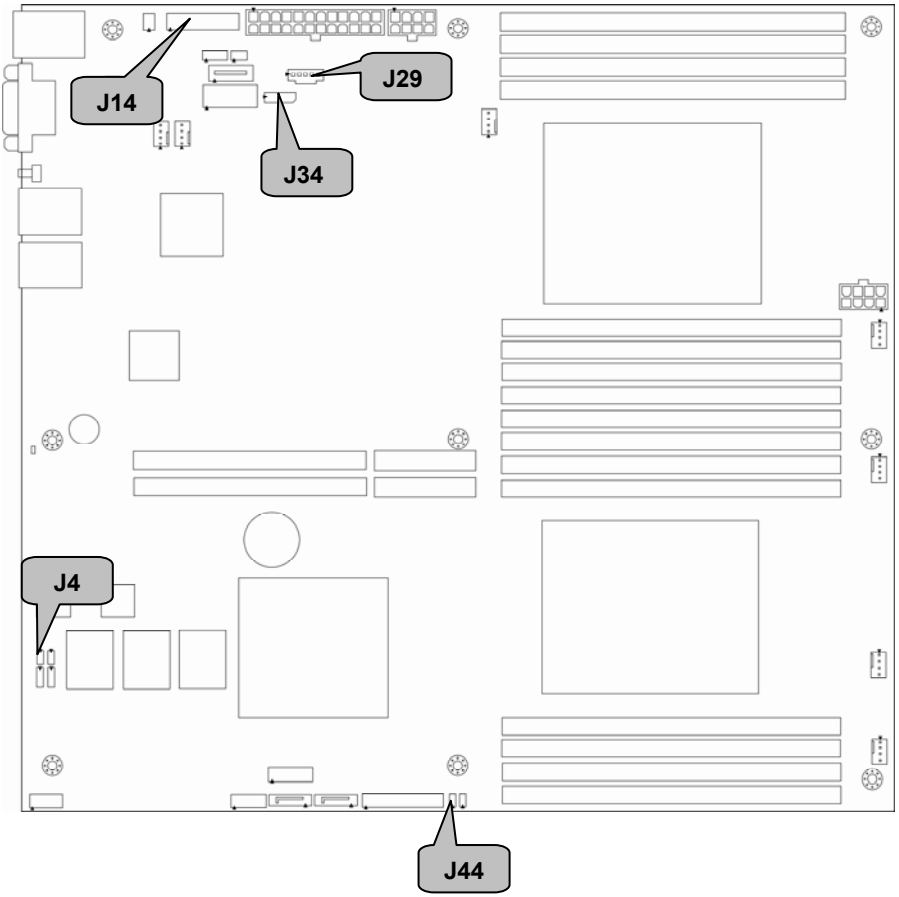
J39: Front Panel Connector

Signal	Pin	Pin	Signal
PWRLED+	1	2	V3P3_AUX
KEY	3	4	IDLED+
PWRLED-	5	6	IDLED-
HDDLED+	7	8	SYS_FAULT1-
HDDLED-	9	10	SYS_FAULT2-
PWR_SW#	11	12	LAN1LED+
GND	13	14	LAN1LED-
RST_SW#	15	16	SMBDATA
GND	17	18	SMBCLK
IDLED_SW#	19	20	INTRUSION#
NC	21	22	LAN2LED+
NMI_SW#	23	24	LAN2LED-

J1/J26: USB Front Panel Header (blue)



Signal	Pin	Pin	Signal
VCC	1	2	VCC
USBD-	3	4	USBD-
USBD+	5	6	USBD+
GND	7	8	GND
KEY	9	10	NC


J14
J29
J34
J4
J44

J4: Chassis Intrusion Header

1  Open	**Pin**	**1**	**2**
	Signal	INTRUSION#	GND
1  Short (**Default**)	Open: Use this header to **trigger** the system chassis intrusion alarm. Short: Use this header to **disable** the system chassis intrusion alarm.		

J14: Front Fan Connector (Reserved for Barebone Fan Board)

Signal	Pin	Pin	Signal
FAN1_TACH	**1**	**2**	FAN2_TACH
FAN3_TACH	**3**	**4**	FAN4_TACH
FAN5_TACH	**5**	**6**	FAN6_TACH
FAN7_TACH	**7**	**8**	FAN8_TACH
FAN9_TACH	**9**	**10**	FAN10_TACH
GND	**11**	**12**	KEY
PWM2	**13**	**14**	PWM1
FAN11_TACH	**15**	**16**	SMB_DATA
FAN12_TACH	**17**	**18**	SMB_CLK
3VAUX	**19**	**20**	PWM3

J29: IPMB Connector

1  4

Signal	Pin	Pin	Signal
BMC_SMB_DATA	**1**	**2**	GND
BMC_SMB_CLK	**3**	**4**	NC

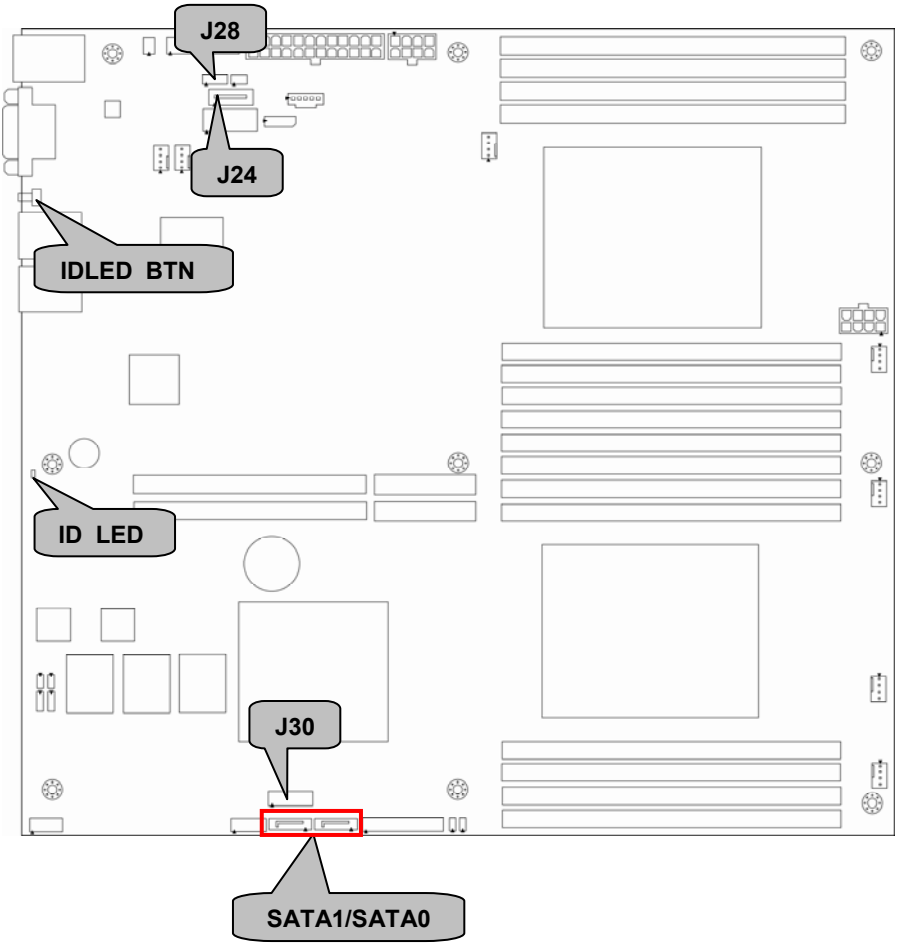
J34: PSMI Connector

1  5

Pin	1	2	3	4	5
Signal	SMB_CLK	SMB_DAT	SMB_ALERT#	GND	V3P3

J44: LAN3 LED Header

Pin	1	2
Signal	LAN3LED+	LAN3LED-


J28
J24
IDLED BTN
ID LED
J30
SATA1/SATA0

J28: Port 80 Header

Signal	Pin	Pin	Signal
V3P3	1	2	FRAME
LAD0	3	4	KEY
LAD1	5	6	RESET#
LAD2	7	8	GND
LAD3	9	10	CLK

ID_LED / IDLED_BTN: ID LED and Button

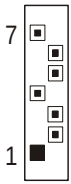
Pin	Signal	
+	P3V3_AUX	
-	ID_SW_L	
State	**Color**	**Description**
On	Blue	System identified
Off	Off	System not identified

NOTE: The ID LED can be activated remotely using IPMI.
Please visit the TYAN Web Site at **http://www.tyan.com** to download the latest IPMI Configuration Guide for more details.

J24: Vertical (Type A) USB Connectors

Pin	1	2	3	4
Signal	VCC	USBD-	USBD+	GND

SATA0/SATA1: SATA2 Connector

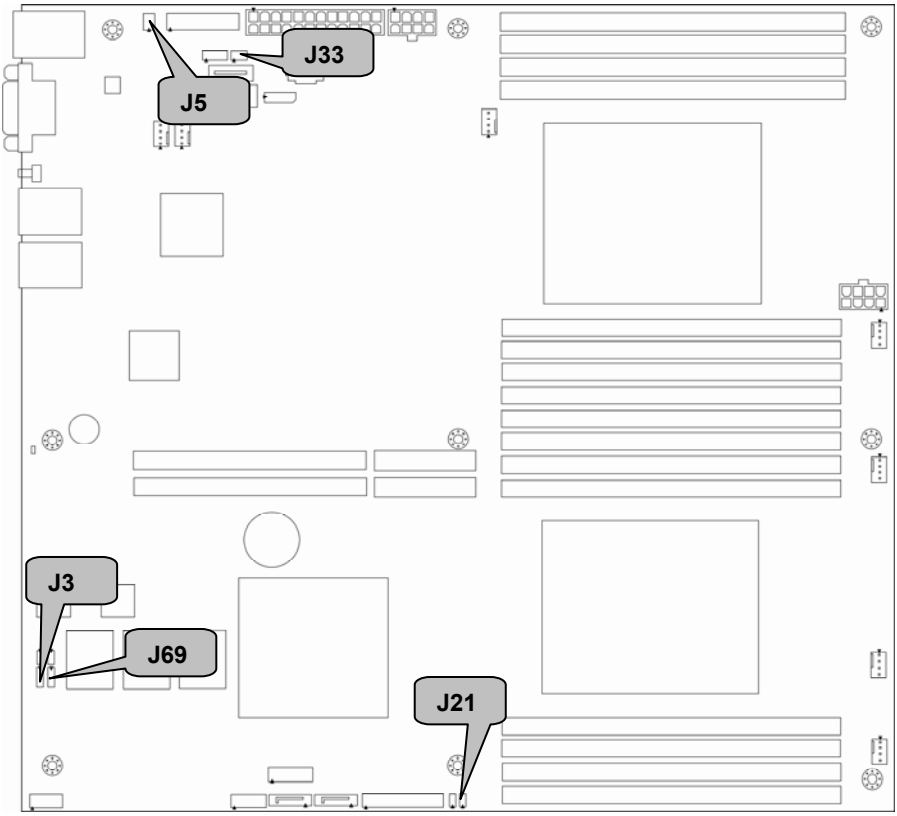


1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

Connects to the Serial ATA ready drives via the Serial ATA cable.

J30: SATA SGPIO Header

Signal	Pin	Pin	Signal
SMBCLK	1	2	SDATAOUT0
SMBDATA	3	4	SDATAOUT1
GND	5	6	SLOAD
KEY	7	8	SCLOCK
VCC3_AUX	8	10	HDD_FAULT


J33
J5
J3
J69
J21

J3: Clear CMOS Jumper

 Normal (**Default**)	You can reset the CMOS settings by using this jumper. This can be useful if you have forgotten your system/setup password, or need to clear the system BIOS setting. 1. Power off system and disconnect power connectors from the motherboard. 2. Remove the jumper from Pin_1 and Pin_2 (Default setting). 3. Move the jumper cap to close Pin_2 and Pin_3 for several seconds to Clear CMOS. 4. Put jumper cap back to Pin_1 and Pin_2 (Default setting). 5. Reconnect power connectors to the motherboard and power on system.
 Clear CMOS	

J69: ME Firmware Update Jumper

	Pin 1-2 Closed: no function (**Default**)
	Pin 2-3 Closed: clear ME to default setting

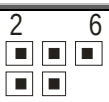
J5: PCH SKU Upgrade ROM Module Header

Pin	1	2	3
Signal	GND	PCH_SKU_KEY	GND

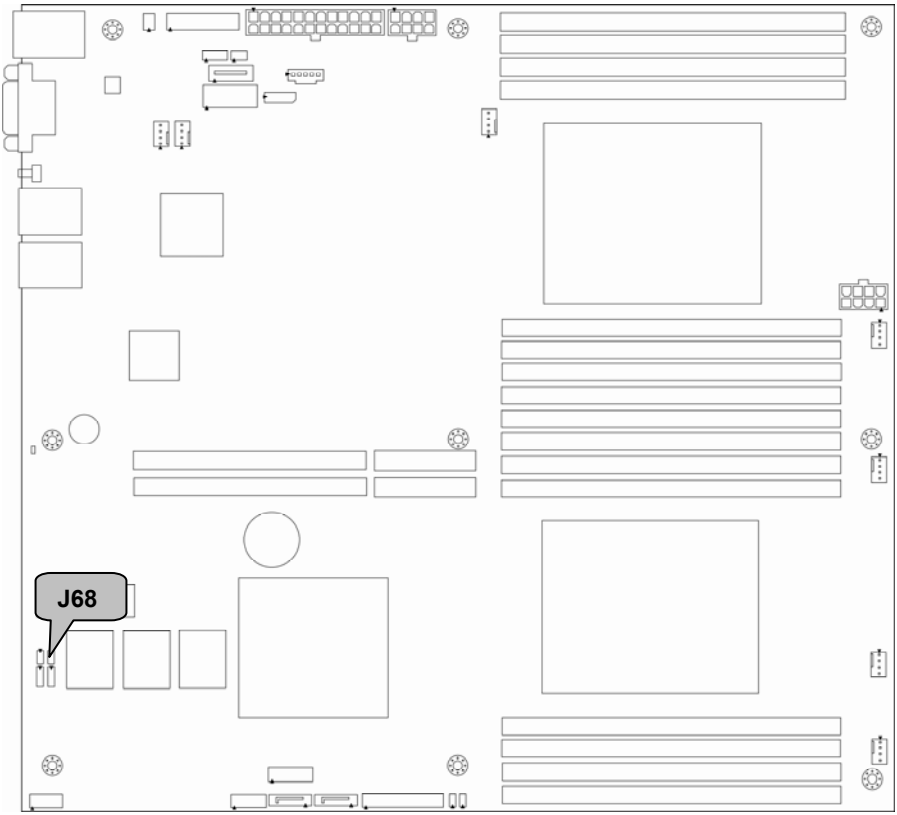
J21: ID LED SW Connector

Pin	1	2
Signal	IDLED_SW#	GND

J33: SAS SMB Header



Signal	Pin	Pin	Signal
Power	1	2	SMBus Clock
Ground	3	4	SMBus Data
NC	5	6	Fault


J68

J68: Flash Security Override Header

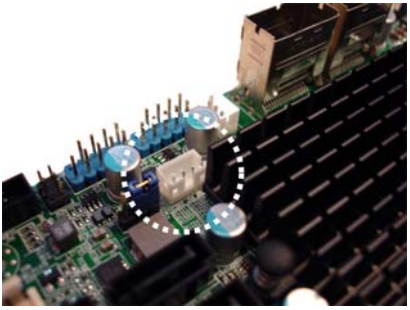
1	Pin	1	2
	Signal	V3P3_AUX	AUD_AZA_SDO

Patsburg Upgrade ROM Key Installation

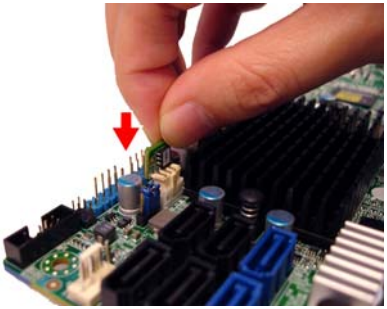
The following procedures illustrate how to install the Patsburg Upgrade ROM Key on the motherboard. Please note that the motherboard may not look like the board you purchased. Therefore, the illustrations should be held for your reference only.

1. Take out the Patsburg Upgrade ROM Key.

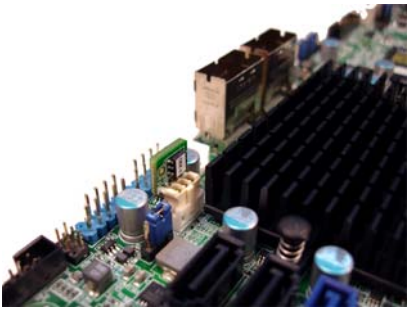
2. Locate the Patsburg Upgrade ROM Header on your motherboard. Please note that the picture is only an example and may not exactly match your particular motherboard.



3. Insert the Upgrade ROM Key in the direction as the arrow shows.



4. You have completed the Patsburg Upgrade ROM Key installation.



2.4 Installing the Processor and Heatsink

The types of processors supported by the S7056 are listed in the ***Hardware Specifications*** section on page 5. Check our website at **http://www.tyan.com** for the latest list of validated Intel® processors for this specific motherboard.

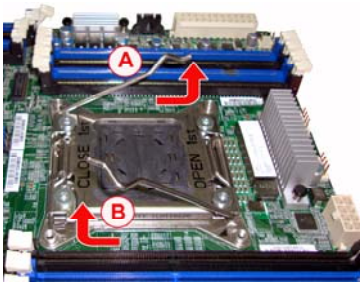
> **NOTE:** MiTAC is not liable for damage as a result of operating an unsupported configuration.

Processor Installation (Socket R for Intel Sandy Bridge CPU)

Follow the steps described later to install the processors and heat sinks.
The following pictures illustrate how to install the Intel® Sandy Bridge processor on the Socket R. Please note that the motherboard may not look exactly like the one you purchased. Therefore, the illustrations should be held for your reference only.

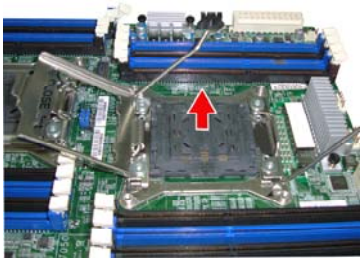
NOTE: Please save and replace the CPU protection cap when returning for service.

1. Locate the CPU socket.
2. Pull the CPU lever slightly away from the socket and then push it to a fully open position.

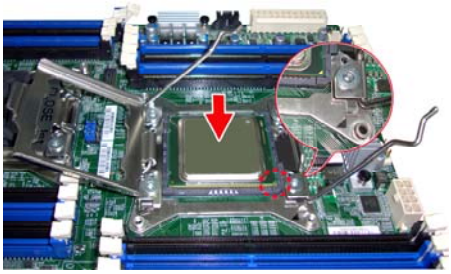


3. Lift the socket cover to a fully open position.

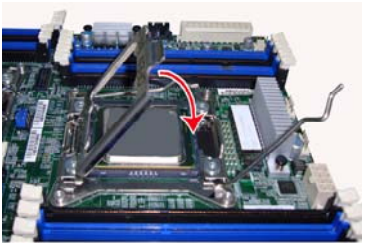
4. Take off the CPU protection cap.

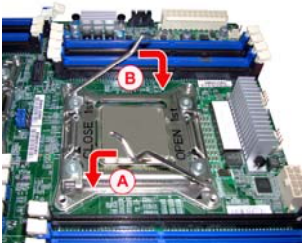


5. Place the CPU in the CPU socket and make sure that the gold arrow is located in the right direction with two notches properly aligned.



6. Close the socket cover and press the CPU socket lever down to lock the CPU in place.





7. The CPU installation is now complete.

Heat sink Installation

After installing the processor, you will need to proceed to install the heat sink. The CPU heat sink will ensure that the processor do not overheat and continue to operate at maximum performance for as long as you own them. An overheated processor is dangerous to the motherboard. The processors will overheat within seconds, enter thermal protection, and shut down if heatsinks are not installed.

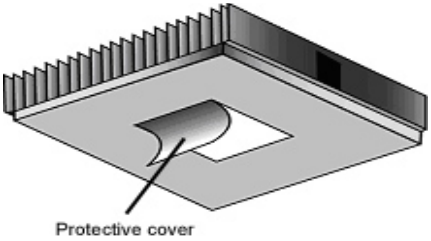
For the safest method of installation and information on choosing the appropriate heat sink, using heat sinks validated by Intel®. Please refer to the Intel® website: **http://www.intel.com**

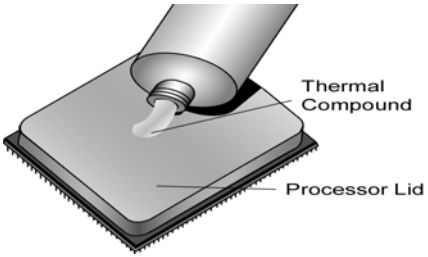
The following diagram illustrates how to install the heatsink on the Intel® Sandy Bridge Socket R:

1. Place the heat sink on top of the CPU and secure it to the motherboard with 4 screws.

2. Connect the fan power cord.

2.5 Thermal Interface Material





There are two types of thermal interface materials designed for use with the processors.

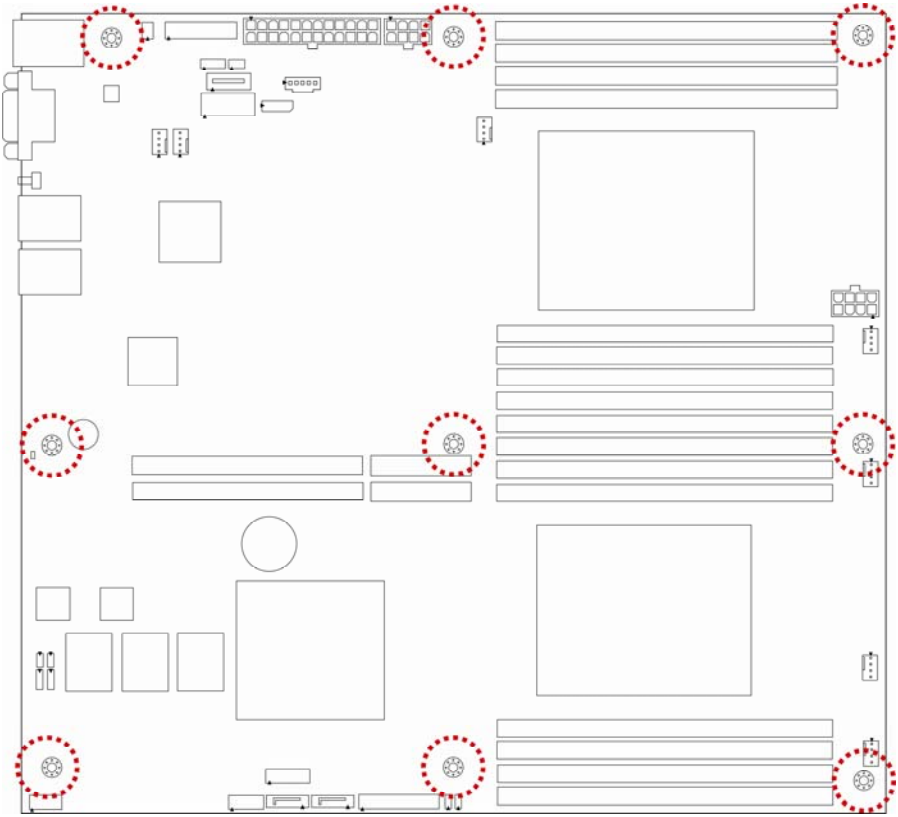
The most common material comes as a small pad attached to the heat sink at the time of purchase. There should be a protective cover over the material. Take care not to touch this material. Simply remove the protective cover and place the heat sink on the processor.

