



# Your PDF Guides

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

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**User guide ASUS MAXIMUS VI EXTREME**  
**Operating instructions ASUS MAXIMUS VI EXTREME**  
**Instructions for use ASUS MAXIMUS VI EXTREME**  
**Instruction manual ASUS MAXIMUS VI EXTREME**

**MAXIMUS VI  
EXTREME**

**ASUS**

**Motherboard**



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..... tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided. 4. Chapter 4: Software support This chapter describes the contents of the support DVD that comes with the motherboard package and the software. 5. Chapter 5: RAID support This chapter describes the RAID configurations. Where to find more information Refer to the following sources for additional information and for product and software updates. 1. ASUS websites The ASUS website ([www.asus.com](http://www.asus.com)) provides updated information on ASUS hardware and software products. 2. Optional documentation Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package. vii Conventions used in this guide To ensure that you perform certain tasks properly, take note of the following symbols used throughout this manual. DANGER/WARNING: Information to prevent injury to yourself when trying to complete a task. CAUTION: Information to prevent damage to the components when trying to complete a task IMPORTANT: Instructions that you MUST follow to complete a task. . NOTE: Tips and additional information to help you complete a task. Typography Bold text Indicates a menu or an item to select.



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Used to emphasize a word or a phrase. Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key. Example: <Enter> means that you must press the Enter or Return key.

<Key1> + <Key2> + <Key3> If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Italics <Key> viii  
MAXIMUS VI EXTREME specifications summary LGA1150 socket for 4th Generation Intel® Core™ i7 / Intel® Core™ i5 / Intel® Core™ i3, Pentium®, Celeron® Processors Supports 22nm CPU CPU Supports Intel® Turbo Boost Technology 2.0\* \* The Intel® Turbo Boost Technology 2.0 support depends on the CPU type. \*\* Refer to <http://support.asus.com/cpu.aspx> for Intel CPU support list. Chipset Intel® Z87 Express Chipset Dual channel memory architecture  
4 x DIMM, max. 32GB, DDR3 3000(O.  
C.) / 2933(O.C.) / 2800(O.C.  
) / 2666(O.C.) / 2600(O.C.) / 2500 (O.  
C.) / 2400 (O.C.) / 2200(O.C.) / 2133(O.C.) / 2000(O.C.) / 1866(O.

C.) / 1800(O.C.) / 1600 / 1333 MHz, non-ECC, un-buffered memory Supports Intel® Extreme Memory Profile (XMP) \* Hyper DIMM support is subject to the physical characteristics of individual CPUs. \*\* Please refer to Memory QVL (Qualified Vendors List) for details. Memory 5 x PCI Express 3.0\*/2.0 x16 slots (single at native x16, dual at x8/x8\*\*, triple at x8/x16/x8, quad at x8/x16/x8/x8) 1 x PCI Express 2.0 x4 slot Expansion slots 1 x mini-PCI Express 2.0 x1 slot\*\*\* on mPCIe Combo II expansion card \* PCIe 3.

0 speed is supported by 4th generation Intel® Core™ Processors. \*\* Native x8/x8 mode is available only when PCIe\_x16/x8\_1 and PCIe\_x8\_B2 slots are in use. \*\*\* The mini-PCIe slot is pre-installed with a Wi-Fi/Bluetooth module. Integrated Intel® HD Graphics Processor Multi-VGA output support: DisplayPort/HDMI port DisplayPort 1.2\* with max.

resolution of 4096 x 2160 @ 24 Hz/ 3840 x 2160 at 60Hz VGA HDMI with max. resolution of 4096 x 2160 at 24Hz / 2560 x 1600 at 60Hz Intel® InTru™ 3D/ Intel® Quick Sync Video/ Intel® Clear Video HD Technology/ Intel® Insider™ \* DP 1.2 Multi-Stream Transport, supports DP 1.2 monitor daisy chain up to 3 displays. Multi-GPU support NVIDIA® 4-Way/3-Way/Quad-GPU SLI® Technology AMD CrossFireX™ Technology (continued on the next page) ix Intel® Z87 Express Chipset: Storage 6 x SATA 6.

0 Gb/s ports \* - Intel® Rapid Storage 12 supports RAID 0, 1, 5, and 10 - Intel® Smart Response Technology, Intel® Rapid Start Technology, and Intel® Smart Connect Technology\*\* 1 x M.2 (NGFF) SSD socket 2 on mPCIe Combo II expansion card - Supports PCI Express 2.0 x1 and SATA 6Gb/s standard - Supports M.2 (NGFF) Type 2242 (22mm x 42mm) SSD card - 4 x SATA 6.0 Gb/s ports \*\*\* ASMedia® SATA 6Gb/s controller: \* SATA 6Gb/s port 5 will be disabled when M.2 (NGFF) slot on mPCIe Combo II is in use. \*\* The functions supported depends on the CPU types. \*\*\* These SATA ports are for data hard drives only. ATAPI devices are not supported. LAN Wireless Data Network Bluetooth 1 x Intel® I217-V Gigabit LAN Controller Wi-Fi 802.

11 a/b/g/n/ac supports dual frequency band 2.4/5 GHz \* The module is pre-installed on the mPCIe Combo II expansion card. Bluetooth v4.0/3.0+HS \* The module is pre-installed on the mPCIe Combo II expansion card. Realtek® ALC1150 8-Channel High Definition Audio CODEC Audio - Supports jack-detection, multi-streaming, front panel jackretasking - Content Protection for Full Rate lossless DVD Audio, Blu-ray DVD, and HD-DVD audio content playback - Optical S/PDIF output port at back panel Intel® Z87 Express Chipset - 4 x USB 3.0 ports (2 ports at mid-board [red], 2 ports at back panel [blue] with ASUS USB 3.0 Boost support\*) - 8 x USB 2.0 ports (2 ports at back panel, 1 port reserved for ROG Connect; 6 ports at mid-board\*\*) - 4 x USB 3.0 ports (4 ports at back panel [blue]) USB ASMedia® USB 3.

