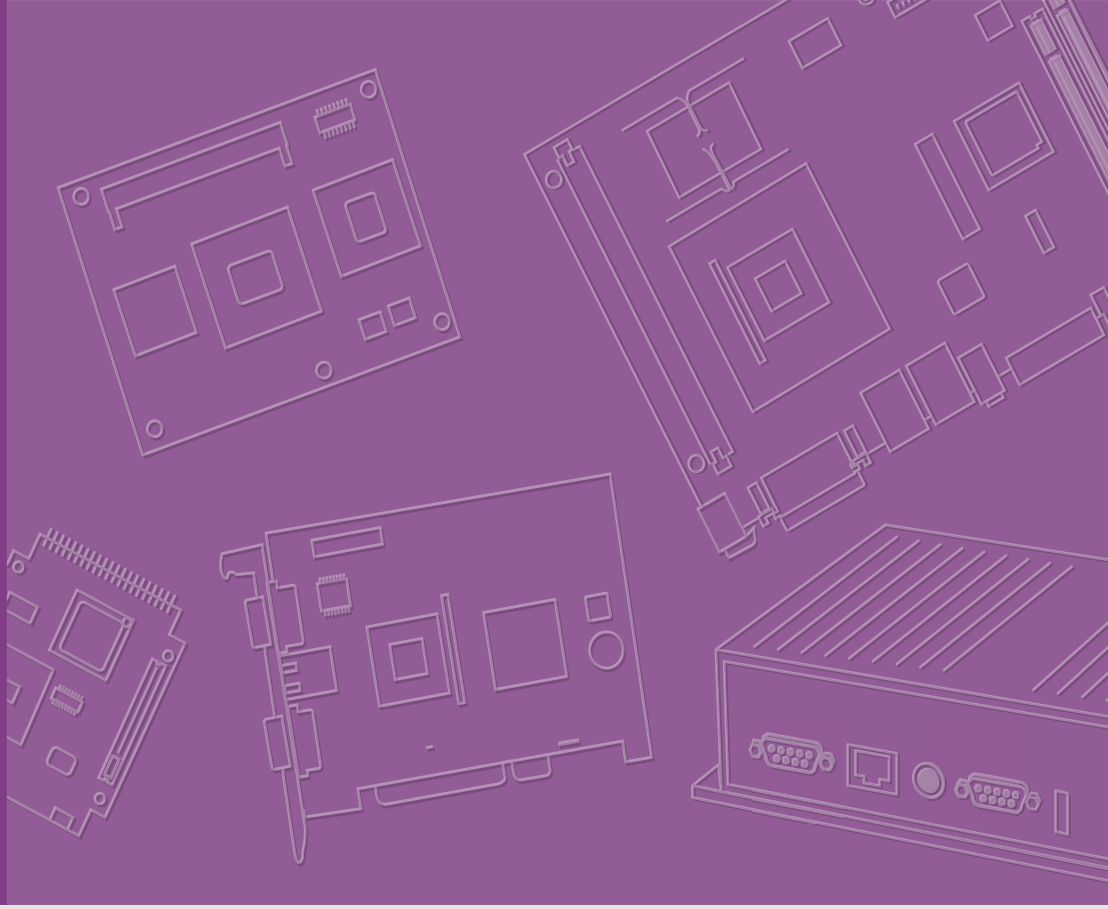

User Manual

ARK-2250

Computer

ADVANTECH

Enabling an Intelligent Planet

Attention!

Please note:

This package contains a hard-copy user manual in Chinese for China CCC certification purposes, and there is an English user manual included as a PDF file on the website. Please disregard the Chinese hard copy user manual if the product is not to be sold and/or installed in China.

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For technical support and service, please visit our support website at:

http://support.advantech.com.tw/support/

Part No. 2006K22500 Edition 1

Printed in China May 2017

Product Warranty (2 years)

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

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

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

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

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

Declaration of Conformity

FCC Class B

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

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

Technical Support and Assistance

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

Warnings, Cautions and Notes

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

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

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

Note! *Notes provide optional additional information.*

Packing List

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

- 1 x ARK-2250 unit
- 1 x Registration and 2 years warranty card
- 1 x China RoHS
- 1 x 2-pole Phoenix to DC jack power cable
- 1 x Utility CD
- 1 x Simplified Chinese manual

Ordering Information

Model Number	Description
ARK-2250L-U6A1E	ARK-2250L Intel Core i7-6600U 2.6GHz system
ARK-2250L-U3A1E	ARK-2250L Intel Core i3-6100U 2.3GHz system

Optional Accessories

For ARK-2250

Part Number	Description
96PSA-A60W12W6	AC-to-DC Adapter, DC12V/5A 60W with lockable DC jack
MOS-1120Y-0201E	Isolated RS-232, 2-Ch, DB9
MOS-1120Y-1401E	Non-Isolated RS-232, DB37, 4-Ch
MOS-1121Y-0201E	Isolated RS-422/485, 2-Ch, DB9
MOS-1121Y-1401E	Non-Isolated RS-422/485, DB37, 4-Ch
MOS-2120-Z1101E	Giga LAN Ethernet module, 1-Ch
MOS-2220-X1101E	Parallel LPT module, 1-Ch, USB I/F
MOS-1130Y-0201E	Isolated CANBus, 2-Ch, DB9, PCIe I/F
MOS-2230-Z1201E	CANBus module, 2-Ch, USB I/F
MOS-1110Y-0101E	Isolated 16 DI/8 DO, 1-Ch, DB37, PCIe I/F
MIOE-PWR2-00A1E	9~36V DC-in power module
96PSA-A65W19P2-1	AC-to-DC Adapter, DC19V/3.42A 65W (for MIOe-PWR2)
AMO-2201E	4x RS232/422/485+ removable 2.5" drive (2nd layer)
AMO-2203E	2x isolated CAN-Bus (2nd layer)
AMO-2204E	3x GbE + iDoor (2nd layer, this iDoor support USB I/F only)

Safety Instructions

1. Please read these safety instructions carefully.
2. Please keep this User's Manual for later reference.
3. Please disconnect this equipment from AC outlet before cleaning. Use a damp cloth. Don't use liquid or sprayed detergent for cleaning. Use moisture sheet or clothe for cleaning.
4. For pluggable equipment, the socket-outlet shall near the equipment and shall be easily accessible.
5. Please keep this equipment from humidity.
6. Lay this equipment on a reliable surface when install. A drop or fall could cause injury.
7. The openings on the enclosure are for air convection hence protecting the equipment from overheating. DO NOT COVER THE OPENINGS.
8. Make sure the voltage of the power source when connecting the equipment to the power outlet.
9. Place the power cord such a way 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 long time, disconnect the equipment from mains to avoid being damaged by transient over-voltage.
12. Never pour any liquid into ventilation openings; this could cause fire or electrical shock.
13. Never open the equipment. For safety reasons, only qualified service personnel should open the equipment.
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 -40° C (-40° F) or above 85° C (185° 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.
17. The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).
18. RESTRICTED ACCESS AREA: The equipment should only be installed in a Restricted Access Area.
19. DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

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

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

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

FCC RF Radiation Exposure Statement:

1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2. This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

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

(1) this device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

According to FCC 15.407(e), the device is intended to operate in the frequency band of 5.15GHz to 5.25GHz under all conditions of normal operation. Normal operation of this device is restricted to indoor used only to reduce any potential for harmful interference to co-channel MSS operations.

Contents

Chapter 1

General Introduction

This chapter gives background information on ARK-2250 series.

1.1 Introduction

ARK-2250 is an intelligent, modular and fanless embedded system. A fully modular design, ARK-2250 supports easy I/O switching with optional iDoor modules, wide range power board and MIOe board expansions. ARK-2250 is targeted at factory automation, machine automation, kiosks, and self-service applications.

Rugged & Multifunctional Design

ARK-2250 embedded box PC is powered by an Intel 6th gen core i3/i7 processor. The compact size system provides a selection of I/O ports: 2 x USB 3.0, 4 x USB 2.0, 2 x GbE, 4 x COM, 2 x mPCIe and 1 x 2.5" HDD. The default power input is 12V DC in, and it also supports an optional wide range 9~36V power module with wide temperature operation of -20 to 60C. ARK-2250 passes worldwide certification including CE/FCC, CB, UL, CCC and BSMI.

Multiple Display Support

ARK-2250 supports up to 3 display types: VGA, HDMI as the default display, and with an expansion display module, it can provide DP, HDMI, DVI-D as the 3rd optional display port. The graphic engine is DirectX 11.3, OpenGL 4.4, and OpenCL 2.1 Full AVC/VC1/MPEG2 HW Decode.

Built in Intelligent Management Tools - WISE-PaSS/RMM

Advantech WISE-PaSS/RMM provides a valuable suite of programmable APIs such as multi-level watchdog, hardware monitor, system restore, and other user-friendly interface. iManager is an intelligent self-management cross platform tool that monitors system status for problems and takes action if anything is abnormal. It offers a boot up guarantee in critical, low temperature environments so systems can automatically recover when voltages dip. WISE-PaSS/RMM makes the whole system more reliable and more intelligent. ARK-2250L provides easy remote management so users can monitor, configure, and control a large number of terminals to make maintenance and system recovery simpler.

1.2 Product Features

1.2.1 General

- **CPU:**
  Intel 6th gen core i7-6600U processor 2.6GHz
  Intel 6th gen core i3-6100U processor 2.3GHz
- **BIOS:** AMI UEFI 128Mbit
- **System Memory:** 1x DDR3L 1600MHz up to 16 GB
- **Watchdog Timer:** Single chip Watchdog 255-level interval timer, setup by software
- **I/O Interface:** 4 x RS232/422/485
- **USB:** 2 x USB 2.0, 4 x USB 3.0 compliant ports
- **Audio:** High Definition Audio (HD), Line out, Mic-in
- **Storage:** 1 x mSATA and 1 x high capacity 2.5” SATA HDD (up to 12.5mm height)
- **Expansion Interface:**
  - Supports 2 x MiniPCIe (1 with SIM holder)
  - Supports 1 x iDoor expansion (by 1st layer)
  - Supports 1 x ARK Plus expansion (by 2nd layer)

1.2.2 Display

- **Controller:** Intel® HD Graphics 520
- **Resolution:**
  - VGA: Supports up to 1920 x 1200
  - HDMI: Supports up to 4096 x 2160 @ 24Hz
- **Dual Display:** VGA+HDMI
- **Triple Display:** VGA+HDMI+3rd optional display

1.2.3 Ethernet

- **Chipset:**
  - LAN1 Intel i219
  - LAN2 Intel i210
- **Speed:** 1000 Mbps
- **Interface:** 2 x RJ45
- **Standard:** Compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3x, IEEE 802.3y, IEEE 802.ab.

1.3 Chipset

1.3.1 Functional Specification

1.3.1.1 Processor

Processor	Intel 6th gen core i7-6600U processor 2.6GHz Intel 6th gen core i3-6100U processor 2.3GHz
Memory	Supports DDR3L 1600MHz up to 16GB 1 x 204-pin SODIMM socket type

1.3.1.2 Chipset

Internal Graphics Features	■ DirectX 11.3, OpenGL 4.4 ■ Display Ports VGA + HDMI, HDMI 1.4a
Video Accelerator	■ H/W accelerated video decode ■ Video decoder: AVC/VC1/MPEG2 HW Decode ■ Supports DVD, Blu-ray, and HD video
SATA Interface	■ Supports several optional sections of Serial ATA II: Extensions to Serial ATA 1.0 Specification, Revision 1.0 ■ Supports SATA transfers to 300 Mbytes/sec. ■ Supports mSATA socket
USB Interface	■ USB host interface with support for 1 USB 3.0 and 4 USB 2.0 ports ■ All ports are High-Speed, Full-Speed, and Low-Speed capable ■ Supports legacy keyboard/mouse software
BIOS	■ UEFI 128Mbit

1.3.1.3 Others

Serial ports	■ COM1 ~ COM4: Supports RS-232/422/485 and change mode under BIOS setting ** COM1 ~ COM4 RS-485 supports auto-flow control. COM connector: D-SUB CON. 9P
Ethernet	**LAN1 Intel i219, LAN2 Intel i210** ■ Compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3x, IEEE 802.3y, IEEE 802.ab. ■ Supports 10/100/1000 Mbps. LAN Connectors: Phone Jack RJ45 8P 90D(F)
Audio	**Audio Codec: Realtek ALC888S:** ■ Compliant with HD Audio specifications ■ Supports 16/20/24-bit DAC and 16/20/24-bit ADC resolution ■ Supports: Line-out, Mic-in Audio Connectors: Ear Phone Jack * 2
Battery backup	■ BATTERY 3V/210 mAh with WIRE x 1

1.3.2 WISE-PaSS/RMM

Sequence control	Supported
Watchdog timer	Multi Level WDT Programmable 1-255 sec / min

Hardware monitor	CPU Temperature / input Current / input Voltage
Power saving	Deep sleep S5 mode
System information	Running HR / Boot record

1.4 Mechanical Specifications

1.4.1 Dimensions

260[10.24] x 54[2.13] x 140.2[5.52] Unit: mm [Inch]

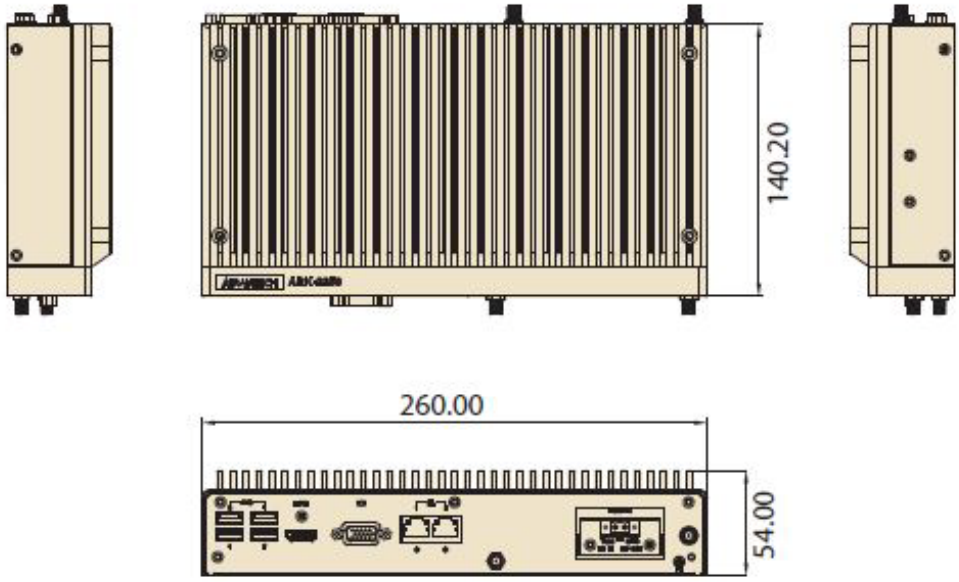


Figure 1.1 ARK-2250 Mechanical dimension drawing

1.4.2 Weight

2.3 kg (5.06 lb)

1.5 Power Requirement

1.5.1 System Power

- **Minimum power input:**
  - ARK-2250: DC 12V, 5A

1.5.2 RTC Battery

- Lithium 3 V/210 mAH

1.6 Environment Specification

1.6.1 Operating Temperature

- With Industrial Grade SSD/mSATA: -20 ~ 60° C (-4~140° F), with air flow, speed=0.7 m/sec
- With 2.5-inch hard disk 0 to 45° C (32~113° F), with air flow, speed=0.7 m/sec

1.6.2 Relative Humidity

- 95% @ 40° C (non-condensing)

1.6.3 Storage Temperature

- -40 ~ 85° C (-40 ~ 185° F)

1.6.4 Vibration during Operation

- When the system is equipped with SSD/mSATA: 3Grms, IEC 60068-2-64, random, 5 ~ 500 Hz, 1hr/axis, x,y,z 3 axes.

1.6.5 Shock during Operation

- When the system is equipped with SSD/mSATA: 30G, IEC 60068-2-27, half sine, 11 ms duration.

1.6.6 Safety

- UL, CB, CCC, BSMI

1.6.7 EMC

- CE, FCC, CCC, BSMI

Chapter 2

H/W Installation

This chapter introduces external IO and the installation of ARK-2250 hardware.

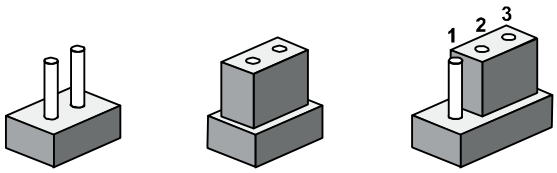
2.1 Introduction

The following sections show the internal jumpers settings and the external connector pin assignments for application.

2.2 Jumpers

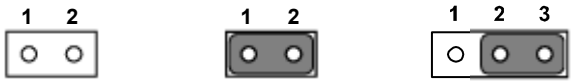
2.2.1 Jumper Description

You may configure ARK-2250 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**

The jumper settings are schematically depicted in this manual as follows.



open **closed** **closed 2-3**

A pair of needle-nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes. Generally, you simply need a standard cable to make most connections.

