

WADE-8212

WADE-8212

Industrial Mini-ITX Board

Version 1.2



Revision History

R1.0	Preliminary
R1.1	Update M.2(Key B)information
R1.2	Update page 44 about model name information

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Preface

This user's guide provides information about the components, features, connectors and BIOS Setup menus available on the WADE-8212. This document should be referred to when designing Mini-ITX application. The other reference documents that should be used include the following:

- ✧ Intel Comet Lake Design Guide
- ✧ Intel Comet Lake Specification

Please contact Portwell Sales Representative for above documents.

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1 Introduction

WADE-8212-Q470E based on the Intel® Core™ Processor which offers 14nm Hi-K process technology with energy efficient architecture. WADE-8212 support dual channels DDR4 SO - DIMM up to 64GB.

Desktop solution is still popular in the market of DVR and Factory Automation which can fulfill most of these applications; therefore, with high performance and high-end specifications, WADE-8212 is our first generation Comet lake-S chip architecture on Mini-ITX line.

2 Specifications

Main Processor	◆ Intel® Comet -S Core™ i Processors
System Chipset	◆ Intel® Q470E Express chipset
System BIOS	◆ AMI UEFI BIOS
Main Memory	◆ Up to 64 GB in 2 slots DDR4 SO-DIMM sockets. Supports dual channel DDR4 2400/2666 MHz SDRAM - Intel Core i9 / i7 / i5 / i3 CPUs support DDR4 up to 2666 MHz - Intel Pentium / Celeron CPU support DDR4 up to 2400 MHz
Graphics	◆ Controller: Intel® UHD 630 Graphics, support DirectX12,OpenGL 4.5 ◆ VGA: Supports VGA up to resolution 1920 x 1200 ◆ DP: Supports DP up to resolution 4096 x 2160 ◆ HDMI: Supports DP up to resolution 4096 x 2160 ◆ LVDS: Supports LVDS up to resolution 1920 x 1200
Expansion Interface	◆ One SIM Ccard socket ◆ One M.2 (Key E, 2230) with PCIe, CNVI and USB2.0 for Wireless ◆ One M.2 (Key M, 2242/2260) with PCIe and SATA3 for SSD ◆ One M.2 (Key B, 3042/3052) with USB2.0 Signal
SATA Interface	◆ Four SATA ports(SATA 6Gb/s)
Input/Output	◆ Five Ports: 2x RS-232/422/485 on REAR I/O & 3x RS-232 on board header ◆ USB Port: 4x USB 3.1 on REAR I/O, 2x USB 3.1 on board header ,4x USB 2.0 on board header ◆ GPIO connector: 4GPI + 4GPO ◆ Audio Interface: Mic-In / Line-Out
Ethernet	◆ Supports dual 10/100/1000 Mbps Ethernet port (s) via PCI Express x1 bus which provides 500 MB/s data transmission rate

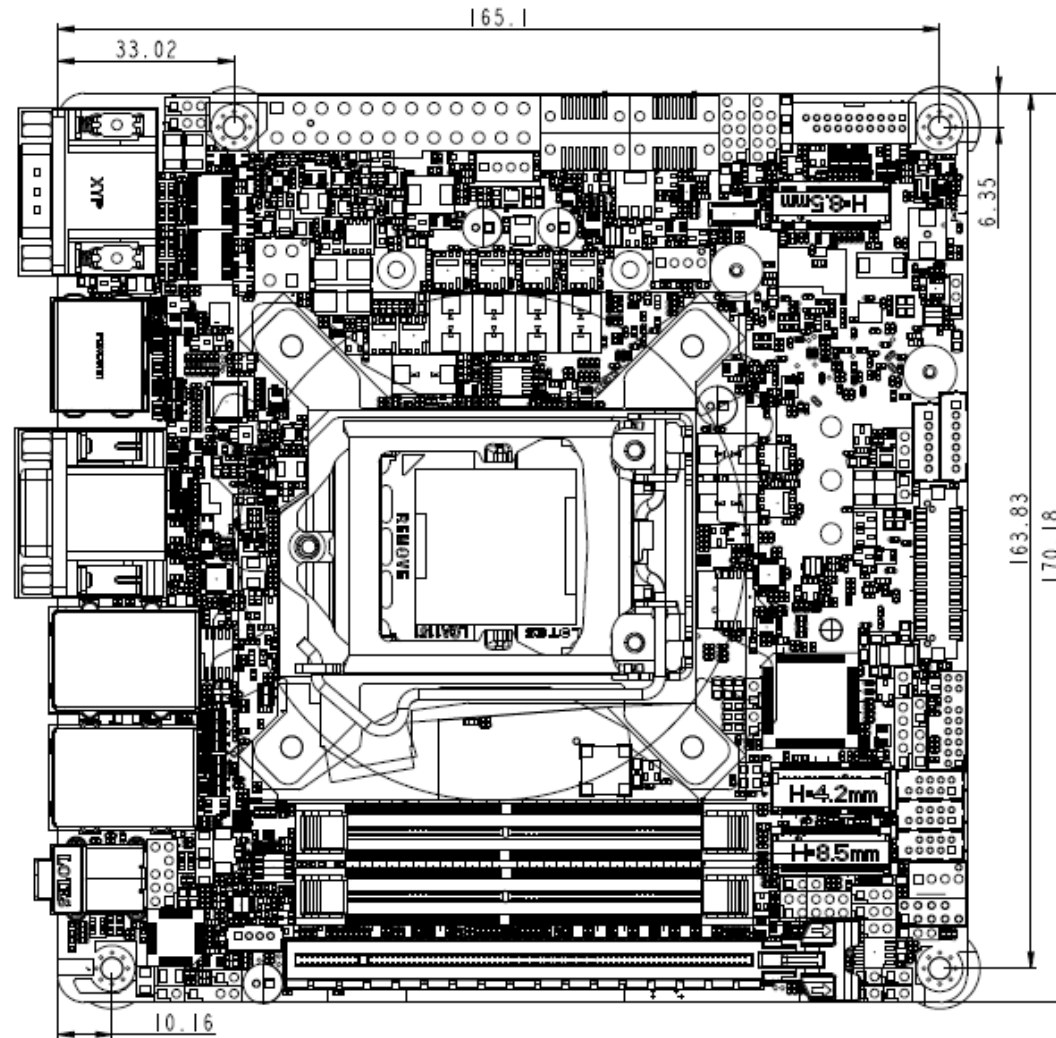
High Drive GPIO	◆ One pin-header for GPIO(4bit in & 4bit out)
Mechanical and environmental specifications	◆ Operating temperature: 0 ~ 60° C ◆ Storage temperature:-20 ~ 80° C ◆ Humidity: 5 ~ 90% non-condensing ◆ Power supply voltage: ATX ◆ Board size: 170mm x 170 mm

2.1 Supported Operating Systems

The WADE-8212 supports the following operating systems.

- ✧ Windows 10 Enterprise & IOT Enterprise (64b) RS5 (Legacy boot not supported for Windows 10, Linux.)
- ✧ Ubuntu, SuSe, Redhat Enterprise
- ✧ Yocto project BSP Tool-based Embedded Linux Distribution
- ✧ Wind River VxWorks 7.0

2.2 Mechanical Dimensions



2.3 Power Consumption

Test Configuration	
CPU Type	Intel® Core™ i5-10600 CPU @ 3.30GHz
SBC BIOS	Portwell, Inc. WADE-8212 TEST BIOS (51104T00)
Memory	Innodisk 16GB DDR4 2666
VGA Card	Onboard Intel® UHD Graphics 630
VGA Driver	Intel® UHD Graphics 630 Driver ver:26.20.100.7926_Q0
LAN Card	Onboard Intel® Ethernet Connection(2) I219-LM
LAN Driver	Intel® Ethernet Connection(2) I219-LM
LAN Card #2	Onboard Intel® I225LM Gigabit Network Connection
LAN Driver #2	Intel® I225LM Gigabit Network Connection ver:25.0_562413
Audio Card	Onboard Realtek ALC887 High Definition Audio
Audio Driver	Realtek ALC887 High Definition Audio Version: 6.0.1.8186
Chipset Driver	Intel® Comet lake-S Chipset Device
USB 3.0 Driver	Intel® USB 3.0 eXtensible Host Controller Adaptation Driver Version: 6.3.9600.17393
SATA HDD	Intel SSD 256G
Power Supply	FSP460-60PFB 460W
Power consumption	

ATX:

Item	Power ON	Full Loading 10Min	Full Loading 30Min
CPU +12V	0.98A	2.05A	1.98A
System +12V	0.83A	1.48A	1.26A
System +3.3V	0.55A	0.65A	0.69A
System +5V	1.11A	1.37A	1.34A
System+ Device +12V	0.97A	1.81A	1.56A
System+ Device +5V	1.87A		
USB2.0 Loading Test	4.98 V/ 570 mA		

2.4 Environmental Specifications

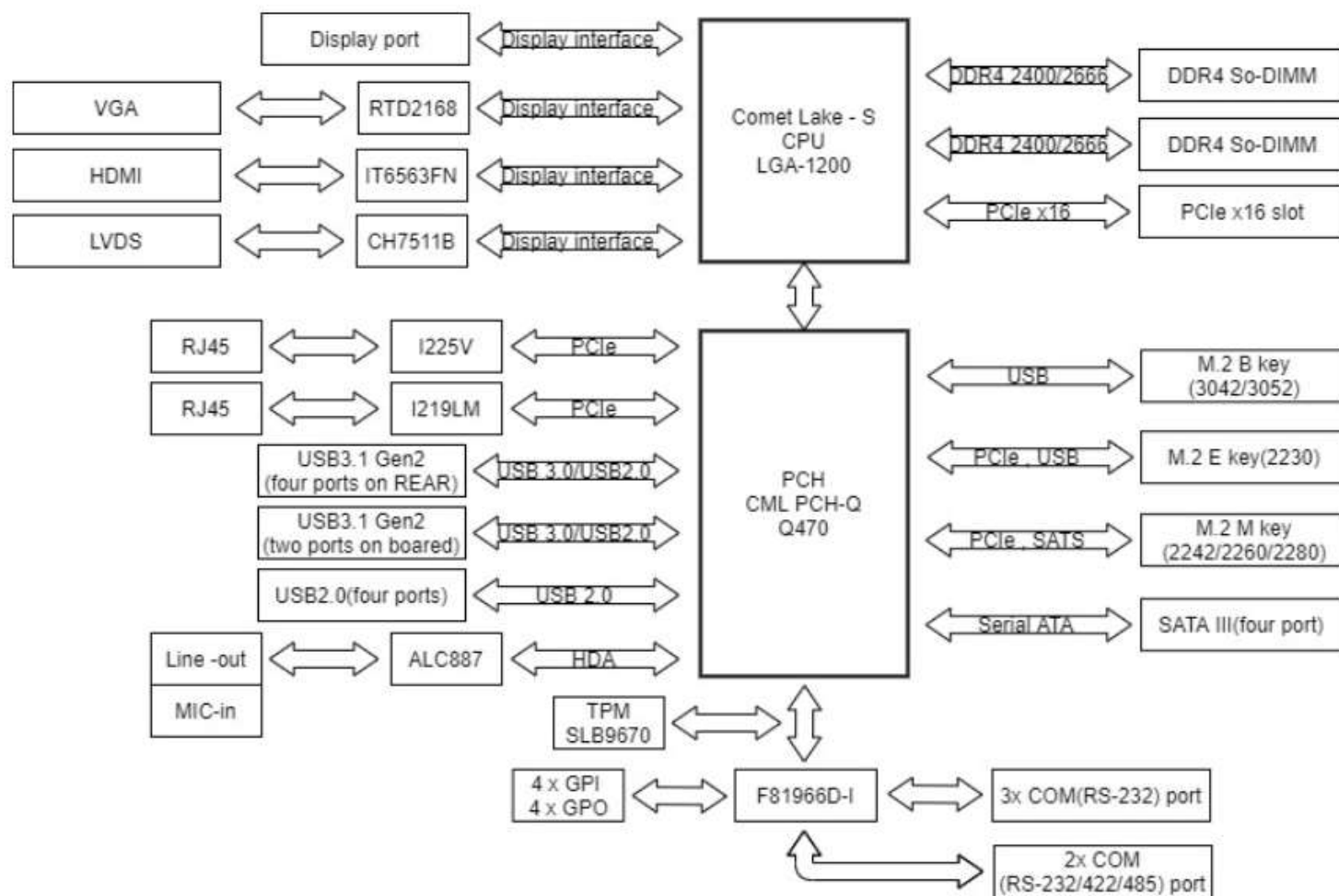
Storage Temperature : -20~80°C

Operation Temperature : 0~60°C

Storage Humidity : 5~90%

Operation Humidity: 10~90%

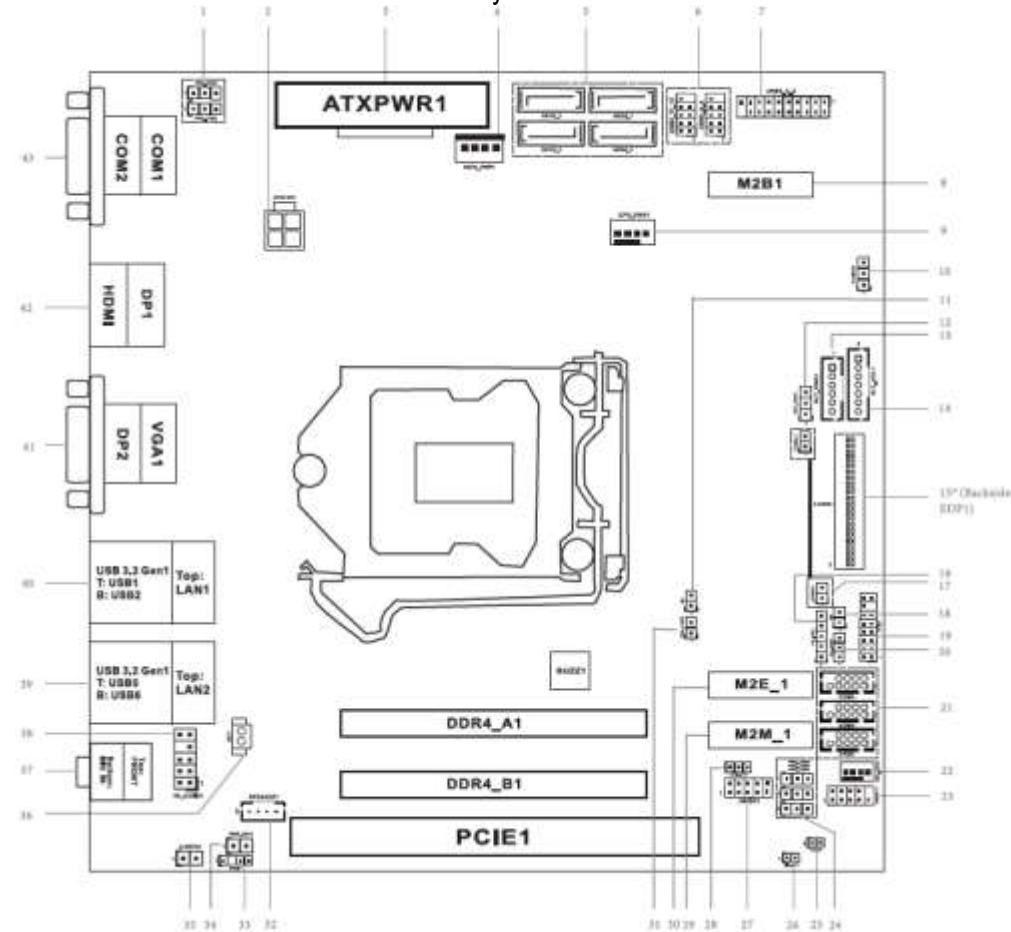
3 Block Diagram



4 Hardware Configuration

4.1 Jumpers and Connectors

This chapter indicates jumpers', headers' and connectors' locations. Users may find useful information related to hardware settings in this chapter.



