



Military IP65 GPU Computer Intel 13th Raptor Lake-H i7-13800HRE Processor, Nvidia MXM A4500 GPU



User's Manual Revision Date: Sep.04 2024

Revision Date: Sep. 04. 2024

Safety Information

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area.
- If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your local distributor.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter any technical problems with the product, contact your local distributor

Statement

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- All product specifications are subject to change without prior notice

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Revision History

Revision	Date (yyyy/mm/dd)	Changes
Version 1.0	2024/09/04	Initial release

Packing list

- ► AV600-RH-A45 Military IP65 GPU Rugged System
- ► CD (Driver + Quick Installation Guide)

Ordering information

Model	No.	AV600-RH-A204 AV600-RH-A208 AV600-RH-A45				
Architecture			COM Express			
Coolin	g		Conduction Cooling			
CPU		Intel	13th Raptor Lake-H i7-13800	HRE		
RAM		16GB D	DR5 5200MHz SO-DIMM (Up to	o 96GB)		
MXM	GPU	MXM A2000(4G)	MXM A2000(8G)	MXM A4500(16G)		
Storag	•	2x 2.5" SATA III SSD (up to 16TB each)				
Storay	-	1x M.2 2280 NVMe SSD (up to 2TB)				
	Power	1x DC-IN				
	X1	4x RS232 (RS422/485 option)				
I/O	X2	2x GbE + 2x USB2.0				
	X3	4x DI/4x DO + 1x VGA (option)				
	X4	1x USB3.0				
3G-SDI		2x In/Out 3G-SDI or 4x In 3G-SDI (option)				
Dimension		250 x 325 x 100 mm 250 x 325 x122mm				
MIL-STD-461		Compliance				
MIL-STD-810		Compliance				



If any of the above items is damaged or missing, please contact your local distributor.



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CHAPTER 1: PRODUCT INTRODUCTION

1-1. Key Features

System		
CPU	Intel® 13 th Raptor Lake-H i7-13800HRE,14C/20T, 2.5/5.0GHz, 24MB cache, 45W	
Memory Type	2x 8GB DDR5 5200MHz SO-DIMM (up to 96GB), non-ECC	
GPU	NVidia® RTX A4500 5888 CUDA® cores, 16GB GDDR6	
Expansion slot	2x Full-size mini PCIe (with SIM card slot)	
•	2x M.2 2280 M key (both PCIe x4 from PEG)	
	1x SATAIII 2.5" SSD (Swappable SSD Tray)	
Front I/O		
DC IN	1x DC-IN with D38999-20FB5PN connector	
X1	1x USB3.0 with D38999 connector	
X2	1x mini-DP port with D38999 connector	
X3	1x GbE LAN RJ45 D38999 connector	
X4	1x GbE LAN RJ45 D38999 connector	
LED	1x SSD LED indicator	
SSD	1x Swappable SSD Tray	
Power Button with LED backlight		
Applications		
Applications	Military IP65 GPU Rugged Mission MIL-STD 810 Computer is built to meet strict size, weight, and power (SWaP) requirements and to withstand harsh environments, including temperature extremes, shock/vibe, sand/dust, and salt/fog.	
Operation System		
OS Support	Windows 10 / 11 64Bit, Linux by option	
Mechanical & Envir	onment	
Chassis	Aluminum Alloy, Corrosion design	
Finish	Anodic aluminum oxide	
Cooling	Natural Passive Convection/Conduction. No Moving Parts	
Ingress Protection	IP65	
Power Requirements	Power Supply, 18-36V DC In	
Dimension (W x D x H)	250 x 350 x 120mm (9.84" x 13.78" x 4.72")	
Operating Temp40 to 60°C		
Storage Temp.	- 40 to 85°C	
Relative Humidity	5% to 95%, non-condensing	

*All specifications and photos are subject to change without notice.

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1-2. Dimensions(2D)





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1-3. Panel Component







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CHAPTER 2: JUMPERS AND CONNECTORS LOCATIONS

2.1. D38999 Connect Pin Definitions

DC-In



	CON1	
黄	А	TN14
黄	В	INI
黑	С	TNO
黑	D	TINZ
綠	Shell	0 端

X1: 1x USB3.0



USB3.0 Standard A front coupling side connector to USB3.0 Standard A back side connector			
Pin Number	Signal Name	Description	
1	VBUS	Power	
2	D-	LICP2 0 differential pair	
3	D+	OSB2.0 differential pair	
4	GND	Ground for Power return	
5	StdA-SSRX-	Super speed receiver	
6	StdA-SSRX+	Differential pair	
7	GND_DRAIN	Ground for Signal return	
8	StdA-SSTX-	Super speed transmitter	
9	StdA-SSTX+	Differential pair	
Shell	sHIELD	Connector metal shell	

