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You can read the recommendations in the user guide, the technical guide or the installation guide for GIGABYTE GA-990FXA-UD5. You'll find the answers to all your questions on the GIGABYTE GA-990FXA-UD5 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-990FXA-UD5
User guide GIGABYTE GA-990FXA-UD5
Operating instructions GIGABYTE GA-990FXA-UD5
Instructions for use GIGABYTE GA-990FXA-UD5
Instruction manual GIGABYTE GA-990FXA-UD5

GA-990FXA-UD5

User's Manual
Rev. 1001
12ME-990FXA5-1001R



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Manual abstract:

@@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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.. 102 5-3-1 5-3-2 Box Contents GA-990FXA-UD5 motherboard Motherboard driver disk User's Manual Quick Installation Guide Four SATA cables I/O Shield One 2-Way SLI bridge connector (Note) One 3-Way SLI bridge connector (Note) (Note) To enable NVIDIA SLI technology, you need SLI-supported graphics cards, BIOS, and driver. For more details, please go to GIGABYTE's website. · 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. · The motherboard image is for reference only.

Optional Items 2-port USB 2.0 bracket (Part No. 12CRI-1UB030-5*R) 2-port SATA power cable (Part No.

12CF1-2SERPW-0*R) COM port cable (Part No. 12CF1-1CM001-3*R) 2-port IEEE 1394a bracket (Part No. 12CF1-1IE008-0*R) 3.5" Front Panel with 2 USB 3.0/2.0 ports (Part No. 12CRI-FPX582-0*R) -6- GA-990FXA-UD5 Motherboard Layout KB_MS_USB OPTICAL USB_1394_ESATA USB_ESATA Marvell 88SE9172 ATX_12V CPU_FAN Socket AM3+ PWR_FAN R_USB30 USB_LAN ATX AUDIO Etron EJ168 PCIEX1(Note) Realtek RTL8111E BAT DDR3_4 DDR3_2 DDR3_3 DDR3_1 AMD 990FX PCIEX16_1 PCIEX4_1 GA-990FXA-UD5 AMD SB950 Marvell 88SE9172 GSATA3_7 GSATA3_6 SATA3_4 SATA3_5 SATA3_2 SATA3_3 PCIEX16_2 CODEC PCIEX4_2 B_BIOS M_BIOS SATA3_0 SATA3_1 PCIEX8 VIA VT6308 PCI_F_1394 COMA Etron EJ168 F_USB30 TPM iTE IT8720 SYS_FAN1 F_AUDIO CLR_CMOS SPDIF_O SYS_FAN2 F_USB3 F_USB2 F_USB1 F_PANEL (Note) Due to a hardware limitation, the PCIEX1 slot can only accommodate a shorter PCI Express x1 expansion card. For a longer expansion card, use other expansion slots. -7- GA-990FXA-UD5 Motherboard Block Diagram 2 PCI Express x8 1 PCI Express x16 1 PCI Express x16 or CPU CLK+/- (200 MHz) AM3+/AM3 CPU DDR3 2000(O.C.

/1866/1600/1333/1066 MHz Dual Channel Memory PCIe CLK (100 MHz) x8 x16 x16 Hyper Transport Bus 2 SATA 6Gb/s 2 USB 3.0/2.0 Etron EJ168 x1 Switch PCI Express Bus PCIe CLK (100 MHz) 2 PCI Express x4 PCI Express Bus x1 x1 Marvell 88SE9172 1 PCI Express x1 PCI Bus x4 x4 AMD 990FX LAN RJ45 Realtek RTL8111E Marvell 88SE9172 x1 PCIe CLK (100 MHz) PCI Express Bus x1 x1 Etron EJ168 AMD SB950 14 USB 2.0/1.1 6 SATA 6Gb/s Dual BIOS LPC Bus 2 SATA 6Gb/s 2 USB 3.

0/2.0 VIA VT6308 CODEC iTE IT8720 Surround Speaker Out Center/Subwoofer Speaker Out Side Speaker Out S/PDIF Out MIC Line Out Line In COM Port 2 IEEE 1394a PS/2 KB/Mouse 1 PCI PCI CLK (33 MHz) -8- Chapter 1 1-1 Hardware Installation 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, 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 module (TPM) header 1 x PS/2 keyboard/mouse port 1 x optical S/PDIF Out connector 1 x IEEE 1394 port 8 x USB 2.0/1.1 ports 2 x USB 3.

0/2.0 ports 2 x eSATA 6Gb/s connectors 1 x RJ-45 port 6 x audio jacks (Center/Subwoofer Speaker Out/Rear Speaker Out/Side Speaker Out/Line In/Line Out/Microphone) iTE IT8720 chip - 11 Hardware Installation I/O Controller Hardware Monitor System voltage detection CPU/System temperature detection CPU/System/Power fan speed detection CPU overheating warning CPU/System/Power fan fail warning CPU/System fan speed control * Whether the CPU/system fan speed control function is supported will depend on the CPU/system cooler you install.



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BIOS Unique Features Bundled Software Operating System Form Factor 2 x 32 Mbit flash Use of licensed AWARD BIOS Support for DualBIOS™ PnP 1.0a, DMI 2.0, SM BIOS 2.4, ACPI 1.0b Support for @BIOS Support for Q-Flash Support for Xpress BIOS Rescue Support for Download Center Support for Xpress Install Support for Xpress Recovery2 Support for EasyTune * Available functions in EasyTune may differ by motherboard model. Support for Easy Energy Saver Support for Smart Recovery Support for Auto Green Support for ON/OFF Charge Support for Cloud OC Support for 3TB+ Unlock Support for Q-Share Norton Internet Security (OEM version) Support for Microsoft® Windows 7/Vista/XP ATX Form Factor; 30.5cm x 24.4cm * GIGABYTE reserves the right to make any changes to the product specifications and product-related information without prior notice.