2.2.2 Jumper List

Table 2.1: Jumper setting	
J1	Auto Power On Setting
SW2	RTC Reset

2.2.3 Jumper Location

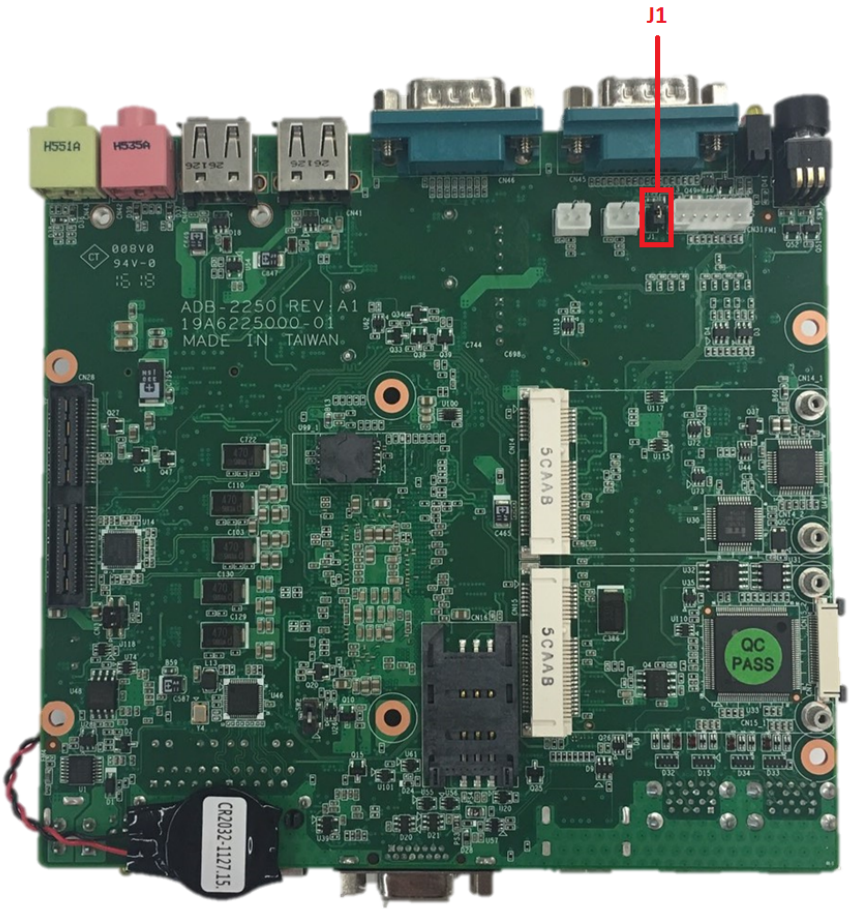


Figure 2.1 Jumper Layout

2.2.4 Jumper Setting

On the Motherboard

J1	Auto Power On Setting
Part Number	1653002101
Footprint	HD_2x1P_79_D
Description	PIN HEADER 2*1P 180D(M)SQUARE 2.0mm DIP W/O Pb
Setting	Function
NL	Power On by power button (default)
(1-2)*	Auto Power On

SW2	RTC Reset
Part Number	1600000071
Footprint	SW_3P_CJS-1201TA1
Description	CJS-1201TA1
Setting	Function
1*	Normal (Default)
3	RTC Reset

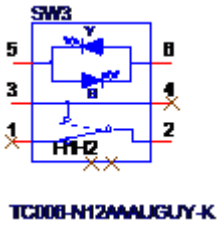
2.3 Connectors

Table 2.2: Connectors

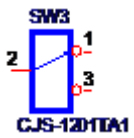
CN1	12V Power Input
CN2	NL/DCJACK_2
CN4	Battery
CN5	SODIMMDDR3_204
CN7	EC Debug Port
CN8	Power Switch
CN9	Reset
CN10	GPIO
CN11	SATA
CN12	SATA
CN13	SATA Power
CN39	SATA Power
CN14	Mini PCIE
CN15	Mini PCIE(mSATA)
CN16	SIM
CN19	COM1/COM2
CN20	NL/RJ45_W/XFMR&LED
CN21	LAN
CN22	NL/RJ45_W/XFMR&LED
CN24	External USB2.0+USB3.0
CN25	External USB2.0+USB3.0
CN27	VGA
CN28	MIOe
CN29	SMBus
CN31	PS2
CN34	HDMI
CN40	USB2.0
CN41	USB2.0
CN42	MIC_IN
CN43	LINE_OUT
CN45	COM3
CN46	COM4

J1 Auto Power On Setting	
Part Number	1653002101
Footprint	HD_2x1P_79_D
Description	PIN HEADER 2*1P 180D(M)SQUARE 2.0mm DIP W/O Pb
Setting	**Function**
NC	Power Button for Power On (default)
(1-2)*	Auto Power On

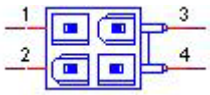
SW3 ON/OFF button LED	
Part Number	1600002144
Footprint	SW_6P_TC006-N12AAAUGUY-K_D
Description	TACT SW TC006-N12AABUGUY-K DIP 6P 8x17.85x12.6
Pin	**Function**
1	NC
2	GND
3	ON/OFF#
4	NC
5	LED_Yellow_standby
6	LED_Green_power on



SW2 RTC_RESET#	
Part Number	1600000071
Footprint	SW_3P_CJS-1201TA1
Description	DIP SW CJS-1201TA1 SMD 3P SPDT P=6.0mm W=2.5mm
Pin	**Function**
2->1	normal
2->3	RTC RST#



CN1 12V Power Input	
Part Number	1655003865
Footprint	WF_2x2P_165_BOX_RA_D_740SP
Description	ATX PWRCONN 2x2P 4.2mm 90D(M) DIP 740-77-04TS50
Pin	**Pin Name**
1	GND
2	GND
3	+12V
4	+12V



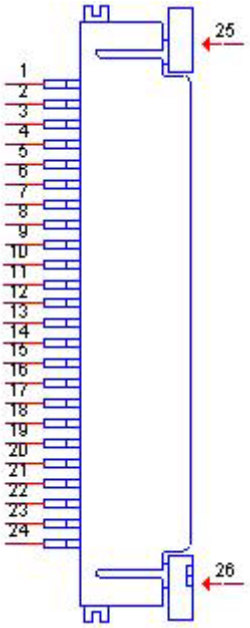
CN2 NL/DCJACK_2	
Part Number	1652005278
Footprint	PJ_2P_2DC-G213B200
Description	
Pin	**Pin Name**
1	+12V
2	GND
3	NC

CN4 Battery	
Part Number	1655005427-01
Footprint	WF_2P_49_53398-0271
Description	WAFER 2P 1.25mm 180D(M) SMD 53398-0271
Pin	**Pin Name**
1	+3V
2	GND

CN5 SODIMMDDR3_204	
Part Number	1651002088
Footprint	SODIMMDDR3_204P_AS0A626-HA
Description	DDR3 SODIMM H=9.2mm 204P SMD AS0A626-HASN-7H
Pin	**Pin Name**

CN6 SODIMMDDR3_204	
Part Number	1651002087-11
Footprint	DDR3_204P_AS0A626-N2S6-7H
Description	
Pin	**Pin Name**

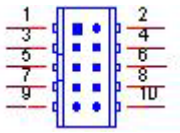
CN7 EC Debug Port	
Part Number	1654009557
Footprint	FPC24H-05M
Description	FFC/FPC Conn. 24P 0.5mm 90D(F) SMD 52435-2471
Pin	**Pin Name**
1	EC_KSI7
2	EC_KSI6
3	EC_KSI5
4	EC_KSI4
5	EC_KSI3
6	EC_KSI2
7	EC_KSI1
8	EC_KSI0
9	EC_KSO15
10	EC_KSO14
11	EC_KSO13
12	EC_KSO12
13	EC_KSO11
14	EC_KSO10
15	EC_KSO9
16	EC_KSO8
17	EC_KSO7
18	EC_KSO6
19	EC_KSO5
20	EC_KSO4
21	EC_KSO3
22	EC_KSO2
23	EC_KSO1
24	EC_KSO0
25	GND
26	GND



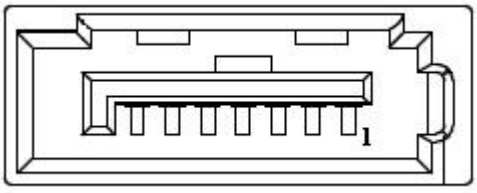
CN8 Power Switch	
Part Number	1655302020
Footprint	WF_2P_79_BOX_R1_D
Description	WAFER BOX 2P 2.0mm 180D(M) DIP A2001WV2-2P
Pin	**Pin Name**
1	PSIN
2	GND

CN9 Reset	
Part Number	1655302020
Footprint	WF_2P_79_BOX_R1_D
Description	WAFER BOX 2P 2.0mm 180D(M) DIP A2001WV2-2P
Pin	**Pin Name**
1	RESET#
2	GND

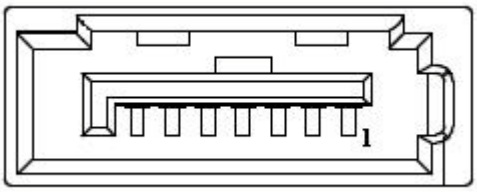
CN10 GPIO	
Part Number	1653004099
Footprint	HD_5x2P_79_23N685B-10M10
Description	BOX HEADER 5x2P 2.00mm 180D(M) SMD 23N685B-10M10
Pin	**Pin Name**
1	+5V
2	GPIO4
3	GPIO0
4	GPIO5
5	GPIO1
6	GPIO6
7	GPIO2
8	GPIO7
9	GPIO3
10	GND



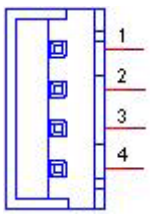
CN11 SATA	
Part Number	1654011616-01
Footprint	SATA_7P_WATF-07DBN6SB1U
Description	
Pin	**Pin Name**
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND



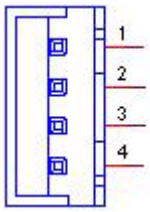
CN12 SATA	
Part Number	1654011616-01
Footprint	SATA_7P_WATF-07DBN6SB1U
Description	
Pin	**Pin Name**
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND



CN13 SATA Power	
Part Number	1655001154
Footprint	WF_4P_98_BOX_R1_D
Description	WAFER BOX 4P 2.50mm 180D(M) DIP 24W1170-04S10-01
Pin	**Pin Name**
1	+5V
2	GND
3	GND
4	+12V



CN39 SATA Power	
Part Number	1655001154
Footprint	WF_4P_98_BOX_R1_D
Description	WAFER BOX 4P 2.50mm 180D(M) DIP 24W1170-04S10-01
Pin	**Pin Name**
1	+5V
2	GND
3	GND
4	+12V



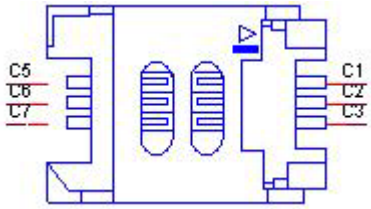
CN14 Mini PCIE	
Part Number	1654002538
Footprint	MINIPCIE_HALF_PICO_ITX
Description	
Pin	**Pin Name**
1	WAKE#
2	+3.3VSB
3	NC
4	GND
5	NC
6	+1.5V
7	NC
8	UIM_PWR
9	GND
10	UIM_DATA
11	REFCLK-
12	UIM_CLK
13	REFCLK+
14	UIM_RESET
15	GND
16	UIM_VPP
17	NC
18	GND
19	NC
20	W_DISABLE#
21	GND
22	PERST#
23	PERn0
24	+3.3VSB

25	PERp0
26	GND
27	GND
28	+1.5V
29	GND
30	SMB_CLK
31	PETn0
32	SMB_DAT
33	PETp0
34	GND
35	GND
36	USB D-
37	GND
38	USB D+
39	+3.3VSB
40	GND
41	+3.3VSB
42	NC
43	SEL
44	NC
45	NC
46	NC
47	NC
48	+1.5V
49	NC
50	GND
51	NC
52	+3.3VSB

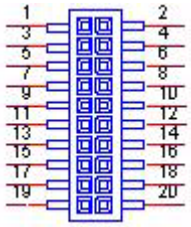
CN15 Mini PCIE(mSATA)	
Part Number	1654002538
Footprint	MINIPCIE_HALF_PICO_ITX
Description	
Pin	**Pin Name**
1	WAKE#
2	+3.3VSB
3	NC
4	GND
5	NC
6	+1.5V
7	NC
8	UIM_PWR
9	GND
10	UIM_DATA
11	REFCLK-
12	UIM_CLK
13	REFCLK+

14	UIM_RESET
15	GND
16	UIM_VPP
17	NC
18	GND
19	NC
20	W_DISABLE#
21	GND
22	PERST#
23	mSATA_mPCIE_RX-
24	+3.3VSB
25	mSATA_mPCIE_RX+
26	GND
27	GND
28	+1.5V
29	GND
30	SMB_CLK
31	mSATA_mPCIE_TX-
32	SMB_DAT
33	mSATA_mPCIE_TX+
34	GND
35	GND
36	USB D-
37	GND
38	USB D+
39	+3.3VSB
40	GND
41	+3.3VSB
42	NC
43	SEL
44	NC
45	NC
46	NC
47	NC
48	+1.5V
49	NC
50	GND
51	NC
52	+3.3VSB

CN16 SIM	
Part Number	1654010809-01
Footprint	SIM_6P_5210622-SINR03
Description	
Pin	**Pin Name**
C1	UIM_PWR
C2	UIM_RESET
C3	UIM_CLK
C5	GND
C6	UIM_VPP
C7	UIM_DATA

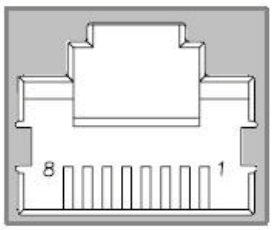


CN19 COM<1>/COM<2>/RS422/RS485	
Part Number	1653004793
Footprint	HD_10x2P_79_23N685B-20M10
Description	BOX HEADER 10x2P 2.0mm 180D(M)SMD 23N685B-20M10B
Pin	**Pin Name**
1	422TX<1>-/485D<1>-/DCD<1>#
2	DSR<1>#
3	422TX<1>+/485D<1>+/RXD<1>
4	RTS<1>#
5	422RX<1>+/TXD<1>
6	CTS<1>#
7	422RX<1>-/DTR<1>#
8	RI<1>#
9	GND
10	GND
11	422TX<2>-/485D<2>-/DCD<2>#
12	DSR<2>#
13	422TX<2>+/485D<2>+/RXD<2>
14	RTS<2>#
15	422RX<2>+/TXD<2>
16	CTS<2>#
17	422RX<2>-/DTR<2>#
18	RI<2>#
19	GND
20	GND



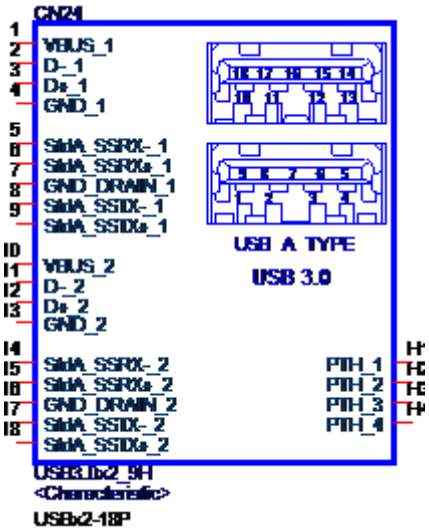
CN20 NL/RJ45_W/XFMR&LED	
Part Number	00
Footprint	RJ45_14P_RTA-195AAK1A
Description	
Pin	**Pin Name**

CN21 LAN	
Part Number	1652003274
Footprint	RJ45_28P_RTB-19GB9J1A
Description	PHONE JACK RJ45 28P DIP RTB-19GB9J1A
Pin	**Pin Name**
1	TX+(10/100),BI_DA+(GHz)
2	TX-(10/100),BI_DA-(GHz)
3	RX+(10/100),BI_DB+(GHz)
4	BI_DC+(GHz)
5	BI_DC-(GHz)
6	RX-(10/100),BI_DB-(GHz)
7	BI_DD+(GHz)
8	BI_DD-(GHz)

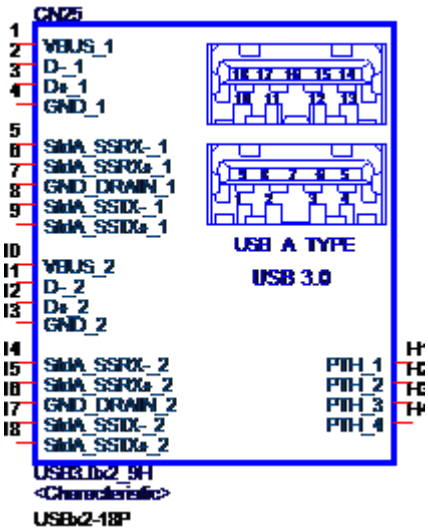


CN22 NL/RJ45_W/XFMR&LED	
Part Number	00
Footprint	RJ45_14P_RTA-195AAK1A
Description	
Pin	**Pin Name**

