Your PDF Guides

You can read the recommendations in the user guide, the technical guide or the installation guide for GIGABYTE GA-Z87-DS3H. You'll find the answers to all your questions on the GIGABYTE GA-Z87-DS3H in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

User manual GIGABYTE GA-Z87-DS3H
User guide GIGABYTE GA-Z87-DS3H
Operating instructions GIGABYTE GA-Z87-DS3H
Instructions for use GIGABYTE GA-Z87-DS3H
Instruction manual GIGABYTE GA-Z87-DS3H

GA-Z87-DS3H
GA-H87-DS3H

User's Manual

Rev. 1101
12ME-Z87DS3H-1101R

Manual abstract:

@@25, 2013 Sept. 25, 2013 Copyright © 2013 GIGA-BYTE TECHNOLOGY CO., LTD. All rights reserved. @@@@@@@□□ For detailed product information, carefully read the User's Manual. For product-related information, check on our website at: http://www.gigabyte.com Identifying Your Motherboard Revision The revision number on your motherboard looks like this: "REV: X.X." For example, "REV: 1.0" means the revision of the motherboard is 1.0. Check your motherboard revision before updating motherboard BIOS, drivers, or when looking for technical information. Example: Table of Contents Box Contents..

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Box Contents

☐☐ GA-Z87-DS3H or GA-H87-DS3H motherboard
☐ Motherboard driver disk ☐ User's Manual ☐ Quick Installation Guide
☐ Two SATA cables ☐ I/O Shield

The box contents above are for reference only and the actual items shall depend on the product package you obtain. The box contents are subject to change without notice.

Optional Items
☐☐ 2-port USB 2.0 bracket (Part No. 12CR1-1UB030-6*R)
☐☐ eSATA bracket (Part No. 12CF1-3SATPW-4*R)
☐☐ 3.5" Front Panel with 2 USB 3.0/2.0 ports (Part No. 12CR1-FPX582-2*R)
☐☐ ☐☐ ☐☐ ☐☐ S/PDIF In cable (Part No. 12CR1-1SPDIN-1*R)
HDMI-to-DVI adapter (Part No. 12CT2-HDMI01-1*R) LPT port cable (Part No. 12CF1-1LP001-0*R) COM port cable (Part No. 12CF1-1CM001-3*R)

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GA-Z87-DS3H/GA-H87-DS3H Motherboard Layout

KB_MS_USB ATX_12V_2X4 DVI VGA LGA1150 HDMI CPU_FAN ATX R_USB30 USB30_LAN GA-Z87-DS3H/GA-H87-DS3H SYS_FAN1 SYS_FAN2 F_USB30 DDR3_4 DDR3_2 DDR3_3 DDR3_1 1 0 3 2 5 4 B_BIOS M_BIOS F_USB1 SYS_FAN3 BAT Intel® Z87j Intel® H87k SATA3 PCIe to PCI Bridge CLR_CMOS LPT F_PANEL F_USB3 F_USB2 AUDIO PCIEX1_1 Realtek® GbE LAN PCIEX16 CODEC PCIEX1_2 PCIEX1_3 PCI1 iTE® Super I/O SPDIF_IN PCI2 F_AUDIO COMA SPDIF_O

j Only for GA-Z87-DS3H. k Only for GA-H87-DS3H.

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GA-Z87-DS3H/GA-H87-DS3H Motherboard Block Diagram

1 PCI Express x16 DVI-D PCIe CLK (100 MHz) HDMI CPU CLK+/- (100 MHz) LGA1150 CPU DDR3 1600/1333 MHz Dual Channel Memory PCI Express Bus x16 LAN RJ45 Realtek® GbE LAN DMI 2.0 FDI D-Sub Dual BIOS 6 SATA 6Gb/s PCI Express Bus x1 x1 x1 x1 x1 PCIe to PCI Bridge Intel® Z87j Intel® H87k 6 USB 3.0/2.0 8 USB 2.0/1.1 3 PCI Express x1 PCI Bus LPC Bus iTE® Super I/O LPT COM PS/2 KB/Mouse CODEC Rear Speaker Out Center/Subwoofer Speaker Out 2 PCI PCI CLK (33 MHz)

j Only for GA-Z87-DS3H. k Only for GA-H87-DS3H.

For detailed product information/limitation(s), refer to "1-2 Product Specifications."

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Side Speaker Out MIC Line Out Line In S/PDIF In S/PDIF Out

Chapter 1 Hardware Installation

1-1 Installation Precautions

The motherboard contains numerous delicate electronic circuits and components which can become damaged as a result of electrostatic discharge (ESD). Prior to installation, carefully read the user's manual and follow these procedures:

•• Prior to installation, make sure the chassis is suitable for the motherboard.
•• Prior to installation, do not remove or break motherboard S/N (Serial Number) sticker or warranty sticker provided by your dealer. These stickers are required for warranty validation.
•• Always remove the AC power by unplugging the power cord from the power outlet before installing or removing the motherboard or other hardware components.
•• When connecting hardware components to the internal connectors on the motherboard, make sure they are connected tightly and securely.
•• When handling the motherboard, avoid touching any metal leads or connectors.
•• It is best to wear an electrostatic discharge (ESD) wrist strap when handling electronic components such as a motherboard, CPU or memory. If you do not have an ESD wrist strap, keep your hands dry and first touch a metal object to eliminate static electricity.
•• Prior to installing the motherboard, please have it on top of an antistatic pad or within an electrostatic shielding container.
•• Before unplugging the power supply cable from the motherboard, make sure the power supply has been turned off.
•• Before turning on the power, make sure the power supply voltage has been set according to the local voltage standard.
•• Before using the product, please verify that all cables and power connectors of your hardware components are connected.
•• To prevent damage to the motherboard, do not allow screws to come in contact with the motherboard circuit or its components.
•• Make sure there are no leftover screws or metal components placed on the motherboard or within the computer casing.
•• Do not place the computer system on an uneven surface.
•• Do not place the computer system in a high-temperature environment.
•• Turning on the computer power during the installation process can lead to damage to system components as well as physical harm to the user.
•• If you are uncertain about any installation steps or have a problem related to the use of the product, please consult a certified computer technician.

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Hardware Installation

1-2 Product Specifications

CPU	☐☐ Support for Intel® Core™ i7 processors/Intel® Core™ i5 processors/ Intel® Core™ i3 processors/Intel® Pentium® processors/ Intel® Celeron® processors in the LGA1150 package (Go to GIGABYTE's website for the latest CPU support list.) ☐☐ L3 cache varies with CPU
Chipset	☐☐ Intel® Z87j/H87k Express Chipset
Memory	☐☐ 4 x 1.5V DDR3 DIMM sockets supporting up to 32 GB of system memory * ☐Due to a Windows 32-bit operating system limitation, when more than 4 GB of ☐☐ ☐☐ ☐☐ ☐☐ ☐☐ Dual channel memory architecture
Onboard Graphics	☐☐ Support

) Integrated Graphics Processor: - 1 x D-Sub port - 1 x DVI-D port, supporting a maximum resoluest CPU support list.) •• Always turn off the computer and unplug the power cord from the power outlet before installing the CPU to prevent hardware damage. •• Locate the pin one of the CPU. The CPU cannot be inserted if oriented incorrectly. (Or you may locate the notches on both sides of the CPU and alignment keys on the CPU socket.) •• Apply an even and thin layer of thermal grease on the surface of the CPU. •• Do not turn on the computer if the CPU cooler is not installed, otherwise overheating and damage of the CPU may occur. •• Set the CPU host frequency in accordance with the CPU specifications.

