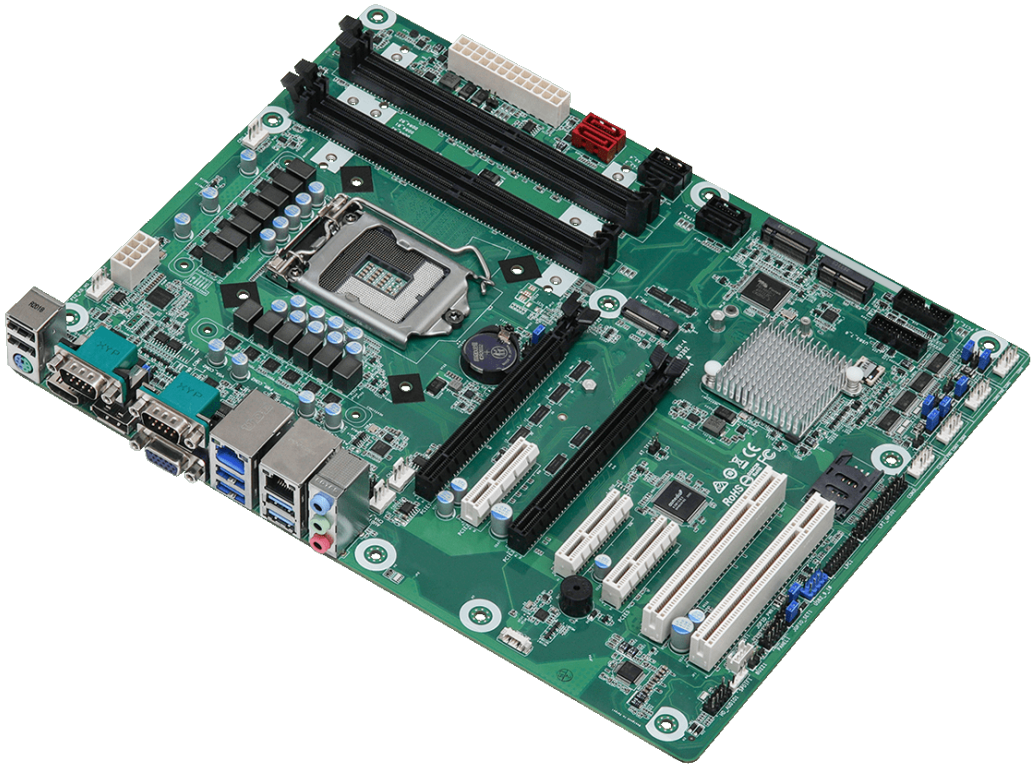
IMB-M46

User's Manual

ATX Motherboard with 10th Gen Intel® Core™ i9/i7/i5/i3 Processors and Intel® Q470E Chipset



Manual Rev.: 1.1

Revision Date: November 13, 2025

Part Number: 50M-13015-1010

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Preface

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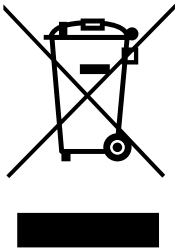
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Revision History

Revision	Description	Date	By
1.0	Initial release	2022-06-22	CC
1.1	Connector pinouts updated	2025-11-13	AL

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1 Introduction

ADLINK IMB-M46 ATX is an industrial motherboard supporting 10th Generation Intel® Core™ i9/i7/i5/i3 desktop processors, an Intel® Q470E Chipset, and 5 PCIe expansion slots to provide a cost-competitive embedded computing solution. It includes high-speed data transfer interfaces such as PCIe 3.0, USB 3.2 Gen2, and SATA 6 Gb/s (SATA III), and dual-channel DDR4 2400/2666/2933 MHz RAM for industrial automation applications. With industrial-grade I/O port design, the IMB-M46 offers a significant competitive advantage for embedded computing applications in terms of device compatibility, durable connectivity, and extreme environment readiness.

1.1 Packing List

- IMB-M46 ATX motherboard
- Rear I/O shield

1.2 Optional Accessories

- 2-port USB 2.0 cable with bracket (Part Number: 30-25010-3010)
- 4-port USB 3.0 cable with bracket (Part Number: 30-25305-0010-A0)
- 2-port USB 3.0 cable with bracket (Part Number: 30-25046-0100)
- 1-port LPT cable with bracket (Part Number: 30-25019-2000)
- 2-port COM cable with bracket (Part Number: 30-25116-0000-A0)
- Low-profile CPU cooler for <=65W, 35W CPU (Part Number: 32-20530-0010)
- High-profile CPU cooler for >= 65W CPU (Part Number: 32-20495-0000)

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2 Specifications

2.1 Core System

- **CPU:**
  - Intel® Core™ i9-10900E, 4.7GHz, 10 Core, 20M Cache, DDR4 2933MHz support, 65W
  - Intel® Core™ i9-10900TE, 4.5GHz, 10 Core, 20M Cache, DDR4 2933MHz support, 35W
  - Intel® Core™ i7-10700E, 4.5GHz, 8 Core, 16M Cache, DDR4 2933MHz support, 65W
  - Intel® Core™ i7-10700TE, 4.4GHz, 8 Core, 16M Cache, DDR4 2933MHz support, 35W
  - Intel® Core™ i5-10500E, 4.2GHz, 6 Core, 12M Cache, DDR4 2666MHz support, 65W
  - Intel® Core™ i5-10500TE, 3.7GHz, 6 Core, 12M Cache, DDR4 2666MHz support, 35W
  - Intel® Core™ i3-10100E, 3.8GHz, 4 Core, 6M Cache, DDR4 2666MHz support, 65W
  - Intel® Core™ i3-10100TE, 3.6GHz, 4 Core, 6M Cache, DDR4 2666MHz support, 35W
  - Intel® Pentium® Gold G6400, 3.2GHz, 2 Core, 4M Cache, DDR4 2400MHz support, 35W
  - Intel® Pentium® Gold G6400, 3.8GHz, 2 Core, 4M Cache, DDR4 2400MHz support, 58W
  - Intel® Celeron® Processor G5900TE, 3.0GHz, 2M Cache, DDR4 2666MHz support, 35W
  - Intel® Celeron® Processor G5900E, 3.2GHz, 2M Cache, DDR4 2666MHz support, 58W
- **Chipset:** Intel® Q470E Express Chipset
- **Memory:** 4x 288-pin DDR4 NON ECC socket, dual-channel DDR4 2400/2666/2933 MHz, up to 128 GB (based on CPU)
- **BIOS:** AMI® UEFI BIOS, 256 Mb SPI Flash Memory
- **Hardware Monitor:** CPU voltage
  - +3.3V voltage
  - +5V voltage
  - +12V voltage
  - CPU temperature
  - System temperature
  - CPU fan speed
  - System fan speed

2.2 I/O Interface

- **Expansion slots:**
  - 1x PCIe x16 Gen3
  - 1x PCIe x8 Gen3
  - 3x PCIe x4 Gen3
  - 2xPCI
- **SATA:** 6x SATA 6.0 Gb/s connectors, Intel® software RAID 0/1/5/10 support
- **USB:** 4x USB 3.2 Gen2 connectors (rear), 2x USB 2.0 connectors (rear), 4x USB 3.2 Gen1 pin headers,2x USB 2.0 pin headers
- **COM**: 2x RS-232/422/485 (rear), 4x RS-232 pin headers

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- **Parallel Port:** 1x LPT pin header
- **PS/2 Combo Port:** 1x PS/2 keyboard/mouse pin header
- **DIO:** 8-bit GPIO (shared with LPT header)
- **TPM:** TPM 2.0
- **M.2 connectors:**
  - 1x M.2 (Key E, 2230) with PCIe x1, USB 2.0 and CNVi for Wireless
  - 1x M.2 (Key B, 3042/3052) with PCIe x1 / USB 3.2 Gen1 / USB 2.0 and SIM socket for 4G/5G
  - 1x M.2 (Key M, 2242/2260/2280)

2.3 Video

- **Interfaces:** 1x VGA connector (rear), resolution up to 1920 x 1200 at 60 Hz, 1x HDMI 2.0a connector (rear) resolution up to 3840 x 2160 at 30 Hz, 1x DP 1.2 connector (rear), resolution up to 3840 x 2160 at 60 Hz

2.4 Audio

- **Audio Codec:** Realtek® ALC887 or ALC897
- **Interfaces**: 1x Mic-in, 1x Line-in, and 1x Line-out connectors (rear)

2.5 LAN

- **LAN1:** Intel® I219-LM via RJ45 connector
- **LAN2:** Intel® I225-LM via RJ45 connector

2.6 Temperatures

- **Operating Temperature:** 0°C to 60°C
- **Storage Temperature:** -40°C to 85°C

2.7 Humidity

- 60° C at 95% RH, non-condensing

2.8 Certificate (EMC)

- CE/FCC Class B

2.9 Form Factor

- **ATX**: 305 mm x 244 mm (W x L)

2.10 Operating Systems

- Microsoft® Windows® 10, 64-bit

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2.11 Functional Block Diagram

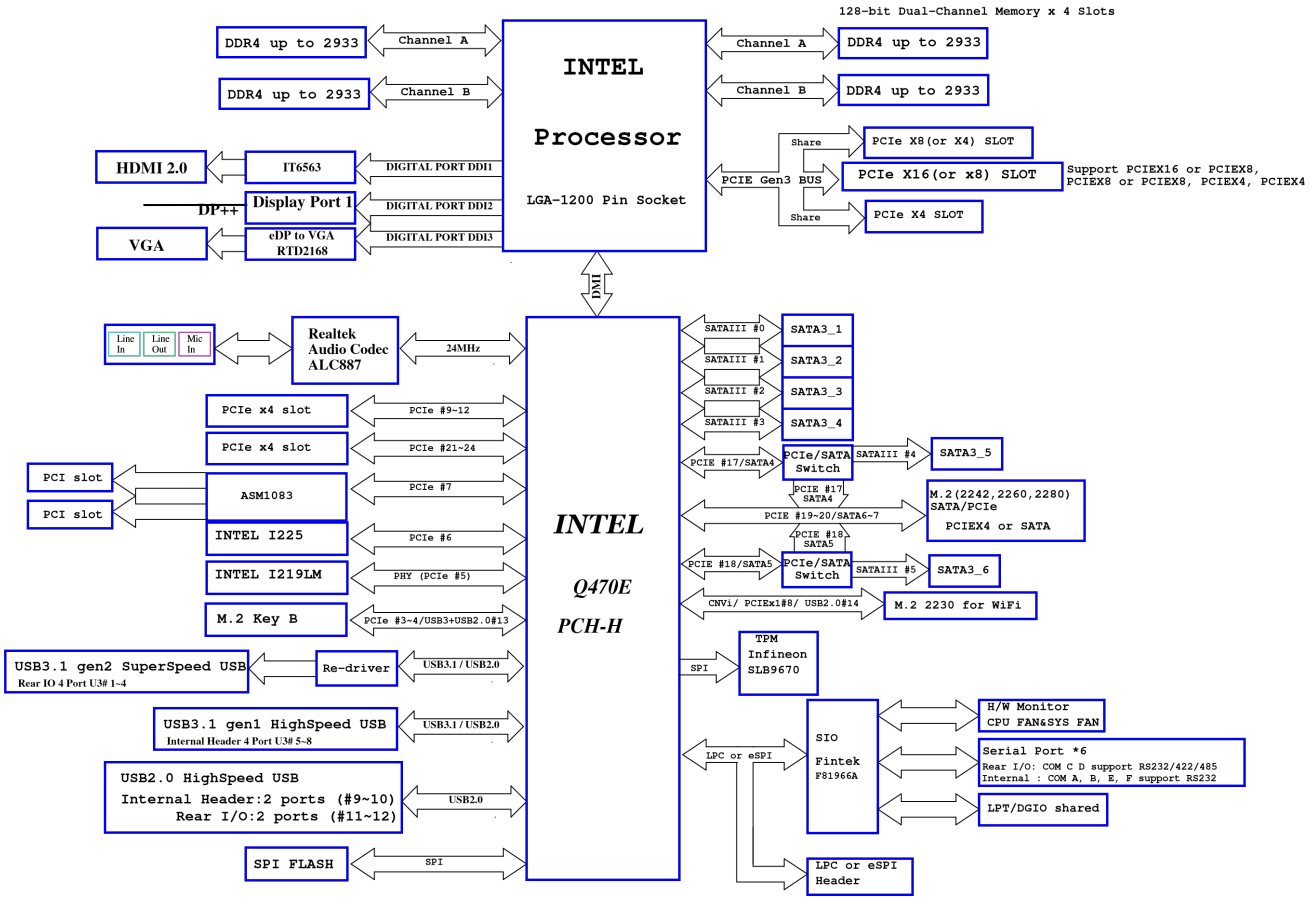


Figure 1: Functional Block Diagram

- M.2 (Key M, 2242 / 2260 / 2280) with PCIe x4 and SATA3 shares the same source with SATA3_5 and SATA3_6 Ports
- When using M.2 PCIe x4 SSD, both SATA3_5 and SATA_6 Ports are disabled.
- When using M.2 SATA SSD, only SATA3_5 Port is disabled, and SATA3_6 Port is available.

