



COM Express[™] PCOM-B653VGL User's Guide Rev 2.0

PORTWELL PCOM-B653VGL

Revision History

R0.1	Preliminary
R0.2	Update BIOS and Tables information
R1.0	Initial release
R2.0	Update Display and Part number

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1 Introduction

This PCOM-B653VGL User's Guide contains detail information of the productspecifications, features, mechanical dimensions, heat sink/cooler and BIOS Setup.

PCOM-B653VGL is designed according to COM (Computer On Module) PICMG Open Modular Computing Standards COM Express[™] Specification Rev3.0 Type 6 and Compact form factor (95x95cm).

PCOM-B653VGL, a COM Express Module with Intel 8th Generation processor code name Whiskey lake U. PCOM-B653VGL is the successor of PCOM-B644VG (Intel Kabylake U platform) targeted on Ultra low power processors 15W, 1-Chip processor includes a Platform Controller Hub (PCH) on the same die and suitable for wide working temperature from 0°C to +60°C. PCOM-B653VGL supports dual channel DDR4 memory. Display interfaces are VGA, LVDS, dual DDI and DP display with 4K x 2K high resolution display.

2 Block Diagram



Figure 1 PCOM-B653VGL Block Diagram

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3 Specifications

		General				
Product	PCOM-B653VGL					
Form Factor		COM Express [®] Type 6	Compact Rev. 3.0			
		Intel [®] Core TM				
Processor	i7-8665UE	i5-8365UE	i3-8145UE	4305UE		
Core	4	4	2	2		
Freq.	1.70 GHz	1.60 GHZ	2.20 GHz	2.00 GHz		
Turbo	4.40 GHz	4.10 GHz	3.90 GHz	2.00 GHz		
Cache	8MB	6MB	4MB	2MB		
Processor Graphics	Intel [®] UHD Graphics 620	Intel [®] UHD Graphics 620	Intel [®] UHD Graphics 620	Intel [®] UHD Graphics 610		
Graphics Base Frequency	300.00 MHz	300.00 MHz	300.00 MHz	300.00 MHz		
Graphics Max Dynamic Frequency	1.15 GHz	1.05 GHz	1.00 GHz	1.00 GHz		
HW Encoding	H.264 AVC, MPEG2, HEVC, VP8/9, JPEG					
HW Decoding	H.264 AVC, VC1, MPEG2, VP8/9, JPEG					
HW Acceleration	DX 11.3/12, OpenGL 4.5, OpenCL 2.1					
Processor TDP	15 W	15 W	15 W	15 W		
BIOS	AMIBIOS					
ECC Memory Supported	No					
Memory	2x DDR4 SODIMM sockets Dual channel					

I/O Interface				
SATA			2x SATA III	
			4x USB 3.1 Gen2 (Port 0~3)	
USB			8x USB 2.0 (Port 0~7)	
Ethernet			1 GbE (I219-LM)	
	GPIO	8 GPIO (4 GPI and 4	I GPO)	
Social 1/O	12C	Baud Rate : 400KHz		
Serial I/O	SMBus	us Baud Rate : 100KHz		
	UART	Only RX/TX signal		
PEG	1x PCle Gen3 x4			
	1x PCle Gen3 x4			
PCI Express	1x PCle Gen3 x1			
			1x PCle Gen3 x1 (Option)	
	Default	Options	Resolution	
		VGA	VGA Up to 1920x1200 @ 60Hz	
	DDI2	DDI2	HDMI up to 4096x2160 @ 60Hz	
Diaglass			DP Up to 4096x2304 @ 60Hz	
Dispiay		eDP	eDP Up to 4096x2304 @ 60Hz	
	LVDS	LVDS	LVDS Up to 1920x1200 @ 60Hz	
			HDMI up to 4096x2160 @ 60Hz	
	ווטט דוטט		DP Up to 4096x2304 @ 60Hz	
Security	TPM 2.0 (Infineon SLB9670)			

Table 1 PCOM-B653VGL Specifications

3.1 Supported Operating Systems

The PCOM-B653VGL supports the following operating systems.

Vendor	Operating System	Supported
Microsoft	Windows 10 (64bit)	Yes
Linux	Ubuntu 18.04	Yes
	Fedora 31	Yes

Table 2 Supported Operating Systems

3.2 Windows OS driver

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

Item	Driver version	Windows OS
Chipset	10.1.18019.8144	Driver_PCOM-B653VGL_chipset-10.1.18019.8144-public-mup
Graphic	100.7158	Driver_PCOM-B653VGL_igfx_win10_100.7158
Ethernet(I219-LM)	12.18.8.9	Driver_PCOM-B653VGL_I219-LM
ME_Driver	1909.12.0.1236	Driver_PCOM-B653VGL_ME_Consumer_Win10_64_1909.12.0.1236
Table 3 PCOM-B653\/GL Driver list		

3.3 Electrical Characteristics

Input voltage	+12VDC (Nominal)
	+6VDC ~ +18VDC (Wide range)
RTC Battery power consumption	3.2uA
Power on mode	ATX / AT

Table 4 Electrical characteristics

3.4 Power sequence

PCOM-B653VGLPower sequence



Figure 2 Power on sequence

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3.5 Circuit protection design

PCOM-B653VGL has designed Schottkydiode protection on the module for Serial Port, FAN(PWMOUT & TACHIN), LID and SLEEP. Considerations must be taken while designing carrier board.

*Note : Pull up voltage VCC is 5V.



Figure 3 Circuit protection design

3.6 Mechanical Dimensions



Figure 4 Mechanical Dimensions - Top & BOT & Assembly

3.7 Module and HS weight

Weight

Module	80.0g
Cooler (H/S+FAN)	165g
Accessory (Screws & Stand-off)	17g

Table 5 Module and AccessoryWeight

3.8 Environmental Specifications

Storage Temperature	0~60°C
Operation Temperature	0~60°C
Storage Humidity	0%~95%
Operation Humidity	0%~95%

Table 6 Environmental Specifications

3.9 Optional function rework SOP

1. Optional function rework SOP : eDP

PCOM-B653VGL Default display is LVDS, rework following SOP for eDP display interface.

> Step 1

Remove below resistors and caps : C329,C333,C142,C143,C144,C145,R258,R726

> Step 2

Add below resistors and caps : C148,C149,R716,R717,R718,R715,R225,R727

Quick Tips

Remove 8 parts (yellow color rectangle) Add 8 parts (Red color rectangle)

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Remove (bottom side)



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Figure 5 Optional function rework SOP : eDP

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2. Optional function rework SOP : DDI2 (HDMI)

PCOM-B653VGL Default display is DDI2(HDMI/DP), rework following SOP for VGA display interface

Step 1

Remove R598, R599, R614, R615, R611, Q3, R731, R730.

> Step 2

Add C172,C173,C180,C181,C195,C203,C290





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Add (Bottom side)



Figure 6 Optional function rework SOP : DDI2 (HDMI)

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4 Heatsink / Cooler dimensions



Figure 7 Heat sink / cooler mechanical dimensions

4.1 H/S Assembly



Figure 8 H/S Assembly guide

4.2 Packaging

Package	Appearance	Size
Anti-Static bubble bag		180x135mm
White Paper Box		210x151x40mm
Shipping Box (10 pcs White paper box)		595x300x195mm

Table 7 Packaging

4.3 Ordering Guide

PCOM-B653VGL

Product	Ordering P/N	Status		
PCOM-B653VGL-8145UE	AB1-3K05	Available		
PCOM-B653VGL-8365UE	AB1-3K04	Available		
PCOM-B653VGL-8665UE	AB1-3K06	Available		

Table 8 Ordering Guide - PCOM-B653VGL

Accessory

Product	Ordering P/N	Status		
PCOM-B653VGL Cooler	B9971821	Available		
PCOM-B653VGL Heat Spreader	B830A560	Available		
PCOM-C605	AB1-3998	Available		

Table 9 Ordering Guide - Accessory

5 Signal Descriptions and Pinout Tables

Below tables lists PCOM-B653VGL AB and CD Row connectors Type 6 pin name, un-connected pins are present as NC

