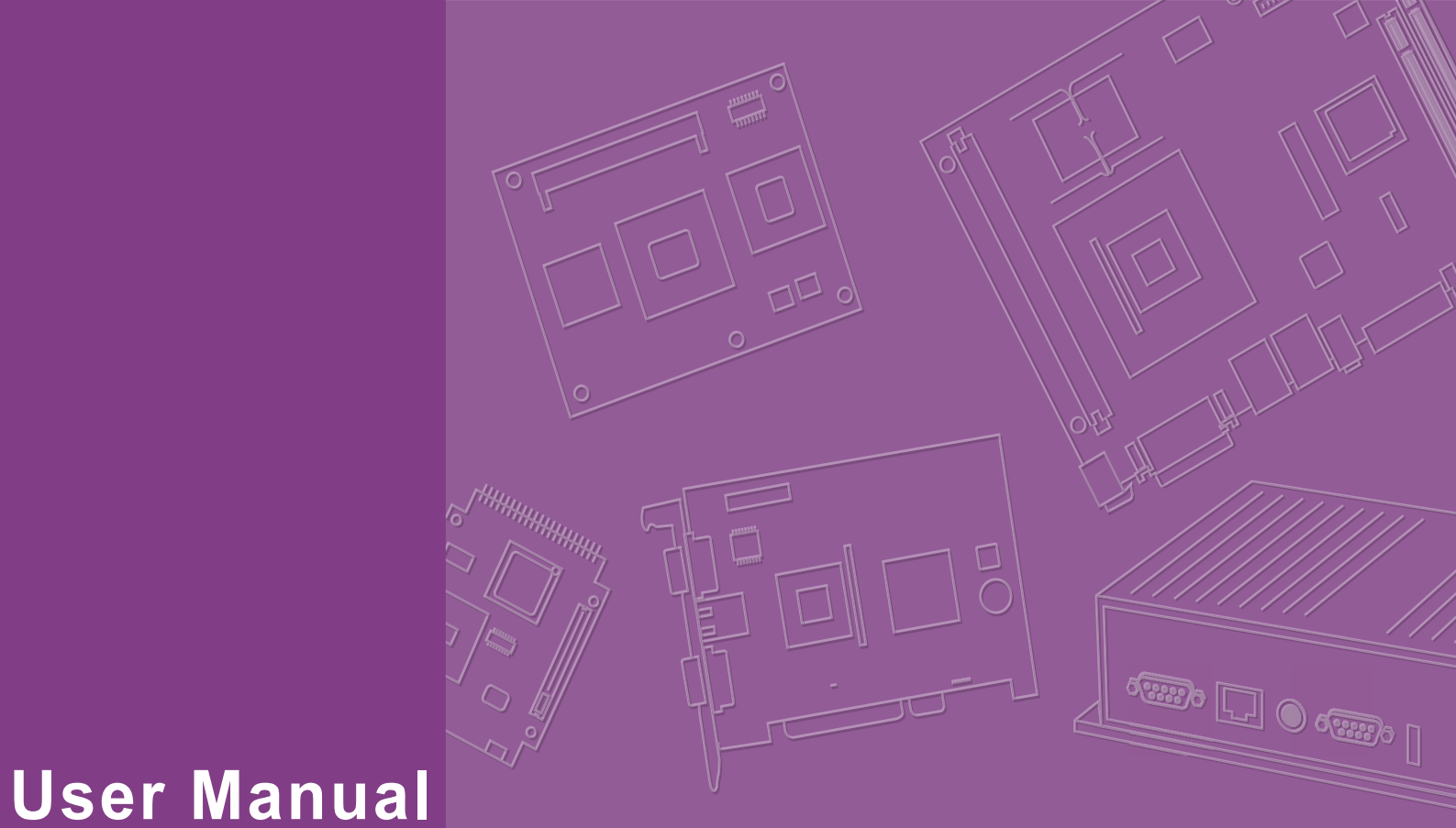




User Manual

EPC-U2117

ADVANTECH

Enabling an Intelligent Planet

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Product Warranty (2 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Declaration of Conformity

FCC Class B

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Warning! *Any changes or modifications made to the equipment which are not expressly approved by the relevant standards authority could void your authority to operate the equipment.*



Caution!



This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

Technical Support and Assistance

1. Visit the Advantech web site at www.advantech.com/support where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
 - Product name and serial number
 - Description of your peripheral attachments
 - Description of your software (operating system, version, application software, etc.)
 - A complete description of the problem
 - The exact wording of any error messages

Warning!



Warnings, Cautions and Notes

Warning! *Warnings indicate conditions, which if not observed, can cause personal injury!*



Caution! *Cautions are included to help you avoid damaging hardware or losing data.*



There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Note! *Notes provide optional additional information.*



Packing List

Before installation, please ensure the following items have been shipped:

- 1 x EPC-U2117 unit
- 1 x China RoHS

Ordering Information

Model Number	Description
EPC-U2117E3W-03Y10	Intel Atom E3930 1.3GHz, 32GB eMMC, 4GB memory

*Optional Accessories

Power Cord

Part Number	Description
1700001524	Power Cable 3-pin 180cm, USA type (for AC adapter 96PSA-A36W12W7)
170203183C	Power Cable 3-pin 180cm, Europe type (for AC adapter 96PSA-A36W12W7)
170203180A	Power Cable 3-pin 180cm, UK type (for AC adapter 96PSA-A36W12W7)
1700008921	Power Cable 3-pin PSE Mark 183cm (for AC adapter 96PSA-A36W12W7)
1702002600	Power cable 3-pin 183 cm, USA type (for AC adapter 96PSA-A60W12W6)
1702002605	Power cable 3-pin 183 cm, Europe type (for AC adapter 96PSA-A60W12W6)
1700018704	Power cable 3-pin 183 cm, UK type (for AC adapter 96PSA-A60W12W6)
1700000237	Power cable 3-pin 183 cm, PSE type (for AC adapter 96PSA-A60W12W6)
1700000596	Power cord, 3-pin power cord (CCC) (for AC adapter 96PSA-A60W12W6)

Mounting Kit

Part Number	Description	Note
EPC-BRKU-DR010	EPC-U2000 Din Rail mounting kit	Din Rail and VESA Mount

Antenna Cable

Part Number	Description	Note
1750008653-01	Cable Ant. SMA/F-R-BH MHF4/113 BLK 200mm	For WiFi
1750006009	Antenna Cable SMA (F) to MHF 1.32 25cm	For LTE

Antenna

Part Number	Description	Note
1750008717-01	Dipole Ant. D.B 2.4/5G WIFI 3dBi SMA/M-R BLK	For WiFi
1750007990-01	Antenna 4G/LTE full band L=11 cm 50 Ohm	For LTE

Safety Instructions

1. Please read these safety instructions carefully.
2. Please keep this User's Manual for later reference.
3. Please disconnect this equipment from AC outlet before cleaning. Use a damp cloth. Don't use liquid or sprayed detergent for cleaning. Use moisture sheet or clothe for cleaning.
4. For pluggable equipment, the socket-outlet shall near the equipment and shall be easily accessible.
5. Please keep this equipment from humidity.
6. Lay this equipment on a reliable surface when install. A drop or fall could cause injury.
7. The openings on the enclosure are for air convection hence protecting the equipment from overheating. **DO NOT COVER THE OPENINGS.**
8. Make sure the voltage of the power source when connecting the equipment to the power outlet.
9. Ensure to connect the power cord to a socket-outlet with earthing connection
10. Place the power cord such a way that people cannot step on it. Do not place anything over the power cord.
11. All cautions and warnings on the equipment should be noted.
12. If the equipment is not used for long time, disconnect the equipment from mains to avoid being damaged by transient over-voltage.
13. Never pour any liquid into ventilation openings; this could cause fire or electrical shock.
14. Never open the equipment. For safety reasons, only qualified service personnel should open the equipment.
15. Before any internal installation procedures are carried out on the system, make sure the system is turned off and cooled down for 15 minutes. Failing to run off the system before opening it can cause permanent damage to the system and serious or fatal injury to the user.
16. If one of the following situations arises, get the equipment checked by service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated into the equipment.
 - The equipment has been exposed to moisture.
 - The equipment does not work well, or you cannot get it to work according to the user's manual.
 - The equipment has been dropped and damaged.
 - The equipment has obvious signs of breakage.
17. Do not leave this equipment in an environment where the storage temperature may go below -40° C (-40° F) or above 85° C (185° F). This could damage the equipment. the equipment should be in a controlled environment.
18. Caution: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer, discard used batteries according to the manufacturer's instructions.
 - Risk of explosion if the battery is replaced by an incorrect type
 - Replacement of a BATTERY with an incorrect type that can defeat a SAFE-GUARD (for example, in the case of some lithium BATTERY types);
 - Disposal of a BATTERY into fire or a hot oven, or mechanically crushing or cutting of a BATTERY, that can result in an EXPLOSION;

- Leaving a BATTERY in an extremely high temperature surrounding environment that can result in an EXPLOSION or the leakage of flammable liquid or gas;
 - A BATTERY subjected to extremely low air pressure that may result in an EXPLOSION or the leakage of flammable liquid or gas.
19. The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).
 20. RESTRICTED ACCESS AREA: The equipment should only be installed in a Restricted Access Area.
 21. This equipment is not suitable for use in locations where children are likely to be present.
 22. Suitable for installation in Information Technology Rooms in accordance with Article 645 of the National Electrical Code and NFPA 75
 23. DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Instructions de sécurité

1. Veuillez lire attentivement ces instructions de sécurité.
2. Veuillez conserver ce manuel de l'utilisateur pour toute référence ultérieure.
3. Veuillez déconnecter cet équipement de la prise secteur avant le nettoyage, utilisez un chiffon humide, n'utilisez pas de détergent liquide ou pulvérisé pour le nettoyage, utilisez une feuille d'humidité ou un chiffon pour le nettoyer.
4. Pour les équipements enfichables, la prise de courant doit se trouver à proximité de l'équipement et doit être facilement accessible.
5. Veuillez garder cet équipement de l'humidité.
6. Posez cet équipement sur une surface fiable lorsqu'il est installé.
7. Les ouvertures de l'enceinte sont destinées à la convection de l'air et protègent finalement l'équipement contre la surchauffe.
8. Assurez-vous de la tension de la source d'alimentation lorsque vous connectez l'équipement à la prise secteur.
9. Assurez-vous de connecter le cordon d'alimentation à une prise de courant avec connexion à la terre
10. Placez le cordon d'alimentation de manière à ce que les personnes ne puissent pas marcher dessus. Ne placez rien sur le cordon d'alimentation.
11. Toutes les précautions et tous les avertissements sur l'équipement doivent être notés.
12. Si l'appareil n'est pas utilisé pendant une longue période, débranchez-le du secteur pour éviter d'être endommagé par une surtension transitoire.
13. Ne jamais verser de liquide dans les ouvertures de ventilation, cela pourrait provoquer un incendie ou un choc électrique.
14. N'ouvrez jamais l'appareil. Pour des raisons de sécurité, seul le personnel de maintenance qualifié doit ouvrir l'équipement.
15. Avant d'effectuer toute procédure d'installation interne sur le système, assurez-vous que le système est éteint et refroidi pendant 15 minutes, sans quoi le système risque d'être endommagé de manière permanente et de provoquer des blessures graves ou mortelles. L'utilisateur
16. Si l'une des situations suivantes se présente, faites vérifier l'équipement par le personnel de service:
 - Le cordon d'alimentation ou la fiche est endommagé.
 - Le liquide a pénétré dans l'équipement.

-
- Equipment L'équipement a été exposé à l'humidité.
 - Equipment L'équipement ne fonctionne pas bien ou vous ne pouvez pas le faire fonctionner conformément au manuel de l'utilisateur.
 - Equipment L'équipement est tombé et est endommagé.
 - Equipment L'équipement présente des signes évidents de rupture.
17. Ne laissez pas cet appareil dans un environnement où la température de stockage peut être inférieure à -40 ° C (-40° F) ou supérieure à 85 ° C (185° F), ce qui pourrait endommager l'équipement. Environnement contrôlé
 18. Attention: Danger d'explosion si la batterie n'est pas remplacée correctement Remplacez uniquement par un type identique ou équivalent recommandé par le fabricant, jetez les piles usagées conformément aux instructions du fabricant.
 - Risque d'explosion si la batterie est remplacée par un type incorrect
 - Remplacement d'une BATTERIE par un type incorrect pouvant neutraliser un SAFEGUARD (par exemple dans le cas de certains types de BATTERIE au lithium);
 - La mise au rebut d'une BATTERIE au feu ou dans un four chaud, ou le broyage ou la découpe mécanique d'une BATTERIE, pouvant entraîner une EXPLOSION;
 - Laisser une BATTERIE dans un environnement extrêmement chaud pouvant entraîner une EXPLOSION ou une fuite de liquide ou de gaz inflammable;
 - Une BATTERIE </ RTI> est une pression d'air extrêmement basse qui peut provoquer une EXPLOSION ou une fuite de liquide ou de gaz inflammable.
 19. Le niveau de pression acoustique au poste de conduite conformément à la norme CEI 704-1: 1982 ne dépasse pas 70 dB (A).
 20. ZONE D'ACCÈS RESTREINTE: L'équipement ne doit être installé que dans une zone d'accès restreint.
 21. Cet équipement ne peut pas être utilisé dans des endroits où des enfants sont susceptibles d'être présents.
 22. Convient à une installation dans des salles informatiques conformément à l'article 645 du Code national de l'électricité et à la norme NFPA 75
 23. AVIS DE NON-RESPONSABILITÉ: Cet ensemble d'instructions est conforme à la norme CEI 704-1. Advantech décline toute responsabilité concernant l'exactitude des déclarations contenues dans ce document.

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Chapter 1

Introduction

This Chapter briefly introduces the EP-U2117 product.

1.1 Overview

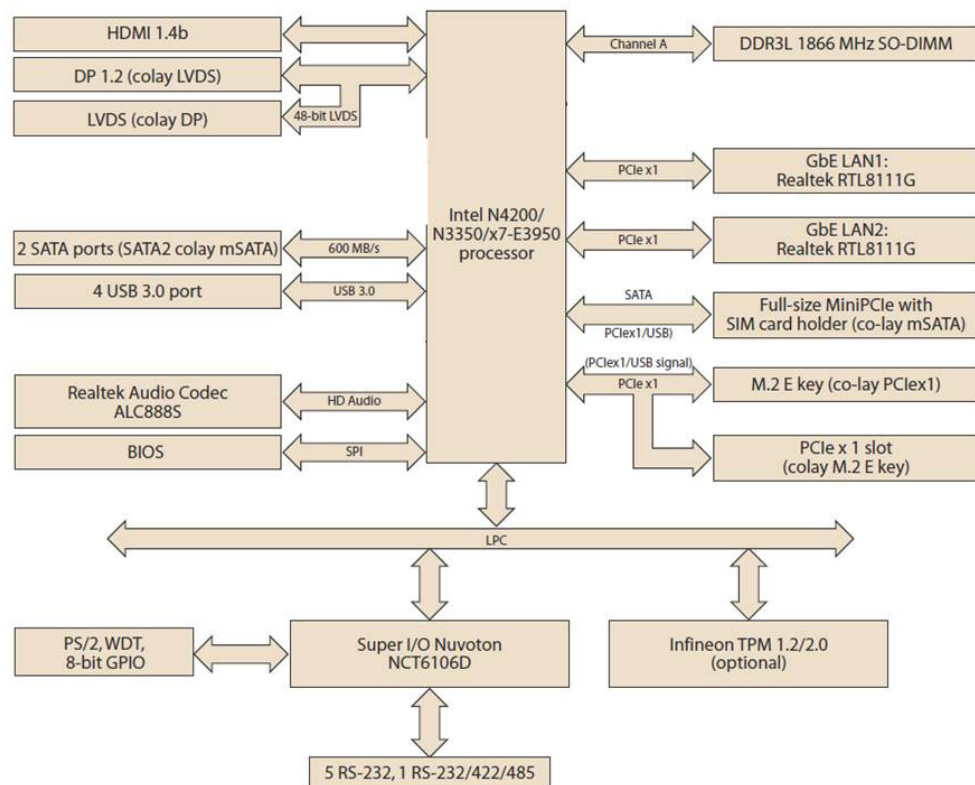
The Advantech EPC-U2117 is palm-sized system uses the latest Intel Atom E3900 processor technology to give a 30% CPU performance enhancement and a 45% graphic performance boost. EPC-U2117 is designed with dual display output, multiple I/O, and wide range 12-24V DC power inputs, which target smart vending machines, digital signage, smart kiosks, and more. EPC-U2117 is compatible with Microsoft Windows 10 IoT Enterprise, and Linux OS. Furthermore, EPC-U2117 has Advantech's WISE-PaaS DeviceOn intelligent software integrated for remote system monitoring and management.

Benefits:

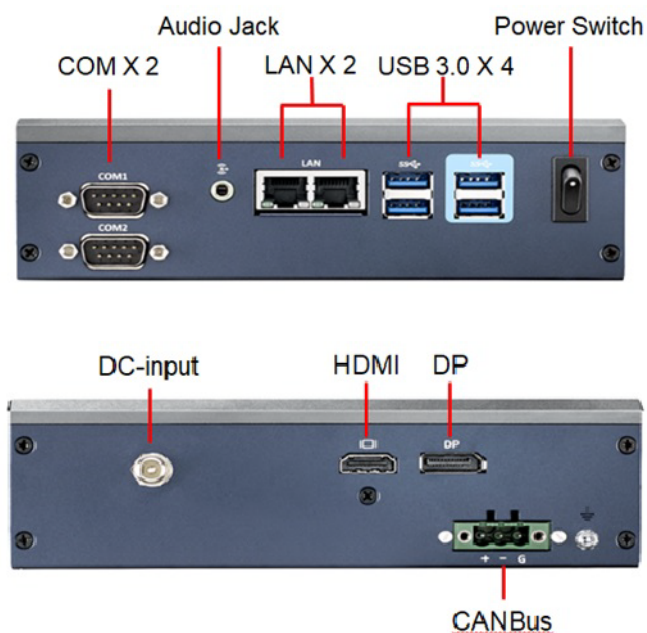
- Palm-size embedded system with CE/FCC/CCC/BSMI certification
- Fanless, wide-temperature operation with high performance and flexibility
- Supports 12V ~ 24V wide voltage DC input.
- One-stop Integrated Solution: Integrated ultra compact motherboard, chassis peripherals and software
- RS-232, RS-422/485, ccTalk, MDB, CANBus dedicated I/O design for Smart Kiosk, vending machine.
- Dimensions: 170 x 117 x 52.6 mm

1.2 System Configuration

The following diagram is a block diagram of the EPC-U2117.



1.3 I/O Placement



1.4 General Specifications

1.4.1 Standard PC Functions

- Intel® Atom® E3900, series processor; low power, high performance.
- Supports two gigabit Ethernet and one M.2 & one Full Size miniPCIE module for Wi-Fi, 3G/LTE, mSATA modules.
- Multiple I/O with 4 x USB 3.0 ports, RS-232 (optional for MDB) and ccTalk (optional for RS422/RS485) ports for data communication.
- Wide range power input support-12~24V DC input for Industry and transportation.
- Palm-size, with extended temperature support under -20 ~ 60 °C.
- Supports Win10 Enterprise 64-bit, Linux OS.
- Advantech WISE-PaaS/DeviceON SW built-in.
- Certificated with AWS Greengrass & Microsoft Azure IoT Edge.

