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You can read the recommendations in the user guide, the technical guide or the installation guide for GIGABYTE GA-Z97X-SOC FORCE LN2. You'll find the answers to all your questions on the GIGABYTE GA-Z97X-SOC FORCE LN2 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-Z97X-SOC FORCE LN2
User guide GIGABYTE GA-Z97X-SOC FORCE LN2
Operating instructions GIGABYTE GA-Z97X-SOC FORCE LN2
Instructions for use GIGABYTE GA-Z97X-SOC FORCE LN2
Instruction manual GIGABYTE GA-Z97X-SOC FORCE LN2

GA-Z97X-SOC Force LN2

User's Manual
Rev. 1001
12ME-Z97SLN2-1001R



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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.

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- Before turning on the power, make sure the power supply voltage has been set according to the local voltage standard. •• Before using the product, please verify that all cables and power connectors of your hardware components are connected. •• To prevent damage to the motherboard, do not allow screws to come in contact with the motherboard circuit or its components. •• Make sure there are no leftover screws or metal components placed on the motherboard or within the computer casing. •• Do not place the computer system on an uneven surface.
- Do not place the computer system in a high-temperature environment. •• Turning on the computer power during the installation process can lead to damage. •• The motherboard includes 1 x 24-pin ATX main power connector 1 x 8-pin ATX 12V power connector 1 x 4-pin ATX 12V power connector 1 x OC PEG power connector 1 x SATA Express connector 6 x SATA 6Gb/s connectors 1 x CPU fan header 1 x water cooling fan header (CPU_OPT) 6 x system fan headers 1 x front panel header 1 x front panel audio header 1 x S/PDIF Out header 1 x USB 3.



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1. Dual Channel mode cannot be enabled if only one DDR3 memory module is installed. 2. When enabling Dual Channel mode with two memory modules, it is recommended that memory of the same capacity, brand, speed, and chips be used for optimum performance.

Hardware Installation 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 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 PCI Slot
Follow the steps below to correctly install your expansion card in the expansion slot. 1.

Locate an expansion slot that supports your card. Remove the metal slot cover from the chassis back panel. 2. Align the card with the slot, and press down on the card until it is fully seated in the slot. 3.

Make sure the metal contacts on the card are completely inserted into the slot. 4. Secure the card's metal bracket to the chassis back panel with a screw. 5.

After installing all expansion cards, replace the chassis cover(s). 6. Turn on your computer. If necessary, go to BIOS Setup to make any required BIOS changes for your expansion card(s). 7. Install the driver provided with the expansion card in your operating system.

Example: Installing and Removing a PCI Express Graphics Card: •• Installing a Graphics Card: Gently push down on the top edge of the card until it is fully inserted into the PCI Express slot. Make sure the card is securely seated in the slot and does not rock. •• Removing the Card: Gently push back on the lever on the slot and then lift the card straight out from the slot. **Hardware Installation - 18 - 1-6 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. For the latest GPU support information, please refer to the AMD official website.) -- CrossFire (Note 1)/SLI bridge connectors -- A power supply with sufficient power is recommended (Note 2) (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. (To set up a 2-Way configuration, we recommend installing the graphics cards in the PCIEX16 and PCIEX8 slots.

To set up a 3-Way configuration, we recommend installing the graphics cards in the PCIEX16, PCIEX8, and PCIEX4_1 slots.) Step 2: Insert the CrossFire(Note 1)/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 PCIEX16 slot. C-1. To Enable CrossFire Function After installing the graphics card driver in the operating system, go to the Catalyst Control Center.

Browse to Performance\AMD CrossFireX™ Configuration and ensure the Enable 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. Configuring the Graphics Card Driver 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. - 19 - **Hardware Installation D. Installing the OC Brace (Note 3)** OC Brace allows extreme overclockers and system testers to safely install up to four graphics cards in an open case or test bed without risking PCIe slot damage or preventing cards not showing up in the OS due to poor contact with PCIe slot. Refer to the following installation instructions: Step 1: As shown, align the screw holes on the OC Brace and back plate with the screw holes near the PCIe slots on the motherboard. Step 2: Fasten two of the included thumb screws (starting from the screw hole near the back panel audio connectors) to hold the OC Brace in place. Step 3: After installing the graphics cards, use the included thumb screws to secure the metal brackets of the graphics cards to the OC Brace. (Note 1) The bridge connectors may be needed or not depending on your graphics cards.

