

COM-SKUC6 & COM-KBUC6

COM Express Module

User's Manual 4th Ed

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Packing List

Before setting up your product, please make sure the following items have been shipped:

| Item | Quantity |
|--------------------------|----------|
| ● COM-SKUC6 or COM-KBUC6 | 1 |

If any of these items are missing or damaged, please contact your distributor or sales representative immediately.

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 AAEON.com for the latest version of this document.

Safety Precautions

Please read the following safety instructions carefully. It is advised that you keep this manual for future references

1. All cautions and warnings on the device should be noted.
2. Make sure the power source matches the power rating of the device.
3. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
4. Always completely disconnect the power before working on the system's hardware.
5. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
6. If the device is not to be used for a long time, disconnect it from the power supply to avoid damage by transient over-voltage.
7. Always disconnect this device from any AC supply before cleaning.
8. While cleaning, use a damp cloth instead of liquid or spray detergents.
9. Make sure the device is installed near a power outlet and is easily accessible.
10. Keep this device away from humidity.
11. Place the device on a solid surface during installation to prevent falls
12. Do not cover the openings on the device to ensure optimal heat dissipation.
13. Watch out for high temperatures when the system is running.
14. Do not touch the heat sink or heat spreader when the system is running
15. Never pour any liquid into the openings. This could cause fire or electric shock.
16. As most electronic components are sensitive to static electrical charge, be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and contain all electronic components in any static-shielded containers.

17. If any of the following situations arises, please the contact our service personnel:
 - i. Damaged power cord or plug
 - ii. Liquid intrusion to the device
 - iii. Exposure to moisture
 - iv. Device is not working as expected or in a manner as described in this manual
 - v. The device is dropped or damaged
 - vi. Any obvious signs of damage displayed on the device
18. **DO NOT LEAVE THIS DEVICE IN AN UNCONTROLLED ENVIRONMENT WITH TEMPERATURES BEYOND THE DEVICE'S PERMITTED STORAGE TEMPERATURES (SEE CHAPTER 1) TO PREVENT DAMAGE.**

FCC Statement

Warning!



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.

Caution:

There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions and your local government's recycling or disposal directives.

Attention:

Il y a un risque d'explosion si la batterie est remplacée de façon incorrecte. Ne la remplacer qu'avec le même modèle ou équivalent recommandé par le constructeur. Recycler les batteries usées en accord avec les instructions du fabricant et les directives gouvernementales de recyclage.

China RoHS Requirements (CN)

产品中有毒有害物质或元素名称及含量

AAEON Main Board/ Daughter Board/ Backplane

| 部件名称 | 有毒有害物质或元素 | | | | | |
|--|-----------|-----------|-----------|-----------------|---------------|-----------------|
| | 铅 (Pb) | 汞 (Hg) | 镉 (Cd) | 六价铬 (Cr(VI)) | 多溴联苯 (PBB) | 多溴二苯醚 (PBDE) |
| 印刷电路板 及其电子组件 | ○ | ○ | ○ | ○ | ○ | ○ |
| 外部信号 连接器及线材 | ○ | ○ | ○ | ○ | ○ | ○ |
| <p>O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 标准规定的限量要求以下。</p> <p>X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求。</p> <p>备注: 此产品所标示之环保使用期限, 系指在一般正常使用状况下。</p> | | | | | | |

China RoHS Requirement (EN)

Poisonous or Hazardous Substances or Elements in Products

AAEON Main Board/ Daughter Board/ Backplane

| Component | Poisonous or Hazardous Substances or Elements | | | | | |
|---|---|--------------|--------------|------------------------------|--------------------------------|---------------------------------------|
| | Lead (Pb) | Mercury (Hg) | Cadmium (Cd) | Hexavalent Chromium (Cr(VI)) | Polybrominated Biphenyls (PBB) | Polybrominated Diphenyl Ethers (PBDE) |
| PCB & Other Components | ○ | ○ | ○ | ○ | ○ | ○ |
| Wires & Connectors for External Connections | ○ | ○ | ○ | ○ | ○ | ○ |
| <p>O: The quantity of poisonous or hazardous substances or elements found in each of the component's parts is below the SJ/T 11363-2006-stipulated requirement.</p> <p>X: The quantity of poisonous or hazardous substances or elements found in at least one of the component's parts is beyond the SJ/T 11363-2006-stipulated requirement.</p> <p>Note: The Environment Friendly Use Period as labeled on this product is applicable under normal usage only</p> | | | | | | |

Table of Contents

| | |
|---|-----------|
| Chapter 1 - Product Specifications | 1 |
| 1.1 Specifications | 2 |
| Chapter 2 – Hardware Information | 4 |
| 2.1 Dimensions, Jumpers and Connectors | 5 |
| 2.2 List of Jumpers | 8 |
| 2.2.1 AT/ATX Switch & DDI/VGA Switch (SW1) | 8 |
| 2.2.2 ROW A/B Connector (CN1) | 8 |
| 2.2.3 ROW C/D Connector (CN2) | 13 |
| 2.2.4 RTC Connector (CN3) | 17 |
| 2.2.5 SPI ROM FLASH (CN4) | 17 |
| Chapter 3 - AMI BIOS Setup | 18 |
| 3.1 System Test and Initialization | 19 |
| 3.2 AMI BIOS Setup | 20 |
| 3.3 Setup submenu: Main | 21 |
| 3.4 Setup submenu: Advanced | 22 |
| 3.4.1 Advanced: CPU Configuration | 23 |
| 3.4.2 Advanced: SATA Configuration | 24 |
| 3.4.3 Advanced: USB Configuration | 26 |
| 3.4.4 Advanced: On-Module FEATURES | 27 |
| 3.4.5 Advanced: SIO Configuration | 28 |
| 3.4.5.1 SIO Configuration: Serial Port 9 Configuration | 29 |
| 3.4.5.2 SIO Configuration: Serial Port 10 Configuration | 30 |
| 3.4.6 Advanced: Power Management | 31 |
| 3.4.7 Advanced: Digital IO Port Configuration | 32 |
| 3.4.8 Advanced: On-Module Hardware Monitor | 33 |
| 3.4.8.1 Fan 1 Mode Configuration: CPU Smart Fan Full Mode | 34 |

| | | |
|-------------------|---|-----------|
| 3.4.8.2 | Fan 1 Mode Configuration: CPU Smart Fan Manual Mode | 35 |
| 3.4.8.3 | Fan 1 Mode Configuration: CPU Smart Fan Auto Mode | 36 |
| 3.4.9 | Advanced: Trusted Computing | 37 |
| 3.4.10 | Advanced: Firmware Update Configuration | 39 |
| 3.5 | Setup submenu: Chipset | 40 |
| 3.5.1 | Chipset: System Agent (SA) Configuration | 41 |
| 3.5.1.1 | System Agent (SA): Graphics Configuration | 42 |
| 3.5.1.2 | Graphics Configuration: LVDS Panel Configuration | 43 |
| 3.5.2 | Chipset: PCH-IO Configuration | 45 |
| 3.5.3 | Chipset: PCIE Type Switch Selection | 46 |
| 3.6 | Setup submenu: Security | 47 |
| 3.6.1 | Security: Secure Boot | 48 |
| 3.6.1.1 | Secure Boot: Key Management | 49 |
| 3.7 | Setup submenu: Boot | 52 |
| 3.7.1 | Boot: Hard Drive BBS Priorities | 53 |
| 3.8 | Setup submenu: Save & Exit | 54 |
| Chapter 4 | Drivers Installation | 55 |
| 4.1 | Driver Download/Installation | 56 |
| 4.1.1 | COM-KBUC6 Driver Installation Steps | 56 |
| 4.1.2 | COM-SKUC6 Driver Installation Steps | 58 |
| Appendix A | Watchdog Timer Programming | 60 |
| A.1 | Watchdog Timer Initial Program | 61 |
| Appendix B | I/O Information | 66 |
| B.1 | I/O Address Map | 67 |
| B.2 | Memory Address Map | 68 |
| B.3 | IRQ Mapping Chart | 69 |
| Appendix C | Programming Digital I/O | 79 |
| C.1 | Digital I/O Programming | 80 |

| | | |
|---|---------------------------------|-----------|
| C.2 | Digital I/O Register..... | 80 |
| C.2 | Digital I/O Sample Program..... | 81 |
| Appendix D –Notes for Users..... | | 85 |
| D.1 | Notes for Users..... | 86 |

Chapter 1

Product Specifications

1.1 Specifications

System

| | |
|-----------------------------|---|
| Form Factor | COM Express Compact Size, Type 6 |
| CPU | Onboard 6th/7th Generation Intel® Core™ U-series SoC Processor |
| CPU Frequency | Up to i7-7600U 2C/2.8 GHz |
| Chipset | Onboard 6th/7th Generation Intel® Core™ U-series SoC |
| Memory Type | DDR3L 1600, SODIMM x1 |
| Max. Memory Capacity | 8GB |
| BIOS | AMI BIOS, Legacy Free |
| Wake on LAN | YES |
| Watchdog Timer | 255 Levels |
| Power Requirement | Nominal : +12V |
| Power Supply Type | AT/ATX |
| Power Consumption (Typical) | i7-7600U, 8GB DDR3L, full loading 1.32A@12V during 100% loading burn in test |
| Dimension (L x W) | 3.75" x 3.75" (95 mm x 95 mm) |
| Operating Temperature | 32°F ~ 140°F (0°C ~ 60°C) |
| Storage Temperature | -40°F ~ 185°F (-40°C ~ 85°C) |
| Operating Humidity | 0% ~ 90% relative humidity, non-condensing |
| MTBF (Hours) | 80,000 |
| Certification | CE / FCC Class A |

Display

| | |
|--------------------|--|
| VCD/LCD Controller | Onboard 6th Gen Intel® Core U-Series Processor, GT2-520/510 Onboard 7th Gen Intel® Core U-Series Processor, GT2-620/610 |
| Video Output | VGA, LVDS/eDP, DDI x 1 (up to 2) |
| LVDS Interface | — |

I/O

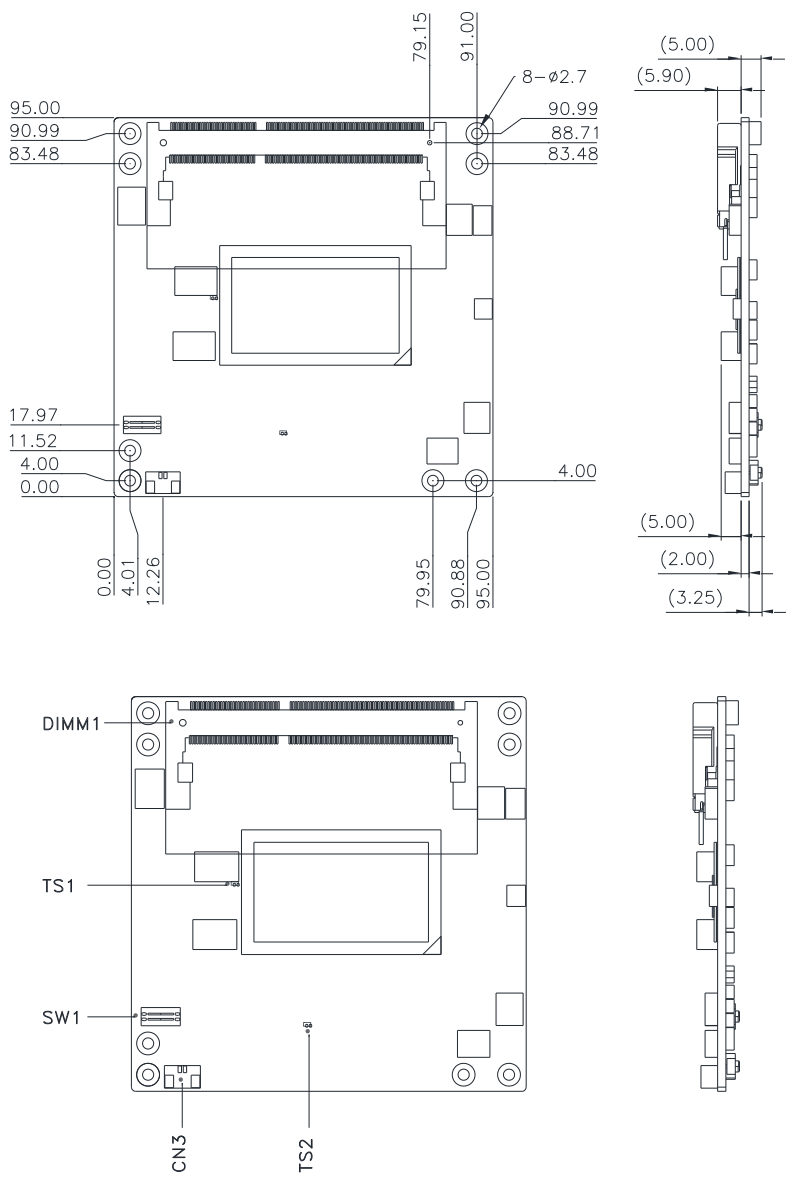
| | |
|-----------------|-------------------------------------|
| Ethernet | Intel® I219-LM Gigabit Ethernet |
| Audio | HD Audio |
| USB Port | USB 2.0 x 8 USB 3.0 x 4 |
| Serial Port | 2-Wire UART (Tx/Rx) x 2 |
| HDD Interface | SATAIII x 2 ; i5 & i7 up to 3 |
| Onboard Storage | — |
| Expansion Slot | PCIe[x1] x 8 I2C LPC SMBus |
| GPIO | GPIO 8-bit |
| TPM | Optional |
| Note | — |

Chapter 2

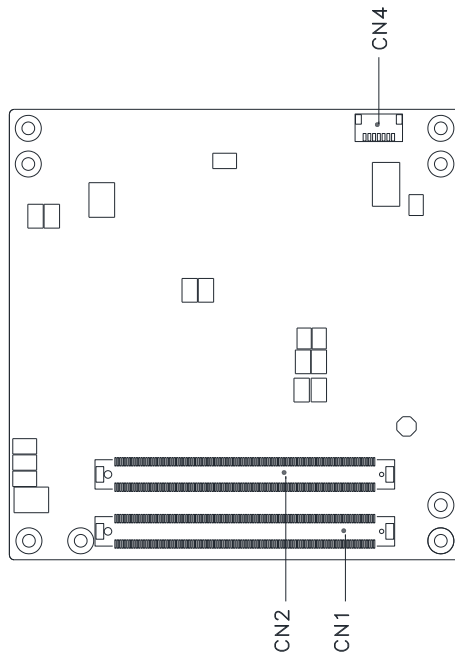
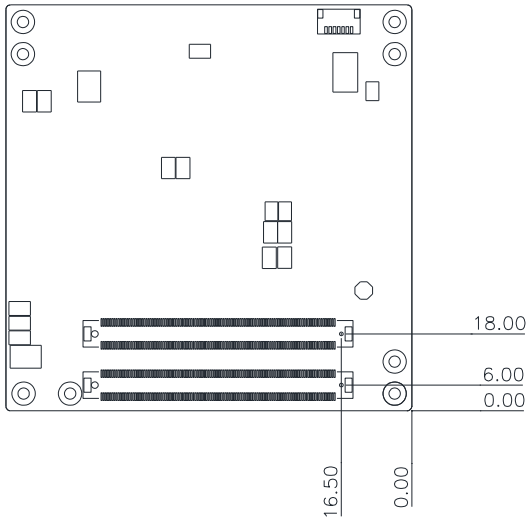
Hardware Information