COM Express R3.0 Type 6 PCOM-B653VGL	Functional Optional	
Row AB	IVA	Row CD
GBE0 I2C SMBUS	VGA HD Audio LPC SPI	USB 3.0 Port 0 PEG #0 USB 3.0 Port 1 PEG #1 USB 3.0 Port 2 PEG #2 USB 3.0 Port 3 PEG #3
SATA Port 0 SATA Port 1 SATA Port 2 SATA Port 3	PCIE #0 PCIE #1 PCIE #2 PCIE #3 PCIE #4	PCIE #6 PEG #5 PEG #6 PEG #7 PEG #8 PEG #8
USB 2.0 Port 0 USB 2.0 Port 1 USB 2.0 Port 2 USB 2.0 Port 3 USB 2.0 Port 4	PCIE #4 PCIE #5 LVDS A LVDS B eDP	DDI 1 PEG #9 DDI 2 PEG #10 DDI 3 PEG #11 PEG #12 PEG #13 PEG #14 PEG #14
USB 2.0 Port 5 USB 2.0 Port 6 USB 2.0 Port 7	GPI GPO	PEG #15
+5VSB VCC 12V	Serial Port 0 Serial Port 1	VCC 12V

Figure 9 AB & CD Row connector signals

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	PCOM-B653VGL-ZR0 Pin out							
	(Original Type 6 pin definition)							
Pin	Row A	Pin	Row B	Pin	Row C	Pin	Row D	
A1	GND(FIXED)	B1	GND(FIXED)	C1	GND(FIXED)	D1	GND(FIXED)	
A2	GBE0_MDI3-	B2	GBE0_ACT#	C2	GND	D2	GND	
A3	GBE0_MDI3+	B3	LPC_FRAME#	C3	USB_SSRX0-	D3	USB_SSTX0-	
A4	GBE0_LINK100#	B4	LPC_AD0	C4	USB_SSRX0+	D4	USB_SSTX0+	
A5	GBE0_LINK1000#	B5	LPC_AD1	C5	GND	D5	GND	
A6	GBE0_MDI2-	B6	LPC_AD2	C6	USB_SSRX1-	D6	USB_SSTX1-	
A7	GBE0_MDI2+	B7	LPC_AD3	C7	USB_SSRX1+	D7	USB_SSTX1+	
A8	GBE0_LINK#	B8	NC(LPC_DRQ0#)	C8	GND	D8	GND	
A9	GBE0_MDI1-	B9	NC(LPC_DRQ1#)	C9	USB_SSRX2-	D9	USB_SSTX2-	
A10	GBE0_MDI1+	B10	LPC_CLK	C10	USB_SSRX2+	D10	USB_SSTX2+	
A11	GND(FIXED)	B11	GND(FIXED)	C11	GND(FIXED)	D11	GND(FIXED)	
A12	GBE0_MDI0-	B12	PWRBTN#	C12	USB_SSRX3-	D12	USB_SSTX3-	
A13	GBE0_MDI0+	B13	SMB_CK	C13	USB_SSRX3+	D13	USB_SSTX3+	
A14	NC(GBE0_CTREF)	B14	SMB_DAT	C14	GND	D14	GND	
A15	SUS_S3#	B15	SMB_ALERT#	C15	NC(DDI1_PAIR6+)	D15	DDI1_CTRLCLK_AUX+	

Table 10 PCOM-B653VGL Pin-out 1-7

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A16	SATA0_TX+	B16	SATA1_TX+	C16	NC(DDI1_PAIR6-)	D16	DDI1_CTRLCLK_AUX-
A17	SATA0_TX-	B17	SATA1_TX-	C17	NC(RSVD15)	D17	NC(RSVD15)
A18	SUS_S4#	B18	SUS_SATA	C18	NC(RSVD15)	D18	NC(RSVD15_
A19	SATA0_RX+	B19	SATA1_RX	C19	NC(PCIE_RX6+)	D19	NC(PCIE_TX6+)
A20	SATA0_RX-	B20	SATA1_RX	C20	NC(PCIE_RX6-)	D20	NC(PCIE_TX6)-
A21	GND(FIXED)	B21	GND(FIXED)	C21	GND(FIXED)	D21	GND(FIXED)
A22	NC(SATA2_TX+)	B22	NC(SATA3_TX+)	C22	NC(PCIE_RX7+)	D22	NC(PCIE_TX7+)
A23	NC(SATA2_TX-)	B23	NC(SATA3_TX-)	C23	NC(PCIE_RX7-)	D23	NC(PCIE_TX7-)
A24	SUS_S5#	B24	PWR_OK	C24	DDI1_HPD	D24	NC(RSVD20)
A25	NC(SATA2_RX+)	B25	NC(SATA3_RX+)	C25	NC(DDI1_PAIR4+)	D25	NC(RSVD21)
A26	NC(SATA2_RX-)	B26	NC(SATA3_RX-)	C26	NC(DDI1_PAIR4-)	D26	NC(DDI1_PAIR0+)
A27	BATLOW#	B27	WDT	C27	NC(RSVD15)	D27	NC(DDI1_PAIR0)-
A28	(S)ATA_ACT#	B28	NC(PCH_HDA_SDI1)	C28	NC(RSVD15)	D28	NC(RSVD21)
A29	AC/HDA_SYNC	B29	AC/HDA_SDIN1	C29	NC(DDI1_PAIR5+)	D29	DPB_TXP1
A30	AC/HDA_RST#	B30	AC/HDA_SDIN0	C30	NC(DDI1_PAIR5-)	D30	DPB_TXN1

Table 11 PCOM-B653VGL Pin-out 2-7

COM Express TM PORTWELL PCOM-B653VC								3VGL	
	A31	GND(FIXED)	B31	GND(FIXED)	C31	GND(FIXED)	D31	GND(FIXED)	
	A32	AC/HDA_BITCLK	B32	SPKR	C32	DDI2_CTRLCLK_AUX+	D32	DDI1_PAIR2+	
	A33	AC/HDA_SDOUT	B33	I2C_CK	C33	DDI2_CTRLCLK_AUX-	D33	DDI1_PAIR2-	
	A34	BIOS_DIS0#	B34	I2C_DAT	C34	DDI2_DDC_AUX_SEL	D34	DDI1_DDC_AUX_SEL	
	A35	THRMTRIP#	B35	THRM#	C35	NC(RSVD15)	D35	NC(RSVD15)	
	A36	USB6-	B36	USB7-	C36	NC(DDI3_CTRLCLK_AUX+)	D36	DDI1_PAIR3+	
	A37	USB6+	B37	USB7+	C37	NC(DDI3_CTRLCLK_AUX-)	D37	DDI1_PAIR3-	
	A38	USB_6_7_OC#	B38	USB_4_5_OC#	C38	NC(DDI3_DDC_AUX_SEL)	D38	NC(RSVD15)	
	A39	USB4-	B39	USB5-	C39	NC(DDI3_PAIR0+)	D39	DDI2_PAIR0+	
	A40	USB4+	B40	USB5+	C40	NC(DDI3_PAIR0-)	D40	DDI2_PAIR0-	
	A41	GND(FIXED)	B41	GND(FIXED)	C41	GND(FIXED)	D41	GND(FIXED)	
	A42	USB2-	B42	USB3-	C42	NC(DDI3_PAIR1+)	D42	DDI2_PAIR1+	
	A43	USB2+	B43	USB3+	C43	NC(DDI3_PAIR1-)	D43	DDI2_PAIR1-	
	A44	USB_2_3_OC#	B44	USB_0_1_OC#	C44	NC(DDI3_HPD)	D44	DDI2_HPD	
	A45	USB0-	B45	USB1-	C45	NC(RSVD15)	D45	NC(RSVD15)	

Table 12 PCOM-B653VGL Pin-out 3-7
COM	Expres	STM				PC	ORTWEI	LL PCOM-B65	53VGL
	A46	USB0+	B46	USB1+	C46	NC(DDI3_PAIR2+)	D46	DDI2_PAIR2+]
	A47	VCC_RTC	B47	EXCD1_PERST#	C47	NC(DDI3_PAIR2-)	D47	DDI2_PAIR2-	
	A48	EXCD0_PERST#	B48	EXCD1_CPPE#	C48	NC(RSVD15)	D48	NC(RSVD15)	
	A49	NC(EXCD0_CPPE#)	B49	SYS_RESET#	C49	NC(DDI3_PAIR3+)	D49	DDI2_PAIR3+	
	A50	LPC_SERIRQ	B50	CB_RESET#	C50	NC(DDI3_PAIR3-)	D50	DDI2_PAIR3-	
	A51	GND(FIXED)	B51	GND(FIXED)	C51	GND(FIXED)	D51	GND(FIXED)	
	A52	PCIE_TX5+	B52	PCIE_RX5+	C52	PEG_RX0+	D52	PEG_TX0+	
	A53	PCIE_TX5-	B53	PCIE_RX5-	C53	PEG_RX0-	D53	PEG_TX0-	
	A54	GP10	B54	GPO1	C54	NC(TYPE0#)	D54	PEG_LANE_RV#	
	A55	PCIE_TX4+	B55	PCIE_RX4+	C55	PEG_RX1+	D55	PEG_TX1+	
	A56	PCIE_TX4-	B56	PCIE_RX4-	C56	PEG_RX1-	D56	PEG_TX1-	
	A57	GND	B57	GPO2	C57	NC(TYPE1#)	D57	TYPE2#	
	A58	PCIE_TX3+	B58	PCIE_RX3+	C58	PEG_RX2+	D58	PEG_TX2+	
	A59	PCIE_TX3-	B59	PCIE_RX3-	C59	PEG_RX2-	D59	PEG_TX2-]
	A60	GND(FIXED)	B60	GND(FIXED)	C60	GND(FIXED)	D60	GND(FIXED)]

