

USER MANUAL

VB7009

Mini-ITX embedded board

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Regulatory Compliance

FCC-A Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his personal expense.

Notice 1

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2

Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

Notice 3

The product described in this document is designed for general use, VIA Technologies assumes no responsibility for the conflicts or damages arising from incompatibility of the product. Check compatibility issue with your local sales representatives before placing an order.

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Tested To Comply With FCC Standards FOR HOME OR OFFICE USE



Battery Recycling and Disposal

- $\hfill\square$ Only use the appropriate battery specified for this product.
- $\hfill\square$ Do not re-use, recharge, or reheat an old battery.
- $\hfill\square$ \hfill Do not attempt to force open the battery.
- $\hfill\square$ \hfill Do not discard used batteries with regular trash.
- $\hfill\square$ Discard used batteries according to local regulations.

Safety Precautions

- $\hfill\square$ Always read the safety instructions carefully.
- $\hfill\square$ \hfill Keep this User's Manual for future reference.
- $\hfill\square$ All cautions and warnings on the equipment should be noted.
- $\hfill\square$ \hfill Keep this equipment away from humidity.
- $\hfill\square$ Lay this equipment on a reliable flat surface before setting it up.
- □ Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
- $\hfill\square$ \hfill Place the power cord in such a way that people cannot step on it.
- $\hfill\square$ Always unplug the power cord before inserting any add-on card or module.
- \Box If any of the following situations arises, get the equipment checked by authorized service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated into the equipment.
 - The equipment has been exposed to moisture.
 - The equipment has not worked well or you cannot get it work according to User's Manual.
 - The equipment has dropped and damaged.
 - The equipment has obvious sign of breakage.
- □ Do not leave this equipment in an environment unconditioned or in a storage temperature above 60°C (140°F). The equipment may be damaged.
- $\hfill\square$ \hfill Do not leave this equipment in direct sunlight.
- $\hfill\square$ Never pour any liquid into the opening. Liquid can cause damage or electrical shock.
- $\hfill\square$ Do not place anything over the power cord.
- Do not cover the ventilation holes. The openings on the enclosure protect the equipment from overheating





Box Contents

- □ 1 x VB7009 board
- \Box 1 x I/O bracket
- □ 1 x SATA cable

Ordering Information

Part Number	Description
VB7009-12QCE	Mini-ITX Board with 1.2GHz VIA Eden [®] X4 CPU with VGA, LVDS, 8 x USB 2.0, 6 x COM, 2 x Gigabit Ethernet, 2 x SATA, PCI slot, ATX connector
VB7009-16	Mini-ITX Board with 1.6GHz VIA C7 [®] -D CPU with VGA, LVDS, 8 x USB 2.0, 4 x COM, 2 x Gigabit Ethernet, 2 x SATA, PCI slot, ATX connector
VB70009-10E	Mini-ITX Board with 1.0GHz VIA C7 [®] CPU with VGA, LVDS, 8 x USB 2.0, 4 x COM, 2 x Gigabit Ethernet, 2 x SATA, PCI slot, ATX connector
VB7009-12XC	Mini-ITX Board with 1.2GHz VIA Nano [®] X2 E-Series CPU with VGA, LVDS, 8 x USB 2.0, 6 x COM, 2 x Gigabit Ethernet, 2 SATA, PCI slot, ATX connector

Optional Accessories

I/O Expansion Cards

Part Number	Description
LPC-01	Expansion module for four COM ports
LPC-02	Expansion module for four COM ports (5V or 12V)
LPC-04	Expansion module for two or four COM ports (5V or 12V)
PWB-M120	120W DC-DC power board, voltage range from 12V-24V
EXT-PCI	One to two PCI riser card
Wireless Modules	
Part Number	Description
00GO27100BU2B0D0	VNT9271 IEEE 802.11b/g/n USB Wi-Fi dongle
EMIO-1533-00A2	VNT9271 IEEE 802.11b/g/n USB Wi-Fi module with assembly kit and
	antenna
EMIO-5531-00A1	VAB-820-W IEEE 802.11b/g/n USB Wi-Fi & Bluetooth module with
	assembly kit and antenna



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1. Product Overview

The VIA VB7009 Mini-ITX mainboard is an entry-level native x86 mainboard designed mainly for embedded and thin client applications. It can also be used for various domain applications such as desktop PC, industrial PC, etc. The mainboard is based on the VIA VX900 Unified Digital Media IGP chipset that features the VIA C-9 HD DX9 with 3D/2D graphics and video accelerators for rich digital media performance.

The VIA VB7009 includes a secure and power efficient VIA C7[®]-D / C7[®] / Nano[®] X2 E-Series / Eden[®] X4 processor. The VIA C7[®]-D / C7[®] / Nano[®] X2 E-Series / Eden[®] X4 processor includes the VIA Padlock Security Engine, VIA StepAhead[™] Technology Suite, VIA PowerSaver[™] and VIA CoolStream[™] technology.

The VIA VB7009 has one 1066MHz DDR3 DIMM slot that supports up to 4GB memory size. The VIA VB7009 provides support for high fidelity audio with its included VIA VT1708S High Definition Audio codec. In addition it supports two SATA 3Gbps storage devices.

The VIA VB7009 is compatible with a full range of Mini-ITX chassis as well as FlexATX and MicroATX enclosures and power supplies. The VIA VB7009 is fully compatible with Microsoft[®] and Linux operating systems.

1.1. Key Features and Benefits

1.1.1. VIA C7[®]-D / C7[®] / Nano[®] X2 E-Series / Eden[®] X4 Processor

The VIA C7®-D / C7® / Nano® X2 E-Series / Eden® X4 is an x86 processor packed into an ultra-compact package (measuring 21mm × 21mm). It delivers an energy-efficient yet powerful performance, with cool and quiet operation that makes it ideal for embedded system applications.

The VIA C7[®]-D / C7[®] is a single core 32-bit processor based on 90 nanometer process technology, and it is the world's first Carbon Free processor.

The VIA Nano[®] X2[®] E-Series is a 64-bit dual core processor that can deliver an improved multitasking ability without consuming more power. It is based on the latest 40 nanometer process technology.

The VIA Eden® X4 processor is a new processor generation, designed for high performance computing, surpassing the existing VIA QuadCore. The VIA Eden® X4 processor is a multi-core, super scalar, out-of-order architecture and is manufactured using advanced 28nm CMOS technology. This architecture and process technology provides a highly compatible, high- performance, and low-power consumption solution for any computing market.

1.1.2. VIA VX900 Chipset

The VIA VX900 Unified Digital Media Chipset is designed to enable high quality digital video streaming and DVD playback in a new generation of fanless, small form factor PCs and IA devices. The VIA VX900 features VIA C-9 HD DX9 with 3D/2D graphics and video acceleration, DDR3 1066/800 support, motion compensation and dual display support to ensure a rich overall entertainment experience.



1.1.3. Modular Expansion Options

The VIA VB7009 ensures long-term usability with its support for industry standard expansion options. Its support for legacy PCI expansion cards helps to smooth and reduce the costs of transitioning to newer expansion technologies. The VIA VB7009 enables companies to slowly roll out upgrades as necessary instead of having to replace everything all at once. This ensures that companies using the VB7009 obtain the maximum benefits from its past investments in PCI expansion cards.



1.2. Product Specifications

- Processor
 - $_{\odot}~$ 1.6 GHz VIA C7®-D (for VB7009-16 SKU^1)
 - Supports 800MHz Front Side Bus
 - $_{\odot}~$ 1.0GHz VIA C7 $^{\rm (e}$ (for VB7009-10E SKU $^{\rm 2})$
 - Supports 400MHz Front Side Bus
 - 1.2GHz VIA Nano[®] X2 E-Series (for VB7009-12XC SKU¹)
 - Supports 800MHz Front Side Bus
 - 1.2GHz VIA Eden[®] X4 (for VB7009-12QCE SKU²)
 - Supports 1066MHz Front Side Bus
- Chipset
 - VIA VX900 Unified Digital Media IGP chipset
 - 31mm x 31mm FCBGA

• System Memory

- 1 x DIMM slot supporting DDR3 1066MHz
- $_{\odot}$ Supports up to 4GB memory size
- Graphics
 - Integrated VIA C-9 HD DX9 3D/2D AGP graphics
 - MPEG-2, WMV9, VC1, and H.264 Full HD video decoder
 - DirectX 9 support

Onboard Peripherals

- Serial ATA
 - 2 SATA connectors
 - Supports up to 3Gbps
- $_{\circ}$ Onboard LAN
 - VIA VT6130 PCIe Gigabit Ethernet controller
- $_{\odot}~$ Onboard LVDS
 - VIA VT1636 LVDS transmitter
- Onboard Audio
 - VIA VT1708S High Definition Audio Codec
- Onboard Super I/O
 - Fintek F81865F-I Super I/O controller
 - Supports up to four COM ports
- Onboard I/O Connectors
 - $_{\odot}~$ 2 x USB 2.0 pin headers for 4 USB ports
 - \circ 2 x SATA connectors
 - $_{\odot}~$ 1 x Front audio pin header for Line-out and Mic-in
 - o 1 x Front panel pin header

- \circ 1 x PS/2 Keyboard and Mouse pin header
- 1 x Digital I/O (GPI x 4 + GPO x 4)
- \circ 1 x CPU fan connector
- \circ 1 x System fan connector
- 3 x COM pin headers by F81865-I, with 5V/12V select (available only for VB7009-16 & VB7009-10E SKU)
- 5 x COM pin headers by F81865-I, with 5V/12V select (available only for VB7009-12XC & VB7009-12QCE SKU)
- $_{\odot}~1$ x PCI slot
- o 1 x Dual-channel (or 1 x single-channel) LVDS panel connector (18/24 bit)
- \circ 1 x LVDS inverter connector
- \circ 1 x LPC pin header
- \circ 1 x SPDIF connector
- \circ 1 x SPI pin header
- 1 x SMBus pin header
- \circ 1 x Temperature sensor pin header
- 1 x Clear CMOS jumper
- 1 x COM2 voltage select jumper
- 1 x COM3 and COM4 voltage select jumper
- 1 x COM5 and COM6 voltage select jumper (available only for VB7009-12XC & VB7009-12QCE SKU)
- 1 x SATA DOM voltage select jumper
- 1 x LVDS panel power select jumper (5V/3.3V)
- \circ 1 x LVDS inverter power select jumper (5V/12V)
- \circ 1 x Buzzer
- \circ 1 x ATX power connector (20-pin)

• Back Panel I/O

- o 1 x VGA port
- 1 x COM port
- 1 x Parallel port
- 2 x Gigabit Ethernet ports
- o 4 x USB 2.0 ports
- \circ 1 x PS/2 Keyboard port
- 1 x PS/2 Mouse port
- o 3 x Audio jacks: Line-in, Line-out, Mic-in (Vertical, Smart 5.1 support)

BIOS

- $_{\circ}~$ Award BIOS
- 。 8 Mbit SPI flash memory

• Supported Operating System

- \circ Windows 7
- Windows Embedded Standard 7
- Windows Embedded POSReady 7
- Windows Embedded Standard
- \circ Windows XP
- Windows CE
- Linux



• System Monitoring & Management

- Wake-on-LAN
- Wake-on-Keyboard
- Wake-on-Mouse
- $_{\circ}~$ RTC Timer to Power On
- AC power failure recovery
- Operating Temperature
 - ∘ 0°C ~ 60°C

• Operating Humidity

0% ~ 95% (relative humidity; non-condensing)

• Form Factor

- \circ Mini-ITX
- 17cm x 17cm (6.7" x 6.7")

• Compliance

- \circ CE
- FCC
- RoHS

Notes:

- 1. The VB7009-16 and VB7009-12XC SKUs use heatsink with fan.
- 2. The VB7009-10E and VB7009-12QCE SKUs use heatsink.

3. As the operating temperature provided in the specifications is a result of the test performed in VIA's chamber, a number of variables can influence this result. Please note that the working temperature may vary depending on the actual situation and environment. It is highly suggested to execute a solid testing and take all the variables into consideration when building the system. Please ensure that the system runs well under the operating temperature in terms of application.



1.3. Layout Diagram



Figure 1: Layout diagram of the VB7009 mainboard (top view)





1.4. Product Dimensions



Figure 2: Mounting holes and dimensions of the VB7009 mainboard



Figure 3: External I/O port dimensions of the VB7009 mainboard



1.5. Height Distribution



Figure 4: Height distribution of the VB7009 mainboard



2. I/O Interface

The VIA VB7009 has a wide selection of interfaces integrated into the board. It includes a selection of frequently used ports as part of the external I/O coastline.

2.1. External I/O Ports



PS2 Keyboard port

Figure 5: External I/O ports

2.1.1. PS/2 Port

The mainboard has two integrated PS/2 ports for keyboard and mouse. Each port is using the 6-pin Mini-DIN connector. The color purple is use for a PS/2 keyboard while the color green is use for a PS/2 mouse. The pinout of the PS/2 port is shown below.



Figure 6: PS/2 port diagram

Pin	Signal
1	Data
2	NC
3	GND
4	+5V
5	Clock
6	NC

Table 1: PS/2 port pinout



2.1.2. VGA Port

The integrated 15-pin VGA port uses a female DE-15 connector. The VGA port is for connecting to analog displays. The pinout of the VGA port is shown below.



Figure 7: VGA port diagram

Pin	Signal	Pin	Signal
1	VGA-R	9	+5V
2	VGA-G	10	GND
3	VGA-B	11	NC
4	NC	12	VGA-SPD
5	GND	13	VGA_HS
6	GND	14	VGA_VS
7	GND	15	VGA-SPCLK
8	GND		

Table 2: VGA port pinout

2.1.3. COM Port

The integrated 9-pin COM port uses a male DE-9 connector. The COM (COM1) port supports the RS-232 standard. The pinout of the COM port is shown below.



