
R180-F34
R180-F28
Dual LGA2011 sockets R3 motherboard for Intel® E5-2600 V3 series processors

Service Guide
Rev. 1.0

Manual abstract:

@@All rights reserved. @@@@@@Get an access to our complete source of sales, marketing & technical materials at: http://reseller.b2b.gigabyte.com https://www.facebook.com/gigabyteserver Preface Before using this information and the product it supports, please read the following general information. 1. This Service Guide provides you with all technical information relating to the BASIC CONFIGURATION decided for GIGABYTE's "global" product offering. To better fit local marketrequirements and enhance product competitiveness, your regional office MAY have decided toextend the functionality of a machine (e.
g. add-on card, modem, or extra memory capability).These LOCALIZED FEATURES will NOT be covered in this generic service guide. In suchcases, please contact your regional offices or the responsible personnel/channel to provide youwith further technical details. 2.
Please note WHEN ORDERING SPARE PARTS, you should check the most up-to-date informationavailable on your regional web or channel. For whatever reason, if a part number change is made,it will not be noted in the printed Service Guide. For GIGABYTE-AUTHORIZED SERVICEPROVIDERS, your GIGABYTE office may have a DIFFERENT part number code to thosegiven in the FRU list of this printed Service Guide. You MUST use the list provided by yourregional GIGABYTE office to order FRU parts for repair and service of customer machines. Table of Contents Box Contents.

.....120 5-9-1 5-9-2 5-10 BIOS Reence at his own expense.Properly shielded and grounded cables and connectors must be used in order to meet FCC emissionlimits. Neither the provider nor the manufacturer are responsible for any radio or television interferencecaused by using other than recommended cables and connectors or by unauthorized changes ormodifications to this equipment. Unauthorized changes or modifications could void the user's authority tooperate the equipment. 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. Canadian Department of Communications Compliance Statement This digital apparatus does not exceed the Class A limits for radio noise emissions from digitalapparatus as set out in the radio interference regulations of Industry Canada.Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables auxappareils numeriques de Classe A prescrites dans le reglement sur le brouillage radioelectrique edicte parIndustrie Canada. Class A equipment This device has been tested and found to comply with the limits for a class A digital device pursuantPart 15 of the FCC Rules. These limits are designed to provide reasonable protection againstharmful interference when the equipment is operated in a commercial environment.

This equipmentgenerate, uses, and can radiate radio frequency energy, and if not installed and used in accordancewith the instructions, may cause harmful interference to radio communication. Operation of thisequipment in a residential area is likely to cause harmful interference, in which case the user will berequired to correct the interference at personal expence. However, there is no guarantee that interference will not occur in a particular installation. If thisdevice does cause harmful interference to radio or television reception, which can be determined bytuning the device off and on, the user is encouraged to try to correct the interference by on or more ofthe following measures: • Reorient or relocate the receiving antenna • Increase the separation between the device and receiver • Connect the device into an outlet on a circuit different from that to which the receiver isconnected'Consult the dealer or an experienced radio/television technician for help. -9- WEEE Symbol Statement The symbol shown below is on the product or on its packaging, which indicates that this product must not be disposed of with other waste.

Instead, the device should be taken to the waste collection centers for activation of the treatment, collection, recycling and disposal procedure. The separate

collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment.

For more information about where you can drop off your waste equipment for recycling, please contact your local government office, your household waste disposal service or where you purchased the product for details of environmentally safe recycling. w When your electrical or electronic equipment is no longer useful to you, "take it back" to your local or regional waste collection administration for recycling. w If you need further assistance in recycling, reusing in your "end of life" product, you may contact us at the Customer Care number listed in your product's user's manual and we will be glad to help you with your effort. Battery Warning: Incorrectly installing a battery or using incompatible battery may increase the risk of ifre explosion. Replace the battery only with the same or equivalent type. • Do not disassemble, crush, punchture batteries. • Do not store or place your battery pack next to or in a heat source such as a fire, heatgenerating appliance, can or exhaust vent. Heating battery cells to temperatures above 65oC (149 oF) can cause explosion or fire.

• Do not attempt to open or service batteries. Do not dispose of batteries in a fire or with household waste. - 10 - Chapter 1 Hardware Installation 1-1 Installation Precautions The motherboard/system contain numerous delicate electronic circuits and components which can become damaged as a result of electrostatic discharge (ESD). Prior to installation, carefully read the service guide and follow these procedures: • Prior to installation, do not remove or break motherboard S/N (Serial Number) sticker or warranty sticker provided by your dealer. These stickers are required for warranty validation. • Always remove the AC power by unplugging the power cord from the power outlet before installing or removing the motherboard or other hardware components. • When connecting hardware components to the internal connectors on the motherboard, make sure they are connected tightly and securely. • When handling the motherboard, avoid touching any metal leads or connectors. • It is best to wear an electrostatic discharge (ESD) wrist strap when handling electronic components such as a motherboard, CPU or memory. If you do not have an ESD wrist strap, keep your hands dry and first touch a metal object to eliminate static electricity.
• Prior to installing the motherboard, please have it on top of an antistatic pad or within an electrostatic shielding container. • Before unplugging the power supply cable from the motherboard, make sure the power supply has been turned off. • Before turning on the power, make sure the power supply voltage has been set according to the local voltage standard. • Before using the product, please verify that all cables and power connectors of your hardware components are connected. • To prevent damage to the motherboard, do not allow screws to come in contact with the motherboard circuit or its components.
• Make sure there are no leftover screws or metal components placed on the motherboard or within the computer casing. • Do not place the computer system on an uneven surface. • Do not place the computer system in a high-temperature environment. • Turning on the computer power during the installation process can lead to damage to system components as well as physical harm to the user. • If you are uncertain about any installation steps or have a problem related to the use of the product, please consult a certified computer technician.
- 11 - Hardware Installation 1-2 Product Specifications CPU □□ □□ □□ □□ □□ Support for Intel® Xeon® E5-2600 V3 series processors in the LGA2011 package L3 cache varies with CPU Supports Dual QuickPath Interconnect up to 9.6GT/s Enhanced Intel SpeedStep Technology (EIST) Support Intel Virtualization Technology (VT) Chipset Memory □□ Intel® C612 Express (Wellsburg) Chipset □□ 24 x 1.2V DDR4 DIMM sockets supporting up to 768GB RDIMM of system memory □□ 24 x 1.2V DDR4 DIMM sockets supporting up to 1.5TB LRDIMM of system memory □□ Four channel memory architecture □□ Supports DDR4 2133MHz RDIMM memory modules □□ Supports DDR4 2133MHz LR-DIMM memory modules □□ Support for ECC RDIMM/LRDIMM memory modules □□ Intel® I350 supports dual GbE LAN ports □□ 2 x PCIe x16 slots (Gen3 x16 bus) □□ 1 x PCIe x8 slot (Gen3 x8 bus) □□ 1 x PCIe mezzanine type T (Gen3 x8 bus) slot □□ ASPEED ® AST2400 supports 16MB DDR3 VRAM □□ 4 x 3.5” Hot-Swap HDDs (R180-F34) 8 x 2.5” Hot-Swap HDDs (R180-F28) 4 x 40x40x28mm /18000rpm 4 x 40x40x56mm/23000rpm 2 x USB 3.0 ports 2 x USB 2.0 ports 1 x 14-pin ATX main power connector 3 x 8-pin ATX power connectors 3 x 4-pin ATX 12V power connectors 2 x hot-plug power supply connectors 2 x Mini-SAS connectors (SATA3 6Gb/s signal) 2 x SATA3 6Gb/s connectors 2 x CPU fan headers 5 x System fan headers 1 x Front panel header 1 x HDD Back plane borad header 1 x TPM module connector 1 x Software RAID key connector 1 x IPMB connector LAN Expansion Slot Onboard Graphics Mass Storage System Fans USB Internal Connectors Hardware Installation - 12 - Rear Panel I/O Front Panel LED/Buttons □□ 2 x USB 3.0 ports 2 x USB 2.

