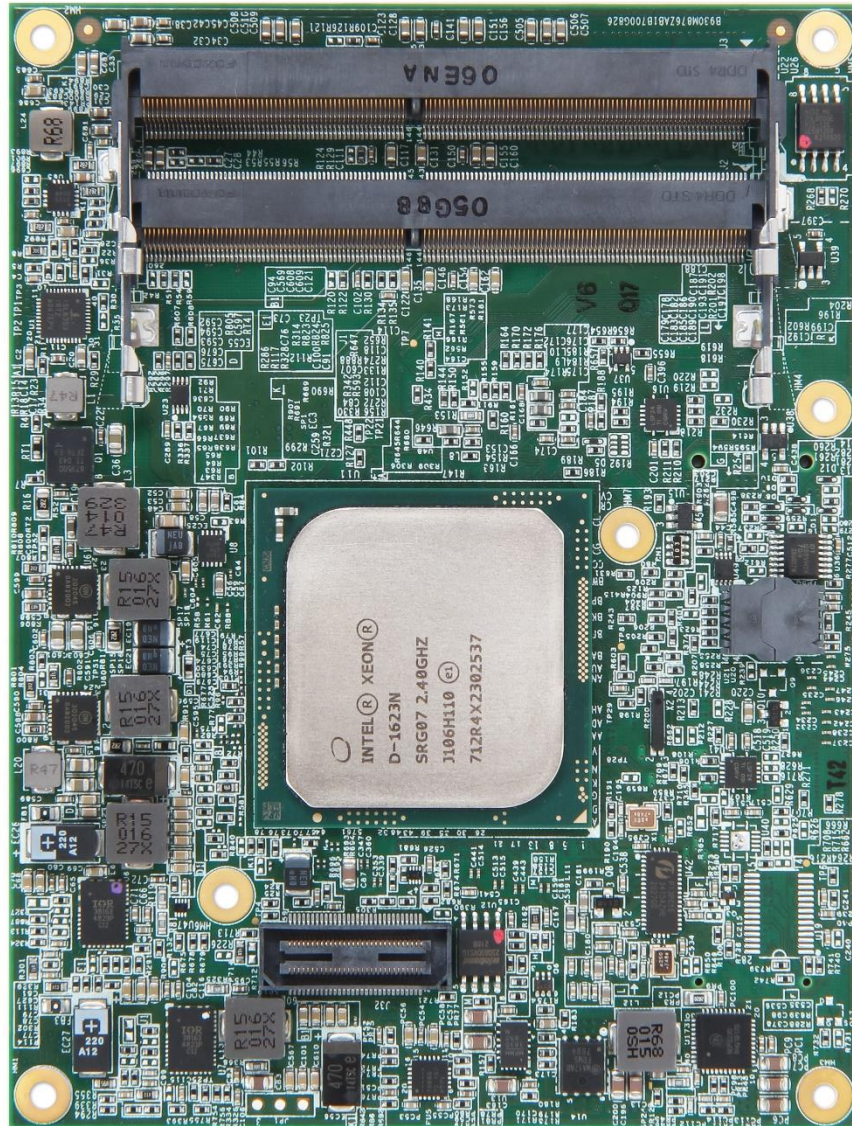




COM Express™

PCOM-B700G-NS

User's Guide R0.2

Revision History

Rev.	Note	Date
R0.1	Preliminary	2021 / 10 / 29
R0.2	Correct typo	2022 / 02 / 15

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1 Introduction

PCOM-B700G-NS, a Type 7 COM Express® basic size(125 x 95 mm) module which based on Intel® Hewitt Lake Xeon® D-1600 series processors. In this architecture, it could provide up to 8 cores and up to 16 threads processors within the TDP from 35w to 45w, and 4x 10G KR ports and up to 30 Gbps of cryptography offload with Intel® QuickAssist Technology (Intel® QAT), it's also extending 24x PCIe 3.0 and 8x PCIe 2.0 lanes, 4x USB 3.2 Gen1, and 2x SATA III ports. A selected SKU support wide-temperature range.

PCOM-B700G-NS offer an effective upgrade path for solutions already using the previous D-1500 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-B700G-NS SKU List

Series	PCOM-B700G-NS			
Ordering P/N	AB1-3K99	AB1-3L02Z	AB1-3L00	AB1-3L01
<u>CPU Specifications</u>				
Processor	D-1649N	D-1633N	D-1623N	D-1627
# of Cores	8	6	4	4
# of Threads	16	12	8	8
Cache	12 MB	9 MB	6 MB	6 MB
Base Frequency	2.3 GHz	2.5 GHz	2.4 GHz	2.9 GHz
Turbo Frequency	3.0 GHz	3.2 GHz	3.2 GHz	3.2 GHz
TDP	45 W	45 W	35 W	45 W
<u>Memory Specifications</u>				
Capacity	3x SO-DIMM (96GB)	3x SO-DIMM (96GB)	3x SO-DIMM (96GB)	3x SO-DIMM (96GB)
Speed	2133 Mhz	2133 Mhz	1866 Mhz	2133 Mhz
ECC	Yes	Yes	Yes	Yes
<u>I/O Specifications</u>				
PCIe	24x PCIe 3.0 8x PCIe 2.0	24x PCIe 3.0 8x PCIe 2.0	24x PCIe 3.0 8x PCIe 2.0	24x PCIe 3.0 8x PCIe 2.0
USB 3.0/2.0	4x	4x	4x	4x
SATA	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

Table 1 PCOM-B700G-NS SKU

2 Block Diagram

PCOM-B700G-NS

COM Express® Type 7
Basic Size 125x95mm

AT / ATX Mode

-40° C ~ +85° C
(Selected SKUs)

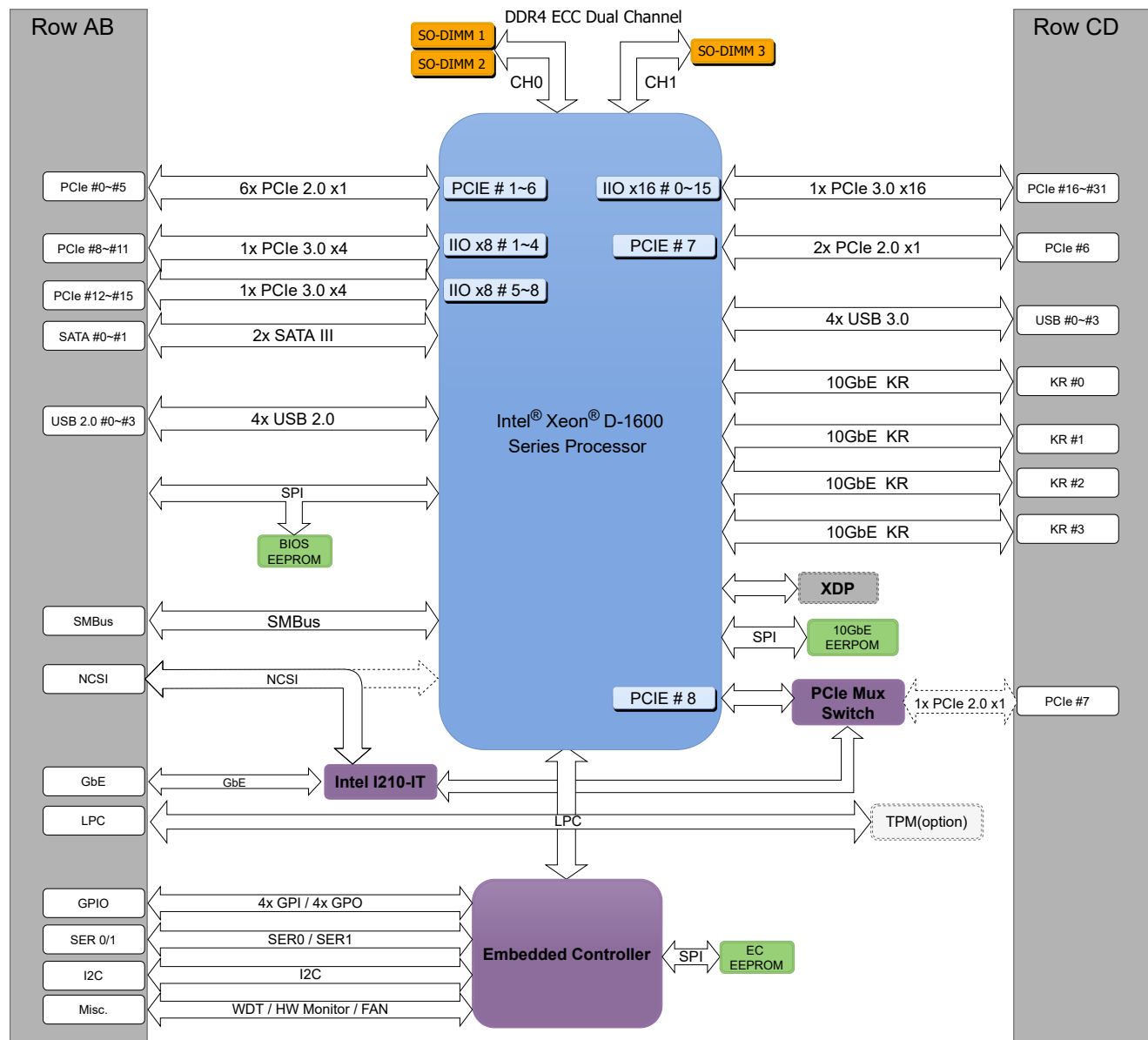


Figure 1 Block Diagram

3 Specifications

Product	➤ PCOM-B700G-NS
Form Factor	➤ COM Express® Type 7, Basic Size (125 X 95mm)
Processor	➤ Intel® Xeon® D-1649N ➤ Intel® Xeon® D-1633N ➤ Intel® Xeon® D-1623N ➤ Intel® Xeon® D-1627
BIOS	➤ AMI BIOS
Memory	➤ 3x SO-DIMM DDR4 ➤ Support ECC ➤ Up to 96GB 2400MHz
Graphic	➤ No Support
Ethernet	➤ 1x GbE (via Intel® i210AT/IT) ➤ 4x KR (10GbE)
Audio	➤ No Support
PCI Express	➤ 24x PCIe 3.0 and 8x PCIe 2.0
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 (Option)
Power Management	➤ ACPI 4.0
Environment	➤ Operating Temperature 0°C ~60°C Extended : -40°C ~+85°C (selected SKU) ➤ Storage Temperature -40°C ~+85°C ➤ Relative Humidity 5%~95%

Table 2 PCOM-B700G-NS SPEC

3.1 Supported Operating Systems

The PCOM-B700G-NS supports the following operating systems.

Vendor	Operating System	Supported
Microsoft	Windows 10 IoT Enterprise x64	
	Windows Server 2008	
	Windows Server 2012	
	Windows Server 2016	
Linux	Kernel 4.14	
	Yocto Yp 2.4 rocko	
	Ubuntu 16.04 / 18.04	
	Red Hat 6.6 / 7.1	
	CentOS 6.6 / 7.1	
	Wind River WRL8 / WRL 9	
	SUSE 11 SP4 / 12 SP1	

Table 3 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 $\pm$ 5%
RTC Battery	From Carrier
Power on mode	ATX Mode & AT Mode

Table 4 Electrical characteristics

Power Distribution

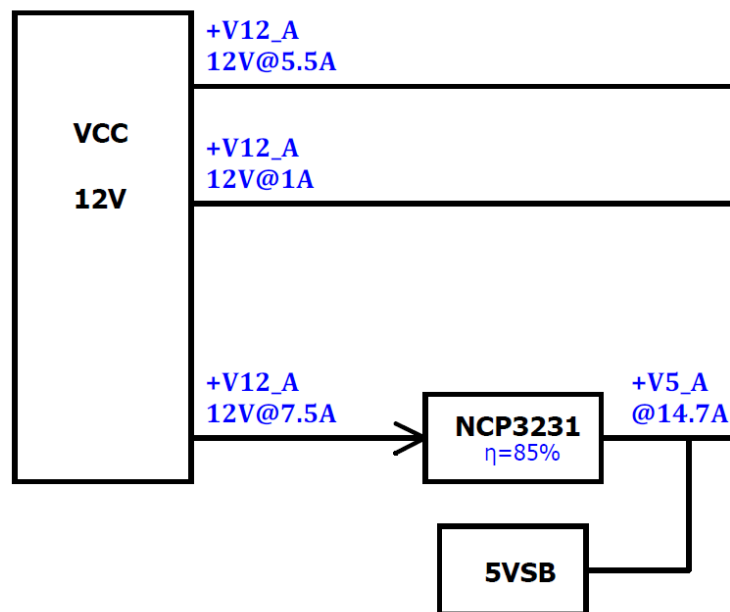


Figure 2 PCOM-B700G-NS Power on sequence

- ATX Power Sequence

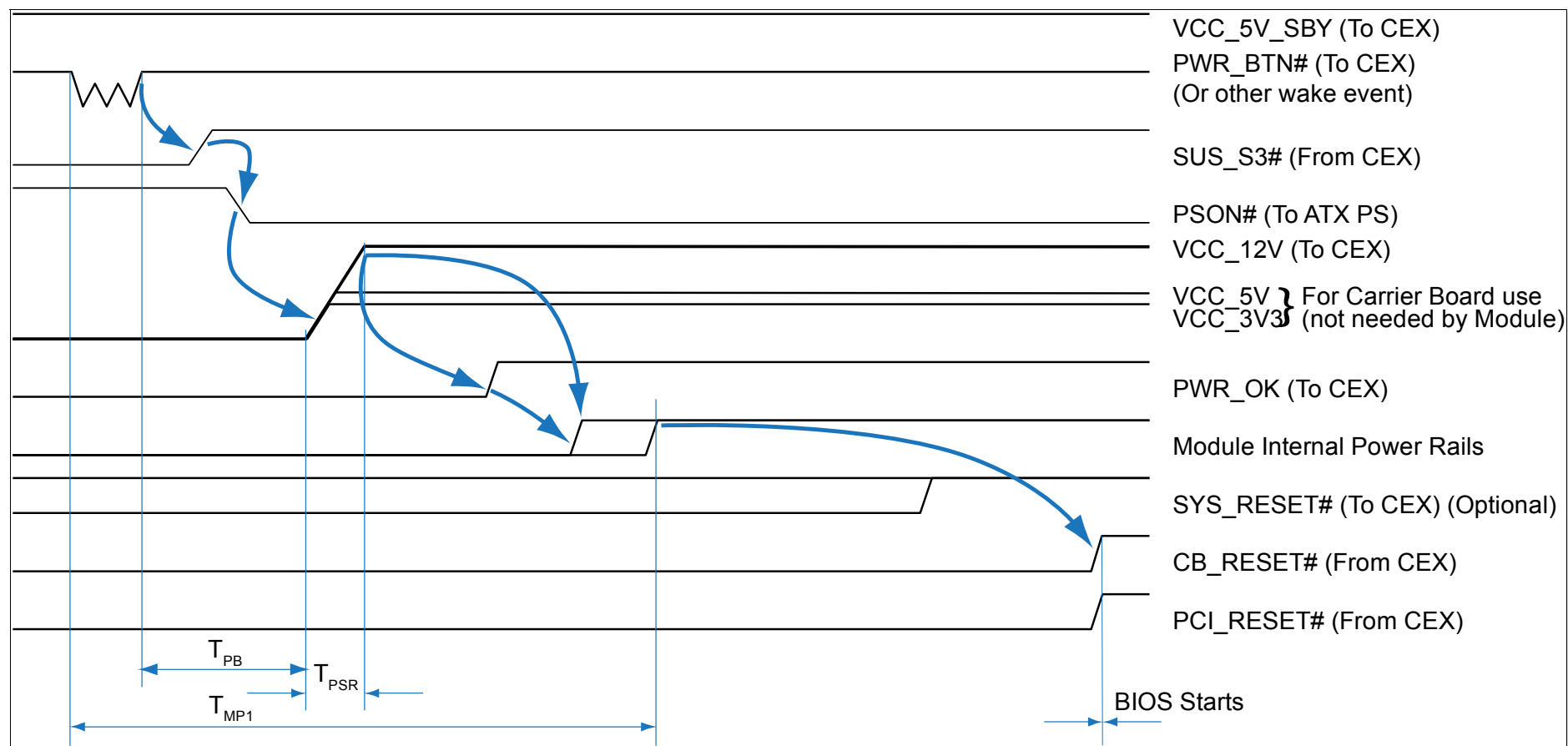


Figure 3 ATX style boot
(Reference from COM Express® Carrier Design Guide)