Table 13 PCOM-B653VGL Pin-out 4-7

PORTWELL PCOM-B653VGL

A61	PCIE_TX2+	B61	PCIE_RX2+	C61	PCIE_RX12+	D61	PCIE_TX12+
A62	PCIE_TX2-	B62	PCIE_RX2-	C62	PCIE_RX12-	D62	PCIE_TX12-
A63	GPI1	B63	GPO3	C63	NC(RSVD15)	D63	NC(RSVD15)
A64	PCIE_TX1+	B64	PCIE_RX1+	C64	NC(RSVD15)	D64	NC(RSVD15)
A65	PCIE_TX1-	B65	PCIE_RX1-	C65	NC(PEG_RX4+)	D65	NC(PEG_TX4+)
A66	GND	B66	WAKE0#	C66	NC(PEG_RX4-)	D66	NC(PEG_TX4-)
A67	GPI2	B67	N/A(WAKE1#)	C67	NC(RSVD15)	D67	GND
A68	PCIE_TX0+	B68	PCIE_RX0+	C68	NC(PEG_RX5+)	D68	NC(PEG_TX5+)
A69	PCIE_TX0-	B69	PCIE_RX0-	C69	NC(PEG_RX5-)	D69	NC(PEG_TX5-)
A70	GND(FIXED)	B70	GND(FIXED)	C70	GND(FIXED)	D70	GND(FIXED)
A71	LVDS_A0+ / eDP_TX2+	B71	LVDS_B0+	C71	NC(PEG_RX6+)	D71	NC(PEG_TX6+)
A72	LVDS_A0- / eDP_TX2-	B72	LVDS_B0-	C72	NC(PEG_RX6-)	D72	NC(PEG_TX6-)
A73	LVDS_A1+ / eDP_TX1+	B73	LVDS_B1+	C73	GND	D73	GND
A74	LVDS_A1- / eDP_TX1-	B74	LVDS_B1-	C74	NC(PEG_RX7+)	D74	NC(PEG_TX7+)
A75	LVDS_A2+ / eDP_TX0+	B75	LVDS_B2+	C75	NC(PEG_RX7-)	D75	NC(PEG_TX7-)

Table 14 PCOM-B653VGL Pin-out 5-7

PORTWELL PCOM-B653VGL

A76	LVDS_A2- / eDP_TX0-	B76	LVDS_B2-	C76	GND	D76	GND
A77	LVDS_VDD_EN / eDP_VDD_EN	B77	LVDS_B3+	C77	NC(RSVD)	D77	D77(RSVD)
A78	LVDS_A3+	B78	LVDS_B3-	C78	NC(PEG_RX8+)	D78	NC(PEG_TX8+)
A79	LVDS_A3-	B79	LVDS_BKLT_EN / eDP_BKLT_EN	C79	NCPEG_RX8-)	D79	NC(PEG_TX8-)
A80	GND(FIXED)	B80	GND(FIXED)	C80	GND(FIXED)	D80	GND(FIXED)
A81	LVDS_A_CK+ / eDP_TX3+	B81	LVDS_B_CK+	C81	NC(PEG_RX9+)	D81	NC(PEG_TX9+)
A82	LVDS_A_CK- / eDP_TX3-	B82	LVDS_B_CK-	C82	NC(PEG_RX9-)	D82	NC(PEG_TX9-)
A83	LVDS_I2C_CK / eDP_AUX+	B83	LVDS_BKLT_CTRL / eDP_BKLT_CTRL	C83	NC(RSVD)	D83	NC(RSVD)
A84	LVDS_I2C_DAT / eDP_AUX-	B84	VCC_5V_SBY	C84	GND	D84	GND
A85	GPI3	B85	VCC_5V_SBY	C85	NC(PEG_RX10+)	D85	NC(PEG_TX10+)
A86	NC(RSVD15)	B86	VCC_5V_SBY	C86	NC(PEG_RX10-)	D86	NC(PEG_TX10-)
A87	eDP_HDP	B87	VCC_5V_SBY	C87	GND	D87	GND
A88	PCIE_CLK_REF+	B88	BIOS_DIS1#	C88	NC(PEG_RX11+)	D88	NC(PEG_TX11+)
A89	PCIE_CLK_REF-	B89	VGA_RED	C89	NC(PEG_RX11-)	D89	NC(PEG_TX11-)
A90	GND(FIXED)	B90	GND(FIXED)	C90	GND(FIXED)	D90	GND(FIXED)

Table 15 PCOM-B653VGL Pin-out 6-7

PORTWELL PCOM-B653VGL

A91	SPI_POWER	B91	VGA_GRN	C91	NC(PEG_RX12+)	D91	NC(PEG_TX12+)
A92	SPI_MISO	B92	VGA_BLU	C92	NC(PEG_RX12-)	D92	NC(PEG_TX12-)
A93	GPO0	B93	VGA_HSYNC	C93	GND	D93	GND
A94	SPI_CLK	B94	VGA_VSYNC	C94	NC(PEG_RX13+)	D94	NC(PEG_TX13+)
A95	SPI_MOSI	B95	VGA_I2C_CK	C95	NC(PEG_RX13-)	D95	NC(PEG_TX13-)
A96	NC(TPM_PP)	B96	VGA_I2C_DAT	C96	GND	D96	GND
A97	NC(TYPE10#)	B97	SPI_CS#	C97	NC(RSVD17)	D97	NC(RSVD)
A98	SER0_TX	B98	RSVD15	C98	NC(PEG_RX14+)	D98	NC(PEG_TX14+)
A99	SER0_RX	B99	RSVD15	C99	NC(PEG_RX14-)	D99	NC(PEG_TX14-)
A100	GND(FIXED)	B100	GND(FIXED)	C100	GND(FIXED)	D100	GND(FIXED)
A101	SER1_TX	B101	FAN_PWNOUT	C101	NC(PEG_RX15+)	D101	NC(PEG_TX15+)
A102	SER1_RX	B102	FAN_TACHIN	C102	NC(PEG_RX15-)	D102	NC(PEG_TX15-)
A103	LID#	B103	SLEEP#	C103	GND	D103	GND
A104	VCC_12V	B104	VCC_12V	C104	VCC_12V	D104	VCC_12V
A105	VCC_12V	B105	VCC_12V	C105	VCC_12V	D105	VCC_12V
A106	VCC_12V	B106	VCC_12V	C106	VCC_12V	D106	VCC_12V
A107	VCC_12V	B107	VCC_12V	C107	VCC_12V	D107	VCC_12V
A108	VCC_12V	B108	VCC_12V	C108	VCC_12V	D108	VCC_12V
A109	VCC_12V	B109	VCC_12V	C109	VCC_12V	D109	VCC_12V
A110	GND(FIXED)	B110	GND(FIXED)	C110	GND(FIXED)	D110	GND(FIXED)

Table 16 PCOM-B653VGL Pin-out 7-7

6 BIOS Setup Items

PCOM-B653VGL 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 CMOS RAM so that it is retained during power-off periods. When system is turned on, PCOM-B653VGL communicates with peripheral devices and checks its hardware resources against the configuration information stored in the CMOS memory. If any error is detected, or the CMOS 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.