Figure 8: COM port diagram

Pin	Signal	Pin	Signal
1	RIN11/-DCD1	6	RIN21/-DSR1
2	RIN31/SIN1	7	DOUT11/-RTS1
3	DOUT21/SOUT1	8	RIN41/-CTS1
4	DOUT31/-DTR1	9	-XRI1/-RI1
5	GND		

Table 3: COM port pinout



2.1.4. Parallel Port

The integrated 25-pin parallel port uses a female DB-25 connector. A parallel port is a standard printer port that supports Enhanced Parallel Port (EPP) and Extended Capabilities Parallel Port (ECP) modes. The pinout of the Parallel port is shown below.



Figure 9: Parallel port diagram

Pin	Signal	Pin	Signal
1	-LPSTB	2	LPD0
3	LPD1	4	LPD2
5	LPD3	6	LPD4
7	LPD5	8	LPD6
9	LPD7	10	-LPACK
11	LPBUSY	12	LPPE
13	LPSLCT	14	-LPAFD
15	-LPERR	16	-LPINIT
17	-LPSLIN	18	GND
19	GND	20	GND
21	GND	22	GND
23	GND	24	GND
25	GND		

Table 4: Parallel port pinout



2.1.5. Gigabit Ethernet Port

The two integrated 8-pin Gigabit Ethernet ports are using an 8 Position 8 Contact (8P8C) receptacle connector (commonly referred to as RJ-45). The Gigabit Ethernet ports are controlled by VIA Gigabit Ethernet controller. The pinout of the Gigabit Ethernet port is shown below.



Figure 10: Gigabit Ethernet port diagram

Pin	Signal
1	Signal pair 1+
2	Signal pair 1-
3	Signal pair 2+
4	Signal pair 3+
5	Signal pair 3-
6	Signal pair 2-
7	Signal pair 4+
8	Signal pair 4-

Table 5: Gigabit Ethernet port pinout

The Gigabit Ethernet port (RJ-45) has two individual LED indicators located on the front side to show its Active/Link status and Speed status.

	Link LED	Active LED	
	(Left LED on RJ-45 connector)	(Right LED on RJ-45 connector)	
Link Off	Off	Off	
Cread 10Mbit	The LED is always On and flashing in	Flash in Yellow color	
speed_10Molt	colors Green and Orange		
Speed_100Mbit	The LED is always On in Green color	Flash in Yellow color	
Speed_1000Mbit	The LED is always On in Orange color	Flash in Yellow color	

Table 6: Gigabit Ethernet LED color definition



2.1.6. USB 2.0 Port

There are four integrated USB 2.0 ports located below the two Gigabit Ethernet ports at the external I/O panel. The USB 2.0 interface port gives complete Plug and Play and hot swap capability for external devices and it complies with USB UHCI, rev. 2.0. Each USB port is using the USB Type A receptacle connector. The pinout of the typical USB port is shown below.



Figure 11: USB 2.0 port diagram

Pin	Signal
1	+5VSUS
2	Data-
3	Data+
4	GND



2.1.7. Audio Jacks

There are three audio jack receptacles integrated into a single stack on the I/O coastline. Each receptacle can fit a 3.5mm Tip Ring Sleeve (TRS) connector to enable connections to Line-out Line-in, and Mic-in. The Line-out jack is for connecting to external speakers or headphones. The Line-In jack is for connecting to external audio devices such as CD player, tape player and etc. The Mic-in jack is for connecting to a microphone.



Figure 12: Audio jack receptacle stack diagram

Wiring	Line-in	Line-out	Mic-in
Tip	Left channel in	Left channel	Left channel
Ring	Right channel in	Right channel	Right channel
Sleeve	GND	GND	GND

Table 8: Audio jack receptacle pinout



2.2. Onboard Connectors

2.2.1. ATX Power Connector

The mainboard has a 20-pin ATX power connector onboard. The ATX power connector is labeled as "ATX_POWER1". The pinout of the ATX power connector is shown below.



Figure 13: ATX power connector diagram

Pin	Signal	Pin	Signal
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	GND	13	GND
4	+5V	14	Power Supply On
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	Power OK	18	NC
9	+5VSUS	19	+5V
10	+12V	20	+5V

 Table 9: ATX power connector pinout



2.2.2. CMOS Battery Slot

The mainboard is equipped with a CMOS battery slot, which is compatible with CR2032 coin batteries. The CMOS battery slot is labeled as "BAT2". When inserting a CR2032 coin battery, be sure that the positive side is facing the locking clip.



Figure 14: CMOS battery slot diagram

Pin	Signal
1	GND
2	+3V
3	GND

Table 10: CMOS battery slot pinout



2.2.3. Front Panel Pin Header

The front panel pin header consists of 15 pins in a 16-pin block. Pin 15 is keyed. The front panel pin header is labeled as "F_PANEL1". It provides access to system LEDs, power, reset, system speaker and HDD LED. The pinout of the front panel pin header is shown below.



Figure 15: Front panel pin header diagram

Pin	Signal	Pin	Signal
1	+5VDUAL	2	+5V
3	+5VDUAL	4	SATA_LED
5	PWR_LED	6	PWR_BTN
7	+5V	8	GND
9	NC	10	-RST_SW
11	NC	12	GND
13	SPEAK	14	+5V
15	Кеу	16	-SLEEP_LED

Table 11: Front panel pin header pinout



2.2.4. Front Audio Pin Header

In addition to the TRS audio jacks on the external I/O coastline, the mainboard has a pin header for Lineout and Mic-in. The pin header is labeled as "F_AUDIO1". The pinout of the pin header is shown below.



Figure 16: Front audio pin header diagram

Pin	Signal	Pin	Signal
1	MIC2IN_L	2	AGND
3	MIC2IN_R	4	AGND
5	HPOUTR	6	MIC2_JD
7	F_AUDIO_SENSE	8	Кеу
9	HPOUTL	10	HPOUT_JD

Table 12: Front audio pin header pinout



2.2.5. SMBus Pin Header

The SMBus pin header consists of three pins that allow connecting the SMBus devices. Devices communicate with a SMBus host and/or other SMBus devices using the SMBus interface. It is labeled as "SMBUS1". The pinout of the SMBus pin header is shown below.



Figure 17: SMBus pin header diagram

Pin	Signal	
1	SMB_CK	
2	SMB_DT	
3	GND	

Table 13: SMBus pin header pinout



2.2.6. CPU and System Fan Connectors

There are two fan connectors on board: one for the CPU and one for the chassis. The fan connector for the CPU is labeled as "CPUFAN1" and the fan connector for the system is labeled as "SYSFAN1". The fans provide variable fan speeds controlled by the BIOS. The pinout of the fan connectors is shown below.



Figure 18: CPU and System fan connector diagram

CPU fan (CPUFAN1)		
Pin	Signal	
1	F_IO2 / Fan speed detection	
2	F_PWM2 / Fan speed control	
3	GND	

System fan (SYSFAN1)		
Pin	Signal	
1	F_IO1 / Fan speed detection	
2	F_PWM1 / Fan speed control	
3	GND	

Table 14: CPU and System fan connector pinout



2.2.7. SATA Connectors

The two SATA connectors on board can support up to 3 Gbps transfer speeds, enabling fast data file transfer with independent DMA operation. The SATA connectors are labeled as "SATA1" and "SATA2". The pinout of the SATA connectors are as shown below.



\mathbb{D}

Notes:

SATA connector pin 7:

1. GND is for SATA HDD (default setting).

2. +5V is for SATA DOM. To enable the +5V on pin 7, set the SATA DOM voltage select jumper.



2.2.8. USB 2.0 Pin Headers

The mainboard has two USB 2.0 pin headers blocks that support up to four USB 2.0 ports. The pin header blocks are labeled as USB_4, and "USB_5". The pinout of the USB pin headers are shown below.



Figure 20: USB 2.0 pin header diagram

USB_4				
Pin	Signal	Pin	Signal	
1	+5VDUAL	2	+5VDUAL	
3	USBD_T1-	4	USBD_T0-	
5	USBD_T1+	6	USBD_T0+	
7	GND	8	GND	
9	Кеу	10	GND	

USB_5				
Pin	Signal	Pin	Signal	
1	+5VDUAL	2	+5VDUAL	
3	USBD_T6-	4	USBD_T7-	
5	USBD_T6+	6	USBD_T7+	
7	GND	8	GND	
9	Кеу	10	GND	

Table 16: USB 2.0 pin header pinout


2.2.9. COM Pin Headers

There are COM pin headers on the mainboard in addition to the COM port 1 on the external I/O. Each COM pin header supports the RS-232 standard. The COM pin headers labeled as "COM2, COM3 and COM4" are available in VB7009-16 and VB7009-10E SKUs, while the additional "COM5" and "COM6" pin headers are offered only by VB7009-12XC and VB7009-12QCE SKUs. All the COM pin headers can support +5V or +12V. See page 34 for details on setting the voltage. The pinout of the COM pin headers are shown below.



Figure 21: COM pin header diagram

Pin	Signal	Pin	Signal
1	COM_DCD	2	COM_RXD
3	COM_TXD	4	COM_DTR
5	GND	6	COM_DSR
7	COM_RTS	8	COM_CTS
9	COM_RI	10	Кеу

Table 17: COM pin header pinout



2.2.10. PS/2 Keyboard and Mouse Pin Header

The mainboard has a pin header for PS/2 keyboard and mouse. The pin header is labeled as "JKB/MS1". The pinout of the pin header is shown below.



Figure 22: PS/2 keyboard and mouse pin header diagram

Pin	Signal	Pin	Signal
1	+5VDUAL	2	GND
3	KB_CLK	4	KB_DATA
5	EKBCLK	6	EKBDATA
7	MS_CLK	8	MS_DATA
9	EMSCLK	10	EMSDATA

Table 18: PS/2 keyboard and mouse pin header pinout



When the pin header is not in use, please short pin 3&5, pin 4&6, pin 7&9 and pin 8&10



2.2.11. LVDS Panel Connector

The mainboard has one 40-pin LVDS panel connector on the bottom side. It can support one dualchannel LVDS or one single-channel LVDS. The LVDS panel connector is labeled as "PANEL_CONN1". The pinout of the connector is shown below.



Figure 23: LVDS panel connector diagram

Pin	Signal	Pin	Signal
1	-A4_L	2	PVDD
3	A4_L	4	PVDD
5	GND	6	GND
7	-A5_L	8	GND
9	A5_L	10	-A0_L
11	GND	12	A0_L
13	-A6_L	14	GND
15	A6_L	16	-A1_L
17	GND	18	A1_L
19	-CLK2_L	20	GND
21	CLK2_L	22	-A2_L
23	GND	24	A2_L
25	-A7_L	26	GND
27	A7_L	28	-CLK1_L
29	NC	30	CLK1_L
31	NC	32	GND
33	NC	34	-A3_L
35	NC	36	A3_L
37	NC	38	SPCLK1
39	NC	40	SPD1

Table 19: LVDS panel connector pinout (dual-channel)



Pin	Signal	Pin	Signal
1	NC	2	PVDD
3	NC	4	PVDD
5	NC	6	GND
7	NC	8	GND
9	NC	10	-A0_L
11	NC	12	A0_L
13	NC	14	GND
15	NC	16	-A1_L
17	NC	18	A1_L
19	NC	20	GND
21	NC	22	-A2_L
23	NC	24	A2_L
25	NC	26	GND
27	NC	28	-CLK1_L
29	NC	30	CLK1_L
31	NC	32	GND
33	NC	34	-A3_L
35	NC	36	A3_L
37	NC	38	SPCLK1
39	NC	40	SPD1

Table 20: LVDS panel connector pinout (single-channel)



2.2.12. LVDS Inverter Connector

The mainboard has one LVDS Inverter connector on the bottom side. The LVDS Inverter connector is labeled as "INVERTER1". The pinout of the connector is shown below.



Figure 24: LVDS Inverter connector diagram

Pin	Signal		
1	IVDD		
2	IVDD		
3	BAKLITE_EN		
4	LVDS_PWM		
5	BAKLITE_EN		
6	LVDS_DA		
7	GND		
8	GND		

Table 21: LVDS Inverter connector pinout



2.2.13. S/PDIF Connector

The mainboard has one 3-pin S/PDIF (Sony/Philips Digital Interface Format) connector. The S/PDIF output provides digital audio to external speakers or compressed AC3 data to an external Dolby Digital Decoder. The connector is labeled as "S/PDIF". The pinout of the connector is shown below.



Figure 25: S/PDIF connector diagram

Pin	Signal	
1	+5V	
2	SPDIFO	
3	GND	

Table 22: S/PDIF connector pinout



2.2.14. SPI Pin Header

The mainboard has one 8-pin SPI pin header. The SPI (Serial Peripheral Interface) pin-header is used to connect to the SPI BIOS programming fixture. The pin header is labeled as "SPI1". The pinout of the pin header is shown below.



Figure 26: SPI pin header diagram

Pin	Signal	Pin	Signal
1	SPIVCC	2	GND
3	MSPISS0	4	MSPICLK
5	MSPIDI	6	MSPIDO
7	key	8	-PCIRST

Table 23: SPI pin header pinout



2.2.15. LPC Pin Header

The mainboard has one LPC pin header for connecting LPC devices. The pin header is labeled as "LPC1". The pinout of the pin header is shown below.



Figure 27: LPC pin header diagram

Pin	Signal	Pin	Signal
1	LPCAD1	2	LPC33CLK
3	-LPCRST	4	GND
5	LPCAD0	6	LPC48CLK
7	LPCAD2	8	-LPCFRAME
9	SERIRQ	10	LPCAD3
11	-LPCDRQ1	12	-EXTSMI
13	+5V	14	+3.3V
15	+5V	16	+3.3V
17	GND	18	GND
19	GND	20	Кеу

Table 24: LPC pin header pinout diagram



2.2.16. Digital I/O Pin Header

The onboard Digital I/O pin header supports up to four GPO and four GPI signals. The pin header is labeled as "DIO1". The pinout of the pin headers are shown below.