4.2 Jumpers Settings

For users to customize WADE-8212's features. In the following sections, Short means covering a jumper cap over jumper pins; Open or N/C (Not Connected) means removing a jumper cap from jumper pins. Users can refer to Figure 1 for the Jumper allocations.

Jumper Table

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

Jumper Function List	
1	COM Port PWR Setting Jumpers(COM 1~2)
2	4-Pin ATX Power Input/Output Connector
3	24-Pin ATX Power Input Connector
4	SATA Power Output Connector
5	SATA Connector (SATA3_1~4)
6	USB 2.0 Headers
7	USB 3.2(Gen1) Headers(USB3_3_4)
8	M.2 B key Socket
9	4 Pin CPU Fan Connector(+12V)
10	Clear CMOS Header(CLRMOS1)
11	Chassis Intrusion Headers(CI1)
12	Backlight Power Select
13	Inverter Power Control Wafer(BLT_PWR1)

14	Backlight Volume Control(BLT_VOL1)
15	LVDS Panel Connector
16	Panel Power Select
17	LVDSBL1
18	Chassis Intrusion Headers(CI2)
19	TPM Header
20	Backlight Control Level
21	COM Port Headers(COM 3~5_RS232)
22	4 Pin Chassis Fan Connector(+12V)
23	System Panel Header
24	COM Port PWR Setting Jumpers(COM 3~5)
25	Buzzer
26	SIO_AT1
27	Digital Input/Output Pin Header(JGPIO1)
28	Digital Input/Output Default Value Setting(JGPIO_SET1)
29	M.2 M key Socket
30	M.2 E key Socket
31	PWR LOSS Header(PWR_LOSS1)
32	3W Audio AMP Output Wafer
33	SPDIF Header
34	PWR_BAT1
35	Clear CMOS Header(CLRMOS2)

36	Battery Connector
37	Audio Output
38	Front Panel Audio Header
39	Top:RJ45 LAN port(LAN2) Bottom:USB 3.1 Ports(USB3_5_6)
40	Top:RJ45 LAN port(LAN1) Bottom:USB 3.1 Ports(USB3_1_2)
41	Top: D-Sub Port(VGA)
42	Top: Display Port (DP2) Bottom: HDMI Port(HDMI)
43	Top: COM Port 1(RS232/422/485)* Bottom: COM Port 2(RS232/422/485)*

Back Side :

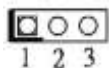
SIM Card Socket(SIM1)

MCU Connector(MCU_CON1)

1: COM Port PWR Setting Jumpers(COM 1~2)

PWR_COM1 (For COM Port1)

PWR_COM2 (For COM Port2)



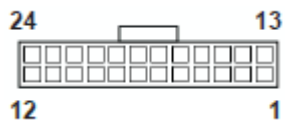
1-2 : +5V

2-3 : +12V

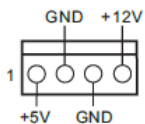
2: 4-pin ATX Power Input/Output Connector



3: 24-pin ATX Power Input Connector



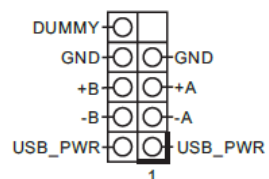
4: SATA Power Output Connector



5: SATA3 Connectors (SATA3_1~4)

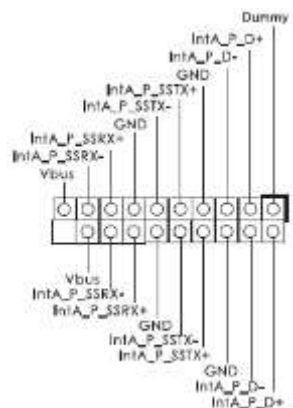
6: USB2.0 Headers

(USB2_8_9, USB2_11_12)



7: USB3.0 Header

(USB3_3_4)



8: M.2 Key-B Socket (M2B1)

Pin	Signal	Signal	Pin
1	NA	+3.3V	2
3	GND	+3.3V	4
5	GND	FULL_Card_Power_off	6
7	USB_D+	W_DISABLE	8
9	USB_D-	WWAN_LED#	10
11	GND		
21	GND	NA	20
23	NA	NA	22
25	NA	NA	24
27	GND	NA	26
29	USB3_RX-	NA	28
31	USB3_RX+	UIM_RESET	30
33	GND	UIM_CLK	32
35	USB3_TX-	UIM_DATA	34
37	USB3_TX+	UIM_PWR	36
39	GND	NA	38
41	PERn0	NA	40
43	PERp0	NA	42
45	GND	NA	44
47	PETn0	NA	46
49	PETp0	NA	48
51	GND	PERST#	50
53	PEFCLKn	CLKREQ#	52
55	PEFCLKp	WAKE#	54
57	GND	NA	56
59	NA	NA	58
61	NA	NA	60
63	NA	NA	62
65	NA	NA	64
67	NA	NA	66
69	NA	NA	68
71	GND	+3.3V	70
73	GND	+3.3V	72
75	NA	+3.3V	74

29: M.2 Key-M Socket (M2M1)

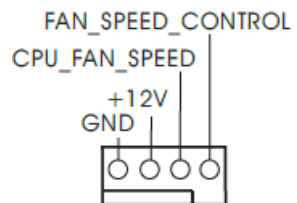
Pin	Signal	Signal	Pin
1	GND	+3.3V	2
3	GND	+3.3V	4
5	PERn3	NA	6
7	PERp3	NA	8
9	GND	SATA_LED	10
11	PETn3	+3.3V	12
13	PETp3	+3.3V	14
15	GND	+3.3V	16
17	PERn2	+3.3V	18
19	PERp2	NA	20
21	GND	NA	22
23	PETn2	NA	24
25	PETp2	NA	26
27	GND	NA	28
29	PERn1	NA	30
31	PERp1	NA	32
33	GND	NA	34
35	PETn1	NA	36
37	PETp1	DEVSLP	38
39	GND	SMB_CLK	40
41	PERn0/SATA-B+	SMB_DATA	42
43	PERp0/SATA-B-	NA	44
45	GND	NA	46
47	PETn0/SATA-A-	NA	48
49	PETp0/SATA-A+	PERST#	50
51	GND	CLKREQ#	52
53	PEFCLKn	WAKE#	54
55	PEFCLKp	NA	56
57	GND	NA	58
67	NA	NA	68
69	PEDET	+3.3V	70
71	GND	+3.3V	72
73	GND	+3.3V	74
75	GND		

30: M.2 Key-E Socket (M2E1)

Pin	Signal	Signal	Pin
1	GND	+3.3V	2
3	USB_D+	+3.3V	4
5	USB_D-	NA	6
7	GND	NA	8
9	CNV_WGR_D1-	CNV_RF_RESET	10
11	CNV_WGR_D1+	NA	12
13	GND	MODEM_CLKREQ	14
15	CNV_WGR_D0-	NA	16
17	CNV_WGR_D0+	GND	18
19	GND	NA	20
21	CNV_WGR_CLK-	CNV_BRI_RSP	22
23	CNV_WGR_CLK+		
33	GND	CNV_BGI_DT	32
35	PETp	CNV_RGI_RSP	34
37	PETn	CNV_BRI_DT	36
39	GND	NA	38
41	PERp	NA	40
43	PERn	NA	42
45	GND	NA	44
47	PEFCLKp	NA	46
49	PEFCLKn	NA	48
51	GND	SUSCLK	50
53	CLKREQ#	PERST0#	52
55	WAKE#	W_DISABLE1#	54
57	GND	W_DISABLE2#	56
59	CNV_WT_D1-	SMB_DATA	58
61	CNV_WT_D1+	SMB_CLK	60
63	GND	NA	62
65	CNV_WT_D0-	CLKIN_XTAL_LCP	64
67	CNV_WT_D0+	NA	66
69	GND	NA	68
71	CNV_WT_CLK-	NA	70
73	CNV_WT_CLK+	+3.3V	72
75	GND	+3.3V	74

9: 4-Pin CPU FAN Connector (+12V)

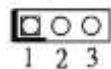
(CPU_FAN1)



10: Clear CMOS Header (CLRMOS1)

1-2 : Normal

2-3 : Clear CMOS

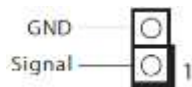


11: Chassis Intrusion Headers (CI1)

CI1 :

Close : Active Case Open

Open : Normal

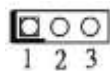


12: Backlight Power Select

(LCD_BLT_VCC) (BKT_PWR1)

1-2 : LCD_BLT_VCC : +5V

2-3 : LCD_BLT_VCC : +12V

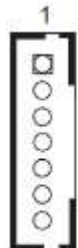


13: Inverter Power Control Wafer (BLT_PWR1)



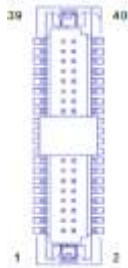
PIN	Signal Name
1	GND
2	GND
3	CON_LBKLT_CTL
4	CON_LBKLT_EN
5	LCD_BLT_VCC
6	LCD_BLT_VCC

14: Backlight Volume Control (BLT_VOL1)



PIN	Signal Name
1	GPIO_VOL_UP
2	GPIO_VOL_DW
3	PWRDN
4	BLT_UP
5	BLT_DW
6	GND
7	GND

15: LVDS Panel Connector



PIN	Signal Name	PIN	Signal Name
39	LCD_BLT_VCC	40	LCD_BLT_VCC
37	CON_LBKLT_CTL	38	LCD_BLT_VCC
35	GND	36	CON_LBKLT_EN
33	LVDS_B_CLK#	34	LVDS_B_CLK
31	LVDS_B_DATA3	32	GND
29	DPLVDD_EN	30	LVDS_B_DATA3#
27	LVDS_B_DATA2#	28	LVDS_B_DATA2
25	LVDS_B_DATA1#	26	GND
23	GND	24	LVDS_B_DATA1#
21	LVDS_B_DATA0#	22	LVDS_B_DATA0
19	LVDS_A_CLK	20	GND
17	GND	18	LVDS_A_CLK#
15	LVDS_A_DATA3#	16	LVDS_A_DATA3
13	LVDS_A_DATA2	14	GND
11	GND	12	LVDS_A_DATA2#
9	LVDS_A_DATA1#	10	LVDS_A_DATA1
7	LVDS_A_DATA0	8	PD (Panel Detection)
5	LDDC_DATA	6	LVDS_A_DATA0#
3	+3.3V	4	LDDC_CLK
1	LCD_VCC	2	LCD_VCC

* PD (Panel Detection): Connect this pin to LVDS Panel's Ground pin to detect Panel detection.

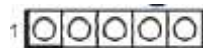
16: Panel Power Select

(LCD_VCC) (PNL_PWR1)

1-2 : LCD_VCC : +3V

2-3 : LCD_VCC : +5V

4-5 : LCD_VCC : +12V



17: LVDSBL1

Open : Protect LCD_VCC

Short : No Protect LCD_VCC

LVDSBL2

Open : Protect LCD_BLT_VCC

Short : No Protect LCD_BLT_VCC



18: Chassis Intrusion Headers (CI2)

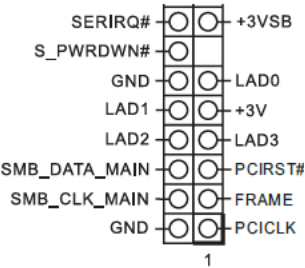
CI2 :

Close : Active Case Open

Open : Normal



19: TPM Header

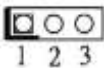


20: Backlight Control Level

(CON_LBKLT_CTL) (BLT_PWM1)

1-2 : From eDP PWM to CON_LBKLT_CTL

2-3 : From LVDS PWM to CON_LBKLT_CTL



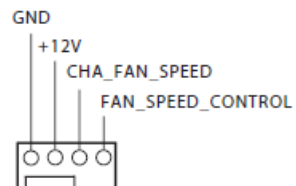
21: COM Port Headers

(COM3, 4, 5) (RS232)

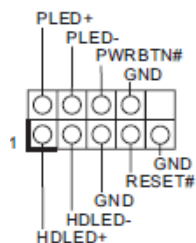


PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name
10	N/A	8	CCTS#	6	DDSR#	4	DDTR#	2	RRXD
9	PWR	7	RRTS#	5	GND	3	TTXD	1	DDCD#

22: 4-Pin Chassis FAN Connector (+12V)



23: System Panel Header

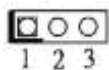


24: COM Port PWR Setting Jumpers(COM 3~4)

PWR_COM3 (For COM Port3)

PWR_COM4 (For COM Port4)

PWR_COM5 (For COM Port5)



1-2 : +5V

2-3 : +12V

25: Buzzer

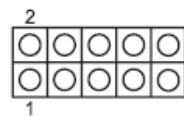


26: SIO_AT1

Open : ATX Mode
Short : AT Mode



27: Digital Input/Output Pin Header (JGPIO1)

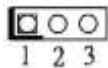


PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name
2	SIO_GP71	4	SIO_GP72	6	SIO_GP73	8	SIO_GP74	10	GND
1	SIO_GP75	3	SIO_GP76	5	SIO_GP77	7	SIO_GP80	9	JGPIO_PWR

28: Digital Input / Output Default Value Setting (JGPIO_SET1)

1-2 : Pull-High

2-3 : Pull-Low



31: PWR LOSS Header (PWR_LOSS1)

Short : Power Loss

Open : no Power Loss

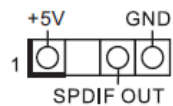


32: 3W Audio AMP Output Wafer



PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name
1	OUTLN	2	OUTLP	3	OUTRP	4	OUTRN

33: SPDIF Header



34: PWR_BAT1

Open : Normal

Short : Charge Battery



35: Clear CMOS Header (CLRMOS2)

Open : Normal

Short : Auto Clear CMOS (Power Off)



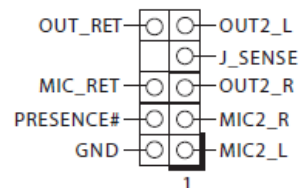
36: Battery Connector

37: Audio Output

Green - Line Out

Pink - Mic In

38: Front Panel Audio Header



39: Top : RJ45 LAN Port (LAN2)

Bottom : USB3.0 Ports (USB_5_6)

40: Top : RJ45 LAN Port (LAN1)

Bottom : USB3.0 Ports (USB_1_2)

41: Top : D-Sub Port (VGA1)

42: Top : DisplayPort (DP2)

Bottom : HDMI Port (HDMI)

43: Top : COM Port (COM1) (RS232/422/485)*

Bottom : COM Port (COM2) (RS232/422/485)*

* Please refer to below table for the pin definition. In addition, they can be adjusted in BIOS setup utility > Advanced Screen > Super IO Configuration. You may refer to our user manual for details.