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3 Mechanical Layout

3.1 Connector Locations

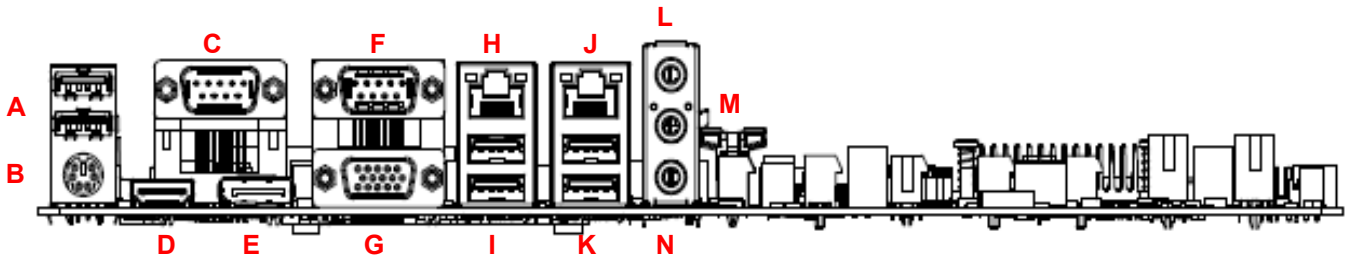


Figure 2: IO Panel Connector Locations

Table 1: IO Panel Connector Definitions

IO Panel Connectors	
Item	**Description**
A	2x USB2.0 port
B	PS/2 Keyboard/Mouse port
C	COM1 RS-232/422/485
D	HDMI port
E	DisplayPort
F	COM2 RS-232/422/485
G	VGA port
H	LAN1
I	2x USB 3.2 Gen 2
J	LAN2
K	2x USB 3.2 Gen 2
L	Line in (light blue)
M	Line out (lime)
N	Mic in (pink)

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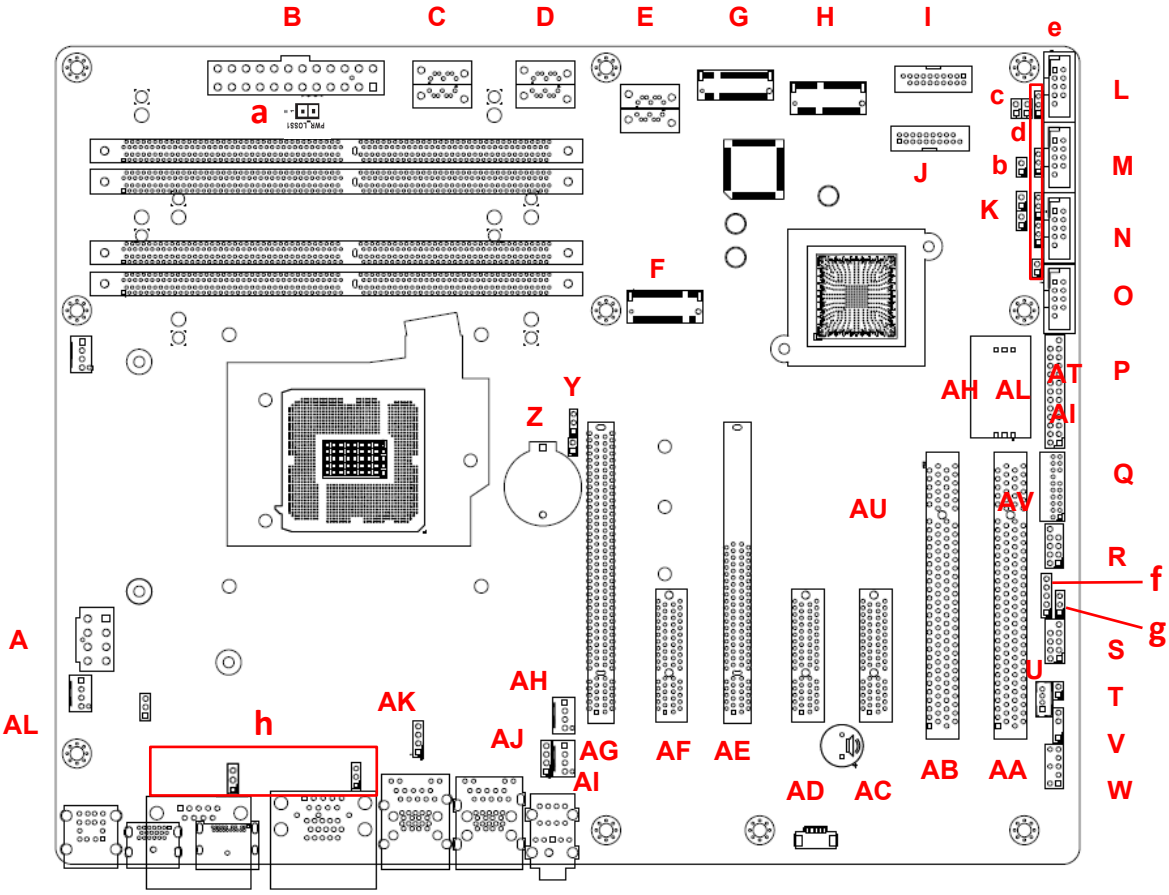


Figure 3: Onboard Connector Locations

Table 2: Onboard Connector Definitions

Onboard Connectors		
Item	Description	Remarks
A	ATX 12V Power connector	ATX12V1
B	ATX Power 24-pin	
C	SATA3 connectors	SATA3_5, SATA3_6
D	SATA3 connectors	SATA3_3, SATA3_4
E	SATA3 connectors	SATA3_1, SATA3_2
F	M.2 Key-M socket	M2_1
G	M.2 Key-B socket	M2_B1
H	M.2 Key-E socket	M2_2
I	USB 3.2 Gen1 headers	USB3_5, USB3_6
J	USB 32 Gen1 headers	USB3_7, USB3_8
K	Chassis Intrusion headers	CI1, CI2
L	COM port headers	COM6
M	COM port headers	COM5
N	COM port headers	COM4
O	COM port headers	COM3

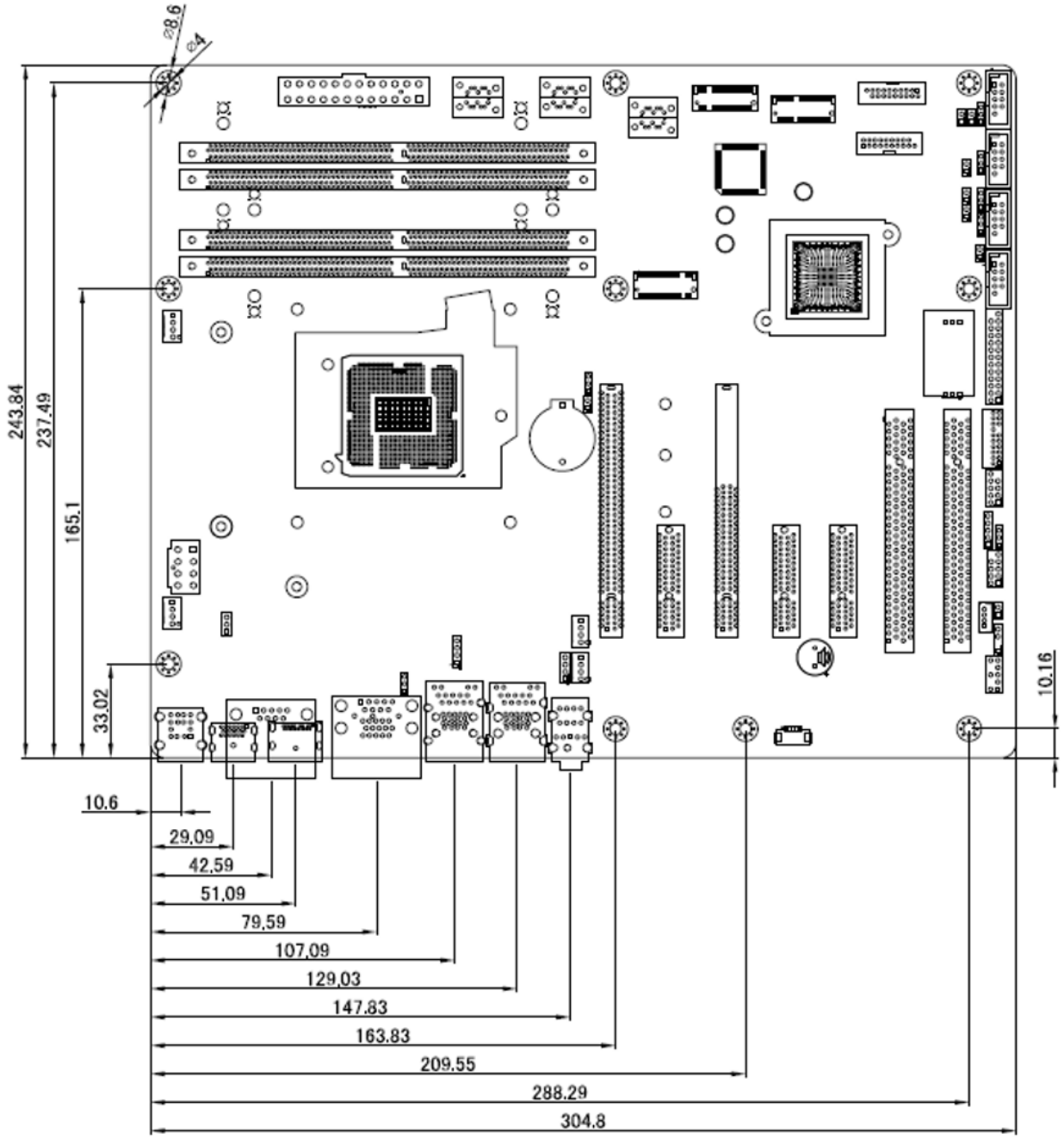
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Onboard Connectors		
P	Printer port / GPIO header	LPT_GPIO1
Q	LPC header	LPT1
R	USB 2.0 header	USB2_9, USB2_10
S	System Panel header	PANEL1
T	Buzzer	BUZZ1
U	SMBUS	SMBUS_TEST1
V	SPDIF header	
W	Front Panel Audio header	HDAUDIO_1
X	MCU connector	MCU_CON1
Y	Clear CMOS header	CLRMOS1
Z	PWR_BAT1	PCIEx4_3
AA	PCI2	PCI2
AB	PCI1	PCI1
AC	PCI Express x4	PCIE5
AD	PCI Express x4	PCIE4
AE	PCI Express x8	PCIE3
AF	PCI Express x4	PCIE2
AG	PCI Express x16	PCIE1
AH	Chassis Fan connectors (+12V)	CHA_FAN3
AI	Chassis Fan connectors (+12V)	CHA_FAN2
AJ	LAN LED headers	LAN_LED2 (for LAN2 Port)
AK	LAN LED headers	LAN_LED1 (for LAN1 Port)
AL	Chassis Fan connectors (+12V)	CHA_FAN1
Jumpers		
Item	Description	Remarks
a	PWR Loss jumper	PWR_LOSS1
b	PCIe Isolation jumper	PCIE_ISOLATION
c	DACC1	
d	ATX/AT Mode jumper	SIO_AT1
e	COM Port Pin9 PWR Setting jumpers	PWR_COM3 (for COM Port3) PWR_COM4 (for COM Port4) PWR_COM5 (for COM Port5) PWR_COM6 (for COM Port6)
f	Digital Input / Output Power Select	JGPIO_PWR1
g	Digital Input / Output Default Value Setting	JGPIO_SET1
h	COM Port Pin9 PWR Setting jumpers	PWR_COM1 (for COM Port1) PWR_COM2 (for COM Port2)

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3.2 Mechanical Dimensions

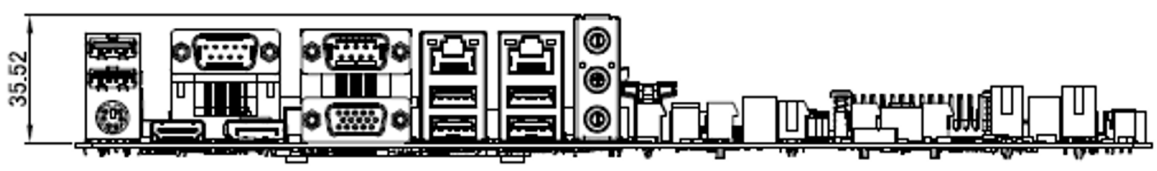
Top View



Dimensions: mm

Figure 4: Mechanical Dimensions

Side View



Dimensions: mm

Figure 5: Mechanical Dimensions - IO Panel

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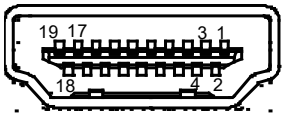
4 Connector Pinouts

See 3.1 Connector Locations on page 7 for connector locations.

