



# **Operating Guide**

## **VB7001-Series Mini-ITX Mainboard**

## Table of Contents

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Table of Contents.....	i
VIA VB7001-Series Overview.....	1
VIA VB7001-Series Layout.....	2
VIA VB7001-Series Specifications.....	3
VIA VB7001 Processor SKUs .....	4
VIA CN700 Chipset Overview .....	5
VIA VB7001-Series I/O Back Panel Layout .....	6
VIA VB7001-Series Layout Diagram & Mounting Holes.....	7
VIA VB7001-Series Layout Diagram & Height Distribution.....	8
Power Consumption .....	9
VIA VB7001 .....	9
Power Specifications .....	11
VIA VB7001-Series Microsoft and Linux Driver Support .....	12
MICROSOFT DRIVER SUPPORT.....	12
LINUX DRIVER SUPPORT .....	12
Contact.....	13

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## VIA VB7001-Series Overview

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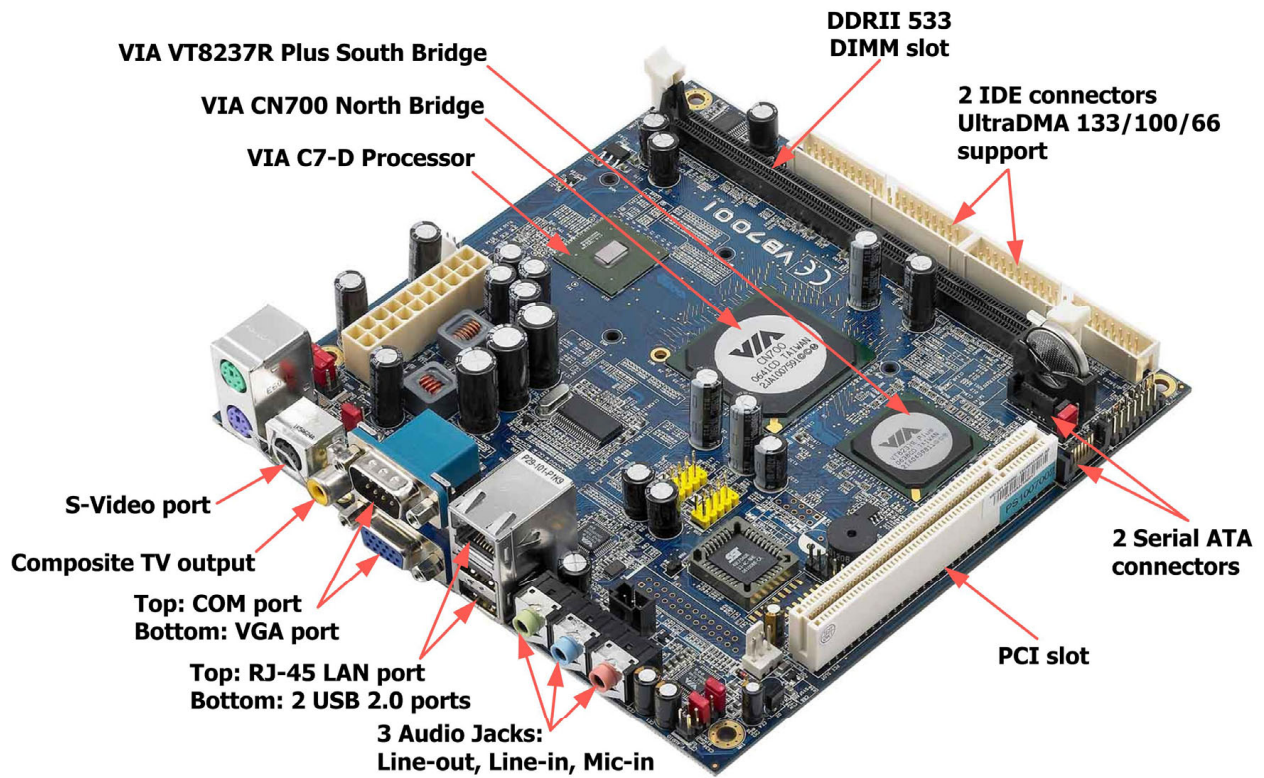
The VIA VB7001-Series Mini-ITX Mainboard is an ultra compact native x86 platform optimized for today's demanding embedded and productivity applications. The mainboard is based on the VIA CN700 chipset featuring an embedded hardware MPEG-2 accelerator and integrated VIA UniChrome™ Pro 2D/3D graphics for rich digital media performance. With the sizable memory bandwidth of DDRII 533MHz SDRAM DIMM and the high data transfer speed of ATA-133 and further enhanced by support of 8-Channel AC'97 codec for Smart 5.1 surround sound and SPDIF, the VIA VB7001-Series delivers the increased performance levels required by today's embedded digital media applications.

