MX6210N/MX6412J

Intel® Celeron N6210/J6412 SoC
Mini-ITX Motherboard

User's Manual

Edition 1.02 – December, 2021

FCC Statement

THIS DEVICE SUPPORTS PART 15 FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:

(1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE.

(2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS "A" DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES.

THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND, IF NOT INSTATLLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS.

OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE HARMFUL INTERFERENCE IN WHICH CASE THE USER WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT HIS OWN EXPENSE.

Notice

This guide is designed for experienced users to setup the system within the shortest time. For detailedinformation, please always refer to the electronic user's manual.

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As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into body, or (b) support or sustain life and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

Manual Objectives

This manual describes in detail the BCM MX6210N and MX6412J Main board.

We strongly recommend that you study this manual carefully before attempting to interface with this mainboard or change the standard configurations. Whilst all the necessary information is available in this manual we would recommend that unless you are confident, you contact your supplier for guidance.

Please be aware that it is possible to create configurations within the CMOS RAM that make booting impossible. If this should happen, clear the CMOS settings, (see the description of the Jumper Settings fordetails).

If you have any suggestions or find any errors concerning this manual and want to inform us of these, please contact our Customer Service department with the relevant details.

Safety Precautions

Warning!

Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitiveelectronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

Caution!

Always ground yourself to remove any static charge before touching the mainboard. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electroniccomponents in a static-dissipative surface or static-shielded bag when they are notin the chassis.

Document Amendment History

Revision	Date	Comment
1st (1.00)	Nov, 2021	Initial Release

CONTENTS

Thin Mini-ITX Board Features

This chapter briefly describes the features of Thin Mini-ITX Board MX6210N and MX6412J. Below to summarize the major features of the Desktop Board.

Feature Summary

TABLE: MX6210N and MX6412J FEATURES

General SPEC	
Processor	**Intel® Elkhart Lake N6210 Dual Core SoC** MX6210N: PN# 71822
	Intel® Elkhart Lake J6412 Quad Core SoC **MX6412J:** PN# 71821
Memory	Two Horizontal 260-pin SoDIMM DDR4 Memory Slots; Supports up to 32GB
Integrated Graphics	**Intel® Gen11LP Graphic**
Display Interface	2 x HDMI Display Output supporting up to 4K@30Hz
	18/24 bits Dual Channel LVDS Through Parade PS8625 or Equivalent (Co-Lay eDP)
Storage	**Onboard eMMC (Optional)**
Super I/O	**Nuvoton® NCT6126D or Equivalent**
Type	eSPI Super I/O
COM Ports	2 x RS232/422/485 Port (with 5V/12V/RI)
	2 x RS232 Port (with 5V/12V/RI)
WatchDog Timer	1 Sec ~ 255 Sec
H/W Monitor	Yes
TPM	**Infineon® SLB 9670VQ2.0 TPM 2.0/FW 7.85 or Equivalent**
Type	TPM 2.0
USB 3.0 Hub	**Genesys® GL3523 or Equivalent**
Type	4 Ports USB 3.0 Hub
Ethernet 1	**Intel® i225-LM (HSIO LANE #2)**

Type	PCI Express Gigabit Ethernet
Ethernet 2	**Intel® i225-LM (HSIO LANE #3)**
Type	PCI Express Gigabit Ethernet
Ethernet 3	**Intel® i211-AT (HSIO LANE #4)**
Type	PCI Express Gigabit Ethernet
Ethernet 4	**Intel® i211-AT (HSIO LANE #5)**
Type	PCI Express Gigabit Ethernet
Audio	**Realtek® ALC888S or ALC897 or Equivalent**
Type	HD Audio Codec
Amplifier	2W Per Channel Stereo Amplifier
BIOS	***AMI® 256Mb SPI BIOS**
Expansion Slots	
PCI-E	1 x 2230 M.2 E Key (with PCIe x1 & USB 2.0 Signal)
	1 x 2280 & 2242 M.2 M Key (with PCIe x2 & SATA III Signal)
Internal I/O Connectors	
COM	2 x RS-232/422/485 Header (2x5 2.0mm Header)
	2 x RS-232 Header (2x5 2.0mm Header)
I^2C	1 x I^2C Header (2x4 2.0mm Header) Signal level: 1.8V x1, 3.3V x1 DC output: 3.3V
I^2S	1 x I^2S Header (1x6 2.0mm Header) Signal level: 1.8V DC output: 3.3V
USB	2 x USB 2.0 header (4 x USB 2.0 Ports)
	1 x Dual Mode USB 3.0 Vertical Type A Connector (Host & Device)
LVDS/eDP	1 x LVDS/eDP Header LVDS: HIROSE #DF13-40DP-1.25V eDP: ACES 50203-4001-001 (optional)
Backlight	1 x Backlight Header (1x5 2.0mm Header)
Fan	1 x 4 Pin CPU Fan Header
	1 x 4 Pin System Fan Header
GPIO	1 x 8 bits GPIO Headers (4 In/4 Out) (2x5 2.0mm Header) Signal level: 3.3V

	DC output: 5V
SPI	1 x SPI Header (2x4 2.0mm Header)
eSPI	1 x eSPI Header (2x5 2.0mm Header)
SATA	1 x SATA III Connectors (Red)
SATA Power	1 x 15 pin SATA Power Connector
Front Audio	1 x Front Audio Header (2x5 2.54mm Pitch)
Front Panel	1 x Front Panel Header (2x5 2.54mm Pitch)
Amp	1 x Amplifier Locking Type Header (1x4 2.00mm Pitch)
Buzzer	1 x Onboard Buzzer
CMOS Battery	1 x Horizontal Socket Type Battery
DC-In	1 x Mini-Fit Jr 4 Pin DC-In Connector
Back I/O Panel	
HDMI	2 x HDMI Connectors
LAN	2 x RJ45 Connectors
	2 x RJ45 Connectors
USB	4 x USB 3.0 Connectors
Audio	1 x MIC/Line-Out combo Jack
DC-In	1 x Barrel Type DC-In Connector (ID 2.5mm/OD 5.5mm)
Power & Connector	12V – 24V Wide Range DC-In
Form Factor	Mini-ITX 6.7 x 6.7 inches
Cooling	Passive Heatsink
Layer	8 Layer Board
Color	BCM Standard Blue
Regulatory Compliance	FCC Class B/CE/UL/CB
	RoHS and REACH Compliant
	Conflict Minerals Survey
Support OS	Microsoft Windows 10 64-bit (Win10 IoT Enterprise 2019 LTSC and Win 10 Pro 20H2)
	*Linux Ubuntu 20.04
Operation Environment	
Temperature	0 C to 60 C
Humidity	5% to 85% non-condensing
Storage Environment	

Temperature	-10 C to 60 C
Humidity	5% to 85% non-condensing
Accessories	
SATA Signal	1 x SATA Signal Cable
SATA Power	1 x SATA Power Cable
I/O Shield	1 x Full Size I/O Shield
	1 x Half Size I/O Shield
Packaging	Mini-ITX Bulk Pack

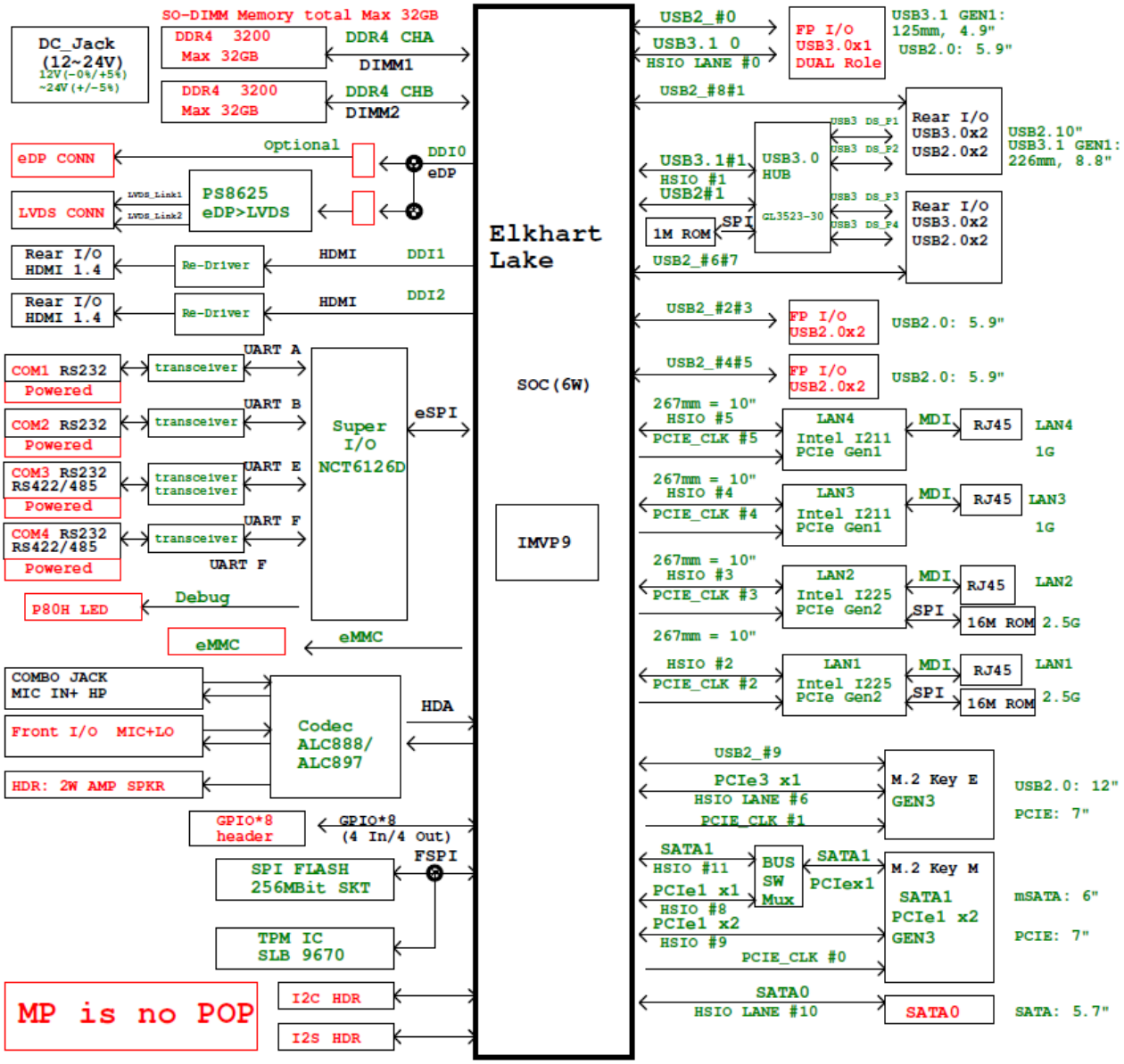
**Notes 1: It's a normal behavior that POST will be stayed at "A2" for about 50s.*

**Notes 2: Linux kernel 5.11 has hang code issue during reboot and power off.*

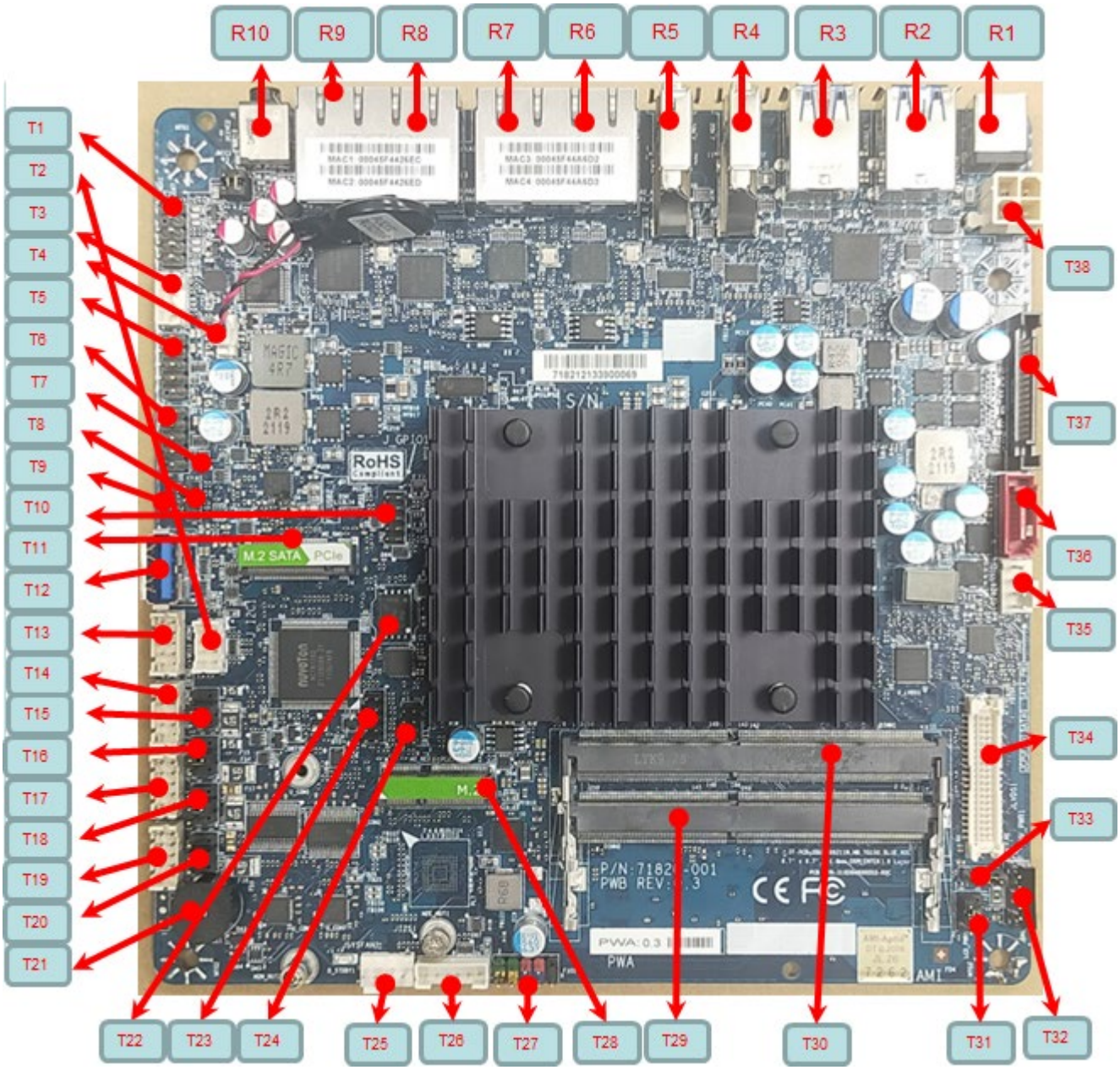
1. Hardware Specification

1.1 HW Design

1.1.1 Block Diagram



1.1.2 Placement - Top



T1	HDR: Front Audio	T20	JUMP: COM4 PWR SET
T2	HDR: I2C	T21	Buzzer
T3	HDR: INT_SPK1	T22	Socket / IC: BIOS (MP is no socket)
T4	HDR: Battery	T23	HDR: eSPI
T5	HDR: Front USB2x2	T24	HDR: SPI
T6	HDR: Front USB2x2	T25	HDR: SYS FAN
T7	HDR: Clear CMOS	T26	HDR: I2S
T8	HDR: P80 SET	T27	HDR: Front I/O
T9	HDR: Board ID	T28	Socket: M2 Key E
T10	HDR: GPIO	T29	Socket:DIMM2

T11	Socket: M2 Key-M	T30	Socket:DIMM1
T12	CONN: USB3.0	T31	Jumper: LCD_PWR
T13	HDR: COM1	T32	Jumper: PNL PWR
T14	HDR: COM2	T33	HDR: BACK Light PWR
T15	JUMP: COM1 PWR SET	T34	CONN: LVDS
T16	JUMP: COM2 PWR SET	T35	HDR: CPU FAN
T17	HDR: COM3	T36	CONN: SATA0
T18	JUMP: COM3 PWR SET	T37	CONN: SATA 15P PWR
T19	HDR: COM4	T38	CONN: 4P PWR IN

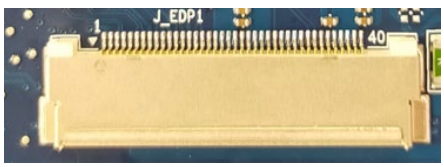
R1	DC PWR JACK
R2	USB3.0 x2
R3	USB3.0 x2
R4	HDMI
R5	HDMI
R6	LAN4 2.5G I225
R7	LAN3 2.5G I225
R8	LAN2 1G I211
R9	LAN1 1G I211
R10	Combo Jack: MIC/HP

1.1.3 Placement - Bottom

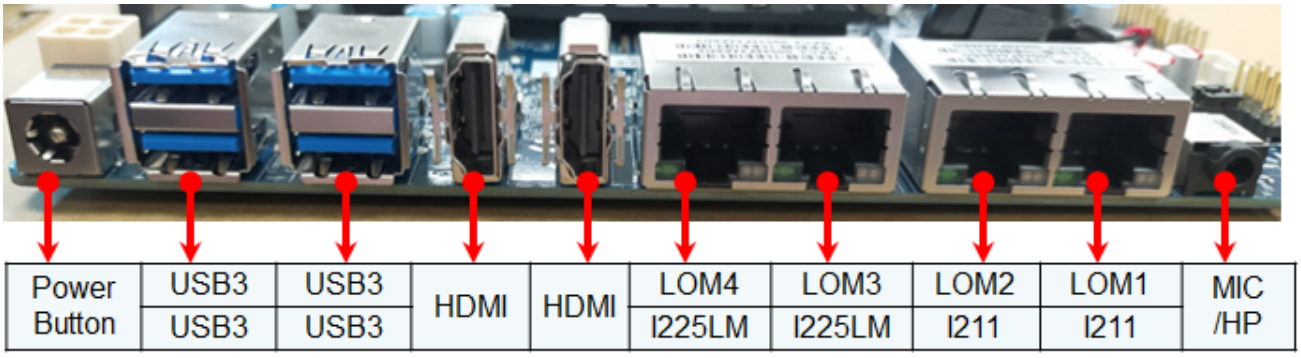
eDP connector for eDP cable: This is optional SKU w/o LVDS connector

B1	eDP connector (MP is no POP

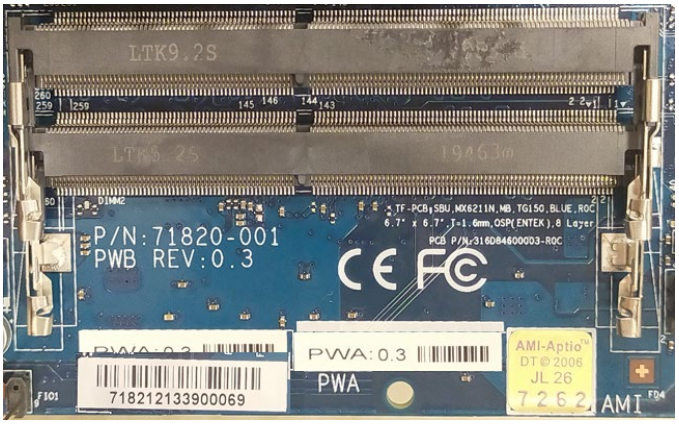
Location: JEDP1



1.1.4 Placement – Rear IO



1.1.5 Silkscreen and Label Definition



■ PWA# Table

PWA#	Stage	SCH	Note
0.1	NPI	R0A	EVT
0.2	NPI	R0B	DVT
0.3	NPI	R0C	PVT/MVT
1.0	MP	R01	Production Release
1.1	MP	R01	1st ECR/Rework
1.2	MP	R01	2nd ECR/Rework
2.0	MP	R02	ECR with PCB change

■ CE, FCC, and RoHS Logo

■ PWB# Table

PWB#	Stage	SCH	Note
0.1	NPI	R0A	EVT
0.2	NPI	R0B	DVT
0.3	NPI	R0C	PVT

…	NPI	…	PVT#
1.0	MP	R01	Production Release
2.0	MP	R02	Production PCB re-spin
…	MP	…	Production PCB #

■ S/N# Label

Rule for Serial number:

BCM SN# 705010646100001

SN# is in 15 alphanumeric barcode format on a label. Defined as:

First 5 digits = Part Number (70501),

6th and 7th digits = Year (06),

8th and 9th digits = Week (46 = 46th week of that year),

10th = BCM internal control code, contact Wing for details.

11th - 15th digits = Serial Number (start with 00001).

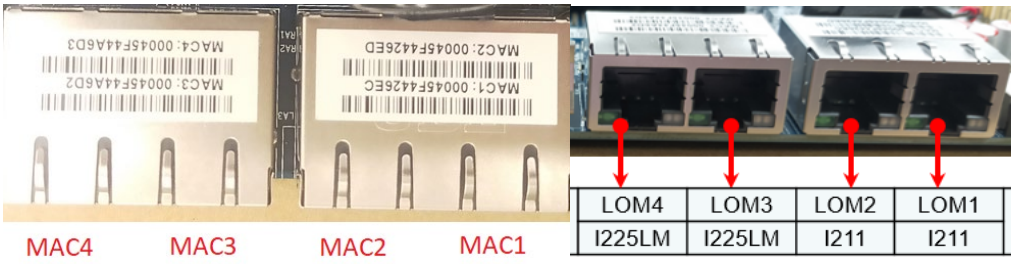
Intel® Elkhart Lake N6210 Dual Core SoC
MX6210N: PN# 71822
Intel® Elkhart Lake J6412 Quad Core SoC
MX6412J: PN# 71821

■ M.2 M Key & E Key Label

M2 Key E

M2 Key M

■ LOM MAC Address Label



2. Product Specification

2.1 Elkhart Lake Processor Spec

CPU/SOC parts spec

Intel® Celeron® Processor N6210 spec

Intel® Pentium® Processor J6412 spec

2.2 System Memory- 2ea DDR4 SO-DIMM

EHL memory controller can support DDR4 technologies. The system supports memory configuration 1x64 DDR4 and 2x64 DDR4.