4.1 Rear IO Connectors

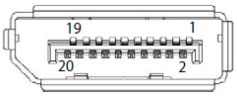
4.1.1 HDMI

Pin	Signal	Pin	Signal
1	HDMI1_CON_DP2	2	GND
3	HDMI1_CON_DN2	4	HDMI1_CON_DP1
5	GND	6	HDMI1_CON_DN1
7	HDMI1_CON_DP0	8	GND
9	HDMI1_CON_DN0	10	HDMI1_CON_CKP
11	GND	12	HDMI1_CON_CKN
13	NC	14	NC
15	HDMI1_DDC_CLK	16	HDMI1_DDC_DATA
17	GND	18	+5V_HDMI
19	HDMI1_CON_HPD		



4.1.2 DisplayPort

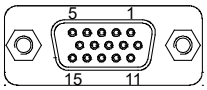
Pin	Signal	Pin	Signal
1	CN_DDPx0+	2	GND
3	CN_DDPx0-	4	CN_DDPx1+
5	GND	6	CN_DDPx1-
7	CN_DDPx2+	8	GND
9	CN_DDPx2-	10	CN_DDPx3+
11	GND	12	CN_DDPx3-
13	CN_DDPx_AUX_SEL	14	CN_DDPx_CONFIG2
15	CN_DDPx_AUX+	16	GND
17	CN_DDPx_AUX-	18	CN_DDPx_HPD
19	GND	20	+V3.3_DDPx_PWR_CN



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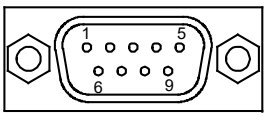
4.1.3 VGA Connector

Pin	Signal	Pin	Signal
1	VGA_CON_RED	2	VGA_CON_GREEN
3	VGA_CON_BLUE	4	NC
5	GND	6	GND
7	GND	8	GND
9	+5V_HDMI	10	GND
11	NC	12	VGA_DDCDAT
13	VGA_CON_HS	14	VGA_CON_VS
15	VGA_DDCCLK		



4.1.4 COM 1-2 Connector Stack (Top connector COM1, Bottom connector COM2)

Pin	Signal		
	RS-232	RS-422	RS-485
1	DCD#	Tx-	Tx/Rx-
2	RxD	Tx+	N/A
3	TxD	Rx+	Tx/Rx+
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	No Power/ 5V/12V	N/A	N/A

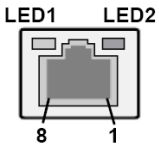


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4.1.5 Ethernet Connectors (LAN1, LAN2)

Dual 10/100/1000Mbit/s LAN Ethernet controllers based on Intel® i219LM/i225LM, support PXE and WOL over both LANs.In BIOS menu only LAN 1 have wake on LAN option

Pin	10BASE-T/100BASE-TX	1000BASE-T
1	TX+	LAN_MDI0+
2	TX-	LAN_MDI0-
3	RX+	LAN_MDI1+
4	--	LAN_MDI2+
5	--	LAN_MDI2-
6	RX-	LAN_MDI1-
7	--	LAN_MDI3+
8	--	LAN_MDI3-



LED1 (Speed)		LED2 (Link/Activity)	
Status	Description	Status	Description
Off	10 Mb connection	Off	No Link
Orange	100 Mb connection	Green	Linked
Green	1 Gb connection	Blinking	Data Activity

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4.2 Onboard Headers / Connectors

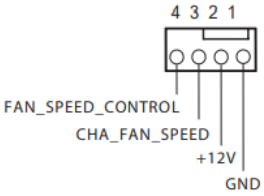
4.2.1 CPU_FAN1, SYS_FAN1, SYS_FAN2

Pin	Signal	Description
1	GND	Ground
2	+12 V	FAN Power
3	Tach	FAN Tachometer
4	PWM	FAN PWM

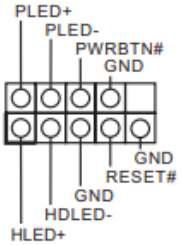


The fan header supports +12 V at 1 A maximum

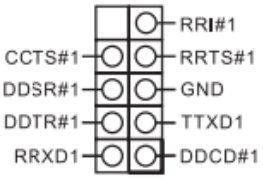
4.2.2 Chassis Fan Connectors (+12V)



4.2.3 System Panel Header

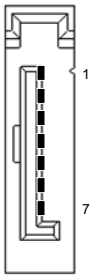


4.2.4 COM3, COM4, COM5, COM6



4.2.5 SATA1, SATA2, SATA3, SATA4, SATA5, SATA6

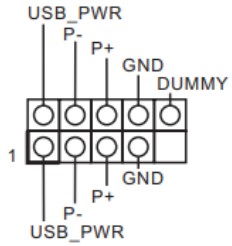
Pin	Signal	Description			
1	GND	Ground	5	RXN	Receive diff data – negative
2	TXP	Transmit diff data – positive	6	RXP	Receive diff data – positive
3	TXN	Transmit diff data – negative	7	GND	Ground
4	GND	Ground			



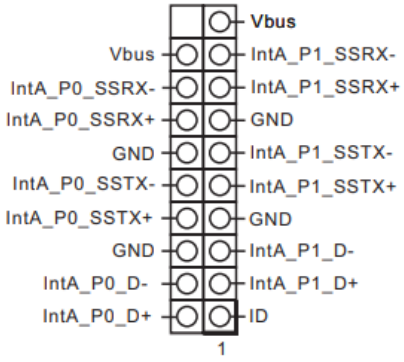
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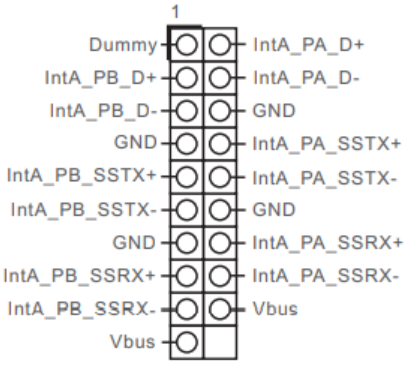
4.2.6 USB Connectors

USB 2.0 Header

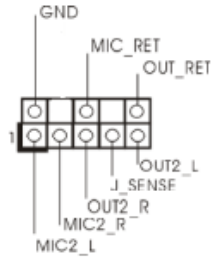


USB 3.2 Gen 1 Headers



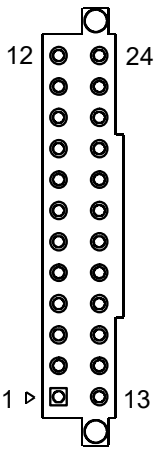


4.2.7 Front Panel Audio Header



4.2.8 ATXPWR1

Pin	Signal	Pin	Signal
1	+3.3 V	13	+3.3 V
2	+3.3 V	14	-12 V
3	Ground	15	Ground
4	+5 V	16	PS-ON# (power supply remote on/off)
5	Ground	17	Ground
6	+5 V	18	Ground
7	Ground	19	Ground
8	PWRGD (Power Good)	20	No connect
9	+5 V (Standby)	21	+5 V

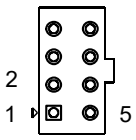


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Pin	Signal	Pin	Signal
10	+12 V	22	+5 V
11	+12 V	23	+5 V
12	3.3V	24	Ground

4.2.9 ATX12V1

Pin	Signal	Pin	Signal
1	Ground	5	+12V
2	Ground	6	+12V
3	Ground	7	+12V
4	Ground	8	+12V



4.2.10 Printer Port / GPIO Header

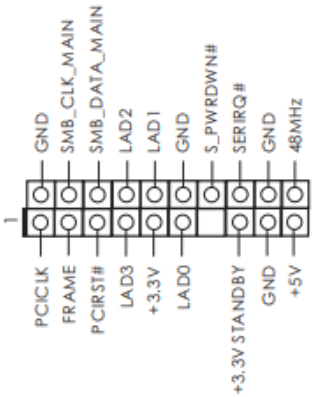
Printer Port



GPIO

PIN	Signal Name	PIN	Signal Name
26	NC	25	NA
24	GND	23	SIO_GP70
22	GND	21	SIO_GP71
20	GND	19	SIO_GP72
18	GND	17	SIO_GP87
16	GND	15	SIO_GP86
14	GND	13	SIO_GP85
12	JGPIOPWR	11	SIO_GP84
10	JGPIOPWR	9	SIO_GP83
8	SIO_GP73	7	SIO_GP82
6	SIO_GP74	5	SIO_GP81
4	SIO_GP75	3	SIO_GP80
2	SIO_GP76	1	SIO_GP77

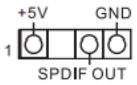
4.2.11 LPC Header



This connector supports a Trusted Platform Module (TPM) system, which can securely store keys, digital certificates, passwords, and data. A TPM system can effectively enhance network security, protect digital identities while ensuring platform integrity.

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4.2.12 SPDIF Header



SPDIF header provides SPDIF audio output to HDMI VGA card and allows the system to connect with HDMI Digital TV / projector / LCD devices.

Connect the SPDIF connector of an HDMI VGA card to this header.

4.2.13 LAN LED Header



4.2.14 SMBUS_TEST1



PIN	Signal Name	PIN	Signal Name	PIN	Signal Name	PIN	Signal Name
1	+3V	2	SMB_CLK	3	SMB_DATA	4	GND

4.2.15 Buzzer

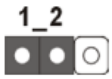


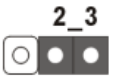
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4.3 Jumper and Swtich Settings

4.3.1 Clear CMOS Jumpers

(3-pin CLRMOS1)





1-2 : Normal
2-3 : Clear CMOS

CLRMOS1 allows you to clear the data in CMOS. To clear and reset the system parameters back to factory default, turn off and unplug your system from power, wait for 15 seconds, and use a jumper cap to short pin2 and pin3 on CLRMOS1 for 5 seconds.

Please be reminded not to clear the CMOS right after a BIOS update. If you need to clear the CMOS after updating the BIOS, you must boot up and then shut down the system before proceeding with clearing CMOS.

Note: The date, time, and user default profile will only be cleared if the CMOS battery is removed.

(2-pin CLRMOS2)



CLRMOS2 :
Open : Normal
Short : Auto Clear CMOS
(Power Off)

CLRMOS2 allows you to clear the data in CMOS automatically upon AC startup. The data in CMOS includes system setup information, such as system password, date, time, and other system parameters.

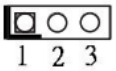
To clear and reset the system parameters back to factory default, turn off and unplug your system from power, and then use a jumper cap to short the pins on CLRMOS2.

4.3.2 Digital Input / Output Power Select (JGPIOPWR)



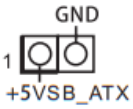
1-2 : +12V
2-3 : +5V
3-4 : +5V
4-5: GND

4.3.3 COM Port Pin9 PWR Setting Jumpers



1-2 : +5V
2-3 : +12V

4.3.4 PWR LOSS Header



Short : Power Loss
Open : no Power Loss

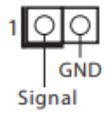
4.3.5 ATX/AT Mode Jumper



Open : ATX Mode
Short : AT Mode

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4.3.6 Chassis Intrusion Headers



CI1 :
Short : Active Case Open
Open : Normal
CI2 :
Short : Normal
Open : Active Case Open

4.3.7 Digital Input / Output Default Value Setting



1-2 : Pull-High
2-3 : Pull-Low

4.3.8 PWR_BAT1



Open : Normal
Short : Charge Battery

4.3.9 PCIe Isolation Jumper



4.3.10 DACC1



Short : ACC
Open : no ACC

Note: ACC function is used to auto clear CMOS when the system boots improperly..

4.4 Expansion Slots

There are 5 PCI Express slots, 2 PCI slots, 3 M.2 sockets and 1 SIM socket on this motherboard.