It is not recommended that the system bus frequency be set beyond hardware specifications since it does not meet the standard requiremeproof design. A memory module can be installed in only one direction. If you are unable to insert the memory, switch the direction. 1-4-1 Dual Channel Memory Configuration This motherboard provides four DDR3 memory sockets and supports Dual Channel Technology. After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory.

Enabling Dual Channel memory mode will double the original memory bandwidth. The four DDR3 memory sockets are divided into two channels and each channel has two memory sockets as following: Channel A: DDR3_4, DDR3_2 Channel B: DDR3_3, DDR3_1 Dual Channel Memory Configurations Table: DDR3_4 Two Modules Four Modules -DS/SS DS/SS DDR3_2 DS/SS -DS/SS DDR3_3 -DS/SS DS/SS DDR3_1 DS/SS -DS/SS (SS=Single-Sided, DS=Double-Sided, " - "=No Memory) Due to CPU limitations, read the following guidelines before installing the memory in Dual Channel mode. 1. Dual Channel mode cannot be enabled if only one DDR3 memory module is installed. 2.

When enabling Dual Channel mode with two or four memory modules, it is recommended that memory of the same capacity, brand, speed, and chips be used and installed in the same colored DDR3 sockets. For optimum performance, when enabling Dual Channel mode with two memory modules, we recommend that you install them in the DDR3_1 and DDR3_2 sockets. Hardware Installation DDR3_4 DDR3_2 DDR3_3 DDR3_1 - 16 - 1-4-2 Installing a Memory Before installing a memory module, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the memory module. DDR3 and DDR2 DIMMs are not compatible to each other or DDR DIMMs. Be sure to install DDR3 DIMMs on this motherboard. Notch DDR3 DIMM A DDR3 memory module has a notch, so it can only fit in one direction. Follow the steps below to correctly install your memory modules in the memory sockets. Step 1: Note the orientation of the memory module. Spread the retaining clips at both ends of the memory socket. Place the memory module on the socket.

As indicated in the picture on the left, place your fingers on the top edge of the memory, push down on the memory and insert it vertically into the memory socket. Step 2: The clips at both ends of the socket will snap into place when the memory module is securely inserted. - 17 - Hardware Installation 1-5 Installing an Expansion Card Read the following guidelines before you begin to install an expansion card: •• Make sure the motherboard supports the expansion card. Carefully read the manual that came with your expansion card. •• Always turn off the computer and unplug the power cord from the power outlet before installing an expansion card to prevent hardware damage. PCI Express x1 Slot PCI Express x16 Slot PCI Slot Follow the steps below to correctly install your expansion card in the expansion slot. 1. Locate an expansion slot that supports your card. Remove the metal slot cover from the chassis back panel. 2.

Align the card with the slot, and press down on the card until it is fully seated in the slot. 3. Make sure the metal contacts on the card are completely inserted into the slot. 4. Secure the card's metal bracket to the chassis back panel with a screw.

5. After installing all expansion cards, replace the chassis cover(s). 6. Turn on your computer. If necessary, go to BIOS Setup to make any required BIOS changes for your expansion card(s).

7. Install the driver provided with the expansion card in your operating system. Example: Installing and Removing a PCI Express Graphics Card: •• Installing a Graphics Card: Gently push down on the top edge of the card until it is fully inserted into the PCI Express slot. Make sure the card is securely seated in the slot and does not rock. •• Removing the Card: Gently push back on the lever on the slot and then lift the card straight out from the slot. Hardware Installation - 18 - 1-6 Back Panel Connectors USB 2.0/1.1 Port The USB port supports the USB 2.0/1.1 specification.

Use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive and etc. PS/2 Keyboard/Mouse Port D-Sub Port Use this port to connect a PS/2 mouse or keyboard. The D-Sub port supports a 15-pin D-Sub connector and supports a maximum resolution of 1920x1200. Connect a monitor that supports D-Sub connection to this port. DVI-D Port (Note) The DVI-D port conforms to the DVI-D specification and supports a maximum resolution of 1920x1200 (the actual resolutions supported depend on the monitor being used). Connect a monitor that supports DVI-D connection to this port. HDMI Port The HDMI port is HDCP compliant and supports Dolby True HD and DTS HD Master Audio formats. It also supports up to 192KHz/24bit 8-channel LPCM audio output. You can use this port to connect your HDMI-supported monitor. The maximum supported resolution is 4096x2160, but the actual resolutions supported are dependent on the monitor being used.

After installing the HDMI device, make sure to set the default sound playback device to HDMI. (The item name may differ depending on your operating system. The screenshot below is from Windows 8.) In Windows 8, select All Apps>Control Panel>Hardware and Sound>Sound>Playback, set Intel(R) Display Audio to the default playback device. (Note) The DVI-D port does not support D-Sub connection by adapter.

•• When removing the cable connected to a back panel connector, first remove the cable from your device and then remove it from the motherboard. •• When removing the cable, pull it straight out from the connector. Do not rock it side to side to prevent an electrical short inside the cable connector. - 19 Hardware Installation Triple-Display Configurations for the Onboard Graphics: Triple-display configurations are supported after you install motherboard drivers in OS. Only dual-display configurations are supported during the BIOS Setup or POST process.

USB 3.0/2.0 Port RJ-45 LAN Port Connection/ Speed LED The USB 3.0 port supports the USB 3.0 specification and is compatible to the USB 2.0/1.1 specification. Use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive and etc.

The Gigabit Ethernet LAN port provides Internet connection at up to 1 Gbps data rate. The following describes the states of the LAN port LEDs.

Activity LED Connection/Speed LED: State Orange Green Off Description 1 Gbps data rate 100 Mbps data rate 10 Mbps data rate Activity LED: State Blinking Off Description Data transmission or receiving is occurring No data transmission or receiving is occurring LAN Port Center/Subwoofer Speaker Out Jack (Orange) Rear Speaker Out Jack (Black) Side Speaker Out Jack (Gray) Line In Jack (Blue) Use this audio jack to connect center/subwoofer speakers in a 5.1/7.1-channel audio configuration. This jack can be used to connect front speakers in a 4/5.1/7.1-channel audio configuration. Use this audio jack to connect side speakers in a 7.1-channel audio configuration. The default line in jack. Use this audio jack for line in devices such as an optical drive, walkman, etc.

Line Out Jack (Green) Mic In Jack (Pink) The default line out jack. Use this audio jack for a headphone or 2-channel speaker. This jack can be used to connect front speakers in a 4/5.1/7.1-channel audio configuration.

The default Mic in jack. Microphones must be connected to this jack. The audio jacks can be reconfigured to perform different functions via the audio software (supported functions for each jack may vary based on hardware specification). Only microphones still MUST be connected to the default Mic in jack. Refer to the instructions on setting up a 2/4/5.

