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You can read the recommendations in the user guide, the technical guide or the installation guide for GIGABYTE GA-X99-UD3P. You'll find the answers to all your questions on the GIGABYTE GA-X99-UD3P 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-X99-UD3P
User guide GIGABYTE GA-X99-UD3P
Operating instructions GIGABYTE GA-X99-UD3P
Instructions for use GIGABYTE GA-X99-UD3P
Instruction manual GIGABYTE GA-X99-UD3P

GA-X99-UD3P

User's Manual
Rev. 1001
12ME-X99UD3P-1001R



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Manual abstract:

© 2015, 2015 Jan. 30, 2015 Copyright © 2015 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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•• 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. -9- Hardware Installation 1-2 Product Specifications CPU □□ Support for Intel® Core™ i7 processors in the LGA2011-3 package (Go to GIGABYTE's website for the latest CPU support list.

) □□ L3 cache varies with CPU □□ Intel® X99 Express Chipset □□ 4 x DDR4 DIMM sockets supporting up to 32 GB of system memory * □□ ue to a Windows 32-bit operating system limitation, when more than 4 GB of physical D memory is installed, the actual memory size displayed will be less than the size of the physical memory installed. Chipset Memory □□ □□ □□ □□ □□ Audio □□ □□ □□ □□ 4 channel memory architecture Support for DDR4 2133/1866/1600/1333 MHz memory modules Support for non-ECC memory modules Support for Extreme Memory Profile (XMP) memory modules S □ support for RDIMM 1Rx8/2Rx8/1Rx4/2Rx4 memory modules (operate in nonECC mode) (□□ Go to GIGABYTE's website for the latest supported memory speeds and memory modules.



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Be sure to install DDR4 DIMMs on this motherboard. Notch DDR4 DIMM A DDR4 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 clip at the right end 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 clip at the right end 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 x16 Slot PCI Express x1 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 Setting up AMD CrossFire™/NVIDIA® SLI™ Configuration A.

System Requirements -- Windows 8.1/8/7 operating system -- A CrossFire/SLI-supported motherboard with two or more PCI Express x16 slots and correct driver -- CrossFire/SLI-ready graphics cards of identical brand and chip and correct driver (Current GPUs that support 3-Way/4-Way CrossFire technology include the ATI Radeon™ HD 3800, HD 4800, HD 5800 series, and AMD Radeon™ HD 6800, HD 6900, HD 7800, and HD 7900 series. Current GPUs that support 3-Way/4-Way SLI™ technology include the NVIDIA® 8800 GTX, 8800 Ultra, 9800 GTX, GTX 260, GTX 280, GTX 470, GTX 480, GTX 570, GTX 580, GTX 590, and GTX 600 series.) For the latest GPU support information, please refer to the AMD/NVIDIA® website.) (Note 1) -- CrossFire(Note 2)/SLI(Note 3) bridge connectors -- 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 CrossFire/SLI graphics cards on the PCI Express x16 slots.

Step 2: Insert the CrossFire(Note 2)/SLI bridge connectors in the CrossFire/SLI gold edge connectors on top of the cards. Step 3: Plug the display cable into the graphics card on the PCIE_1 slot. □□ Refer to the table below when an i7-5960X or i7-5930K CPU is installed: □ PCIE_1 PCIE_4 PCIE_2 PCIE_3 1 Graphics Card 1 ---2 Graphics Cards 1-1 -3 Graphics Cards 1-1 1 4 Graphics Cards 1 1 1 1 PCIE_1 PCIE_4 PCIE_2 PCIE_3 To set up a 3-Way SLI configuration, use the GC-3SLI-X99 bridge connector. □□ Refer to the table below for setting up a 3-Way SLI configuration with an i7-5820K CPU. Make sure to use □□ the GC-3SLI bridge connector. PCIE_1 PCIE_4 PCIE_2 PCIE_3 1 Graphics Card 1 ---2 Graphics Cards 1-1 -3 Graphics Cards 1 1 1 -- (Note 1) The 4-Way SLI configuration is not supported when an i7-5820K CPU is installed. (Note 2) The bridge connector(s) may be needed or not depending on your graphics cards. (Note 3) The 3-Way and 4-Way bridge connectors are optional. •• □ Procedure and driver screen for enabling CrossFire/SLI technology may differ by graphics cards and driver P version. Refer to the manual that came with your graphics cards for more information about enabling CrossFire/SLI technology.