2.1 Dimensions, Jumpers and Connectors

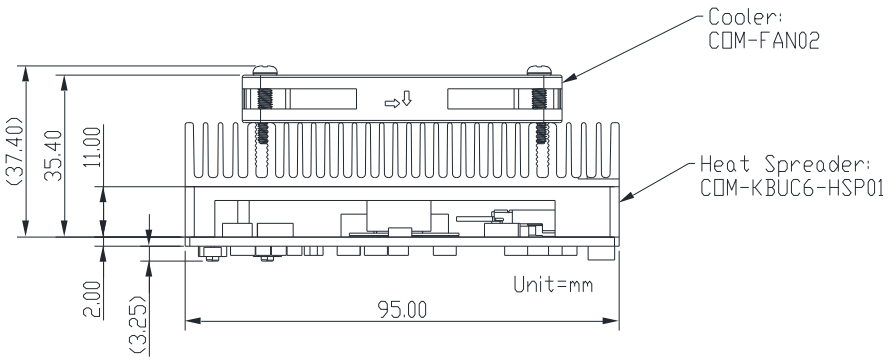
Component Side



Solder Side



With Heat spreader



2.2 List of Jumpers

Please refer to the table below for all of the board's jumpers that you can configure for your application

| Label | Function |
|-------|--------------------------------|
| SW1 | AT/ATX switch & DDI/VGA switch |
| DIMM1 | DDR3L Socket |
| CN1 | ROW A/B |
| CN2 | ROW C/D |
| CN3 | RTC Connector |
| CN4 | SPI ROM FLASH |

2.2.1 AT/ATX Switch & DDI/VGA Switch (SW1)

| | ON | OFF |
|---|---------------|--------------------|
| 1 | AT Mode | ATX Mode (Default) |
| 2 | VGA (Default) | DDI |

2.2.2 ROW A/B Connector (CN1)

| Row A | | Row B | |
|-------|----------------|-------|-------------|
| Pin | Signal | Pin | Signal |
| A1 | GND (FIXED) | B1 | GND (FIXED) |
| A2 | GBE0_MDI3- | B2 | GBE0_ACT# |
| A3 | GBE0_MDI3+ | B3 | LPC_FRAME# |
| A4 | GBE0_LINK100# | B4 | LPC_AD0 |
| A5 | GBE0_LINK1000# | B5 | LPC_AD1 |
| A6 | GBE0_MDI2- | B6 | LPC_AD2 |

| Row A | | Row B | |
|-------|------------------|-------|-------------|
| Pin | Signal | Pin | Signal |
| A7 | GBE0_MDI2+ | B7 | LPC_AD3 |
| A8 | GBE0_LINK | B8 | N.C |
| A9 | GBE0_MDI1- | B9 | N.C |
| A10 | GBE0_MDI1+ | B10 | LPC_CLK |
| A11 | GND (FIXED) | B11 | GND (FIXED) |
| A12 | GBE0_MDI0- | B12 | PWRBTN# |
| A13 | GBE0_MDI0+ | B13 | SMB_CK |
| A14 | GBE0_CTREF | B14 | SMB_DAT |
| A15 | SUS_S3# | B15 | SMB_ALERT# |
| A16 | SATA0_TX+ | B16 | SATA1_TX+ |
| A17 | SATA0_TX- | B17 | SATA1_TX- |
| A18 | SUS_S4# | B18 | SUS_STAT# |
| A19 | SATA0_RX+ | B19 | SATA1_RX+ |
| A20 | SATA0_RX- | B20 | SATA1_RX- |
| A21 | GND (FIXED) | B21 | GND (FIXED) |
| A22 | SATA2_TX+ (note) | B22 | N.C |
| A23 | SATA2_TX- (note) | B23 | N.C |
| A24 | SUS_S5# | B24 | PWR_OK |
| A25 | SATA2_RX+ (note) | B25 | N.C |
| A26 | SATA2_RX- (note) | B26 | N.C |
| A27 | BATLOW# | B27 | WDT |
| A28 | ATA_ACT# | B28 | N.C |
| A29 | AC_SYNC | B29 | AC_SDIN1 |
| A30 | AC_RST# | B30 | AC_SDIN0 |
| A31 | GND (FIXED) | B31 | GND (FIXED) |
| A32 | AC_BITCLK | B32 | SPKR |
| A33 | AC_SDOOUT | B33 | I2C_CK |

| Row A | | Row B | |
|-------|-----------------|-------|-----------------|
| Pin | Signal | Pin | Signal |
| A34 | BIOS_DIS0# | B34 | I2C_DAT |
| A35 | THRMTRIP# | B35 | N.C |
| A36 | USB6- | B36 | USB7- |
| A37 | USB6+ | B37 | USB7+ |
| A38 | USB_6_7_OC# | B38 | USB_4_5_OC# |
| A39 | USB4- | B39 | USB5- |
| A40 | USB4+ | B40 | USB5+ |
| A41 | GND (FIXED) | B41 | GND (FIXED) |
| A42 | USB2- | B42 | USB3- |
| A43 | USB2+ | B43 | USB3+ |
| A44 | USB_2_3_OC# | B44 | USB_0_1_OC# |
| A45 | USB0- | B45 | USB1- |
| A46 | USB0+ | B46 | USB1+ |
| A47 | VCC_RTC | B47 | EXCD1_PERST# |
| A48 | EXCD0_PERST# | B48 | EXCD1_CPPE# |
| A49 | EXCD0_CPPE# | B49 | SYS_RESET# |
| A50 | LPC_SERIRQ | B50 | CB_RESET# |
| A51 | GND (FIXED) | B51 | GND (FIXED) |
| A52 | PCIE_TX5+(note) | B52 | PCIE_RX5+(note) |
| A53 | PCIE_TX5-(note) | B53 | PCIE_RX5-(note) |
| A54 | GPIO | B54 | GPO1 |
| A55 | PCIE_TX4+(note) | B55 | PCIE_RX4+(note) |
| A56 | PCIE_TX4-(note) | B56 | PCIE_RX4-(note) |
| A57 | GND | B57 | GPO2 |
| A58 | PCIE_TX3+(note) | B58 | PCIE_RX3+(note) |
| A59 | PCIE_TX3-(note) | B59 | PCIE_RX3-(note) |
| A60 | GND (FIXED) | B60 | GND (FIXED) |

| Row A | | Row B | |
|-------|-------------------|-------|----------------|
| Pin | Signal | Pin | Signal |
| A61 | PCIE_TX2+ | B61 | PCIE_RX2+ |
| A62 | PCIE_TX2- | B62 | PCIE_RX2- |
| A63 | GPI1 | B63 | GPO3 |
| A64 | PCIE_TX1+ | B64 | PCIE_RX1+ |
| A65 | PCIE_TX1- | B65 | PCIE_RX1- |
| A66 | GND | B66 | WAKE0# |
| A67 | GPI2 | B67 | WAKE1# |
| A68 | PCIE_TX0+ | B68 | PCIE_RX0+ |
| A69 | PCIE_TX0- | B69 | PCIE_RX0- |
| A70 | GND (FIXED) | B70 | GND (FIXED) |
| A71 | LVDS_A0+ | B71 | LVDS_B0+ |
| A72 | LVDS_A0- | B72 | LVDS_B0- |
| A73 | LVDS_A1+ | B73 | LVDS_B1+ |
| A74 | LVDS_A1- | B74 | LVDS_B1- |
| A75 | LVDS_A2+ | B75 | LVDS_B2+ |
| A76 | LVDS_A2- | B76 | LVDS_B2- |
| A77 | LVDS_VDD_EN | B77 | LVDS_B3+ |
| A78 | LVDS_A3+ | B78 | LVDS_B3- |
| A79 | LVDS_A3- | B79 | LVDS_BKLT_EN |
| A80 | GND (FIXED) | B80 | GND (FIXED) |
| A81 | LVDS_A_CK+ | B81 | LVDS_B_CK+ |
| A82 | LVDS_A_CK- | B82 | LVDS_B_CK- |
| A83 | LVDS_I2C_CK | B83 | LVDS_BKLT_CTRL |
| A84 | LVDS_I2C_DAT | B84 | VCC_5V_SBY |
| A85 | GPI3 | B85 | VCC_5V_SBY |
| A86 | KBRST#(option) | B86 | VCC_5V_SBY |
| A87 | H_A20GATE(option) | B87 | VCC_5V_SBY |

| Row A | | Row B | |
|-------|----------------|-------|-------------|
| Pin | Signal | Pin | Signal |
| A88 | PCIE0_CK_REF+ | B88 | BISO_DIS1# |
| A89 | PCIE0_CK_REF- | B89 | VGA_RED |
| A90 | GND (FIXED) | B90 | GND (FIXED) |
| A91 | +V3.3S(option) | B91 | VGA_GRN |
| A92 | SPI_MISO | B92 | VGA_BLU |
| A93 | GPO0 | B93 | VGA_HSYNC |
| A94 | SPI_CLK | B94 | VGA_VSYNC |
| A95 | SPI_MOSI | B95 | VGA_I2C_CK |
| A96 | GND | B96 | VGA_I2C_DAT |
| A97 | N.C | B97 | SPI_CS# |
| A98 | CB_STXD1X | B98 | SMI# |
| A99 | CB_SRXD1X | B99 | SCI# |
| A100 | GND (FIXED) | B100 | GND (FIXED) |
| A101 | CB_STXD2X | B101 | CB_FAN_PWM |
| A102 | CB_SRXD2X | B102 | CB_FAN_TACH |
| A103 | PCH_LID# | B103 | PCH_SLEEP# |
| A104 | VCC_12V | B104 | VCC_12V |
| A105 | VCC_12V | B105 | VCC_12V |
| A106 | VCC_12V | B106 | VCC_12V |
| A107 | VCC_12V | B107 | VCC_12V |
| A108 | VCC_12V | B108 | VCC_12V |
| A109 | VCC_12V | B109 | VCC_12V |
| A110 | GND (FIXED) | B110 | GND (FIXED) |

*Note : Custom BIOS require to active this pin. This function for i5/i7 sku CPU only.

2.2.3 ROW C/D Connector (CN2)

| Row C | | Row D | |
|-------|-----------------|-------|--------------------|
| Pin | Signal | Pin | Signal |
| C1 | GND (FIXED) | D1 | GND (FIXED) |
| C2 | GND (FIXED) | D2 | GND (FIXED) |
| C3 | USB_SSRX0- | D3 | USB_SSTX0- |
| C4 | USB_SSRX0+ | D4 | USB_SSTX0+ |
| C5 | GND (FIXED) | D5 | GND (FIXED) |
| C6 | USB_SSRX1- | D6 | USB_SSTX1- |
| C7 | USB_SSRX1+ | D7 | USB_SSTX1+ |
| C8 | GND (FIXED) | D8 | GND (FIXED) |
| C9 | USB_SSRX2- | D9 | USB_SSTX2- |
| C10 | USB_SSRX2+ | D10 | USB_SSTX2+ |
| C11 | GND (FIXED) | D11 | GND (FIXED) |
| C12 | USB_SSRX3- | D12 | USB_SSTX3- |
| C13 | USB_SSRX3+ | D13 | USB_SSTX3+ |
| C14 | GND (FIXED) | D14 | GND (FIXED) |
| C15 | N.C | D15 | DDI1_CTRLCLK_AUX+ |
| C16 | N.C | D16 | DDI1_CTRLDATA_AUX- |
| C17 | RSVD | D17 | RSVD |
| C18 | RSVD | D18 | RSVD |
| C19 | PCIE_RX6+(note) | D19 | PCIE_TX6+(note) |
| C20 | PCIE_RX6-(note) | D20 | PCIE_TX6-(note) |
| C21 | GND (FIXED) | D21 | GND (FIXED) |
| C22 | PCIE_RX7+(note) | D22 | PCIE_TX7+(note) |
| C23 | PCIE_RX7-(note) | D23 | PCIE_TX7-(note) |
| C24 | DDI1_HPD | D24 | RSVD |

| | | | |
|-----|--------------------|-----|------------------|
| C25 | N.C | D25 | RSVD |
| C26 | N.C | D26 | DDI1_PAIR0+ |
| C27 | RSVD | D27 | DDI1_PAIR0- |
| C28 | RSVD | D28 | RSVD |
| C29 | N.C | D29 | DDI1_PAIR1+ |
| C30 | N.C | D30 | DDI1_PAIR1- |
| C31 | GND (FIXED) | D31 | GND (FIXED) |
| C32 | DDI2_CTRLCLK_AUX+ | D32 | DDI1_PAIR2+ |
| C33 | DDI2_CTRLDATA_AUX- | D33 | DDI1_PAIR2- |
| C34 | DDI2_DDC_AUX_SEL | D34 | DDI1_DDC_AUX_SEL |
| C35 | RSVD | D35 | RSVD |
| C36 | N.C | D36 | DDI1_PAIR3+ |
| C37 | N.C | D37 | DDI1_PAIR3- |
| C38 | N.C | D38 | RSVD |
| C39 | N.C | D39 | DDI2_PAIR0+ |
| C40 | N.C | D40 | DDI2_PAIR0- |
| C41 | GND (FIXED) | D41 | GND (FIXED) |
| C42 | N.C | D42 | DDI2_PAIR1+ |
| C43 | N.C | D43 | DDI2_PAIR1- |
| C44 | N.C | D44 | DDI1_HPDP |
| C45 | RSVD | D45 | RSVD |
| C46 | N.C | D46 | DDI2_PAIR2+ |
| C47 | N.C | D47 | DDI2_PAIR2- |
| C48 | RSVD | D48 | RSVD |
| C49 | N.C | D49 | DDI2_PAIR3+ |
| C50 | N.C | D50 | DDI2_PAIR3- |
| C51 | GND (FIXED) | D51 | GND (FIXED) |
| C52 | N.C | D52 | N.C |
| C53 | N.C | D53 | N.C |

| | | | |
|-----|-------------|-----|-------------|
| C54 | N.C | D54 | N.C |
| C55 | N.C | D55 | N.C |
| C56 | N.C | D56 | N.C |
| C57 | N.C | D57 | GND |
| C58 | N.C | D58 | N.C |
| C59 | N.C | D59 | N.C |
| C60 | GND (FIXED) | D60 | GND (FIXED) |
| C61 | N.C | D61 | N.C |
| C62 | N.C | D62 | N.C |
| C63 | RSVD | D63 | RSVD |
| C64 | RSVD | D64 | RSVD |
| C65 | N.C | D65 | N.C |
| C66 | N.C | D66 | N.C |
| C67 | RSVD | D67 | GND (FIXED) |
| C68 | N.C | D68 | N.C |
| C69 | N.C | D69 | N.C |
| C70 | GND (FIXED) | D70 | GND (FIXED) |
| C71 | N.C | D71 | N.C |
| C72 | N.C | D72 | N.C |
| C73 | GND (FIXED) | D73 | GND (FIXED) |
| C74 | N.C | D74 | N.C |
| C75 | N.C | D75 | N.C |
| C76 | GND (FIXED) | D76 | GND (FIXED) |
| C77 | RSVD | D77 | RSVD |
| C78 | N.C | D78 | N.C |
| C79 | N.C | D79 | N.C |
| C80 | GND (FIXED) | D80 | GND (FIXED) |
| C81 | N.C | D81 | N.C |
| C82 | N.C | D82 | N.C |

| | | | |
|------|-------------|------|-------------|
| C83 | RSVD | D83 | RSVD |
| C84 | GND (FIXED) | D84 | GND (FIXED) |
| C85 | N.C | D85 | N.C |
| C86 | N.C | D86 | N.C |
| C87 | GND (FIXED) | D87 | GND (FIXED) |
| C88 | N.C | D88 | N.C |
| C89 | N.C | D89 | N.C |
| C90 | GND (FIXED) | D90 | GND (FIXED) |
| C91 | N.C | D91 | N.C |
| C92 | N.C | D92 | N.C |
| C93 | GND | D93 | GND |
| C94 | N.C | D94 | N.C |
| C95 | N.C | D95 | N.C |
| C96 | GND (FIXED) | D96 | GND (FIXED) |
| C97 | RSVD | D97 | RSVD |
| C98 | N.C | D98 | N.C |
| C99 | N.C | D99 | N.C |
| C100 | GND (FIXED) | D100 | GND (FIXED) |
| C101 | N.C | D101 | N.C |
| C102 | N.C | D102 | N.C |
| C103 | GND (FIXED) | D103 | GND |
| C104 | VCC_12V | D104 | VCC_12V |
| C105 | VCC_12V | D105 | VCC_12V |
| C106 | VCC_12V | D106 | VCC_12V |
| C107 | VCC_12V | D107 | VCC_12V |
| C108 | VCC_12V | D108 | VCC_12V |
| C109 | VCC_12V | D109 | VCC_12V |
| C110 | GND (FIXED) | D110 | GND (FIXED) |

*Note : Custom BIOS require to active this pin. This function for i5/i7 sku CPU only.

