

Asus AAEON AQ7-ADN User Manual

Qseven cpu module

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Summary of Contents for Asus AAEON AQ7-ADN

Page 1 AQ7-ADN Qseven CPU Module User's Manual 1 Last Updated: June 13, 2024...

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Page 3 Acknowledgements All other products' name or trademarks are properties of their

respective owners. Microsoft Windows® is a registered trademark of Microsoft Corp. ● Intel® and Atom® are registered trademarks of Intel Corporation. ● Intel® Core[™] is a trademark of Intel Corporation. ●...

<u>Page 4</u> Packing List Before setting up your product, please make sure the following items have been shipped: Item Quantity AQ7-ADN • If any of these items are missing or damaged, please contact your distributor or sales representative immediately. Preface...

<u>Page 5</u> About this Document This User's Manual contains all the essential information, such as detailed descriptions and explanations on the product's hardware and software features (if any), its specifications, dimensions, jumper/connector settings/definitions, and driver installation instructions (if any), to facilitate users in setting up their product. Users may refer to the product page at AAEON.com for the latest version of this document.

<u>Page 6</u> Safety Precautions Please read the following safety instructions carefully. It is advised that you keep this manual for future references All cautions and warnings on the device should be noted. Make sure the power source matches the power rating of the device. Position the power cord so that people cannot step on it.

<u>Page 7</u> If any of the following situations arises, please the contact our service personnel: Damaged power cord or plug Liquid intrusion to the device iii. Exposure to moisture Device is not working as expected or in a manner as described in this manual The device is dropped or damaged Any obvious signs of damage displayed on the device...

<u>Page 8</u> FCC Statement This device complies with Part 15 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.

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 China RoHS Requirements (CN)
 China RoHS
 China RoHS
 Calibria

 Board/ Backplane
 Control
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 Control
 Control

Page 10 China RoHS Requirement (EN) Poisonous or Hazardous Substances or Elements in Products AAEON Main Board/ Daughter Board/ Backplane Poisonous or Hazardous Substances or Elements Hexavalent Polybrominated Polybrominated Component Lead Mercury Cadmium Chromium Biphenyls Diphenyl Ethers (Pb) (Hg) (Cd) (Cr(VI)) (PBB) (PBDE) PCB &...

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Page 13: Chapter 1 - Product Specifications

Chapter 1 Chapter 1 - Product Specifications...

Page 14: Specifications

Specifications System Form Factor Qseven Module Intel Atom® X Series/Intel® Processor Nseries/ Intel® Core™ i3-N305 CPU Intel® Core™ i3-N305 (8C, up to 3.8 GHz, 15W) Intel Atom® x7425E (4C, up to 3.4 GHz, 12W) Intel® Processor N200 (4C, up to 3.7 GHz, 6W) Intel®...

Page 15 Display Graphics Controller Intel® UHD Graphics Video Output Dual Display: DP x 1, up to 3840 x 2160 @144Hz 18/24-bit Single/Dual-Channel LVDS or eDP x 1, up to 1920 x 1080/3840 x 2160 @60Hz Ethernet Realtek RTL8111H-CG 1GbE x 1 Audio High Definition Audio

Interface USB Port...

Page 16: Block Diagram

Block Diagram Chapter 1 - Product Specifications...

Page 17: Chapter 2 - Hardware Information

Chapter 2 Chapter 2 - Hardware Information...

Page 18: Dimensions

Dimensions Top Side Bottom Side Chapter 2 - Hardware Information...

Page 19 With Active Cooler With Heatspreader Chapter 2 - Hardware Information...

Page 20: Jumpers And Connectors

Jumpers and Connectors Top Side Chapter 2 - Hardware Information...

Page 21 Bottom Side Chapter 2 – Hardware Information...

Page 22: List Of Connectors

List of Connectors Please refer to the table below for all of the board's connectors that you can configure for your application Label Function MIPI-CSI Connector AQ7 MXM Gold Finger Chapter 2 - Hardware Information...

Page 23: Mipi-Csi Connector (Cn1)

2.3.1 MIPI-CSI Connector (CN1) Pin Name Signal Type Signal Level CSI_A_D0_DN DIFF CSI_A_D0_DP DIFF CSI_A_D1_DP DIFF CSI_A_D1_DN DIFF CSI_A_CK_DN DIFF CSI_A_CK_DP DIFF CSI_B_D0_DP DIFF CSI_B_D0_DN DIFF CSI_B_D1_DN DIFF CSI_B_D1_DP DIFF CSI_B_CK_DP DIFF CSI_B_CK_DN DIFF CSI_C_D0_DN DIFF CSI_C_D0_DP DIFF CSI_C_D1_DP DIFF Chapter 2 -...