•• □ When two or more graphics cards are installed, we recommend that you connect the power cable from the power supply to the ATX4P connector to ensure system stability. - 19 - Hardware Installation C. Configuring the Graphics Card Driver C-1. To Enable CrossFire Function After installing the graphics card driver in the operating system, go to the AMD Catalyst Control Center. Browse to Performance\AMD CrossFireX™ and ensure the Enable AMD CrossFireX check box is selected.

If your system has more than two CrossFire cards, select the GPU combination you want to use and click Apply. (Available combination options are dependent on the number of graphics cards.) C-2. To Enable SLI Function After installing the graphics card driver in the operating system, go to the NVIDIA Control Panel. Browse to the Configure SLI, Surround, Physx screen and ensure Maximize 3D performance is enabled.

Hardware Installation - 20 - 1-7 Back Panel Connectors PS/2 Keyboard and PS/2 Mouse Port Use the upper port (green) to connect a PS/2 mouse and the lower port (purple) to connect a PS/2 keyboard. 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. USB 3.0/2.0 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. USB 3.0/2.0 Port (White) 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. Before using Q-Flash Plus, make sure to insert the USB flash drive into this port first. RJ-45 LAN Port 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 Blinking On 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) Optical S/PDIF Out Connector Line In Jack (Blue) Use this audio jack to connect center/subwoofer speakers in a 5.



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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. 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 line in jack. Use this audio jack for line in devices such as an optical drive, walkman, etc. •• 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. - 21 Hardware Installation Line Out Jack (Green) The line out jack.

This jack supports audio amplifying function. For better sound quality, it is recommended that you connect your headphone/speaker to this jack (actual effects may vary by the device being used). 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. Mic In Jack (Pink) The Mic in jack. Microphones must be connected to this jack. Wi-Fi Antenna Connector Holes Secure the antenna connectors, washers, and nuts onto the holes. The audio jacks can be reconfigured to perform different functions via the audio software (supported functions may vary based on hardware specification).

If you install a Side Speaker, you need to retask other audio jack to be Side Speaker out. Only microphones still MUST be connected to the default Mic in jack.

Hardware Installation - 22 - 1-8 Internal Connectors 6 1 4 2 5 15 5 8 11 19 18 14 13 3 17 16 10 21 5 12 8 7 9 20 1) 2) 3) 4) 5) 6) 7) 8) 9) 10) 11) ATX_12V_2X4 ATX ATX4P CPU_FAN SYS_FAN1/2/3 CPU_OPT SATA_EXPRESS SATA3 0/1/2/3/4/5 sSATA3 0/1/2/3 M2_10G M2_WIFI 12) 13) 14) 15) 16) 17) 18) 19) 20) 21) F_PANEL F_AUDIO SPDIF_O F_USB30 F_USB1/F_USB2 TPM THB_C BAT CLR_CMOS CPU Mode Switch 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. - 23 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 +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 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 23 ATX) 3.

3V (Only for 2x12-pin 24 ATX) 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 - 24 - 3) ATX4P (PCIe Power Connector) The power connector provide auxiliary power to the onboard PCI Express x16 slots. When two or more graphics cards are installed, we recommend that you connect the power cable from the power supply to the ATX4P connector to ensure system stability. 1 Pin No. 1 2 3 4 Definition VCC GND GND +12V 4/5) CPU_FAN/SYS_FAN1/2/3 (Fan Headers) All fan headers on this motherboard are 4-pin. 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 Definition GND +12V Sense Speed Control Definition GND Speed Control Sense VCC SYS_FAN1/2/3: 1 SYS_FAN2 1 SYS_FAN1/3 •• 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.

- 25 - Hardware Installation S 1 2 3 1 2 3 6) CPU_OPT (Water Cooling CPU Fan Header) S The fan header is 4-pin and possesses 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. Pin No. 1 2 3 3 4 Definition GND Speed Control Sense B SS VCC 1 S S S _ S F B_ 7) SATA_EXPRESS (SATA Express Connector) S The SATA Express connector supports a single SATA Express device.