2.2.4 RTC Connector (CN3)

| Pin | Signal |
|-----|---------------|
| 1 | Battery power |
| 2 | GND |

2.2.5 SPI ROM FLASH (CN4)

| Pin | Signal |
|-----|------------|
| 1 | SPI_SO_F |
| 2 | GND |
| 3 | SPI_CLK_F |
| 4 | 3.3V |
| 5 | SPI_SI_F |
| 6 | SPI_CE0#_F |
| 7 | SPI_CE1#_F |

Chapter 3

AMI BIOS Setup

3.1 System Test and Initialization

The board uses certain routines to test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors.

System configuration verification routines check the current system configuration stored in the CMOS memory and BIOS NVRAM. If a system configuration is not found or a system configuration data error is detected, the system will load the optimized default and re-boot with this default system configuration automatically.

There are four situations in which you will need to setup system configuration:

- You are starting your system for the first time.
- You have changed the hardware attached to your system.
- The system configuration is reset by Clear-CMOS jumper.
- The CMOS memory has lost power and the configuration information has been erased.

The COM-KBUC6-A11 CMOS memory has an integral lithium battery backup for data retention. You will need to replace the complete unit when it runs down.

3.2 AMI BIOS Setup

The AMI BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This information is stored in the battery-backed CMOS RAM and BIOS NVRAM so it retains the Setup information when the power is turned off.

To enter Setup, power on the computer and press or <ESC> immediately.

The function of each interface is as follows:

Main – Date and time can be set here. Use <Tab> to switch between date elements.

Advanced – Enable/disable boot option for legacy network devices.

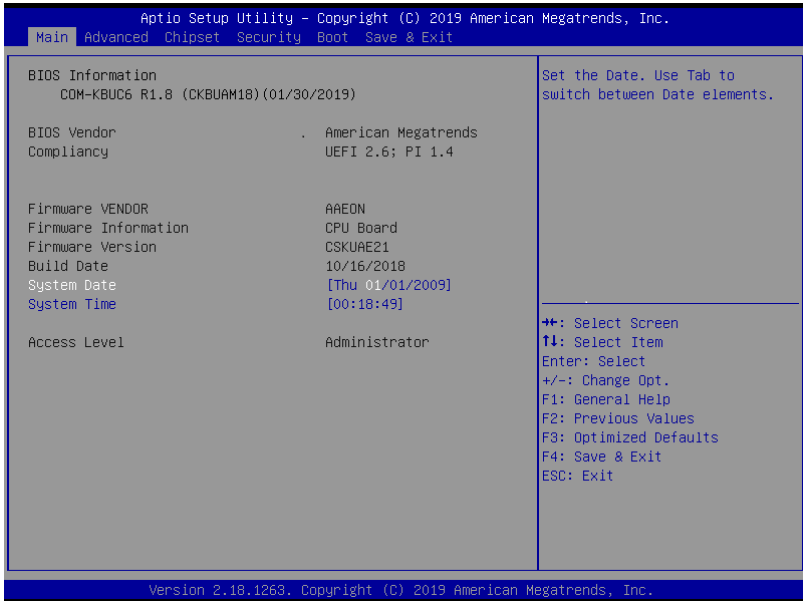
Chipset – Host bridge parameters.

Security – Password for setup administrator can be set here.

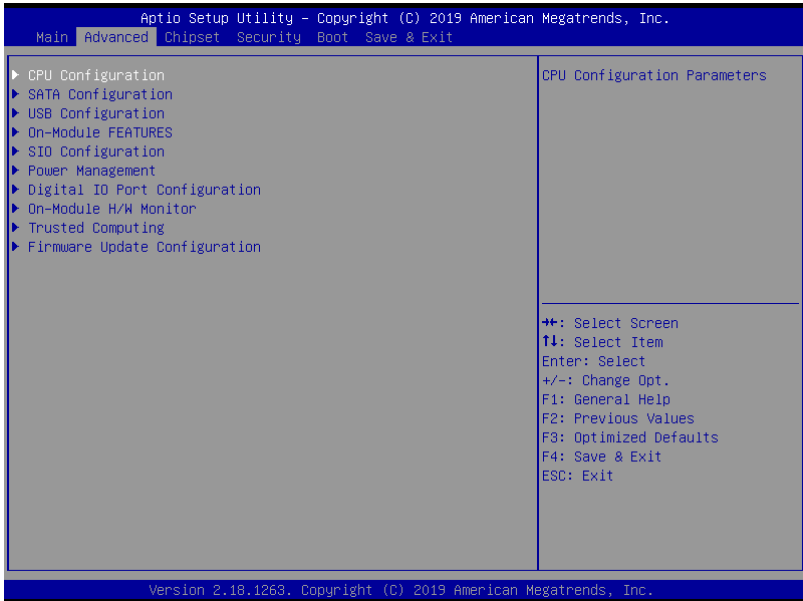
Boot – Enable/disable Quiet Boot Option.

Save & Exit – Save changes and exit Setup.

3.3 Setup submenu: Main



3.4 Setup submenu: Advanced

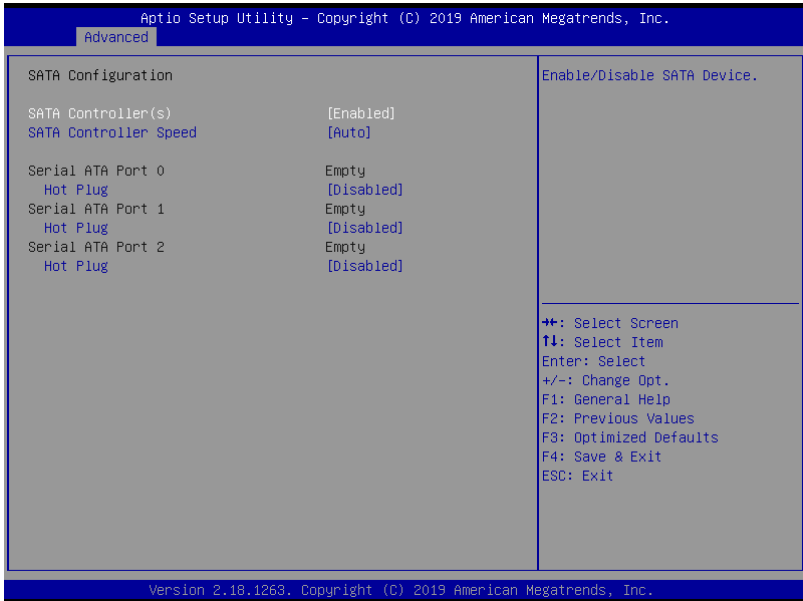


3.4.1 Advanced: CPU Configuration



| Options Summary | | |
|---|----------|-----------------------------------|
| Hyper-Threading | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). | | |
| Intel (VMX) Virtualization Technology | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology. | | |
| Intel® Speed Shift Technology | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable/Disable Intel® Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states. | | |
| Intel® SpeedStep™ | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Allows more than two frequency ranges to be supported. | | |

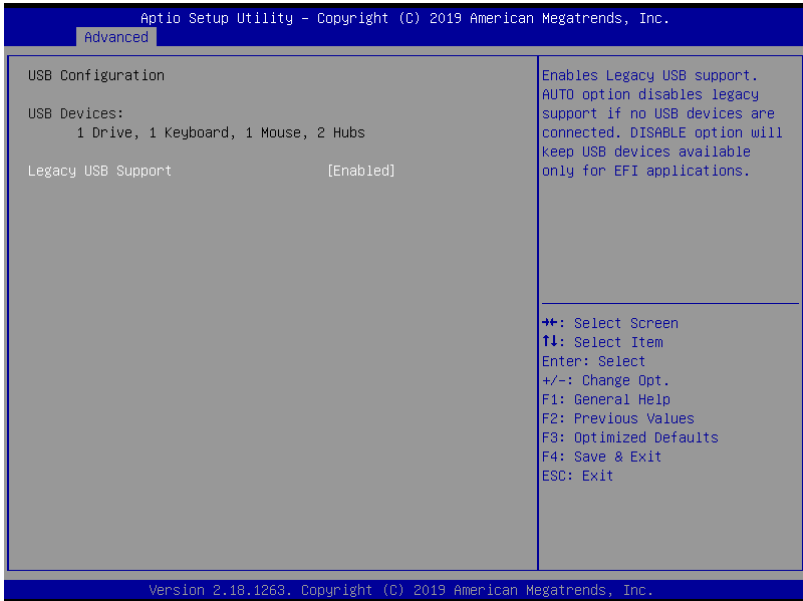
3.4.2 Advanced: SATA Configuration



| Options Summary | | |
|--|----------|-----------------------------------|
| SATA Controller(s) | Enabled | Optimal Default, Failsafe Default |
| | Disabled | |
| Enable/Disable SATA Device. | | |
| SATA Controller Speed | Auto | Optimal Default, Failsafe Default |
| | Gen1 | |
| | Gen2 | |
| | Gen3 | |
| Indicates the maximum speed the SATA controller can support. | | |
| Port 0 | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable or Disable SATA Port. | | |
| Hot Plug | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Designates this port as Hot Pluggable. | | |

| Options Summary | | |
|--|----------|-----------------------------------|
| Port 1 | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable or Disable SATA Port. | | |
| Hot Plug | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Designates this port as Hot Pluggable. | | |
| Port 2 | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable or Disable SATA Port. | | |
| Hot Plug | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Designates this port as Hot Pluggable. | | |

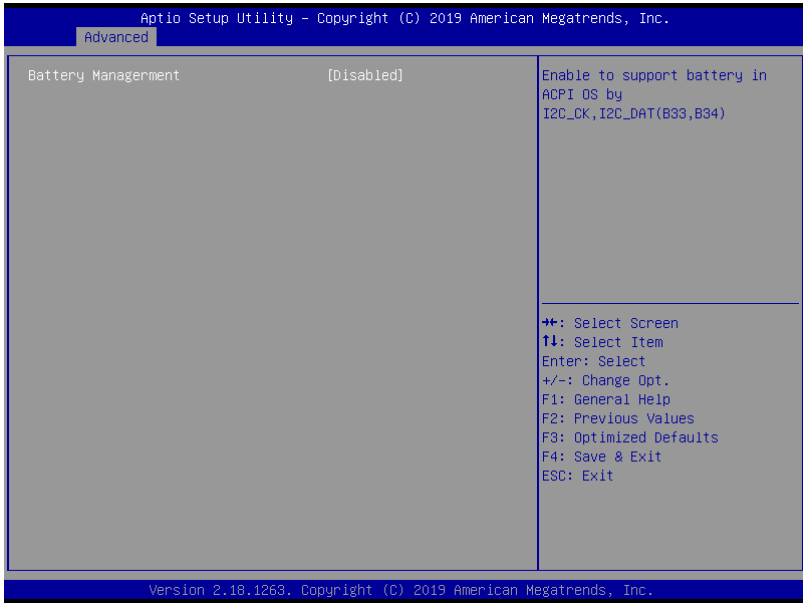
3.4.3 Advanced: USB Configuration



Options summary:

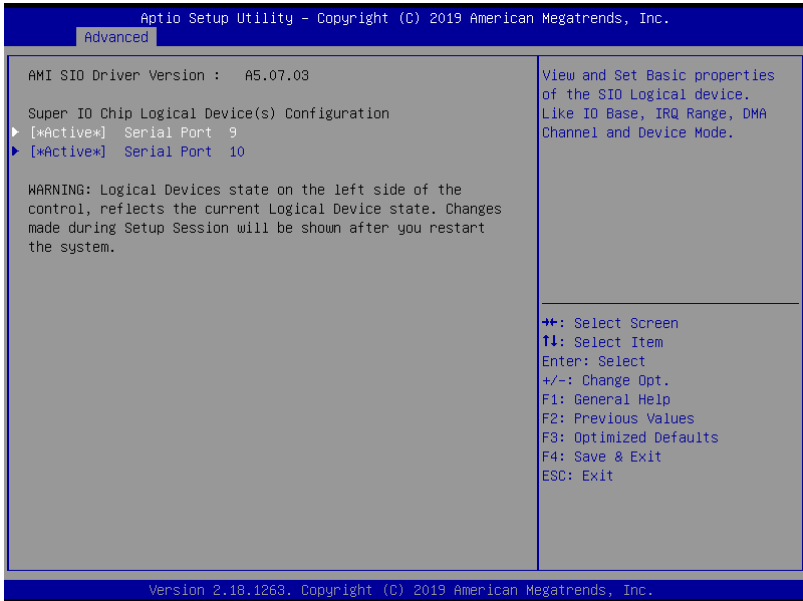
| Options Summary | | |
|---|----------|-----------------------------------|
| Legacy USB Support | Enabled | Optimal Default, Failsafe Default |
| | Disabled | |
| | Auto | |
| Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. Disable option will keep USB devices available only for EFI application. | | |