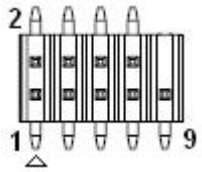
CN24 External USB2.0*2+USB3.0*2	
Part Number	1654010969-01
Footprint	USB_9x2P_UEA1112C-8HS6-4F
Description	USB CONN. 18P 2.0mm 90D(F) DIP UEA1112C
Pin	**Pin Name**
1	+5V
2	D-
3	D+
4	GND
5	SSRX-
6	SSRX+
7	GND
8	SSTX-
9	SSTX+
10	+5V
11	D-
12	D+
13	GND
14	SSRX-
15	SSRX+
16	GND
17	SSTX-
18	SSTX+



CN25 External USB2.0*2+USB3.0*2		
Part Number		1654010969-01
Footprint		USB_9x2P_UEA1112C-8HS6-4F
Description		USB CONN. 18P 2.0mm 90D(F) DIP UEA1112C
Pin		**Pin Name**
1		+5V
2		D-
3		D+
4		GND
5		SSRX-
6		SSRX+
7		GND
8		SSTX-
9		SSTX+
10		+5V
11		D-
12		D+
13		GND
14		SSRX-
15		SSRX+
16		GND
17	S	STX-
18		SSTX+

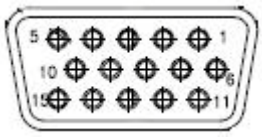


CN26 Internal USB	
Part Number	1653005260
Footprint	HD_5x2P_79_N10
Description	PIN HEADER 2x5P 2.0mm 180D(M) SMD 21N22050
Pin	**Pin Name**
1	+5V
2	+5V
3	A_D-
4	B_D-
5	A_D+
6	B_D+
7	GND
8	GND
9	GND



Matching Cable?1703100260 1703100121

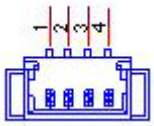
CN27 VGA	
Part Number	1654000055
Footprint	DBVGA-VF5MS
Description	D-SUB Conn. 15P 90D(F) DIP 070242FR015S200ZU
Pin	**Pin Name**
1	RED
2	GREEN
3	BLUE
4	NC
5	GND
6	GND
7	GND
8	GND
9	+5V
10	GND
11	NC
12	DDAT
13	HSYNC
14	VSYNC
15	DCLK



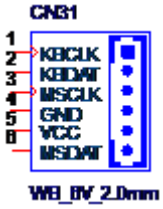
CN28 MIOe	
Part Number	1654006235
Footprint	MIOE_CPUSIDE
Description	
Pin	**Pin Name**
1	GND
2	GND
3	PCIE_RX0+
4	PCIE_TX0+
5	PCIE_RX0-
6	PCIE_TX0-
7	GND
8	GND
9	PCIE_RX1+
10	PCIE_TX1+
11	PCIE_RX1-
12	PCIE_TX1-
13	GND
14	GND
15	PCIE_RX2+
16	PCIE_TX2+
17	PCIE_RX2-
18	PCIE_TX2-
19	GND
20	GND
21	PCIE_RX3+
22	PCIE_TX3+
23	PCIE_RX3-
24	PCIE_TX3-
25	GND
26	GND
27	PCIE_CLK+
28	LOUTL
29	PCIE_CLK-
30	LOUTR
31	GND
32	AGND
33	SMB_STB_CLK
34	NC
35	SMB_STB_DAT
36	NC
37	PCIE_WAKE#
38	NC
39	RESET#
40	NC
41	PowerOn
42	CLK

43	NC
44	LPC_AD0
45	DDP_HPD
46	LPC_AD1
47	GND
48	LPC_AD2
49	DDP_AUX+/DDC_CLK
50	LPC_AD3
51	DDP_AUX-/DDC_DAT
52	LPC_DRQ#0
53	GND
54	LPC_SERIRQ
55	DDP_D0+
56	LPC_FRAME#
57	DDP_D0-
58	GND
59	GND
60	USB0_D+
61	DDP_D1+
62	USB0_D-
63	DDP_D1-
64	GND
65	GND
66	USB1_D+/USB_SSTX+
67	DDP_D2+
68	USB1_D-/USB_SSTX-
69	DDP_D2-
70	GND
71	GND
72	USB2_D+/USB_SSRX+
73	DDP_D3+
74	USB2_D-/USB_SSRX-
75	DDP_D3-
76	GND
77	GND
78	USB_OC#
79	+12VSB
80	+12VSB
83	GND
84	GND
85	GND
86	GND
87	+5VSB
88	+5VSB
89	+5VSB
90	+5VSB

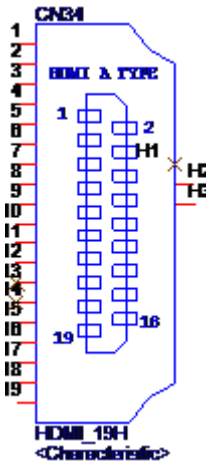
CN29 SMBus	
Part Number	1655904020
Footprint	FPC4V-125M
Description	WAFER 4P 1.25mm 180D(M) SMD 85205-04001
Pin	**Pin Name**
1	GND
2	SMB_DAT
3	SMB_CLK
4	+5V



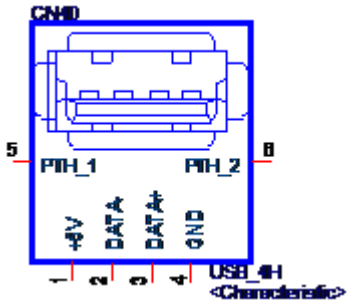
CN31 PS2	
Part Number	1655306020
Footprint	WHL6V-2M
Description	WAFER BOX 6P 2.0mm 180D(M) DIP A2001WV2-6P
Pin	**Pin Name**
1	KBCLK
2	KBDAT
3	MSCLK
4	GND
5	VCC(+V5SB)
6	MSDAT



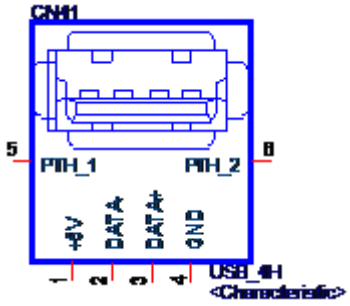
CN34 HDMI	
Part Number	1654012242-01
Footprint	HDMI_19P_R3660019-X02-R
Description	HDMI Conn. 19P 90D(M) DIP R3660019-X02-R
Pin	**Pin Name**
1	TMDS Data2+
2	TMDS Data2 Shield
3	TMDS Data2–
4	TMDS Data1+
5	TMDS Data1 Shield
6	TMDS Data1–
7	TMDS Data0+
8	TMDS Data0 Shield
9	TMDS Data0–
10	TMDS Clock+
11	TMDS Clock Shield
12	TMDS Clock–
13	Reserved
14	Reserved
15	SCL
16	SDA
17	GND
18	+5V Power
19	Hot Plug Detect



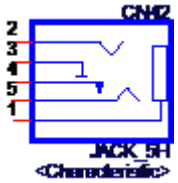
CN40 USB2.0	
Part Number	1654000464
Footprint	USB-020173
Description	USB CONN. 4P 90D(F) DIP 020173MR004S526ZL
Pin	**Pin Name**
1	VCC(+V5SB)
2	DATA-
3	DATA+
4	GND



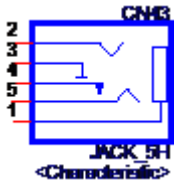
CN41 USB2.0	
Part Number	1654000464
Footprint	USB-020173
Description	USB CONN. 4P 90D(F) DIP 020173MR004S526ZL
Pin	**Pin Name**
1	VCC(+V5SB)
2	DATA-
3	DATA+
4	GND



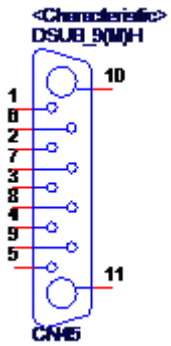
CN42 MIC_IN	
Part Number	1652006893-01
Footprint	PJ_5P_JA13331-N51D-4F
Description	AUDIO Jack 5P 5.0mm D3.5 90D(F) PINK DIP JA13331
Pin	**Pin Name**
1	GND
2	MIC_L
3	GND
4	MIC_JD
5	MIC_R



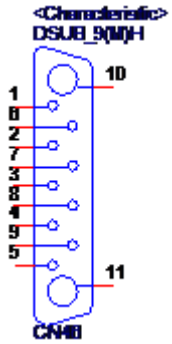
CN43 LINE_OUT	
Part Number	1652006891-01
Footprint	PJ_5P_JA13331-N54B-4F
Description	Phone Jack 5P 5.0mm D3.5 90D(F) DIP Lime JA13331
Pin	**Pin Name**
1	GND
2	LOUT_L
3	GND
4	LOUT_JD
5	LOUT_R



CN45 COM3	
Part Number	1654011267-01
Footprint	DB_9P_DSB5-09M1-GNR0-5G
Description	D-sub 9P 2.775mm 90D(M) DIP DSB5-09M1-GNR0-4G
Pin	**Pin Name**
1	COM3_DCD# or 485-422_COM3_TXD-
2	COM3_RXD or 485-422_COM3_TXD+
3	COM3_TXD or 422_COM3_RXD-
4	COM3_DTR# or 422_COM3_RXD+
5	GND
6	COM3_DSR#
7	COM3_RTS#
8	COM3_CTS#
9	COM3_RI#
10	GND
11	GND



CN46 COM4	
Part Number	1654011267-01
Footprint	DB_9P_DSB5-09M1-GNR0-5G
Description	D-sub 9P 2.775mm 90D(M) DIP DSB5-09M1-GNR0-4G
Pin	**Pin Name**
1	COM3_DCD# or 485-422_COM3_TXD-
2	COM3_RXD or 485-422_COM3_TXD+
3	COM3_TXD or 422_COM3_RXD-
4	COM3_DTR# or 422_COM3_RXD+
5	GND
6	COM3_DSR#
7	COM3_RTS#
8	COM3_CTS#
9	COM3_RI#
10	GND
11	GND



2.3.1 ARK-2250 External I/O

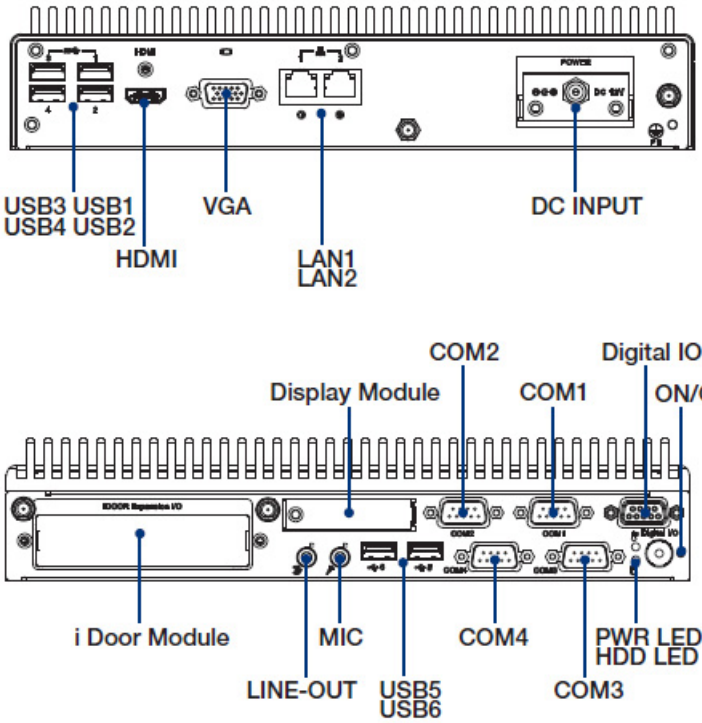


图 2.2：ARK-2250 IO 接口图

2.3.1.1 COM Connector

ARK-2250 provides four D-sub 9-pin connectors, which offers RS232/422/485 serial communication interface ports. Default setting is RS-232, if you want to use RS-422/485, you can refer to Section 3.4.2 BIOS Setup.

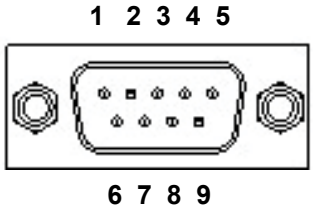


Figure 2.3 COM Connector

Table 2.3: COM Connector Pin Assignments

	RS-232	RS-422	RS-485
Pin	**Signal Name**	**Signal Name**	**Signal Name**
1	DCD	Tx-	DATA-
2	RxD	Tx+	DATA+
3	TxD	Rx+	NC
4	DTR	Rx-	NC
5	GND	GND	GND
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC

Note! *NC means no connection.*

2.3.1.2 Ethernet Connector (LAN)

ARK-2250 is equipped with two Ethernet controllers that are fully compliant with IEEE 802.3u 10/100/1000 Mbps CSMA/CD standards. LAN1, LAN2 are all equipped with Intel i219/i210 Ethernet controller. The Ethernet port provides a standard RJ-45 jack connector with LED indicators on the front side to show its Active/Link status (Green LED) and Speed status (Yellow LED).

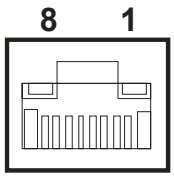


Figure 2.4 Ethernet Connector

Table 2.4: Ethernet Pin Assignments

Pin	10/100/1000BaseT Signal Name
1	TX+
2	TX-
3	RX+

4	MDI2+
5	MDI2-
6	RX-
7	MDI3+
8	MDI3-

2.3.1.3 Audio Connector

ARK-2250 offers stereo audio ports by three phone jack connectors of Line_Out, Line_In and Mic_In. The audio chip is controlled by ALC888S, and it's compliant with Azalea standard.

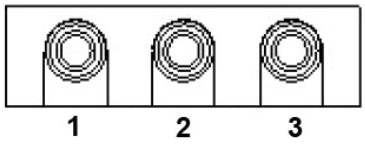


Figure 2.5 Audio Connector

Table 2.5: Audio Connector Pin Assignments

Pin	Signal Name
1	Mic_In
2	Line_In
3	Line_Out

2.3.1.4 USB Connector

ARK-2250 supports up to 5 USB connectors. The USB connectors are used to connect any device that conforms to the USB interface. Most digital devices conform to this standard. The USB interface supports Plug and Play and the user can connect or disconnect the device without turning off the computer.

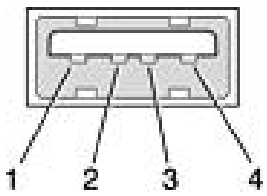


Figure 2.6 USB Connector

Table 2.6: USB Connector Pin Assignments

Pin	Signal Name	Pin	Signal Name
1	VCC	2	USB_data-
3	USB_data+	4	GND

2.3.1.5 VGA Connector

ARK-2250 provides a high resolution VGA interface connected by a D-sub 15-pin connector to support a VGA CRT monitor, supports display resolutions of up to 2048 x 1152 @ 60Hz.

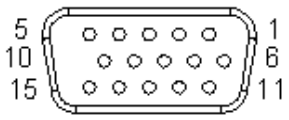


Figure 2.7 VGA Connector

Table 2.7: VGA Pin Assignments

Pin	Signal Name	Pin	Signal Name
1	Red	2	Green
3	Blue	4	NC
5	GND	6	GND
7	GND	8	GND
9	NC	10	GND
11	NC	12	DDAT
13	H-SYNC	14	V-SYNC
15	DCLK		

2.3.1.6 Power On/Off Button

ARK-2250's Power button supports dual functions: Soft Power -On/Off (Instant off or Delay 4 Seconds then off), and Suspend.

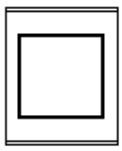


Figure 2.8 Power Button

2.3.1.7 LED Indicators

There are two LEDs on the front panel that indicate system status: Power LED is for system status; and HDD LED is for HDD status.