WADE-8212

PIN	RS232	RS422	RS485
1	DCD	TX-	RTX-
2	RXD	RX+	N/A
3	TXD	TX+	RTX+
4	DTR	RX-	N/A
5	GND	GND	GND
6	DSR	N/A	N/A
7	RTS	N/A	N/A
8	CTS	N/A	N/A
9	+5V / +12V	N/A	N/A

5 Signal Descriptions

5.1 Watch Dog Signal

```
void WatchDogTest()
{
    bool bSuccess = false;
    int WDTimer = 30;
    printf("Please input WatchDog timer:");
    scanf("%d", &WDTimer);
    ShowError(bSuccess = AsrLibWDSetConfig(WDTimer));
    ShowError(bSuccess = AsrLibWDTrigger());
    char Key = 0;
    int CurrentTime = 0;
    int WaitSeconds = WDTimer;
    while (WaitSeconds) {
        ShowError(CurrentTime = AsrLibWDCounter());
        WaitSeconds--;
        while (1)
        {
            while (kbhit())
            {
```



```
Key = _getch();
if (Key == 'r')
{
    AsrLibWDDisable();
    ShowError(bSuccess = AsrLibWDSetConfig(WDTimer));
    ShowError(bSuccess = AsrLibWDTrigger());
    WaitSeconds = WDTimer;
    ShowError(CurrentTime = AsrLibWDCounter());
    break;
}
else if (Key == 'c') {
    AsrLibWDDisable();
    WaitSeconds = 0;
    _tprintf(_T("\nWatchDog Disable"));
    break;
}
}

if (WaitSeconds == 0)
    break;

if (CurrentTime != AsrLibWDCounter()) {
    WaitSeconds--;
```

```
    printf("\rWatchDog timer %d, press 'r' to reset timer, 'c' to disable WatchDog.", WaitSeconds);  
    CurrentTime = AsrLibWDCounter();  
}  
}  
printf("\n");  
}  
}
```

5.2 GPIO Signal

```
void GpioTest()
{
    bool bSuccess = false;
    _tprintf(_T("\n"));
    _tprintf(_T("Current state\n"));
    _tprintf(_T("-----\n"));
    // Check AsrLibGetSioGpioGroup & AsrLibSetSioGpioGroup
    int GP2x = 2;
    int PinCount = 8;
    int n = 0;
    SSORE_GPIO_VALUE Values[8];

    ::AsrLibGetSioGpioGroup(GP2x, Values, &PinCount);
    for (n = 0; n < PinCount; n++) {
        DisplayGpioString(&Values[n]);
    }

    _tprintf(_T("\n"));
    int GPIOType = 0;
    printf("Input GPIOType:(1:GPIO_INPUT 2:GPIO_OUTPUT_LOW 3:GPIO_OUTPUT_HIGH)");
    scanf("%d", &GPIOType);
}
```

```
if (GPIONType == 1) {  
    for (int i = 0; i < PinCount; i++) {  
        Values[i].Value = ESCORE_GPIO_INPUT_LOW;  
    }  
    ShowError(bSuccess = AsrLibSetSioGpioGroup(GP2x, Values, PinCount));  
    //ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 0, ESCORE_GPIO_INPUT_LOW));  
    //ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 1, ESCORE_GPIO_INPUT_LOW));  
    //ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 2, ESCORE_GPIO_INPUT_LOW));  
    //ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 3, ESCORE_GPIO_INPUT_LOW));  
    //ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 4, ESCORE_GPIO_INPUT_LOW));  
    //ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 5, ESCORE_GPIO_INPUT_LOW));  
    //ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 6, ESCORE_GPIO_INPUT_LOW));  
    //ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 7, ESCORE_GPIO_INPUT_LOW));  
} else if (GPIONType == 2) {  
    ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 0, ESCORE_GPIO_OUTPUT_LOW));  
    ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 1, ESCORE_GPIO_OUTPUT_LOW));  
    ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 2, ESCORE_GPIO_OUTPUT_LOW));  
    ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 3, ESCORE_GPIO_OUTPUT_LOW));  
    ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 4, ESCORE_GPIO_OUTPUT_LOW));  
    ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 5, ESCORE_GPIO_OUTPUT_LOW));  
    ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 6, ESCORE_GPIO_OUTPUT_LOW));  
    ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 7, ESCORE_GPIO_OUTPUT_LOW));  
}
```

```

} else if (GPIOType == 3) {
    ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 0, ESCORE_GPIO_OUTPUT_HIGH));
    ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 1, ESCORE_GPIO_OUTPUT_HIGH));
    ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 2, ESCORE_GPIO_OUTPUT_HIGH));
    ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 3, ESCORE_GPIO_OUTPUT_HIGH));
    ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 4, ESCORE_GPIO_OUTPUT_HIGH));
    ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 5, ESCORE_GPIO_OUTPUT_HIGH));
    ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 6, ESCORE_GPIO_OUTPUT_HIGH));
    ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 7, ESCORE_GPIO_OUTPUT_HIGH));
} else {
    ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 0, ESCORE_GPIO_OUTPUT_HIGH));
    ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 1, ESCORE_GPIO_OUTPUT_LOW));
    ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 2, ESCORE_GPIO_OUTPUT_HIGH));
    ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 3, ESCORE_GPIO_OUTPUT_LOW));
    ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 4, ESCORE_GPIO_OUTPUT_HIGH));
    ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 5, ESCORE_GPIO_OUTPUT_LOW));
    ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 6, ESCORE_GPIO_OUTPUT_HIGH));
    ShowError(bSuccess = AsrLibSetSioGpioValue((GP2x * 10) + 7, ESCORE_GPIO_OUTPUT_LOW));
}

_tprintf(_T("New state\n"));
_tprintf(_T("-----\n"));

```

```
::AsrLibGetSioGpioGroup(GP2x, Values, &PinCount);  
for (n = 0; n < PinCount; n++) {  
    DisplayGpioString(&Values[n]);  
}  
}
```

6 System Resources

6.1 Intel® Comet Lake -S PCH

Intel® Q470E Chipset (Intel® GL82Q470E PCH)

6.2 Main Memory

WADE-8212 provides 2x260 pin So-DIMM sockets. The maximum memory can be up to 64GB. Memory clock and related settings can be detected by BIOS via SPD interface.

Watch out the contact and lock integrity of memory module with socket, it will impact on the system reliability. Follow normal procedures to install memory module into memory socket. Before locking, make sure that all modules have been fully inserted into the card slots.

6.3 Installing the Single Board Computer

To install your WADE-8212 into standard chassis or proprietary environment, please perform the following:

Step 1 : Check all jumpers setting on proper position

Step 2 : Install and configure CPU,CPU cooling and memory module on right position

Step 3 : Place WADE-8212 into the dedicated position in the system

Step 4 : Attach cables to existing peripheral devices and secure it

WARNING

Please ensure that mother board is properly inserted and fixed by mechanism.

Note:

Please refer to section 6.3.1 to 6.3.4 to install INF/Graphic/LAN

6.3.1 Chipset Component Driver

WADE-8212 is based on Intel® Q470E chipset and desktop processors including Core™ i7 / i5 / i3 sku . It's a new chipset that some old operating systems might not be able to recognize. To overcome this compatibility issue, for Windows Operating Systems such as Windows 8, please install its INF before any of other Drivers are installed. You can find very easily this chipset component driver in WADE-8212 DVD-title

6.3.2 Intel® UHD Graphics 630

WADE-8212 has integrated Intel® UHD Graphics 630 which supports DirectX 12 、 OpenGL 4.5. It is the most advanced design to gain an outstanding graphic performance. WADE-8212 supports VGA, DP, HDMI, LVDS display output. This combination makes WADE-8212 an excellent performance hardware.

Drivers Support

Please find the Graphic driver in the WADE-8212 DVD-title. The driver supports Windows 10.

6.3.3 Intel LAN I225V/I219LM Gigabit Ethernet Controller

- Intel I225V Gigabit Ethernet controller and 1x RJ45 connectors on rear I/O
- Intel I219LM Gigabit Ethernet controller and 1x RJ45 connectors on rear I/O

Drivers Support

Please find Intel I225V/I219LM LAN driver in /Ethernet directory of WADE-8212 DVD-title. The driver supports Windows 10.

7 BIOS Setup Items

7.1 Introduction

The following section describes the BIOS setup program. The BIOS setup program can be used to view and change the BIOS settings for the module. Only experienced users should change the default BIOS settings.

7.2 BIOS Setup

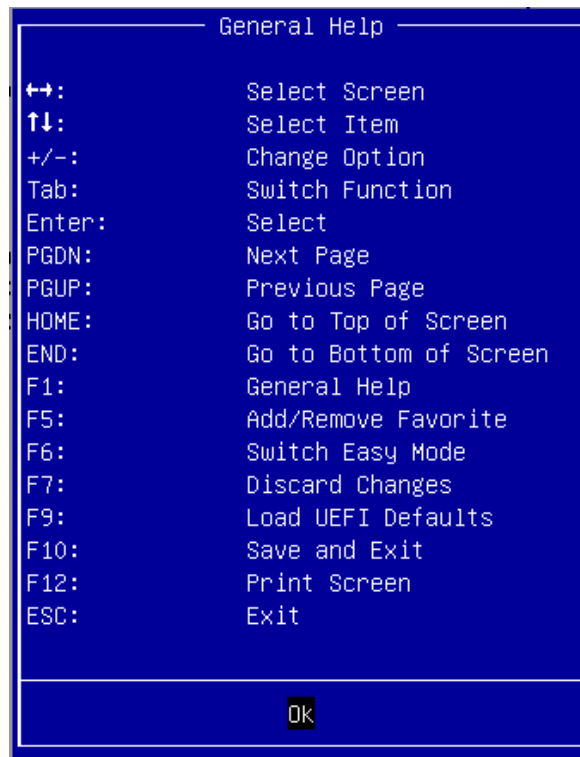
Power on the computer and the system will start POST (Power on Self Test) process. When the message below appears on the screen, press <Delete> or <ESC> key will enter BIOS setup screen.

Press<Delete> or <ESC> to enter SETUP

If the message disappears before responding and still wish to enter Setup, please restart the system by turning it OFF and On or pressing the RESET button. It can be also restarted by pressing <Ctrl>, <Alt>, and <Delete> keys on keyboard simultaneously.

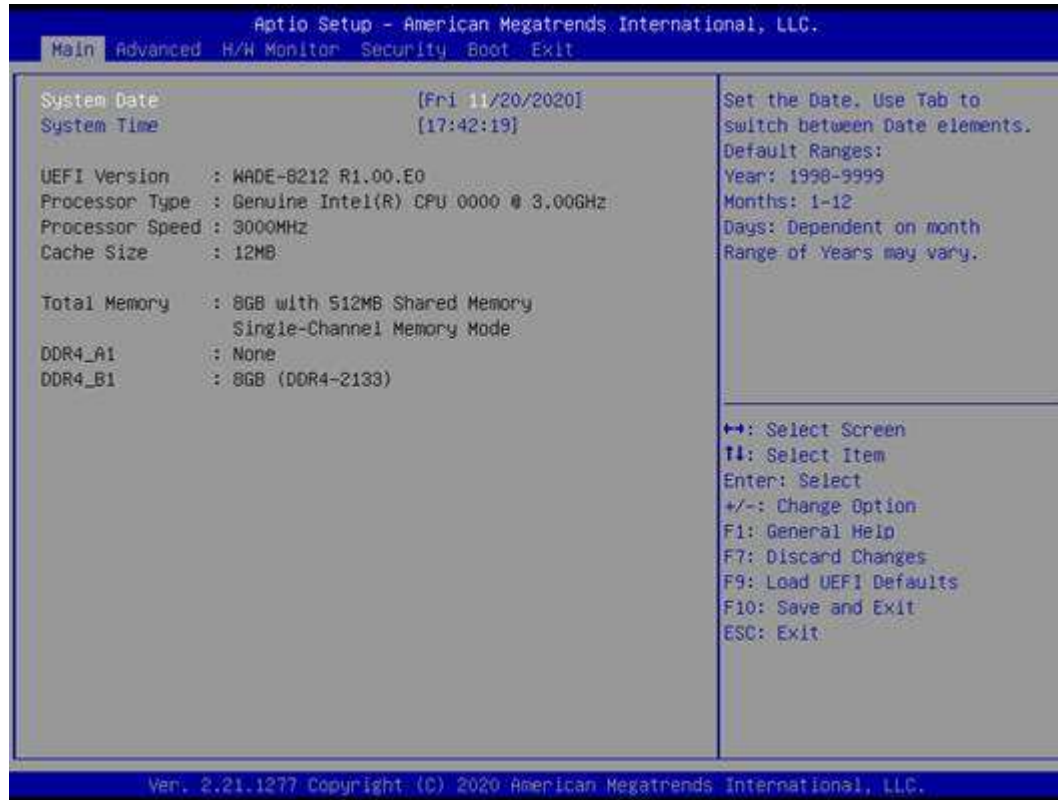
Press <F1> to Run General Help or Resume

The BIOS setup program provides a General Help screen. The menu can be easily called up from any menu by pressing <F1>. The Help screen lists all the possible keys to use and the selections for the highlighted item. Press <Esc> to exit the Help Screen.



7.2.1 Main

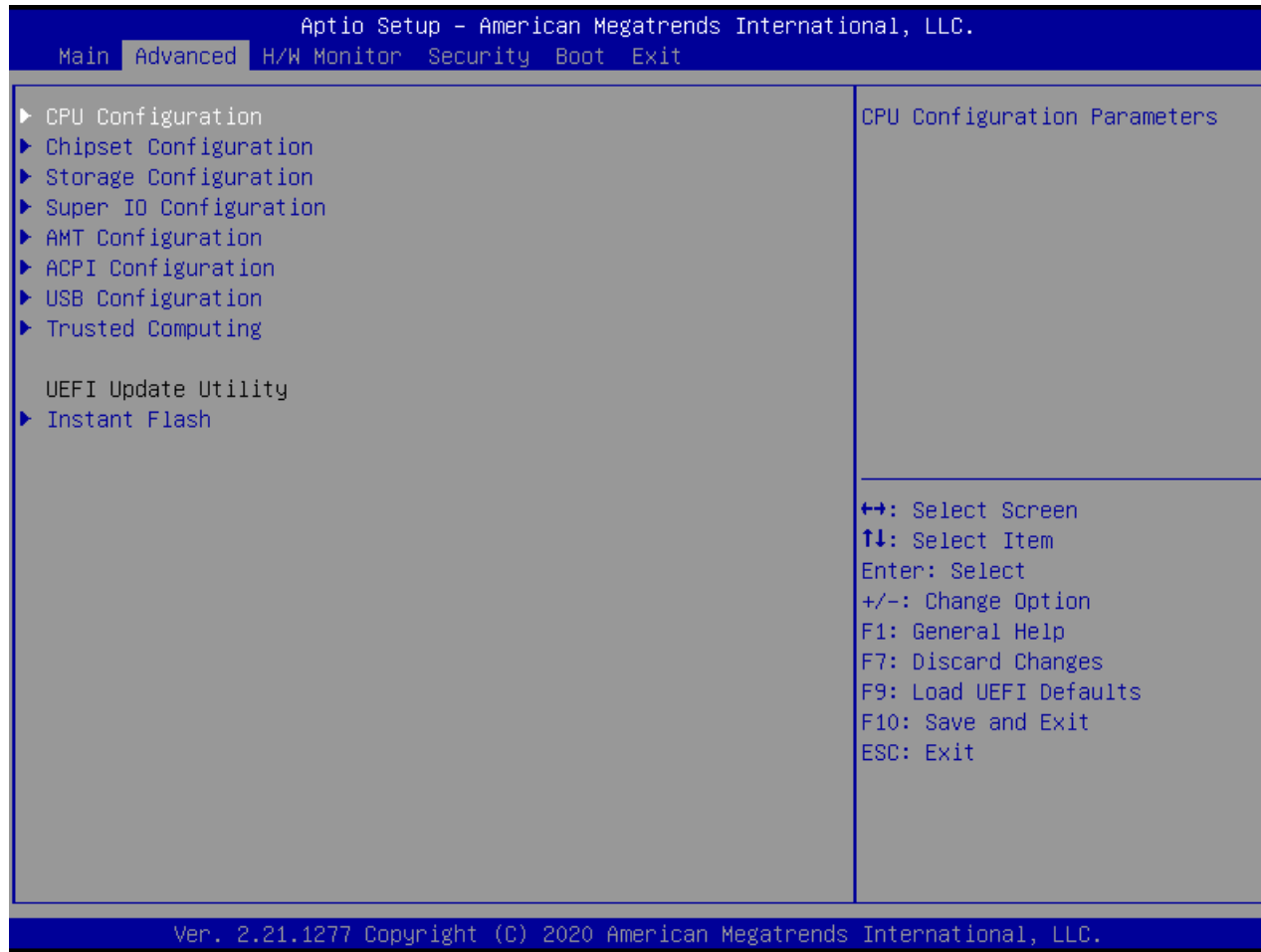
Use this menu for basic system configurations, such as time, date etc.



Feature	Description	Options
System Date	The date format is <Day>, <Month> <Date> <Year>. Use [+] or [-] to configure system Date.	
System Time	The time format is <Hour> <Minute> <Second>. Use [+] or [-] to configure system Time.	

