

OXY5741A

Rugged Open-Standard EBX SBC
Expansion, Extend Temperature
-40 to 85°C



Safety Information

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area.
- If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your local distributor.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter any technical problems with the product, contact your local distributor

Statement

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- All product specifications are subject to change without prior notice

RoHS Compliance



Perfectron RoHS Environmental Policy and Status Update

Perfectron is a global citizen for building the digital infrastructure. We are committed to providing green products and services, which are compliant with European Union RoHS (Restriction on Use of Hazardous Substance in Electronic Equipment) directive 2011/65/EU, to be your trusted green partner and to protect our environment.

In order to meet the RoHS compliant directives, Perfectron has established an engineering and manufacturing task force to implement the introduction of green products. The task force will ensure that we follow the standard Perfectron development procedure and that all the new RoHS components and new manufacturing processes maintain the highest industry quality levels for which Perfectron are renowned.

The model selection criteria will be based on market demand. Vendors and suppliers will ensure that all designed components will be RoHS compliant

Revision History

| Revision | Date (yyyy/mm/dd) | Changes |
|----------|-------------------|--------------------------------------|
| V1.0 | 2021/04/22 | First release |
| V1.1 | 2021/05/27 | Add Mechanical Dimensions |
| V1.2 | 2021/9/10 | Modify DIO Pin Define |
| V1.3 | 2021/12/7 | Typesetting modification |
| V1.4 | 2022/11/24 | Add COM1/COM2 RS422/RS485 Pin define |

Packing List

| Item | Description | Q'ty |
|------|----------------------------|------|
| 1 | OXY5741A EBX SBC | 1 |
| 2 | CD(Driver + User's manual) | 1 |



If any of the above items is damaged or missing, please contact your local distributor.

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Chapter 1 : Product Introduction

1.1 Specifications

System

| | |
|-------------|--|
| CPU | Intel® Core™ i7-9850HE Processor (6 Cores/12 Threads,9M Cache,up to 4.40GHz),45W Intel® Core i7-9850HL Processor (6 Cores/12 Threads,9M Cache,up to 4.10GHz), 25W Intel® XEON® E-2276ME Processor (6 Cores/12 Threads,12M Cache,up to 4.50GHz),45W Intel® XEON® E-2276ML Processor (6 Cores/12 Threads,12M Cache,up to 4.20GHz),25W Intel® Core™ i5-8400H Processor (6 Cores/12 Threads,8M Cache,up to 4.20GHz),45W |
| Memory type | 4 x 260 Pin DDR4 2666MHz SO-DIMM (up to 128GB, XEON® SKU support ECC) |
| Chipset | CM246 |
| BIOS Code | AMI UEFI BIOS |
| BIOS Flash | SPI Flash |
| Super I/O | ITE 8786 |
| TPM | TPM2.0(SLB9665) |
| iAMT | iAMT12.0 |
| WatchDog | 1-255 sec. or 1-255 min. software programmable and can be generate system reset |

Display

| | |
|---------------|---|
| Chipset | Intel® UHD Graphics 630 |
| LVDS | Dual channel 24-bit LVDS, max resolution up to 1920 x 1080 @ 60Hz |
| Display Port | Up to 4096 x 2304 @ 60Hz |
| Multi-Display | Triple simultaneous displays with 48-bit LVDS+DP |

Audio

| | |
|-------|---------|
| Codec | ALC888S |
|-------|---------|

Expansion

| | |
|-----------|---|
| M.2 | 1 x M.2(M-key,Type: 2280, SATA/PCIe 3.0 x 4 NVMe) |
| Mini PCIe | 2 x Full size (USB / PCIe and 1 x micro SIM Card) |
| FPE | 1 |
| PCIe/104 | 1 x TYPE 2 |

| | |
|---------|--|
| Chipset | Intel® I210 & I219LM GbE LAN(10/100/1000 Mbps support) |
|---------|--|

| | |
|-----|-----|
| WOL | Yes |
|-----|-----|

| | |
|---------------|-------------|
| Boot from LAN | Yes for PXE |
|---------------|-------------|

Rear I/O

| | |
|--------------|---|
| Display Port | 2 |
|--------------|---|

| | |
|---------|------------|
| USB 3.0 | 4 x USB3.0 |
|---------|------------|

| | |
|-----|---|
| LAN | 2 |
|-----|---|

Front I/O

| | |
|-----|---|
| LED | 6 (HDD, 2 x LAN ACT+LINK) RED/GREEN LED |
|-----|---|

| | |
|-----------|---|
| PW Button | 1 |
|-----------|---|

| | |
|-----|-------------|
| USB | 2 x USB 3.0 |
|-----|-------------|

Internal I/O

| | |
|--------|---|
| USB2.0 | 4 |
|--------|---|

| | |
|------|-------------|
| GPIO | 1(4in/4out) |
|------|-------------|

| | |
|---------|----------------|
| SATAIII | 4 (0,1,5 RAID) |
|---------|----------------|

| | |
|------------|---|
| SATA Power | 4 |
|------------|---|

| | |
|----|---|
| DP | 1 |
|----|---|

| | |
|-------|-----------------------|
| Audio | 1 (Line-out / Mic-in) |
|-------|-----------------------|

| | |
|--------|-------------------------------------|
| Serial | 2 (RS-232/422/485 autoflow control) |
|--------|-------------------------------------|

| | |
|--------------|---|
| DC connector | 1 |
|--------------|---|

| | |
|---------------|---|
| LVDS Inverter | 1 |
|---------------|---|

| | |
|----------------|---|
| LVDS connector | 1 |
|----------------|---|

| | |
|-----|---|
| LPC | 1 |
|-----|---|

| | |
|---------|---|
| CPU FAN | 1 |
|---------|---|

| | |
|---------------------|--|
| Front Panel Control | Power LED, HD LED, Reset, Power Switch, Buzzer |
|---------------------|--|

Mechanical and Environmental

| | |
|-------------|-----|
| Form Factor | EBX |
|-------------|-----|

| | |
|------------|-----------|
| Power Type | DC-IN 12V |
|------------|-----------|

| | |
|-------------------|------|
| Power Consumption | 180W |
|-------------------|------|

| | |
|-----------|---------------|
| Dimension | 146mm x 243mm |
|-----------|---------------|

| | |
|-----------------------|----------------------------|
| Operation Temperature | -40 to 85°C |
| Storage Temperature | -40 to 85°C |
| Relative Humidity | 10% to 90%, non-condensing |

Standard Compliance

| | |
|---------------------|----------|
| Standart Compliance | CE / FCC |
|---------------------|----------|

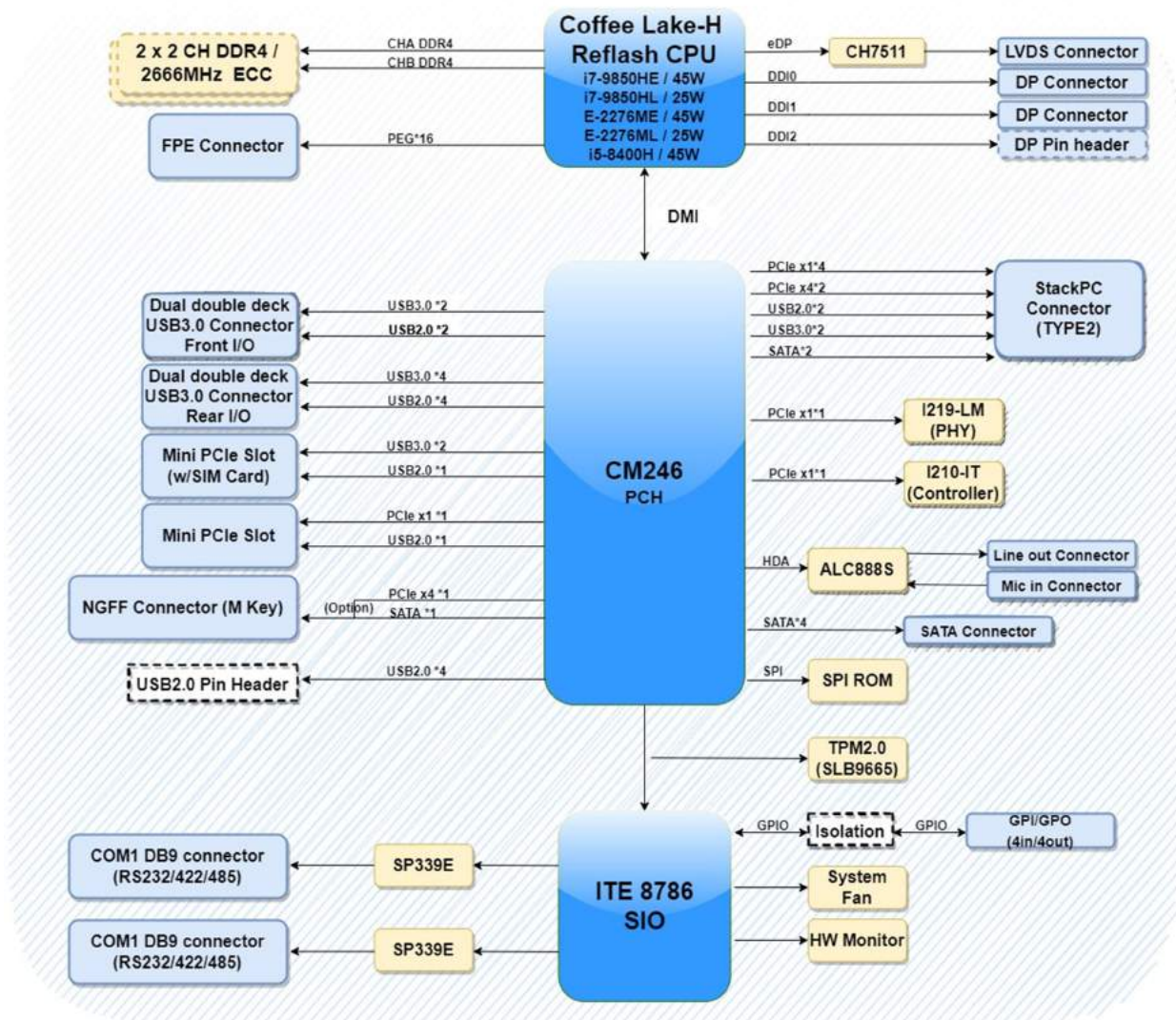
OS

| | |
|------------|--|
| OS Support | Windows®10 64-bit Linux(Support by request) |
|------------|--|

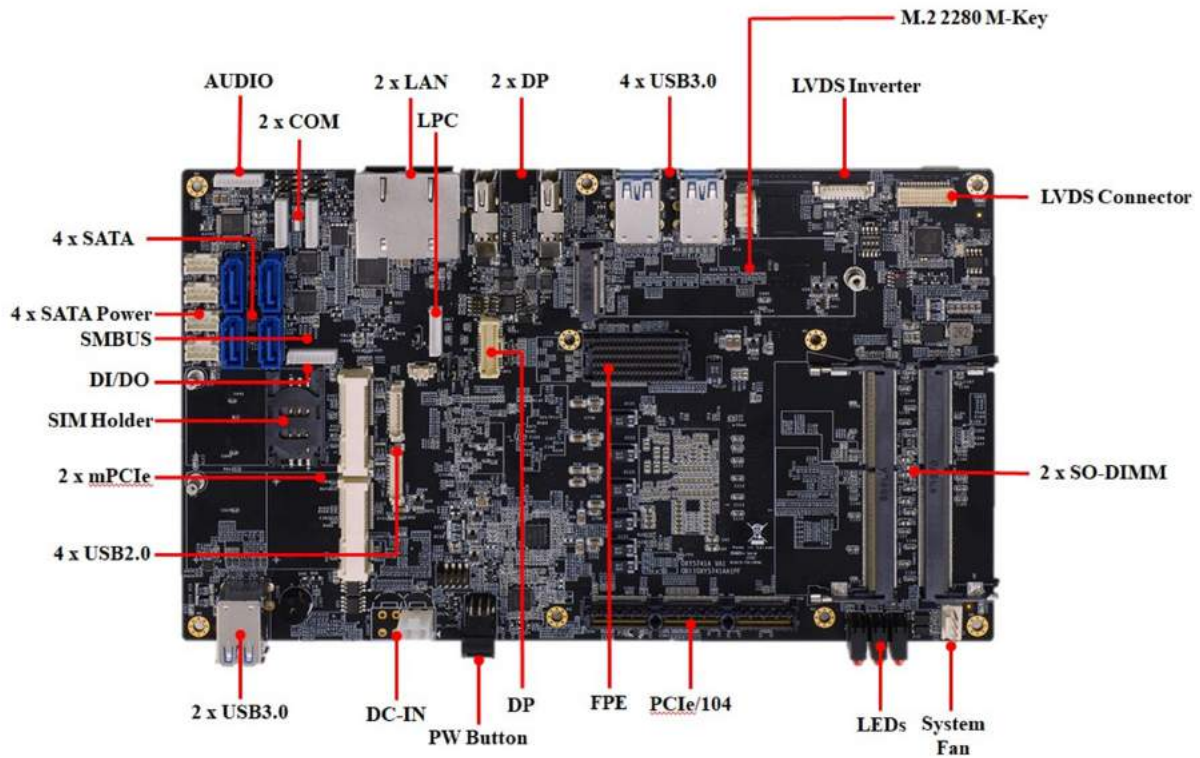
Modular Architecture

| | |
|-----------------------|--|
| PCIe/104 Bus | <p>PCIe/104 (PCIe v3.0, Type 2) bus – Two Gen3.0 x 4 lanes plus quad Gen 3.0 x1 lanes. Supports integration with stackable PCIe/104 and/or PCI/104-Express I/O cards. PCI-PCIe bridge adapter required to support PCI-104 and/or PC/104-Plus IO cards.</p> |
| FPE | <p>FPE B2B connector to support PCIe Gen3.0 x16 lanes Use this feature configures the PCI-E port Bifurcation setting for a PCI-E port Specified by the user. The options are x8x4x4, x8x8 and x16 (SK229) 3 card slots available for PCIe/104 or PCIe adapter cards example :</p> <ol style="list-style-type: none"> (1) FPE/PCIe104 to 4 mini SAS connectors (SK229) (2) Mini SAS to PCIe x16 slot (x8 signal (SK228) (3) Mini SAS to PCIe x16 slot (x16 signal (SK226/SK230) (4) Mini SAS to MXM adapter board (SK224) |
| Mini PCIe | <p>2 x Full size mini PCIe slot</p> <ol style="list-style-type: none"> (1) 1 x slot dedicated for Mini-PCIe card I/O module (i.e. MIL-STD-1553, ARINC 429, serial, Ethernet, GPS, etc.) (2) 1 x slot auto-detectable mSATA storage or Mini-PCIe card I/O (3) 60+ pins available on DTL-38999 for Mini-PCIe I/O signals |
| M.2 | <p>M.2 2280 slot to support PCIe Gen3.0 x4 or NVME SSD storage device by jumper setting.</p> |
| Expansion I/O Support | <p>5 to 6 card slots available for PCIe/104 or PCI/104-Express cards example :</p> <ol style="list-style-type: none"> (1) HDSDI/PAL/NTSC H.264 frame grabber (mPCIe by SK401) (2) H.264 video recorder/network streaming card, (mPCIe by SK401) (3) MIL-STD-1553 /ARINC429 (mPCIe by SK401) (4) CAN data-bus module (mPCIe by SK401) (5) Ethernet NIC / 10GbE LAN switch (SK506 ; SK502) |
| Data Storage | <p>4 x SATA controllers for SATA 3.0 and 1 x NVME SSD can support Data Storage function</p> <ol style="list-style-type: none"> (1) SATA LAN 0 (2) SATA LAN 1 (3) SATA LAN 2 (4) SATA LAN 3 (5) M.2 2280 NVMe SSD |

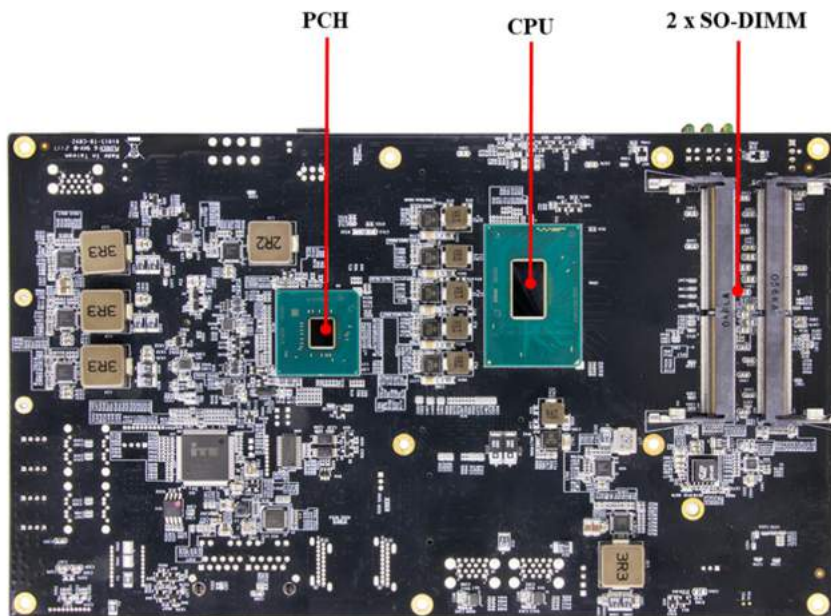
1.2 Block Diagram



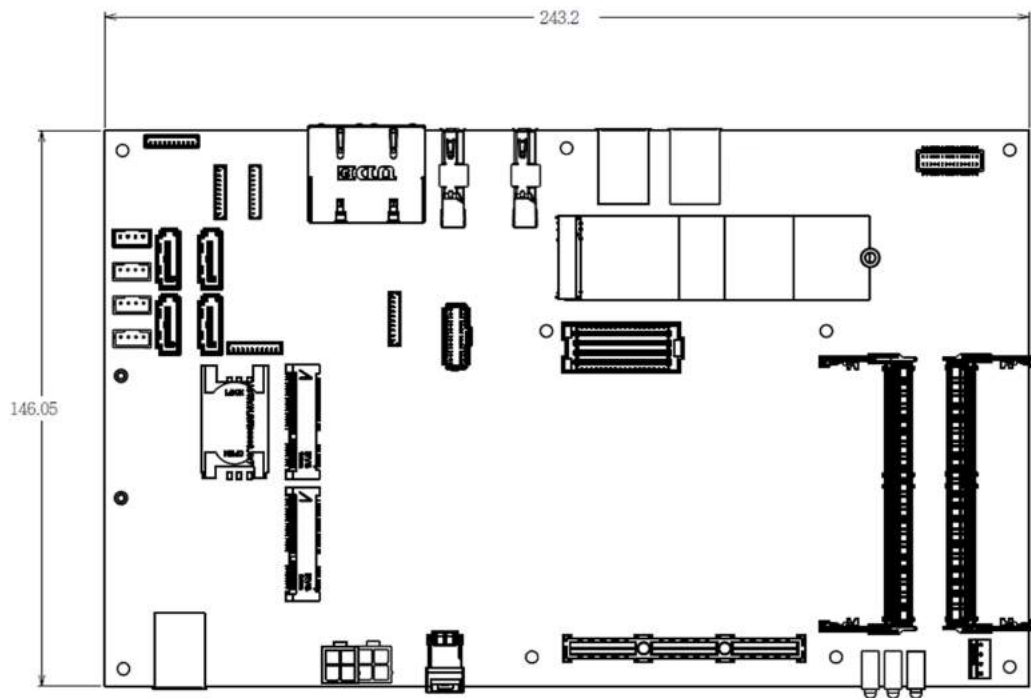
1.3 Board Placement



OXY5741A Bottom Side



1.4 Mechanical Dimensions



Chapter 2 : Jumpers and Connectors Location

2.1 Jumpers and connectors list

| Label | Function |
|---------------------|---|
| BAT1 | BATTERY connector |
| CN1 | Inverter connector |
| CN10/CN12/CN14/CN16 | SATA Power |
| CN17 | LPC connector (Update BIOS) |
| CN19 | SMBUS |
| CN2 | LVDS Connector |
| CN6/CN7 | USB2.0 (Total 4 Port) |
| CN8 | M.2 M KEY Connector |
| CN9/CN11/CN13/CN15 | Serial SATA Connectors |
| DC_JACK1 | ATX12V DC connector |
| DIMM0 | DDR4 SO DIMM Socket |
| DIMM1 | DDR4 SO DIMM Socket |
| DIMM2 | DDR4 SO DIMM Socket |
| DIMM3 | DDR4 SO DIMM Socket |
| DP3 | DISPLAY PORT HEADER |
| FP1 | Front Panel |
| FPE1 | FPE Top connector |
| J1 | Front side MIC-In/ Line-Out Connector |
| J2 | Digital I/O Box Head |
| J3 | RS232/422/485 with 5V/12V selectable |
| J4 | RS232/422/485 with 5V/12V selectable |
| J5 | System Fan connector |
| JCMOS1 | ME Flash Security |
| JCMOS2 | RTC Reset |
| JM2 | M.2 Signal select |
| JP1 | LVDS_VDD select |
| JP3 | COM1 +12/+5V selection |
| JP4 | COM2 +12/+5V selection |
| JP5 | AT/ATX Mode |
| LED2 | LAN1 LED STATUS |
| LED3 | LAN2 LED STATUS |
| LED4 | Power/HDD LED |
| MCARD1 | Mini PCIE Card Slot<Full size Co-lay mSATA> |
| MCARD2 | Mini PCIE Card Slot<Full size Co-lay mSATA> |
| SIM_CARD1 | SIM card socket |

| | |
|----------|---------------------------|
| STACKPC1 | PCIe/104 connector |
| SW1 | LVDS Resolution selection |
| SW2 | Power Button |
| SW3 | PCIE CFG[5:6] |