Notes: J6412, N6210, EHL: Don't support In-Band ECC and ECC spec

Supported DDR4 SODIMM Module Configurations

Supported DDR4 SODIMM Module Configurations

Raw Card Version	Speed (Mt/s)	DIMM Capacity	DRAM Device Technology	DRAM Organization	# of DRAM Devices	#of Ranks	# of Row/Col Address bit	# of Banks inside DRAM	Page Size
A	3200	8GB	8Gb	1024M x 8	8	1	16/10	16	8K
A	3200	16GB	16Gb	2048M x 8	8	1	17/10	16	8K
C	3200	4GB	8Gb	512M x 16	4	1	16/10	8	8K
C	3200	8GB	16Gb	1024M x 16	4	1	17/10	8	8K
E	3200	16GB	8Gb	1024M x 8	16	2	16/10	16	8K
E	3200	32GB	16Gb	2048M x 8	16	2	17/10	16	8K

DIMM placement: DIMM1 (Up) /DIMM2 (Down)

- Channel Max Capacity (GB): 32GB
- System Max Capacity (GB): 32GB

2.3 Onboard Graphics

Board must support all integrated graphics features supported by the processor through the PCH (including but not limited to DirectX, HD/Blu-ray video hardware decoding, PAVP-Lite and HDCP).
Support 3 Display pipes, simultaneous multi-streaming on all three display pipes (1x Internal and 2x External Displays)
Supports Intel® Display Power Saving Technology (DPST) 6.3, Panel Self Refresh (PSR) and Display Refresh Rate Switching Technology (DRRS)

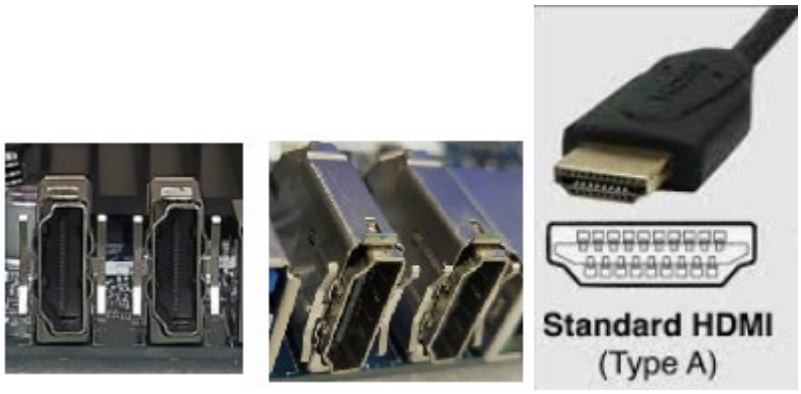
1. HDMI 1.4b x 2ea
2. LVDS x1 / eDP 1.3 internal connector (optional)

HDMI feature: High-Definition Multimedia Interface (HDMI*)

- HD – HDMI1.4 flush mount graphics connector: back panel video
- Data Rate: 5.4 GT/s
- HDCP 2.3 Yes
- HD Audio Yes
- Compressed Audio Yes
- DSC (Display Stream Compression): No

- The High-Definition Multimedia Interface (HDMI*) is provided for transmitting uncompressed digital audio and video signals from DVD players, set-top boxes, and other audio-visual sources to television sets, projectors, and other video displays. It can carry high-quality multi-channel audio data and all standard and high-definition consumer electronics video formats. The HDMI display interface connecting the processor and display devices uses transition minimized differential signaling (TMDS) to carry audiovisual information through the same HDMI cable.
- HDMI includes three separate communications channels: TMDS, DDC, and the optional CEC (consumer electronics control). CEC is not supported on the processor. As shown in the following figure, the HDMI cable carries four differential pairs that make up the TMDS data and clock channels. These channels are used to carry video, audio, and auxiliary data. In addition, HDMI carries a VESA DDC. The DDC is used by an HDMI Source to determine the capabilities and characteristics of the Sink.
- Audio, video, and auxiliary (control/status) data is transmitted across the three TMDS data channels. The video pixel clock is transmitted on the TMDS clock channel and is used by the receiver for data recovery on the three data channels. The digital display data signals driven natively through the PCH are AC coupled and needs level shifting to convert the AC coupled signals to the HDMI compliant digital signals.
- Maximum Resolution 3840× 2160@30 Hz (4K@30 Hz); Data Rate 2.9 GT/s

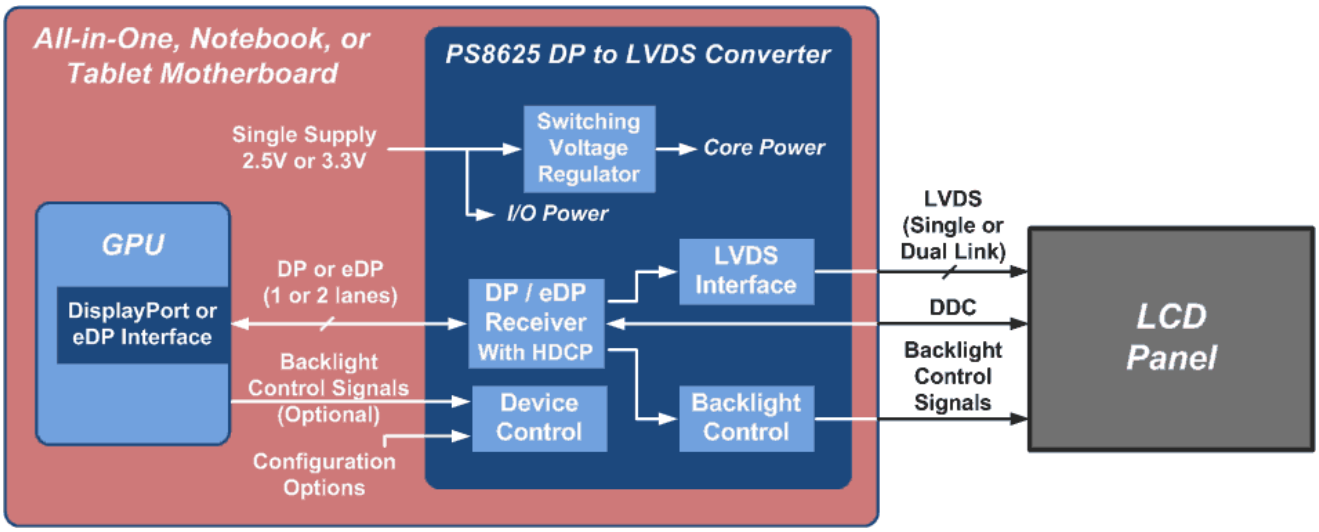
- Supports Audio on HDMI

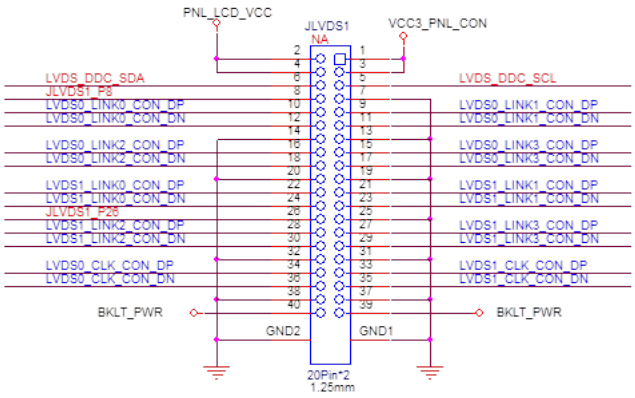


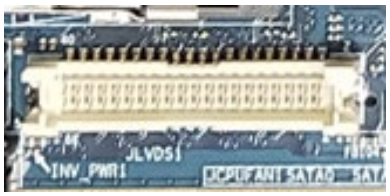
LVDS feature:

eDP to LVDS bridge IC: Parade PS8625QFN56GTR

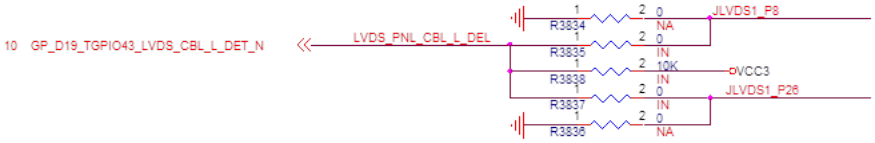
- Enables the use of LVDS display panels with DisplayPort™ or eDP™ video Source devices
- Single link or dual link LVDS output, clock speed up to 135MHz
- Supports up to 1920×1200@60Hz at 18 or 24 bit color depth







Add GP_D19_TGPIO43_LVDS_CBL_L_DET_N to support LVDS cable detection from Pin 8 & Pin 26



Connector: TF-CON;LVDS,SBU,20Pin*2,1.25mm,MA,ST,Gold Flash,TWO SIDE,Nature,PA6T

Joint Tech Electronic Industrial Co.,Ltd.	A1252WV-SF-2X20PD01
XIAN YI INTERNATIONAL CO., LTD	W2631-40P-R3211

2.4 Connector Pinout & Indicator Definition

2.4.1 Panel Backlight Header

Pin	Signal	Description
1	PNL_BL_12V	BKLT PWR 12V
2	GND	Ground
3	PNL_BKLT_PWR_EN	Backlight enable
4	PNL_BKLT_CTRL_PWM	Backlight control
5	BKLT PWR 5V	BKLT PWR 5V

2.4.2 eDP (Optional)

Connector: TF-CON;SBU,40Pin,0.5mm,FM,R/A,Gold Flash,WHITE

ACES ELECTRONIC CO.,LTD	88341-4001

Pin	Signal	Pin	Signal
1	NC_Reserved	21	LCD_VCC
2	High-speed_GND	22	LCD_Self_Test-or-NC
3	Lane3_N (DDPD_[3]N)	23	LCD_GND
4	Lane3_P (DDPD_[3]P)	24	LCD_GND
5	High-speed_GND	25	LCD_GND
6	Lane2_N (DDPD_[2]N)	26	LCD_GND
7	Lane2_P (DDPD_[2]P)	27	HPD (DDPD_HPD)
8	High-speed_GND	28	BKLT_GND
9	Lane1_N (DDPD_[1]N)	29	BKLT_GND
10	Lane1_P (DDPD_[1]P)	30	BKLT_GND
11	High-speed_GND	31	BKLT_GND
12	Lane0_N (DDPD_[0]N)	32	BKLT_ENABLE
13	Lane0_P (DDPD_[0]P)	33	BKLT_PWM_DIM
14	High-speed_GND	34	NC_Reserved
15	AUX_CH_P (DDPD_AUXP)	35	NC_Reserved
16	AUX_CH_N (DDPD_AUXN)	36	BKLT_PWR
17	High-speed_GND	37	BKLT_PWR
18	LCD_VCC	38	BKLT_PWR
19	LCD_VCC	39	BKLT_PWR
20	LCD_VCC	40	NC_Reserved

2.4.3 M.2 M Key & E Key Expansion Slot

Slot Configuration	Electrical	Physical Connector	Color
M2_KE1	M.2 key E socket	M.2 Key E socket	Black
M2_KM1	M.2 key M socket	M.2 key M socket	Black

- **M.2 Support key-E Type 2230 for WLAN/USB2.0 feature**
  PCI Express GEN1
  USB 2.0

- **M.2 Support key-M 1 x 2280 / 2260 (SATA III or PCie x1/x2 Signal) feature**
  PCI Express GEN3
  SATA GEN3

Function	Pin	Pin	Function
GND	1	2	3V3
GND	3	4	3V3
NC	5	6	NC
NC	7	8	NC
GND	9	10	DAS/DSS#_IO/LED1#_I_0/3_3V
NC	11	12	3V3
NC	13	14	3V3
GND	15	16	3V3
NC	17	18	3V3
NC	19	20	NC
GND	21	22	NC
NC	23	24	NC
NC	25	26	NC
GND	27	28	NC
PERN1	29	30	NC
PERP1	31	32	NC
GND	33	34	NC
PERT1	35	36	NC
PERP1	37	38	DEVSLP_O
GND	39	40	NC
PERN0 / SATA B+	41	42	NC
PERP0 / SATA B-	43	44	NC
GND	45	46	NC
PETN0 / SATA A-	47	48	NC
PETP0 / SATA A+	49	50	PERST#_O_0/3_3V
GND	51	52	CLKREQ#_IO_0/3_3V
REFCLKN	53	54	NC
REFCLKP	55	56	NC
GND	57	58	NC
KEY	59	60	KEY
KEY	61	62	KEY
KEY	63	64	KEY
KEY	65	66	KEY
NC	67	68	NC
PEDET_NC_PCIE/GND_SATA	69	70	3V3
GND	71	72	3V3
GND	73	74	3V3

GND	75		

2.4.4 USB 3.0 Port

4ea USB 3.0: dual USB3.0 port x2 connector

USB3.0 bus control by USB3.0 Gen1 hub (**Genesys® GL3523**)

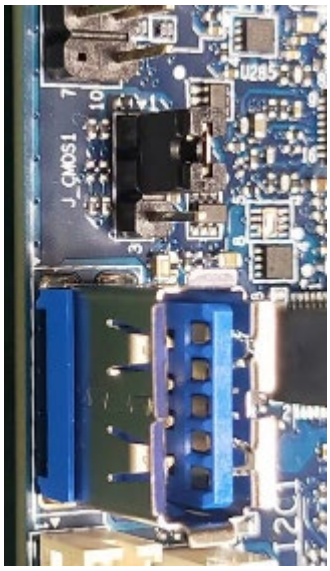
USB2.0 bus control by EHL SOC

USB3.0 Internal – Type A

1ea USB 3.0 Type-A connector

USB3.0 /USB2.0 bus control by EHL SOC

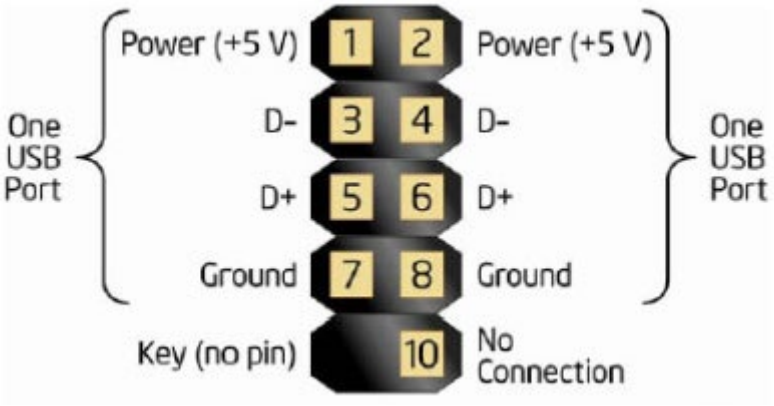
Dual Mode USB 3.0 Vertical Type A Connector (Host & Device)



2.4.5 USB 2.0 Port

USB2.0 Internal – 5Px2 NP9 header x2

- 4ea USB 2.0: dual USB2.0 port header x2
- Can't support USB power at S5 mode



Pin	Signal	Pin	Signal
1	+5V DC	2	+5V DC
3	Data (negative)	4	Data (negative)
5	Data (positive)	6	Data (positive)
7	Ground	8	Ground
9	Key (no pin)	10	No Connect

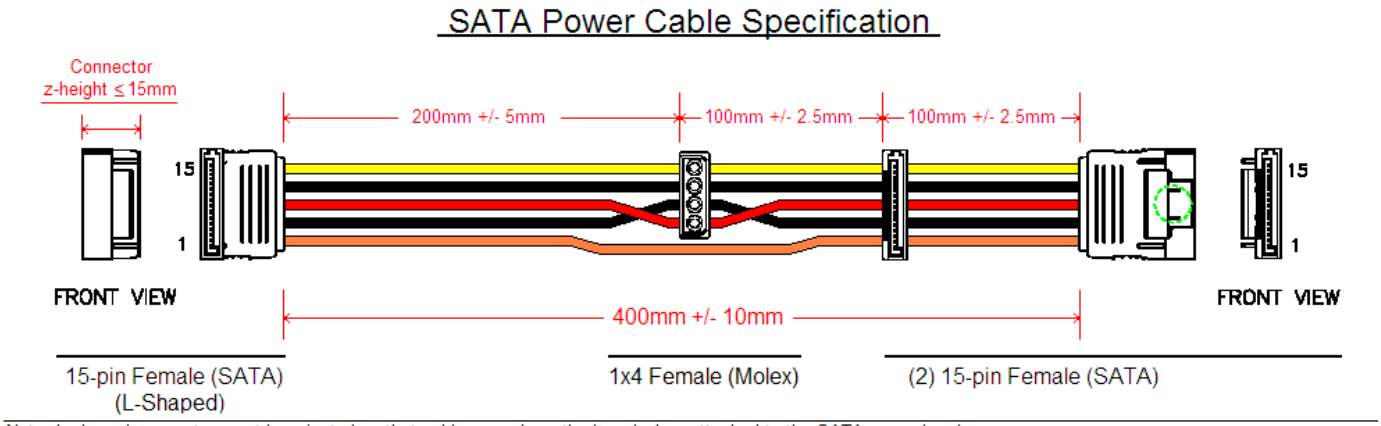
TF-CON;HDR,SBU,5Pin*2,-P9,MA,2.54mm,BLACK,ST,Gold Flash,PA6T(Nylon 6T),NO P9,DIP	
Joint Tech	A2546WV-2X05PR6BG0NQ9G
GRAND-TEK	HPH-212050-006
SUPERIOR TECH	PHED-DS010G1ABONA-N012

2.4.6 SATA Power – 15pin Standard

Board must provide internal SATA power connector in order to power internal SATA devices. SATA power connector must be vertically oriented 15-pin male colored black, compatible with standard SATA 15-pin female power cable connectivity solutions.

Board must support SATA power with at least 1.0A from 12V rail, 2.5A from 5V rail and 0.5A from 3.3V rail, which must be provided from the board's DC-to-DC circuit and accounted for in the board's total power budget.

Below is example for cable drawing



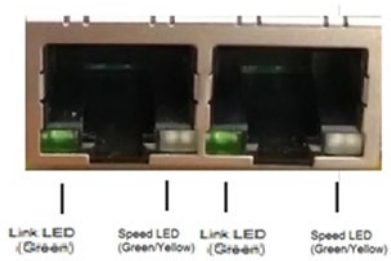
Note: L-shaped connector must be oriented so that cables run above the board when attached to the SATA power header.

Pin	Name	Color	Description
1	+3.3VDC	Orange	+3.3 VDC
2	+3.3VDC	Orange	+3.3 VDC
3	+3.3VDC/ DevSleep	NC	NC
4	COM	Black	Ground
5	COM	Black	Ground
6	COM	Black	Ground
7	+5VDC	Red	+5 VDC
8	+5VDC	Red	+5 VDC
9	+5VDC	Red	+5 VDC
10	COM	Black	Ground
11	COM	Black	NC
12	COM	Black	Ground
13	+12VDC	Yellow	+12 VDC
14	+12VDC	Yellow	+12 VDC
15	+12VDC	Yellow	+12 VDC

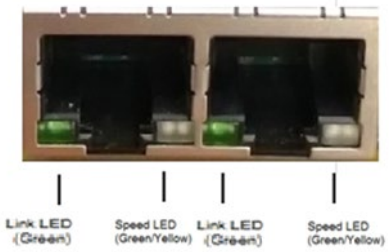
2.4.7 i211 and i215LM LAN Indicator

Onboard I225 RJ45 connectors must have integrated magnetics and support dual status LEDs per port, as below data

Diagram	LED	Color	State	Condition
	Link	NA	off	LAN link is not established

				or LAN disable
	Link	Green	on	LAN link is established or LAN port disable
	Link	Green	blinking	LAN activity occurring
	Speed	NA	off	10/100 M b/s data rate or LAN disable
	Speed	Green	on	2500 M b/s data rate
	Speed	Orange	on	1000 M b/s data rate or LAN port disable

Onboard I211/I210 RJ45 connectors must have integrated magnetics and support dual status LEDs per port, as Below

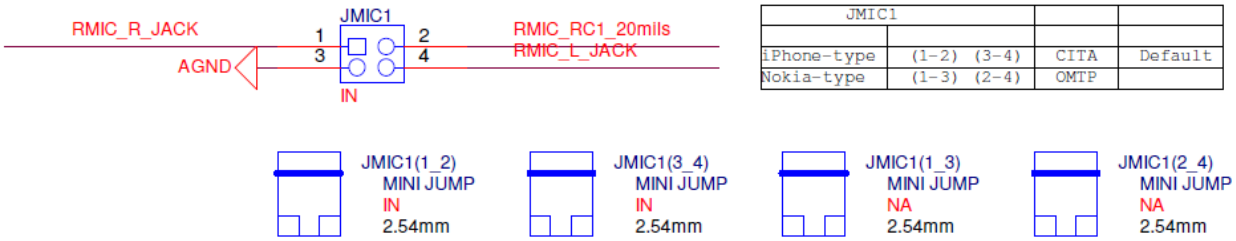
Diagram	LED	Color	State	Condition
	Link	NA	off	LAN link is not established or LAN disable
	Link	Green	on	LAN link is established or LAN port disable
	Link	Green	blinking	LAN activity occurring
	Speed	NA	off	10 M b/s data rate or LAN disable
	Speed	Green	on	100 M b/s data rate
	Speed	Orange	on	1000 M b/s data rate or LAN port disable

2.4.8 Audio Combo Jack

Codec driver cannot support Headset type auto detection from iPhone-type and Nokia-type parts

Here is jumper setting guide to support iPhone-type or Nokia-type parts

		JMIC1 Jumper setting	
iPhone-type headset CITA	CITA	(1-2) (3-4)	Default BOM
Nokia-type headset CMTP	CMTP	(1-3) (2-4)	

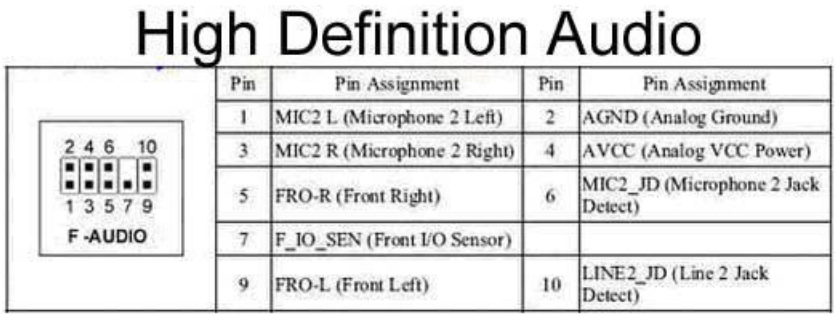


TP Headset Connector Pinout from web data

2.4.9 Front I/O Header

Front I/O header 5P*2: MIC + Line out

Front panel audio header must be 2x5, 2.54mm pitch, colored BLACK and keyed at pin 8



Pin	Pin Assignment	Pin	Pin Assignment
1	MIC2 L (Microphone 2 Left)	2	AGND (Analog Ground)
3	MIC2 R (Microphone 2 Right)	4	AVCC (Analog VCC Power)
5	FRO-R (Front Right)	6	MIC2_JD (Microphone 2 Jack Detect)
7	F_IO_SEN (Front I/O Sensor)		
9	FRO-L (Front Left)	10	LINE2_JD (Line 2 Jack Detect)

TF-CON;HDR,SBU,5Pin*2,-P8,MA,2.54mm,BLACK,ST,Gold Flash,PA6T(Nylon 6T)

SUPERIOR TECH CO.,LTD.	PHED-DS010G1ABONA-N020
Aquatech Corporation	YNK12030-HPH-212050-002

2.4.10 Speaker Header

2W Per Channel Stereo Amplifier:

Pin	Signal – DVT/PVT	Signal – R01
1	Audio SPK R-	Audio SPK R-
2	Audio SPK R+	Audio SPK R+
3	Audio SPK L+	Audio SPK L-
4	Audio SPK L1	Audio SPK L+

TF-CON;HDR,SBU,4Pin,4 Walls,MA,2.0mm,NATURAL,ST,TIN,PA46(Nylon 46),DIP

Joint Tech Electronic Industrial Co.,Ltd.	A2001WV-04P146

2.4.11 COM Header

COM1, COM2 : 2 x RS232 Port (with 5V/12V/RI)

Pin		Signal	Pin		Signal
1	COM3_P1_40mils	DCD (Data Carrier Detect)	2	NRX3	RXD# (Receive Data)
3	NTX3	TXD# (Transmit Data)	4	NDTR3	DTR (Data Terminal Ready)
5	GND	Ground	6	NDSR3	DSR (Data Set Ready)
7	NRTS3	RTS (Request To Send)	8	NCTS3	CTS (Clear To Send)

9	COM3_P9_40mils	RI (Ring Indicator)	10	Key	Key (no pin)

COM3, COM4 : 2 x RS232/422/485 Port (with 5V/12V/RI)

Pin	Signal			Pin	Signal		
	RS232	RS485	RS422		RS232	RS485	RS422
1	DCD (Data Carrier Detect)	R(A) / T(A)	TX(B)	2	RXD# (Receive Data)	R(B) / T(B)	TX(A)
3	TXD# (Transmit Data)	NC	RX(A)	4	DTR (Data Terminal Ready)	NC	RX(B)
5	Ground	Ground	Ground	6	DSR (Data Set Ready)	NC	NC
7	RTS (Request To Send)	DE#/RE	NC	8	CTS (Clear To Send)	NC	NC
9	RI (Ring Indicator)	NC	NC	10	Key (no pin)	Key (no pin)	Key (no pin)

2.4.12 CPU & SYS Fan Header

JCPUFAN1

Pin1 = GND

Pin2 = 12V

Pin3 = CPU_FAN_TACH

Pin4 = CPU_FAN_CTRL

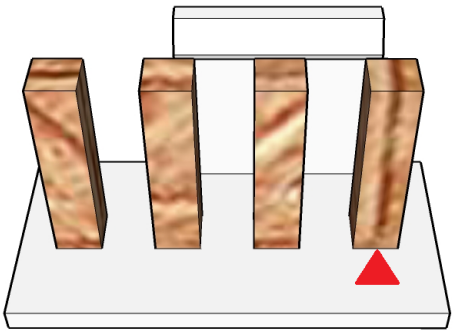
JSYSFAN1

Pin1 = GND

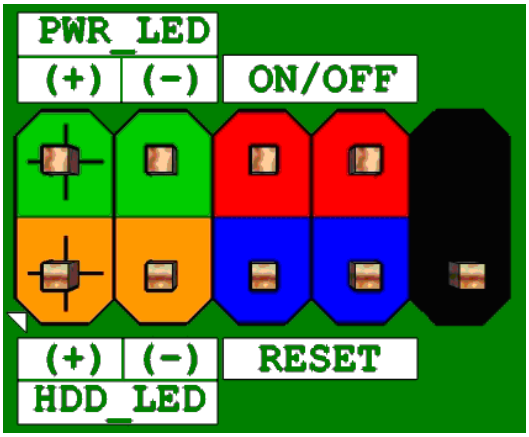
Pin2 = 12V

Pin3 = SYS_FAN_TACH

Pin4 = SYS_FAN_CTRL



2.4.13 Front Panel Header



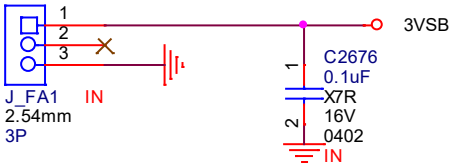
Pin	Signal Name	Description	Pin	Signal Name	Description
1	HDD_POWER_LED	Pull-up resistor (750Ω) to +5V	2	POWER_LED_MAIN	[Out] Front panel LED (main color)
3	HDD_LED#	[Out] Hard disk activity LED	4	POWER_LED_ALT	[Out] Front panel LED (alt color)
5	GROUND	Ground	6	POWER_SWITCH#	[In] Power switch
7	RESET_SWITCH#	[In] Reset switch	8	GROUND	Ground
9	+5V_DC	Power	10	KEY	No pin

TF-CON;HDR,SBU,5Pin*2,-P10,MA,2.54mm,BLACK,ST,Gold Flash,PA6T(Nylon 6T),-P10;(Black + Color Sprayed Printing,DIP	
SUPERIOR TECH CO.,LTD.	PHED-DS010G1AZONA-N157

2.4.14 SPI Header

Notes: MB is at G3 mode and add external 3.3V to support 3VSB power to protect SP600 power leakage when run/program BIOS code

Step1: take 2nd R01 MB (support external 3VSB power)



Step2: link the J_FA1.1 to J_FA1.1 (3VSB)

Step3: link the J_FA1.3 to J_FA1.3 (3VSB)

