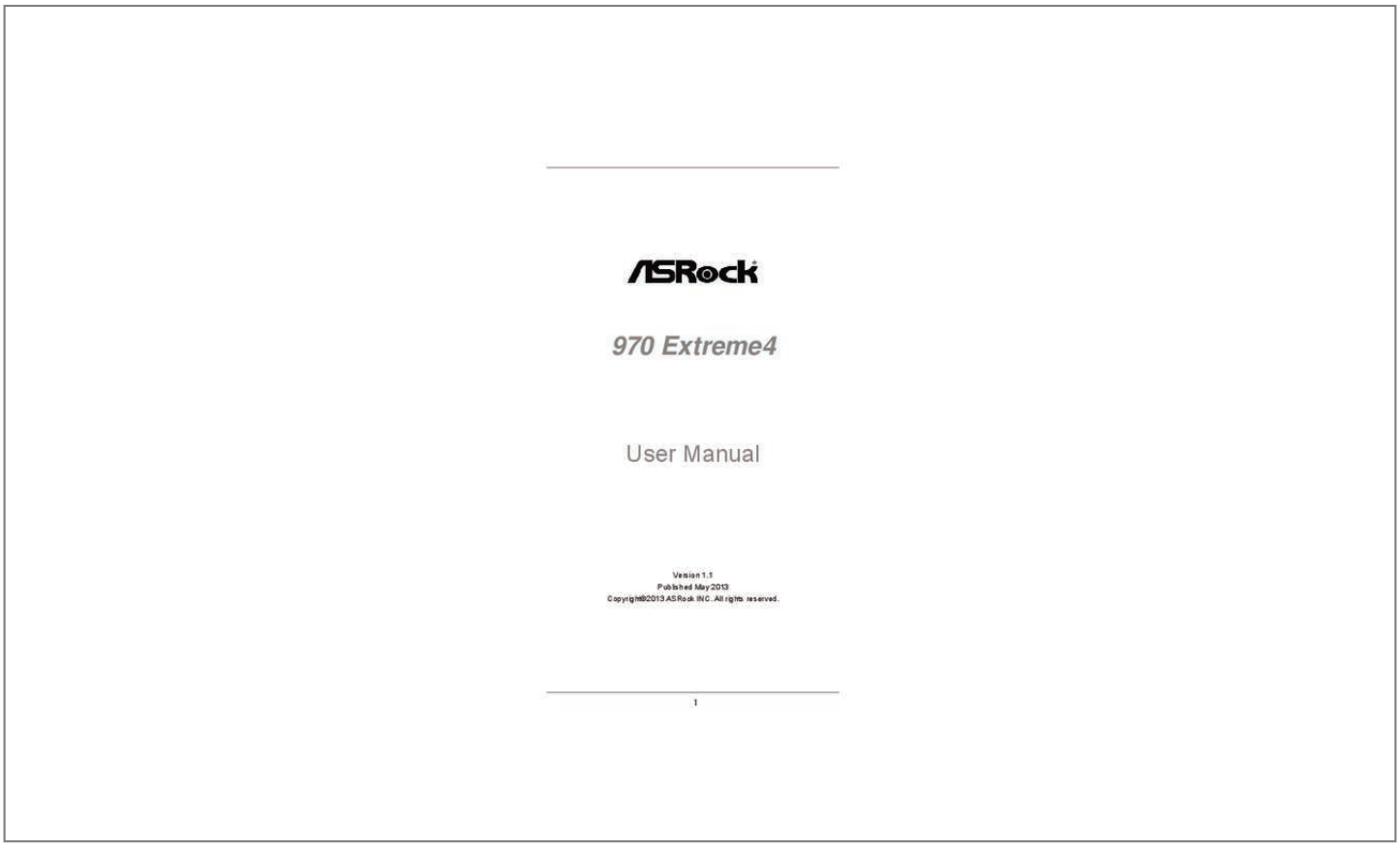

Manual abstract:

In no event shall ASRock, its directors, of f cers, employees, or agents be liable for any indirect, special, incidental, or consequential damages (including damages for loss of prof ts, loss of business, loss of data, interruption of business and the like), even if ASRock has been advised of the possibility of such damages arising from any defect or error in the manual or product. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. CALIFORNIA, USA ONLY The Lithium battery adopted on this motherboard contains Perchlorate, a toxic substance controlled in Perchlorate Best Management Practices (BMP) regulations passed by the California Legislature. When you discard the Lithium battery in California, USA, please follow the related regulations in advance. "Perchlorate Material-special handling may apply, see www.dtsc.ca.gov/hazardouswaste/perchlorate" ASRock Website: http://www.asrock.
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. 67 4 1. Introduction Thank you for purchasing ASRock 970 Extreme4 motherboard, a reliable motherboard produced under ASRock's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock's commitment to quality and endurance. In this manual, chapter 1 and 2 contain introduction of the motherboard and stepby-step guide to the hardware installation.
Chapter 3 and 4 contain the conf guration guide to BIOS setup and information of the Support CD. Because the motherboard specif cations and the BIOS software might be updated, the content of this manual will be subject to change without notice. In case any modi f cations of this manual occur , the updated version will be available on ASRock website without further notice. You may f nd the latest VGA cards and CPU support lists on ASRock website as well. ASRock website http://www.asrock.com If you require technical support related to this motherboard, please visit our website for specif c information about the model you are using. www.asrock.com/support/index.

asp 1.1 Package Contents ASRock 970 Extreme4 Motherboard (ATX Form Factor: 12.0-in x 9.6-in, 30.5 cm x 24.4 cm) ASRock 970 Extreme4 Quick Installation Guide ASRock 970 Extreme4 Support CD 1 x ASRock SLI_Bridge_2S Card 4 x Serial ATA (SATA) Data Cables (Optional) 1 x 3.5mm Audio Cable (Optional) 1 x I/O Panel Shield ASRock Reminds You... To get better performance in Windows ® 7 / 7 64-bit / V istaTM / VistaTM 64 bit, it is recommended to set the BIOS option in Storage Con f guration to AHCI mode.
For the BIOS setup, please refer to the "User Manual" in our support CD for details. 5 1.2 Specifications Platform - ATX Form Factor: 12.0-in x 9.6-in, 30. 5 cm x 24.4 cm - All Solid Capacitor design (100% Japan-made high-quality Conductive Polymer Capacitors) - Support for Socket AM3+ processors - Support for Socket AM3 processors: AMD PhenomTM II X6 / X4 / X3 / X2 (except 920 / 940) / Athlon II X4 / X3 / X2 / Sempron processors - Supports 8-Core CPU - Supports UCC feature (Unlock CPU Core) (see CAUTION 1) - V4 + 1 Power Phase Design - Supports CPU up to 140W - Supports AMD's Cool 'n' QuietTM Technology - FSB 2600 MHz (5.2 GT/s) - Supports Untied Overclocking Technology (see CAUTION 2) - Supports Hyper-Transport 3.0 (HT 3.0) Technology - Northbridge: AMD 970 - Southbridge: AMD SB950 - Dual Channel DDR3 Memory Technology (see CAUTION 3) - 4 x DDR3 DIMM slots - Support DDR3 2100(OC)/1866(OC)/1800(OC)/1600(OC)/ 1333/1066/800 non-ECC, un-buffered memory (see CAUTION 4) - Max.
capacity of system memory: 32GB (see CAUTION 5) - 3 x PCI Express 2.0 x16 slot (PCIE2/PCIE4: single at x16 (PCIE2) / x8 (PCIE4), or dual at x8 (PCIE2) / x8 (PCIE4); PCIE5: x4 mode) - 2 x PCI Express 2.0 x1 slots - 2 x PCI slots - Supports AMDTM Quad CrossFireXTM, 3-Way CrossFireXTM and CrossFireXTM - Supports NVIDIA® SLITM - 7.1 CH HD Audio with Content Protection (Realtek ALC892 Audio Codec) - Premium Blu-ray audio support - PCIE x1 Gigabit LAN 10/100/1000 Mb/s - Realtek RTL8111E - Supports Wake-On-LAN - Supports LAN Cable Detection CPU Chipset Memory Expansion Slot Audio LAN 6 Rear Panel I/O SATA3 USB 3.0 Connector Smart Switch BIOS Feature - Supports Energy Eff cient Ethernet 802.3az - Supports PXE I/O Panel - 1 x PS/2 Mouse Port - 1 x PS/2 Keyboard Port - 1 x Coaxial SPDIF Out Port - 1 x Optical SPDIF Out Port - 4 x Ready-to-Use USB 2.0 Ports - 2 x Ready-to-Use USB 3.0 Ports - 1 x eSATA3 Connector - 1 x RJ-45 LAN Port with LED (ACT/LINK LED and SPEED LED) - 1 x IEEE 1394 Port - 1 x Clear CMOS Switch with LED - HD Audio Jack: Side Speaker/Rear Speaker/Central/Bass/ Line in/Front Speaker/Microphone (see CAUTION 6) - 5 x SATA3 6.0 Gb/s connectors by AMD SB950, support RAID(RAID 0, RAID 1, RAID 0+1, JBOD and RAID 5), NCQ, AHCI and "Hot Plug" functions - 2 x Rear USB 3.

