COM Express™
PCOM-B705GT
User's Guide R1.1

Revision History

Rev.	Note	Date
R1.0	Release	2023/4/10
R1.1	Revise Chapter 9 Portwell Software Tool	2024/1/15

Contents

List of Tables

List of Figures

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1 Introduction

PCOM-B705GT, a Type 7 COM Express® basic size(125 x 95 mm) module which based on Intel® Xeon® D-1700 series processors. In this architecture, it could provide up to 10 cores / 20 threads processors with the maximum TDP=67w, and 4x 10G KR ports. It also supports 16x PCIe 4.0, 16x PCIe 3.0 lanes, 4x USB 3.2 Gen1, and 2x SATA III ports. Selected SKUs support wide-temperature range.

PCOM-B705GT offer an effective upgrade path for solutions already using the previous D-1600 COM Express modules, ideal for applications in edge/micro server and alike, requiring relatively lower power consumption while supporting high computing performance and communication throughput.

1.1 PCOM-B705GT SKU List

Series	PCOM-B705GT				
Ordering P/N	AB1-3P64	AB1-3P66	AB1-3P65	AB1-3P67	AB1-3P68
CPU Specifications					
Processor	D-1746TER	D-1732TE	D-1735TR	D-1715TER	D-1712TR
# of Cores	10	8	8	4	4
# of Threads	20	16	16	8	8
Cache	15 MB	15 MB	15 MB	10 MB	10 MB
Base Frequency	2.0 GHz	1.9 GHz	2.2 GHz	2.4 GHz	2.0 GHz
Turbo Frequency	2.5 GHz	2.4 GHz	2.7 GHz	2.9 GHz	2.5 GHz
TDP	67 W	52 W	59 W	50 W	40 W
Memory Specifications					
Capacity	4x SO-DIMM	4x SO-DIMM	4x SO-DIMM	3x SO-DIMM	3x SO-DIMM
Speed	2666 MT/s	2666 MT/s	2666 MT/s	2666 MT/s	2666 MT/s
ECC	Yes	Yes	Yes	Yes	Yes
I/O Specifications					
PCIe	16x PCIe 4.0 16x PCIe 3.0	16x PCIe 4.0 16x PCIe 3.0	16x PCIe 4.0 16x PCIe 3.0	16x PCIe 4.0 16x PCIe 3.0	16x PCIe 4.0 16x PCIe 3.0
USB 3.0/2.0	4x	4x	4x	4x	4x
SATA	2x	2x	2x	2x	2x
Ethernet	4x 10G KR 1x GbE	4x 10G KR 1x GbE	4x 10G KR 1x GbE	4x 10G KR 1x GbE	4x 10G KR 1x GbE

Table 1 PCOM-B705GT SKUs

2 Block Diagram
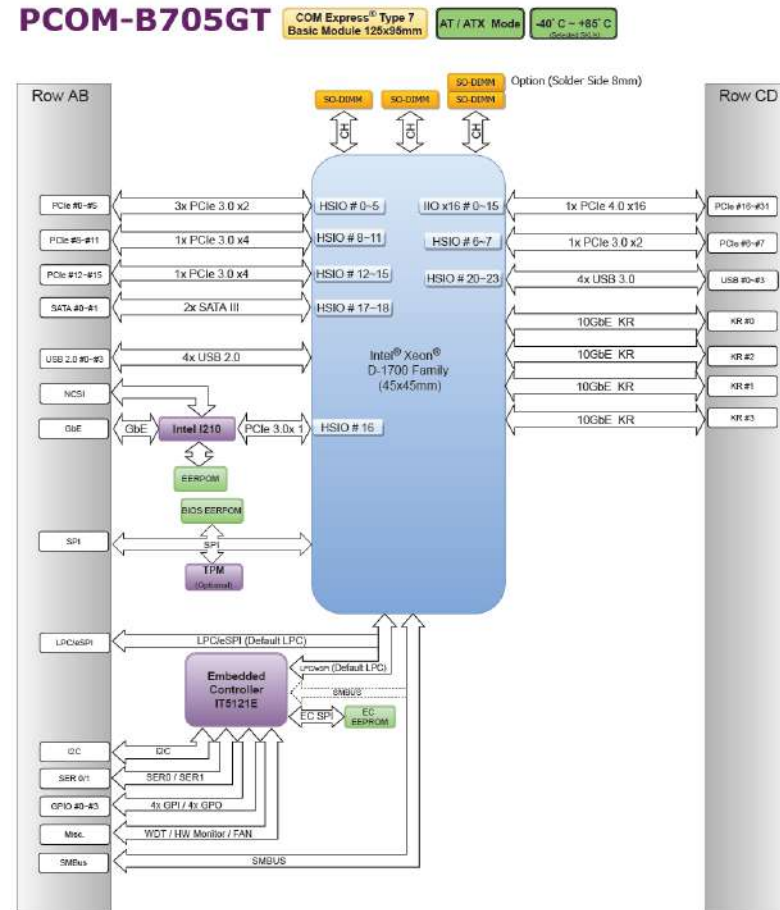
Figure 1 Block Diagram

3 Specifications

Product	➤ PCOM-B705GT
Form Factor	➤ COM Express® Type 7, Basic Size (125mm X 95mm)
Processor	➤ Intel® Xeon® D-1746TER ➤ Intel® Xeon® D-1735TR ➤ Intel® Xeon® D-1732TE ➤ Intel® Xeon® D-1715TER ➤ Intel® Xeon® D-1712TR
BIOS	➤ AMI UEFI BIOS
Memory	➤ Support ECC and Non-ECC, up to 3 Channel Memory Operation ➤ 4x DDR4 SO-DIMM slots with 3 channels for 8 Core / 10 Core SKUs, up to 128GB, 2666MT/s ➤ 3x DDR4 SO-DIMM slots with 2 channels for 4 Core SKUs, up to 96GB, 2666MT/s
Ethernet	➤ 1x GbE (via Intel® i210AT/IT) ➤ 4x 10GbE: Mode Configuration, need different BIOS firmware for proper operation. ■ 100G and 50G SKU: provide default BIOS support 4x 10G support LEK 7.0 CEI Mode. ■ For KR Mode Support, please contact sales for firmware support. ■ For 4x 25GbE Support on 100G SKU, please contact sales for ODM request. SEE TABLE BELOW

SKU	P/N	CPU Spec	Integrated Ethernet Bandwidth	LEK 7.0 (CEI)	LEK 7.6 (KR)	SODIMM Qty
D-1746TER	AB1-3P64Z	10C, eTemp	100G	10G*4	10G*4	4
D-1735TR	AB1-3P65Z	8C, cTemp	50G	10G*4	10G*4	4
D-1732TE	AB1-3P66Z	8C eTemp	50G	10G*4	10G*4	4
D-1715TER	AB1-3P67Z	4C, eTemp	50G	10G*4	10G*4	3
D-1712TR	AB1-3P68Z	4C, cTemp	50G	10G*4	10G*4	3

Graphic & Audio	➢ No Support
PCI Express	➢ 16x PCIe 4.0 and 16x PCIe 3.0
I/O	➢ 4x USB 3.0 / 2.0 ➢ 2x SATA ➢ 8 bit GPIO (default 4 in / 4 out) ➢ I2C / SMBus ➢ 2x UART
Hardware Monitors	➢ ITE series Embedded Controller, Voltage, Fan and Temperature
Security	➢ TPM 2.0
Power Management	➢ ACPI 4.0
Environment	➢ Operating Temperature: 0°C ~+60°C Extended: -40°C ~+80°C (selected SKU) ➢ Storage Temperature: -40°C ~+85°C ➢ Relative Humidity 5%~95%

Table 2 PCOM-B705GT SPEC

3.1   Supported Operating Systems

The PCOM-B705GT supports the following operating systems.

Vendor	Operating System	Support
Windows	Microsoft Windows 10 IoT Enterprise LTSC	Intel, Microsoft
	Microsoft Windows Server 19H1, 19H2, 20H1	Intel, Microsoft
Linux	Red Hat Enterprise Linux 7.6 or latest	Red Hat
	SUSE Linux Enterpriser Server 12 SP4 or latest	SUSE, Open Source
	SUSE Linux Enterpriser Server 15 SP2 or latest	SUSE, Open Source
	Ubuntu 19.04 or latest	Canonical, Open Source
	Wind River Linux	Wind River
	Yocto Project BSP tool-based embedded Linux(64-bit)	Intel, Open Source
RTOS	Wind River VxWorks	Wind River
VMM	Linux KVM	Open Source
	ACRN	Open Source
	VMWare ESXi	VMware, Open Source
	Microsoft Windows Hyper-V: Windows Server 19H1	Microsoft
	Microsoft Windows Hyper-V: Windows Server 19H2	
	Microsoft Windows Hyper-V: Windows Server 20H1	
	Microsoft Azure	Microsoft

Table 2 OS Support list

Portwell does not endorse/validate/support any specific Linux distribution or entity mentioned on this list.

Portwell recommends customers to work with Linux vendors/open-source communities to find feature list and support model.

3.2   Windows OS Driver

Please download the drivers from Portwell download center website http://www.portwell.tw/support/download_center.php

3.3   Electrical Characteristics

Input voltage	+12V ± 5%
RTC Battery	From Carrier
Power on mode	ATX Mode & AT Mode

Table 3 Electrical characteristics

● ATX Power Sequence
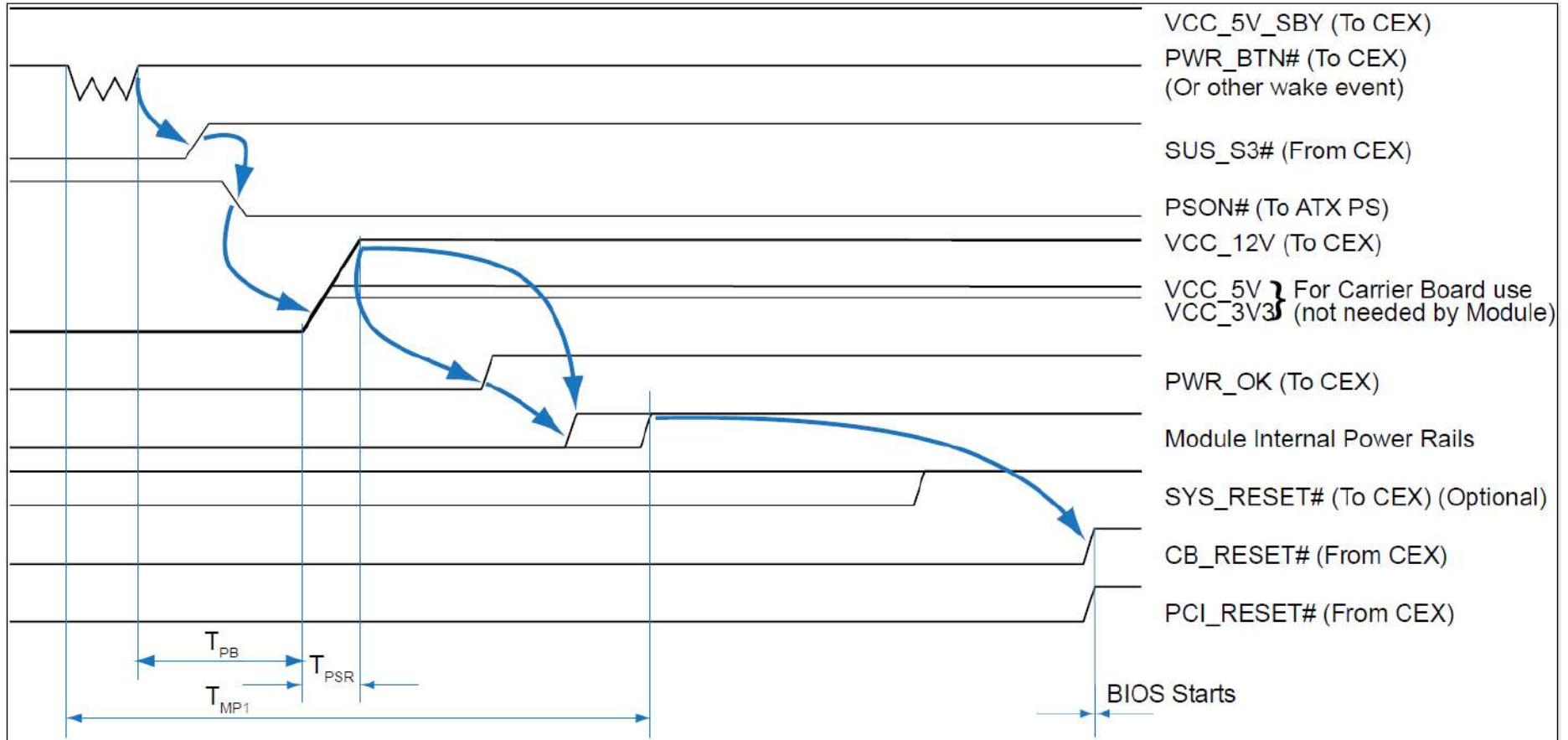
Figure 2 ATX style boot

(Reference from COM Express® Carrier Design Guide)

● AT Power Sequence
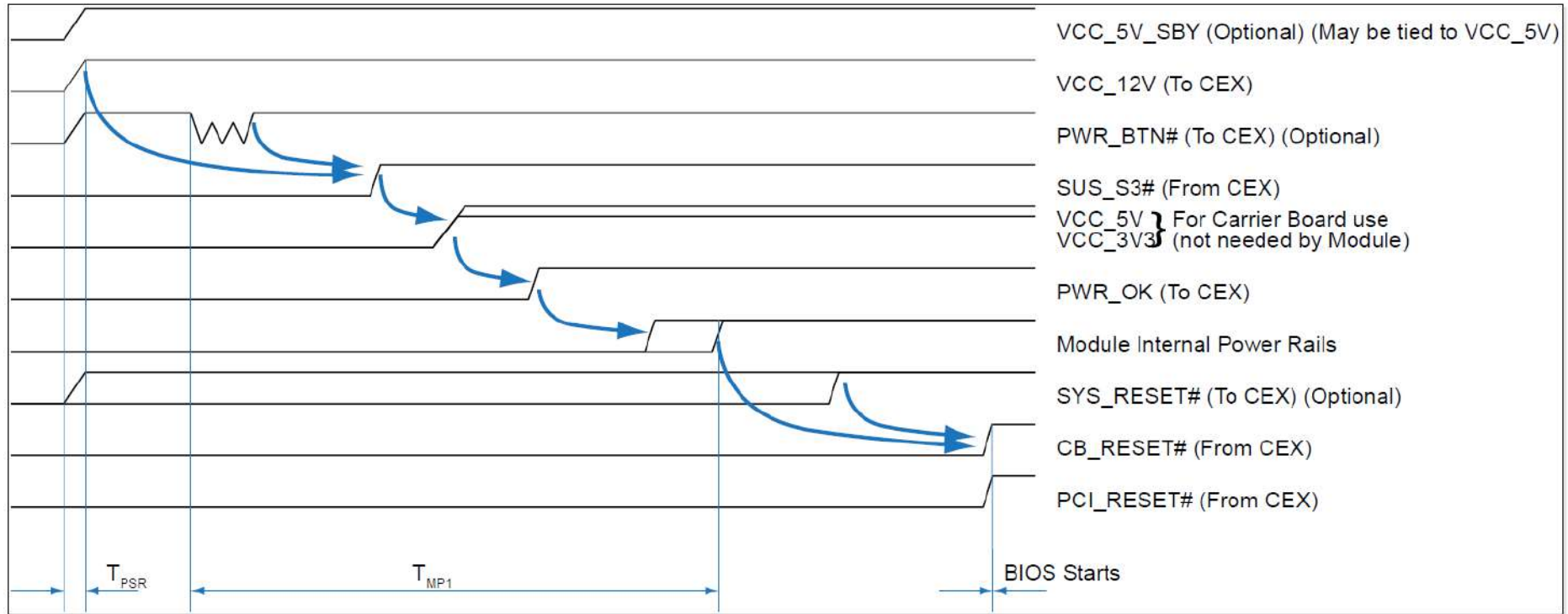
Figure 3 AT style boot
(Reference from COM Express® Carrier Design Guide)

