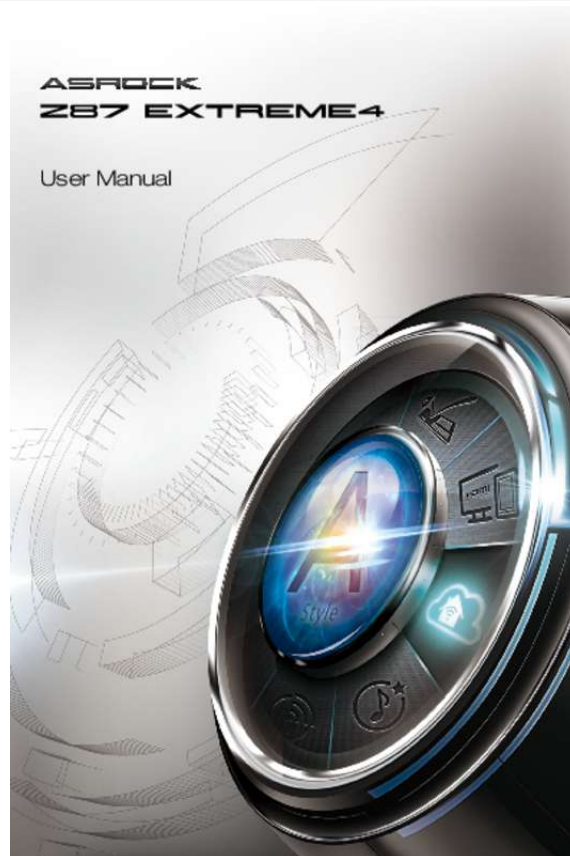




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User manual ASROCK Z87 EXTREME4
User guide ASROCK Z87 EXTREME4
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Instructions for use ASROCK Z87 EXTREME4
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Manual abstract:

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90 91 93 94 97 98 101 102 Z87 Extreme4 Chapter 1 Introduction Thank you for purchasing ASRock Z87 Extreme4 motherboard, a reliable motherboard

produced under ASRock's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock's commitment to quality and endurance. In this manual, Chapter 1 and 2 contains the introduction of the motherboard and step-by-step installation guides.

Chapter 3 contains the operation guide of the software and utilities. Chapter 4 contains the configuration guide of the BIOS setup. Because the motherboard specifications and the BIOS software might be updated, the content of this documentation will be subject to change without notice. In case any modifications of this documentation occur, the updated version will be available on ASRock's website without further notice. If you require technical support related to this motherboard, please visit our website for specific information about the model you are using. You may find the latest VGA cards and CPU support list on

ASRock's website as well. ASRock website <http://www.asrock.com>. 1.

1 Package Contents •••••ASRock Z87 Extreme4 Motherboard (ATX Form Factor) ASRock Z87 Extreme4 Quick Installation Guide ASRock Z87 Extreme4 Support CD 4 x Serial ATA (SATA) Data Cables (Optional) 1 x I/O Panel Shield 1 x ASRock SLI_Bridge_2S Card 1 English 1.2 Specifications Platform • ATX Form Factor • Premium Gold Capacitor design (100% Japan-made highquality Conductive Polymer Capacitors) • Home Cloud • Purity Sound™ • HDMI-In • Supports 4th Generation Intel® Core™ i7 / i5 / i3 / Xeon® / Pentium® / Celeron® in LGA1150 Package • Digi Power Design • 12 Power Phase Design •

Supports Intel® Turbo Boost 2.0 Technology • Supports Intel® K-Series unlocked CPU • Supports ASRock BCLK Full-range Overclocking • Intel® Z87 • Dual Channel DDR3 Memory Technology • 4 x DDR3 DIMM slots • Supports DDR3 2933+(OC)/2800(OC)/2400(OC)/2133(OC)/ 1866(OC)/1600/1333/1066 non-ECC, un-buffered memory • Max. capacity of system memory: 32GB (see CAUTION) • Supports Intel® Extreme Memory Profile (XMP)1.3/1.

2 • Distortion-Free Slot • 3 x PCI Express 3.0 x16 slots (PCIE2/PCIE4/PCIE5: single at x16 (PCIE2); dual at x8 (PCIE2) / x8 (PCIE4); triple at x8 (PCIE2) / x4 (PCIE4) / x4 (PCIE5)) • 2 x PCI Express 2.0 x1 slots • 2 x PCI slots • Supports AMD Quad CrossFireXTM, 3-Way CrossFireXTM and CrossFireXTM • Supports NVIDIA® Quad SLITM and SLITM A-Style CPU Chipset Memory Expansion Slot English 2 Z87 Extreme4 Graphics • Intel® HD Graphics Built-in

Visuals and the VGA outputs can be supported only with processors which are GPU integrated. • Supports Intel® HD Graphics Built-in Visuals : Intel® Quick Sync Video with AVC, MVC (S3D) and MPEG-2 Full HW Encode1, Intel® InTru™ 3D, Intel® Clear Video HD Technology, Intel® Insider™, Intel® HD Graphics 4400/4600 • Pixel Shader 5.0, DirectX 11.

1 • Max. shared memory 1792MB • Four VGA Output options: D-sub, DVI-D, HDMI and DisplayPort • Supports Triple Monitors • Supports HDMI Technology with max. resolution up to 4K × 2K (4096x2304) @ 24Hz • Supports DVI-D with max. resolution up to 1920x1200 @ 60Hz • Supports D-Sub with max.



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English 10 Z87 Extreme4 1.4 Motherboard Layout 1 2 3 4 5 6 DDR3_A1 (64 bit, 240-pin module) DDR3_A2 (64 bit, 240-pin module) DDR3_B1 (64 bit, 240-pin module) DDR3_B2 (64 bit, 240-pin module) HDMI_IN1 31 eSATA0 Front USB 3.

