Lanner

Vehicle Computing

Rugged Platforms for Vehicles and Railway Computing

R6S User Manual

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About this Document

This manual describes the overview of the various functionalities of this product, and the information you need to get it ready for operation. It is intended for those who are:

- responsible for installing, administering and troubleshooting this system or Information Technology professionals.
- assumed to be qualified in the servicing of computer equipment, such as professional system integrators, or service personnel and technicians.

Icon Descriptions

The icons are used in the manual to serve as an indication of interest topics or important messages. Below is a description of these icons:

Note or Information: This mark indicates that there is a note of interest and is something that you should pay special attention to while using the product.

Warning or Important: This mark indicates that there is a caution or warning and it is something that could damage your property or product.

Online Resources and Technical Support

To obtain additional documentation resources and software updates for your system, please visit the Lanner Download Center. For certain categories of documents, please register for a Lanner Account at Lanner's official website, in order to access published documents and downloadable resources.

In addition to contacting your distributor or sales representative, you could visit our Lanner Technical Support, to fill in a support ticket to our technical support department.

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Documentation Feedback

Your feedback is valuable to us, as it will help us continue to provide you with more accurate and relevant documentation. To provide any feedback, comments or to report an error, please email to contact@lannerinc.com. Thank you for your time.

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Acknowledgment

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of 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 instruction, 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.

FCC Caution

- Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
- This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Note

1. An unshielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used.
2. Use only shielded cables to connect I/O devices to this equipment.
3. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Important

1. Operations in the 5.15-5.25GHz band are restricted to indoor usage only.
2. This device meets all the other requirements specified in Part 15E, Section 15.407 of the FCC Rules.

Safety Guidelines

Follow these guidelines to ensure general safety:

- Keep the chassis area clear and dust-free during and after installation.
- Do not wear loose clothing or jewelry that could get caught in the chassis. Fasten your tie or scarf and roll up your sleeves.
- Wear safety glasses if you are working under any conditions that might be hazardous to your eyes.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Disconnect all power by turning off the power and unplugging the power cord before installing or removing a chassis or working near power supplies
- Do not work alone if potentially hazardous conditions exist.
- Never assume that power is disconnected from a circuit; always check the circuit.

Consignes de sécurité

Suivez ces consignes pour assurer la sécurité générale :

- Laissez la zone du châssis propre et sans poussière pendant et après l'installation.
- Ne portez pas de vêtements amples ou de bijoux qui pourraient être pris dans le châssis. Attachez votre cravate ou écharpe et remontez vos manches.
- Portez des lunettes de sécurité pour protéger vos yeux.
- N'effectuez aucune action qui pourrait créer un danger pour d'autres ou rendre l'équipement dangereux.
- Coupez complètement l'alimentation en éteignant l'alimentation et en débranchant le cordon d'alimentation avant d'installer ou de retirer un châssis ou de travailler à proximité de sources d'alimentation.
- Ne travaillez pas seul si des conditions dangereuses sont présentes.
- Ne considérez jamais que l'alimentation est coupée d'un circuit, vérifiez toujours le circuit. Cet appareil génère, utilise et émet une énergie radiofréquence et, s'il n'est pas installé et utilisé conformément aux instructions des fournisseurs de composants sans fil, il risque de provoquer des interférences dans les communications radio.

Lithium Battery Caution

- There is risk of Explosion if Battery is replaced by an incorrect type.
- Dispose of used batteries according to the instructions.
- Installation only by a skilled person who knows all Installation and Device Specifications which are to be applied.
- Do not carry the handle of power supplies when moving to another place.
- Please conform to your local laws and regulations regarding safe disposal of lithium BATTERY.
- Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery can result in an explosion.
- Leaving a battery in an extremely high temperature surrounding environment 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.

Avertissement concernant la pile au lithium

- Risque d'explosion si la pile est remplacée par une autre d'un mauvais type.
- Jetez les piles usagées conformément aux instructions.
- L'installation doit être effectuée par un électricien formé ou une personne formée à l'électricité connaissant toutes les spécifications d'installation et d'appareil du produit.
- Ne transportez pas l'unité en la tenant par le câble d'alimentation lorsque vous déplacez l'appareil.

Operating Safety

- Electrical equipment generates heat. Ambient air temperature may not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Be sure that the room in which you choose to operate your system has adequate air circulation.
- Ensure that the chassis cover is secure. The chassis design allows cooling air to circulate effectively. An open chassis permits air leaks, which may interrupt and redirect the flow of cooling air from internal components.
- Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD damage occurs when electronic components are improperly handled and can result in complete or intermittent failures. Be sure to follow ESD-prevention procedures when removing and replacing components to avoid these problems.
- Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. If no wrist strap is available, ground yourself by touching the metal part of the chassis.
- Periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms (Mohms).

Sécurité de fonctionnement

- L'équipement électrique génère de la chaleur. La température ambiante peut ne pas être adéquate pour refroidir l'équipement à une température de fonctionnement acceptable sans circulation adaptée. Vérifiez que votre site propose une circulation d'air adéquate.
- Vérifiez que le couvercle du châssis est bien fixé. La conception du châssis permet à l'air de refroidissement de bien circuler. Un châssis ouvert laisse l'air s'échapper, ce qui peut interrompre et rediriger le flux d'air frais destiné aux composants internes.
- Les décharges électrostatiques (ESD) peuvent endommager l'équipement et gêner les circuits électriques. Des dégâts d'ESD surviennent lorsque des composants électroniques sont mal manipulés et peuvent causer des pannes totales ou intermittentes. Suivez les procédures de prévention d'ESD lors du retrait et du remplacement de composants.
- Portez un bracelet anti-ESD et veillez à ce qu'il soit bien au contact de la peau. Si aucun bracelet n'est disponible, reliez votre corps à la terre en touchant la partie métallique du châssis.
- Vérifiez régulièrement la valeur de résistance du bracelet antistatique, qui doit être comprise entre 1 et 10 mégohms (Mohms).

Mounting Installation Precaution

The following should be put into consideration for rackmount or similar mounting installations:

- Do not install and/or operate this unit in any place that flammable objects are stored or used in.
- The installation of this product must be performed by trained specialists; otherwise, a non-specialist might create the risk of the system's falling to the ground or other damages.
- Lanner Electronics Inc. shall not be held liable for any losses resulting from insufficient strength for supporting the system or use of inappropriate installation components.
- Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.
- Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of airflow required for safe operation of the equipment is not compromised.
- Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

- Reliable Grounding - Reliable grounding of rack mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

Installation & Operation :

- This equipment must be grounded. The power cord for product should be connected to a socket-outlet with earthing connection.
  Cet équipement doit être mis à la terre. La fiche d'alimentation doit être connectée à une prise de terre correctement câblée
- Suitable for installation in Information Technology Rooms in accordance with Article 645 of the National Electrical Code and NFPA 75.
  Peut être installé dans des salles de matériel de traitement de l'information conformément à l'article 645 du National Electrical Code et à la NFPA 75.
- The machine can only be used in a restricted access location and must be installed by a skilled person.
  Les matériels sont destinés à être installés dans des EMPLACEMENTS À ACCÈS RESTREINT.
- This product is intended to be supplied by a Listed Power Adapter or DC power source, rated 12-24Vdc, 17.5-8A minimum, Tma = 70°C, and the altitude of operation = 5000m.

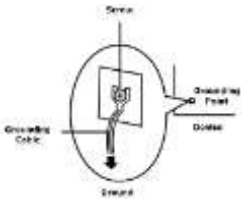
Electrical Safety Instructions

Before turning on the device, ground the grounding cable of the equipment. Proper grounding (grounding) is very important to protect the equipment against the harmful effects of external noise and to reduce the risk of electrocution in the event of a lightning strike. To uninstall the equipment, disconnect the ground wire after turning off the power. A ground wire is required and the part connecting the conductor must be greater than 4 mm2 or 10 AWG.

Consignes de sécurité électrique

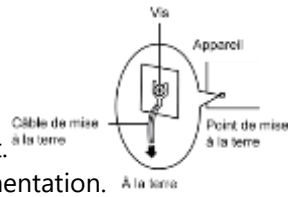
- Avant d'allumer l'appareil, reliez le câble de mise à la terre de l'équipement à la terre.
- Une bonne mise à la terre (connexion à la terre) est très importante pour protéger l'équipement contre les effets néfastes du bruit externe et réduire les risques d'électrocution en cas de foudre.
- Pour désinstaller l'équipement, débranchez le câble de mise à la terre après avoir éteint l'appareil.
- Un câble de mise à la terre est requis et la zone reliant les sections du conducteur doit faire plus de 4 mm2 ou 10 AWG.

Grounding Procedure for Power Source



- Loosen the screw of the earthing point.
- Connect the grounding cable to the ground.
- The protection device for the power source must provide 30 A current.
- This protection device must be connected to the power source before power.
- The cable hould 16 AWG

Procédure de mise à la terre pour source d'alimentation



- Desserrez la vis du terminal de mise à la terre.
- Branchez le câble de mise à la terre à la terre.
- L'appareil de protection pour la source d'alimentation doit fournir 30 A de courant.
- Cet appareil de protection doit être branché à la source d'alimentation avant l'alimentation.
- Le câble doit 16 AWG

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CHAPTER 1 : PRODUCT OVERVIEW

Built for rolling stock settings, R6S has gone through extensive vibration and shock testing. The system is certified with EN 50155, EN 50121-3-2, EN 50121-4, EN 50125-3 and EN 45545 standard as a fan-less rolling stock computer. R6S not only features high-performance Intel Core i7-7600U CPU, but also boasts an abundance of I/O and internal expansion capabilities, including 10x M12 PoE ports, 1x Removable 2.5" drive bay for 2x storages, 2x COM ports, dual video ports (DVI-D/VGA), USB, and DIDO ports, making it perfect for rolling stock control and monitoring, infotainment, video surveillance and fleet management.

Main Features

- Intel® Core i7-7600U Processor
- Certified with EN 50155, EN 50121-3-2, EN 50121-4, EN 50125-3 and EN45545 standard
- 10x rugged PoE ports with M12 connectors
- Support full size mini-PCIe & M.2 sockets for LTE/Wi-Fi module card expansion
- Wide range operating temperature from -40 to 70°C
- Onboard GPS receiver module and G-sensor
- Removable 2.5" drive bay for 2x 2.5" storage (HDD/SSD is not included)
- CAN bus port, USB (2.0 or 3.0), COM, DIO, Audio, VGA, DVI-D ports, and built-in wall mount kit

Package Content

Your package contains the following items:

- 1x R6S Vehicle Computer
- 1x IR-RPB6SA1A DC to DC Converter

Ordering Information

SKU No.	Main Features
R6SA	Intel Core i7-7600U Processor, 2x miniPCIe socket with dual SIM, DC 32~96V power input
R6SB	Intel Core i7-7600U Processor, 1x miniPCIe socket, 4x M.2 with single SIM each, DC 24~36V power input
R6SC	Intel Core i7-7600U Processor, 1x miniPCIe socket, 4x M.2 with single SIM each, DC 72~110V power input

Optional Accessories

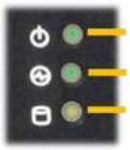
Model	Description
080W000891000	LAN Cable M12, 8P, RJ45, 8P8C, 30cm, 180° – 180° Prodaconn TM-18L-R-R6S-03 (LAN/PoE/Console) (For AVL Testing Only)

System Specifications

Processor System	CPU	Intel® Core™ i7-7600U CPU onboard
	Frequency	2.8 GHz
	BIOS	AMI SPI Flash BIOS
	Chipset	SoC
Fanless		Yes
Memory	Technology	1x DDR4 2133 SO-DIMM Socket
	Max. Capacity	Up to 16GB (Factory default: 16GB pre-installed)
	Socket	1x 260-pin SODIMM
Ethernet	Controller	4x Intel i210IT
	Speed	10/100/1000 Mbps
	PoE	IEEE 802.3af
	Interface	M12 X-coded
Storage	Type	2x 2.5" HDD/SSD drive removable bay (HDD/SSD not included)
I/O	LAN Port	1x GbE RJ45
	Display Port	A SKU: 1x VGA, 1x resolution up to 2048x1536; 1x DVI-D, resolution up to 1920x1200 B/C SKU: 2x HDMI, 1x resolution up to 3840x2160
	PoE Port	10x IEEE 802.3af standard PoE ports
	Audio	Mic-in and Line-out with 2-watt by HD Audio
	Serial I/O Port	A SKU: 2x RS-232/422/485 with RI/5V by DB9 (male) B/C SKU: 4x RS-232/422/485
	GPS	u-blox NEO-M8N; 3 GNSS (GPS, Galileo, GLONASS, BeiDou), default @ GPS+, GLONASS dual band
	G-sensor	ADXL 345
	CAN Port	1x CAN Bus J1939 / J1708 (Optional)
	Digital I/O Port	7x DI 12V TTL selectable, 7x DO 24V TTL, Max. 100mA 2x IGN-DI of ignition control to MCU
	USB Port	A SKU: 3x USB 2.0 Type A, 2x USB 3.0 Type A B/C SKU: 2x USB 2.0 Type A, 2x USB 3.0 Type A
	Antenna	A SKU: SMA antenna hole x6 (includes GPS+GLONASS x1); B/C SKU: SMA antenna hole x12 (includes GPS+GLONASS x1)
Expansion Interface	PCIe/USB	A SKU: 2x Full-size Mini-PCIe with dual SIM card readers B/C SKU: 4x M.2 with 1x SIM on each for LTE; 1x Full-size Mini-PCIe for Wi-Fi
Cooling	Processor	Passive CPU heatsink
	System	Fanless design with corrugated aluminum
Power	Connector	5-pin M12 K-coded (Ground, DC_IN, Ground, IGN, Chassis Ground)
	Input	A SKU: DC 32~96V B SKU: DC 24~36V C SKU: DC 72~110V
	Output	A SKU: DC 12V/2A out; by M12 A-coded B/C SKU: N/A
Miscellaneous	Hardware	Fintek F81866AD-I integrated watchdog timer
	Internal RTC with Li Battery	Yes
Environment	Operating Temp	-40~70°C / -40~158°F
	Storage Temp	-40~85°C / -40~185°F
	Humidity	5%~95% @ 40°C / 104°F (Storage Level)
Mechanical	Dimension (WxHxD)	272.4 x 121.3 x 228 mm (10.72" x 4.77" x 8.97")
	Weight	20.8 kg
	Mounting	Wall mount kit

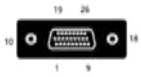
OS Support	Microsoft Windows	Win10 IoT Enterprise
	Linux	Redhat Enterprise 5, Fedora 14. Linux Kernel 2.6.18 or later
Certification	EMC	FCC/CE Class A, RoHS
	Safety	E-13 include ISO-7637-2
	Certified	IP rated 50, MIL-STD-810G, EN 50155, EN 50121-3-2, EN 50121-4, EN 50125-3, and EN 45545

Front Panel (R6SA/B/C)

No.	Description	
F1	System Status LED Indicator	 System Power Status System Status HDD Status
F2	USB 3.0 Port	2x USB 3.0 Type A
F3	USB 2.0 Port	2x USB 2.0 Type A
F4	GbE Port	1x RJ45 port with LED indicators
F5	Storage Lock	Lock for removable 2.5" storage caddy
F6	SIM Cover	A SKU: 2x Dual SIM card socket B/C SKU: 5x Single SIM card socket
F7	Antenna Port	LTE Antenna  Wi-Fi Antenna
F8	Storage Bay	2x SATA interface storage bays to support removable 2.5" HDD/SSD drive
F9	SD Card	SD Card socket

Rear Panel (R6SA)

<table>
<tr><th>No.</th><th colspan="2">Description</th></tr>
<tr><td>R1</td><td>PoE Port  </td><td>10x M12X-coded 8-pin PoE Port
<table>
<tr><th>Pin</th><th>Signals</th><th>Pin</th><th>Signals</th></tr>
<tr><td>1</td><td>LANx*_MX0P</td><td>2</td><td>LANx*_MX0N</td></tr>
<tr><td>3</td><td>LANx*_MX1P</td><td>4</td><td>LANx*_MX1N</td></tr>
<tr><td>5</td><td>LANx*_MX3P</td><td>6</td><td>LANx*_MX3N</td></tr>
<tr><td>7</td><td>LANx*_MX2N</td><td>8</td><td>LANx*_MX2P</td></tr>
</table></td></tr>
<tr><td>R2</td><td>System / NVR
DC Isolated Input
M12 K-Code Male  </td><td>1x M12 K-coded 5-pin for power source, DC 9~54V level
<table>
<tr><th colspan="2">Pin</th><th>Description</th></tr>
<tr><td>PIN 1</td><td>GND</td><td>Signal Ground</td></tr>
<tr><td>PIN 2</td><td>DC_IN</td><td>DC Isolated 52V Input (From DC to DC Converter)</td></tr>
<tr><td>PIN 3</td><td>MCU_PG</td><td>System Power Good Status
(without isolated meets EMI solution)</td></tr>
<tr><td>PIN 4</td><td>IGN_IN</td><td>Ignition on Trigger Form DC to DC Converter</td></tr>
<tr><td>PIN 5 (PE)</td><td>CHASSIS GND</td><td>Chassis Ground</td></tr>
<tr><td colspan="3">Note: DC_in, below 44V without PoE power support
DC_in, above 45V enable PoE power support</td></tr>
</table></td></tr>
<tr><td>R3</td><td>DC Output  </td><td>1x M12 A-coded 5-pin for DC 12V power output
<table>
<tr><th>Pin</th><th>Signals</th><th>Pin</th><th>Signals</th></tr>
<tr><td>1</td><td>12V_Output</td><td>2</td><td>FORWARD</td></tr>
<tr><td>3</td><td>SPEED</td><td>4</td><td>12V_GND</td></tr>
<tr><td>5</td><td>GPS GND</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>R4</td><td>DVI-D Port</td><td>1x DVI-D Connector</td></tr>
<tr><td>R5</td><td>VGA Port</td><td>1x VGA DB15 Connector</td></tr>
<tr><td>R6</td><td>COM Port  </td><td>2x DB9 Male Connector for RS232/422/485
<table>
<tr><th>Pin</th><th>Signals</th><th>Pin</th><th>Signals</th></tr>
<tr><td>1_down</td><td>COM1_C_DCD_TN</td><td>2_up</td><td>COM1_C_RXD_TP</td></tr>
<tr><td>3_down</td><td>COM1_C_TXD_RP</td><td>4_up</td><td>COM1_C_DTR_RN</td></tr>
<tr><td>5_down</td><td>GND_COM</td><td>6_up</td><td>COM1_C_DSR</td></tr>
<tr><td>7_down</td><td>COM1_C_RTS</td><td>8_up</td><td>COM1_C_CTS</td></tr>
<tr><td>9_down</td><td>COM1_C_RI</td><td></td><td></td></tr>
<tr><td>1_up</td><td>COM2_C_DCD_TN</td><td>2_down</td><td>COM2_C_RXD_TP</td></tr>
<tr><td>3_up</td><td>COM2_C_TXD_RP</td><td>4_down</td><td>COM2_C_DTR_RN</td></tr>
<tr><td>5_up</td><td>GND_COM</td><td>6_down</td><td>COM2_C_DSR</td></tr>
<tr><td>7_up</td><td>COM2_C_RTS</td><td>8_down</td><td>COM2_C-CTS</td></tr>
<tr><td>9_up</td><td>COM2_C_RI</td><td></td><td></td></tr>
</table></td></tr>
</table>

<table>
<tr><td>R7</td><td>Multi-IO  </td><td>1x DB26 Female Connector for GPIO & CAN Bus
<table>
<tr><th>Pin</th><th>Signals</th><th>Pin</th><th>Signals</th><th>Pin</th><th>Signals</th></tr>
<tr><td>1</td><td>CAN_H/J1939+_R</td><td>10</td><td>CAN_L/J1939-_R</td><td>19</td><td>DO_5</td></tr>
<tr><td>2</td><td>DI_0</td><td>11</td><td>DGIN_0</td><td>20</td><td>12V_GND</td></tr>
<tr><td>3</td><td>DI_1</td><td>12</td><td>J1850+/J1708+_R</td><td>21</td><td>12V_GND</td></tr>
<tr><td>4</td><td>DI_2</td><td>13</td><td>J1850-/J1708-R</td><td>22</td><td>DO_0</td></tr>
<tr><td>5</td><td>DI_3</td><td>14</td><td>DO_6</td><td>23</td><td>DO_1</td></tr>
<tr><td>6</td><td>12V_GND</td><td>15</td><td>DGIN_1</td><td>24</td><td>DO_2</td></tr>
<tr><td>7</td><td>GND_CAN</td><td>16</td><td>DI_4</td><td>25</td><td>DO_3</td></tr>
<tr><td>8</td><td>V_CAR BAT</td><td>17</td><td>GND_CAN</td><td>26</td><td>DO_4</td></tr>
<tr><td>9</td><td>DI_COM</td><td>18</td><td>DI_6</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>R8</td><td>Audio Port  </td><td>1x Realtek ALC886-GR, supports external Audio I/O for MIC-in/Line-out with L/R-channels via 9-pin female connector.
<table>
<tr><th>Pin</th><th>Signals</th><th>Pin</th><th>Signals</th></tr>
<tr><td>1</td><td>MIC_IN_R</td><td>2</td><td>GND_AUD</td></tr>
<tr><td>3</td><td>X</td><td>4</td><td>GND_AUD</td></tr>
<tr><td>5</td><td>AMPOUT_R</td><td>6</td><td>MIC_IN_L</td></tr>
<tr><td>7</td><td>GND_AUD</td><td>8</td><td>GND_AUD</td></tr>
<tr><td>9</td><td>AMPOUT_L</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>R9</td><td>USB 2.0 Port</td><td>1x USB 2.0 Type A
<table>
<tr><th>Pin</th><th>Signals</th><th>Pin</th><th>Signals</th></tr>
<tr><td>1</td><td>VCCUSB2</td><td>3</td><td>USB20_P7_L</td></tr>
<tr><td>2</td><td>USB20_N7_L</td><td>4</td><td>GND</td></tr>
</table></td></tr>
<tr><td>R10</td><td>Antenna Port
(GPS+GLONASS default)</td><td>1x 3 GNSS (GPS, Galileo, GLONASS, BeiDou) antenna,
(G-sensor no antenna needed)</td></tr>
</table>

DC to DC Converter

For R6SA

Front

Rear

<table>
<tr><th>No.</th><th>Description</th></tr>
<tr><td>F1</td><td>DC Rated Voltage Input
M12 K-Code Male 

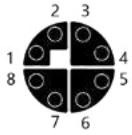
<table>
<tr><th colspan="2">Pin</th><th>Description</th></tr>
<tr><td>PIN 1</td><td>GND</td><td>Primary Ground</td></tr>
<tr><td>PIN 2</td><td>DC_IN</td><td>DC Rated Voltage Input</td></tr>
<tr><td>PIN 3</td><td>GND</td><td>Primary Ground</td></tr>
<tr><td>PIN 4</td><td>IGN_IN</td><td>Power ON Trigger from car ignition ON</td></tr>
<tr><td>PIN 5 (PE)</td><td>CHASSIS_GND</td><td>Chassis Ground</td></tr>
<tr><td colspan="3">Note: SKU A: RATED VOLTAGE at DC 32~96V</td></tr>
</table></td></tr>
<tr><td>R1</td><td>DC Isolated Output
M12 K-Code Female 

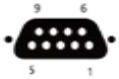
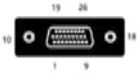
<table>
<tr><th colspan="2">Pin</th><th>Description</th></tr>
<tr><td>PIN 1</td><td>IGN_OUT</td><td>Adapter Ignition on Trigger Signal</td></tr>
<tr><td>PIN 2</td><td>MCU_PG</td><td>MCU Power good detect pin (Isolated)</td></tr>
<tr><td>PIN 3</td><td>DC Output</td><td>DC Isolated 52V Output</td></tr>
<tr><td>PIN 4</td><td>GND</td><td>Secondary Ground (S_G for NVR)</td></tr>
<tr><td>PIN 5 (PE)</td><td>CHASSIS_GND</td><td>Chassis Ground</td></tr>
</table></td></tr>
</table>

Rear Panel (R6SB/C)

Grounding Point:

For safety measures to help prevent people from accidentally coming in contact with electrical hazards.

<table>
<tr><th>No.</th><th>Description</th></tr>
<tr><td>R1</td><td>PoE Port
 
</td><td>10x M12X-coded 8-pin PoE Port
<table>
<tr><th>Pin</th><th>Signals</th><th>Pin</th><th>Signals</th></tr>
<tr><td>1</td><td>LANx*_MX0P</td><td>2</td><td>LANx*_MX0N</td></tr>
<tr><td>3</td><td>LANx*_MX1P</td><td>4</td><td>LANx*_MX1N</td></tr>
<tr><td>5</td><td>LANx*_MX3P</td><td>6</td><td>LANx*_MX3N</td></tr>
<tr><td>7</td><td>LANx*_MX2N</td><td>8</td><td>LANx*_MX2P</td></tr>
</table></td></tr>
<tr><td>R2</td><td>System / NVR
DC Isolated Input
M12 K-Code Male
 
</td><td>1x M12 K-coded 5-pin for power source, DC 9~54V level
<table>
<tr><th colspan="2">Pin</th><th>Description</th></tr>
<tr><td>PIN 1</td><td>GND</td><td>Signal Ground</td></tr>
<tr><td>PIN 2</td><td>DC_IN</td><td>DC Isolated 52V Input (From DC to DC Converter)</td></tr>
<tr><td>PIN 3</td><td>MCU_PG</td><td>System Power Good Status
(without isolated meets EMI solution)</td></tr>
<tr><td>PIN 4</td><td>IGN_IN</td><td>Ignition on Trigger Form DC to DC Converter</td></tr>
<tr><td>PIN 5 (PE)</td><td>CHASSIS GND</td><td>Chassis Ground</td></tr>
<tr><td colspan="3">Note: DC_in, below 44V without PoE power support
DC_in, above 45V enable PoE power support</td></tr>
</table></td></tr>
<tr><td>R3</td><td>COM 1 Port (Console)
  </td><td>
<table>
<tr><th>Pin</th><th>Signals</th><th>Pin</th><th>Signals</th></tr>
<tr><td>1</td><td>COM1_C_DCD_TN</td><td>2</td><td>COM1_C_RXD_TP</td></tr>
<tr><td>3</td><td>COM1_C_TXD_RP</td><td>4</td><td>COM1_C_DTR_RN</td></tr>
<tr><td>5</td><td>COM1_2_GND</td><td>6</td><td>COM1_C_DSR</td></tr>
<tr><td>7</td><td>COM1_C_RTS</td><td>8</td><td>COM1_C_CTS</td></tr>
<tr><td>9</td><td>COM1_C_RI</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>R4</td><td>COM 2 Port
  </td><td>
<table>
<tr><th>Pin</th><th>Signals</th><th>Pin</th><th>Signals</th></tr>
<tr><td>1</td><td>COM2_C_DCD_TN</td><td>2</td><td>COM2_C_RXD_TP</td></tr>
<tr><td>3</td><td>COM2_C_TXD_RP</td><td>4</td><td>COM2_C_DTR_RN</td></tr>
<tr><td>5</td><td>COM2_2_GND</td><td>6</td><td>COM2_C_DSR</td></tr>
<tr><td>7</td><td>COM2_C_RTS</td><td>8</td><td>COM2_C_CTS</td></tr>
<tr><td>9</td><td>COM2_C_RI</td><td></td><td></td></tr>
</table></td></tr>
</table>

<table>
<tr><td>R5</td><td>COM 4 Port
  </td><td>
<table>
<tr><th>Pin</th><th>Signals</th><th>Pin</th><th>Signals</th></tr>
<tr><td>1_up</td><td>COM4_C_DCD_TN</td><td>2_up</td><td>COM4_C_RXD_TP</td></tr>
<tr><td>3_up</td><td>COM4_C_TXD_RP</td><td>4_up</td><td>COM4_C_DTR_RN</td></tr>
<tr><td>5_up</td><td>COM4_2_GND</td><td>6_up</td><td>COM4_C_DSR</td></tr>
<tr><td>7_up</td><td>COM4_C_RTS</td><td>8_up</td><td>COM4_C_CTS</td></tr>
<tr><td>9_up</td><td>COM4_C_RI</td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>R6</td><td>COM 5 Port
  </td><td>
<table>
<tr><th>Pin</th><th>Signals</th><th>Pin</th><th>Signals</th></tr>
<tr><td>1_up</td><td>COM5_C_DCD_TN</td><td>2_up</td><td>COM5_C_RXD_TP</td></tr>
<tr><td>3_up</td><td>COM5_C_TXD_RP</td><td>4_up</td><td>COM5_C_DTR_RN</td></tr>
<tr><td>5_up</td><td>COM5_2_GND</td><td>6_up</td><td>COM5_C_DSR</td></tr>
<tr><td>7_up</td><td>COM5_C_RTS</td><td>8_up</td><td>COM5_C_CTS</td></tr>
<tr><td>9_up</td><td>COM5_C_RI</td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>R7</td><td>Display Port</td><td>2x HDMI Ports</td></tr>
<tr><td>R8</td><td>Multi-IO
  </td><td>1x DB26 Female Connector for GPIO & CAN Bus
<table>
<tr><th>Pin</th><th>Signals</th><th>Pin</th><th>Signals</th><th>Pin</th><th>Signals</th></tr>
<tr><td>1</td><td>FORWARD_CONN</td><td>10</td><td>SPEED_CONN</td><td>19</td><td>DO_5</td></tr>
<tr><td>2</td><td>DI_0</td><td>11</td><td>DGIN_0</td><td>20</td><td>12V_GND</td></tr>
<tr><td>3</td><td>DI_1</td><td>12</td><td>GND_GPS</td><td>21</td><td>12V_GND</td></tr>
<tr><td>4</td><td>DI_2</td><td>13</td><td>X</td><td>22</td><td>DO_0</td></tr>
<tr><td>5</td><td>DI_3</td><td>14</td><td>DO_6</td><td>23</td><td>DO_1</td></tr>
<tr><td>6</td><td>DIO_GND</td><td>15</td><td>DGIN_1</td><td>24</td><td>DO_2</td></tr>
<tr><td>7</td><td>X</td><td>16</td><td>DI_4</td><td>25</td><td>DO_3</td></tr>
<tr><td>8</td><td>X</td><td>17</td><td>DI_5</td><td>26</td><td>DO_4</td></tr>
<tr><td>9</td><td>DI_COMMON</td><td>18</td><td>DI_6</td><td></td><td>DO_5</td></tr>
</table>
</td></tr>
<tr><td>R9</td><td>Audio Port
  </td><td>1x Realtek ALC886-GR, supports external audio I/O for Mic-in/Line-out with L/R-channels via 9-pin Female Connector.
<table>
<tr><th>Pin</th><th>Signals</th><th>Pin</th><th>Signals</th></tr>
<tr><td>1</td><td>MIC_IN_R</td><td>2</td><td>GND_AUD</td></tr>
<tr><td>3</td><td>x</td><td>4</td><td>GND_AUD</td></tr>
<tr><td>5</td><td>AMPOUT_R</td><td>6</td><td>MIC_IN_L</td></tr>
<tr><td>7</td><td>GND_AUD</td><td>8</td><td>GND_AUD</td></tr>
<tr><td>9</td><td>AMPOUT_L</td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>R10</td><td>Antenna Port</td><td>6x LTE Antenna Port</td></tr>
<tr><td>R11</td><td>Antenna Port
(GPS+GLONASS default)</td><td>1x 3 GNSS (GPS, Galileo, GLONASS, BeiDou) antenna support
(G-sensor has no antenna needed)</td></tr>
</table>

DC to DC Converter

For R6SB

Front

Rear

<table>
<tr><th>No.</th><th>Description</th></tr>
<tr><td>F1</td><td>DC Rated Voltage Input
M12 K-Code Male
 

<table>
<tr><th colspan="2">Pin</th><th>Description</th></tr>
<tr><td>PIN 1</td><td>GND</td><td>Primary Ground</td></tr>
<tr><td>PIN 2</td><td>DC_IN</td><td>DC Rated Voltage Input</td></tr>
<tr><td>PIN 3</td><td>GND</td><td>Primary Ground</td></tr>
<tr><td>PIN 4</td><td>IGN_IN</td><td>Power ON Trigger from car ignition ON</td></tr>
<tr><td>PIN 5 (PE)</td><td>CHASSIS_GND</td><td>Chassis Ground</td></tr>
<tr><td colspan="3">Note: SKU B: RATED VOLTAGE at DC 24~36V</td></tr>
</table></td></tr>
<tr><td>R1</td><td>DC Isolated Output
M12 K-Code Female
 

<table>
<tr><th colspan="2">Pin</th><th>Description</th></tr>
<tr><td>PIN 1</td><td>IGN_OUT</td><td>Adapter Ignition on Trigger Signal</td></tr>
<tr><td>PIN 2</td><td>MCU_PG</td><td>MCU Power good detect pin (Isolated)</td></tr>
<tr><td>PIN 3</td><td>DC Output</td><td>DC Isolated 52V Output</td></tr>
<tr><td>PIN 4</td><td>GND</td><td>Secondary Ground (S_G for NVR)</td></tr>
<tr><td>PIN 5 (PE)</td><td>CHASSIS_GND</td><td>Chassis Ground</td></tr>
</table></td></tr>
</table>

