



User Manual

DS-780

**Multi-Display Digital Signage
Player with Fanless Design**

ADVANTECH

Enabling an Intelligent Planet

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

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

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

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

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

Technical Support and Assistance

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

Warnings, Cautions and Notes

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



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



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

Note! Notes provide optional additional information.



Declaration of Conformity

FCC Class B

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

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

Packing List

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

- 1 x DS-780 Unit
- 1 x accessory box including:
 - 1 x Power Adaptor
 - 1 x Bracket set for fixing power adapter plug
 - 2 x Mounting Brackets
 - 1 x China RoHS
 - 1 x User Manual
 - 1 x Content Management Software
 - 4 x Foot rubbers and screws

Optional Accessory

Part Number	Description
1700001524	3-pin power cord (US)
170203183C	3-pin power cord (EU)
170203180A	3-pin power cord (UK)
1702031836	3-pin power cord (AU)
1700008921	3-pin power cord with PSE (Japan)
1700019146	3-pin power cord with CCC (China)



Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated into the equipment.
 - The equipment has been exposed to moisture.
 - The equipment does not work well, or you cannot get it to work according to the user's manual.
 - The equipment has been dropped and damaged.
 - The equipment has obvious signs of breakage.
15. **DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.**
16. **CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.**

ATTENTION: Risque d'explosion si la batterie est remplacée de manière incorrecte. Remplacer uniquement avec un modèle recommandé par le fabricant, et éliminer les piles usagées selon les instructions du fabricant.

DISCLAIMER: This set of instructions is given according to IEC 60950-1(ed.2). Advantech disclaims all responsibility for the accuracy of any statements contained herein.

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Chapter 1

General Introduction

This chapter gives background information of DS-780 series.

1.1 Introduction

Digital signage is one of the most effective and eye-catching communications mediums on the market. Advantech DS-780 is an ideal digital signage player. It's not only a high graphic performance computer but also a low power for advanced Digital Signage Player. It powered by 6th generation Intel® Core™ U series processor and designed with fanless solution. DS-780 supports 4K resolution by HDMI outputs and has slide-in chassis design for maintaining the storage device easily.

The 6th generation Intel® Core™ U series support of HEVC / H.265 video decoding. The HEVC / H.265 video compression technology can reduce video file size, reducing the occupied storage space, but also to reduce the network transmission network bandwidth consumed, it is suitable for playing high-resolution video request.

DS-780 has 3 x HDMI ports to support triple display output simultaneously. And has 2 x GbE ports, 4 USB 3.0 ports, 1 x COM (RS-232) and 1 x combo Audio port (SPDIF / Line-out / Mic-in) for system integration and application. For better connectivity, it supports 1 x mini PCIe interface for add-on functions such as wireless modules, 3G modules. DS-780 also supports 1 x M.2 (2230/1630 E Key) interface for WIFI modules.

As a high performance and low power design with fanless solution, DS-780 is ideal for single to triple display applications in stores, lobbies, restaurants, FIDS and other display public spaces.

1.2 Product Features

1.2.1 General

- 6th Gen. Intel® Core™ U series i7-6650U /i7-6600U/ i5-6360U /i5-6300U/i3-6100U/Celeron-3955U processors (CPU TDP up to 15W)
 - Supports 3 x HDMI ports (1 x HDMI 2.0, 2 x HDMI 1.4*)
 - Supports 2 x GbE, 4 x USB 3.0 and 1 x COM(RS-232)
 - Supports 2.5-inch SATA HDD/SSD drive bay for storage devices
 - Built-in 1 x Mini PCIe slot for easy expansion e.g. WiFi, 3G etc
 - Built-in 1 x M.2 slot (2230/1630 E Key) for easy expansion with WIFI modules
- * One of the HDMI 1.4 (HDMI3) no support Audio, HDCP and Hot plug and no display in BIOS and DOS.

1.2.2 Display

- Resolution:
 - HDMI 2.0: 3840 x 2160 @60Hz
 - HDMI 1.4: 3840 x 2160 @24Hz

1.2.3 Power Consumption

- Idle: 8.35 W (w/o expansion)
- Max.: 23.3 W (w/o expansion)

1.3 Hardware Specifications

- **CPU:** Intel® Core™ Skylake-U series i7-6650U /i7-6600U/ i5-6360U /i5-6300U/ i3-6100U/Celeron-3955U
- **System Chipset:** SoC solution, built-in Intel® Core™ Skylake-U processor
- **BIOS:** AMI uEFI 64 Mbit Flash BIOS
- **System Memory:** 2 x DDR4 SO-DIMM sockets, support DDR4 2133 MHz up to 32 GB (Max. 16GB per each SO-DIMM socket)
- **Processor Graphics:** Intel® IRIS Graphics 540 (i7-6650U / i5-6360U), Intel® HD Graphics 520 (i7-6600U/i5-6300U/i3-6100U), Intel® HD Graphics 510 (Celeron-3955U)
- **Storage:** Supports 1 x 2.5" SATA HDD/SSD
- **Watchdog Timer:** Supported by Advantech SUSIAccess API
- **I/O Interface:**
 - COM: 1 x RS-232
 - USB: 4 x USB 3.0
 - Audio: 1 x SPDIF / Line-Out / Mic-in
- **Ethernet Chipset:** 1 x Intel i219, 1 x Realtek 8111G
- **Speed:** 10/100/1000 Mbps
- **Interface:** 2 x RJ-45 jacks with LED
- **Standard:** IEEE 802.3 (10 / 1000 Base-T, 100 Base-TX) or IEEE 802.3u (Auto-Negotiation)
- **Expansion**
 - Mini PCIe: 1 socket internal (Full size), support mSATA interface
 - M.2(2230/1630 E Key).

1.4 Mechanical Specifications

1.4.1 Dimensions

235 x 175 x 35 mm (9.25" x 6.89" x 1.38") (W x D x H)

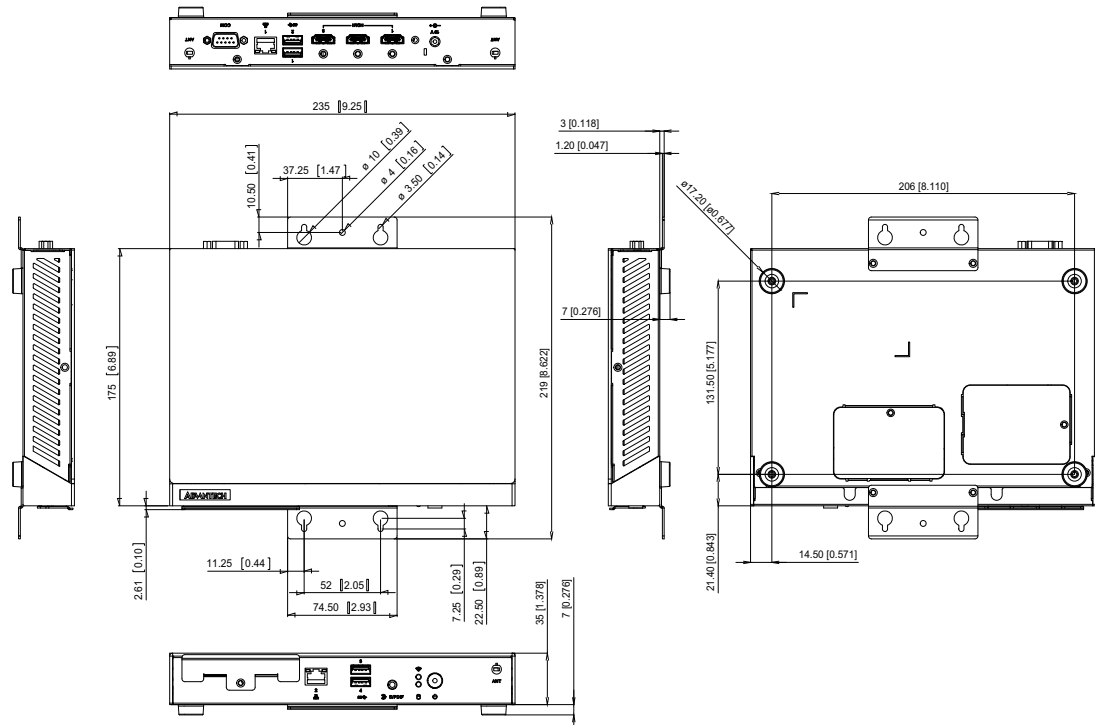


Figure 1.1 DS-780 mechanical dimensions

1.4.2 Weight

1.5 kg (3.3 lb)

1.5 Power Requirements

1.5.1 System Power

Minimum power input: DC 19V, 3.42A

1.5.2 RTC Battery

3V/220 mAh CR2032

1.6 Environment Specification

1.6.1 Operating Temperature

0° C - 40° C (32 ~ 104° F) with 0.7m/s air flow

1.6.2 Relative Humidity

95% @ 40° C (non-condensing)

1.6.3 Storage Temperature

-20° C ~ 60° C (-4 ~ 140° F)

1.6.4 Vibration Loading During Operation

- 1.0 Grms, IEC 60068-2-64, random, 5 ~ 500 Hz , 3 axes,1 hr/axis.

1.6.5 Shock During Operation

- 10 G, IEC 60068-2-27, half sine, 11 ms duration

1.6.6 Safety

UL,CB, BSMI, CCC

1.6.7 EMC

CE/FCC Class B, BSMI, CCC

Chapter 2

Hardware Installation

This chapter describes DS-780 external I/O and explains the hardware installation processes.

2.1 DS-780 Front and Rear Views

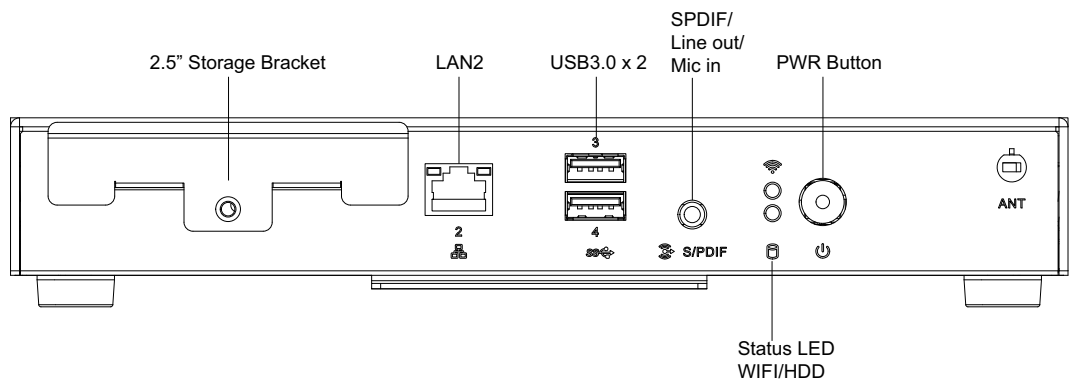


Figure 2.1 Front view

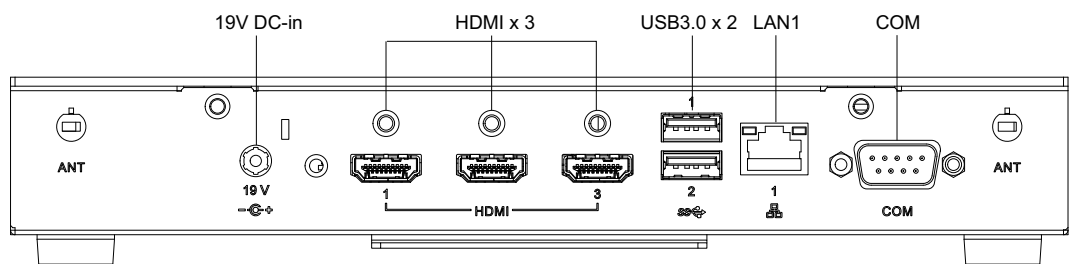


Figure 2.2 Rear view

2.2 DS-780 Front External I/O Connectors

2.2.1 Power ON/OFF Button

DS-780 has a power ON/OFF button on front side. Push this button to turn the system ON and OFF. It can also support 4 second delay soft power off.