● PWR_OK signal

Carrier board hardware must keep this signal low until all power rails and clocks are stable. Releasing PWR_OK too early or not driving it low at all may cause boot up abnormal symptom. It is a good design implementation to delay the PWR_OK signal a little (at least 100ms) after all carrier board power rails are up, to ensure a stable system.
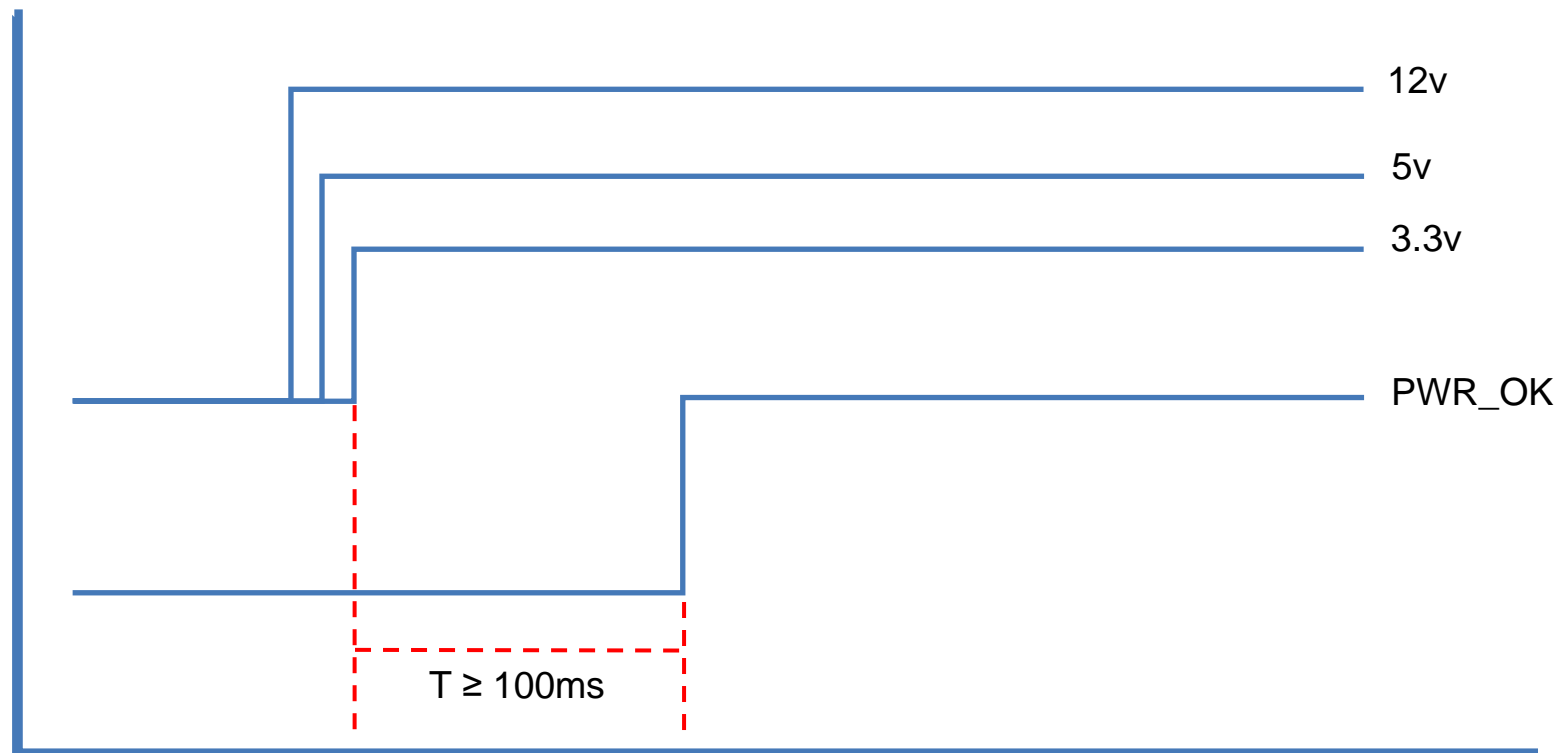
Figure 4 PWR_OK signal brief diagram

3.4　Power Consumption

Series	PCOM-B705GT				
Ordering P/N	AB1-3P64	AB1-3P66	AB1-3P65	AB1-3P67	AB1-3P68
Processor	D-1746TER	D-1732TE	D-1735TR	D-1715TER	D-1712TR
Power Consumption					
S0 Idle	1.56A	1.54A	1.59A	1.64A	1.56A
100% workload without turbo mode	4.48A	4.13A	3.84A	3.43A	2.99A
100% Workload with turbo mode	4.83A	4.35A	3.85A	3.81A	3.10A
Peak Current	2.83A	2.69A	2.78A	2.48A	2.36A

Table 4 PCOM-B705GT Power Consumption

3.5   Mechanical Dimensions

● Top Side Dimension
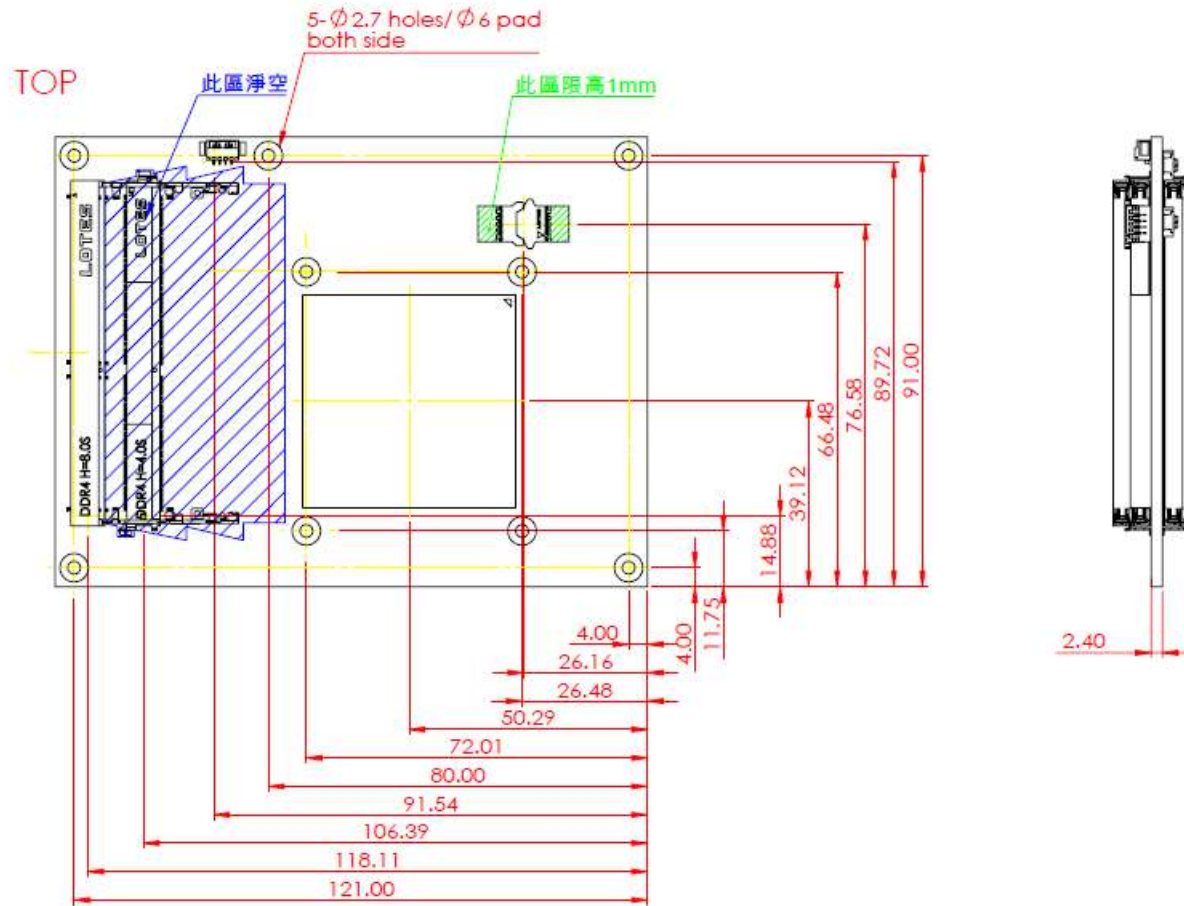
Figure 5 Mechanical Dimension - Top

● Bottom Side Dimension
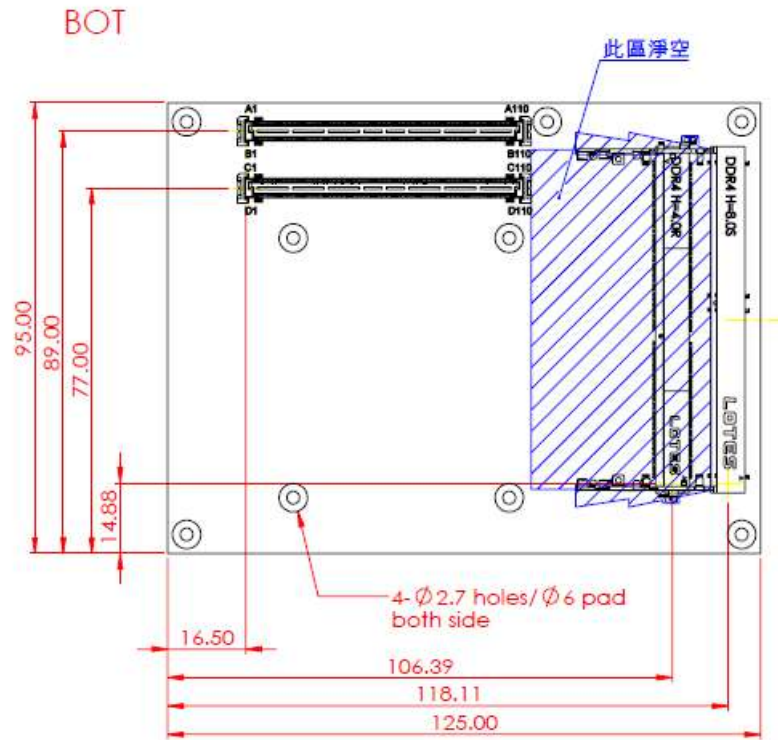
Figure 6 Mechanical Dimension - Bottom

3.6   4x SO-DIMM Slot Design

PCOM-B705GT has designed to support up to four DDR4 SO-DIMM slots up to 128GB capacities. Before inserting the DDR4 SO-DIMM memory, please refer to below connector arrangement. There are two SO-DIMM slots on channel 0, one slot on channel 1, and one slot on channel 2. The channel 2, SO-DIMM A (the bottom side, 8mm) only supported on 8C / 10C SOC SKUs.
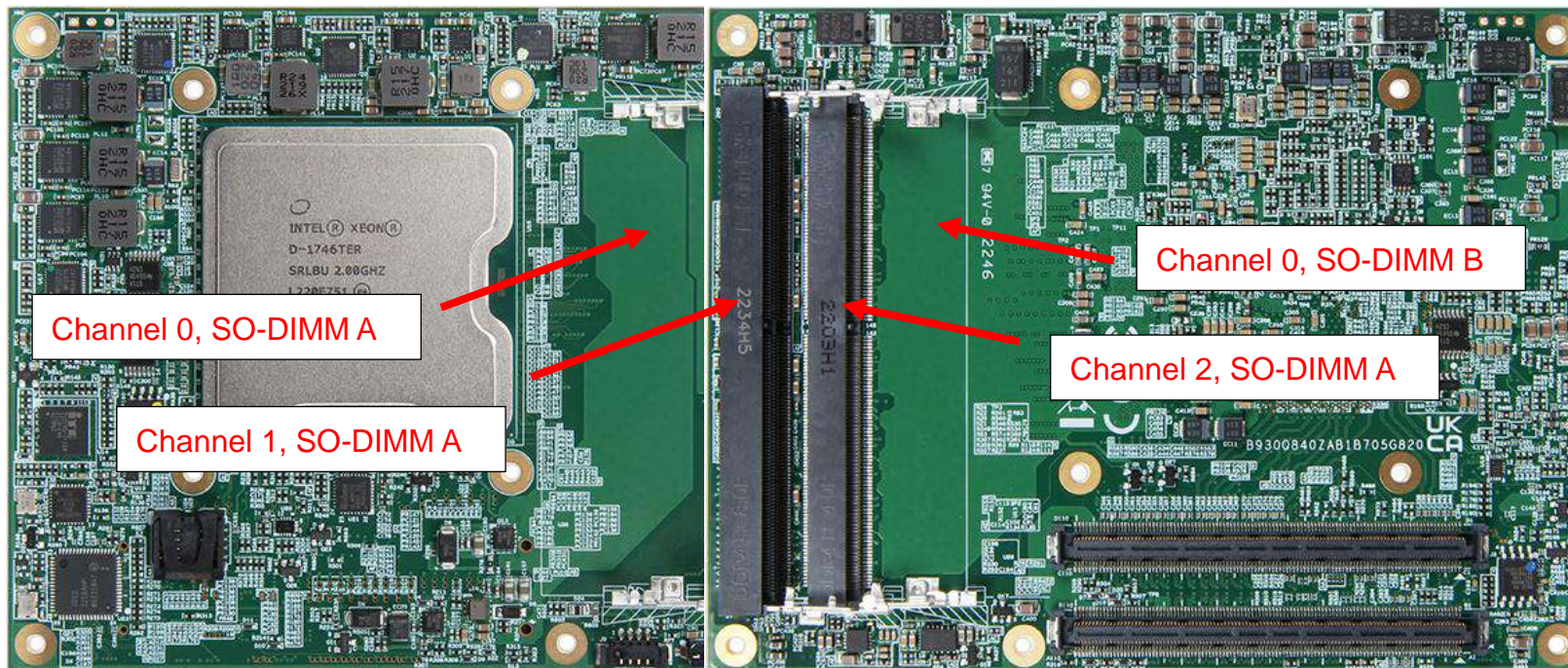
Figure 7 SO-DIMM slot design