The second type of interface material is usually packaged separately. It is commonly referred to as 'thermal compound'. Simply apply a thin layer on to the CPU lid (applying too much will actually reduce the cooling).

NOTE: Always check with the manufacturer of the heat sink & processor to ensure that the thermal interface material is compatible with the processor and meets the manufacturer's warranty requirements.

2.6 Tips on Installing Motherboard in Chassis

Before installing your motherboard, make sure your chassis has the necessary motherboard support studs installed. These studs are usually metal and are gold in color. Usually, the chassis manufacturer will pre-install the support studs. If you are unsure of stud placement, simply lay the motherboard inside the chassis and align the screw holes of the motherboard to the studs inside the case. If there are any studs missing, you will know right away since the motherboard will not be able to be securely installed.

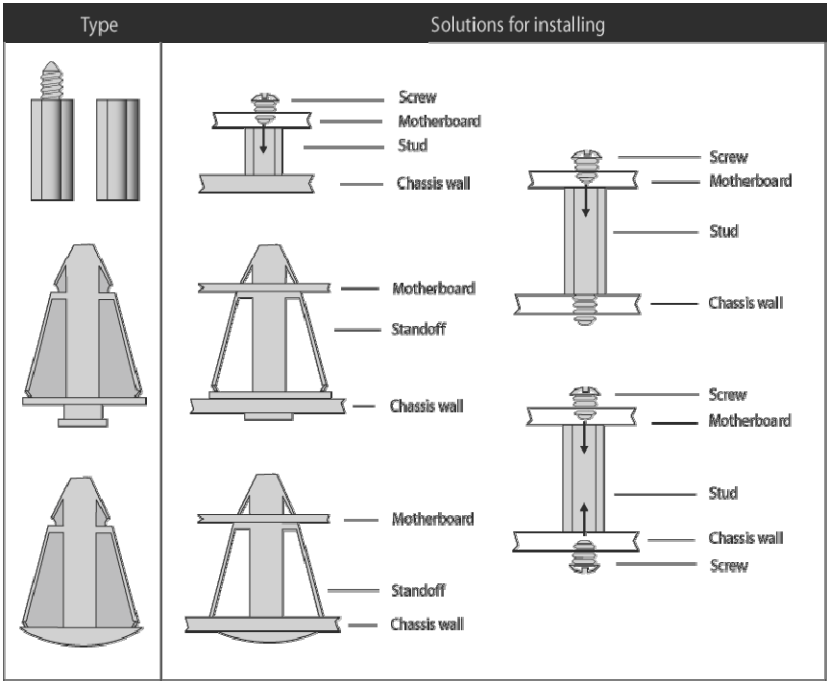


Note: Be especially careful to look for extra stand-offs. If there are any stand-offs present that are not aligned with a mounting hole on the motherboard, it will likely short components on the back of the motherboard when installed. This will cause malfunction and/or damage to your motherboard.

Some chassis include plastic studs instead of metal. Although the plastic studs are usable, MiTAC recommends using metal studs with screws that will fasten the motherboard more securely in place.

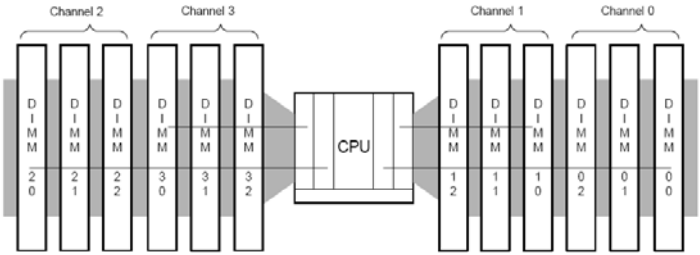
Below is a chart detailing what the most common motherboard studs look like and how they should be installed.

Mounting the Motherboard



2.7 Installing the Memory

Before installing memory, ensure that the memory you have is compatible with the motherboard and processor. Check the TYAN Web site at http://**www.tyan.com** for details of the type of memory recommended for your motherboard.



- The Sandy Bridge-EP/EX processor is a quad-channel design with a total of 4 DDR3 channels
- This platform supports Unbuffered DDR3, Registered DDR3, and LR DIMM (Load Reduced DIMM) DDR3 for buffered memory solutions demanding higher capacity memory subsystems.
- DDR3 data transfer rates of 800, 1066, 1333, and 1600 MT/s are supported
- Each memory channel is 72 or 64 bits wide for ECC or Non-ECC
- Both 1.5V and 1.35V DDR3 DIMMs are supported
- Gb, 2-Gb, and 4-Gb DDR3 DRAM technologies are supported for these devices:
  - UDIMMs x8, x16
  - RDIMMs x4, x8
  - LRDIMM x4, x8
- Up to 8 ranks are supported per memory channel. DIMMS may be 1, 2 or 4 ranks per module.
- All installed memory will automatically be detected. No jumpers or settings need to be changed for memory detection.
- All memory must be of the same type and density. **Registered, Unbuffered, and LRDIMM memory types can NOT be mixed and matched on the same motherboard.**

Recommended Memory Population Table

	Single CPU Installed (CPU0 only)							
Quantity of memory installed	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
CPU0_DIMM_A0	√	√	√	√	√	√	√	√
CPU0_DIMM_A1					√	√	√	√
CPU0_DIMM_B0		√	√	√	√	√	√	√
CPU0_DIMM_B1						√	√	√
CPU0_DIMM_C0			√	√	√	√	√	√
CPU0_DIMM_C1							√	√
CPU0_DIMM_D0				√	√	√	√	√
CPU0_DIMM_D1								√

NOTE:

1. √ indicates a populated DIMM slot.
2. Use paired memory installation for max performance.
3. Populate the same DIMM type in each channel, specifically
   - Use the same DIMM size
   - Use the same # of ranks per DIMM
4. Dual-rank DIMMs are recommended over single-rank DIMMs.
5. Un-buffered DIMM can offer slightly better performance than registerd DIMM if populating only a single DIMM per channel.
6. Always install with DIMM_A0 Slot first, following the alphabetical order (starting with DIMM_A0, DIMM_B0, DIMM_C0, DIMM_D0), and then the numerical order (starting with DIMM_A1, DIMM_B1, DIMM_C1, DIMM_D1, DIMM_A2, DIMM_B2, DIMM_C2, DIMM_D2).

	Dual CPU installed (CPU0 and CPU1)										
Quantity of memory installed	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**10**	**12**	**14**	**16**
CPU0_DIMM_A0	√	√	√	√	√	√	√	√	√	√	√
CPU0_DIMM_A1								√	√	√	√
CPU0_DIMM_B0		√	√	√	√	√	√	√	√	√	√
CPU0_DIMM_B1									√	√	√
CPU0_DIMM_C0				√	√	√	√	√	√	√	√
CPU0_DIMM_C1									√	√	√
CPU0_DIMM_D0						√	√	√	√	√	√
CPU0_DIMM_D1											√
CPU1_DIMM_A0	√	√	√	√	√	√	√	√	√	√	√
CPU1_DIMM_A1								√	√	√	√
CPU1_DIMM_B0			√	√	√	√	√	√	√	√	√
CPU1_DIMM_B1										√	√
CPU1_DIMM_C0					√	√	√	√	√	√	√
CPU1_DIMM_C1										√	√
CPU1_DIMM_D0							√	√	√	√	√
CPU1_DIMM_D1											√

NOTE:

1. √ indicates a populated DIMM slot.
2. Use paired memory installation for max performance.
3. Populate the same DIMM type in each channel, specifically
   - Use the same DIMM size
   - Use the same # of ranks per DIMM
4. Dual-rank DIMMs are recommended over single-rank DIMMs.
5. Un-buffered DIMM can offer slightly better performance than registerd DIMM if populating only a single DIMM per channel.
6. Always install with CPU0 and DIMM_A0 Slot first, following the alphabetical order, (for example: CPU0_DIMM_A0, CPU1_DIMM_A0, CPU0_DIMM_B0, CPU1_DIMM_B0) and then the numerical order (for example: CPU0_DIMM_A1, CPU1_DIMM_A1, CPU0_DIMM_A2, CPU1_DIMM_A2).

Intel®Xeon®processor E5-2600 product families UDIMM Support

Ranks Per DIMM & Data Width	Memory Capacity per DIMM			1.35V		1.50V	
				1DPC	2DPC	1DPC	2DPC
SRx8 Non-ECC	1 GB	2GB	4GB	N/A	N/A	1066, 1333	1066, 1333
DRx8 Non-ECC	2GB	4GB	8GB	N/A	N/A	1066, 1333	1066, 1333
SRx16 Non-ECC	512 MB	1GB	2GB	N/A	N/A	1066, 1333	1066, 1333
SRx8 ECC	1GB	2GB	4GB	1066, 1333	1066	1066, 1333	1066, 1333
DRx8 ECC	2GB	4GB	8GB	1066, 1333	1066	1066, 1333	1066, 1333

Intel®Xeon®processor E5-1600/2600 product families v2 UDIMM Support (Reduce Length)

Ranks Per DIMM & Data Width	Memory Capacity per DIMM			1.35V		1.50V	
				1DPC	2DPC	1DPC	2DPC
SRx8 Non-ECC	1 GB	2GB	4GB	N/A	N/A	1066, 1333, 1600, 1866	1066, 1333, 1600
DRx8 Non-ECC	2GB	4GB	8GB	N/A	N/A	1066, 1333, 1600, 1866	1066, 1333, 1600
SRx16 Non-ECC	512 MB	1GB	2GB	N/A	N/A	1066, 1333, 1600, 1866	1066, 1333, 1600
SRx8 ECC	1GB	2GB	4GB	1066, 1333	1066, 1333	1066, 1333, 1600, 1866	1066, 1333, 1600
DRx8 ECC	2GB	4GB	8GB	1066, 1333	1066, 1333	1066, 1333, 1600, 1866	1066, 1333, 1600

NOTE 1: The blue blocks indicate that the DRAM Densities are supported but not validated.

NOTE 2: The grey blocks indicate that the DRAM Densities are supported and validated.

NOTE 3: 1DPC => One dimm per channel

NOTE 4: 2DPC => Two dimm per channel

- Supported DRAM Densities are 1Gb, 2Gb and 4Gb. Only 2Gb and 4Gb are validated by Intel.
- Command Address Timing is 1N for 1DPC and 2N for 2DPC.

Intel®Xeon®processor E5-2600 product families LRDIMM Support

Ranks Per DIMM & Data Width	Memory Capacity per DIMM		1.35V		1.50V	
			1DPC	2DPC	1DPC	2DPC
QRx4 (DDP)	16GB	32GB	1066	1066	1066, 1333	1066, 1333
QRx8 (P)	8GB	16GB	1066	1066	1066, 1333	1066, 1333

Intel®Xeon®processor E5-1600/2600 v2 product families LRDIMM Support (Reduce Length)

Ranks Per DIMM & Data Width	Memory Capacity per DIMM		1.35V		1.50V	
			1DPC	2DPC	1DPC	2DPC
QRx4 (DDP)	16GB	32GB	1066, 1333, 1600	1066, 1333, 1600	1066, 1333, 1600, 1866	1066, 1333, 1600
8Rx4 (QDP)	32GB	16GB	1066	1066	1066	1066

NOTE 1: The grey blocks indicate that the DRAM Densities are supported and validated.
NOTE 2: 1DPC => One dimm per channel
NOTE 3: 2DPC => Two dimm per channel

- Physical Rank is used to calculate DIMM Capacity.
- Supported and validated DRAM Densities are 2Gb and 4Gb.
- Command Address Timing is 1N.
- The speeds are estimated targets and will be verified through simulation.
- DDP -Dual Die Package DRAM stacking. P –Planer monolithic DRAM Die.

Intel®Xeon®processor E5-1600/2600 product families RDIMM Support

Ranks Per DIMM & Data Width	Memory Capacity per DIMM			1.35V		1.50V	
				1DPC	2DPC	1DPC	2DPC
SRx8	1GB	2GB	4GB	1066, 1333	1066, 1333	1066, 1333, 1600	1066, 1333, 1600
DRx8	2GB	4GB	8GB	1066, 1333	1066, 1333	1066, 1333, 1600	1066, 1333, 1600
SRx4	2GB	4GB	8GB	1066, 1333	1066, 1333	1066, 1333, 1600	1066, 1333, 1600
DRx4	4GB	8GB	16GB	1066, 1333	1066, 1333	1066, 1333, 1600	1066, 1333, 1600
QRx4	8GB	16GB	32GB	800	800	1066	800
QRx8	4GB	8GB	16GB	800	800	1066	800

Intel®Xeon®processor E5-2600 v2 product families RDIMM Support (Reduce Length)

Ranks Per DIMM & Data Width	Memory Capacity per DIMM			1.35V		1.50V	
				1DPC	2DPC	1DPC	2DPC
SRx8	1GB	2GB	4GB	1066, 1333	1066, 1333	1066, 1333, 1600, 1866	1066, 1333, 1600
DRx8	2GB	4GB	8GB	1066, 1333	1066, 1333	1066, 1333, 1600, 1866	1066, 1333, 1600
SRx4	2GB	4GB	8GB	1066, 1333	1066, 1333	1066, 1333, 1600, 1866	1066, 1333, 1600
DRx4	4GB	8GB	16GB	1066, 1333	1066, 1333	1066, 1333, 1600, 1866	1066, 1333, 1600
QRx4	8GB	16GB	32GB	800	800	800, 1066	800
QRx8	4GB	8GB	16GB	800	800	800, 1066	800

NOTE 1: The blue blocks indicate that the DRAM Densities are supported but not validated.

NOTE 2: The grey blocks indicate that the DRAM Densities are supported and validated.

NOTE 3: The yellow blocks indicate that the DRAM Densities are supported with limited validated.

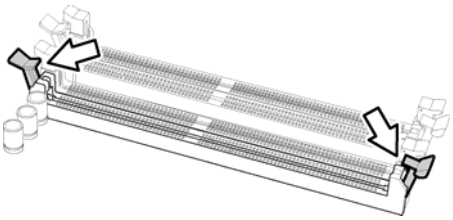
NOTE 4: 1DPC => One dimm per channel
NOTE 5: 2DPC => Two dimm per channel

- Supported DRAM Densities are 1Gb, 2Gb and 4Gb. Only 2Gb and 4Gb are validated by Intel.
- Command Address Timing is 1N.
- QR RDIMM are supported but not validated by Intel/PMO in a homogenous environment. The coverage will have limited system level testing, no signal integrity testing, and no interoperability testing. The passing QR RDIMMs will be web posted.

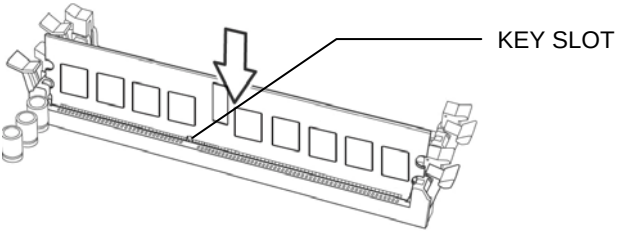
Memory Installation Procedure

Follow these instructions to install memory modules into the S7056.

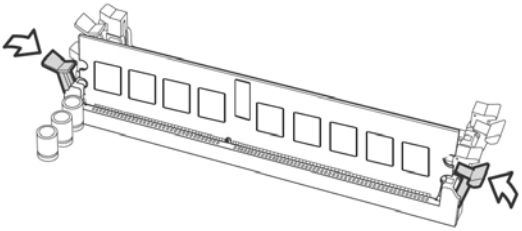
1. Press the locking levers in the direction shown in the following illustration.



2. Align the memory module with the socket. The memory module is keyed to fit only one way in the socket.



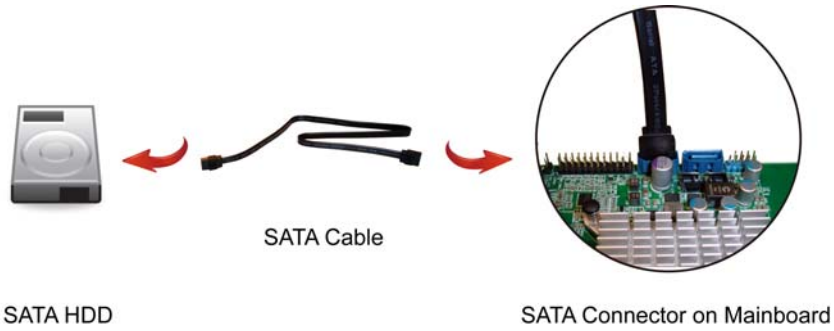
3. Seat the module firmly into the socket by gently pressing down until it sits flush with the socket. The locking levers pop up into place.



2.8 Attaching Drive Cables

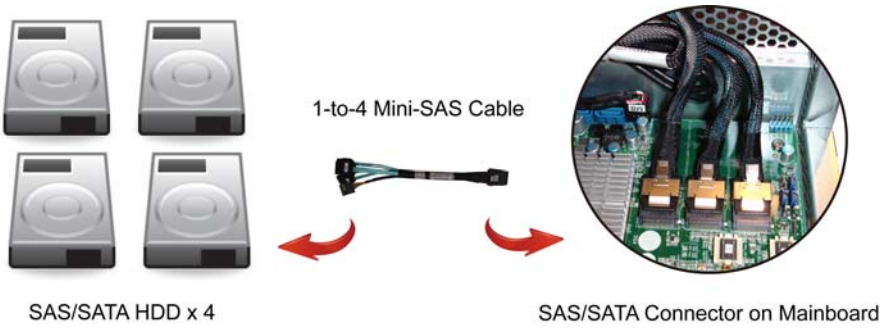
Attaching SATA Cables

The following illustrates how to make a SATA Cable connection. If you are in need of SATA/SAS cables or power adapters please contact your local sales representative.



Attaching SAS Cables

The following illustrates how to make a SAS Cable connection. If you are in need of SATA/SAS cables or power adapters please contact your local sales representative.



2.9 Installing Add-In Cards

Before installing add-in cards, it's helpful to know if they are fully compatible with your motherboard. For this reason, we've provided the diagrams below, showing the slots that may appear on your motherboard.

PCI-E Gen3 x16 slot

PCI-E Gen3 x4 slot

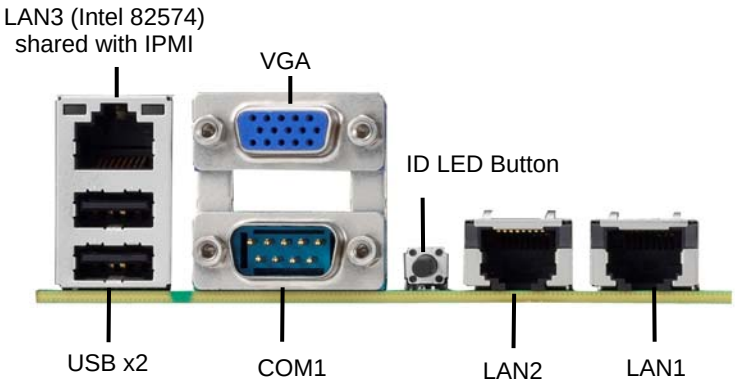
Simply find the appropriate slot for your add-in card and insert the card firmly. Do not force any add-in cards into any slots if they do not seat in place. It is better to try another slot or return the faulty card rather than damaging both the motherboard and the add-in card.

TIP: It's a good practice to install add-in cards in a staggered manner rather than making them directly adjacent to each other. Doing so allows air to circulate within the chassis more easily, thus improving cooling for all installed devices.

NOTE: You must always unplug the power connector from the motherboard before performing system hardware changes to avoid damaging the board or expansion device.

2.10 Connecting External Devices

Connecting external devices to the motherboard is an easy task. The motherboard supports a number of different interfaces through connecting peripherals. See the following diagrams for the details.

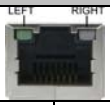


NOTE:

1. When i350 LAN chip is on, LAN1 and LAN2 can support 10Mbps~1Gbps.
2. When X540 LAN chip is on, LAN1 and LAN2 can support up to 100Mbps~10Gbps.
3. Peripheral devices can be plugged straight into any of these ports but software may be required to complete the installation.

Onboard LAN LED Color Definition

The **three** onboard Ethernet ports have green and yellow LEDs to indicate LAN status. The chart below illustrates the different LED states.

10/100/1000 Mbps LAN Link/Activity LED Scheme			
		**Left LED (Link/Activity)**	**Right LED (Speed)**
No Link		OFF	OFF
10 Mbps	**Link**	Green	OFF
	Active	Blinking Green	OFF
100 Mbps	**Link**	Green	Solid Green
	Active	Blinking Green	Solid Green
1000 Mbps	**Link**	Green	Solid Yellow
	Active	Blinking Green	Solid Yellow
10 Gbps	**Link**	Yellow	Solid Yellow
	Active	Blinking Yellow	Solid Yellow

2.11 Installing the Power Supply

There are **three (3)** power connectors on your S7056 motherboard. The S7056 supports EPS 12V power supply.

PWR1 (J27): ATX 24-Pin Power Connector

Signal	Pin	Pin	Signal
V3P3	1	13	V3P3
V3P3	2	14	-12V
GND	3	15	GND
+5V	4	16	PS_ON#
GND	5	17	GND
+5V	6	18	GND
GND	7	19	GND
PWROK	8	20	Reserved
5VSB	9	21	+5V
+12V	10	22	+5V
+12V	11	23	+5V
V3P3	12	24	GND

PWR2 (J43) / PWR3 (J62): SSI 8-Pin CPU/DIMM Power Connector

Signal	Pin	Pin	Signal
GND	1	2	+12V
GND	3	4	+12V
GND	5	6	+12V
GND	7	8	+12V

NOTE: You must unplug the power supply before plugging the power cables to motherboard connectors.

2.12 Finishing Up

Congratulations on making it this far! You have finished setting up the hardware aspect of your computer. Before closing up your chassis, make sure that all cables and wires are connected properly, especially SATA cables and most importantly, jumpers. You may have difficulty powering on your system if the motherboard jumpers are not set correctly.
In the rare circumstance that you have experienced difficulty, you can find help by asking your vendor for assistance. If they are not available for assistance, please find setup information and documentation online at our website or by calling your vendor's support line.

Chapter 3: BIOS Setup

3.1 About the BIOS

The BIOS is the basic input/output system, the firmware on the motherboard that enables your hardware to interface with your software. The BIOS determines what a computer can do without accessing programs from a disk. The BIOS contains all the code required to control the keyboard, display screen, disk drives, serial communications, and a number of miscellaneous functions. This chapter describes the various BIOS settings that can be used to configure your system.

The BIOS section of this manual is subject to change without notice and is provided for reference purposes only. The settings and configurations of the BIOS are current at the time of print and are subject to change, and therefore may not match exactly what is displayed on screen.

This section describes the BIOS setup program. The setup program lets you modify basic configuration settings. The settings are then stored in a dedicated, battery-backed memory (called NVRAM) that retains the information even when the power is turned off.