0 SuperSpeed USB HUB controller \* The UASP standard for Intel® native USB 3.0 is only supported under Windows 8® OS. \*\* 2 x USB2.0 ports at mid-board shares with ROG extension (ROG\_EXT) port. (continued on the next page) □ ROG Extreme OC Kit - EZ Plug - LN2 Mode - Slow Mode - PCIe x16 Lane switch ROG Connect - RC Diagram - RC Remote - RC Poster ROG Extreme Engine Digi+ III - Full digital 8+2 phase CPU/DRAM power - NexFET™ Power Block MOSFET - 60A BlackWing Chokes - 10K Black Metallic Capacitors mPCIe Combo II (mPCIe/M.

2 (NGFF) combo card) UEFI BIOS features - ROG BIOS Print - GPU.DIMM Post - Extreme Tweaker - Tweaker's Paradise - ROG SSD Secure Erase - O.C. Profile - ROG Pulse CPU Level Up Probelt ROG RAMDisk ASUS Dual Intelligent Processors 4 - 4-way Optimization Tuning Key ASUS EPU ASUS Wi-Fi GO! ROG Exclusive Features Special Features ASUS Exclusive Features - AI Suite III - TurboV EVO - DIGI+ Power Control - Fan Xpert 2 - USB 3.0 Boost - GPU Boost - AI Charger+ - USB Charger+ - Disk Unlocker (continued on the next page) xi ASUS EZ DIY - ASUS BIOS Flashback - ASUS CrashFree BIOS 3 - ASUS EZ Flash 2 - ASUS C.

P.R. (CPU Parameter Recall) Special Features ASUS Q-Design - ASUS Q-Code - ASUS Q-Shield - ASUS Q-Connector - ASUS Q-LED (CPU, DRAM, VGA, Boot Device LED) - ASUS Q-Slot - ASUS Q-DIMM 1 x Clear CMOS button 1 x ROG Connect button 2 x USB 2.0 ports (1 port can be switched to ROG Connect) 6 x USB 3.0 ports [blue] Back I/O Ports 1 x LAN (RJ45) port 1 x Optical S/PDIF out 1 x HDMI port 1 x DisplayPort 1 x PS/2 keyboard/mouse combo port 6 x Audio jacks 1 x USB 3.0 connector (supports additional two USB 3.0 ports) 3 x USB 2.0 connectors (support additional six USB 2.0 ports, one connector via ROG\_EXT header) 10 x SATA 6.0 Gb/s connectors 1 x ROG Extension (ROG\_EXT) header 1 x 4-pin CPU fan connector 1 x 4-pin CPU optional fan connector 3 x 4-pin Chassis fan connector 3 x 4-pin Optional fan connector 3 x Thermal sensor connectors 1 x 24-pin EATX Power connector Internal Connectors 1 x 8-pin EATX 12V Power connector 1 x 4-pin EATX 12V Power connector 1 x 6-pin EZ Plug connector (in black for PCIe slots) 1 x 4-pin EZ Plug connector (in white for back I/O and PCIe slots) 10 x ProbeIt Measurement Points 1 x LN2 Mode jumper 1 x Slow mode switch 1 x Power-on button 1 x Reset button 1 x MemOK! button 1 x BIOS Switch button 1 x S/PDIF out header (continued on the next page) xii 1 x Front panel audio connector (AAFP) 1 x System panel connector Internal Connectors 1 x mPCIe Combo II connector 1 x Directkey button 1 x DRCT (DirectKey) header 1 x FastBoot switch 1 x User's manual 1 x I/O Shield OC Panel Kit - 1 x OC Panel - 1 x OC Panel 5.

25-inch drive bay metal case - 1 x OC Panel cable - Set of screws (1 x 6 pcs) 1 x mPCIe Combo II card with dual-band WiFi 802.11 a/b/g/n/ac + Bluetooth v4.0/3.0+HS module Accessory 1 x 2T2R dual-band Wi-Fi moving antenna 5 x 2-in-1 SATA 6Gb/s signal cables 1 x 4-Way SLI® bridge 1 x 3-Way SLI® bridge 1 x SLI® cable 1 x CrossFire™ cable 1 x ROG Connect cable 1 x 2-in-1 ASUS Q-Connector Kit 1 x 12-in-1 ROG Cable Label 1 x ROG Magnet Manageability BIOS Features Manageability WfM2.