For R6SC

Front

Rear

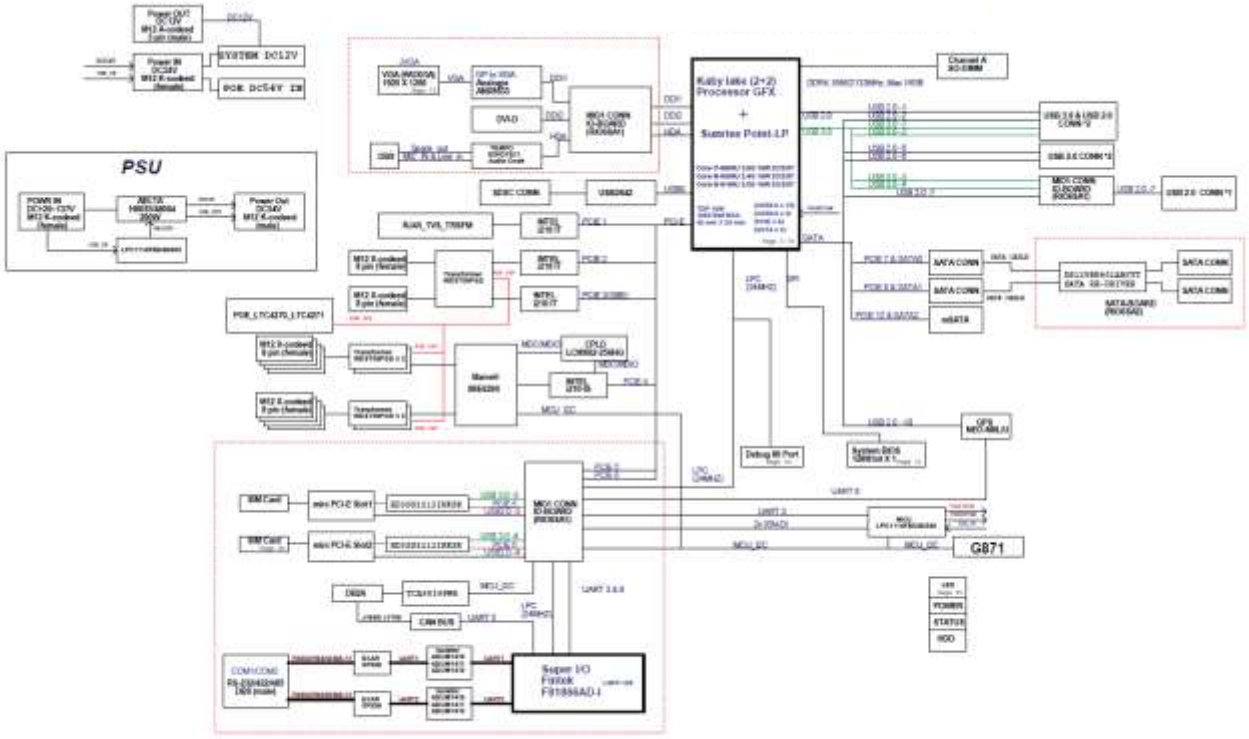
<table>
<tr><th>No.</th><th>Description</th></tr>
<tr><td>F1</td><td>DC Rated Voltage Input
M12 K-Code Male
 

<table>
<tr><th colspan="2">Pin</th><th>Description</th></tr>
<tr><td>PIN 1</td><td>GND</td><td>Primary Ground</td></tr>
<tr><td>PIN 2</td><td>DC_IN</td><td>DC Rated Voltage Input</td></tr>
<tr><td>PIN 3</td><td>GND</td><td>Primary Ground</td></tr>
<tr><td>PIN 4</td><td>IGN_IN</td><td>Power ON Trigger from car ignition ON</td></tr>
<tr><td>PIN 5 (PE)</td><td>CHASSIS_GND</td><td>Chassis Ground</td></tr>
<tr><td colspan="3">Note: SKU C: RATED VOLTAGE at DC 72~110V</td></tr>
</table></td></tr>
<tr><td>R1</td><td>DC Isolated Output
M12 K-Code Female
 

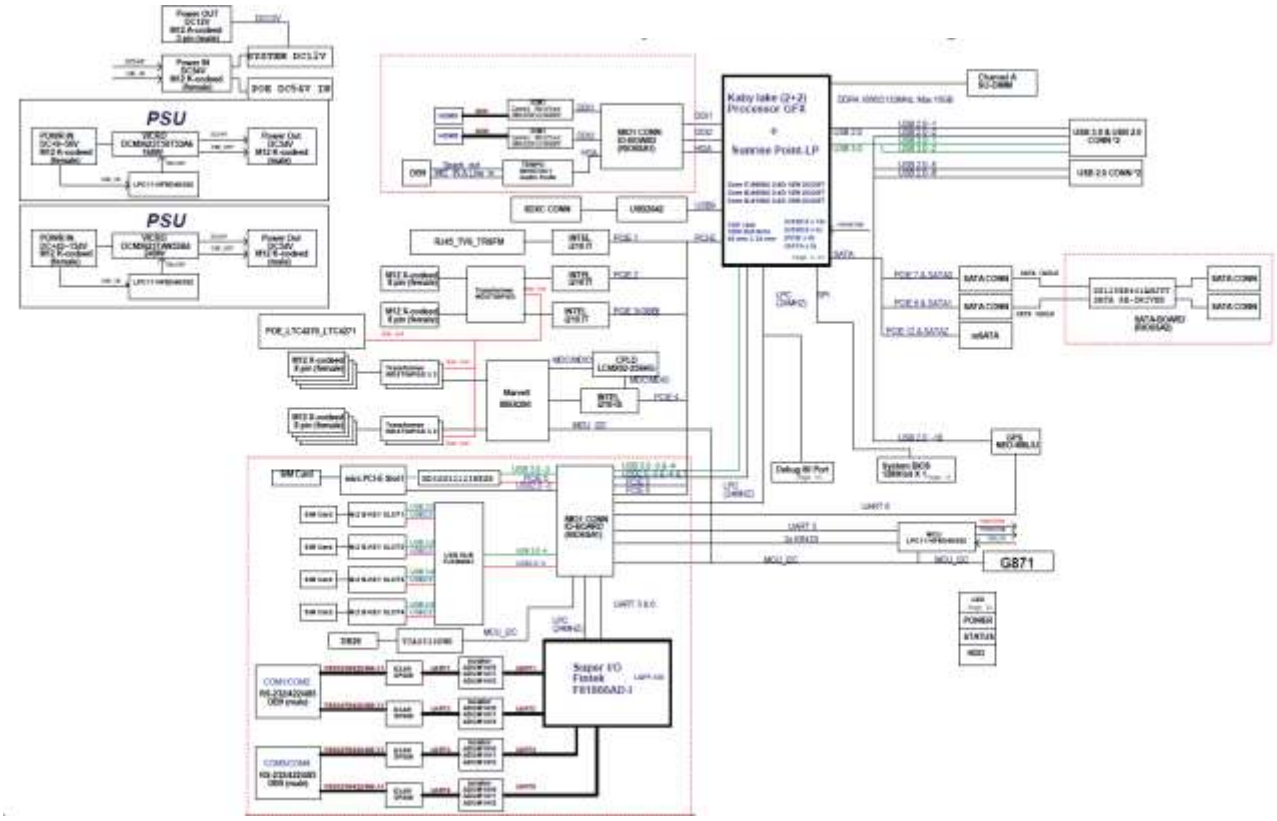
<table>
<tr><th colspan="2">Pin</th><th>Description</th></tr>
<tr><td>PIN 1</td><td>IGN_OUT</td><td>Adapter Ignition on Trigger Signal</td></tr>
<tr><td>PIN 2</td><td>MCU_PG</td><td>MCU Power good detect pin (Isolated)</td></tr>
<tr><td>PIN 3</td><td>DC Output</td><td>DC Isolated 52V Output</td></tr>
<tr><td>PIN 4</td><td>GND</td><td>Secondary Ground (S_G for NVR)</td></tr>
<tr><td>PIN 5 (PE)</td><td>CHASSIS_GND</td><td>Chassis Ground</td></tr>
</table></td></tr>
</table>

Motherboard Information

Block Diagram (A SKU)

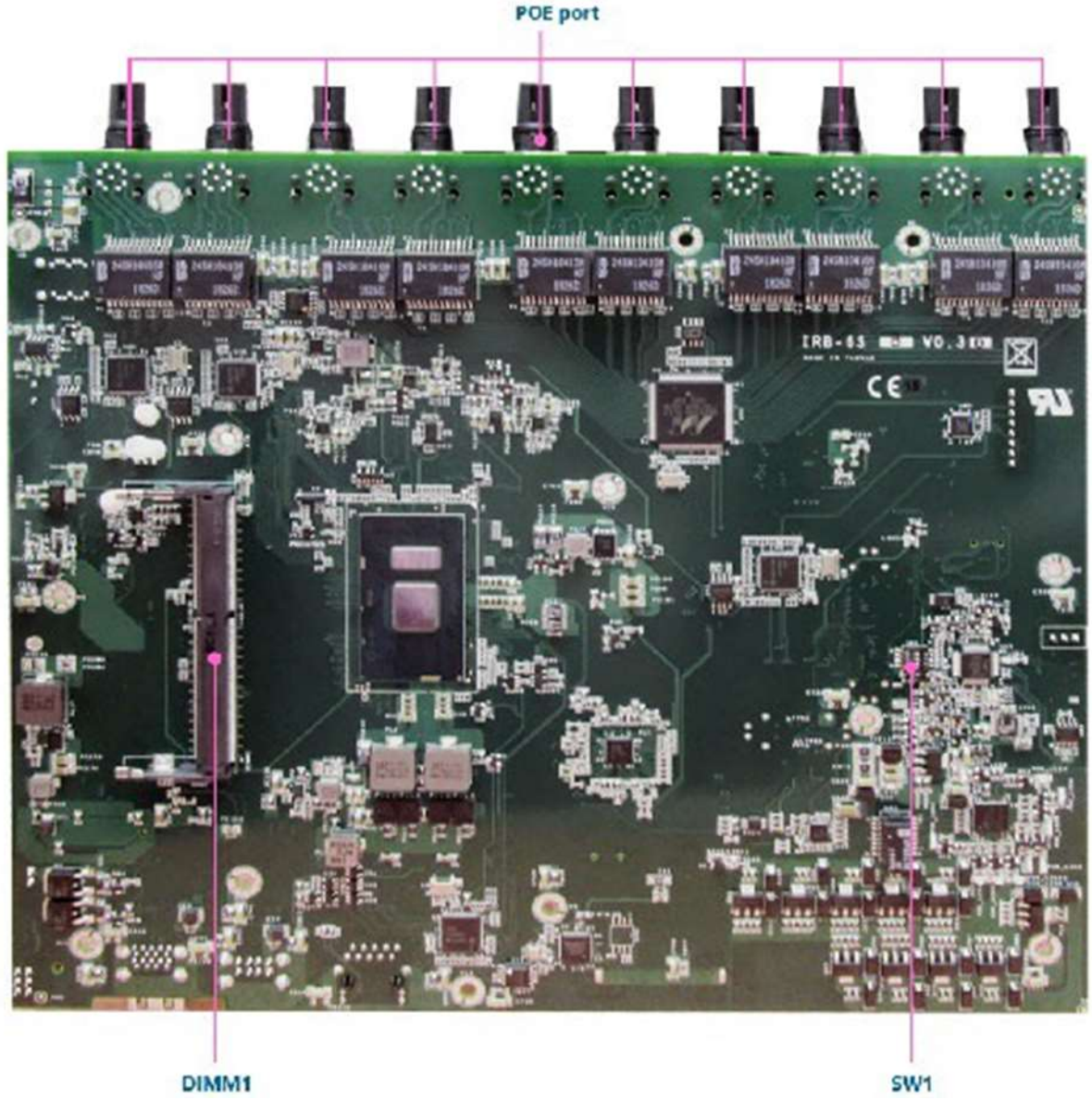


Block Diagram (B/C SKU)

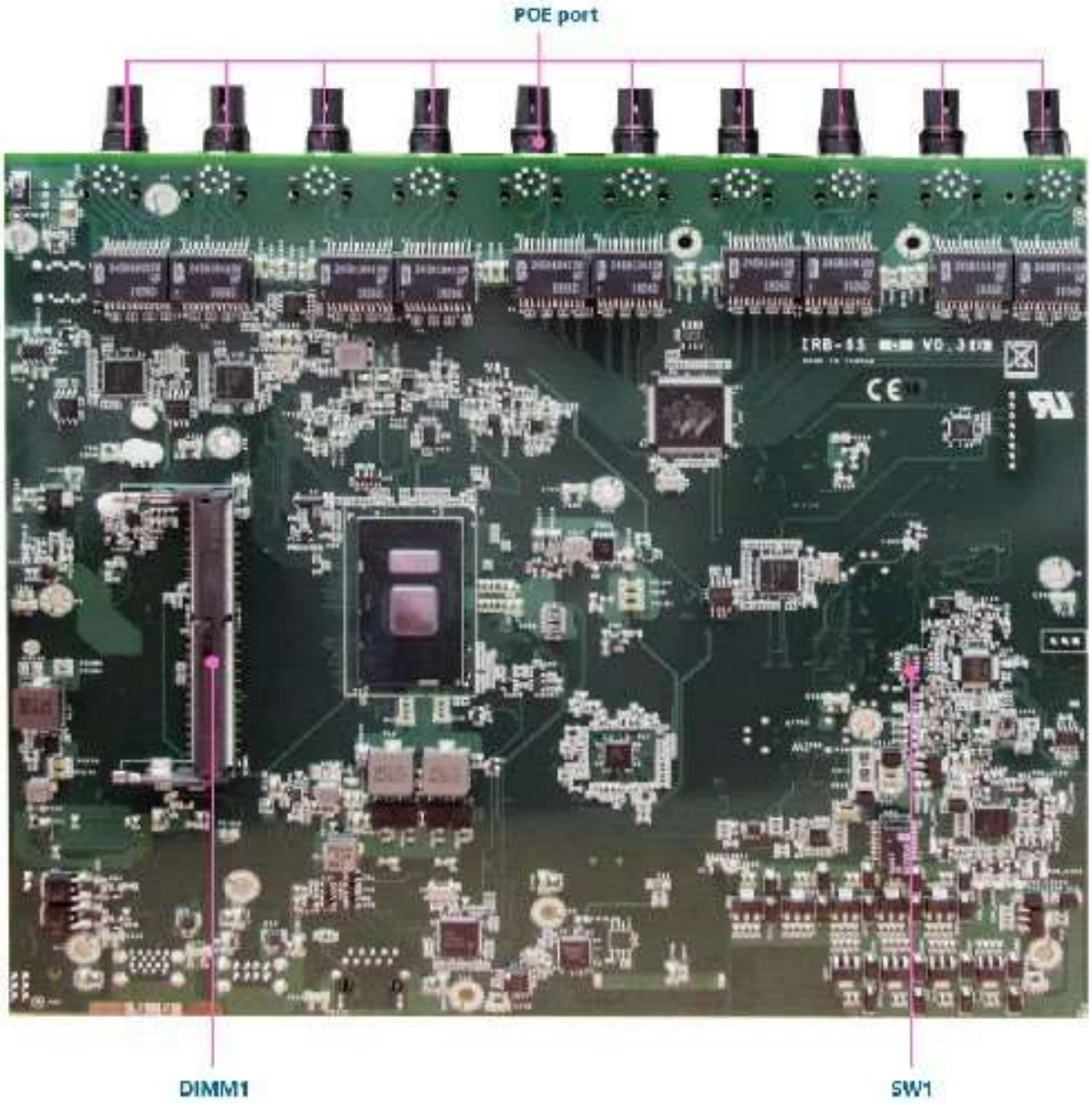


Motherboard Layout

Front View

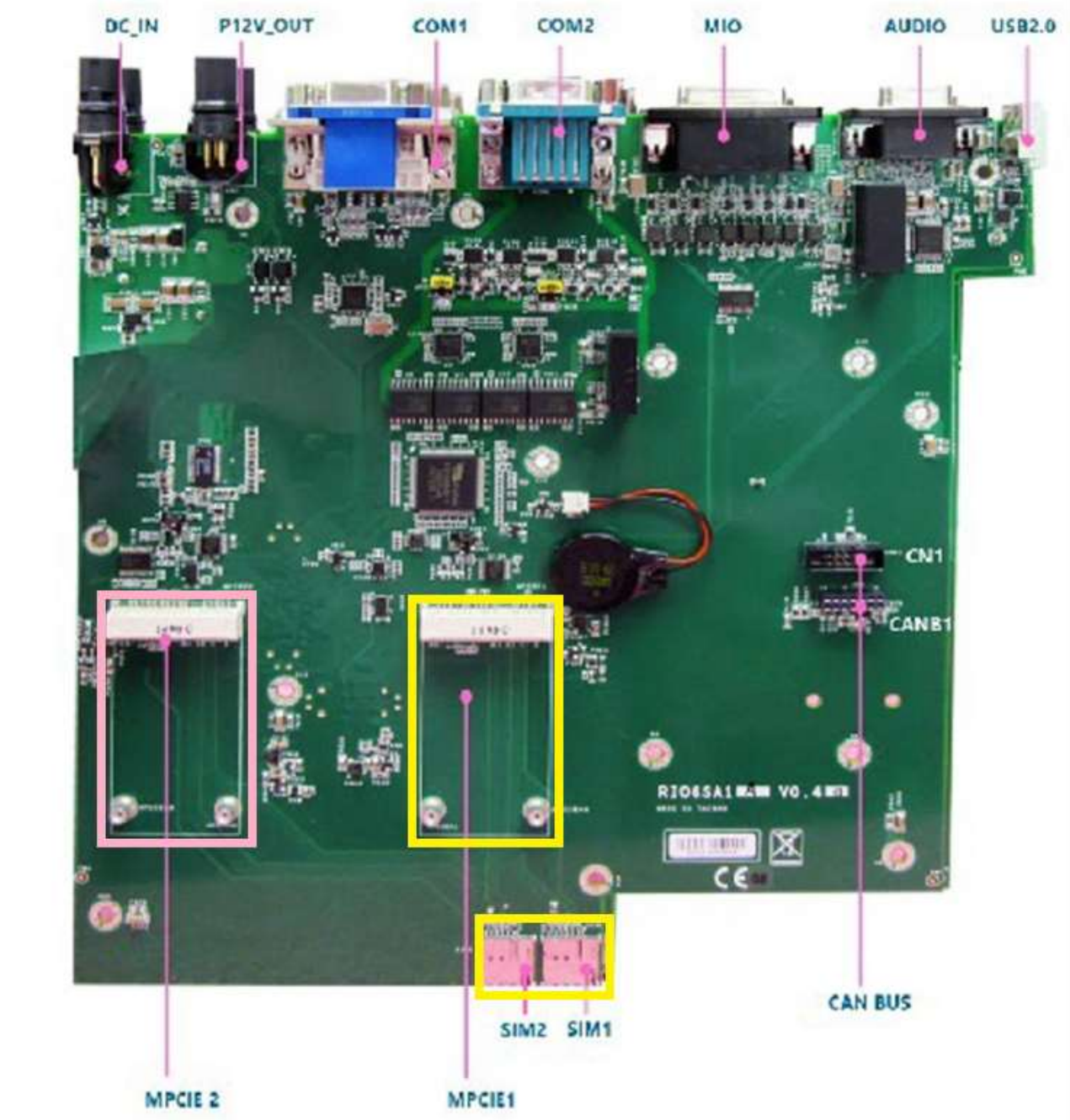


Rear View



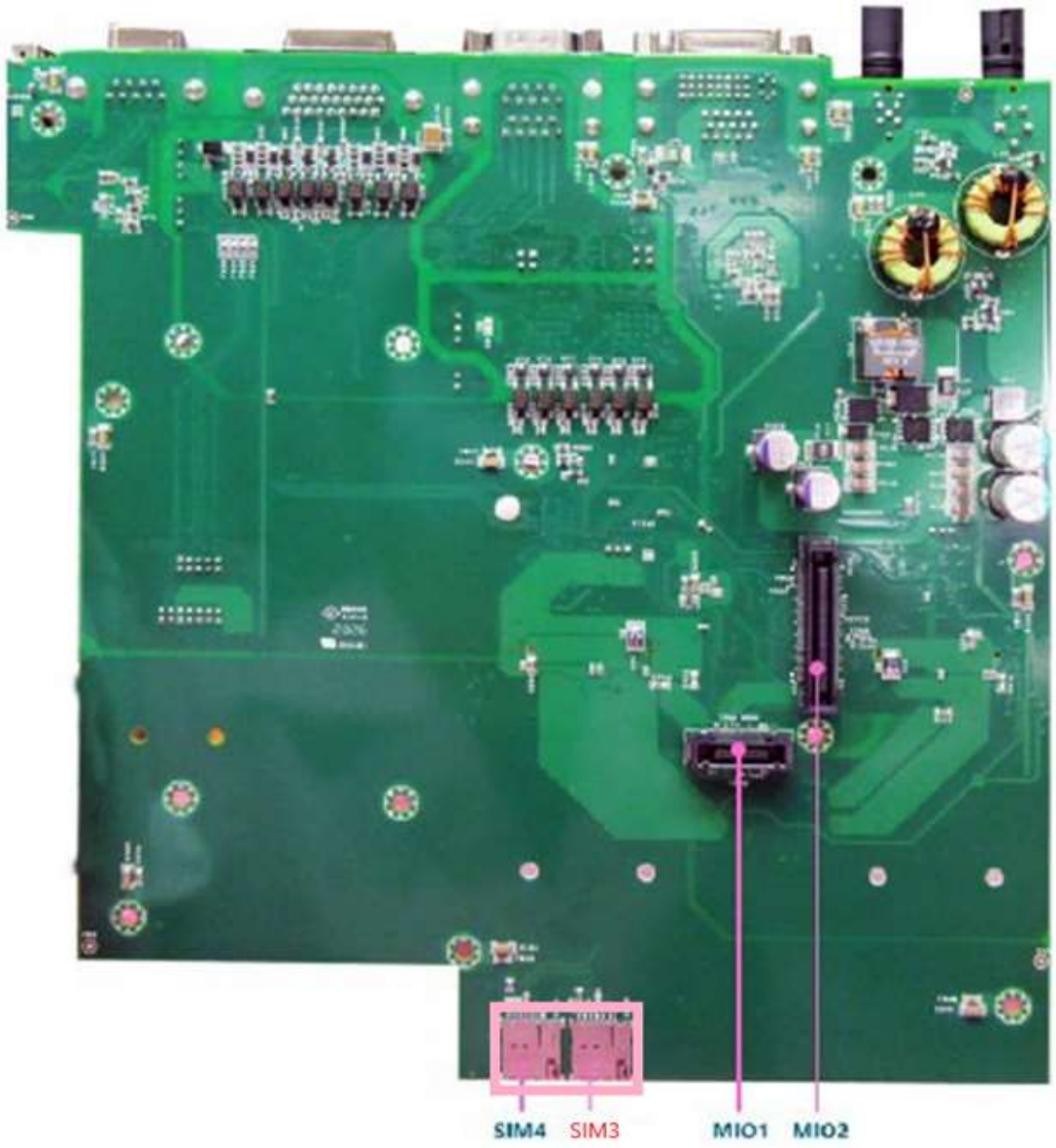
IO Board Layout (A SKU)

Front View



NOTE: The SIM cards shall be plugged in before booting up the device since there is no hot-swap feature enabled.

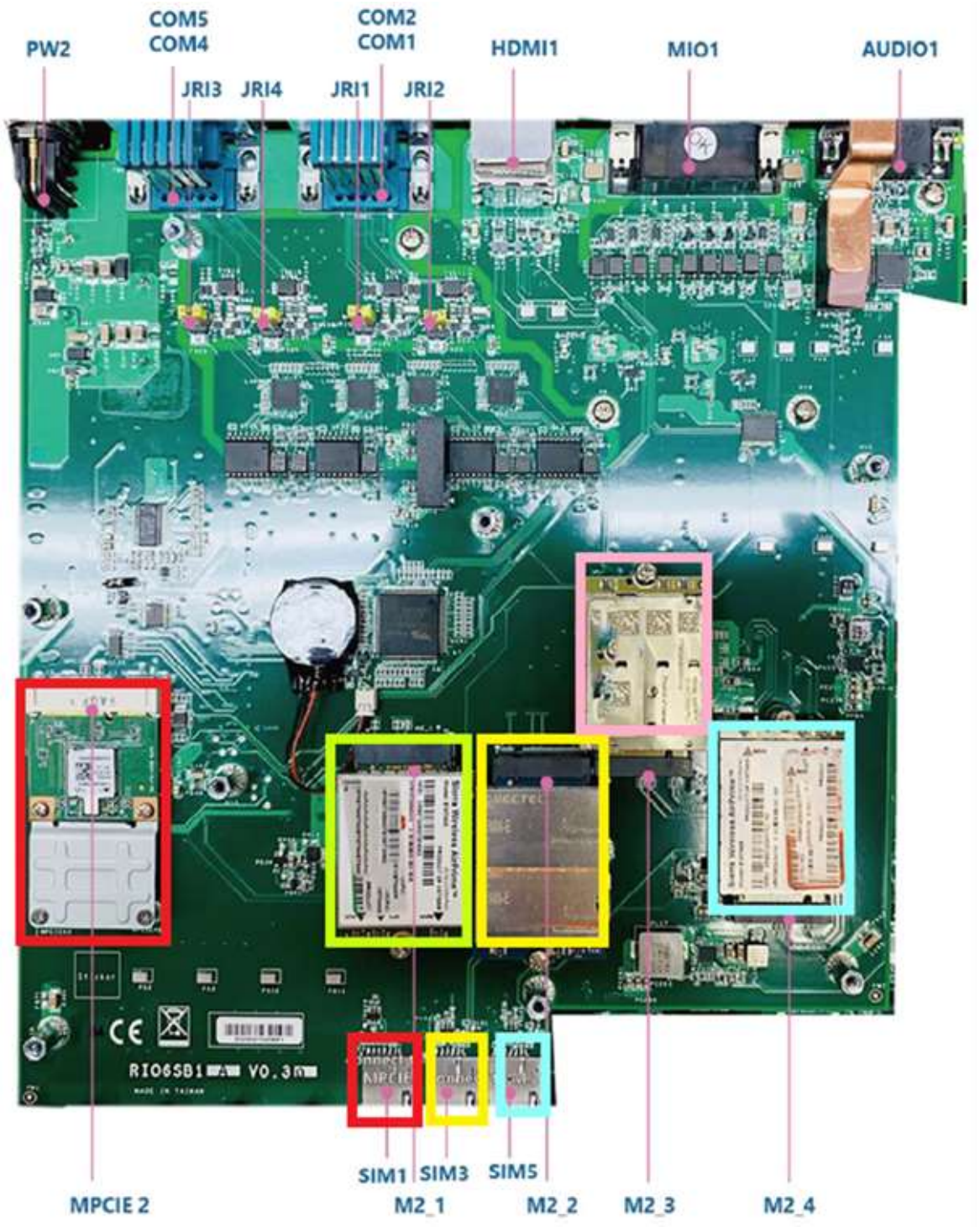
Rear View



NOTE: The SIM cards shall be plugged in before booting up the device since there is no hot-swap feature enabled.

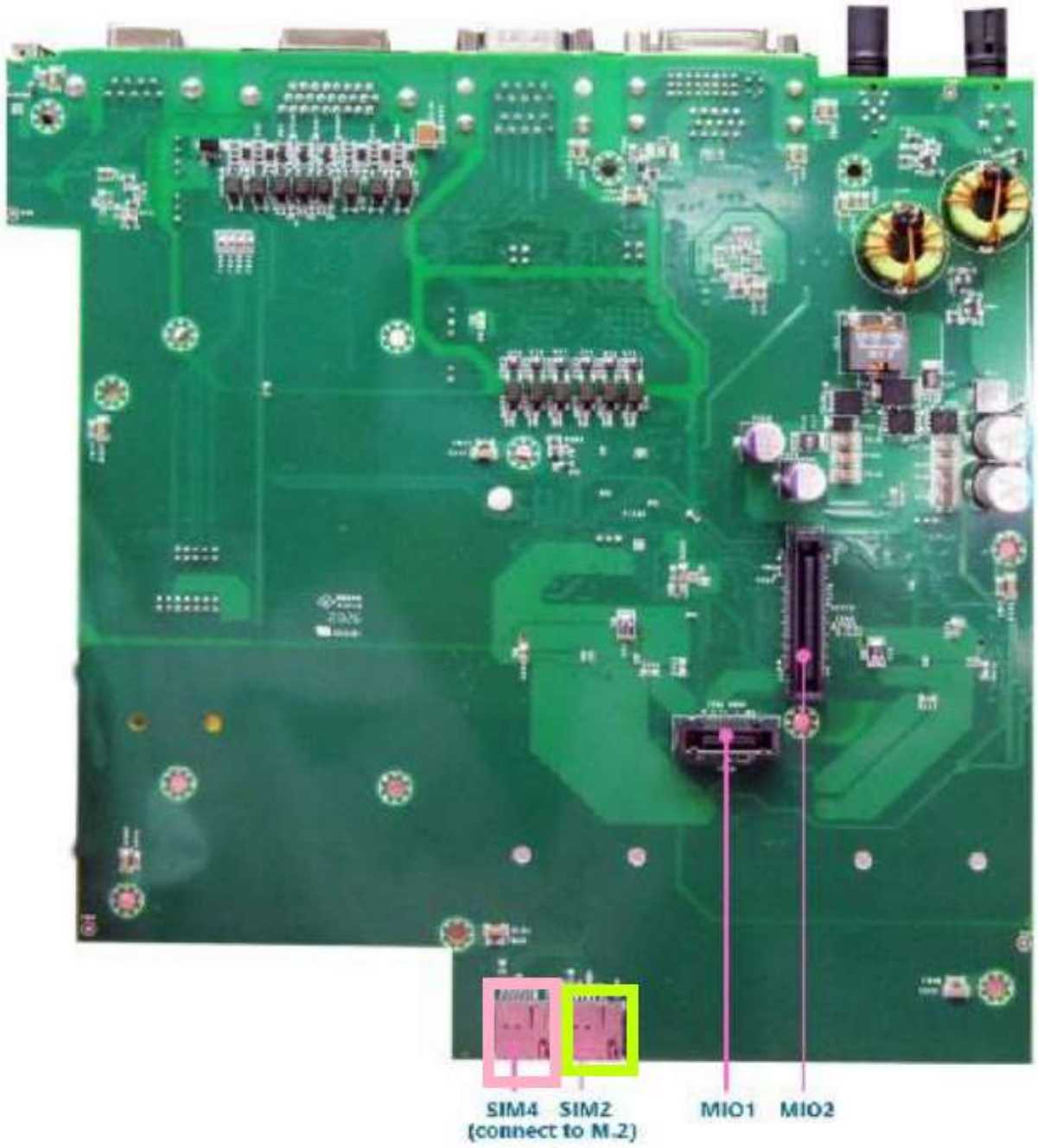
IO Board Layout (B/C SKU)

Front View



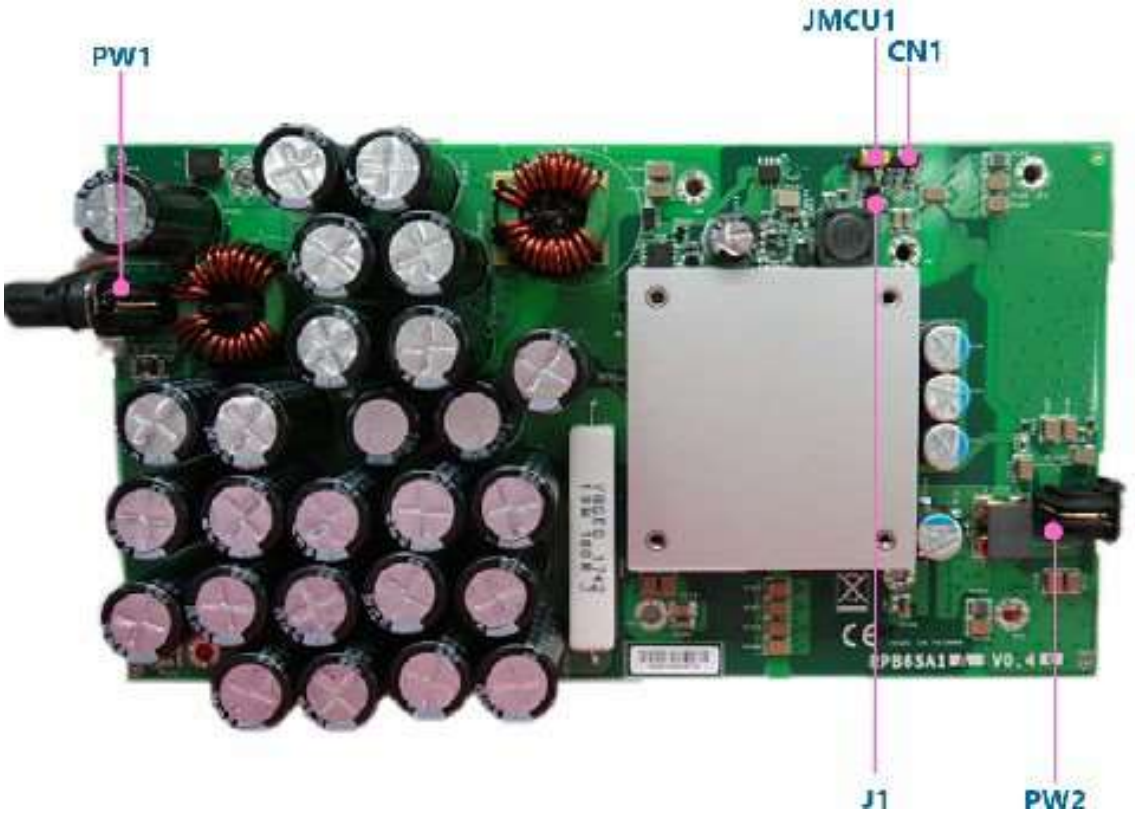
NOTE: The SIM cards shall be plugged in before booting up the device since there is no hot-swap feature enabled.