3.7　Environmental Specifications

Storage Temperature	-40°C ~ 85°C
Operation Temperature	0°C ~ 60°C Extended : -40°C ~ 85°C (Selected SKU)
Storage Humidity	0% ~ 95%
Operation Humidity	0% ~ 95%

Table 5 Environmental Specifications

3.8   Ordering Guide

◆ **Module**

Product	Ordering P/N
PCOM-B705GT-D1746TER	AB1-3P64
PCOM-B705GT-D1735TR	AB1-3P65
PCOM-B705GT-D1732TE	AB1-3P66
PCOM-B705GT-D1715TE	AB1-3P67
PCOM-B705GT-D1712TR	AB1-3P68

Table 6 Ordering Guide - PCOM-B705GT

◆ **Accessory**

Accessory	Ordering P/N
Cooler	B9972180
Heatsink	B830C060
Heat-spreader	B830C070
Evaluation Carrier PCOM-C701-BMC	AB1-3K14Z

Table 7 Ordering Guide - Accessory

4   Thermal Solution

- Cooler Dimension
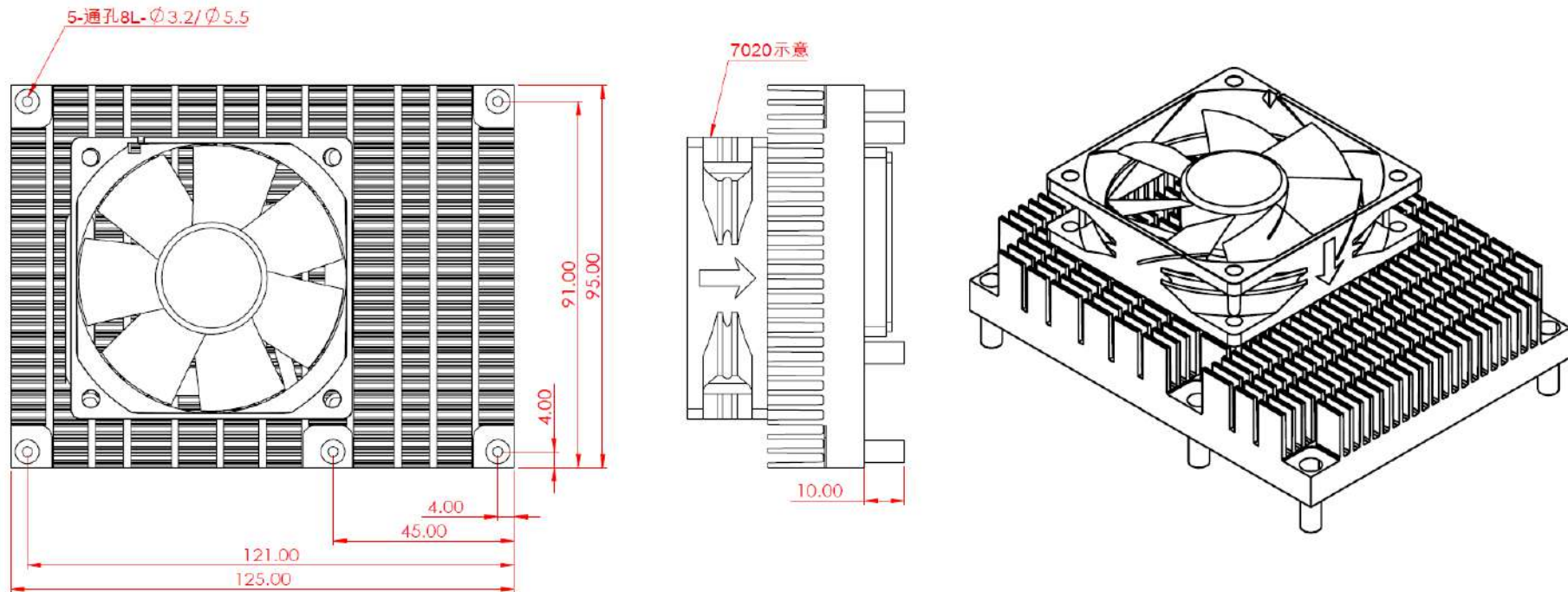
Figure 8 Cooler mechanical dimension

● Heatsink Dimension
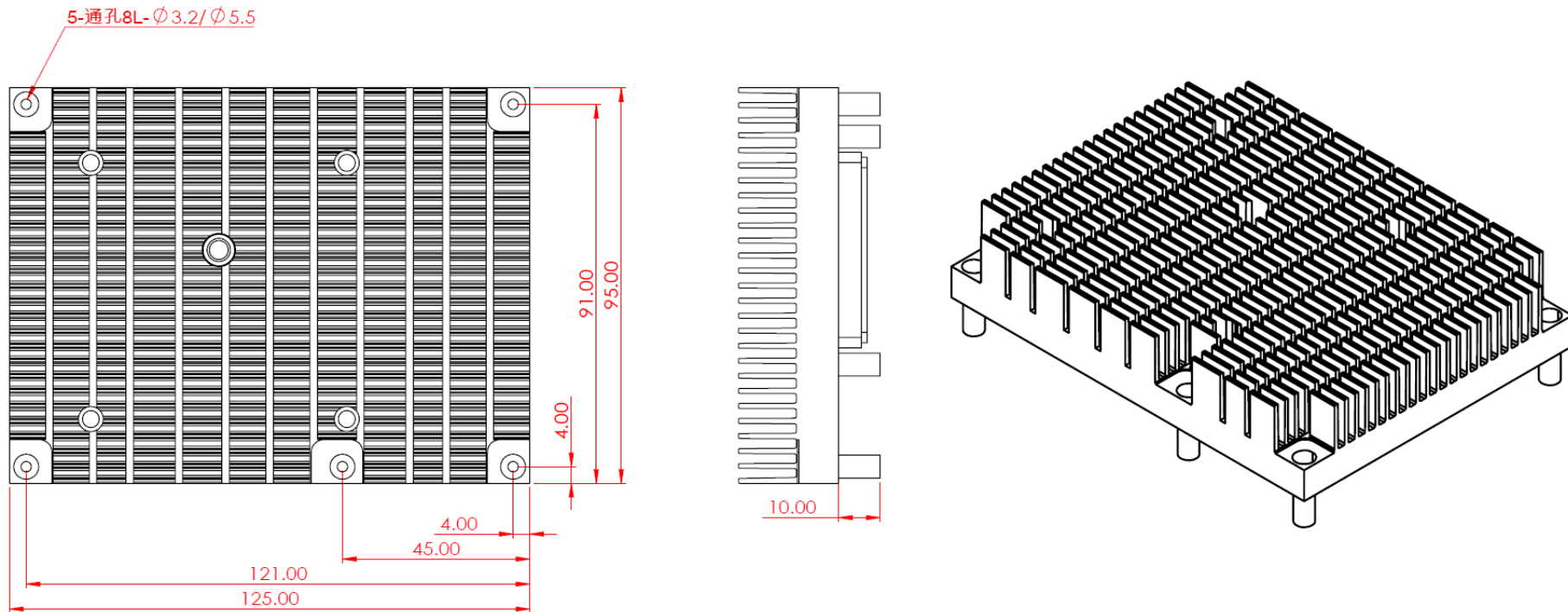
Figure 9 Heatsink mechanical dimension

● Heatspreader Dimension
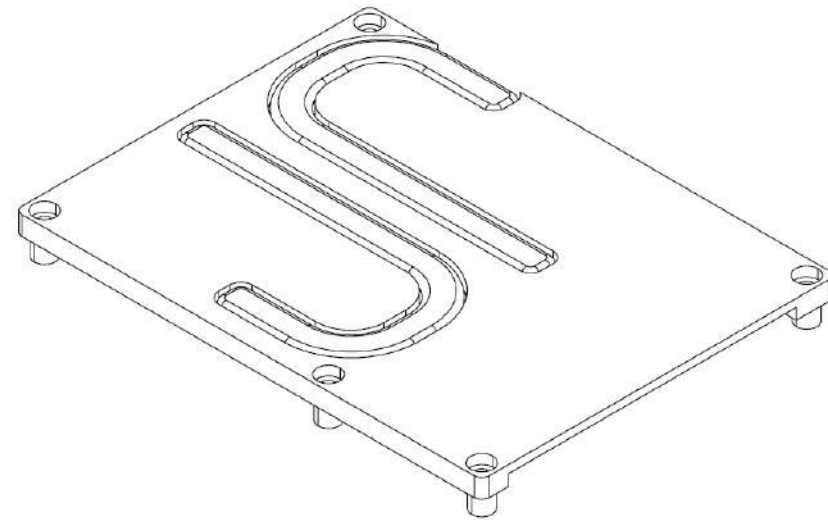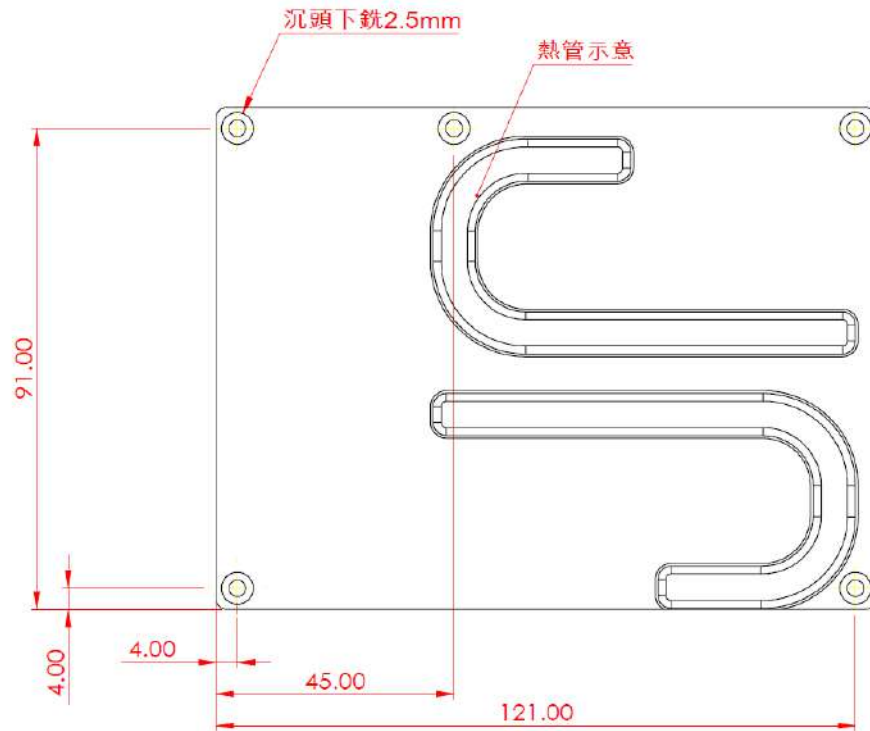
Figure 10 Heatspreader mechanical dimension

5   Pin out Tables

Pin	Row A	Row B	Row C	Row D
1	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
2	I210_MDI3_N	I210_ACT#	GND	GND
3	I210_MDI3_P	ESPI_CS1#_FRAME#	USB3_HSIO20_RXN0	USB3_HSIO20_TXN0
4	I210_100#	ESPI_IO0_LAD0	USB3_HSIO20_RXP0	USB3_HSIO20_TXP0
5	I210_1G#	ESPI_IO1_BMC	GND	GND
6	I210_MDI2_N	ESPI_IO2_LAD2	USB3_HSIO21_RXN1	USB3_HSIO21_TXN1
7	I210_MDI2_P	ESPI_IO3_LAD3	USB3_HSIO21_RXP1	USB3_HSIO21_TXP1
8	I210_LINK#	ESPI_ALERT1#_SIRQ	GND	GND
9	I210_MDI1_N	ESPI_ALERT#	USB3_HSIO22_RXN2	USB3_HSIO22_TXN2
10	I210_MDI1_P	ESPI_CLK_COME	USB3_HSIO22_RXP2	USB3_HSIO22_TXP2
11	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
12	I210_MDI0_N -	COME_PWRBTN#	USB3_HSIO23_RXN3	USB3_HSIO23_TXN3
13	I210_MDI0_P	SoC_SMB_SCL	USB3_HSIO23_RXP3	USB3_HSIO23_TXP3
14	GBE_CTREF_CN	SoC_SMB_SDA	GND	GND
15	KBC_SLPS3#	SoC_SMB_ALERT#	10PHY_MDC3_CN	10PHY_MDA3_CN
16	SATA_HSIO17_TXP17	SATA_HSIO18_TXP18	10PHY_MDC2_CN	10PHY_MDA2_CN
17	SATA_HSIO17_TXN17	SATA_HSIO18_TXN18	10G_PORT2_SDP	10G_PORT3_SDP
18	KBC_SLPS45#	ESPI_RESET#_SUSSTATE#	GND	GND
19	SATA_HSIO17_RXP17	SATA_HSIO18_RXP18	PCIE_HSIO6_RXP6	PCIE_HSIO6_TXP6
20	SATA_HSIO17_RXN17	SATA_HSIO18_RXN18	PCIE_HSIO6_RXN6	PCIE_HSIO6_TXN6
21	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)

22	PCIE_HSIO15_TXP15	PCIE_HSIO15_RXP15	PCIE_HSIO7_RXP7	PCIE_HSIO7_TXP7
23	PCIE_HSIO15_TXN15	PCIE_HSIO15_RXN15	PCIE_HSIO7_RXN7	PCIE_HSIO7_TXN7
24	KBC_SLPS45#	COME_PWROK	10G_INT2_CN	10G_INT3_CN
25	PCIE_HSIO14_TXP14	PCIE_HSIO14_RXP14	GND	GND
26	PCIE_HSIO14_TXN14	PCIE_HSIO14_RXN14	COME_ETH0_KR_RXDP3	ETH0_COME_KR_TXDP3
27	BATLOW_N	WDTO#	COME_ETH0_KR_RXDN3	ETH0_COME_KR_TXDN3
28	COMe_SATA_LED#	GND	GND	GND
29	NC	COME_PCIe_GEN4_CLKP	COME_ETH0_KR_RXDP2	ETH0_COME_KR_TXDP2
30	NC	COME_PCIe_GEN4_CLKN	COME_ETH0_KR_RXDN2	ETH0_COME_KR_TXDN2
31	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
32	RSVD	SPKR	NAC_I2C_SDA3	NAC_I2C_SCL3
33	RSVD	SMB1_CLK_COMe	NAC_I2C_SDA2	NAC_I2C_SCL2
34	BIOS_DIS0#	SMB1_DATA_COMe	10GPHY_RST23_CN	10GPHY_SEL23_CN
35	SoC_THERMTRIP#	COMe_THRM#	CEI_RST#	CEI_PRSNT#
36	PCIE_HSIO13_TXP13	PCIE_HSIO13_RXP13	10G_LED_SDA	NC
37	PCIE_HSIO13_TXN13	PCIE_HSIO13_RXN13	10G_LED_SCL	NC
38	GND	GND	NAC_I2C_SDA1	NAC_I2C_SCL1
39	PCIE_HSIO12_TXP12	PCIE_HSIO12_RXP12	CEI_SDA	CEI_SCL
40	PCIE_HSIO12_TXN12	PCIE_HSIO12_RXN12	10G_PORT0_SDP	10G_PORT1_SDP
41	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
42	SOC_USB2_DN2	SOC_USB2_DN3	COME_ETH0_KR_RXDP1	ETH0_COME_KR_TXDP1
43	SOC_USB2_DP2	SOC_USB2_DP3	COME_ETH0_KR_RXDN1	ETH0_COME_KR_TXDN1
44	COMe_USB_OC#	COMe_USB_OC#	GND	GND
45	SOC_USB2_DN0	SOC_USB2_DN1	10PHY_MDC1_CN	10PHY_MDA1_CN
46	SOC_USB2_DP0	SOC_USB2_DP1	CEI_MDC	CEI_MDIO
47	+V3P3_RTC	COME_ESPI_EN#	CEI_INT#	ETH_PHY_INT#

