EM218 EM219 EM229 V1.1

User Manual

Ordering Information:

Model: EM218							
Sub-model	Intel CPU	LAN	COM	USB2.0	USB3.0	Memory	Power
EM218-2C	J1800	1	2	7	1	1*NB-DDR3,Max. 8GB RAM	DC 12V
EM218-4C			4				

Model: EM219							
Sub-model	Intel CPU	LAN	COM	USB2.0	USB3.0	Memory	Power
EM219-2C	J1900	1	2	7	1	1*NB-DDR3,Max. 8GB RAM	DC 12V
EM219-4C			4				

Model: EM229							
Sub-model	Intel CPU	LAN	COM	USB2.0	USB3.0	Memory	Power
EM229-2C	J2900	1	2	7	1	1*NB-DDR3,Max. 8GB RAM	DC 12V
EM229-4C			4				

EM218,EM219,EM229 motherboards support Intel ATOM Bay Trail processor(FCBGA1170)					
CPU Model	Brand	Base Frequency (GHz)	Burst Frequency (GHz)	TDP (W)	CPU Graphics
J1800	Celeron	Dual cores, 2.41	2.58	10	Intel HD Graphics (1080P,2k,FHD)
J1900		Quad Cores, 2.0	2.42		
J2900	Pentium	Quad Cores , 2.41	2.66		

⚠Warmly remind:

(1) By default,the motherboard supports EDP1,EDP2 pins,does not support LVDS pin.
The EDP2 conflicts with LVDS.You can choose one of the EDP2,LVDS,but not both.If you need LVDS,please tell us to change the motherboard in advance.

(2)
EDP1 is 30pins,it uses an integrated screen&backlight cable;
EDP2 is 20pins,it uses independent screen cable,backlight cable.

(3) The motherboard supports optional 2*COM,4*COM.By default,the COM1,COM2,COM3,COM4 only support RS232.

(4) The 9th pin of COM1/COM2/COM3/COM4 supports output optional 0V , 5V ,12V by JPCOM1/JPCOM2/JPCOM3 /JPCOM4 jumper setting.
By default,the COM1,COM2 have 0V.

(5) The motherboard only has 1*USB3.0 port.In the blue USB interface,the above is the USB2.0 interface,and the bottom is the USB3.0 interface.The black USB interfaces are USB2.0 ports.

(6) By default,the Mini-PCIE slot has PCIE,USB signals.

(7) By default,the MSATA slot has SATA,USB signals.The MSATA slot supports changing the SATA signal to the PCIE signal.Please note that the SATA signal will not exist after the change.If you need PCIE signal for MSATA slot,please tell us in advance.

(8) By default,the motherboard is fanless,if you need fan cooling,please contact us to change in advance.

(9) The motherboard only supports 1*RJ45 LAN port,does not support 2*LAN,POE port.

(10) Please use the correct voltage. Excessive voltage will burn the motherboard.

(11) Please use enough current.If the current is insufficient, it will not work, and even cause crashes, restarts, blue screens and other problems.

(12) Provide CCC, ISO 9001: 2015, MSDS,China certificate for energy conservation product certificates.

(13) All product specifications are subject to change without notice.

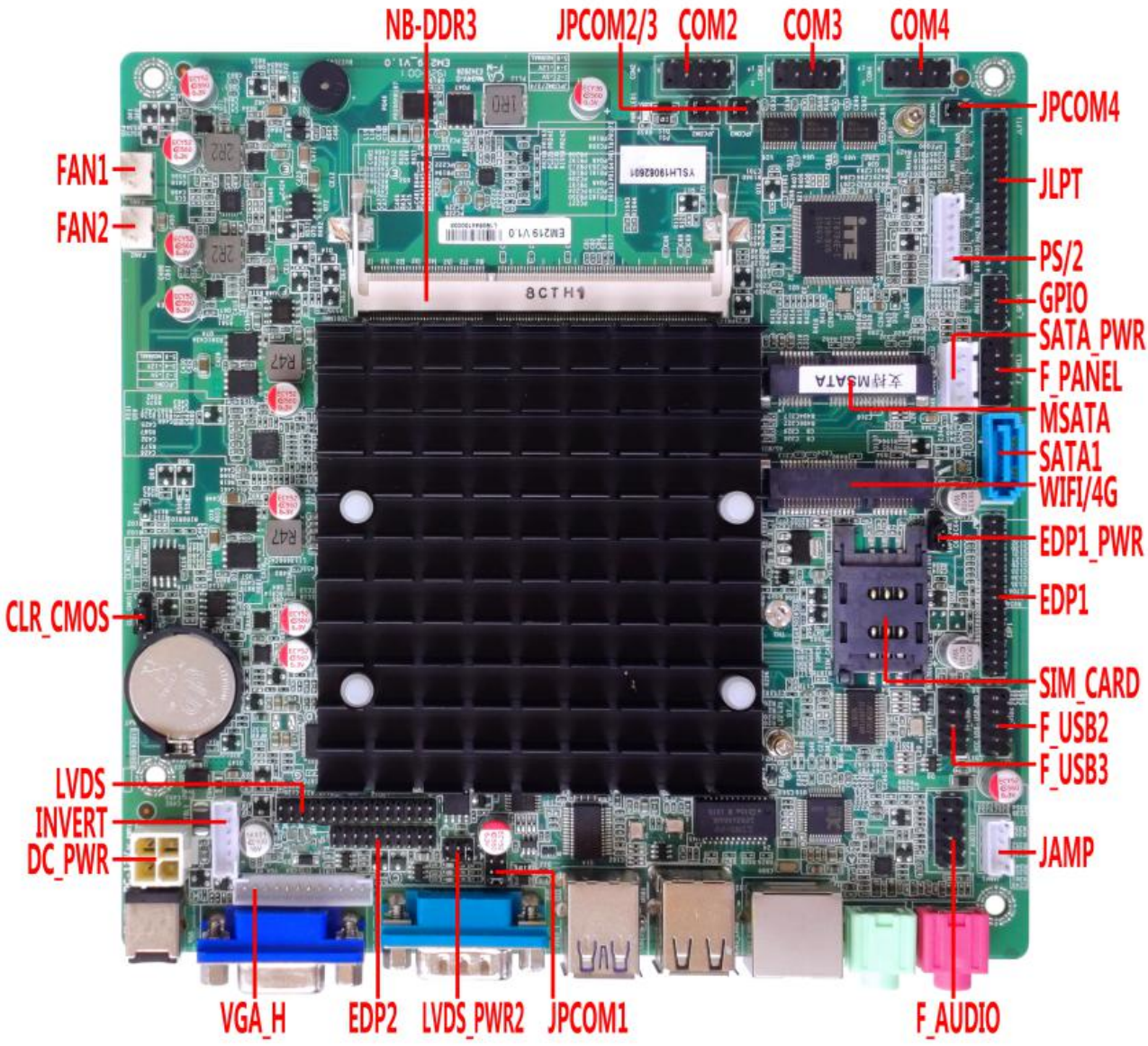
Chapter One The Motherboard specifications

Form Factor	Standard Thin-ITX,170*170*18mm(L*W*H)	
Processor	EM218:Support Intel Celeron dual cores J1800 CPU; EM219:Support Intel Celeron quad cores J1900 CPU; EM229:Support Intel Pentium quad cores J2900 CPU.	
Chipset	Intel Bay trail SOC Chipset	
Cooling	Heat sink(Fanless,passive cooling); Optional thin silent cool fan.	
Supply	1*DC_JACK1 interface	DC port:5.5*2.5mm; Support 12V;
	1*DC_PWR1 interface	The motherboard full load power consumption is about 25W; Recommend 12V 5A / 7A / 10A power adapter.
Memory	1*SODIMM1 slot	1*NB-DDR3 1600MHz 1.35V Memory slot,Max. 8GB RAM.
Ethernet	1*RJ45 LAN interface	Realtek 8111H 10/100/1000Mbps RJ45 LAN port; Wake-on-LAN and PXE diskless boot function.
	1*MINI_PCIE interface	Support optional WIFI/Bluetooth/3G/4G/GPS,etc.
Display	Integrated Intel HD Graphics in CPU; Support single display,dual display copy/expansion,single display in DOS.	
	1*VGA DB15 interface	Support Max. Resolution 1920*1200@60Hz
	1*VGA_H1 pin	Support Max. resolution 1920*1200@60Hz (12Pin,1*12Pin,2.0mm)
	1*EDP1 pin	Support Max. resolution 1920*1080@60Hz (30Pin,2*15Pin,2.0mm)
	1*EDP1_PWR pin	EDP1 voltage control pin (3Pin,1*3Pin,2.54mm)
	1*EDP2 pin	Support Max. resolution 1920*1080@60Hz (20Pin,2*10Pin,2.0mm)
	1*LVDS2 pin	Support Max. resolution 1920*1080@60Hz (30Pin,2*15Pin,2.0mm)
	1*LVDS_PWR2 pin	LVDS/EDP2 voltage control pin (6Pin,2*3Pin,2.0mm)
	1*INVERT pin	LVDS/EDP2 backlight control pin (6Pin,1*6Pin,2.0mm)
USB	1*USB3.0 interface	Rear standard USB3.0 interface
	3*USB2.0 interfaces	Rear standard USB2.0 interface
	1*F_USB2 pin	Front USB2.0 pin;One group has 2*USB2.0 (9Pin,2*5Pin,2.54mm)
	1*F_USB3 pin	Front USB2.0 pin;One group has 2*USB2.0 (9Pin,2*5Pin,2.54mm)
Sound	Integrated Realtek ALC662 HD digital audio decoder,6-channel high-fidelity audio controller.	
	1*LINE_OUT interface	Support Audio output
	1*MIC_IN interface	Support Microphone input
	1*JAMP1 pin	This is the amplifier pin. It supports 8Ω 5W speaker dual channel output. (4Pin,1*4Pin,2.0mm)
	1*F_AUDIO1 pin	Standard Audio pin (9Pin,2*5Pin,2.54mm)
Hard Disk	1*SATA1 interface	Standard SATA2.0 hard disk interface
	1*MSATA slot	Mini SATA2.0(MSATA) SSD slot
	1*SATA_PWR pin	It is hard disk power supply pin and can take the 5V,12V electricity. (4Pin,1*4Pin,2.54mm)
Switch	1*F_PANEL1 pin	Switch, power supply light, hard disk light, restart pin. (9Pin,2*5Pin,2.54mm)
Parallel Port	1*JLPT1 pin	Standard printer interface pin (25Pin,2*13Pin,2.0mm)
Serial Port	1*COM1 interface	Support standard RS232;Not support RS422/RS485
	1*COM2/3/4 pin	Support standard RS232;Not support RS422/RS485. (9Pin,2*5Pin,2.54mm)
	1*JPCOM1/2/3/4 pin	Control the 9th pin of the COM1/2/3/4 to choose optional 0V/5V/12V. (6Pin,2*3Pin,2.0mm)
	1*PS/2 pin	Standard PS/2 interface pin (7Pin,1*7Pin,2.0mm)
	1*SIM_CARD1 slot	Support SIM card. A SIM card is required when using 3G/4G function.