3.4.4 Advanced: On-Module FEATURES

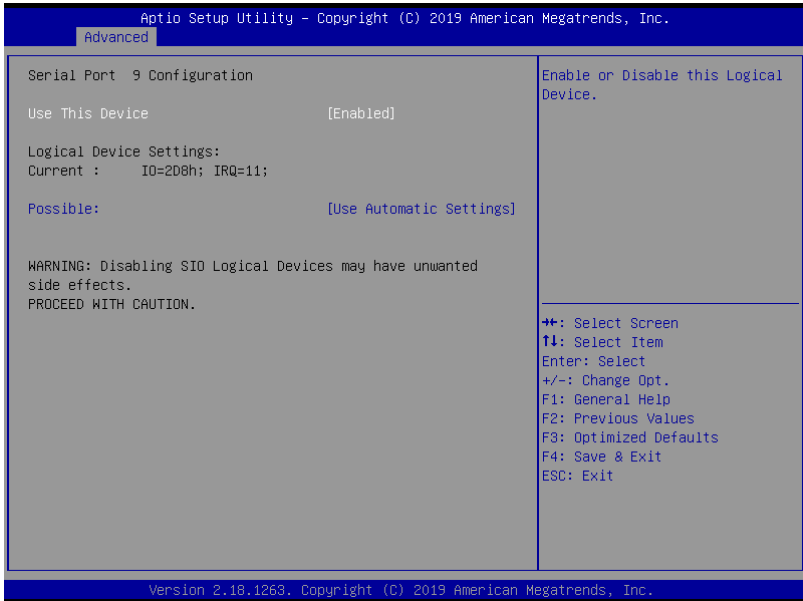


| Options Summary | | |
|---|-------------|-----------------------------------|
| Battery | Disabled | Optimal Default, Failsafe Default |
| Management | One Battery | |
| Enabled to support battery in ACPI OS by I2C_CK , I2C_DAT (B33,B34) | | |

3.4.5 Advanced: SIO Configuration



3.4.5.1 SIO Configuration: Serial Port 9 Configuration



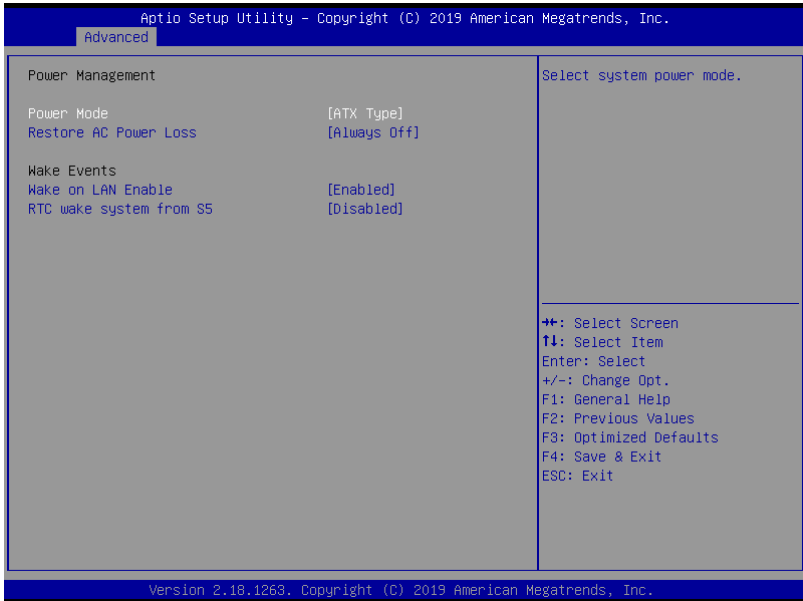
| Options Summary | | |
|--|------------------------|-----------------------------------|
| Use This Device | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enabled or Disabled this Logical Device. | | |
| Possible: | Use Automatic Settings | Optimal Default, Failsafe Default |
| | IO=2D8h; IRQ=11; 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. | | |

3.4.5.2 SIO Configuration: Serial Port 10 Configuration



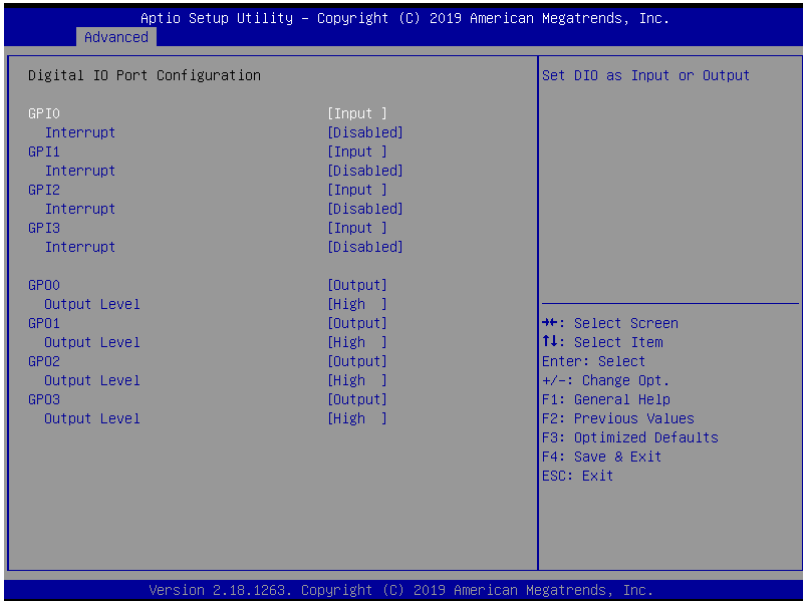
| Options Summary | | |
|--|------------------------|-----------------------------------|
| Use This Device | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enabled or Disabled this Logical Device. | | |
| Possible: | Use Automatic Settings | Optimal Default, Failsafe Default |
| | IO=2C8h; IRQ=10; DMA; | |
| | IO=2D8h; IRQ=10; DMA; | |
| Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts. | | |

3.4.6 Advanced: Power Management



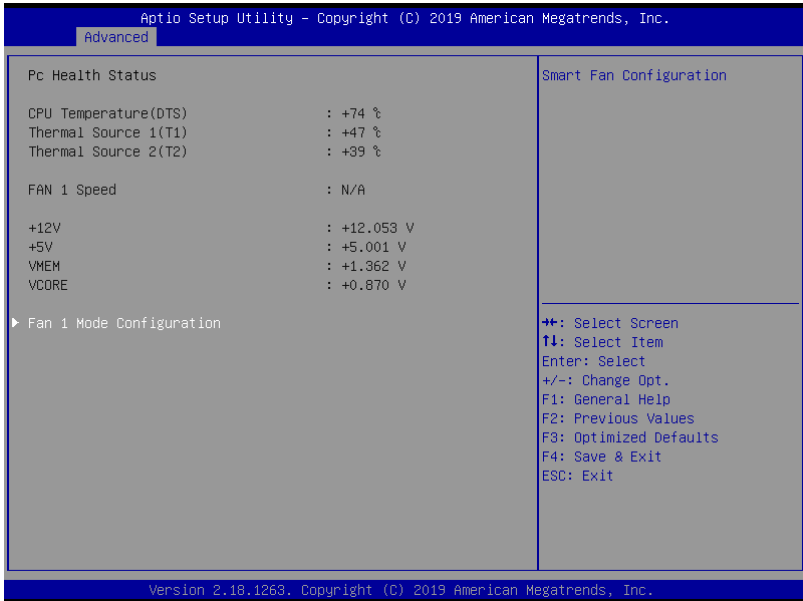
| Options Summary | | |
|--|------------|-----------------------------------|
| Power Mode | ATX Type | Optimal Default, Failsafe Default |
| | AT Type | |
| Select system power mode. | | |
| Restore AC Power Loss | Last State | |
| | Always On | |
| | Always Off | Optimal Default, Failsafe Default |
| Wake on LAN Enable | Enabled | Optimal Default, Failsafe Default |
| | Disabled | |
| Enabled/ Disabled integrated LAN to wake the system. | | |
| RTC wake system from S5 | Disabled | Optimal Default, Failsafe Default |
| | Fixed Time | |
| Fixed Time: System will wake on the hr::min::sec specified. | | |
| Dynameic time: System will wake on the current time + Increase minute(s) | | |

3.4.7 Advanced: Digital IO Port Configuration

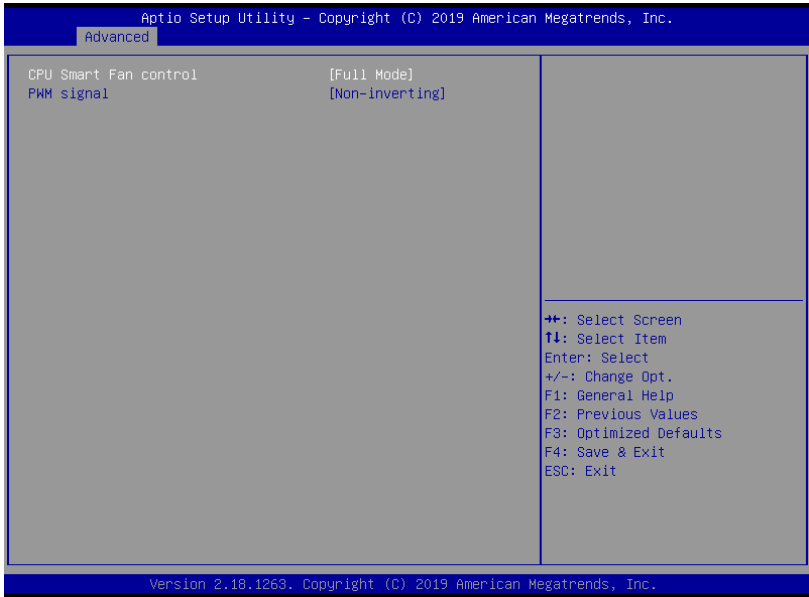


| Options Summary | | |
|--|----------|-----------------------------------|
| GPI * | Input | Optimal Default, Failsafe Default |
| | Output | |
| Set DIO as Input or Output | | |
| Interrupt | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Enabled interrupt function with low pulse mode. This triggered pulse needs more then the 10ms. | | |
| GPO * | Input | |
| | Output | Optimal Default, Failsafe Default |
| Set DIO as Input or Output | | |
| Output Level | High | Optimal Default, Failsafe Default |
| | Low | |
| Set output level when DIO pin is output | | |

3.4.8 Advanced: On-Module Hardware Monitor

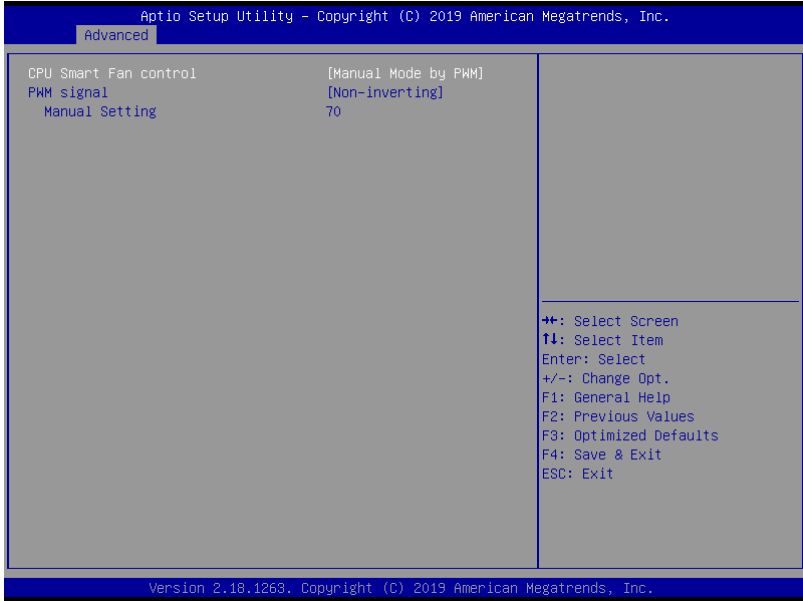


3.4.8.1 Fan 1 Mode Configuration: CPU Smart Fan Full Mode



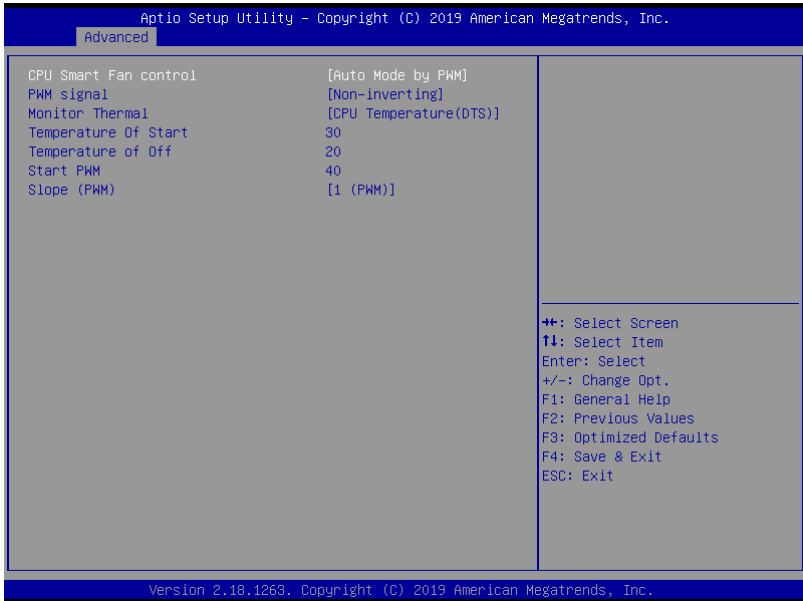
| Options Summary | | |
|--|--------------------|-----------------------------------|
| CPU Smart Fan control | Full Mode | Optimal Default, Failsafe Default |
| | Manual Mode by PWM | |
| | Auto Mode by PWM | |
| PWM signal | Non-inverting | Optimal Default, Failsafe Default |
| | Inverting | |
| Select output PWM of inverting or non-uninverting signal | | |

3.4.8.2 Fan 1 Mode Configuration: CPU Smart Fan Manual Mode



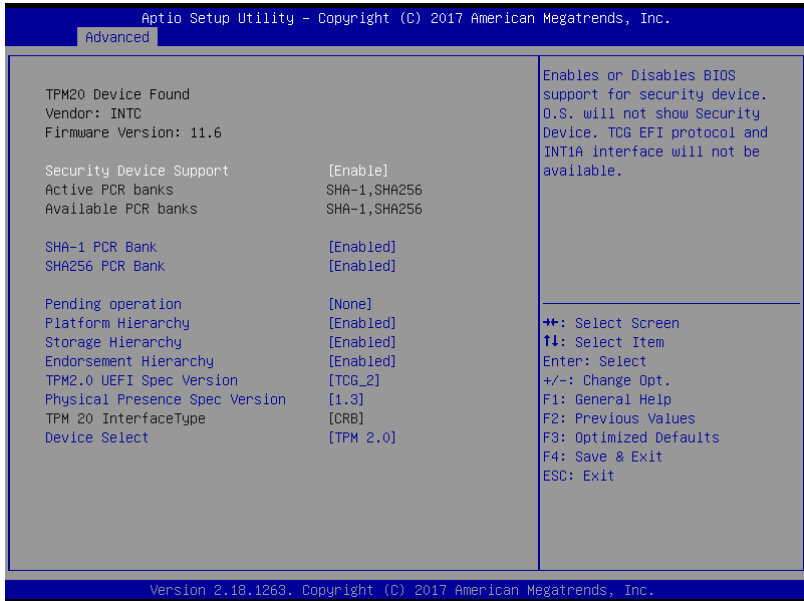
| Options Summary | | |
|--|----|-----------------------------------|
| Manual Setting | 70 | Optimal Default, Failsafe Default |
| Set Fan at fixed Duty-Cycle Min=0 Max=100 Please input Dec number: | | |