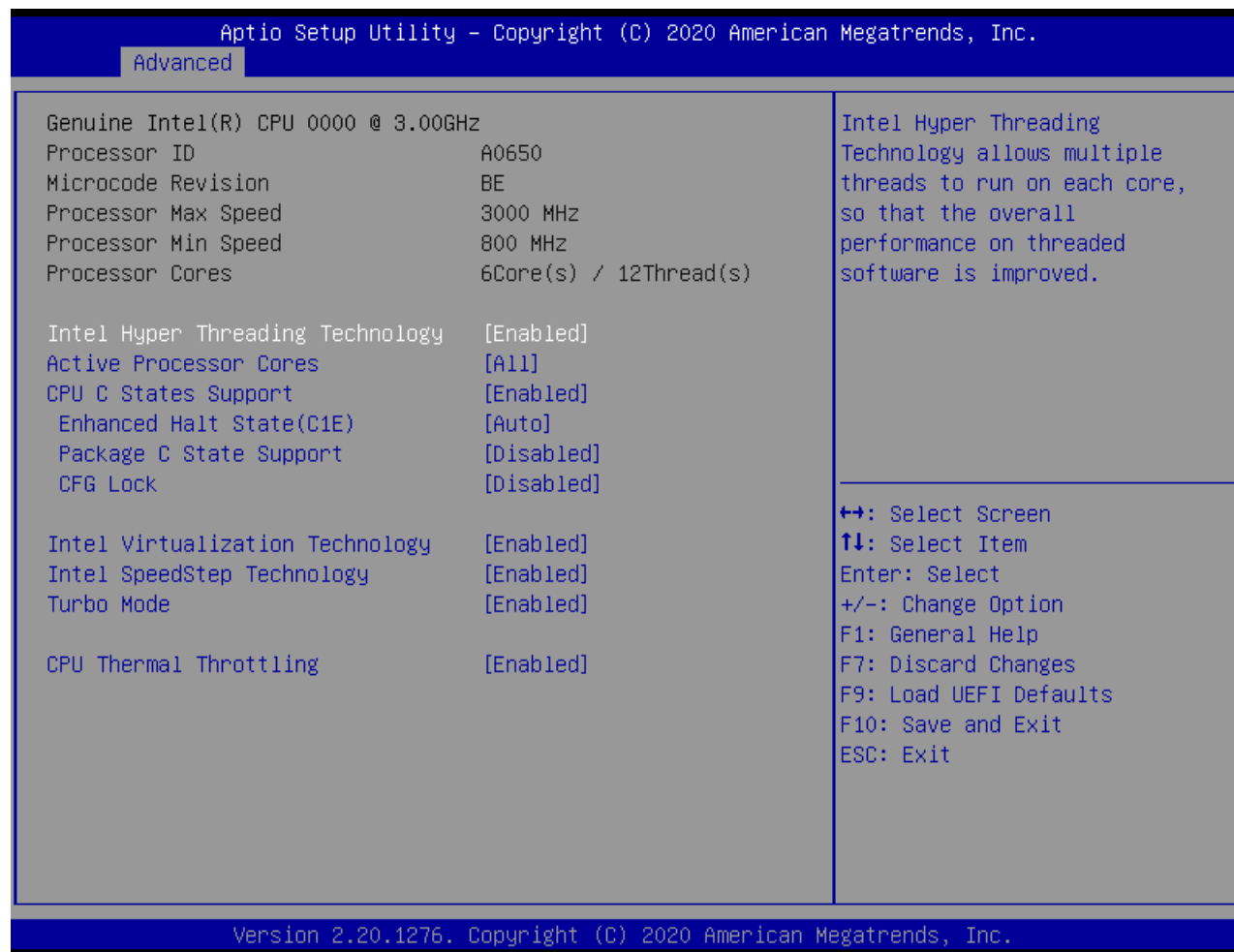
7.2.2 Advanced

Use this menu to set up the items of special enhanced features



CPU Configuration

CPU Configuration Parameters



Feature	Description	Options
Intel Hyper Threading Technology	Intel Hyper Threading Technology allows multiple threads to run on each core, so that the overall performance on threaded software is improved.	★Enabled ,Disabled
Active Processor Cores	Select the number of cores to enable in each processor package.	★All, 1, 2, 3,4,5
CPU C states Support	Enable CPU C states Support for power saving. It is recommended to keep C3, C6 and C7 all enabled for better power saving.	★Disabled, Enabled
CPU C states Support [Enabled]		
Enhanced Halt State(C1E)	Enable Enhanced Halt State (C1E) for lower power consumption.	★Auto ,Disabled, Enabled
Package C State Support	Enable CPU, PCIe, Memory, Graphics C State Support for power saving.	★Disabled, Auto, Enabled
CFG Lock	This item allows you to disable or enable the CFG Lock.	★Disabled, Enabled
Intel Virtualization Technology	Intel Virtualization Technology allows a platform to run multiple operating systems and application in independent partitions, so that one computer system can function as multiple virtual systems.	★Enabled ,Disabled
Intel Speed Step Technology	Allows more than two frequency ranges to be supported.	★Enabled ,Disabled
Turbo Mode	Enable/Disable processor Turbo Mode(requires Intel Speed Step or Intel Speed Shift to be available and enabled)	★Enabled ,Disabled
CPU Thermal Throttling	Enable CPU internal thermal control mechanisms to keep the CPU from overheating.	★Enabled ,Disabled

Chipset Configuration

Configure Chipset Settings

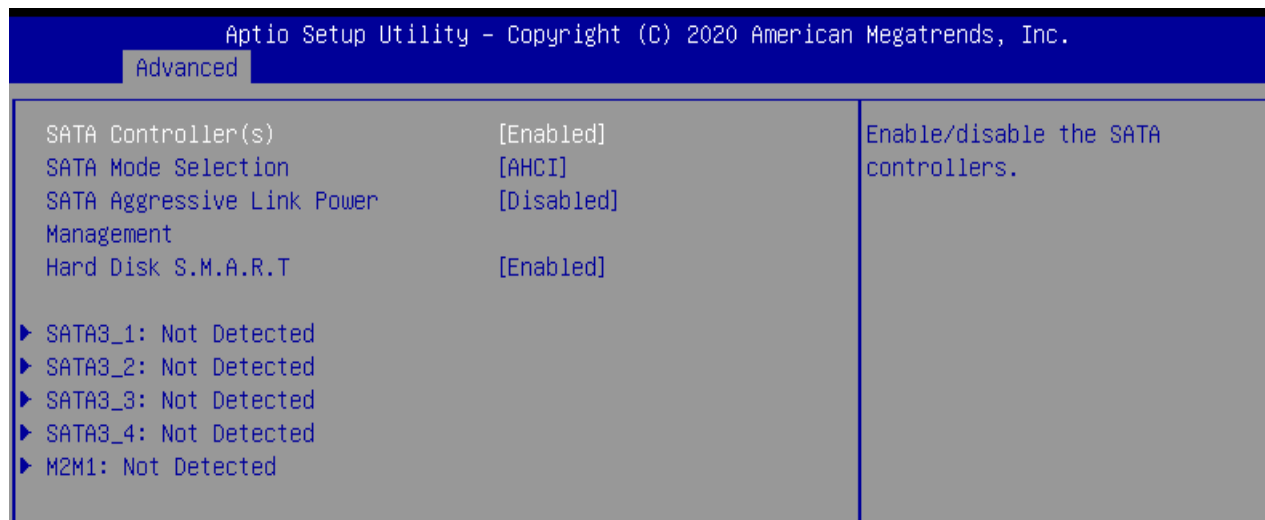
Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.		
Advanced		
ME Firmware Version	14.0.25.7228	Select a primary VGA.
VT-d Capability	Supported	
Primary Graphics Adapter	[PCI Express]	
Above 4G Decoding	[Disabled]	
VT-d	[Enabled]	←→: Select Screen ↑↓: Select Item Enter: Select +/-: Change Option F1: General Help F7: Discard Changes F9: Load UEFI Defaults F10: Save and Exit ESC: Exit
PCIE1 Link Speed	[Auto]	
Share Memory	[Auto]	
IGPU Multi-Monitor	[Disabled]	
Active LVDS	[Enabled]	
Panel Type Selection	[1920x1080/24bit/2ch/LED]	
Onboard LAN1	[Enabled]	
Onboard LAN2	[Enabled]	
Onboard HD Audio	[Enabled]	
Front Panel	[HD]	
Deep Sleep	[Disabled]	
Restore on AC/Power Loss	[Power Off]	
Version 2.20.1276. Copyright (C) 2020 American Megatrends, Inc.		

Feature	Description	Options
Primary Graphics Adapter	Select a primary VGA.	★PCI Express, Onboard
Above 4GB Decoding	Enable/Disable above 4G Memory Mapped IO decoding .This is disabled automatically when Aperture Size is set to 2048MB.	★Disabled ,Enabled
VT-d	VT-d Capability	★Enabled, Disabled
PCIE1 Link Speed	Control PCIE1 Slot Link Speed. Auto mode is optimizing for over clocking.	★Auto,Gen1, Gen2, Gen3
Share Memory	Configure the size of memory that is allocated to the integrated graphics processor when the system boots up.	★Auto,32M,64M,128M,256M,512M,1024M
IGPU Multi-Monitor	Select disable to disable the integrated graphics when an external graphics card is installed. Select enable to keep the integrated graphics enable at all times.	★Disabled, Enabled
Active LVDS	To enable or disable the LVDS.	★Disabled ,Enabled
Active LVDS [Enabled]		
Panel Type Selection	Selection Panel Type	★1920x1080/24bit/2ch/LED, 1440 x 900/24bit/2ch/LED, 1024x768/24bit/1ch/CCFL 1280x1024/24bit/2ch/CCFL, 1366x768/24bit/1ch/CCFL, 1440x900/24bit/2ch/CCFL, 1024 x 600/18bit/1ch/LED, 800x600/18-bit/1-ch/CCFL 1280 x 1024/24bit/2ch/LED, 1024 x 768/24bit/1ch/LED, 1600 x 900/18bit/2ch/LED, 1366 x 768/24bit/1ch/LED, 1366 x 768/18bit/1ch/LED, 800 x 600/24bit/1ch/LED, 640 x 480/24bit/1ch/LED, 1024 x 768/18bit/1ch/LED,

Onboard LAN1	Enable or disable the onboard LAN1 network interface controller.	★Enabled , Disabled
Onboard LAN2	Enable or disable the onboard LAN2 network interface controller.	★Enabled , Disabled
Onboard HD Audio	Auto/enable/disable onboard HD audio. Set to Auto to enable onboard HD audio and automatically disable it when a sound card is installed.	★Enabled , Disabled
Front Panel	Select Front Panel Type.	★HD, HD 7.1
Onboard Digital Audio	Enable audio for the onboard digital outputs.	★Enabled , Disabled
Deep Sleep	Configure deep sleep mode for power saving when the computer is shut down. We recommend disabling Deep Sleep for better system compatibility and stability.	★Disabled, Enabled in S4-S5
Restore on AC/Power Loss	Select the power state after a power failure. If [Power Off] is selected, the power will remain off when the power recovers. If [Power On] is selected, the system will start to boot up when the power recovers.	★Power Off ,Power On

Storage Configuration

Configure Storage devices



Feature	Description	Options
SATA Controller(s)	Enable/disable the SATA controllers.	★ Enabled , Disabled
SATA Mode Selection	AHCI: Supports new features that improve performance. Intel RST Premium (RAID): Combine multiple disk drives into a logical unit. Please press<CTRL-I>to enter RAID ROM during UEFI POST process.	★ AHCI, Intel RST With Intel Optane System Acceleration
SATA Aggressive Link Power Management	SATA Aggressive Link Power Management allows SATA devices to enter a low power state during periods of inactivity to save power. It is only supported by AHCI mode.	★ Disabled, Enabled
Hard Disk S.M.A.R.T	S.M.A.R.T stands for Self-Monitoring, Analysis, and Reporting system for computer hard disk drives to detect and report on various indicators of reliability.	★ Enabled, Disabled

SATA3 1,2,3,4: Not Detected Configuration

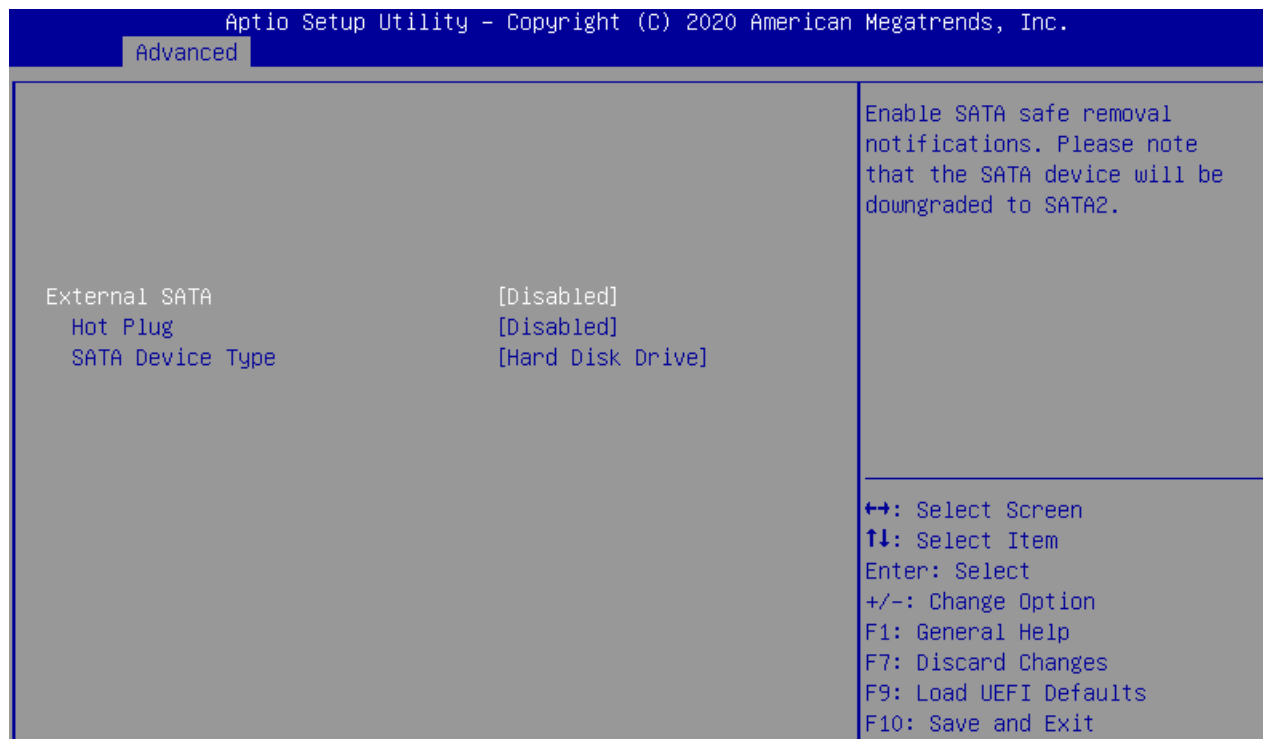
SATA3_(1,2,3,4): Not Detected Configuration



Feature	Description	Options
External SATA	Enable SATA safe removal notifications. Please note that the SATA device will be downgraded to SATA2.	★Disabled ,Enabled
Hot Plug	Enable or disable Hot Plug for this port.	★Disabled ,Enabled
SATA Device Type	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.	★Hard Disk Drive, Solid State Drive

M2M1: Not Detected Configuration

M2M1: Not Detected Configuration



Feature	Description	Options
External SATA	Enable SATA safe removal notifications. Please note that the SATA device will be downgraded to SATA2.	★Disabled ,Enabled
Hot Plug	Enable or disable Hot Plug for this port.	★Disabled ,Enabled
SATA Device Type	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.	★Hard Disk Drive, Solid State Drive