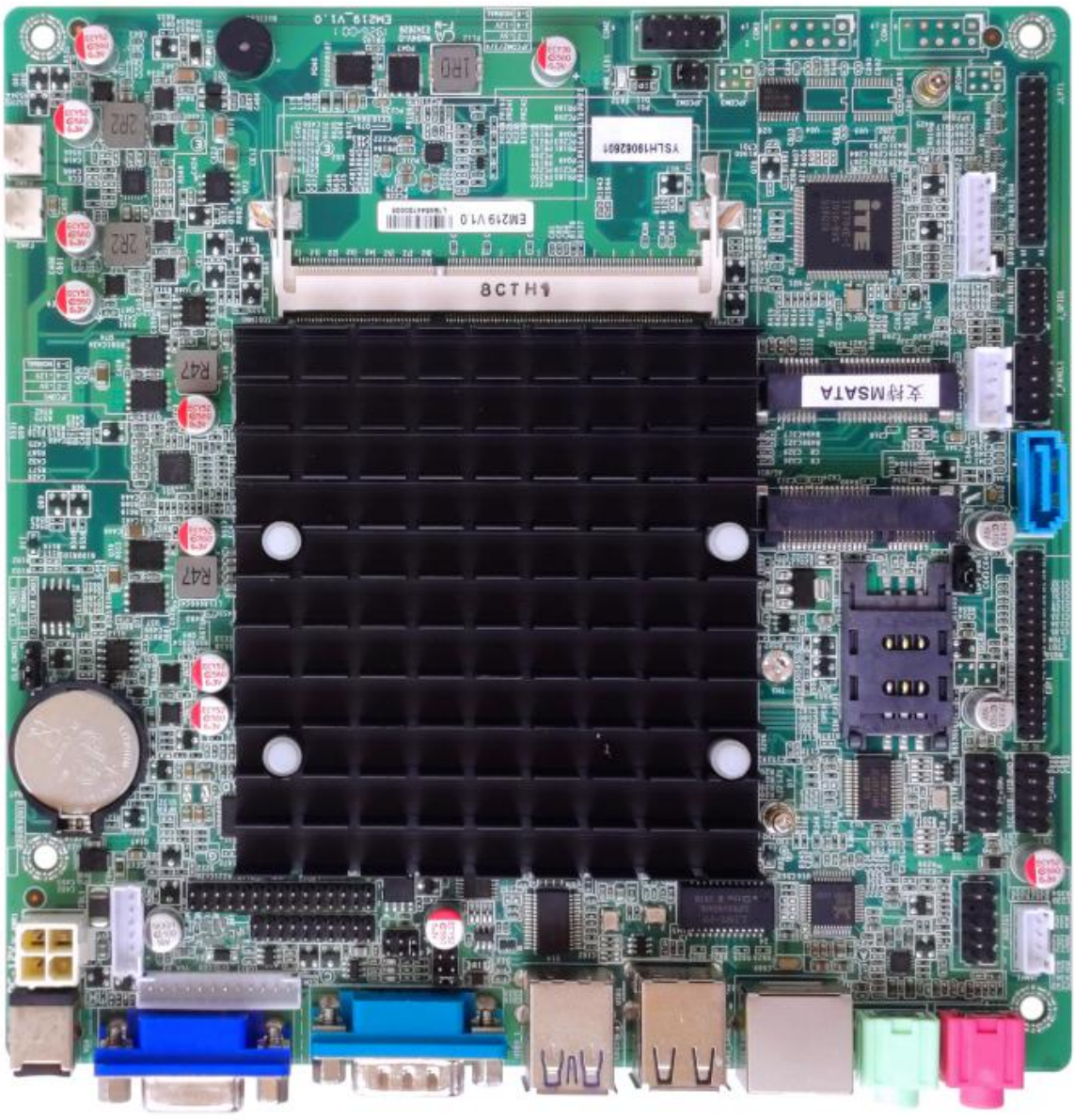
Other I/O	1*CLR_CMOS1 pin	Motherboard discharges,clears pin. (3Pin,1*3Pin,2.54mm)
	2*FAN pin	Fan pin (3Pin,1*3Pin,2.54mm)
	1*J_GPIO1 pin	GPIO control pin (10Pin,2*5Pin,2.0mm)
Operating Environment	Operating temperature:-20℃~60℃; Working humidity:5%~95% Relative humidity, no condensation.	
BIOS	AMI BIOS;Support power on,timing switch,remote switch,intelligently identify devices.	
Watch Dog	Watch Dog programming supports hardware reset function (256 levels, 0~255 seconds).	
Operating System	Support Windows 10,Windows 8,Windows 7,Linux,etc.	

1.1 Motherboard Pictures:

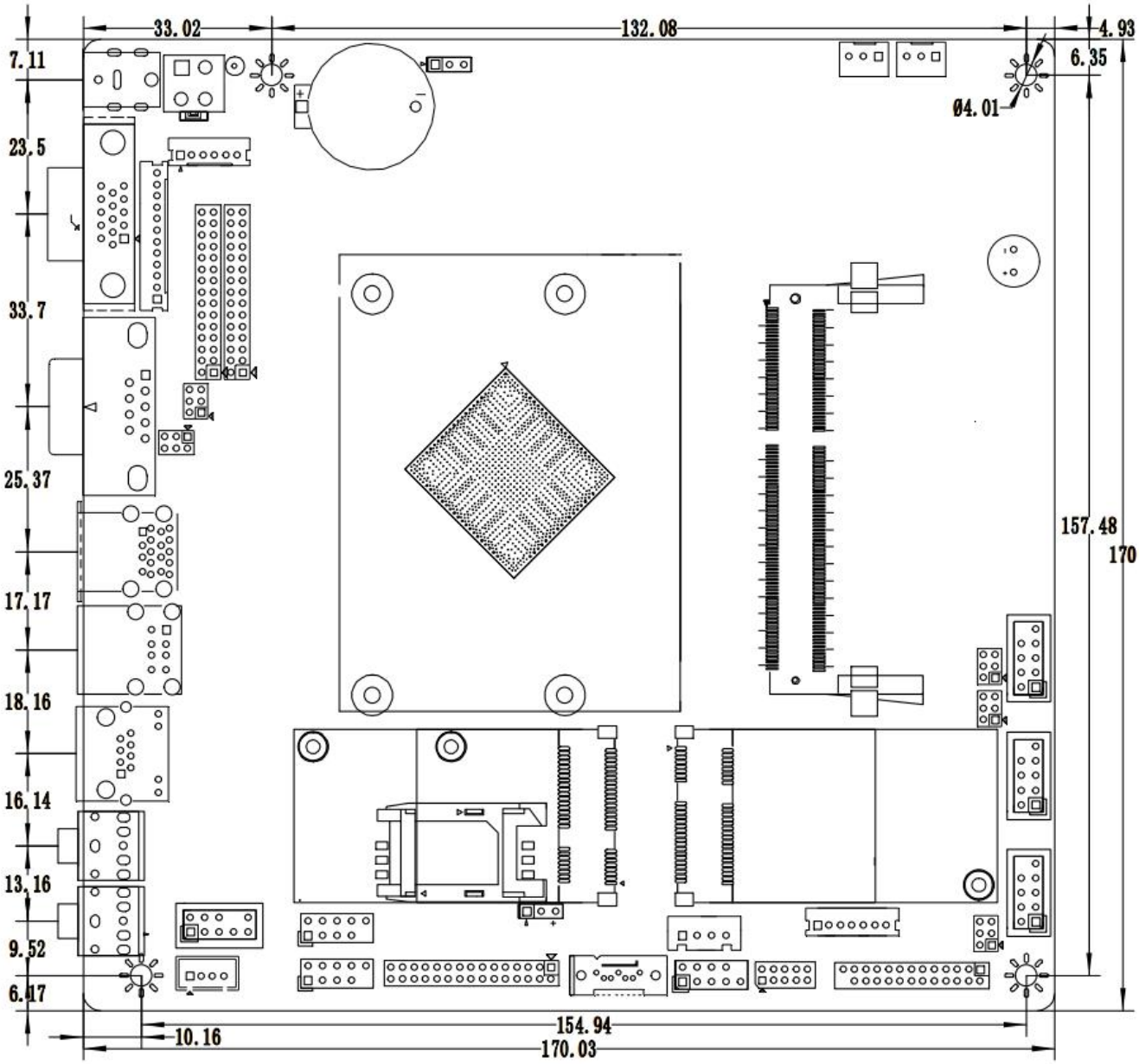
4*COM:

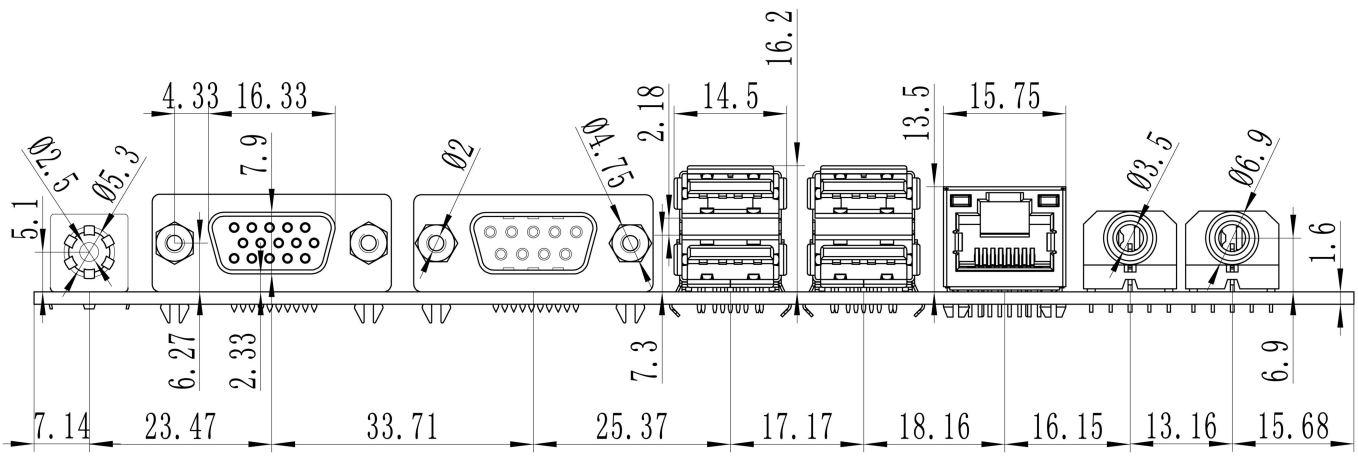


2*COM:



1.2 The motherboard dimension drawing:





Chapter Two The motherboard pin definition and description

2.0 The 1st pin identification methods:

(1) Method 1: Look at the silkscreen mark next to the front pin of the motherboard.

Will be represented by a triangle symbol or a bold line or "1";

(2) Method 2: Look at the back pad of the motherboard. The square pad is the first pin;

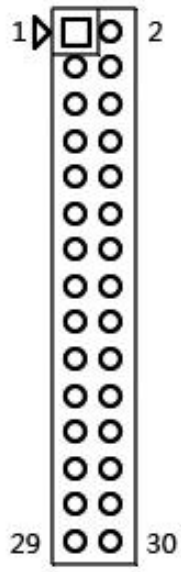
Please pay attention to distinguish the 1st pin when plugging in the device and the cable, otherwise the motherboard and device will be damaged.

2.1 VGA pin definition:

Position symbol: VGA_H1 (1*12Pin,2.0mm)			
pin	definition	pin	definition
1	GND	2	VSYNC
3	HSYNC	4	GND
5	RED	6	GND
7	GRN	8	GND
9	BLUE	10	GND
11	DDC_DATA	12	DDC_CLK
pin position symbol drawing			

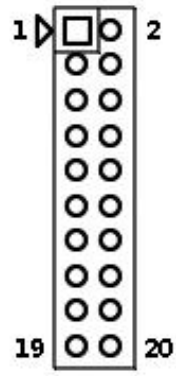
⚠**Notice:The VGA_H1 pin signal is the same signal as the rear VGA port,and only support dual display copy.**

2.2 LVDS pin definition:

Position symbol: LVDS2 (2*15Pin,2.0mm)				pin position symbol drawing
pin	definition	pin	definition	
1	VCC	2	VCC	
3	VCC	4	GND	
5	GND	6	GND	
7	ADO0-	8	ADO0+	
9	ADO1-	10	ADO1+	
11	ADO2-	12	ADO2+	
13	GND	14	GND	
15	ACLK-	16	ACLK+	
17	ADO3-	18	ADO3+	
19	BDO0-	20	BDO0+	
21	BDO1-	22	BDO1+	
23	BDO2-	24	BDO2+	
25	GND	26	GND	
27	BCLK-	28	BCLK+	
29	BDO3-	30	BDO3+	

⚠**Notice: When inserting the LVDS cable, the first pin of the LVDS cable must correspond to the first pin of the LVDS2 pin on motherboard. If the port is reversed or inserted incorrectly, there is a danger of burning the screen and burning the motherboard!**

2.3 EDP2 pin definition:

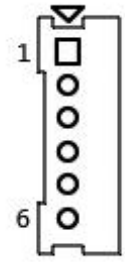
Position symbol: EDP2 (2*15Pin,2.0mm)				pin position symbol drawing
pin	definition	pin	definition	
1	VCC	2	VCC	
3	VCC	4	HPD	
5	GND	6	GND	
7	TX0N	8	TX0P	
9	TX1N	10	TX1P	
11	NC	12	NC	
13	GND	14	GND	
15	AUX-	16	AUX+	
17	GND-	18	GND	
19	TX2N	20	TX2P	

⚠**Notice:**

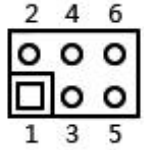
The EDP2 pin needs to connect independent backlight cable.

When inserting the EDP cable, the first pin of the EDP cable must correspond to the first pin of the EDP2 pin on motherboard. If the port is reversed or inserted incorrectly, there is a danger of burning the screen and burning the motherboard!

2.3.1 EDP2/LVDS backlight power supply definition:

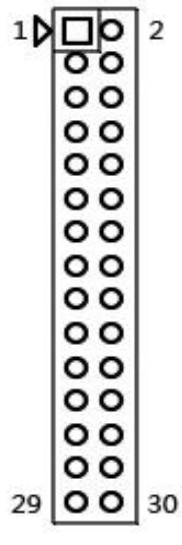
Position symbol: INVERT (1*6Pin,2.0mm)		pin position symbol drawing
pin	definition	
1	+12V	
2	+12V	
3	ON/OFF(Backlight switch)	
4	ADJ(Backlight brightness adjustment)	
5	GND	
6	GND	

2.3.2 EDP2/LVDS screen operating voltage:

Position symbol: LVDS_PWR2 (2*3Pin,2.0mm)		pin position symbol drawing
pin	definition	
1-2 short circuit	+3.3V	
3-4 short circuit	+5V	
5-6 short circuit	+12V	

⚠ **Notice:Screens of different sizes require different operating voltages. The motherboard provides three screen operating voltages of 3.3V, 5V and 12V. Please set the corresponding value of "LVDS_PWR2"according to the working voltage required by the screen, otherwise there will be danger of burning the screen and burning the motherboard!**

2.4 EDP1 pin definition:

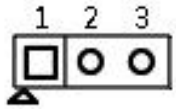
Position symbol: EDP1 (2*15Pin,2.0mm)				pin position symbol drawing
pin	definition	pin	definition	
1	VCC	2	VCC	
3	GND	4	GND	
5	TX0P	6	TX2P	
7	TX0N	8	TX2N	
9	GND	10	GND	
11	TX1P	12	TX3P	
13	TX1N	14	TX3N	
15	GND	16	GND	
17	AUXP	18	HPD	
19	AUXN	20	NC	
21	GND	22	GND	
23	GND	24	GND	
25	BKLT_EN	26	BKCTRL	
27	VCC	28	VCC	
29	VCC	30	NC	

⚠**Notice:**

EDP1 backlight cable and screen cable are two in one.