3.4.8.3 Fan 1 Mode Configuration: CPU Smart Fan Auto Mode



| Options Summary | | |
|-------------------------------|----------------------|-----------------------------------|
| Monitor Thermal | CPU Temperature(DTS) | Optimal Default, Failsafe Default |
| | Thermal Source 1(T1) | |
| | Thermal Source 2(T2) | |
| Select monitor thermal source | | |
| Temperature of Start | 30 | Optimal Default, Failsafe Default |
| Temperature Of Start | | |
| Temperature Of Off | 20 | Optimal Default, Failsafe Default |
| Temperature Of Off | | |
| Start PWM | 40 | Optimal Default, Failsafe Default |
| Start PWM | | |
| Slope (PWM) | 0 (PWM) | |
| | 1 (PWM) | Optimal Default, Failsafe Default |
| | 2 (PWM) | |
| | 4 (PWM) | |
| | 8 (PWM) | |
| | 16 (PWM) | |
| | 32 (PWM) | |
| | 64 (PWM) | |
| Slope (PWM) | | |

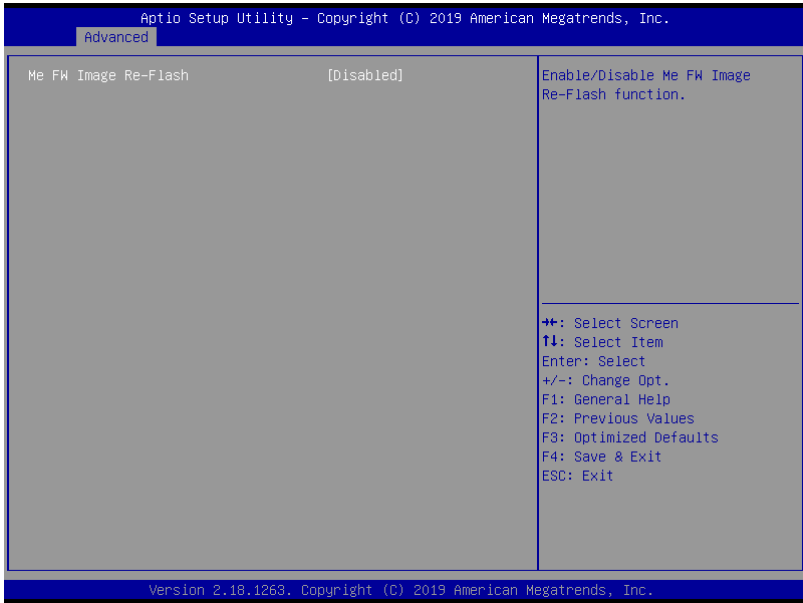
3.4.9 Advanced: Trusted Computing



| 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. | | |
| SHA-1 PCR Bank | Disable | |
| | Enable | Optimal Default, Failsafe Default |
| Enable or Disable SHA-1 PCR Bank | | |
| SHA256 PCR Bank | Disable | |
| | Enable | Optimal Default, Failsafe Default |
| Enable or Disable SHA256 PCR Bank | | |
| Pending operation | None | Optimal Default, Failsafe Default |
| | TPM Clear | |
| Schedule an Operation for the Security Device. NOTE: Your Computer will reboot during restart in order to change state of Security Device. | | |

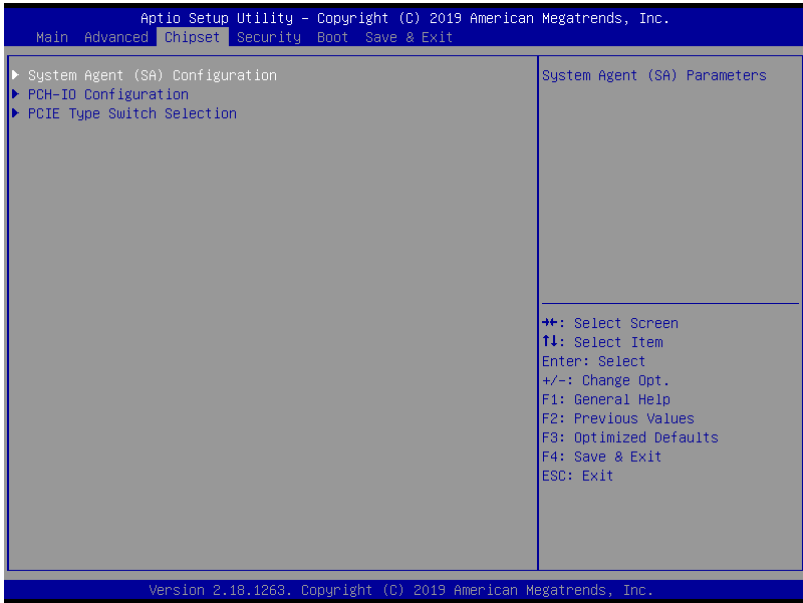
| Options Summary | | |
|--|---------|-----------------------------------|
| Platform Hierarchy | Disable | |
| | Enable | Optimal Default, Failsafe Default |
| Enable or Disable Platform Hierarchy | | |
| Storage Hierarchy | Disable | |
| | Enable | Optimal Default, Failsafe Default |
| Enable or Disable Storage Hierarchy | | |
| Endorsement Hierarchy | Disable | |
| | Enable | Optimal Default, Failsafe Default |
| Enable or Disable Endorsement Hierarchy | | |
| TPM2.0 UEFI Spec Version | TCG_2 | Optimal Default, Failsafe Default |
| | TCG_1_2 | |
| Select the TCG2 Spec Version Support, TCG_1_2: the Compatible mode for Win8/Win10, TCG_2: Support new TCG2 protocol and event format for Win10 or later | | |
| Physical Presence Spec Version | 1.2 | |
| | 1.3 | Optimal Default, Failsafe Default |
| Select to Tell O.S. to support PPI Spec Version 1.2 or 1.3. Note some HCK tests might not support 1.3. | | |
| Device Select | TPM 2.0 | Optimal Default, Failsafe Default |
| TPM 1.2 will restrict support to TPM 1.2 device, TPM 2.0 will restrict support to TPM 2.0 devices, Auto will support both with the default set to TPM 2.0 devices if not found, TPM 1.2 device will be enumerated. | | |

3.4.10 Advanced: Firmware Update Configuration

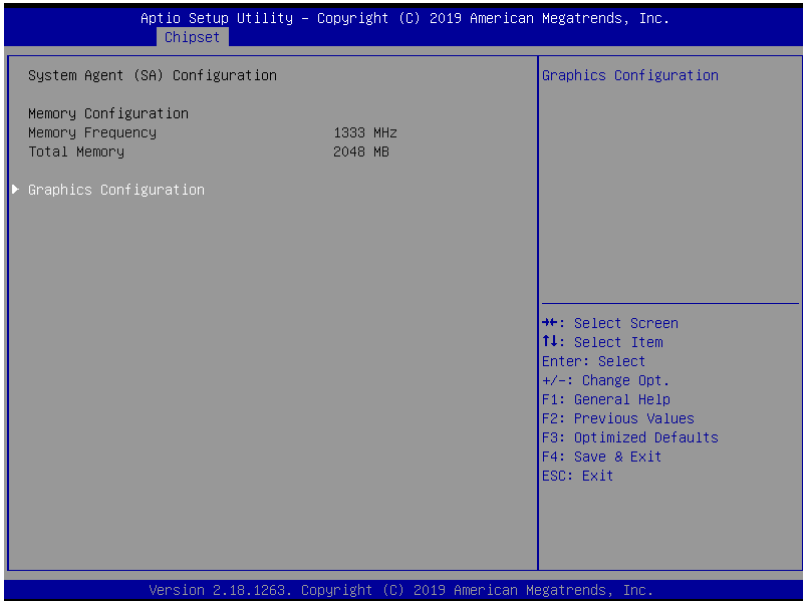


| Options Summary | | |
|--|---------|-----------------------------------|
| Me FW Image | Disable | Optimal Default, Failsafe Default |
| Re-Flash | Enable | |
| Enable/ Disable Me FW Image Re-Flash functinn. | | |

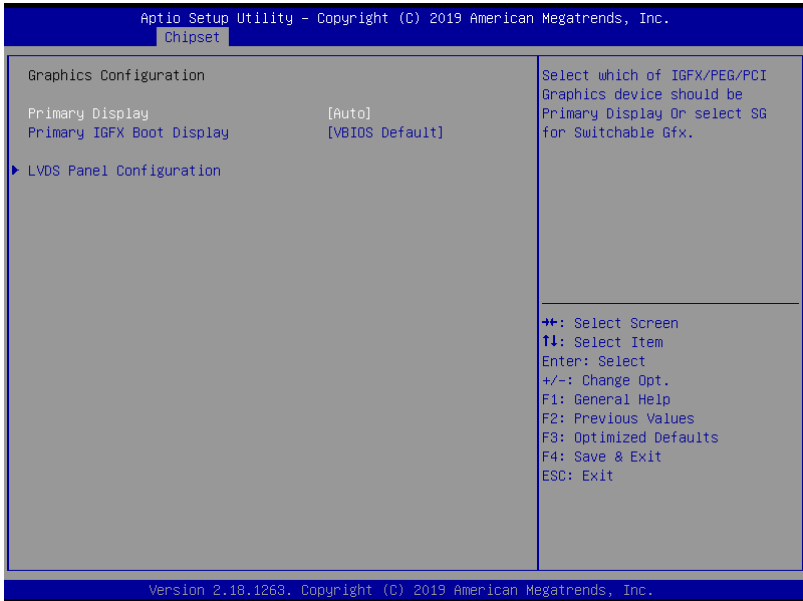
3.5 Setup submenu: Chipset



3.5.1 Chipset: System Agent (SA) Configuration

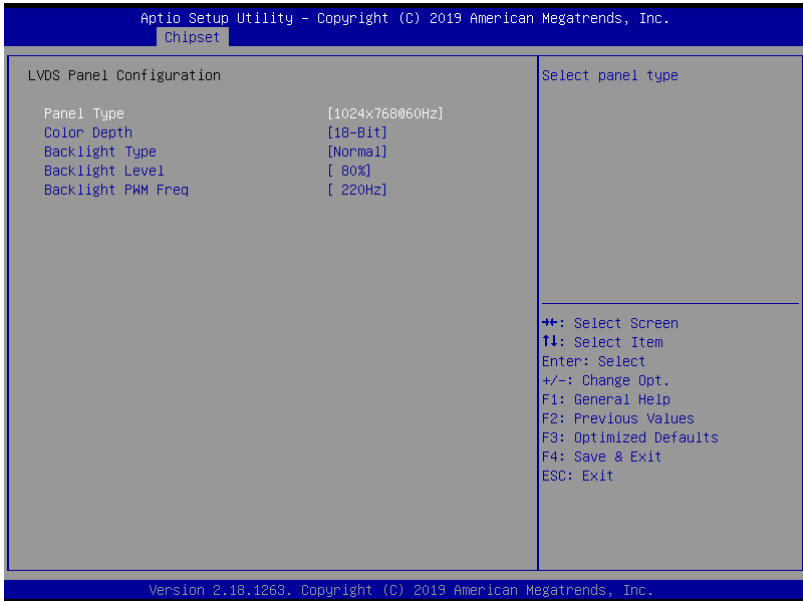


3.5.1.1 System Agent (SA): Graphics Configuration



| Options Summary | | |
|--|---------------|-----------------------------------|
| Primary Display | Auto | Optimal Default, Failsafe Default |
| | IGFX | |
| | PEG | |
| Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx. | | |
| Primary IGFX Boot Display | VBIOS Default | Optimal Default, Failsafe Default |
| | DDI1/DP | |
| | DDI2/VGA | |
| | LVDS/eDP | |
| Select the Video Device which will be activated during POST. This has no effect if external graphic present. Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display. | | |

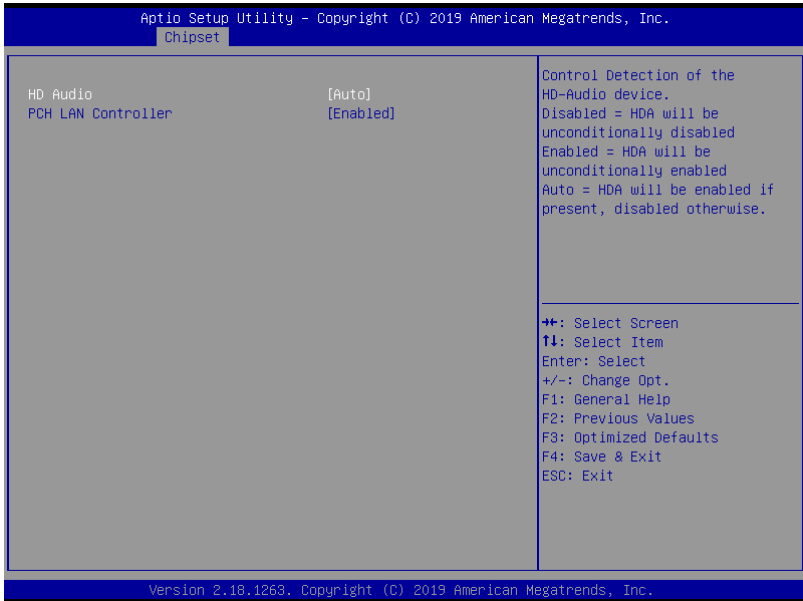
3.5.1.2 Graphics Configuration: LVDS Panel Configuration



| Options Summary | | |
|-------------------|----------------|-----------------------------------|
| Panel Type | 640x480@60Hz | |
| | 800x480@60Hz | |
| | 800x600@60Hz | |
| | 1024x600@60Hz | |
| | 1024x768@60Hz | Optimal Default, Failsafe Default |
| | 1280x768@60Hz | |
| | 1280x800@60Hz | |
| | 1280x1024@60Hz | |
| | 1366x768@60Hz | |
| | 1440x900@60Hz | |
| | 1600x1200@60Hz | |
| | 1920x1080@60Hz | |
| 1920x1200@60Hz | | |
| Select panel type | | |

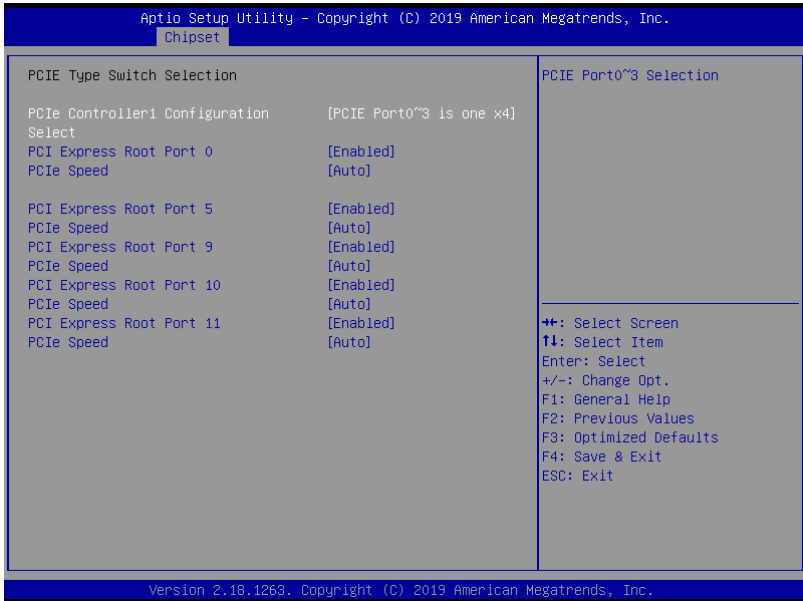
| Options Summary | | |
|--|----------|-----------------------------------|
| Color Depth | 18-bit | Optimal Default, Failsafe Default |
| | 24-bit | |
| Select Color Depth | | |
| Backlight Type | Normal | Optimal Default, Failsafe Default |
| | Inverted | |
| Select backlight control signal type | | |
| Backlight Level | 0% | |
| | 10% | |
| | 20% | |
| | 30% | |
| | 40% | |
| | 50% | |
| | 60% | |
| | 70% | |
| | 80% | Optimal Default, Failsafe Default |
| | 90% | |
| 100% | | |
| Select backlight control level | | |
| Backlight PWM Freq | 100Hz | |
| | 200Hz | |
| | 220Hz | Optimal Default, Failsafe Default |
| | 500Hz | |
| | 1KHz | |
| | 2.2KHz | |
| | 6.5KHz | |
| Select PWM frequency of backlight control signal | | |