Step4: Power on 2nd R01 MB

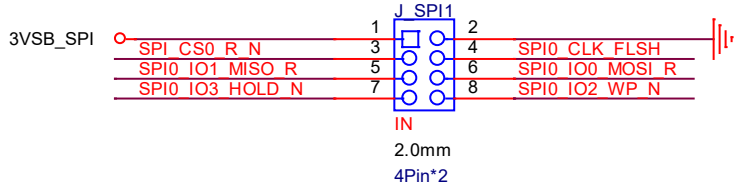
Step5: Make external SPI cable with below spec

Pin	Function	Link	Pin	Function
1	3VSB_SPI	pin1 link pin1	1	Vcc

2	GND	pin2 link pin2	2	GND
3	SPI_CS0_R_N	pin3 link pin3	3	CS
4	SPI0_CLK_FLSH	pin4 link pin4	4	CLK
5	SPI0_IO1_MISO	pin5 link pin5	5	MISO
6	SPI0_IO0_MOSI	pin6 link pin6	6	MOSI
7	SPI0_IO3_HOLD_N	pin7 link pin8	8	I/O3
8	SPI0_IO2_WP_N	NC	7	NC

Step6: Run "program BIOS code" at SF100/SF600 tool

J_SPI1 SPI header pinout:



Here is R01 MB pinout that PVT/DVT MB J_SPI1 pin8 is NC

Pin	Function	Function	Pin
1	3VSB_SPI	GND	2
3	SPI_CS0_R_N	SPI0_CLK_FLSH	4
5	SPI0_IO1_MISO	SPI0_IO0_MOSI	6
7	SPI0_IO3_HOLD_N	SPI0_IO2_WP_N	8

SF100 cable pinout

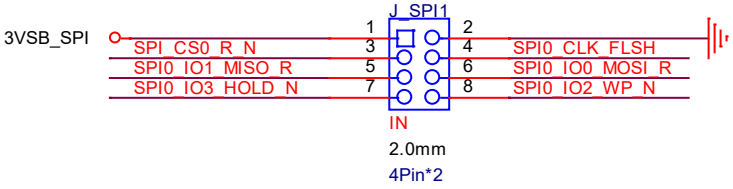
Pin	Function	Function	Pin
1	Vcc	GND	2
3	CS	CLK	4
5	MISO	MOSI	6
7	NC	I/O3	8

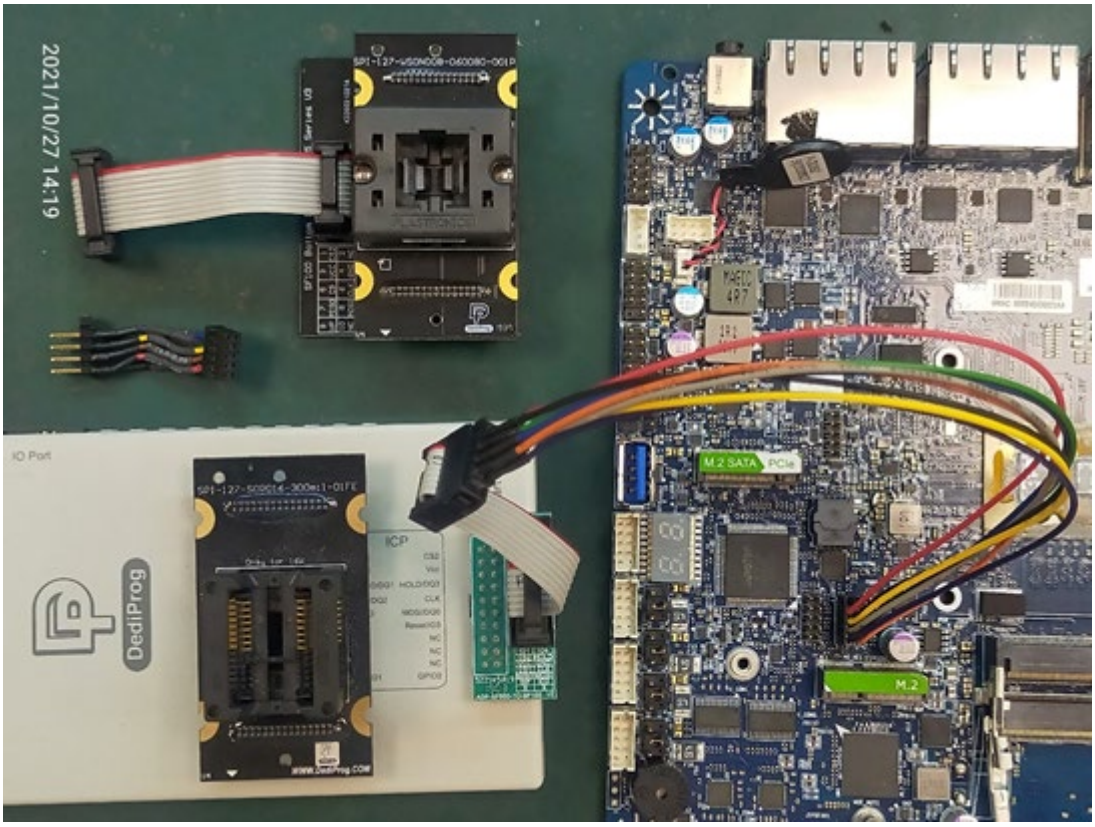
SPI header

SF100 SPI NOR Flash or SF600 SPI NOR Flash + SF100 Universal Adaptor + SP100 cable

Keep pin8 NC for update BIOS flash IC

Pin	Function	Function	Pin
1	Vcc	GND	2
3	CS	CLK	4
5	MISO	MOSI	6
7	NC	I/O3	8



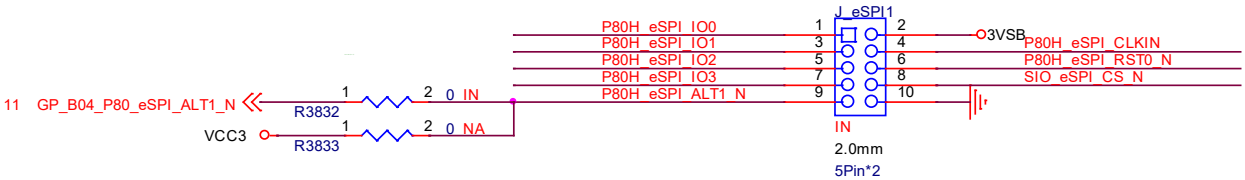


SF600 SPI NOR Flash

Wp/DQ2 signal is optional

Pin	Function	Function	Pin
1	Vpp	CS2	2
3	CS1	Vcc	4
5	MISO/DQ1	Hold/DQ3	6
7	Wp/DQ2	CLK	8
9	GND	MOSI/DQ0	10
11	NC	Reset	12

2.4.15 eSPI Header



2.4.16 I2C Header

Function	Pin	Pin	Function
V_I2C_3P3V	1	2	I2C_RST_N_3P3V
3P3V_I2C2_SCL	3	4	1P8V_I2C5_SCL
3P3V_I2C2_SDA	5	6	1P8V_I2C5_SDA
GND	7	8	I2C_INT_N_3P3V

TF-CON;HDR,SBU,4Pin*2,4 Walls,MA,2.0mm,BEIGE,ST,Gold Flash	
Joint Tech	A2004WV-2X04PY21

2.4.17 I2S Header

Pin	Function
1	V_I2S_PW
2	HDR_I2S_TXD
3	HDR_I2S_SCLK
4	HDR_I2S_SFRM
5	HDR_I2S_RXD
6	GND

TF-CON;HDR,SBU,6Pin,4 Walls,MA,2.0mm,BEIGE,ST,TIN,	
Joint Tech	A2001WV-06PR4NT1N05G

2.4.18 GPIO Header

Function	Pin	Pin	Function
VCC	1	2	GND
GPIO01	3	4	GPIO02
GPIO03	5	6	GPIO04
GPIO05	7	8	GPIO06
GPIO07	9	10	GPIO08

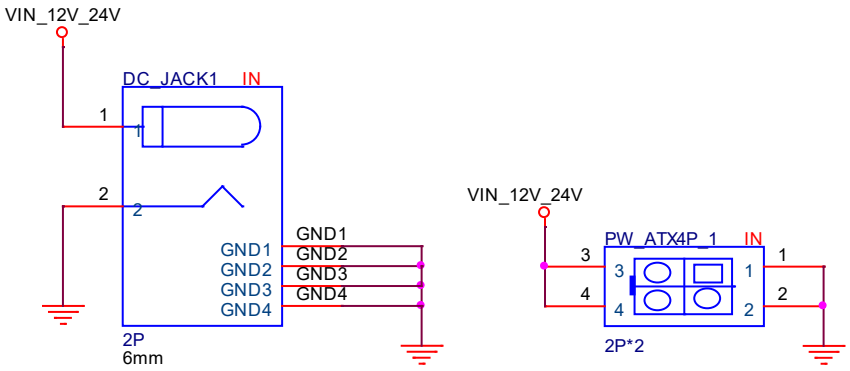
TF-CON;HDR,SBU,5Pin*2,MA,2.0mm,BLACK,ST,Gold Flash,PA6T(Nylon 6T)	
Joint Tech	A2016WV-2X05P6T
ACES	60476-010T1-001

2.4.19 DC-in Connector

12V – 24V Wide Range DC-In

DC_JACK1 and PW_ATX4P_1 are optional to support DC input power

PW_ATX4P_1 is Mini-Fit Jr 4 Pin DC-In Connector



TF-CON;POWER,SBU,ATX,12V,DC,2P*2,FM,4.2mm,ST,PA46(Nylon 46),IVORY,TIN	
TE Connectivity CO.LTD	1-1775099-2
XIAN YI INTERNATIONAL CO., LTD	GW11211-04P-1U
LOTES CHIA TSE TERMINAL INDUST	ABA-POW-003-K34
FOXCONN (HONG HAI PRECISION IN	HM3502E-P1

TF-CON;POWER,SBU,DC Power Jack,DC/20V,2P,MA,6mm,R/A,PA10T,2.2mm	
Ling Yang	DX-01460-BJ100AT01
SINGATRON	2DC-G213-B88F

2.5 Jumper Setting

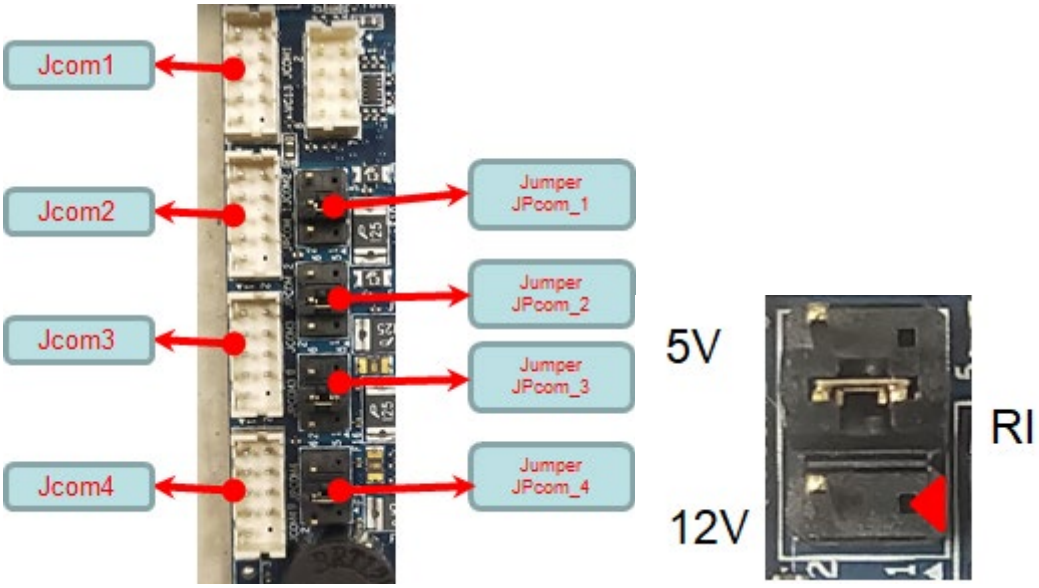
2.5.1 COM Power Jumper Setting

Support 5V 1A (Optional)

Support 12V 1A (Optional)

Support RI signal (Default)

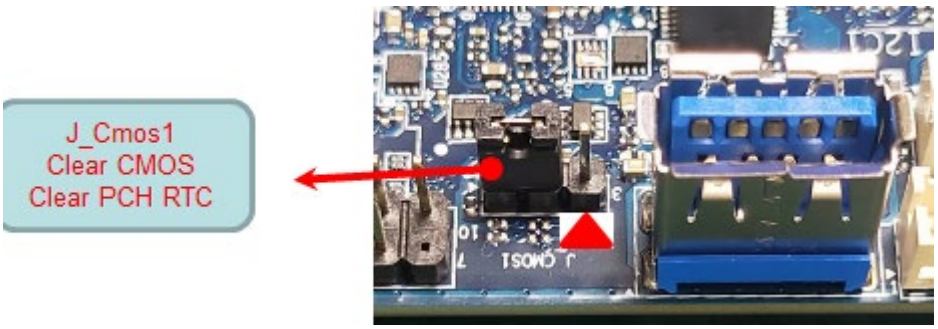
JPCOM_1/JPCOM_2/JPCOM_3/JPCOM_4			
		P2	V_12P
P3	NRI1	P4	COM1_P9
		P6	V+5P



2.5.2 CMOS Jumper Setting

Pins 3&2: Jumper position for CMOS Clear

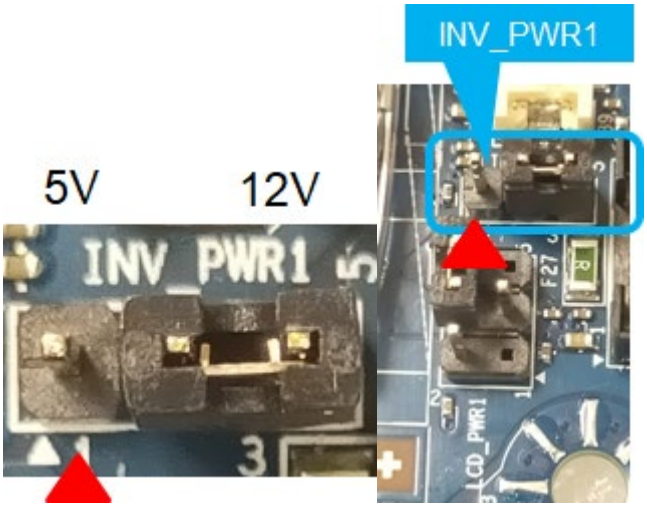
Pin	Signal Name
1	NC
2	SRTC_RTEST_N
3	GND



2.5.3 Backlight Power Jumper Setting

Pin	Signal	Description

1	PNL_BL_5V	5V option
2	BKLT_PWR	Send voltage to connector
3	PNL_BL_12V	12V option



2.5.4 LCD Power Jumper Setting

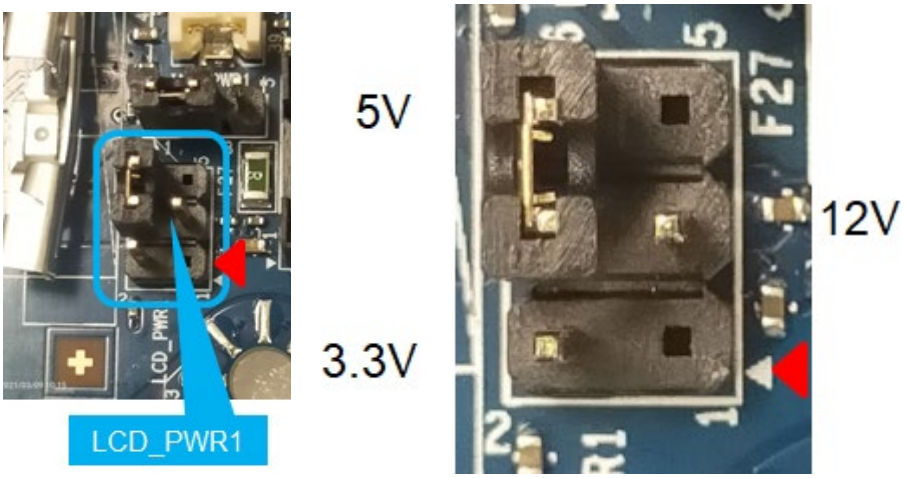
Pin	Signal	Description
1	Key	No pin
2	5V	5V option (default)
3	8v~24V	Vin option same as DC-IN power rail
4	BKLT_PWR	Send voltage to connector
5	Key	No pin
6	12V	12V option

Default LVDS Panel

LCD_PWR1	
12V	(3-4)
5V	(4-6)

eDP Panel Silkscreen

LCD_PWR1	Default
3.3V	(2-4)
5V	(4-6)

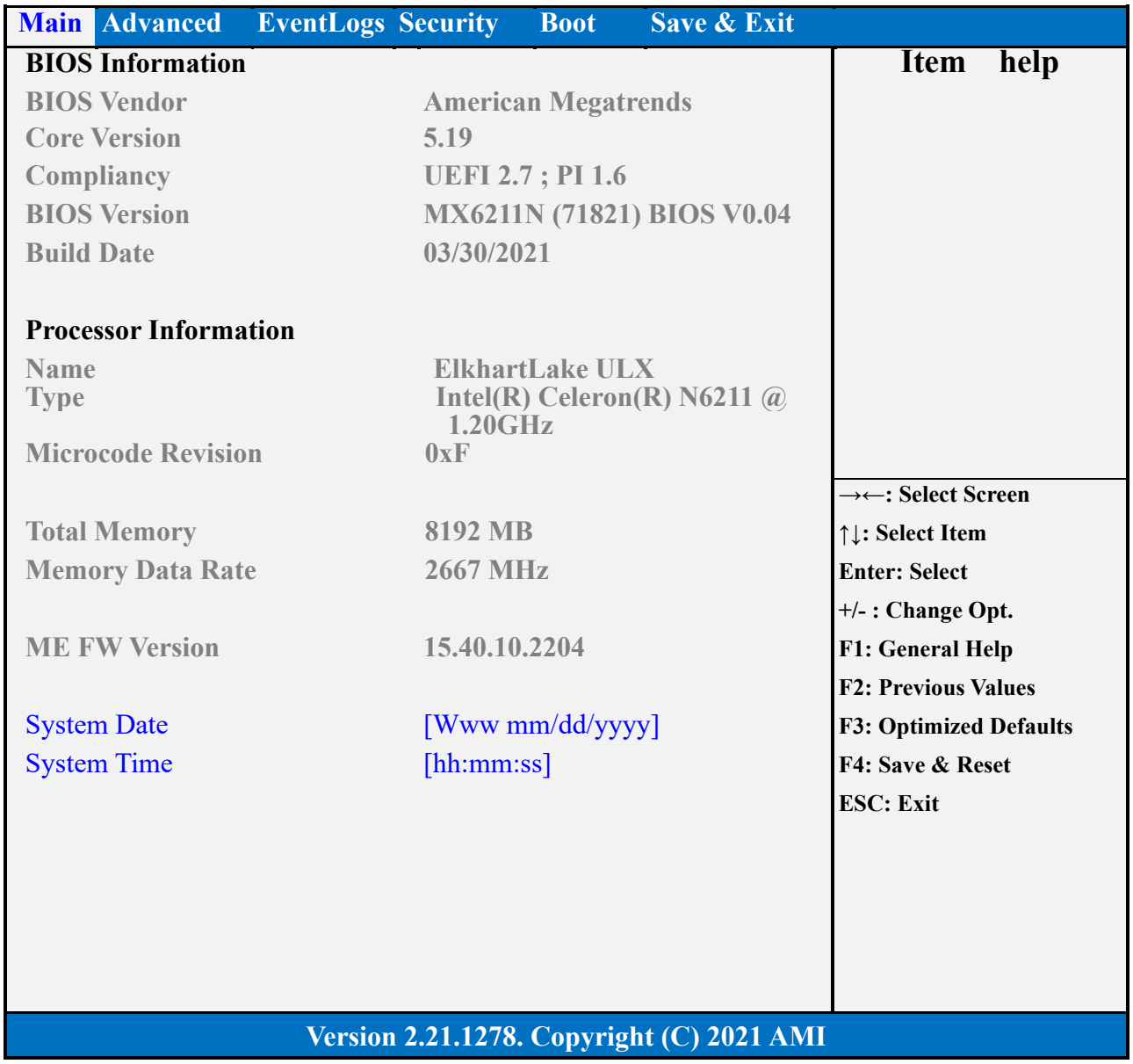


2.6 Power Management

Wake-Up Event	From ACPI State	Comments
Power button	S3, S4, S5, deep S5/S4	Deep sleep doesn't support Deep S3 function
RTC alarm	S3, S4, S5	Doesn't support "S5/S4 WOL disable" and "Deep power enable mode at S4/S5"
LAN	S3, S4, S5	"S5 WOL after G3" must be supported; monitor to remain in sleep state
USB	S3	
PCIe M2 Key E	S3, S4, S5	
PCI	None	None
CIR	None	None
PS2	None	None

MX6210N & MX6412J
BIOS SETUP
SPEC

1 Main Page



Field Name	**BIOS Vender**
Default Value	American Megatrends
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**Core Version**
Default Value	5.19
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**Compliancy**
Default Value	UEFI 2.7 ; PI 1.6
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**BIOS Version**
Default Value	Display the version of the BIOS
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**Build Date**
Default Value	Display build date of the BIOS

Comment	This field is not selectable. There is no help text associated with it.

Field Name	**Processor Information**
Value	Display the installed CPU brand.
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**Total Memory**
Value	Display the installed memory size.
Comment	This field is not selectable. There is no help text associated with it.

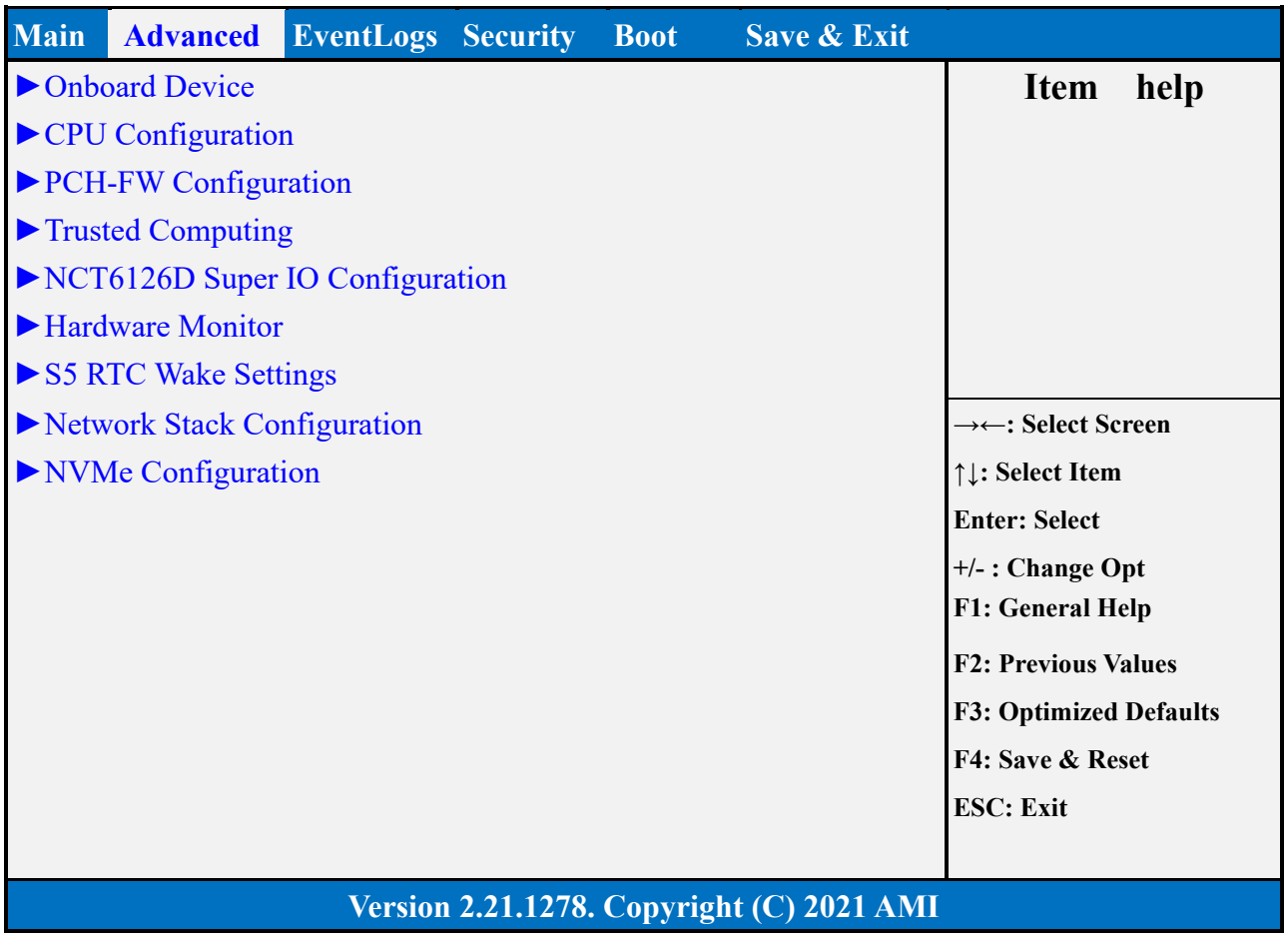
Field Name	**Memory Data Rate**
Value	Display the installed memory frequency.
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**ME FW Version**
Value	ME Firmware Version.
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**System Date**
Default Value	[Www mm/dd/yyyy]
Possible Value	Www : Mon/Tue/Wed/Thu/Fri/Sat/Sun mm : 1-12 dd : 1-31 yyyy : 1998-9999
Help	Set the Date. Use Tab to switch between Date elements.