The latest in high-bandwidth connectivity is supported with four USB 2.0 ports, as well as a COM port and has one 10/100 Fast Ethernet port for extended broadband connectivity. The VIA VB7001-Series also has one PCI slot for expandability options. The VIA VB7001-Series is compatible with a full range of Mini-ITX chassis as well as FlexATX and MicroATX enclosures and power supplies.

The VIA VB7001-Series is fully compatible with Microsoft® and Linux operating systems and is available in a variety of configurations, including the latest VIA C7®-D V4 Bus NanoBGA2 processor for small, low power and secure x86 processor platforms.

## VIA VB7001-Series Layout

### VIA VB7001 Mini-ITX Mainboard (Dimension 17cm x 17cm)



## VIA VB7001-Series Specifications

<b>Model Name</b>	- VB7001
<b>Processor</b>	- VIA C7 <sup>®</sup> -D 1.5GHz NanoBGA2 processor
<b>Chipset</b>	- VIA CN700 North Bridge - VIA VT8237R Plus South Bridge
<b>System Memory</b>	- 1 DDRII 533 DIMM slot - Up to 1GB memory size
<b>VGA</b>	- Integrated VIA UniChrome™ Pro AGP graphics with MPEG-2 acceleration
<b>Expansion Slots</b>	- 1 PCI slot
<b>Onboard IDE</b>	- 2 UltraDMA 133/100/66 Connectors
<b>Onboard Serial ATA</b>	- 2 SATA Connectors
<b>Onboard LAN</b>	- VIA VT6103L 10/100 Base-T Ethernet PHY
<b>Onboard Audio</b>	- VIA VT1618 AC'97 Codec
<b>Onboard TV Out</b>	- VT1622AM SDTV Encoder
<b>Onboard I/O Connectors</b>	- 2 USB pin headers for 4 additional USB 2.0 ports - 2 Fan connectors: CPU/SYS FAN - 1 Front-panel audio pin header (Mic-in and Line-out) - 1 CIR pin header (Switchable for KB/MS) - 1 FIR pin header - 1 SMBus pin header - 1 Optical S/PDIF out connector - 1 Buzzer - 1 ATX Power connector
<b>Back Panel I/O</b>	- 1 PS2 Mouse port - 1 PS2 Keyboard port - 1 Serial port - 1 VGA port - 1 RJ-45 LAN port - 2 USB 2.0 ports - 3 Audio jacks: Line-out, Line-in and Mic-in - 1 RCA jack for composite TV output (optional) or Coaxial S/PDIF - 1 S-Video port (optional)
<b>BIOS</b>	- Award BIOS - LPC 4Mbit flash memory
<b>Operating System</b>	Windows 2000 / XP, Linux, Win CE, XPe
<b>System Monitoring &amp; Management</b>	- System voltage monitoring - CPU voltage monitoring - RTC timer power-on, Wake-on-LAN/Keyboard/Mouse, AC power failure recovery
<b>Operating Temperature</b>	0°C ~ 45°C
<b>Operating Humidity</b>	0% ~ 95% (relative humidity; non-condensing)
<b>Form Factor</b>	- Mini-ITX (4-layer) - 17cm x 17cm

\* The specification is subject to change without prior notice.

## VIA VB7001 Processor SKUs

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The VIA VB7001-Series is available in 1.5GHz speed grades. The VIA VB7001 utilizes the most efficient VIA C7<sup>®</sup>-D NanoBGA2 processor.