0 ATXPWR1 USB3_4_5 PWR_FAN1 CHA_FAN3 CHA_FAN2 USB3_6_7 1 USB3_8 30 Z87 Extreme4 PCIE1 PCI Express 3.0 Vertical Type A USB 1 SATA3_A0_A1 Purity Sound T M SATA3_0_1 SATA3_2_3 29 1 PCIE Intel Z87 SATA3_4_5 11 English PS2 Keyboard/Mouse CPU_FAN2 USB 2.0 T: USB0 B: USB1 ATX12V1 CPU_FAN1 DVI1 HDM1 Bottom: Optical SPDIF Bottom: MIC IN VGA DP_1 LAN USB 3.0 T: USB0 B: USB1 7 USB 3.0 T: USB2 B: USB3 Center: REAR SPK Center: FRONT Top: RJ-45 8 9 Top: Central/Bass Top: LINE IN HD_AUDIO1 10 11 PCIE2 PCIE3 X Fast RAM X Fast LAN X Fast USB 12 13 14 SPEAKER1 BIOS_B_LED 1 PCIE4 Super I/O 64Mb BIOS BIOS_B BIOS_A_LED 15 BIOS_SEL1 1 CLRCMOS1 16 64Mb BIOS BIOS_A 1 17 PCIE2 RoHS CMOS Battery PLED1 PCIE5 IRI COM1 1 CHA_FAN1 USB6_7 USB4_5 USB2_3 PLED PWRBTN Dr.

Debug CLRCBTN2 RSTBTN PWRBTN 1 1 1 1 1 HDLED RESET PANEL1 28 27 26 25 24 23 22 21 20 19 18 No. Description 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 ATX 12V Power Connector (ATX12V1) Chassis Fan Connector (CHA_FAN2) CPU Fan Connector (CPU_FAN1) CPU Fan Connector (CPU_FAN2) 2 x 240-pin DDR3 DIMM Slots (DDR3_A1, DDR3_B1) 2 x 240-pin DDR3 DIMM Slots (DDR3_A2, DDR3_B2) ATX Power Connector (ATXPWR1) USB 3.0 Header (USB3_4_5) (ASMedia Hub) USB 3.0 Header (USB3_6_7) (ASMedia Hub) Vertical Type A USB 3.0 (USB3_12) SATA3 Connectors (SATA3_A0_A1) SATA3 Connectors (SATA3_0_1) SATA3 Connectors (SATA3_2_3) SATA3 Connectors (SATA3_4_5) Chassis Speaker Header (SPEAKER1) BIOS Selection Jumper (BIOS_SEL1) Clear CMOS Jumper (CLRCMOS1) Power Switch (PWRBTN1) Reset Switch (RSTBTN1) Clear CMOS Switch Power LED Header (PLED1) System Panel Header (PANEL1) USB 2.0 Header (USB2_3) USB 2.0 Header (USB4_5) USB 2.0 Header (USB6_7) Chassis Fan Connector (CHA_FAN1) COM Port Header (COM1) Infrared Module Header (IRI) Front Panel Audio Header (HD_AUDIO1) Power Fan Connector (PWR_FAN1) Chassis Fan Connector (CHA_FAN3) English 12 31 Z87 Extreme4 1.5 I/O Panel 1 2 3 4 5 6 7 8 9 17 No. Description 1 2 3 4 5 6 7 8 9 16 15 14 13 12 11 10 No.

Description 10 11 12 13 14 15 16 17 Microphone (Pink) Optical SPDIF Out Port USB 3.0 Ports (USB3_23) USB 3.0 Ports (USB3_01) HDMI-In Port HDMI-Out Port DVI-D Port PS/2 Mouse/Keyboard Port USB 2.0 Ports (USB01) VGA Port Display Port eSATA Connector*** LAN RJ-45 Port* Central / Bass (Orange) Rear Speaker (Black) Line In (Light Blue) Front Speaker (Lime)** 13 English * There are two LEDs on each LAN port. Please refer to the table below for the LAN port LED indications. ACT/LINK LED SPEED LED LAN Port Activity / Link LED Status Off Blinking On Description No Link Data Activity Link Speed LED Status Off Orange Green Description 10Mbps connection 100Mbps connection 1Gbps connection ** If you use a 2-channel speaker, please connect the speaker's plug into "Front Speaker Jack". See the table below for connection details in accordance with the type of speaker you use. Audio Output Channels 2 4 6 8 Front Speaker (No. 9) V V V V Rear Speaker (No. 7) -V V V Central / Bass (No. 6) --V V Line In (No. 8) --V To enable Multi-Streaming, you need to connect a front panel audio cable to the front panel audio header. After restarting your computer, you will find the "Mixer" tool on your system. Please select "Mixer ToolBox", click "Enable playback multi-streaming", and click "ok". Choose "2CH", "4CH", "6CH", or "8CH" and then you are allowed to select "Realtek HDA Primary output" to use the Rear Speaker, Central/Bass, and Front Speaker, or select "Realtek HDA Audio 2nd output" to use the front panel audio.

*** The eSATA connector supports SATA with cables within 1 meters. English 14 Chapter 2 Installation This is an ATX form factor motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it. Pre-installation Precautions Take note of the following precautions before you install motherboard components or change any motherboard settings. • Make sure to unplug the power cord before installing or removing the motherboard.

Failure to do so may cause physical injuries to you and damages to motherboard components. • In order to avoid damage from static electricity to the motherboard's components, NEVER place your motherboard directly on a carpet. Also remember to use a grounded wrist strap or touch a safety grounded object before you handle the components. • Hold components by the edges and do not touch the ICs. • Whenever you uninstall any components, place them on a grounded anti-static pad or in the bag that comes with the components. • When placing screws to secure the motherboard to the chassis, please do not overtighten the screws! Doing so may damage the motherboard. 15 2.1 Installing the CPU 1. Before you insert the 1150-Pin CPU into the socket, please check if the PnP cap is on the socket, if the CPU surface is unclean, or if there are any bent pins in the socket. Do not force to insert the CPU into the socket if above situation is found.

Otherwise, the CPU will be seriously damaged. 2. Unplug all power cables before installing the CPU. 1 A B 2 English 16 Z87 Extreme4 3 4 5 17 English Please save and replace the cover if the processor is removed. The cover must be placed if you wish to return the motherboard for after service. English 18 Z87 Extreme4 2.2 Installing the CPU Fan and Heatsink 1 2 CP U_ FA N 19 English 2.3 Installing Memory Modules (DIMM) This motherboard provides four 240-pin DDR3 (Double Data Rate 3) DIMM slots, and supports Dual Channel Memory Technology. 1. For dual channel configuration, you always need to install identical (the same brand, speed, size and chip-type) DDR3 DIMM pairs.

2. It is unable to activate Dual Channel Memory Technology with only one or three memory module installed. 3. It is not allowed to install a DDR or DDR2 memory module into a DDR3 slot; otherwise, this motherboard and DIMM may be damaged. Dual Channel Memory Configuration Priority 1 2 3 DDR3_A1 Populated Populated DDR3_A2 Populated Populated Populated Populated DDR3_B1 DDR3_B2 Populated Populated The DIMM only fits in one correct orientation.