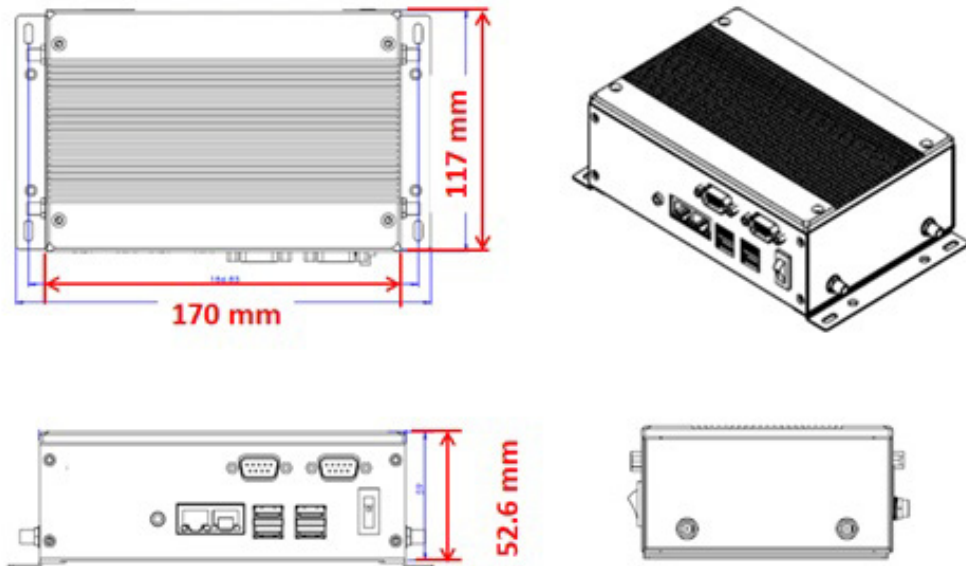
1.4.2 Power Environmental

- **Power adaptor:** AC/DC
 - Input voltage: 100 Vac ~ 240 Vac @ 50 - 60 Hz, 1.5
 - Output voltage: 12 V @ 3 A~24V @2.5A

1.5 Mechanical Specifications

1.5.1 Mechanical Specifications (Terminal)

- **System Dimensions:** 170 X 117 X 52.6 mm (6.69" X 4.6" X 2.07")



- **Carton Dimensions:** 290 (L) X 210 (W) X 175 (H) mm
- **Gross Weight:** 2.0 kg
- **Net Weight:** 1.8 kg

1.6 Environmental Specifications

Temperature & Humidity

- **Operating Temperature:** -20 ~ 60 °C (with RF module)
- **Storage Temperature:** -40~85° C
- **Relative Humidity:** 40 ~ 95% RH (Non-condensed)

Safety

- CE/CCC/BSMI

EMI

- FCC class B approved for USA, Canada, and EU

Vibration:

- With SSD: 3Grms, 60068-2-64, random, 5 ~ 500 Hz, 1 hr/axis

Chapter 2

Jumper and
Connector List

2.1 Jumper and Connector List

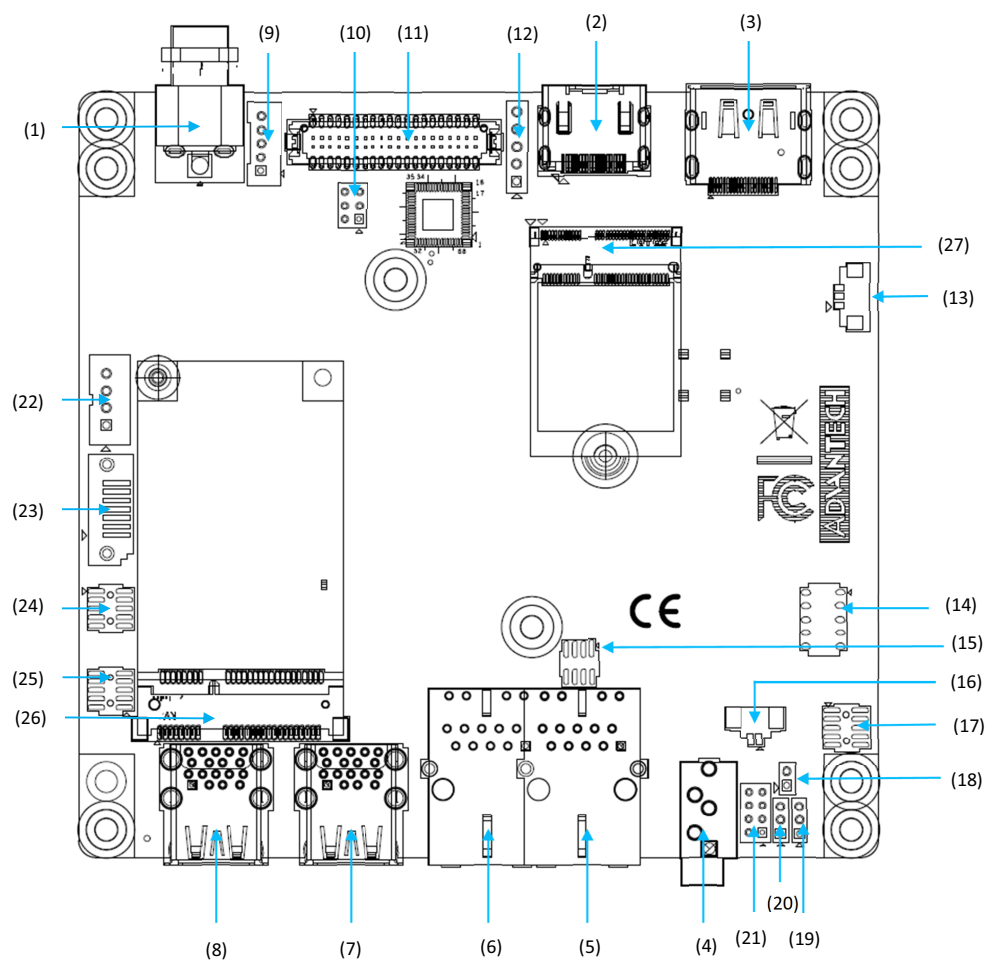


Figure 2.1 Top View

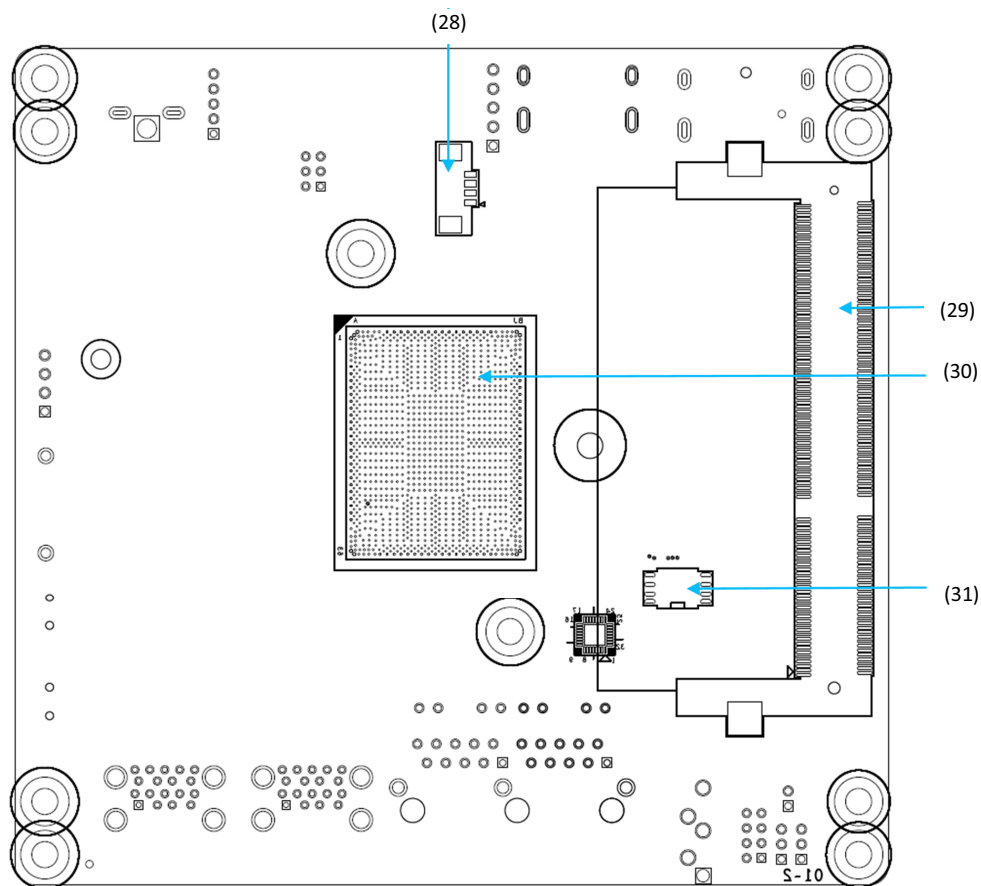


Figure 2.2 Bottom View

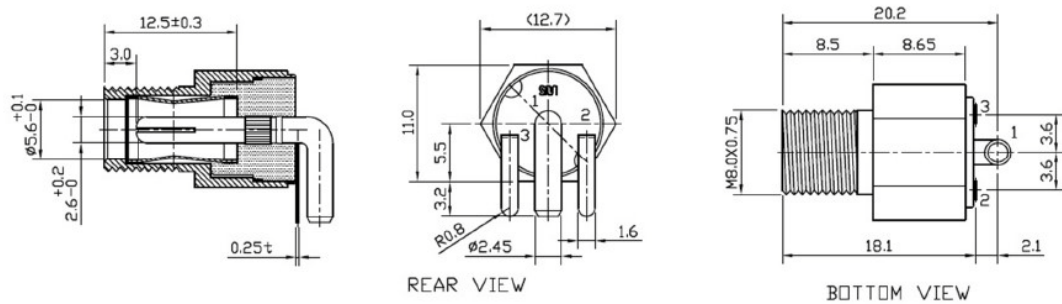
Connector and Header List:

- (1) DC input Connector (DCIN1)
- (2) High Definition Multimedia Interface(HDMI1)
- (3) DisplayPort (DP1)
- (4) HD Analog Audio Interface (AUDIO1)
- (5) Single port RJ45 Connector(LAN1)
- (6) Dual ports RJ45 Connector(LAN12)
- (7) USB 3.0 Connector(USB12)
- (8) USB 3.0 Connector(USB34)
- (9) LVDS Backlight Inverter Power header(INV1)
- (10) LVDS Panel Voltage Selection header(JLVDS1)
- (11) LVDS Panel header(LVDS_EDP1)
- (12) MCU programming header(JCAN2)
- (13) CAN BUS header (CAN1)
- (14) Low Pin Count Header (LPC1)
- (15) SPI Programming Pin Header (SPI_CN1)
- (16) CMOS battery connector(BAT1)
- (17) General Purpose I/O Pin Header (GPIO1)
- (18) COMS Mode selection(JCMOS1)
- (19) AT/ATX Mode selection(PSON1)
- (20) Serial bus header(JFP2)

- (21) PWRBTN#/ RESET#/HDD LED/ Power LED header(JFP1)
- (22) SATA Power header (SATA_PWR1)
- (23) SATA Signal Connector (SATA1)
- (24) COM Port header(COM1)
- (25) COM Port header(COM2)
- (26) MINIPCIE and mSATA Connector (MINI-PCIE1)
- (27) Next Generation Form Factor (M.2_1)
- (28) CPU FAN connector(CPUFAN1)
- (29) DDR3L SO-DIMM Socket (DIMMA1)
- (30) CPU-System on chip(SOC1)
- (31) BIOS Flash(SPI1)

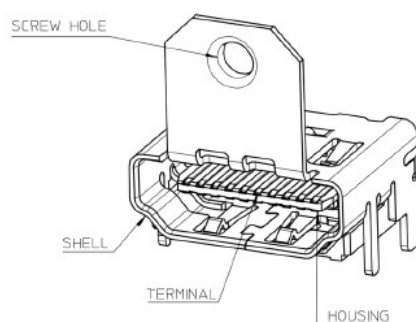
2.2 Connectors

2.2.1 DC input Connector (DCIN1)



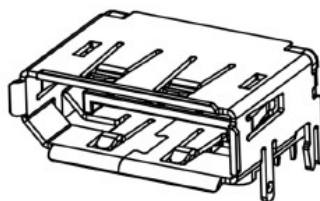
Pin	Signal
1	Power input
2	GND
3	GND

2.2.2 High Definition Multimedia Interface(HDMI1)



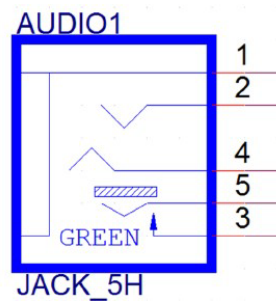
Pin	Signal	Pin	Signal
1	HDMI1_Z_D2+	11	GND
2	GND	12	HDMI1_Z_CLK-
3	HDMI1_Z_D2-	13	x
4	HDMI1_Z_D1+	14	x
5	GND	15	HDMI1_SCL
6	HDMI1_Z_D1-	16	HDMI1_SDA
7	HDMI1_Z_D0+	17	GND
8	GND	18	+V5_HDMI
9	HDMI1_Z_D0-	19	HDMI1_HPD
10	HDMI1_Z_CLK+		

2.2.3 DisplayPort (DP1)



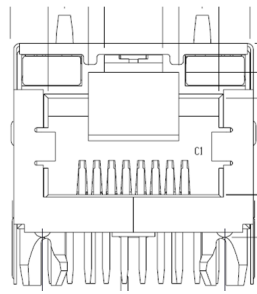
Pin	Signal	Pin	Signal
1	DP1_0+	11	GND
2	GND	12	DP1_3-
3	DP1_0-	13	DP1_AUX_EN#
4	DP1_1+	14	GND
5	GND	15	DP1_AUX+
6	DP1_1-	16	GND
7	DP1_2+	17	DP1_AUX-
8	GND	18	DP1_DP_HPD
9	DP1_2-	19	GND
10	DP1_3+	20	+V3.3_DP1

2.2.4 HD Analog Audio Interface (AUDIO1)



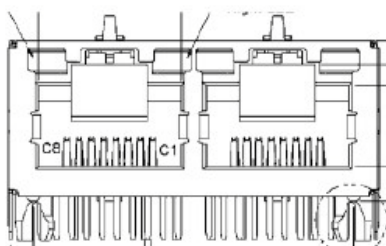
Pin	Signal
1	GND
2	Line_L
3	Detect
4	Line_R
5	GND

2.2.5 Single port RJ45 Connector(LAN1)



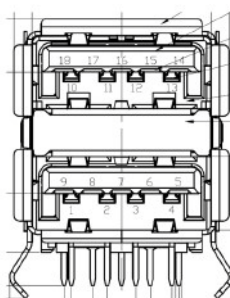
Pin	Signal	Pin	Signal
1	LAN1_MDI0+	8	LAN1_MDI2-
2	LAN1_MDI0-	9	LAN1_MDI3+
3	LAN1_MDI1+	10	LAN1_MDI3-
4	LAN1_MDI1-	11	LAN1_LED1_z_ACT#
5	LAN1_TCT_A	12	+V3.3_DUAL
6	LAN1_TCTG	13	LAN1_LED2_z_1G#
7	LAN1_MDI2+	14	LAN1_LED0_z_100M#

2.2.6 Dual ports RJ45 Connector(LAN12)



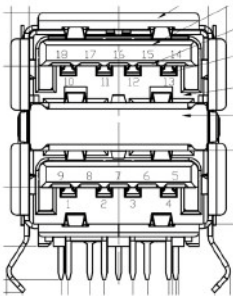
Pin	Signal	Pin	Signal
A1	LAN2_MDIO+	B1	LAN1_MDIO+
A2	LAN2_MDIO-	B2	LAN1_MDIO-
A3	LAN2_MDIO1+	B3	LAN1_MDIO1+
A4	LAN2_MDIO1-	B4	LAN1_MDIO1-
A5	LAN2_TCT_A	B5	LAN1_TCT_A
A6	LAN2_TCTG	B6	LAN1_TCTG
A7	LAN2_MDIO2+	B7	LAN1_MDIO2+
A8	LAN2_MDIO2-	B8	LAN1_MDIO2-
A9	LAN2_MDIO3+	B9	LAN1_MDIO3+
A10	LAN2_MDIO3-	B10	LAN1_MDIO3-
A11	LAN2_LED1_z_ACT#	B11	LAN1_LED1_z_ACT#
A12	+V3.3_DUAL	B12	+V3.3_DUAL
A13	LAN2_LED2_z_1G#	B13	LAN1_LED2_z_1G#
A14	LAN2_LED0_z_100M#	B14	LAN1_LED0_z_100M#

2.2.7 USB 3.0 Connector(USB12)



Pin	Signal	Pin	Signal
1	+USBV1	10	+USBV1
2	USB_D0-	11	USB_D1-
3	USB_D0+	12	USB_D1+
4	GND	13	GND
5	USB3X0_z_RX-	14	USB3X1_z_RX-
6	USB3X0_z_RX+	15	USB3X1_z_RX+
7	GND	16	GND
8	USB3X0_z_TX-	17	USB3X1_z_TX-
9	USB3X0_z_TX+	18	USB3X1_z_TX+

2.2.8 USB 3.0 Connector(USB34)



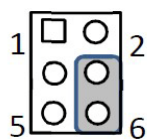
Pin	Signal	Pin	Signal
1	+USBV2	10	+USBV2
2	USB_D2-	11	USB_D3-
3	USB_D2+	12	USB_D3+
4	GND	13	GND
5	USB3X2_z_RX-	14	USB3X3_z_RX-
6	USB3X2_z_RX+	15	USB3X3_z_RX+
7	GND	16	GND
8	USB3X2_z_TX-	17	USB3X3_z_TX-
9	USB3X2_z_TX+	18	USB3X3_z_TX+

2.2.9 LVDS Backlight Inverter Power header(INV1)



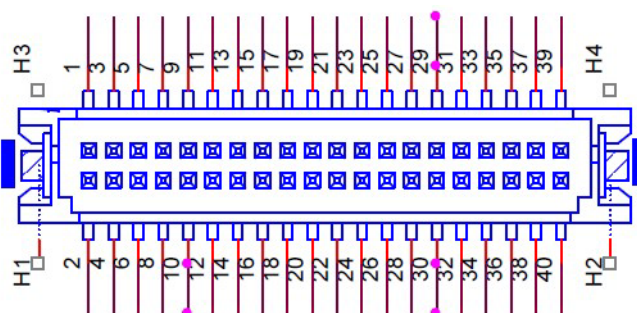
Pin	Signal
1	+12V
2	GND
3	BKL EN
4	BKL CTRL
5	+5V

2.2.10 LVDS Panel Voltage Selection header(JLVDS1)



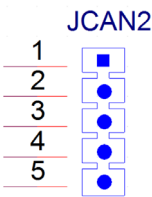
Pin	Signal	Pin	Signal
1	NC	2	+5V
3	+12V	4	EDP1 VDD
5	NC	6	+3.3V

2.2.11 LVDS Panel header(LVDS_EDP1)



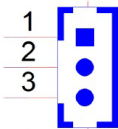
Pin	Signal	Pin	Signal
1	+VDD_LVDS1	2	+VDD_LVDS1
3	LVDS_DET#	4	GND
5	+VDD_LVDS1	6	+VDD_LVDS1
7	LVDS1_A0N	8	LVDS1_A4N
9	LVDS1_A0P	10	LVDS1_A4P
11	GND	12	GND
13	LVDS1_A1N	14	LVDS1_A5N
15	LVDS1_A1P	16	LVDS1_A5P
17	GND	18	GND
19	LVDS1_A2N	20	LVDS1_A6N
21	LVDS1_A2P	22	LVDS1_A6P
23	GND	24	GND
25	LVDS1_CLK1N	26	LVDS1_CLK2N
27	LVDS1_CLK1P	28	LVDS1_CLK2P
29	GND	30	GND
31	LVDS1_SCD	32	LVDS1_SDD
33	GND	34	LVDS1_PIN34
35	LVDS1_A3N	36	LVDS1_A7N
37	LVDS1_A3P	38	LVDS1_A7P
39	LVDS1_ENBKL	40	LVDS1_VCON

2.2.12 MCU programming header(JCAN2)



Pin	Signal
1	MCLR#
2	+V5_CAN
3	GND
4	PG_DAT
5	PG_CLK

2.2.13 CAN BUS header (CAN1)



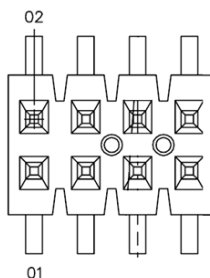
Pin	Signal
1	CAN_H1
2	CAN_L1
3	GND

2.2.14 Low Pin Count Header (LPC1)



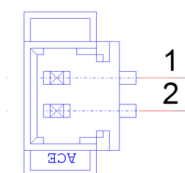
Pin	Signal	Pin	Signal
1	SOC_LPC_AD1	2	CLKOUT_25M_LPC
3	SOC_LPC_AD0	4	PM_PLTRST#
5	+V3.3	6	SOC_LPC_FRAME#
7	GND	8	SOC_LPC_AD3
9	NC	10	SOC_LPC_AD2

2.2.15 SPI Programming Pin Header (SPI_CN1)



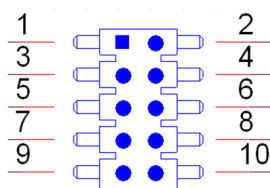
Pin	Signal	Pin	Signal
1	CS#	2	+3.3V
3	MISO	4	NC
5	NC	6	SCK
7	GND	8	MOSI

2.2.16 CMOS battery connector(BAT1)



Pin	Signal
1	VBAT
2	GND

2.2.17 General Purpose I/O Pin Header (GPIO1)



Pin	Signal	Pin	Signal
1	GPIO0	2	GPIO4
3	GPIO1	4	GPIO5
5	GPIO2	6	GPIO6
7	GPIO3	8	GPIO7
9	+3.3V	10	GND