0 ports by ASMedia ASM1042, support USB 1.

0/2.0/3.0 up to 5Gb/s - 1 x Front USB 3.0 header (supports 2 USB 3.0 ports) by ASMedia ASM1042, supports USB 1.0/2.0/3.0 up to 5Gb/s - 5 x SATA3 6.0Gb/s connectors - 1 x IR header - 1 x CIR header - 1 x COM port header - 1 x IEEE 1394 header - 1 x HDMI_SPDIF header - 1 x Power LED header - CPU/Chassis/Power FAN connector - 24 pin ATX power connector - 8 pin 12V power connector - Front panel audio connector - 3 x USB 2.0 headers (support 6 USB 2.

0 ports) - 1 x USB 3.0 header (supports 2 USB 3.0 ports) - 1 x Dr. Debug (7-Segment Debug LED) - 1 x Clear CMOS Switch with LED - 1 x Power Switch with LED - 1 x Reset Switch with LED - 32Mb AMI UEFI Legal BIOS with GUI support - Supports "Plug and Play" 7 BIOS Feature Support CD Unique Feature Hardware Monitor OS Certifications - 32Mb AMI UEFI Legal BIOS with GUI support - Supports "Plug and Play" - ACPI 1.1 Compliance Wake Up Events - Supports jumperfree - SMBIOS 2.

3.1 Support - CPU, VCCM, NB, SB Voltage Multi-adjustment - Drivers, Utilities, AntiVirus Software (Trial Version), CyberLink MediaEspresso 6.5 Trial - ASRock Extreme Tuning Utility (AXTU) (see CAUTION 8) - ASRock Instant Boot - ASRock Instant Flash (see CAUTION 9) - ASRock APP Charger (see CAUTION 10) - ASRock XFast USB (see CAUTION 11) - ASRock On/Off Play Technology (see CAUTION 12) - Hybrid Booster: - CPU Frequency Stepless Control (see CAUTION 13) - ASRt entering operating systems first like MS-DOS or Windows®. With this utility, you can press <F6> key during the POST or press <F2> key to BIOS setup menu to access ASRock Instant Flash. Just launch this tool and save the new BIOS file to your USB flash drive, floppy disk or hard drive, then you can update your BIOS only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system. If you desire a faster, less restricted way of charging your Apple devices, such as iPhone/iPod/iPad Touch, ASRock has prepared a wonderful solution for you - ASRock APP Charger. Simply installing the APP Charger driver, it makes your iPhone charged much quickly from your computer and up to 40% faster than before. ASRock APP Charger allows you to quickly charge many Apple devices simultaneously and even supports continuous charging when your PC enters into Standby mode (S1), Suspend to RAM (S3), hibernation mode (S4) or power off (S5). With APP Charger driver installed, you can easily enjoy the marvelous charging experience than ever. ASRock website: http://www.asrock.com/Feature/AppCharger/index.asp ASRock XFast USB can boost USB storage device performance. The performance may depend on the property of the device.

ASRock On/Off Play Technology allows users to enjoy the great audio experience from the portable audio devices, such like MP3 player or mobile phone to your PC, even when the PC is turned off (or in ACPI S5 mode)! This motherboard also provides a free 3.5mm audio cable (optional) that ensures users the most convenient computing environment. Although this motherboard offers stepless control, it is not recommended to perform over-clocking. Frequencies other than the recommended CPU bus frequencies may cause the instability of the system or damage the CPU. While CPU overheat is detected, the system will automatically shutdown. Before you resume the system, please check if the CPU fan on the motherboard functions properly and unplug the power cord, then plug it back again. To improve heat dissipation, remember to spray thermal grease between the CPU and the heatsink when you install the PC system. 10 15. EuP, stands for Energy Using Product, was a provision regulated by European Union to define the power consumption for the completed system. According to EuP, the total AC power of the completed system shall be under 1.

00W in off mode condition. To meet EuP standard, an EuP ready motherboard and an EuP ready power supply are required. According to Intel's suggestion, the EuP ready power supply must meet the standard of 5v standby power efficiency is higher than 50% under 100 mA current consumption. For EuP ready power supply selection, we recommend you checking with the power supply manufacturer for more details. 11 1.

3 Motherboard Layout 1 24.4cm (9.6-in) PS2 Keyboard USB 3.0 T: USB4 B: USB5 2 3 4 5 6 7 8 PS2 Mouse PWR_FAN1 CPU_FAN2 CPU_FAN1 Support 8-Core CPU LAN PHY AM3+ 140W CPU DDR3_A2 (64 bit, 240-pin module) DDR3_A1 (64 bit, 240-pin module) USB 2.0 T: USB0 B: USB1 DDR3_B1 (64 bit, 240-pin module) DDR3_B2 (64 bit, 240-pin module) FSB800 FSB800 CHA_FAN1 30.

5cm (12.0-in) DDR3 2000+ USB 2.0 T: USB2 B: USB3 ErP/EuP Ready USB 3.0 HD_AUDIO1 42 41 40 AUDIO CODEC PCIE1 AMD 970 Chipset PCIE2 RoHS 1 USB_12_13 Coaxial SPDIF Optical SPDIF Clr CMOS RJ-45 LAN ATX12V1 SOCKET AM3b 9 10 IEEE 1394 eSATA3 Bottom: CTR BASS Bottom: MIC IN Top: SIDE SPK Top: LINE IN Center: REAR SPK Center: FRONT 11 12 39 38 37 36 Designed in Taipei Super I/O PCI1 SATA3 6Gb/s SATA3_4_5 13 14 15 970 Extreme4 PCIE3 CMOS BATTERY PCIE4 AMD SB950 Chipset SATA3_2_3 SATA3_1 16 PCI2 32Mb BIOS X FAST USB Front USB 3.0 1394a 1 PLED1 35 34 Dr. Debug 17 18 19 PCIE5 COM1 HDMI_SPDIF1 IR1 USB_10_11 USB_6_7 USB_8_9 1 FRONT_1394 PWRBTN1 RSTBTN1 PANEL 1 PLED PWRBTN CLRCMOS1 1 1 SPEAKER1 1 1 1 1 CIR1 CHA_FAN3 CHA_FAN2 1 1 1 HDLED RESET 1 33 32 31 30 29 28 27 26 25 24 23 22 21 20 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 ATX 12V Power Connector (ATX12V1) Power Fan Connector (PWR_FAN1) CPU Fan Connector (CPU_FAN2) CPU Fan Connector (CPU_FAN1) AM3+ CPU Socket CPU Heatsink Retention Module 2 x 240-pin DDR3 DIMM Slots (Dual Channel A: DDR3_A1, DDR3_B1; Blue) 2 x 240-pin DDR3 DIMM Slots (Dual Channel B: DDR3_A2, DDR3_B2; White) Chassis Fan Connector (CHA_FAN1) ATX Power Connector (ATXPWR1) USB 3.0 Header (USB_12_13, Blue) Northbridge Controller Southbridge Controller SATA3 Connector (SATA3_4_5, White) SATA3 Connector (SATA3_2_3, White) SATA3 Connector (SATA3_1, White) Dr. Debug (LED) Power LED Header (PLED1) Clear CMOS Jumper (CLRCMOS1) Chassis Speaker Header (SPEAKER 1, White) System Panel Header (PANEL1, White) Reset Switch (RSTBTN) 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 Power Switch (PWRBTN) Front Panel IEEE 1394 Header (FRONT_1394, White) Chassis Fan Connector (CHA_FAN2) Chassis Fan Connector (CHA_FAN3) USB 2.0 Header (USB_6_7, Blue) Consumer Infrared Module Header (CIR1) USB 2.0 Header (USB_8_9, Blue) USB 2.