Figure 2.3 Power button

2.2.2 S/PDIF / Line out / Mic-in Connector

The connector port is a combo connector. It not only allows you to transfer digital sound to an amplifier or television but also can be the Line out and Microphone (Input) functions. It supports Jacks sensing and configuration can be conducted via the driver UI.



Figure 2.4 S/PDIF / Line out / Mic-in connector

2.2.3 USB Connectors

DS-780 front side provides 2 x USB3.0 interface connectors, which give complete Plug & Play and hot swapping capability for up to 127 external devices. The two USB 3.0 interface are compliant with USB UHCI, Rev. 3.0. (Refer to Table 2.1 for pin definitions)

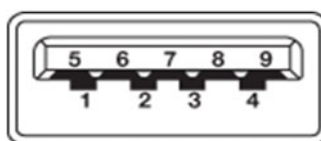


Figure 2.5 USB connector

Table 2.1: USB 3.0 Connector Pin Assignments

Pin	Signal Name
1	VBUS
2	USB Data-
3	USB Data+
4	GND
5	StdA_SSRX-
6	StdA_SSRX+
7	GND_DRAIN
8	StdA_SSTX-
9	StdA_SSTX+

2.2.4 Ethernet Connector (LAN)

DS-780 provides two RJ45 LAN interface connectors (1 x LAN in front-side; 1 x LAN in rear-side), they are fully compliant with IEEE 802.3u 10/100/1000 Base-T standards. The Ethernet port provides a standard RJ-45 jack connector with LED indicators on the front side to show its Active/Link status and speed status.

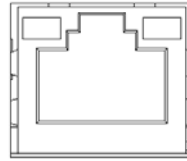


Figure 2.6 LAN connector

Table 2.2: LAN Connector Pin Assignments

Pin	Signal Name
1	MDI0+
2	MDI0-
3	MDI1+
4	MDI1-
5	GND
6	GND
7	MDI2+
8	MDI2-
9	MDI3+
10	MDI3-
11	VCC
12	ACT
13	Link100#
14	Link1000#

2.3 DS-780 Rear External I/O Connectors

2.3.1 Power Input Connector

DS-780 comes with a DC-Jack header that takes 19 VDC external power input.

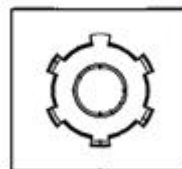


Figure 2.7 DC input connector

2.3.2 HDMI Connector

DS-780 HDMI (High-Definition Multimedia Interface) connectors provide all-digital audio/video interface to transmit the uncompressed audio/video signals and are HDCP compliant. Connect the HDMI audio/video device to this port. HDMI technology can support a maximum resolution of 3840 x 2160p (Ultra HD 4K) but the actual resolutions supported depend on the monitor being used.

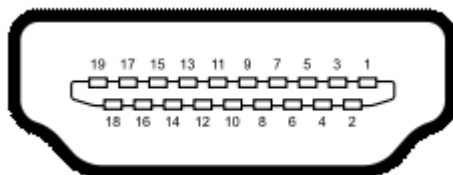


Figure 2.8 HDMI connector

Table 2.3: HDMI Connector Pin Assignments

Pin	Signal Name
1	TMDS Data2+
2	GND
3	TMDS Data2-
4	TMDS Data1+
5	GND
6	TMDS Data1-
7	TMDS Data0+
8	GND
9	TMDS Data0-
10	TMDS Clock+
11	GND
12	TMDS Clock-
13	NC
14	NC
15	SCL
16	SDA
17	GND
18	+5 V Power
19	Detect

2.3.3 USB Connectors

DS-780 rear side provides 2 x USB3.0 interface connectors, which give complete Plug & Play and hot swapping capability for up to 127 external devices.

The USB 3.0 is compliant with USB UHCI, Rev. 3.0. (Pin definition refer Table 2.1)

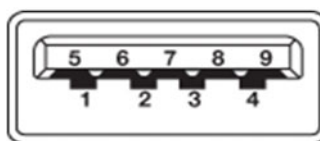


Figure 2.9 USB 3.0 connector

2.3.4 COM Connector

DS-780 provides 1 x D-sub 9-pin connectors serial communication interface port. The port can support RS-232 mode communication.

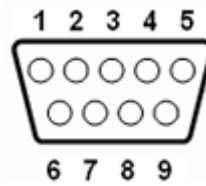


Figure 2.10 COM connector

Table 2.4: COM Port Pin Assignments

Pin	Signal Name
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

2.4 Hardware Installation

2.4.1 Memory Installation

[Top side]

1. Loosening the 4 fixing screws on the side of top cover.
2. Remove the top cover.
3. Insert the memory module into memory socket
4. Assemble back the heatsink cover with the 4 screws

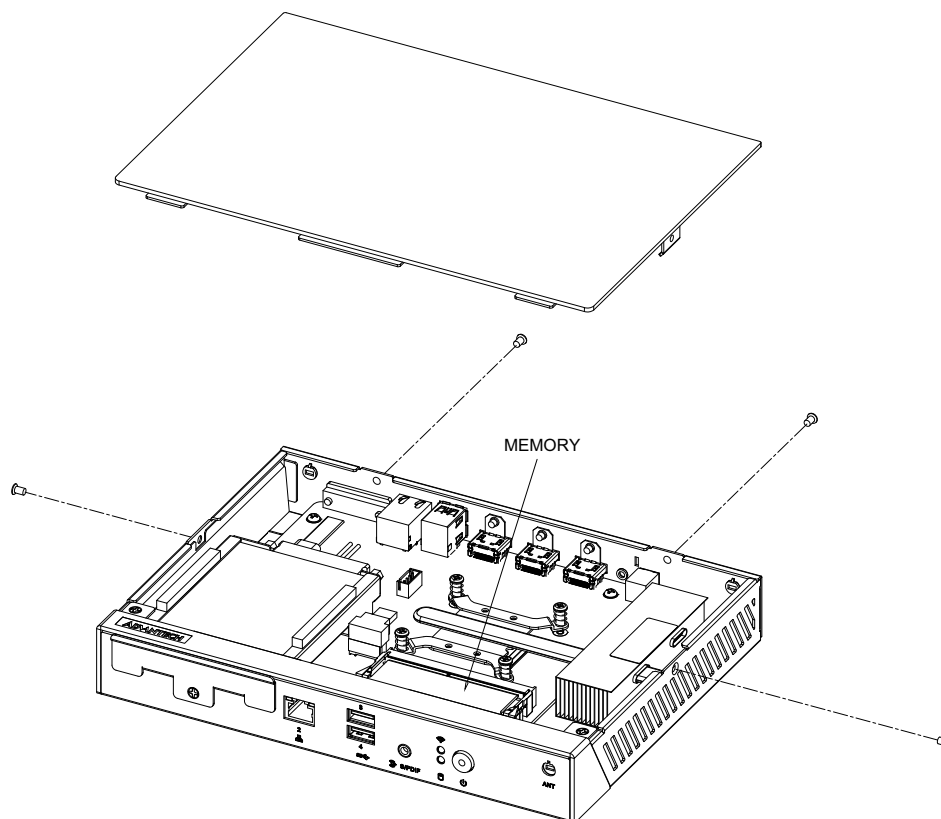


Figure 2.11 Memory module installation-Top side

[Bottom side]

1. Loosening the 1 fixing screw on the memory cover in bottom side.
2. Remove the memory cover.
3. Insert the memory module into memory socket
4. Assemble back the memory cover with the 1 screw.

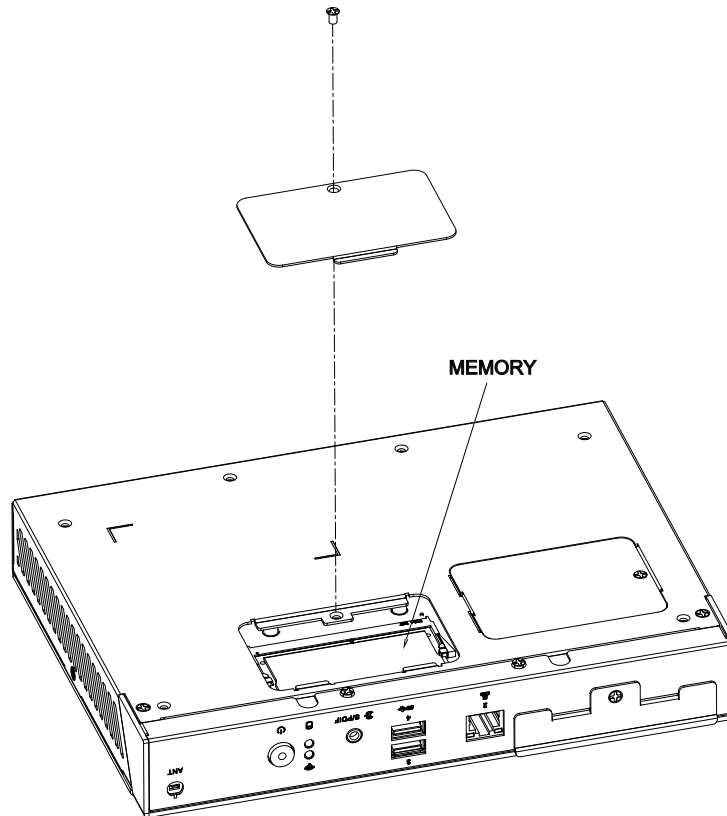


Figure 2.12 Memory module installation-bottom side

2.4.2 HDD/SSD Installation

1. Loosening the screw on the front view and move out the drive bay.
2. Fixing the 4 screws with HDD/SSD and storage bracket.
3. Insert the storage bracket into chassis
4. Fixing the screw back.

