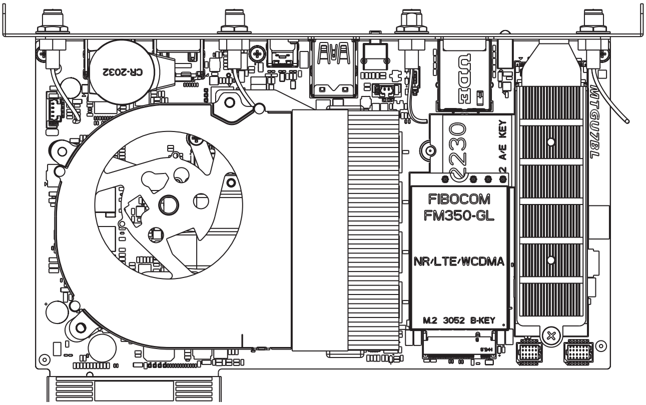
SDM Series

SDM-1185G7EL

SDM-1185G7EL (MTGU7BL-IA)

Smart Display Module Series
Quick Start Guide



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Packing List

Before setting up your product, please make sure the following items have been shipped:

Item	Quantity
SDM-1185G7EL	1
US power cord	1
PSU ADP 12V 120W 100-240VAC	1
External Antenna for WiFi module	2

If any of these items are missing or damaged, please contact your distributor or sales representative immediately.

About this Document

This User's Manual contains all the essential information, such as detailed descriptions and explanations on the product's hardware and software features (if any), its specifications, dimensions, jumper/connector settings/definitions, and driver installation instructions (if any), to facilitate users in setting up their product.

Users may refer to the GIGAIPC.com for the latest version of this document.

Safety Precautions

Please read the following safety instructions carefully. It is advised that you keep this manual for future references

1. All cautions and warnings on the device should be noted.
2. Make sure the power source matches the power rating of the device.
3. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
4. Always completely disconnect the power before working on the system's hardware.
5. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
6. If the device is not to be used for a long time, disconnect it from the power supply to avoid damage by transient over-voltage.
7. Always disconnect this device from any AC supply before cleaning.
8. While cleaning, use a damp cloth instead of liquid or spray detergents.
9. Make sure the device is installed near a power outlet and is easily accessible.
10. Keep this device away from humidity.
11. Place the device on a solid surface during installation to prevent falls
12. Do not cover the openings on the device to ensure optimal heat dissipation.

13. Watch out for high temperatures when the system is running.

14. Do not touch the heat sink or heat spreader when the system is running

15. Never pour any liquid into the openings. This could cause fire or electric shock.

16. As most electronic components are sensitive to static electrical charge, be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and contain all electronic components in any static-shielded containers.

17. If any of the following situations arises, please the contact our service personnel:

    i. Damaged power cord or plug
    ii. Liquid intrusion to the device
    iii. Exposure to moisture
    iv. Device is not working as expected or in a manner as described in this manual
    v. The device is dropped or damaged
    vi. Any obvious signs of damage displayed on the device

18. DO NOT LEAVE THIS DEVICE IN AN UNCONTROLLED ENVIRONMENT WITH TEMPERATURES BEYOND THE DEVICE'S PERMITTED STORAGE TEMPERATURES (SEE CHAPTER 1) TO PREVENT DAMAGE.

FCC Statement

Warning!

This device complies with Part 15 FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

Caution:

There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions and your local government's recycling or disposal directives.

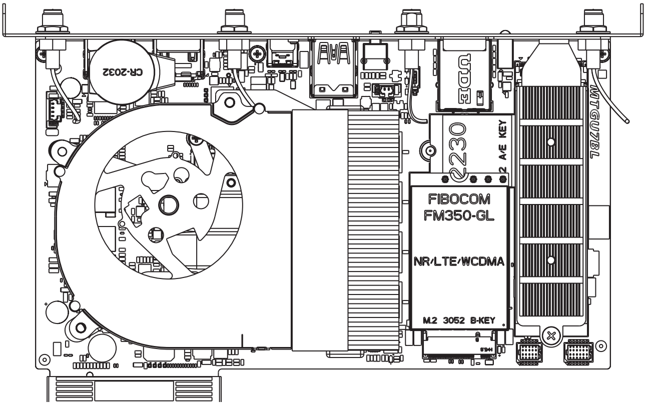
Attention:

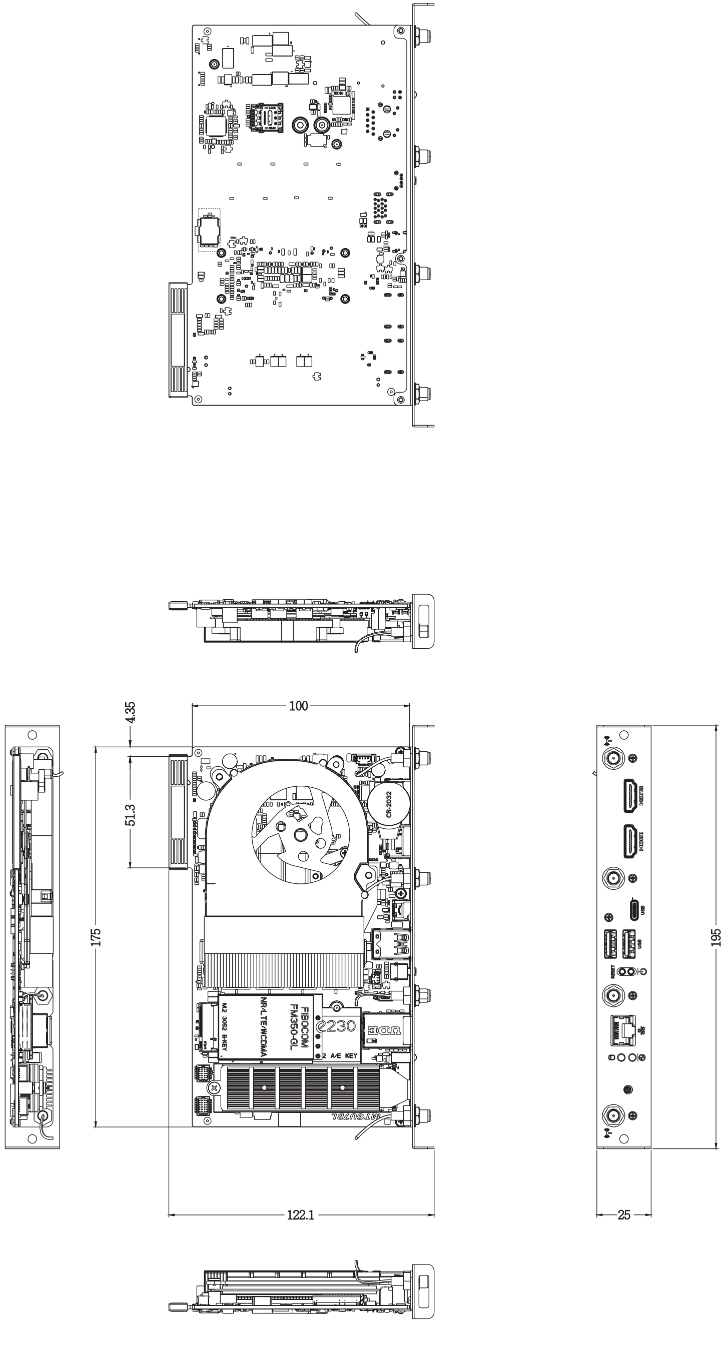
Il y a un risque d'explosion si la batterie est remplacée de façon incorrecte.
Ne la remplacer qu'avec le même modèle ou équivalent recommandé par le constructeur. Recycler les batteries usées en accord avec les instructions du fabricant et les directives gouvernementales de recyclage.

Table Contents

Chapter 1

Chapter 1 - Product Specifications




100
4.35
51.3
175
122.1
195
25
CR-2032
FIBOCOM
FM350-GL
NR/LTE/WCDMA
M.2 3052 B-KEY
e230
2 A/E KEY
RESET
USB

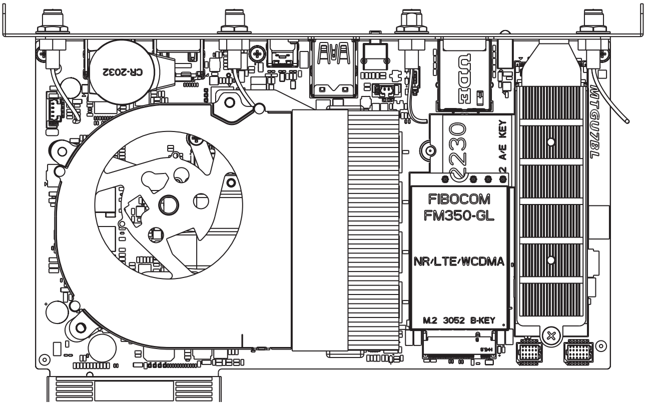
1.1 Specifications

Motherboard	SDM-1185G7EL (MTGU7BL-IA)
Form Factor	SDM-Large 175W x 100D(mm)
CPU	Intel® Core™ i7-1185G7E Processor 10nm SuperFin, 4 cores, 8 threads, up to 4.40 GHz TDP 28W
Socket	1 x FCBGA1449
Memory	16GB LPDDR4x-4267 MT/s (Soldered)
Ethernet	1 x 2.5GbE LAN Port (Intel® I225LM)
Video	Integrated Graphics Processor - Intel® Iris X^e Graphics: 2 x HDMI 2.1 (SDM), supporting a maximum resolution of 7680x4320 @60Hz 2 x HDMI 2.0 (Rear), supporting a maximum resolution of 4096x2160 @60Hz 1 x DP 1.4 through USB type C (8k), supporting a maximum resolution of 7680x4320 @60Hz (4 independent display outputs)
Audio	Intel® integrated Audio
Storage	1 x 2280 M.2 M-Key (Support NVME only) Default SSD supplied with 128GB and heatsink
Expansion Slots	1 x 2230 M.2 E-Key (with Intel AX210 Wi-Fi Card) 1 x 3052 M.2 B-Key (Support 5G)
Rear I/O	2 x HDMI 1 x RJ45 LAN Port 2 x USB 3.2 Type A Gen 2x1 1 x USB 3.2 Type C Gen 2x1 (with DP output) 1 x PWR LED 1 x HDD LED 4 x External Antenna Holes (Optional) 1 x Reset button 1 x Power button
TPM	1 x TPM header (SPI interface)
OS Compatibility	Windows® 10/11 (x64)

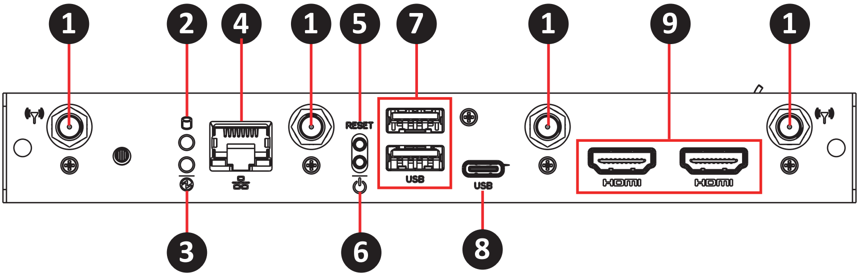
Motherboard	SDM-1185G7EL (MTGU7BL-IA)
Operating Properties	Operating temperature: 0°C to 55°C Operating humidity: 0%-90% (non-condensing) Non-operating temperature: -40°C to 85°C Non-operating humidity: 0%-95% (non-condensing)
Packing Content	Carton size: 469 x 382 x 381 (mm) Packing Capacity: 10pcs Single Box size: 345 x 221 x 70 (mm) Including : US power cord x 1 (P/N: 25CP0-007001-Q0R) PSU ADP 12V 120W 100-240VAC x 1 (P/N: 25EP4-201202-F3S) External Antenna for WiFi module x 2 (P/N: 25CA0-163002-A5S)
Order Information	9MTGU7BLMR-IA (Box packing)

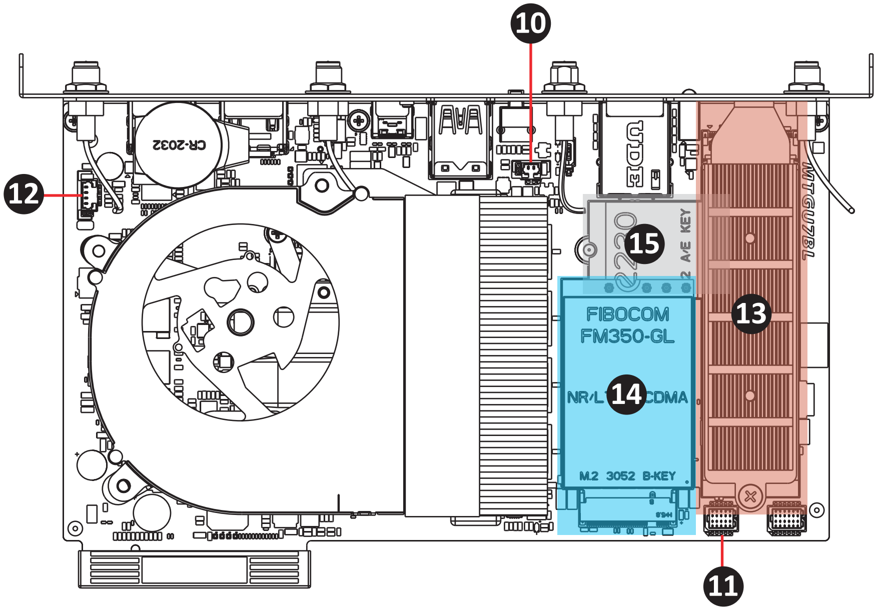
Chapter 2

Chapter 2 – Hardware Information



2.1 Jumpers and Connectors





No	Code	Description
1	Antenna hole	4 x External Antenna Holes (Optional)
2	PS_LED	1 x HDD LED (Top)
3		1 x PWR LED (Bottom)
4	LAN	1 x RJ45 Port
5	PSW_RST	1 x Reset button (Top)
6		1 x Power button (Bottom)
7	USB32	2 x USB 3.2 Type A Gen 2x1
8	USBTC	1 x USB 3.2 Type C Gen 2x1
9	HDMI_1 HDMI_2	2 x HDMI
10	BATTERY	1 x Battery cable connector
11	TPM	1 x Trusted Platform Module Connector
12	CPU_FAN	1 x CPU Fan connector
13	M2M	1 x 2280 M.2 M-Key (Support NVME only)
14	M2B	1 x 3052 M.2 B-Key
15	M2E	1 x 2230 M.2 E-Key

2.2.1 LAN (RJ45 LAN Port)

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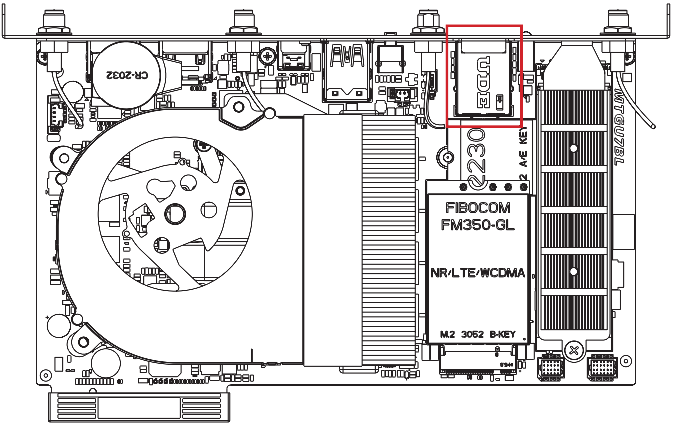
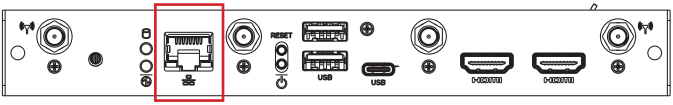
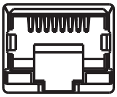




LAN Connector


Pin No.	Definition	Pin No.	Definition
1	TX1+	4	TX3+
2	TX1-	5	TX3-
3	TX2+	7	TX4+
6	TX2-	8	TX4-

State	Description
Orange On	2.5Gbps data rate
Green On	1Gbps data rate
Off	100M&10Mbps data rate

Connector PN	Vendor
RB1-GB-0010	UDE

2.2.2 USB32 (USB 3.2 Type A Gen 2x1)

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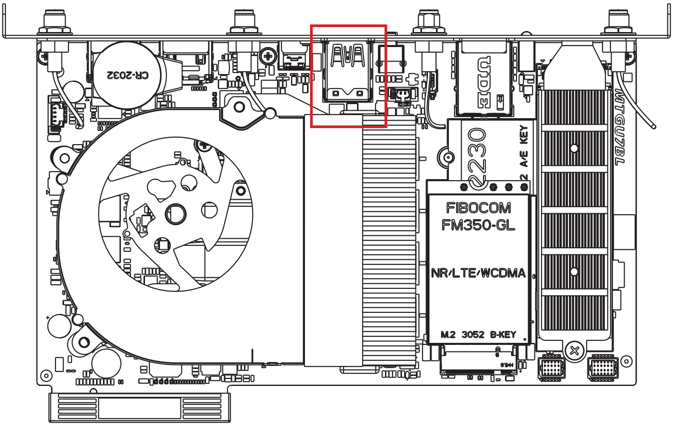
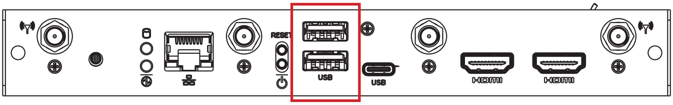
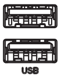




USB 3.2 Gen 2x1 connector


Pin No.	Definition	Pin No.	Definition
1	5V	10	5V
2	USB_Dn	11	USB_Dn
3	USB_Dp	12	USB_Dp
4	GND	13	GND
5	USB3_RXn	14	USB3_RXn
6	USB3_RXp	15	USB3_RXp
7	GND	16	GND
8	USB3_TXn	17	USB3_TXn
9	USB3_TXp	18	USB3_TXp

Connector PN	Vendor
18-A9830-6A33-A	TCONN

2.2.3 USBTC (USB 3.2 Type C Gen 2x1)

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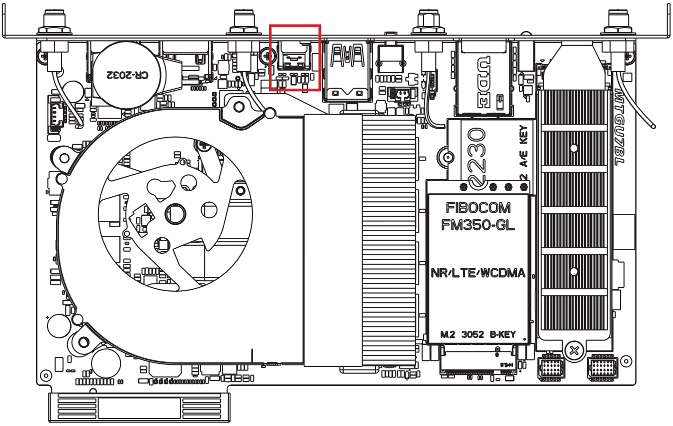

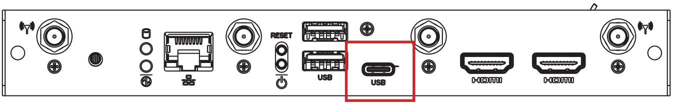

USB Type C Connector
USB

Connector PN	Vendor
DX07S024JJ2	JAE

Pin No.	Definition	Pin No.	Definition
A1	GND	B1	GND
A2	TX1p	B2	TX2p
A3	TX1n	B3	TX2n
A4	VBUS	B4	VBUS
A5	CC1	B5	CC2
A6	Dp	B6	Dp
A7	Dn	B7	Dn
A8	NC	B8	NC
A9	VBUS	B9	VBUS
A10	RX2n	B10	RX1n
A11	RX2p	B11	RX1p
A12	GND	B12	GND

2.2.4 HDMI_1, HDMI_2 (HDMI connector)

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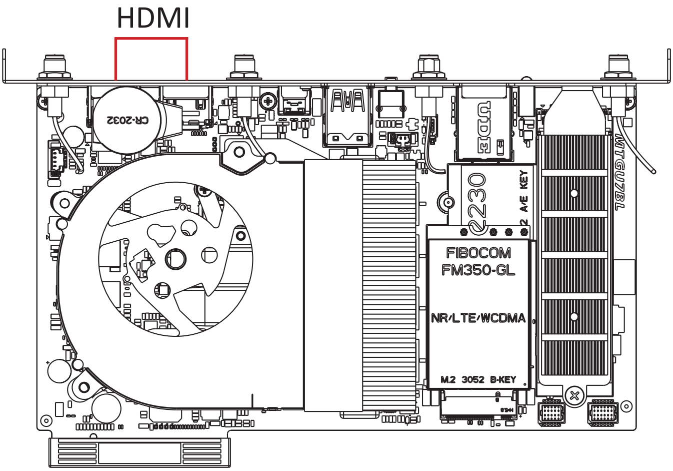
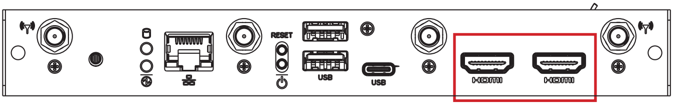




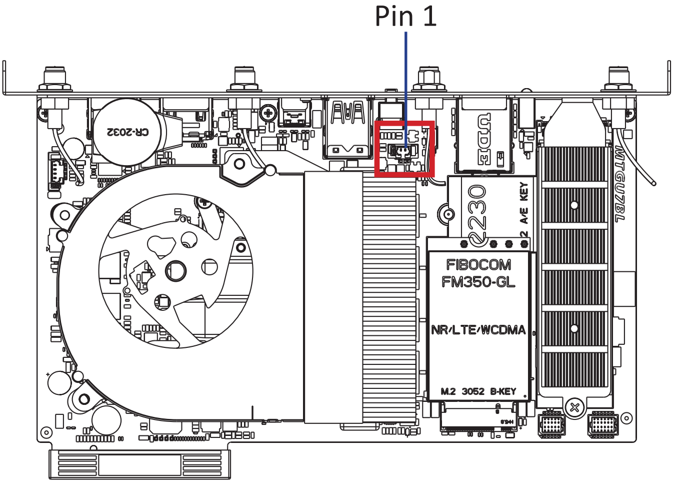
HDMI Connector

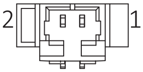
Pin No.	Definition	Pin No.	Definition
1	TX2p	11	GND
2	GND	12	CLKn
3	TX2n	13	NC
4	TX1p	14	NC
5	GND	15	SCL
6	TX1n	16	SDA
7	TX0p	17	GND
8	GND	18	5V
9	TX0n	19	Hot Plug Detect
10	CLKp		

Connector PN	Vendor
D13-0715-19681	WALTA

2.2.5 Battery (Battery cable Connector)

10



Battery Connector


Pin No.	Definition
1	3.3V RTC
2	GND

2.2.4 TPM (Trusted Platform Module Connector)

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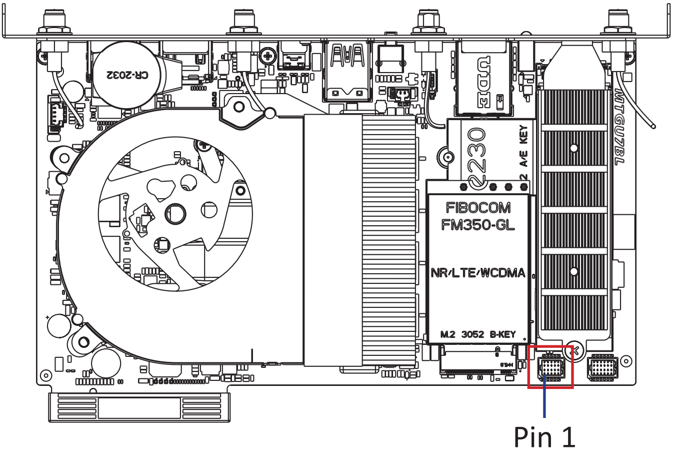
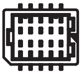


TPM Connector


Connector PN	Vendor
87216-1004-06	ACES

Pin No.	Definition
1	Clock
2	GND
3	SPI_CS
4	TPM_SO
5	RESET
6	TPM_SI
7	NC
8	NC
9	3.3V
10	NC

2.2.3 CPU_FAN (CPU Fan connector)

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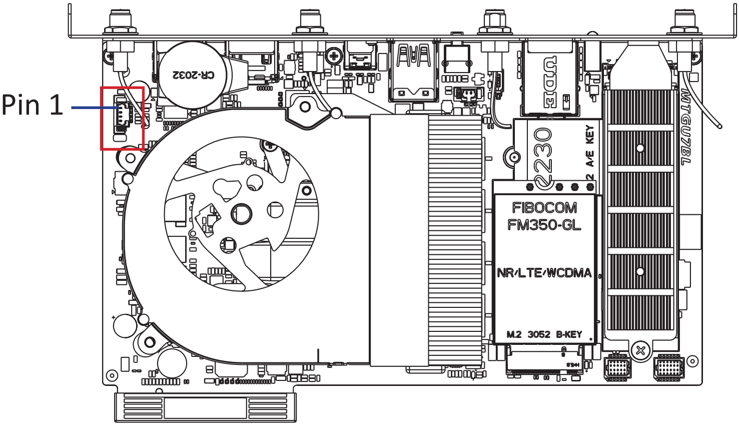
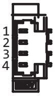


CPU FAN Connector


Pin No.	Definition
1	Speed control
2	Detect
3	GND
4	12V

Connector PN	Vendor
85205-0470N	ACES
A1250WV-S-04PC	JOINT-TECH

2.2.4 M2M (1 x 2280 M.2 M-Key (Support NVME only))

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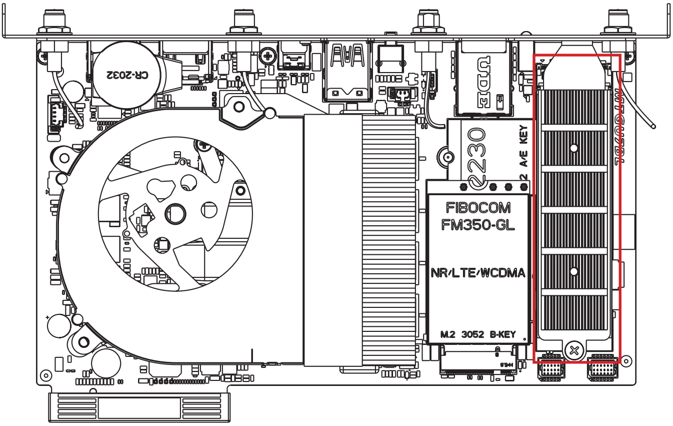
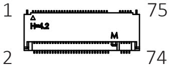


M.2 M Key Connector


Pin No.	Definition	Pin No.	Definition
1	GND	2	3.3V
3	GND	4	3.3V
5	PCIE3 RXn	6	NC
7	PCIE3 RXp	8	NC
9	GND	10	NC
11	PCIE3 TXn	12	3.3V
13	PCIE3 TXp	14	3.3V
15	GND	16	3.3V
17	PCIE2 RXn	18	3.3V
19	PCIE2 RXp	20	NC
21	GND	22	NC
23	PCIE2 TXn	24	NC
25	PCIE2 TXp	26	NC
27	GND	28	NC
29	PCIE1 RXn	30	NC
31	PCIE1 RXp	32	NC
33	GND	34	NC
35	PCIE1 TXn	36	NC
37	PCIE1 TXp	38	DEVSLP
39	GND	40	NC
41	PCIE0 RXn	42	NC
43	PCIE0 RXp	44	NC
45	GND	46	NC
47	PCIE0 TXn	48	NC
49	PCIE0 TXp	50	PCI Reset
51	GND	52	PCIE Clock Request
53	PCIE Clockn	54	Wakeup
55	PCIE Clockp	56	NC
57	GND	58	NC

Pin No.	Definition	Pin No.	Definition
67	NC	68	SUSCLK
69	Detect	70	3.3V
71	GND	72	3.3V
73	GND	74	3.3V
75	GND		

Connector PN	Vendor
80159-8523	BELLWETHER

2.2.5 M2E (1 x 2230 M.2 E-Key)

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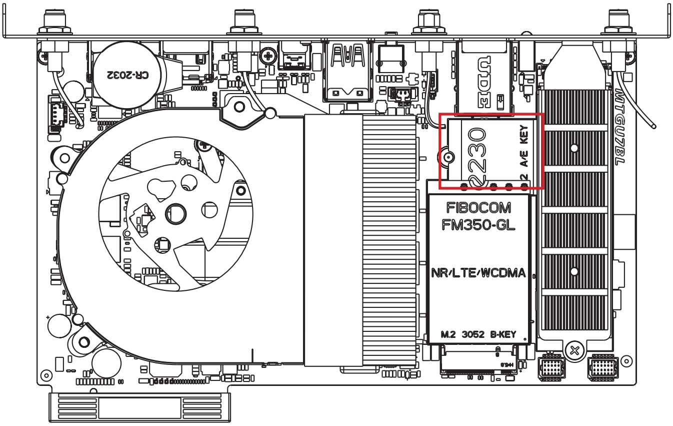
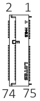


M.2 E Key Connector


Pin No.	Definition	Pin No.	Definition
1	GND	2	3.3V
3	D1p	4	3.3V
5	D1n	6	NC
7	GND	8	NC
9	NC	10	NC
11	NC	12	NC
13	GND	14	NC
15	NC	16	NC
17	NC	18	GND
19	GND	20	NC
21	NC	22	NC
23	NC		

Pin No.	Definition	Pin No.	Definition
33	GND	32	NC
35	PCIE_TXp	34	NC
37	PCIE_TXn	36	NC
39	GND	38	CL_Reset
41	PCIE_RXp	40	CL_DATA
43	PCIE_RXn	42	CL_Clock
45	GND	44	NC
47	PCIE CLOCKp	46	NC
49	PCIE CLOCKn	48	NC
51	GND	50	SUSCLK
53	PCIE Clock Request	52	PCIRST
55	PCIE wake up	54	BT_Disable
57	GND	56	WLAN_DISABLE
59	NC	58	NC
61	NC	60	NC
63	GND	62	NC
65	NC	64	NC
67	NC	66	NC
69	GND	68	NC
71	NC	70	NC
73	NC	72	3.3V
75	GND	74	3.3V

Connector PN	Vendor
APCI0076-P002A	LOTES

2.2.6 M2B (1 x 3052 M.2 B-Key)

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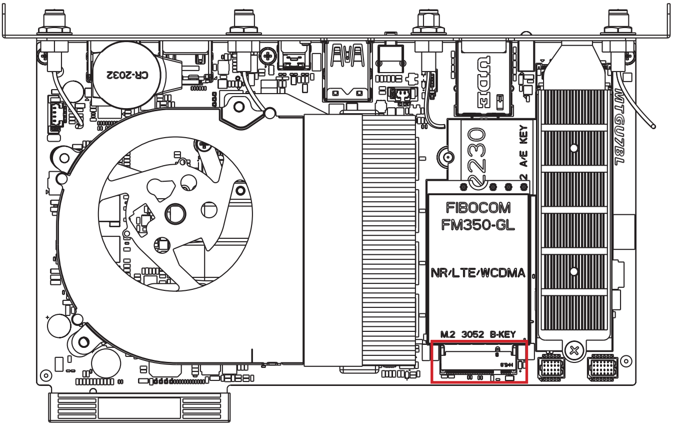
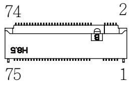


M.2 B Key Connector


Pin No.	Definition	Pin No.	Definition
1	NC	2	3.3V
3	GND	4	3.3V
5	GND	6	WAN OFF
7	USB Dp	8	WAN Disable
9	USB Dn	10	LED
11	GND		

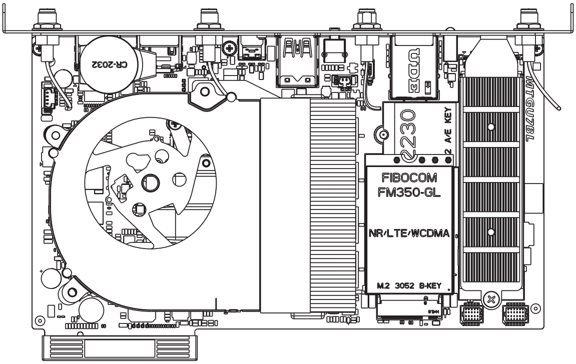
Pin No.	Definition	Pin No.	Definition
21	NC	20	NC
23	M2B_WAKE	22	NC
25	NC	24	NC
27	GND	26	WAN Disable2
29	USB3_RXp	28	NC
31	USB3_RXn	30	SIM_RST#
33	GND	32	SIM_CLK
35	USB3_TXn	34	SIM_DATA
37	USB3_TXp	36	SIM_PWR
39	GND	38	NC

Pin No.	Definition	Pin No.	Definition
41	PCIE_RXn	40	NC
43	PCIE_RXp	42	NC
45	GND	44	NC
47	PCIE_TXn	46	NC
49	PCIE_TXp	48	NC
51	GND	50	Clock
53	CLK_n	52	Clock request
55	CLK_p	54	PCIE_WAKE
57	GND	56	NC
59	NC	58	NC
61	NC	60	NC
63	NC	62	NC
65	NC	64	NC
67	Reset	66	NC
69	NC	68	NC
71	GND	70	3.3V
73	NC	72	3.3V
75	NC	74	3.3V

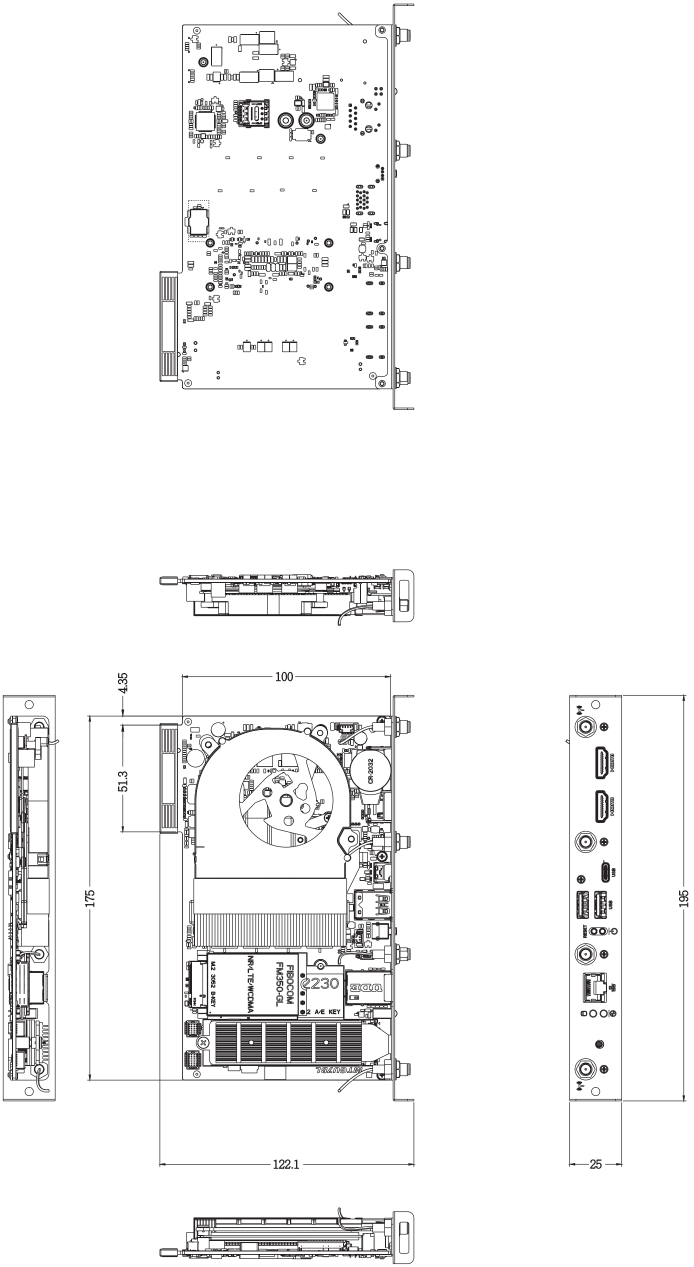
Connector PN	Vendor
2E0BC26-S58BB-7H	FOXCONN

Chapter 3

Chapter 3 – SDM-L Installation

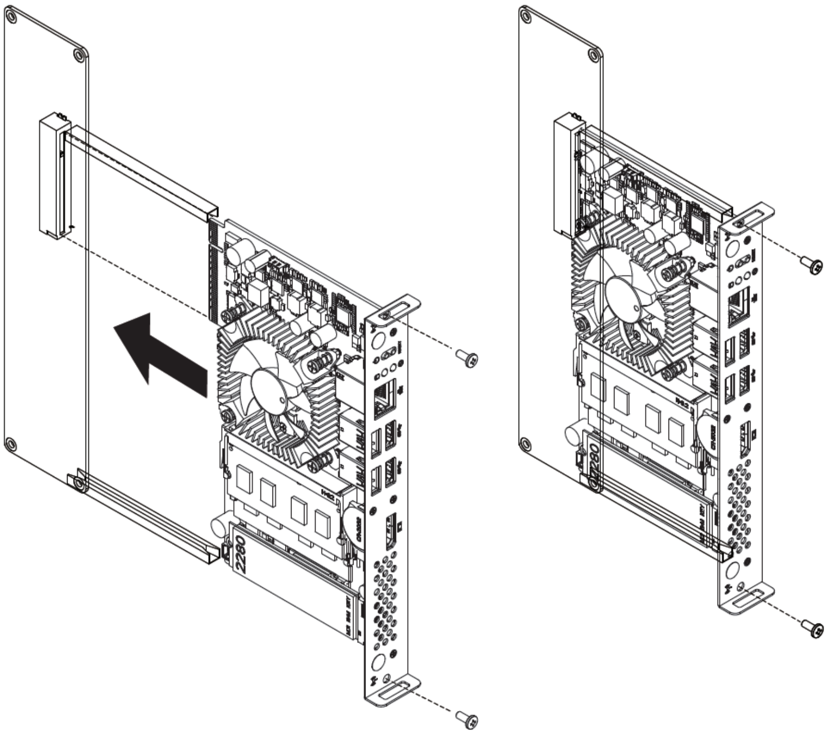


3.1 Dimension



3.2 Installation

[SDM Install]



＊ The image is for reference only.
The actual product could be slightly different.

Chapter 4

Chapter 4 – BIOS

4.1 Introduction

BIOS (Basic input/output system) provides hardware detailed information and boot-up options, which include firmware to control, set-up and test all hardware settings. Therefore, BIOS is the communication bridge between OS/application software and hardware.

4.1.1 How to Entering into BIOS menu

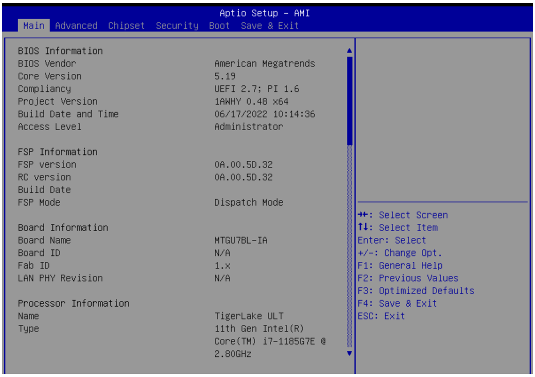
Once the system is power on, press the <DEL> key as soon as possible to access into BIOS Setup program.

