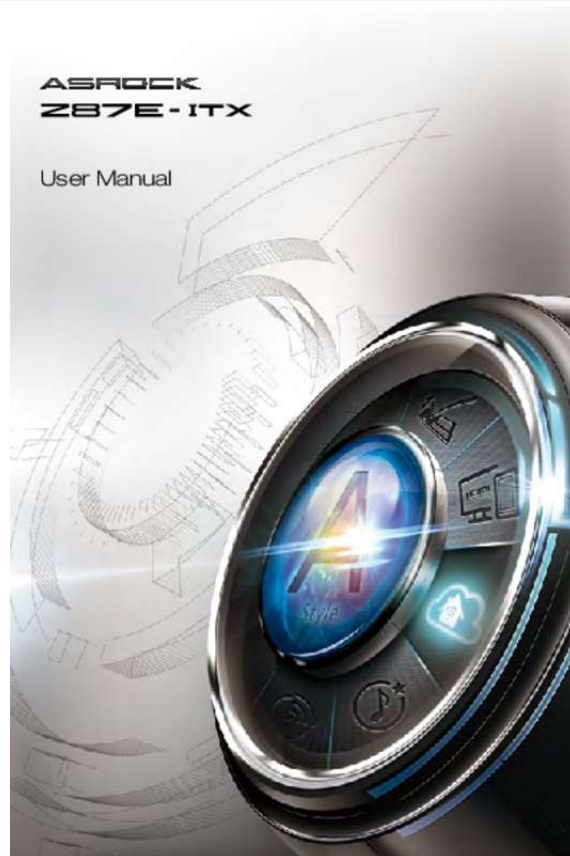




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You can read the recommendations in the user guide, the technical guide or the installation guide for ASROCK Z87E-ITX. You'll find the answers to all your questions on the ASROCK Z87E-ITX in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

User manual ASROCK Z87E-ITX
User guide ASROCK Z87E-ITX
Operating instructions ASROCK Z87E-ITX
Instructions for use ASROCK Z87E-ITX
Instruction manual ASROCK Z87E-ITX



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Manual abstract:

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Contents Chapter 1 Introduction 1.1 Package Contents 1 1 2 7 11 14 16 1.2 Specifications 1.3 Unique Features 1.4 Motherboard Layout 1.5 I/O Panel 1.6 WiFi-802.11n Module and ASRock WiFi 2.4GHz Antenna Chapter 2 Installation 2.1 Installing the CPU 17 18 21 22 24 25 26 2.

2 Installing the CPU Fan and Heatsink 2.3 Installing Memory Modules (DIMM) 2.4 Expansion Slots (PCI and PCI Express Slots) 2.5 Jumpers Setup 2.6 Onboard Headers and Connectors Chapter 3 Software and Utilities Operation 3.1 Installing Drivers 30 30 31 35 40 45 45 50 3.2 A-Tuning 3.3 Intel® Rapid Start Technology 3.4 Intel® Smart Connect Technology 3.5 Intel® Remote Wake Technology 3.

5.1 Configuring and Using MeshCentral 3.5.2 Configuring and Using Splashtop 3.6 Intel® Extreme Tuning Utility (XTU) 3.7 Start8 53 55 Chapter 4 UEFI SETUP UTILITY 4.1 Introduction 58 58 58 59 60 61 70 71 73 75 77 78 79 81 82 83 86 87 90 91 4.1.1 UEFI Menu Bar 4.1.2 Navigation Keys 4.2 Main Screen 4.3 OC Tweaker Screen 4.4 Advanced Screen 4.4.1 CPU Configuration 4.4.2 Chipset Configuration 4.4.3 Storage Configuration 4.

4.4 Intel® Rapid Start Technology 4.4.5 Intel® Smart Connect Technology 4.4.6 ACPI Configuration 4.4.7 USB Configuration 4.4.8 Trusted Computing 4.5 Tools 4.6 Hardware Health Event Monitoring Screen 4.7 Boot Screen 4.8 Security Screen 4.9 Exit Screen Z87E-ITX Chapter 1 Introduction Thank you for purchasing ASRock Z87E-ITX 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 manual 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 Z87E-ITX Motherboard (Mini-ITX Form Factor) ASRock Z87E-ITX Quick Installation Guide ASRock Z87E-ITX Support CD 4 x Serial ATA (SATA) Data Cables (Optional) 1 x I/O Panel Shield 1 x ASRock WiFi 2.4/5GHz Antenna 1 x DVI-to-D-Sub Converter 1 English 1.2 Specifications Platform • Mini-ITX Form Factor • Premium Gold Capacitor design (100% Japan-made highquality Conductive Polymer Capacitors) • Home Cloud • WiFi 802.