*0 ports RJ11 COM port 3 x RJ-45 ports (1 x 10/100/1000 dedicated management LAN port) 1 x VGA port 1 x ID button 1 x Power button/LED 1 x NMI button 1 x ID Switch button/LED 1 x Reset button 2 x LAN LED 1 x System status LED 1 x HDD status LED System voltage detection CPU/System temperature detection CPU/System fan speed detection CPU/System fan speed control I/O Controller Hardware Monitor □□ ASPEED ® AST2400 BMC chip * □ Whether the CPU/system fan speed control function is supported will depend on the CPU/system cooler you install. BIOS Environment Ambient Temperature Relative Humidity System Dimension Electrical Power Supply 1 x 128 Mbit flash AMI BIOS Operating Temperature: 5oC to 35oC Non-operating Temperature: 0oC to 50oC □□ 10-80% operating Humidity at 30oC □□ 430Wx43Hx710D (mm) □□ Hot-swap 800W 200-240VAC at 80 plus platinum □□ Support redundancy function * GIGABYTE reserves the right to make any changes to the product specifications and product-related information without prior notice. - 13 - Hardware Installation 1-3 System Block Diagram - 14 - Hardware Installation Chapter 2 System Hardware Installation Pre-installation Instructions Perform the steps below before you open the server or before you remove or replaceany component. • Back up all important system and data files before performing any hardwareconfiguration. • Turn off the system and all the peripherals connected to it. • Locate the pin one of the CPU.*

The CPU cannot be inserted if oriented incorrectly. (Or you may locate the notches on both sides of the CPU and alignment keys on the CPU socket.) • Apply an even and thin layer of thermal grease on the surface of the CPU. • Do not turn on the computer if the CPU cooler is not installed, otherwise overheating and damage of the CPU may occur.

• Set the CPU host frequency in accordance with the CPU specifications. It is not recommended that the system bus frequency be set beyond hardware specifications since it does not meet the standard requirements for the peripherals. If you wish to set the frequency beyond the standard specifications, please do so according to your hardware specifications including the CPU, graphics card, memory, hard drive, etc. Hardware Installation - 15 - 2-1 Removing Chassis Cover Before you remove or install the system cover • Make sure the system is not turned on or connected to AC power. Follow these instructions to remove the system cover: 1.

2. 3. 4. 5. 6.

Loosen and remove the screws securing the back cover. Push down the indentation located at the side of the back chassis Loosen and remove the thumbscrews. Slide the cover horizontally to the back and remove the cover in the direction of the arrow. Loosen and remove the screws securing the front top cover. Remove the front top cover from the system. 2 4 3 1 5 - 16 - Hardware Installation 2-2 Removing and Installing the Fan Duct Follow these instructions to remove/install the fan duct: 1. 2. Lift up to remove the fan duct To install the fan duct, align the fan duct with the guiding groove. Push down the fan duct into chassis until its firmly seats Hardware Installation - 17 - 2-3 Installing the CPU Read the following guidelines before you begin to install the CPU: • Make sure that the motherboard supports the CPU. • Always turn off the computer and unplug the power cord from the power outlet before installing the CPU to prevent hardware damage.

• Unplug all cables from the power outlets. • Disconnect all telecommunication cables from their ports. • Place the system unit on a flat and stable surface. • Open the system according to the instructions. WARNING! Failure to properly turn off the server before you start installing components may cause serious damage. Do not attempt the procedures described in the following sections unless you are a qualified service technician. Follow these instructions to install the CPU: 1. 2. 3. 4.

Raise the metal locking lever on the socket. Remove the plastic covering on the CPU socket.Insert the CPU with the correct orientation. The CPU only fits in one orientation. Replace the metal cover.

Push the metal lever back into locked position. 1 3 2 4 - 18 - Hardware Installation 2-4 Installing the Heat Sink Follow these instructions to install the heat sinks: 1. 2. 3. Apply thermal compound evenly on the top of the CPU.

Remove the protective cover from the underside of the heat sink. Place the heat sink(s) on top of the CPU. Tighten the four positioning screws. 3 2 Hardware Installation - 19 - 2-5 Installing the Memory Read the following guidelines before you begin to install the memory: • Make sure that the motherboard supports the memory. It is recommended that memory of the same capacity, brand, speed, and chips be used. • Always turn off the computer and unplug the power cord from the power outlet before installing the memory to prevent hardware damage. • Memory modules have a foolproof design. A memory module can be installed in only one direction. If you are unable to insert the memory, switch the direction. 2-5-1 Four Channel Memory Configuration This motherboard provides 24 DDR4 memory sockets and supports Four Channel Technology.

After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory. Enabling Four Channel memory mode will be four times of the original memory bandwidth. The four DDR4 memory sockets are divided into four channels each channel has two memory sockets as following: Channel 1: DIMM_P0_A0/DIMM_P0_A1/DIMM_P0_A2 (For pimary CPU); DIMM_P1_E0/DIMM_P1_E1/DIMM_P1_E2 (For secondary CPU) Channel 2: DIMM_P0_B0/DIMM_P0_B1/DIMM_P0_B2 (For pimary CPU); DIMM_P1_F0/DIMM_P1_F1/DIMM_P1_F (For secondary CPU) Channel 3: DIMM_P0_C0/DIMM_P0_C1/DIMM_P0_C2 (For pimary CPU); DIMM_P1_G0/DIMM_P1_G1/DIMM_P1_G2 (For secondary CPU) Channel 4: DIMM_P0_D0/DIMM_P0_D1/DIMM_P0_D2 (For pimary CPU); DIMM_P1_H0/DIMM_P1_H1/DIMM_P1_H2 (For secondary CPU) DIMM_P0_C0 DIMM_P0_C1 DIMM_P0_C2 DIMM_P0_D0 DIMM_P0_D1 DIMM_P0_D2 DIMM_P0_B2 DIMM_P0_B1 DIMM_P0_B0 DIMM_P0_A2 DIMM_P0_A1 DIMM_P0_A0 DIMM_P1_G0 DIMM_P1_G1 DIMM_P1_G2 DIMM_P1_H0 DIMM_P1_H1 DIMM_P1_H1 DIMM_P1_H2 DIMM_P1_F2 DIMM_P1_F1 DIMM_P1_F0 DIMM_P1_E2 DIMM_P1_E1 DIMM_P1_E0 - 20 - Hardware Installation 2-5-2 Installing a Memory Before installing a memory module, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the memory module. Be sure to install DDR4 DIMMs on this motherboard. Follow these instructions to install the Memory: 1. 2. 3. Insert the DIMM memory module vertically into the DIMM slot, and push it down. Close the plastic clip at both edges of the DIMM slots to lock the DIMM module. Reverse the installation steps when you want to remove the DIMM module.