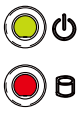
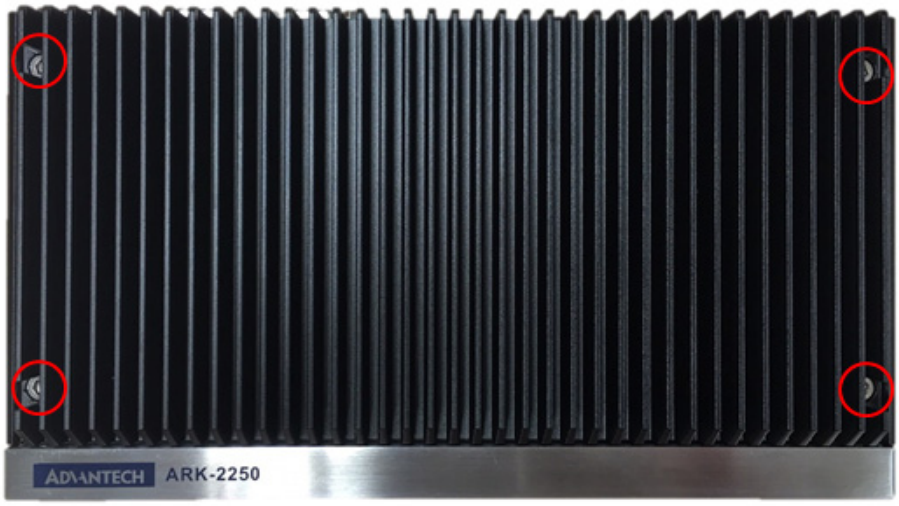


Figure 2.9 LED Indicators

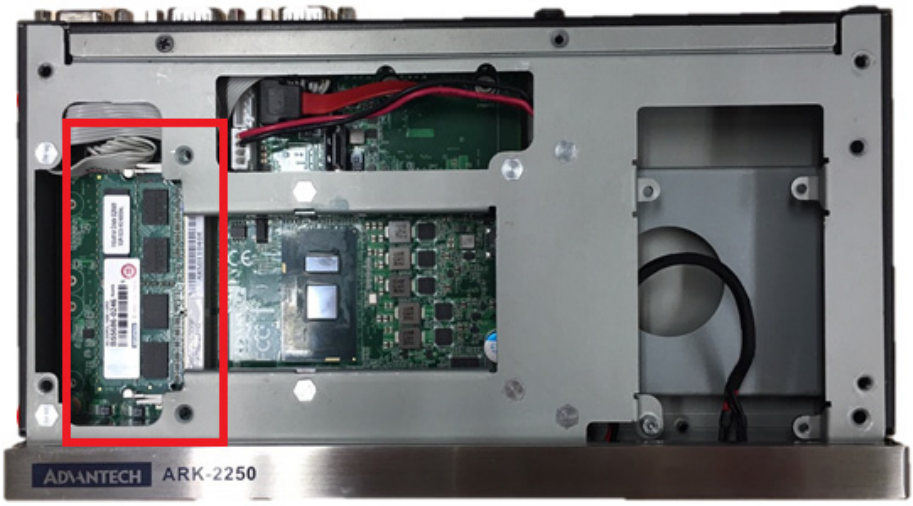
2.4 Installation

2.4.1 Memory Installation

1. Unscrew the 4 screws on the top cover. (Please use the tool in the accessory box.)



2. Remove the top cover and install the memory into the memory socket.

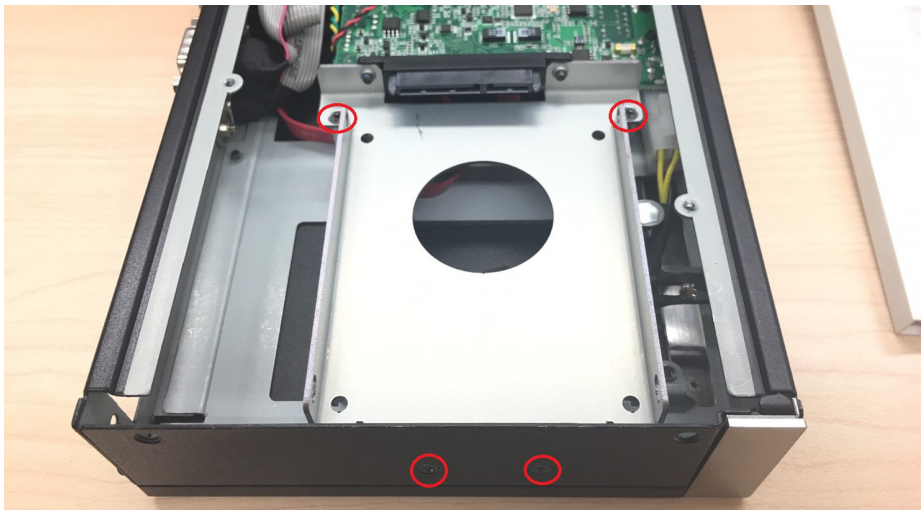


3. Replace the top cover.

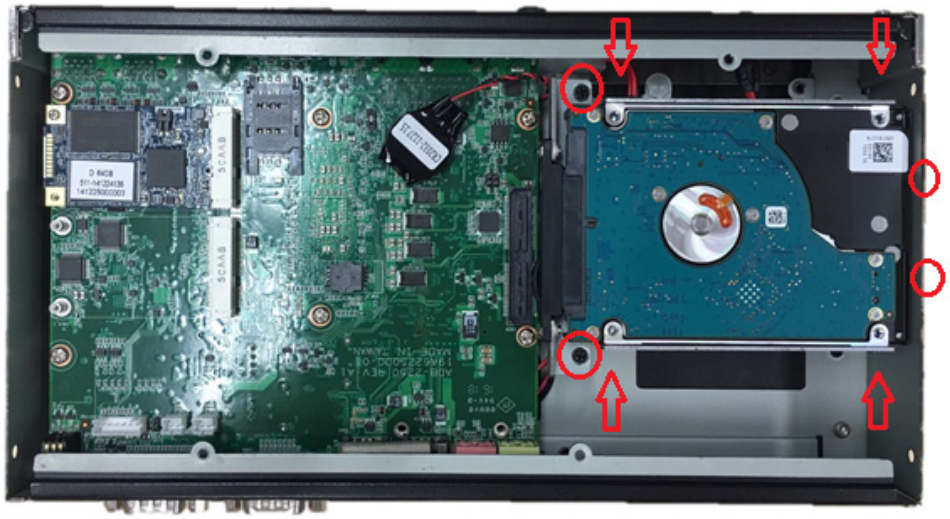
2.4.2 HDD/SSD Installation

1. Unscrew the 4 screws on the bottom cover, and the 4 screws on both sides of ARK-2250.

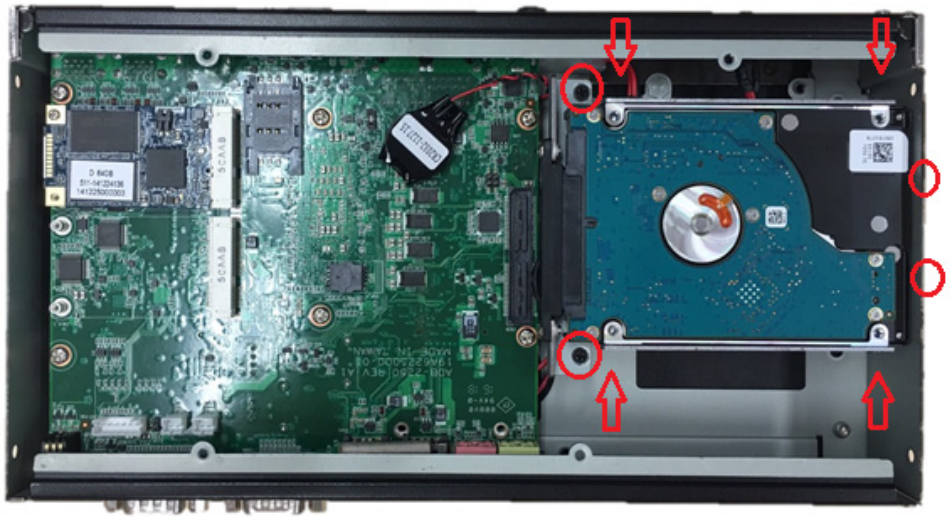
2. Unscrew the 4 screws on the HDD bay.



3. Install the HDD/SSD into the HDD bay, and fix the HDD onto the bracket.



4. Fix the 4 screws back onto the HDD bay.



5. Replace the bottom cover and fix the 8 screws back onto the system.

2.4.3 mSATA Installation

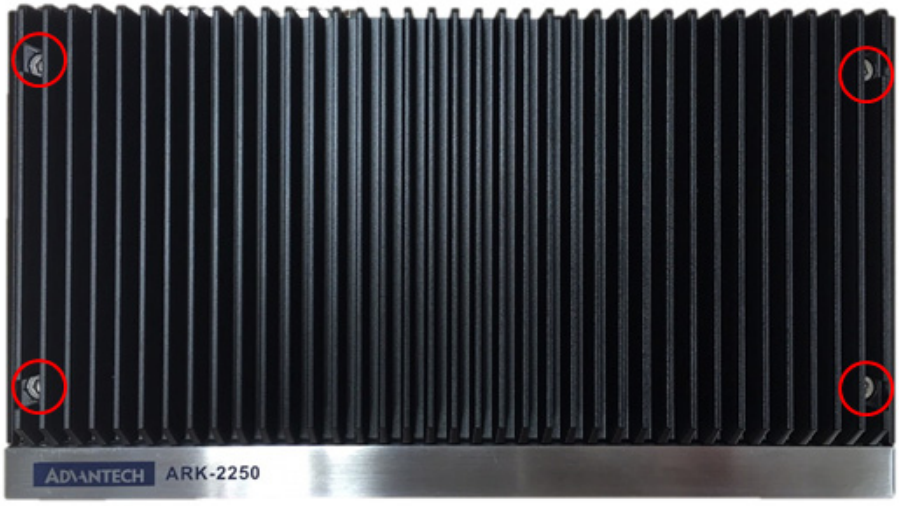
1. Unscrew the 4 screws on the bottom cover, and the 4 screws on both sides of ARK-2250.

2. Put the mSATA module onto the mSATA slot (CN15), and fasten the 2 screws back on the mSATA module.

3. Replace the bottom cover and fasten the 8 screws back onto the system.

2.4.4 Power Module (MIOe-PWR2) Installation (Option)

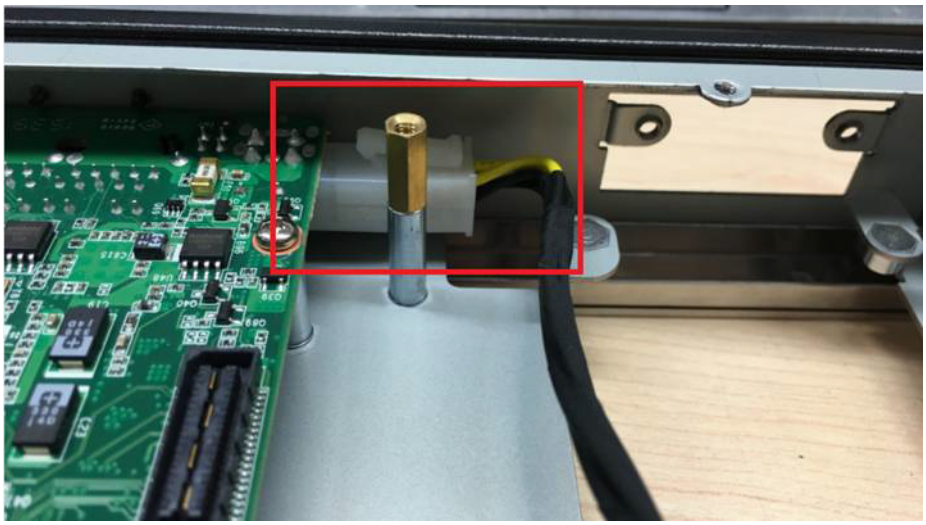
1. Remove the 4 screws on the top cover. (Please use the tool in the accessory box.)



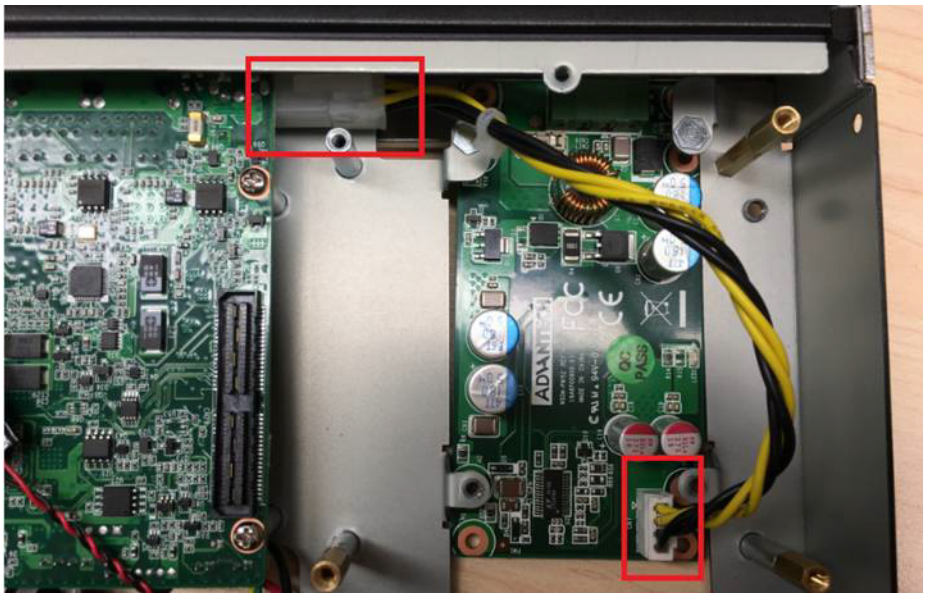
2. Remove the 2 screws on the power bracket for the original DC jack on the front panel.

3. Unscrew the 4 screws on the bottom cover and on both sides of ARK-2250.

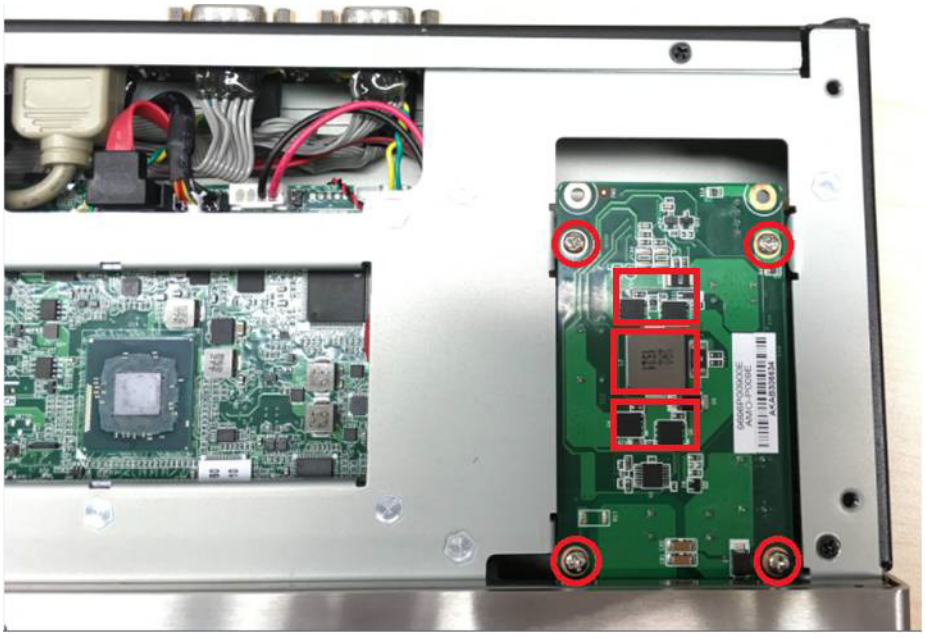
4. Remove the original internal power cable from the M/B.



5. Link the MIOe-PWR2 internal power cable from M/B to the power board.



6. Turn to the top side, and fasten the 4 screws for the power board, and tape 3 thermal pads on the red marks.



7. Screw the new power bracket for MIOe-PWR2 on the front panel.

8. Replace the bottom cover and the 8 screws back onto the system.
9. Replace the top cover and the 4 screws.

2.4.5 iDoor Module Installation (Option)

Please refer to the start up manual in the iDoor kit.

2.4.6 2nd Layer MIOe Module Installation (Option)

Please refer to the start up manual in the iDoor kit.

Chapter 3

BIOS Settings

3.1 BIOS Setup

With the AMIBIOS setup program, you can modify BIOS settings and control the various system features. This chapter describes the basic navigation of the ARK-2250 BIOS setup screens.

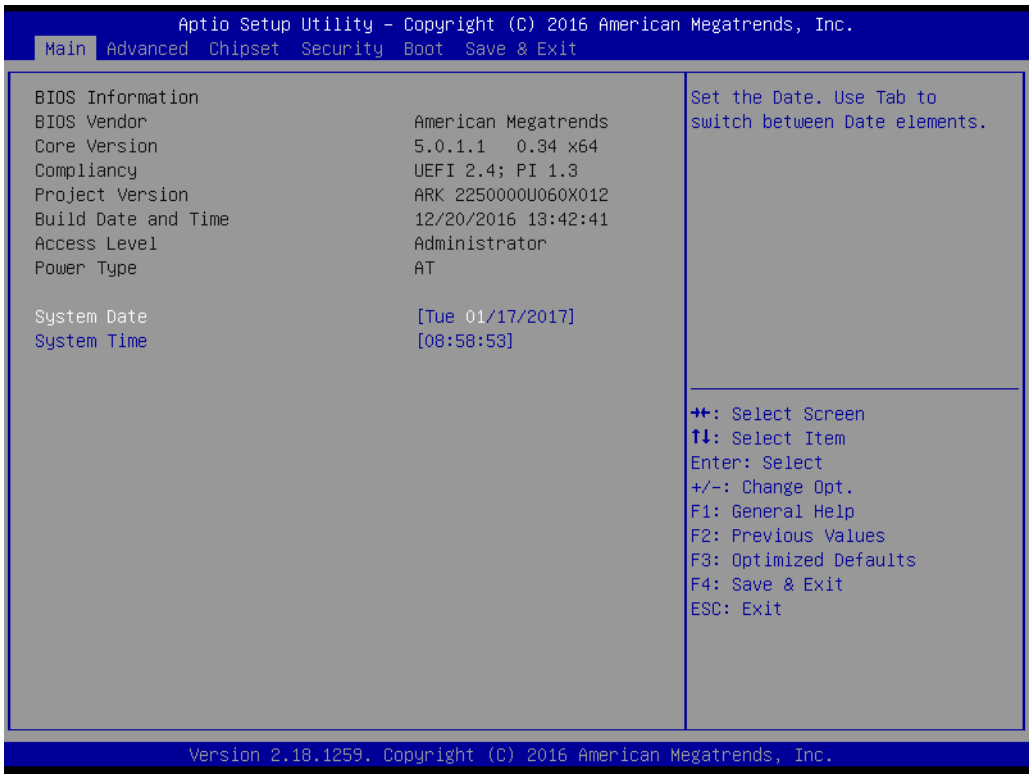


Figure 3.1 Setup program initial screen

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

3.2 Entering Setup

Turn on the computer and then press <F2> or <DEL> to enter Setup menu.