_ S _ M2_10G, SATA Express, and SATA3 4/5 connectors can only be used one at a time. The SATA3 4/5 connectors will become unavailable when an M.2 SSD is installed. Hardware Installation - 26 - B_ S _ 8) 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® Chipset supports RAID 0, RAID 1, RAID 5, and RAID 10. Refer to Chapter 3, "Configuring SATA Hard Drive(s)," for instructions on configuring a RAID array. SATA3 3 2 1 5 4 0 7 7 1 1 S _ Pin No. 1 2 3 4 5 6 7 Definition GND TXP TXN GND RXN RXP GND DEBUG PORT To enable hot-plugging for the SATA ports, refer to Chapter 2, "BIOS Setup," "Chipset\PCH SATA Configuration," for more information.

9) sSATA3 0/1/2/3 (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 standards. Only AHCI and IDE modes are supported. Each SATA connector supports a single SATA device. sSATA3 7 7 3 1 2 0 1 1 Pin No. 1 2 3 4 5 6 7 Definition GND TXP TXN GND RXN RXP GND DEBUG PORT To enable hot-plugging for the SATA ports, refer to Chapter 2, "BIOS Setup," "Chipset\PCH sSATA Configuration," for more information.



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- 27 - Hardware Installation S_ _ B _ U _ B F 10) M2_10G (M.2 Socket 3 Connector) F_USB3 F You can insert an M.2 SSD into this connector. _0 _ F _0 F Follow the steps below to correctly install an M.

2 SSD in the M2_10G connector. Step 1: Use a screw driver to unfasten the screw and nut from the motherboard. Locate the proper mounting hole for the M.2 SSD to be installed and then screw the nut first. Step 2: Slide the M.2 SSD into the connector at an oblique angle. Step 3: Press the M.2 SSD down and then secure it with the screw. Step 4: The installation is completed, as shown in the picture above. •• On the motherboard there are two length adjustment holes for the M.

2 SSD. Select the proper hole for the M.2 SSD to be installed and refasten the screw and nut. •• M2_10G, SATA Express, and SATA3 4/5 connectors can only be used one at a time. The SATA3 4/5 connectors will become unavailable when an M.2 SSD is installed. Hardware Installation - 28 - _ U _ B F F_USB3 F 11) M2_WIFI (M.2 Socket 1 Connector) You can insert an M.2 Wi-Fi module into this connector. _0 _ F _0 F Follow the steps below to correctly install an M.

2 Wi-Fi module in the M.2 Wi-Fi connector. Step 1: Use a screw driver to unfasten the screw from the motherboard. Step 2: Slide the M.2 Wi-Fi module into the connector at an oblique angle. Step 3: Press the M.2 Wi-Fi module down and then secure it with the screw. Step 4: The installation is completed, as shown in the picture above. - 29 - Hardware Installation 12) 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+ PW2 1 SPEAK+ NC NC SPEAK20 19 Chassis Intrusion Header HD+ HDRESRES+ CICI+ Hard Drive Reset Activity LED Switch •• PLED/PWR_LED (Power LED, Yellow/Purple): Connects to the power status indicator on the chassis front panel. The LED System Status LED is on when the system is operating. The LED is off when the system is in S3/ S0 On S4 sleep state or powered off (S5). S3/S4/S5 Off •• 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. •• NC (Orange): No Connection. 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 - 30 - PWR_LED+ PWR_LED PW2 Power LED 13) 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 F_2 GND 3 MIC2_R 4 -ACZ_DET 5 LINE2_R 6 Sense 7 FAUDIO_JD 8 No Pin 9 LINE2_L 10 Sense 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_ B S supports HD audio by default. •• The front panel audio header S •• Audio signals will be present on both of the front and back panel audio connections simultaneously. •• Some chassis provide a front panel audio module that has separated connectors on each wire _S instead of a single plug. For information about connecting the front panel audio module that has different wire assignments, please contact the chassis manufacturer. 1 1 1 _ S 1 2 3 1 2 3 B 14) SPDIF_O (SPDIF Out Header) This header supports digital SPDIF Out and connects a SPDIF digital audio cable (provided by expansion cards) for digital audio output from your motherboard to certain expansion cards like graphics cards and S sound cards. For example, some graphics cards may require you to use a 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 SPDIF digital audio cable, carefully read the manual for your expansion card. 1 2 3 1 2 3 S B_ B _ S S_ _ B 1 S 3 B SS S U Pin No. 1 2 Definition SPDIF O GND _ _ 3 _ U _ B F_USB3 F _ S F - 31 B_ Hardware Installation 15) F_USB30 (USB 3.0/2.0 Header) F_USB30 F_ U F_ 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. Pin No. 1 2 3 4 B_ 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+ B SS SSTX2GND SSRX2+ SSRX2VBUS No Pin 1 20 1 S 1 2 3 1 2 3 S 16) F_USB1/F_USB2 (USB 2.0/1.1 Headers) 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. Definition B SS S 1 Power (5V) 2 Power (5V) 3 USB DX4 USB DY5 USB DX+ 6 USB S F DY+ 7 GND 8 GND 9 No Pin 10 NC S 9 10 3 1 2 S _ •• Do not plug the IEEE 1394 bracket (2x5-pin) cable into the USB 2.0/1.1 header. 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. S_ Hardware Installation - 32 - 1 11 10 1 _ S 1 2 3 1 1 2 3 U _ _ B_ B SS 1 1 B_ 1 B SS _ S You may connect a TPM (Trusted Platform Module) to this header.