†↓++ : Move Enter : Select +/- : Value
Enter : Select +/- : Value
+/- : Value
ESC : Exit
F1 : General Help
F2 : Previous Values
F3 : Optimized Defaults
F4 : Save & Exit Setup
F12 : Capture Screen
<k> : Scroll help area upwards</k>
<m> : Scroll help area downwards</m>
OK

6.2 Main

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

Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc.					
Main Configuration Security Boot	Save & Exit				
Project Name	PCOM-B653VGI				
BIOS Version & Build Date	0.0.11 (01/07/2020 14:06:37)				
EC Version & Build Date	91128T00 (11/28/2019)				
Access Level	Administrator				
Deserves Televestice					
Processor information	Ubjekevijske ULT				
Nalle	WHISKEYLAKE ULT Intol(R) Cond(IN) iE RREEUE CRU # 1 COCHT				
Speed	1000 MH→				
speeu TD					
Stepping	V/0				
Раскала	¥0 BC01528				
Number of Processors	4Core(s) / 8Thread(s)				
Microcode Revision	80 BC				
GT Info	GT2 (0x3FA0)				
41 1110					
IGFX VBIOS Version	N/A				
IGFX GOP Version	9.0.1087				
Memory RC Version	0.7.1.108				
Total Memory	8192 MB				
Memory Frequency	2400 MHz				
Channel O Slot O	Populated & Enabled				
Size	8192 MB (DDR4)				
Channel 1 Slot O	Not Populated / Disabled				

PORTWELL	PCOM-B653VGL

PCH Information	
Name	CNL PCH-LP
PCH SKU	(U) Premium SKU
Stepping	DO
ChipsetInit Base Revision	7
ChipsetInit OEM Revision	68
Package	Not Implemented Yet
TXT Capability of Platform/PCH	Supported
Production Type	Production
Dual Output Fast Read support	Not supported
Read ID/Status Clock Freq	48 MHz
Write and Erase Clock Freq	48 MHz
Fast Read Clock Freq	48 MHz
Fast Read support	Supported
Read Clock Freq	30 MHz
Number of Components	1 Component
SPI Component O Density	16 MB
ME EW Vancion	10 0 95 1497
ME Finnword SKU	IC.V.JJ.1427
ME FINIWARE SKO	
System Date	[Thu 01/01/2009]
System Time	[16:08:26]

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Figure 10 BIOS MAIN

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

Table 17BIOS System Description

PCOM-B653VGL User's Guide

6.3 Configuration

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

Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc. Main <mark>Configuration</mark> Security Boot Save & Exit						
 CPU Configuration Chipset Configuration Graphics Configuration Power Control Configuration PCI/PCIE Configuration LAN Configuration SATA Configuration USB Configuration TPM Configuration Super ID Configuration H/W Monitor Serial Port Console Redirection 	CPU Configuration Parameters					
Version 2.20.1271. Copyright (C) 2020 American Megat	rends, Inc.					

Figure 11 BIOS CONFIGURATION

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6.4 CPU

CPU Configuration Parameters

CPU Configuration		Number of cores to enable in each
Type ID Speed L1 Data Cache L1 Instruction Cache L2 Cache L3 Cache	Intel(R) Core(TM) i5-8365UE CPU @ 1 0x806EC 1800 MHz 32 KB × 4 32 KB × 4 256 KB × 4 6 MB	processor package.
L4 Cache VMX SMX/TXT	N/A Supported Supported	
Active Processor Cores Hyper-Threading Boot performance mode Intel (VMX) Virtualization Technology	[A11] [Enabled] [Max Non-Turbo Performance] [Enabled]	
Intel(R) Speed Shift Technology Turbo Mode C states Enhanced C-states C-State Auto Demotion C-State Un-demotion Package C-State Demotion	[Enabled] [Enabled] [Enabled] [Disabled] [Disabled] [Disabled] [Disabled]	<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults</pre>
Package C-State Un-demotion CState Pre-Wake IO MWAIT Redirection Package C State Limit	[Disabled] [Disabled] [Disabled] [Auto]	F4: Save & Exit F12: Capture Screen ESC: Exit

Figure 12 BIOS CPU

PORTWELL PCOM-B653VGL

Feature	Description	Options
Active Processor Cores	Number of cores to enable in each processor package.	★All, 1, 2, 3,
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 Non-Turbo Performance, Turbo Performance, Max Battery ,
Intel (VMX) Virtualization Technology	When enabled, a VMM can utilize the additional hardware capabilities provided by Vander pool Technology.	★Enabled, Disabled
Intel® Speed Step™	Allows more than two frequency ranges to be supported.	★Enabled, Disabled
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	★Enabled, Disabled
Turbo Mode	Enable/Disable processor Turbo Mode (requires Intel Speed Step or Intel Speed Shift to be available and enabled)	★Enabled, Disabled
C states	Enable/disable CPU Power Management. Allows CPU to go to C states It's not 100% utilized	★Disabled, Enabled
C states[Enabled]		
Enhanced C-states	Enable/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,C1 and C3
Package C State Demotion	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,C6,C7, C7S,C8,C9,C10,Cpu Default,

Table 18BIOS CPU Description

6.5 ChipsetConfiguration

Configuration Chipset feature

Aptio Configuration	Setup Utility – Copyright (C) 20:	20 American Megatrends, Inc.
Chipset Configuration		VT-d capability
VT-d Above 4GB MMIO BIOS assignment	[Enabled] [Disabled]	
HD Audio Port 80h Redirection	[Enabled] [LPC Bus]	
		<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt.</pre>

Figure 13 BIOS CHIPSET

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

Table 19BIOS Chipset Description

6.6 Graphics Configuration

Configuration Graphics Settings

Configuration	Aptio Setup Utility – Copyright (C)	2020 American Megatrends, Inc.
Graphics Configuration		Select which of IGFX/PEG/PCI Graphics
		device should be Primary Display Or
Primary Display	[Auto]	select SG for Switchable Gfx.
Internal Graphics	[Auto]	
DVMT Pre-Allocated	[32M]	
DVMT Total Gfx Mem	[256M]	
eDP-to-LVDS configuration		
		++ Colect Screen
		11. Select Item
		Enter: Select
		+/-: Change Ont
		E1: General Heln
		F2: Previous Values

Figure 14 BIOS LAN

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, PCIE
Internal Graphics	Keep IGFX enable based on the setup options.	★Auto, Disable, Enable
D\/MT Dro Allocated	Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory	★ 32M,0M,64M,4M,8M,12M,16M,20M,24M,
	size used by the Internal Graphics Device.	28M,32M/F7,36M,40M,44M,48M,52M,56M, 60M
DVMT Total Gfx	Select DVMT5.0 Total Graphic Memory size used by the	+256M 128M MAY
Mem	Internal Graphics Device	

Table 20BIOS LAN Description

COM ExpressTM eDP-to-LVDS configuration

PORTWELL PCOM-B653VGL

eDP-to-LVDS(PTN3460)

A) Main	ptio Setup Utility – Copyright (C) 2020 Americar	n Megatrends, Inc.
eDP-to-LVDS configuration		Select Panel Profile for current use
Panel Profile Color depth and data format Channel Mode Clock Mode	[1024x768] [VESA and JEIDA 18 bpp] [Single Channel] [Even Bus]	
▶ OEM Profile		
		<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F12: Capture Screen</pre>

Figure 15 BIOS eDP-to-LVDS

Feature	Description	Options
Papal Profile	Soloct Papal Profile for current use	★1024x768,640x480,800x480,800x600,1280x800
FailerFlolle		1280x1024,1366x768,1440x900,1920x1080,OEM Profile
Color depth and data format	Select Color depth and data format	\bigstar VESA and JEIDA 18 bpp, VESA 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