(Note 2) □ hen two or more graphics cards are installed, we recommend that you connect the power cable W from the power supply to the OC_PEG connector to ensure system stability. (Note 3) The components received may vary in appearance from the products illustrated.

Procedure and driver screen for enabling CrossFire/SLI technology may differ by graphics cards and driver version. Refer to the manual that came with your graphics cards for more information about enabling CrossFire/SLI technology. **Hardware Installation - 20 - 1-7 Back Panel Connectors USB 2.0/1.1 Port D-Sub 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. The D-Sub port supports a 15-pin D-Sub connector and supports a maximum resolution of 1920x1200@60Hz (the actual resolutions supported depend on the monitor being used). Connect a monitor that supports D-Sub connection to this port.

DVI-D Port (Note) The DVI-D port conforms to the DVI-D specification and supports a maximum resolution of 1920x1200@60Hz (the actual resolutions supported depend on the monitor being used). Connect a monitor that supports DVI-D connection to this port. **Optical S/PDIF Out Connector HDMI Port** This connector provides digital audio out to an external audio system that supports digital optical audio.



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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: 3 1 ATX_12V 4 2 Pin No. 1 2 3 4 Definition GND GND +12V +12V ATX_12V_2X4: 5 1 ATX_12V_2X4 8 4 Pin No. 1 2 3 4 5 6 7 8 Definition GND (Only for 2x4-pin 12V) GND (Only for 2x4-pin 12V) GND GND +12V (Only for 2x4-pin 12V) +12V (Only for 2x4-pin 12V) +12V +12V ATX: 12 24 Pin No. 1 2 3 4 5 6 7 8 9 10 11 12 1 ATX 13 Definition 3.3V 3.3V GND +5V GND +5V GND Power Good 5VSB (stand by +5V) +12V +12V (Only for 2x12-pin ATX) 3.3V (Only for 2x12-pin ATX) Pin No.

13 14 15 16 17 18 19 20 21 22 23 24 Definition 3.3V -12V GND PS_ON (soft On/Off) GND GND GND -5V +5V +5V +5V (Only for 2x12-pin ATX) GND (Only for 2x12-pin ATX) Hardware Installation - 28 - _ S 1 2 3 1 2 3 B B S _ B 1 2 3 1 2 3 S S B _ B 3) OC_PEG (PCIe Power Connector) The power connector provides auxiliary power to the onboard PCI Express x16 slots. When two or more graphics cards are installed, we recommend that you connect the 2x3 power cable from the power supply S to this connector to ensure system stability. S _ B B SS S U _ _ 3 4 1 _ U _ B 6 3 F_USB3 F Pin No. 1 2 3 4 5 6 Definition +12V +12V +12V GND GND GND 4/5) CPU_FAN/SYS_FAN1/2/3/4/5/6 (Fan Headers) The motherboard has a 4-pin CPU fan header (CPU_FAN), four 4-pin (SYS_FAN1/SYS_FAN2/SYS_FAN3/ SYS_FAN4) and two 3-pin (SYS_FAN5/SYS_FAN6) system fan headers.

Most fan headers possess a foolproof insertion design. When connecting a fan cable, be sure to connect it in the correct orientation (the black connector wire is the ground wire). The speed control function requires the use of a fan with fan speed control design. For optimum heat dissipation, it is recommended that a system fan be installed inside the chassis. CPU_FAN: 1 CPU_FAN Pin No. 1 2 3 4 Pin No. 1 2 3 4 Pin No. 1 2 3 Definition GND +12V Sense Speed Control Definition GND +12V / Speed Control Sense VCC Definition GND +12V NC SYS_FAN1/2/3/4: 1 SYS_FAN1 1 SYS_FAN2/3/4 SYS_FAN5/6: 1 SYS_FAN5 SYS_FAN6 1 •• 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. - 29 Hardware Installation S 1 2 3 1 2 3 1 2 3 6) CPU_OPT (Water Cooling CPU Fan Header) 1 2 3 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 4 3 1 Definition GND +12V/Speed Control Sense VCC B SS S U S S _ S F 7) SATA_EXPRESS (SATA Express Connector) S _ The SATA Express connector supports a single SATA Express device. S _ SATA Express and SATA3 4/5 connectors can only be used one at a time. Hardware Installation - 30 - 8) SATA3 0/1/2/3/4/5 (SATA 6Gb/s Connectors) S _ 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 7 7 1 0 3 2 5 4 1 1 Pin No. 1 2 3 4 5 6 7 Definition GND TXP TXN GND RXN RXP GND S _ •• 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. •• To enable hot-plugging for the SATA ports, refer to Chapter 2, "BIOS Setup," "Peripherals/SATA Configuration," for more information. •• SATA Express and SATA3 4/5 connectors can only be used one at a time.