To start the BIOS setup utility:

1. Turn on or reboot your system.
2. Press <**F2**> or <**Del>** during POST (<**Tab**> on remote console) to start the BIOS setup utility.

3.1.1 Setup Basics

The table below shows how to navigate in the setup program using the keyboard.

Key	Function
<F1>	General help window
<ESC>	Exit current menu
←arrow → keys	Select a different menu
↑ or ↓ arrow keys	Move cursor up/down
<Tab> / <Shift-Tab>	Cycle cursor up/down
<Home> / <End>	Move cursor to top/bottom of the window
<PgUp> / <PgDn>	Move cursor to next/previous page
<->	Select the previous value/setting of the field
<+>	Select the next value/setting of the field
<F8>	Load Fail Safe default configuration values of the menu
<F3>	Load the Optimal default configuration values of the menu
<F4>	Save and exit
<Enter>	Execute command or select submenu

3.1.2 Getting Help

Pressing [**F1**] will display a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press [**ESC**] or the [**Enter**] key again.

3.1.3 In Case of Problems

If you have trouble booting your computer after making and saving the changes with the BIOS setup program, you can restart the computer by holding the power button down until the computer shuts off (usually within 4 seconds); resetting by pressing CTRL-ALT-DEL; or clearing the CMOS.
The best advice is to only alter settings that you thoroughly understand. In particular, do not change settings in the Chipset section unless you are absolutely sure of what you are doing. The Chipset defaults have been carefully chosen either by MiTAC or your system manufacturer for best performance and reliability. Even a seemingly small change to the Chipset setup options may cause the system to become unstable or unusable.

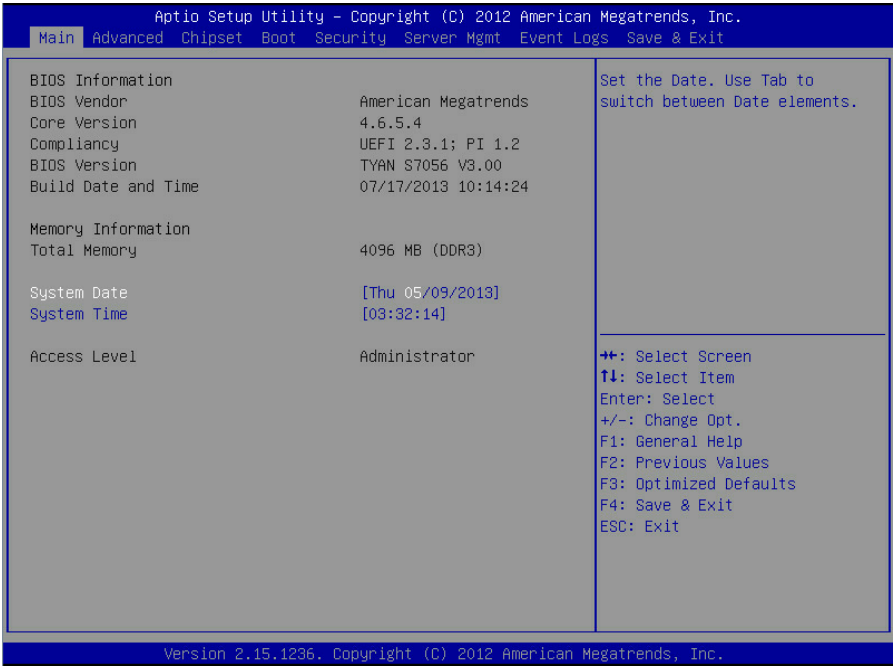
3.1.4 Setup Variations

Not all systems have the same BIOS setup layout or options. While the basic look and function of the BIOS setup remains more or less the same for most systems, the appearance of your Setup screen may differ from the charts shown in this section. Each system design and chipset combination requires a custom configuration. In addition, the final appearance of the Setup program depends on the system designer. Your system designer may decide that certain items should not be available for user configuration, and remove them from the BIOS setup program.

NOTE: The following pages provide the details of BIOS menu. Please be aware that the BIOS menus are continually changing due to continual BIOS updates over the product lifespan of the motherboard. The BIOS menus provided are current as of the date when this manual was written. Please visit TYAN's website at http://www.tyan.com for information on BIOS updates available for this specific motherboard.

3.2 Main Menu

In this section, you can alter general features such as the date and time.
Note that the options listed below are for options that can directly be changed within the Main Setup screen.



BIOS Information
It displays BIOS related information.

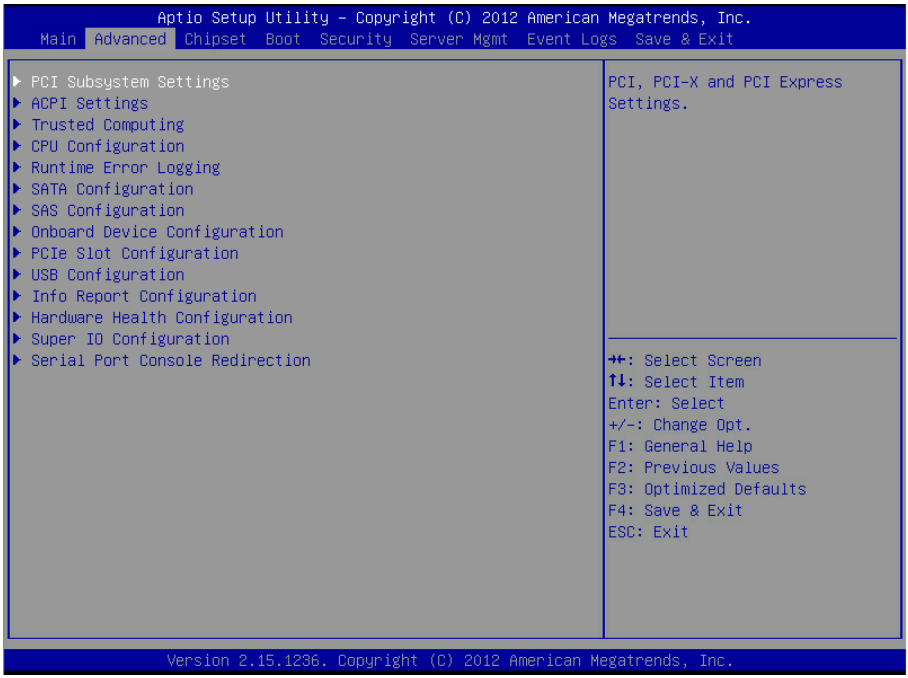
Memory Information
This displays the total memory size.

System Date
Adjust the system date.
MM (Months): DD (Days): YYYY (Years)

System Time
Adjust the system clock.
HH (24 hours format): MM (Minutes): SS (Seconds)

Access Level
Read only.

3.3 Advanced Menu



PCI Subsystem Settings
PCI, PCI-X and PCI Express Settings.

ACPI Settings
System ACPI Parameters.

Trusted Computing
Trusted Computing settings.

CPU Configuration
CPU Configuration Parameters.

Runtime Error Logging
Runtime Error Logging Support Setup Options

SATA Configuration
SATA Devices Configuration.

SAS Configuration
SAS Devices Configuration.

Onboard Device Configuration
Onboard Device Configuration.

PCIe Slot Configuration
PCIe Slot Configuration.

USB Configuration
USB Configuration Parameters.

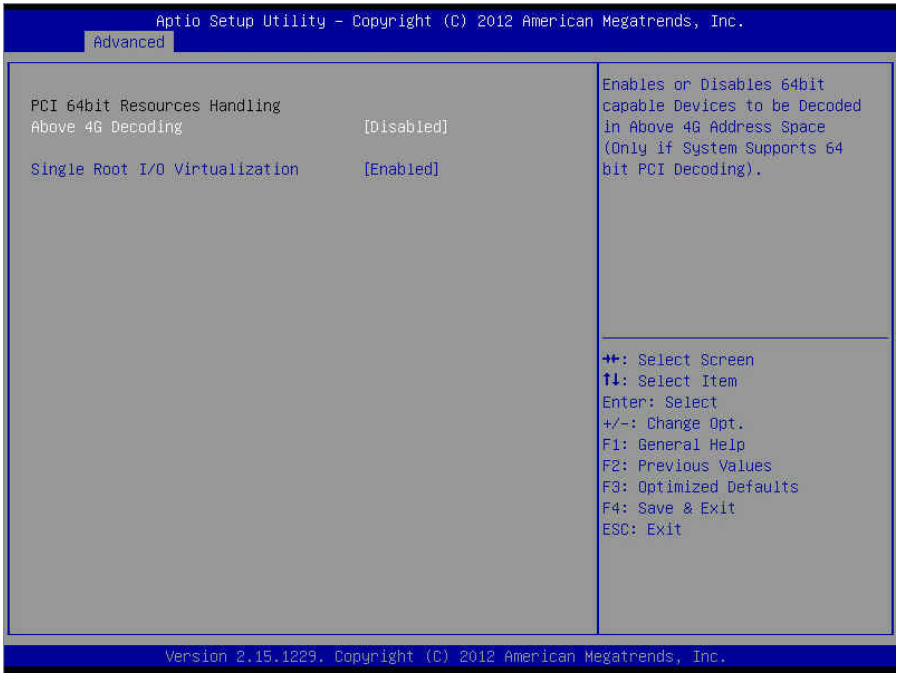
Info Report Configuration
Info Report Configuration.

Hardware Health Configuration
Hardware health Configuration Parameters.

Super IO Configuration
System Super IO Chip Parameters.

Serial Port Console Redirection
Serial Port Console Redirection.

3.3.1 PCI Subsystem Settings



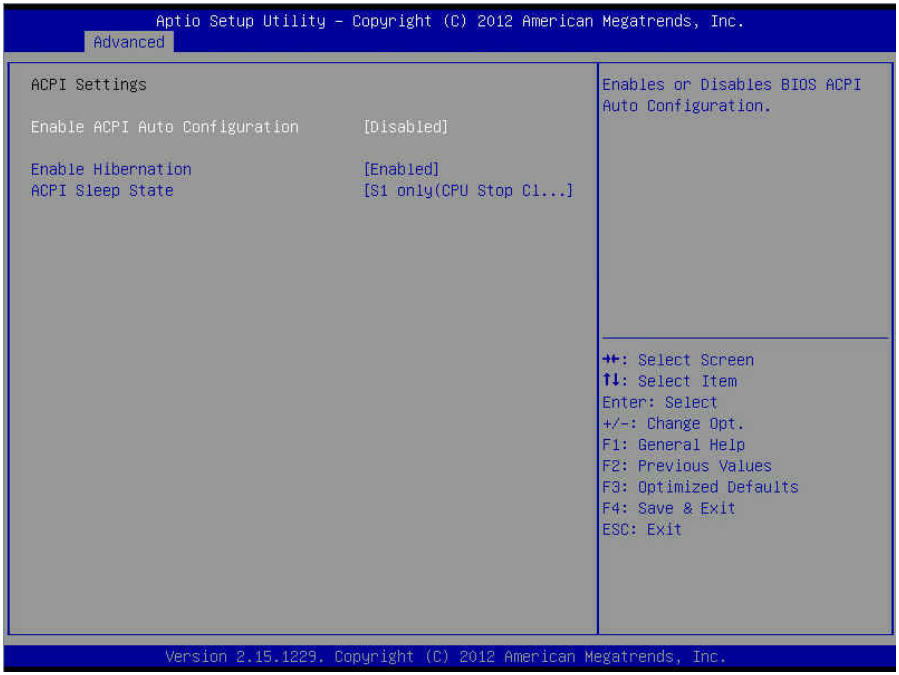
Above 4G Decoding
Enable or disable 64 bit capable devices to be decoded in Above 4G Address Space (only if system supports 64 bit PCI Decoding).

Disabled / Enabled

Single Root I/O Virtualization
Single Root I/O Virtualization (SR-IOV). SR-IOV is a specification that allows a PCIe device to enable/disable multiple separate physical PCIe devices.

Disabled / **Enabled**

3.3.2 ACPI Settings

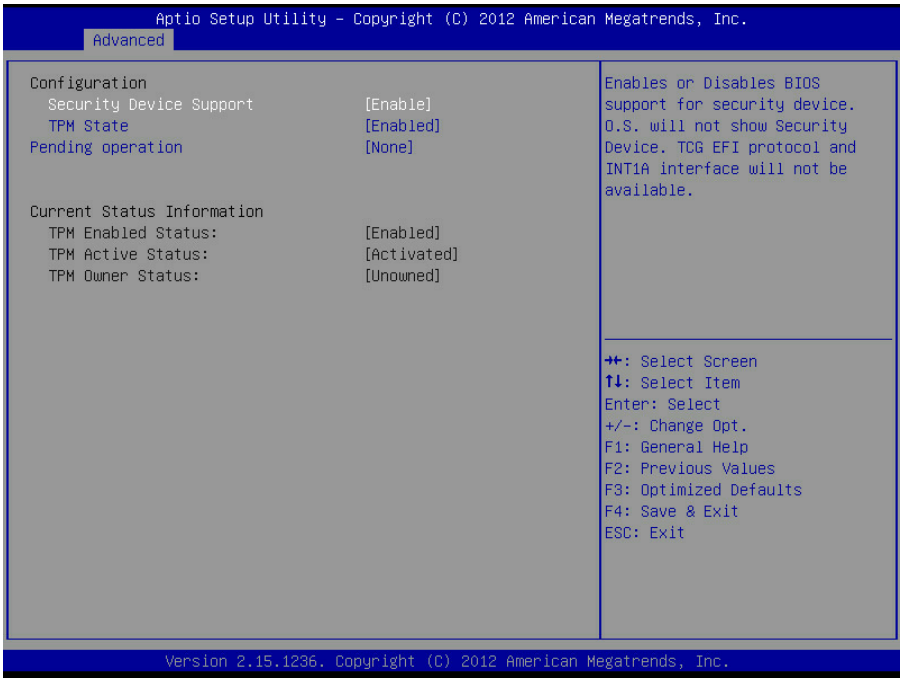


Enable ACPI Auto Configuration
Enable or disable ACPI Auto Configuration.
Disabled / Enabled

Enable Hibernation
Enable or disable System ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some OS.
Disabled / **Enabled**

ACPI Sleep State
Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.
Suspend Disabled / **S1 only (CPU Stop Clock)**

3.3.3 Trusted Computing (optional)



Security Device Support
Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INTIA interface will not be available.

Disabled / Enabled

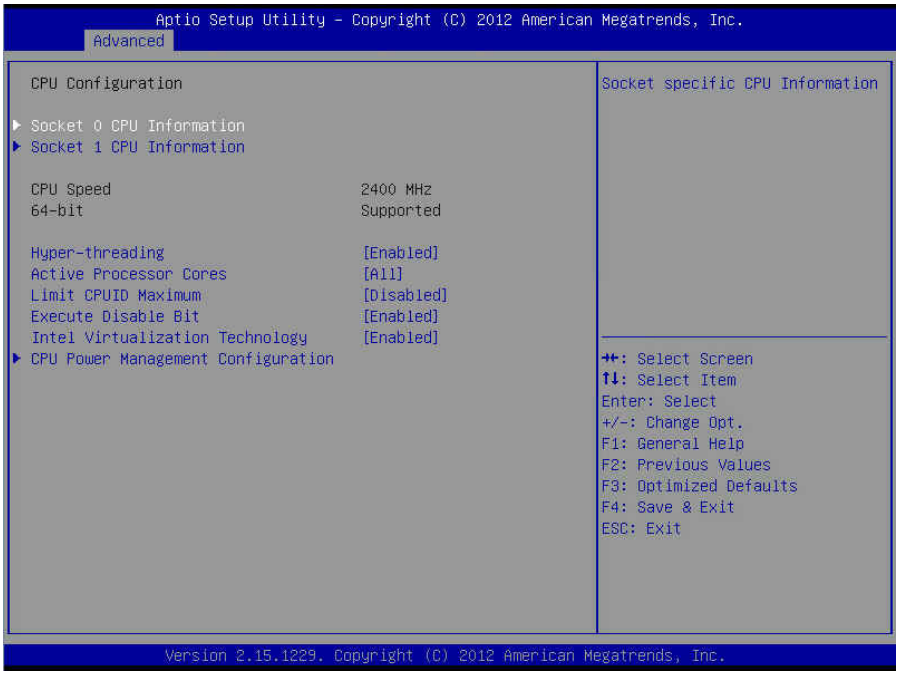
TPM State
Turn TPM Enable/Disable. NOTE: Your Computer will reboot during restart in order to change State of TPM.

Disabled / **Enabled**

Pending operation
Schedule an Operation for the Security Device. NOTE: Your Computer will reboot during restart in order to change State of Security Device.

None / Enable Take Ownership / Disable Take Ownership / TPM Clear

3.3.4 CPU Configuration



CPU Speed / 64-bit
Read only.

Hyper Threading
Enabled for Windows XP and Linux (OS optimized for Hyper Threading Technology) and disabled for other OS (OS not optimized for Hyper Threading Technology). When disabled only one thread per enabled core is enabled.

Enabled / Disabled

Active Processor Cores
Number of cores to enable in each processor package.

All / 1 / 2 / 3 / 4 / 5 / 6 / 7

Limit CPUID Maximum
Disabled for Windows XP.

Disabled / Enabled

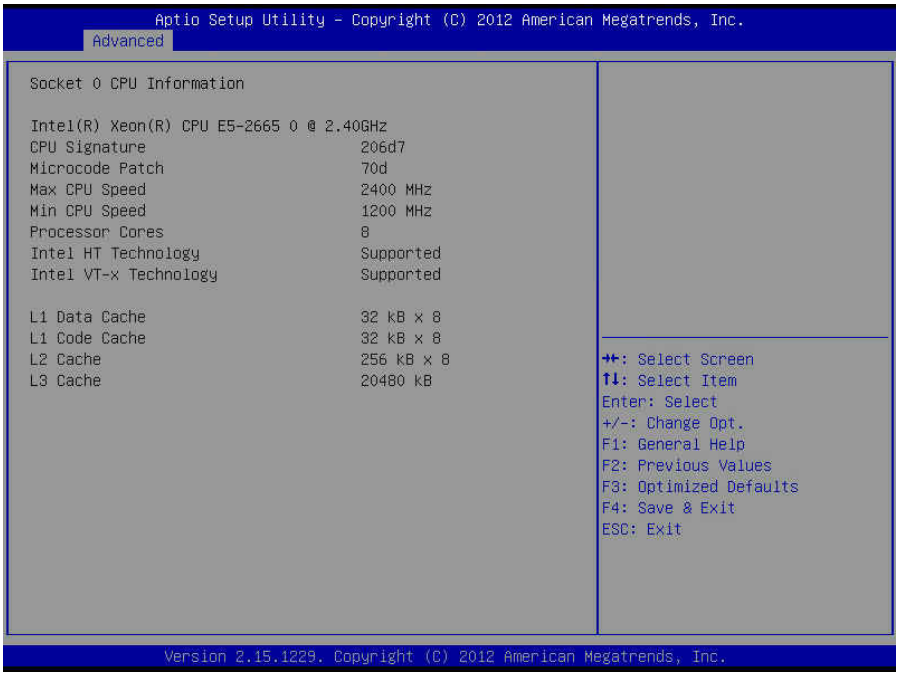
Execute Disable Bit
XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Server 2003 SP1, Windows XP SP2, SuSE Linux 9.2, RedHat Enterprise 3 Update 3).

Enabled / Disabled

Intel Virtualization Technology
When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
NOTE: Once the lock bit is set, the contents of this register can not be modified until S5 reset occurs.

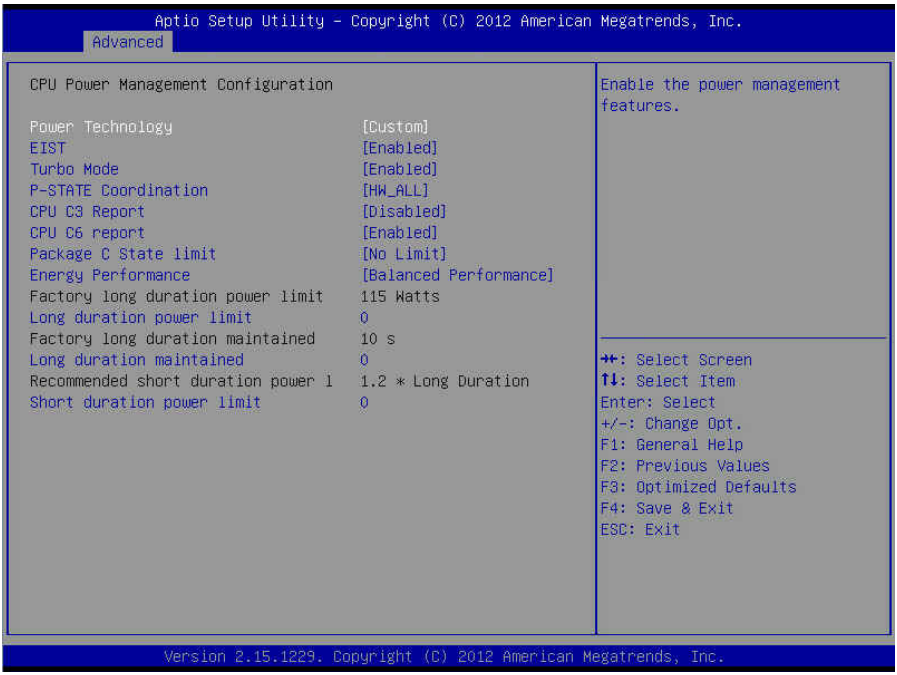
Enabled / Disabled

3.3.4.1 Socket 0/1 CPU Information



Read only.

3.3.4.2 CPU Power Management Configuration



Power Technology
Enable the power management features.
Custom / Disabled / Energy Efficient

EIST
Enable/Disable Intel StepSpeed.
Disabled / **Enabled**

Turbo Mode
Enable/Disable Turbo Mode.
Enabled / Disabled

P-STATE Coordination
Change P-State coordination type.
HW_ALL / Disabled

CPU C3 Report
Enable/Disable CPU C3 (ACPI C2) report to OS.
Disabled / Enabled

CPU C6 Report
Enable/Disable CPU C6 (ACPI C3) report to OS.
Enabled / Disabled

Package C State Limit
Select Package C State Limit.
No Limit / C0 / C2 / C6 / C7

Energy Performance
Optimize between performance and power savings. Windows 2008 and later OSes override this value according to its power plan.
Performance / Balanced performance / Balanced Energy / Energy Efficient

Factory Long Duration Power Limit
Read only.

Long Duration Power Limit
Long duration power limit in Watts.