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X2: 1x min-DP



CON1	CON2			CON1	CON2		
1	1	GND	GND	2	37	PURPLE	DET
3	3	WHITE	TP0	4	35	BLUE	GND
5	5	RED	TN0	6	35	WHITE	GND
7	7	GND	GND	8	25	GND	GND
9	9	WHITE	TP1	10	21	WHITE	TP3
11	11	GREEN	TN1	12	23	BLACK	TN3
13	13	GND	GND	14	25	GND	GND
15	15	WHITE	TP2	16	31	WHITE	AUX P
17	17	BLUE	TN2	18	33	BROWN	AUP N
19	19	GREEN	GND	20	39	RED	PWR

X3 & X4: 1x GbE LAN RJ45

Data Transmission:

- 10 BaseT, 100 BaseTX, 1000 BaseT and 10G Base T up to 500 MHz networks
- · Cat.6A connector according to TIA568C.2 and ISO/IEC11801 standard



RJFTV6A 7 X 1RA X





CHAPTER 3: BIOS SETUP ITEMs

This chapter provides users with detailed descriptions on how to set up a basic system configuration through the AMI BIOS setup utility.

3.1 INTRODUCTION

The following section describes the BIOS setup program. The BIOS setup program can be used to view and change the BIOS settings for the module. Only experienced users should change the default BIOS setting.

3.2 BIOS 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 <Delete> or <ESC> key will enter BIOS setup screen.

Press <ESC > or <Delete> 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.



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3.2.1 MAIN

Use this menu for basic system configurations, such as time, date etc.

	Aptio Setup - AMI		
Main Configuration Security	Boot Save & Exit		
Project Name BIOS Version & Build Date EC Version & Build Date Access Level	PCOM-B658VGL 0.0.9 (05/31/2023 10:48:00) 0.2 (03/13/2023) Administrator		
Processor Information Name Type	RaptorLake ULT 13th Gen Intel(R) Core(TM) i7–13800HE		
Total Memory	7936 MB		
PCH Information PCH SKU	RPL-P: Premium		
Detailed System Information			
System Date System Time	[Wed_07/19/2023] [14:56:47]		

Feature	Description	Options
Detailed System Information		
System Data	The date format is <day>, <month> <date> <year>. Use</year></date></month></day>	
System Date	[+] or $[-]$ to configure system Date.	
Svotom Time	The time format is <hour> <minute> <second>. Use [+]</second></minute></hour>	
System Time	or [$-$] to configure system Time.	

3.2.2 CONFIGURATION

Use this menu to set up the items of special enhanced features.



3.2.2.1 CPU CONFIGURATION

CPU Configuration Parameters.

	Aptio Setup – AMI Configuration			
ſ	CPU Configuration		Number of P-cores to enable in each	
	Type ID Speed L1 Data Cache	13th Gen Intel(R) Core(TM) i7–13800HE 0x806A2 2500 MHz 48 KB x 6	Cores and E-cores are looked at together. When both are {0,0}, Pcode will enable all cores.	
	L1 Instruction Cache L2 Cache	32 KB × 6 1280 KB × 6		
	L3 Cache VMX SMX/TXT	24 MB Supported Supported		
	Active Performance-cores Active Efficient-cores Hyper-Threading Boot performance mode Intel (VMX) Virtualization Technology Intel (VMX) Virtualization Technology	(A11) (A11) [Enabled] [Turbo Performance] [Enabled] [Enabled]		
	Intel(R) Speed Shift Technology	[Enabled]	++: Select Screen	
	Turbo Mode C states Enhanced C-states	[Enabled] [Enabled] [Enabled]	T∔: Select Item Enter: Select +/-: Change Opt.	
	C-State Auto Demotion C-State Un-demotion	[C1] [C1]	F1: General Help F2: Previous Values	
	Package C-State Demotion Package C-State Un-demotion	[Enabled] [Enabled]	F3: Optimized Defaults F4: Save & Exit	
	UState Pre-wake IO MWAIT Redirection Package C State Limit	[Enabled] [Disabled] [Auto]	F8: F01 List F12: Capture Screen ESC: Exit	

Feature	Description	Ontions
Active Performance- cores	Number of P-cores to enable in each processor package. Note: Number of Cores and E-cores are looked at together. When both are {0,0}, Pcode will	★All, 5, 4, 3, 2, 1
Active Efficient-cores	enable cores Number of E-cores to enable in each processor package. Note: Number of Cores and E-cores are looked at together. When both are {0,0}, Pcode will enable cores	★All, 7, 6, 5, 4, 3, 2, 1, 0
Hyper-Threading	Enabled or Disabled Hyper-Threading Technology.	★Enabled, Disabled
Boot performance mode	Select the performance state that the BIOS will set starting from reset vector	Max Battery, Max Non-Turbo Performance ★Turbo Performance,
Intel (VMX) Virtualization Technology	When enabled, a VMM can utilize the additional hardware capabilities provided by Vander pool Technology.	Disabled, ★Enabled
Intel® Speed Step™	Allows more than two frequency ranges to be supported.	Disabled, ★Enabled
Intel® Speed Shift Technology	Enable/Disable Intel® Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states	Disabled, ★Enabled
Turbo Mode	Enable/Disable processor Turbo Mode (requires Intel Speed Step or Intel Speed Shift to be available and enabled)	Disabled, ★Enabled
C states	Enable/disable CPU Power Management. Allows CPU to go to C states It's not 100% utilized	Disabled, ★Enabled