Rear View

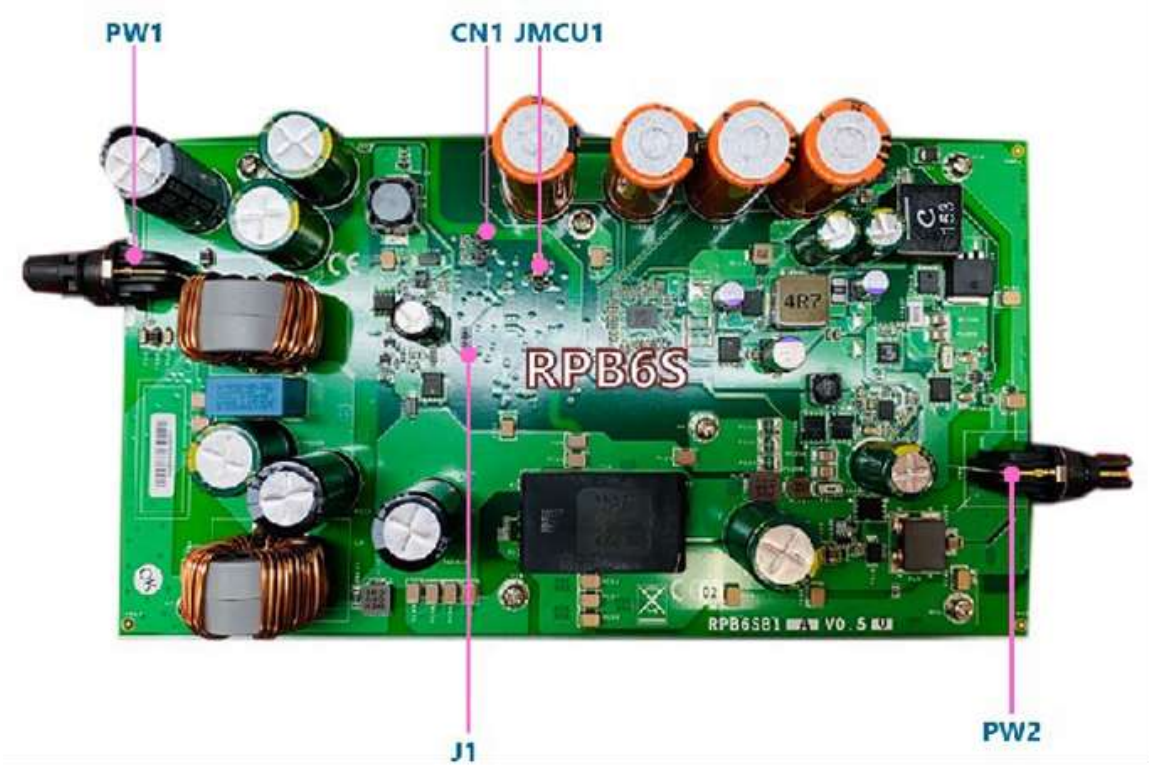


NOTE: The SIM cards shall be plugged in before booting up the device since there is no hot-swap feature enabled.

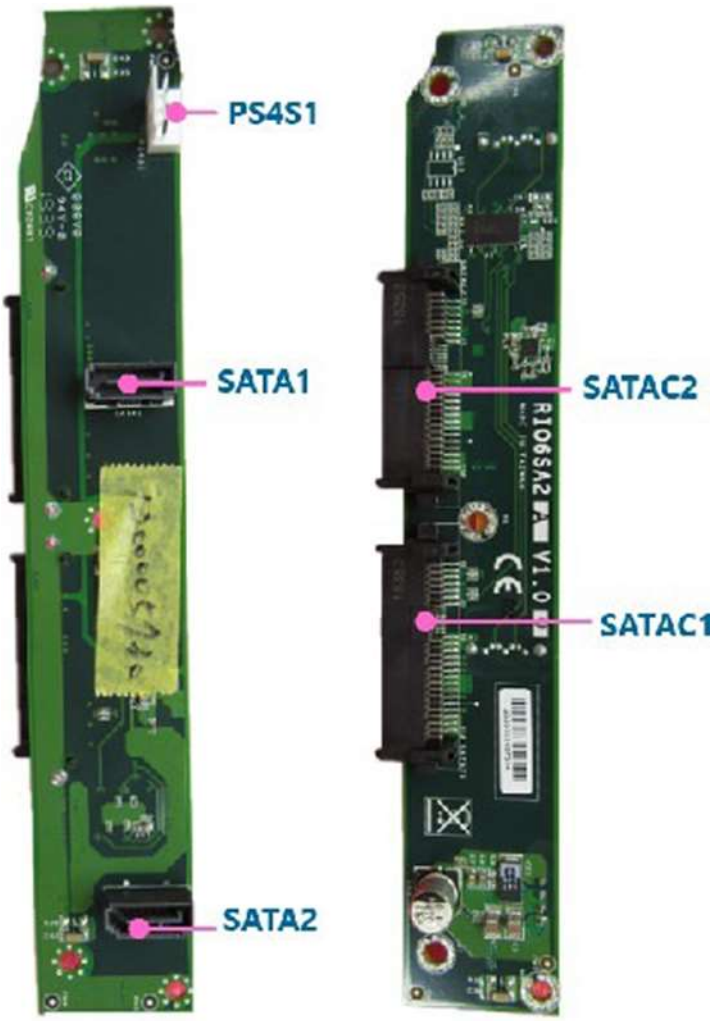
Power Board Layout (A SKU)



Power Board Layout (B/C SKU)



I/O Board Layout (A SKU)



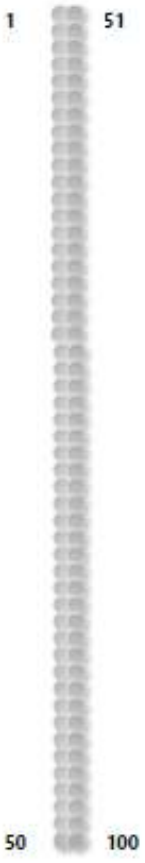
Internal Jumper & Connectors (Motherboard)

MIO1

Pin	Signals	Pin	Signals
1	GND	21	GND
2	P3V3	22	DC_IN
3	P3V3	23	DC_IN
4	P3V3	24	DC_IN
5	P3V3	25	DC_IN
6	P3V3	26	DC_IN
7	P3V3	27	DC_IN
8	TP81	28	DC_IN
9	PCH_PWROK	29	DC_IN
10	MCU_PG	30	TP79
11	GND	31	SIO_DGOUT_0
12	SMB_S0_CLK	32	TP80
13	SMB_S0_DAT	33	GND
14	P12V_SB_PG	34	P12V_VIN
15	IGNITION	35	P12V_VIN
16	IGN3V3_SB	36	P12V_SB
17	GND	37	P12V_SB
18	GND	38	P12V_SB
19	P12V_SB	39	P12V_SB
20	P12V_SB	40	P12V_SB

MIO2

Pin	Signals	Pin	Signals
1	PM_SUP_S3#	51	VCC_CORE
2	HDA_RST#_R	52	HDA_SDI1
3	HDA_BLK_R	53	HDA_SDI0
4	HDA_SDO_R	54	SPEED
5	HDA_SYNC_R	55	FORWARD
6	GND	56	PLTRST
7	SIO_CLKIN	57	DDI1_DAT
8	SOUT6	58	DDI1_CLK
9	SIN6	59	DDI2_CLK
10	LPC_LFRAME#	60	DDI2_HPD
11	LPC_SERIRQ	61	DDI1_HPD
12	LPC_LAD0	62	DDI2_DAT
13	LPC_LAD1	63	GND
14	LPC_LAD3	64	USB20_N7
15	LPC_LAD2	65	USB20_P7
16	SIO_CLK_24M	66	USB20_N6
17	SOUT3	67	USB20_P6
18	SIN3	68	GND
19	PM_SUP_S4#	69	USB20_N5
20	KBRST#	70	USB20_P5
21	P1V2_VDDQ	71	USB_OC2#
22	TP78	72	GND
23	TP77	73	USB3_HTX_DRX_P4
24	RSMRST#	74	USB3_HTX_DRX_N4
25	CPU_PECI	75	USB3_HRX_DTX_N4
26	WDT	76	USB3_HRX_DTX_P4
27	PME#	77	GND
28	MCU_CLK	78	USB3_HTX_DRX_P3
29	DGIN_0_MCU	79	USB3_HTX_DRX_N3
30	EXT_PWR	80	USB3_HRX_DTX_N3
31	MCU_DAT	81	USB3_HRX_DTX_P3
32	GND	82	GND
33	DDI2_TXP2	83	CLK_PCIE_P4_MIO
34	DDI2_TXN2	84	CLK_PCIE_N4_MIO
35	DDI2_TXP3	85	GND
36	DDI2_TXN3	86	PCIE_HTX_DRX_N5
37	DDI2_TXN0	87	PCIE_HTX_DRX_P5
38	DDI2_TXP0	88	PCIE_HTX_DRX_P6
39	DDI2_TXP1	89	PCIE_HTX_DRX_N6
40	DDI2_TXN1	90	GND
41	GND	91	PCIE_HRX_DTX_P5
42	DDI1_TXN0	92	PCIE_HRX_DTX_N5
43	DDI1_TXP0	93	PCIE_HRX_DTX_P6
44	DDI1_TXN1	94	PCIE_HRX_DTX_N6
45	DDI1_TXP1	95	GND
46	DDI1_TXP2	96	DDI2_AUX_N
47	DDI1_TXN2	97	DDI2_AUX_P
48	DDI1_TXP3	98	DDI1_AUX_P
49	DDI1_TXN3	99	DDI1_AUX_N
50	GND	100	GND



SATA PWR

Pin	Signals	Pin	Signals
1	P5V	6	GND
2	P5V	7	GND
3	P3V3	8	GND
4	P5V	9	GND
5	GND	10	GND

SATA1 (IN)

Pin	Signals
1	GND
2	SATA_HTX_DRX_P0
3	SATA_HTX_DRX_N0
4	GND
5	SATA_HRX_DTX_N0
6	SATA_HRX_DTX_P0
7	GND

SATA2 (IN)

Pin	Signals
1	GND
2	SATA_HTX_DRX_P1
3	SATA_HTX_DRX_N1
4	GND
5	SATA_HRX_DTX_N1
6	SATA_HRX_DTX_P1
7	GND

mSATA1

Pin	Signals	Pin	Signals
1	x	2	P3V3
3	x	4	GND
5	x	6	P1V5_MPCIE
7	x	8	x
9	GND	10	x
11	x	12	x
13	x	14	x
15	GND	16	x
17	x	18	GND
19	x	20	x
21	GND	22	x
23	SATA_HRX_C_DTXP2	24	P3V3
25	SATA_HRX_C_DTXN2	26	GND
27	GND	28	P1V5_MPCIE
29	GND	30	SMB_S0_CLK
31	SATA_HTX_C_DTXN2	32	SMB_S0_DAT
33	SATA_HTX_C_DTXP2	34	GND
35	GND	36	x
37	GND	38	x
39	P3V3	40	GND
41	P3V3	42	x
43	x	44	x
45	x	46	x
47	x	48	x
49	x	50	GND
51	x	52	P3V3
53	GND	54	GND

LAN14~LAN13

Pin	Signals	Pin	Signals
1	LANX_MX0P	8	LANX_MX2P
2	LANX_MX0N	7	LANX_MX2N
3	LANX_MX1P	6	LANX_MX3P
4	LANX_MX1P	5	LANX_MX3P

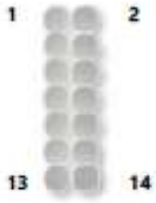
Internal Jumper & Connectors (IO Board)

MPCIE1 & MPCIE2

Pin	Signals	Pin	Signals
1	E_WAKE1-	2	P3V3_WLAN1
3	x	4	GND
5	x	6	P1V5_MPCIE1
7	UIM1_RST2	8	UIM1_PWR
9	GND	10	UIM1_RST1
11	CLK_PCIE_N_MPCIE1_SW	12	UIM1_CLK1
13	CLK_PCIE_P_MPCIE1_SW	14	UIM1_DAT1
15	GND	16	UIM1_VPP1
17	UIM1_CLK2	18	GND
19	UIM1_DAT2	20	x
21	GND	22	x
23	PCIE_HRX_R_DTX_P5	24	P3V3_WLAN1
25	PCIE_HRX_R_DTX_N5	26	GND
27	GND	28	P1V5_MPCIE1
29	GND	30	E_SCLK
31	PCIE_HTX_R_DRX_N5	32	E_SDTA
33	PCIE_HTX_R_DRX_P5	34	GND
35	GND	36	USB20_P5_R
37	GND	38	USB20_N5_R
39	P3V3_WLAN1	40	GND
41	P3V3_WLAN1	42	LED_WWAN1-
43	GND	44	LED_WLAN1-
45	x	46	x
47	x	48	P1V5_MPCIE1
49	x	50	GND
51	x	52	P3V3_WLAN1
53	GND	54	GND

CAN(CN1)

Pin	Signals	Pin	Signals
1	BAT_12V_24V	2	x
3	DO	4	x
5	GND_CAN8	6	GND_CAN8
7	TP TP28	8	J1850+/J1708+
9	SIN5	10	J1850-/J1708-
11	SOUT5	12	CAN_H/J1939+
13	P5V	14	CAN_L/J1939-



CAN(CANB1)

Pin	Signals	Pin	Signals
1	J1850-/J1708-	2	J1850-/J1708-
3	GND	4	J1850+/J1708+
5	CAN_H/J1939+	6	J1850+/J1708+
7	x	8	AT_12V_24V
9	CAN_L/J1939-	10	x

PW2 (DC_OUT)

Pin	Signals
1	IGN_OUT
2	SYS_PG_R
3	P53VA
4	GND
5	H11 GND

Internal Jumper & Connectors (RIOSA2)

SATAC1 (OUT)

Pin	Signals
S1	GND
S2	RD_SATA_HTX_DRX_P0
S3	RD_SATA_HTX_DRX_N0
S4	GND
S5	RD_SATA_HRX_DTX_N0
S6	RD_SATA_HRX_DTX_P0
S7	GND
P1	TP1
P2	TP1
P3	TP1
P4	GND
P5	GND
P6	GND
P7	P5V
P8	P5V
P9	P5V
P10	GND
P11	TP
P12	GND
P13	P12V
P14	P12V
P15	P12V

PS4S1

Pin	Signals
1	P12V
2	GND
3	GND
4	P5V

SATAC2 (OUT)

Pin	Signals
S1	GND
S2	RD_SATA_HTX_DRX_P1
S3	RD_SATA_HTX_DRX_N1
S4	GND
S5	RD_SATA_HRX_DTX_N1
S6	RD_SATA_HRX_DTX_P1
S7	GND
P1	TP2
P2	TP2
P3	TP2
P4	GND
P5	GND
P6	GND
P7	P5V
P8	P5V
P9	P5V
P10	GND
P11	TP
P12	GND
P13	P12V
P14	P12V
P15	P12V

Internal Jumper & Connectors (Power Board)

RPB6S1

PW1 (DC_IN)

Pin	Signals
1	GND
2	DC_IN
3	GND
4	IGN_IN
5	CHASSIS GND

PW2 (DC_OUT)

Pin	Signals
1	IGN_OUT
2	MCU_PG
3	DC 54V Output
4	GND
5	CHASSIS GND

RPB6SB1

CN1

Pin	Signals
1	EXT_TXD_R
2	GND_PSEDCIN_1
3	EXT_RXD_R

JMCU1

Pin	Signals
1	IGN3V3_SB
2	PIO_1
3	GND_PSEDCIN_1

CHAPTER 2 : HARDWARE SETUP

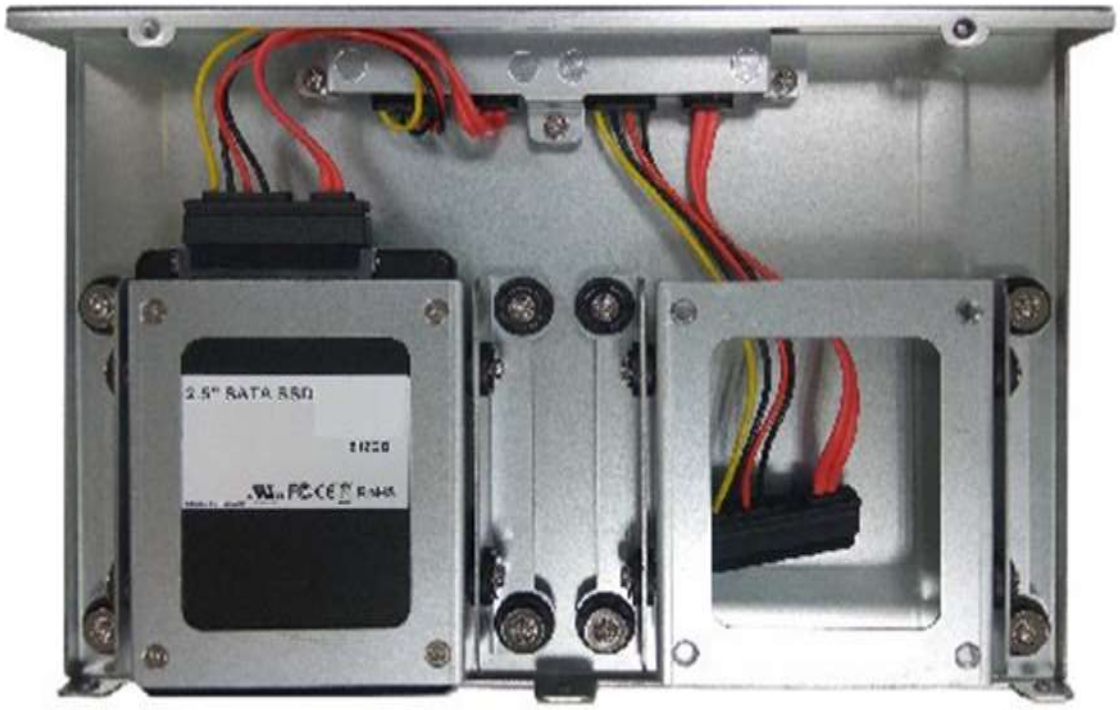
Hard Disk Installation

To install the hard disk,

1. Loosen the two hand screws that secure the hard disk tray.
2. Pull out the tray as shown in the picture below.

3. Remove the screws shown in the picture in order to open the tray.

4. Install the disk onto the tray, and connect the SATA cable. Then, repeat the same steps to install the other disk.



5. Lock the disk tray into the system chassis.

CHAPTER 3 : SOFTWARE SETUP

BIOS Setup

BIOS is a firmware embedded on an exclusive chip on the system's motherboard. Lanner's BIOS firmware offering including market-proven technologies such as Secure Boot and Intel Boot Guard technology deliver solid commitments for the shield protection against malware, uncertified sequences and other named cyber threats. BIOS update for Lanner PCs are available for download here.

Entering Setup

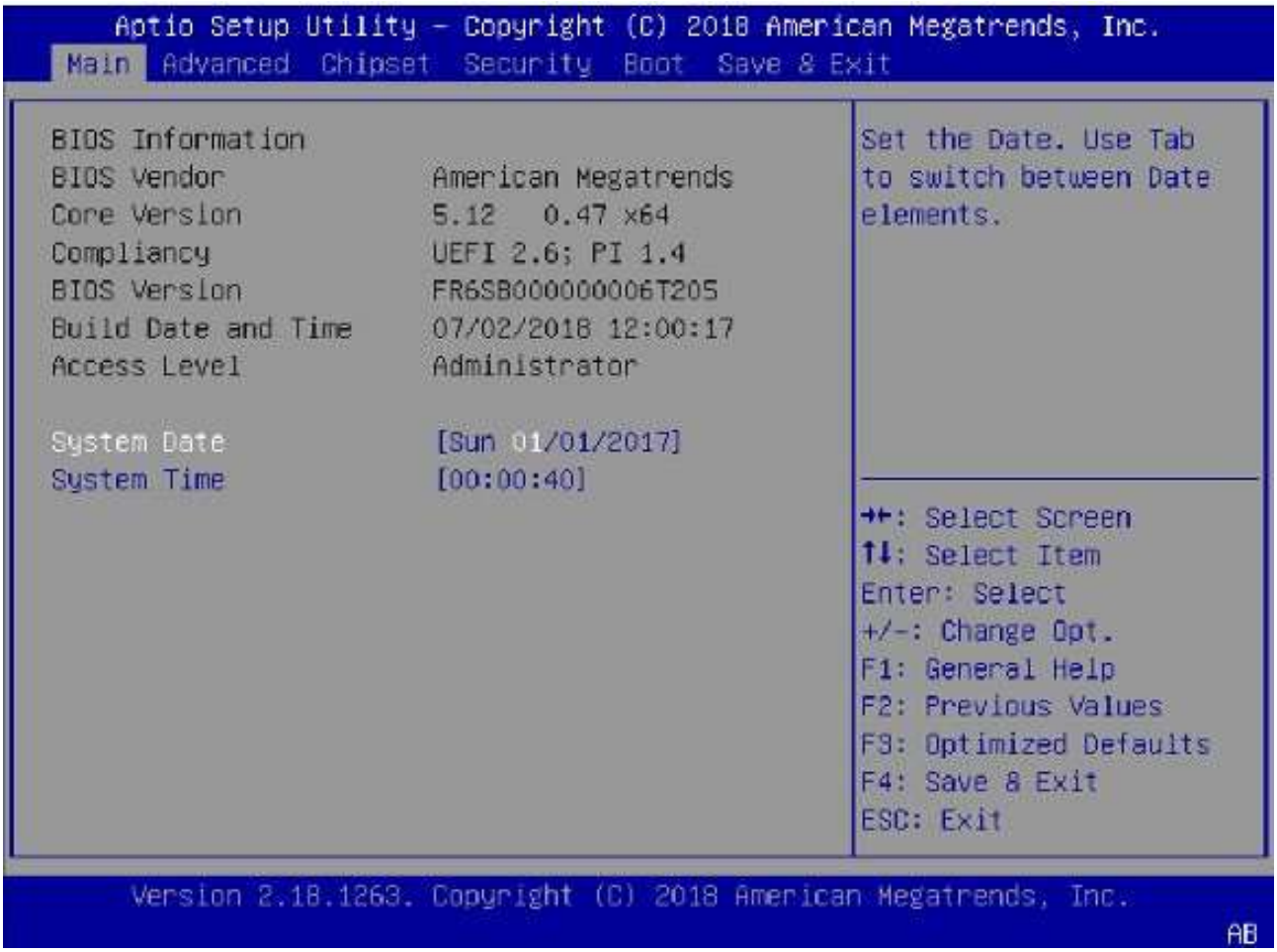
To enter the BIOS setup utility, simply follow the steps below:

1. Boot up the system.
2. Pressing the <Tab> or <Del> key immediately allows you to enter the Setup utility, and then you will be directed to the BIOS main screen. The instructions for BIOS navigations are as below:

Control Keys	Description
→←	select a setup screen, for instance, [Main], [Advanced], [IntelRCSetup], [Security], [Boot], and [Save & Exit]
↑↓	select an item/option on a setup screen
<Enter>	select an item/option or enter a sub-menu
+/-	to adjust values for the selected setup item/option
F1	to display General Help screen
F2	to retrieve previous values, such as the parameters configured the last time you had entered BIOS.
F3	to load optimized default values
F4	to save configurations and exit BIOS
<Esc>	to exit the current screen

Main Page

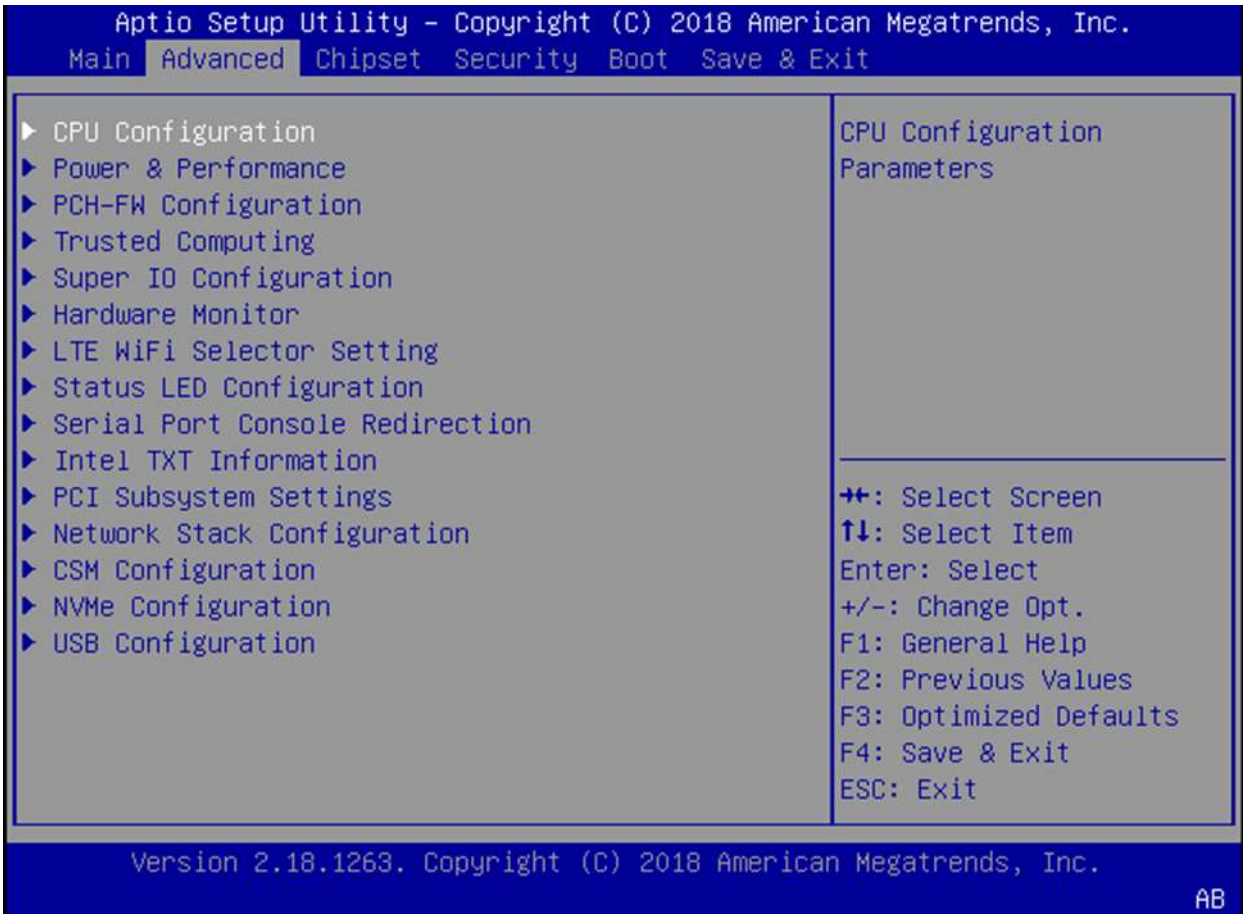
Setup main page contains BIOS information and project version information.



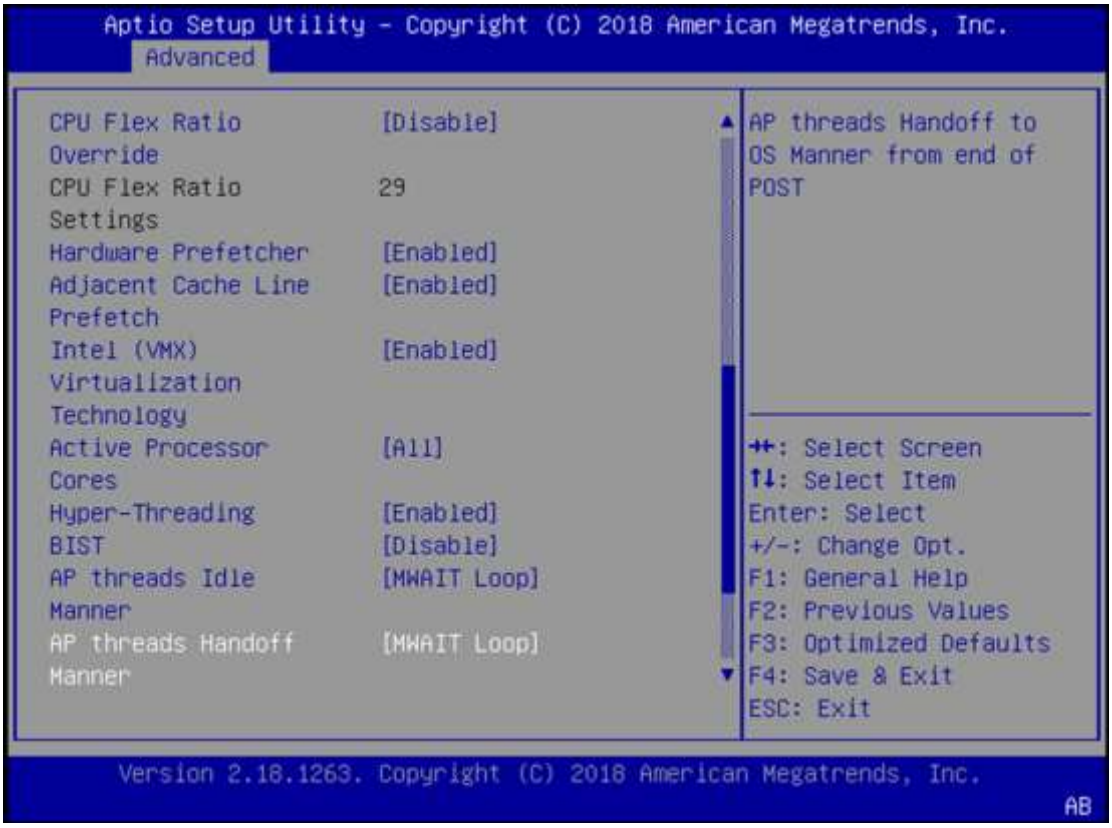
Feature	Description
BIOS Information	BIOS Vendor: American Megatrends Core Version: AMI Kernel version, CRB code base, X64 Compliancy: UEFI version, PI version Project Version: BIOS release version Build Date and Time: MM/DD/YYYY Access Level: Administrator / User
System Date	To set the Date, use **<Tab>** to switch between Date elements. Default Range of Year: 2005-2099 Default Range of Month: 1-12 Days: dependent on Month.
System Time	To set the Date, use **<Tab>** to switch between Date elements.

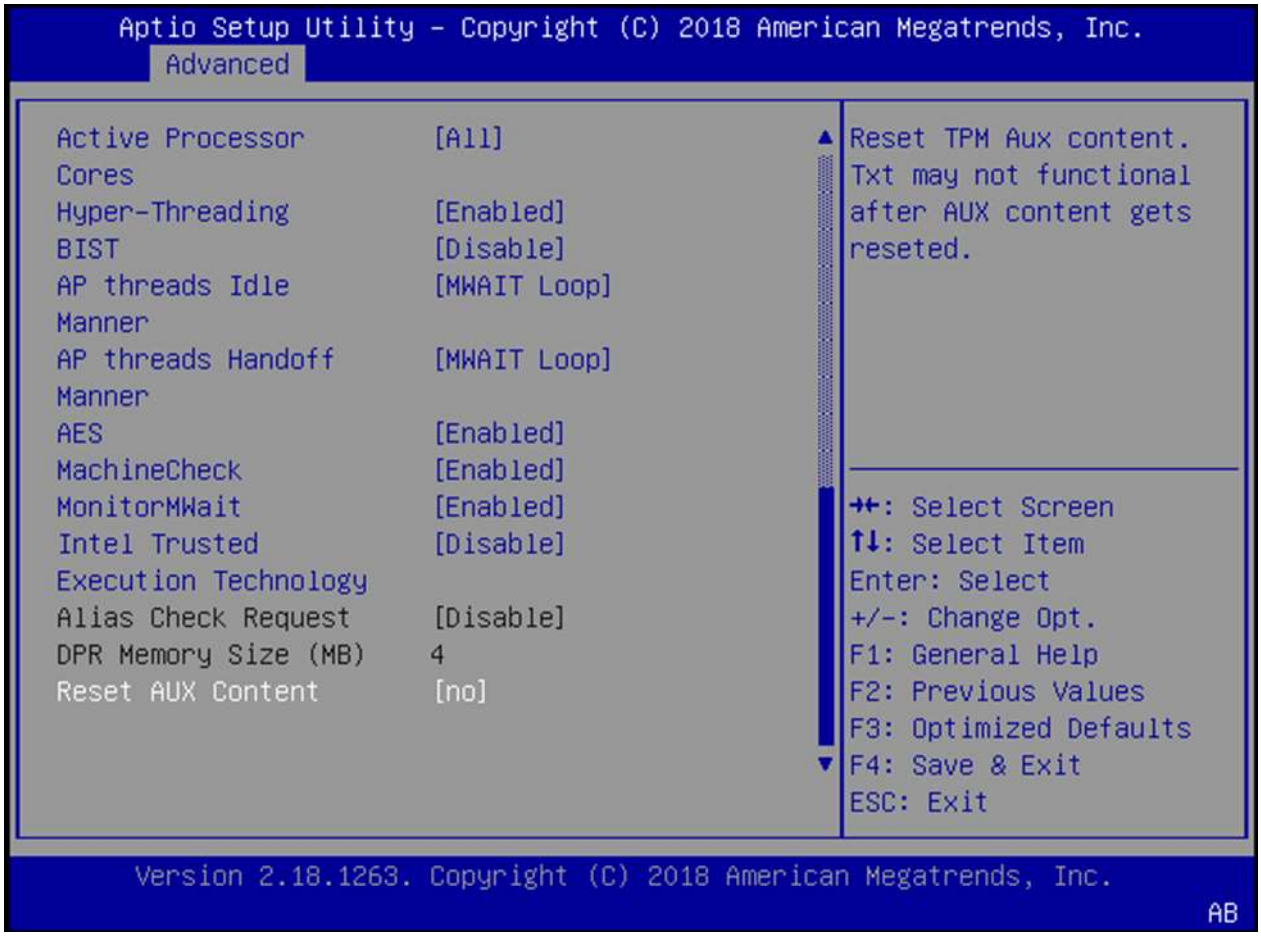
Advanced Page

Select the **Advanced** menu item from the BIOS setup screen to enter the "Advanced" setup screen. Users can select any of the items in the left frame of the screen.