Field Name	**System Time**
Default Value	[hh :mm :ss]
Possible Value	hh : 0-23 mm : 0-59 ss : 0-59
Help	Set the Time. Use Tab to switch between Time elements.

2 Advanced Page



Field Name	**Onboard Device**
Help	Onboard Device Configuration.
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**CPU Configuration**
Help	CPU Configuration Parameters.
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**PCH-FW Configuration**
Help	Configure Management Engine Technology Parameters.
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**Trusted Computing**
Help	Trusted Computing Settings
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**NCT6126D Super IO Configuration**
Help	System Super IO Chip Parameters.
Comment	Press Enter when selected to go into the associated Sub-Menu.

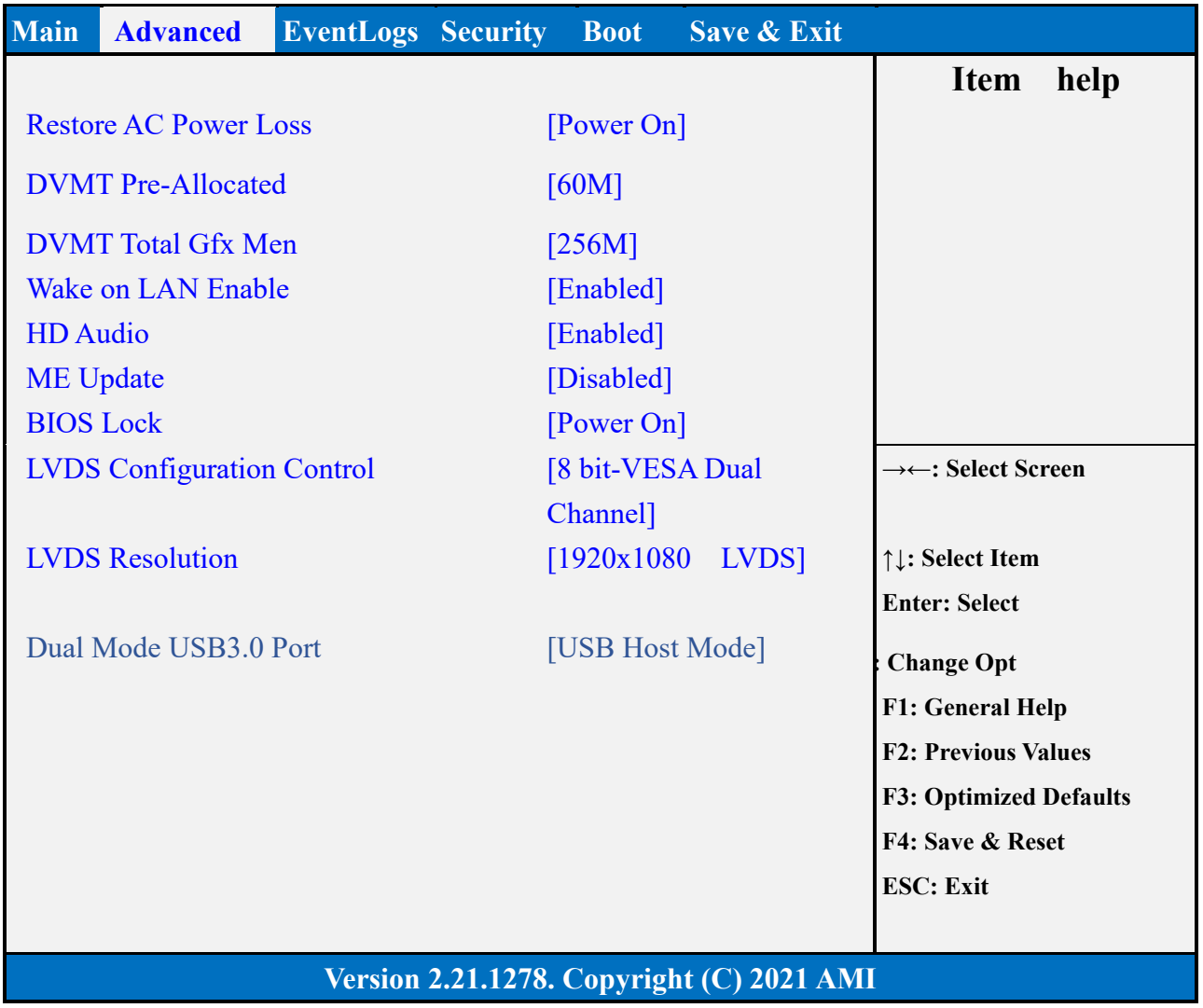
Field Name	**Hardware Monitor**
Help	Monitor hardware status
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**S5 RTC Wake Settings**
Help	Enable system to wake from S5 using RTC alarm
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**Network Stack Configuration**
Help	Network Stack Settings.
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**NVMe Configuration**
Help	NVMe Device Options Settings
Comment	Press Enter when selected to go into the associated Sub-Menu.

Onboard Device



Field Name	**Restore AC Power Loss**
Default Value	[Power On]
Possible Value	Power On Power Off Last State
Help	Specify what state to go to when power is re-applied after a power failure (G3 state).

Field Name	**DVMT Pre-Allocated**
Default Value	[60M]
Possible Value	64M 32M/F7 36M 40M 44M

	48M 52M 56M 60M
Help	Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.

Field Name	**DVMT Total Gfx Mem**
Default Value	[256M]
Possible Value	128M 256M MAX
Help	Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device.

Field Name	**Wake on LAN Enable**
Default Value	[Enabled]
Possible Value	Enabled Disabled
Help	Enable/Disable integrated LAN to wake the system.

Field Name	**HD Audio**
Default Value	[Enabled]
Possible Value	Enabled Disabled
Help	Control Detection of the HD-Audio device. Disabled = HDA will be unconditionally disabled Enabled = HDA will be unconditionally enabled.

Field Name	**ME Update**
Default Value	[Disabled]
Possible Value	Enabled Disabled
Help	Temporary disable Intel CSME for ME FW Update. Enabled = Intel CSME disabled after first time reboot only.

Field Name	**BIOS Lock**
Default Value	[Enabled]
Possible Value	Disabled Enabled
Help	Enable/Disable the PCH BIOS Lock Enable feature. Required to be enabled to ensure SMM protection of flash.

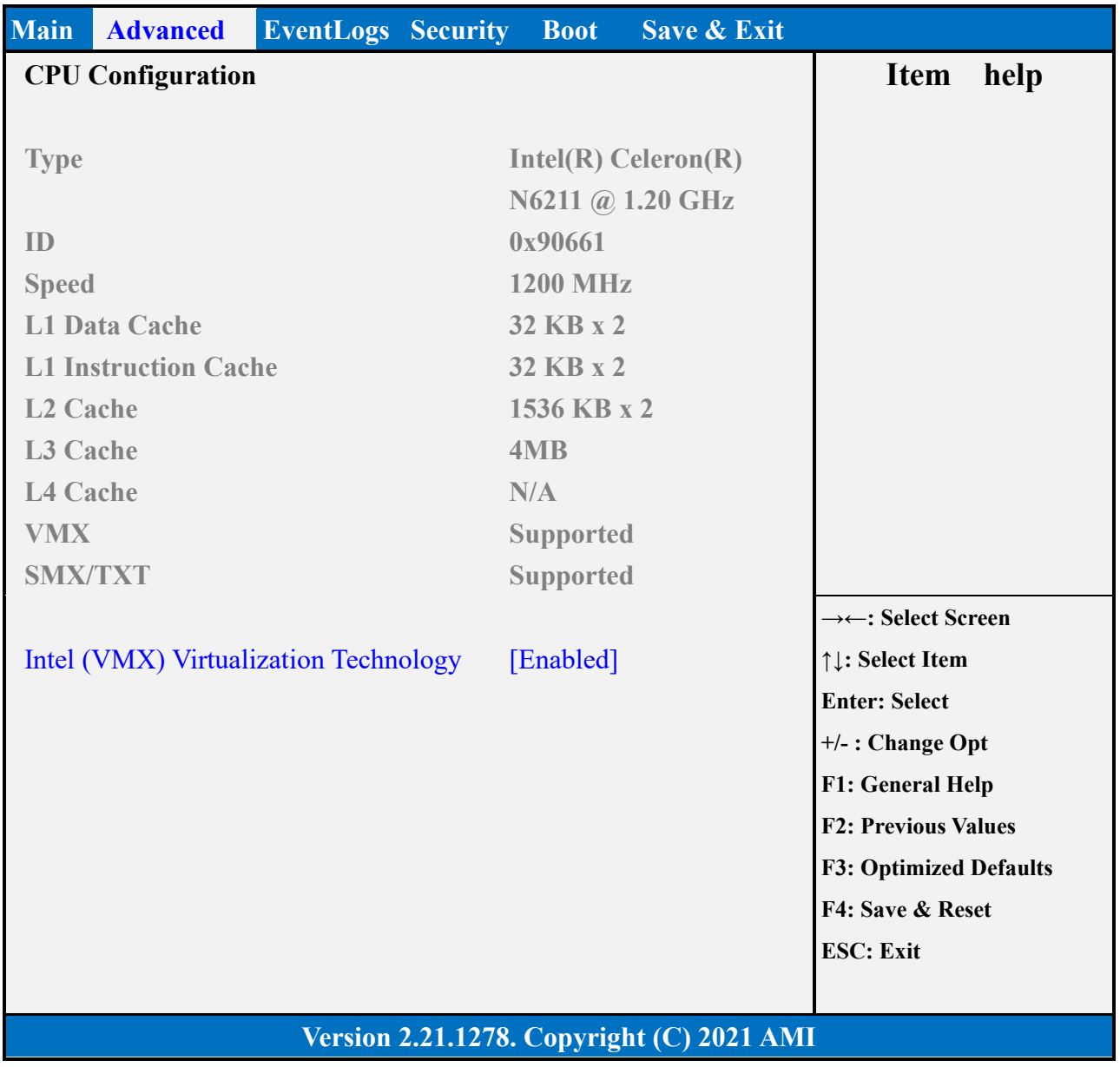
Field Name	**LVDS Configuration Control**
Default Value	[Disable]
Possible Value	8 bit-VESA Single Channel 8 bit-VESA Dual Channel 6 bit-VESA Single Channel 6 bit-VESA Dual Channel 8 bit-JEIDA Single Channel 8 bit-JEIDA Dual Channel Disable
Help	Sets LVDS connectivity.

Field Name	**LVDS Resolution**
Default Value	[1920x1080 LVDS]
Possible Value	1024x768 LVDS 1366x768 LVDS 1920x1080 LVDS

Help	Select LCD panel used by Internal Graphics Device by selecting the appropriate setup item.

Field Name	**Dual Mode USB3.0 Port**
Default Value	[USB Host Mode]
Possible Value	USB Host Mode USB Device Mode
Help	Select USB Operation Mode.

CPU Configuration



Field Name	**Type**
Default Value	[Intel CPU Brand String]
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**ID**
Default Value	Displays CPU Signature
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**Speed**

Default Value	Displays the CPU Speed
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**L1 Data Cache**
Default Value	L1 Data Cache Size
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**L1 Instruction Cache**
Default Value	L1 Instruction Cache Size
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**L2 Cache**
Default Value	L2 Cache Size
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**L3 Cache**
Default Value	L3 Cache Size
Comment	This field is not selectable. There is no help text associated with it.

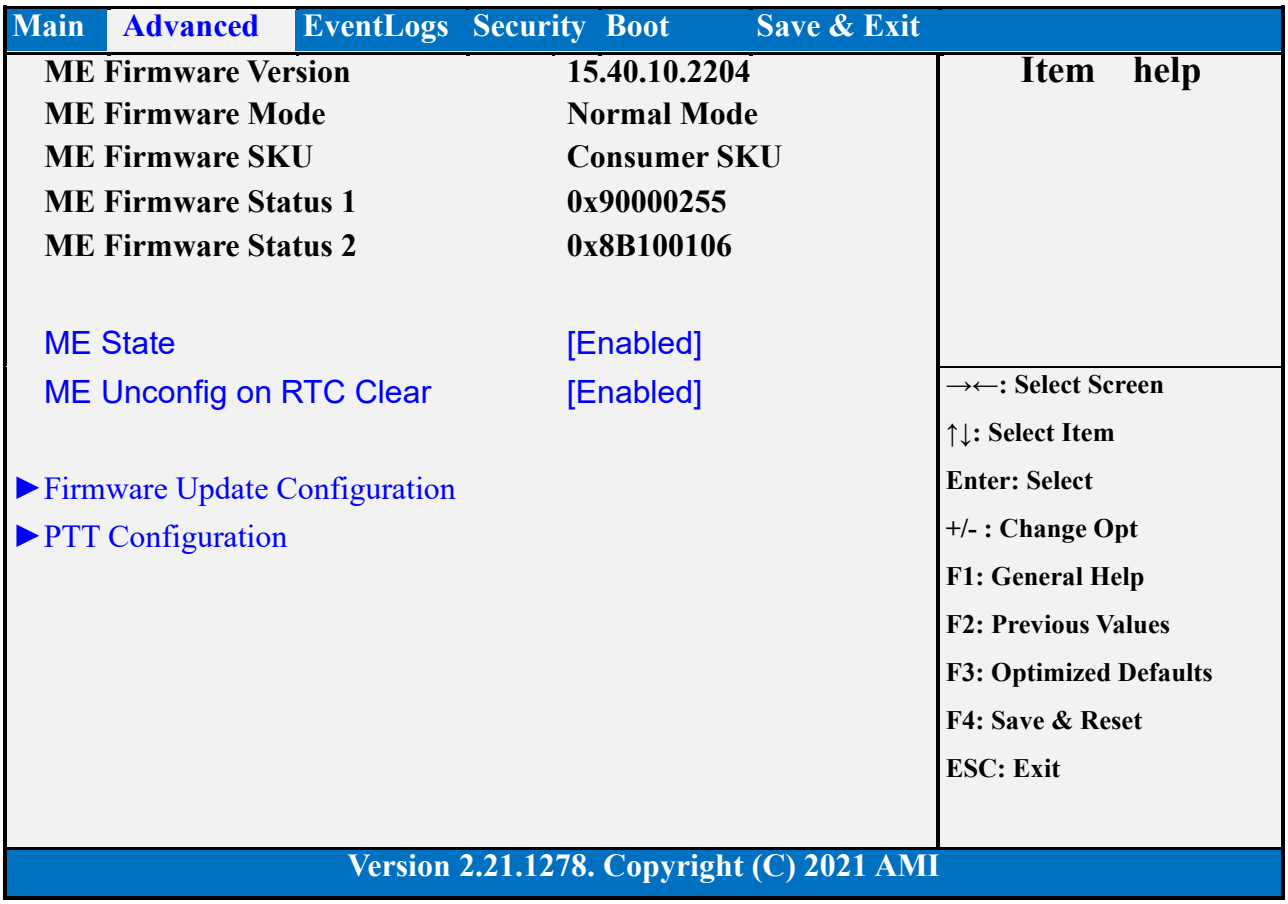
Field Name	**L4 Cache**
Default Value	L4 Cache Size
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**VMX**
Default Value	VMX Supported or Not
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**SMX/TXT**
Default Value	SMX/TXT Supported or Not
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**Intel (VMX) Virtualization Technology**
Default Value	[~~Disabled~~ Enabled]
Possible Value	Enabled Disabled
Help	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

PCH-FW Configuration



Field Name	**ME Firmware Version**
Default Value	ME version value by BIOS release
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**ME Firmware Mode**
Default Value	ME Mode
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**ME Firmware SKU**
Default Value	ME SKU by BIOS release
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**ME Firmware Status 1**
Default Value	0x90000255
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**ME Firmware Status 2**
Default Value	0x89100106
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**ME State**
Default Value	[Enabled]
Possible Value	Disabled Enabled

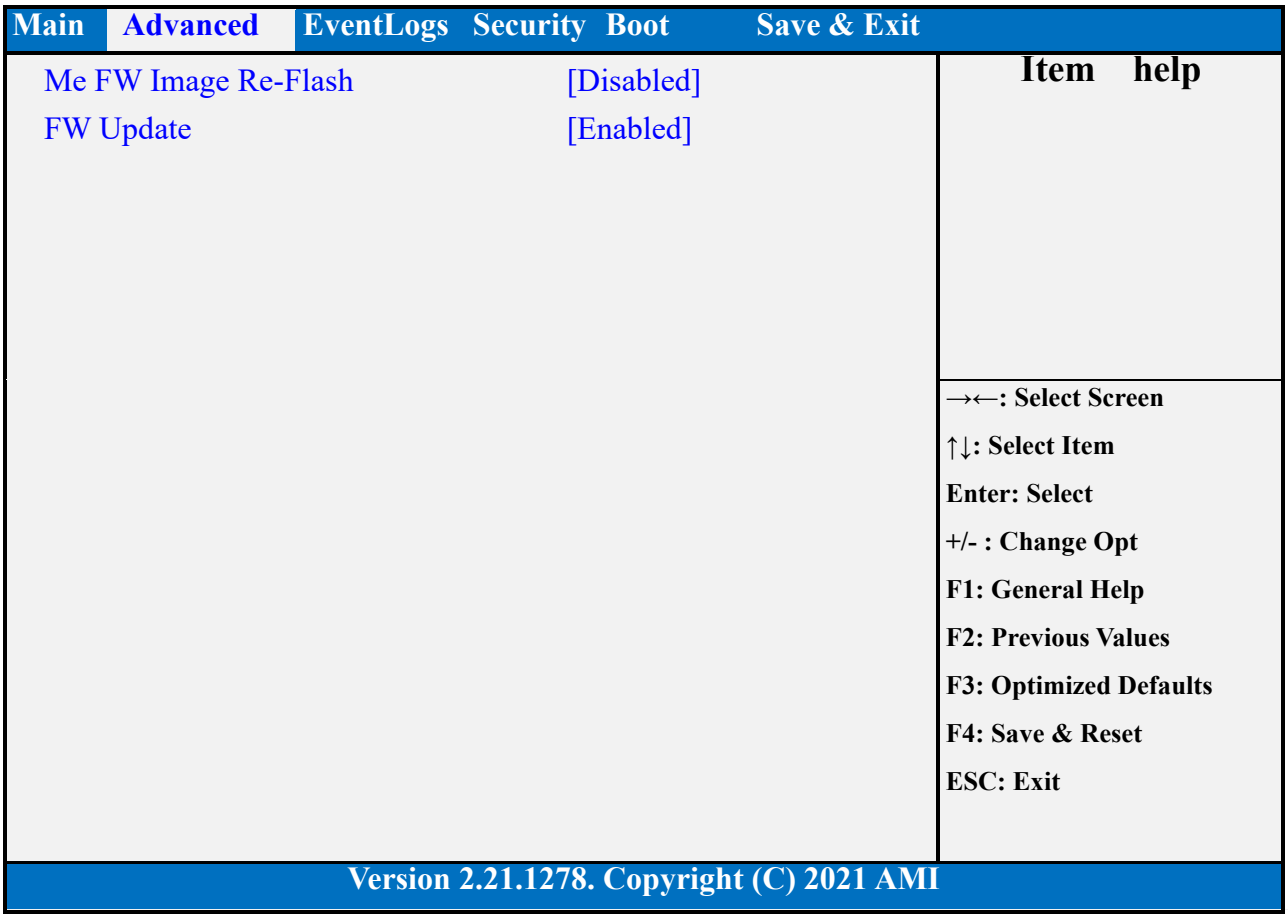
Help	When Disabled ME will be put into ME Temporarily Disabled Mode.

Field Name	**ME Unconfig on RTC Clear**
Default Value	[Enabled]
Possible Value	Disabled Enabled
Help	When disabled ME will not be unconfigured on RTC Clear.

Field Name	**Firmware Update Configuration**
Help	Configure Management Engine Technology Parameters
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**PTT Configuration**
Help	Configure PTT
Comment	Press Enter when selected to go into the associated Sub-Menu.

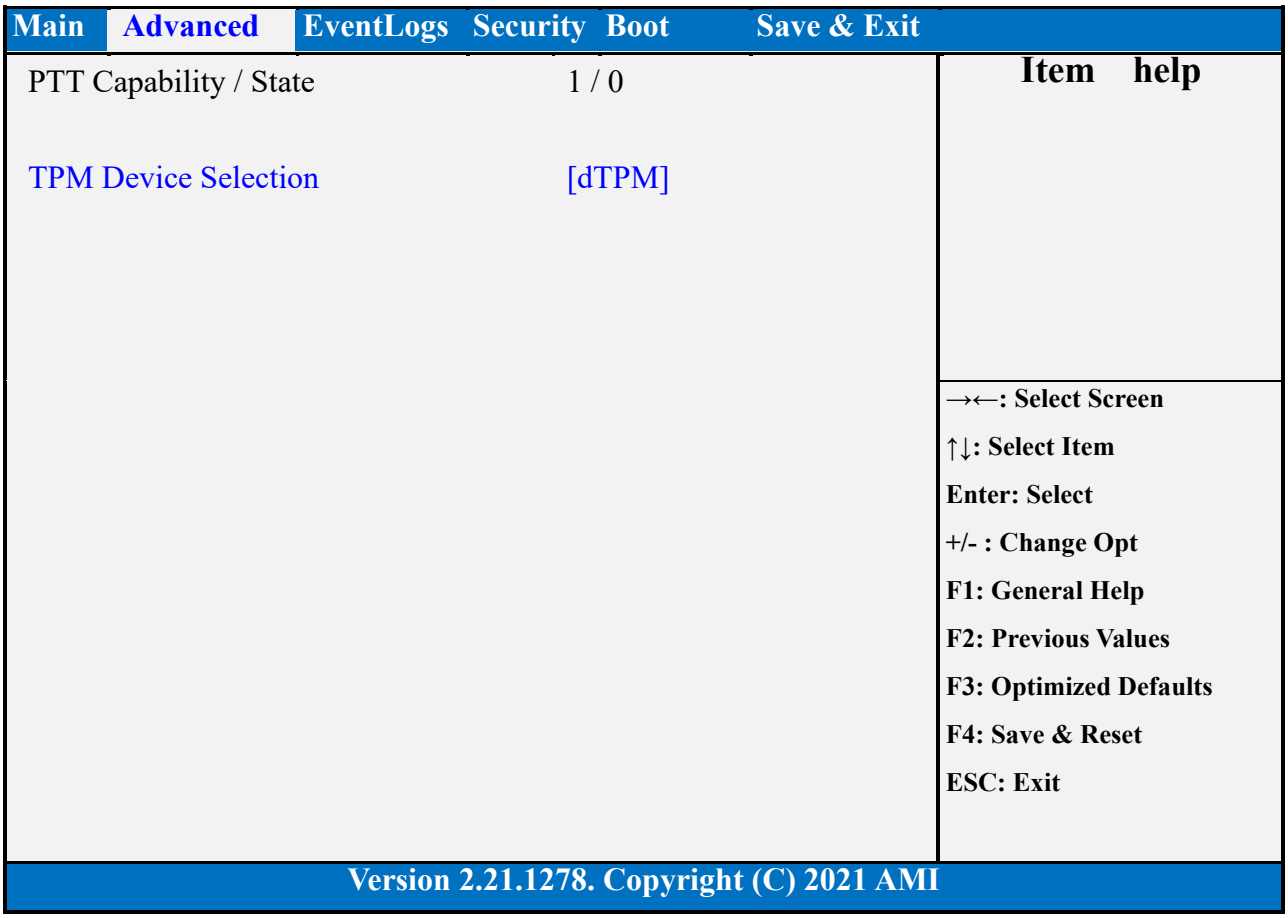
Firmware Update Configuration



Field Name	**Me FW Image Re-Flash**
Default Value	[Disabled]
Possible Value	Disabled Enabled
Help	Enable/Disable Me FW Image Re-Flash function.

Field Name	**FW Update**
Default Value	[Enabled]
Possible Value	Disabled Enabled
Help	Enable/Disable ME FW Update function.