1 Iac • Supports 4th Generation Intel® Core™ i7 / i5 / i3 / Xeon® / Pentium® / Celeron® in LGA1150 Package • Digi Power Design • 6 Power Phase Design • DrMOS • 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 • 2 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: 16GB (see CAUTION) • Supports Intel® Extreme Memory Profile (XMP) 1.3/1.2 • 1 x PCI Express 3.0 x16 slot • 1 x half mini-PCI Express slot: For WiFi + BT module • 1 x mSATA/full mini-PCI Express slot A-Style CPU Chipset Memory Expansion Slot English 2 Z87E-ITX 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 • Three VGA Output options: DVI-I, HDMI and DisplayPort • Supports Triple Monitors • Supports HDMI Technology with max.

resolution up to 4K x 2K (4096x2304) @ 24Hz • Supports DVI-I with max. resolution up to 1920x1200 @ 60Hz • Supports DisplayPort with max. resolution up to 4K x 2K (4096x2304) @ 24Hz • Supports Auto Lip Sync, Deep Color (12bpc), xvYCC and HBR (High Bit Rate Audio) with HDMI (Compliant HDMI monitor is required) • Supports HDCP function with DVI-I, HDMI and DisplayPort ports • Supports Full HD 1080p Blu-ray (BD) / HD-DVD playback with DVI-I, HDMI and DisplayPort ports Audio • 7.1 CH HD Audio with Content Protection (Realtek ALC1150 Audio Codec) P • remium Blu-ray audio support • TI® NE5532 Premium Headset Amplifier (supports up to 600 Ohms headsets) S • supports DTS Connect 3 English LAN ••••• Gigabit LAN 10/100/1000 Mb/s Giga PHY Intel® I217V Supports Intel® Remote Wake Technology Supports Wake-On-LAN Supports Energy Efficient Ethernet 802.



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3az Supports PXE Wireless LAN Supports IEEE 802.

11a/b/g/n/ac Supports Dual-Band (2.4/5 GHz) Supports High speed wireless connection up to 867Mbps 2 antennas to support 2 (Transmit) x 2 (Receive) diversity technology • Supports Bluetooth 4.0 / 3.0 + High speed class II •••••••••• 1 x PS/2 Mouse/Keyboard Port 1 x DVI-I Port 1 x HDMI Port 1 x DisplayPort 1 x Optical SPDIF Out Port 1 x eSATA Connector 2 x USB 2.0 Ports 4 x USB 3.

0 Ports Rear Panel I/O 1 x RJ-45 LAN Port with LED (ACT/LINK LED and SPEED LED) • 1 x Clear CMOS Switch • HD Audio Jack: Rear Speaker / Central / Bass / Line in / Front Speaker / Microphone English 4 Z87E-ITX Storage • 6 x SATA3 6.0 Gb/s connectors, support RAID (RAID 0, RAID 1, RAID 5, RAID 10, Intel Rapid Storage Technology 12 and Intel Smart Response Technology), NCQ, AHCI and “Hot Plug” (SATA3_5 connector is shared with the eSATA port; SATA3_4 connector is shared with the mSATA/miniPCI Express slot) • 1 x eSATA connector, supports NCQ, AHCI and “Hot Plug” functions • 1 x mSATA 6.0 Gb/s connector (Solid-State Drive connector), supports NCQ, AHCI functions and Full-size mini-PCI Express modules Connector 1 x Chassis Intrusion header 1 x TPM header 1 x CPU Fan connector (4-pin) 1 x Chassis Fan connector (4-pin) 1 x 24 pin ATX power connector 1 x 8 pin 12V power connector (High Density Power Connector) • 1 x Front panel audio connector • 2 x USB 2.0 headers (support 4 USB 2.0 ports) • 1 x USB 3.0 header (supports 2 USB 3.0 ports) ••••••••••64Mb AMI UEFI Legal BIOS with Multilingual GUI support ACPI 1.1 Compliance Wake Up Events SMBIOS 2.3.1 Support CPU, DRAM, PCH 1.