It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation. English 20 Z87 Extreme4 1 2 3 21 English 2.4 Expansion Slots (PCI and PCI Express Slots) There are 2 PCI slots and 5 PCI Express slots on the motherboard. Before installing an expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.



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PCI slot: The PCI1 and PCI2 slot are used to install expansion cards that have 32-bit PCI interface. PCIe slots: PCIE1 (PCIe 2.0 x1 slot) is used for PCI Express x1 lane width cards. PCIE2 (PCIe 3.0 x16 slot) is used for PCI Express x16 lane width graphics cards. PCIE3 (PCIe 2.0 x1 slot) is used for PCI Express x1 lane width cards. PCIE4 (PCIe 3.0 x16 slot) is used for PCI Express x8 lane width graphics cards. PCIE5 (PCIe 3.0 x16 slot) is used for PCI Express x4 lane width graphics cards.

PCIe Slot Configurations PCIE2 Single Graphics Card Two Graphics Cards in CrossFireXTM or SLITM Mode x16 PCIE4 N/A PCIE5 N/A x8 x8 N/A Three Graphics Cards in 3-Way CrossFireXTM Mode x8 x4 x4 For a better thermal environment, please connect a chassis fan to the motherboard's chassis fan connector (CHA_FAN1, CHA_FAN2 or CHA_FAN3) when using multiple graphics cards. English 22 Z87 Extreme4 2.5 Jumpers Setup The illustration shows how jumpers are setup. When the jumper cap is placed on the pins, the jumper is "Short". If no jumper cap is placed on the pins, the jumper is "Open". The illustration shows a 3-pin jumper whose pin1 and pin2 are "Short" when a jumper cap is placed on these 2 pins. Clear CMOS Jumper (CLRCMOS1) (see p.11, No. 17) Default Clear CMOS CLRCMOS1 allows you to clear the data in CMOS.

To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply. After waiting for 15 seconds, use a jumper cap to short pin2 and pin3 on CLRCMOS1 for 5 seconds. However, please do not clear the CMOS right after you update the BIOS. If you need to clear the CMOS when you just finish updating the BIOS, you must boot up the system first, and then shut it down before you do the clear-CMOS action. Please be noted that the password, date, time, and user default profile will be cleared only if the CMOS battery is removed.

The Clear CMOS Switch has the same function as the Clear CMOS jumper. 23 English BIOS Selection Jumper (BIOS_SEL1) (see p.11, No. 16) Default Backup BIOS (Main BIOS) This motherboard has two BIOS onboard, a main BIOS (BIOS_A) and a backup BIOS (BIOS_B), which enhances protection for the safety and stability of your system. Normally, the system works on the main BIOS.

However, if the main BIOS is corrupted or damaged, please use a jumper cap to short pin2 and pin3, then the backup BIOS will take over on the next system boot. After that, short pin1 and pin2 again, then use "Secure Backup UEFI" in the UEFI Setup Utility to duplicate a working copy of the BIOS files to the primary BIOS to ensure normal system operation. For safety issues, users are not able to update the backup BIOS manually. Users may refer to the BIOS LEDs (BIOS_A_LED or BIOS_B_LED) to identify which BIOS is currently activated. English 24 Z87 Extreme4 2.6 Onboard Headers and Connectors Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage to the motherboard. System Panel Header (9-pin PANEL1) (see p.11, No.

22) 1 PLED+ PLEDPWRBTN# GND GND RESET# GND HDLEDHDLED+ Connect the power switch, reset switch 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. PWRBTN (Power Switch): Connect to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch. RESET (Reset Switch): Connect 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. PLED (System Power LED): Connect to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED keeps blinking when the system is in S1/S3 sleep state. The LED is off when the system is in S4 sleep state or powered off (S5).

HDLED (Hard Drive Activity LED): Connect to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data. The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

25 English Power LED Header (3-pin PLED1) (see p.11, No. 21) 1 PLEDPLED+ PLED+ Please connect the chassis power LED to this header to indicate the system's power status. These eight SATA3 connectors support SATA data cables for internal storage devices with up to 6.0 Gb/s data transfer rate.

If the eSATA port on the rear I/O has been connected, the internal SATA3_A0 will not function. To minimize the boot time, use Intel® Z87 SATA ports (SATA3_0) for your bootable devices. USB 2.0 Headers (9-pin USB2_3) (see p.11, No. 23) (9-pin USB4_5) (see p.11, No. 24) (9-pin USB6_7) (see p.11, No. 25) SATA3_4_5 SATA3_2_3 Serial ATA3 Connectors (SATA3_0_1: see p.

11, No. 12) (SATA3_2_3: see p.11, No. 13) (SATA3_4_5: see p.11, No. 14) (SATA3_A0_A1: see p.11, No. 11) SATA3_0_1 SATA3_A0_A1 USB_PWR PP+ GND DUMMY 1 GND P+ PUSB_PWR Besides two USB 2.0 ports on the I/O panel, there are three headers on this motherboard. Each USB 2.0

header can support two ports. USB 3.0 Headers (19-pin USB3_4_5) (see p.11, No. 8) (19-pin USB3_6_7) (see p.

11, No. 9) Vbus IntA_PA_SSRXIntA_PA_SSRX+ GND IntA_PA_SSTXIntA_PA_SSTX+ GND IntA_PA_DIntA_PA_D+ 1

IntA_PB_SSRXIntA_PB_SSRX+ GND IntA_PB_SSTXIntA_PB_SSTX+ GND IntA_PB_DIntA_PB_D+ Dummy Besides four USB 3.0 ports on the I/O panel, there are one header on this motherboard. Each USB 3.0 header can support two ports.

English 26 (USB3_8) (see p.11, No. 10) Z87 Extreme4 Front Panel Audio Header (9-pin HD_AUDIO1) (see p.11, No. 29) GN D PRESENCE# MIC_RET OUT_RET OUT2_L J_SENSE OUT2_R MIC2_R MIC2_L 1 This header is for connecting audio devices to the front audio panel. 1. High Definition Audio supports Jack Sensing, but the panel wire on the chassis must support HDA to function correctly. Please follow the instructions in our manual and chassis manual to install your system. 2. If you use an AC'97 audio panel, please install it to the front panel audio header by the steps below: A.

Connect Mic_IN (MIC) to MIC2_L. B. Connect Audio_R (RIN) to OUT2_R and Audio_L (LIN) to OUT2_L. C. Connect Ground (GND) to Ground (GND). D. MIC_RET and OUT_RET are for the HD audio panel only. You don't need to connect them for the AC'97 audio panel. E. To activate the front mic, go to the "FrontMic" Tab in the Realtek Control panel and adjust "Recording Volume".