2.2.18 COMS Mode selection(JCMOS1)



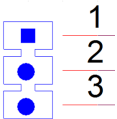
Pin	Signal
1	VBAT
2	RTC RESET#
3	GND

2.2.19 AT/ATX Mode selection(PSON1)



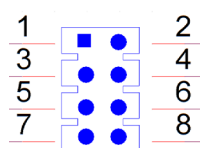
Pin	Signal
1	AT
2	+3.3V
3	ATX

2.2.20 Serial bus header(JFP2)



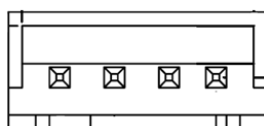
Pin	Signal
1	SMB_DATA
2	SMB_CLK
3	GND

2.2.21 PWRBTN#/ RESET#/HDD LED/ Power LED header(JFP1)



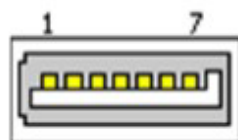
Pin	Signal	Pin	Signal
1	HDD LED+	2	PWR_BTN+
3	HDD LED-	4	PWR_BTN-
5	PWR LED+	6	RST_BTN+
7	PWR LED-	8	RST_BTN-

2.2.22 SATA Power header (SATA_PWR1)



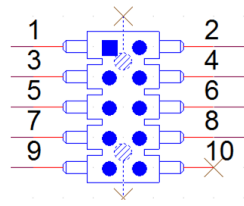
Pin	Signal	Pin	Signal
1	+V5	3	GND
2	GND	4	+12V

2.2.23 SATA Signal Connector (SATA1)



Pin	Signal
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

2.2.24 COM Port header(COM1)



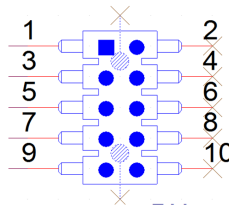
For RS232:

Pin	Signal	Pin	Signal
1	DCD#	2	DSR#
3	RXD	4	RTS#
5	TXD	6	CTS#
7	DTR#	8	RI#
9	GND	10	NC

For MDB (option):

Pin	Signal	Pin	Signal
1	NC	2	NC
3	RXD	4	NC
5	TXD	6	NC
7	NC	8	NC
9	GND	10	NC

2.2.25 COM Port header(COM2)



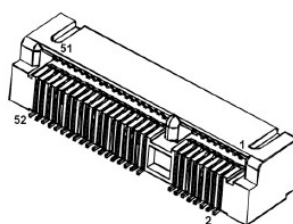
For RS-422/485:

Pin	Signal	Pin	Signal
1	COM2_422_485_TX-	2	NC
3	COM2_422_485_TX+	4	NC
5	COM2_422_RX+	6	NC
7	COM2_422_RX-	8	NC
9	GND	10	NC

For ccTlak (option):

Pin	Signal	Pin	Signal
1	NC	2	NC
3	NC	4	NC
5	Data	6	NC
7	NC	8	NC
9	GND	10	NC

2.2.26 MINIPCIE and mSATA Connector (MINI-PCIE1)



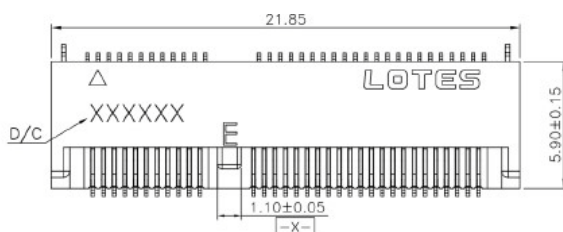
MINIPCIE:

Pin	Signal	Pin	Signal
1	WAKE#	2	+3.3Vaux
3	Reserved	4	GND
5	Reserved	6	+1.5V
7	CLKREQ#	8	Reserved
9	GND	10	Reserved
11	REFCLK-	12	Reserved
13	REFCLK+	14	Reserved
15	GND	16	Reserved
17	Reserved	18	GND
19	Reserved	20	DISABLE#
21	DETECT#	22	RESET#
23	PCIE_RX+	24	+3.3Vaux
25	PCIE_RX-	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PCIE_TX-	32	SMB_DATA
33	PCIE_TX+	34	GND
35	GND	36	USB_D-
37	GND	38	USB_D+
39	+3.3Vaux	40	GND
41	+3.3Vaux	42	Reserved
43	V1.2_DETECT#	44	LED_WLAN#
45	Reserved	46	Reserved
47	Reserved	48	+1.5V
49	Reserved	50	GND
51	MSATA_DETECT#	52	+3.3Vaux

mSATA:

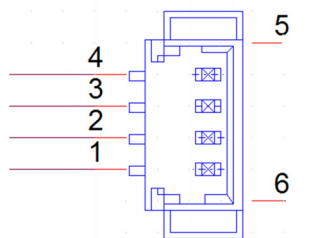
Pin	Signal	Pin	Signal
1	Reserved	2	+3.3V
3	Reserved	4	GND
5	Reserved	6	+1.5V
7	Reserved	8	Reserved
9	GND	10	Reserved
11	Reserved	12	Reserved
13	Reserved	14	Reserved
15	GND	16	Reserved
17	Reserved	18	GND
19	Reserved	20	Reserved
21	DETECT#	22	Reserved
23	RX+	24	+3.3V
25	RX-	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	TX-	32	SMB_DATA
33	TX+	34	GND
35	GND	36	Reserved
37	GND	38	Reserved
39	+3.3V	40	GND
41	+3.3V	42	Reserved
43	Reserved	44	Reserved
45	Reserved	46	Reserved
47	Reserved	48	+1.5V
49	Reserved	50	GND
51	MSATA_DETECT#	52	+3.3V

2.2.27 Next Generation Form Factor (M.2_1)



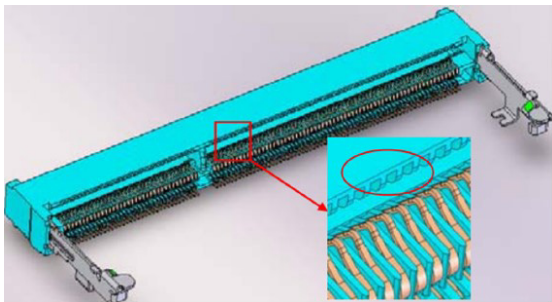
Pin	Signal	Pin	Signal
1	GND	43	PCIE_RX-
2	+V3.3SB_M.2	44	NC
3	USB_D+	45	GND
4	+V3.3SB_M.2	46	NC
5	USB_D-	47	CK100M_NGFF+
6	NC	48	NC
7	GND	49	CK100M_NGFF-
8	NGFF_I2S3_Z_BCLK	50	NGFF_PMU_SUSCLK
9	SDIO_WIFI_CLK	51	GND
10	NGFF_I2S3_Z_SYNC	52	NGFF_PLTRST#
11	SDIO_WIFI_CMD	53	PCIE_REQ2_NGFF#
12	NGFF_I2S3_Z_SDI	54	NGFF_BT_DISABLE#
13	SDIO_WIFI_D0	55	PCIE_NGFF_WAKE2#
14	NGFF_I2S3_Z_SDO	56	NGFF_WIFI_DISABLE#
15	SDIO_WIFI_D1	57	GND
16	NC	58	NC
17	SDIO_WIFI_D2	59	NC
18	GND	60	NC
19	SDIO_WIFI_D3	61	NC
20	NGFF_CONN_UART_WAKE#	62	NC
21	SDIO_WIFI_WAKE#	63	GND
22	NGFF_UART0_Z_RXD	64	NC
23	SDIO_WIFI_RST	65	NC
32	NGFF_UART0_Z_TXD	66	NC
33	GND	67	NC
34	NGFF_UART0_Z_CTS#	68	NC
35	PCIE_TX+	69	GND
36	NGFF_UART0_Z_RTS#	70	NC
37	PCIE_TX-	71	NC
38	NC	72	+V3.3SB_M.2
39	GND	73	NC
40	NC	74	+V3.3SB_M.2
41	PCIE_RX+	75	GND
42	NC		

2.2.28 CPU FAN connector(CPUFAN1)

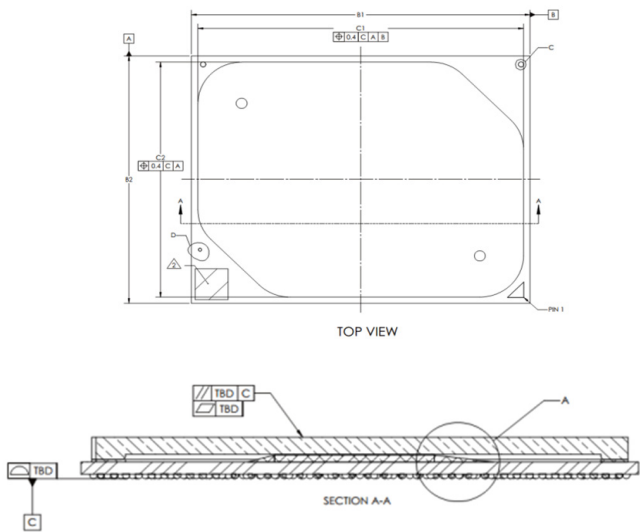


Pin	Signal
1	GND
2	VCC
3	CPU FANOUT
4	CPU FANIN

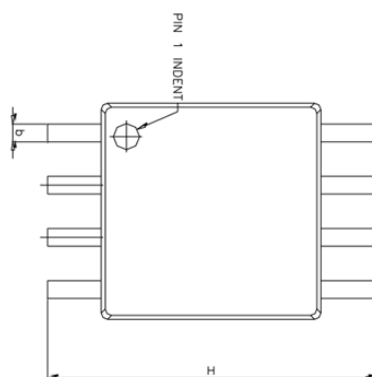
2.2.29 DDR3L SO-DIMM Socket (DIMMA1)



2.2.30 CPU-System on chip(SOC1)



2.2.31 BIOS Flash(SPI1)



Pin	Signal	Pin	Signal
1	SPI_Z_CS0	5	SPI_Z_MOSI
2	SPI_Z_MISO	6	SPI_Z_CLK
3	SPI_Z_IO2	7	SPI_Z_IO3
4	GND	8	+V1.8SB_SPI

2.3 Jumper List

- (1) LVDS Panel Voltage Selection header(JLVDS1)
- (2) COMS Mode selection(JCMOS1)
- (3) AT/ATX Mode selection(PSON1)

- (1) LVDS Panel Voltage Selection header(JLVDS1)

Function	Jumper Setting
Jumper position for 5V(2-4)	
Jumper position for 3.3V(4-6) (Default)	
Jumper position for 12V(3-4)	

(2) COMS Mode selection(JCMOS1)

Function	Jumper Setting
Keep CMOS Data(1-2)(Default)	123
Clear CMOS Data(2-3)	123

(3) ATX/AT Mode Selection (PSON1)

Function	Jumper Setting
AT Mode(1-2)	123
ATX Mode	123

Chapter 3

Peripheral Installation

3.1 HDD Installation

1. Unscrew the bottom cover screws.
2. Secure the 2.5" SATA HDD onto the bottom cover. The screws are in the accessory box.



3. Connect SATA signal and power cable to the 2.5" SATA HDD.



4. Secure the bottom cover in its original position.



3.2 Mini PCIe Module Installation

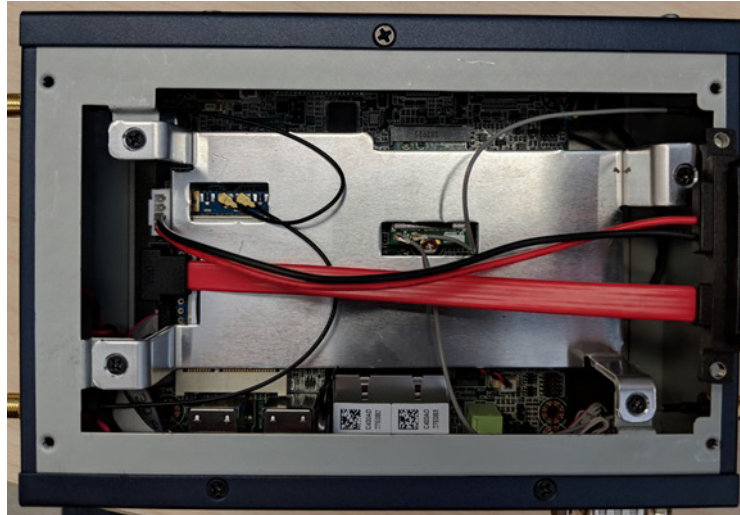
1. Unscrew the bottom cover screws.



2. Insert Mini PCIe module into the slot and secure with screws to fix the module.



3. Connect the antenna cable to the module.



4. Secure the bottom cover in its original position.



Chapter 4

BIOS Setup

4.1 BIOS Setup

AMI BIOS has been integrated into many motherboards for decades. With the AMI BIOS Setup program, users can modify BIOS settings and control various system features. This chapter describes the basic navigation of the EP-U2117 BIOS setup screens.

AMI's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This information is stored in flash ROM so it retains the Setup information when the power is turned off.

Note! *Default BIOS is supported for 64-bit OS installation, if you have any BIOS setting requirement, please contact with sales representative for details.*



Control Keys

< ↑ > < ↓ > < ← > < → >	Move select item
<Enter>	Select item
<Esc>	Main Menu - Quit without saving changes to the CMOS Sub Menu - Exit current page and return to the Main Menu
<Page Up/+>	Increase the numeric value or make changes
<Page Down/->	Decrease the numeric value or make changes
<F1>	General help, for Setup Sub Menu
<F2>	Item help
<F5>	Load previous values
<F7>	Load setup defaults
<F10>	Save all CMOS changes

4.2 Entering Setup

4.2.1 Main Setup

Press to enter AMI BIOS CMOS Setup Utility, the Main Menu will appear on the screen. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.



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.

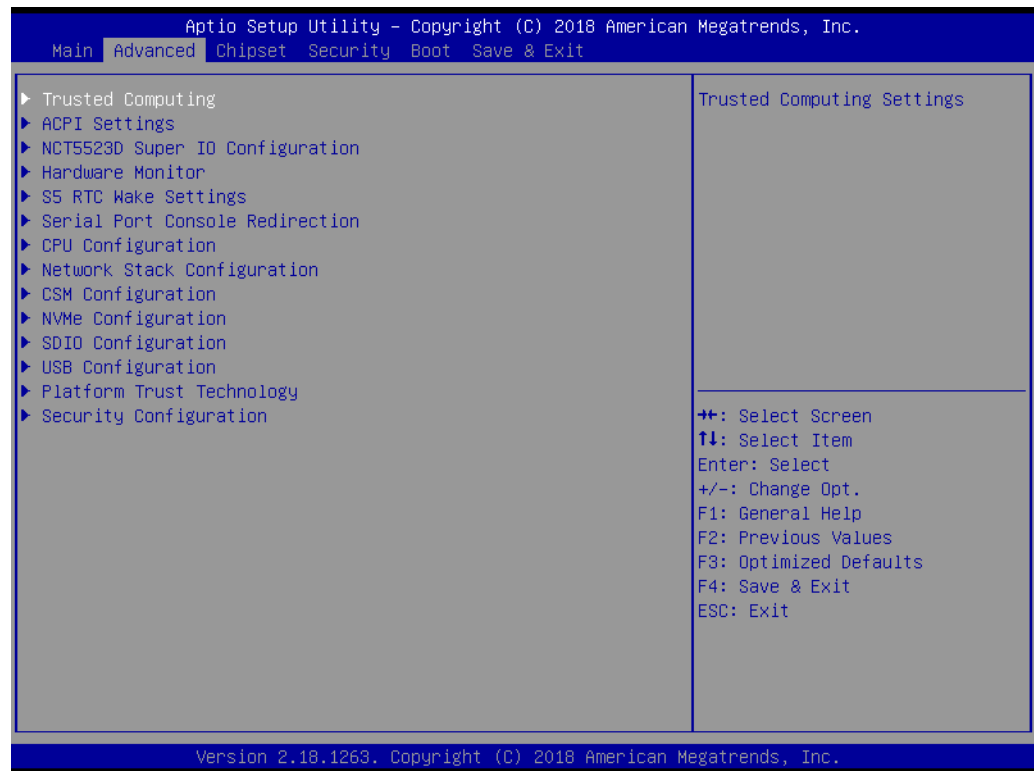
Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

■ System date / System time

Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

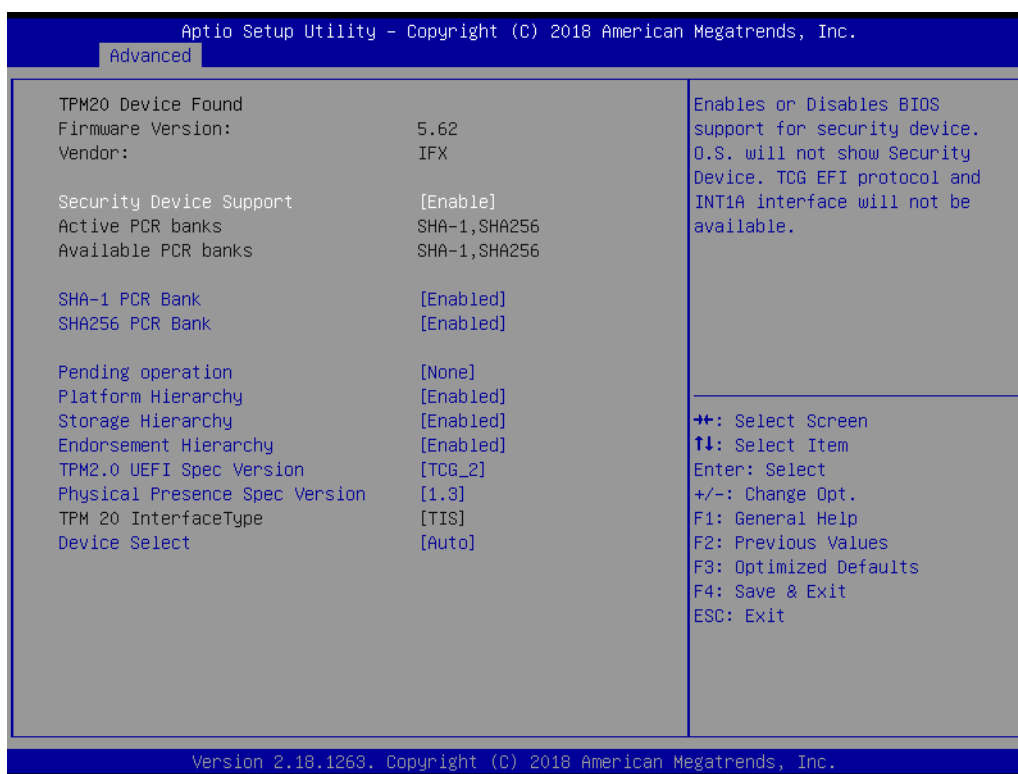
4.2.2 Advanced BIOS Features Setup

Select the Advanced tab from the EPC-U2117 setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as CPU Configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screens are shown below. The sub menus are described on the following pages.