- AT Power Sequence

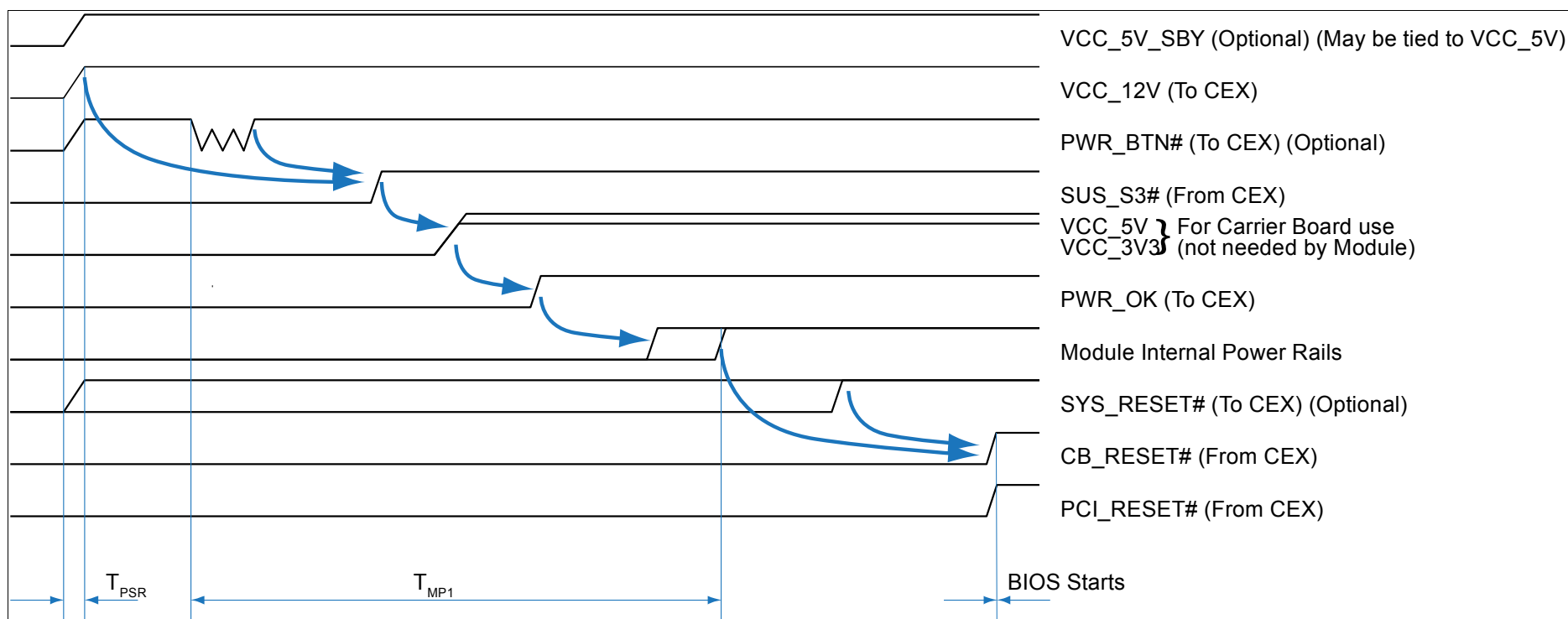


Figure 4 AT style boot
 (Reference from COM Express® Carrier Design Guide)

- 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.

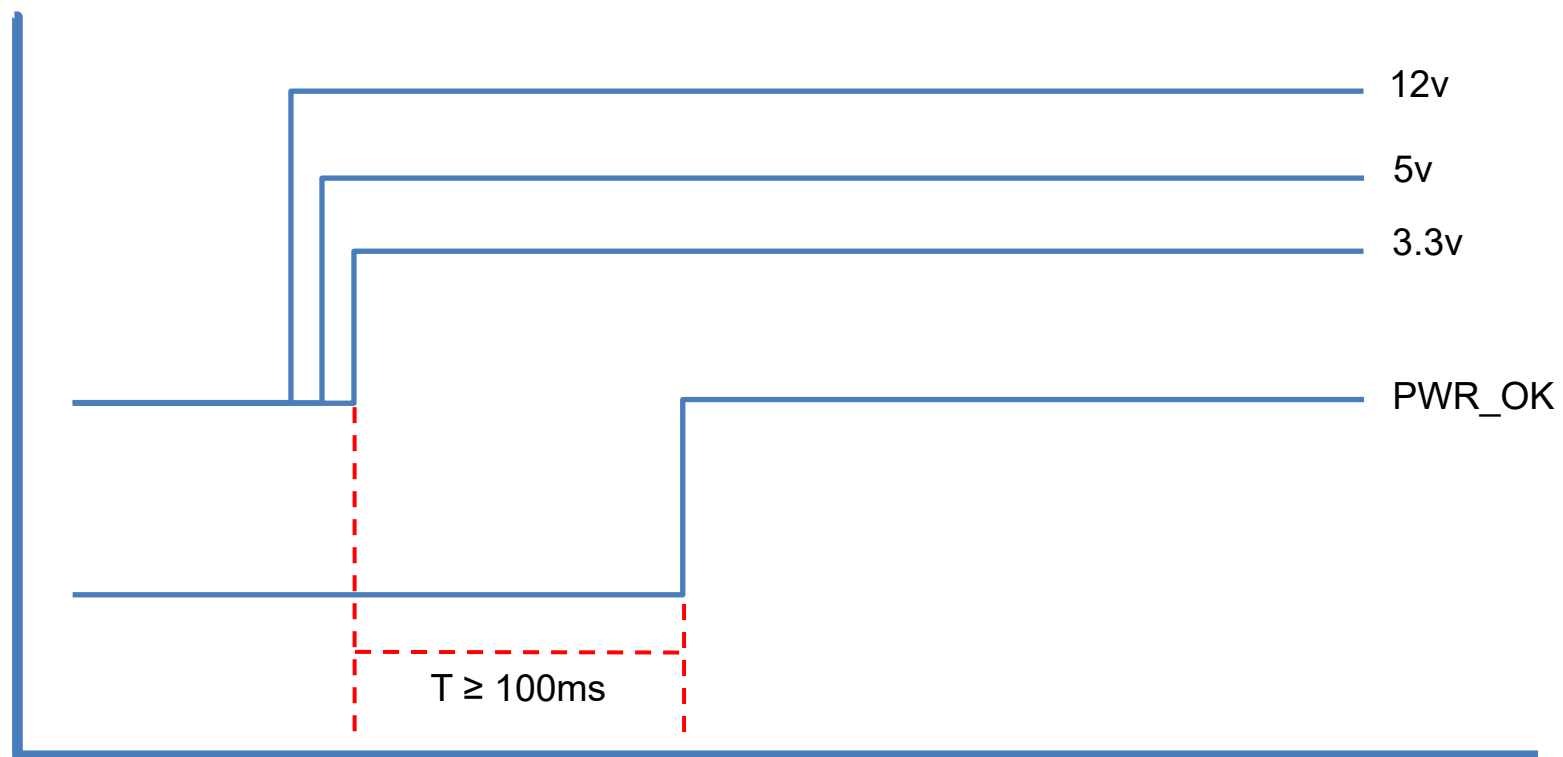


Figure 5 PWR_OK signal brief diagram

3.4 Power Consumption

Series	PCOM-B700G-NS			
Ordering P/N	AB1-3K99	AB1-3L02Z	AB1-3L00	AB1-3L01
Processor	D-1649N	D-1633N	D-1623N	D-1627
<u>Power Consumption</u>				
S0 Idle	TBD	TBD	TBD	TBD
100% workload without turbo mode	TBD	TBD	TBD	TBD
100% Workload with turbo mode	TBD	TBD	TBD	TBD
Peak Current	TBD	TBD	TBD	TBD
S3	TBD	TBD	TBD	TBD

Table 5 PCOM-B700G-NS Power Consumption

3.5 Mechanical Dimensions

● Top Side Dimension

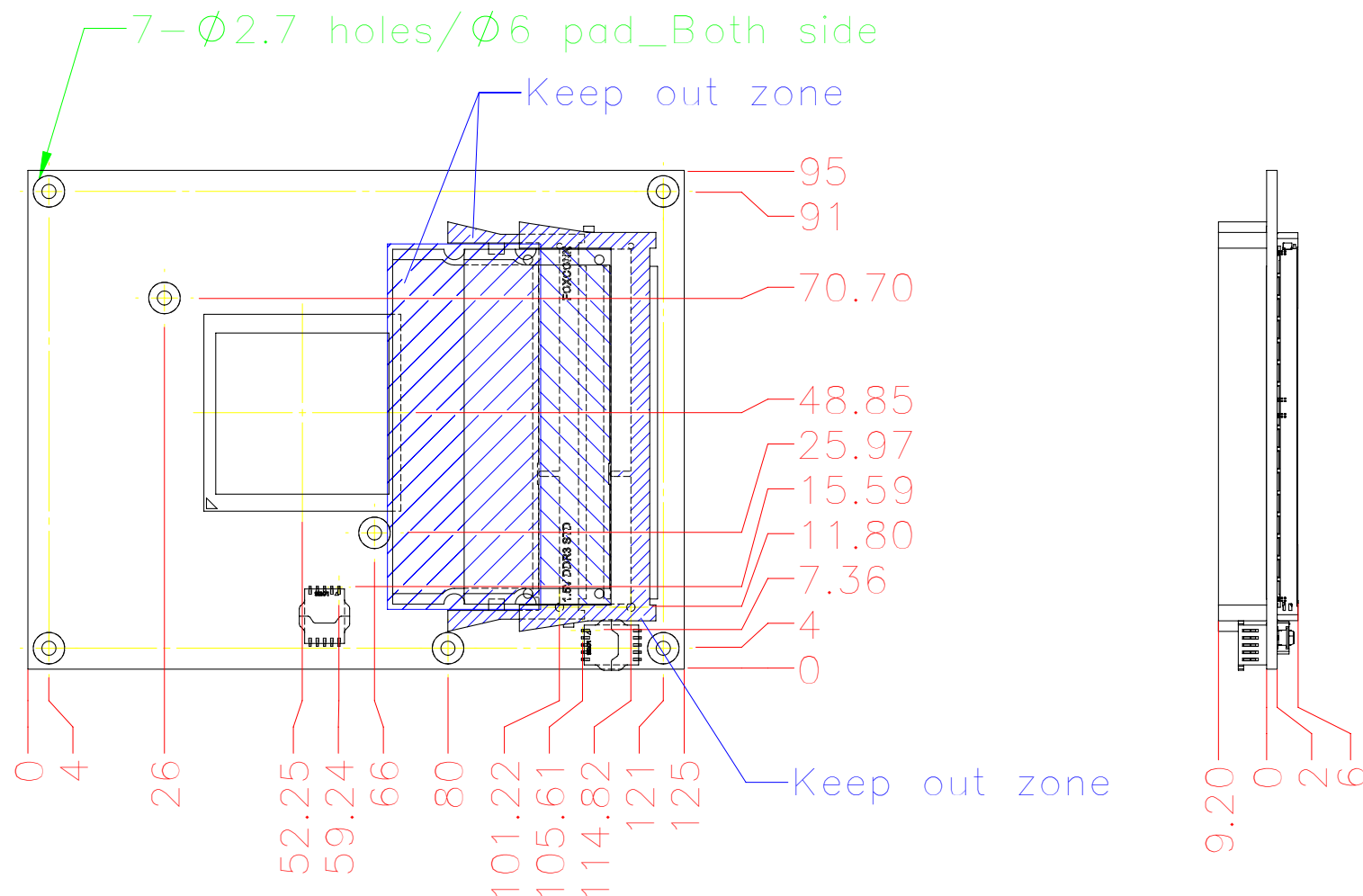


Figure 6 Mechanical Dimension - Top

- Bottom Side Dimension

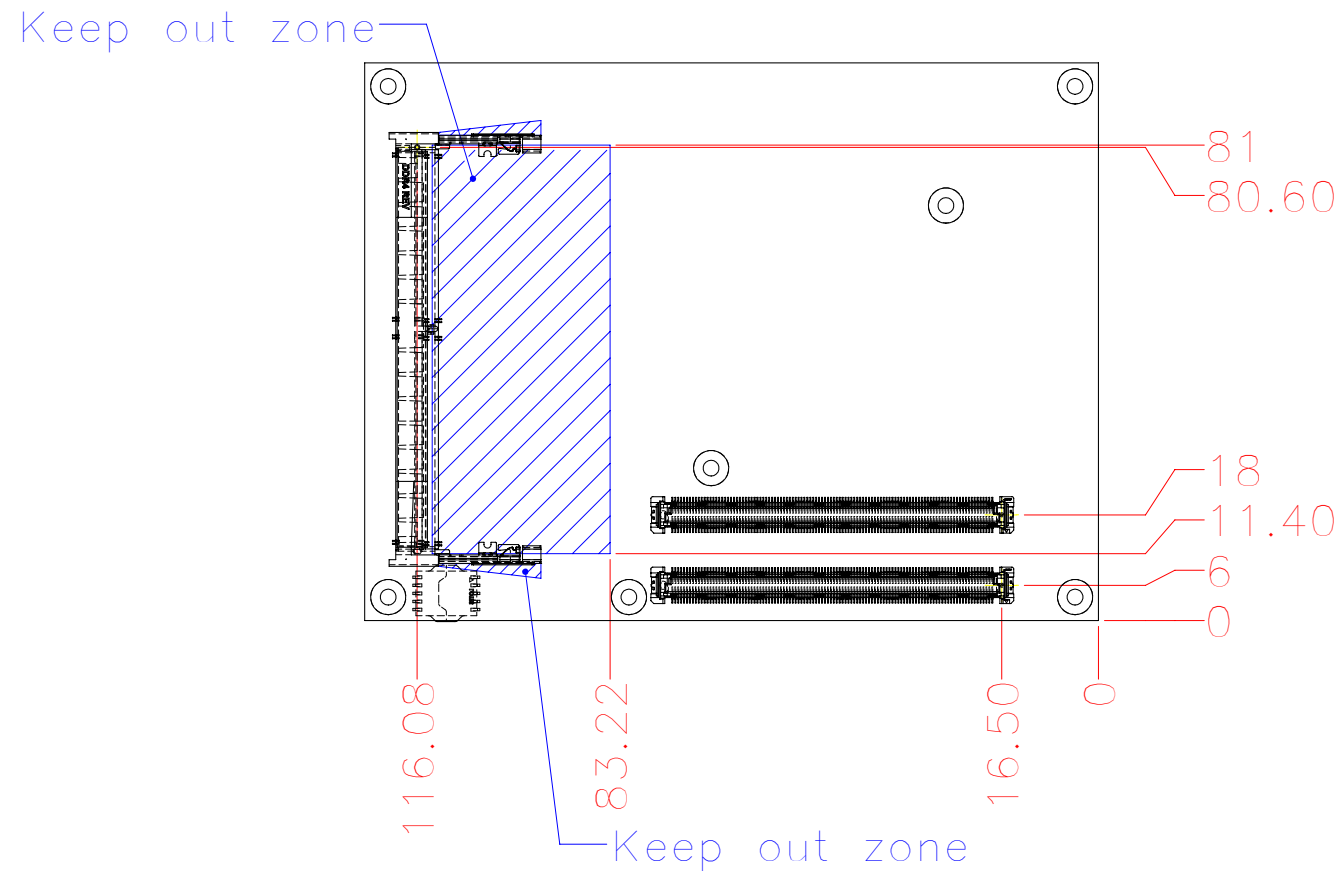


Figure 7 Mechanical Dimension - Bottom

3.6 3x SO-DIMM slot design

PCOM-B700G-NS has designed additional Memory SO-DIMM slot, which supports 3x SO-DIMM up to DDR4 up to 96GB capacities. Before inserting the DDR4 SO-DIMM memory, please refer to below SO-DIMM arrangement and note that, there are 2 SO-DIMM slot of channel 0, the CH0 SO-DIMM1 (the bottom side) works only if CH0 SD-DIMM0 (the top side upper one) is inserted.