1 2 2 2-5-3 DIMM Population Table Ranks Per DIMM and Data Width Speed (MT/s); Slot Per Channel (SPC) and DIMM Per Channel (DPC) 1 Slot Per Channel 1DPC RDIMM SRx4 2133 2 Slot Per Channel 1DPC 2133 2DPC 1866 Type RDIMM SRx8 2133 2133 1866 RDIMM DRx8 2133 2133 1866 RDIMM DRx4 2133 2133 1866 LRDIMM QRx4 2133 2133 2133 When only one DIMM is used, it must be populated in memory slot0 first. Memory populated sequence must be followed with slot0/slot1/slot2. System will not boot normally with incorrect populated sequence. Hardware Installation - 21 - 2-6 Installing the PCI Expansion Card • Voltages can be present within the server whenever an AC power source is connected. This voltage is present even when the main power switch is in the off position.

Ensure that the system is powered-down and all power sources have been disconnected from the server prior to installing a PCI card. Failure to observe these warnings could result in personal injury or damage to equipment. • The PCI riser assembly does not include a riser card or any cabling as standard. To install a PCI card, a riser card must be installed. Follow these instructions to PCI Expansion card: 1.

Remove the securing screw on the riser bracket. 2. Remove the securing special screw on the riser bracket. 3. Lift up the riser bracket out of system. 4. Loosen and remove the bracket securing screw. 5. Orient the PCI-E card with the riser guide slot and push in the direction of the arrow until the PCI-E card sits in the PCI card connector. 6.

Secure the PCI-E card with the screw. 7. Reverse the previous steps to install the riser bracket.

1 2 3 6 4 5 - 22 - Hardware Installation 1 2 3 6 4 5 - 23 - Hardware Installation 2-6-1 Installing Add-on Card (Optional) Follow these instructions to install Add-on card: 1. Remove theriser bracket from the system following the steps outlined in 2-6 Installing the PCI Expansion Card. 2. Remove the PCI bracket and mini PCI card. 3. Insert the dedicated rear bracket and secure with screw. 4.

Engage the support bracket with mezzaine card and secure with screws. 5. Attach the interposer card to the selected slot (PCIE_4). 6. Insert the add-on card into the interposer card.

Make sure that the card is properly seated. 7. Tighten the thumbscrew. 1 2 3 5 4 6 - 24 - Hardware Installation 2-7 Installing the Hard Disk Drive Read the following guidelines before you begin to install the Hard disk drive: • Take note of the drive tray orientation before sliding it out. • The tray will not fit back into the bay if inserted incorrectly.

• Make sure that the HDD is connected to the HDD connector on the backplane. Follow these instructions to install the Hard disk drive: 1. 2. 3. 4. 5. Press the release button. Pull the locking lever to remove the HDD tray. Remove the HDD dummy cover. Slide hard disk into blank.

Secure the hard drive to the tray with four (4) screws as shown. Do not over tighten thescrews. Slide the blank into the bay until it locks into place. 3 2 1 4 4 Hardware Installation - 25 - 2-7-1 Hard Disk Drive Security Lock The HDD bays incorporate a security screw to prevent accidental HDD release.To engage the lock, turn the security screw clock-wise toward the Lock symbol. To disengage the lock,turn the security screw counter clock-wise toward the Unlock symbol as shown. Hardware Installation - 26 - 2-8 Replacing the FAN Assemblly 1. 2. 3. 4.

Follow these instructions to replace the fan assembly: Remove the fan duct from the system following the steps outlined in 2-2 Removing and Installing the Fan Duct. Remove the fan assemble pulling the rear edge in the direction of the arrow. Lift up the fan assembly from the chassis. Reverse the previous steps to install the replacement fan assembly. 1 2 - 27 - Hardware Installation 2-9 Replacing the Power Supply 1.

2. 3. 4. Follow these instructions to replace the power supply: Disconnect the three power cables. Remove the four screws securing on the power supply. Lift the power supply out of the chassis in the direction of the arrow. Insert the replacement power supply firmly into the chassis. Connect the AC power cord to the replacement power supply. 2 1 Hardware Installation - 28 - 3-1 Front View Chapter 3 System Appearance 2 4 3 5 1 No. 1. 2. 3. 4. 5. Decription HDD bays Front USB 3.

0 ports Front Panel LEDs and buttons ID button and LED Power button and LED 3-2 Rear View 1 2 3 4 5 6 7 8 9 10 No. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. Decription Power supply fan Power supply module cord socket VGA port RJ-45 LAN ports ID switch button RJ-11 COMport USB 2.0 ports 10/100/1000 Server management LAN port USB 3.0 ports Low-profile riser card bay • Please Go to Chapter 3-3 Front Panel LED and Buttons for detail description of function LEDs. - 29 Hardware Installation 3-3 Front Panel LED and Buttons 8 7 6 5 4 3 2 1 No.

Name Color Green Status Solid On Blink Off Solid On Off Solid On Critical Event N/A N/A N/A N/A N/A N/A N/A Description System is powered on System is in ACPI S1 state (sleep mode) • System is not powered on or in ACPI S5 state (power off) System is in ACPI S4 state (hibernate mode) 1. Power button and LED Green N/A Blue N/A • 2. ID Button and LED System identification is active. System identification is disabled. System is operating normally. Degrade condition, may indicates the following: • CPU failure • DIMM killed Critical condition, may indicates the following: • Power module failure • System fan failure • Power supply voltage issue • System temperature/voltage issue Non-critical condition, may indicates the following: • Redundant power module failure • Temperature and voltage issue • Chassis intrusion System is not ready. May indicate the following: • POST error • NMI error • Processor or terminator missing Green Blink Solid On Yes 3. System Status LED Amber Blink N/A N/A Off N/A - 30 - Hardware Installation Green On Blink On Blink Off Solid On Blink Off Solid On Blink Off N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A HDD locate HDD access HDD fault HDD rebuilding • No HDD access • No HDD fault Link between system and network or no access Data transmission or receiving is occurring No data transmission or receiving is occurring Link between system and network or no access Data transmission or receiving is occurring No data transmission or receiving is occurring Press the button to reset the system. Press the button server generates a NMI to the processor if the multiple-bit ECC errors occur, which effectively halt the server. 4. HDD Status LED Amber Green/ Amber N/A Green 5. LA2 Active/ Link LED Green N/A Green 6. LAN1 Active/ Link LED Green N/A 7. 8. Reset Button NMI button Hardware Installation - 31 - 3-4 Rear System LAN LEDs 1 2 2 No.

1. Name 1GbE Speed LED 1GbE Link/ Activity LED Color Yellow Green N/A Green N/A 1 2 Status On On Off On Blink Off 1 Description 1 Gbps data rate 100 Mbps data rate 10 Mbps data rate Link between system and network or no access Data transmission or receiving is occurring No data transmission or receiving is occurring 2. - 32 - Hardware Installation 3-5 Hard Disk Drive LEDs 1 2 No 1 Description HDD Access HDD Locate HDD Failure HDD connected and rebuilding data Reserve Multi Color LEDs LED Active LED Active Green Amber Blink Off On Off Off On Blink Blink (Alternative) 2 Hardware Installation - 33 - 3-6 Cable Routing 2 3 4 1 5 3 5 5 3 5 5 5 3 5 5 3 4 2 1 No. 1. 3. 5. Suggest Cable Front switch cable/Front LED cable Mini SAS cable System fan power cable - 34 - No. 2. 4. 6.