**VB7001**  
VIA C7<sup>®</sup>-D NanoBGA2 processor  
1.5 GHz  
1.084v Operating Volts  
128KB L1 Cache  
128KB L2 Cache  
MMX, SSE, SSE2 and SSE3  
Padlock and ACE Encryption



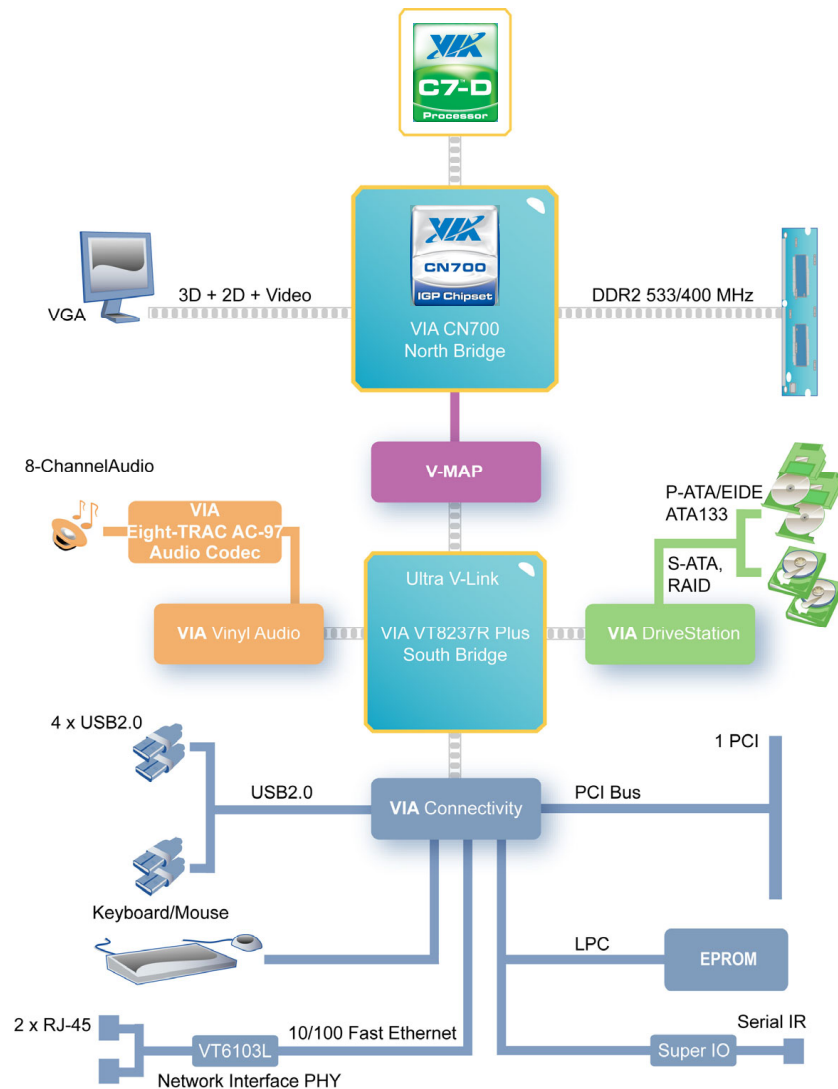
Suitable for small, low power, ultra efficient and secure x86 platform.



PadLock ACE US government approved Advanced Encryption Standard (AES), performing cryptographic functions for securing e-mails, personal files, online transactions, and networks.