1/7.1-channel audio configuration in Chapter 6, "Configuring 2/4/5.1/7.1-Channel Audio." Hardware Installation - 20 - 1-7 Internal Connectors 1 3 2 4 12 4 5 10 9 11 14 15 13 8 13 6 7 1) 2) 3) 4) 5) 6) 7) 8) ATX_12V_2X4 ATX CPU_FAN SYS_FAN1/2/3 BAT SATA3 0/1/2/3/4/5 CLR_CMOS F_PANEL 9) 10) 11) 12) 13) 14) 15) F_AUDIO SPDIF_IN SPDIF_O F_USB30 F_USB1/F_USB2/F_USB3 COMA LPT Read the following guidelines before connecting external devices: •• First make sure your devices are compliant with the connectors you wish to connect. •• Before installing the devices, be sure to turn off the devices and your computer. Unplug the power cord from the power outlet to prevent damage to the devices. •• After installing the device and before turning on the computer, make sure the device cable has been securely attached to the connector on the motherboard. - 21 Hardware Installation 1/2) ATX_12V_2X4/ATX (2x4 12V Power Connector and 2x12 Main Power Connector) With the use of the power connector, the power supply can supply enough stable power to all the components on the motherboard. Before connecting the power connector, first make sure the power supply is turned off and all devices are properly installed.

The power connector possesses a foolproof design. Connect the power supply cable to the power connector in the correct orientation. The 12V power connector mainly supplies power to the CPU. If the 12V power connector is not connected, the computer will not start. To meet expansion requirements, it is recommended that a power supply that can withstand high power consumption be used (500W or greater). If a power supply is used that does not provide the required power, the result can lead to an unstable or unbootable system. ATX_12V_2X4: 5 1 ATX_12V_2X4 8 4 Pin No. 1 2 3 4 5 6 7 8 Definition GND (Only for 2x4-pin 12V) GND (Only for 2x4-pin 12V) GND GND +12V (Only for 2x4-pin 12V) +12V (Only for 2x4-pin 12V) +12V +12V ATX: 12 24 Pin No. 1 2 3 4 5 6 7 8 9 10 11 12 1 ATX 13 Definition 3.3V 3.

3V GND +5V GND +5V GND Power Good 5VSB (stand by +5V) +12V +12V (Only for 2x12-pin ATX) 3.3V (Only for 2x12-pin ATX) Pin No. 13 14 15 16 17 18 19 20 21 22 23 24 Definition 3.3V -12V GND PS_ON (soft On/Off) GND GND GND -5V +5V +5V +5V (Only for 2x12-pin ATX) GND (Only for 2x12-pin ATX) Hardware Installation - 22 - 3/4) CPU_FAN/SYS_FAN1/SYS_FAN2/SYS_FAN3 (Fan Headers) The motherboard has a 4-pin CPU fan header (CPU_FAN), two 4-pin (SYS_FAN1/2) and a 3-pin (SYS_FAN) system fan headers. Most fan headers possess a foolproof insertion design. When connecting a fan cable, be sure to connect it in the correct orientation (the black connector wire is the ground wire). The speed control function requires the use of a fan with fan speed control design. For optimum heat dissipation, it is recommended that a system fan be installed inside the chassis. CPU_FAN: 1 CPU_FAN Pin No. 1 2 3 4 Pin No.

1 2 3 4 SYS_FAN3 Definition GND +12V Sense Speed Control Definition GND +12V / Speed Control Sense VCC Definition GND +12V N/A SYS_FAN1/2: 1 SYS_FAN1/2 1 SYS_FAN3 Pin No. 1 2 3 •• Be sure to connect fan cables to the fan headers to prevent your CPU and system from overheating. Overheating may result in damage to the CPU or the system may hang. •• These fan headers are not configuration jumper blocks. Do not place a jumper cap on the headers. 5) BAT (Battery) The battery provides power to keep the values (such as BIOS configurations, date, and time information) in the CMOS when the computer is turned off. Replace the battery when the battery voltage drops to a low level, or the CMOS values may not be accurate or may be lost. You may clear the CMOS values by removing the battery: 1. Turn off your computer and unplug the power cord. 2.

Gently remove the battery from the battery holder and wait for one minute. (Or use a metal object like a screwdriver to touch the positive and negative terminals of the battery holder, making them short for 5 seconds.) 3. Replace the battery. 4. Plug in the power cord and restart your computer. •• Always turn off your computer and unplug the power cord before replacing the battery. •• Replace the battery with an equivalent one. Danger of explosion if the battery is replaced with an incorrect model. •• Contact the place of purchase or local dealer if you are not able to replace the battery by yourself or uncertain about the battery model.

•• When installing the battery, note the orientation of the positive side (+) and the negative side (-) of the battery (the positive side should face up). •• Used batteries must be handled in accordance with local environmental regulations. - 23 Hardware Installation DEBUG PORT DEBUG PORT DEBUG PORT DEBUG PORT DEBUG PORT 6) SATA3 0/1/2/3/4/5 (SATA 6Gb/s Connectors) The SATA connectors conform to SATA 6Gb/s standard and are compatible with SATA 3Gb/s and SATA 1.5Gb/s standard. Each SATA connector supports a single SATA device.

The Intel® Z87j/H87k Chipset supports RAID 0, RAID 1, RAID 5, and RAID 10. Refer to Chapter 3, "Configuring SATA hard drives," for instructions on configuring a RAID array. SATA3 1 0 3 2 5 4 1 1 1 7 7 7 DEBUG PORT Pin No. 1 2 3 4 5 6 7 Definition GND TXP TXN GND RXN RXP GND •• A RAID 0 or RAID 1 configuration requires at least two hard drives. If more than two hard drives are to be used, the total number of hard drives must be an even number. •• A RAID 5 configuration requires at least three hard drives.

(The total number of hard drives does not have to be an even number.) •• A RAID 10 configuration requires four hard drives. 7) CLR_CMOS (Clear CMOS Jumper) Use this jumper to clear the BIOS configuration and reset the CMOS values to factory defaults. To clear the CMOS values, use a metal object like a screwdriver to touch the two pins for a few seconds. Open: Normal Short: Clear CMOS Values •• Always turn off your computer and unplug the power cord from the power outlet before clearing the CMOS values. •• After system restart, go to BIOS Setup to load factory defaults (select Load Optimized Defaults) or manually configure the BIOS settings (refer to Chapter 2, "BIOS Setup," for BIOS configurations). Hardware Installation - 24 - 8) F_PANEL (Front Panel Header) Connect the power switch, reset switch, speaker, chassis intrusion switch/sensor and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables. Power LED Power Switch Speaker PLED+ PLEDPW+ PW-SPEAK+ 2 1 HD+ HDRESRES+ CICI+ PWR_LED+ PWR_LEDPWR_LEDPower LED Chassis Intrusion Header SPEAK20 19 Hard Drive Reset Activity LED Switch •• PLED/PWR_LED (Power LED, Yellow/Purple): System Status LED S0 On S3/S4/S5 Off Connects to the power status indicator on the chassis front panel.