Chassis Speaker Header (4-pin SPEAKER1) (see p.11, No. 15) Chassis and Power Fan Connectors (4-pin CHA_FAN1) (see p.11, No. 26) (3-pin CHA_FAN2) (see p.

11, No. 2) (3-pin CHA_FAN3) (see p.11, No. 31) (3-pin PWR_FAN1) (see p.



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11, No.

30) **DUMMY SPEAKER 1 +5V DUMMY** Please connect the chassis speaker to this header. **GND +12V FAN_SPEED FAN_SPEED_CONTROL** Please connect fan cables to the fan connectors and match the black wire to the ground pin. **GND +12V FAN_SPEED 27 English CPU Fan Connectors (4-pin CPU_FAN1)** (see p.11, No. 3) **(3-pin CPU_FAN2)** (see p.11, No. 4) **ATX Power Connector (24-pin ATXPWR1)** (see p.11, No. 7) **FAN_SPEED_CONTROL FAN_SPEED + 12V GN D 4 3 2 1 FAN_SPEED + 12V GND** This motherboard provides a 4-Pin CPU fan (Quiet Fan) connector. If you plan to connect a 3-Pin CPU fan, please connect it to Pin 1-3.

This motherboard provides a 24-pin ATX power connector. To use a 20-pin ATX power supply, please plug it along Pin 1 and Pin 13. This motherboard provides an 8-pin ATX 12V power connector. To use a 4-pin ATX power supply, please plug it along Pin 1 and Pin 5. This header supports an optional wireless transmitting and receiving infrared module. **12 24 1 13 ATX 12V Power Connector (8-pin ATX12V1)** (see p.11, No. 1) **1 4 5 8 Infrared Module Header (5-pin IRI)** (see p.11, No. 28) **IRTX +5VSB DUMMY 1 GND IRRX Serial Port Header (9-pin COM1)** (see p.

11, No. 27) **1 RRXD1 DDTR#1 DDSR#1 CCTS#1 This COM1 header supports a serial port module. RRI#1 RRTS#1 GND TTXD1 DDCCD#1 English 28 Z87 Extreme4 2.7 Smart Switches** The motherboard has three smart switches: Power Switch, Reset Switch and Clear CMOS Switch, allowing users to quickly turn on/off the system, reset the system or clear the CMOS values. **Power Switch (PWRBTN)** (see p. 11, No. 18) **Reset Switch (RSTBTN)** (see p.11, No. 19) **Clear CMOS Switch (CLRCBTN)** (see p.11, No.

20) **Power Switch** allows users to quickly turn on/off the system. **Reset Switch** allows users to quickly reset the system. **Clear CMOS Switch** allows users to quickly clear the CMOS values. This function is operational only when you power off your computer and unplug the power supply. **29 English 2.8 Dr. Debug** **Dr. Debug** is used to provide code information, which makes troubleshooting even easier. Please see the diagrams below for reading the **Dr. Debug** codes.

Code 00 Description Please check if the CPU is installed correctly and then clear CMOS. Problem related to memory, VGA card or other devices. Please clear CMOS, re-install the memory and VGA card, and remove other USB, PCI devices. Problem related to memory. Please re-install the CPU and memory then clear CMOS. If the problem still exists, please install only one memory module or try using other memory modules. The Memory could not be detected. Please re-install the memory and CPU. If the problem still exists, please install only one memory module or try using other memory modules. Chipset initialization error.

Please press reset or clear CMOS. Problem related to PCI-E devices. Please re-install PCI-E devices or try installing them in other slots. If the problem still exists, please remove all PCI-E devices or try using another VGA card. Problem related to IDE or SATA devices. Please re-install IDE and SATA devices. If the problem still exists, please clear CMOS and try removing all SATA devices. Problem related to memory. Please re-install the CPU and memory. If the problem still exists, please install only one memory module or try using other memory modules.

0d 01 - 54 (except 0d), 5A- 60 55 61 - 91 92 - 99 A0 - A7 b0 English 30 Z87 Extreme4 b4 Problem related to USB devices. Please try removing all USB devices. Problem related to memory. Please re-install the CPU and memory then clear CMOS. If the problem still exists, please install only one memory module or try using other memory modules. The VGA could not be recognized. Please clear CMOS and try re-installing the VGA card. If the problem still exists, please try installing the VGA card in other slots or use other VGA cards. The Keyboard and mouse could not be recognized. Please try re-installing the keyboard and mouse.

Invalid Password. Please check if the CPU is installed correctly and then clear CMOS. **b7 d6 d7 d8 FF 31 English 2.9 Using the HDMI-In Port** The HDMI-In port on this motherboard lets you easily switch between PC screen (on-board VGA) and external video source on the same monitor. This function saves you the hassle of switching cables back and forth when you want to display the screen of another device, such as smartphone, tablet, camcorder, DVD player, or another PC, onto the PC monitor. Another useful feature of this function is that external video source can be viewed even when your PC is in standby mode or powered off. For example, you can play smartphone games or watch tablet video on your PC screen. **USB 3.0 USB 3.0 English 32 Z87 Extreme4 USB 3.0 USB 3.0 Connection Diagram Power Source 33 English HDMI Adapter Step 1** Connect your monitor to the HDMI-Out port on the motherboard via an HDMI cable. **Step 2** Connect an external devices with HDMI output to the HDMI-In port on the motherboard via an HDMI cable. **Step 3** Double-click the "A-Tuning" function in "Tools" tab. **Step 4** Click the textbox and enter the action to set a hotkey.

Then click Apply to apply the setting. icon on the desktop and find "HDMI-IN" **Step 5** Use the hotkey to switch between on-board PC screen or HDMI-In Source. 1. If there is no video displayed on your monitor, make sure that the cables are properly connected and make sure that "Deep S5" option in BIOS SETUP is set to [Disable]. 2.

