IEI Integration Corp.

MODEL:

TANK-700-QM67W-MRAY

High Performance Fanless Embedded System with Intel® 32nm CPU, On-board 2.0 GB DDR3 Memory, HDMI, USB 3.0, Gigabit LAN, Audio, 9V~36V DC Input, RoHS Compliant

User Manual

Rev. 1.00 – 25 November, 2014

RoHS Lead Free

Revision

Date	Version	Changes
25 November, 2014	1.00	Initial release

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Introduction

1.1 Overview

Figure 1-1: TANK-700-QM67W-MRAY

The TANK-700-QM67W-MRAY Series fanless embedded system is powered by the Intel® Core™ i3-2330E processor and uses the Intel® QM67 chipset. It has one 204-pin DDR3 2 GB SO-DIMM memory and on-board DDR3 2 GB memory. It has one HDMI port for display. Two USB 3.0 and four USB 2.0 ports provide flexible expansion options. Serial device connectivity is provided by six RS-232 and two RS-422/485 ports.

1.2 Features

The TANK-700-QM67W-MRAY features are listed below:

- Intel® Core™ i3-2330E processor
- On-board DDR3 2 GB memory
  1 x 204-pin DDR3 2 GB SO-DIMM memory (Total: 4GB)
- Two RJ-45 Gigabit Ethernet ports
- One HDMI port
- Dual-band 2.4/5 GHz 802.11a/b/g/n 3T3R MIMO Wi-Fi for high speed wireless transmission
- Two USB 3.0 ports
- Four USB 2.0 ports
- Eight COM ports (four with isolation)
- Extended temperature fanless design supports -20°C~70°C

1.3 Technical Specifications

The TANK-700-QM67W-MRAY technical specifications are listed in **Table 1-1**.

Specifications	
Chassis	
Dimensions (WxDxH)	310 x 200 x 62 mm
System Fan	Fanless
Chassis Construction	Extruded aluminum alloys
Motherboard	
CPU	Intel® Core™ i3-2330E processor
Chipset	Intel® QM67
Memory	On-board DDR3 2 GB memory 1 x 204-pin DDR3 2GB SO-DIMM memory Total: 4GB
Storage	
Hard Drive	1 x 2.5" 128G MLC SSD
I/O Interfaces	
USB 3.0	2 x USB 3.0 ports
USB 2.0	4 x USB 2.0 ports
Ethernet	2 x RJ-45 LAN
RS-232	4 x DB-9 serial ports (2 x DB-9 serial ports with isolation) 2 x RJ-45 serial ports
RS-422/RS-485	2 x RJ-45 serial ports with isolation
Display	1 x HDMI port (supports resolution up to 1920 x 1200 @ 60Hz)
Audio Connector	1 x Line-out port 1 x Mic-in port
Wireless	2 x 802.11a/b/g/n 3T3R Module
Digital I/O	8-bit digital I/O, 4-bit input/4-bit output

Specifications	
Expansions	
PCIe Mini	2 x Full Size (One Colay mSATA)
Power	
Power Input	Terminal Block: 9 V~36 V DC DC Jack: 10.5 V~36 V DC
Reliability	
Mounting	Wall mount
Operating Temperature	-20°C ~70°C with air flow (SSD), 5% ~ 95%, non-condensing
Operating Shock	Half-sine wave shock 5G, 11ms, 3 shocks per axis
Operating Vibration	MIL-STD-810F 514.5C-2 (with SSD)
Safety/EMC	CE
OS	
Supported OS	Microsoft® Windows® Embedded Standard 7 E Microsoft® Windows® XP Embedded

Table 1-1: Technical Specifications

1.4 Connector Panel

1.4.1 Front Panel

The TANK-700-QM67W-MRAY front panel contains:

- 9 x LED indicators
- 1 x Power button
- 2 x RS-232 serial ports
- 2 x RS-422/485 serial ports with isolation
- 2 x USB 3.0 port connectors
- 6 x Wireless antenna connectors

An overview of the front panel is shown in **Figure 1-2**.

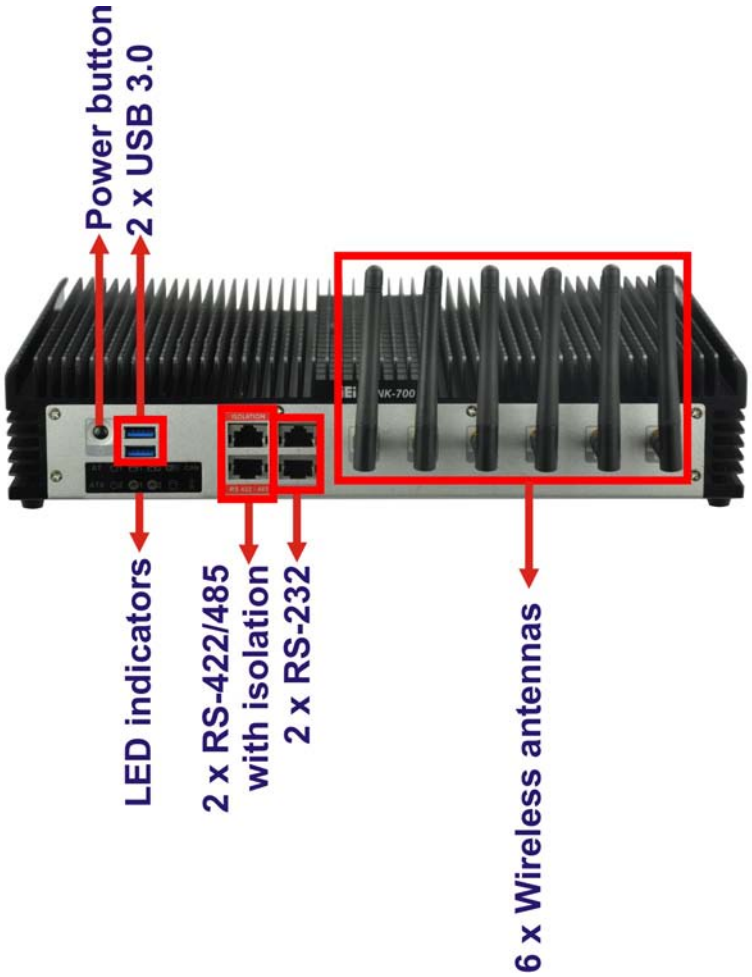


Figure 1-2: TANK-700-QM67W-MRAY Front Panel

1.4.2 Rear Panel

The TANK-700-QM67W-MRAY rear panel contains:

- 1 x DIO port
- 1 x 2-pin terminal block for remote control
- 2 x RJ-45 Gigabit LAN ports
- 1 x HDMI port
- 1 x Line-out port (green)
- 1 x Mic-in port (pink)
- 1 x 4-pin power jack for 10.5V (+/-0.3V) ~ 36V power input
- 1 x Power terminal block for 9V (+/-0.3V) ~ 36V power input

- 1 x Reset button
- 4 x RS-232 serial ports (2 x RS-232 serial ports with isolation)
- 4 x USB 2.0 port connectors

An overview of the rear panel is shown in **Figure 1-3** below.

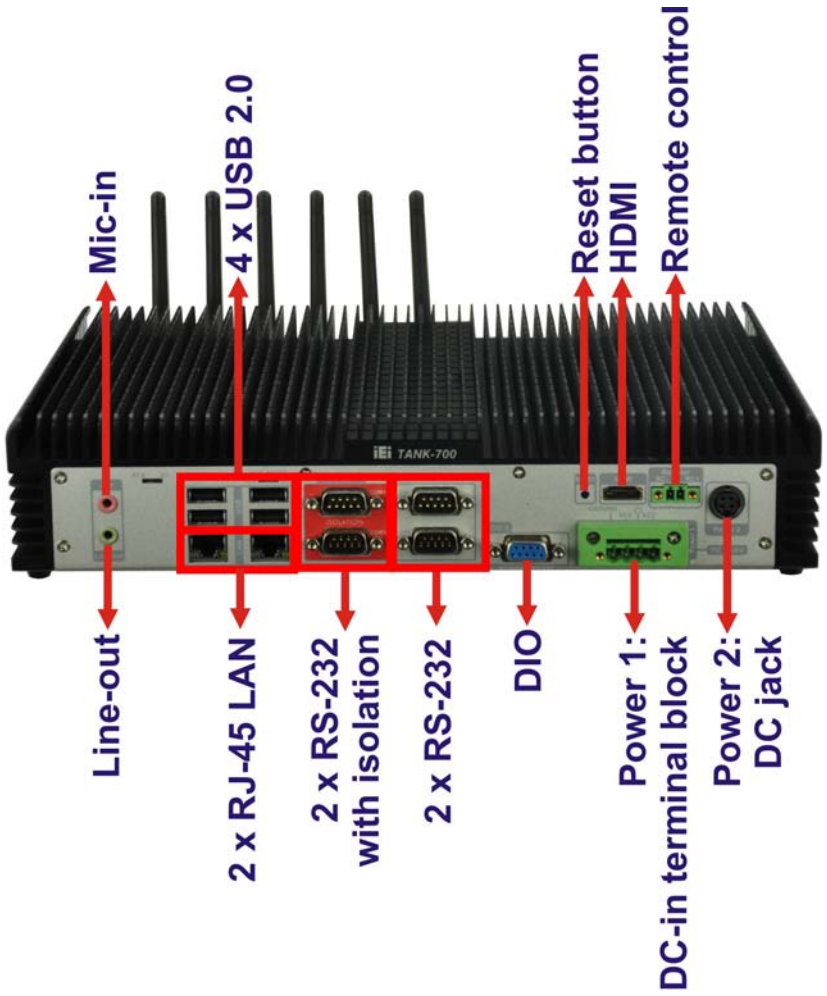


Figure 1-3: TANK-700-QM67W-MRAY Rear Panel

1.5 LED Indicators

There are several indicators on the front panel of the TANK-700-QM67W-MRAY as shown in **Figure 1-4**. The TANK-700-QM67W-MRAY has no SPF Fiber, CAN bus, so these LED indicators are disabled.

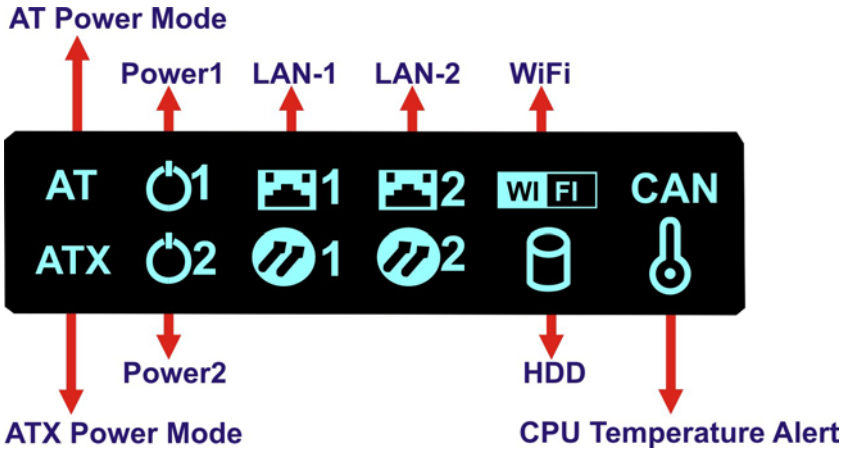


Figure 1-4: TANK-700-QM67W-MRAY LED Indicators

WARNING:

The CPU Temperature Alert LED turns red when the CPU temperature is too high. If this situation occurs, lower the environment temperature or close some running applications to cool down the CPU.

1.6 Dimensions

The physical dimensions are shown below:

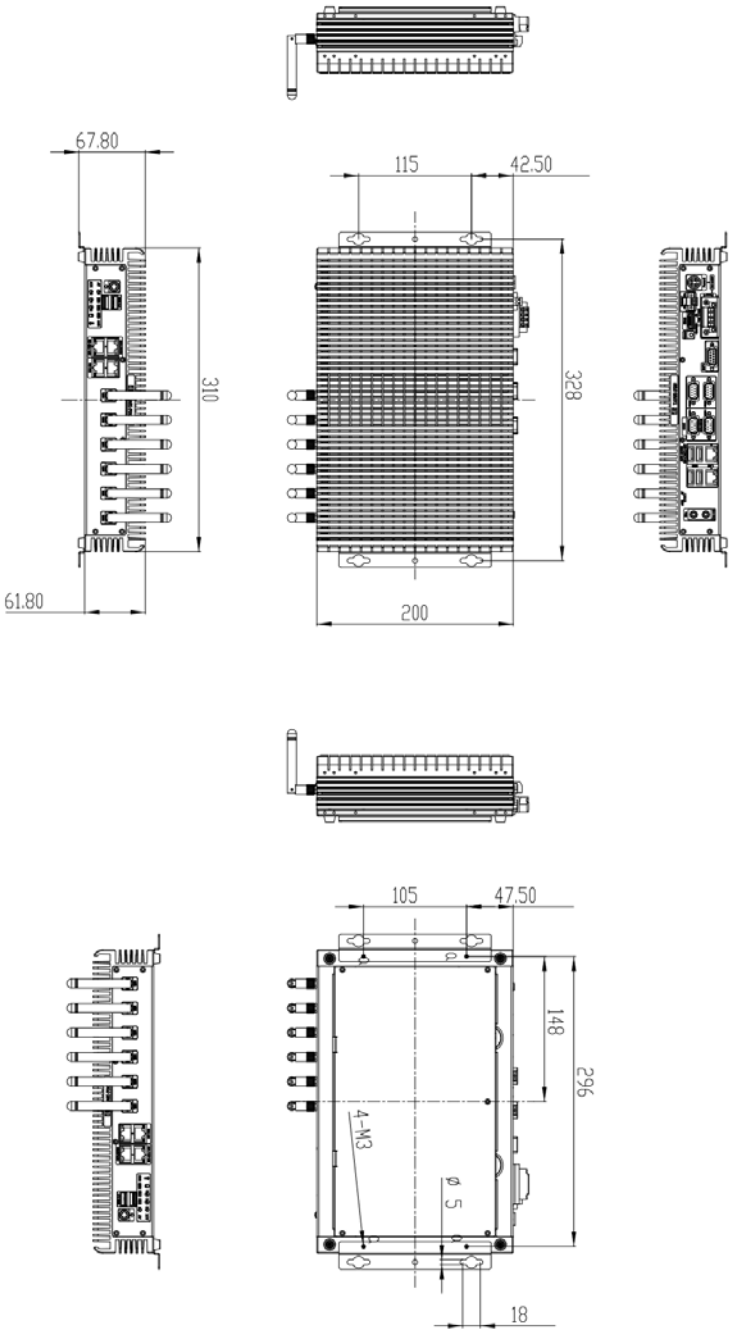


Figure 1-5: Physical Dimensions (millimeters)

Chapter

2

Unpacking

2.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during installation may result in permanent damage to the TANK-700-QM67W-MRAY and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the TANK-700-QM67W-MRAY. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the TANK-700-QM67W-MRAY or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the TANK-700-QM67W-MRAY, place it on an antic-static pad. This reduces the possibility of ESD damaging the TANK-700-QM67W-MRAY.

2.2 Unpacking Precautions

When the TANK-700-QM67W-MRAY is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 2.1**.
- Make sure the packing box is facing upwards so the TANK-700-QM67W-MRAY does not fall out of the box.
- Make sure all the components shown in **Section 2.3** are present.