The LED is on when the system is operating. The LED is off when the system is in S3/ S4 sleep state or powered off (S5). •• PW (Power Switch, Red): Connects to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch (refer to Chapter 2, "BIOS Setup," "Power Management," for more information). •• SPEAK (Speaker, Orange): Connects to the speaker on the chassis front panel. The system reports system startup status by issuing a beep code. One single short beep will be heard if no problem is detected at system startup. •• HD (Hard Drive Activity LED, Blue): Connects to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data. •• RES (Reset Switch, Green): Connects to the reset switch on the chassis front panel.

Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart. •• CI (Chassis Intrusion Header, Gray): Connects to the chassis intrusion switch/sensor on the chassis that can detect if the chassis cover has been removed. This function requires a chassis with a chassis intrusion switch/sensor. The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc.

When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly. - 25 Hardware Installation 9) F_AUDIO (Front Panel Audio Header) The front panel audio header supports Intel High Definition audio (HD) and AC'97 audio. You may connect your chassis front panel audio module to this header. Make sure the wire assignments of the module connector match the pin assignments of the motherboard header. Incorrect connection between the module connector and the motherboard header will make the device unable to work or even damage it.

For HD Front Panel Audio: Pin No. Definition 1 MIC2_L 2F_ GND 3 MIC2_R 4 -ACZ_DET 5 LINE2_R 6 GND 7 FAUDIO_JD 8 No Pin 9 LINE2_L 10 GND For AC'97 Front Panel Audio: Pin No. Definition 1 MIC F_ 2 GND 3 MIC Power 4 NC 5 Line Out (R) 6 NC 7 NC 8 No Pin 9 Line Out (L) 10 NC 9 F_ U 10 1 2 B_ •• The front panel audio header supports HD audio by default. If your chassis provides an AC'97 front panel audio module, refer to the instructions on how to activate AC'97 functionality via the audio software in Chapter 6, "Configuring 2/4/5.1/7.1-Channel Audio." •• Audio signals will be present on both of the front and back panel audio connections simultaneously. If you want to mute the back panel audio (only supported when using an HD front panel audio module), refer to Chapter 6, "Configuring 2/4/5.1/7.1-Channel Audio.

" •• Some chassis provide a front panel audio module that has separated connectors on each wire instead of a single plug. For information about connecting the front panel audio module that has different wire assignments, please contact the chassis manufacturer. 10) SPDIF_IN (S/PDIF In Header) This header supports digital S/PDIF In and can connect to an audio device that supports digital audio out via an optional S/PDIF In cable. For purchasing the optional S/PDIF In cable, please contact the local dealer. 1 Pin No. 1 2 3 Definition Power SPDIFI GND Hardware Installation - 26 - 11) SPDIF_O (S/PDIF Out Header) This header supports digital S/PDIF Out and connects a S/PDIF digital audio cable (provided by expansion cards) for digital audio output from your motherboard to certain expansion cards like graphics cards and sound cards. For example, some graphics cards may require you to use a S/PDIF digital audio cable for digital audio output from your motherboard to your graphics card if you wish to connect an HDMI display to the graphics card and have digital audio output from the HDMI display at the same time. For information about connecting the S/PDIF digital audio cable, carefully read the manual for your expansion card. 1 Pin No. 1 2 Definition SPDIFO GND 12) F_USB30 (USB 3.

0/2.0 Header) The header conforms to USB 3.0/2.0 specification and can provide two USB ports. For purchasing the optional 3.

5" front panel that provides two USB 3.0/2.0 ports, please contact the local dealer. F_USB30 20 1 11 10 Pin No. 1 2 3 4 5 6 7 8 9 10 Definition VBUS SSRX1SSRX1+ GND SSTX1SSTX1+ GND D1D1+ NC Pin No.

11 12 13 14 15 16 17 18 19 20 Definition D2+ D2GND SSTX2+ SSTX2GND SSRX2+ SSRX2VBUS No Pin F_ U B_ Prior to installing the USB bracket, be sure to turn off your computer and unplug the power cord from the power outlet to prevent damage to the USB bracket. - 27 - Hardware Installation 13) F_USB1/F_USB2/F_USB3 (USB 2.0/1.1 Headers) UG T The headers conform to USB 2.0/1.1 specification. Each USB header can provide two USB ports via an optional USB bracket. For purchasing the optional USB bracket, please contact the local dealer. Pin No. 1 2 3 4 5 6 7 8 9 10 Definition Power (5V) Power (5V) USB DXUSB DYUSB DX+ USB DY+ GND GND No Pin NC 9 10 1 2 •• Do not plug the IEEE 1394 bracket (2x5-pin) cable into the USB 2.

0/1.1 header. •• Prior to installing the USB bracket, be sure to turn off your computer and unplug the power cord from the power outlet to prevent damage to the USB bracket. 14) COMA (Serial Port Header) The COM header can provide one serial port via an optional COM port cable. For purchasing the optional COM port cable, please contact the local dealer.

Pin No. 1 2 3 4 5 6 7 8 9 10 Definition NDCDNSIN NSOUT NDTRGND NDSRNRTSNCTSNRINo Pin 9 10 1 2 Hardware Installation - 28 - 15) LPT (Parallel Port Header) The LPT header can provide one parallel port via an optional LPT port cable. For purchasing the optional LPT port cable, please contact the local dealer. 25 1 26 2 Pin No. 1 2 3 4 5 6 7 8 9 10 11 12 13 Definition STBAFDPD0 ERRPD1 INITPD2 SLINPD3 GND PD4 GND PD5 Pin No. 14 15 16 17 18 19 20 21 22 23 24 25 26 Definition GND PD6 GND PD7 GND ACKGND BUSY GND PE No Pin SLCT GND - 29 - Hardware Installation Hardware Installation - 30 - Chapter 2 BIOS Setup BIOS (Basic Input and Output System) records hardware parameters of the system in the CMOS on the motherboard. Its major functions include conducting the Power-On Self-Test (POST) during system startup, saving system parameters and loading operating system, etc. BIOS includes a BIOS Setup program that allows the user to modify basic system configuration settings or to activate certain system features. When the power is turned off, the battery on the motherboard supplies the necessary power to the CMOS to keep the configuration values in the CMOS. To access the BIOS Setup program, press the <Delete> key during the POST when the power is turned on.

To upgrade the BIOS, use either the GIGABYTE Q-Flash or @BIOS utility. •• Q-Flash allows the user to quickly and easily upgrade or back up BIOS without entering the operating system. •• @BIOS is a Windows-based utility that searches and downloads the latest version of BIOS from the Internet and updates the BIOS. For instructions on using the Q-Flash and @BIOS utilities, refer to Chapter 5, "BIOS Update Utilities." •• Because BIOS flashing is potentially risky, if you do not encounter problems using the current version of BIOS, it is recommended that you not flash the BIOS.

To flash the BIOS, do it with caution. Inadequate BIOS flashing may result in system malfunction. •• It is recommended that you not alter the default settings (unless you need to) to prevent system instability or other unexpected results. Inadequately altering the settings may result in system's failure to boot. If this occurs, try to clear the CMOS values and reset the board to default values. (Refer to the "Load Optimized Defaults" section in this chapter or introductions of the battery/clear CMOS jumper in Chapter 1 for how to clear the CMOS values.) - 31 - BIOS Setup 2-1 Startup Screen The following startup Logo screen will appear when the computer boots. Function Keys Function Keys: <DEL>: BIOS SETUP\Q-FLASH Press the <Delete> key to enter BIOS Setup or to access the Q-Flash utility in BIOS Setup. <F9>: SYSTEM INFORMATION Press the <F9> key to display your system information. <F12>: BOOT MENU Boot Menu allows you to set the first boot device without entering BIOS Setup.