3.5.2 Chipset: PCH-IO Configuration



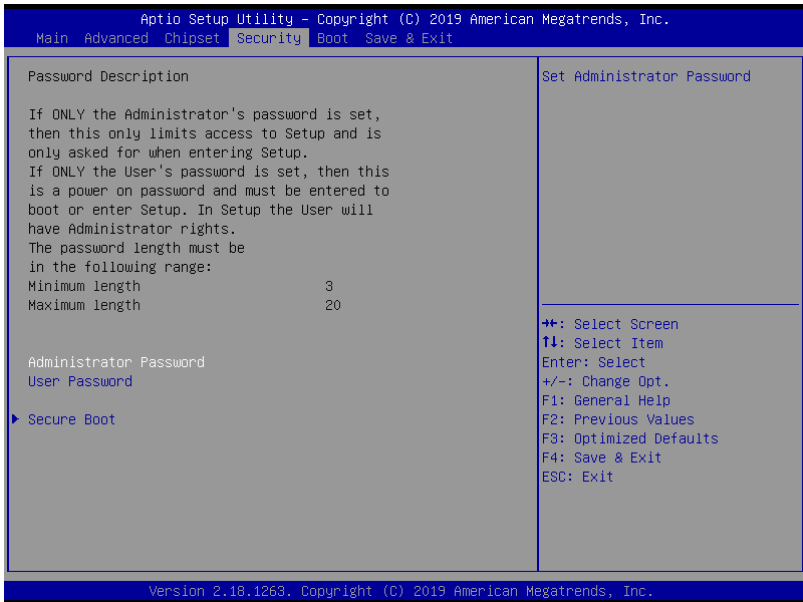
| Options Summary | | |
|---|----------|-----------------------------------|
| HD Audio | Disabled | |
| | Enabled | |
| | Auto | Optimal Default, Failsafe Default |
| Control Detection of the HD-Audio device. Disabled = HDA will be unconditionally disabled Enabled = HDA will be unconditionally enabled Auto = HDA will be enabled if present, disabled otherwise. | | |
| PCH LAN Controller | Enabled | Optimal Default, Failsafe Default |
| | Disabled | |
| Enable or disable onboard NIC. | | |

3.5.3 Chipset: PCIe Type Switch Selection



| Options Summary | | |
|---------------------------------------|--------------------------|-----------------------------------|
| PCIe Controller1 Configuration Select | PCIe Port0~3 are four X1 | |
| | PCIe Port0~3 is one X4 | Optimal Default, Failsafe Default |
| PCI Express Root Port * Selection. | | |
| PCI Express Root Port 1 | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Control the PCI Express Root Port. | | |
| PCIe Speed | Auto | Optimal Default, Failsafe Default |
| | Gen1 | |
| | Gen2 | |
| | Gen3 | |
| Configure PCIe Speed. | | |

3.6 Setup submenu: Security



Change Administrator/User Password

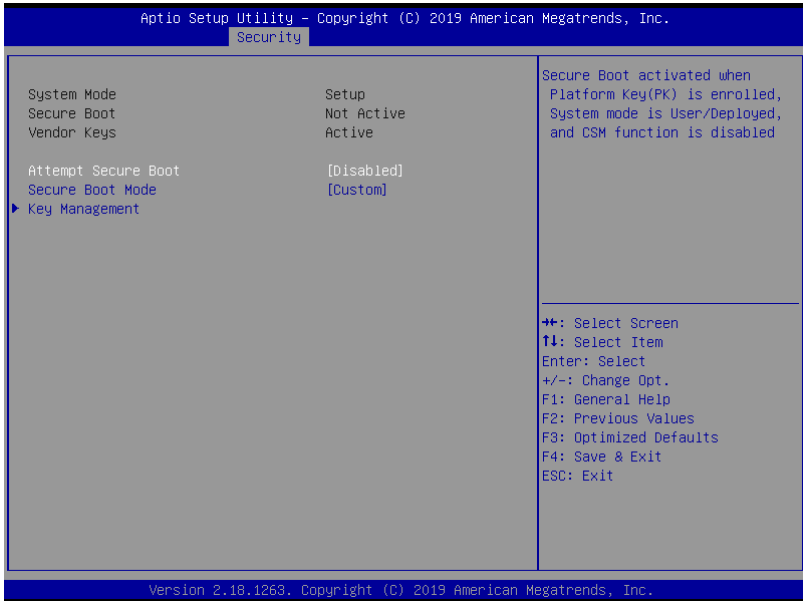
You can set an Administrator password. If you set an Administrator password, you can then set a User password. User passwords do not have access to many of the features in the Setup utility.

Select the password you want to set and press <Enter>. A dialog box will appear which lets you set the password. Passwords must be between 3 and 20 letters or numbers. Press <Enter> and re-enter the password into the next dialog box that appears. Press <Enter> after you have retyped it correctly. The password is required at boot time, or when the user enters the Setup utility.

Remove Password

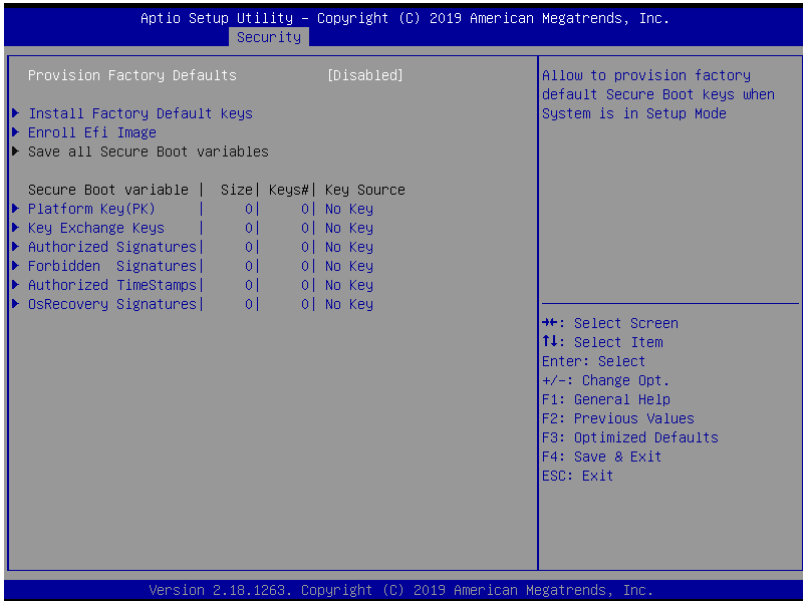
Highlight this item and type in the current password. At the next dialog box press <Enter> to disable password protection.

3.6.1 Security: Secure Boot



| Options Summary | | |
|--|----------|-----------------------------------|
| Attempt Secure Boot | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Secure Boot activated when Platform Key(PK) is enrolled, System mode is User/Deployed, and CSM function is disable | | |
| Secure Boot Mode | Standard | |
| | Custom | Optimal Default, Failsafe Default |
| Secure Boot Mode selector: Standard/Custom. In Custom mode Secure Boot Variables can be configured without authentication | | |

3.6.1.1 Secure Boot: Key Management



| Options Summary | | |
|--|----------|-----------------------------------|
| Provision Factory Defaults | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Allow to provision factory default Secure Boot keys when System is in setup Mode | | |
| Install Factory Default keys | | |
| Force System to User Mode - install all Factory Default keys | | |
| Enroll Efi Image | | |
| Allow the image to run in Secure Boot mode. | | |
| Enroll SHA256 hash of the binary into Authorized Signature Database (db) | | |

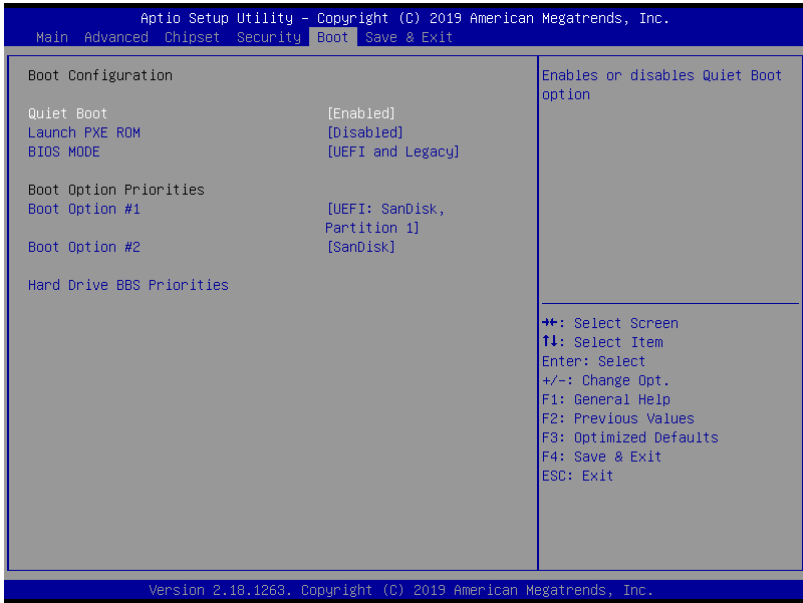
Table Continues on next page.

| Options Summary | |
|---|--|
| Platform Key(PK) | |
| Enroll Factory Defaults or load certificates from a file: 1.Public Key Certificate in: a)EFI_SIGNATURE_LIST b)EFI_CERT_X509 (DER encoded) c)EFI_CERT_RSA2048 (bin) d)EFI_CERT_SHA256,384,512 2.Authenticated UEFI Variable 3.EFI PE/COFF Image(SHA256) Key Source: Default,External,Mixed,Test | |
| Key Exchange Keys | |
| Enroll Factory Defaults or load certificates from a file: 1.Public Key Certificate in: a)EFI_SIGNATURE_LIST b)EFI_CERT_X509 (DER encoded) c)EFI_CERT_RSA2048 (bin) d)EFI_CERT_SHA256,384,512 2.Authenticated UEFI Variable 3.EFI PE/COFF Image(SHA256) Key Source: Default,External,Mixed,Test | |
| Authorized Signatures | |
| Enroll Factory Defaults or load certificates from a file: 1.Public Key Certificate in: a)EFI_SIGNATURE_LIST b)EFI_CERT_X509 (DER encoded) c)EFI_CERT_RSA2048 (bin) d)EFI_CERT_SHA256,384,512 2.Authenticated UEFI Variable 3.EFI PE/COFF Image(SHA256) Key Source: Default,External,Mixed,Test | |

Table Continues on next page.

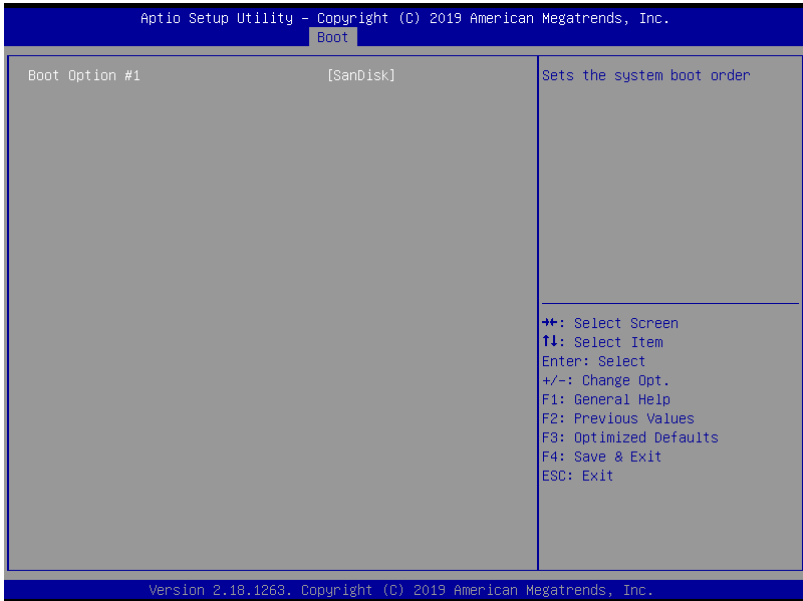
| Options Summary | |
|---|--|
| Forbidden Signatures | |
| Enroll Factory Defaults or load certificates from a file: 1.Public Key Certificate in: a)EFI_SIGNATURE_LIST b)EFI_CERT_X509 (DER encoded) c)EFI_CERT_RSA2048 (bin) d)EFI_CERT_SHA256,384,512 2.Authenticated UEFI Variable 3.EFI PE/COFF Image(SHA256) Key Source: Default,External,Mixed,Test | |
| Authorized TimeStamps | |
| Enroll Factory Defaults or load certificates from a file: 1.Public Key Certificate in: a)EFI_SIGNATURE_LIST b)EFI_CERT_X509 (DER encoded) c)EFI_CERT_RSA2048 (bin) d)EFI_CERT_SHA256,384,512 2.Authenticated UEFI Variable 3.EFI PE/COFF Image(SHA256) Key Source: Default,External,Mixed,Test | |
| OsRecovery Signatures | |
| Enroll Factory Defaults or load certificates from a file: 1.Public Key Certificate in: a)EFI_SIGNATURE_LIST b)EFI_CERT_X509 (DER encoded) c)EFI_CERT_RSA2048 (bin) d)EFI_CERT_SHA256,384,512 2.Authenticated UEFI Variable 3.EFI PE/COFF Image(SHA256) Key Source: Default,External,Mixed,Test | |

3.7 Setup submenu: Boot

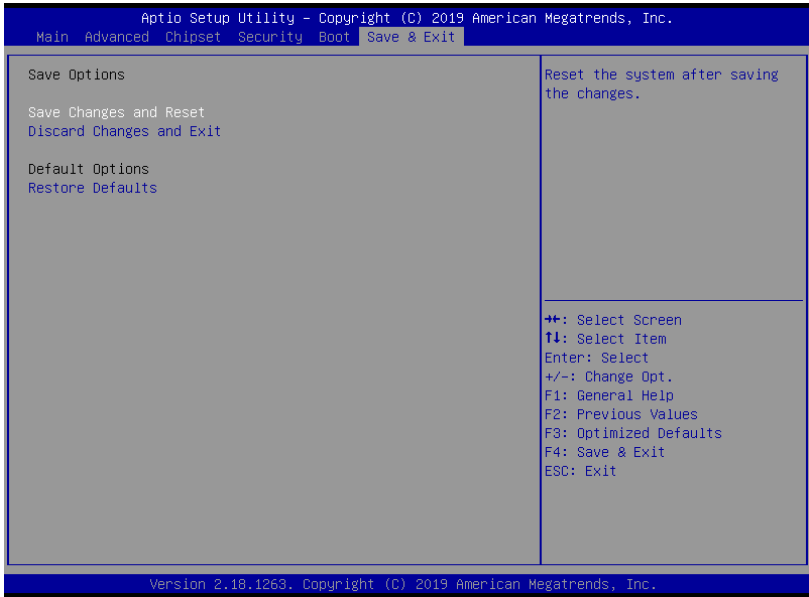


| Options Summary | | |
|--|-----------------|-----------------------------------|
| Quiet Boot | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enables or Disables Quiet Boot option. | | |
| Launch PXE Boot | Disabled | Optimal Default, Failsafe Default |
| | UEFI | |
| | Legacy | |
| Controls the execution of UEFI and Legacy PXE OpROM. | | |
| BIOS MODE | UEFI and Legacy | Optimal Default, Failsafe Default |
| | UEFI only | |
| Select using BIOS mode. | | |

3.7.1 Boot: Hard Drive BBS Priorities



3.8 Setup submenu: Save & Exit



Chapter 4

Drivers Installation

4.1 Driver Download/Installation

Drivers for the COM-KBUC6/SKUC6 can be downloaded from the product page on the AAEON website by following this link:

<https://www.aaeon.com/en/p/com-express-modules-com-kbuc6>

Download the driver(s) you need and follow the steps below to install them.