2.3 Unpacking Checklist

NOTE:

If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the TANK-700-QM67W-MRAY from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The TANK-700-QM67W-MRAY is shipped with the following components:

Quantity	Item and Part Number	Image
Standard		
1	TANK-700-QM67W-MRAY Series	
2	Mounting bracket (**P/N**: 41020-0163J4-00-RS)	
8	Mounting bracket screw (**P/N**: 44033-030062-RS)	
8	Chassis screw (**P/N**: 44013-030041-RS)	

Quantity	Item and Part Number	Image
Standard		
4	RJ-45 to DB-9 COM port cable (**P/N**: 32005-000200-200-RS)	
6	Wireless antenna (**P/N**: 32505-000900-100-RS)	
1	Pluggable DC-in terminal block (**P/N**: 33502-000055-RS)	
1	Pluggable remote control terminal block (**P/N**: 33101-000422-RS)	
1	One Key Recovery CD (**P/N**: 7B000-000724-RS)	
1	Utility CD	

Chapter

3

Installation

3.1 Installation Precautions

During installation, be aware of the precautions below:

- **Read the user manual**: The user manual provides a complete description of the TANK-700-QM67W-MRAY, installation instructions and configuration options.
- **DANGER! Disconnect Power**: Power to the TANK-700-QM67W-MRAY must be disconnected during the installation process, or before any attempt is made to access the rear panel. Electric shock and personal injury might occur if the rear panel of the TANK-700-QM67W-MRAY is opened while the power cord is still connected to an electrical outlet.
- **Qualified Personnel**: The TANK-700-QM67W-MRAY must be installed and operated only by trained and qualified personnel. Maintenance, upgrades, or repairs may only be carried out by qualified personnel who are familiar with the associated dangers.
- **Air Circulation**: Make sure there is sufficient air circulation when installing the TANK-700-QM67W-MRAY. The TANK-700-QM67W-MRAY's cooling vents must not be obstructed by any objects. Blocking the vents can cause overheating of the TANK-700-QM67W-MRAY. Leave at least 5 cm of clearance around the TANK-700-QM67W-MRAY to prevent overheating.
- **Grounding**: The TANK-700-QM67W-MRAY should be properly grounded. The voltage feeds must not be overloaded. Adjust the cabling and provide external overcharge protection per the electrical values indicated on the label attached to the back of the TANK-700-QM67W-MRAY.

3.2 Hard Disk Drive (HDD) Installation

To install the hard drive, please follow the steps below:

Step 1: Remove the bottom panel by removing the five retention screws from the bottom panel.

Figure 3-1: Bottom Panel Retention Screws

Step 2: Remove the four HDD bracket retention screws and unplug the SATA signal and power cables connected to the TANK-700-QM67W-MRAY. And then lift the HDD bracket out of the TANK-700-QM67W-MRAY and put it on a flat surface.

Figure 3-2: HDD Bracket Retention Screws

Step 3: Attach the HDD to the HDD bracket, and then slide the HDD to connect the SATA connector.

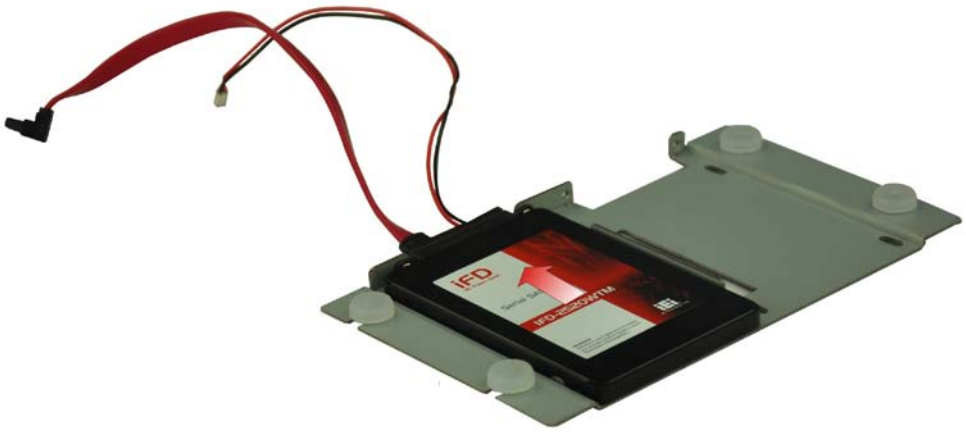


Figure 3-3: HDD Installation

Step 4: Secure the HDD with the HDD bracket by four retention screws.

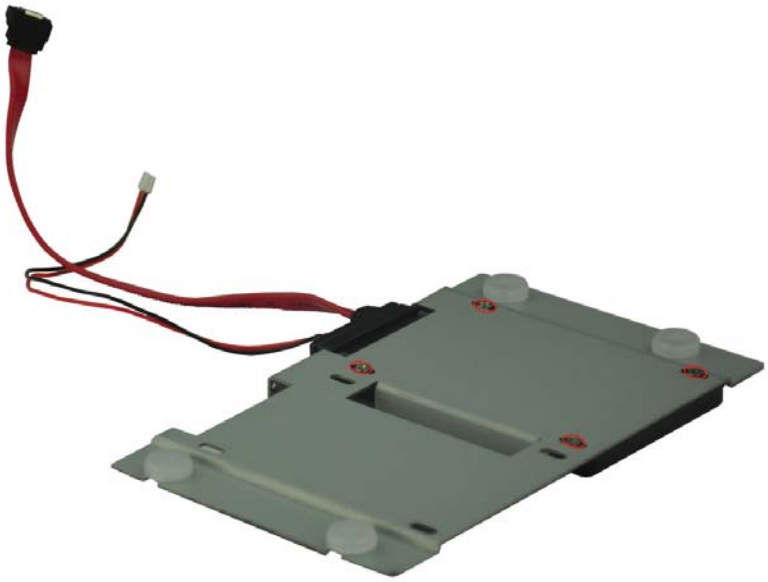


Figure 3-4: HDD Retention Screws

Step 5: Secure the HDD bracket with TANK-700-QM67W-MRAY by the four retention screws that were previously removed.

Step 6: Reconnect the SATA signal and power cables to the TANK-700-QM67W-MRAY.

Step 7: Reinstall the bottom panel to the TANK-700-QM67W-MRAY.

3.3 Pluggable DC-In Terminal Block Installation

To install the pluggable DC-in terminal block, please follow the steps below:

Step 1: Locate the DC-in terminal block connector. The location of the connector is shown in **Figure 1-3**.

Step 2: Align the pluggable DC-in terminal block with the DC-in terminal block connector on the TANK-700-QM67W-MRAY.

Step 3: Once aligned, insert the pluggable DC-in terminal block into the DC-in terminal block connector.

Step 4: Secure the pluggable DC-in terminal block to the external interface by tightening the two retention screws on either side of the terminal block (**Figure 3-5**).

Figure 3-5: Pluggable DC-in Terminal Block Installation

3.4 Pluggable Remote Control Terminal Block Installation

To install the pluggable remote control terminal block, please follow the steps below:

Step 1: Locate the remote control terminal block connector. The location of the connector is shown in **Figure 1-3**.

Step 2: Align the pluggable remote control terminal block with the remote control terminal block connector on the TANK-700-QM67W-MRAY.

Step 3: Once aligned, insert the pluggable remote control terminal block into the remote control terminal block connector.

Step 4: Secure the pluggable remote control terminal block to the external interface by tightening the two retention screws on either side of the terminal block (**Figure 3-6**).

Figure 3-6: Pluggable Remote Control Terminal Block Installation

3.5 SO-DIMM Installation

WARNING:

Using incorrectly specified SO-DIMM may cause permanently damage the TANK-700-QM67W-MRAY. Please make sure the purchased SO-DIMM complies with the memory specifications of the TANK-700-QM67W-MRAY.

To install a SO-DIMM into a SO-DIMM socket, please follow the steps below.

Step 1: Remove the bottom panel by removing the five retention screws from the bottom panel (**Figure 3-1**).

Step 2: Unplug the SATA signal and power cables connected to the TANK-700-QM67W-MRAY, and then place the bottom panel on a flat surface.

Step 3: Locate the SO-DIMM socket on the motherboard (**Figure 3-7**).

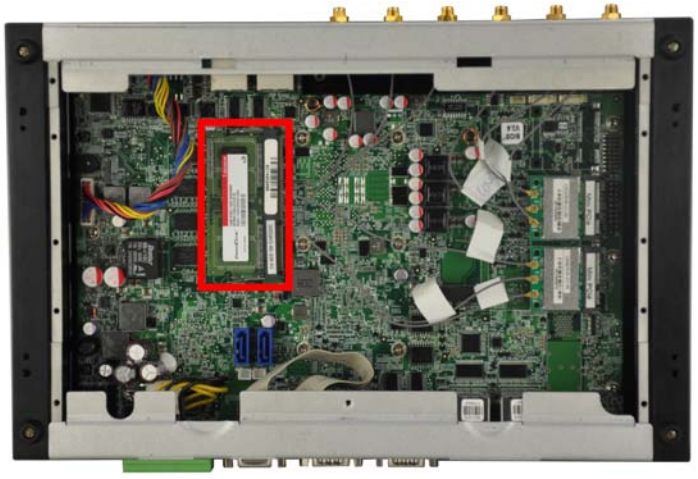


Figure 3-7: SO-DIMM Socket

Step 4: Align the SO-DIMM with the socket. The SO-DIMM must be oriented in such a way that the notch in the middle of the SO-DIMM must be aligned with the plastic bridge in the socket (**Figure 3-8**).

Step 5: Push the SO-DIMM into the socket at an angle (**Figure 3-8**).

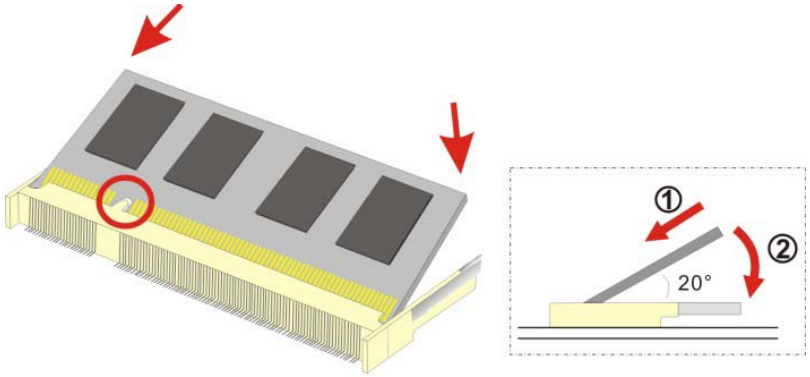


Figure 3-8: SO-DIMM Installation

Step 6: Gently pull the arms of the SO-DIMM socket out and push the rear of the SO-DIMM down (**Figure 3-8**).

Step 7: Release the arms on the SO-DIMM socket. They clip into place and secure the SO-DIMM in the socket.

Step 8: Install the bracket that was previously removed in the same position it was before.

Step 9: Reinstall the bottom panel to the TANK-700-QM67W-MRAY.

3.6 Mounting the System with Mounting Brackets

To mount the embedded system onto a wall or some other surface using the two mounting brackets, please follow the steps below.

Step 1: Turn the embedded system over.

Step 2: Align the two retention screw holes in each bracket with the corresponding retention screw holes on the sides of the bottom surface (**Figure 3-9**).

Figure 3-9: Mounting Bracket Retention Screws

Step 3: Secure the brackets to the system by inserting two retention screws into each bracket (**Figure 3-9**).

Step 4: Drill holes in the intended installation surface.

Step 5: Align the mounting holes in the sides of the mounting brackets with the predrilled holes in the mounting surface.

Step 6: Insert four retention screws, two in each bracket, to secure the system to the wall.

3.7 External Peripheral Interface Connectors

The TANK-700-QM67W-MRAY has the following connectors. Detailed descriptions of the connectors can be found in the subsections below.

- Audio
- DIO
- Ethernet
- GPIO for remote control
- HDMI
- Power button
- Power input

- Reset button
- RS-232
- RS-422/485
- USB
- Wireless antenna

3.7.1 ACC Mode Selection

The TANK-700-QM67W-MRAY allows turning the ACC mode on or off. The setting can be made through the ACC mode switch on the rear panel as shown below.

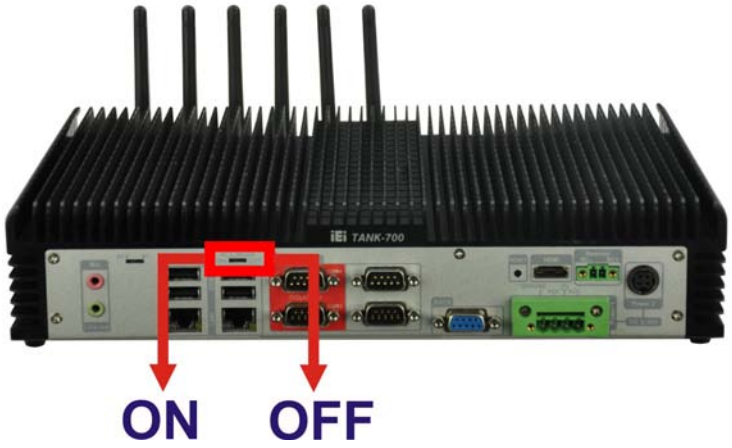


Figure 3-10: ACC Mode Switch

3.7.2 AT/ATX Power Mode Selection

The TANK-700-QM67W-MRAY supports AT and ATX power modes. The setting can be made through the AT/ATX power mode switch on the rear panel as shown below.

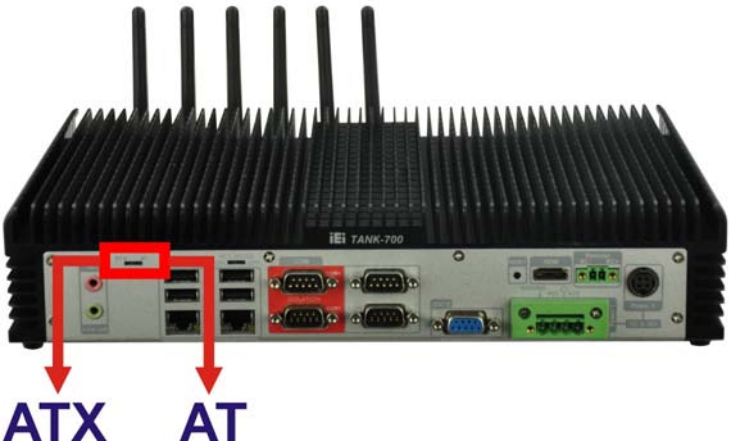


Figure 3-11: AT/ATX Power Mode Switch

3.7.3 Audio Connector

CN Label: Line out and Mic

CN Type: Audio jack

CN Location: See **Figure 3-12**

The audio jacks connect to external audio devices.

- **Microphone (Pink):** Connects a microphone.
- **Line Out port (Green):** Connects to a headphone or a speaker. With multi-channel configurations, this port can also connect to front speakers.

Figure 3-12: Audio Connector

3.7.4 Digital Input/Output Connector

CN Label: **DIO x 8**

CN Type: DB-9 male connector

CN Location: See **Figure 1-3**

CN Pinouts: See **Table 3-1** and **Figure 3-13**

The digital I/O connector provides programmable input and output for external devices. The pinouts for the digital I/O connector are listed in the table below.

Pin	Description	Pin	Description
1	DIN0	6	DOUT2
2	DOUT0	7	DIN3
3	DIN1	8	DOUT3
4	DOUT1	9	VCC5
5	DIN2		

Table 3-1: DIO Connector Pinouts

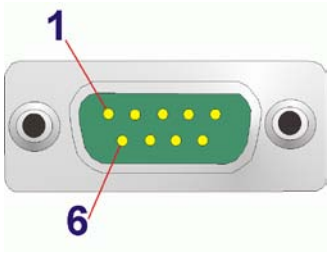


Figure 3-13: DIO Connector Pinout Location

3.7.5 HDMI Connector

CN Label: **HDMI**

CN Type: HDMI type A connector

CN Location: See **Figure 1-3**

CN Pinouts: See **Table 3-2**

The HDMI (High-Definition Multimedia Interface) connector connects to digital audio or video sources.

Pin	Description	Pin	Description
1	HDMI_DATA2	2	GND
3	HDMI_DATA2#	4	HDMI_DATA1

Pin	Description	Pin	Description
5	GND	6	HDMI_DATA1#
7	HDMI_DATA0	8	GND
9	HDMI_DATA0#	10	HDMI_CLK
11	GND	12	HDMI_CLK#
13	N/C	14	N/C
15	HDMI_SCL	16	HDMI_SDA
17	GND	18	+5V
19	HDMI_HPD	20	HDMI_GND
21	HDMI_GND	22	HDMI_GND
23	HDMI_GND		

Table 3-2: HDMI Connector Pinouts

3.7.6 LAN Connectors

CN Label: **LAN**

CN Type: RJ-45

CN Location: See **Figure 1-3**

CN Pinouts: See **Table 3-3**

The LAN connectors allow connection to an external network.

Step 1: **Locate the RJ-45 connectors.** The locations of the RJ-45 connectors are shown in **Figure 1-3**.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the TANK-700-QM67W-MRAY. See **Figure 3-14**.