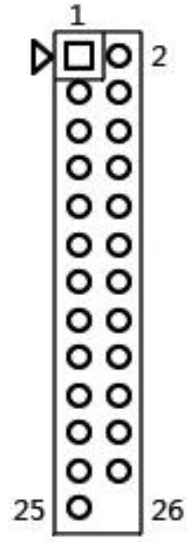
When inserting the EDP cable, the first pin of the EDP cable must correspond to the first pin of the EDP1 pin on motherboard. If the port is reversed or inserted incorrectly, there is a danger of burning the screen and burning the motherboard!

2.4.1 EDP1 screen operating voltage:

Position symbol: EDP1_PWR (1*3Pin,2.54mm)		pin position symbol drawing
pin	definition	
1-2 short circuit	+3.3V	
2-3 short circuit	+5V	

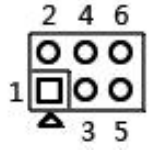
⚠ **Notice:Screens of different sizes require different operating voltages. The motherboard provides two screen operating voltages of 3.3V, 5V. Please set the corresponding value of "EDP1_PWR"according to the working voltage required by the screen, otherwise there will be danger of burning the screen and burning the motherboard!**

2.5 LPT pin definition:

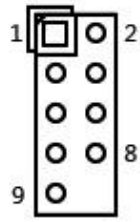
Position symbol: JLPT1 (2*13Pin,2.0mm)				pin position symbol drawing
pin	definition	pin	definition	
1	STB	2	AFD	
3	PD0	4	ERR	
5	PD1	6	INIT	
7	PD2	8	SLIN	
9	PD3	10	GND	
11	PD4	12	GND	
13	PD5	14	GND	
15	PD6	16	GND	
17	PD7	18	GND	
19	ACK	20	GND	
21	BUSY	22	GND	
23	PE	24	GND	
25	SLCT	26	NC	

2.6 Serial port(COM) function and pin definition:

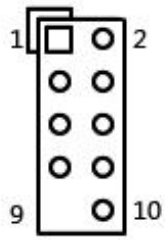
- **The motherboard supports standard RS232 signal,does not support RS422/RS485.**
- **The 9th pin of the COM1/COM2 /COM3/COM4 can change the jumper setting to output +5V or +12V voltage by JPCOM1/JPCOM2/JPCOM3/JPCOM4.**

Position symbol: JPCOM1 JPCOM2 JPCOM3 JPCOM4 (2*3Pin,2.0mm)		pin position symbol drawing
pin	The 9th pin of COM1/COM2/COM3/COM4 is charged	
1-2 short circuit	+5V	
3-4 short circuit	+12V	
5-6 short circuit	Without electricity(Default)	

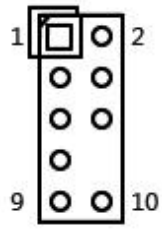
COM1/2/3/4 definition:

Position symbol: COM2 COM3 COM4 (2*5Pin,2.54mm)				pin position symbol drawing
pin	definition	pin	definition	
1	DCD	2	RXD	
3	TXD	4	DTR	
5	GND	6	DSR	
7	RTS	8	CTS	
9	RI	10	NC	
COM1 interface	DB9公头（针）			

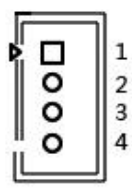
2.7 USB pin definition:

Position symbol: F_USB2 F_USB3 (2*5Pin,2.54mm)				pin position symbol drawing
pin	definition	pin	definition	
1	VCC+5V	2	VCC+5V	
3	DATA0-	4	DATA1-	
5	DATA0+	6	DATA1+	
7	GND	8	GND	
9	NC	10	GND	

2.8 Audio interface and pin definition:

Position symbol: F_AUDIO1 (2*5Pin,2.54mm)				pin position symbol drawing
pin	definition	pin	definition	
1	MIC-L	2	GND	
3	MIC-R	4	NC	
5	LINE OUT-R	6	MIC_JD	
7	FAUDIO_JD	8	NC	
9	LINE OUT-L	10	LINE_JD	

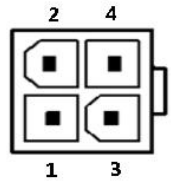
2.9 Speaker(Power Amplifier) pin definition:

Position symbol: JAMP1 (1*4Pin,2.0mm)		pin position symbol drawing
pin	definition	
1	L+	
2	L-	
3	R-	
4	R+	

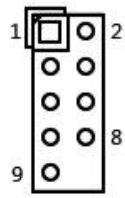
2.10 Power supply and switch pin definition:

The motherboard provides a standard 5.5*2.5mm DC port (DC_JACK1),1*4PIN ATX power supply interface.

4PIN ATX definition:

Position symbol: DC_PWR1 (2*2Pin)		pin position symbol drawing
pin	definition	
1	GND	
2	GND	
3	+12V	
4	+12V	

Switch pin definition:

Position symbol: F_PANEL1 (2*5Pin,2.54mm)						pin position symbol drawing
pin	definition		pin	definition		
1	HDLED+	Hard disk LED	2	PWRLED+	Power supply LED	
3	HDLED-		4	GND		
5	RST	Restart	6	P_SW IN	Switch	
7	GND		8	GND		
9	GND		10	NC		

(1)Hard disk indicator light:

The 1st and 3rd pins are HDDLED. The 1st pin is the positive side of the LED.When the hard disk is being read or written,the indicator light will flash, indicating that the hard disk is running.

(2)Power supply indicator light:

The 2nd and 4th pins are Power LED. The 2nd pin is the positive side of the LED.When the motherboard is powered on,the power indicator light is on.When the motherboard is powered off, the power indicator light is off.

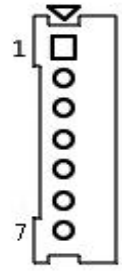
(3)Restart button:

The 5th,7th pins are Restart Buttons.When the system fails and cannot continue to work, the restart can restart the system.

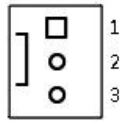
(4)Power supply switch control:

The 6th, 8th pins are power supply buttons.Using these two pins to connect to the bounce switch on the front panel of the chassis to turn on or off the computer.

2.11 PS/2 pin definition:

Position symbol: PS/2 (1*7Pin,2.0mm)		pin position symbol drawing
pin	definition	
1	K_SATA	
2	K_CLK	
3	GND	
4	M_DATA	
5	M_CLK	
6	GND	
7	+5V	

2.12 Fan interface definition:

Position symbol: FAN1 FAN2 (1*3Pin,2.54mm)		pin position symbol drawing
pin	definition	
1	GND	
2	+12V	
3	TAC(Fan speed detection)	

2.13 Hard disk interface and definition:

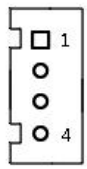
The motherboard provides:

- **1*SATA2.0 hard disk interface;**
- **1*MSATA2.0 slot;**
- **1*4Pin hard disk power supply voltage interface.**

SATA definition:

Position symbol: SATA1	
pin	definition
1	GND
2	SATA_TXP
3	SATA_TXN
4	GND
5	SATA_RXN
6	SATA_RXP
7	GND

SATA_PWR definition:

Position symbol: SATA_PWR (1*4Pin,2.54mm)		pin position symbol drawing
pin	definition	
1	12V	
2	GND	
3	GND	
4	5V	

⚠**Notice:The first pin of the"SATA_PWR"hard disk power supply interface is 12V output, and the fourth pin is 5V output. When using, you must use the customized power cord from our company to avoid burning the hard disk.**

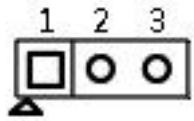
2.14 Motherboard discharges,clears and battery:

The"CMOS" is powered by the button battery on the motherboard.
Clearing the "CMOS" will cause the previous BIOS settings to be cleared and restore the original factory setting.

Clearing CMOS procedures:
Method 1:
(1)Turn off the motherboard and disconnect the power.
(2)Use metal conductors to briefly connect the pin 2,pin 3 of "CLR_CMOS1" for 5~6 seconds.
(3)When booting up, press "Delete" to enter the BIOS.
(4)After entering the BIOS, press "F9" ,"Enter" to reload the optimal default value.
(5)Press the "F10" to save and exit the setting.

Method 2:
When the motherboard is powered off, plug and pull the button battery to achieve the motherboard clear function. Remove the button battery, and then re-install the button battery after 10 seconds.Please pay attention to the positive and negative of the battery.

CMOS pin definition:

Position symbol: CLR_CMOS1 (1*3Pin,2.54mm)		pin position symbol drawing
pin	Function	
1-2 short circuit	Normal	
2-3 short circuit	Clear CMOS content,BIOS will restore factory settings.	

⚠**Notice: Please do not clear the"CMOS"when the motherboard is running or charging, so as not to damage the motherboard.**

Button battery specification: 3V CR2032

⚠**Notice:**

(1) Please make sure the battery is facing up.
(2) Please make sure the battery voltage is enough 2.8V~3V.
(3) Please must use the same model or the manufacturer recommend the same type of battery.
(4) If the battery is not replaced correctly, there is a danger of explosion!

Chapter Three BIOS Setup

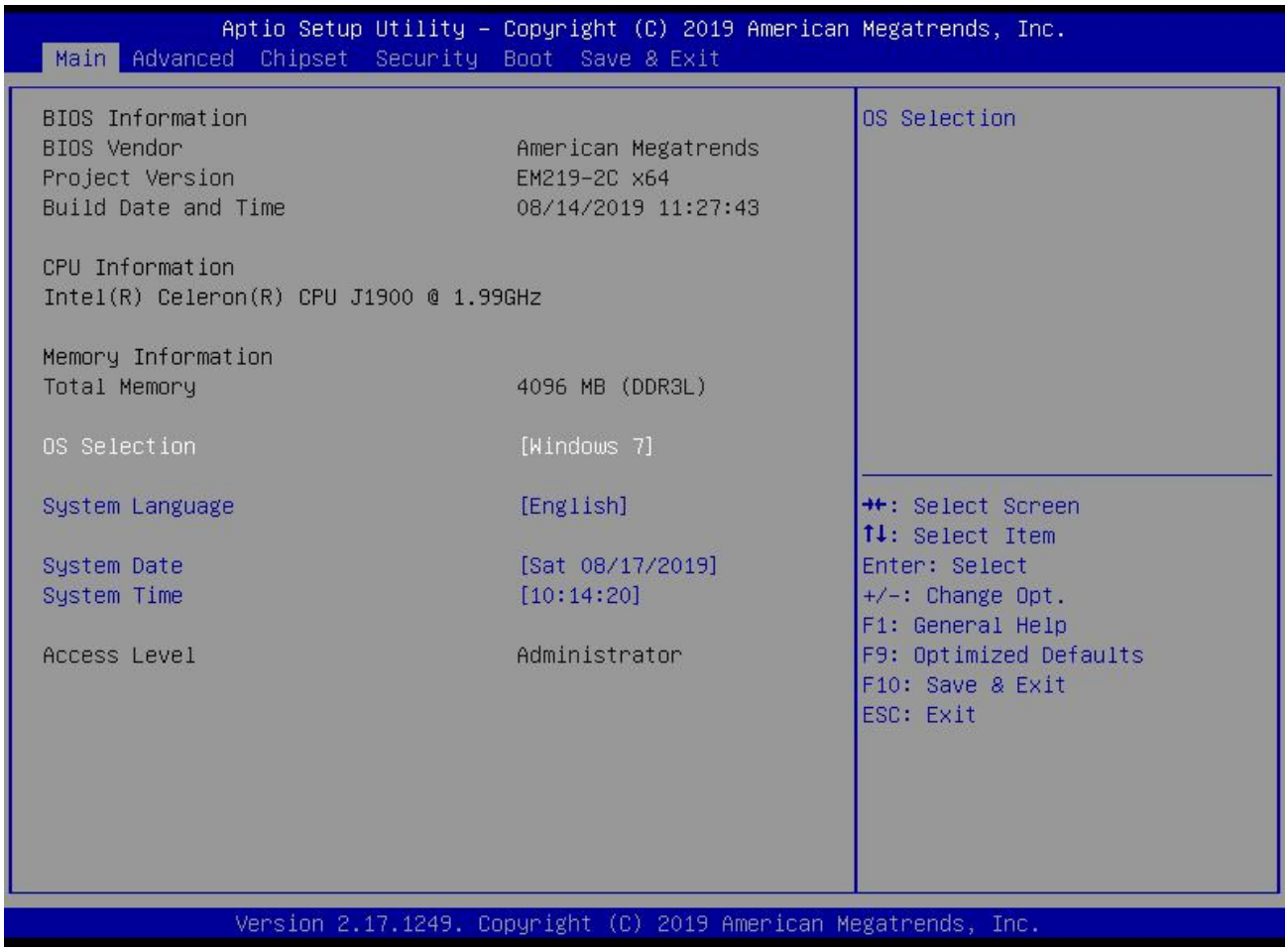
BIOS hot key	Function
When starting, press the "Delete" button	Enter "BIOS"
When starting, press the "F11" button	Select"Setup",or select enter"BIOS".
← →	Select Screen(Move the left and right arrows to select an entry).
↑ ↓	Select Item(Move the up and down arrows to select an entry).
Enter	Select(Select item and enter the submenu).
+/-	Change Opt.(Change selections,add or subtract values).
F1	General help(Show related help content).
F9	Optimized Defaults(Go back to the vendor's default settings).
F10	Save&Exit
Esc	Exit

3.0 How to enter the BIOS?

- **Method 1 : After starting, press"Delete"continuously to enter the BIOS directly.**

Method 2 : Press"F11"continuously after booting, then select "Enter Setup"to enter the BIOS.

