MTC-1000 USER Manual

10.1" Fanless Open Frame Multi-Touch Computer
Intel Atom® x7-E3950 Processor (Apollo Lake)

Vecow

Record of Revision

Version	Date	Page	Description	Remark
1.00	2020/02/25	All	Official Release	

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FCC

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if it is not installed and used in accordance with the instruction manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CE

The products described in this manual comply with all applicable European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

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Order Information

Part Number	Description
MTC-1010W-3950A	MTC-1010W, Intel Atom® x7-E3950, 2 GigE LAN, DC 9V to 36V
MTC-1010W-3950B	MTC-1010W, Intel Atom® x7-E3950, 2 GigE LAN, DC 9V to 36V, With VESA-Back Cover Kit

Optional Accessories

Part Number	Description
DDR3L 4G	Certified DDR3L 4GB 1600/1866 MHz RAM
DDR3L 8G	Certified DDR3L 8GB 1600/1866 MHz RAM
PWA-120W1	120W, 24V, 90VAC to 264VAC Power Adapter with 3-pin Terminal Block
4G Module	Mini PCIe 4G/GPS Module with Antenna
WiFi & Bluetooth Module	WiFi+Bluetooth Module with Antenna

Note : Vecow suggest to install wide operation temperature memory and storage devices when system work under rush environment.

Table of Contents

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GENERAL INTRODUCTION

1.1 Overview

Vecow's MTC-1010W is a 10.1" fanless, open frame, multi-touch panel computer. MTC-1010W adopts Intel Atom$^{®}$ quad-core x7-E3950 processor (Apollo Lake), single DDR3L SO-DIMM supports up to 8GB memory; Advanced Intel$^{®}$ HD graphics 505 supports DirectX 12, OpenGL 4.3 and OpenCL 2.1 API, up to 4K resolution. It equipped with 10-point projected capacitive multi-touch screen features with 7H anti- scratch surface, built-in dual GigE LAN supporting IEEE 1588 Precision Time Protocol (PTP), one DB9 type RS-232/422/485, DVI-I and HDMI, 1 SIM for WiFi/4G/3G/LTE/GPRS/UMTS, 4 USB, 2 Mini PCIe, 1 SATA III, 9V to 36V wide range DC power input. MTC-1010W is and ideal product for AIO control panel on automation equipment, HMI for production line, self-service panel for digital signage, showroom interactive signage, and public service terminals, like meeting room control panel.

1.2 Features

- Open Frame Design

- 10.1" 1280 x 800 (16 : 10) WSVGA TFT LED LCD

- 10-point Projected Capacitive Multi-touch Screen

- Intel Atom® x7-E3950 Processor

- 2 GigE LAN Supporting IEEE 1588 Precision Time Protocol (PTP)

- Supports Landscape and Portrait screen

- DC 9V to 36V Wide Range Power Input

- 2 Mini PCIe for WiFi/4G/3G/LTE/GPRS/UMTS

- Optional Infineon SLB9665 Supports TPM 2.0, LPC Interface

- Fanless Design

1.3 Specifications of MTC-1010W

Panel	
Panel Type	WSVGA TFT LED LCD
Size	10.1"
Max Resolution	1280 x 800
Display Color	16.7M
Brightness (cd/m2)	350
Viewing Angle	170°/170° (H/V)
Contrast Ratio	800 : 1
Touch Screen	
Touch Screen Type	10-point Projected Capacitive
Transparency	≥ 91%
Surface Hardness	7H Surface Hardness
Control Interface	USB Interface
System	
Processor	Intel Atom® x7-E3950 Processor
Chipset	Intel® Apollo Lake PCH-LP
Memory	1 DDR3L 1866MHz SO-DIMM, up to 8GB
Graphics	Intel® HD Graphics 505
Audio	Realtek ALC892, 5.1 Channel HD Audio
I/O Interface	
LAN	LAN 1/2 : Intel® I210 GigE LAN supports IEEE 1588, RJ45 Type
Serial	1 COM RS-232/422/485 (DB9 Type)
USB	• 2 USB 3.0 Type A • 2 USB 2.0 Type A
Display	• VGA : Up to 1920 x 1440 @60Hz • HDMI : Up to 3840 x 2160 @60Hz
Storage	
SATA	1 2.5" SATA III (6Gbps)
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
Expansion	
Mini PCIe	2 Full Size Mini PCIe Socket : • 1 Full-size for PCIe/USB/Internal SIM Card • 1 Full-size for PCIe/USB/mSATA

Power	
Power Input	9V to 36V, DC-in
Power Interface	3-pin Terminal Block : V+, V-, Frame Ground
Power Adapter	AC to DC 120W Power Adapter (Optional Accessory)
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Optional Infineon SLB9665 supports TPM 2.0, LPC Interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
Microsoft	Window 10
Linux	Fedora 19, Ubuntu 10.04 LTS, or Linux Kernel 3.0 above
Mechanical	
Dimension	256.5mm x 178.3mm x 47.1mm (10.10" x 7.02" x 1.85")
Weight	1.5kg (3.31 lb)
Mounting	• Panel Mount • VESA mount (75 x 75) by optional accessory kit
Environment	
Operating Temperature	-20°C to 60°C (-4°F to 140°F)
Storage Temperature	-20°C to 60°C (-4°F to 140°F)
Humidity	5% to 95% Humidity, non-condensing
Relative Humidity	95% at 60°C
Shock	• IEC 60068-2-27 • 20G, Half-sine, 11ms
Vibration	• IEC 60068-2-64 • Non-operation : 10Hz to 200Hz, 1Grms, X, Y, Z, 30 mins each Axis
EMC	CE, FCC

1.4 MTC-1010W Mechanical Drawing

Unit : mm (inch)

274.0 (10.79)
233.8 (9.20)

252.0 (9.92)
230.0 (9.06)
102.5 (4.04) 102.5 (4.04)

47.1 (1.85)

12.1 (0.48)

30.0 (1.18)

Active View

30.0 (1.18)

148.2 (5.83)

225.1 (8.86)

59.3 (233) 59.3 (233)
143.7 (5.66)
165.8 (6.53)

129.1 (5.08)
187.9 (7.40)

47.1 (1.85)

75.0 (2.95)

75.0 (2.95)

4-M4 For VESA
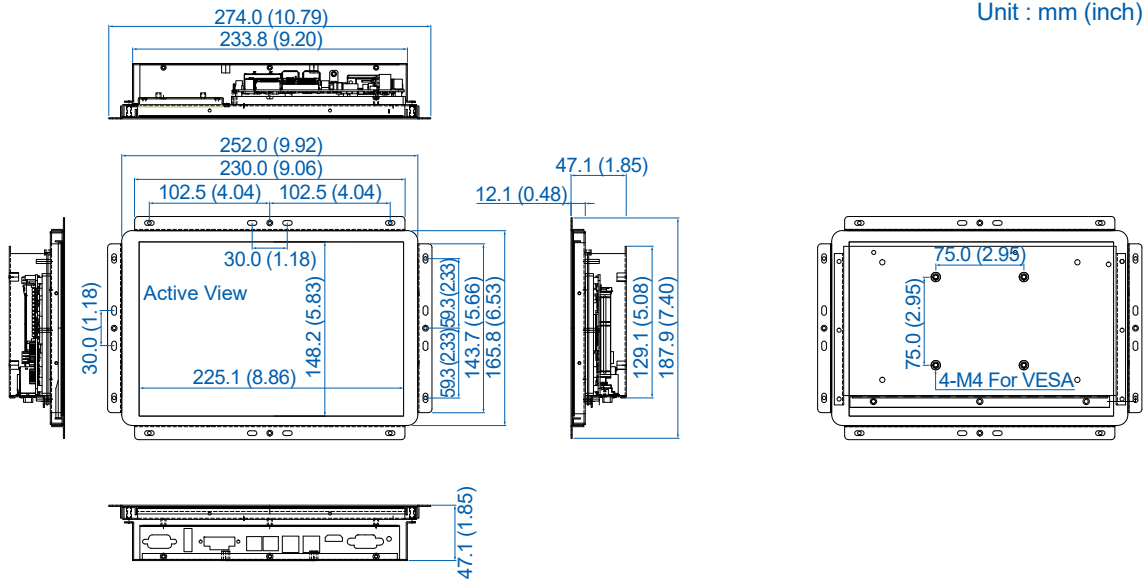
2

GETTING TO KNOW YOUR MTC-1000

2.1 Packing List

Item	Description	Qty
1	MTC-1010 Panel PC	1
2	Driver/User Manual DVD	1
3	• Waterproof rubber when panel mount use • M2.5x6L screw for Mini PCIe Socket (P/N : 53-2426906-30B) • Screws for HDD bracket • 3 Pin terminal block	1 2 4 1

2.2 I/O & Functions

2.2.1 Power Input
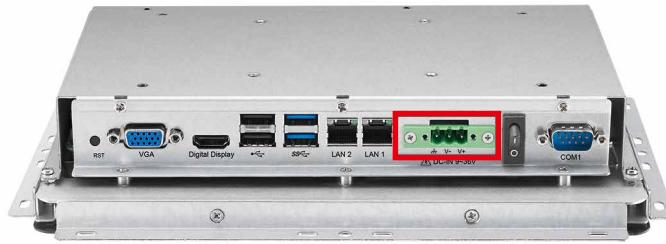
MTC-1010W supports 9V to 36V DC power input.

Pin No.	Definition
Left	Earth GND
Middle	V-
Right	V+

2.2.2 LAN Connector
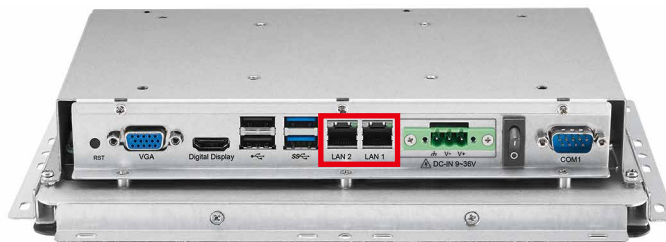
There are two RJ-45 LAN ports supporting 10/100/1000 Mbps Ethernet connections in the front side. LAN 1 (Left side) and LAN 2 (Right side) are powered by Intel® I210 Ethernet engine with IEEE 1588, The Precision Time Protocol (PTP) function. When both LAN 1 and LAN 2 work in normal status, basic iAMT function is enabled.

The LED indicator on the right bottom corner lightens in solid green when the cable is properly connected to a 100Mbps Ethernet network; The LED indicator on the right bottom corner lightens in solid orange when the cable is properly connected to a 1000Mbps Ethernet network; The left LED will keep twinkling/off when Ethernet data packets are being transmitted/received.