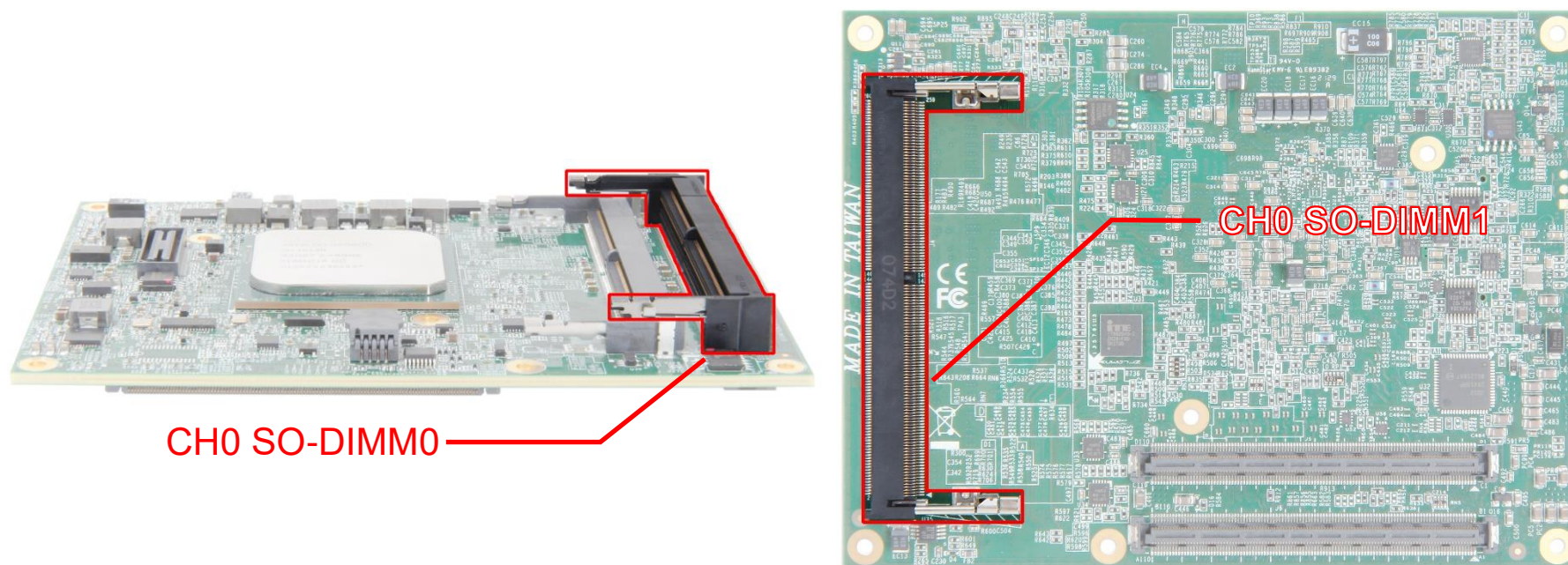


Figure 8 SO-DIMM slot design

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 6 Environmental Specifications

3.8 Ordering Guide

♦ Module

Product	Ordering P/N
PCOM-B700G-NS-D1649N	AB1-3K99
PCOM-B700G-NS-D1633N	AB1-3L02
PCOM-B700G-NS-D1623N	AB1-3L00
PCOM-B700G-NS-D1627	AB1-3L01

Table 7 Ordering Guide - PCOM-B700G-NS

♦ Accessory

Accessory	Ordering P/N
Cooler	B9972000
Heatsink	B830B350
Heatspreader	B830B360
Evaluation Carrier PCOM-C701-BMC	AB1-3K14Z

Table 8 Ordering Guide - Accessory

4 Thermal Solution

- Cooler Dimension

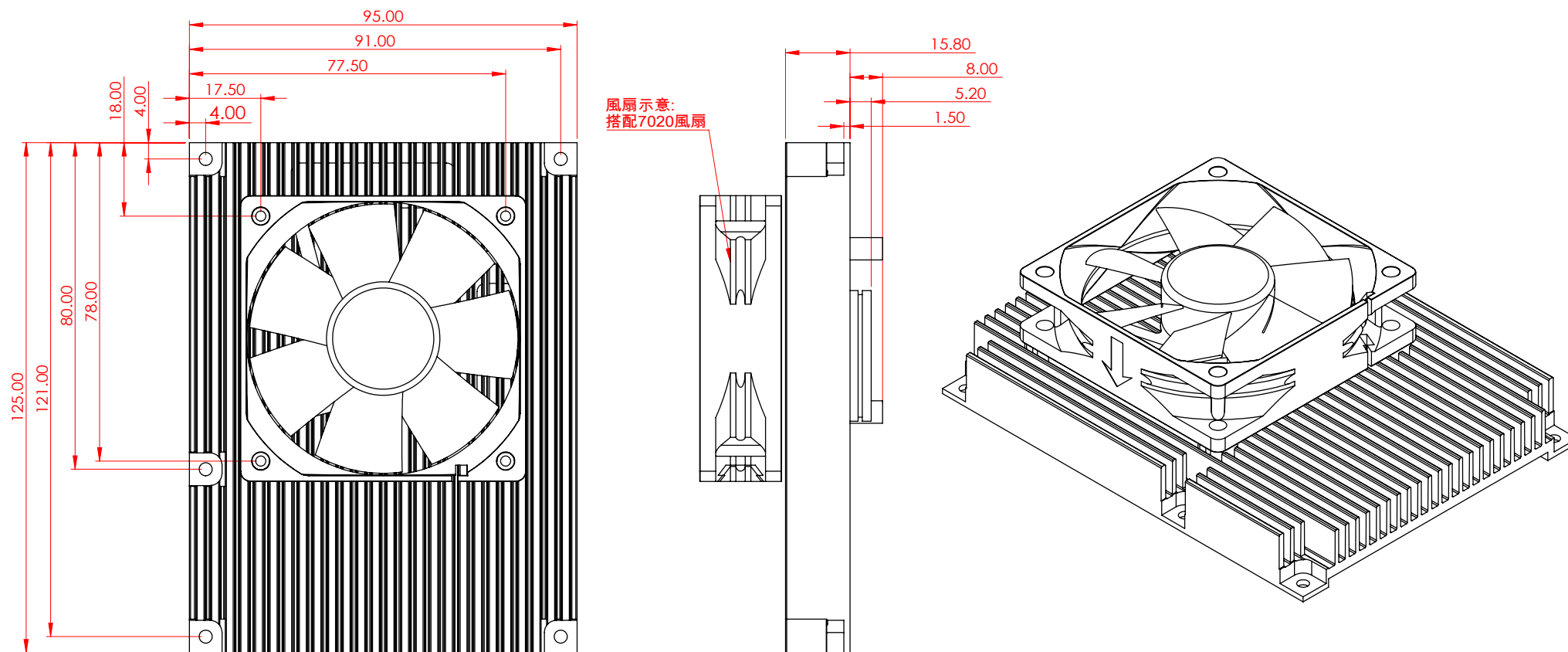


Figure 9 Cooler mechanical dimension

- Heatsink Dimension

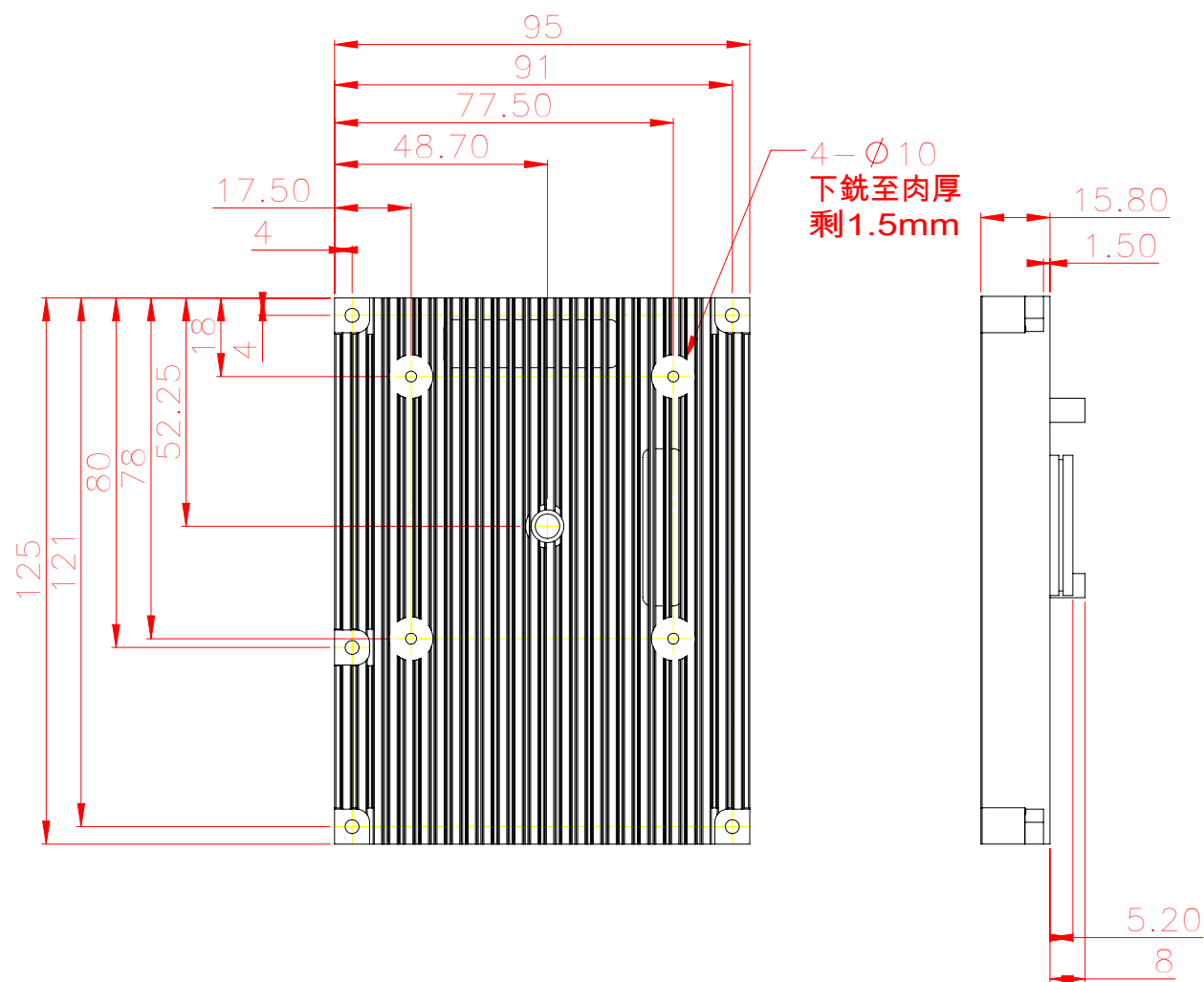


Figure 10 Heatsink mechanical dimension

- Heatspreader Dimension

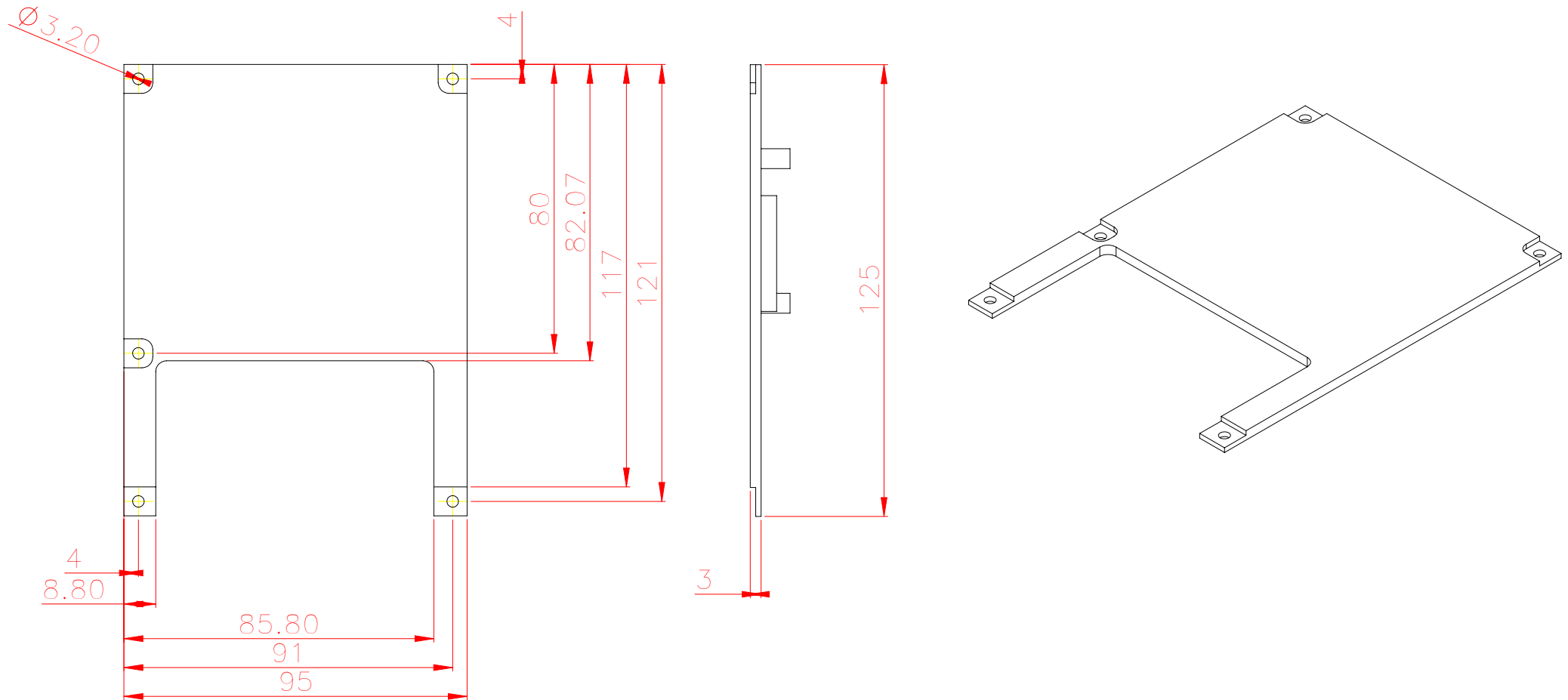


Figure 11 Heatspreader mechanical dimension

5 Pin out Tables

Pin	Row A	Row B	Row C	Row D
1	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
2	GBE0_MDI3-	GBE0_ACT#	GND	GND
3	GBE0_MDI3+	LPC_FRAME#	USB_SSRX0-	USB_SSTX0-
4	GBE0_LINK100#	LPC_AD0	USB_SSRX0+	USB_SSTX0+
5	GBE0_LINK1000#	LPC_AD1	GND	GND
6	GBE0_MDI2-	LPC_AD2	USB_SSRX1-	USB_SSTX1-
7	GBE0_MDI2+	LPC_AD3	USB_SSRX1+	USB_SSTX1+
8	GBE0_LINK#	LPC_DRQ0#	GND	GND
9	GBE0_MDI1-	LPC_DRQ1#	USB_SSRX2-	USB_SSTX2-
10	GBE0_MDI1+	LPC_CLK	USB_SSRX2+	USB_SSTX2+
11	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
12	GBE0_MDI0-	PWRBTN#	USB_SSRX3-	USB_SSTX3-
13	GBE0_MDI0+	SMB_CK	USB_SSRX3+	USB_SSTX3+
14	NC	SMB_DAT	GND	GND
15	SUS_S3#	SMB_ALERT#	10G_PHY_MDC_SCL3	10G_PHY_MDIO_SDA3
16	SATA0_TX+	SATA1_TX+	10G_PHY_MDC_SCL2	10G_PHY_MDIO_SDA2
17	SATA0_TX-	SATA1_TX-	10G_SDP2	10G_SDP3
18	SUS_S4#	SUS_STAT#	GND	GND
19	SATA0_RX+	SATA1_RX+	PCIE_RX6+	PCIE_TX6+
20	SATA0_RX-	SATA1_RX-	PCIE_RX6-	PCIE_TX6-
21	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)

22	PCIE_TX15+	PCIE_RX15+	PCIE_RX7+	PCIE_TX7+
23	PCIE_TX15-	PCIE_RX15-	PCIE_RX7-	PCIE_TX7-
24	SUS_S5#	PWR_OK	10G_INT2	10G_INT3
25	PCIE_TX14+	PCIE_RX14+	GND	GND
26	PCIE_TX14-	PCIE_RX14-	10G_KR_RX3+	10G_KR_TX3+
27	BATLOW#	WDT	10G_KR_RX3-	10G_KR_TX3-
28	(S)ATA_ACT#	NC	GND	GND
29	NC	NC	10G_KR_RX2+	10G_KR_TX2+
30	NC	NC	10G_KR_RX2-	10G_KR_TX2-
31	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
32	NC	SPKR	10G_SFP_SDA3	10G_SFP_SCL3
33	NC	I2C_CK	10G_SFP_SDA2	10G_SFP_SCL2
34	BIOS_DIS0#	I2C_DAT	10G_PHY_RST_23	10G_PHY_CAP_23
35	THRMTRIP#	THRM#	10G_PHY_RST_01	10G_PHY_CAP_01
36	PCIE_TX13+	PCIE_RX13+	10G_LED_SDA	NC
37	PCIE_TX13-	PCIE_RX13-	10G_LED_SCL	NC
38	GND	GND	10G_SFP_SDA1	10G_SFP_SCL1
39	PCIE_TX12+	PCIE_RX12+	10G_SFP_SDA0	10G_SFP_SCL0
40	PCIE_TX12-	PCIE_RX12-	10G_SDP0	10G_SDP1
41	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
42	USB2-	USB3-	10G_KR_RX1+	10G_KR_TX1+
43	USB2+	USB3+	10G_KR_RX1-	10G_KR_TX1-
44	USB_2_3_OC#	USB_0_1_OC#	GND	GND
45	USB0-	USB1-	10G_PHY_MDC_SCL1	10G_PHY_MDIO_SDA1
46	USB0+	USB1+	10G_PHY_MDC_SCL0	10G_PHY_MDIO_SDA0
47	VCC_RTC	NC	10G_INT0	10G_INT1