2.2 Jumper Settings

CN1: Inverter connector

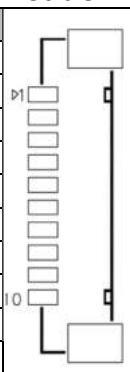
| PIN | DEFINITION |
|-----|---------------|
| 1 | 12V |
| 2 | 12V |
| 3 | 12V |
| 4 | 5VS |
| 5 | 5VS |
| 6 | GND |
| 7 | GND |
| 8 | BL_EN |
| 9 | LVDS_BKL_CTRL |
| 10 | GND |

CN2: LVDS Connector

| PIN | DEFINITION | PIN | DEFINITION |
|-----|-------------|-----|-------------|
| 1 | LVDS_BCLK | 2 | GND |
| 3 | LVDS_BCLK# | 4 | LVDS_A3 |
| 5 | GND | 6 | LVDS_A3# |
| 7 | LVDS_B3 | 8 | GND |
| 9 | LVDS_B3# | 10 | LVDS_ACLK |
| 11 | LVDS_B2 | 12 | LVDS_ACLK # |
| 13 | LVDS_B2# | 14 | GND |
| 15 | LVDS_B1 | 16 | LVDS_A2 |
| 17 | LVDS_B1# | 18 | LVDS_A2# |
| 19 | LVDS_B0 | 20 | LVDS_A1 |
| 21 | LVDS_B0# | 22 | LVDS_A1# |
| 23 | GND | 24 | LVDS_A0 |
| 25 | LVDS_DCC_SC | 26 | LVDS_A0# |
| 27 | LVDS_DCC_SD | 28 | GND |
| 29 | +VDD_LVDS | 30 | +VDD_LVDS |

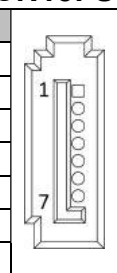
CN7: USB2.0 Pin Header

| PIN | DEFINITION |
|-----|-------------|
| 1 | +USB2_VCC9 |
| 2 | USB2_N9_C |
| 3 | USB2_P9_C |
| 4 | GND |
| 5 | GND |
| 6 | +USB2_VCC10 |
| 7 | USB2_N10_C |
| 8 | USB2_P10_C |
| 9 | GND |
| 10 | GND |



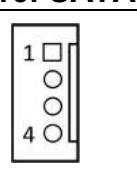
CN9/CN11/CN13/CN15: Serial SATA Connectors

| PIN | DEFINITION |
|-----|------------|
| 1 | GND |
| 2 | TXP |
| 3 | TXN |
| 4 | GND |
| 5 | RXN |
| 6 | RXP |
| 7 | GND |



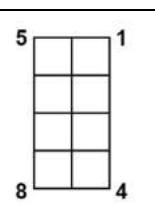
CN10/CN12/CN14/CN16: SATA POWER Connector

| PIN | DEFINITION |
|-----|------------|
| 1 | 12V |
| 2 | GND |
| 3 | GND |
| 4 | 5VS |



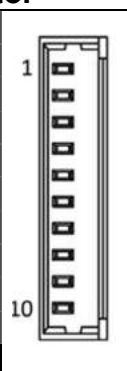
DC_JACK1: DC-IN

| PIN | DEFINITION | PIN | DEFINITION |
|-----|------------|-----|------------|
| 1 | GND | 2 | GND |
| 3 | GND | 4 | GND |
| 5 | +12VSB | 6 | +12VSB |
| 7 | +12VSB | 8 | +12VSB |



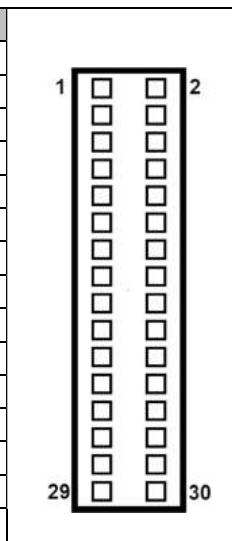
CN17: LPC connector

| PIN | DEFINITION |
|-----|---------------|
| 1 | GND |
| 2 | INT_SERIRQ |
| 3 | 3V3 |
| 4 | LPC_AD0 |
| 5 | LPC_AD1 |
| 6 | LPC_AD2 |
| 7 | LPC_AD3 |
| 8 | LPC_FRAME# |
| 9 | CHIP_PLTRST# |
| 10 | C_LPC_CLK_SIO |



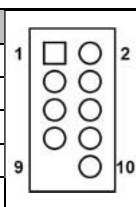
DP3: DISPLAY PORT HEADER

| PIN | DEFINITION | PIN | DEFINITION |
|-----|------------------|-----|------------|
| 1 | GND | 2 | GND |
| 3 | DDI3_TXP0_DP_C | 4 | NC |
| 5 | DDI3_TXN0_DP_C | 6 | NC |
| 7 | DDI3_TXP1_DP_C | 8 | NC |
| 9 | DDI3_TXN1_DP_C | 10 | NC |
| 11 | DDI3_TXP2_DP_C | 12 | NC |
| 13 | DDI3_TXN2_DP_C | 14 | NC |
| 15 | DDI3_TXP3_DP_C | 16 | NC |
| 17 | DDI3_TXN3_DP_C | 18 | NC |
| 19 | DDI3_AUX_P_C | 20 | NC |
| 21 | DDI3_AUX_N_C | 22 | NC |
| 23 | GND | 24 | GND |
| 25 | DDI3_DDC_AUX_SEL | 26 | NC |
| 27 | DP3_DET | 28 | NC |
| 29 | DP3_PWR | 30 | NC |



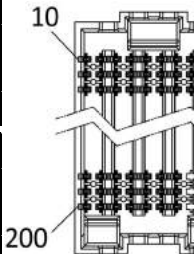
FP1: Front Panel

| PIN | DEFINITION | PIN | DEFINITION |
|-----|------------|-----|------------|
| 1 | FP_HDLED+ | 2 | FP_PLED+ |
| 3 | HDLED- | 4 | GND |
| 5 | GND | 6 | PANSWIN# |
| 7 | EXT_RESET# | 8 | GND |
| 9 | NC | 10 | NC |



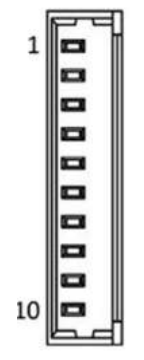
FPE1: FPE Top Connector

| PIN | DEFINITION | PIN | DEFINITION | PIN | DEFINITION | PIN | DEFINITION | PIN | DEFINITION |
|-----|------------|-----|------------|-----|------------|-----|--------------|-----|--------------|
| 1 | NC | 2 | NC | 3 | GND | 4 | 3V3 | 5 | GND |
| 11 | GND | 12 | NC | 13 | GND | 14 | NC | 15 | GND |
| 21 | NC | 22 | NC | 23 | NC | 24 | GND | 25 | NC |
| 31 | NC | 32 | NC | 33 | NC | 34 | NC | 35 | NC |
| 41 | GND | 42 | NC | 43 | GND | 44 | NC | 45 | GND |
| 51 | NC | 52 | GND | 53 | NC | 54 | GND | 55 | NC |
| 61 | NC | 62 | NC | 63 | NC | 64 | NC | 65 | NC |
| 71 | GND | 72 | NC | 73 | GND | 74 | NC | 75 | GND |
| 81 | PEG_TXP0 | 82 | NC | 83 | PEG_TXP2 | 84 | GND | 85 | PEG_TXP4 |
| 91 | PEG_TXN0 | 92 | PEG_TXP1 | 93 | PEG_TXN2 | 94 | PEG_TXP3 | 95 | PEG_TXN4 |
| 101 | GND | 102 | PEG_TXN1 | 103 | GND | 104 | PEG_TXN3 | 105 | GND |
| 111 | PEG_RXP_0 | 112 | GND | 113 | PEG_RXP_2 | 114 | GND | 115 | PEG_RXP_4 |
| 121 | PEG_RXN_0 | 122 | PEG_RXP_1 | 123 | PEG_RXN_2 | 124 | PEG_RXP_3 | 125 | PEG_RXN_4 |
| 131 | GND | 132 | PEG_RXN_1 | 133 | GND | 134 | PEG_RXN_3 | 135 | GND |
| 141 | PEG_TXP8 | 142 | GND | 143 | PEG_TXP10 | 144 | GND | 145 | PEG_TXP12 |
| 151 | PEG_TXN8 | 152 | PEG_TXP9 | 153 | PEG_TXN10 | 154 | PEG_TXP11 | 155 | PEG_TXN12 |
| 161 | GND | 162 | PEG_TXN9 | 163 | GND | 164 | PEG_TXN11 | 165 | GND |
| 171 | PEG_RXP_8 | 172 | GND | 173 | PEG_RXP_10 | 174 | GND | 175 | PEG_RXP_12 |
| 181 | PEG_RXN_8 | 182 | PEG_RXP_9 | 183 | PEG_RXN_10 | 184 | PEG_RXP_11 | 185 | PEG_RXN_12 |
| 191 | GND | 192 | PEG_RXN_9 | 193 | GND | 194 | PEG_RXN_11 | 195 | GND |
| PIN | NAME | PIN | NAME | PIN | NAME | PIN | NAME | PIN | NAME |
| 6 | 3V3SB | 7 | GND | 8 | 5VSB | 9 | 5V | 10 | +12V |
| 16 | NC | 17 | GND | 18 | NC | 19 | 5V | 20 | +12V |
| 26 | GND | 27 | NC | 28 | GND | 29 | 5V | 30 | +12V |
| 36 | NC | 37 | NC | 38 | NC | 39 | NC | 40 | +12V |
| 46 | NC | 47 | GND | 48 | NC | 49 | GND | 50 | +12V |
| 56 | GND | 57 | NC | 58 | GND | 59 | GND | 60 | +12V |
| 66 | NC | 67 | NC | 68 | NC | 69 | GND | 70 | +12V |
| 76 | NC | 77 | GND | 78 | NC | 79 | GND | 80 | +12V |
| 86 | GND | 87 | PEG_TXP6 | 88 | GND | 89 | GND | 90 | +12V |
| 96 | PEG_TXP5 | 97 | PEG_TXN6 | 98 | PEG_TXP7 | 99 | GND | 100 | NC |
| 106 | PEG_TXN5 | 107 | GND | 108 | PEG_TXN7 | 109 | GND | 110 | IO_PLTRST# |
| 116 | GND | 117 | PEG_RXP_6 | 118 | GND | 119 | PEG_A_CLK_P5 | 120 | GND |
| 126 | PEG_RXP_5 | 127 | PEG_RXN_6 | 128 | PEG_RXP_7 | 129 | PEG_A_CLK_N5 | 130 | FPE_BUS_ERR# |
| 136 | PEG_RXN_5 | 137 | GND | 138 | PEG_RXN_7 | 139 | GND | 140 | 3V3SB |
| 146 | GND | 147 | PEG_TXP14 | 148 | GND | 149 | PEG_B_CLK_P6 | 150 | GND |
| 156 | PEG_TXP13 | 157 | PEG_TXN14 | 158 | PEG_TXP15 | 159 | PEG_B_CLK_N6 | 160 | GND |
| 166 | PEG_TXN13 | 167 | GND | 168 | PEG_TXN15 | 169 | GND | 170 | NC |
| 176 | GND | 177 | PEG_RXP_14 | 178 | GND | 179 | NC | 180 | +12V |
| 186 | PEG_RXP_13 | 187 | PEG_RXN_14 | 188 | PEG_RXP_15 | 189 | 3V3 | 190 | +12V |
| 196 | PEG_RXN_13 | 197 | GND | 198 | PEG_RXN_15 | 199 | 3V3 | 200 | +12V |



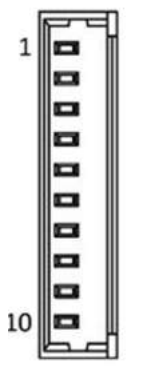
J1 : Audio Box Head

| PIN | DEFINITION |
|-----|------------|
| 1 | GND |
| 2 | MIC1_JD |
| 3 | MIC1_R |
| 4 | MIC1_L |
| 5 | FRONT_JD |
| 6 | FRONT_R |
| 7 | FRONT_L |
| 8 | NC |
| 9 | NC |
| 10 | NC |



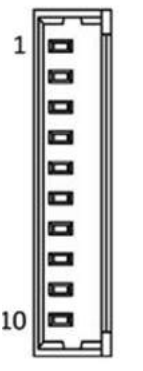
J2: Digital I/O Box Head

| PIN | DEFINITION |
|-----|--------------|
| 1 | DIO0(Input) |
| 2 | DIO1(Input) |
| 3 | DIO2(Input) |
| 4 | DIO3(Input) |
| 5 | DIO4(Output) |
| 6 | DIO5(Output) |
| 7 | DIO6(Output) |
| 8 | DIO7(Output) |
| 9 | 3V3 |
| 10 | GND |




J3: RS232/422/485 Box Head

| PIN | RS232 | RS422 | RS485 |
|-----|-----------|-------|-------|
| 1 | 5V | NC | NC |
| 2 | GND | GND | GND |
| 3 | COM1P9SEL | NC | NC |
| 4 | COM1_DTR- | RX- | NC |
| 5 | COM1_CTS- | NC | NC |
| 6 | COM1_TXD- | RX+ | NC |
| 7 | COM1_RTS- | NC | NC |
| 8 | COM1_RXD- | TX+ | Data+ |
| 9 | COM1_DSR- | NC | NC |
| 10 | COM1_DCD- | TX- | Data- |



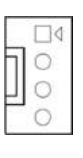
J4: RS232/422/485 Box Head

| PIN | RS232 | RS422 | RS485 |
|-----|-----------|-------|-------|
| 1 | 5V | NC | NC |
| 2 | GND | GND | GND |
| 3 | COM2P9SEL | NC | NC |
| 4 | COM2_DTR- | RX- | NC |
| 5 | COM2_CTS- | NC | NC |
| 6 | COM2_TXD- | RX+ | NC |
| 7 | COM2_RTS- | NC | NC |
| 8 | COM2_RXD- | TX+ | Data+ |
| 9 | COM2_DSR- | NC | NC |
| 10 | COM2_DCD- | TX- | Data- |

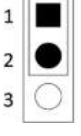
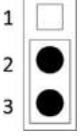


J5: SYSTEM FAN Connector

| PIN | DEFINITION |
|-----|---------------|
| 1 | SYSTEMFAN_PWN |
| 2 | SYSTEMFAN_IO |
| 3 | +12V |
| 4 | GND |

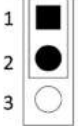
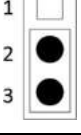


JCMOS1: ME Flash Security

| Jumper | Function description | Setting |
|--------|----------------------|---|
| 1-2 | ME Lock |  |
| 2-3 | ME Unlock |  |

Default setting: 1-2

JCMOS2: RTC Reset

| Jumper | Function description | Setting |
|--------|----------------------|---|
| 1-2 | Default |  |
| 2-3 | Clear CMOS |  |

Default setting: 1-2

JM2: M.2 Signal select

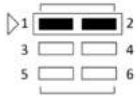
| Jumper | Function description | Setting |
|--------------------------|----------------------|---------|
| 1-2 | PCIe | |
| 2-3 | SATA | |
| Default setting: Non-Put | | |

JP1: LVDS_VDD select

| Jumper | Function description | Setting |
|----------------------|----------------------|---------|
| 1-2 | 3.3V | |
| 2-3 | 5V | |
| Default setting: 2-3 | | |

JP3: COM1 5V/12V selection

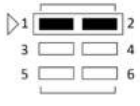
| PIN | DEFINITION | PIN | DEFINITION |
|-----|------------|-----|------------|
| 1 | RI1#_OPTO | 2 | COM1P9SEL |
| 3 | 5V | 4 | COM1P9SEL |
| 5 | +12V | 6 | COM1P9SEL |



Default :1-2 short

JP4: COM2 5V/12V selection

| PIN | DEFINITION | PIN | DEFINITION |
|-----|------------|-----|------------|
| 1 | RI1#_OPTO | 2 | COM2P9SEL |
| 3 | 5V | 4 | COM2P9SEL |
| 5 | 12V | 6 | COM2P9SEL |



Default :1-2 short

JP5 : AT/ATX Mode Selection(Default ATX)

| Jumper | Function description | Setting |
|---------|----------------------|---------|
| Non-Put | ATX | |

| | | |
|--------------------------|----|--|
| 1-2 | AT | |
| Default setting: Non-Put | | |

LED2: LAN2 LED STATUS

| LED1 | Light | Dark | Flash |
|-------|-------|--------|----------|
| RED | 1000M | 100M | NA |
| GREEN | LINK | UNLINK | ACTIVITY |

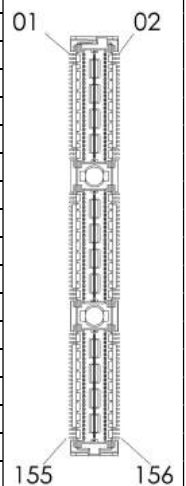
LED3: LAN3 LED STATUS

| LED2 | Light | Dark | Flash |
|-------|-------|---------|----------|
| RED | 1000M | 100M | NA |
| GREEN | Link | Un-link | Activity |

LED4: POWER/SSD LED

| LED2 | Light | Dark | Flash |
|-------|----------|---------------|------------|
| RED | NA | HDD un-access | HDD access |
| GREEN | Power On | Power Off | NA |

| PIN | DEFINITION | PIN | DEFINITION | PIN | DEFINITION | PIN | DEFINITION | PIN | DEFINITION | PIN | DEFINITION |
|-----|------------|-----|------------|-----|---------------|-----|---------------|-----|---------------|-----|--------------|
| 1 | USB_OC# | 2 | PE_RST# | 53 | STK0/WAKE# | 54 | STK1/PEG_ENA# | 105 | STK2/SDVO_DAT | 106 | SDVO_CLK |
| 3 | 3V3 | 4 | 3V3 | 55 | GND | 56 | GND | 107 | GND | 108 | GND |
| 5 | USB_1p | 6 | USB_0p | 57 | PEx16_0T(8)p | 58 | PEx16_0T(0)p | 109 | PEx16_0R(8)p | 110 | PEx16_0R(0)p |
| 7 | USB_1n | 8 | USB_0n | 59 | PEx16_0T(8)n | 60 | PEx16_0T(0)n | 111 | PEx16_0R(8)n | 112 | PEx16_0R(0)n |
| 9 | GND | 10 | GND | 61 | GND | 62 | GND | 113 | GND | 114 | GND |
| 11 | PEx1_1Tp | 12 | PEx1_0Tp | 63 | PEx16_0T(9)p | 64 | PEx16_0T(1)p | 115 | PEx16_0R(9)p | 116 | PEx16_0R(1)p |
| 13 | PEx1_1Tn | 14 | PEx1_0Tn | 65 | PEx16_0T(9)n | 66 | PEx16_0T(1)n | 117 | PEx16_0R(9)n | 118 | PEx16_0R(1)n |
| 15 | GND | 16 | GND | 67 | GND | 68 | GND | 119 | GND | 120 | GND |
| 17 | PEx1_2Tp | 18 | PEx1_3Tp | 69 | PEx16_0T(10)p | 70 | PEx16_0T(2)p | 121 | PEx16_0R(10)p | 122 | PEx16_0R(2)p |
| 19 | PEx1_2Tn | 20 | PEx1_3Tn | 71 | PEx16_0T(10)n | 72 | PEx16_0T(2)n | 123 | PEx16_0R(10)n | 124 | PEx16_0R(2)n |
| 21 | GND | 22 | GND | 73 | GND | 74 | GND | 125 | GND | 126 | GND |
| 23 | PEx1_1Rp | 24 | PEx1_0Rp | 75 | PEx16_0T(11)p | 76 | PEx16_0T(3)p | 127 | PEx16_0R(11)p | 128 | PEx16_0R(3)p |
| 25 | PEx1_1Rn | 26 | PEx1_0Rn | 77 | PEx16_0T(11)n | 78 | PEx16_0T(3)n | 129 | PEx16_0R(11)n | 130 | PEx16_0R(3)n |
| 27 | GND | 28 | GND | 79 | GND | 80 | GND | 131 | GND | 132 | GND |
| 29 | PEx1_2Rp | 30 | PEx1_3Rp | 81 | PEx16_0T(12)p | 82 | PEx16_0T(4)p | 133 | PEx16_0R(12)p | 134 | PEx16_0R(4)p |
| 31 | PEx1_2Rn | 32 | PEx1_3Rn | 83 | PEx16_0T(12)n | 84 | PEx16_0T(4)n | 135 | PEx16_0R(12)n | 136 | PEx16_0R(4)n |
| 33 | GND | 34 | GND | 85 | GND | 86 | GND | 137 | GND | 138 | GND |
| 35 | PEx1_1CIkp | 36 | PEx1_0CIkp | 87 | PEx16_0T(13)p | 88 | PEx16_0T(5)p | 139 | PEx16_0R(13)p | 140 | PEx16_0R(5)p |
| 37 | PEx1_1CIkn | 38 | PEx1_0CIkn | 89 | PEx16_0T(13)n | 90 | PEx16_0T(5)n | 141 | PEx16_0R(13)n | 142 | PEx16_0R(5)n |
| 39 | +5V_SB | 40 | +5V_SB | 91 | GND | 92 | GND | 143 | GND | 144 | GND |
| 41 | PEx1_2CIkp | 42 | PEx1_3CIkp | 93 | PEx16_0T(14)p | 94 | PEx16_0T(6)p | 145 | PEx16_0R(14)p | 146 | PEx16_0R(6)p |
| 43 | PEx1_2CIkn | 44 | PEx1_3CIkn | 95 | PEx16_0T(14)n | 96 | PEx16_0T(6)n | 147 | PEx16_0R(14)n | 148 | PEx16_0R(6)n |