Suggest Cable Front panel USB 3.0 cable HDD back plane board power cable System fan power cable Hardware Installation 4-1 MD90-FS0 Motherboard Components 1 2 3 4 5 6 Chapter 4 Motherboard Components 72 71 73 74 7 9 70 69 68 67 66 65 64 12 11 13 10 14 8 15 60 59 61 16 62 63 58 17 57 55 53 51 56 54 52 46 44 42 40 38 36 34 45 43 41 39 37 35 32 28 26 24 29 27 25 18 19 20 21 22 23 50 49 48 47 33 31 30 Item 1 2 3 4 5 6 7 8 9 10 11 12 USB3_MLAN Code COM1_USB2 SW_ID LAN1 LAN2 VGA RISER_SLOT3 RISER_SLOT2 PCIE_4 BAT S3_MASK CASE_OPEN Description BMC Management LAN port (top) / USB 3.0 ports (bottom) RJ11 COM port (top) / USB 2.0 ports (bottom)/ ID switch button LAN1 port LAN2 port VGA port PCI Express x16 slot PCI Express x16 PCI Express x16 slot (Proprietary slot) Battery socket S3 Power On Select jumper Case open intrusion alert header - 35 - Hardware Installation 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 SW_RAID CLR_CMOS PSU1 PSU2 ATX1 12V_GPU3_2 12V_GPU3_1 12V_GPU2_2 12V_GPU2_1 12V_GPU1_2 12V_GPU1_1 DIMM_P1_E0 DIMM_P1_E1 DIMM_P1_E2 DIMM_P1_F0 DIMM_P1_F1 DIMM_P1_F2 SYS_FAN5 SYS_FAN4 CPU1 CPU1_FAN DIMM_P1_H2 DIMM_P1_H1 DIMM_P1_H0 DIMM_P1_G2 DIMM_P1_G1 DIMM_P1_G0 DIMM_P0_A0 DIMM_P0_A1 DIMM_P0_A2 DIMM_P0_B0 DIMM_P0_B1 DIMM_P0_B2 CPU0 CPU0_FAN SYS_FAN3 SYS_FAN2 SYS_FAN1 DIMM_P0_D2 DIMM_P0_D1 DIMM_P0_D0 DIMM_P0_C2 DIMM_P0_C1 DIMM_P0_C0 Intel/LSI Software RAID Key jumper Clear CMOS jumper Hot-plug PSU module connector#1 Hot-plug PSU module connector#1 14 pin main power connector 4 pin 12V power connector 8 pin power connector 4 pin 12V power connector 8 pin power connector 4 pin 12V power connector 8 pin power connector Channel 1 slot 0 (for secondary CPU) Channel 1 slot 1 (for secondary CPU) Channel 1 slot 2 (for secondary CPU) Channel 2 slot 0 (for secondary CPU) Channel 2 slot 1 (for secondary CPU) Channel 2 slot 2 (for secondary CPU) System fan connector#5 System fan connector#4 Intel LGA2011 Socket R3 (Secondary CPU) CPU1 fan connector (for Secondary CPU) Channel 3 slot 2 (for secondary CPU) Channel 3 slot 1 (for secondary CPU) Channel 3 slot 0 (for secondary CPU) Channel 4 slot 2 (for secondary CPU) Channel 4 slot 1 (for secondary CPU) Channel 4 slot 0 (for secondary CPU) Channel 4 slot 0 (for primary CPU) Channel 1 slot 1 (for primary CPU) Channel 1 slot 2 (for primary CPU) Channel 2 slot 0 (for primary CPU) Channel 2 slot 1 (for primary CPU) Channel 2 slot 2 (for primary CPU) Intel LGA2011 Socket R3 (Primary CPU) CPU0 fan connector (for Primary CPU) System fan connector#3 System fan connector#2 System fan connector#1 Channel 4 slot 2 (for primary CPU) Channel 4 slot 1 (for primary CPU) Channel 4 slot 0 (for primary CPU) Channel 3 slot 2 (for primary CPU)

Channel 3 slot 1 (for primary CPU) Channel 3 slot 0 (for primary CPU) - 36 - Hardware Installation 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 FP_1 BP_1 IPMB F_USB3 BUZZER1 PCH_ME ME_UPDATE MINI_CN1 MINI_CN2 SATA5 SATA4 RISER_1_2 BIOS_PWD BIOS_RCVR LED_BMC RISER_1_1 BMC_FRB TPM Front panel header HDD back plane board header IPMB connector USB 3.

0 header Buzzer ME recovery jumper ME update jumper Mini-SAS cable connector#1 supports SATA3 6Gb/s Mini-SAS cable connector#2 supports SATA3 6Gb/s SATA3 6Gb/s connector SATA3 6Gb/s connector PCI Express x16 slot (Gigabyte extension slot) Clearing Supervisor Password jumper BIOS recovery jumper BMC firmware readiness LED PCI Express x4 slot (Gigabyte extension slot) Force to Stop FRB Timer jumper TPM module connector Hardware Installation - 37 - 4-2 Jumper Setting 7 6 5 2 1 4 3 No.

1. 2. 3. 4. 5.

6. 7. Jumper Code CLR_CMOS (Clearing CMOS Jumper) S3_MASK (S3 Power On Select Jumper) ME_UPDATE (ME Update Jumper) PCH_ME (ME Recovery Jumper) BIOS_PWD (Clearing Supervisor Password Jumper) BIOS_RCVR (BIOS Recovery Jumper) BMC_FRB (Force to Stop FRB Timer Jumper) Jumper Setting 1-2 Close: Normal operation (Default setting) 2-3 Close: Clear CMOS data 1-2 Close: Stop an initial power on when BMC is not ready. 2-3 Close: Keep initial power on. (Default setting) 1-2 Close: Normal operation (Default setting) 2-3 Close: ME recovery mode. 1-2 Close: Normal operation (Default setting) 2-3 Close: ME recovery mode. 1-2 Close: Normal operation. (Default setting) 2-3 Close: Skip supervisor password. 1-2 Close: Normal operation (Default setting) 2-3 Close: BIOS recovery mode. 1-2 Close: Normal operation (Default setting) 2-3 Close: Force to Stop FRB Timer - 38 Hardware Installation Chapter 5 BIOS Setup BIOS (Basic Input and Output System) records hardware parameters of the system in the EFI on the motherboard.

Its major functions include conducting the Power-On Self-Test (POST) during system startup, saving system parameters and loading operating system, etc. BIOS includes a BIOS Setup program that allows the user to modify basic system configuration settings or to activate certain system features. When the power is turned off, the battery on the motherboard supplies the necessary power to the CMOS to keep the configuration values in the CMOS. To access the BIOS Setup program, press the <F2> key during the POST when the power is turned on. • BIOS flashing is potentially risky, if you do not encounter problems of using the current BIOS version, it is recommended that you don't flash the BIOS. To flash the BIOS, do it with caution. Inadequate BIOS flashing may result in system malfunction. • It is recommended that you not alter the default settings (unless you need to) to prevent system instability or other unexpected results. Inadequately altering the settings may result in system's failure to boot. If this occurs, try to clear the CMOS values and reset the board to default values. (Refer to the Exit section in this chapter or introductions of the battery/clearing CMOS jumper in Chapter 1 for how to clear the CMOS values.) BIOS Setup Program Function Keys <f><g> Move the selection bar to select the screen <h><i> Move the selection bar to select an item <+> Increase the numeric value or make changes <-> Decrease the numeric value or make changes <Enter> Execute command or enter the submenu <Esc> Main Menu: Exit the BIOS Setup program Submenus: Exit current submenu <F1> Show descriptions of general help <F3> Restore the previous BIOS settings for the current submenus <F9> Load the Optimized BIOS default settings for the current submenus <F10> Save all the changes and exit the BIOS Setup program - 39 - BIOS Setup Main This setup page includes all the items in standard compatible BIOS. This setup page includes all the items of AMI BIOS special enhanced features. (ex: Auto detect fan and temperature status, automatically configure hard disk parameters.) This setup page includes all the submenu options for configuring the function of processor, network, North Bridge, South Bridge, and System event logs.