In Boot Menu, use the up arrow key <h> or the down arrow key <i> to select the first boot device, then press <Enter> to accept. The system will boot from the device immediately. Note: The setting in Boot Menu is effective for one time only. After system restart, the device boot order will still be based on BIOS Setup settings. <END>: Q-FLASH Press the <End> key to access the Q-Flash utility directly without having to enter BIOS Setup first. BIOS Setup - 32 - 2-2 The Main Menu A. Dashboard Mode (Default) Differing from traditional UEFI interface, the Dashboard Mode provides a fancy and user-friendly BIOS environment where users can easily point and click through various settings and make adjustments for optimum performance. In Dashboard Mode, you can use your mouse to move through the option menus for quick configuration or you can click Classic Setup under the Shortcuts list on the right of the screen or press <F2> to switch to the traditional BIOS Setup screen. B. Classic Setup In Classic Setup, you can press the arrow keys on your keyboard to move among the items and press <Enter> to accept or enter a sub-menu.

Or you can use your mouse to select the item you want. (Sample BIOS Version:Z87-DS3H E4) Setup Menus Switch to Dashboard Mode Enter Q-Flash Select Default Language Help Function Keys Configuration Items Current Settings - 33 - BIOS Setup Classic Setup Function Keys <f><g> <h><i> <Enter> <+>/<Page Up> <->/<Page Down> <F2> <F5> <F7> <F8> <F9> <F10> <F12> <Esc> Move the selection bar to select a setup menu Move the selection bar to select an configuration item on a menu Execute command or enter a menu Increase the numeric value or make changes Decrease the numeric value or make changes Switch to Dashboard Mode Restore the previous BIOS settings for the current submenus Load the Optimized BIOS default settings for the current submenus Access the Q-Flash utility Display system information Save all the changes and exit the BIOS Setup program Capture the current screen as an image and save it to your USB drive Main Menu: Exit the BIOS Setup program Submenus: Exit current submenu BIOS Setup Menus M.I.T. Use this menu to configure the clock, frequency, and voltages of your CPU and memory, etc.

Or check the system/CPU temperatures, voltages, and fan speeds. Use this menu to configure the default language used by the BIOS and system time and date. System Information BIOS Features Peripherals Use this menu to configure the device boot order, advanced features available on the CPU, and the primary display adapter. Use this menu to configure all peripheral devices, such as SATA, USB, integrated audio, and integrated LAN, etc. Use this menu to configure all the power-saving functions.

Power Management Save & Exit Save all the changes made in the BIOS Setup program to the CMOS and exit BIOS Setup. You can save the current BIOS settings to a profile or load optimized defaults for optimal-performance system operations. •• When the system is not stable as usual, select the Load Optimized Defaults item to set your system to its defaults. •• The BIOS Setup menus described in this chapter are for reference only and may differ by BIOS version. BIOS Setup - 34 - 2-3 M.I.T. Whether the system will work stably with the overclock/overvoltage settings you made is dependent on your overall system configurations. Incorrectly doing overclock/overvoltage may result in damage to CPU, chipset, or memory and reduce the useful life of these components. This page is for advanced users only and we recommend you not to alter the default settings to prevent system instability or other unexpected results.

(Inadequately altering the settings may result in system's failure to boot. If this occurs, clear the CMOS values and reset the board to default values.) This section provides information on the BIOS version, CPU base clock, CPU frequency, memory frequency, total memory size, CPU temperature and Vcore.

``M.I.T. Current Status This screen provides information on CPU/memory frequencies/parameters. ``Advanced Frequency Settings && Performance Upgrade (Note) Provides you with five different overclocking configurations. Options are: 20% Upgrade, 40% Upgrade, 60% Upgrade, 80% Upgrade, 100% Upgrade. (Default: Auto) Allows you to manually set the CPU base clock in 0.

01 MHz increments. (Default: Auto) Important: It is highly recommended that the CPU frequency be set in accordance with the CPU specifications. && CPU Base Clock && Host/PCIe Clock Frequency (Note) Allows you to manually set the host clock frequency (which controls CPU, PCIe, and memory frequencies) in 0.01 MHz increments. This item is configurable only when CPU Base Clock is set to Manual.

Allows you to configure the Processor Base Clock by multiplying the Host/PCIe Clock Frequency by several preset host clock multipliers. This item is configurable only when CPU Base Clock is set to Manual. Enables or disables CPU/PCIe Spread Spectrum. (Default: Auto) && Processor Base Clock (Gear Ratio) (Note) && Spread Spectrum Control (Note) && Host Clock Value This value is determined by multiplying the Host/PCIe Clock Frequency value by the Processor Base Clock (Gear Ratio) value. && Processor Graphics Clock Allows you to set the onboard graphics clock.

The adjustable range is from 400 MHz to 4000 MHz. (Default: Auto) This item is present only when you install a CPU that supports this feature. @@- 36 - (Note) BIOS Setup && CPU Upgrade (Note) Allows you to set the CPU frequency. Options may vary depending on the CPU being used. (Default: Auto) && CPU Clock Ratio Allows you to alter the clock ratio for the installed CPU. The adjustable range is dependent on the CPU being installed. Displays the current operating CPU frequency. && CPU Frequency ``Advanced CPU Core Settings (Note) This item is present only when you install a CPU that supports this feature. @@- 37 BIOS Setup && CPU Clock Ratio, CPU Frequency && K OC (Note) The settings above are synchronous to those under the same items on the Advanced Frequency Settings menu. Allows for increased performance by using certain CPUs.

(Default: Auto) Allows you to set the CPU PLL. Auto lets the BIOS automatically configure this setting. (Default: Auto) Allows you to set the Filter PLL. Auto lets the BIOS automatically configure this setting. (Default: Auto) Allows you to set the CPU Uncore ratio. The adjustable range is dependent on the CPU being used. Displays the current CPU Uncore frequency. && CPU PLL Selection && Filter PLL Level && Uncore Ratio && Uncore Frequency && Intel(R) Turbo Boost Technology (Note) Allows you to determine whether to enable the Intel CPU Turbo Boost technology. Auto lets the BIOS automatically configure this setting. (Default: Auto) Allows you to set the CPU Turbo ratios for different number of active cores.

Auto sets the CPU Turbo ratios according to the CPU specifications. (Default: Auto) Allows you to set a power limit for CPU Turbo mode. When the CPU power consumption exceeds the specified power limit, the CPU will automatically reduce the core frequency in order to reduce the power. Auto sets the power limit according to the CPU specifications. (Default: Auto) Allows you to set a current limit for CPU Turbo mode.

When the CPU current exceeds the specified current limit, the CPU will automatically reduce the core frequency in order to reduce the current. Auto sets the power limit according to the CPU specifications. (Default: Auto) Allows you to select the number of CPU cores to enable in an Intel® multi-core CPU (the number of CPU cores may vary by CPU). Auto lets the BIOS automatically configure this setting. (Default: Auto) Allows you to determine whether to enable multi-threading technology when using an Intel® CPU that supports this function.