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0, DMI2.0, WOL by PME, PXE 64 Mb UEFI AMI BIOS, PnP, DMI 2.0, WfM 2.0, SM BIOS 2.5, ACPI 2.0a, Multi-language BIOS WfM2.0, DMI2.0, WOL by PME, PXE Drivers ROG RAMDisk ROG CPU-Z Support DVD contents ROG Mem Tweakt Kaspersky® Anti-Virus DAEMON Tools Pro Standard ASUS WebStorage ASUS Utilities Form Factor ATX Form Factor, 12" x 9.6" (30.5cm x 24.4cm) Specifications are subject to change without notice. xiii OC Panel specifications summary Display 2.6-inch LCM Pure hardware-based overclocking support Boot debug POST code Intuitive tuning in two OC modes - EXTREME Mode for subzero OC benching - NORMAL Mode for in-chassis usage Seamless integration with CPU Level Up at one-click OC button Real-time control and display CPU fan speed, temperature, BCLK and RATIO Adjustable system voltages, frequencies on-the-fly Features Stylish design with 90 plus-degree-tilt movable faceplate (EXTREME Mode) FanSpeed Control button - Standard/Silent/Turbo mode Four (4) additional 4-pin fan headers LCM backlight on/off ROG exclusive features - VGA Hotwire - Subzero Sense - Slow Mode - Pause Switch - VGA SMB header - ProbeIt POWER I/O Ports FAN Power Installation Requirements Voltage : 1 x SATA power connector : 4 x 4-pin extra Fan connectors : +12V, +5V, +5VSB ROG\_EXT port : 1 x 18-1 pin data connection port Power consumption : 5A 1 x 5.25-inch drive bay required for NORMAL Mode installation 1 x SATA power cable from system power supply Maximus VI Series and other motherboards with ROG\_EXT port \*Visit the ASUS website at [www.asus.com](http://www.asus.com) for the latest motherboard support/compatibility lists.

\*\*Please install the latest utility/firmware (ROG Connect Plus) for better compatibility. \*\*\*Update the motherboard BIOS to the latest version for better compatibility with OC Panel. Compatibility xiv Package contents Motherboard Cables Check your motherboard package for the following items. ROG MAXIMUS VI EXTREME 1 x ROG Connect cable 5 x 2-in-1 SATA 6.0 Gb/s signal cables 1 x 4-WAY SLI® bridge 1 x 3-WAY SLI® bridge 1 x SLI® cable 1 x CrossFire™ cable 1 x ROG\_EXT cable (for OC Panel) Accessories 1 x I/O Shield 1 x OC Panel 1 x OC Panel 5.25-inch drive bay metal case 1 x mPCIe Combo II card with dual band Wi-Fi / Bluetooth module 1 x dual band Wi-Fi Moving Antenna 1 x 12-in-1 ROG cable label 1 x 2-in-1 ASUS Q-Connector kit 1 x ROG Magnet Application DVD Documentation ROG motherboard support DVD User guide If any of the above items is damaged or missing, contact your retailer. xv Installation tools and components 1 bag of screws Philips (cross) screwdriver PC chassis Power supply unit Intel LGA 1150 CPU Intel LGA 1150 compatible CPU Fan DDR3 DIMM SATA hard disk drive SATA optical disc drive (optional) Graphics card (optional) The tools and components in the table above are not included in the motherboard package. xvi Chapter 1: Product Introduction Product introduction 1.1 1.1.

1 Special features Product highlights 1 Republic of Gamers The Republic of Gamers offers you the best of the best. We offer the best hardware engineering, the fastest performance, the most innovative ideas, and we welcome the best gamers to join in. In the Republic of Gamers, mercy rules are only for the weak, and bragging rights means everything. We believe in making statements and we excel in competitions. If your character matches our trait, then join the elite Republic of Gamers and make your presence felt. LGA1150 socket for 4th Generation Intel® Core™ i7 / Intel® Core™ i5 / Intel® Core™ i3, Pentium® and Celeron® Processors This motherboard supports 4th generation Intel® Core™ i7/ Intel® Core™ i5/ Intel® Core™ i3, Pentium® and Celeron® processors in the LGA1150 package. It provides great graphics and system performance with its GPU, dual-channel DDR3 memory slots, and PCI Express 2.0/3.0 expansion slots. Intel® Z87 Express Chipset Intel® Z87 Express Chipset is a single-chipset that supports the LGA1150 socket 4th generation Intel® Core™ i7/ Intel® Core™ i5/ Intel® Core™ i3, Pentium® and Celeron® processors.

It utilizes the serial point-to-point links, which increases bandwidth and enhances the system's performance. It natively supports up to six USB 3.0 ports for up to ten times faster transfer rate than USB 2.0, and enables the iGPU function for Intel® integrated graphics performance. PCI Express® 3.0

0 PCI Express® 3.0 (PCIe 3.0) is the PCI Express bus standard that provides twice the performance and speed of PCIe 2.0. It provides an optimal graphics performance, unprecedented data speed, and seamless transition with its complete backward compatibility to PCIe 1.

0/2.0 devices. SLI®/CrossFire™ On-Demand ASUS MAXIMUS VI EXTREME 1-1 Chapter 1 This motherboard features a unique PCIe 3.0 bridge chip to support multi-GPU SLI®/ CrossFireX™ graphics cards for an unrivaled gaming performance. With the Intel® Z87 platform to optimize the PCIe allocation of multiple GPUs, it supports up to 4-WAY GPU SLI® or CrossFireX™ configuration. 1.1.2 ROG Intelligent Performance & Overclocking features mPCIe Combo II ROG mPCIe Combo II offers expandability solutions with the latest connectivity standards via the proprietary connector onboard. It provides your system with the fastest Wi-Fi 802.11ac and Bluetooth 4.

0 connection. It also features the M.2 (NGFF) slot for an optimal system performance. ROG Connect ROG Connect allows you to monitor the status of your desktop PC and tweak its parameters in real-time via a notebook. ROG Connect links your main system to a notebook through a USB cable, allowing you to view real-time POST code and hardware status readouts on your notebook, as well as make on-the-fly parameter adjustments at a purely hardware level.

