



# **Operating Guide**

## **EPIA ML-Series Mini-ITX Mainboard**

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## VIA EPIA ML-Series Overview

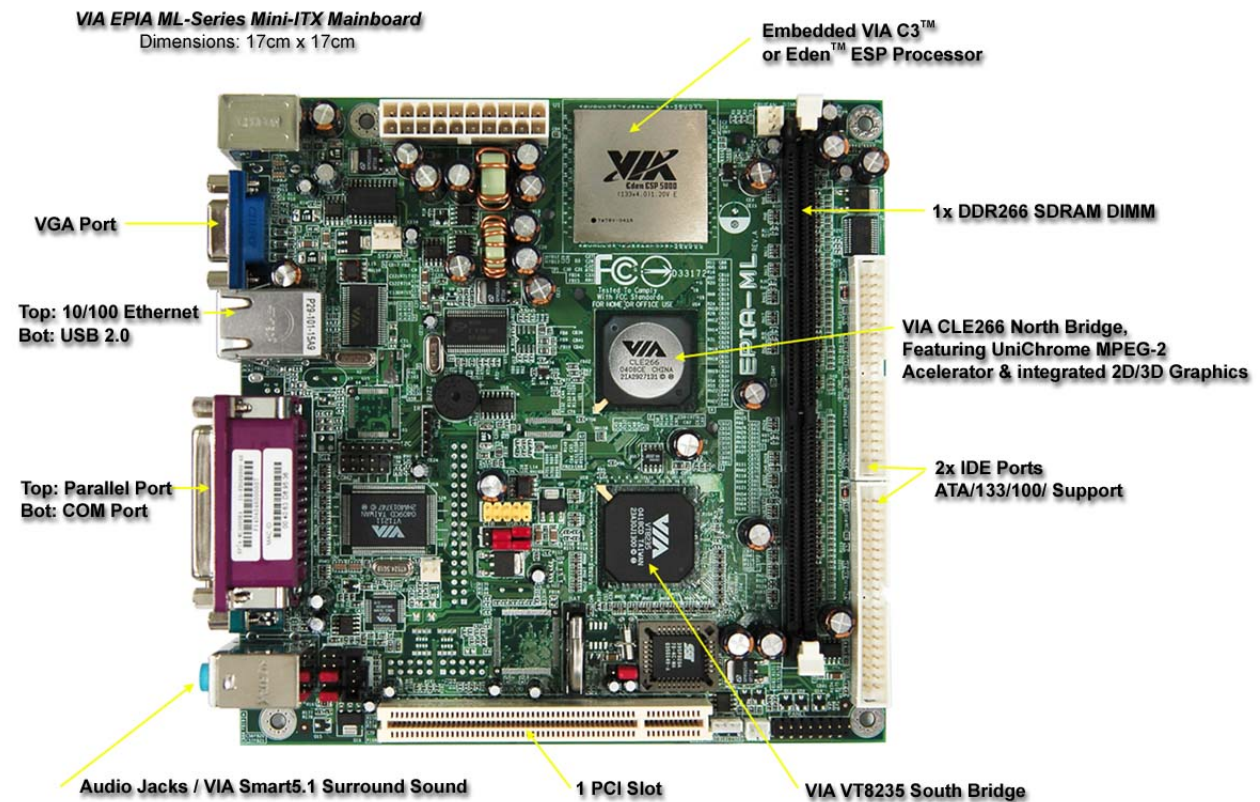
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The VIA EPIA ML-Series Mini-ITX Mainboard is an ultra compact native x86 platform optimized for today's demanding embedded and productivity applications. The mainboard is based on the VIA CLE266 chipset featuring an embedded hardware MPEG-2 accelerator and integrated VIA UniChrome™ 2D/3D graphics for rich digital media performance. With the sizable memory bandwidth of DDR266 SDRAM DIMM and the high data transfer speeds of ATA-133 and further enhanced by support of 6-Channel AC'97 codec for Smart 5.1 surround sound, the VIA EPIA ML-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 one Parallel port, two COM ports and 10/100 Fast Ethernet port for extended broadband connectivity. The VIA EPIA ML-Series also has one PCI slot for expandability options. The VIA EPIA ML-Series is compatible with a full range of Mini-ITX chassis as well as FlexATX and MicroATX enclosures and power supplies.