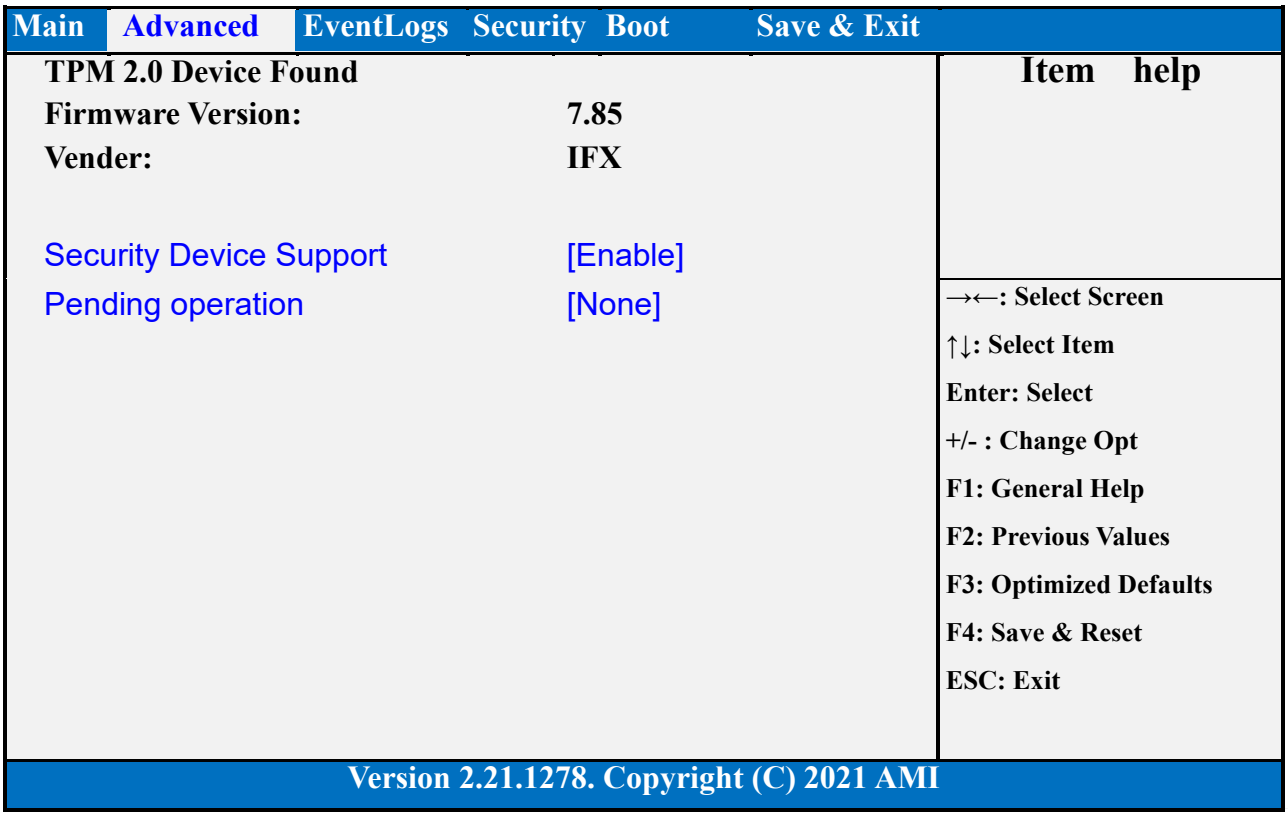
PTT Configuration



Field Name	PTT Capability / State
Default Value	1 / 0
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**TPM Device Selection**
Default Value	[dTPM]
Possible Value	dTPM PTT
Help	Selects TPM device: PTT or dTPM. PTT – Enables PTT in SkuMgr dTPM 1.2 – Disables PTT in SkuMgr Warning ! PTT/dTPM will be disabled and all data saved on it will be lost.

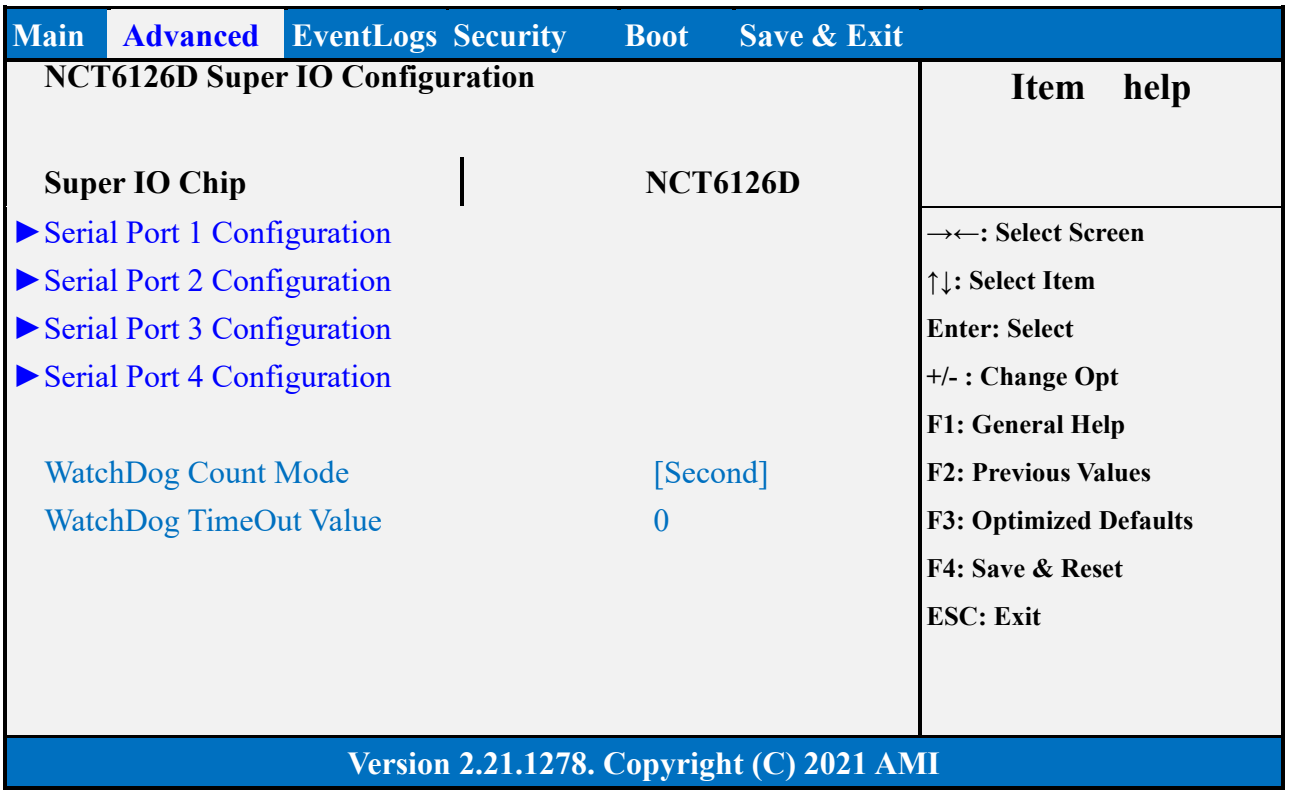
Trusted Computing



Field Name	**Security Device Support**
Default Value	[Enable]
Possible Value	Disable Enable
Help	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.

Field Name	**Pending operation**
Default Value	[None]
Possible Value	None TPM Clear
Help	Schedule an Operation for the Security Device. NOTE: Your Computer will reboot during restart in order to change State of Security Device.

NCT6126D Super IO Configuration



Field Name	**Serial Port 1 Configuration**
Help	Set Parameters of Serial Port 1 (COMA)
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**Serial Port 2 Configuration**
Help	Set Parameters of Serial Port 2 (COMB)
Comment	Press Enter when selected to go into the associated Sub-Menu.

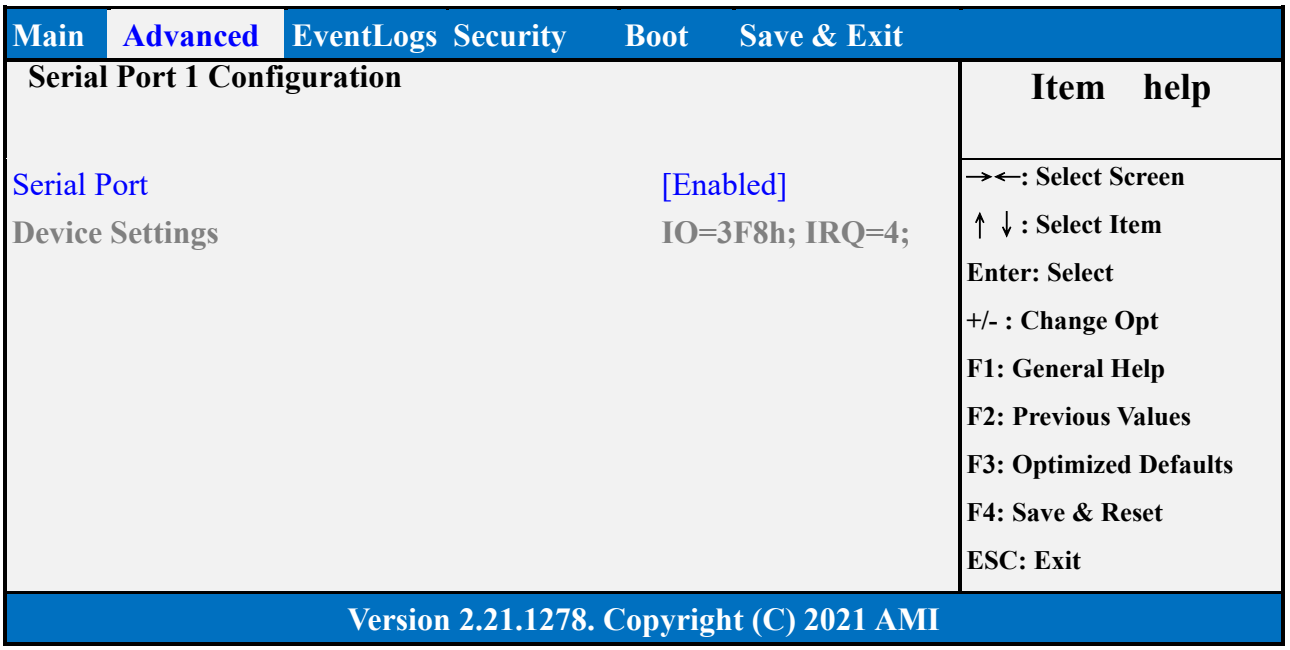
Field Name	**Serial Port 3 Configuration**
Help	Set Parameters of Serial Port 3 (COME)
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**Serial Port 4 Configuration**
Help	Set Parameters of Serial Port 4 (COMF)
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**WatchDog Count Mode**
Default Value	[Second]
Possible Value	Second Minute
Help	Configure watchdog count mode.

Field Name	**WatchDog TimeOut Value**
Default Value	[0]
Possible Value	0 ~ 255
Help	Configure watchdog TimeOut Value.

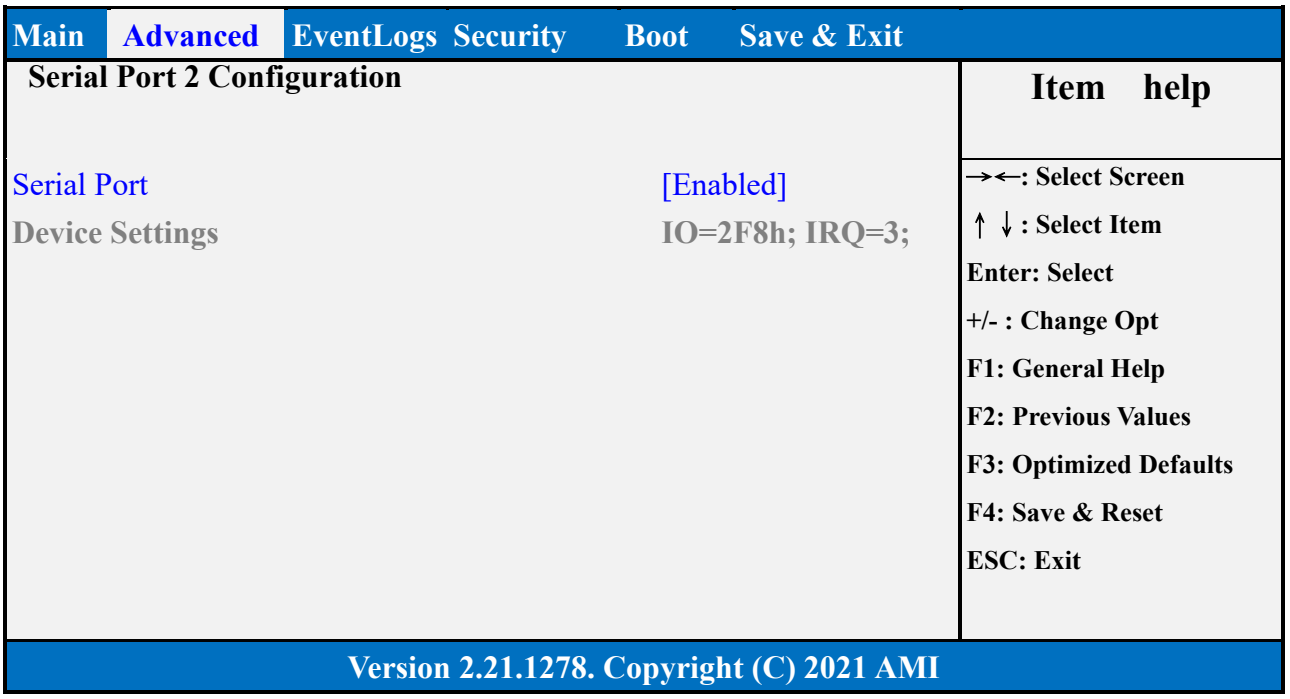
Serial Port 1 Configuration



Field Name	**Serial Port**
Default Value	[Enabled]
Possible Value	Disabled Enabled
Help	Enable or Disable Serial Port(COM)

Field Name	**Device Settings**
Default Value	Device Super IO COM1 Address and IRQ.
Comment	This field is not selectable. There is no help text associated with it.

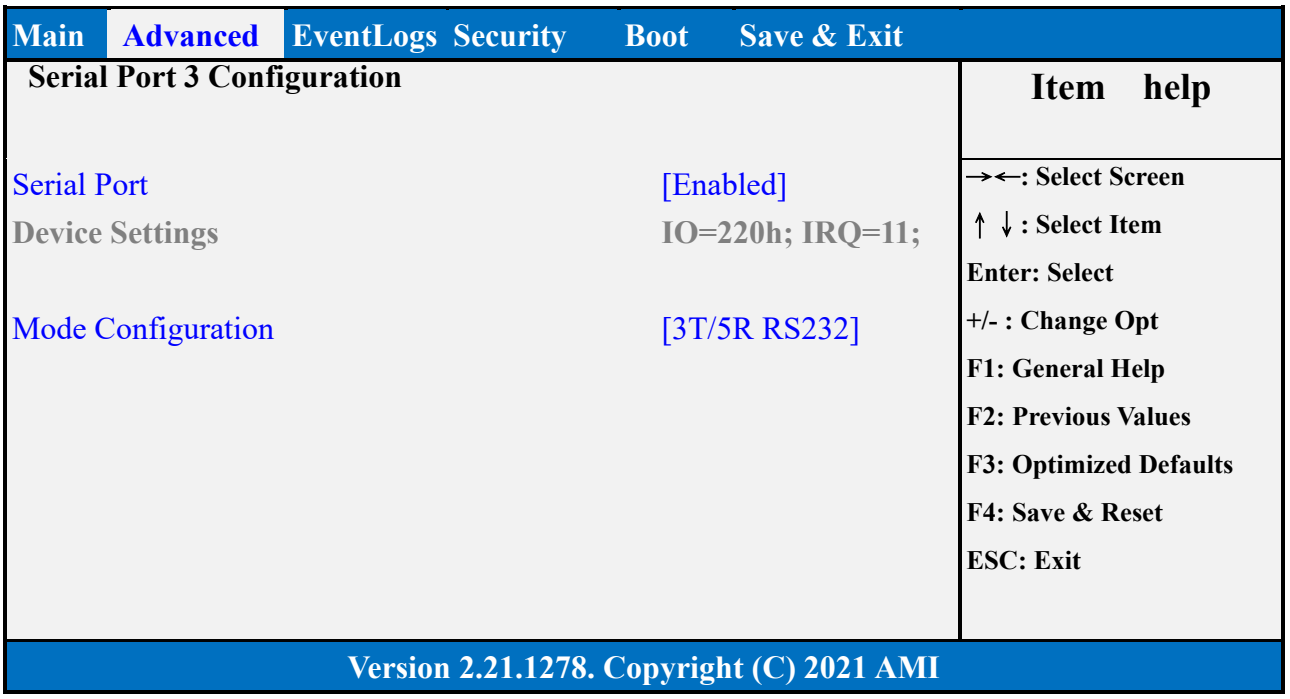
Serial Port 2 Configuration



Field Name	**Serial Port**
Default Value	[Enabled]
Possible Value	Disabled Enabled
Help	Enable or Disable Serial Port(COM)

Field Name	**Device Settings**
Default Value	Device Super IO COM2 Address and IRQ.
Comment	This field is not selectable. There is no help text associated with it.

Serial Port 3 Configuration

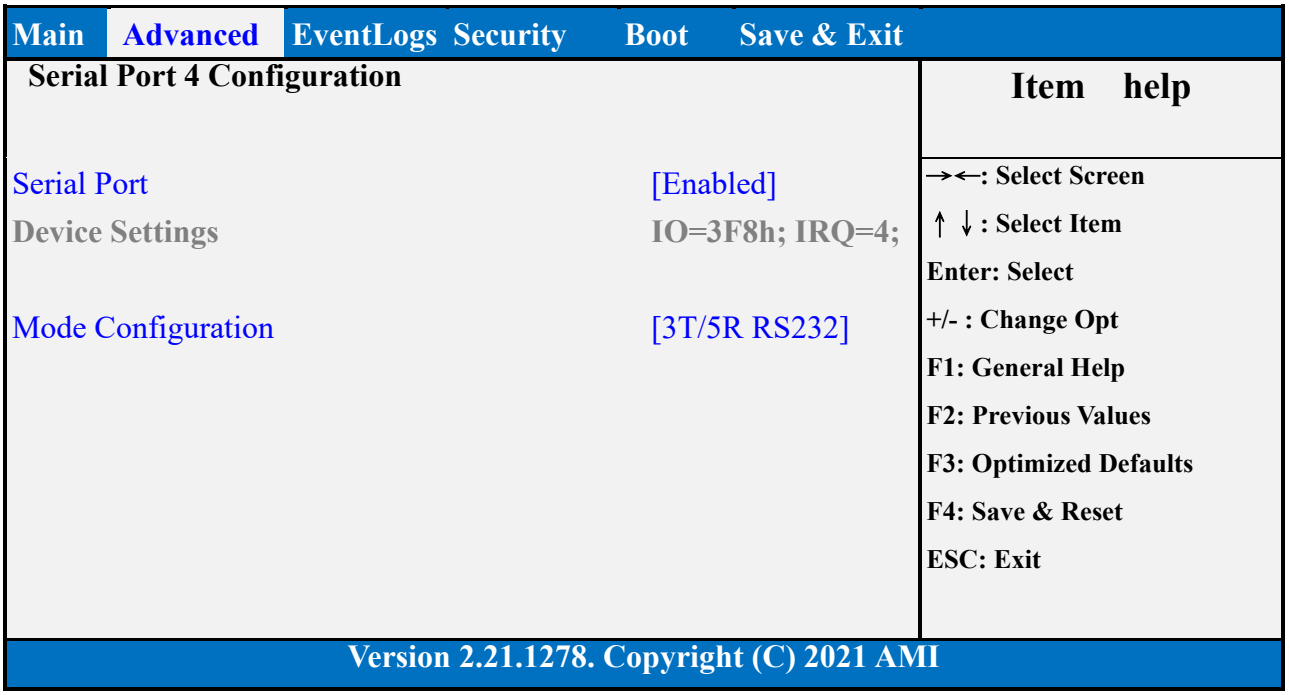


Field Name	**Serial Port**
Default Value	[Enabled]
Possible Value	Disabled Enabled
Help	Enable or Disable Serial Port(COM)

Field Name	**Device Settings**
Default Value	Device Super IO COM3 Address and IRQ.
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**Mode Configuration**
Default Value	[3T/5R RS232]
Possible Value	1T/1R RS422 3T/5R RS232 1T/1R RS485 TX ENABLE Low Active 1T/1R RS422 with termination resistor 1T/1R RS485 with termination resistor TX ENABLE Low Active
Help	Configure serial port as RS232/RS422/RS485.

Serial Port 4 Configuration

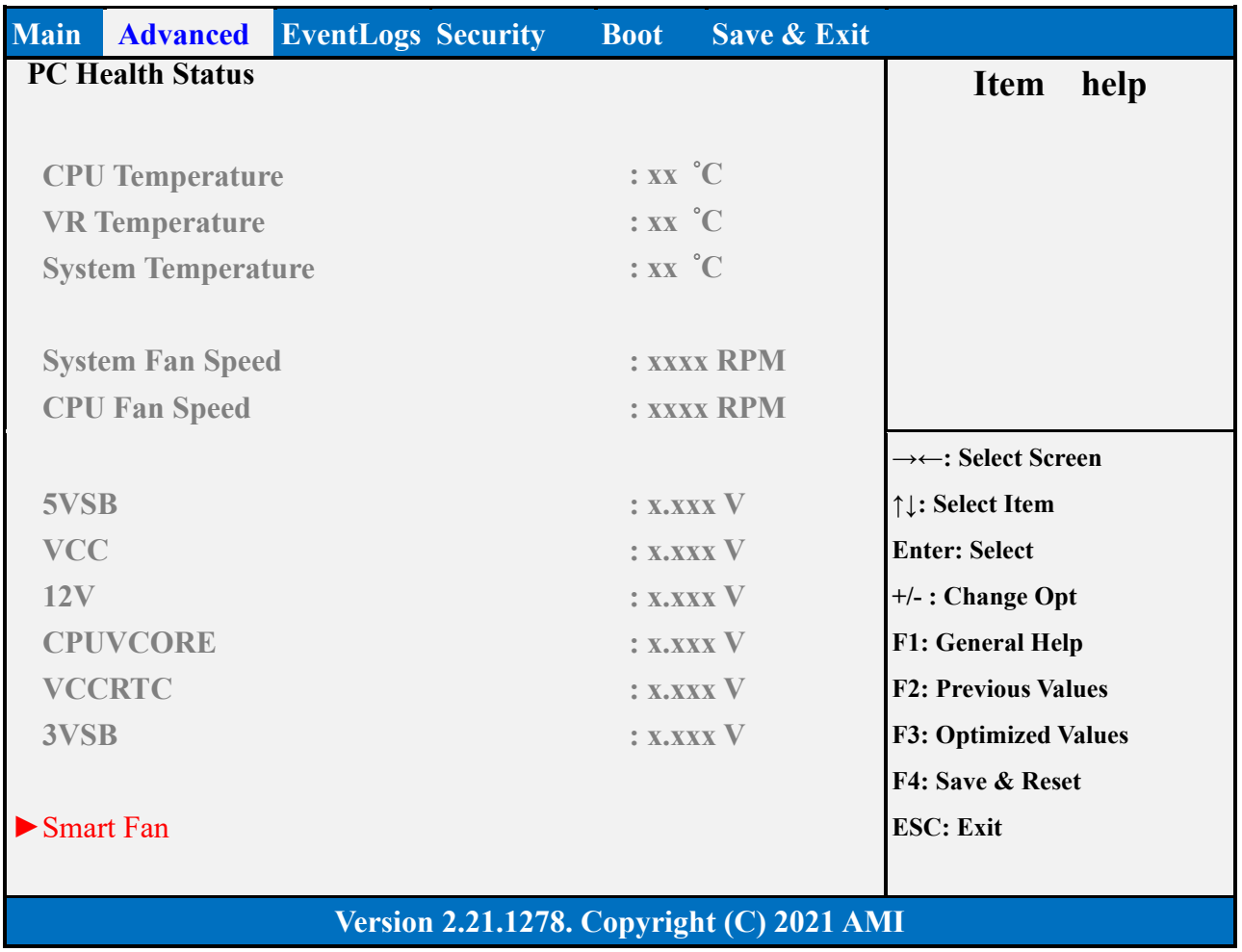


Field Name	**Serial Port**
Default Value	[Enabled]
Possible Value	Disabled Enabled
Help	Enable or Disable Serial Port(COM)

Field Name	**Device Settings**
Default Value	Device Super IO COM4 Address and IRQ.
Comment	This field is not selectable. There is no help text associated with it.

Field Name	**Mode Configuration**
Default Value	[3T/5R RS232]
Possible Value	1T/1R RS422 3T/5R RS232 1T/1R RS485 TX ENABLE Low Active 1T/1R RS422 with termination resistor 1T/1R RS485 with termination resistor TX ENABLE Low Active
Help	Configure serial port as RS232/RS422/RS485.