Extreme Engine Digi+ III The Extreme Engine Digi+ III offers the best CPU/Memory design on the Z87® motherboard. It is equipped with NexFET™ Power Block MOSFET that offers great durability and provides up to 90% efficiency under normal operation. The BlackWing Chokes handles pressures with ease. The Black Metallic solid capacitor lasts five times longer than the generic capacitors with better low temperature tolerance. Altogether making it the perfect motherboard for overclocking.

iROG The iROG is a special IC that fully maximizes ROG's unique functions, providing you with full control of your motherboard at any stage. It greatly increases your overclocking enjoyment, and offers you with advanced system control and management features purely at a hardware level. CPU Level Up With ROG's CPU Level Up, overclocking has never been so easy, or cost-free. Simply select the processor that you want to overclock to, and the motherboard will do the rest. USB BIOS FlashBack USB BIOS Flashback offers a hassle-free updating solution for your ultimate convenience.

Simply install a USB storage device containing the BIOS file, press the BIOS Flashback button for three seconds, and the UEFI BIOS is automatically updated even without entering the existing the BIOS or operating system.



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It also allows you to regularly check for UEFI BIOS updates, and download the latest BIOS automatically. GPU.DIMM Post GPU.DIMM Post enables you to catch potential problems even before you enter the OS, saving you valuable time in detecting component failure under extreme conditions. With GPU. DIMM Post, quickly and easily check your graphic cards, memory modules' statuses in the BIOS, and overclocking settings. Chapter 1 1-2 BIOS Print ROG offers a whole new UEFI BIOS feature to handle the demands of an overclocking experience. The motherboard features ROG BIOS Print that allows you to easily share your BIOS settings to others with the press of a button. Chapter 1: Product introduction ProbeIt This motherboard consists of ten (10) ProbeIt measurement points that helps you detect your system's current voltage. With the use of a multimeter device, these points can help measure your system's Vcore, PCH, IO (Digital/Analog), DRAM, iGPU, System agent and other critical voltages. Extreme Tweaker Extreme Tweaker is the one stop shop to fine-tune your system to optimal performance. With Extreme Tweaker, you can adjust the system settings such as frequency, over-voltage, memory timing, and more. Loadline Calibration Maintaining ample voltage support for the CPU is critical during overclocking. The Loadline Calibration ensures stable and optimal CPU voltage under heavy loading.

It helps overclockers enjoy the motherboard's ultimate OC capabilities and benchmark scores. BIOS Flashback BIOS Flashback gives you the ability to save two versions of BIOS simultaneously: one saved BIOS for the tweaked overclocking setting, and one saved BIOS from the previous version. OC Panel Overclocking made easier than ever! No more messing with the BIOS, OS, or software utilities. OC Panel is the next step in dedicated direct tweaking. It works inside the case or as an external console, and features normal mode with info covering CPU temp, ratio, base clock, and CPU fan speed. With one press of the CPU Level Up button you can instantly apply custom profiles designed by the world's leading overclockers, while FanSpeed Control modifies blower RPMs. In extreme mode, some of the most commonly used voltage tuning settings are offered, along with Subzero Sense and VGA Hotwire, giving you field access to super-cool liquid thermal temp readings and streamlined hardware-level GPU overvolting. ASUS MAXIMUS VI EXTREME 1-3 Chapter 1 1.1.3 Wi-Fi GO! ASUS special features ASUS Wi-Fi GO! leads the way to a more enjoyable home entertainment.

With ASUS Wi-Fi GO!, you can wirelessly stream media files to HDTV devices, remotely control and access your computer using your mobile device, and easily transfer files between your computer and mobile device. Conveniently use and enjoy these ASUS Wi-Fi GO! functions: •••••••• Cloud GO!: Allows you to control files and sync them all across cloud services in a few clicks. Media Streaming Hub: Allows you to stream media files to an HDTV device. Remote Desktop: Allows you to view your computer's desktop and remotely operate your computer in real-time from your mobile device. Remote Keyboard and Mouse: Allows you to use your mobile device's touch panel as a remote keyboard and mouse for your computer.

Smart Motion Control: Allows you to remotely control your computer using your mobile device's customized gestures. File Transfer: Allows you to transfer files between your computer and mobile device. Capture and Send: Allows you to take screenshots and send them to a mobile device. 1.1.

4 ROG rich-bundled software © Kaspersky Anti-Virus Kaspersky® Anti-Virus Personal offers premium antivirus protection for individual users and home offices. It is based on advanced antivirus technologies. The product incorporates the Kaspersky® Anti-Virus engine, which is renowned for malicious program detection rates that are among the industry's highest. DAEMON Tools Pro Standard DAEMON Tools Pro offers essential functionality to backup CD, DVD and Blu-ray discs. It converts optical media into virtual discs and emulates devices to work with the virtual copies. DAEMON Tools Pro organizes data, music, video, and photo collections on a PC, notebook, or netbook. ROG CPU-Z ROG CPU-Z, authorized by Intel's CPU Identification (CPUID), is a customized ROG utility that allows you to gather information about your system's main components. It gives you the current information and status of your CPU, motherboard, memory, and other main components. Get that ROG look of reporting your system's current information with ROG CPU-Z. Chapter 1 1-4 MemTweakIt MemTweakIt is a DRAM efficiency tool that allows you to fine-tune your DRAM in real time and allows you to post and share your DRAM configuration scores to the ROG website.