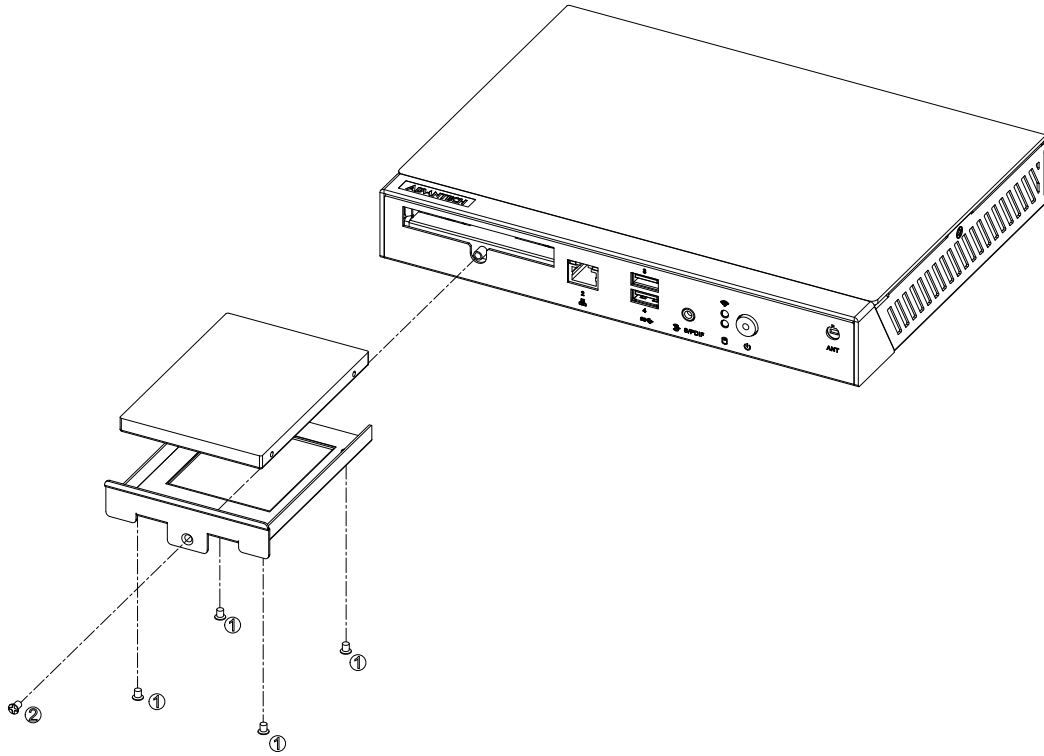


Figure 2.13 HDD/SSD installation

2.4.3 Mini PCIe card / M.2 / SIM Card and Antenna Installation

1. Loosening the fixing screw on the mini PCIe cover and remove the cover..
2. Insert the mini PCIe module / M.2 / SIM card into the sockets and fix it with screws
3. Loosening the 4 fixing screws on the side of top cover
4. Attach the antenna module to the ant holes of chassis
5. Assemble the antenna cable to mini PCIe/ M.2 module on the bottom side.
6. Assemble back the mini PCIe cover with the screw.
7. Assemble back the top cover with the screws

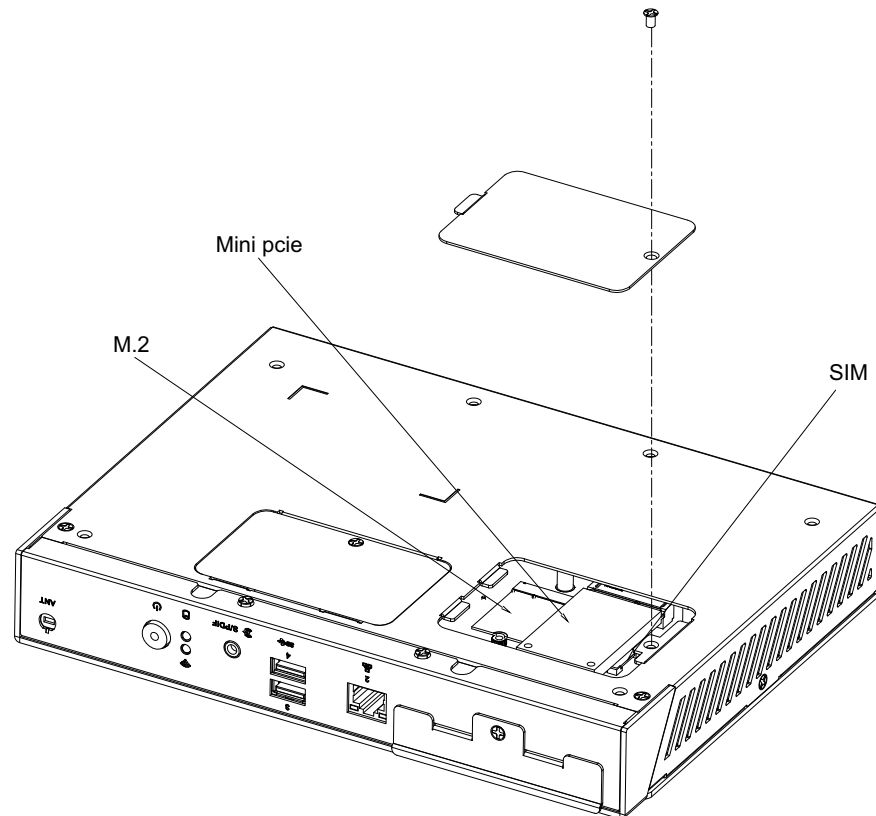


Figure 2.14 Mini PCIe / M.2 / SIM card installation

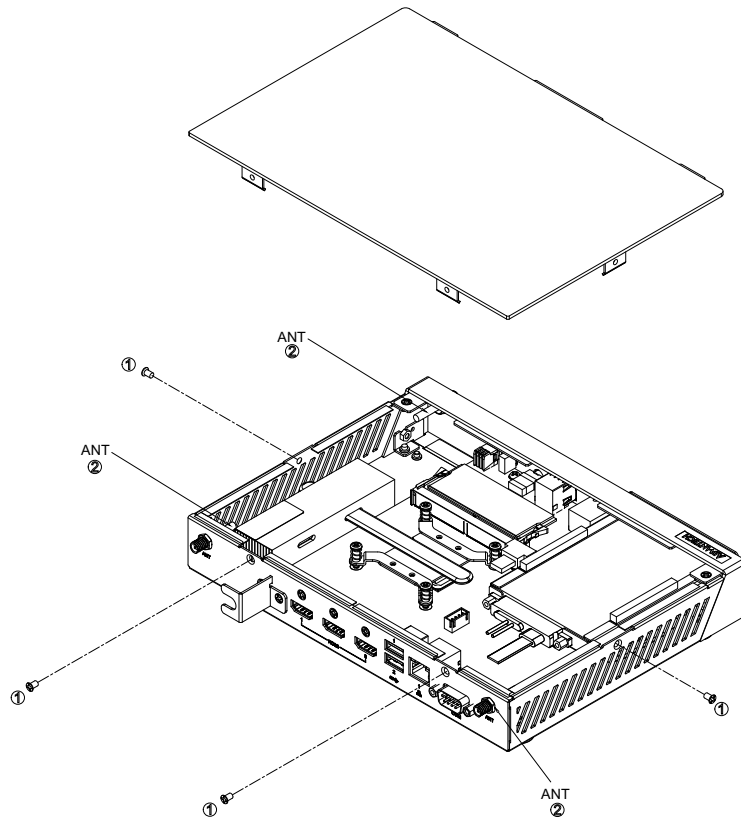


Figure 2.15 Antenna module installation

2.4.4 Mount Brackets Installation

1. Loosening the fixing screws on the bottom side.
2. Fixing the two mount brackets with 4 screws directly.

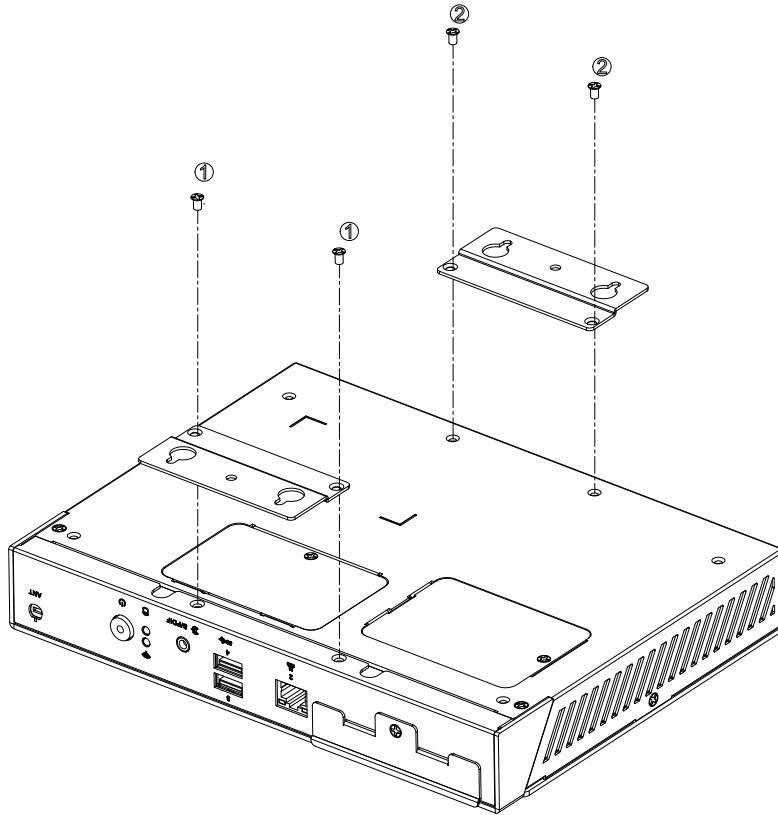


Figure 2.16 Mount brackets installation

2.4.5 Rubber Feet Installation

1. Retrieve the four rubber feet from the accessory box.
2. Attach the rubber feet to the four corners and fix them by four screws directly.

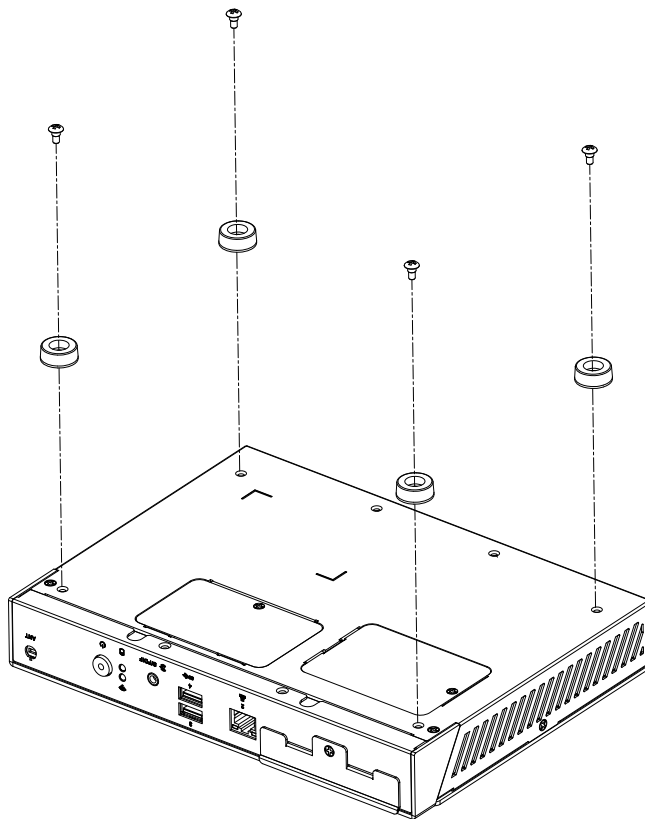


Figure 2.17 Rubber feet Installation

Chapter 3

BIOS Settings

This chapter introduces how to set BIOS configuration data.