4.1.2 Function Keys to setup in BIOS Setup program

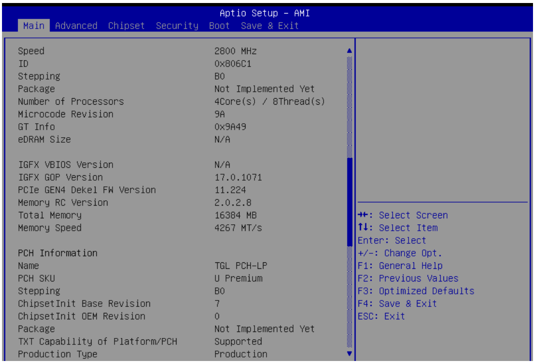
Function keys	Description
→←	Select Screen
↑↓	Select Item
Enter	Execute command or enter the submenu
+	Increase the numeric value or make changes
—	Decrease the numeric value or make changes
F1	General Help
F2	Previous Values
F3	Load Optimized Defaults Settings
F4	Save changes & Exit the BIOS Setup program
ESC	Exit the BIOS Setup program

4.2 The Main Menu

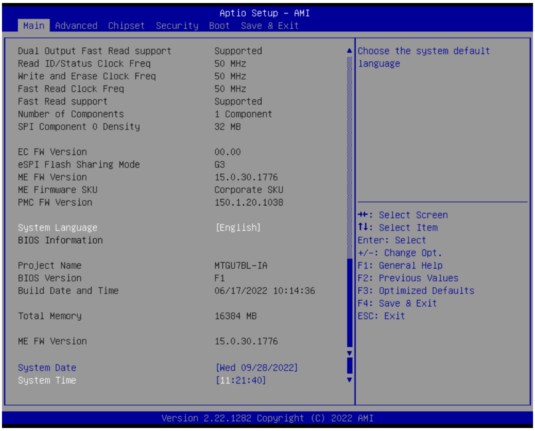
The main menu shows the basic system information.
Use arrow keys to move among the items.



```
                           Aptio Setup - AMI
  Main  Advanced  Chipset  Security  Boot  Save & Exit

  BIOS Information
  BIOS Vendor                          American Megatrends
  Core Version                         5.19
  Compliancy                           UEFI 2.7; PI 1.6
  Project Version                      1AWHY 0.48 x64
  Build Date and Time                  06/17/2022 10:14:36
  Access Level                         Administrator

  FSP Information
  FSP version                          0A.00.5D.32
  RC version                           0A.00.5D.32
  Build Date
  FSP Mode                             Dispatch Mode

  Board Information                                          →←: Select Screen
  Board Name                           MTGU7BL-IA            ↑↓: Select Item
  Board ID                             N/A                   Enter: Select
  Fab ID                               1.x                   +/-: Change Opt.
  LAN PHY Revision                     N/A                   F1: General Help
                                                             F2: Previous Values
  Processor Information                                      F3: Optimized Defaults
  Name                                 TigerLake ULT         F4: Save & Exit
  Type                                 11th Gen Intel(R)     ESC: Exit
                                       Core(TM) i7-1185G7E @
                                       2.80GHz
```



```
                           Aptio Setup - AMI
  Main  Advanced  Chipset  Security  Boot  Save & Exit

  Speed                                2800 MHz
  ID                                   0x806C1
  Stepping                             B0
  Package                              Not Implemented Yet
  Number of Processors                 4Core(s) / 8Thread(s)
  Microcode Revision                   9A
  GT Info                              0x9A49
  eDRAM Size                           N/A

  IGFX VBIOS Version                   N/A
  IGFX GOP Version                     17.0.1071
  PCIe GEN4 Dekel FW Version           11.224
  Memory RC Version                    2.0.2.8
  Total Memory                         16384 MB              →←: Select Screen
  Memory Speed                         4267 MT/s             ↑↓: Select Item
                                                             Enter: Select
  PCH Information                                            +/-: Change Opt.
  Name                                 TGL PCH-LP            F1: General Help
  PCH SKU                              U Premium             F2: Previous Values
  Stepping                             B0                    F3: Optimized Defaults
  ChipsetInit Base Revision            7                     F4: Save & Exit
  ChipsetInit OEM Revision             0                     ESC: Exit
  Package                              Not Implemented Yet
  TXT Capability of Platform/PCH       Supported
  Production Type                      Production
```



```
                           Aptio Setup - AMI
  Main  Advanced  Chipset  Security  Boot  Save & Exit

  Dual Output Fast Read support        Supported             Choose the system default
  Read ID/Status Clock Freq            50 MHz                language
  Write and Erase Clock Freq           50 MHz
  Fast Read Clock Freq                 50 MHz
  Fast Read support                    Supported
  Number of Components                 1 Component
  SPI Component 0 Density              32 MB

  EC FW Version                        00.00
  eSPI Flash Sharing Mode              G3
  ME FW Version                        15.0.30.1776
  ME Firmware SKU                      Corporate SKU
  PMC FW Version                       150.1.20.1038
                                                             →←: Select Screen
  System Language                      [English]             ↑↓: Select Item
  BIOS Information                                           Enter: Select
                                                             +/-: Change Opt.
  Project Name                         MTGU7BL-IA            F1: General Help
  BIOS Version                         F1                    F2: Previous Values
  Build Date and Time                  06/17/2022 10:14:36   F3: Optimized Defaults
                                                             F4: Save & Exit
  Total Memory                         16384 MB              ESC: Exit

  ME FW Version                        15.0.30.1776

  System Date                          [Wed 09/28/2022]
  System Time                          [11:21:40]

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```
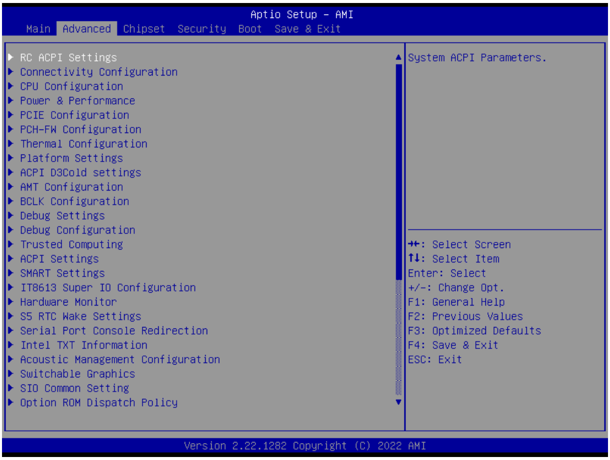

No.	Items	Description
1	**BIOS Information**	BIOS Vendor : shows BIOS vendor name Core Version : shows BIOS Core version Compliancy : shows Project Version : shows BIOS project version Build Date and Time : shows BIOS build date and time Access Level : shows access level
2	**FSP Information**	FSP version : shows FSP version RC version : shows RC version Build Date : [Blank] FSP Mode : shows FSP mode
3	**Board Information**	Board Name : shows Motherboard model name Board ID : N/A Fab ID : shows Fab ID LAN PHY Revision : N/A
4	**Processor Information**	Name : shows platform codename Type : shows CPU model name Speed : shows CPU Speed ID : shows CPU ID Stepping : shows CPU stepping Package : Not Implemented yet Number of Processors : shows CPU's core & theread information Microcode Revision : shows Microcode revision GT Info : shows GT info eDRAM size : N/A
5	**IGFXX VBIOS Version**	N/A
6	**IGFX GOP Version**	shows IGFX GOP version
7	**PCIe GEN4 Dekel FW Version**	shows PCIe Gen4 Dekel FW Version
8	**Memory RC Version**	Shows memory RC version
9	**Total Memory**	shows total memory size
10	**Memory Speed**	shows memory speed
11	**PCH Information**	Name : shows PCH platform codename PCH SKU : shows PCH sku information Stepping : shows PCH stepping ChipsetInit Base Revision : shows ChipsetInit Base Revision ChipsetInit OEM Revision : shows ChipsetInit OEM Revision Package : Not Implemented Yet TXT Capability of Platform/PCH : shows if support TXT Capability Production Type : shows PCH's production type
12	**Dual Output Fast Read support**	shows if dual output fast read support
13	**Read ID/Status Clock Freq**	shows Read ID/Status Clock frequency

14	**Write and Erase Clock Freq**	shows write and Erase Clock frequency
15	**Fast Read Clock Freq**	shows Fast read clock frequency
16	**Number of components**	shows number of components
17	**SPI Component 0 Density**	shows SPI component 0 density
18	**EC FW Version**	shows EC FW Version
19	**eSPI Flash Sharing Mode**	shows eSPI flash sharing mode
20	**ME FW Version**	shows ME FW version
21	**ME Firmware sku**	shows ME firmware sku
22	**PMC FW Version**	shows PMC FW version
23	**System Language**	shows system language
24	**BIOS Information**	[Blank]
25	**Project name**	shows project name information
26	**BIOS Version**	shows BIOS version of the system
27	**Build Date and Time**	Shows the Build Date and Time when the BIOS was created.
28	**Total Memory**	Shows the total memory size of the installed memory
29	**ME FW version**	Shows ME firmware version
30	**System Date**	Set the Date for the system (Format : Week - Month - Day - Year)
31	**System Time**	Set the time for the system (Format : Hour - Minute - Second)

4.3 Advanced

The Advanced menu is to configure the functions of hardware settings through submenu. Use arrow keys to move among the items, and press <Enter> to access into the related submenu.



```
                         Aptio Setup - AMI
  Main  Advanced  Chipset  Security  Boot  Save & Exit

► RC ACPI Settings                              System ACPI Parameters.
► Connectivity Configuration
► CPU Configuration
► Power & Performance
► PCIE Configuration
► PCH-FW Configuration
► Thermal Configuration
► Platform Settings
► ACPI D3Cold settings
► AMT Configuration
► BCLK Configuration
► Debug Settings
► Debug Configuration
► Trusted Computing                             →←: Select Screen
► ACPI Settings                                 ↑↓: Select Item
► SMART Settings                                Enter: Select
► IT8613 Super IO Configuration                 +/-: Change Opt.
► Hardware Monitor                              F1: General Help
► S5 RTC Wake Settings                          F2: Previous Values
► Serial Port Console Redirection               F3: Optimized Defaults
► Intel TXT Information                         F4: Save & Exit
► Acoustic Management Configuration             ESC: Exit
► Switchable Graphics
► SIO Common Setting
► Option ROM Dispatch Policy

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```

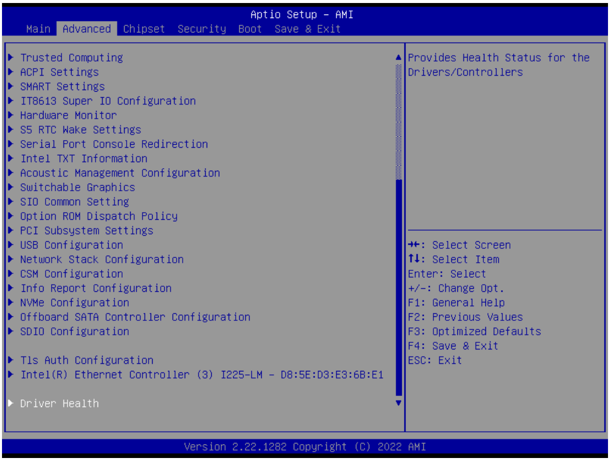

```
                         Aptio Setup - AMI
  Main  Advanced  Chipset  Security  Boot  Save & Exit

► Trusted Computing                             Provides Health Status for the
► ACPI Settings                                 Drivers/Controllers
► SMART Settings
► IT8613 Super IO Configuration
► Hardware Monitor
► S5 RTC Wake Settings
► Serial Port Console Redirection
► Intel TXT Information
► Acoustic Management Configuration
► Switchable Graphics
► SIO Common Setting
► Option ROM Dispatch Policy
► PCI Subsystem Settings
► USB Configuration                             →←: Select Screen
► Network Stack Configuration                   ↑↓: Select Item
► CSM Configuration                             Enter: Select
► Info Report Configuration                     +/-: Change Opt.
► NVMe Configuration                            F1: General Help
► Offboard SATA Controller Configuration        F2: Previous Values
► SDIO Configuration                            F3: Optimized Defaults
                                                F4: Save & Exit
► Tls Auth Configuration                        ESC: Exit
► Intel(R) Ethernet Controller (3) I225-LM - D8:5E:D3:E3:6B:E1

► Driver Health

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```
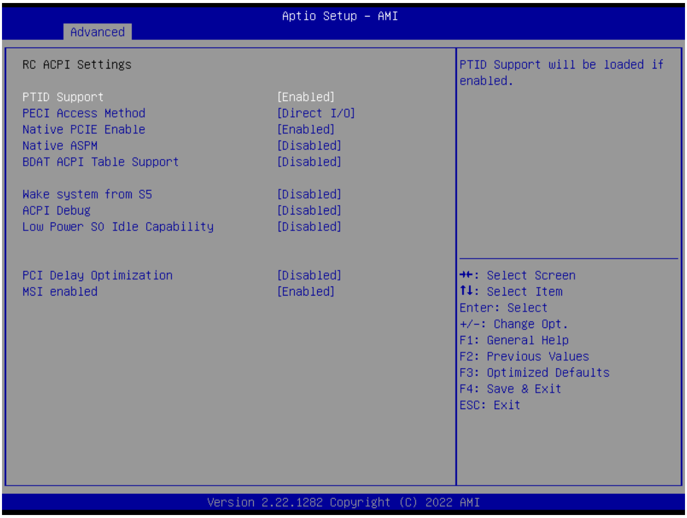

4.3.1 RC ACPI Settings



```
                              Aptio Setup - AMI
    Advanced
 RC ACPI Settings                                     PTID Support will be loaded if
                                                      enabled.
 PTID Support                     [Enabled]
 PECI Access Method               [Direct I/O]
 Native PCIE Enable               [Enabled]
 Native ASPM                      [Disabled]
 BDAT ACPI Table Support          [Disabled]

 Wake system from S5              [Disabled]
 ACPI Debug                       [Disabled]
 Low Power S0 Idle Capability     [Disabled]


 PCI Delay Optimization           [Disabled]          →←: Select Screen
 MSI enabled                      [Enabled]           ↑↓: Select Item
                                                      Enter: Select
                                                      +/-: Change Opt.
                                                      F1: General Help
                                                      F2: Previous Values
                                                      F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit

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```
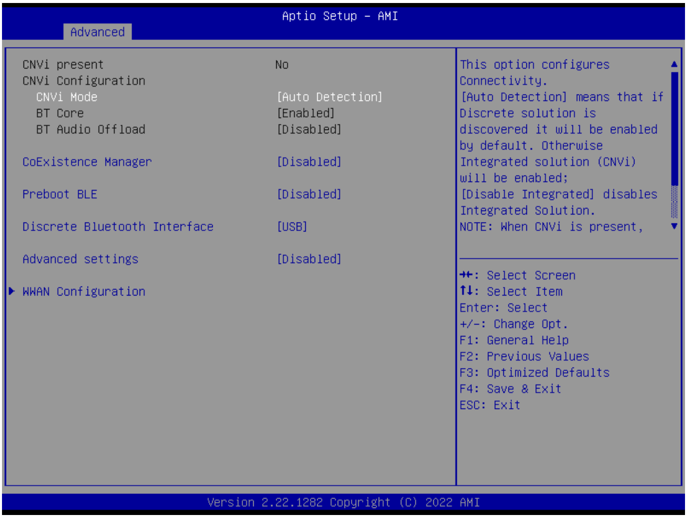

No.	Item	Description
1	PTID Support	Disabled : Disables PTID support Enabled : Enables PTID support (Default setting)
2	PECI Access Method	Direct I/O : PECI Access method is Direct I/O (Default setting) ACPI : PECI Access method is ACPI
3	Native PCIE Enable	Disabled : Disables native PCIE Enable function Enabled : Enables native PCIE Enable function (Default setting)
4	Native ASPM	Auto : Detect automatically if OS or BIOS controls ASPM Enabled : use OS controls ASPM Disabled : use BIOS controls ASPM (Default setting)
5	BDAT ACPI Table Support	Disabled : Disables support for the BDAT ACPI table (Default setting) Enabled : Enables support for the BDAT ACPI table
6	Wake system from S5	Disabled : Disables system wake up from S5 (Default setting) Enabled : Enables system wake up from S5

7	ACPI Debug	Disabled : Disables ACPI debug function (Default setting) Enabled : Enables ACPI debug function
8	Low Power S0 Idle Capability	Disabled : Disables Low power S0 Idle Capability (Default setting) Enabled : Enables Low power S0 Idle Capability
9	PCI Delay Optimization	Disabled : Disables PCI Delay optimization function (Default setting) Enabled : Enables PCI Delay optimization function
10	MSI enabled	Disabled : Disables MSI support in FADT Enabled : Enables MSI support in FADT (Default setting)

4.3.2 Connectivity Configuration



```
                         Aptio Setup - AMI
     Advanced
  CNVi present                         No                 This option configures
  CNVi Configuration                                      Connectivity.
    CNVi Mode                          [Auto Detection]   [Auto Detection] means that if
    BT Core                            [Enabled]          Discrete solution is
    BT Audio Offload                   [Disabled]         discovered it will be enabled
                                                          by default. Otherwise
  CoExistence Manager                  [Disabled]         Integrated solution (CNVi)
                                                          will be enabled;
  Preboot BLE                          [Disabled]         [Disable Integrated] disables
                                                          Integrated Solution.
  Discrete Bluetooth Interface         [USB]              NOTE: When CNVi is present,

  Advanced settings                    [Disabled]
                                                          →←: Select Screen
▶ WWAN Configuration                                      ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit

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```
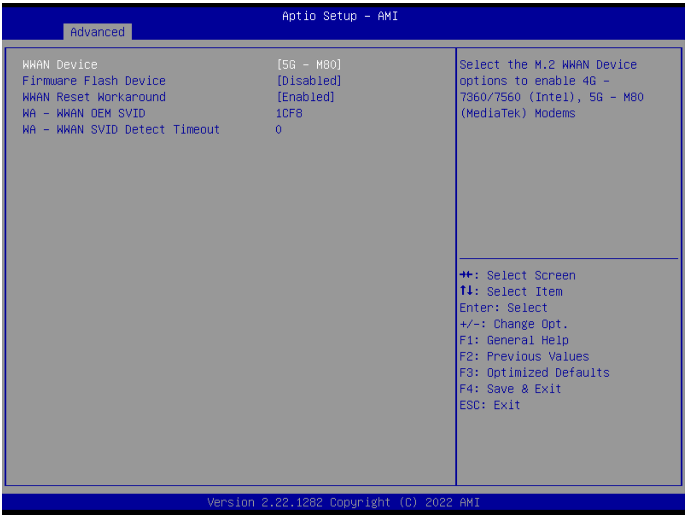

No.	Item	Description
1	CNVi Configuration	CNVi Mode : **Disable Integrated : Disables Integrated solution** **Auto Detection : If discrete solution is discovered, it will be enabled by default. otherwise, integrated solution (CNVi) will be enabled. (Default setting)** BT Core : **Enabled : Enables BT core (Default setting)** BT Audio Offload : **Disabled : Disables BT Audio offload (Default setting)**
2	CoExistence Manager	**Disabled : Disables CoExistence Manager function (Default setting)** **Enabled : Enables CoExistence Manager function**
3	Preboot BLE	**Disabled : Disables to preboot bluetooth function (Default setting)** **Enabled : Enables to preboot bluetooth function**
4	Discrete Bluetooth Interface	**Disabled : Disables to select BT interface** **USB : To be abled to select BT interface (Default setting)**
5	Advanced settings	Configure ACPI objects for wireless devices **Disabled : Disables for advanced settings (Default setting)** **Enabled : Enables for advanced settings**
6	WWAN Configuration	Please see next page



```
                              Aptio Setup - AMI
         Advanced
  WWAN Device                          [5G - M80]        Select the M.2 WWAN Device
  Firmware Flash Device                [Disabled]        options to enable 4G -
  WWAN Reset Workaround                [Enabled]         7360/7560 (Intel), 5G - M80
  WA - WWAN OEM SVID                   1CF8              (MediaTek) Modems
  WA - WWAN SVID Detect Timeout        0

                                                         →←: Select Screen
                                                         ↑↓: Select Item
                                                         Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit

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```
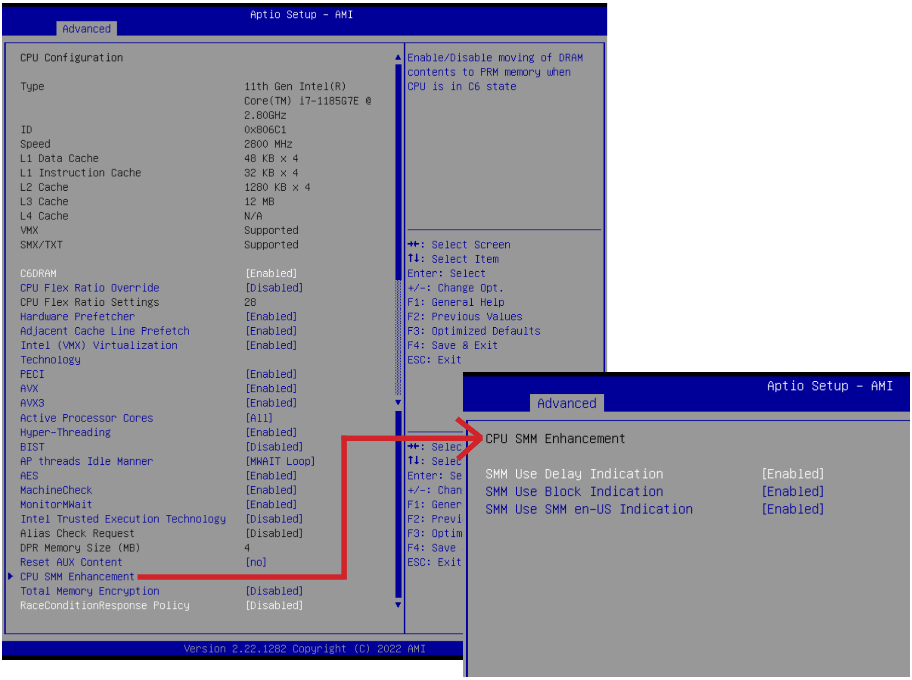

No.	Item	Description
6.1	**WWAN Device**	Select M.2 WWAN Device for different speeed **Disabled : Disables M.2 WWAN Device function** **4G - 7360/7560 : select M.2 WWAN Device to support 4G - 7360/7560** **5G - M80 : select M.2 WWAN Device to support 5G - M80 (Default setting)**
6.2	**Firmware Flash Device**	To Enable or Disable WWAN Firmware Flash Device **Disabled : Disables WWAN Firmware Flash Device (Default setting)** **Enabled : Enables WWAN Firmware Flash Device**
6.3	**WWAN Reset Workaround**	**Disabled : Disables WWAN Reset workaround function** **Enabled : Enables WWAN Reset workaround function (Default setting)**
6.4	**WA - WWAN OEM SVID**	WWAN OEM Sub-vendor ID
6.5	**WA - WWAN SVID Detect Timeout**	The timeout value is for detecting WWAN OEM SVID.

4.3.3 CPU Configuration

This submenu shows detailed CPU informations.



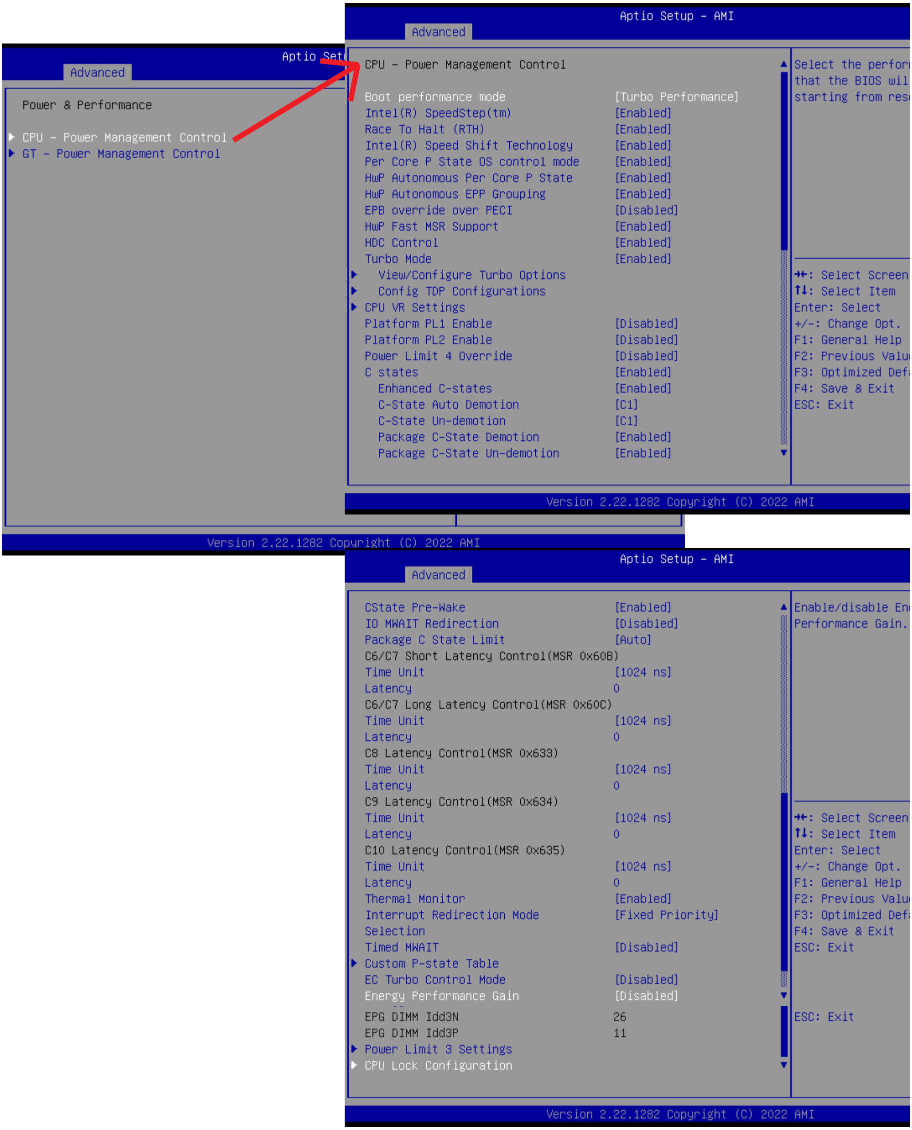
```
                              Aptio Setup - AMI
          Advanced
 CPU Configuration                                      Enable/Disable moving of DRAM
                                                        contents to PRM memory when
 Type                         11th Gen Intel(R)         CPU is in C6 state
                              Core(TM) i7-1185G7E @
                              2.80GHz
 ID                           0x806C1
 Speed                        2800 MHz
 L1 Data Cache                48 KB x 4
 L1 Instruction Cache         32 KB x 4
 L2 Cache                     1280 KB x 4
 L3 Cache                     12 MB
 L4 Cache                     N/A
 VMX                          Supported
 SMX/TXT                      Supported                 ++: Select Screen
                                                        ↑↓: Select Item
 C6DRAM                       [Enabled]                 Enter: Select
 CPU Flex Ratio Override      [Disabled]                +/-: Change Opt.
 CPU Flex Ratio Settings      28                        F1: General Help
 Hardware Prefetcher          [Enabled]                 F2: Previous Values
 Adjacent Cache Line Prefetch [Enabled]                 F3: Optimized Defaults
 Intel (VMX) Virtualization   [Enabled]                 F4: Save & Exit
 Technology                                             ESC: Exit
 PECI                         [Enabled]
 AVX                          [Enabled]
 AVX3                         [Enabled]
 Active Processor Cores       [All]
 Hyper-Threading              [Enabled]
 BIST                         [Disabled]
 AP threads Idle Manner       [MWAIT Loop]
 AES                          [Enabled]
 MachineCheck                 [Enabled]
 MonitorMWait                 [Enabled]
 Intel Trusted Execution Technology [Disabled]
 Alias Check Request          [Disabled]
 DPR Memory Size (MB)         4
 Reset AUX Content            [no]
▶ CPU SMM Enhancement
 Total Memory Encryption      [Disabled]
 RaceConditionResponse Policy [Disabled]
                 Version 2.22.1282 Copyright (C) 2022 AMI
```

```
                                   Aptio Setup - AMI
      Advanced
 CPU SMM Enhancement

 SMM Use Delay Indication                  [Enabled]
 SMM Use Block Indication                  [Enabled]
 SMM Use SMM en-US Indication              [Enabled]
```

No.	Item	Description
1	**C6DRAM**	Enables or Disables moving of DRAM contents to PRM memory when CPU is in C6 state. **Disabled / Enabled (Default setting)**
2	**CPU Flex Ratio Override**	**Disabled (Default setting) / Enabled**
3	**Hardware Prefetcher**	To turn on or off the MLC streamer prefetcher. **Disabled / Enabled (Default setting)**
4	**Adjacent Cache Line Prefetch**	To turn on or off prefetching of adjacent cache lines. **Disabled / Enabled (Default setting)**
5	**Intel (VMX) Virtualization Technology**	Virtualization enhanced by Intel® Virtualization Technology will allow a platform to run multiple operating systems and applications in independent partitions. With virtualization, one computer system can function as multiple virtual systems. **Enabled (Default setting) / Disabled**
6	**PECI**	**Disabled / Enabled (Default setting)**
7	**AVX**	**Enabled (Default setting) / Disabled**
8	**AVX3**	**Enabled (Default setting) / Disabled**

9	**Active Processor Cores**	Number of cores to enable in each processor package. **option items : All (Default setting), 1, 2, 3**
10	**Hyper-Threading**	**Disabled / Enabled (Default setting)**
11	**BIST (Built-In Self Test)**	**Disabled (Default setting) / Enabled**
12	**AP threads Idle Manner**	**HALT Loop : AP threads Idle Manner runs in HALT loop** **MWAIT Loop : AP threads Idle Manner runs in MWAIT loop (Default setting)** **RUN Loop : AP threads Idle Manner runs in RUN loop**
13	**AES (Advanced Encryption Standard)**	**Disabled /Enabled (Default setting)**
14	**MachineCheck**	**Disabled / Enabled (Default setting)**
15	**MonitorMWait**	**Disabled / Enabled (Default setting)**
16	**Intel Trusted Execution Technology**	**Disabled (Default setting) / Enabled**
17	**Reset AUX Content**	**Yes : agree to reset TPM Aux content** **No : disagree to reset TPM Aux content (Default setting)**
18	**CPU SMM Enhancement**	**18.1)** SMM Use Delay Indication : SMM Delayed MSR for MP sync in SMI **Disabled / Enabled (Default setting)** **18.2)** SMM Use Block Indication : SMM Blocked MSR for MP sync in SMI **Disabled / Enabled (Default setting)** **18.3)** SMM Use SMM en-US Indication : SMM Enable MSR for MP sync in SMI **Disabled / Enabled (Default setting)**
19	**Total Memory Encryption**	Configure Total Memory Encryption (TME) to protect DRAM data from physical attacks. **Disabled (Default setting) / Enabled**
20	**RaceCondition-Response Policy**	**Disabled (Default setting) / Enabled**

4.3.4 Power & Performance : CPU - Power Management Control



```
Aptio Set
Advanced

Power & Performance

▶ CPU - Power Management Control
▶ GT - Power Management Control

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```

```
                         Aptio Setup - AMI
Advanced

CPU - Power Management Control                          Select the perfor
                                                        that the BIOS wil
Boot performance mode              [Turbo Performance]  starting from res
Intel(R) SpeedStep(tm)             [Enabled]
Race To Halt (RTH)                 [Enabled]
Intel(R) Speed Shift Technology    [Enabled]
Per Core P State OS control mode   [Enabled]
HwP Autonomous Per Core P State    [Enabled]
HwP Autonomous EPP Grouping        [Enabled]
EPB override over PECI             [Disabled]
HwP Fast MSR Support               [Enabled]
HDC Control                        [Enabled]
Turbo Mode                         [Enabled]
▶ View/Configure Turbo Options                          ↔: Select Screen
▶ Config TDP Configurations                             ↑↓: Select Item
▶ CPU VR Settings                                       Enter: Select
Platform PL1 Enable                [Disabled]           +/-: Change Opt.
Platform PL2 Enable                [Disabled]           F1: General Help
Power Limit 4 Override             [Disabled]           F2: Previous Valu
C states                           [Enabled]            F3: Optimized Def
  Enhanced C-states                [Enabled]            F4: Save & Exit
  C-State Auto Demotion            [C1]                 ESC: Exit
  C-State Un-demotion              [C1]
  Package C-State Demotion         [Enabled]
  Package C-State Un-demotion      [Enabled]

         Version 2.22.1282 Copyright (C) 2022 AMI
```

```
                         Aptio Setup - AMI
Advanced

CState Pre-Wake                    [Enabled]            Enable/disable En
IO MWAIT Redirection               [Disabled]           Performance Gain.
Package C State Limit              [Auto]
C6/C7 Short Latency Control(MSR 0x60B)
Time Unit                          [1024 ns]
Latency                            0
C6/C7 Long Latency Control(MSR 0x60C)
Time Unit                          [1024 ns]
Latency                            0
C8 Latency Control(MSR 0x633)
Time Unit                          [1024 ns]
Latency                            0
C9 Latency Control(MSR 0x634)
Time Unit                          [1024 ns]            ↔: Select Screen
Latency                            0                    ↑↓: Select Item
C10 Latency Control(MSR 0x635)                          Enter: Select
Time Unit                          [1024 ns]            +/-: Change Opt.
Latency                            0                    F1: General Help
Thermal Monitor                    [Enabled]            F2: Previous Valu
Interrupt Redirection Mode         [Fixed Priority]     F3: Optimized Def
Selection                                               F4: Save & Exit
Timed MWAIT                        [Disabled]           ESC: Exit
▶ Custom P-state Table
EC Turbo Control Mode              [Disabled]
Energy Performance Gain            [Disabled]
EPG DIMM Idd3N                     26                   ESC: Exit
EPG DIMM Idd3P                     11
▶ Power Limit 3 Settings
▶ CPU Lock Configuration

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```
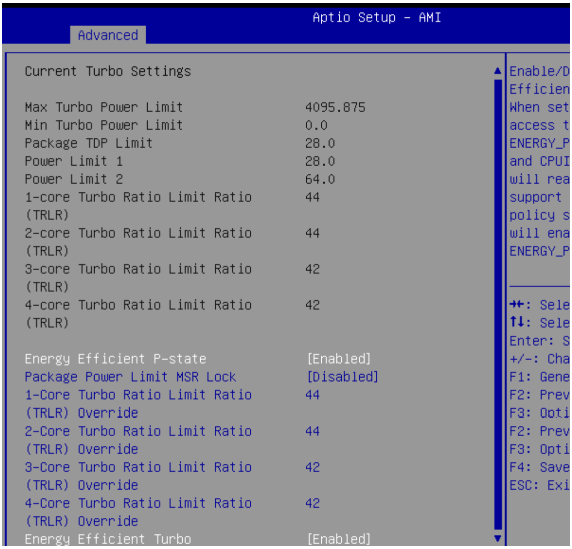
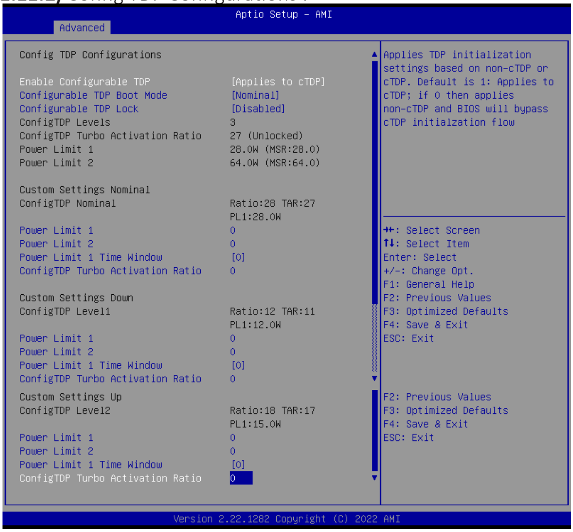

No.	Item	Description
1.1	**Boot performance mode**	**Option items : Max Battery, Max Non-Turbo Performance, Turbo Performance (Default setting)**
1.2	**Intel(R) SpeedStep(tm)**	According to Intel CPU loading, Intel SpeedStep Technology will automatically adjust the CPU voltage and core frequency to decrease heat and power consumption for power saving. **Enabled (Default setting) / Disabled**
1.3	**Race To Halt (RTH)**	RTH will dynamically increase CPU frequency in order to enter pkg C-State faster to reduce overall power. **Disabled / Enabled (Default setting)**
1.4	**Intel(R) Speed Shift Technology**	To speed up CPU frequency transition time from basic frequency to maximum frequency. **Enabled (Default setting) / Disabled**
1.5	**Per Core P State OS control mode**	**Disabled / Enabled (Default setting)**
1.6	**HwP Autonomous Per Core P State**	**Disabled / Enabled (Default setting)**
1.7	**HwP Autonomous EPP Grouping**	**Disabled / Enabled (Default setting)**
1.8	**EPB override over PECI**	**Disabled (Default setting) / Enabled**
1.9	**HWP Fast MSR Support**	**Disabled / Enabled (Default setting)**
1.10	**HDC Control**	**Disabled / Enabled (Default setting)**

1.11	**Turbo Mode**	**Disabled / Enabled (Default setting)** **1.11.1)** View/Configure Turbo Options :  Aptio Setup – AMI Advanced Current Turbo Settings Max Turbo Power Limit 4095.875 Min Turbo Power Limit 0.0 Package TDP Limit 28.0 Power Limit 1 28.0 Power Limit 2 64.0 1-core Turbo Ratio Limit Ratio (TRLR) 44 2-core Turbo Ratio Limit Ratio (TRLR) 44 3-core Turbo Ratio Limit Ratio (TRLR) 42 4-core Turbo Ratio Limit Ratio (TRLR) 42 Energy Efficient P-state [Enabled] Package Power Limit MSR Lock [Disabled] 1-Core Turbo Ratio Limit Ratio (TRLR) Override 44 2-Core Turbo Ratio Limit Ratio (TRLR) Override 44 3-Core Turbo Ratio Limit Ratio (TRLR) Override 42 4-Core Turbo Ratio Limit Ratio (TRLR) Override 42 Energy Efficient Turbo [Enabled] Enable/D Efficien When set access t ENERGY_P and CPUI will rea support policy s will ena ENERGY_P →←: Sele ↑↓: Sele Enter: S +/-: Cha F1: Gene F2: Prev F3: Opti F2: Prev F3: Opti F4: Save ESC: Exi **1.11.1.1)** Energy Efficient P-state : **Enabled (Default setting) / Disabled** **1.11.1.2)** Package Power Limit MSR Lock : **Disabled (Default setting) / Enabled** **1.11.1.3 ~ 6)** 1-Core Turbo Ratio Limit Ratio (TRLR) Override 2-Core Turbo Ratio Limit Ratio (TRLR) Override 3-Core Turbo Ratio Limit Ratio (TRLR) Override 4-Core Turbo Ratio Limit Ratio (TRLR) Override each Core Turbo Ratio Limit Ratio (TRLR) with range of Max Non-Turbo Ratio up to 120. **1.11.1.7)** Energy Efficient Turbo : **Disabled / Enabled (Default setting)**

1.11 **Turbo Mode**

1.11.2) Config TDP Configurations :



```
                              Aptio Setup - AMI
        Advanced
 Config TDP Configurations                                    ▲ Applies TDP initialization
                                                                settings based on non-cTDP or
 Enable Configurable TDP               [Applies to cTDP]        cTDP. Default is 1: Applies to
 Configurable TDP Boot Mode            [Nominal]                cTDP; if 0 then applies
 Configurable TDP Lock                 [Disabled]               non-cTDP and BIOS will bypass
 ConfigTDP Levels                      3                        cTDP initialzation flow
 ConfigTDP Turbo Activation Ratio      27 (Unlocked)
 Power Limit 1                         28.0W (MSR:28.0)
 Power Limit 2                         64.0W (MSR:64.0)

 Custom Settings Nominal
 ConfigTDP Nominal                     Ratio:28 TAR:27
                                       PL1:28.0W
 Power Limit 1                         0                        ++: Select Screen
 Power Limit 2                         0                        ↑↓: Select Item
 Power Limit 1 Time Window             [0]                      Enter: Select
 ConfigTDP Turbo Activation Ratio      0                        +/-: Change Opt.
                                                                F1: General Help
 Custom Settings Down                                           F2: Previous Values
 ConfigTDP Level1                      Ratio:12 TAR:11          F3: Optimized Defaults
                                       PL1:12.0W                F4: Save & Exit
 Power Limit 1                         0                        ESC: Exit
 Power Limit 2                         0
 Power Limit 1 Time Window             [0]
 ConfigTDP Turbo Activation Ratio      0                      ▼
 Custom Settings Up                                             F2: Previous Values
 ConfigTDP Level2                      Ratio:18 TAR:17          F3: Optimized Defaults
                                       PL1:15.0W                F4: Save & Exit
 Power Limit 1                         0                        ESC: Exit
 Power Limit 2                         0
 Power Limit 1 Time Window             [0]
 ConfigTDP Turbo Activation Ratio      0                      ▼
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```

1.11.2.1) Enable Configurable TDP :
Option items : Applies to non-cTDP, Applies to cTDP (Default setting)

1.11.2.2) Configurable TDP Boot Mode :
Option items : Nominal (Default setting), Down, Up, Deactivate

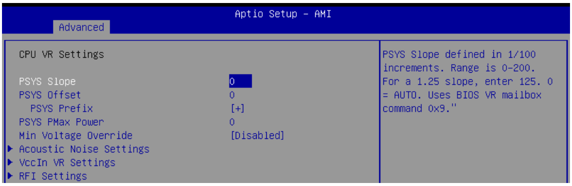
1.11.2.3) Configurable TDP Lock :
Enabled / Disabled (Default setting)

1.11.2.4~6). Custom Settings Nominal ConfigTDP Nominal / Custom Settings Down ConfigTDP Level1 / Custom Settings up ConfigTDP Level2:
Power Limit 1 : in Milli Watts.
Power Limit 2 : in Milli Watts.
Ex : For 12.50W, please enter 12500

Power Limit 1 Time Window : value in seconds. The value may vary from 0 to 128.

Config TDP Turbo Activation Ratio : Needs to be configured with valid values.

<table>
<tr>
<td>1.12</td>
<td><b>CPU VR Settings</b></td>
<td>



```
                          Aptio Setup - AMI
       Advanced

 CPU VR Settings                                  PSYS Slope defined in 1/100
                                                  increments. Range is 0-200.
 PSYS Slope                        0              For a 1.25 slope, enter 125. 0
 PSYS Offset                       0              = AUTO. Uses BIOS VR mailbox
   PSYS Prefix                     [+]            command 0x9."
 PSYS PMax Power                   0
 Min Voltage Override              [Disabled]
▶ Acoustic Noise Settings
▶ VccIn VR Settings
▶ RFI Settings
```

1.12.1) PSYS Slope : Range is 0-200, and is defined in 1/100 increments.
Ex : for a 1.25 slope, please enter 125.

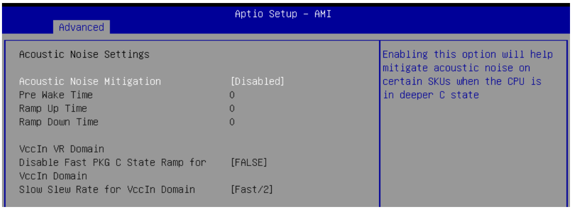
1.12.2) PSYS Offset : Range is 0-63999, and is defined in 1/1000 increments.
Ex : for an offset of 25.348, please enter 25348.

1.12.2.1) PSYS Prefix : set the offset vale as positive or negative.

1.12.3) PSYS PMax Power : Range is 0-8192, and is defined in 1/8 watt increments.
Ex : for a PMax of 125W, please enter 1000.

1.12.4) Min Voltage Override :
Disabled (Default settings) / Enabled

1.12.5) Acoustic Noise Settings:



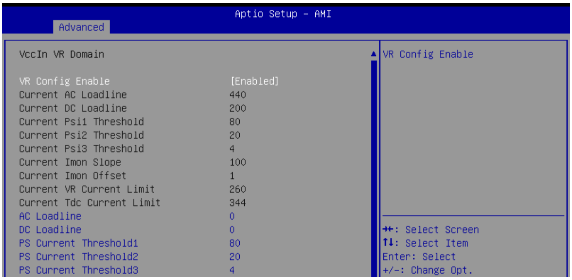
```
                          Aptio Setup - AMI
       Advanced