9) F_AUDIO (Front Panel Audio Header) The front panel audio header supports Intel® High Definition audio (HD) and AC'97 audio. You may connect your chassis front panel audio module to this header. Make sure the wire assignments of the module connector match the pin assignments of the motherboard header. Incorrect connection between the module connector and the motherboard header will make the device unable to work or even damage it. For HD Front Panel Audio: Pin No. Definition 1 MIC2_L F _ 2 GND 3 MIC2_R 4 -ACZ_DET 5 LINE2_R 6 GND 7 FAUDIO_JD 8 No Pin 9 LINE2_L 10 GND For AC'97 Front Panel Audio: Pin No. Definition 1 MIC F _ 2 GND 3 MIC Power 4 NC 5 Line Out (R) 6 NC 7 NC 8 No Pin 9 Line Out (L) 10 NC 9 F _ U 10 1 2 B _ 1 2 3 B S supports HD audio by default. If your chassis provides an AC'97 •• The front panel audio header S front panel audio module, refer to the instructions on how to activate AC'97 functionality via the audio software in Chapter 6, "Configuring 2/4/5.1/7.1-Channel Audio.

" •• Audio signals will be present on both of the front and S panel audio connections simultaneously. back If you want to mute the back panel audio (only supported when using an HD front panel audio module), refer to Chapter 6, "Configuring 2/4/5.1/7.1-Channel Audio." •• Some chassis provide a front panel audio module that has separated connectors on each wire 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 - 31 1 2 3 1 2 3 S 1 2 3 1 1 _ B Hardware Installation S B _ B 10) F_PANEL (Front Panel Header) Connect the power switch, reset switch, speaker, chassis intrusion switch/sensor and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables. Power LED Power Switch Speaker PLED+ PLEDPW+ PW- SPEAK+ 2 1 HD+ HDRESRES+ CICI+ PWR_LED+ PWR_LED PWR_LED Power LED Chassis Intrusion Header SPEAK20 19 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.



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You may configure the way to turn off your system using the power switch (refer to Chapter 2, "BIOS Setup," "Power Management," for more information). ••

SPEAK (Speaker, Orange): Connects to the speaker on the chassis front panel. The system reports system startup status by issuing a beep code. One single short beep will be heard if no problem is detected at system startup. •• **HD (Hard Drive Activity LED, Blue):** Connects to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data. •• **RES (Reset Switch, Green):** Connects to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