3.1 BIOS Introduction

Using the AMI BIOS Setup program, users can modify the BIOS settings and control various system features. This chapter describes the basic navigation of the BIOS setup screens for the DS-780 series.

The AMI BIOS's ROM features a built-in setup program that allows users to modify the basic system configuration. This information is stored in the flash portion of the CMOS to ensure the setup information is retained even when the system is powered off.

3.2 Entering Setup

3.2.1 Main Setup

When first entering the BIOS Setup Utility, users will land on the Main setup screen. Users can always return to the Main setup screen by selecting the Main tab.

The Main BIOS setup screen features two main frames. The left frame displays all configurable options. The blue options can be configured, whereas the gray options cannot. The right frame displays the key legend, above which is an area reserved for text messages. When an option is selected in the left frame, the text becomes white and is often accompanied by a text message.

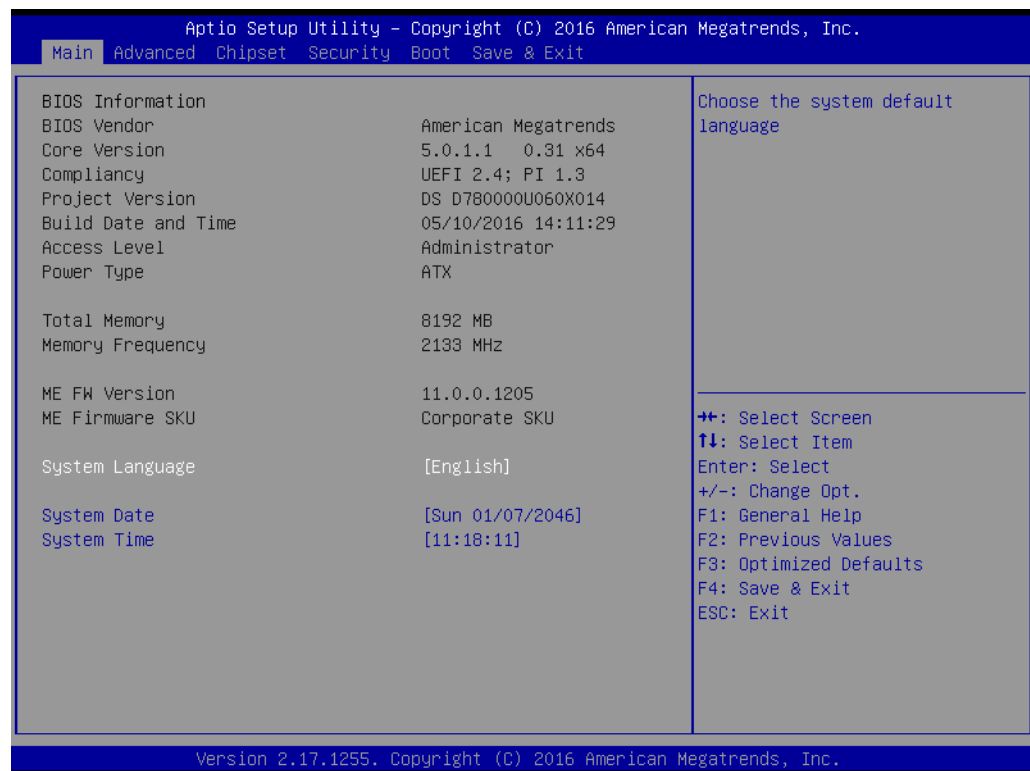


Figure 3.1 Main setup screen

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

3.2.2 Advanced BIOS Setup

Select the Advanced tab from the DS-780 setup screen to enter the Advanced BIOS setup screen. You can select any of the items in the left frame of the screen, such as CPU configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screens are shown below. The sub-menus are described on the following pages.

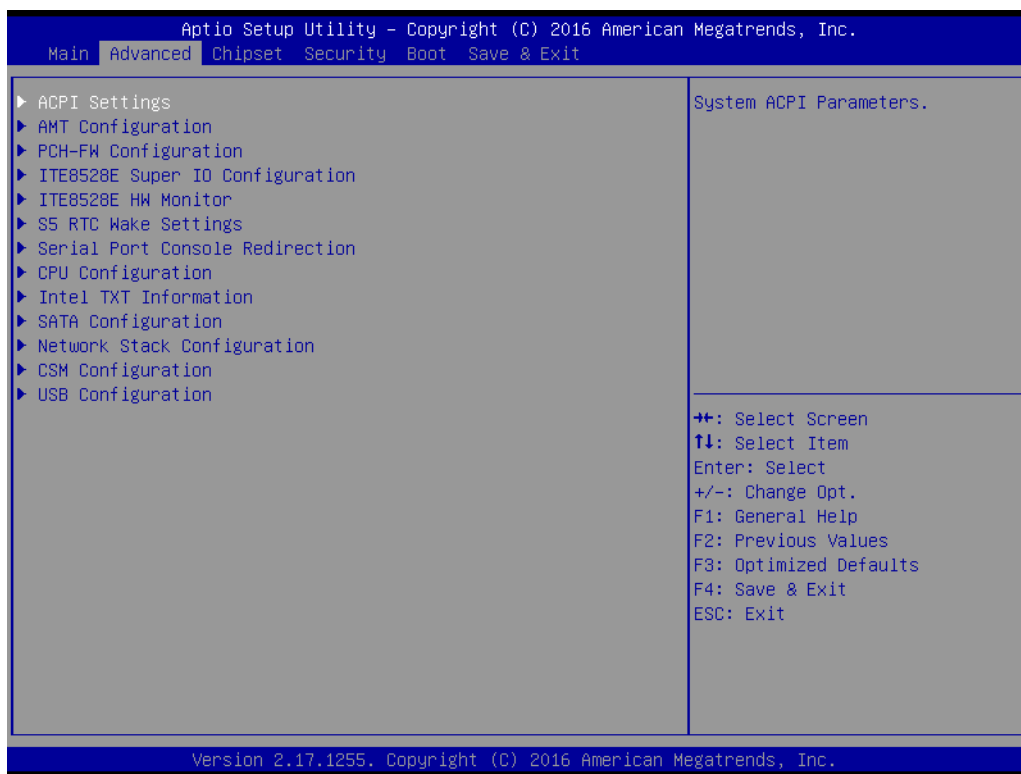


Figure 3.2 Advanced BIOS setup screen

- **ACPI Settings**

This item allows users to control hardware monitoring and power management.

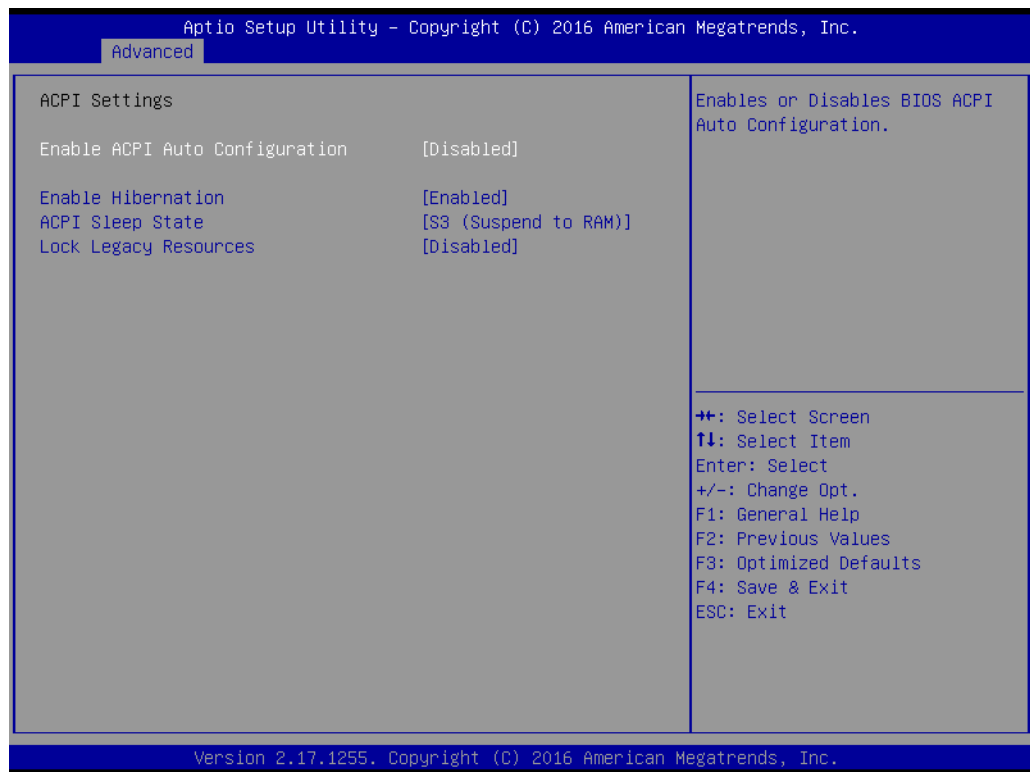
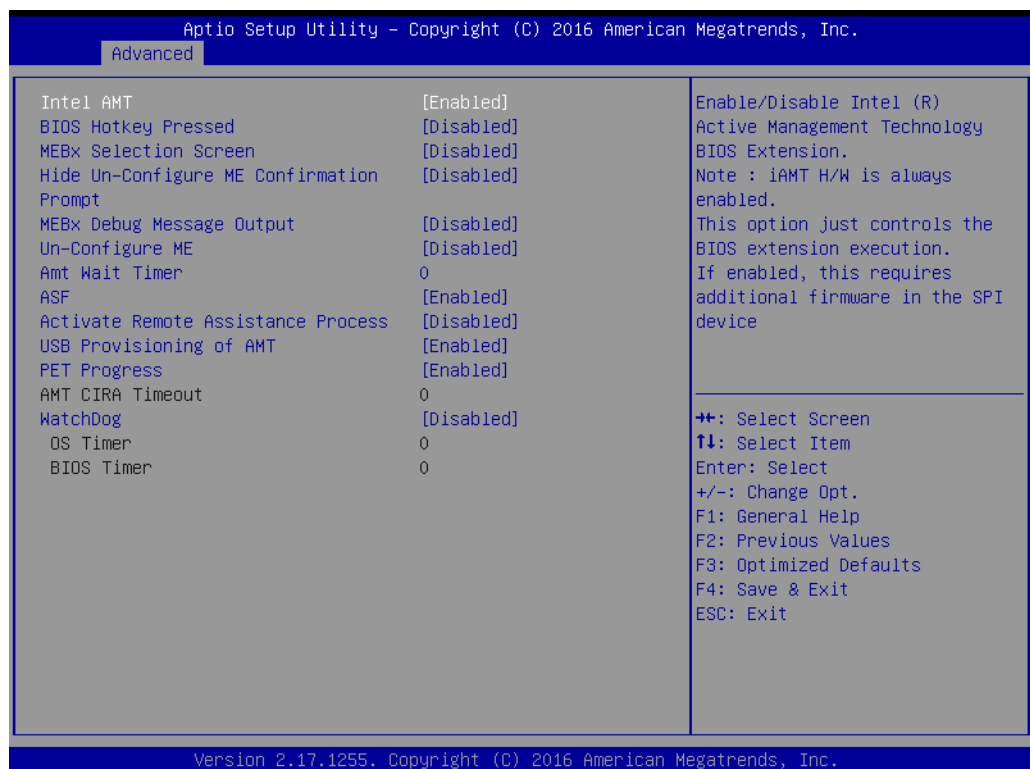