 Acoustic Noise Settings                          Enabling this option will help
                                                  mitigate acoustic noise on
 Acoustic Noise Mitigation         [Disabled]     certain SKUs when the CPU is
 Pre Wake Time                     0              in deeper C state
 Ramp Up Time                      0
 Ramp Down Time                    0

 VccIn VR Domain
 Disable Fast PKG C State Ramp for [FALSE]
 VccIn Domain
 Slow Slew Rate for VccIn Domain   [Fast/2]
```

Acoustic Noise Mitigation : help mitigate acoustic noise on certain SKUs when the CPU is in deeper C state.
Disabled (Default settings) / Enabled

1.12.6) VccIn VR Settings :

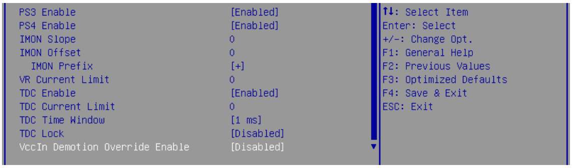


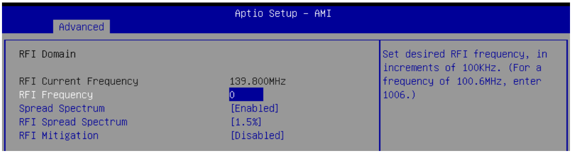
```
                          Aptio Setup - AMI
       Advanced

 VccIn VR Domain                                ▲ VR Config Enable

 VR Config Enable                  [Enabled]
 Current AC Loadline               440
 Current DC Loadline               200
 Current Psi1 Threshold            80
 Current Psi2 Threshold            20
 Current Psi3 Threshold            4
 Current Imon Slope                100
 Current Imon Offset               1
 Current VR Current Limit          260
 Current Tdc Current Limit         344
 AC Loadline                       0
 DC Loadline                       0               →←: Select Screen
 PS Current Threshold1             80              ↑↓: Select Item
 PS Current Threshold2             20              Enter: Select
 PS Current Threshold3             4               +/-: Change Opt.
```

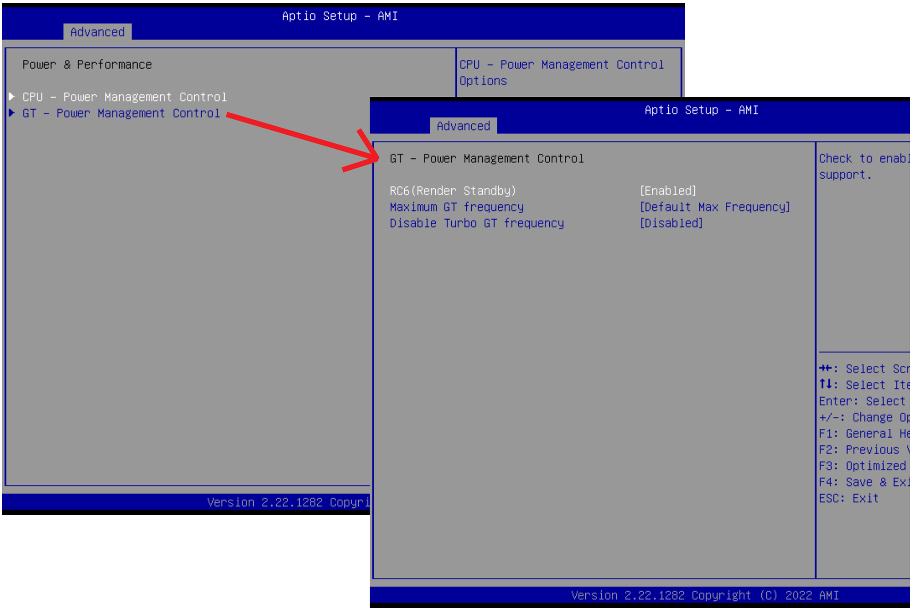
</td>
</tr>
</table>

1.12	**CPU VR Settings**	 PS3 Enable [Enabled] PS4 Enable [Enabled] IMON Slope 0 IMON Offset 0 IMON Prefix [+] VR Current Limit 0 TDC Enable [Enabled] TDC Current Limit 0 TDC Time Window [1 ms] TDC Lock [Disabled] VccIn Demotion Override Enable [Disabled] ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit **1.12.6.1)** VR Config Enable : **Disabled / Enabled (Default setting)** **1.12.6.2~3)** AC Loadline / DC Loadline : Range is 0-6249 (0-62.49 mOhms), is defined in 1/100 mOhms. Ex : a value of 1255 = 12.55 mOhm. **1.12.6.4~6)** PS Current Threshold1 / PS Current Threshold2 / PS Current Threshold3 : Range is 0-512 (0-128A), is defined in 1/4 A increments. Ex : a value of 400 = 100A **1.12.6.7~8)** PS3 Enable / PS4 Enable : **Disabled : 0 / Enabled : 1** **1.12.6.9)** IMON Slope : Range is 0-200, is defined in 1/100 increments. Ex : For a 1.25 slope, please enter 125. **1.12.6.10)** IMON Offset : Range is 0-63999, is defined in 1/1000 increments. Ex : For an offset of 25.348, please enter 25348. **1.12.6.10.1)** IMON Prefix : sets the offset vaule as positive or negative. **1.12.6.11)** VR Current Limit : Voltage Regulator current Limit value represents the Maximum instantaneous current allowed at any given time. The value is represented in 1/4 A increments. Ex : A value of 400 = 100A. **1.12.6.12)** TDC Enable : **Disabled / Enabled (Default setting)** **1.12.6.13)** TDC Current Limit : Range is 0-32767, is defined in 1/8A increments. Ex : For a TDC current Limit of 125A, please enter 1000. **1.12.6.14)** TDC Time Window : Range from 1ms to 10ms (value in milli seconds), except for 9ms. 9ms has no valid encoding in the MSR definition.

1.12	**CPU VR Settings**	**1.12.6.15)** TDC Lock : **Disabled (Default setting) / Enabled** **1.12.6.16)** VccIn Demotion Override Enable : **Disabled (Default setting) / Enabled** **1.12.7)** RFI Settings : Aptio Setup – AMI Advanced RFI Domain RFI Current Frequency 139.800MHz RFI Frequency 0 Spread Spectrum [Enabled] RFI Spread Spectrum [1.5%] RFI Mitigation [Disabled] Set desired RFI frequency, in increments of 100KHz. (For a frequency of 100.6MHz, enter 1006.) **1.12.7.1)** RFI Frequency : Set desired RFI frequency, in increments of 100KHz. Ex : For 1 frequency of 100.6MHz, please enter 1006 **1.12.7.2)** Spread Spectrum : **Disabled / Enabled (Default setting)** **1.12.7.3)** RFI Spread Spectrum : Option items : 0.5%, 1%, 1.5% (Default setting), 2%, 3%, 4%, 5%, 6% **1.12.7.4)** RFI Mitigation : **Disabled (Default setting) / Enabled**
1.13	**Platform PL1 Enable**	**Disabled (Default setting) / Enabled**
1.14	**Platform PL2 Enable**	**Disabled (Default setting) / Enabled**
1.15	**Power Limit 4 Override**	**Disabled (Default setting) / Enabled**
1.16	**C states**	**Disabled / Enabled (Default setting)** **1.16.1)** Enhanced C-states : **Disabled / Enabled (Default setting)** **1.16.2)** C-State Auto Demotion : **Option item : Disabled or C1** **1.16.3)** C-State Un-demotion : **Option item : Disabled or C1** **1.16.4)** Package C-State demotion : **Disabled / Enabled (Default setting)** **1.16.5)** Package C-State Un-demotion : **Disabled / Enabled (Default setting)**
1.17	**CState Pre-Wake**	**Disabled / Enabled (Default setting)**
1.18	**IO MWAIT Redirection**	**Disabled (Default setting) / Enabled**

1.19	**Package C State Limit**	Option items : C0/C1, C2, C3, C6, C7, C7S, C8, C9, C10, Cpu Default, Auto (Default setting)
1.20~ 24	**C6/C7 Short Latency Control (MSR 0x60B)** **C6/C7 Long Latency Control (MSR 0x60C)** **C8 Latency Control (MSR 0x633)** **C9 Latency Control (MSR 0x634)** **C10 Latency Control (MSR 0x635)**	Time Unit : Option items : 1 ns , 32ns, 1024ns (Default setting), 32768 ns, 1048576 ns, 33554432 ns Latency : Interrupt response time limit value, enter 0 - 10.
1.25	**Thermal Monitor**	**Disabled / Enabled (Default setting)**
1.26	**Interrupt Redirection Mode Selection**	Option items : Fixed Priority (Default setting), Round robin, Hash Vector, No Change
1.27	**Timed MWAIT**	**Disabled (Default setting) / Enabled**
1.28	**Custom P-state Table**	Number of P states : sets the number of custom P-states. At least 2 states must be present.
1.29	**EC Turbo Control Mode**	**Disabled (Default setting) / Enabled**
1.30	**Energy Performance Gain**	**Disabled (Default setting) / Enabled**
1.31	**EPG DIMM Idd3N**	**26**
1.32	**EPG DIMM Idd3P**	**11**
1.33	**Power Limit 3 Settings**	Power Limit 3 Override **Disabled (Default setting) / Enabled**
1.34	**CPU Lock Configuration**	CFG Lock : **Disabled /Enabled (Default setting)** Overclocking Lock : **Disabled / Enabled (Default setting)**

4.3.4 Power & Performance : GT - Power Management Control



```
Aptio Setup - AMI
Advanced

Power & Performance                         CPU - Power Management Control
                                            Options
▶ CPU - Power Management Control
▶ GT - Power Management Control

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```

```
Aptio Setup - AMI
Advanced

GT - Power Management Control                            Check to enabl
                                                         support.
RC6(Render Standby)           [Enabled]
Maximum GT frequency          [Default Max Frequency]
Disable Turbo GT frequency    [Disabled]

                                                         →←: Select Scr
                                                         ↑↓: Select Ite
                                                         Enter: Select
                                                         +/-: Change Op
                                                         F1: General He
                                                         F2: Previous V
                                                         F3: Optimized
                                                         F4: Save & Exi
                                                         ESC: Exit

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```
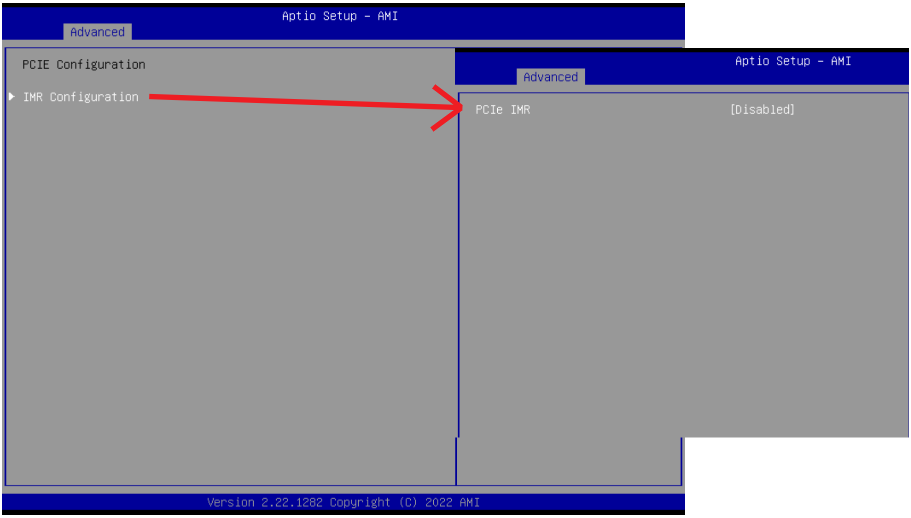

No.	Item	Description
2.1	**RC6 (Render Standby)**	Check to enable render standby support. **Disabled / Enabled (Default setting)**
2.2	**Maximum GT frequency**	Option items : Default Max Frequency (Default setting), 100Mhz, 150Mhz, 200Mhz, 250Mhz, 300Mhz, 350Mhz, 400Mhz, 450Mhz, 500Mhz, 550Mhz, 600Mhz, 650Mhz, 700Mhz, 750Mhz, 800Mhz, 850Mhz, 900Mhz, 950Mhz, 1000Mhz, 1050Mhz, 1100Mhz, 1150Mhz, 1200Mhz
2.3	**Disable Turbo GT frequency**	**Enabled / Disabled (Default setting)**

4.3.5 PCIE Configuration



```
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Advanced

PCIE Configuration

▶ IMR Configuration

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```

```
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Advanced

PCIe IMR                                  [Disabled]
```
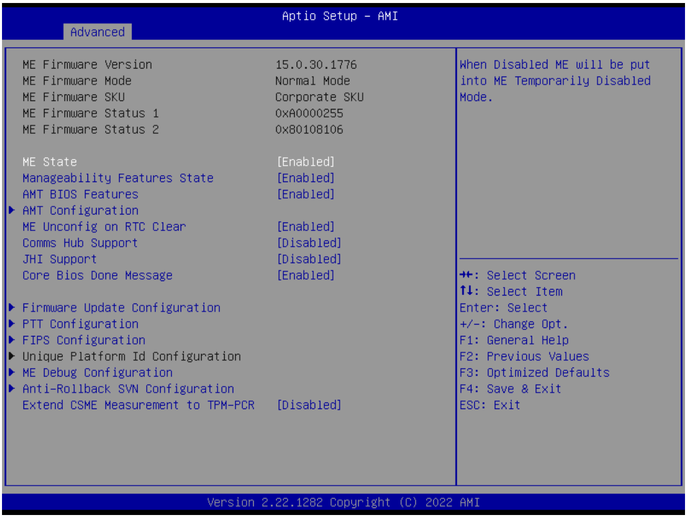

No.	Item	Description
1	**IMR Configuration**	PCIe IMR : **Disabled (Default setting) / Enabled**

4.3.6 PCH-FW Configuration



```
                              Aptio Setup - AMI
        Advanced

 ME Firmware Version                   15.0.30.1776       When Disabled ME will be put
 ME Firmware Mode                      Normal Mode        into ME Temporarily Disabled
 ME Firmware SKU                       Corporate SKU      Mode.
 ME Firmware Status 1                  0xA0000255
 ME Firmware Status 2                  0x80108106

 ME State                              [Enabled]
 Manageability Features State          [Enabled]
 AMT BIOS Features                     [Enabled]
▶ AMT Configuration
 ME Unconfig on RTC Clear              [Enabled]
 Comms Hub Support                     [Disabled]
 JHI Support                           [Disabled]
 Core Bios Done Message                [Enabled]          →←: Select Screen
                                                          ↑↓: Select Item
▶ Firmware Update Configuration                           Enter: Select
▶ PTT Configuration                                       +/-: Change Opt.
▶ FIPS Configuration                                      F1: General Help
▶ Unique Platform Id Configuration                        F2: Previous Values
▶ ME Debug Configuration                                  F3: Optimized Defaults
▶ Anti-Rollback SVN Configuration                         F4: Save & Exit
 Extend CSME Measurement to TPM-PCR    [Disabled]         ESC: Exit

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```
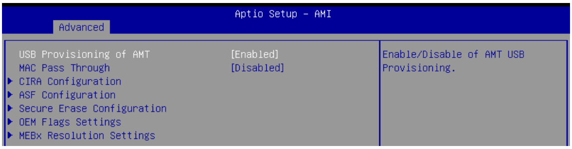
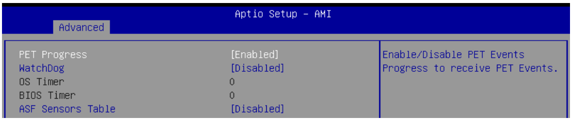
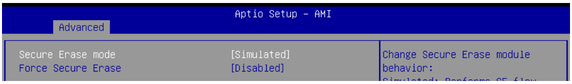
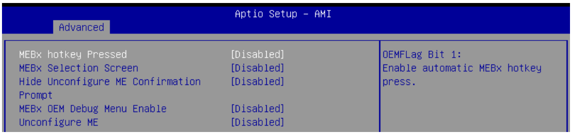
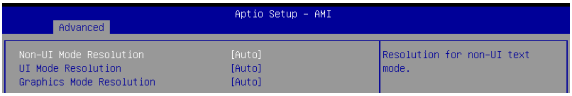
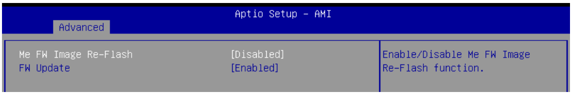
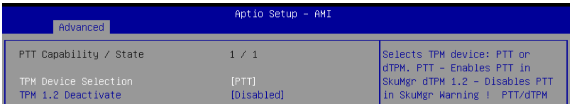
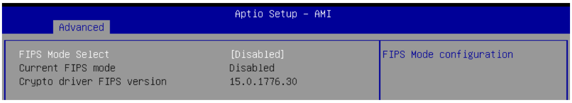
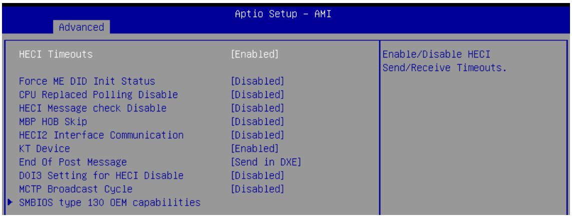
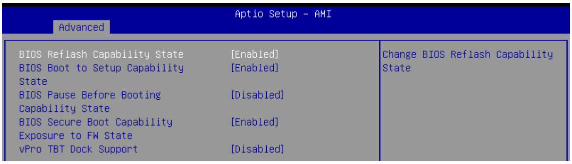
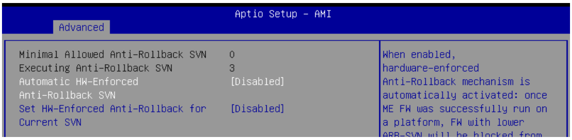

No.	Item	EDescription
1	ME State	**Disabled / Enabled : Enables ME state function**
2	Manageability Features State	**Disabled / Enabled (Default setting)**
3	AMT BIOS Features	**Disabled / Enabled (Default setting)**

4	AMT Configuration	
		`Aptio Setup - AMI` / `Advanced`
		`USB Provisioning of AMT [Enabled]`
		`MAC Pass Through [Disabled]`
		`▶ CIRA Configuration`
		`▶ ASF Configuration`
		`▶ Secure Erase Configuration`
		`▶ OEM Flags Settings`
		`▶ MEBx Resolution Settings`
		`Enable/Disable of AMT USB Provisioning.`
		4.1) USB Provisioning of AMT : Inserting a specially formatted USB drive into a system, to let the other system remotely control.
		Disabled / Enabled (Default setting)
		4.2) MAC Pass Through :
		Disabled (Default setting) / Enabled

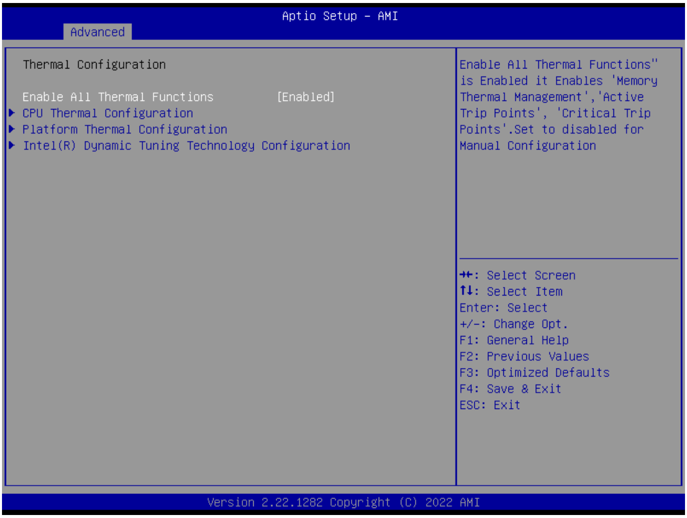
4	**AMT Configuration**	**4.3)** CIRA Configuration : Activate Remote Assistance Process : Trigger CIRA boot **Disabled (Default setting) / Enabled** **4.4)** ASF Configuration :  Aptio Setup - AMI Advanced PET Progress [Enabled] WatchDog [Disabled] OS Timer 0 BIOS Timer 0 ASF Sensors Table [Disabled] Enable/Disable PET Events Progress to receive PET Events. **4.4.1)** PET Progress : Choose to receive PET events or not **Disabled / Enabled (Default setting)** **4.4.2)** WatchDog : Choose to enables watchdog timer or not **Disabled (Default setting) / Enabled** **4.4.3)** OS Timer : Sets OS Watchdog Timer. **4.4.4)** BIOS Timer : Sets BIOS Timer. **4.4.5)** ASF Sensors Table : **Disabled (Default setting) / Enabled** **4.5)** Secure Erase Configuration :  Aptio Setup - AMI Advanced Secure Erase mode [Simulated] Force Secure Erase [Disabled] Change Secure Erase module behavior: Simulated: Performs SE flow **4.5.1)** Secure Erase mode : Choose to enables secure erase mode or not. **Simulated : Performs SE flow without erasing SSD (Default setting)** **Real : Erase SSD** **4.5.2)** Force Secure Erase : Force Secure Erase on next boot. **Disabled (Default setting) / Enabled** **4.6)** OEM Flags Settings :  Aptio Setup - AMI Advanced MEBx hotkey Pressed [Disabled] MEBx Selection Screen [Disabled] Hide Unconfigure ME Confirmation Prompt [Disabled] MEBx OEM Debug Menu Enable [Disabled] Unconfigure ME [Disabled] OEMFLag Bit 1: Enable automatic MEBx hotkey press. **4.6.1)** MEBx hotkey Pressed : Enables or Disables automatic MEBx hotkey press. **Disabled (Default setting) / Enabled** **4.6.2)** MEBx Selection Screen : Enables or Disables MEBx Selection Screen. **Disabled (Default setting) / Enabled** **4.6.3)** Hide Unconfigure ME Confirmation Prompt : To hide un-configured ME without password confirmation prompt. **Disabled (Default setting) / Enabled**

4	**AMT Configuration**	**4.6.4)** MEBx OEM Debug Menu Enable : Enables or Disables MEBx debug message. **Disabled (Default setting) /Enabled** **4.6.5)** Unconfigure ME : To Un-configure ME without password. **Disabled (Default setting) / Enabled** **4.7)** MEBx Resolution Settings :  Aptio Setup – AMI Advanced Non-UI Mode Resolution [Auto] UI Mode Resolution [Auto] Graphics Mode Resolution [Auto] Resolution for non-UI text mode. **4.7.1)** Non-UI Mode Resolution : Resolution for non-UI text mode. Option items : Auto (Default setting), 80x25, 100x31 **4.7.2)** UI Mode Resolution : Resolution for UI text mode. Option items : Auto (Default setting), 80x25, 100x31 **4.7.3)** Graphics Mode Resolution : Resolution for graphics mode. Option items : Auto (Default setting), 640x480, 800x600, 1024x768
5	**ME Unconfig on RTC Clear**	**Disabled / Enabled (Default setting)**
6	**Comms Hub Supprt**	**Disabled (Default setting) / Enabled**
7	**JHI Support**	**Disabled (Default setting) / Enabled**
8	**Core Bios Done Message**	**Disabled / Enabled (Default setting)**
9	**Firmware Update Configuration**	 Aptio Setup – AMI Advanced Me FW Image Re-Flash [Disabled] FW Update [Enabled] Enable/Disable Me FW Image Re-Flash function. **9.1)** Me FW Image Re-Flash : **Disabled (Default setting) / Enabled** **9.2)** FW Update : **Disabled / Enabled (Default setting)**
10	**PTT Configuration**	 Aptio Setup – AMI Advanced PTT Capability / State 1 / 1 TPM Device Selection [PTT] TPM 1.2 Deactivate [Disabled] Selects TPM device: PTT or dTPM. PTT – Enables PTT in SkuMgr dTPM 1.2 – Disables PTT in SkuMgr Warning ! PTT/dTPM **10.1)** TPM Device Selection : **dTPM : External TPM (When using External TPM module or having TPM chip on MB)** **PTT : Internal TPM (Default setting)** **10.2)** TPM 1.2 Deactivate : **Disabled (Default setting) / Enabled**

11	**FIPS Configuration**	 Aptio Setup – AMI Advanced FIPS Mode Select [Disabled] Current FIPS mode Disabled Crypto driver FIPS version 15.0.1776.30 FIPS Mode configuration FIPS Mode Select : **Disabled (Default setting) / Enabled**
12	**ME Debug Configuration**	 Aptio Setup – AMI Advanced HECI Timeouts [Enabled] Force ME DID Init Status [Disabled] CPU Replaced Polling Disable [Disabled] HECI Message check Disable [Disabled] MBP HOB Skip [Disabled] HECI2 Interface Communication [Disabled] KT Device [Enabled] End Of Post Message [Send in DXE] DOI3 Setting for HECI Disable [Disabled] MCTP Broadcast Cycle [Disabled] ▸ SMBIOS type 130 OEM capabilities Enable/Disable HECI Send/Receive Timeouts. **12.1)** HECI Timeouts : **Disabled / Enabled (Default setting)** **12.2)** Force ME DID Init Status : Option items : Disabled (Default setting), 0 - Success, 1 - No Memory in Channels, 2 - Memory Init Error **12.3)** CPU Replaced Polling Disable : **Disabled (Default setting) / Enabled** **12.4)** HECI Message check Disable : **Disabled (Default setting) / Enabled** **12.5)** MBP HOB Skip : **Disabled (Default setting) / Enabled** **12.6)** HECI2 Interface Communication : **Disabled (Default setting) / Enabled** **12.7)** KT Device : **Disabled / Enabled (Default setting)** **12.8)** End of Post Message : Option items : Disabled End of Post Message , or Send in DXE (Default setting) **12.9)** DOI3 Setting for HECI Disable : **Disabled (Default setting) / Enabled** **12.10)** MCTP Broadcast Cycle : **Disabled (Default setting) / Enabled**

12	**ME Debug Configuration**	**12.11)** SMBIOS type 130 OEM capabilities :  Aptio Setup – AMI Advanced BIOS Reflash Capability State [Enabled] BIOS Boot to Setup Capability State [Enabled] BIOS Pause Before Booting Capability State [Disabled] BIOS Secure Boot Capability Exposure to FW State [Enabled] vPro TBT Dock Support [Disabled] Change BIOS Reflash Capability State **12.11.1)** BIOS Reflash Capability State : **Disabled / Enabled (Default setting)** **12.11.2)** BIOS Boot to Setup Capability State : **Disabled / Enabled (Default setting)** **12.11.3)** BIOS Pause Before Booting Capability State : **Disabled (Default setting) / Enabled** **12.11.4)** BIOS Secure Boot Capability Exposure to FW State : **Disabled / Enabled (Default setting)** **12.11.5)** vPro TBT Dock Support : **Disabled (Default setting) / Enabled**
13	**Anti-Rollback SVN Configuration**	 Aptio Setup – AMI Advanced Minimal Allowed Anti-Rollback SVN 0 Executing Anti-Rollback SVN 3 Automatic HW-Enforced Anti-Rollback SVN [Disabled] Set HW-Enforced Anti-Rollback for Current SVN [Disabled] When enabled, hardware-enforced Anti-Rollback mechanism is automatically activated: once ME FW was successfully run on a platform, FW with lower ARB-SVN will be blocked from **13.1)** Automatic HW-Enforced Anti-Rollback SVN : **Disabled (Default setting) / Enabled** **13.2)** Set HW-Enforced Anti-Rollback for Current SVN : **Disabled (Default setting) / Enabled**
14	**Extend CSME Measurement to TPM-PCR**	**Disabled (Default setting) / Enabled**

4.3.7 Thermal Configuration



```
                              Aptio Setup - AMI
      Advanced
 Thermal Configuration                                  │Enable All Thermal Functions"
                                                        │is Enabled it Enables 'Memory
 Enable All Thermal Functions          [Enabled]        │Thermal Management','Active
▶ CPU Thermal Configuration                             │Trip Points', 'Critical Trip
▶ Platform Thermal Configuration                        │Points'.Set to disabled for
▶ Intel(R) Dynamic Tuning Technology Configuration      │Manual Configuration
                                                        │
                                                        │→←: Select Screen
                                                        │↑↓: Select Item
                                                        │Enter: Select
                                                        │+/-: Change Opt.
                                                        │F1: General Help
                                                        │F2: Previous Values
                                                        │F3: Optimized Defaults
                                                        │F4: Save & Exit
                                                        │ESC: Exit
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```
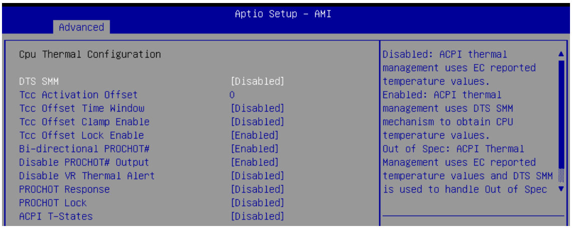
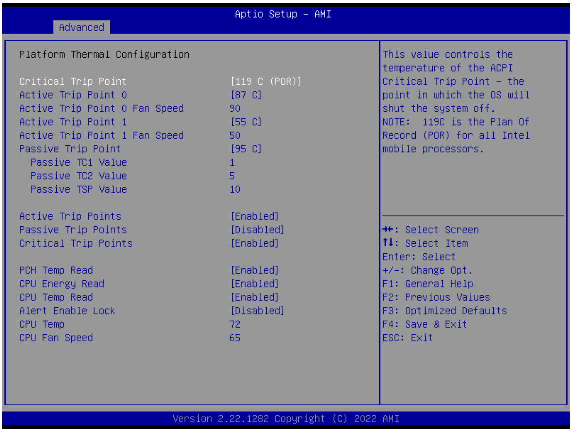

No.	Item	Description
1	**Enable All Thermal Functions**	**Disabled / Enabled (Default setting)**
2	**CPU Thermal Configuration**	 **2.1)** DTS SMM : **Disabled : ACPI thermal management uses EC reported temperature values. (Default setting)** **Enabled : ACPI thermal management uses DTS SMM mechanism to obtain CPU temperature values.** **Critical Temp Reporting (Out of spec) : ACPI thermal management uses EC reported temperature values and DTS SMM is used to handle out of spec.**

```
                              Aptio Setup - AMI
      Advanced
 Cpu Thermal Configuration                          │Disabled: ACPI thermal         ▲
                                                    │management uses EC reported
 DTS SMM                            [Disabled]      │temperature values.
 Tcc Activation Offset              0               │Enabled: ACPI thermal
 Tcc Offset Time Window             [Disabled]      │management uses DTS SMM
 Tcc Offset Clamp Enable            [Disabled]      │mechanism to obtain CPU
 Tcc Offset Lock Enable             [Enabled]       │temperature values.
 Bi-directional PROCHOT#            [Enabled]       │Out of Spec: ACPI Thermal
 Disable PROCHOT# Output            [Enabled]       │Management uses EC reported
 Disable VR Thermal Alert           [Disabled]      │temperature values and DTS SMM
 PROCHOT Response                   [Disabled]      │is used to handle Out of Spec  ▼
 PROCHOT Lock                       [Disabled]      │
 ACPI T-States                      [Disabled]      │
```

2	**CPU Thermal Configuration**	**2.2)** Tcc Acivation offset : Range is from 0 to 63. **2.3)** Tcc Offset Time Window : Range is from 5ms to 448s. Option items : Disabled (Default setting), 5 ms, 10 ms, 55 ms, 156 ms, 375 ms, 500 ms, 750 ms, 1 sec, 2 sec, 3 sec, 4 sec, 5 sec, 6 sec, 7 sec, 8 sec, 10 sec, 12 sec, 14 sec, 16 sec, 20 sec, 24 sec, 28 sec, 32 sec, 40 sec, 48 sec, 56 sec, 64 sec, 80 sec, 96 sec, 112 sec, 128 sec, 160 sec, 192 sec, 224 sec, 256 sec, 320 sec, 384 sec, 448 sec **2.4)** Tcc Offset Clamp Enable : **Disabled : Disables Tcc Offset clamp enable function (Default setting)** **Enabled : Enables for Running Average Temperature Limit (RATL) feature to allow CPU to throttle below P1.** **2.5)** Tcc Offset Lock Enable : **Disabled : Disables Tcc Offset Lock enable function** **Enabled : Enables for Running Average Temperature Limit (RATL) feature to lock Temperature Target MSR. (Default setting)** **2.6)** Bi-directional PROCHOT# : **Disabled : Disables Bi-directional PROCHOT# function** **Enabled : Enables to let external agents can drive PROCHOT# to throttle the processor. (Default setting)** **2.7)** Disable PROCHOT# Output : **Disabled / Enabled (Default setting)** **2.8)** Disable VR Thermal Alert : **Disabled (Default setting) / Enabled** **2.9)** PROCHOT Response : **Disabled : Disables PROCHOT Response function (Default setting)** **Enabled : Enables PROCHOT Response function** **2.10)** PROCHOT Lock : **Disabled : Disables PROCHOT Lock function (Default setting)** **Enabled : Enables PROCHOT Lock function** **2.11)** ACPI T-States : **Disabled : Disables ACPI T-States function (Default setting)** **Enabled : Enables ACPI T-States function**

3

Platform Thermal Configuration



```
                          Aptio Setup - AMI
  Advanced
 Platform Thermal Configuration                       This value controls the
                                                      temperature of the ACPI
 Critical Trip Point                [119 C (POR)]     Critical Trip Point - the
 Active Trip Point 0                [87 C]            point in which the OS will
 Active Trip Point 0 Fan Speed      90                shut the system off.
 Active Trip Point 1                [55 C]            NOTE:  119C is the Plan Of
 Active Trip Point 1 Fan Speed      50                Record (POR) for all Intel
 Passive Trip Point                 [95 C]            mobile processors.
   Passive TC1 Value                1
   Passive TC2 Value                5
   Passive TSP Value                10

 Active Trip Points                 [Enabled]
 Passive Trip Points                [Disabled]        →←: Select Screen
 Critical Trip Points               [Enabled]         ↑↓: Select Item
                                                      Enter: Select
 PCH Temp Read                      [Enabled]         +/-: Change Opt.
 CPU Energy Read                    [Enabled]         F1: General Help
 CPU Temp Read                      [Enabled]         F2: Previous Values
 Alert Enable Lock                  [Disabled]        F3: Optimized Defaults
 CPU Temp                           72                F4: Save & Exit
 CPU Fan Speed                      65                ESC: Exit

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```

3.1) Critical Trip Point :
Option items : 15 C, 23 C, 31 C, 39 C, 47 C, 55 C, 63 C, 71 C , 79 C, 87 C, 95 C, 100 C, 103 C , 111 C , 119 C (POR) (Default setting), 127 C, 130 C

3.2) Active Trip Point 0 : This value controls the temperature of the ACPI active.
Option items : Disabled, 15 C, 23 C, 31 C, 39 C, 47 C, 55 C, 63 C, 71 C, 79 C, 87 C (Default setting), 95 C, 103 C, 111 C, 119 C (POR)

3.3) Active Trip Point 0 Fan Speed : This is the speed at which fan will run when Active Trip Point 0 is crosssed.
The value must between 0 (Fan off) - 100 (Max fan speed).

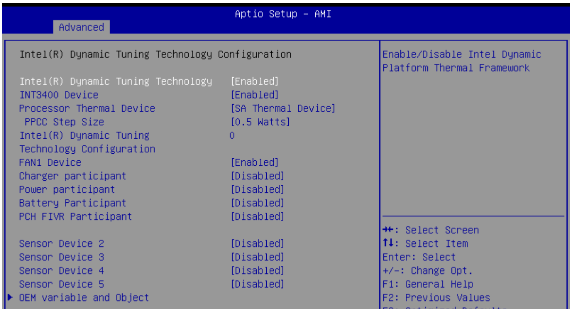
3.4) Active Trip Point 1 : This value controls the temperature of the ACPI active.
Option items : Disabled, 15 C, 23 C, 31 C, 39 C, 47 C, 55 C(Default setting), 63 C, 71 C, 79 C, 87 C, 95 C, 103 C, 111 C, 119 C (POR)

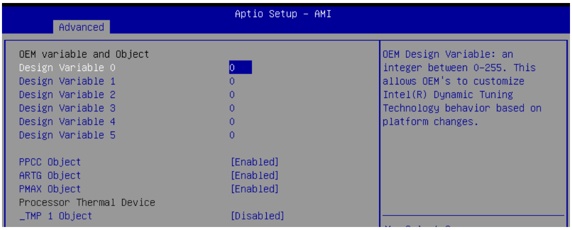
3.5) Active Trip Point 1 Fan Speed : This is the speed at which fan will run when Active Trip Point 1 is crosssed.
The value must between 0 (Fan off) - 100 (Max fan speed).

3.6) Passive Trip Point : This value controls the temperature of the ACPI passive trip point in which the OS will begin throttling the processor.
Option items : Disabled, 15 C, 23 C, 31 C, 39 C, 47 C, 55 C, 63 C, 71 C, 79 C, 87 C, 95 C (Default setting), 103 C, 111 C, 119 C (POR)

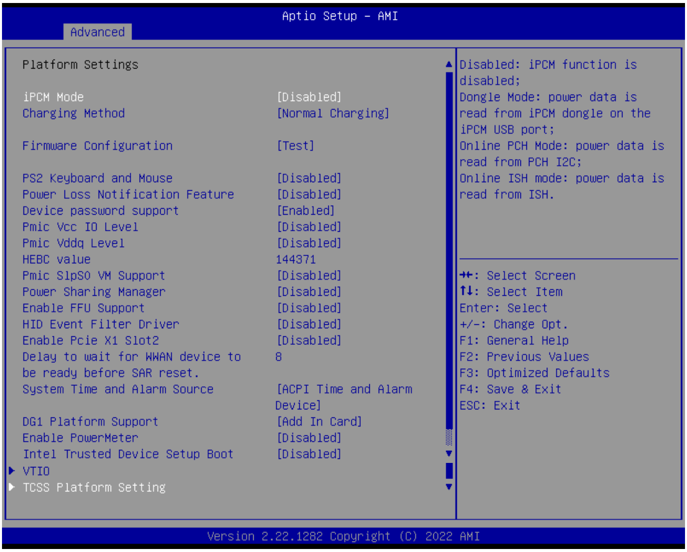
3.6.1~2) Passive TC1 Value / Passive TC2 Value : This value sets the TC1/ TC2 value for the ACPI Passive Cooling Formula. Range is 1 -16.

3.6.3) Passive TSP Value : This value sets the TSP value for the ACPI Passive cooling Formula. It represents in tenths of a second how often the OS will read the temperature when passive cooling is enabled. Range is 2 - 32.

3	**Platform Thermal Configuration**	**3.7)** Active Trip Points : **Enabled (Default setting) / Disabled** **3.8)** Passive Trip Points : **Disabled (Default setting) / Enabled** **3.9)** Critical Trip Points : **Disabled / Enabled (Default setting)** **3.10)** PCH Temp Read : **Disabled / Enabled (Default setting)** **3.11)** CPU Energy Read : **Disabled / Enabled (Default setting)** **3.12)** CPU Temp Read : **Disabled / Enabled (Default setting)** **3.13)** Alert Enable Lock : **Disabled (Default setting) / Enabled** **3.14)** CPU Temp : Fail Safe temp that EC will use if OS is hung up. **3.15)** CPU Fan Speed : Fan speed that EC will use if OS is hung up.
4	**Intel(R) Dynamic Tuning Technology Configuration**	 Aptio Setup – AMI Advanced Intel(R) Dynamic Tuning Technology Configuration Intel(R) Dynamic Tuning Technology [Enabled] INT3400 Device [Enabled] Processor Thermal Device [SA Thermal Device] PPCC Step Size [0.5 Watts] Intel(R) Dynamic Tuning Technology Configuration 0 FAN1 Device [Enabled] Charger participant [Disabled] Power participant [Disabled] Battery Participant [Disabled] PCH FIVR Participant [Disabled] Sensor Device 2 [Disabled] Sensor Device 3 [Disabled] Sensor Device 4 [Disabled] Sensor Device 5 [Disabled] ▶ OEM variable and Object Enable/Disable Intel Dynamic Platform Thermal Framework →←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values **4.1)** Intel(R) Dynamic Tuning Technology : **Disabled / Enabled (Default setting)** **4.2)** INT3400 Device : **Disabled / Enabled (Default setting)** **4.3)** Processor Thermal Device : **Disabled : Disables Processor Thermal Device** **SA Thermal Device : Enables Processor Thermal Device (Default setting)** **4.3.1)** PPCC Step Size : Step size for Turbo Power Limit (RARL) control. Option items : 0.5 Watts (Default setting), 1.0 Watts, 1.5 Watts, 2.0 Watts **4.4)** Intel(R) Dynamic Tuning Technology Configuration : An Integer containing the Intel(R) Dynamic Tuning Technology Configuration. Bitmap as below : 0=enable, 1=disable BIT 0 - Generic UI Access Control BIT 1 - Restricted UI Acess Control BIT 2 - shell Access Control BIT 3 - Environment Monitoring

4	**Intel(R) Dynamic Tuning Technology Configuration**	**4.5)** FAN1 Device : **Disabled / Enabled (Default setting)** **4.6)** Charger participant : **Disabled (Default setting) / Enabled** **4.7)** Power participant : **Disabled (Default setting) / Enabled** **4.8)** Battery Participant : **Disabled (Default setting) / Enabled** **4.9)** PCH FIVR Participant : **Disabled (Default setting) / Enabled** **4.10)** Sensor Device 2 : VR Hotspot Q50 sensor **Disabled (Default setting) / Enabled** **4.11)** Sensor Device 3 : Skin Hotspot U50 sensor **Disabled (Default setting) / Enabled** **4.12)** Sensor Device 4 : PMIC-MCP Hotspot Q16 sensor **Disabled (Default setting) / Enabled** **4.13)** Sensor Device 5 : C-Skin Chassis U50 IR sensor **Disabled (Default setting) / Enabled** **4.14)** OEM variable and Object :  Aptio Setup - AMI Advanced OEM variable and Object Design Variable 0 0 Design Variable 1 0 Design Variable 2 0 Design Variable 3 0 Design Variable 4 0 Design Variable 5 0 PPCC Object [Enabled] ARTG Object [Enabled] PMAX Object [Enabled] Processor Thermal Device _TMP 1 Object [Disabled] OEM Design Variable: an integer between 0-255. This allows OEM's to customize Intel(R) Dynamic Tuning Technology behavior based on platform changes. OEM Design Variable : This allows OEM's to customize Intel(R) Dynamic Tuning Technology behavior based on platform changes. **4.14.1)** Design Variable 0 : An integer is between 0 - 255 **4.14.2)** Design Variable 1 : An integer is between 0 - 255 **4.14.3)** Design Variable 2 : An integer is between 0 - 255 **4.14.4)** Design Variable 3 : An integer is between 0 - 255 **4.14.5)** Design Variable 4 : An integer is between 0 - 255 **4.14.6)** Design Variable 5 : An integer is between 0 - 255 **4.14.7)** PPCC object : **Disabled / Enabled (Default setting)** **4.14.8)** ARTG object : **Disabled / Enabled (Default setting)** **4.14.9)** PMAX object : **Disabled / Enabled (Default setting)** **4.14.10)** _TMP 1 object : **Disabled (Default setting) / Enabled**

4.3.8 Platform Settings