The VIA EPIA ML-Series is fully compatible with Microsoft® and Linux operating systems and is available in a variety of configurations, including the fanless VIA Eden™ ESP processor for silent system designs and the highly efficient VIA C3™ processor for more demanding multimedia applications.

## VIA EPIA ML-Series Layout



## VIA EPIA ML-Series Specifications

VIA EPIA ML Specifications	
<b>Processor</b>	- VIA C3™/ VIA Eden™ EPGA processor
<b>Chipset</b>	- VIA CLE266 North Bridge - VIA VT8235 South Bridge
<b>System Memory</b>	- 1 DDR266 DIMM socket - Up to 1GB memory size
<b>VGA</b>	- Integrated VIA UniChrome AGP Graphics
<b>Expansion Slots</b>	- 1 PCI
<b>Onboard IDE</b>	- 2 X UltraDMA 133/100/66 Connectors
<b>Onboard LAN</b>	- VIA VT6103 10/100 Base-T Ethernet PHY
<b>Onboard Audio</b>	- VIA VT1616 6 channel AC'97 Codec
<b>Onboard I/O Connectors</b>	- 1 USB connector for 2 additional USB 2.0 ports - Front-panel audio connectors (mic-in and line-out) - 1 CD Audio-in connector - 1 Buzzer - FIR connector - CIR connector (Switchable for KB/MS) - Wake-on-LAN connector - CPU/Sys FAN/Fan 3 - 1 SM Bus connector - 1 Serial port connector for a second com port
<b>Back Panel I/O</b>	- 1 PS2 mouse port - 1 PS2 keyboard port - 1 Parallel - 1 RJ-45 LAN port - 1 Serial port - 2 USB 2.0 ports - 1 VGA port - 3 Audio jacks: line-out, line-in and mic-in (Smart 5.1 support)
<b>BIOS</b>	- Award BIOS - 2Mbit flash memory
<b>System Monitoring &amp; Management</b>	- CPU voltage monitoring - Wake-on-LAN, Keyboard Power-on, Timer Power-on - System power management - AC power failure recovery
<b>Operating Temperature</b>	- 0 ~ 50°C
<b>Operating Humidity</b>	- 0% ~ 93% (relative humidity; non-condensing)
<b>Form Factor</b>	- Mini-ITX (4 layer) - 17 cm x 17 cm

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

## VIA EPIA ML Processor SKUs

The VIA EPIA ML-Series is available in two different speed grades. The VIA EPIA ML6000EA utilizes VIA's ultra low power VIA Eden™ ESP processor while the VIA EPIA ML8000A utilizes the robust VIA C3™ processor.



**EPIA ML6000EA**

VIA Eden™ ESP 5000 processor  
533 MHz  
Fanless Operation  
1.2v Operating Volts  
128KB L1 Cache  
64KB L2 Cache  
MMX and 3D Now