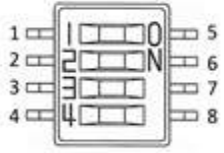


| | | | | | | | | | | | |
|----|-----------|----|-------------|-----|---------------|-----|--------------|-----|---------------|-----|--------------|
| 45 | DIR | 46 | PWRGOOD | 97 | GND | 98 | GND | 149 | GND | 150 | GND |
| 47 | SMB_DAT | 48 | PEx16_Clkp | 99 | PEx16_0T(15)p | 100 | PEx16_0T(7)p | 151 | PEx16_0R(15)p | 152 | PEx16_0R(7)p |
| 49 | SMB_CLK | 50 | PEx16_Clk_n | 101 | PEx16_0T(15)n | 102 | PEx16_0T(7)n | 153 | PEx16_0R(15)n | 154 | PEx16_0R(7)n |
| 51 | SMB_ALERT | 52 | PSON# | 103 | GND | 104 | GND | 155 | GND | 156 | GND |

STACKPC1: CONNECTOR A TOP


SW1: LVDS Resolution select

| SW1 | | | | |
|-----|-----|-----|-----|-------------------------|
| 1 | 2 | 3 | 4 | DEFINITION |
| on | on | on | on | 800*600/18bit (single) |
| on | on | on | off | 1024*768/18bit (single) |
| on | on | off | on | 1024*768/24bit (single) |
| on | on | off | off | 1280*800/18bit (single) |
| on | off | on | on | 1280*1024/24bit (dual) |
| on | off | on | off | 1366*768/24bit (single) |
| on | off | off | on | 1440*900/24bit (dual) |
| on | off | off | off | 1920*1080/24bit (dual) |

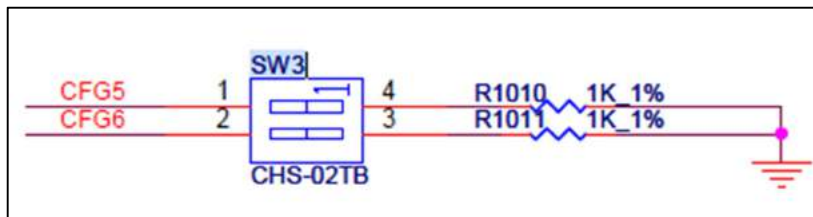


SW2: POWER BUTTON

| PIN | DEFINITION |
|-----|------------|
| ON | NO LIGHT |
| OFF | BLUE LIGHT |



SW3 : CFG5/CFG6



CFG [6:5]:
 00=1 x8, 2 x4 PCI Express.
 01=Reserved.
 10=2 x8 PCI Express.
 *11=1 x16 PCI Express.

Chapter 3: AMI BIOS UTILITY

This chapter provides users with detailed descriptions on how to set up a basic system configuration through the AMI BIOS setup utility.


3.1 Starting

To enter the setup screens, perform the following steps:

- Turn on the computer and press the key immediately.
- After the key is pressed, the main BIOS setup menu displays. Other setup screens can be accessed from the main BIOS setup menu, such as the Chipset and Power menus.

3.2 Navigation Keys

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process. Some of the hot keys are <F1>, <F10>, <Enter>, <ESC>, and <Arrow> keys.



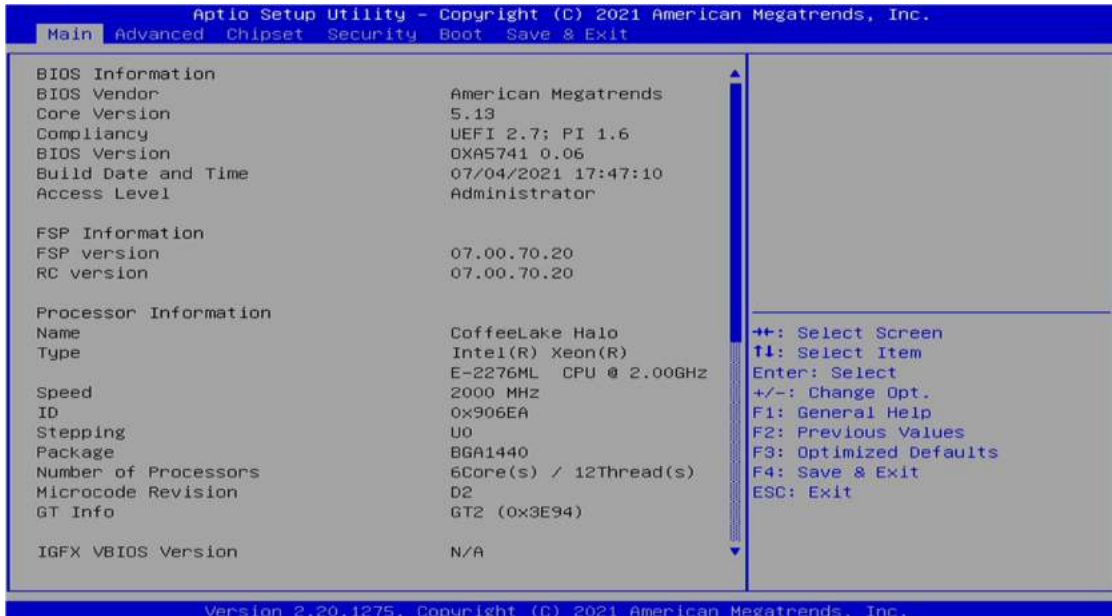
Some of the navigation keys may differ from one screen to another.

| | |
|---------------|---|
| Left/Right | The Left and Right <Arrow> keys moves the cursor to select a menu. |
| Up/Down | The Up and Down <Arrow> keys moves the cursor to select a setup screen or sub-screen. |
| +– Plus/Minus | The Plus and Minus <Arrow> keys changes the field value of a particular setup setting. |
| Tab | The <Tab> key selects the setup fields. |
| F1 | The <F1> key displays the General Help screen. |
| F10 | The <F10> key saves any changes made and exits the BIOS setup utility. |
| Esc | The <Esc> key discards any changes made and exits the BIOS setup utility. |
| Enter | The <Enter> key displays a sub-screen or changes a selected or highlighted option in each menu. |

3.3 Main Menu

The Main menu is the screen that first displays when BIOS Setup is entered, unless an error has occurred.

When you first enter the BIOS Setup Utility, you will encounter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.



The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

- **System Date**

Use this function to change the system date.

Select System Date using the Up and Down <Arrow> keys. Enter the new values through the keyboard. Press the Left and Right <Arrow> keys to move between fields. The date setting must be entered in MM/DD/YY format.

- **System Time**

Use this function to change the system time.

Select System Time using the Up and Down <Arrow> keys. Enter the new values through the keyboard. Press the Left and Right <Arrow> keys to move between fields. The time setting is entered in HH:MM:SS format.

Note: The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

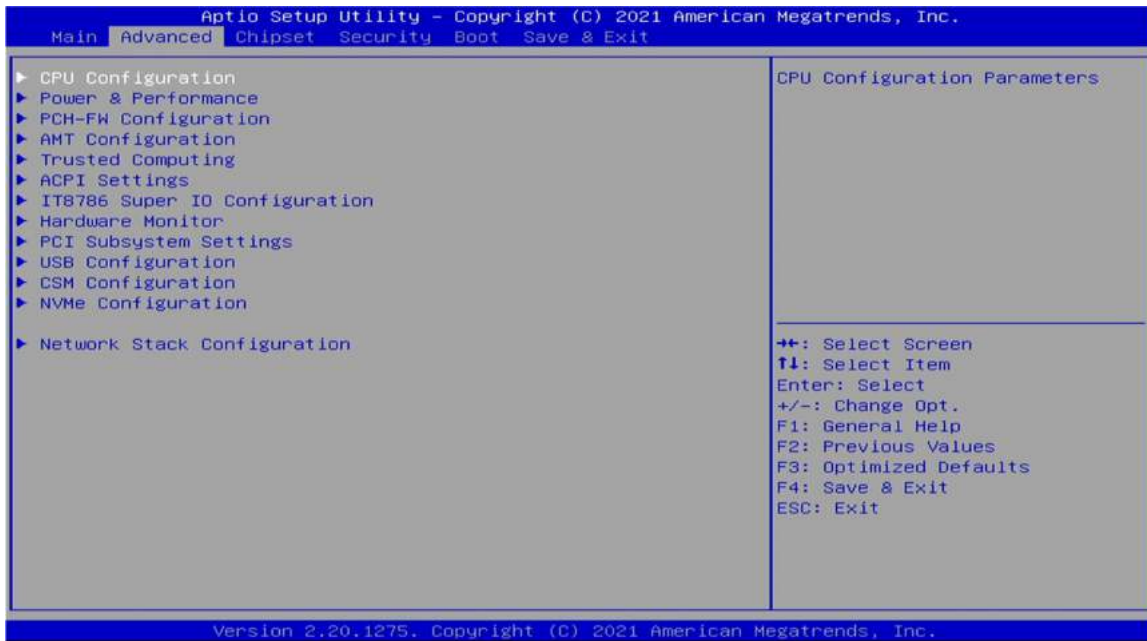
- **Access Level**

Display the access level of the current user in the BIOS.

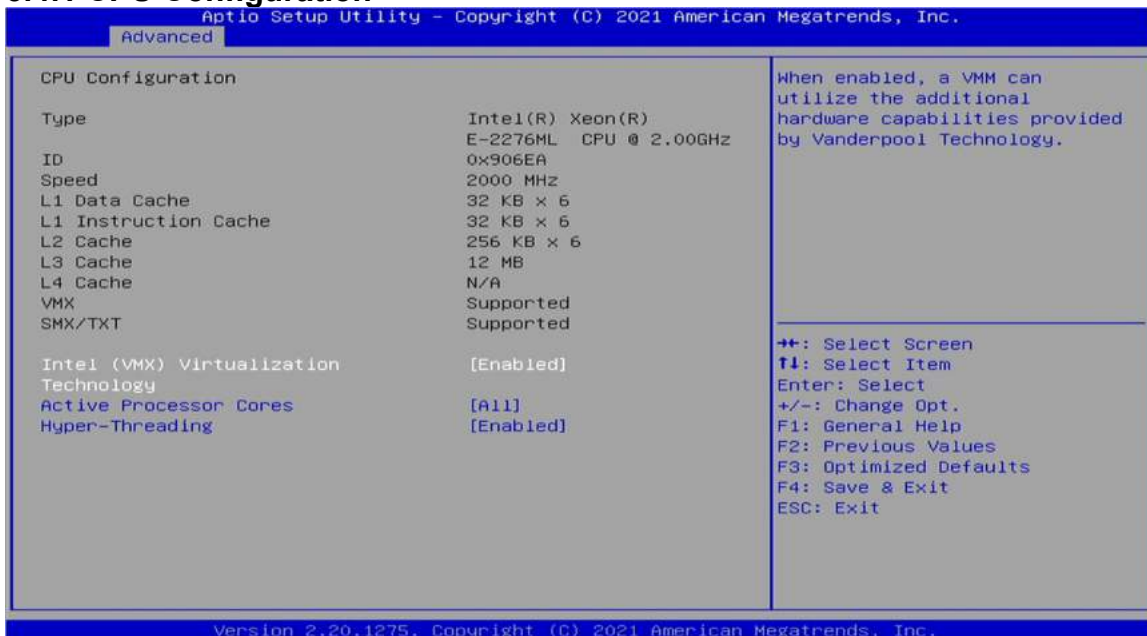
3.4 Advanced Menu

The Advanced Menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

Setting incorrect field values may cause the system to malfunction.



3.4.1 CPU Configuration

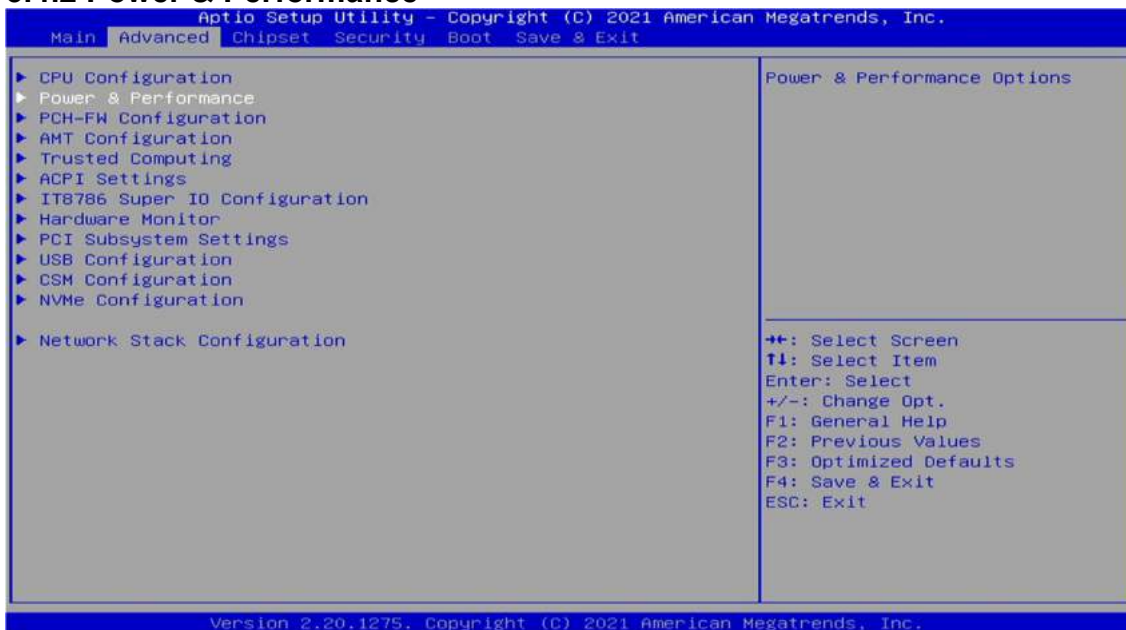


| | |
|-------------------|--|
| Field Name | Intel (VMX) Virtualization Technology |
| Default Value | [Enabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|-------------------------------|
| Field Name | Active Processor Cores |
| Default Value | [A11] |
| Possible Value | A11 1 2 3 4 5 |

| | |
|-------------------|------------------------|
| Field Name | Hyper-Threading |
| Default Value | [Enabled] |
| Possible Value | Disabled Enabled |

3.4.2 Power & Performance



| | |
|-------------------|--------------------------------|
| Field Name | Intel (R) SpeedStep(tm) |
| Default Value | [Enabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|---------------------|
| Field Name | Turbo Mode |
| Default Value | [Enabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|---------------------|
| Field Name | C states |
| Default Value | [Disabled] |
| Possible Value | Disabled Enabled |

3.4.3 PCH-FW Configuration



| | |
|-------------------|---------------------|
| Field Name | ME State |
| Default Value | [Enabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|-------------------------------------|
| Field Name | Manageability Features State |
| Default Value | [Enabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|--------------------------|
| Field Name | AMT BIOS Features |
| Default Value | [Enabled] |
| Possible Value | Disabled Enabled |

3.4.4 AMT Configuration



| | |
|-------------------|---------------------|
| Field Name | ASF support |
| Default Value | [Enabled] |
| Possible Value | Disabled Enabled |

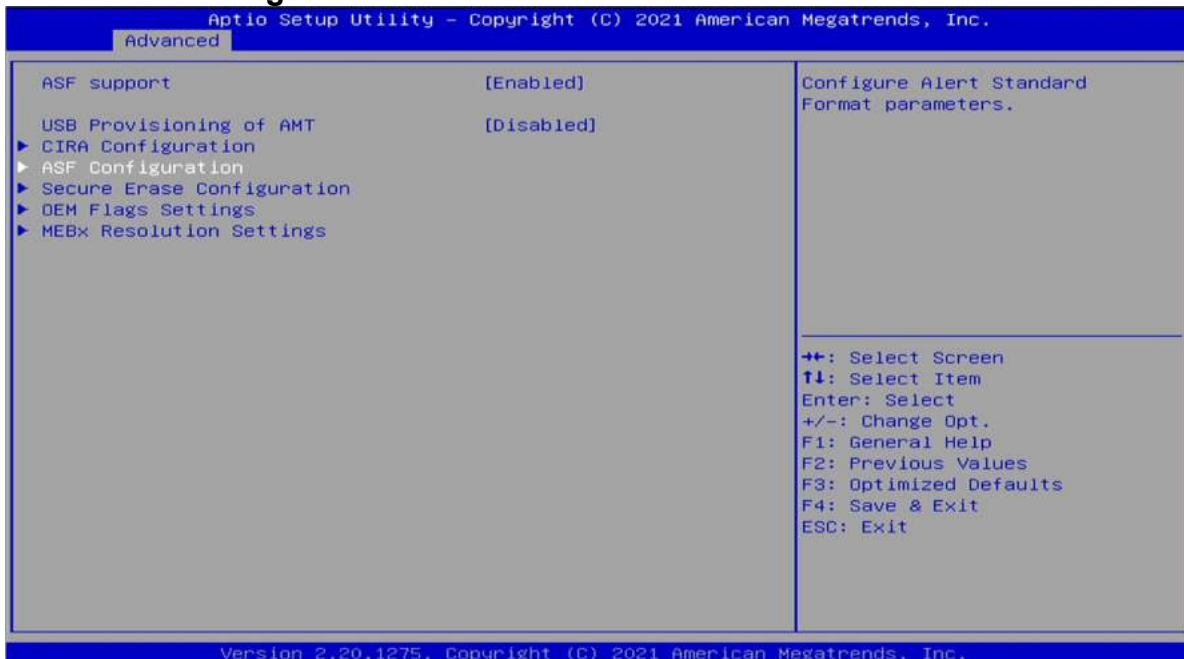
| | |
|-------------------|--------------------------------|
| Field Name | USB Provisioning of AMT |
| Default Value | [Disabled] |
| Possible Value | Disabled Enabled |

3.4.4.1 CIRA Configuration



| | |
|-------------------|---|
| Field Name | Activate Remote Assistance Process |
| Default Value | [Disabled] |
| Possible Value | Disabled Enabled |

3.4.4.2 ASF Configuration



| | |
|-------------------|---------------------|
| Field Name | PET Progress |
| Default Value | [Enabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|---------------------|
| Field Name | WatchDog |
| Default Value | [Disabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|--------------------------|
| Field Name | ASF Sensors Table |
| Default Value | [Disabled] |
| Possible Value | Disabled Enabled |