LED Location	LED Color	10Mbps	100Mbps	1000Mbps
Right	Green/ Orange	Off	Solid Green	Solid Orange
Left	Green	Twinkling Green	Twinkling Green	Twinkling Green
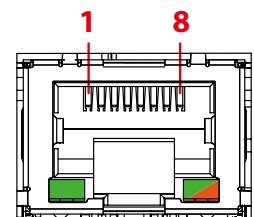
2.2.3 USB Connector
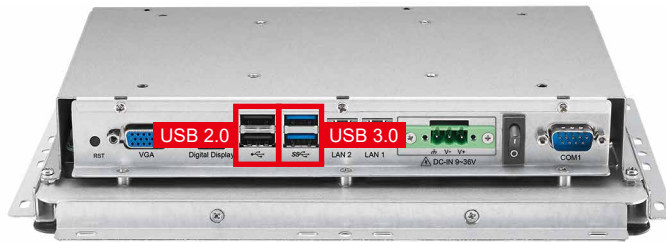
There are 2 standard USB 2.0 connections available supporting up to 480MB per second data rate and 2 standard USB 3.0 connections available supporting up to 5GB per second data rate. It also compliant with the requirements of Super Speed (SS), high speed (HS), full speed (FS) and low speed (LS).

2.2.4 VGA Connector

The VGA Port supports auxiliary channel mode. The connection supports up to 1920 x 1440 resolution at 60Hz.

2.2.5 HDMI (Digital Display)

Onboard HDMI Port supports DDC channel mode. The connection supports up to 3840 x 2160 resolution at 30Hz.

2.2.6 Series Port

Serial port can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. The default definition is RS-232, but if you want to change to RS-422 or RS-485, you can find the settings in BIOS.

BIOS Setting	Function
COM 1 COM 2	RS-232
	RS-422 (5-wire)
	RS-422 (9-wire)
	RS-485
	RS-485 w/z auto-flow control
	MDI1_N
	MDI3_P
	MDI1_N

The pin assignments are listed in the following table :

Serial Port	Pin No.	RS-232	RS-422 (5-wire)	RS-422 (9-wire)	RS-485 (3-wire)
1, 2	1	DCD	TXD-	TXD-	DATA-
	2	RXD	TXD+	TXD+	DATA+
	3	TXD	RXD+	RXD+	-----------
	4	DTR	RXD-	RXD-	-----------
	5	GND	GND	GND	GND
	6	DSR	-----------	RTS-	-----------
	7	RTS	-----------	RTS+	-----------
	8	CTS	-----------	CTS+	-----------
	9	RT	-----------	CTS-	-----------
	10	DCD	TXD-	TXD-	DATA-

2.3 Connector/Jumper Locations
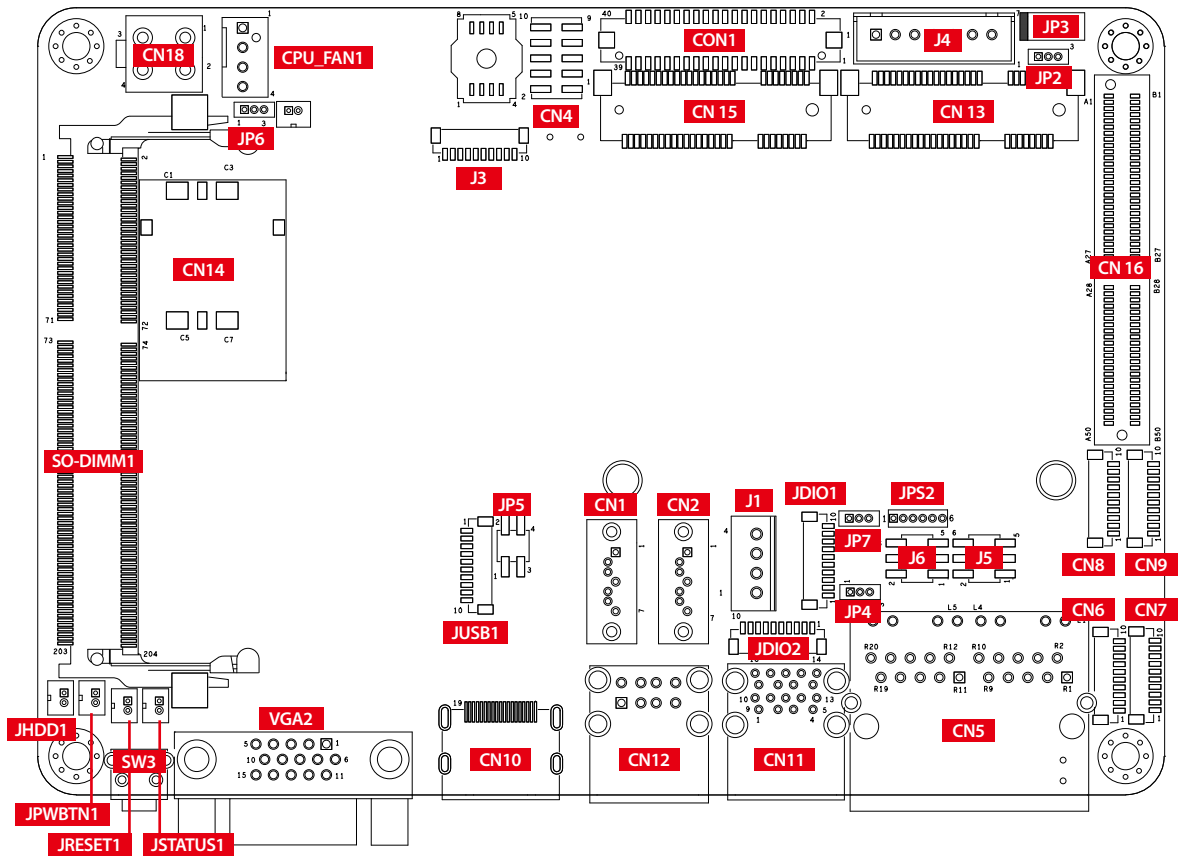
2.3.1 JPW BTN, JRESET, JSTATUS, JHDD : Miscellaneous Pin Header
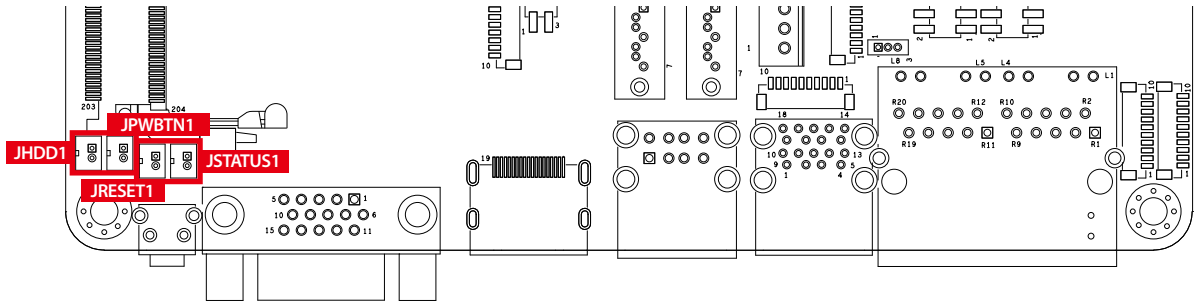
These pin headers can be used as a backup for following functions, hard drive LED indicator, reset button, power LED indicator, and power-on/off button, which already be accessed by the front and top panels. The pinouts of Miscellaneous port are listed in following table :

	Group	Pin No.	Description
	JPWBTN	1	GND
		2	FP_PWR_BTN_IN
	JRESET	1	GND
		2	FP_RST_BTN_N
	JSTATUS	1	PWR_LED_N
		2	PWR_LED_P
	JHDD	1	HDD_LED_N
		2	HDD_LED_P

2.3.2 JP5, CN15 : Mini PCIe, mSATA
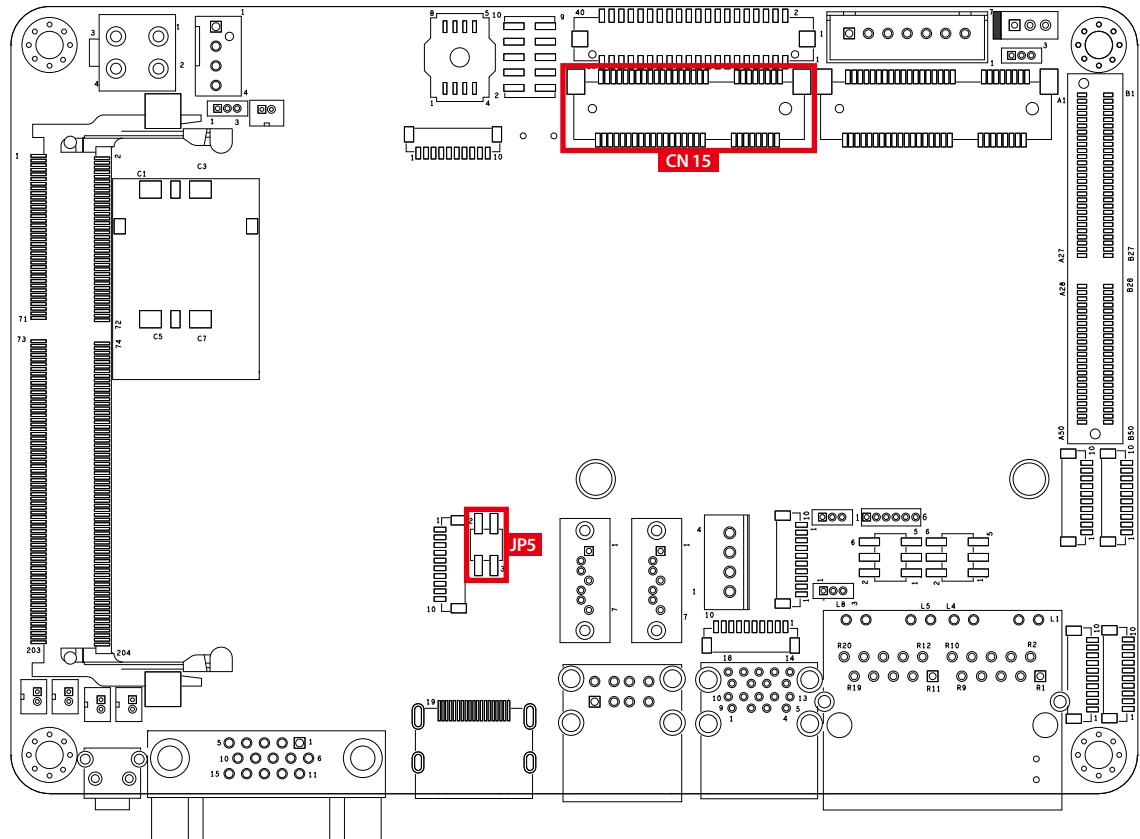
Both mSATA and Mini PCIe share the same form factor and similar electrical pinout assignments on their connectors. You can adjust JP5 to choose mSATA or Mini PCIe function. The pin assignments of CN15 and JP5 are listed in the following table :

JP5

Pin No.	Function
1-3/2-4	mSATA
NC	Mini PCIe (Default)