Chapter 1: Product introduction ROG RAMDisk RAMDisk reserves part of system memory and turns it into actual storage, so you can place favorite app and game cache files in it to enjoy high-speed RAM performance while accessing them. Plus, this extends SSD lifespan and keeps your main storage optimized for really important tasks, and you get auto data backup and restore. ASUS MAXIMUS VI EXTREME 1-5 Chapter 1 1.2 1.2.1 Motherboard overview Before you proceed Take note of the following precautions before you install motherboard components or change any motherboard settings. •• Unplug the power cord from the wall socket before touching any component. Before handling components, use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, to avoid damaging them due to static electricity. Hold components by the edges to avoid touching the ICs on them.

Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.

Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, or components. ••• Chapter 1 1-6 Chapter 1: Product introduction 1.2.2 Motherboard layout Refer to 1.

2.9 Internal connectors and 2.3.1 Rear I/O connection for more information about rear panel connectors and internal connectors. ASUS MAXIMUS VI EXTREME 1-7 Chapter 1 Layout contents Connectors/Jumpers/Buttons and switches/Slots 1.

Power connectors (24-pin EATXPWR, 8-pin EATX12V, 4-pin EATX12V) 2. LGA1150 CPU Socket 3. CPU, chassis, and optional fan connectors (4-pin CPU\_FAN, 4-pin CPU\_OPT, 4-pin OPT\_FAN1-3, 4-pin CHA\_FAN1-3) 4. DDR3 DIMM slots 5. Q\_Code LEDs 6. PCIe x16 Lane switch 7. START (Power-on) button 8. Slow Mode switch 9. RESET button 10. MemOK! button 11.

Thermal sensor cable connectors (2-pin OPT\_TEMP1-3) 12. USB 3.0 connectors (20-1 pin USB3\_12) 13. LN2 Mode header 14. Intel® Z87 Serial ATA 6.0 Gb/s connectors (7-pin SATA6G\_1-6 [red]) 15.



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5 1.5 1.5 1.5 1.5 .....4 .....Vendors Part No.

Size SS/ DS Chip Brand Chip NO. Timing Voltage •(continued on the next page) ASUS MAXIMUS VI EXTREME 1-17 Chapter 1 •Vendors Part No. Size SS/ DS Chip Brand Chip NO. Timing Voltage DIMM socket support (Optional) 2 4 •Mach Xtreme Mach Xtreme MICRON OCZ OCZ Patriot Patriot MXD3U133316GQ 16GB (4x 4GB) 2GB 2GB 4GB (2x 2GB) 8GB (2x 4GB) 8GB 16GB (2x 8GB) 2GB 4GB 4GB 2GB 4GB 4GB 8GB 8GB DS - - - - • MXD3V13332GS MT8JTF25664AZ1G4M1 OCZ3G1333LV4GK OCZ3G1333LV8GK PG38G1333EL(XMP) PGD316G1333ELK(XMP) SS SS DS DS DS DS Mach Xtreme MICRON - C2S46D30-D313 D9PFJ - 9-9-9 9-9-9 9-9-9-24 1.65 1.65 1.5 1.5 ..... RiDATA RiDATA SAMSUNG Silicon Power Silicon Power Team Transcend Transcend C304627CB1AG22Fe E304459CB1AG32Cf M378B5273CH0-CH9 SP002GBLTU133V02 SP004GBLTU133V02 TED34096M1333HC9 JM1333KLH-8G(623654) TS1GLK64V3H(620053) DS DS DS SS DS DS DS DS RiDATA RiDATA SAMSUNG S-POWER S-POWER Team Transcend MICRON C304627CB1AG22Fe E304459CB1AG32Cf K4B2G0846C 20YT3NG 20YT3NG T3D2568LT-13 TK963EBF3 D9QBJ 9 9 9-9-9-24 9-9-9-24 - - ..... Side(s): SS - Single-sided DS - Double-sided DIMMs DIMM socket support: Supports one (1) module inserted into any slot as Single-channel memory configuration. We suggest that you install the module into A1 slot. Supports two (2) modules inserted into either the red slots or the black slots as one pair of Dual-channel memory configuration.

We suggest that you install the modules into slots A1 and B1 for better compatibility. Supports four (4) modules inserted into both the red and black slots as two pairs of Dual-channel memory configuration. •••ASUS exclusively provides hyper DIMM support function. Hyper DIMM support is subject to the physical characteristics of individual CPUs. Load the X.M.P. settings in the BIOS for the hyper DIMM support. Visit the ASUS website for the latest QVL. Chapter 1 1-18 Chapter 1: Product introduction 1.

2.5 Expansion slots Unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components. Slot No. 1 2 3 4 5 6 Slot Description PCIe 3.

0/2.0 x16/x8\_1 slot PCIe 3.0/2.0 x16\_A2 slot PCIe 3.0/2.

0 x8\_B2 slot PCIe 3.0/2.0 x8\_3 slot PCIe 2.0/1.1 x4\_1 slot ASUS MAXIMUS VI EXTREME 1-19 Chapter 1 PCIe 3.0/2.0 x8\_4 slot VGA Configuration PCIe 3.0 operating mode Single VGA x16 (Native) SLI/ CrossFireX x8 (Native) 3-WAY SLI/ CrossFireX x8 (Native) 4-WAY SLI/ CrossfireX x8 (Native) PCIe 3.0/2.0\_x16/x8\_1 PCIe 3.

0/2.0\_x16\_A2 - - - - -x8 (Native) x16 x16 PCIe 3.0/2.0\_x8\_B2 PCIe 3.0/2.0\_x8\_3 PCIe 3.0/2.0\_x8\_4 - x8 - - x8 x8 - - •••We recommend that you provide sufficient power when running CrossFireX™ or SLI® mode. Connect a chassis fan to the motherboard connector labeled CHA\_FAN1-3 when using multiple graphics cards for better thermal environment. 4th generation Intel® Core™ processors support PCIe 3.