•• **CI (Chassis Intrusion Header, Gray):** Connects to the chassis intrusion switch/sensor on the chassis that can detect if the chassis cover has been removed. This function requires a chassis with a chassis intrusion switch/sensor. The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly. Hardware Installation - 32 - 11) SPDIF_O (S/PDIF Out Header) This header supports digital S/PDIF Out and connects a S/PDIF digital audio cable (provided by expansion cards) for digital audio output from your motherboard to certain expansion cards like graphics cards and sound cards. For example, some graphics cards may require you to use a S/PDIF digital audio cable for digital audio output from your motherboard to your graphics card if you wish to connect an HDMI display to the graphics card and have digital audio output from the HDMI display at the same time. For information about connecting the S/PDIF digital audio cable, carefully read the manual for your expansion card. Pin No. 1 2 Definition SPDIFO GND 1 12) F_USB30 (USB 3.0/2.0 Header) The header conforms to USB 3.0/2.0 specification and can provide two USB ports. For purchasing the optional 3.5" front panel that provides two USB 3.0/2.0 ports, please contact the local dealer. Pin No. 1 2 3 4 5 6 7 8 9 10 Definition VBUS SSRX1SSRX1+ GND SSTX1SSTX1+ GND DID1+ NC Pin No. 11 12 13 14 15 16 17 18 19 20 Definition D2+ D2GND SSTX2+ SSTX2GND SSRX2+ SSRX2VBUS No Pin F_USB30 1 10 20 11 F_U B_ 1 1 2 3 1 2 3 1 1 2 3 S Prior to installing the USB front panel, be sure to turn off your computer and unplug the power cord from the power outlet to prevent damage to the USB front panel. - 33 - Hardware Installation B SS S 1 1 2 3 1 13) F_USB1 (USB 2.0/1.1 Header) The header conforms 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. F_ F_ F_ F_ F_ U 9 10 1 2 B_ B SS 1 1 B SS 1 1 _S _S _B B B S_ B B S_ B S 1 2 3 1 2 3 S 1 2 3 S S •• 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 S B_ S B_ from the power outlet to prevent damage B the USB bracket. to B 1 2 3 1 2 3 1 2 3 14) F_USB2/F_USB3 (USB 2.0/1.1 Connectors) S_ _S _S S_ _B _ The two USB ports make it easier to save data, flash the BIOS or install software in open bench testing B platforms whether for extreme overclocking or simply pretesting the PC before final component installation inside a case scenarios where accessing the rear panel IO can be an inconvenience. U 1 2 3 4 1 2 3 4 1 2 3 4 B SS S B SS S U 1 2 3 4 _3 _3 _3 _U _B _U _B 1 2 3 4 1 2 3 4 F_USB2 F F_USB3 F_USB3F F_USB3 Hardware Installation - 34 - 1 2 3 4 5 1 2 3 4 5 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 S S U S S U 1 2 3 4 1 2 3 1 2 3 4 1 1 1 1 2 3 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 16) 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. - 35 Hardware Installation 17) 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 - 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.



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

To flash the BIOS, do it with caution. Inadequate BIOS flashing may result in system malfunction. •• It is recommended that you not alter the default settings (unless you need to) to prevent system instability or other unexpected results. Inadequately altering the settings may result in system's failure to boot. If this occurs, try to clear the CMOS values and reset the board to default values. (Refer to the "Load Optimized Defaults" section in this chapter or introductions of the battery or the clear CMOS jumper/button 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. Or you can use your mouse to select the item you want. (Sample BIOS Version: F1c) Setup Menu 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> <F2> <F5> <F7> <F8> <F9> <F10> <F12> <Esc> Move the selection bar to select a setup menu Move the selection bar to select an configuration item on a menu Execute command or enter a menu Increase the numeric value or make changes Decrease the numeric value or make changes Switch to 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.

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. □□ System Information □□ BIOS Features □□ Peripherals Use this menu to configure all peripheral devices, such as SATA, USB, integrated audio, and integrated LAN, etc. Use this menu to configure all the power-saving functions. □□ Power Management □□ Save & Exit Save all the changes made in the BIOS Setup program to the CMOS and exit BIOS Setup. You can save the current BIOS settings to a profile or load optimized defaults for optimal-performance system operations. - 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, Vcore, and memory voltage. BIOS Setup - 42 - ``M.I.T.

Current Status This screen provides information on CPU/memory frequencies/parameters. ``Advanced Frequency Settings && Performance Upgrade (Note) && CPU Base Clock Provides you with five different overclocking configurations. Options are: 20% Upgrade, 40% Upgrade, 60% Upgrade, 80% Upgrade, 100% Upgrade. (Default: Auto) Allows you to manually set the CPU base clock in 0.01 MHz increments. (Default: Auto) Important: It is highly recommended that the CPU frequency be set in accordance with the CPU specifications. 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.