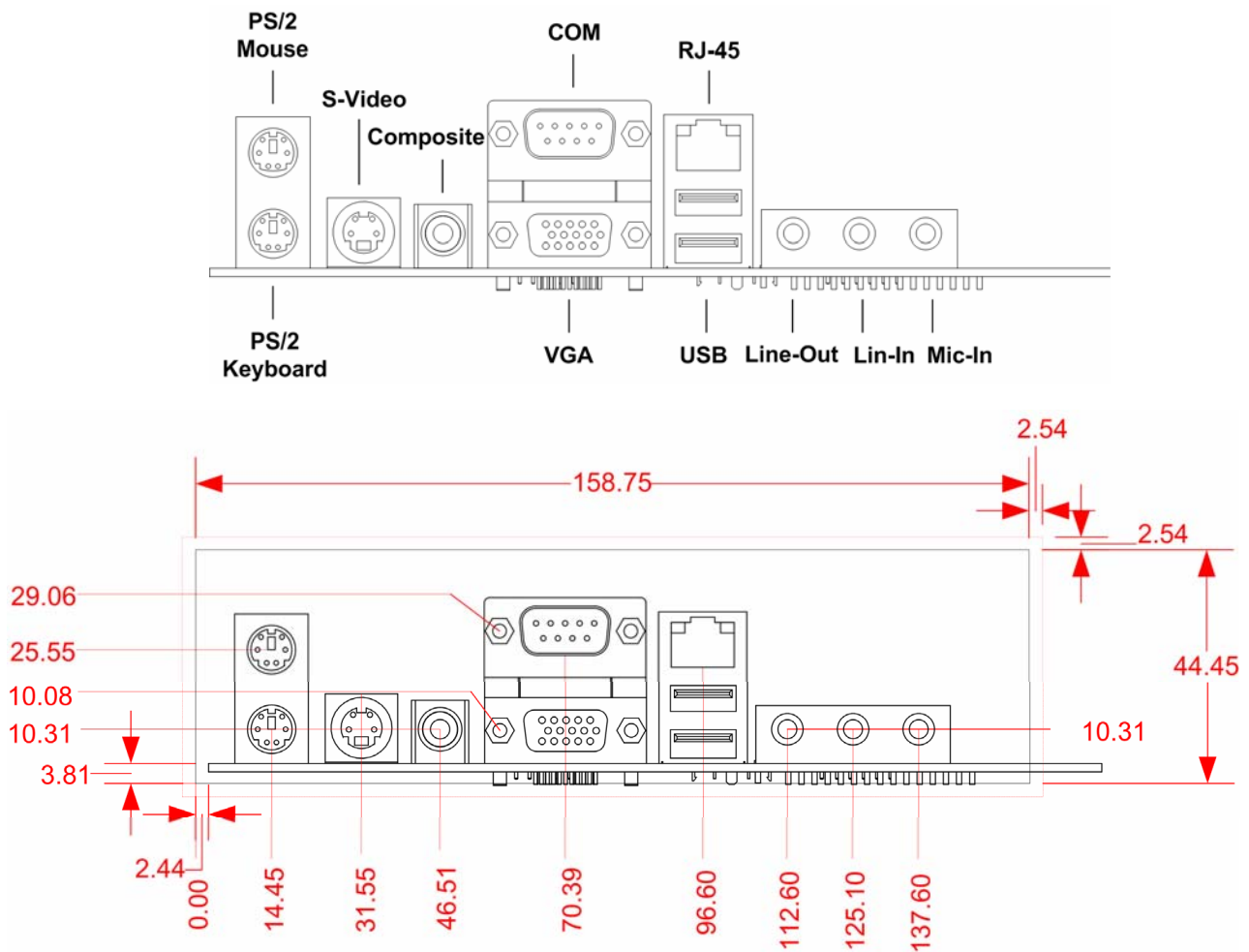
## VIA CN700 Chipset Overview

The VIA CN700 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 [CN700](#) features the embedded VIA UniChrome™ Pro 2D/3D MPEG-2 acceleration, DDR2 533/400MHz support, motion compensation and duo-view support to ensure a rich overall entertainment experience. Outstanding connectivity features include USB 2.0, 10/100 LAN and ATA/133.