```
                              Aptio Setup - AMI
        Advanced
 Platform Settings                                     Disabled: iPCM function is
                                                       disabled;
 iPCM Mode                          [Disabled]         Dongle Mode: power data is
 Charging Method                    [Normal Charging]  read from iPCM dongle on the
                                                       iPCM USB port;
 Firmware Configuration             [Test]             Online PCH Mode: power data is
                                                       read from PCH I2C;
 PS2 Keyboard and Mouse             [Disabled]         Online ISH mode: power data is
 Power Loss Notification Feature    [Disabled]         read from ISH.
 Device password support            [Enabled]
 Pmic Vcc IO Level                  [Disabled]
 Pmic Vddq Level                    [Disabled]
 HEBC value                         144371
 Pmic SlpS0 VM Support              [Disabled]         →←: Select Screen
 Power Sharing Manager              [Disabled]         ↑↓: Select Item
 Enable FFU Support                 [Disabled]         Enter: Select
 HID Event Filter Driver            [Disabled]         +/-: Change Opt.
 Enable Pcie X1 Slot2               [Disabled]         F1: General Help
 Delay to wait for WWAN device to   8                  F2: Previous Values
 be ready before SAR reset.                            F3: Optimized Defaults
 System Time and Alarm Source       [ACPI Time and Alarm F4: Save & Exit
                                    Device]            ESC: Exit
 DG1 Platform Support               [Add In Card]
 Enable PowerMeter                  [Disabled]
 Intel Trusted Device Setup Boot    [Disabled]
▶ VTIO
▶ TCSS Platform Setting

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```
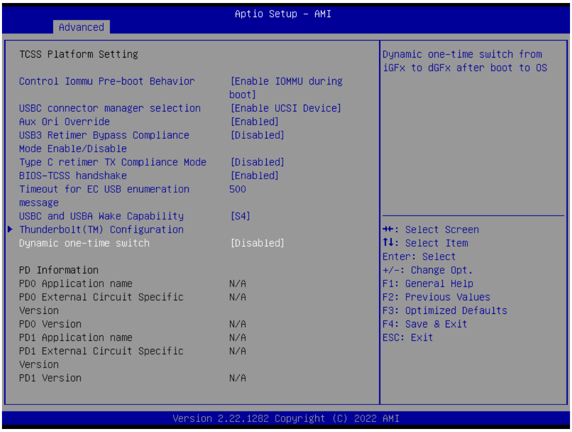

No.	Item	Description
1	**iPCM Mode**	Option items : DIsabled (Default setting), Dongle Mode, Online PCH Mode, Online ISH Mode
2	**Charging Method**	Selet charging method : **Normal Charging (Default setting), or Fast Charging**
3	**Firmware Configuration**	Option items : Ignore Policy Update , Production, Test (Default setting)
4	**PS2 Keyboard and Mouse**	**Enabled / Disabled (Default setting)**
5	**Power Loss Notification Feature**	**Disabled (Default setting) / Enabled**
6	**Device password support**	**Disabled / Enabled (Default setting)**
7	**Pmic Vcc IO Level**	Select the Pmic Vcc IO Voltage level Option items : Disabled (Default setting), 1.05V, 1.071V, 1.023V, 0.997V, 0.850V, 0.900V, 0.950V

8	**Pmic Vddq Level**	Select the Pmic Vddq Voltage Level Option items : Disabled (Default setting), 0, 1, 2, 3, 4, 5, 6, 7
9	**HEBC value**	HEBC value 32bit
10	**Pmic SlpS0 VM Support**	Support to auto check Primium PMIC and disable SlpS0 voltage **Disabled (Default setting) / Enabled**
11	**Power Sharing Manager**	Configure the PSM ACPI object **Disabled (Default setting) / Enabled**
12	**Enable FFU Support**	**Disabled (Default setting) / Enabled**
13	**HID Event Filter Driver**	**Disabled (Default setting) / Enabled**
14	**Enable Pcie X1 Slot2**	It is only for TGL UP4 board. **Disabled (Default setting) / Enabled**
15	**Delay to wait for WWAN device to be ready before SAR rest**	**Value is between 0 - 255 seconds.**
16	**System Time and Alarm Source**	Select source of system time and alarm functions : **ACPI Time and Alarm Device (Default setting), or Legacy RTC**
17	**DG1 Platform Support**	Select DG1 platform support : **Add In Card (Default setting) , or MB Down.**
18	**Enable PowerMeter**	**Disabled (Default setting) / Enabled**
19	**Intel trusted device setup boot**	**Enabled / Disabled (Default setting)**
20	**VITO**	Enable VITO Support : **Disabled (Default setting) / Enabled**
21	**TCSS Platform setting**	

```
                         Aptio Setup - AMI
      Advanced

  TCSS Platform Setting                                  Dynamic one-time switch from
                                                         iGFx to dGFx after boot to OS
  Control Iommu Pre-boot Behavior     [Enable IOMMU during
                                      boot]
  USBC connector manager selection    [Enable UCSI Device]
  Aux Ori Override                    [Enabled]
  USB3 Retimer Bypass Compliance      [Disabled]
  Mode Enable/Disable
  Type C retimer TX Compliance Mode   [Disabled]
  BIOS-TCSS handshake                 [Enabled]
  Timeout for EC USB enumeration      500
  message
  USBC and USBA Wake Capability       [S4]
▶ Thunderbolt(TM) Configuration                          →←: Select Screen
  Dynamic one-time switch             [Disabled]         ↑↓: Select Item
                                                         Enter: Select
  PD Information                                         +/-: Change Opt.
  PD0 Application name                N/A                F1: General Help
  PD0 External Circuit Specific       N/A                F2: Previous Values
  Version                                                F3: Optimized Defaults
  PD0 Version                         N/A                F4: Save & Exit
  PD1 Application name                N/A                ESC: Exit
  PD1 External Circuit Specific       N/A
  Version
  PD1 Version                         N/A

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```
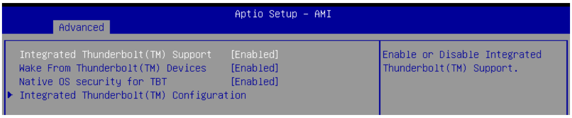
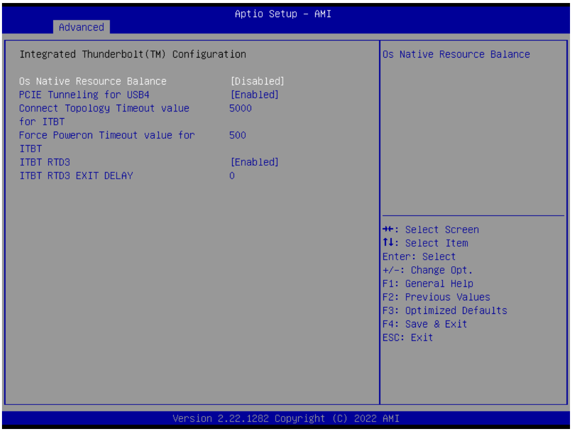
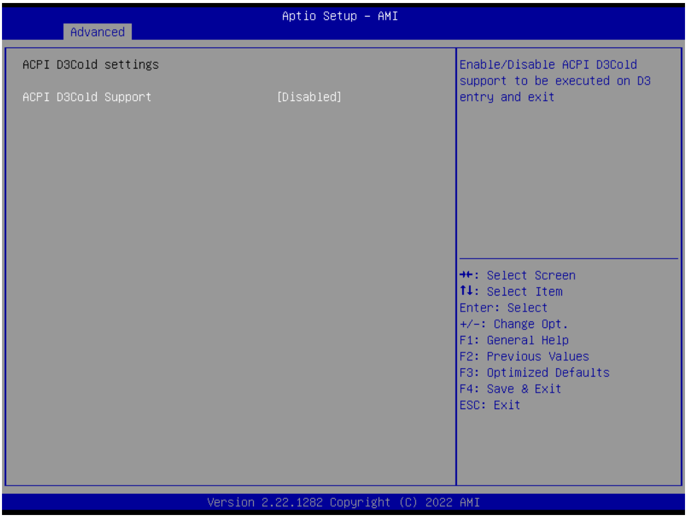

21	**TCSS Platform setting**	**21.1)** Control Iommu Pre-boot Behavior : **Disable IOMMU / Enable IOMMU during boot (Default setting)** **21.2)** USBC connector manager selection : Select UCSI or UCMC device in ACPI support based on configuration **Disabled : Disables USBC connector manager selection** **Enable UCSI Device : Select UCSI device (Default setting)** **Enable UCMC Device : Select UCMC device** **21.3)** Aux Ori Override : **Disabled / Enabled (Default setting)** **21.4)** USB3 Retimer Bypass Compliance Mode Enable/Disable : **Disabled (Default setting) / Enabled** **21.5)** Type C retimer TX Compliance Mode : **Disabled (Default setting) / Enabled** **21.6)** BIOS-TCSS handshake : **Disabled / Enabled (Default setting)** **21.7)** Timeout for EC USB enumeration message : Value in milli seconds. **21.8)** USBC and USBA Wake Capability : option items : S3 or S4 (Default setting) **21.9)** Thunderbolt(TM) Configuration **:**  Aptio Setup – AMI Advanced Integrated Thunderbolt(TM) Support [Enabled] Wake From Thunderbolt(TM) Devices [Enabled] Native OS security for TBT [Enabled] ▶ Integrated Thunderbolt(TM) Configuration Enable or Disable Integrated Thunderbolt(TM) Support. **21.9.1)** Integrated Thunderbolt (TM) Support : **Disabled / Enabled (Default setting)** **21.9.2)** Wake From Thunderbolt(TM) Devices : **Disabled / Enabled (Default setting)** **21.9.3)** Native OS security for TBT : Native OS security solution for Thunderbolt host **Disabled / Enabled (Default setting)**

21	**TCSS Platform setting**	**21.9.4)** Integrated Thunderbolt(TM) Configuration :  Aptio Setup - AMI Advanced Integrated Thunderbolt(TM) Configuration Os Native Resource Balance [Disabled] PCIE Tunneling for USB4 [Enabled] Connect Topology Timeout value for ITBT 5000 Force Poweron Timeout value for ITBT 500 ITBT RTD3 [Enabled] ITBT RTD3 EXIT DELAY 0 Os Native Resource Balance →←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit Version 2.22.1282 Copyright (C) 2022 AMI **21.9.4.1)** Os Native Resource Balance : **Disabled (Default setting) / Enabled** **21.9.4.2)** PCIE Tunneling for USB4 : **Disabled / Enabled (Default setting)** **21.9.4.3)** Connect Topology Timeout value For ITBT : Connect Topology Timeout value for Integrated Thunderbolt (TM) Controller **21.9.4.4)** Force Poweron Timeout value for ITBT : Force Poweron Timeout value for Integrated Thunderbolt (TM) **21.9.4.5)** ITBT RTD3 **Disabled / Enabled (Default setting)** **21.9.4.6)** ITBT RTD3 EXIT DELAY : value in milli seconds
22	**Dynamic one-time switch**	**Disabled (Default setting) / Enabled**

4.3.9 ACPI D3Cold settings



```
Aptio Setup - AMI
Advanced

ACPI D3Cold settings

ACPI D3Cold Support                [Disabled]
```

```
Enable/Disable ACPI D3Cold
support to be executed on D3
entry and exit

→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
```

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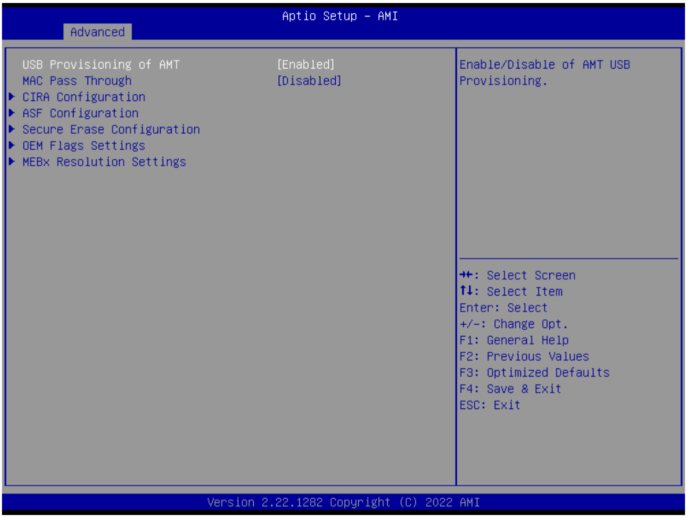
Item	Description
ACPI D3Cold Support	Disabled (Default setting) / Enabled

4.3.10 AMT Configuration



```
                              Aptio Setup - AMI
        Advanced

  USB Provisioning of AMT                 [Enabled]      Enable/Disable of AMT USB
  MAC Pass Through                        [Disabled]     Provisioning.
▶ CIRA Configuration
▶ ASF Configuration
▶ Secure Erase Configuration
▶ OEM Flags Settings
▶ MEBx Resolution Settings
                                                         →←: Select Screen
                                                         ↑↓: Select Item
                                                         Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit

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```
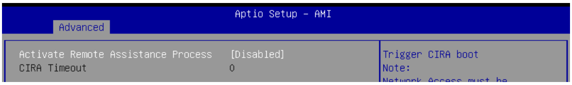
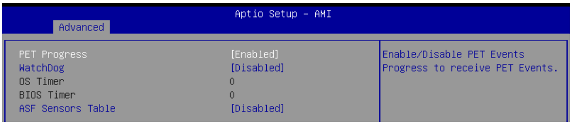
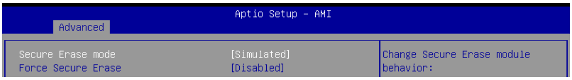
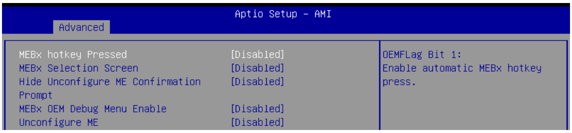
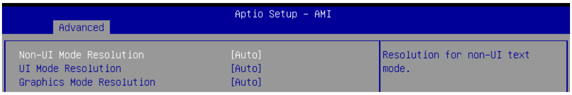
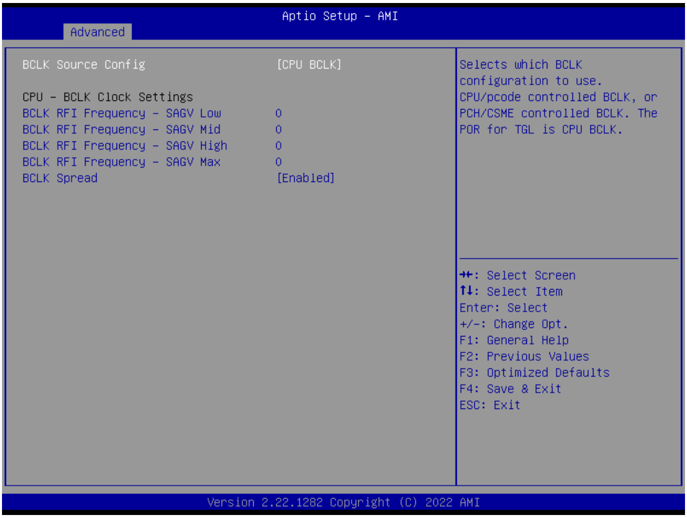

No.	Item	Description
1	**USB Provisioning of AMT**	Inserting a specially formatted USB drive into a system, to let the other system remotely control**.** **Disabled / Enabled (Default setting)**
2	**MAC Pass Through**	**Disabled (Default setting) / Enabled**
3	**CIRA Configuration**	 Aptio Setup - AMI Advanced Activate Remote Assistance Process [Disabled] CIRA Timeout 0 Trigger CIRA boot Note: Network Access must be Activate Remote Assistance Process : Trigger CIRA boot **Disabled (Default setting) / Enabled**
4	**ASF Congifuration**	 Aptio Setup - AMI Advanced PET Progress [Enabled] WatchDog [Disabled] OS Timer 0 BIOS Timer 0 ASF Sensors Table [Disabled] Enable/Disable PET Events Progress to receive PET Events.

4	**ASF Congifuration**	**4.1)** PET Progress : Choose to receive PET events or not **Disabled / Enabled (Default setting)** **4.2)** WatchDog : Choose to enables watchdog timer or not **Disabled (Default setting) / Enabled** **4.3)** OS Timer : Sets OS Watchdog Timer. **4.4)** BIOS Timer : Sets BIOS Timer. **4.5)** ASF Sensors Table : **Disabled (Default setting) / Enabled**
5	**Secure Erase Configuration**	 Aptio Setup – AMI Advanced Secure Erase mode [Simulated] Force Secure Erase [Disabled] Change Secure Erase module behavior: 5.1) Secure Erase mode : Choose to enables secure erase mode or not. **Simulated : Performs SE flow without erasing SSD (Default setting)** **Real : Erase SSD** 5.2) Force Secure Erase : Force Secure Erase on next boot. **Disabled (Default setting) / Enabled**
6	**OEM Flags Settings**	 Aptio Setup – AMI Advanced MEBx hotkey Pressed [Disabled] MEBx Selection Screen [Disabled] Hide Unconfigure ME Confirmation Prompt [Disabled] MEBx OEM Debug Menu Enable [Disabled] Unconfigure ME [Disabled] OEMFLag Bit 1: Enable automatic MEBx hotkey press. **6.1)** MEBx hotkey Pressed : Enables or Disables automatic MEBx hotkey press. **Disabled (Default setting) / Enabled** **6.2)** MEBx Selection Screen : Enables or Disables MEBx Selection Screen. **Disabled (Default setting) / Enabled** **6.3)** Hide Unconfigure ME Confirmation Prompt : To hide un-configured ME without password confirmation prompt. **Disabled (Default setting) / Enabled** **6.4)** MEBx OEM Debug Menu Enable : Enables or Disables MEBx debug message. **Disabled (Default setting) / Enabled** **6.5)** Unconfigure ME : To Un-configure ME without password. **Disabled (Default setting) / Enabled**

7	**MEBx Resolution Settings**	 Aptio Setup – AMI Advanced Non-UI Mode Resolution [Auto] UI Mode Resolution [Auto] Graphics Mode Resolution [Auto] Resolution for non-UI text mode. **7.1)** Non-UI Mode Resolution : resolution for non-UI text mode. Option items : Auto (Default setting), 80x25, 100x31 **7.2)** UI Mode Resolution : resolution for UI text mode. Option items : Auto (Default setting), 80x25, 100x31 **7.3)** Graphics Mode Resolution : Resolution for graphics mode. Option items : Auto (Default setting), 640x480, 800x600, 1024x768

4.3.11 BCLK Configuration



```
                         Aptio Setup - AMI
        Advanced

 BCLK Source Config                    [CPU BCLK]      Selects which BCLK
                                                       configuration to use.
 CPU - BCLK Clock Settings                             CPU/pcode controlled BCLK, or
 BCLK RFI Frequency - SAGV Low         0               PCH/CSME controlled BCLK. The
 BCLK RFI Frequency - SAGV Mid         0               POR for TGL is CPU BCLK.
 BCLK RFI Frequency - SAGV High        0
 BCLK RFI Frequency - SAGV Max         0
 BCLK Spread                           [Enabled]

                                                       →←: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit

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```
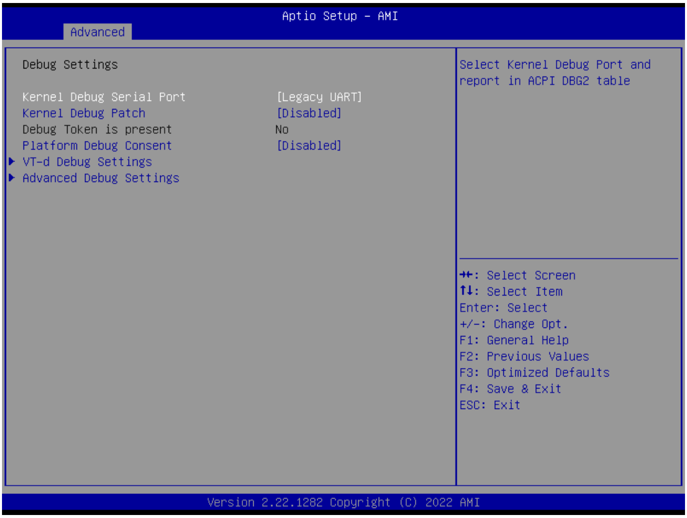

No.	Item	Description
1	**BCLK Source Config**	Select which BCLK configuration to use. **CPU BCLK : configure CPU/pcode controlled BCLK. (Default setting)** **PCH BCLK : configure PCH/CSME controlled BCLK.**
2	**CPU - BCLK Clock Settings**	BCLK RFI Frequency - SAGV Low/ BCLK RFI Frequency - SAGV Mid/ BCLK RFI Frequency - SAGV High/ BCLK RFI Frequency - SAGV Max : BCLK RFI Frequency value is in 10kHz increments. Range is 0 and 98-100Mhz. Example : For 98.75MHz, please enter 9875
3	**BCLK Spread**	**Disabled / Enabled (Default setting)**

4.3.12 Debug Settings



```
                         Aptio Setup - AMI
         Advanced
 Debug Settings                                    Select Kernel Debug Port and
                                                   report in ACPI DBG2 table
 Kernel Debug Serial Port         [Legacy UART]
 Kernel Debug Patch               [Disabled]
 Debug Token is present           No
 Platform Debug Consent           [Disabled]
▶ VT-d Debug Settings
▶ Advanced Debug Settings

                                                   →←: Select Screen
                                                   ↑↓: Select Item
                                                   Enter: Select
                                                   +/-: Change Opt.
                                                   F1: General Help
                                                   F2: Previous Values
                                                   F3: Optimized Defaults
                                                   F4: Save & Exit
                                                   ESC: Exit

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```
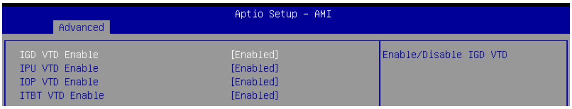
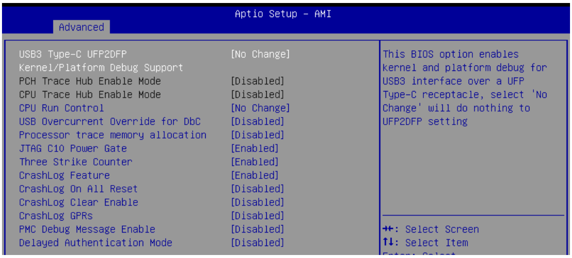
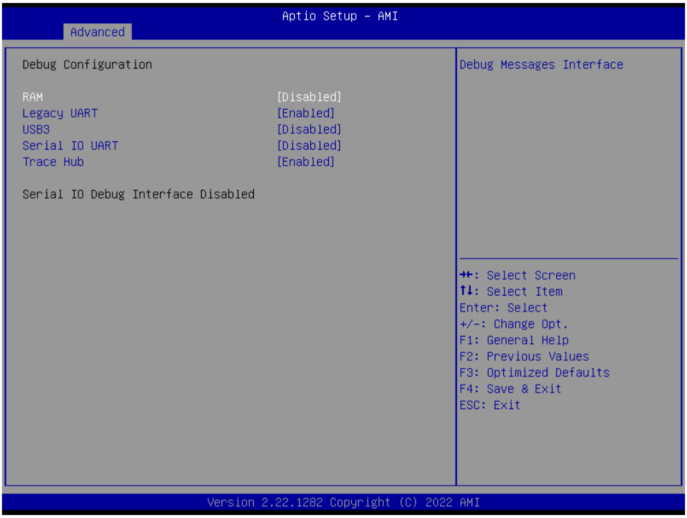

No.	Item	Description
1	**Kernel Debug Serial Port**	Select Kernel Debug port and report in ACPI DBG2 table Option items : Legacy UART (Default setting), SERIALIO UARTS
2	**Kernel Debug Patch**	**Disabled (Default setting) / Enabled**
3	**Debug Token is present**	No (Default setting)
4	**Platform Debug Consent**	Option items : Disabled (Default setting), Enabled (USB2 Dbc), Enabled (DCI OOB), Enabled (2 Wire DCI 00B), Enabled (USB3 DbC), Enabled (XDP/MIPI60), Manual
5	**VT-d Debug Settings**	 Aptio Setup - AMI Advanced IGD VTD Enable [Enabled] IPU VTD Enable [Enabled] IOP VTD Enable [Enabled] ITBT VTD Enable [Enabled] Enable/Disable IGD VTD **5.1)** IGD VTD Enable : **Enabled (Default setting) / Disabled** **5.2)** IPU VTD Enable : **Enabled (Default setting) / Disabled**

5	**VT-d Debug Settings**	**5.3)** IOP VTD Enable : **Enabled (Default setting) / Disabled** **5.4)** ITBT VTD Enable : **Enabled (Default setting) / Disabled**
6	**Advanced Debug Settings**	 Aptio Setup – AMI Advanced USB3 Type-C UFP2DFP Kernel/Platform Debug Support [No Change] PCH Trace Hub Enable Mode [Disabled] CPU Trace Hub Enable Mode [Disabled] CPU Run Control [No Change] USB Overcurrent Override for DbC [Disabled] Processor trace memory allocation [Disabled] JTAG C10 Power Gate [Enabled] Three Strike Counter [Enabled] CrashLog Feature [Enabled] CrashLog On All Reset [Disabled] CrashLog Clear Enable [Disabled] CrashLog GPRs [Disabled] PMC Debug Message Enable [Disabled] Delayed Authentication Mode [Disabled] This BIOS option enables kernel and platform debug for USB3 interface over a UFP Type-C receptacle, select 'No Change' will do nothing to UFP2DFP setting →←: Select Screen ↑↓: Select Item **6.1)** USB3 Type-C UFP2DFP Kernel/Platform Debug Support : This BIOS option enables Kernel and platform debug for UBS3 interface over a UFP Type-C receptacle. **Disabled : Disables USB3 Type-C UFP2DFP Kernel/Platform Debug Support** **Enabled : Enables USB3 Type-C UFP2DFP Kernel/Platform Debug Support** **No Change : do nothing to UFP2DFP setting (Default setting)** **6.2)** PCH Trace Hub Enable Mode : **Disabled (Default setting)** **6.3)** CPU Trace Hub Enable Mode : **Disabled (Default setting)** **6.4)** CPU Run Control : **Disabled : Disables CPU run control support** **Enabled : Enables CPU run control support** **No Change : Comply with H/W value (Default setting)** **6.5)** USB Overcurrent Override for DbC : **Disabled (Default setting) / Enabled** **6.6)** Processor trace memory allocation : Option items : Disabled (Default setting), 4KB, 8KB, 16KB, 32KB, 64KB, 128KB, 256KB, 512KB, 1MB, 2MB, 4MB, 8MB, 16MB, 32MB, 64MB, 128MB **6.7)** JTAG C10 Power Gate : **Disabled / Enabled (Default setting)** **6.8)** Three Strike Conunter : **Disabled / Enabled (Default setting)** **6.9)** CrashLog Feature : **Disabled / Enabled (Default setting)**

6	**Advanced Debug Settings**	**6.10)** CrashLog On All Reset : **Disabled (Default setting) / Enabled** **6.11)** CrashLog Clear Enable : **Disabled (Default setting) / Enabled** **6.12)** CrashLog GPRs : **Disabled : Disables CrashLog GPRs function (Default setting)** **Enabled : Enables CrashLog GPRs function** **Gprs Enabled, Smm Gprs Disabled** **6.13)** PMC Debug Message Enable : **Disabled (Default setting) / Enabled** **6.14)** Delayed Authentication Mode : **Disabled (Default setting) / Enabled**

4.3.13 Debug Configuration



```
                         Aptio Setup - AMI
     Advanced
 Debug Configuration                              Debug Messages Interface

 RAM                           [Disabled]
 Legacy UART                   [Enabled]
 USB3                          [Disabled]
 Serial IO UART                [Disabled]
 Trace Hub                     [Enabled]

 Serial IO Debug Interface Disabled

                                                  →←: Select Screen
                                                  ↑↓: Select Item
                                                  Enter: Select
                                                  +/-: Change Opt.
                                                  F1: General Help
                                                  F2: Previous Values
                                                  F3: Optimized Defaults
                                                  F4: Save & Exit
                                                  ESC: Exit

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```
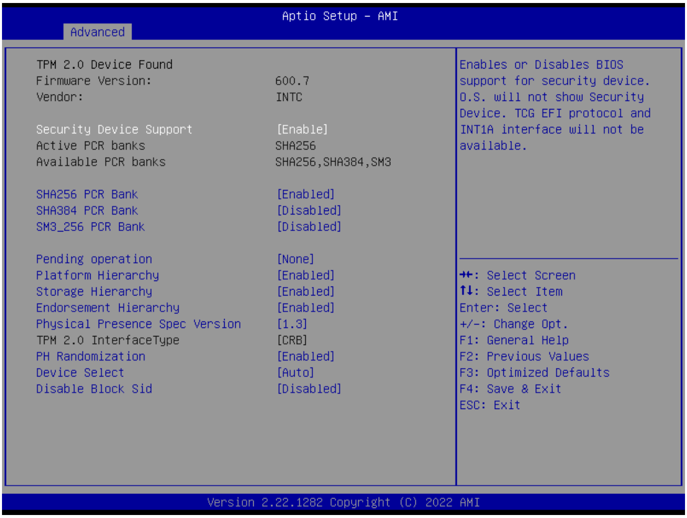

No.	Item	Description
1	RAM	Disabled (Default setting) /Enabled
2	Legacy UART	Disabled / Enabled (Default setting)
3	USB3	Disabled (Default setting) / Enabled
4	Serial IO UART	Disabled (Default setting) / Enabled
5	Trace HUB	Disabled / Enabled (Default setting)

4.3.14 Trusted Computing



```
                              Aptio Setup - AMI
        Advanced
  TPM 2.0 Device Found                                  Enables or Disables BIOS
  Firmware Version:                 600.7               support for security device.
  Vendor:                           INTC                O.S. will not show Security
                                                        Device. TCG EFI protocol and
  Security Device Support           [Enable]            INT1A interface will not be
  Active PCR banks                  SHA256              available.
  Available PCR banks               SHA256,SHA384,SM3

  SHA256 PCR Bank                   [Enabled]
  SHA384 PCR Bank                   [Disabled]
  SM3_256 PCR Bank                  [Disabled]

  Pending operation                 [None]
  Platform Hierarchy                [Enabled]           →←: Select Screen
  Storage Hierarchy                 [Enabled]           ↑↓: Select Item
  Endorsement Hierarchy             [Enabled]           Enter: Select
  Physical Presence Spec Version    [1.3]               +/-: Change Opt.
  TPM 2.0 InterfaceType             [CRB]               F1: General Help
  PH Randomization                  [Enabled]           F2: Previous Values
  Device Select                     [Auto]              F3: Optimized Defaults
  Disable Block Sid                 [Disabled]          F4: Save & Exit
                                                        ESC: Exit

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```
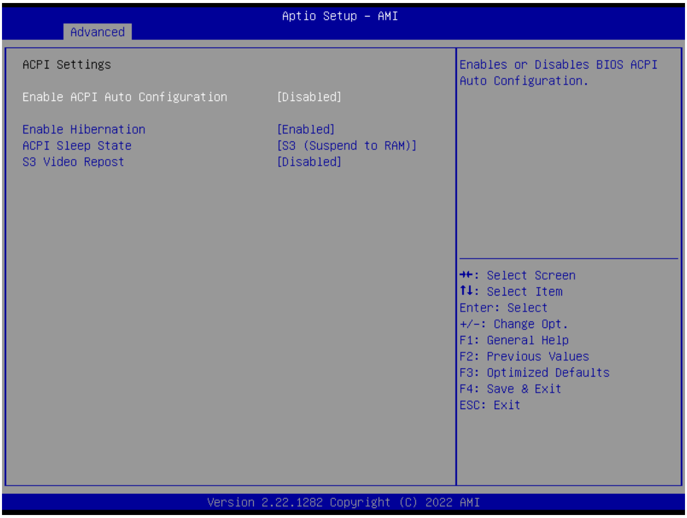

No.	Item	Description
1	**Security Device Supprt**	**Disabled / Enabled (Default setting)**
2	**SHA256 PCR Bank**	**Disabled / Enabled (Default setting)**
3	**SHA384 PCR Bank**	**Disabled (Default setting) / Enabled**
4	**SM3_256 PCR Bank**	**Disabled (Default setting) / Enabled**
5	**Pending operation**	**None : No execution will be conducted (Default setting)** **TPM clear : Set to clear data on TPM**
6	**Platform Hierarchy**	**Disabled / Enabled (Default setting)**
7	**Storage Hierarchy**	**Disabled / Enabled (Default setting)**
8	**Endorsement Hierarchy**	**Disabled / Enabled (Default setting)**
9	**Physical Presence Spec Version**	Choose PPI spec version Option items : 1.2 or 1.3 (Default setting)
10	**PH Randomization**	**Disabled / Enabled (Default setting)**
11	**Device Select**	Option items : TPM 1.2, TPM 2.0, Auto (Default setting)
12	**Disable Block Sid**	**Enabled / Disabled (Default setting)**

4.3.15 ACPI Settings



```
                              Aptio Setup - AMI
      Advanced

 ACPI Settings                                     | Enables or Disables BIOS ACPI
                                                   | Auto Configuration.
 Enable ACPI Auto Configuration      [Disabled]    |
                                                   |
 Enable Hibernation                  [Enabled]     |
 ACPI Sleep State                    [S3 (Suspend to RAM)]
 S3 Video Repost                     [Disabled]    |
                                                   | →←: Select Screen
                                                   | ↑↓: Select Item
                                                   | Enter: Select
                                                   | +/-: Change Opt.
                                                   | F1: General Help
                                                   | F2: Previous Values
                                                   | F3: Optimized Defaults
                                                   | F4: Save & Exit
                                                   | ESC: Exit

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```
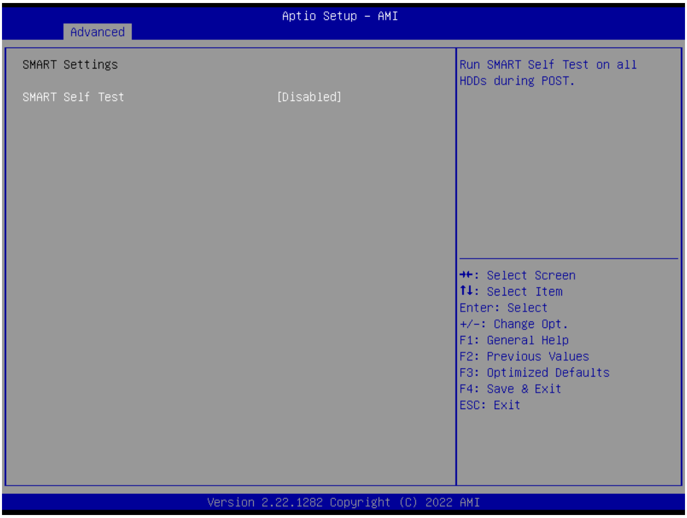

No.	Item	Description
1	**Enable ACPI Auto Configuration**	**Disabled (Default setting) / Enabled**
2	**Enable Hibernation**	**Disabled / Enabled (Default setting)**
3	**ACPI Sleep State**	Option items : Suspend Disabled , S3 (Suspend to RAM) (Default setting)
4	**S3 Video Repost**	**Disabled (Default setting) / Enabled**

4.3.16 SMART Settings



```
Aptio Setup – AMI
Advanced

SMART Settings                                  Run SMART Self Test on all
                                                HDDs during POST.
SMART Self Test                 [Disabled]

                                                →←: Select Screen
                                                ↑↓: Select Item
                                                Enter: Select
                                                +/-: Change Opt.
                                                F1: General Help
                                                F2: Previous Values
                                                F3: Optimized Defaults
                                                F4: Save & Exit
                                                ESC: Exit

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```
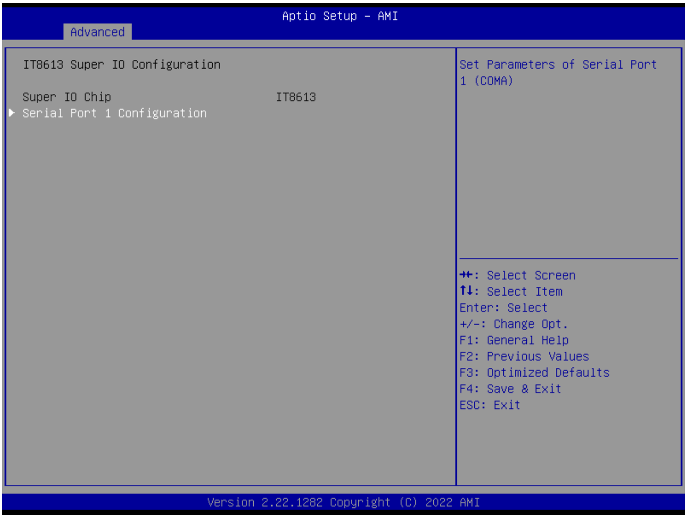

No.	Item	Description
1	**SMART Self Test**	Run SMART Self Test on all HDDs during POST. **Disabled : Disables SMART Self Test (Default setting)** **Enabled : Enables SMART Selft Test**

4.3.17 IT8613 Supr IO Configuration



```
                              Aptio Setup - AMI
      Advanced
 IT8613 Super IO Configuration                  Set Parameters of Serial Port
                                                1 (COMA)
 Super IO Chip                    IT8613
▶ Serial Port 1 Configuration

                                                →←: Select Screen
                                                ↑↓: Select Item
                                                Enter: Select
                                                +/-: Change Opt.
                                                F1: General Help
                                                F2: Previous Values
                                                F3: Optimized Defaults
                                                F4: Save & Exit
                                                ESC: Exit

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```
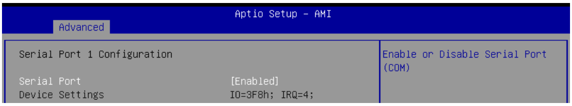
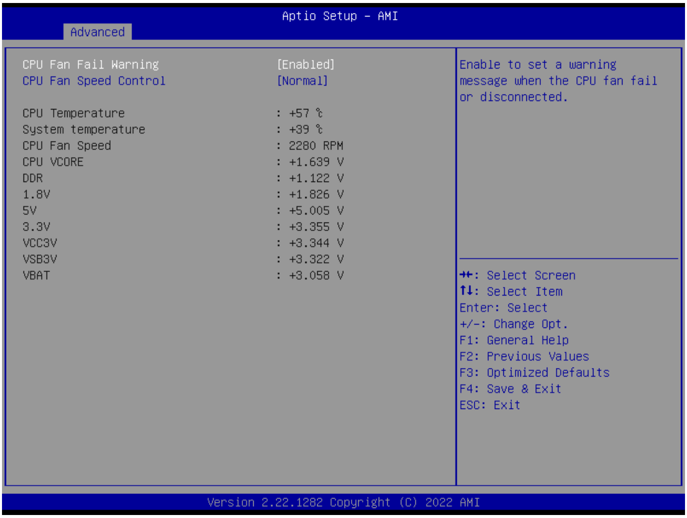

No.	Item	Description
1	**Super IO Chip**	Shows Super IO chip model
2	**Serial Port 1 Confiugration**	 Aptio Setup - AMI Advanced Serial Port 1 Configuration Serial Port [Enabled] Device Settings IO=3F8h; IRQ=4; Enable or Disable Serial Port (COM) Serial Port : **Enabled : Enables allows you to configure the serial port settings** **Disabled : if Disabled, displays no configuration for the serial port** Device settings : Display the specified Serial Port base I/O address and IRQ

4.3.18 Hardware Monitor