Figure 28: Digital I/O pin header diagram

Pin	Signal	Pin	Signal
1	+5V	2	+12V
3	GPO_23	4	GPI_03
5	GPO_22	6	GPI_02
7	GPO_21	8	GPI_01
9	GPO_20	10	GPI_00
11	GND	12	Кеу

Table 25: Digital I/O pin header pinout



2.2.17. Temperature Sensor Pin Header

The mainboard supports a pin header (3-pin) that allows the connection of a temperature sensor cable for detecting the system's internal air temperature. The temperature reading can be seen in the BIOS Setup Utility. The pin header is labeled as "J5". The pin out of the temperature sensor pin header is shown below.



Figure 29: Temperature sensor pin header diagram

Pin	Signal	
1	TMPIN2	
2	TMPIN2	
3	HWMGND	

Table 26: Temperature sensor pin header pinout



3. Jumpers

Jumper Description

A jumper consists of pair conductive pins used to close in or bypass an electronic circuit to set up or configure particular feature using a jumper cap. The jumper cap is a small metal clip covered by plastic. It performs like a connecting bridge to short (connect) the pair of pins. The usual colors of the jumper cap are black/red/blue/white/yellow.

Jumper Setting

There are two settings of the jumper pin: "Short and Open". The pins are "Short" when a jumper cap is placed on the pair of pins. The pins are "Open" if the jumper cap is removed.

In addition, there are jumpers that have three or more pins, and some pins are arranged in series. In case of a jumper with three pins, place the jumper cap on pin 1 and pin 2 or pin 2 and 3 to Short it.

Some jumper size is small or mounted on the crowded location of the board that makes it difficult to access. Therefore, using a long-nose plier in installing and removing the jumper cap is very helpful.







Short (pin 1-2)

Figure 30: Jumper settings example diagram



Caution:

Make sure to install the jumper cap on the correct pins. Installing it in the wrong pin might cause damage and malfunction.



3.1. Clear CMOS Jumper

The onboard CMOS RAM stores system configuration data and has an onboard battery power supply. To reset the CMOS settings, set the jumper on pins 2 and 3 while the system is off. Return the jumper to pins 1 and 2 afterwards. Setting the jumper while the system is on will damage the mainboard. The default setting is on pins 1 and 2.



Figure 31: Clear CMOS jumper diagram

Setting	Pin 1	Pin 2	Pin 3
Regular (default)	Short	Short	Open
Clear CMOS	Open	Short	Short

Table 27: Clear CMOS jumper settings

Note:

Except when clearing the RTC RAM, never remove the cap from the CLEAR_CMOS jumper default position. Removing the cap will cause system boot failure. Avoid clearing the CMOS while the system is on; it will damage the mainboard.



3.2. COM Voltage Select Jumpers

Each of the additional COM ports (available through the onboard COM pin headers, see page 22) can support both +5V and +12V. COM2 has its own pin header block. COM3 and COM4 share a single pin header block. COM5 and COM6 also share a single pin header block.

3.2.1. COM2 Voltage Select Jumper

The voltage for COM2 is controlled by the jumper labeled as "J12". The voltage can be either +5V or +12V. +5V is the default setting. The jumper settings are shown below.



Figure 32: COM2 voltage select jumper diagram

Setting	Pin 1	Pin 2	Pin 3
+5V (default)	Short	Short	Open
+12V	Open	Short	Short

Table 28: COM2 voltage select jumper settings



3.2.2. COM3 and COM4 Voltage Select Jumper

The voltage for COM3 and COM4 is controlled by the jumper labeled as "J13". Refer to Figure 33 for the location of the jumper.

The voltage can be either +5V or +12V. +5V is the default setting. The even pin numbers correspond to COM3. The odd pin numbers correspond to COM4. The jumper settings are shown below.



Figure 33: COM3 and COM4 voltage select jumper diagram

COM4 Setting	Pin 1	Pin 3	Pin 5
+5V (default)	Short	Short	Open
+12V	Open	Short	Short
COM3 Setting	Pin 2	Pin 4	Pin 6
+5V (default)	Short	Short	Open

Table 29: COM3 and COM4 voltage select jumper settings



3.2.3. COM5 and COM6 Voltage Select Jumper

The voltage for COM5 and COM6 is controlled by the jumper labeled as "J14". Refer to Figure 34 for the location of the jumper.

The voltage can be either +5V or +12V. +5V is the default setting. The even pin numbers correspond to COM5. The odd pin numbers correspond to COM6. The jumper settings are shown below.



Figure 34: COM5 and COM6 voltage select jumper diagram

COM6 Setting	Pin 1	Pin 3	Pin 5
+5V (default)	Short	Short	Open
+12V	Open	Short	Short
COM5 Setting	Pin 2	Pin 4	Pin 6
+5V (default)	Short	Short	Open
+12V	Open	Short	Short

Table 30: COM5 and COM6 voltage select jumper settings

Note:

If the mainboard is not equipped with COM5 and COM6, then the J14 jumper will not be on the mainboard either.



3.3. SATA DOM Voltage Select Jumper

The SATA connectors (see page 20) can be used to support Disk-on-Module (DOM) flash drives. When the jumpers are set, +5V will be delivered to the 7th pin of the SATA connectors. The pin jumper is labeled as "J2". The jumper settings are shown below.



Figure 35: SATA DOM voltage select jumper diagram

SATA1 Setting	Pin 1	Pin 3	Pin 5
DOM support	Short	Short	Open
Regular (default)	Open	Short	Short
SATA2 Setting	Pin 2	Pin 4	Pin 6
DOM support	Short	Short	Open
Regular (default)	Open	Short	Short
	Open	JHOIT	JHOLL

Table 31: SATA DOM voltage select jumper settings



The default settings of "SATA DOM Voltage Select Jumper": short pin 3&5 and pin 4&6



3.4. LVDS Panel Power Select Jumper

The mainboard has a jumper that controls the voltage delivered to the LVDS panel connector. The jumper is labeled as "PVDD1". The jumper settings are shown below.



Figure 36: LVDS panel power select jumper diagram

LVDS panel power setting	Pin 1	Pin 2	Pin 3
+5V	Short	Short	Open
+3.3V (default)	Open	Short	Short

Table 32: LVDS panel power select jumper settings



3.5. LVDS Inverter Power Select Jumper

The mainboard has a jumper that controls the input voltage delivered to the LVDS inverter connector. The jumper is labeled as "IVDD_SEL1". The jumper settings are shown below.



Figure 37: LVDS inverter power select jumper diagram

LVDS inverter power setting	Pin 1	Pin 2	Pin 3
+5V	Short	Short	Open
+12V (default)	Open	Short	Short

Table 33: LVDS inverter power select jumper settings



4. Expansion Slots

4.1. DDR3 Memory Slots

The mainboard provide one DDR3 DIMM memory slot. The memory slot can accommodate up to 4GB of 1066MHz memory. The memory slot is labeled as "DIMM1". The location of the DDR3 memory slot is shown below.



Figure 38: DDR3 memory slot diagram



4.1.1. Installing a Memory Module

Step 1

Disengage the locking mechanism at both ends of the DIMM slot by pressing the retaining clips outward.



Figure 39: Unlocking the memory DIMM slot

Step 2

Align the notch on the DIMM memory module with the counterpart on the DIMM slot.



Figure 40: Inserting the memory module

Step 3

Insert the DIMM memory module into the slot and push down at both ends until the locking clips lock the DIMM memory module into place.



Figure 41: Locking the memory module



4.1.2. Removing a Memory Module

Step 1

To disengage the locking clips, push outward the locking clips on both ends of memory slot. When the locking clips have cleared, the DIMM memory module will automatically pop up. Remove the memory module.



Figure 42: Removing the memory module



4.1.3. PCI Slot

The onboard PCI slot, labeled as "PCI_SLOT1", supports 5V 32-bit PCI cards. It is not compatible with PCI cards requiring 3.3V signaling. The location of the PCI slot is shown below.



Figure 43: PCI slot diagram





5. Installing into a Chassis

The VB7009 can be fitted into any chassis that has the mounting holes for compatible with the standard Mini-ITX mounting hole locations. Additionally, the chassis must meet the minimum height requirements for specified areas of the mainboard. If a riser card module is being used, the chassis will need to accommodate the additional space requirements.

5.1.1. Suggested minimum chassis dimensions

The figure below shows the suggested minimum space requirements that a chassis should have in order to work well with the VB7009.



Figure 44: Suggested minimum chassis dimensions

Each side of the mainboard should have a buffer zone from the internal wall of the chassis. The side of the mainboard that accommodates the I/O coastline should have a buffer of 1.00 mm. The side on the opposite end of the I/O coastline should have a buffer of at least 5.00 mm. The two sides adjacent to the I/O coastline should have at least a 10.00 mm buffer.

For the side that is close to the PCI slot, the buffer should be at least 100.00 mm if a riser card module will be used.



5.1.2. Suggested minimum chassis height

The figure below shows the suggested minimum height requirements for the internal space of the chassis. It is not necessary for the internal ceiling to be evenly flat. What is required is that the internal ceiling height must be strictly observed for each section that is highlighted. The highest part of the ceiling will be above the PCI slot.



Figure 45: Suggested minimum internal chassis ceiling height



5.1.3. Suggested keepout areas

The figure below shows the areas of the mainboard that is highly suggested to leave unobstructed.



Figure 46: Suggested keepout areas



6. BIOS Setup Utility

6.1. Entering the BIOS Setup Utility

Power on the computer and press **Delete** during the beginning of the boot sequence to enter the BIOS Setup Utility. If the entry point has passed, restart the system and try again.

6.2. Control Keys

Up	Move up one row
Down	Move down one row
Left	Move to the left in the navigation bar
Right	Move to the right in the navigation bar
Enter	Access the highlighted item / Select the item
Esc	Jumps to the Exit screen or returns to the previous screen
Page up	/ + ¹ Increase the numeric value
Page do	wn / $-^1$ Decrease the numeric value
F1	General help ²
F5	Restore the previous CMOS value
F7	Load optimized defaults

F10 Save all the changes and exit

Notes:

- 1. Must be pressed using the 10-key pad.
- 2. The General help contents are only for the Status Page and Option Page setup menus.

6.3. Navigating the BIOS Menus

The main menu displays all the BIOS setup categories. Use the <Left>/<Right> and <Up>/<Down> arrow keys to select any item or sub-menu. Descriptions of the selected/highlighted category are displayed at the bottom of the screen.

The small triangular arrowhead symbol next to a field indicates that a sub-menu is available (see figure below). Press **<Enter>** to display the sub-menu. To exit the sub-menu, press **<Esc>**.

6.4. Getting Help

The BIOS Setup Utility provides a "General Help" screen. This screen can be accessed at any time by pressing F1. The help screen displays the keys for using and navigating the BIOS Setup Utility. Press Esc to exit the help screen.



6.5. Main Menu (BIOS for VB7009-16 / VB7009-10E / VB7009-12XC SKU)

The Main Menu contains thirteen setup functions and two exit choices. Use arrow keys to select the items and press **<Enter>** to accept or enter Sub-menu.

Phoenix - AwardBI0S CM0S Setup Utility		
▶ Standard (M0S Features	▷ Frequency/Voltage Control	
▶ Advanced BI0S Features	Load Optimized Defaults	
▷ Advanced Chipset Features	Set Supervisor Password	
▷ Integrated Peripherals	Set User Password	
⊳ Power Management Setup	Save & Exit Setup	
▷ PnP/PCI Configurations	Exit Without Saving	
▷ PC Health Status		
Esc: Quit	↑↓→← : Select Item	
FlO: Save & Exit Setup		
Time, Date, Hard Disk Type		

Figure 47: Illustration of the Main menu screen (for VB7009-16/VB7009-10E/VB7009-12XC SKU)

6.5.1. Standard CMOS Features

Use this menu to set basic system configurations.

6.5.2. Advanced BIOS Features

Use this menu to set the advanced features available on your system.

6.5.3. Advanced Chipset Features

Use this menu to set chipset specific features and optimize system performance.

6.5.4. Integrated Peripherals

Use this menu to set onboard peripherals features.

6.5.5. Power Management Setup

Use this menu to set onboard power management functions.

6.5.6. PnP/PCI Configurations

Use this menu to set the PnP and PCI configurations.

6.5.7. PC Health Status

This menu shows the PC health status.



6.5.8. Frequency/Voltage Control

Use this menu to set the system frequency and voltage control.

6.5.9. Load Optimized Defaults

Use this menu option to load BIOS default settings for optimal and high performance system operations.

6.5.10. Set Supervisor Password

Use this menu option to set the BIOS supervisor password.

6.5.11. Set User Password

Use this menu option to set the BIOS user password.

6.5.12. Save & Exit Setup

Save BIOS setting changes and exit setup.

6.5.13. Exit Without Saving

Discard all BIOS setting changes and exit setup



6.6. Standard CMOS Features

⊅ate (mm∶dd∶yy)	Mony Sept 26 2011	Item Help
Time (hh∶mm∶ss) ▷ IDE Channel O Master ▷ IDE Channel O Slave] : 17 : A [None] [None]	Menu Level ▷ Change the day₁ month₁ year and century
Video Halt On	EEGA/VGA] EAll, But Keyboard]	
Base Memory Extended Memory Total Memory	640K 784384K 785408K	

Figure 48: Illustration of the Standard CMOS Features screen

6.6.1. Date

The date format is [Day, Month Date, Year]

6.6.2. Time

The time format is [Hour : Minute : Second]

6.6.3. Video

Settings: [EGA/VGA, CGA 40, CGA 80, MONO]

6.6.4. Halt On

Set the system's response to specific boot errors. Below is a table that details the possible settings.