Table 21BIOS eDP to LVDS Description

COM ExpressTM OEM Profile

PORTWELL PCOM-B653VGL

PANEL 1 Help

Profile Name :emptyRename ProfileColor depth and data format[VESA andChannel Mode[Single CHClock Mode[Even Bus]Pixel Clock0.000 Mhz2500H Active Pixels0640H Blank Pixels0160H Offset Pixels016H Width Pixels096V Active Lines045V Offset Lines010V Width Lines02H & V sync Signal Polarity[Postive]	JEIDA 18 bpp] anne1]
Active Profile[VESA and Channel Mode[Single CH Channel ModeChannel Mode[Even Bus]Clock Mode[Even Bus]Pixel Clock0.000 Mhz25004 Active Pixels06404 Blank Pixels01604 Offset Pixels0967 Active Lines04807 Blank Lines0107 Width Lines028 V sync Signal Polarity[Postive]	JEIDA 18 bpp] nanne1]
Solar dependenceSolar dependenceSingle ChannelChannel Mode[Even Bus]Clock Mode[Even Bus]Pixel Clock0.000 Mhz4 Active Pixels06 Hight Pixels016 Hight Pixels06 Width Pixels07 Active Lines07 Blank Lines07 Offset Lines07 Width Lines08 V sync Signal Polarity[Postive]	anne1]
Block Mode[Even Bus]'ixel Clock0.000 Mhz2500(Active Pixels0640Blank Pixels0160Offset Pixels096'Active Lines0480'Blank Lines045'Offset Lines02Width Lines02& V sync Signal Polarity[Postive]	
Prixel Clock 0.000 Mhz 2500 Active Pixels 0 640 Blank Pixels 0 160 Offset Pixels 0 96 Active Lines 0 480 Blank Lines 0 45 Offset Lines 0 10 Width Lines 0 2 & V sync Signal Polarity [Postive]	
Active Pixels 0 640 Blank Pixels 0 160 Offset Pixels 0 96 Active Lines 0 480 Blank Lines 0 45 Offset Lines 0 10 Width Lines 0 2 & V sync Signal Polarity [Postive]	
# Blank Pixels0160# Offset Pixels016# Width Pixels096/ Active Lines0480/ Blank Lines045/ Offset Lines010/ Width Lines02# & V sync Signal Polarity[Postive]	
<pre>4 Offset Pixels 0 16 4 Width Pixels 0 96 7 Active Lines 0 480 7 Blank Lines 0 45 7 Offset Lines 0 10 7 Width Lines 0 2 8 & V sync Signal Polarity [Postive]</pre>	
<pre>4 Width Pixels 0 96 / Active Lines 0 480 / Blank Lines 0 45 / Offset Lines 0 10 / Width Lines 0 2 # & V sync Signal Polarity [Postive]</pre>	
/ Active Lines 0 480 / Blank Lines 0 45 / Offset Lines 0 10 / Width Lines 0 2 I & V sync Signal Polarity [Postive]	
/ Blank Lines 0 45 / Offset Lines 0 10 / Width Lines 0 2 H & V sync Signal Polarity [Postive]	
/ Offset Lines 0 10 / Width Lines 0 2 & V sync Signal Polarity [Postive]	
/Width Lines 0 2 & V sync Signal Polarity [Postive]	
ι & v sync signal Polarity [Postive]	
	the Salast Senson
	1. Select Item
	Enter: Select
	+/-: Change Ont.
	F1: General Help
	F2: Previous Values
	F3: Optimized Defaults
	F4: Save & Exit
	F12: Capture Screen
	ESC: Exit

Figure 16 BIOS OEM Profile

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PORTWELL PCOM-B653VGL

Feature	Description	Options
Color depth and data format	Select Color depth and data format	★VESA and JEIDA 18 bpp, VESA 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

Table 22BIOS OEM Description

6.7 Power Control Configuration

System Power Control Configuration Parameters

Apti Configuration	o Setup Utility – Copyright (C) 2020 Am	erican Megatrends, Inc.
Power Control Configuration		Enables or Disables System ability to
Enable Hibernation ACPI Sleep State Power Loss Function Wake System via RTC	[Enabled] [S3 (Suspend to RAM)] [Always OFF] [Disabled]	option may not be effective with some operating systems.
		<pre>++: Select Screen f↓: Select Item Enter: Select</pre>

Figure 17BIOS Power Control Configuration

Feature	Description	Options
Enable Hibernation	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some operation systems.	★Enabled ,Disabled
ACPI Sleep State	Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.	★S3 (Suspend to RAM) ,Suspend Disabled
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
Wake System from S5 via RTC	Enable or disable System wake on alarm event. When enabled, System will wake on the hr::min::sec Specified/programmed by the Tools from OS	★Disabled, Enabled

Table 23BIOS Power Control Description

6.8 PCI/PCIE Configuration

PCI/PCI Express Settings

Configuration	Aptio Setup Utility – Copyright (C) 2020 American Mega	trends, Inc.
PCI/PCIE Configuration		PCI Express Root Port Settings.
 PCI Express Root Port 5 PCI Express Root Port 6 PCI Express Root Port 7 PCI Express Root Port 8 PCI Express Root Port 10 PCI Express Root Port 13 		
		<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F12: Capture Screen ESC: Exit</pre>
	Version 2.20.1271. Copyright (C) 2020 American Megatro	ends, Inc.

Figure 18BIOS PCI/PCIE Configuration

PORTWELL PCOM-B653VGL

COM ExpressTM PCI Express Root Port5/6/7/8/10/13

Configuration	Aptio Setup Utility – Copyright (C) 2020	American Megatrends, Inc.
PCI Express Root Port 5 ASPM 5 PCIe Speed	[Enabled] [Disabled] [Auto]	Control the PCI Express Root Port.
		++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values

Figure 19 BIOS PCI Express Root Port

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

Table 24BIOS PCI Express Root Port Description

6.9 LAN Configuration

Configuration On Board LAN device.

Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc.	
le∕Disable onboard NIC.	
Select Schoon	
n: Select	
Change Ont	
Concerci Help	
aeneral nelp Dogwigwa Valwaa	
Previous values	
optimized Defaults	
Save & Exit	
Capture Screen	
EXIC	

Figure 20 BIOS LAN Configuration

PORTWELL PCOM-B653VGL

Feature	Description	Options
PCH LAN Controller	Enable/Disable onboard NIC	\star Enabled , Disabled
Wake on LAN Enable	Enable/Disable integrated LAN to wake the system.	\star Enabled , Disabled
Launch UEFI PXE ROM	Enable/Disable UEFI Network Stack	★Disabled, Enabled
Launch UEFI PXE		
ROM[Enable]		
Inva DVE Support	Enable/Disable Ipv4 PXE boot support. If disable, IPv4 PXE boot	
IPV4 PXE Support	support will not be available.	
Inv4 HTTD Support	Enable/Disable Ipv4 HTTP boot support. If disable, IPv4 HTTP boot	★Enabled, Disabled
	support will not be available.	
Inve DVE Support	Enable/Disable Ipv6 PXE boot support. If disable, IPv6 PXE boot	★Enabled, Disabled
	support will not be available.	
Inve HTTD Support	Enable/Disable Ipv6 HTTP boot support. If disable, IPv6 HTTP boot	★Enabled, Disabled
	support will not be available.	
IPSEC Certificate	Support to Enable/Disable IPSEC certificate for Ikev	★Enabled, Disabled
DVE hast weit time	Wait time in seconds to press ESC key to abort the PXE boot. Use	★0
PAE boot wait time	either +/- or numeric keys to set the values	
Madia dataat aquat	Number of times the presence of media will be checked. Use either +/-	★1
	or numeric keys to set the values.	

Table 25BIOS LANDescription

6.10 SATA Configuration

SATA Device Options Settings

Configuration	Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc.		
SATA Configuration		Enable/Disable SATA Device.	
SATA Controller(s) SATA Mode Selection SATA Controller Speed	[Enabled] [AHCI] [Default]		
Serial ATA Port 0 Software Preserve Port 0 Hot Plug Configured as eSATA SATA Device Type Serial ATA Port 1 Software Preserve Port 1 Hot Plug Configured as eSATA SATA Device Type	Empty Unknown [Enabled] [Disabled] Hot Plug supported [Hard Disk Drive] Empty Unknown [Enabled] [Disabled] Hot Plug supported [Hard Disk Drive]		
Shin Device Type		++: Select Screen 11: Select Item Enter: Select	

Figure 21BIOS SATA Configuration

Feature	Description	Options
SATA Controller(s)	Enable/Disable SATA Device	★Enabled , Disabled
SATA Mode Selection	Determines how SATA controller(s) operate.	★AHCI,RAID
SATA Controller Speed	Indicates the maximum speed the SATA controller can support	★Default,Gen1,Gen2,Gen3
Serial ATA Port 0/1		
Port 0/1	Enable or Disable SATA Port	★Enabled ,Disabled
Hot Plug	Designates this port as Hot Pluggable	★Disabled, Enabled
SATA Device Type	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive	★Hard Disk Drive, Solid State Drive

Table 26BIOS SATADescription

6.11 USB Configuration

USB Configuration Parameters

Aptio Se Configuration	tup Utility – Copyright	(C) 2020 American Megatrends, Inc.
USB Configuration		Enable/Disable this USB Physical Connector (physical port). Once
USB Controllers:		disabled, any USB devices plug into the
1 XHCI		connector will not be detected by BIOS
USB Devices:		or OS.
1 Drive, 1 Keyboard		
USB SS Physical Connector #0	[Enabled]	
USB SS Physical Connector #1	[Enabled]	
USB SS Physical Connector #2	[Enabled]	
USB SS Physical Connector #3	[Enabled]	
USB HS Physical Connector #0	[Enabled]	
USB HS Physical Connector #1	[Enabled]	
USB HS Physical Connector #2	[Enabled]	
USB HS Physical Connector #3	[Enabled]	
USB HS Physical Connector #4	[Enabled]	
USB HS Physical Connector #5	[Enabled]	
USB HS Physical Connector #6	[Enabled]	
USB HS Physical Connector #7	[Enabled]	++: Select Screen
		↑↓: Select Item
Legacy USB Support	[Enabled]	Enter: Select
XHCI Hand-off	[Enabled]	+/-: Change Opt.
USB Mass Storage Driver Support	[Enabled]	E1: General Help
		E2: Previous Values
		E3: Ontimized Defaults
		10. Optimized berudits

Figure 22BIOS USB Configuration

PORTWELL PCOM-B653VGL

Feature	Description	Options
USB SS/HS Physical Connector #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 ,Disabled
Legacy USB Support	Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI application	★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
USB Mass Storage Driver Support	Enable/Disable USB Mass Storage Driver Support	★Enabled , Disabled

Table 27BIOS USB Description

6.12 TPM Configuration

Trusted Computing Setting

Configuration	Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc.	
Configuration Security Device Support NO Security Device Found	[Disable]	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.
		<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F12: Capture Screen ESC: Exit</pre>

Figure 23 BIOS TPM Configuration

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

Table 28 BIOS TPM Description

6.13 Super IO Configuration

System Super IO Chip Parameters.