48	NC	NC	GND	GND
49	GBE0_SDP	SYS_RESET#	10G_KR_RX0+	10G_KR_TX0+
50	LPC_SERIRQ	CB_RESET#	10G_KR_RX0-	10G_KR_TX0-
51	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
52	PCIE_TX5+	PCIE_RX5+	PCIE_RX16+	PCIE_TX16+
53	PCIE_TX5-	PCIE_RX5-	PCIE_RX16-	PCIE_TX16-
54	GPI0	GPO1	TYPE0#	NC
55	PCIE_TX4+	PCIE_RX4+	PCIE_RX17+	PCIE_TX17+
56	PCIE_TX4-	PCIE_RX4-	PCIE_RX17-	PCIE_TX17-
57	GND	GPO2	TYPE1#	TYPE2#
58	PCIE_TX3+	PCIE_RX3+	PCIE_RX18+	PCIE_TX18+
59	PCIE_TX3-	PCIE_RX3-	PCIE_RX18-	PCIE_TX18-
60	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
61	PCIE_TX2+	PCIE_RX2+	PCIE_RX19+	PCIE_TX19+
62	PCIE_TX2-	PCIE_RX2-	PCIE_RX19-	PCIE_TX19-
63	GPI1	GPO3	NC	NC
64	PCIE_TX1+	PCIE_RX1+	NC	NC
65	PCIE_TX1-	PCIE_RX1-	PCIE_RX20+	PCIE_TX20+
66	GND	WAKE0#	PCIE_RX20-	PCIE_TX20-
67	GPI2	WAKE1#	RAPID_SHUTDOWN	GND
68	PCIE_TX0+	PCIE_RX0+	PCIE_RX21+	PCIE_TX21+
69	PCIE_TX0-	PCIE_RX0-	PCIE_RX21-	PCIE_TX21-
70	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
71	PCIE_TX8+	PCIE_RX8+	PCIE_RX22+	PCIE_TX22+
72	PCIE_TX8-	PCIE_RX8-	PCIE_RX22-	PCIE_TX22-
73	GND	GND	GND	GND

74	PCIE_TX9+	PCIE_RX9+	PCIE_RX23+	PCIE_TX23+
75	PCIE_TX9-	PCIE_RX9-	PCIE_RX23-	PCIE_TX23-
76	GND	GND	GND	GND
77	PCIE_TX10+	PCIE_RX10+	NC	NC
78	PCIE_TX10-	PCIE_RX10-	PCIE_RX24+	PCIE_TX24+
79	GND	GND	PCIE_RX24-	PCIE_TX24-
80	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
81	PCIE_TX11+	PCIE_RX11+	PCIE_RX25+	PCIE_TX25+
82	PCIE_TX11-	PCIE_RX11-	PCIE_RX25-	PCIE_TX25-
83	GND	GND	NC	NC
84	NCSI_TX_EN	VCC_5V_SBY	GND	GND
85	GPI3	VCC_5V_SBY	PCIE_RX26+	PCIE_TX26+
86	NC	VCC_5V_SBY	PCIE_RX26-	PCIE_TX26-
87	NC	VCC_5V_SBY	GND	GND
88	PCIE_CK_REF+	BIOS_DIS1#	PCIE_RX27+	PCIE_TX27+
89	PCIE_CK_REF-	NC	PCIE_RX27-	PCIE_TX27-
90	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
91	SPI_POWER	NCSI_CLK_IN	PCIE_RX28+	PCIE_TX28+
92	SPI_MISO	NCSI_RXD1	PCIE_RX28-	PCIE_TX28-
93	GPO0	NCSI_RXD0	GND	GND
94	SPI_CLK	NCSI_CRS_DV	PCIE_RX29+	PCIE_TX29+
95	SPI_MOSI	NCSI_TXD1	PCIE_RX29-	PCIE_TX29-
96	NC	NCSI_TXD0	GND	GND
97	TYPE10#	SPI_CS#	NC	NC
98	SER0_TX	NCSI_ARB_IN	PCIE_RX30+	PCIE_TX30+
99	SER0_RX	NCSI_ARB_OUT	PCIE_RX30-	PCIE_TX30-

100	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
101	SER1_TX	FAN_PWMOUT	PCIE_RX31+	PCIE_TX31+
102	SER1_RX	FAN_TACHIN	PCIE_RX31-	PCIE_TX31-
103	LID#	SLEEP#	GND	GND
104	VCC_12V	VCC_12V	VCC_12V	VCC_12V
105	VCC_12V	VCC_12V	VCC_12V	VCC_12V
106	VCC_12V	VCC_12V	VCC_12V	VCC_12V
107	VCC_12V	VCC_12V	VCC_12V	VCC_12V
108	VCC_12V	VCC_12V	VCC_12V	VCC_12V
109	VCC_12V	VCC_12V	VCC_12V	VCC_12V
110	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)

Table 9 Pin out description

6 BIOS Setup Items

PCOM-B700G-NS 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-B700G-NS 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

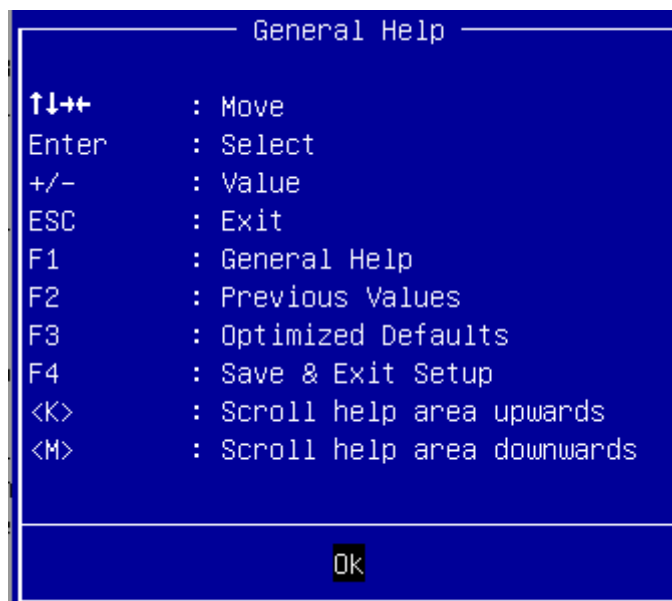
Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press key will enter BIOS setup screen.

Press to enter SETUP

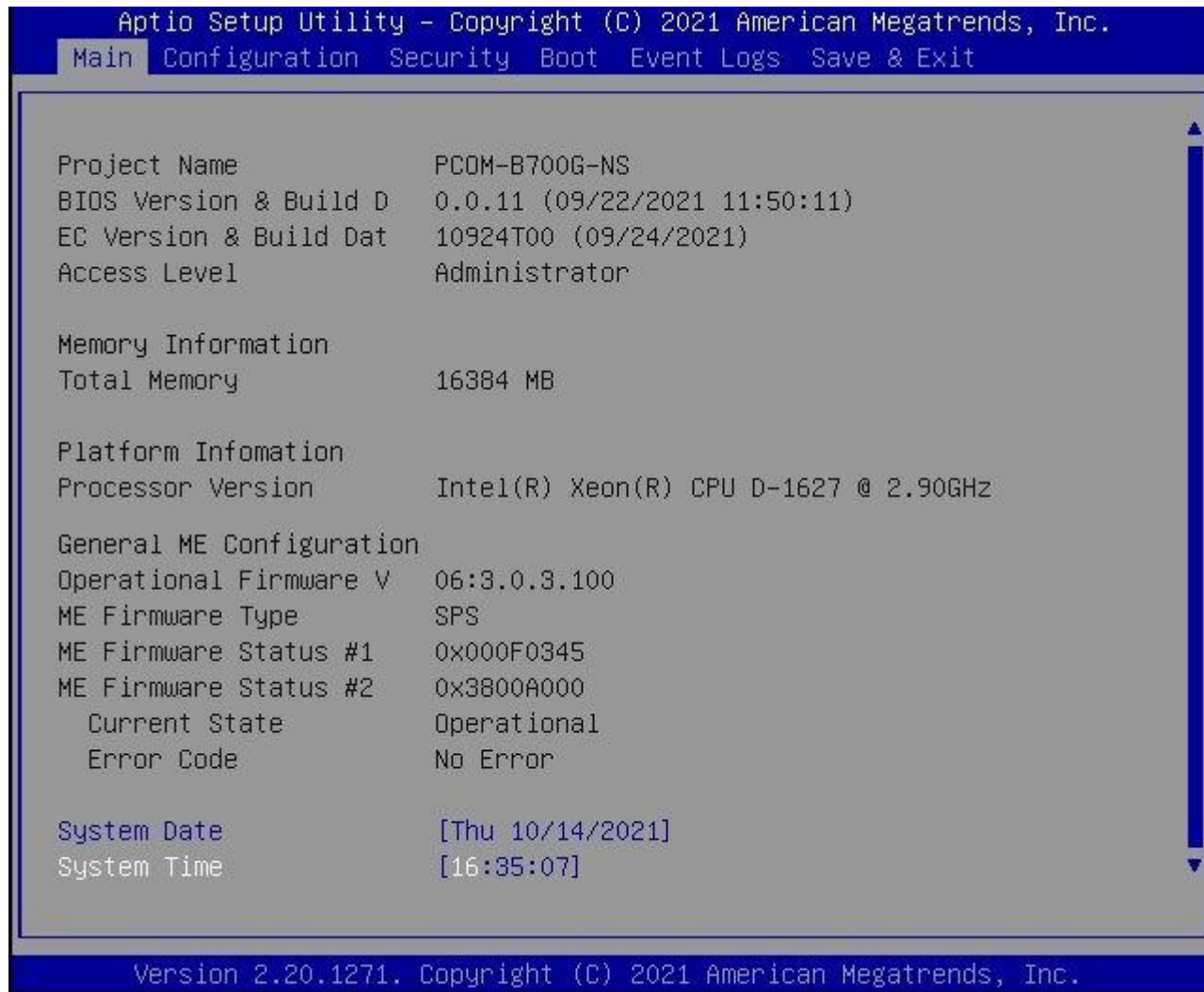
If the message disappears before responding and still wish to enter Setup, please restart the system by turning it OFF and On or pressing the RESET button. It can be also restarted by pressing <Ctrl>, <Alt>, and <Delete> keys on keyboard simultaneously.

Press <F1> to Run General Help or Resume

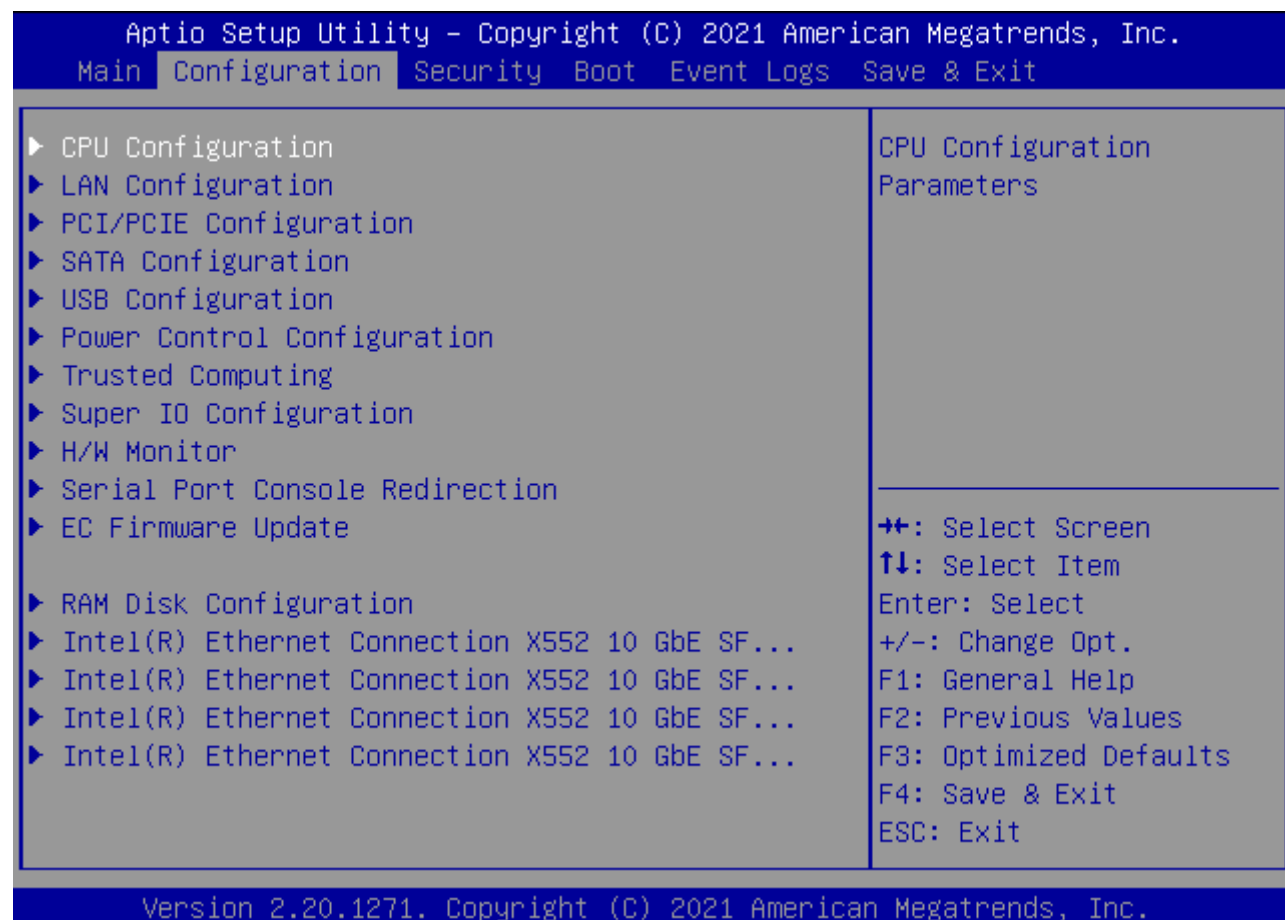
The BIOS setup program provides a General Help screen. The menu can be easily called up from any menu by pressing <F1>. The Help screen lists all the possible keys to use and the selections for the highlighted item. Press <Esc> to exit the Help screen.