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Enables or disables CPU/PCIe Spread Spectrum. (Default: Auto) && Host/PCIe Clock Frequency (Note) && Processor Base Clock (Gear Ratio) (Note) && Spread Spectrum Control (Note) && Host Clock Value && Processor Graphics Clock 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 onboard graphics clock. The adjustable range is from 400 MHz to 4000 MHz. (Default: Auto) && CPU Upgrade (Note) (Note) Allows you to set the CPU frequency. Options may vary depending on the CPU being used. (Default: Auto) This item is present only when you install a CPU that supports this feature. @@- 43 BIOS Setup && CPU Clock Ratio Allows you to alter the clock ratio for the installed CPU. The adjustable range is dependent on the CPU being installed.

Displays the current operating CPU frequency. && CPU Frequency ``Advanced CPU Core Settings && CPU Clock Ratio, CPU Frequency 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.

&& K OC (Note) && CPU PLL Selection && Filter PLL Level && Uncore Ratio && Uncore Frequency && Intel(R) Turbo Boost Technology (Note) Allows you to determine whether to enable the Intel CPU Turbo Boost technology. Auto lets the BIOS automatically configure this setting. (Default: Auto) Allows you to set the CPU Turbo ratios for different number of active cores. Auto sets the CPU Turbo ratios according to the CPU specifications. (Default: Auto) This item is present only when you install a CPU that supports this feature. @@- 44 - && Turbo Ratio (1-Core Active~4-Core Active) (Note) (Note)

BIOS Setup && Turbo Power Limit (Watts) && Core Current Limit (Amps) Allows you to set a power limit for CPU Turbo mode. When the CPU power consumption exceeds the specified power limit, the CPU will automatically reduce the core frequency in order to reduce the power. Auto sets the power limit according to the CPU specifications. (Default: Auto) Allows you to set a current limit for CPU Turbo mode. When the CPU current exceeds the specified current limit, the CPU will automatically reduce the core frequency in order to reduce the current.

Auto sets the power limit according to the CPU specifications. (Default: Auto) Allows you to select the number of CPU cores to enable in an Intel® multi-core CPU (the number of CPU cores may vary by CPU). Auto lets the BIOS automatically configure this setting. (Default: Auto) Allows you to determine whether to enable multi-threading technology when using an Intel® CPU that supports this function. This feature only works for operating systems that support multi-processor mode. Auto lets the BIOS automatically configure this setting. (Default: Auto) Enables or disables Intel® CPU Enhanced Halt (C1E) function, a CPU power-saving function in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. Auto lets the BIOS automatically configure this setting. (Default: Auto) Allows you to determine whether to let the CPU enter C3 mode in system halt state.

When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. The C3 state is a more enhanced power-saving state than C1. Auto lets the BIOS automatically configure this setting. (Default: Auto) 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. && No. of CPU Cores Enabled (Note 1) && Hyper-Threading Technology (Note 1) && CPU Enhanced Halt (C1E) (Note 1) && C3 State Support (Note 1) && C6/C7 State Support (Note 1) && CPU Thermal Monitor (Note 1) && CPU EIST Function (Note 1) && Extreme Memory Profile (X.M.P.)

P.) (Note 2) (Note 1) This item is present only when you install a CPU that supports this feature. @@(Note 2) This item is present only when you install a CPU and a memory module that support this feature. - 45 BIOS Setup && System Memory Multiplier Allows you to set the system memory multiplier. Auto sets memory multiplier according to memory SPD data. (Default: Auto) The first memory frequency value is the normal operating frequency of the memory being used; the second is the memory frequency that is automatically adjusted according to the System Memory Multiplier settings. && Memory Frequency (MHz) ``Advanced Memory Settings && Extreme Memory Profile (X.M.P.) (Note), System Memory Multiplier, Memory Frequency(MHz) The settings above are synchronous to those under the same items on the Advanced Frequency Settings menu.

Allows you to set the memory frequency. Options may vary depending on the memory being used. (Default: Disabled) Provides memory detection and training methods. Auto Lets the BIOS automatically configure this setting. (Default) Enable Fast Boot kip memory detection and training in some specific criteria for faster memory S boot.

Disable Fast Boot Detect and train memory at every single boot. P rovides three different memory performance enhancement settings: Normal (basic performance), Enhanced Stability, and Enhanced Performance. (Default: Normal) Manual and Advanced Manual allows the Channel Interleaving, Rank Interleaving, and memory timing settings below to be configurable.



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