0 speed rate. •••When the system is running with four VGA cards, ensure to connect the EZ PLUG\_1/2 for extra PCIe power supply. PCIe 3.0/2.0\_x16/x8\_1 slot switches to x8 mode when other PCIe 3.

0/2.0 slots are occupied. PCIe 3.0/2.0\_x8\_B2 slot will be disabled when PCIe 3.

0/2.0\_x16\_A2, PCIe 3.0/2.0\_x8\_3, PCIe 3.0/2.0\_x8\_4 slots are occupied. Chapter 1 1-20 Chapter 1: Product introduction IRQ assignments for this motherboard A PCIe\_x16/x8\_1 PCIe\_x8\_B2 PCIe\_x4\_1 I.G.F.X.

Intel LAN Controller SATA #0 SATA #1 High Definition Audio EHCI# 0 (USB 2.0) EHCI# 1 (USB 2.0) XHCI (USB 3.0) shared - shared shared - - - - - B - shared - - - - - C - - - - - D - - E - - F - - - - - shared G - - H - - - - - shared - shared - shared - - - - - shared - - - - - shared - - shared - - - - - ASUS MAXIMUS VI EXTREME 1-21 Chapter 1 1.2.6 Onboard switches and buttons allow you to fine-tune performance when working on a bare or open-case system. This is ideal for overclockers and gamers who continually change settings to enhance system performance. 1. Power-on button The motherboard comes with a power-on button that allows you to power up or wake up the system. The button also lights up when the system is plugged to a power source indicating that you should shut down the system and unplug the power cable before removing or installing any motherboard component.

Onboard buttons and switches 2. Reset button Press the reset button to reboot the system. Chapter 1 1-22 Chapter 1: Product introduction 3. MemOK! button Installing DIMMs that are not compatible with the motherboard may cause system boot failure, and the DRAM\_LED lights continuously. Press and hold the MemOK! button until the MEMOK\_LED starts blinking to begin automatic memory compatibility tuning for successful boot.

•••Refer to section 1.2.8 Onboard LEDs for the exact location of the MEMOK\_LED and DRAM\_LED. The DRAM\_LED also lights up when the DIMM is not properly installed. Turn off the system and reinstall the DIMM before using the MemOK! function.

The MemOK! switch does not function under Windows® OS environment. During the tuning process, the system loads and tests failsafe memory settings. It takes about 30 seconds for the system to test one set of failsafe settings. If the test fails, the system reboots and test the next set of failsafe settings. The blinking speed of the MEMOK\_LED increases, indicating different test processes. Due to memory tuning requirement, the system automatically reboots when each timing set is tested. If the installed DIMMs still fail to boot after the whole tuning process, the DRAM\_LED lights continuously. Replace the DIMMs with ones recommended in the Memory QVL (Qualified Vendors Lists) in this user manual or on the ASUS website at [www.asus.com](http://www.asus.com).

If you turn off the computer and replace DIMMs during the tuning process, the system continues memory tuning after turning on the computer.



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To stop memory tuning, turn off the computer and unplug the power cord for about 5–10 seconds. If your system fails to boot up due to BIOS overlocking, press the MemOK! switch to boot and load the BIOS default settings. A message will appear during POST reminding you that the BIOS has been restored to its default settings. We recommend that you download and update to the latest BIOS version from the ASUS website at [www.asus.com](http://www.asus.com) after using the MemOK! function. ••••ASUS MAXIMUS VI EXTREME 1-23 Chapter 1 4. BIOS Switch button The motherboard comes with two BIOS. Press the BIOS button to switch BIOS and load different BIOS settings.

The nearby BIOS LEDs indicate the BIOS you are using. 5. Slow Mode switch Slow Mode switch allows your system to provide better overclocking margins when using the LN2 cooling system. When enabled, the Slow Mode switch prevents the system from crashing, slows down the CPU, and the system's tuner will make the adjustments. Chapter 1 1-24 Ensure to set the LN2 Mode jumper to [Enable] before using the Slow Mode Switch.

Chapter 1: Product introduction 6. PCIe x16 Lane switch This DIP switch allows you to enable and disable the corresponding PCIe x16 slots. When one of the installed PCIe x16 cards is out of order, you can slide the switch to find out the faulty one without removing the cards. 7. Fast Boot switch This switch allows you to enable or disable the Fast Boot feature.

When enabled, the system boot speed is accelerated. ASUS MAXIMUS VI EXTREME 1-25 Chapter 1 8. DirectKey button This feature allows your system to go to the BIOS Setup program with the press of a button. With DirectKey, you can enter the BIOS anytime without having to press the <Del> key during POST. It also allows you to turn on or turn off your system and conveniently enter the BIOS during boot-up. Ensure to save your data before using the DirectKey button. • When the system is on and you press the DirectKey button, your system will shut down. Press the DirectKey button again or the Power-on button to reboot and enter the BIOS directly. Turn off your system using the power-on button to allow your system to go through POST (without entering the BIOS) when you reboot your system. Refer to section 3.

8 Boot Menu for details about setting the DirectKey default function. •• Chapter 1 1-26 Chapter 1: Product introduction 1.2.7 1. LN2 Mode jumper (3-pin LN2\_MODE) Jumpers When enabled, the LN2 Mode jumper allows your system to eliminate the cold bug\* in the processor during POST. It allows the processor to run at an extremely low temperature and helps the system boot fast. \* The cold bug is an issue with CPUs that causes to fail to boot at low (usually sub zero) temperatures. ASUS MAXIMUS VI EXTREME 1-27 Chapter 1 1.2.8 1.