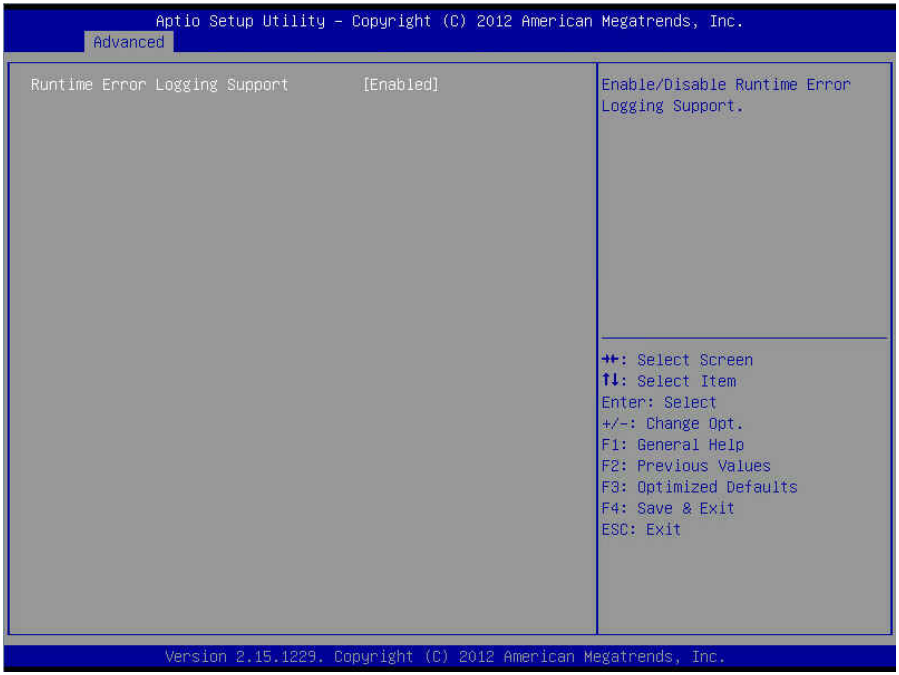
Factory Long Duration Maintained
Read only.

Long Duration Maintained
Time window which the long duration power is maintained.

Recommended short duration power limit
Read only.

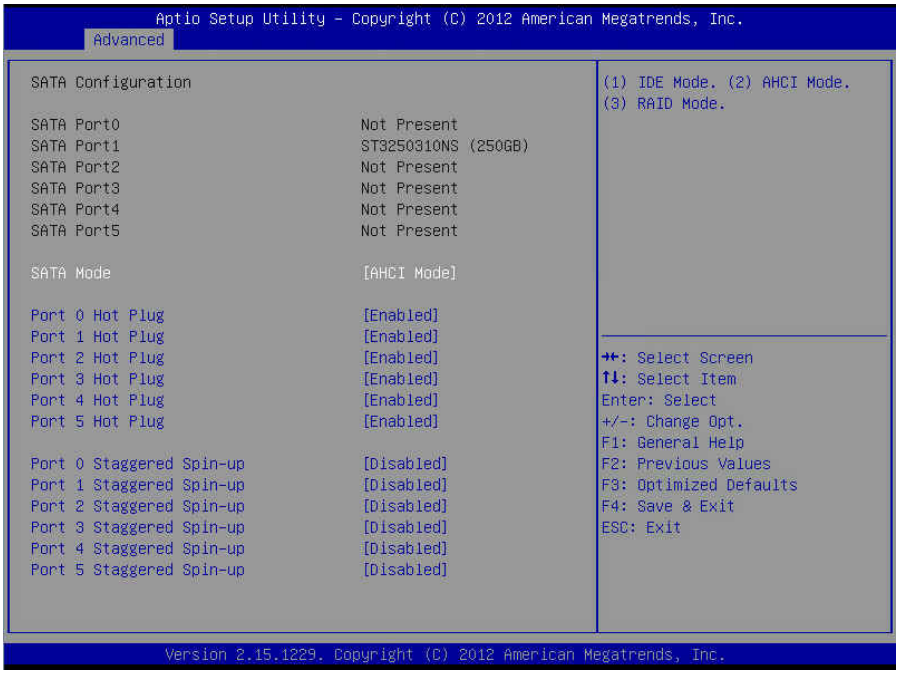
Short duration power limit
Short duration power limit in Watts.

3.3.5 Runtime Error Logging Configuration



Runtime Error Logging Support
Enable or disable Runtime Error Logging Support.
Enabled / Disabled

3.3.6 SATA Configuration



SATA Configuration

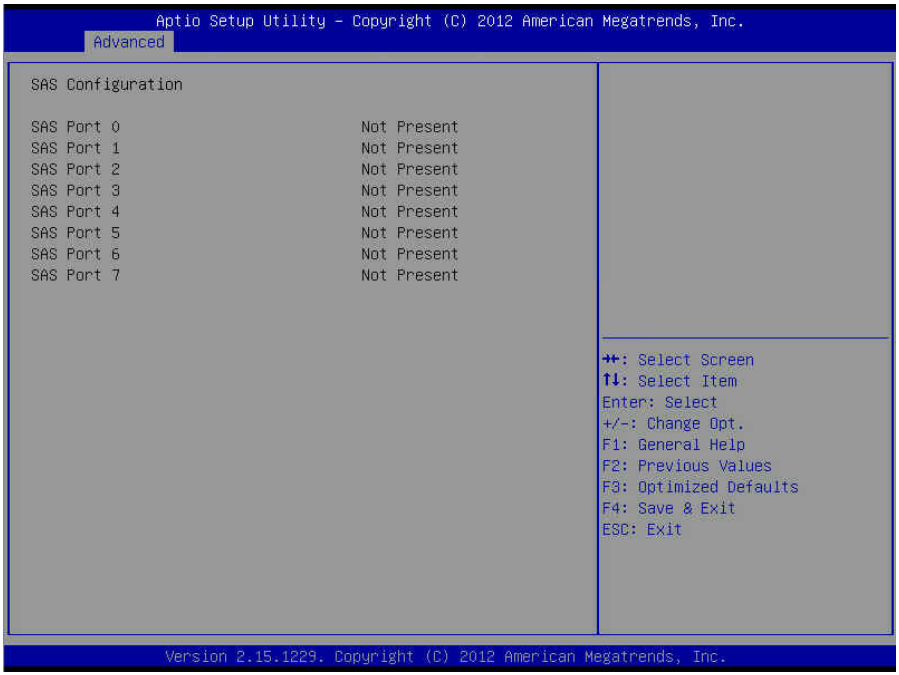
SATA Port 0 / 1 / 2 / 3 / 4 / 5
Read only.

SATA Mode
Select SATA Mode.
IDE Mode **/ AHCI Mode** / RAID Mode / Disabled

Port 0 / 1 / 2 / 3 / 4 / 5 Hot Plug
Enable/Disable SATA Ports Hot Plug Support.
Enabled / Disabled

Port 0 / 1 / 2 / 3 / 4 / 5 Staggered Spin-up
AHCI Supports Staggered Spin-up.
Disabled / Enabled

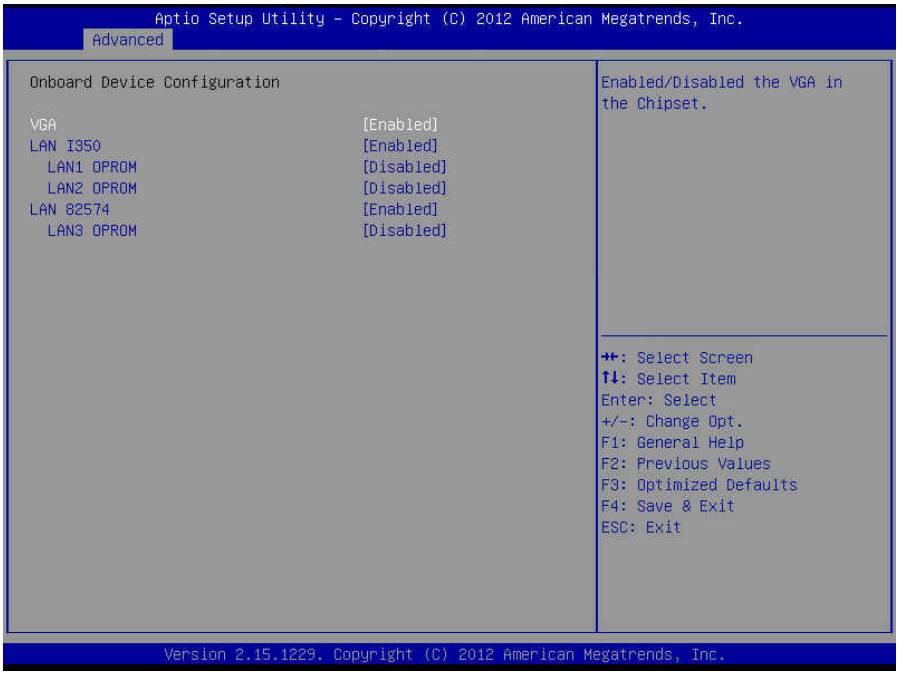
3.3.7 SAS Configuration



Read only.

NOTE: You can press [**CTRL_I**] to set the RAID function while the RAID Card OPROM is loading.

3.3.8 Onboard Device Configuration



VGA
Enabled/Disabled the VGA in the Chipset.
Enabled / Disabled

LAN i350
Enable or disable the LAN controller.
Enabled / Disabled

LAN1 Option ROM
Enabled/Disabled the LAN Option ROM in the Chipset.
Disabled / PXE / ISCSI

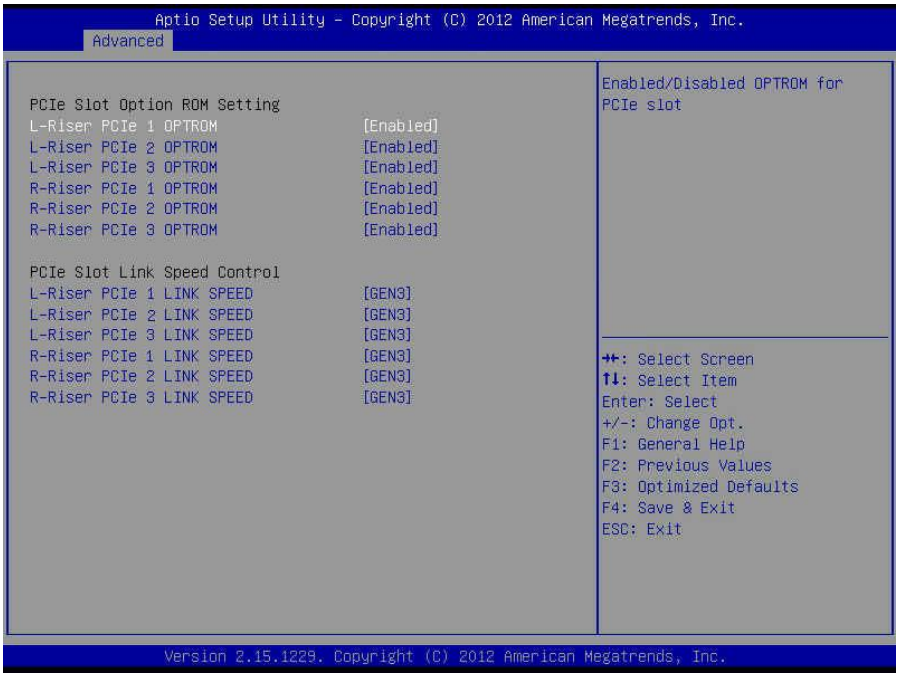
NOTE: The ISCSI function is only supported in LAN1.

LAN2 Option ROM
Enabled/Disabled the LAN Option ROM in the Chipset.
Disabled / PXE

LAN 82574
Enable or disable the LAN controller.
Enabled / Disabled

LAN3 Option ROM
Enabled/Disabled the LAN Option ROM in the Chipset.
Disabled / PXE

3.3.9 PCIe Slot Configuration



PCIe Slot Option ROM Setting

Left-Riser PCIe 1/2/3 OPTROM

Enabled/Disabled OPTROM for PCIe slot.

Enabled / Disabled

Right-Riser PCIe SLOT 1/2/3 OPTROM

Enabled/Disabled OPTROM for PCIe slot.

Enabled / Disabled

PCIe Slot Link Speed Control

Left-Riser PCIe 1/2/3 LINK SPEED

Select target Link Speed Gen1, Gen2 or Gen3

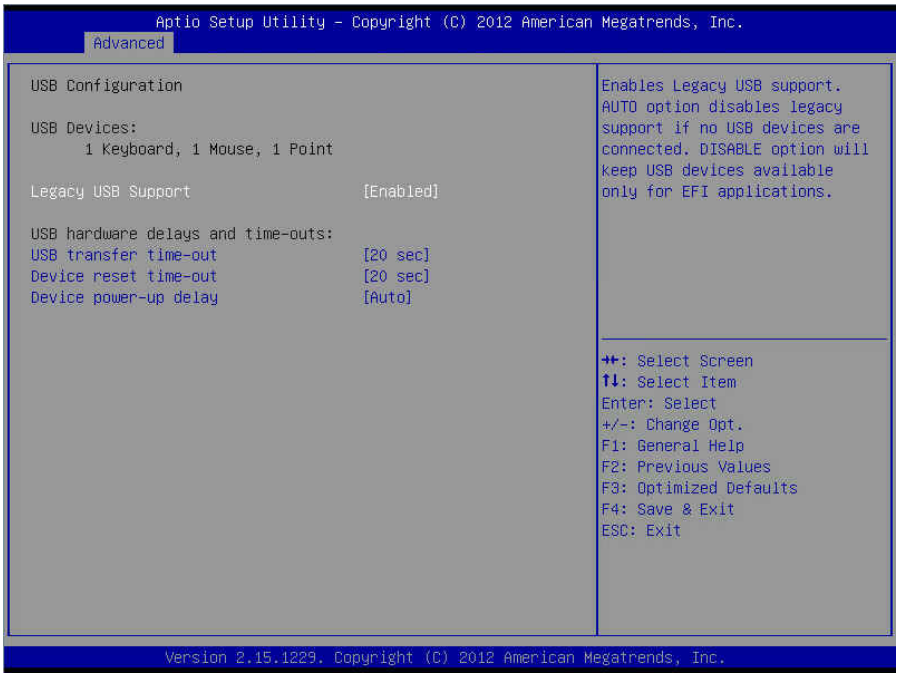
GEN1 / GEN2 / **GEN3**

Right-Riser PCIe 1/2/3 LINK SPEED

Enabled/Disabled OPTROM for PCIe slot.

GEN1 / GEN2 / **GEN3**

3.3.10 USB Configuration



Legacy USB Support
Enable USB legacy support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.

Enabled / Disabled / Auto

USB transfer time-out
The time-out value for Control, Bulk and Interrupt transfers.

20 sec / 10 sec / 5 sec / 1 sec

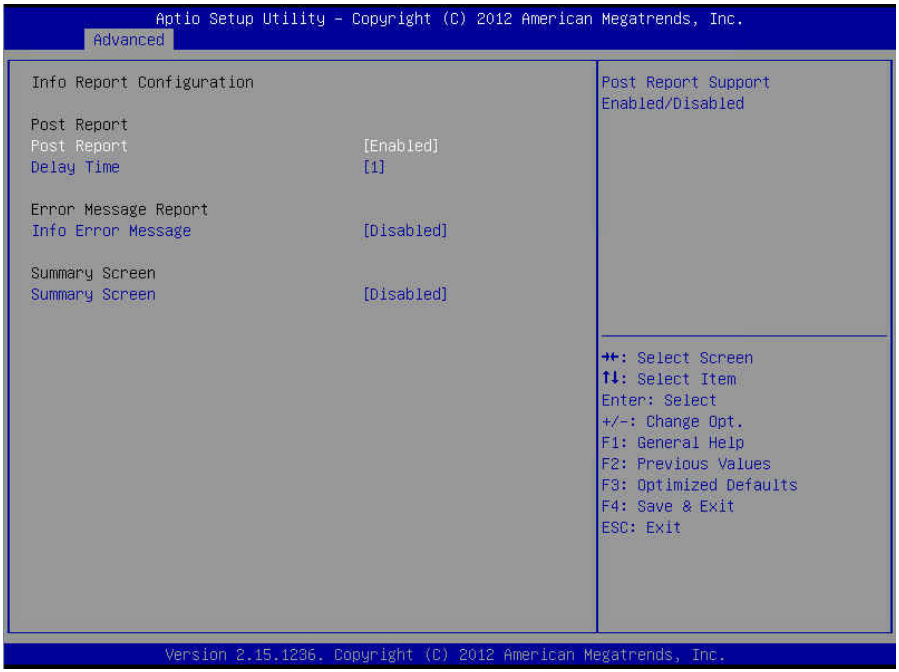
Device reset time-out
USB mass storage device Start Unit command time-out.

20 sec / 10 sec / 30 sec / 40 sec

Device power-up delay
Maximum time the device will take before it properly reports itself to the Host Controller. AUTO uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

Auto / Manual

3.3.11 Info Report Configuration



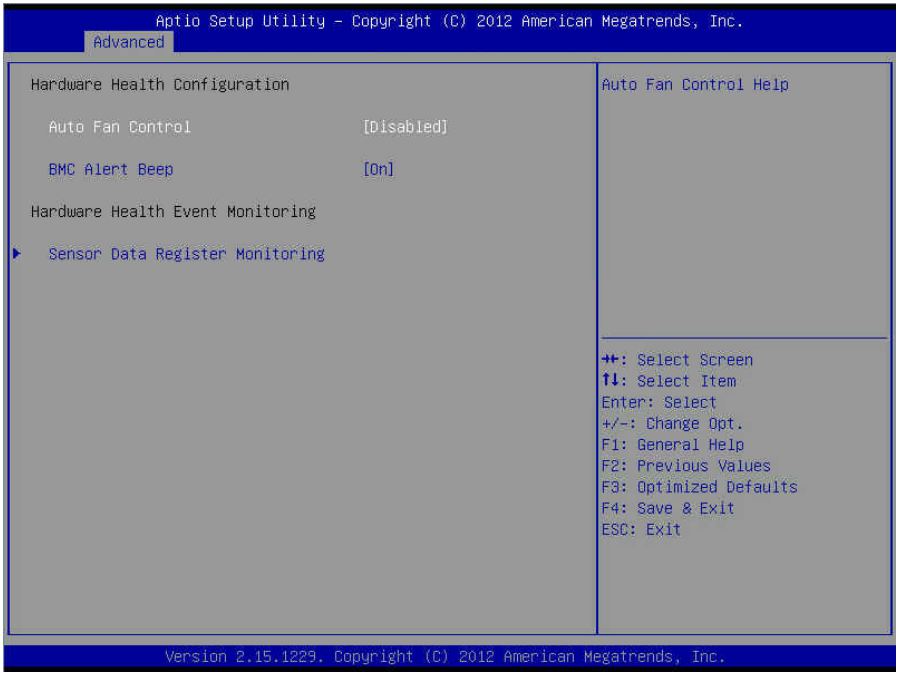
Post Report
Post Report Support Enabled/Disabled.
Enabled / Disabled

Delay Time
Post Report Wait Time: 0 ~ 10 Seconds.
1 / 0 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10 / Until Press ESC

Info Error Message
Info Error Message Support Enabled/Disabled.
Disabled / Enabled

Summary Screen
Summary Screen Support Enabled/Disabled.
Disabled / Enabled

3.3.12 Hardware Health Configuration

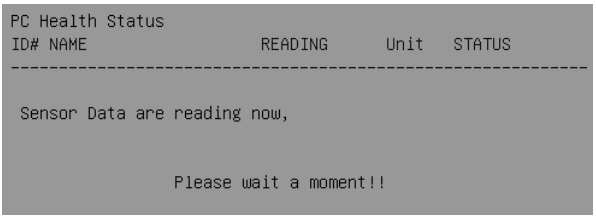


Auto Fan Control
Select [Disabled] to allow the fan speed running FULL ON.
Disabled / Enabled

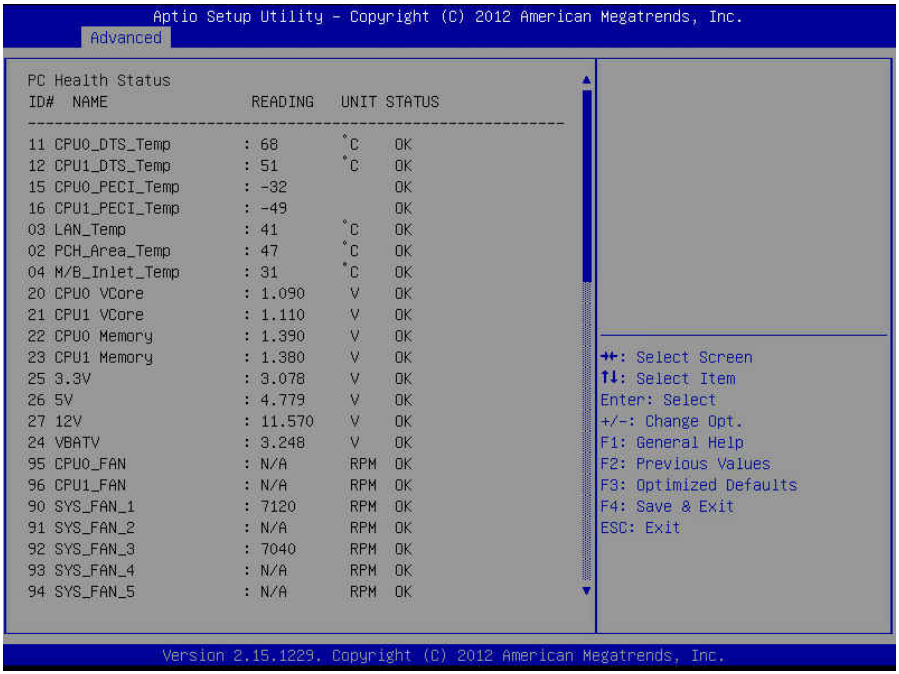
BMC Alert Beep
BMC Alert Beep On/Off.
On / Off

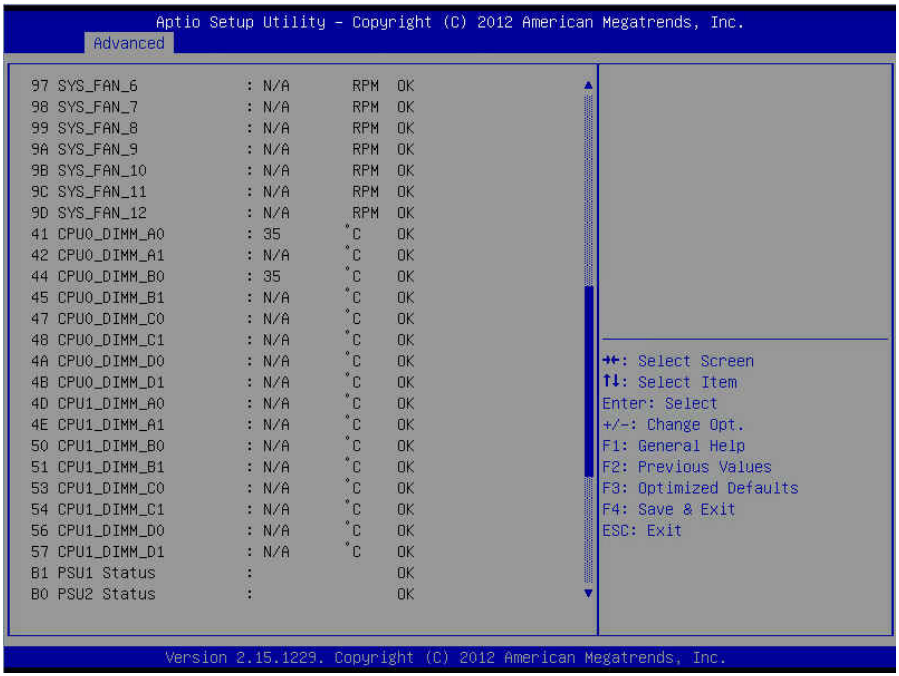
3.3.12.1 Sensor Data Register Monitoring

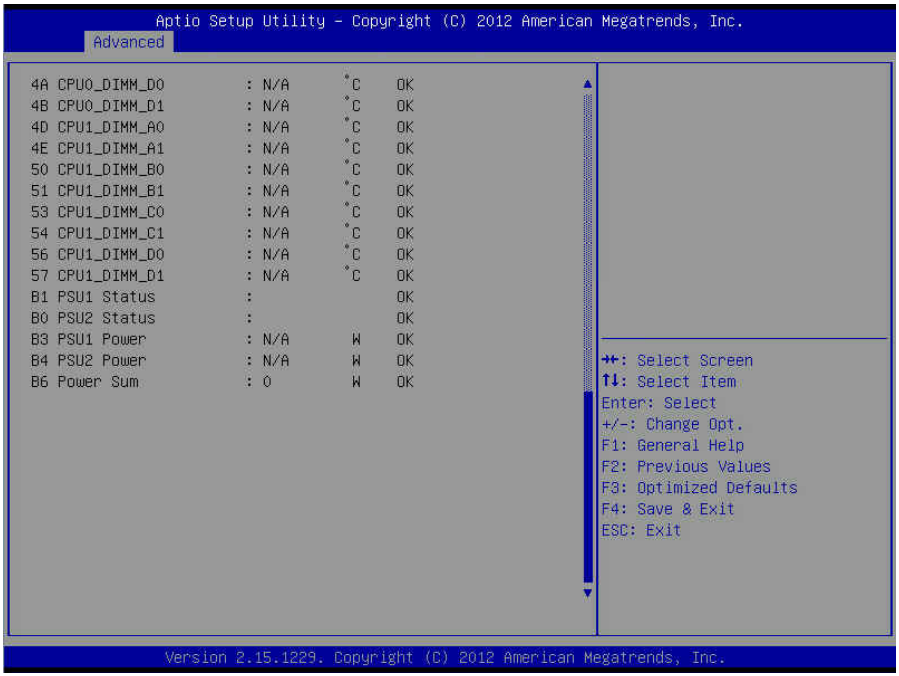
When you enter the **Sensor Data Register Monitoring** submenu, you will see the following dialog window pop out. Please wait 8~10 seconds.