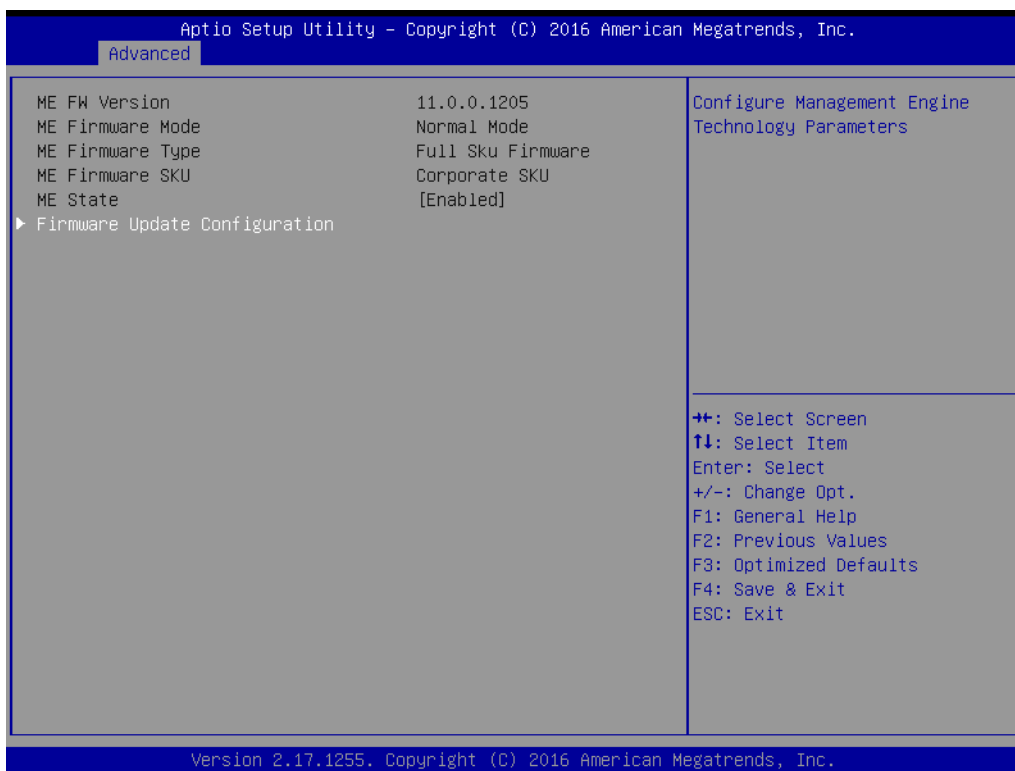
Figure 3.3 ACPI setup screen

- **AMT Configuration**

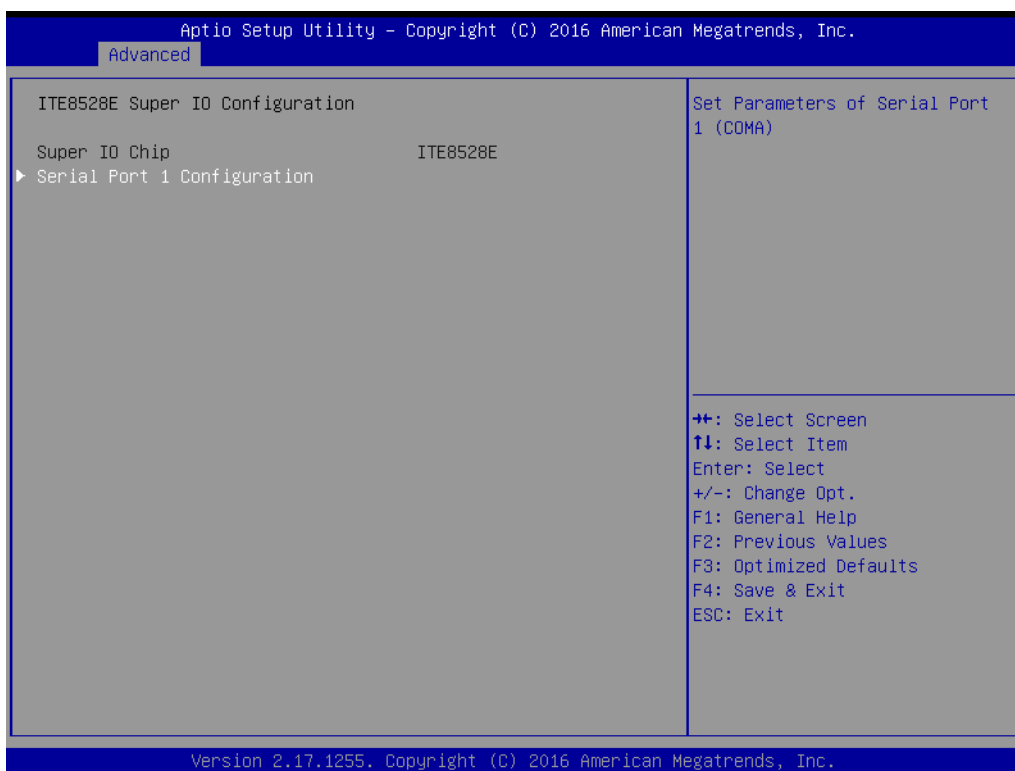
This section is used to configure Active Management Technology (AMT) options. Intel® AMT Enables or disables Active Management Technology



- **PCH-FW Configuration**
Configure Management Engine Technology Parameters

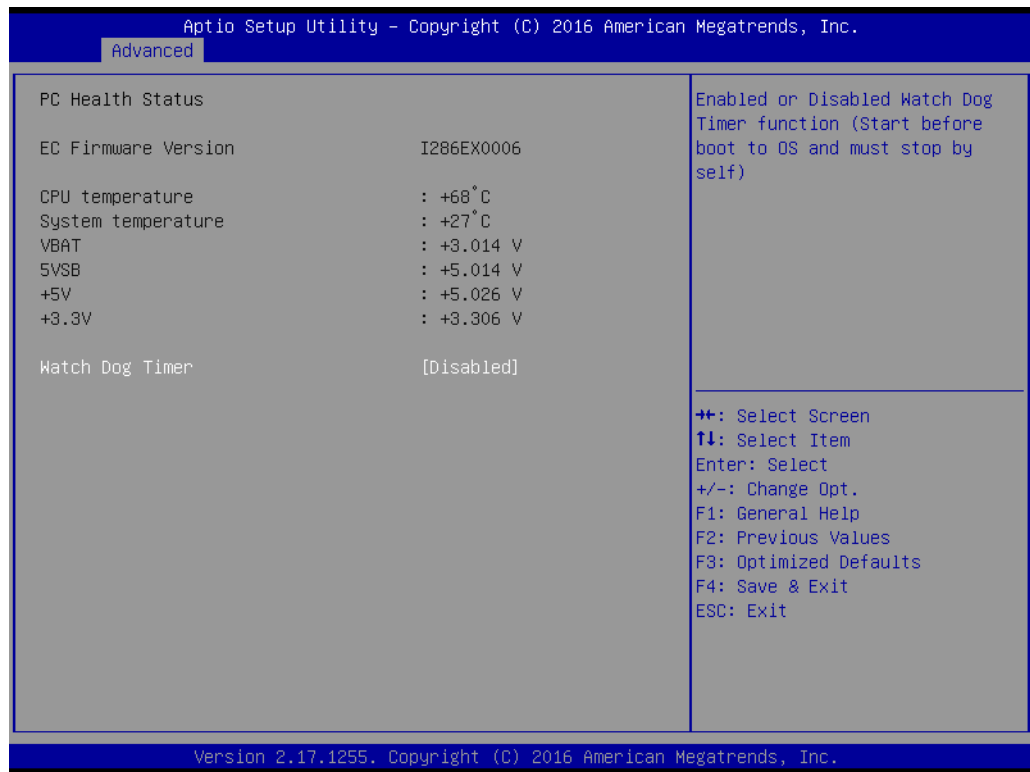


- **ITE8528E Super I/O Configuration**
System super I/O chip parameters



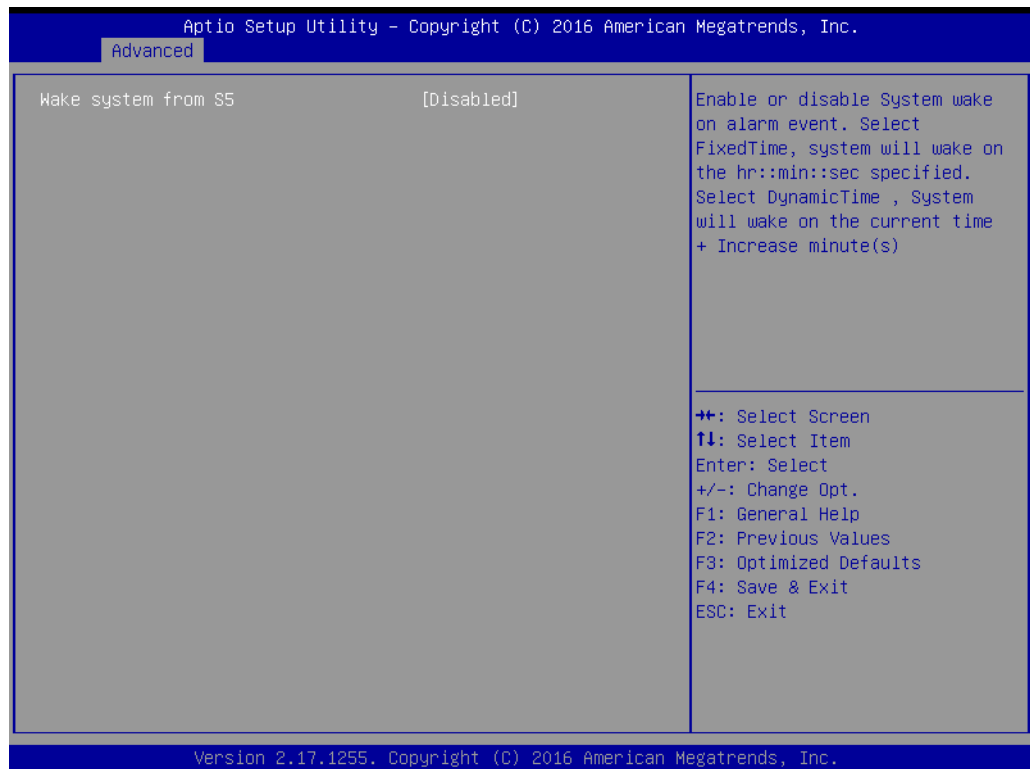
■ **ITE8528E HW Monitor**

Enabled or disabled watch dog timer function (Start before boot to OS and must by self)