Page 24 Pin Name Signal Type Signal Level CSI_C_D1_DN DIFF CSI_C_CK_DN DIFF CSI_C_CK_DP DIFF CSI_D_D0_DP DIFF CSI_D_D0_DN DIFF CSI_D_D1_DN DIFF CSI_D_D1_DP DIFF CSI_D_CK_DP DIFF CSI_D_CK_DN DIFF MGCLKOUT1 MGCLKOUT0 MGCLKOUT3 MGCLKOUT2 CRD1_PWREN STROBE_CAM_CRD2_PWREN CAM1_RST# GPPC_CAM_CLK_CAM2_RST# GPPC_PRIVACY_CAM2 I2C1_SCL_ISH_INT_GP_CRD_GSB I2C1_SDA_GPPC_CAM_SYNC I2C5_SCL GPPC_PRIVACY_CAM1_I2C5_SDA_Chapter 2 -...

Page 25: Aq7 Mxm Gold Finger (Gf1)

Pin Name Signal Type Signal Level +V3P3S +3.3V SLP_S3_N +V3P3S +3.3V +V3P3S +3.3V +V3P3S +3.3V 2.3.2 AQ7 MXM Gold Finger (GF1) Pin Name Pin Name GBE_MDI3- GBE_MDI2-GBE_MDI3+ GBE_MDI2+ GBE_LINK100# GBE_LINK1000# GBE_MDI1- GBE_MDI0- GBE_MDI1+ GBE_MDI0+ GBE_LINK# GBE_ACT# GBE_CTREF SUS_S5# WAKE# SUS_S3# GP00 PWRBTN#...

Page 26 Pin Name Pin Name SDIO_CMD SDIO_WP SDIO_PWR# SDIO_DAT1 SDIO_DAT0 SDIO_DAT3 SDIO_DAT2 reserved reserved reserved reserved USB_OTG_PEN HDA_SYNC / I2S_WS SMB_CLK / GP1_I2C_CLK HDA_RST# / I2S_RST# SMB_DAT / GP1_I2C_DAT HDA_BITCLK / I2S_CLK SMB_ALERT# HDA_SDI / I2S_SDI GP0_I2C_CLK HDA_SDO / I2S_SDO GP0_I2C_DAT THRM# WDTRIG# THRMTRIP#...

Page 27 Pin Name Pin Name LVDS_PPEN LVDS_BLEN eDP0_TX3+ / LVDS_A3+ eDP1_TX3+ / LVDS_B3+ eDP0_TX3- / LVDS_A3- eDP1_TX3- / LVDS_B3- eDP0_AUX+ / LVDS_A_CLK+ eDP1_AUX+ / LVDS_B_CLK+ eDP0_AUX- / LVDS_A_CLK- eDP1_AUX- / LVDS_B_CLK- LVDS_BLT_CTRL/GP_PWM_OUT0_124 GP_1-Wire_Bus / HDMI_CEC_GP2_I2C_DAT/LVDS_DID_DAT eDP0_HPD#/LVDS_BLC_DAT_GP2_I2C_CLK / LVDS_DID_CLK eDP1_HPD#/LVDS_BLC_CLK CAN0_TX CAN0_RX...

Page 28 Pin Name Pin Name UARTO_RX UARTO_CTS# PCIE0_TX+ PCIE0_RX+ PCIE0_TX-PCIE0_RX- LPC_AD0 / GPIO0 LPC_AD1 / GPIO1 LPC_AD2 / GPIO2 LPC_AD3 / GPIO3 LPC_CLK / GPIO4 LPC_FRAME# / GPIO5 SERIRQ / GPIO6 LPC_LDRQ# / GPIO7 VCC_RTC SPKR / GP_PWM_OUT2 FAN_TACHOIN / GP_TIMER_IN FAN_PWMOUT/GP_PWM_OUT1 SPI_MOSI SPI_CS0#...

Page 29: Thermal Solution

Thermal Solution Chapter 2 - Hardware Information...

Page 30: Chapter 3 - Ami Bios Setup

Chapter 3 Chapter 3 - AMI BIOS Setup...