Hardware Installation - 12 - 1-3 Installing the CPU and CPU Cooler Read the following guidelines before you begin to install the CPU: · Make sure that the motherboard supports the CPU. (Go to GIGABYTE's website for the latest 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 requirements for the peripherals.

If you wish to set the frequency beyond the standard specifications, please do so according to your hardware specifications including the CPU, graphics card, memory, hard drive, etc. **1-3-1 Installing the CPU A.** Locate the pin one (denoted by a small triangle) of the CPU socket and the CPU. A Small Triangle Mark Denotes Pin One of the Socket AM3+ Socket A Small Triangle Marking Denotes CPU Pin One AM3+/AM3 CPU - 13 - **Hardware Installation B.** Follow the steps below to correctly install the CPU into the motherboard CPU socket. · Before installing the CPU, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the CPU. · Do not force the CPU into the CPU socket. The CPU cannot fit in if oriented incorrectly.

Adjust the CPU orientation if this occurs. **CPU Socket Locking Lever Step 1:** Completely lift up the CPU socket locking lever.

Step 2: Align the CPU pin one (small triangle marking) with the triangle mark on the CPU socket and gently insert the CPU into the socket. Make sure that the CPU pins fit perfectly into their holes. Once the CPU is positioned into its socket, place one finger down on the middle of the CPU, lowering the locking lever and latching it into the fully locked position. **Hardware Installation - 14 - 1-3-2 Installing the CPU Cooler** Follow the steps below to correctly install the CPU cooler on the CPU. (The following procedure uses the GIGABYTE cooler as the example.) **Step 1:** Apply an even and thin layer of thermal grease on the surface of the installed CPU. **Step 2:** Place the CPU cooler on the CPU. **Step 3:** Hook the CPU cooler clip to the mounting lug on one side of the retention frame. On the other side, push straight down on the CPU cooler clip to hook it to the mounting lug on the retention frame. **Step 4:** Turn the cam handle from the left side to the right side (as the picture above shows) to lock into place.

(Refer to your CPU cooler installation manual for instructions on installing the cooler.) **Step 5:** Finally, attach the power connector of the CPU cooler to the CPU fan header (CPU_FAN) on the motherboard. Use extreme care when removing the CPU cooler because the thermal grease/tape between the CPU cooler and CPU may adhere to the CPU. Inadequately removing the CPU cooler may damage the CPU. - 15 **Hardware Installation 1-4 Installing the Memory**

Read the following guidelines before you begin to install the memory: · Make sure that the motherboard supports the memory.

It is recommended that memory of the same capacity, brand, speed, and chips be used. (Go to GIGABYTE's website for the latest supported memory speeds and memory modules.) · Always turn off the computer and unplug the power cord from the power outlet before installing the memory to prevent hardware damage. · Memory modules have a foolproof 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 0: DDR3_2, DDR3_4 Channel 1: DDR3_1, DDR3_3 **Dual Channel Memory Configurations**

Table Two Modules Four Modules DDR3_4 -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 for optimum performance. 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.



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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 (PCIEX16_1/PCIEX16_2) PCI Express x16 Slot (PCIEX8/PCIEX4_1/PCIEX4_2) 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 from the PCIEX16_1/PCIEX16_2

Slot: Gently push back on the lever on the slot and then lift the card straight out from the slot. Hardware Installation - 18 - · Removing the Card from the PCIEX8/PCIEX4_1/PCIEX4_2 Slot: Press the latch at the end of the PCI Express slot to release the card and then pull the card straight up from the slot. 1-6

- Setup of AMD CrossFireXTM Configuration A. System Requirements The 2-Way CrossFireX technology currently support Windows 7, Vista, XP operating systems The 3-Way CrossFireX technology currently support Windows 7 and Vista operating systems A CrossFireX-supported motherboard with

two/three/four PCI Express x16 slots and correct driver Two/three CrossFireX-ready graphics cards of identical brand and chip and correct driver (Current GPUs that support 3-Way CrossFireX technology include the ATI Radeon HD 3800, HD 4800, and HD 5800 series and AMD Radeon HD 6950, HD 6970 and HD 6990 series.) - CrossFireX bridge connector(s) (Note) - A power supply with sufficient power is recommended (refer to the manual of your graphics

cards for the power requirement) B. Connecting the Graphics Cards Step 1: Observe the steps in "1-5 Installing an Expansion Card" and install two/three graphics cards on the PCI Express x16 slots. The following table shows the recommended configurations with two/three cards. Recommended 2/3-Way

CrossFireX Configurations: PCIEX16_1 2-Way 3-Way a PCIEX16_2 a PCIEX8 -a PCIEX4_1 --PCIEX4_2 --- Step 2: Insert the CrossFireX bridge connector(s) (Note) in the CrossFireX gold edge connectors on top of the graphics cards.

Step 3: Plug the display cable into the graphics card on the PCIEX16_1 slot. C. Configuring the Graphics Card Driver After installing the graphics card driver in the operating system, go to the Catalyst Control Center. Browse to Performance\AMD CrossFireX Configurations and ensure the Enable

CrossFireXTM check box is selected. Select the GPU combination you want to use.