3.1 Main Menu(BIOS information):



(1) BIOS Vendor: American Megatrends

(2) Project Version: EM219-2C x64

(3) Build Date and Time: 08/14/2019 11:27:43

(4) Processor Information: CPU model

(5) Memory Information:

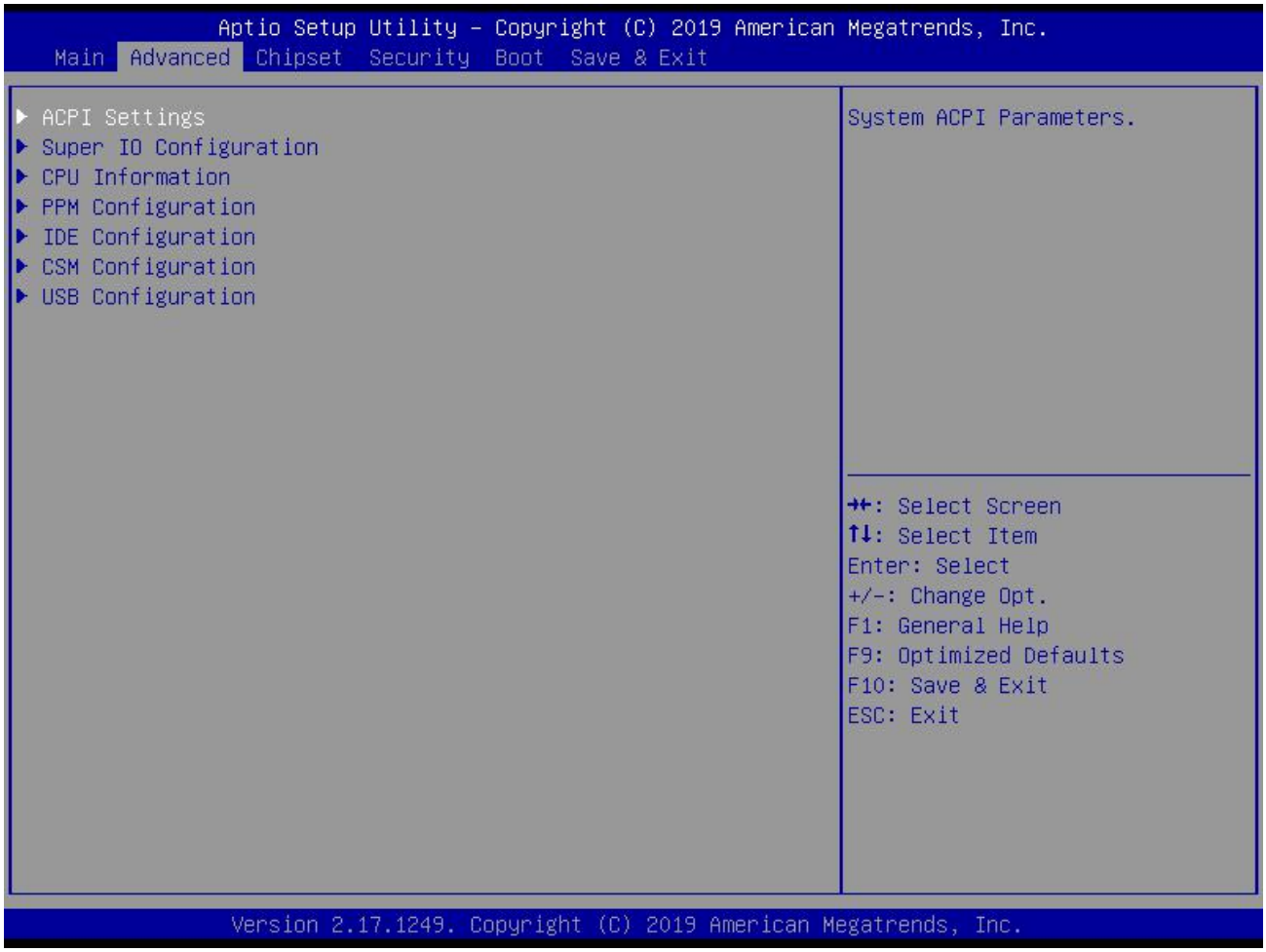
(6) OS Selection: It is operating system options,you can choose Windows 7 / Linux / Windows 8.X

- **Windows 7: Windows 7**
- **Linux: Android**
- **Windows 10: Windows 8.X**

(7) System Date: The format is week Month/day/year

(8) System Time: The format is hour/minute/second

3.2 Advanced:



(1) ACPI Settings: Advanced configuration and power supply management interface setting.

(2) Super IO Configuration:

(3) CPU Information: CPU parameter information and common setting options

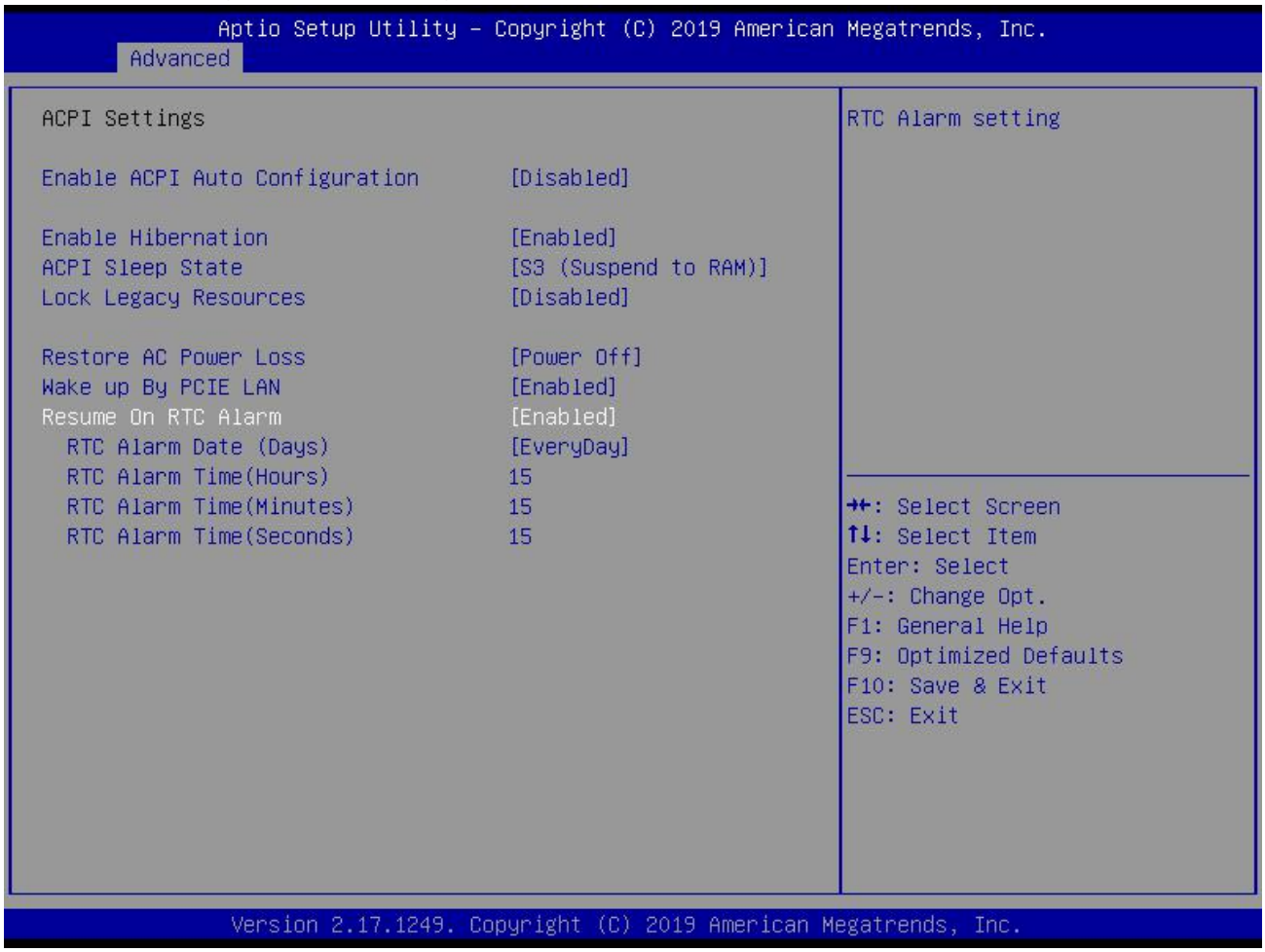
(4) PPM Configuration:

(5) IDE Configuration: Hard disk mode settings and information

(6) CSM Configuration:

(7) USB Configuration: USB information and control options

3.2.1 ACPI Settings(C-state Settings): C-State : Disabled



(1)Enable ACPI Auto Configuration:

This item is ACPI automatically configured. It can"Enabled"or"Disabled"the ACPI auto configuration of the BIOS.By default, the motherboard is set to"Disabled".

(2)Enable Hibernation:

This item is hibernation support. It can "Enabled"or"Disabled"the system hibernation function(In OS/S4 sleep state).However, this option does not work in some operating systems. By default, the motherboard is set to"Enabled".

(3)ACPI Sleep State:

This item is used to select the power saving mode when the system sleeps.The mode is different, the system power consumption will be different.

- **Suspend Disabled: Turn off sleep mode.**
- **S1(CPU Stop Clock): The CPU stops working, but the other devices are still powered normally.**
- **S3(Suspend to Ram): Suspend to memory.**

(4)Lock Legacy Resources:

It can"Enabled"or"Disabled"legacy resources lock.

(5)Wake up By PCIE LAN:

This is the"Wake on LAN"switch.The"Disabled"is turn off; The"Enabled"is turn on.

3.2.2 Set the Power on/off function in BIOS:

Restore AC Power Loss: It is the"power on/off"switch in BIOS.

- **Power Off : After the motherboard is powered,it won't automatically boot and you need to boot it manually.**
- **Power On: After the motherboard is powered,it will automatically boot and you don't need to boot it manually.**

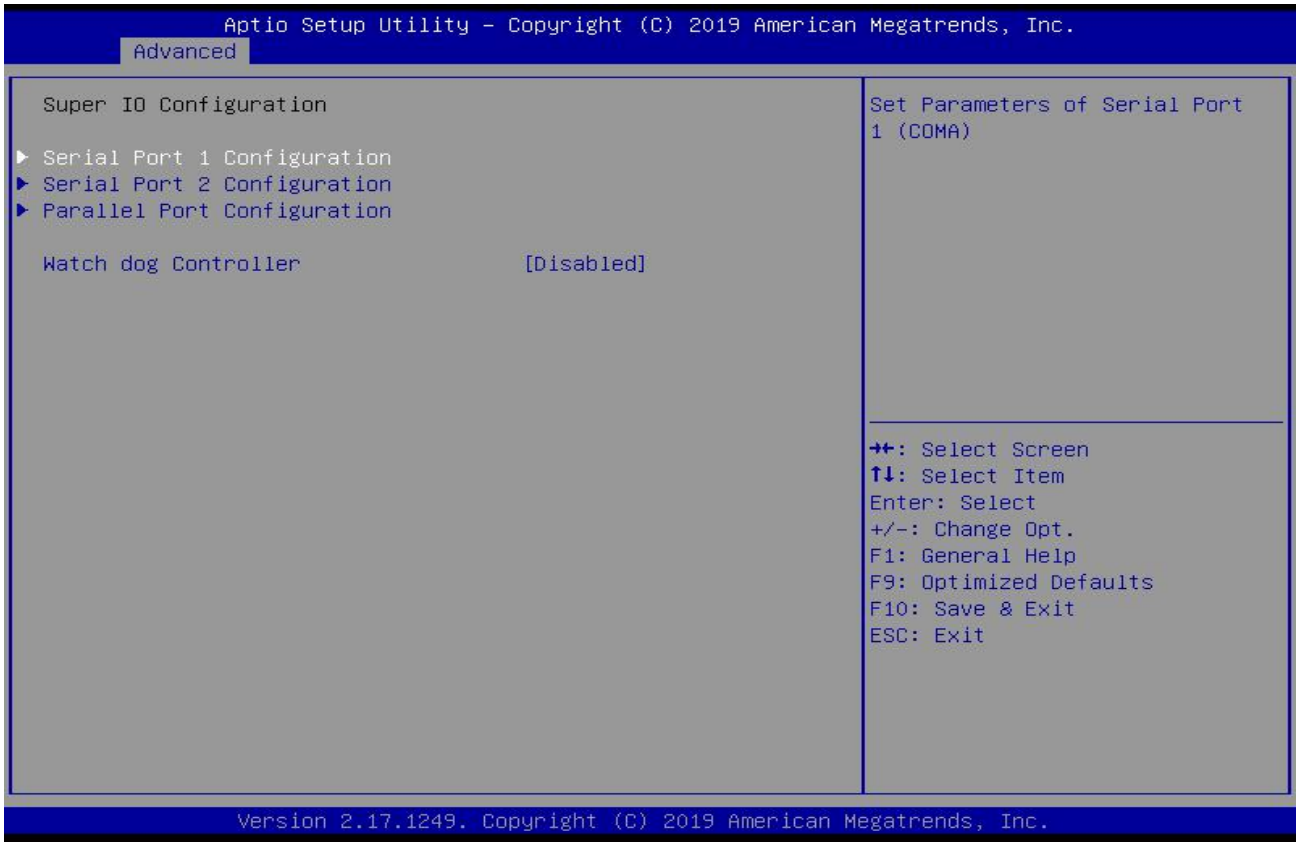
By default,the motherboard is set to "Power Off".