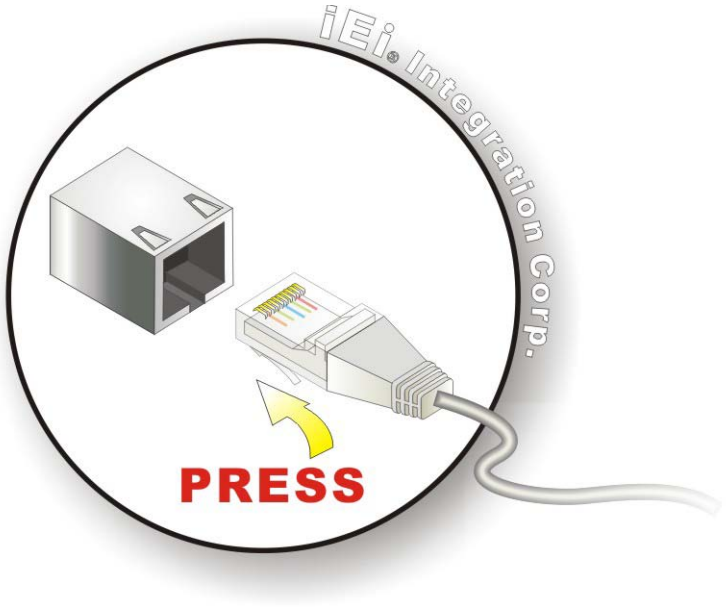


Figure 3-14: LAN Connection

Step 3: **Insert the LAN cable RJ-45 connector.** Once aligned, gently insert the LAN cable RJ-45 connector into the on-board RJ-45 connector.

Pin	Description	Pin	Description
1	TRD1P0	5	TRD1P2
2	TRD1N0	6	TRD1N2
3.	TRD1P1	7	TRD1P3
4.	TRD1N1	8	TRD1N3

Table 3-3: LAN Pinouts

Figure 3-15: RJ-45 Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See **Table 3-4**.

Activity/Link LED		Speed LED	
STATUS	**DESCRIPTION**	**STATUS**	**DESCRIPTION**
Off	No link	Off	10 Mbps connection
Yellow	Linked	Green	100 Mbps connection
Blinking	TX/RX activity	Orange	1 Gbps connection

Table 3-4: RJ-45 Ethernet Connector LEDs

3.7.7 Power Input, 4-pin Terminal Block

CN Label: **POWER 1**

CN Type: 4-pin terminal block

CN Location: See **Figure 1-3**

CN Pinouts: See **Table 3-5** and **Figure 3-16**

Connect the leads of a 9V~36V DC power supply into the terminal block. Make sure that the power and ground wires are attached to the correct sockets of the connector.

Pin	Description	Pin	Description
1	GND	3	Power button
2	VCC	4	ACC

Table 3-5: 4-pin Terminal Block Pinouts

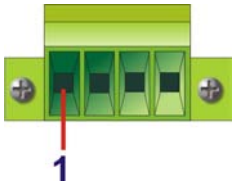


Figure 3-16: 4-pin Terminal Block Pinout Location

3.7.8 Power Input, 4-pin DIN Connector

CN Label: POWER 2

CN Type: 4-pin DIN connector

CN Location: See **Figure 1-3**

CN Pinouts: See **Table 3-6** and **Figure 3-17**

The power connector connects to the 10.5V~36V DC power adapter.

Figure 3-17: Power Input Connector

Pin	Description	Pin	Description
1	+12V	3	+12V
2	GND	4	GND

Table 3-6: Power Input Pinouts

3.7.9 Remote Control Connector (For AT Power Mode Only)

CN Label: **Remoter**

CN Type: 2-pin terminal block

CN Location: See **Figure 1-3**

CN Pinouts: See **Figure 3-18**

The 2-pin terminal block connects to a remote control device. Users can control the system power on/off by inputting high or low voltage into the terminal block.

- **Turn off** the system: **2 V ~ 5 V** input
- **Turn on** the system: **less than 0.4 V** input

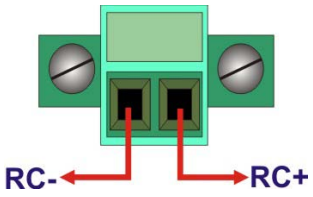


Figure 3-18: Remote Control Terminal Block Pinout Location

3.7.10 RJ-45 RS-232 Serial Ports

CN Label:	**RS 232**
CN Type:	RJ-45
CN Location:	See **Figure 1-2**
CN Pinouts:	See **Table 3-7** and **Figure 3-20**

RS-232 serial port devices can be attached to the RJ-45 RS-232 serial ports on the front panel.

Step 1: **Locate the RJ-45 RS-232 connectors**. The locations of the RJ-45 RS-232 connectors are shown in **Figure 1-2**.

Step 2: **Insert the RJ-45 connector**. Insert the RJ-45 connector on the RJ-45 to DB-9 COM port cable to one of the RJ-45 RS-232 connectors on the TANK-700-QM67W-MRAY. See **Figure 3-19**.

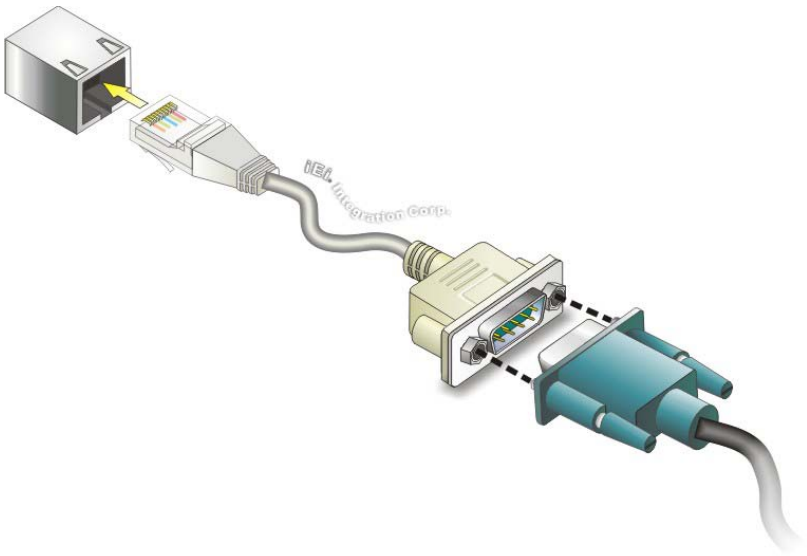


Figure 3-19: RJ-45 RS-232 Serial Device Connection

Step 3: **Insert the serial connector**. Insert the DB-9 connector of a serial device into the DB-9 connector on the RJ-45 to DB-9 COM port cable.

Step 4: **Secure the connector**. Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

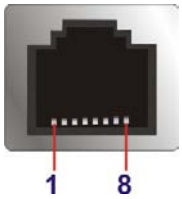


Figure 3-20: RJ-45 RS-232 Serial Port Pinout Location

Pin	Description	Pin	Description
1	RI	5	RTS
2	DTR	6	RX
3.	CTS	7	DSR
4.	TX	8	DCD

Table 3-7: RJ-45 RS-232 Serial Port Pinouts

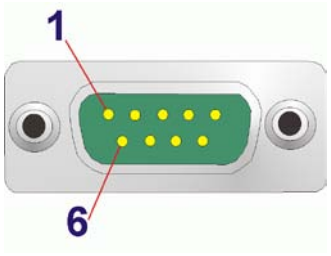


Figure 3-21: DB-9 Connector Pinout Location

Pin	Description	Pin	Description
1	DCD	6	DSR
2	RX	7	RTS
3	TX	8	CTS
4	DTR	9	RI
5	GND		

Table 3-8: DB-9 Connector Pinouts

3.7.11 RJ-45 RS-422/485 Serial Ports

CN Label:	**RS 422/485**
CN Type:	RJ-45
CN Location:	See **Figure 1-2**
CN Pinouts:	See **Table 3-9** and **Figure 3-23**

RS-422/485 serial port devices can be attached to the RJ-45 RS-422/485 serial ports on the front panel.

Step 1: **Locate the RJ-45 RS-422/485 connectors**. The locations of the RJ-45 RS-422/485 connectors are shown in **Figure 1-2**.

Step 2: **Insert the RJ-45 connector**. Insert the RJ-45 connector on the RJ-45 to DB-9 COM port cable to one of the RJ-45 RS-422/485 connectors on the TANK-700-QM67W-MRAY. See **Figure 3-22**.

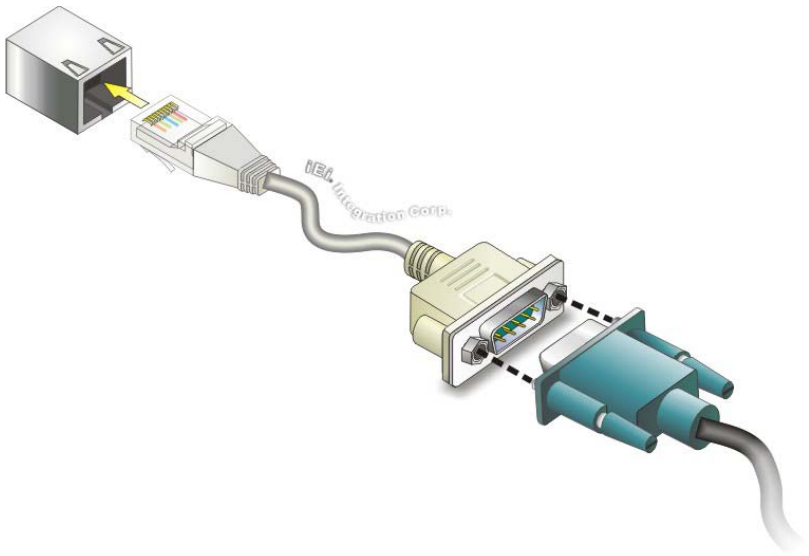


Figure 3-22: RJ-45 RS-422/485 Serial Device Connection

Step 3: **Insert the serial connector**. Insert the DB-9 connector of a serial device into the DB-9 connector on the RJ-45 to DB-9 COM port cable.

Step 4: **Secure the connector**. Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

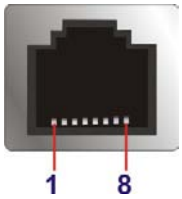


Figure 3-23: RJ-45 RS-422/485 Serial Port Pinout Location

Pin	Description (RS-422)	Description (RS-485)
1	N/A	N/A
2	TXD422#	TXD485#
3	N/A	N/A
4	TXD422+	TXD485+
5	N/A	N/A
6	RXD422#	N/A
7	N/A	N/A
8	RXD422+	N/A

Table 3-9: RJ-45 RS-422/485 Serial Port Pinouts

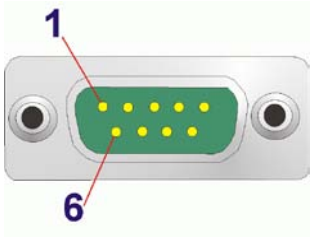


Figure 3-24: DB-9 Connector Pinout Location

Pin	Description (RS-422)	Description (RS-485)
1	RXD422+	N/A
2	RXD422#	N/A
3	TXD422+	TXD485+
4	TXD422#	TXD485#
5	GND	GND
6	N/A	N/A
7	N/A	N/A

8	N/A	N/A
9	N/A	N/A

Table 3-10: DB-9 Connector Pinouts

3.7.12 RS-232 Serial Port Connectors

CN Label: **COM1**, **COM2**, **COM3** and **COM4**

CN Type: DB-9 connectors

CN Location: See **Figure 1-3**

CN Pinouts: See **Table 3-11** and **Figure 3-26**

RS-232 serial port devices can be attached to the DB-9 ports on the rear panel.

Step 1: **Locate the DB-9 connector**. The locations of the DB-9 connectors are shown in **Figure 1-3**.

Step 2: **Insert the serial connector**. Insert the DB-9 connector of a serial device into the DB-9 connector on the external peripheral interface. See **Figure 3-25**.

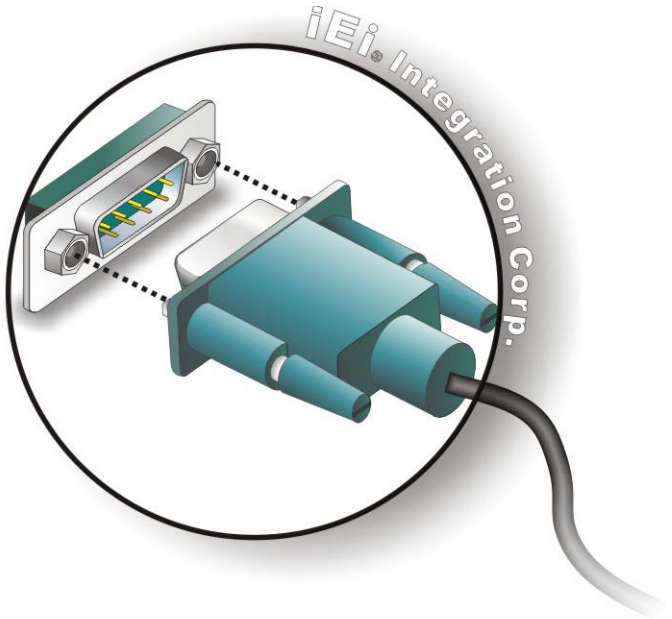


Figure 3-25: Serial Device Connector

Step 3: **Secure the connector**. Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

Pin	Description	Pin	Description
1	DCD	6	DSR
2	RX	7	RTS
3	TX	8	CTS
4	DTR	9	RI
5	GND		

Table 3-11: Serial Port Pinouts

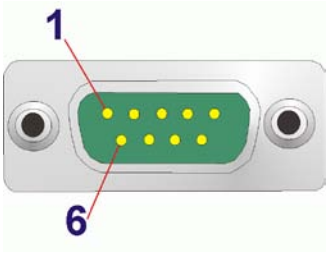


Figure 3-26: Serial Port Pinout Location

3.7.13 USB Connectors

CN Label: USB

CN Type: USB port

CN Location: See **Figure 1-2** and **Figure 1-3**

CN Pinouts: See **Table 3-12**

The USB ports are for connecting USB peripheral devices to the system.

Step 1: **Locate the USB connectors**. The locations of the USB connectors are shown in **Figure 1-3**.

Step 2: **Align the connectors**. Align the USB device connector with one of the connectors. See **Figure 3-27**.

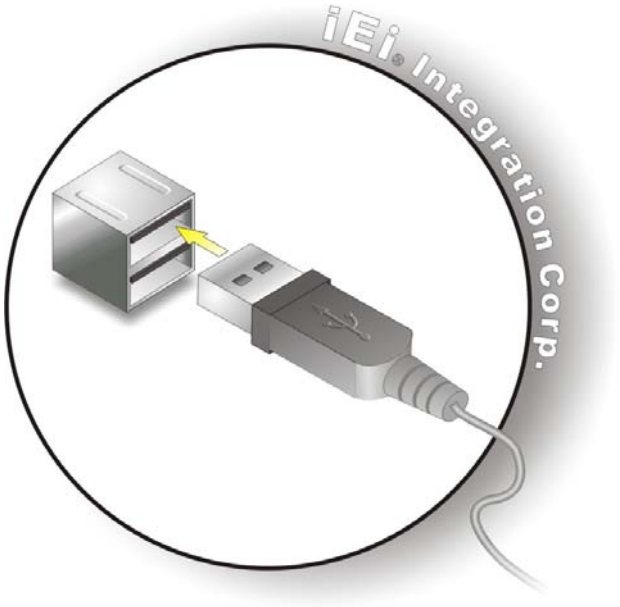


Figure 3-27: USB Device Connection

Step 3: **Insert the device connector**. Once aligned, gently insert the USB device connector into the on-board connector.

Pin	Description	Pin	Description
1	VCC	5	VCC
2	DATA-	6	DATA-
3	DATA+	7	DATA+
4	GROUND	8	GROUND

Table 3-12: USB Port Pinouts

3.8 Powering On/Off the System

WARNING:

Make sure a power supply with the correct input voltage is being fed into the system. Incorrect voltages applied to the system may cause damage to the internal electronic components and may also cause injury to the user.