(Available combination options are dependent on the number of graphics cards you install.) (Note) The bridge connector(s) may be needed or not depending on your graphics cards. Procedure and driver screen for enabling CrossFireX technology may differ by graphics cards and driver version. Refer to the

manual that came with your graphics cards for more information about enabling CrossFireX technology. - 19 - Hardware Installation 1-7 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 Use this port to connect a PS/2 mouse or keyboard. Optical S/PDIF Out Connector IEEE 1394a Port This connector

provides digital audio out to an external audio system that supports digital optical audio. Before using this feature, ensure that your audio system provides an optical digital audio in connector. The IEEE 1394 port supports the IEEE 1394a specification, featuring high speed, high bandwidth and hotplug capabilities.

Use this port for an IEEE 1394a device.

eSATA 6Gb/s Port The eSATA 6Gb/s port conforms to SATA 6Gb/s standard and is compatible with SATA 3Gb/s and SATA 1.5Gb/s standard. Use the port to connect an external SATA device or a SATA port multiplier. The Marvell 88SE9172 chip supports RAID function. Refer to Chapter 5, "Configuring SATA

Hard Drive(s)," for instructions on configuring a RAID array. USB 3.0/2.0 Port RJ-45 LAN Port 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.

Connection/ Speed LED 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 Description Blinking Data transmission or receiving is occurring Off No data transmission or receiving is occurring LAN Port Hardware

Installation - 20 - 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. Use this audio jack to connect rear speakers in a 7.1-channel

audio configuration.

Use this audio jack to connect side speakers in a 4/5.1/7.1-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. In addition to the default speakers settings, the ~ audio jacks can be reconfigured to perform different functions via the audio software. 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 5, "Configuring 2/4/5.1/7.1-Channel Audio."



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· 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.

Hardware Installation - 21 - Internal Connectors 1 3 5 2 6 8 7 11 10 14 4 15 12 13 16 9 4 17 1) 2) 3) 4) 5) 6) 7) 8) 9) ATX_12V ATX CPU_FAN SYS_FAN1/2 PWR_FAN BAT SATA3_0/1/2/3/4/5 GSATA3_6/7 F_PANEL 10) 11) 12) 13) 14) 15) 16) 17) F_AUDIO SPDIF_O F_USB1/F_USB2/F_USB3 F_USB30 F_1394 COMA TPM CLR_CMOS 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.

Hardware Installation - 22 - 1/2) ATX_12V/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: 8 4 5 ATX_12V 1 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 1 ATX 13 Pin No. 1 2 3 4 5 6 7 8 9 10 11 12 Definition Pin No. 3.3V 13 3.3V 14 GND 15 +5V 16 GND 17 +5V 18 GND 19 Power Good 20 5VSB (stand by +5V) 21 +12V 22 +12V (Only for 2x12-pin ATX) 23 3.

3V (Only for 2x12-pin ATX) 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) - 23 - **Hardware Installation 3/4/5) CPU_FAN/SYS_FAN1/SYS_FAN2/PWR_FAN (Fan Headers)** The motherboard has a 4-pin CPU fan header (CPU_FAN), a 4-pin (SYS_FAN1) and a 3-pin (SYS_FAN2) system fan headers, and a 3-pin power fan header (PWR_FAN). 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 motherboard supports CPU fan speed control, which requires the use of a CPU 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 SYS_FAN1: Definition GND +12V/Speed Control Sense Speed Control Definition GND +12V/Speed Control Sense Reserve Definition GND +12V Sense 1 SYS_FAN1 Pin No. 1 2 3 4 Pin No. 1 2 3 SYS_FAN2/PWR_FAN: 1 SYS_FAN2 1 PWR_FAN 6) BAT (Battery) · 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. 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.

Hardware Installation - 24 - 7) SATA3_0/1/2/3/4/5 (SATA 6Gb/s Connectors, Controlled by AMD SB950 South Bridge) The SATA connectors conform to SATA 6Gb/s standard and are compatible with SATA 3Gb/s and SATA 1.5Gb/s standards. Each SATA connector supports a single SATA device. The AMD SB950 South Bridge supports RAID 0, RAID 1, RAID 5, RAID 10, and JBOD. Refer to Chapter 5, "Configuring SATA Hard Drive(s)," for instructions on configuring a RAID array. Pin No. 1 2 3 4 5 6 7 Definition GND TXP TXN GND RXN RXP GND SATA3_0 7 7 SATA3_1 SATA3_2 SATA3_4 1 1 SATA3_5 SATA3_3 8) GSATA3_6/7 (SATA 6Gb/s Connectors, Controlled by Marvell 88SE9172 Chip) UG T DEBUG PORT 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 Marvell 88SE9172 chip supports RAID 0 and RAID 1.

Refer to Chapter 5, "Configuring SATA Hard Drive(s)," for instructions on configuring a RAID array. Pin No. 1 2 3 4 5 6 7 Definition GND TXP TXN GND RXN RXP GND GSATA3_7 7 7 GSATA3_6 1 1 Please connect the L-shaped end of the SATA cable to your SATA hard drive. UG T · 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.

- 25 **Hardware Installation 9) 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.

Message/Power/ Sleep LED Power Switch Speaker MSG+ MSGPW+ PW- SPEAK+ 2 1 HD+ HDRESRES+ CICI+ PWR+ PWR- SPEAK20 19 Hard Drive Activity LED Reset Switch Power LED Chassis Intrusion Header · MSG/PWR (Message/Power/Sleep LED, Yellow/Purple): Connects to the power status indicator on the chassis front panel.



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The LED System Status LED is on when the system is operating. The LED keeps blinking when the sysS0 On S1 Blinking tem is in S1 sleep state. The LED is off when the system is in S3/S4 sleep S3/S4/S5 Off 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 Setup," 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. If a problem is detected, the BIOS may issue beeps in different patterns to indicate the problem.

Refer to Chapter 5, "Troubleshooting," for information about beep codes. · 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.