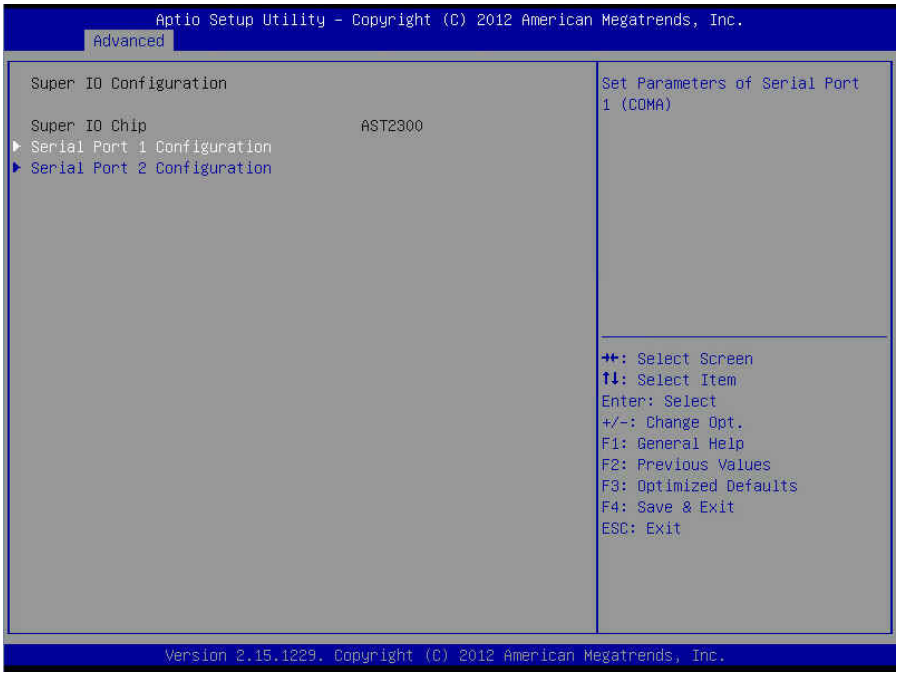
NOTE 1: SDR can not be modified. Read only.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
PC Health Status
ID# NAME READING UNIT STATUS
11 CPU0_DTS_Temp : 68 °C OK
12 CPU1_DTS_Temp : 51 °C OK
15 CPU0_PECI_Temp : -32 OK
16 CPU1_PECI_Temp : -49 OK
03 LAN_Temp : 41 °C OK
02 PCH_Area_Temp : 47 °C OK
04 M/B_Inlet_Temp : 31 °C OK
20 CPU0 VCore : 1.090 V OK
21 CPU1 VCore : 1.110 V OK
22 CPU0 Memory : 1.390 V OK
23 CPU1 Memory : 1.380 V OK
25 3.3V : 3.078 V OK
26 5V : 4.779 V OK
27 12V : 11.570 V OK
24 VBATV : 3.248 V OK
95 CPU0_FAN : N/A RPM OK
96 CPU1_FAN : N/A RPM OK
90 SYS_FAN_1 : 7120 RPM OK
91 SYS_FAN_2 : N/A RPM OK
92 SYS_FAN_3 : 7040 RPM OK
93 SYS_FAN_4 : N/A RPM OK
94 SYS_FAN_5 : N/A RPM OK
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1229. Copyright (C) 2012 American Megatrends, Inc.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
97 SYS_FAN_6 : N/A RPM OK
98 SYS_FAN_7 : N/A RPM OK
99 SYS_FAN_8 : N/A RPM OK
9A SYS_FAN_9 : N/A RPM OK
9B SYS_FAN_10 : N/A RPM OK
9C SYS_FAN_11 : N/A RPM OK
9D SYS_FAN_12 : N/A RPM OK
41 CPU0_DIMM_A0 : 35 °C OK
42 CPU0_DIMM_A1 : N/A °C OK
44 CPU0_DIMM_B0 : 35 °C OK
45 CPU0_DIMM_B1 : N/A °C OK
47 CPU0_DIMM_C0 : N/A °C OK
48 CPU0_DIMM_C1 : N/A °C OK
4A CPU0_DIMM_D0 : N/A °C OK
4B CPU0_DIMM_D1 : N/A °C OK
4D CPU1_DIMM_A0 : N/A °C OK
4E CPU1_DIMM_A1 : N/A °C OK
50 CPU1_DIMM_B0 : N/A °C OK
51 CPU1_DIMM_B1 : N/A °C OK
53 CPU1_DIMM_C0 : N/A °C OK
54 CPU1_DIMM_C1 : N/A °C OK
56 CPU1_DIMM_D0 : N/A °C OK
57 CPU1_DIMM_D1 : N/A °C OK
B1 PSU1 Status : OK
B0 PSU2 Status : OK
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1229. Copyright (C) 2012 American Megatrends, Inc.

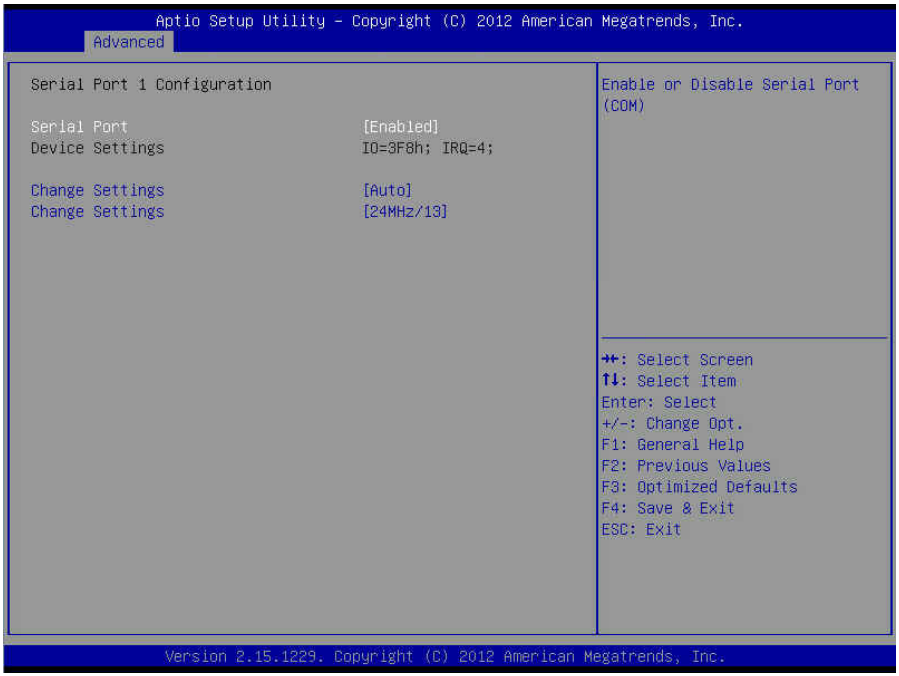

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
4A CPU0_DIMM_D0 : N/A °C OK
4B CPU0_DIMM_D1 : N/A °C OK
4D CPU1_DIMM_A0 : N/A °C OK
4E CPU1_DIMM_A1 : N/A °C OK
50 CPU1_DIMM_B0 : N/A °C OK
51 CPU1_DIMM_B1 : N/A °C OK
53 CPU1_DIMM_C0 : N/A °C OK
54 CPU1_DIMM_C1 : N/A °C OK
56 CPU1_DIMM_D0 : N/A °C OK
57 CPU1_DIMM_D1 : N/A °C OK
B1 PSU1 Status : OK
B0 PSU2 Status : OK
B3 PSU1 Power : N/A W OK
B4 PSU2 Power : N/A W OK
B6 Power Sum : 0 W OK
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1229. Copyright (C) 2012 American Megatrends, Inc.

3.3.13 Super IO Configuration



Super IO Chip
Read only.

3.3.13.1 Serial Port 1/2 Configuration



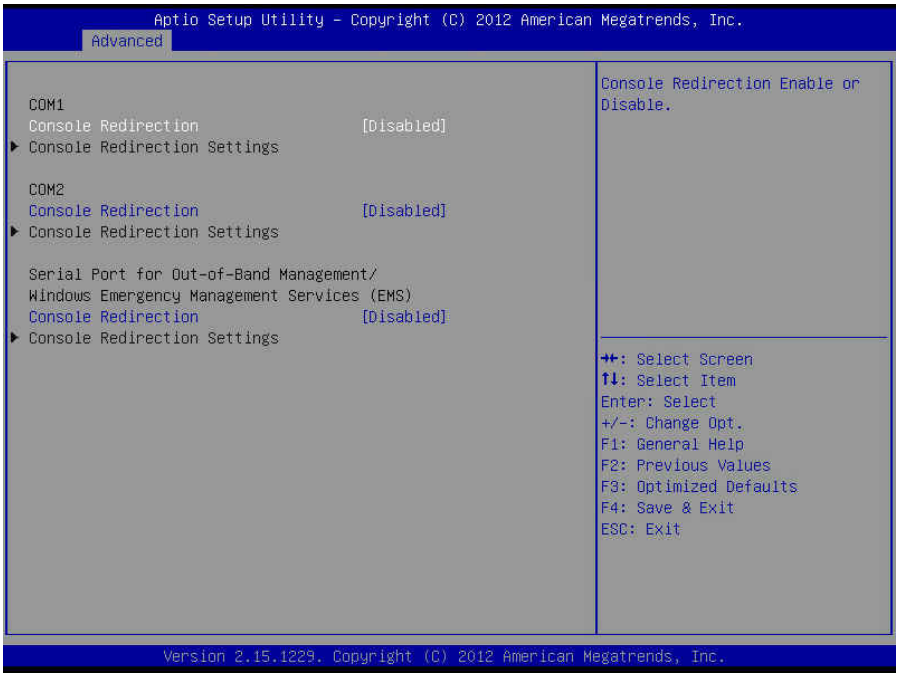
Serial Port
Enable or disable Serial Port (COM).
Enabled / Disabled

Device Settings
Read only.

Change Settings
Select an optimal setting for Super IO Device.
Auto / IO=3F8h; IRQ=4;
/ IO=3F8h, IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;
/ IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;
/ IO=3E8h, IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;
/ IO=2E8h, IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

Change Settings
SUART clock source.
24MHZ/13 / 24MHz

3.3.14 Serial Port Console Redirection

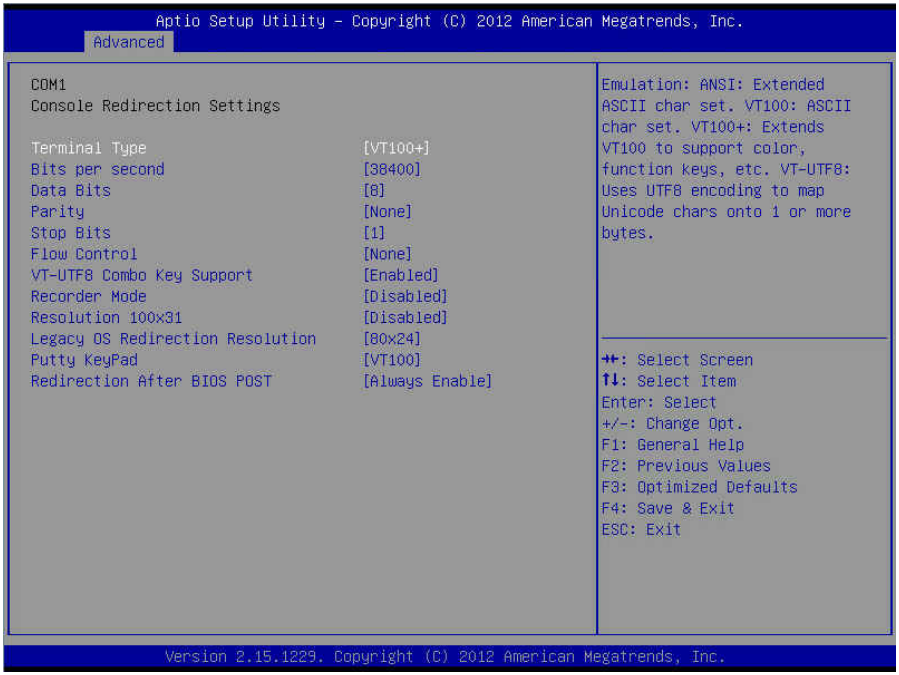


Console Redirection
Console redirection enable or disable.
Disabled / Enabled

Serial Port for Out-Of-Band Management/Windows Emergency Services (EMS)
Console Redirection
Console redirection enable or disable.
Disabled / Enabled

Console Redirection Settings
The settings specify how the host computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.
NOTE: Console Redirection Settings submenu appears when **Console Redirection** is set to **[Enabled]**.

3.3.14.1 Console Redirection Settings



Terminal Type
VT-UTF8 is the preferred terminal type for out-of-band management. The next best choice is VT100+ and then VT100. See above, in Console Redirection Settings page, for more Help with Terminal Type/Emulation.

VT-UTF8 **/** VT100 / **VT100+** / ANSI

Bits per Second
Select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

38400 / 9600 / 19200 / 115200 / 57600

Data Bits

8 / 7

Parity
A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if the num of 1's in the data bits is odd. Mark: parity bit is always 1. Space: parity bit is always 0. Mark and Space parity do not allow for error detection.

None / Even / Odd / Mark / Space

Stop Bits
Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.

1 / 2

Flow Control
Flow Control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to restart the flow. Hardware flow control uses two wires to send start/stop signal.

None / Hardware RTS/CTS

VT-UTF8 Combo Key Support
Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals.

Enabled / Disabled

Recorder Mode
With this mode enabled only text will be sent. This is to capture Terminal data.

Disabled / Enabled

Resolution 100x31
Enable or disable extended terminal resolution.

Disabled / Enabled

Legacy OS Redirection Resolution
On Legacy OS, the number of rows and columns supported redirection.

80x24 / 80x25

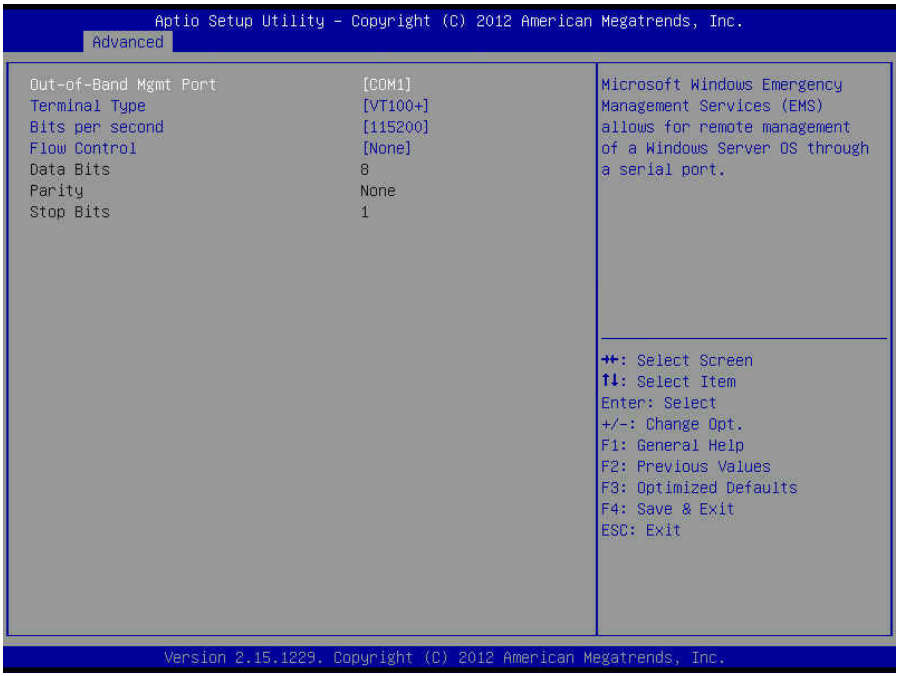
Putty KeyPad
Select FunctionKey and KeyPad on Putty.

VT100 / LINUX / XTERMR6 / SCO / ESCN / VT400

Redirection After BIOS POST
The Settings specify if BootLoader is selected than Legacy Console Redirection is disabled before booting to Legacy OS. Default value is Always Enable which means Legacy Console Redirection is enabled for Legacy OS.

Always Enable / BootLoader

3.3.14.2 Serial Port for Out-Of-Band Management/Windows Emergency Services (EMS) Console Redirection Settings



Out-of Band Mgmt Port
Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port.

COM1 / COM2

Terminal Type
VT-UTF8 is the preferred terminal type for out-of-band management. The next best choice is VT100+ and then VT100. See above, in Console Redirection Settings page, for more Help with Terminal Type/Emulation.

VT-UTF8 **/** VT100 / **VT100+** / ANSI

Bits per Second
Select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

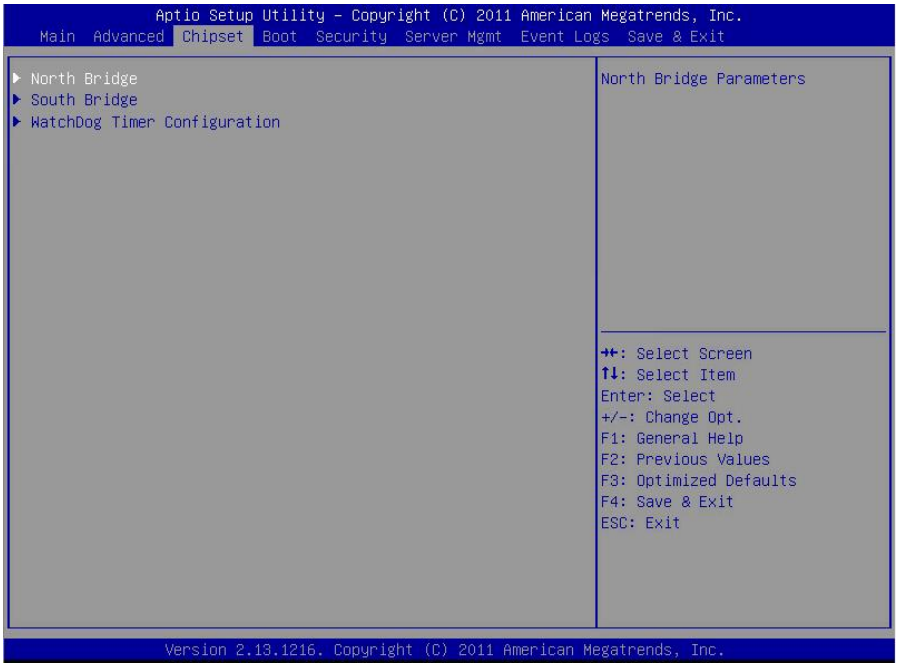
115200 / 9600 / 19200 / 38400 / 57600

Flow Control
Flow Control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a ‘stop’ signal can be sent to stop the data flow. Once the buffers are empty, a ‘start’ signal can be sent to restart the flow. Hardware flow control uses two wires to send start/stop signal.

None / Hardware RTS/CTS

Data Bits / Parity / Stop Bits
Read only.

3.4 Chipset Menu

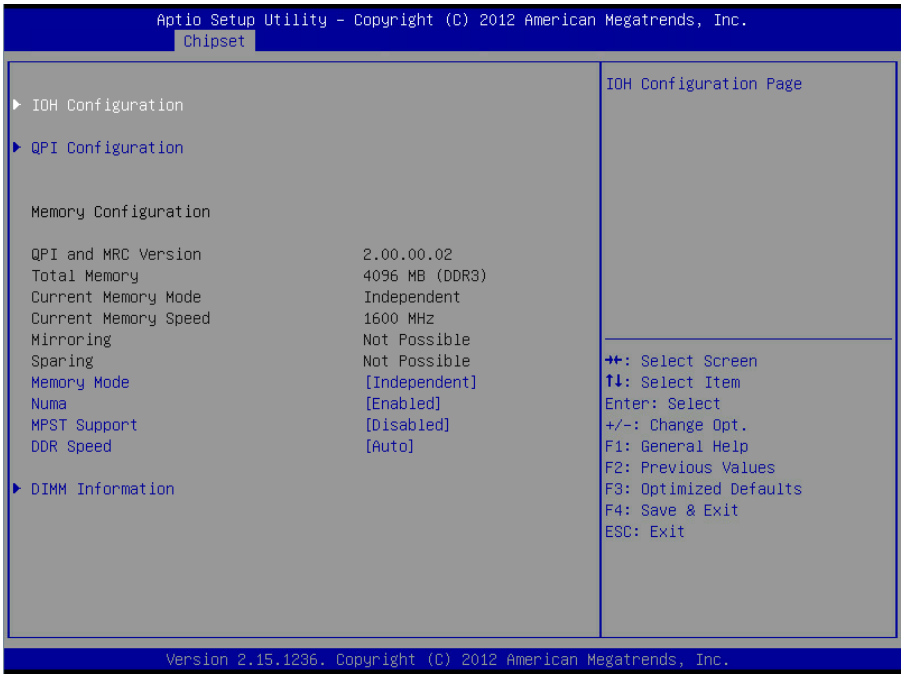


North Bridge
North Bridge Parameters.

South Bridge
South Bridge Parameters.

WatchDog Timer Configuration
WatchDog Timer Configuration.