3.2.3 Timed boot settings:

Resume On RTC Alarm: It is timed booting setting(Automatically start operating system in fixed time).
The"Disabled" is turn off; The"Enabled"is turn on.

- **RTC Alarm Date(Days)**
- **RTC Alarm Time(Hours)**
- **RTC Alarm Time(Minutes)**
- **RTC Alarm Time(Seconds)**

3.2.4 Super IO Configuration:



(1) Serial Port 1 Configuration: It is COM1 configuration information and settings. Only support RS232.

(2) Serial Port 2 Configuration: It is COM2 configuration information and settings. Only support RS232.

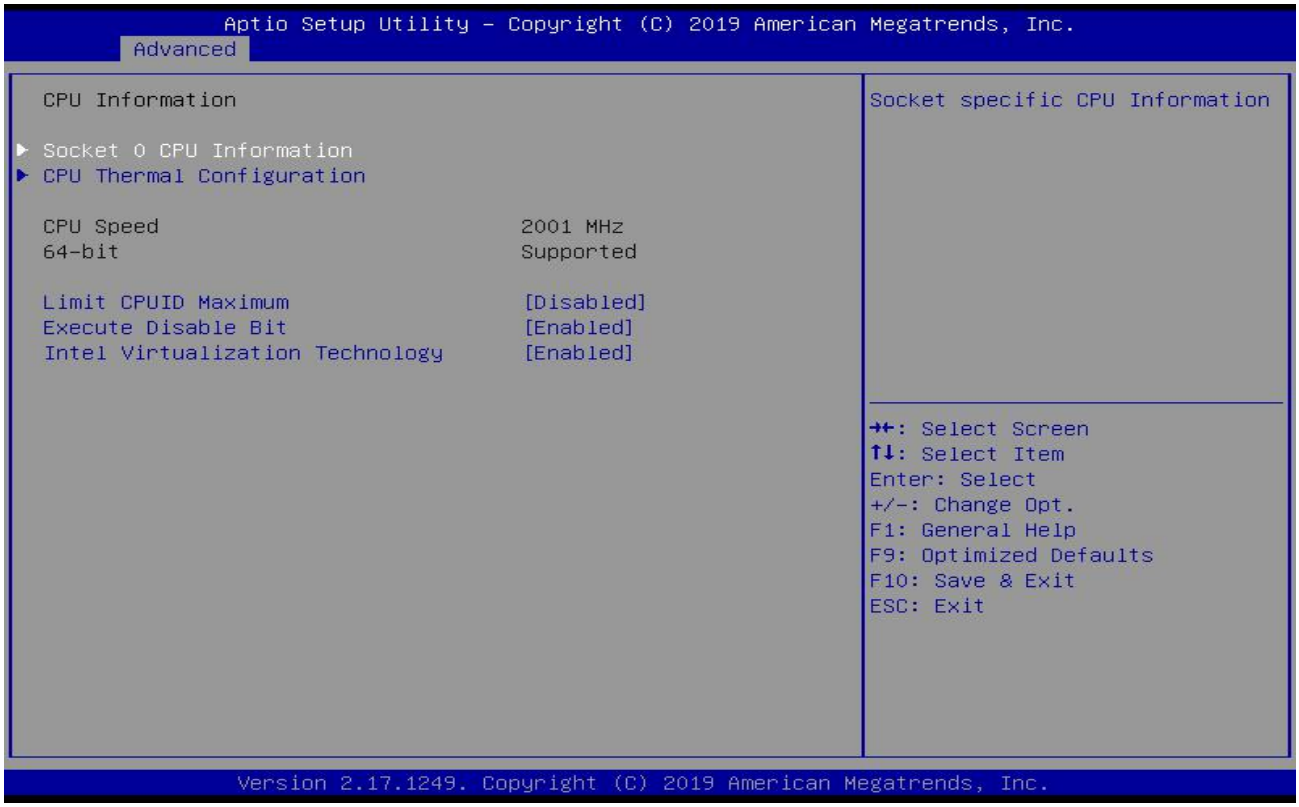
(3) Serial Port 3 Configuration: It is COM3 configuration information and settings. Only support RS232.

(4) Serial Port 4 Configuration: It is COM4 configuration information and settings. Only support RS232.

(5) Parallel Port Configuration:It is LPT configuration information and settings.

(6) Watch dog Controller:This is the watch dog setting.

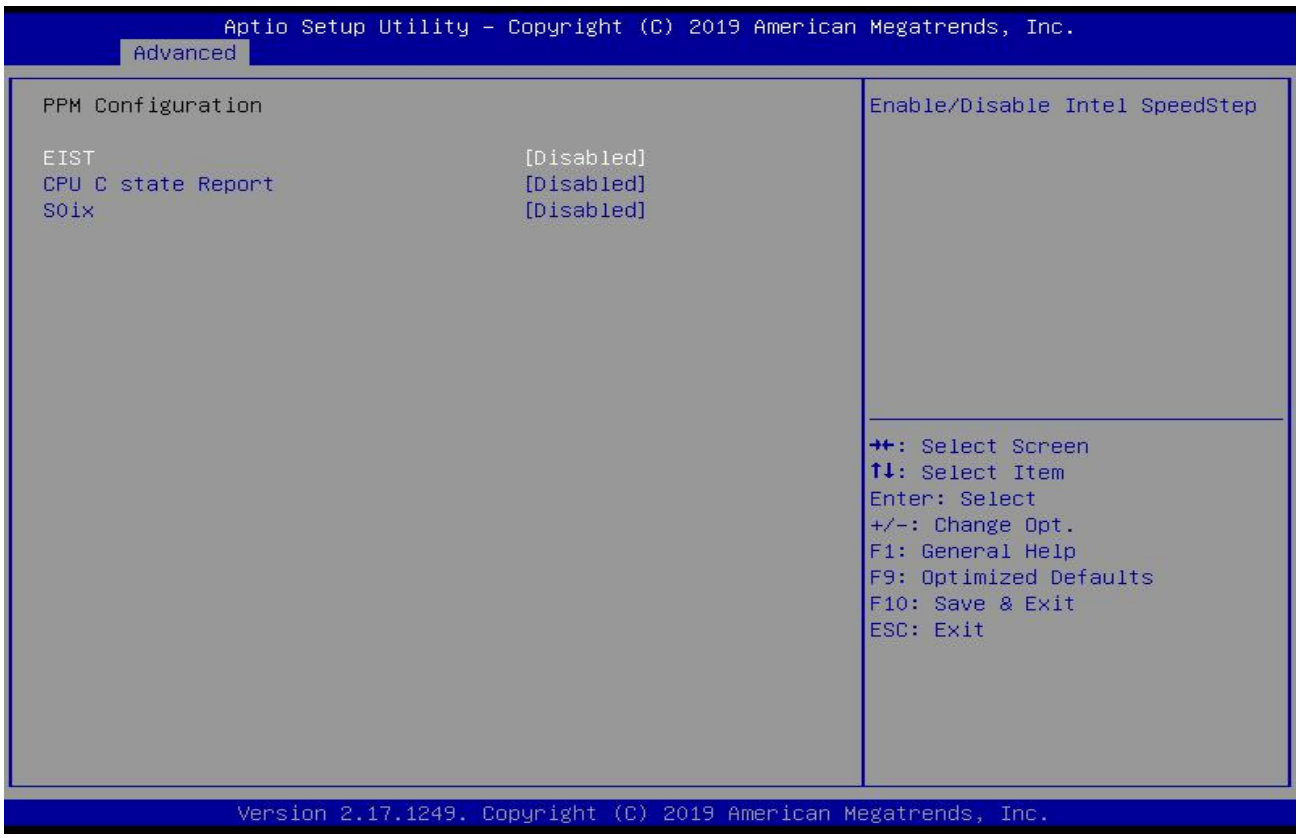
3.2.5 CPU Information:



The read-only item contains the details of the CPU.

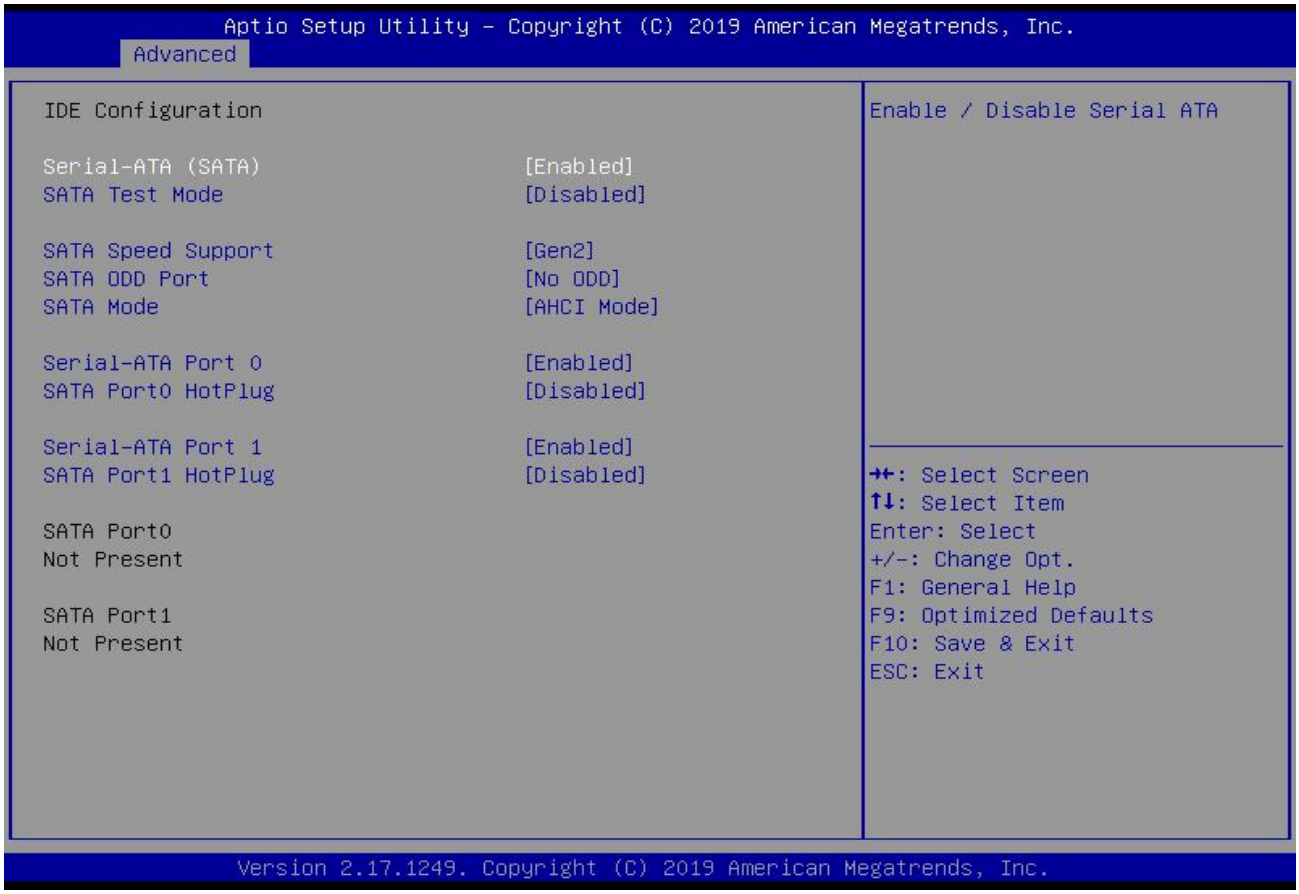
It specifically includes information such as CPU manufacturer, model, frequency, level 1 cache capacity, and level 2 cache capacity,etc.

3.2.6 PPM Configuration:



EIST:CPU Turbo frequency setting.