48	RSVD	NC	GND	GND
49	GBE0_SDP	COME_RSTBTN#	COME_ETH0_KR_RXDP0	ETH0_COME_KR_TXDP0
50	ESPI_ALERT1#_SIRQ	PLTRST2#	COME_ETH0_KR_RXDN0	ETH0_COME_KR_TXDN0
51	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
52	PCIE_HSIO5_TXP5	PCIE_HSIO5_RXP5	COME_SoC_PCIE4_RXDP0	SoC_COME_PCIE4_TXDP0
53	PCIE_HSIO5_TXN5	PCIE_HSIO5_RXN5	COME_SoC_PCIE4_RXDN0	SoC_COME_PCIE4_TXDN0
54	EC_GPI0	EC_GPO1	GND	GND
55	PCIE_HSIO4_TXP4	PCIE_HSIO4_RXP4	COME_SoC_PCIE4_RXDP1	SoC_COME_PCIE4_TXDP1
56	PCIE_HSIO4_TXN4	PCIE_HSIO4_RXN4	COME_SoC_PCIE4_RXDN1	SoC_COME_PCIE4_TXDN1
57	GND	EC_GPO2	TYPE1	GND
58	PCIE_HSIO3_TXP3	PCIE_HSIO3_RXP3	COME_SoC_PCIE4_RXDP2	SoC_COME_PCIE4_TXDP2
59	PCIE_HSIO3_TXN3	PCIE_HSIO3_RXN3	COME_SoC_PCIE4_RXDN2	SoC_COME_PCIE4_TXDN2
60	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
61	PCIE_HSIO2_TXP2	PCIE_HSIO2_RXP2	COME_SoC_PCIE4_RXDP3	SoC_COME_PCIE4_TXDP3
62	PCIE_HSIO2_TXN2	PCIE_HSIO2_RXN2	COME_SoC_PCIE4_RXDN3	SoC_COME_PCIE4_TXDN3
63	EC_GPI1	EC_GPO3	GND	GND
64	PCIE_HSIO1_TXP1	PCIE_HSIO1_RXP1	GND	GND
65	PCIE_HSIO1_TXN1	PCIE_HSIO1_RXN1	COME_SoC_PCIE4_RXDP4	SoC_COME_PCIE4_TXDP4
66	GND	WAKE0#_CN	COME_SoC_PCIE4_RXDN4	SoC_COME_PCIE4_TXDN4
67	EC_GPI2	WAKE1#_CN	RAPID_SUTDN	GND
68	PCIE_HSIO0_TXP0	PCIE_HSIO0_RXP0	COME_SoC_PCIE4_RXDP5	SoC_COME_PCIE4_TXDP5
69	PCIE_HSIO0_TXN0	PCIE_HSIO0_RXN0	COME_SoC_PCIE4_RXDN5	SoC_COME_PCIE4_TXDN5
70	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
71	PCIE_HSIO8_TXP8	PCIE_HSIO8_RXP8	COME_SoC_PCIE4_RXDP6	SoC_COME_PCIE4_TXDP6
72	PCIE_HSIO8_TXN8	PCIE_HSIO8_RXN8	COME_SoC_PCIE4_RXDN6	SoC_COME_PCIE4_TXDN6
73	GND	GND	GND	GND

74	PCIE_HSIO9_TXP9	PCIE_HSIO9_RXP9	COME_SoC_PCIE4_RXDP7	SoC_COME_PCIE4_TXDP7
75	PCIE_HSIO9_TXN9-	PCIE_HSIO9_RXN9	COME_SoC_PCIE4_RXDN7	SoC_COME_PCIE4_TXDN7
76	GND	GND	GND	GND
77	PCIE_HSIO10_TXP10	PCIE_HSIO10_RXP10	GND	GND
78	PCIE_HSIO10_TXN10	PCIE_HSIO10_RXN10	COME_SoC_PCIE4_RXDP8	SoC_COME_PCIE4_TXDP8
79	GND	GND	COME_SoC_PCIE4_RXDN8	SoC_COME_PCIE4_TXDN8
80	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
81	PCIE_HSIO11_TXP11	PCIE_HSIO11_RXP11	COME_SoC_PCIE4_RXDP9	SoC_COME_PCIE4_TXDP9
82	PCIE_HSIO11_TXN11	PCIE_HSIO11_RXN11	COME_SoC_PCIE4_RXDN9	SoC_COME_PCIE4_TXDN9
83	GND	GND	GND	GND
84	LAN_NCSI_TXEN	+5VSB	GND	GND
85	EC_GPI3	+5VSB	COME_SoC_PCIE4_RXDP10	SoC_COME_PCIE4_TXDP10
86	NC	+5VSB	COME_SoC_PCIE4_RXDN10	SoC_COME_PCIE4_TXDN10
87	GND	+5VSB	GND	GND
88	COMe_PCIe_GEN3_CLKP	BIOS_DIS1#	COME_SoC_PCIE4_RXDP11	SoC_COME_PCIE4_TXDP11
89	COMe_PCIe_GEN3_CLKN	NCSI_RX_ER_CN	COME_SoC_PCIE4_RXDN11	SoC_COME_PCIE4_TXDN11
90	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
91	SPI_PWR_CN	LAN_NCSI_CLKIN	COME_SoC_PCIE4_RXDP12	SoC_COME_PCIE4_TXDP12
92	COME_SPI_MISO	LAN_NCSI_RXD1	COME_SoC_PCIE4_RXDN12	SoC_COME_PCIE4_TXDN12
93	EC_GPO0	LAN_NCSI_RXD0	GND	GND
94	COME_SPI_CLK	LAN_NCSI_CRS_DV	COME_SoC_PCIE4_RXDP13	SoC_COME_PCIE4_TXDP13
95	COME_SPI_MOSI	LAN_NCSI_TXD1	COME_SoC_PCIE4_RXDN13	SoC_COME_PCIE4_TXDN13
96	TPM_PP	LAN_NCSI_TXD0	GND	GND
97	NC	COME_SPI_CS0#	GND	GND
98	SER0_TX	NCSI_ARB_IN	COME_SoC_PCIE4_RXDP14	SoC_COME_PCIE4_TXDP14
99	SER0_RX	NCSI_ARB_OUT	COME_SoC_PCIE4_RXDN14	SoC_COME_PCIE4_TXDN14

100	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
101	SER1_TX	FAN_PWMOUT_CN	COME_SoC_PCIE4_RXDP15	SoC_COME_PCIE4_TXDP15
102	SER1_RX	FAN_TACHIN_CN	COME_SoC_PCIE4_RXDN15	SoC_COME_PCIE4_TXDN15
103	LID#_CN	SLEEP#_CN	GND	GND
104	+V12_A	+V12_A	+V12_A	+V12_A
105	+V12_A	+V12_A	+V12_A	+V12_A
106	+V12_A	+V12_A	+V12_A	+V12_A
107	+V12_A	+V12_A	+V12_A	+V12_A
108	+V12_A	+V12_A	+V12_A	+V12_A
109	+V12_A	+V12_A	+V12_A	+V12_A
110	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)

Table 8 Pin out Description

6 BIOS Setup Items

PCOM-B705GT is equipped with the AMI BIOS stored in Flash ROM. These BIOS has a built-in setup program that allows users to modify the basic system configuration easily. This type of information is stored in SPI ROM so that it is retained during power-off periods. When system is turned on, PCOM-B705GT communicates with peripheral devices and checks its hardware resources against the configuration information stored in the BIOS. If any error is detected, or the BIOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start up.

6.1   Entering Setup -- Launch System Setup

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

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

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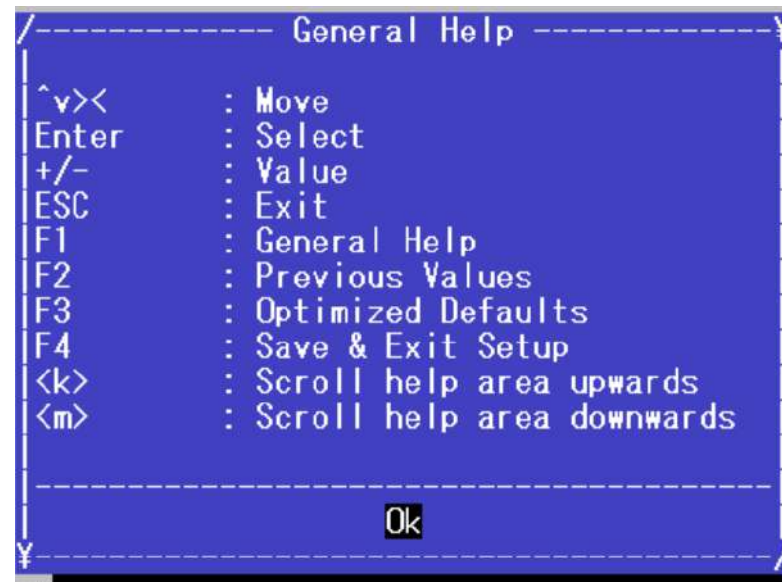
6.2   Main

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

6.3　Configuration

CPU Configuration

```
                        Aptio Setup - AMI
        Configuration
/----------------------------------------------+-----------------------------¥
| CPU Configuration                            |Enables Hyper Threading      |
| Processor 0 Version                          |(Software Method to           |
| Intel(R) Xeon(R) D-1746                       |Enable/Disable Logical        |
| TER CPU @ 2.00GHz                            |Processor threads.            |
|                                              |                              |
| Hyper-Threading [ALL]      [Enable]          |                              |
| SpeedStep (Pstates)        [Enable]          |                              |
| Turbo Mode                 [Enable]          |                              |
| Boot performance mode      [Max Performance] |                              |
| Package C State            [Auto]            |------------------------------|
| CPU Flex Ratio             [Disable]         |><: Select Screen             |
| Override                                     |^v: Select Item               |
| CPU Core Flex Ratio        23                |Enter: Select                 |
|                                              |+/-: Change Opt.              |
|                                              |F1: General Help              |
|                                              |F2: Previous Values           |
|                                              |F3: Optimized Defaults        |
|                                              |F4: Save & Exit               |
|                                              |ESC: Exit█                    |
¥----------------------------------------------+-----------------------------/
                Version 2.22.1286 Copyright (C) 2023 AMI
```

Feature	Description	Options
Hyper-Threading [ALL]	Enables Hyper Threading (Software Method to Enable / Disable Logical Processor threads.)	Disabled, ★Enabled
SpeedStep (Pstates)	Enable/Disable EIST (P-States)	Disabled, ★Enabled
Turbo Mode	Enable/Disable processor Turbo Mode (requires EMTTM enabled too)	Disabled, ★Enabled
Boot performance mode	Select the performance state that the BIOS will set before OS hand off	★Max Performance, Max Eifficient, Set by Intel Node Manager
Package C State	Package C State limit.	C0/C1 state, C2 state, C6(non Retention) state, ★Auto
CPU Flex Ratio Override	Enable/Disable CPU Flex Ratio Programming	★Disabled, Enabled
CPU Core Flex Ratio	Non-Turbo Mode Processor Core Ratio Multiplier	

Chipset Configuration

```
                          Aptio Setup - AMI
         Configuration
/----------------------------------------------+-------------------------¥
| Chipset Configuration                        |Enables or Disables      |
|                                              |64bit capable Devices    |
| Above 4G Decoding          [Enabled]         |to be Decoded in Above   |
|                                              |4G Address Space (Only   |
|                                              |if System Supports 64    |
|                                              |bit PCI Decoding).       |
|                                              |                         |
|                                              |                         |
|                                              |                         |
|                                              |-------------------------|
|                                              |><: Select Screen        |
|                                              |^v: Select Item          |
|                                              |Enter: Select            |
|                                              |+/-: Change Opt.         |
|                                              |F1: General Help         |
|                                              |F2: Previous Values      |
|                                              |F3: Optimized Defaults   |
|                                              |F4: Save & Exit          |
|                                              |ESC: Exit                |
|                                              |                         |
¥----------------------------------------------+-------------------------/
             Version 2.22.1286 Copyright (C) 2023 AMI
```
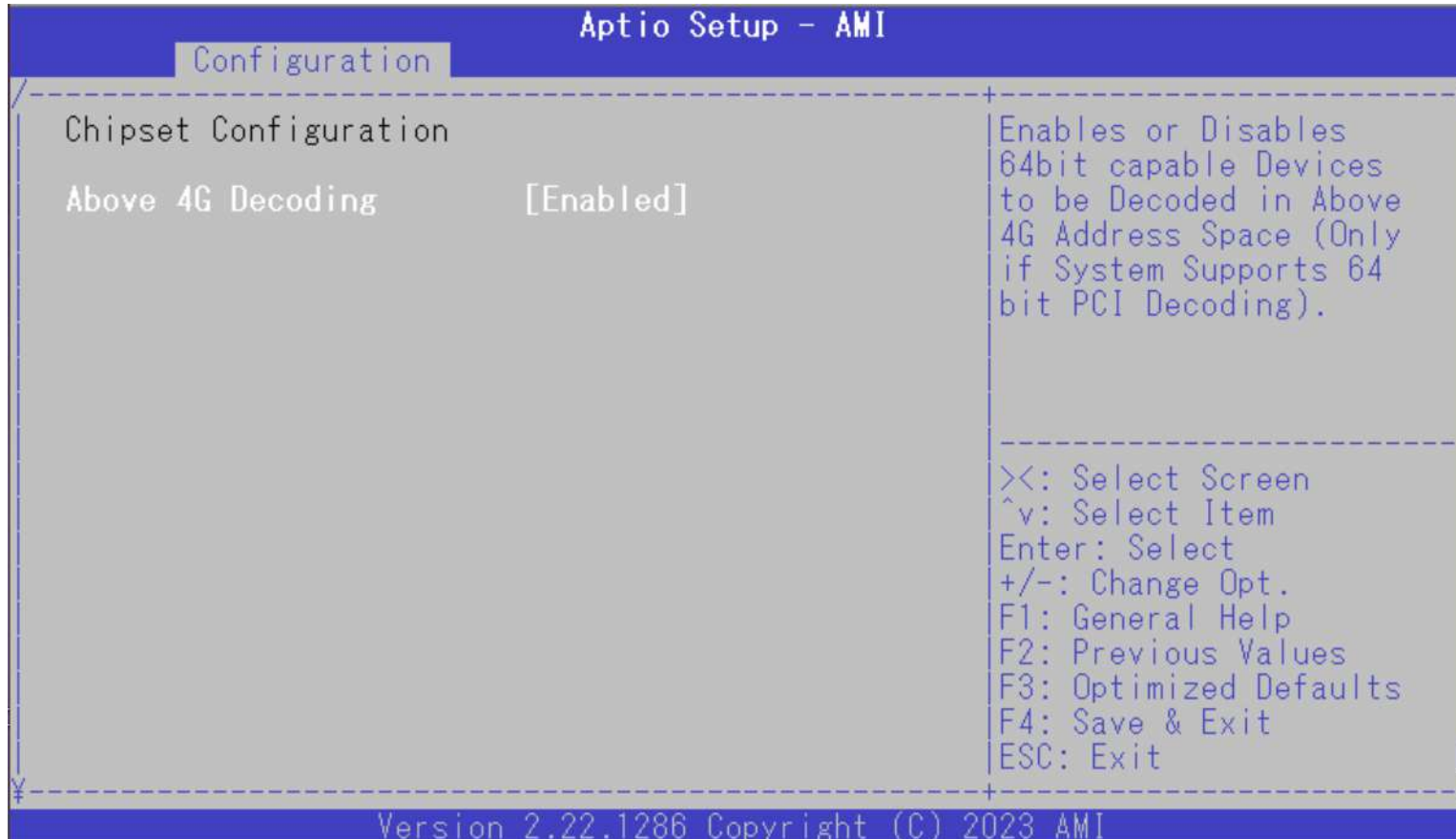
Feature	Description	Options
Above 4G Decoding	Enables or Disables 64bit capable Devices to be Decoded in Above 4G Address Space (Only if System Supports 64 bit PCI Decoding).	Disabled, ★Enabled