Settings	Description
All Errors	System halts when any error is detected
No Errors	System does not halt for any error
All, But Keyboard	System halts for all non-key errors



6.7. IDE Channels

Channel 0 Master

IDE HDD Auto-Detection	[Press Enter]	Item Help
IDE Channel O Master	EAuto]	Menu Level ⊳
Capacity	O MB	To auto-detect the HDD's size, head on this channel
Cylinder Head		
Precomp		
Landing Zone		
Sector		

Figure 49: Illustration of the IDE Channel 0 Master screen

Channel 0 Slave

Pho	oenix - AwardBI0S CM IDE Channel	105 Setup Utility O Slave
IDE HDD Auto-Detection	E Press Ente	er]]
IDE Channel O Slave Access Mode	[Auto] [Auto]	Menu Level ▷ To auto-detect the HDD's size, beed on this
Capacity	O MB	channel
Cylinder Head Precomp Landing Zone Sector		
★↓→★: Move Enter: Select F5: Previous Value	+/-/PU/PD: Value ues	F1D: Save ESC: Exit F1: General Help F7: Optimized Defaults

Figure 50: Illustration of the IDE Channel 0 Slave screen



The specifications of your drive must match with the drive table. The hard disk will not work properly if you enter incorrect information in this category. Select **"Auto"** whenever possible. If you select **"Manual"**, make sure the information is from your hard disk vendor or system manufacturer.

Settings	Description
[storage] Channel	The name of this match the name of the menu.
	Settings: [None, Auto, Manual]
Access Mode	Settings: [CHS, LBA, Large, Auto]
Capacity	Formatted size of the storage device
Cylinder	Number of cylinders
Head	Number of heads
Precomp	Write precompensation
Landing Zone	Cylinder location of the landing zone
Sector	Number of sectors

Below is a table that details required hard drive information when using the "Manual" mode.



6.8. Advanced BIOS Features

> CPU Feature > Hard Disk Boot Priority	[Press Enter] [Press Enter]	Item Help
Quick Power On Self Test First Boot Device	[Enabled]] [None]]	Menu Level D
Second Boot Device	E Nonel	
Third Boot Device	[None]	
Boot Other Device Boot Up Numbock Status	E0n] [Disabled]	
Security Option	ESetup]	
Full Screen L0G0 Show	[Disabled]	
Summary Screen Show	[Disabled]	

Figure 51: Illustration of the Advanced BIOS Features screen

The Advanced BIOS Features section includes the following submenus:

- □ CPU Feature
- □ Hard Disk Boot Priority

6.8.1. Quick Power On Self-Test

Shortens Power On Self-Test (POST) cycle to enable shorter boot up time.

Settings	Description
Disabled	Standard Power On Self Test (POST)
Enabled	Shorten Power On Self Test (POST) cycle and boot up time

6.8.2. First/Second/Third Boot Device

Set the boot device sequence as BIOS attempts to load the disk operating system.

Settings	Description	
Removable	Boot from external drive	
Hard Disk	Boot from the HDD	
CDROM	Boot from CDROM	
Legacy LAN	Boot from network drive	
VIA Networking	Boot from network drive	
Disabled	Disable the boot device sequence	



6.8.3. Boot Other Device

Enables the system to boot from alternate devices if the system fails to boot from the "First/Second/Third Boot Device" lists.

Settings	Description	
Disabled	No alternate boot device allowed	
Enabled	Enable alternate boot device	

6.8.4. Boot Up NumLock Status

Set the NumLock status when the system is powered on.

Settings	Description	
Off	Forces keypad to behave as arrow keys	
On	Forces keypad to behave as 10-key	

6.8.5. Security Option

Selects whether the password is required every time the System boots, or only when you enter Setup.

Settings	Description
Setup	Password prompt appears only when end users try to run BIOS Setup
System	Password prompt appears every time when the computer is powered on and when end users try to run BIOS Setup

6.8.6. Full Screen Logo Show

Show full screen logo during BIOS boot up process.

Settings: [Disabled, Enabled]

6.8.7. Summary Screen Show

Show summary screen.

Settings: [Disabled, Enabled]



6.9. CPU Feature

Phoenix - AwardBIOS CMOS Setup Utility CPU Features		
Thermal Management	[[Thermal Monitor 3]]	Item Help
Phon Support	EDISADI601	Menu Level ⊳
		Thermal Monitor 3 Dynamic Ratio & VID transition
↑↓→★: Move Enter: Select F5: Previous Val	+/-/PU/PD: Value F10: Save	ESC: Exit Fl: General Help Optimized Defaults

Figure 52: Illustration of the CPU Feature screen

6.9.1. Thermal Management

This item sets CPU's thermal control rule to protect CPU from overheating.

Settings	Description	
Thermal Monitor 3	Dynamic Ratio & VID Transition	
Disabled	Disable this feature	

6.9.2. PMON support

This feature controlled the CPU speed to perform automatically at best performance to comply with the given system applications.

Settings	Description	
Disabled	Turn off this feature.	
Auto	Automatically control the CPU speed to perform at best performance.	



6.10. Hard Disk Boot Priority

Phoenix - AwardBIOS CMOS Setup Utility Hard Disk Boot Priority		
l. Bootable Add-in Cards	Item Help	
	<pre>Menu Level ▷ Use < ↑ > or < ↓ > to select a device, then press < + > to move it up, or < - > to move it down the list. Press <esc> to exit this menu.</esc></pre>	
✦↓→←: Move Enter: Select +/-/PU/PD: Change Priority F F5: Previous Values Fb: Fail-Safe Defaults	FlD: Save ESC: Exit F7: Optimized Defaults	

Figure 53: Illustration of the Hard Disk Boot Priority screen

This is for setting the priority of the hard disk boot order when the "Hard Disk" option is selected in the "[First/Second/Third] Boot Device" menu item.



6.11. Advanced Chipset Features

Phoenix - AwardBIOS CMOS Setup Utility Advanced Chipset Features		
▷ PCIE Bus Control	[Press Enter]	Item Help
▷ UMA & P2P Bridge Control ▷ CPU & PCI Bus Control LCD Clock Source Control LCD Backlight Control	[Press Enter] []чKHz] []чKHz] [Level 0]	Menu Level ⊳
↑↓→←: Move Enter: Select F5: Previous Va	t +/-/PU/PD: Value F1D: Save alues F7:	ESC: Exit Fl: General Help Optimized Defaults

Figure 54: Illustration of the Advanced Chipset Features screen



Caution:

The Advanced Chipset Features menu is used for optimizing the chipset functions. Do not change these settings unless you are familiar with the chipset.

The Advanced Chipset Features section includes the following submenus:

- D PCIE Bus Control
- □ UMA & P2P Bridge Control
- CPU & PCI Bus Control

6.11.1. LCD Clock Source Control

Settings: [14 KHz, 7 KHz, 110 Hz, 55 Hz]

6.11.2. LCD Backlight Control

Settings: [Level 0, Level 1, Level 2, Level 3, Level 4, Level 5, Level 6, Level 7, Level 8]


6.12. PCIE Bus Control

CIE Root Port CIE Target Link Speed	E <mark>Enable</mark>] EAuto]	Item Help
CIE PED Control	[Enable] [Disablod]	Manu Laural N
CIE Root-Port-Reset Enable	[Disabled]	
aximum Payload Size	E Auto]	
CIE ASPM Function	E Auto]	

Figure 55: Illustration of the PCIE Bus Control screen

6.12.1. PCIE Root Port

Settings: [Disabled, Enabled]

6.12.2. PCIE Target Link Speed

Settings: [Auto, Force Gen1]

6.12.3. PCIE PEO Control

Settings: [Disabled, Enabled]

6.12.4. PCIE Hot-Reset Enable

Settings: [Disabled, Enabled]

6.12.5. PCIE Root-Port-Reset Enable

Settings: [Disabled, Enabled]

6.12.6. Maximum Payload Size

Settings: [Auto, 128 Byte]

6.12.7. PCIE ASPM Function

Settings: [Force Disable, Auto]

6.13. UMA & P2P Bridge Control

Phoer	nix - AwardBI0S CM0 UMA & P2P Bridge	S Setup Util: Control	ity
UMA Enable VGA Share Memory Size	ĽEnable] Ľ256M]		Item Help
CPU Direct Access FB Select Display Device L Select Display Device 2 Panel Type Engine Clock Control x ECLK Frequency in MHz	EEnable] [Manual] [CRT]] [TV] [D2] [Disabled] [D		Menu Level ⊳
L ▲↓→←: Move Enter: Select F5: Previous Values	+/-/PU/PD: Value s	F10: Save F7: 0	I ESC: Exit Fl∷ General Help ptimized Defaults

Figure 56: Illustration of the UMA & P2P Bridge Control screen

6.13.1. UMA Enable

Settings: [Disabled, Enabled]

6.13.2. VGA Share Memory Size

This setting allows you to select the amount of system memory that is allocated to the integrated graphics processor.

Settings: [64M, 128M, 256M]

6.13.3. CPU Direct Access FB

Settings: [Disabled, Enabled]

6.13.4. Select Display Device

This setting refers to the type of display being used with the system. Settings: [Auto, Manual]

6.13.5. Select Display Device 1

This setting refers to the type of display device 1 being used with the system. Settings: [CRT, LCD]

6.13.6. Select Display Device 2

This setting refers to the type of display device 2 being used with the system. Settings: [CRT, LCD]

6.13.7. Panel Type

Key in a HEX number.

Settings: [Min = 0000, Max = 0000F]

6.13.8. Engine Clock Control



6.14. CPU & PCI Bus Control

	Phoenix - AwardBIOS CMOS CPU & PCI Bus Co	Setup Utili ontrol	ty
PCI Master D WS Write	[Enabled]		Item Help
PCI Delay Transaction SB P2P Bridge	[Enabled] [Disabled]		Menu Level ⊳
↓→←: Move Enter: Selec	t +/-/PU/PD: Value	FlO: Save	ESC: Exit Fl: General Help
F5: Previous V	alues	F7: 0	ptimized Defaults

Figure 57: Illustration of the CPU & PCI Bus Control screen

6.14.1. PCI Master 0 WS Write

Settings: [Enabled, Disabled]

6.14.2. PCI Delay Transaction Settings: [Disabled, Enabled]

6.14.3. SB P2P Bridge



6.15. Integrated Peripherals

Pho	penix - AwardBIOS CMOS Setup U Integrated Peripherals	tility
▷ VIA OnChip IDE Device	[Press Enter]	Item Help
▷ VIA OnChip PCI Device ▷ SuperIO Device ▷ USB Device Setting	[Press Enter] [Press Enter] [Press Enter]	Menu Level ⊳
P USD Device Secting	LFIESS LIDER 3	
↓→ ←: Move Enter: Select	+/-/PU/PD: Value FLO: Sav	e ESC: Exit Fl: General Help
F5: Previous Valu	Jes Fi	<pre>?: Optimized Defaults</pre>

Figure 58: Illustration of the Integrated Peripherals screen

The Integrated Peripherals section includes the following submenus:

- □ VIA OnChip IDE Device
- □ VIA OnChip PCI Device
- □ SuperIO Device
- □ USB Device Setting

6.16. VIA OnChip IDE Device

	Phoenix - AwardBIOS CMOS Setup Utility VIA OnChip IDE Device			
0nChip Sa	AT A	[Enabled]		Item Help
				Menu Level ⊳
↓ ↓↓↓↓ ←: Move	Enter: Select	+/-/PU/PD: Value	F10: Save	ESC: Exit Fl: General Help
	F5: Previous Valu	les	F7: 0	ptimized Defaults

Figure 59: Illustration of the VIA OnChip IDE Device screen

6.16.1. OnChip SATA



6.17. VIA OnChip PCI Device

Phoenix - AwardBIOS CMOS Setup Utility VIA OnChip PCI Device			
Onboard PCIE LAN	[Enabled]		Item Help
Hide DLFL OnChip HDAC Device Clear HDA Wake Enable bit NB HD Audio Codec L	[Disabled] [Enabled] [Enabled] [Enabled]		Menu Level ⊳
L ↑↓→→-: Move Enter: Select F5: Previous Va	+/-/PU/PD: Value lues	F10: Save F7: 0	ESC: Exit Fl: General Help ptimized Defaults

Figure 60: Illustration of the VIA OnChip PCI Device screen

6.17.1. Onboard PCIE LAN

Settings: [Enabled, Disabled]

6.17.2. Hide D1F1

Settings: [Enabled, Disabled]

6.17.3. OnChip HDAC Device

Settings: [Enabled, Disabled]

6.17.4. Clear HDA Wake Enable bit

Settings: [Enabled, Disabled]

6.17.5. NB HD Audio Codec 1

Settings: [Enabled, Disabled]



6.18. SuperIO Device

Pr	noenix - AwardBI0S CM0S Setup Ut SuperI0 Device	ility
Onboard Serial Port L	[]F&/IRQ4]]	Item Help
Onboard Serial Port 2 Onboard Serial Port 3 Onboard Serial Port 4 Onboard Parallel Port	[2F8/IR03] [3E8/IR04] [2E8/IR04] [378/IR07]	Menu Level ⊳
x ECP Mode Use DMA	З	
★↓→★: Move Enter: Select F5: Previous Val	+/-/PU/PD: Value F1D: Save lues F7	ESC: Exit Fl: General Help : Optimized Defaults

Figure 61: Illustration of the SuperIO Device screen

6.18.1. Onboard Serial Ports 1 ~ 4

Set the base I/O port address and IRQ for the onboard serial ports. Selecting "Auto" allows the BIOS to automatically determine the correct base I/O port.

Port	Address	IRQ
1	Disabled, 3F8, 2F8, 3E8, 2E8, 338, 348, Auto	4
2	Disabled, 3F8, 2F8, 3E8, 2E8, 338, 348, Auto	4
3	Disabled, 3F8, 2F8, 3E8, 2E8, 338, 348, Auto	4
4	Disabled, 3F8, 2F8, 3E8, 2E8, 338, 348, Auto	4

6.18.2. Onboard Parallel Port

This specifies the I/O port address and IRQ of the onboard parallel port. Settings: [Disabled, 378/IRQ7, 278/IRQ5, 3BC/IRQ7]

6.18.3. Parallel Port Mode

Set the parallel port mode. To operate the onboard parallel port as Standard Parallel Port, choose SPP. To operate the onboard parallel port in the EPP mode, choose EPP. By choosing ECP, the onboard parallel port will operate in ECP mode. Choosing ECP + EPP will allow the onboard parallel port to support both the ECP and EPP modes simultaneously.

Settings: [SPP, EPP, ECP, ECP + EPP]

6.18.4. ECP Mode Use DMA

ECP (Extended Capabilities Port) has two DMA channels that it can use. The default channel is 3. However, some expansion cards may use channel 3 as well. To solve this conflict, change the ECP channel to 1. Select a DMA channel for the port.