Hardware Installation - 26 - 10) 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 2 GND F_PANEL(NH) 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 2 GND F_PANEL 3 MIC Power (H61M-D2) 4 NC 5 Line Out (R) 6 NC 7 NC 8 No Pin 9 Line Out (L) 10 NC 9 F_AUDIO(H) 10 1 2 BIOS supports HD audio by default. If your chassis provides an AC'97 The front panel audio header Switcher (X58A-OC) front panel audio module, refer to the instructions on how to activate AC'97 functionality via the audio software in Chapter 5, "Configuring 2/4/5.1/7.1-Channel Audio." M_SATA · 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 5, "Configuring 2/4/5.1/7.1-Channel Audio." Voltage measurement module(X58A-OC) · Some chassis provide a front panel audio module that has separated connectors on each wire PWM Switch (X58A-OC) instead of a single plug. For information about connecting the front panel audio module that has different wire assignments, please contact the chassis manufacturer. · DB_PORT 1 1 DIP 123 11) SPDIF_O (S/SPDIF Out Header) DIP 123 This header supports digital S/SPDIF Out and connects a S/SPDIF digital audio cable (provided by expanPCIe power connector (SATA)(X58A-OC) sion 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/SPDIF 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/SPDIF digital audio cable, carefully read the manual for your expansion card. - 27 - 123 DIP 1 1 123 1 DIP Pin No.

1 2 Definition SPDIFO GND Hardware Installation 12) F_USB1/F_USB2/F_USB3 (USB 2.0/1.1 Headers) G 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 13) 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. 1 10 F_USB30 20 11 F_AUDIO(H) 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+ DB_PORT SSRX2VBUS No Pin BIOS When the system is in S4/S5 mode, only the USB ports routed to the F_USB1 Voltage measurement module(X58A-OC) header can support the ON/OFF Charge function.

TPM · 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. Hardware Installation - 28 PCIe power connector (SATA)(X58A-OC) w/housing PW 14) F_1394 (IEEE 1394a Header) G The header conforms to IEEE 1394a specification. The IEEE 1394a header can provide one IEEE 1394a port via an optional IEEE 1394a bracket. For purchasing the optional IEEE 1394a bracket, please contact the local dealer. Pin No. 1 2 3 4 5 6 7 8 9 10 Definition TPA+ TPAGNDGND TPB+ TPBPower (12V) Power (12V) No Pin GND 9 10 1 2 · Do not plug the USB bracket cable into the IEEE 1394a header. · Prior to installing the IEEE 1394a bracket, be sure to turn off your computer and unplug the power cord from the power outlet to prevent damage to the IEEE 1394a bracket.

· To connect an IEEE 1394a device, attach one end of the device cable to your computer and then attach the other end of the cable to the IEEE 1394a device. Ensure that the cable is securely connected. 15) 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 - 29 - Hardware Installation DB_PORT BIOS Switc 1 You may connect a TPM (Trusted Platform Module) to this header. TPM w/housing 19 1 Voltage measurement module(X58A-OC) DIP PWM Swi 20 2 Pin No.



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1 2 3 4 5 6 7 8 9 10 Definition LCLK GND LFRAME No Pin LRESET NC LAD3 LAD2 VCC3 LAD1 Pin No. 11 12 13 14 15 16 17 18 19 20 Definition LAD0 GND NC ID SB3V SERIRQ GND NC NC SUSCLK PCIe power connector (SATA)(X58A-OC) 17 CLR_CMOS (Clearing CMOS Jumper) Use this jumper to clear the CMOS values (e.g.

date information and BIOS configurations) and reset the CMOS values to factory defaults. To clear the CMOS values, place a jumper cap on the two pins to temporarily short the two pins or 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 clearing the CMOS values and before turning on your computer, be sure to remove the jumper cap from the jumper. Failure to do so may cause damage to the motherboard.

· 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 - 30 - 1 16) TPM (Trusted Platform Module Header) DIP 123 1 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 see more advanced BIOS Setup menu options, you can press <Ctrl> + <F1> in the main menu of the BIOS Setup program. 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 4, "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. · BIOS will emit a beep code during the POST.

Refer to Chapter 5, "Troubleshooting," for the beep codes description. · 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/ clearing CMOS jumper in Chapter 1 for how to clear the CMOS values.) - 31 - BIOS Setup 2-1 Startup Screen The following screens may appear when the computer boots. A. The LOGO Screen (Default) Function Keys B. The POST Screen Award Modular BIOS v6.00PG Copyright (C) 1984-2011, Award Software, Inc. GA-990FXA-UD5 F1a . . . : BIOS Setup <F9>: XpressRecovery2 <F12>: Boot Menu <End>: Qflash 04/26/2011-RD990-SB950-7A66FG04C-00 Motherboard Model BIOS Version Function Keys Function Keys: <TAB>: POST SCREEN Press the <Tab> key to show the BIOS POST screen.

To show the BIOS POST screen at system startup, refer to the instructions on the Full Screen LOGO Show item on page 44. : BIOS SETUP\Q-FLASH Press the <Delete> key to enter BIOS Setup or to access the Q-Flash utility in BIOS Setup. <F9>: XPRESS RECOVERY2 If you have ever entered Xpress Recovery2 to back up hard drive data using the driver disk, the <F9> key can be used for subsequent access to Xpress Recovery2 during the POST. For more information, refer to Chapter 4, "Xpress Recovery2." <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. To exit Boot Menu, press <Esc>. The system will directly boot from the device configured in Boot Menu. 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. You can access Boot Menu again to change the first boot device setting as needed. <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 Once you enter the BIOS Setup program, the Main Menu (as shown below) appears on the screen. Use arrow keys to move among the items and press <Enter> to accept or enter a sub-menu. (Sample BIOS Version: F1a) CMOS Setup Utility-Copyright (C) 1984-2011 Award Software MB Intelligent Tweaker(M).