Suitable for fanless systems with low heat and ultra low-power requirements



**EPIA ML8000A**

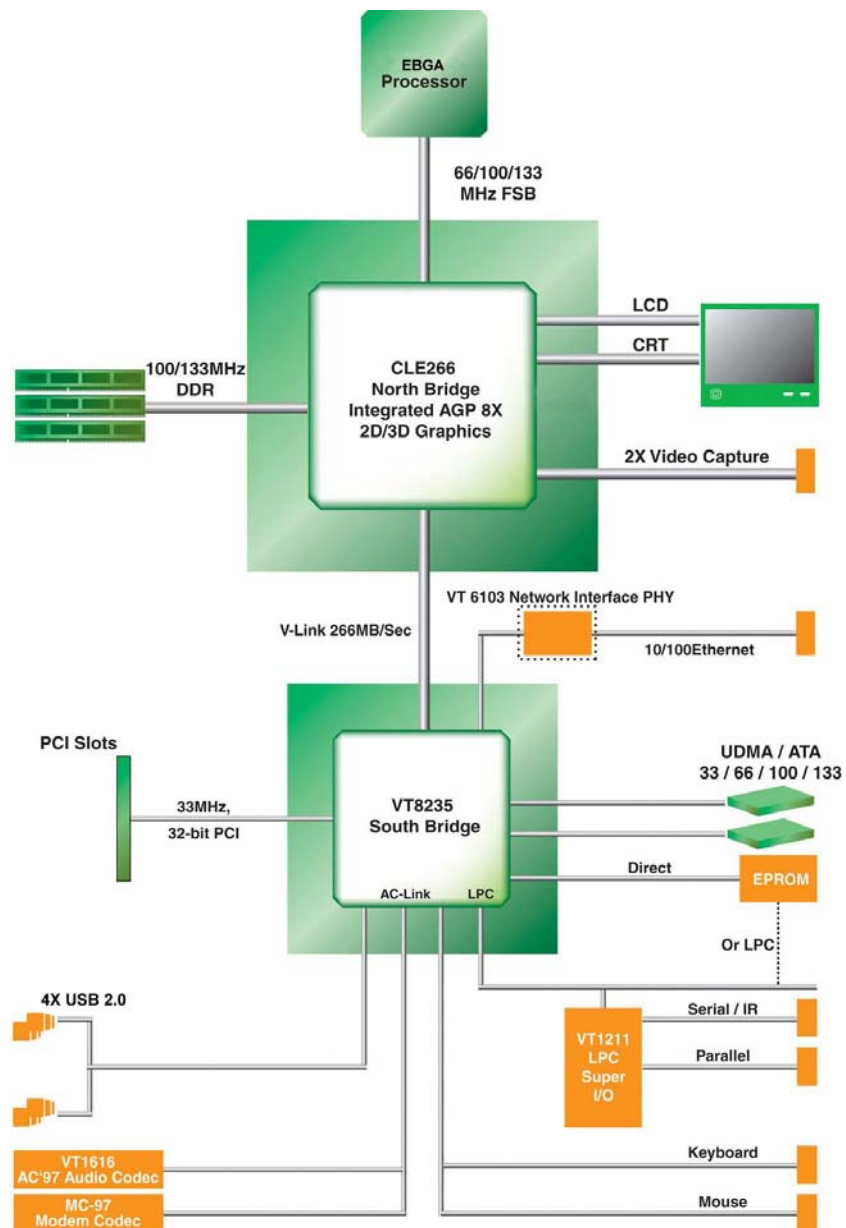
VIA C3™ processor  
800 MHz  
1.65v Operating Volts  
128KB L1 Cache  
64KB L2 Cache  
MMX and 3D Now