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Enhanced C-StatesEnable/disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-State.		Disabled, ★Enabled
C-State Auto Demotion	Configure C-State Auto Demotion	Disable, C1 ,C3 , ★C1 and C3
C-State Un-demotion	Configure C-State Un-demotion	Disable, C1 ,C3 , \star C1 and C3
Package C State Package C-State Demotion		★Disabled, Enabled
Package C State Un-demotion	Package C-State Un-demotion	★Disabled, Enabled
CState Pre-Wake	Disable – Sets bit 30 of POWER_CTL MSR(0x1FC) to 1 to disable the Cstate Pre-Wake	Disabled, ★Enabled
IO MWAIT Redirection	When set, will map IO_read instructions sent to IO registers PMG_IO_BASE_ADDRBASE+offset to MWAIT(offset)	★Disabled, Enabled
Package C State Limit	Maximum Package C State Limit Setting. Cpu Default: Leaves to Factory default value. Auto: Initializes to deepest available Package C States Limit	★Auto,C0/C1,C2,C3,C 6,C7, C7S,C8,C9,C10,Cpu Default,

3.2.2.2 CHIPSET CONFIGURATION

Configuration Chipset feature.

Chipset Configuration		VT-d capability
VT-d Above 4GB MMIO BIOS assignment	[Enabled] [Disabled]	
HD Audio Port 80h Redirection	[Enabled] [LPC Bus]	
Me FW Image Re-Flash	[Disabled]	

Feature	Description	Options
VT-d	VT-d Capability	★Enabled ,Disable d
Above 4GB MMIO BIOS assignment	Enable/Disable above 4GB MemoryMappedIO BIOS assignment This is enabled automatically when Aperture Size is set to 2048MB	★Disabled, Enabled
HD Audio	Control Detection of the HD-Audio device. Disabled= HAD will be unconditionally disabled Enabled= HAD will be unconditionally enabled.	★Enabled ,Disable d
Port 80h Redirection	Control where the Port 80h cycles are sent	★LPC Bus, PCIE Bus
Me FW Image Re-Flash	Enable/Disable Me FW Image Re-Flash function	★Disabled, Enabled

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3.2.2.3 GRAPHICS CONFIGURATION

Configuration Graphics Settings.

Feature	Description	Options
Primary Display	Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.	★Auto, IGFX, PEG, PCI
Internal Graphics	Keep IGFX enable based on the setup options.	★Auto, Disable, Enable
DVMT Pre-Allocated	Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.	0M,32M,64M,4M,8M,12 M,16M,20M,24M,28M, 32M/F7,36M,40M,44M,4 8M,52M,56M,★60M
DVMT Total Gfx Mem	Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device	★256M, 128M, MAX

3.2.2.4 EDP-TO-LVDS CONFIGURATION

eDP-to-LVDS.

Main	Aptio Setup - AMI Main		
eDP-to-LVDS config	guration		Select Panel Profile for current use
Panel Profile [1024x768] Color depth and data format [VESA and J Channel Mode [Single Cha Clock Mode [Even Bus]		JEIDA 18 bpp] annel]	
▶ OEM Profile			
			++: Select Screen
Feature	Description	Options	
Panel Profile	Select Panel Profile for current use.	★1024x768,640x48 1280x1024,1366x7 Profile	30,800x480,800x600,1280x800 68,1440x900,1920x1080,OEM
Color depth	Select Color depth	★VESA and JEIDA	18 bpp. VESA 24 bpp. JEIDA 24
and data format	and data format	bpp	·····
	Select LVDS		
Channel Mode	Channel Mode	★Single Channel, I	Jual Channel
	Select clock output		
JIOCK MODE	for LVDS.	★Even Bus, Odd Bus, Both Buses	

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3.2.2.5 OEM PROFILE

PANEL 1 Configuration.