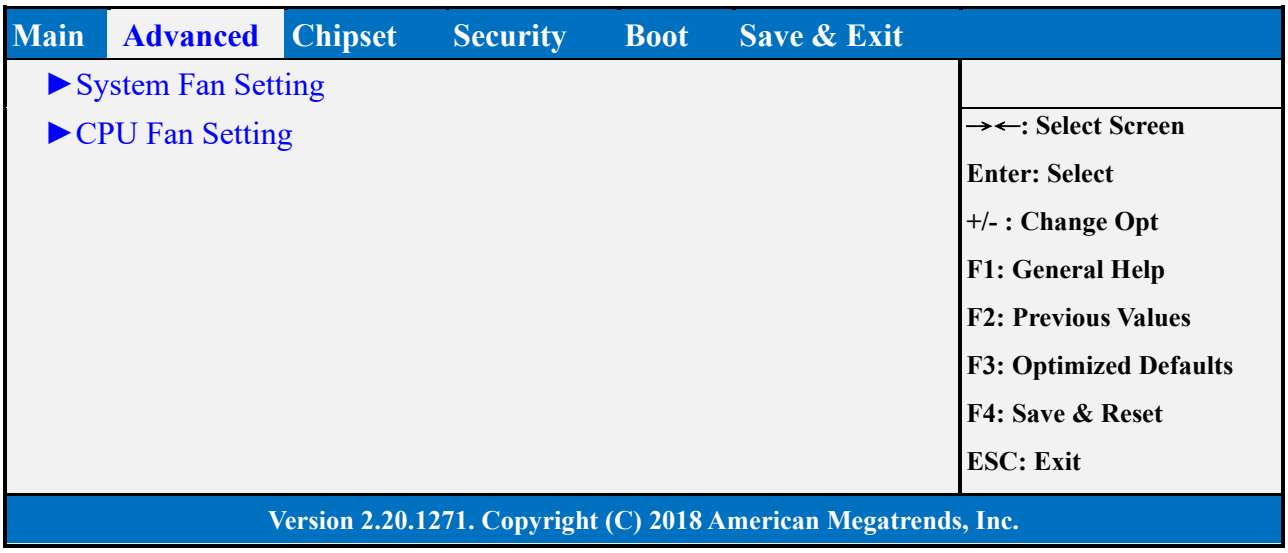
Hardware Monitor



Type	**Range**
VR Temperature	**-20 ~ 120 °C**
System Temperature	**-20 ~ 120 °C**
System Fan Speed	**There are many kinds of the fan could be installed into the system, so we could only set 0 RPM for the failed fan speed, and there is als no high RPM limitation.**
CPU Fan Speed	**There are many kinds of the fan could be installed into the system, so we could only set 0 RPM for the failed fan speed, and there is als no high RPM limitation.**
5VSB	**4.75V~5.25V (Pin 100 VIN0 => Vref = 1V) [R0A Vref = 1.05V]**
VCC	**4.75V~5.25V (Pin 99 VIN1 => Vref = 1V)**
12V	**11.4V~12.6V (Pin 98 VIN2 => Vref = 1V)**
CPUVCORE	**0V~2V (Pin 101 CPUCORE)**
VCCRTC	**2V~3.465V (Pin 74 VBAT)**
3VSB	**3.135V~3.465V (Pin 97 AVSB)**

Field Name	**Smart Fan**
Help	Smart Fan function setting
Comment	Press Enter when selected to go into the associated Sub-Menu.

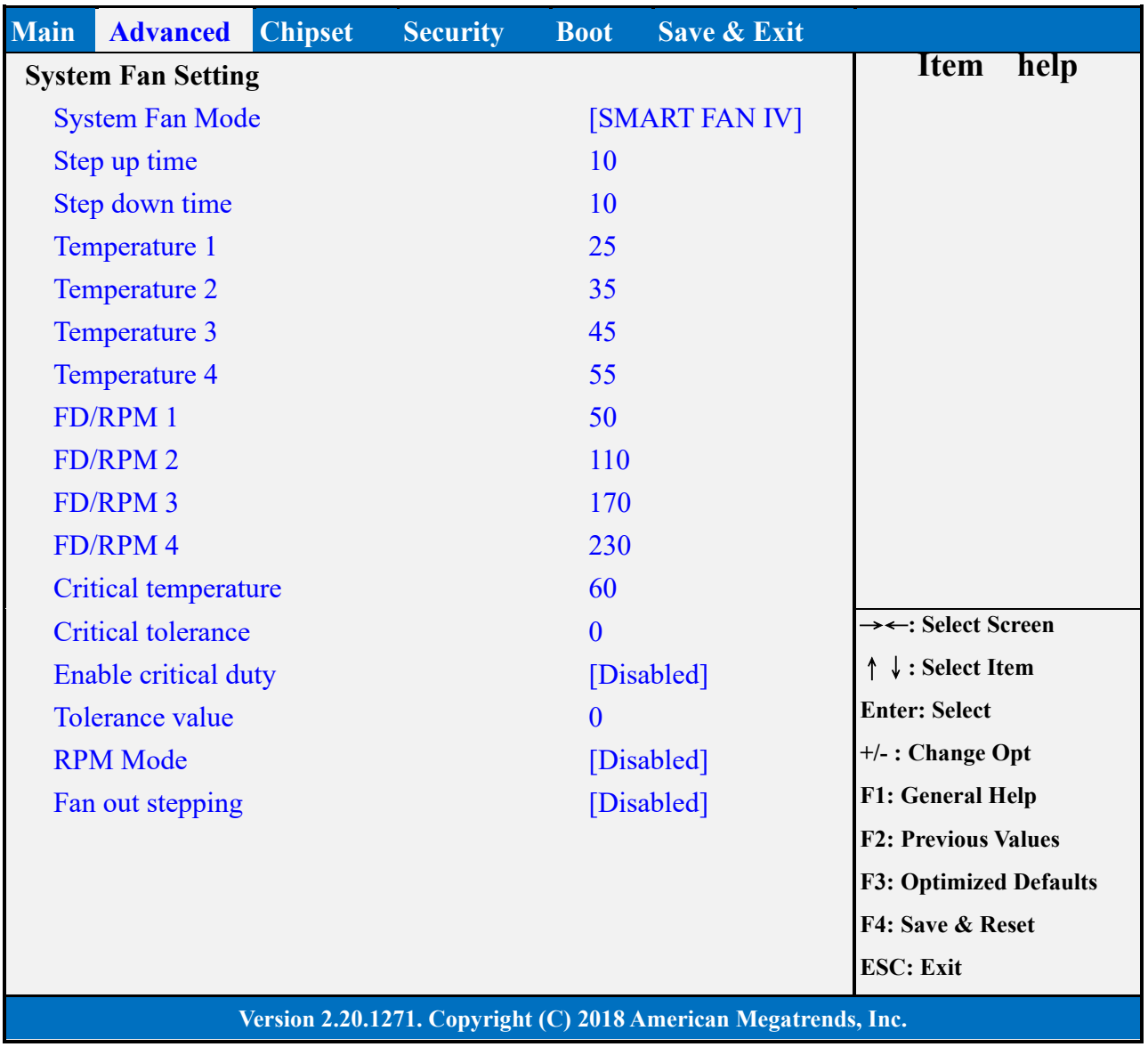
Smart Fan



Field Name	**System Fan Setting**
Help	Smart Fan function setting
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**CPU Fan Setting**
Help	Smart Fan function setting
Comment	Press Enter when selected to go into the associated Sub-Menu.

System Fan Setting



Field Name	**System Fan Mode**
Default Value	[SMART FAN IV]
Possible Value	Manual mode SMART FAN IV
Help	Fan control mode select

Field Name	**Step up time**
Default Value	10
Possible Value	0 ~ 255
Help	The amount of time Fan takes to increase its values by one step. (Units are intervals of 0.1 second)

Field Name	**Step down time**
Default Value	10
Possible Value	0 ~ 255
Help	The amount of time Fan takes to increase its values by one step. (Units are intervals of 0.1 second)

Field Name	**Temperature 1**

Default Value	25
Possible Value	0 ~ 255
Help	The value of temperature 1.

Field Name	**Temperature 2**
Default Value	35
Possible Value	0 ~ 255
Help	The value of temperature 2.

Field Name	**Temperature 3**
Default Value	45
Possible Value	0 ~ 255
Help	The value of temperature 3.

Field Name	**Temperature 4**
Default Value	55
Possible Value	0 ~ 255
Help	The value of temperature 4.

Field Name	**FD/RPM 1**
Default Value	50
Possible Value	0 ~ 255
Help	The value of Fan Duty/RPM when temperature is T1.

Field Name	**FD/RPM 2**
Default Value	110
Possible Value	0 ~ 255
Help	The value of Fan Duty/RPM when temperature is T2.

Field Name	**FD/RPM 3**
Default Value	170
Possible Value	0 ~ 255
Help	The value of Fan Duty/RPM when temperature is T3.

Field Name	**FD/RPM 4**
Default Value	230
Possible Value	0 ~ 255
Help	The value of Fan Duty/RPM when temperature is T4.

Field Name	**Critical temperature**
Default Value	60
Possible Value	0 ~ 255
Help	Fan temperature critical value.

Field Name	**Critical tolerance**
Default Value	0
Possible Value	0 ~ 7
Help	Critical Temperature Tolerance.

Field Name	**Enable critical duty**
Default Value	[Disabled]
Possible Value	Disabled Enabled

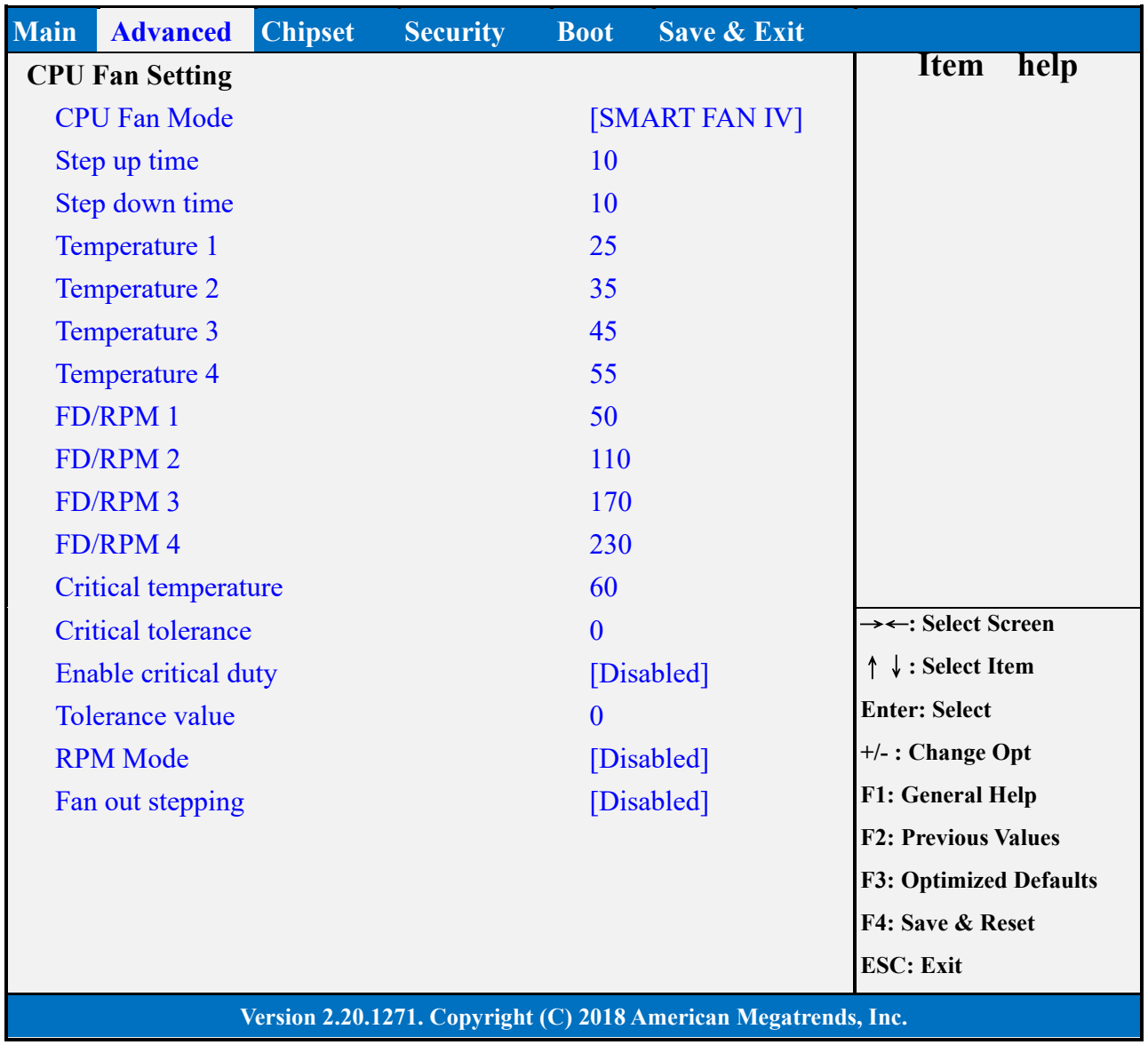
Help	Enable critical duty, if enable will use critical duty value for fan out. If not will use full speed for fan out.

Field Name	**Tolerance value**
Default Value	0
Possible Value	0 ~ 7
Help	Tolerance value.

Field Name	**RPM Mode**
Default Value	[Disabled]
Possible Value	Disabled Enabled
Help	Enable/Disable SMART FAN IV Close Loop Fan Control RPM Mode.

Field Name	**Fan out stepping**
Default Value	[Disabled]
Possible Value	Disabled Enabled
Help	Enable/Disable SMART FAN IV stepping.

CPU Fan Setting



Field Name	**CPU Fan Mode**
Default Value	[SMART FAN IV]
Possible Value	Manual mode SMART FAN IV
Help	Fan control mode select

Field Name	**Step up time**
Default Value	10
Possible Value	0 ~ 255
Help	The amount of time Fan takes to increase its values by one step. (Units are intervals of 0.1 second)

Field Name	**Step down time**
Default Value	10
Possible Value	0 ~ 255

Help	The amount of time Fan takes to increase its values by one step. (Units are intervals of 0.1 second)

Field Name	**Temperature 1**
Default Value	25
Possible Value	0 ~ 255
Help	The value of temperature 1.

Field Name	**Temperature 2**
Default Value	35
Possible Value	0 ~ 255
Help	The value of temperature 2.

Field Name	**Temperature 3**
Default Value	45
Possible Value	0 ~ 255
Help	The value of temperature 3.

Field Name	**Temperature 4**
Default Value	55
Possible Value	0 ~ 255
Help	The value of temperature 4.

Field Name	**FD/RPM 1**
Default Value	50
Possible Value	0 ~ 255
Help	The value of Fan Duty/RPM when temperature is T1.

Field Name	**FD/RPM 2**
Default Value	110
Possible Value	0 ~ 255
Help	The value of Fan Duty/RPM when temperature is T2.

Field Name	**FD/RPM 3**
Default Value	170
Possible Value	0 ~ 255
Help	The value of Fan Duty/RPM when temperature is T3.

Field Name	**FD/RPM 4**
Default Value	230
Possible Value	0 ~ 255
Help	The value of Fan Duty/RPM when temperature is T4.

Field Name	**Critical temperature**
Default Value	60
Possible Value	0 ~ 255
Help	Fan temperature critical value.

Field Name	**Critical tolerance**
Default Value	0
Possible Value	0 ~ 7
Help	Critical Temperature Tolerance.

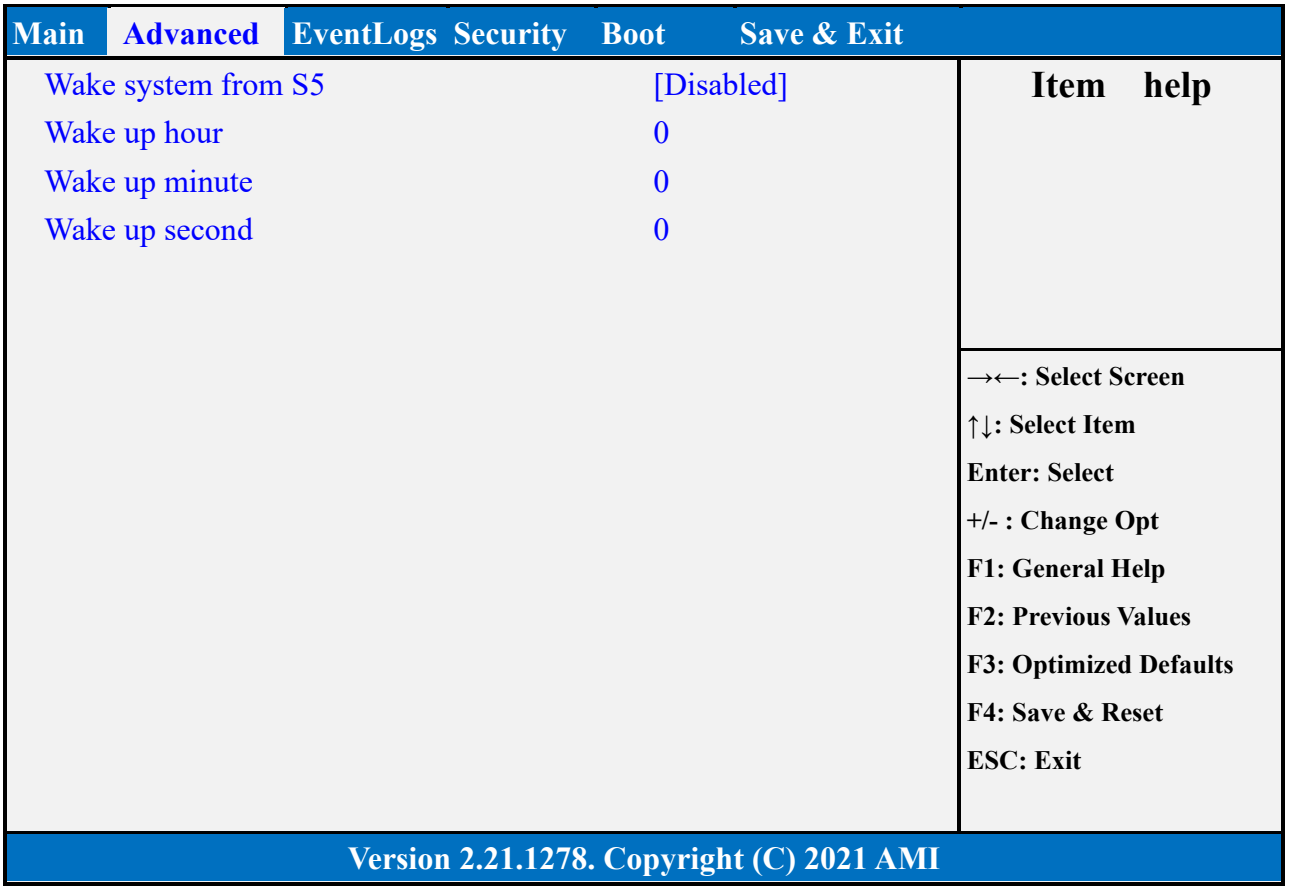
Field Name	**Enable critical duty**
Default Value	[Disabled]
Possible Value	Disabled Enabled
Help	Enable critical duty, if enable will use critical duty value for fan out. If not will use full speed for fan out.

Field Name	**Tolerance value**
Default Value	0
Possible Value	0 ~ 7
Help	Tolerance value.

Field Name	**RPM Mode**
Default Value	[Disabled]
Possible Value	Disabled Enabled
Help	Enable/Disable SMART FAN IV Close Loop Fan Control RPM Mode.

Field Name	**Fan out stepping**
Default Value	[Disabled]
Possible Value	Disabled Enabled
Help	Enable/Disable SMART FAN IV stepping.

S5 RTC Wake Settings



Field Name	Wake system from S5
Default Value	[Disabled]
Possible Value	Disabled Fixed Time
Help	Enable or disable System wake on alarm event, Select FixedTime, system will wake on the hr::min::sec specified.

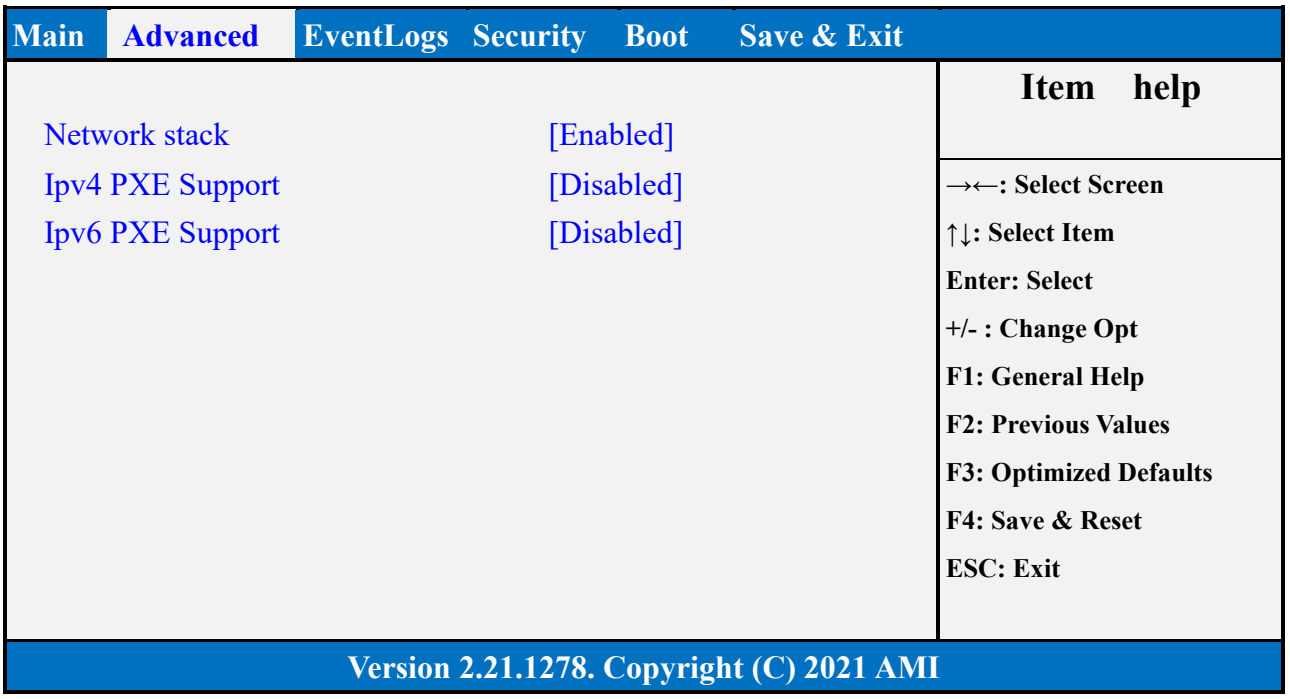
Field Name	Wake up hour(Show when Wake system from S5 set to Fixed Time)
Default Value	0
Possible Value	0-23
Help	Select 0-23 For example enter 3 for 3am and 15 for 3pm

Field Name	Wake up minute(Show when Wake system from S5 set to Fixed Time)
Default Value	0
Possible Value	0-59
Help	Select 0 – 59 for Minute

Field Name	Wake up second(Show when Wake system from S5 set to Fixed Time)

Default Value	0
Possible Value	0 - 59
Help	Select 0 – 59 for Second

Network Stack Configuration

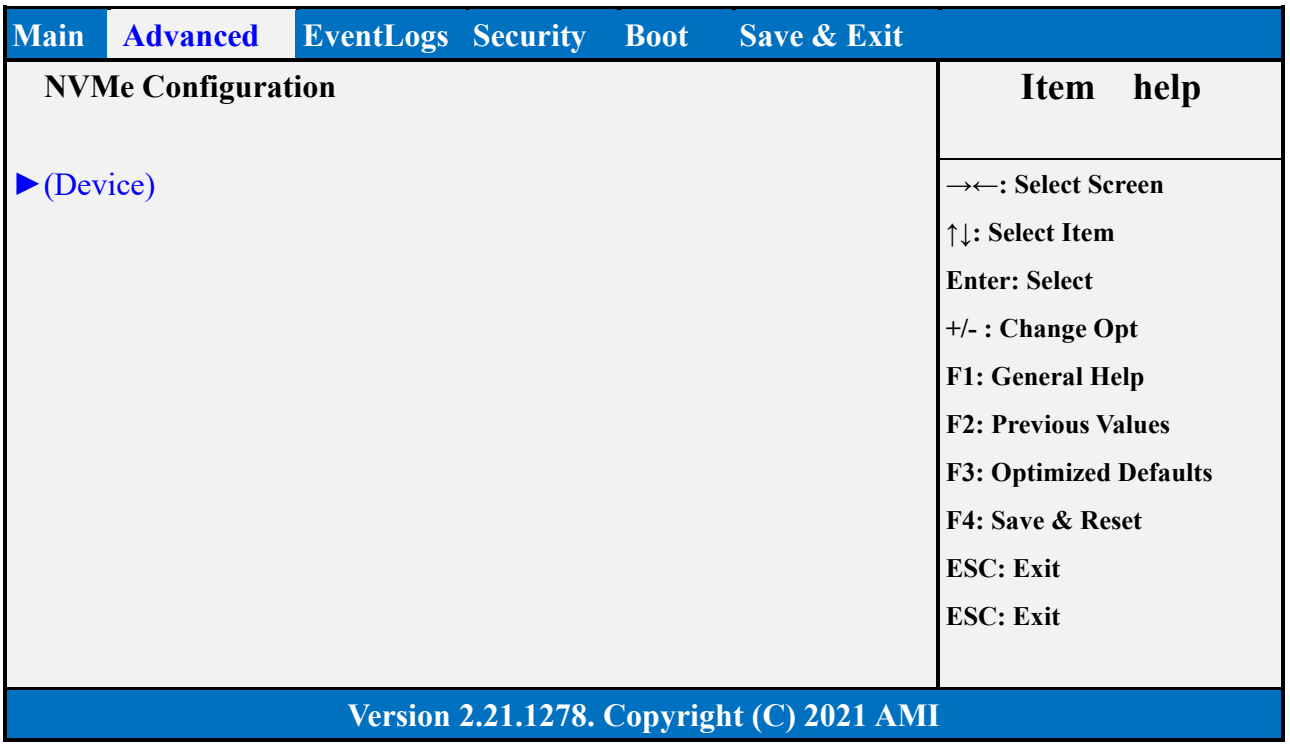


Field Name	**Network stack**
Default Value	[Disabled]
Possible Value	Disabled Enabled
Help	Enable/Disable UEFI Network stack.