3.2.1 Main Setup

When users first enter the BIOS Setup Utility, users will enter the Main setup screen. Users can always return to the Main setup screen by selecting the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.

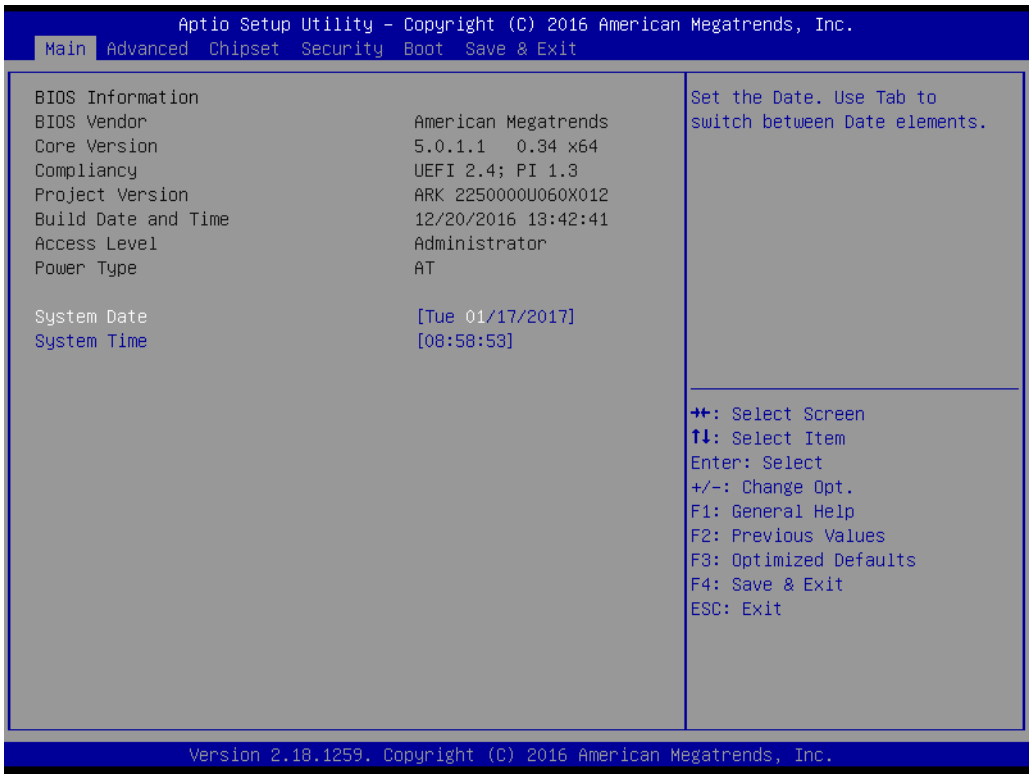


Figure 3.2 Main setup screen

The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can. The right frame displays the key legend.

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

- **System date / System time**

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

3.2.2 Advanced BIOS Features Setup

Select the Advanced tab from the ARK-2250 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.

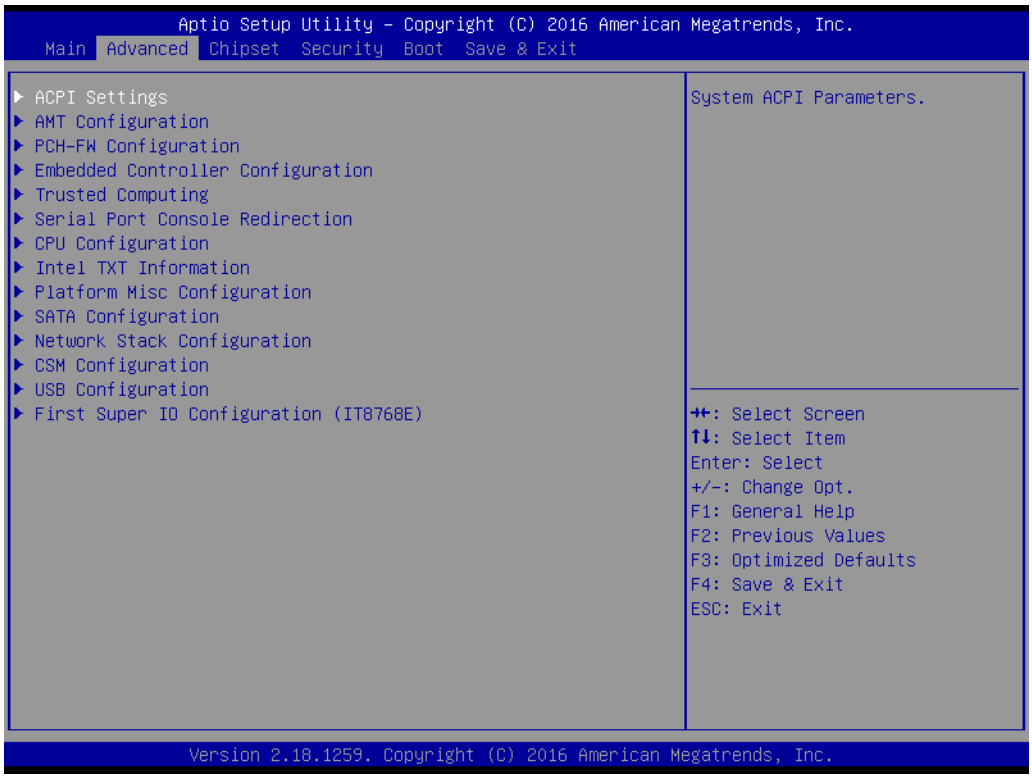


Figure 3.3 Advanced BIOS features setup screen

3.2.2.1 ACPI Settings

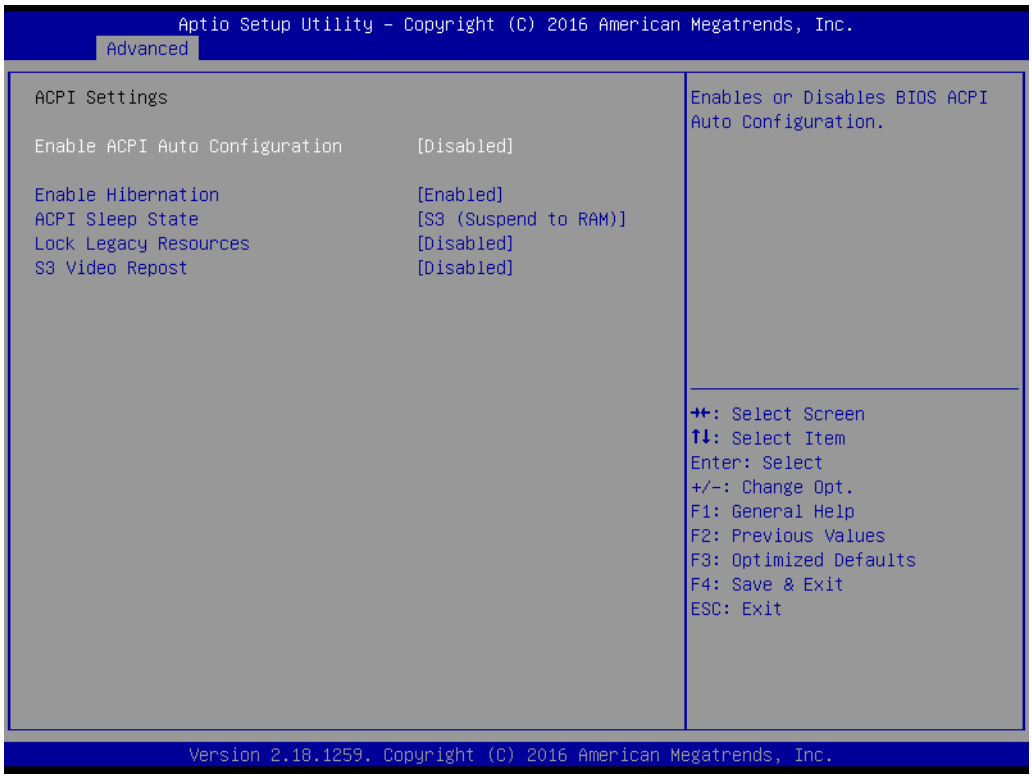
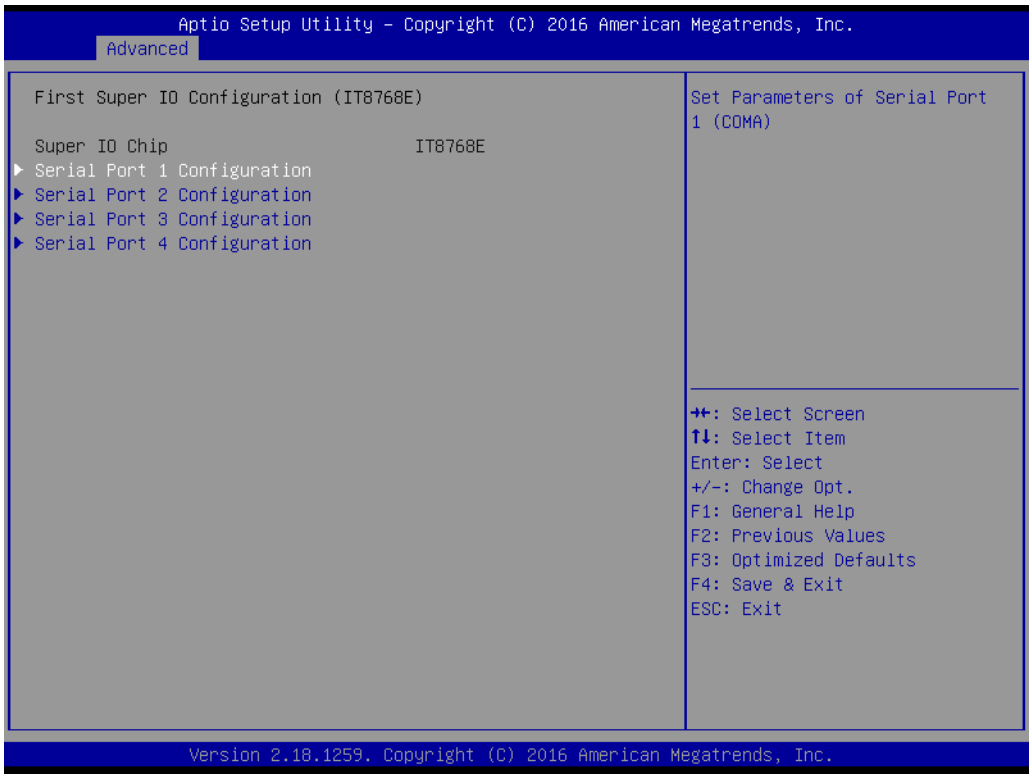


Figure 3.4 ACPI Setting

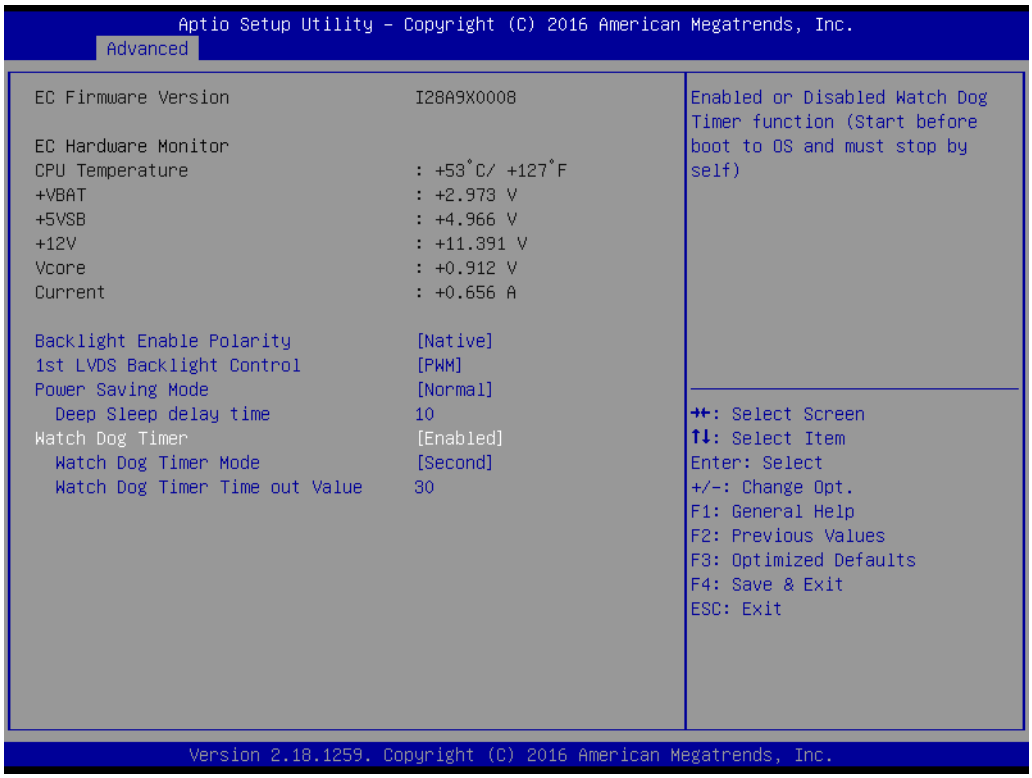
- **Enable ACPI Auto Configuration**
  This item allows users to enable or disable BIOS ACPI auto configuration.
- **Enable Hibernation**
  This item allows users to enable or disable hibernation.
- **ACPI Sleep State**
  This item allows users to set the ACPI sleep state.
- **Lock Legacy Resources**
  This item allows users to lock legacy device resources.

3.2.2.2 Super I/O Configuration



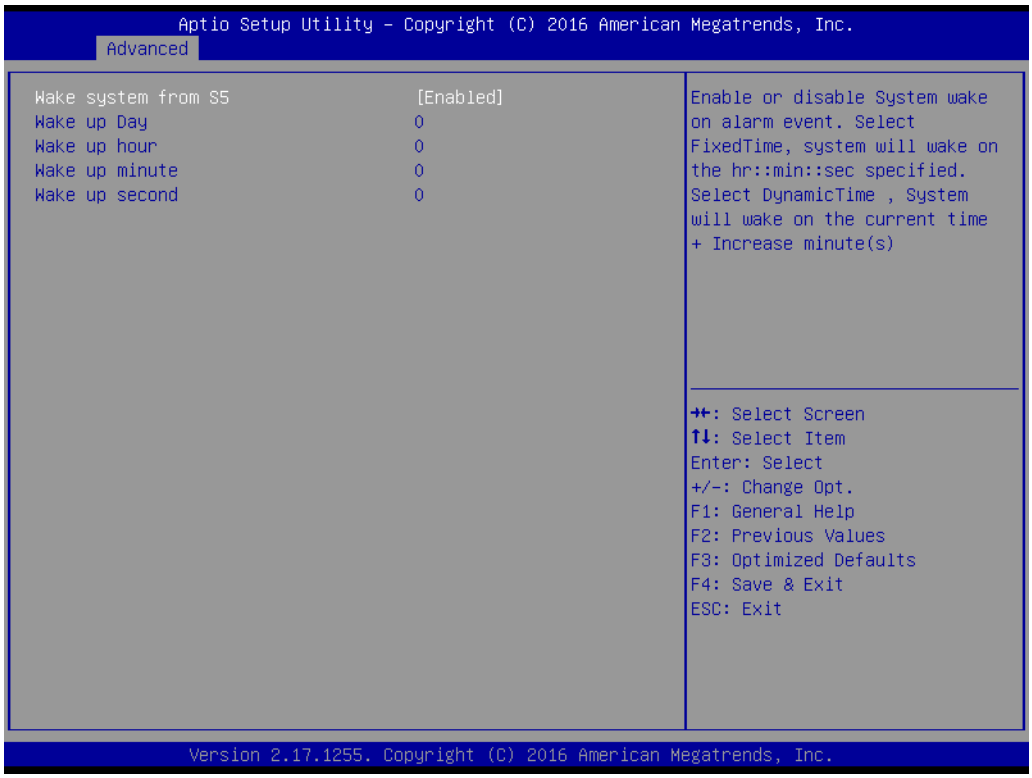
- **Serial Port 1 Configuration**
  Set Parameters of Serial Port 1 (COMA).
- **Serial Port 2 Configuration**
  Set Parameters of Serial Port 2 (COMB).
- **Serial Port 3 Configuration**
  Set Parameters of Serial Port 3 (COMC).
- **Serial Port 4 Configuration**
  Set Parameters of Serial Port 4 (COMD).