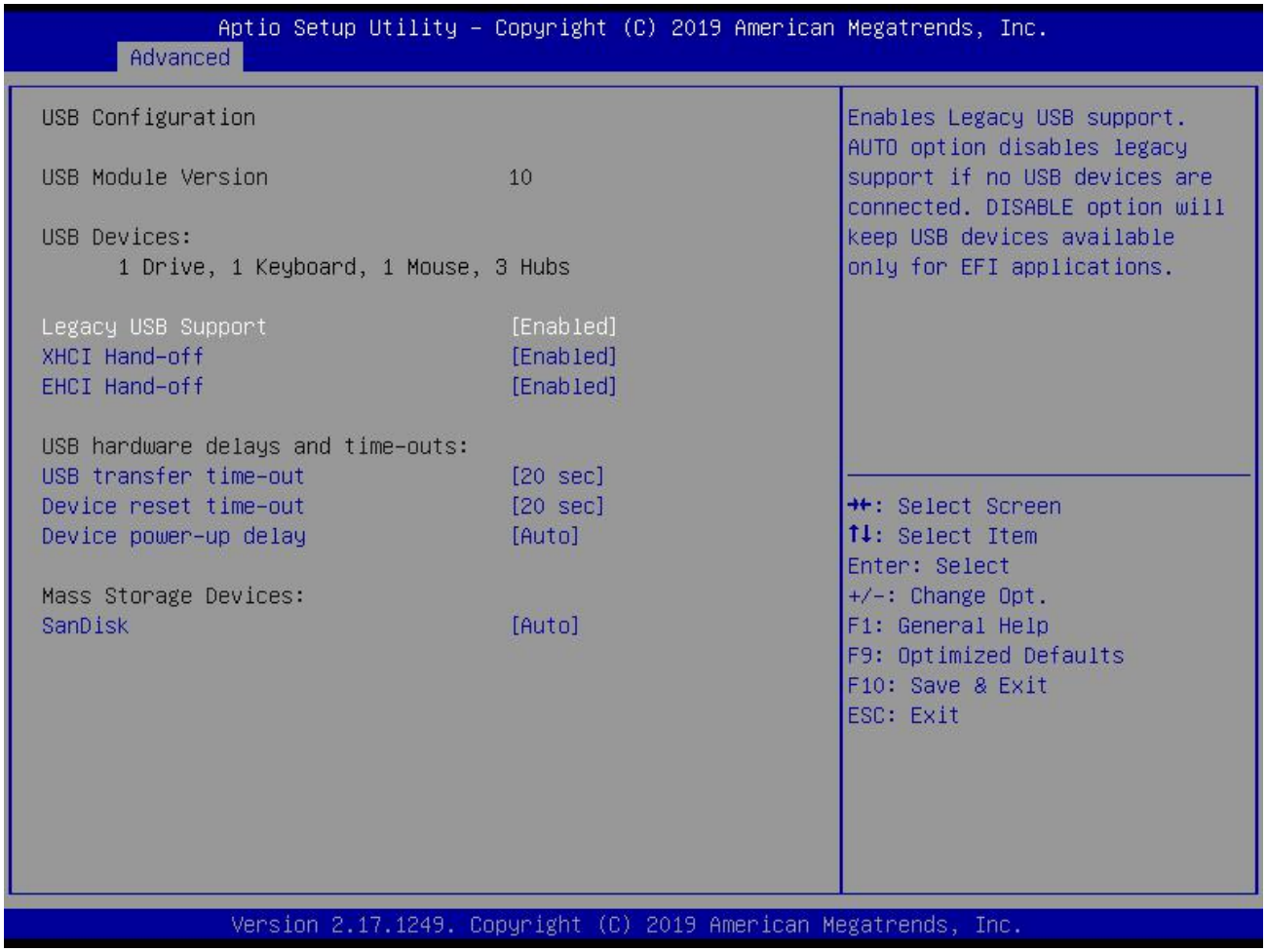
3.2.7 IDE Configuration:



(1) SATA Test Mode:It is Hard Disk Test Mode

(2) SATA Mode:It is Hard Disk Mode Setting

3.2.8 USB Configuration:



(1)Legacy USB Support :

This item is used for the settings of the old USB.

If you need to support USB device,U disk, USB keyboard under DOS,please set this item to "Enabled"or "Auto", otherwise select "Disabled".

(2)XHCI Hand-off:

Whether to enable the USB XHCI transport protocol.

(3)EHCI Hand-off:

This option is used to determine whether to cut the USB hub into USB2.0 mode before entering the OS.

(4)USB Transfer time-out:

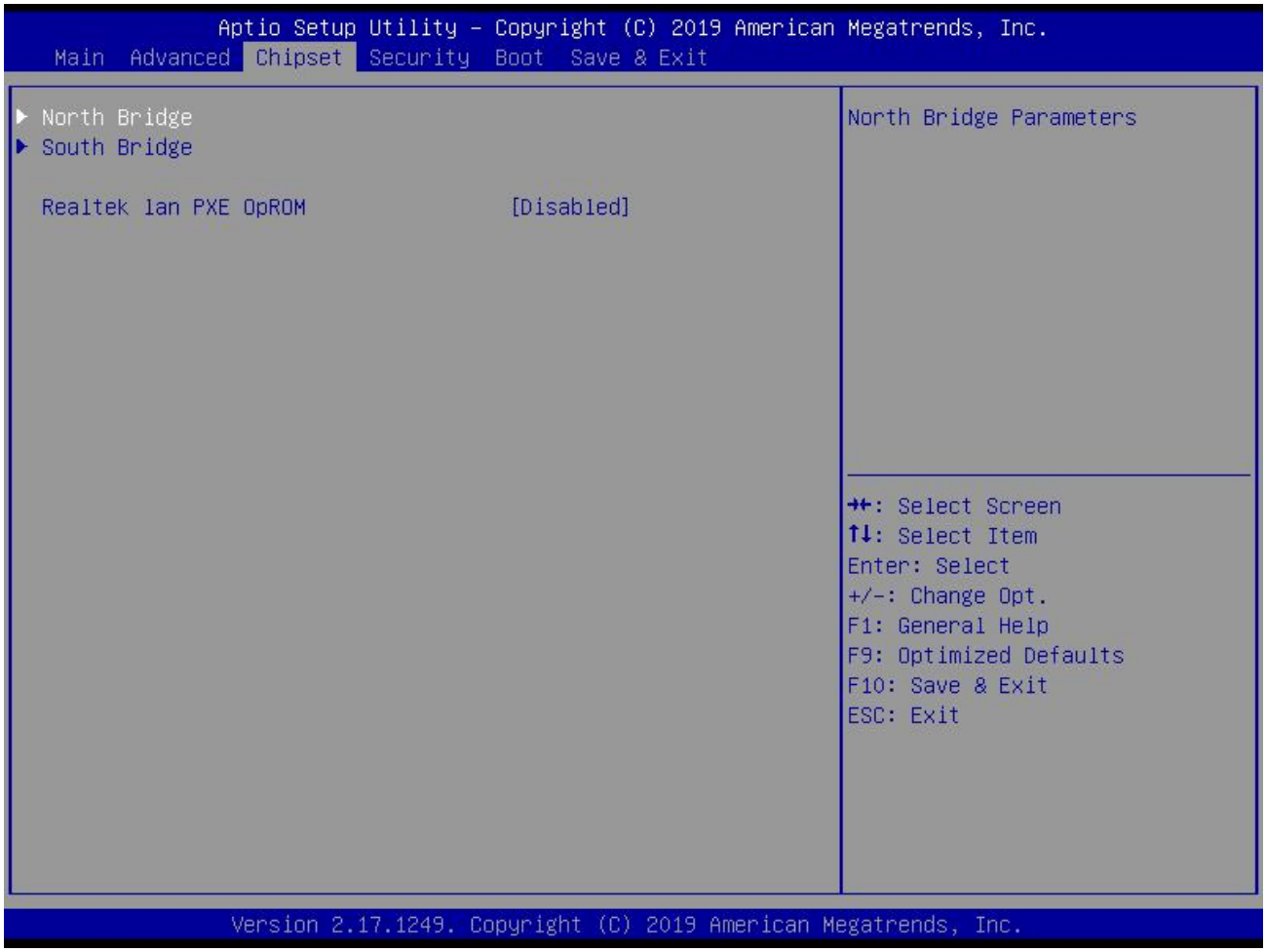
Set the time-out of the control, batch, and interrupt transmission. By default, the time is set to "20 sec".

(5)Device reset time-out:

Set the time-out of the large-capacity USB disk boot command. By default, the time is set to "20 sec".

(6)Device Power-up Delay: Set the maximum delay time that the USB device reports to the primary controller.

3.3 Chipset:



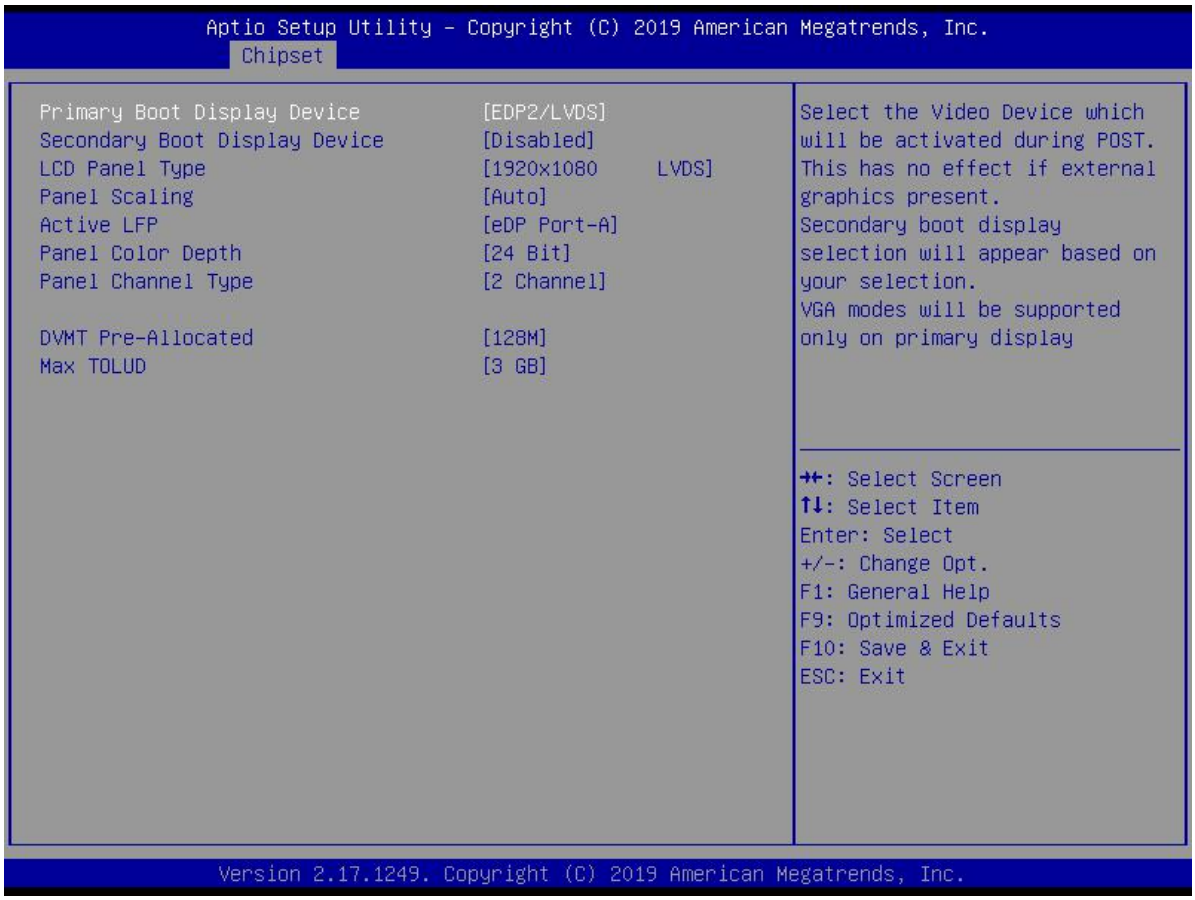
(1)North Bridge: It includes video memory,display device options,etc.

(2)South Bridge: It includes PCI-E,USB,PXE options,etc.

(3)Realtek lan PXE OpROM: This is Diskless boot (It includes network card,PXE settings).

3.3.1 North Bridge:

3.3.2 LVDS setting:



(1)Primary Boot Display Device:
This is the guide of the first display device. The "VBIOS Auto"is automatically recognized.
You can also set it to VGA or EDP1 or EDP2/LVDS.

(2)LCD Panel Type:
This is an option of the LVDS resolution.It only works for LVDS.

(3)Panel Scaling:

(4)Active LFP:
It is LVDS switch.The"No LVDS" is turn off; The"eDP Port-A"is turn on.