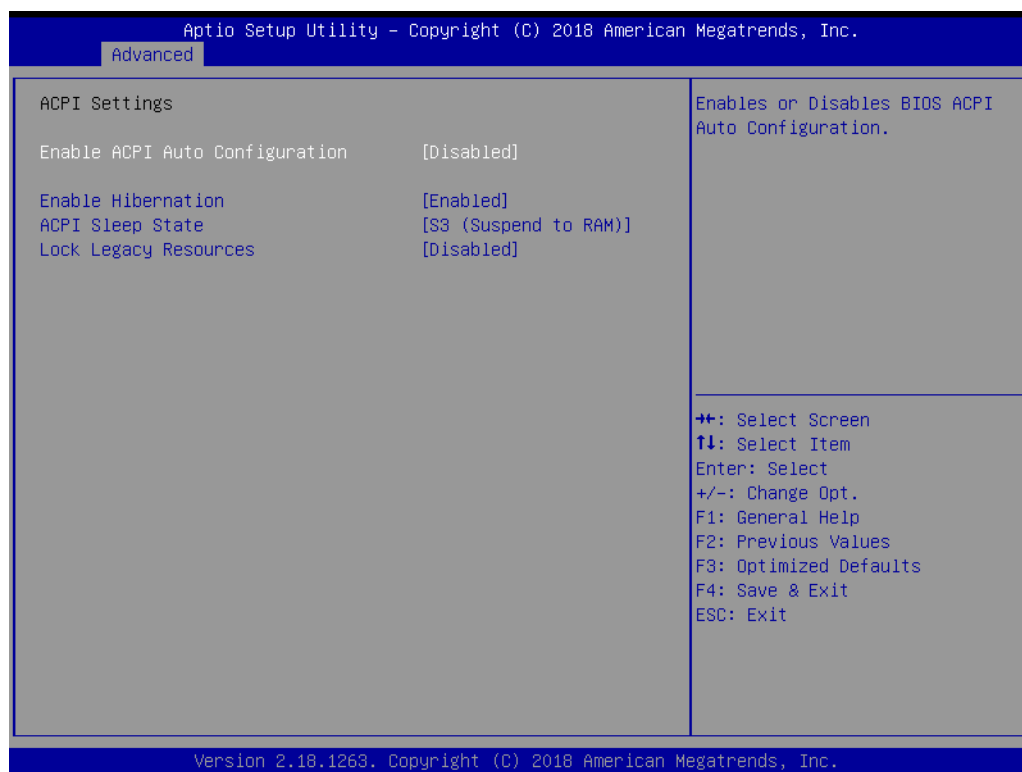
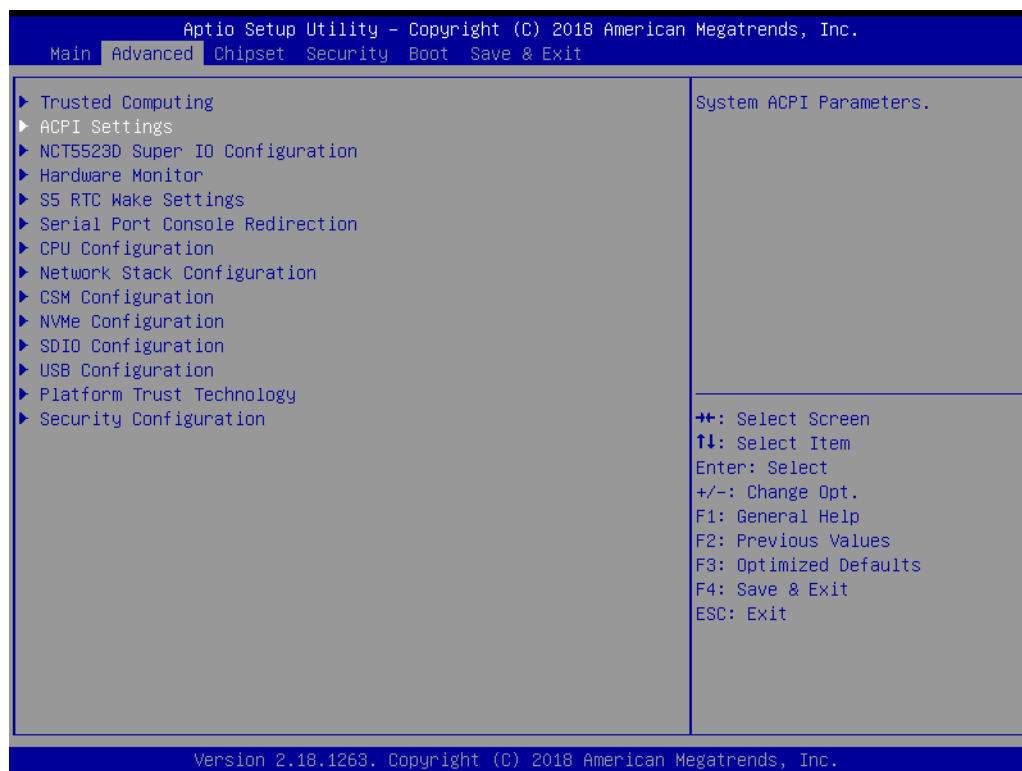


4.2.2.1 Security Device Support

Enable or disable BIOS support for security device.



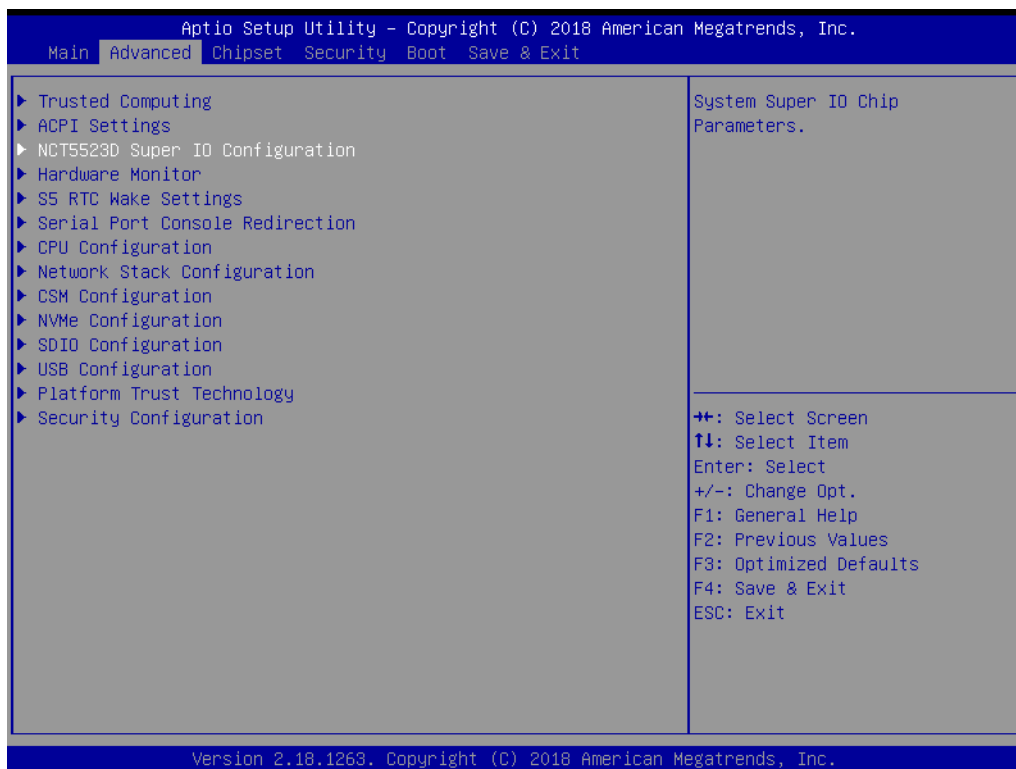
4.2.2.2 ACPI Settings

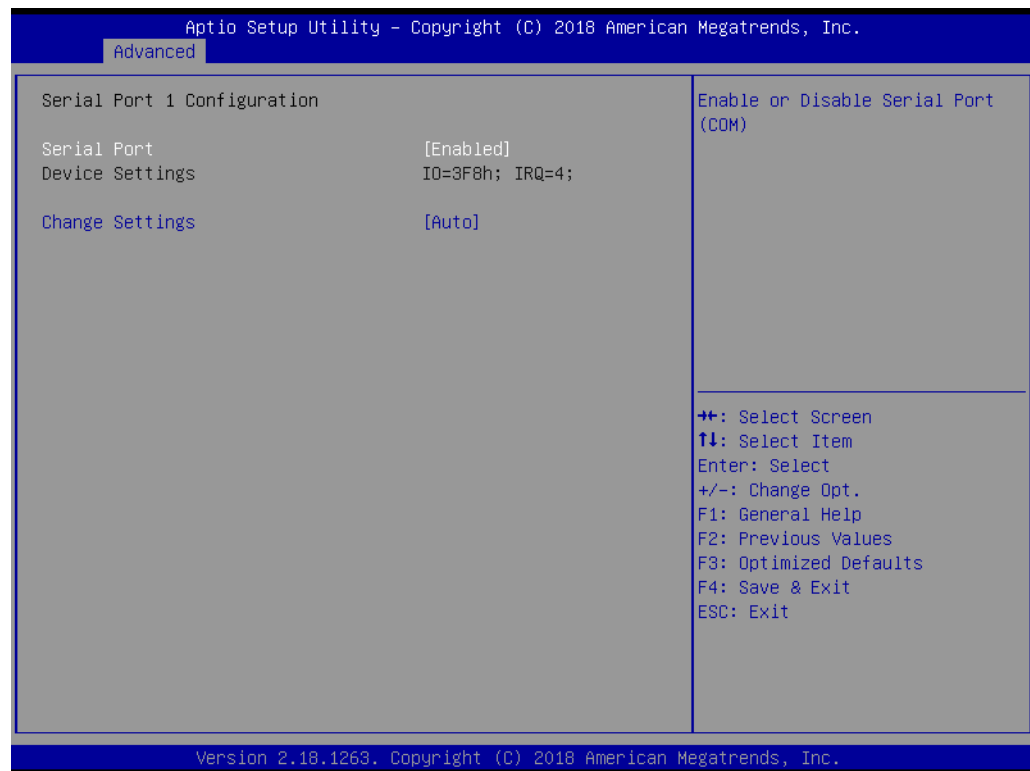


- **Enable ACPI Auto Configuration**
Enable or disable BIOS ACPI auto configuration.
- **Enable Hibernation**
This item allows users enables or disables system ability to hibernate (OS/S4 Sleep State).

- **ACPI Sleep State**
This item allows users to set the ACPI sleep state.
- **Lock Legacy Resources**
This item allows users to lock legacy device resources.

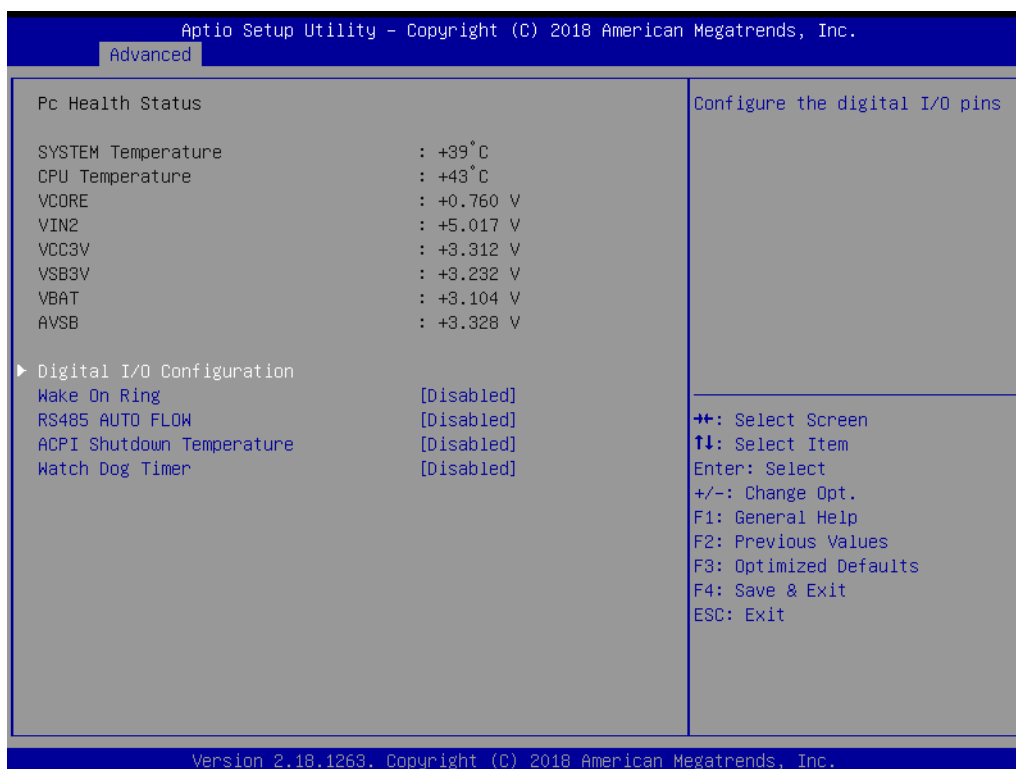
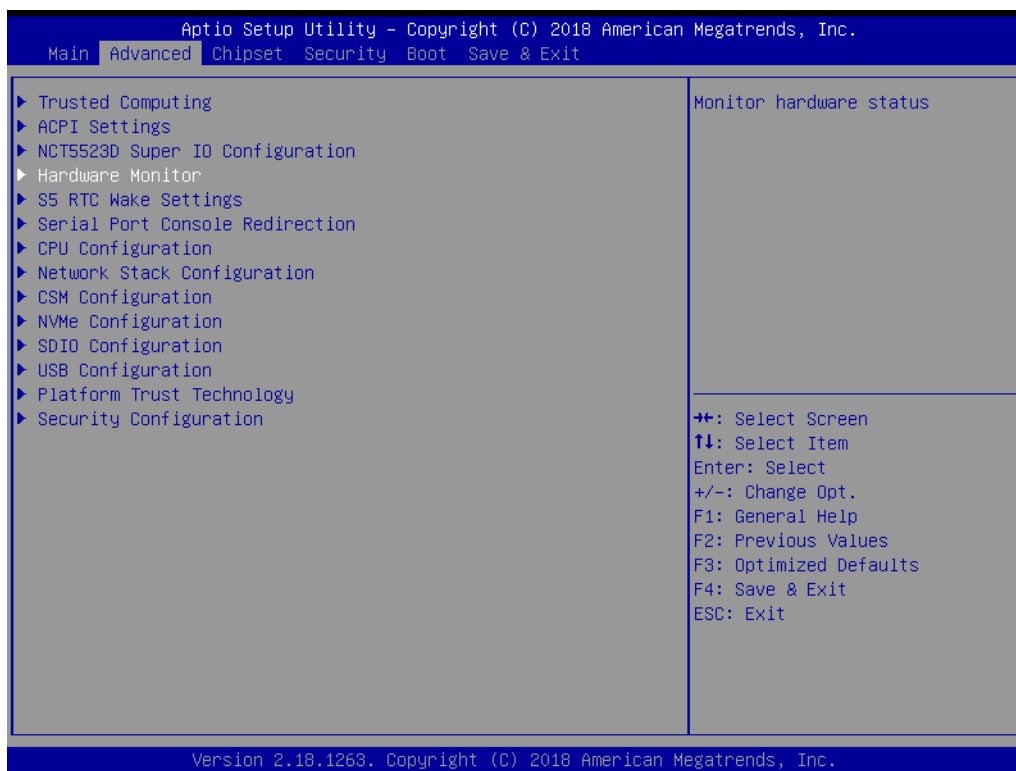
4.2.2.3 NCT5523D Super IO Configuration





- **Serial Port 1&2 Configuration**
This item allows users to enable or disable serial Ports 1/2
- **Change Settings**
This item allows users to change the serial port 1/2

4.2.2.4 Hardware Monitor



This item allows you to monitor HW status

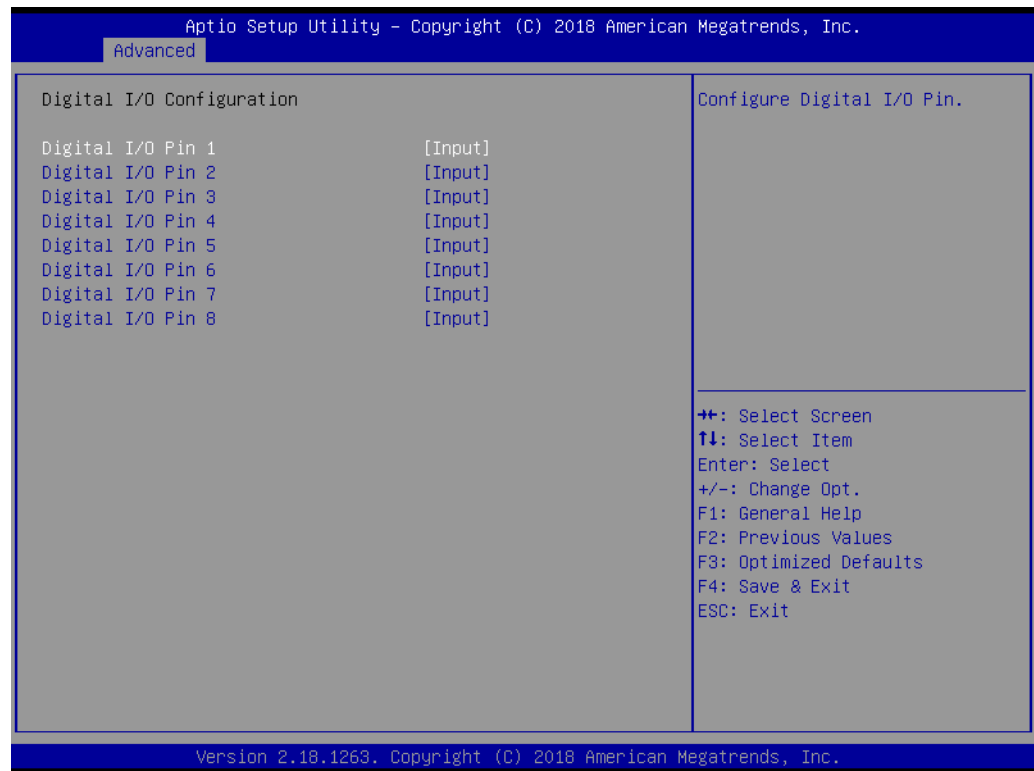
- **Execute Disable Bit**

This item allows users to enable or disable the No-Execution page protection.