Configuratio	n	Aptio Setup - AMI	
PANEL 1 Configurati	on		
Profile Name : Rename Profile		empty	
Color depth and dat Channel Mode Clock Mode Pixel Clock H Active Pixels H Blank Pixels H Width Pixels V Active Lines V Blank Lines V Offset Lines V Width Lines H & V suc Signal P	a format 0.000 Mhz 0 0 0 0 0 0 0 0 0	[VESA and JEIDA 18 bpp] [Single Channel] [Even Bus] 2500 640 160 16 96 480 45 10 2 [Poctive]	
			++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F8: PCI List

Feature	Description	Options
Color depth and	Select Color depth and data format	★VESA and JEIDA 18 bpp, VESA
data format		24 bpp, JEIDA 24 bpp
Channel Mode	Select LVDS Channel Mode	★Single Channel, Dual Channel
Clock Mode	Select clock output for LVDS.	★Even Bus, Odd Bus, Both Buses
Pixel Clock	Pixel Clock(10Khz)	★2500
H Active Pixels	H Active Pixels (Pixel)	★640
H Blank Pixels	H Blank Pixels (Pixel)	★ 160
H Offset Pixels	H Offset Pixels (Pixel)	★16
H Width Pixels	H Width Pixels (Pixel)	★96
V Active Lines	V Active Lines (Line)	★480
V Blank Lines	V Blank Lines (Line)	★45
V Offset Lines	V Offset Lines (Line)	★10
V Width Lines	V Width Lines (Line)	★2
H&V sync Signal Polarity	Flag: 0x1E Signal Polarity is Postive 0x18 Signal Polarity is Non-Postive	★Postive, Non-Postive

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3.2.2.6 POWER CONTROL CONFIGURATION

System Power Control Configuration Parameters.

Configuration	Aptio Setup – AMI	
Power Control Configuration		Enables or Disables System ability to Hibernate (DS/S4 Sleen State) This
Enable Hibernation ACPI Sleep State Power Loss Function	[Enabled] [S3 (Suspend to RAM)] [Always OFF]	option may not be effective with some operating systems.
		++: Select Screen

Feature	Description	Options
Enable Hibernation	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some operating system	Disabled, ★Enabled
ACPI Sleep State	Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.	Suspend Disabled ,★S3 (Suspend to RAM)
Power Loss Function	Control SIO Power Loss Function. ON is always ON, OFF is always OFF, Last state will depends on last power state	★Always OFF, Always ON, Last State,

3.2.2.7 PCI/PCIE CONFIGURATION

PCI, PCI-X and PCI Express Settings.

	Aptio Setup – AMI Configuration	
Γ	PCI/PCIE Configuration	PCI Express Root Port Settings.
	CPU PCI Express Root Port COME PEG Port 0 (H-Series Processors) - COMe PEG Port 8 - COMe PEG Port 12	
	PCH PCI Express Root Port COME PCIE Port 1 COME PCIE Port 2 COME PCIE Port 3 COME PCIE Port 4 COME PCIE Port 5	
		++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help

3.2.2.8 COME PEG PORT 0, 8, 12

PCI Express Root Port Settings.

Configuration	Aptio Setup – AMI Configuration			
COMe PEG Port 0 (H-Serie ASPM PCIe Speed	s Processors) [Enabled] [Disabled] [Auto]	Control the PC	I Express Root Port.	
Feature	Description		Options	
COMe PEG Port 0,8, 12	Control the PCI Express Root Port.		Disabled, ★Enabled	
ASPM	Set the ASPM Level: Force L0s – Force all links to L0s Sta AUTO - BIOS auto configure DISABLE – Disables ASPM	ate	★Disabled, L0s, L1, L0sL1, Auto	
PCIe Speed	Configure PCIe Speed		★Auto, Gen1, Gen2, Gen3	

3.2.2.9 PCH PCI EXPRESS ROOT PORT 1~5

PCI Express Root Port Settings.

Configuration	Aptio Setup – AMI	
COME PCIE Port 1 ASPM PCIE Speed	[Enabled] [Disabled] [Auto]	Control the PCI Express Root Port.

Feature	Description	Options
COMe PCIe Port 1~5	Control the PCI Express Root Port.	Disabled, ★Enabled
ASPM	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO - BIOS auto configure DISABLE – Disables ASPM	★Disabled, L0s, L1, L0sL1, Auto
PCIe Speed	Configure PCIe Speed	★Auto, Gen1, Gen2, Gen3

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3.2.2.10 LAN CONFIGURATION

Configuration On Board LAN Device.