Suitable for compact systems running multimedia applications

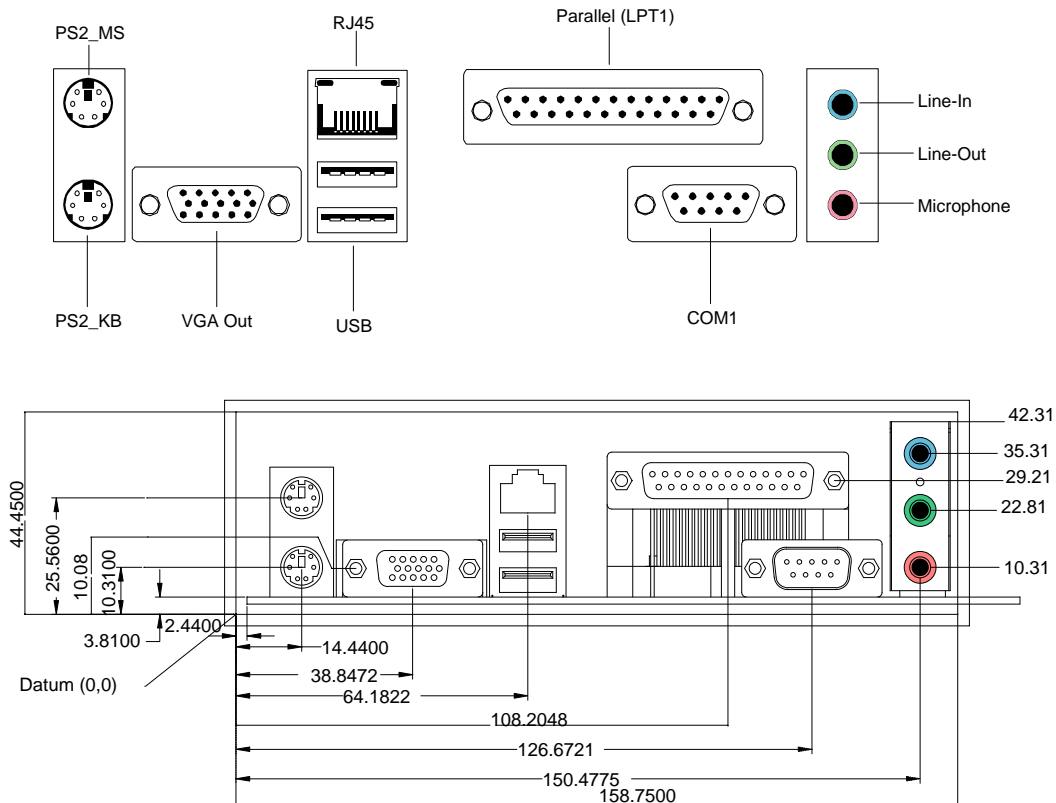
## VIA CLE266 Chipset Overview

The VIA CLE266 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 [CLE266](#) features the embedded VIA UniChrome™ 2D/3D MPEG-2 accelerator, DDR266 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.