4.1.1 COM-KBUC6 Driver Installation Steps

Step 1 – Install Chipset Driver

1. Click the **Step1 - Chipset** folder followed by **SetupChipset.exe**
2. Follow the instructions
3. Drivers will be installed automatically

Step 2 – Install Graphics Driver

1. Click the **Step2 - Graphic** folder and select your OS
2. Click the **Setup.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Step 3 – Install LAN Driver

1. Click the **Step3 - LAN** folder then the **Windows** folder.
2. Click the **ProWinx64.exe** file in the folder.
3. Follow the instructions
4. Drivers will be installed automatically

Step 4 – Install Audio Driver

1. Click the **STEP4 - Audio** folder followed by **0008-64bit_Win7_Win8_Win81_Win10_R281.exe**
2. Follow the instructions
3. Drivers will be installed automatically

Step 5 – Install ME Driver

1. Click the **STEP5 - ME** folder followed by **SetupME.exe**
2. Follow the instructions
3. Drivers will be installed automatically

Step 6 – Install ACPI Driver

1. Click the **STEP6 - InterruptDIO** folder and select your OS
2. Follow the instructions in **ACPI Driver Test SOP.docx** to install and test ACPI drivers.

4.1.2 COM-SKUC6 Driver Installation Steps

Step 1 – Install Chipset Driver

1. Click the **Step1 - Chipset** folder followed by **SetupChipset.exe**
2. Follow the instructions
3. Drivers will be installed automatically

Step 2 – Install Graphics Driver

1. Click the **Step2 - Graphic** folder and select your OS
2. Click the **Setup.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Step 3 – Install LAN Driver

1. Click the **Step3 - LAN** folder then select your OS.
2. For Linux, Click the **igb-5.3.3.2** folder and follow the instructions in **README**
3. For Windows, Click **Autorun.exe** and follow the instructions. Drivers will be installed automatically.

Step 4 – Install Audio Driver

1. Click the **STEP4 - Audio** folder followed by **win7_win8_1** folder.
2. Click **0002-Win7_Win8_Win81_R276.exe**
3. Follow the instructions
4. Drivers will be installed automatically

Step 5 – Install USB 3.0 (Windows 7 only)

1. Click the **STEP5 – USB 3.0** folder followed by **Win7** folder
2. Click **Setup.exe**
3. Follow the instructions
4. Drivers will be installed automatically

Step 6 – Install ME Driver

1. Click the **STEP5 - ME** folder followed by **Windows** folder.
2. Click **Setup.exe**
3. Follow the instructions
4. Drivers will be installed automatically

Step 7 – Install ACPI Driver

1. Click the **STEP6 - InterruptDIO** folder and select your OS
2. Follow the instructions in **ACPI Driver Test SOP.docx** to install and test ACPI drivers.

Appendix A

Watchdog Timer Programming

A.1 Watchdog Timer Initial Program

Table 1 : Embedded BRAM relative register table

| | Default Value | Note |
|----------------------------|---------------|----------------------------------|
| Index | 0x284(Note1) | BRAM Index Register |
| Data | 0x285(Note2) | BRAM Data Register |
| Logical Device Number | 0xA8(Note3) | Watch dog Logical Device Number |
| Function and Device Number | 0x00(Note4) | Watch dog Function/Device Number |

Table 2 : Watchdog relative register table

| | Option Register | BitNum | Value | Note |
|--------------------------|-----------------|--------------|-----------|---|
| Timer Counter | 0x00(Note5) | | (Note10) | Time of watchdog timer (0~255) |
| Counting Unit | 0x01(Note6) | 0(Note7) | 0(Note11) | Select time unit. 0: second 1: minute |
| Watchdog RST pulse width | 0x01(Note8) | [3:2](Note9) | 0(Note12) | 0: 20ms 1: 60ms 2: 100ms 3: 250ms |

```
*****
// Embedded BRAM relative definition (Please reference to Table 1)
#define byte EcBRAMIndex //This parameter is represented from Note1
#define byte EcBRAMData //This parameter is represented from Note2
#define byte BRAMLDRReg //This parameter is represented from Note3
#define byte BRAMFnDataReg //This parameter is represented from Note4
#define void EcBRAMWriteByte(byte Offset, byte Value);
#define byte EcBRAMReadByte(byte Offset);
#define void IOWriteByte(byte Offset, byte Value);
#define byte IOReadByte(byte Offset);
// Watch Dog relative definition (Please reference to Table 2)
#define byte TimerReg //This parameter is represented from Note5
#define byte TimerVal // This parameter is represented from Note10
#define byte UnitReg //This parameter is represented from Note6
#define byte UnitBit //This parameter is represented from Note7
#define byte UnitVal //This parameter is represented from Note11
#define byte RSTReg //This parameter is represented from Note8
#define byte RSTBit //This parameter is represented from Note9
#define byte RSTVal //This parameter is represented from Note12
*****
```

```
*****  
VOID Main()  
    // Procedure : AaeonWDTConfig  
    // (byte)Timer : Time of WDT timer.(0x00~0xFF)  
    // (boolean)Unit : Select time unit(0: second, 1: minute).  
    AaeonWDTConfig();  
  
    // Procedure : AaeonWDTEnable  
    // This procedure will enable the WDT counting.  
    AaeonWDTEnable();  
}
```

```

*****
// Procedure : AaeonWDTEnable
VOID AaeonWDTEnable (){
    WDTEnableDisable(1);
}

// Procedure : AaeonWDTConfig
VOID AaeonWDTConfig (){
    // Disable WDT counting
    WDTEnableDisable(0);
    // WDT relative parameter setting
    WDTParameterSetting();
}

VOID WDTEnableDisable(byte Value){
    ECBRAMWriteByte(TimerReg , Value);
}

VOID WDTParameterSetting(){
    Byte TempByte;

    // Watchdog Timer counter setting
    ECBRAMWriteByte(TimerReg , TimerVal);
    // WDT counting unit setting
    TempByte = ECBRAMReadByte(UnitReg);
    TempByte |= (UnitVal << UnitBit);
    ECBRAMWriteByte(UnitReg , TempByte);
    // WDT RST pulse width setting
    TempByte = ECBRAMReadByte(RSTReg);
    TempByte |= (RSTVal << RSTBit);
    ECBRAMWriteByte(RSTReg , TempByte);
}
*****

```

```
*****
VOID ECBRAMWriteByte(byte OPReg, byte OPBit, byte Value){
    IOWriteByte(EcBRAMIndex, 0x10);
    IOWriteByte(EcBRAMData, BRAMLDNReg);
    IOWriteByte(EcBRAMIndex, 0x11);
    IOWriteByte(EcBRAMData, BRAMFnDataReg);

    IOWriteByte(EcBRAMIndex, 0x13 + OPReg);
    IOWriteByte(EcBRAMData, Value);

    IOWriteByte(EcBRAMIndex, 0x12);
    IOWriteByte(EcBRAMData, 0x30);           //Write start
}

Byte ECBRAMReadByte(byte OPReg){
    IOWriteByte(EcBRAMIndex, 0x10);
    IOWriteByte(EcBRAMData, BRAMLDNReg);
    IOWriteByte(EcBRAMIndex, 0x11);
    IOWriteByte(EcBRAMData, BRAMFnDataReg);










































    IOWriteByte(EcBRAMIndex, 0x12);
    IOWriteByte(EcBRAMData, 0x10);         //Read start

    IOWriteByte(EcBRAMIndex, 0x13 + OPReg);
    Return      IOReadByte(EcBRAMData, Value);
}
*****
```

Appendix B

I/O Information










































B.1 I/O Address Map







































| Input/output (IO) | |
|---|-----------------------------------|
|  [0000000000000000 - 000000000000CF7] | PCI Express Root Complex |
|  [0000000000000020 - 000000000000021] | Programmable interrupt controller |
|  [0000000000000024 - 000000000000025] | Programmable interrupt controller |
|  [0000000000000028 - 000000000000029] | Programmable interrupt controller |
|  [000000000000002C - 00000000000002D] | Programmable interrupt controller |
|  [000000000000002E - 00000000000002F] | Motherboard resources |
|  [0000000000000030 - 000000000000031] | Programmable interrupt controller |
|  [0000000000000034 - 000000000000035] | Programmable interrupt controller |
|  [0000000000000038 - 000000000000039] | Programmable interrupt controller |
|  [000000000000003C - 00000000000003D] | Programmable interrupt controller |
|  [0000000000000040 - 000000000000043] | System timer |
|  [000000000000004E - 00000000000004F] | Motherboard resources |
|  [0000000000000050 - 000000000000053] | System timer |
|  [0000000000000060 - 000000000000060] | Standard PS/2 Keyboard |
|  [0000000000000061 - 000000000000061] | Motherboard resources |
|  [0000000000000063 - 000000000000063] | Motherboard resources |
|  [0000000000000064 - 000000000000064] | Standard PS/2 Keyboard |
|  [0000000000000065 - 000000000000065] | Motherboard resources |
|  [0000000000000067 - 000000000000067] | Motherboard resources |
|  [0000000000000070 - 000000000000070] | Motherboard resources |
|  [0000000000000070 - 000000000000077] | System CMOS/real time clock |
|  [0000000000000080 - 000000000000080] | Motherboard resources |
|  [0000000000000092 - 000000000000092] | Motherboard resources |
|  [00000000000000A0 - 00000000000000A1] | Programmable interrupt controller |
|  [00000000000000A4 - 00000000000000A5] | Programmable interrupt controller |
|  [00000000000000A8 - 00000000000000A9] | Programmable interrupt controller |
|  [00000000000000AC - 00000000000000AD] | Programmable interrupt controller |
|  [00000000000000B0 - 00000000000000B1] | Programmable interrupt controller |
|  [00000000000000B2 - 00000000000000B3] | Motherboard resources |
|  [00000000000000B4 - 00000000000000B5] | Programmable interrupt controller |
|  [00000000000000B8 - 00000000000000B9] | Programmable interrupt controller |
|  [00000000000000BC - 00000000000000BD] | Programmable interrupt controller |
|  [00000000000002C8 - 00000000000002CF] | Communications Port (COM10) |
|  [00000000000002D8 - 00000000000002DF] | Communications Port (COM9) |
|  [00000000000002F8 - 00000000000002FF] | Communications Port (COM2) |
|  [0000000000000378 - 000000000000037F] | Printer Port (LPT1) |
|  [00000000000003B0 - 00000000000003BB] | Intel(R) HD Graphics 510 |
|  [00000000000003C0 - 00000000000003DF] | Intel(R) HD Graphics 510 |
|  [00000000000003F8 - 00000000000003FF] | Communications Port (COM1) |
|  [00000000000004D0 - 00000000000004D1] | Programmable interrupt controller |
|  [0000000000000680 - 000000000000069F] | Motherboard resources |











































B.2 Memory Address Map











































| Memory | |
|---------------------------------------|--|
| [0000000000A0000 - 0000000000BFFFFF] | Intel(R) HD Graphics 510 |
| [0000000000A0000 - 0000000000BFFFFF] | PCI Express Root Complex |
| [0000000080000000 - 00000000DFFFFFFF] | PCI Express Root Complex |
| [00000000C0000000 - 00000000CFFFFFFF] | Intel(R) HD Graphics 510 |
| [00000000C0000000 - 00000000CFFFFFFF] | Intel(R) HD Graphics 520 |
| [00000000DE000000 - 00000000DEFFFFFF] | Intel(R) HD Graphics 510 |
| [00000000DE000000 - 00000000DEFFFFFF] | Intel(R) HD Graphics 520 |
| [00000000DF000000 - 00000000DF1FFFFF] | Intel(R) Ethernet Connection I219-LM |
| [00000000DF020000 - 00000000DF02FFFF] | High Definition Audio Controller |
| [00000000DF030000 - 00000000DF03FFFF] | Intel(R) USB 3.0 eXtensible Host Controller - 0100 (Microsoft) |
| [00000000DF040000 - 00000000DF043FFF] | High Definition Audio Controller |
| [00000000DF044000 - 00000000DF047FFF] | Mobile 6th Generation Intel(R) Processor Family I/O PMC - 9D21 |
| [00000000DF048000 - 00000000DF049FFF] | Standard SATA AHCI Controller |
| [00000000DF04A000 - 00000000DF04A0FF] | Mobile 6th Generation Intel(R) Processor Family I/O SMBUS - 9D23 |
| [00000000DF04B000 - 00000000DF04B7FF] | Standard SATA AHCI Controller |
| [00000000DF04C000 - 00000000DF04C0FF] | Standard SATA AHCI Controller |
| [00000000DF04E000 - 00000000DF04EFFF] | Mobile 6th Generation Intel(R) Processor Family I/O Thermal subsystem - 9D31 |
| [00000000DFFE0000 - 00000000FFFFFFF] | Motherboard resources |
| [00000000DE000000 - 00000000EFFFFFFF] | Motherboard resources |
| [00000000FD000000 - 00000000FDABFFFF] | Motherboard resources |
| [00000000FD000000 - 00000000FE7FFFFF] | PCI Express Root Complex |
| [00000000FDAC0000 - 00000000FDACFFFF] | Motherboard resources |
| [00000000FDAD0000 - 00000000FDADFFFF] | Motherboard resources |
| [00000000FDAE0000 - 00000000FDAEFFFF] | Motherboard resources |
| [00000000FDAF0000 - 00000000FDAFFFFF] | Motherboard resources |
| [00000000FDB00000 - 00000000FDFFFFFF] | Motherboard resources |
| [00000000FE000000 - 00000000FE01FFFF] | Motherboard resources |
| [00000000FE028000 - 00000000FE028FFF] | Motherboard resources |
| [00000000FE029000 - 00000000FE029FFF] | Motherboard resources |
| [00000000FE036000 - 00000000FE03BFFF] | Motherboard resources |
| [00000000FE03D000 - 00000000FE3FFFFF] | Motherboard resources |
| [00000000FE40F000 - 00000000FE40FFFF] | Intel(R) Management Engine Interface |
| [00000000FE410000 - 00000000FE7FFFFF] | Motherboard resources |
| [00000000FED00000 - 00000000FED003FF] | High precision event timer |
| [00000000FED10000 - 00000000FED17FFF] | Motherboard resources |
| [00000000FED18000 - 00000000FED18FFF] | Motherboard resources |
| [00000000FED19000 - 00000000FED19FFF] | Motherboard resources |
| [00000000FED20000 - 00000000FED3FFFF] | Motherboard resources |
| [00000000FED45000 - 00000000FED8FFFF] | Motherboard resources |
| [00000000FED90000 - 00000000FED93FFF] | Motherboard resources |
| [00000000FEE00000 - 00000000FEEFFFFF] | Motherboard resources |
| [00000000FF000000 - 00000000FFFFFFF] | Intel(R) 82802 Firmware Hub Device |
| [00000000FF000000 - 00000000FFFFFFF] | Motherboard resources |











