If required, connect a power source to the adapter that lets the smartphone/tablet output HDMI signal. **English 34 Z87 Extreme4 2.10 SLITM and Quad SLITM Operation Guide** This motherboard supports NVIDIA® SLITM and Quad SLITM (Scalable Link Interface) technology that allows you to install up to two identical PCI Express x16 graphics cards. Currently, NVIDIA® SLITM and Quad SLITM technology supports Windows® 7 / 7 64-bit / 8 / 8 64-bit OS. **Requirements 1.** You should only use identical SLITM-ready graphics cards that are NVIDIA® certified. **2.** Make sure that your graphics card driver supports NVIDIA® SLITM technology. Download the drivers from the NVIDIA® website: www.nvidia.com.

com 3. Make sure that your power supply unit (PSU) can provide at least the minimum power your system requires. It is recommended to use a NVIDIA® certified PSU. Please refer to the NVIDIA® website for details. **2.10.1 Installing Two SLITM-Ready Graphics Cards Step 1** Insert one graphics card into PCIE2 slot and the other graphics card to PCIE4 slot. Make sure that the cards are properly seated on the slots. **Step 2** If required, connect the auxiliary power source to the PCI Express graphics cards. **35 English Step 3** Align and insert the ASRock SLI_Bridge_2S Card to the goldfingers on each graphics card.

Make sure the ASRock SLI_Bridge_2S Card is firmly in place. **SLI_Bridge_2S Card ASRock SLI_Bridge_2S Card Step 4** Connect a VGA cable or a DVI cable to the monitor connector or the DVI connector of the graphics card that is inserted to PCIE2 slot. **English 36 Z87 Extreme4 2.10.2 Driver Installation and Setup** Install the graphics card drivers to your system.



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After that, you can enable the Multi-Graphics Processing Unit (GPU) in the NVIDIA® nView system tray utility. Please follow the below procedures to enable the multi-GPU. For SLITM and Quad SLITM mode Step 1 Double-click the NVIDIA Control Panel icon in the Windows® system tray. Step 2 In the left pane, click Set SLI and PhysX configuration. Then select Maximize 3D performance and click Apply.

Step 3 Reboot your system. Step 4 You can freely enjoy the benefits of SLITM or Quad SLITM. 37 English 2.11 CrossFireXTM, 3-Way CrossFireXTM and Quad CrossFireXTM Operation Guide This motherboard supports CrossFireXTM, 3-way CrossFireXTM and Quad CrossFireXTM that allows you to install up to three identical PCI Express x16 graphics cards. Currently CrossFireXTM, 3-way CrossFireXTM and Quad CrossFireXTM are supported with Windows® 7 / 8 64-bit / 8 / 8 64-bit OS. 1. You should only use identical CrossFireXTM-ready graphics cards that are AMD certified. 2. Make sure that your graphics card driver supports AMD CrossFireXTM technology. 3. It is recommended to use a AMD certified PSU.

Please refer to the AMD's website for details. 4. Please check AMD's website for details. 5. Then select Enable AMD CrossFireX and click Apply. 6. After the installation, you will find the icon "A-Tuning" on your desktop.

Double-click the "A-Tuning" icon, A-Tuning main menu will pop up. 3.2.2 Using A-Tuning There are five sections in AXTU main menu: Operation Mode, Tools, OC Tweaker, System Info and Tech Service. Operation Mode Choose an operation mode for your computer. English 42 Z87 Extreme4 Tools Various tools and utilities.

XFast RAM Boost the system's performance and extend the HDD's or SSD's lifespan! Create a hidden partition, then assign which files should be stored in the RAM drive. Fast Boot Fast Boot minimizes your computer's boot time. Please note that Ultra Fast mode is only supported by Windows 8 and the VBIOS must support UEFI GOP if you are using an external graphics card. OMG Schedule the starting and ending hours of Internet access granted to other users.

Place X marks on the time table to disable the Internet.

Good Night LED Switch off the Power/HDD/LAN LEDs when the system is on, and automatically switch off the Power and Keyboard LEDs when the system enters into Standby/ Hibernation mode. FAN-Tastic Tuning Configure up to five different fan speeds using the graph. The fans will automatically shift to the next speed level when the assigned temperature is met. 43 English Dehumidifier Prevent motherboard damages due to dampness. Enable this function and configure the period of time until the computer powers on, and the duration of the dehumidifying process.

HDMI-IN Connect two different devices to one monitor and toggle between the primary and secondary screen without replugging the connectors every time. Please set a hotkey for switching between the two devices. OC Tweaker Configurations for overclocking the system. System Info View information about the system. English 44 Z87 Extreme4 Tech Service Contact Tech Service. 45 English 3.3 Intel® Rapid Start Technology Intel® Rapid Start Technology enables your system to wake up faster from deep sleep, saving time and power consumption. Feel secure to know that your system will resume to working condition even if an unexpected power loss happens while the PC is in sleep mode. 3.3.

1 System Requirements ••• Confirm whether your motherboard supports this feature. Operating system: Microsoft Windows 8/7 (32- or 64-bit edition) Set the SATA mode to AHCI. If Windows 8/7 is already installed under IDE mode, directly changing the SATA mode to AHCI may cause Windows 8/7 to crash while booting. If your system is not in AHCI mode, please follow the instructions below. There are certain risks. Please backup any important data before operating to avoid loss. 1. Press Win + R simultaneously in Windows 8/7, type "Regedit" into the word box then click OK. 2. Enter into HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\msahci in Windows Registry Editor.

Double click on the value Start and change the value from 3 into 0. Click on OK. English 46 Z87 Extreme4 3. 4. 5.

Exit the Registry Editor window and restart the computer. Press F2 to enter BIOS, then go to Advanced -> Storage Configuration and change SATA Mode to AHCI. Press F10 to save changes and exit. Enter Windows 8/7. Windows will discover the new device and install AHCI drivers automatically.

3.3.2 Setup Guide Configuring Rapid Start Step 1 Run ASRock Rapid Start utility from Start -> All Programs -> ASRock Utility. Step 2 If you have more than one hard drives in your system, you must select one, then choose the Partition Size desired for your hidden partition and click on Create. The system will automatically create a hidden partition according to your settings. If there are SSD's installed into your system, it is recommended to create the partition on the SSD. 47 English Step 3 When prompted to restart after the setup, click Yes to reboot. Step 4 Double-click the Intel® Rapid Start Technology Manager icon system tray. in the Windows English 48 Z87 Extreme4 Step 5 Make sure Rapid Start is on. Drag the slider to configure the time.

For example, if the timer value is set to ten minutes, the system will enable Rapid Start mode after entering sleep state for ten minutes. If the timer is set to 0 minutes, Windows will immediately enable Rapid Start mode as it enters sleep state. Using Rapid Start 1. You may shut down the computer without terminating the applications or files you are executing currently. Click on Windows Start -> the arrow next to Shut down, and click on Sleep. 2. 3. Windows system will enter sleep state. According to your settings in Rapid Start Technology Manager, the system will automatically wake up and enable Rapid Start mode after entering sleep state for a period of time. The power of the computer in Rapid Start mode can be cut off, it will not cause data loss of the programs or files you were executing before entering sleep state.