```
                              Aptio Setup - AMI
         Advanced
  CPU Fan Fail Warning                 [Enabled]          Enable to set a warning
  CPU Fan Speed Control                [Normal]           message when the CPU fan fail
                                                          or disconnected.
  CPU Temperature                      : +57 ℃
  System temperature                   : +39 ℃
  CPU Fan Speed                        : 2280 RPM
  CPU VCORE                            : +1.639 V
  DDR                                  : +1.122 V
  1.8V                                 : +1.826 V
  5V                                   : +5.005 V
  3.3V                                 : +3.355 V
  VCC3V                                : +3.344 V
  VSB3V                                : +3.322 V
  VBAT                                 : +3.058 V         →←: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit

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```
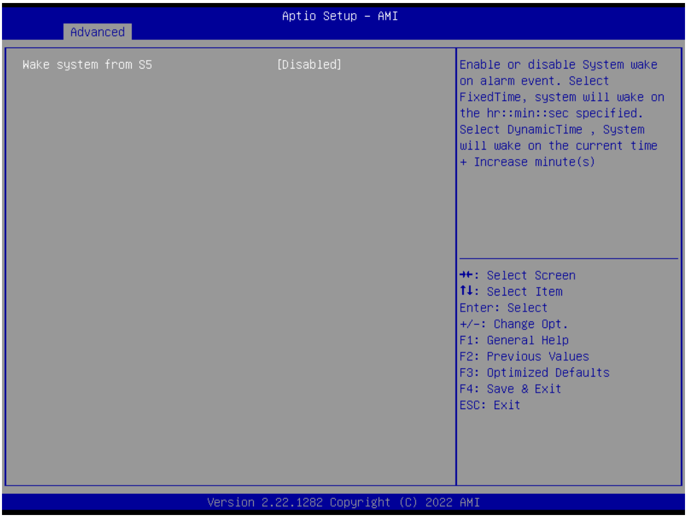

No.	Item	Description
1	**CPU Fan Fail Warning**	**Enabled (Default setting) / Disabled**
2	**CPU Fan Speed Control**	**Normal : Fan speed set by BIOS default (Default setting)** **Full Speed : Set Fan operates at full speed**
3	**CPU Temperature**	Shows current CPU temperature
4	**System Temperature**	Shows current system temperature
5	**CPU Fan Speed**	Shows current CPU fan Speed

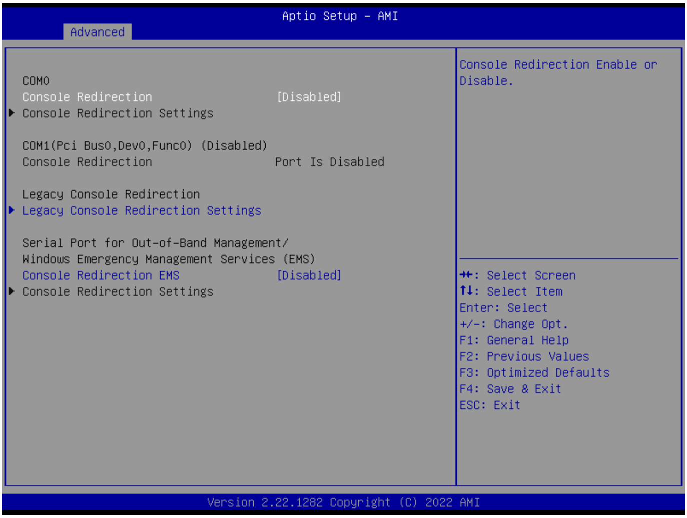
4.3.19 S5 RTC Wake Settings



```
                              Aptio Setup - AMI
      Advanced
  Wake system from S5                  [Disabled]        Enable or disable System wake
                                                         on alarm event. Select
                                                         FixedTime, system will wake on
                                                         the hr::min::sec specified.
                                                         Select DynamicTime , System
                                                         will wake on the current time
                                                         + Increase minute(s)

                                                         →←: Select Screen
                                                         ↑↓: Select Item
                                                         Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit
                  Version 2.22.1282 Copyright (C) 2022 AMI
```

Item	Description
Wake system from S5	Enable or Disable System to wake on a specific time. Disabled : Disables system to wake on a specific time (Default setting) Fixed Time : Enables system to wake on a specific time (Format : hr : min : sec)

4.3.20 Serial Port Console Redirection



```
                          Aptio Setup - AMI
  Advanced
 COM0                                          | Console Redirection Enable or
 Console Redirection            [Disabled]     | Disable.
▶ Console Redirection Settings                 |
                                               |
 COM1(Pci Bus0,Dev0,Func0) (Disabled)          |
 Console Redirection            Port Is Disabled
                                               |
 Legacy Console Redirection                    |
▶ Legacy Console Redirection Settings          |
                                               |
 Serial Port for Out-of-Band Management/       |
 Windows Emergency Management Services (EMS)   |
 Console Redirection EMS        [Disabled]     | →←: Select Screen
▶ Console Redirection Settings                 | ↑↓: Select Item
                                               | Enter: Select
                                               | +/-: Change Opt.
                                               | F1: General Help
                                               | F2: Previous Values
                                               | F3: Optimized Defaults
                                               | F4: Save & Exit
                                               | ESC: Exit

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```
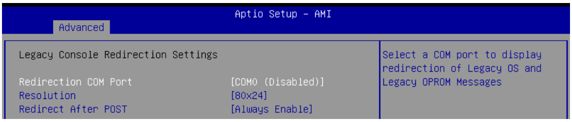
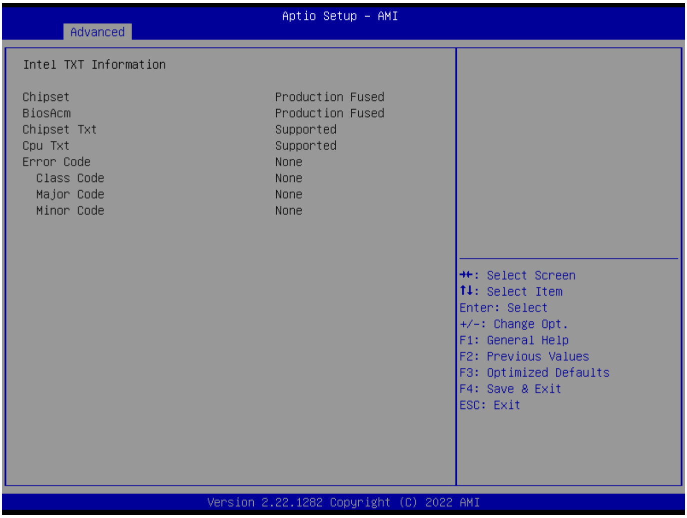

No.	Item	Description
1	**COM0**	Console Redirection : **Disabled (Default setting) / Enabled**
2	**Legacy Console Redirection**	 Aptio Setup - AMI Advanced Legacy Console Redirection Settings Redirection COM Port [COM0 (Disabled)] Resolution [80x24] Redirect After POST [Always Enable] Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages Legacy Console Redirection Settings : **2.1)** Redirection COM Port : COM0 (Disabled) (Default setting), COM1 (Pci, Bus0, Dev0, Func0) (Disabled) **2.2)** Resolution : 80x24 (Default setting), 80x25 **2.3)** Redirect After POST : Always Enable (Default setting), BootLoader
3	**Serial Port for Out-of-Band Management / Windows Emergency Management Services (EMS)**	Console Redirection EMS : **Disabled (Default setting) / Enabled** When Console Redirection EMS enables, you can enter into "Console Redirection Settings" menu to modify several settings : **3.1)** Out-of-Band Mgmt Port : COM0 (Default setting), COM1 (Pci, Bus0,Dev0, Func0) (Disabled) **3.2)** Terminal Type EMS : VT100, VT100+, VT-UTF8 (Default setting), ANSI **3.3)** Bits per second EMS : 9600, 19200, 57600, 115200 (Default setting) **3.4)** Flow Control EMS : None (Default setting), Hardware RTS/CTS, Software Xon/Xoff

4.3.21 Intel TXT Information

Shows Intel TXT information



```
                                Aptio Setup - AMI
        Advanced
  Intel TXT Information

  Chipset                             Production Fused
  BiosAcm                             Production Fused
  Chipset Txt                         Supported
  Cpu Txt                             Supported
  Error Code                          None
    Class Code                        None
    Major Code                        None
    Minor Code                        None

                                                        →←: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit

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```
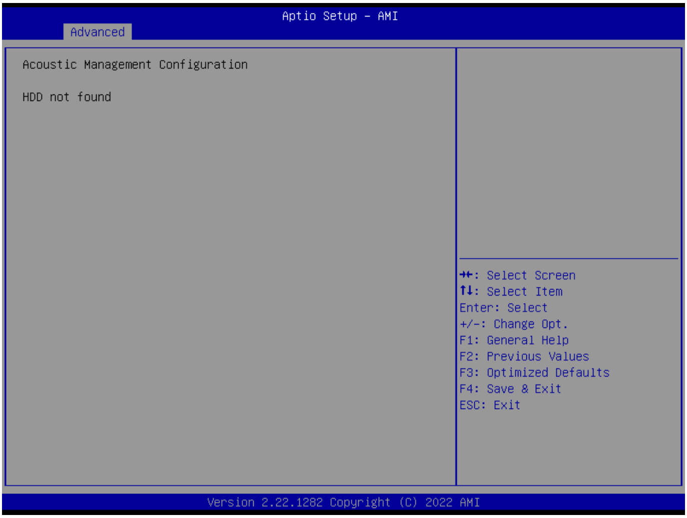
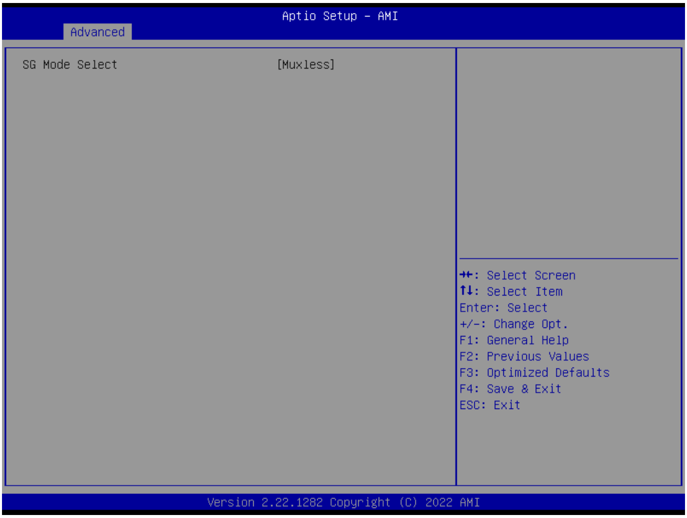

4.3.22 Acoustic Management Configuration



```
Aptio Setup – AMI
Advanced

Acoustic Management Configuration

HDD not found
```

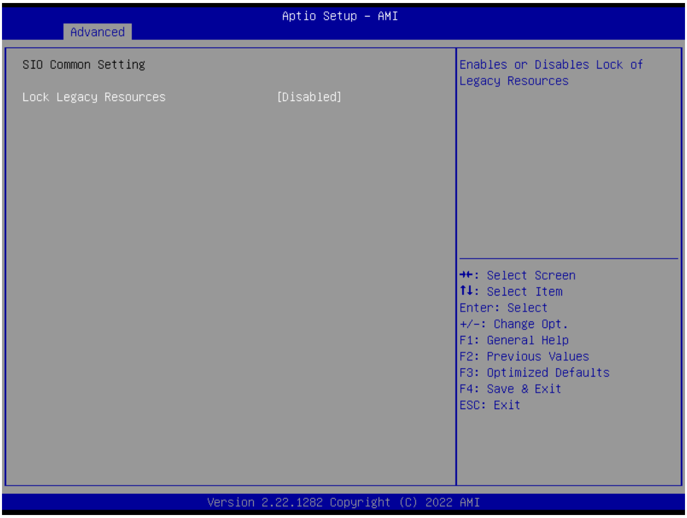
4.3.23 Switchable Graphics



```
SG Mode Select                    [Muxless]
```

Item	Description
SG Mode Select	Muxless (Default setting)

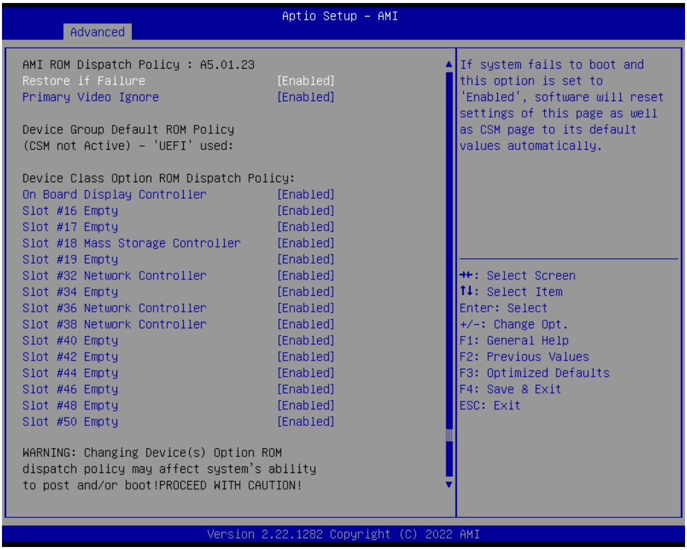
4.3.24 SIO Common Setting



```
Aptio Setup – AMI
Advanced

SIO Common Setting

Lock Legacy Resources                  [Disabled]

Enables or Disables Lock of
Legacy Resources

→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.22.1282 Copyright (C) 2022 AMI
```

Item	Description
Lock Legacy Resources	**Disabled (Default setting) / Enabled**

4.3.24 Option ROM Dispatch Policy

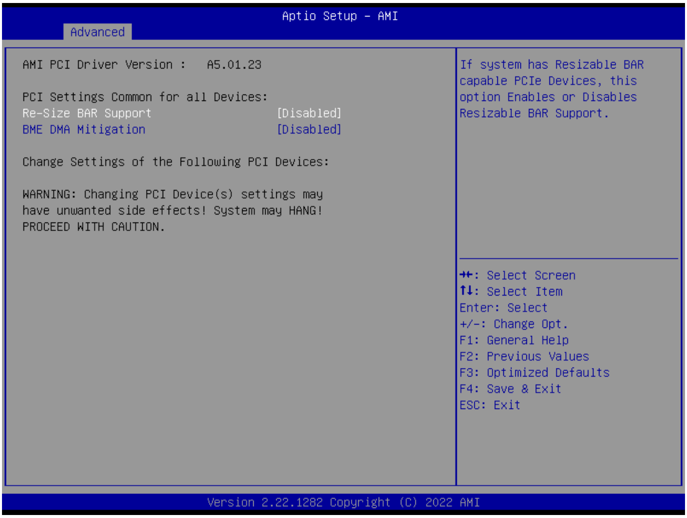


```
Aptio Setup - AMI
Advanced

AMI ROM Dispatch Policy : A5.01.23
Restore if Failure                   [Enabled]
Primary Video Ignore                 [Enabled]

Device Group Default ROM Policy
(CSM not Active) - 'UEFI' used:

Device Class Option ROM Dispatch Policy:
On Board Display Controller          [Enabled]
Slot #16 Empty                       [Enabled]
Slot #17 Empty                       [Enabled]
Slot #18 Mass Storage Controller     [Enabled]
Slot #19 Empty                       [Enabled]
Slot #32 Network Controller          [Enabled]
Slot #34 Empty                       [Enabled]
Slot #36 Network Controller          [Enabled]
Slot #38 Network Controller          [Enabled]
Slot #40 Empty                       [Enabled]
Slot #42 Empty                       [Enabled]
Slot #44 Empty                       [Enabled]
Slot #46 Empty                       [Enabled]
Slot #48 Empty                       [Enabled]
Slot #50 Empty                       [Enabled]

WARNING: Changing Device(s) Option ROM
dispatch policy may affect system's ability
to post and/or boot!PROCEED WITH CAUTION!

If system fails to boot and
this option is set to
'Enabled', software will reset
settings of this page as well
as CSM page to its default
values automatically.

→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.22.1282 Copyright (C) 2022 AMI
```

No.	Item	Description
1	**Restore if Failure**	To reset settings of this page as well as CSM page to its default values automatically. **Disabled / Enabled (Default setting)**
2	**Primary Video Ignore**	**Disabled / Enabled (Default setting)**
3	**Device Class Option ROM Dispatch Policy**	**3.1)** On Board Display Controller : **Disabled / Enabled (Default setting)** **3.2)** Slot #16 Empty : Enable or Disable Option ROM execution for selected Slot. **Disabed / Enabled (Default setting)** **3.3)** Slot #17 Empty : Enable or Disable Option ROM execution for selected Slot. **Disabled / Enabled (Default setting)** **3.4)** Slot #18 Mass Storage Controller : **Disabled / Enabled (Default setting)**

3	**Device Class Option ROM Dispatch Policy**	**3.5)** Slot #19 Empty : Enable or Disable Option ROM execution for selected Slot. **Disabled / Enabled (Default setting)** **3.6)** Slot #32 Network Controller : **Disabled / Enabled (Default setting)** **3.7)** Slot #34 Empty : Enable or Disable Option ROM execution for selected Slot. **Disabled / Enabled (Default setting)** **3.8)** Slot #36 Network Controller : **Disabled / Enabled (Default setting)** **3.9)** Slot #38 Network Contorller : **Disabled / Enabled (Default setting)** **3.10)** Slot #40 Empty : Enable or Disable Option ROM execution for selected Slot. **Disabled / Enabled (Default setting)** **3.11)** Slot #42 Empty : Enable or Disable Option ROM execution for selected Slot. **Disabled / Enabled (Default setting)** **3.12)** Slot #44 Empty : Enable or Disable Option ROM execution for selected Slot. **Disabled / Enabled (Default setting)** **3.13)** Slot #46 Empty : Enable or Disable Option ROM execution for selected Slot. **Disabled / Enabled (Default setting)** **3.14)** Slot #48 Empty : Enable or Disable Option ROM execution for selected Slot. **Disabled / Enabled (Default setting)** **3.15)** Slot #50 Empty : Enable or Disable Option ROM execution for selected Slot. **Disabled / Enabled (Default setting)**

4.3.25 PCI Subsystem Settings

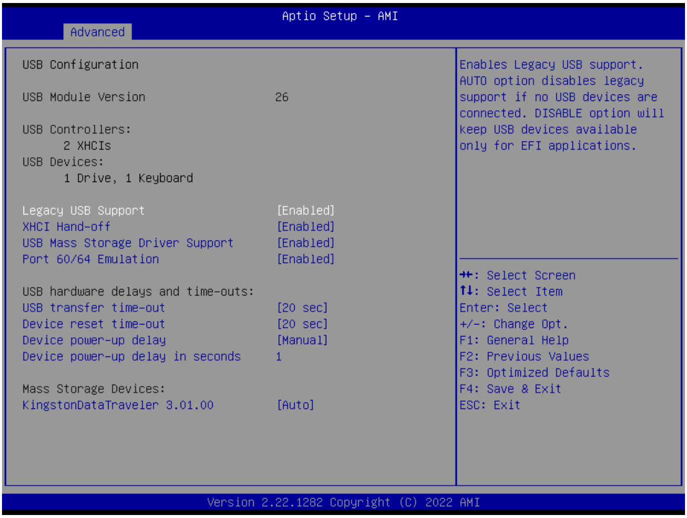


```
AMI PCI Driver Version :   A5.01.23

PCI Settings Common for all Devices:
Re-Size BAR Support                     [Disabled]
BME DMA Mitigation                      [Disabled]

Change Settings of the Following PCI Devices:

WARNING: Changing PCI Device(s) settings may
have unwanted side effects! System may HANG!
PROCEED WITH CAUTION.
```

If system has Resizable BAR capable PCIe Devices, this option Enables or Disables Resizable BAR Support.

No.	Item	Description
1	**PCI Settings Common for all Devices**	**1.1)** Re-Size BAR Support : If system has Resizable BAR capable PCIe Devices, this option Enables or Disables Resizable BAR support **Disabled (Default setting) / Enabled** **1.2)** BME DMA Mitigation : **Disabed (Default setting) / Enabled**

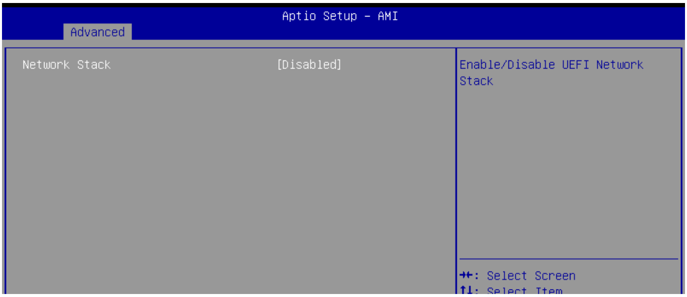
4.3.26 USB Configuration



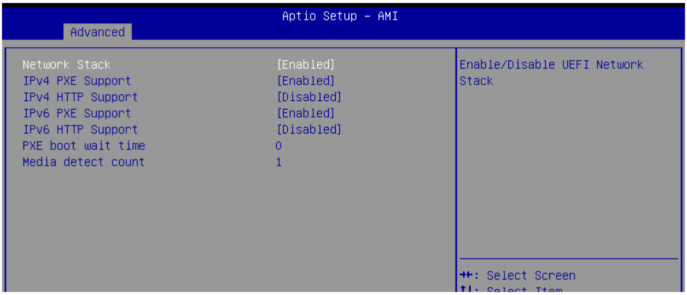
```
                              Aptio Setup - AMI
         Advanced
 USB Configuration                                   | Enables Legacy USB support.
                                                     | AUTO option disables legacy
 USB Module Version                    26            | support if no USB devices are
                                                     | connected. DISABLE option will
 USB Controllers:                                    | keep USB devices available
       2 XHCIs                                       | only for EFI applications.
 USB Devices:                                        |
       1 Drive, 1 Keyboard                           |
                                                     |
 Legacy USB Support                     [Enabled]    |
 XHCI Hand-off                          [Enabled]    |
 USB Mass Storage Driver Support        [Enabled]    |
 Port 60/64 Emulation                   [Enabled]    |
                                                     | →←: Select Screen
 USB hardware delays and time-outs:                  | ↑↓: Select Item
 USB transfer time-out                  [20 sec]     | Enter: Select
 Device reset time-out                  [20 sec]     | +/-: Change Opt.
 Device power-up delay                  [Manual]     | F1: General Help
 Device power-up delay in seconds       1            | F2: Previous Values
                                                     | F3: Optimized Defaults
 Mass Storage Devices:                               | F4: Save & Exit
 KingstonDataTraveler 3.01.00           [Auto]       | ESC: Exit

               Version 2.22.1282 Copyright (C) 2022 AMI
```

No.	Item	Description
1	Legacy USB Support	**Enabled : Enables Legacy UBS support (Default setting)** **Disabled : Disables Legacy USB support, and will keep USB devices available only for EFI applications.** **Auto : will disable legacy support if no USB devices are connected.**
2	XHCI Hand-off	**Enabled (Default setting) / Disabled**
3	USB Mass Storage Driver support	**Disabled / Enabled (Default setting)**
4	Port 60/64 Emulation	**Disabled / Enabled (Default setting)**
5	USB hardware delays and time-outs	**5.1)** USB transfer time-out Option items : 1 sec, 5 sec, 10 sec, 20 sec (Default setting) **5.2)** Device reset time-out Option items : 10 sec, 20 sec (Default setting), 30 sec, 40 sec **5.3)** Device power-up delay **Auto / Manual (Default setting)** **5.4)** Device power-up delay in seconds : Range is 1 to 40 second

4.3.27 Network Stack Configuration



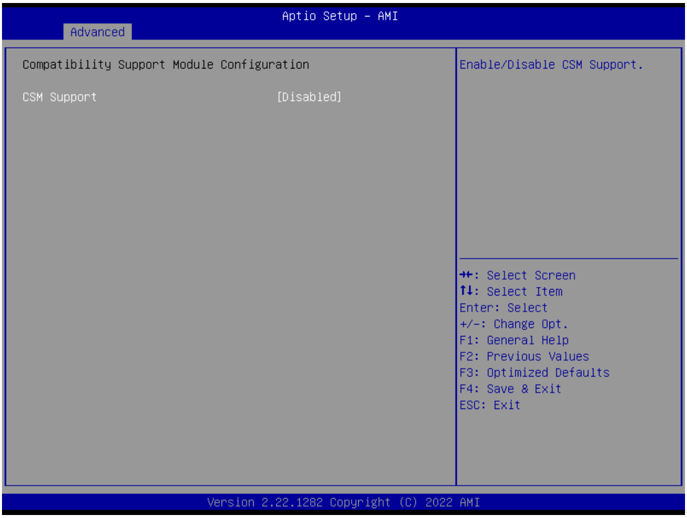
```
                         Aptio Setup - AMI
     Advanced
 Network Stack                  [Disabled]      Enable/Disable UEFI Network
                                                Stack

                                                →←: Select Screen
                                                ↑↓: Select Item
```



```
                         Aptio Setup - AMI
     Advanced
 Network Stack                  [Enabled]       Enable/Disable UEFI Network
 IPv4 PXE Support               [Enabled]       Stack
 IPv4 HTTP Support              [Disabled]
 IPv6 PXE Support               [Enabled]
 IPv6 HTTP Support              [Disabled]
 PXE boot wait time             0
 Media detect count             1

                                                →←: Select Screen
                                                ↑↓: Select Item
```

No.	Item	Description
1	**Network Stack**	When system is power on, install LAN driver under UEFI mode **Disabled (Default setting) / Enabled**
2	**IPv4 PXE Support**	When Network stack is enabled : **Disabled / Enabled (Default setting)**
3	**IPv4 HTTP Support**	When Network stack is enabled : **Disabled (Default setting) / Enabled**
4	**IPv6 PXE Support**	When Network stack is enabled : **Disabled / Enabled (Default setting)**
5	**IPv6 HTTP Support**	When Network stack is enabled : **Disabled (Default setting) / Enabled**
6	**PXE boot wait time**	Use either +/- or numeric key to set the value.
7	**Media detect count**	Use either +/- or numeric key to set the value.

4.3.28 CSM Configuration

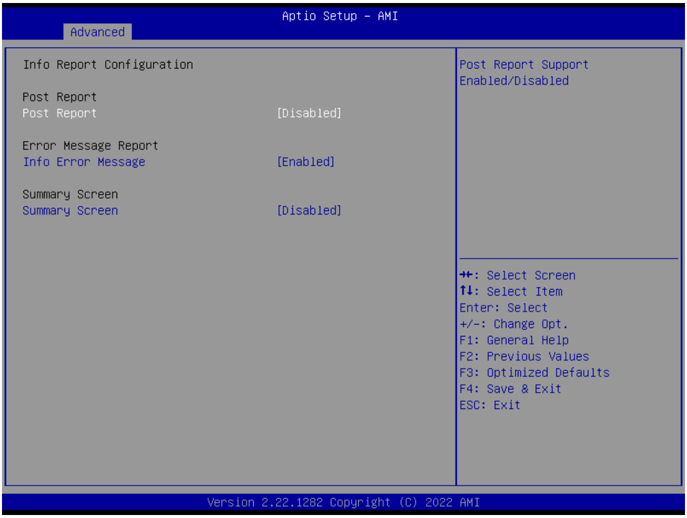


```
Compatibility Support Module Configuration

CSM Support                                [Disabled]
```

```
Enable/Disable CSM Support.

→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
```

Item	Description
CSM Support	**Disabled (Default setting) / Enabled**

4.3.29 Info Report Configuration

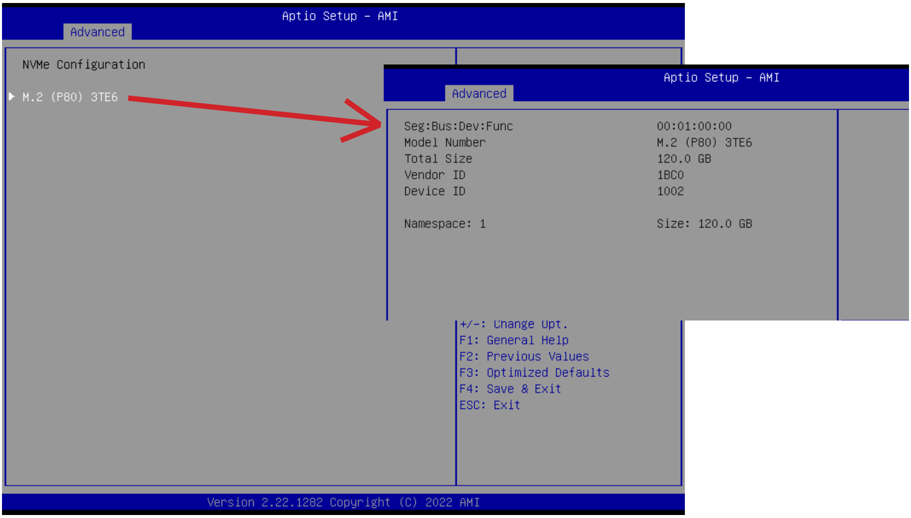


```
                         Aptio Setup - AMI
   Advanced

 Info Report Configuration                          Post Report Support
                                                    Enabled/Disabled
 Post Report
 Post Report                        [Disabled]

 Error Message Report
 Info Error Message                 [Enabled]

 Summary Screen
 Summary Screen                     [Disabled]

                                                    →←: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit

              Version 2.22.1282 Copyright (C) 2022 AMI
```

No.	Item	Description
1	**Post Report**	Post Report : **Disabled (Default setting) / Enabled**
2	**Error Message Report**	Info Error Message : **Disabled / Enabled (Default setting)**
3	**Summary Screen**	Summary Screen : **Disabled (Default setting) / Enabled**

4.3.30 NVMe Configuration

Shows NVMe M.2 SSD information

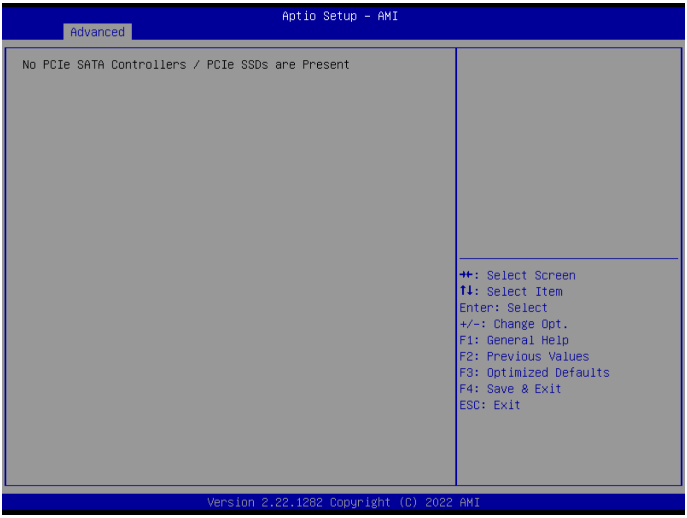


```
NVMe Configuration

▶ M.2 (P80) 3TE6
```

```
Seg:Bus:Dev:Func                     00:01:00:00
Model Number                         M.2 (P80) 3TE6
Total Size                           120.0 GB
Vendor ID                            1BC0
Device ID                            1002

Namespace: 1                         Size: 120.0 GB
```

```
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
```

4.3.31 offboard SATA Controller Configuration

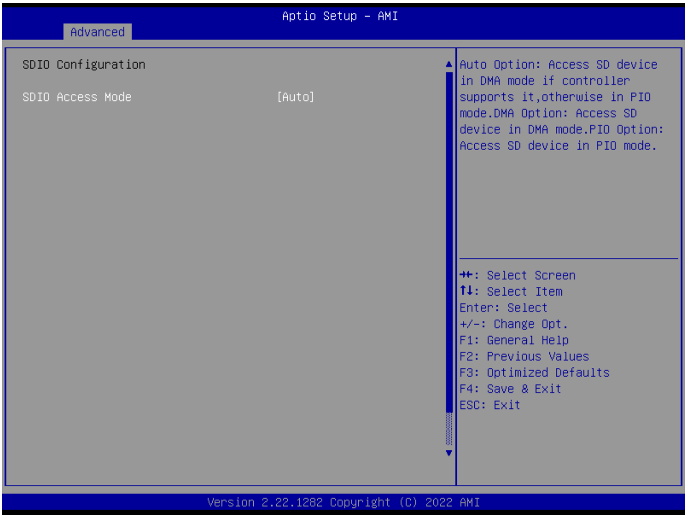


Aptio Setup - AMI

No PCIe SATA Controllers / PCIe SSDs are Present

Version 2.22.1282 Copyright (C) 2022 AMI

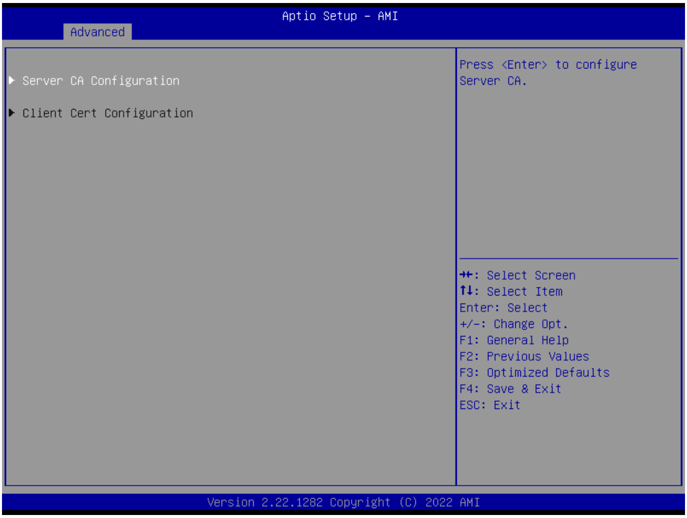
4.3.32 SDIO Configuration



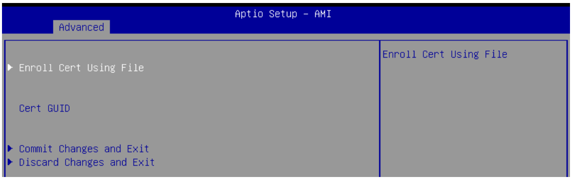
```
                         Aptio Setup - AMI
    Advanced
 SDIO Configuration                                    Auto Option: Access SD device
                                                       in DMA mode if controller
 SDIO Access Mode                 [Auto]               supports it,otherwise in PIO
                                                       mode.DMA Option: Access SD
                                                       device in DMA mode.PIO Option:
                                                       Access SD device in PIO mode.

                                                       →←: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit

             Version 2.22.1282 Copyright (C) 2022 AMI
```

Item	Description
SDIO Access Mode	Option items : Auto (Default setting), ADMA, SDMA

4.3.33 Tls Auth Configuration

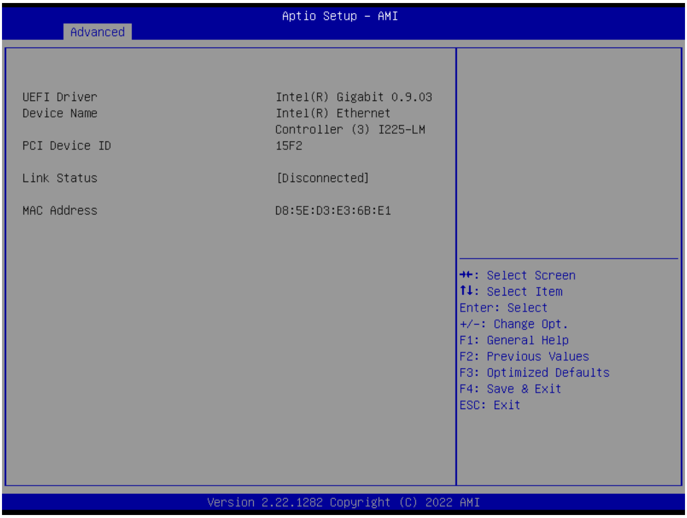


```
                         Aptio Setup - AMI
   Advanced

 ▶ Server CA Configuration                  Press <Enter> to configure
                                            Server CA.
 ▶ Client Cert Configuration

                                            →←: Select Screen
                                            ↑↓: Select Item
                                            Enter: Select
                                            +/-: Change Opt.
                                            F1: General Help
                                            F2: Previous Values
                                            F3: Optimized Defaults
                                            F4: Save & Exit
                                            ESC: Exit

              Version 2.22.1282 Copyright (C) 2022 AMI
```

Item	Description
Server CA Configuration	 Aptio Setup - AMI Advanced ▶ Enroll Cert Using File Cert GUID ▶ Commit Changes and Exit ▶ Discard Changes and Exit Enroll Cert Using File Enroll Cert Enroll Cert Using File : Option items : SYSTEM 256MB, Windows 102GB, WinRE 1023MB, RecoveryImage 7GB Cert GUID : Input digit character in 11111111-2222-3333-4444-12345 890ab format.