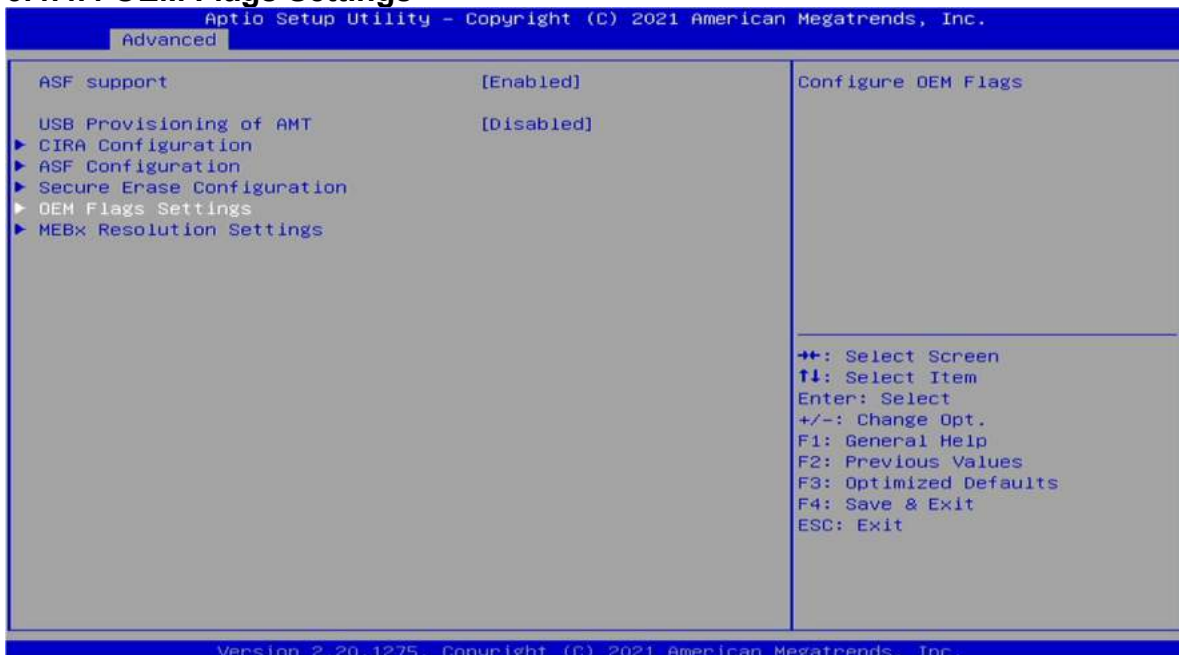
3.4.4.3 Secure Erase Configuration



| Field Name | Secure Erase mode |
|----------------|-------------------|
| Default Value | [Simulated] |
| Possible Value | Simulated Real |

| Field Name | Force Secure Erase |
|----------------|---------------------|
| Default Value | [Disabled] |
| Possible Value | Disabled Enabled |

3.4.4.4 OEM Flags Settings



| | |
|-------------------|----------------------------|
| Field Name | MEBx hotkey Pressed |
| Default Value | [Disabled] |
| Possible Value | Disabled Enabled |

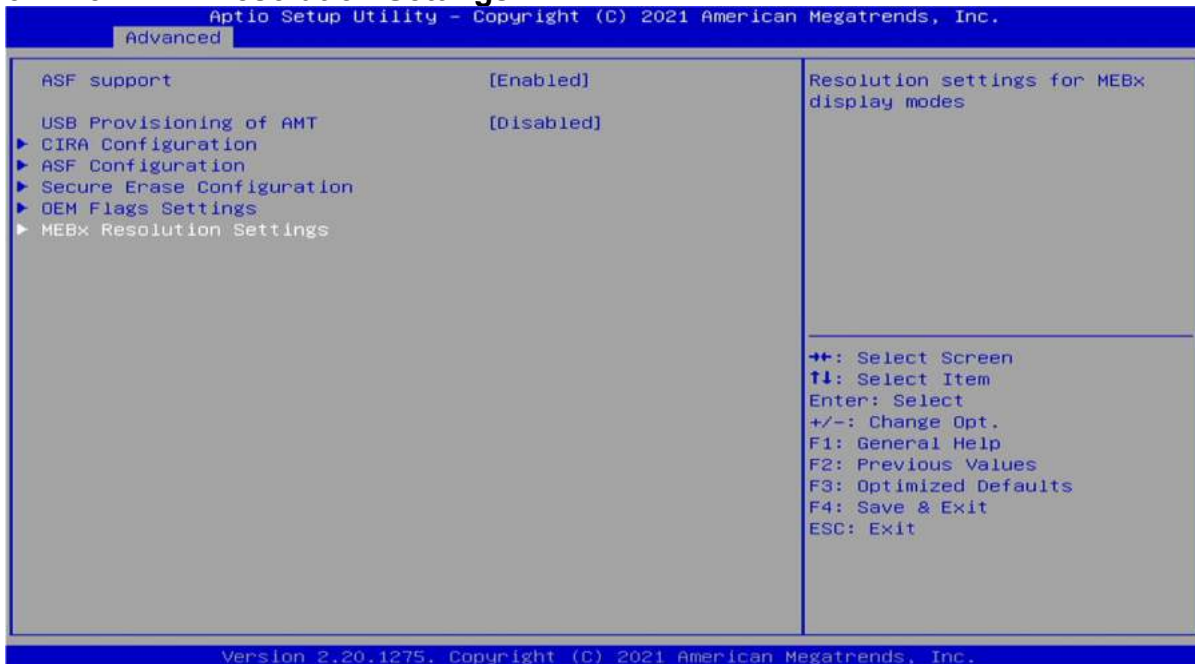
| | |
|-------------------|------------------------------|
| Field Name | MEBx Selection Screen |
| Default Value | [Disabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|--|
| Field Name | Hide Unconfigure ME Confirmation Prompt |
| Default Value | [Disabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|-----------------------------------|
| Field Name | MEBx OEM Debug Menu Enable |
| Default Value | [Disabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|-----------------------|
| Field Name | Unconfigure ME |
| Default Value | [Disabled] |
| Possible Value | Disabled Enabled |

3.4.4.5 MEBx Resolution Settings

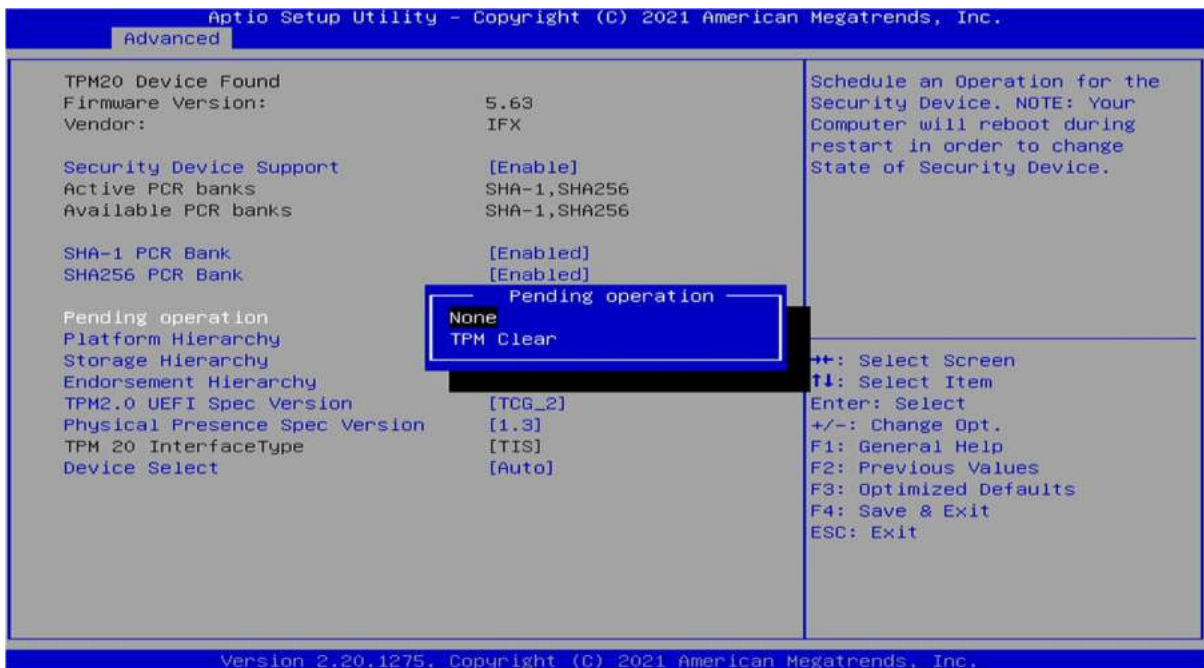


| | |
|-------------------|-------------------------------|
| Field Name | Non-UI Mode Resoultion |
| Default Value | [Auto] |
| Possible Value | Auto 80x25 |

| | |
|--|--------|
| | 100x31 |
|--|--------|

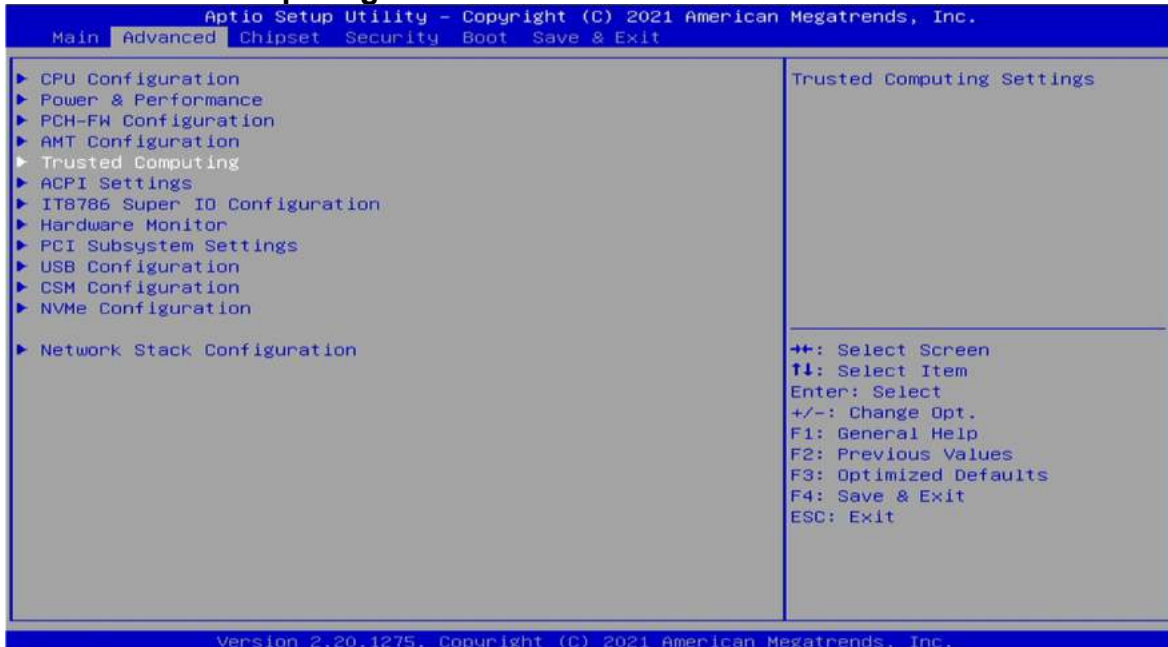
| Field Name | UI Mode Resolution |
|----------------|-------------------------|
| Default Value | [Auto] |
| Possible Value | Auto 80x25 100x31 |

| Field Name | Graphics Mode Resoultion |
|----------------|--|
| Default Value | [Auto] |
| Possible Value | Auto 640x480 800x600 1024x768 |



| Field Name | Pending operation |
|----------------|-------------------|
| Default Value | [None] |
| Possible Value | None TPM Clear |

3.4.5 Trusted Computing



| | |
|-------------------|--------------------------------|
| Field Name | Security Device Support |
| Default Value | [Enabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|-----------------------|
| Field Name | SHA-1 PCR Bank |
| Default Value | [Enabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|------------------------|
| Field Name | SHA256 PCR Bank |
| Default Value | [Enabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|--------------------------|
| Field Name | Pending operation |
| Default Value | [None] |
| Possible Value | None TPM Clear |

| | |
|-------------------|---------------------------|
| Field Name | Platform Hierarchy |
| Default Value | [Enabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|--------------------------|
| Field Name | Storage Hierarchy |
| Default Value | [Enabled] |
| Possible Value | Disabled Enabled |

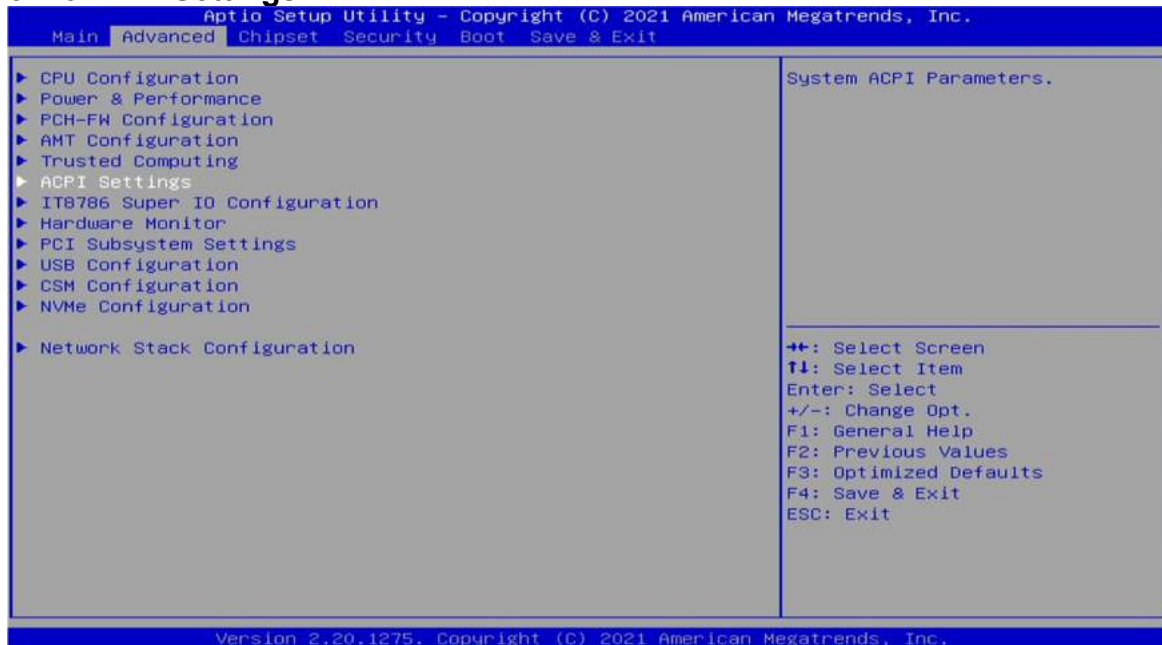
| | |
|-------------------|------------------------------|
| Field Name | Endorsement Hierarchy |
| Default Value | [Enabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|---------------------------------|
| Field Name | TPM2.0 UEFI Spec Version |
| Default Value | [TCG_2] |
| Possible Value | TCG_1_2 TCG_2 |

| | |
|-------------------|---------------------------------------|
| Field Name | Physical Presence Spec Version |
| Default Value | [1.3] |
| Possible Value | 1.2 1.3 |

| | |
|-------------------|----------------------------|
| Field Name | Device Select |
| Default Value | [Auto] |
| Possible Value | TPM 1.2 TPM 2.0 Auto |

3.4.6 ACPI Settings



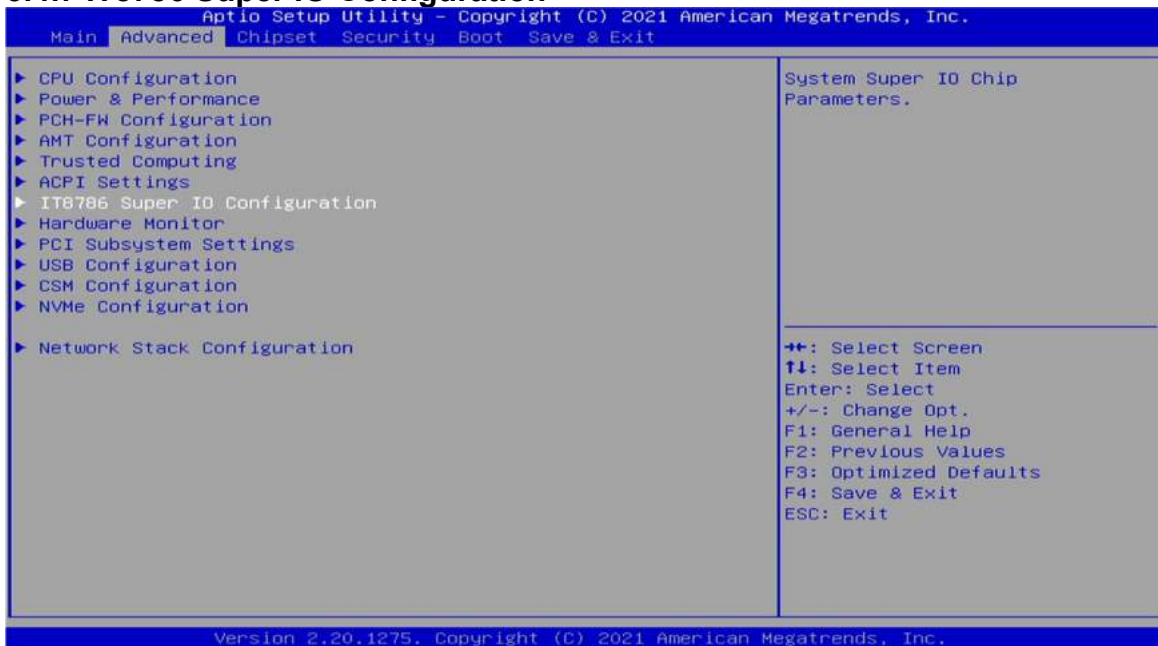
| | |
|-------------------|---------------------------------------|
| Field Name | Enable ACPI Auto Configuration |
| Default Value | [Disabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|---------------------------|
| Field Name | Enable Hibernation |
| Default Value | [Enabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|---|
| Field Name | ACPI Sleep State |
| Default Value | [S3 (Suspend to RAM)] |
| Possible Value | Suspend Disabled S3 (Suspend to RAM) |

| | |
|-------------------|------------------------------|
| Field Name | Lock Legacy Resources |
| Default Value | [Disabled] |
| Possible Value | Disabled Enabled |

3.4.7 IT8786 Super IO Configuration



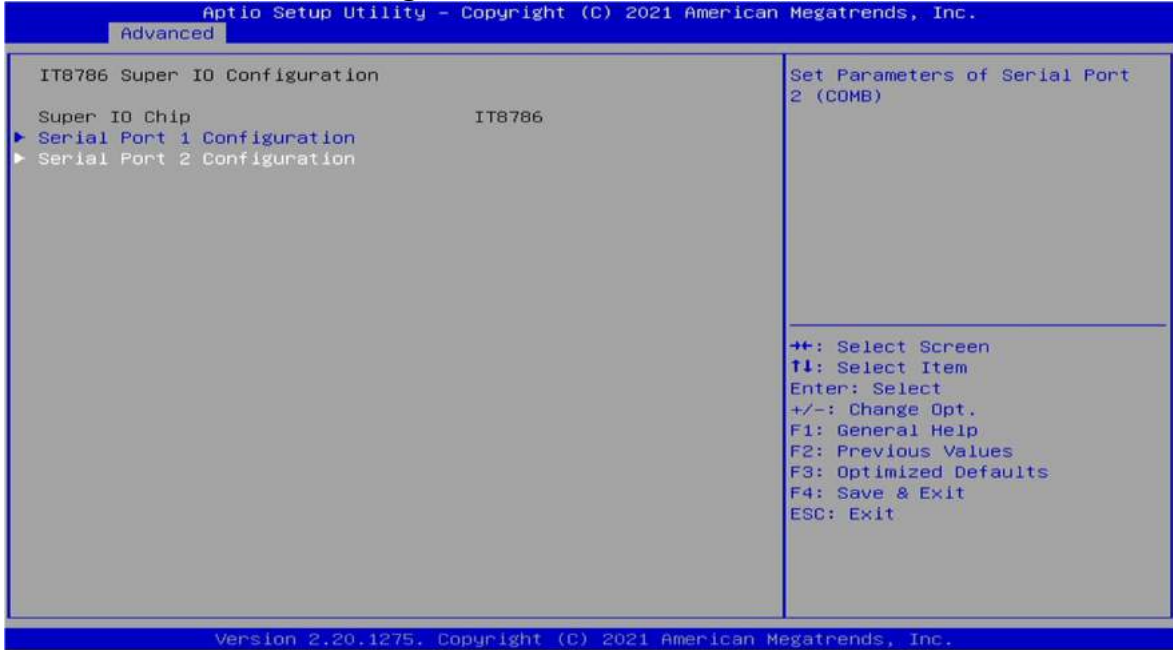
3.4.7.1 Serial Port 1 Configuration



| | |
|-------------------|---------------------|
| Field Name | Serial Port |
| Default Value | [Enabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|--|
| Field Name | COM1 Control |
| Default Value | [RS-232] |
| Possible Value | Loopback RS-232 RS-485 Half Duplex RS-485/422 Full Duplex |