CN15

Pin No.	Signal Name	Pin No.	Signal Name
51	Reserved	52	+3.3Vaux
49	Reserved	50	GND
47	Reserved	48	+1.5V
45	Reserved	46	Reserved
43	Status	44	Reserved
41	+3.3Vaux	42	Reserved
39	+3.3Vaux	40	GND
37	GND	38	USB_D+
35	GND	36	USB_D-
33	PETp0	34	GND
31	PETn0	32	SMB_DATA
29	GND	30	SMB_CLK
27	GND	28	+1.5V
25	PERp0	26	GND
23	PERn0	24	+3.3Vaux
21	GND	22	PERST#
19	Reserved	20	Reserved
17	Reserved	18	GND
Mechanical Key			
15	GND	16	UIM_VPP
13	REFCLK+	14	UIM_RESET
11	REFCLK-	12	UIM_CLK
9	GND	10	UIM_DATA
7	CLKREQ#	8	UIM_PWR
5	Reserved	6	1.5V
3	Reserved	4	GND
1	WAKE#	2	3.3Vaux

2.3.3 CN13, SIM : Mini PCIe
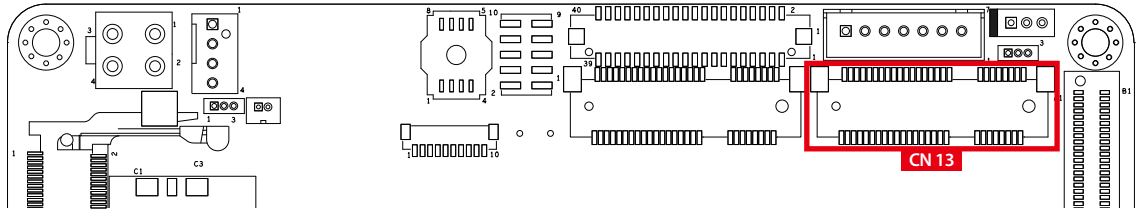
Note : The SIM card socket does not support hot-plug. Please make sure to unplug the system power before inserting the SIM card(s).

The pin assignments of CN13 are listed in the following table :

Pin No.	Signal Name	Pin No.	Signal Name
51	Reserved	52	+3.3Vaux
49	Reserved	50	GND
47	Reserved	48	+1.5V
45	Reserved	46	Reserved
43	Status	44	Reserved
41	+3.3Vaux	42	Reserved
39	+3.3Vaux	40	GND
37	GND	38	USB_D+
35	GND	36	USB_D-
33	PETp0	34	GND
31	PETn0	32	SMB_DATA
29	GND	30	SMB_CLK
27	GND	28	+1.5V
25	PERp0	26	GND
23	PERn0	24	+3.3Vaux
21	GND	22	PERST#
19	Reserved	20	Reserved
17	Reserved	18	GND
Mechanical Key			
15	GND	16	UIM_VPP
13	REFCLK+	14	UIM_RESET
11	REFCLK-	12	UIM_CLK
9	GND	10	UIM_DATA
7	CLKREQ#	8	UIM_PWR
5	Reserved	6	1.5V
3	Reserved	4	GND
1	WAKE#	2	3.3Vaux

## 2.3.4 CN6 To CN9 : COM 1 To COM 4 Serial Port
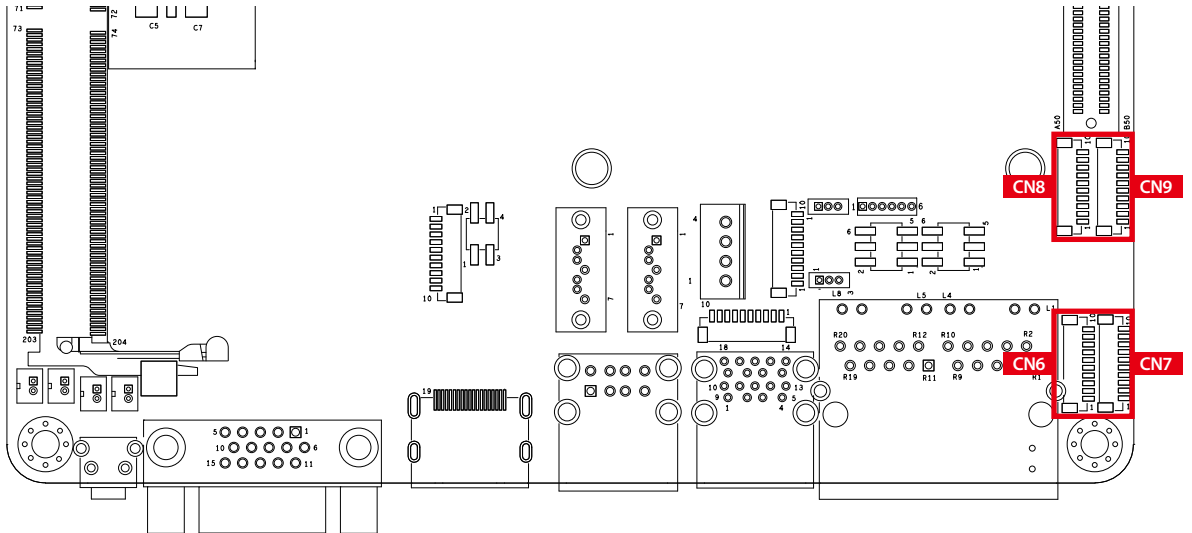
Serial port 1 to 4 can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. The default definition of COM 1 to 4 is RS-232, if you want to change to RS-422 or RS-485, you can find the setting in BIOS.

| BIOS Setting	Function
COM 1 (CN6) COM 2 (CN7) COM 3 (CN8) COM 4 (CN9)	RS-232
	RS-422 (5-wire)
	RS-422 (9-wire)
	RS-485
	RS-485 w/z auto-flow control

The pin assignments of CN13 are listed in the following table :

Serial Port	Pin No.	RS-232	RS-422 (5-wire)	RS-422 (9-wire)	RS-485 (3-wire)
1, 2, 3, 4	1	DCD	TXD-	TXD-	DATA-
	2	RXD	TXD+	TXD+	DATA+
	3	TXD	RXD+	RXD+	-----------
	4	DTR	RXD-	RXD-	-----------
	5	GND	GND	GND	GND
	6	DSR	-----------	RTS-	-----------
	7	RTS	-----------	RTS+	-----------
	8	CTS	-----------	CTS+	-----------
	9	RI	-----------	CTS-	-----------
	10	DCD	TXD-	TXD-	DATA-

2.4 Main Board Jumper Settings

2.4.1 Front View of MTC-1010W Main Board With Jumper Location

The figure below is the top view of the MTC-1010W main board. It shows the location of the jumpers.
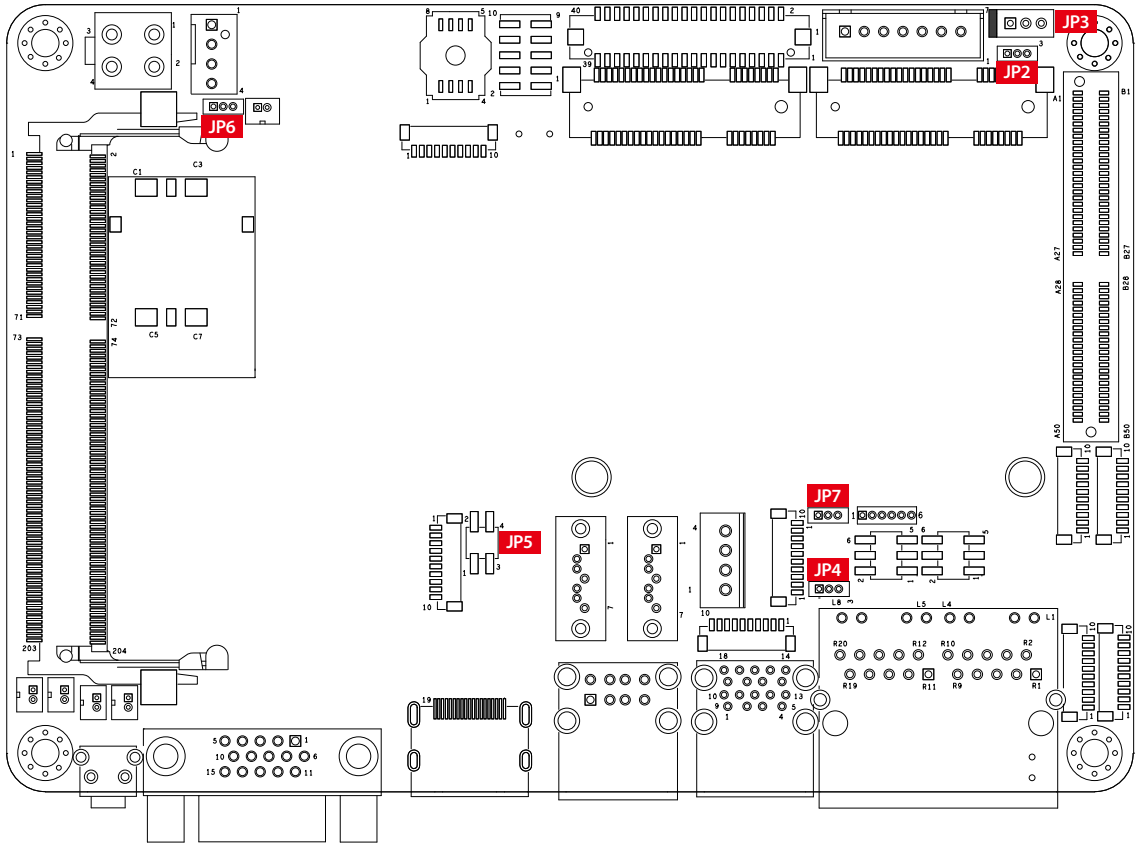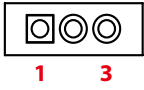
You may configure your card to match the needs of your application by setting jumpers. A jumper is a metal bridge used to close an electric circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" a jumper, you connect the pins with the clip. To "open" a jumper, you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case you would connect either pins 1 and 2, or 2 and 3.

Open

Closed

Closed 2-3
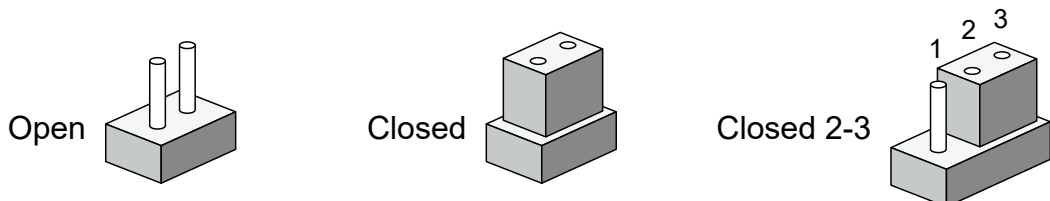
2.4.2 JP2 : Backlight Control Level Select
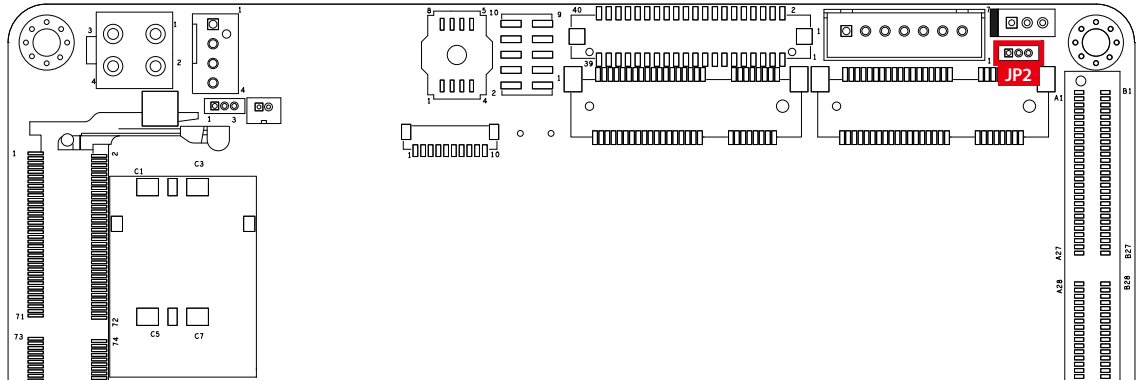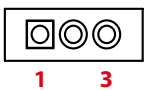
JP2 provides LVDS backlight control selection function, closing Pin 1, 2 is for 3.3V and closing Pin 2, 3 is for 5V.