Field Name	**Ipv4 PXE Support** (Available when Network stack Enabled)
Default Value	[Disabled]
Possible Value	Disabled Enabled
Help	Enable/Disable Ipv4 PXE Boot Support. If disabled IPV4 PXE boot support will not be available.

Field Name	**Ipv6 PXE Support** (Available when Network stack Enabled)
Default Value	[Disabled]
Possible Value	Disabled Enabled
Help	Enable/Disable Ipv6 PXE Boot Support. If disabled IPV6 PXE boot support will not be available.

NVMe Configuration



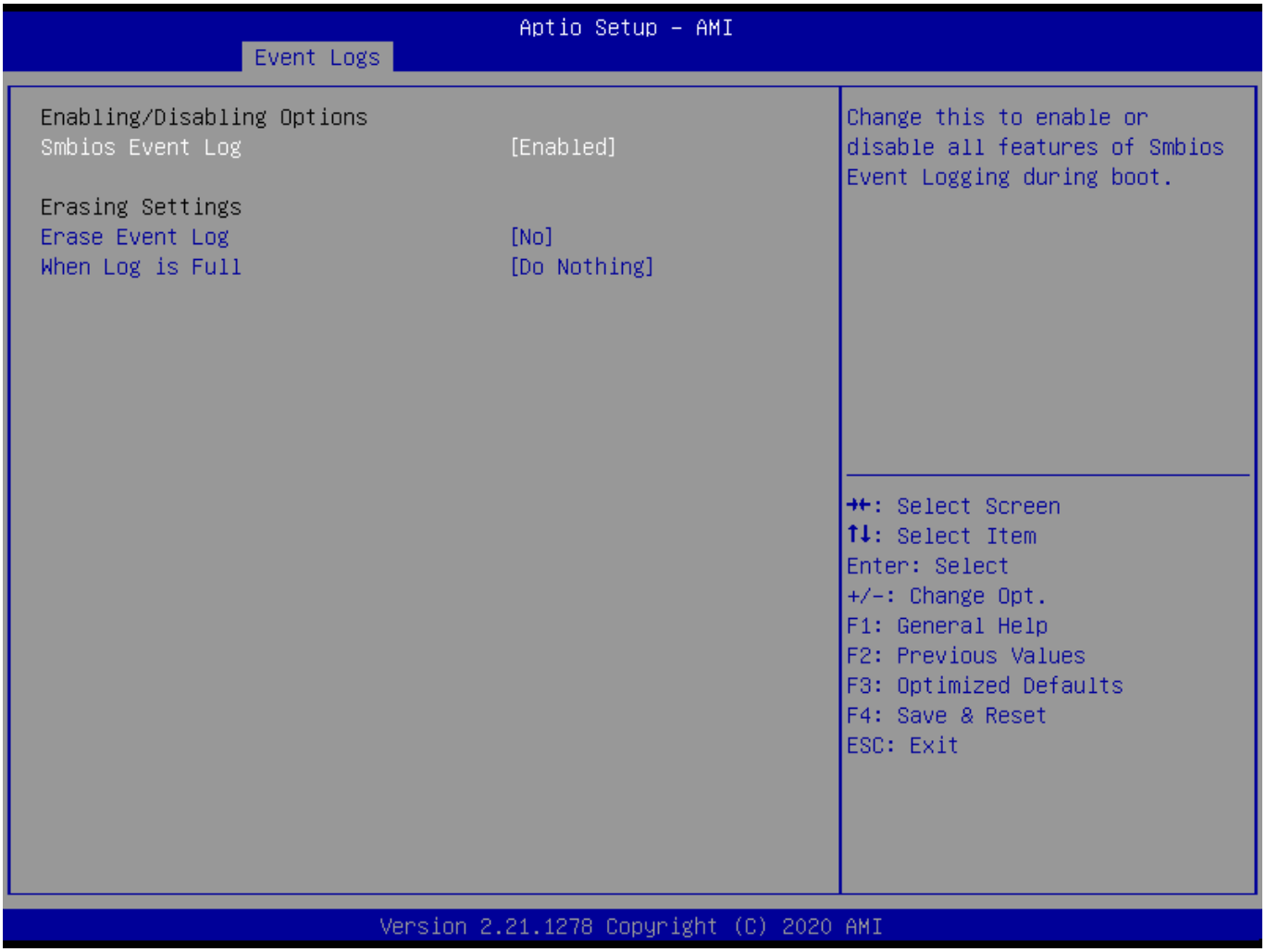
Field Name	**(Device)**
Comment	Press Enter when selected to go into the associated Sub-Menu.

3 Event Logs

Field Name	**Change Smbios Event Log Settings**
Help	Press <Enter> to change the Smbios Event Log configuration.
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**View Smbios Event Log**
Help	Press <Enter> to view the Smbios Event Log records.
Comment	Press Enter when selected to go into the associated Sub-Menu.

Change Smbios Event Log Settings

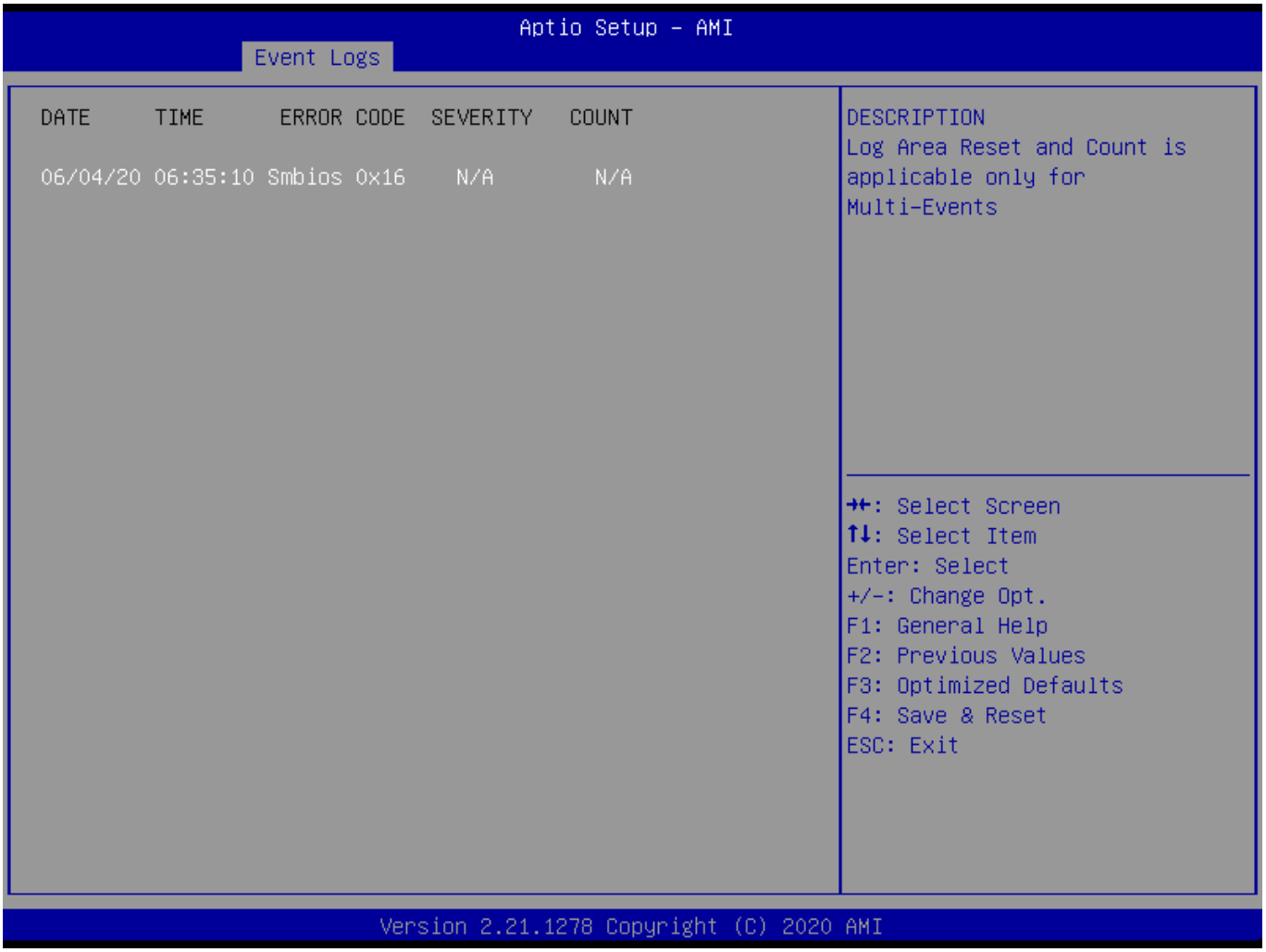


Field Name	**Smbios Event Log**
Default Value	[Enabled]
Possible Value	Enabled Disabled
Help	Change this to enable or disable all feature of Smbios Event Logging during boot.

Field Name	**Erase Event Log**
Default Value	[No]
Possible Value	No / Yes, Next reset / Yes, Every reset
Help	Choose options for erasing Smbios Event Log. Erasing is done prior to any logging activation during reset.

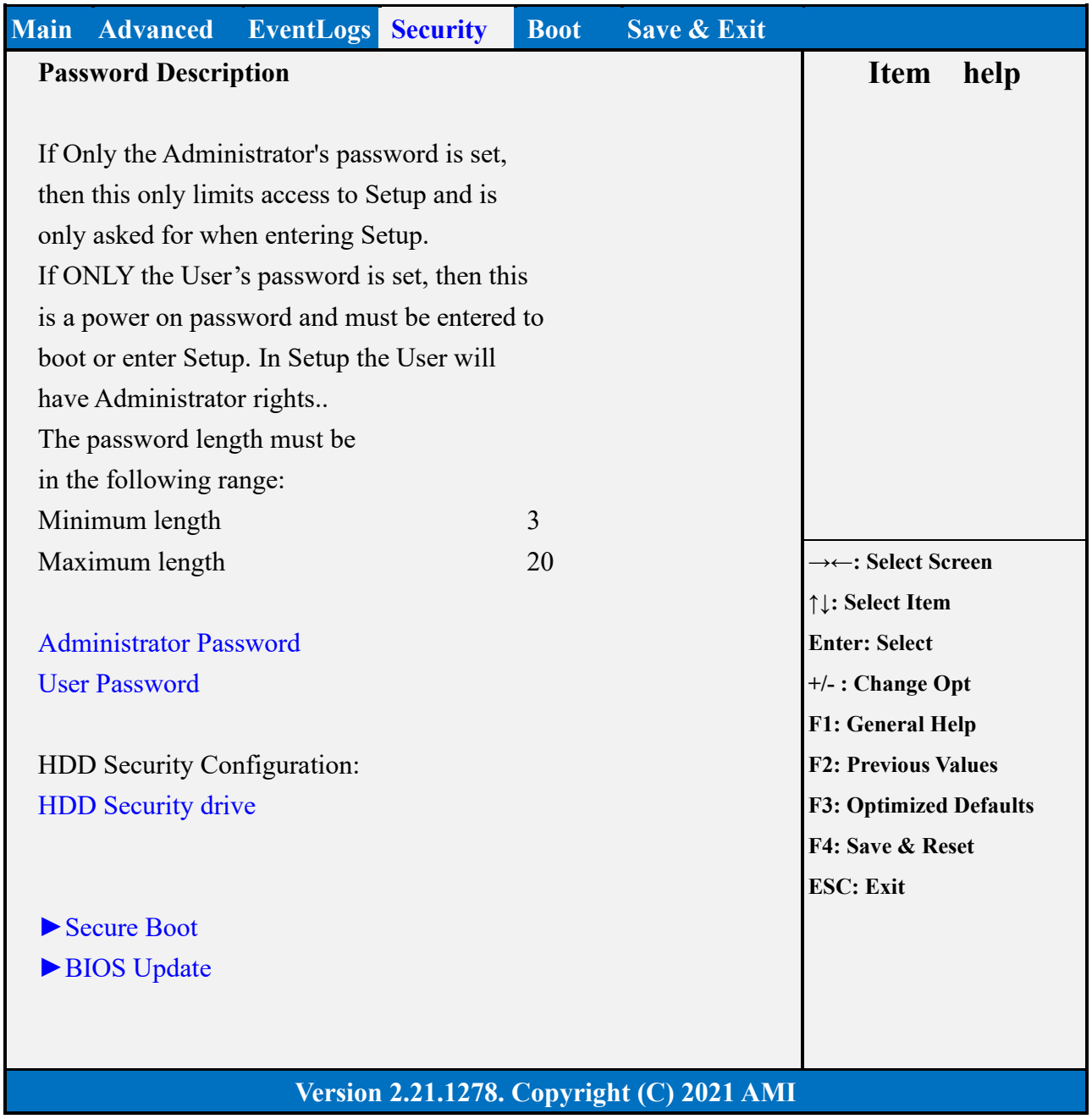
Field Name	**When Log is Full**
Default Value	[Do Nothing]
Possible Value	Do Nothing Erase Immediately
Help	Choose options for reactions to a full Smbios Event Log.

View Smbios Event Log



Field Name	**DATE / TIME / ERROR CODE / SEVERITY / COUNT**
Default Value	MM/DD/YY HH:MM:SS Smbios 0x16 N/A N/A
Possible Value	By Events.
Help	By Events.

4 Security Page



Field Name	**Administrator Password**
Help	Set Administrator Password

Field Name	**User Password**
Help	Set User Password.

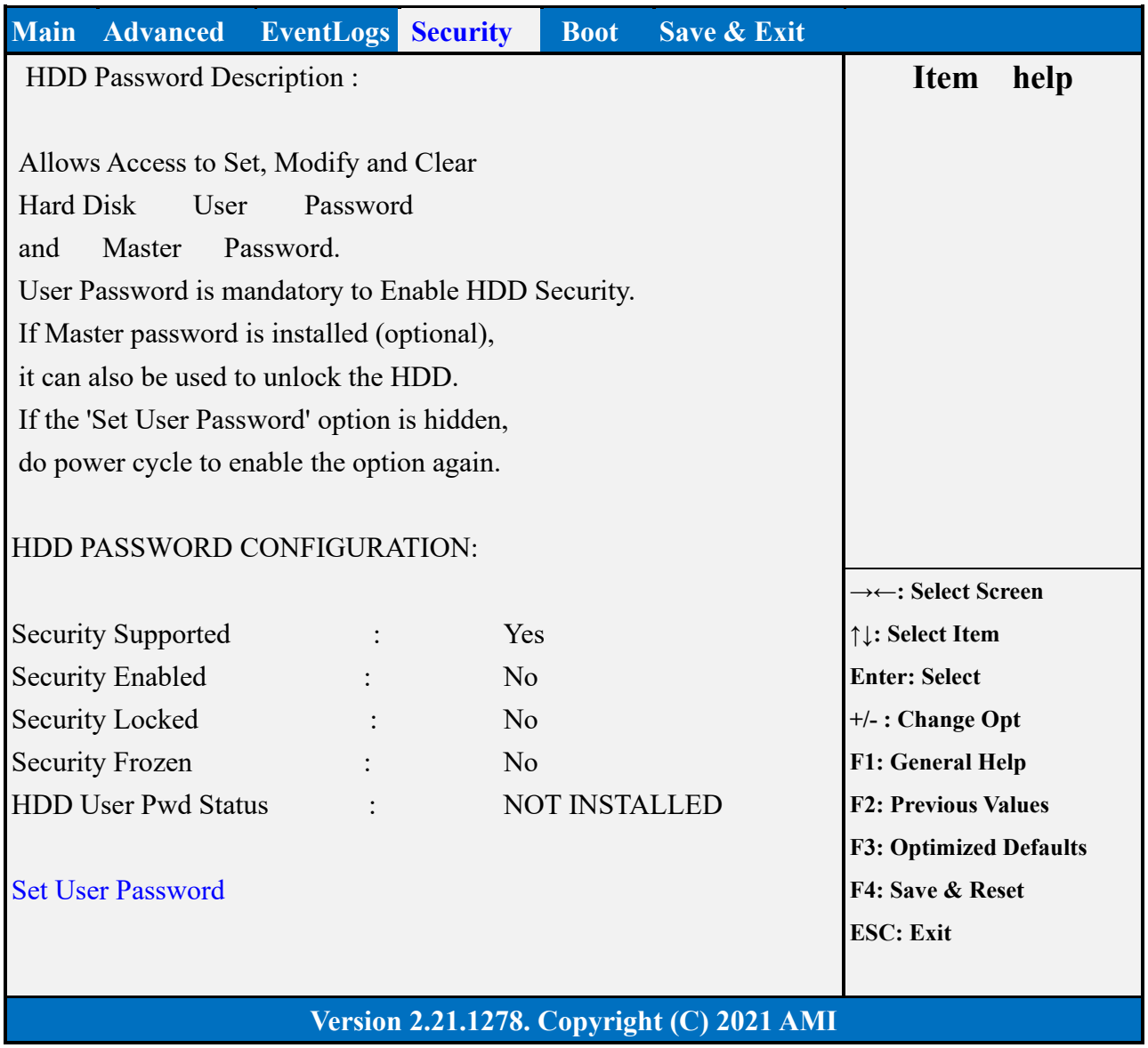
Field Name	**HDD Security drive**
Help	HDD Security Configuration for selected drive
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**Secure Boot**

Help	Secure Boot Configuration
Comment	Press Enter when selected to go into the associated Sub-Menu.

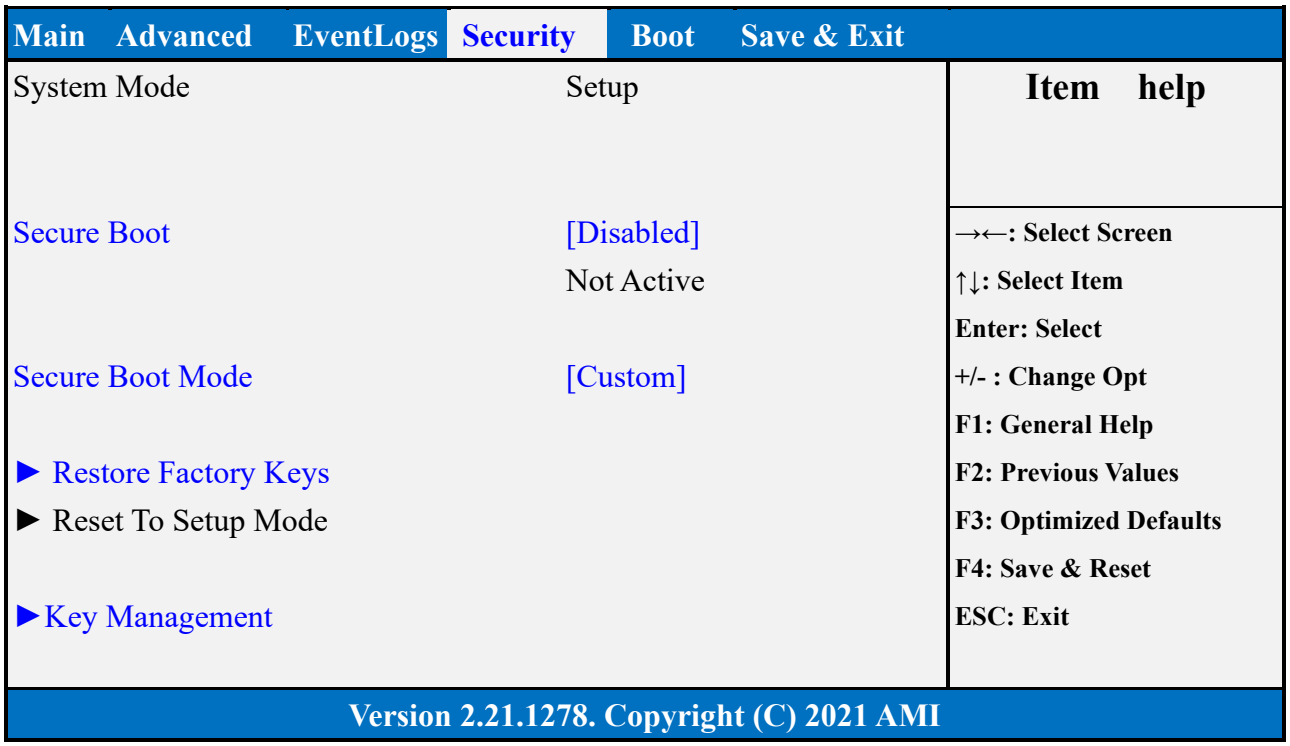
Field Name	**BIOS Update**
Help	BIOS Update support
Comment	Press Enter when selected to go into the associated Sub-Menu.

HDD Security



Field Name	**Set User Password**
Help	Set HDD User Password. *** Advisable to Power Cycle System after Setting Hard Disk Passwords ***.Discard or Save changes option in setup does not have any impac on HDD when password is set or removed. If the 'Set HDD User Password' option is hidden, do power cycle to enable the option again

Secure Boot



Field Name	**Secure Boot**
Default Value	[Disabled]
Possible Value	Enabled Disabled
Help	Secure Boot feature is Active if Secure Boot is Enabled,Platform Key(PK) is enrolled and the System is in User mode.The mode change requires platform reset

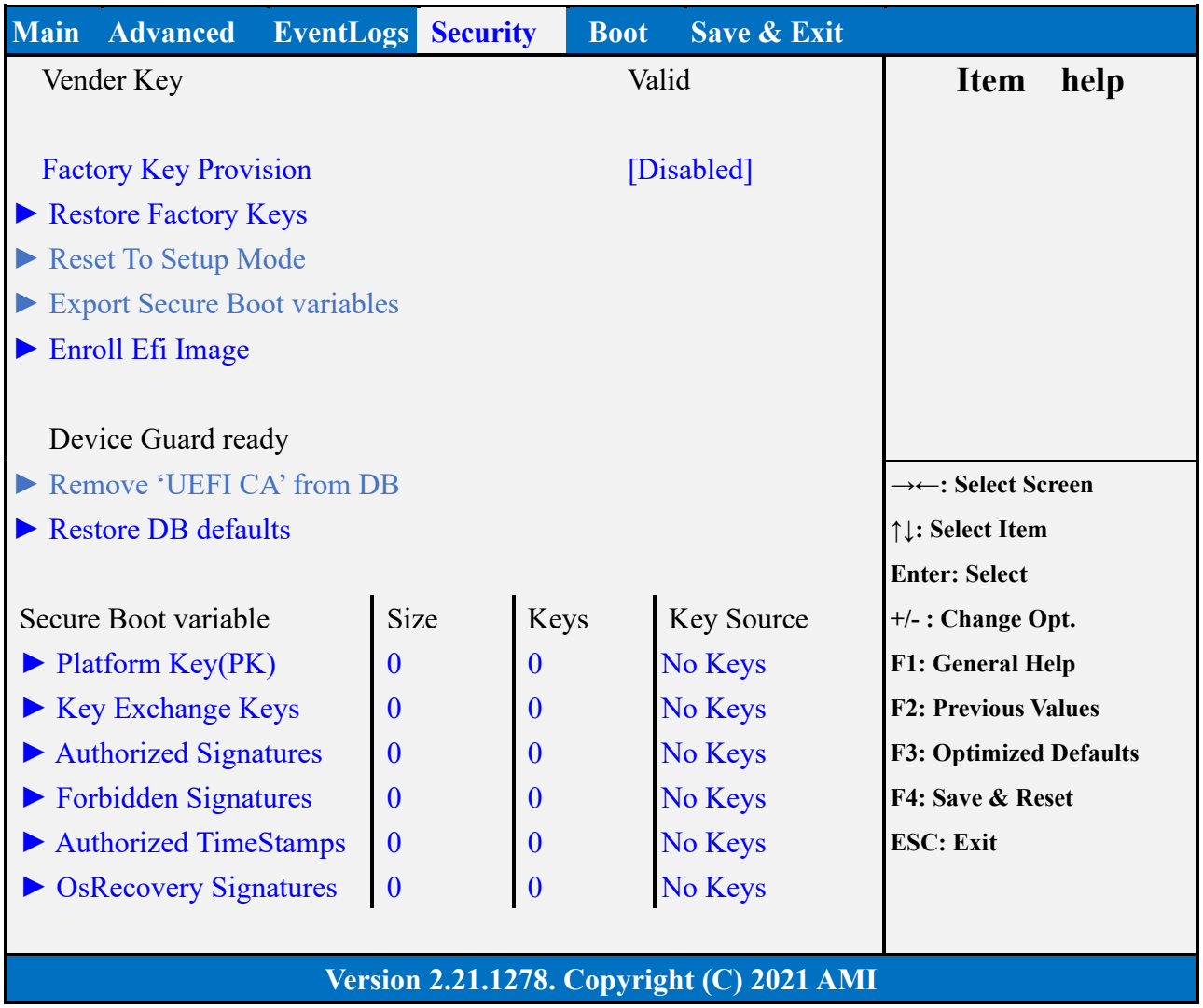
Field Name	**Secure Boot Mode**
Default Value	[Custom]
Possible Value	Standard Custom
Help	Secure Boot mode options:Standard or Custom.In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication

Field Name	**Restore Factory Keys**
Help	Force System to User Mode. Install factory default Secure Boot key databases

Field Name	**Reset to Setup Mode**
Help	Delete all Secure Boot key databases from NVRAM

Field Name	**Key Management**
Help	Enables expert users to modify Secure Boot Policy variables without full authentication
Comment	Enables expert users to modify Secure Boot Policy variables without full authentication

Key Management



Field Name	**Factory Key Provision**
Default Value	[Disabled]
Possible Value	Enabled Disabled
Help	Install factory default Secure Boot keys after the platform reset and while the System i in Setup mode

Field Name	**Restore Factory Keys**
Help	Force System to User Mode. Install factory default Secure Boot key databases

Field Name	**Reset to Setup Mode**
Help	Delete all Secure Boot key databases from NVRAM

Field Name	**Export Secure Boot variables**
Help	Copy NVRAM content of Secure Boot variables to files in a root folder on a file system device

Field Name	**Enroll Efi Image**

Help	Allow the image to run in Secure Boot mode. Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db)

Field Name	**Remove 'UEFI CA' from DB**
Help	Device Guard ready system must not list 'Microsoft UEFI CA' Certificate in Authorized Signature database (db)

Field Name	**Restore DB defaults**
Help	Restore DB variable to factory defaults

Field Name	**Platform Key (PK)**
Default Value	Size:0, Keys:0, Key source: No Keys
Help	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
comment	Press Enter when selected to go into the associated Sub-Menu "Key Management".