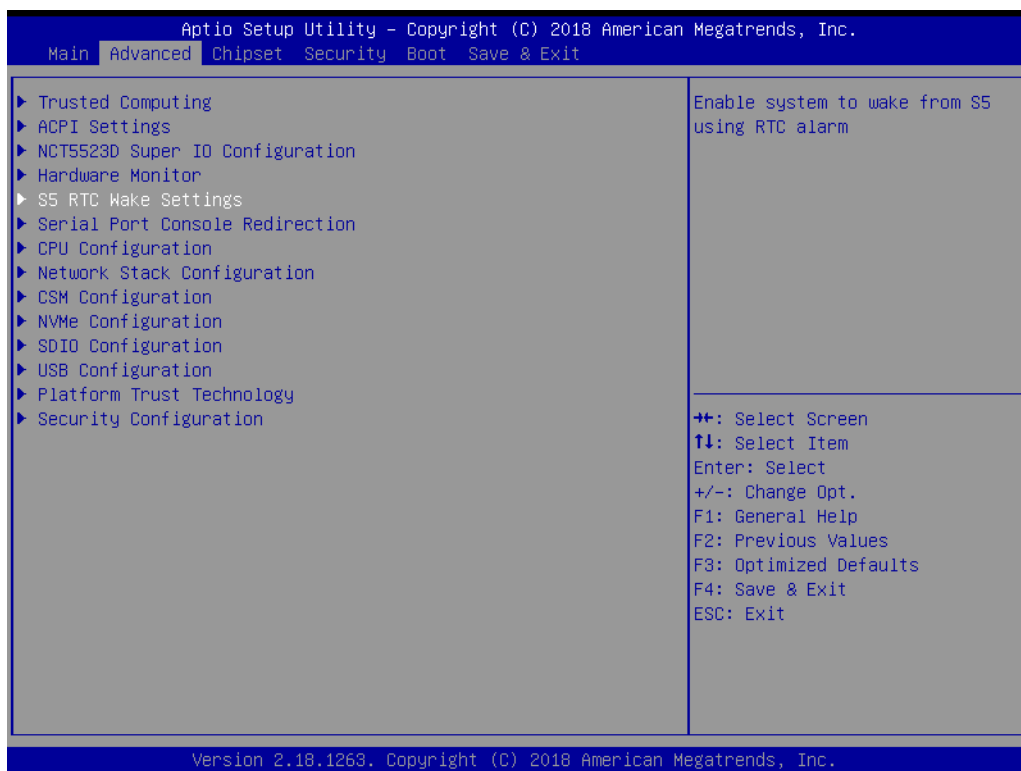
- **Intel Virtualization Technology**

When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

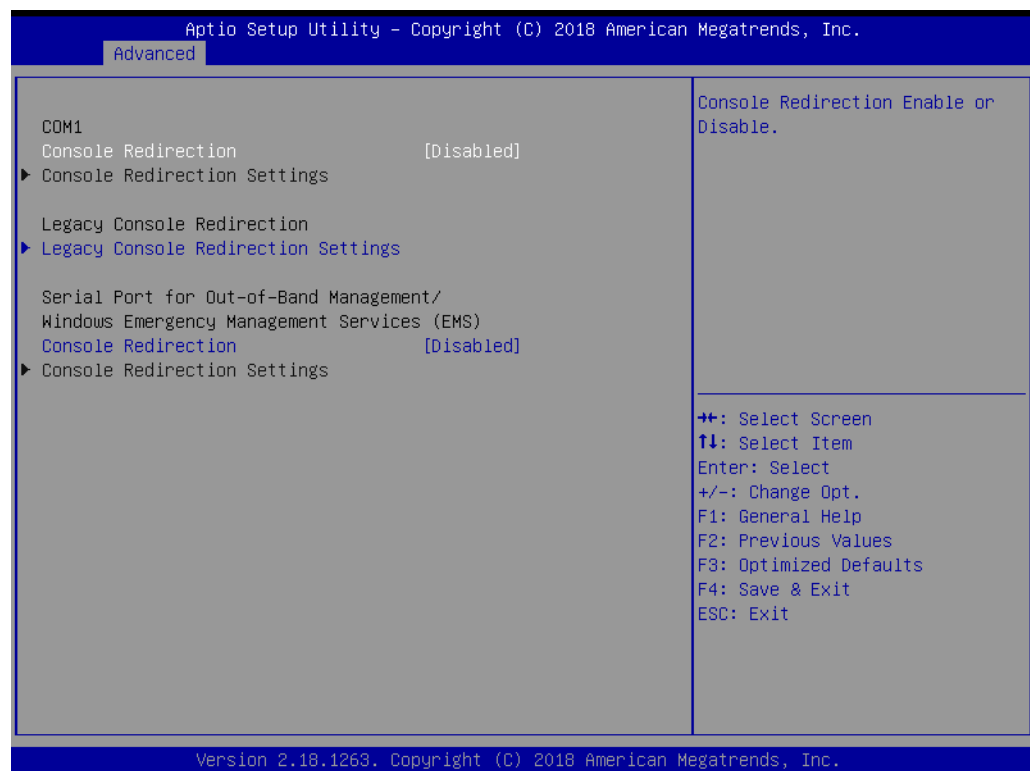
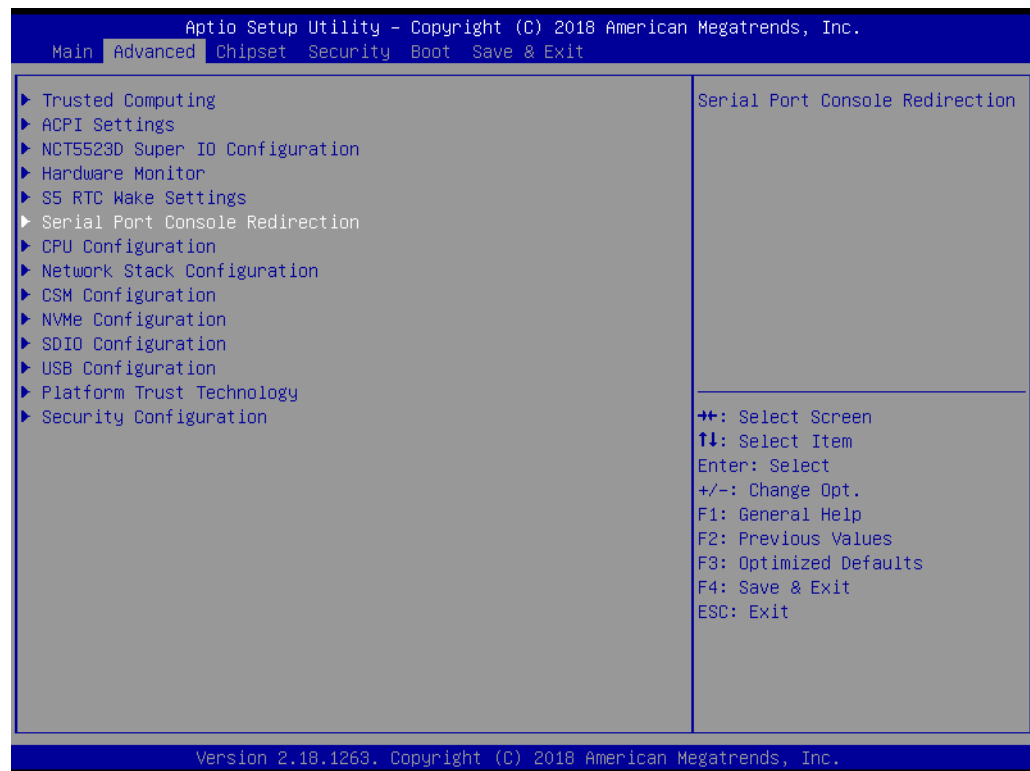
- **Wake On Ring**
This item allows users to enable or disable Wake On Ring functionality.
- **RS-485 AUTO FLOW**
This item allows users to enable or disable the RS-485 AUTO FLOW function.
- **ACPI Shutdown Temperature**
This item allows users to set the CPU temperature threshold at which the system automatically shuts down to prevent the CPU from overheating.
- **Watchdog Timer**
This item allows users to enable or disable the Watchdog timer.



- **Digital I/O Configuration**
This item will allow users to set up Digital I/O 1~8 to "input" or "output".



- **Wake System From S5**
Enable or disable system wake on alarm event.

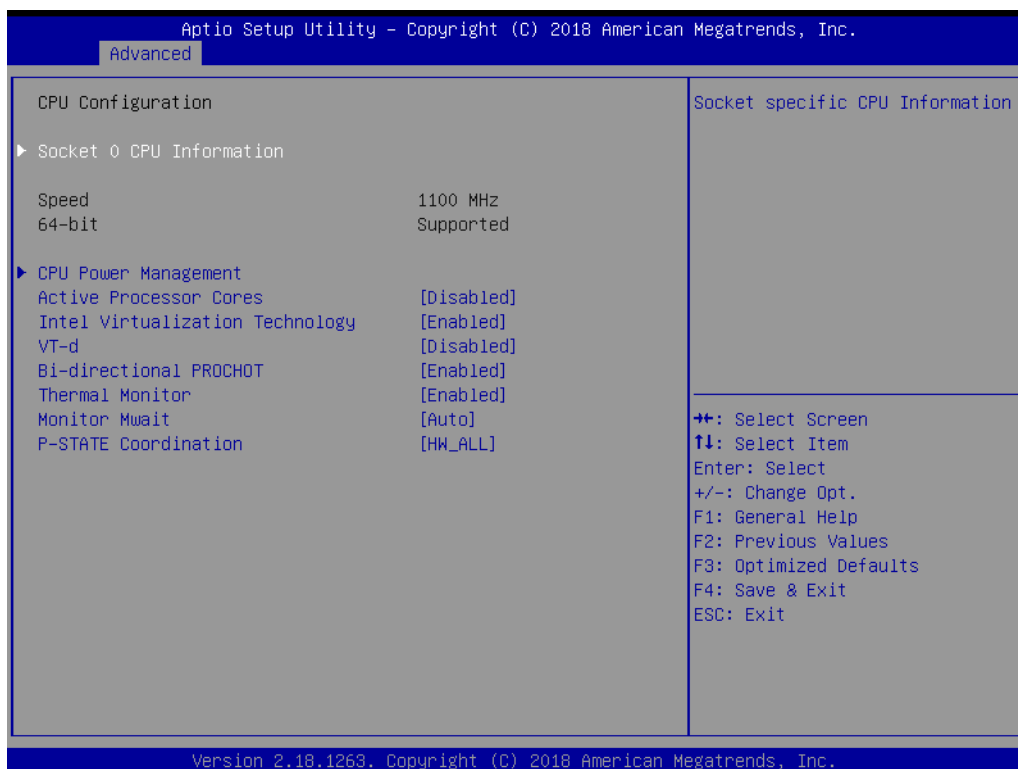
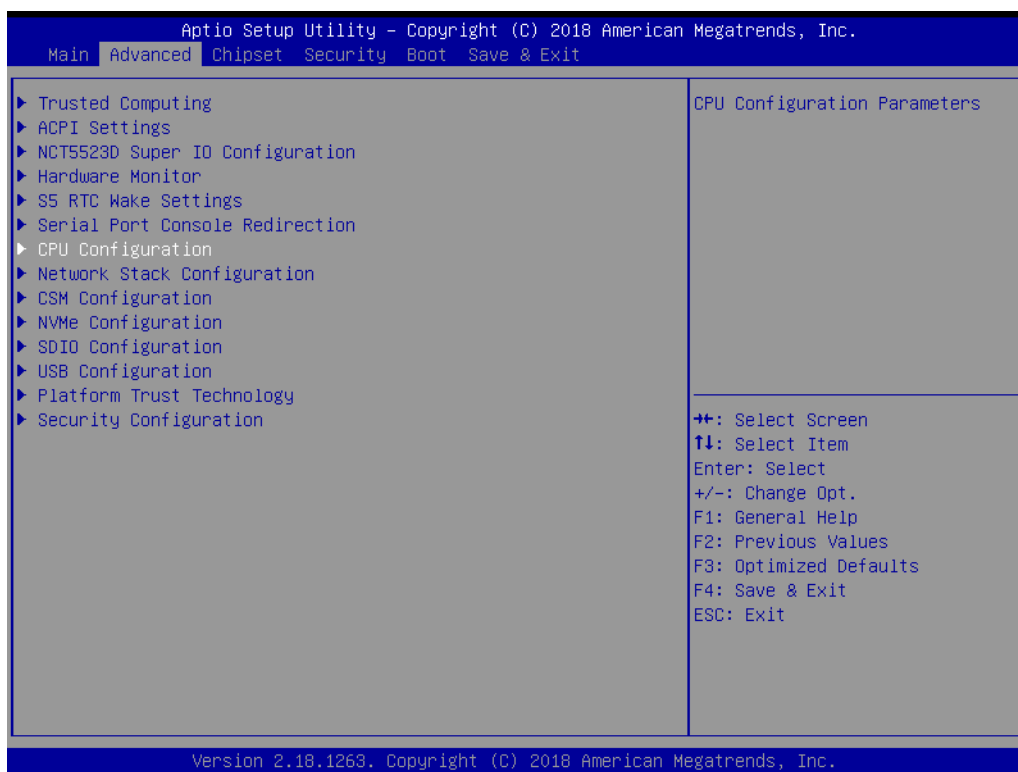


■ Console Redirection

This item allows users to enable or disable console redirection.

4.2.2.5 CPU Configuration

This page shows CPU Information.



- **Active Processor Cores**
Number of cores to enable in each processor package.
- **Intel Virtualization Technology**

When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

- **VT-d**

Enable or disable VT-d

- **Bi-directional PROCHOT**

When a processor thermal sensor trips (either core), the PROCHOT# will be driven. If bi-direction is enabled, external agents can drive PROCHOT# to throttle the processor.

- **Thermal Monitor**

Enable or disable Thermal Monitor

- **Monitor Mwait**

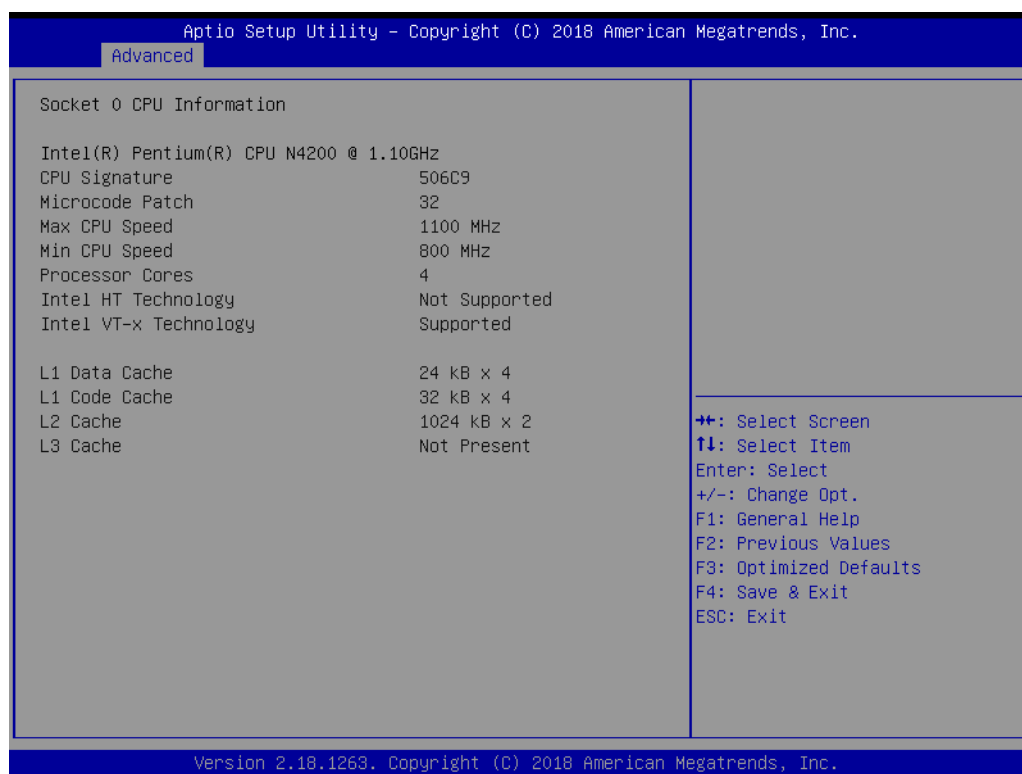
Enable/Disable Monitor Mwait.

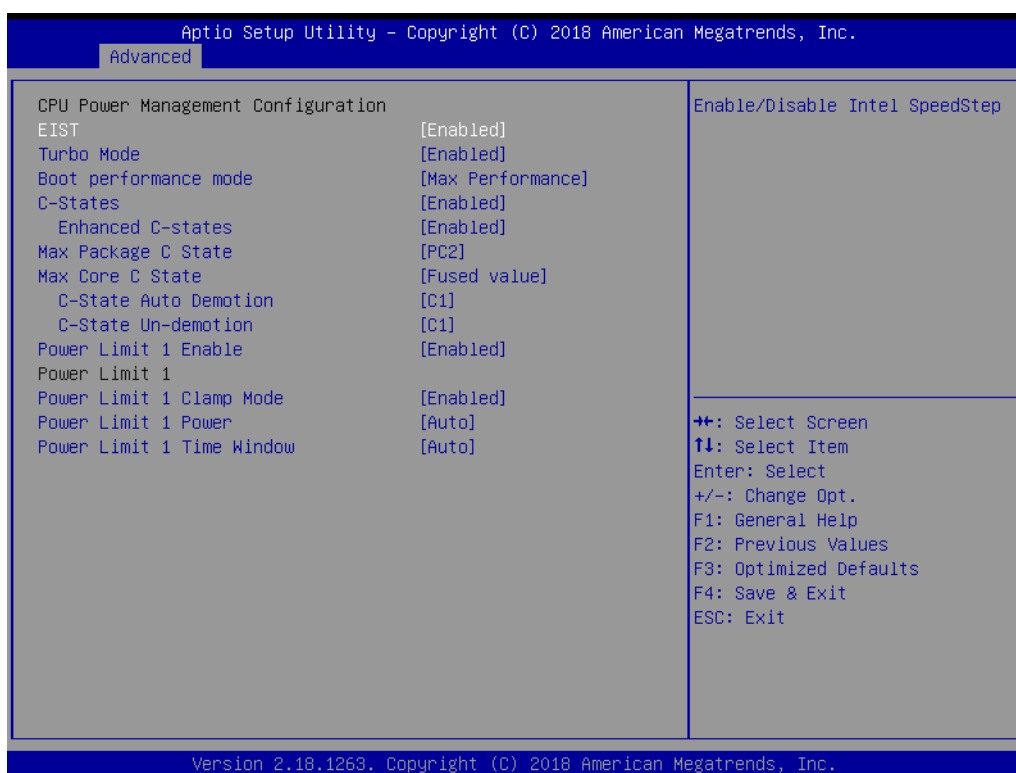
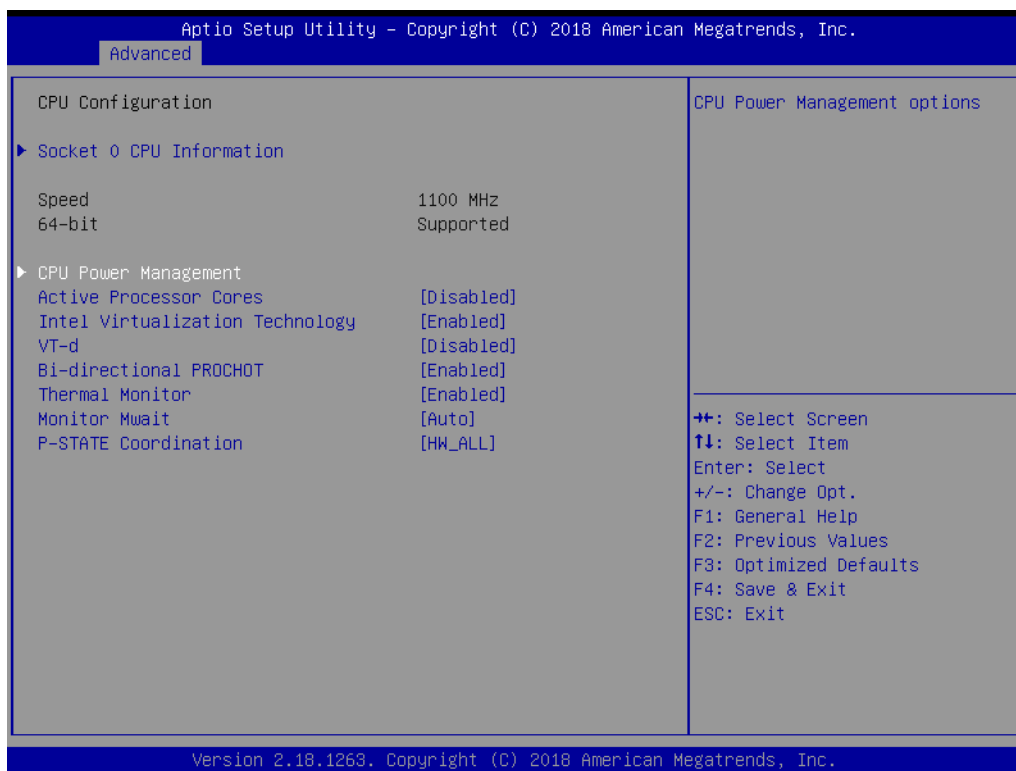
- **VT-d**

Enable/Disable CPU VT-d.

- **P-STATE Coordination**

Change P-STATE Coordination type.





- **EIST**
Enabled or disabled Intel Speed Step function.
- **Turbo Mode**
Enabled or disabled Turbo Mode
- **Boot performance mode**
Select the performance state that the BIOS will set before OS handoff.

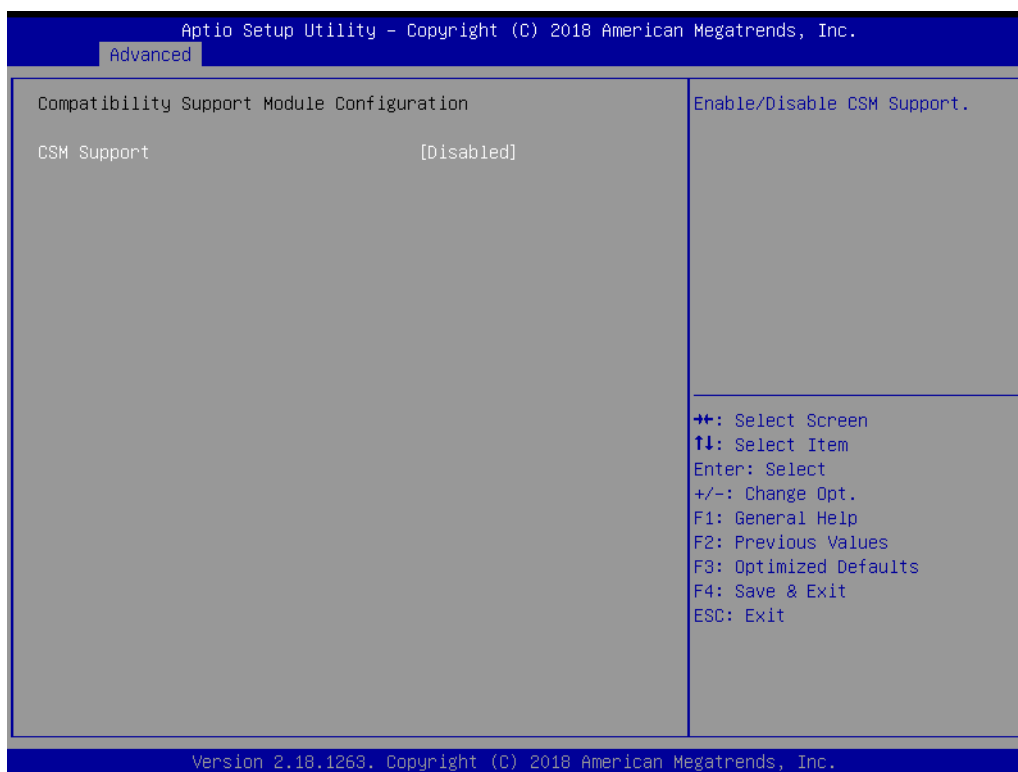
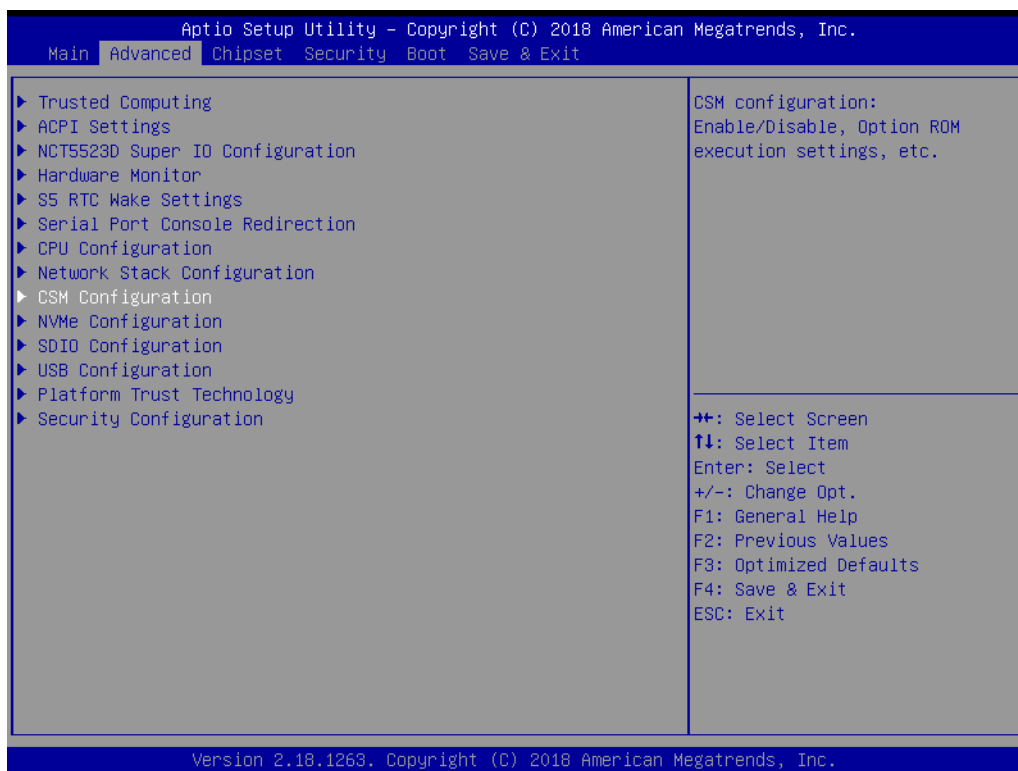
- **C-States**
Enabled or disabled C-States
- **Enhanced C-States**
Enabled or disabled C1E. When enabled, CPU will switch to minimum speed when all cores enter C-State.
- **Max Package C State**
Controls the max package C state that the processor will support.
- **Max Core C State**
This option controls the Max Core C State that cores will support.
- **C-State Auto Demotion**
Configure C-State Auto Demotion.
- **C-State Un-Demotion**
Configure C-State Un-demotion.
- **Power Limit 1 Enable**
Enable/Disable Power Limit 1.
- **Power Limit 1 Clamp Mode**
Enable/Disable Power Limit 1 Clamp Mode.
- **Power Limit 1 Power**
Power Limit 1 in Watts. Auto will program Power Limit 1 based on silicon default support value.
- **Power Limit 1 Time Window**
Power Limit 1 Time Window Value in seconds. Auto will program Power Limit 1 Time Window based on silicon default support value.