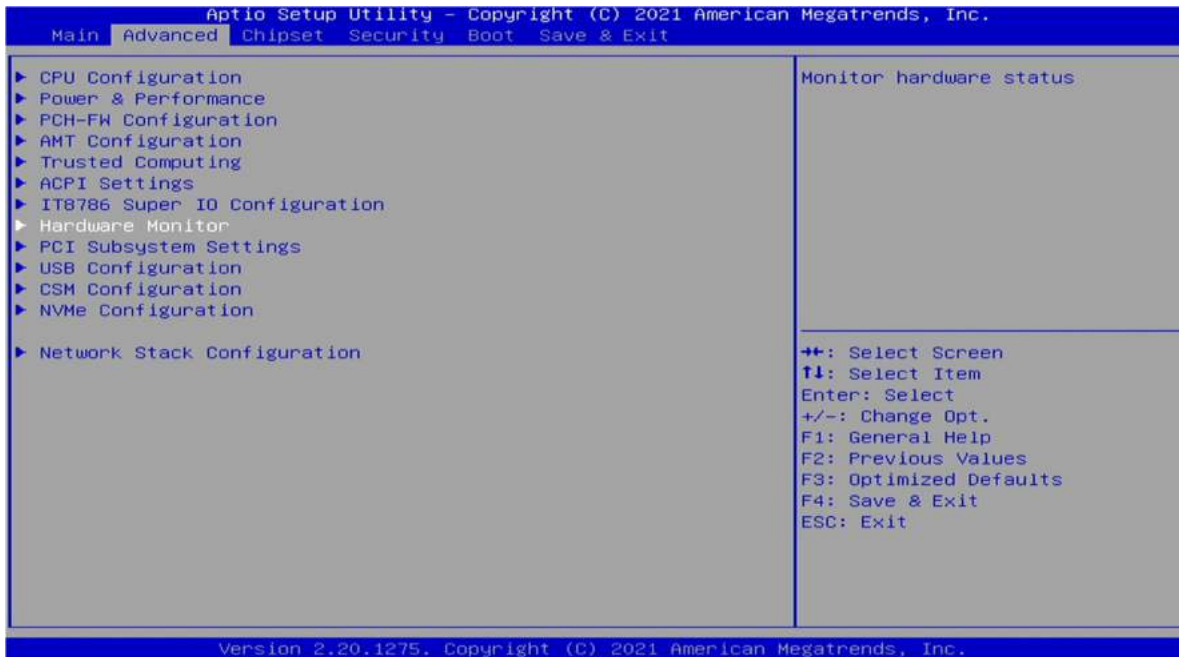
3.4.7.2 Serial Poet 2 Configuration



| | |
|-------------------|---------------------|
| Field Name | Serial Port |
| Default Value | [Enabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|--|
| Field Name | COM2 Control |
| Default Value | [RS-232] |
| Possible Value | Loopback RS-232 RS-485 Half Duplex RS-485/422 Full Duplex |

3.4.8 Hardware Monitor



3.4.8.1 Smart Fan Function



| | |
|-------------------|---------------------------|
| Field Name | FAN_CTL Polarity |
| Default Value | [Active high] |
| Possible Value | Active low Active high |

| | |
|-------------------|---------------------------|
| Field Name | Smoothing control |
| Default Value | [4Hz] |
| Possible Value | 1Hz 16Hz 8Hz 4Hz |

3.4.8.2 System Fan Function



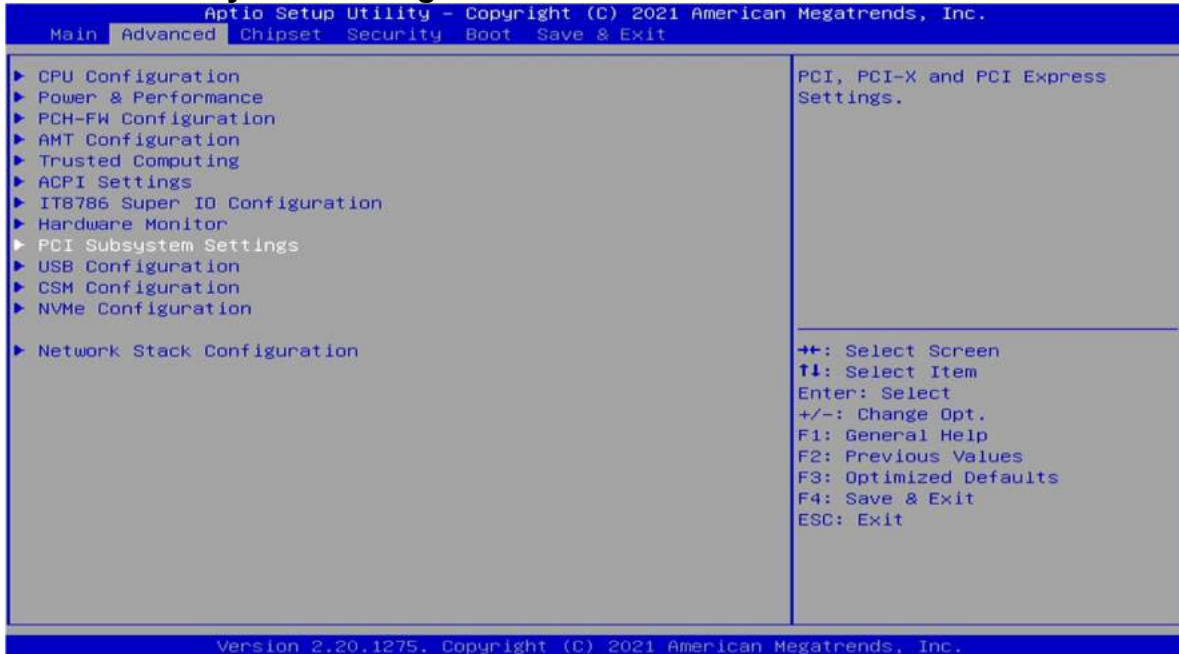
| | |
|-------------------|---------------------------------|
| Field Name | Smart Fan Mode |
| Default Value | [Automatic Mode] |
| Possible Value | Software Mode Automatic Mode |

| | |
|-------------------|---------------------------------|
| Field Name | Smart Fan Mode |
| Default Value | [Automatic Mode] |
| Possible Value | Software Mode Automatic Mode |

| | |
|-------------------|------------------------|
| Field Name | System Fan Type |
| Default Value | [PWM] |
| Possible Value | PWM RPM |

| | |
|-------------------|-------------------------------|
| Field Name | Temperature select |
| Default Value | [TMP IN3] |
| Possible Value | TMP IN1 TMP IN2 TMP IN3 |

3.4.9 PCI Subsystem Settings



| | |
|-------------------|--------------------------|
| Field Name | Above 4G Decoding |
| Default Value | [Disabled] |
| Possible Value | Disabled Enabled |

3.4.10 USB configuration



| | |
|-------------------|-----------------------------|
| Field Name | Legacy USB Support |
| Default Value | [Enabled] |
| Possible Value | Enabled Disabled Auto |

| | |
|-------------------|----------------------|
| Field Name | XHCI Hand-off |
| Default Value | [Enabled] |
| Possible Value | Enabled Disabled |

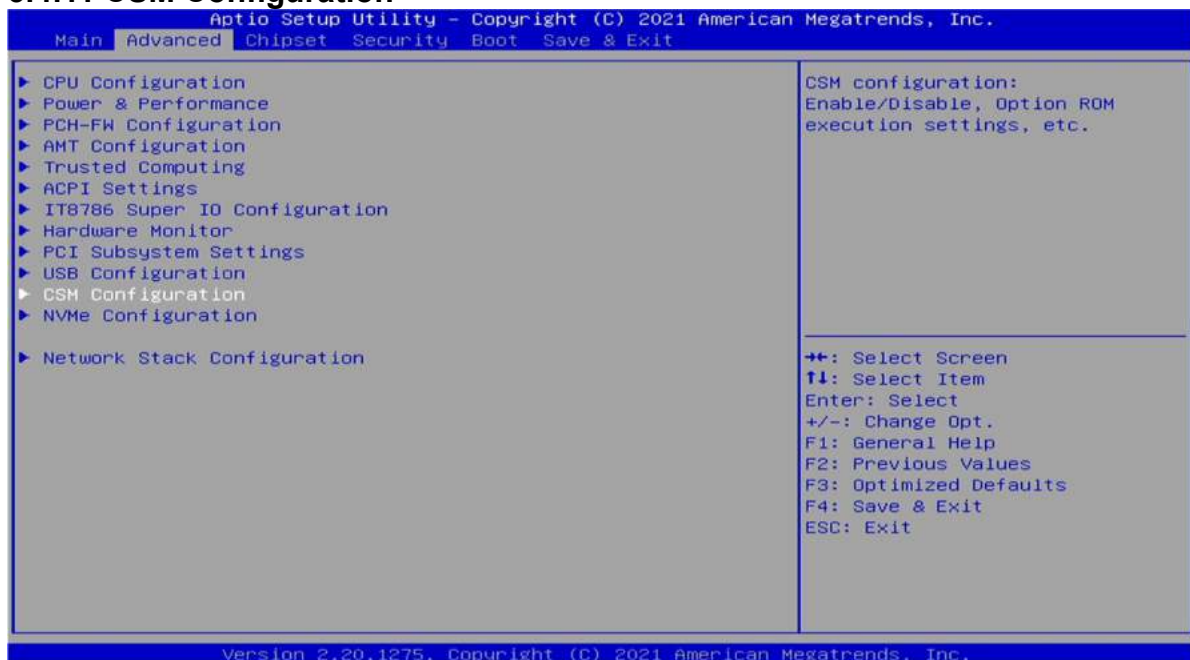
| | |
|-------------------|--|
| Field Name | USB Mass Storage Driver Support |
| Default Value | [Enabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|------------------------------------|
| Field Name | USB transfer time-out |
| Default Value | [20 sec] |
| Possible Value | 1 sec 5 sec 10 sec 20 sec |

| | |
|-------------------|--------------------------------------|
| Field Name | Device reset time-out |
| Default Value | [20 sec] |
| Possible Value | 10 sec 20 sec 30 sec 40 sec |

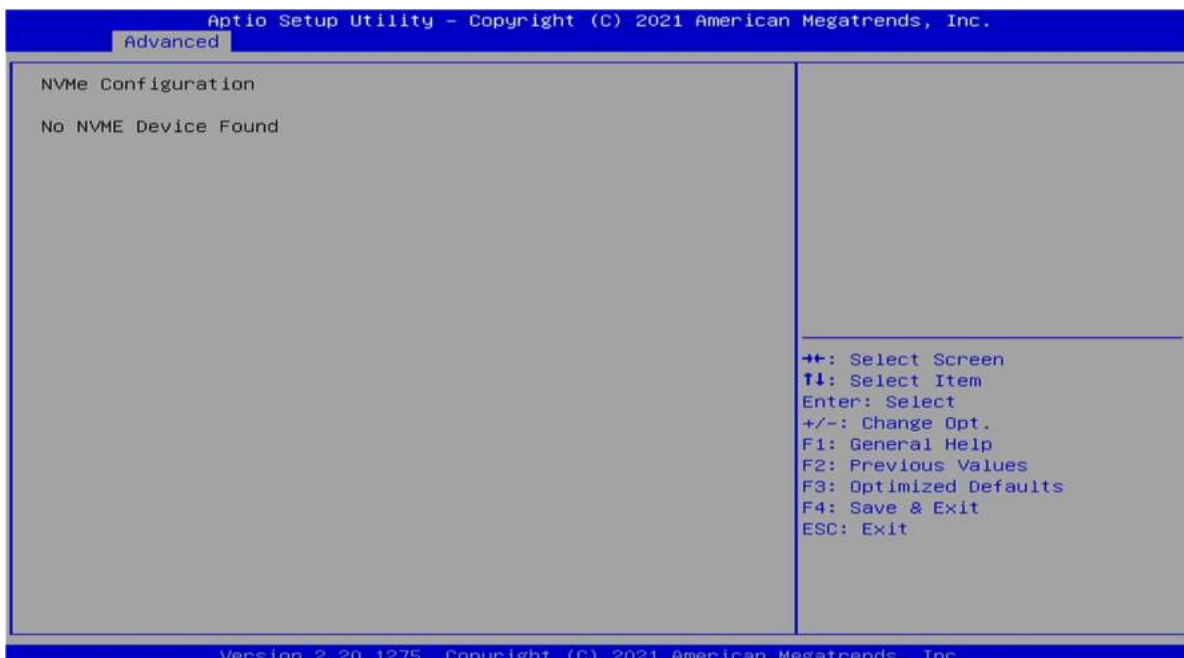
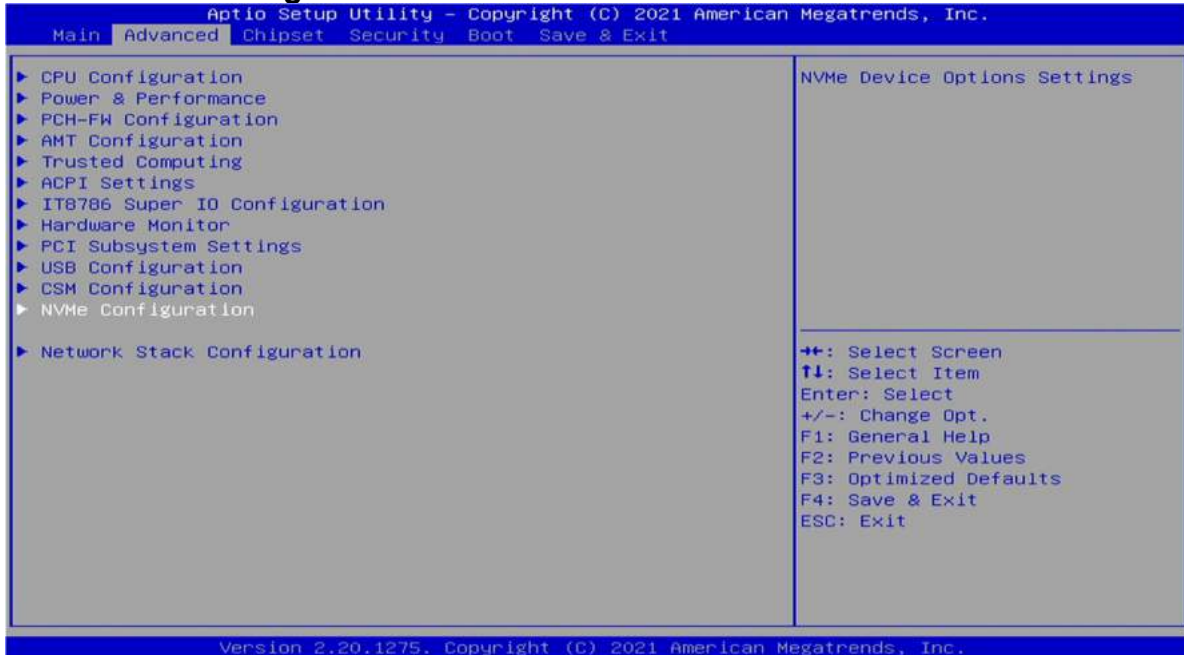
| | |
|-------------------|------------------------------|
| Field Name | Device power-up delay |
| Default Value | [Auto] |
| Possible Value | Auto Manual |

3.4.11 CSM Configuration

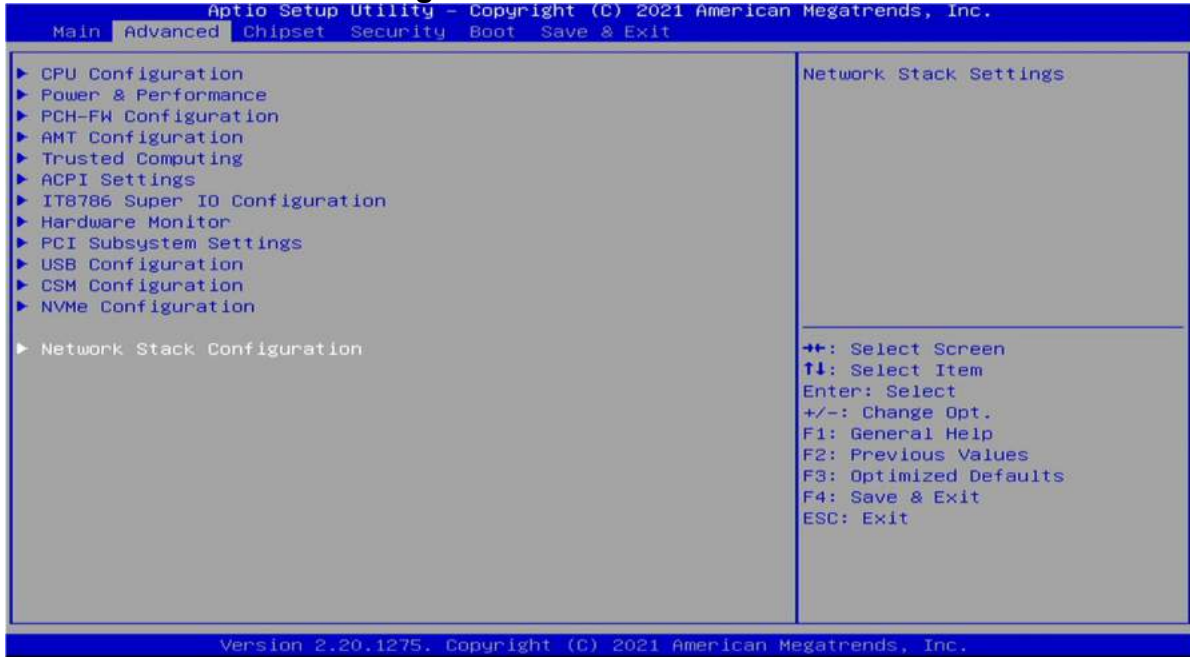


| | |
|-------------------|---------------------|
| Field Name | CSM Support |
| Default Value | [Disabled] |
| Possible Value | Disabled Enabled |

3.4.12 NVMe Configuration



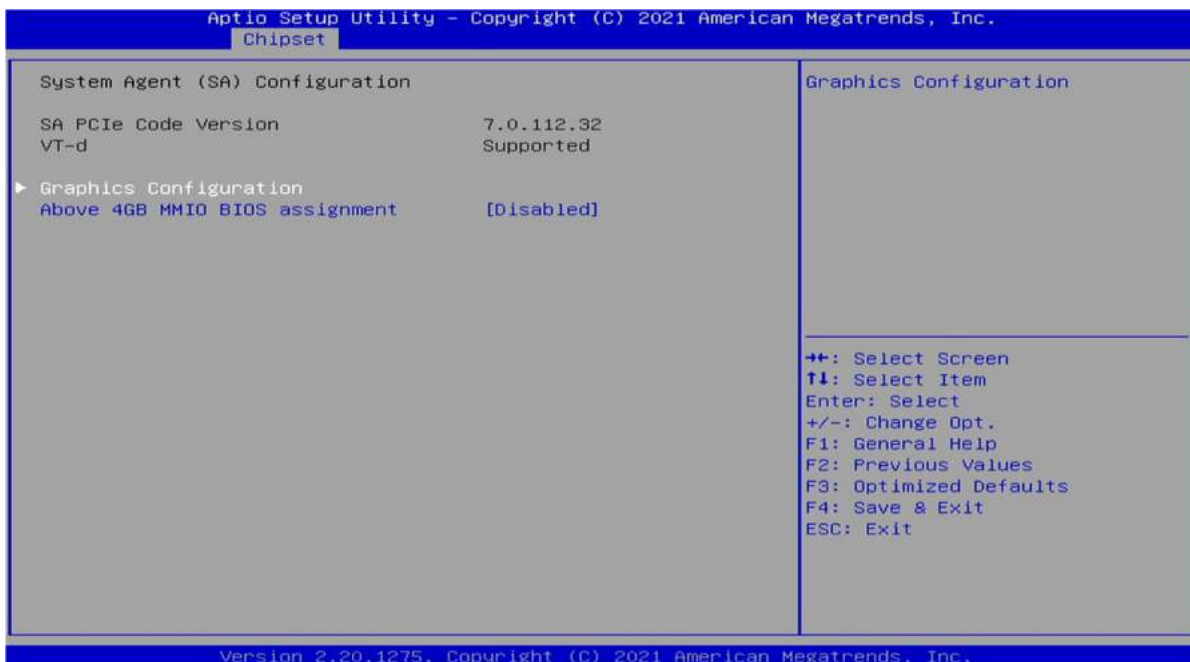
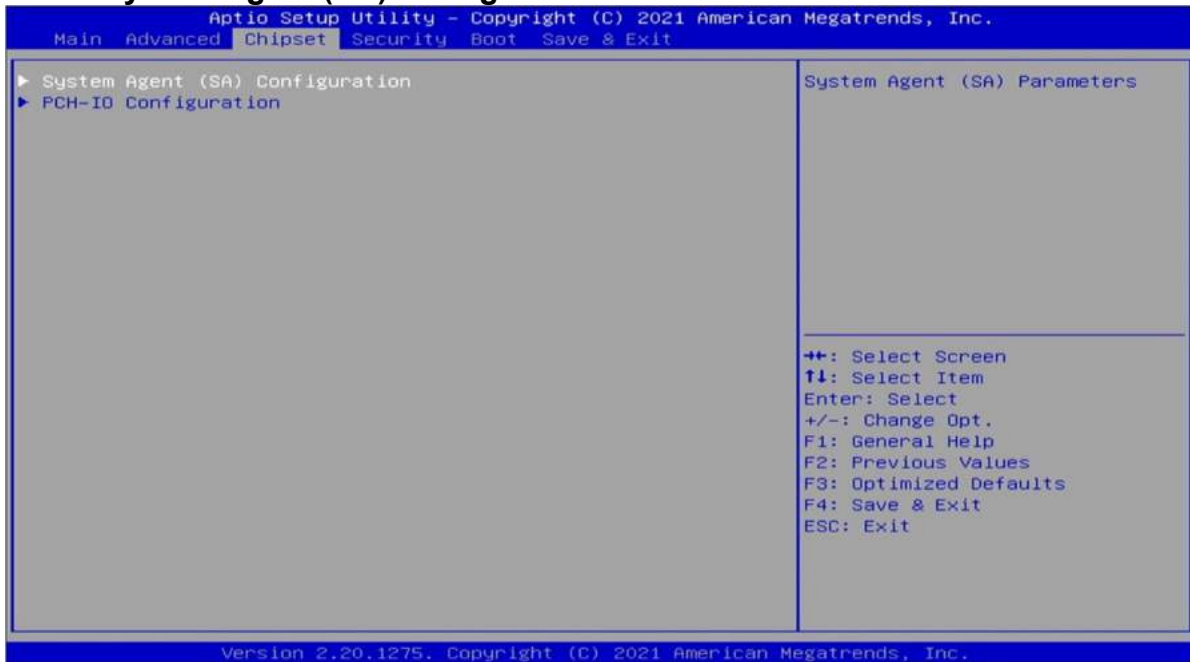
3.4.13 Network Stack Configuration



| Field Name | Network Stack |
|----------------|---------------------|
| Default Value | [Disabled] |
| Possible Value | Disabled Enabled |