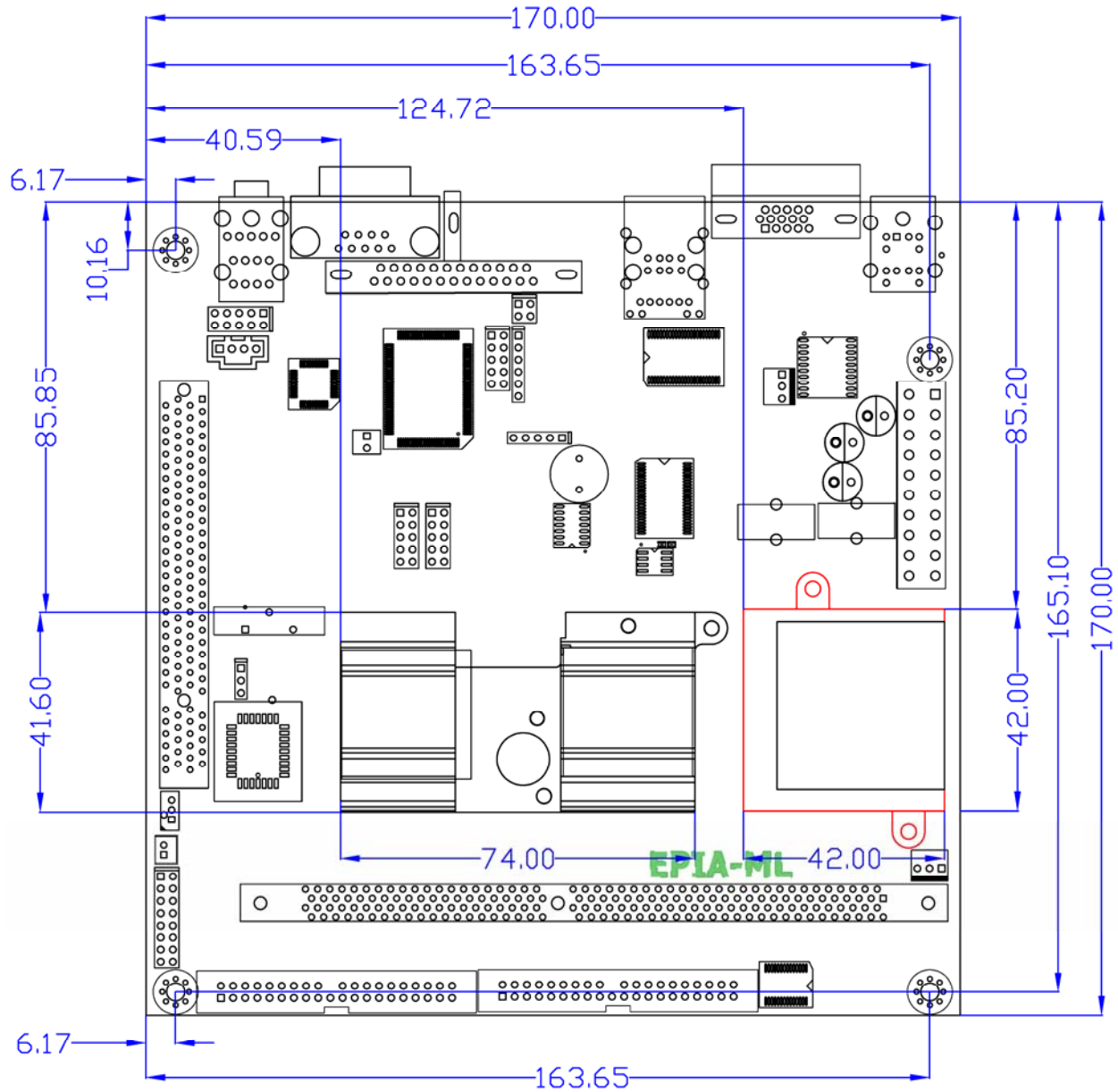
## VIA EPIA ML-Series I/O Back Panel Layout

The EPIA ML's ultra compact 17cm x 17cm, integrated design supports all the standard legacy x86 connectivity options as well as VGA port, RJ45 LAN port, USB 2.0 ports, Parallel port, COM port, and VIA 6-Channel C'97 audio.