- **Power on** the system: press the power button for 3 seconds

- **Power off** the system: press the power button for 6 seconds

Figure 3-28: Power Button

3.9 Redundant Power

The TANK-700-QM67W-MRAY is a system that supports redundant power. The redundant power input increases the reliability of the system and prevents data loss and system corruption from sudden power failure. The system can instantly and uninterruptedly switch to the second power input when the main power is unavailable or in low voltage capacity.

There are two power connectors on the rear panel. Power 1 connector is a 4-pin terminal block that supports ACC On signal. Power 2 connector is a DIN connector that can directly connect to a power adapter. The supported power input voltages are:

- **Power 1 (terminal block)**: 9 V (+/-0.3 V) ~ 36 V
- **Power 2 (DC jack)**: 10.5 V (+/-0.3 V) ~ 36 V

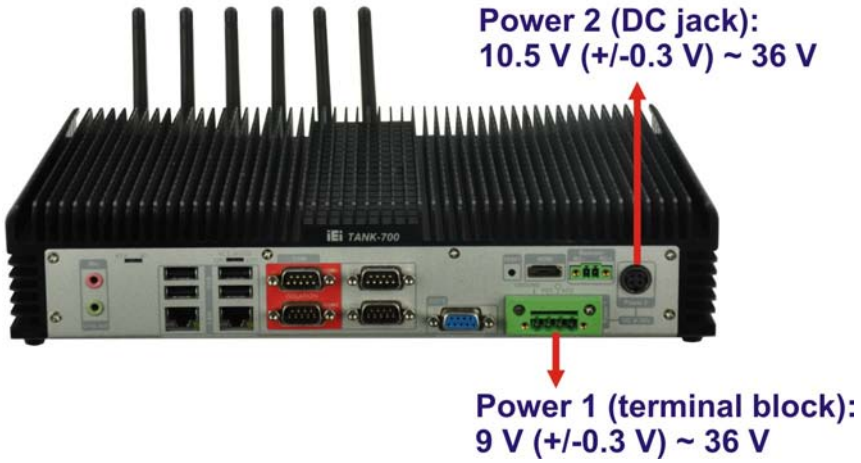


Figure 3-29: Power Connectors

When the system is in ACC On mode, the main power input is from Power 1 connector; when the system is in ACC Off mode, the main power input is from Power 2 connector. The ACC on/off mode is selected by the ACC mode switch on the rear panel (**Figure 3-10**).

The following sections describe how the redundant power works in ACC On mode and ACC Off mode.

3.9.1 ACC ON

NOTE:

In ACC On mode, the Power 1 connector must connect to the ACC on signal to be able to control system power.

The ACC On mode is designed for vehicle applications. When the TANK-700-QM67W-MRAY is in ACC On mode, the main power input is the Power 1 connector and the backup power is from the Power 2 connector.

3.9.1.1 Boot-up

When both power connectors are connected to a power source with over 9 V, the two power LEDs on the front panel remain off until **the ACC ON signal jumps from low to**

high. The user can choose AT power mode or ATX power mode to control the system. The following flow diagrams show the boot-up process and the LED status in AT and ATX power modes.

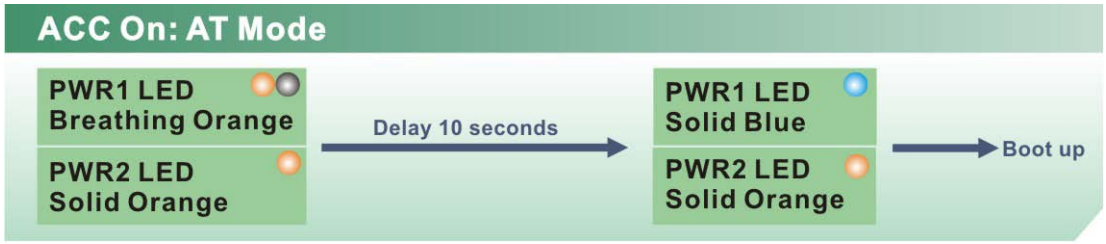


Figure 3-30: ACC On: AT Mode

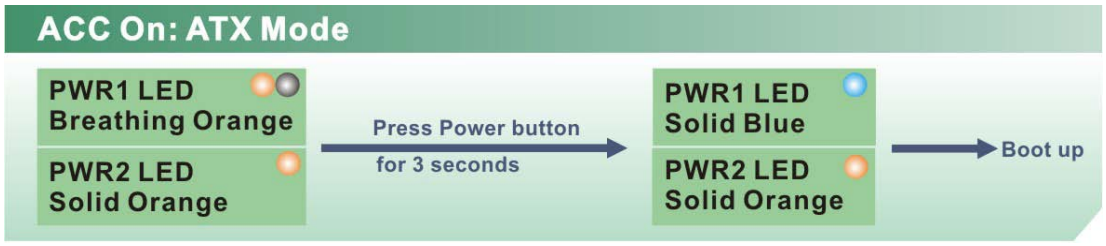


Figure 3-31: ACC On: ATX Mode

3.9.1.2 Switch to Backup Power

During operation, system power will switch from Power 1 to Power 2 automatically when the following situations occur:

- Power 1 < 9V and Power 2 > 10.5V
- Power 1 > 9V, but the ACC ON signal jumps from high to low
- Power 1 is unplugged and Power 2 > 10.5V

The following flow diagram shows how the power is switched between Power 1 and Power 2 and their LED statuses.

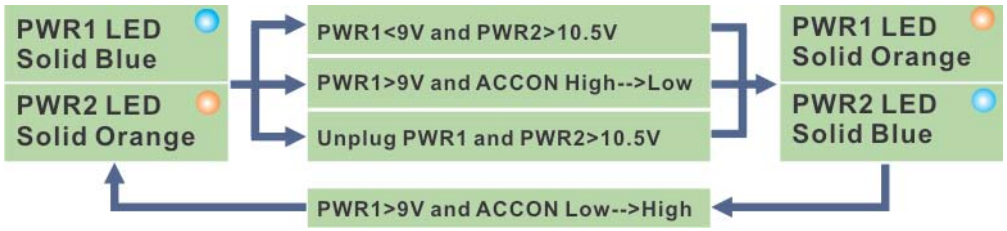


Figure 3-32: ACC On: Switch Between PWR1 and PWR2

3.9.1.3 Shutdown

The system will shutdown in the following situations:

- Power 1 < 9V and Power 2 < 10.5V
- Power 1 > 9V, Power 2 < 10.5V and ACC ON signal jumps from high to low
- Press Power button for 6 seconds

The following flow diagram shows the system shutdown process and the LED statuses.

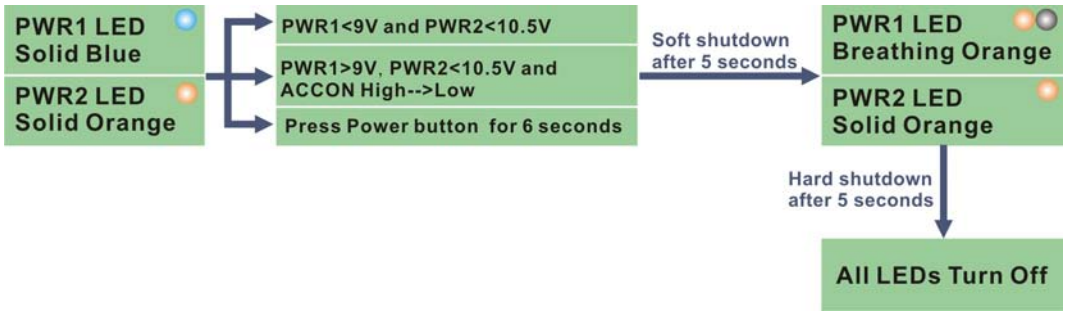


Figure 3-33: ACC On: Shutdown

NOTE:

To turn on the system in ATX power mode, press the Power button for three seconds. Press the Power button for six seconds to turn off the system.

3.9.2 ACC OFF

When the TANK-700-QM67W-MRAY is in ACC Off mode, the main power input is the Power 2 connector and the backup power is from the Power 1 connector.

3.9.2.1 Boot-up

When both power connectors are connected to a power source with over 9 V, the two power LEDs on the front panel turn on. The user can choose AT power mode or ATX

power mode to control the system. The following flow diagrams show the boot-up process and the LED status in AT and ATX power modes.

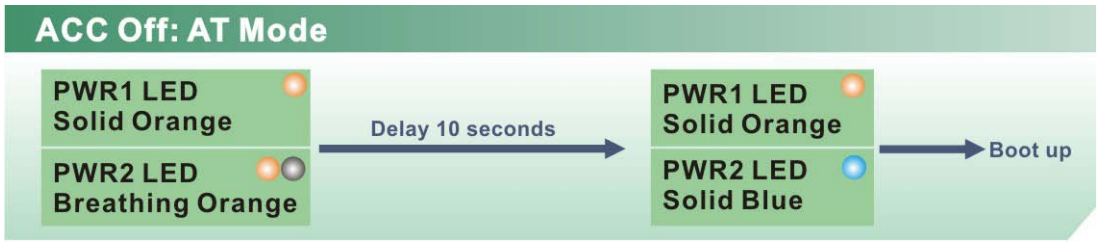


Figure 3-34: ACC Off: AT Mode

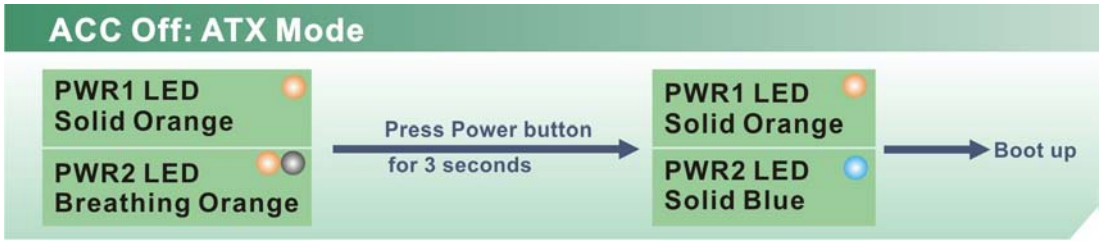


Figure 3-35: ACC Off: ATX Mode

3.9.2.2 Switch to Backup Power

During operation, system power switches from Power 2 to Power 1 automatically when the following situations occur:

- Power 2 < 10.5V and Power 1 > 9V
- Power 2 is unplugged and Power 1 > 9V

The following flow diagram shows how the power is switched between Power 2 and Power 1 and their LED statuses.

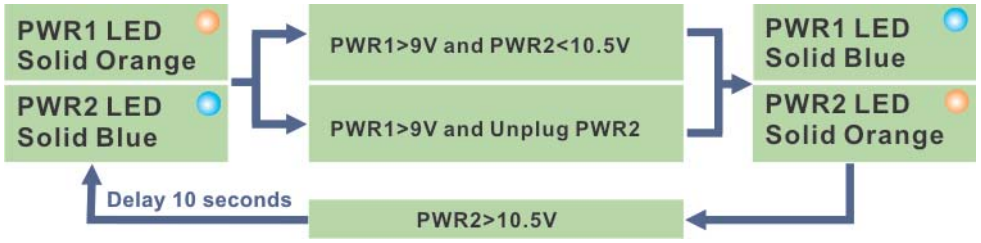


Figure 3-36: ACC Off: Switch Between PWR1 and PWR2

NOTE:

System power can switch between Power 2 and Power 1 automatically when a 12 V power adapter is being connected to Power 2 and the power input of Power 1 is from 9 V to 16 V. If Power 2 is unplugged and the power input of Power 1 is over 16 V, system power will switch to Power 1 automatically. However, the system remains using the power source from Power 1 even if Power 2 is re-plugged.

System power can switch between Power 2 and Power 1 automatically when a 19 V power adapter is being connected to Power 2 and the power input of Power 1 is from 9 V to 26 V. If Power 2 is unplugged and the power input of Power 1 is over 26 V, system power will switch to Power 1 automatically. However, the system remains using the power source from Power 1 even if Power 2 is re-plugged.

3.9.2.3 Shutdown

The system will shutdown in the following situations:

- Power 2 < 10.5V and Power 1 < 9V
- Press Power buttons for 6 seconds

The following flow diagram shows the system shutdown process and the LED statuses.

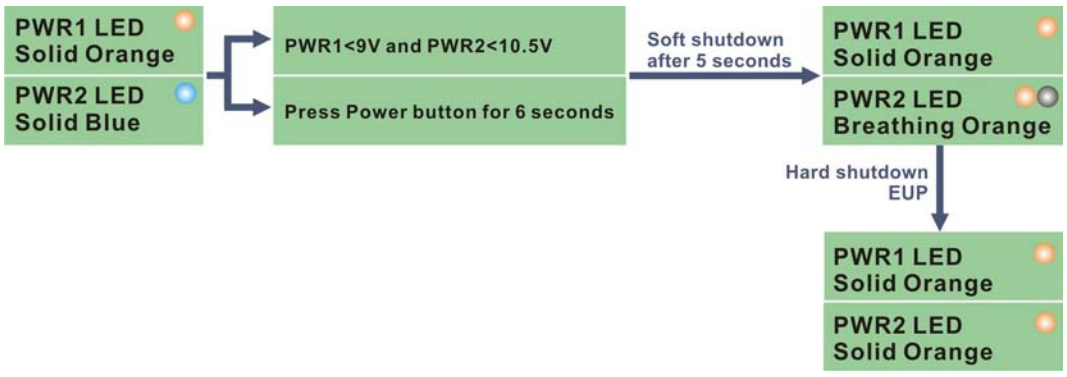


Figure 3-37: ACC Off: Shutdown

NOTE:

The power LED turns off when the power cable is unplugged from the system.

Chapter

4

BIOS

4.1 Introduction

The BIOS is programmed onto the BIOS chip. The BIOS setup program allows changes to certain system settings. This chapter outlines the options that can be changed.

4.1.1 Starting Setup

The UEFI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DEL** or **F2** key as soon as the system is turned on or
2. Press the **DEL** or **F2** key when the "**Press DEL or F2 to enter SETUP**" message appears on the screen.

If the message disappears before the **DEL or F2** key is pressed, restart the computer and try again.

4.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in the following table.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
+	Increase the numeric value or make changes
-	Decrease the numeric value or make changes
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes

Key	Function
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2	Previous values
F3	Load optimized defaults
F4	Save changes and Exit BIOS

Table 4-1: BIOS Navigation Keys

4.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

4.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after changes to the system configuration are made, CMOS defaults. Use the jumper described in Chapter 2.

4.1.5 BIOS Menu Bar

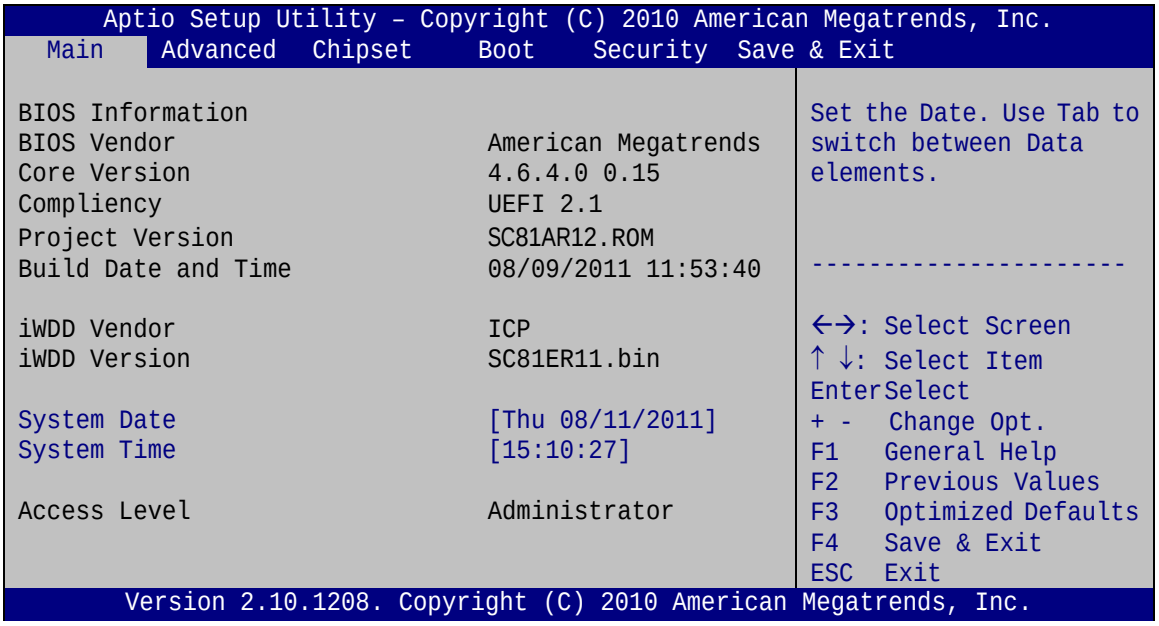
The **menu bar** on top of the BIOS screen has the following main items:

- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- Chipset – Changes the chipset settings.
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.
- Save & Exit – Selects exit options and loads default settings.