4. When you wish to continue to use the computer just hit the power button, the system will rapidly return to Windows, the programs and files which you were using before entering sleep state will be accessible immediately. English 50 Z87 Extreme4 3.4 Intel® Smart Connect Technology Intel® Smart Connect Technology is a feature that periodically wakes your computer from Windows® sleep state to refresh email or social networking applications. It saves your waiting time and keeps the content always up-to-date.

3.4.1 System Requirements ••• Confirm whether your motherboard supports this feature. Operating system: Microsoft Windows 8/7 (32- or 64-bit edition) Set the SATA mode to AHCI. If Windows 8/7 is already installed under IDE mode, directly changing the SATA mode to AHCI may cause Windows 8/7 to crash while booting.



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If your system is not in AHCI mode, please follow the instructions below. There are certain risks. Please backup any important data before operating to avoid loss. 1. Press Win + R simultaneously in Windows 8/7, type "Regedit" into the word box then click OK. 2. Enter into HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\msahci in Windows Registry Editor. Double click on the value Start and change the value from 3 into 0. Click on OK. 51 English 3.

4.2 Setup Guide Installing ASRock Smart Connect Utility Step 1 Install ASRock Smart Connect Utility, which is located in the folder at the following path of the Support CD: \ASRock Utility > Smart Connect. Step 2 Once installed, run ASRock Smart Connect from your desktop or go to Windows Start -> All Programs -> ASRock Utility. English 52 Z87 Extreme4 Step 3 Click the Add button. Take Foxmail as an example, add Foxmail to the Application list. Step 4 Select Foxmail from the Application List, then click the arrow pointing right to add this application to the Smart Connect List. Click Apply to enable Smart Connect. 53 English Step 5 Step 6 Double-click the Intel® Smart Connect Technology Manager icon Windows system tray. Step 7 Drag the slider to configure how often the system will connect to the network to download updates. Shorter durations will provide more frequent updates, but may cause more power consumption.

in the Using Smart Connect 1. Keep the applications which you wish to connect to the internet and receive updates while the system is in sleep state running. Foxmail for instance, keep Foxmail running. Click on Windows Start -> the arrow next to Shut down, and click on Sleep. 2. English 3. Windows system will enter sleep state. 54 Z87 Extreme4 4. The system will wake up from sleep state periodically, and then start to update Foxmail. The screen will not display anything so the computer can maintain minimum power usage.

Afterwards, the system will automatically return to sleep state again. Upon waking up the system, you will find the new mail that were sent to you during sleep state are already updated and ready to be read in Foxmail. 5. 55 English 3.5 Intel® Remote Wake Technology Intel® Remote Wake Technology allows you to use programs or services over the Internet to wake up your home computer from energy efficient sleep mode. Before configuring this feature, verify the following. • Remote Wake has been enabled in "Intel® Smart Connect Technology Manager". Make sure that the "PCI Device Power On" is enabled in UEFI SETUP UTILITY > Advanced > ACPI Configuration. 3.5.

1 Configuring and Using MeshCentral MeshCentral allows you to remotely wake up a PC from any network using a single web site. Just download and install the mesh agent on your computers and your computers will show up in the "My Devices" section of MeshCentral.com. Creating a Mesh Step 1 Login to Meshcentral.com. If you have not created a MeshCentral account, go to MeshCentral.com and create a new account. English 56 Step 2 Click the "My Account" tab. Then click on "New" to create a new mesh. Z87 Extreme4 Step 3 A new mesh window will pop up. Enter a mesh name and password. Step 4 Select all the checkboxes and click Create Mesh. Downloading and Installing Mesh Agent Step 1 Click Install on the My Account page. Step 2 Step 3 Right-click on the MeshAgent.exe and select Run as administrator. 57 English Select the mesh and download both files. Make sure both files are in the same directory. Step 4 Click Install / Update. Step 5 Wait a minute for the New Machine to appear in "My Device". English 58 Z87 Extreme4 Step 6 Check whether "Intel Remote Wake" appeared or not. Step 7 Click on Power Actions. Step 8 Click on Wake or Sleep. 59 English Waking up a PC using mobile device. Before waking up your home computer using a mobile device, please log out of MeshCentral on other previously used computers or devices. Step 1 Login to meshcentral.com/m. Step 2 Select a Machine. Step 3 Click on Wake or Sleep. English 60 Tutorial Video Z87 Extreme4 3.5.

2 Configuring and Using Splashtop Splashtop is a remote desktop access software that lets you remotely access your home computer from your mobile device. Before configuring this feature, verify that the "Remote Wake" has been enabled in "Intel® Smart Connect Technology Manager". Setup Guide Step 1 Download and install Streamer on your home computer, which is located in the folder at the following path of the Support CD: \ASRock Utility > Splashtop Streamer. Then enter your Splashtop Account. If you have not created a Splashtop account, create one. Step 2 Download and install "Splashtop 2" on your mobile device and log into the app. Using Remote Wakeup Step 1 In "Splashtop 2", tap the edit button next to an offline machine from the list. Step 2 Tap "Wake up this computer". 61 English Using Remote Control Step 1 In "Splashtop 2", tap an online machine from the list to connect to your home computer. Step 2 Start remotely accessing your home computer. The functionality and price of the Splashtop APP and subscription fee is subject to change. Please check www.splashtop.com for details. English 62 Z87 Extreme4 Accessing Data Playing Video 63 English 3.

6 Intel® Extreme Tuning Utility (XTU) Intel® Extreme Tuning Utility is an overclocking utility that allows you to tune and tweak your system for performance optimization while still maintaining system stability. Double-click on your desktop to access Intel® Extreme Tuning Utility. Overclocking may affect your system's stability, or even cause damage to the components and devices of your system. It should be done at your own risk and expense. We are not responsible for the possible damage caused by overclocking.

3.7.1 UI Overview Navigation Panel Adjustment Panel Information Panel System Monitoring Screen Navigation Panel: Provides access to the functions of this tuning utility. Adjustment Panel: Provides tuning options. Information Panel: Displays readouts, such as clock speeds and turbo boost power capacities. System Monitoring Screen: Provides a graph for you to track CPU usage, memory usage, and CPU temperature. English 64 Z87 Extreme4 System Information Displays the major information of your system. Manual Tuning Manual Tuning shows the major readings of your system and allows you to tune the parameters, including voltage for the CPU core, GPU, and TurboBoost functions. Click Apply to apply the settings. Click Save to save your current settings as a profile.