Ap Configuration	tio Setup Utility – Copyright (C) 2020 American Megatrends, Inc.
Super IO Configuration		Set Parameters of Serial Port 1 (COMA)
 Serial Port 1 Configuration Serial Port 2 Configuration 		
Watch Dog Timer Timer Unit Timer value	[Enabled] [Second] 20	
		++: Select Screen ↑↓: Select Item Enter: Select
		+/−: Change Opt. F1: General Help
		F2: Previous Values F3: Optimized Defaults
		F4: Save & Exit F12: Capture Screen

Figure 24 BIOS Super IO Configuration

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

Table 29 BIOS Super IO Description

COM ExpressTM Serial Port 1 Configuration

Set Parameters of Serial Port 1 (COM A)

Aptio Setu Main	p Utility – Copyright (C) 2020 America	n Megatrends, Inc.
Serial Port 1 Configuration		Enable or Disable Serial Port (COM)
Module Serial Port 1 Device Settings	[Enabled] IO=3F8h; IRQ=4;	
Change Settings	[Auto]	
		++: Select Screen
		↑↓: Select Item
		Enter: Select
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit

Figure 25 BIOS 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=3,4,5,6,7,9,10,11,12 IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12 IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12 IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12

Table 30 BIOS Serial Port 1 Description

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COM ExpressTM Serial Port 2 Configuration

Set Parameters of Serial Port 2 (COM B)

Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc. Main		
Serial Port 2 Configuration		Enable or Disable Serial Port (COM)
Module Serial Port 2 Device Settings	[Enabled] IO=3E8h; IRQ=3;	
Change Settings	[Auto]	
		14: Select Item Enter: Select
		+/-: Change Upt. F1: General Help
		F2: Previous Values F3: Optimized Defaults
		F12: Capture Screen ESC: Exit

Figure 26BIOS Serial Port 2 Configuration

Feature	Description	Options
Serial Port	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=3,4,5,6,7,9,10,11,12 IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12 IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12 IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12

Table 31 BIOS Serial Port 2 Description

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6.14 H/W Monitor

Monitor hardware status

Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc. Configuration		
cro temperature	. +34 6	
Fan1 Speed	: 5674 RPM	
Vcore	: +0.729 V	
+3.3V	: +3.300 V	
+5V	: +5.049 V	
+12V	: +11.979 V	
VDIMM	: +1.185 V	
		Mar Collect Concer
		the Select Streen
		Fator: Soloct
		Enter, Select
		E1: Coponal Hain
		E2: Provious Values
		E2: Ontimized Defaults
		E4. Save & Evit
		E12: Canture Screen
		ESC: Exit
		LOOT ENT

Figure 27 BIOS H/W MONITOR

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6.15 Serial Port Console Redirection

Serial Port Console Redirection

Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc. Configuration			
Serial Port Console Redirection		Console Redirection Enable or Disable.	
COMO Console Redirection ▶ Console Redirection Settings	[Disabled]		
COM1(Pci Bus0,Dev0,Func0) (Disabled) Console Redirection	Port Is Disabled		
		++: Select Screen 14: Select Item Enter: Select +/: Select	
		F1: General Help F2: Previous Values F3: Optimized Defaults	
		F12: Capture Screen ESC: Exit	

Figure 28BIOS Serial Port Console Redirection

Feature	Description	Options	
Console Redirection	Console Redirection Enable or Disable	★Disabled, Ena	abled
Table 32 BIOS Serial Port Console Description			
Copyright © PORTWELL 2	020 PCOM-B653VGL	User's Guide	66

COM ExpressTM Console Redirection Settings

Configuration	Aptio Setup Utility – Copyright (C) 2020) American Megatrends, Inc.
COMO Console Redirection Setting Terminal Type Bits per second Data Bits Parity Stop Bits Flow Control VT-UTF8 Combo Key Support Recorder Mode Resolution 100x31 Putty KeyPad	S [ANSI] [115200] [8] [None] [1] [None] [Enabled] [Disabled] [Disabled] [VT100]	<pre>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.</pre> ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F12: Capture Screen ESC: Exit
	Version 2.20.1271. Copyright (C) 2020 f	American Megatrends, Inc.

Figure 29BIOS Console Redirection Settings

PORTWELL PCOM-B653VGL

COM Express TM	PORT	WELL	PCOM-B653VGL
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.	★ANSI, V ⁻ VT-UTF8	T100, VT100+,
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, 57600	9600, 19200, 38400,
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.	t ★ None, E ^v Space	ven, Odd, Mark,
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 signals.	★ None, H	ardware RTS/CTS
VT-UTFB 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.	★Disablec	l, Enabled
Resolution 100x31	Enables or disables extended terminal resolution	★Disablec	l, Enabled
Putty KeyPad	Select FunctionKey and KeyPad on Putty	★VT100, I SCO,ESCI	_INUX,XTERMR6, N,VT400

Table 33BIOS Console Redirection Description

6.16 Security

Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc. Main Configuration <mark>Security</mark> Boot Save & Exit			
Password Description		[Setup] check password when enter setup	
If ONLY the Administrator's password is then this only limits access to Setup a only asked for when entering Setup. If ONLY the User's password is set, the is a power on password and must be enter boot or enter Setup. In Setup the User have Administrator rights. The password length must be in the following range: Minimum length Maximum length Password Check Mode Administrator Password	s set, and is an this ared to will 3 20 [Setup]	[Power on] check password on every time system power on.	
USEI FASSIULU		<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F12: Capture Screen ESC: Exit</pre>	

Figure 30BIOS Security

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

Table 34BIOS Security Description

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6.17 Boot

Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc. Main Configuration Security <mark>Boot</mark> Save & Exit				
Boot Configuration Security of Boot Configuration Setup Prompt Timeout Bootup NumLock State CSM Support Network Storage Video Full Screen LOGO Post Report Summary Screen Boot mode select FIXED BOOT ORDER Priorities Boot Option #1 Boot Option #2 Boot Option #3 Boot Option #4 Boot Option #5 Boot Option #6 Boot Option #7 • UEFI Application Boot Priorities • UEFI USB Drive BBS Priorities	<pre>101 Save & EXIT 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</pre>	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.		
Vers:	on 2.20.1271. Copyright (C) 2020 American Mega	rrends, Inc.		

Figure 31 BIOS Boot

PORTWELL PCOM-B653VGL

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, Enabled
CSM Support[Enable]		
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
Full Screen LOGO	Enables or disables Quiet Boot option and Full Screen LOGO.	★Disabled, Enabled
Post Report	Post Report Support Enabled/Disabled	★Disabled, Enabled
Summary Screen	Summary Screen Support Enabled/Disabled	★Disabled, Enabled
Boot mode select	Select boot mode LEGACY/UEFI	★UEFI ,Legacy
Boot Option #1~7	Sets the system boot order	★Hard Disk, NVME,UEFI AP, CD/DVD,SD,USB Device, Network, Disabled
UEFI Application Boot Priorities	Specifies the Boot Device Priority sequence from available UEFI Application	

Table 35BIOS Boot Description

6.18 Save & Exit

Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc. 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 UEFI: UFD 3.0 Silicon-Power16GPMAP, Partition 1 Launch EFI Shell from filesystem device		
	++: Select Screen 14: Select Item	
	Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values	

Figure 32 BIOS 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	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 filesystem device	Attempts to Launch EFI Shell application (Shell.efi) from one of the available filesystem devices.	

Table 36BIOS Save & Exit Description

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PCOM-B653VGL User's Guide
7 BIOS Update

BIOS/EC DOS Update SOP process

Step 1. Create a DOS USB DOK (Caution : Must be FAT or FAT32 format).

Step 2. Unzip update file to the DOS USB DOK.