LAN Configuration

```
                        Aptio Setup - AMI
     Configuration
/--------------------------------------------------+-----------------------\
| LAN Configuration                                |Control the PCI Express |
|                                                  |Root Port.              |
| Enable I210 LAN          [Enabled]               |                        |
| Controller                                       |                        |
| Intel Ethernet Controller WGI210AT               |                        |
| LAN MAC Address          00-90-FB-7B-80-F8       |                        |
|                                                  |                        |
| Intel Ethernet Controller E823-L                 |                        |
| LAN MAC Address          00-00-00-00-01-00       |                        |
| Intel Ethernet Controller E823-L                 |------------------------|
| LAN MAC Address          00-00-00-00-01-01       |><: Select Screen       |
| Intel Ethernet Controller E823-L                 |^v: Select Item         |
| LAN MAC Address          00-00-00-00-01-02       |Enter: Select           |
| Intel Ethernet Controller E823-L                 |+/-: Change Opt.        |
| LAN MAC Address          00-00-00-00-01-03       |F1: General Help        |
|                                                  |F2: Previous Values     |
|                                                  |F3: Optimized Defaults  |
|                                                  |F4: Save & Exit         |
|                                                  |ESC: Exit               |
\--------------------------------------------------+-----------------------/
             Version 2.22.1286 Copyright (C) 2023 AMI
```

Feature	Description	Options
Enabled I210 LAN Control	**Control the PCI Express Root Port.**	Disabled, ★Enabled

PCI/PCIE Configuration
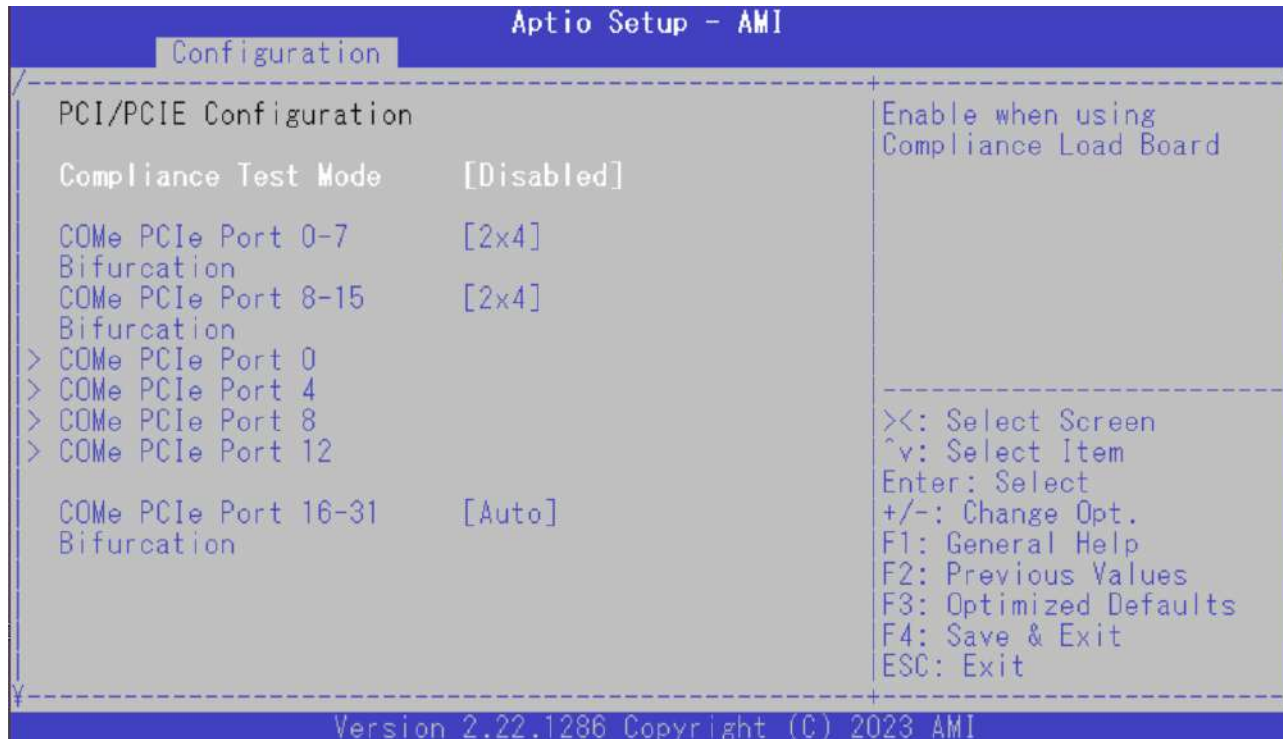
Feature	Description	Options
Compliance Test Mode	Enable when using Compliance Load Board	★Disabled, Enabled
COMe PCIe Port 0-7 Bifurcation	Allows changing PCIE bifurcation	4x2, 1x4 2x2, 2x2 1x4, ★2x4, 1x8
COMe PCIe Port 8-15 Bifurcation	Allows changing PCIE bifurcation	4x2, 1x4 2x2, 2x2 1x4, ★2x4, 1x8
COMe PCIe Port 0/4/8/12	PCI Express Root Port Settings	
COMe PCIe Port 16-31 Bifuration	Selects PCIe port Bifurcation for selected slot(s)	★Auto, x4x4x4x4, x4x4x8, x8x8, x16

➢ **COMe PCIe Port 0/4/8/12**

```
                          Aptio Setup - AMI
       Configuration
/------------------------------------------+----------------------------¥
| COMe PCIe Port 0          [Enabled]       |Control the PCI Express     |
| PCIe Speed                [Gen3]          |Root Port.                  |
|                                           |                            |
|                                           |                            |
|                                           |                            |
|                                           |                            |
|                                           |                            |
|                                           | -------------------------- |
|                                           |><: Select Screen           |
|                                           |^v: Select Item             |
|                                           |Enter: Select               |
|                                           |+/-: Change Opt.            |
|                                           |F1: General Help            |
|                                           |F2: Previous Values         |
|                                           |F3: Optimized Defaults      |
|                                           |F4: Save & Exit             |
|                                           |ESC: Exit                   |
¥------------------------------------------+----------------------------/
           Version 2.22.1286 Copyright (C) 2023 AMI
```
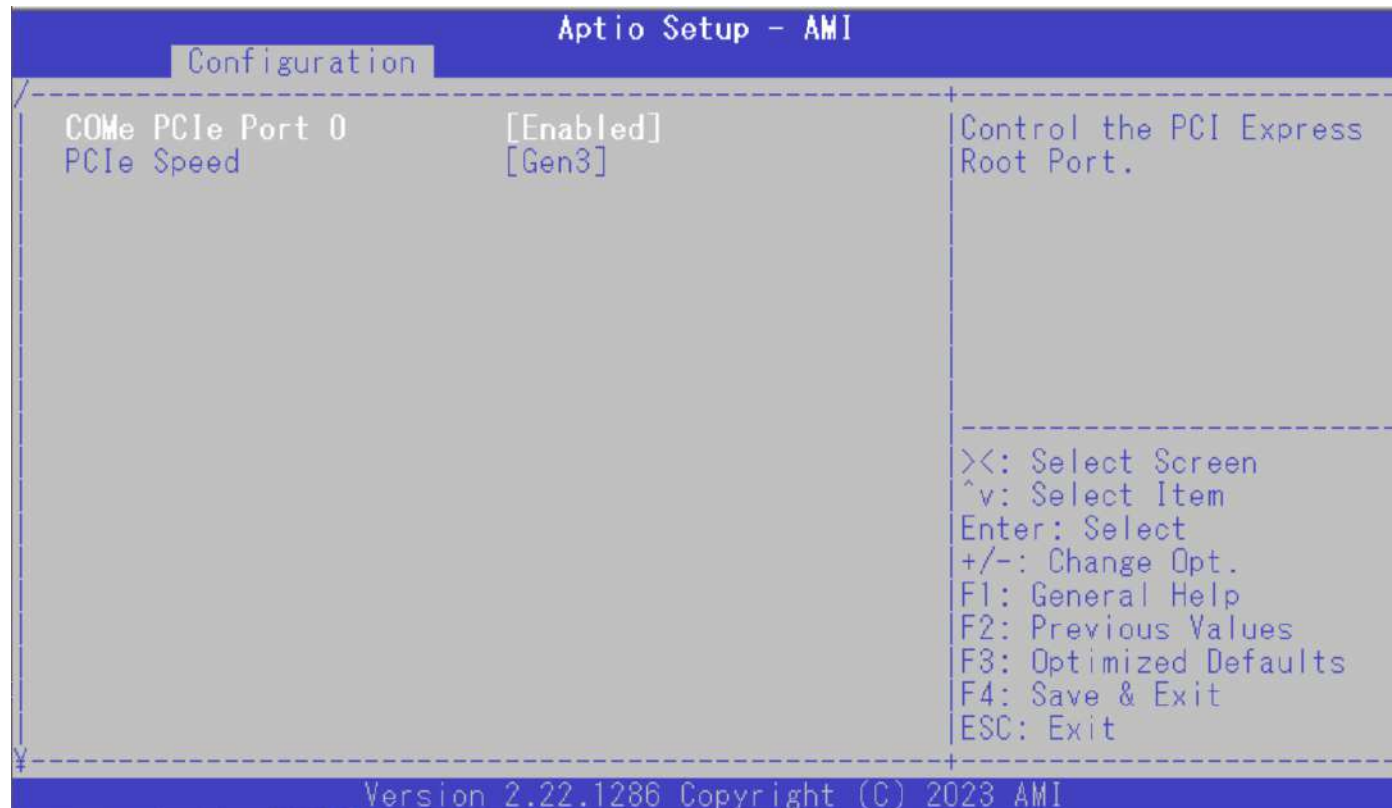
Feature	Description	Options
COMe PCIe Port 0/4/8/12	Control the PCI Express Root Port	Disabled, ★Enabled
PCIe Speed	Configure PCIe Speed Auto is equal to Gen2 or Gen3 depending on DTR soft strap	Gen1, Gen2, ★Gen3

➢ **COMe PCIe Port 16~31**

```
                          Aptio Setup - AMI
        Configuration
/--------------------------------------------+------------------------¥
| PCI-E Port              [Auto]              |In auto mode the BIOS  ^|
| Link Speed              [Auto]              |will remove the EXP    *|
| PCI-E Port Link Status  Link Did Not Train  |port if there is no    *|
| PCI-E Port Link Max     Max Width x16       |device or errors on    *|
| PCI-E Port Link Speed   Link Did Not Train  |that device and the    *|
|                                             |device is not HP       +|
|                                             |capable.               +|
|                                             |Enable/Disable is used v|
|                                             |                        |
|                                             |------------------------|
|                                             |><: Select Screen       |
|                                             |^v: Select Item         |
|                                             |Enter: Select           |
|                                             |+/-: Change Opt.        |
|                                             |F1: General Help        |
|                                             |F2: Previous Values     |
|                                             |F3: Optimized Defaults  |
|                                             |F4: Save & Exit         |
|                                             |ESC: Exit█              |
¥--------------------------------------------+------------------------/
           Version 2.22.1286 Copyright (C) 2023 AMI
```

Feature	Description	Options
PCI-E Port	In auto mode the BIOS will remove the EXP port if there is no device or errors on that device and the device is not HP capable. Enable/Disable is used to enable/disable the port and expose/hide its CFG space.	★Auto, Disabled, Enabled
Link Speed	Choose Link Speed for this PCIe port.	★Auto Gen 1 (2.5 GT/s), Gen 2 (5 GT/s), Gen 3 (8 GT/s), Gen 4 (16 GT/s)