CPU Configuration

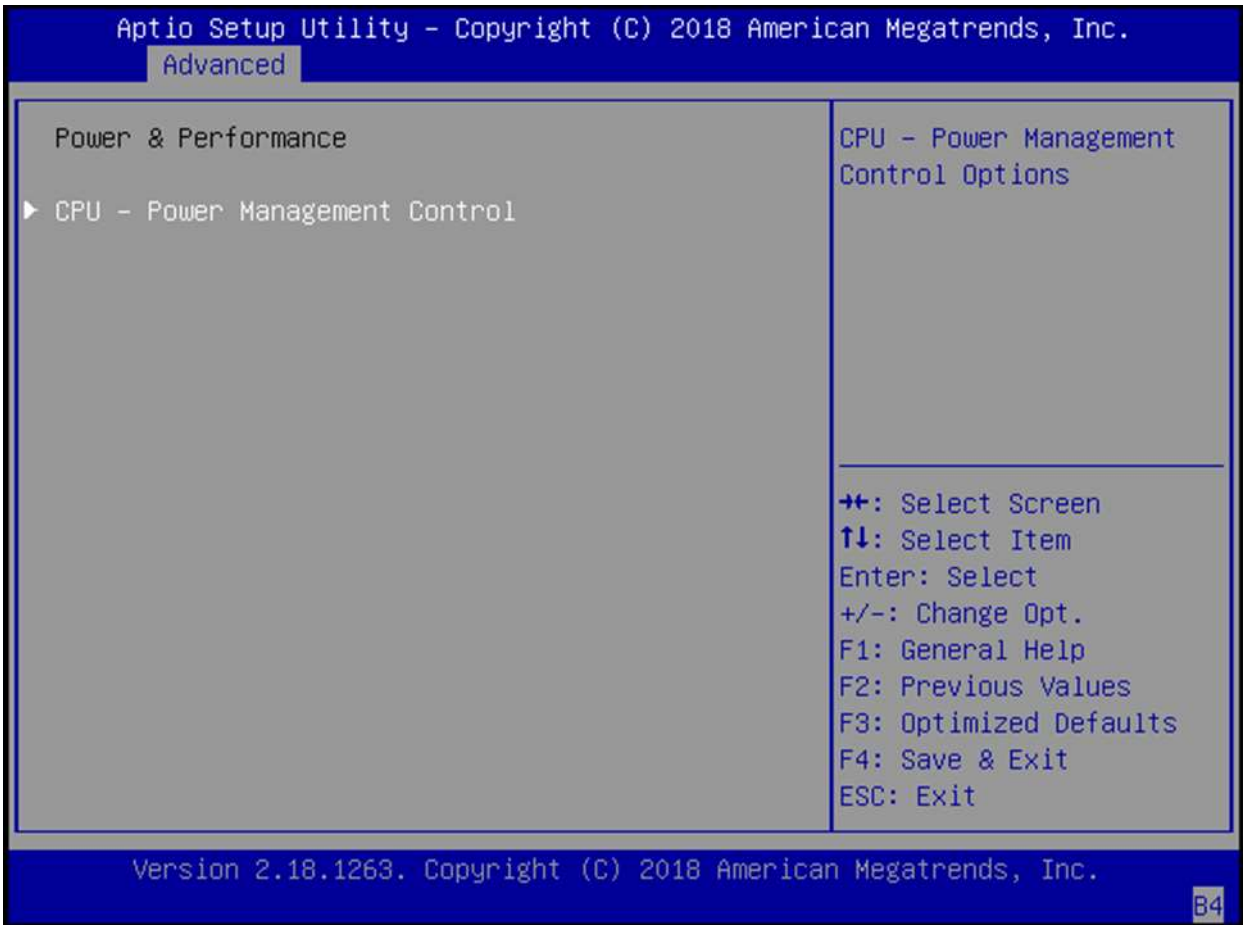




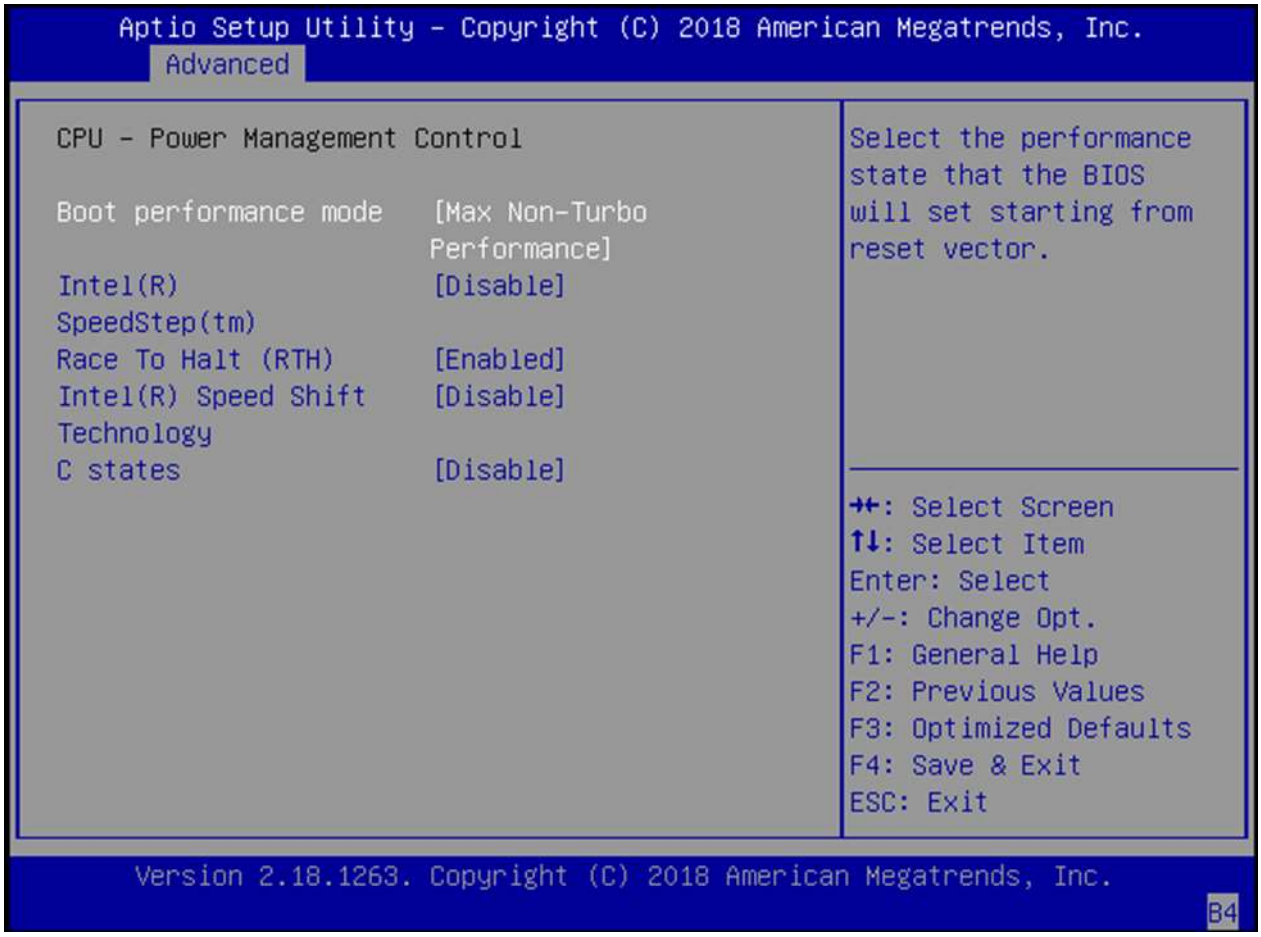
Feature	Options	Description
SW Guard Extensions (SGX)	Enabled Disabled	Enable/Disable Software Guard Extensions (SGX)
CPU Flex Ratio Override	Disabled Enabled	Enable/Disable CPU Flex Ratio Programming
CPU Flex Ratio Settings	29	This value must be between Max Efficiency Ratio (LFM) and Maximum non-turbo ratio set by Hardware (HFM).
Hardware Prefetcher	Disabled Enabled	To turn on/off the MLC streamer prefetcher.
Adjacent Cache Line Prefetch	Disabled Enabled	To turn on/off prefetching of adjacent cache lines.
Intel (VMX) Virtualization Technology	Disabled Enabled	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Active Processor Cores	ALL 1	Number of cores to enable in each processor package.
Hyper-Threading	Disabled Enabled	Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS. (OS not optimized for Hyper-Threading Technology).

BIST	Disabled Enabled	Enable/Disable BIST (Built-In Self Test) on reset.
AP Threads Idle Manner	HALT Loop MWAIT Loop RUN Loop	AP threads Idle Manner for waiting signal to run.
AP Threads Handoff Manner	HALT Loop MWAIT Loop	AP threads Handoff to OS Manner from end of POST
AES	Disabled Enabled	Enable/Disable AES (Advanced Encryption Standard)
MachineCheck	Disabled Enabled	Enable/Disable Machine Check
MonitorMWait	Disabled Enabled	Enable/Disable MonitorMWait
Intel Trusted Execution Technology	Disabled Enabled	Enables utilization of additional hardware capabilities provided by Intel® Trusted Execution Technology. Changes require a full power cycle to take effect.
Alias Check Request	Disabled Enabled	Enables Txt Alias Checking capability. Changes require full Txt capability before it will take effect. It is a one time only change, next reboot will be rest.
DPR Memory Size (MB)	4	Reserve DPR memory size (0-255) MB
Reset AUX Content	Yes No	Reset TPM Aux content. Txt may not functional after AUX content gets reseted.

Power & Performance

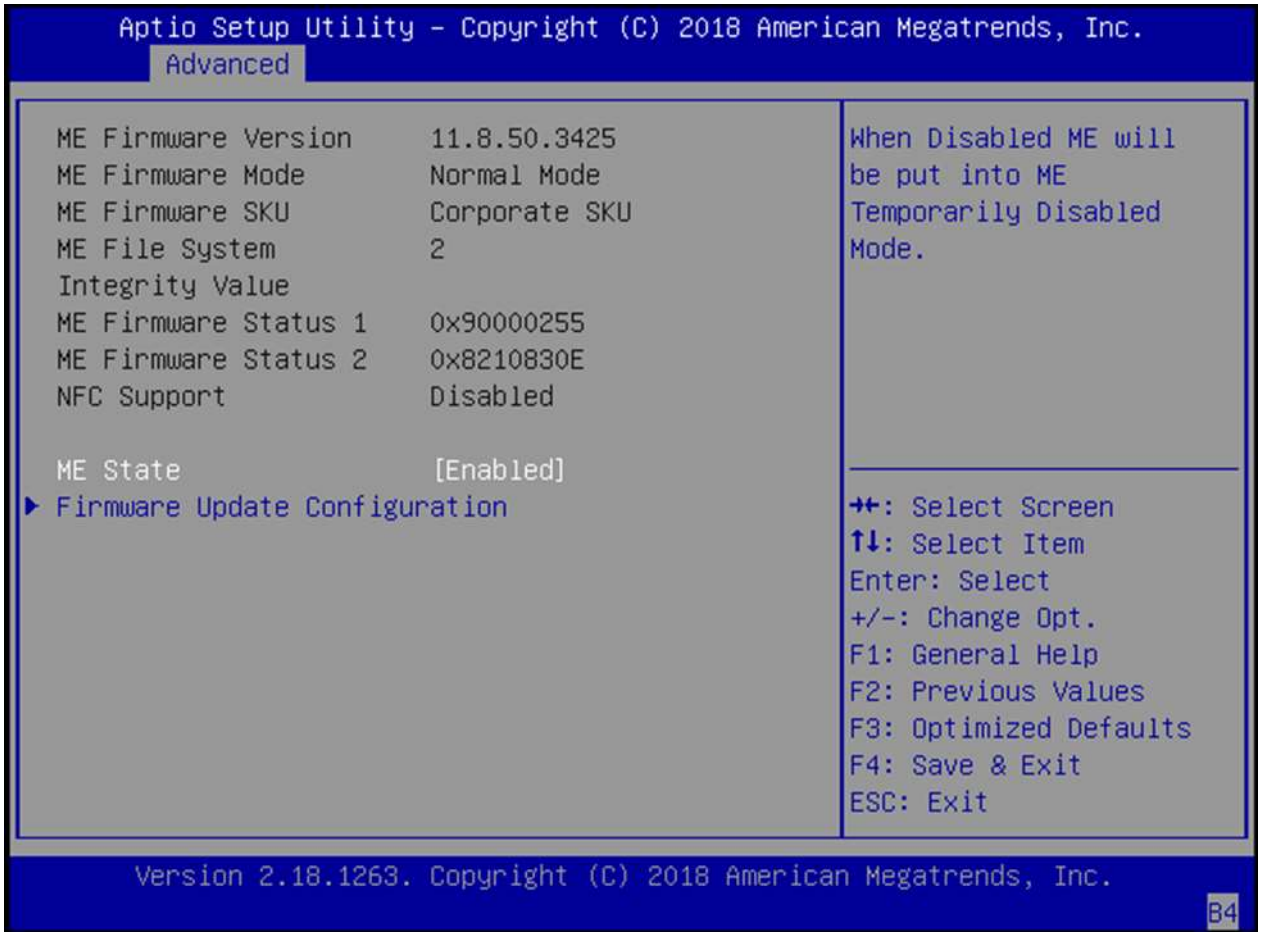


CPU - Power Management Control



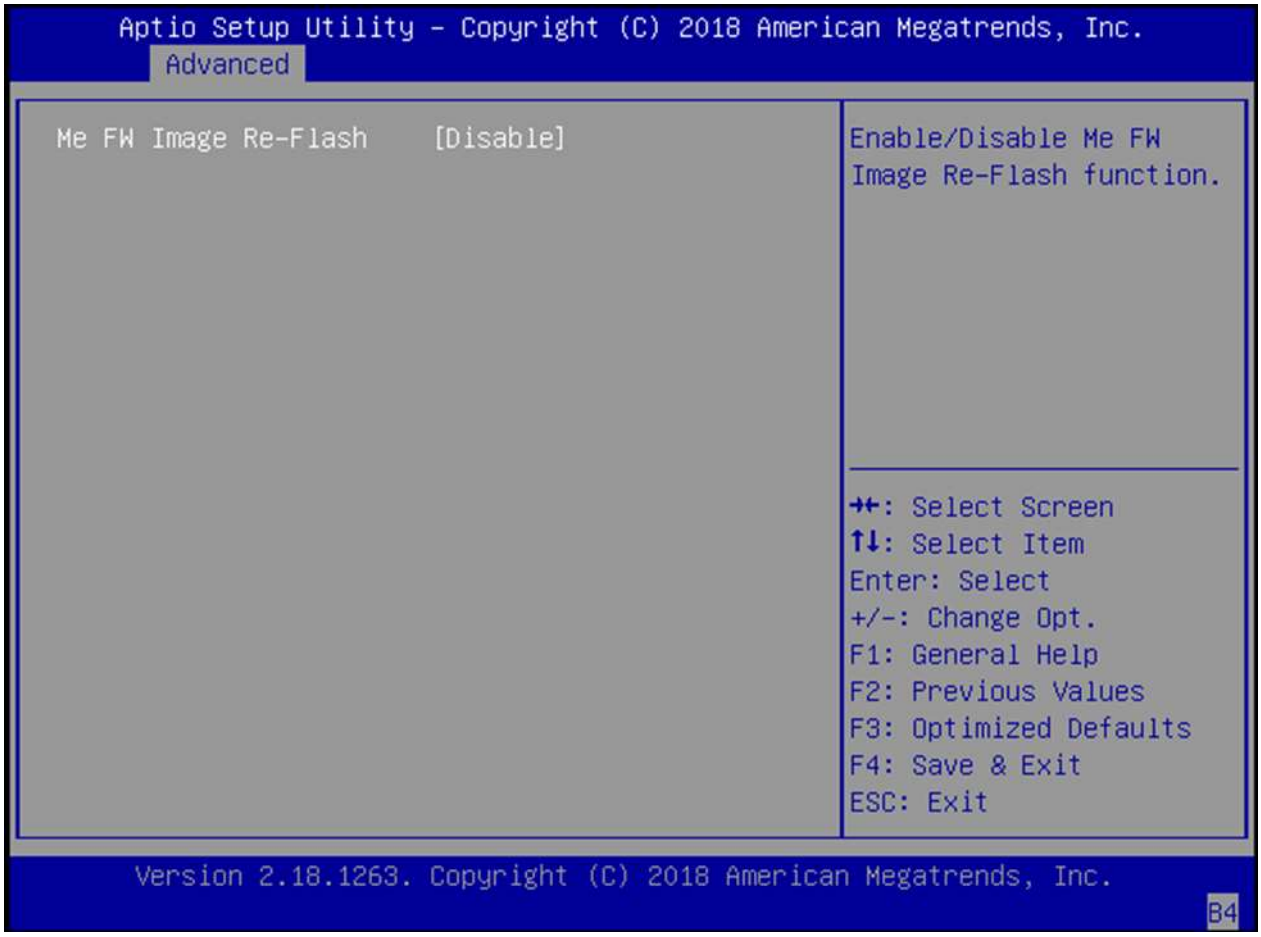
Feature	Options	Description
Boot Performance Mode	Max Non-Turbo Performance Max Battery Turbo Performance	Select the performance state that the BIOS will set starting from reset vector.
Intel® SpeedStep™	Disabled Enabled	Allows more than two frequency ranges to be supported
Race To Halt (RTH)	Disabled Enabled	Enable/Disable Race To Halt feature. RTH will dynamically increase CPU frequency in order to enter pkg C-State faster to reduce overall power. (RTH is controlled through MSR 1FC bit 20)
Intel® Speed Shift Technology	Enabled Disabled	Enable/Disable Intel® Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware-controlled P-states.
C states	Enabled Disabled	Enable/Disable CPU Power Management. Allows CPU to go to C states when its not 100% utilized.

PCH-FW Configuration



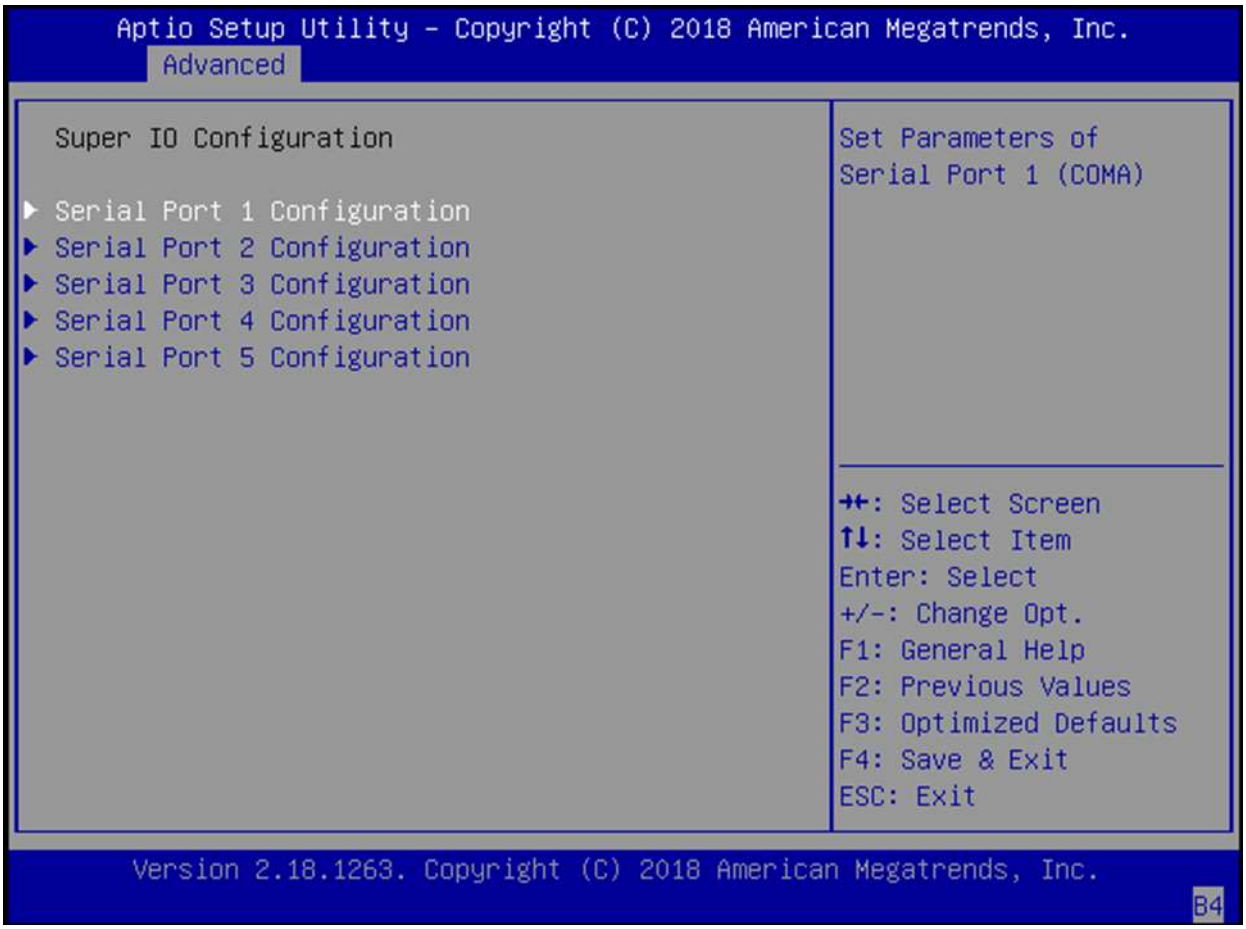
Feature	Options	Description
ME State	Disabled Enabled	When Disabled ME will put into ME Temporarily Disabled Mode

Firmware Update Configuration

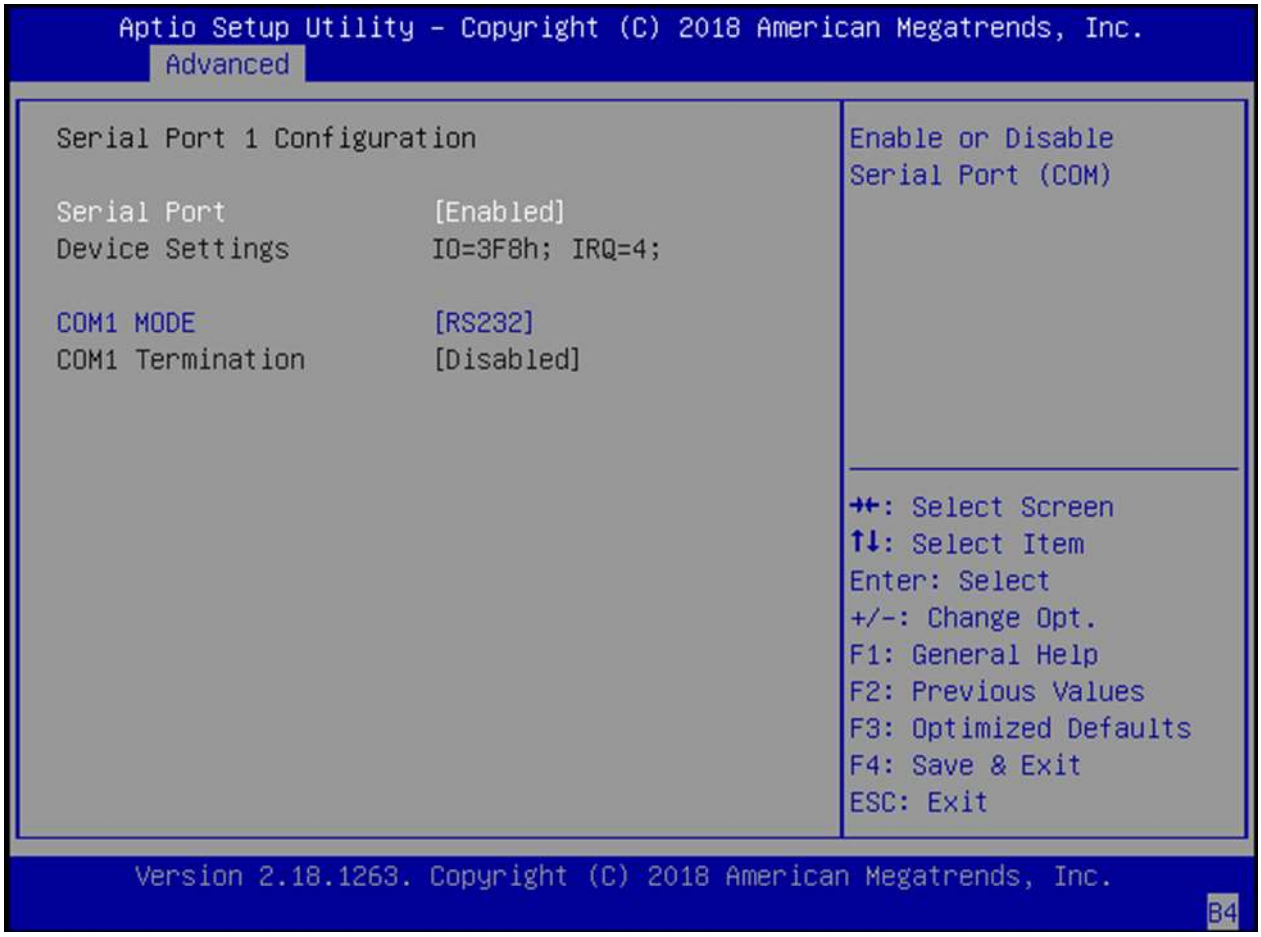


Feature	Options	Description
Me FW Image Re-Flash	Disabled Enable	Enable/Disable Me FW Image Re-Flash function.

Super IO Configuration

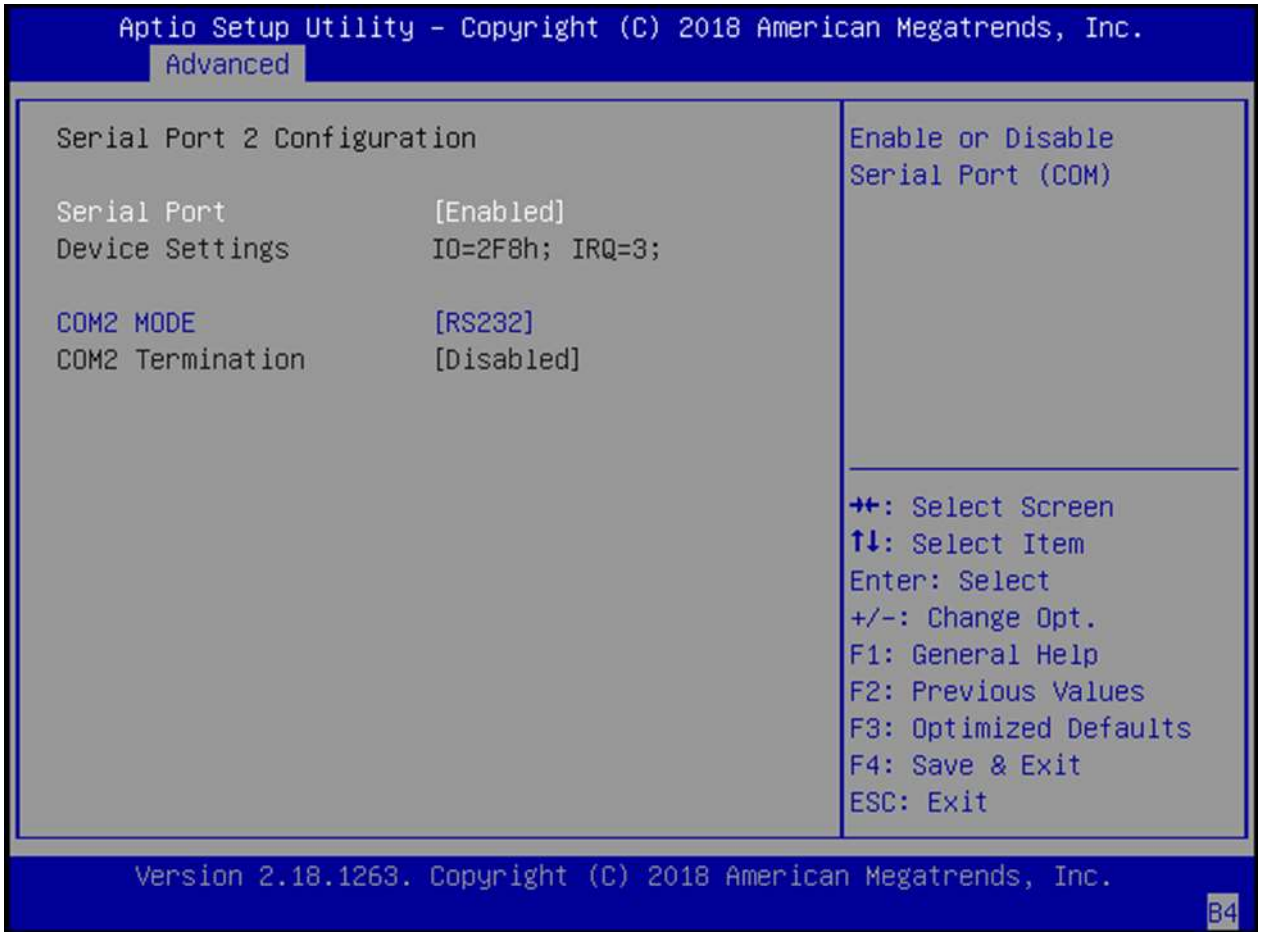


Serial Port 1 Configuration



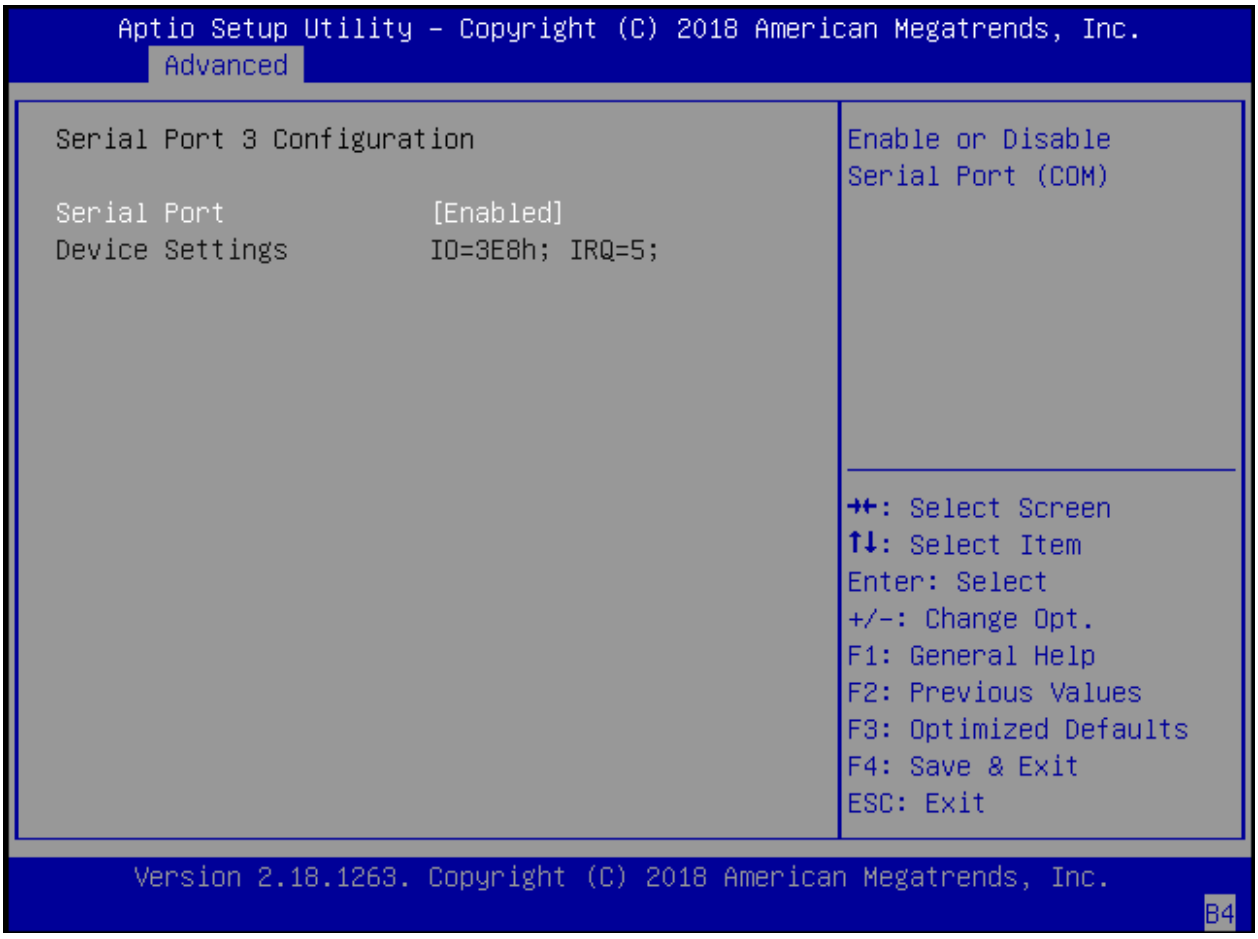
Feature	Options	Description
Serial Port	Disabled Enabled	Enable or Disable Serial Port (COM)
Device Settings	NA	IO = 3F8h; IRQ = 4
COM1 Mode	RS232 RS485 RS422	COM RS-422/485 Support
COM1 Termination	Disabled Enabled	COM RS-422/485 Receiver Termination