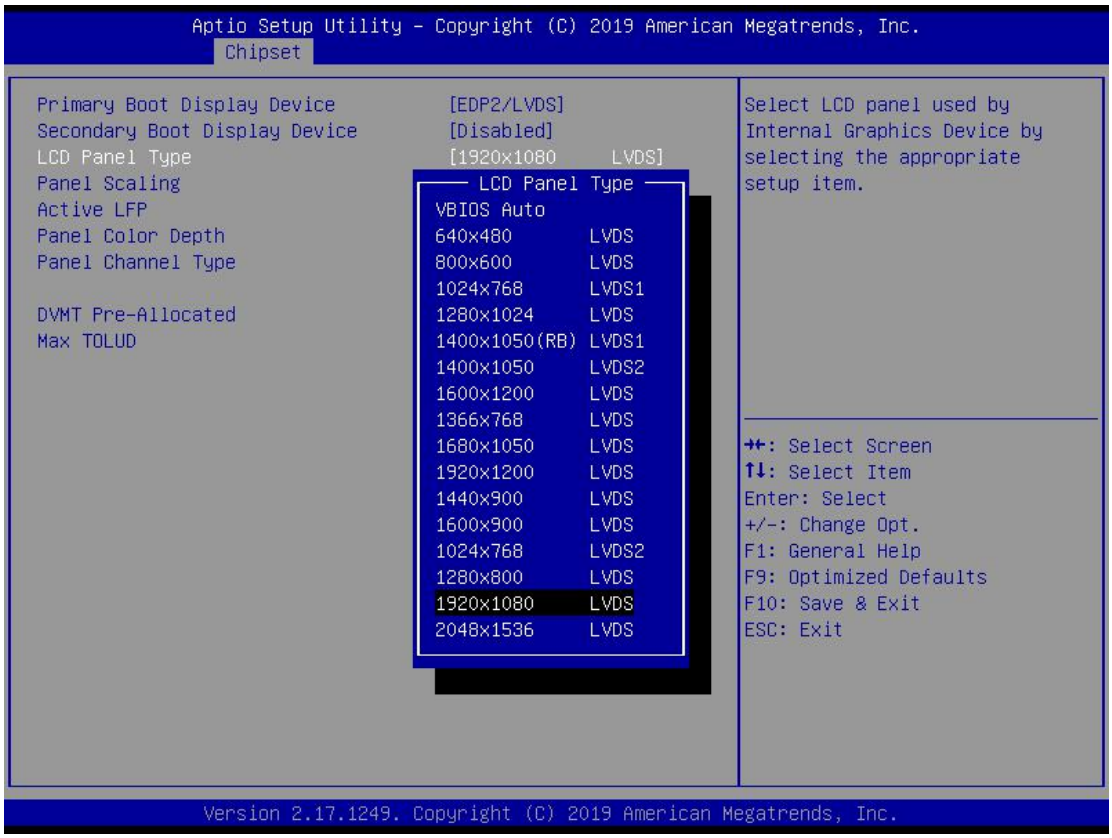
(5)Panel Color Depth:
It has 18 bit and 24 bit options(According to the corresponding number of bits on the screen).

(6)Panel Channel Type:LVDS channel setting (choose"2 Channel" or "1 Channel" according to the screen)

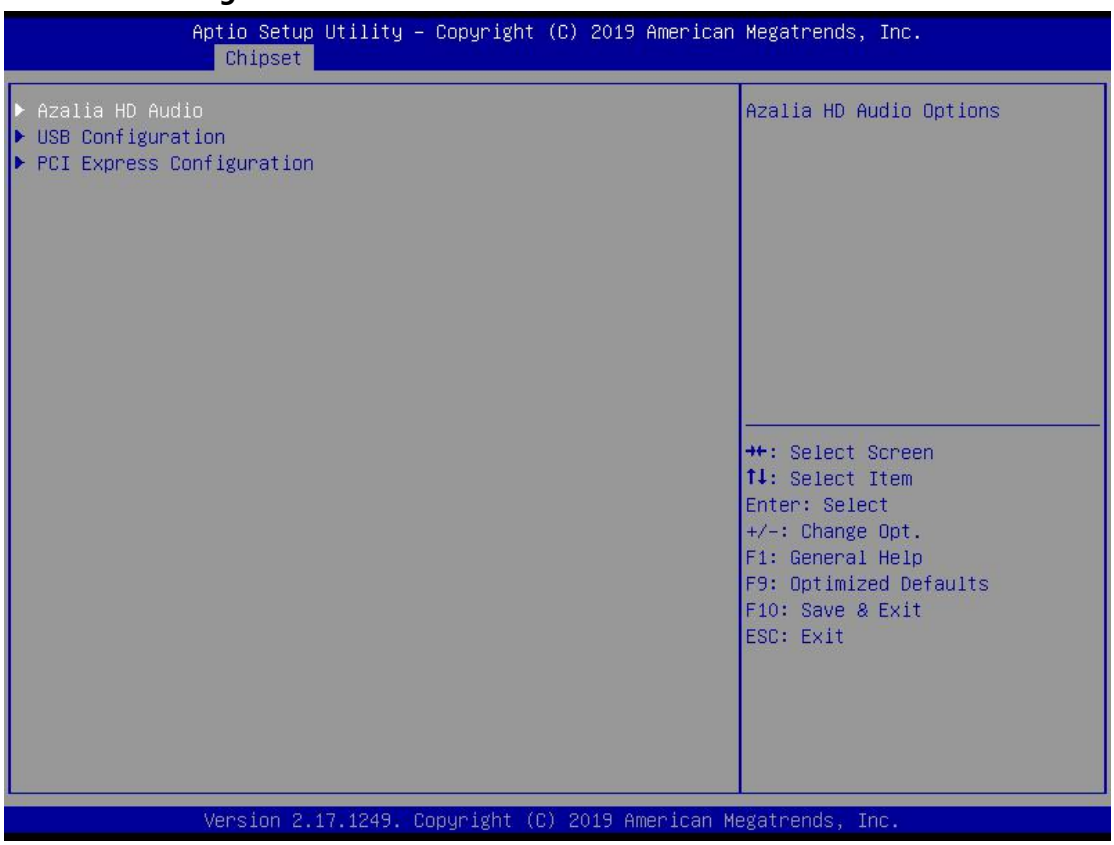
(7)DVMT Pre-Allocated:
Allocate the capacity of the graphics memory(Video Memory).It is Pre-allocate options.

(8)Max TOLUD:

3.3.3 LVDS resolution list:



3.3.4 South Bridge:

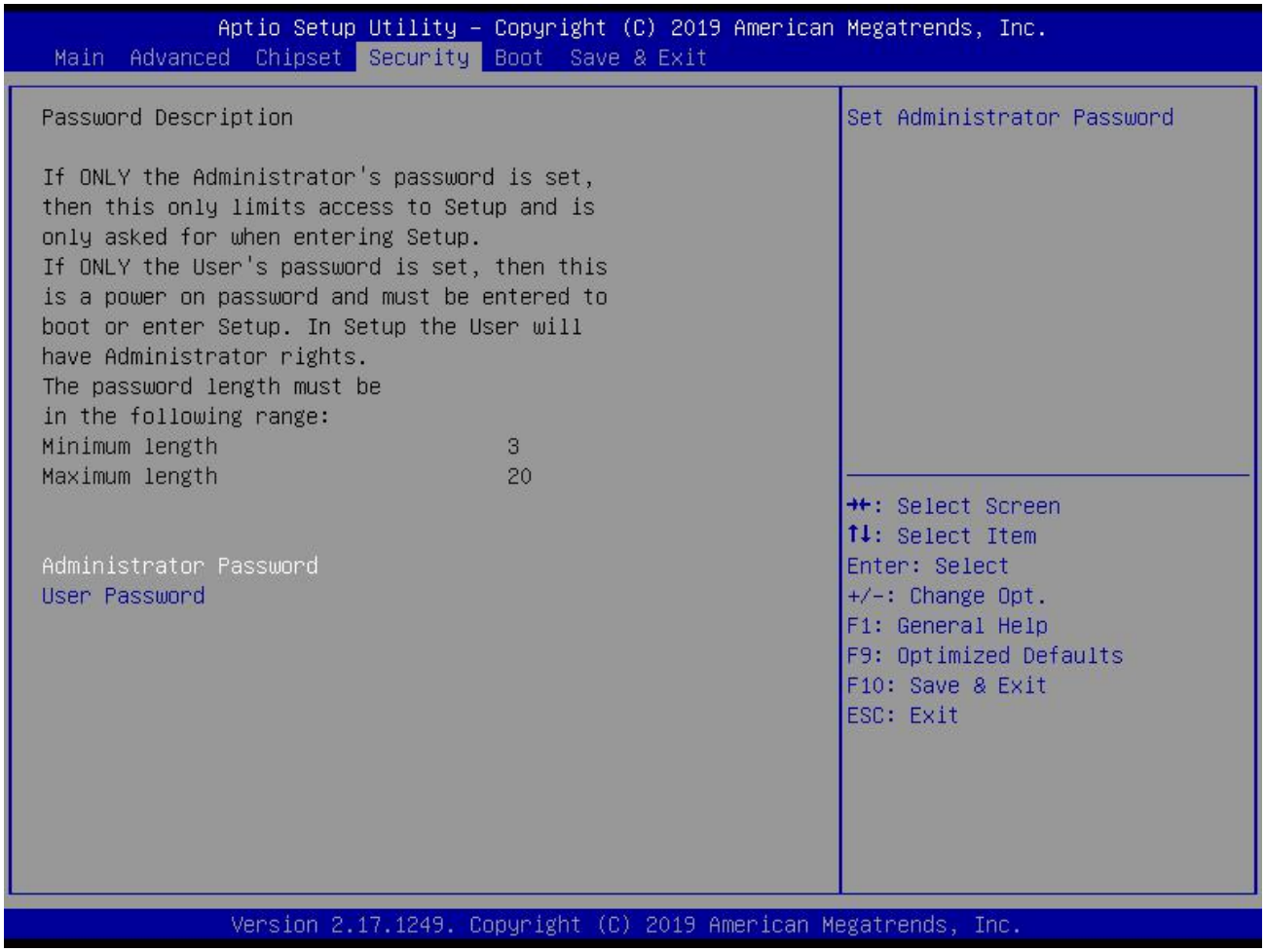


(1)Azalia HD Audio: This item is the sound card configuration

(2)USB configuration: This item is USB setting.

(3)PCI Express Configuration: This item is PCIE setting.

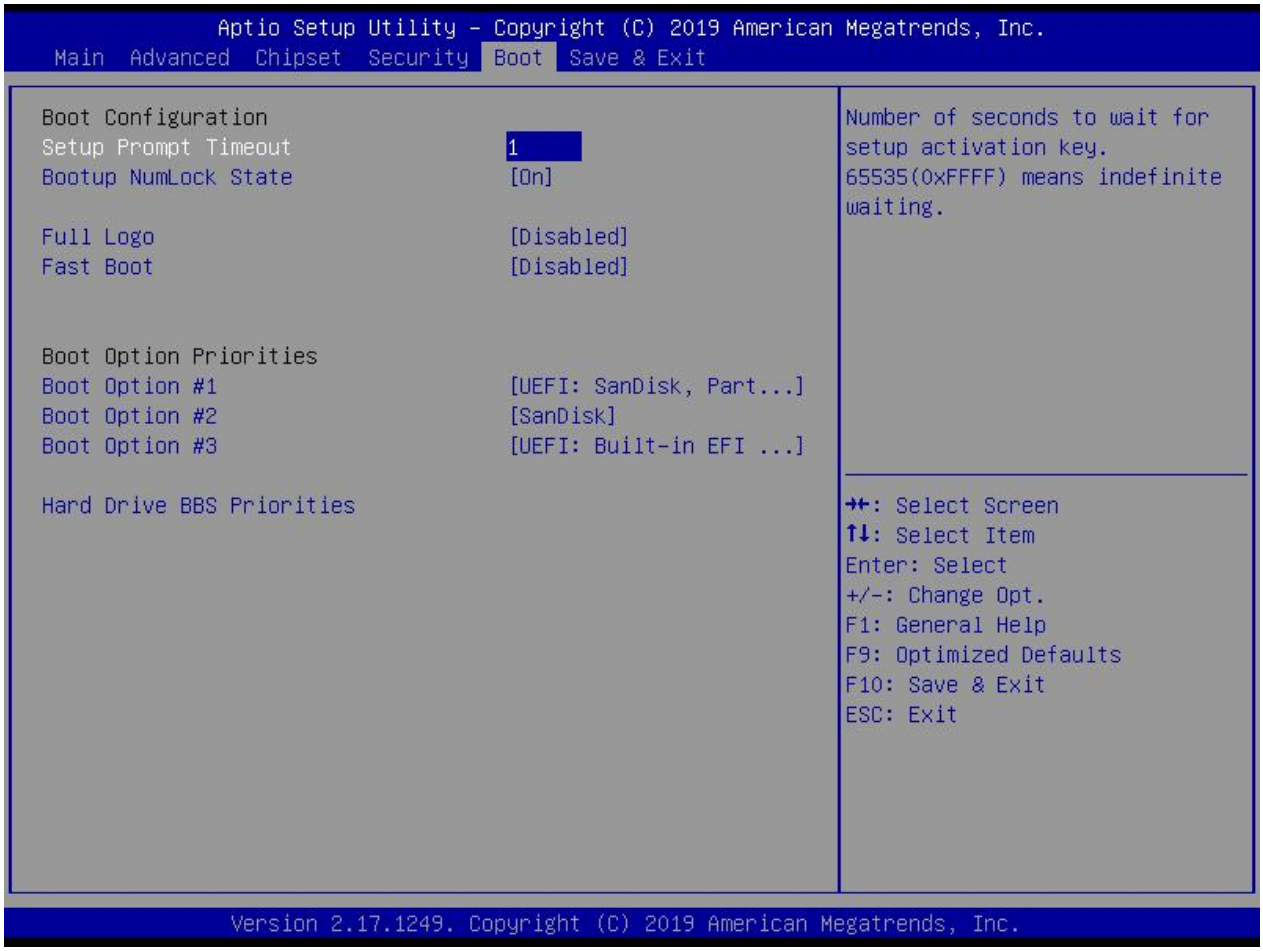
3.4 Security(Password Settings):



(1)Administrator Password: It is used to set the superuser password.