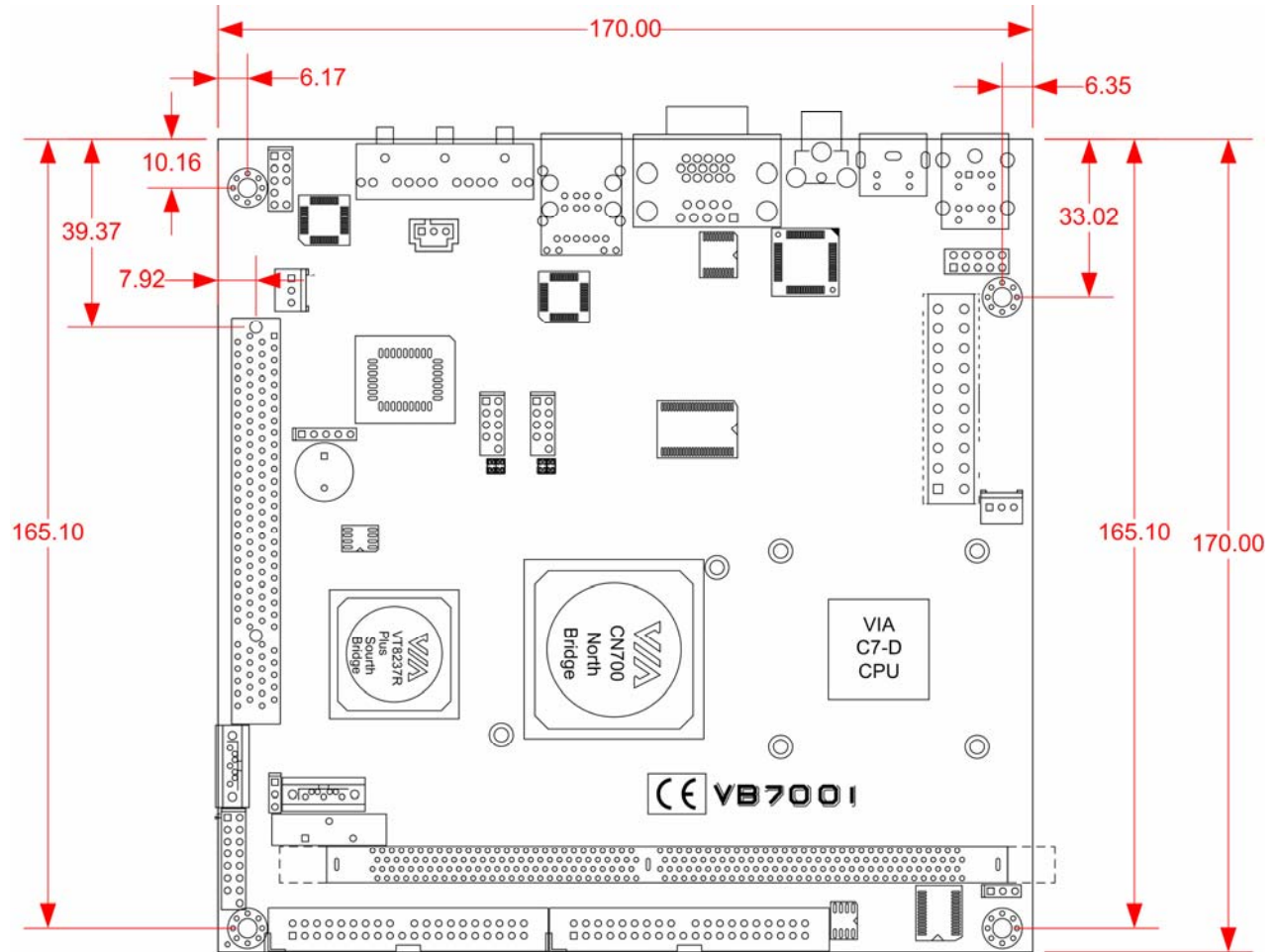


## VIA VB7001-Series I/O Back Panel Layout

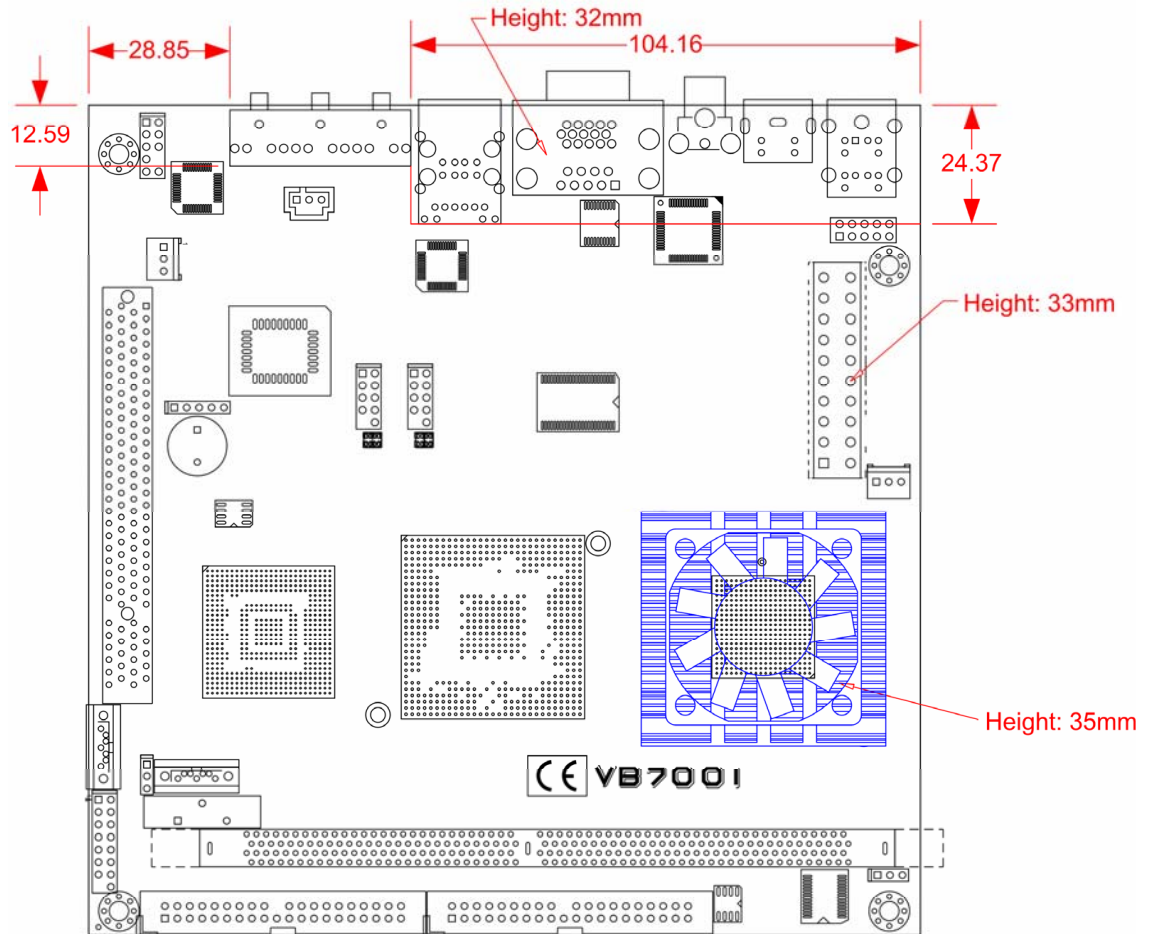
The VB7001's ultra compact 17cm x 17cm, integrated design supports all the standard legacy x86 connectivity options as well as PS/2 Mouse port, PS/2 Keyboard port, VGA port, COM port, RJ45 LAN port, USB 2.0 ports, composite RCA jack, S-Video port and audio jacks.



## VIA VB7001-Series Layout Diagram & Mounting Holes



## VIA VB7001-Series Layout Diagram & Height Distribution



Other heights are under 21mm.

## Power Consumption

Power consumption tests were carried out comparing the VIA VB7001 (running with the 1.5GHz VIA C7<sup>®</sup>-D NanoBGA2 processor). The following tables are a comprehensive breakdown of the VB7001 platform's voltage, amp and wattage values while running common system applications.