Hard Disk LED Onboard LEDs The hard disk LED is designed to indicate the hard disk activity. It blinks when data is being written into or read from the hard disk drive. The LED does not light up when there is no hard disk drive connected to the motherboard or when the hard disk drive does not function. 2. Blinking: Indicates that MemOK! is enabled before POST.

MemOK! LED Chapter 1 1-28 Chapter 1: Product introduction 3. Q LED Q LEDs check key components (CPU, DRAM, VGA card, and booting devices) in sequence during motherboard booting process. If an error is found, the corresponding LED will continue lighting until the problem is solved. This user-friendly design provides an intuitive way to locate the root problem within seconds. 4.

Power LED The motherboard comes with a power-on button that lights up to indicate that the system is ON, in sleep mode, or in soft-off mode. This is a reminder that you should shut down the system and unplug the power cable before removing or plugging in any motherboard component. The illustration below shows the location of the onboard power-on button. ASUS MAXIMUS VI EXTREME 1-29 Chapter 1 5. BIOS LED The BIOS LEDs help indicate the BIOS activity. Press the BIOS button to switch between BIOS1 and BIOS2 and the LED lights up when the corresponding BIOS is in use. 6. Q-Code LEDs The Q-Code LED design provides you with a 2-digit error code that displays the system status. Refer to the Q-Code table on the next page for details. Chapter 1 1-30 Chapter 1: Product introduction Q-Code table Code 00 01 02 03 04 06 07 08 09 0B 0C – 0D 0E 0F 10 11 – 14 15 – 18 19 – 1C 2B – 2F 30 31 32 – 36 37 – 3A 3B – 3E 4F Description Not used Power on.

Reset type detection (soft/hard). AP initialization before microcode loading System Agent initialization before microcode loading PCH initialization before microcode loading Microcode loading AP initialization after microcode loading System Agent initialization after microcode loading PCH initialization after microcode loading Cache initialization Reserved for future AMI SEC error codes Microcode not found Microcode not loaded PEI Core is started Pre-memory CPU initialization is started Pre-memory System Agent initialization is started Pre-memory PCH initialization is started Memory initialization Reserved for ASL (see ASL Status Codes section below) Memory Installed CPU post-memory initialization Post-Memory System Agent initialization is started Post-Memory PCH initialization is started DXE IPL is started (continued on the next page) ASUS MAXIMUS VI EXTREME 1-31 Chapter 1 Q-Code table Code 50 – 53 54 55 56 57 58 59 00 01 02 03 04 06 07 08 09 0B 0C – 0D 0E 0F 10 11 – 14 15 – 18 19 – 1C 2B – 2F 30 31 32 – 36 37 – 3A Description Memory initialization error. Invalid memory type or incompatible memory speed Unspecified memory initialization error Memory not installed Invalid CPU type or Speed CPU mismatch CPU self test failed or possible CPU cache error CPU micro-code is not found or micro-code update is failed Not used Power on. Reset type detection (soft/hard). AP initialization before microcode loading System Agent initialization before microcode loading PCH initialization before microcode loading Microcode loading AP initialization after microcode loading System Agent initialization after microcode loading PCH initialization after microcode loading Cache initialization Reserved for future AMI SEC error codes Microcode not found Microcode not loaded PEI Core is started Pre-memory CPU initialization is started Pre-memory System Agent initialization is started Pre-memory PCH initialization is started Memory initialization Reserved for ASL (see ASL Status Codes section below) Memory Installed CPU post-memory initialization Post-Memory System Agent initialization is started (continued on the next page) Chapter 1 1-32 Chapter 1: Product introduction Q-Code table Code 3B – 3E 4F 50 – 53 54 55 56 57 58 59 5A 5B 5C – 5F E0 E1 E2 E3 E4 – E7 E8 E9 EA EB EC – EF F0 F1 F2 F3 F4 F5 – F7 F8 Description Post-Memory PCH initialization is started DXE IPL is started Memory initialization error.