1	DOS_Update	e.zip - WinRAR (evaluatio	n copy)	- 🗆 🗙
File Commands Tools Favorites	Dptions Help	🍢 💷 🔒		
Add Extract To Test View	Delete Find	Wizard Info VirusSo	can Comment SFX	
DOS_Update.zip - ZIP archi	ve, unpacked size 67	7,472 bytes		×
Name	Size	Packed Type	Modified	CRC32
D		檔案資料夾		
Flash.exe	66,884	66,126 應用程式	2015/9/24下午 02:29	946BF87A
😢 readme.txt	513	250 TXT 福案 57 Windows 批	2015/9/24 下午 02:29	FEAF6487
		Total 67,472 b	oytes in 3 files	
	▶ 本機	▶ 1G DOS (F:) ▶		
	↑ 🔒 Sy ■ CO	ystem Volume Information OMMAND.COM		
	IC	D.SYS		
	S M	ISDOS.SYS ash.exe		
	re S U	pdate.bat		

Step 3. Plug the DOS USB DOK to the target system and boot from the DOS USB DOK.

Mair	Aptio Setup Utility – Copyright (C) 20 Configuration Security Boot Save & Exit
Save	Changes and Reset
Disca	rd Changes and Reset
Resto	re Defaults
Boot	Override
PO: F	LEXTOR PX-256M5Pro
USB 2	.0 Flash Drive 8.07
Laund	h EFI Shell from filesystem device

Step 4. Under the update file folder, type command : "update" and press enter.

C:>>dir Volume in drive C is 1G DOS Volume Serial Number is 5458-DC5E Directory of C:> FLASH_EXE 66,884 09-24-15 2:29p README_TXT 513 09-24-15 2:29p UPDATE BAT 75 11-22-11 10:30a 3 file(s) 67,472 bytes 0 dir(s) 1,005,137,920 bytes free	Microsoft(R) Windows 98 (C)Copyright Microsoft Corp 1981-1999.	
Volume in drive C is 1G DOS Volume Serial Number is 5458-DC5E Directory of C:\ FLASH EXE 66,884 09-24-15 2:29p README TXT 513 09-24-15 2:29p UPDATE BAT 75 11-22-11 10:30a 3 file(s) 67,472 bytes 0 dir(s) 1,005,137,920 bytes free	C:\>dir	
FLASH EXE 66,884 09-24-15 2:29p README TXT 513 09-24-15 2:29p UPDATE BAT 75 11-22-11 10:30a 3 file(s) 67,472 bytes 0 dir(s) 1,005,137,920 bytes	Volume in drive C is 1G DOS Volume Serial Number is 5458-DC5E Directory of C:\	
	FLASH EXE 66,884 09-24-15 2:29p README TXT 513 09-24-15 2:29p UPDATE BAT 75 11-22-11 10:30a 3 file(s) 67,472 bytes 0 dir(s) 1,005,137,920 bytes free	

PORTWELL PCOM-B653VGL

COM ExpressTM

Step 5. The update process will start and you can see the update progress. Once finished, please power off and restart the system.



<End of BIOS/EC DOS update process>

COM ExpressTM BIOS/EC UEFI Update SOP process

Step 1. Prepare a USB DOK (Caution : Must be FAT or FAT32 format).

Step 2. Unzip update file to the USB DOK.

>	Upc	late.zip - WinF	RAR (eval	uation copy)		×	
File Commands	Tools Favorites Opt	ions Help					
Add Extract	To Test View	Delete Find	Wizard	Info VirusScan Comme	nt SFX		
🗈 🗎 🗈 Upda	ite.zip - ZIP archive, unpa	cked size 4,208,6	59 bytes			~	
Name	Size	Packed	Туре	Modified	CRC32		
- III			檔案資料夾				
🛛 😘 Readme.txt	375	201	TXT 檔案	2015/11/26 下午 04:24	A98D2643		
Dpdate.efi	4,208,284	4,152,514	EFI 檔案	2015/11/26 下午 04:24	CAE20869		
<						>	
9 •• 0			Tota	al 4,208,659 bytes in 2 files			

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PCOM-B653VGL

Step 3. Select UEFI boot mode in the BIOS boot menu and save, then restart the system.

Boot Configuration Setup Prompt Timeout 1 Bootup Numkock State Dotion NOM Messages Full screen Logo Full screen Logo Full screen Logo Full screen Logo Full screen Logo Fost Report Fast Boot Boot mode select FIKED BOOT ORDER Priorities Boot Option #1 Boot Option #3 Boot Option #3 Boot Option #3 Boot Option #5 Boot Option #6 Boot Option #7 Boot Option #7 Boot Option #7 Boot Option #8 Boot Option #7 Boot Option #8 Boot Option #8 Boot Option #8 Boot Option #7 Boot Option #8 Boot Option #8 Boot Option #8 Boot Option #7 Boot Option #8 Boot Option #8 Boot Option #8 Boot Option #8 Boot Option #7 Boot Option #8 Boot O	Boot Configuration 1 Setup Prompt Timeout 1 Bootup NumLack State [On] Gate20 Active [Upon Request] Option ROM Messages [Force BIDS] Full screen Logo [Disabled] Post Report [Disabled] Summary Screen [Disabled] Poot mode select
Full screen Logo [Disabled] Post Report [Disabled] Summary Screen [Disabled] Past Boot Boot mode select Boot mode select LEGACY FixED BOOT ORDER Priorities [Hard Disk: PLEXTOR] Boot Option #1 [USB Key:USB 2.0 Fla] Boot Option #2 [USB Key:USB 2.0 Fla] Boot Option #3 [USB Key:USB 2.0 Fla] Boot Option #4 [USB Floppy] Boot Option #5 [USB Hand Disk] Boot Option #6 [USB Lan] Boot Option #6 [USB Lan] Boot Option #7 [USB Lan] Boot Option #8 [USB Lan] Boot Option #6 [Use Lon/k]	Full screen Logo [Disabled] Post Report [Disabled] Summary Screen [Disabled] Fast Boot Boot mode select Boot mode select UEFI FIXED BOOT ORDER Priorities Hard Disk: PLEXTOR] Boot Option #1 [Hard Disk: PLEXTOR]
Fost Report [Disabled] Summary Screen [Disabled] Fast Boot Boot mode select Boot mode select [LEGACY FixED Boot ORDER Priorities [Hard Disk: PLEXTOR] Boot Option #1 [Hard Disk: PLEXTOR] Boot Option #2 [Hard Disk: PLEXTOR] Boot Option #3 [USB Key:USB 2.0 Fla] Boot Option #4 [USB CD/DVD] Boot Option #5 [USB Hard Disk] Boot Option #6 [USB Hard Disk] Boot Option #6 [USB Key:USB 2.0 Fla]	Post.Report [Disabled] Summary Screen [Disabled] Fast Boot Boot mode select Boot mode select LEGACY FIXED BOOT ORDER Priorities [Hard Disk: PLEXTOR] Boot Option #2 [USB Kenviller 2 o cleat]
FIXED BOOT ORDER PrioritiesBoot Option #1Boot Option #2Boot Option #2Boot Option #3Boot Option #4Boot Option #4Boot Option #5Boot Option #6Boot Option #7Boot Option #7Boot Option #8	FIXED BOOT ORDER Priorities Boot Option #1 Boot Option #2 UISB KewlISB 2 of 5k] Hard Disk: PLEXTOR]
	Boot Option #3LUSB Floppy]F1: General HelpBoot Option #4LUSB Floppy]F1: General HelpBoot Option #5LUSB CD/DVD]F2: Previous ValuesBoot Option #6LUSB Lan]F3: Optimized DefaultsBoot Option #7LUSB Lan]F4: Save & ExitBoot Option #8LNetwork]ESC: Exit

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Step 4. Plug the USB DOK to the target system and boot from UEFI Shell.



Step 5. Under the UEFI shell, direct to your USB DOK, below example fs0 and type command : "update" and press enter.

EFI Shell version 2.31 [5.9]	
Current running mode 1.1.2	
Device mapping table	
fs0 :Removable HardDisk – Alias hd17b0d0b blk0	
PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x1,0x0)/USB(0x3,0x0)/HD(1,HDD,0)	
blk0 :Removable HardDisk - Alias hd17b0d0b fs0	
PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x1,0x0)/USB(0x3,0x0)/HD(1 MPR 0wo	
blk1 :BlockDevice - Alias (null)	
PciRoot(0x0)/Pci(0x13,0x0)/Sata(0x1,0x0)	
blk2 :Removable BlockDevice - Alias (null)	
PC1Root(0x0)/Pci(0x1D,0x0)/USB(0x1,0x0)/USB(0x3,0x0)	
Press FSC in 4 seconds to suite the	
Shell> fs0:	
fs0:\> update_	

Step 6. The update process will start and you can see the update progress. Once finished, please power off and restart the system.