0 Header (USB_10_11, Blue) COM Port Header (COM1) Infrared Module Header (IR1) HDMI_SPDIF Header (HDMI_SPDIF1, White) PCI Express 2.0 x16 Slot (PCIE5; Blue) SPI Flash Memory (32Mb) PCI Slot (PCI2) PCI Express 2.0 x16 Slot (PCIE4; Blue) PCI Express 2.0 x1 Slot (PCIE3; White) PCI Slot (PCI1) PCI Express 2.0 x16 Slot (PCIE2; Blue) PCI Express 2.0 x1 Slot (PCIE1; White) Front Panel Audio Header (HD_AUDIO1, White) 12 1.

*4 I/O Panel 1 2 3 4 5 6 17 16 15 14 13 12 11 10 7 8 9 1 *2 3 4 5 6 7 ** 8 9 PS/2 Mouse Port (Green) LAN RJ-45 Port USB 2.0 Ports (USB23) Side Speaker (Gray) Rear Speaker (Black) Central / Bass (Orange) Line In (Light Blue) Front Speaker (Lime) Microphone (Pink) 10 11 *** 12 13 14 15 16 17 USB 3.0 Port (USB45) IEEE 1394 Port (IEEE 1394) eSATA3 Connector USB 2.0 Ports (USB01) Clear CMOS Switch (CLRCBTN) Optical SPDIF Out Port Coaxial SPDIF Out Port PS/2 Keyboard Port (Purple) * There are two LED next to the LAN port.*

*Please refer to the table below for the LAN port LED indications. LAN Port LED Indications Activity/Link LED Status Description Status SPEED LED Description ACT/LINK SPEED LED LED Off No Link Blinking Data Activity On Link Off Orange Green 10Mbps connection 100Mbps connection 1Gbps connection LAN Port ** If you use 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. TABLE for Audio Output Connection Audio Output Channels Front Speaker Rear Speaker (No. 8) (No. 5) 2 V -4 V V 6 V V 8 V V Central / Bass (No. 6) -- --V -VV Side Speaker (No. 7) -- 13 To enable Multi-Streaming function, you need to connect a front panel audio cable to the front panel audio header. After restarting your computer, you will f nd "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 Rear Speaker, Central/Bass, and Front Speaker, or select "Realtek HDA Audio 2nd output" to use front panel audio. *** eSATA3 connector supports SATA Gen3 in cable 1M. 14 2. Installation This is an ATX form factor (12.0-in x 9.6-in, 30.5 cm x 24.4 cm) motherboard. Before you install the motherboard, study the conf guration of your chassis to ensure that the motherboard f ts into it. Pre-installation Precautions Take note of the following precautions before you install motherboard components or change any motherboard settings.*

Before you install or remove any component, ensure that the power is switched of f or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components. 1. 2. 3. 4. 5. Unplug the power cord from the wall socket before touching any component. To avoid damaging the motherboard components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before you handle components.

Hold components by the edges and do not touch the ICs. Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that comes with the component. When placing screws into the screw holes to secure the motherboard to the chassis, please do not over-tighten the screws! Doing so may damage the motherboard. 15 2.1 CPU Installation Step 1.

Step 2. Step 3. Unlock the socket by lifting the lever up to a 90 angle. Position the CPU directly above the socket such that the CPU corner with the golden triangle matches the socket corner with a small triangle. Carefully insert the CPU into the socket until it f ts in place.

The CPU f ts only in one correct orientation. DO NOT force the CPU into the socket to avoid bending of the pins. o Step 4. When the CPU is in place, press it f rmly on the socket while you push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked. Lever 90° Up CPU Golden Triangle Socker Corner Small Triangle STEP 1: Lift Up The Socket Lever STEP 2 / STEP 3: STEP 4: Match The CPU Golden Triangle Push Down And Lock To The Socket Corner Small The Socket Lever Triangle 2.2 Installation of CPU Fan and Heatsink After you install the CPU into this motherboard, it is necessary to install a larger heatsink and cooling fan to dissipate heat. You also need to spray thermal grease between the CPU and the heatsink to improve heat dissipation. Make sure that the CPU and the heatsink are securely fastened and in good contact with each other . Then connect the CPU fan to the CPU FAN connector (CPU_FAN1, see Page 12, No.

4 or CPU_F AN2, see Page 12, No. 3). For proper installation, please kindly refer to the instruction manuals of the CPU fan and the heatsink. 16 2.3 Installation of Memory Modules (DIMM) This motherboard provides four 240-pin DDR3 (Double Data Rate 3) DIMM slots, and supports Dual Channel Memory Technology. For dual channel conf guration, you always need to install identical (the same brand, speed, size and chip-type) DDR3 DIMM pair in the slots of the same color . In other words, you have to install identical DDR3 DIMM pair in Dual Channel A (DDR3_A1 and DDR3_B1; Blue slots; see p.12 No.7) or identical DDR3 DIMM pair in Dual Channel B (DDR3_ A2 and DDR3_B2; White slots; see p.12 No.

8), so that Dual Channel Memory Technology can be activated. This motherboard also allows you to install four DDR3 DIMMs for dual channel con f guration, and please install identical DDR3 DIMMs in all four slots. You may refer to the Dual Channel Memory Conf guration Table below. Dual Channel Memory Configurations DDR3_A1 (Blue Slot) Populated Populated DDR3_A2 (White Slot) Populated Populated DDR3_B1 (Blue Slot) Populated Populated DDR3_B2 (White Slot) Populated Populated (1) (2) (3) * For the conf guration (3), please install identical DDR3 DIMMs in all four slots. 1.*

2. Please install the memory module into the white slot (DDR3_A2 and DDR3_B2) for the f rst priority. If you want to install two memory modules, for optimal compatibility and reliability, it is recommended to install them in the slots of the same color. In other words, install them either in the set of blue slots (DDR3_A1 and DDR3_B1), or in the set of white slots (DDR3_ A2 and DDR3_B2). If only one memory module or three memory modules are installed in the DDR3 DIMM slots on this motherboard, it is unable to activate the Dual Channel Memory Technology.

If a pair of memory modules is NOT installed in the same Dual Channel, for example, installing a pair of memory modules in DDR3_A1 and DDR3_A2, it is unable to activate the Dual Channel Memory Technology . It is not allowed to install a DDR or DDR2 memory module into DDR3 slot; otherwise, this motherboard and DIMM may be damaged. If you adopt DDR3 2000/1866/1800/1600 memory modules on this motherboard, it is recommended to install them on DDR3_A2 and DDR3_B2 slots. 3. 4. 5. 6. 17 Installing a DIMM Please make sure to disconnect power supply before adding or removing DIMMs or the system components. Step 1. Step 2.