Server additional features enabled/disabled setup menus. Change, set, or disable supervisor and user password. Configuration supervisor password allows you to restrict access to the system and BIOS Setup. A supervisor password allows you to make changes in BIOS Setup. A user password only allows you to view the BIOS settings but not to make changes.

This setup page provides items for configuration of boot sequence. Save all the changes made in the BIOS Setup program to the CMOS and exit BIOS Setup. (Pressing <F10> can also carry out this task.) Abandon all changes and the previous settings remain in effect. Pressing <Y> to the confirmation message will exit BIOS Setup. (Pressing <Esc> can also carry out this task.) Advanced Intel RC Setup Server Management Security Boot Exit BIOS Setup - 40 - 5-1 The Main Menu Once you enter the BIOS Setup program, the Main Menu (as shown below) appears on the screen. Use arrow keys to move among the items and press <Enter> to accept or enter other sub-menu. Main Menu Help The on-screen description of a highlighted setup option is displayed on the bottom line of the Main Menu. Submenu Help While in a submenu, press <F1> to display a help screen (General Help) of function keys available for the menu.

Press <Esc> to exit the help screen. Help for each item is in the Item Help block on the right side of the submenu. • When the system is not stable as usual, select the Restore Defaults item to set your system to its defaults. • The BIOS Setup menus described in this chapter are for reference only and may differ by BIOS version. - 41 - BIOS Setup BIOS Information Porject Name Porject Version Display the project name information. @@Display the SDR version information. @@Display the frequency information of the installed memory. @@Set the date following the weekday-month-day- year format. @@@@@@Options available: Enabled/Disabled. @@Options available: VT100/VT100+/ANSI /VT-UTF8.

Default setting is ANSI. Select the baud rate for console redirection. Options available: 9600/19200/38400/57600/115200. Default setting is 115200. Select the data bits for console redirection.

Options available: 7/8. Default setting is 8. @@Even: parity bi is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if num of 1's in the data bits is odd. Mark: parity bit is always 1.

Space: Parity bit is always 0. @@@@Default setting is None. Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit. Options available: 1/2. Default setting is 1. Flow control can prevent data loss from buffer overflow. @@@@Hardware flow control uses two wires to send start/stop signals.

Options available: None/Hardware RTS/CTS. Default setting is None. Enable/Disable VT-UTF8 Combo Key Support. Options available: Enabled/Disabled. Default setting is Enabled. When this mode enabled, only text will be send. This is to capture Terminal data. Options available: Enabled/Disabled.

@@Default setting is Enabled. Options available: Enabled/Disabled.
On Legacy OS, the number of Rows and Columns supported redirection. Options available: 80x24/80X25. @@Options available: VT100/LINUX/XTERMR6/SCO/ESCN/VT400. @@Options available: Always Enable/Boot Loader. Default setting is Always Enable.
@@Options available: COM1/COM2. @@@@Options available: Enabled/Disabled. Default setting is Enabled. Enable/Disable onboard LAN devices. Options available: Enabled/Disabled.
Default setting is Enabled. @@Options available: Enabled/Disabled. @@@@Default setting is 32 PCI Bus Clocks. Enable/Disable VGA Palette Tegisters Snooping. Options available: Enabled/Disabled. Default setting is Disabled. Enable/Disable Above 4G Decoding. Options available: Enabled/Disabled.
@@Options available: Enabled/Disabled. Default setting is Disabled.

Press [Enter] for configuration of advanced items. PCI Express Settings BIOS Setup - 49 - 5-2-2-1 PCI Express Settings PCI Express Device Register Settings Relaxed Ordering Enable/DIsable PCI Express Device Relaxed Ordering feature. Options available: Enabled/Disabled. Default setting is Disabled. Wnen this feature is enabled, the system will allow device to use 8-bit Tag field as a requester. Options available: Enabled/Disabled. Default setting is Disabled. Enable/Disable PCI Express Device No Snoop option. Options available: Enabled/Disabled. Default setting is Enabled.
Set maximum playload for PCI Express Device or allow system BIOS to select the value. Options available: Auto/128 Bytes/256 Bytes/512 Bytes/1024 Bytes/2048 Bytes/4096 Bytes. Default setting is Auto. Extended Tag No Snoop Maximum Playload PCI Express Link Register Settings Extended Synch Link Training Retry Wnen this feature is enabled, the system will allow generation of Extended Synchronization patterns. Options available: Enabled/Disabled. Default setting is Disabled. Define the number of Retry Attempts software wil take to retrain the link if previous training attempt was unsuccessful. Options available: Disabled/2/3/5.Default setting is 5. - 50 BIOS Setup Link Training Timeout (us) Define the number of Microseconds software will wait before polling 'Link Training' bit in Link Status register.
Press <+> / <-> keys to increase or decrease the desired values. Value rang is from 10 to 10000 us. When this item is set to 'Disable Link, the system will operate power save feature for those unpopulated PCI Express links. Options available: Keep Link ON/ Disable Link. Default setting is Keep Link ON. Unpopulated Links BIOS Setup - 51 - 5-2-3 Network Stack Network stack Enable/Disable UEFI network stack. Options available: Enabled/DIsabled. Default setting is Disabled. Enable/Disable Ipv4 PXE feature. Options available: Enabled/DIsabled.

Default setting is Enabled. Enable/Disable Ipv6 PXE feature. Options available: Enabled/DIsabled. Default setting is Enabled. Press <+> / <-> keys to increase or decrease the desired values. Press <+> / <-> keys to increase or decrease the desired values. Ipv4 PXE Support(Note) Ipv6 PXE Support(Note) PXE boot wait time(Note) Media detect time(Note) (Note) This item appears when Network Stack is set to Enabled. - 52 - BIOS Setup 5-2-4 CSM Configuration Compatibility Support Module Configuration CSM Support Enable/Disable Compatibility Support Module (CSM) support. Options available: Enabled/Disabled. Default setting is Enabled.
Display CSM Module version information. Upon Request: GA20 can be disabled using BIOS services. Always: Do not allow disabling GA20; this option is useful when any RT code is executed above 1MB. Options available: Upon Request/Always. Default setting is Upon Request.
Option ROM Messages. Options available: Force BIOS/Keep Current. Default setting is Force BIOS. Enabled: Allowed headless retry boot Options available: Enabled/Disabled. Default setting is Enabled.
Determines which devices system will boot to. Options available: UEFI and Legacy/Legacy only/UEFI only. Default setting is UEFI and Legacy. CSM16 Module Version Gate20 Active Option ROM Messages INT19 Endless Retry Boot option filter BIOS Setup - 53 - Option ROM execution Network Controls the execution UEFI and Legacy PXE OpROM. Options available: Do not launch/UEFI/Legacy. Default setting is Legacy. Storage Controls the execution UEFI and Legacy Storage OpROM. Options available: Do not launch/UEFI/Legacy. Default setting is Legacy. Video Controls the execution UEFI and Legacy Video OpROM.