3.2.2.3 Embedded Controller Configuration



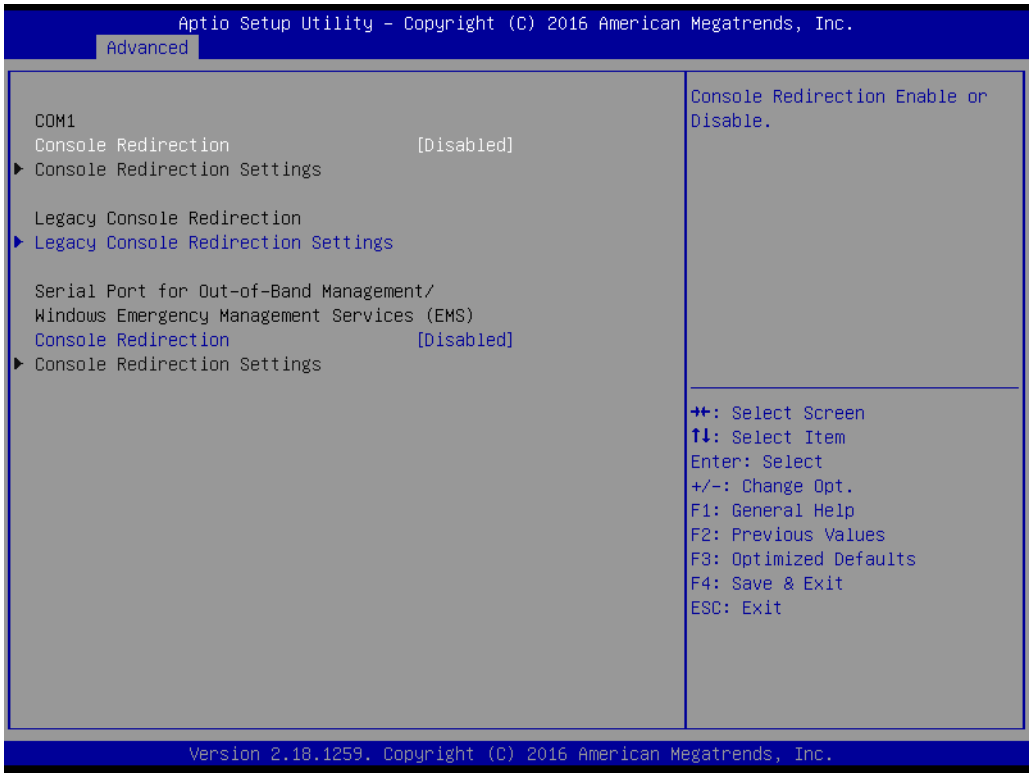
- **EC Hardware Monitor**
  This page display all information about system Temperature/Voltage/Current.
- **EC Power Saving Mode**
  This item allows users to set board's power saving mode when off.
- **EC Watch Dog Function**
  This item allows users to select EC watchdog timer.

3.2.2.4 S5 RTC Wake Settings



- **Wake system from S5**
  Enable or disable System wake on alarm event. Select FixedTime, system will wake on the hr:min:sec specified.

3.2.2.5 Serial Port Console Redirection



- **Console Redirection**
  This item allows users to enable or disable console redirection for Microsoft Windows Emergency Management Services (EMS).
- **Console Redirection**
  This item allows users to configuration console redirection detail settings.

3.2.2.6 CPU Configuration

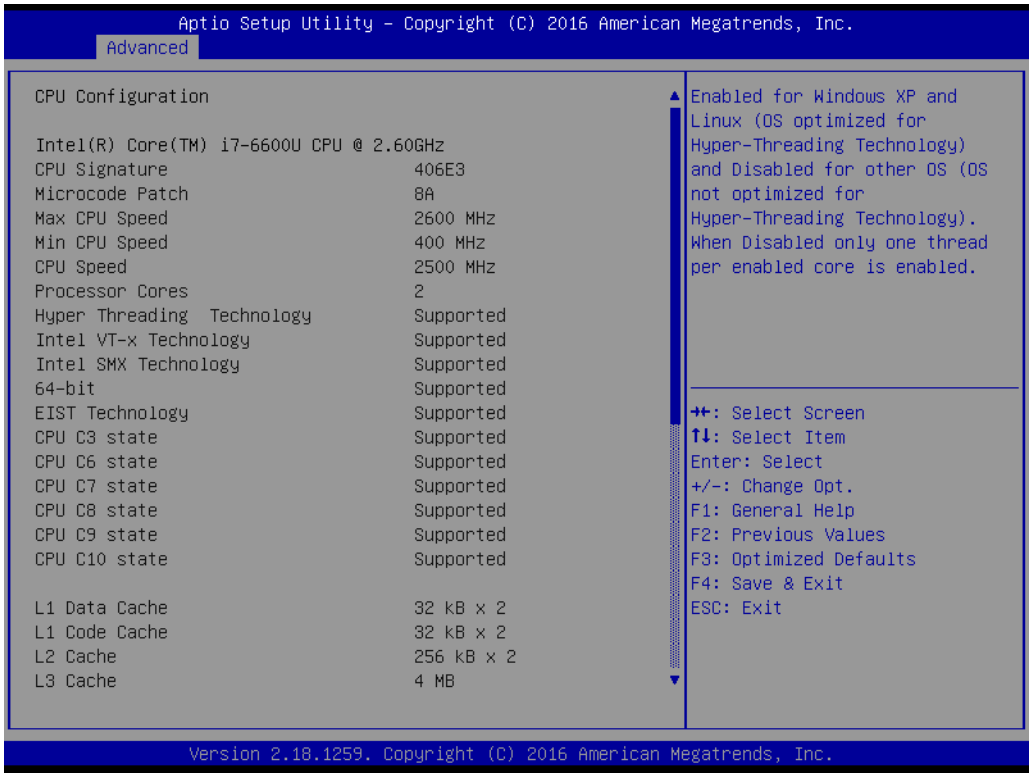
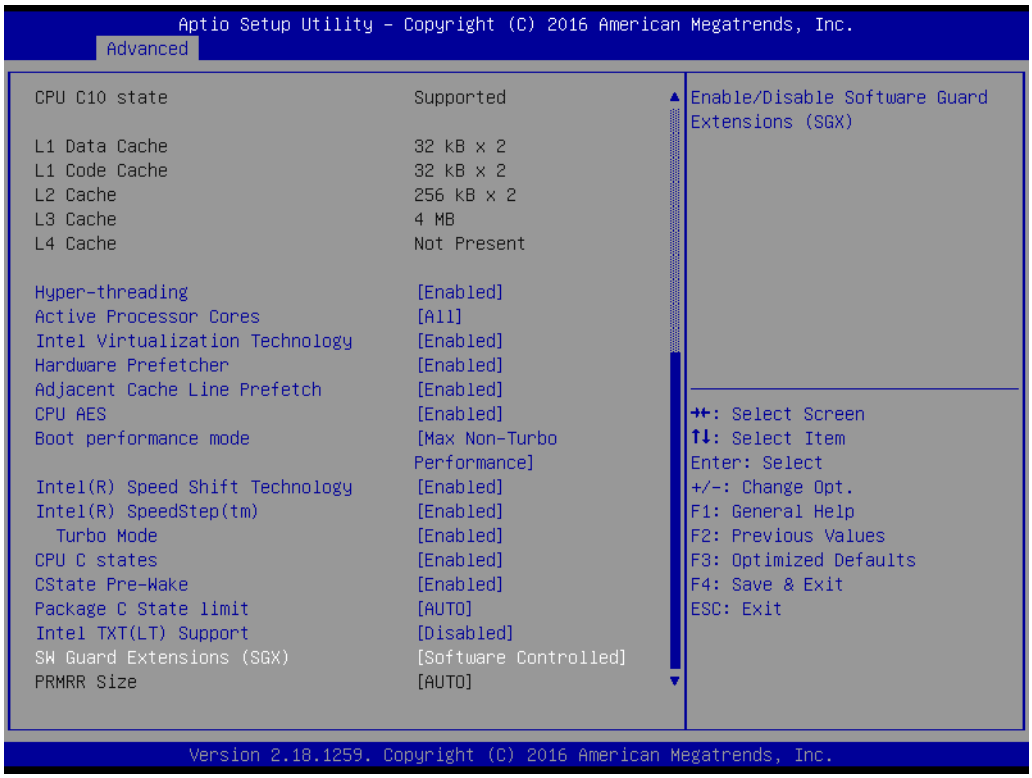


Figure 3.5 Intel Fast Flash Standby

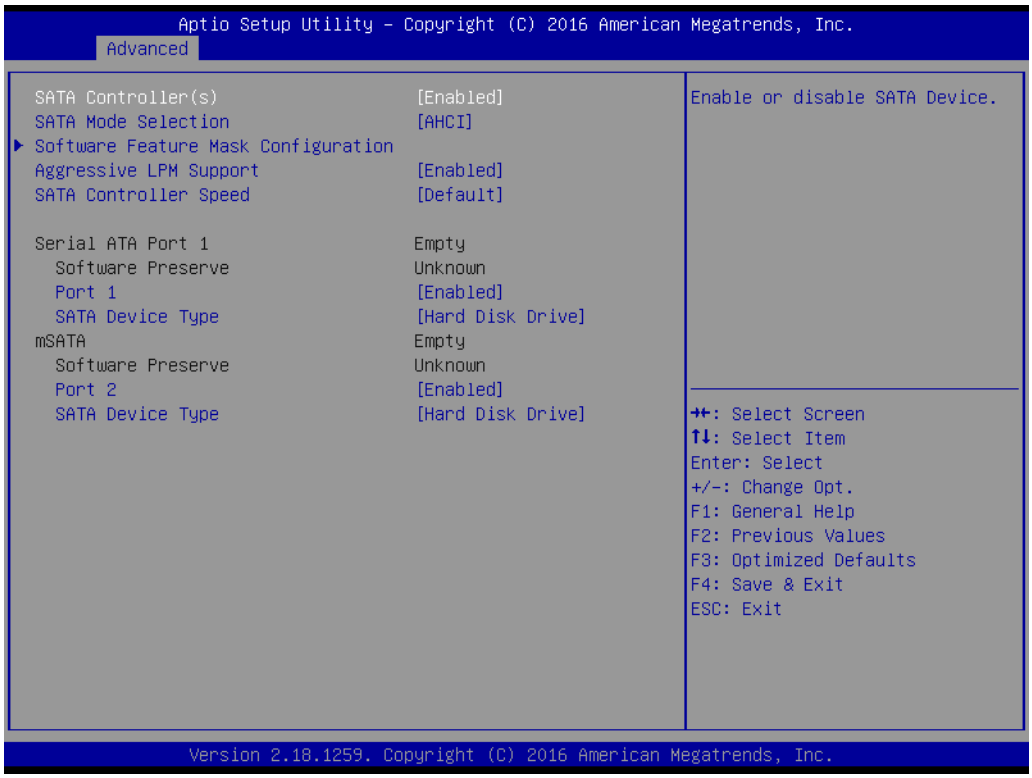
- **Limit CPUID Maximum**
  Disabled for Windows XP.
- **Execute Disable Bit**
  XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Server 2003 SP1, Windows XP SP2, SuSE Linux 9.2, RedHat Enterprise 3 Update 3.)
- **Hardware Prefetcher**
  Enable mid level cache(L2) streamer prefetcher.
- **Adjacent Cache Line Prefetch**
  Enable mid level cache(L2) prefetching of adjacent cache lines.
- **Intel Virtualization Technology**
  When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
- **Power Technology**
  Enables power management features.

3.2.2.7 PPM Configuration



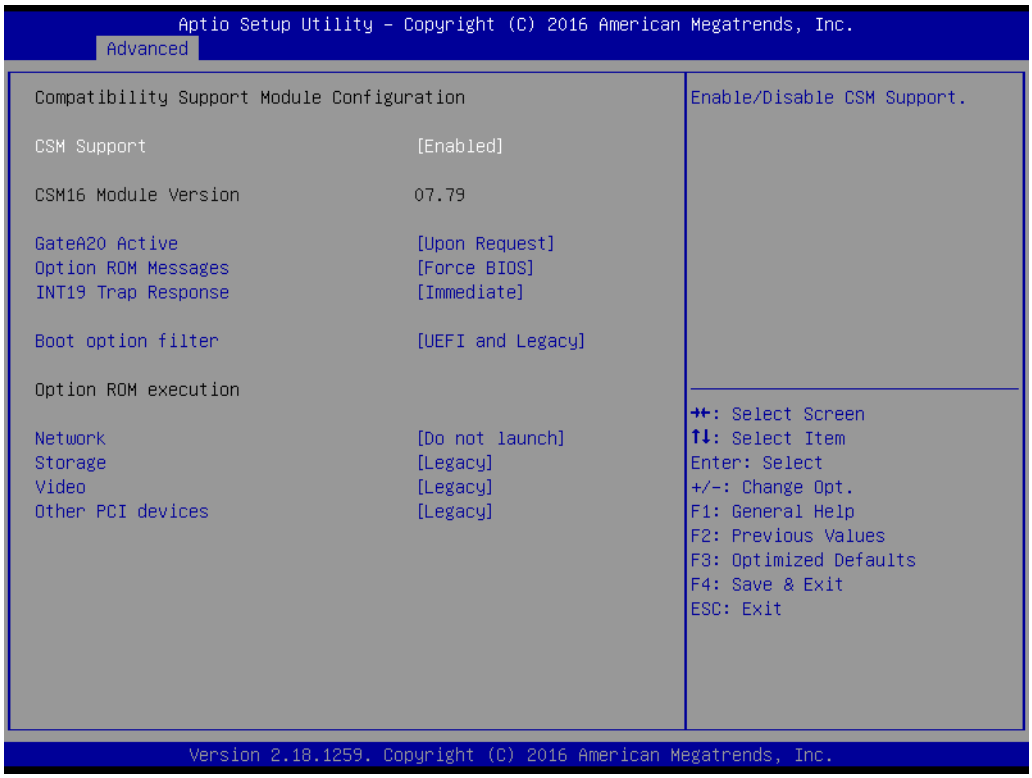
- **CPU C state Report**
  Enable/Disable CPU C state report to OS.
- **Max CPU C-state**
  This option controls Max C state that the processor will support.

3.2.2.8 IDE Configuration



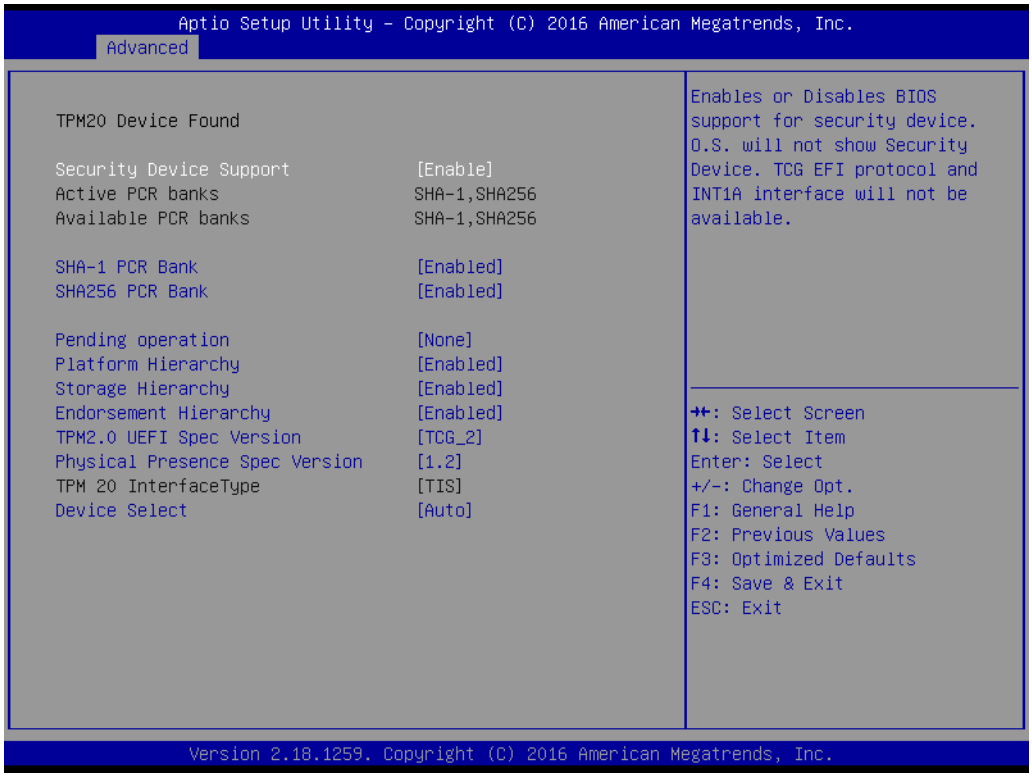
- **Serial-ATA (SATA)**
  Enable / Disable Serial ATA.
- **SATA Speed Support**
  SATA Speed Support Gen1 or Gen2.
- **SATA Mode**
  Select IDE / AHCI.
- **Serial-ATA Port 0 / Port1**
  Enable / Disable Serial ATA Port0 / Port1.
- **SATA Port 0 / Port1 HotPlug**
  Enable / Disable SATA Port0 / Port1 hotplug function.