This feature only works for operating systems that support multi-processor mode. Auto lets the BIOS automatically configure this setting. (Default: Auto) Enables or disables Intel® CPU Enhanced Halt (C1E) function, a CPU power-saving function in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. Auto lets the BIOS automatically configure this setting. (Default: Auto) Allows you to determine whether to let the CPU enter C3 mode in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. The C3 state is a more enhanced power-saving state than C1. Auto lets the BIOS automatically configure this setting. (Default: Auto) This item is present only when you install a CPU that supports this feature.

@@- 38 - && Turbo Ratio (1-Core Active~4-Core Active) (Note) && Turbo Power Limit (Watts) && Core Current Limit (Amps) && No. of CPU Cores Enabled (Note) && Hyper-Threading Technology (Note) && CPU Enhanced Halt (C1E) (Note) && C3 State Support (Note) (Note) BIOS Setup && C6/C7 State Support (Note 1) Allows you to determine whether to let the CPU enter C6/C7 mode in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. The C6/C7 state is a more enhanced power-saving state than C3. Auto lets the BIOS automatically configure this setting. (Default: Auto) Enables or disables Intel® Thermal Monitor function, a CPU overheating protection function. When enabled, the CPU core frequency and voltage will be reduced when the CPU is overheated. Auto lets the BIOS automatically configure this setting. (Default: Auto) Enables or disables Enhanced Intel® Speed Step Technology (EIST). Depending on CPU loading, Intel EIST technology can dynamically and effectively lower the CPU voltage and core frequency to decrease average power consumption and heat production.

Auto lets the BIOS automatically configure this setting. (Default: Auto) && CPU Thermal Monitor (Note 1) && CPU EIST Function (Note 1) && Extreme Memory Profile (X.M.P.) (Note 2) Allows the BIOS to read the SPD data on XMP memory module(s) to enhance memory performance when enabled. □Disabled □ Disables this function. (Default) □Profile1 □ Uses Profile 1 settings. □Profile2 (Note 2) Uses Profile 2 settings. □ Allows you to set the system memory multiplier. Auto sets memory multiplier according to memory SPD data.

(Default: Auto) The first memory frequency value is the normal operating frequency of the memory being used; the second is the memory frequency that is automatically adjusted according to the System Memory Multiplier settings. && System Memory Multiplier && Memory Frequency (MHz) (Note 1) This item is present only when you install a CPU that supports this feature.

@@(Note 2) This item is present only when you install a CPU and a memory module that support this feature. - 39 BIOS Setup ``Advanced Memory Settings && Extreme Memory Profile (X.M.P.) (Note), System Memory Multiplier, Memory Frequency(MHz) The settings above are synchronous to those under the same items on the Advanced Frequency Settings menu. Allows you to set the memory frequency. Options may vary depending on the memory being used. (Default: Disabled) Provides memory detection and training methods.

□Auto □ Lets BIOS automatically configure this setting. (Default) □Normal □ Standard detection and training □Fast □ Skip memory detection and training in some specific criteria for faster memory boot. □Coldboot □ Detect and train memory at every single boot. && Memory Overclocking Profiles (Note) && Memory Boot Mode (Note) && Memory Enhancement Settings && Memory Timing Mode P □ rovides three different memory performance enhancement settings: Normal (basic performance), Enhanced Stability, and Enhanced Performance. (Default: Normal) Manual and Advanced Manual allows the Channel Interleaving, Rank Interleaving, and memory timing settings below to be configurable. Options are: Auto (default), Manual, Advanced Manual. When using a non-XMP memory module or Extreme Memory Profile (X.M.P.) is set to Disabled, this item will display as 1.

50V. When Extreme Memory Profile (X.M.P.) is set to Profile1 or Profile2, this item will display the value based on the SPD data on the XMP memory. && Profile DDR Voltage (Note) This item is present only when you install a CPU and a memory module that support this feature. BIOS Setup - 40 - && Channel Interleaving Enables or disables memory channel interleaving. Enabled allows the system to simultaneously access different channels of the memory to increase memory performance and stability. Auto lets the BIOS automatically configure this setting. (Default: Auto) Enables or disables memory rank interleaving.

Enabled allows the system to simultaneously access different ranks of the memory to increase memory performance and stability. Auto lets the BIOS automatically configure this setting. (Default: Auto) && Rank Interleaving ``Channel A/B Memory Sub Timings This sub-menu provides memory timing settings for each channel of memory. This sub-menu provides memory timing settings for each channel of memory. The respective timing setting screens are configurable only when Memory Timing Mode is set to Manual or Advanced Manual. Note: Your system may become unstable or fail to boot after you make changes on the memory timings. If this occurs, please reset the board to default values by loading optimized defaults or clearing the CMOS values. - 41 - BIOS Setup ``Advanced Voltage Settings ``CPU Core Voltage Control This section provides CPU voltage control options. ``Chipset Voltage Control `` DRAM Voltage Control This section provides Chipset voltage control options. This section provides memory voltage control options.

BIOS Setup - 42 - ``PC Health Status && Reset Case Open Status □Disabled Keeps or clears the record of previous chassis intrusion status. (Default) □ □Enabled □ □ Clears the record of previous chassis intrusion status and the Case Open field will show "No" at next boot. Displays the detection status of the chassis intrusion detection device attached to the motherboard CI header. If the system chassis cover is removed, this field will show "Yes", otherwise it will show "No". To clear the chassis intrusion status record, set Reset Case Open Status to Enabled, save the settings to the CMOS, and then restart your system. - 43 BIOS Setup && Case Open && CPU Vcore/CPU VRIN/DRAM Voltage/+3.3V/+5V/+12V/CPU VAXG Displays the current system voltages. && CPU/System Temperature && CPU/System Fan Speed Displays current CPU/system temperature. Displays current CPU/system fan speeds. && CPU/System Temperature Warning && CPU/System Fan Fail Warning Sets the warning threshold for CPU/system temperature.

When temperature exceeds the threshold, BIOS will emit warning sound. Options are: Disabled (default), 60oC/140oF, 70oC/158oF, 80oC/176oF, 90oC/194oF. && CPU Fan Speed Control (CPU_FAN Connector) Allows the system to emit warning sound if the fan is not connected or fails. Check the fan condition or fan connection when this occurs. (Default: Disabled) Allows you to determine whether to enable the fan speed control function and adjust the fan speed.

□Normal □ A □ llows the fan to run at different speeds according to the CPU temperature. You can adjust the fan speed with EasyTune based on your system requirements. (Default) □Silent □ Allows the fan to run at slow speeds. □Manual □ Allows you to control the fan speed under the Fan Speed Percentage item. □Full Speed □ Allows the fan to run at full speeds.

Allows you to control the fan speed. This item is configurable only when CPU Fan Speed Control is set to Manual. Options are: 0.75 PWM value /oC ~ 2.50 PWM value /oC. Allows you to determine whether to enable the fan speed control function and adjust the fan speed. □Normal □ A □ llows the fan to run at different speeds according to the system temperature. You can adjust the fan speed with EasyTune based on your system requirements. (Default) □Silent □ Allows the fan to run at slow speeds. □Manual □ Allows you to control the fan speed under the Fan Speed Percentage item.