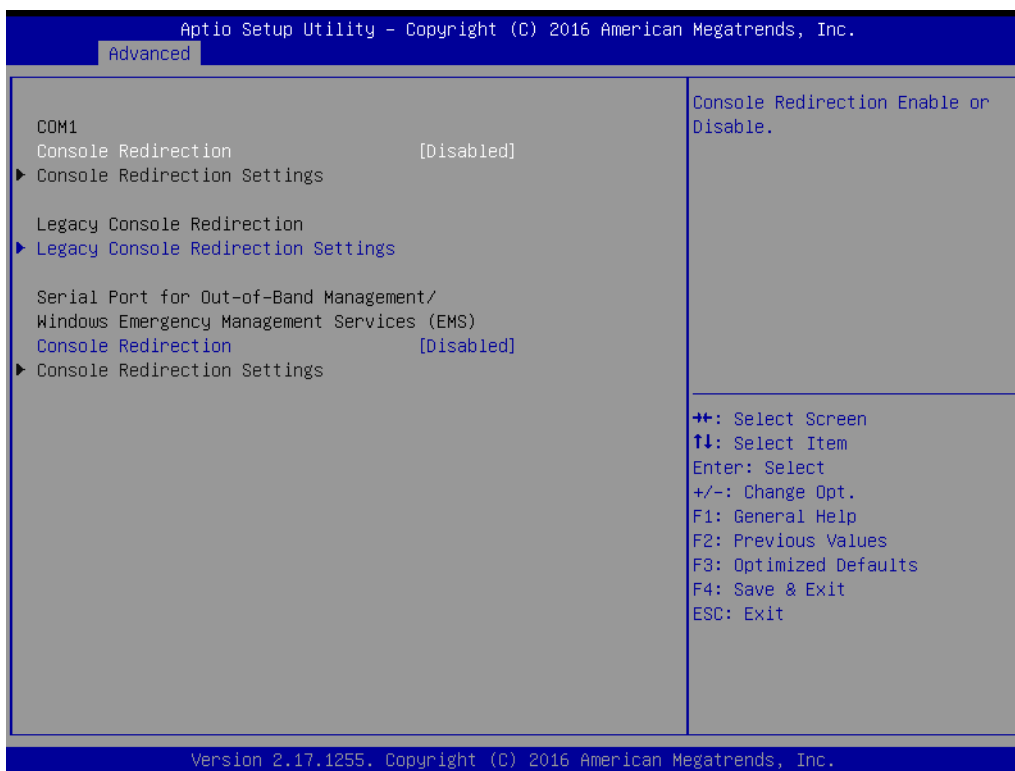


■ **S5 RTC Wake Settings**

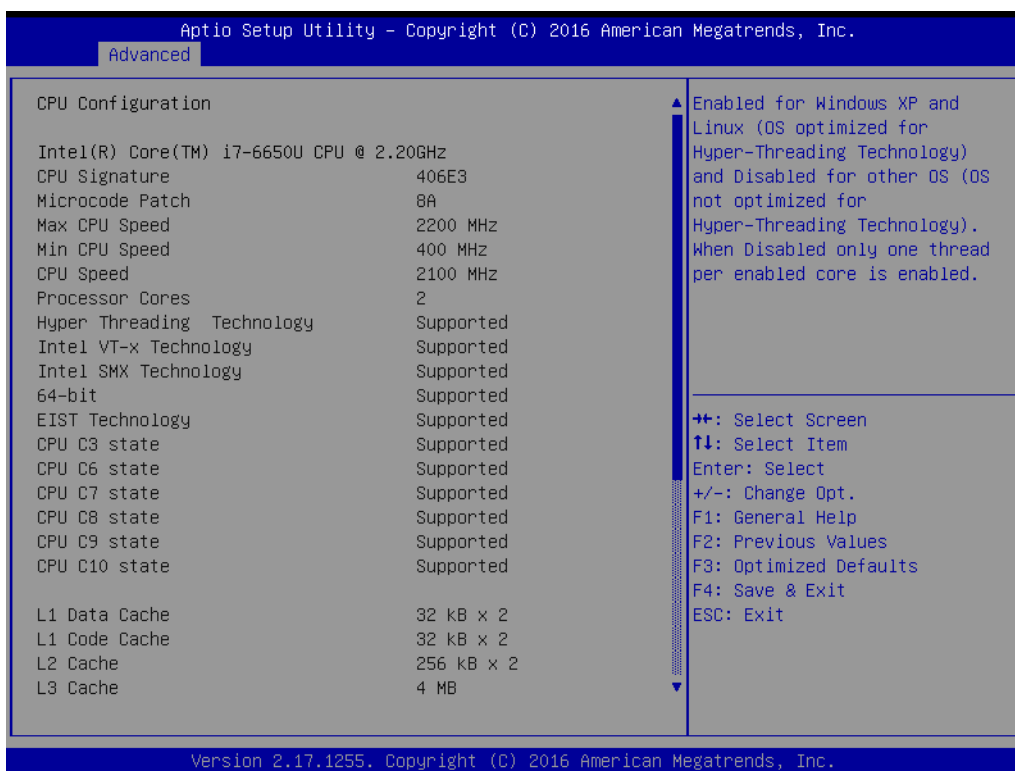
Enable or disable system wake on alarm event.



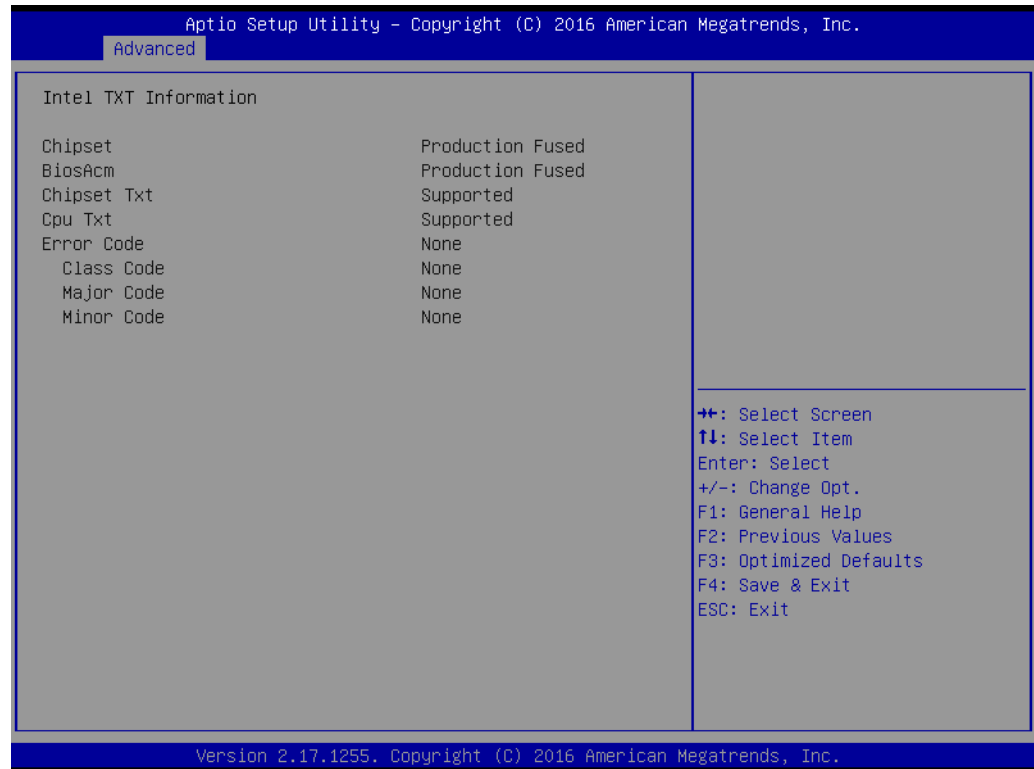
- **Serial Port Console Redirection**
Console redirection enable or disable