Unlock a DIMM slot by pressing the retaining clips outward. Align a DIMM on the slot such that the notch on the DIMM matches the break on the slot. The DIMM only f ts 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. Step 3. Firmly insert the DIMM into the slot until the retaining clips at both ends fully snap back in place and the DIMM is properly seated. 18 2.4 Expansion Slots (PCI and PCI Express Slots) There are 2 PCI slots and 5 PCI Express slots on this motherboard. PCI Slots: PCI slots are used to install expansion cards that have the 32-bit PCI interface. PCIE Slots: PCIE1 / PCIE3 (PCIE x1 slot; White) is used for PCI Express cards with x1 lane width cards, such as Gigabit LAN card and SATA2 card.

PCIE2 / PCIE4 (PCIE x16 slot; Blue) is used for PCI Express x16 lane width graphics cards, or used to install PCI Express graphics cards to support SLITM and CrossFireXTM function. PCIE5 (PCIE x16 slot; Blue) is used for PCI Express x4 lane width cards, or used to install PCI Express graphics cards to support 3-Way CrossFireXTM function. 1. 2. In single VGA card mode, it is recommended to install a PCI Express x16 graphics card on PCIE2 slot.

In CrossFireXTM or SLITM mode, please install PCI Express x16 graphics cards on PCIE2 and PCIE4 slots. Therefore, both these two slots will work at x8 bandwidth." In 3-Way CrossFireXTM mode, please install PCI Express x16 graphics cards on PCIE2, PCIE4 and PCIE5 slots. Therefore, PCIE2 and PCIE4 slots will work at x8 bandwidth while PCIE5 slot will work at x4 bandwidth. Please connect a chassis fan to motherboard chassis fan connector (CHA_FAN1, CHA_FAN2 or CHA_FAN3) when using multiple graphics cards for better thermal environment.

3. 4. Installing an expansion card Step 1. Before installing the 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. Remove the system unit cover (if your motherboard is already installed in a chassis). Remove the bracket facing the slot that you intend to use. Keep the screws for later use. Align the card connector with the slot and press f rmly until the card is completely seated on the slot. Fasten the card to the chassis with screws.

Replace the system cover. Step 2. Step 3. Step 4. Step 5. Step 6. 19 2.5 SLITM Operation Guide This motherboard supports NVIDIA ® SLITM technology (Scalable Link Interface) that allows you to install up to three identical PCI Express x16 graphics cards. Currently , NVIDIA® SLITM technology supports Windows ® XP / XP 64-bit / V istaTM / VistaTM 64bit / 7 / 7 64-bit OS. Please follow the installation procedures in this section.

Requirements 1. 2. For SLITM technology, you should have two identical SLITM-ready graphics cards that are NVIDIA® certif ed. Make sure that your graphics card driver supports NVIDIA ® SLITM technology. Download the driver from NVIDIA® website (www.

nvidia.com). Make sure that your power supply unit (PSU) can provide at least the minimum power required by your system. It is recommended to use NVIDIA ® certif ed PSU. Please refer to NVIDIA ® website for details.

3. 2.5.1 Graphics Card Setup 2.5.1.1 Installing Two SLITM-Ready Graphics Cards Step 1. Install the identical SLI TM-ready graphics cards that are NVIDIA ® certif ed because different types of graphics cards will not work together properly . (Even the GPU chips version shall be the same.) Insert one graphics card into PCIE2 slot and the other graphics card to PCIE4 slot.

Make sure that the cards are properly seated on the slots. Step2. If required, connect the auxiliary power source to the PCI Express graphics cards. 20 Step3. Align and insert ASRock SLI_Bridge_2S Card to the gold f ngers on each graphics card. Make sure ASRock SLI_Bridge_2S Card is f rmly in place. ASRock SLI_Bridge_2S Card Step4. Connect a VGA cable or a DVI cable to the monitor connector or the DVI connector of the graphics card that is inserted to PCIE2 slot. 2.5.

2 Driver Installation and Setup Install the graphics card drivers to your system. After that, you can enable the MultiGraphics Processing Unit (GPU) feature in the NVIDIA® nView system tray utility. Please follow the procedures below to enable the multi-GPU feature. For Windows® XP / XP 64-bit OS: A. Double-click NVIDIA Settings icon on your Windows® taskbar.

B. From the pop-up menu, select Set SLI and PhysX configuration. In Set PhysX GPU acceleration item, please select Enabled. In Select an SLI configuration item, please select Enable SLI. And click Apply.

C. Reboot your system. D. You can freely enjoy the benef t of SLITM feature. 21 For Windows® VistaTM / VistaTM 64-bit / 7 / 7 64-bit OS: A. Click the Start icon on your Windows taskbar. B. From the pop-up menu, select All Programs, and then click NVIDIA Corporation. C. Select NVIDIA Control Panel tab.

D. Select Control Panel tab. E. From the pop-up menu, select Set SLI and PhysX configuration. In Set PhysX GPU acceleration item, please select Enabled. In Select an SLI configuration item, please select Enable SLI. And click Apply. F. Reboot your system. G.

*You can freely enjoy the benef t of SLITM feature. * SLITM appearing here is a registered trademark of NVIDIA® Technologies Inc., and is used only for identif cation or explanation and to the owners' benef t, without intent to infringe. 22 2.6 CrossFireXTM, 3-Way CrossFireXTM and Quad CrossFireXTM Operation Guide This motherboard supports CrossFireX TM , 3-way CrossFireX TM and Quad CrossFireX TM feature.*

CrossFireX TM technology offers the most advantageous means available of combining multiple high performance Graphics Processing Units (GPU) in a single PC. Combining a range of dif ferent operating modes with intelligent software design and an innovative interconnect mechanism, CrossFireX TM enables the highest possible level of performance and image quality in any 3D application. Currently CrossFireXTM feature is supported with Windows® XP with Service Pack 2 / VistaTM / 7 OS. 3-way CrossFireX TM and Quad CrossFireXTM feature are supported with Windows ® VistaTM / 7 OS only . Please check AMD website for AMDTM CrossFireXTM driver updates.

1. If a customer incorrectly configures their system they will not see the performance benef ts of CrossFireX TM. All three CrossFireX TM components, a CrossFireXTM Ready graphics card, a CrossFireXTM Ready motherboard and a CrossFireXTM Edition co-processor graphics card, must be installed correctly to benef t from the CrossFireXTM multi-GPU platform. 2. If you pair a 12-pipe CrossFireXTM Edition card with a 16-pipe card, both cards will operate as 12-pipe cards while in CrossFireXTM mode. 2.6.1 Graphics Card Setup 2.6.1.

1 Installing Two CrossFireXTM-Ready Graphics Cards Different CrossFireXTM cards may require dif ferent methods to enable CrossFireXTM feature. In the following procedures, we use Radeon HD 3870 as the example graphics card. For other CrossFireX TM cards that AMDTM has released or will release in the future, please refer to AMDTM graphics card manuals for detailed installation guide.

Step 1. Insert one Radeon graphics card into PCIE2 slot and the other Radeon graphics card to PCIE4 slot. Make sure that the cards are properly seated on the slots. 23 Step 2. Connect two Radeon graphics cards by installing CrossFire Bridge on CrossFire Bridge Interconnects on the top of Radeon graphics cards. (CrossFire Bridge is provided with the graphics card you purchase, not bundled with this motherboard. Please refer to your graphics card vendor for details.