	Pin No.	Function
1 3	1-2	+3.3V (Default)
	2-3	+5V

2.4.3 JP3 : LVDS Module, Power Selection
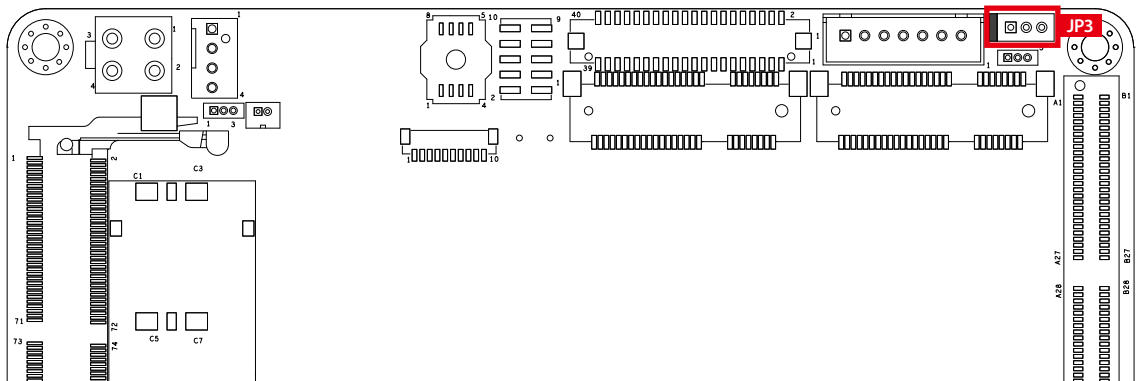
JP3 provides LVDS voltage selection function, Closing Pin 1 and Pin 2 is for 3.3V LVDS power input; closing Pin 2 and Pin 3 is for 5V LVDS power input.

	Pin No.	Function
1 3	1-2	+3.3V (Default)
	2-3	+5V System Power

2.4.4 JP4 : USB Power Select
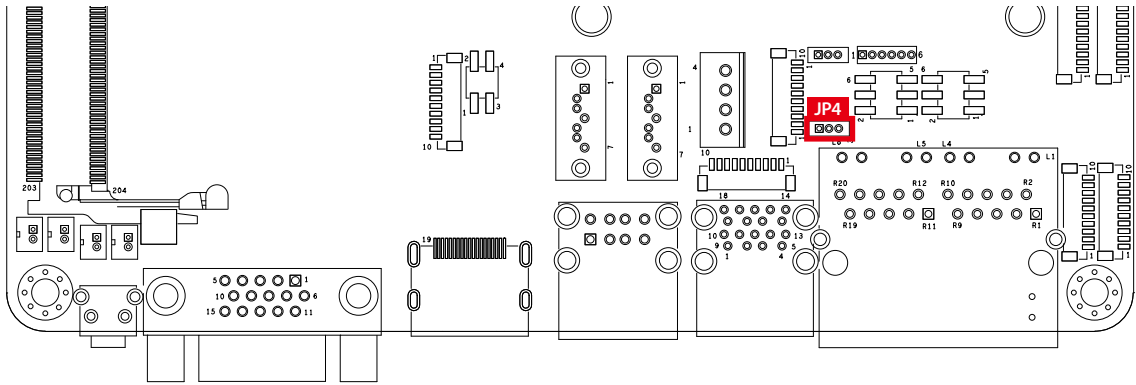
	Pin No.	Function
1　**3**	1-2	+5V Standby Power (Default)
	2-3	+5V System Power

2.4.5 JP5 : CN13 mSATA/Mini PCIe; CN1 SATA/NC Select
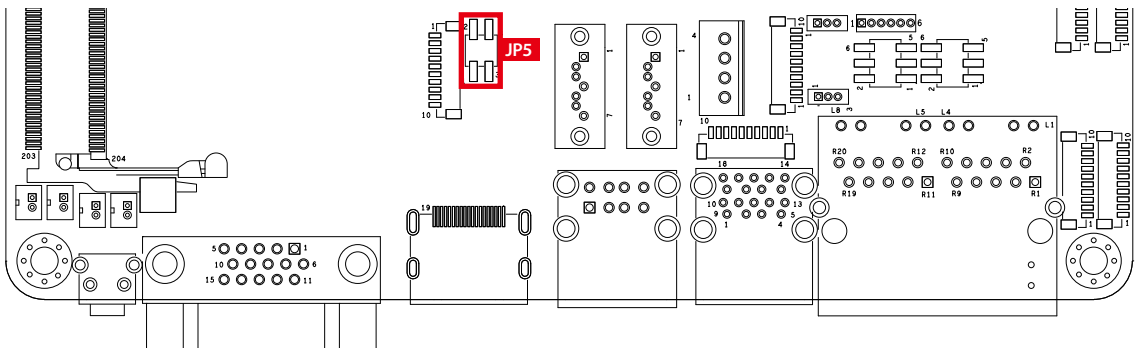
	Pin No.	CN15	CN1
2　**4**　**1**　**3**	1-3/2-4	mSATA	N/C
	N/C	Mini PCIe (Default)	SATA (Default)

3

SYSTEM SETUP

3.1 Installing HDD/SDD Storage Devices

Step 1 Remove screws from 2.5" storage bracket (marked in red).

Step 2 Remove 4pcs M3x4 screws of SSD/HDD Tray from back cover.
Step 3 Lock up 2.5" SSD/HDD on HDD bracket and plug-in SATA data and power cable to SSD/HDD.
Step 4 Lock up 4pcs screws (marked in yellow) to fix the SSD/HDD on the tray.
Step 5 Lock up screws on panel chassis (marked in red).

Note 1 : We strongly recommend you to buy wide temp. RAM and pre-install by VECOW for MTC-1010W series panel pc.
Note 2 : We strongly recommend you to buy storage and pre-install by VECOW for MTC-1010W, 10.1" Multi-touch panel pc.

3.2 Installing Mini PCIe Cards

Step 1 Install Mini PCIe card into Mini PCIe socket.
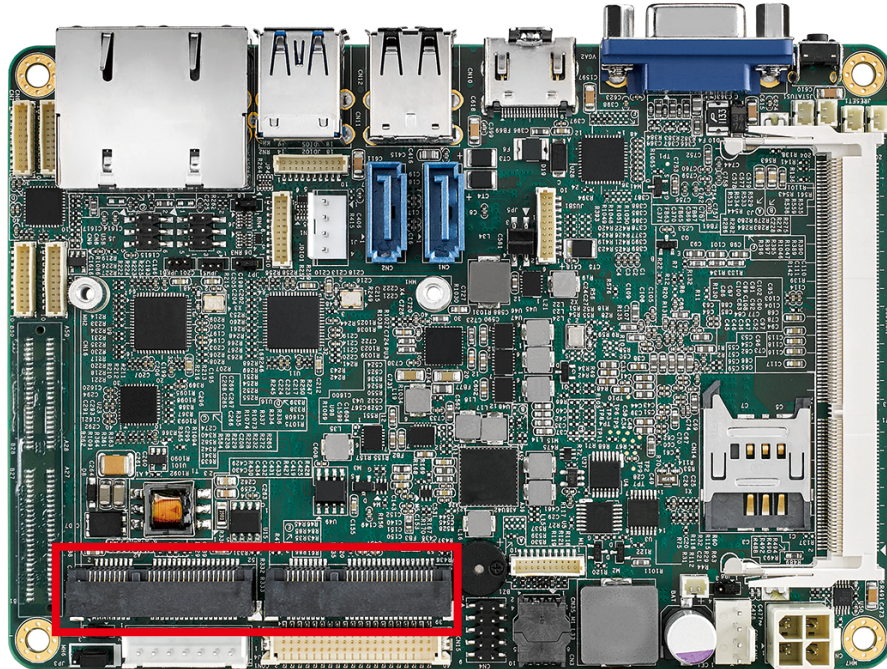
Step 2 Install Mini PCIe card into Mini PCIe socket.

Step 3 Fasten one M2.5 screw.
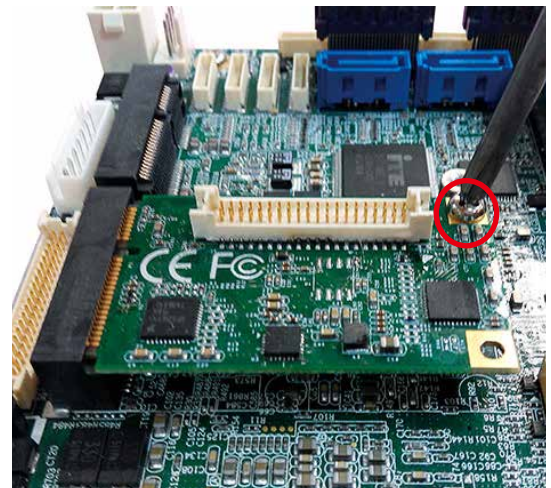
3.3 Mounting For MTC-1000 Series

Put the panel PC into the wall or device you want and Lock by M3 screws.

4

BIOS SETUP

4.1 Entering Setup

```
            Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
    Main  Advanced  Chipset  Security  Boot  Save & Exit

    BIOS Information
    BIOS Vendor                          American Megatrends
    Core Version                         5.12
    Compliancy                           UEFI 2.5; PI 1.4
    Project Version                      E2000XXE3T00005
    Build Date and Time                  10/19/2018 17:02:34
    Access Level                         Administrator

    Platform firmware Information
    BXT SOC                              D0
    MRC Version                          0.56
    PUNIT FW                             32
    PMC FW                               03.29
    TXE FW                               3.1.50.2238          →←: Select Screen
    ISH FW                               N/A                  ↑↓: Select Item
    GOP                                  10.0.1036            Enter: Select
    CPU Flavor                           BXT Notebook/Desktop ... +/-: Change Opt.
    Board ID                             Oxbow Hill CRB (06)  F1: General Help
    Fab ID                               FAB A                F2: Previous Values
                                                              F3: Optimized Defaults
                                                              F4: Save & Exit
    Memory Information                                        ESC: Exit
    Total Memory                         4096 MB
    Memory Speed                         1600 MHz
```

Figure 4-1 : Entering Setup Screen

BIOS provides an interface for users to check and change system configuration. The BIOS setup program is accessed by pressing the <Del> key when POST display output is shown.