05V, PCH 1.5V Voltage Multi-adjustment BIOS Feature Support CD • Drivers, Utilities, AntiVirus Software (Trial Version), CyberLink MediaEspresso 6.5 Trial, Google Chrome Browser and Toolbar, Start8, MeshCentral, Splashtop Streamer, Intel® • Extreme Tuning Utility (XTU) • CPU/Chassis Temperature Sensing • CPU/Chassis Tachometer • CPU/Chassis Quiet Fan (Allow Chassis Fan Speed AutoAdjust by CPU Temperature) • CPU/Chassis Fan Multi-Speed Control • Voltage Monitoring: +12V, +5V, +3.3V, CPU Vcore 5 English Hardware Monitor OS Certifications • Microsoft® Windows® 8 / 8.1 64-bit / 7 / 7.1 64-bit compliant • FCC, CE, WHQL • ErP/EuP Ready (ErP/EuP ready power supply is required) * For detailed product information, please visit our website: <http://www.asrock.com> Please realize that there is a certain risk involved with overclocking, including adjusting the setting in the BIOS, applying Untied Overclocking Technology, or using third-party overclocking tools. 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 possible damage caused by overclocking. Due to limitation, the actual memory size may be less than 4GB for the reservation for system usage under Windows® 32-bit operating systems.

Windows® 64-bit operating systems do not have such limitations. You can use ASRock XFast RAM to utilize the memory that Windows® cannot use. English 6 Z87E-ITX 1.3 Unique Features ASRock A-Tuning A-Tuning is ASRock's multi purpose software suite with a new interface, more new features and improved utilities, including XFast RAM, Dehumidifier, Good Night LED, FAN-Tastic Tuning, OC Tweaker and a whole lot more. ASRock Instant Flash ASRock Instant Flash is a BIOS flash utility embedded in Flash ROM.

This convenient BIOS update tool allows you to update the system BIOS in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Just save the new BIOS file to your USB storage and launch this tool by pressing <F6> or <F2> during POST to enter the BIOS setup menu to access ASRock Instant Flash. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system. ASRock APP Charger Simply by installing the ASRock APP Charger makes your iPhone/iPad/iPod Touch charge up to 40% faster than before on your computer. ASRock APP Charger allows you to quickly charge many Apple devices simultaneously and even supy enabling this function, the PC will enter the UEFI directly after you restart.

ASRock Good Night LED ASRock Good Night LED technology offers you a better sleeping environment by extinguishing the unessential LEDs. By enabling Good Night LED in the BIOS, the Power/HDD LEDs will be switched off when the system is powered on. Good Night LED will automatically switch off the Power and Keyboard LEDs when the system enters into Standby/Hibernation mode as well. ASRock USB Key In a world where time is money, why waste precious time everyday typing usernames to log in to Windows? Why should we even bother memorizing those foot long passwords? Just plug in the USB Key and let your computer log in to windows automatically! ASRock Home Cloud can connect with your PC from anywhere in the world. You will be able to power your PC on or turn it off, monitor and take control of it remotely with another smartphone, tablet or computer. 9 English This motherboard supports remote wake with the onboard Intel LAN, so you ASRock FAN-Tastic Tuning ASRock FAN-Tastic Tuning is included in A-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. English 10 Z87E-ITX 1.4 Motherboard Layout 1 2 3 4 Z87E-ITX RoHS DDR3_A1 (64 bit, 240-pin module) DDR3_B1 (64 bit, 240-pin module) USB 3.