(2)User Password: It is used to set the normal user password.

3.5 Boot:



(1)Setup Prompt Timeout:

Set the screen prompt time to wait when starting up.If you do not press the"Setup"hot key within the set time, it will continue to start.By default,the motherboard is set to"1".

Warm reminder:If the computer's configuration is very advanced and starts is fast.And you want to see your customized logo on screen. You can set larger value in Setup Prompt Timeout,the logo will disappear more slowly,the computer will delay loading the system. Recommend:"Setup Prompt Timeout : 3".

(2)Bootup NumLock State:

Activate the numeric lock function of the keypad after the system is powered up to the DOS system.

Its options:

- **"On": Digital lock is on when the system starts up.**
- **"Off": The keypad is in cursor control when the system starts up.**

By default, the motherboard is set to"On".

(3)Full Logo:

This item is display switch of the customized LOGO in starting operating system screen.

The"Disabled"is turn off; The"Enabled"is turn on.

(4)Fast Boot:

The"Disabled"is turn off; The"Enabled"is turn on.

(5)Boot Option Priorities:

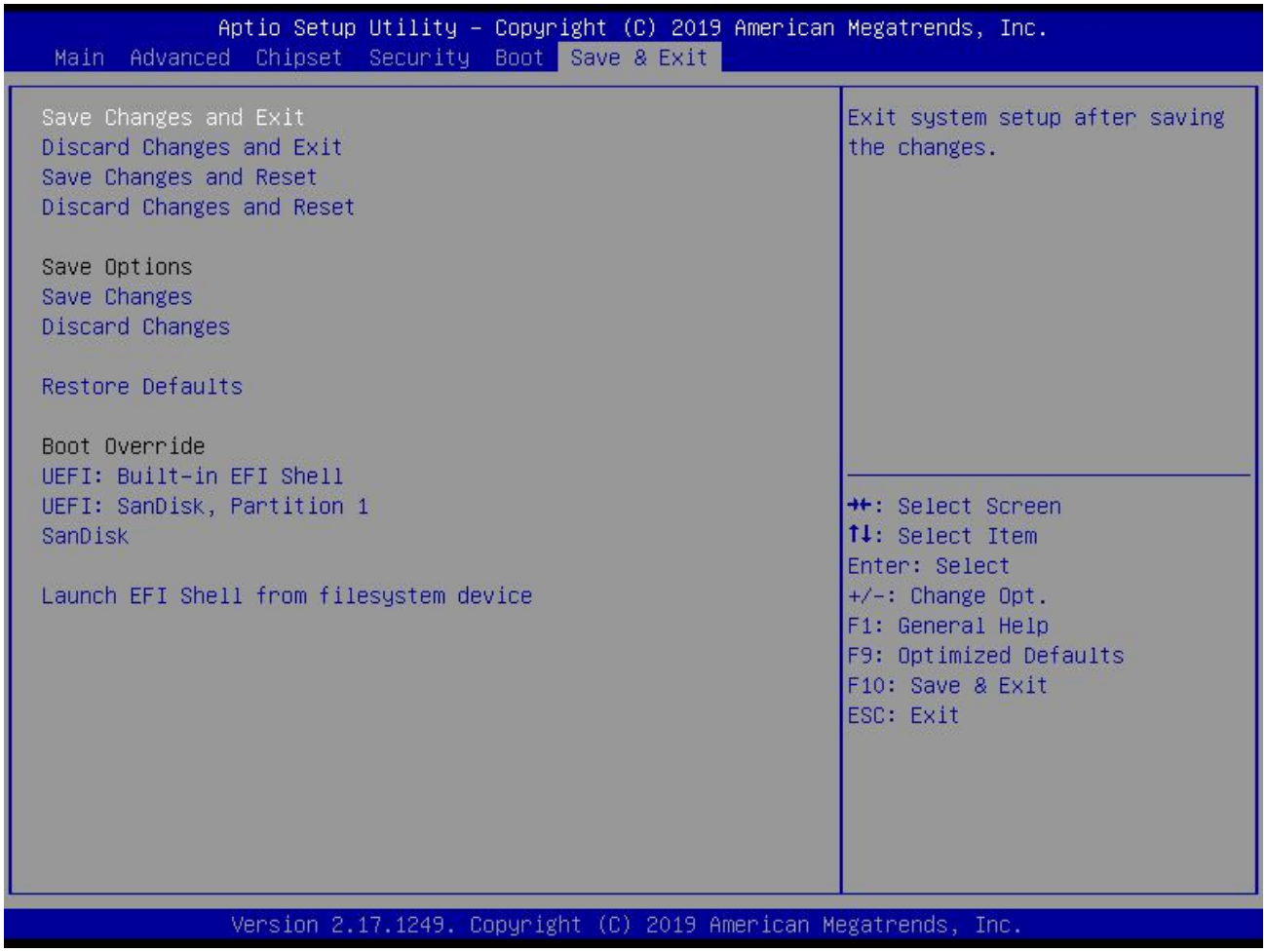
The system will detect the device in the set order. Find a device that can be booted and it will boot from this device.The"Boot Option #1"is the priority boot device.

(6)Hard Disk BBS Priorities:

This is the priority setting for hard disk boot.

Notice:This option only appears if a hard disk is installed.

3.6 Save & Exit:



(1)Save Changes and Exit: Save,exit the BIOS settings,then restart the computer.

(2)Discard Changes and Exit: Give up your changes and exit the setting,then restart the computer.

(3)Save Changes and Reset: Save,exit the BIOS settings,then restart the computer.

(4)Discard Changes and Reset:Give up your changes and exit the setting,then restart the computer.

(5)Save Changes: Save BIOS setting.

(6)Discard Changes:Give up the changed settings.

(7)Restore Defaults:Restore the original factory 's settings.

(8)Boot Override:

This option is used to select the specified boot device.The boot devices are a SATA hard disk, a USB flash drive, an EFI Shell, a PXE, etc.It will boot directly,does not need to save&exit.

Other methods: When booting, press "F11"to directly select the specified device to boot.

Chapter Four Analysis and Solution of Common Faults

Common Faults	Solutions
The computer does not boot after the power is connected	1. Please confirm that the power cable is connected properly. 2. Please confirm whether the power adapter meets the power supply requirements of the motherboard. 3. Please re-plug the memory. 4. Please replace the memory. 5. Please follow the steps in the motherboard manual to clear the motherboard CMOS. 6. Please confirm if there is an external card.After taking the external card, whether the computer start normally.
After booting, VGA does not display	1.Please check if the monitor is turned on. 2.Please check the power cord is properly connected to the monitor and system unit. 3.Please check the monitor cable is properly connected to the system unit and monitor. 4.Please check if the display brightness control is set to dark.Brightness can be increased by the brightness control.To get more detailed information, please refer to the monitor instruction. 5. When the display is in "Power Save" mode, please press any key on the keyboard to display the screen.
Unable to save BIOS setting	1.Please confirm whether the CMOS battery voltage is lower than 2.8V. If it is lower than 2.8V, please replace the battery, then reset the BIOS and save it. 2.The BIOS settings are incorrect.Adjust the time and date in the BIOS according to the button (DEL) indicated on the startup screen.
Prompt that a bootable device could not be found	1. Please confirm whether the hard disk power cable and hard disk data cable are connected properly. 2. Please confirm whether the hard disk is physically damaged. 3. Please confirm that the operating system is installed properly on the hard disk.
During the process of entering the system,the computer appears blue screen or crashes	1.Please confirm whether the memory and external card are loose. 2. Please try to remove the newly installed hardware or uninstall the driver or software. 3. Please try to replace the memory. 4. Please try to enter the BIOS to change the hard disk mode.
Entering the operating system is slow	1.Please try to use a third-party software to check if the hard drive has bad track. 2. Please confirm whether there is too little space for operating system in the hard disk partition. 3. Please check if the CPU cooling fan is rotating normally.
Operating system automatically restarts	1. Please check if the CPU cooling fan is rotating normally. 2. Please confirm if you accidentally press the reset button of the industrial mini computer. 3. Please use anti-virus software to confirm whether the system is infected with a virus. 4. Please confirm whether the memory and external card are loose. 5. Please confirm whether the power supply carrying capacity is sufficient.Please try to replace the power supply. 6. Please try to replace the memory.
Unable to detect USB device	1. Please confirm if the USB device needs to be powered separately. 2. Please confirm if the USB interface is in imperfect contact. 3. Please confirm if the USB controller is turned on in the BIOS Setup.

LVDS screen does not display	1.Connect VGA, start the computer, enter the BIOS to confirm whether the LVDS switch is turned on.Whether the resolution is adjusted to the corresponding demand. 2.Please confirm whether"LVDS_PWR"is adjusted to the corresponding working voltage. 3.Please check if the backlight power ON/OFF pin is plugged in and has voltage. 4.Please confirm if the monitor cable is plugged in correctly. Please confirm whether the monitor is working properly.
The LVDS screen appears blurred or image tail	1.Please try to enter the BIOS to set the corresponding number of bits for the screen (the number of bits:18bit or 24bit). 2.Please confirm whether the screen cable is damaged. 3.Please confirm whether the monitor is working properly. 4.Please try to exchange the cable order of the screen. 5.Please try to replace the memory.

Attachment: GPIO template

M219 GPIO Configuration:

PIN1：GND
PIN2：+5V
PIN3-----GPI：GPIO51 IO_ADDRESS:0xA04, BIT1
PIN4-----GPO：GPIO12 IO_ADDRESS:0xA00, BIT2
PIN5-----GPI：GPIO37 IO_ADDRESS:0xA02, BIT7
PIN6-----GPO：GPIO40 IO_ADDRESS:0xA03, BIT0
PIN7-----GPI：GPIO36 IO_ADDRESS:0xA02, BIT6
PIN8-----GPO：GPIO10 IO_ADDRESS:0xA00, BIT0
PIN9-----GPI：GPIO23 IO_ADDRESS:0xA01, BIT3
PIN10：NA

//GPIO porting:
1. GPIO setting.

```
//enter config.
IoWrite8(0x2E, 0x87);
IoWrite8(0x2E, 0x01);
IoWrite8(0x2E, 0x55);
IoWrite8(0x2E, 0x55);

//LDN 07
IoWrite8(0x2E, 0x07);
IoWrite8(0x2F, 0x07);
```

```
//Global Reg setting.
IoWrite8(0x2E, 0x25);
IoWrite8(0x2F, 0x05);
IoWrite8(0x2E, 0x26);
IoWrite8(0x2F, 0x08);
IoWrite8(0x2E, 0x27);
IoWrite8(0x2F, 0xC0);
IoWrite8(0x2E, 0x28);
IoWrite8(0x2F, 0x01);
IoWrite8(0x2E, 0x29);
IoWrite8(0x2F, 0x02);

//GPIO 10,12 GPO setting.
IoWrite8(0x2E, 0xC0);
IoWrite8(0x2F, 0x05);
IoWrite8(0x2E, 0xC8);
IoWrite8(0x2F, 0x05);

//GPIO 23 GPI setting..
IoWrite8(0x2E, 0xB9);
IoWrite8(0x2F, 0x08);//internal pull-up
IoWrite8(0x2E, 0xC1);
IoWrite8(0x2F, 0x08);
IoWrite8(0x2E, 0xC9);
IoWrite8(0x2F, 0x00);

//GPIO 36,37 GPI setting.
IoWrite8(0x2E, 0xBA);//internal pull-up
IoWrite8(0x2F, 0xC0);
IoWrite8(0x2E, 0xC2);
IoWrite8(0x2F, 0xC0);
IoWrite8(0x2E, 0xCA);
IoWrite8(0x2F, 0x00);

//GPIO 40 GPO setting.
IoWrite8(0x2E, 0xC3);
IoWrite8(0x2F, 0x01);
IoWrite8(0x2E, 0xCB);
IoWrite8(0x2F, 0x01);

//GPIO 51 GPI setting.
IoWrite8(0x2E, 0xBC); //internal pull-up
IoWrite8(0x2F, 0x02);
IoWrite8(0x2E, 0xC4);
IoWrite8(0x2F, 0x02);
IoWrite8(0x2E, 0xCC);
IoWrite8(0x2F, 0x00);

//Exit Config.
```

```
IoWrite8(0x2E, 0x02);
IoWrite8(0x2F, 0x02);
```

2. GPIO High/Low Setting.

```
//GPO Read&Write.
//set GP40 High for example.
Value8 = IoRead8(0xA03) | BIT0;
IoWrite8(0xA03, Value8);

//set GP40 Low for example.
Value8 = IoRead8(0xA03) & ~BIT0;
IoWrite8(0xA03, Value8);


//GPI Read.
//Read GP51 Status for example.
Status =   IoRead8(0xA04) & BIT1;
```