Field Name	**Key Exchange Keys**
Default Value	Size:0, Keys:0, Key source: No Keys
Help	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
comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**Authorized Signatures**
Default Value	Size:0, Keys:0, Key source: No Keys
Help	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
comment	Press Enter when selected to go into the associated Sub-Menu.

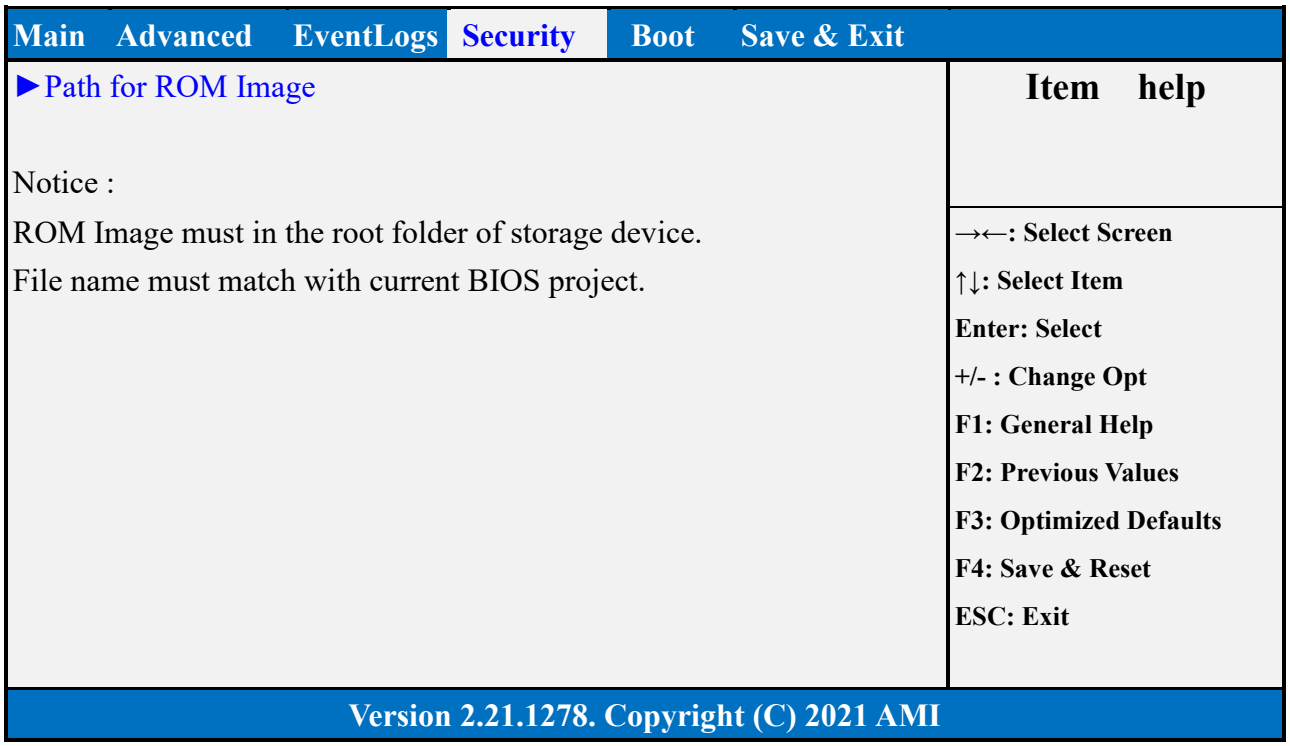
Field Name	**Forbidden Signatures**
Default Value	Size:0, Keys:0, Key source: No Keys
Help	Enroll Factory Defaults or load certificates from a file: 1.Public Key Certificate: a)EFI_SIGNATURE_LIST

	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
comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**Authorized TimeStamps**
Default Value	Size:0, Keys:0, Key source: No Keys
Help	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
comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**OsRecovery Signatures**
Default Value	Size:0, Keys:0, Key source: No Keys
Help	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
comment	Press Enter when selected to go into the associated Sub-Menu.

BIOS Update



Field Name	**Path for ROM Image**
Help	Enter the path to the Secure flash option

5 Boot Page

Field Name	**Setup Prompt Timeout**
Default Value	1
Possible Value	1~65535
Help	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

Field Name	**Bootup NumLock State**
Default Value	[On]
Possible Value	On Off
Help	Select the keyboard NumLock state

Field Name	**Boot Option #1**

Default Value	[USB Floppy]
Possible Value	USB Floppy, CD/DVD, USB CD/DVD, Hard Disk , USB Key, USB Hard Disk , NVME, Network, Disabled
Help	Sets the system boot order

Field Name	**Boot Option #2**
Default Value	[CD/DVD]
Possible Value	USB Floppy, CD/DVD, USB CD/DVD, Hard Disk , USB Key, USB Hard Disk , NVME, Network, Disabled
Help	Sets the system boot order

Field Name	**Boot Option #3**
Default Value	[USB CD/DVD]
Possible Value	USB Floppy, CD/DVD, USB CD/DVD, Hard Disk , USB Key, USB Hard Disk , NVME, Network, Disabled
Help	Sets the system boot order

Field Name	**Boot Option #4**
Default Value	[Hard Disk]
Possible Value	USB Floppy, CD/DVD, USB CD/DVD, Hard Disk , USB Key, USB Hard Disk , NVME, Network, Disabled
Help	Sets the system boot order

Field Name	**Boot Option #5**
Default Value	[USB Key]
Possible Value	USB Floppy, CD/DVD, USB CD/DVD, Hard Disk , USB Key, USB Hard Disk , NVME, Network, Disabled
Help	Sets the system boot order

Field Name	**Boot Option #6**
Default Value	[USB Hard Disk]
Possible Value	USB Floppy, CD/DVD, USB CD/DVD, Hard Disk , USB Key, USB Hard Disk , NVME, Network, Disabled
Help	Sets the system boot order

Field Name	**Boot Option #7**
Default Value	[NVME]
Possible Value	USB Floppy, CD/DVD, USB CD/DVD, Hard Disk , USB Key, USB Hard Disk , NVME, Network, Disabled
Help	Sets the system boot order

Field Name	**Boot Option #8**
Default Value	[Network]
Possible Value	USB Floppy, CD/DVD, USB CD/DVD, Hard Disk , USB Key, USB Hard Disk , NVME, Network, Disabled
Help	Sets the system boot order

Field Name	**UEFI USB Floppy Drive BBS Priorities**
Help	Specifies the Boot Device Priority sequence from available UEFI USB Floppy Drives.
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**UEFI CDROM/DVD ROM Drive BBS Priorities**
Help	Specifies the Boot Device Priority sequence from available UEFI

	CDROM/DVD Drives.
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**UEFI USB CDROM/DVD ROM Drive BBS Priorities**
Help	Specifies the Boot Device Priority sequence from available UEFI USB CDROM/DVD Drives.
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**UEFI Hard Disk Drive BBS Priorities**
Help	Specifies the Boot Device Priority sequence from available UEFI Hard Disk Drives.
Comment	Press Enter when selected to go into the associated Sub-Menu.

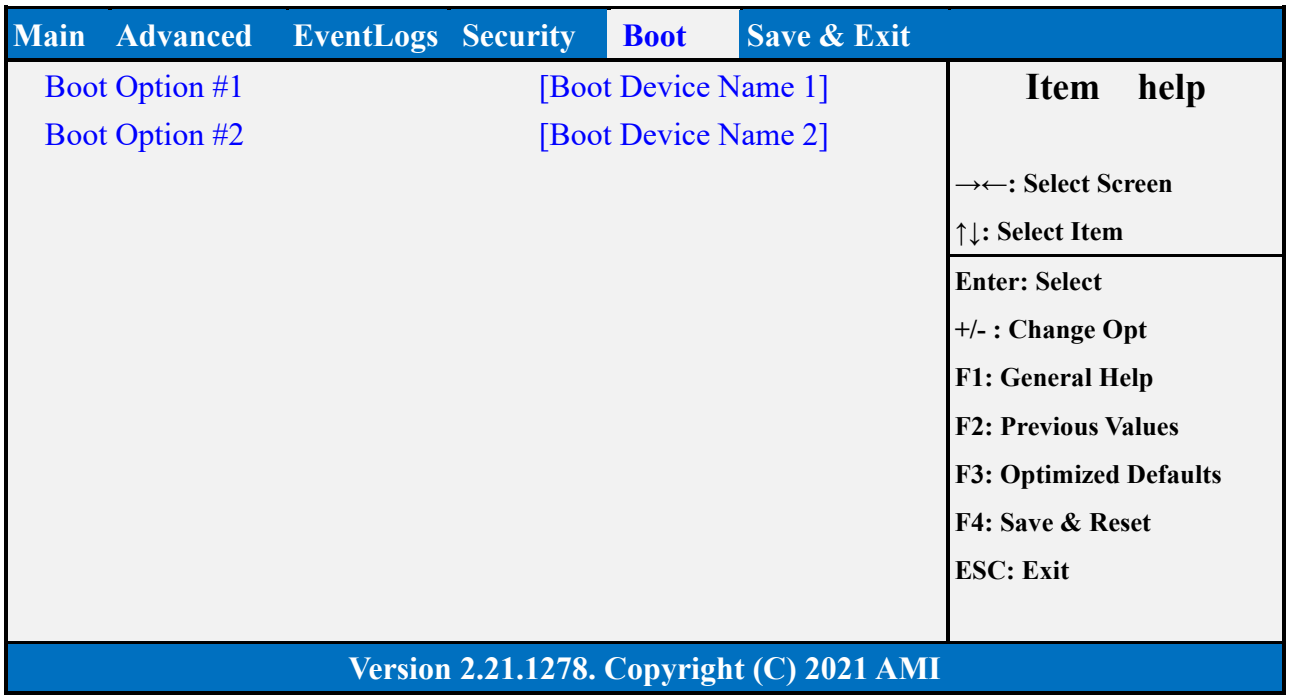
Field Name	**UEFI USB KEY Drive BBS Priorities**
Help	Specifies the Boot Device Priority sequence from available UEFI USB Key Drives.
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**UEFI USB Hard Disk Drive BBS Priorities**
Help	Specifies the Boot Device Priority sequence from available UEFI USB Hard Disk Drives.
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**UEFI NVME Drive BBS Priorities**
Help	Specifies the Boot Device Priority sequence from available UEFI NVME Drives.
Comment	Press Enter when selected to go into the associated Sub-Menu.

Field Name	**UEFI NETWORK Drive BBS Priorities**
Help	Specifies the Boot Device Priority sequence from available UEFI NETWORK Drives.
Comment	Press Enter when selected to go into the associated Sub-Menu.

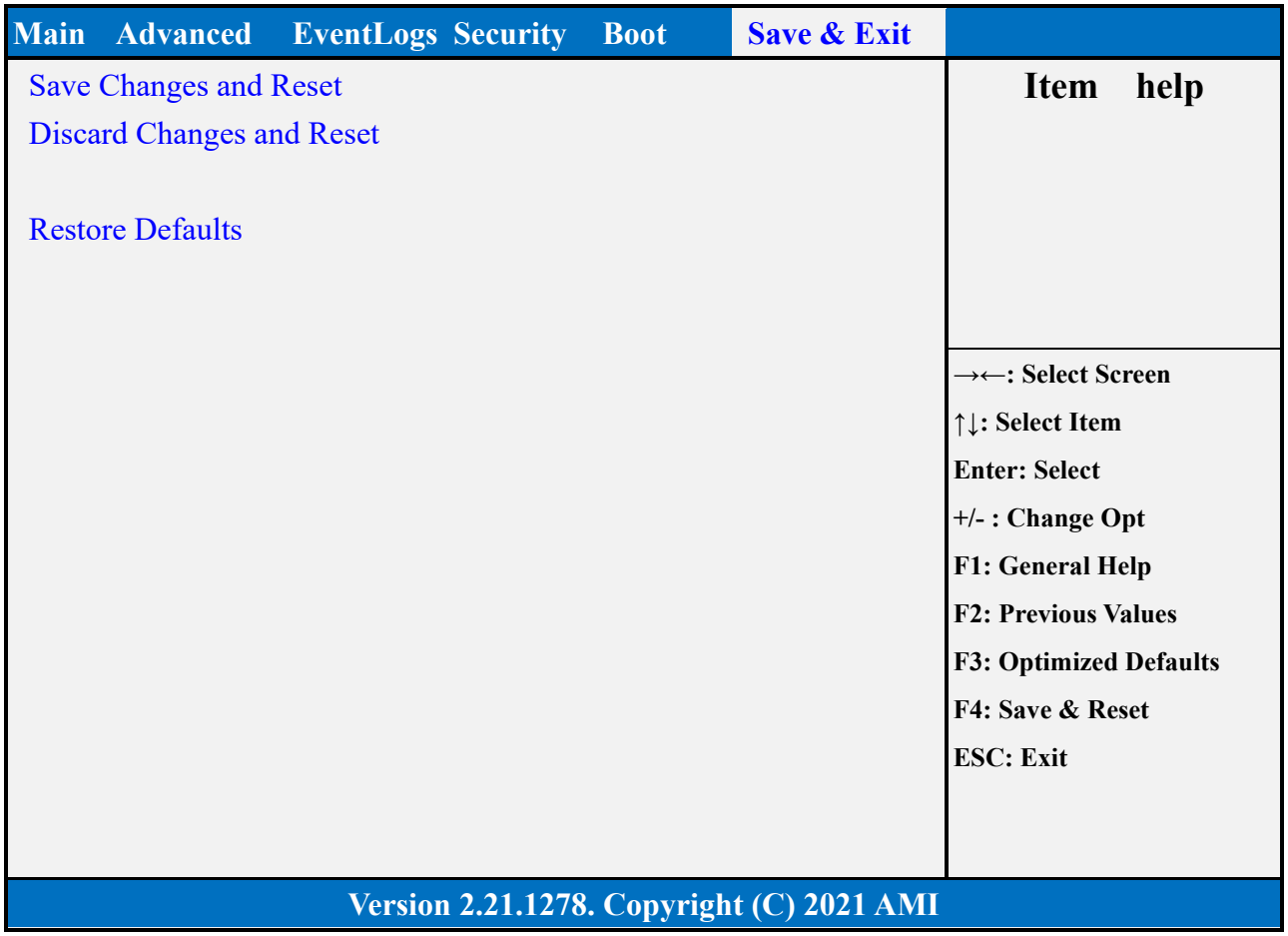
(List Boot Device Type) Drive BBS Priorities



Field Name	**Boot Option #1**
Default Value	
Possible Value	Boot Device Name 1 of this type, Disable
Help	Sets the system boot order

Field Name	**Boot Option #2**
Default Value	
Possible Value	Boot Device Name 2 of this type, Disable
Help	Sets the system boot order

6 Save & Exit Page

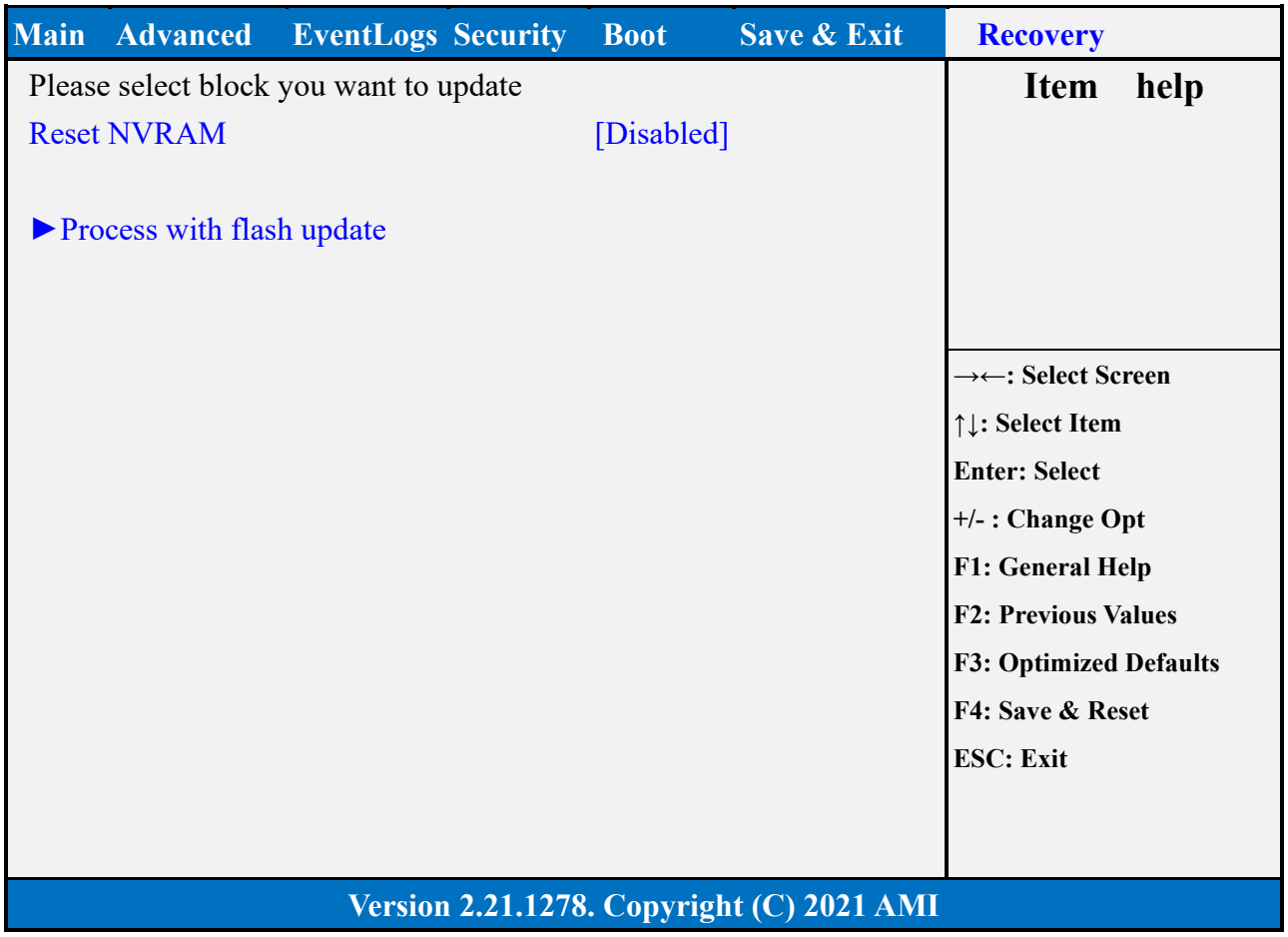


Field Name	**Save Changes and Reset**
Help	Reset the system after saving the changes.

Field Name	**Discard Changes and Rest**
Help	Reset system setup without saving any changes.

Field Name	**Restore Defaults**
Help	Restore/Load Default values for all the setup options.

7 Recovery Page (Active for 4.3 Secure Flash Update only)

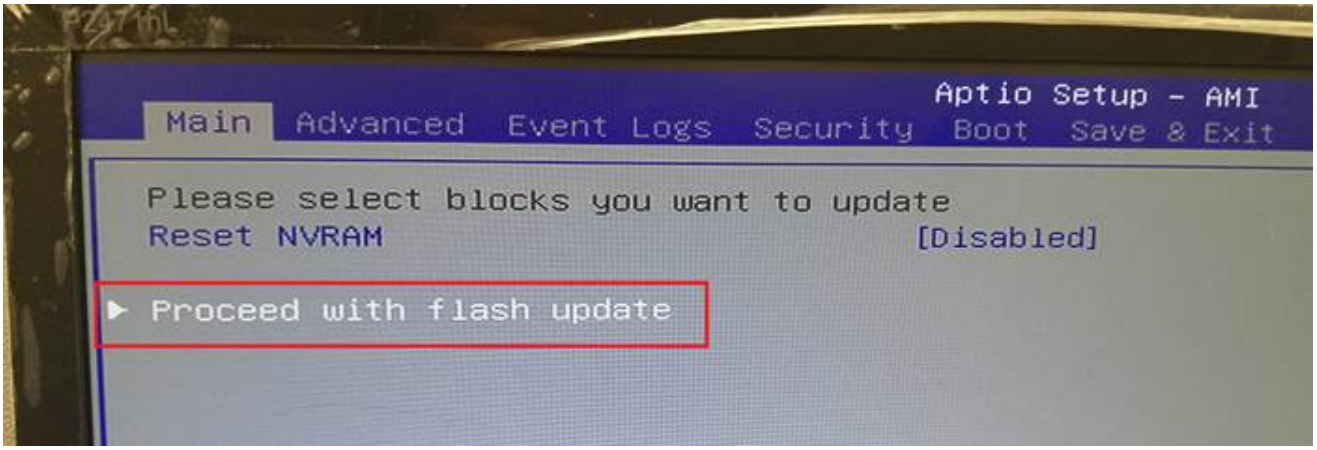


Field Name	**Reset NVRAM**
Default Value	[Disabled]
Possible Value	Enabled Disabled
Help	Set this option to reset NVRAM to default values

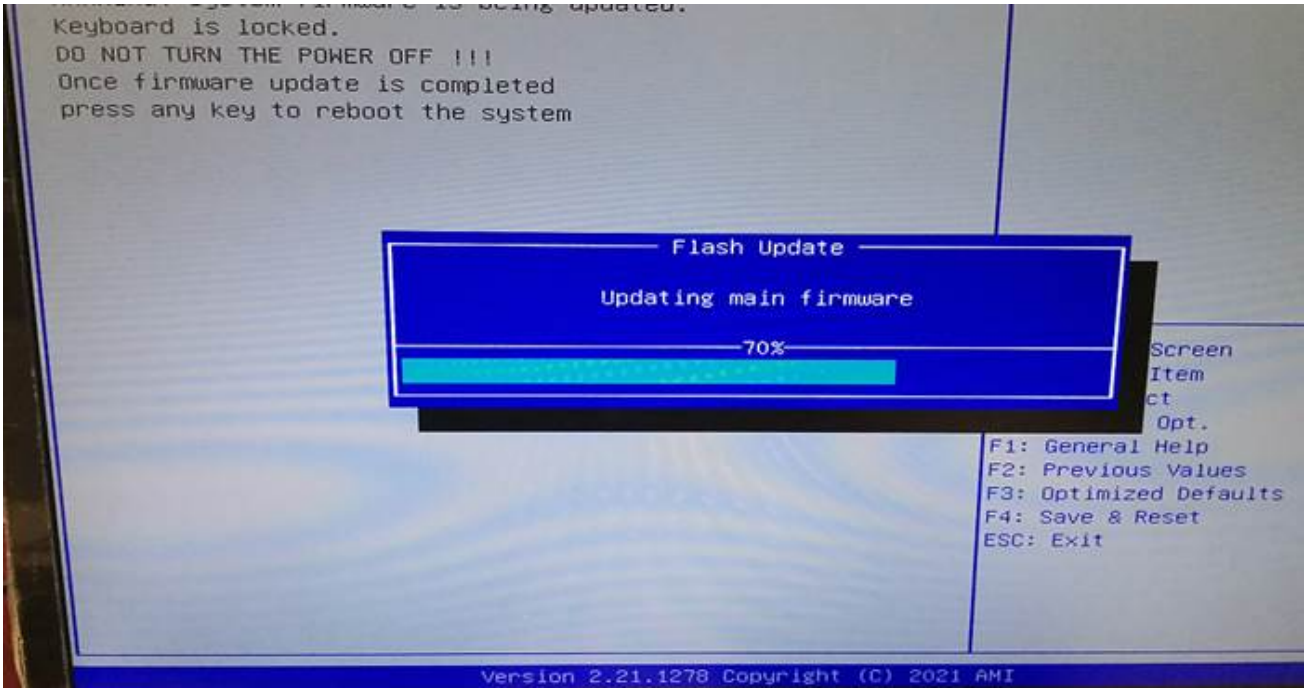
Field Name	**Process with flash update**
Help	Select this to start flash update

Please see the BIOS update instructions as below.

1. Advanced -> Onboard Device -> BIOS Lock -> Disabled
2. Save Changes and Reboot
3. Security -> BIOS update
4. After "System is going to reboot" and press 'OK', then next reboot will enter BIOS menu and appear below screen.



5. Press "Process with flash update".
6. When the BIOS is updating, you will see the following screen.



7. When BIOS update is done, you will see the information as below. Press any key to reboot the system.