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

4.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered. The **Main** menu gives an overview of the basic system information.



BIOS Menu 1: Main

➔ System Overview

The **BIOS Information** lists a brief summary of the BIOS. The fields in **BIOS Information** cannot be changed. The items shown in the system overview include:

- **BIOS Vendor:** Installed BIOS vendor
- **Core Version:** Current BIOS version
- **Project Version:** the board version
- **Build Date and Time:** Date and time the current BIOS version was made

The System Overview field also has two user configurable fields:

➔ System Date [xx/xx/xx]

Use the **System Date** option to set the system date. Manually enter the day, month and year.

➔ System Time [xx:xx:xx]

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

4.3 Advanced

Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

WARNING!

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

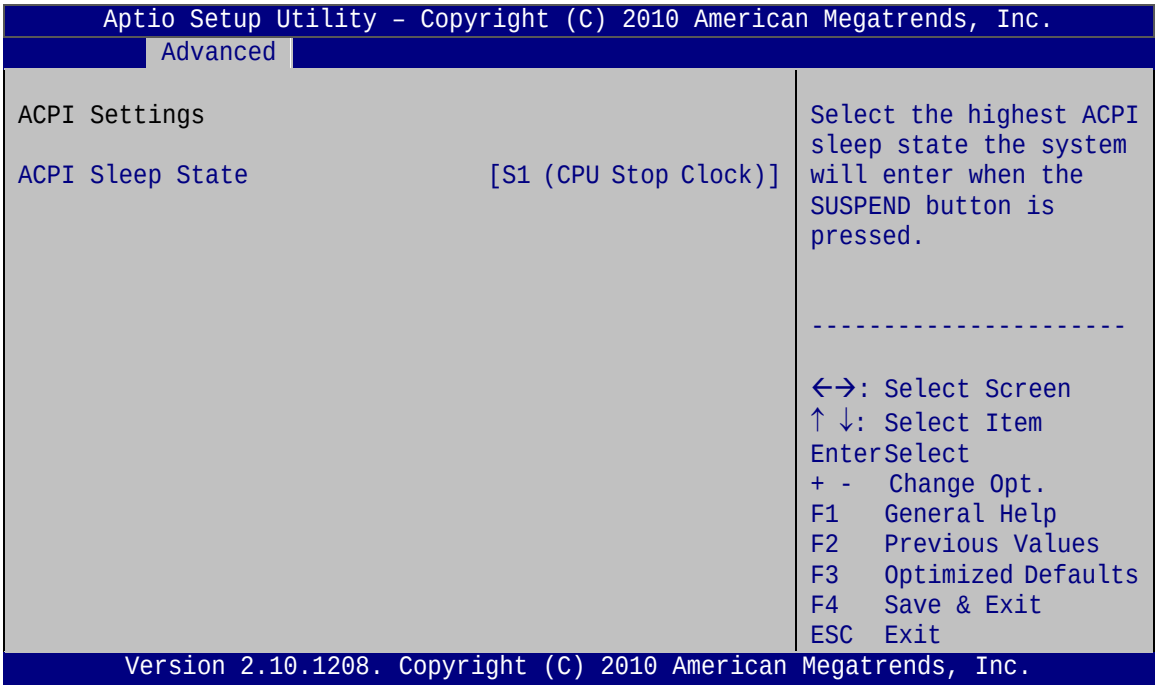
```
      Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
  Main    Advanced  Chipset     Boot     Security  Save & Exit

> ACPI Settings                                   System ACPI Parameters
> Trusted Computing
> CPU Configuration
> SATA Configuration
> USB Configuration                               ----------------------
> F81216 Second Super IO Configuration
> Super IO Configuration                          ←→: Select Screen
> H/M Monitor                                     ↑ ↓: Select Item
> Serial Port Console Redirection                 EnterSelect
> iEi Feature                                     + -   Change Opt.
                                                  F1    General Help
                                                  F2    Previous Values
                                                  F3    Optimized Defaults
                                                  F4    Save & Exit
                                                  ESC   Exit
       Version 2.10.1208. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 2: Advanced

4.3.1 ACPI Settings

The **ACPI Settings** menu (**BIOS Menu 3**) configures the Advanced Configuration and Power Interface (ACPI) options.



BIOS Menu 3: ACPI Configuration

➔ ACPI Sleep State [S1 (CPU Stop Clock)]

Use the **ACPI Sleep State** option to specify the sleep state the system enters when it is not being used.

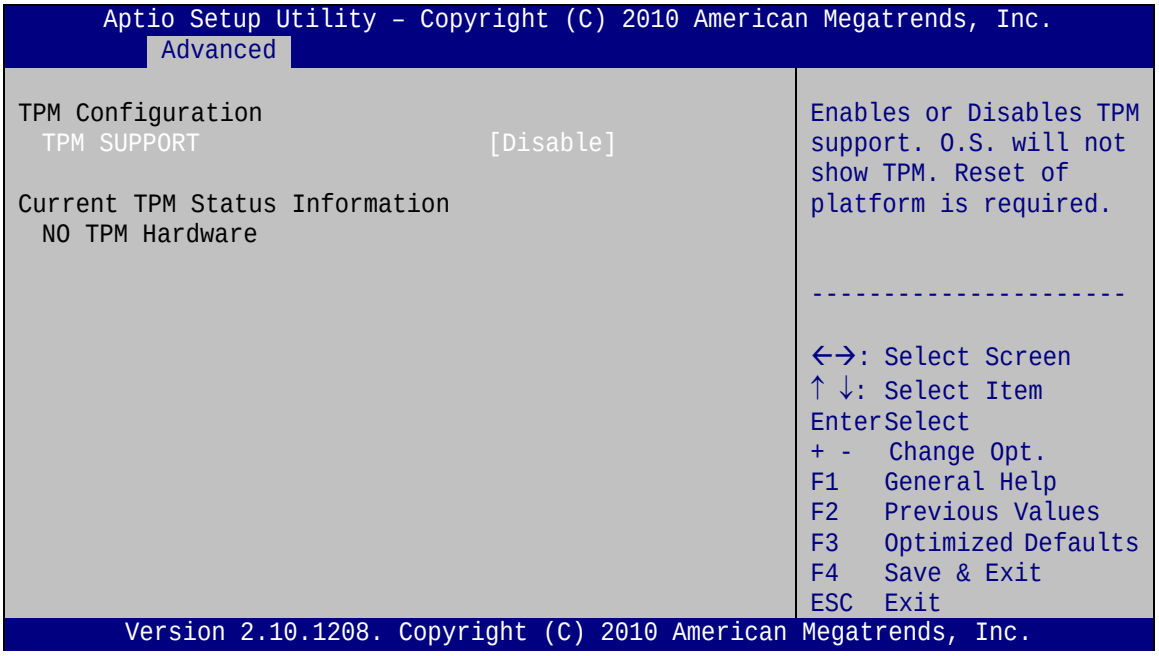
➔ **Suspend Disabled**

➔ **S1 (CPU Stop Clock)** **DEFAULT** The system enters S1(POS) sleep state. The system appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.

➔ **S3 (Suspend to RAM)** The caches are flushed and the CPU is powered off. Power to the RAM is maintained. The computer returns slower to a working state, but more power is saved.

4.3.2 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 4**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).



BIOS Menu 4: TPM Configuration

➔ TPM Support [Disable]

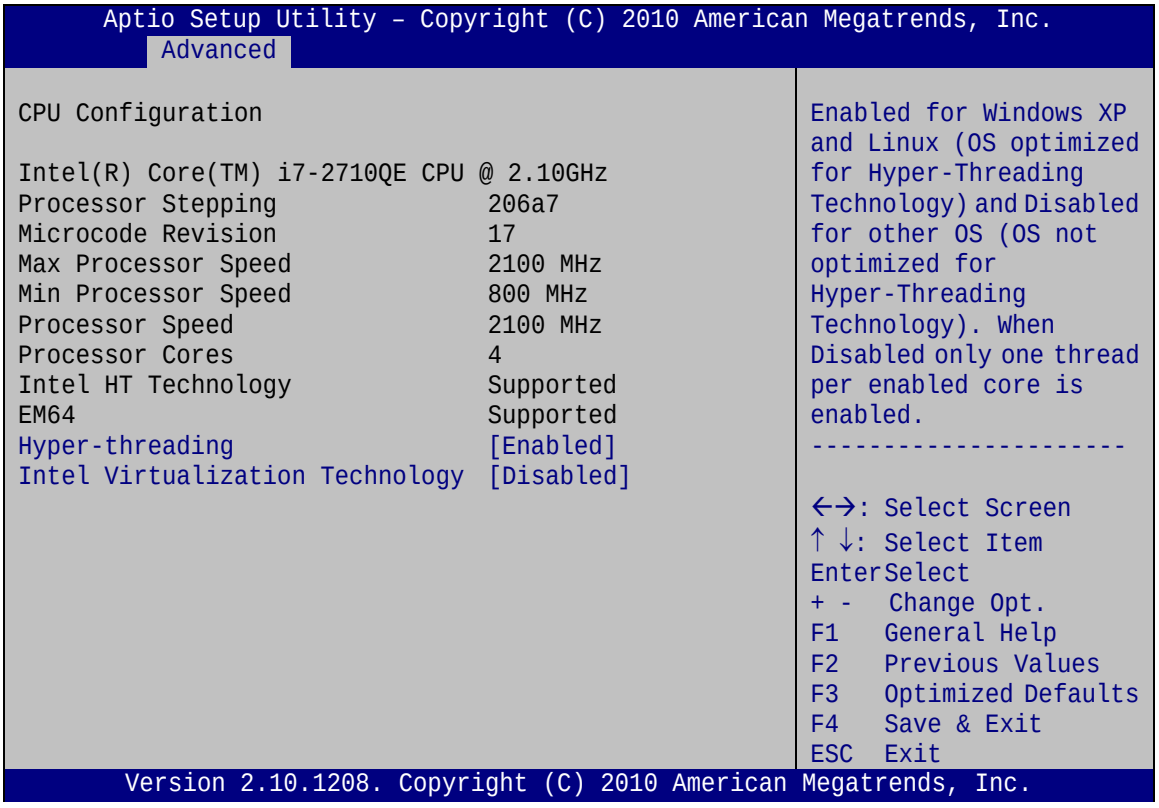
Use the **TPM Support** option to configure support for the TPM.

➔ **Disable** **DEFAULT** TPM support is disabled.

➔ **Enable** TPM support is enabled.

4.3.3 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 5**) to view detailed CPU specifications and configure the CPU.



BIOS Menu 5: CPU Configuration

The CPU Configuration menu (**BIOS Menu 5**) lists the following CPU details:

- Processor Type
- Processor Stepping: Lists the CPU processing stepping
- Microcode Revision: Lists the microcode revision
- Max Processor Speed: Lists the maximum CPU processing speed
- Min Processor Speed: Lists the minimum CPU processing speed
- Processor Speed: Lists the CPU processing speed
- Processor Cores: Lists the number of the processor core
- Intel HT Technology: Indicates if the Intel Hyper-Threading Technology is supported by the CPU.
- EMT64: Indicates if the EM64T is supported by the CPU.

➔ Hyper-threading [Enabled]

Use the **Hyper-threading** function to enable or disable the CPU hyper threading function.

➔ **Disabled** Disables the use of hyper threading technology

➔ **Enabled** **DEFAULT** Enables the use of hyper threading technology

➔ Intel Virtualization Technology [Disabled]

Use the **Intel Virtualization Technology** option to enable or disable virtualization on the system. When combined with third party software, Intel® Virtualization technology allows several OSs to run on the same system at the same time.

➔ **Disabled** **DEFAULT** Disables Intel Virtualization Technology.

➔ **Enabled** Enables Intel Virtualization Technology.

4.3.4 SATA Configuration

Use the **SATA Configuration** menu (**BIOS Menu 6**) to change and/or set the configuration of the SATA devices installed in the system.

```
      Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
          Advanced
 SATA Controller(s)              [Enabled]          Enable or Disable SATA
 SATA Mode Selection             [IDE]              Device.

 Serial ATA Port 0               Empty
   Software Preserve             Unknown            ----------------------

 Serial ATA Port 1               Empty              ←→: Select Screen
   Software Preserve             Unknown            ↑ ↓: Select Item
                                                    EnterSelect
                                                    + -   Change Opt.
                                                    F1    General Help
                                                    F2    Previous Values
                                                    F3    Optimized Defaults
                                                    F4    Save & Exit
                                                    ESC   Exit
      Version 2.10.1208. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 6: SATA Configuration

➔ SATA Controller(s) [Enabled]

Use the **SATA Controller(s)** option to enable or disable the SATA controller.

➔ **Enabled**	**DEFAULT**	Enables the on-board SATA controller.
➔ **Disabled**		Disables the on-board SATA controller.

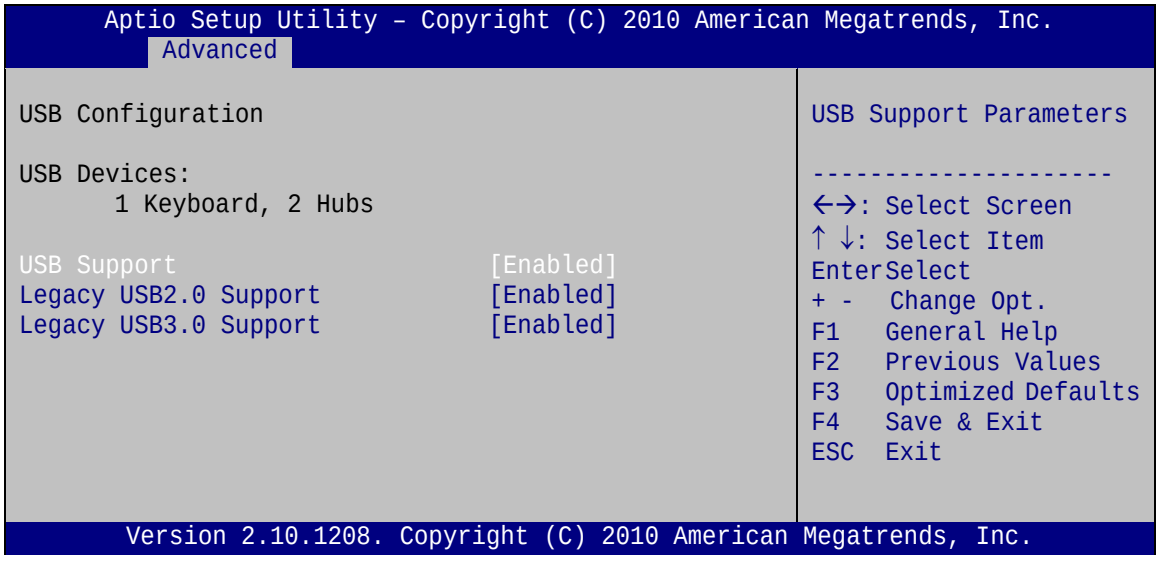
➔ SATA Mode Selection [IDE]

Use the **SATA Mode Selection** option to configure SATA devices as normal IDE devices.

➔ **IDE**	**DEFAULT**	Configures SATA devices as normal IDE device.
➔ **AHCI**		Configures SATA devices as AHCI device.
➔ **RAID**		Configures SATA devices as RAID device.

4.3.5 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 7**) to read USB configuration information and configure the USB settings.



BIOS Menu 7: USB Configuration

➔ USB Devices

The **USB Devices** field lists the USB devices that are enabled on the system

➔ USB2.0 Support [Enabled]

Use the **USB2.0 Support** option to enable or disable USB 2.0 support on the system.