) CrossFire Bridge or Step 3. Connect the DVI monitor cable to the DVI connector on the Radeon graphics card on PCIE2 slot. (You may use the DVI to D-Sub adapter to convert the DVI connector to D-Sub interface, and then connect the D-Sub monitor cable to the DVI to D-Sub adapter.) 24 2.6.

1.2 Installing Three CrossFireXTM-Ready Graphics Cards Step 1. Install one Radeon graphics card to PCIE2 slot. For the proper installation procedures, please refer to section "Expansion Slots". Step 2.

Install one Radeon graphics card to PCIE4 slot. For the proper installation procedures, please refer to section "Expansion Slots". Step 3. Install one Radeon graphics card to PCIE5 slot. For the proper installation procedures, please refer to section "Expansion Slots". Step 4. Use one CrossFire TM Bridge to connect Radeon graphics cards on PCIE2 and PCIE4 slots, and use the other CrossFire TM Bridge to connect Radeon graphics cards on PCIE4 and PCIE5 slots. (CrossFire TM Bridge is provided with the graphics card you purchase, not bundled with this motherboard. Please refer to your graphics card vendor for details.) 25 CrossFireTM Bridge Step 5.

Connect the DVI monitor cable to the DVI connector on the Radeon graphics card on PCIE2 slot. (You may use the DVI to D-Sub adapter to convert the DVI connector to D-Sub interface, and then connect the D-Sub monitor cable to the DVI to D-Sub adapter.) 26 2.6.2 Driver Installation and Setup Step 1. Step 2. Power on your computer and boot into OS. Remove the AMDTM driver if you have any VGA driver installed in your system. The Catalyst Uninstaller is an optional download. We recommend using this utility to uninstall any previously installed Catalyst drivers prior to installation.

Please check AMD website for AMDTM driver updates. Step 3. Install the required drivers to your system. For Windows® XP OS: A. AMDTM recommends Windows® XP Service Pack 2 or higher to be installed (If you have Windows® XP Service Pack 2 or higher installed in your system, there is no need to download it again): http://www.

microsoft.com/windowsxp/sp2/default.mspx B. You must have Microsoft .NET Framework installed prior to downloading and installing the CATALYST Control Center.

Please check Microsoft website for details. For Windows® 7 / VistaTM OS: Install the CATALYST Control Center. Please check AMD website for details. Restart your computer. Install the VGA card drivers to your system, and restart your computer. Then you will f nd "ATI Catalyst Control Center" on your Windows® taskbar. Step 4. Step 5. ATI Catalyst Control Center Step 6. Double-click "ATI Catalyst Control Center".

*Click "V iew", select "CrossFireXTM", and then check the item "Enable CrossFireX TM". Select "2 GPUs" and click "Apply" (if you install two Radeon graphics cards). Select "3 GPUs" and click "OK" (if you install three Radeon graphics cards). 27 Although you have selected the option "Enable CrossFireTM", the CrossFireXTM function may not work actually. Your computer will automatically reboot. After restarting your computer, please conf rm whether the option "Enable CrossFireTM" in "ATI Catalyst Control Center" is selected or not; if not, please select it again, and then you are able to enjoy the bene f t of CrossFireXTM feature. Step 7. You can freely enjoy the bene f t of CrossFireX TM, 3-Way CrossFireXTM or Quad CrossFireXTM feature. * CrossFireXTM appearing here is a registered trademark of AMDTM Technologies Inc., and is used only for identif cation or explanation and to the owners' benef t, without intent to infringe.*

** For further information of AMDTM CrossFireXTM technology, please check AMD website for updates and details. 2.7 Surround Display Feature This motherboard supports Surround Display upgrade. With the external add-on PCI Express VGA cards, you can easily enjoy the benef ts of Surround Display feature. For the detailed instruction, please refer to the document at the following path in the Support CD: .*

.\ Surround Display Information 28 2.8 ASRock Smart Remote Installation Guide ASRock Smart Remote is only used for ASRock motherboard with CIR header . Please refer to below procedures for the quick installation and usage of ASRock Smart Remote. Step1.

Find the CIR header located next to the USB 2.0 header on ASRock motherboard. Connect the front USB cable to the USB 2.0 header (as below, pin 1-5) and the CIR header. Please make sure the wire assignments and the pin assignments are matched correctly. USB_PWR PP+ GND DUMMY USB 2.0 header (9-pin, blue) CIR header (4-pin, white) Step2. GND IRTX IRRX ATX+5VSB Step3. Install Multi-Angle CIR Receiver to the front USB port. If Multi-Angle CIR Receiver cannot successfully receive the infrared signals from MCE Remote Controller, please try to install it to the other front USB port.

3 CIR sensors in different angles 1. 2. Only one of the front USB port can support CIR function. When the CIR function is enabled, the other port will remain USB function. Multi-Angle CIR Receiver is used for front USB only . Please do not use the rear USB bracket to connect it on the rear panel. Multi-Angle CIR Receiver can receive the multi-direction infrared signals (top, down and front), which is compatible with most of the chassis on the market. The Multi-Angle CIR Receiver does not support Hot-Plug function. Please install it before you boot the system. 3.

** ASRock Smart Remote is only supported by some of ASRock motherboards. Please refer to ASRock website for the motherboard support list: http://www.asrock.com 29 2.9 Jumpers Setup The illustration shows how jumpers are setup.*

When the jumper cap is placed on pins, the jumper is "Short". If no jumper cap is placed on pins, the jumper is "Open". The illustration shows a 3-pin jumper whose pin1 and pin2 are "Short" when jumper cap is placed on these 2 pins. Jumper Setting Clear CMOS Jumper (CLRCMOS1) (see p.12, No. @@@@@@@@@@@@Do NOT place jumper caps over these headers and connectors. @@16) (SATA3_2_3: see p.12, No. 15) (SATA3_4_5: see p.12, No. @@@@@@@@@@29) (9-pin USB_10_11) (see p.12 No. 30) USB 3.0 Header (19-pin USB_12_13) (see p.12 No.

@@@@@@@@@@42) 32 1. @@@@2. @@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 HD audio panel only. You don't need to connect them for AC'97 audio panel.

E. To activate the front mic. For Windows® XP / XP 64-bit OS: Select “Mixer”. Select “Recorder”. Then click “FrontMic”.
@@@@21) This header accommodates several system front panel functions. 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 conf gure 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 sys-tem is in S1 sleep state. The LED is off when the system is in S3/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. 33 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 assign-ments are matched correctly. Chassis Speaker Header (4-pin SPEAKER 1) (see p.12 No. 20) SPEAKER DUMMY +5V DUMMY 1 Please connect the chassis speaker to this header. Please connect the chassis power LED to this header to indicate system power status. The LED is on when the system is operating. The LED keeps blinking in S1 state. The LED is off in S3/S4 state or S5 state (power off). Please connect the fan cables to the fan connectors and match the black wire to the ground pin. CHA_FAN1/2/3 fan speed can be controlled through UEFI or AXTU.
Power LED Header (3-pin PLED1) (see p.12 No. 18) Chassis and Power Fan Connectors (4-pin CHA_FAN1) (see p.12 No. 9) GND +12V CHA_FAN_SPEED FAN_SPEED_CONTROL (3-pin CHA_FAN2) (see p.
12 No. 25) (3-pin CHA_FAN3) (see p.12 No. 26) GND CHA_FAN_SPEED +12V GND CHA_FAN_SPEED +12V (3-pin PWR_FAN1) (see p.12 No. 2) +12V GND PWR_FAN_SPEED CPU Fan Connectors (4-pin CPU_FAN1) (see p.12 No. 4) CPU_FAN_SPEED +12V GND FAN_SPEED_CONTROL 1 2 3 4 Please connect the CPU fan cable to the connector and match the black wire to the ground pin. 34 Though this motherboard provides 4-Pin CPU fan (Quiet Fan) support, the 3-Pin CPU fan still can work successfully even without the fan speed control function. If you plan to connect the 3-Pin CPU fan to the CPU fan connector on this motherboard, please connect it to Pin 1-3. Pin 1-3 Connected 3-Pin Fan Installation (3-pin CPU_FAN2) (see p.12 No. 3) +12V GND CPU_FAN_SPEED ATX Power Connector (24-pin ATXPWR1) (see p.12 No. 10) 12 24 Please connect an ATX power supply to this connector.