Serial Port 2 Configuration



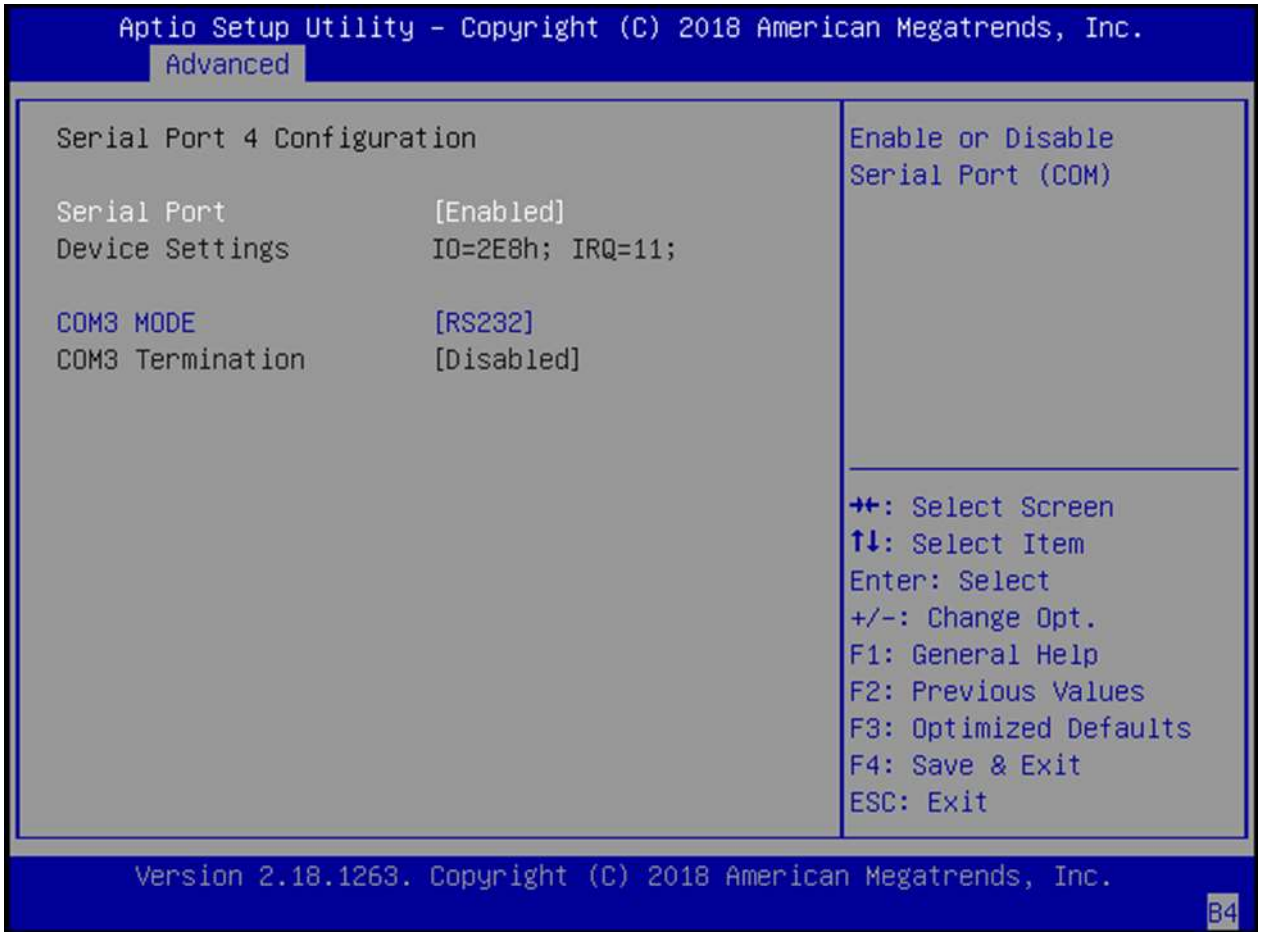
Feature	Options	Description
Serial Port	Disabled Enabled	Enable or Disable Serial Port (COM)
Device Settings	NA	IO = 2F8h; IRQ = 3
COM2 Mode	RS232 RS485 RS422	COM RS-422/485 Support
COM2 Termination	Disabled Enabled	COM RS-422/485 Receiver Termination

Serial Port 3 Configuration



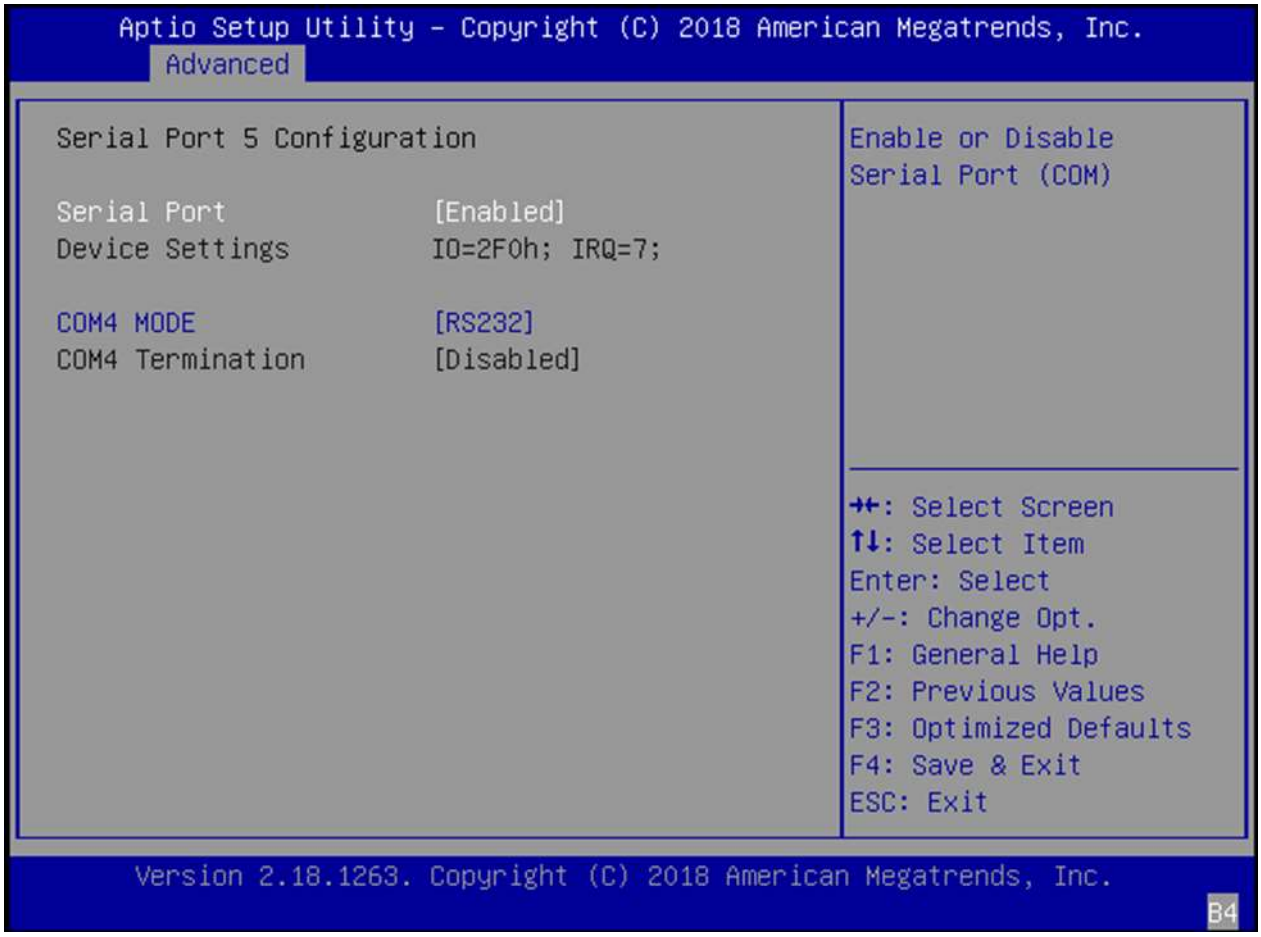
Feature	Options	Description
Serial Port	Disabled Enabled	Enable or Disable Serial Port (COM)
Device Settings	NA	IO = 3E8h; IRQ = 5

Serial Port 4 Configuration



Feature	Options	Description
Serial Port	Disabled Enabled	Enable or Disable Serial Port (COM)
Device Settings	NA	IO = 2E8h; IRQ = 11
COM4 Mode	RS232 RS485 RS422	COM RS-422/485 Support
COM4 Termination	Disabled Enabled	COM RS-422/485 Receiver Termination

Serial Port 5 Configuration

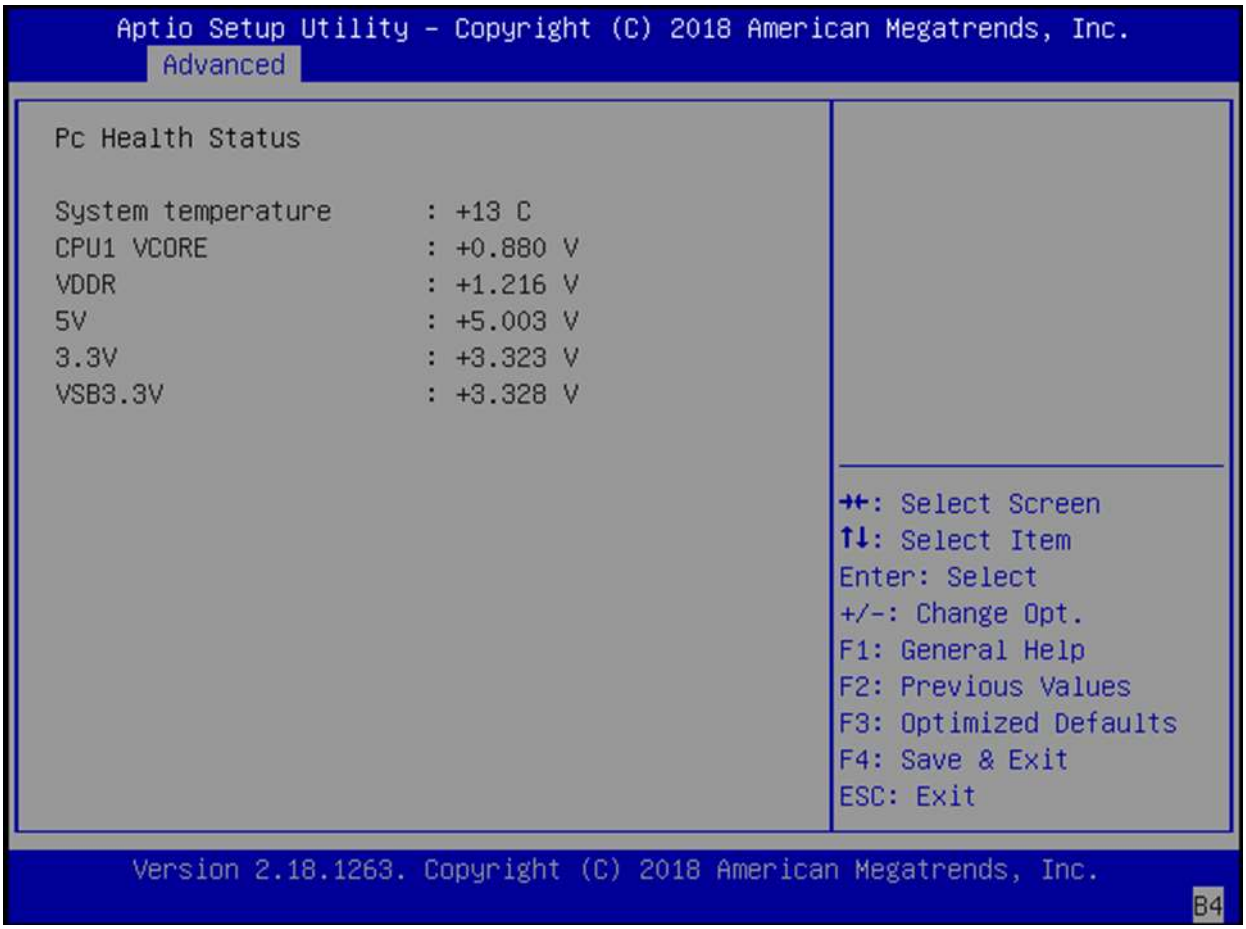


Feature	Options	Description
Serial Port	Disabled Enabled	Enable or Disable Serial Port (COM)
Device Settings	NA	IO = 2F0h; IRQ = 7
COM5 Mode	RS232 RS485 RS422	COM RS-422/485 Support
COM5 Termination	Disabled Enabled	COM RS-422/485 Receiver Termination

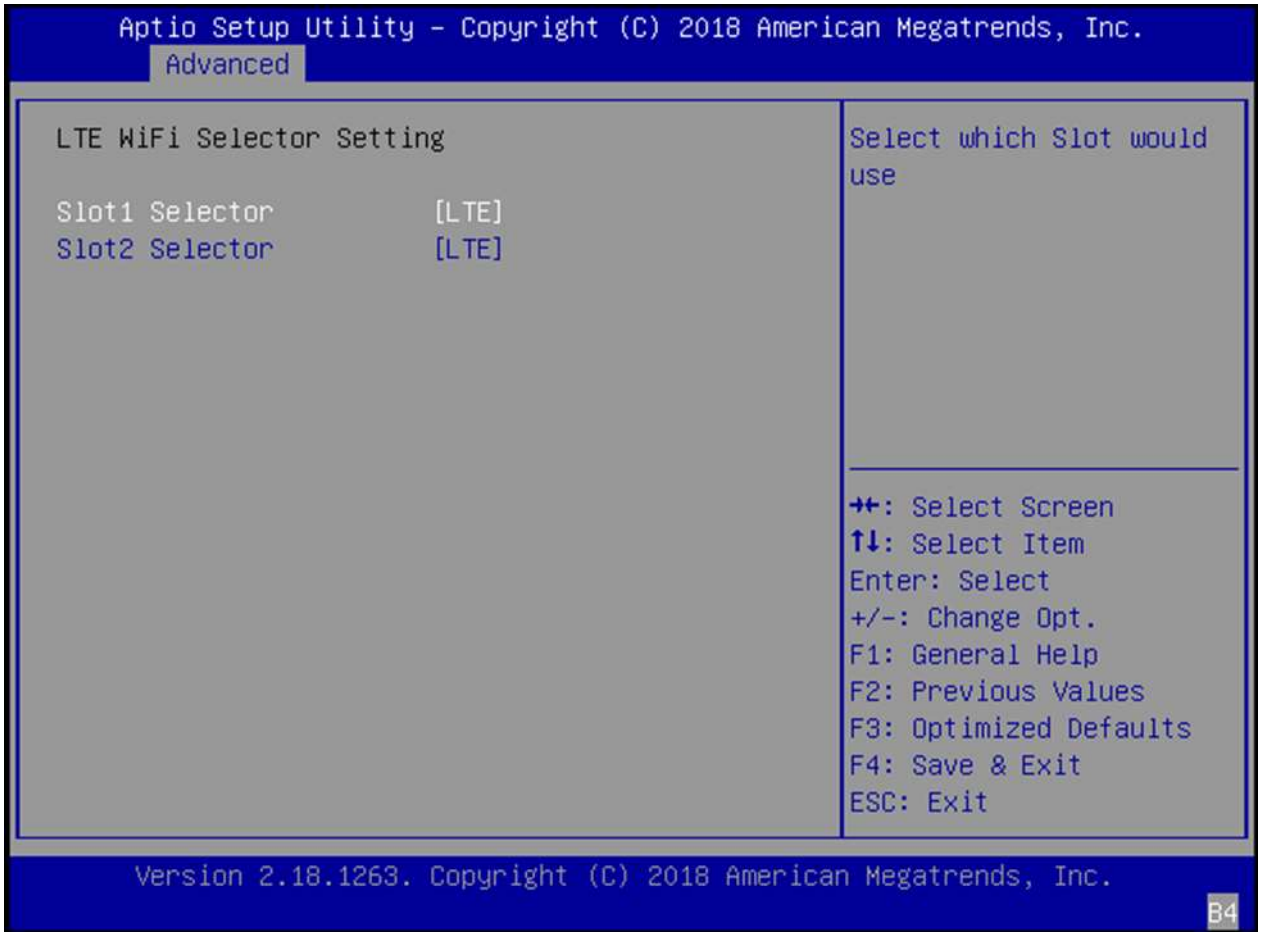
Serial Port 6 Configuration

Feature	Options	Description
Serial Port	Disabled Enabled	Enable or Disable Serial Port (COM)
Device Settings	NA	IO = 2E0h; IRQ = 10

Hardware Monitor



LTE Wi-Fi Selector Setting

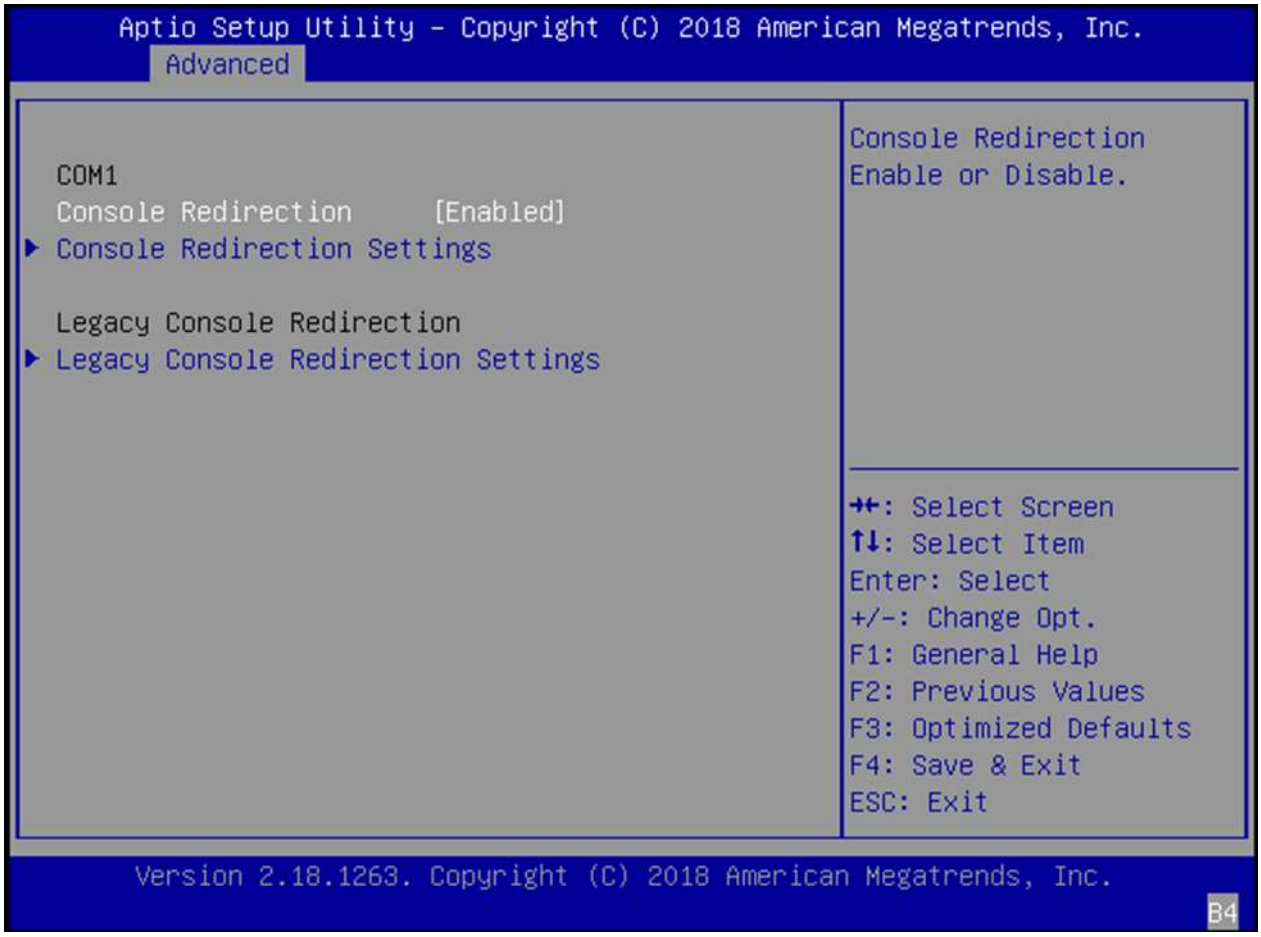


Feature	Options	Description
Slot1 Selector	Wi-Fi LTE	Select Which Slot would be used
Slot2 Selector	Wi-Fi LTE	Select Which Slot would be used

Status LED Configuration

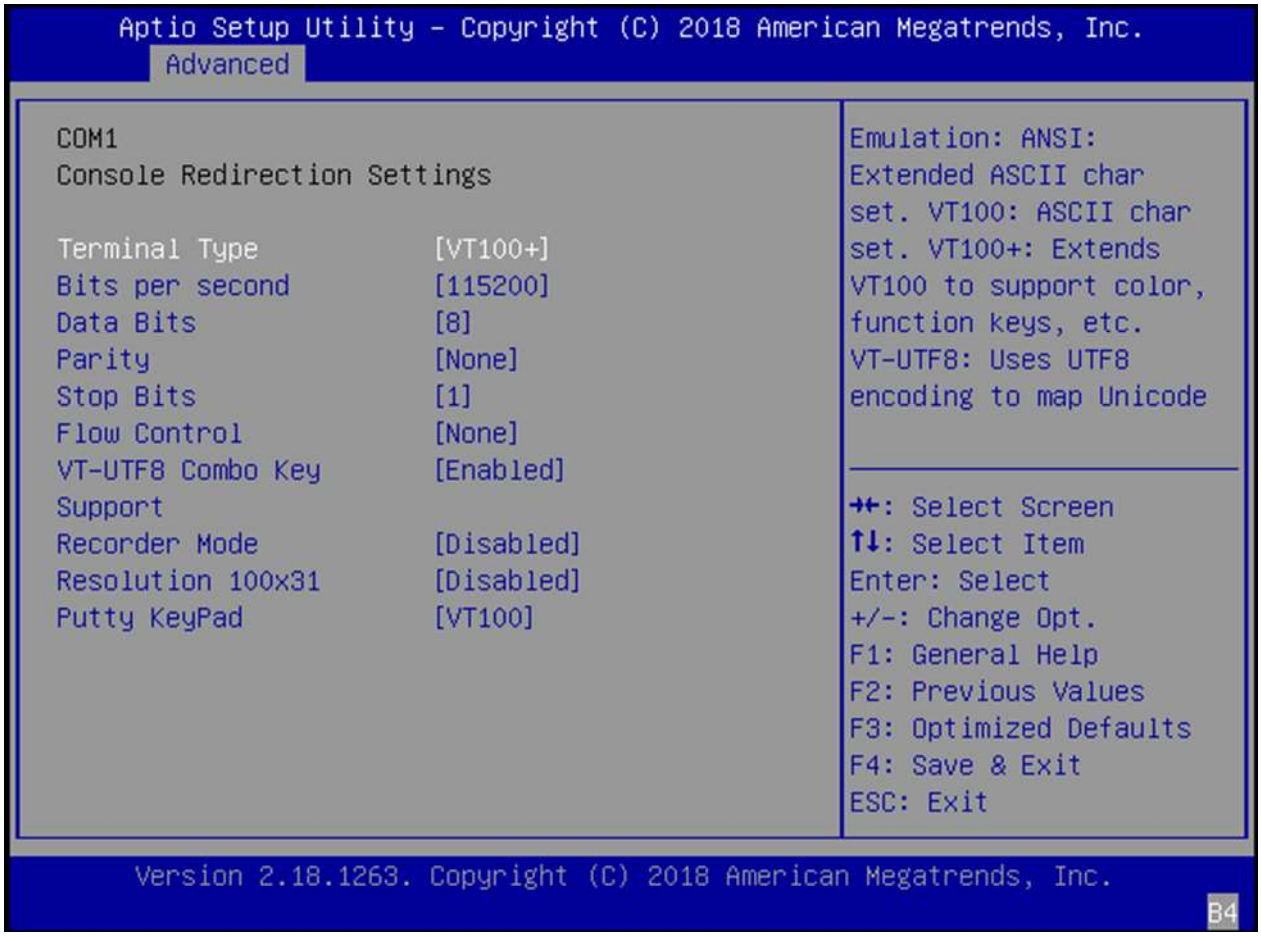
Feature	Options	Description
Status LED	Off Green Red	Configuration Status LED

Serial Port Console Redirection



Feature	Options	Description
COM1 Console Redirection	Disabled Enabled	Console Redirection Enable or Disable

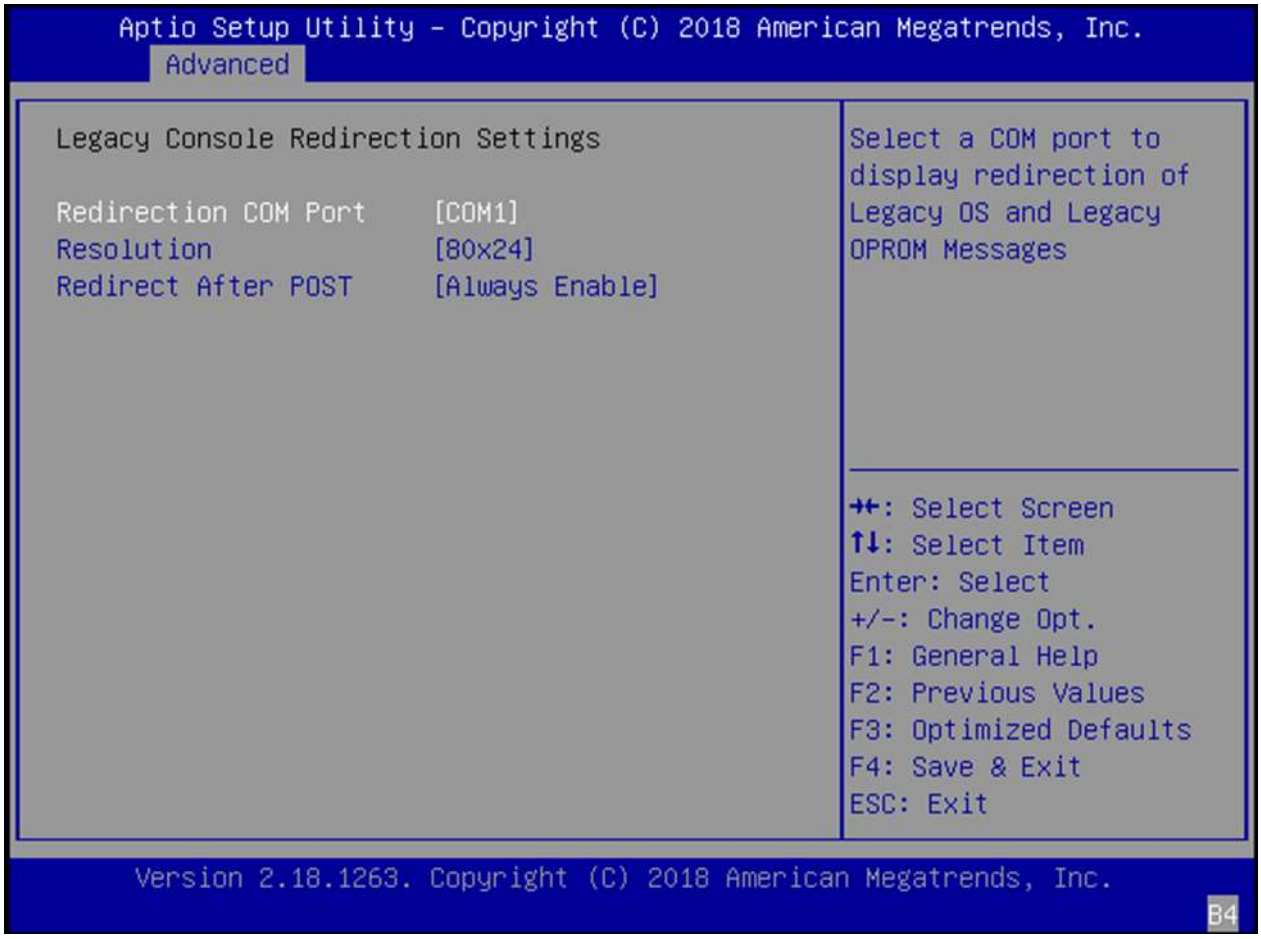
Console Redirection Settings



Feature	Options	Description
Terminal Type	VT100 VT100+ VT-UTF8 ANSI	VT100: ASCII char set VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes ANSI: Extended ASCII char set
Bits per second	9600 19200 38400 57600 115200	Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.
Data Bits	7 8	Data Bits
Parity	None Even Odd Mark Space	A parity bit can be sent with the data bits to detect some transmission errors.
Stop Bits	1 2	Indicates the end of a serial data packet.
Flow Control	None	Flow Control can prevent data loss from buffer overflow

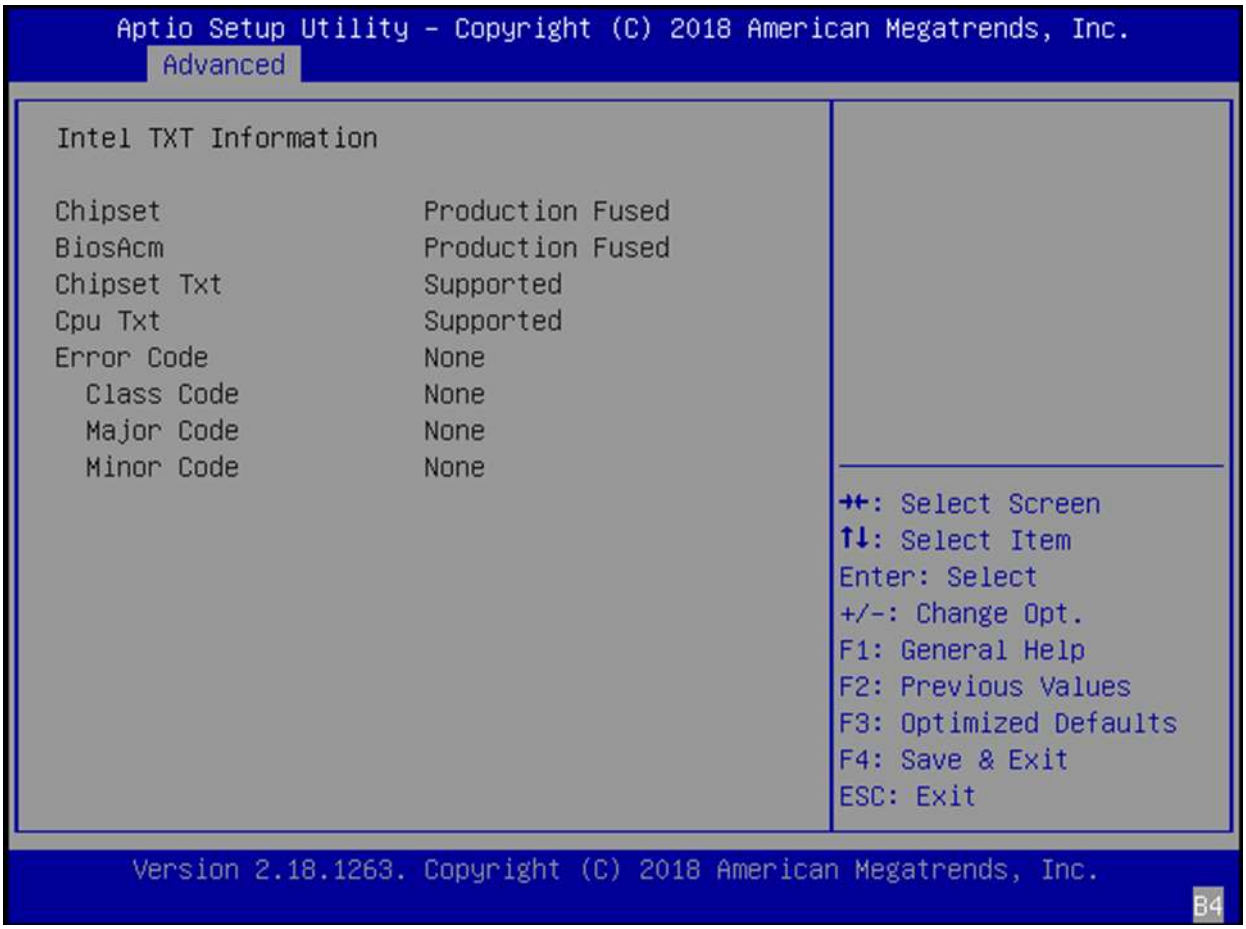
	Hardware RTS/CTS	
VT-UTF8 Combo Key Support	Disabled Enabled	Enables VT-UTF8 Combination Key Support for ANSI/VT100 terminals
Recorder Mode	Disabled Enabled	With this mode enabled, only text will be sent. This is to capture Terminal data.
Resolution 100x31	Disabled Enabled	Enables or disables extended terminal resolution
Putty KeyPad	VT100 LINUX XTERM86 SCO ESCN VT400	Selects FunctionKey and KeyPad on Putty

Legacy Console Redirection Settings

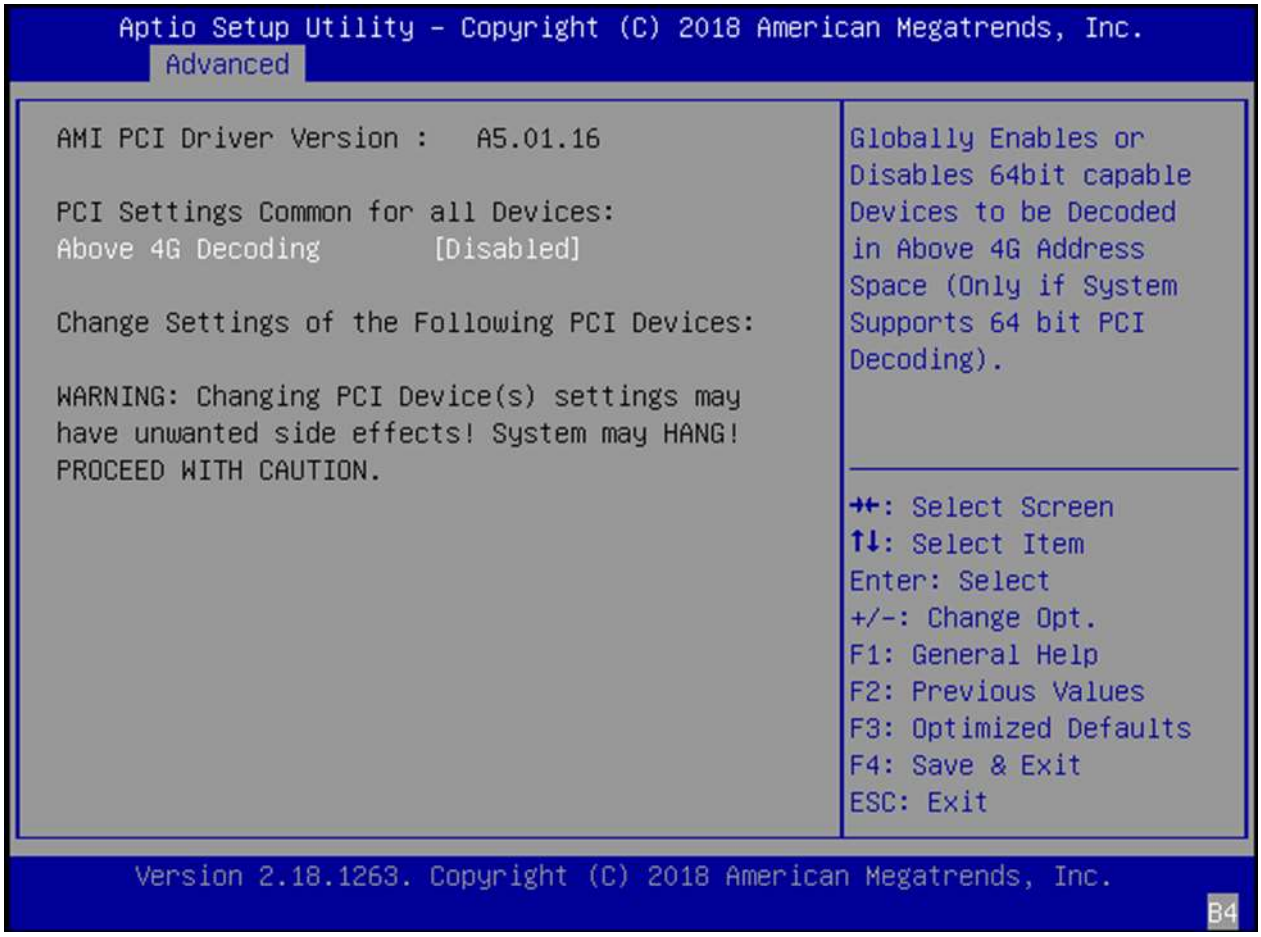


Feature	Options	Description
Redirection COM Port	COM1	Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages.
Resolution	80x24 80x25	On Legacy OS, the Number of Rows and Columns supported redirection.
Redirection After BIOS Post	Always Enable Bootloader	When **Bootloader** is selected, Legacy Console Redirection is disabled before booting to legacy OS. When **Always Enable** is selected, then Legacy Console Redirection is enabled for legacy OS. Default setting for this option is set to **Always Enable**.