➔	**Disabled**		USB 2.0 support disabled
➔	**Enabled**	**DEFAULT**	USB 2.0 support enabled

➔ Legacy USB2.0 Support [Enabled]

Use the **Legacy USB2.0 Support** BIOS option to enable USB mouse and USB keyboard support. Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

➔	**Enabled**	**DEFAULT**	Legacy USB support enabled
➔	**Disabled**		Legacy USB support disabled
➔	**Auto**		Legacy USB support disabled if no USB devices are connected

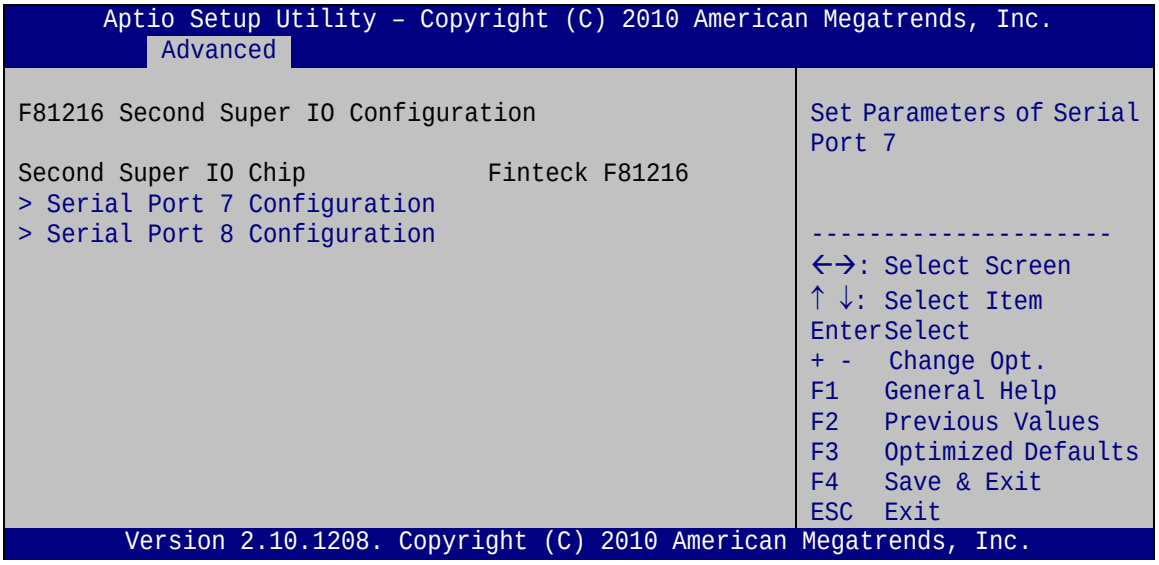
➔ Legacy USB3.0 Support [Enabled]

Use the **USB3.0 Support** option to enable or disable USB 3.0 support on the system.

➔	**Enabled**	**DEFAULT**	USB 3.0 support enabled
➔	**Disabled**		USB 3.0 support disabled

4.3.6 Second Super IO Configuration

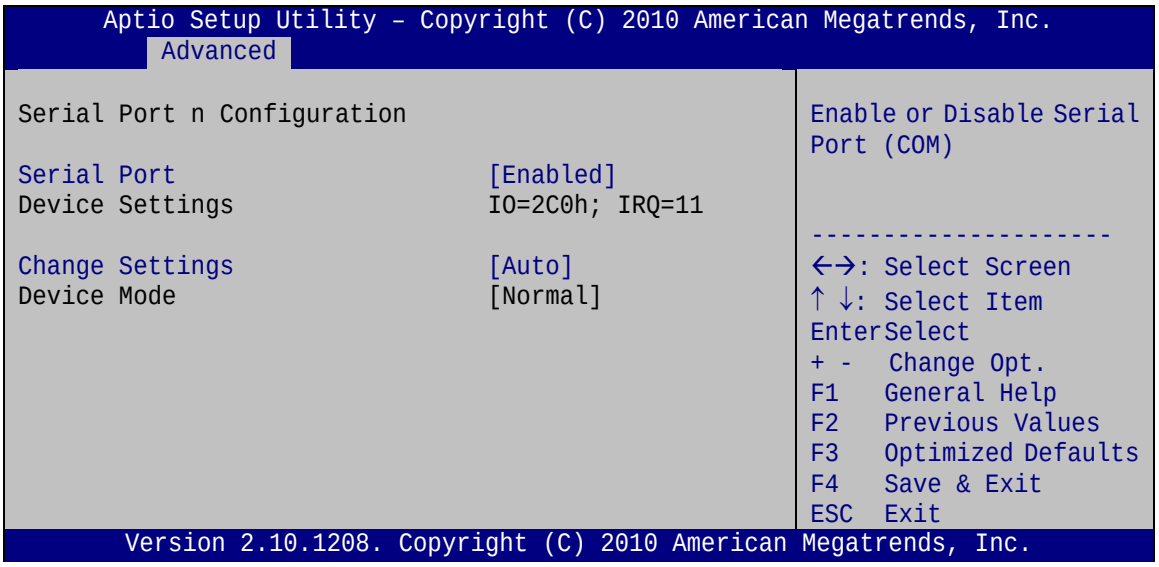
Use the **F81216 Second Super IO Configuration** menu (**BIOS Menu 8**) to set or change the configurations for the serial ports.



BIOS Menu 8: F81216 Second Super IO Configuration

4.3.6.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 9**) to configure the serial port n.



BIOS Menu 9: Serial Port n Configuration Menu

4.3.6.1.1 Serial Port 7 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**		Disable the serial port
➔ **Enabled**	**DEFAULT**	Enable the serial port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔ **IO=3F8h; IRQ=3**		Serial Port I/O port address is 3F8h and the interrupt address is IRQ3
➔ **IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**		Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
➔ **IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**		Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
➔ **IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**		Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
➔ **IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**		Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12

➔ Device Mode [Normal]

Use the **Device Mode** option to enable or disable the serial port.

➔ **Normal**	**DEFAULT**	Sets the serial port mode to normal.
➔ **RS422/485**		Enables serial port RS-422/485 support.

4.3.6.1.2 Serial Port 8 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**		Disable the serial port
➔ **Enabled**	**DEFAULT**	Enable the serial port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔ **IO=2F8h; IRQ=3**		Serial Port I/O port address is 2F8h and the interrupt address is IRQ3
➔ **IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**		Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
➔ **IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**		Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12

- **IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12** — Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
- **IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12** — Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12

➔ Device Mode [Normal]

Use the **Device Mode** option to enable or disable the serial port.

- **Normal** **DEFAULT** — Sets the serial port mode to normal.
- **RS422/485** — Enables serial port RS-422/485 support.