4.3.34 Intel(R) Ethernet Controller (3) I255-LM -D8:5E:D3:E3:6B:E1

shows Intel Ethernet controller information

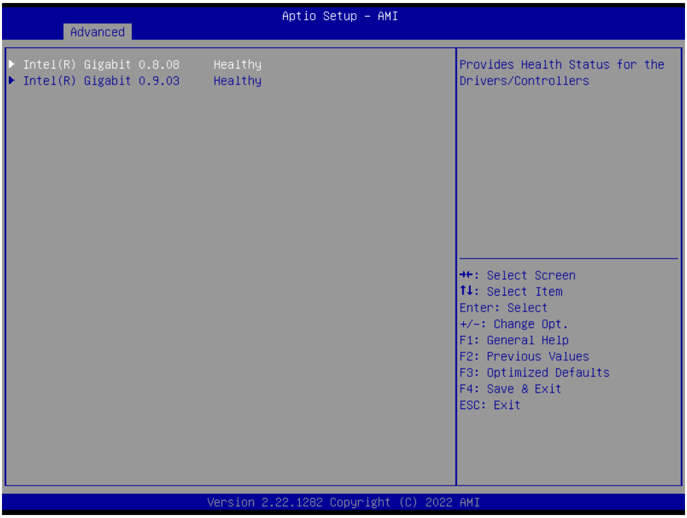


```
UEFI Driver                                  Intel(R) Gigabit 0.9.03
Device Name                                  Intel(R) Ethernet
                                             Controller (3) I225-LM
PCI Device ID                                15F2

Link Status                                  [Disconnected]

MAC Address                                  D8:5E:D3:E3:6B:E1
```

```
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
```

Version 2.22.1282 Copyright (C) 2022 AMI

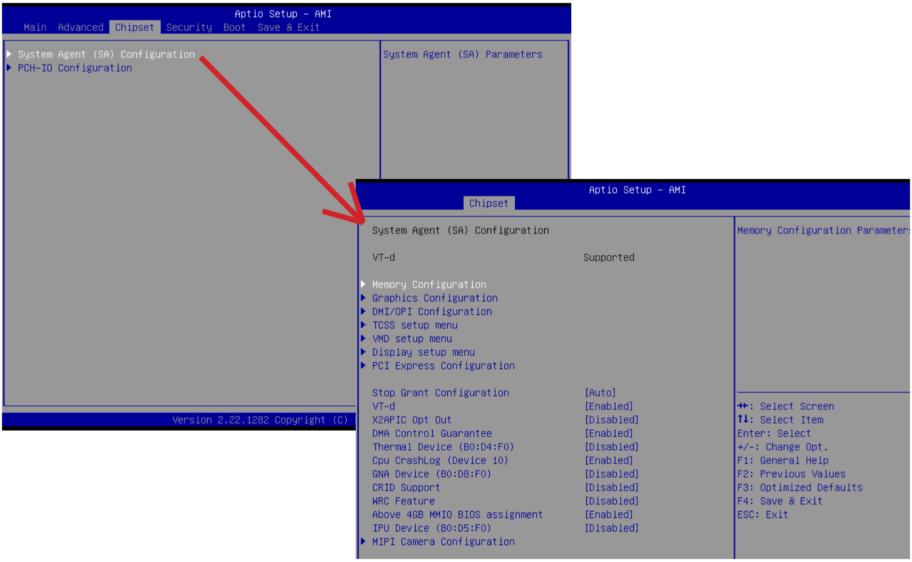
4.3.35 Driver Health



```
                              Aptio Setup - AMI
      Advanced
 ► Intel(R) Gigabit 0.8.08     Healthy            Provides Health Status for the
 ► Intel(R) Gigabit 0.9.03     Healthy            Drivers/Controllers

                                                  →←: Select Screen
                                                  ↑↓: Select Item
                                                  Enter: Select
                                                  +/-: Change Opt.
                                                  F1: General Help
                                                  F2: Previous Values
                                                  F3: Optimized Defaults
                                                  F4: Save & Exit
                                                  ESC: Exit

                 Version 2.22.1282 Copyright (C) 2022 AMI
```

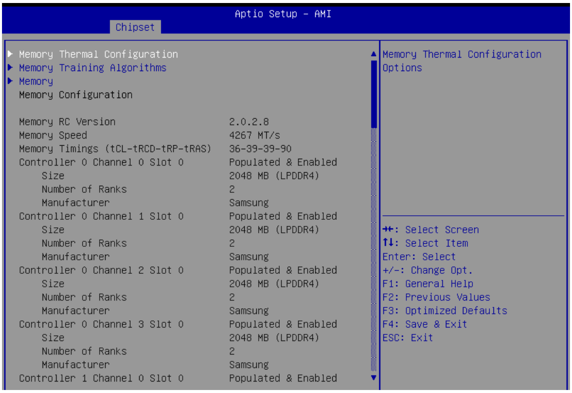
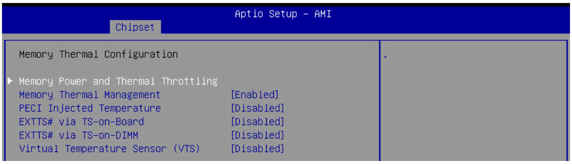
No.	Item	Description
1	**Intel(R) Gigabit 0.8.08 Healthy**	Provides Health Status for the Drivers/Contorllers
2	**Intel(R) Gigabit 0.9.03 Healthy**	Provides Health Status for the Drivers/Contorllers

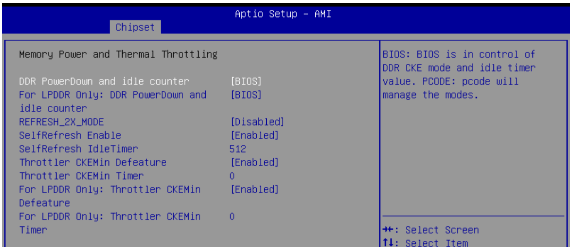
4.4 Chipset - System Agent (SA) Configuration



```
                         Aptio Setup – AMI
  Main  Advanced  Chipset  Security  Boot  Save & Exit

▶ System Agent (SA) Configuration          System Agent (SA) Parameters
▶ PCH-IO Configuration

                   Version 2.22.1282 Copyright (C)
```

```
                         Aptio Setup – AMI
                Chipset

  System Agent (SA) Configuration                     Memory Configuration Parameter

  VT-d                                 Supported

▶ Memory Configuration
▶ Graphics Configuration
▶ DMI/OPI Configuration
▶ TCSS setup menu
▶ VMD setup menu
▶ Display setup menu
▶ PCI Express Configuration

  Stop Grant Configuration             [Auto]
  VT-d                                 [Enabled]         ↔: Select Screen
  X2APIC Opt Out                       [Disabled]        ↑↓: Select Item
  DMA Control Guarantee                [Enabled]         Enter: Select
  Thermal Device (B0:D4:F0)            [Disabled]        +/-: Change Opt.
  Cpu CrashLog (Device 10)             [Enabled]         F1: General Help
  GNA Device (B0:D8:F0)                [Disabled]        F2: Previous Values
  CRID Support                         [Disabled]        F3: Optimized Defaults
  WRC Feature                          [Disabled]        F4: Save & Exit
  Above 4GB MMIO BIOS assignment       [Enabled]         ESC: Exit
  IPU Device (B0:D5:F0)                [Disabled]
▶ MIPI Camera Configuration
```

No.	Item	Description
1.1	Memory Configuration	 Aptio Setup – AMI Chipset ▶ Memory Thermal Configuration ▶ Memory Training Algorithms ▶ Memory Memory Configuration Memory RC Version 2.0.2.8 Memory Speed 4267 MT/s Memory Timings (tCL-tRCD-tRP-tRAS) 36-39-39-90 Controller 0 Channel 0 Slot 0 Populated & Enabled Size 2048 MB (LPDDR4) Number of Ranks 2 Manufacturer Samsung Controller 0 Channel 1 Slot 0 Populated & Enabled Size 2048 MB (LPDDR4) Number of Ranks 2 Manufacturer Samsung Controller 0 Channel 2 Slot 0 Populated & Enabled Size 2048 MB (LPDDR4) Number of Ranks 2 Manufacturer Samsung Controller 0 Channel 3 Slot 0 Populated & Enabled Size 2048 MB (LPDDR4) Number of Ranks 2 Manufacturer Samsung Controller 1 Channel 0 Slot 0 Populated & Enabled Memory Thermal Configuration Options ↔: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit **1.1.1)** Memory Thermal Configuration :  Aptio Setup – AMI Chipset Memory Thermal Configuration ▶ Memory Power and Thermal Throttling Memory Thermal Management [Enabled] PECI Injected Temperature [Disabled] EXTTS# via TS-on-Board [Disabled] EXTTS# via TS-on-DIMM [Disabled] Virtual Temperature Sensor (VTS) [Disabled]

1.1	**Memory Configuration**	**1.1.1.1)** Memory Power and Thermal Throttling :  Aptio Setup – AMI Chipset Memory Power and Thermal Throttling DDR PowerDown and idle counter [BIOS] For LPDDR Only: DDR PowerDown and idle counter [BIOS] REFRESH_2X_MODE [Disabled] SelfRefresh Enable [Enabled] SelfRefresh IdleTimer 512 Throttler CKEMin Defeature [Enabled] Throttler CKEMin Timer 0 For LPDDR Only: Throttler CKEMin Defeature [Enabled] For LPDDR Only: Throttler CKEMin Timer 0 BIOS: BIOS is in control of DDR CKE mode and idle timer value. PCODE: pcode will manage the modes. →←: Select Screen ↑↓: Select Item **1.1.1.1.1)** DDR PowerDown and idle counter : **PCODE : pcode will manage the modes.** **BIOS : BIOS is in control of DDR CKE mode and idle timer value. (Default setting)** **1.1.1.1.2)** For LPDDR Only : DDR PowerDown and idle counter : **PCODE : pcode will manage the modes.** **BIOS : BIOS is in control of DDR CKE mode and idle timer value. (Default setting)** **1.1.1.1.3)** REFRESH_2X_MODE : Option items : Disabled (Default setting), 1 - Enabled for WARM or HOT , 2 - Enable HOT only **1.1.1.1.4)** SelfRefresh Enable : **Disabled / Enabled (Default setting)** **1.1.1.1.5)** SelfRefresh IdleTimer : Range [64K-1;512] in DCLK800s (512 =Def) **1.1.1.1.6)** Throttler CKEMin Defeature : **Enabled (Default setting) / Disabled** **1.1.1.1.7)** Throttler CKEMin Timer : Time value for CKEMin, range [255;0] **1.1.1.1.8)** For LPDDR Only : Throttler CKEMin Defeature : **Enabled (Default setting) / Disabled** **1.1.1.1.9)** For LPDDR Only : Throttler CKEMin Timer : Time value for CKEMin, range [255;0] **1.1.1.2)** Memory Thermal Management : **Disabled / Enabled (Default setting)** **1.1.1.3)** PECI Injected Temperature : to let memory temperatures to be injected to the processor via PECI. **Disabled (Default setting) / Enabled** **1.1.1.4)** EXTTS# via TS-on-Board : to routing TS-on-Board's ALERT# and THERM# to EXTTS# pins on the PCH. **Disabled (Default setting) / Enabled**

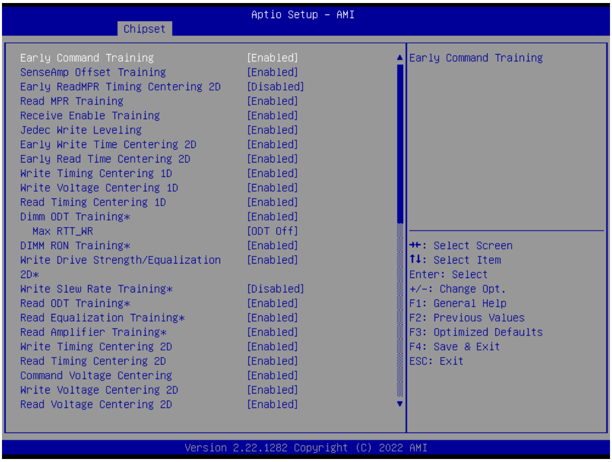
1.1

Memory Configuration

1.1.1.5) EXTTS# via TS-on-DIMM : to routing TS-on-DIMM's ALERT# to EXTTS# pin on the PCH.
Disabled (Default setting) / Enabeld

1.1.1.6) Virtual Temperature Sensor (VTS) :
Disabled (Default setting) / Enabled

1.1.2) MEMORY Training Algorithms :



```
                              Aptio Setup - AMI
        Chipset

  Early Command Training                 [Enabled]       Early Command Training
  SenseAmp Offset Training               [Enabled]
  Early ReadMPR Timing Centering 2D      [Disabled]
  Read MPR Training                      [Enabled]
  Receive Enable Training                [Enabled]
  Jedec Write Leveling                   [Enabled]
  Early Write Time Centering 2D          [Enabled]
  Early Read Time Centering 2D           [Enabled]
  Write Timing Centering 1D              [Enabled]
  Write Voltage Centering 1D             [Enabled]
  Read Timing Centering 1D               [Enabled]
  Dimm ODT Training*                     [Enabled]
    Max RTT_WR                           [ODT Off]
  DIMM RON Training*                     [Enabled]       →←: Select Screen
  Write Drive Strength/Equalization      [Enabled]       ↑↓: Select Item
  2D*                                                    Enter: Select
  Write Slew Rate Training*              [Disabled]      +/-: Change Opt.
  Read ODT Training*                     [Enabled]       F1: General Help
  Read Equalization Training*            [Enabled]       F2: Previous Values
  Read Amplifier Training*               [Enabled]       F3: Optimized Defaults
  Write Timing Centering 2D              [Enabled]       F4: Save & Exit
  Read Timing Centering 2D               [Enabled]       ESC: Exit
  Command Voltage Centering              [Enabled]
  Write Voltage Centering 2D             [Enabled]
  Read Voltage Centering 2D              [Enabled]

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```
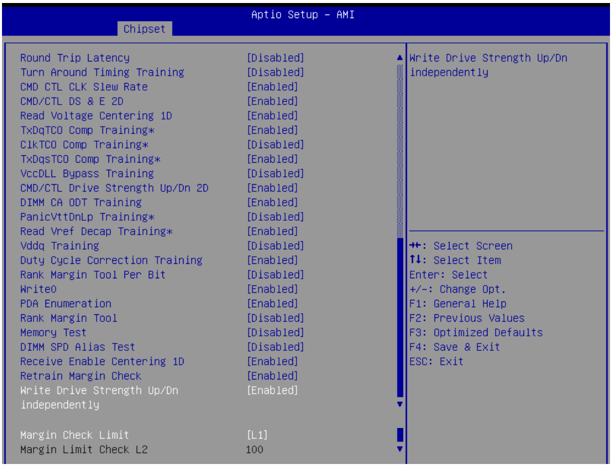



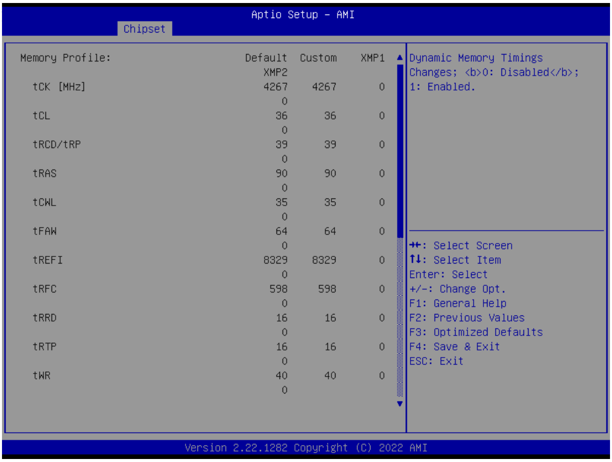
```
                              Aptio Setup - AMI
        Chipset

  Round Trip Latency                     [Disabled]      Write Drive Strength Up/Dn
  Turn Around Timing Training            [Disabled]      independently
  CMD CTL CLK Slew Rate                  [Enabled]
  CMD/CTL DS & E 2D                      [Enabled]
  Read Voltage Centering 1D              [Enabled]
  TxDqTCO Comp Training*                 [Enabled]
  ClkTCO Comp Training*                  [Disabled]
  TxDqsTCO Comp Training*                [Enabled]
  VccDLL Bypass Training                 [Disabled]
  CMD/CTL Drive Strength Up/Dn 2D        [Enabled]
  DIMM CA ODT Training                   [Enabled]
  PanicVttDnLp Training*                 [Disabled]
  Read Vref Decap Training*              [Enabled]
  Vddq Training                          [Disabled]      →←: Select Screen
  Duty Cycle Correction Training         [Enabled]       ↑↓: Select Item
  Rank Margin Tool Per Bit               [Disabled]      Enter: Select
  Write0                                 [Enabled]       +/-: Change Opt.
  PDA Enumeration                        [Enabled]       F1: General Help
  Rank Margin Tool                       [Disabled]      F2: Previous Values
  Memory Test                            [Disabled]      F3: Optimized Defaults
  DIMM SPD Alias Test                    [Disabled]      F4: Save & Exit
  Receive Enable Centering 1D            [Enabled]       ESC: Exit
  Retrain Margin Check                   [Enabled]
  Write Drive Strength Up/Dn             [Enabled]
  independently

  Margin Check Limit                     [L1]
  Margin Limit Check L2                  100
```

1.1	**Memory Configuration**	**1.1.2.1)** Early Command Training : **Disabled / Enabled (Default setting)** **1.1.2.2)** SenseAmp Offset Training : **Disabled / Enabled (Default setting)** **1.1.2.3)** Early ReadMPR Timing Centering 2D : **Disabled (Default setting) / Enabled** **1.1.2.4)** Read MPR Training : **Disabled / Enabled (Default setting)** **1.1.2.5)** Receive Enable Training : **Disabled / Enabled (Default setting)** **1.1.2.6)** Jedec Write Leveling : **Disabled / Enabled (Default setting)** **1.1.2.7)** Early Write Time Centering 2D : **Disabled / Enabled (Default setting)** **1.1.2.8)** Early Read Time Centering 2D : **Disabled / Enabled (Default setting)** **1.1.2.9)** Write Timing Centering 1D : **Disabled / Enabled (Default setting)** **1.1.2.10)** Write Voltage Centering 1D : **Disabled / Enabled (Default setting)** **1.1.2.11)** Read Timing Centering 1D : **Disabled / Enabled (Default setting)** **1.1.2.12)** Dimm ODT Training* : **Disabled / Enabled (Default setting)** **1.1.2.13)** MAX RTT_WR : **ODT Off (Default setting) / 120 ohms** **1.1.2.14)** DIMM RON Training* : **Disabled / Enabled (Default setting)** **1.1.2.15)** Write Drive Strength/Equalization 2D* : **Disabled / Enabled (Default setting)** **1.1.2.16)** Write Slew Rate Training* : **Disabled (Default setting) / Enabled** **1.1.2.17)** Read ODT Training* : **Disabled / Enabled (Default setting)**

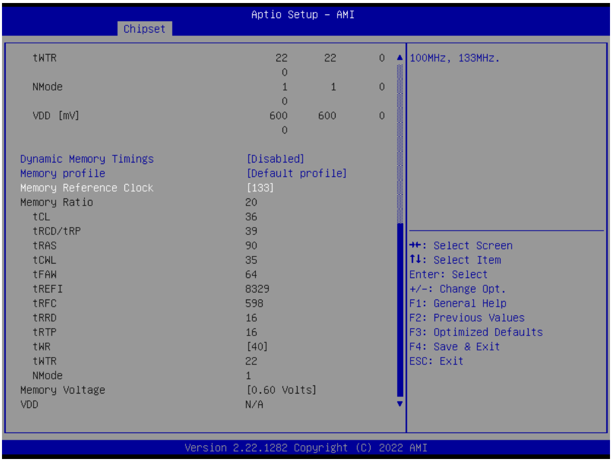
1.1	**Memory Configuration**	**1.1.2.18)** Read Equalization Training* : **Disabled / Enabled (Default setting)** **1.1.2.19)** Read Amplifier Training* : **Disabled / Enabled (Default setting)** **1.1.2.20)** Write Timing Centering 2D : **Disabled / Enabled (Default setting)** **1.1.2.21)** Read Timing Centering 2D : **Disabled / Enabled (Default setting)** **1.1.2.22)** Command Voltage Centering : **Disabled / Enabled (Default setting)** **1.1.2.23)** Write Voltage Centering 2D : **Disabled / Enabled (Default setting)** **1.1.2.24)** Read Voltage Centering 2D : **Disabled / Enabled (Default setting)** **1.1.2.25)** Late Command Training : **Disabled / Enabled (Default setting)** **1.1.2.26)** Round Trip Latency : **Disabled (Default setting) / Enabled** **1.1.2.27)** Turn Around Timing Training : **Disabled (Default setting) / Enabled** **1.1.2.28)** CMD CTL CLK Slew Rate : **Disabled / Enabled (Default setting)** **1.1.2.29)** CMD/CTL DS & E 2D : **Disabled / Enabled (Default setting)** **1.1.2.30)** Read Voltage Centering 1D : **Disabled / Enabled (Default setting)** **1.1.2.31)** TxDqTC0 Comp Training* : **Disabled / Enabled (Default setting)** **1.1.2.32)** ClkTCO Comp Training* : **Disabled (Default setting) / Enabled** **1.1.2.33)** TxDqsTCO Comp Training* : **Disabled / Enabled (Default setting)** **1.1.2.34)** VccDLL Bypass Training : **Disabled (Default setting) / Enabled**

1.1	**Memory Configuration**	**1.1.2.35)** CMD/CTL Drive Strength Up/Dn 2D : **Disabled / Enabled (Default setting)** **1.1.2.36)** DIMM CA ODT Training : **Disabled / Enabled (Default setting)** **1.1.2.37)** PanicVttDnLp Training* : **Disabled (Default setting)/ Enabled** **1.1.2.38)** Read Vref Decap Training* : **Disabled / Enabled (Default setting)** **1.1.2.39)** Vddq Training : **Disabled (Default setting) / Enabled** **1.1.2.40)** Duty Cycle Correction Training : **Disabled / Enabled (Default setting)** **1.1.2.41)** Rank Margin Tool Per Bit : **Disabled (Default setting) / Enabled** **1.1.2.42)** Write0 : **Disabled / Enabled (Default setting)** **1.1.2.43)** PDA Enumeration : **Disabled / Enabled (Default setting)** **1.1.2.44)** Rank Margin Tool : **Disabled (Default setting) / Enabled** **1.1.2.45)** Memory Test : **Disabled (Default setting) / Enabled** **1.1.2.46)** DIMM SPD Alias Test : **Disabled (Default setting) / Enabled** **1.1.2.47)** Receive Enable Centering 1D : **Disabled / Enabled (Default setting)** **1.1.2.48)** Retrain Margin Check : **Disabled / Enabled (Default setting)** **1.1.2.49)** Write Drive Strength Up/Dn independently : **Disabled / Enabled (Default setting)** **1.1.2.50)** Margin Cehck Limit : **Option items : Disabled , L1 (Default setting), L2, Both**

1.1	Memory Configuration	



```
                              Aptio Setup - AMI
                 Chipset
 Memory Profile:                  Default  Custom   XMP1  ▲ Dynamic Memory Timings
                                     XMP2                  Changes; <b>0: Disabled</b>;
   tCK [MHz]                         4267    4267      0    1: Enabled.
                                        0
   tCL                                 36      36      0
                                        0
   tRCD/tRP                            39      39      0
                                        0
   tRAS                                90      90      0
                                        0
   tCWL                                35      35      0
                                        0
   tFAW                                64      64      0
                                        0                  ++: Select Screen
   tREFI                             8329    8329      0    ↑↓: Select Item
                                        0                  Enter: Select
   tRFC                               598     598      0    +/-: Change Opt.
                                        0                  F1: General Help
   tRRD                                16      16      0    F2: Previous Values
                                        0                  F3: Optimized Defaults
   tRTP                                16      16      0    F4: Save & Exit
                                        0                  ESC: Exit
   tWR                                 40      40      0
                                        0
                                                        ▼
               Version 2.22.1282 Copyright (C) 2022 AMI
```



```
                              Aptio Setup - AMI
                 Chipset
   tWTR                                22      22      0  ▲ 100MHz, 133MHz.
                                        0
   NMode                                1       1      0
                                        0
   VDD [mV]                           600     600      0
                                        0

 Dynamic Memory Timings           [Disabled]
 Memory profile                   [Default profile]
 Memory Reference Clock           [133]
 Memory Ratio                     20
   tCL                            36
   tRCD/tRP                       39                       ++: Select Screen
   tRAS                           90                       ↑↓: Select Item
   tCWL                           35                       Enter: Select
   tFAW                           64                       +/-: Change Opt.
   tREFI                          8329                     F1: General Help
   tRFC                           598                      F2: Previous Values
   tRRD                           16                       F3: Optimized Defaults
   tRTP                           16                       F4: Save & Exit
   tWR                            [40]                     ESC: Exit
   tWTR                           22
   NMode                          1
 Memory Voltage                   [0.60 Volts]
 VDD                              N/A                   ▼
               Version 2.22.1282 Copyright (C) 2022 AMI
```

1.1.3.1) Dynamic Memory Timings :
Disabled (Default setting) / Enabled

1.1.3.2) Memory profile :
Option items : Default profile (Default setting), Custom profile

1.1.3.3) Memory Reference Clock :
Option items : 133MHz (Default setting), 100MHz

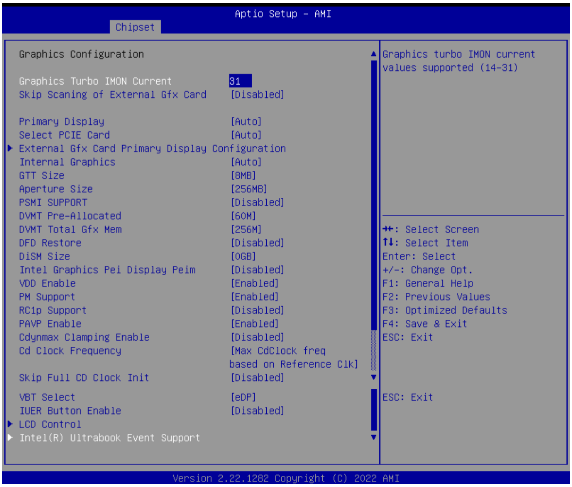
1.1.4) MRC ULT Safe Config :
Disabled (Default setting) / Enabled

1.1	**Memory Configuration**	**1.1.5)** LPDDR DqDqs Re-Training : **Disabled / Enabled (Default setting)** **1.1.6)** Safe Mode Support : **Disabled (Default setting) / Enabled** **1.1.7)** Override Performance Downgrade For Mixed Memory : **Disabled (Default setting) / Enabled** **1.1.8)** Memory Test on Warm Boot : To Let Base Memory Test run on Warm Boot : **Disabled / Enabled (Default setting)** **1.1.9)** Maximum Memory Frequency : **Option items : Auto (Default setting), 1067, 1200, 1333, 1467, 1733, 1867, 2133, 2267, 2533, 2667, 2933, 3067, 3333, 3467, 3733, 3867, 4133, 4267, 4533, 4667, 4933, 5067, 5333, 5467, 5733, 5867, 6133, 6267, 6533, 6667, 6933, 7067, 7467, 7733, 7867, 8000, 8133, 8267, 1600, 2000, 2400, 2800, 3200, 3600, 4000, 4400, 4800, 5200, 5600, 6000, 6400, 6800, 7200, 7600, 8400** **1.1.10)** HOB Buffer Size : **Option items : Auto (Default setting), 1B, 1KB, Max (assuming 63KB total HOB size)** **1.1.11)** Max TOLUD : **Option items : Dynamic (Default setting), 1 GB, 1.25 GB, 1.5 GB, 1.75 GB, 2 GB, 2.25 GB, 2.5 GB, 2.75 GB, 3 GB, 3.25 GB, 3.5 GB** **1.1.12)** SA GV : System Agent Geyserville. **Option items : Disabled, Fixed to 1st Point, Fixed to 2nd Point, Fixed to 3rd Point, Fixed to 4th Point, Enabled (Default setting)** **1.1.13)** First Point Frequency : Specify the frequency for the given point. **1.1.14)** First Point Gear : Selection for the Gear Ratio of the SAGV point. **1.1.15)** Second Point Frequency : Specify the frequency for the given point. **1.1.16)** Second Point Gear : Selection for the Gear Ratio of the SAGV point. **1.1.17)** Third Point Frequency : Specify the frequency for the given point. **1.1.18)** Third Point Gear : Selection for the Gear Ratio of the SAGV point. **1.1.19)** Fourth Point Frequency : Specify the frequency for the given point. **1.1.20)** Fourth Point Gear : Selection for the Gear Ratio of the SAGV point. **1.1.21)** Retrain on Fast Fail : **Disabled /Enabled (Default setting)**

1.1	**Memory Configuration**	**1.1.22)** DDR4_1DPC : **Option items : Disabled , Enabled on DIMM0 Only, Enabled on DIMM1 Only, Enabled (Default setting)** **1.1.23)** Enable RH Prevention : Actively prevent Row Hammer **Disabled (Default setting) / Enabled** **1.1.24)** Refresh Watermarks : **Option items : High (Default setting), Low** **1.1.25)** Exit On Failure (MRC) : **Disabled / Enabled (Default setting)** **1.1.26)** New Features 1 - MRC : **Disabled (Default setting) / Enabled** **1.1.27)** New Features 2 - MRC : **Disabled (Default setting) / Enabled** **1.1.28)** Ch Hash Override POR settings : **Disabled (Default setting) / Enabled** **1.1.29)** Extended Bank Hashing : **Disabled / Enabled (Default setting)** **1.1.30)** Per Bank Refresh : **Disabled / Enabled (Default setting)** **1.1.31)** VC1 Read Metering : **Disabled / Enabled (Default setting)** **1.1.32)** Strong Weak Leaker : Value for StrongWkLeaker **1.1.33)** Power Down Mode : CKE Power Down Mode control **Option items : Auto (Default setting), No Power Down, APD, PPD-DLLoff** **1.1.34)** Pwr Down Idle Timer : **0 for Auto. 64 for ULX/ULT, 128 for DT/Hal** **1.1.35)** Page Close Idle Timeout : **Enabled (Default setting) / Disabled** **1.1.36)** Memory Scrambler : **Disabled / Enabled (Default setting)** **1.1.37)** Force ColdReset : **Enabled / Disabled (Default setting)**

1.1	**Memory Configuration**	**1.1.38~45)** Controller 0, Channel 0 DIMM Control / Controller 0, Channel 1 DIMM Control / Controller 0, Channel 2 DIMM Control / Controller 0, Channel 3 DIMM Control / Controller 1, Channel 0 DIMM Control / Controller 1, Channel 1 DIMM Control / Controller 1, Channel 2 DIMM Control / Controller 1, Channel 3 DIMM Control : **Option items : Enable both DIMMs (Default setting), Disable DIMM0, Disable DIMM1, Disable both DIMMs** **1.1.46)** Force Single Bank : **Disabled (Default setting) / Enabled** **1.1.47)** DDR MEMORY DOWN Config : **Disabled (Default setting) / Enabled** **1.1.48)** In-Band ECC Support : **Disabled (Default setting) / Enabled** **1.1.49)** Memory Remap : to let memory remap above 4GB **Enabled (Default setting) / Disabled** **1.1.50)** Time Measure : **Disabled (Default setting) / Enabled** **1.1.51)** Fast Boot : fast path thru the MRC **Disabled / Enabled (Default setting)** **1.1.52)** Rank Margin Tool Per Task : **Disabled (Default setting) / Enabled** **1.1.53)** Training Tracing : printing of the current trained state at every major training step. **Disabled (Default setting) / Enabled** **1.1.54)** Lpddr Mem WL Set : **Option items : Set A , Set B (Default setting)** **1.1.55)** Rank Margin Tool Loop Count : Specifies the Loop Count to be used during Rank Margin Tool Testing. **0 for Auto.** **1.1.56)** Vddq Voltage Override : **0 for Auto.**

1.2 **Graphics Configuration**



```
                          Aptio Setup - AMI
          Chipset

  Graphics Configuration                                 Graphics turbo IMON current
                                                         values supported (14-31)
  Graphics Turbo IMON Current          31
  Skip Scaning of External Gfx Card    [Disabled]

  Primary Display                      [Auto]
  Select PCIE Card                     [Auto]
▶ External Gfx Card Primary Display Configuration
  Internal Graphics                    [Auto]
  GTT Size                             [8MB]
  Aperture Size                        [256MB]
  PSMI SUPPORT                         [Disabled]
  DVMT Pre-Allocated                   [60M]
  DVMT Total Gfx Mem                   [256M]            →←: Select Screen
  DFD Restore                          [Disabled]        ↑↓: Select Item
  DiSM Size                            [0GB]             Enter: Select
  Intel Graphics Pei Display Peim      [Disabled]        +/-: Change Opt.
  VDD Enable                           [Enabled]         F1: General Help
  PM Support                           [Enabled]         F2: Previous Values
  RC1p Support                         [Disabled]        F3: Optimized Defaults
  PAVP Enable                          [Enabled]         F4: Save & Exit
  Cdynmax Clamping Enable              [Disabled]        ESC: Exit
  Cd Clock Frequency                   [Max CdClock freq
                                       based on Reference Clk]
  Skip Full CD Clock Init              [Disabled]

  VBT Select                           [eDP]             ESC: Exit
  IUER Button Enable                   [Disabled]
▶ LCD Control
▶ Intel(R) Ultrabook Event Support

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```
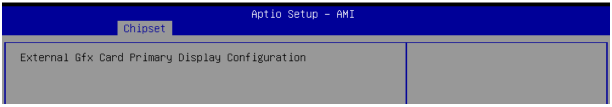

1.2.1) Graphics Turbo IMON Current :
Graphics turbo IMON current values supported 14 - 31.

1.2.2) Skip Scaning of External Gfx Card :
Disabled (Default setting) / Enabled

1.2.3) Primary Display : Select which of IGFX/PEG/PCI Graphics device should be primary display or select HG for Hybrid Gfx.
Option items : Auto (Default setting), IGFX, PEG Slot, PCH PCI, HG

1.2.4) Select PCIE Card :
Auto : Skip GPIO based Power Enable to dGPU (Default setting)
Elk Creek 4 : DGPU Power Enable = Active Low
PEG Eval : DGPU Power Enable = Active High

1.2.5) External Gfx Card Primary Display Configuration



```
                          Aptio Setup - AMI
          Chipset

  External Gfx Card Primary Display Configuration
```

1.2.6) Internal Graphics :
Option items : Auto (Default setting), Disabled, Enabled

1.2.7) GTT size :
Option items : 2MB, 4MB, 8MB (Default setting)

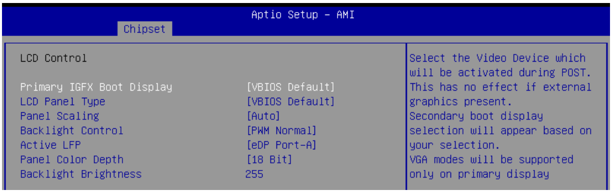
1.2.8) Aperture size :
Option items : 128MB, 256MB (Default setting), 512MB, 1024MB

1.2.9) PSMI Support :
Disabled (Default setting) / Enabled

1.2	**Graphics Configuration**	**1.2.10)** DVMT Pre-Allocated : **Option items : 0M, 32M, 64M, 96M, 128M, 160M, 4M, 8M, 12M, 16M, 20M, 24M, 28M, 32M/F7, 36M, 40M, 44M, 48M, 52M, 56M, 60M (Default setting)** **1.2.11)** DVMT Total Gfx Mem : **Option items : 128M, 256M (Default setting), MAX** **1.2.12)** DFD Restore : **Disabled (Default setting) / Enabled** **1.2.13)** DiSM Size : **Option items : 0GB (Default setting), 1GB, 2GB, 3GB, 4GB, 5GB, 6GB, 7GB** **1.2.14)** Intel Graphics Pei Display Peim : **Enabled / Disabled (Default setting)** **1.2.15)** VDD Enable : **Disabled / Enabled (Default setting)** **1.2.16)** PM Support : **Enabled (Default setting) / Disabled** **1.2.17)** RC1p Support : **Enabled / Disabled (Default setting)** **1.2.18)** PAVP Enable : **Enabled (Default setting) / Disabled** **1.2.19)** Cdynmax Clamping Enable : **Enabled / Disabled (Default setting)** **1.2.20)** Cd Clock Frequency : **Option items : 192Mhz, 307.2 Mhz, 326.4 Mhz, 556.8 Mhz, 652.8 Mhz, Max CdClock freq based on Reference Clk (Default setting)** **1.2.21)** Skip Full CD Clock Init : **Enabled / Disabled (Default setting)** **1.2.22)** VBT Select : **eDP (Default setting) / MIPI** **1.2.23)** IUER Button Enable : **Disabled (Default setting) / Enabled**

1.2 **Graphics Configuration**

1.2.24) LCD Control :



```
                          Aptio Setup - AMI
      Chipset

 LCD Control                                     Select the Video Device which
                                                 will be activated during POST.
 Primary IGFX Boot Display      [VBIOS Default]  This has no effect if external
 LCD Panel Type                 [VBIOS Default]  graphics present.
 Panel Scaling                  [Auto]           Secondary boot display
 Backlight Control              [PWM Normal]     selection will appear based on
 Active LFP                     [eDP Port-A]     your selection.
 Panel Color Depth              [18 Bit]         VGA modes will be supported
 Backlight Brightness           255              only on primary display
```

1.2.24.1) Primary IGFX Boot Display : Select the Video Device which will be activated during POST. This has no effect if external graphics present.
Option items : VBIOS Default (Default setting), EFP, LFP, EFP3, EFP2, EFP4

1.2.24.2) LCD Panel Type : Select LCD panel used by Internal Graphics Device by selecting the appropriate setup item.
Option items : VBIOS Default (Default setting), 640x480 LVDS, 800x600 LVDS, 1024x768 LVDS, 1280x1024 LVDS, 1400x1050 LVDS1, 1400x1050 LVDS2, 1600x1200 LVDS, 1280x768 LVDS, 1680x1050 LVDS, 1920x1200 LVDS, 1600x900 LVDS, 1280x800 LVDS, 1280x600 LVDS, 2048x1536 LVDS, 1366x768 LVDS

1.2.24.3) Panel Scaling : Select the LCD panel scaling option used by the Internal Graphics Device.
Option items : Auto (Default setting), Off, Force scaling

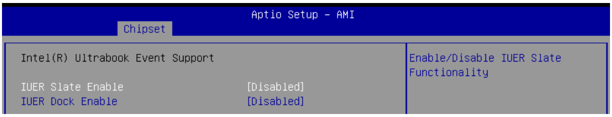
1.2.24.4) Backlight Control :
Option items : PWM Inverted / PWM Normal (Default setting)

1.2.24.5) Active LFP :
Option items : No eDP / eDP Port-A (Default setting)

1.2.24.6) Panel Color Depth : Select the LFP Panel Color Depth
Option items : 18 Bit (Default setting), 24 Bit

1.2.24.7) Backlight Brightness : Set VBIOS Brightness.
Range is 0 - 255.

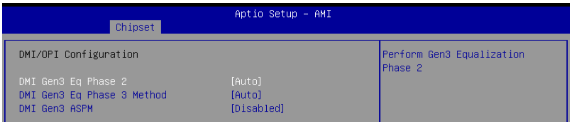
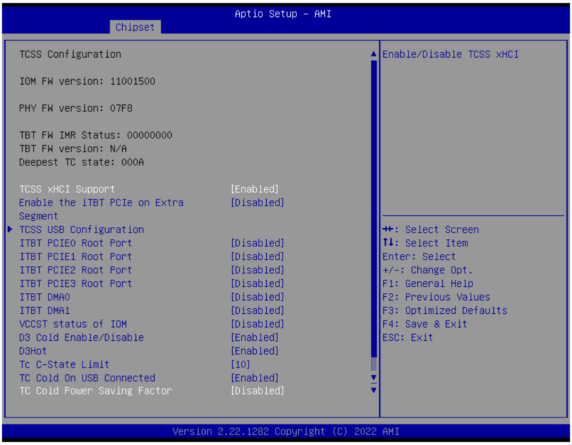
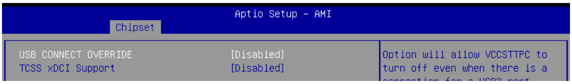
1.2.25) Intel(R) Ultrabook Event Support :

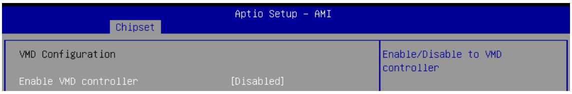
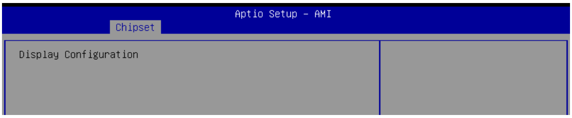


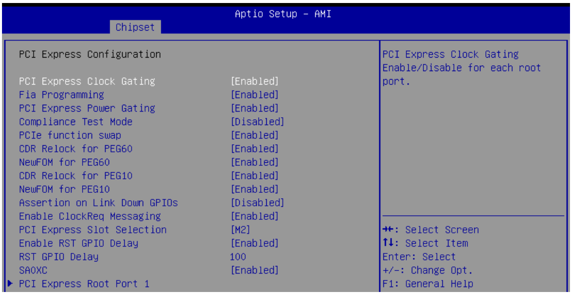
```
                          Aptio Setup - AMI
      Chipset

 Intel(R) Ultrabook Event Support                Enable/Disable IUER Slate
                                                 Functionality
 IUER Slate Enable              [Disabled]
 IUER Dock Enable               [Disabled]
```

1.2.25.1) IUER Slate Enable :
Disabled (Default setting) / Enabled

1.2.25.2) IUER Dock Enable :
Disabled (Default setting) / Enabled

1.3	**DMI/OPI Configuration**	 Aptio Setup – AMI Chipset DMI/OPI Configuration DMI Gen3 Eq Phase 2 [Auto] DMI Gen3 Eq Phase 3 Method [Auto] DMI Gen3 ASPM [Disabled] Perform Gen3 Equalization Phase 2 **1.3.1)** DMI Gen3 Eq Phase 2 : **Option items : Disabled, Enabled, Auto (Default setting)** **1.3.2)** DMI Gen3 Eq Phase 3 Method : **Option items : Auto (Default setting), Adaptive Hardware Equalization, Adaptive Software Equalization, Static Equalization, Disabled.** **1.3.3)** DMI Gen3 ASPM : **Option items : Disabled (Default setting), Auto, ASPM L0s, ASPM L1, ASPM L0sL1**
1.4	**TCSS setup menu**	 Aptio Setup – AMI Chipset TCSS Configuration IOM FW version: 11001500 PHY FW version: 07F8 TBT FW IMR Status: 00000000 TBT FW version: N/A Deepest TC state: 000A TCSS xHCI Support [Enabled] Enable the iTBT PCIe on Extra Segment [Disabled] ► TCSS USB Configuration ITBT PCIE0 Root Port [Disabled] ITBT PCIE1 Root Port [Disabled] ITBT PCIE2 Root Port [Disabled] ITBT PCIE3 Root Port [Disabled] ITBT DMA0 [Disabled] ITBT DMA1 [Disabled] VCCST status of IOM [Disabled] D3 Cold Enable/Disable [Enabled] D3Hot [Enabled] Tc C-State Limit [10] TC Cold On USB Connected [Enabled] TC Cold Power Saving Factor [Disabled] Enable/Disable TCSS xHCI →←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit Version 2.22.1282 Copyright (C) 2022 AMI **1.4.1)** TCSS xHCI Support : **Disabled / Enabled (Default setting)** **1.4.2.)** Enable the iTBT PCIe on Extra Segment : **Disabled (Default setting) / Enabled** **1.4.3)** TCSS USB Configuration :  Aptio Setup – AMI Chipset USB CONNECT OVERRIDE [Disabled] TCSS xDCI Support [Disabled] Option will allow VCCSTTPC to turn off even when there is a connection for a USB2 port **1.4.3.1)** USB CONNECT OVERRIDE : **Disabled (Default setting) / Enabled** **1.4.3.2)** TCSS xDCI Support : **Disabled (Default setting) / Enabled**

1.4	**TCSS setup menu**	**1.4.4~7)** ITBT PCIE0 Root Port / ITBT PCIE1 Root Port / ITBT PCIE2 Root Port / ITBT PCIE3 Root Port : **Disabled (Default setting) / Enabled** **1.4.8)** ITBT DMA0 : **Disabled (Default setting) / Enabled** **1.4.9)** ITBT DMA1 : **Disabled (Default setting) / Enabled** **1.4.10)** VCCST status of IOM : **Disabled (Default setting) / Enabled** **1.4.11)** D3 Cold Enable/Disable : **Disabled / Enabled (Default setting)** **1.4.12)** D3Hot : **Disabled / Enabled (Default setting)** **1.4.13)** Tc C-State Limit : **Option items : Disable, 1, 2, 4, 5, 6, 7, 10(Default setting)** **1.4.14)** TC Cold on USB Connected : **Disabled / Enabled (Default setting)** **1.4.15)** TC Cold Power Saving Factor : **Disabled (Default setting) / Enabled**
1.5	**VMD setup menu**	 VMD Configuration Enable VMD controller [Disabled] Enable/Disable to VMD controller Enable VMD controller : Intel VMD feature helps you to control and manage NVMe PCIe SSD. **Enabled / Disabled (Default setting)**
1.6	**Display setup menu**	 Display Configuration