Aptio Setup – AMI Configuration			
LAN Configuration		Control the PCI Express Root Port.	
Intel Ethernet Controller I226LM			
LAN MAC Address	00-90-FB-7C-5E-8F		
OnBoard LAN Controller#1			
PCTE WAKE(Wake On Lan)	[Enabled]		
Launch LIEFT PXF ROM	[Enabled]		
TPv4 PXF Support	[Enabled]		
IPv4 HTTP Support	[Enabled]		
IPv6 PXE Support	[Enabled]		
IPv6 HTTP Support	[Enabled]		
PXE boot wait time	0		
Media detect count	1		
		++: Select Screen	
		11: Select Item	
		Enter: Select	
		+/-: Change Opt.	
		F1: General Help	
		F2: Previous Values	
		F3: Optimized Defaults	

Feature	Description	Options
Onboard LAN	Enchle/Dischle onheard NIC	★Enabled ,
Controller #1	Enable/Disable onboard NIC	Disabled
PCIE_WAKE	Control DCIE workott nin for Wake On Lon function	★Enabled ,
(Wake on LAN)	Control PCIE wake# pintion wake On Lan function	Disabled
Launch UEFI PXE	Enable/Disable LIEEL Network Stock	★Disabled,
ROM	Enable/Disable OEFT Network Stack	Enabled
Launch UEFI PXE	ROM[Enable]	
lpv4 PXE	Enable/Disable Inv/ DXE boot support	Disabled,
Support		★Enabled
lpv4 HTTP	Enable/Disable Ipv4 HTTP boot support. If disable, IPv4	Disabled,
Support	HTTP boot support will not be available.	★Enabled
lpv6 PXE	Enable/Disable Ipv6 PXE boot support. If disable, IPv6	Disabled,
Support	PXE boot support will not be available.	★Enabled
lpv6 HTTP	Enable/Disable Ipv6 HTTP boot support. If disable, IPv6	Disabled,
Support	HTTP boot support will not be available.	★Enabled
IPSEC	Support to Enchle/Dischle IDSEC cortificate for Ikov	Disabled,
Certificate	Support to Enable/Disable IPSEC certificate for they	★Enabled
PXE boot wait	Wait time in seconds to press ESC key to abort the PXE	★ 0
time	boot. Use either +/- or numeric keys to set the values	
Media detect	Number of times the presence of media will be checked.	★ 1
count	Use either +/- or numeric keys to set the values.	

3.2.2.11 SATA CONFIGURATION

SATA/NVMe Device Options Settings.

Configuration	Aptio Setup - AMI		
SATA/NVMe Configuration		SATA Device Options Sett	ings
 ► SATA And RST Configuration ► NVMe Configuration 			
		++: Select Screen	
ature	Description		Options
ATA And RST Configuration	on SATA Device Options Settings		
VMe Configuration	NVMe Device Options Settings		

3.2.2.12 SATA AND RST CONFIGURATION

Enable/Disable to VMD controller

Configuration	Aptio Setup - AMI		
SATA Configuration SATA Controller(S) Enable VMD controller(RV COME SATA Port 0 Software Preserve Port 0 Hot Plug Configured as eSATA SATA Device Type COME SATA Port 1 Software Preserve Port 1 Hot Plug Configured as eSATA SATA Device Type	[Enabled] AID mode) [Disabled] Empty Unknown [Enabled] Hot Plug supported [Hard Disk Drive] Empty Unknown [Enabled] [Disabled] Hot Plug supported [Hard Disk Drive]	<pre>Enable/Disable Enable/Disable #*: Select Scru 14: Select Itel Enter: Select #/-: Change Op F1: General He F2: Previous Vu F3: Optimized I F4: Save & Exi: F8: PCI List F12: Capture Si ESC: Exit</pre>	SATA Device.
Feature	Description		Options
SATA Controller(s)	Enable/Disable the SATA Device.		★Enabled , Disabled
Enable VMD			

Mode) COMe SATA Port 0~1

controller(RAID

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★Disabled, Enabled

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Port 0~1	Enable or Disable SATA Port	★Enabled ,Disabled
Hot Plug	Designates this port as Hot Pluggable	★Disabled, Enabled
SATA Device	Identify the SATA port is connected to Solid	★Hard Disk
Туре	State Drive or Hard Disk Drive	Drive, Solid State Drive

3.2.2.13 USB CONFIGURATION

USB Configuration Parameters.

Configuration		Aptio Setup - AMI
USB Configuration		Enable/Disable this USB Physical
USP Controllors:		Connector (physical port). Unce dischlad, any USP devices plug into the
2 XHCIe		connector will not be detected by BIOS
USB Devices:		on OS.
1 Drive, 1 Keyboard, 1 Mouse		
COMe USB 3.0 Port 0		
COMe USB 3.0 Port 1	[Enabled]	
COMe USB 3.0 Port 2	[Enabled]	
COMe USB 3.0 Port 3	[Enabled]	
COMe USB 2.0 Port 0	[Enabled]	
COMe USB 2.0 Port 1	[Enabled]	
COMe USB 2.0 Port 2	[Enabled]	
COMe USB 2.0 Port 3	[Enabled]	
COMe USB 2.0 Port 4	[Enabled]	
COMe USB 2.0 Port 5	[Enabled]	
COMe USB 2.0 Port 6	[Enabled]	
COMe USB 2.0 Port 7	[Enabled]	++: Select Screen
		T4: Select Item
XHCI Hand-off	[Enabled]	Enter: Select
USB Mass Storage Driver Support	[Enabled]	+/-: Change Upt.
		F1: General Help
Naca Stanada Daviasat		F2: Previous values
Mass Storage Devices:	[Outo]	F3: Optimized Defaults
050	[Huto]	F4: SaVe & EXIT