Intel TXT Information

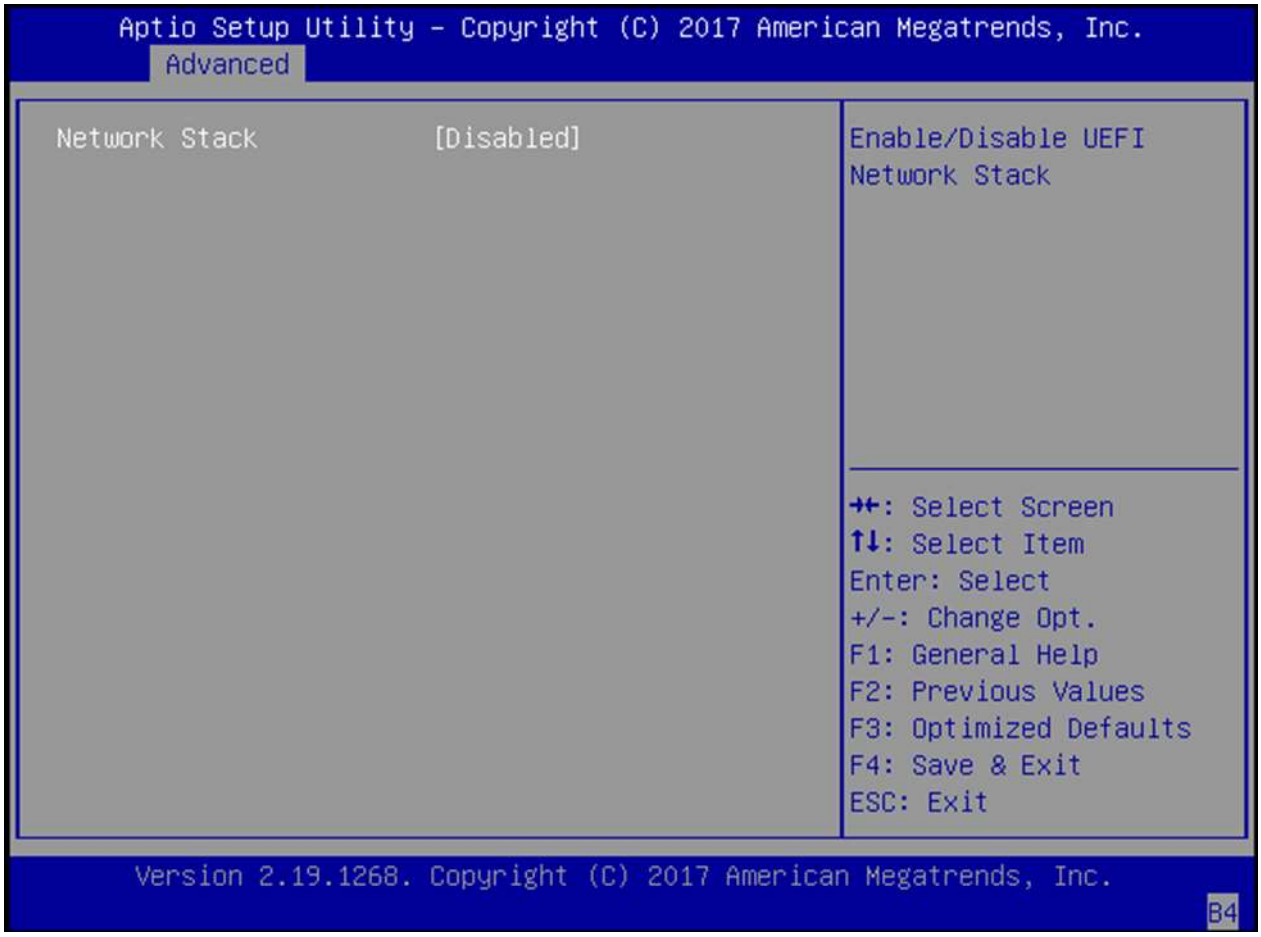


PCI Subsystem Settings



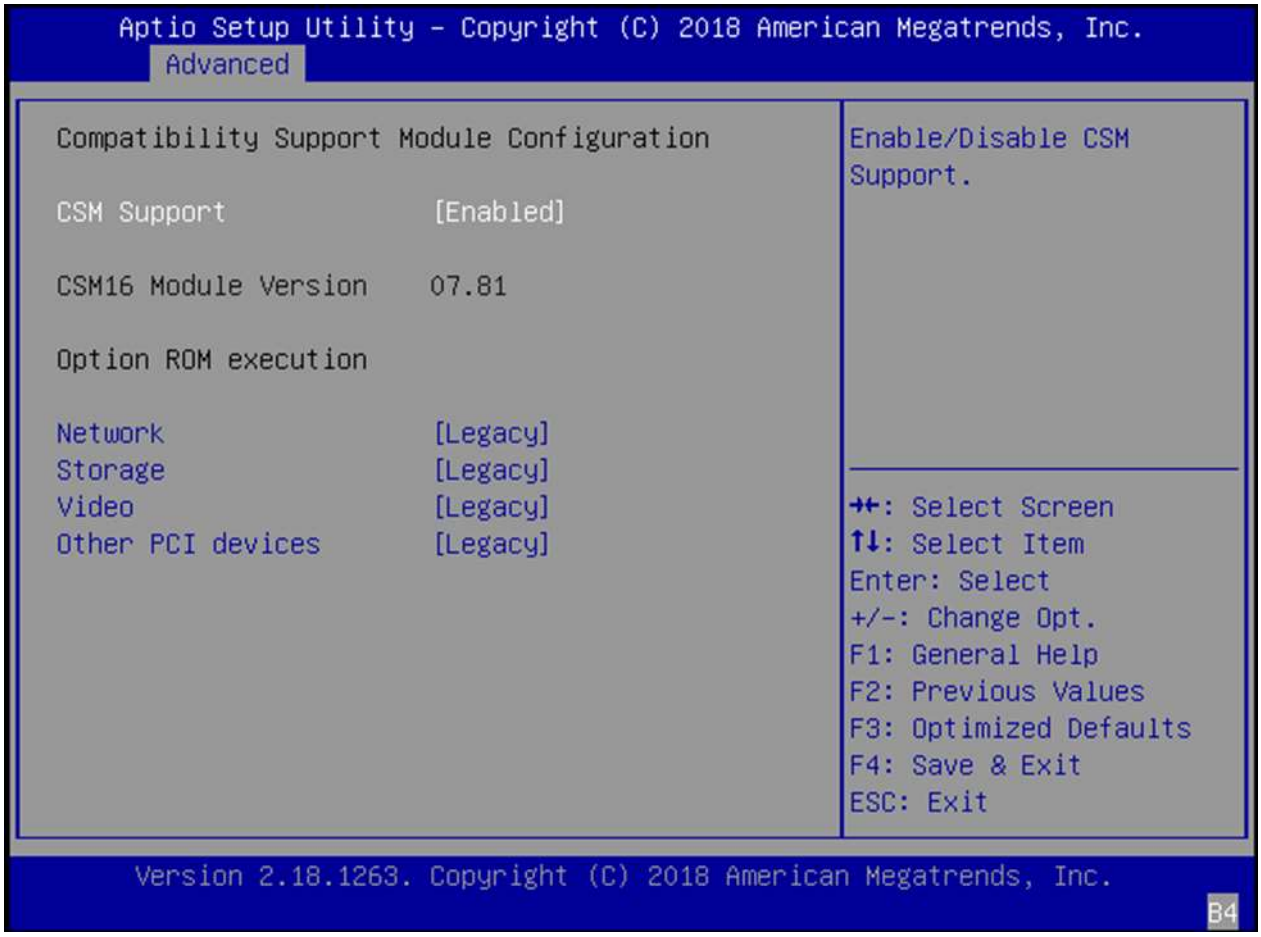
Feature	Options	Description
Above 4G Decoding	Disabled Enabled	Globally Enables or Disables 64bit capable devices to be decoded in above 4G address space (only if System supports 64bit PCI decoding)

Network Stack Configuration



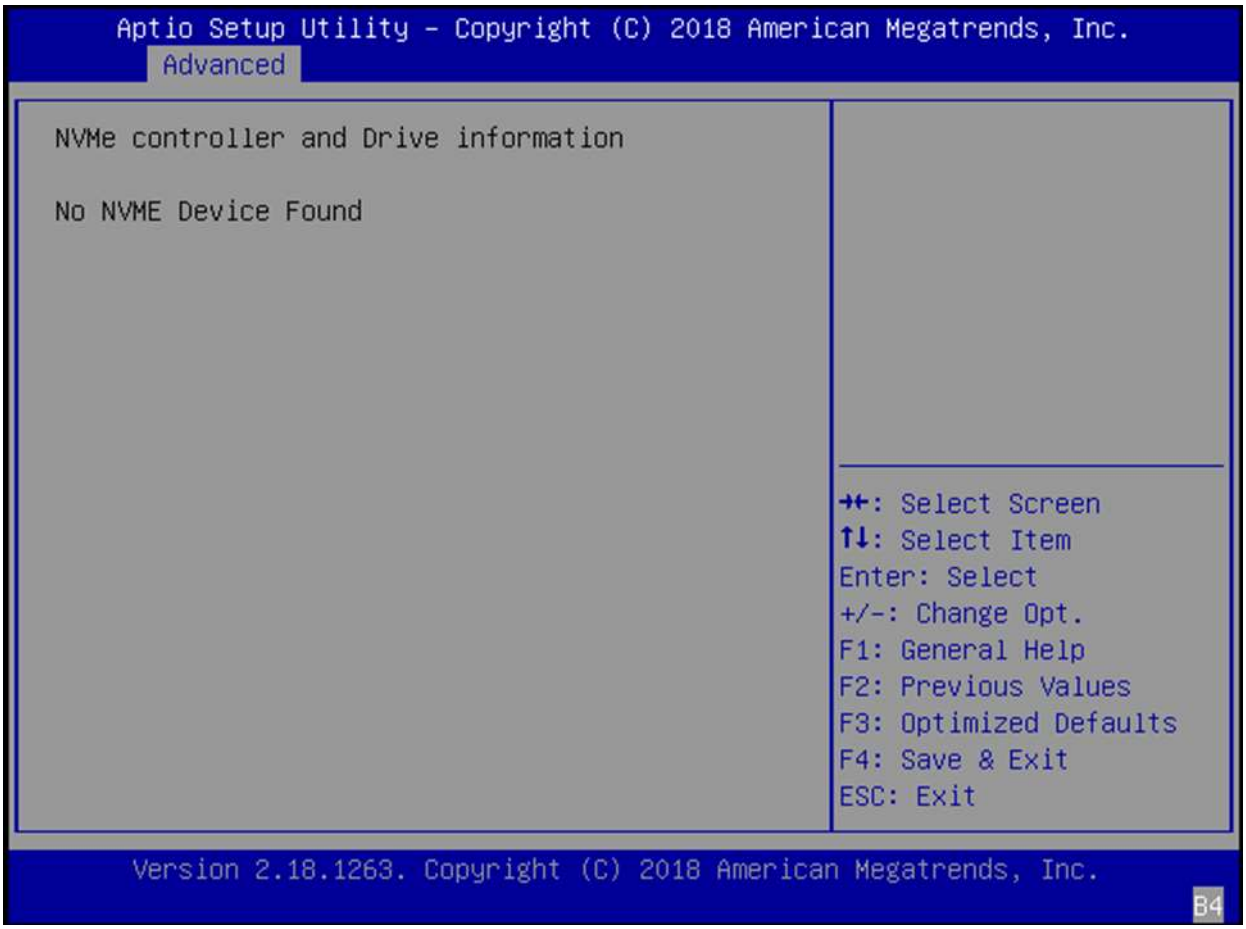
Feature	Options	Description
Network Stack	Disabled Enabled	Enables or disables UEFI Network Stack

CSM Configuration

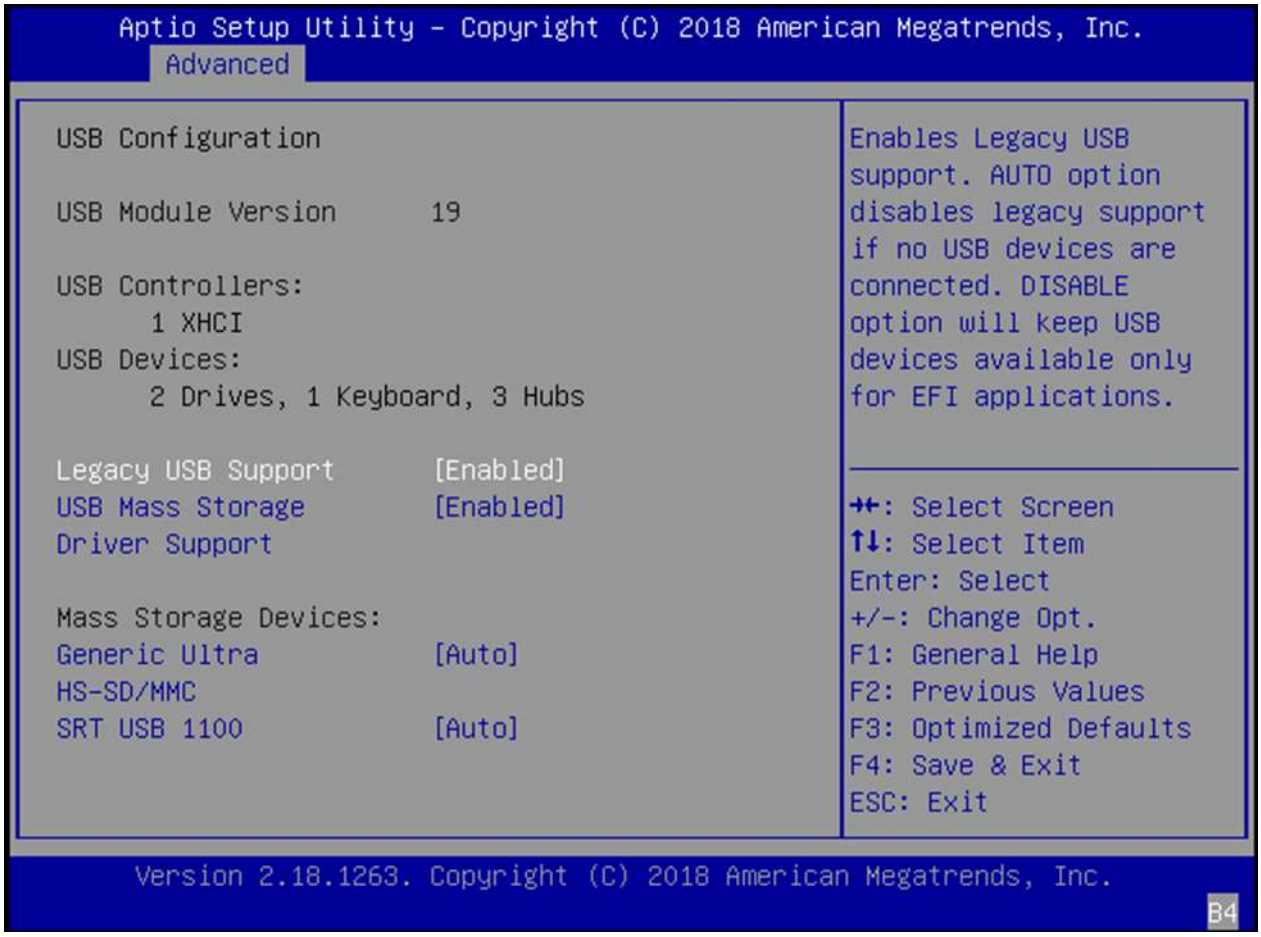


Feature	Options	Description
CSM Support	Disabled Enabled	Enables/Disables CSM Support
Network	Do Not Launch UEFI Legacy	Controls the execution of UEFI and Legacy PXE OpROM
Storage	Do Not Launch UEFI Legacy	Controls the execution of UEFI and Legacy Storage OpROM
Video	Do Not Launch UEFI Legacy	Controls the execution of UEFI and Legacy Video OpROM
Other PCI Device	Do Not Launch UEFI Legacy	Determines OpROM execution policy for devices other than Network, Storage, or Video

NVMe Configuration



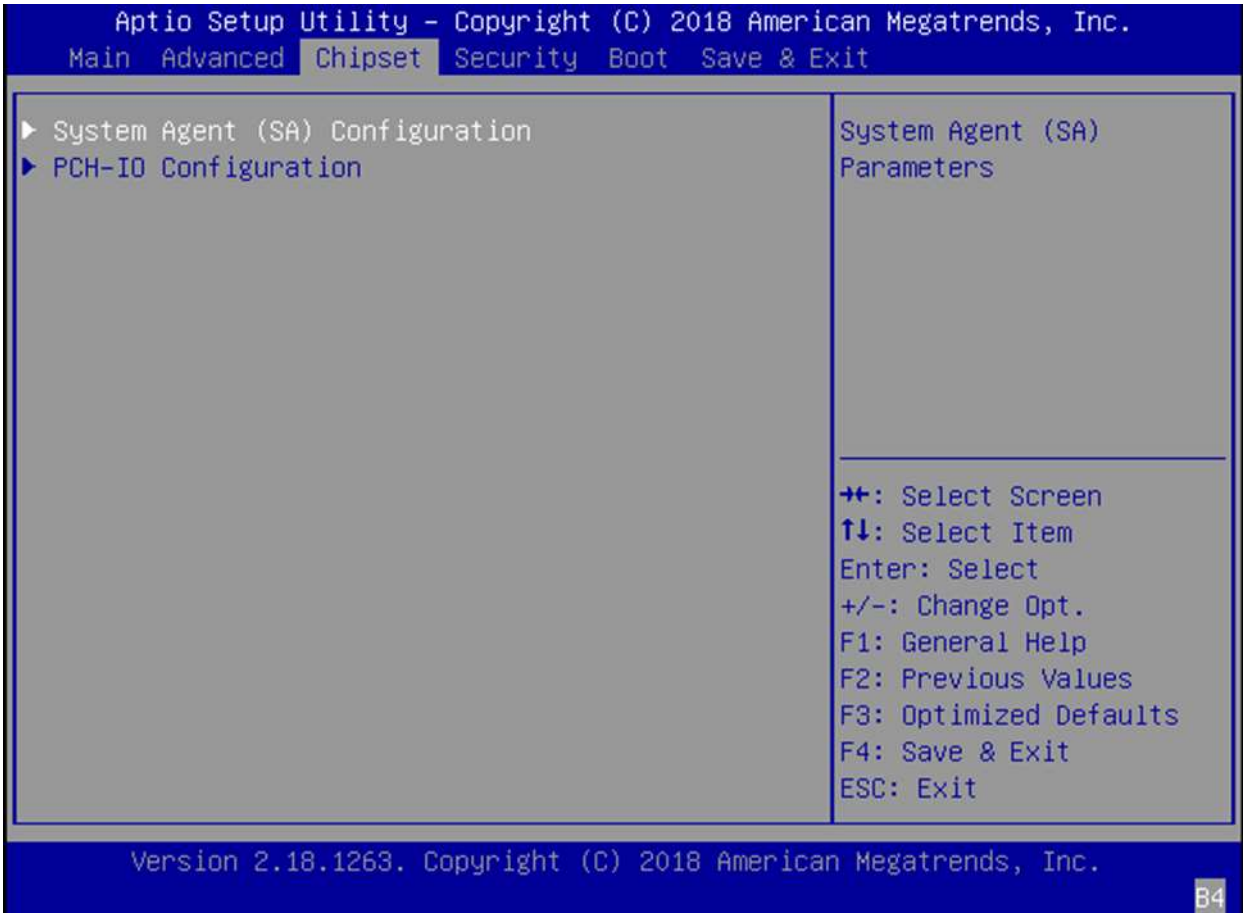
USB Configuration



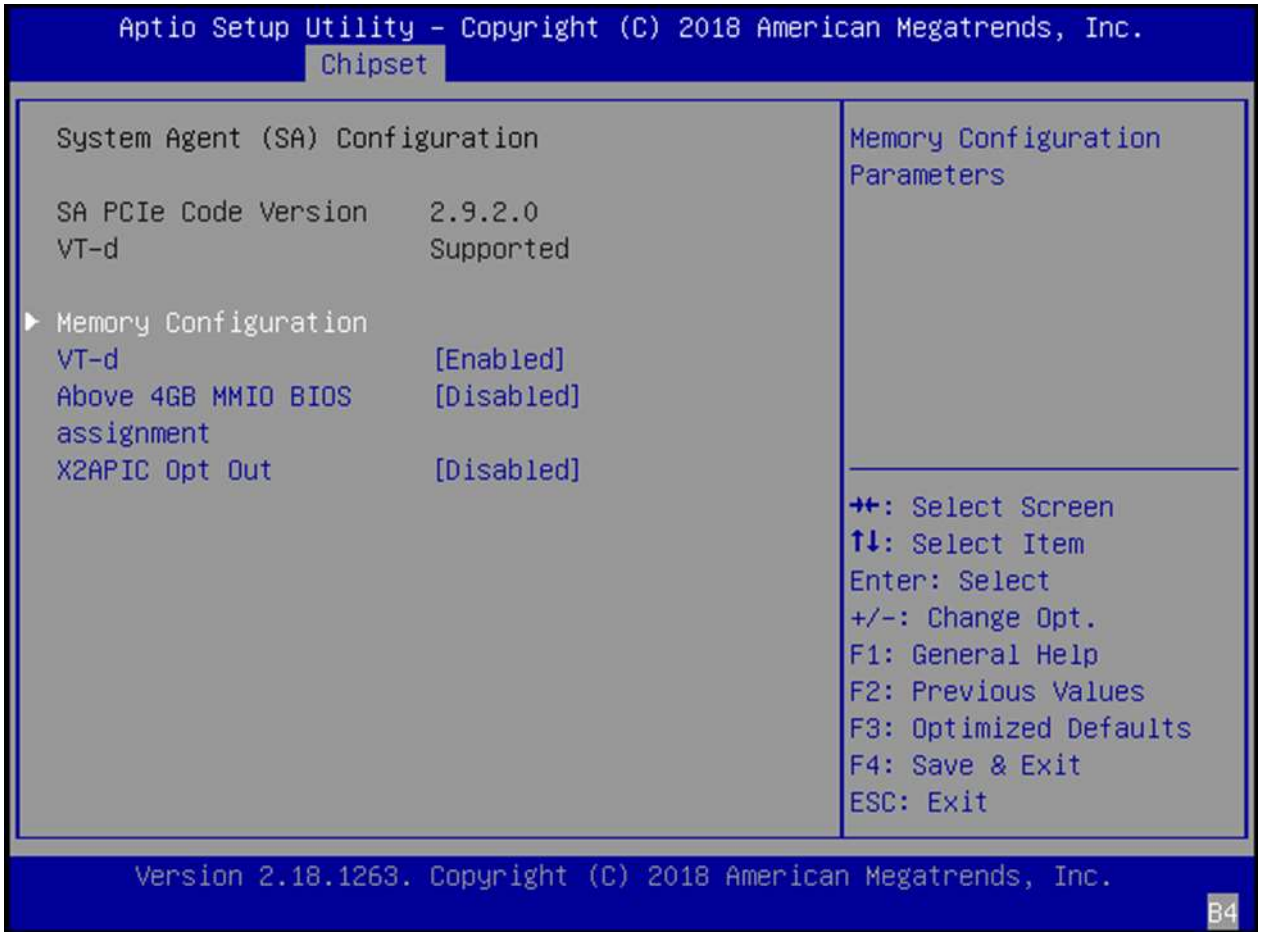
Feature	Options	Description
Legacy USB Support	Enabled Disabled Auto	**Enables** Legacy USB support **Auto** option disables legacy support if no USB devices are connected; **Disabled** option will keep USB devices available only for EFI applications
USB Mass Storage Driver Support	Disabled Enabled	Enables or disables USB Mass Storage Driver Support

Chipset

Select the **Chipset** menu item from the BIOS setup screen to enter the "Chipset" setup screen. Users can select any of the items in the left frame of the screen.

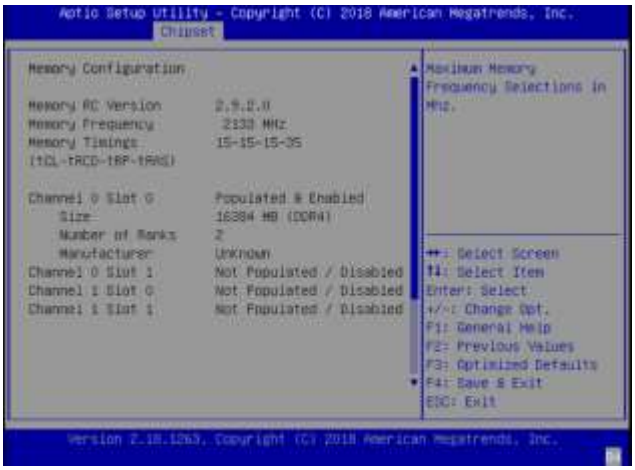


System Agent (SA) Configuration



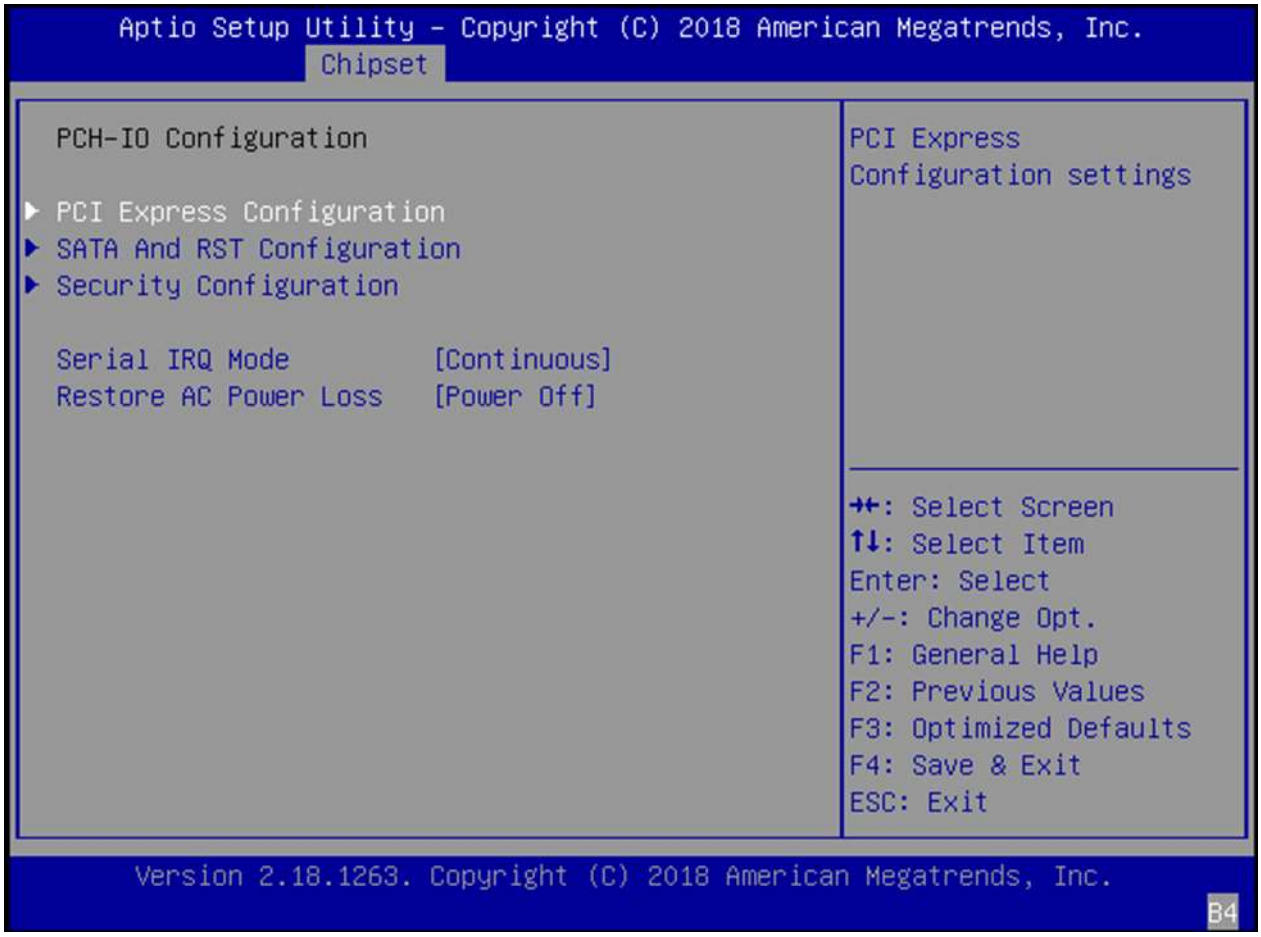
Feature	Options	Description
VT-d	Disabled Enabled	VT-d capability
Above 4GB MMIO BIOS assignment	Disabled Enabled	Enable/Disable above 4GB MemoryMappedIO BIOS assignment. This is enabled automatically when Aperture Size is set to 2048MB
Z2APIC Opt Out	Disabled Enabled	Enable/Disable X2APIC_OPT_OUT bit

Memory Configuration



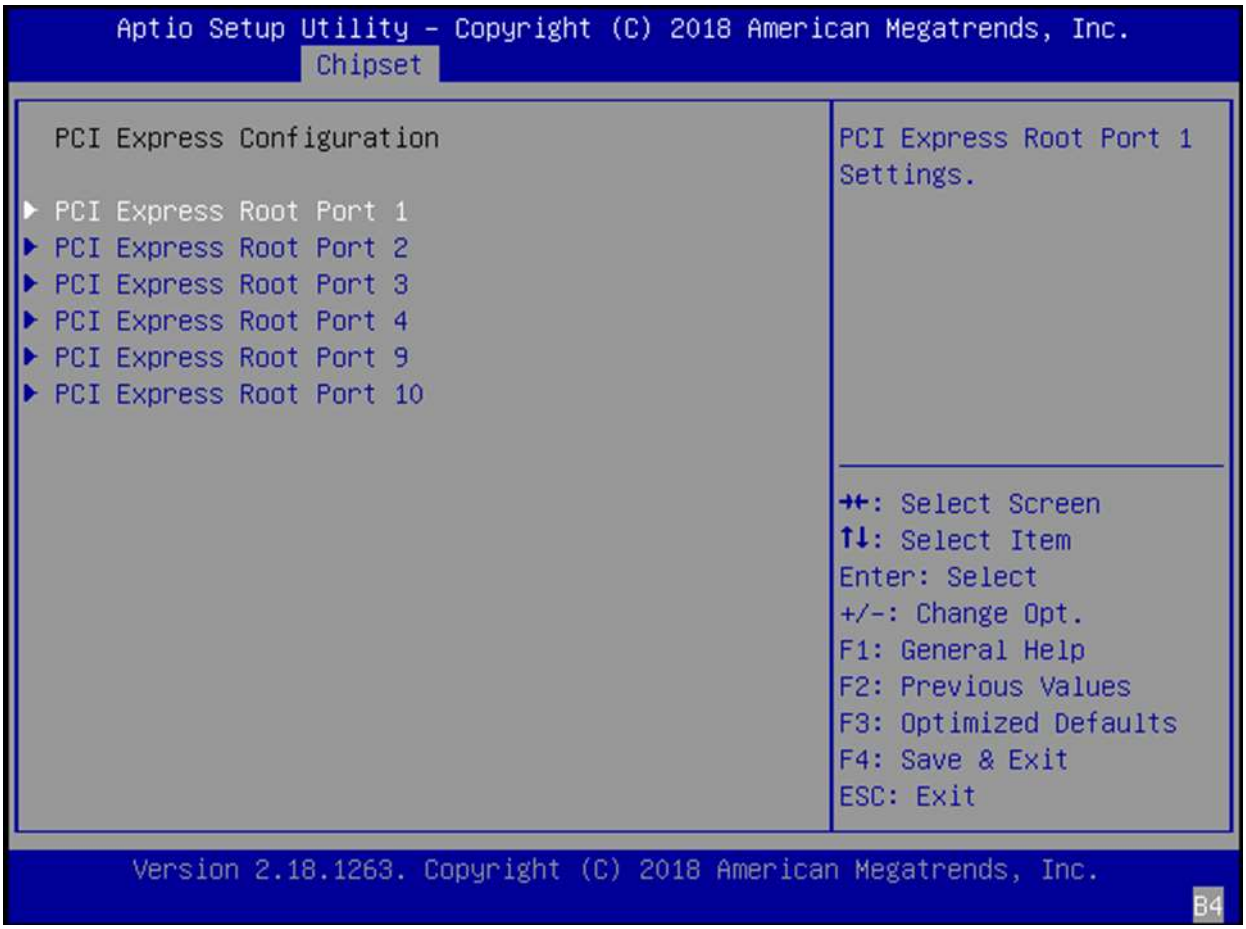
Feature	Options	Description
Maximum Memory Frequency	Auto 1067~3733	Maximum Memory Frequency Selections in MHz
Max TOLUD	Dynamic 1GB~ 3.5GB	Maximum Value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller.