SATA Configuration

```
                        Aptio Setup - AMI
      Configuration
/-----------------------------------------+-----------------------------¥
| SATA Configuration                      |Enable or Disable SATA       |
|                                         |Port                         |
| Serial ATA Port 1      [Not Installed]  |                             |
|                                         |                             |
| Serial ATA Port 2      [Not Installed]  |                             |
|                                         |                             |
|  Port 0                [Enabled]        |                             |
|  Port 1                [Enabled]        |                             |
|                                         |                             |
|                                         |                             |
|                                         |-----------------------------|
|                                         |><: Select Screen            |
|                                         |^v: Select Item              |
|                                         |Enter: Select                |
|                                         |+/-: Change Opt.             |
|                                         |F1: General Help             |
|                                         |F2: Previous Values          |
|                                         |F3: Optimized Defaults       |
|                                         |F4: Save & Exit              |
|                                         |ESC: Exit                    |
¥-----------------------------------------+-----------------------------/
            Version 2.22.1286 Copyright (C) 2023 AMI
```
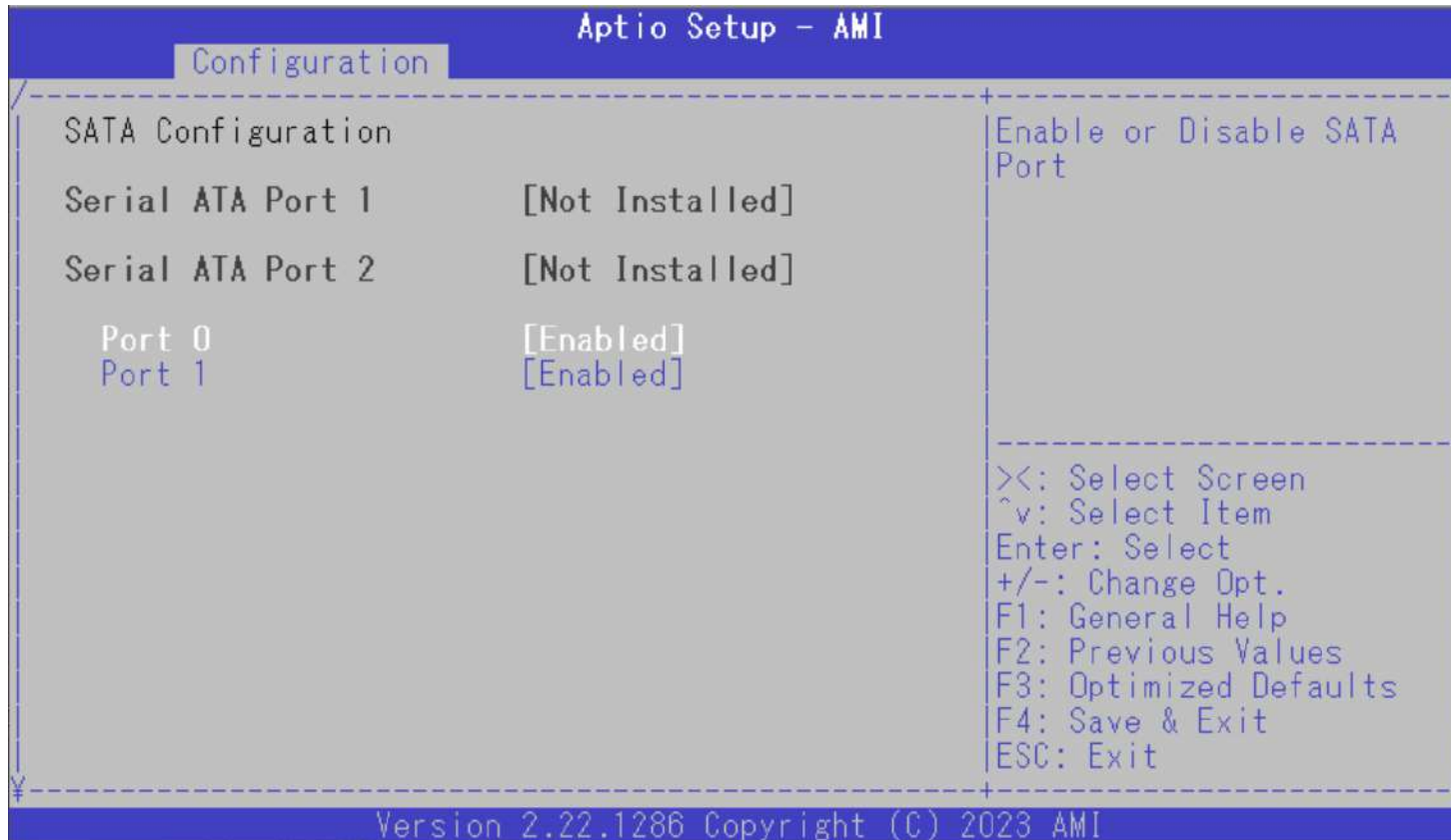
Feature	Description	Options
Port 0	Enabled or Disabled SATA Port	Disabled, ★Enabled
Port 1	Enabled or Disabled SATA Port	Disabled, ★Enabled

USB Configuration

```
                        Aptio Setup - AMI
       Configuration
/------------------------------------------------+-----------------------¥
| USB Configuration                              ^|Enables Legacy USB     |
|                                                *|support. AUTO option   |
| USB Controllers:                               *|disables legacy support|
|      1 XHCI                                     *|if no USB devices are  |
| USB Devices:                                   *|connected. DISABLE     |
|      1 Keyboard                                 *|option will keep USB   |
|                                                *|devices available only |
| Legacy USB Support         [Enabled]           *|for EFI applications.  |
| XHCI Hand-off              [Enabled]           *|                       |
| USB Mass Storage           [Enabled]           *|-----------------------|
| Driver Support                                 *|><: Select Screen      |
|                                                *|^v: Select Item        |
| USB hardware delays                            *|Enter: Select          |
| and time-outs:                                 *|+/-: Change Opt.       |
| USB transfer time-out      [20 sec]            *|F1: General Help       |
| Device reset time-out      [20 sec]            *|F2: Previous Values    |
| Device power-up delay      [Auto]              +|F3: Optimized Defaults |
|                                                v|F4: Save & Exit        |
|                                                 |ESC: Exit              |
¥------------------------------------------------+-----------------------/
             Version 2.22.1286 Copyright (C) 2023 AMI
```

Feature	Description	Options
Legacy USB Support	Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected.	★Enabled , Disabled, Auto
XHCI Hand-off	This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver	Disabled, ★Enabled
USB Mass Storage Driver Support	Enable/Disable USB Mass Storage Driver Support	Disabled, ★Enabled
USB transfer time-out	The time-out value for Control, Bulk, and Interrupt transfers.	1, 5, 10, ★20 sec
Device reset time-out	USB mass storage device Start Unit command time-out.	10, ★20, 30, 40 sec
Device power-up delay	Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken.	★Auto, Manual

Power Control Configuration
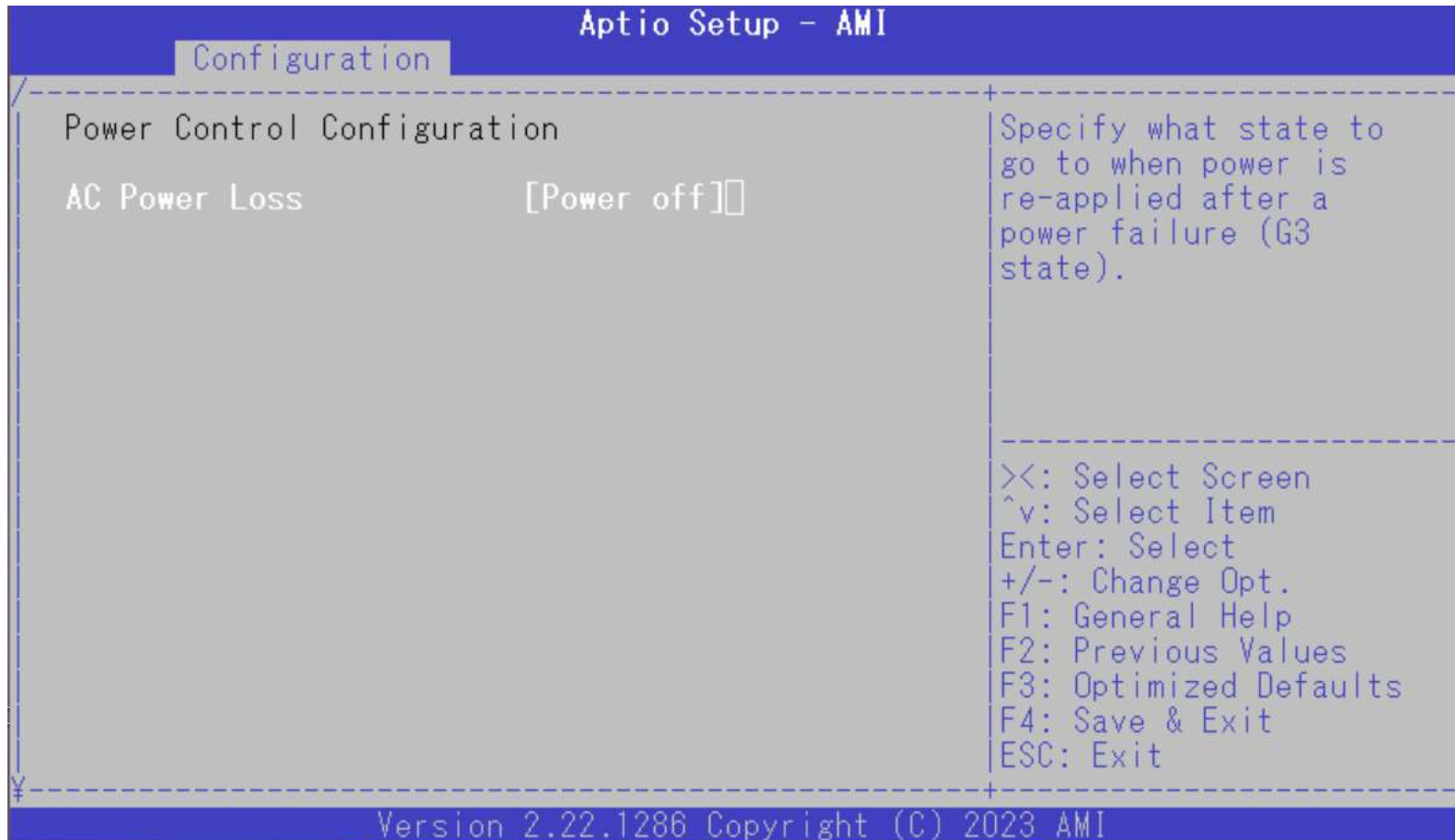
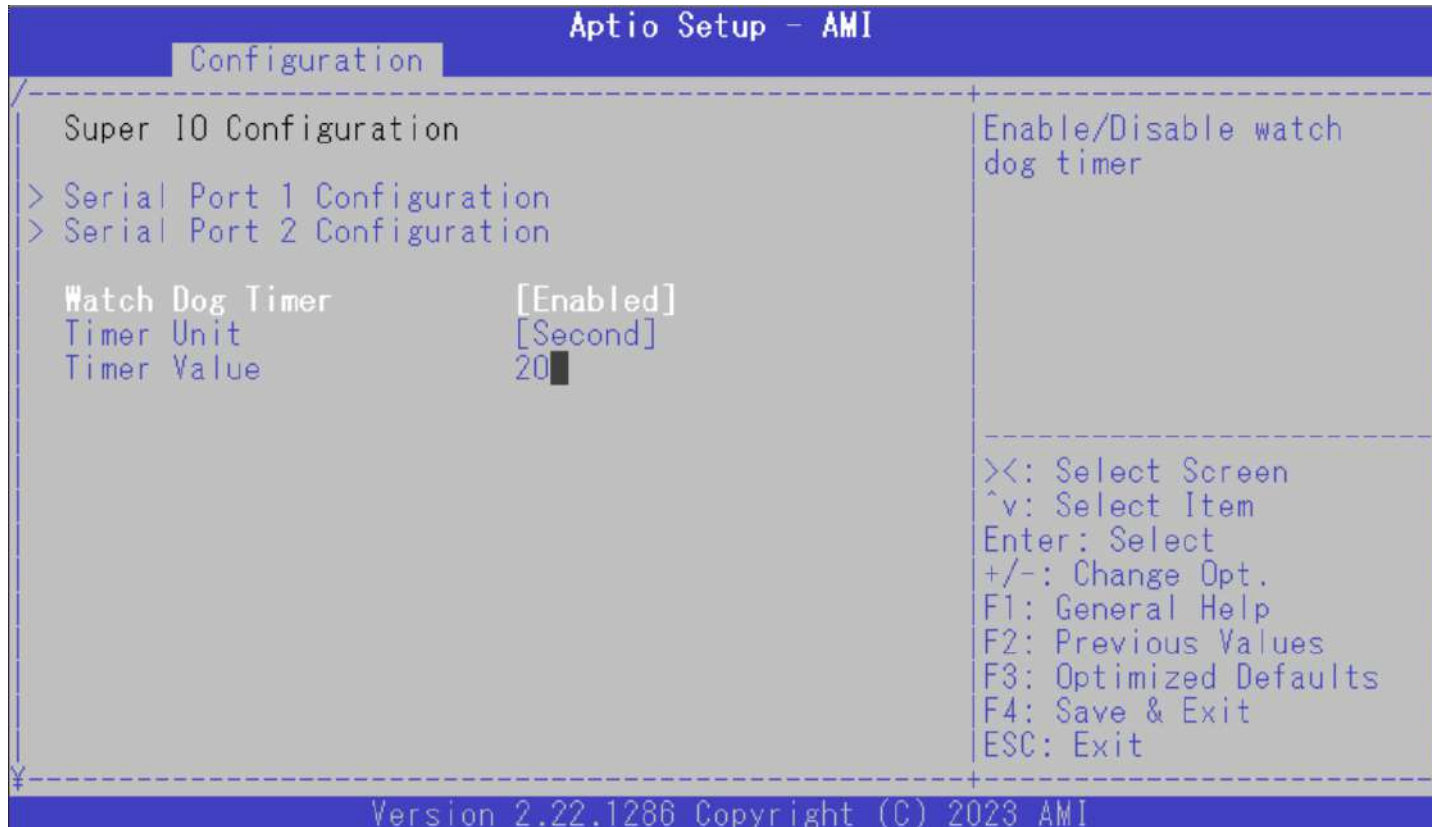| Feature	Description	Options
AC Power Loss	Specify what state to go to when power is re-applied after a power failure (G3 state)	Power On, ★Power Off

TPM Configuration

Feature	Description	Options
TPM v1.2 Support	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A Interface will not be available.	★Enabled, Disabled
SHA256 PCR Bank	Enable or Disable SHA256 PCR Bank.	Disabled, ★Enabled
Pending operation	Schedule an Operation for the Security Device. NOTE: Your Computer will reboot during restart in order to change State of Security Device	★None, TPM Clear
Platform Hierarchy	Enable or Disable Platform Hierarchy.	Disabled, ★Enabled
Storage Hierarchy	Enable or Disable Storage Hierarchy	Disabled, ★Enabled
Endorsement Hierarchy	Enable or Disable Endorsement Hierarchy.	Disabled, ★Enabled
TPM 2.0 UEFI Spec Version	Select the TCG2 Spec Version Support, TCG_1_2: the Compatible mode for Win8/Win10, TCG_2: Support new TCG2 protocol and event format for Win10 or later.	TCG_1_2, ★TCG_2
Physical Presence Spec Version	Select to Tell O.S. to support PPI Spec Version 1.2 or 1.3. Note some HCK tests might not support 1.3	1.2, ★1.3
Device Select	TPM 1.2 will restrict support to TPM 1.2 devices, TPM 2.0 will restrict support to TPM 2.0 devices, Auto will support both with the default set to TPM 2.0 devices if not found, TPM 1.2 devices will be enumerated.	TPM 1.2, TPM 2.0, ★Auto

Super IO Configuration

Feature	Description	Options
Watch Dog Timer	Enable/Disable Watch Dog Timer	★Disabled, Enabled
Timer Unit	Select Timer count unit of WDT [Watch Dog Timer [Enabled]]	★Second, Minute
Timer value	Set WDT Timer value seconds / minutes [Watch Dog Timer [Enabled]]	★20

➤ **Serial Port 1 Configuration**

```
                         Aptio Setup - AMI
      Configuration
/--------------------------------------+-----------------------¥
| Serial Port 1 Configuration          |Enable or Disable      |
|                                      |Serial Port (COM)      |
| Module Serial Port 1    [Enabled]    |                       |
| Current Limit Override  IO=3F8h; IRQ=4;|                     |
|                                      |                       |
| Change Settings         [Auto]       |                       |
|                                      |                       |
|                                      |                       |
|                                      |                       |
|                                      |                       |
|                                      | ----------------------|
|                                      |><: Select Screen      |
|                                      |^v: Select Item        |
|                                      |Enter: Select          |
|                                      |+/-: Change Opt.       |
|                                      |F1: General Help       |
|                                      |F2: Previous Values    |
|                                      |F3: Optimized Defaults |
|                                      |F4: Save & Exit        |
|                                      |ESC: Exit              |
¥--------------------------------------+-----------------------/
              Version 2.22.1286 Copyright (C) 2023 AMI
```