Feature	Description	Options
COMe USB 3.0 Port #0~7	Enable/Disable this USB Physical Connector (physical port). Once disable, any USB devices plug into the connector will not be detected by BIOS or OS	★Enabled ,Disa bled
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 ,Disa bled
USB Mass Storage Driver Support	Enable/Disable USB Mass Storage Driver Support	★Enabled ,Disa bled
USB	Mass storage device emulation type. 'AUTO' enumerates devices according to their media format. Optical drives are emulated as 'CDROM', drives with no media will be emulated according to a drive type	★Auto, Floppy, Forced FDD, Hard Disk, CD-ROM

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3.2.2.14 TPM CONFIGURATIN

Trust Computing Settings.

Aptio Setup - AMI Configuration			
TPM 2 0 Device Found		Enables or Disables BIOS support for security device. O.S. will not show	
Firmware Version: Vendor:	7.85 IFX	Security Device. TCG EFI protocol and INT1A interface will not be available.	
Security Device Support Active PCR banks Available PCR banks	(Enable) SHA256 SHA256		
SHA256 PCR Bank	[Enabled]		
Pending operation Platform Hierarchy Storage Hierarchy Endorsement Hierarchy TPM 2.0 UEFI Spec Version Physical Presence Spec Version TPM 2.0 InterfaceTune	[None] [Enabled] [Enabled] [TCG_2] [1.3] [TTS]		
Device Select	[Auto]	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help	

Feature	Description	Options
Security Device 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.	Disabled, ★Enabled
SHA256 PCR Bank	Enables or Disables 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	Enables or Disables Platform Hierarchy	Disabled, ★Enabled
Storage Hierarchy	Enables or Disables Storage Hierarchy	Disabled, ★Enabled
Endorsement Hierarchy	Enables or Disables 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 TPM2.0 devices if not found, TPM 1.2 devices will be enumerated	TPM1.2, TPM2.0, ★Auto

3.2.2.15 SUPER IO CONFIGURATION

System Super IO Chip Parameters.

Configuration	Aptio Setup - AMI	
Super IO Configuration		Enable/Disable watch dog timer
 Serial Port 1 Configuration Serial Port 2 Configuration 		
Watch Dog Timer Timer Unit Timer Value	[Enabled] [Second] 20	

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

3.2.2.16 SERIAL PORT 1 CONFIGURATION

Set Parameters of Serial Port 1.

Configuration	Aptio Setup - AMI		
Serial Port 1 Configuration		Enable or Di	sable Serial Port (COM)
Module Serial Port 1 Device Settings	(Enabled) IO=3F8h; IRQ=4;		
la churc	Description		Optiono
eature	Enable or Disable Serial	Port (COM)	
eature odule Serial Port 1	Description Enable or Disable Serial F	Port (COM)	Options ★Enabled, Disab



3.2.2.17 SERIAL PORT 2 CONFIGURATION

Set Parameters of Serial Port 2.

Configura	Aptio Setup - AMI		
Serial Port 2 Co	nfiguration	Enable or Dis	able Serial Port (COM)
Module Serial Po Device Settings	nt 2 [Enabled] IO=3E8h; IRQ=3;		
Feature	Description		Options
Serial Port 2	Enable or Disable Serial Port (CON	(N	★Enabled, Disabled

3.2.2.18 H/W MONITOR

Monitor hardware status.

Aptio Setup – AMI			
Module Fan Function	[Enabled]	Disable / Enable the smart fan control.	
Module Fan Control Mode	[Thermal Cruise Mode]		
Module Fan Tolerance Temp	5		
Module Fan Start Target Temp	40		
Module Fan Full Target Temp	60		
Module Fan Low End	5		
Carrier Fan Function			
Carrier Fan Control Mode	[Thermal Cruise Mode]		
Carrier Fan Tolerance Temp	5		
Carrier Fan Start Target Temp	40		
Carrier Fan Full Target Temp	60		
Carrier Fan Low End	5		
CPU Temperature	: +40 °C		
Module Fan Speed	: N/A		
Carrier Fan Speed	: 5324 RPM	++: Select Screen	
		↑↓: Select Item	
Vcone	: +0.684 V	Enter: Select	

Feature	Description	Options
Module Fan Function	Enable/Disable the smart fan control	★Disabled, Enabled
Module Fan Function [Enable]		
Module Fan Control Mode	Smart Fan Mode Select	★Thermal Cruise Mode, Fan Control Mode