4.2 Main Menu

```
          Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
     Main  Advanced  Chipset  Security  Boot  Save & Exit
  Compliancy                        UEFI 2.5; PI 1.4           ▲   Set the Time. Use Tab to
  Project Version                   E2000XXE3T00005                switch between Time elements.
  Build Date and Time               10/19/2018 17:02:34
  Access Level                      Administrator

  Platform firmware Information
  BXT SOC                           D0
  MRC Version                       0.56
  PUNIT FW                          32
  PMC FW                            03.29
  TXE FW                            3.1.50.2238
  ISH FW                            N/A
  GOP                               10.0.1036
  CPU Flavor                        BXT Notebook/Desktop ...      →←: Select Screen
  Board ID                          Oxbow Hill CRB (06)           ↑↓: Select Item
  Fab ID                            FAB A                         Enter: Select
                                                                  +/-: Change Opt.
                                                                  F1: General Help
  Memory Information                                              F2: Previous Values
  Total Memory                      4096 MB                       F3: Optimized Defaults
  Memory Speed                      1600 MHz                      F4: Save & Exit
                                                                  ESC: Exit
  System Date                       [Mon 10/22/2018]
  System Time                       [09:57:49]                ▼
```

Figure 4-2 : BIOS Main Menu

The Main menu displays BIOS version and system information. There are two options on Main menu.

System Data
Set the date. Use <Tab> to switch between date elements.

System Time
Set the time. Use <Tab> to switch between time elements.

4.3 Advanced

```
          Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
     Main  Advanced  Chipset  Security  Boot  Save & Exit
  ► ACPI Settings                                               System ACPI Parameters.
  ► SMART Settings
  ► IT8786 Super IO Configuration
  ► Hardware Monitor
  ► Serial Port Console Redirection
  ► CPU Configuration
  ► Network Stack Configuration
  ► CSM Configuration
  ► USB Configuration



                                                                →←: Select Screen
                                                                ↑↓: Select Item
                                                                Enter: Select
```

Figure 4-3 : BIOS Advanced menu

Select advanced tab to enter advanced BIOS setup options, such as CPU configuration, Network configuration, and USB configuration.

```
              Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
    Advanced

    ACPI Settings                                            Enables or Disables System
                                                             ability to Hibernate (OS/S4
                                                             Sleep State). This option may
    Enable Hibernation            [Enabled]                  be not effective with some OS.
    ACPI Sleep State              [S3 (Suspend to RAM)]
```
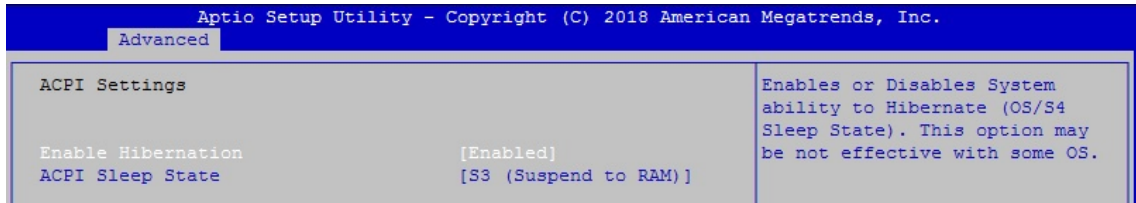
Figure 4-3-1 : ACPI Settings

Enable Hibernation

Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.

ACPI Sleep State

Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

4.3.2 SMART Settings

```
              Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
    Advanced

    SMART Settings                                           Run SMART Self Test on all
                                                             HDDs during POST.
    SMART Self Test               [Disabled]
```
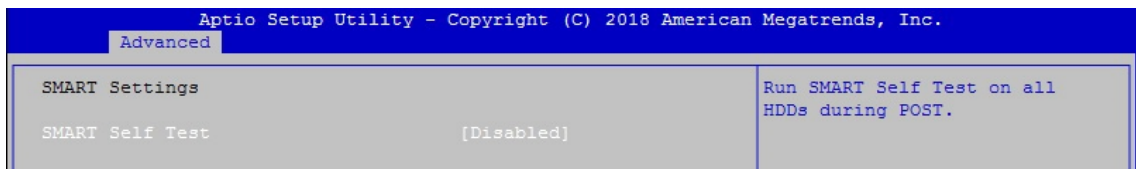
Figure 4-3-2 : SMART Settings

SMART Self Test

Run SMART Self Test on all HDDs during POST.

4.3.3 IT8786 Super IO Configuration

```
              Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
    Advanced

    IT8786 Super IO Configuration                            Set Parameters of Serial Port
                                                             1 (COMA)
    Super IO Chip                 IT8786
  ▶ Serial Port 1 Configuration
  ▶ Serial Port 2 Configuration
  ▶ Serial Port 3 Configuration
  ▶ Serial Port 4 Configuration
```
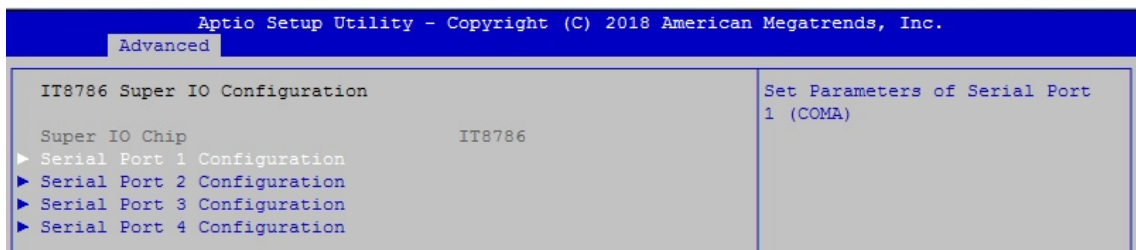
Figure 4-3-3-1 : Super IO Settings

```
              Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
    Advanced

    Serial Port 1 Configuration                              Enable or Disable Serial Port
                                                             (COM)
    Serial Port                   [Enabled]
    Device Settings               IO=3F8h; IRQ=4;

    Change Settings               [Auto]
    Interface Mode                [RS-232 Mode]
```
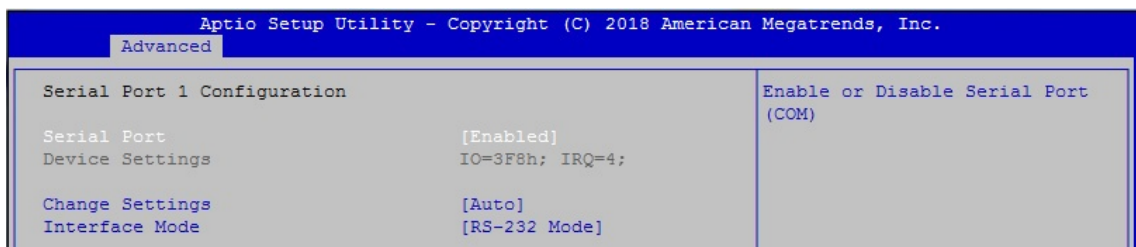
Figure 4-3-3-2 : Super IO Serial Port Configuration

Serial Port 1 to port 4 Configuration

Options for Serial Port 1 to Serial Port 4.
Entering the corresponding Port option then end user can change the settings such as I/O resource and UART mode.

4.3.4 Hardware Monitor

```
        Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
     Advanced

  Pc Health Status                                         This value controls the
                                                           temperature of the ACPI
  System temperature1              : +60 ℃                 Critical Trip Point - the
  Fan1 Speed                       : N/A                   point in which the OS will
  VCore                            : +0.876 V              shut the system off.
  DDR                              : +1.344 V              NOTE:  100C is the Plan Of
  +12V                             : +12.024 V             Record (POR) for all Intel
  +5V                              : +4.980 V              mobile processors.
  +3.3V                            : +3.304 V

  Critical Trip Point              [125 C]
```

Figure 4-3-4 : Hardware Monitor Settings

The IT8786 SIO features an enhanced hardware monitor providing thermal, fan speed, and system voltage's status monitoring.

Critical trip Point
This value controls the temperature of the ACPI Critical Trip Point - the point in which the OS will shut the system off.

4.3.5 Serial Port Console Redirection

```
        Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
     Advanced

                                                           Console Redirection Enable or
  COM0                                                     Disable.
  Console Redirection              [Disabled]
▶ Console Redirection Settings

  Legacy Console Redirection
▶ Legacy Console Redirection Settings

  Serial Port for Out-of-Band Management/
  Windows Emergency Management Services (EMS)
  Console Redirection              [Disabled]
▶ Console Redirection Settings
```

Figure 4-3-5 : Serial Port Console Redirection Settings

Console Redirection
Console Redirection Enable or Disable.

Console Redirection Settings
The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

Legacy Console Redirection
Legacy Console Redirection Settings.

Serial Port for Out-of-Band Management/Windows Emergency Management Services (EMS)
Console redirection enable or disable.

4.3.6 CPU Configuration

```
              Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
        Advanced

   CPU Configuration                                          Socket specific CPU Information

 ▶ Socket 0 CPU Information

   Speed                               1600 MHz
   64-bit                              Supported

 ▶ CPU Power Management
   Active Processor Cores              [Disabled]
   Intel Virtualization Technology     [Enabled]
   VT-d                                [Disabled]

                                                             →←: Select Screen
                                                             ↑↓: Select Item
```
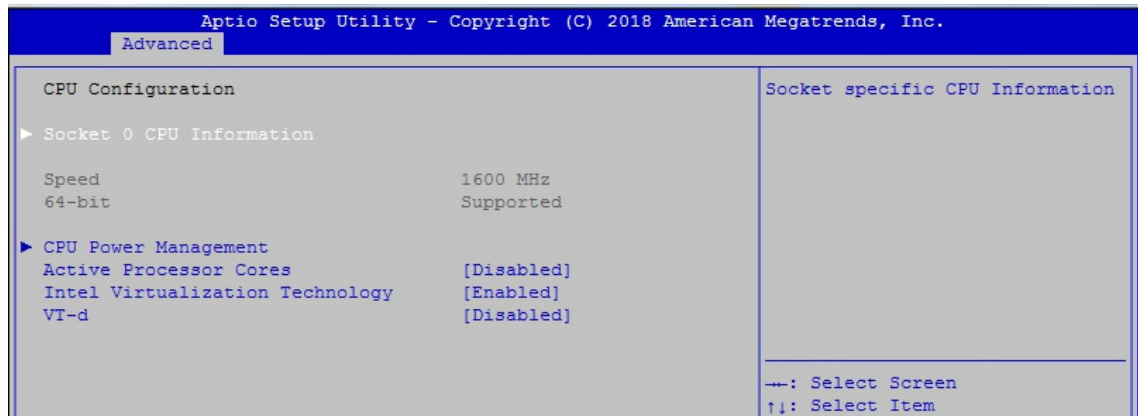
Figure 4-3-6-1 : CPU Configuration

Active Processor Cores
Enable this to disable core in each processor package.