PCIe and PCI slots:

	Slot 1 (PCIe1)	Slot 2 (PCIe2)	Slot 3 (PCIe3)	Slot 4 (PCIe4)	Slot 5 (PCIe5)	Slot 6 (PCI1)	Slot 7 (PCI2)
Source	CPU	PCI bridge	CPU	PCH	PCH	PCH	PCI bridge
Bandwidth	PCIe 3.0	PCIe 3.0	PCIe 3.0	PCIe 3.0	PCIe 3.0	PCI	PCI
Lane Config 1	x16	N/A	N/A	x4	x4	PCI	PCI
Lane Config 2	x8	N/A	x8				
Lane Config 3	x8	x4	x4				

SIM socket: 1 x SIM socket connected to M.2 key B

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M.2 sockets:

- M.2 Key-M (M2_1)

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		

- M.2 Key-E (M2_2)

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

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- M.2 Key-B (M2_B1)

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

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5 Driver Installation

Download the requisite drivers for your system from the IMB-M46 product page at:

https://www.adlinktech.com/Products/Industrial_Motherboards_SBCs/ATXMotherboards/IMB-M46

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6 System Resources

6.1 System Memory Map

Table 3: System Memory Map

Address Range	Address Range	Size	Description
(4GB-2MB)	FFE00000 – FFFFFFFF	2 MB	High BIOS Area
(4GB-18MB) – (4GB-17MB-1)	FEE00000 – FEEFFFFF	1 MB	MSI Interrupts
(4GB-20MB) – (4GB-19MB-1)	FEC00000 – FECFFFFF	1 MB	APIC Configuration Space
15MB – 16MB	F00000 – FFFFFF	1 MB	ISA Hole
1MB -15MB	100000 - EFFFFF	14MB	Main Memory
0K –1MB	00000 – FFFFFF	1MB	DOS Compatibility Memory

6.2 I/O Map

Table 4: IO Map

Hex Range	Device
0000-0CF7	PCI Express Root Complex
0D00-FFFF	PCI Express Root Complex
0020-0021	Programmable interrupt controller
0024-0025	Programmable interrupt controller
0028-0029	Programmable interrupt controller
002C-002D	Programmable interrupt controller
0030-0031	Programmable interrupt controller
0034-0035	Programmable interrupt controller
0038-0039	Programmable interrupt controller
003C-003D	Programmable interrupt controller
00A0-00A1	Programmable interrupt controller
00A4-00A5	Programmable interrupt controller
00A8-00A9	Programmable interrupt controller
00AC-00AD	Programmable interrupt controller
00B0-00B1	Programmable interrupt controller
00B4-00B5	Programmable interrupt controller
00B8-00B9	Programmable interrupt controller
00BC-00BD	Programmable interrupt controller
04D0-04D1	Programmable interrupt controller
04D0-04D1	Programmable interrupt controller
002E-002F	Motherboard resources
004E-004F	Motherboard resources
0061-0061	Motherboard resources

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Hex Range	Device
0063-0063	Motherboard resources
0065-0065	Motherboard resources
0067-0067	Motherboard resources
0070-0070	Motherboard resources
0080-0080	Motherboard resources
0092-0092	Motherboard resources
00B2-00B3	Motherboard resources
0680-069F	Motherboard resources
FFFF-FFFF	Motherboard resources
1800-18FE	Motherboard resources
164E-164F	Motherboard resources
0040-0043	System timer
0050-0053	System timer
0070-0077	System CMOS/real time clock
00F0-00F0	Numeric data processor
02E0-02E7	COM5
02E8-02EF	COM4
02F8-02FF	COM2
0378-037F	Printer Port
03E0-03E7	COM6
03E8-03EF	COM3
03F8-03FF	COM1
E000-EFFF	Chipset PCI Express Root Port
E000-EFFF	PCI-to-PCI Bridge
F000-F03F	Intel HD Graphic 630
F040-F05F	SMBUS
F090-F097	Standard SATA AHCI Controller
F080-F083	Standard SATA AHCI Controller
F060-F07F	Standard SATA AHCI Controller

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6.3 Interrupt Request (IRQ) Lines

6.3.1 IRQ Lines PIC Mode

Table 5: IRQ Lines PIC Mode

IRQ#	Device
0	System timer
3	COM2
4	COM1
5	COM3, COM4
8	System CMOS/real time clock
10	COM5, COM6
13	Numeric data processor
14	Intel Serial IO GPIO Host Controller
15	Intel Chipset Smbus
16	HD Audio Controller

Note: These IRQs can be used for PCI devices when onboard device is disabled.

6.3.2 IRQ Lines APIC Mode

Table 6 IRQ Lines APIC Mode

IRQ#	Typical Interrupt Resource	Connected to Pin	Available
0	System Counter	N/A	No
1	N/A	N/A	
2	N/A	N/A	
3	Serial Port 2 (COM2)	IRQ3 via SERIRQ / PIRQ	Note (1)
4	Serial Port 1 (COM1)	IRQ4 via SERIRQ / PIRQ	Note (1)
5	Serial Port3 (COM3)	IRQ5 via SERIRQ / PIRQ	Note (1)
5	Serial Port4 (COM4)	IRQ5 via SERIRQ / PIRQ	Note (1)
7	N/A	N/A	
8	Real-time clock	N/A	No
9	N/A	N/A	
10	Serial Port5 (COM5)	IRQ10 via SERIRQ / PIRQ	Note (1)
10	Serial Port6 (COM6)	IRQ10 via SERIRQ / PIRQ	Note (1)
12	N/A	N/A	
13	Math Processor	N/A	Note (1)
14	Intel IO GPIO Host Controller	N/A	Note (1)
16	High Definition Audio Controller	N/A	
54-511	Microsoft ACPI-Compliant System	N/A	Note (1)

Note: These IRQs can be used for PCI devices when onboard device is disabled.

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6.4 PCI Features

6.4.1 PCI Configuration Space Map

Table 7 PCI Configuration Space Map

Bus Number	Device Number	Function Number	Routing	Description
00h	00h	00h	N/A	Intel Host Bridge
00h	02h	00h	Internal	Intel VGA Controller
00h	14h	00h	Internal	Intel USB 3.0 XHCI
00h	14h	02h	Internal	Intel Data acquisition/signal process
00h	16h	00h	Internal	Intel Communication device
00h	17h	00h	Internal	Intel AHCI 1.0 controller
00h	1Ch	00h	Internal	Intel PCI-to-PCI bridge PCIe
00h	1Ch	01h	Internal	Intel PCI-to-PCI bridge PCIe
00h	1Ch	02h	Internal	Intel PCI-to-PCI bridge PCIe
00h	1Ch	03h	Internal	Intel PCI-to-PCI bridge PCIe
00h	1Dh	00h	Internal	Intel PCI-to-PCI bridge PCIe
00h	1Dh	05h	Internal	Intel PCI-to-PCI bridge PCIe
00h	1Fh	00h	Internal	Intel ISA bridge
00h	1Fh	03h	Internal	Intel Multimedia
00h	1Fh	04h	Internal	Intel SMBU
00h	1Fh	05h	Internal	Intel Controller
00h	1Fh	06h	Internal	Intel Ethernet Controller
02h	00h	00h	Internal	ITE PCI toPCI Bridge
04h	00h	00h	Internal	Intel Ethernet Controller PCIe
05h	00h	00h	Internal	Intel Ethernet Controller PCIe
07h	00h	00h	Internal	Intel Ethernet Controller PCIe

Note: The bus number change if the PEG/PCIE port has a device.

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Table 8 PCI Interrupt Routing Map

INT Line	LpcBridge	High Definition Audio	SMBus	PCIE Root Port #2 (IT8892)	PCIE Root Port #3 (LAN3)	PCIE Root Port #4 (LAN4)
Int0	INTA:16	INTA:16	INTA:16	INTB:17	INTC:18	INTD:19
Int1	INTB:17			INTC:18	INTD:19	INTA:16
Int2	INTC:18			INTD:19	INTA:16	INTB:17
Int3	INTD:19			INTA:16	INTB:17	INTC:18

INT Line	PCI Slot 1	PCI Slot 2	PCIE Root Port #5 (PCIex4)	PCIE Root Port #9 (PCIex4)	PCIE Root Port #13 (LAN1)	PCIE Root Port #14 (LAN2)
Int0	INTA:17	INTA:18	INTA:16	INTA:16	INTA:16	INTB:17
Int1	INTB:18	INTB:19	INTB:17	INTB:17	INTB:17	INTC:18
Int2	INTC:19	INTC:16	INTC:18	INTC:18	INTC:18	INTD:19
Int3	INTD:16	INTD:17	INTD:19	INTD:19	INTD:19	INTA:16

INT Line	PCIE Root Port #21 (PCIex4)
Int0	INTA:16
Int1	INTB:17
Int2	INTC:18
Int3	INTD:19

6.5 SMBus Slave Addresses

Table 9 SMBus Slave Addresses

Device	Address
DIMM_A1	A0h
DIMM_A2	A2h
DIMM_B1	A4h
DIMM_B2	A6h

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7 UEFI Setup

7.1 Menu Structure

This section presents the primary menus of the UEFI Setup Utility. Use the following table as a quick reference for the contents of the UEFI Setup Utility. The subsections describe the submenus and options for each menu item.

2 Options to enter UEFI Setup Utility:

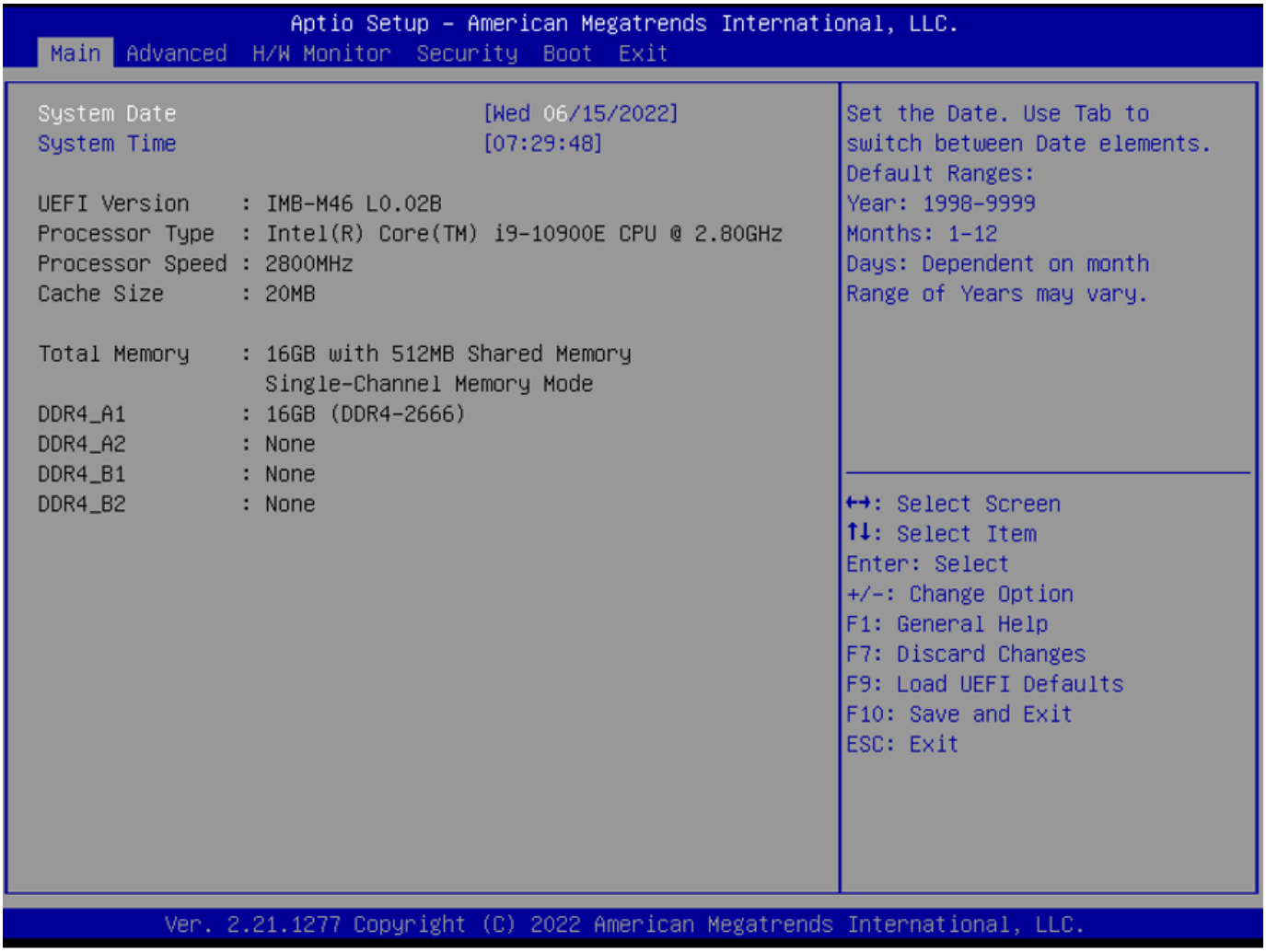
- Press [F2] or [Del] during POST (Power-On-Self-Test)
- Press [Ctl] + [Alt] + [Del] after POST