0 T: USB1 B: USB2 TPMS1 PLED PWRBTN SATA3_0 HDLED RESET 1 1 SPEAKER1 PANEL1 1 11 English PS2 Keyboard /Mouse CPU_FAN1 USB 2.0 T: USB A0 B: USB A1 CHA_FAN1 DVII HDMI Ctr CMOS Bottom: Optical SPDIF Bottom: MIC IN ATXPWR1 USB 3.0 T: USB3 B: USB4 DP_1 ATX12V1 5 eSATA5 USB_2_3 USB_4_5 CMOS Battery 64Mb BIOS Top: RJ-45 1 1 Intel Z87 SATA3_5 SATA3_4 6 7 8 9 WiFi-802.11n Module SATA3_3 HD_AUDIO1 SATA3_2 USB3_5_6 Top: CTR BASS Top: LINE IN Center: REAR SPK Center: FRONT AUDIO CODEC MINI_PCIE1 SATA3_1 CII 1 10 11 12 13 14 1 PCIE1 CLRCMOS1 1 22 21 20 19 18 17 16 15 23 mSATA/mini-PCIe English 12 Z87E-ITX No. Description 1 2 3 4 5 6 7 8 9 10 12 13 14 15 16 17 18 19 20 21 22 23 CPU Fan Connector (CPU_FAN1) ATX 12V Power Connector (ATX12V1) 2 x 240-pin DDR3 DIMM Slots (DDR3_A1, DDR3_B1) Chassis Fan Connector (CHA_FAN1) ATX Power Connector (ATXPWR1) SATA3 Connector (SATA3_5) (shared with eSATA) USB 3.0 Header (USB3_5_6) SATA3 Connector (SATA3_4) (shared with mSATA) SATA3 Connector (SATA3_3) TPM Header (TPMS1) System Panel Header (PANEL1) Chassis Speaker Header (SPEAKER1) Clear CMOS Jumper (CLRCMOS1) SATA3 Connector (SATA3_1) SATA3 Connector (SATA3_0) SATA3 Connector (SATA3_2) mini-PCI Express Slot (MINI_PCIE1) WiFi-802.



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11n Module USB 2.0 Header (USB_4_5) USB 2.0 Header (USB_2_3) Front Panel Audio Header (HD_AUDIO1) mSATA Connector (MINI_PCIE2) 11 Chassis Intrusion Header (CII) 13 English 1.5 I/O Panel 1 2 3 4 5 6 7 8 9 17 16 15 14 13 12 11 10 No.

Description 1 2 3 4 5 6 7 8 9 USB 2.0 Ports (USB01) Antenna Ports Display Port eSATA Connector*** LAN RJ-45 Port Central / Bass (Orange) Rear Speaker (Black) Line In (Light Blue) Front Speaker (Lime)** No. Description 10 11 12 13 14 15 16 17 Microphone (Pink) Optical SPDIF Out Port USB 3.0 Ports (USB3_34) USB 3.0 Ports (USB3_12) Clear CMOS Switch HDMI Port DVI-I Port PS/2 Keyboard Port English 14 Z87E-ITX * 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. 8) V V V V Rear Speaker (No.

6) -V V V Central / Bass (No. 5) --V V Line In (No. 7) ---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 is shared with SATA3_5 connector. 15 English 1.6 WiFi-802.11n Module and ASRock WiFi 2.

4GHz Antenna WiFi + BT Module This motherboard comes with an exclusive WiFi 802.11 a/b/g/n/ac + BT v4.0 module that offers support for WiFi 802.11 a/b/g/n/ac connectivity standards and Bluetooth v4.0. WiFi + BT module is an easy-to-use wireless local area network (WLAN) adapter to support WiFi + BT. Bluetooth v4.0 standard features Smart Ready technology that adds a whole new class of functionality into the mobile devices including Apple's most recent iPhone 4S. BT 4.0 also includes Low Energy Technology and ensures extraordinary low power consumption for PCs.

The 2T2R WiFi solution sets a WiFi high speed standard and offers max link rate up to 867Mbps. * The transmission speed may vary according to the environment. * The WiFi + BT module is supported under Windows® 8 / 8 64-bit / 7 / 7 64-bit only. WiFi + BT Module Antenna Ports ASRock WiFi 2.4GHz Antenna English 16 Chapter 2 Installation This is a Mini-ITX 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. 17 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 18 Z87E-ITX 3 4 5 19 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 20 Z87E-ITX 2.2 Installing the CPU Fan and Heatsink 1 2 CP U_ FA N 21 English 2.3 Installing Memory Modules (DIMM) This motherboard provides two 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 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. 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 22 Z87E-ITX 1 2 3 23 English 2.

4 Expansion Slots (PCI and PCI Express Slots) There is 1 PCI Express slot, 1 mini-PCI Express slot, and 1 mSATA/mini-PCI Express slot on this 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. PCIe slots: PCIE1 (PCIe 3.0 x16 slot) is used for PCI Express x16 lane width graphics cards.