4.2.2.6 Network Stack Configuration



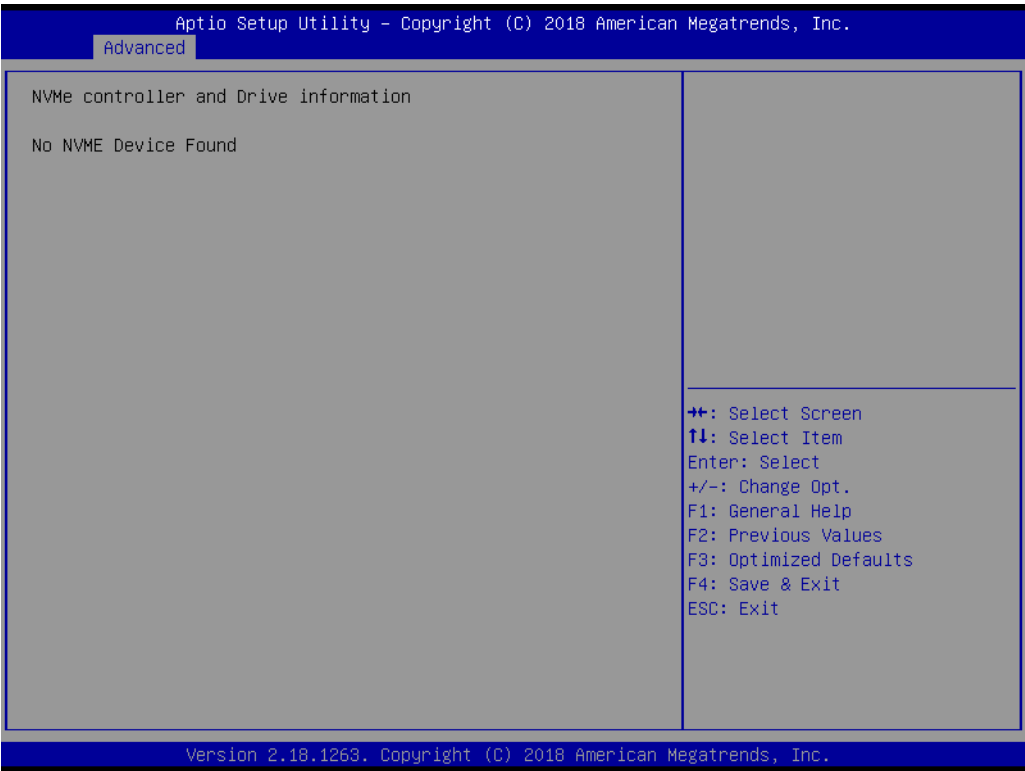
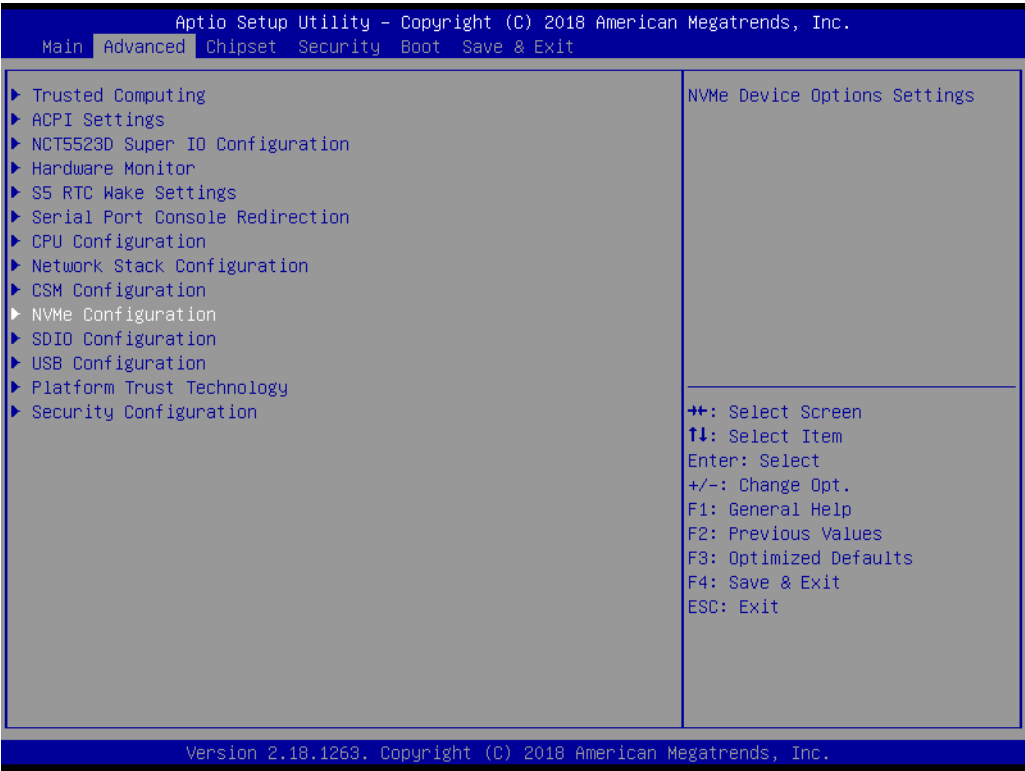
- **Network Stack**
Enable/Disable UEFI Network Stack.

4.2.2.7 CSM Configuration

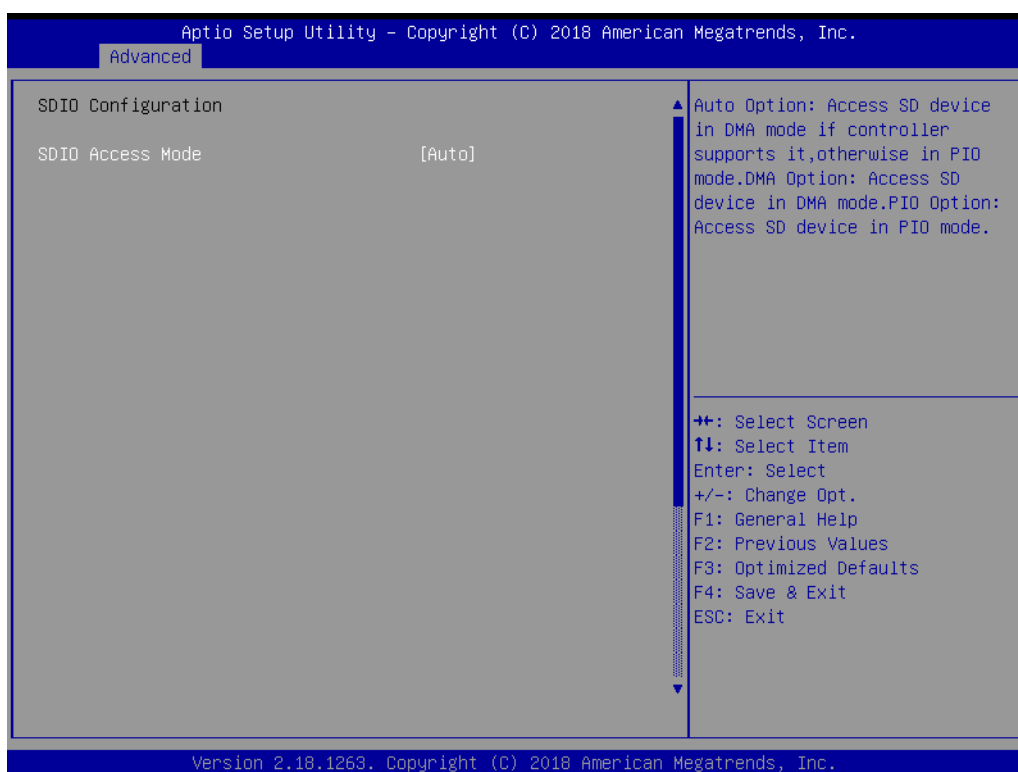
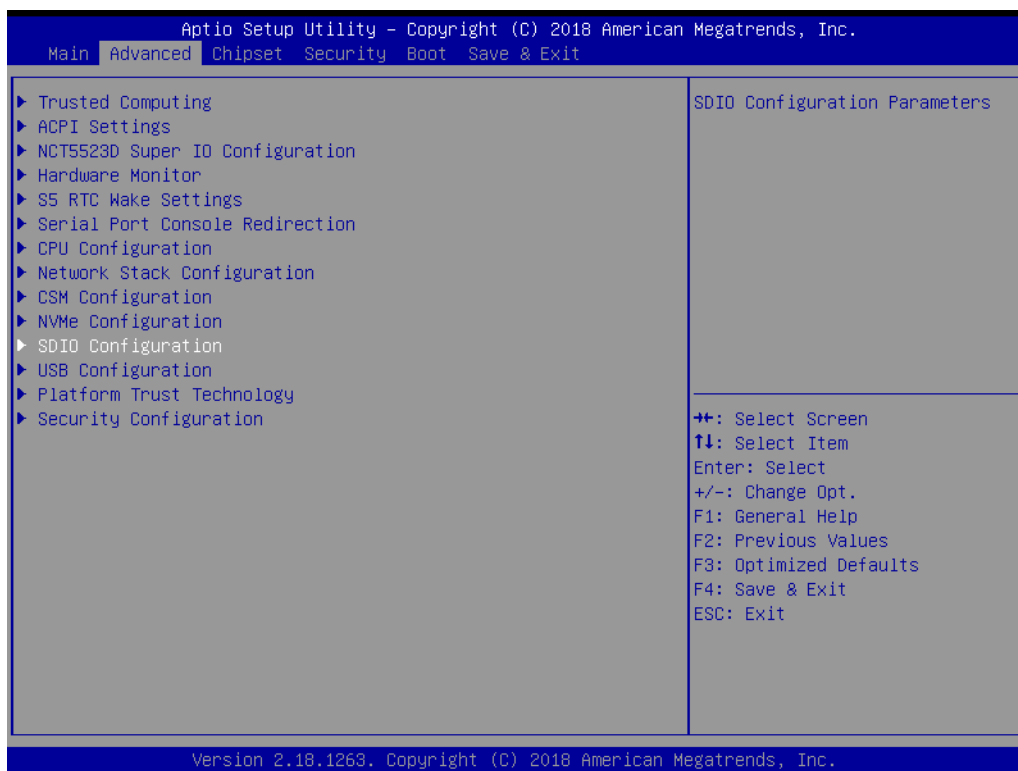


- **CSM Support**
Enable or disable CSM Support.

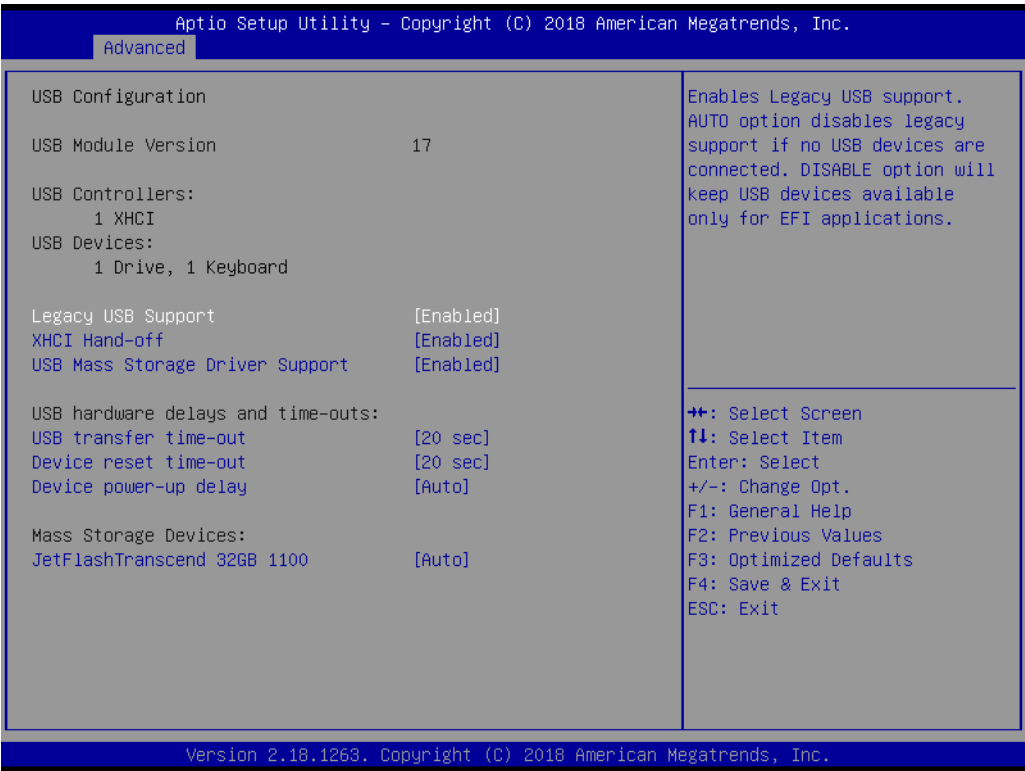
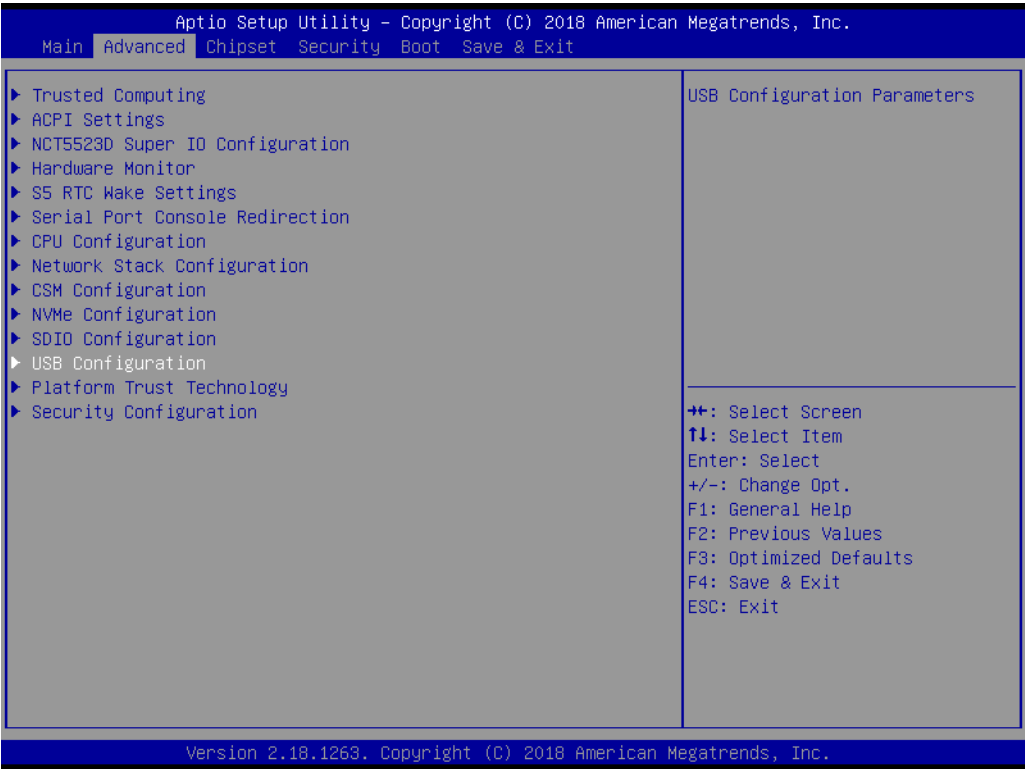
4.2.2.8 NVMe Configuration



4.2.2.9 SDIO Configuration



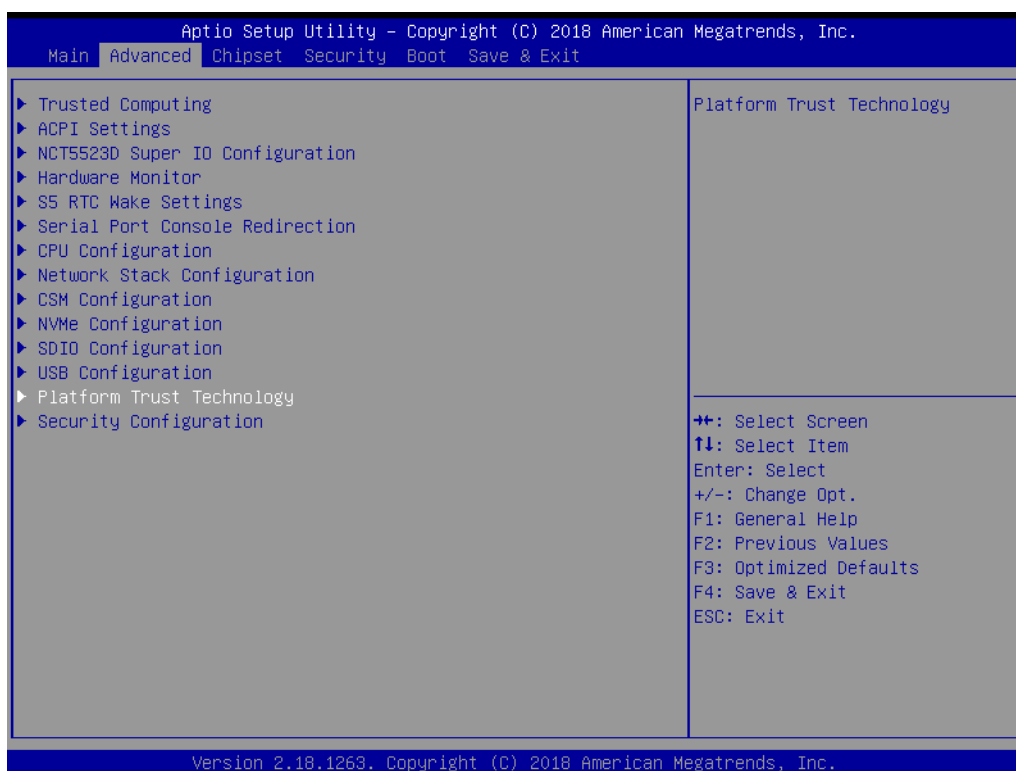
4.2.2.10 USB Configuration



- **Legacy USB Support**
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 applications.

- **XHCI Hand-off**
This is a workaround for OS without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
- **USB Mass Storage Driver Support**
Enable/Disable USB Mass Storage Driver Support.
- **USB transmit time-out**
USB mass storage device transmit command time-out.
- **Device reset time-out**
USB mass storage device start unit command time-out.
- **Device power-up delay**
Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.
- **Mass storage device**
Mass storage device emulation type. 'AUTO' enumerates devices according to their media format. Optical drives are emulated as 'CDROM', drives with no media will be emulated according to a drive type.