6.2 Main



6.3 Configuration



CPU Configuration

Feature	Description	Options
Hyper-Threading [ALL]	Enables Hyper Threading (Software Method to Enable / Disable Logical Processor threads.)	★Enabled, Disabled
Enable Intel TXT Support	Enables Intel Trusted Execution Technology Configuration. Please disable 'EV DFX Features' when TXT is enabled.	Enabled, ★Disabled
EIST (P-States)	When enabled, OS sets CPU frequency according load. When disabled, CPU frequency is set at max non-turbo.	★Enabled, Disabled
Boot performance mode	Select the performance state that the BIOS will set before OS hand off.	★Max Performance, Max Efficient,
Turbo Mode	Turbo mode allows a CPU logical processor to execute a higher frequency when enough power is available not exceed CPU defined limits.	★Enabled, Disabled
Enable CPU Autonomous	Enable CPU Autonomous C-state which is CPU converts HALT instruction to MWAIT.	Enabled, ★Disabled
CPU C6 report	Enable/Disable CPU C6 (ACPI C2) report to OS Recommended to be enabled.	★Enabled, Disabled
Enhanced Halt State (C1E)	Enables the Enhanced C1E state of the CPU, takes effect after reboot.	★Enabled, Disabled
OS ACPI Cx	Report CC3/CC6 to OS ACPI C2 or ACPI C3.	★ACPI C2, ACPI C3

LAN Configuration

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

PCI/PCIE Configuration

Feature	Description	Options
PCI-E ASPM Support (Global)	This option enables / disabled the ASPM support for all downstream devices.	★Disabled, L1 Only
Target Link Speed	If supported by hardware and set to 'Force to X.X GT/S' for Downstream Ports, this sets an upper limit on Link operational speed by restricting the values advertised by the Upstream component in its training sequences. When 'Auto' is selected HW initialized data will be used.	★Auto, Force to 2.5 GT/S, Force to 5.0 GT/S, Force to 8.0 GT/S
PCIe Switch Select	Select PCIe Function.	★PCIe LAN I210, PCIe Slot
COMe PCIe Port 0-3 Bifurcation (PCIe Port Configuration Soft Strap 1)	These straps set the default value of PCIe Port Configuration 1 register covering PCIe ports 0-3.	★4x1 Ports 0-3 (x1) / 1x2, 2x1 Port 0 (x2), Port 1 (disabled), Ports 2, 3 (x1) / 2x2 Port 0 (x2), Port 2 (x2), Ports 1, 3 (disabled) / 1x4 Port 0 (x4), Ports 1-3 (disabled)
COMe PCIe Port 4-7 Bifurcation (PCIe Port Configuration Soft Strap 2)	These straps set the default value of PCIe Port Configuration 2 register covering PCIe ports 4-7.	★4x1 Ports 4-7 (x1) / 1x2, 2x1 Port 04 (x2), Port 5 (disabled), Ports 6, 7 (x1) / 2x2 Port 4 (x2), Port 6 (x2), Ports 5, 7 (disabled) / 1x4 Port 4 (x4), Ports 5-7 (disabled)
COMe PCIe Port 8-15 Bifurcation (IIO Port 1)	Select PCIe port Bifurcation for selected slot (s).	★x4x4, x8
COMe PCIe Port 16-31 Bifurcation (IIO Port 3)	Select PCIe port Bifurcation for selected slot (s).	★x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16

SATA Configuration

Feature	Description	Options
SATA Controller	Enabled or Disabled SATA Controller.	★Enabled , Disabled
SATA Speed Selection	Select SATA interface speed.	★Auto, Gen1, Gen2, Gen3
Port 0 / Port 1	Enabled or Disabled SATA Port	★Enabled , Disabled
Hot plug	Hot plug	★Enabled , Disabled
Configure as eSATA	Configures port as External SATA (eSATA)	Enabled, ★Disabled
Spin Up Device	If enabled for any of ports Staggered Spin Up will be performed and only the drives which have this option enabled will spin up at boot. Otherwise all drives spin up at boot.	Enabled, ★Disabled
SATA Device Type	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.	★ Hard Disk Drive, Solid State Drive

USB Configuration

Feature	Description	Options
COMe USB 2.0 Port 0 ~ 3	Disable USB port.	★Enabled , Disabled
COMe USB 3.0 Port 0 ~ 3	Disable USB port.	★Enabled , Disabled
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	★Enabled , Disabled
EHCI Hand-off	This is a workaround for OSES without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver	Enabled, ★Disabled
USB Mass Storage Driver Support	Enable/Disable USB Mass Storage Driver Support	★Enabled , Disabled
Port 60/64 Emulation	Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSES.	Enabled, ★Disabled
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
Enable Hibernation	Enables or Disables system ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some operating systems.	★Enabled , Disabled
Restore AC Power Loss	Select S0/S5 for ACPI state after a G3.	★Power On, Power Off, Last State

Trusted Computing

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

Super IO Configuration

Feature	Description	Options
Serial Port 1 Configuration	Enable or Disable Serial Port (COM)	★Enabled, Disabled
Serial Port 2 Configuration	Enable or Disable Serial Port (COM)	★Enabled, Disabled
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

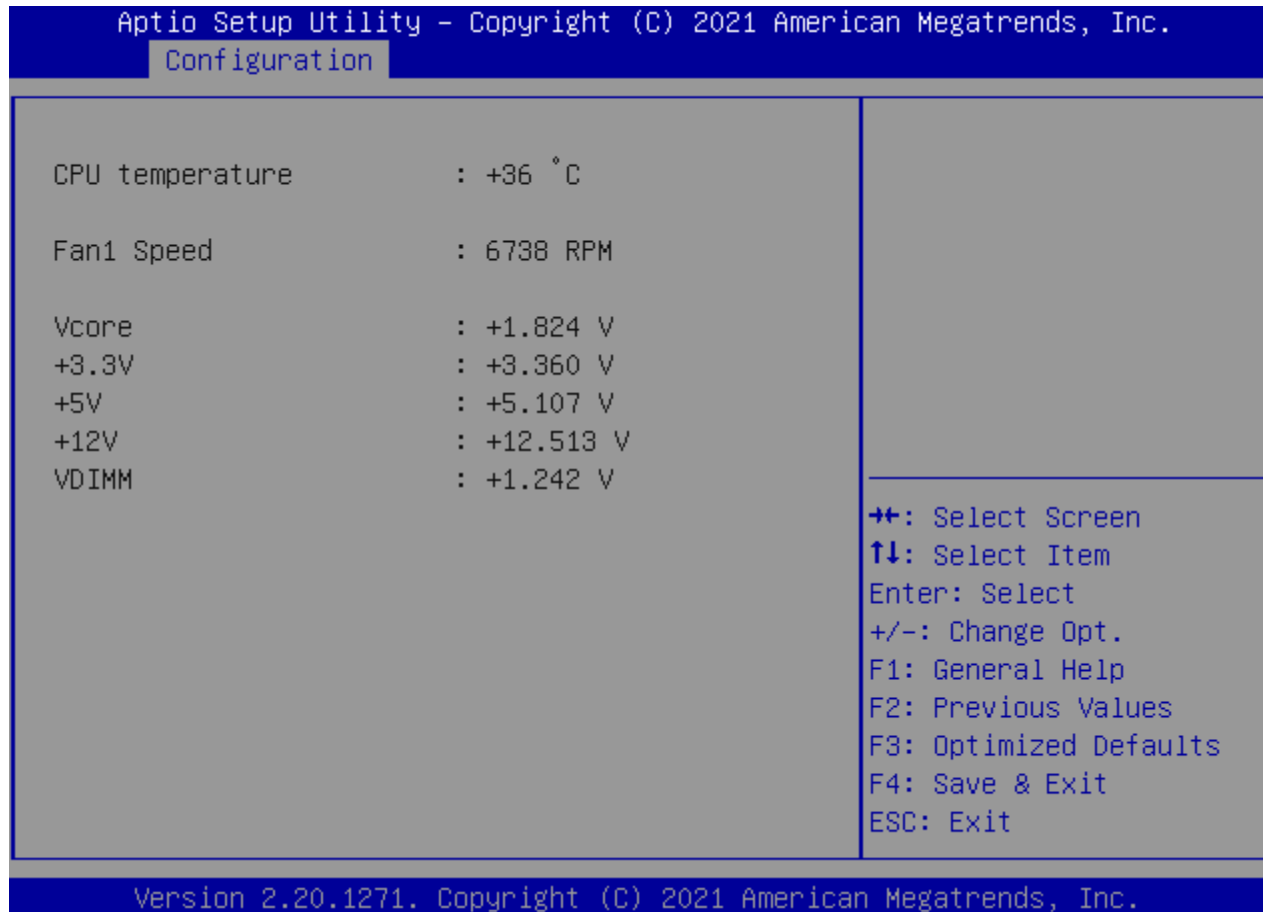
➤ Serial Port 1 Configuration

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

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



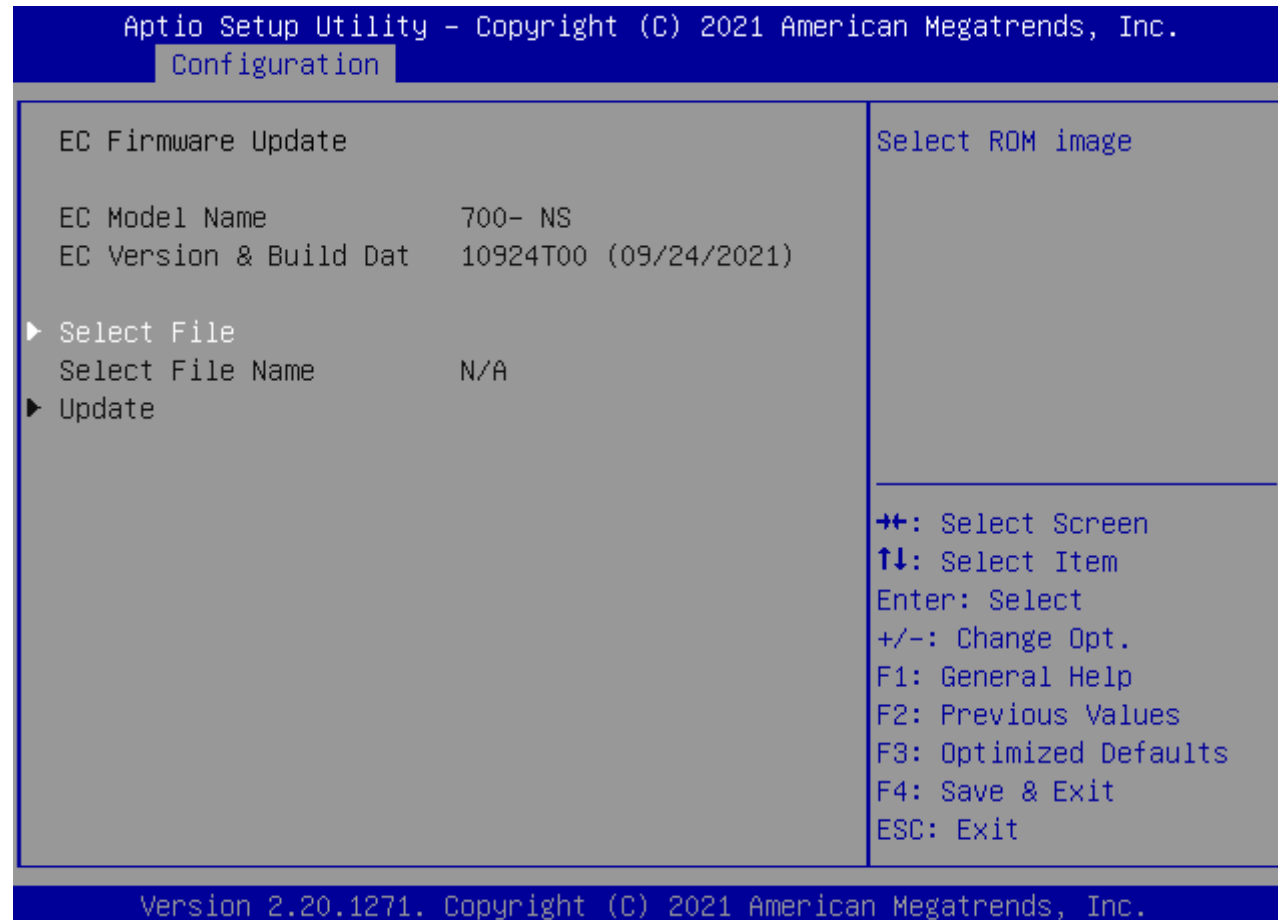
Serial Port Console Redirection

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

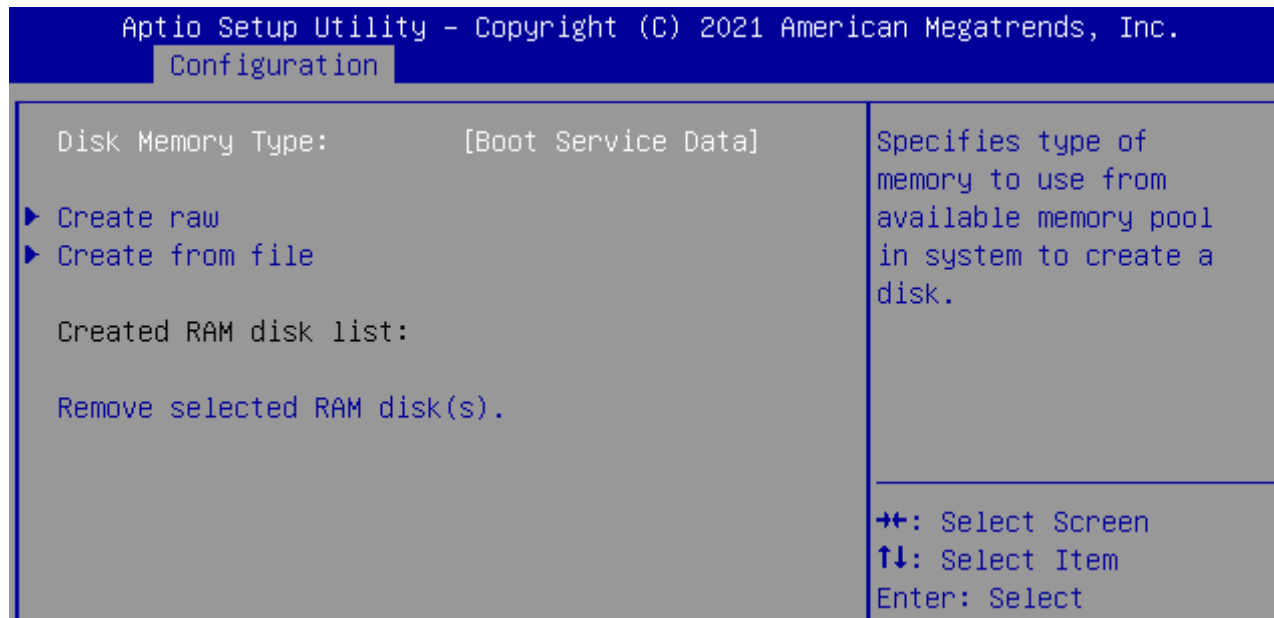
➤ Console Redirection Settings

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
wRecorder 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

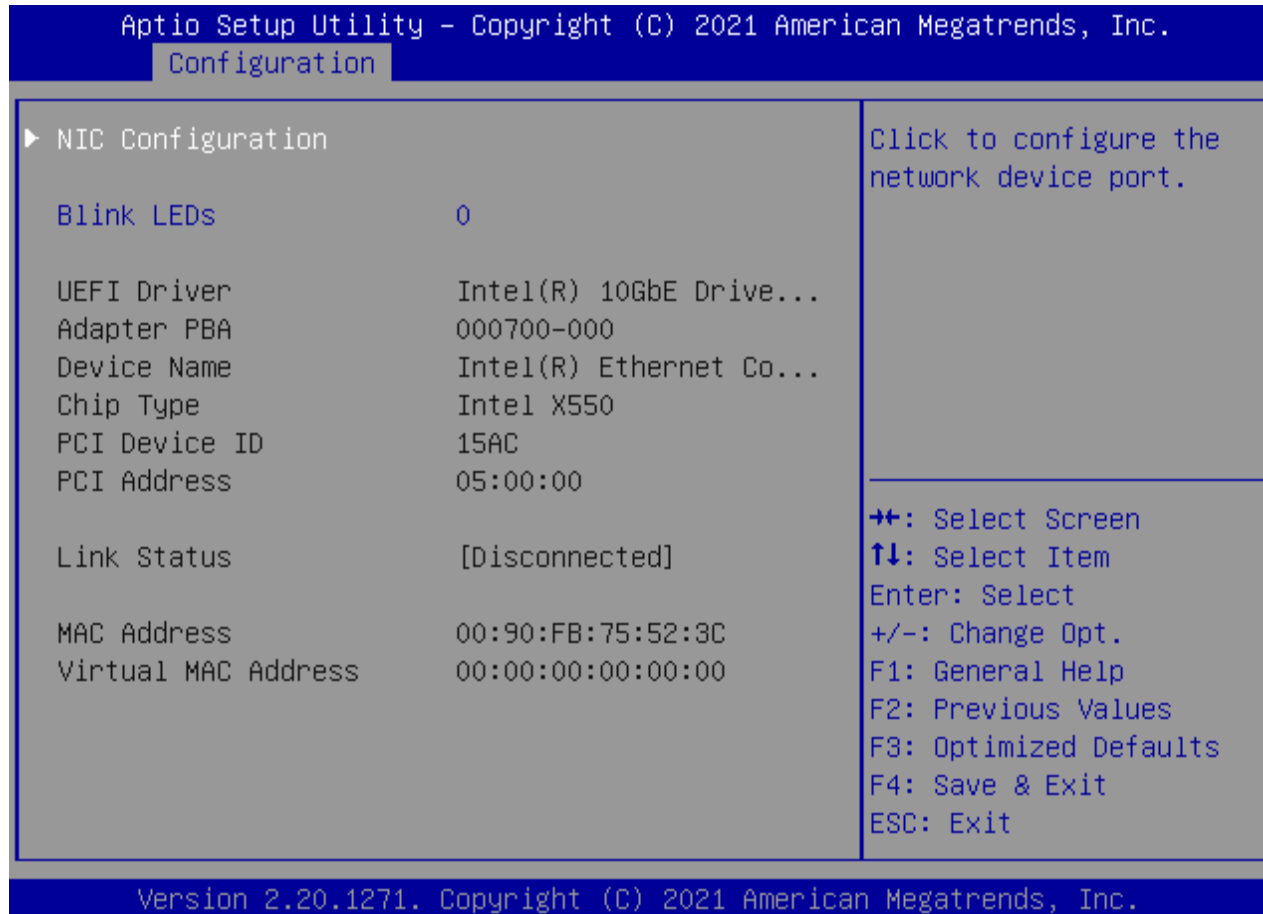


Disk Memory Type:

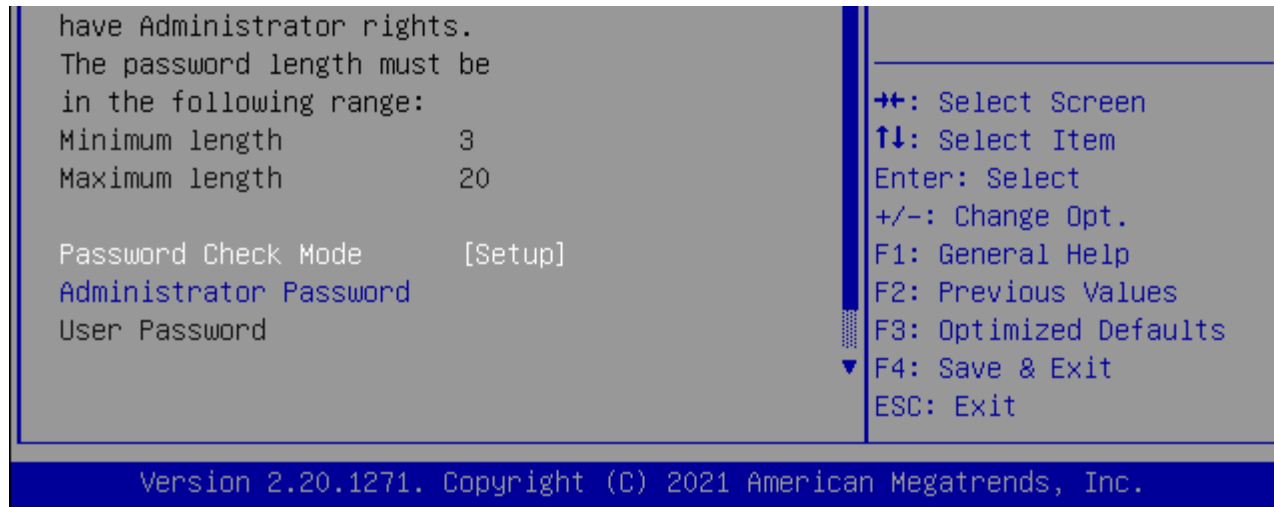


Feature	Description	Options
Dusk Memory Type	Specifies type of memory to use from available memory pool in system to create a disk.	★Boot Service Data, Reserved
Create raw	Create a raw RAM disk.	
Create from file	Create a raw RAM disk from a given file.	
Remove selected RAM disk (s)	Remove selected RAM disk (s).	

Intel(R) Ethernet Connection X552 10 GbE SFP+:

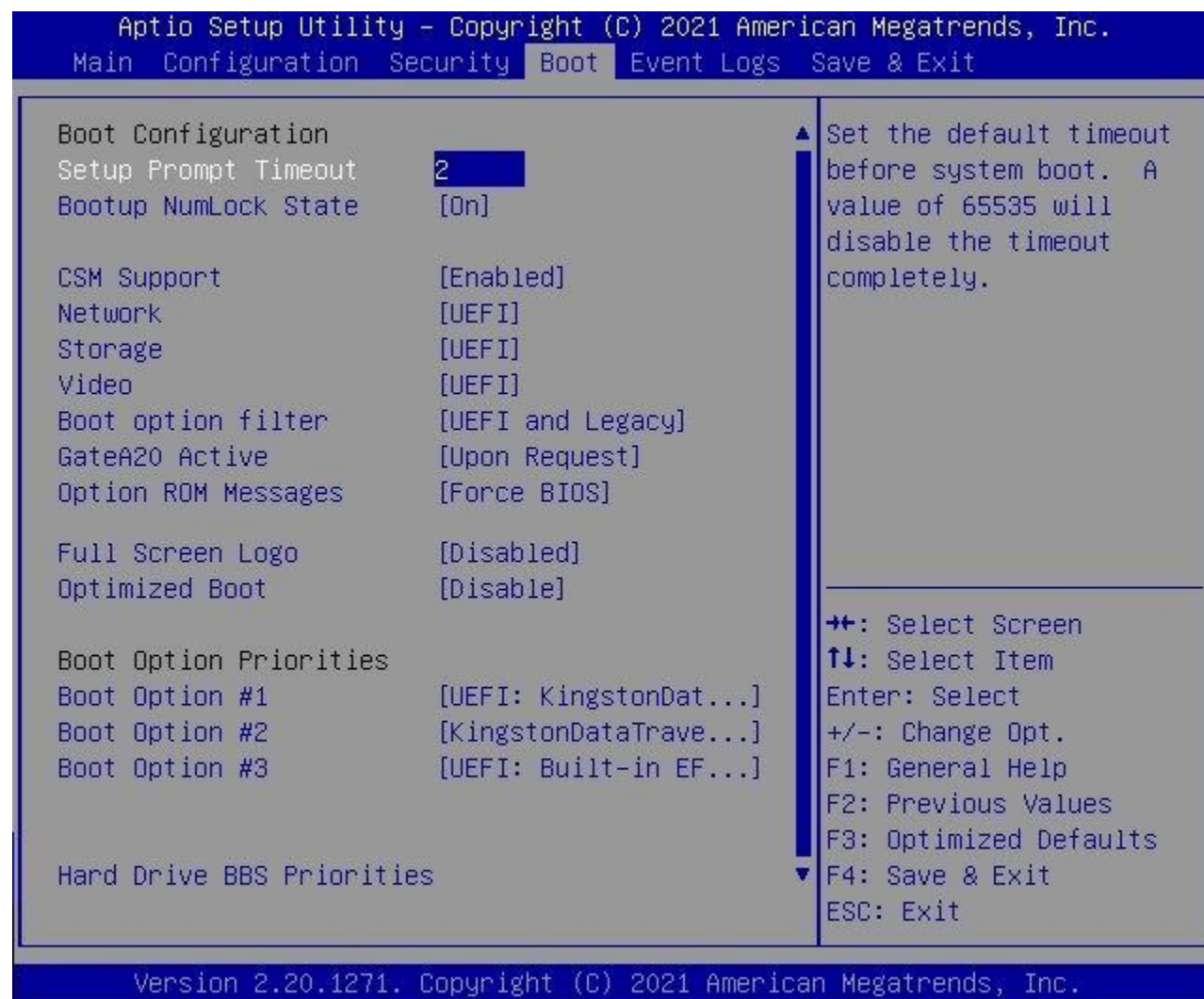


6.4 Security



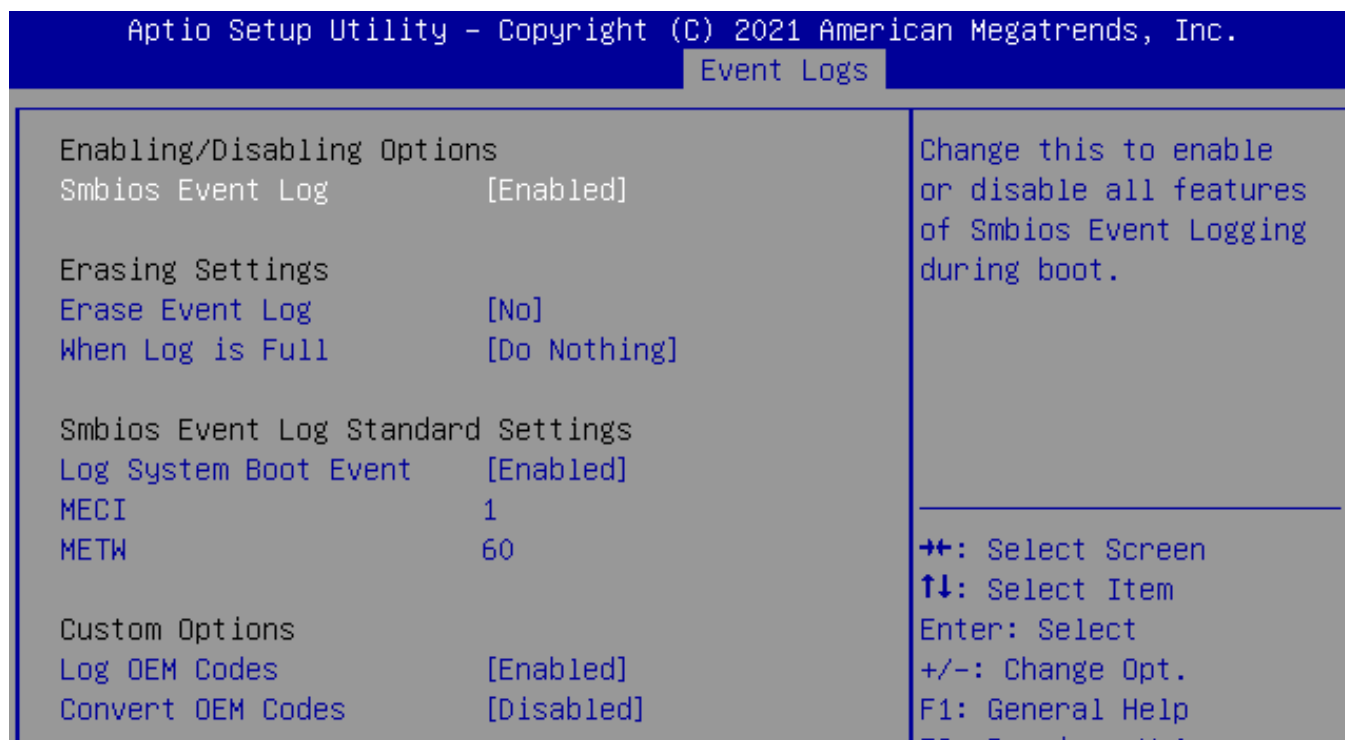
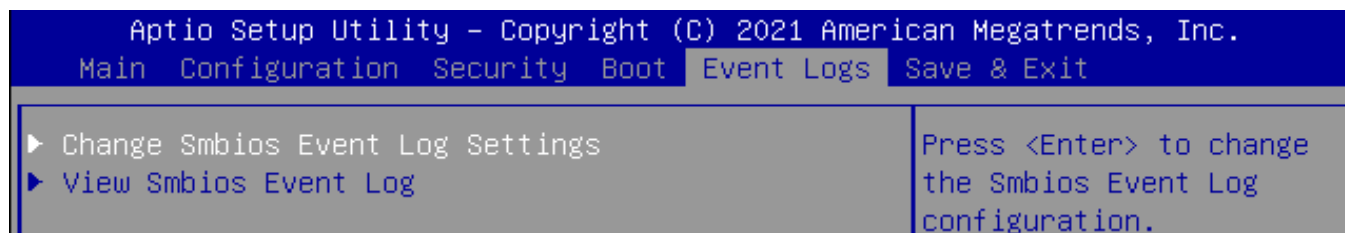
Feature	Description	Options
Password Check Mode	[Setup] check password when enter setup screen. [Power on] check password on every time system power on.	★Setup, Power On
Administrator Password	Set Administrator Password	

6.5 Boot



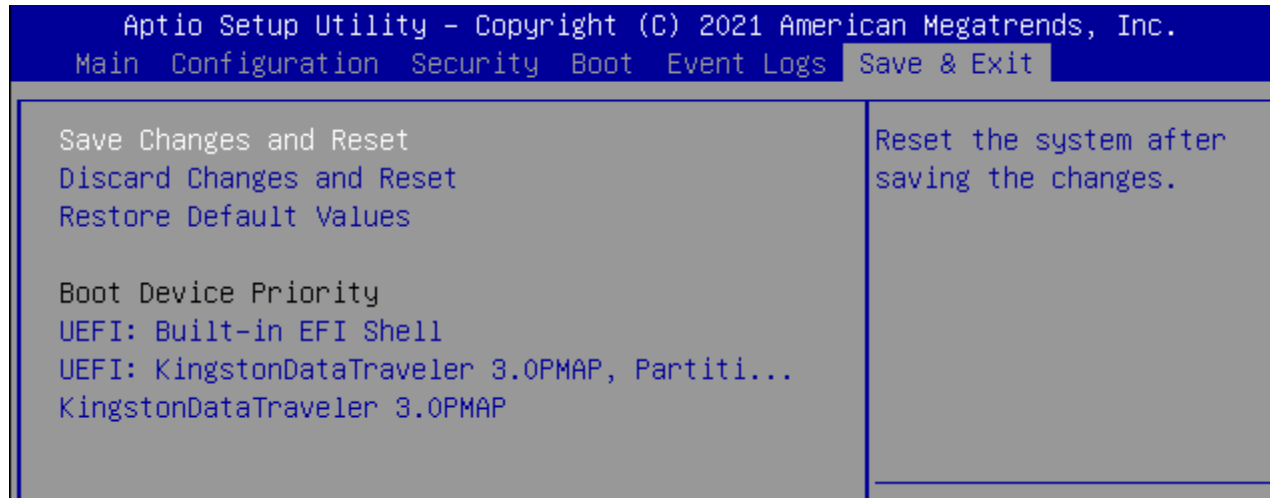
Feature	Description	Options
Setup Prompt Timeout	Set the default timeout before system boot. A value of 65535 will disable the timeout completely.	★2
Bootup NumLock State	Select the keyboard NumLock state.	★On, Off
CSM Support	Enable/Disable CSM support.	★Enabled, Disabled
Network	Controls the execution of UEFI and Legacy Network OpROM.	★UEFI, Do not launch, Legacy
Storage	Controls the execution of UEFI and Legacy Storage OpROM.	★UEFI, Do not launch, Legacy
Video	Controls the execution of UEFI and Legacy Video OpROM.	★UEFI, Do not launch, Legacy
Boot option filter	This option controls Legacy/UEFI ROMs priority.	★UEFI and Legacy, Legacy only, UEFI only
GateA20 Active	UPON REQUEST – GA20 can be disabled using BIOS services. ALWAYS – do not allow disabling. GA20: this option is useful when any RT code is executed above 1MB.	★Upon Request, Always
Option ROM Messages	Set display mode for Option ROM.	★Force BIOS, Keep Current
Full Screen LOGO	Enables or disables Quiet Boot option and Full screen Logo.	★Disabled, Enabled
Optimized Boot	Enables or disables Optimized Boot, Enabling Optimized Boot will disable Csm support and disable connecting Network devices to decrease boot time. While disabling Optimized Boot, make sure to restore Csm Support option to previous value before enabling Optimized Boot.	Enabled, ★Disabled
Boot Option #	Sets the system boot order	UEFI: Built-in EFI Shell Disabled
Hard Drive BBS Priorities	Set the order of the legacy devices in this group.	