3.4.1 North Bridge



Memory Configuration

QPI and MRC Version / Total Memory / Current Memory Mode / Current Memory Speed / Mirroring / Sparing

Read only.

Memory Mode

Select the mode for memory initialization.

Independent / Mirroring / Lock Step / Sparing

NUMA

Enable or Disable Non uniform Memory Access (NUMA).

Enabled / Disabled

MPST Support

Enable or Disable MPST Support. Along with enabling MPST Support, it also requires NUMA to be enabled and Channel Interleaving to be set to 1-way for MPST tables to be published.

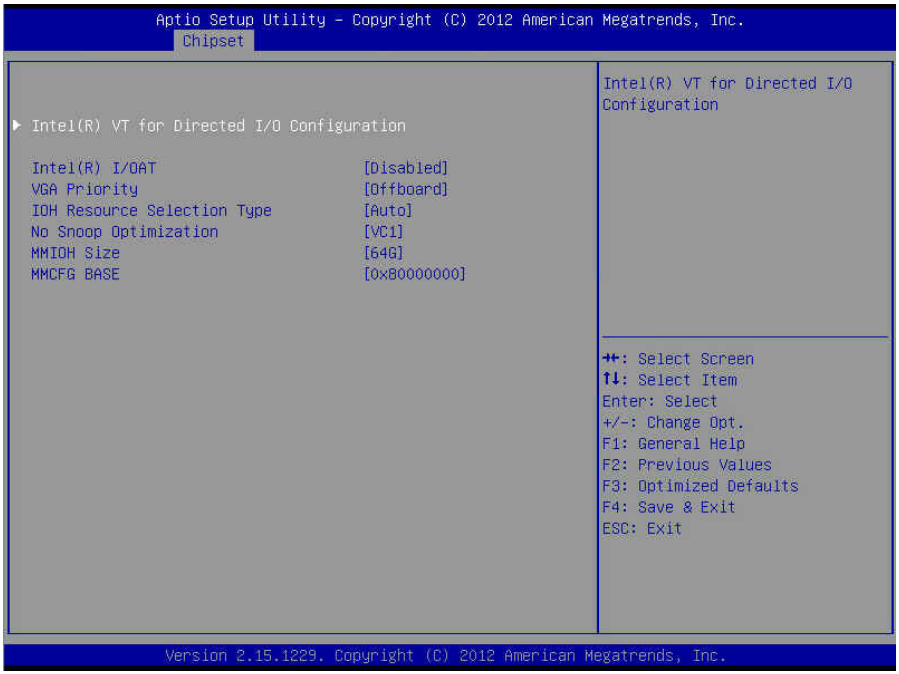
Disabled / Enabled

DDR Speed

Force DDR Speed.

Auto / Force DDR3 800 / Force DDR3 1066 / Force DDR3 1333 / Force DDR3 1600

3.4.1.1 IOH Configuration Submenu



Intel® I/OAT
Enable/Disable Intel® I/O Acceleration Technology (I/OAT).
Disabled / Enabled

VGA Priority
Decide the priority between onboard and its offboard video device found.
Offboard / Onboard

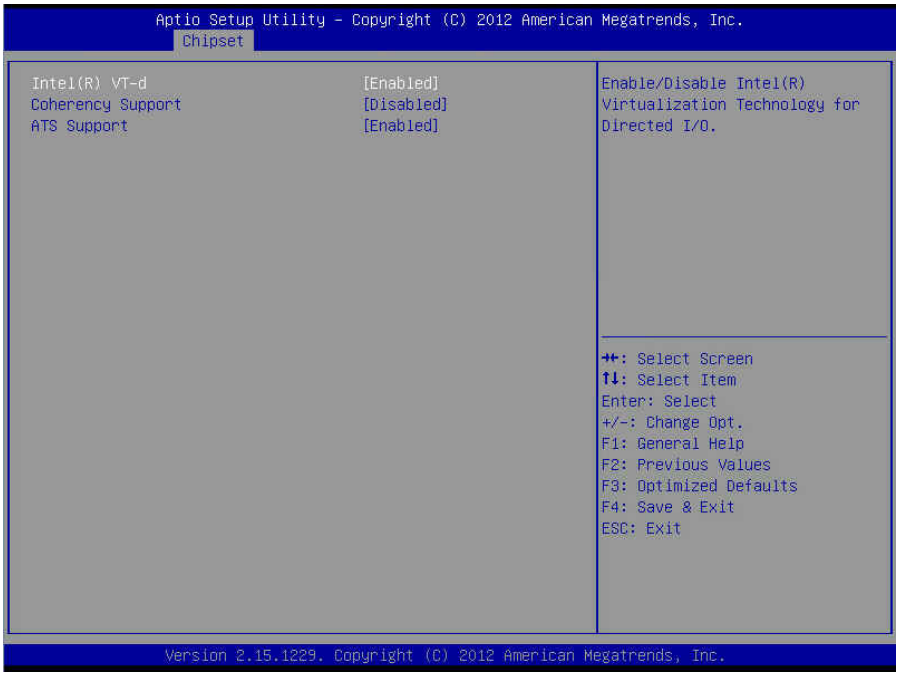
IOH Resource Selection Type
Allow to select Auto/Manual. When Auto option is selected PCI resource allocation across multiple IOHs is optimized automatically based on the PCI devices present. With Manual option user can force the PCI resource allocation across multiple IOHs based on the ratios selected.
Auto / Manual

No Snoop Optimization
This configuration requires that No Snoop in PCI Express Settings is enabled. It is recommended that this option is left at default (VC1).
VC1 / VC0/VCP/VC1

MMIOH Size
Select number of 1GB contiguous regions to be assigned MMIOH space per CPU.
64G / 1G / 2G / 4G / 8G / 16G / 32G / 128G

MMCFG Base
Select the MMCFG BASE Values.
0x80000000 / 0xA0000000 / 0xC0000000

3.4.1.1.1 Intel® VT for Directed I/O Configuration Submenu



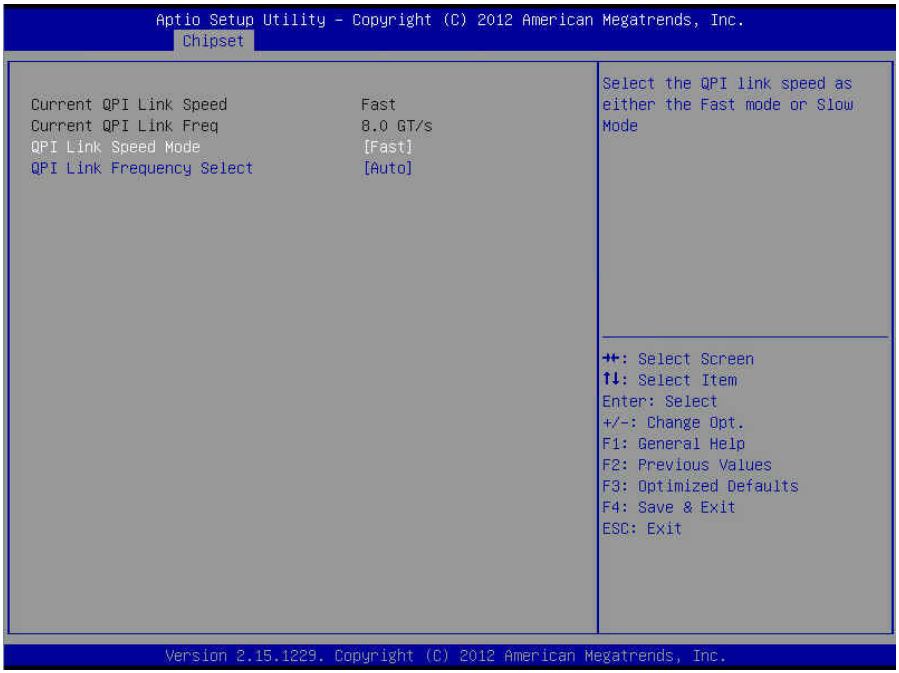
Intel® VT-d
Enable/Disable Intel® Virtualization Technology Directed I/O.
Disabled / Enabled

NOTE: The following items will appear when **Intel® VT-d** is set to [Enabled].

Coherency Support
Enable/Disable VT-d Engine Coherency Support.
Disabled / Enabled

ATS Support
Enable/Disable VT-d Engine Address Translation Services support.
Enabled / Disabled

3.4.1.2 QPI Configuration Submenu



Current QPI Link Speed / Current QPI Link Freq
Read only.

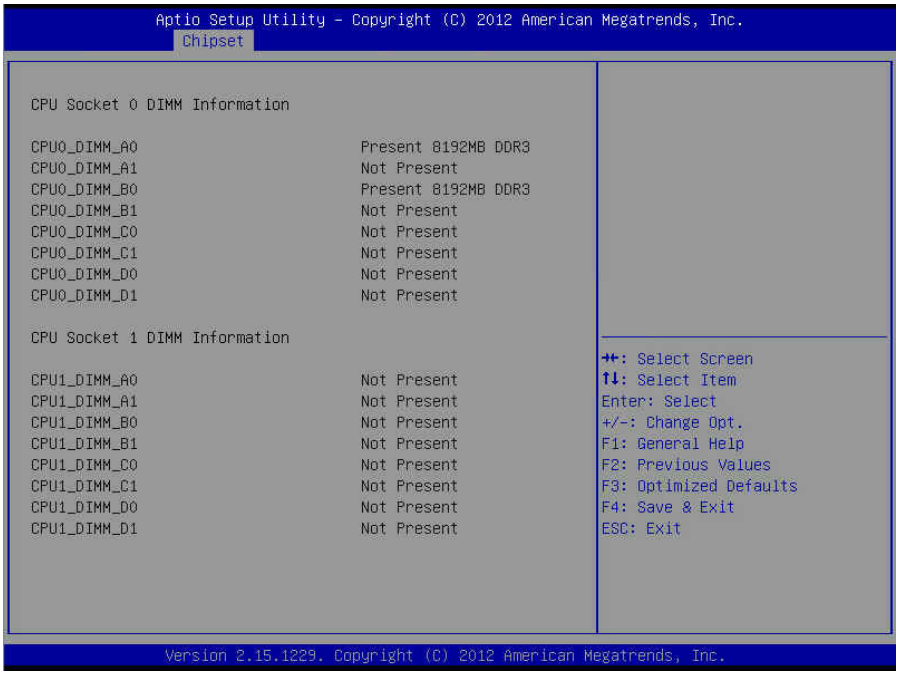
QPI Link Speed Mode
Select the QPI link speed as either the Fast Mode or the Slow Mode.

Fast / Slow

QPI Link Frequency Select
Select the QPI Link Frequency.

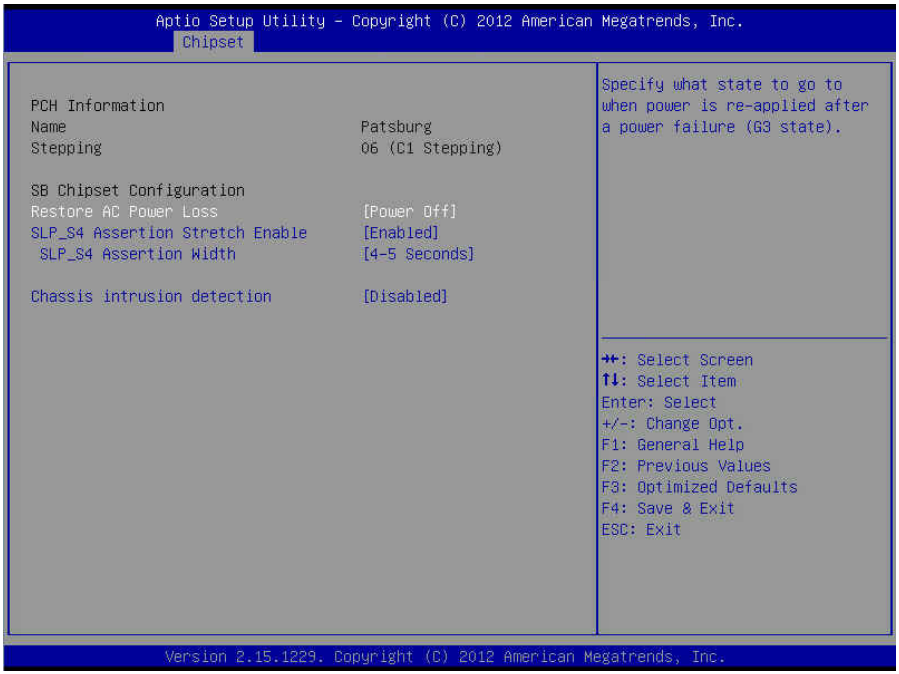
Auto / 6.4GT/s / 7.2GT/s / 8.0GT/s

3.4.1.3 DIMM Information Submenu



Read only.

3.4.2 South Bridge



PCH Information

Name / Stepping

Read only.

SB Chipset Configuration

Restore AC Power Loss

Specify what state to go to when power is re-applied after a power failure (G3 state).

Power Off / Power On / Last State

SLP_S4 Assertion Stretch Enable

Enabled/Disabled SLP_S4# Assertion Stretch.

Enabled / Disabled

SLP_S4 Assertion Width

Select a minimum assertion width of the SLP_S4# signal.

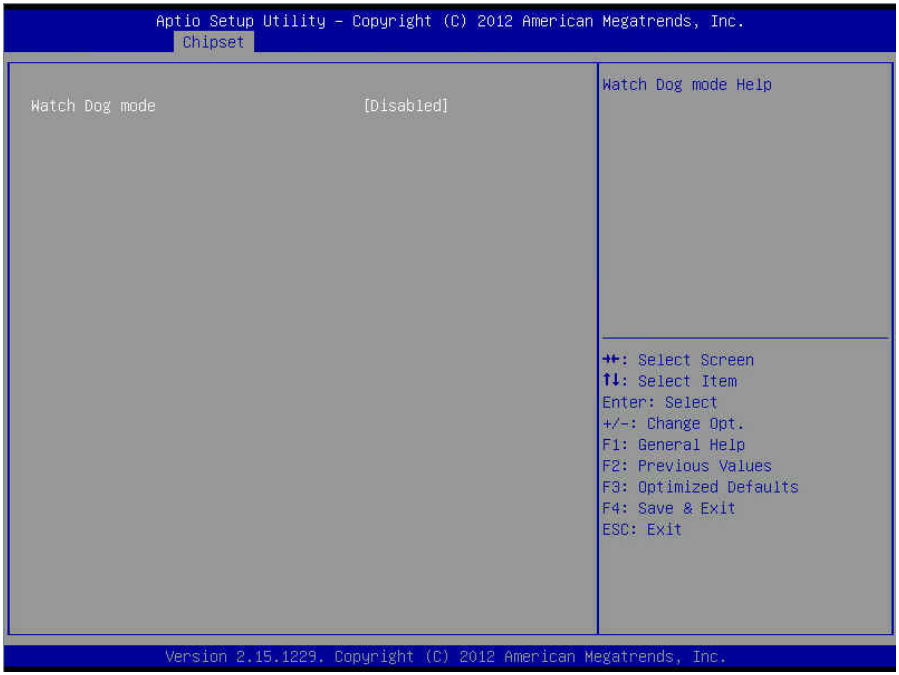
4-5 Seconds / 1-2 Seconds / 2-3 Seconds / 3-4 Seconds

Chassis Intrusion Detection

Enabled: When a chassis open event is detected, the BIOS will display the event.

Disabled / Enabled

3.4.3 WatchDog Timer Configuration

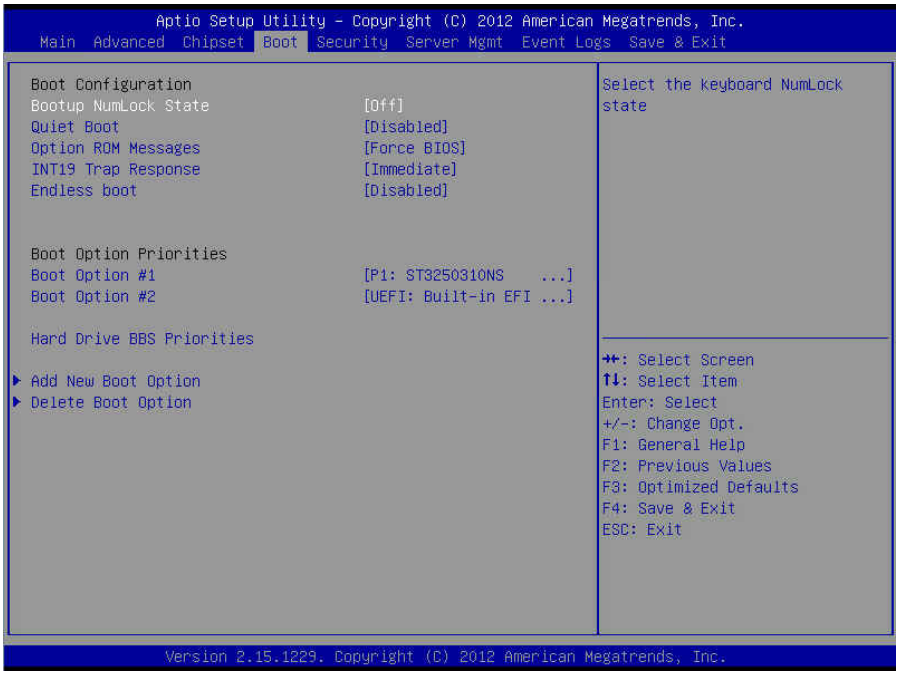


Watch Dog Mode
Watch Dog Mode Help.
Disabled / POST / OS / PowerON

NOTE: Watch Dog Timer will not appear when **Watch Dog Mode** is set to [Disabled].

Watch Dog Timer
Watch Dog Timer Help.
2 MINS / 4 MINS / 6 MINS / 8 MINS / 10 MINS

3.5 Boot



Boot Configuration

Bootup NumLock State

Select the keyboard NumLock state.

Off / On

Quiet Boot

Enable or disable Quiet Boot option.

Disabled / Enabled

Option ROM Messages

Select display mode for Option ROM.

Force BIOS / Keep Current

INT 19 Trap Response

BIOS reaction on INT19 trapping by option ROM: IMMEDIATE - execute the trap right away; POSTPONED - execute the trap during legacy boot.

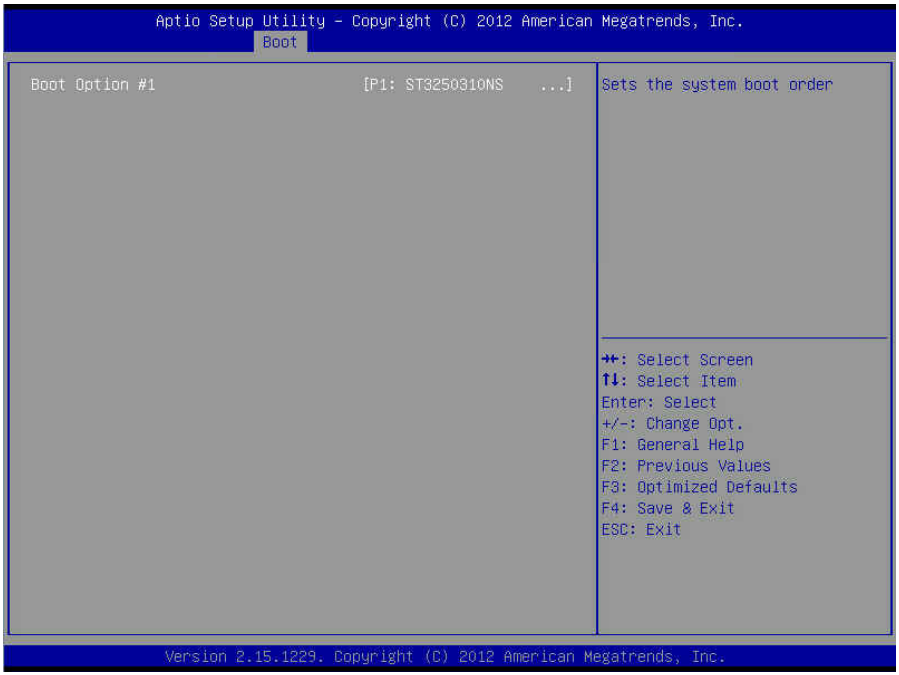
Immediate / Postponed

Endless Boot
Enable or disable Endless Boot.
Disabled / Enabled

Boot Option Priorities

Boot Option #1/Boot Option #2
Select the first/second boot device.
Device Name / Disabled

3.5.1 Hard Drive BBS Priorities



Boot Option #1
Set the system boot order.

Device Name / Disabled

3.5.2 Add New Boot Option

Add Boot Option
Specify name for new boot option.

Path for Boot Option
Enter the path to the boot option In the format fsx: \path\filename.efi

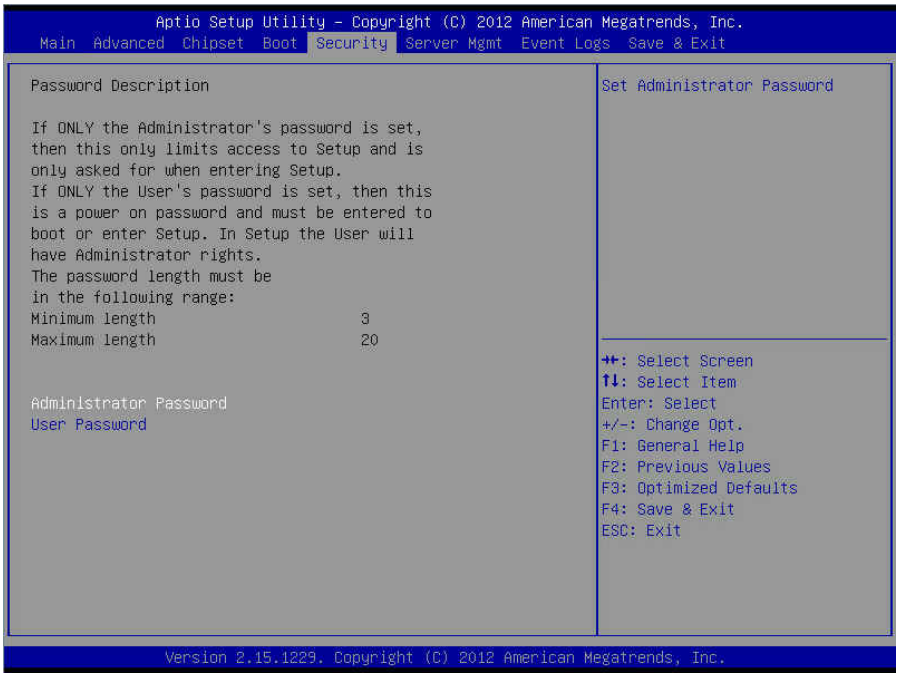
Boot Option File Path
Read only.

Create
Create the newly formed boot option.