<End of BIOS/EC UEFI update process>

8 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 more information please contact PORTWELL.

PORTWELL BIOS web Tool (PBT)

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

PORTWELL EC Auto Test Tool (PECAT)

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

9 Industry Specifications

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

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

10 Quick Start Guide

The PCOM-B653VGL Quick Start Guide illustrates the Module and accessories assemble processes, and also guides users how to power on the product and enter BIOS menu. The contents include heat sink / cooler and Module introduction, assembling of heat sink / cooler and Carrier, and debug message.

10.1 PCOM-B653VGL Introduction

This section introduces the Top and Bottom side of PCOM-B653VGL.

Top side of PCOM-B653VGL



Figure 33 PCOM-B653VGL - Top

Bottom side of PCOM-B653VGL



Figure 34 PCOM-B653VGL - Bottom

PORTWELL PCOM-B653VGL

10.2 Cooler

The section introduces PCOM-B653VGL cooler.

Top view of PCOM-B653VGL cooler



Figure 35 Cooler - Top

PORTWELL PCOM-B653VGL

Bottom view of PCOM-B653VGL cooler



Figure 36 Cooler - Bottom

PORTWELL PCOM-B653VGL

10.3 Accessory

This section presents PCOM-B653VGL cooler accessories.

- 1. Copper pillar M2.5 (Female) x5 pcs
- 2. Copper pillar M2.5 (Male) x5 pcs
- 3. Screws M2.5 x5 pcs



Figure 37M2.5 Female Copper pillar



Figure 38M2.5 Male Copper pillar M2.5

PORTWELL PCOM-B653VGL



Figure 39M2.5 Screws

10.4 Assembly SOP

This section presents the step by step procedures for assembling PCOM-B653VGL, cooler and PCOM-C605 carrier.



$\textbf{COM Express}^{\text{TM}}$

Step 1

Accessories required :

- 1. PCOM-C605
- 2. Copper pillar M2.5 (Female) x4 pcs
- 3. Copper pillar M2.5 (Male) x4 pcs

Screws the 4 pcs Copper pillar M2.5 (Female) and 4 pcs Copper pillar M2.5 (Female) on the compact size position of PCOM-C605.



Figure 41 Assembly Step 1

Step 2

Accessories required :

- 1. PCOM-B653VGL x1
- 2. DDR4 Memory x1
- 3. Screws x4 pcs
- 4. PCOM-C605 x1

Screwing the PCOM-B653VGL(with DDR4 Memory connected) on PCOM-C605 from Step1 with 4 male M2.5 copper pillar.



Figure 42 Assembly Step 2

10.5 Power ON

This section presents the required input voltage and how to power on PCOM-B653VGL.

The nominal DC input voltage is +12V, for powering on PCOM-B653VGL on PCOM-C605 Carrier with ATX power, make sure the PSON is low level, and connect the +12V cable to PCOM-C605 J21.

Auto Power ON

Every time PSU power on, PCOM-B653VGL will automatically boot.



Figure 43PCOM-C605 +12V

BIOS Menu

Alter powering on, press Der on keyboard to enter BIOS menu, the BIOS version and EC version can be rour
--

Apt Main Configuration Security	io Setup Utility – Copyright (C) 2020 Americ Boot Save & Exit	an Megatrends, Inc.
Project Name BIOS Version & Build Date	PCOM-B653VGL 0.0.11 (01/07/2020 14:06:37)	OS version
EU Version & Build Date	91128100 (11/28/2019)	
Access Level	Administrator	version
Processor Information		
Name	WhiskeyLake ULT	
Туре	Intel(R) Core(TM) 15-8365UE CPU @	1.60GHz
Speed	1800 MHz	
ID	0×806EC	
Stepping	VO	
Package	BGA1528	
Number of Processors	4Core(s) / 8Thread(s)	
Microcode Revision	BC	
GT Info	GT2 (0x3EA0)	

Figure 44 BIOS Menu

10.6 Debug message

This section presents the POST code of PCOM-B653VGL, users can check the POST code for boot procedure diagnostic.



Figure 45 PCOM-B653VGL Header

PCOM-B653VGL POST code table can be found below for reference.

POST code	Description
0x10	PEI_CORE_STARTED
0x11	CPU Initialization

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	PC)F
0x15	North Bridge Initialization	
0x19	South Bridge Initialization	
0x2B	Memory SPD	
0x2C	MEMORY DETECT	
0x2D	MEMORY TIMING	
0x2E	MEMORY CONFIG	
0x2F	MEMORY Initialization	
0x31	MEMORY INSTALLED	
0x32	CPU Initialization	
0x33	CPU CACHE Initialization	
0x34	CPU AP Initialization	
0x35	CPU BSP Initialization	
0x36	CPU SMM Initialization	
0x37	MEMORY North Bridge Initialization	
0x3B	MEMORY South Bridge Initialization	
0x4F	DXE IPL	
0x60	DXE CORE	
0x61	DXE NVRAM	
0x62	DXE South BridgeRUN	
0x63	DXE CPU Initialization	
0x68	DXE North Bridge HB Initialization	
0x69	DXE North Bridge Initialization	
0x6A	DXE North Bridge SMM Initialization	
0x70	DXE South Bridge Initialization	
0x71	DXE South Bridge SMM Initialization	
0x72	DXE South Bridge DEVICES Initialization	

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0x78	DXE ACPI
0x79	DXE CSM
0x90	DXE BDS
0x91	DXE BDS CONNECT DRIVRES
0x92	DXE PCI BUS
0x93	DXE PCI BUS HPC
0x94	DXE PCI BUS ENUM
0x95	DXE PCI BUS REQUEST RESOURCES
0x96	DXE PCI BUS ASSIGN RESOURCES
0x97	DXE_CON_OUT_CONNECT
0x98	DXE_CON_IN_CONNECT
0x99	DXE_SIO_Initialization
0x9A	DXE_USouth Bridge_BEGIN
0x9B	DXE_USouth Bridge_RESET
0x9C	DXE_USouth Bridge_DETECT
0x9D	DXE_USouth Bridge_ENABLE
0xA0	DXE_IDE_BEGIN
0xA1	DXE_IDE_RESET
0xA2	DXE_IDE_DETECT
0xA3	DXE_IDE_ENABLE
0xA4	DXE_SCSI_BEGIN
0xA5	DXE_SCSI_RESET
0xA6	DXE_SCSI_DETECT
0xA7	DXE_SCSI_ENABLE
0xA8	DXE_SETUP_VERIFYING_PASSWORD
0xA9	DXE_SETUP_START

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0xAB	DXE_SETUP_INPUT_WAIT
0xAD	DXE_READY_TO_BOOT
0xAE	DXE_LEGACY_BOOT
0xAF	DXE_EXIT_BOOT_SERVICES
0xB0	RT_SET_VIRTUAL_ADDRESS_MAP_BEGIN
0xB1	RT_SET_VIRTUAL_ADDRESS_MAP_END
0xB2	DXE_LEGACY_OPROM_Initialization
0xB3	DXE_RESET_SYSTEM
0xB4	DXE_USouth Bridge_HOTPLUG
0xB5	DXE_PCI_BUS_HOTPLUG
0xB6	DXE_NVRAM_CLEANUP
0xB7	DXE_CONFIGURATION_RESET
0xD0	DXE_CPU_ERROR
0xD1	DXE_North Bridge_ERROR
0xD2	DXE_South Bridge_ERROR,
0xD3	DXE_ARCH_PROTOCOL_NOT_AVAILABLE
0xD4	DXE_PCI_BUS_OUT_OF_RESOURCES
0xD5	DXE_LEGACY_OPROM_NO_SPACE
0xD6	DXE_NO_CON_OUT
0xD7	DXE_NO_CON_IN
0xD8	DXE_INVALID_PASSWORD
0xD9	DXE_BOOT_OPTION_LOAD_ERROR
0xDA	DXE_BOOT_OPTION_FAILED
0xDB	DXE_FLASH_UPDATE_FAILED
0xDC	DXE_RESET_NOT_AVAILABLE
0xE0	PEI_S3_STARTED

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0xE1	PEI_S3_BOOT_SCRIPT
0xE2	PEI_S3_VIDEO_REPOST
0xE3	PEI_S3_OS_WAKE
0xF0	PEI_RECOVERY_AUTO
0xF1	PEI_RECOVERY_USER
0xF2	PEI_RECOVERY_STARTED
0xF3	PEI_RECOVERY_CAPSULE_FOUND
0xF4	PEI_RECOVERY_CAPSULE_LOADED
0xFF	Boot process not start

Table 37 PCOM-B653VGL Debug message