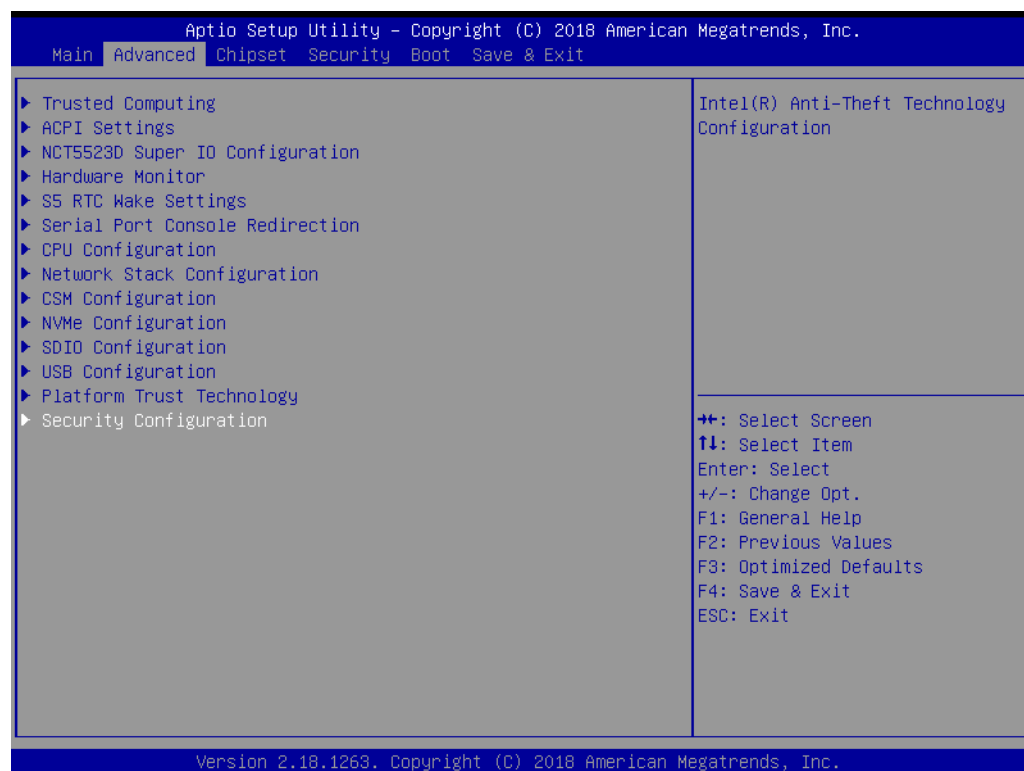
4.2.2.11 Platform Trusted Technology

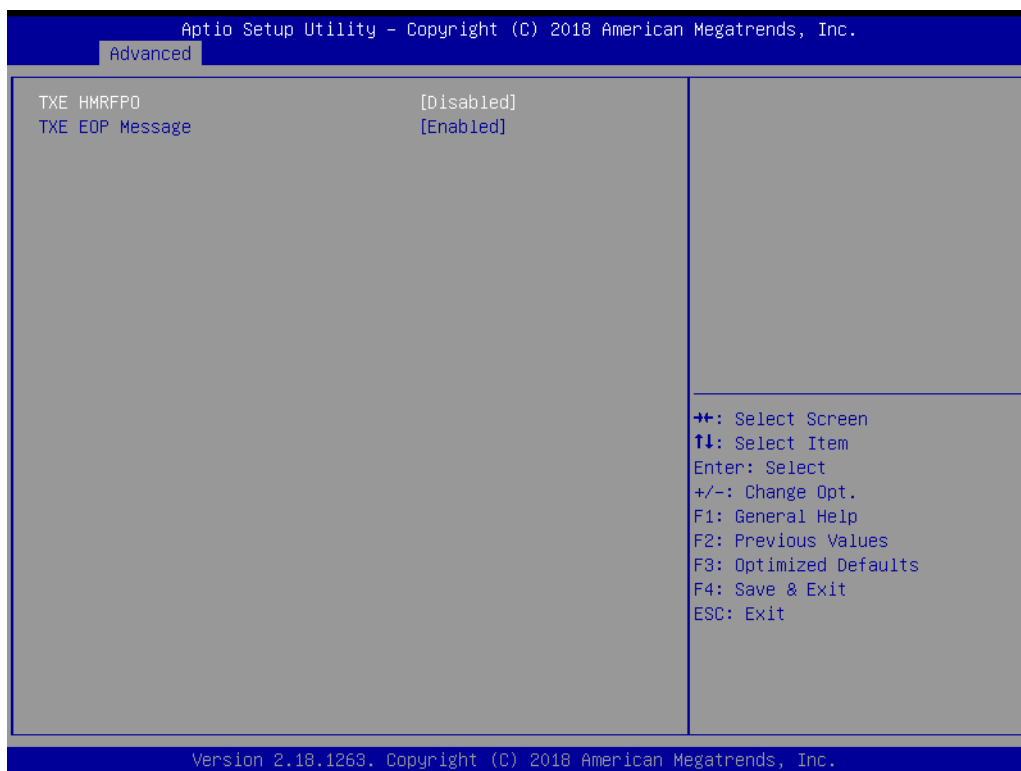




- **fTPM**
Enable or disable fTPM.

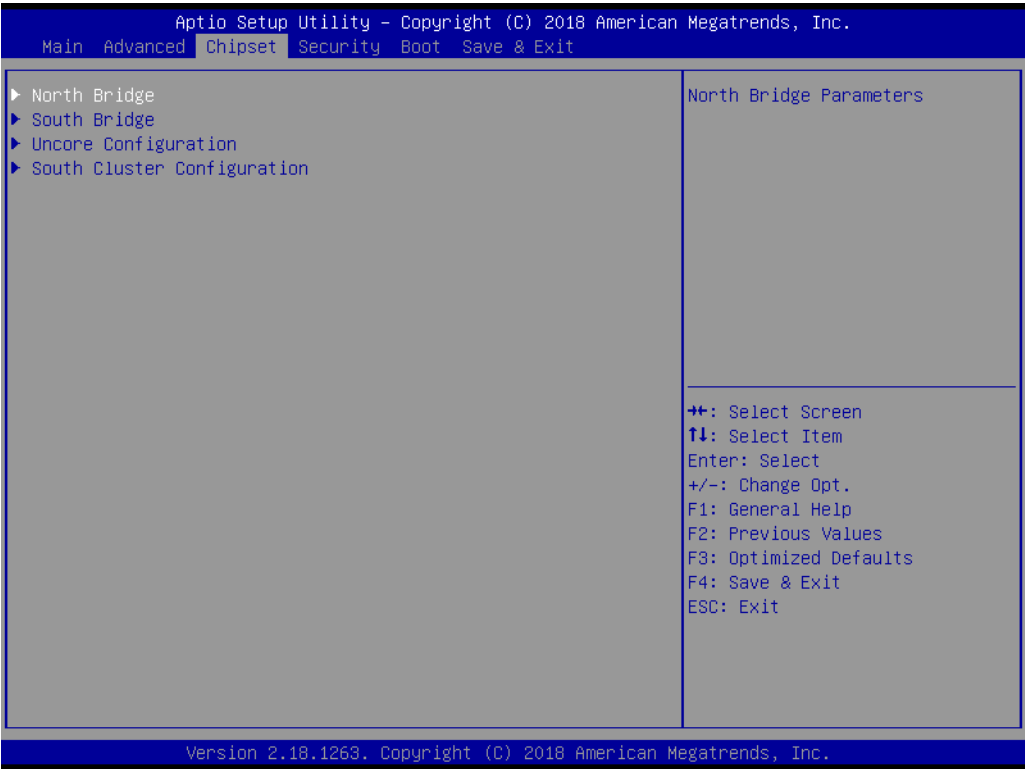
4.2.2.12 Security Configuration



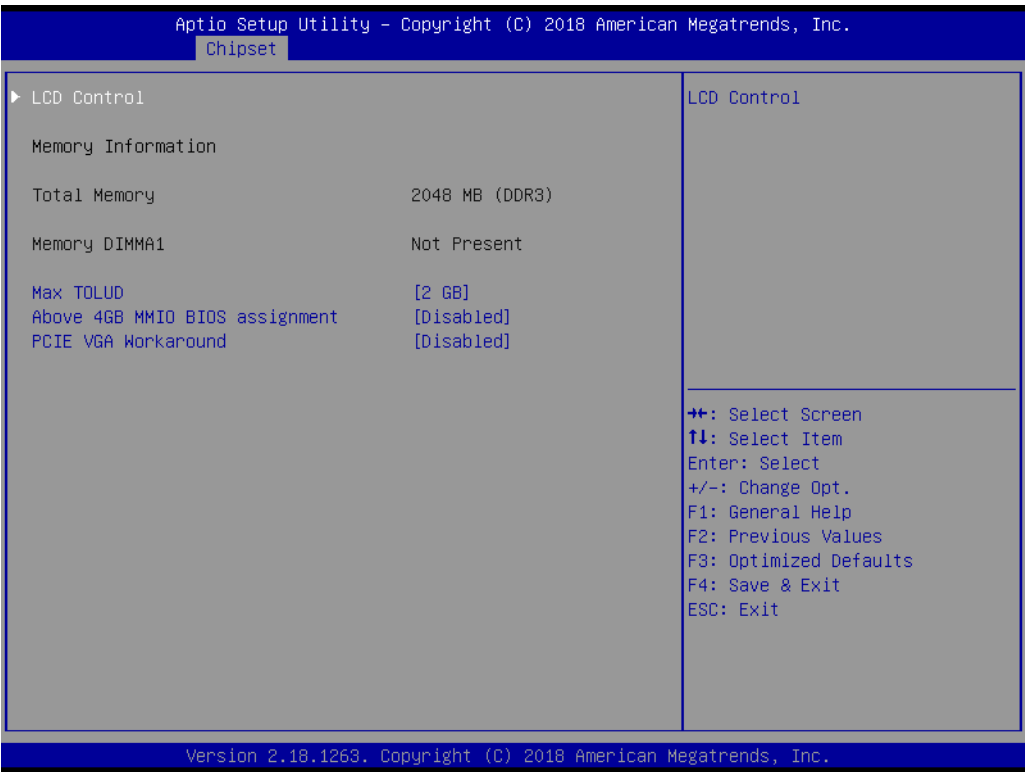


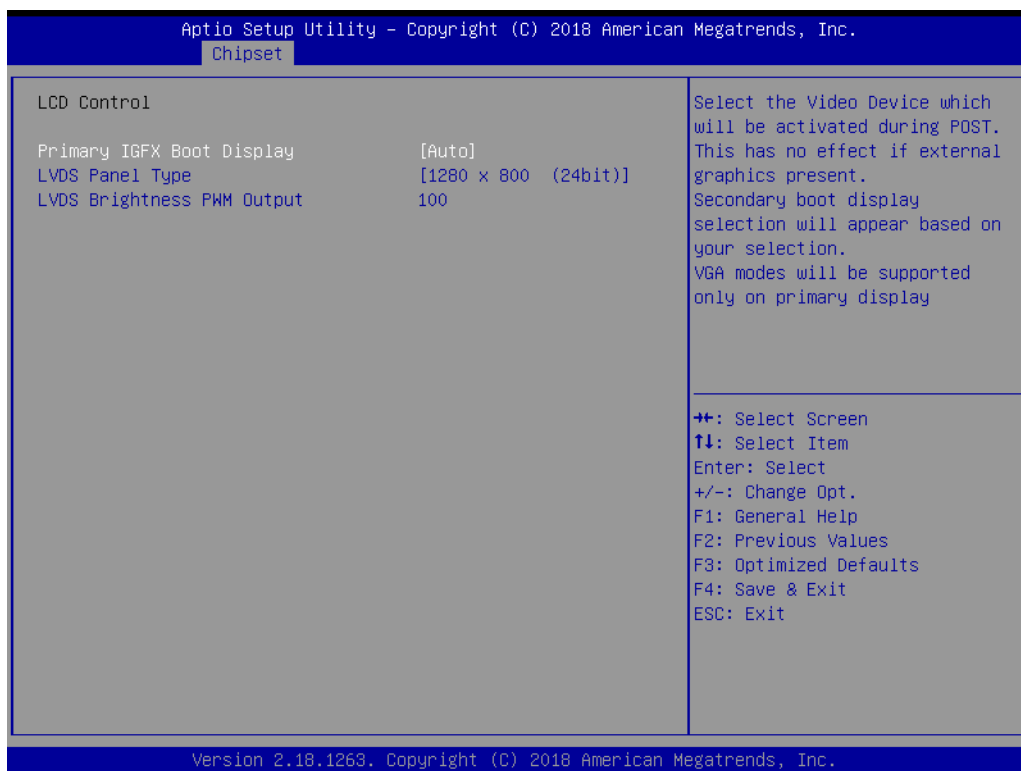
- **TXE HMRFPD**
This item allows users to enable or disable TXE HMRFPD.
- **TXE EOP Message**
Send EOP message before entering OS

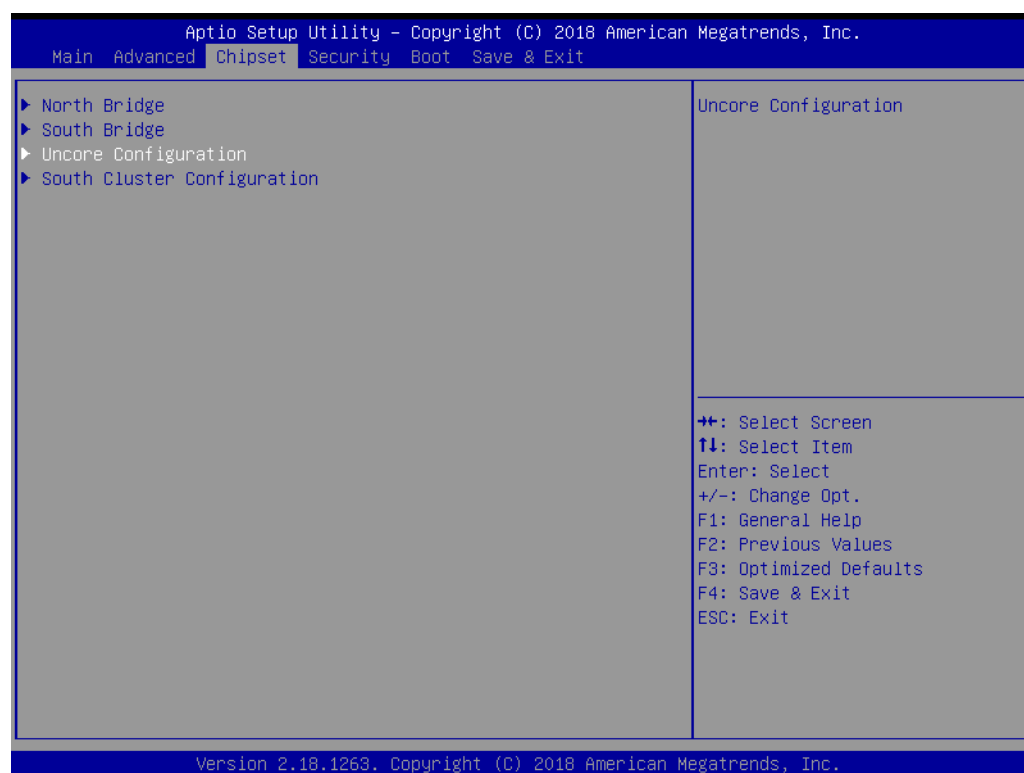
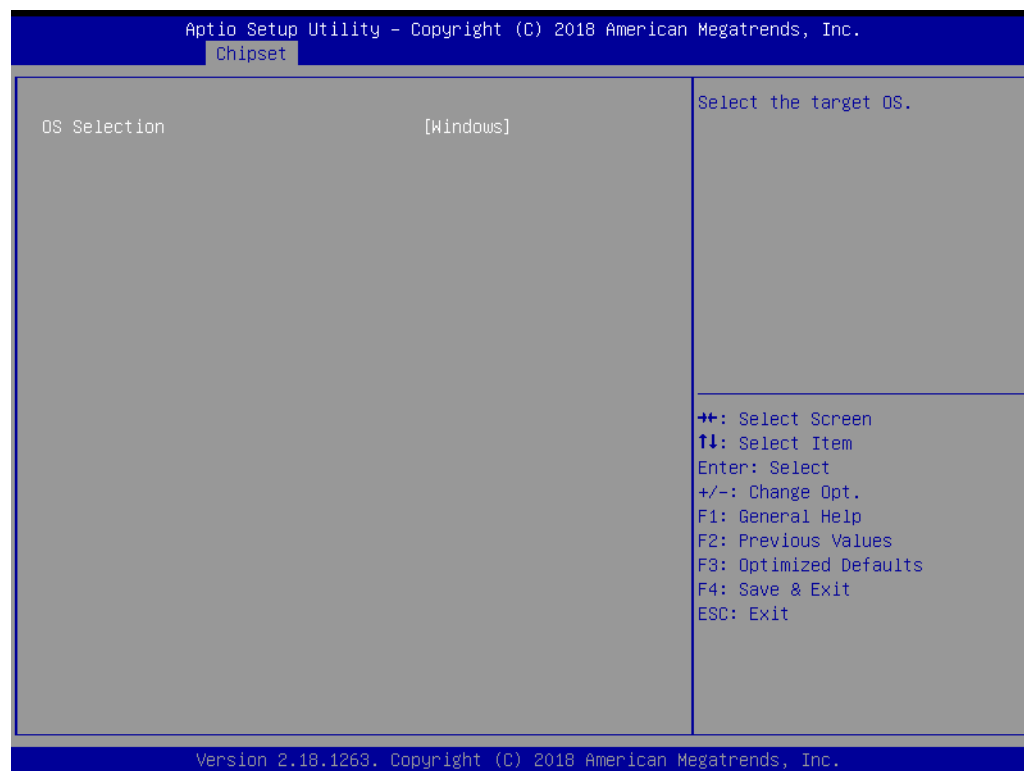
4.2.3 Chipset