6.6 Event Logs



Feature	Description	Options
Smbios Event Log	Change this to enable or disable all features of Smbios Event Logging during boot.	★Enabled, Disabled
Erase Event Log	Choose options for erasing Smbios Event Log. Erasing is done prior to any logging activation during reset.	★No, Yes Next reset, Yes Every reset
When Log is Full	Choose options for reactions to a full Smbios Event Log.	★Do Nothing, Erase Immediately
Log System Boot Event	Choose option to enable / disable logging of System boot event.	★Enabled, Disabled
MECI	Multiple Event Count Increment: The number of occurrences of a duplicate event that must pass before the multiple-event counter of log entry is updated.	★1
METW	Multiple Event Time Window: The number of minutes which must pass between duplicate log entries which utilize a multiple-event counter. The value ranges from 0 to 99 minutes.	★60
Log OEM Codes	Enable or disable the logging of EFI Status Codes as OEM Codes (if not already converted to legacy)	★Enabled, Disabled
Convert OEM Codes	Enable or disable the converting of EFI Status Codes to Standard Smbios Types (Not all may be translated).	Enabled, ★Disabled

6.7 Save & Exit



Feature	Description	Options
Save Changes and Reset	Reset the system after saving the changes.	
Discard Changes and Reset	Reset system setup without saving any 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

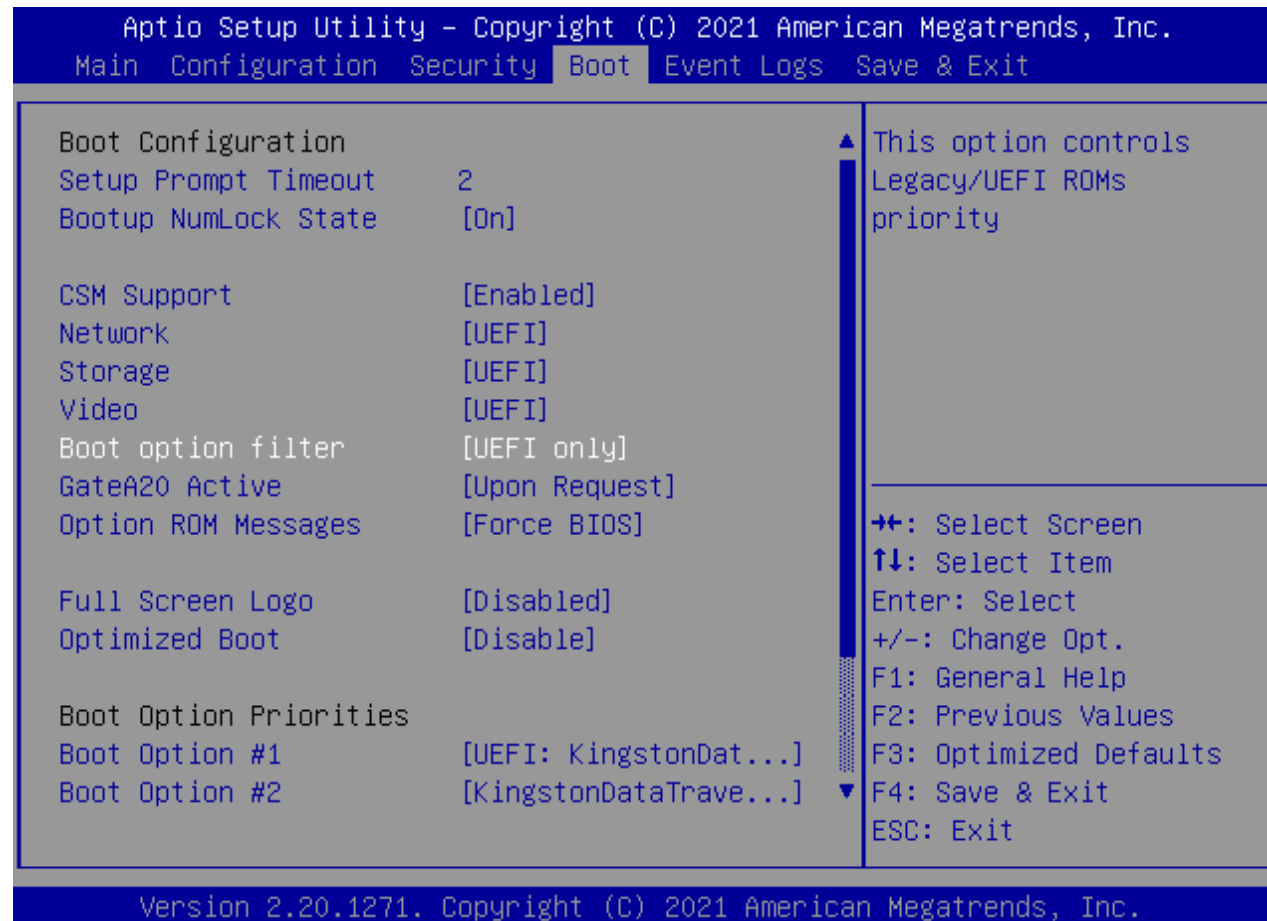
Table 10 System Resources

8 BIOS/EC Update

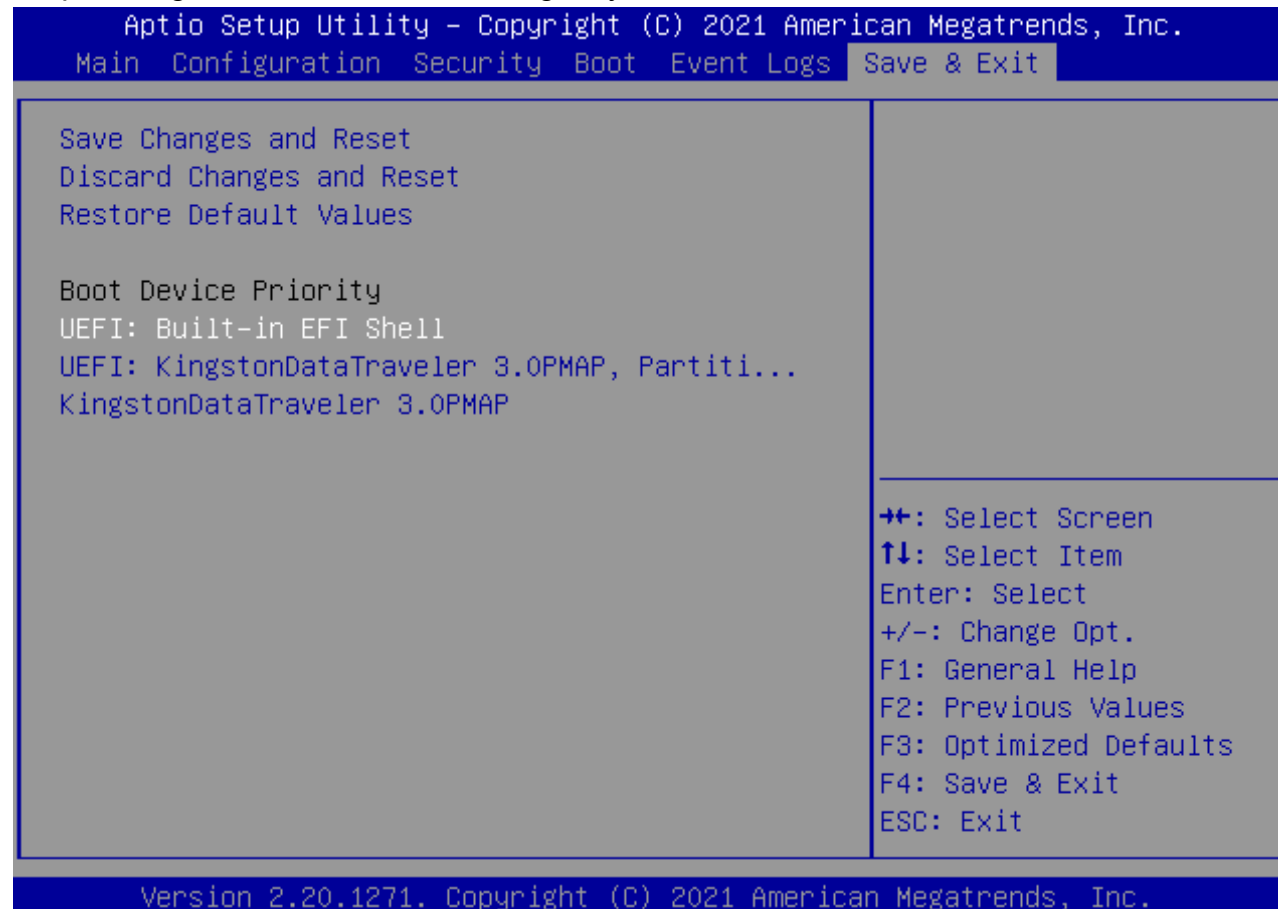
PCOM-B700G-NS only support BIOS/EC update under UEFI shell environment, refer the following step, please.

Step 1. Unzip update file to the USB DOK (USB DOK must be FAT or FAT32 format)

Step 2. Select UEFI only mode in the BIOS boot menu and save, then restart the system

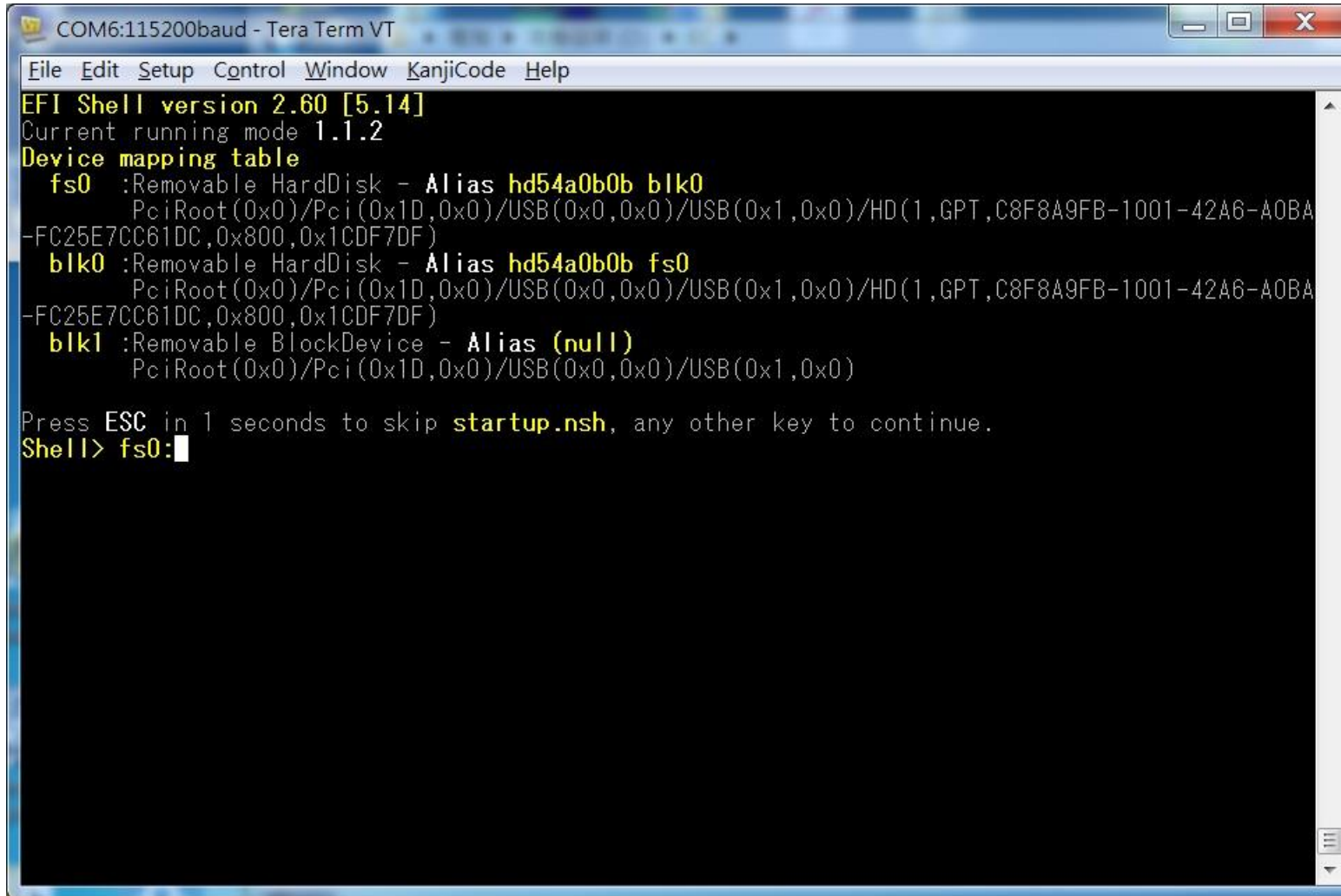


Step 3. Plug the USB DOK on the target system and boot from UEFI shell

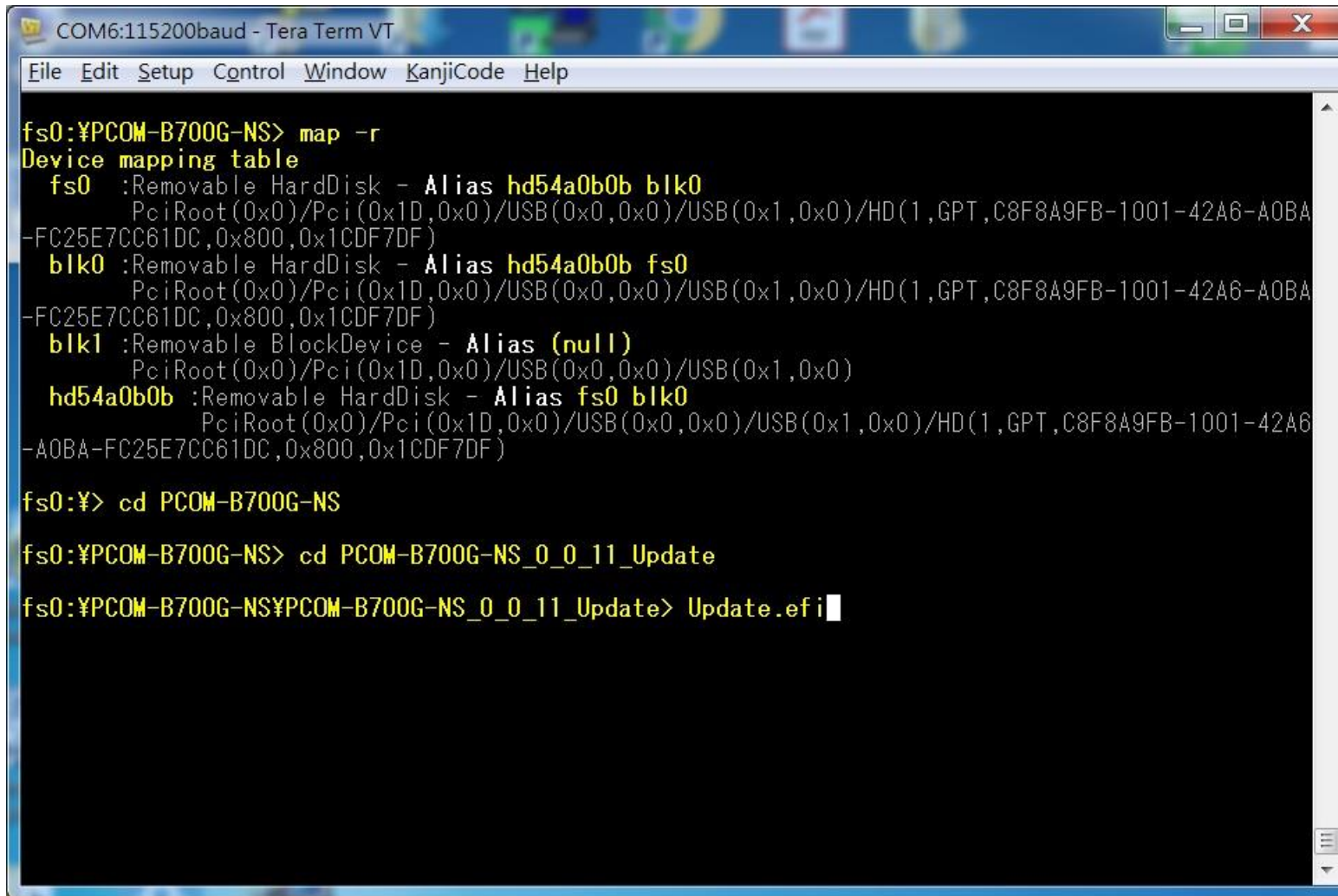


Step 4. Under the UEFI shell, change prompt to your USB DOK, the below example is “**fs0:**”

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



```
COM6:115200baud - Tera Term VT
File Edit Setup Control Window KanjiCode Help
EFI Shell version 2.60 [5.14]
Current running mode 1.1.2
Device mapping table
  fs0 :Removable HardDisk - Alias hd54a0b0b blk0
      PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x0,0x0)/USB(0x1,0x0)/HD(1,GPT,C8F8A9FB-1001-42A6-A0BA
      -FC25E7CC61DC,0x800,0x1CDF7DF)
  blk0 :Removable HardDisk - Alias hd54a0b0b fs0
      PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x0,0x0)/USB(0x1,0x0)/HD(1,GPT,C8F8A9FB-1001-42A6-A0BA
      -FC25E7CC61DC,0x800,0x1CDF7DF)
  blk1 :Removable BlockDevice - Alias (null)
      PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x0,0x0)/USB(0x1,0x0)
Press ESC in 1 seconds to skip startup.nsh, any other key to continue.
Shell> fs0:
```