Super IO Configuration

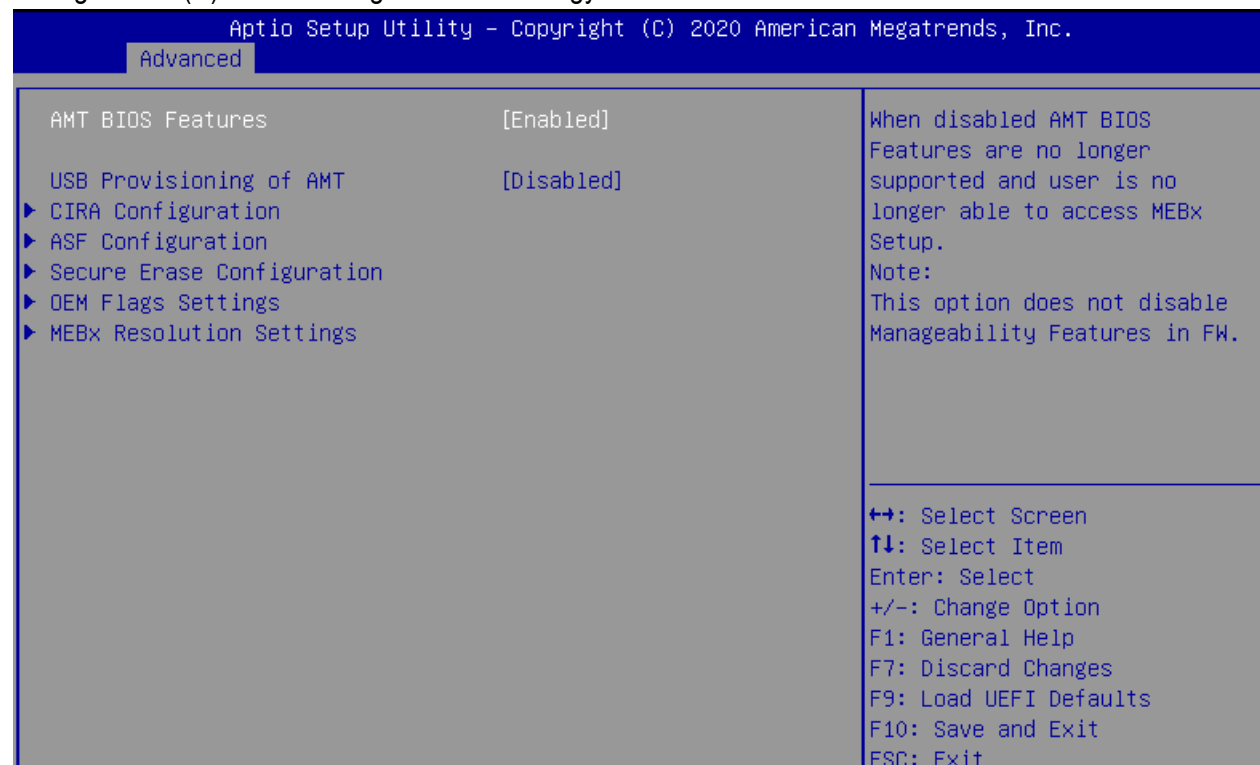
Configure Super IO Settings.

Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.		
Advanced		
COM1	[Enabled]	Enable or Disable COM1 IO=3F8h; IRQ=4;
Type Select	[RS232]	
COM2	[Enabled]	
Type Select	[RS232]	
COM3	[Enabled]	
COM4	[Enabled]	
COM5	[Enabled]	
WDT Timeout Reset	[Enabled]	
WDT Initial Value (Sec.)	255	
		←→: Select Screen ↑↓: Select Item Enter: Select +/-: Change Option F1: General Help F7: Discard Changes F9: Load UEFI Defaults F10: Save and Exit ESC: Exit
Version 2.20.1276. Copyright (C) 2020 American Megatrends, Inc.		

Feature	Description	Options
COM1	Enable or Disable COM1 , IO=3F8h; IRQ=4;	★Enabled ,Disabled
Type Select	Set COM Type	★RS232,RS422,RS485
COM2	Enable or Disable COM2 , IO=2F8h; IRQ=3;	★Enabled ,Disabled
Type Select	Set COM Type	★RS232,RS422,RS485
COM3	Enable or Disable COM3 , IO=3E8h; IRQ=7	★Enabled ,Disabled
COM4	Enable or Disable COM4, IO=2E8h; IRQ=7;	★Enabled ,Disabled
COM5	Enable or Disable COM4, IO=2E0h; IRQ=10;	★Enabled ,Disabled
WDT Timeout Reset	Enable/Disable Watch Dog Timer timeout to reset system.	★Disabled , Enabled
WDT Timeout Reset[Enabled]		
WDT Initial Value (Sec.)	Watch Dog Timer Initial Value to count down.	★255

AMT Configuration

Configure Intel(R) Active Management Technology Parameters



Feature	Description	Options
AMT BIOS Features	When disabled AMT BIOS Features are no longer supported and user is no longer able to access MEBx Setup. Note: This option does not disable Manageability Features in FW.	★Enable ,Disabled
USB Provisioning of AMT	Enable/Disable of AMT USB Provisioning.	★Disabled, Enable

CIRA Configuration

Configure Remote Assistance Process parameters

Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.

Advanced

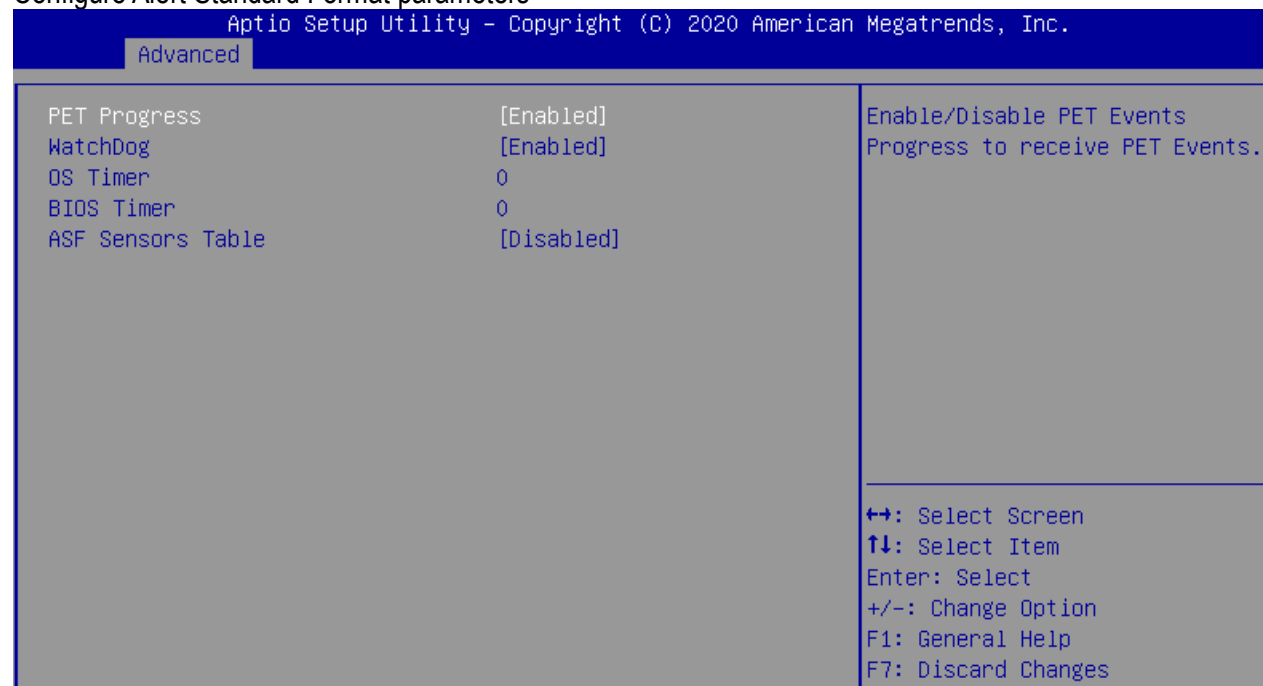
Activate Remote Assistance Process	[Enabled]	Trigger CIRA boot
CIRA Timeout	0	Note: Network Access must be activated first from MEBx Setup.

↔: Select Screen
 ↑↓: Select Item
 Enter: Select
 +/-: Change Option
 F1: General Help
 F7: Discard Changes

Feature	Description	Options
Activate Remote Assistance Process	Trigger CIRA boot. Note: Network Access must be activated first from MEBx Setup.	★ Disabled, Enable
Activate Remote Assistance Process[Enable]		
CIRA Timeout	OEM defined timeout for MPS connection to be established. 0-use the default timeout value of 60 seconds. 255- MEBx waits until the connection succeeds	★ 0

ASF Configuration

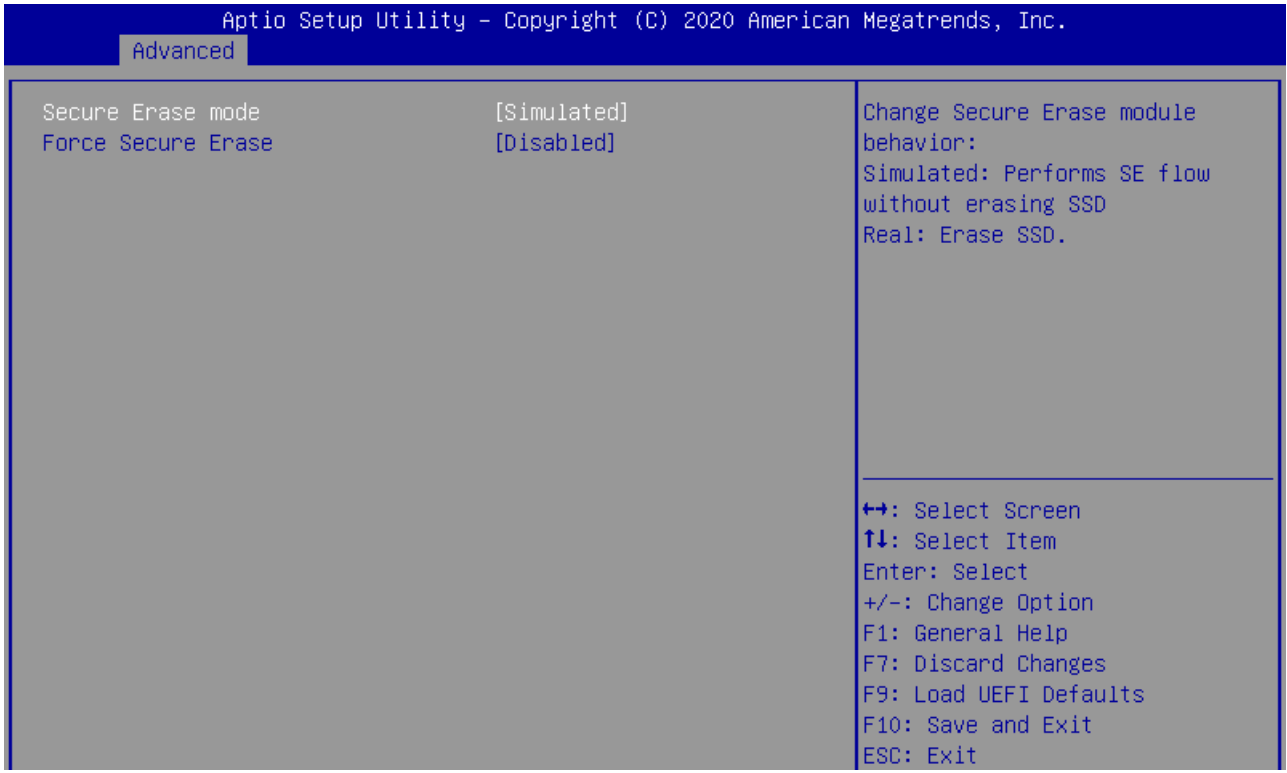
Configure Alert Standard Format parameters



Feature	Description	Options
PET Process	Enable/Disable PET Events Progress to receive PET Events.	★ Enable , Disabled
WatchDog	Enable/Disable WatchDog Timer.	★ Disabled, Enable
WatchDog [Enabled]		
OS Timer	Set OS watchdog timer	★ 0
BIOS Timer	Set BIOS watchdog timer	★ 0
ASF Sensors Table	Adds ASF Sensor Table into ASF! ACPI Table	★ Disabled, Enable

Secure Erase Configuration

Secure Erase Configuration menu



Feature	Description	Options
Secure Erase mode	Change Secure Erase module behavior: Simulated: Performs SE flow without erasing SSD Real: Erase SSD.	★Simulation, Real
Force Secure Erase	Force Secure Erase on next boot	★Disabled, Enable

OEM Flags Settings

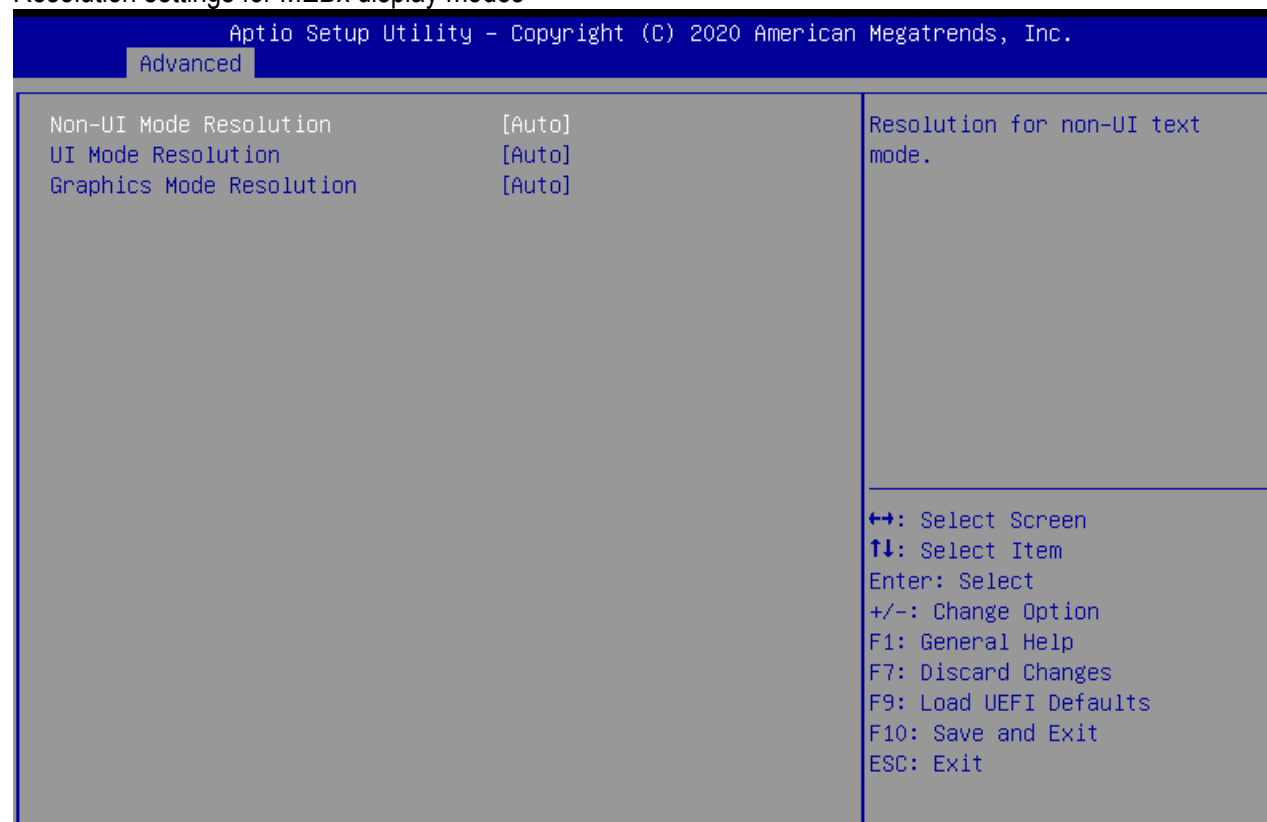
Configure OEM Flags



Feature	Description	Options
MEBx hotkey Pressed	OEMFlag Bit 1: Enable automatic MEBx hotkey press.	★Disabled, Enable
MEBx Selection Screen	OEMFlag Bit 2: Enable MEBx selection screen with 2 options: Press 1 to enter ME Configuration Screens Press 2 to initiate a remote connection Note: Network Access must be activated from MEBx Setup for this screen to be displayed.	★Disabled, Enable
Hide Unconfigure ME Confirmation Prompt	OEMFlag Bit 6: Hide Unconfigure ME confirmation prompt when attempting ME unconfiguration.	★Disabled, Enable
MEBx OEM Debug Menu Enable	OEMFlag Bit 14: Enable OEM debug menu in MEBx.	★Disabled, Enable
Unconfigure ME	OEMFlag Bit 15: Unconfigure ME with resetting MEBx password to default.	★Disabled, Enable

MEBx Resolution Settings

Resolution settings for MEBx display modes



Feature	Description	Options
Non-UI Mode Resolution	Resolution for non-UI text mode.	★Auto, 80x25,100x31
UI Mode Resolution	Resolution for UI text mode.	★Auto, 80x25,100x31
Graphics Mode Resolution	Resolution for graphic mode.	★Auto, 640x480,800x600,1024x768

ACPI Configuration

ACPI Parameters.

Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.

Advanced

Suspend to RAM	[Auto]	It is recommended to select auto for ACPI S3 power saving.
PCIE Devices Power On	[Disabled]	
RTC Alarm Power On	[Enabled]	
RTC Alarm Date	[Every Day]	
RTC Alarm Hour	[0]	
RTC Alarm Minute	[0]	
RTC Alarm Second	[0]	

↔: Select Screen

↑↓: Select Item

Enter: Select

+/-: Change Option

F1: General Help

F7: Discard Changes

F9: Load UEFI Defaults

F10: Save and Exit

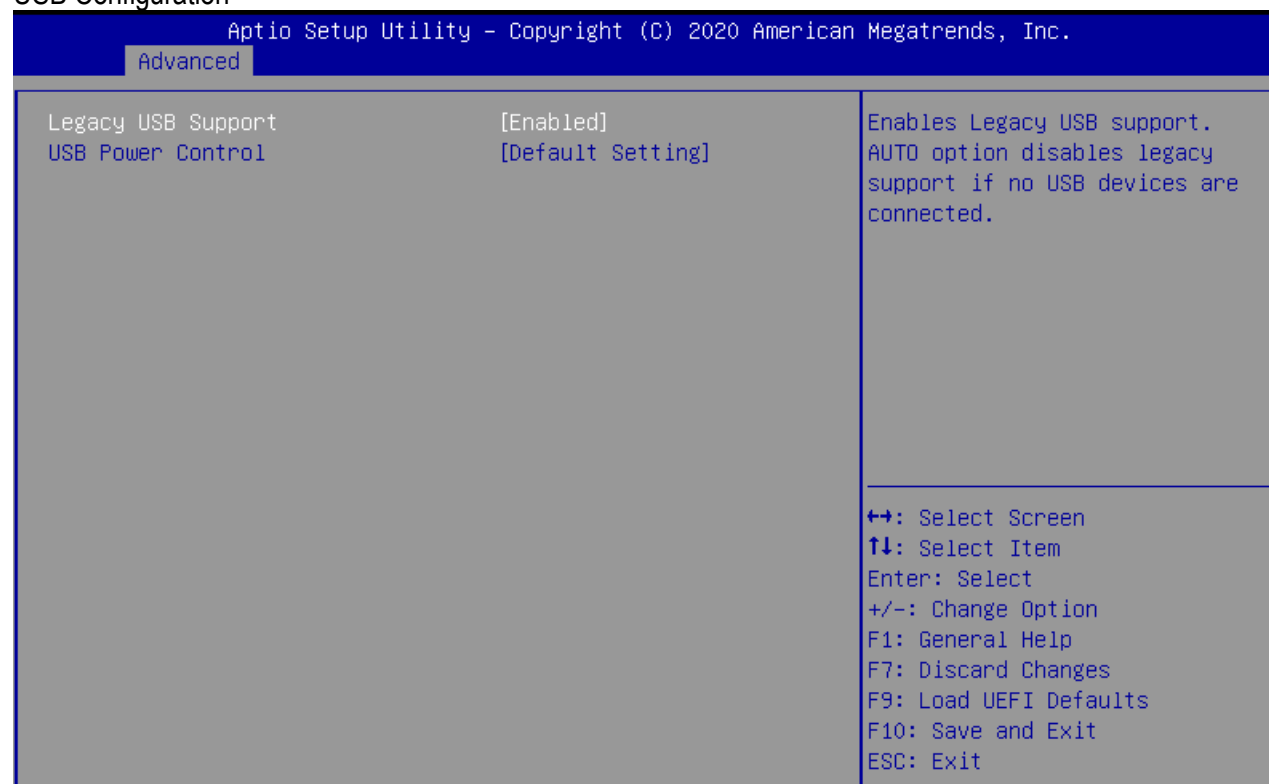
ESC: Exit

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Feature	Description	Options
Suspend to RAM	It is recommended to select auto for ACPI S3 power saving.	★Auto ,Disabled
PCIE Devices Power On	Allow the system to be waked up by a PCIE device and enable wake on LAN.	★Disabled, Enable
RTC Alarm Power On	Allow the system to be waked up by the real time clock alarm. Set it to By OS to let it be handled by your operating system.	★By OS ,Disabled, Enable
RTC Alarm Power On [Enabled]		
RTC Alarm Date	Set Date of RTC power on feature.	★EveryDay,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31
RTC Alarm Hour	Set Hour of RTC power on feature.	★0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,
RTC Alarm Minute	Set Minute of RTC power on feature.	★0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,20,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59
RTC Alarm Second	Set Second of RTC power on feature.	★0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,20,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59

USB Configuration

USB Configuration



Feature	Description	Options
Legacy USB Support	Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected.	★ Enabled, UEFI Setup only
USB Power Control	Always enabled: Enable USB power in S0/S3/S4/S5, Default setting: Enable USB power in S0/S3, disable USB power in S4/S5.	★ Default setting ,Always Enabled

Trusted Computing

Trusted Computing Settings

Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.		
Advanced		
TPM20 Device Found		Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
Firmware Version:	7.85	
Vendor:	IFX	
Security Device Support	[Enable]	
Active PCR banks	SHA256	↔: Select Screen ↑↓: Select Item Enter: Select +/-: Change Option F1: General Help F7: Discard Changes F9: Load UEFI Defaults F10: Save and Exit ESC: Exit
Available PCR banks	SHA-1,SHA256	
SHA-1 PCR Bank	[Disabled]	
SHA256 PCR Bank	[Enabled]	
Pending operation	[None]	
Platform Hierarchy	[Enabled]	
Storage Hierarchy	[Enabled]	
Endorsement Hierarchy	[Enabled]	
TPM2.0 UEFI Spec Version	[TCG_2]	
Physical Presence Spec Version	[1.3]	
TPM 20 InterfaceType	[TIS]	
Device Select	[Auto]	
Version 2.20.1276. Copyright (C) 2020 American Megatrends, Inc.		

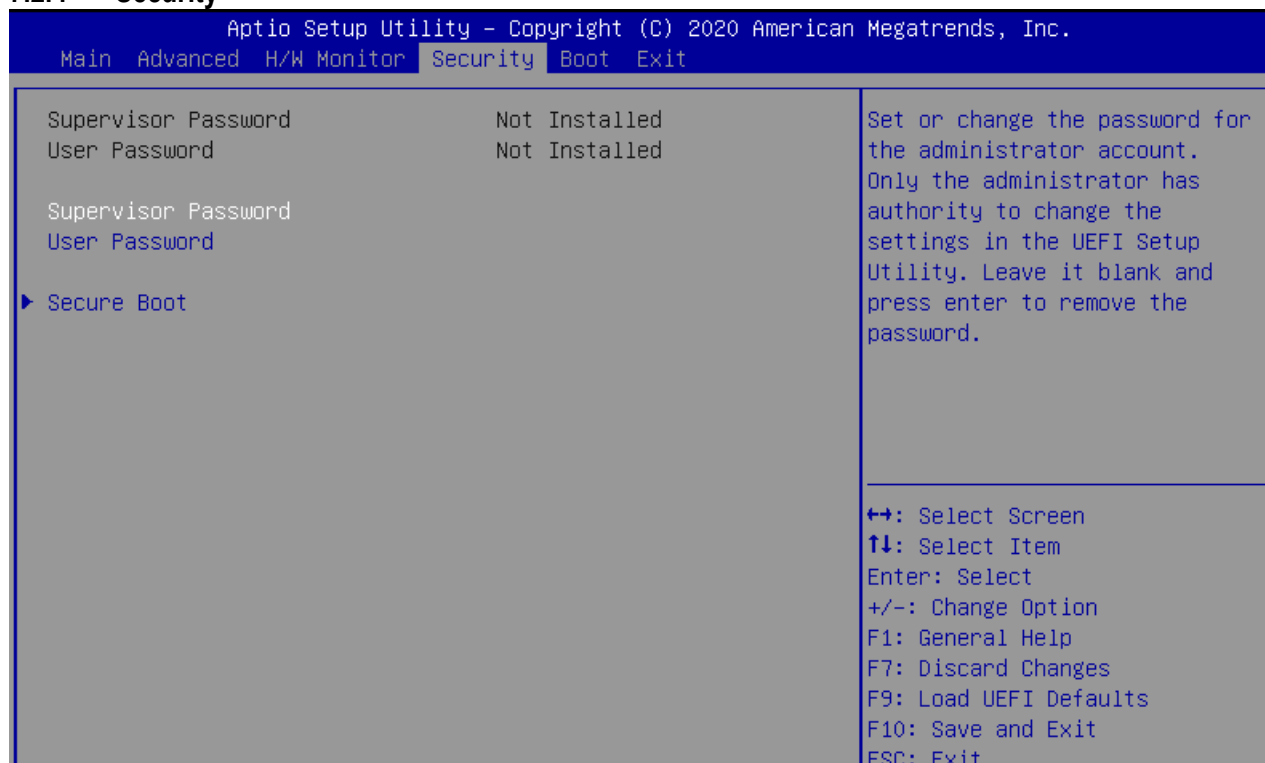
Feature	Description	Options
Security Device Support	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.	★Enable ,Disable
SHA-1 PCR Bank	Enable or Disable SHA-1 PCR Bank	★Disable, Enable
SHA256 PCR Bank	Enable or Disable SHA256 PCR Bank	★Enable ,Disable
Pending operation	Schedule an Operation for the Security Device. NOTE: Your Computer will reboot during restart in order to change State of Security Device.	★None, TPM Clear
Platform Hierarchy	Enable or Disable Platform Hierarchy	★Enable ,Disable
Storage Hierarchy	Enable or Disable Storage Hierarchy	★Enable ,Disable
Endorsement Hierarchy	Enable or Disable Endorsement Hierarchy	★Enable ,Disable
TPM2.0 UEFI Spec Version	Select the TCG2 Spec Version Support, TCG_1_2: the Compatible mode for Win8/Win10	★TCG_2,TCG_1_2
Physical Presence Spec Version	Select to Tell O.S.to support PPI Spec Version 1.2 or 1.3. Note some HCK tests might not support 1.3.	★1.3,1.2
Device Select	TPM1.2 will restrict support to TPM1.2 devices,TPM2.0 will restrict support to TPM2.0 devices, Auto will support both with the default set to TPM2.0 devices if not found, TPM1.2 devices will be enumerated	★Auto ,TPM1.2,TPM2.0

7.2.3 H/W Monitor

Aptio Setup Utility - Copyright (C) 2020 American Megatrends, Inc.		
Main Advanced H/W Monitor Security Boot Exit		
Hardware Health Event Monitoring		Quiet Fan Function Control
CPU Temperature	: +30 °C	
M/B Temperature	: +29 °C	
CPU_FAN1 Speed	: 4950 RPM	
CHA_FAN1 Speed	: N/A	
+3V	: +3.360 V	
+3VSB	: +3.360 V	
VCORE	: +0.968 V	
VCCM	: +1.200 V	
+5V	: +5.136 V	
+12V	: +12.008 V	
CPU_FAN1 Setting	[Automatic mode]	↔: Select Screen
Target CPU Temperature	[50 °C/122 °F]	↑↓: Select Item
Target Fan Speed	[Level 9]	Enter: Select
CHA_FAN1 Setting	[Automatic mode]	+/-: Change Option
Target CPU Temperature	[50 °C/122 °F]	F1: General Help
Target Fan Speed	[Level 9]	F7: Discard Changes
Case Open Feature	[Disabled]	F9: Load UEFI Defaults
		F10: Save and Exit
		ESC: Exit
Version 2.20.1276. Copyright (C) 2020 American Megatrends, Inc.		

Feature	Description	Options
CPU_FAN1 Setting	Quiet Fan Function Control	★Full On, Automatic Mode
CPU_FAN1 Setting[Automatic Mode]		
Target CPU Temperature	Target CPU Temperature Value.	★50°C/122°F, 45°C/113°F, 46°C/114°F, 47°C/116°F, 48°C/118°F, 49°C/120°F, 51°C/123°F, 52°C/125°F, 53°C/127°F, 54°C/129°F, 55°C/131°F, 56°C/132°F, 57°C/134°F, 58°C/136°F, 59°C/138°F, 60°C/140°F, 61°C/141°F, 62°C/143°F, 63°C/145°F, 64°C/147°F, 65°C/149°F
Target Fan Speed	The higher the level, the higher the fan speed.	★Level 9, Level 1, Level 2, Level 3, Level 4, Level 5, Level 6, Level 7, Level 8
CHA_FAN1 Setting	Quiet Fan Function Control	★Full On, Automatic Mode
CHA_FAN1 Setting[Automatic Mode]		
Target CPU Temperature	Target CPU Temperature Value.	★50°C/122°F, 45°C/113°F, 46°C/114°F, 47°C/116°F, 48°C/118°F, 49°C/120°F, 51°C/123°F, 52°C/125°F, 53°C/127°F, 54°C/129°F, 55°C/131°F, 56°C/132°F, 57°C/134°F, 58°C/136°F, 59°C/138°F, 60°C/140°F, 61°C/141°F, 62°C/143°F, 63°C/145°F, 64°C/147°F, 65°C/149°F
Target Fan Speed	The higher the level, the higher the fan speed.	★Level 9, Level 1, Level 2, Level 3, Level 4, Level 5, Level 6, Level 7, Level 8,
Case Open Feature	Enable or disable the feature of Case Open.	★Disabled, Enabled