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Module Fan	In Thermal Cruise Mode: Tolerance of Target	★5
Tolerance Temp	Temperature	
Module Fan Start	In Thermal Cruise Mode: Start Temperature	+10
Target Temp		* 40
Module Fan Full	In Thermal Cruise Mode: Full Speed Temperature	+60
Target Temp		*00
Module Fan Low	In Thermal Cruise Mode: Low end of fan speed	. . .
End	(0~100%)	×ο
Carrier Fan	Enchle /Dischle the emert for control	★Disabled,
Function	Enable/Disable the smart fan control	Enabled
Carrier Fan		
Function [Enable]		
Carrier Ean		★Thermal Cruise
	Smart Fan Mode Select	Mode.
		Fan Control Mode
Carrier Fan	In Thermal Cruise Mode: Tolerance of Target	. . .
Tolerance Temp	Temperature	×O
Carrier Fan Start	In Thermal Cruise Mode: Start Temperature	+ 10
Target Temp		★40
Carrier Fan Full	In Thermal Cruise Mode: Full Speed Temperature	+60
Target Temp		*00
Carrier Fan Low	In Thermal Cruise Mode: Low end of fan speed	+ 5
End	(0~100%)	×υ

3.2.2.19 SERIAL PORT CONSOLE REDIRECTION

Serial Port Console Redirections.

Configuration	Aptio Setup - AMI	
Serial Port Console Red	irection	Console Redirection Enable or Disable.
COMO Console Redirection ► Console Redirection Set	[Disabled] tings	
		++: Select Screen
eature	Description	Options
onsole Redirection	Console Redirection Enable or Disat	ole ★Disabled, Enable



3.2.2.20 COM0 CONSOLE REDIRECTION SETTINGS

Conf	Aptio Setup - AMI		
COMO Console Rec Terminal Ty Bits per se Data Bits Parity Stop Bits Flow Contro VT-UTF8 Com Recorder Mc Resolution Putty KeyPa	lirection Settings pe [VT100Plus] cond [115200] [8] [None] [1] pl [None] bbo Key Support [Enabled] ide [Disabled] 100x31 [Disabled] id [VT100]	Emulation: ANSI: Extend set. VT100: ASCII char: Extends VT100 to suppor function Keys, etc. VT- encoding to map Unicode more bytes. ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults	ed ASCII char set. VT100Plus: t color, UTF8: Uses UTF8 chars onto 1 or
Feature	Description		Options
Terminal Type	Emulation: ANSI: Extended ASCII char set. V char set. VT100+: Extends VT100 to support o keys, etc. VT-UTF8: Uses UTF8 encoding to chars onto 1 or more bytes.	VT100,★VT100 Plus, VT-UTF8, ANSI	
Bits per second	Select Serial port transmission speed. The sp matched on other side. Long or noisy lines ma 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 de transmission errors. Even: parity bit is 0 if the the data bits is even. Odd: parity bit is 0 if nur data bits is odd. Mark: parity bit is always 1. S is always 0. Mark and Space Parity do not all detection. They can be used as an additional	★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.		
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,		
VT-UTFB Combo Key Support	Enable VT-UTF8 Combination Key Support fo	★Enabled, Disabled	

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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 FunctionKey and KeyPad on Putty	★VT100, LINUX,XTERM R6, SCO,ESCN,VT4 00

3.2.2.21 EC FIRMWARE UPDATE

EC Firmware Update.

Configura	tion	Aptio Setup - AMI		
EC Firmware Upda	te		Select ROM image	
EC Model Name EC Version & Bui	658 1d Date 0.2	3-РWG 2 (03/13/2023)		
 ▶ Select File Select File Name ▶ Update 	N/f	à		
ature	Description			Options
lect File	Select ROM ima	ige		



3.2.3 SECURITY

Aptio Setup – AMI Main Configuration <mark>Security</mark> Boot Save & Exit			
Password Description If ONLY the Administrator's password is a then this only limits access to Setup an only asked for when entering Setup. If ONLY the User's password is set, then is a power on password and must be enter boot or enter Setup. In Setup the User w have Administrator rights. The password length must be in the following range: Minimum length Maximum length	set, d is this ed to ill 3 20	[Setup] check password when enter setup screen. [Power on] check password on every time system power on.	
Password Check Mode Administrator Password User Password		++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Helo	
► Secure Boot		F2: Previous Values F3: Optimized Defaults F4: Save & Exit	