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Invalid memory type or incompatible memory speed Unspecified memory initialization error Memory not installed Invalid CPU type or Speed CPU mismatch CPU self test failed or possible CPU cache error CPU micro-code is not found or micro-code update is failed Internal CPU error Reset PPI is not available Reserved for future AMI error codes S3 Resume is started (S3 Resume PPI is called by the DXE IPL) S3 Boot Script execution Video repost OS S3 wake vector call Reserved for future AMI progress codes S3 Resume Failed S3 Resume PPI not Found S3 Resume Boot Script Error S3 OS Wake Error Reserved for future AMI error codes Recovery condition triggered by firmware (Auto recovery) Recovery condition triggered by user (Forced recovery) Recovery process started Recovery firmware image is loaded Reserved for future AMI progress codes Recovery PPI is not available (continued on the next page) ASUS MAXIMUS VI EXTREME 1-33 Chapter 1 Recovery firmware image is found Q-Code table Code F9 FA FB – FF 60 61 62 63 – 67 68 69 6A 6B – 6F 70 71 72 73 – 77 78 79 7A – 7F 90 91 92 93 94 95 96 97 98 99 9A 9B Description Recovery capsule is not found Invalid recovery capsule Reserved for future AMI error codes DXE Core is started NVRAM initialization Installation of the PCH Runtime Services CPU DXE initialization is started PCI host bridge initialization System Agent DXE initialization is started System Agent DXE SMM initialization is started System Agent DXE initialization (System Agent module specific) PCH DXE initialization is started PCH DXE SMM initialization is started PCH devices initialization PCH DXE Initialization (PCH module specific) ACPI module initialization CSM initialization Reserved for future AMI DXE codes Boot Device Selection (BDS) phase is started Driver connecting is started PCI Bus initialization is started PCI Bus Hot Plug Controller Initialization PCI Bus Enumeration PCI Bus Request Resources PCI Bus Assign Resources Console Output devices connect Console input devices connect Super IO Initialization USB initialization is started USB Reset (continued on the next page) Chapter 1 1-34 Chapter 1: Product introduction Q-Code table Code 9C 9D 9E – 9F A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 AA AB AC AD AE AF B0 B1 B2 B3 B4 B5 B6 B7 B8– BF D0 D1 Description USB Detect USB Enable Reserved for future AMI codes IDE initialization is started IDE Reset IDE Detect IDE Enable SCSI initialization is started SCSI Reset SCSI Detect SCSI Enable Setup Verifying Password Start of Setup Reserved for ASL (see ASL Status Codes section below) Setup Input Wait Reserved for ASL (see ASL Status Codes section below) Ready To Boot event Legacy Boot event Exit Boot Services event Runtime Set Virtual Address MAP Begin Runtime Set Virtual Address MAP End Legacy Option ROM Initialization System Reset USB hot plug PCI bus hot plug Clean-up of NVRAM Reserved for future AMI codes CPU initialization error System Agent initialization error (continued on the next page) ASUS MAXIMUS VI EXTREME 1-35 Chapter 1 Configuration Reset (reset of NVRAM settings) Q-Code table Code D2 D3 D4 D5 D6 D7 D8 D9 DA DB DC Description PCH initialization error Some of the Architectural Protocols are not available PCI resource allocation error. Out of Resources No Space for Legacy Option ROM No Console Output Devices are found No Console Input Devices are found Invalid password Error loading Boot Option (LoadImage returned error) Boot Option is failed (StartImage returned error) Flash update is failed Reset protocol is not available ACPI/ASL Checkpoints Code 0x01 0x02 0x03 0x04 0x05 0x10 0x20 0x30 0x40 0xAC 0xAA Description System is entering S1 sleep state System is entering S2 sleep state System is entering S3 sleep state System is entering S4 sleep state System is entering S5 sleep state System is waking up from the S1 sleep state System is waking up from the S2 sleep state System is waking up from the S3 sleep state System is waking up from the S4 sleep state System has transitioned into ACPI mode. Interrupt controller is in PIC mode. System has transitioned into ACPI mode. Interrupt controller is in APIC mode.

Chapter 1 1-36 Chapter 1: Product introduction 1.2.9 1. Intel Z87 Serial ATA 6.0 Gb/s connectors (7-pin SATA6G\_1-6 [red]) © Internal connectors These connectors connect to Serial ATA 6.

0 Gb/s hard disk drives via Serial ATA 6.0 Gb/s signal cables. If you installed Serial ATA hard disk drives, you can create a RAID 0, 1, 5, and 10 configuration with the Intel® Rapid Storage Technology through the onboard Intel® Z87 chipset. • These connectors are set to [AHCI Mode] by default. If you intend to create a Serial ATA RAID set using these connectors, set the SATA Mode item in the BIOS to [RAID Mode].

Refer to section 3.6.3 SATA Configuration for details. Before creating a RAID set, refer to section 5.1 RAID configurations or the manual bundled in the motherboard support DVD. Native Command Queuing (NCQ) is a protocol allowing hard disk drives to internally optimize the order in which received read and write commands are executed. When using NCQ, set the SATA Mode in the BIOS to [AHCI Mode]. Refer to section 3.6.3 SATA Configuration for details.

••• ASUS MAXIMUS VI EXTREME 1-37 Chapter 1 3. ASMedia® Serial ATA 6.0 Gb/s connectors (7-pin SATA6G\_E12/E34 [red]) These connectors connect to Serial ATA 6.0 Gb/s hard disk drives via Serial ATA 6.0 Gb/s signal cables. 4. USB 3.0 connector (20-1 pin USB3\_12) This connector allows you to connect a USB 3.0 module for additional USB 3.0 front or rear panel ports.

With an installed USB 3.0 module, you can enjoy all the benefits of USB 3.0 including faster data transfer speeds of up to 5Gbps, faster charging time for USB-chargeable devices, optimized power efficiency, and backward compatibility with USB 2.0. Chapter 1 1-38 ••• The USB 3.

0 module is purchased separately. These connectors are based on xHCI specification. We recommend you to install the related driver to fully use the USB 3.0 ports under Windows® 7. Chapter 1: Product introduction 5.

Digital audio connector (4-1 pin SPDIF\_OUT) This connector is for an additional Sony/Philips Digital Interface (S/PDIF) port. Connect the S/PDIF Out module cable to this connector, then install the module to a slot opening at the back of the system chassis. The S/PDIF module is purchased separately. ASUS MAXIMUS VI EXTREME 1-39 Chapter 1 6. USB 2.0 connectors (10-1 pin USB910; USB1112; USB1314) These connectors are for USB 2.0 ports. Connect the USB module cable to any of these connectors, then install the module to a slot opening at the back of the system chassis. These USB connectors comply with USB 2.0 specification that supports up to 48 MBps connection speed.

Never connect a 1394 cable to the USB connectors. Doing so will damage the motherboard! You can connect the front panel USB cable to the ASUS Q-Connector (USB) first, and then install the Q-Connector (USB) to the USB connector onboard if your chassis supports front panel USB ports.



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