4.3.7 Super IO Configuration

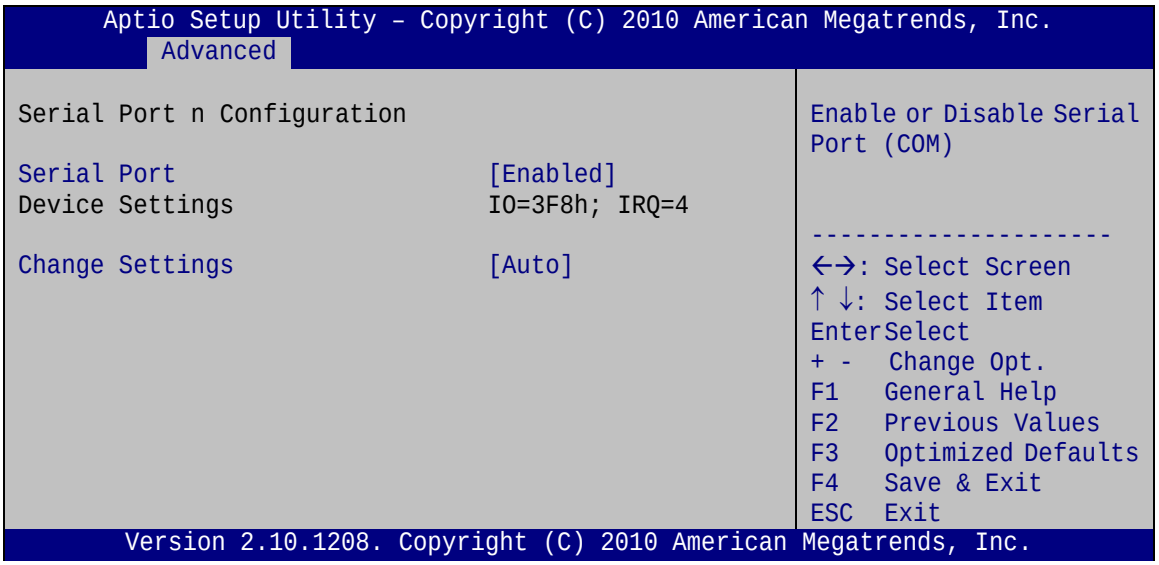
Use the **Super IO Configuration** menu (**BIOS Menu 10**) to set or change the configurations for the serial ports.

```
      Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
          Advanced
 Super IO Configuration                          | Set Parameters of Serial
                                                 | Port 1 (COMA)
 Super IO Chip                    Finteck F81866 |
 > Serial Port 1 Configuration                   |
 > Serial Port 2 Configuration                   | ---------------------
 > Serial Port 3 Configuration                   | ←→: Select Screen
 > Serial Port 4 Configuration                   | ↑ ↓: Select Item
 > Serial Port 5 Configuration                   | EnterSelect
 > Serial Port 6 Configuration                   | + -   Change Opt.
                                                 | F1    General Help
                                                 | F2    Previous Values
                                                 | F3    Optimized Defaults
                                                 | F4    Save & Exit
                                                 | ESC   Exit
       Version 2.10.1208. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 10: Super IO Configuration

4.3.7.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 11**) to configure the serial port n.



BIOS Menu 11: Serial Port n Configuration Menu

4.3.7.1.1 Serial Port 1 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

- ➔ **Disabled** — Disable the serial port
- ➔ **Enabled** **DEFAULT** — Enable the serial port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

- ➔ **Auto** **DEFAULT** — The serial port IO port address and interrupt address are automatically detected.
- ➔ **IO=3F8h; IRQ=4** — Serial Port I/O port address is 3F8h and the interrupt address is IRQ4

- ➔ **IO=3F8h; IRQ=3, 4** — Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4
- ➔ **IO=2F8h; IRQ=3, 4** — Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4
- ➔ **IO=2C0h; IRQ=3, 4** — Serial Port I/O port address is 2C0h and the interrupt address is IRQ3, 4
- ➔ **IO=2C8h; IRQ=3, 4** — Serial Port I/O port address is 2C8h and the interrupt address is IRQ3, 4

4.3.7.1.2 Serial Port 2 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

- ➔ **Disabled** — Disable the serial port
- ➔ **Enabled** **DEFAULT** — Enable the serial port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

- ➔ **Auto** **DEFAULT** — The serial port IO port address and interrupt address are automatically detected.
- ➔ **IO=2F8h; IRQ=3** — Serial Port I/O port address is 2F8h and the interrupt address is IRQ3
- ➔ **IO=3F8h; IRQ=3, 4** — Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4
- ➔ **IO=2F8h; IRQ=3, 4** — Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4
- ➔ **IO=2C0h; IRQ=3, 4** — Serial Port I/O port address is 2C0h and the interrupt address is IRQ3, 4

- **IO=2C8h; IRQ=3, 4** — Serial Port I/O port address is 2C8h and the interrupt address is IRQ3, 4

4.3.7.1.3 Serial Port 3 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

- **Disabled** — Disable the serial port
- **Enabled** **DEFAULT** — Enable the serial port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

- **Auto** **DEFAULT** — The serial port IO port address and interrupt address are automatically detected.
- **IO=3E8h; IRQ=10** — Serial Port I/O port address is 3E8h and the interrupt address is IRQ10
- **IO=3E8h; IRQ=10, 11** — Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11
- **IO=2E8h; IRQ=10, 11** — Serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11
- **IO=2D0h; IRQ=10, 11** — Serial Port I/O port address is 2D0h and the interrupt address is IRQ10, 11
- **IO=2D8h; IRQ=10, 11** — Serial Port I/O port address is 2D8h and the interrupt address is IRQ10, 11

4.3.7.1.4 Serial Port 4 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**		Disable the serial port
➔ **Enabled**	**DEFAULT**	Enable the serial port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔ **IO=2E8h; IRQ=10**		Serial Port I/O port address is 2E8h and the interrupt address is IRQ10
➔ **IO=3E8h; IRQ=10, 11**		Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11
➔ **IO=2E8h; IRQ=10, 11**		Serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11
➔ **IO=2D0h; IRQ=10, 11**		Serial Port I/O port address is 2D0h and the interrupt address is IRQ10, 11
➔ **IO=2D8h; IRQ=10, 11**		Serial Port I/O port address is 2D8h and the interrupt address is IRQ10, 11

4.3.7.1.5 Serial Port 5 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**		Disable the serial port
➔ **Enabled**	**DEFAULT**	Enable the serial port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔ **IO=2C0h; IRQ=10**		Serial Port I/O port address is 2C0h and the interrupt address is IRQ10
➔ **IO=2C0h; IRQ=10, 11**		Serial Port I/O port address is 2C0h and the interrupt address is IRQ10, 11
➔ **IO=2C8h; IRQ=10, 11**		Serial Port I/O port address is 2C8h and the interrupt address is IRQ10, 11
➔ **IO=2D0h; IRQ=10, 11**		Serial Port I/O port address is 2D0h and the interrupt address is IRQ10, 11
➔ **IO=2D8h; IRQ=10, 11**		Serial Port I/O port address is 2D8h and the interrupt address is IRQ10, 11
➔ **IO=2E0h; IRQ=10, 11**		Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11

4.3.7.1.6 Serial Port 6 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**		Disable the serial port
➔ **Enabled**	**DEFAULT**	Enable the serial port

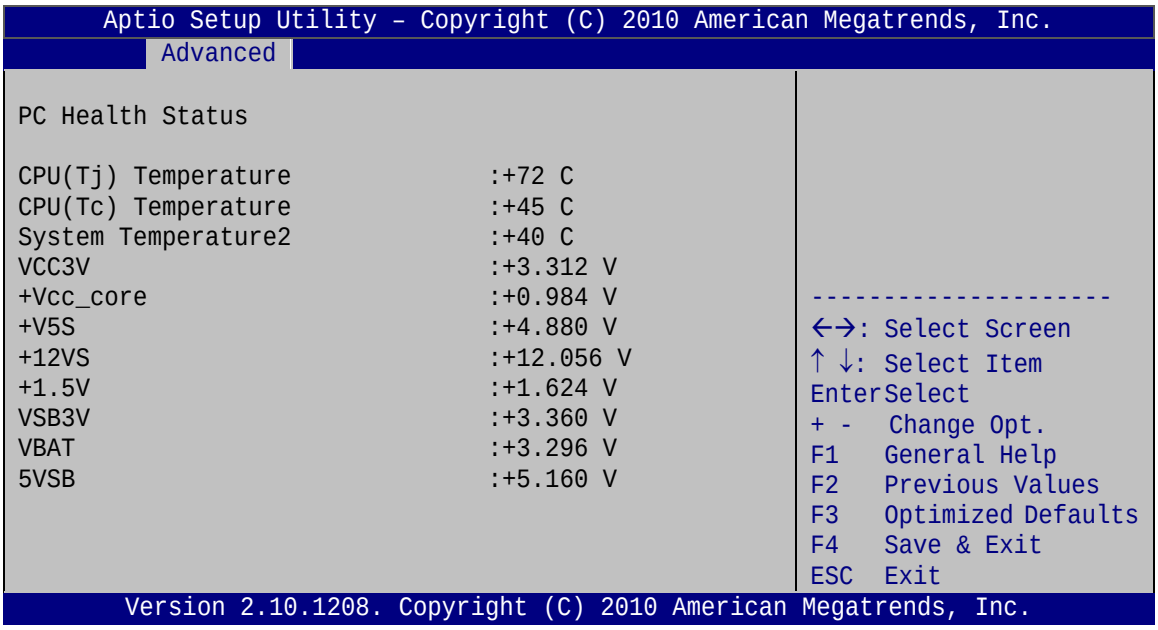
➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔	**Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔	**IO=2E0h; IRQ=10**		Serial Port I/O port address is 2E0h and the interrupt address is IRQ10
➔	**IO=2C0h; IRQ=10, 11**		Serial Port I/O port address is 2C0h and the interrupt address is IRQ10, 11
➔	**IO=2C8h; IRQ=10, 11**		Serial Port I/O port address is 2C8h and the interrupt address is IRQ10, 11
➔	**IO=2D0h; IRQ=10, 11**		Serial Port I/O port address is 2D0h and the interrupt address is IRQ10, 11
➔	**IO=2D8h; IRQ=10, 11**		Serial Port I/O port address is 2D8h and the interrupt address is IRQ10, 11
➔	**IO=2E0h; IRQ=10, 11**		Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11

4.3.8 H/W Monitor

The **H/W Monitor** menu (**BIOS Menu 12**) shows the operating temperature, fan speeds and system voltages.



BIOS Menu 12: H/W Monitor

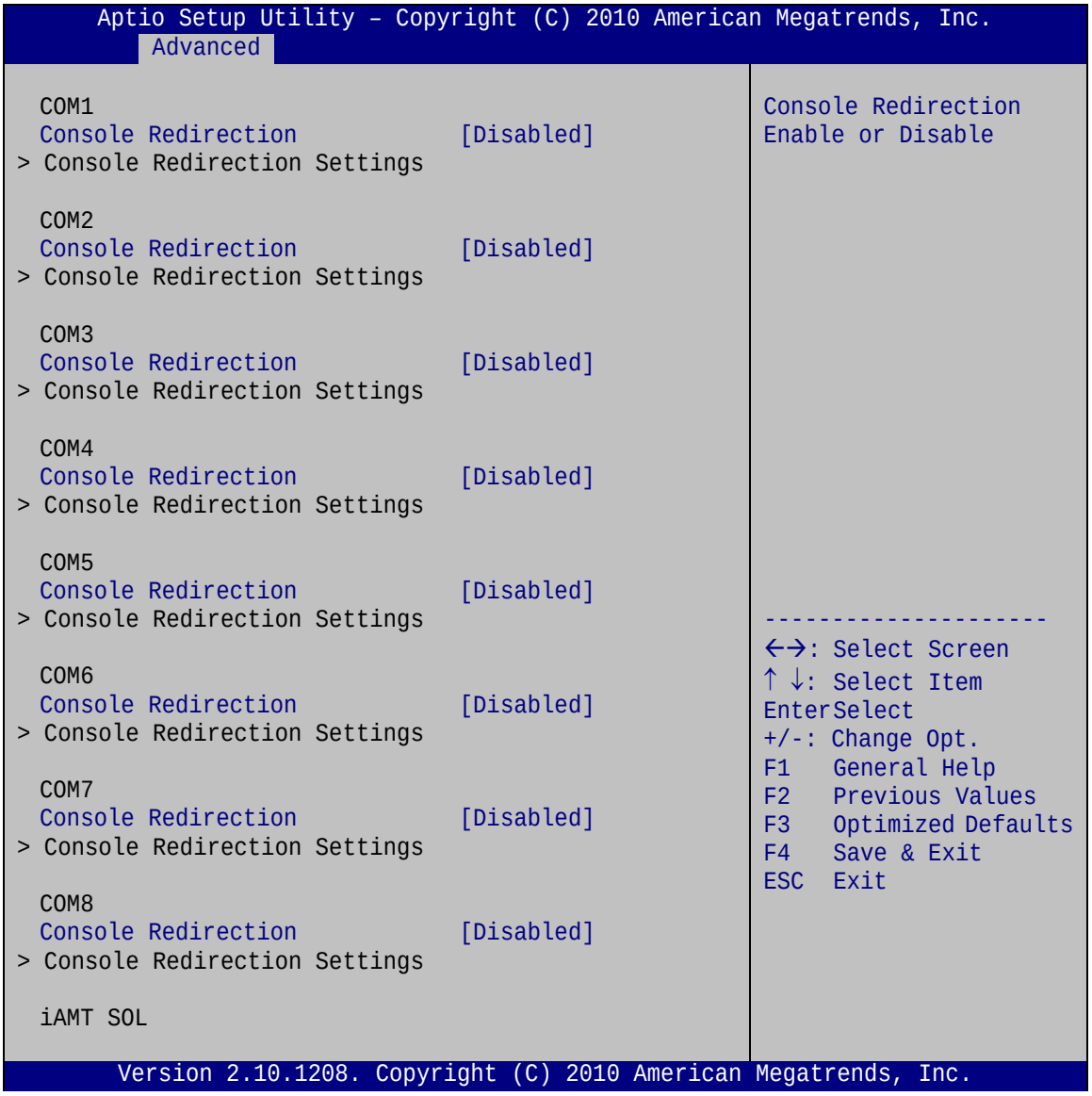
➔ PC Health Status

The following system parameters and values are shown. The system parameters that are monitored are:

- System Temperatures:
  - CPU Temperature
  - System Temperature
- Voltages:
  - VCC3V
  - Vcc_core
  - +V5S
  - +V12S
  - +1.5V
  - VSB3V
  - VBAT
  - 5VSB

4.3.9 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 13**) allows the console redirection options to be configured. Console redirection allows users to maintain a system remotely by re-directing keyboard input and text output through the serial port.



BIOS Menu 13: Serial Port Console Redirection

➔ Console Redirection [Disabled]

Use **Console Redirection** option to enable or disable the console redirection function.

- ➔ **Disabled** **DEFAULT** Disabled the console redirection function
- ➔ **Enabled** Enabled the console redirection function

➔ Terminal Type [VT100+]

Use the **Terminal Type** option to specify the remote terminal type.

- ➔ **VT100** The target terminal type is VT100
- ➔ **VT100+** **DEFAULT** The target terminal type is VT100+
- ➔ **VT-UTF8** The target terminal type is VT-UTF8
- ➔ **ANSI** The target terminal type is ANSI

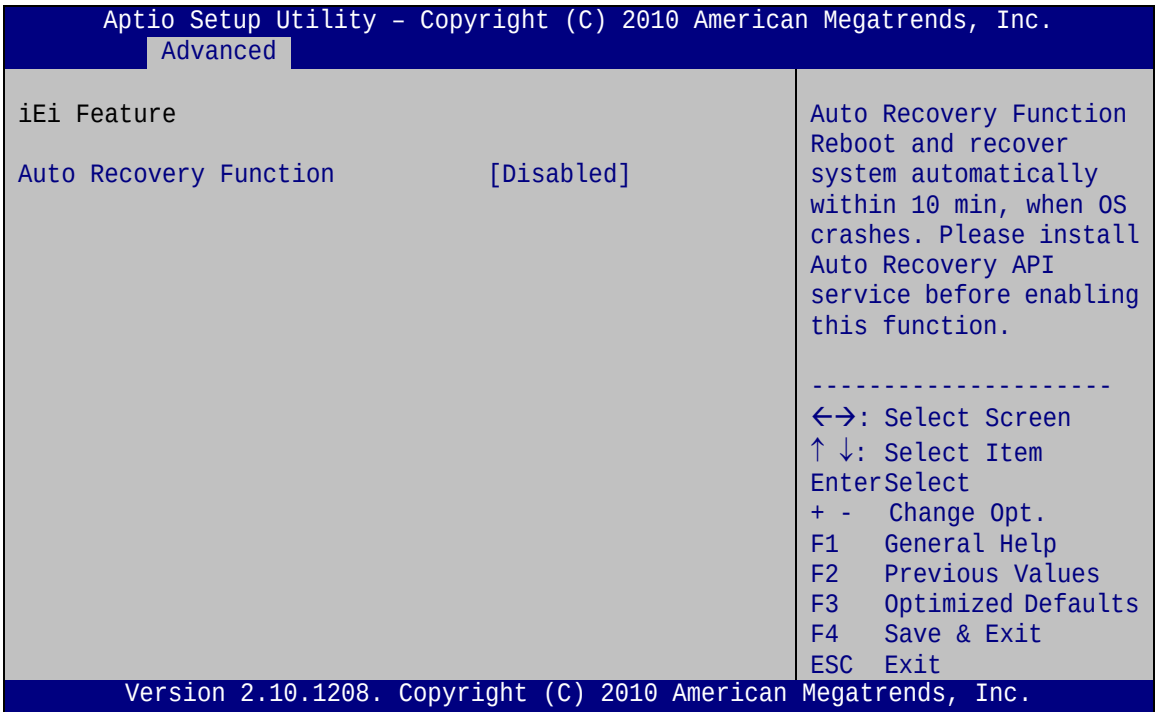
➔ Bits per second [115200]

Use the **Bits per second** option to specify the serial port transmission speed. The speed must match the other side. Long or noisy lines may require lower speeds.

- ➔ **9600** Sets the serial port transmission speed at 9600.
- ➔ **19200** Sets the serial port transmission speed at 19200.
- ➔ **38400** Sets the serial port transmission speed at 38400.
- ➔ **57600** Sets the serial port transmission speed at 57600.
- ➔ **115200** **DEFAULT** Sets the serial port transmission speed at 115200.

4.3.10 iEi Feature

Use the **iEi Feature** menu (**BIOS Menu 14**) to configure the iEi features.



BIOS Menu 14: iEi Feature

➔ Auto Recovery Function [Disabled]

Use **Auto Recovery Function** option to enable or disable the auto recovery function.

➔ **Disabled** **DEFAULT** Disabled the auto recovery function

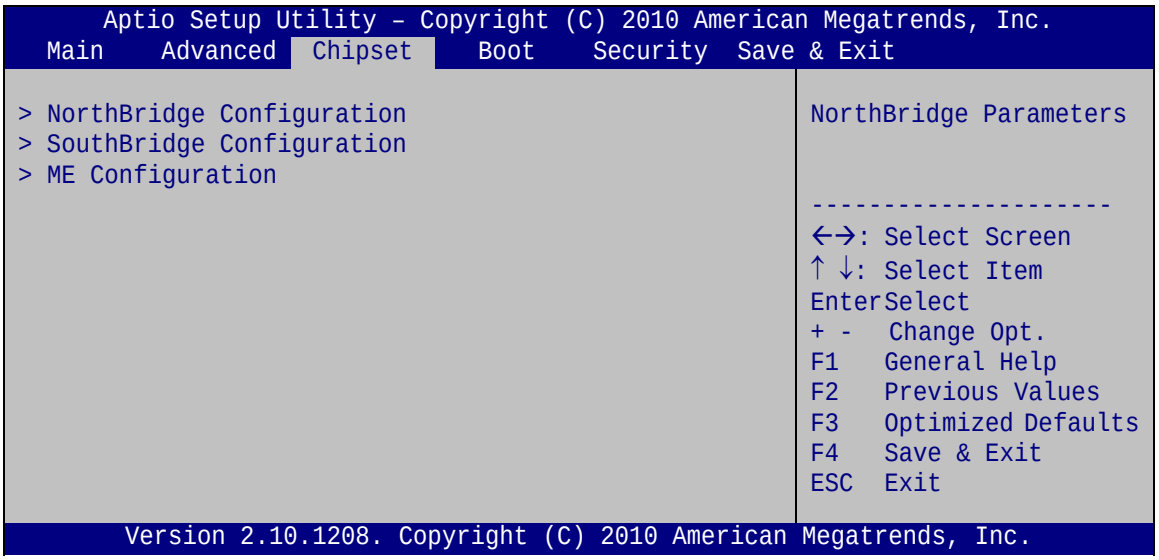
➔ **Enabled** Enabled the auto recovery function

4.4 Chipset

Use the **Chipset** menu (**BIOS Menu 15**) to access the Northbridge and Southbridge configuration menus.

WARNING!

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.



BIOS Menu 15: Chipset

4.4.1 NorthBridge Configuration

Use the **NorthBridge Configuration** menu (**BIOS Menu 16**) to configure the Northbridge chipset.

```
Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
                    Chipset

NorthBridge Configuration                  | Config Graphics
                                           | Settings.
Memory Information                         |
Memory Frequency          1333 Mhz         |
Total Memory              2048 MB (DDR3)   | ---------------------
Memory Slot               Not Present      | ←→: Select Screen
Onboard Memory            2048 MB (DDR3)   | ↑ ↓: Select Item
                                           | EnterSelect
> Graphics Configuration                   | + -   Change Opt.
                                           | F1    General Help
                                           | F2    Previous Values
                                           | F3    Optimized Defaults
                                           | F4    Save & Exit
                                           | ESC   Exit
Version 2.10.1208. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 16: Northbridge Chipset Configuration

4.4.1.1 Graphics Configuration

Use the **Graphics Configuration** menu (**BIOS Menu 17**) to configure the graphics options.

```
Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
                    Chipset

Graphics Configuration                     | Select DVMT 5.0
                                           | Pre-Allocated (Fixed)
DVMT Pre-Allocated        [64M]            | Graphics Memory size
DVMT Total Gfx Mem        [MAX]            | used by the Internal
                                           | Graphics Device.
Boot Display Device       [CRT]            | ---------------------
                                           | ←→: Select Screen
                                           | ↑ ↓: Select Item
                                           | EnterSelect
                                           | + -   Change Opt.
                                           | F1    General Help
                                           | F2    Previous Values
                                           | F3    Optimized Defaults
                                           | F4    Save & Exit
                                           | ESC   Exit
Version 2.10.1208. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 17: Graphics Configuration

➔ DVMT Pre-Allocated [64 M]

Use the **DVMT Pre-Allocated** option to specify the amount of system memory that can be used by the Internal Graphics Device.

➔	**0M**		0 MB of memory used by internal graphics device
➔	**32 M**		32 MB of memory used by internal graphics device
➔	**64 M**	**DEFAULT**	64 MB of memory used by internal graphics device
➔	**96 M**		96 MB of memory used by internal graphics device
➔	**128 M**		128 MB of memory used by internal graphics device
➔	**160 M**		160 MB of memory used by internal graphics device
➔	**192 M**		192 MB of memory used by internal graphics device
➔	**224 M**		224 MB of memory used by internal graphics device
➔	**256 M**		256 MB of memory used by internal graphics device
➔	**288 M**		288 MB of memory used by internal graphics device
➔	**320 M**		320 MB of memory used by internal graphics device
➔	**352 M**		352 MB of memory used by internal graphics device
➔	**384 M**		384 MB of memory used by internal graphics device
➔	**416 M**		416 MB of memory used by internal graphics device
➔	**448 M**		448 MB of memory used by internal graphics device

- ➔ **480 M** — 480 MB of memory used by internal graphics device
- ➔ **512 M** — 512 MB of memory used by internal graphics device

➔ DVMT Total Gfx Mem [MAX]

Use the **DVMT Total Gfx Mem** option to select the amount of DVMT5.0 total memory used by the Internal Graphics Device.

- ➔ **128M** — 128 MB of memory used by internal graphics device
- ➔ **256M** — 256MB of memory used by internal graphics device
- ➔ **MAX** **DEFAULT** — Maximum amount of memory used by internal graphics device

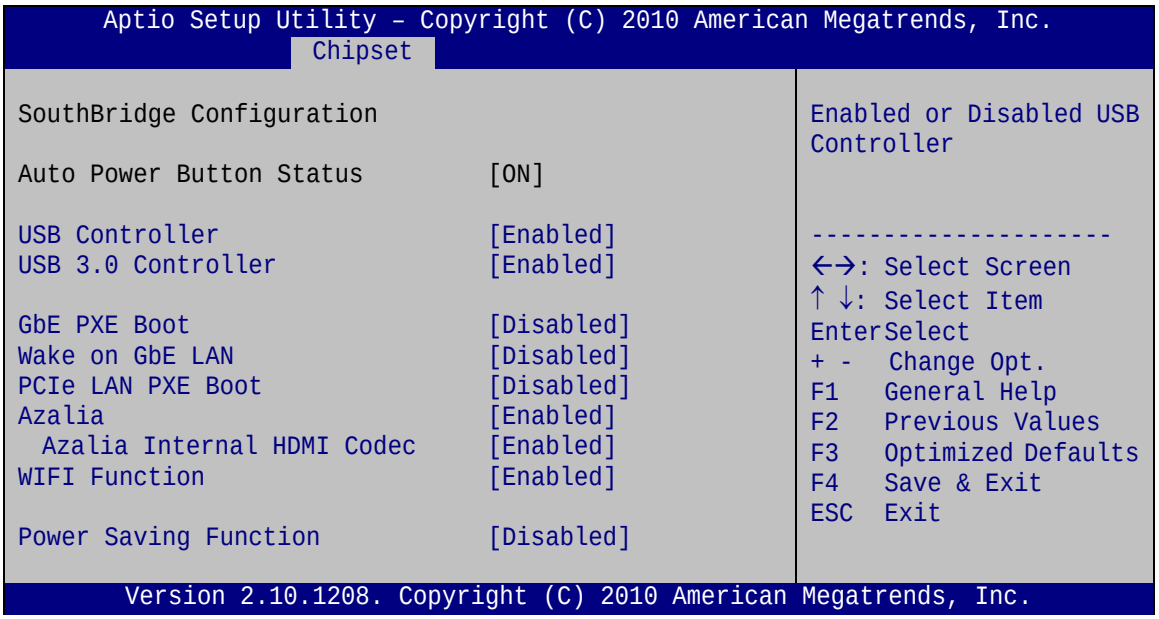
➔ Boot Display Device [CRT]

Use the **Boot Display Device** option to configure the boot display device function.

- ➔ **CRT** **DEFAULT** — Enables CRT as the boot display device.
- ➔ **HDMI** — Enables HDMI as the boot display device.

4.4.2 SouthBridge Configuration

Use the **SouthBridge Configuration** menu (**BIOS Menu 18**) to configure the Southbridge chipset.



BIOS Menu 18: Southbridge Chipset Configuration

➔ USB Controller [Enabled]

Use the **USB Controller** BIOS option to enable or disable USB controller.

➔ **Disabled** USB controller disabled

➔ **Enabled** **DEFAULT** USB controller enabled

➔ USB 3.0 Controller [Enabled]

Use the **USB 3.0 Controller** BIOS option to enable or disable USB 3.0 controller.

➔ **Enabled** **DEFAULT** USB 3.0 controller enabled

➔ **Disabled** USB 3.0 controller disabled

➔ GbE PXE Boot [Disabled]

Use the **GbE PXE Boot** option to enable or disable the boot option for GbE devices.

➔ **Disabled** **DEFAULT** Disables the GbE PXE Boot option

➔ **Enabled** Enables the GbE PXE Boot option

➔ Wake on GbE LAN [Disabled]

Use the **Wake on GbE LAN** option to enable or disable resuming from GbE LAN controller.

- ➔ **Disabled** **DEFAULT** Disables Resume on GbE LAN option
- ➔ **Enabled** Enables Resume on GbE LAN option

➔ PCIe LAN PXE Boot [Disabled]

Use the **PCIe LAN PXE Boot** option to enable or disable the boot option for the PCIe LAN PXE.

- ➔ **Disabled** **DEFAULT** Disables PCIe LAN PXE Boot option
- ➔ **Enabled** Enables PCIe LAN PXE Boot option

➔ Azalia [Enabled]

Use the **Azalia** option to enable or disable the High Definition Audio controller.

- ➔ **Enabled** **DEFAULT** The onboard High Definition Audio controller automatically detected and enabled
- ➔ **Disabled** The onboard High Definition Audio controller is disabled

➔ Azalia Internal HDMI Codec [Enabled]

Use the **Azalia Internal HDMI Codec** option to enable or disable the internal HDMI codec for High Definition Audio.

- ➔ **Disabled** Disables the internal HDMI codec for High Definition Audio
- ➔ **Enabled** **DEFAULT** Enables the internal HDMI codec for High Definition Audio

➔ WIFI Function [Enabled]

Use the **WIFI Function** BIOS option to enable or disable the WiFi function.

- ➔ **Disabled** The WiFi function is disabled
- ➔ **Enabled** **DEFAULT** The WiFi function is enabled

➔ Power Saving Function [Disabled]

Use the **Power Saving Function** BIOS option to enable or disable the power saving function.

- ➔ **Disabled** **DEFAULT** The power saving function is disabled
- ➔ **Enabled** The power saving function is enabled

4.4.3 ME Configuration

Use the **ME Configuration** menu (**BIOS Menu 19**) to configure the Intel® Management Engine (ME) configuration options.