3.2.2.9 CSM Configuration



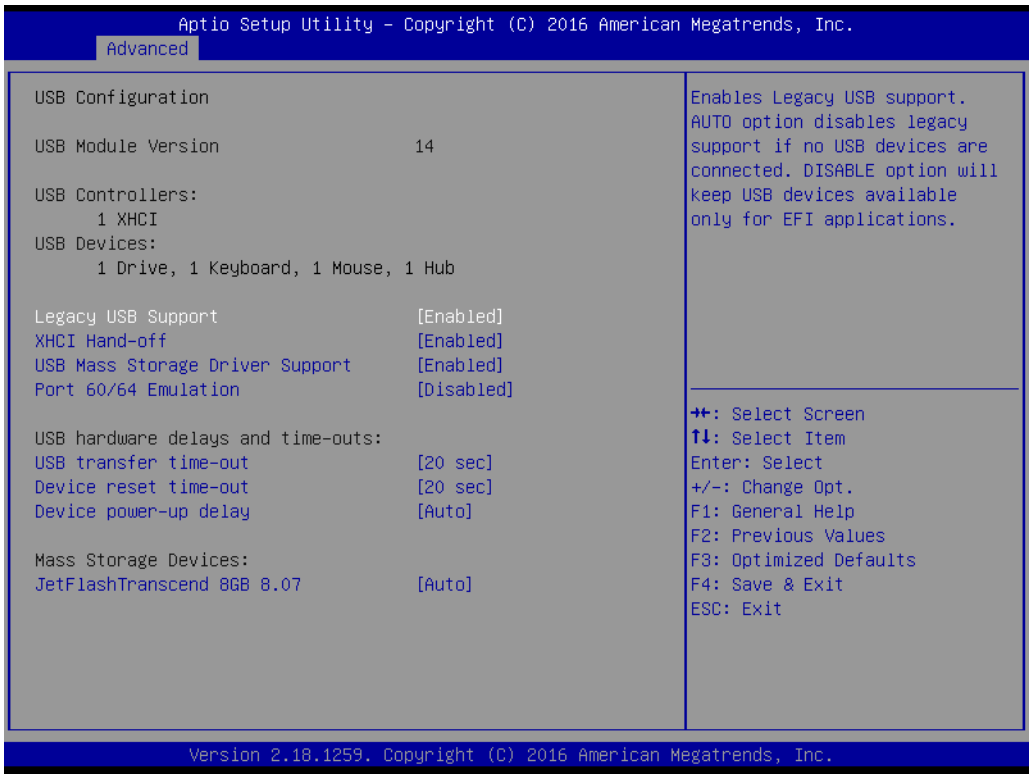
- **CSM Support**
  Enable/Disable CSM Support.
- **GateA20 Active**
- UPON REQUEST - GA20 can be disabled using BIOS services. We suggest you do not disable GA20 as this option is useful when any RT code is executed above 1MB.
- **Option ROM Messages**
  Set display mode for Option ROM.
- **INT19 Trap 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 ROM 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.

3.2.2.10 Trusted Computing



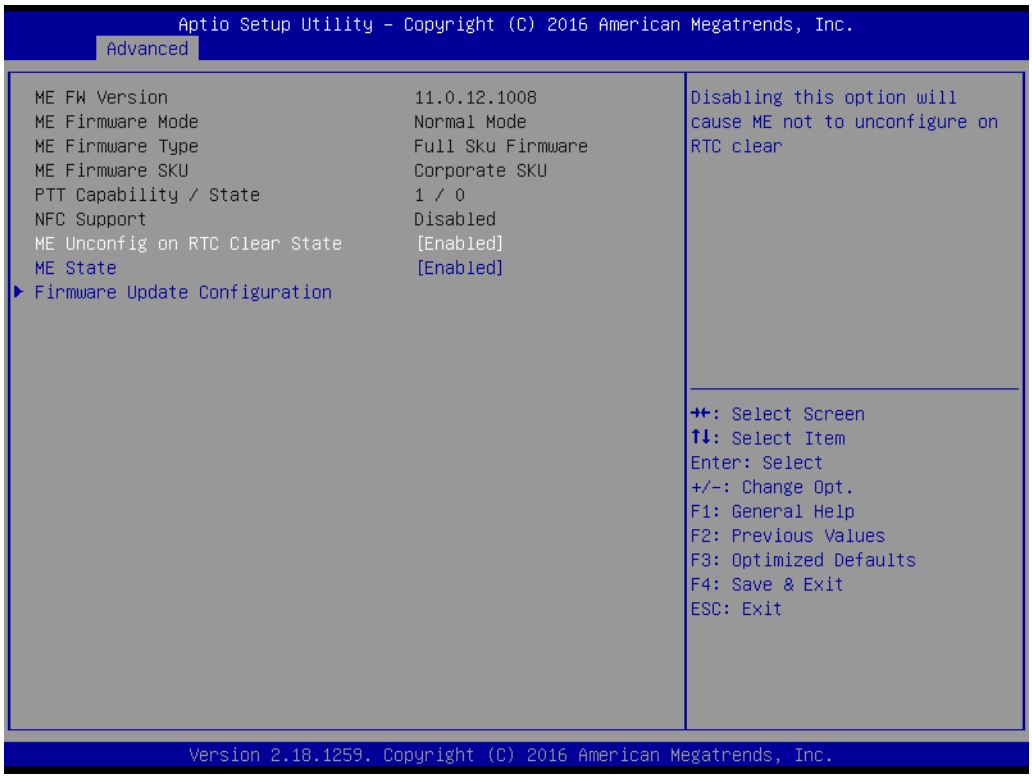
- **Trusted Computing**
  Enables or Disables BIOS support for security devices. OS will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

3.2.2.11 USB Configuration



- **Legacy USB Support**
  Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
- **XHCI Hand-off**
  This is a workaround for OS without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
- **EHCI Hand-Off**
  This is a workaround for OS without EHCI hand-off support. The EHCI ownership change should claim by EHCI driver.
- **USB Mass Storage Driver Support**
  Enable/Disable USB Mass Storage Driver Support.
- **USB transfer time-out**
  Time-out value for control, bulk, and interrupt transfers.
- **Device reset time-out**
  USB mass storage device start unit command time-out.
- **Device power-up delay**
  Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

3.2.3 Security Configuration

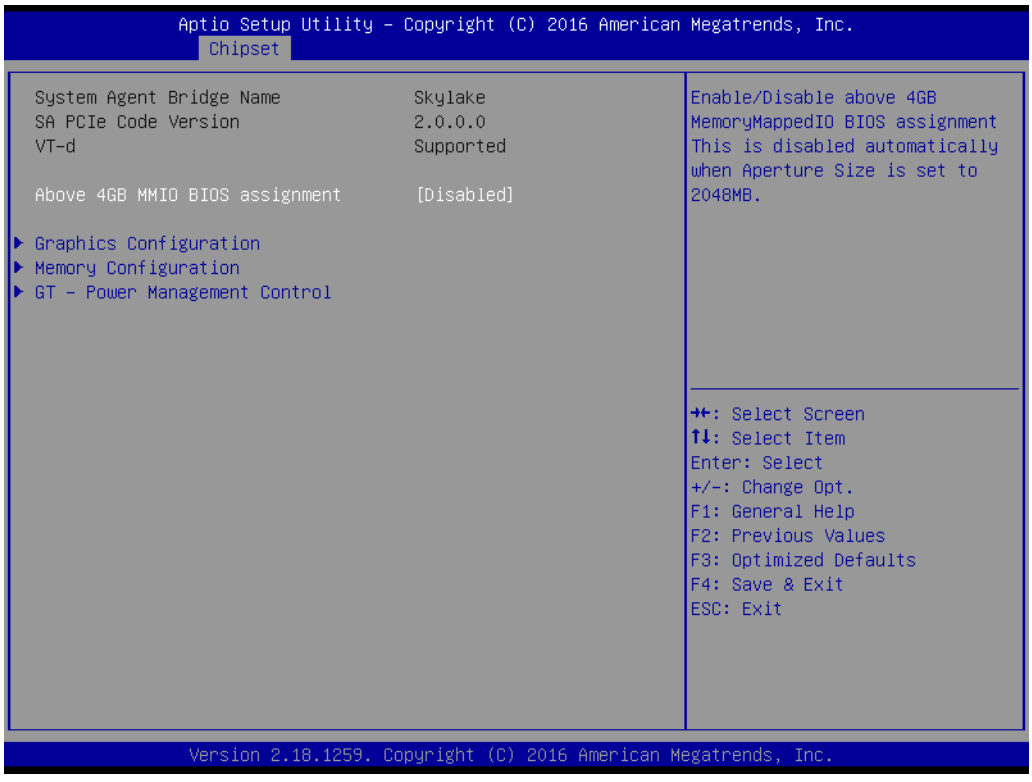


- **TXE**
- **TXE HMRFPO Disable**
- **TXE Firmware Update**
- **TXE EOP Message**
  Send EOP message before entering OS
- **TXE Unconfiguration Perform**
  Revert TXE settings to factory defaults

3.2.3.1 Chipset Configuration

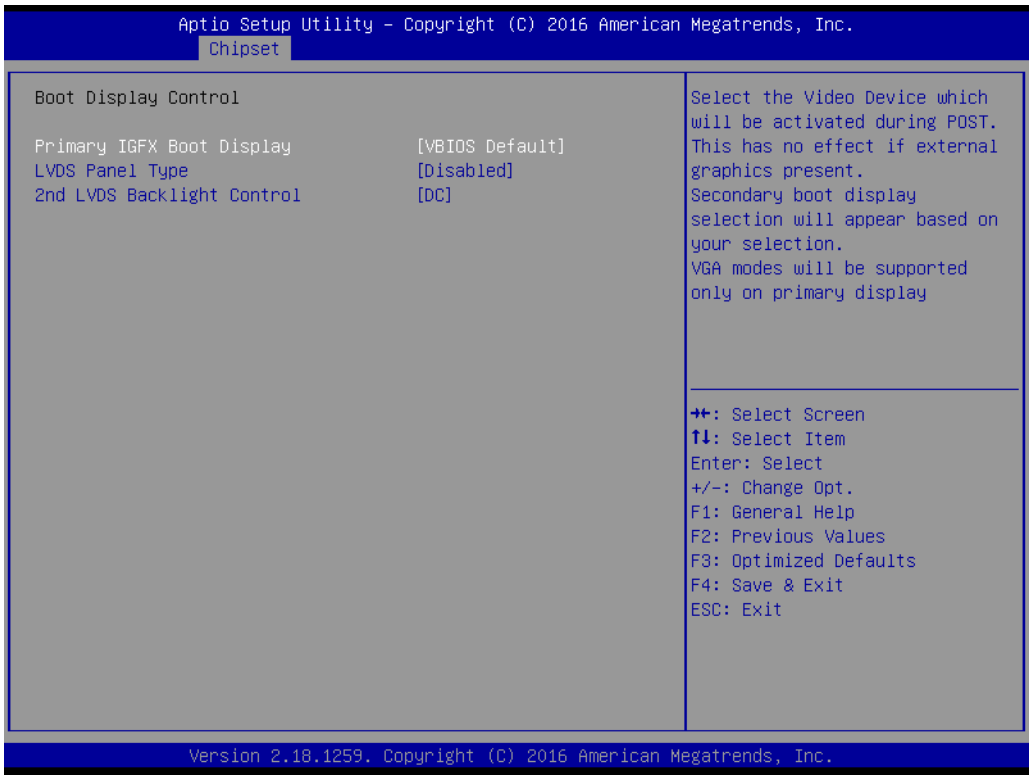
- **North Bridge**
  Details for North Bridge items.
- **South Bridge**
  Details for South Bridge items.

3.2.3.2 North Bridge



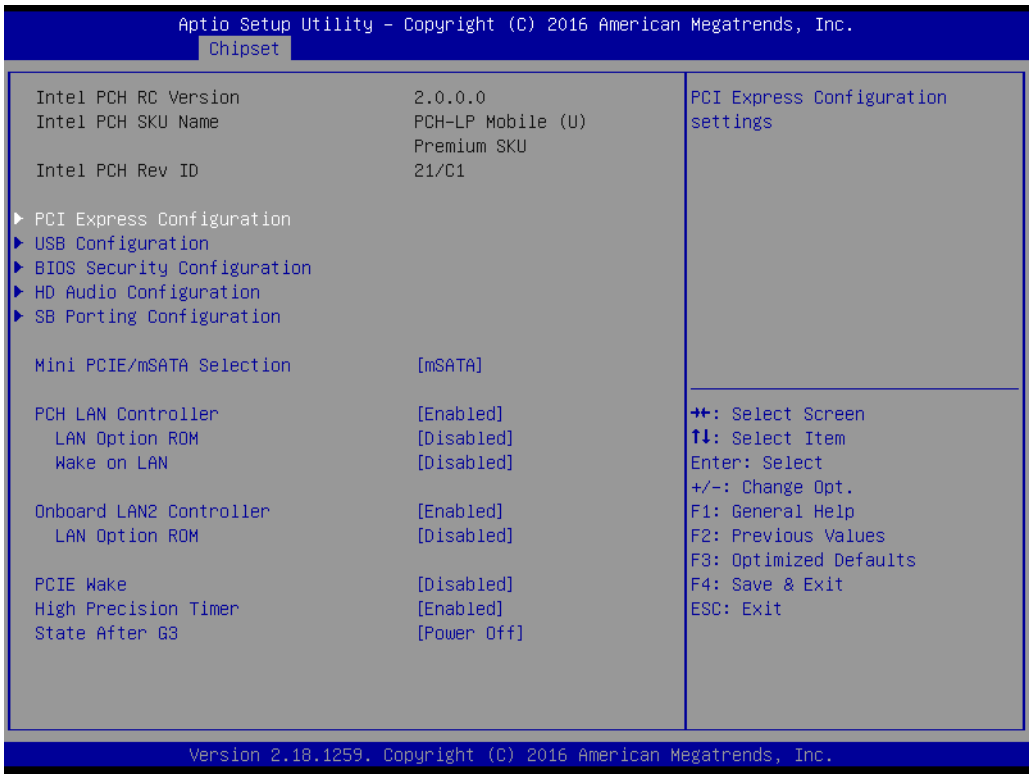
- **Intel IGD Configuration**
  Config Intel IGD settings.
- **Max TOLUD**
  Maximum value of TOLUD.

3.2.3.3 Intel IGD Configuration



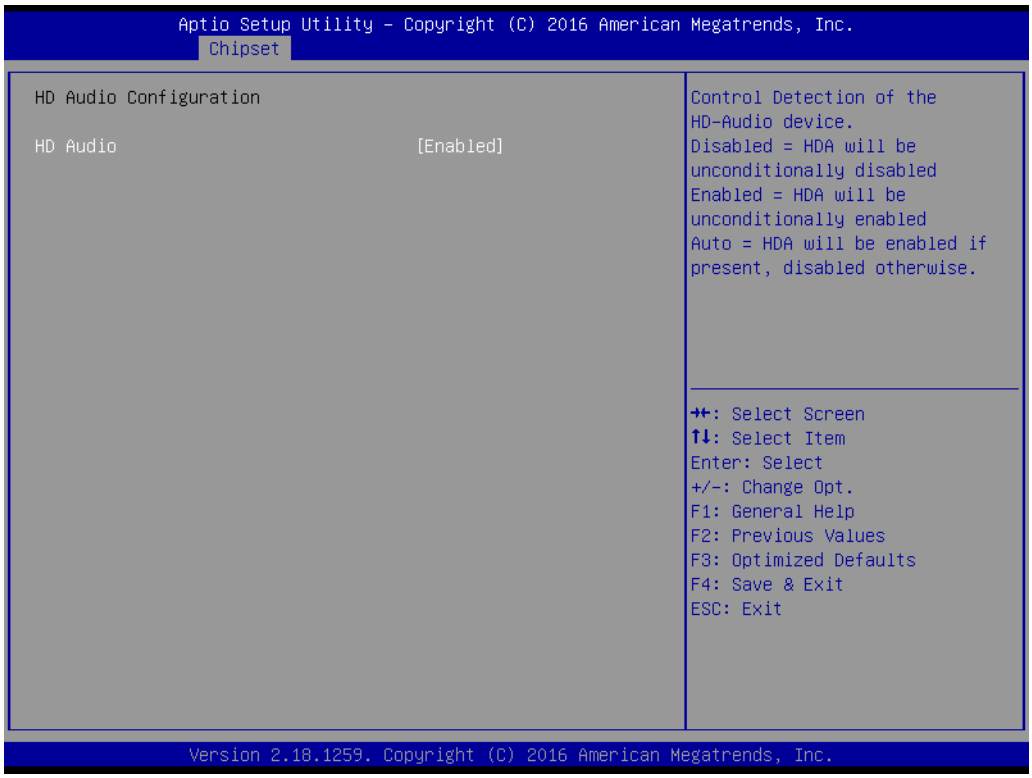
- **Primary IGFX Boot Display**
  Select the Video Device which will be activated during POST. This has no effect if external graphics are present. Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display.
- **DVMT Pre-Allocated**
  Select DVMT 5.0 pre-allocated (Fixed) graphics memory size used by the internal graphics device.
- **DVMT Total Gfx Mem**
  Select DVMT 5.0 total graphic memory size used by the internal graphics device.
- **Aperture Size**
  Select the aperture size.
- **DOP CG**
  Enable/Disable DOP clock gating.
- **GTT Size**
  Select the GTT Size.
- **IGD Thermal**
  Enable/Disable IGD Thermal.
- **Spread Spectrum clock**
  Enable/Disable Spread Spectrum clock.