Options available: Do not launch/UEFI/Legacy. Default setting is Legacy. Other PCI devices Determines OpROM execution policy for devices other than network, Storage, or Video. Options available: UEFI/Legacy. Default setting is UEFI. - 54 - BIOS Setup 5-2-5 Post Report Configuration Post Report Configuration Error Message Report Post Error Message Enable/Disable Info Error Message support. Options available: Enabled/Disabled. Default setting is Enabled. BIOS Setup - 55 - 5-2-6 Trusted Computing Configuration Security Device Support Select Enabled to activate TPM support feature. Options available: Enabled/Disabled.
Default setting is Disabled. Display current TPM status information. Current Status Information - 56 - BIOS Setup 5-2-7 USB Configuration USB Configuration USB Devices: XHCI Hand-off Display the USB devices connected to the system. Enable/Disable XHCI (USB 3.0) Hand-off support. Options available: Enabled/Disabled. Default setting is Enabled. Enable/Disable EHCI (USB 2.0) Hand-off function. Options available: Enabled/Disabled. Default setting is Disabled. Enable/Disable USB Mass Storage Driver Support. Options available: Enabled/Disabled. Default setting is Enabled. Enable I/O port 60h/64h emulation support. This should be enabled for the complete USB Keyboard Legacy support for non-USB aware OS. Options available: Enabled/Disabled. Default setting is Enabled. EHCI Hand-off USB Mass Storage Driver Support(Note) Port 60/64 Emulation (Note) This item is present only if you attach USB types of device. - 57 - BIOS Setup 5-2-8 Chipset Configuration Restore on AC Power Loss (Note) Defines the power state to resume to after a system shutdown that is due to an interruption in AC power.

When set to Last State, the system will return to the active power state prior to shutdown. When set to Stay Off, the system remains off after power shutdown. Options available: Last State/Stay Off/Power On. The default setting depends on the BMC setting. Enable/Disable Deep Sleep mode. Options available: Enabled/Disabled. Default setting is Disabled. Configure ystem fan curve mode Options available: Full Dpeed Mode/Performance ModeBalanced mode/Energy Saving Mode. Default setting is Performance Mode. Enable/Disable Chassis intrusion alter funtion.
Options available: Enabled/Disabled. Default setting is Disabled. Deep Sleep (EuP) Fan Curve Mode Chassis Opened Warning (Note) When the power policy is controlled by BMC, please wait for 15-20 seconds for BMC to save the last power state.

*- 58 BIOS Setup 5-9 SIO Configuration BIOS Setup - 59 - AMI SIO Driver Version Super IO Chip Logical Device(s) Configuration [*Active*] Serial Port 1 Press [Enter] for confuguration of advanced items. Display the AMI SIO driver version information.*

Serial Port 1 Configuration Use This Device Logical Device Settings: Current: Possible: When enabled allows you to configure the serial port 1 settings. When set to Disabled, displays no configuration for the serial port. Options available: Enabled/Disabled. Default setting is Enabled. Display the Serial Port 1 base I/O addressand IRQ.

Configure Serial Port 1 base I/O addressand IRQ. Option available: Use Automatic Settings IO=3F8h; IRQ=4; DMA;/ IO=3F8h; IRQ=3,4,5,7,9,10,11,12; DMA;/ IO=2F8h; IRQ=3,4,5,7,9,10,11,12; DMA;/ IO=3E8h; IRQ=3,4,5,7,9,10,11,12; DMA;/ IO=2E8h; IRQ=3,4,5,7,9,10,11,12; DMA; Default setting is Use Automatic Settings. BIOS Setup - 60 - 5-2-10 iSCSI Configuration iSCSI Initiator Name Add an Attempts Delete Attempts Press [Enter] for configuration of advanced items. Press [Enter] for configuration of advanced items. Press [Enter] for configuration of advanced items. Change Attempt Order BIOS Setup - 61 - 5-3 Intel RC Setup Menu Intel RC Setup menu displays submenu options for configuring the function of North Bridge and South Bridge. Select a submenu item, then press Enter to access the related submenu screen. RC Revision Display Intel RC version information. - 62 - BIOS Setup 5-3-1 Processor Configuration BIOS Setup - 63 - Processor Configuration Pre-Socket Configuration Press [Enter] for configuration of advanced items. Processor Socket/Processor ID/Processor Frequency/Processor Max Raito/ Processor Min Raio/Microcode Revision/L1 Cache RAM/L2 Cache RAM/L3 Cache RAM/ Processor 0/1Version Hyper-Threading [All] Displays the technical specifications for the installed processor.

The Hyper Threading Technology allows a single processor to execute two or more separate threads concurrently. When hyper-threading is enabled, multi-threaded software applications can execute their threads, thereby improving performance. Options available: Enabled/Disabled. Default setting is Enabled. When enabled, the processor prevents the execution of code in data-only memory pages. This provides some protection against buffer overflow attacks. When disabled, the processor will not restrict code execution in any memory area. This makes the processor more vulnerable to buffer overflow attacks. Options available: Enabled/Disabled. Default setting is Enabled.

Enable/Disable Intel Trusted Execution Technology support function. Options available: Enabled/Disabled. Default setting is Disabled. Enable/Disable Vanderpool Technology. This will take effect after rebooting the system.

Options available: Enabled/Disabled. Default setting is Enabled. Enable/Disblae Intel Safer Mode Extensions (SMX) support function. Options available: Enabled/Disabled. Default setting is Disabled.

Select whether to enable the speculative prefetch unit of the processor. Options available: Enabled/Disabled. Default setting is Enabled. When enabled, cache lines are fetched in pairs. When disabled, only the required cache line is fetched. Options available: Enabled/Disabled. Default setting is Enabled. Enable prefetch of next L1 Data line based upon multiple loads in same cache line. Options available: Enabled/Disabled. Default setting is Enabled.

Enable prefetch of next L1 Data line based upon sequential load history. Options available: Enabled/Disabled. Default setting is Enabled. Execute Disable Bit Enable Intel TXT Support VMX (Vanderpool Technology) Enable SMX (Intel Safer Mode Extensions Technology) Hardware Prefetcher Adjacent Cache Line Prefetch DCU Streamer Prefetch DCU IP Prefetch DCU Mode Configure DCU mode. Options available: 32KB 8Way Without ECC/16KB 4Way With ECC. Default setting is 32KB 8Way Without ECCC. - 64 BIOS Setup Direct Cache Access (DCA) DCA Prefetch Delay X2APIC Options available: Auto/Enabled/Disabled. Default setting is Auto. Options available: Disabled/8/16/24/32/40/48/56/64/72/80/88/96/104/112. Default setting is 32. Options available: Enabled/Disabled. Default setting is Disabled. AES-NI Enable/Disable AES-NI (Intel Advanced Encryption Standard New Instructions) support function. Options available: Enabled/Disabled. Default setting is Enabled.

BIOS Setup - 65 - 5-3-1-1 Pre-Socket Configuration - 66 - BIOS Setup CPU Socket 0/1 Configuration Cores Enabled (for CPU socket 0/1) Press [Enter] for configuration of advanced items. Number of Cores to enable. 0 means all cores. 14 Cores is available. Press the numeric keys to adjust desired values. BIOS Setup - 67 - 5-3-2 Advanced Power Management Configuration Advanced Power Management Configuration Power Technology Config TDP Option available:Disable/Energy Efficient/Custom. Default setting is Energy Efficient. Options available: Enabled/Disabled. Default setting is Disabled. Press [Enter] for configuration of advanced items. Press [Enter] for configuration of advanced items. Press [Enter] for configuration of advanced items. CPU P State Control CPU C State Control CPU T State Control - 68 - BIOS Setup 5-3-2-1 CPU P State Control EIST (P-State) Conventional Intel SpeedStep Technology switches both voltage and frequency in tandem between high and low levels in response to processor load. Options available: Enabled/Disabled. Default setting is Enabled.