Settings: [1, 3]



6.19. USB Device Setting

USB 1.0 Controller	<pre>[Enabled]</pre>	Item Help
USB 2.0 Controller USB Operation Mode	〖Enabled〗 〖High Speed〗	Menu Level ⊳
USB Keyboard Function	[Enabled]	
USB Mouse Function	[Enabled]	<pre>[Enabled] or [Disabled]</pre>
USB Storage Function	[Enabled]]	Universal Host Controlle Interface for Universal
*** USB Mass Storage Device	Boot Setting ***	Serial Bus

Figure 62: Illustration of the USB Device Setting screen

6.19.1. USB 1.0 Controller

Enable or disable Universal Host Controller Interface for Universal Serial Bus.

Settings: [Disabled, Enabled]

6.19.2. USB 2.0 Controller

Enable or disable Enhanced Host Controller Interface for Universal Serial Bus.

Settings: [Disabled, Enabled]

6.19.3. USB Operation Mode

Auto decide USB device operation mode.

Settings	Description
Full/Low Speed	All of USB Device operated on full/low speed mode
High Speed	If USB device was high speed device, then it operated on high speed mode.

6.19.4. USB Keyboard Function

Enable or disable legacy support of USB keyboard.

Settings: [Disabled, Enabled]

6.19.5. USB Mouse Function

Settings: [Disabled, Enabled]

6.19.6. USB Storage Function

Enable or disable legacy support of USB mass storage.



6.20. Power Management Setup

Phoenix - AwardBIOS CMOS Setup Utility Power Management Setup		
EuP/ErP Lotb	[Disabled]	Item Help
ACPI Suspend Type Soft-Off by PWRBTN Run VGABIOS if S∃ Resume AC Loss Auto Restart HPET Support WDRT Support WDRT Run/Stop WDRT Count ▷ Wakeup Event Detect	ESL&S3] EInstant-Off] EAuto] EOff] EEnabled] ERun] ELO23] EPress Enter]	Menu Level ▷ EEnable] or EDisable] EuP/ErP Lot5 support used GPI00, for MB VT8595C and later.
★↓→←: Move Enter: Select F5: Previous Values	+/-/PU/PD: Value F10: Sav s F	ve ESC: Exit F⊥: General Help 7: 0ptimized Defaults

Figure 63: Illustration of the Power Management Setup screen

The Power Management Setup section includes the following submenus:

□ Wakeup Event Detect

6.20.1. EuP/ErP Lot6

This feature determines whether to let the system consume less power ACPI S3/S4/S5 state.

Settings: [Disabled, Enabled]

Note:

When EuP/ErP Lot6 support is enabled, the Wake on LAN from system OS ACPI S3/S4/S5 state will be disabled.

6.20.2. ACPI Suspend Type

Settings	Description
S1(POS)	S1/Power On Suspend (POS) is a low power state. In this state, no system context
	(CPU or chipset) is lost and hardware maintains all system contexts.
S3(STR)	S3/Suspend To RAM (STR) is a power-down state. In this state, power is supplied only
	to essential components such as main memory and wakeup-capable devices. The
	system context is saved to main memory, and context is restored from the memory
	when a "wakeup" event occurs.
S1 & S3	Depends on the OS to select S1 or S3.

6.20.3. Soft-Off by PWRBTN

Settings	Description
Delay 4 Sec	System is turned off if power button is pressed for more than four seconds.
Instant-Off	Power button functions as a normal power-on/-off button.



6.20.4. Run VGABIOS if S3 Resume

Select whether to run VGA BIOS if resuming from S3 state. This is only necessary for older VGA drivers. Settings: [Auto, Yes, No]

6.20.5. AC Loss Auto Restart

The field defines how the system will respond after an AC power loss during system operation.

Settings	Description
Off	Keeps the system in an off state until the power button is pressed
On	Restarts the system when the power is back
Former-Sts	Former-Sts

6.20.6. HPET Support

Settings: [Disabled, Enabled]

6.20.7. WDRT Support

Settings: [Disabled, Enabled

6.20.8. WDRT Run/Stop

Settings: [Stop, Run]

6.20.9. WDRT Count Key in a DEC number.

Settings: [Min = 0, Max = 1023]



6.21. Wakeup Event Detect

Phoenix - AwardBIOS CMOS Setup Utility Wakeup Event Detect			
PS2KB Wakeup Select PS2KB Wakeup Key Select PS2MS Wakeup Key Select PS2 Keyboard Power ON PS2 Mouse Power ON RTC Alarm Resume × Date (of Month) × Resume Time (hh:mm:ss)	[Hot Key] [Any Key] [Any Button] [Disabled] [Disabled] [Disabled] [: [:]	Item Help Menu Level D When Select Password, Please press ENTER key to change Password Max. & numbers	
↑↓→←: Move Enter: Select +/-/PU/PD: Value FLD: Save ESC: Exit FL: General Help F5: Previous Values F7: Optimized Defaults			

Figure 64: Illustration of the Wakeup Event Detect screen

6.21.1. PS2KB Wakeup Select

This feature has two settings: Hot Key and Password. To select the Password option, press <Page Up> or <Page Down>. To set the password, enter up to eight digits and press <Enter>.

Settings: [Hot Key]

6.21.2. PS2KB Wakeup Key Select

This feature is only available when "Hot Key" is chosen in "PS2KB Wakeup Select".

Settings: [Ctrl+F1, Ctrl+F2, Ctrl+F3, Ctrl+F4, Ctrl+F5, Ctrl+F6, Ctrl+F7, Ctrl+F8, Ctrl+F9, Ctrl+F10, Ctrl+F11, Ctrl+F12, Power, Wake, Any Key]

6.21.3. PS2MS Wakeup Key Select

Enables any mouse activity to restore the system from the power saving mode to an active state.

Settings: [Any Button, Left Button, Right Button]

6.21.4. PS2 Keyboard Power ON

Settings: [Disabled, Enabled]

6.21.5. PS2 Mouse Power ON

Settings: [Disabled, Enabled]

6.21.6. RTC Alarm Resume

Set a scheduled time and/or date to automatically power on the system. Settings: [Disabled, Enabled]

6.21.7. Date (of Month)

This field can only be set if "RTC Alarm Resume" is enabled. The field specifies the date for "RTC Alarm Resume".



6.21.8. Resume Time (hh:mm:ss)

This field can only be set if "RTC Alarm Resume" is enabled. The field specifies the time for "RTC Alarm Resume".



6.22. PnP/PCI Configurations

Init Display First	EPCIE × D	Item Help
Resources Controlled By x IR@ Resources	EAuto(ESCD)] Press Enter	Menu Level ⊳

Figure 65: Illustration of the PnP/PCI Configurations screen

Note:

This section covers some very technical items and it is strongly recommended to leave the default settings as is unless you are an experienced user.

6.22.1. Init Display First

Settings: [PCI slot, Onboard, PCIEx]

6.22.2. Resources Controlled By

Enables the BIOS to automatically configure all the Plug-and-Play compatible devices.

Settings	Description		
Auto(ESCD)	BIOS will automatically assign IRQ, DMA and memory base address fields		
Manual	Unlocks "IRQ Resources" for manual configuration		



6.23. PC Health Status

1.000V	Item Help
3-200V 5-100V	
11-880V	Menu Level ⊳
ЭПоС	
O RPM	
O RPM	
	1.000V 3.200V 5.100V 11.880V 30°C 0 RPM 0 RPM

Figure 66: Illustration of the PC Health Status screen

The PC Health Status displays the current status of all of the monitored hardware devices/components such as CPU voltages, temperatures and fan speeds.



6.24. Frequency/Voltage Control

Current FSB Frequency	100 MHz 533 MHz	Item Help
PRAM Clock Spread Spectrum	□By SPD □ + / - □ - 1 %]]	Menu Level ⊳

Figure 67: Illustration of the Frequency/Voltage Control screen

6.24.1 DRAM Clock

This chipset supports synchronous and asynchronous mode between host clock and DRAM clock frequency.

Settings: [By SPD, 400 MHz, 533 MHz]

6.24.2 Spread Spectrum

When the mainboard's clock generator pulses, the extreme values (spikes) of the pulses create EMI (Electromagnetic Interference). The Spread Spectrum function reduces the EMI generated by modulating the pulses so that the spikes of the pulses are reduced to flatter curves.

Settings: [Disabled, +/- 0.1%, +/- 0.2%, +/- 0.3%, +/- 0.4%, +/- 0.5%, +/- 0.6%, +/- 0.7%, +/- 0.8%, +/- 0.9%]



6.25. Load Optimized Defaults



Figure 68: Illustration of the Load Optimized Defaults screen

This option is for restoring all the default optimized BIOS settings. The default optimized values are set by the mainboard manufacturer to provide a stable system with optimized performance.

Entering "Y" and press <Enter> to load the default optimized BIOS values.

Entering "N" will cancel the load optimized defaults request.

6.26. Set Supervisor/User Password

Phoenix - AwardBI0S CM0S Setup Utility			
▷ Standard CMOS Features	▷ Frequency/Voltage Control		
▶ Advanced BI0S Features	Load Optimized Defaults		
▷ Advanced Chipset Features	Set Supervisor Password		
▷ Integrated Peripherals			
▷ Power Management Setup Enter Password:			
▷ PnP/PCI Configurations	Exit Without Saving		
▷ PC Health Status			
Esc: Quit FlO: Save & Exit Setup	↑↓→ ←: Select Item		
Change/Set/Disable Password			

Figure 69: Illustration of the Set Supervisor/User Password screen

This option is for setting a password for entering BIOS Setup. When a password has been set, a password prompt will be displayed whenever BIOS Setup is run. This prevents an unauthorized person from changing any part of your system configuration.



There are two types of passwords you can set: Supervisor password and User password. When a supervisor password is used, the BIOS Setup program can be accessed and the BIOS settings can be changed. When a user password is used, the BIOS Setup program can be accessed but the BIOS settings cannot be changed.

To set the password, type the password (up to eight characters in length) and press **<Enter>**. The password typed now will clear any previously set password from CMOS memory. The new password will need to be reentered to be confirmed. To cancel the process press **<Esc>**.

To disable the password, press **<Enter>** when prompted to enter a new password. A message will show up to confirm disabling the password. To cancel the process press **<Esc>**.

Additionally, when a password is enabled, the BIOS can be set to request the password each time the system is booted. This would prevent unauthorized use of the system. See "Security Option" in the "Advanced BIOS Features" section for more details.



6.27. Save & Exit Setup

Phoenix - AwardBIOS CMOS Setup Utility			
▷ Standard CMOS Features	▷ Frequency/Voltage Control		
▷ Advanced BI0S Features	Load Optimized Defaults		
D Advanced Chipset Features	Set Supervisor Password		
▷ Integrated Peripherals ▷ Power Management Setup SAVE to CMOS and EXIT (Y/N)?Y			
▷ PnP/PCI Configurations	Exit Without Saving		
▷ PC Health Status			
Esc: Quit FlD: Save & Exit Setup	↑↓→ ←: Select Item		
Save Data to CMOS			

Figure 70: Illustration of the Save & Exit Setup screen

Entering " \mathbf{Y} " saves any changes made, and exits the program.

Entering "N" will cancel the exit request.

6.28. Exit Without Saving

Phoenix - AwardBIOS CMOS Setup Utility			
▷ Standard CMOS Features	▷ Frequency/Voltage Control		
▶ Advanced BI0S Features	Load Optimized Defaults		
▷ Advanced Chipset Features	Set Supervisor Password		
▷ Integrated Peripherals			
▷ Power Management Setup Quit Without	Quit Without Saving (Y/N)?		
▷ PnP/PCI Configurations	Exit Without Saving		
▷ PC Health Status			
Esc: Quit F10: Save & Exit Setup	↑↓→ ←: Select Item		
Abandon all Data			

Figure 71: Illustration of the Exit Without Saving screen

Entering " \boldsymbol{Y} discards any changes made and exits the program.

Entering $\ensuremath{''} N\ensuremath{''}$ will cancel the exit request



6.29. Main Menu (BIOS for VB7009-12QCE SKU)

The System Overview screen is the default screen that is shown when the BIOS Setup Utility is launched. This screen can be accessed by traversing the navigation bar to the "Main" label.

Advanced Boo	BIOS SETUP L	ITILITY Thinset Exi	(
en Overview			Use [ENTER] , [TAB]
IOS Ion :08.00.16 d Date:07/03/15 iS3400201			or ISHIFT-TABJ to select a field. Use [+] or [-] to configure system Time.
e ssor Eden X4 C425001.2+G e n Memory :1792MB	Hz		
en Tino en Date	[09:17:01] [Wed_07/15	5/2015)	 ↔ Select Screen 14 Select Item ← Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit
en Tino en Date	E09:17:011 (Wed 07/15	5/20151	+- Select Sc +- Change F Tab Select F F1 General I F10 Save and ESC Exit

Figure 72: Illustration of the Main menu screen (for VB7009-12QCE SKU)

6.29.1. AMIBIOS

The content in this section of the screen shows the current BIOS version, build date, and ID number.

6.29.2. Processor

This content in this section shows the CPU information that has been detected. This information includes the CPU name and speed

6.29.3. System Memory

This section shows the amount of available memory that has been detected.

6.29.4. System Time

This section shows the current system time. Press **Tab** to traverse right and **Shift+Tab** to traverse left through the hour, minute, and second segments. The **+** and **-** keys on the number pad can be used to change the values. The time format is [Hour : Minute : Second].

6.29.5. System Date

This section shows the current system date. Press **Tab** to traverse right and **Shift+Tab** to traverse left through the month, day, and year segments. The **+** and **-** keys on the number pad can be used to change the values. The weekday name is automatically updated when the date is altered. The date format is [Weekday, Month, Day, Year].



6.30. Advanced Settings

The Advanced Settings screen shows a list of categories that can provide access to a sub-screen. Subscreen links can be identified by the preceding right-facing arrowhead.