MINI_PCIE1 (mini-PCIe slot) is used for WiFi module. MINI_PCIE2 (mSATA/mini-PCIe slot) is used for mSATA or mini-PCIe module. *** The mSATA/mini-PCIe slot is shared with SATA3_4 connector. English 24 Z87E-ITX 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". Clear CMOS Jumper (CLR_CMOS1) (see p.11, No. 14) 2-pin Jumper Short: Clear CMOS Open: Default CLR_CMOS1 allows you to clear the data in CMOS.

The data in CMOS includes system setup information such as system password, date, time, and system setup parameters. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord, then use a jumper cap to short the pins on CLR_CMOS1 for 3 seconds. Please remember to remove the jumper cap after clearing the CMOS. 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.



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1. The Clear CMOS Switch has the same function as the Clear CMOS jumper. 2. If you clear the CMOS, the case open may be detected. Please adjust the BIOS option "Clear Status" to clear the record of previous chassis intrusion status. 25 English 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. 12) GND GND PWRBTN# PLEDPLED+ 1 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.

English 26 Z87E-ITX Serial ATA3 Connectors (SATA3_0: see p.11, No. 16) (SATA3_1: see p.11, No. 15) (SATA3_2: see p.11, No. 17) (SATA3_3: see p.11, No. 9) (SATA3_4: see p.11, No.

8) (SATA3_5: see p.11, No. 6) USB 2.0 Headers (9-pin USB_2_3) (see p.11, No.

21) (9-pin USB_4_5) (see p.11, No. 20) SATA3_5 SATA3_4 SATA3_3 SATA3_2 SATA3_1 These six SATA3 connectors support SATA data cables for internal storage devices with up to 6.0 Gb/s data transfer rate. SATA3_5 connector is shared with the eSATA port; SATA3_4 connector is shared with the mSATA/mini-PCIe slot.

SATA3_0 1 USB_PWR PP+ GND USB_PWR PP+ GND DUMMY Besides two USB 2.0 ports on the I/O panel, there are two headers on this motherboard. Each USB 2.0 header can support two ports. 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. USB 3.0 Headers (19-pin USB3_5_6) (see p.

11, No. 7) Vbus 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 27 English Front Panel Audio Header (9-pin HD_AUDIO1) (see p.11, No. 21) GND PRESENCE# MIC_RET OUT2_L J_SENSE OUT2_R MIC2_R MIC2_L 1 OUT_RET 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. 13) Chassis and Power Fan Connectors (4-pin CHA_FAN1) (see p.11, No. 4) CPU Fan Connectors (4-pin CPU_FAN1) (see p.11, No. 1) DUMMY SPEAKER 1 +5V DUMMY Please connect the chassis speaker to this header. FAN_SPEED_CONTROL CPU_FAN_SPEED +12V GND Please connect fan cables to the fan connectors and match the black wire to the ground pin. 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. 1 2 3 4 GND + 12V CPU_FAN_SPEED FAN_SPEED_CONTROL English 28 Z87E-ITX ATX Power Connector (24-pin ATXPWR1) (see p.

11, No. 5) 12 24 1 13 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 motherboard supports CASE OPEN detection feature that detects if the chassis cover has been removed. This feature requires a chassis with chassis intrusion detection design. This connector supports Trusted Platform Module (TPM) system, which can securely store keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protects digital identities, and ensures platform integrity. ATX 12V Power Connector (8-pin ATX12V1) (see p.

11, No. 2) 5 1 8 4 Chassis Intrusion Header (2-pin C11) (see p.11, No. 11) 1 GND Signal TPM Header (17-pin TPMS1) (see p.11, No.

10) F_CLKRUN# SERIRQ# S_PWRDWN# GND LAD1_L LAD2_L SMB_DATA_MAIN SMB_CLK_MAIN GND 1 GND +3VSB LAD0_L +3V LAD3_L TPM_RST# LFRAME#_L CK_33M_TPM 29 English Chapter 3 Software and Utilities Operation 3.1 Installing Drivers The Support CD that comes with the motherboard contains necessary drivers and useful utilities that enhance the motherboard's features. Running The Support CD To begin using the support CD, insert the CD into your CD-ROM drive. The CD automatically displays the Main Menu if "AUTORUN" is enabled in your computer. If the Main Menu does not appear automatically, locate and double click on the file "ASRSETUP.