Page 31: System Test And Initialization

System Test and Initialization The system uses certain routines to perform testing and initialization during the boot up sequence. If an error, fatal or non-fatal, is encountered, the system will output a few short beeps or an error message. The board can usually continue the boot up sequence with non-fatal errors.

Page 32: Ami Bios Setup

AMI BIOS Setup The AMI BIOS ROM has a pre-installed Setup program that allows users to modify basic system configurations, which is stored in the battery-backed CMOS RAM and BIOS NVRAM so that the information is retained when the power is turned off. To enter BIOS Setup, press ...

Page 33: Setup Submenu: Main

Setup Submenu: Main Chapter 3 - AMI BIOS Setup...

Page 34: Setup Submenu: Advanced

Setup Submenu: Advanced Chapter 3 – AMI BIOS Setup...

Page 35: Cpu Configuration

3.4.1 CPU Configuration Options Summary Intel (VMX) Virtualization Disabled Technology Enabled Optimal Default, Failsafe Default When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology. Intel® SpeedStep[™] Disabled Enabled Optimal Default, Failsafe Default Allows more than two frequency ranges to be supported. Turbo Mode Disabled Enabled...

Page 36: Pch-Fw Configuration

3.4.2 PCH-FW Configuration Chapter 3 – AMI BIOS Setup...

Page 37: Firmware Update Configuration

3.4.2.1 Firmware Update Configuration Options Summary Me FW Image Re-Flash Disabled Optimal Default, Failsafe Default Enabled Enable/Disable Me FW Image Re-Flash function. FW Update Disabled Enabled Optimal Default, Failsafe Default Enable/Disable ME FW Update function. Chapter 3 – AMI BIOS Setup...

Page 38: Ptt Configuration

3.4.3 PTT Configuration Options Summary TPM Device Selection dTPM Optimal Default, Failsafe Default Selects TPM device: PTT or discrete TPM. PTT - enables PTT in SkuMgr dTPM - disables PTT is SkuMgr Warning! PTT/dTPM will be disabled and all data saved on it will be lost. Chapter 3 -...

Page 39: Trusted Computing

3.4.4 Trusted Computing Options Summary Security Device Support Disable Enable Optimal Default, Failsafe Default Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available. SHA256 PCR Bank Disabled Enabled Optimal Default, Failsafe Default...

Page 40 Options Summary Schedule an Operation for the Security Device. Note: Your Computer will reboot during restart in order to change State of Security Device. Platform Hierarchy Disabled Enabled Optimal Default, Failsafe Default Enable or Disable Platform Hierarchy. Storage Hierarchy Disabled Enabled Optimal Default, Failsafe Default Enable or Disable or Disable Storage Hierarchy.

Page 41: Sata Configuration

3.4.5 SATA Configuration Options Summary SATA Controller(s) Disabled Enabled Optimal Default, Failsafe Default Enable/Disable SATA Device. Port 0 (CN38) Disabled Enabled Optimal Default, Failsafe Default Enable or Disable SATA Port. Chapter 3 – AMI BIOS Setup...

Page 42: On-Module H/W Monitor

3.4.6 On-Module H/W Monitor Fan Mode: Auto – Slope Linear Options Summary System FAN Full Mode Manual Mode Auto – Slope Linear Optimal Default, Failsafe Default Fan Mode select. PWM signal Non-inverting Optimal Default, Failsafe Default Inverting Select output PWM of inverting or non-inverting signal. Thermal Monitoring CPU Temperature Optimal Default, Failsafe Default...

Page 43 Options Summary PWM turns off when monitored thermal sensor is less or equal to. Range: 0- 100 START PWM The beginning PWM output value when Start-Up temperature is triggered. Slope (PWM) 0 (PWM) 1 (PWM) Optimal Default, Failsafe Default 2 (PWM) 4 (PWM) 8 (PWM) 16 (PWM)

Page 44 Fan Mode: Full Mode Options Summary System FAN Full Mode Optimal Default, Failsafe Default Manual Mode Auto – Slope Linear Fan Mode select. Chapter 3 – AMI BIOS Setup...

Page 45 Fan Mode: Manual Mode Options Summary System FAN Full Mode Manual Mode Optimal Default, Failsafe Default Auto – Slope Linear Fan Mode select. PWM setting The PWM value of manual mode. Range: 0 – 100 Chapter 3 – AMI BIOS Setup...