### VIA VB7001

#### A. IDEL Status

	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	3.147	2.764	8.698
Main Board +5V	4.948	1.044	5.166
Main Board 5VSB	5.034	0.093	0.468
Main Board +12V	12.054	0.169	2.037
<b>Main Board Power Consumption</b>			<b>16.369</b>

#### B. MP3 Playing

	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	3.107	2.916	9.060
Main Board +5V	4.868	2.137	10.403
Main Board 5VSB	5.011	0.094	0.471
Main Board +12V	12.055	0.168	2.025
<b>Main Board Power Consumption</b>			<b>21.959</b>

#### C. DVD Playing

	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	3.109	2.957	9.193
Main Board +5V	4.919	1.297	6.380
Main Board 5VSB	5.022	0.091	0.457
Main Board +12V	12.025	0.168	2.020
<b>Main Board Power Consumption</b>			<b>18.050</b>

**D. S3 Status**

	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	0.020	0.024	0.000
Main Board +5V	0.043	0.027	0.001
Main Board 5VSB	5.128	0.140	0.718
Main Board +12V	0.014	0.008	0.000
<b>Main Board Power Consumption</b>			<b>0.720</b>

**E. Run C.C. Winstone 2004**

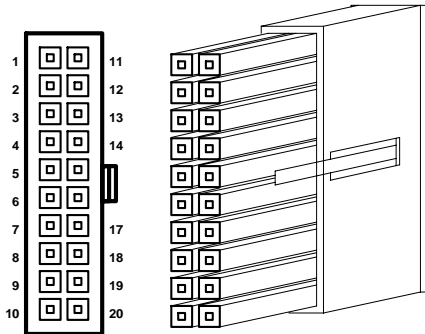
	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	3.120	2.797	8.727
Main Board +5V	4.844	2.498	12.100
Main Board 5VSB	5.007	0.094	0.471
Main Board +12V	12.064	0.163	1.966
<b>Main Board Power Consumption</b>			<b>23.264</b>

**F. Data Download from Network**

	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	3.149	2.471	7.781
Main Board +5V	4.973	0.761	3.784
Main Board 5VSB	5.045	0.092	0.464
Main Board +12V	12.036	0.168	2.022
<b>Main Board Power Consumption</b>			<b>14.052</b>

## Power Specifications

The VB7001 utilizes an industry standard 20-pin ATX main connector to the power supply. Due to the VB7001 platform's ultra low power requirements a 90 – 120 Watt ATX power supply is ample for even the heaviest of multimedia system applications.



<b>1</b>	+3V	<b>11</b>	+3V
<b>2</b>	+3V	<b>12</b>	-12V
<b>3</b>	Gnd	<b>13</b>	Gnd
<b>4</b>	+5V	<b>14</b>	PWR_ON-
<b>5</b>	Gnd	<b>15</b>	Gnd
<b>6</b>	+5V	<b>16</b>	Gnd
<b>7</b>	Gnd	<b>17</b>	Gnd
<b>8</b>	PWR_GD	<b>18</b>	NC
<b>9</b>	5V_SB	<b>19</b>	+5V
<b>10</b>	+12V	<b>20</b>	+5V

Note: NC = no connection

## VIA VB7001-Series Microsoft and Linux Driver Support

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### Microsoft Driver Support

VIA VB7001 series offers full support for the complete range of Microsoft operating systems.

For standard operating systems, Windows 2000/XP latest drivers downloads can be found in the VEPD website at [www.viaembedded.com](http://www.viaembedded.com).

For embedded operating systems, Windows CE.NET and XP Embedded related driver supports can be found in the VIA Arena website at [www.viaarena.com](http://www.viaarena.com).

### Linux Driver Support

VIA VB7001 mainboards have a very high degree of support under Linux.

Support and drivers are provided through various methods including:

- Drivers provided by VIA
  - Using a driver built into a distribution package
  - Visiting VIA Arena website at [www.viaarena.com](http://www.viaarena.com) for latest updates on a monthly basis
- 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. You can submit a request either through the [Developers portal](#) on VIA Arena, or through your VEPD support contact. Alternatively, VIA can work further towards providing additional drivers to suite your specific needs.

## Contact

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For more information on the VIA VB7001-Series Mini ITX Mainboard contact your sales representative or visit our website at [www.viaembedded.com](http://www.viaembedded.com)

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