- **CPU Configuration**
CPU configuration parameters

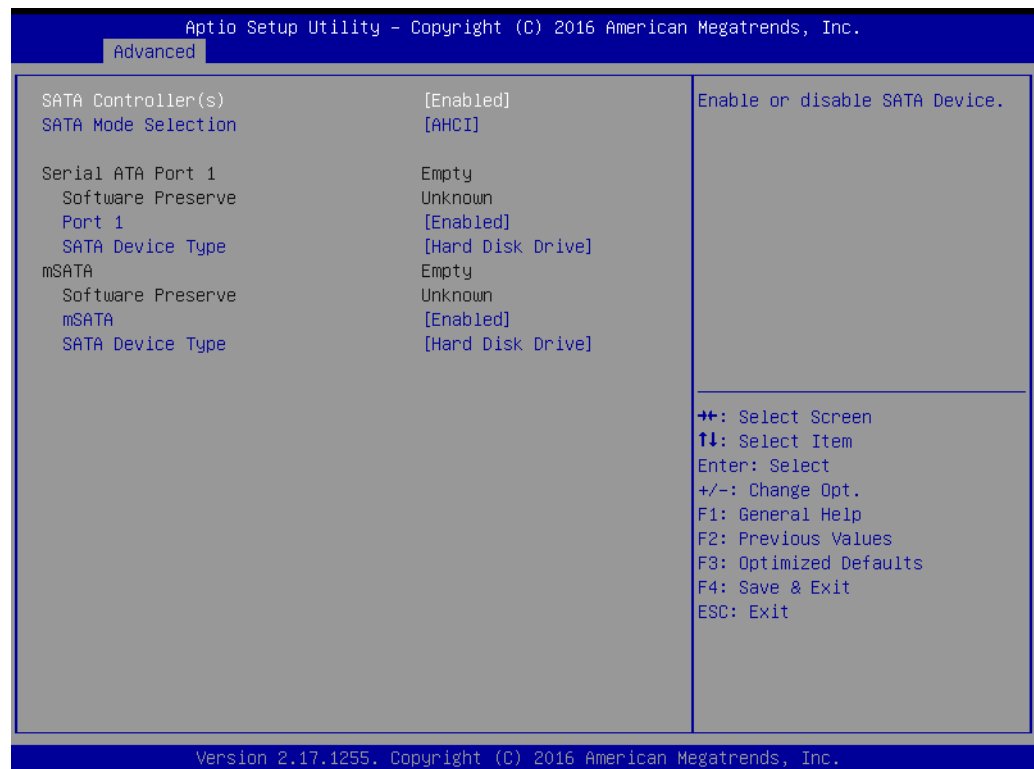


■ Intel TXT Information



■ SATA Configuration

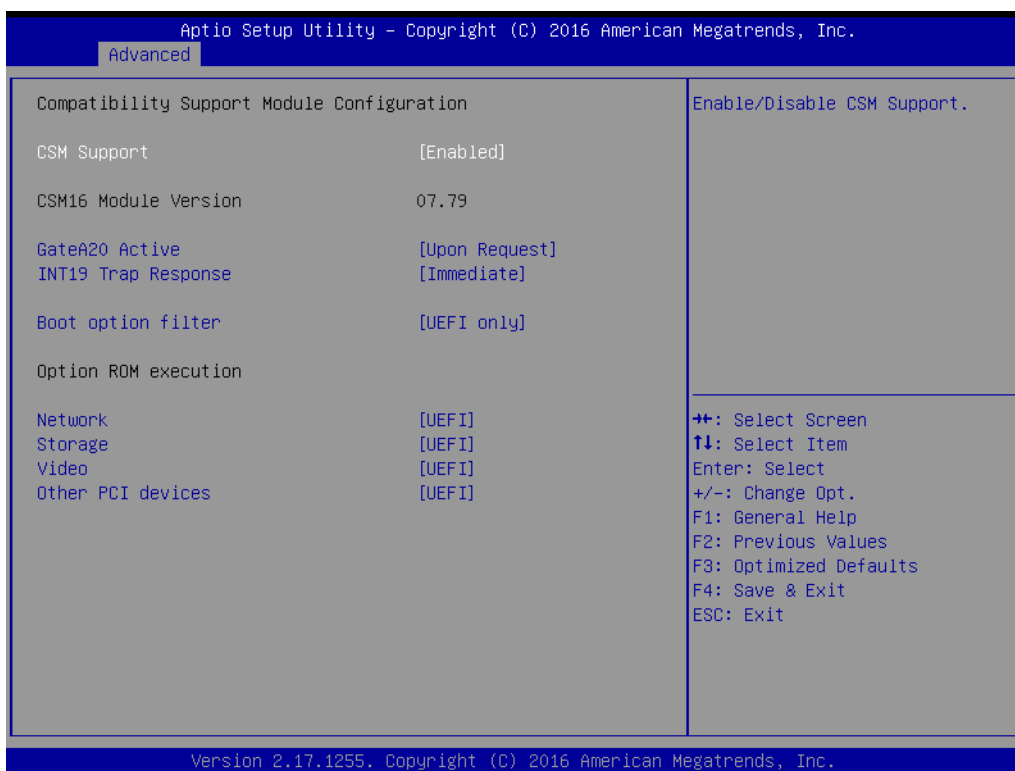
Enable or disable SATA Device



- **Network Stack configuration**
Enable/Disable UEFI network stack.



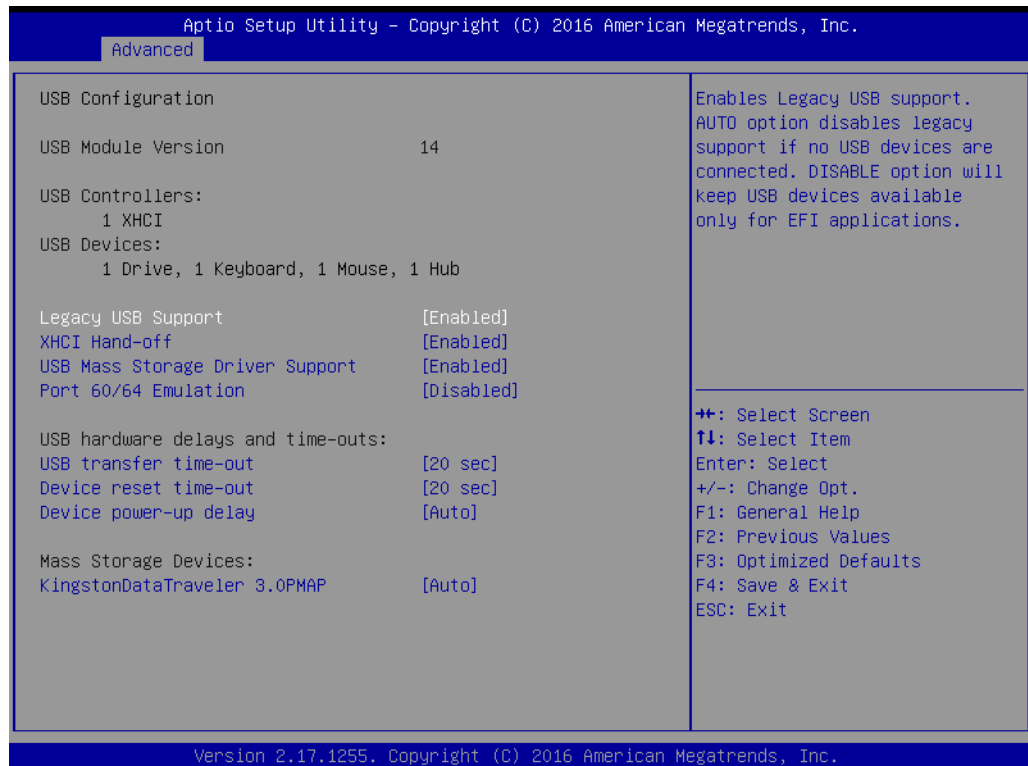
- **CSM Configuration**
Enable/disable option ROM execution



■ USB Configuration

USB configuration parameters

- Legacy USB Support
Enable/disable legacy USB support. The Auto option disables legacy support if no USB devices are connected. The Disable option renders USB devices available for EFI applications only.
- XHCI Hand-Off
This provides a workaround for OS without XHCI hand-off support. The XHCI ownership change should be claimed by the XHCI driver.
- USB Mass Storage Driver Support
Enable/disable USB mass storage driver support
- Port 60/64 Emulation
Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-usb aware OSes.
- USB Transfer Timeout
Allows users to set the timeout value for control, bulk, and interrupt transfers; options include 1, 5, 10, and 20 seconds.
- Device Reset Timeout
Allows users to set the USB mass storage device start unit command timeout time; options include 10, 20, 30, and 40 seconds.
- Device Power-Up Delay
Enable/disable



3.2.3 BIOS Chipset setup

Select the Chipset tab in the DS-780 BIOS Setup Utility to enter the BIOS Chipset setup screen. Users can select any item displayed in the left frame of the screen.

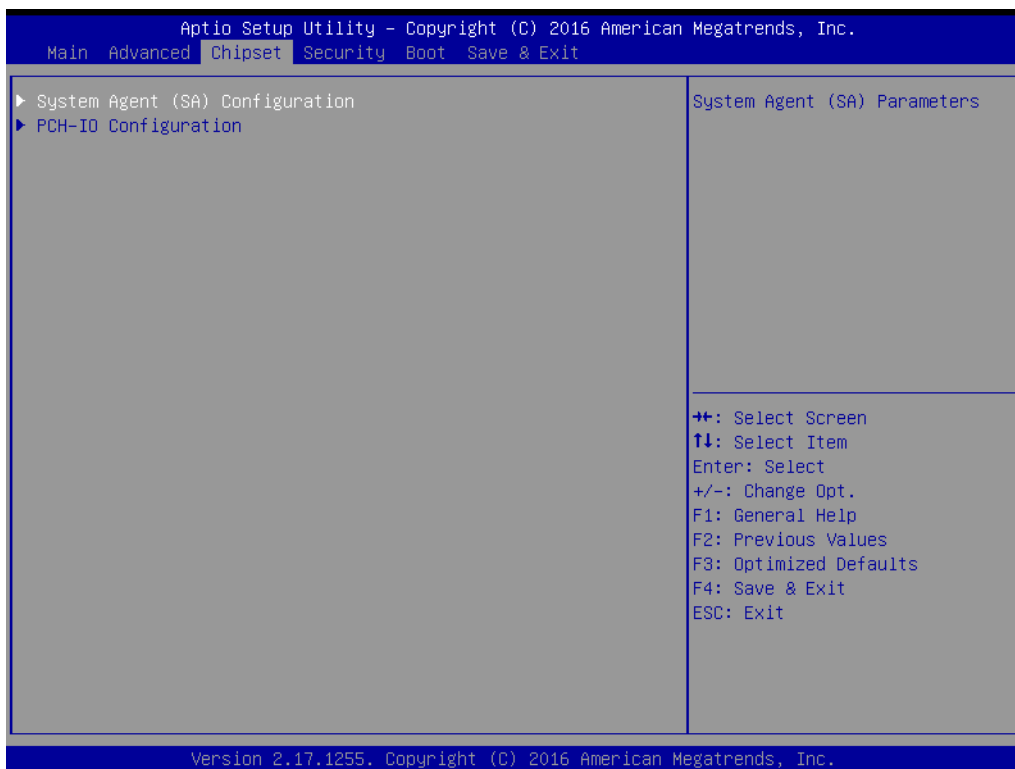
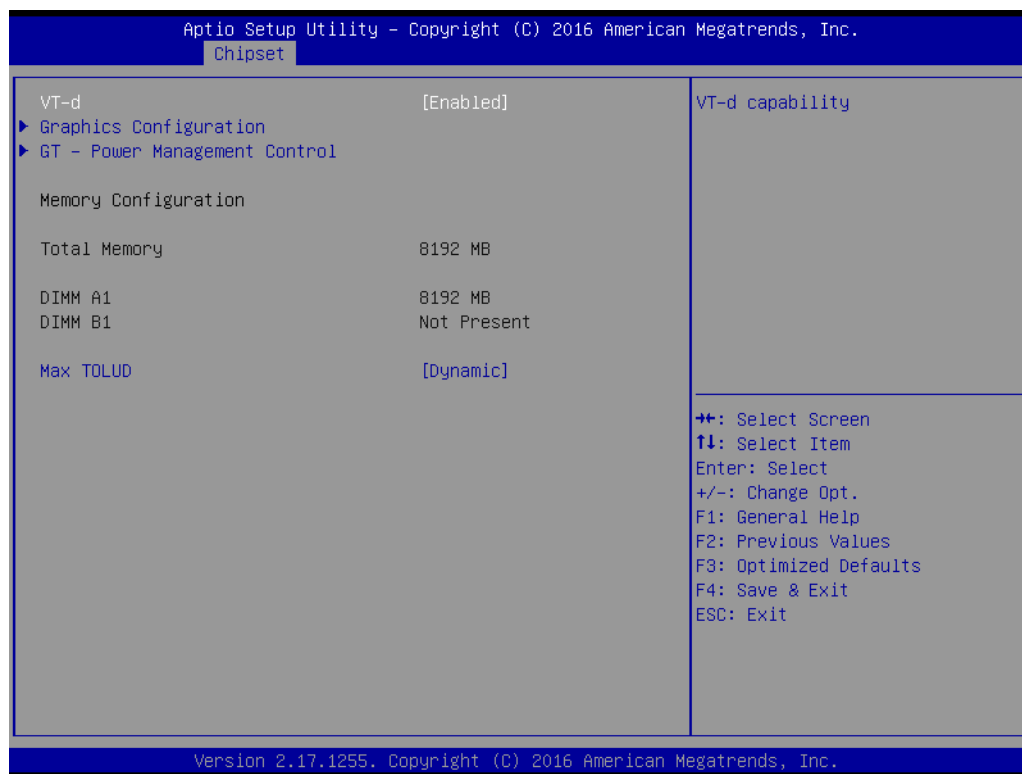