1.7	**PCI Express Configuration**	 Aptio Setup – AMI Chipset PCI Express Configuration PCI Express Clock Gating [Enabled] Fia Programming [Enabled] PCI Express Power Gating [Enabled] Compliance Test Mode [Disabled] PCIe function swap [Enabled] CDR Relock for PEG60 [Enabled] NewFOM for PEG60 [Enabled] CDR Relock for PEG10 [Enabled] NewFOM for PEG10 [Enabled] Assertion on Link Down GPIOs [Disabled] Enable ClockReq Messaging [Enabled] PCI Express Slot Selection [M2] Enable RST GPIO Delay [Enabled] RST GPIO Delay 100 SAOXC [Enabled] ▸ PCI Express Root Port 1 PCI Express Clock Gating Enable/Disable for each root port. →←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help **1.7.1)** PCI Express Clock Gating : **Disabled / Enabled (Default setting)** **1.7.2)** Fia Programming : **Disabled / Enabled (Default setting)** **1.7.3)** PCI Express Power Gating : **Disabed / Enabled (Default setting)** **1.7.4)** Compliance Test Mode : **Disabled (Default setting) / Enabled** **1.7.5)** PCIe function swap : **Disabed / Enabled (Default setting)** **1.7.6)** CDR Relock for PEG60 : **Disabed / Enabled (Default setting)** **1.7.7)** NewFOM for PEG60 : **Disabed / Enabled (Default setting)** **1.7.8)** CDR Relock for PEG10 : **Disabed / Enabled (Default setting)** **1.7.9)** NewFOM for PEG10 : **Disabed / Enabled (Default setting)** **1.7.10)** Assertion on Link Down GPIOs : **Disabled (Default setting) / Enabled** **1.7.11)** Enable ClockReq Messaging : **Disabed / Enabled (Default setting)** **1.7.12)** PCI Express Slot Selection : **Option items : M2 (Default setting), CEMx4 slot** **1.7.13)** Enable RST GPIO Delay : **Enabled (Default setting) / Disabled**

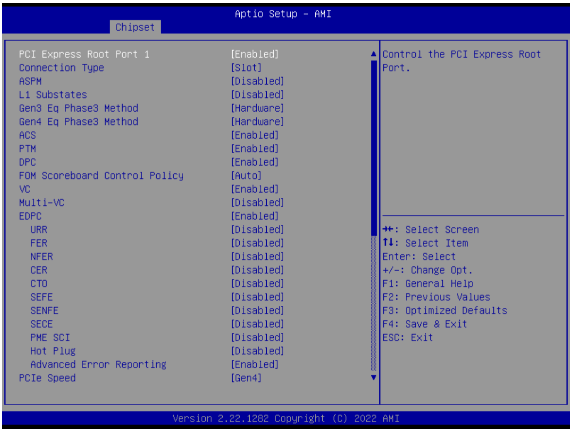
1.7

PCI Express Configuration

1.7.14) RST GPIO Delay : in milli senconds

1.7.15) SA0XC :
Disabled / Enabled (Default setting)

1.7.16) PCI Express Root Port 1 :



```
                         Aptio Setup - AMI
          Chipset

 PCI Express Root Port 1             [Enabled]        Control the PCI Express Root
 Connection Type                     [Slot]           Port.
 ASPM                                [Disabled]
 L1 Substates                        [Disabled]
 Gen3 Eq Phase3 Method               [Hardware]
 Gen4 Eq Phase3 Method               [Hardware]
 ACS                                 [Enabled]
 PTM                                 [Enabled]
 DPC                                 [Enabled]
 FOM Scoreboard Control Policy       [Auto]
 VC                                  [Enabled]
 Multi-VC                            [Disabled]
 EDPC                                [Enabled]
   URR                               [Disabled]       ⇆: Select Screen
   FER                               [Disabled]       ↑↓: Select Item
   NFER                              [Disabled]       Enter: Select
   CER                               [Disabled]       +/-: Change Opt.
   CTO                               [Disabled]       F1: General Help
   SEFE                              [Disabled]       F2: Previous Values
   SENFE                             [Disabled]       F3: Optimized Defaults
   SECE                              [Disabled]       F4: Save & Exit
   PME SCI                           [Disabled]       ESC: Exit
   Hot Plug                          [Disabled]
   Advanced Error Reporting          [Enabled]
 PCIe Speed                          [Gen4]

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```

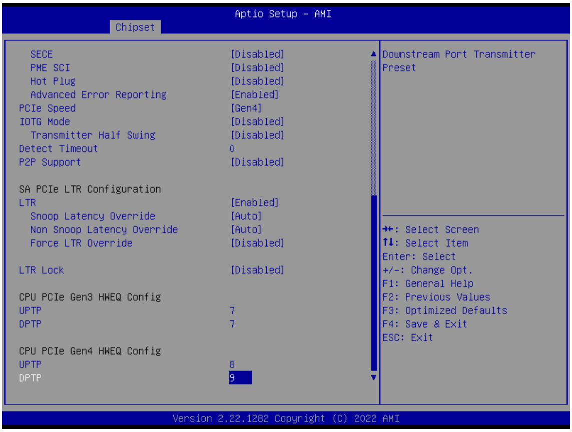

```
                         Aptio Setup - AMI
          Chipset

   SECE                              [Disabled]       Downstream Port Transmitter
   PME SCI                           [Disabled]       Preset
   Hot Plug                          [Disabled]
   Advanced Error Reporting          [Enabled]
 PCIe Speed                          [Gen4]
 IOTG Mode                           [Disabled]
   Transmitter Half Swing            [Disabled]
 Detect Timeout                      0
 P2P Support                         [Disabled]

 SA PCIe LTR Configuration
 LTR                                 [Enabled]
   Snoop Latency Override            [Auto]
   Non Snoop Latency Override        [Auto]           ⇆: Select Screen
   Force LTR Override                [Disabled]       ↑↓: Select Item
                                                      Enter: Select
 LTR Lock                            [Disabled]       +/-: Change Opt.
                                                      F1: General Help
 CPU PCIe Gen3 HWEQ Config                            F2: Previous Values
 UPTP                                7                F3: Optimized Defaults
 DPTP                                7                F4: Save & Exit
                                                      ESC: Exit
 CPU PCIe Gen4 HWEQ Config
 UPTP                                8
 DPTP                                9

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```

1.7.16.1) PCI Express Root Port 1 : Control the PCI Express Root Port.
Disabled / Enabled (Default setting)

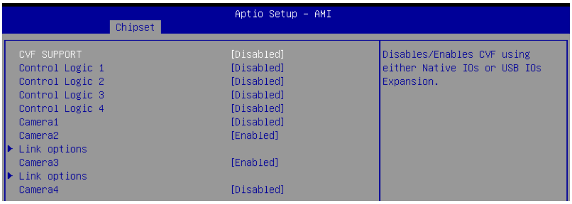
1.7.16.2) Connection Type :
Option items : Built-in, Slot (Default setting)

1.7.16.3) ASPM : Set ASPM Level :
Option items : Disabled (Default setting) , L1

1.7.16.4) L1 Substates :
Option items : Disabled (Default seting), L1.1 , L1.1 & L1.2

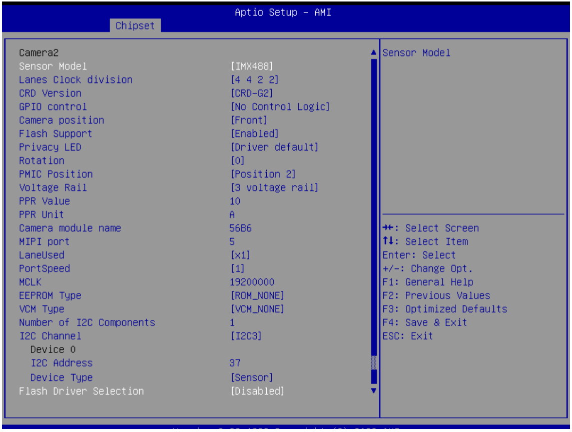
1.7	**PCI Express Configuration**	**1.7.16.5)** Gen3 Eq Phase3 Method : **Hardware (Default setting) / Static Coeff** **1.7.16.6)** Gen4 Eq Phase3 Method : **Hardware (Default setting) / Static Coeff** **1.7.16.7)** ACS : Access Control Services Extended Capabiliy **Disabled / Enabled (Default setting)** **1.7.16.8)** PTM : Precision Time Measurement **Disabled / Enabled (Default setting)** **1.7.16.9)** DPC : Downstream Port Containment **Disabled / Enabled (Default setting)** **1.7.16.10)** FOM Scoreboard Control policy : **Option items : Auto (Default setting), Gen3, Gen4, Gen3/Gen4** **1.7.16.11)** VC : Virtual Channel **Disabled / Enabled (Default setting)** **1.7.16.12)** Multi-VC : Multi Virtual Channel **Disabled (Default setting) / Enabled** **1.7.16.13)** EDPC : Rootport extensions for Downstream Port Containment **Disabled / Enabled (Default setting)** **1.7.16.13.1)** URR : PCI Express Unsupported Request Reporting **Disabled (Default setting) / Enabled** **1.7.16.13.2)** FER : PCI Express Device Fatal Error Reporting **Disabled (Default setting) / Enabled** **1.7.16.13.3)** NFER : PCI Express Device Non-Fatal Error Reporting **Disabled (Default setting) / Enabled** **1.7.16.13.4)** CER : PCI Express Device Correctable Error Reporting **Disabled (Default setting) / Enabled** **1.7.16.13.5)** CTO : **Disabled (Default setting) / Enabled** **1.7.16.13.6)** SEFE : Root PCI Express System Error on Fatal Error **Disabled (Default setting) / Enabled** **1.7.16.13.7)** SENFE : Root PCI Express System Error on Non-Fatal Error **Disabled (Default setting) / Enabled** **1.7.16.13.8)** SECE : Root PCI Express **Disabled (Default setting) / Enabled**

1.7	**PCI Express Configuration**	**1.7.16.13.9)** PME SCI : PCI Express PME SCI **Disabled (Default setting) / Enabled** **1.7.16.13.10)** Hot Plug : PCI Express Hot Plug **Disabled (Default setting) / Enabled** **1.7.16.13.11)** Advanced Error Reporting : **Disabled / Enabled (Default setting)** **1.7.16.14)** PCIe Speed : **Option items : Auto, Gen1, Gen2, Gne3, Gen4 (Default setting)** **1.7.16.15)** IOTG Mode : **Disabled (Default setting) / Enabled** **1.7.16.15.1)** Transmitter Half Swing : **Disabled (Default setting) / Enabled** **1.7.16.16)** Detect Timeout : The number of milliseconds reference code will wait for link to exit detect state for enabled ports before assuming ther is no device and potentially disabling the port **1.7.16.17)** P2P Support : **Disabled (Default setting) / Enabled** **1.7.16.18)** SA PCIe LTR Configuration : **1.7.16.18.1)** LTR : **Disabled / Enabled (Default setting)** **1.7.16.18.1.1)** Snoop Latency Override : **Option items : Disabled , Manual , Auto (Default setting)** **1.7.16.18.1.2)** Non Snoop Latency Override : **Option items : Disabled , Manual , Auto (Default setting)** **1.7.16.18.1.3)** Force LTR Override : **Disabled (Default setting) / Enabled** **1.7.16.18.2)** LTR Lock : PCIE LTR Configuration Lock **Disabled (Default setting) / Enabled** **1.7.16.19)** CPU PCIe Gen3 HWEQ Config **1.7.16.19.1)** UPTP : Upstream Port Transmitter preset **1.7.16.19.2)** DPTP : Downstream Port Transmitter preset **1.7.16.20)** CPU PCIe Gen4 HWEQ Config **1.7.16.20.1)** UPTP : Upstream Port Transmitter preset **1.7.16.20.2)** DPTP : Downstream Port Transmitter preset

1.8	Stop Grant Configuration	Automatic/Manual stop grant configuration **Option items : Auto (Default setting) / Manual**
1.9	VT-d	VT-d capability : **Disabled / Enabled (Default setting)**
1.10	X2APIC Opt Out	**Disabled (Default setting) / Enabled**
1.11	DMA Control Guarantee	**Disabled / Enabled (Default setting)**
1.12	Thermal Device (B0:D4:F0)	**Disabled (Default setting) / Enabled**
1.13	Cpu CrashLog (Device 10)	**Disabled / Enabled (Default setting)**
1.14	GNA Device (B0:D8:F0)	**Disabled (Default setting) / Enabled**
1.15	CRID Supportt	**Disabled (Default setting) / Enabled**
1.16	WRC Feature	**Disabled (Default setting) / Enabled**
1.17	Above 4GB MMIO BIOS assignment	**Disabled / Enabled (Default setting)**
1.18	IPU Device (B0:D5:F0)	**Disabled (Default setting) / Enabled**
1.19	MIPI Camera Configuration	 CVF SUPPORT [Disabled] Control Logic 1 [Disabled] Control Logic 2 [Disabled] Control Logic 3 [Disabled] Control Logic 4 [Disabled] Camera1 [Disabled] Camera2 [Enabled] ▶ Link options Camera3 [Enabled] ▶ Link options Camera4 [Disabled] Disables/Enables CVF using either Native IOs or USB IOs Expansion. **1.19.1)** CVF SUPPORT : **Options : Disabled (Default setting), Native IOs, USB Bridge** **1.19.2~5)** Control Logic 1 / Control Logic 2 / Control Logic 3 / Control Logic 4 : **Disabled (Default setting) / Enabled** **1.19.6)** Camera1 : **Disabled (Default setting) / Enabled** **1.19.7)** Camera2 : **Disabled / Enabled (Default setting)**

1.19 **MIPI Camera Configuration**

1.19.8) Link options :



```
                         Aptio Setup - AMI
          Chipset

 Camera2                                        Sensor Model
 Sensor Model              [IMX488]
 Lanes Clock division      [4 4 2 2]
 CRD Version               [CRD-G2]
 GPIO control              [No Control Logic]
 Camera position           [Front]
 Flash Support             [Enabled]
 Privacy LED               [Driver default]
 Rotation                  [0]
 PMIC Position             [Position 2]
 Voltage Rail              [3 voltage rail]
 PPR Value                 10
 PPR Unit                  A
 Camera module name        56B6                 →←: Select Screen
 MIPI port                 5                    ↑↓: Select Item
 LaneUsed                  [x1]                 Enter: Select
 PortSpeed                 [1]                  +/-: Change Opt.
 MCLK                      19200000             F1: General Help
 EEPROM Type               [ROM_NONE]           F2: Previous Values
 VCM Type                  [VCM_NONE]           F3: Optimized Defaults
 Number of I2C Components  1                    F4: Save & Exit
 I2C Channel               [I2C3]               ESC: Exit
   Device 0
   I2C Address             37
   Device Type             [Sensor]
 Flash Driver Selection    [Disabled]
```

1.19.8.1) Sensor Model :

Option items : IMX135, OV5693, IMX179, OV8858, OV2740-IVCAM, OV9728, IMX188, IMX208, OV5670, OV8865, HM2051, OV2742, OV9234, OV8856, OV16860, IMX362, IMX488 (Default setting), OVTI01AS, OV13858, OVTI5678, OVTI9738, HIMAX11B1, User Custom

1.19.8.2) Lanes Clock division :

Option items : 4 4 2 2 (Default setting), 4 4 3 1, 4 4 4 0, 8 0 2 2, 8 0 3 1, 8 0 4 0

1.19.8.3) CRD Version :

Option items : PTC, CRD-D, CRD-G, Kilshon-PPV, CRD-G2 (Default setting)

1.19.8.4) GPIO control : No Control Logic

1.19.8.5) Camera position :

Option items : Front (Default setting), Back

1.19.8.6) Flash Support :

Option items : Driver default, Disabled , Enabled (Default setting)

1.19.8.7) Privacy LED :

Option items: Driver default (Default setting), ILEDA 16mA, ILEDB 2mA, ILEDB 4mA, ILEDB 8mA, ILEDB 16mA

1.19.8.8) Rotation :

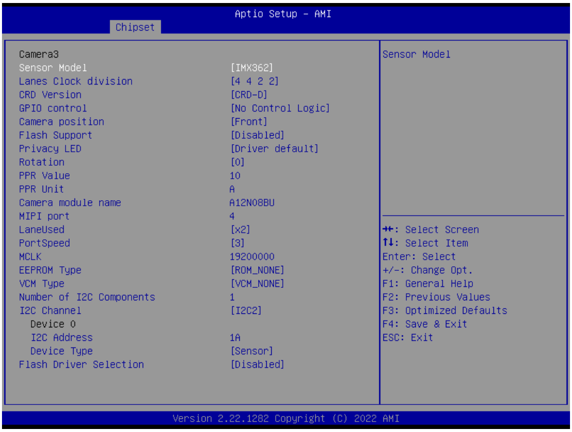
Option items : 0 (Default setting), 90, 180, 270

1.19.8.9) PMIC Position :

Position 1 : this item indicates the current module is placed on the left side of the CRD-G2 card

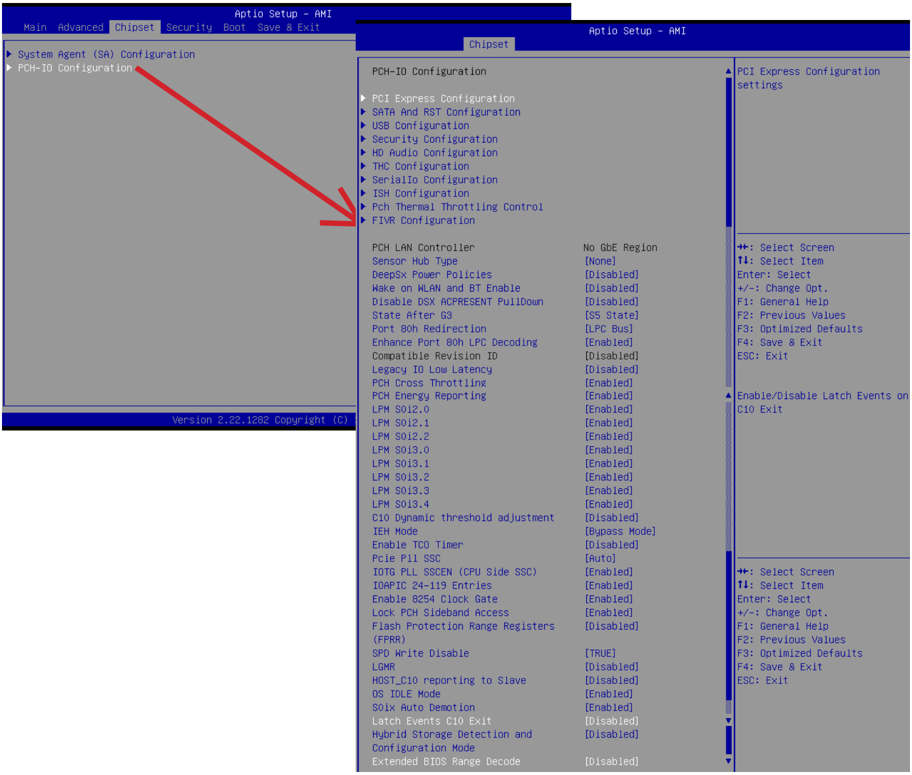
Position 2 : this item indicates the current module is placed on the right side of the CRD-G2 card (Default setting)

1.19	**MIPI Camera Configuration**	**1.19.8.10)** Voltage Rail : **Option items : 3 voltage rail (Default setting) , 2 voltage rail** **1.19.8.11)** PPR Value : PPR value of sensor **1.19.8.12)** PPR Unit : PPR unit of sensor **1.19.8.13)** Camera module name : shows camera module name **1.19.8.14)** MIPI port : Link used **1.19.8.15)** LaneUsed : **option items : x1 (Default setting), x2, x3, x4** **1.19.8.16)** PortSpeed : **Option items : 0 : Sensor Default, 1 : <416Mbps (Default setting), 2 : <1.5Gbps , 3 : <2Gbps , 4 : <2.5Gbps , 5 : <4Gbps , 6 : >4Gbps** **1.19.8.17)** MCLK **1.19.8.18)** EEPROM Type : **Option items : ROM_NONE (Default setting), ROM_OTP, ROM_EEPROM_16K_64, ROM_EEPROM_16K_16, ROM_OTP_ACPI_ACPI, ROM_ACPI, ROM_EEPROM_BRCA016GWZ, ROM_EEPROM_24AA32, ROM_EEPROM_CAT24C08, ROM_EEPROM_M24C64, ROM_EEPROM_DW98068, ROM_EEPROM_CAT24C16, ROM_EEPROM_CAT24C64, ROM_EEPROM_24AA16** **1.19.8.19)** VCM Type : **VCM_NONE (Default setting), VCM_AD5823, VCM_DW9714, VCM_AD5816, VCM_DW9719, VCM_DW9718, VCM_DW98068, VCM_WV517S, VCM_LC898122XA, VCM_LC898212AXB, VCM_RESERVED1, VCM_RESERVED2, VCM_AK7371, VCM_BU64297GWZ** **1.19.8.20)** Number of I2C Components **1.19.8.21)** I2C Channel : **Option items : I2C0, I2C1, I2C2, I2C3 (Default setting) , I2C4, I2C5** **1.19.8.21.1)** I2C Address **1.19.8.21.2)** Device Type : **Option items : Sensor (Default setting), VCM, EEPROM, EEPROM_EXT1, EEPROM_EX2, EEPROM_EXT3, EEPROM_EXT4, EEPROM_EXT5, EEPROM_EXT6, EEPROM_EXT7, IO Expander, Flash** **1.19.8.22)** Flash Driver Selection : **Option items : Disabled (Default setting), External, Internal PMIC** **1.19.9)** Camera3 : **Disabled / Enabled (Default setting)**

1.19	**MIPI Camera Configuration**	**1.19.10)** Link options:  Aptio Setup - AMI Chipset Camera3 Sensor Model [IMX362] Lanes Clock division [4 4 2 2] CRD Version [CRD-D] GPIO control [No Control Logic] Camera position [Front] Flash Support [Disabled] Privacy LED [Driver default] Rotation [0] PPR Value 10 PPR Unit A Camera module name A12N08BU MIPI port 4 LaneUsed [x2] PortSpeed [3] MCLK 19200000 EEPROM Type [ROM_NONE] VCM Type [VCM_NONE] Number of I2C Components 1 I2C Channel [I2C2] Device 0 I2C Address 1A Device Type [Sensor] Flash Driver Selection [Disabled] Sensor Model →←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit Version 2.22.1282 Copyright (C) 2022 AMI **1.19.10.1)** Sensor Model : **Option items : IMX135, OV5693, IMX179, OV8858, OV2740-IVCAM, OV9728, IMX188, IMX208, OV5670, OV8865, HM2051, OV2742, OV9234, OV8856, OV16860, IMX362 (Default setting), IMX488, OVTI01AS, OV13858, OVTI5678, OVTI9738, HIMAX11B1, User Custom** **1.19.10.2)** Lanes Clock division : **Option items : 4 4 2 2 (Default setting), 4 4 3 1, 4 4 4 0, 8 0 2 2, 8 0 3 1, 8 0 4 0** **1.19.10.3)** CRD Version : **Option items : PTC, CRD-D (Default setting), CRD-G, Kilshon-PPV, CRD-G2** **1.19.10.4)** GPIO control : No Control Logic **1.19.10.5)** Camera position : **Option items : Front (Default setting), Back** **1.19.10.6)** Flash Support : **Option items : Driver default, Disabled (Default setting) , Enabled** **1.19.10.7)** Privacy LED : **Option items: Driver default (Default setting), ILEDA 16mA, ILEDB 2mA, ILEDB 4mA, ILEDB 8mA, ILEDB 16mA** **1.19.10.8)** Rotation : **Option items : 0 (Default setting), 90, 180, 270** **1.19.10.9)** PPR Value : PPR value of sensor **1.19.10.10)** PPR Unit : PPR unit of sensor

1.19	**MIPI Camera Configuration**	**1.19.10.11)** Camera module name : shows camera module name **1.19.10.12)** MIPI port : Link used **1.19.10.13)** LaneUsed : **option items : x1 (Default setting), x2, x3, x4** **1.19.10.14)** PortSpeed : **Option items : 0 : Sensor Default, 1 : <416Mbps , 2 : <1.5Gbps , 3 : <2Gbps (Default setting) , 4 : <2.5Gbps , 5 : <4Gbps , 6 : >4Gbps** **1.19.10.15)** MCLK **1.19.10.16)** EEPROM Type : **Option items : ROM_NONE (Default setting), ROM_OTP, ROM_EEPROM_16K_64, ROM_EEPROM_16K_16, ROM_OTP_ACPI_ACPI, ROM_ACPI, ROM_EEPROM_BRCA016GWZ, ROM_EEPROM_24AA32, ROM_EEPROM_CAT24C08, ROM_EEPROM_M24C64, ROM_EEPROM_DW98068, ROM_EEPROM_CAT24C16, ROM_EEPROM_CAT24C64, ROM_EEPROM_24AA16** **1.19.10.17)** VCM Type : **VCM_NONE (Default setting), VCM_AD5823, VCM_DW9714, VCM_AD5816, VCM_DW9719, VCM_DW9718, VCM_DW98068, VCM_WV517S, VCM_LC898122XA, VCM_LC898212AXB, VCM_RESERVED1, VCM_RESERVED2, VCM_AK7371, VCM_BU64297GWZ** **1.19.10.18)** Number of I2C Components **1.19.10.19)** I2C Channel : **Option items : I2C0, I2C1, I2C2 (Default setting) , I2C3, I2C4, I2C5** **1.19.10.19.1)** I2C Address **1.19.10.19.2)** Device Type : **Option items : Sensor (Default setting), VCM, EEPROM, EEPROM_EXT1, EEPROM_EX2, EEPROM_EXT3, EEPROM_EXT4, EEPROM_EXT5, EEPROM_EXT6, EEPROM_EXT7, IO Expander, Flash** **1.19.10.20)** Flash Driver Selection : **Option items : Disabled (Default setting), External, Internal PMIC** **1.19.11)** Camera4 : **Disabled (Default setting) / Enabled**

4.4 Chipset - PCH-IO Configuration



```
                     Aptio Setup – AMI
 Main  Advanced  Chipset  Security  Boot  Save & Exit

▶ System Agent (SA) Configuration
▶ PCH-IO Configuration

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```
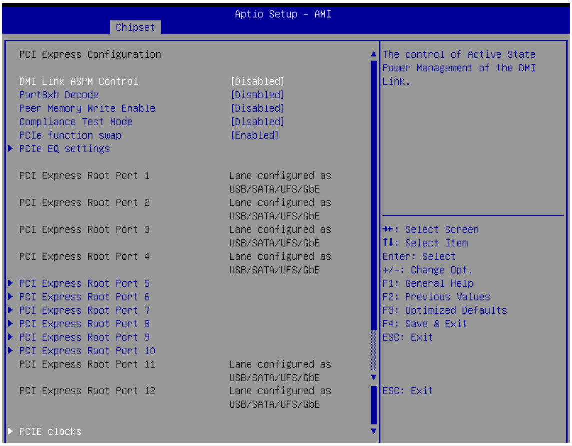
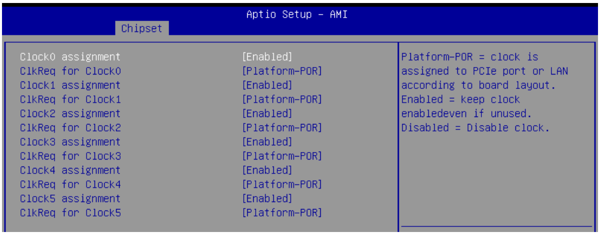
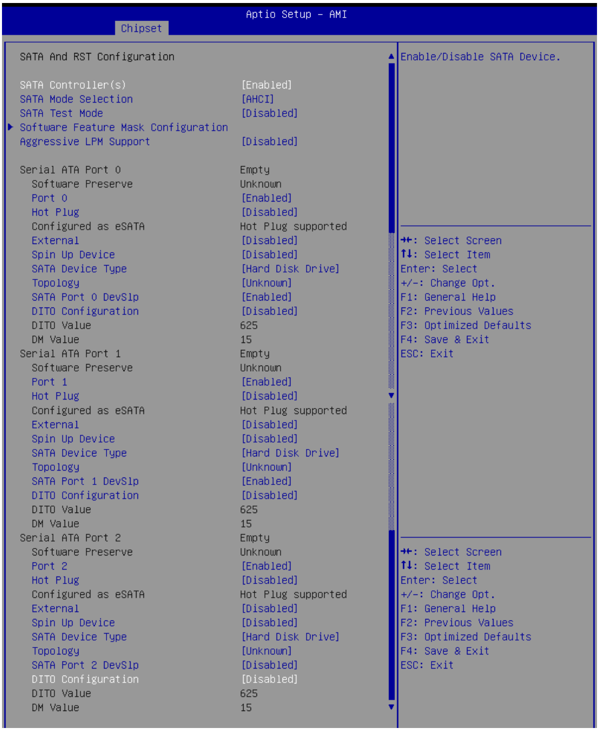

```
                          Aptio Setup – AMI
                Chipset

 PCH-IO Configuration                                      ▲ PCI Express Configuration
                                                             settings
▶ PCI Express Configuration
▶ SATA And RST Configuration
▶ USB Configuration
▶ Security Configuration
▶ HD Audio Configuration
▶ THC Configuration
▶ SerialIo Configuration
▶ ISH Configuration
▶ Pch Thermal Throttling Control
▶ FIVR Configuration

 PCH LAN Controller                     No GbE Region        →←: Select Screen
 Sensor Hub Type                        [None]               ↑↓: Select Item
 DeepSx Power Policies                  [Disabled]           Enter: Select
 Wake on WLAN and BT Enable             [Disabled]           +/-: Change Opt.
 Disable DSX ACPRESENT PullDown         [Disabled]           F1: General Help
 State After G3                         [S5 State]           F2: Previous Values
 Port 80h Redirection                   [LPC Bus]            F3: Optimized Defaults
 Enhance Port 80h LPC Decoding          [Enabled]            F4: Save & Exit
 Compatible Revision ID                 [Disabled]           ESC: Exit
 Legacy IO Low Latency                  [Disabled]
 PCH Cross Throttling                   [Enabled]
 PCH Energy Reporting                   [Enabled]          ▲ Enable/Disable Latch Events on
 LPM S0i2.0                             [Enabled]            C10 Exit
 LPM S0i2.1                             [Enabled]
 LPM S0i2.2                             [Enabled]
 LPM S0i3.0                             [Enabled]
 LPM S0i3.1                             [Enabled]
 LPM S0i3.2                             [Enabled]
 LPM S0i3.3                             [Enabled]
 LPM S0i3.4                             [Enabled]
 C10 Dynamic threshold adjustment       [Disabled]
 IEH Mode                               [Bypass Mode]
 Enable TCO Timer                       [Disabled]
 Pcie Pll SSC                           [Auto]
 IOTG PLL SSCEN (CPU Side SSC)          [Enabled]            →←: Select Screen
 IOAPIC 24-119 Entries                  [Enabled]            ↑↓: Select Item
 Enable 8254 Clock Gate                 [Enabled]            Enter: Select
 Lock PCH Sideband Access               [Enabled]            +/-: Change Opt.
 Flash Protection Range Registers       [Disabled]           F1: General Help
 (FPRR)                                                      F2: Previous Values
 SPD Write Disable                      [TRUE]               F3: Optimized Defaults
 LGMR                                   [Disabled]           F4: Save & Exit
 HOST_C10 reporting to Slave            [Disabled]           ESC: Exit
 OS IDLE Mode                           [Enabled]
 S0ix Auto Demotion                     [Enabled]
 Latch Events C10 Exit                  [Disabled]         ▼
 Hybrid Storage Detection and           [Disabled]
 Configuration Mode
 Extended BIOS Range Decode             [Disabled]         ▼
```

No.	Item	Description
2.1	PCI Express Configuration	

```
                       Aptio Setup – AMI
             Chipset

 PCI Express Configuration                           ▲ The control of Active State
                                                       Power Management of the DMI
 DMI Link ASPM Control              [Disabled]         Link.
 Port8xh Decode                     [Disabled]
 Peer Memory Write Enable           [Disabled]
 Compliance Test Mode               [Disabled]
 PCIe function swap                 [Enabled]
▶ PCIe EQ settings

 PCI Express Root Port 1            Lane configured as
                                    USB/SATA/UFS/GbE
 PCI Express Root Port 2            Lane configured as
                                    USB/SATA/UFS/GbE
 PCI Express Root Port 3            Lane configured as     →←: Select Screen
                                    USB/SATA/UFS/GbE       ↑↓: Select Item
 PCI Express Root Port 4            Lane configured as     Enter: Select
                                    USB/SATA/UFS/GbE       +/-: Change Opt.
▶ PCI Express Root Port 5                                  F1: General Help
▶ PCI Express Root Port 6                                  F2: Previous Values
▶ PCI Express Root Port 7                                  F3: Optimized Defaults
▶ PCI Express Root Port 8                                  F4: Save & Exit
▶ PCI Express Root Port 9                                  ESC: Exit
▶ PCI Express Root Port 10
 PCI Express Root Port 11           Lane configured as
                                    USB/SATA/UFS/GbE     ▼
 PCI Express Root Port 12           Lane configured as     ESC: Exit
                                    USB/SATA/UFS/GbE

▶ PCIE clocks                                            ▼
```

2.1	**PCI Express Configuration**	**2.1.1)** DMI Link ASPM Control : The control of Active State Power Management of the DMI Link. **Option items : Disabled (Default setting), L0s, L1, L0sL1, Auto** **2.1.2)** Port8xh Decode : PCI Express Port8xh Decode **Disabled (Default setting) / Enabled** **2.1.3)** Peer Memory Write Enable : **Disabled (Default setting) / Enabled** **2.1.4)** Compliance Test Mode : **Disabled (Default setting) / Enabled** **2.1.5)** PCIe function swap : **Disabled / Enabled (Default setting)** **2.1.6)** PCIe EQ settings : This form contains options for controlling PCIe EQ process PCIe EQ override : Choose your own PCIe EQ settings, only for users who have a thorough understanding of equalization process **Disabled (Default setting) / Enabled** **2.1.7~12)** PCI Express Root Port 5 / PCI Express Root Port 6 / PCI Express Root Port 7 / PCI Express Root Port 8 / PCI Express Root Port 9 / PCI Express Root Port 10 : PCI Express Root Port setting **2.1.13) PCIE clocks :**  Clock0 assignment [Enabled] ClkReq for Clock0 [Platform-POR] Clock1 assignment [Enabled] ClkReq for Clock1 [Platform-POR] Clock2 assignment [Enabled] ClkReq for Clock2 [Platform-POR] Clock3 assignment [Enabled] ClkReq for Clock3 [Platform-POR] Clock4 assignment [Enabled] ClkReq for Clock4 [Platform-POR] Clock5 assignment [Enabled] ClkReq for Clock5 [Platform-POR] Platform-POR = clock is assigned to PCIe port or LAN according to board layout. Enabled = keep clock enabledeven if unused. Disabled = Disable clock. 2.1.13.1、3、5、7、9、11) Clock0 assignment / Clock1 assignment / Clock2 assignment / Clock3 assignment / Clock4 assignment / Clock5 assignment : **Option items : Platform-POR, Enabled (Default setting), Disabled** 2.1.13.2、4、6、8、10、12) ClkReq for Clock0 / ClkReq for Clock1 / ClkReq for Clock2 / ClkReq for Clock3 /ClkReq for Clock4 / ClkReq for Clock5 : **Option items : Platform-POR (Default setting), Disabled**

2.2 **SATA And RST Configuration**



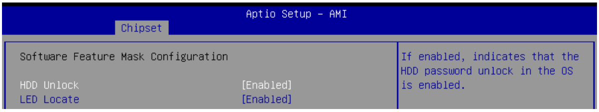
```
                              Aptio Setup - AMI
              Chipset

 SATA And RST Configuration                               Enable/Disable SATA Device.