Page 46: Sio Configuration

3.4.7 SIO Configuration Chapter 3 – AMI BIOS Setup...

Page 47: Serial Port

3.4.7.1 Serial Port Options Summary Use This Device Disabled Enabled Optimal Default, Failsafe Default Enable or Disable this Logical Device. Possible: Use Automatic Settings Optimal Default, Failsafe Default IO=3F8h; IRQ=4; DMA; IO=2C8h; IRQ=11; DMA; Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts.

Page 48: Serial Port Console Redirection

3.4.8 Serial Port Console Redirection Options Summary Console Redirection Disabled Optimal Default, Failsafe Default Enabled Console Redirection Enable or Disable. Console Redirection EMS Disabled Optimal Default, Failsafe Default Enabled Console Redirection Enable or Disable. Chapter 3 – AMI BIOS Setup...

Page 49: Legacy Console Redirection Settings

3.4.8.1 Legacy Console Redirection Settings Options Summary Redirection COM port COM0 Optimal Default, Failsafe Default COM1(Pci Bus0, Dev0, Func0) (Disabled) Select a COM Port to display redirection of Legacy OS and Legacy OPROM message. Resolution 80x24 Optimal Default, Failsafe Default 80x25 On Legacy OS, the number of Rows and Columns supported redirection.

Page 50: Aaeon Bios Robot

3.4.9 AAEON BIOS Robot Options Summary Sends watch dog before Disabled Optimal Default, Failsafe Default BIOS POST Enabled Enabled - Robot set Watch Dog Timer (WDT) right after power on, before BIOS start POST process. And then Robot will clear WDT on completion of POST. WDT will reset system automatically if it is not cleared before its timer counts down to zero.

Page 51 Options Summary OS Timer (minute) Optimal Default, Failsafe Default Timer count set to Watch Dog Timer for OS loading. Delayed POST (PEI phase) Disabled Optimal Default, Failsafe Default Enabled Enabled - Robot holds BIOS from starting POST, right after power on. This allows BIOS POST to start with stable power or start after system is physically warmed-up.

Page 52: Device Detecting Configuration

3.4.9.1 Device Detecting Configuration Options Summary Action Reset System Optimal Default, Failsafe Default Hold System Select action that robot should do. Soft or hard reset Soft Optimal Default, Failsafe Default Hard Select reset type robot should send on each boot. Retry-Count Optimal Default, Failsafe Default Fill retry counter here.

Page 53: Device #* Detecting Configuration

3.4.9.2 Device #* Detecting Configuration Options Summary Interface Disabled Optimal Default, Failsafe Default SMBUS Legacy I/O Super I/O MMIO Select interface robot should use to communicate with device. Chapter 3 – AMI BIOS Setup...

Page 54: Power Management

3.4.10 Power Management Options Summary Power Mode ATX Type AT Type Optimal Default, Failsafe Default Select system power mode. Restore AC Power Loss Last State Always On Always Off Optimal Default, Failsafe Default SIO Restore AC Power Loss: To decide the behavior after system power cut then resupply. Note: The CMOS battery must present.

Page 55: Gpio Port Configuration

Options Summary By Date: System will wake on the day with hr::min::sec specified. By Weekday: System will wake on the enabled weekday with hr::min::sec specified. Bypass: BIOS will not control RTC wake function. 3.4.11 GPIO Port Configuration Options Summary GPIO Port 1 Input Optimal Default, Failsafe Default Output...

<u>Page 56</u> Options Summary GPIO Port 4 Input Optimal Default, Failsafe Default Output Set GPIO as Input or Output. GPIO Port 5 Input Output Optimal Default, Failsafe Default Set GPIO as Input or Output. GPIO Port 6 Input Output Optimal Default, Failsafe Default Set GPIO as Input or Output.

Page 57: Setup Submenu: Chipset

Setup Submenu: Chipset Chapter 3 – AMI BIOS Setup...

Page 58: System Agent (Sa) Configuration

3.5.1 System Agent (SA) Configuration Options Summary VT-d Disabled Optimal Default, Failsafe Default Enabled VT-d capability. Chapter 3 – AMI BIOS Setup...

Page 59: Memory Configuration

3.5.1.1 Memory Configuration Options Summary In-Band ECC Support Disabled Optimal Default, Failsafe Default Enabled Enable/Disable In-Band ECC. Will be enabled if memory has symmetric configuration. Chapter 3 – AMI BIOS Setup...