Main	**Advanced**	**H/W Monitor**
- Sets up the system time/date and displays the system information: - System Information - System Date - System Time	- Contains advanced system configurations, including: - - CPU - Chipset - Storage - Super IO - AMT Technology - ACPI - USB - Trusted Computing - Advanced Screen - H/W Health Monitoring Screen - Security Screen - Boot Screen	- Displays Hardware Status info, including: - - CPU Temperature - Motherboard Temperature - CPU Fan Speed - Voltages
Security	**Boot**	**Exit**
- Changes or clears the supervisor/user password for the system	- Configures the boot settings and boot priority for available devices	- Exits the UEFI Setup Utility while saving or discard the changes made - Also allows you to load the UEFI default settings

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7.2 Main Menu

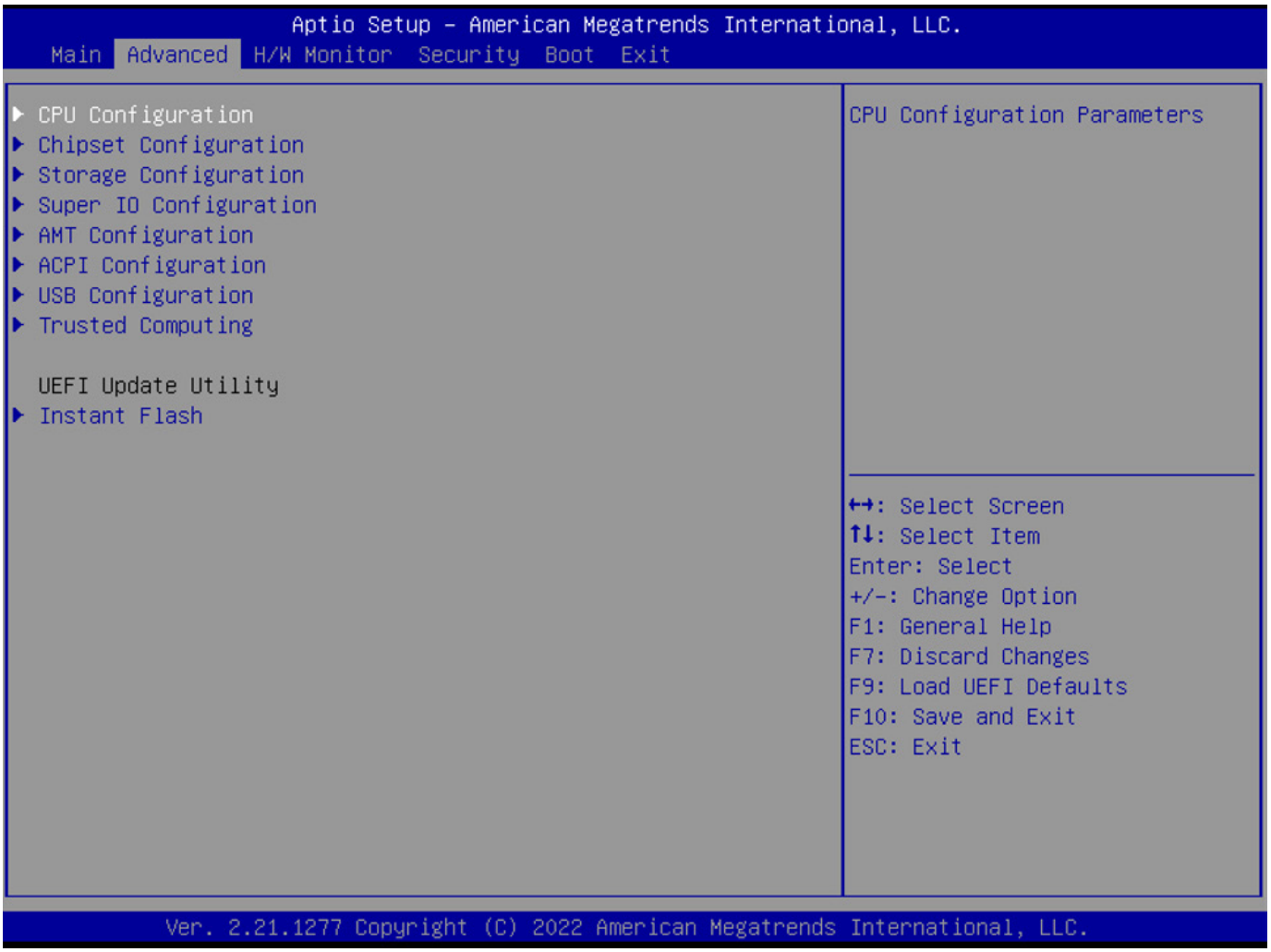
Upon entering the UEFI Setup Utility, the Main Menu is displayed, providing read-only information about your system and also allows you to set the System Date and Time. Refer to the screenshots and tables below for details of the submenus and settings.



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7.3 Advanced Menu

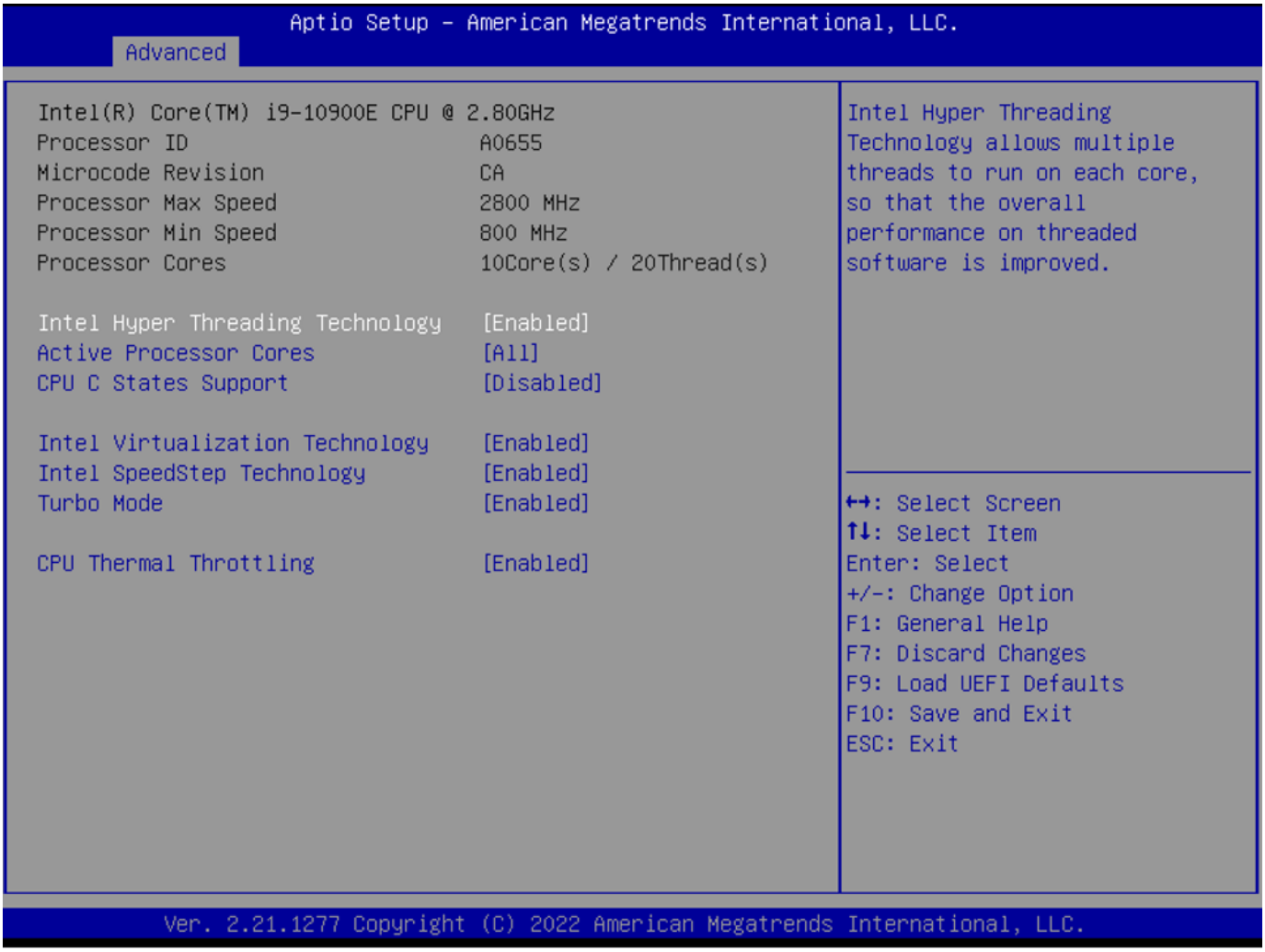
Contains the configurations for the following: CPU Configuration, Chipset Configuration, Storage Configuration, Super IO Configuration, AMT Configuration, ACPI Configuration, USB Configuration, and Trusted Computing.



Feature	Description
Instant Flash	Updates system UEFI without requiring to enter operation systems.

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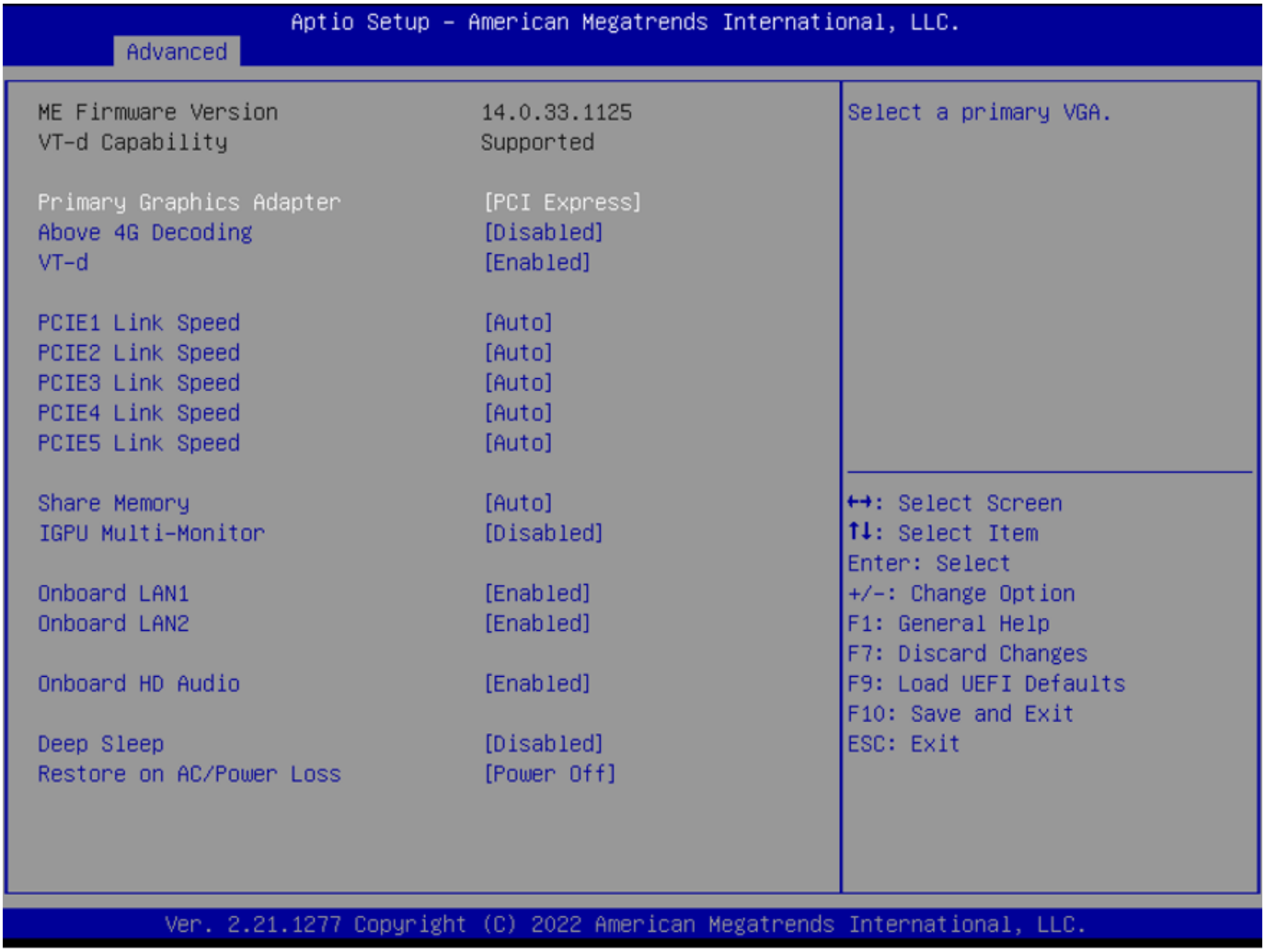
7.3.1 Advanced > CPU Configuration



