



Operating Guide

EPIA PD-Series Mini-ITX Mainboard

Table of Contents

TABLE OF CONTENTS	I
VIA EPIA PD-SERIES OVERVIEW	1
VIA EPIA PD-SERIES LAYOUT	2
VIA EPIA PD-SERIES SPECIFICATIONS	3
VIA EPIA PD PROCESSOR SKUS.....	4
VIA CLE266 CHIPSET OVERVIEW	5
VIA EPIA PD-SERIES I/O BACK PANEL LAYOUT	6
VIA EPIA PD-SERIES LAYOUT DIAGRAM & MOUNTING HOLES.....	7
VIA EPIA PD-SERIES LAYOUT DIAGRAM & HEIGHT DISTRIBUTION.....	8
NOISE LEVEL DATA	9
POWER CONSUMPTION	10
VIA EPIA PD 10000	10
VIA EPIA PD 6000E	11
POWER SPECIFICATIONS	12
VIA EPIA PD-SERIES LINUX & MICROSOFT DRIVER SUPPORT	13
LINUX DRIVER SUPPORT	13
MICROSOFT DRIVER SUPPORT.....	13
CONTACT	14

VIA EPIA PD-Series Overview

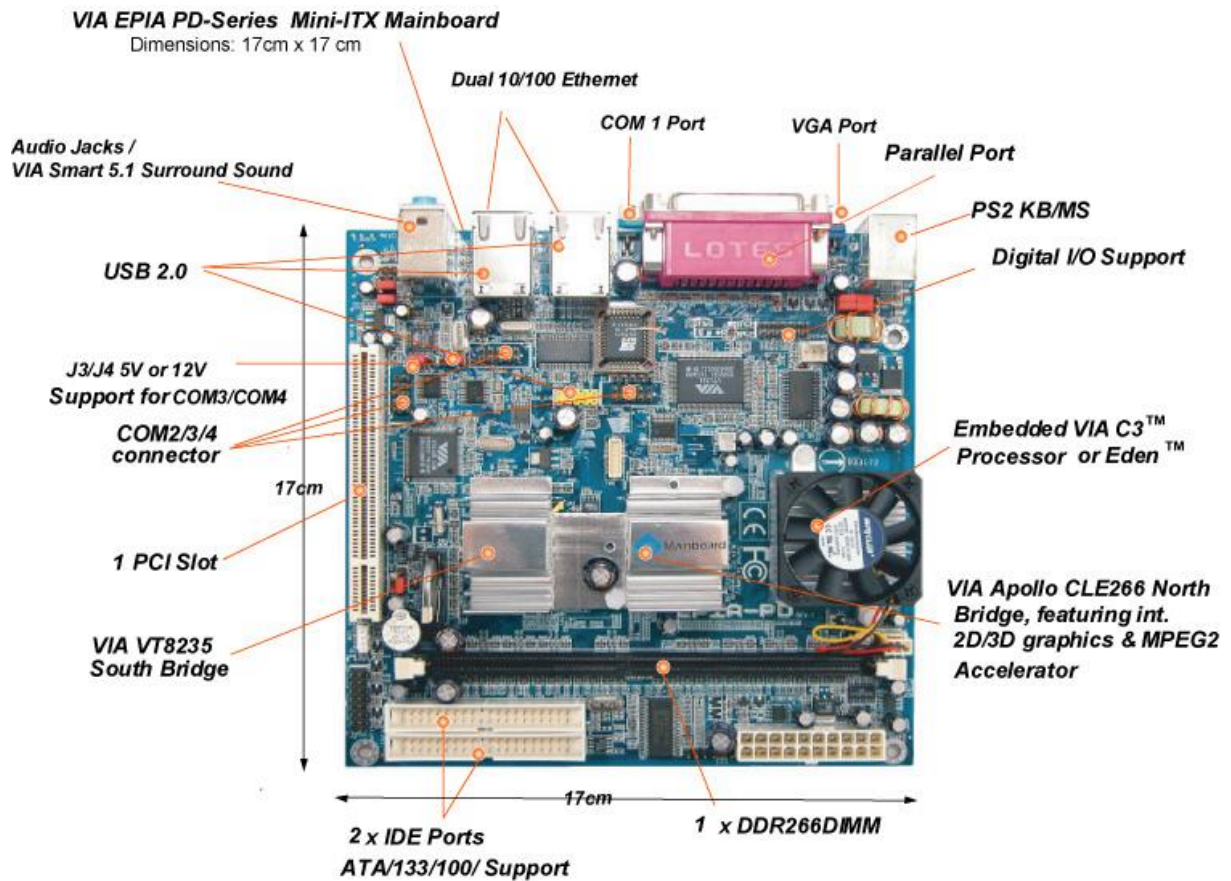
The VIA EPIA PD-Series Mini-ITX Mainboard is an ultra compact x86 digital I/O, 4 COM ports and dual LAN platform with unprecedented expandability and versatility for today's ever-growing need of networking applications. The VIA EPIA PD features more connectivity options than any other EPIA mainboard opening up a vast range of applications in the POS, office, public places, and commercial LANs. Measuring a mere 17 x 17 cm, the VIA EPIA PD-series enables space and power saving systems with minimal moving parts making it ultra reliable for 24/7 operation in a once-on-always-on network environment.