I.T.) Standard CMOS Features Advanced BIOS Features Integrated Peripherals Power Management Setup PC Health Status higf: Select Item F10: Save & Exit Setup Change CPU's Clock & Voltage Load Fail-Safe Defaults Load Optimized Defaults Set Supervisor Password Set User Password Save & Exit Setup Exit Without Saving F11: Save CMOS to BIOS F12: Load CMOS from BIOS ESC: Quit F8: Q-Flash BIOS Setup Program Function Keys <h><i><f><g> Move the selection bar to select an item <Enter> Execute command or enter the submenu <Esc> Main Menu: Exit the BIOS Setup program Submenus: Exit current submenu <Page Up> Increase the numeric value or make changes <Page Down> Decrease the numeric value or make changes <F1> Show descriptions of the function keys <F2> Move cursor to the Item Help block on the right (submenus only) <F5> Restore the previous BIOS settings for the current submenus <F6> Load the Fail-Safe BIOS default settings for the current submenus <F7> Load the Optimized BIOS default settings for the current submenus <F8> Access the Q-Flash utility <F9> Display system information <F10> Save all the changes and exit the BIOS Setup program <F11> Save CMOS to BIOS <F12> Load CMOS from BIOS Main Menu Help The on-screen description of a highlighted setup option is displayed on the bottom line of the Main Menu. Submenu Help While in a submenu, press <F1> to display a help screen (General Help) of function keys available for the menu.



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Press <Esc> to exit the help screen. Help for each item is in the Item Help block on the right side of the submenu. · If you do not find the settings you want in the Main Menu or a submenu, press <Ctrl>+<F1> to access more advanced options. · 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. - 33 BIOS Setup The Functions of the <F11> and <F12> keys (For the Main Menu Only) F11: Save CMOS to BIOS This function allows you to save the current BIOS settings to a profile.

You can create up to 8 profiles (Profile 1-8) and name each profile. First enter the profile name (to erase the default profile name, use the SPACE key) and then press <Enter> to complete. F12: Load CMOS from BIOS If your system becomes unstable and you have loaded the BIOS default settings, you can use this function to load the BIOS settings from a profile created before, without the hassles of reconfiguring the BIOS settings. First select the profile you wish to load, then press <Enter> to complete. MB Intelligent Tweaker(M.

I.T.) Standard CMOS Features Advanced BIOS Features Integrated Peripherals Use this menu to configure the clock, frequency and voltages of your CPU, memory, etc. Use this menu to configure the system time and date, hard drive types, and the type of errors that stop the system boot, etc. 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 Setup PC Health Status Load Fail-Safe Defaults Use this menu to see information about autodetected system/CPU temperature, system voltage and fan speed, etc. Fail-Safe defaults are factory settings for the most stable, minimal-performance system operations. Optimized defaults are factory settings for optimal-performance system operations. Change, set, or disable password. It allows you to restrict access to the system and BIOS Setup. A supervisor password allows you to make changes in BIOS Setup. Change, set, or disable password. It allows you to restrict access to the system and BIOS Setup.

A user password only allows you to view the BIOS settings but not to make changes. Load Optimized Defaults Set Supervisor Password Set User Password Save & Exit Setup Exit Without Saving Save all the changes made in the BIOS Setup program to the CMOS and exit BIOS Setup. (Pressing <F10> can also carry out this task.) Abandon all changes and the previous settings remain in effect. Pressing <Y> to the confirmation message will exit BIOS Setup. (Pressing <Esc> can also carry out this task.) BIOS Setup - 34 - 2-3 MB Intelligent Tweaker(M.I.T.) CMOS Setup Utility-Copyright (C) 1984-2011 Award Software MB Intelligent Tweaker(M.

I.T.) [Auto] [Auto] [Enabled] [Auto] [Disabled] [Auto] 200 [Auto] [Auto] [Auto] [Auto] x6.66 [PressEnter] [Auto] Auto Auto Auto Auto F10: Save ESC: Exit F1: General Help F7: Optimized Defaults 2800Mhz 2000Mhz Item Help Menu Level CPU Clock Ratio CPU NorthBridge Freq. Core Performance Boost (Note) CPB Ratio (Note) Turbo CPB (Note) CPU Host Clock Control x CPU Frequency(MHz) PCIE Clock(MHz) HT Link Width HT Link Frequency Set Memory Clock x Memory Clock DRAMConfiguration ***** System Voltage Optimized ***** System Voltage Control x CPU PLL Voltage Control x DRAM Voltage Control x DDR VTT Voltage Control x NB Voltage Control Enter: Select high: Move F5: Previous Values 2000Mhz 1333Mhz +/-PU/PD: Value F6: Fail-Safe Defaults CMOS Setup Utility-Copyright (C) 1984-2011 Award Software MB Intelligent Tweaker(M.

I.T.) x x x HT Link Voltage Control NB/PCIE/PLL Voltage Control CPU NB VID Control CPU Voltage Control Normal CPU Vcore Auto Auto Auto Auto 1.3250V Item Help Menu Level Enter: Select high: Move F5: Previous Values +/-PU/PD: Value F6: Fail-Safe Defaults F10: Save ESC: Exit F1: General Help F7: Optimized Defaults · 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.) · When the System Voltage Optimized item blinks in red, it is recommended that you set the System Voltage Control item to Auto to optimize the system voltage settings. CPU Clock Ratio Allows you to alter the clock ratio for the installed CPU. The adjustable range is dependent on the CPU being used. (Note) This item is present only when you install a CPU that supports this feature. - 35 BIOS Setup CPU NorthBridge Freq. Allows you to alter the North Bridge controller frequency for the installed CPU. The adjustable range is dependent on the CPU being used.