3.2.3.4 South Bridge



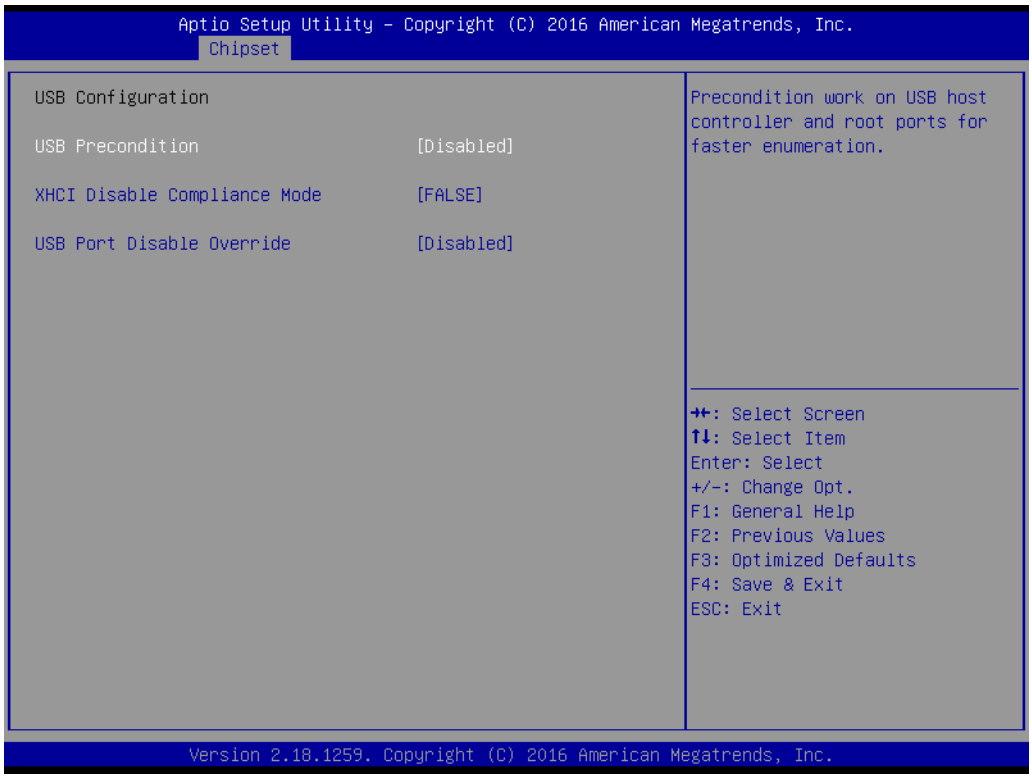
- **Azalia HD Audio**
  Azalia HD Audio options.
- **USB Configuration**
  USB Configuration Settings.
- **PCI Express Configuration**
  PCI Express Configuration settings.
- **High Precision Timer**
  Enables or disables the high precision timer.
- **LAN1 Controller**
  Enable or Disable the LAN1.
- **LAN2 Controller**
  Enable or Disable the LAN2.
- **PCIE Wake**
  Enable or Disable PCIE to wake the system from S5.
- **Restore AC Power Loss**
  Select AC power state when power is re-applied after a power failure.
- **Serial IRQ Mode**
  Configure Serial IRQ Mode.
- **Global SMI Lock**
  Enable or Disable SMI lock.
- **BIOS Read/Write Protection**
  Enable or Disable BIOS SPI region read/write protect.

3.2.3.5 Azalia HD Audio



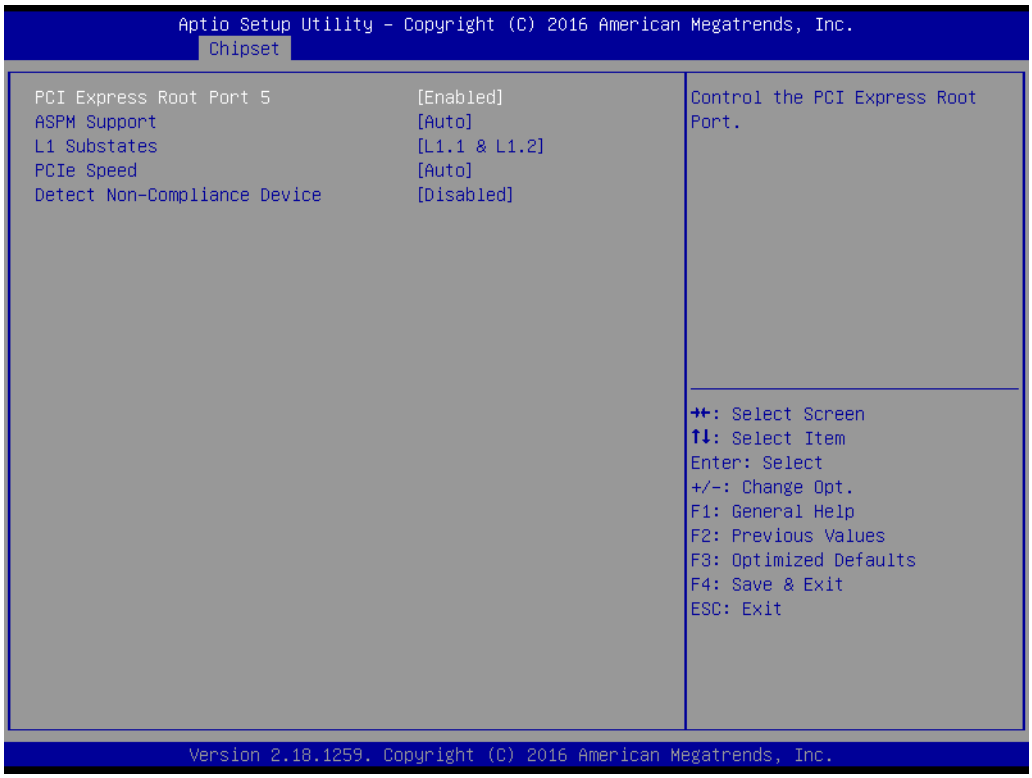
- **Audio Controller**
  Control Detection of the Azalia device. Disabled = Azalia will be unconditionally disabled. Enabled = Azalia will be unconditionally Enabled. Auto = Azalia will be enabled if present disabled otherwise.
- **Azalia HDMI Codec**
  Enable/Disable internal HDMI codec for Azalia
- **HDMI Port B**
  Enable/Disable HDMI Port B
- **HDMI Port C**
  Enable/Disable HDMI Port C

3.2.3.6 USB Configuration



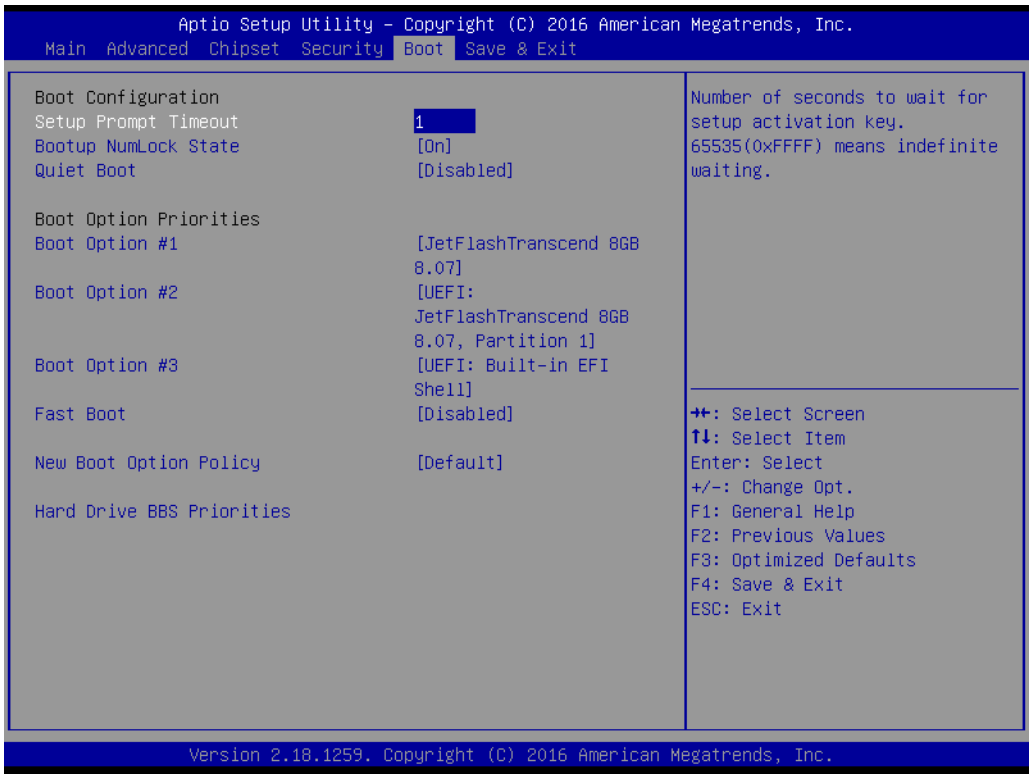
- **OS Selection**
  OS Selection to choose Windows 8.X / Windows 7.
- **XHCI Mode**
  Mode of operation of xHCI controller.
- **USB 2.0(EHCI) Support**
  Control the USB EHCI (USB 2.0) functions. One EHCI controller must always be enabled.
- **USB Per Port Control**
  Control each of the USB ports (1~4). Enable: Enable USB per port; Disable: Use USB port X settings.

3.2.3.7 PCI Express Configuration



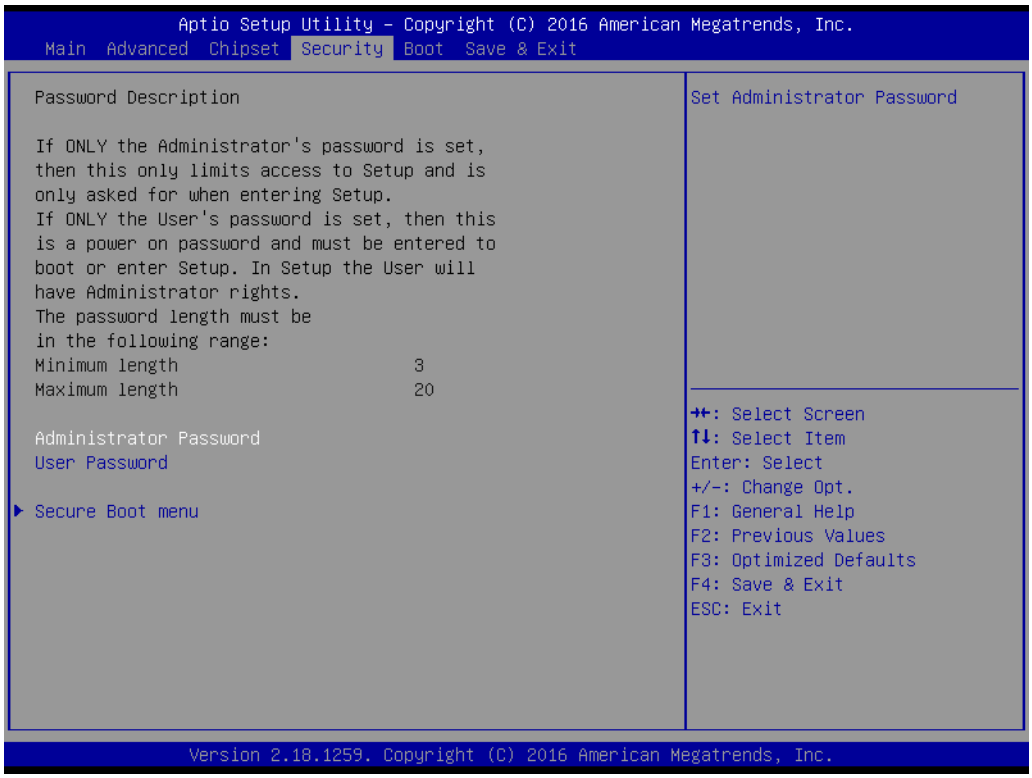
- **PCI Express Port0 / Port2**
  Enable or Disable the PCI Express Port0 / Port 2 in the chipset.
- **PCIe Speed**
  Configure PCIe Port Speed.

3.2.4 Boot Settings



- **Setup Prompt Timeout**
  Number of seconds that the firmware will wait before initiating the original default boot selection. A value of 0 indicates that the default boot selection is to be initiated immediately on boot. A value of 65535 (0xFFFF) indicates that firmware will wait for user input before booting. This means the default boot selection is not automatically started by the firmware.
- **Bootup NumLock State**
  Select the keyboard NumLock state.
- **Quiet Boot**
  Enables or disables Quiet Boot option.
- **Boot Option #1**
  Sets the system boot order.

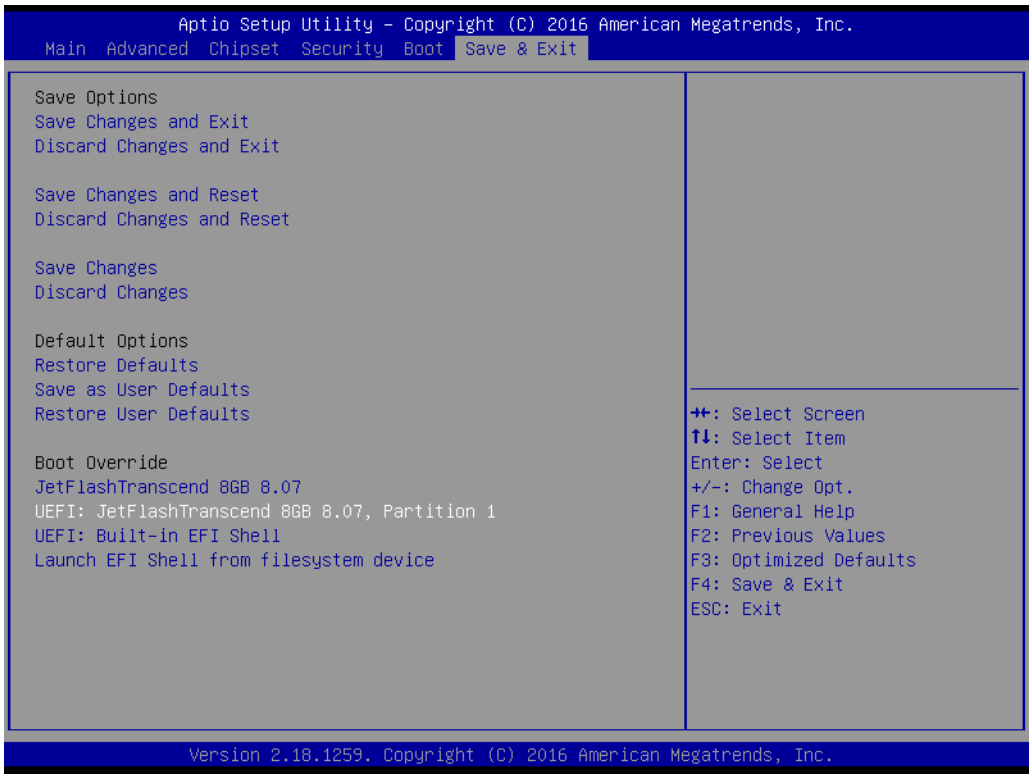
3.2.5 Security Setup



Select Security Setup from the ARK-2250 Setup main BIOS setup menu. All Security Setup options, such as password protection is described in this section. To access the sub menu for the following items, select the item and press <Enter>:

- **Change Administrator / User Password**
  Select this option and press <ENTER> to access the sub menu, and then type in the password.

3.2.6 Save & Exit



- **Save Changes and Exit**
  This item allows you to exit system setup after saving the changes.
- **Discard Changes and Exit**
  This item allows you to exit system setup without saving any changes.
- **Save Changes and Reset**
  This item allows you to reset the system after saving the changes.
- **Discard Changes and Reset**
  This item allows you to rest system setup without saving any changes.
- **Save Changes**
  This item allows you to save changes done so far to any of the options.
- **Discard Changes**
  This item allows you to discard changes done so far to any of the options.
- **Restore Defaults**
  This item allows you to restore/load default values for all the options.
- **Save as User Defaults**
  This item allows you to save the changes done so far as user defaults.
- **Restore User Defaults**
  This item allows you to restore the user defaults to all the options.
- **Boot Override**
  Boot device select can override your boot priority.

Appendix A

Watchdog Timer Sample Code

A.1 EC Watchdog Timer sample code

```
EC_Command_Port = 0x29Ah
EC_Data_Port = 0x299h
Write EC HW ram = 0x89
Watch dog event flag = 0x57
Watchdog reset delay time = 0x5E
Reset event = 0x04
Start WDT function = 0x28
================================================
.model small
.486p
.stack 256
.data
.code
org 100h
.STARTup

mov dx, EC_Command_Port
mov al,89h          ; Write EC HW ram.
out dx,al

mov dx, EC_Command_Port
mov al, 5Fh         ; Watchdog reset delay time low byte (5Eh is high byte) index.
out dx,al

mov dx, EC_Data_Port
mov al, 30h         ;Set 3 seconds delay time.
out dx,al

mov dx, EC_Command_Port
mov al,89h          ; Write EC HW ram.
out dx,al

mov dx, EC_Command_Port
mov al, 57h         ; Watch dog event flag.
out dx,al

mov dx, EC_Data_Port
mov al, 04h          ; Reset event.
out dx,al

mov dx, EC_Command_Port
mov al,28h          ; start WDT function.
out dx,al

.exit
END
```

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All product specifications are subject to change without notice.