Feature	Description	Options
Module Serial Port 1	Enable or Disable Serial Port (COM)	★Enabled, Disabled
Change Settings	Select an optimal settings for Super IO Device	★Auto ,IO=3F8h; IRQ=4; IO=3F8h; IRQ=3,4,10,11; IO=2F8h; IRQ=3,4,10,11; IO=3E8h; IRQ=3,4,10,11; IO=2E8h; IRQ=3,4,10,11;

➢ **Serial Port 2 Configuration**

```
                        Aptio Setup - AMI
        Configuration
/--------------------------------------------+-----------------------¥
| Serial Port 2 Configuration                |Enable or Disable      |
|                                            |Serial Port (COM)      |
| Module Serial Port 2     [Enabled]         |                       |
| Current Limit Override   IO=3E8h; IRQ=3;   |                       |
|                                            |                       |
| Change Settings          [Auto]            |                       |
|                                            |                       |
|                                            |                       |
|                                            |                       |
|                                            |                       |
|                                            |-----------------------|
|                                            |><: Select Screen      |
|                                            |^v: Select Item        |
|                                            |Enter: Select          |
|                                            |+/-: Change Opt.       |
|                                            |F1: General Help       |
|                                            |F2: Previous Values    |
|                                            |F3: Optimized Defaults |
|                                            |F4: Save & Exit        |
|                                            |ESC: Exit              |
|                                            |                       |
¥--------------------------------------------+-----------------------/
              Version 2.22.1286 Copyright (C) 2023 AMI
```

Feature	Description	Options
Module Serial Port 2	Enable or Disable Serial Port (COM)	★Enabled, Disabled
Change Settings	Select an optimal settings for Super IO Device	★Auto ,IO=3E8h; IRQ=3; IO=3F8h; IRQ=3,4,10,11; IO=2F8h; IRQ=3,4,10,11; IO=3E8h; IRQ=3,4,10,11; IO=2E8h; IRQ=3,4,10,11;

H/W Monitor

```
Aptio Setup Utility - Copyright (C) 2021 American Megatrends, Inc.
 Configuration


CPU temperature          : +36 °C


Fan1 Speed               : 6738 RPM


Vcore                    : +1.824 V
+3.3V                    : +3.360 V
+5V                      : +5.107 V
+12V                     : +12.513 V
VDIMM                    : +1.242 V


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


       Version 2.20.1271. Copyright (C) 2021 American Megatrends, Inc.
```

Serial Port Console Redirection
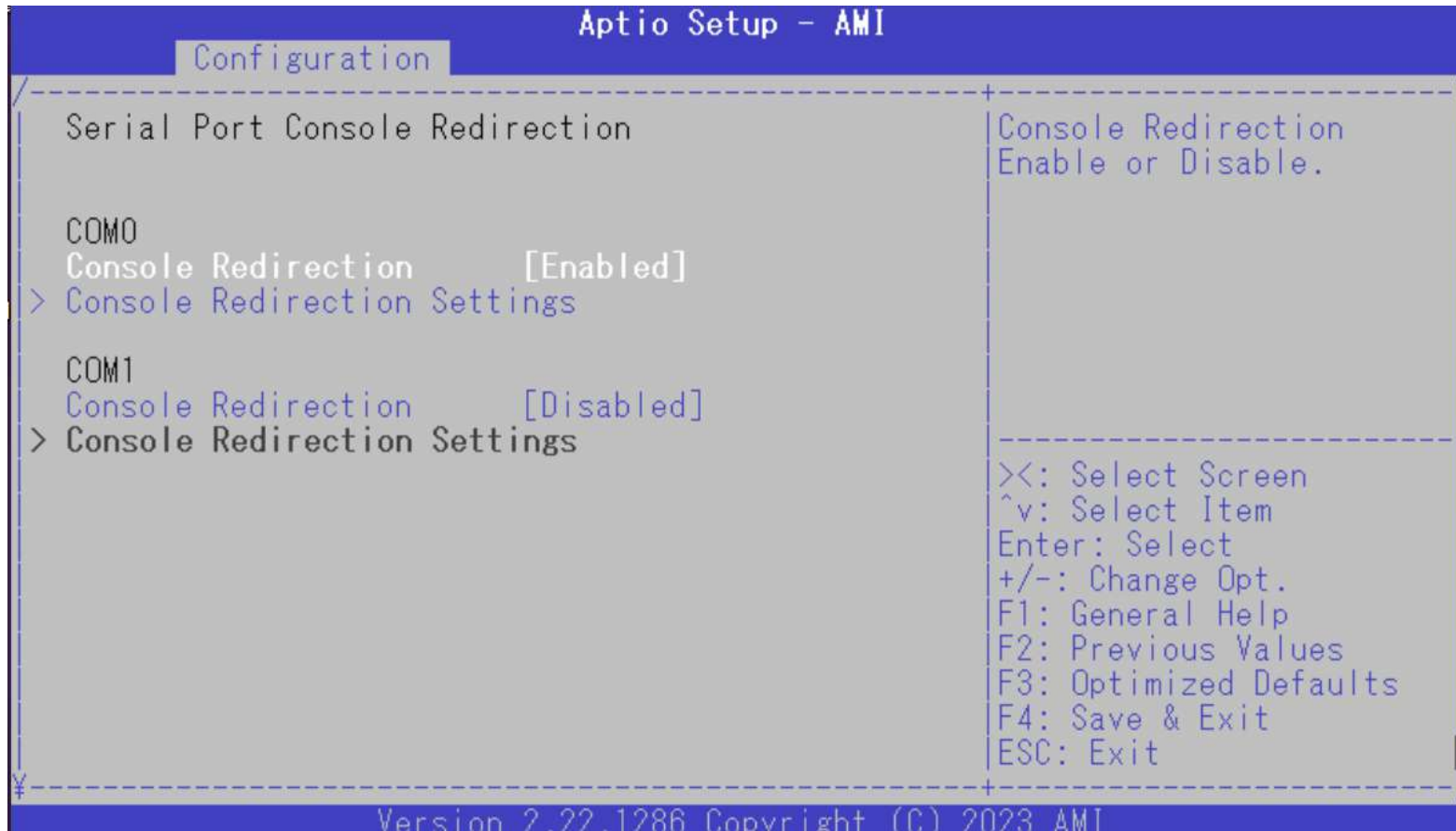
Feature	Description	Options
COM0 Console Redirection	Console Redirection Enable or Disable	Disabled, ★Enabled
COM1 Console Redirection	Console Redirection Enable or Disable	★Disabled, Enabled

➢ **Console Redirection Settings**

Feature	Description	Options
Terminal Type	Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color , function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.	★VT100+, VT100, ANSI, VT-UTF8
Bits per second	Select Serial port transmission speed. The speed must be matched on other side. Long or noisy lines may require lower speeds.	★115200, 9600, 19200, 38400, 57600
Data bits	Data bits	★8, 7
Parity	A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if num of 1's in the data bits is odd. Mark: parity bit is always 1. Space parity bit is always 0. Mark and Space Parity do not allow for error detection. They can be used as an additional data bit.	★None, Even, Odd, Mark, Space
Stop Bits	Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.	★1,2
Flow Control	Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signal.	★None, Hardware RTS/CTS
VT-UTF8 Combo Key Support	Enable VT-UTF8 Combination Key Support for ANSI / VT100 terminals	★Enabled, Disabled
Recorder Mode	With this mode enabled only text will be sent. This is to capture Terminal data.	★Disabled, Enabled
Resolution 100x31	Enables or disables extended terminal resolution	★Disabled, Enabled
Putty KeyPad	Select Function Key and KeyPad on Putty.	★VT100, LINUX, XTERMR6, SCO, ESCN, VT400

EC Firmware Update

```
                          Aptio Setup - AMI
         Configuration
/-------------------------------------------------+-----------------------------\
| EC Firmware Update                              |Select ROM image             |
|                                                 |                             |
| EC Model Name          705-PWG                  |                             |
| EC Version & Build     0.4 (05/22/2023)         |                             |
| Date                                            |                             |
|                                                 |                             |
|> Select File                                    |                             |
| Select File Name       N/A                      |                             |
|> Update                                         |                             |
|                                                 |-----------------------------|
|                                                 |><: Select Screen            |
|                                                 |^v: Select Item              |
|                                                 |Enter: Select                |
|                                                 |+/-: Change Opt.             |
|                                                 |F1: General Help             |
|                                                 |F2: Previous Values          |
|                                                 |F3: Optimized Defaults       |
|                                                 |F4: Save & Exit              |
|                                                 |ESC: Exit                    |
\-------------------------------------------------+-----------------------------/
            Version 2.22.1286 Copyright (C) 2023 AMI
```

6.4   Security

Feature	Description	Options
Password Check Mode	[Setup] check password when enter setup screen. [Power on] check password on every time system power on.	★Setup, Power On
Administrator Password	Set Administrator Password	

➢ **Secure Boot**
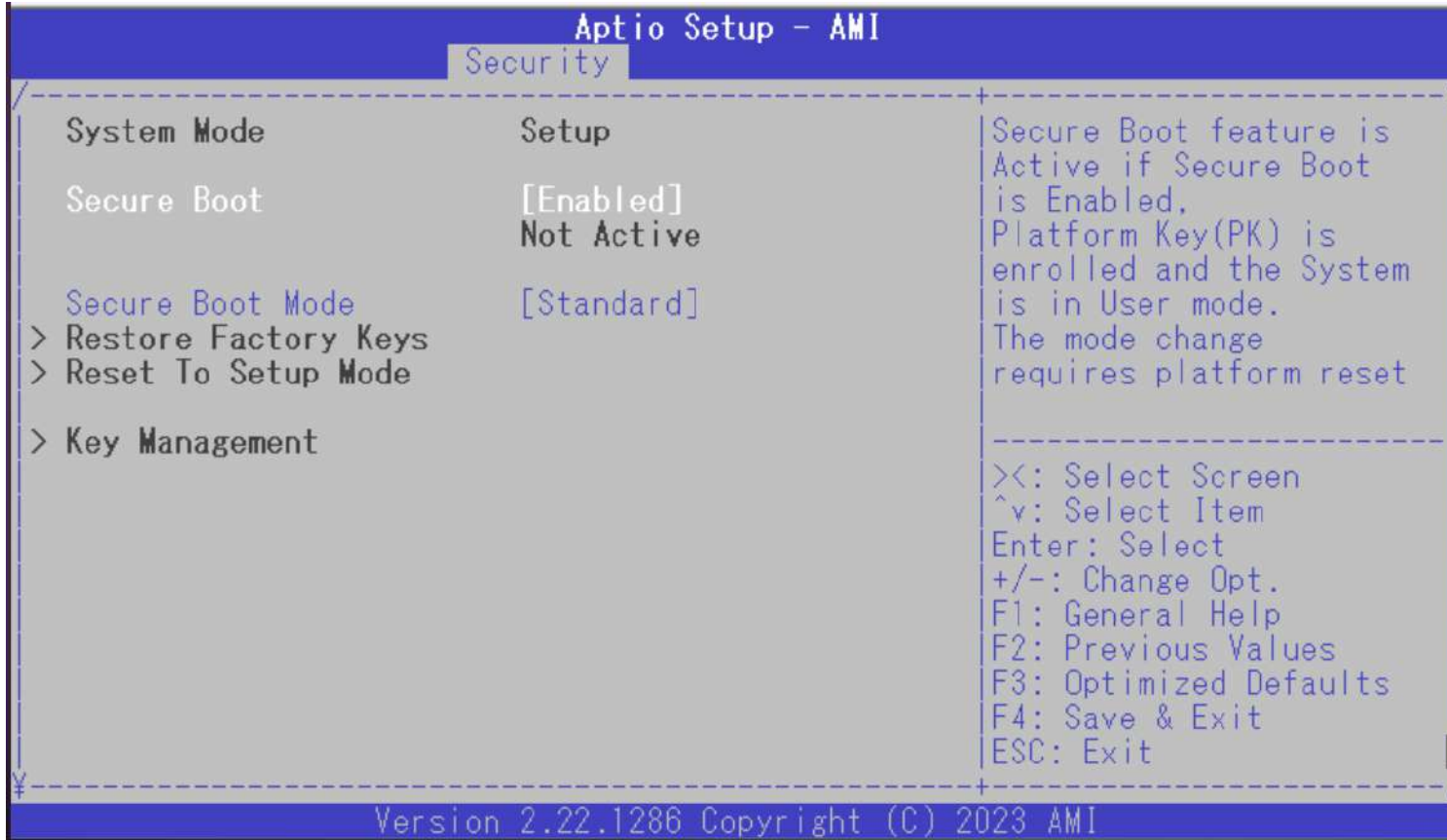
Feature	Description	Options
Secure Boot	Secure Boot feature is Active if Secure Boot is Enable, Platform Key(PK) is enrolled and the System is in User mode. The mode change requires platform reset	Disabled, ★Enabled
Secure Boot Mode	Secure Boot mode options: Standard or Custom. In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full	★Standard, Custom

6.5 Boot
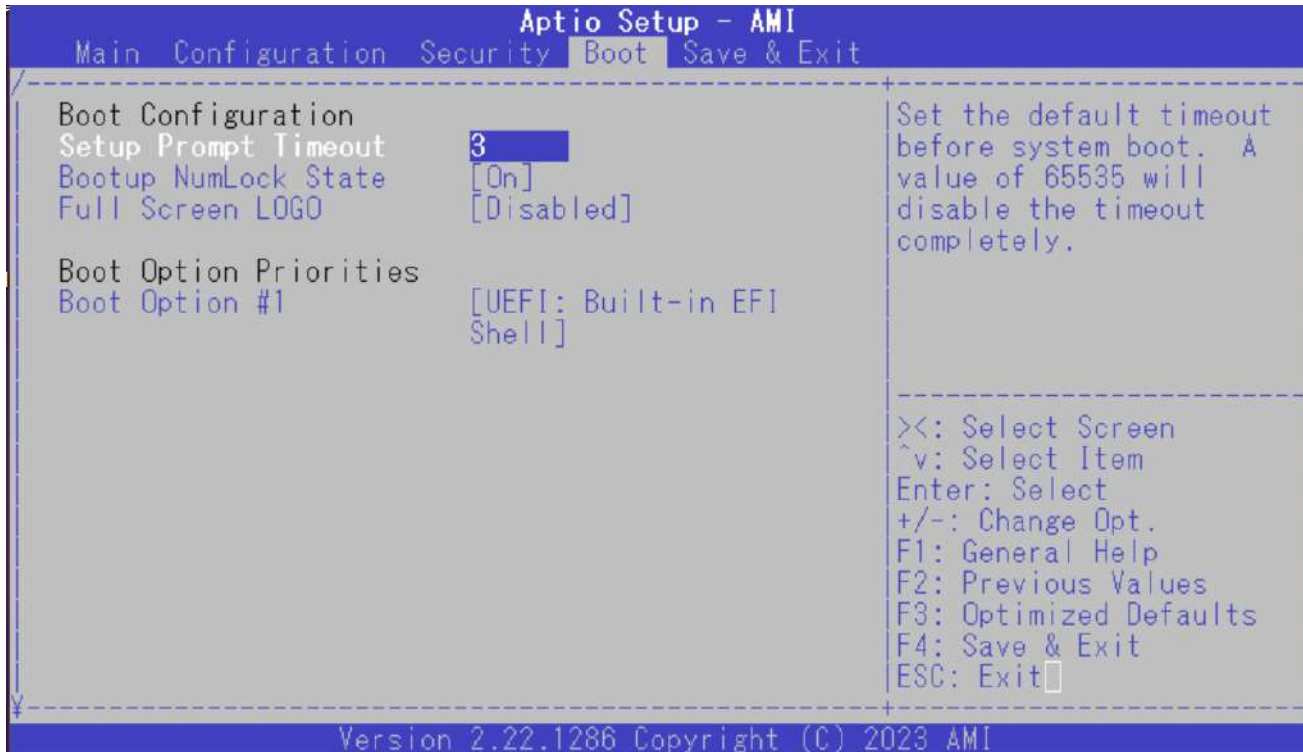
Feature	Description	Options
Setup Prompt Timeout	Set the default timeout before system boot. A value of 65535 will disable the timeout completely.	★3
Bootup NumLock State	Select the keyboard NumLock state.	★On, Off
Full Screen LOGO	Enables or disables Quiet Boot option and Full screen Logo.	★Disabled, Enabled
Boot Option #	Sets the system boot order	UEFI: Built-in EFI Shell Disabled