3.5.3 Delete Boot Option

Delete Boot Option
Remove an EFI boot option from the boot order.
Select one to delete / UEFI: Built-in EFI Shell

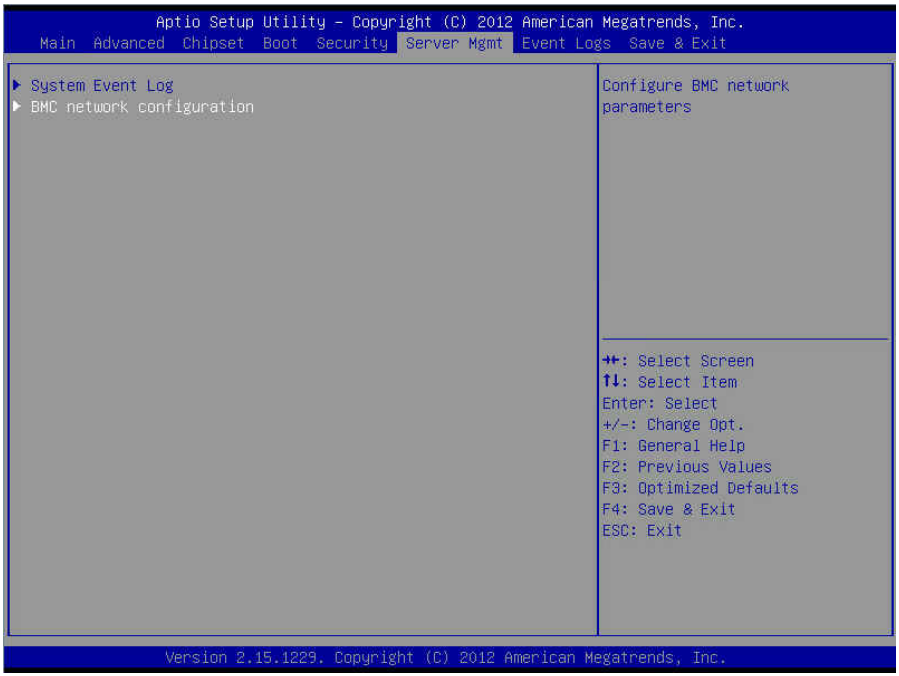
3.6 Security



Administrator Password
Set administrator password in the ***Create New Password*** window. After you key in the password, the ***Confirm New Password*** window will pop out to ask for confirmation.

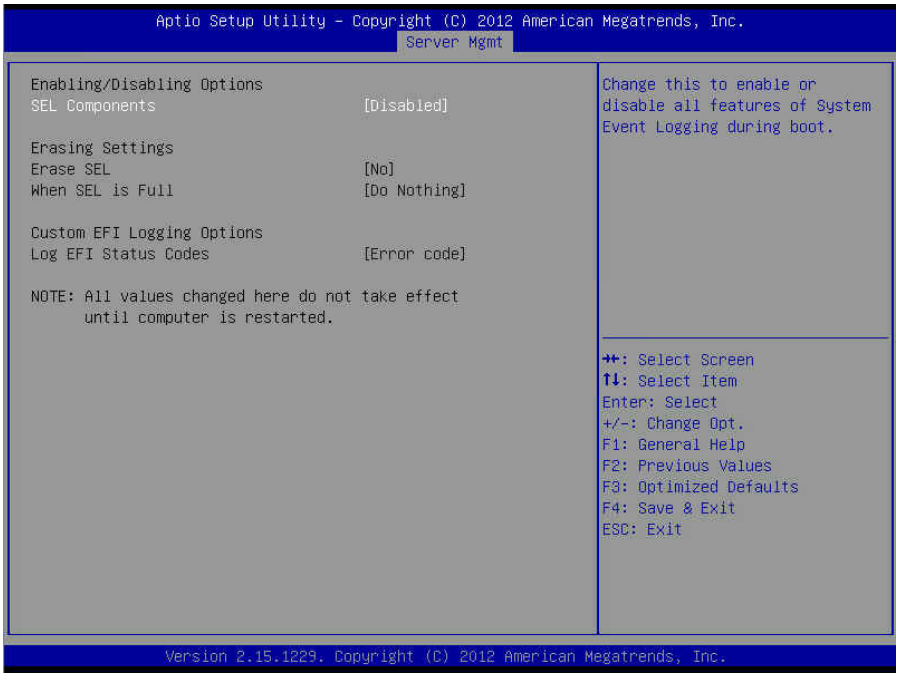
User Password
Set user password in the ***Create New Password*** window. After you key in the password, the ***Confirm New Password*** window will pop out to ask for confirmation.

3.7 Server Management



Press <Enter> to change the SEL event log configuration.
Enable/Disable interfaces to communicate with BMC.

3.7.1 System Event Log



Enabling/Disabling Options

SEL Components

Change this to enable or disable all features of System Event Logging during boot.

Disabled / Enabled

Erasing Settings

Erase SEL

Choose options for erasing SEL.

No / Yes, on next reset / No, on every reset

When SEL is Full

Choose options for reactions to a full SEL.

Do Nothing / Erase Immediately

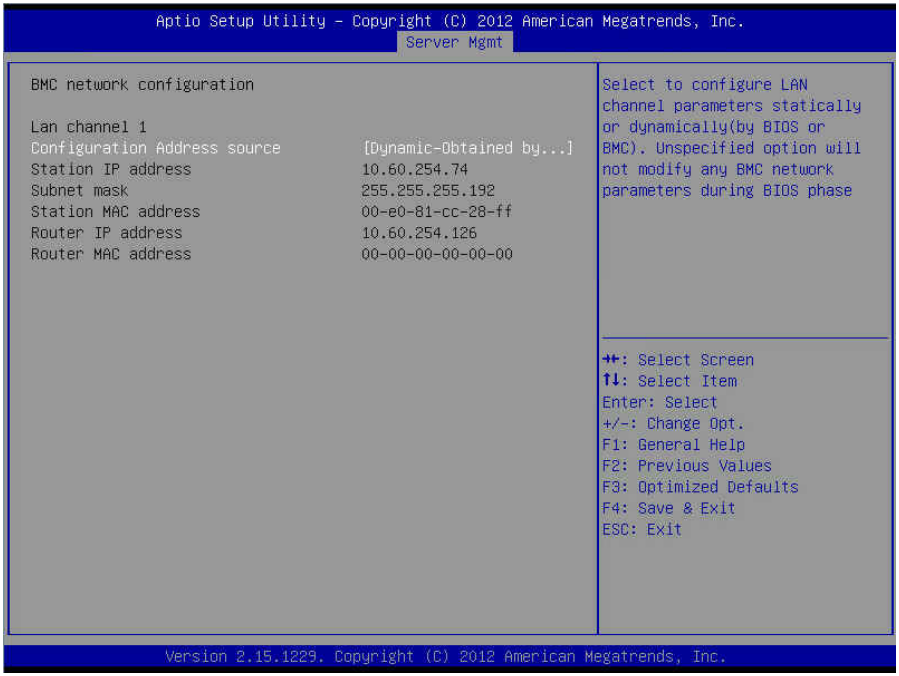
Custom EFI Logging Options

Log EFI Status Codes

Disable the logging of EFI Status Codes or log only error code or only progress code or both.

Both / Disabled / **Error Code** / Progress Code

3.7.2 BMC Network Configuration



Lan channel 1

Configuration Address Source

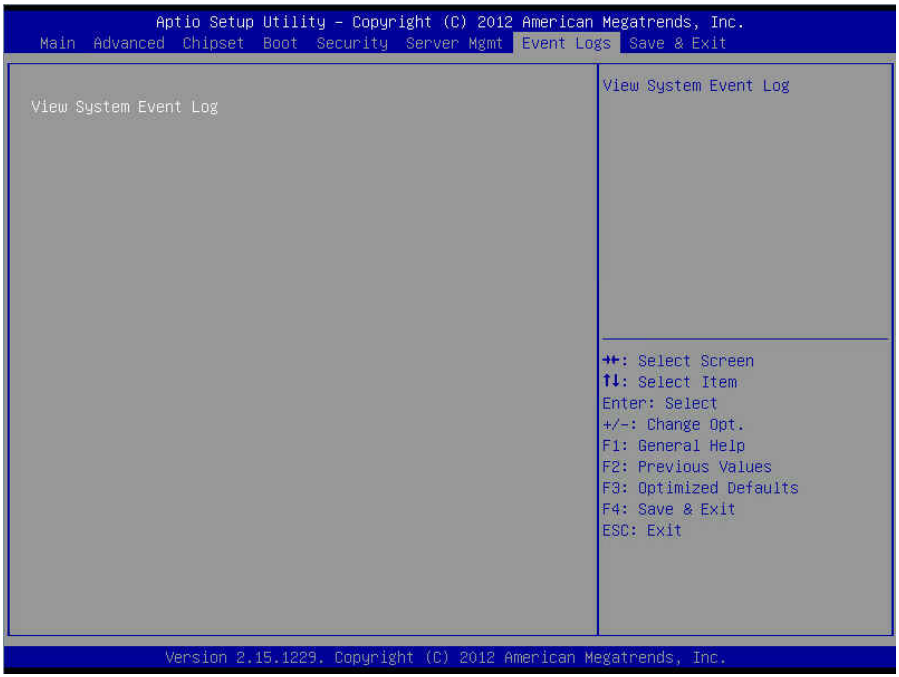
Select the configure LAN channel parameters statically or dynamically (by BIOS or BMC). Unspecified option will not modify any BMC network parameters during BIOS phase.

Unspecified / Static / Dynamic-Obtained by BMC

Station IP Address / Subnet Mask / Station MAC Address / Router IP Address / Router MAC Address

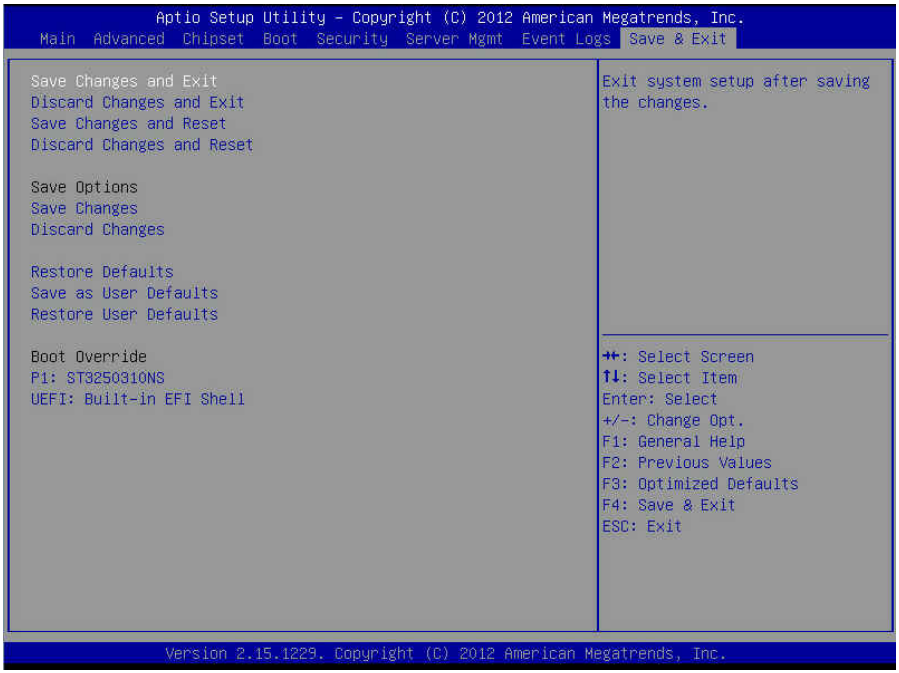
Read only.

3.8 Event Logs



Read only.

3.9 Save & Exit



Save Changes and Exit
Exit system setup after saving the changes.

Discard Changes and Exit
Exit system setup without saving any changes.

Save Changes and Reset
Reset the system after saving the changes.

Discard Changes and Reset
Reset system setup without saving any changes.

Save Options
Save Changes
Save changes done so far to any of the setup options.

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

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

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

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

Boot Override
Read only.

NOTE

Chapter 4: Diagnostics

NOTE: if you experience problems with setting up your system, always check the following things in the following order:

Memory, Video, CPU

By checking these items, you will most likely find out what the problem might have been when setting up your system. For more information on troubleshooting, check the TYAN website at http://www.tyan.com.

4.1 Flash Utility

Every BIOS file is unique for the motherboard it was designed for. For Flash Utilities, BIOS downloads, and information on how to properly use the Flash Utility with your motherboard, please check the TYAN web site at http://www.tyan.com

NOTE: Please be aware that by flashing your BIOS, you agree that in the event of a BIOS flash failure, you must contact your dealer for a replacement BIOS. There are no exceptions. TYAN does not have a policy for replacing BIOS chips directly with end users. In no event will TYAN be held responsible for damages done by the end user.

4.2 AMIBIOS Post Code (Aptio)

The POST code checkpoints are the largest set of checkpoints during the BIOS pre-boot process. The following table describes the type of checkpoints that may occur during the POST portion of the BIOS:

Checkpoint Ranges

Status Code Range	Description
0x01 – 0x0B	SEC execution
0x0C – 0x0F	Sec errors
0x10 – 0x2F	PEI execution up to and including memory detection
0x30 – 0x4F	PEI execution after memory detection
0x50 – 0x5F	PEI errors
0x60 – 0x8F	DXE execution up to BDS
0x90 – 0xCF	BDS execution
0xD0 – 0xDF	DXE errors
0xE0 – 0xE8	S3 Resume (PEI)
0xE9 – 0xEF	S3 Resume errors (PEI)
0xF0 – 0xF8	Recovery (PEI)
0xF9 – 0xFF	Recovery errors (PEI)

Standard Checkpoints

SEC Phase

Status Code	Description
0x00	Note used
Progress Codes	
0x01	Power on. Reset type detection (soft/hard).
0x02	AP initialization before microcode loading
0x03	North Bridge initialization before microcode loading
0x04	South Bridge initialization before microcode loading
0x05	OEM initialization before microcode loading
0x06	Microcode loading
0x07	AP initialization after microcode loading
0x08	North Bridge initialization after microcode loading
0x09	South Bridge initialization after microcode loading
0x0A	OEM initialization after microcode loading
0x0B	Cache initialization

SEC Error Codes	
0x0C – 0x0D	Reserved for future AMI SEC error codes
0x0E	Microcode not found
0x0F	Microcode not found

SEC Beep Codes
None

PEI Phase

Status Code	Description
Progress Codes	
0x10	PCI Core is started
0x11	Pre-memory CPU initialization is started
0x12	Pre-memory CPU initialization (CPU module specific)
0x13	Pre-memory CPU initialization (CPU module specific)
0x14	Pre-memory CPU initialization (CPU module specific)
0x15	Pre-memory North Bridge initialization is started
0x16	Pre-Memory North Bridge initialization (North Bridge module specific)
0x17	Pre-memory North Bridge initialization (North Bridge module specific)
0x18	Pre-Memory North Bridge initialization (North Bridge module specific)
0x19	Pre-memory South Bridge initialization is started
0x1A	Pre-Memory South Bridge initialization (South Bridge module specific)
0x1B	Pre-memory South Bridge initialization (South Bridge module specific)
0x1C	Pre-Memory South Bridge initialization (South Bridge module specific)
0x1D – 0x2A	OEM pre-memory initialization codes
0x2B	Memory initialization. Serial Presence Detect (SPD) data reading
0x2C	Memory initialization. Memory presence detection
0x2D	Memory initialization. Programming memory timing information
0x2E	Memory initialization. Configuring memory
0x2F	Memory initialization (other)
0x30	Reserved for ASL (see ASL Status Codes section below)
0x31	Memory Installed
0x32	CPU post-memory initialization is started.
0x33	CPU post-memory initialization. Cache initialization
0x34	CPU post-memory initialization. Application Processor(s) (AP) initialization
0x35	CPU post-memory initialization. Boot Strap Processor (BSP) selection
0x36	CPU post-memory initialization. System Management Mode(SMM) initialization
0x37	Post-Memory North Bridge initialization is started.

Status Code	Description
0x38	Post-Memory North Bridge initialization (North Bridge module specific)
0x39	Post-Memory North Bridge initialization (North Bridge module specific)
0x3A	Post-Memory North Bridge initialization (North Bridge module specific)
0x3B	Post-Memory South Bridge initialization is started
0x3C	Post-Memory South Bridge initialization (South Bridge module specific)
0x3D	Post-Memory South Bridge initialization (South Bridge module specific)
0x3E	Post-Memory South Bridge initialization (South Bridge module specific)
0x3F – 0x4E	OEM post memory initialization codes
0x4F	DXE PIL is started
PCI Error Codes	
0x50	Memory initialization error. Invalid memory type or incompatible memory speed
0x51	Memory initialization error. SPD reading has failed.
0x52	Memory initialization error. Invalid memory size or memory modules do not match.
0x53	Memory initialization error. No usable memory detected
0x54	Unspecified memory initialization error
0x55	Memory not installed
0x56	Invalid CPU type or speed
0x57	CPU mismatch
0x58	CPU self test failed or possible CPU cache error
0x59	CPU microcode is not found or microcode update is failed.
0x5A	Internal CPU error
0x5B	Reset PPI is not available.
0x5C – 0x5F	Reserved for future AMI error codes
S3 Resume Progress Codes	
0xE0	S3 Resume is started (S3 Resume PPI is called by the DXE IPL).
0xE1	S3 Boot Script execution
0xE2	Video repost
0xE3	OS S3 wake vector call
0xE4 – 0xE7	Reserved for future AMI progress codes
S3 Resume Error Codes	
0xE8	S3 Resume failed
0xE9	S3 Resume PPI not found
0xEA	S3 Resume Boot Script error
0xEB	S3 OS wake error
0xEC – 0xEF	Reserved for future AMI error codes

Recovery Progress Codes	
0xF0	Recovery condition triggered by firmware (Auto recovery)
0xF1	Recovery condition triggered by user (forced recovery)
0xF2	Recovery process started
0xF3	Recovery firmware image is found.
0xF4	Recovery firmware image is loaded.
0xF5 – 0xF7	Reserved for future AMI progress codes
Recovery Error Codes	
0xF8	Recovery PPI is not available.
0xF9	Recovery capsule is not found.
0xFA	Invalid recovery capsule
0xFB – 0xFF	Reserved for future AMI error codes

PEI Beep Codes

# of Beeps	Description
1 (repeatedly)	Memory not installed
1	Memory was installed twice (installPEIMemory routine in PEI Core called twice).
2	Recovery started
3	DXEIPL was not found.
3	DXE Core Firmware Volume was not found.
4	Recovery failed
4	S3 Resume failed
7	Reset PPI is not available.

DXE Phase

Status Code	Description
0x60	DXE Core is started.
0x61	NVRAM initialization
0x62	Installation of the South Bridge Runtime Services
0x63	CPU DXE initialization is started.
0x64	CPU DXE initialization (CPU module specific)
0x65	CPU DXE initialization (CPU module specific)
0x66	CPU DXE initialization (CPU module specific)
0x67	CPU DXE initialization (CPU module specific)
0x68	PCI host bridge initialization
0x69	North Bridge DXE initialization is started.
0x6A	North Bridge DXE SMM initialization is started.
0x6B	North Bridge DXE initialization (North Bridge module specific)

Status Code	Description
0x6C	North Bridge DXE initialization (North Bridge module specific)
0x6D	North Bridge DXE initialization (North Bridge module specific)
0x6E	North Bridge DXE initialization (North Bridge module specific)
0x6F	North Bridge DXE initialization (North Bridge module specific)
0x70	South Bridge DXE initialization is started.
0x71	South Bridge DXE SMM initialization is started.
0x72	South Bridge devices initialization
0x73	South Bridge DXE initialization (South Bridge module specific)
0x74	South Bridge DXE initialization (South Bridge module specific)
0x75	South Bridge DXE initialization (South Bridge module specific)
0x76	South Bridge DXE initialization (South Bridge module specific)
0x77	South Bridge DXE initialization (South Bridge module specific)
0x78	ACPI module initialization
0x79	CSM initialization
0x7A – 0x7F	Reserved for future AMI DXE codes
0x80 – 0x8F	OEM DXE initialization codes
0x90	Boot Device Selection (BDS) phase is started
0x91	Driver connecting is started
0x92	PCI Bus initialization is started
0x93	PCI Bus Hot Plug Controller initialization
0x94	PCI Bus Enumeration
0x95	PCI BUS Request Resources
0x96	PCI Bus Assign Resources
0x97	Console output devices connect
0x98	Console Input devices connect
0x99	Super IO initialization
0x9A	USB initialization is started.
0x9B	USB Reset
0x9C	USB Detect
0x9D	USB Enable
0x9E -0x9F	Reserved for future AMI codes
0xA0	IDE initialization is started
0xA1	IDE Reset
0xA2	IDE Detect
0xA3	IDE Enable
0xA4	SCSI initialization is started.

Status Code	Description
0xA5	SCSI Reset
0xA6	SCSI Detect
0xA7	SCSI Enable
0xA8	Setup Verifying Password
0xA9	Start of Setup
0xAA	Reserved for ASL (see ASL Status Codes section below)
0xAB	Setup Input Wait
0xAC	Reserved for ASL (see ASL Status Codes section below)
0xAD	Ready To Boot event
0xAE	Legacy Boot event
0xAF	Exit Boot Services event
0xB0	Runtime Set Virtual Address MAP Begin
0xB1	Runtime Set Virtual Address MAP End
0xB2	Legacy Option ROM initialization
0xB3	System Reset
0xB4	USB hot plug
0xB5	PCI bus hot plug
0xB6	Clean-up of NVRAM
0xB7	Configuration Reset (reset of NVRAM settings)
0xB8 – 0xBF	Reserved for future AMI codes
0xC0 – 0xCF	OEM BDS initialization codes
DXE Error Codes	
0xD0	CPU initialization error
0xD1	North Bridge initialization error
0xD2	South Bridge initialization error
0xD3	Some of the Architectural Protocols are not available
0xD4	PCI resource allocation error. Out of Resources
0xD5	No Space for Legacy Option ROM
0xD6	No Console Output Devices are found.
0xD7	No Console Input Devices are found.
0xD8	Invalid password
0xD9	Error loading Boot Option (LoadImage returned error)
0xDA	Boot Option is failed (StartImage returned error).
0xDB	Flash update is failed.
0xDC	Reset protocol is not available.

DXE Beep Codes

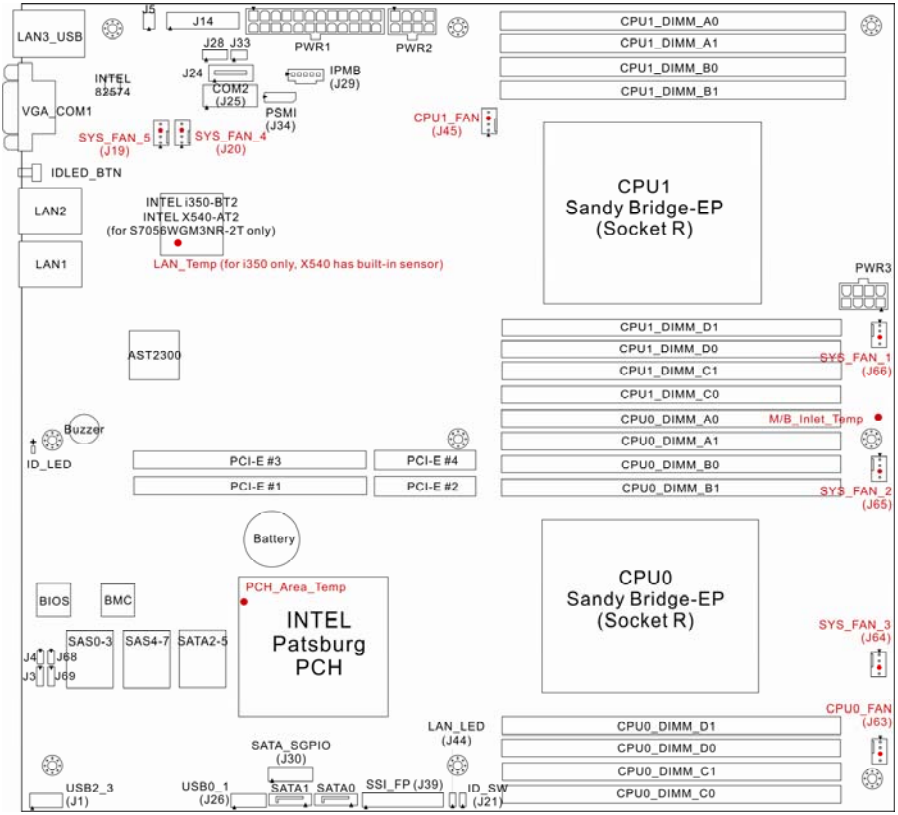
# of Beeps	Description
1	Invalid password
4	Some of the Architectural Protocols are not available.
5	No Console Output Devices are found.
5	No Console Input Devices are found.
6	Flash update is failed.
7	Reset protocol is not available.
8	Platform PCI resource requirements cannot be met.