3.5 Chipset

3.5.1 System Agent (SA) Configuration



| Field Name | Primary Display |
|----------------|----------------------------------|
| Default Value | [Auto] |
| Possible Value | Auto IGFX PEG PCI SG |

| | |
|-------------------|-----------------------------|
| Field Name | Internal Graphics |
| Default Value | [Auto] |
| Possible Value | Auto Disabled Enabled |

| | |
|-------------------|-------------------|
| Field Name | GTT Size |
| Default Value | [8MB] |
| Possible Value | 2MB 4MB 8MB |

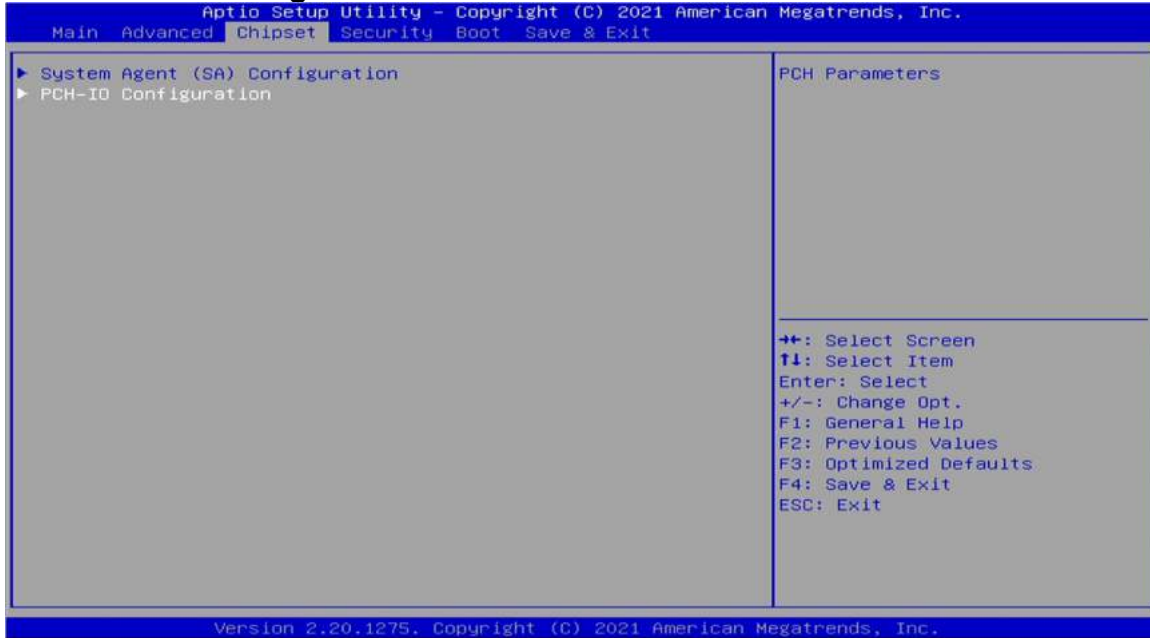
| | |
|-------------------|---|
| Field Name | Aperture Size |
| Default Value | [256MB] |
| Possible Value | 128MB 256MB 512MB 1024MB 2048MB |

| | |
|-------------------|--|
| Field Name | DVMT Pre-Allocated |
| Default Value | [32M] |
| Possible Value | 0M 32M 64M 4M 8M 12M 16M 20M 24M 28M 32M/F7 36M 40M 44M 48M 52M 56M 60M |

| | |
|-------------------|---------------------------|
| Field Name | DVMT Total Gfx Mem |
| Default Value | [128M] |
| Possible Value | 128M 256M MAX |

| | |
|-------------------|---------------------------------------|
| Field Name | Above 4GB MMIO BIOS assignment |
| Default Value | [Enabled] |
| Possible Value | Enabled Disabled |

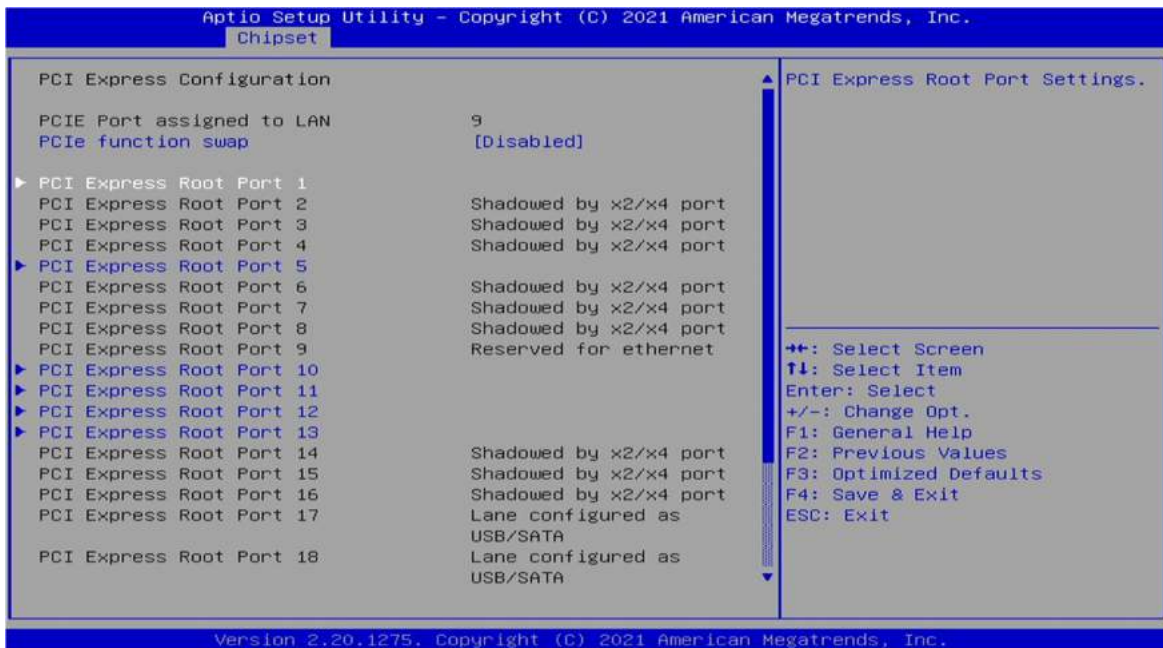
3.5.2 PCH-IO Configuration



3.5.2.1 PCI Express configuration



| | |
|-------------------|---------------------------|
| Field Name | PCIe function swap |
| Default Value | [Disabled] |
| Possible Value | Disabled Enabled |



| | |
|-------------------|--------------------------------|
| Field Name | PCI Express Root Port 1 |
| Default Value | [Enabled] |

| | |
|-------------------|--------------------------------|
| Field Name | PCI Express Root Port 5 |
| Default Value | [Enabled] |

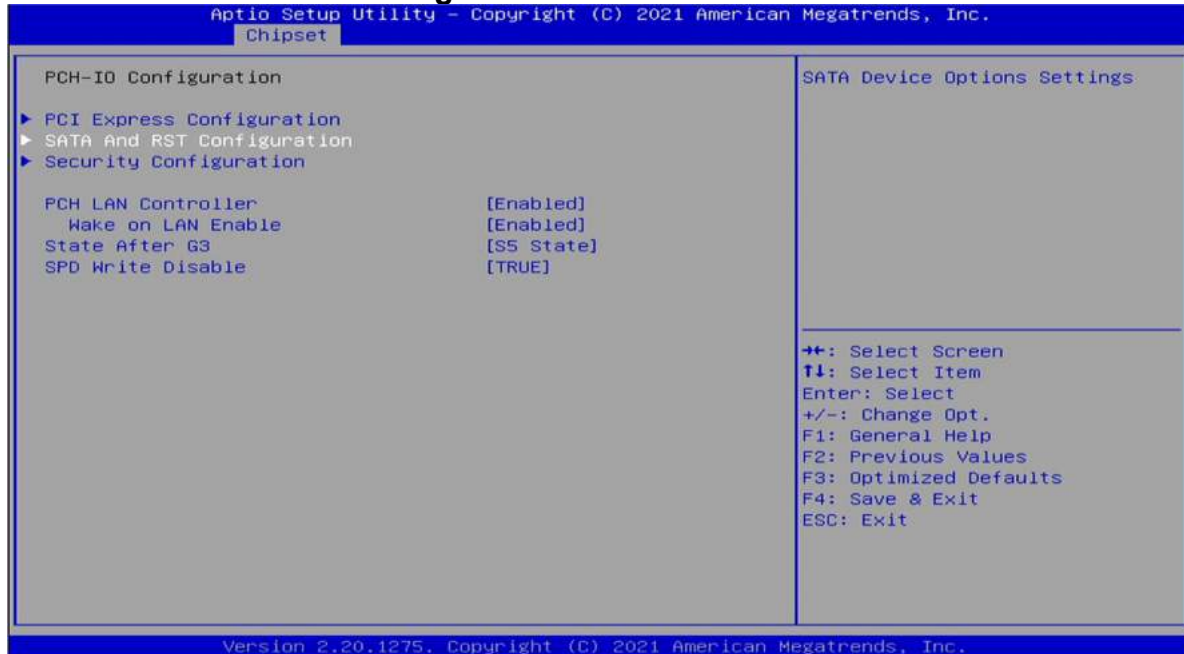
| | |
|-------------------|---------------------------------|
| Field Name | PCI Express Root Port 10 |
| Default Value | [Enabled] |

| | |
|-------------------|---------------------------------|
| Field Name | PCI Express Root Port 11 |
| Default Value | [Enabled] |

| | |
|-------------------|---------------------------------|
| Field Name | PCI Express Root Port 12 |
| Default Value | [Enabled] |

| | |
|-------------------|---------------------------------|
| Field Name | PCI Express Root Port 13 |
| Default Value | [Enabled] |

3.5.2.2 SATA And RST configuration



| | |
|-------------------|---------------------------|
| Field Name | SATA Controller(s) |
| Default Value | [Enabled] |
| Possible Value | Enabled Disabled |

| | |
|-------------------|---|
| Field Name | SATA Mode Selection |
| Default Value | [AHCI] |
| Possible Value | AHCI Intel RST Premium With Intel Optane System Acceleration |

| | |
|-------------------|---------------------|
| Field Name | M.2 Port |
| Default Value | [Disabled] |
| Possible Value | Disabled Enabled |

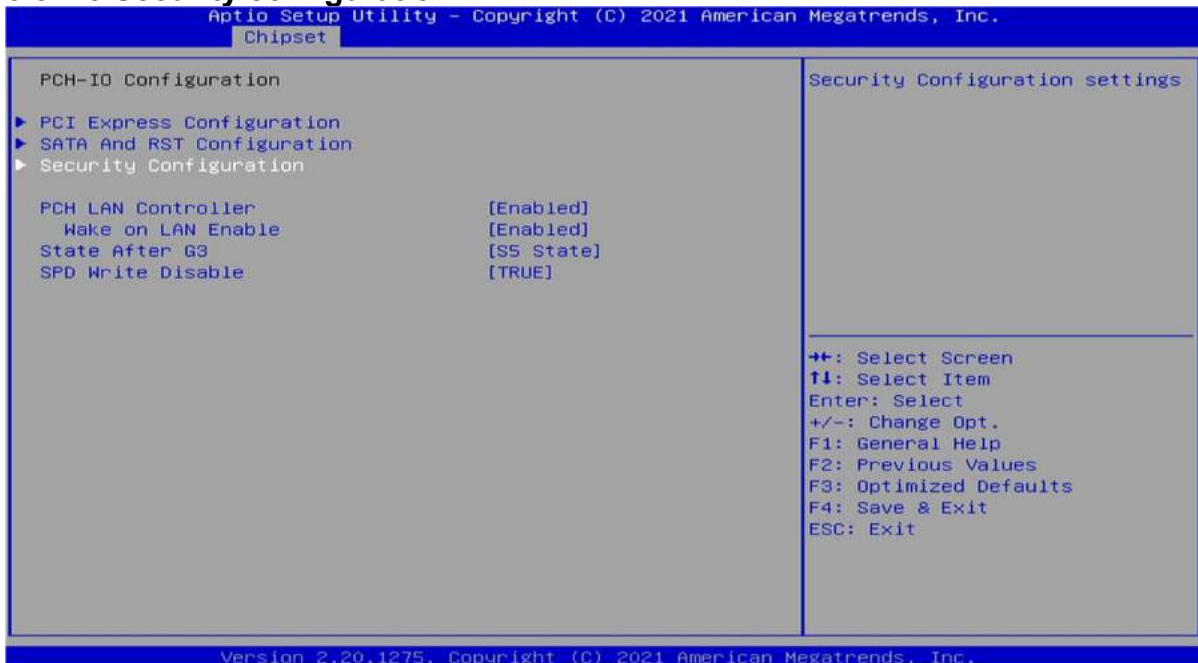
| | |
|-------------------|---------------------|
| Field Name | Port 1 |
| Default Value | [Enabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|---------------------|
| Field Name | Port 2 |
| Default Value | [Enabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|---------------------|
| Field Name | Port 3 |
| Default Value | [Enabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|---------------------|
| Field Name | Port 4 |
| Default Value | [Enabled] |
| Possible Value | Disabled Enabled |

3.5.2.3 Security configuration



| | |
|-------------------|------------------------|
| Field Name | RTC Memory Lock |
| Default Value | [Enabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|---------------------|
| Field Name | BIOS Lock |
| Default Value | [Enabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|--------------------------------------|
| Field Name | Force unlock on all GPIO pads |
| Default Value | [Disabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|---------------------------|
| Field Name | PCH LAN Controller |
| Default Value | [Enabled] |
| Possible Value | Enabled Disabled |

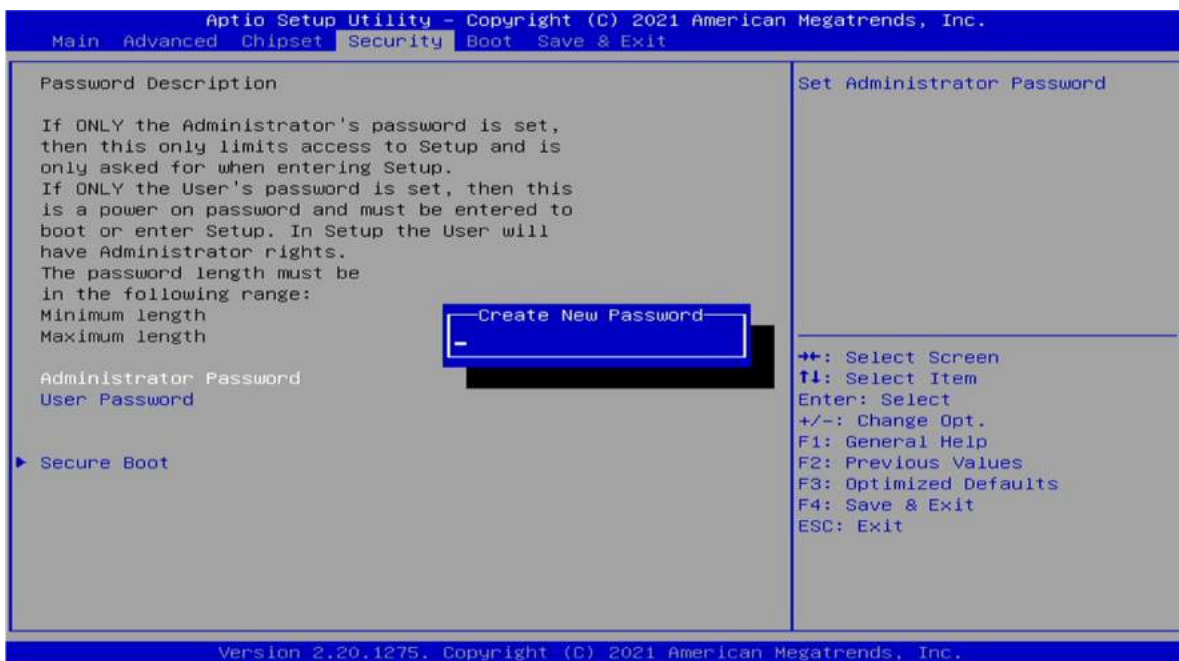
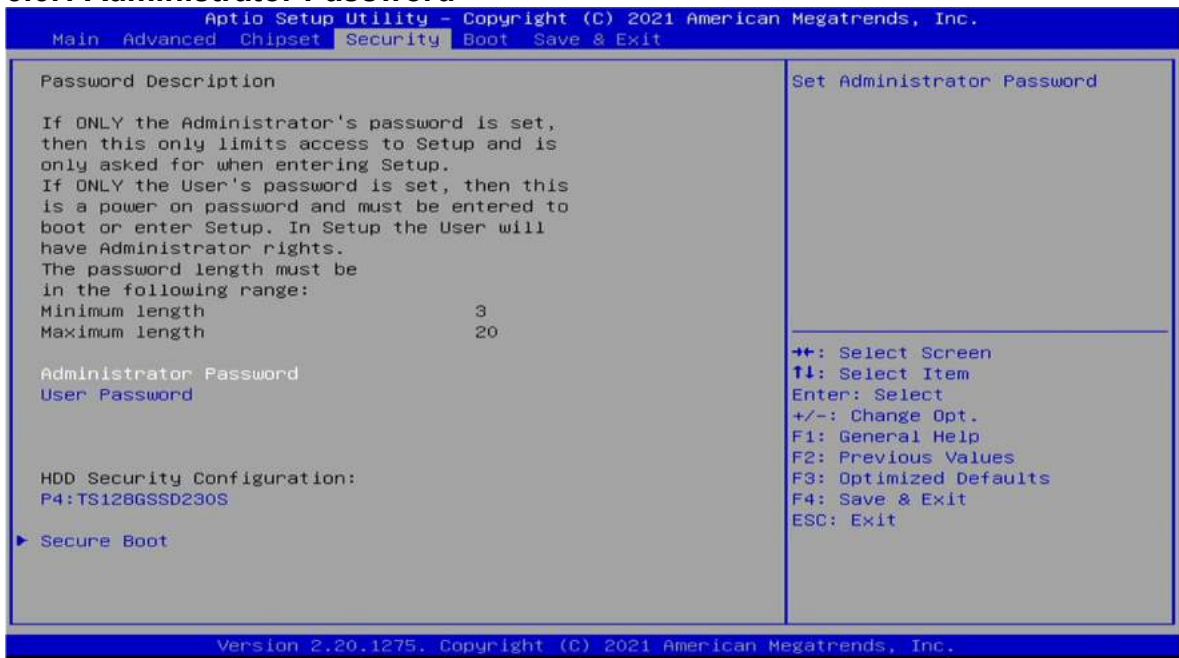
| | |
|-------------------|---------------------------|
| Field Name | Wake on LAN Enable |
| Default Value | [Enabled] |
| Possible Value | Enabled Disabled |

| | |
|-------------------|-----------------------|
| Field Name | State After G3 |
| Default Value | [S5 State] |
| Possible Value | S0 State S5 State |