6.6　Save & Exit
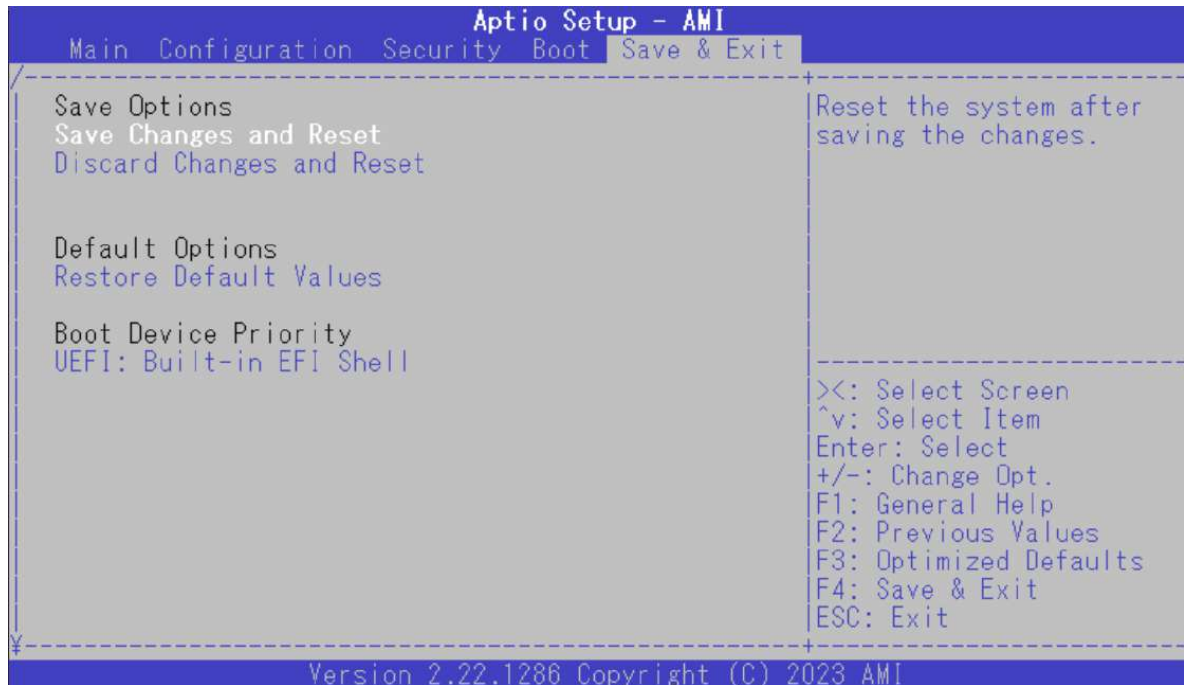
Feature	Description	Options
Save Changes and Reset	Reset the system after saving the changes.	
Restore Defaults Values	Restore/Load Default values for all the setup options.	
UEFI: Built-in EFI Shell	Reset the system after saving the changes. (Boot option filter: UEFI only)	

7   System Resources

LPC

Device	I/O Address	Note
Embedded Controller	0x6E / 0x6F	EC Address
	0x62 / 0x66	EC ACPI CMD Port
	0x200 / 0x201	EC BRAM Port for I2C function
	0x300~0x3FF	EC LPC IO Space
	0x3F8~0x3FF	EC UART1
	0x3E8~0x3EF	EC UART2
Carrier SIO	N/A	

SMBUS

SMBUS Address	Information
0x44	SMBus ARP
0x6C	PCIe Clock Buffer
0x10 / 0x12 / 0x16 / 0x48	Reserved

Table 9 System Resources

8 BIOS/EC Update

PCOM-B705GT only support BIOS/EC update under UEFI shell environment, refer the following step, please.

Step 1. The switch need to set on "on"
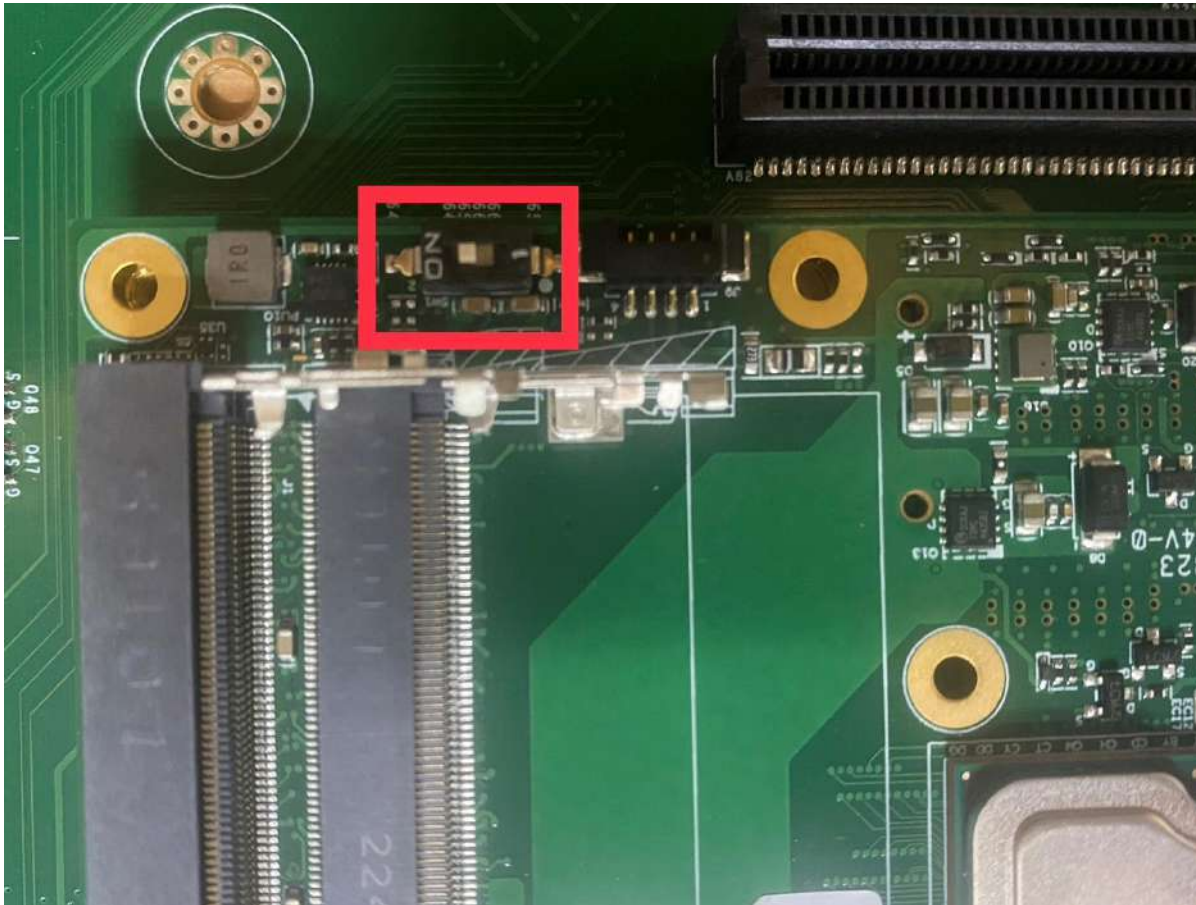
Step 2. Unzip update file to the USB DOK (USB DOK must be FAT or FAT32 format)

Step 3. Plug the USB DOK on the target system and boot from UEFI shell

Step 4. Under the UEFI shell, change prompt to your USB DOK, the below example is " **fs0:** "

Step 5. Then change the folder with updated file and use command: " **update** " and press enter

```
EFI Shell version 2.80 [5.28]
Current running mode 1.1.2
Device mapping table
  fs0        :Removable HardDisk - Alias hd35h0b blk0
             PciRoot(0x0)/Pci(0x1E,0x0)/USB(0x7,0x0)/HD(1,MBR,0xF87AA5B3,0x20,0x3A
1FFE0)
  blk0       :Removable HardDisk - Alias hd35h0b fs0
             PciRoot(0x0)/Pci(0x1E,0x0)/USB(0x7,0x0)/HD(1,MBR,0xF87AA5B3,0x20,0x3A
1FFE0)
  blk1       :Removable BlockDevice - Alias (null)
             PciRoot(0x0)/Pci(0x1E,0x0)/USB(0x7,0x0)

Press ESC in 5 seconds to skip startup.nsh, any other key to continue.
Shell> fs0:

fs0:\> cd PCOM-B705GT

fs0:\PCOM-B705GT> Update.efi
```
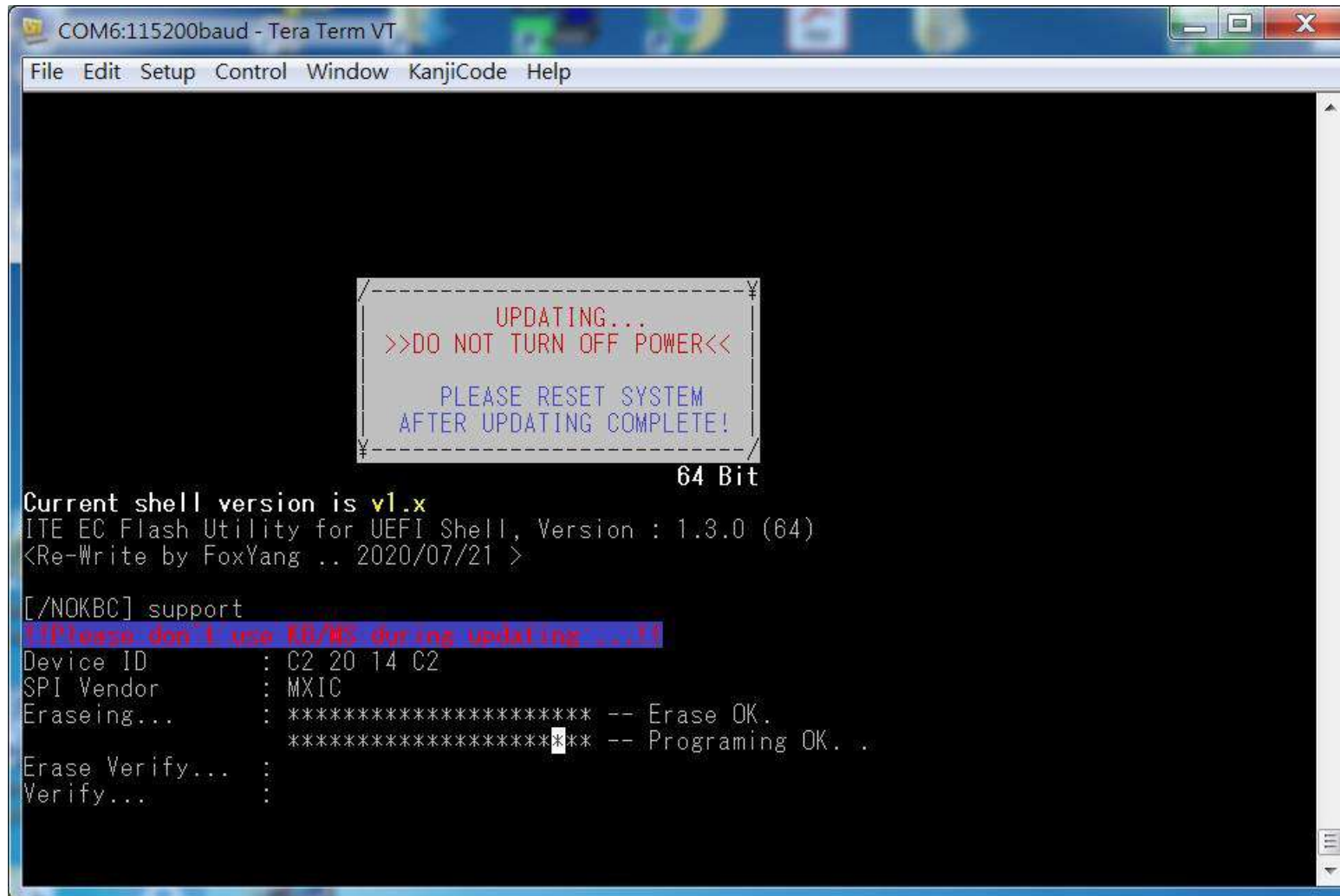
Step 6. The updating process will start and show the updating progress

Step 7. Please power off and restart the system once updating finished

(BIOS updating progress)

(EC updating progress)

9   PORTWELL Software Tool

PORTWELL Download Center

https://www.portwell.com.tw/support-center/download-center/

PORTWELL Evaluation Tool (PET)

The PORTWELL Evaluation Tool (PET) is an API which PORTWELL's customers can access the GPIO, I2C, SMBus, etc under Windows and Linux OS. For further information please contact PORTWELL.

10   Packaging Information

PCOM-B700G-NS's packaging specification will follow the Portwell standard style.

Package	Appearance	Size
Anti-Static bubble bag		180x130mm
White Paper Box		210x150x40mm
Shipping Box (10 pcs White paper box)		595x300x185mm

Table 10 Packaging information

11   Industry Specifications

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

Low Pin Count Interface Specification, Revision 1.0 (LPC) http://www.intel.com/design/chipsets/industry/lpc.htm
Universal Serial Bus (USB) Specification, Revision 2.0 http://www.usb.org/home
PCI Specification, Revision 2.3 https://www.pcisig.com/specifications
Serial ATA Specification, Revision 3.0 http://www.serialata.org/
PICMG® COM Express Module™ Base Specification http://www.picmg.org/
PCI Express Base Specification, Revision 2.0 https://www.pcisig.com/specifications