 SATA Controller(s)                    [Enabled]
 SATA Mode Selection                   [AHCI]
 SATA Test Mode                        [Disabled]
▶Software Feature Mask Configuration
 Aggressive LPM Support                [Disabled]

 Serial ATA Port 0                     Empty
   Software Preserve                   Unknown
   Port 0                              [Enabled]
   Hot Plug                            [Disabled]
   Configured as eSATA                 Hot Plug supported
   External                            [Disabled]         →←: Select Screen
   Spin Up Device                      [Disabled]         ↑↓: Select Item
   SATA Device Type                    [Hard Disk Drive]  Enter: Select
   Topology                            [Unknown]          +/-: Change Opt.
   SATA Port 0 DevSlp                  [Enabled]          F1: General Help
   DITO Configuration                  [Disabled]         F2: Previous Values
   DITO Value                          625                F3: Optimized Defaults
   DM Value                            15                 F4: Save & Exit
 Serial ATA Port 1                     Empty              ESC: Exit
   Software Preserve                   Unknown
   Port 1                              [Enabled]
   Hot Plug                            [Disabled]
   Configured as eSATA                 Hot Plug supported
   External                            [Disabled]
   Spin Up Device                      [Disabled]
   SATA Device Type                    [Hard Disk Drive]
   Topology                            [Unknown]
   SATA Port 1 DevSlp                  [Enabled]
   DITO Configuration                  [Disabled]
   DITO Value                          625
   DM Value                            15
 Serial ATA Port 2                     Empty
   Software Preserve                   Unknown            →←: Select Screen
   Port 2                              [Enabled]          ↑↓: Select Item
   Hot Plug                            [Disabled]         Enter: Select
   Configured as eSATA                 Hot Plug supported +/-: Change Opt.
   External                            [Disabled]         F1: General Help
   Spin Up Device                      [Disabled]         F2: Previous Values
   SATA Device Type                    [Hard Disk Drive]  F3: Optimized Defaults
   Topology                            [Unknown]          F4: Save & Exit
   SATA Port 2 DevSlp                  [Disabled]         ESC: Exit
   DITO Configuration                  [Disabled]
   DITO Value                          625
   DM Value                            15
```

2.2.1) SATA Controller(s) : Enable / Disable SATA Device
Enabled (Default setting) / Disabled

2.2.2) SATA Mode Selection : Determines how SATA controller(s) operate
AHCI (Default setting)

2.2.3) SATA Test Mode :
Enabled / Disabled (Default setting)

2.2.4) Software Feature Mask Configuration :



```
                              Aptio Setup - AMI
              Chipset

 Software Feature Mask Configuration                      If enabled, indicates that the
                                                          HDD password unlock in the OS
 HDD Unlock                            [Enabled]          is enabled.
 LED Locate                            [Enabled]
```

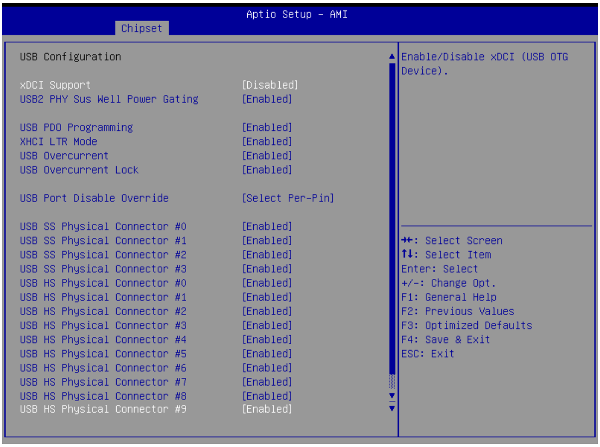
2.2.4.1) HDD Unlock :
Disabled / Enabled (Default setting)

2.2.4.2) LED Locate :
Disabled / Enabled (Default setting)

2.2	**SATA And RST Configuration**	**2.2.5)** Aggressive LPM Support : Enable PCH to aggressively enter link power state. **Disabled (Default setting) / Enabled** **2.2.6)** Serial ATA Port 0 : **2.2.6.1)** Port 0 : **Disabled / Enabled (Default setting)** **2.2.6.2)** Hot Plug : Designates this port as Hot Pluggable **Disabled (Default setting) / Enabled** **2.2.6.3)** External : Mark this port as external **Disabled (Default setting) / Enabled** **2.2.6.4)** Spin Up Device : **Disabled (Default setting) / Enabled** **2.2.6.5)** SATA Device Type : Identify the SATA port is connected to Solid State Drive or Hard Disk Drive **Option items : Hard Disk Drive (Default setting) , Solid State Drive** **2.2.6.6)** Topology : Identify the SATA Topology if it is Default or ISATA or Flex or Direct Connect or M2 : **Option items : Unknown (Default setting), ISATA, Direct Connect, Flex, M2** **2.2.6.7)** SATA Port 0 DevSlp : **Disabled / Enabled (Default setting)** **2.2.6.8)** DITO Configuration : **Disabled (Default setting) / Enabled** **2.2.7)** Serial ATA Port 1 : **2.2.7.1)** Port 1 : **Disabled / Enabled (Default setting)** **2.2.7.2)** Hot Plug : Designates this port as Hot Pluggable **Disabled (Default setting) / Enabled** **2.2.7.3)** External : Mark this port as external **Disabled (Default setting) / Enabled** **2.2.7.4)** Spin Up Device : **Disabled (Default setting) / Enabled** **2.2.7.5)** SATA Device Type : Identify the SATA port is connected to Solid State Drive or Hard Disk Drive **Option items : Hard Disk Drive (Default setting) , Solid State Drive**

2.2	**SATA And RST Configuration**	**2.2.7.6)** Topology : Identify the SATA Topology if it is Default or ISATA or Flex or Direct Connect or M2 : **Option items : Unknown (Default setting), ISATA, Direct Connect, Flex, M2** **2.2.7.7)** SATA Port 1 DevSlp : **Disabled / Enabled (Default setting)** **2.2.7.8)** DITO Configuration : **Disabled (Default setting) / Enabled** **2.2.8)** Serial ATA Port 2 : **2.2.8.1)** Port 2 : **Disabled / Enabled (Default setting)** **2.2.8.2)** Hot Plug : Designates this port as Hot Pluggable **Disabled (Default setting) / Enabled** **2.2.8.3)** External : Mark this port as external **Disabled (Default setting) / Enabled** **2.2.8.4)** Spin Up Device : **Disabled (Default setting) / Enabled** **2.2.8.5)** SATA Device Type : Identify the SATA port is connected to Solid State Drive or Hard Disk Drive **Option items : Hard Disk Drive (Default setting) , Solid State Drive** **2.2.8.6)** Topology : Identify the SATA Topology if it is Default or ISATA or Flex or Direct Connect or M2 : **Option items : Unknown (Default setting), ISATA, Direct Connect, Flex, M2** **2.2.8.7)** SATA Port 2 DevSlp : **Disabled / Enabled (Default setting)** **2.2.8.8)** DITO Configuration : **Disabled (Default setting) / Enabled**

2.3 **USB Configuration**



```
                                  Aptio Setup - AMI
                    Chipset
  USB Configuration                                         Enable/Disable xDCI (USB OTG
                                                            Device).
  xDCI Support                        [Disabled]
  USB2 PHY Sus Well Power Gating      [Enabled]

  USB PDO Programming                 [Enabled]
  XHCI LTR Mode                       [Enabled]
  USB Overcurrent                     [Enabled]
  USB Overcurrent Lock                [Enabled]

  USB Port Disable Override           [Select Per-Pin]

  USB SS Physical Connector #0        [Enabled]
  USB SS Physical Connector #1        [Enabled]             →←: Select Screen
  USB SS Physical Connector #2        [Enabled]             ↑↓: Select Item
  USB SS Physical Connector #3        [Enabled]             Enter: Select
  USB HS Physical Connector #0        [Enabled]             +/-: Change Opt.
  USB HS Physical Connector #1        [Enabled]             F1: General Help
  USB HS Physical Connector #2        [Enabled]             F2: Previous Values
  USB HS Physical Connector #3        [Enabled]             F3: Optimized Defaults
  USB HS Physical Connector #4        [Enabled]             F4: Save & Exit
  USB HS Physical Connector #5        [Enabled]             ESC: Exit
  USB HS Physical Connector #6        [Enabled]
  USB HS Physical Connector #7        [Enabled]
  USB HS Physical Connector #8        [Enabled]
  USB HS Physical Connector #9        [Enabled]
```

2.3.1) xDCI Support :
Disabled (Default setting) / Enabled

2.3.2) USB2 PHY Sus Well Power Gating :
Disabled / Enabled (Default setting)

2.3.3) USB PD0 Programming :
Disabled / Enabled (Default setting)

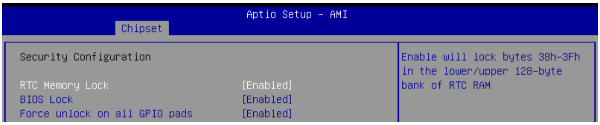
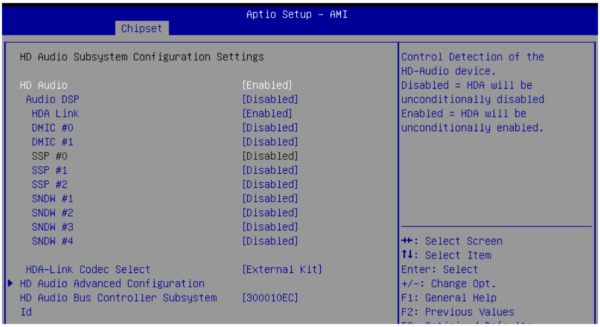
2.3.4) XHCI LTR Mode :
Disabled / Enabled (Default setting)

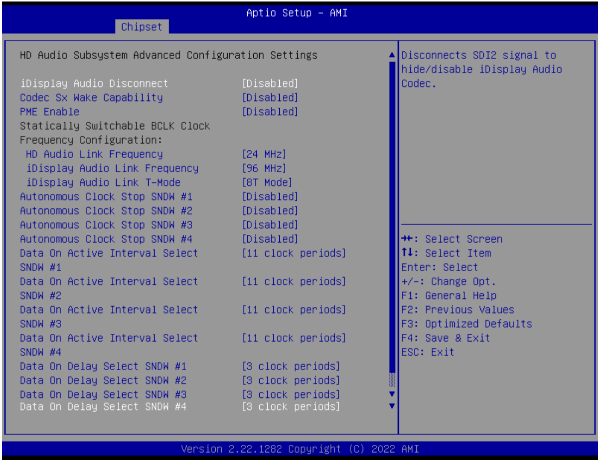
2.3.5) USB Overcureent :
Disabled / Enabled (Default setting)

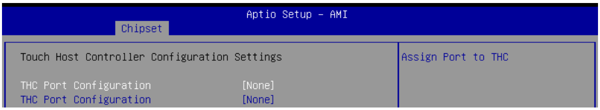
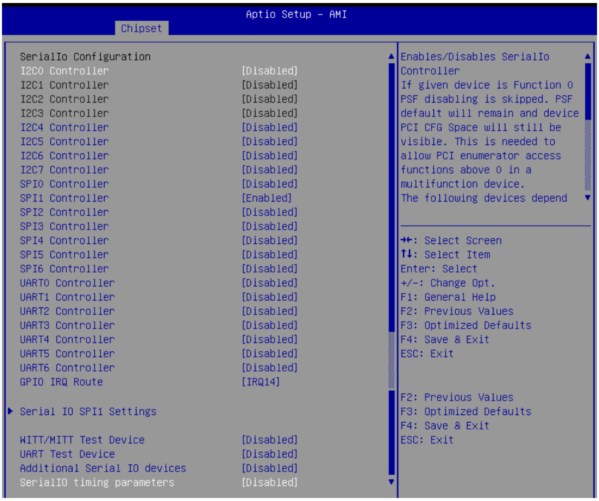
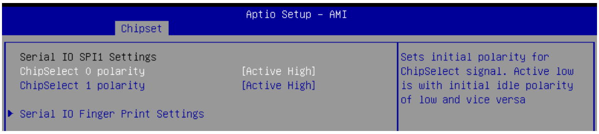
2.3.6) USB Overcurrent Lock :
Disabled / Enabled (Default setting)

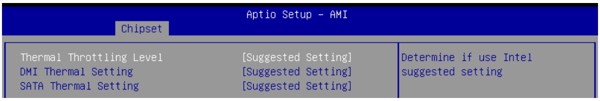
2.3.7) USB Port Disable Override :
Disabled / Select Per-pin (Default setting)

2.3.8~21) USB SS Physical Connector #0 / USB SS Physical Connector #1 / USB SS Physical Connector #2 / USB SS Physical Connector #3 / USB HS Physical Connector #0 / USB HS Physical Connector #1 / USB HS Physical Connector #2 / USB HS Physical Connector #3 / USB HS Physical Connector #4 / USB HS Physical Connector #5 / USB HS Physical Connector #6 / USB HS Physical Connector #7 / USB HS Physical Connector #8 /USB HS Physical Connector #9 :
Disabled / Enabled (Default setting)

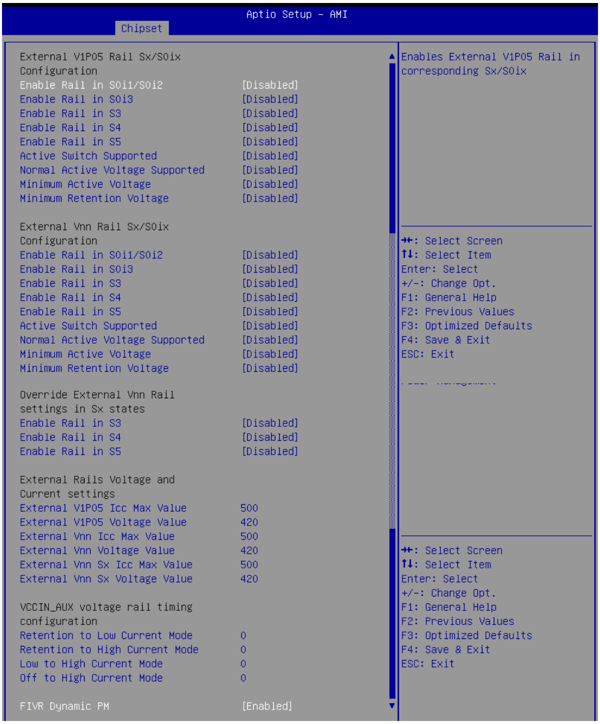
2.4	**Security Configuration**	 Aptio Setup – AMI Chipset Security Configuration RTC Memory Lock [Enabled] BIOS Lock [Enabled] Force unlock on all GPIO pads [Enabled] Enable will lock bytes 38h-3Fh in the lower/upper 128-byte bank of RTC RAM **2.4.1)** RTC Memory Lock : **Disabled / Enabled (Default setting)** **2.4.2)** BIOS Lock : **Disabled / Enabled (Default setting)** **2.4.3)** Force unlock on all GPIO pads : **Disabled / Enabled (Default setting)**
2.5	**HD Audio Configuration**	 Aptio Setup – AMI Chipset HD Audio Subsystem Configuration Settings HD Audio [Enabled] Audio DSP [Disabled] HDA Link [Enabled] DMIC #0 [Disabled] DMIC #1 [Disabled] SSP #0 [Disabled] SSP #1 [Disabled] SSP #2 [Disabled] SNDW #1 [Disabled] SNDW #2 [Disabled] SNDW #3 [Disabled] SNDW #4 [Disabled] HDA-Link Codec Select [External Kit] ▶ HD Audio Advanced Configuration HD Audio Bus Controller Subsystem Id [300010EC] Control Detection of the HD-Audio device. Disabled = HDA will be unconditionally disabled Enabled = HDA will be unconditionally enabled. →←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values **2.5.1)** HD Audio : Control Detection of the HD-Audio device **Disabled / Enabled (Default setting)** **2.5.1.1)** Audio DSP : **Disabled (Default setting) / Enabled** **2.5.1.1.1)** HDA Link : **Disabled / Enabled (Default setting)** **2.5.1.1.2~3)** DMIC #0 / DMIC #1 : **Disabled (Default setting) / Enabled** **2.5.1.1.4~6)** SSP #0 / SSP #1 / SSP #2 : **Disabled (Default setting)** **2.5.1.1.7~10)** SNDW #1 / SNDW #2 / SNDW #3 / SNDW #4 : **Disabled (Default setting) / Enabled** **2.5.1.2)** HDA-Link Codec Select : Selects whether platform onboard codec (single verb table installed) or External codec Kit (multple verb tables installed) will be used : **Option items : Platform Onboard , External Kit (Default setting)**

2.5	**HD Audio Configuration**	**2.5.2)** HD Audio Advanced Configuration :  Aptio Setup - AMI Chipset HD Audio Subsystem Advanced Configuration Settings iDisplay Audio Disconnect [Disabled] Codec Sx Wake Capability [Disabled] PME Enable [Disabled] Statically Switchable BCLK Clock Frequency Configuration: HD Audio Link Frequency [24 MHz] iDisplay Audio Link Frequency [96 MHz] iDisplay Audio Link T-Mode [8T Mode] Autonomous Clock Stop SNDW #1 [Disabled] Autonomous Clock Stop SNDW #2 [Disabled] Autonomous Clock Stop SNDW #3 [Disabled] Autonomous Clock Stop SNDW #4 [Disabled] Data On Active Interval Select SNDW #1 [11 clock periods] Data On Active Interval Select SNDW #2 [11 clock periods] Data On Active Interval Select SNDW #3 [11 clock periods] Data On Active Interval Select SNDW #4 [11 clock periods] Data On Delay Select SNDW #1 [3 clock periods] Data On Delay Select SNDW #2 [3 clock periods] Data On Delay Select SNDW #3 [3 clock periods] Data On Delay Select SNDW #4 [3 clock periods] Disconnects SDI2 signal to hide/disable iDisplay Audio Codec. →←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit Version 2.22.1282 Copyright (C) 2022 AMI **2.5.2.1)** iDisplay Audio Disconnect : **Disabled (Default setting) / Enabled** **2.5.2.2)** Codec Sx Wake Capability : **Disabled (Default setting) / Enabled** **2.5.2.3)** PME Enable : **Disabled (Default setting) / Enabled** **2.5.2.4)** Statically Switchable BCLK Clock Frequency Configuration : **2.5.2.4.1)** HD Audio Link Frequency : Selects HD Audio Link frequency **Option items : 6 MHz, 12MHz, 24MHz (Default setting)** **2.5.2.4.2)** iDisplay Audio Link Frequency : Selects iDisplay Link frequency **Option items : 48 MHz , 96 MHz (Default setting)** **2.5.2.4.3)** iDisplay Audio Link T-Mode : **Option items : 2T mode, 4T mode, 8T mode (Default setting), 16T mode** **2.5.2.5~8)** Autonomous Clock Stop SNDW #1 / Autonomous Clock Stop SNDW #2 / Autonomous Clock Stop SNDW #3 / Autonomous Clock Stop SNDW #4 : **Disabled (Default setting) / Enabled** **2.5.2.9~12)** Data On Active Interval Select SNDW #1 / Data On Active Interval Select SNDW #2 / Data On Active Interval Select SNDW #3 / Data On Active Interval Select SNDW # 4 : **Option items : 6 clock periods , 7 clock periods, 8 clock periods, 11 clock periods (Default setting)** **2.5.2.13~16)** Date on Delay Select SNDW #1 / Date on Delay Select SNDW #2 / Date on Delay Select SNDW #3 / Date on Delay Select SNDW #4 : **Option items : 2 clock periods , 3 clock periods (Default setting)**

2.5	**HD Audio Configuration**	**2.5.3)** HD Audio Bus Controller Subsystem ID : Selects HD Audio BUS Controller subsystem ID : **Option items : 72708086, 300010EC (Default setting), 300210EC, 300410EC, 300610EC, 300810EC, 300A10EC, 300C10EC, 300E10EC, 301010EC, 301210EC, 301610EC, 301810EC, 301A10EC, 301C10EC, 301E10EC, 302010EC, 302210EC, 302410EC, 302610EC, 302810EC, 302A10EC, 302C10EC, 302E10EC**
2.6	**THC Configuration**	 Aptio Setup - AMI Chipset Touch Host Controller Configuration Settings THC Port Configuration [None] THC Port Configuration [None] Assign Port to THC THC Port Configuration : **None (Default setting) / THC0**
2.7	**SerialIO Configuration**	 Aptio Setup - AMI Chipset SerialIo Configuration I2C0 Controller [Disabled] I2C1 Controller [Disabled] I2C2 Controller [Disabled] I2C3 Controller [Disabled] I2C4 Controller [Disabled] I2C5 Controller [Disabled] I2C6 Controller [Disabled] I2C7 Controller [Disabled] SPI0 Controller [Disabled] SPI1 Controller [Enabled] SPI2 Controller [Disabled] SPI3 Controller [Disabled] SPI4 Controller [Disabled] SPI5 Controller [Disabled] SPI6 Controller [Disabled] UART0 Controller [Disabled] UART1 Controller [Disabled] UART2 Controller [Disabled] UART3 Controller [Disabled] UART4 Controller [Disabled] UART5 Controller [Disabled] UART6 Controller [Disabled] GPIO IRQ Route [IRQ14] ▶ Serial IO SPI1 Settings WITT/MITT Test Device [Disabled] UART Test Device [Disabled] Additional Serial IO devices [Disabled] SerialIO timing parameters [Disabled] Enables/Disables SerialIo Controller If given device is Function 0 PSF disabling is skipped. PSF default will remain and device PCI CFG Space will still be visible. This is needed to allow PCI enumerator access functions above 0 in a multifunction device. The following devices depend →←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit **2.7.1~22)** I2C0 Controller / I2C1 Controller / I2C2 Controller / I2C3 Controller / I2C4 Controller / I2C5 Controller / I2C6 Controller / I2C7 Controller / SPI0 Controller / SPI1 Controller / SPI2 Controller / SPI3 Controller / SPI4 Controller / SPI5 Controller / SPI6 Controller / UART0 Controller / UART1 Controller / UART2 Controller / UART3 Controller / UART4 Controller / UART5 Controller / UART6 Controller : **Disabled (Default setting) / Enabled only for SPI1 Controller** **2.7.23)** GPIO IRQ Route : **IRQ14 (Default setting) / IRQ15** **2.7.24)** Serial IO SPI1 Settings :  Aptio Setup - AMI Chipset Serial IO SPI1 Settings ChipSelect 0 polarity [Active High] ChipSelect 1 polarity [Active High] ▶ Serial IO Finger Print Settings Sets initial polarity for ChipSelect signal. Active low is with initial idle polarity of low and vice versa

2.7	**SerialIO Configuration**	**2.7.24.1)** ChipSelect 0 polarity : **Active Low / Active High (Default setting)** **2.7.24.2)** ChipSelect 1 polarity : **Active Low / Active High (Default setting)** **2.7.24.3)** Serial IO Finger Print Settings : **2.7.24.3.1)** Finger Print Sensor : **Option items : Disabled (Default setting) , FPC1011, FPC1020, VFSI6101, Synaptics VFSI7500, EGIS0300, FPC1021** **2.7.25)** WITT/MITT Test Device : Choose if WITT Device is used and with which controller. **Option items : Disabled (Default setting), Enabled - I2C0, Enabled - I2C1, Enabled - I2C2, Enabled - I2C3, Enabled - I2C4, Enabled - I2C5, Enabled - SPI0, Enabled - SPI1, Enabled - SPI2** **2.7.26)** UART Test Device : Choose if UART Test Device is used and with which controller. **Option items : Disabled (Default setting), Enabled - UART0, Enabled - UART1, Enabled - UART2** **2.7.27)** Additional Serial IO devices : **Disabled (Default setting) / Enabled** **2.7.28)** SerialIO timing parameters : **Disabled (Default setting) / Enabled**
2.8	**ISH Configuration**	Integrated Sensor Hub (ISH) Configuration
2.9	**Pch Thermal Throttling Control**	 Aptio Setup – AMI Chipset Thermal Throttling Level [Suggested Setting] DMI Thermal Setting [Suggested Setting] SATA Thermal Setting [Suggested Setting] Determine if use Intel suggested setting **2.9.1)** Thermal Throttling Level : Determine if use Intel suggested setting : **Suggested Setting (Default setting) / Manual** **2.9.2)** DMI Thermal Setting : Determine if use Intel suggested setting : **Suggested Setting (Default setting) / Manual** **2.9.3)** SATA Thermal Setting : Determine if use Intel suggested setting : **Suggested Setting (Default setting) / Manual**

2.10 **FIVR Configuration**



```
                              Aptio Setup - AMI
          Chipset

  External V1P05 Rail Sx/S0ix                                 Enables External V1P05 Rail in
  Configuration                                               corresponding Sx/S0ix
  Enable Rail in S0i1/S0i2              [Disabled]
  Enable Rail in S0i3                   [Disabled]
  Enable Rail in S3                     [Disabled]
  Enable Rail in S4                     [Disabled]
  Enable Rail in S5                     [Disabled]
  Active Switch Supported               [Disabled]
  Normal Active Voltage Supported       [Disabled]
  Minimum Active Voltage                [Disabled]
  Minimum Retention Voltage             [Disabled]

  External Vnn Rail Sx/S0ix
  Configuration                                               ++: Select Screen
  Enable Rail in S0i1/S0i2              [Disabled]            ↑↓: Select Item
  Enable Rail in S0i3                   [Disabled]            Enter: Select
  Enable Rail in S3                     [Disabled]            +/-: Change Opt.
  Enable Rail in S4                     [Disabled]            F1: General Help
  Enable Rail in S5                     [Disabled]            F2: Previous Values
  Active Switch Supported               [Disabled]            F3: Optimized Defaults
  Normal Active Voltage Supported       [Disabled]            F4: Save & Exit
  Minimum Active Voltage                [Disabled]            ESC: Exit
  Minimum Retention Voltage             [Disabled]

  Override External Vnn Rail
  settings in Sx states
  Enable Rail in S3                     [Disabled]
  Enable Rail in S4                     [Disabled]
  Enable Rail in S5                     [Disabled]

  External Rails Voltage and
  Current settings
  External V1P05 Icc Max Value          500
  External V1P05 Voltage Value          420
  External Vnn Icc Max Value            500
  External Vnn Voltage Value            420                   ++: Select Screen
  External Vnn Sx Icc Max Value         500                   ↑↓: Select Item
  External Vnn Sx Voltage Value         420                   Enter: Select
                                                              +/-: Change Opt.
  VCCIN_AUX voltage rail timing                               F1: General Help
  configuration                                               F2: Previous Values
  Retention to Low Current Mode         0                     F3: Optimized Defaults
  Retention to High Current Mode        0                     F4: Save & Exit
  Low to High Current Mode              0                     ESC: Exit
  Off to High Current Mode              0

  FIVR Dynamic PM                       [Enabled]
```

2.10.1) External V1P05 Rail Sx/S0iX Configuration :

2.10.1.1) Enable Rail in S0i1/S0i2 :
Disabled (Default setting) / Enabled

2.10.1.2) Enable Rail in S0i3 :
Disabled (Default setting) / Enabled

2.10.1.3) Enable Rail in S3 :
Disabled (Default setting) / Enabled

2.10.1.4) Enable Rail in S4 :
Disabled (Default setting) / Enabled

2.10.1.5) Enable Rail in S5:
Disabled (Default setting) / Enabled

2.10.1.6) Active Switch Supported :
Disabled (Default setting) / Enabled

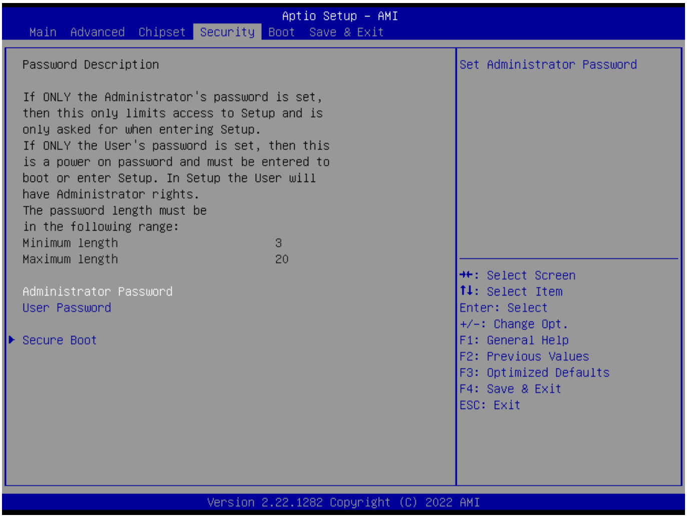
2.10.1.7) Normal Active Voltage Supported :
Disabled (Default setting) / Enabled

2.10	**FIVR Configuration**	**2.10.1.8)** Minimum Active Voltage : **Disabled (Default setting) / Enabled** **2.10.1.9)** Minimum Retention Voltage : **Disabled (Default setting) / Enabled** **2.10.2)** External Vnn Rail Sx/S0ix Configuration : **2.10.2.1)** Enable Rail in S0i1/S0i2 : **Disabled (Default setting) / Enabled** **2.10.2.2)** Enable Rail in S0i3 : **Disabled (Default setting) / Enabled** **2.10.2.3)** Enable Rail in S3 : **Disabled (Default setting) / Enabled** **2.10.2.4)** Enable Rail in S4 : **Disabled (Default setting) / Enabled** **2.10.2.5)** Enable Rail in S5: **Disabled (Default setting) / Enabled** **2.10.2.6)** Active Switch Supported : **Disabled (Default setting) / Enabled** **2.10.2.7)** Normal Active Voltage Supported : **Disabled (Default setting) / Enabled** **2.10.2.8)** Minimum Active Voltage : **Disabled (Default setting) / Enabled** **2.10.2.9)** Minimum Retention Voltage : **Disabled (Default setting) / Enabled** **2.10.3)** Override External Vnn Rail settings in Sx states : **2.10.3.1~3)** Enable Rail is S3 / Enable Rail is S4 / Enable Rail is S5 : **Disabled (Default setting) / Enabled** **2.10.4)** External Rails Voltage and Current settings : **2.10.4.1)** External V1P05 Icc Max Value : Value are between 0 and 500 mA. **2.10.4.2)** External V1P05 Voltage Value : Value are in 2.5mV increments. Ex : 0 = 0mV, 1 = 2.5mV, 2 = 5mV **2.10.4.3)** External Vnn Icc Max Value : Value are between 0 and 500 mA. **2.10.4.4)** External Vnn Voltage Value : Value are in 2.5mV increments. Ex : 0 = 0mV, 1 = 2.5mV, 2 = 5mV **2.10.4.5)** External Vnn Sx Icc Max Value : Value are between 0 and 500 mA.

2.10	FIVR Configuration	**2.10.4.5)** External Vnn Sx Voltage Value : Value are in 2.5mV increments. Ex : 0 = 0mV, 1 = 2.5mV, 2 = 5mV **2.10.5)** VCCIN_AUX voltage rail timing configuration : **2.10.5.1)** Retention to Low Current Mode : Transition time in microseconds from off (0V) to High Current mode Voltage. **2.10.5.2)** Retention to High Current Mode : Transition time in microseconds from Retention Mode Voltage to High current Mode Voltage. **2.10.5.3)** Low to High Current Mode : Transition time in microseconds from Low current mode voltage to High current mode voltage. **2.10.5.4)** Off to High Current Mode : Transition time in microseconds from Off (0V) to High current mode voltage. **2.10.6)** FIVR Dynamic PM : FIVR Dynamic Power management **Disabled / Enabled (Default setting)**
2.11	Sensor Hub Type	**Option items : None (Default setting) , I2C Sensor Hub, USB Sensor Hub**
2.12	DeepSx Power Policies	**Option items : Dsiabled (Default setting), Enabled in S4-S5/Battery, Enabled in S5/Battery, Enabled in S4-S5, Enabled in S5**
2.13	Wake on WLAN and BT Enable	**Enabled / Disabled (Default setting)**
2.14	Disable DSX ACPRESENT PullDown	**Enabled / Disabled (Default setting)**
2.15	State After G3	Specify what state to go to when power is re-applied after a power failure. **S0 State / S5 State (Default setting)**
2.16	Port 80h Redirection	Control where the port 80h cycles are sent. **LPC Bus (Default setting) / PCIE Bus**
2.17	Enhance Port 80h LPC Decoding	support the word/dword decoding of port 80h behind LPC **Disabled / Enabled (Default setting)**
2.18	Compatible Revision	**Disabled (Default setting)**
2.19	Legacy IO Low Latency	**Disabled (Default setting) / Enabled**
2.20	PCH Cross Throttling	**Disabled / Enabled (Default setting)**
2.21	PCH Energy Reporting	**Disabled / Enabled (Default setting)**
2.22	LPM S0i2.0	**Disabled / Enabled (Default setting)**
2.23	LPM S0i2.1	**Disabled / Enabled (Default setting)**
2.24	LPM S0i2.2	**Disabled / Enabled (Default setting)**
2.25	LPM S0i3.0	**Disabled / Enabled (Default setting)**

2.26	LPM S0i3.1	Disabled / Enabled (Default setting)
2.27	LPM S0i3.2	Disabled / Enabled (Default setting)
2.28	LPM S0i3.3	Disabled / Enabled (Default setting)
2.29	LPM S0i3.4	Disabled / Enabled (Default setting)
2.30	C10 Dynamic threshold adjustment	Disabled (Default setting) / Enabled
2.31	IEH Mode	Bypass mode (Default setting) / Enabled
2.32	Enable TCO Timer	Disabled (Default setting) / Enabled
2.33	PCie Pll SSC	Option items : Auto (Default setting), 0.0%, 0.1%, 0.2%, 0.3%, 0.4%, 0.5%, 0.6%, 0.7%, 0.8%, 0.9%, 1.0%, 1.1%, 1.2%, 1.3%, 1.4%, 1.5%, 1.6%, 1.7%, 1.8%, 1.9%, 2.0%, Disable
2.34	IOTG PLL SSCEN (CPU Side SSC)	Disabled / Enabled (Default setting)
2.35	IOAPIC 24-119 Entries	Disabled / Enabled (Default setting)
2.36	Enable 8254 Clock Gate	Disabled / Enabled (Default setting) / Enabled in Runtime and S3 Resume
2.37	Lock PCH Sideband Access	Disabled / Enabled (Default setting)
2.38	Flash Protection Range Registers (FPRR)	Disabled (Default setting) / Enabled
2.39	SPD Write Disable	TRUE (Default setting) / FALSE
2.40	LGMR	Disabled (Default setting) / Enabled
2.41	HOST_C10 reporting to Slave	Disabled (Default setting) / Enabled
2.42	OS IDLE Mode	Disabled / Enabled (Default setting)
2.43	S0ix Auto Demotion	Enabled (Default setting) / Disabled
2.44	Latch Events C10 Exit	Enabled / Disabled (Default setting)
2.45	Hybrid Storage Detection and Configuration Mode	Dynamic Configuration for Hybrid Storage Enable / Disabled (Default setting)
2.46	Extended BIOS Range Decode	Disabled (Default setting) / Enabled

4.5 Security



```
                          Aptio Setup - AMI
   Main  Advanced  Chipset  Security  Boot  Save & Exit

  Password Description                              Set Administrator Password

  If ONLY the Administrator's password is set,
  then this only limits access to Setup and is
  only asked for when entering Setup.
  If ONLY the User's password is set, then this
  is a power on password and must be entered to
  boot or enter Setup. In Setup the User will
  have Administrator rights.
  The password length must be
  in the following range:
  Minimum length                      3
  Maximum length                      20
                                                    →←: Select Screen
  Administrator Password                            ↑↓: Select Item
  User Password                                     Enter: Select
                                                    +/-: Change Opt.
▶ Secure Boot                                       F1: General Help
                                                    F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit

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```
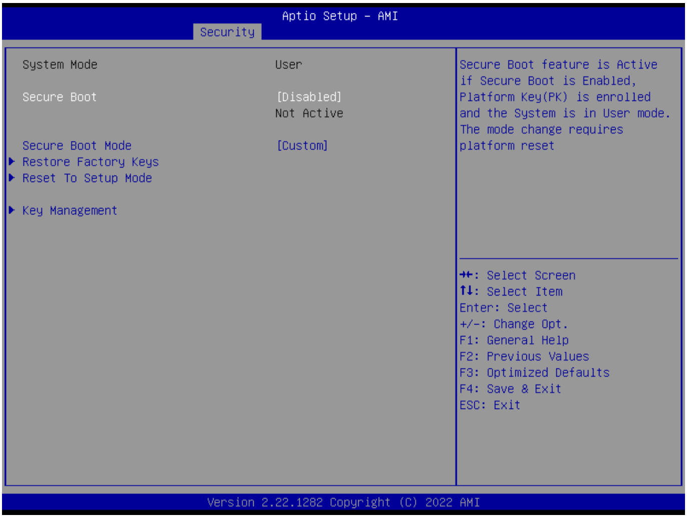

Item	Description
Administrator Password	To set up Administrator's password **Minimum length : 3** **Maximum length : 20**
User Password	To set up User's password **Minimum length : 3** **Maximum length : 20**
Secure Boot	Press <Enter> to configure the advanced items



```
                         Aptio Setup - AMI
                Security
  System Mode                         User            Secure Boot feature is Active
                                                      if Secure Boot is Enabled,
  Secure Boot                         [Disabled]      Platform Key(PK) is enrolled
                                      Not Active      and the System is in User mode.
                                                      The mode change requires
  Secure Boot Mode                    [Custom]        platform reset
▶ Restore Factory Keys
▶ Reset To Setup Mode

▶ Key Management
                                                      →←: Select Screen
                                                      ↑↓: Select Item
                                                      Enter: Select
                                                      +/-: Change Opt.
                                                      F1: General Help
                                                      F2: Previous Values
                                                      F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit

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```
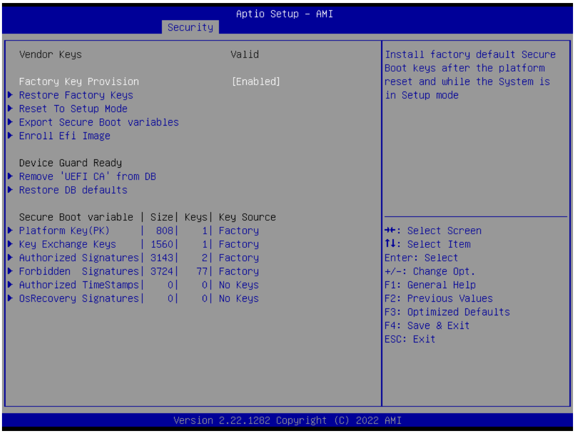

Item	Description
Secure Boot	Secure Boot requires all the applications that are running during the booting process to be pre-signed with valid digital certificates **Enabled : Enables Secure Boot function** **Disabled : Disables Secure Boot function (Default setting)**
Secure Boot Mode	**Standard : Standard mode** **Custom : Custom mode (Default setting)**
Restore Factory Keys	To restore factory settings **Yes : Agree to restore factory settings** **No : Cancel to restore factory settings**
Reset To Setup Mode	**Yes : Agree to setup mode** **No : Cancel to setup mode**
Key Management	Enables expert users to modify Secure boot policy variables without full authentication Press <Enter> to configure the advanced items



```
                              Aptio Setup - AMI
                    Security
  Vendor Keys                         Valid          | Install factory default Secure
                                                     | Boot keys after the platform
  Factory Key Provision               [Enabled]      | reset and while the System is
▶ Restore Factory Keys                               | in Setup mode
▶ Reset To Setup Mode                                |
▶ Export Secure Boot variables                       |
▶ Enroll Efi Image                                   |
                                                     |
  Device Guard Ready                                 |
▶ Remove 'UEFI CA' from DB                           |
▶ Restore DB defaults                                |
                                                     |
  Secure Boot variable  | Size| Keys| Key Source     |
▶ Platform Key(PK)      |  808|    1| Factory        | →←: Select Screen
▶ Key Exchange Keys     | 1560|    1| Factory        | ↑↓: Select Item
▶ Authorized Signatures| 3143|    2| Factory        | Enter: Select
▶ Forbidden  Signatures| 3724|   77| Factory        | +/-: Change Opt.
▶ Authorized TimeStamps|    0|    0| No Keys        | F1: General Help
▶ OsRecovery Signatures|    0|    0| No Keys        | F2: Previous Values
                                                     | F3: Optimized Defaults
                                                     | F4: Save & Exit
                                                     | ESC: Exit

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```
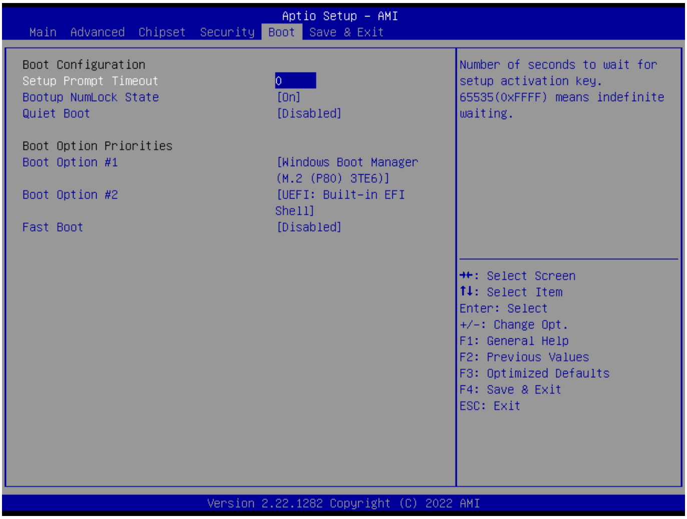

Item	Description
Factory Key Provision	Install factory default Secure Boot keys after the platform reset and while the system is in Setup mode **Enabled : Enables Factory Key Provision (Default setting)** **Disabled : Disables Factory Key Provision**
Restore Factory Keys	To restore factory settings **Yes : Agree to restore factory settings** **No : Cancel to restore factory settings**
Reset To Setup Mode	**Yes : Agree to setup mode** **No : Cancel to setup mode**
Export Secure Boot variables	Copy NVRAM content of Secure Boot variables to files in a root folder on a file system device
Enroll Efi Image	Allow the image to run in Secure Boot mode
Remove 'UEFI CA' from DB	To remove 'UEFI CA' from database **Yes : Agree to remove 'UEFI CA' from database** **No : Cancel to remove 'UEFI CA' from database**
Restore DB defaults	Restore DB variables to factory defaults **Yes : Agree to restore DB defaults** **No : Cancel to restore DB defaults**

Item	Description
Platform Key (PK)	These items allows you to enroll factory defaults or load Certificates from a file.
Key Exchange Keys	
Authorized Signatures	
Forbidden Signatures	
Authorized TimeStamps	
OsRecovery Signatures	

4.6 Boot

This Boot menu allows you to set/change system boot options



```
                              Aptio Setup - AMI
  Main  Advanced  Chipset  Security  Boot  Save & Exit

 Boot Configuration                                  Number of seconds to wait for
 Setup Prompt Timeout                 0              setup activation key.
 Bootup NumLock State                 [On]           65535(0xFFFF) means indefinite
 Quiet Boot                           [Disabled]     waiting.

 Boot Option Priorities
 Boot Option #1                       [Windows Boot Manager
                                      (M.2 (P80) 3TE6)]
 Boot Option #2                       [UEFI: Built-in EFI
                                      Shell]
 Fast Boot                            [Disabled]
                                                     →←: Select Screen
                                                     ↑↓: Select Item
                                                     Enter: Select
                                                     +/-: Change Opt.
                                                     F1: General Help
                                                     F2: Previous Values
                                                     F3: Optimized Defaults
                                                     F4: Save & Exit
                                                     ESC: Exit

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```
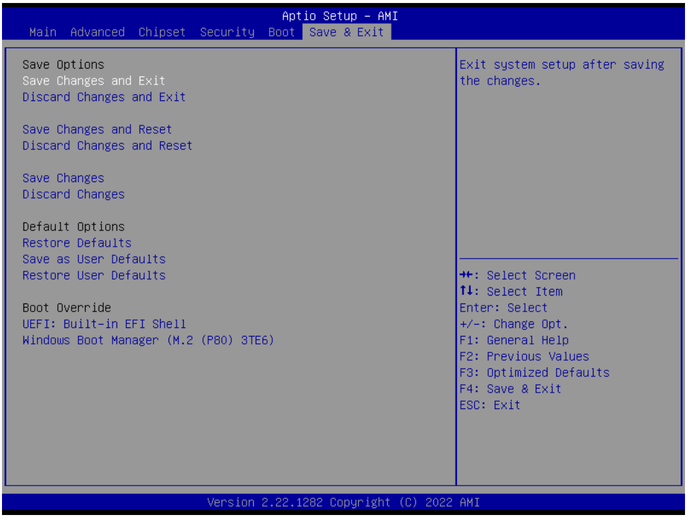

Item	Description
Setup Prompt Timout	Number of seconds to wait for setup activation key.
Bootup NumLock State	Select the Keyboard NumLock state : **On (Default setting) / Off**
Quiet Boot	**Disabled (Default setting) / Enabled**
Boot Option #1 **Boot Option #2**	Shows the information of the storage that be installed in the system **Choose/set the boot priority**
Fast Boot	**Disabled (Default setting) / Enabled**

4.7 Save & Exit



```
                              Aptio Setup - AMI
  Main  Advanced  Chipset  Security  Boot  Save & Exit

  Save Options                                    Exit system setup after saving
  Save Changes and Exit                           the changes.
  Discard Changes and Exit

  Save Changes and Reset
  Discard Changes and Reset

  Save Changes
  Discard Changes

  Default Options
  Restore Defaults
  Save as User Defaults                           →←: Select Screen
  Restore User Defaults                           ↑↓: Select Item
                                                  Enter: Select
  Boot Override                                   +/-: Change Opt.
  UEFI: Built-in EFI Shell                        F1: General Help
  Windows Boot Manager (M.2 (P80) 3TE6)           F2: Previous Values
                                                  F3: Optimized Defaults
                                                  F4: Save & Exit
                                                  ESC: Exit

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```

Item	Description
Save Changes and Exit	Exit system setup after saving the changes. **Yes : Agree to save and reset** **No : Cancel to save and reset**
Discard Changes and Exit	Exit system setup without saving any changes. **Yes : Agree to save and reset** **No : Cancel to save and reset**
Save Changes and Reset	After configuring all the options that you wish to change, choose this option to save all the changes and reboot the system. **Yes : Agree to save and reset** **No : Cancel to save and reset**
Discard Changes and Reset	Choose this option to reboot the system without saving any changes. **Yes : Agree to discard changes and reset** **No : Cancel to discard changes and reset**
Save Changes	Save Changes done so far to any of the setup options. **Yes : Agree to Save configuration** **No : Cancel to Save configuration**

Discard Changes	Discard Changes done so far to any of the setup options. **Yes : Agree to Save configuration** **No : Cancel to Save configuration**
Restore Defaults	Restore/Load default values for all the setup options **Yes : Agree to load optimized defaults** **No : Cancel to load optimized defaults**
Save as User Defaults	Save the changes done so far as User defaults. **Yes : Agree to Save configuration** **No : Cancel to Save configuration**
Restore User Defaults	**Restore the user defaults to all the setup options** **Yes : Agree to restore user defaults** **No : Cancel to restore user defaults**
Boot override	Boot override