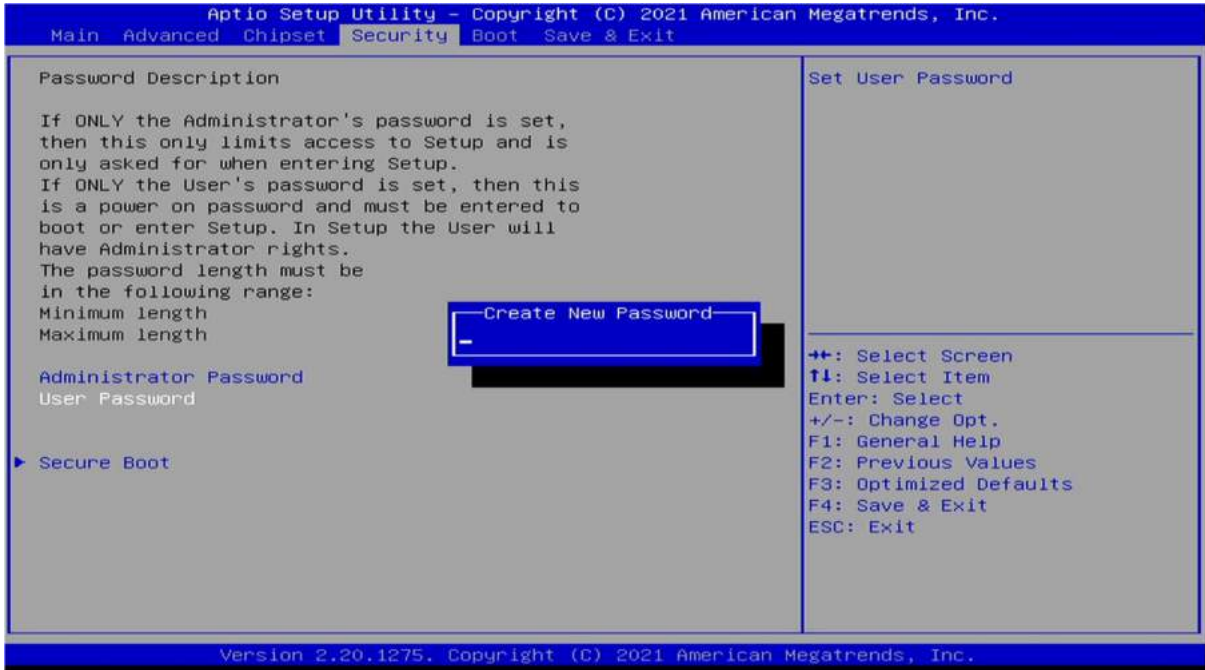
| | |
|-------------------|--------------------------|
| Field Name | SPD Write Disable |
| Default Value | [TRUE] |
| Possible Value | TRUE FALSE |

3.6 Security

3.6.1 Administrator Password



3.6.2 User Password



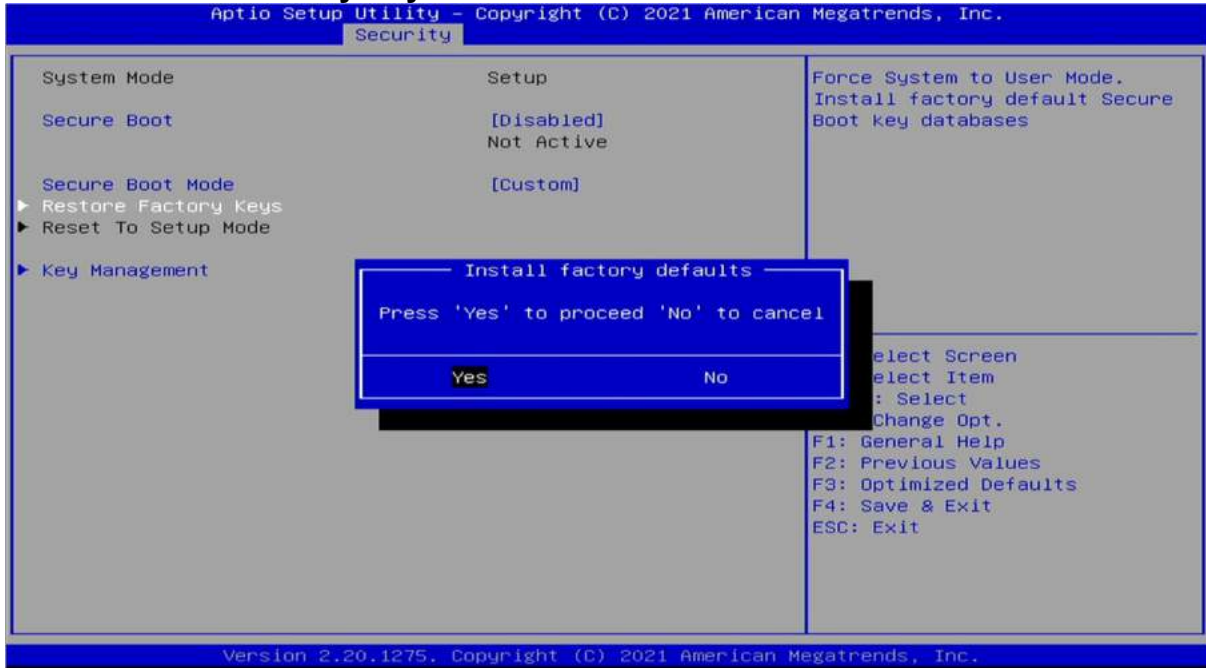
3.6.3 Secure Boot



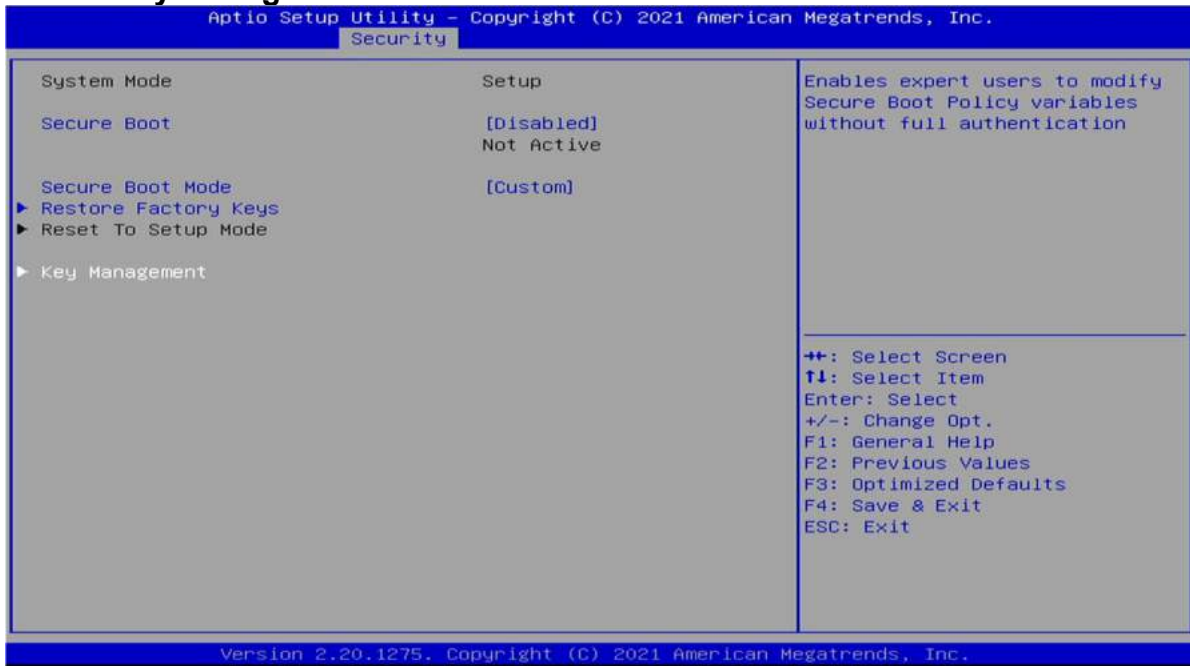
| | |
|-------------------|---------------------|
| Field Name | Secure Boot |
| Default Value | [Disabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|-------------------------|
| Field Name | Secure Boot Mode |
| Default Value | [Custom] |
| Possible Value | Standard Custom |

3.6.3.1 Restore Factory Keys

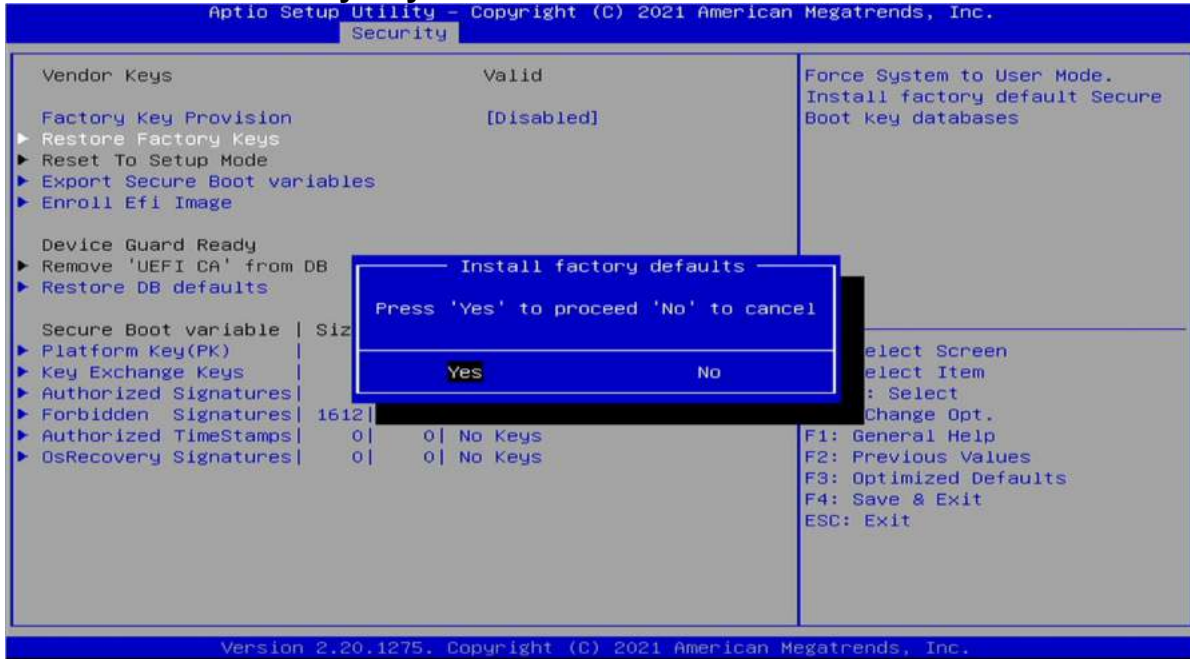


3.6.3.2 Key Management



| Field Name | Factory Key Provision |
|----------------|-----------------------|
| Default Value | [Disabled] |
| Possible Value | Disabled Enabled |

3.6.3.3 Restore Factory Keys



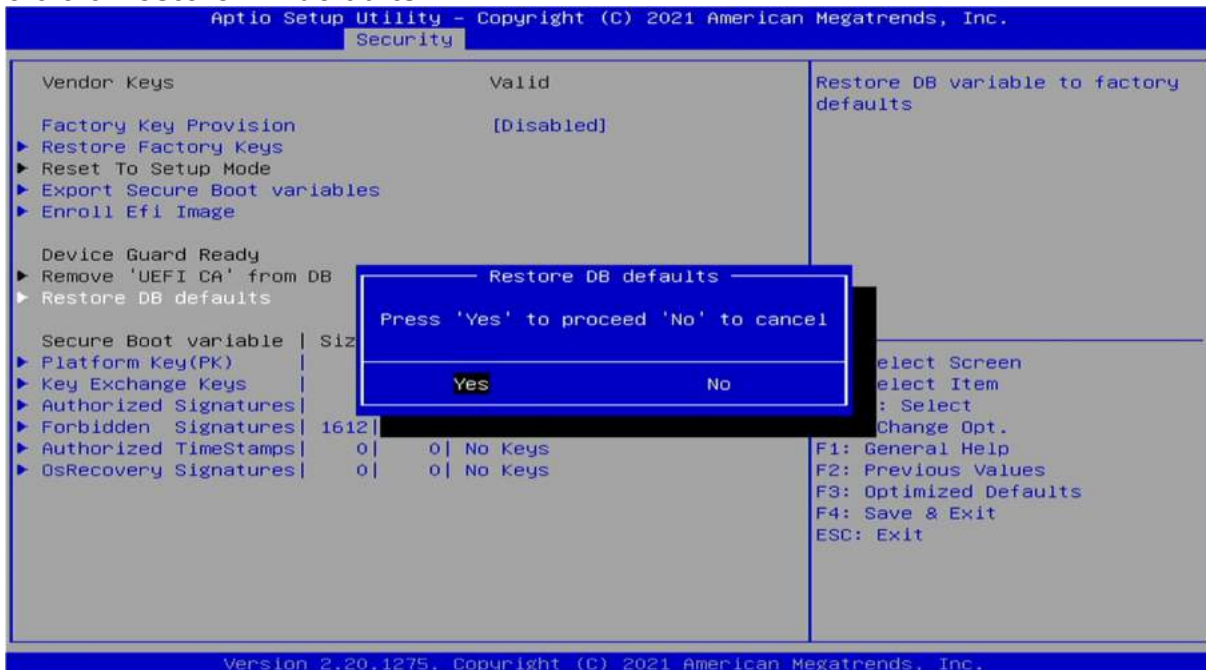
3.6.3.4 Export Secure Boot variables



3.6.3.5 File System



3.6.3.6 Restore DB defaults



3.6.3.7 Platform Key(PK)

Aptio Setup Utility - Copyright (C) 2021 American Megatrends, Inc.

Security

Vendor Keys Valid

Factory Key Provision [Disabled]

- ▶ Restore Factory Keys
- ▶ Reset To Setup Mode
- ▶ Export Secure Boot variables
- ▶ Enroll Efi Image

Device Guard Ready

- ▶ Remove 'UEFI CA' from DB
- ▶ Restore DB defaults

| Secure Boot variable | Size | Keys | |
|-------------------------|------|------|----------|
| ▶ Platform Key(PK) | 0 | 0 | No Keys |
| ▶ Key Exchange Keys | 0 | 0 | No Keys |
| ▶ Authorized Signatures | 0 | 0 | No Keys |
| ▶ Forbidden Signatures | 1612 | 33 | External |
| ▶ Authorized TimeStamps | 0 | 0 | No Keys |
| ▶ OsRecovery Signatures | 0 | 0 | No Keys |

Enroll Factory Defaults or load certificates from a file:

- Public Key Certificate:
 - EFI_SIGNATURE_LIST
 - EFI_CERT_X509 (DER)
 - EFI_CERT_RSA2048 (bin)
 - EFI_CERT_SHAXXX
- Authenticated UEFI Variable
- EFI PE/COFF Image(SHA256)

Key Source:
Factory,External,Mixed

++: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.20.1275. Copyright (C) 2021 American Megatrends, Inc.

3.6.3.8 Key Exchange Kesys

Aptio Setup Utility - Copyright (C) 2021 American Megatrends, Inc.

Security

Vendor Keys Valid

Factory Key Provision [Disabled]

- ▶ Restore Factory Keys
- ▶ Reset To Setup Mode
- ▶ Export Secure Boot variables
- ▶ Enroll Efi Image

Device Guard Ready

- ▶ Remove 'UEFI CA' from DB
- ▶ Restore DB defaults

| Secure Boot variable | Size | Keys | |
|-------------------------|------|------|----------|
| ▶ Platform Key(PK) | 0 | 0 | No Keys |
| ▶ Key Exchange Keys | 0 | 0 | No Keys |
| ▶ Authorized Signatures | 0 | 0 | No Keys |
| ▶ Forbidden Signatures | 1612 | 33 | External |
| ▶ Authorized TimeStamps | 0 | 0 | No Keys |
| ▶ OsRecovery Signatures | 0 | 0 | No Keys |

Enroll Factory Defaults or load certificates from a file:

- Public Key Certificate:
 - EFI_SIGNATURE_LIST
 - EFI_CERT_X509 (DER)
 - EFI_CERT_RSA2048 (bin)
 - EFI_CERT_SHAXXX
- Authenticated UEFI Variable
- EFI PE/COFF Image(SHA256)

Key Source:
Factory,External,Mixed

++: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.20.1275. Copyright (C) 2021 American Megatrends, Inc.

3.6.3.9 Authorized Signatures

Aptio Setup Utility - Copyright (C) 2021 American Megatrends, Inc.

Security

| | |
|--------------------------------|------------|
| Vendor Keys | Valid |
| Factory Key Provision | [Disabled] |
| ▶ Restore Factory Keys | |
| ▶ Reset To Setup Mode | |
| ▶ Export Secure Boot variables | |
| ▶ Enroll Efi Image | |
| Device Guard Ready | |
| ▶ Remove 'UEFI CA' from DB | |
| ▶ Restore DB defaults | |

| Secure Boot variable | Size | Keys |
|-------------------------|------|---------------|
| ▶ Platform Key(PK) | 0 | |
| ▶ Key Exchange Keys | 0 | 0 No Keys |
| ▶ Authorized Signatures | 0 | 0 No Keys |
| ▶ Forbidden Signatures | 1612 | 33 External |
| ▶ Authorized TimeStamps | 0 | 0 No Keys |
| ▶ OsRecovery Signatures | 0 | 0 No Keys |

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.Authenticated UEFI Variable
 3.EFI PE/COFF Image(SHA256)
 Key Source:
 Factory,External,Mixed

Authorized Signatures

Update
Append

++: Select Screen
 ↑↓: Select Item
 Enter: Select
 +/-: Change Opt.
 F1: General Help
 F2: Previous Values
 F3: Optimized Defaults
 F4: Save & Exit
 ESC: Exit

Version 2.20.1275. Copyright (C) 2021 American Megatrends, Inc.

3.6.3.10 Forbidden Signatures

Aptio Setup Utility - Copyright (C) 2021 American Megatrends, Inc.