Feature	Description
Intel Hyper Threading Technology	Allows multiple threads to run on each core, thereby improving the overall performance on threaded software
Active Processor Cores	Selects the number of cores to enable in each processor package
CPU C States Support	Optimizes power saving. It is recommended to keep C3, C6 and C7 all enabled for better power saving.
Intel Virtualization Technology	Enables support for VMM (Virtual Machine Architecture) to utilize the additional hardware capabilities provided by Vanderpool Technology. This option will be hidden if the installed CPU does not support Intel Virtualization Technology.
Intel SpeedStep Technology	Intel's new power saving technology, allowing processors to switch between multiple frequencies and voltage points for better power saving. This item will be hidden if the current CPU does not support Intel SpeedStep technology
Turbo Mode	Allows processor cores to run faster than marked frequency
CPU Thermal Throttling	Enables CPU internal thermal control mechanism to keep the CPU from overheating

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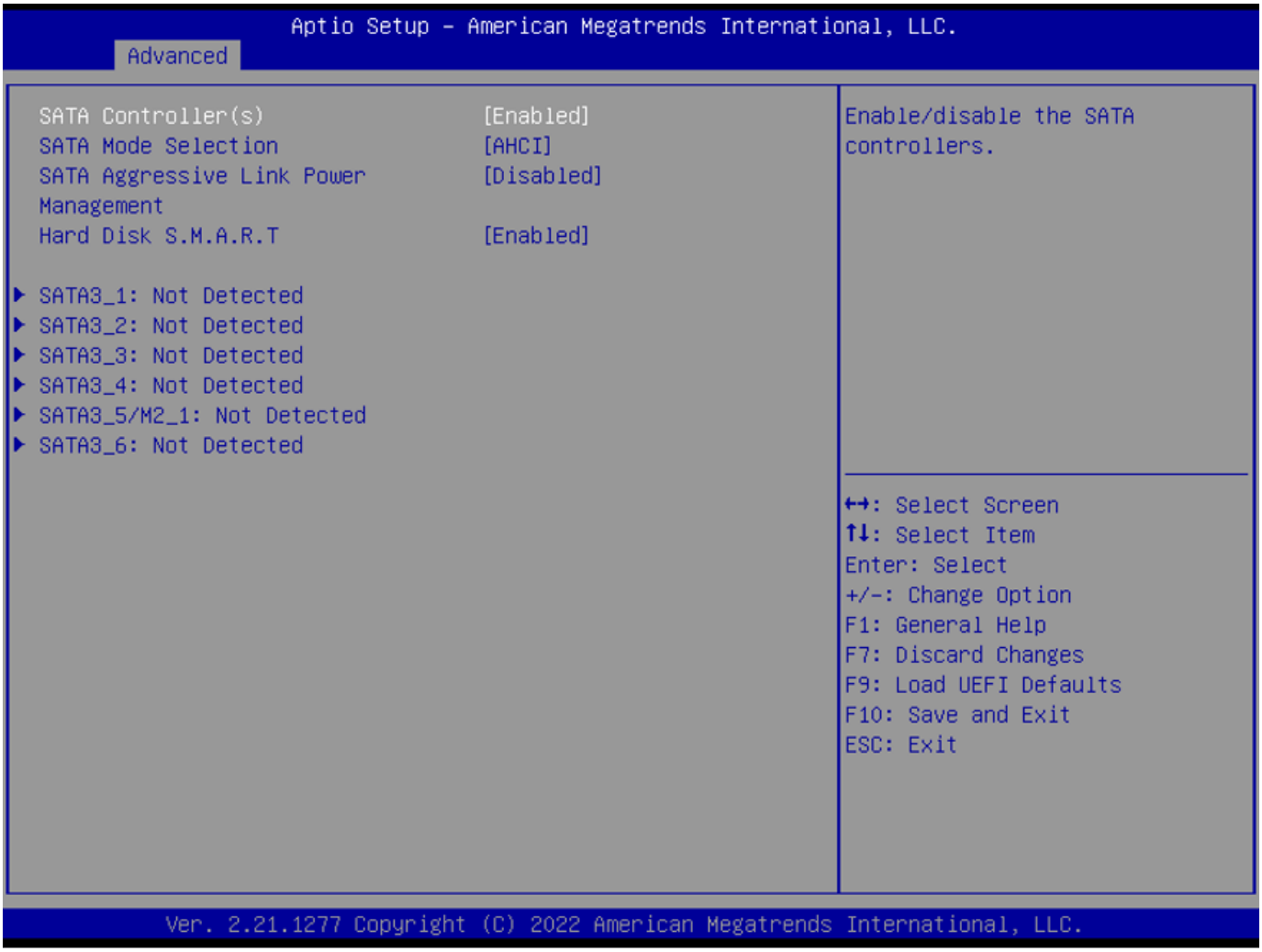
7.3.2 Advanced > Chipset Configuration



Feature	Description
Primary Graphics Adapter	Switches the boot priority of your graphic adapter between PCI Express and Onboard
Above 4G Decoding	Enables 64-bit capable devices to be decoded in Above 4G Address Space
VT-d	Enables Intel® VT-d technology (virtualization for directed I/O)
PCIE Link Speed (1-5)	Selects the link speed for PCIE 1-5
Share Memory	Configures the size of memory that is allocated to the integrated processor upon bootup
IGPU Multi-Monitor	Disables the integrated graphics when an external graphics card is installed
Onboard LAN (1,2)	Enables the Onboard LAN1,2 features
Onboard HD Audio	Enables the Onboard HD Audio feature
Deep Sleep	Enables mobile platforms (DC only) or desktop platforms (AC only) to support Deep S4/S5
Restore on AC/Power Loss	Selects the power state after a power failure

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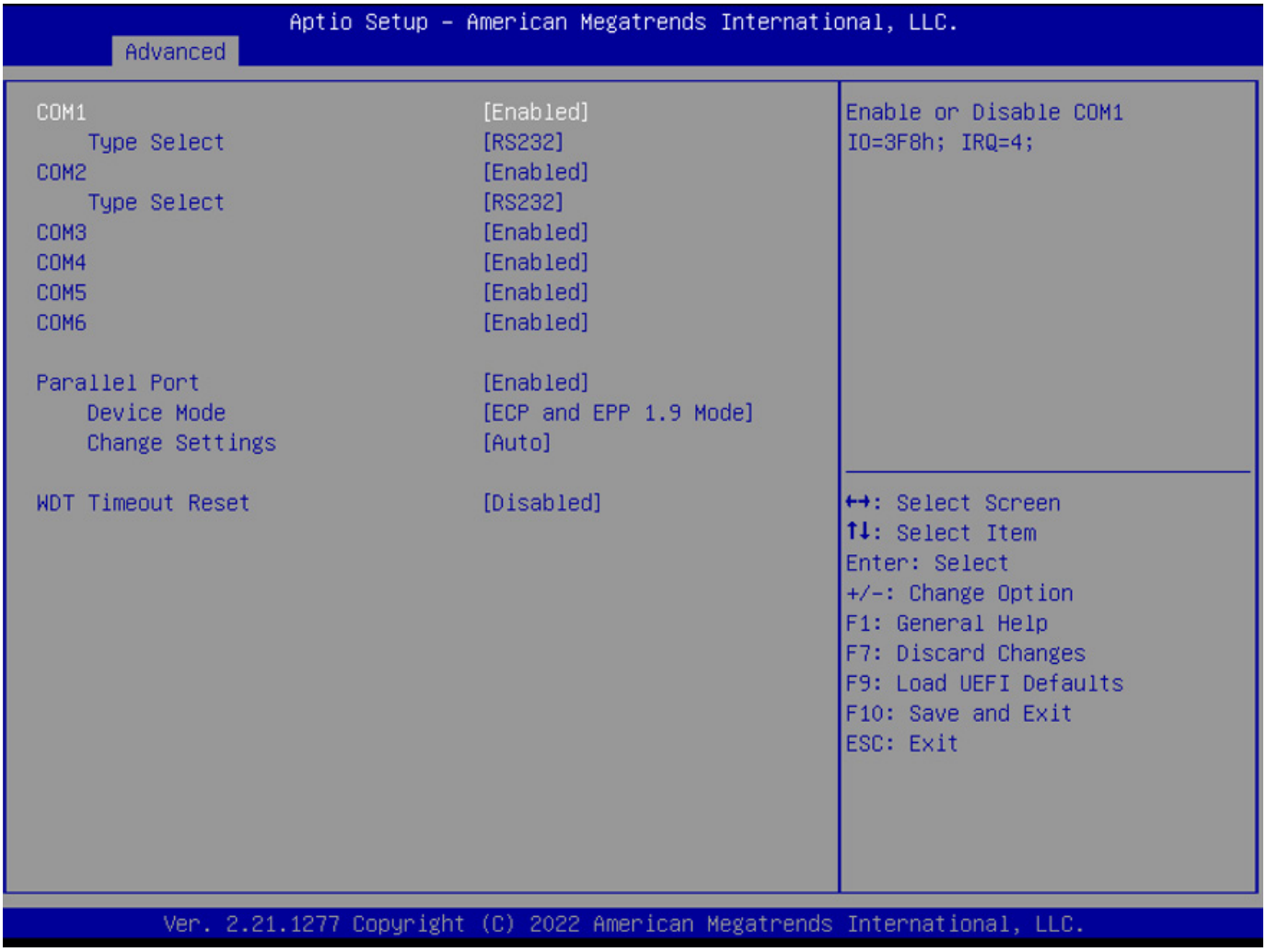
7.3.3 Advanced > Storage Configuration



Feature	Description
SATA Controller(s)	Enables the SATA Controller feature
SATA Mode Selection	Selects SATA mode
SATA Aggressive Link Power Management	Configures SATA Aggressive Link Power Management
Hard Disk S.M.A.R.T.	Enables the Self-Monitoring, Analysis, and Reporting Technology feature

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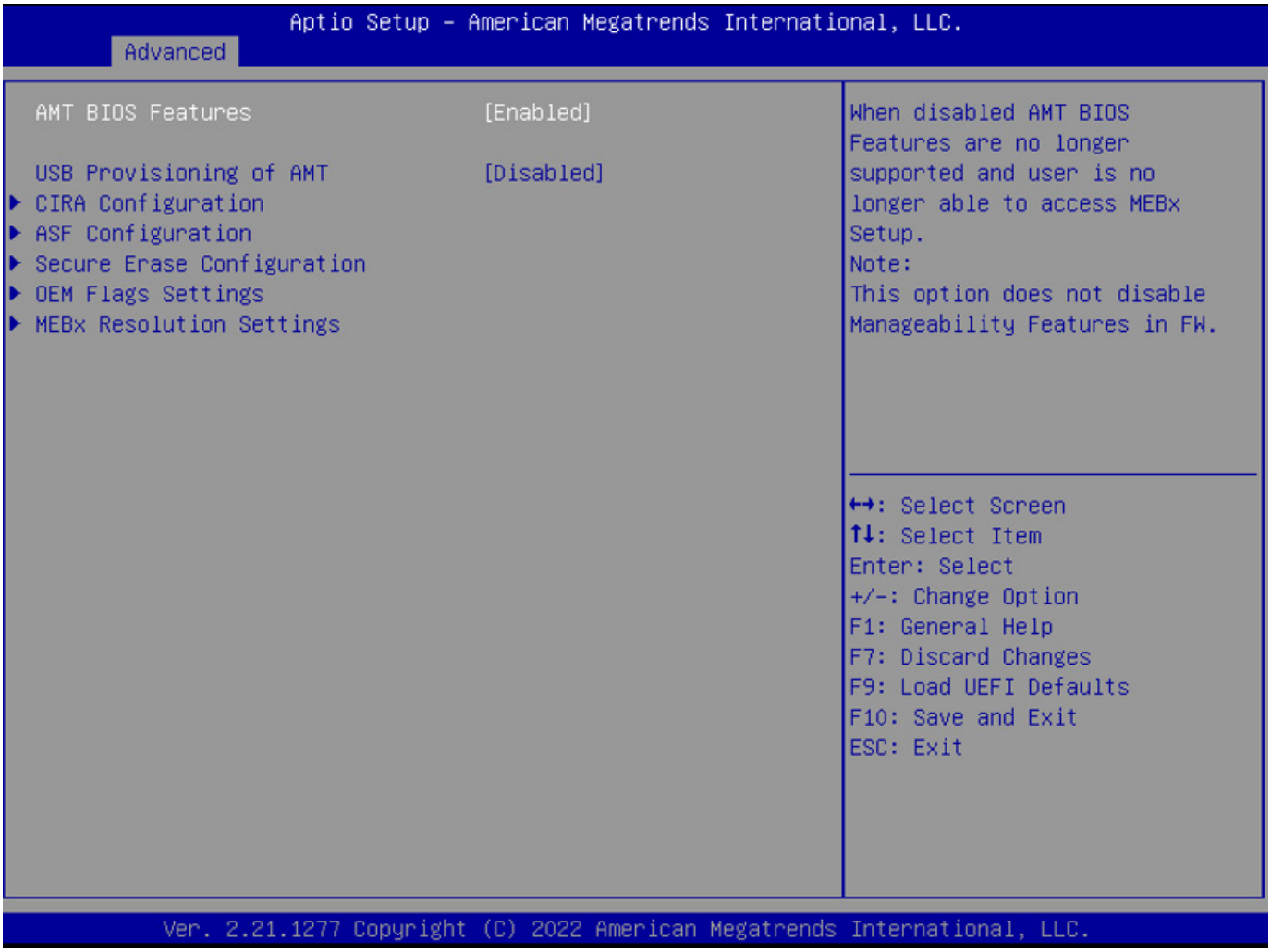
7.3.4 Advanced > Super IO Configuration