□Full Speed □ Allows the fan to run at full speeds. Allows you to control the fan speed. This item is configurable only when 1st System Fan Speed Control is set to Manual. Options are: 0.75 PWM value /oC ~ 2.50 PWM value /oC. Allows you to determine whether to enable the fan speed control function and adjust the fan speed. □Normal □ A □ llows the fan to run at different speeds according to the system temperature. (Default) □Silent □ Allows the fan to run at slow speeds. □Manual □ Allows you to control the fan speed under the Fan Speed Percentage item.

□Full Speed □ Allows the fan to run at full speeds. Allows you to control the fan speed. This item is configurable only when 2nd System Fan Speed Control is set to Manual. Options are: 0.75 PWM value /oC ~ 2.

50 PWM value /oC. && Fan Speed Percentage && 1st System Fan Speed Control (SYS_FAN1 Connector) && Fan Speed Percentage && 2nd System Fan Speed Control (SYS_FAN2 Connector) && Fan Speed Percentage BIOS Setup - 44 - ``Miscellaneous Settings && PCIe Slot Configuration Allows you to set the operation mode of the PCI Express slots to Gen 1, Gen 2, or Gen 3. Actual operation mode is subject to the hardware specification of each slot. For example, the PCI Express x1 slots can support up to Gen 2 mode only. Auto lets the BIOS automatically configure this setting. (Default: Auto) Allows you to determine whether to enhance some legacy benchmark performance.

(Default: Disabled) && 3DMark01 Boost - 45 - BIOS Setup 2-4 System Information This section provides information on your CPU, memory, motherboard model, and BIOS version. You can also select the default language used by the BIOS and manually set the system time. && System Language Selects the default language used by the BIOS. && System Date Sets the system date. The date format is week (read-only), month, date, and year. Use <Enter> to switch between the Month, Date, and Year fields and use the <Page Up> or <Page Down> key to set the desired value. Sets the system time. The time format is hour, minute, and second. For example, 1 p.

m. is 13:0:0. Use <Enter> to switch between the Hour, Minute, and Second fields and use the <Page Up> or <Page Down> key to set the desired value. Displays the current access level depending on the type of password protection used. (If no password is set, the default will display as Administrator.) The Administrator level allows you to make changes to all BIOS settings; the User level only allows you to make changes to certain BIOS settings but not all. && System Time && Access Level BIOS Setup - 46 - 2-5 BIOS Features && Boot Option Priorities Specifies the overall boot order from the available devices. Removable storage devices that support GPT format will be prefixed with "UEFI:" string on the boot device list. To boot from an operating system that supports GPT partitioning, select the device prefixed with "UEFI:" string. Or if you want to install an operating system that supports GPT partitioning such as Windows 7 64-bit, select the optical drive that contains the Windows 7 64-bit installation disk and is prefixed with "UEFI:" string.

Enables or disables Numlock feature on the numeric keypad of the keyboard after the POST. (Default: Enabled) - 47 BIOS Setup && Bootup NumLock State && Security Option Specifies whether a password is required every time the system boots, or only when you enter BIOS Setup. After configuring this item, set the password(s) under the Administrator Password/User Password item. ⬜Setup ⬜ password is only required for entering the BIOS Setup program. ⬜ A ⬜System ⬜A password is required for booting the system and for entering the BIOS Setup program.

⬜ (Default) Allows you to determine whether to display the GIGABYTE Logo at system startup. Disabled skips the GIGABYTE Logo when the system starts up. (Default: Enabled) && Full Screen LOGO Show && Fast Boot Enables or disables Fast Boot to shorten the OS boot process. Ultra Fast provides the fastest bootup speed. (Default: Disabled) Allows you to select which type of operating system to boot.

⬜Auto ⬜ Enables legacy option ROM only. ⬜EFI Driver ⬜ Enables EFI option ROM. (Default) This item is configurable only when Fast Boot is set to Enabled or Ultra Fast. ⬜Disabled ⬜ All USB devices are disabled before the OS boot process completes. ⬜Full Initial ⬜ All USB devices are functional in the operating system and during the POST. ⬜Partial Initial Part of the USB devices are disabled before the OS boot process completes. (Default) ⬜ This item is configurable only when Fast Boot is set to Enabled. This item is disabled when Fast Boot is set to Ultra Fast. ⬜Disabled ⬜ All PS/2 devices are disabled before the OS boot process completes. ⬜Enabled ⬜ All PS/2 devices are functional in the operating system and during the POST.

(Default) This item is configurable only when Fast Boot is set to Enabled. This item is disabled when Fast Boot is set to Ultra Fast. ⬜Disabled ⬜ Disables booting from the network. (Default) ⬜Enabled ⬜ Enables booting from the network. This item is configurable only when Fast Boot is set to Enabled or Ultra Fast. ⬜Normal Boot Enables normal bootup upon the return of the AC power. (Default) ⬜ ⬜Fast Boot ⬜ Keeps the Fast Boot settings upon the return of the AC power. This item is configurable only when Fast Boot is set to Enabled or Ultra Fast. Allows you to determine whether to limit CPUID maximum value. Set this item to Disabled for Windows XP operating system; set this item to Enabled for legacy operating system such as Windows NT4.

0. (Default: Disabled) && VGA Support && USB Support && PS2 Devices Support && NetWork Stack Driver Support && Next Boot After AC Power Loss && Limit CPUID Maximum (Note) (Note) This item is present only when you install a CPU that supports this feature. @@- 48 - BIOS Setup && Execute Disable Bit (Note) Enables or disables Intel® Execute Disable Bit function. This function may enhance protection for the computer, reducing exposure to viruses and malicious buffer overflow attacks when working with its supporting software and system. (Default: Enabled) Enables or disables Intel® Virtualization Technology.

Virtualization enhanced by Intel® Virtualization Technology will allow a platform to run multiple operating systems and applications in independent partitions. With virtualization, one computer system can function as multiple virtual systems. (Default: Enabled) Enables or disables Intel® Trusted Execution Technology (Intel® TXT). Intel® Trusted Execution Technology provides a hardware-based security foundation. (Default: Disabled) Enables or disables Intel® Dynamic Storage Accelerator.

@@@@@@@@⬜Always ⬜ Enables UEFI CSM. @@@@Allows you to select which type of operating system to boot. @@@@@This item is configurable only when CSM Support is set to Always. @@@@⬜Disabled ⬜ Disables option ROM. ⬜Legacy Only ⬜ Enables legacy option ROM only. (Default) ⬜UEFI Only ⬜ Enables UEFI option ROM only. ⬜Legacy First ⬜ Enables legacy option ROM first. ⬜UEFI First ⬜ Enables UEFI option ROM first. @@@@@@@⬜Legacy OpROM ⬜ Enables legacy option ROM only. ⬜UEFI OpROM ⬜ Enables UEFI option ROM only.