Stress Test Stress Test allows maximum load testing on both CPU and memory. Specify the duration and click Start Testing. Benchmarking With Benchmarking, you can share and compare the scores online with other users in the HWBot community. Click Run to benchmark your current settings. Click Compare Online to upload your score.



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Profiles Profiles shows a list of profiles for your overclocking settings and Benchmark results, which can be exported to share with other overclockers. 65 English 3.7 Start8 For those Windows 8 users who miss the Start Menu, Start8 is an ideal solution that brings back the familiar Start Menu along with added customizations for greater efficiency. 3.7.

1 Installing Start8 Install Start8, which is located in the folder at the following path of the Support CD: \ASRock Utility > Start8. 3.7.2 Configuring Start8 Style Select between the Windows 7 style and Windows 8 style Start Menu. Then select the theme of the Start Menu and customize the style of the Start icon. English 66 Z87 Extreme4 Configure Configure provides configuration options, including icon sizes, which shortcuts you want Start Menu to display, quick access to recently used apps, the functionality of the power button, and more. Control 67 English Control lets you configure what a click on the start button or a press on the Windows key does. Desktop Desktop allows you to disable the hot corners when you are working on the desktop. It also lets you choose whether or not the system boots directly into desktop mode and bypass the Metro user interface. About Displays information about Start8.

English 68 Z87 Extreme4 Chapter 4 UEFI SETUP UTILITY 4.1 Introduction ASRock Interactive UEFI is a blend of system configuration tools, cool sound effects and stunning visuals. Not only will it make BIOS setup less difficult but also a lot more amusing. This section explains how to use the UEFI Setup Utility to configure your system. You may run the UEFI Setup Utility by pressing <F2> or right after you power on the computer, otherwise, the Power-On-Self-Test (POST) will continue with its test routines. If you wish to enter the UEFI Setup Utility after POST, restart the system by pressing <Ctl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on. Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen. 4.1.

1 UEFI Menu Bar The top of the screen has a menu bar with the following selections: Main OC Tweaker Advanced Tool H/W Monitor Boot Security Exit For setting system time/date information For overclocking configurations For advanced system configurations Useful tools Displays current hardware status For configuring boot settings and boot priority For security settings Exit the current screen or the UEFI Setup Utility 69 English 4.1.2 Navigation Keys Use < > key or < > key to choose among the selections on the menu bar, and use < > key or < > key to move the cursor up or down to select items, then press <Enter> to get into the sub screen. You can also use the mouse to click your required item. Please check the following table for the descriptions of each navigation key. Navigation Key(s) Description To change option for the selected items Switch to next function Go to the previous page Go to the next page Go to the top of the screen Go to the bottom of the screen To display the General Help Screen Toggle sound on/off Discard changes and exit the SETUP UTILITY Load optimal default values for all the settings Save changes and exit the SETUP UTILITY Print screen Jump to the Exit Screen or exit the current screen + / <Tab> <PGUP> <PGDN> <HOME> <END> <F1> <F4> <F7> <F9> <F10> <F12> <ESC> English 70 Z87 Extreme4 4.2 Main Screen When you enter the UEFI Setup Utility, the Main screen will appear and display the system overview. Active Page on Entry Select the default page when entering the UEFI setup utility. UEFI Guide UEFI Guide is a quick tutorial for ASRock's UEFI setup Utility. You may abort the tutorial by pressing "esc".

71 English 4.3 OC Tweaker Screen In the OC Tweaker screen, you can set up overclocking features. Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen. Advanced Turbo You can use this option to increase your system performance. This option appears only when your CPU supports this function.

This option appears only when you adopt K-Series CPU. Load Optimized CPU OC Setting You can use this option to load optimized CPU overclocking setting. Please note that overcloing may cause damage to your CPU and motherboard. It should be done at your own risk and expense. This option appears only when you adopt K-Series CPU.

English 72 Load Optimized GPU OC Setting You can use this option to load optimized GPU overclocking setting. Please note that overcloing may cause damage to your GPU and motherboard. It should be done at your own risk and expense. This option appears only when you adopt K-Series CPU. Z87 Extreme4 CPU Configuration CPU Ratio The CPU speed is determined by the CPU Ratio multiplied with the BCLK. Increasing the CPU Ratio will increase the internal CPU clock speed without affecting the clock speed of other components. CPU Cache Ratio The CPU Internal Bus Speed Ratio. The maximum should be the same as the CPU Ratio. BCLK/PCIE Frequency The CPU speed is determined by the CPU Ratio multiplied with the BCLK. Increasing the BCLK will increase the internal CPU clock speed but also affect the clock speed of other components.

Spread Spectrum Enable Spread Spectrum to reduce electromagnetic interference for passing EMI tests. Disable to achieve higher clock speeds when overclocking. Intel SpeedStep Technology Intel SpeedStep technology allows processors to switch between multiple frequencies and voltage points for better power saving and heat dissipation. Intel Turbo Boost Technology Intel Turbo Boost Technology enables the processor to run above its base operating frequency when the operating system requests the highest performance state. Filter PLL Frequency CPU BCLK Filter Frequency. Choose 1.6 for better overclocking capabilities. Long Duration Power Limit Configure Package Power Limit 1 in watts. When the limit is exceeded, the CPU ratio will be lowered after a period of time. A lower limit can protect the CPU and save power, while a higher limit may improve performance.

Configure the period of time until the CPU ratio is lowered when the Long Duration Power Limit is exceeded. 73 English Long Duration Maintained Short Duration Power Limit Configure Package Power Limit 2 in watts. When the limit is exceeded, the CPU ratio will be lowered immediately. A lower limit can protect the CPU and save power, while a higher limit may improve performance. Primary Plane Current Limit Configure the current limit of the CPU under Turbo Mode in ampere.

A lower limit can protect the CPU and save power, while a higher limit may improve performance.



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GT Frequency Configure the frequency of the integrated GPU. *GT Voltage Mode Auto:* For optimized settings. *Adaptive:* Add voltage to the integrated GPU when the system is under heavy load. *Override:* The voltage is fixed.