EXE" in the Support CD to display the menu. Drivers Menu The drivers compatible to your system will be auto-detected and listed on the support CD driver page. Please click Install All or follow the order from top to bottom to install those required drivers. Therefore, the drivers you install can work properly.

Utilities Menu The Utilities Menu shows the application software that the motherboard supports. Click on a specific item then follow the installation wizard to install it. To improve Windows 7 compatibility, please download and install the following hot fix provided by Microsoft. "KB2720599":

<http://support.microsoft.com/kb/2720599/en-us> English 30 Z87E-ITX 3.

2 A-Tuning A-Tuning is ASRock's multi purpose software suite with a new interface, more new features and improved utilities, including XFast RAM, Dehumidifier, Good Night LED, FAN-Tastic Tuning, OC Tweaker and a whole lot more. 3.2.1 Installing A-Tuning When you install the all-in-one driver to your system from ASRock's support CD, A-Tuning will be auto-installed as well.



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Adjustment Panel: Provides tuning options. capacities. System Monitoring Screen: Provides a graph for you to track CPU usage, memory usage, and CPU temperature. 53 English Information Panel: Displays readouts, such as clock speeds and turbo boost power 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. Profiles Profiles shows a list of profiles for your overclocking settings and Benchmark results, which can be exported to share with other overclockers. English 54 Z87E-ITX 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. 55 English 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 English 56 Z87E-ITX 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. 57 English 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 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 English 58 Security Exit Z87E-ITX 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> 59 English 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". English 60 Z87E-ITX 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.

Load Optimized GPU OC Setting You can use this option to load optimized GPU overclocking setting. Please note that overclocing 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. 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. 61 English 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.

Long Duration Maintained Configure the period of time until the CPU ratio is lowered when the Long Duration Power Limit is exceeded.



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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. English 62 Z87E-ITX 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. 63 English 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) English 64 The number of clock cycles required between a bank active command and issuing the precharge command.

Z87E-ITX 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.

tRDRD Configure between module read to read delay. 65 English 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. English 66 RTL (CHB) Configure round trip latency for channel B. Z87E-ITX 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. 67 English 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 English 68 CPU Input Voltage Configure the voltage for the CPU. Z87E-ITX CPU Load-Line Calibration CPU Load-Line Calibration helps prevent CPU voltage droop when the system is under heavy load. 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. 69 English 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, ACPI Configuration, USB Configuration and Trusted Computing.

Setting wrong values in this section may cause the system to malfunction. English 70 Z87E-ITX 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.



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

71 English Enable C7 deep sleep state for lower power consumption. CPU Thermal Throttling Enable CPU internal thermal control mechanisms to keep the CPU from overheating. No-Execute Memory Protection Processors with No-Execution Memory Protection Technology may prevent certain classes of malicious buffer overflow attacks. Intel Virtualization Technology Intel Virtualization Technology allows a platform to run multiple operating systems and applications in independent partitions, so that one computer system can function as multiple virtual systems. Hardware Prefetcher Automatically prefetch data and code for the processor.

Enable for better performance. Adjacent Cache Line Prefetch Automatically prefetch the subsequent cache line while retrieving the currently requested cache line. Enable for better performance. English 72 Z87E-ITX 4.4.

2 Chipset Configuration Primary Graphics Adapter Select a primary VGA. VT-d Intel® Virtualization Technology for Directed I/O helps your virtual machine monitor better utilize hardware by improving application compatibility and reliability, and providing additional levels of manageability, security, isolation, and I/O performance. PCIE1 Link Speed Select the link speed for PCIE1. Share Memory Configure the size of memory that is allocated to the integrated graphics processor when the system boots up. IGPU Multi-Monitor English 73 Select disable to disable the integrated graphics when an external graphics card is installed. Select enable to keep the integrated graphics enabled at all times. Render Standby Power down the render unit when the GPU is idle for lower power consumption. Onboard HD Audio Enable/disable onboard HD audio. Set to Auto to enable onboard HD audio and automatically disable it when a sound card is installed. Front Panel Enable/disable front panel HD audio.