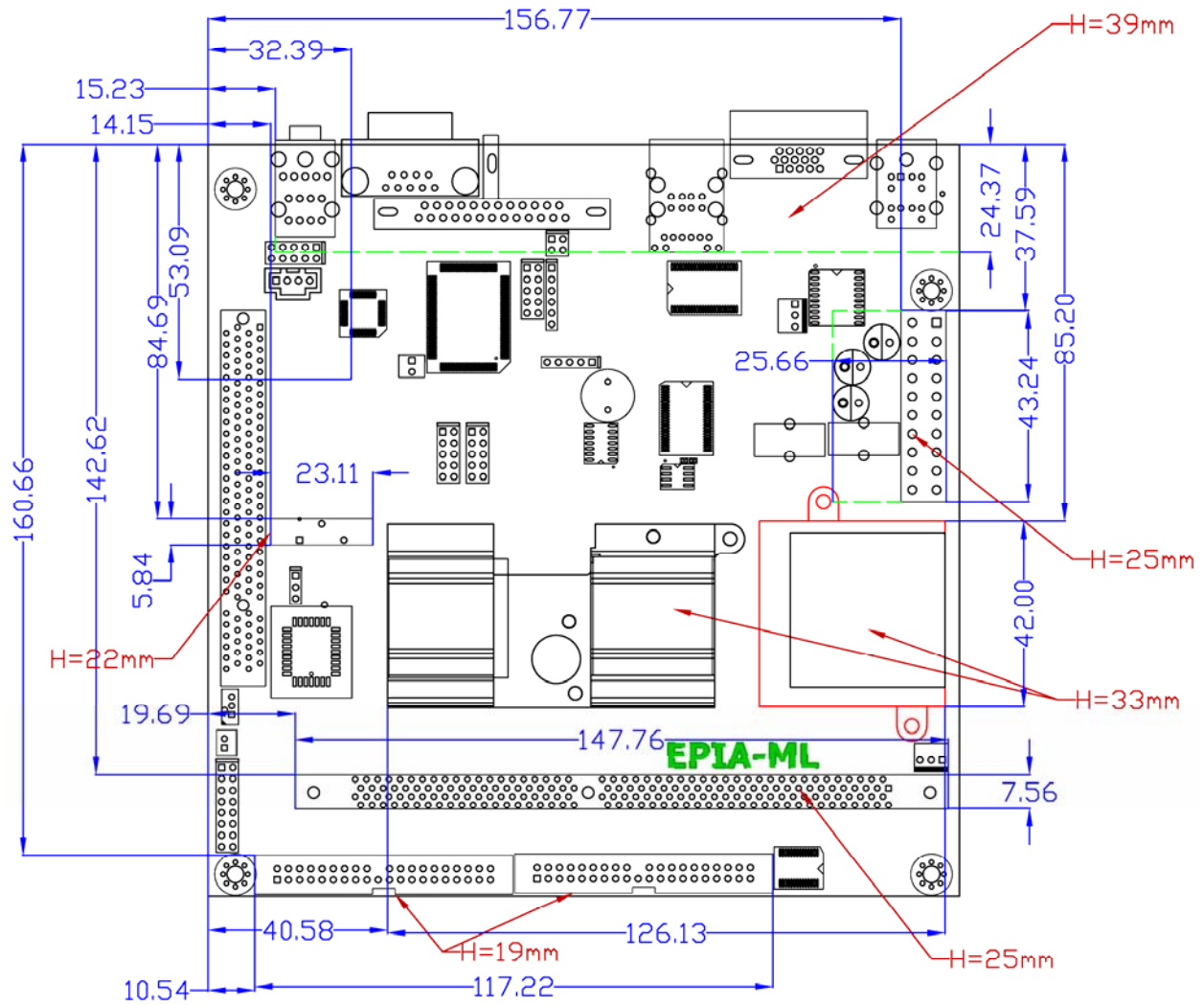




## VIA EPIA ML-Series Layout Diagram & Mounting Holes



## VIA EPIA ML-Series Layout Diagram & Height Distribution



## Noise Level Data

VIA and the EPIA series have been at the forefront of the quiet computing initiative. The VIA EPIA ML-Series has been designed to be totally non-obtrusive with noise levels equivalent to a person whispering. With noise levels ranging from the totally silent VIA EPIA ML5000EA to 25dBA for the VIA EPIA ML8000A, a new wave of system design innovation and exciting opportunities are being created in an almost limitless number of emerging new market segments - ranging from fanless thin clients, flat panel small form factor desktop replacement systems, LCD PCs and a host of other space and power saving systems.

Common Sounds	dBA Level
Threshold of hearing	0 dBA
VIA EPIA ML5000EA	0 dBA
Normal breathing	10 dBA
Whispering at 1 meter	20 dBA
VIA EPIA ML8000A	25 dBA
Conventional PC	35 – 50 dBA
Rainfall	50 dBA
Normal speech	60 dBA

The dBA scale is logarithmic, i.e. 10 dBA represents a doubling in volume. dBA values are measured at a distance of one meter.

## Power Consumption

Power consumption tests were carried out comparing the VIA EPIA ML8000A (running the 800MHz VIA C3™ processor) and the VIA EPIA ML5000EA (running with the 533MHz). The following tables are a comprehensive breakdown of the EPIA platform’s voltage, amp and wattage values while running common system applications.