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	

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3.2.4 Воот

Aptio Setup – AMI Main Configuration Security <mark>Boot</mark> Save & Exit				
Boot Configuration Setup Prompt Timeout Bootup NumLock State CSM Support Full Screen LOGO Boot mode select FIXED BOOT ORDER Priorities Boot Option #1 Boot Option #2 Boot Option #3 Boot Option #4 Boot Option #5 • UEFI Application Boot Priorities	1 [On] [Disabled] [Disabled] [UEFI] [Hard Disk] [NYME] [USB Device] [Network] [UEFI AP:UEFI: Built-in EFI Shell]	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.		
		++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values		

Feature	Description	Options
Setup Prompt Timeout	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.	★1
Bootup NumLock State	Select the keyboard NumLock state	★ On, Off
CSM Support	Enable/Disable CSM support	★Disabled
Full Screen LOGO	Enables or disables Quiet Boot option and Full screen Logo.	★Disabled, Enabled
Boot mode select	Select boot mode LEGACY/UEFI	★UEFI ,Legacy
Boot Option #1~5	Sets the system boot order	 ★Hard Disk, NVME, USB Device, Network, UEFI AP: UEFI: Built-in EFI Shell, Disabled
UEFI Application Boot Priorities	Specifies the Boot Device Priority sequence	

3.2.5 SAVE & EXIT

Aptio Setup – AMI Main Configuration Security Boot <mark>Save & Exit</mark>		
Save Options Save Changes and Reset Discard Changes and Reset	Reset the system after saving the changes.	
Default Options Restore Defaults Boot Override UEFI: Built-in EFI Shell Launch EFI Shell from filesystem device		

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	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)	
Launch EFI Shell from	Attempts to Launch EFI Shell application (Shell.efi)	
filesystem device	from one of the available filesystem devices.	

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3.3 BIOS / EC UPDATE

PCOM-B658VGL only support BIOS/EC update under UEFI shell environment, refer the following step, please.

3.3.1 BIOS UPDATE

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

Step 2. Make sure "Boot mode select" item is "UEFI" in the BIOS "Boot" page

Shown as below picture.

	Aptio Setup — AMI
Main Configuration Security Boot Sa	ave & Exit
Boot Configuration	
Setup Prompt Timeout	1
Bootup NumLock State	[0n]
CSM Support	[Disabled]
Full Screen LOGO	[Disabled]
Boot mode select	[UEFI]
FIXED BOOT ORDER Priorities	
Boot Option #1	[Hard Disk]
Boot Option #2	[NVME]
Boot Option #3	[CD/DVD]
Boot Option #4	[USB Device]
Boot Option #5	[Network]
Boot Option #6	[UEFI AP:UEFI: Built-in EFI Shell]

Step 3. Plug the USB DOK on the target system and select "Built-in EFI Shell" in the BIOS "Save & Exit" page

Shown as below picture

Main Configuration Security Boot Save & Exit	Aptio Setup – AMI
Save Options Save Changes and Reset Discard Changes and Reset	
Default Options Restore Defaults	
Boot Override UEFI: Built-in EFI Shell Launch EFI Shell trom tilesystem device	

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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



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

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

```
EDK II
UEFI v2.70 (American Megatrends, 0x00050013)
Mapping table
      FSO: Alias(s):HDOrOb:;BLK1:
          PciRoot(0x0)/Pci(0x14,0x0)/USB(0x11,0x0)/HD(1,MBR,0x6A4499BF,0x800,0x1
D6B800)
    BLK0: Alias(s):
          PciRoot(0x0)/Pci(0x14,0x0)/USB(0x11,0x0)
Intel (R) Flash Programming Tool Version: 15.0.30.1776
Copyright (C) 2005 – 2021, Intel Corporation. All rights reserved.
Reading HSFSTS register... Flash Descriptor: Valid
   --- Flash Devices Found ---
    ID:0xC22019
                  Size: 32768KB (262144Kb)
GbE Region does not exist.
 Erasing Flash Block [0x2000000] - 100 percent complete.
 Programming Flash [0x2000000] 32768KB of 32768KB - 100 percent complete.
RESULT: The data is identical.32768KB of 32768KB – 100 percent complete.
PT Operation Successful.
SO:\Update_FPT_PCOM-B657VGL_0_0_16\> _
```

(BIOS updating finished)



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3.3.2 EC UPDATE

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

Step 2. Select "EC Firmware Update" item in BIOS setup menu



Step 3. Select EC binary file by option item shown as below

Configuration	Aptio Setup - AMI	
EC Firmware Update		Select ROM image
EC Model Name EC Version & Build Date	657-PWG 0.6 (03/23/2022)	
▶ Select File Select File Name ▶ Update	N/A	
	Select File	_
	[] EC_PCOM-8657VGL_0_6.bin (128KB)	
		<pre>##: Select screen 14: Select Item Enter: Select +/-: Change Opt. Et. Concept. Uptn</pre>



Step 4. Select "Yes" to start EC update (Please don't turn off power during firmware update)



Step 5. Turn off power to make system into G3 status once updating finished, then power on the system