Figure 3.4 BIOS Chipset setup

- **System Agent (SA) Configuration**
 - Vt-d capability
 - Graphics configuration
 - GT – Power management control
 - Max TOLUD



■ PCH-IO Configuration

PCH-IO Parameters

- PCI Express Configuration
 - PCI Express Configuration settings
- USB Configuration
 - USB configuration settings
 - a.USB Precondition
 - b.XHCI Disable Compliance Mode
 - c.USB port Disable override
- HD Audio
 - Control detection of the HD-Audio device.
 - Disable=HDA will be unconditionally disabled
 - Enable=HDA will be unconditionally enabled
 - Auto= HDA will be enabled if present, disable otherwise.
- LAN1 Control
 - Enable or disable onboard NIC
- LAN2 Control
 - Enable or disable onboard NIC
- PCIe Wake
 - Enable/disable PCIE to wake the system from S5.
- Wake on WLAN Enable from DeepSx
 - Enable/Disable PCI Express wireless LAN to wake the system from DeepSx.
- State after G3
 - Specify what state to go to when power is re-applied after a power failure (S3 state)

3.2.4 BIOS Security setup

Select the Security tab from the setup screen to enter the BIOS Security setup screen.

Set Administrator Password and User password.

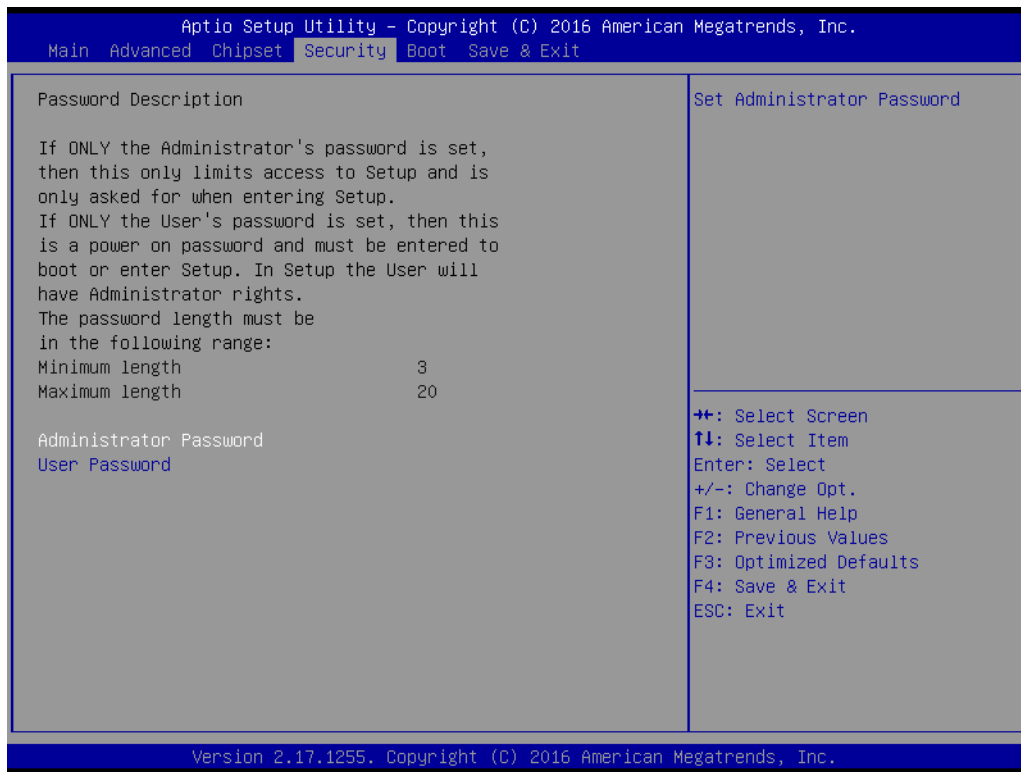


Figure 3.5 BIOS Security setup

3.2.5 BIOS Boot setup

Select the Boot tab from the DS-780 setup screen to enter the BIOS Boot setup screen. Users can select any item in the left frame of the screen.

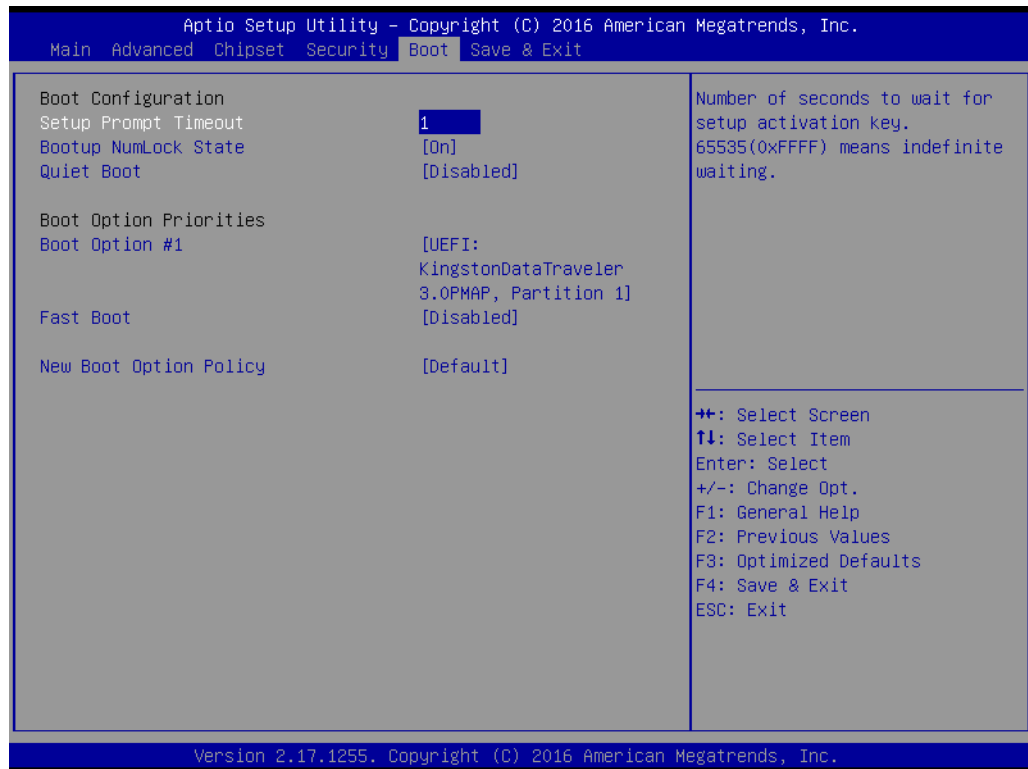


Figure 3.6 BIOS Boot setup

- **Setup Prompt Timeout**
Allows users to set the number of seconds to wait for a setup activation key. A value of 65535 (0xFFFF) means wait indefinitely.
- **Bootup NumLock State**
Allows users to select the keyboard NumLock state
- **Quiet Boot**
Enable/disable quiet booting
- **Boot Option #1**
Set the system boot order
- **Fast Boot**
Enable/disable rapid booting by initializing the minimum number of devices necessary for launching the active boot option.
- **New boot option policy**
Controls the placement of newly detected UEFI boot options.

3.2.6 BIOS Save& Exit setup

Select the Save & Exit tab from the setup screen to enter the BIOS Save & Exit setup screen.

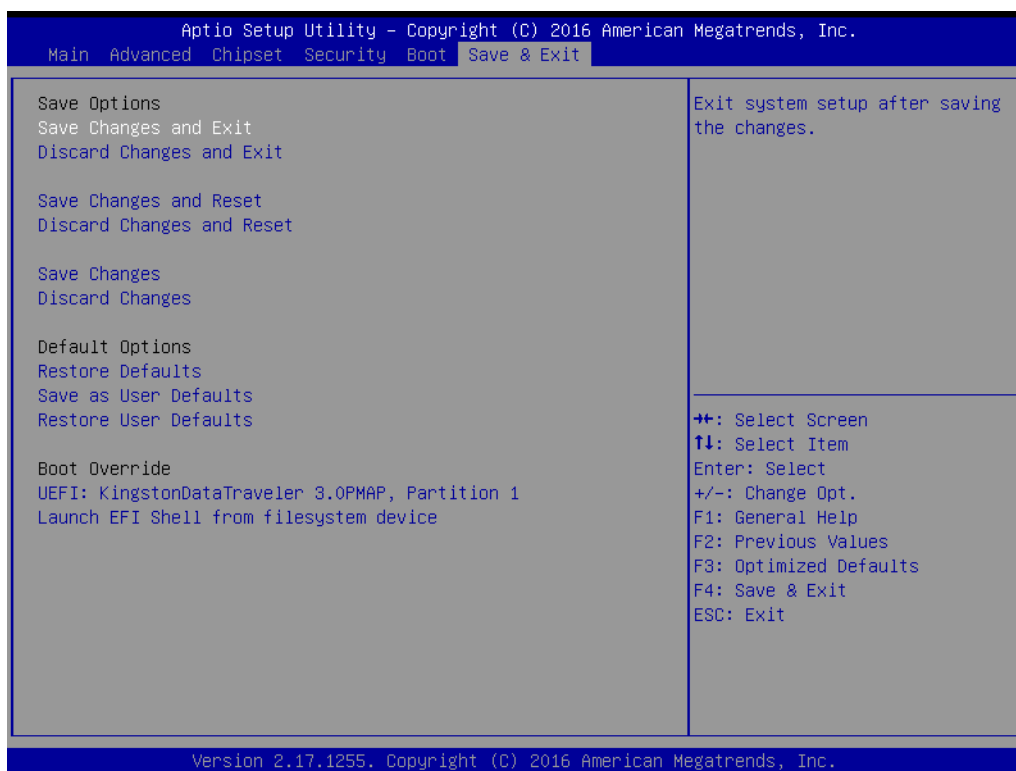


Figure 3.7 BIOS Save& Exit setup

- **Save Changes and Exit**
Exit system setup after saving changes
- **Discard Changes and Exit**
Exit system setup without saving changes
- **Save Changes and Reset**
Reset the system after saving changes
- **Discard Changes and Reset**
Reset the system without saving changes
- **Save Changes**
Save changes to all setup options
- **Discard Changes**
Discard changes to all setup options
- **Restore Defaults**
Restore/load the default values for all setup options
- **Save as User Defaults**
Save changes as User Defaults
- **Restore User Defaults**
Restore the User Defaults to all setup options
- **Boot Override**
 - Launch EFI Shell From File System Device
Allows users to launch the EFI Shell application (Shell.efi) from an available file system device

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