ACPI/ASL Checkpoints

Status Code	Description
0x01	System is entering S1 sleep state.
0x02	System is entering S2 sleep state.
0x03	System is entering S3 sleep state.
0x04	System is entering S4 sleep state.
0x05	System is entering S5 sleep state.
0x10	System is waking up from the S1 sleep state.
0x20	System is waking up from the S2 sleep state.
0x30	System is waking up from the S3 sleep state.
0x40	System is waking up from the S4 sleep state.
0xAC	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.
0xAA	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.

Appendix I: Fan and Temp Sensors

This section aims to help readers identify the locations of some specific FAN and Temp Sensors on the motherboard. A table of BIOS Temp sensor name explanation is also included for readers' reference.

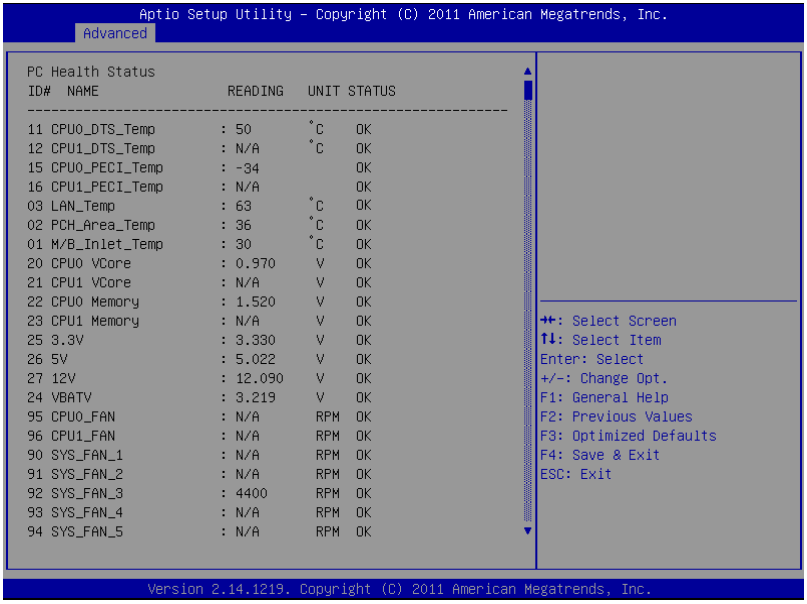


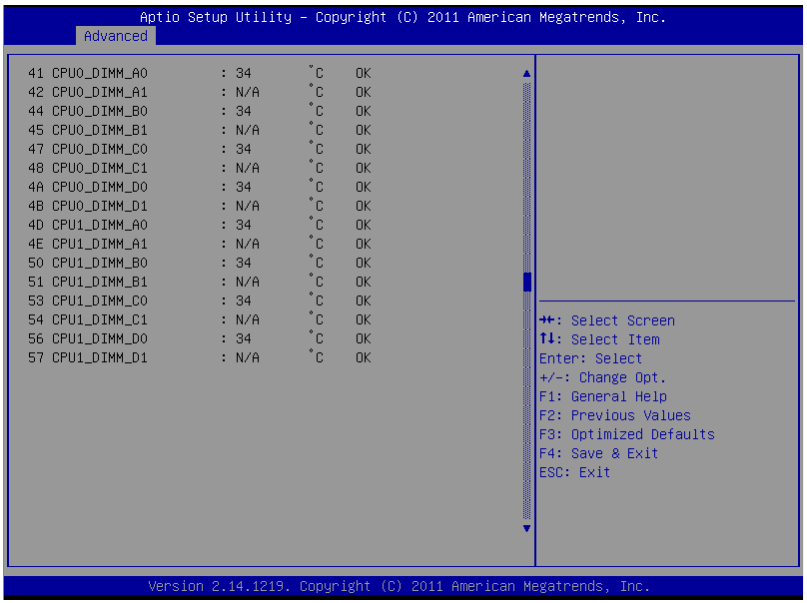
NOTE: The red dot indicates the sensor.

Fan and Temp Sensor Location:

1. Fan Sensor: It is located in the third pin of the fan connector, which detects the fan speed (rpm)
2. Temp Sensor: PCH_Area_Temp, LAN_Temp and M/B_Inlet_Temp. They detect the system temperature around.
   NOTE: The system temperature is measured in a scale defined by **Intel**, not in Fahrenheit or Celsius.

BIOS Temp Sensor Name Explanation:





BIOS Temp Sensor	Name Explanation
CPU0_DTS_Temp	Temperature of the CPU0 Digital Temperature Sensor
CPU1_DTS_Temp	Temperature of the CPU1 Digital Temperature Sensor
CPU0_PECI_Temp	Temperature of the CPU0 Platform Environment Control Interface
CPU1_PECI_Temp	Temperature of the CPU1 Platform Environment Control Interface
LAN_Temp	Temperature of the LAN Chip Area
PCH_Area_Temp	Temperature of the PCH Area
M/B_Inlet_Temp	Temperature of the M/B Air Inlet Area
CPU0_DIMM_A0	Temperature of CPU0 DIMM A0 Slot
CPU0_DIMM_A1	Temperature of CPU0 DIMM A1 Slot
CPU0_DIMM_B0	Temperature of CPU0 DIMM B0 Slot
CPU0_DIMM_B1	Temperature of CPU0 DIMM B1 Slot
CPU0_DIMM_C0	Temperature of CPU0 DIMM C0 Slot
CPU0_DIMM_C1	Temperature of CPU0 DIMM C1 Slot
CPU0_DIMM_D0	Temperature of CPU0 DIMM D0 Slot
CPU0_DIMM_D1	Temperature of CPU0 DIMM D1 Slot
CPU1_DIMM_A0	Temperature of CPU1 DIMM A0 Slot
CPU1_DIMM_A1	Temperature of CPU1 DIMM A1 Slot
CPU1_DIMM_B0	Temperature of CPU1 DIMM B0 Slot
CPU1_DIMM_B1	Temperature of CPU1 DIMM B1 Slot
CPU1_DIMM_C0	Temperature of CPU1 DIMM C0 Slot
CPU1_DIMM_C1	Temperature of CPU1 DIMM C1 Slot
CPU1_DIMM_D0	Temperature of CPU1 DIMM D0 Slot
CPU1_DIMM_D1	Temperature of CPU1 DIMM D1 Slot
BIOS FAN Sensor	**Name Explanation**
CPU0_FAN	Fan speed of CPU0_FAN
CPU1_FAN	Fan speed of CPU1_FAN
SYS_FAN_1	Fan speed of SYS_FAN_1
SYS_FAN_2	Fan speed of SYS_FAN_2
SYS_FAN_3	Fan speed of SYS_FAN_3
SYS_FAN_4	Fan speed of SYS_FAN_4
SYS_FAN_5	Fan speed of SYS_FAN_5

NOTE

Appendix II: RAID OPROM Configuration

This section describes how to setup the RAID system with the RAID OPROM Utility.

Introduction

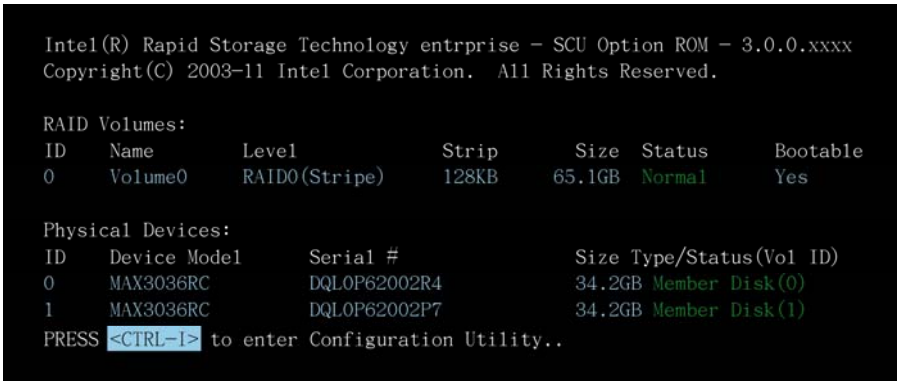
The RAID Option ROM (OPROM) is an application that runs on your motherboard's Basic Input Output System (BIOS). RAID OPROM appears when you first boot your computer, before your operating system loads.

Installation

There is no installation required. RAID OPROM comes factor-installed on your Intel motherboard.

Opening RAID OPROM

When the RAID OPROM loads during boot-up, it displays pertinent information about the RAID logical drives that it finds.



When the RAID Option ROM screen appears, press **<CTRL-I>** to enter the Utility.

Follow the instructions on your computer screen to complete the RAID OPROM Configuration.

NOTE

Glossary

ACPI (Advanced Configuration and Power Interface): a power management specification that allows the operating system to control the amount of power distributed to the computer's devices. Devices not in use can be turned off, reducing unnecessary power expenditure.

AGP (Accelerated Graphics Port): a PCI-based interface which was designed specifically for demands of 3D graphics applications. The 32-bit AGP channel directly links the graphics controller to the main memory. While the channel runs only at 66 MHz, it supports data transmission during both the rising and falling ends of the clock cycle, yielding an effective speed of 133 MHz.

ATAPI (AT Attachment Packet Interface): also known as IDE or ATA; a drive implementation that includes the disk controller on the device itself. It allows CD-ROMs and tape drives to be configured as master or slave devices, just like HDDs.

ATX: the form factor designed to replace the AT form factor. It improves on the AT design by rotating the board 90 degrees, so that the IDE connectors are closer to the drive bays, and the CPU is closer to the power supply and cooling fan. The keyboard, mouse, USB, serial, and parallel ports are built-in.

Bandwidth: refers to carrying capacity. The greater the bandwidth, the more data the bus, phone line, or other electrical path can carry. Greater bandwidth results in greater speed.

BBS (BIOS Boot Specification): a feature within the BIOS that creates, prioritizes, and maintains a list of all Initial Program Load (IPL) devices, and then stores that list in NVRAM. IPL devices have the ability to load and execute an OS, as well as provide the ability to return to the BIOS if the OS load process fails. At that point, the next IPL device is called upon to attempt loading of the OS.

BIOS (Basic Input/Output System): the program that resides in the ROM chip, which provides the basic instructions for controlling your computer's hardware. Both the operating system and application software use BIOS routines to ensure compatibility.

Buffer: a portion of RAM which is used to temporarily store data; usually from an application though it is also used when printing and in most keyboard drivers. The CPU can manipulate data in a buffer before copying it to a disk drive. While this improves system performance (reading to or writing from a disk drive a single time is much faster than doing so repeatedly) there is the possibility of losing your data should the system crash. Information in a buffer is temporarily stored, not permanently saved.

Bus: a data pathway. The term is used especially to refer to the connection between the processor and system memory, and between the processor and PCI or ISA local buses.

Bus mastering: allows peripheral devices and IDEs to access the system memory without going through the CPU (similar to DMA channels).

Cache: a temporary storage area for data that will be needed often by an application. Using a cache lowers data access times since the information is stored in SRAM instead of slower DRAM. Note that the cache is also much smaller than your regular memory: a typical cache size is 512KB, while you may have as much as 4GB of regular memory.

Closed and open jumpers: jumpers and jumper pins are active when they are “on” or “closed”, and inactive when they are “off” or “open”.

CMOS (Complementary Metal-Oxide Semiconductors): chips that hold the basic startup information for the BIOS.

COM port: another name for the serial port, which is called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another). Parallel ports transmit the bits of a byte on eight different wires at the same time (that is, in parallel form, eight bits at the same time).

DDR (Double Data Rate): a technology designed to double the clock speed of the memory. It activates output on both the rising and falling edge of the system clock rather than on just the rising edge, potentially doubling output.

DIMM (Dual In-line Memory Module): faster and more capacious form of RAM than SIMMs, and do not need to be installed in pairs.

DIMM bank: sometimes called DIMM socket because the physical slot and the logical unit are the same. That is, one DIMM module fits into one DIMM socket, which is capable of acting as a memory bank.

DMA (Direct Memory Access): channels that are similar to IRQs. DMA channels allow hardware devices (like soundcards or keyboards) to access the main memory without involving the CPU. This frees up CPU resources for other tasks. As with IRQs, it is vital that you do not double up devices on a single line. Plug-n-Play devices will take care of this for you.

DRAM (Dynamic RAM): widely available, very affordable form of RAM which looses data if it is not recharged regularly (every few milliseconds). This refresh requirement makes DRAM three to ten times slower than non-recharged RAM such as SRAM.

ECC (Error Correction Code or Error Checking and Correcting): allows data to be checked for errors during run-time. Errors can subsequently be corrected at the same time that they're found.

EEPROM (Electrically Erasable Programmable ROM): also called Flash BIOS, it is a ROM chip which can, unlike normal ROM, be updated. This allows you to keep up with changes in the BIOS programs without having to buy a new chip. TYAN®'s BIOS updates can be found at http://**www.tyan.com**

ESCD (Extended System Configuration Data): a format for storing information about Plug-n-Play devices in the system BIOS. This information helps properly configure the system each time it boots.

Firmware: low-level software that controls the system hardware.

Form factor: an industry term for the size, shape, power supply type, and external connector type of the Personal Computer Board (PCB) or motherboard. The standard form factors are the AT and ATX.

Global timer: onboard hardware timer, such as the Real-Time Clock (RTC).

HDD: stands for Hard Disk Drive, a type of fixed drive.

H-SYNC: controls the horizontal synchronization/properties of the monitor.

HyperTransport™: a high speed, low latency, scalable point-to-point link for interconnecting ICs on boards. It can be significantly faster than a PCI bus for an equivalent number of pins. It provides the bandwidth and flexibility critical for today's networking and computing platforms while retaining the fundamental programming model of PCI.

IC (Integrated Circuit): the formal name for the computer chip.

IDE (Integrated Device/Drive Electronics): a simple, self-contained HDD interface. It can handle drives up to 8.4 GB in size. Almost all IDEs sold now are in fact Enhanced IDEs (EIDEs), with maximum capacity determined by the hardware controller.

IDE INT (IDE Interrupt): Hardware interrupt signal that goes to the IDE.

I/O (Input/Output): the connection between your computer and another piece of hardware (mouse, keyboard, etc.)

IRQ (Interrupt Request): an electronic request that runs from a hardware device to the CPU. The interrupt controller assigns priorities to incoming requests and delivers them to the CPU. It is important that there is only one device hooked up to each IRQ line; doubling up devices on IRQ lines can lock up your system. Plug-n-Play operating systems can take care of these details for you.

Latency: the amount of time that one part of a system spends waiting for another part to catch up. This occurs most commonly when the system sends data out to a peripheral device and has to wait for the peripheral to spread (peripherals tend to be slower than onboard system components).

NVRAM: ROM and EEPROM are both examples of Non-Volatile RAM, memory that holds its data without power. DRAM, in contrast, is volatile.

Parallel port: transmits the bits of a byte on eight different wires at the same time.

PCI (Peripheral Component Interconnect): a 32 or 64-bit local bus (data pathway) which is faster than the ISA bus. Local buses are those which operate within a single system (as opposed to a network bus, which connects multiple systems).

PCI PIO (PCI Programmable Input/Output) modes: the data transfer modes used by IDE drives. These modes use the CPU for data transfer (in contrast, DMA channels do not). PCI refers to the type of bus used by these modes to communicate with the CPU.

PCI-to-PCI Bridge: allows you to connect multiple PCI devices onto one PCI slot.

Pipeline burst SRAM: a fast secondary cache. It is used as a secondary cache because SRAM is slower than SDRAM, but usually larger. Data is cached first to the faster primary cache, and then, when the primary cache is full, to the slower secondary cache.

PnP (Plug-n-Play): a design standard that has become ascendant in the industry. Plug-n-Play devices require little set-up to use. Devices and operating systems that are not Plug-n-Play require you to reconfigure your system each time you add or change any part of your hardware.

PXE (Preboot Execution Environment): one of four components that together make up the Wired for Management 2.0 baseline specification. PXE was
designed to define a standard set of preboot protocol services within a client with the goal of allowing networked-based booting to boot using industry standard protocols.

RAID (Redundant Array of Independent Disks): a way for the same data to be stored in different places on many hard drives. By using this method, the data is stored redundantly and multiple hard drives will appear as a single drive to the operating system. RAID level 0 is known as striping, where data is striped (or overlapped) across multiple hard drives, but offers no fault-tolerance. RAID level 1 is known as mirroring, which stores the data within at least two hard drives, but does not stripe. RAID level 1 also allows for faster access time and fault-tolerance, since either hard drive can be read at the same time. RAID level 0+1 is striping and mirroring, providing fault-tolerance, striping, and faster access all at the same time.

RAIDIOS: RAID I/O Steering (Intel)

RAM (Random Access Memory): technically refers to a type of memory where any byte can be accessed without touching the adjacent data and is often referred to the system's main memory. This memory is available to any program running on the computer.

ROM (Read-Only Memory): a storage chip which contains the BIOS; the basic instructions required to boot the computer and start up the operating system.

SDRAM (Synchronous Dynamic RAM): called as such because it can keep two sets of memory addresses open simultaneously. By transferring data alternately from one set of addresses and then the other, SDRAM cuts down on the delays associated with non-synchronous RAM, which must close one address bank before opening the next.

Serial port: called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another).

SCSI Interrupt Steering Logic (SISL): Architecture that allows a RAID controller, such as AcceleRAID 150, 200 or 250, to implement RAID on a system board-embedded SCSI bus or a set of SCSI busses. SISL: SCSI Interrupt Steering Logic (LSI) (only on LSI SCSI boards)

Sleep/Suspend mode: in this mode, all devices except the CPU shut down.

SDRAM (Static RAM): unlike DRAM, this type of RAM does not need to be refreshed in order to prevent data loss. Thus, it is faster and more expensive.

SLI (Scalable Link Interface): NVIDIA SLI technology links two graphics cards together to provide scalability and increased performance. NVIDIA SLI takes advantage of the increased bandwidth of the PCI Express bus architecture, and features hardware and software innovations within NVIDIA GPUs (graphics processing units) and NVIDIA MCPs (media and communications processors). Depending on the application, NVIDIA SLI can deliver as much as two times the performance of a single GPU configuration.

Standby mode: in this mode, the video and hard drives shut down; all other devices continue to operate normally.

UltraDMA-33/66/100: a fast version of the old DMA channel. UltraDMA is also called UltraATA. Without a proper UltraDMA controller, your system cannot take advantage of higher data transfer rates of the new UltraDMA/UltraATA hard drives.

USB (Universal Serial Bus): a versatile port. This one port type can function as a serial, parallel, mouse, keyboard or joystick port. It is fast enough to support video transfer, and is capable of supporting up to 127 daisy-chained peripheral devices.

VGA (Video Graphics Array): the PC video display standard

V-SYNC: controls the vertical scanning properties of the monitor.

ZCR (Zero Channel RAID): PCI card that allows a RAID card to use the onboard SCSI chip, thus lowering cost of RAID solution

ZIF Socket (Zero Insertion Force socket): these sockets make it possible to insert CPUs without damaging the sensitive CPU pins. The CPU is lightly placed in an open ZIF socket, and a lever is pulled down. This shifts the processor over and down, guiding it into the board and locking it into place.

Technical Support

If a problem arises with your system, you should first turn to your dealer for direct support. Your system has most likely been configured or designed by them and they should have the best idea of what hardware and software your system contains. Hence, they should be of the most assistance for you. Furthermore, if you purchased your system from a dealer near you, take the system to them directly to have it serviced instead of attempting to do so yourself (which can have expensive consequences).

If these options are not available for you then TYAN® Computer Corporation can help. Besides designing innovative and quality products for over a decade, TYAN has continuously offered customers service beyond their expectations. TYAN®'s website (**www.tyan.com**) provides easy-to-access FAQ searches and online Trouble Ticket creation as well as Instant Chat capabilities with our Support Agents. TYAN® also provides easy-to-access resources such as in-depth Linux Online Support sections with downloadable Linux drivers and comprehensive compatibility reports for chassis, memory and much more. With all these convenient resources just a few keystrokes away, users can easily find the latest software and operating system components to keep their systems running as powerful and productive as possible. TYAN® also ranks high for its commitment to fast and friendly customer support through email. By offering plenty of options for users, TYAN® serves multiple market segments with the industry's most competitive services to support them.

"TYAN's tech support is some of the most impressive we've seen, with great response time and exceptional organization in general" - Anandtech.com

Help Resources:

1. See the beep codes section of this manual.
2. See the TYAN® website for FAQ's, bulletins, driver updates, and other information: **http://www.tyan.com**
3. Contact your dealer for help BEFORE calling TYAN®.
4. Check the TYAN® user group in Google Forum: **alt.comp.periphs.mainboard.TYAN**

Returning Merchandise for Service

During the warranty period, contact your distributor or system vendor FIRST for any product problems. This warranty only covers normal customer use and does not cover damages incurred during shipping or failure due to the alteration, misuse, abuse, or improper maintenance of products.

NOTE:
A receipt or copy of your invoice marked with the date of purchase is required before any warranty service can be rendered. You may obtain service by calling the manufacturer for a Return Merchandise Authorization (RMA) number. The RMA number Should be prominently displayed on the outside of the shipping carton and the package should be mailed prepaid. TYAN® will pay to have the board shipped back to you.

Notice for the USA
Compliance Information Statement (Declaration of Conformity Procedure) DoC
FCC Part 15: This device complies with part 15 of the FCC Rules

Operation is subject to the following conditions:

This device may not cause harmful interference, and this device must accept any interference received including interference that may cause undesired operation. 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 one or more of the following measures:
Reorient or relocate the receiving antenna.
Increase the separation between the equipment and the receiver.
Plug the equipment into an outlet on a circuit different from that of the receiver.
Consult the dealer on an experienced radio/television technician for help.

Notice for Canada
This apparatus complies with the Class B limits for radio interference as specified in the Canadian Department of Communications Radio Interference Regulations. (Cet appareil est conforme aux norms de Classe B d'interference radio tel que specifie par le Ministere Canadien des Communications dans les reglements d'ineteference radio.)

CAUTION: Lithium battery included with this board. Do not puncture, mutilate, or dispose of battery in fire. There is danger of an explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by manufacturer. Dispose of used battery according to manufacturer instructions and in accordance with your local regulations.

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