Page 60: Lvds Panel Configuration

3.5.1.2 LVDS Panel Configuration Options Summary LVDS Disabled Enabled Optimal Default, Failsafe Default Enable/Disabled this panel Panel Type 640x480@60Hz 800x480@60Hz 800x600@60Hz 1024x600@60Hz 10247x68@60Hz Optimal Default, Failsafe Default 1280x768@60Hz 1280x800@60Hz 1280x1024@60Hz 1366x768@60Hz 1440x900@60Hz 1600x1200@60Hz Chapter 3 – AMI BIOS Setup...

Page 61 Options Summary Panel Type 1920x1080@60Hz 1920x1200@60Hz Select panel type Color Depth 18-Bit Optimal Default, Failsafe Default 24-Bit 36-Bit 48-Bit Select Color Depth Backlight Mode BIOS & Application Windows Slider Optimal Default, Failsafe Default Select backlight control signal type Chapter 3 – AMI BIOS Setup...

Page 62: Pch-Io Configuration

3.5.2 PCH-IO Configuration Options Summary HD Audio Disabled Enabled Optimal Default, Failsafe Default Control Detection of the HD-Audio device. Disabled = HDA will be unconditionally disabled. Enabled = HDA will be unconditionally enabled. eMMC 5.1 Controller Disabled Enabled Optimal Default, Failsafe Default Enable or Disable SCS eMMC 5.1 Controller.

Page 63: Setup Submenu: Security

Setup Submenu: Security Change User/Administrator Password You can set an Administrator Password or User Password. An Administrator Password must be set before you can set a User Password. The password will be required during boot up, or when the user enters the Setup utility. A User Password does not provide access to many of the features in the Setup utility.

Page 64: Secure Boot

3.6.1 Secure Boot Options Summary Secure Boot Disabled Optimal Default, Failsafe Default Enabled Secure Boot feature is Active if Secure Boot is Enabled, Platform Key (PK) is enrolled and the System is in User mode. The mode change requires platform reset. Secure Boot Mode Standard Custom...

Page 65: Key Management

3.6.1.1 Key Management Options Summary Factory Key Provision Disabled Optimal Default, Failsafe Default Enabled Install factory default Secure Boot keys after the platform reset and while the System is in Setup mode. Restore Factory Keys Force system to user mode. Install factory default Secure Boot key databases.

Page 66 Options Summary Append Forbidden Signatures (dbx) Update Append Authorized TimeStamps Update (dbt) Append OsRecovery Signatures (dbr) Update Append Enroll Factory Defaults or load certificates from a file: 1. Public Key Certificate: a) EFI_SIGNATURE_LIST b) EFI_CERT_X509 (DER) c) EFI_CERT_RSA2048 (bin) d) EFI_CERT_SHAXXX 2.

Page 67: Setup Submenu: Boot

Setup Submenu: Boot Options Summary Quiet Boot Disabled Enabled Optimal Default, Failsafe Default Enables or disables Quiet Boot option. LAN UEFI PXE Driver Disabled Optimal Default, Failsafe Default Enabled Enable/Disable LAN UEFI PXE Driver Chapter 3 – AMI BIOS Setup...

Page 68: Setup Submenu: Save & Exit

Setup Submenu: Save & Exit Chapter 3 - AMI BIOS Setup...

Page 69: Chapter 4 - Drivers Installation

Chapter 4 Chapter 4 - Drivers Installation...

Page 70: Drivers Download And Installation

Drivers Download and Installation Drivers for the AQ7-ADN can be downloaded from the product page on the AAEON website by following this link: https://www.aaeon.com/en/ Download the driver(s) you need and follow the steps below to install them. Chipset Driver Open the folder where you unzipped the Chipset Drivers Run the SetupChipset.exe file in the folder Follow the instructions Drivers will be installed automatically...

Page 71 Install Audio Drivers Note: Ensure Intel Smart Sound Driver (Intel(R)_SST_ADL_v10.29.00.7919) is installed before the Realtek Audio driver (Realtek Audio 6.0.9034.2) Install Intel Smart Sound Driver Open the Audio folder Open the Intel(R)_SST_ADL_v10.29.00.7919 subfolder Follow the setup information within the file to manually install driver. Install Realtek Audio Driver Open the Audio folder Open the Realtek Audio 6.0.9034.2 folder...

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