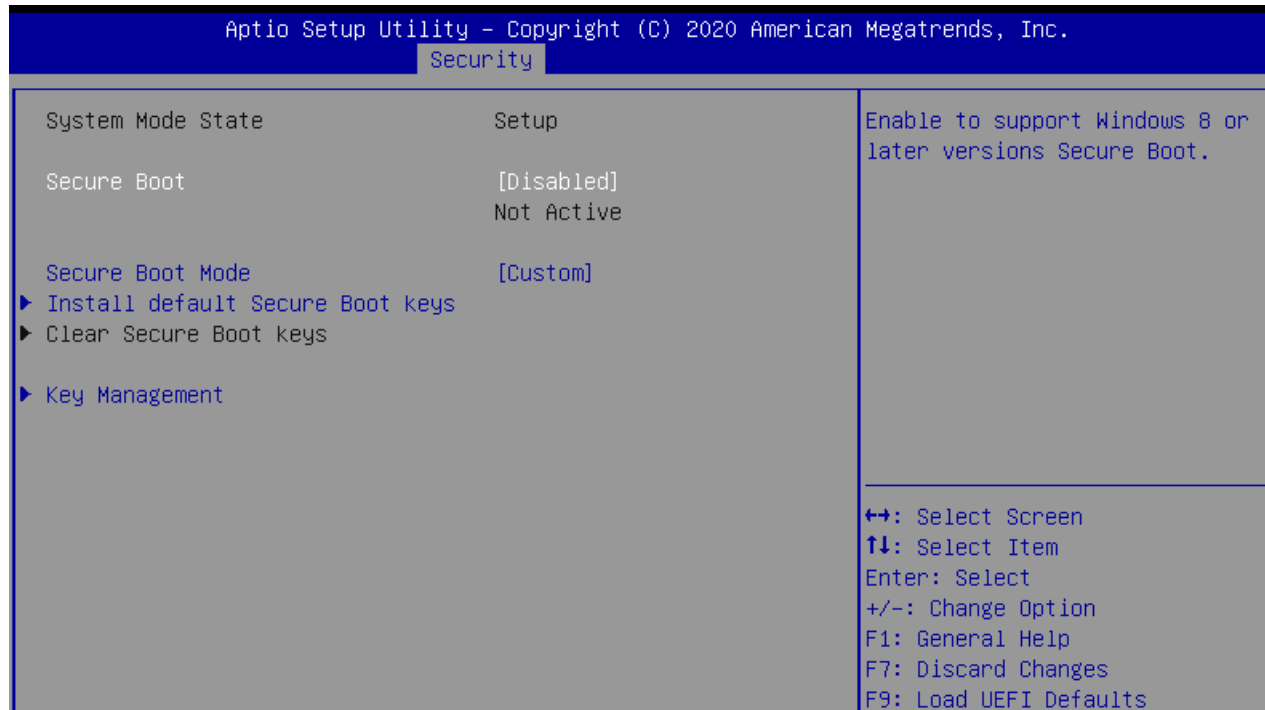
7.2.4 Security



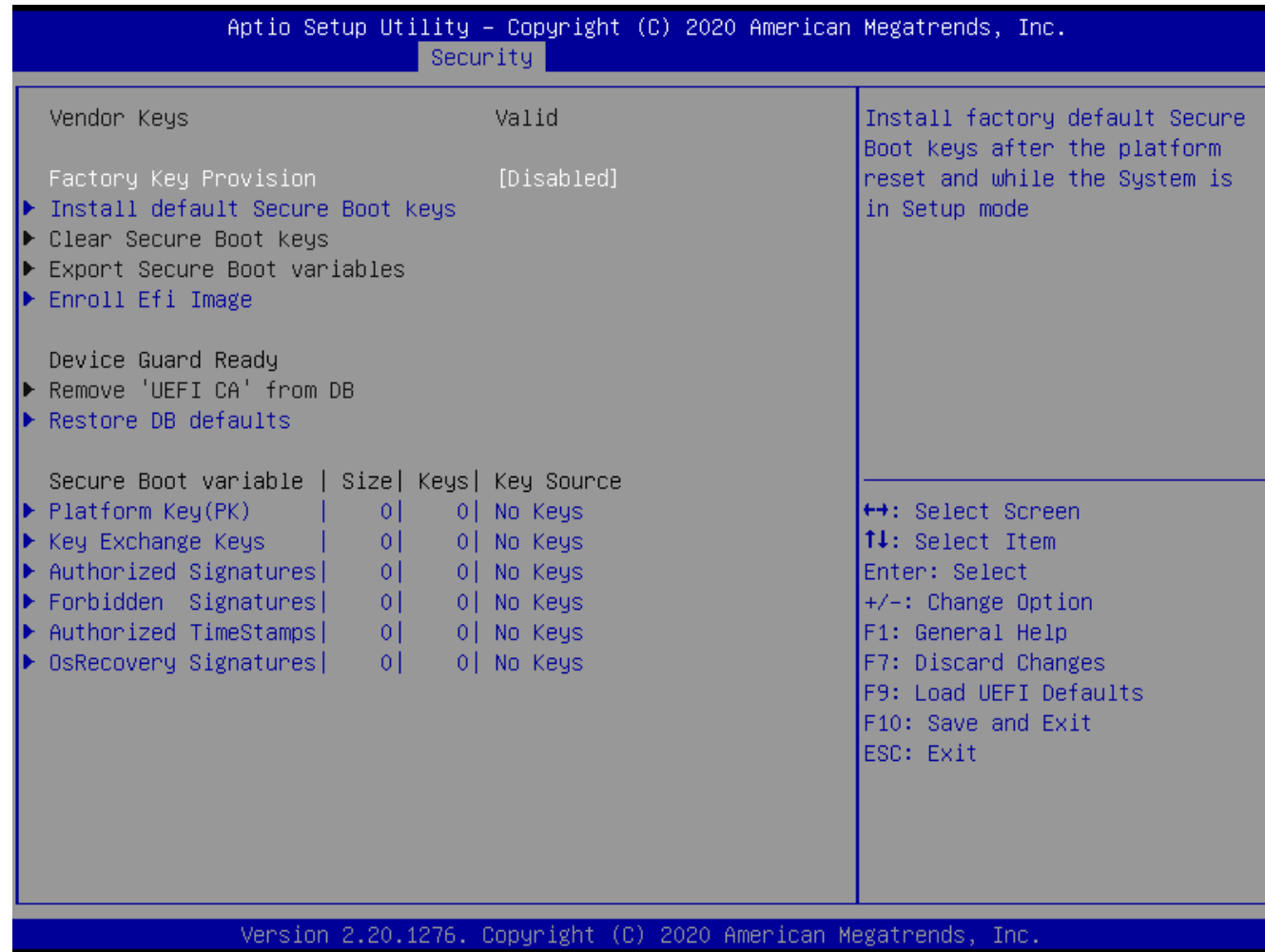
Feature	Description	Options
Supervisor Password	Set or change the password for the administrator account. Only the administrator has authority to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.	
User Password	Set or change the password for the user account. Users are unable to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.	

Secure Boot

Secure Boot configuration

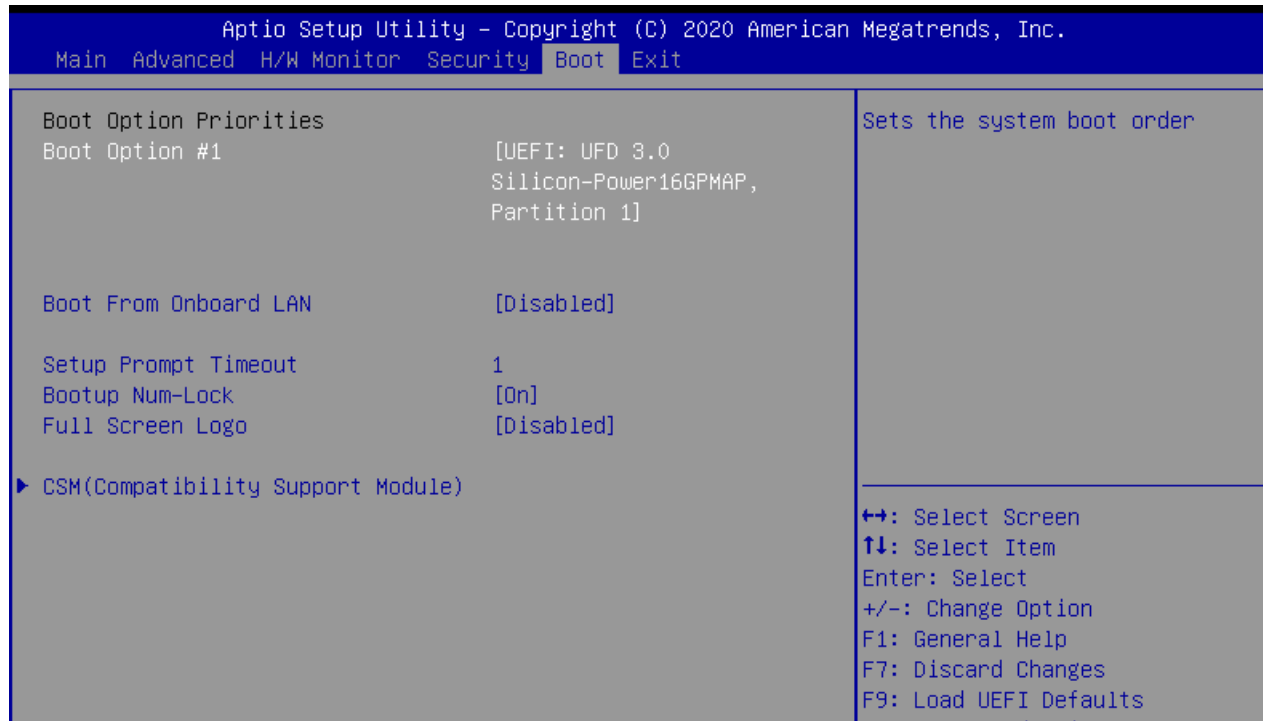


Feature	Description	Options
Secure Boot	Enable to support Windows 8 or later versions Secure Boot.	★ Disabled, Enabled
Secure Boot Mode	Secure Boot Mode options: Standard or Custom. In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication	★ Custom ,Standard
Install default Secure Boot keys	Please install default secure boot keys if it's the first time you use secure boot.	
Clear Secure Boot Keys	Force System to Setup Mode- clear all Secure Boot Variables. Change takes effect after reboot	

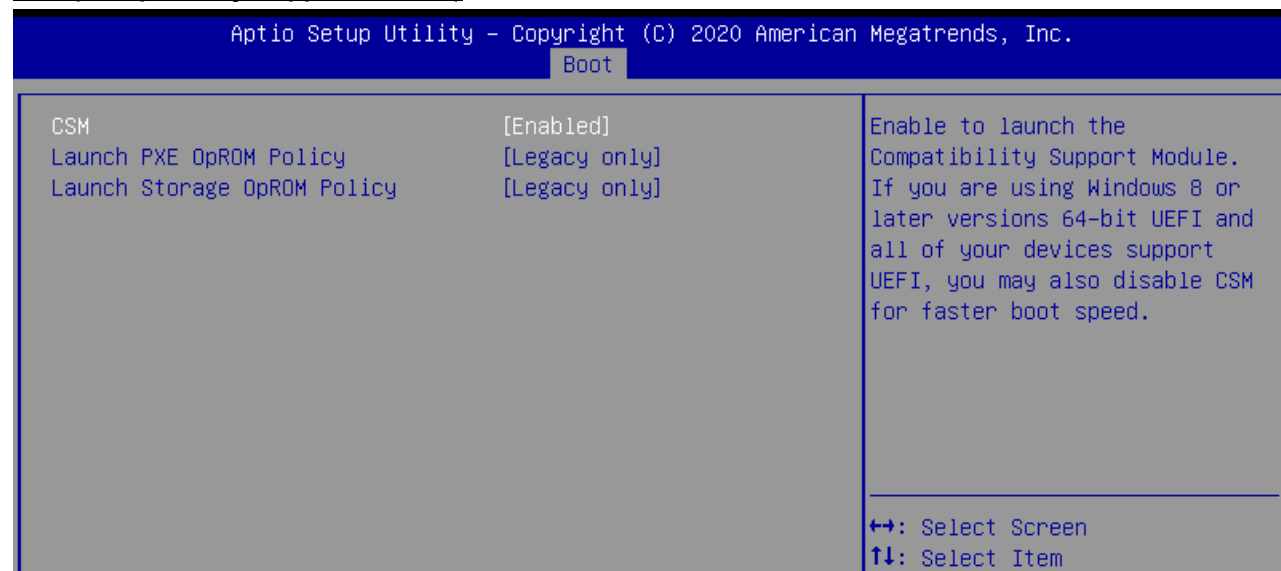
Key Management

Feature	Description	Options
Factory Key Provision	Install factory default Secure Boot keys after the platform reset and while the System is in Setup mode.	★Disabled, Enabled
Install default Secure Boot keys	Please install default secure boot keys if it's the first time you use secure boot.	
Enroll Efi Image	Allow the image to run in Secure Boot mode. Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db)	
Restore DB defaults	Restore DB variable to factory defaults	
Platform Key(PK)	Enroll Factory Defaults or load certificates from a file: 1.Public Key Certificate: a)EFI_SIGNATURE_LIST b) EFI_CERT_X509 (DER) c) EFI_CERT_RSA2048 (bin) d)EFI_CERT_SHAXXX 2.Authenticated UEFI Variable 3.EFI PE/COFF Image(SHA256) Key Source: Factory, External, Mixed	
Key Exchange Keys		
Authorized Signatures		
Forbidden Signatures		
Authorized TimeStamps		
OsRecovery Signatures		

7.2.5 Boot

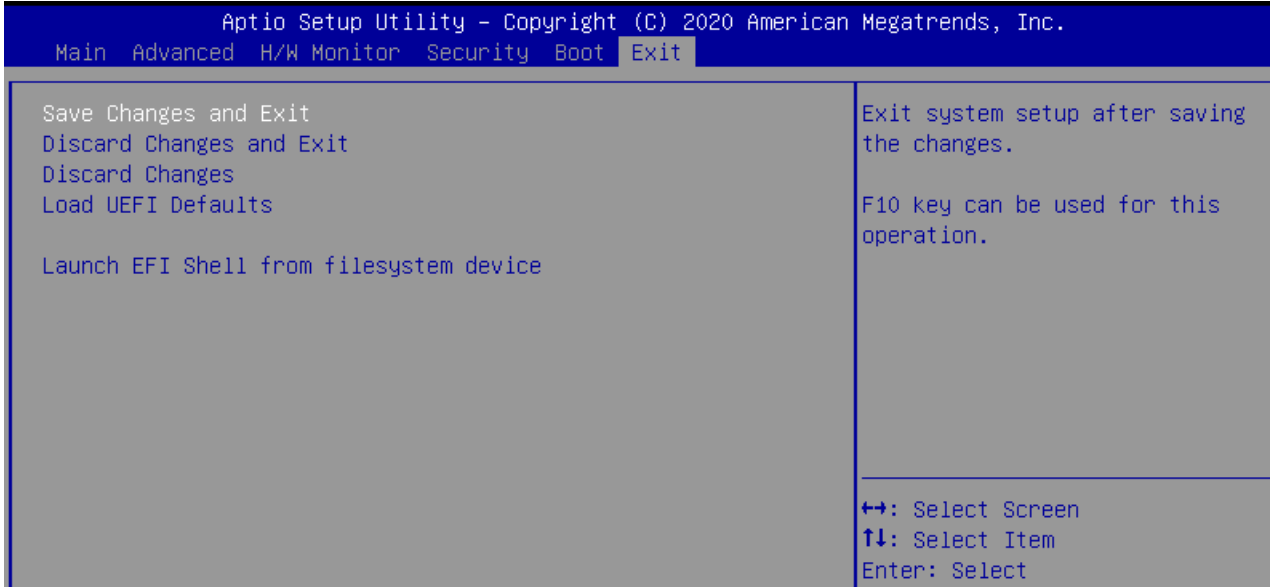


Feature	Description	Options
Boot Option #1	Sets the system boot order	★Disable, Enabled
Boot From Onboard LAN	Boot From Onboard LAN	★Disabled, Enabled
Setup Prompt Timeout	Configure the number of seconds to wait for the UEFI setup utility.	★1
Bootup Num-Lock	Select whether Num Lock should be turned on or off when the system boots up.	★On, Off
Full Screen Logo	Enable to display the boot logo or disable to show normal POST messages.	★Disabled, Enabled

CSM(Compatibility Support Module)

Feature	Description	Options
CSM	Enable to launch the Compatibility Support Module. If you are using Windows 8 or later versions 64-bit UEFI and all of your devices support UEFI, you may also disable CSM for faster boot speed.	★Disable, Enabled
CSM[Enable]		
Launch PXE OpROM Policy	Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Select Do not launch to not execute both legacy and UEFI option ROM.	★Legacy only, Do not launch, UEFI only,
Launch Storage OpROM Policy	Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. Select Do not launch to not execute both legacy and UEFI option ROM.	★Legacy only ,Do not launch, UEFI only

7.2.6 Exit



Feature	Description	Options
Save Changes and Exit	Exit system setup after saving the changes. F10 key can be used for this operation.	
Discard Changes and Exit	Exit system setup without saving any changes. Esc key can be used for this operation.	
Discard Changes	Discard Changes done so far to any of setup options. F7 key can be used for this operation.	
Load UEFI Defaults	Load UEFI Default values for all the setup question. F9 key can be used for this operation.	
Launch EFI Shell from filesystem device	Attempts to Launch EFI Shell application (Shell.efi) from one of the available filesystem devices.	