Security

| | |
|--------------------------------|------------|
| Vendor Keys | Valid |
| Factory Key Provision | [Disabled] |
| ▶ Restore Factory Keys | |
| ▶ Reset To Setup Mode | |
| ▶ Export Secure Boot variables | |
| ▶ Enroll Efi Image | |
| Device Guard Ready | |
| ▶ Remove 'UEFI CA' from DB | |
| ▶ Restore DB defaults | |

| Secure Boot variable | Size | Keys |
|-------------------------|------|---------------|
| ▶ Platform Key(PK) | 0 | |
| ▶ Key Exchange Keys | 0 | |
| ▶ Authorized Signatures | 0 | |
| ▶ Forbidden Signatures | 1612 | 33 External |
| ▶ Authorized TimeStamps | 0 | 0 No Keys |
| ▶ OsRecovery Signatures | 0 | 0 No Keys |

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.Authenticated UEFI Variable
 3.EFI PE/COFF Image(SHA256)
 Key Source:
 Factory,External,Mixed

Forbidden Signatures

Details
Export
Update
Append
Delete

++: Select Screen
 ↑↓: Select Item
 Enter: Select
 +/-: Change Opt.
 F1: General Help
 F2: Previous Values
 F3: Optimized Defaults
 F4: Save & Exit
 ESC: Exit

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3.6.3.11 Authorized TimeStamps

The screenshot shows the 'Security' menu in the Aptio Setup Utility. The 'Authorized TimeStamps' option is highlighted, and a sub-menu is open with 'Update' selected. The main menu lists various security options like 'Vendor Keys', 'Factory Key Provision', and 'Secure Boot variable'. The right side of the screen displays enrollment instructions and key source information.

| Secure Boot variable | Size | Keys | Key Source |
|-----------------------|------|------|------------|
| Platform Key(PK) | 0 | 0 | No Keys |
| Key Exchange Keys | 0 | 0 | No Keys |
| Authorized Signatures | 0 | 0 | No Keys |
| Forbidden Signatures | 1612 | 33 | External |
| Authorized TimeStamps | 0 | 0 | No Keys |
| OsRecovery Signatures | 0 | 0 | No Keys |

3.6.3.12 OsRecovery Signatures

The screenshot shows the 'Security' menu in the Aptio Setup Utility. The 'OsRecovery Signatures' option is highlighted, and a sub-menu is open with 'Update' selected. The main menu lists various security options like 'Vendor Keys', 'Factory Key Provision', and 'Secure Boot variable'. The right side of the screen displays enrollment instructions and key source information.

| Secure Boot variable | Size | Keys | Key Source |
|-----------------------|------|------|------------|
| Platform Key(PK) | 0 | 0 | No Keys |
| Key Exchange Keys | 0 | 0 | No Keys |
| Authorized Signatures | 0 | 0 | No Keys |
| Forbidden Signatures | 1612 | 33 | External |
| Authorized TimeStamps | 0 | 0 | No Keys |
| OsRecovery Signatures | 0 | 0 | No Keys |

3.7 Boot



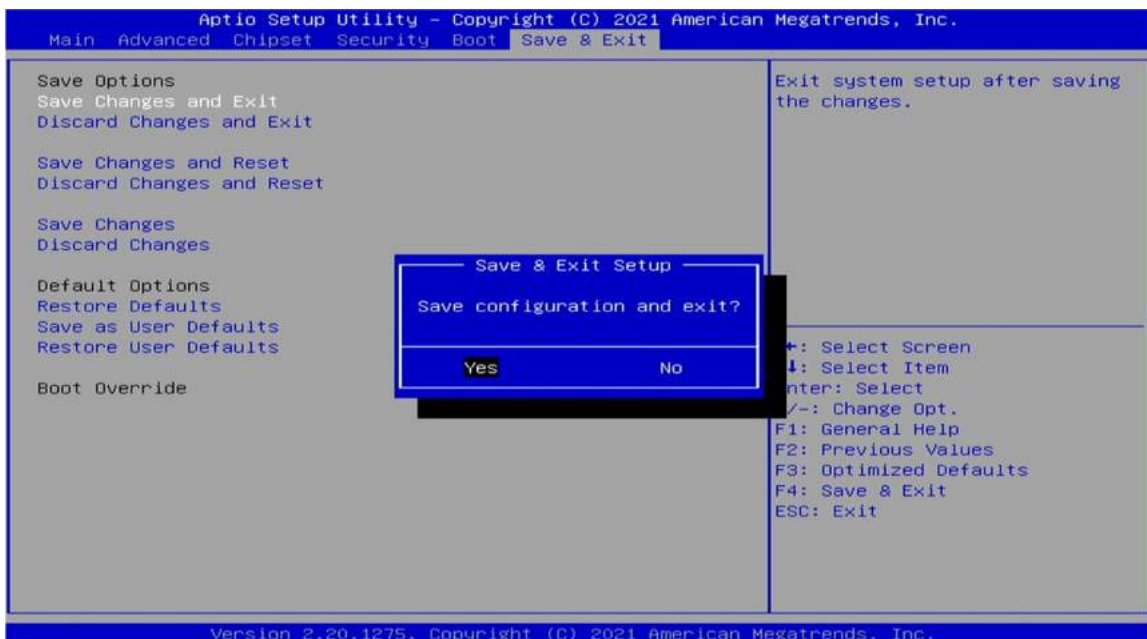
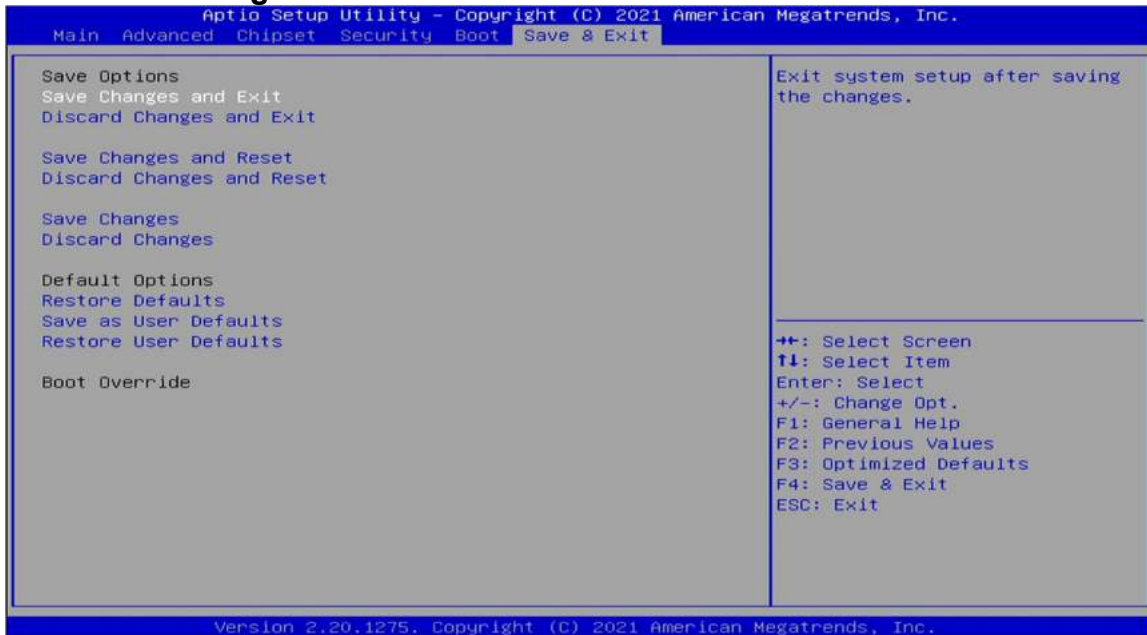
| | |
|-------------------|-----------------------------|
| Field Name | Bootup NumLock State |
| Default Value | [Off] |
| Possible Value | On Off |

| | |
|-------------------|---------------------|
| Field Name | Quiet Boot |
| Default Value | [Enabled] |
| Possible Value | Disabled Enabled |

| | |
|-------------------|-------------------------|
| Field Name | Fast Boot |
| Default Value | [Disable Link] |
| Possible Value | Disable Link Enabled |

3.8 Save & Exit

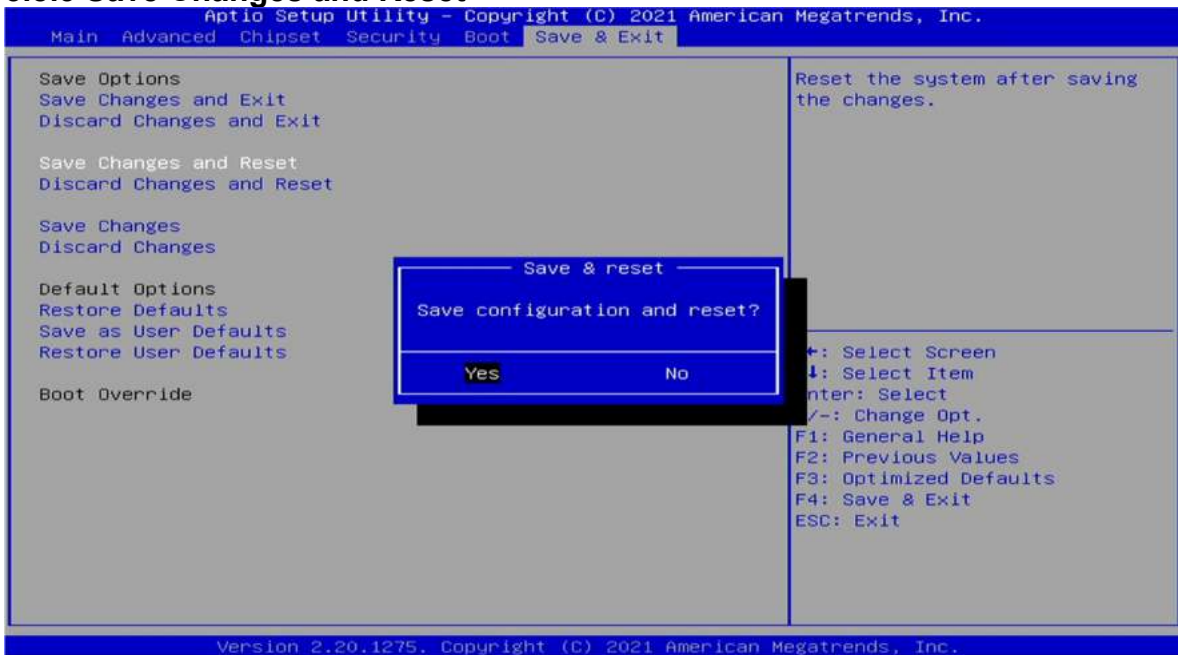
3.8.1 Save Changes and Exit



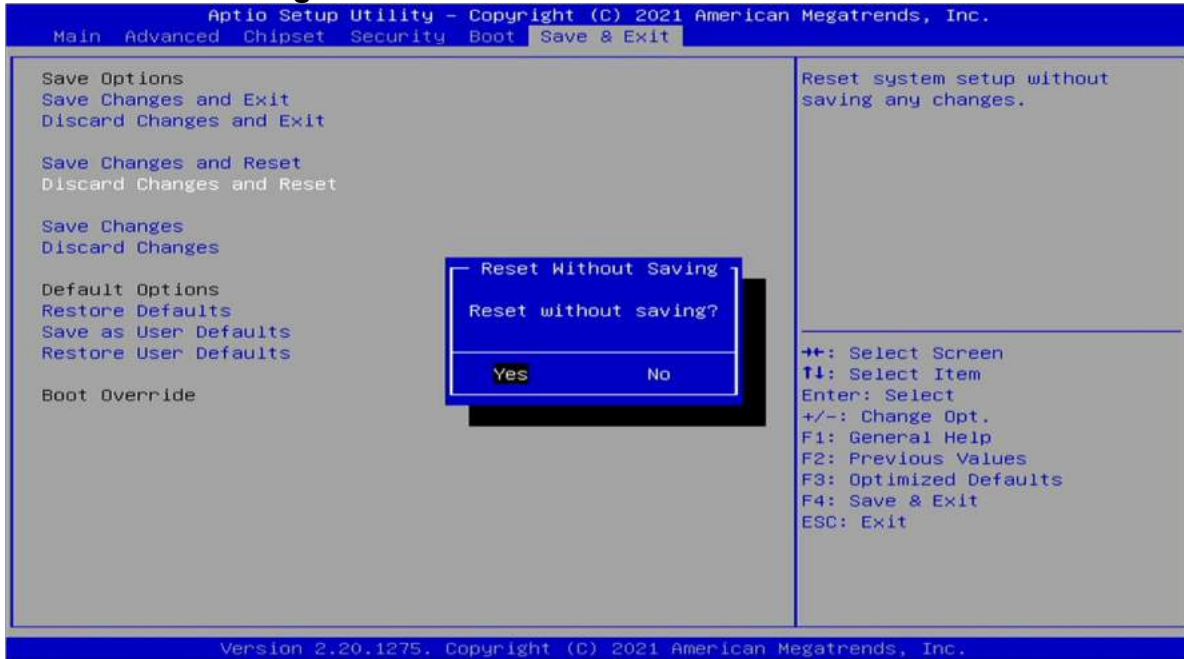
3.8.2 Discard Changes and Exit



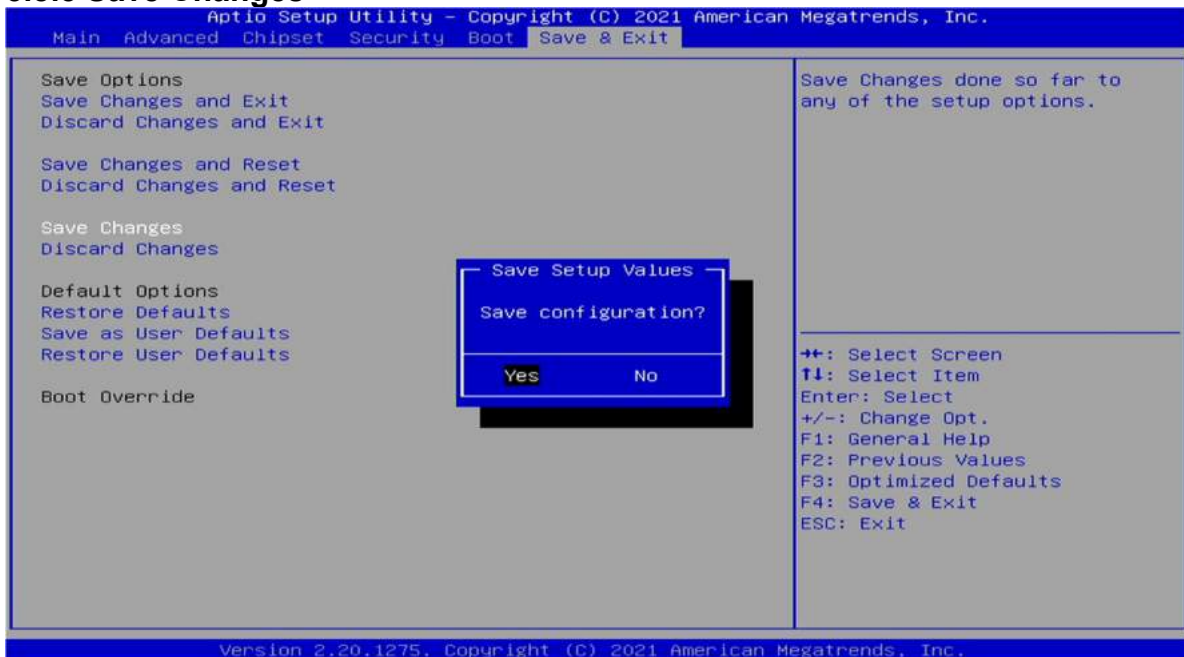
3.8.3 Save Changes and Reset



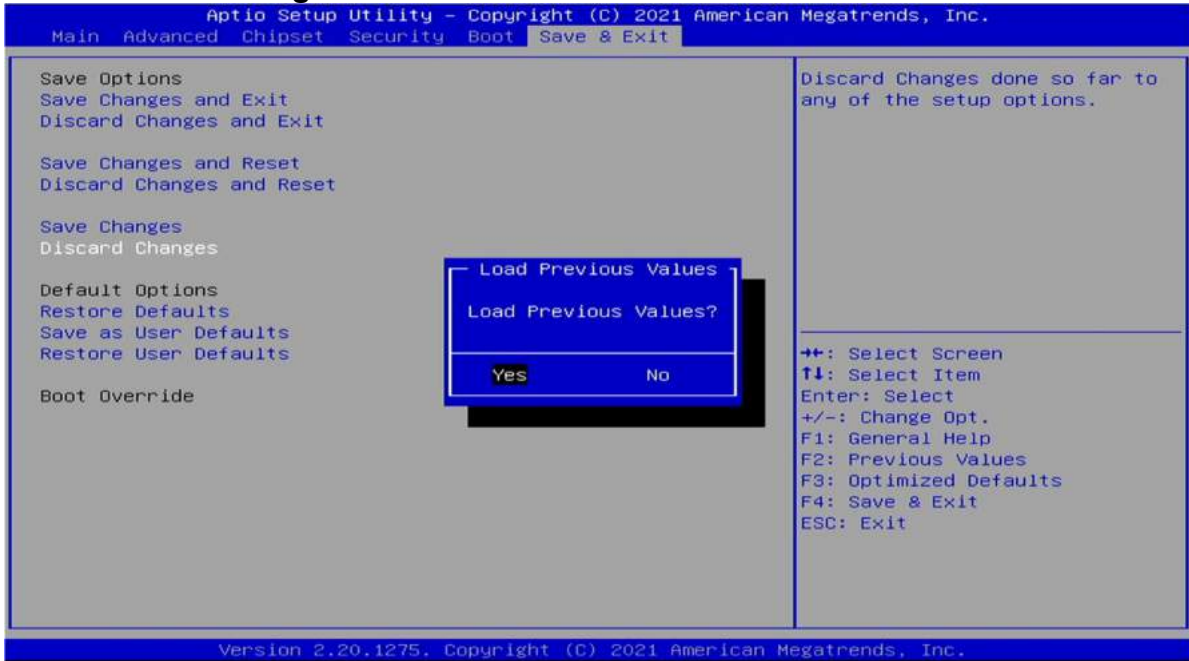
3.8.4 Discard Changes and Reset



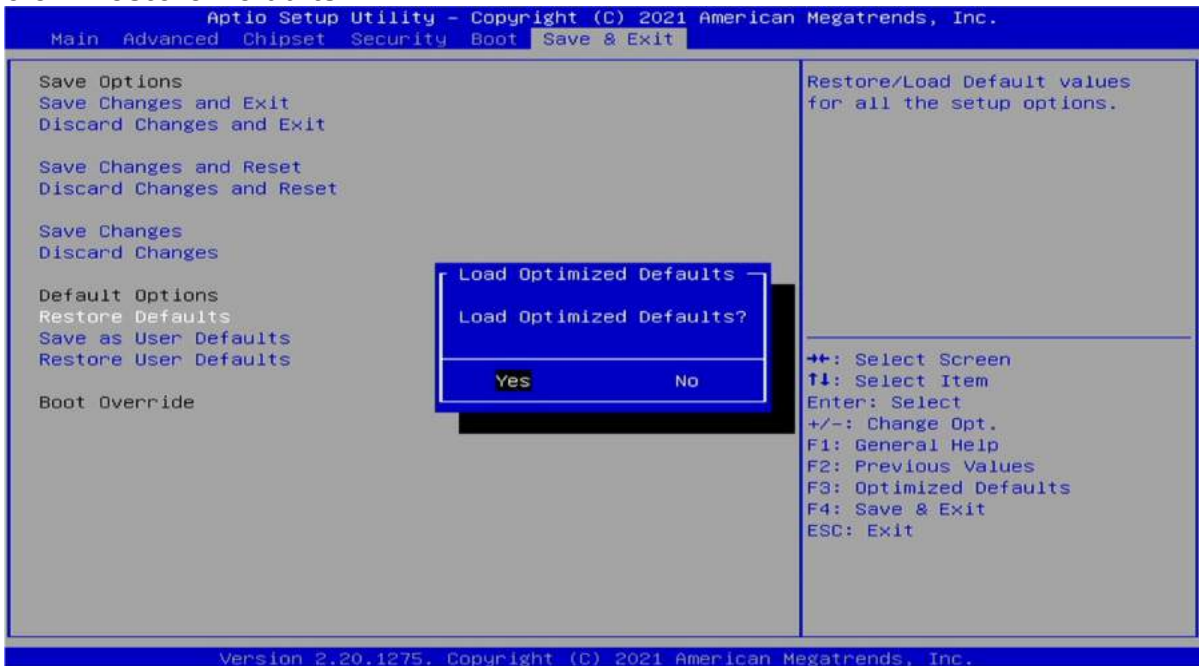
3.8.5 Save Changes



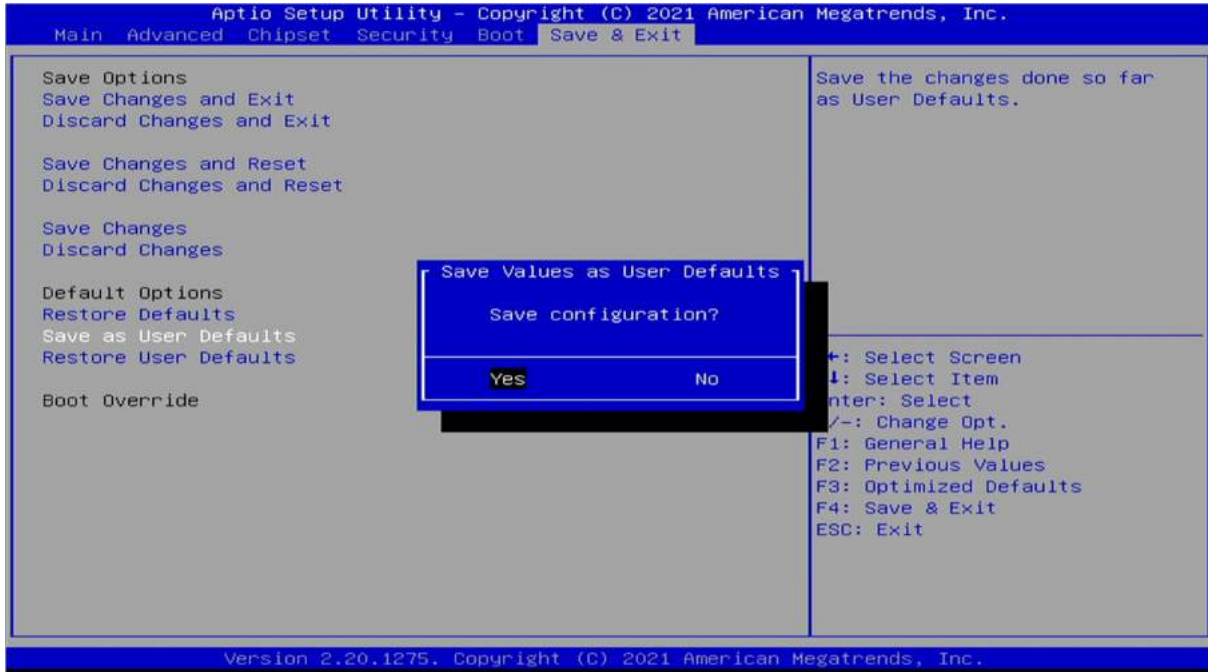
3.8.6 Discard Changes



3.8.7 Restore Defaults



3.8.8 Save as User Defaults



3.8.9 Restore User Defaults