BIOS SETUP UTILITY	
lain <mark>Advanced Boot Security Chipset</mark>	Exit
Ndvanced Settings	Configure CPU.
 JARNING: Setting wrong values in below sections may cause system to malfunction. CPU Configuration SuperIO Configuration Hardware Health Configuration ACPI Configuration APM Configuration Spread Spectrum Configuration USB Configuration CRB Configuration 	← Select Screen †4 Select Item Enter Go to Sub Screen F1 General Help F10 Save and Exit ESC Exit

Figure 73: Illustration of the Advanced Settings screen

The Advanced Settings screen contains the following links:

- CPU Configuration
- IDE Configuration
- SuperIO Configuration
- Hardware Health Configuration
- ACPI Configuration
- APM Configuration
- Spread Spectrum Configuration
- USB Configuration
- CRB Configuration

6.30.1. CPU Configuration

The CPU Configuration screen shows detailed information about the built-in processor. In addition to the processor information, the thermal controls can be set.



BLOS SETUP UTI	LITY	
Configure advanced CPU settings Module Version:01.0C		-
Manufacturer:UIA UIA Eden X4 C425001.2+6Hz Speed (FSB 266MHz = 6.5): 1733MHz Core :4 Cache L1 :64 KB Cache L2 :2048 KB Microcode revision : 5A PMON Support : N/A		
	↔ 14 F1 F10 ESC	Select Screen Select Item General Help Save and Exit Exit

Figure 74: Illustration of the CPU Configuration screen

6.30.2. IDE Configuration

The IDE Configuration screen shows links to the primary master and slave IDE hard drive information screens.



Figure 75: Illustration of IDE Configuration screen

6.30.3. SuperIO Configuration

The SuperIO Configuration screen shows the specific addresses and IRQs of the onboard serial ports.





Configure F81865F Super IO Chipset		Allows BIOS to Select	
Sorial Port1 Serial Port2 Serial Port3 Serial Port4 Serial Port5 Serial Port6 Parallel Port Mode	13F8/1R941 12F8/1R941 13E8/1R941 12E8/1R941 12B8/1R941 12B8/1R941 1378/1R971 1Norma11	Addr	esses .
		↔ †4 +- F1 F10 ESC	Select Screen Select Item Change Option General Help Save and Exit Exit

Figure 76: Illustration of SuperIO Configuration screen

6.30.3.1. Serial Ports 1 to 6 Address

The Serial Port 1 to 6 has three selectable options.

Port	Address and IRQs
1	3F8/IRQ4/Disabled
2	2F8/IRQ4/Disabled
3	3E8/IRQ4/Disabled
4	2E8/IRQ4/Disabled
5	2B0/IRQ4/Disabled
6	2B8/IRQ4/Disabled

Table 34: Serial port addresses and IRQs

6.30.3.2. Parallel Port

The Parallel Port has three selectable options: 378/IRQ7/Disabled.

6.30.3.2.1. Parallel Port Mode

The Parallel Port Mode has five selectable options: Normal/Bi-directional/ECP/EPP/ECP&EPP.



6.30.4. Hardware Health Configuration

The Hardware Health Configuration screen has no editable fields. The system temperature is taken from an optional sensor that is connected to the J5 pin header.

Advanced	BIOS SETUP UTILITY	
Hardware Health Configuration		Fan confiruration
CPU Temperature System Temperature Vcore +3.30 +120 CPU Fan Speed System Fan Speed CPU FON Hode Sotting System Fan Mode Setting	:40°C/104°F :35°C/95°F :1.024 U :3.376 U :13.376 U :N/A :N/A IFull Speed] IFull Speed]	mode setting ↔ Select Screen 11 Select Item ↔ Change Option F1 General Help F10 Save and Exit ESC Exit

Figure 77: Illustration of Hardware Health Configuration screen

6.30.4.1. CPU FAN Mode Setting

The CPU FAN has two selectable mode options.

Auto Fan by RPM

The speed of the CPU fan is varied according to CPU temperature. Press Enter to do the following settings: CPU Temp. Limit of Highest/CPU Temp. Limit of Second/CPU Temp. Limit of Third/CPU Temp. Limit of Lowest/Fan 1 Highest Setting/Fan 1 Second Setting/Fan 1 Third Setting/Fan 1 Fourth Setting/Fan 1 Lowest Setting.

Full Speed

The CPU fan speed is fixed and running at highest speed.

6.30.4.2. System FAN Mode Setting

The System FAN has two selectable mode options.

Auto Fan by RPM

The speed of the system fan is varied according to system temperature. Press Enter to do the following settings: System Temp. Limit of Highest/System Temp. Limit of Second/System Temp. Limit of Third/System Temp. Limit of Lowest/Fan 2 Highest Setting/Fan 2 Second Setting/Fan 2 Third Setting/Fan 2 Fourth Setting/Fan 2 Lowest Setting.

Full Speed

The system fan speed is fixed and running at highest speed.



6.30.5. ACPI Settings

ACPI grants the operating system direct control over system power management. The ACPI Configuration screen can be used to set a number of power management related functions.

Advanced	BIOS SETUP UTILITY		
ACPI Settings		Select the ACPI	
Suspend node ACPI Version Features USB S4 WakeUp	(Auto) LACPI v3.01 LDisabled)	— state used for System Suspend.	
		←→ Select Screen †4 Select Item ←→ Change Option F1 General Help F10 Save and Exit	
		ESC Exit	

Figure 78: Illustration of ACPI Configuration screen

6.30.5.1. Suspend Mode

The Suspend Mode field has three selectable options.

S1 (POS)

S1/Power On Suspend (POS) is a low power state. In this state, no system context (CPU or chipset) is lost and hardware maintains all system contexts.

S3 (STR)

S3/Suspend To RAM (STR) is a power-down state. In this state, power is supplied only to essential components such as main memory and wakeup-capable devices. The system context is saved to main memory, and context is restored from the memory when a "wakeup" event occurs.

Auto

When the Suspend Mode is set to Auto, the operating system will control the power state.

6.30.5.2. ACPI Version Features

The ACPI Version has three selectable version options.

ACPI v1.0 Supports ACPI v1.0

ACPI v2.0 Supports ACPI v2.0

ACPI v3.0 Supports ACPI v3.0

6.30.5.3. USB S4 Wakeup

The USB S4 WakeUp enables the system to resume through the USB device port from S4 state. There are two options: "Enabled" or "Disabled".



6.30.6. APM Settings

APM enables the operating system to co-work with the BIOS to control the system power management. The APM Configuration screen can be used to set a number of power management functions.

Advanced	BIOS SETUP UTILITY		
APM Settings			Options
Power Button Mode Restore on AC/Power Loss	10n/0ffl IPower-Offl	On/O Stan	ff dby end
Advanced Resume Events Conti	ols	0.00	
Resume On PS/2 KBC Wake-Up Key	[Disabled] [Ang Keg]		
Resume On PS/2 Mouse	(Disabled)		
PCI Lan S5 Wakeup	[Disabled]		
Resume On RTC Alarm	[Disabled]		
		** 11	Select Screen Select Item
		11	Change Option General Help
		F10	Save and Exit
		ESC	Exit
v02.69 (C) Copurial	t 1985-2010, America	un Megatren	ds. Inc.

Figure 79: Illustration of APM Configuration screen

6.30.6.1. Power Button Mode

The Power Button Mode has three options.

On/Off

When On/Off is selected, pressing the power button will instantly cause the system to power on or off.

Standby

When Standby is selected, the power button must be pressed and held down for 4 seconds before the system will power off.

Suspend

When Suspend is selected, pressing the power button will instantly cause the system to enter suspend mode.

6.30.6.2. Restore on AC/Power Loss

Restore on AC/Power Loss defines how the system will respond after AC power has been interrupted while the system is on. There are three options.

Power Off

The Power Off option keeps the system in an off state until the power button is pressed again.

Power On

The Power On option restarts the system when the power has returned.

Last State

The Last State option restores the system to its previous state when the power was interrupted.



6.30.6.3. Resume on PS/2 KBC

Resume on PS/2 KBC wakes up a system that has been put into suspend or standby mode. When this feature is enabled, keyboard activity as defined in the **Wake-Up Key** feature will cause the system to wake up. This feature has three options.

S3/S4/S5

The S3/S4/S5 option enables PS/2 keyboard activity to be detected if the system is in S3/S4/S5 power saving mode.

Disabled

The Disabled option disables the detection of all PS/2 keyboard activity.

6.30.6.4. Wake-Up Key

The Wake-Up Key feature can only be set when **Resume on PS/2 KBC** is set to "S3/S4/S5". Otherwise, this feature will be not selectable. This feature has two options.

Any Key

The Any Key option enables any key on the keyboard to trigger the Wake-Up event.

Specific Key

The Specific Key option unlocks the Wake-Up Password feature.

6.30.6.5. Wake-Up Password

The Wake-Up Password feature can only be set when the **Wake-Up Key** feature is set to "Specific Key". This feature enables the user to specify a key sequence that must be entered in order to wake up the system.

The key sequence can consist of up to 6 alphanumeric characters and some special characters. Function keys and modifier keys (such as Ctrl, Alt, Del, etc.) cannot be used.

6.30.6.6. Resume on PS/2 Mouse

Resume on PS/2 Mouse wakes up a system that has been put into suspend or standby mode. When this feature is enabled, any PS/2 mouse activity that is detected will cause the system to wake up. This feature has three options.



S3

The S3 option enables any PS/2 mouse activity to be detected if the system is in S3 power saving mode.

S3/S4/S5

The S3/S4/S5 option enables any PS/2 mouse activity to be detected if the system is in S3/S4/S5 power saving mode.

Disabled

The Disabled option disables the detection of all PS/2 mouse activity.

6.30.6.7. PCI Lan S5 Wakeup

The PCI LAN S5 Wakeup feature enables the BIOS to allow remote wake-up from the S5 power off state through the PCI bus. This feature has two options: "Enabled" or "Disabled" support PCI Lan S5 Wakeup.



6.30.6.8. Resume on RTC Alarm

Resume on RTC Alarm can only be used if **Resume on Software RTC Alarm** is not enabled. This feature enables the BIOS to automatically power on the system at a scheduled time. When enabled, the **RTC Alarm Date** and **System Time** features will be unlocked.

6.30.6.9. RTC Alarm Date (Days)

The RTC Alarm Date feature is visible only when **Resume on RTC Alarm** is enabled. This feature enables the user to specify a specific date each month or daily recurrence. Use the + and - keys on the number pad to change the value of the RTC Alarm Date.

Every Day

The Every Day option triggers the RTC Alarm daily.

1 - 31

When a specific numeric date is selected, the RTC Alarm will be triggered on that day of the month.

6.30.6.10. System Time

The System Time option enables the user to specify the time the system should power on for the date that is set in **RTC Alarm Date**.

6.30.7. Spread Spectrum Configuration

The Spread Spectrum Configuration screen enables access to the Spread Spectrum Setting feature.

BIOS SETUP UTILITY Advanced	
Spread Spectrum Configuration	Dynamic to adjust SSC
Spread Spectrum Setting [0.12] Options Disabled 0.12 0.22 0.32 0.32 0.42 0.52 0.62 0.72 0.92 0.32	 ↔ Select Screen ↑↓ Select Item ↔ Change Option F1 General Help F10 Save and Exit ESC Exit

Figure 80: Illustration of Spread Spectrum Configuration screen

6.30.7.1. Spread Spectrum Setting

The Spread Spectrum Setting feature enables the BIOS to modulate the clock frequencies originating from the mainboard. The settings are in percentages of modulation. Higher percentages result in greater modulation of clock frequencies. This feature has settings that range from 0.1% to 0.9%.



6.30.8. USB Configuration

The USB Configuration screen shows the number of connected USB devices.

B	IOS SETUP UTILITY		
navancea			
USB Configuration		Enables support for	
Module Version - 2.24.5-13.4		optic	on disables
USB Devices Enabled : 1 Keyboard		no US conne	cy support if 3B devices are ected.
==Onboard VX900 USB Setup Item	3==		
Legacy USB Support USB 2.0 Controller Mode	(Enabled) [H1Speed]	la n	
			Select Screen
		11	Select Item Change Option
1		F1	General Help
		F10 ESC	Save and Exit
v02.69 (C)Copyright	1985-2010, American Me	gatrend	ls, Inc.

Figure 81: Illustration of USB Configuration screen

6.30.8.1. Legacy USB Support

The Legacy USB Support feature enables environments that do not have native USB support to use USB devices. This feature has three options.

Enabled

The Enabled option keeps the Legacy USB Support feature on at all times.

Disabled

The Disabled option keeps the Legacy USB Support feature off at all times.

6.30.8.2. USB2.0 Controller Mode

The USB 2.0 Controller Mode feature enables the user to set the USB 2.0 controller in HiSpeed (480Mbps) or FullSpeed (12Mbps) mode.

FullSpeed

The FullSpeed option limits the USB 2.0 controller to transfer data at 12Mbps.

HiSpeed

The HiSpeed option enables the USB 2.0 controller to transfer data at 480Mbps. The connected USB device must support USB 2.0 HiSpeed in order to benefit from this setting.



6.30.9. CRB Configuration

The CRB Configuration screen shows the available BIOS-controlled DRAM clock, graphics adapter, display device and LAN control features.

Advanced	BIUS SETUP UTILITY	
CRB Configuration		Options
UT6130 LAN Control LAN Option ROM	LEnabledJ (Disabled)	Disabled Enabled
		↔ Select Screen 14 Select Item

Figure 82: Illustration of CRB Configuration screen

6.30.9.1. VT6130 LAN Control

The VT6130 LAN Control feature determines whether the onboard LAN controller will be used or not.

6.30.9.2. LAN Option ROM

The LAN Option ROM feature will only be visible if the **VT6130 LAN Control** feature is enabled. If the LAN Option ROM feature is enabled, then the system will load a separate ROM for the LAN controller in order to boot from Gigabit LAN.



6.31. Boot Settings

The Boot Settings screen has a single link that goes to the **Boot Settings Configuration** screen.