When this item is enabled, tje processor will automatically ramp up the clock speed of 1-2 of its processing cores to improve its performance. When this item is disabled, the processor will not overclock any of its core. Options available: Enabled/Disabled. Default setting is Enabled. In HW_ALL mode, the processor hardware is responsible for coordinating the P-state among logical processors dependencies. The OS is responsible for keeping the P-state request up to date on all logical processors. In SW_ALL mode, the OS Power Manager is responsible for coordinating the P-state among logical processors with dependencies and must initiate the transition on all of those Logical Processors. In SW_ANY mode, the OS Power Manager is responsible for coordinating the P-state among logical processors with dependencies and may initiate the transition on any of those Logical Processors. Options available: HW_ALL/SW_ALL/SW_ANY. Default setting is HW_ALL.

Turbo Mode P-state coordination BIOS Setup - 69 - 5-3-2-2 CPU C State Control Package C State Limit Configure state for the C-State package limit. Options available: C0/C1 state/C2 state/C6(non Retention) state/C6(Retention) state. Default setting is C6(non Retention) state. Allows you to determine whether to let the CPU enter C3/C6 mode in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption.

The C3/C6 state is a more enhanced power-saving state than C1. Options available: Enabled/Disabled. Default setting for C3 is Disabled; default setting for C6 is Enabled. CPU C3/C6 Report - 70 - BIOS Setup 5-3-2-3 CPU T State Control ACPI T-States Enable/Disable CPU throttling by OS. Thorttling reduces power comsumption.

Options available: Enabled/Disabled. Default setting is Enabled. BIOS Setup - 71 - 5-3-3 Common RefCode Configuration Common RefCode Configuration Isoc Mode Numa (Non-Uniform Memory Access) Options available: Auto/Enabled/Disabled. Default setting is Auto. Options available: Enabled/Disabled. Default setting is Enabled. - 72 - BIOS Setup 5-3-4 QPI Configuration BIOS Setup - 73 - QPI General Configuration QPI Status Press [Enter] for configuration of advanced items. Press [Enter] to view QPI status. Options available: Slow/Fast. Default setting is Fast.

Options available: 6.4GB/s/8.0GB/s/9.6GB/s/Auto/Auto Limited. Default setting is Auto. Link Speed Mode Link Frequency Select - 74 - BIOS Setup 5-3-5 Memory Configuration Integrated Memory Controller (iMC) Enforce POR Enable to enforce POR restrictions for DDR4 frequency and voltage programming. Options available: Enforce POR/Disabled/Enforce Stretch Goals. Default setting is Enforce POR. Configure memory frequency. Options available: Auto/1333/1400/1600/1800/1867/2000/2133.

Default setting is Auto. Options available: Auto/Disabled/Enabled. Default setting is Auto. Options available: Auto/Disabled/Enabled. Default setting is Auto. Display RMT Pattern Length. Options available: Enabled/Disabled. Default setting is Enabled. Press [Enter] for configuration of advanced items. Press [Enter] for configuration of advanced items.

Memory Frequency ECC Support Rank Margin Tool RMT Pattern Length SPD Write Lock Memory Topology Memory Thermal BIOS Setup - 75 - Memory Map Memory RAS Configuration Press [Enter] for configuration of advanced items. Press [Enter] for configuration of advanced items. - 76 - BIOS Setup 5-3-5-1 Memory Topology BIOS Setup - 77 - 5-3-5-2 Memory Thermal Set Throttling Mode Configure Thermal Throttling Mode. Select OLTT or CLTT mode. Options available: Disabled/CLTT Mode. Default setting is CLTT Mode. Options available: Disabled/Output-only/Input-only. Default setting is Input-only. MEMHOT Throttling Mode - 78 - BIOS Setup 5-3-5-3 Memory Map Socket Interleave Below 4GB Splits the 0-4GB address space between two sockets, so that both sockets get a chunk of local memory below 4GB. Options available: Disabled/Enabled.

Default setting is Disabled. Options available: Auto/1-way Interleave/2-way Interleave/3-way Interleave/4-way Interleave. Default setting is Auto. Options available: Auto/1-way Interleave/2-way Interleave/4-way Interleave/8-way Interleave. Default setting is Auto. Channel Interleaving Rank Interleaving BIOS Setup - 79 - 5-3-5-4 Memory RAS Configuration RAS Mode Enable/Disable RAS modes. Enabling Sparing and Mirroring is not supported. When this item is set to enabled, Sparing will be selected. Options available: Disable/Mirror/Lockstep Mode. Default setting is Disabled.

Options available: Auto/Disabled/Enabled. Default setting is Auto. Options available: Disabled/Enabled. Default setting is Disabled. Press <+> / <-> keys to increase or decrease the desired values.

Lockstep x4 DIMMs Memory Rank Sparing Correctable Error Threshold - 80 - BIOS Setup 5-3-6 IIO Configuration IIO Configuration EV DFX Features Set this option to allow DFX Lock Bits to remain clear. Options available: Enabled/Disabled. Default setting is Disabled. Press [Enter] for configuration of advanced items. Press [Enter] for configuration of advanced items.

IOAT Configuration Intel VT for Directed I/O (VT-d) BIOS Setup - 81 - 5-3-6-1 IOAT Configuration IOAT Configuration Enable IOAT Control to enable/disable IOAT (Intel I/O Acceleration Technology) device. Options available: Enabled/Disabled. Default setting is Disabled. Enable/Disable PCI Express Device No Snoop option. Options available: Enabled/Disabled. Default setting is Disabled. No Snoop - 82 - BIOS Setup 5-3-6-2 Intel VT for Directed I/O (VT-d) Intel VT for Directed I/O (VT-d) VT-d Azalea VCp Optimizations Enable/Disable Azalea VCp optimizations. Options available: Enabled/Disabled. Default setting is Disabled. Enable/Disable Intel VT for Directed I/O (VT-d) support function.

Options available: Enabled/Disabled. Default setting is Enabled. Enable/Disable interrupt remapping support function. Options available: Enabled/Disabled. Default setting is Enabled. Options available: Enabled/Disabled. Default setting is Enabled. Options available: Enabled/Disabled. Default setting is Enabled. Intel VT for Directed I/O (VT-d) Interrupt Remapping Coherency Suuport (Non-Isoch) Coherency Suuport (Isoch) BIOS Setup - 83 - 5-3-7 PCH Configuration PCH Configuration PCH Devices PCH sSATA Configuration PCH SATA Configuration USB Configuration Press [Enter] for configuration of advanced items.

Press [Enter] for configuration of advanced items. Press [Enter] for configuration of advanced items. Press [Enter] for configuration of advanced items. - 84 - BIOS Setup 5-3-7-1 PCH Devices PCH CRID Enable/Disable Intel Compatible Revision ID. Options available: Enabled/Disabled.

Default setting is Disabled. BIOS Setup - 85 - 5-3-7-2 PCH sSATA Configuration - 86 - BIOS Setup When SATA Type is set to IDE PCH sSATA Configuration sSATA Controller(s) Enable/Disable sSATA controller. Options available: Enabled/Disabled. Default setting is Enabled. Coonfigure on chip SATA type. IDE Mode: When set to IDE, the SATA controller disables its RAID and AHCI functions and runs in the IDE emulation mode. This is not allowed to access RAID setup utility. RAID Mode: When set to RAID, the SATA controllerenables both its RAID and AHCI functions. You will be allows access the RAID setup utility at boot time. ACHI Mode: When set to AHCI,the SATA controller enables its AHCI functionality. Then the RAID function is disabled and cannot be access the RAID setup utility at boot time. Options available: IDE/RAID/ACHI/Disabled. Default setting is ACHI. Enable/Disable SATA Test Mode. Options available: Enabled/Disabled.