1 13 Though this motherboard provides 24-pin ATX power connector, it can still work if you adopt a traditional 20-pin ATX power supply. To use the 20-pin ATX power supply, please plug your power supply along with Pin 1 and Pin 13. 20-Pin ATX Power Supply Installation 12 24 1 13 ATX 12V Power Connector (8-pin ATX12V1) (see p.12 No. 1) 8 5 Please connect an ATX 12V power supply to this connector. 4 1 Though this motherboard provides 8-pin ATX 12V power connector, it can still work if you adopt a traditional 4-pin ATX 12V power supply. To use the 4-pin ATX power supply, please plug your power supply along with Pin 1 and Pin 5. 8 5 4-Pin ATX 12V Power Supply Installation 4 1 IEEE 1394 Header (9-pin FRONT_1394) (see p.12 No. 24) Besides one default IEEE 1394 port on the I/O panel, there is one IEEE 1394 header (FRONT_1394) on this motherboard.
This IEEE 1394 header can support one IEEE 1394 port. 35 Serial port Header (9-pin COM1) (see p.12 No.31) This COM1 header supports a serial port module. HDMI_SPDIF Header (2-pin HDMI_SPDIF1) (see p.
12 No. 33) HDMI_SPDIF header, providing SPDIF audio output to HDMI VGA card, allows the system to connect HDMI Digital TV/ projector/LCD devices. Please connect the HDMI_SPDIF connector of HDMI VGA card to this header. 2.11 Smart Switches This motherboard has three smart switches: power switch, reset switch and clear CMOS switch, allowing users to quickly turn on/off or reset the system or clear the CMOS values.
Power Switch (PWRBTN) (see p.12 No. 23) Power Switch is a smart switch, allowing users to quickly turn on/off the system. Reset Switch is a smart switch, allowing users to quickly reset the system. Clear CMOS Switch is a smart switch, allowing users to quickly clear the CMOS values Reset Switch (RSTBTN) (see p.12 No. 22) Clear CMOS Switch (CLRCBTN) (see p.13 No. 14) 36 2.12 Dr.

Debug Dr. Debug is used to provide code information, which makes troubleshooting even easier. Please see the diagrams below for reading the Dr. Debug codes. Status Code 0x00 0x01 0x02 0x03 0x04 0x05 0x06 0x07 0x08 0x09 0x0A 0x0B 0x0C – 0x0D 0x0E 0x0F 0x10 0x11 0x12 0x13 0x14 0x15 0x16 0x17 0x18 0x19 0x1A 0x1B 0x1C 0x1D – 0x2A 0x2B 0x2C 0x2D 0x2E 0x2F 0x30 0x31 0x32 0x33 0x34 0x35 0x36 Description Not used Power on. Reset type detection (soft/hard) AP initialization before microcode loading North Bridge initialization before microcode loading South Bridge initialization before microcode loading OEM initialization before microcode loading Microcode loading AP initialization after microcode loading North Bridge initialization after microcode loading South Bridge initialization after microcode loading OEM 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 CPU initialization (CPU module specif c) Pre-memory CPU initialization (CPU module specif c) Pre-memory CPU initialization (CPU module specif c) Pre-memory North Bridge initialization is started Pre-Memory North Bridge initialization (North Bridge module specif c) Pre-Memory North Bridge initialization (North Bridge module specif c) Pre-Memory North Bridge initialization (North Bridge module specif c) Pre-memory South Bridge initialization is started Pre-memory South Bridge initialization (South Bridge module specif c) Pre-memory South Bridge initialization (South Bridge module specif c) Pre-memory South Bridge initialization (South Bridge module specif c) OEM pre-memory initialization codes Memory initialization. Serial Presence Detect (SPD) data reading Memory initialization. Memory presence detection Memory initialization. Programming memory timing information Memory initialization. Conf guring memory Memory initialization (other) Reserved for ASL (see ASL Status Codes section below) Memory Installed CPU post-memory initialization is started CPU post-memory initialization.

Cache initialization CPU post-memory initialization. Application Processor(s) (AP) initialization CPU post-memory initialization. Boot Strap Processor (BSP) selection CPU post-memory initialization. System Management Mode (SMM) initialization 37 0x37 0x38 0x39 0x3A 0x3B 0x3C 0x3D 0x3E 0x3F-0x4E 0x4F 0x50 speed 0x51 0x52 0x53 0x54 0x55 0x56 0x57 0x58 0x59 0x5A 0x5B 0x5C-0x5F 0xE0 0xE1 0xE2 0xE3 0xE4-0xE7 0xE8 0xE9 0xEA 0xEB 0xEC-0xEF 0xF0 0xF1 0xF2 0xF3 0xF4 0xF5-0xF7 0xF8 0xF9 0xFA 0xFB – 0xFF 0x60 0X61 Post-Memory North Bridge initialization is started Post-Memory North Bridge initialization (North Bridge module specif c) Post-Memory North Bridge initialization (North Bridge module specif c) Post-Memory North Bridge initialization (North Bridge module specif c) Post-Memory South Bridge initialization is started Post-Memory South Bridge initialization (South Bridge module specif c) Post-Memory South Bridge initialization (South Bridge module specif c) Post-Memory South Bridge initialization (South Bridge module specif c) OEM post memory initialization codes DXE IPL is started Memory initialization error. Invalid memory type or incompatible memory Memory initialization error.

SPD reading has failed Memory initialization error. Invalid memory size or memory modules do not match Memory initialization error. No usable memory detected Unspecif ed 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 stared (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 f rmware (Auto recovery) Recovery condition triggered by user (Forced recovery) Recovery process started Recovery f rmware image is found Recovery f rmware image is loaded Reserved for future AMI progress codes Recovery PPI is not available Recovery capsule is not found Invalid recovery capsule Reserved for future AMI error codes DXE Core is started NVRAM initialization 38 0x62 0x63 0x64 0x65 0x66 0x67 0x68 0x69 0x6A 0x6B 0x6C 0x6D 0x6E 0x6F 0x70 0x71 0x72 0x73 0x74 0x75 0x76 0x77 0x78 0x79 0x7A – 0x7F 0x80 – 0x8F 0x90 0x91 0x92 0x93 0x94 0x95 0x96 0x97 0x98 0x99 0x9A 0x9B 0x9C 0x9D 0x9E – 0x9F 0xA0 0xA1 0xA2 0xA3 0xA4 0xA5 Installation of the South Bridge Runtime Services CPU DXE initialization is started CPU DXE initialization (CPU module specif c) CPU DXE initialization (CPU module specif c) CPU DXE initialization (CPU module specif c) CPU DXE initialization (CPU module specif c) PCI host bridge initialization North Bridge DXE initialization is started North Bridge DXE SMM initialization is started North Bridge DXE initialization (North Bridge module specif c) North Bridge DXE initialization (North Bridge module specif c) North Bridge DXE initialization (North Bridge module specif c) North Bridge DXE initialization (North Bridge module specif c) North Bridge DXE initialization (North Bridge module specif c) South Bridge DXE initialization is started South Bridge DXE SMM initialization is started South Bridge devices initialization South Bridge DXE Initialization (South Bridge module specif c) South Bridge DXE Initialization (South Bridge module specif c) South Bridge DXE Initialization (South Bridge module specif c) South Bridge DXE Initialization (South Bridge module specif c) South Bridge DXE Initialization (South Bridge module specif c) ACPI module initialization CSM initialization Reserved for future AMI DXE codes OEM DXE initialization 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 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 39 0xA6 0xA7 0xA8 0xA9 0xAA 0xAB 0xAC 0xAD 0xAE 0xAF 0xB0 0xB1 0xB2 0xB3 0xB4 0xB5 0xB6 0xB7 0xB8 – 0xBF 0xC0 – 0xCF 0xD0 0xD1 0xD2 0xD3 0xD4 0xD5 0xD6 0xD7 0xD8 0xD9 0xDA 0xDB 0xDC 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 Conf guration Reset (reset of NVRAM settings) Reserved for future AMI codes OEM BDS initialization codes CPU initialization error North Bridge initialization error South Bridge 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 40 2.13 Serial ATA3 (SATA3) Hard Disks Installation This motherboard adopts AMD SB950 chipset that supports Serial ATA3 (SATA3) hard disks and RAID (RAID 0, RAID 1, RAID 0+1, JBOD and RAID 5) functions.