Allows you to determine whether to enable the Core Performance Boost (CPB) technology, a CPU performance-boost technology. (Default: Enabled) Allows you alter the ratio for the CPB. The adjustable range is dependent on the CPU being installed. (Default: Auto) Allows you to determine whether to improve CPU performance. (Default: Disabled) Core Performance Boost (Note) CPB Ratio (Note) Turbo CPB (Note) CPU Host Clock Control CPU Frequency(MHz) Enables or disables the control of CPU host clock. Auto (default) allows the BIOS to automatically adjust the CPU host frequency. Manual allows the CPU Frequency (MHz) item below to be configurable. Note: If your system fails to boot after overclocking, please wait for 20 seconds to allow for automated system reboot, or clear the CMOS values to reset the board to default values. Allows you to manually set the CPU host frequency. The adjustable range is from 200 MHz to 500 MHz.

This option is configurable only when CPU Host Clock Control is set to Manual. Important It is highly recommended that the CPU frequency be set in accordance with the CPU specifications. Allows you to manually set the PCIe clock frequency. The adjustable range is from 100 MHz to 150 MHz. Auto sets the PCIe clock frequency to standard 100 MHz.

(Default: Auto) Allows you to manually set the width for the HT Link between the CPU and chipset. Auto BIOS will automatically adjust the HT Link Width. (Default) 8 bit Sets HT Link Width to 8 bit. 16 bit Sets HT Link Width to 16 bit. Allows you to manually set the frequency for the HT Link between the CPU and chipset.



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Auto BIOS will automatically adjust the HT Link Frequency. (Default) x1~x10 Sets HT Link Frequency to x1~x10 (200 MHz~2.0 GHz). PCIE Clock(MHz): HT Link Width HT Link Frequency Set Memory Clock Memory Clock Determines whether to manually set the memory clock. Auto lets BIOS automatically set the memory clock as required. Manual allows the memory clock control item below to be configurable. (Default: Auto) This option is configurable only when Set Memory Clock is set to Manual. The adjustable range is dependent on the CPU being installed. (Note) This item is present only when you install a CPU that supports this feature. - 36 - BIOS Setup DRAM Configuration CMOS Setup Utility-Copyright (C) 1984-2011 Award Software DRAM Configuration CPU Host Clock Control x CPU Frequency(MHz) Set Memory Clock x Memory Clock DCTs Mode DDR3 Timing Items x 1T/2T Command Timing x CAS# latency x RAS to CAS R/W Delay x Row Precharge Time x Minimum RAS Active Time x TwTr Command Delay x Trfc0 for DIMM1, DIMM3 x Trfc1 for DIMM2, DIMM4 x Write Recovery Time x Precharge Time x Row Cycle Time x RAS to RAS Delay **DCTs Drive Strength** Enter: Select high: Move F5: Previous Values [Auto] 200 [Auto] x6.

66 1333Mhz [Unganged] [Auto] SPD Auto Auto --Auto 9T 9T Auto 9T 9T Auto 9T 9T Auto 24T 24T Auto 5T 5T Auto 110ns 110ns Auto --Auto 10T 10T Auto 5T 5T Auto 33T Auto 4T 4T DCT0 DCT1 +/-/PU/PD: Value F6: Fail-Safe Defaults F10: Save Item Help Menu Level ESC: Exit F1: General Help F7: Optimized Defaults CMOS Setup Utility-Copyright (C) 1984-2011 Award Software DRAM Configuration ProcOdt(ohms) DQS Drive Strength Data Drive Strength MEMCLK Drive Strength Addr/Cmd Drive Strength CS/ODT Drive Strength CKE Drive Strength **DCTs Addr/Cmd Timing** Addr/Cmd Setup Time Addr/Cmd Fine Delay CS/ODT Setup Time CS/ODT Fine Delay CKE Setup Time CKE Fine Delay Channel Interleaving Bank Interleaving DQS Training Control CKE Power Down Mode Memclock tri-stating Enter: Select high: Move F5: Previous Values [Auto] 60 [Auto] 1.0x [Auto] 1.0x [Auto] 1.5x [Auto] 1.5x [Auto] 1.5x [Auto] 1.5x DCT0 [Auto] 1/2T [Auto] 0/64 [Auto] 1/2T [Auto] 0/64 [Auto] 1/2T [Auto] 0/64 [Auto] 240 [Auto] 1.5x [Auto] 1.5x [Auto] 1.5x [Auto] 2.

0x [Auto] 2.0x [Auto] 2.0x DCT1 [Auto] 1/2T [Auto] 0/64 [Auto] 1/2T [Auto] 0/64 [Auto] 1/2T [Auto] 0/64 [Auto] 1/2T [Auto] 0/64 Item Help Menu Level [Enabled] [Enabled] [Skip DQS] [Disabled] [Disabled] +/-/PU/PD: Value F6: Fail-Safe Defaults F10: Save ESC: Exit F1: General Help F7: Optimized Defaults CPU Host Clock Control, CPU Frequency (MHz), Set Memory Clock, Memory Clock The settings under the four items above are synchronous to those under the same items on the MB Intelligent Tweaker(M.I.T.

) main menu. Allows you to set memory control mode. Ganged Sets memory control mode to single dual-channel. Unganged Sets memory control mode to two single-channel. (Default) DCTs Mode DDR3 Timing Items Manual allows all DDR3 Timing items below to be configurable.