Onboard HDMI HD Audio Enable audio for the onboard digital outputs. Onboard LAN Enable or disable the onboard network interface controller. Deep Sleep Configure deep sleep mode for power saving when the computer is shut down. Restore on AC/Power Loss Select the power state after a power failure. If [Power Off] is selected, the power will remain off when the power recovers. If [Power On] is selected, the system will start to boot up when the power recovers. Good Night LED By enabling Good Night LED, the Power/HDD LEDs will be switched off when the system is on. It will also automatically switch off the Power and Keyboard LEDs when the system enters into Standby/Hibernation mode. WANI Radio Enable/disable the WiFi module's connectivity. English 74 Z87E-ITX 4.

4.3 Storage Configuration SATA Controller(s) Enable/disable the SATA controllers. SATA Mode Selection IDE: For better compatibility. AHCI: Supports new features that improve performance. RAID: Combine multiple disk drives into a logical unit.

AHCI (Advanced Host Controller Interface) supports NCQ and other new features that will improve SATA disk performance but IDE mode does not have these advantages. SATA Aggressive Link Power Management SATA Aggressive Link Power Management allows SATA devices to enter a low power state during periods of inactivity to save power. It is only supported by AHCI mode. Dynamic Storage Accelerator Keep this option enabled for higher HDD and SSD I/O performance, lower latency and increased system responsiveness. 75 English Hard Disk S.

M.A.R.T. S.M.A.R.T stands for Self-Monitoring, Analysis, and Reporting Technology. It is a monitoring system for computer hard disk drives to detect and report on various indicators of reliability.

English 76 Z87E-ITX 4.4.4 Intel® Rapid Start Technology Intel® Rapid Start Technology Intel® Rapid Start Technology is a new zero power hibernation mode which allows users to resume in just 5-6 seconds. 77 English 4.4.5 Intel® Smart Connect Technology Intel® Smart Connect Technology Intel® Smart Connect Technology automatically updates your email and social networks, such as Twitter, Facebook, etc. while the computer is in sleep mode. English 78 Z87E-ITX 4.4.6 ACPI Configuration Suspend to RAM Select disable for ACPI suspend type S1.

It is recommended to select auto for ACPI S3 power saving. Check Ready Bit Enable to enter the operating system after S3 only when the hard disk is ready, this is recommended for better system stability. ACPI HPET Table Enable the High Precision Event Timer for better performance and to pass WHQL tests. PS/2 Keyboard Power On Allow the system to be waked up by a PS/2 Keyboard. PCI Devices Power On Allow the system to be waked up by a PCI device and enable wake on LAN.

Wake From Onboard LAN Allow the system to be waked up by the Onboard Intel I217V LAN. 79 English Ring-In Power On Allow the system to be waked up by onboard COM port modem Ring-In signals. RTC Alarm Power On Allow the system to be waked up by the real time clock alarm. Set it to By OS to let it be handled by your operating system. USB Keyboard/Remote Power On Allow the system to be waked up by an USB keyboard or remote controller.

USB Mouse Power On Allow the system to be waked up by an USB mouse. English 80 Z87E-ITX 4.4.7 USB Configuration USB Controller Enable or disable all the USB ports. USB 3.0 Controller Enable or disable all the USB 3.0 ports. Legacy USB Support Enable or disable Legacy OS Support for USB 2.0 devices. If you encounter USB compatibility issues it is recommended to disable legacy USB support.

Select UEFI Setup Only to support USB devices under the UEFI setup and Windows/Linux operating systems only. Legacy USB 3.0 Support Enable or disable Legacy OS Support for USB 3.0 devices. 81 English 4.4.8 Trusted Computing Security Device Support Enable or disable BIOS support for security device. English 82 Z87E-ITX 4.5 Tools System Browser ASRock System Browser shows the overview of your current PC and the devices connected. OMG (Online Management Guard) Administrators are able to establish an internet curfew or restrict internet access at specified times via OMG.

@@@@@Please setup network configuration before using Internet Flash. *For BIOS backup and recovery purpose, it is recommended to plug in your USB pen drive before using this function. Network Configuration Use this to configure internet connection settings for Internet Flash. Internet Setting Enable or disable sound effects in the setup utility. UEFI Download Server Select a server to download the UEFI firmware.

Dehumidifier Function If Dehumidifier Function is enabled, the computer will power on automatically to dehumidify the system after entering S4/S5 state.