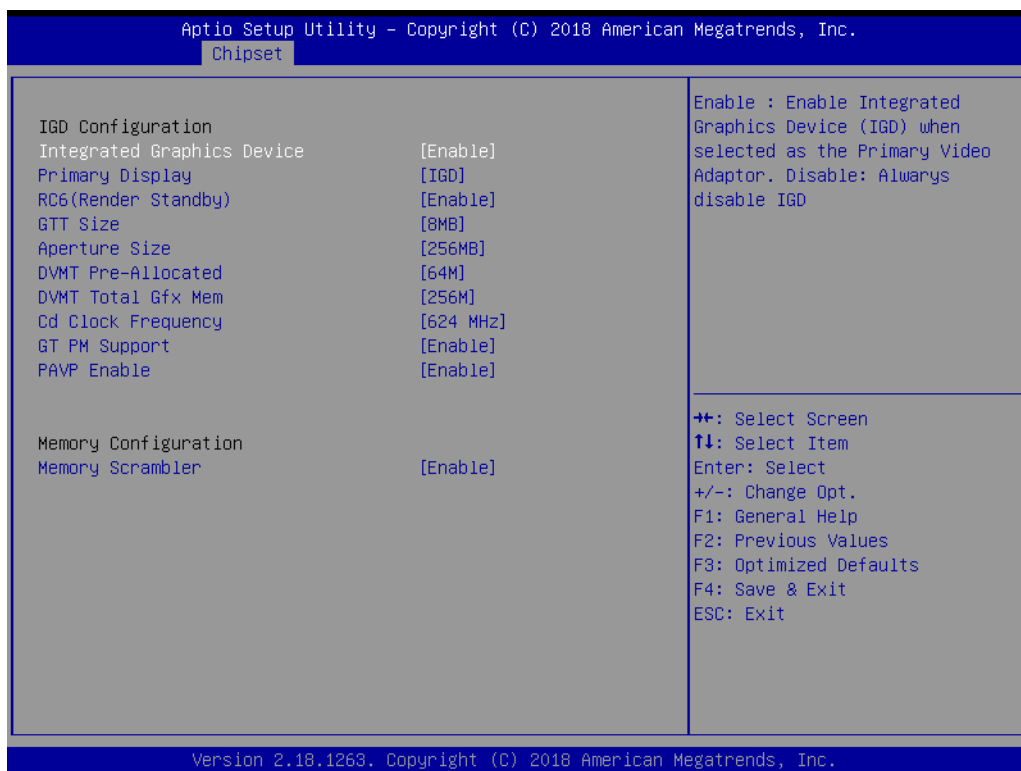


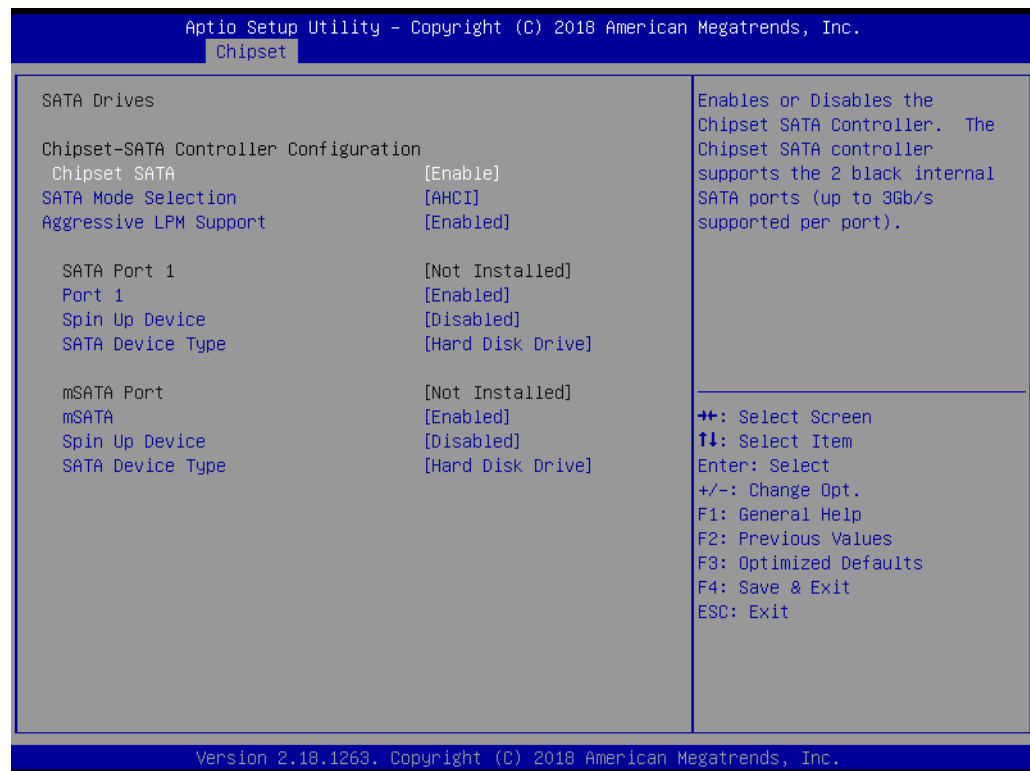
4.2.3.1 North Bridge



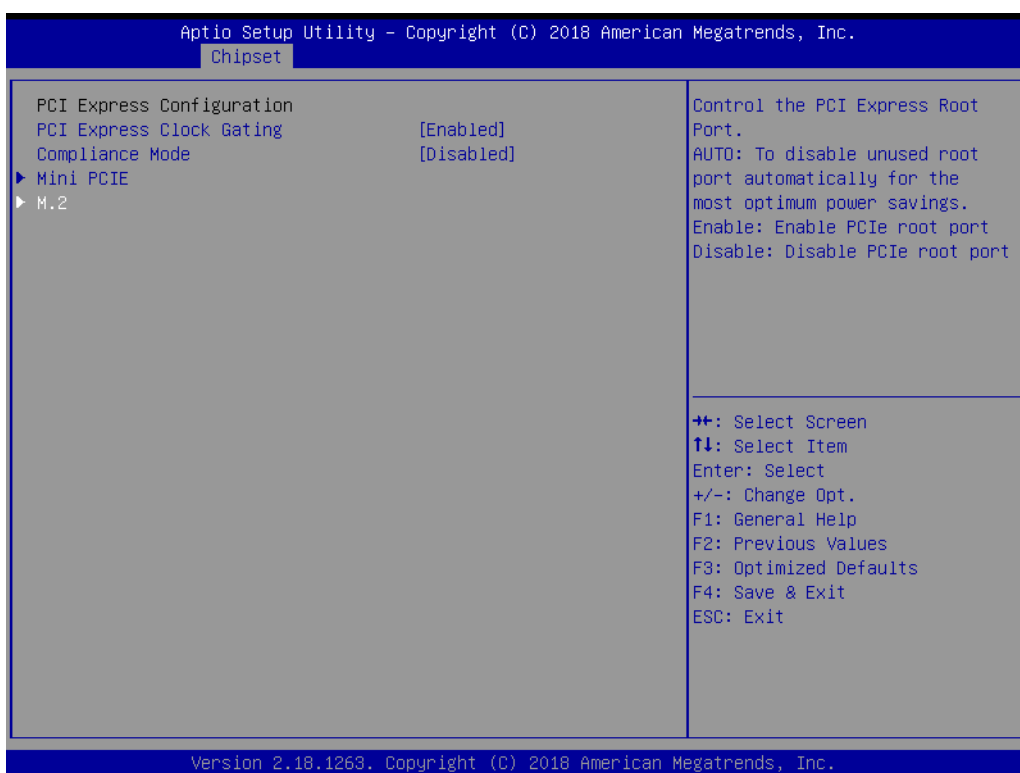
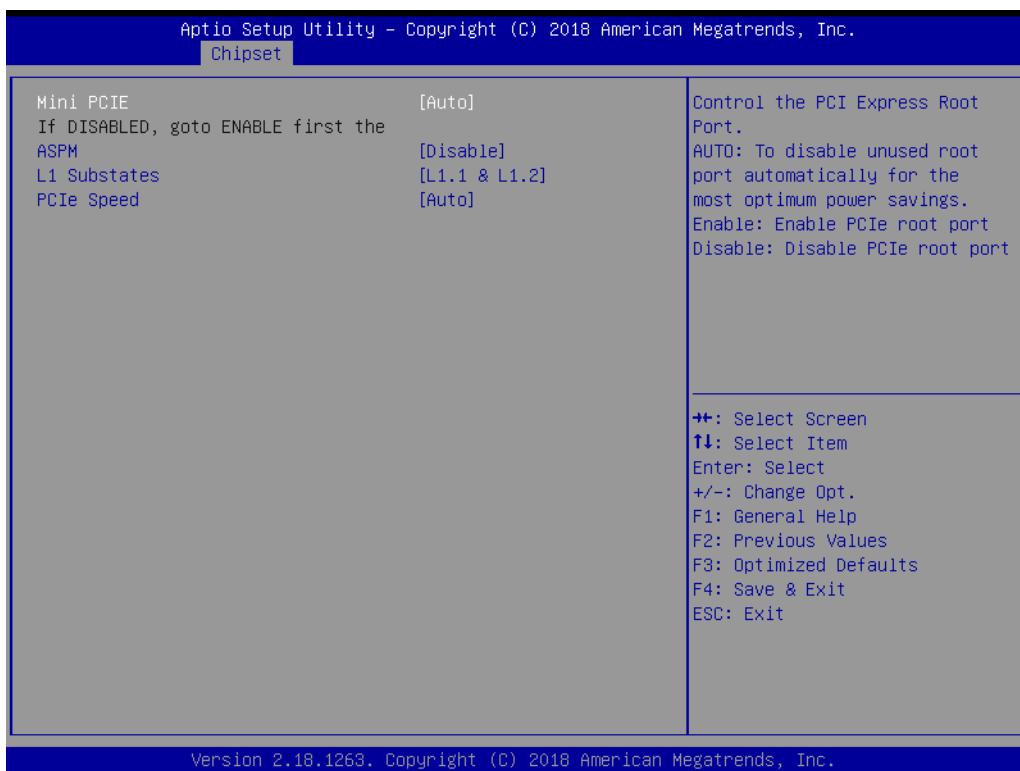


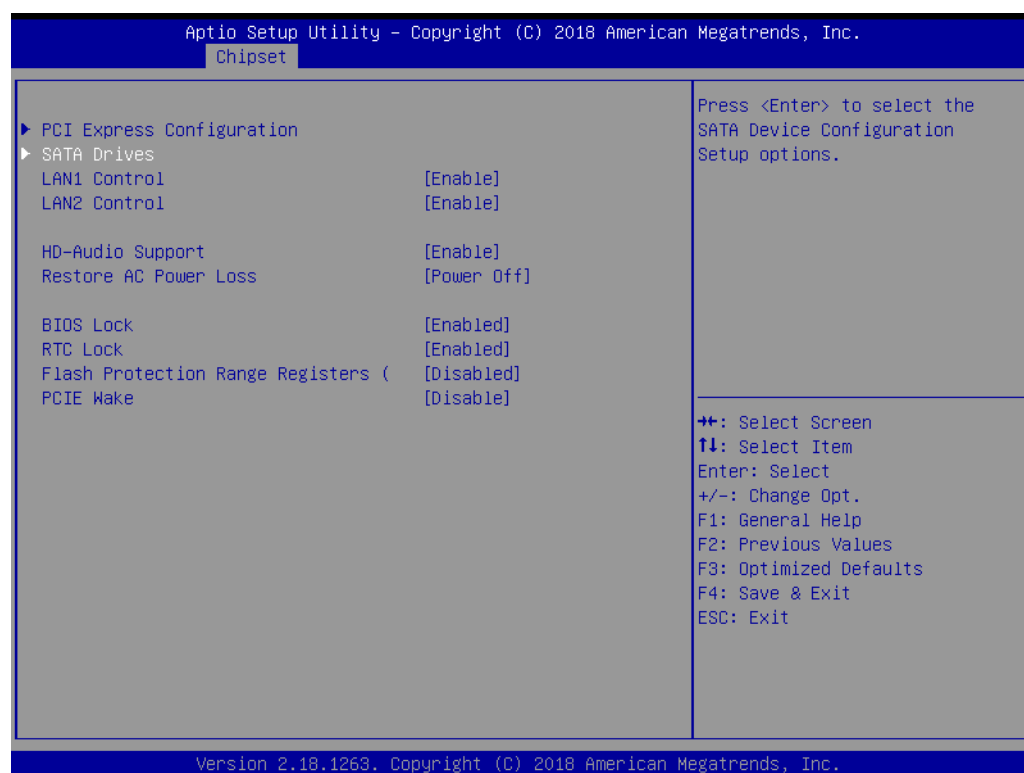




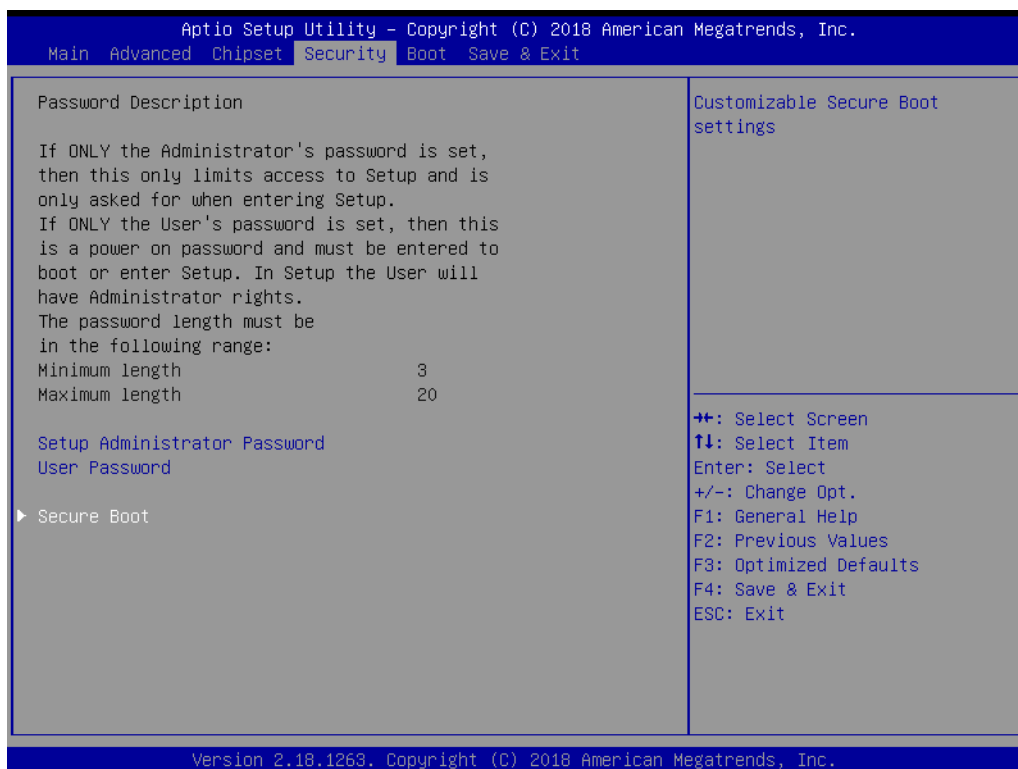


- **Chipset SATA**
Enables or disables the chipset SATA controller. The chipset SATA controller supports two internal SATA ports (up to 3Gb/s per port).
- **SATA Mode Selection**
This item allows users to select the mode of the SATA controller(s).
- **SATA Device Type**
Identify if the SATA type is connected to a solid state drive or hard disk drive.
- **Aggressive LPM Support**
This item allows users to enable or disable Aggressive LPM Support.
- **Spin Up Device**
This item allows users to enable or disable the Spin Up Device.
- **Port 1**
This item allows users to enable or disable the Serial-ATA Port 1 device.
- **Port 2**
This item allows users to enable or disable the Serial-ATA Port 2 device.

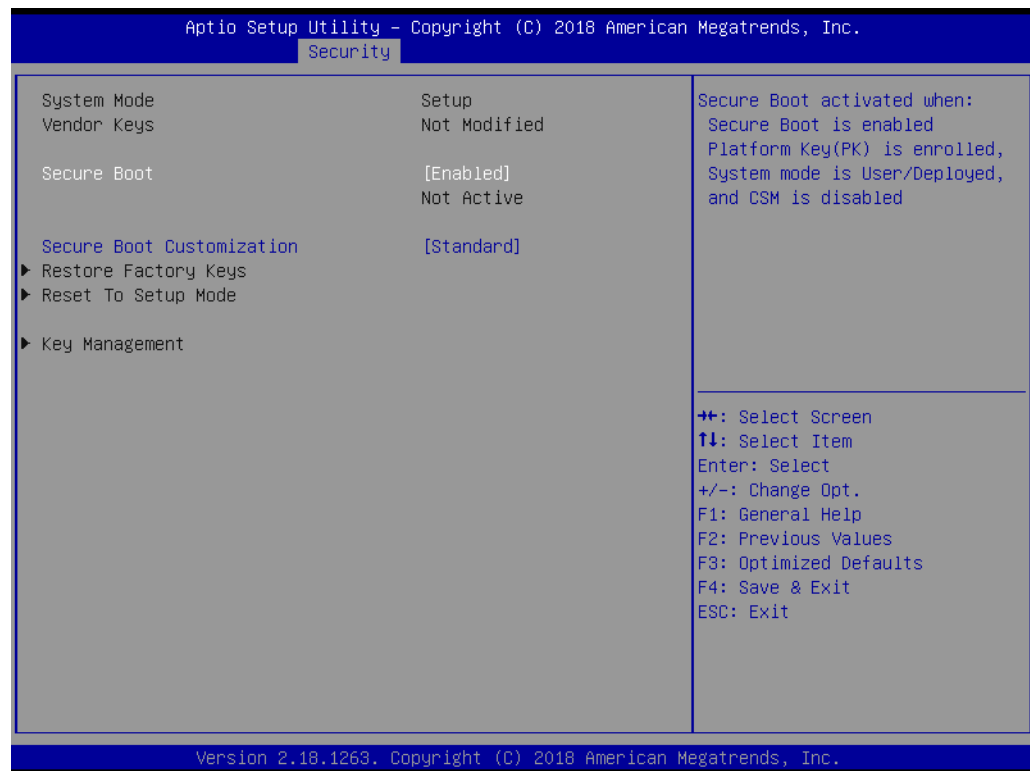




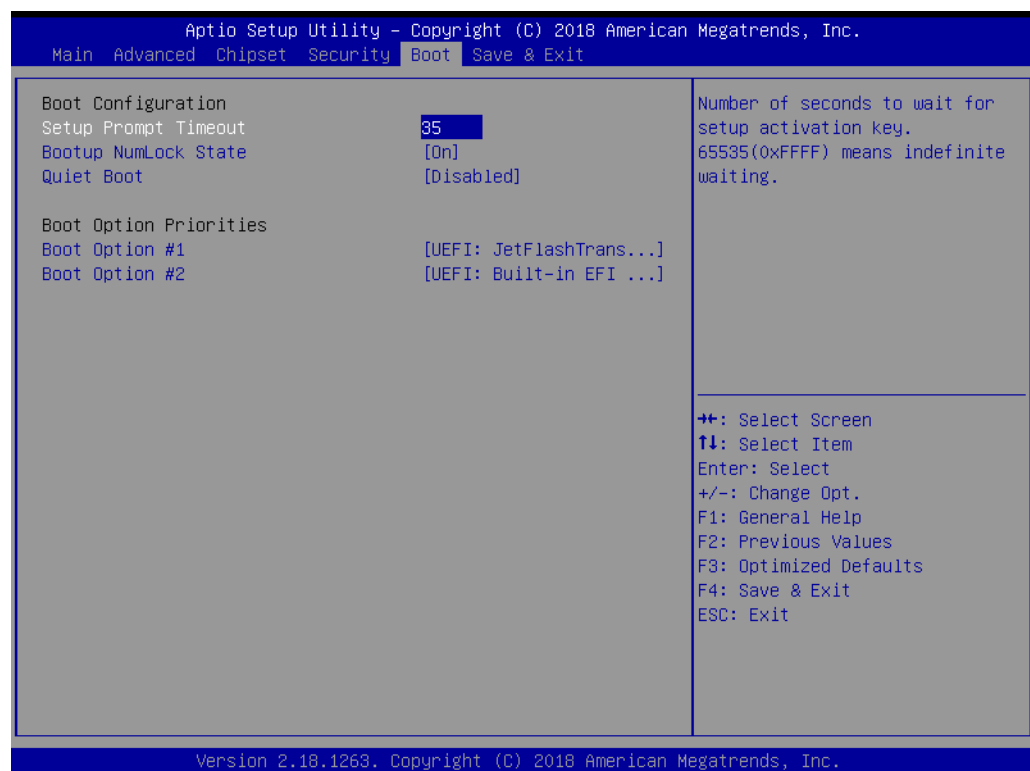
4.2.4 Security Boot



- **Attempt Secure Boot**
Secure Boot activated when platform key (PK) is enrolled, system mode is user/deployed, and CSM function is disabled.
- **Secure Boot Mode**
- Secure Boot mode - Custom & Standard, Set UEFI Secure Boot Mode to STANDARD mode or CUSTOM mode, this change is effect after save. And after eset, the mode will return to STANDARD mode.



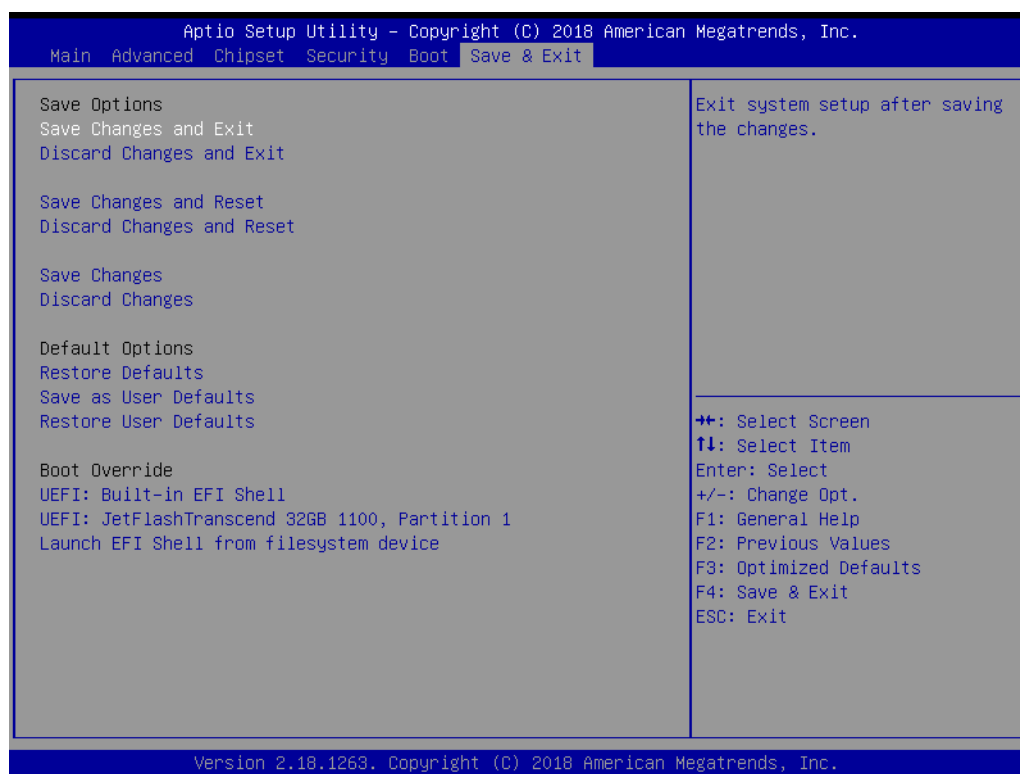
- **Bootup NumLock State**
Select the keyboard NumLock state.
- **Quiet Boot**
Enables or disables Quiet Boot option.



- **Bootup NumLock State**
Select the keyboard NumLock state.

- **Quiet Boot**
Enables or disables Quiet Boot option.

4.2.5 Save & Exit





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