GT Adaptive Voltage Configure the fixed voltage added to the integrated GPU. *GT Voltage Offset* Configure the voltage added to the integrated GPU when the system is under heavy load. *DRAM Timing Configuration* *DRAM Reference Clock Select* Auto for optimized settings. *DRAM Frequency* If [Auto] is selected, the motherboard will detect the memory module(s) inserted and assign the appropriate frequency automatically. *English 74 Z87 Extreme4 DRAM Configuration* *DRAM Tweaker* Fine tune the DRAM settings by leaving marks in checkboxes. Click OK to confirm and apply your new settings. *CAS# Latency (tCL)* The time between sending a column address to the memory and the beginning of the data in response. *RAS# to CAS# Delay (tRCD)* The number of clock cycles required between the opening of a row of memory and accessing columns within it. *Row Precharge Time (tRP)* The number of clock cycles required between the issuing of the precharge command and opening the next row. *RAS# Active Time (tRAS)* The number of clock cycles required between a bank active command and issuing the precharge command.

75 English Command Rate (CR) The delay between when a memory chip is selected and when the first active command can be issued. *Write Recovery Time (tWR)* The amount of delay that must elapse after the completion of a valid write operation, before an active bank can be precharged. *Refresh Cycle Time (tRFC)* The number of clocks from a Refresh command until the first Activate command to the same rank. *RAS to RAS Delay (tRRD)* The number of clocks between two rows activated in different banks of the same rank. *Write to Read Delay (tWTR)* The number of clocks between the last valid write operation and the next read command to the same internal bank. *Read to Precharge (tRTP)* The number of clocks that are inserted between a read command to a row precharge command to the same rank. *Four Activate Window (tFAW)* The time window in which four activates are allowed the same rank. *CAS Write Latency (tCWL)* Configure CAS Write Latency. *tREFI* Configure refresh cycles at an average periodic interval. *tCKE* Configure the period of time the DDR3 initiates a minimum of one refresh command internally once it enters Self-Refresh mode.

English 76 tRDRD Configure between module read to read delay. *Z87 Extreme4 tRDRDDR* Configure between module read to read delay from different ranks. *tRDRDDD* Use this to change DRAM *tRWSR* Auto/Manual settings. The default is [Auto]. *tWRRD* Configure between module write to read delay. *tWRRDDR* Configure between module write to read delay from different ranks. *tWRRDDD* Use this to change DRAM *tRRSR* Auto/Manual settings. The default is [Auto]. Configure between module write to read delay from different DIMMs. *tWRWR* Configure between module write to write delay. *tWRWRDR* Configure between module write to write delay from different ranks. *tWRWRDD* Configure between module write to write delay from different DIMMs. *tRDWR* Configure between module read to write delay. *tRDWRDR* Configure between module read to write delay from different ranks. *tRDWRDD* Configure between module read to write delay from different DIMMs. *RTL (CHA)* Configure round trip latency for channel A. *RTL (CHB)* Configure round trip latency for channel B. *77 English IO-L (CHA)* Configure IO latency for channel A. *IO-L (CHB)* Configure IO latency for channel B. *ODT WR (CHA)* Configure the memory on die termination resistors' WR for channel A.

ODT WR (CHB) Configure the memory on die termination resistors' WR for channel B. *ODT NOM (CHA)* Use this to change *ODT (CHA)* Auto/Manual settings. The default is [Auto]. *ODT NOM (CHB)* Use this to change *ODT (CHB)* Auto/Manual settings. The default is [Auto]. *Command Tri State Enable for DRAM power saving.* *MRC Fast Boot Enable* Memory Fast Boot to skip DRAM memory training for booting faster. *FIVR Configuration* *FIVR Switch Frequency Signature* Select whether to boost or lower the FIVR Switch Frequency. *FIVR Switch Frequency Offset* Configure the percentage of frequency boost or deduction. *CPU Voltage Mode Auto:* For optimized settings.

Adaptive: Add voltage to the CPU when the system is under heavy load. *Override:* The voltage is fixed. *English 78 Z87 Extreme4 CPU Override Voltage* Configure the voltage added to the CPU when the system is under heavy load. *CPU Voltage Offset* Configure the dynamic CPU voltage added to the CPU. *CPU Cache Override Voltage* Add voltage to the CPU Cache when the system is under heavy load.

CPU Cache Adaptive Voltage Configure the voltage added to the CPU Cache when the system is under heavy load. *CPU Cache Voltage Offset* Configure the voltage for the CPU Cache. Setting the voltage higher may increase system stability when overclocking. *System Agent Voltage Offset* Configure the voltage for the System Agent. Setting the voltage higher may increase system stability when overclocking.

CPU Analog IO Voltage Offset *CPU I/O Analog Voltage.* *CPU Digital IO Voltage Offset* *CPU I/O Digital Voltage.* *CPU Integrated VR Faults Disable* *FIVR Faults* to raise the threshold to trigger CPU over current protection and over voltage protection for better overclocking capabilities. *CPU Integrated VR Efficiency Mode Enable* *FIVR Efficiency Management* for power saving. Disable for better performance and overclocking capabilities. *Voltage Configuration* *CPU Input Voltage* *CPU Load-Line Calibration* *CPU Load-Line Calibration* helps prevent CPU voltage droop when the system is under heavy load. *79 English* Configure the voltage for the CPU. *VCORE External Offset* The fixed external voltage input to the CPU. *DRAM Voltage* Use this to configure DRAM Voltage. The default value is [Auto].

PCH 1.05V Voltage *Chipset 1.05V Voltage.* Use default settings for best performance. *PCH 1.5V Voltage I/O 1.5V Voltage.* Use default settings for best performance. *English 80 Z87 Extreme4 4.4 Advanced Screen* In this section, you may set the configurations for the following items: *CPU Configuration*, *Chipset Configuration*, *Storage Configuration*, *Intel® Rapid Start Technology*, *Intel® Smart Connect Technology*, *Super IO Configuration*, *ACPI Configuration* and *USB Configuration*.

Setting wrong values in this section may cause the system to malfunction. *81 English 4.4.1 CPU Configuration Active Processor Cores* Select the number of cores to enable in each processor package. *CPU C States Support Enable* *CPU C States Support* for power saving.

It is recommended to keep C3, C6 and C7 all enabled for better power saving. *Enhanced Halt State (C1E)* Enable Enhanced Halt State (C1E) for lower power consumption. *CPU C3 State Support Enable* C3 sleep state for lower power consumption. *CPU C6 State Support Enable* C6 deep sleep state for lower power consumption. *CPU C7 State Support Enable* C7 deep sleep state for lower power consumption.

English 82 Package C State Support Enable CPU, PCIe, Memory, Graphics C State Support for power saving.



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