```
Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
                        Chipset

ME Configuration                                   Enable/Disable Intel(R)
                                                   Active Management
ME FW Version              7.0.10.1203             Technology BIOS
ME Firmware Mode           Normal Mode             Extension.
ME Firmware Type           Full Sku Firmware       Note : iAMT H/W is always
ME Firmware SKU            5MB                     enabled. This option
                                                   just controls the BIOS
Intel AMT                  [Enabled]               extension execution. If
Un-Configure ME            [Disabled]              enabled, this requires
                                                   aditonal firmware in the
                                                   SPI device.
                                                   ---------------------
                                                   ←→: Select Screen
                                                   ↑ ↓: Select Item
                                                   EnterSelect
                                                   + -   Change Opt.
                                                   F1    General Help
                                                   F2    Previous Values
                                                   F3    Optimized Defaults
                                                   F4    Save & Exit
                                                   ESC   Exit
Version 2.10.1208. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 19: ME Configuration

➔ Intel AMT [Enabled]

Use **Intel AMT** option to enable or disable the Intel® AMT function.

- ➔ **Disabled** Intel® AMT is disabled
- ➔ **Enabled** **DEFAULT** Intel® AMT is enabled

➔ Un-Configure ME [Disabled]

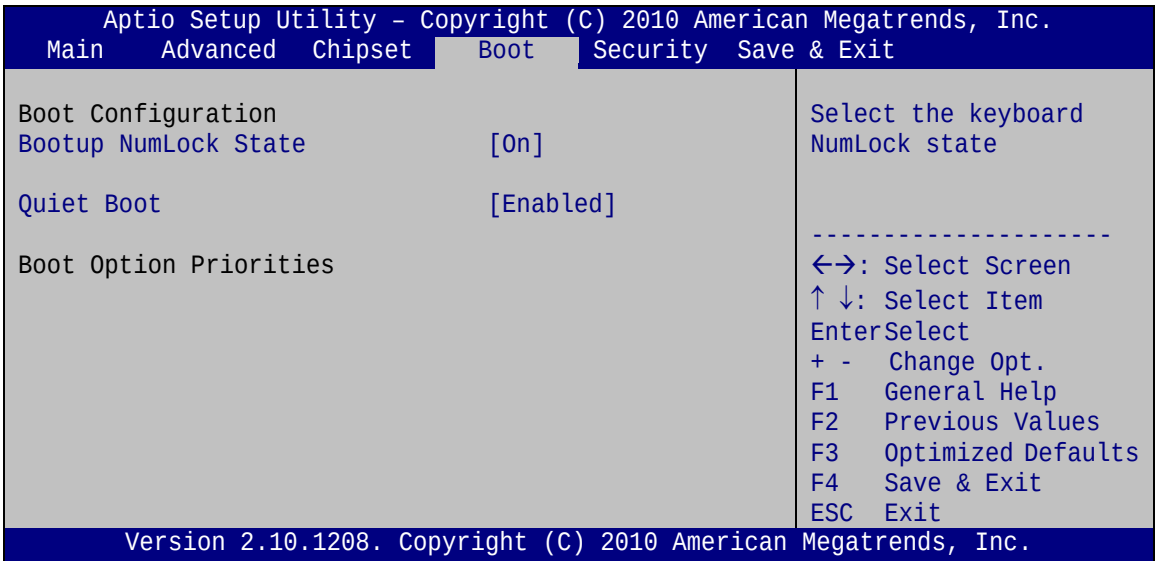
Use the **Un-Configure ME** option to perform ME un-configure without password operation.

➔ **Disabled** **DEFAULT** Disable ME un-configure

➔ **Enabled** Enable ME un-configure

4.5 Boot

Use the **Boot** menu (**BIOS Menu 20**) to configure system boot options.



BIOS Menu 20: Boot

➔ Bootup NumLock State [On]

Use the **Bootup NumLock State** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **On** **DEFAULT** Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ **Off** Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

➔ Quiet Boot [Enabled]

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

➔ **Disabled** Normal POST messages displayed

➔ **Enabled** **DEFAULT** OEM Logo displayed instead of POST messages

4.6 Security

Use the **Security** menu (**BIOS Menu 21**) to set system and user passwords.

```
      Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
  Main    Advanced   Chipset    Boot    Security  Save & Exit

Password Description                          Set Setup Administrator
                                              Password
If ONLY the Administrator's password is set,
then this only limits access to Setup and is  ---------------------
only asked for when entering Setup.           ←→: Select Screen
If ONLY the User's password is set, then this ↑ ↓: Select Item
is a power on password and must be entered to EnterSelect
boot or enter Setup. In Setup the User will   + -   Change Opt.
have Administrator rights.                    F1    General Help
The password must be 3 to 20 characters long. F2    Previous Values
                                              F3    Optimized Defaults
Administrator Password                        F4    Save & Exit
User Password                                 ESC   Exit
       Version 2.10.1208. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 21: Security

➔ Administrator Password

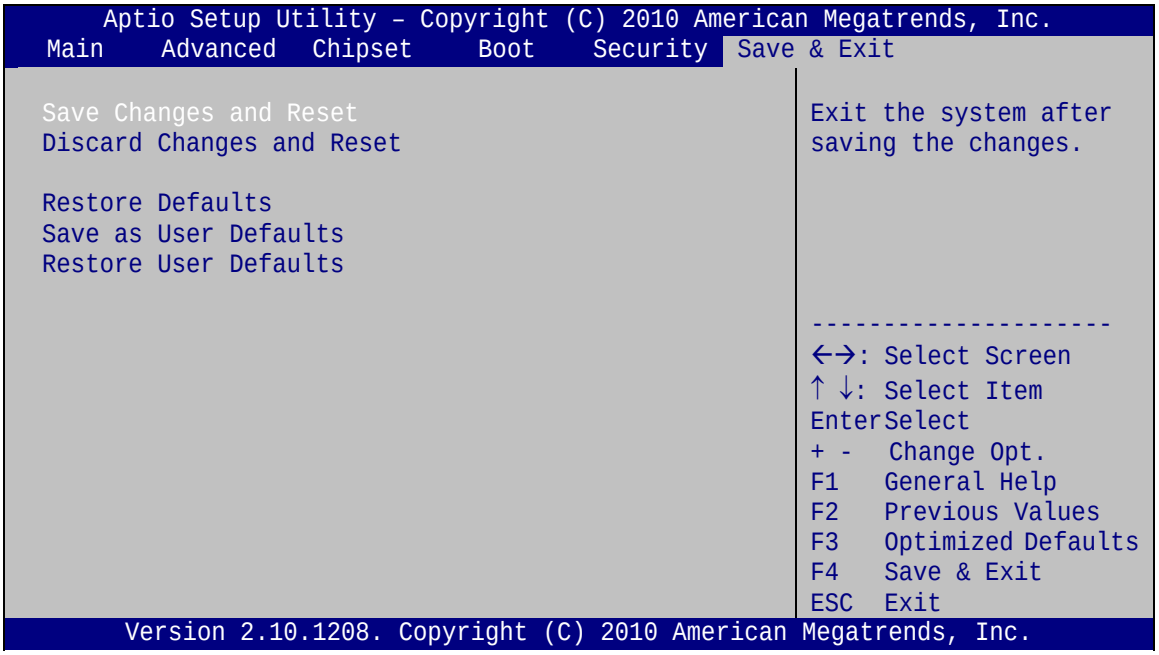
Use the **Administrator Password** to set or change a administrator password.

➔ User Password

Use the **User Password** to set or change a user password.

4.7 Exit

Use the **Exit** menu (**BIOS Menu 22**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 22:Exit

➔ Save Changes and Reset

Use the **Save Changes and Reset** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

➔ Discard Changes and Reset

Use the **Discard Changes and Reset** option to exit the system without saving the changes made to the BIOS configuration setup program.

➔ Restore Defaults

Use the **Restore Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F3 key can be used for this operation.**

➔ Save as User Defaults

Use the **Save as User Defaults** option to save the changes done so far as user defaults.

➔ Restore User Defaults

Use the **Restore User Defaults** option to restore the user defaults to all the setup options.

Appendix

A

Safety Precautions

A.1 Safety Precautions

WARNING:

The precautions outlined in this appendix should be strictly followed. Failure to follow these precautions may result in permanent damage to the TANK-700-QM67W-MRAY.

Please follow the safety precautions outlined in the sections that follow:

A.1.1 General Safety Precautions

Please ensure the following safety precautions are adhered to at all times.

- ***Make sure the power is turned off and the power cord is disconnected*** when moving, installing or modifying the system.
- ***Do not apply voltage levels that exceed the specified voltage range***. Doing so may cause fire and/or an electrical shock.
- ***Electric shocks can occur*** if opened while still powered on.
- ***Do not drop or insert any objects*** into the ventilation openings.
- ***If considerable amounts of dust, water, or fluids enter the system***, turn off the power supply immediately, unplug the power cord, and contact the system vendor.
- **DO NOT**:
  - Drop the system against a hard surface.
  - Strike or exert excessive force onto the system.
  - Touch any of the system with a sharp object
  - In a site where the ambient temperature exceeds the rated temperature

A.1.2 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the TANK-700-QM67W-MRAY may result in permanent damage to the TANK-700-QM67W-MRAY and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the TANK-700-QM67W-MRAY. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the TANK-700-QM67W-MRAY is opened and any of the electrical components are handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging any electrical component.
- ***Self-grounding***: Before handling any electrical component, touch any grounded conducting material. During the time the electrical component is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring or working with an electrical component, place it on an antic-static pad. This reduces the possibility of ESD damage.
- ***Only handle the edges of the electrical component***: When handling the electrical component, hold the electrical component by its edges.

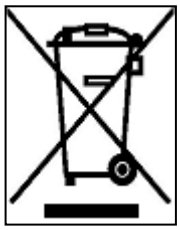
A.1.3 Product Disposal

CAUTION:

Risk of explosion if battery is replaced by an incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.

- Outside the European Union - If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.
- Within the European Union:



EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your display products, please follow the guidance of your local authority, or ask the shop where you purchased the product. The mark on electrical and electronic products only applies to the current European Union Member States.

Please follow the national guidelines for electrical and electronic product disposal.

A.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the TANK-700-QM67W-MRAY, please follow the guidelines below.

A.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the TANK-700-QM67W-MRAY, please read the details below.

- The interior of the TANK-700-QM67W-MRAY does not require cleaning. Keep fluids away from the TANK-700-QM67W-MRAY interior.
- Be cautious of all small removable components when vacuuming the TANK-700-QM67W-MRAY.
- Turn the TANK-700-QM67W-MRAY off before cleaning the TANK-700-QM67W-MRAY.
- Never drop any objects or liquids through the openings of the TANK-700-QM67W-MRAY.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the TANK-700-QM67W-MRAY.
- Avoid eating, drinking and smoking within vicinity of the TANK-700-QM67W-MRAY.

A.2.2 Cleaning Tools

Some components in the TANK-700-QM67W-MRAY may only be cleaned using a product specifically designed for the purpose. In such case, the product will be explicitly mentioned in the cleaning tips. Below is a list of items to use when cleaning the TANK-700-QM67W-MRAY.

- ***Cloth*** – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the TANK-700-QM67W-MRAY.
- ***Water or rubbing alcohol*** – A cloth moistened with water or rubbing alcohol can be used to clean the TANK-700-QM67W-MRAY.
- ***Using solvents*** – The use of solvents is not recommended when cleaning the TANK-700-QM67W-MRAY as they may damage the plastic parts.
- ***Vacuum cleaner*** – Using a vacuum specifically designed for computers is one of the best methods of cleaning the TANK-700-QM67W-MRAY. Dust and dirt can restrict the airflow in the TANK-700-QM67W-MRAY and cause its circuitry to corrode.
- ***Cotton swabs*** - Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas.
- ***Foam swabs*** - Whenever possible, it is best to use lint free swabs such as foam swabs for cleaning.

Appendix

B

Hazardous Materials Disclosure

B.1 Hazardous Materials Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	O	O	O	O	O	O
Display	O	O	O	O	O	O
Printed Circuit Board	O	O	O	O	O	O
Metal Fasteners	O	O	O	O	O	O
Cable Assembly	O	O	O	O	O	O
Fan Assembly	O	O	O	O	O	O
Power Supply Assemblies	O	O	O	O	O	O
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	O	O	O	O	O	O
显示	O	O	O	O	O	O
印刷电路板	O	O	O	O	O	O
金属螺帽	O	O	O	O	O	O
电缆组装	O	O	O	O	O	O
风扇组装	O	O	O	O	O	O
电力供应组装	O	O	O	O	O	O
电池	O	O	O	O	O	O
O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。 X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。						