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English 84 Z87E-ITX Dehumidifier Period Configure the period of time until the computer powers on and enables Dehumidifier after entering S4/S5 state. Dehumidifier Duration Configure the duration of the dehumidifying process before it returns to S4/S5 state. Dehumidifier CPU Fan Setting Configure the speed of the CPU fan while Dehumidifier is enabled. The higher the value, the faster the fan speed.

Max: 255 Min: 1 Save User Default Type a profile name and press enter to save your settings as user default. Load User Default Load previously saved user defaults. 85 English 4.6 Hardware Health Event Monitoring Screen This section allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, fan speed and voltage. CPU Fan 1 Setting Select a fan mode for CPU Fans 1, or choose Customize to set 5 CPU temperatures and assign a respective fan speed for each temperature. Chassis Fan 1 Setting Select a fan mode for Chassis Fan 1, or choose Customize to set 5 CPU temperatures and assign a respective fan speed for each temperature. Over Temperature Protection When Over Temperature Protection is enabled, the system automatically shuts down when the motherboard is overheated. Case Open Feature Enable or disable Case Open Feature to detect whether the chassis cover has been removed. English 86 Z87E-ITX 4.7 Boot Screen This section displays the available devices on your system for you to configure the boot settings and the boot priority.

Fast Boot Fast Boot minimizes your computer's boot time. In fast mode you may not boot from an USB storage device. Ultra Fast mode is only supported by Windows 8 and the VBIOS must support UEFI GOP if you are using an external graphics card. Please notice that Ultra Fast mode will boot so fast that the only way to enter this UEFI Setup Utility is to Clear CMOS or run the Restart to UEFI utility in Windows. Boot From Onboard LAN Allow the system to be waked up by the onboard LAN. Setup Prompt Timeout Configure the number of seconds to wait for the setup hot key. Bootup Num-Lock Select whether Num Lock should be turned on or off when the system boots up. Select whether the Boot Beep should be turned on or off when the system boots up. Please note that a buzzer is needed. 87 English Boot Beep Full Screen Logo Enable to display the boot logo or disable to show normal POST messages.

AddOn ROM Display Enable AddOn ROM Display to see the AddOn ROM messages or configure the AddOn ROM if you've enabled Full Screen Logo. Disable for faster boot speed. Boot Failure Guard If the computer fails to boot for a number of times the system automatically restores the default settings. Boot Failure Guard Count Configure the number of attempts to boot until the system automatically restores the default settings. CSM (Compatibility Support Module) CSM Enable to launch the Compatibility Support Module.

Please do not disable unless you're running a WHCK test. If you are using Windows 8 64-bit and all of your devices support UEFI, you may also disable CSM for faster boot speed. English 88 Launch PXE OpROM Policy Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Do not launch? Z87E-ITX Launch Storage OpROM Policy Select UEFI only to run those that support UEFI option ROM only.

Select Legacy only to run those that support legacy option ROM only. Do not launch? Launch Video OpROM Policy Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Do not launch? 89 English 4.8 Security Screen In this section you may set or change the supervisor/user password for the system. You may also clear the user password. Supervisor Password Set or change the password for the administrator account. Only the administrator has authority to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password. User Password Set or change the password for the user account.

Users are unable to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password. Secure Boot Enable to support Windows 8 Secure Boot. English 90 Z87E-ITX 4.9 Exit Screen Save Changes and Exit When you select this option the following message, "Save configuration changes and exit setup?" will pop out. Select [OK] to save changes and exit the UEFI SETUP Utility. Discard Changes and Exit When you select this option the following message, "Discard changes and exit setup?" will pop out. Select [OK] to exit the UEFI SETUP Utility without saving any changes. Discard Changes When you select this option the following message, "Discard changes?" will pop out. Select [OK] to discard all changes.

Load UEFI Defaults Load UEFI default values for all options. The F9 key can be used for this operation. Launch EFI Shell from filesystem device English 91 Copy shellx64.efi to the root directory to launch EFI Shell. Contact Information If you need to contact ASRock or want to know more about ASRock, you're welcome to visit ASRock's website at <http://www.asrock.com>;

or you may contact your dealer for further information. For technical questions, please submit a support request form at <http://www.asrock.com/support/tsd>.

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