PCH-IO Configuration



Feature	Options	Description
Serial IRQ Mode	Quiet Continuous	Configure Serial IRQ mode
Restore AC Power Loss	Power ON Power OFF	Specify what state to go to when power is re-applied after a power failure (G3 state)

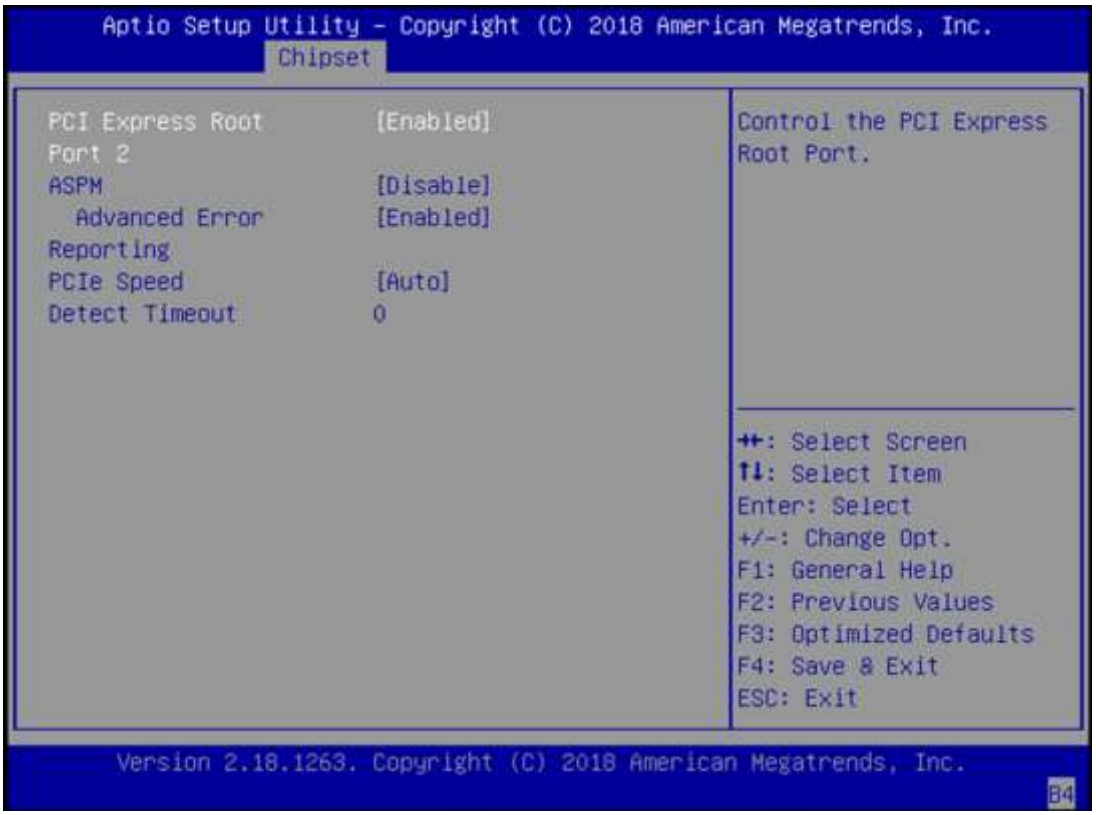
PCI Express Configuration



PCI Express Root Port1

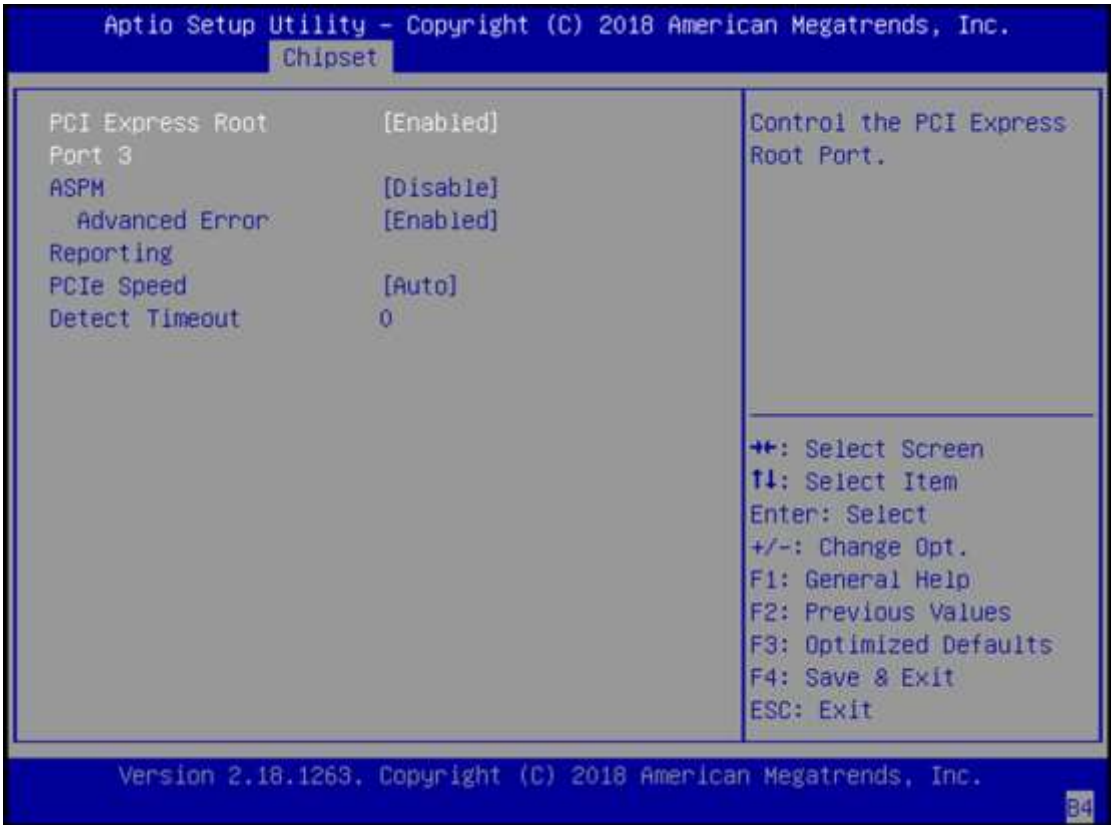
Feature	Options	Description
PCI Express Root Port1	Disabled Enabled	Control the PCI Express Root Port
ASPM	Auto L0sL1 L1 L0s Disabled	Set the ASPM Level: Force all links to 0s State AUTO – BIOS auto configure DISABLE – Disabled ASPM
Advanced Error Reporting	Disabled Enabled	Advanced Error Reporting Enable/Disable
PCIe Speed	Auto Gen1 Gen2 Gen3	Configure PCIe Speed
Detect Timeout	0	The number of milliseconds reference code will wait for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.

PCI Express Root Port2



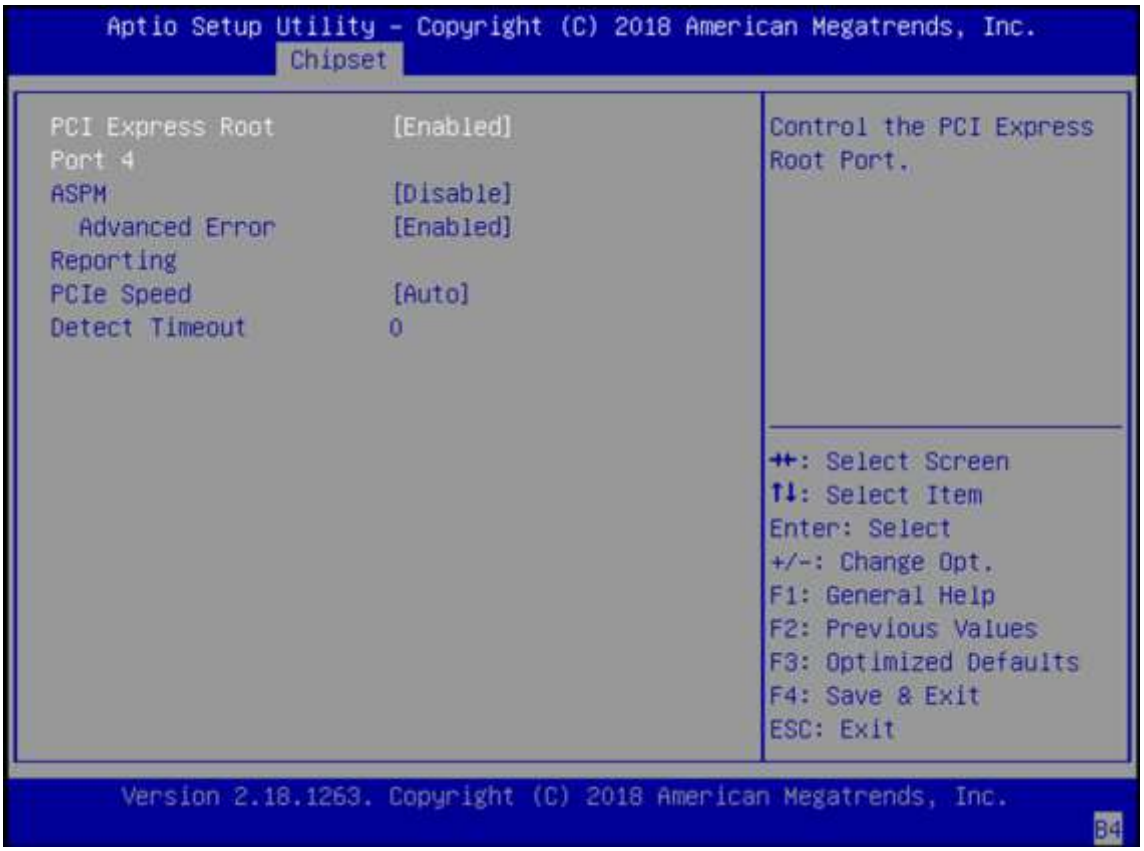
Feature	Options	Description
PCI Express Root Port2	Disabled Enabled	Control the PCI Express Root Port
ASPM	Auto L0sL1 L1 L0s Disabled	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disabled ASPM
Advanced Error Reporting	Disabled Enabled	Advanced Error Reporting Enable/Disable
PCIe Speed	Auto Gen1 Gen2 Gen3	Configure PCIe Speed
Detect Timeout	0	The number of milliseconds reference code will wait for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.

PCI Express Root Port3



Feature	Options	Description
PCI Express Root Port3	Disabled Enabled	Control the PCI Express Root Port
ASPM	Auto L0sL1 L1 L0s Disabled	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disabled ASPM
Advanced Error Reporting	Disabled Enabled	Advanced Error Reporting Enable/Disable
PCIe Speed	Auto Gen1 Gen2 Gen3	Configure PCIe Speed
Detect Timeout	0	The number of milliseconds reference code will wait for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.

PCI Express Root Port4

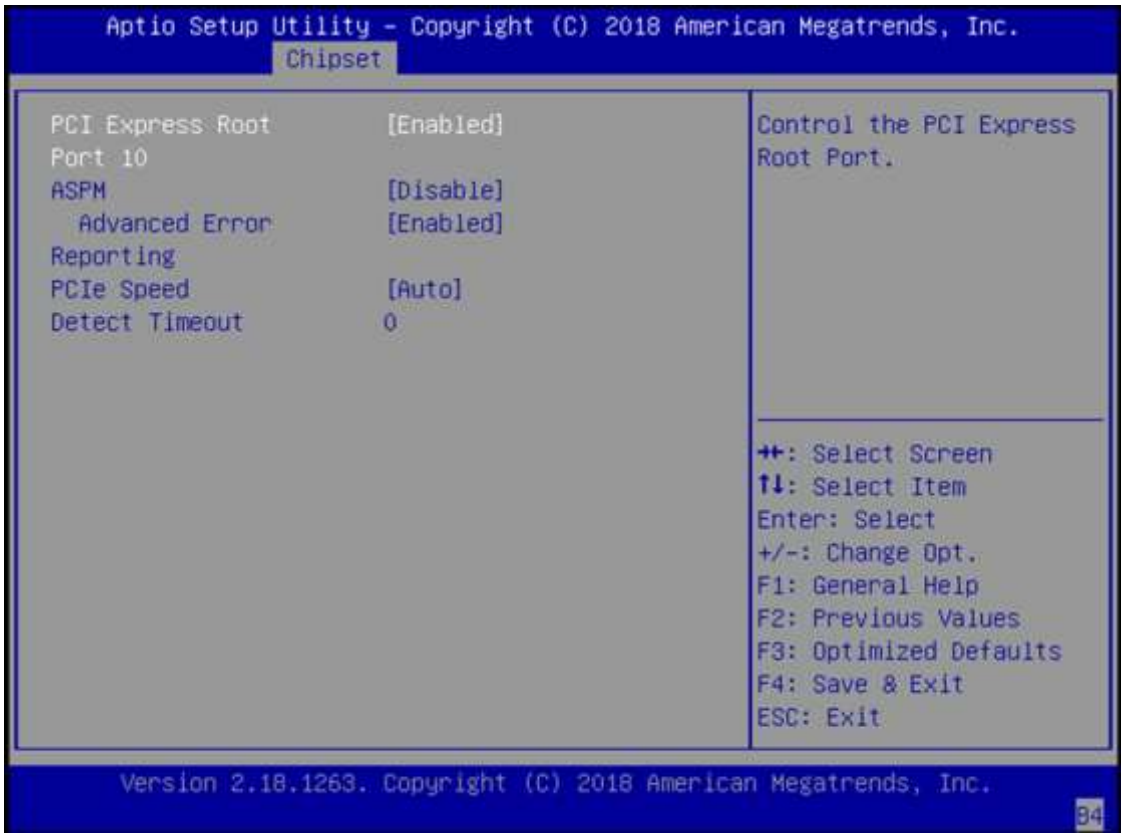


Feature	Options	Description
PCI Express Root Port3	Disabled Enabled	Control the PCI Express Root Port
ASPM	Auto L0sL1 L1 L0s Disabled	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disabled ASPM
Advanced Error Reporting	Disabled Enabled	Advanced Error Reporting Enable/Disable
PCIe Speed	Auto Gen1 Gen2 Gen3	Configure PCIe Speed
Detect Timeout	0	The number of milliseconds reference code will wait for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.

PCI Express Root Port9

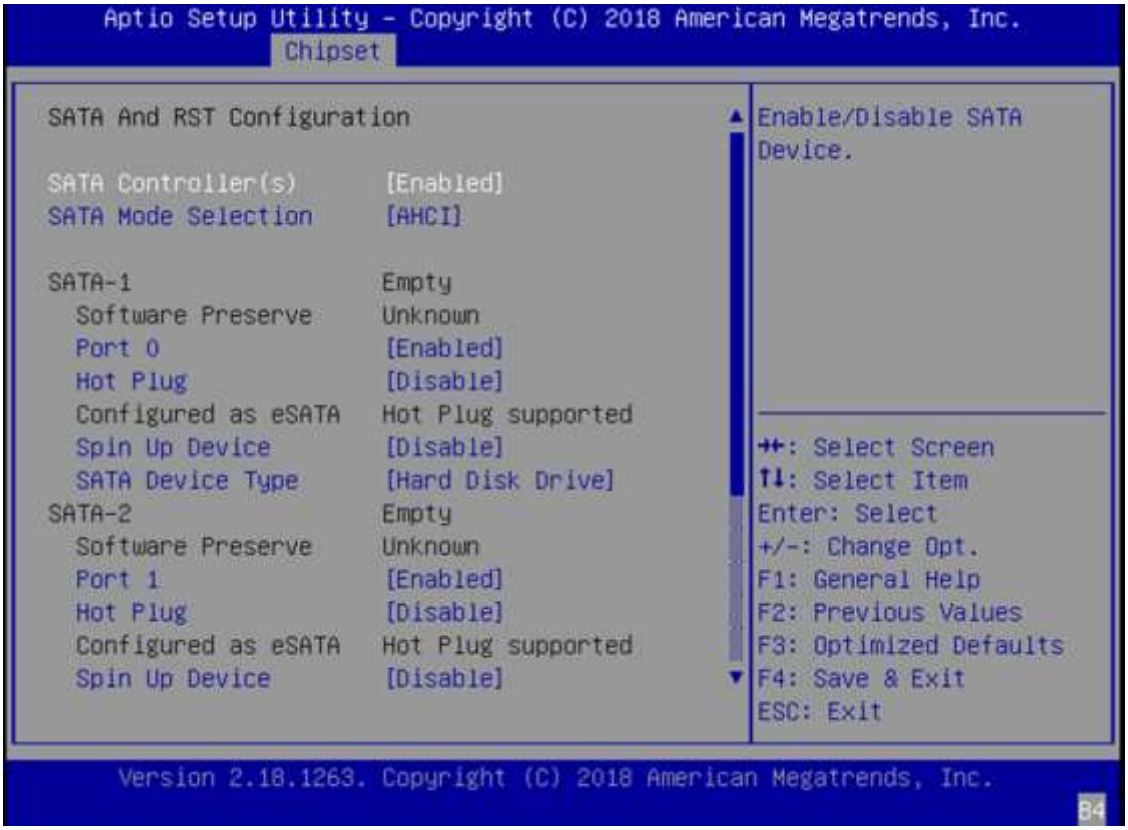
Feature	Options	Description
PCI Express Root Port3	Disabled Enabled	Control the PCI Express Root Port
ASPM	Auto L0sL1 L1 L0s Disabled	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disabled ASPM
Advanced Error Reporting	Disabled Enabled	Advanced Error Reporting Enable/Disable
PCIe Speed	Auto Gen1 Gen2 Gen3	Configure PCIe Speed
Detect Timeout	0	The number of milliseconds reference code will wait for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.

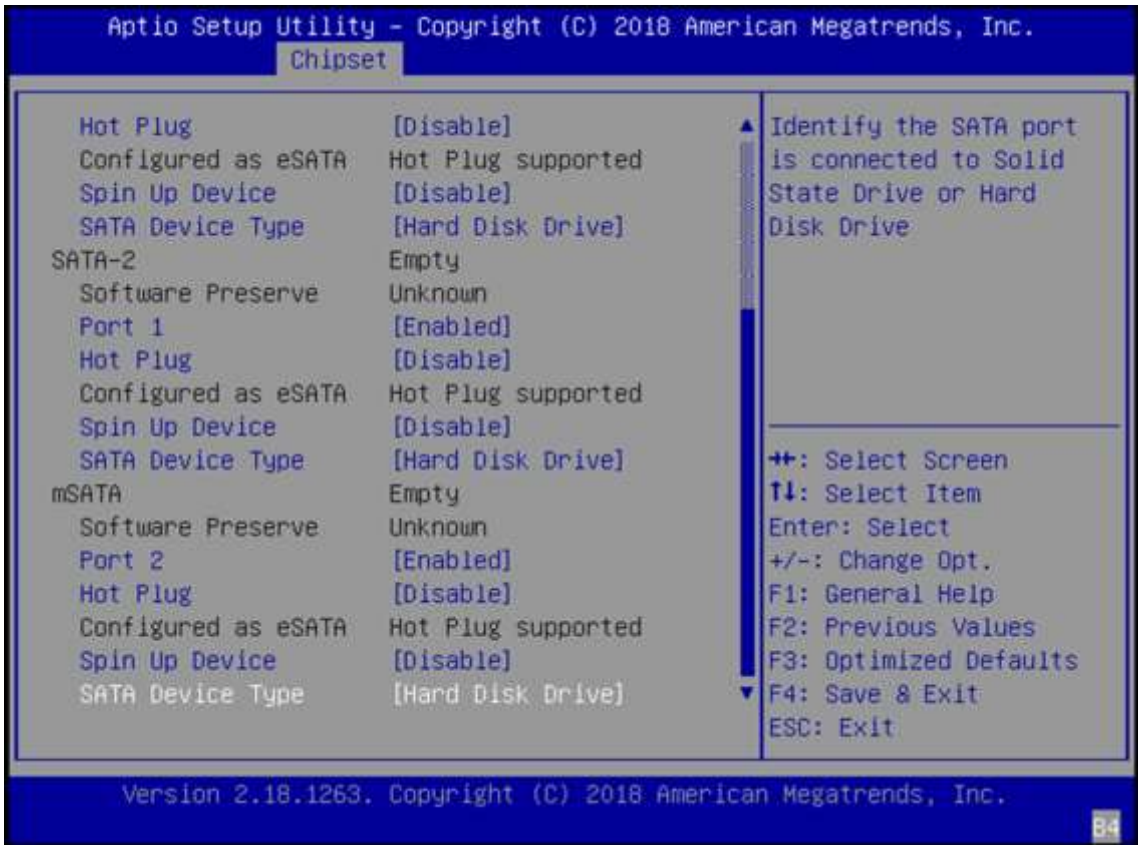
PCI Express Root Port10



Feature	Options	Description
PCI Express Root Port3	Disabled Enabled	Control the PCI Express Root Port
ASPM	Auto L0sL1 L1 L0s Disabled	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disabled ASPM
Advanced Error Reporting	Disabled Enabled	Advanced Error Reporting Enable/Disable
PCIe Speed	Auto Gen1 Gen2 Gen3	Configure PCIe Speed
Detect Timeout	0	The number of milliseconds reference code will wait for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.

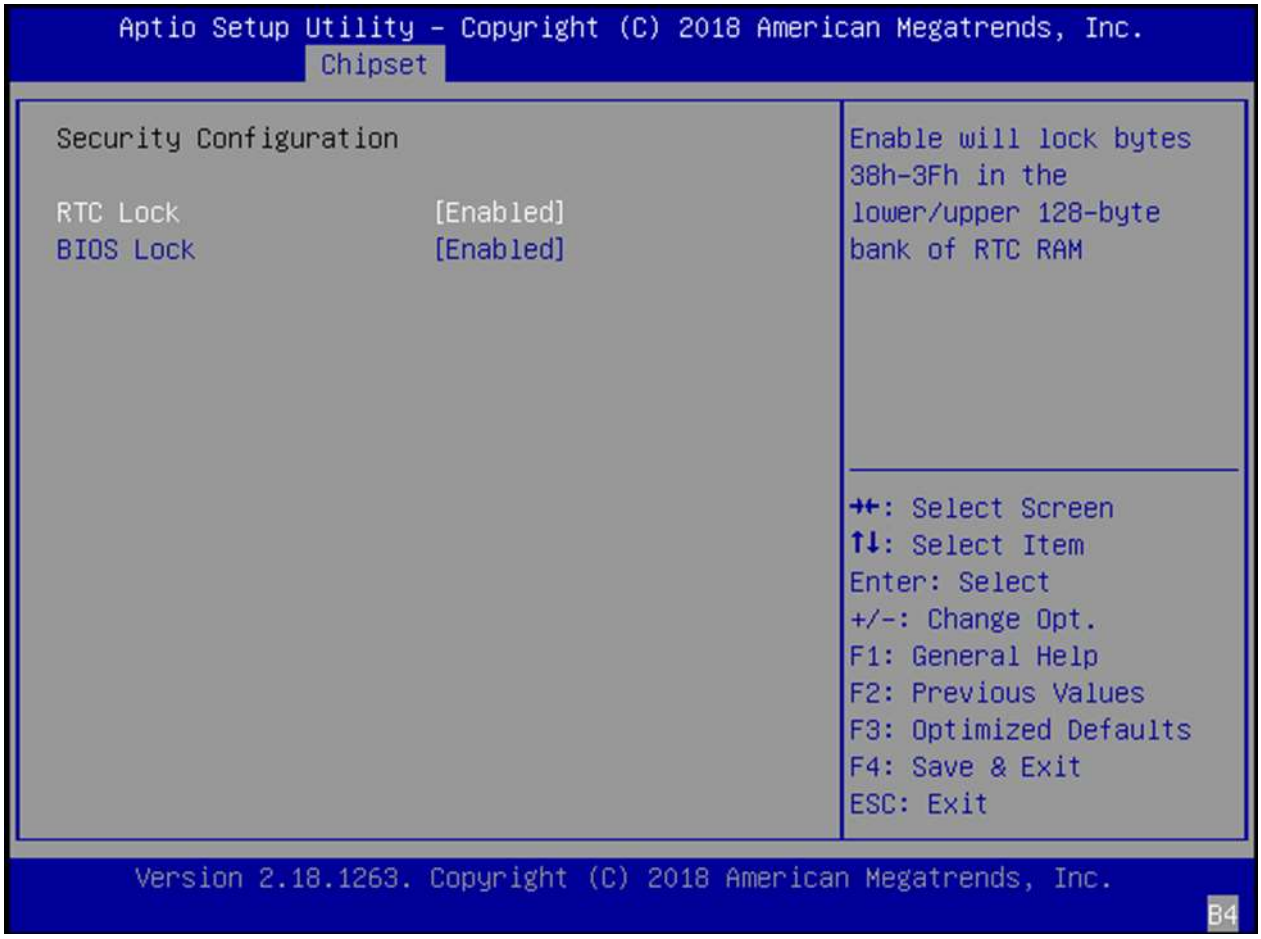
SATA and RST Configuration





Feature	Options	Description
SATA Controller(s)	Enabled Disabled	Enable/Disable SATA Device
SATA Mode Selection	AHCI Intel RST	Determines how SATA Controller(s) operate
Port 0/1/2	Disabled Enabled	Enable or Disable SATA Port
Hot Plug	Disabled Enabled	Designates this port as Hot Pluggable
Spin Up Device	Disabled Enabled	If enabled for any of ports Staggered Spin Up with be performed and only the drivees which have this option enabled will spin up at boot. Otherwise all drives spin up at boot.
SATA Device Type	Hard Disk Drive Solid State Drive	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive

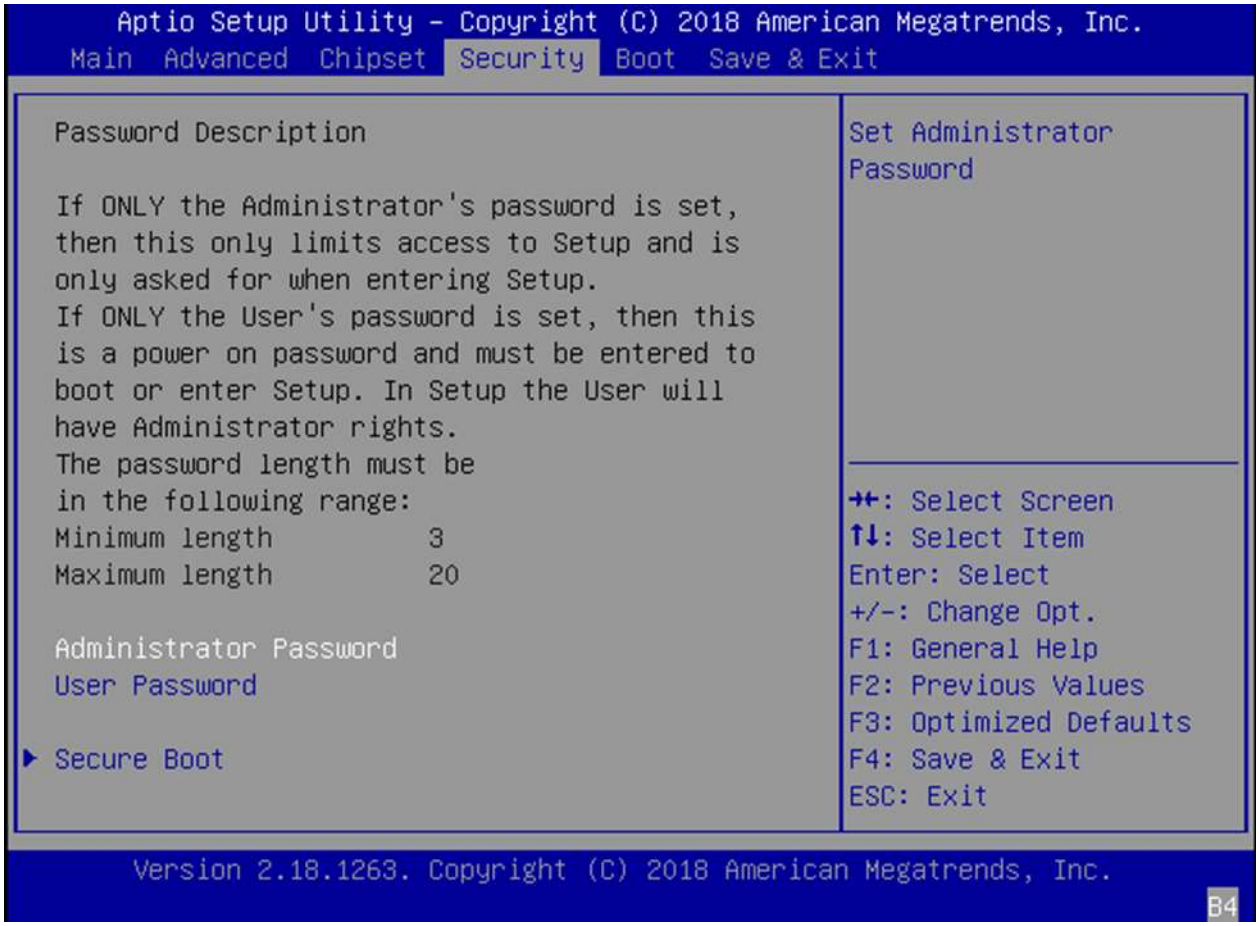
Security Configuration



Feature	Options	Description
RTC Lock	Disabled Enabled	Enable will lock bytes 38h-3Fh in the lower/upper 128-byte bank of RTC RAM.
BIOS Lock	Disabled Enabled	Enable/Disable the PCH BIOS Lock Enable feature. Required to enabled to ensure SMM protection of flash.