Options are: Auto (default), Manual. - 37 - BIOS Setup 1T/2T Command Timing CAS# latency Options are: Auto (default), 1T, 2T. Options are: Auto (default), 5T~14T. Options are: Auto (default), 2T~19T. Options are: Auto (default), 2T~19T. Options are: Auto (default), 8T~40T. Options are: Auto (default), 4T~9T. Options are: Auto (default), 90ns, 110ns, 160ns, 300ns, 350ns. Options are: Auto (default), 90ns, 110ns, 160ns, 300ns, 350ns. Options are: Auto (default), 5T~8T, 10T, 12T, 14T, 16T.

Options are: Auto (default), 4T~10T. Options are: Auto (default), 10T~56T. Options are: Auto (default), 1T~9T. **DCTs Drive Strength** RAS to CAS R/W Delay Row Precharge Time Minimum RAS Active Time TwTr Command Delay Trfc0 for DIMM1, DIMM3 Trfc2 for DIMM2, DIMM4 Write Recovery Time Precharge Time Row Cycle Time RAS to RAS Delay ProcOdt(ohms) DQS Drive Strength Data Drive Strength Options are: Auto (default), 240 ohms, 120 ohms, 60 ohms. Options are: Auto (default), 0.75x, 1.0x, 1.25x, 1.5x. Options are: Auto (default), 0.

75x, 1.0x, 1.25x, 1.5x. Options are: Auto (default), 0.

75x, 1.0x, 1.25x, 1.5x. Options are: Auto (default), 1.

0x, 1.25x, 1.5x, 2.0x. Options are: Auto (default), 1.0x, 1.25x, 1.5x, 2.0x. Options are: Auto (default), 1.

0x, 1.25x, 1.5x, 2.0x. MEMCLK Drive Strength Addr/Cmd Drive Strength CS/ODT Drive Strength CKE Drive Strength BIOS Setup - 38 - **DCTs Addr/Cmd Timing** Addr/Cmd Setup Time Addr/Cmd Fine Delay CS/ODT Setup Time CS/ODT Fine Delay CKE Setup Time CKE Fine Delay Options are: Auto (default), 1/2T, 2T. Options are: Auto (default), 0/64~31/64. Options are: Auto (default), 1/2T, 2T. Options are: Auto (default), 0/64~31/64. Options are: Auto (default), 1/2T, 2T. Options are: Auto (default), 0/64~31/64.

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. (Default: Enabled) Enables or disables memory bank interleaving. Enabled allows the system to simultaneously access different banks of the memory to increase memory performance and stability. (Default: Enabled) Enables or disables memory DQS training each time the system restarts.

(Default: Skip DQS) Bank Interleaving DQS Training Control CKE Power Down Mode Memclock tri-stating Determines whether to set the memory to power down mode when the CKE pin is closed. (Default: Disabled) Determines whether to enable memory clock tri-stating in CPU C3 or Alt VID mode. (Default: Disabled) ***** System Voltage Optimized ***** System Voltage Control CPU PLL Voltage Control Determines whether to manually set the system voltages. Auto lets the BIOS automatically set the system voltages as required. Manual allows all voltage control items below to be configurable.

(Default: Auto) Allows you to set the CPU PLL voltage. Normal Supplies the CPU PLL voltage as required. (Default) 2.025V ~ 3.135V The adjustable range is from 2.025V to 3.135V. Note: Increasing CPU voltage may result in damage to your CPU or reduce the useful life of the CPU. - 39 - BIOS Setup DRAM Voltage Control Allows you to set memory voltage. Normal Supplies the memory voltage as required.

(Default) 1.025V ~ 2.135V The adjustable range is from 1.025V to 2.135V. Note: Increasing memory voltage may result in damage to the memory or reduce the useful life of the memory. Allows you to set the memory VTT voltage. Normal Supplies the memory VTT voltage as required. (Default) 0.515V ~ 1.145V The adjustable range is from 0.515V to 1.145V. Note: Increasing memory voltage may result in damage to the memory or reduce the useful life of the memory. Allows you to set the North Bridge voltage.

Normal Supplies the North Bridge voltage as required. (Default) 0.865V ~ 1.975V The adjustable range is from 0.865V to 1.

975V. Allows you to set the HT Link voltage. Normal Supplies the HT Link voltage as required. (Default) 0.725V ~ 1.835V The adjustable range is from 0.725V to 1.835V. Allows you to set the North Bridge PCIe PLL voltage.



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Normal Supplies the North Bridge PCIe PLL voltage as required.

(Default) 1.325V ~ 2.435V The adjustable range is from 1.325V to 2.435V. DDR VTT Voltage Control NB Voltage Control HT Link Voltage Control NB/PCIe/PLL Voltage Control CPU NB VID Control CPU Voltage Control Allows you to set the CPU North Bridge VID voltage. Auto sets the CPU North Bridge VID voltage as required. The adjustable range is dependent on the CPU being installed. (Default: Normal) Note: Increasing CPU voltage may result in damage to your CPU or reduce the useful life of the CPU. Allows you to set the CPU voltage.