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19 1 2 3 20 1 2 3 2 SPin No. Definition LCLK GND LFRAME No Pin LRESET NC LAD3 LAD2 VCC3 S LAD1 Pin No. 11 12 13 14 15 16 17 18 19 20 S 3
Definition LAD0 GND NC ID SB3V SERIRQ GND NC NC U SUSCLK S S 3 1 2 3 4 5 6 7 8 9 B SS 10 S _ S F TM S _ 18) THB_C (Thunderbolt Add-In Card
Connector) This connector is for a GIGABYTE Thunderbolt™ add-in card. Pin No.
1 2 3 4 5 Definition GPIOA GPIOB N_SLP_S3 N_S4_S5 GND B_1 S _ S _ Supports a Thunderbolt™ add-in card. S _ - 33 - S _ 1 2 3 S 1 S 1 2 3 _ _ B SS 3
S S F B_ Hardware Installation 1 17) TPM (Trusted Platform Module Header) 1 1 1 2 3 1 19) 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. 20) 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 - 34 - 1 2 2: □ C Mode. (Please note that using this mode may result in inO
compatibility.) S 3 B SS 1 2 3 1 2 3 1 2 3 1 2 3 1 1 1 - 35 - Hardware Installation F_USB30 F_USB30 S _ 1 2 1: Default S 3 B SS S _ This switch allows the
overclockers to switch between CPU default mode and OC mode. F _ U F _ U B _ S S S F S F 21) CPU Mode Switch B _ B _ S S B SS B SS S S 1 1 1 2 3 1 2 3
U U 1 2 3 1 2 3 F _ F _ S _ S _ _ _ _ 3 3 1 1 Hardware Installation - 36 - 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. •• 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.)

) - 37 - BIOS Setup 2-1 Startup Screen The following startup Logo screen will appear when the computer boots. Function Keys Function Keys: : 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 - 38 - 2-2 The
Main Menu A.

Startup Guide (Default) The Startup Guide screen simplifies conventional complicated BIOS setup menus and presents only the most frequently used options
in the easy-to-use interface. It helps first-time users to perform basic system setups more quickly and easily. B. ST Mode (Smart Tweak Mode) Differing from
traditional UEFI interface, the ST 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 ST Mode, you can use your mouse to move through the option menus for quick configuration or press
<F2> to switch to the traditional BIOS Setup screen. •• 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. - 39 BIOS Setup C. Classic Setup
Classic Setup is the conventional BIOS Setup interface where you can press the arrow keys on your keyboard to move among the items and press <Enter> to
accept or enter a sub-menu.



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Or you can use your mouse to select the item you want.

(Sample BIOS Version: F1c) Setup Menus Switch to ST Mode Enter Q-Flash Select Default Language Help Function Keys Configuration Items Current Settings Classic Setup Function Keys <f><g> <h><i> <Enter> <+>/<Page Up> <->/<Page Down> <F1> <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 Show descriptions of the function keys Switch to ST Mode or Startup Guide screen 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 - 40 - BIOS Setup Menus M.I.T. System Information BIOS Features Peripherals Chipset 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. Use this menu to configure the device boot order and advanced features available on the CPU. Use this menu to configure all peripheral devices, such as USB, display settings, etc. Use this menu to configure Chipset-related options, such as SATA, onboard 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. - 41 - BIOS Setup 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 CPU voltage, etc. BIOS Setup - 42 - ``M.I.T. Current Status This screen provides information on CPU/memory frequencies/parameters. ``Advanced Frequency Settings && CPU Base Clock && Host/PCIe Clock Frequency (Note) 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. 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) This item is configurable only when CPU Base Clock is set to Manual.