You may install SATA3 hard disks on this motherboard for internal storage devices. This section will guide you to install the SATA3 hard disks. STEP 1: Install the SATA3 hard disks into the drive bays of your chassis. STEP 2: Connect the SATA power cable to the SATA3 hard disk. STEP 3: Connect one end of the SATA data cable to the motherboard's SATA3 connector. STEP 4: Connect the other end of the SATA data cable to the SATA3 hard disk. 2.14 Hot Plug and Hot Swap Functions for SATA3 HDDs This motherboard supports Hot Plug and Hot Swap functions for SA TA3 in RAID / AHCI mode. AMD SB950 chipset provides hardware support for Advanced Host controller Interface (AHCI), a new programming interface for SA TA host controllers developed thru a joint industry effort. NOTE What is Hot Plug Function? If the SATA3 HDDs are NOT set for RAID conf guration, it is called "Hot Plug" for the action to insert and remove the SA TA3 HDDs while the system is still power-on and in working condition.

However, please note that it cannot perform Hot Plug if the OS has been installed into the SATA3 HDD. What is Hot Swap Function? If SATA3 HDDs are built as RAID 1 or RAID 5 then it is called "Hot Swap" for the action to insert and remove the SA TA3 HDDs while the system is still power-on and in working condition.

*41 2.15 SATA3 HDD Hot Plug Feature and Operation Guide This motherboard supports Hot Plug feature for SATA3 HDD in RAID / AHCI mode. Please read below operation guide of Hot Plug feature carefully . Before you process the SATA3 HDD Hot Plug, please check below cable accessories from the motherboard gift box pack. A. 7-pin SATA data cable B. SATA power cable with SATA 15-pin power connector interface A. SATA data cable (Red) B. SATA power cable SATA 7-pin connector The SATA 15-pin power connector (Black) connect to SATA3 HDD 1x4-pin conventional power connector (White) connect to power supply Caution 1. Without SATA 15-pin power connector interface, the SATA3 Hot Plug cannot be processed. 2. Even some SATA3 HDDs provide both SATA 15-pin power connector and IDE 1x4-pin conventional power connector interfaces, the IDE 1x4-pin conventional power connector interface is def nitely not able to support Hot Plug and will cause the HDD damage and data loss. Points of attention, before you process the Hot Plug: 1. Below operation procedure is designed only for our motherboard, which supports SATA3 HDD Hot Plug. * The SATA3 Hot Plug feature might not be supported by the chipset because of its limitation, the SATA3 Hot Plug support information of our motherboard is indicated in the product spec on our website: www.asrock.com 2. Make sure your SATA3 HDD can support Hot Plug function from your dealer or HDD user manual.*

The SATA3 HDD, which cannot support Hot Plug function, will be damaged under the Hot Plug operation. 3. Please make sure the SATA3 driver is installed into system properly. The latest SATA3 driver is available on our support website: www.asrock.com 4. Make sure to use the SATA power cable & data cable, which are from our motherboard package. 5. Please follow below instructions step by step to reduce the risk of HDD crash or data loss. 42 How to Hot Plug a SATA3 HDD: Points of attention, before you process the Hot Plug: Please do follow below instruction sequence to process the Hot Plug, improper procedure will cause the SATA3 HDD damage and data loss.

Step 1 Please connect SATA power cable 1x4-pin Step 2 Connect SATA data cable to end (White) to the power supply 1x4-pin the motherboard's SATAII / SATA3 cable. connector. SATA power cable 1x4-pin power connector (White) Step 3 Connect SATA 15-pin power cable connector (Black) end to SATA3 HDD. Step 4 Connect SATA data cable to the SATA3 HDD. How to Hot Unplug a SATA3 HDD: Points of attention, before you process the Hot Unplug: Please do follow below instruction sequence to process the Hot Unplug, improper procedure will cause the SATA3 HDD damage and data loss. Step 1 Unplug SATA data cable from SATA3 HDD side. Step 2 Unplug SATA 15-pin power cable connector (Black) from SATA3 HDD side. 43 2.16 Driver Installation Guide To install the drivers to your system, please insert the support CD to your optical drive f rst. Then, the drivers compatible to your system can be auto-detected and listed on the support CD driver page.

Please follow the order from up to bottom side to install those required drivers. Therefore, the drivers you install can work properly. 2.17 Installing Windows® 7 / 7 64-bit / VistaTM / VistaTM 64-bit / XP / XP 64-bit With RAID Functions If you want to install Windows ® 7 / 7 64-bit / V istaTM / VistaTM 64-bit / XP / XP 64-bit on a RAID disk composed of 2 or more SA TA3 HDDs with RAID functions, please follow below procedures according to the OS you install. 2.

17.1 Installing Windows® XP / XP 64-bit With RAID Functions If you want to install Windows ® XP / XP 64-bit on a RAID disk composed of 2 or more SATA3 HDDs with RAID functions, please follow below steps. STEP 1: Set up UEFI. A. Enter UEFI SETUP UTILITY Advanced screen Storage Conf guration.

B. Set the "SATA Mode" option to [RAID]. STEP 2: Make a SATA3 Driver Diskette. (Please use USB floppy or floppy disk.) A. Insert the ASRock Support CD into your optical drive to boot your system. B. During POST at the beginning of system boot-up, press <F11> key, and then a window for boot devices selection appears. Please select CD-ROM as the boot device. C.

When you see the message on the screen, "Generate Serial ATA driver diskette [YN]?", press <Y>. D. Then you will see these messages, Please insert a diskette into the floppy drive. WARNING! Formatting the floppy diskette will lose ALL data in it! Start to format and copy files [YN]? Please insert a f oppy diskette into the f oppy drive, and press any key. E. The system will start to format the f oppy diskette and copy SATA3 drivers into the f oppy diskette. 44 STEP 3: Use "RAID Installation Guide" to set RAID configuration. Before you start to conf gure RAID function, you need to check the RAID installation guide in the Support CD for proper con f guration. Please refer to the BIOS RAID installation guide part of the document in the following path in the Support CD: ..

\ RAID Installation Guide STEP 4: Install Windows® XP / XP 64-bit OS on your system. After step 1, 2, 3, you can start to install Windows® XP / XP 64-bit OS on your system. At the beginning of Windows ® setup, press F6 to install a third-party RAID driver. When prompted, insert the SA TA3 driver diskette containing the AMD RAID driver. After reading the f oppy disk, the driver will be presented.

Select the driver to install according to the OS you install. 2.17.2 Installing Windows® 7 / 7 64-bit / VistaTM / VistaTM 64-bit With RAID Functions If you want to install Windows ® 7 / 7 64-bit / V istaTM / VistaTM 64-bit on a RAID disk composed of 2 or more SATA3 HDDs with RAID functions, please follow below steps. STEP 1: Set up UEFI.