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

VT-d
Enable/Disable CPU VT-d.

```
              Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
        Advanced

   Socket 0 CPU Information

   Intel(R) Atom(TM) Processor E3950 @ 1.60GHz
   CPU Signature                       506C9
   Microcode Patch                     32
   Max CPU Speed                       1600 MHz
   Min CPU Speed                       800 MHz
   Processor Cores                     4
   Intel HT Technology                 Not Supported
   Intel VT-x Technology               Supported

   L1 Data Cache                       24 kB x 4
   L1 Code Cache                       32 kB x 4
   L2 Cache                            1024 kB x 2      →←: Select Screen
   L3 Cache                            Not Present      ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
```

Figure 4-3-6-2 : CPU Information

Socket specific CPU Information.
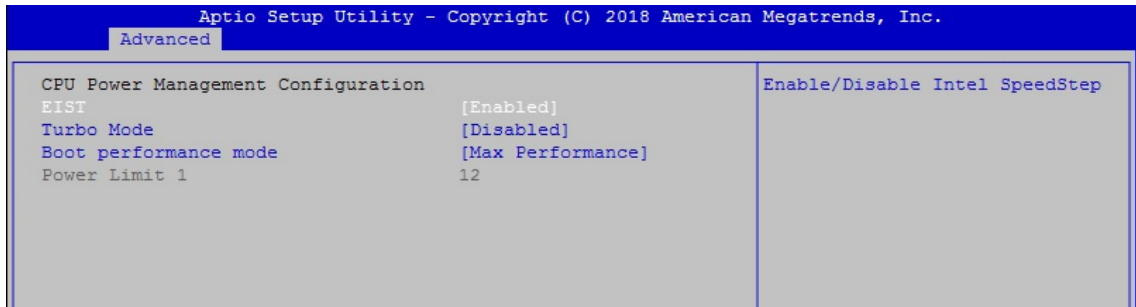
Figure 4-3-6-3 : CPU Power Management

EIST
Enable/Disable Intel SpeedStep.

Turbo Mode
Turbo Mode.

Boot performance mode
Select the performance state that the BIOS will set before OS handoff.

4.3.7 Network Stack Configuration
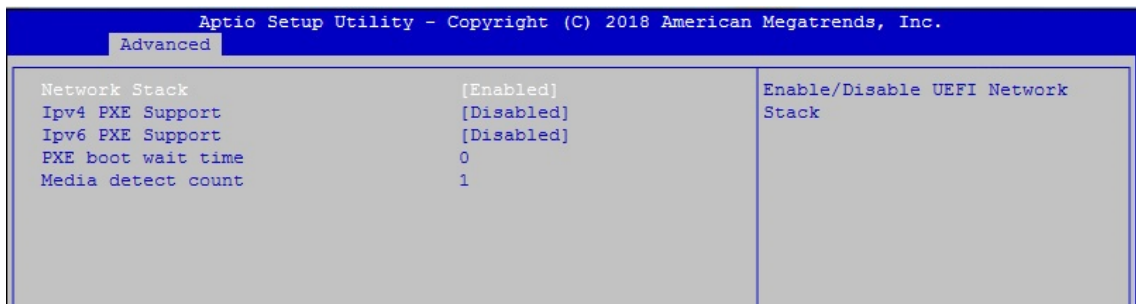
Figure 4-3-7 : Network Stack Settings

Network Stack
Enable/Disable UEFI Network Stack.

Ipv4 PXE Support
Enable Ipv4 PXE Boot Support. If disabled IPV4 PXE boot option will not be created.

Ipv6 PXE Support
Enable Ipv6 PXE boot Support. If disabled IPV6 PXE boot option will not be created.

PXE boot wait time
Wait time to press ESC key to abort the PXE boot.

Media detect count
Number of times presence of media will be checked.

4.3.8 CSM Configuration

```
              Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
        Advanced

  Compatibility Support Module Configuration                  Enable/Disable CSM Support.

  CSM Support                        [Enabled]

  CSM16 Module Version               A6.A7

  GateA20 Active                     [Upon Request]
  INT19 Trap Response                [Immediate]

  Boot option filter                 [UEFI and Legacy]

  Option ROM execution

  Network                            [UEFI]         →←: Select Screen
  Storage                            [UEFI]         ↑↓: Select Item
  Video                              [UEFI]         Enter: Select
  Other PCI devices                  [UEFI]         +/-: Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
```

Figure 4-3-8 : CSM Settings

CSM Support
Enable/Disable CSM support.

GateA20 Active
UPON REQUEST - GA20 can be disabled using BIOS services. ALWAYS - do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.

INT19 Trap Response
BIOS reaction on INT19 trapping by Option ROM : IMMEDIATE - execute the trap right away; POSTPONED - execute the trap during legacy boot.

Boot option filter
This option controls Legacy/UEFI ROMs priority.

Network
Controls the execution of UEFI and Legacy PXE OpROM.

Storage
Controls the execution of UEFI and Legacy Storage OpROM.

Video
Controls the execution of UEFI and Legacy Video OpROM.

Other PCI devices
Determines OpROM execution policy for devices other than Network, Storage, or Video.

4.4 Chipset

```
              Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
         Main  Advanced  Chipset  Security  Boot  Save & Exit
      ─────────────────────────────────────────────────────────────────────────
      ▶ North Bridge                                         North Bridge Parameters
      ▶ South Bridge
      ▶ LVDS Configuration
      ▶ Uncore Configuration
      ▶ South Cluster Configuration
```
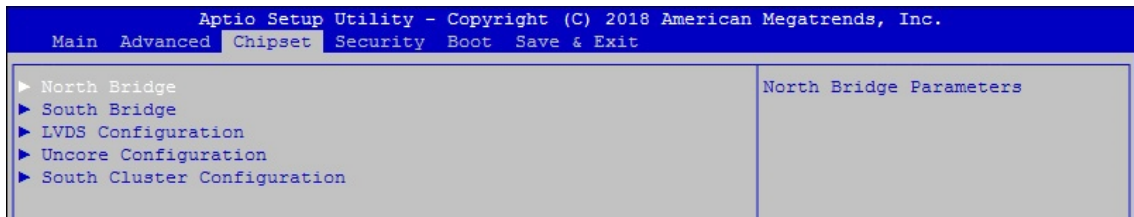
Figure 4-4 : Chipset

North Bridge
North Bridge Parameters.

South Bridge
South Bridge Parameters.

LVDS Configuration
LVDS Configuration.

Uncore Configuration
Uncore Configuration.

South Cluster Configuration
South Cluster Configuration.

4.4.1 North Bridge

```
              Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
                   Chipset
      ─────────────────────────────────────────────────────────────────────────
                                                             Maximum Value of TOLUD.
         Memory Information

         Total Memory                    4096 MB (DDR3L)

         Memory Slot0                    4096 MB (DDR3L)

         Max TOLUD                       [2 GB]
         Above 4GB MMIO BIOS assignment     [Disabled]
```
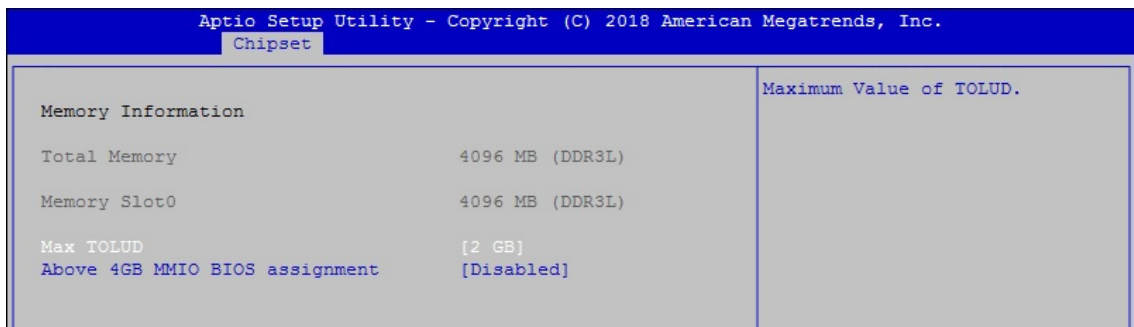
Figure 4-4-1 : North Bridge Settings

Max TOLUD
Maximum Value of TOLUD.

Above 4GB MMIO BIOS assignment
Enable/Disable above 4GB MemoryMappedIO BIOS assignment. This is disabled automatically when Aperture Size is set to 2048MB.

4.4.2 South Bridge
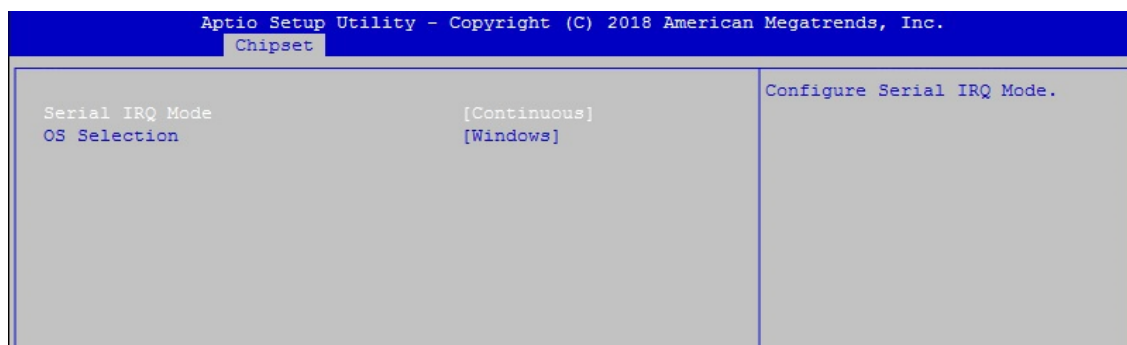
Figure 4-4-2 : South Bridge

Serial IRQ Mode
Configure Serial IRQ Mode.

OS Selection
Select the target OS.

4.4.3 LVDS Configuration
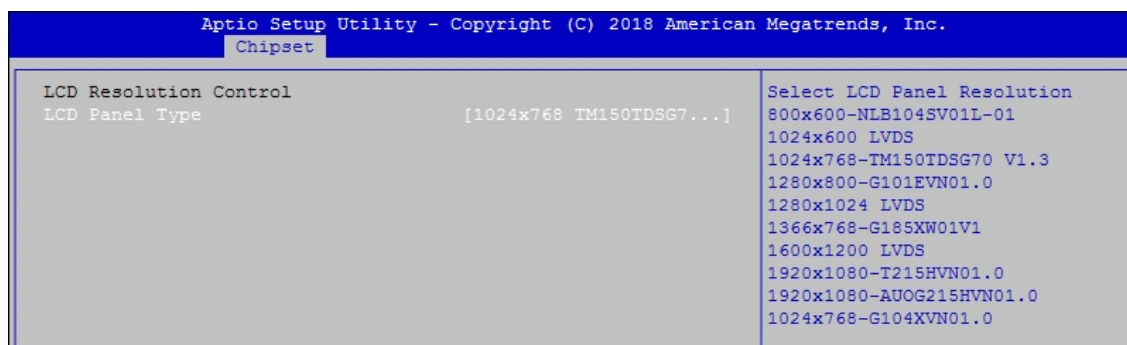
Figure 4-4-3 : LVDS Panel Settings

The LVDS Configuration option will be present if LVDS panel is connected on system.