Figure 83: Illustration of Boot Settings screen

6.31.1. Boot Settings Configuration

The Boot Settings Configuration screen has several features that can be run during the system boot sequence.

(Enab.led) (Enab.led) (On) (Enab.led) (Enab.led)	Allows BIOS certain test booting. This decrease the needed to bo system.	to skip s while s will time ot the
	↔ Select †4 Select ← Change F1 Genera F10 Save a ESC Exit	Screen Item Option I Help nd Exit
	(Enabled) (Enabled) (On) (Enabled) (Enabled)	(Enabled) certain tests (Enabled) decrease the (On) needed to box (Enabled) system. (Enabled) ** Select ** 14 Select ** Change F1 Genera F10 Save a ESC Exit

Figure 84: Illustration of Boot Settings Configuration screen



6.31.1.1. Quick Boot

The Quick Boot feature enables the BIOS to skip certain tests in order to speed up the boot sequence. This feature has two options: enabled and disabled.

6.31.1.2. Quiet Boot

The Quiet Boot feature hides all of the Power-on Self Test (POST) messages during the boot sequence. Instead of the POST messages, the user will see an OEM logo. This feature has two options: enabled and disabled.

6.31.1.3. Bootup Num-Lock

The Bootup Num-Lock feature determines how the 10-key pad will behave. When the feature is enabled, the 10-key pad will behave as a number pad. When the feature is disabled, the 10-key pad will behave as cursor navigation keys.

6.31.1.4. Wait for 'F1' if Error

This feature determines how the system will respond if an error is detected during the boot sequence. If this feature is enabled, the BIOS will pause booting and wait for the user to press F1 to enter the BIOS setup menu. This feature has two options: enabled and disabled.

6.31.1.5. Hit 'DEL' Message Display

This feature determines if the BIOS will display a POST message that informs the user how to access the BIOS Setup Utility.¹ This feature has two options: enabled and disabled.



If the Quiet Boot option is enabled, the settings of this feature will have no effect.



6.32. Security Settings

The Security Settings screen provides a way to restrict access to the BIOS or even the entire system.



Figure 85: Illustration of Security Settings screen

6.32.1. Security Settings

6.32.1.1. Change Supervisor Password

This option is for setting a password for accessing the BIOS setup utility. When a password has been set, a password prompt will be displayed whenever the BIOS setup utility is launched. This prevents an unauthorized person from changing any part of the system configuration.

When a supervisor password is set, the **Password Check** option will be unlocked.

6.32.1.2. Password Check

This feature is compulsory when the **Change Supervisor Password** option is set. The user will have up to three chances to enter the correct password before the BIOS forces the system to stop booting. If the user does not enter the correct password, the keyboard will also lock up. The only way to get past this is to do a hard reboot (i.e., use the system reset button or cut off the power to the system). A soft reboot (i.e., Ctrl+Alt+Del) will not work because the keyboard will be locked. This feature has two options.

Setup

The Setup option forces users to enter a password in order to access the BIOS Setup Utility.

Always

The Always option forces users to enter a password in order to boot up the system.



6.33. Advanced Chipset Settings

The Advanced Chipset Settings screen has two links for accessing North and South bridge functions. Though the VX900 is a single chip solution, the North and South bridge categories are still for grouping features.



Figure 86: Illustration of Advanced Chipset Settings screen

6.33.1. North Bridge VIA VX900 Configuration

The North Bridge VIA VX900 Configuration screen contains two links to sub-screen.



Figure 87: Illustration of North Bridge VIA VX900 Configuration screen



6.33.1.1. DRAM Clock/Timing Configuration

The DRAM Clock/Timing Configuration screen has one feature for controlling the system DRAM. All other DRAM features are automated and cannot be accessed.

DRAM Frequency/Timing Conf	iguration	Options
DRAMIClock	(Auto)	Auto 400 MHz 533 MHz
		← Select Screen 14 Select Item ← Change Option F1 General Help F10 Save and Exit ESC Exit

Figure 88: Illustration of DRAM Frequency/Timing Configuration screen

6.33.1.1.1. DRAM Clock

The DRAM Clock option enables the user to determine how the BIOS handles the memory clock frequency. The memory clock can either be dynamic or static. This feature has three options.

Auto

The Auto option enables the BIOS to select a compatible clock frequency for the installed memory.

400 MHz

The 400 MHz option forces the BIOS to be fixed at 800 MHz for DDR3 memory modules.

533 MHz

The 533 MHz option forces the BIOS to be fixed at 1066 MHz for DDR3 memory modules.



6.33.1.2. OnChip VGA Configuration

The OnChip VGA Configuration screen has features for controlling the integrated graphics controller in the VX900 chipset.

ions
ct Screen ct Item ge Option ral Help and Exit

Figure 89: Illustration of OnChip VGA Configuration screen

6.33.1.2.1. Select Display Device 1 and 2

The Select Display Device feature enables the user to choose a specific display interface. This feature has two options: CRT and LCD. If both Select Display Device 1 and Select Display Device 2 are set to the same interface, then any display device connected to the other interface will not function. For example, if both Select Display 1 and 2 are set to CRT, then no data will be sent to the LCD port.

6.33.1.2.2. Panel Type

The Panel Type feature enables the user to specify the resolution of the display being used with the system. The panel types are predefined in the VGA VBIOS.

Panel Type	Resolution	Panel Type	Resolution
00	640 × 480	08	800 × 480
01	800 × 600	09	1024 × 600
02	1024 × 768	10	1366 x 768
03	1280 × 768	11	1600 × 1200
04	1280 × 1024	12	1680 × 1050
05	1400 × 1050	13	1920 × 1200
06	1440 × 900	14	1920 × 1080
07	1280 × 800	15	1024 × 576

6.33.1.2.3. VGA Share Memory (Frame Buffer)

The VGA Share Memory feature enables the user to choose the amount of the system memory to reserve for use by the integrated graphics controller. The selections of memory amount that can be reserved are 128MB, 256MB and 512MB.



6.33.1.2.4. CPU Direct Access Frame Buffer

The CPU Direct Access Frame Buffer feature enables the CPU to write to the portion of memory reserved for the integrated graphics controller. This feature has two options: "Disabled" and "Enabled".

6.33.1.2.5. LCD Clock Source Control

The clock source for LCD backlights control. This feature has four options: 14KHz/7KHz/110Hz/50Hz.

6.33.1.2.6. LCD Backlight Control

The Backlight Control feature control by VX900 enables the user to control the brightness of the LCD backlight. This feature has five options.

- Level 1 0% PWM Duty
- Level 1 25% PWM Duty
- Level 2 50% PWM Duty
- Level 3 75% PWM Duty
- Level 4 100% PWM Duty



6.33.2. South Bridge VIA VX900 Configuration

The South Bridge VIA VX900 Configuration screen has the following features.

Options Disabled Enable	

Figure 90: Illustration of South Bridge VIA VX900 Configuration screen

6.33.2.1. OnChip HDAC Device

The OnChip HDAC Device feature enables the BIOS to control the high definition audio codec in the chipset. This feature has two options: "Enable" or "Disabled".

6.33.2.2. WATCHDOG Timer Enable

The WATCHDOG Timer Enable feature unlocks three other features that enable the BIOS to monitor the state of the system. This feature has two options: "Enabled" or "Disabled".

6.33.2.3. Eup/ErP Lot6 support

The EuP/ErP Lot6 Support feature enables the BIOS to reduce the power draw to less than 1W when the system is in standby mode. This feature has two options: enabled and disabled.
6.34. Exit Options

			BIOS SETU	P UTILITY	
Main	Advanced	Boot	Security	Chipset	Exit
Exit O	ptions				Exit system setup
Save C Discard Discard	hanges and E d Changes an d Changes	xit d Exit			F10 key can be used
Load 0	ptimal Defau	Its			
					 ↔ Select Screen 14 Select Item Enter Go to Sub Screen F1 General Help F10 Save and Exit F20 F214
	v02.69 (C) Copur i	ght 1985-201	0, American	Megatrends, Inc.

Figure 91: Illustration of Exit Options screen

6.34.1. Save Changes and Exit

Save all changes to the BIOS and exit the BIOS Setup Utility. The "F10" hotkey can also be used to trigger this command.

6.34.2. Discard Changes and Exit

Exit the BIOS Setup Utility without saving any changes. The "Esc" hotkey can also be used to trigger this command.

6.34.3. Discard Changes

This command reverts all changes to the settings that were in place when the BIOS Setup Utility was launched.

6.34.4. Load Optimal Defaults

Load optimal default values for all the setup items. The default optimized values are defined by the mainboard manufacturer to provide optimized environment for a basic system.



7. Driver Installation

7.1 Microsoft Driver Support

The VIA VB7009 mainboard is compatible with Microsoft operating systems. The latest Windows drivers can be downloaded from the VIA website at http://www.viatech.com/en/.

For embedded operating systems, the related drivers can be found in the VIA website at http://www.viatech.com/en/.

7.2 Linux Driver Support

The VIA VB7009 mainboard is highly compatible with many Linux distributions.

Support and drivers are provided through various methods including:

- Drivers provided by VIA
- Using a driver built into a distribution package
- Visiting www.viaembedded.com for the latest updated drivers
- Installing a third party driver (such as the ALSA driver from the Advanced Linux Sound Architecture project for integrated audio)

For OEM clients and system integrators developing a product for long term production, other code and resources may also be made available. Contact VIA to submit a request.



Appendix A. Installing Wireless Accessories

The section provides the installation of the optional wireless accessories for the VB7009 mainboard.

A.1. Installing the VNT9271 USB Wi-Fi Dongle

Step 1

Locate a USB 2.0 port on the back panel I/O.

Step 2

Insert the VNT9271 USB Wi-Fi dongle in one of the USB 2.0 port.



Figure 92: Inserting the VNT9271 USB Wi-Fi dongle



A.2. Installing the EMIO-1533 USB Wi-Fi Module

Step 1

Mount the EMIO-1533 to the prepared standoff in the chassis. Align the two mounting holes on the EMIO-1533 module with the mounting holes on the standoffs. And then secure the EMIO-1533 module in place with two screws.



Figure 93: Installing EMIO-1533 USB Wi-Fi module

Step 2

Connect one end of USB Wi-Fi cable to pin 1, 3, 5, and 7 of onboard USB 2.0 pin header (USB_4 or USB_5) on VB7009 board, and then connect the other end of the cable to the EMIO-1533 module.



Figure 94: Connecting the USB Wi-Fi cable diagram



Step 3

Insert the Wi-Fi antenna cable into the antenna hole from the inside of the panel I/O plate. Insert the toothed washer, fasten it with the nut and install the external antenna.



Figure 95: Installing Wi-Fi antenna cable diagram

Step 4

Connect the other end of the Wi-Fi antenna cable to the micro-RF connector labeled "I-PEX" on the EMIO-1533 module.



Figure 96: Connecting Wi-Fi antenna cable to the EMIO-1533 module



A.3. Installing the EMIO-5531 USB Wi-Fi + Bluetooth Module

Step 1

Mount the EMIO-5531 to the prepared standoff in the chassis. Align the two mounting holes on the EMIO-5531 module with the mounting holes on the standoffs. And then secure the EMIO-5531 module in place with two screws.



Figure 97: Installing EMIO-5531 USB Wi-Fi + BT module

Step 2

Connect one end of USB Wi-Fi cable to pin 1, 3, 5, and 7 of onboard USB 2.0 pin header (USB_4 or USB_5) on VB7009 board, and then connect the other end of the cable to the EMIO-5531 module.



Figure 98: Connecting the USB Wi-Fi cable diagram



Step 3

Insert the Wi-Fi antenna cable into the antenna hole from the inside of the panel I/O plate. Insert the toothed washer, fasten it with the nut and install the external antenna.



Figure 99: Installing Wi-Fi antenna cable diagram

Step 4

Connect the other end of the Wi-Fi antenna cable to the micro-RF connector labeled "I-PEX" on the EMIO-5531 module.



Figure 100: Connecting Wi-Fi antenna cable to the EMIO-5531 module



Appendix B. Power Consumption Report

Power consumption tests were performed on the VIA VB7009. The following tables represent the breakdown of the voltage, amp and wattage values while running common system applications.