A. Enter UEFI SETUP UTILITY Advanced screen Storage Conf guration. B. Set the "SATA Mode" option to [RAID]. STEP 2: Use "RAID Installation Guide" to set RAID configuration. Before you start to conf gure RAID function, you need to check the RAID installation guide in the Support CD for proper con f guration. Please refer to the BIOS RAID installation guide part of the document in the following path in the Support CD: .. \ RAID Installation Guide STEP 3: Make a SATA3 Driver Diskette. (Please use USB floppy or floppy disk.

) Make a SATA3 driver diskette by following section 2.17.1 step 2 on page 44. STEP 4: Install Windows® 7 / 7 64-bit / VistaTM / VistaTM 64-bit OS on your system. 45 2.18 Installing Windows® 7 / 7 64-bit / VistaTM / VistaTM 64-bit / XP / XP 64-bit Without RAID Functions If you want to install Windows ® 7 / 7 64-bit / V istaTM / VistaTM 64-bit / XP / XP 64-bit OS on your SA TA3 HDDs without RAID functions, please follow below procedures according to the OS you install. 2.18.1 Installing Windows® XP / XP 64-bit Without RAID Functions If you want to install Windows ® XP / XP 64-bit on your SA TA3 HDDs without RAID functions, please follow below steps. Using SATA3 HDDs with NCQ and Hot Plug functions (AHCI mode) STEP 1: Set up UEFI.

A.

Enter UEFI SETUP UTILITY Advanced screen Storage Conf guration. B. Set the “SATA Mode” option to [AHCI]. STEP 2: Make a SATA3 Driver Diskette. (Please use USB floppy or floppy disk.) Make a SATA3 driver diskette by following section 2.17.1 step 2 on page 44. STEP 3: Install Windows® XP / XP 64-bit OS on your system.

You can start to install Windows ® XP / XP 64-bit OS on your system. At the beginning of Windows ® setup, press F6 to install a third-party AHCI driver. When prompted, insert the SA TA3 driver diskette containing the AMD AHCI driver. After reading the f oppy disk, the driver will be presented. Select the driver to install according to the OS you install. Using SATA3 HDDs without NCQ and Hot Plug functions (IDE mode) STEP 1: Set up UEFI. A. Enter UEFI SETUP UTILITY Advanced screen Storage Conf guration. B. Set the “SATA Mode” option to [IDE].

STEP 2: Install Windows® XP / XP 64-bit OS on your system. 46 2.18.2 Installing Windows® 7 / 7 64-bit / VistaTM / VistaTM 64-bit Without RAID Functions If you want to install Windows ® 7 / 7 64-bit / V istaTM / VistaTM 64-bit on your SA TA3 HDDs without RAID functions, please follow below steps. Using SATA3 HDDs with NCQ and Hot Plug functions (AHCI mode) STEP 1: Set up UEFI. A. Enter UEFI SETUP UTILITY Advanced screen Storage Conf guration. B. Set the “SATA Mode” option to [AHCI]. STEP 2: Install Windows® 7 / 7 64-bit / VistaTM / VistaTM 64-bit OS on your system.

Using SATA3 HDDs without NCQ and Hot Plug functions (IDE mode) STEP 1: Set up UEFI. A. Enter UEFI SETUP UTILITY Advanced screen Storage Conf guration. B. Set the “SATA Mode” option to [IDE].

STEP 2: Install Windows® 7 / 7 64-bit / VistaTM / VistaTM 64-bit OS on your system. 2.19 Untied Overclocking Technology This motherboard supports Untied Overclocking Technology, which means during overclocking, FSB enjoys better margin due to f xed PCI / PCIE buses. Before you enable Untied Overclocking function, please enter “Overclock Mode” option of UEFI setup to set the selection from [Auto] to [Manual]. Therefore, CPU FSB is untied during overclocking, but PCI / PCIE buses are in the f xed mode so that FSB can operate under a more stable overclocking environment.

Please refer to the warning on page 8 for the possible overclocking risk before you apply Untied Overclocking Technology. 47 3. UEFI SETUP UTILITY 3.1 Introduction This section explains how to use the UEFI SETUP UTILITY to conf gure your system. The SPI Memory on the motherboard stores the UEFI SETUP UTILITY. You may run the UEFI SETUP UTILITY when you start up the computer . Please press <F2> or <Del>during the Power-On-Self-Test (POST) to enter the UEFI SETUP UTILITY, otherwise, 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.

3.1.1 UEFI Menu Bar The top of the screen has a menu bar with the following selections: Main To set up the system time/date information OC Tweaker To set up overclocking features Advanced To set up the advanced UEFI features H/W Monitor To display current hardware status Boot To set up the default system device to locate and load the Operating System Security To set up the security features Exit To exit the current screen or the UEFI SETUP UTILITY Use < > key or < > key to choose among the selections on the menu bar, and then press <Enter> to get into the sub screen. 48 3.1.2 Navigation Keys Please check the following table for the function description of each navigation key. Navigation Key(s) / / + / <Enter> <F1> <F9> <F10> <ESC> Function Description Moves cursor left or right to select Screens Moves cursor up or down to select items To change option for the selected items To bring up the selected screen To display the General Help Screen To load optimal default values for all the settings To save changes and exit the UEFI SETUP UTILITY To jump to the Exit Screen or exit the current screen 3.2 Main Screen When you enter the UEFI SETUP UTILITY, the Main screen will appear and display the system overview. System Time [Hour:Minute:Second] Use this item to specify the system time. System Date [Day Month/Date/Year] Use this item to specify the system date.

49 3.3 OC Tweaker Screen In the OC Tweaker screen, you can set up overclocking features. CPU Configuration Overclock Mode Use this to select Overclock Mode. Configuration options: [Auto] and [Manual]. The default value is [Auto].

Spread Spectrum This item should always be [Auto] for better system stability. ASRock UCC ASRock UCC (Unlock CPU Core) feature simpli f es AMD CPU activation. As long as a simple switch of the UEFI option “ASRock UCC”, you can unlock the extra CPU core to enjoy an instant performance boost. When UCC feature is enabled, the dual-core or triple-core CPU will boost to the quad-core CPU, and some CPU, including quad-core CPU, can also increase L3 cache size up to 6MB, which means you can enjoy the upgrade CPU performance with a better price. Please be noted that UCC feature is supported with AM3/AM3+ CPU only, and in addition, not every AM3/AM3+ CPU can support this function because some CPU’ s hidden core may be malfunctioned. CPU Active Core Control This allows you to adjust CPU Active Core Control feature. The conf guration options depend on the CPU core you adopt. The default value is [Disabled]. Processor Maximum Frequency It will display Processor Maximum Frequency for reference. North Bridge Maximum Frequency It will display North Bridge Maximum Frequency for reference. Processor Maximum Voltage It will display Processor Maximum Voltage for reference. 50 Multiplier/Voltage Change This item is set to [Auto] by default. If it is set to [Manual], you may adjust the value of Processor Frequency and Processor Voltage. However, it is recommended to keep the default value for system stability. HT Bus Speed This feature allows you selecting Hyper-T ransport bus speed.

Con f guration options: [Auto], [200MHz] to [2000MHz]. HT Bus Width This feature allows you selecting Hyper-Transport bus width. Conf guration options: [Auto], [8 Bit] and [16 Bit]. DRAM Configuration DRAM Frequency If [Auto] is selected, the motherboard will detect the memory module(s) inserted and assigns appropriate frequency automatically. DRAM Timing Control Power Down Enable Use this item to enable or disable DDR power down mode. Bank Interleaving Interleaving allows memory accesses to be spread out over banks on the same node, or accross nodes, decreasing access contention. Channel Interleaving It allows you to enable Channel Memory Interleaving.