LCD Panel Type
Select LCD Panel Resolution.

4.4.4 Uncore Configuration
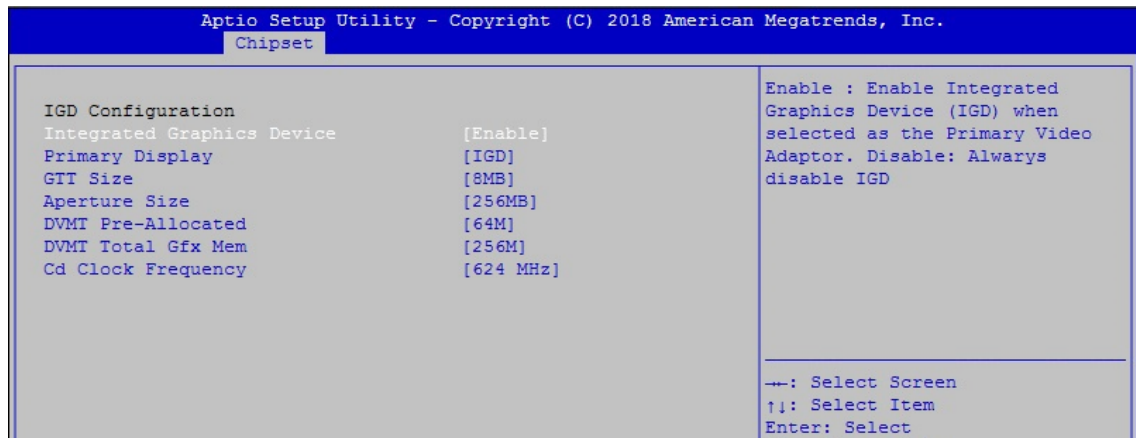
Figure 4-4-4 : Uncore Configuration

Integrated Graphics Device
Enable : Enable Integrated Graphics Device (IGD) when selected as the Primary Video Adaptor. Disable : Always disable IGD.

Primary Display
Select which of IGD/PCI Graphics device should be Primary Display

GTT Size
Select the GTT Size
Aperture Size
Select the Aperture Size

DVMT Pre-Allocated
Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device

DVMT Total Gfx Mem
Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device

Cd Clock Frequency
Select the highest Cd Clock frequency supported by the platform

4.4.5 South Cluster configuration
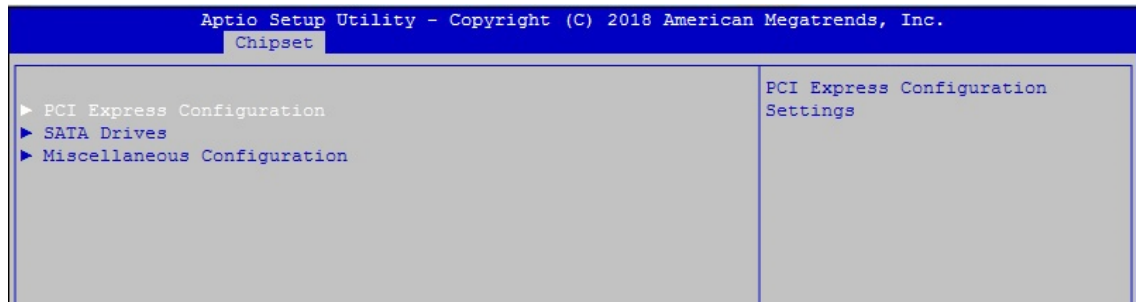
Figure 4-4-5 : South Cluster Settings

4.4.5.1 PCI Express Configuration
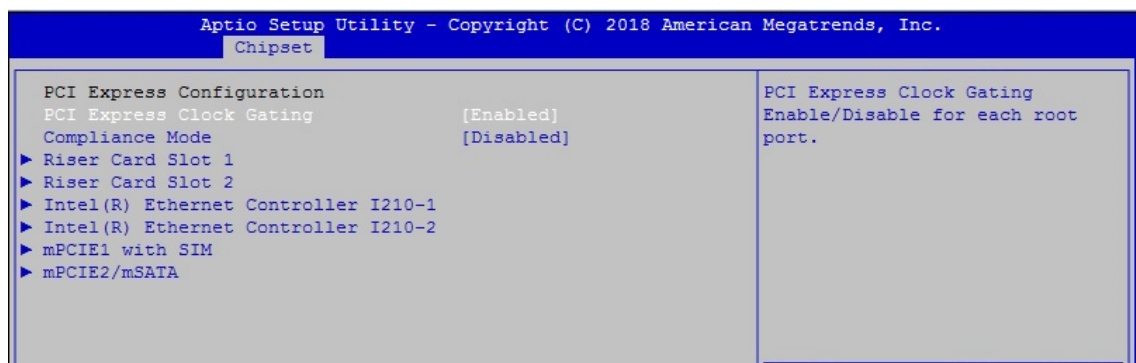
Figure 4-4-5-1 : PCI Express Settings

PCI Express Clock Gating
PCI Express Clock Gating Enable/Disable for each root port.

Compliance Mode
Compliance Mode Enable/Disable.

Riser Card Slot
Riser Card Slot settings.

Intel(R) Ethernet Controller I210
Intel(R) Ethernet Controller I210 Settings

Mini PCIe Slot with SMI
Mini PCIe Slot with SIM settings.

Mini PCIe/mSATA
Mini PCIe/mSATA Slot Settings.

4.4.5.2 SATA Drivers

```
            Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
                Chipset

 SATA Drives                                                      Enables or Disables the
                                                                 Chipset SATA Controller.  The
 Chipset-SATA Controller Configuration                           Chipset SATA controller
  Chipset SATA                           [Enable]                supports the 2 black internal
 SATA Mode Selection                     [AHCI]                  SATA ports (up to 3Gb/s
 Aggressive LPM Support                  [Disabled]              supported per port).

   SATA Port 0                           Phison SSB064G (64.0GB)
   Software Preserve                     Unknown
   Port 0                                [Enabled]
   Spin Up Device                        [Disabled]
   SATA Device Type                      [Hard Disk Drive]

   SATA Port 1                           [Not Installed]         →←: Select Screen
   Software Preserve                     Unknown                 ↑↓: Select Item
   Port 1                                [Enabled]               Enter: Select
   Spin Up Device                        [Disabled]              +/-: Change Opt.
   SATA Device Type                      [Hard Disk Drive]       F1: General Help
                                                                 F2: Previous Values
                                                                 F3: Optimized Defaults
                                                                 F4: Save & Exit
                                                                 ESC: Exit
```

Figure 4-4-5-2 : SATA Devices Settings

Chipset SATA
Enables or Disables the Chipset SATA Controller. The Chipset SATA controller supports the 2 black internal SATA ports (up to 3Gb/s supported per port).

SATA Mode Selection
Determines how SATA controller(s) operate.

Aggressive LPM Support
Enable PCH to aggressively enter link power state.

Options for each SATA port :
Port 0/1
Enable or Disable SATA Port.

Spin up Device
If enabled for any of ports Staggerred Spin Up will be performed and only the drives which have this option enabled will spin up at boot. Otherwise all drives spin up at boot.

SATA Device Type
Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.

4.4.5.3 Miscellaneous Configuration

```
              Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
                  Chipset

    Miscellaneous Configuration                              Specify what state to go to
    State After G3                        [S5 State]         when power is re-applied after
    Board Clock Spread Spectrum           [Disable]          a power failure (G3 state).
    Wake On Lan                           [Disable]          S0 State: System will boot
    BIOS Lock                             [Enabled]          directly as soon as power
    RTC Lock                              [Enabled]          applied.
    Flash Protection Range Registers (    [Disabled]         S5 State: System keeps in
                                                             power-off state until power
                                                             button is pressed.
```

Figure 4-4-5-3 : Miscellaneous Configuration

State After G3
Specify what state to go to when power is re-applied after a power failure (G3 state). S0 State : System will boot directly as soon as power applied. S5 State : System keeps in power-off state until power button is pressed.

Board Clock Spread Spectrum
Enable Clock Chip's Spread Spectrum feature.

Wake On Lan
Enable or Disable the Wake on Lan.

BIOS Lock
Enable/Disable the SC BIOS Lock Enable feature. Required to be enabled to ensure SMM protection of flash.

RTC Lock
Enable will lock bytes 38h-3Fh in the lower/upper 128-byte bank of RTC RAM.

Flash Protection Range Registers (FPRR)
Enable Flash Protection Range Registers.

4.5 Security

```
        Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
    Main  Advanced  Chipset  Security  Boot  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.
    If ONLY the User's password is set, then this
    is a power on password and must be entered to
    boot or enter Setup. In Setup the User will
    have Administrator rights.
    The password length must be
    in the following range:
    Minimum length                  3
    Maximum length                  20                   ──────────────────────────
                                                         →←: Select Screen
                                                         ↑↓: Select Item
    Setup Administrator Password                         Enter: Select
    User Password                                        +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
    HDD Security Configuration:                          F3: Optimized Defaults
    P0:Phison SSB064GPTC0-S91                            F4: Save & Exit
                                                         ESC: Exit
    ► Secure Boot
```
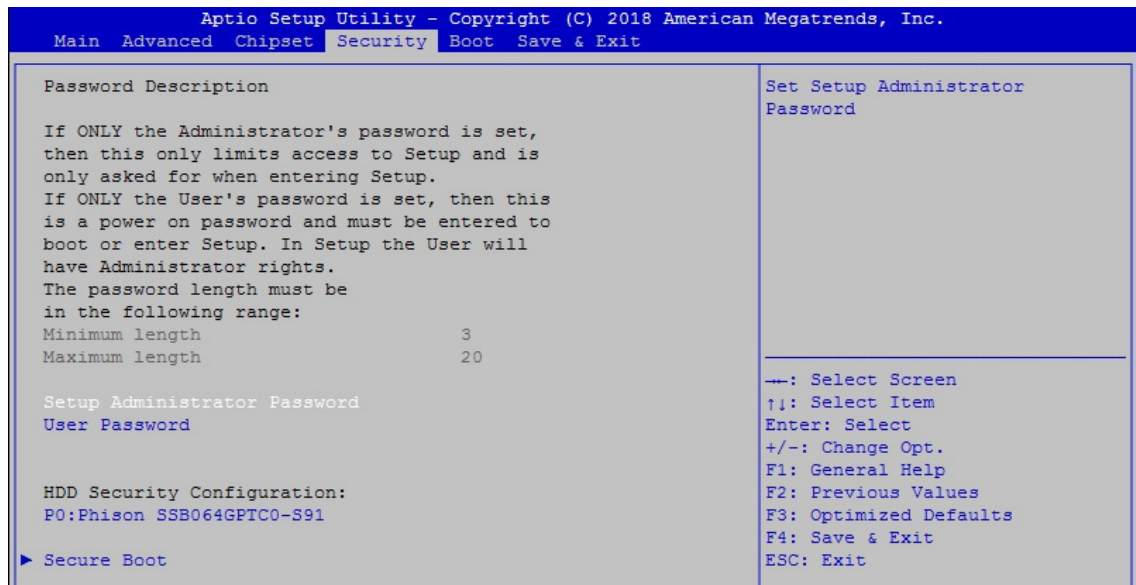
Figure 4-5 : BIOS Security Menu

Setup Administrator Password
Set Setup Administrator Password

User Password
Set User Password

Secure Boot
Customizable Secure Boot Settings.