Auto sets the CPU voltage as required. The adjustable range is dependent on the CPU being installed. (Default: Normal) Note: Increasing CPU voltage may result in damage to your CPU or reduce the useful life of the CPU. Displays the normal operating voltage of your CPU. Normal CPU Vcore BIOS Setup - 40 - 2-4 Standard CMOS Features CMOS Setup Utility-Copyright (C) 1984-2011 Award Software Standard CMOS Features Date (mm:dd:yy) Time (hh:mm:ss) Thu, Apr 21 2011 22:31:24 [None] [None] [None] [None] [None] [None] [None] [None] [None] [None] [All, But Keyboard] 640K 1022M +/-PU/PD: Value F6: Fail-Safe Defaults F10: Save ESC: Exit F1: General Help F7: Optimized Defaults Item Help Menu Level IDE Channel 0 Master IDE Channel 0 Slave IDE Channel 1 Master IDE Channel 1 Slave IDE Channel 2 Master IDE Channel 2 Slave IDE Channel 4 Master IDE Channel 4 Slave IDE Channel 6 Master IDE Channel 6 Slave Halt On Base Memory Extended Memory Enter: Select hgf: Move F5: Previous Values Date (mm:dd:yy) Sets the system date. The date format is week (read-only), month, date and year. Select the desired field and use the up arrow or down arrow key to set the date. Sets the system time. For example, 1 p.m.

is 13:0:0. Select the desired field and use the up arrow or down arrow key to set the time. IDE HDD Auto-Detection Press <Enter> to autodetect the parameters of the SATA device on this channel. IDE Channel 0, 1 Master/Slave Configure your SATA devices by using one of the two methods below: Auto Lets the BIOS automatically detect SATA devices during the POST. (Default) None If no SATA devices are used, set this item to None so the system will skip the detection of the device during the POST for faster system startup. Access Mode Sets the hard drive access mode. Options are: Auto (default), CHS, LBA, Large. IDE Auto-Detection Press <Enter> to autodetect the parameters of the SATA device on this channel. Extended IDE Drive Configure your SATA devices by using one of the two methods below: Auto Lets the BIOS automatically detect SATA devices during the POST. (Default) None If no SATA devices are used, set this item to None so the system will skip the detection of the device during the POST for faster system startup.

Access Mode Sets the hard drive access mode. Options are: Auto (default), Large. Capacity Approximate capacity of the currently installed hard drive. Time (hh:mm:ss) IDE Channel 0, 1 Master/Slave IDE Channel 2, 4, 6 Master/Slave - 41 - BIOS Setup Halt On Allows you to determine whether the system will stop for an error during the POST. All Errors Whenever the BIOS detects a non-fatal error the system boot will stop. No Errors The system boot will not stop for any error. All, But Keyboard The system boot will not stop for a keyboard error but stop for all other errors. (Default) These fields are read-only and are determined by the BIOS POST. Base Memory Also called conventional memory. Typically, 640 KB will be reserved for the MS-DOS operating system. Extended Memory The amount of extended memory. Memory BIOS Setup - 42 - 2-5 Advanced BIOS Features CMOS Setup Utility-Copyright (C) 1984-2011 Award Software Advanced BIOS Features AMD C1E Support (Note) Virtualization AMD K8 Cool&Quiet control CPU Unlock (Note) CPU core Control (Note) CPU core 0 (Note) CPU core 1 (Note) CPU core 2/3/4/5 (Note) Hard Disk Boot Priority EFI CD/DVD Boot Option First Boot Device Second Boot Device Third Boot Device Password Check HDD S.M.A.R.

T. Capability Away Mode Full Screen LOGO Show IOMMU support Init Display First [Auto] [Disabled] [Auto] [Disabled] [Auto] Enabled Enabled Enabled [Press Enter] [Auto] [Hard Disk] [CDROM] [USB-FDD] [Setup] [Disabled] [Disabled] [Enabled] [Disabled] [PCI Slot] +/-PU/PD: Value F6: Fail-Safe Defaults F10: Save Item Help Menu Level x x x Enter: Select hgf: Move F5: Previous Values ESC: Exit F1: General Help F7: Optimized Defaults AMD C1E Support (Note) Enables or disables the C1E CPU power-saving function in system halt state. When enabled, the power consumption will be reduced during system halt state. Auto If a CPU that supports hardware C1E is installed, the BIOS will automatically enable the hardware C1E function. If not, the C1E function will be disabled.

(Default) Enabled If a CPU that supports hardware C1E is installed, the BIOS will automatically enable the hardware C1E function. If not, the BIOS will enable the software C1E function. Disabled Disables the C1E function. Virtualization allows a platform to run multiple operating systems and applications in independent partitions. With virtualization, one computer system can function as multiple virtual systems. (Default: Disabled) Auto Disabled Lets the AMD Cool'n'Quiet driver dynamically adjust the CPU clock and VID to reduce heat output from your computer and its power consumption. (Default) Disables this function. Virtualization AMD K8 Cool&Quiet control CPU Unlock (Note) Allows you to determine whether to unlock hidden CPU cores. (Default: Disabled) CPU core Control (Note) Allows you to determine whether to manually enable/disable CPU Core 1/2/3/4/5. Auto Lets the BIOS to enable all CPU cores (number of cores available depends on the CPU being used).

Manual Allows you to individually enable/disable CPU Core 1/2/3/4/5. This setting is fixed. CPU Core 0 is always enabled. (Note) This item appears only when you install a CPU that supports this feature. - 43 BIOS Setup CPU core 0 (Note) CPU core 1, 2/3/4/5 (Note) Hard Disk Boot Priority Enables or disables CPU Core 1/2/3/4/5. (Default: Enabled) EFI CD/DVD Boot Option Specifies the sequence of loading the operating system from the installed hard drives. Use the up or down arrow key to select a hard drive, then press the plus key <+> (or <PageUp>) or the minus key <-> (or <PageDown>) to move it up or down on the list. Press <Esc> to exit this menu when finished. First/Second/Third Boot Device Set this item to EFI if you want to install the operating system to a hard drive larger than 2.2 TB.

Make sure the operating system to be installed supports booting from a GPT partition, such as Windows 7 64bit and Windows Server 2003 64-bit. Auto lets the BIOS automatically configure this setting depending on the hard drive you install. (Default: Auto) Specifies the boot order from the available devices.



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