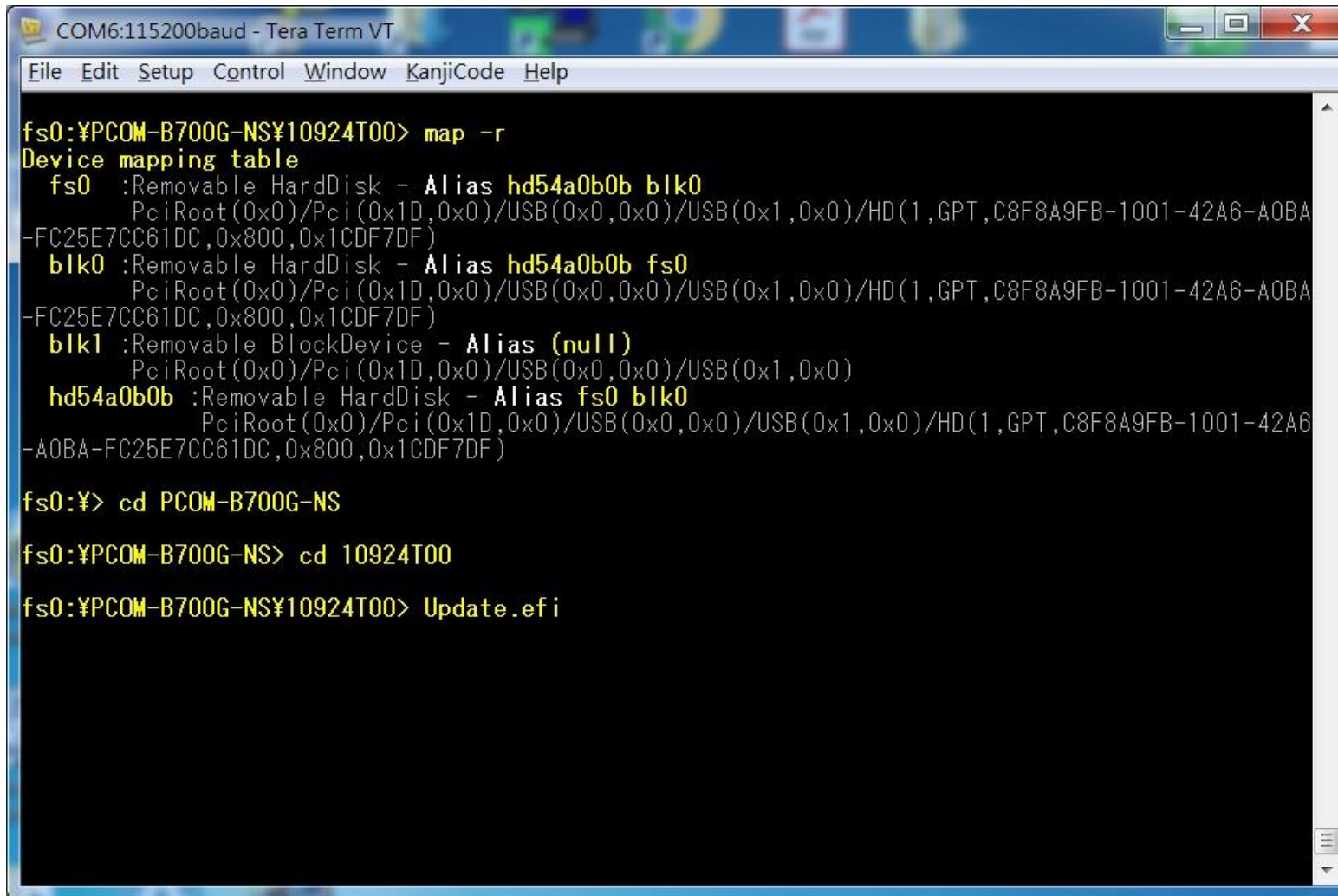


```
COM6:115200baud - Tera Term VT
File Edit Setup Control Window KanjiCode Help

fs0:¥PCOM-B700G-NS> map -r
Device mapping table
  fs0  :Removable HardDisk - Alias hd54a0b0b blk0
        PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x0,0x0)/USB(0x1,0x0)/HD(1,GPT,C8F8A9FB-1001-42A6-A0BA
        -FC25E7CC61DC,0x800,0x1CDF7DF)
  blk0 :Removable HardDisk - Alias hd54a0b0b fs0
        PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x0,0x0)/USB(0x1,0x0)/HD(1,GPT,C8F8A9FB-1001-42A6-A0BA
        -FC25E7CC61DC,0x800,0x1CDF7DF)
  blk1 :Removable BlockDevice - Alias (null)
        PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x0,0x0)/USB(0x1,0x0)
  hd54a0b0b :Removable HardDisk - Alias fs0 blk0
        PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x0,0x0)/USB(0x1,0x0)/HD(1,GPT,C8F8A9FB-1001-42A6
        -A0BA-FC25E7CC61DC,0x800,0x1CDF7DF)

fs0:¥> cd PCOM-B700G-NS
fs0:¥PCOM-B700G-NS> cd PCOM-B700G-NS_0_0_11_Update
fs0:¥PCOM-B700G-NS¥PCOM-B700G-NS_0_0_11_Update> Update.efi
```

(BIOS file update sample)

A screenshot of a Tera Term VT window titled "COM6:115200baud - Tera Term VT". The window has a menu bar with "File", "Edit", "Setup", "Control", "Window", "KanjiCode", and "Help". The main area is a black terminal with yellow text. The text shows a sequence of commands and their outputs: "fs0:¥PCOM-B700G-NS¥10924T00> map -r" followed by a "Device mapping table" listing aliases for fs0, blk0, blk1, and hd54a0b0b. Then "fs0:¥> cd PCOM-B700G-NS", "fs0:¥PCOM-B700G-NS> cd 10924T00", and finally "fs0:¥PCOM-B700G-NS¥10924T00> Update.efi".

```
COM6:115200baud - Tera Term VT
File Edit Setup Control Window KanjiCode Help

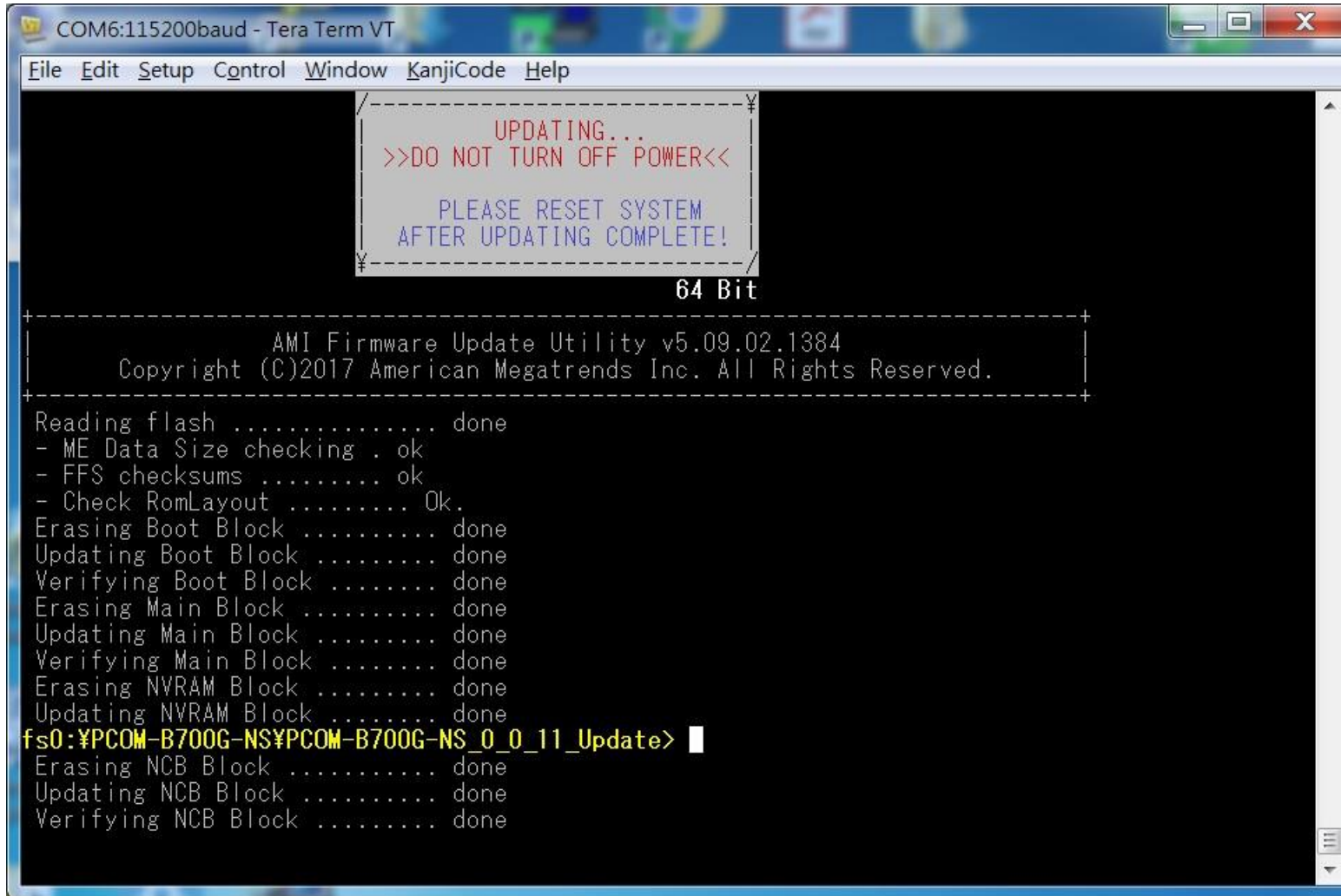
fs0:¥PCOM-B700G-NS¥10924T00> map -r
Device mapping table
  fs0  :Removable HardDisk - Alias hd54a0b0b blk0
        PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x0,0x0)/USB(0x1,0x0)/HD(1,GPT,C8F8A9FB-1001-42A6-A0BA
-FC25E7CC61DC,0x800,0x1CDF7DF)
  blk0 :Removable HardDisk - Alias hd54a0b0b fs0
        PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x0,0x0)/USB(0x1,0x0)/HD(1,GPT,C8F8A9FB-1001-42A6-A0BA
-FC25E7CC61DC,0x800,0x1CDF7DF)
  blk1 :Removable BlockDevice - Alias (null)
        PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x0,0x0)/USB(0x1,0x0)
  hd54a0b0b :Removable HardDisk - Alias fs0 blk0
        PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x0,0x0)/USB(0x1,0x0)/HD(1,GPT,C8F8A9FB-1001-42A6
-A0BA-FC25E7CC61DC,0x800,0x1CDF7DF)

fs0:¥> cd PCOM-B700G-NS
fs0:¥PCOM-B700G-NS> cd 10924T00
fs0:¥PCOM-B700G-NS¥10924T00> Update.efi
```

(EC file update sample)

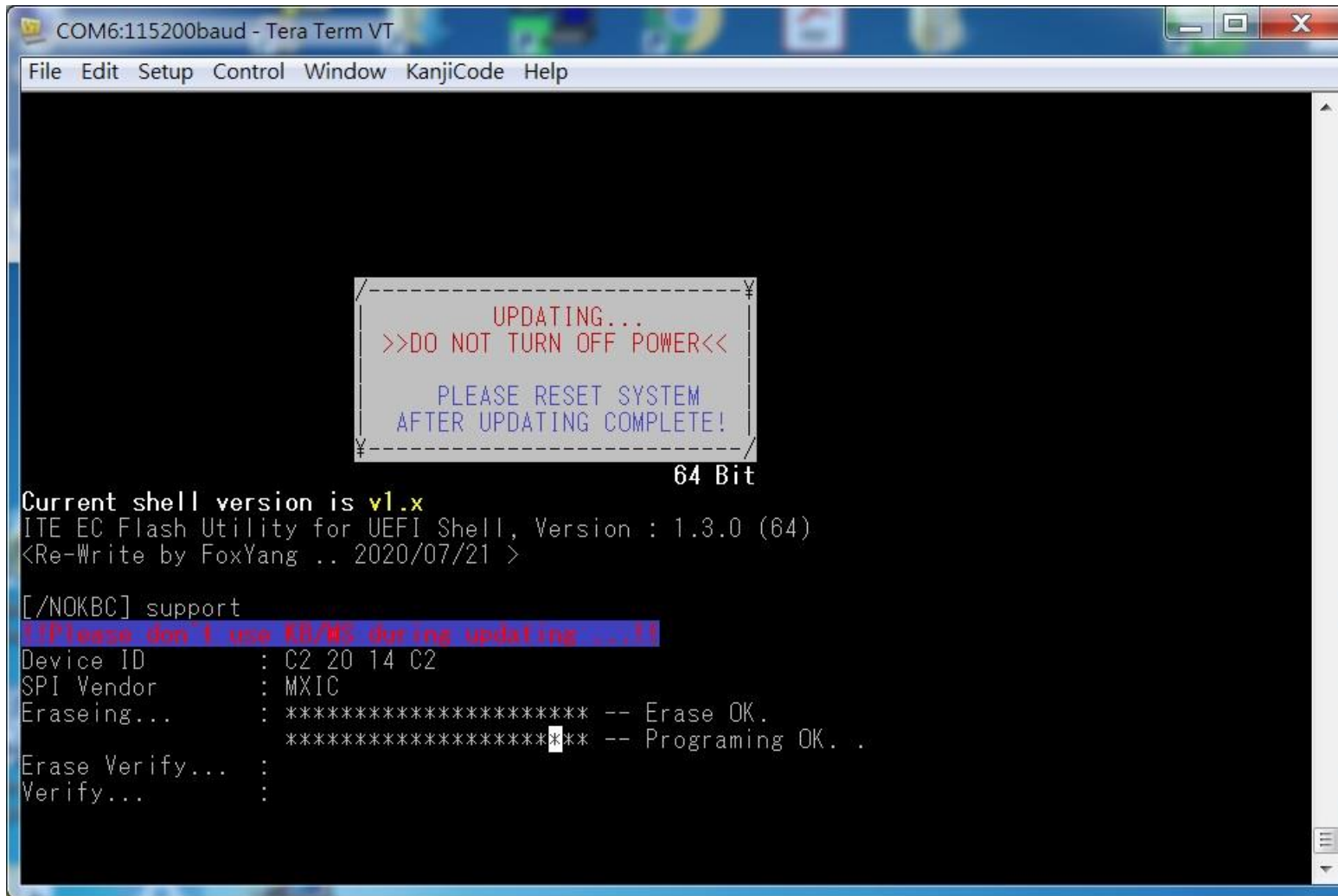
Step 6. The updating process will start and show the updating progress

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



```
COM6:115200baud - Tera Term VT
File Edit Setup Control Window KanjiCode Help
  UPDATING...
  >>DO NOT TURN OFF POWER<<
  PLEASE RESET SYSTEM
  AFTER UPDATING COMPLETE!
  64 Bit
  AMI Firmware Update Utility v5.09.02.1384
  Copyright (C)2017 American Megatrends Inc. All Rights Reserved.
  Reading flash ..... done
  - ME Data Size checking . ok
  - FFS checksums ..... ok
  - Check RomLayout ..... Ok.
  Erasing Boot Block ..... done
  Updating Boot Block ..... done
  Verifying Boot Block ..... done
  Erasing Main Block ..... done
  Updating Main Block ..... done
  Verifying Main Block ..... done
  Erasing NVRAM Block ..... done
  Updating NVRAM Block ..... done
  fs0:¥PCOM-B700G-NS¥PCOM-B700G-NS_0_0_11_Update>
  Erasing NCB Block ..... done
  Updating NCB Block ..... done
  Verifying NCB Block ..... done
```

(BIOS updating progress)



```
COM6:115200baud - Tera Term VT
File Edit Setup Control Window KanjiCode Help

UPDATING...
>>DO NOT TURN OFF POWER<<
PLEASE RESET SYSTEM
AFTER UPDATING COMPLETE!

64 Bit

Current shell version is v1.x
ITE EC Flash Utility for UEFI Shell, Version : 1.3.0 (64)
<Re-Write by FoxYang .. 2020/07/21 >

[/NOKBC] support
!!Please don't use KB/MS during updating...!!
Device ID       : C2 20 14 C2
SPI Vendor      : MXIC
Eraseing...     : ***** -- Erase OK.
                  ***** -- Programing OK. .
Erase Verify... :
Verify...       :
```

(EC updating progress)

9 PORTWELL Software Tool

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.

PORTWELL BIOS web Tool (PBT)

The PORTWELL BIOS web Tool (PBT) is a brand new on-line utility innovated by PORTWELL. PBT now is available for PORTWELL's premiere customers who are able to **add customized BIOS logo** and **change BIOS default settings** on American Megatrends Inc. (AMI) BIOS. Please contact PORTWELL for further information.

PORTWELL EC Auto Test Tool (PECAT)

The PORTWELL EC Auto Test Tool (PECAT) is a brand new utility innovated by PORTWELL. PECAT now is available for PORTWELL's premiere customers, who are able to **Test Embedded Controller Function** in UEFI Mode. Please contact PORTWELL for further information.

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 11 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>