Feature	Description
COM (1-6)	Sets the parameters of COM 1-6
Type Select	Selects the port type: RS232, RS422, or RS485 (for COM 1,2)
Parallel Port	Enables the Parallel port
Device Mode	Selects the device mode according to your connected device
Change Settings	Selects the address of the Parallel port
WDT Timeout Reset	Sets the Watch Dog Timer

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7.3.5 Advanced > AMT Technology

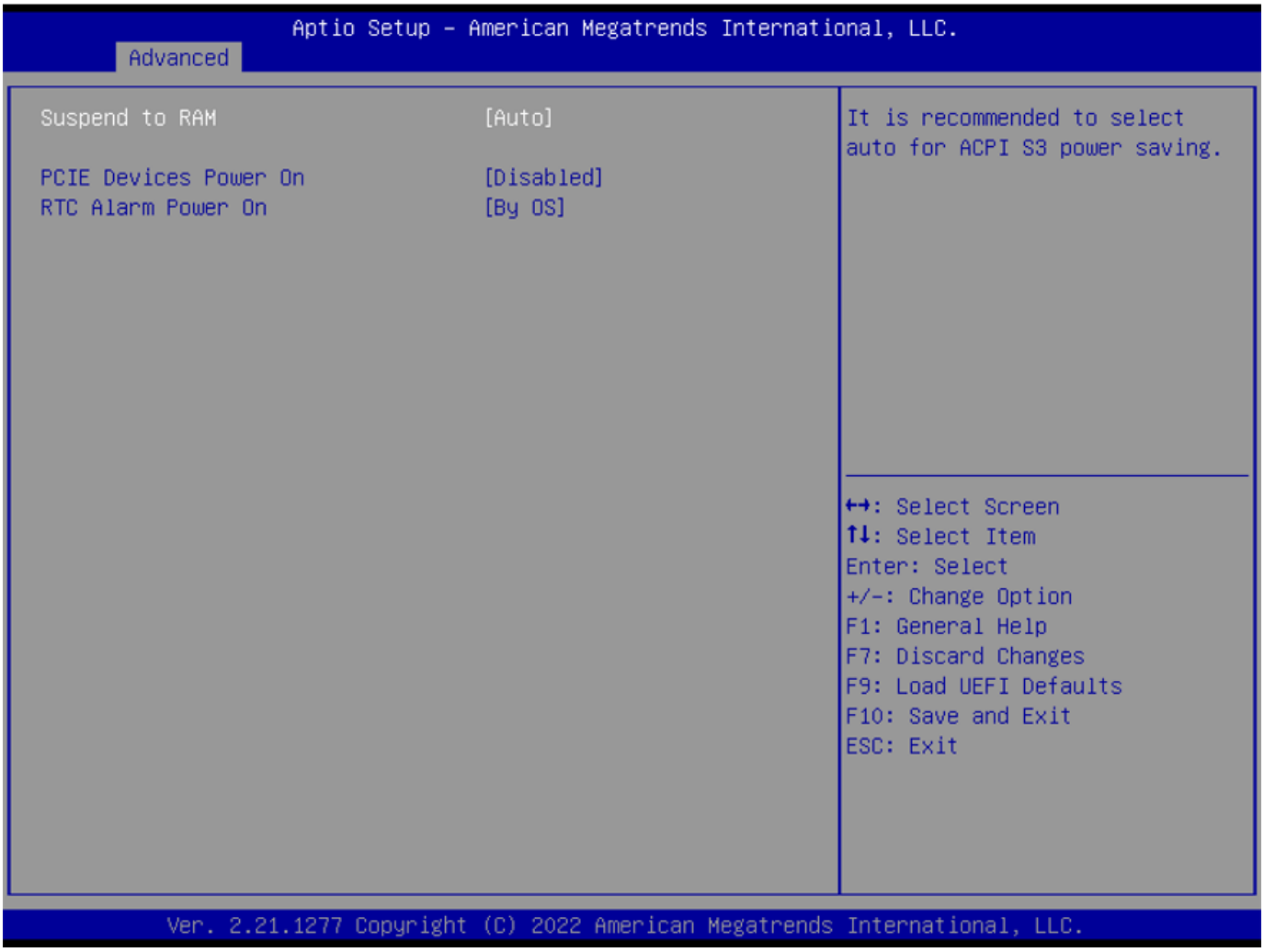


Feature	Description
AMT BIOS Features	Enables Intel® Active Management Technology BIOS Extension
ASF support	Enables Alert Specification Format
USB Provisioning of AMT	Enables AMT USB Provisioning
Secure Erase mode	Changes Secure Erase module behavior: as explained below ● **Simulated:** Performs SE flow without erasing SSD ● **Real:** Erases SSD
Force Secure Erase	Enables Force Secure Erase on next boot
MEBx hotkey Pressed	Enables MEBx hotkey press
MEBx Selection Screen	Enables MEBx Selection Screen
Hide Un-configure ME Confirmation Prompt	Enables Hide Un-Configure ME without password confirmation prompt.
Un-Configure ME	Enables Un-Configure ME without password
WatchDog	Enables AMT WatchDog Timer
Activate Remote Assistance Process	Enables CIRA boot trigger
PET Progress	Enables PET Events progress to receive PET events

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Feature	Description
ASF Sensors Table	Enables ASF Sensor Table
Non-UI Mode Resolution	Sets resolution for non-UI text mode
UI Mode Resolution	Sets resolution for UI text mode
Graphics Mode Resolution	Sets resolution for graphics mode

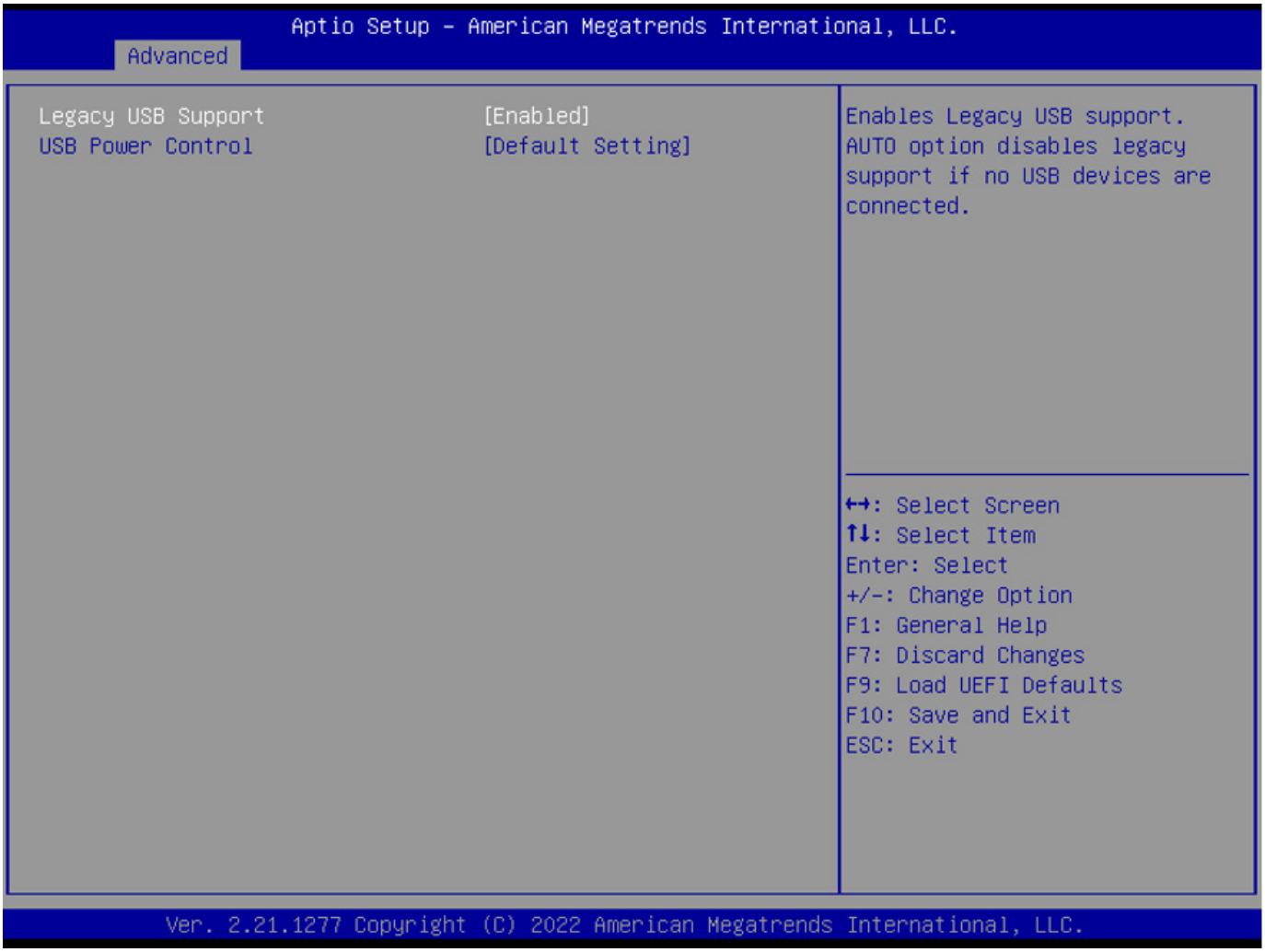
7.3.6 Advanced > ACPI Configuration



Feature	Description
Suspend to RAM	Sets to auto detect or disable the Suspend-to-RAM feature
PCIE Devices Power On	Enables PCIE devices to turn on the system from the power-soft-off mode
RTC Alarm Power On	Enables RTC (Real Time Lock) to power on the system

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7.3.7 Advanced > USB Configuration



Feature	Description
Legacy USB Support	Enables support for legacy USB devices: ● **Enabled:** Enables support for legacy USB ● **UEFI Setup Only:** USB devices can only be used under UEFI setup and Windows / Linux OS
USB Power Control	Controls USB power

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7.3.8 Advanced > Trusted Computing