4.5.1 HDD Security Configuration

```
        Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
                          Security

    HDD Password Description :                           Set HDD User Password.
                                                         *** Advisable to Power Cycle
    Allows  Access to  Set, Modify  and  Clear           System after Setting Hard Disk
    HardDisk User and Master Passwords.                  Passwords ***.
    User Password need to be installed for               Discard or Save changes option
    Enabling Security. Master Password can               in setup does not have any
    be Modified only when successfully unlocked          impact on HDD when password is
    with Master Password in POST.                        set or removed. If the 'Set
    If the 'Set HDD Password' option is grayed out,      HDD User Password' option is
    do power cycle to enable the option again.           grayed out, do power cycle to
                                                         enable the option again
    HDD PASSWORD CONFIGURATION:

    Security Supported       :      Yes                  ──────────────────────────
    Security Enabled         :      No                   →←: Select Screen
    Security Locked          :      No                   ↑↓: Select Item
    Security Frozen          :      No                   Enter: Select
    HDD User Pwd Status      :      NOT INSTALLED         +/-: Change Opt.
    HDD Master Pwd Status    :      INSTALLED             F1: General Help
                                                         F2: Previous Values
    Set User Password                                    F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit
```
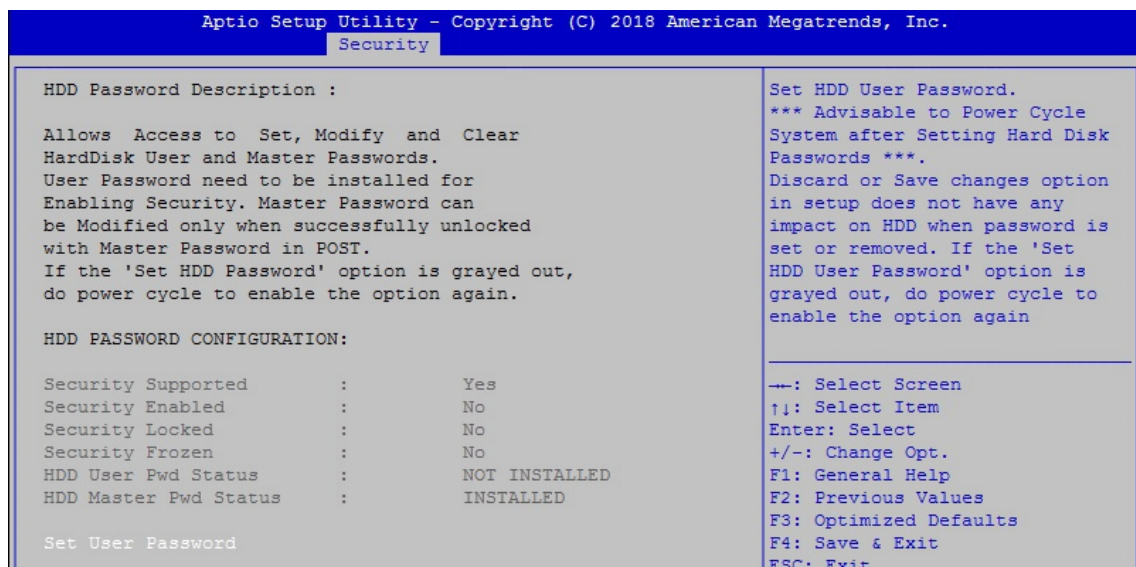
Figure 4-5-1 : HDD Security Settings

Set User Password
Set HDD user password.
Advisable to Power Cycle System after Setting Hard Disk Passwords
Discard or save changes option in setup dies not have any impact on HDD when password is set or removed. If the "Set HDD User Password" option is grayed out, do power cycle to enable the option again.
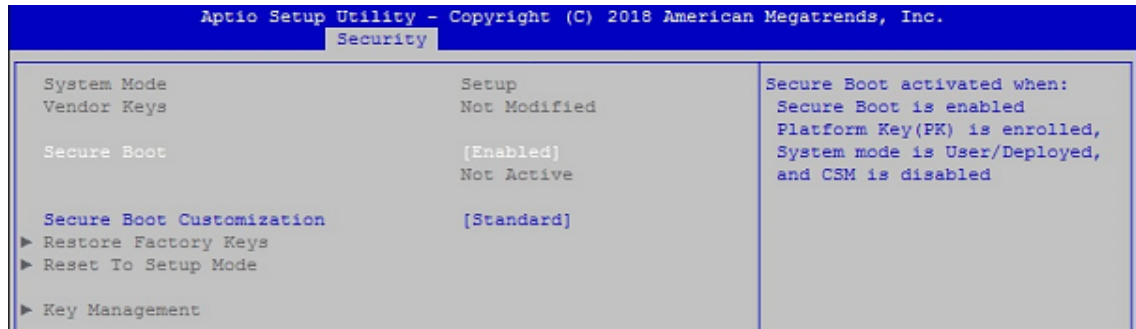
4.5.2 Security Boot

Figure 4-5-2 : Security Boot Settings

Secure Boot
Secure Boot activated when : Secure Boot is enabled Platform Key (PK) is enrolled, System mode is User/Deployed, and CSM is disabled.

Secure Boot Customization
Secure Boot mode – Custom & Standard, Set UEFI Secure Boot mode to STANDARD mode or CUSTOM mode, this change is effect after save. And after reset, the mode will return to STANDARD mode.

Key Management
Enables expert users to modify Secure Boot Policy variables without full authentication.

4.6 Boot

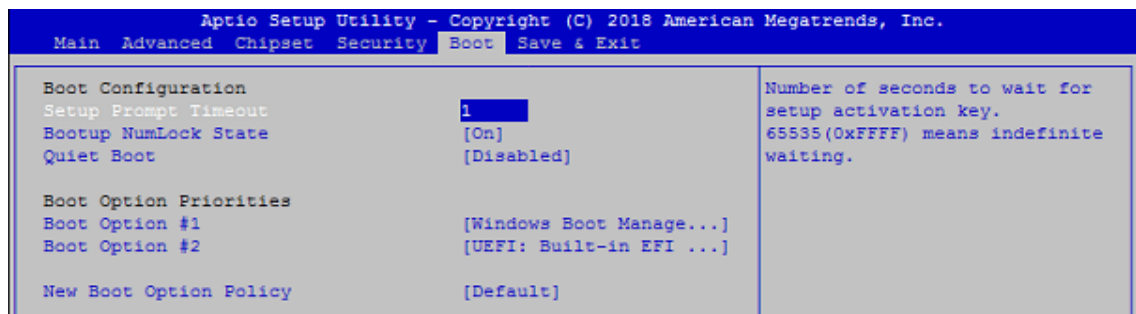

Figure 4-6 : BIOS Boot Menu

Setup Prompt Timeout
Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.

Bootup NumLock State
Select the keyboard NumLock state.

Quiet Boot
Enables or disables Quiet Boot option.

Boot Option #x
Sets the system boot order.

New Boot Option Policy
Controls the placement of newly detected UEFI boot options.

4.7 Save & Exit

```
            Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
     Main  Advanced  Chipset  Security  Boot  Save & Exit

    Save Options                                    Exit system setup after saving
    Save Changes and Exit                           the changes.
    Discard Changes and Exit

    Save Changes and Reset
    Discard Changes and Reset

    Save Changes
    Discard Changes

    Default Options
    Restore Defaults
    Save as User Defaults
    Restore User Defaults                           →←: Select Screen
                                                    ↑↓: Select Item
    Boot Override                                   Enter: Select
    UEFI: Built-in EFI Shell                        +/-: Change Opt.
    Windows Boot Manager (P0: Phison SSB064GPTC0-S91)   F1: General Help
    Launch EFI Shell from filesystem device          F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
```
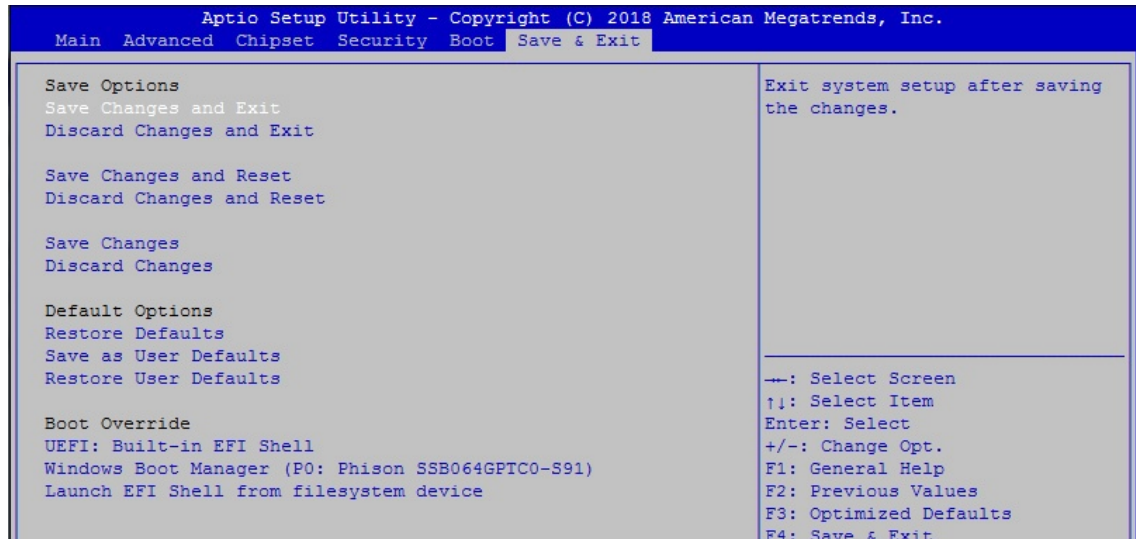
Figure 4-7 : BIOS Save and Exit Menu

Save Changes and Exit
Exit system setup after saving the changes.

Discard Changes and Exit
Exit system setup without saving any changes.

Save Changes and Reset
Reset the system after saving the changes.

Discard Changes and Reset
Reset system setup without saving any changes.

Save Changes
Save Changes done so far to any of the setup options.

Discard Changes
Discard Changes done so far to any of the setup options.

Default options :
Restore Defaults
Restore/Load Default values for all the setup options.

Save as User Defaults
Save the changes done so far as User Defaults.

Restore User Defaults
Restore the User Defaults to all the setup options.

Vecow

For further support information, please visit www.vecow.com