B.3 IRQ Mapping Chart











































| Interrupt request (IRQ) | |
|---|--|
|  | (ISA) 0x00000000 (00) System timer |
|  | (ISA) 0x00000001 (01) Standard PS/2 Keyboard |
|  | (ISA) 0x00000003 (03) Communications Port (COM2) |
|  | (ISA) 0x00000004 (04) Communications Port (COM1) |
|  | (ISA) 0x00000005 (05) Printer Port (LPT1) |
|  | (ISA) 0x00000008 (08) System CMOS/real time clock |
|  | (ISA) 0x0000000A (10) Communications Port (COM10) |
|  | (ISA) 0x0000000B (11) Communications Port (COM9) |
|  | (ISA) 0x0000000B (11) Intel(R) HD Graphics 520 |
|  | (ISA) 0x0000000C (12) Logitech PS/2 Port Mouse |
|  | (ISA) 0x0000000E (14) Motherboard resources |
|  | (ISA) 0x00000051 (81) Microsoft ACPI-Compliant System |
|  | (ISA) 0x00000052 (82) Microsoft ACPI-Compliant System |
|  | (ISA) 0x00000053 (83) Microsoft ACPI-Compliant System |
|  | (ISA) 0x00000054 (84) Microsoft ACPI-Compliant System |
|  | (ISA) 0x00000055 (85) Microsoft ACPI-Compliant System |
|  | (ISA) 0x00000056 (86) Microsoft ACPI-Compliant System |
|  | (ISA) 0x00000057 (87) Microsoft ACPI-Compliant System |
|  | (ISA) 0x00000058 (88) Microsoft ACPI-Compliant System |
|  | (ISA) 0x00000059 (89) Microsoft ACPI-Compliant System |
|  | (ISA) 0x0000005A (90) Microsoft ACPI-Compliant System |
|  | (ISA) 0x0000005B (91) Microsoft ACPI-Compliant System |
|  | (ISA) 0x0000005C (92) Microsoft ACPI-Compliant System |
|  | (ISA) 0x0000005D (93) Microsoft ACPI-Compliant System |
|  | (ISA) 0x0000005E (94) Microsoft ACPI-Compliant System |
|  | (ISA) 0x0000005F (95) Microsoft ACPI-Compliant System |
|  | (ISA) 0x00000060 (96) Microsoft ACPI-Compliant System |
|  | (ISA) 0x00000061 (97) Microsoft ACPI-Compliant System |
|  | (ISA) 0x00000062 (98) Microsoft ACPI-Compliant System |
|  | (ISA) 0x00000063 (99) Microsoft ACPI-Compliant System |
|  | (ISA) 0x00000064 (100) Microsoft ACPI-Compliant System |
|  | (ISA) 0x00000065 (101) Microsoft ACPI-Compliant System |
|  | (ISA) 0x00000066 (102) Microsoft ACPI-Compliant System |
|  | (ISA) 0x00000067 (103) Microsoft ACPI-Compliant System |
|  | (ISA) 0x00000068 (104) Microsoft ACPI-Compliant System |
|  | (ISA) 0x00000069 (105) Microsoft ACPI-Compliant System |
|  | (ISA) 0x0000006A (106) Microsoft ACPI-Compliant System |
|  | (ISA) 0x0000006B (107) Microsoft ACPI-Compliant System |
|  | (ISA) 0x0000006C (108) Microsoft ACPI-Compliant System |
|  | (ISA) 0x0000006D (109) Microsoft ACPI-Compliant System |
|  | (ISA) 0x0000006E (110) Microsoft ACPI-Compliant System |











































| | |
|--|---------------------------------|
|  (ISA) 0x0000006F (111) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000070 (112) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000071 (113) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000072 (114) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000073 (115) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000074 (116) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000075 (117) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000076 (118) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000077 (119) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000078 (120) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000079 (121) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000007A (122) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000007B (123) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000007C (124) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000007D (125) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000007E (126) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000007F (127) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000080 (128) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000081 (129) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000082 (130) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000083 (131) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000084 (132) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000085 (133) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000086 (134) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000087 (135) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000088 (136) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000089 (137) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000008A (138) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000008B (139) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000008C (140) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000008D (141) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000008E (142) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000008F (143) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000090 (144) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000091 (145) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000092 (146) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000093 (147) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000094 (148) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000095 (149) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000096 (150) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000097 (151) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000098 (152) | Microsoft ACPI-Compliant System |











































| | |
|--|---------------------------------|
|  (ISA) 0x00000099 (153) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000009A (154) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000009B (155) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000009C (156) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000009D (157) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000009E (158) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000009F (159) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000A0 (160) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000A1 (161) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000A2 (162) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000A3 (163) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000A4 (164) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000A5 (165) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000A6 (166) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000A7 (167) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000A8 (168) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000A9 (169) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000AA (170) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000AB (171) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000AC (172) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000AD (173) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000AE (174) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000AF (175) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000B0 (176) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000B1 (177) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000B2 (178) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000B3 (179) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000B4 (180) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000B5 (181) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000B6 (182) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000B7 (183) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000B8 (184) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000B9 (185) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000BA (186) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000BB (187) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000BC (188) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000BD (189) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000BE (190) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000000BF (191) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000100 (256) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000101 (257) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000102 (258) | Microsoft ACPI-Compliant System |











































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|  (ISA) 0x00000103 (259) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000104 (260) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000105 (261) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000106 (262) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000107 (263) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000108 (264) | Microsoft ACPI-Compliant System |
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|  (ISA) 0x0000010C (268) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000010D (269) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000010E (270) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000010F (271) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000110 (272) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000111 (273) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000112 (274) | Microsoft ACPI-Compliant System |
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|  (ISA) 0x0000012C (300) | Microsoft ACPI-Compliant System |









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|  (ISA) 0x0000013F (319) | Microsoft ACPI-Compliant System |
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|  (ISA) 0x0000019F (415) | Microsoft ACPI-Compliant System |
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|  (ISA) 0x000001AA (426) | Microsoft ACPI-Compliant System |

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|  (ISA) 0x000001B2 (434) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001B3 (435) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001B4 (436) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001B5 (437) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001B6 (438) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001B7 (439) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001B8 (440) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001B9 (441) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001BA (442) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001BB (443) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001BC (444) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001BD (445) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001BE (446) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001BF (447) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001C0 (448) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001C1 (449) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001C2 (450) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001C3 (451) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001C4 (452) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001C5 (453) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001C6 (454) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001C7 (455) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001C8 (456) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001C9 (457) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001CA (458) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001CB (459) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001CC (460) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001CD (461) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001CE (462) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001CF (463) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001D0 (464) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001D1 (465) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001D2 (466) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001D3 (467) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001D4 (468) | Microsoft ACPI-Compliant System |

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|  (ISA) 0x000001D5 (469) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001D6 (470) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001D7 (471) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001D8 (472) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001D9 (473) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001DA (474) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001DB (475) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001DC (476) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001DD (477) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001DE (478) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001DF (479) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001E0 (480) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001E1 (481) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001E2 (482) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001E3 (483) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001E4 (484) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001E5 (485) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001E6 (486) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001E7 (487) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001E8 (488) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001E9 (489) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001EA (490) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001EB (491) | Microsoft ACPI-Compliant System |
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|  (ISA) 0x000001F0 (496) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F1 (497) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F2 (498) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F3 (499) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F4 (500) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F5 (501) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F6 (502) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F7 (503) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F8 (504) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F9 (505) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001FA (506) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001FB (507) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001FC (508) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001FD (509) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001FE (510) | Microsoft ACPI-Compliant System |

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|---|------------------------|--|
|  | (PCI) 0x0000000B (11) | Mobile 6th Generation Intel(R) Processor Family I/O Thermal subsystem - 9D31 |
|  | (PCI) 0x0000000B (11) | Mobile 6th Generation Intel(R) Processor Family I/O SMBUS - 9D23 |
|  | (PCI) 0x00000010 (16) | High Definition Audio Controller |
|  | (PCI) 0x00000010 (16) | Standard SATA AHCI Controller |
|  | (PCI) 0xFFFFFFFFB (-5) | Intel(R) Management Engine Interface |
|  | (PCI) 0xFFFFFFFFC (-4) | Intel(R) USB 3.0 eXtensible Host Controller - 0100 (Microsoft) |
|  | (PCI) 0xFFFFFFFFD (-3) | Intel(R) HD Graphics 510 |
|  | (PCI) 0xFFFFFFFFE (-2) | Intel(R) Ethernet Connection I219-LM |

Appendix C

Programming Digital I/O

C.1 Digital I/O Programming

The COM-KBUC6 utilizes an AAEON chipset as its Digital I/O controller.

Below are the procedures to complete its configuration, which you can use to develop a customized program to fit your application.

C.2 Digital I/O Register

Table 1 : Embedded BRAM relative register table

| | Default Value | Note |
|--|---------------|---|
| Index | 0x284(Note1) | BRAM Index Register |
| Data | 0x285(Note2) | BRAM Data Register |
| Logical Device Number | 0xA2(Note3) | Watch dog Logical Device Number |
| IO Direction Function and Device Number | 0x00(Note4) | DIO Input/Output Function/Device Number |
| IO Vaule/Status Function and Device Number | 0x01(Note5) | DIO Output Data Function/Device Number |

C.2 Digital I/O Sample Program

```
*****
// Embedded BRAM relative definition (Please reference to Table 1)
#define byte EcBRAMIndex //This parameter is represented from Note1
#define byte EcBRAMData //This parameter is represented from Note2
#define byte BRAMLDNReg //This parameter is represented from Note3
#define byte BRAMFnData0Reg //This parameter is represented from Note4
#define byte BRAMFnData1Reg //This parameter is represented from Note5
#define void EcBRAMWriteByte(byte Offset, byte Value);
#define byte EcBRAMReadByte(byte Offset);
#define void IOWriteByte(byte Offset, byte Value);
#define byte IOReadByte(byte Offset);

// Digital Input Status relative definition (Please reference to Table 2)
#define byte DIO0ToDIO7Reg // This parameter is represented from Note6
#define byte DIO0Bit // This parameter is represented from Note7
#define byte DIO1Bit // This parameter is represented from Note8
#define byte DIO2Bit // This parameter is represented from Note9
#define byte DIO3Bit // This parameter is represented from Note10
#define byte DIO4Bit // This parameter is represented from Note11
#define byte DIO5Bit // This parameter is represented from Note12
#define byte DIO6Bit // This parameter is represented from Note13
#define byte DIO7Bit // This parameter is represented from Note14
#define byte DIO0Val // This parameter is represented from Note15
#define byte DIO1Val // This parameter is represented from Note16
#define byte DIO2Val // This parameter is represented from Note17
#define byte DIO3Val // This parameter is represented from Note18
#define byte DIO4Val // This parameter is represented from Note19
#define byte DIO5Val // This parameter is represented from Note20
#define byte DIO6Val // This parameter is represented from Note21
#define byte DIO7Val // This parameter is represented from Note22
*****
```

```
*****
VOID Main() {
    Boolean PinStatus ;

    // Procedure : AaeonReadPinStatus
    // Input :
    //     Example, Read Digital I/O Pin 3 status
    // Output :
    //     InputStatus :
    //         0: Digital I/O Pin level is low
    //         1: Digital I/O Pin level is High
    PinStatus = AaeonReadPinStatus(DIO0ToDIO7Reg, DIO3Bit);

    // Procedure : AaeonSetOutputLevel
    // Input :
    //     Example, Set Digital I/O Pin 6 level
    AaeonSetOutputLevel(DIO0ToDIO7Reg, DIO6Bit, DIO6Val);
}
*****
```

```
*****
Boolean AaeonReadPinStatus(byte OptionReg, byte BitNum){
    Byte TempByte;

    TempByte = ECBRAMReadByte(BRAMFnData1Reg, OptionReg);
    If (TempByte & BitNum == 0)
        Return 0;
    Return 1;
}
VOID AaeonSetOutputLevel(byte OptionReg, byte BitNum, byte Value){
    Byte TempByte;

    TempByte = ECBRAMReadByte(BRAMFnData1Reg, OptionReg);
    TempByte |= (Value << BitNum);
    ECBRAMWriteByte(OptionReg, BitNum, Value);
}
*****
```



```
*****
VOID ECBRAMWriteByte(byte OPReg, byte OPBit, byte Value){
    IOWriteByte(EcBRAMIndex, 0x10);
    IOWriteByte(EcBRAMData, BRAMLDNReg);
    IOWriteByte(EcBRAMIndex, 0x11);
    IOWriteByte(EcBRAMData, BRAMFnDataReg);

    IOWriteByte(EcBRAMIndex, 0x13 + OPReg);
    IOWriteByte(EcBRAMData, Value);

    IOWriteByte(EcBRAMIndex, 0x12);
    IOWriteByte(EcBRAMData, 0x30);           //Write start
}

Byte ECBRAMReadByte(byte FnDataReg, byte OPReg){
    IOWriteByte(EcBRAMIndex, 0x10);
    IOWriteByte(EcBRAMData, BRAMLDNReg);
    IOWriteByte(EcBRAMIndex, 0x11);
    IOWriteByte(EcBRAMData, FnDataReg);

    IOWriteByte(EcBRAMIndex, 0x12);
    IOWriteByte(EcBRAMData, 0x10);         //Read start

    IOWriteByte(EcBRAMIndex, 0x13 + OPReg);
    Return      IOReadByte(EcBRAMData, Value);
}
*****
```

Appendix D

Notes for Users

D.1 Notes for Users

Please observe the following items to ensure optimal performance:

1. Always use a new SSD with the latest firmware and SATA Gen3 cable for optimal performance and compatibility.
2. With the EHCI controller no longer available on the 6th Gen Intel® Core™ platforms, it is recommended to install Windows 7 through a SATA bus, eg SATA DVD ROM, or refer to <https://downloadcenter.intel.com/download/25476/Windows-7-USB-3-0-Creator-Utility> to create a USB installer.
3. Per Platform and COMe Spec, this product supports Five PCIe[x1] devices in default. If other PCIe device q'ty or grouping required, please contact your AAEON contact for support.
4. After booting to the OS, the board's display priority will be taken over by the graphics driver. In case when LVDS output is not needed, please disable LVDS in BIOS to prevent the driver from automatically setting LVDS as the output device.
5. For extended temperature SKU, it tested under AAEON's condition such as using AAEON thermal solution, tested under UEFI mode, etc.
6. The Kaby Lake platform (KBU) supports Microsoft Windows 10 64-bit version only.