&& 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. Allows you to set the CPU frequency. Options may vary depending on the CPU being used. (Default: Auto) && CPU Upgrade (Note) && CPU Clock Ratio && CPU Frequency (Note) 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. This item is present only when you install a CPU that supports this feature. For more information about Intel® CPUs' unique features, please visit Intel's website. BIOS Setup - 43 - ``Advanced CPU Core Settings && 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) && Turbo Ratio (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) && Turbo Power Limit (Watts) (Note) This item is present only when you install a CPU that supports this feature.

For more information about Intel® CPUs' unique features, please visit Intel's website. - 44 - BIOS Setup && Core Current Limit (Amps) && Active Cores Control (Note 1) 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.



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Auto lets the BIOS automatically configure this setting. (Default: Auto) && Hyper-Threading Technology (Note 1) && CPU Enhanced Halt (C1E) (Note 1) && C3 State Support (Note 1) 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) 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) 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) && C6/C7 State Support (Note 1) && CPU Thermal Monitor (Note 1) && CPU EIST Function (Note 1) && Extreme Memory Profile (X.M.P.) (Note 2) && System Memory Multiplier (Note 1) This item is present only when you install a CPU that supports this feature. For more information about Intel® CPUs' unique features, please visit Intel's website. (Note 2) This item is present only when you install a CPU and a memory module that support this feature. - 45 BIOS Setup && Memory Frequency (MHz) 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. ``Advanced Memory Settings && Extreme Memory Profile (X.

M.P.) (Note), System Memory Multiplier, Memory Frequency(MHz) && Memory Boot Mode The settings above are synchronous to those under the same items on the Advanced Frequency Settings menu. Provides memory detection and training methods. Auto Lets the BIOS automatically configure this setting. (Default) Enable Fast Boot Skip memory detection and training in some specific criteria for faster memory S boot. Disable Fast Boot Detect and train memory at every single boot. && Memory Enhancement Settings && Memory Timing Mode && Profile DDR Voltage P Provides 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, the value is displayed according to your memory specification. When Extreme Memory Profile (X.M.P.) is set to Profile1 or Profile2, the value is displayed according to the SPD data on the XMP memory. (Note) This item is present only when you install a CPU and a memory module that support this feature. - 46 - BIOS Setup && Channel Interleaving && Rank 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) ``Channel A/B/C/D 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.

- 47 - BIOS Setup ``Advanced Voltage Settings ``Advanced Power Settings && CPU VRIN Loadline Calibration Allows you to set the Load-Line Calibration level for the CPU VRIN. The levels are (from highest to lowest): Extreme, Turbo, High, Medium, Low, and Standard. Selecting a higher level keeps the CPU VRIN voltage more consistent with what is set in BIOS under heavy load. Auto lets the BIOS automatically configure this setting and sets the voltage following Intel's specifications. (Default: Auto) Allows you to set the over-current protection level for the CPU VRIN voltage. The adjustable range is from 150.0mV to 400.0mV. Auto lets the BIOS automatically configure this setting. (Default: Auto) - 48 - && CPU VRIN Protection BIOS Setup && DDR CH(A/B) Voltage Protection && DDR CH(C/D) Voltage Protection Allows you to set the voltage limit on Channel A and Channel B memory voltage for over-voltage protection.

The adjustable range is from 150.0mV to 325.0mV. Auto lets the BIOS automatically configure this setting. (Default: Auto) Allows you to set the voltage limit on Channel C and Channel D memory voltage for over-voltage protection. The adjustable range is from 150.0mV to 325.0mV. Auto lets the BIOS automatically configure this setting. (Default: Auto) Allows you to set the over-current protection level for the CPU VRIN voltage.

Auto Lets the BIOS automatically configure this setting. (Default) Standard-Extreme elects Standard, Low, Medium, High, Turbo, or Extreme which represents different S level of over-current protection for the CPU VRIN voltage.



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