@@(Default: Disabled) Enables or disables IPv4 PXE Support. This item is configurable only when Network stack is enabled. Enables or disables IPv6 PXE Support. @@@@You will be requested to confirm the password. Type the password again and press <Enter>. @@@@Allows you to configure a user password. @@You will be requested to confirm the password. Type the password again and press <Enter>. @@@@@@@@⬜IGFX ⬜ Sets the onboard graphics as the first display. @@@@@@@@@This allows the use of USB 3.

0 devices prior to OS boot. @@@@(Default) ⬜Auto ⬜ ⬜ BIOS routes the sharable ports to EHCI controller. Then it uses ACPI protocols to provide an option to enable the xHCI controller and reroute the sharable ports. Note: This is the recommended mode when BIOS does NOT have xHCI pre-boot support. ⬜Enabled ⬜All shared ports are eventually routed to the xHCI controller during the BIOS boot process.

⬜ If BIOS does not have pre-boot support for the xHCI controller, it should initially route the sharable ports to the EHCI controller and then prior to OS boot it should route the ports to xHCI controller.

Note: OS has to provide support for the xHCI controller in this mode. If the OS does not provide support, all sharable ports won't work. ☐Disabled ☐ USB 3.0 ports are routed to the EHCI controller and the xHCI controller is turned ☐ The off.

All USB 3.0 devices function as High Speed devices regardless of xHCI software support/availability. && XHCI Mode - 51 - BIOS Setup ☐Manual ☐Allows you to determine whether to rout the USB 3.0 ports to the xHCI or EHCI controller ☐ before booting to OS, and also provides you with options to manually rout each USB 3.0/2.0 port to xHCI or EHCI. && Audio Controller Enables or disables the onboard audio function. (Default: Auto) If you wish to install a 3rd party add-in audio card instead of using the onboard audio, set this item to Disabled. Enables or disables the onboard graphics function. (Default: Enabled) Allows you to set the onboard graphics memory size.

Options are: 32M~1024M. (Default: 64M) && Intel Processor Graphics && Intel Processor Graphics Memory Allocation && DVMT Total Memory Size Allows you to allocate the DVMT memory size of the onboard graphics. Options are: 128M, 256M, MAX. (Default: MAX) && Intel(R) Rapid Start Technology && Legacy USB Support && XHCI Hand-off && EHCI Hand-off Enables or disables Intel® Rapid Start Technology. (Default: Disabled) Allows USB keyboard/mouse to be used in MS-DOS. (Default: Enabled) Determines whether to enable XHCI Hand-off feature for an operating system without XHCI Hand-off support. (Default: Enabled) Determines whether to enable EHCI Hand-off feature for an operating system without EHCI Hand-off support. (Default: Disabled) Displays a list of connected USB mass storage devices. This item appears only when a USB storage device is installed. Enables or disables the onboard LAN function.

If you wish to install a 3rd party add-in network card instead of using the onboard LAN, set this item to Disabled. && USB Storage Devices && OnBoard LAN Controller BIOS Setup - 52 - ``SATA Configuration && Integrated SATA Controller Enables or disables the integrated SATA controllers. (Default: Enabled) && SATA Mode Selection Enables or disables RAID for the SATA controllers integrated in the Chipset or configures the SATA controllers to AHCI mode. ☐IDE ☐ Configures the SATA controller to IDE mode. ☐RAID ☐ Enables RAID for the SATA controller.

☐AHCI ☐ C ☐ onfigures the SATA controllers to AHCI mode. Advanced Host Controller Interface (AHCI) is an interface specification that allows the storage driver to enable advanced Serial ATA features such as Native Command Queuing and hot plug. (Default) ``Serial ATA Port 0/1/2/3/4/5 && Port 0/1/2/3/4/5 Enables or disables each SATA port. (Default: Enabled) Enables or disable the hot plug capability for each SATA port. (Default: Disabled) && Hot plug && External SATA Enables or disables support for external SATA devices.

(Default: Disabled) ``Super IO Configuration T ☐ his section provides information on the super I/O chip and allows you to configure the serial port and parallel port. Enables or disables the onboard serial port. (Default: Enabled) Enables or disables the onboard parallel port. @@@@@@@@@If this occurs, please set to Enabled. Auto lets the BIOS automatically configure this setting. @@@@@@@@@@@(Default) ☐Delay 4 Sec. ☐ ☐ Press and hold the power button for 4 seconds to turn off the system. If the power button is pressed for less than 4 seconds, the system will enter suspend mode. Allows you to determine whether to let the onboard graphics enter standby mode to decrease power consumption. (Default: Disabled) Determines the state of the system after the return of power from an AC power loss.

☐Always Off ☐ T ☐ he system stays off upon the return of the AC power. (Default) ☐Always On ☐ The system is turned on upon the return of the AC power. ☐Memory ☐ The system returns to its last known awake state upon the return of the AC power. && Resume by Alarm && Soft-Off by PWR-BTTN && RC6(Render Standby) && AC BACK - 55 - BIOS Setup && Power On By Keyboard Allows the system to be turned on by a PS/2 keyboard wake-up event. Note: To use this function, you need an ATX power supply providing at least 1A on the +5VSB lead. ☐Disabled ☐ Disables this function. (Default) ☐Any Key ☐ Press any key to turn on the system. ☐Keyboard 98 Press POWER button on the Windows 98 keyboard to turn on the system. ☐ ☐Password ☐ Set a password with 1~5 characters to turn on the system. ☐Set the password when Power On By Keyboard is set to Password.

Press <Enter> on this item and set a password with up to 5 characters and then press <Enter> to accept. To turn on the system, enter the password and press <Enter>. Note: To cancel the password, press <Enter> on this item. When prompted for the password, press <Enter> again without entering the password to clear the password settings. Allows the system to be turned on by a PS/2 mouse wake-up event.

Note: To use this function, you need an ATX power supply providing at least 1A on the +5VSB lead. ☐Disabled ☐ Disables this function. (Default) ☐Move ☐ Move the mouse to turn on the system. ☐Double Click Double click on left button on the mouse to turn on the system. ☐ Determines whether to let the system consume least power in S5 (shutdown) state.

(Default: Disabled) Note: When this item is set to Enabled, the following functions will become unavailable: PME event wake up, power on by mouse, power on by keyboard, and wake on LAN. && Power On Password && Power On By Mouse && ErP BIOS Setup - 56 - 2-8 Save & Exit && Save & Exit Setup Press <Enter> on this item and select Yes. This saves the changes to the CMOS and exits the BIOS Setup program. Select No or press <Esc> to return to the BIOS Setup Main Menu. Press <Enter> on this item and select Yes. This exits the BIOS Setup without saving the changes made in BIOS Setup to the CMOS. Select No or press <Esc> to return to the BIOS Setup Main Menu. Press <Enter> on this item and select Yes to load the optimal BIOS default settings. The BIOS defaults settings help the system to operate in optimum state. Always load the Optimized defaults after updating the BIOS or after clearing the CMOS values.

Allows you to select a device to boot immediately. Press <Enter> on the device you select and select Yes to confirm. Your system will restart automatically and boot from that device. This function allows you to save the current BIOS settings to a profile. You can create up to 8 profiles and save as Setup Profile 1~ Setup Profile 8. Press <Enter> to complete. Or you can select Select File in HDD/USB/FDD to save the profile to your storage device.