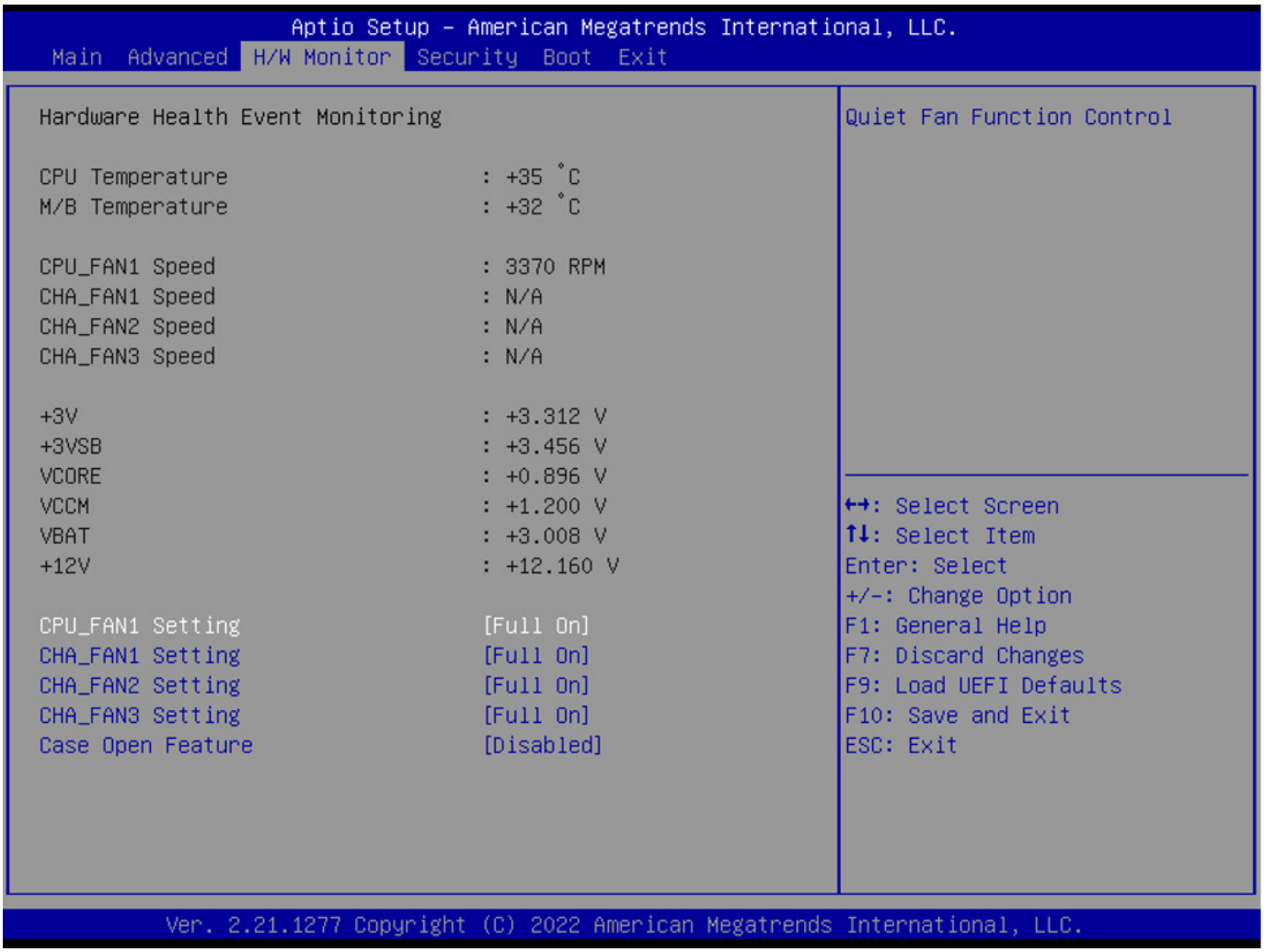


Feature	Description
Security Device Support	Enables BIOS support for security devices

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7.4 Hardware Health Event Monitoring Screen

This screen allows you to monitor the status of your system and installed devices, such as CPU temperature, mothboard temeprature, CPU fan speed, chassis fan speed, and the ctritical voltage.

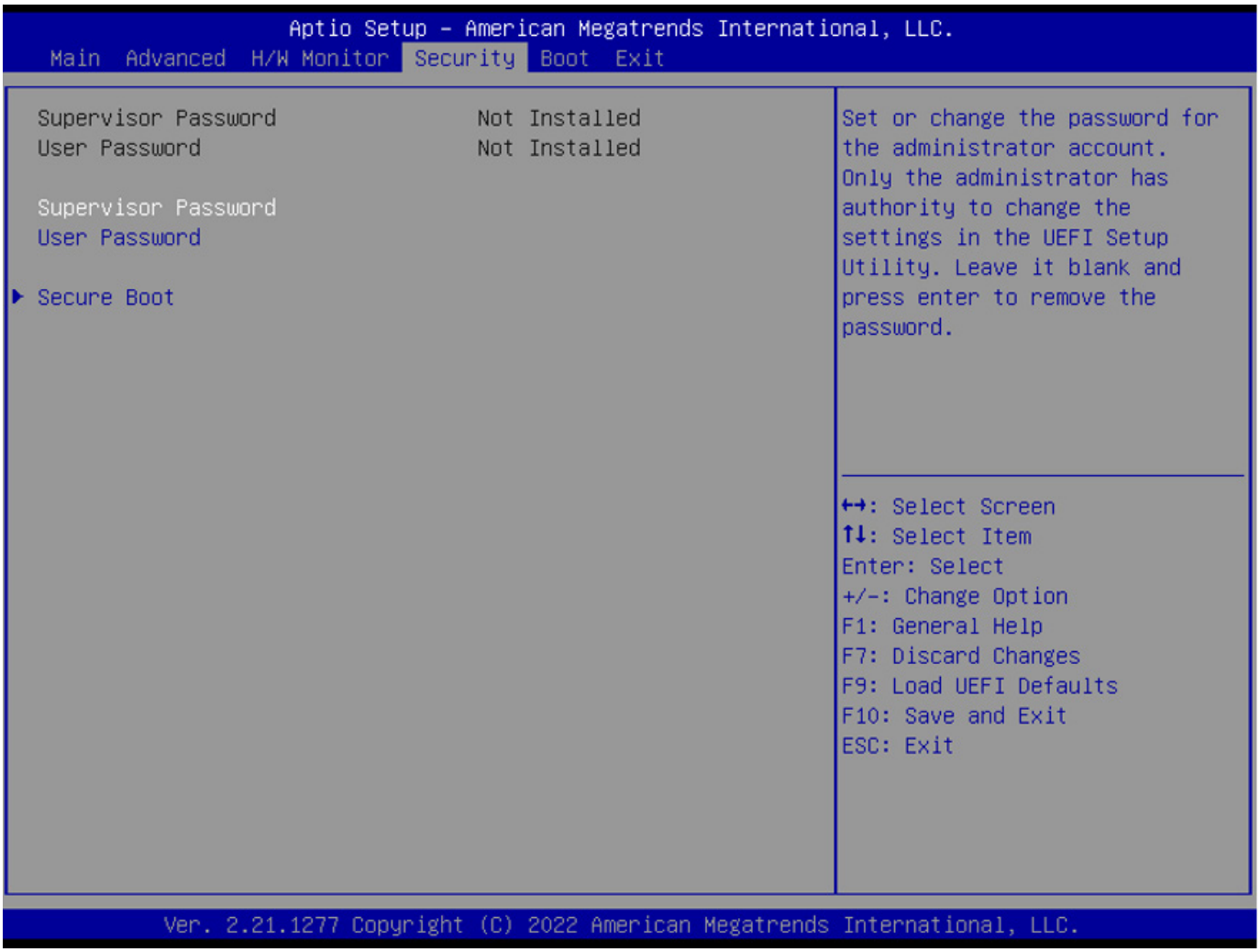


Feature	Description
FAN Setting (CPU, CHA1,2,3)	Sets the speed for CPU Fan1, Chassis Fan1, Chassis Fan2, Chassis Fan 3
Case Open Feature	Enables case open detection feature
Clear Status	Clears case open logs (only appears when the case open feature is enabled and triggered)

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7.5 Security Screen

The Security Screen lets you change or clear the supervisor / user passwords for the system.

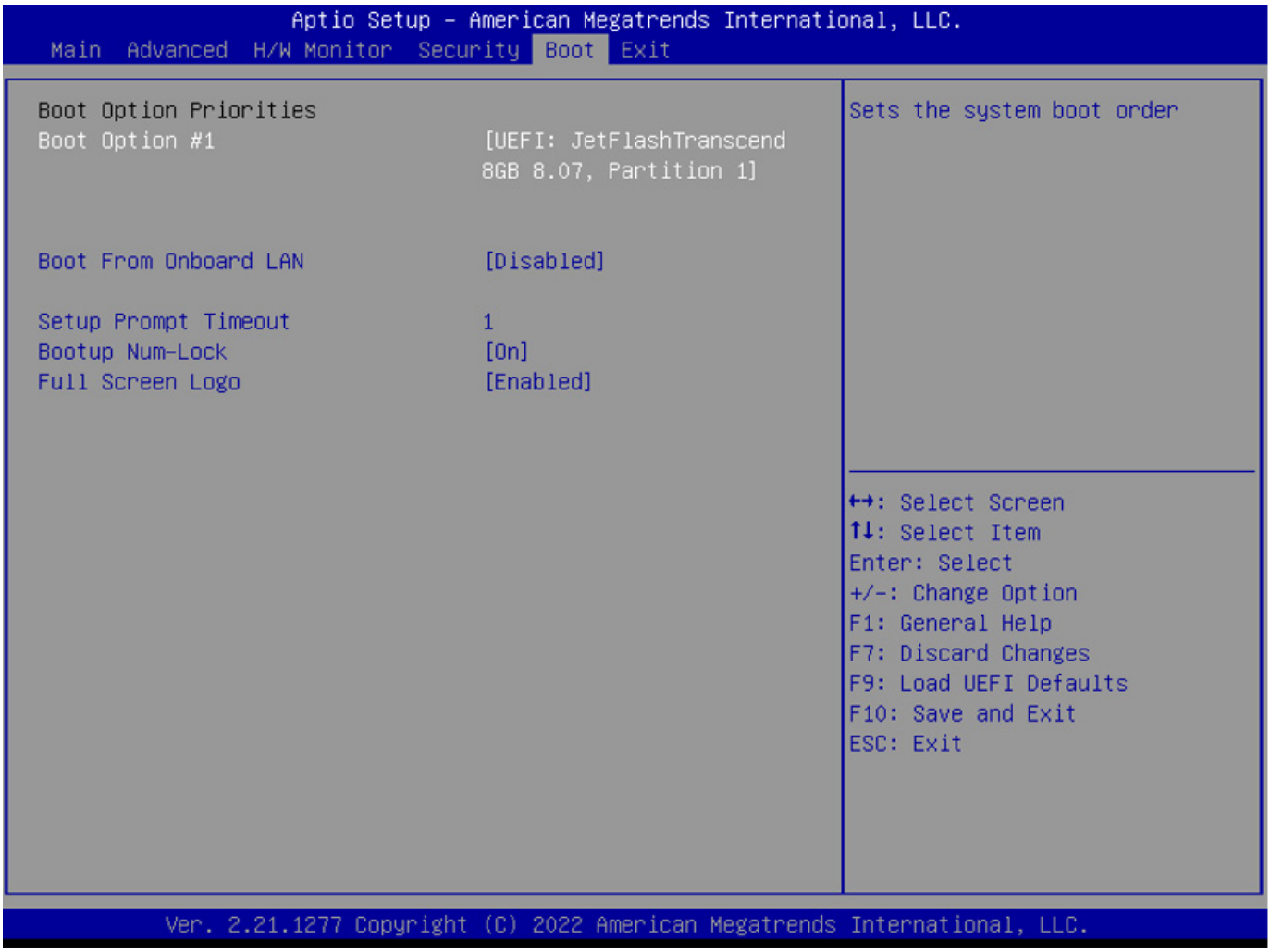


Feature	Description
Administrator Password	Sets Administrator Password
User Password	Sets User Password
Secure Boot	Enables support for Secure Boot

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7.6 Boot Screen

This section displays the avaialbe devices on your system for you to configure the boot priority and settings.



Feature	Description
Boot From Onboard LAN	Enables Boot From Onboard LAN feature
Setup Prompt Timeout	Displays the number of seconds to wait for setup activation key
Bootup Num-Lock	Enables automatically activation of the Numeric Lock upon boot-up
Full Screen Logo	Enables OEM logo

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Safety Instructions

Read and follow all instructions marked on the product and in the documentation before you operate your system. Retain all safety and operating instructions for future use.

- Please read these safety instructions carefully.
- Please keep this User‘s Manual for later reference.
- Read the specifications section of this manual for detailed information on the operating environment of this equipment.
- When installing/mounting or uninstalling/removing equipment, turn off the power and unplug any power cords/cables.
- To avoid electrical shock and/or damage to equipment:
  - Keep equipment away from water or liquid sources.
  - Keep equipment away from high heat or high humidity.
  - Keep equipment properly ventilated (do not block or cover ventilation openings).
  - Make sure to use recommended voltage and power source settings.
  - Always install and operate equipment near an easily accessible electrical socket-outlet.
  - Secure the power cord (do not place any object on/over the power cord).
  - Only install/attach and operate equipment on stable surfaces and/or recommended mountings.
  - If the equipment will not be used for long periods of time, turn off and unplug the equipment from its power source.
- Never attempt to fix the equipment. Equipment should only be serviced by qualified personnel.

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