8 Troubleshooting

This section provides a few useful tips to quickly get WADE-8212 running with success. This section will primarily focus on system integration issues, in terms of BIOS setting, and OS diagnostics.

8.1 Hardware Quick Installation

ATX Power Setting

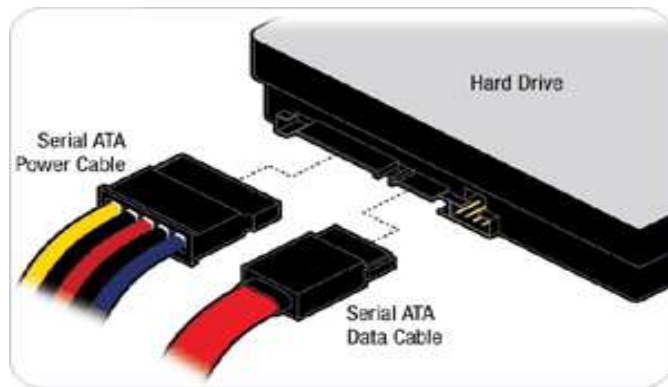
Unlike other Single board computer, WADE-8212 supports ATX only. Therefore, there is no other setting that needs to be set up. However, there are only two connectors that must be connected—J2 (4 pins ATX power connector) & J3 (20 pins ATX Power Connector) on the WADE-8212 board.



Serial ATA

Unlike IDE bus, each Serial ATA channel can only connect to one SATA hard disk at a time;

The installation of Serial ATA is simpler and easier than IDE, because SATA hard disk doesn't require setting up Master and Slave, which can reduce mistake of hardware installation.



WADE-8212 can support four SATA interface (SATAIII, 6.0Gb/s) on board. It has J5 SATA ports on board.

8.2 BIOS Setting

It is assumed that users have correctly adopted modules and connected all the devices cables required before turning on ATX power. DDR4 SO-DIMM Memory, keyboard, mouse, SATA hard disk, VGA connector, power cable of the device, ATX accessories are good examples that deserve attention. With no assurance of properly and correctly accommodating these modules and devices, it is very possible to encounter system failures that result in malfunction of any device.

To make sure that you have a successful start with WADE-8212, it is recommended, when going with the boot-up sequence, to hit "delete " or " Esc" key and enter the BIOS setup menu to tune up a stable BIOS configuration so that you can wake up your system far well.

Loading the default optimal setting

When prompted with the main setup menu, please scroll down to “Restore Defaults”, press “Enter” and select “Yes” to load default optimal BIOS setup. This will force your BIOS setting back to the initial factory configurations. It is recommended to do this so you can be sure the system is running with the BIOS setting that Portwell has highly endorsed. As a matter of fact, users can load the default BIOS setting at any time when system appears to be unstable in boot up sequence.

8.3 FAQ

Information & Support

Question: I forgot my password of system BIOS, what am I supposed to do?

Answer: You can switch off your power supply then find the J10 on the WADE-8212 board to set it from 1-2 short to 2-3 short and wait 5 seconds to clean your password then set it back to 1-2 short to switch on your power supply.

J10 : CMOS Setting

	Jumper Setting Describe
*1-2	Default
2-3	Clean CMOS

WADE-8212

Question: How to update the BIOS file of WADE-8212?

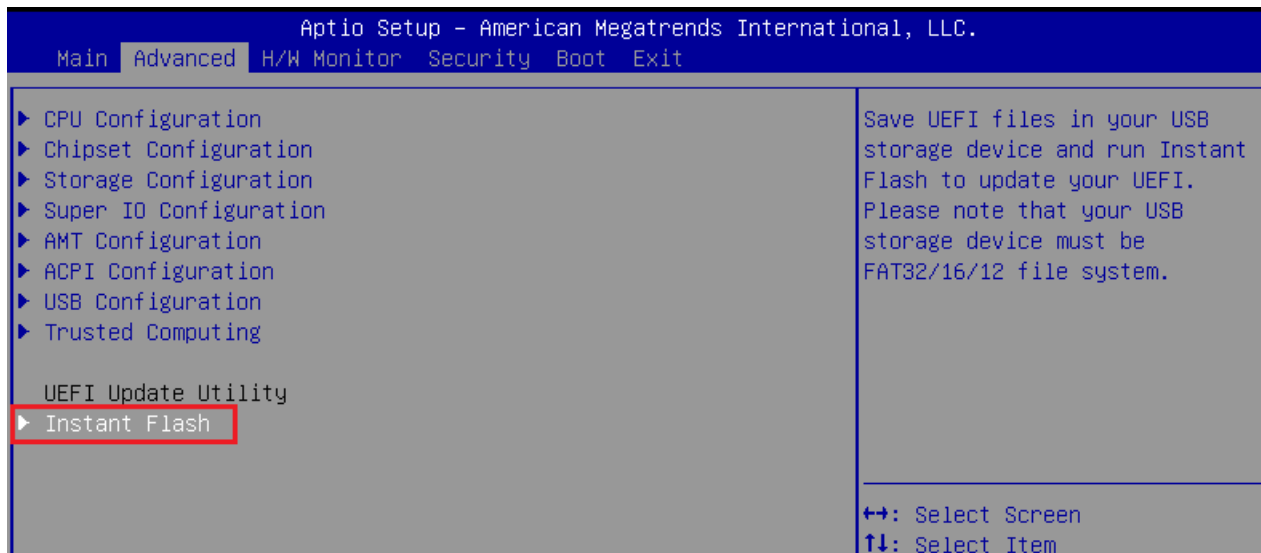
Answer: 1. Please visit web site of [Portwell download center](http://www.portwell.com.tw/support/download_center.php) as below hyperlink

http://www.portwell.com.tw/support/download_center.php

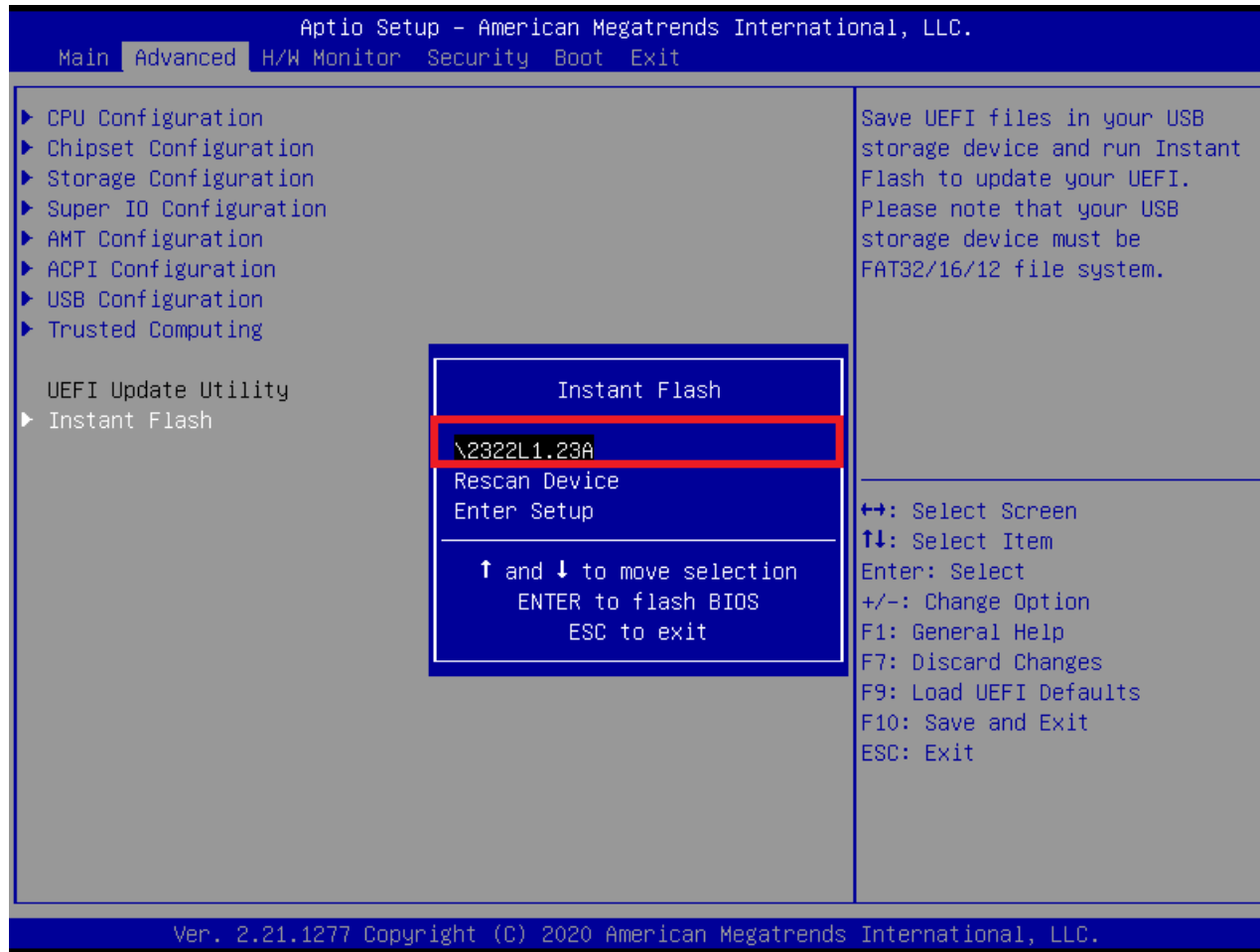
Registering an account in advance is a must. (The E-Mail box should be an existing Company email address that you check regularly.)

<http://www.portwell.com.tw/member/newmember.php>

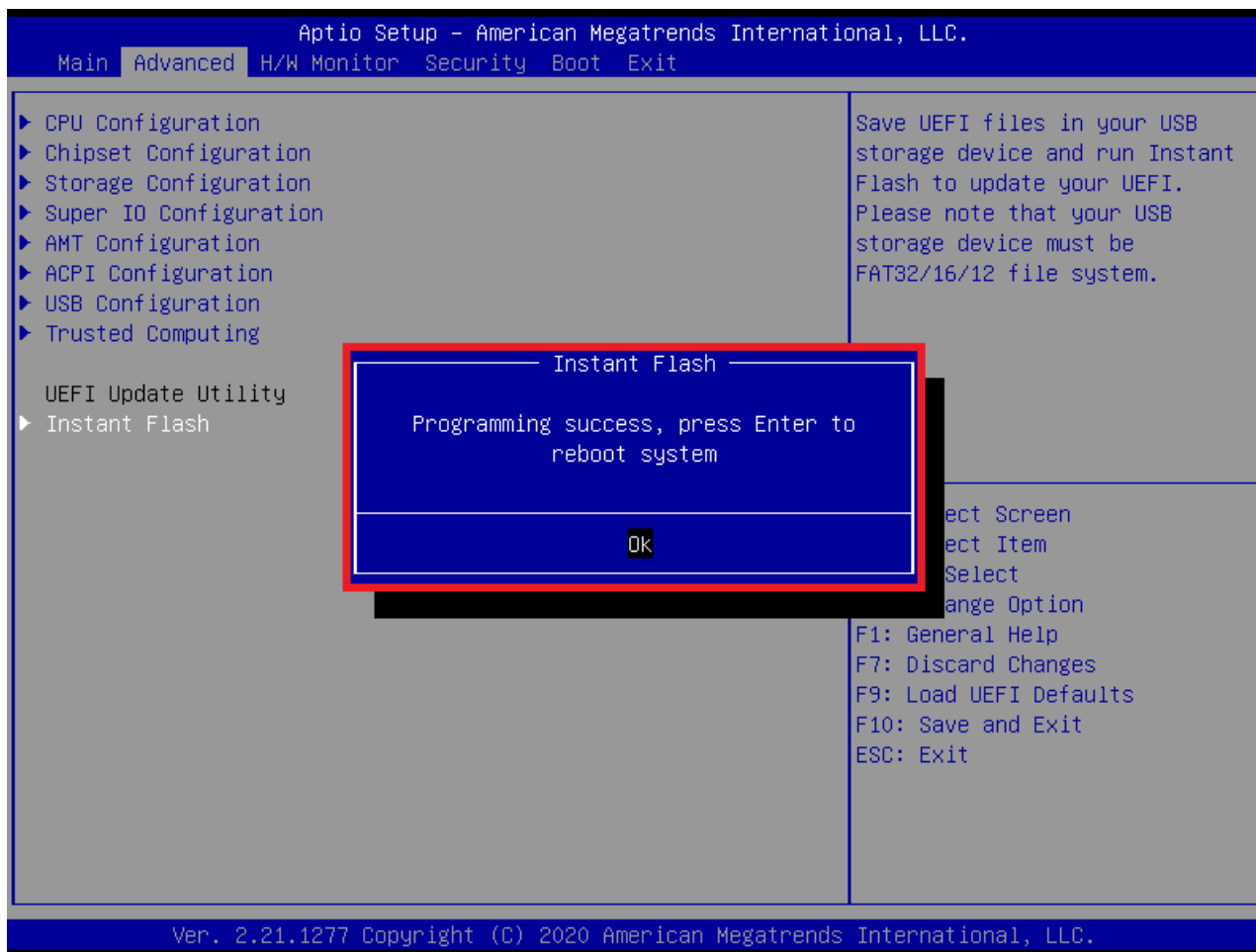
2. Type in your User name and password and log in the download center.
3. Select “[Search download](#)” and type the keyword “[WADE-8212](#)”.
4. Find the “[BIOS](#)” page and download the ROM file and unzip file to USB flash drive (FAT 32 / 16 format).
5. Boot into BIOS and switch to “[Advanced](#)” page then select” [Instant Flash](#)”.



6. Select “[xxxx.23A](#)” file then start updating BIOS.



7. When you see the “**Programming success**” message, which means the BIOS update processes finished. Please cut the AC power off and **wait for 10 seconds** before powering on.



Question: What are the display options while using WADE-8212 board?

Answer: - The WADE-8212 supports VGA 、 HDMI 、 DP and LVDS display output.

Note:

Please visit our Download Center to get the Catalog, User manual, BIOS, and driver files.

http://www.portwell.com.tw/support/download_center.php

If you have other additional technical information or request which is not covered in this manual, please fill in the technical request form as below hyperlink.

http://www.portwell.com.tw/support/problem_report.php

We will do our best to provide a suggestion or solution for you.

Thanks

9 Portwell Software Service

1. If you have customized requirements of BIOS, you can contact person of our company or branch.
2. If you have requirements of WDT 、GPIO APP, you can contact our headquarter or branch, and we can render you assistance on developing.

Portwell Worldwide:	
Portwell, Inc.	E-mail: info@portwell.com.tw
Shanghai Portwell	E-mail: info@portwell.com.cn
Portwell Japan, Inc	E-mail: info@portwell.co.jp
American Portwell Technology	E-mail: info@portwell.com
European Portwell Technology	E-mail: info@portwell.eu
Portwell UK Ltd.	E-mail: info@portwell.co.uk
Portwell Deutschland GmbH	E-mail: info@portwell.eu
Portwell India Technology	E-mail: info@portwell.in
Portwell Korea, Inc.	E-mail: info@portwell.co.kr
Portwell Latin America	E-mail: vendas@portwell.com.br

10 Industry Specifications

10.1 Industry Specifications

The list below provides links to industry specifications that apply to Portwell modules.

Low Pin Count Interface Specification, Revision 1.0 (LPC) <http://www.intel.com/design/chipsets/industry/lpc.htm>

Universal Serial Bus (USB) Specification, Revision 2.0 <http://www.usb.org/home>

PCI Specification, Revision 2.3 <https://www.pcisig.com/specifications>

Serial ATA Specification, Revision 3.0 <http://www.serialata.org/>

PCI Express Base Specification, Revision 2.0 <https://www.pcisig.com/specifications>