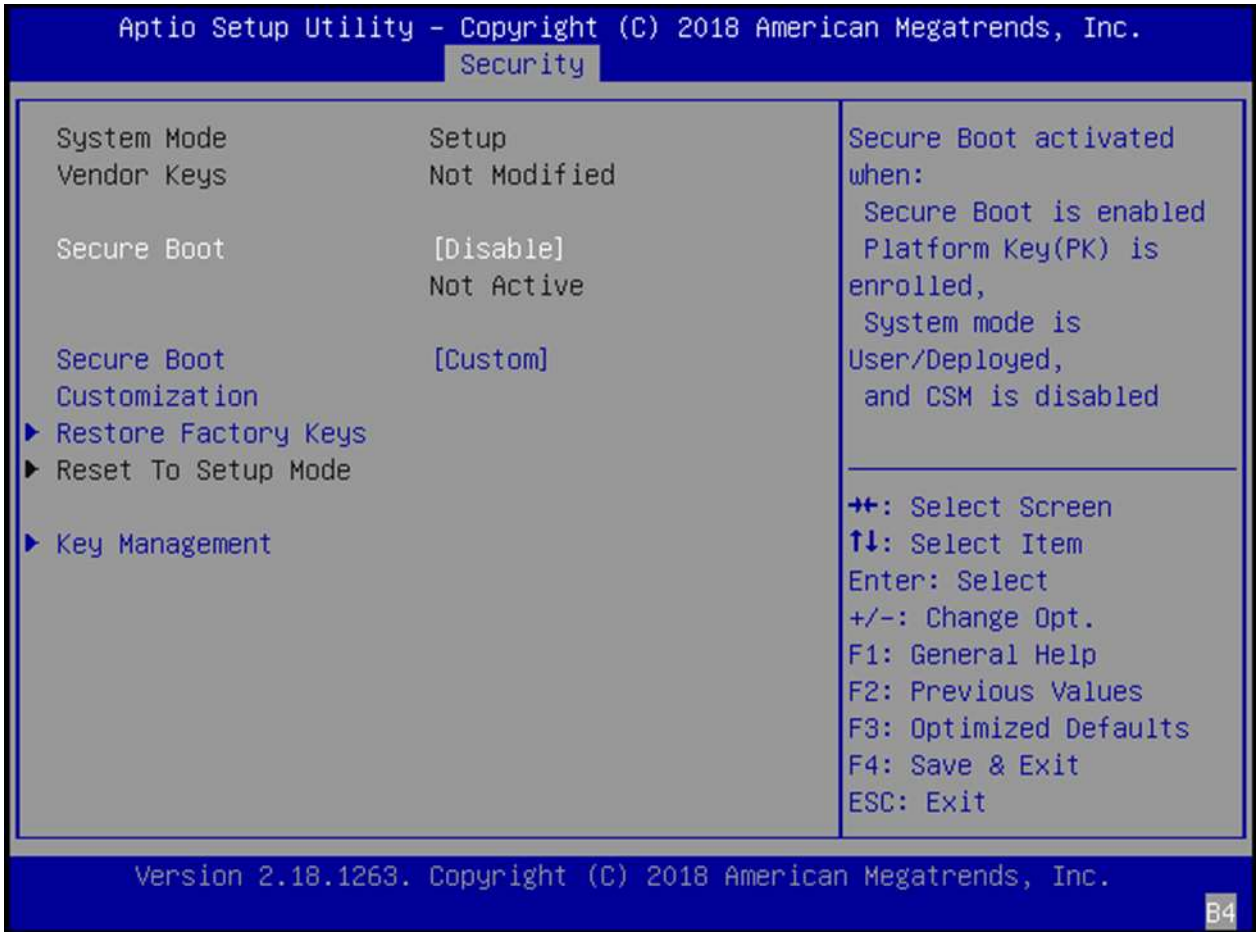
Security

Select the **Security** menu item from the BIOS setup screen to enter the "Security" setup screen. Users can select any of the items in the left frame of the screen.



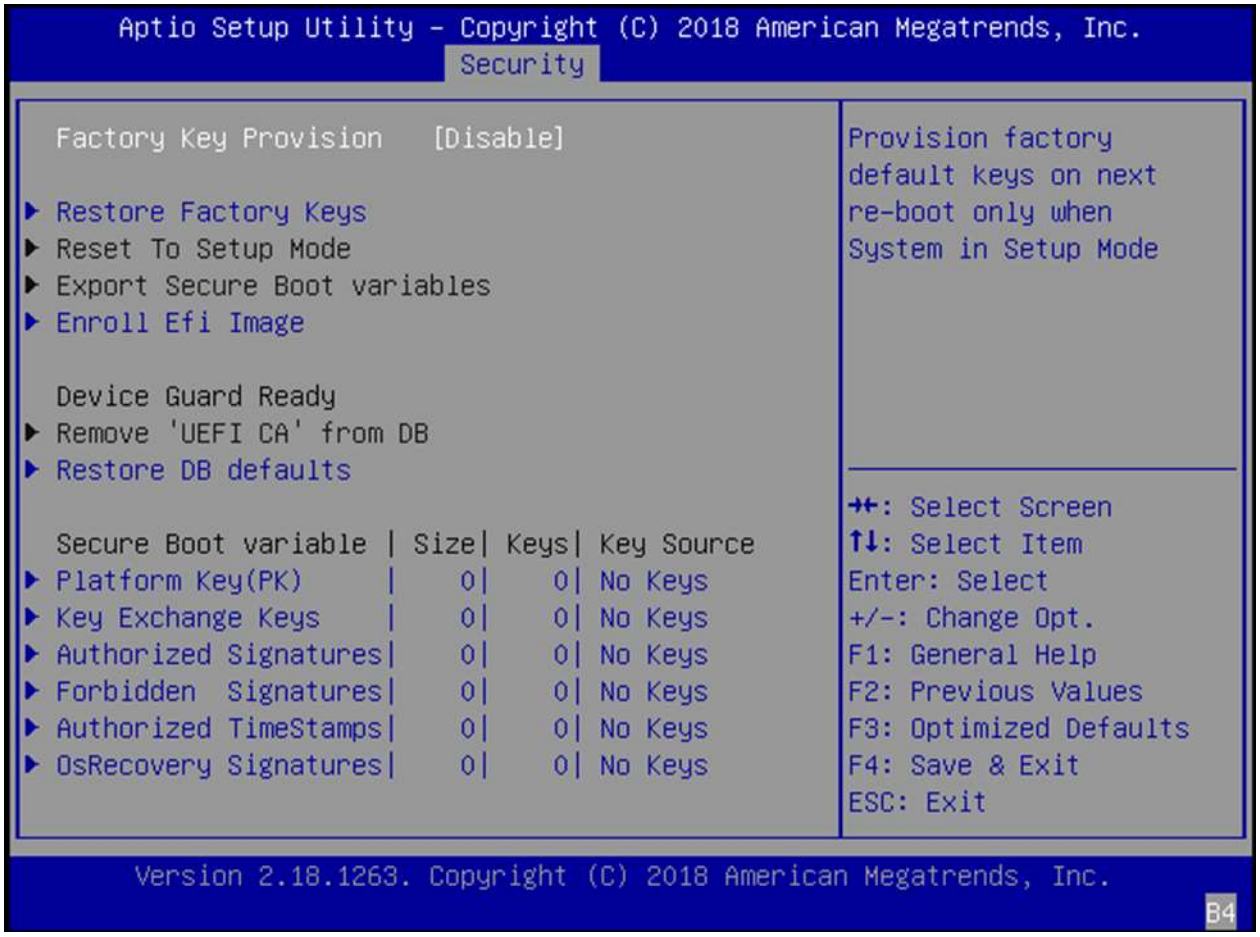
Feature	Options
Administrator Password	If ONLY the Administrator's password is set, it only limits access to Setup and is only asked for when entering Setup.
User Password	If ONLY the User's password is set, it serves as a power-on password and must be entered to boot or enter Setup. In Setup, the user will have Administrator rights.

Secure Boot



Feature	Options	Description
Secure Boot	Disabled Enabled	Secure Boot is activated when Platform Key (PK) is enrolled, System mode is User/Deployed, and CSM function is disabled.
Secure Boot Customization	Standard Custom	Customizable Secure Boot mode: In custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication.

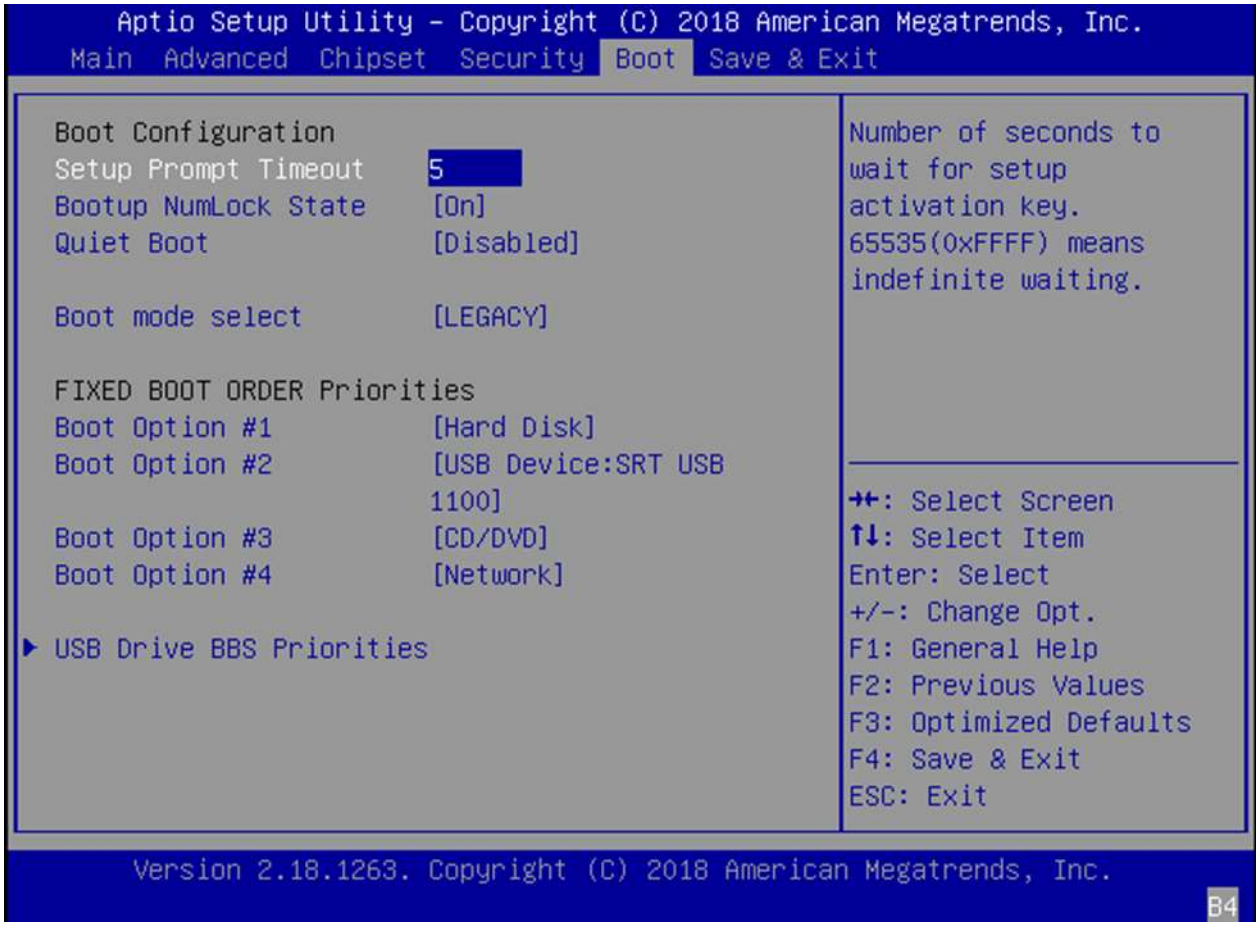
Key Management



Feature	Options	Description
Factory Key Provision	Disabled Enabled	Provision factory default keys on next re-boot only when System in Setup Mode.
Restore Factory Keys	None	Force System to User Mode. Configure NVRAM to contain OEM-defined factory default Secure Boot keys.
Enroll Ffi Image	None	Allows the image to run in Secure Boot mode. Enroll SHA256 hash of the binary into Authorized Signature Database (db)
Restore DB defaults	None	Restore DB variable to factory defaults.

Boot Menu

Select the **Boot** menu item from the BIOS setup screen to enter the "Boot" setup screen. Users can select any of the items in the left frame of the screen.

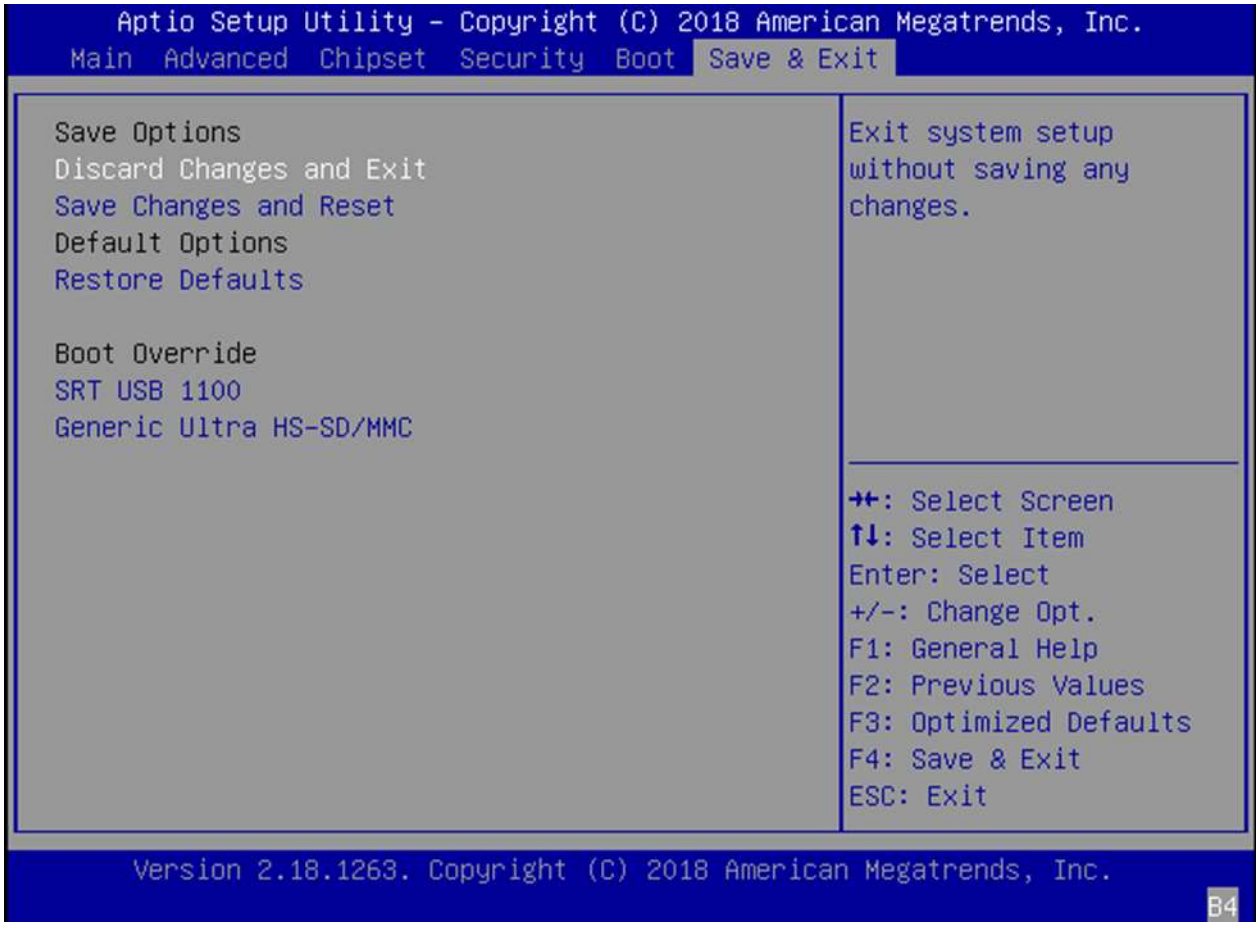


Feature	Options	Description
Setup Prompt Timeout	5	The number of seconds to wait for setup activation key. 65535 means indefinite waiting.
Bootup NumLock State	ON OFF	Select the keyboard NumLock state
Quiet Boot	Disabled Enabled	Enables or disables Quiet Boot option
Boot mode select	LEGACY UEFI DUAL	Select boot mode for Legacy or UEFI

- Choose boot priority from boot option group
- Choose specifies boot device priority sequence from available Group device

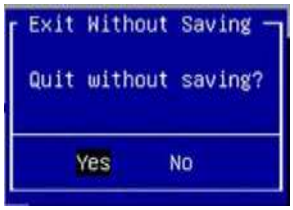
Save and Exit Menu

Select the **Save and Exit** menu item from the BIOS setup screen to enter the setup screen. Users can select any of the items in the left frame of the screen.



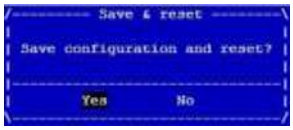
Discard Changes and Exit

Select this option to quit Setup without saving any modifications to the system configuration. The following window will appear after the "Discard Changes and Exit" option is selected. Select "Yes" to Discard changes and Exit Setup.



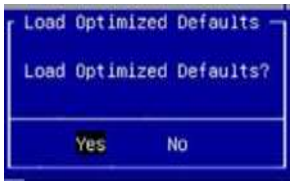
Save Changes and Reset

When Users have completed the system configuration changes, select this option to save the changes and reset from BIOS Setup in order for the new system configuration parameters to take effect. The following window will appear after selecting the “Save Changes and Reset” option is selected. Select “Yes” to Save Changes and reset.



Restore Defaults

Restore default values for all setup options. Select “Yes” to load Optimized defaults.



PS: The items under Boot Override were not same with image. It should depend on devices connect on system.

APPENDIX A: LED INDICATOR EXPLANATIONS

- **Power / Status / Storage**

The status explanations of LED indicators on front panel are as follows:

LED	COLOR	LED ACTION	DESCRIPTION
Power	**Green**	Steady	System is powered ON
	OFF	N/A	System is powered OFF
Status	**Green**	Steady	Control by GPIO
	Red	Steady	Control by GPIO
	OFF	N/A	Control by GPIO (Default) Or No Power ON/ Power OFF
	Note: Status bi-color LED controlled by GPIO		
Storage	**Amber**	Blinking	Storage (HDD/SSD) Active
	OFF	N/A	No Data Access

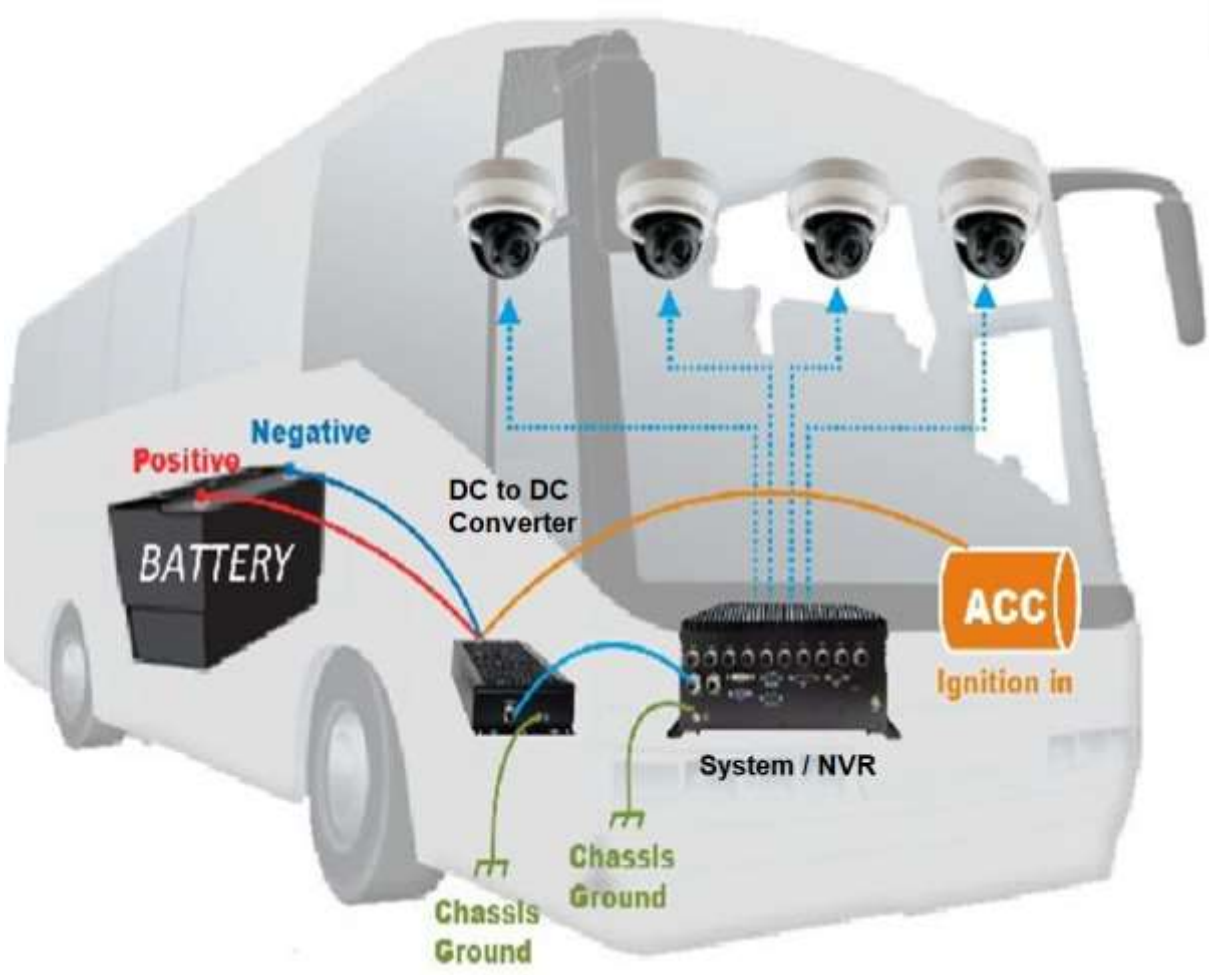
APPENDIX B: IGNITION CONTROL SETUP

Connecting the Devices

The system comes with a controller to ensure that the device is well-shielded against premature failure at the boot or shutdown phase. When installing:

1. Make sure both your vehicle and the system are turned off.
2. Follow the wiring definition and illustration below to connect the vehicle battery and ignition (ACC) to the in-vehicle system through the 5-pin M12 male connector marked as "DC Input" on the system, through the right pin contact.

In a typical in-vehicle computing solution, this system usually acts as a PSE (Power Sourcing Equipment) to power up connected PoE devices, for which you should ensure a minimum of 48V DC power supply to the system with the use of a **DC to DC Adapter.**



DC to DC Converter Description, Front

DC Rated Voltage Input

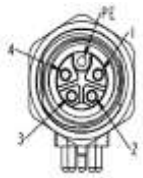
M12 K-Code Male

PIN		Description
PIN 1	GND	Primary Ground
PIN 2	DC_IN	DC Rated Voltage Input
PIN 3	GND	Primary Ground
PIN 4	IGN_IN	Power ON Trigger form car ignition ON
PIN 5 (PE)	CHASSIS GND	Chassis Ground
Note: SKU A: RATED VOLTAGE at DC 32~96V SKU B: RATED VOLTAGE at DC 24~36V SKU C: RATED VOLTAGE at DC 72~110V		

DC to DC Converter Description, Rear

DC Isolated Output

M12 K-Code Female

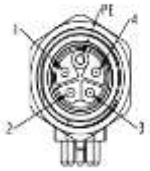


PIN		Description
PIN 1	IGN_OUT	Adapter Ignition on Trigger Signal
PIN 2	MCU_PG	MCU Power_good detect pin (Isolated)
PIN 3	DC Output	DC Isolated 52V Output
PIN 4	GND	Secondary Ground (S_G for NVR)
PIN 5 (PE)	CHASSIS GND	Chassis Ground

System / NVR Description

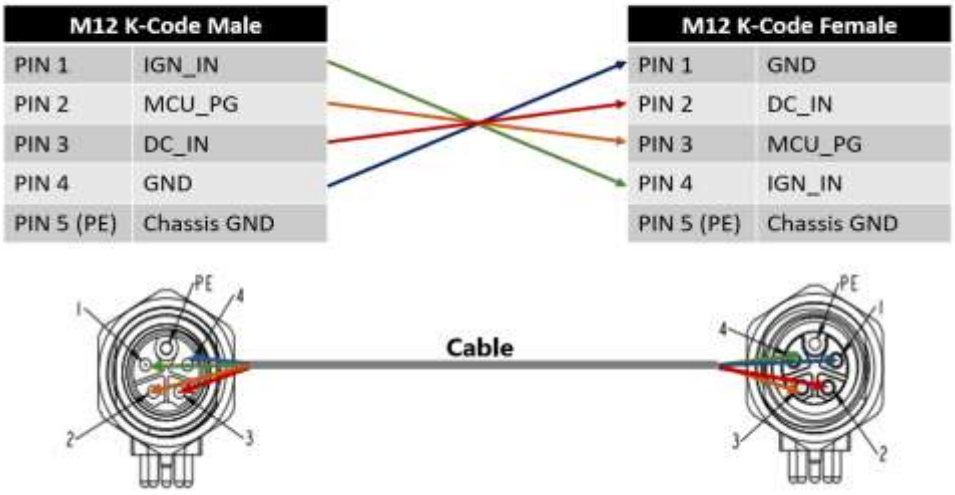
DC Isolated Input

M12 K-Code Male



PIN		Description
PIN 1	GND	Signal Ground
PIN 2	DC_IN	DC Isolated 52V Input (from DC to DC Converter)
PIN 3	MCU_PG	System Power Good Status (without isolated meets EMI solution)
PIN 4	IGN_IN	Ignition on Trigger Form DC to DC Converter
PIN 5 (PE)	CHASSIS GND	Chassis Ground
Note: DC_in, below 44V without PoE power support DC_in, above 45V enable PoE power support		

Power to System DC IN 54V Cable



Correct Handling of Main and IGN Power Supplies when Starting and Ending Use of R6S:

A SKU: RATED VOLTAGE at DC 32~96V

B SKU: RATED VOLTAGE at DC 24~36V

C SKU: RATED VOLTAGE at DC 72~110V

1. It is secured to use the R6S, its OS (Windows or Linux) will boot up reliably every time the input voltage of both the main and the IGN power terminals of DC/DC converter will be changed from 0VDC to **RATED VOLTAGE**.
2. It is secured a working R6S will safely shutdown OS (Windows or Linux) and BIOS without fail every time the input voltage of the IGN power terminal of DC/DC converter will be changed "at the same time" from **RATED VOLTAGE** to 0VDC.
3. It is secured the R6S will not fail or got any damage even if the voltage of the main power input terminal of the DC/DC converter is lowered to **RATED VOLTAGE** after its OS (Windows or Linux) and BIOS are safely shut down.

The above 1~3 items secured the **RATED VOLTAGE can only be turned off (the main power) after the completion of "safely ensure an OS shutdown".

Using the Ignition System Manager (ISM)

Command Format:

1. Host communication interface: COM#6 (RS-232)
2. Support buad rate: 57600/ 8N1
3. Communication protocol: ANSI terminal

GET VariableName

SET VariableName value

MCU Command	Wirte/Read (SET/GET)	VariableName	VariableName value	
Startup Voltage(mV)	SET	STARTUP_VOLTAGE	0(default)	0mV
	GET	STARTUP_VOLTAGE		
Shutdowm Voltage(mV)	SET	INPUT_VOLTAGE_MIN	8500(default)	8500mV
	GET	INPUT_VOLTAGE_MIN		
PowerOn Delay (Sec)	SET	POWERON_DELAY	4(default)	4S
	GET	POWERON_DELAY		
PowerOff Delay (Sec)	SET	SHUTDOWN_DELAY	4(default)	4S
	GET	SHUTDOWN_DELAY		
Input Voltage	GET	INPUT_VOLTAGE		
Wakeup DI1	SET	WAKEUP_ENABLE	7(default)	1:DI1 2:Reserved 4: Reserved
Device ID	GET	DEVICE_ID	R6S_N	
Firmware Version	GET	VERSION	0.06B	
Digital Out (LTE on/off)	SET	DIGITAL_OUT	31(default)	
Digial In	GET	DIGITAL_IN		
Ignition	GET	IGNITION		
Digital POE	SET	DIGITAL_POE	1023(default)	0~1023
	GET	DIGITAL_POE		
Digital DO	SET	DIGITAL_DO	0(default)	0~255
Digital DI	GET	DIGITAL_DI		
Save flash	SAVE			

Example:

1. The minimum voltage for startup,

Setting: 6V (6000mV)

Command	Response Message
SET STARTUP_VOLTAGE 6000	OK
GET STARTUP_VOLTAGE	STARTUP_VOLTAGE = 6000

2. The delay time for POWERON_DELAY state,

Setting: 4S

Command	Response Message
SET POWERON_DELAY4	OK
GET STARTUP_DELAY	POWERON_DELAY=4

3. Wakeup DI1 Enable,

Setting: DI1 enable (001)

Command	Response Message
SET WAKEUP_ENABLE1	OK
GET WAKEUP_ENABLE	WAKEUP_ENABLE=1

4. Device ID

Command	Response Message
GET DEVICE_ID	DEVICE_ID=R6S_N

5. Firmware Version

Command	Response Message
GET VERSION	VERSION=0.6B

6. Write/Read Digital_Out state,

Setting: LTE module ON/OFF

Command	Response Message
SET DIGITAL_OUT3	OK
GET DIGITAL_OUT	DIGITAL_OUT=3

bit0 = LTE 1(MPCIE) – SIM Control

1: Power ON

0: Power OFF

bit1 = LTE 2(M.2) – SIM Control

1: Power ON

0: Power OFF

bit2 = LTE 3(M.2) – Power Control

1: Power ON

0: Power OFF

bit3 = LTE 4(M.2) – Power Control

1: Power ON

0: Power OFF

bit4 = LTE 5(M.2) – Power Control

1: Power ON

0: Power OFF

7. Read Digital_In state

Command	Response Message
GET DIGITAL_IN	DIGITAL_IN=3

8. Ignition state (only read)

Command	Response Message
GET IGNITION	IGNITION=0 (0:Ignition OFF / 1: Ignition ON

9. Control the ON/OFF of each PoE port

Command	Response Message
SET DIGITAL_POE1	OK
GET DIGITAL_POE	DIGITAL_POE=1

POE1/bit0 = 1

POE2/bit1 = 2

POE3/bit2 = 4

POE4/bit3 = 8

POE5/bit4 = 16

POE6/bit5 = 32

POE7/bit7 = 64

POE8/bit7 = 128

POE9/bit8 = 256

POE10/bit9 = 512

To achieve POE1~10 enable, please enter value setting at 1023.

10. Write/Read Digital_DO state,

Setting: DO1, DO2, DO3, DO4, DO5, DO6, DO7, DO8.

Command	Response Message
SET DIGITAL_DO3	OK
GET DIGITAL_DO	DIGITAL_DO=3

DO1/bit0 = 1.

DO2/bit1 = 2.

DO3/bit2 = 4.

DO4/bit3 = 8.

DO5/bit4 = 16.

DO6/bit5 = 32.

DO7/bit6 = 64.

DO8/bit7 = 128.

To achieve DO1~8 enable, please enter value setting at 255.

12. Save setting.

Command	Response Message
SAVE	OK FLASH UPDATED

APPENDIX C: TERMS AND CONDITIONS

Warranty Policy

1. All products are under warranty against defects in materials and workmanship for a period of one year from the date of purchase.
2. The buyer will bear the return freight charges for goods returned for repair within the warranty period; whereas the manufacturer will bear the after service freight charges for goods returned to the user.
3. The buyer will pay for the repair (for replaced components plus service time) and transportation charges (both ways) for items after the expiration of the warranty period.
4. If the RMA Service Request Form does not meet the stated requirement as listed on "RMA Service," RMA goods will be returned at customer's expense.
5. The following conditions are excluded from this warranty:
   - Improper or inadequate maintenance by the customer
   - Unauthorized modification, misuse, or reversed engineering of the product
   - Operation outside of the environmental specifications for the product.

RMA Service

Requesting an RMA#

1. To obtain an RMA number, simply fill out and fax the "RMA Request Form" to your supplier.
2. The customer is required to fill out the problem code as listed. If your problem is not among the codes listed, please write the symptom description in the remarks box.
3. Ship the defective unit(s) on freight prepaid terms. Use the original packing materials when possible.
4. Mark the RMA# clearly on the box.

Note: Customer is responsible for shipping damage(s) resulting from inadequate/loose packing of the defective unit(s). All RMA# are valid for 30 days only; RMA goods received after the effective RMA# period will be rejected.

RMA Service Request Form

When requesting RMA service, please fill out the following form. Without this form enclosed, your RMA cannot be processed.

RMA No:	Reasons to Return: ▫ Repair(Please include failure details) ▫ Testing Purpose
Company:	Contact Person:
Phone No.	Purchased Date:
Fax No.:	Applied Date:
Return Shipping Address: _____ Shipping by: ▫ Air Freight ▫ Sea ▫ Express_____ ▫ Others:_____	

Item	Model Name	Serial Number	Configuration

Item	Problem Code	Failure Status

*Problem Code:

01:D.O.A.	07: BIOS Problem	13: SCSI	19: DIO
02: Second Time R.M.A.	08: Keyboard Controller Fail	14: LPT Port	20: Buzzer
	09: Cache RMA Problem	15: PS2	21: Shut Down
03: CMOS Data Lost	10: Memory Socket Bad	16: LAN	22: Panel Fail
04: FDC Fail	11: Hang Up Software	17: COM Port	23: CRT Fail
05: HDC Fail	12: Out Look Damage	18: Watchdog Timer	24: Others (Pls specify)
06: Bad Slot			

Request Party

Authorized Signature / Date

Confirmed By Supplier

Authorized Signature / Date