B.1. VB7009-16

The tests were performed based on the following additional components:

- CPU: VIA C7[®]-D 1.6GHz
- Chipset: VX900
- Memory: DDR3 DIMM Kingston HyperX 1600MHz 4GB
- HDD SATA: Fujitsu MJA2250BH 250GB
- DVD-ROM: Sony CRX890S
- Power supply: ATX power supply SevenTeam ST-350GL 350W
- Operating System: Windows 7 32-bit

B.1.1. System Idle – Windows 7 32-bit

Power Plane	Volts	Amperes	Watts
+3.3V	3.161	0.650	2.055
+5V	4.845	3.080	14.923
+5VSB	5.033	0.068	0.342
+12V	11.975	0.086	1.030
		Total Power	18.350
		Consumption	

B.1.2. S3 Status – Windows 7 Sleep

Power Plane	Volts	Amperes	Watts
+3.3V	-0.019	0.000	0.000
+5V	-0.010	0.011	0.000
+5VSB	5.080	0.370	1.880
+12V	-0.020	0.009	0.000
		Total Power	1.880
		Consumption	



B.1.3. MP3 Playback – Windows Media Player10

Power Plane	Volts	Amperes	Watts
+3.3V	3.192	0.680	2.171
+5V	4.917	2.240	11.014
+5VSB	5.104	0.057	0.291
+12V	11.998	0.086	1.032
		Total Power	14.508
		Consumption	

B.1.4. DVD Playback – PowerDVD 8.0

Power Plane	Volts	Amperes	Watts
+3.3V	2.955	0.650	1.921
+5V	4.675	4.153	19.415
+5VSB	4.857	0.112	0.544
+12V	11.905	0.078	0.929
		Total Power	22.809
		Consumption	

B.1.5. Graphics – Run 3DMarks'06

Power Plane	Volts	Amperes	Watts
+3.3V	2.979	0.660	1.966
+5V	4.576	4.950	22.651
+5VSB	4.786	0.227	1.086
+12V	11.884	0.065	0.772
		Total Power	26.475
		Consumption	

B.1.6. Functional Test – Run Passmark BurnIn test 6.0

Power Plane	Volts	Amperes	Watts
+3.3V	2.797	0.630	1.762
+5V	4.390	6.450	28.316
+5VSB	4.620	0.361	1.668
+12V	11.762	0.074	0.870
		Total Power	32.616
		Consumption	

B.1.7. Network Access <Single LAN> – Gigabit Ethernet File Transmitting

Power Plane	Volts	Amperes	Watts
+3.3V	2.798	0.640	1.791
+5V	4.420	6.254	27.643
+5VSB	4.636	0.424	1.966
+12V	11.774	0.071	0.836
		Total Power	32.236
		Consumption	

B.1.8. Network Access <Dual LAN> – Gigabit Ethernet File Transmitting

Power Plane	Volts	Amperes	Watts
+3.3V	2.966	0.730	2.165
+5V	4.489	7.204	32.339
+5VSB	4.710	0.452	2.129
+12V	11.880	0.090	1.069
		Total Power	37.702
		Consumption	



B.2. VB7009-10E

The tests were performed based on the following additional components:

- CPU: VIA C7® 1.0GHz
- Chipset: VX900
- Memory: DDR3 DIMM Kingston HyperX 1600MHz 4GB
- HDD SATA: Fujitsu MJA2250BH 250GB
- DVD-ROM: Sony CRX890S
- Power supply: ATX power supply SevenTeam ST-350GL 350W
- Operating System: Windows 7 32-bit

B.2.1. System Idle – Windows 7 32-bit

Power Plane	Volts	Amperes	Watts
+3.3V	3.248	0.700	2.274
+5V	4.969	1.545	7.677
+5VSB	5.173	0.053	0.274
+12V	12.052	0.035	0.422
		Total Power	10.647
		Consumption	

B.2.2. S3 Status – Windows 7 Sleep

Power Plane	Volts	Amperes	Watts
+3.3V	-0.016	0.000	0.000
+5V	-0.008	0.009	0.000
+5VSB	5.071	0.365	1.851
+12V	-0.017	0.005	0.000
		Total Power	1.851
		Consumption	

B.2.3. MP3 Playback – Windows Media Player10

Power Plane	Volts	Amperes	Watts
+3.3V	3.233	0.710	2.295
+5V	4.942	1.827	9.029
+5VSB	5.145	0.062	0.319
+12V	12.051	0.031	0.374
		Total Power	12.017
		Consumption	



B.2.4. DVD Playback – PowerDVD 8.0

Power Plane	Volts	Amperes	Watts
+3.3V	3.186	0.700	2.230
+5V	4.880	2.060	10.053
+5VSB	5.085	0.071	0.361
+12V	12.030	0.040	0.481
		Total Power	13.125
		Consumption	

B.2.5. Graphics – Run 3DMarks'06

Power Plane	Volts	Amperes	Watts
+3.3V	3.175	0.700	2.223
+5V	4.863	2.191	10.655
+5VSB	5.071	0.074	0.375
+12V	12.002	0.040	0.480
		Total Power	13.733
		Consumption	

B.2.6. Functional Test – Run Passmark BurnIn test 6.0

Power Plane	Volts	Amperes	Watts
+3.3V	3.221	0.710	2.287
+5V	4.918	2.050	10.082
+5VSB	5.124	0.068	0.348
+12V	12.049	0.033	0.398
		Total Power	13.115
		Consumption	

B.2.7. Network Access <Single LAN> – Gigabit Ethernet File Transmitting

Power Plane	Volts	Amperes	Watts
+3.3V	3.083	0.700	2.158
+5V	4.700	3.573	16.793
+5VSB	4.868	0.147	0.716
+12V	11.961	0.045	0.538
		Total Power	20.205
		Consumption	

B.2.8. Network Access <Dual LAN> – Gigabit Ethernet File Transmitting

Power Plane	Volts	Amperes	Watts
+3.3V	3.078	0.690	2.124
+5V	4.695	3.606	16.930
+5VSB	4.864	0.144	0.700
+12V	11.954	0.040	0.478
		Total Power	20.232
		Consumption	



B.3. VB7009-12XC

The tests were performed based on the following additional components:

- CPU: VIA Nano[®] X2 E-Series 1.2GHz
- Chipset: VX900
- Memory: DDR3 DIMM Kingston HyperX 1600MHz 4GB
- HDD SATA: Fujitsu MJA2250BH 250GB
- DVD-ROM: Sony CRX890S
- Power supply: ATX power supply SevenTeam ST-350GL 350W
- Operating System: Windows 7 32-bit

B.3.1. System Idle – Windows 7 32-bit

Power Plane	Volts	Amperes	Watts
+3.3V	3.065	0.656	2.011
+5V	4.725	2.378	11.236
+5VSB	4.890	0.096	0.469
+12V	12.032	0.072	0.866
		Total Power	14.582
		Consumption	

B.3.2. S3 Status – Windows 7 Sleep

Power Plane	Volts	Amperes	Watts
+3.3V	-0.016	-0.026	0.000
+5V	-0.005	-0.040	0.000
+5VSB	5.040	0.317	1.598
+12V	-0.017	-0.019	0.000
		Total Power	1.598
		Consumption	

B.3.3. MP3 Playback – Windows Media Player10

Power Plane	Volts	Amperes	Watts
+3.3V	2.998	0.658	1.973
+5V	4.664	2.577	12.019
+5VSB	4.811	0.098	0.471
+12V	11.971	0.075	0.898
		Total Power	15.361
		Consumption	



Power Plane	Volts	Amperes	Watts
+3.3V	2.990	0.653	1.952
+5V	4.673	2.345	10.958
+5VSB	4.846	0.078	0.378
+12V	11.928	0.077	0.918
		Total Power	14.206
		Consumption	

B.3.4. DVD Playback – Windows Media Player10

B.3.5. Graphics – Run 3DMarks'06

Power Plane	Volts	Amperes	Watts
+3.3V	3.000	0.621	1.863
+5V	4.665	3.205	14.951
+5VSB	4.846	0.075	0.363
+12V	11.990	0.063	0.755
		Total Power	17.932
		Consumption	

B.3.6. Functional Test – Run Passmark BurnIn test 6.0

Power Plane	Volts	Amperes	Watts
+3.3V	2.993	0.567	1.697
+5V	4.599	6.052	27.833
+5VSB	4.715	0.108	0.509
+12V	11.992	0.038	0.456
		Total Power	30.495
		Consumption	

B.3.7. Network Access <Single LAN> – Gigabit Ethernet File Transmitting

Power Plane	Volts	Amperes	Watts
+3.3V	2.889	0.591	1.707
+5V	4.526	4.192	18.973
+5VSB	4.666	0.114	0.532
+12V	11.899	0.052	0.619
		Total Power	21.831
		Consumption	

B.3.8. Network Access <Dual LAN> – Gigabit Ethernet File Transmitting

Power Plane	Volts	Amperes	Watts
+3.3V	0.001	0.608	0.001
+5V	4.637	4.340	20.125
+5VSB	4.779	0.122	0.583
+12V	12.020	0.054	0.649
		Total Power	21.358
		Consumption	

B.3.9. S5 Status – Windows 7 Shut down

Power Plane	Volts	Amperes	Watts
+3.3V	-0.028	-0.019	0.001
+5V	-0.020	-0.027	0.001
+5VSB	5.031	0.361	1.816
+12V	-0.028	-0.012	0.000
		Total Power	1.818
		Consumption	



B.4. VB7009-12QCE

The tests were performed based on the following additional components:

- CPU: CNR C4250 X4 1.2+ GHz
- DDR III: Corsair 1600MHz 4GB
- HDD SATA: Fujitsu MJA2250BH 250GB
- Power supply: ATX power supply ENERMAX EG701AX-VH 350W
- Meter: YOKOGAWA DR232-12-00-1D
- Operating System: Windows 7 64bit

B.4.1. System Idle – Windows 7 64bit

MAX	Volts	Amperes	Watts
+3.3V	3.161	0.722	2.282
+5V	4.930	2.333	11.502
+5VSB	5.066	0.144	0.730
+12V	12.401	0.030	0.372
		Total Power	14.885
		Consumption	

MEAN	Volts	Amperes	Watts
+3.3V	3.155	0.711	2.243
+5V	4.927	2.133	10.509
+5VSB	5.064	0.037	0.187
+12V	12.395	0.021	0.260
		Total Power	13.200
		Consumption	

B.4.2. S3 Status – Windows 7 Sleep (EuP Disable)

MAX	Volts	Amperes	Watts
+3.3V	-0.019	-0.011	0.000
+5V	-0.015	-0.021	0.000
+5VSB	5.159	0.416	2.146
+12V	0.119	-0.010	-0.001
		Total Power	2.146
		Consumption	

MEAN	Volts	Amperes	Watts
+3.3V	-0.019	-0.018	0.000
+5V	-0.020	-0.036	0.001
+5VSB	5.157	0.413	2.130
+12V	-0.017	-0.021	0.000
		Total Power	2.130
		Consumption	



B.4.3. MP3 Playback – Windows Media Player10

MAX	Volts	Amperes	Watts
+3.3V	3.163	0.747	2.363
+5V	4.958	3.142	15.578
+5VSB	5.079	0.130	0.660
+12V	12.404	0.035	0.434
		Total Power	19.035
		Consumption	

MEAN	Volts	Amperes	Watts
+3.3V	3.146	0.731	2.300
+5V	4.902	2.273	11.142
+5VSB	5.045	0.057	0.288
+12V	12.387	0.020	0.248
		Total Power	13.977
		Consumption	

B.4.4. MP4 Playback –KM Player10

MAX	Volts	Amperes	Watts
+3.3V	3.148	0.744	2.342
+5V	4.940	2.930	14.474
+5VSB	5.068	0.158	0.801
+12V	12.405	0.025	0.310
		Total Power	17.927
		Consumption	

MEAN	Volts	Amperes	Watts
+3.3V	3.136	0.729	2.286
+5V	4.871	2.428	11.827
+5VSB	5.021	0.095	0.477
+12V	12.377	0.016	0.198
		Total Power	14.788
		Consumption	

B.4.5. Graphics – Run 3DMarks'06

MAX	Volts	Amperes	Watts
+3.3V	3.145	0.735	2.312
+5V	4.939	3.225	15.928
+5VSB	5.061	0.221	1.118
+12V	12.384	0.023	0.285
		Total Power	19.643
		Consumption	



MEAN	Volts	Amperes	Watts
+3.3V	3.131	0.708	2.217
+5V	4.855	2.541	12.337
+5VSB	5.009	0.107	0.536
+12V	12.368	0.014	0.173
		Total Power	15.262
		Consumption	

B.4.6. Functional Test – Run Passmark BurnIn test 6.0

MAX	Volts	Amperes	Watts
+3.3V	3.133	0.731	2.290
+5V	4.875	3.166	15.434
+5VSB	5.030	0.212	1.066
+12V	12.389	0.023	0.285
		Total Power	19.076
		Consumption	

MEAN	Volts	Amperes	Watts
+3.3V	3.125	0.717	2.241
+5V	4.820	2.725	13.135
+5VSB	4.985	0.017	0.085
+12V	12.364	0.051	0.631
		Total Power	16.090
		Consumption	

B.4.7. Network Access <Dual LAN> – Gigabit Ethernet File Transmitting

MAX	Volts	Amperes	Watts
+3.3V	2.964	0.633	1.876
+5V	4.688	3.119	14.622
+5VSB	4.851	0.410	1.989
+12V	12.228	0.007	0.086
		Total Power	18.573
		Consumption	

MEAN	Volts	Amperes	Watts
+3.3V	2.949	0.626	1.846
+5V	4.662	2.807	13.086
+5VSB	4.826	0.273	1.317
+12V	12.217	0.003	0.037
		Total Power	16.286
		Consumption	



B.4.8. S5 Status – Windows 7 Shut down (EuP Disable)

MAX	Volts	Amperes	Watts
+3.3V	-0.010	-0.007	0.000
+5V	0.017	-0.010	0.000
+5VSB	5.165	0.365	1.885
+12V	-0.014	0.006	0.000
		Total Power	1.885
		Consumption	

MEAN	Volts	Amperes	Watts
+3.3V	-0.017	-0.010	0.000
+5V	-0.018	-0.017	0.000
+5VSB	5.165	0.360	1.859
+12V	-0.016	-0.010	0.000
		Total Power	1.859
		Consumption	

B.4.9. S5 Status – Windows 7 Shut down (EuP Enable)

MAX	Volts	Amperes	Watts
+3.3V	0.000	-0.003	0.000
+5V	0.001	0.007	0.000
+5VSB	5.210	0.015	0.078
+12V	0.001	-0.003	0.000
		Total Power	0.078
		Consumption	

MEAN	Volts	Amperes	Watts
+3.3V	-0.001	-0.005	0.000
+5V	0.000	-0.008	0.000
+5VSB	5.209	0.014	0.073
+12V	-0.001	-0.006	0.000
		Total Power	0.073
		Consumption	



Appendix C. Mating Connector Vendor Lists

The following tables listed the mating connector vendor lists of VB7009 mainboard.

Connectors	Part No.	Mating Vendor & P/N	
		Neltron	
F_Audio	99G30-05126I	2214S-XXG-85	SAMIEC
		2214R-XXG-85	SSVV Series
		Neltron	
F_PANEL	99G30-05009I	2214S-XXG-85	SAMIEC
		2214R-XXG-85	55VV SELIES
E 4 5 1		Neltron	N/A
FAN 9	99G30-020035	2218H-03	N/A
les context	00000 000507	ACES	MOLEX
Inverter 99G30-020	99G30-020537	85206-0800	51021-**00
	00020 170150	ACES	HRS
LVDS	99G30-170152	44002-4000	DF13-**DS-1.258C
USB	99G30-05072K	Neltron	
		2214S-XXG-85	SAMTEC
		2214R-XXG-85	Sovy Series

Table 35: VB7009 mating connector vendor lists



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