Default setting is Disabled. Press [Enter] for configuration of advanced items. Configure sSATA as SATA Test Mode SATA Mode options(Note) Support Aggressive Link Power Mana(Note) Enable PCH to aggressively enter link power state. Options available: Enabled/Disabled. Default setting is Enabled. (Note) Only Supported When HDD is in AHCI or RAID Mode. BIOS Setup - 87 - Alternate Device ID on RAID Enable /Disable Alternate Device ID on RAID mode. Options available: Enabled/Disabled. Default setting is Disabled. Please note that this option appears when HDD is in RAID Mode.

The category identifies sSATA type of hard disk that are installed in the computer. System will automatically detect HDD type. Enable/Disable Port 0/1/2/3 device. Options available: Enabled/Disabled. Default setting is Enabled.

Enable/Disable HDD Hot-Plug function. Options available: Enabled/Disabled. Default setting is Disabled. Display Hot-Plug supported information. sSATA Port 0/1/2/3 Port 0/1/2/3 Hot Plug (for Port 0/1/2/3)(Note) Configured as eSATA(Note) Spin Up Device (for Port 0/1/2/3)(Note) On an edge detect from 0 to 1, the PCH starts a COM reset initialization to the device.

Options available: Enabled/Disabled. Default setting is Disabled. Select sSATA device type. Options available: Hard Disk Drive/Solid State Drive. Default setting is Hard Disk Drive. sSATA Device Type (Note) Only Supported When HDD is in AHCI or RAID Mode. - 88 - BIOS Setup 5-3-7-2-1 SATA Mode Options When SATA Type is set to IDE/AHCI Mode SATA LED locate When this option is enabled, LED/SGPIO hardware is attached. Options available: Enabled/Disabled. Default setting is Enabled. BIOS Setup - 89 - When SATA Type is set to RAID Mode SATA LED locate When this option is enabled, LED/SGPIO hardware is attached.

Options available: Enabled/Disabled. Default setting is Enabled. Enable/Disable Intel Rapid Recovery Technology support function. Options available: Enabled/Disabled. Default setting is Enabled. Options available: Enabled/Disabled. Default setting is Enabled. Options available: Enabled/Disabled. Default setting is Enabled. Enable/Disable Intel Smart Response Technology support function.

Options available: Enabled/Disabled. Default setting is Enabled. Options available: 2 Seconds/4 Seconds/6 Seconds/8 Seconds. Default setting is 2 Seconds. Intel Rapid Recovery Technology RAID Option ROM UI banner IRRT Only on ESATA Smart Response Technology RAID OROM prompt delay - 90 - BIOS Setup 5-3-7-3 PCH SATA Configuration BIOS Setup - 91 - When SATA Type is set to IDE PCH SATA Configuration SATA Controller(s) Enable/Disable sSATA controller.

Options available: Enabled/Disabled. Default setting is Enabled. Coonfigure on chip SATA type. IDE Mode: When set to IDE, the SATA controller disables its RAID and AHCI functions and runs in the IDE emulation mode. This is not allowed to access RAID setup utility.

RAID Mode: When set to RAID, the SATA controllerenables both its RAID and AHCI functions. You will be allows access the RAID setup utility at boot time. ACHI Mode: When set to AHCI,the SATA controller enables its AHCI functionality. Then the RAID function is disabled and cannot be access the RAID setup utility at boot time. Options available: IDE/RAID/ACHI/Disabled. Default setting is ACHI. Enable/Disable SATA Test Mode. Options available: Enabled/Disabled. Default setting is Disabled. Enable/Disable SATA RSTe Boot Information.

Options available: Enabled/Disabled. Default setting is Enabled. Configure sSATA as SATA Test Mode SATA RSTe Boot Info(Note 1) SATA Mode options(Note 2) Press [Enter] for configuration of advanced items. (Note 1) Only Supported When HDD is in RAID Mode. (Note 2) Only Supported When HDD is in AHCI or RAID Mode. - 92 BIOS Setup Support Aggressive Link Power Mana(Note) Enable PCH to aggressively enter link power state. Options available: Enabled/Disabled. Default setting is Enabled. Alternate Device ID on RAID sSATA Port 0/1/2/3/4/5 Enable /Disable Alternate Device ID on RAID mode. Options available: Enabled/Disabled.

Default setting is Disabled. Please note that this option appears when HDD is in RAID Mode. The category identifies sSATA type of hard disk that are installed in the computer. System will automatically detect HDD type. Enable/Disable Port 0/1/2/3 device.

Options available: Enabled/Disabled. Default setting is Enabled. Enable/Disable HDD Hot-Plug function. Options available: Enabled/Disabled. Default setting is Disabled.

Display Hot-Plug supported information. Port 0/1/2/3/4/5 Hot Plug (for Port 0/1/2/3/4/5)(Note) Configured as eSATA(Note) Spin Up Device (for Port 0/1/2/3/4/5)(Note) On an edge detect from 0 to 1, the PCH starts a COM reset initialization to the device. Options available: Enabled/Disabled. Default setting is Disabled. Select sSATA device type. Options available: Hard Disk Drive/Solid State Drive. Default setting is Hard Disk Drive. sSATA Device Type (Note) Only Supported When HDD is in AHCI or RAID Mode. BIOS Setup - 93 - 5-3-7-3-1 SATA Mode Options When SATA Type is set to IDE/AHCI Mode SATA LED locate When this option is enabled, LED/SGPIO hardware is attached. Options available: Enabled/Disabled.

Default setting is Enabled. - 94 - BIOS Setup When SATA Type is set to RAID Mode SATA LED locate When this option is enabled, LED/SGPIO hardware is attached. Options available: Enabled/Disabled. Default setting is Enabled. Enable/Disable Intel Rapid Recovery Technology support function. Options available: Enabled/Disabled. Default setting is Enabled. Options available: Enabled/Disabled. Default setting is Enabled. Enable/Disable Intel Smart Response Technology support function.

Options available: Enabled/Disabled. Default setting is Enabled. Options available: 2 Seconds/4 Seconds/6 Seconds/8 Seconds. Default setting is 2 Seconds. Intel Rapid Recovery Technology RAID Option ROM UI banner Smart Response Technology RAID OROM prompt delay BIOS Setup - 95 - 5-3-7-4 USB Configuration USB Precondition Precondition work on USB host conteoller and root ports for faster enumeration.

Options available: Enabled/Disabled. Default setting is Disabled. Enable/Disable xHCI (USB 3.0) support function. Options available: Smart Auto/Enabled/Disabled.

Default setting is Smart Auto. xHCI Mode - 96 - BIOS Setup 5-3-8 Miscellaneous Configuration Miscellaneous Configuration Active Video Select active Video type. Options available: Onboard Device/Offboard Device. Default setting is Offboard Device. BIOS Setup - 97 - 5-3-9 Server ME Configuration Greneral ME Configuration Operational Firmware Version Recovery Firmware Version ME Firmware Features Display Operational Firmware Version information. Display Recovery Firmware Version information. Display ME Firmware features information. Display ME Firmware status information. Display ME Firmware current status information. Display ME Firmware status error code.

Configure MCTP Bus Owner. ME Firmware Status #1/#2 Current State (for ME Firmware) Error Code (for ME Firmware) MCTP Bus Owner - 98 - BIOS Setup 5-3-10 Runtime Error Logging Runtime Error Logging System Errors Enable/Disable system error logging function. Options available: Enabled/Disabled. Default setting is Enabled. Enable/Disable software injection error logging function. Options available: Enabled/Disabled. Default setting is Disabled. Press [Enter] for configuration of advanced items.