### VIA EPIA ML 8000A

#### A. Playing DVD – Power DVD 4.0

	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	3.194	2.431	7.765
Main Board +5V	4.829	3.569	17.235
Main Board 5VSB	4.830	0.051	0.246
Main Board +12V	11.862	0.183	2.171
<b>Main Board Power Consumption</b>			<b>27.416</b>

#### B. Playing MP3 – Media Player

	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	3.184	2.141	6.817
Main Board +5V	4.813	3.232	15.556
Main Board 5VSB	4.825	0.053	0.256
Main Board +12V	11.871	0.183	2.172
<b>Main Board Power Consumption</b>			<b>24.801</b>

#### C. Running Network Application – Files Copy

	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	3.241	2.074	6.722
Main Board +5V	4.919	1.493	7.344
Main Board 5VSB	4.869	0.059	0.287
Main Board +12V	11.881	0.191	2.269
<b>Main Board Power Consumption</b>			<b>16.622</b>

#### D. Idle

	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	3.257	2.045	6.661
Main Board +5V	4.945	0.993	4.910
Main Board 5VSB	4.881	0.055	0.268
Main Board +12V	11.882	0.200	2.376
<b>Main Board Power Consumption</b>			<b>14.216</b>

**E. Run C.C. Winstone 2001**

	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	3.234	2.176	7.037
Main Board +5V	4.855	3.600	17.478
Main Board 5VSB	4.866	0.051	0.248
Main Board +12V	11.927	0.182	0.210
<b>Main Board Power Consumption</b>			<b>24.973</b>

**VIA EPIA ML 6000EA**

**A. Playing DVD – Power DVD 4.0**

	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	3.226	2.478	7.994
Main Board +5V	4.897	1.649	8.075
Main Board 5VSB	4.837	0.057	0.276
Main Board +12V	11.840	0.100	1.184
<b>Main Board Power Consumption</b>			<b>17.529</b>

**B. Playing MP3 – Media Player**

	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	3.230	2.248	7.261
Main Board +5V	4.965	1.511	7.502
Main Board 5VSB	4.913	0.074	0.364
Main Board +12V	11.935	0.125	1.492
<b>Main Board Power Consumption</b>			<b>16.619</b>

**C. Running Network Application – Files Copy**

	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	3.326	2.236	7.437
Main Board +5V	5.019	0.912	4.577
Main Board 5VSB	4.935	0.063	0.311
Main Board +12V	11.900	0.108	1.285
<b>Main Board Power Consumption</b>			<b>13.610</b>

**D. Idle**

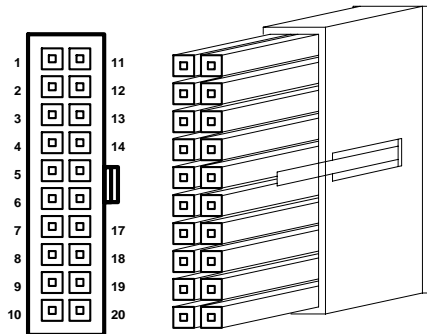
	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	3.294	2.118	6.977
Main Board +5V	4.984	0.731	3.643
Main Board 5VSB	4.900	0.056	0.274
Main Board +12V	11.859	0.099	1.174
<b>Main Board Power Consumption</b>			<b>12.068</b>

**E. Run C.C. Winstone 2001**

	<b>Measured Voltage</b>	<b>Measured Amp.</b>	<b>Watts</b>
Main Board +3.3V	3.228	2.184	7.050
Main Board +5V	4.957	1.621	8.035
Main Board 5VSB	4.910	0.079	0.388
Main Board +12V	11.936	0.123	0.210
<b>Main Board Power Consumption</b>			<b>15.683</b>

## Power Specifications

The EPIA ML utilizes an industry standard 20-pin ATX main connector to the power supply. Due to the EPIA ML 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 EPIA ML-Series Microsoft and Linux Driver Support

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### Microsoft Driver Support

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

For standard operating systems, Windows 98/Me/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 EPIA ML 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 EPIA ML-Series Mini ITX Mainboard contact your sales representative or visit our website at [www.viaembedded.com](http://www.viaembedded.com)

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