The VIA EPIA PD-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.

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 and the high data transfer speeds of ATA-133, the VIA EPIA PD-series delivers the increased performance levels required by today's commercial digital video and audio applications.

The latest in high-bandwidth connectivity is supported with up to six USB 2.0 connections, as well as four COM ports and two 10/100 Fast Ethernet ports for extended broadband connectivity. The VIA EPIA PD-series also offers support for a number of LVDS embedded LCD panels, has one PCI slot for expandability options, The VIA EPIA PD-series is compatible with a full range of Mini-ITX chassis as well as FlexATX and MicroATX enclosures and power supplies.

VIA EPIA PD-Series Layout




VIA EPIA PD-Series Specifications

Processor	<ul style="list-style-type: none"> VIA C3/EDEN EBGA Processor
Chipset	<ul style="list-style-type: none"> VIA CLE266 North Bridge VT8235 South Bridge
System Memory	<ul style="list-style-type: none"> 1 DDR266 DIMM socket Up to 1GB memory size
VGA	<ul style="list-style-type: none"> Integrated VIA Uni Chrome AGP graphics with MPEG-2 Accelerator
Expansion Slots	<ul style="list-style-type: none"> 1 PCI
Onboard IDE	<ul style="list-style-type: none"> 2 X UltraDMA 133/100/66 Connector
Onboard Digital I/O	<ul style="list-style-type: none"> 1 x Digital I/O Connector (4 pin GPI + 4 pin GPO with 5V/12V support)
Onboard LAN	<ul style="list-style-type: none"> VIA VT6105 LOM+VT6103 10/100 Base-T Ethernet PHY
Onboard Audio	<ul style="list-style-type: none"> VIA VT1612A 2 channel AC'97 Codec
Onboard I/O Connectors	<ul style="list-style-type: none"> 1 USB connectors for 2 additional USB 2.0 ports Front-panel audio connectors (mic-in and line-Out) 1 Buzzer SIR connector CIR connector (Switchable for KB/MS) Wake-on-LAN CPU/Sys FAN/Fan 3 1 Connector for LVDS module 3 Serial port connector for 2/3/4 com port; 3/4 com port with 5V or 12V power jumper selection (Default power setting is 5V)
Back Panel I/O	<ul style="list-style-type: none"> 1 PS2 mouse port 1 PS2 keyboard port 1 Parallel 2 RJ-45 LAN port 1 Serial port 4 USB 2.0 ports 1 VGA port 3 Audio jacks: line-out, line-in and mic-in
BIOS	<ul style="list-style-type: none"> Award BIOS 2/4Mbit flash memory
System Monitoring & Management	<ul style="list-style-type: none"> CPU voltage monitoring Wake-on-LAN, Keyboard-Power-on, Timer-Power-on System power management AC power failure recovery
Operating Temperature	<ul style="list-style-type: none"> 0 ~ 50°C
Operating Humidity	<ul style="list-style-type: none"> 0% ~ 93% (relative humidity; non-condensing)
Form Factor	<ul style="list-style-type: none"> Mini-ITX (4 layer) 17 cm x 17 cm

VIA EPIA PD Processor SKUs

The VIA EPIA PD-Series is available in three different speed grades. The VIA EPIA PD6000E utilizes VIA's ultra low power VIA Eden™ ESP processor while the VIA EPIA PD12000/PD10000 utilizes the robust VIA C3™ processor.



EPIA PD6000E

VIA Eden™ ESP 6000 processor
600 MHz
Fanless Operation
1.2v Operating Volts
128KB L1 Cache &
64KB L2 Cache
MMX and 3DNow!



EPIA PD10000

VIA C3™ processor
1.0 GHz
1.4v Operating Volts
128KB L1 Cache
64KB L2 Cache
MMX and SSE



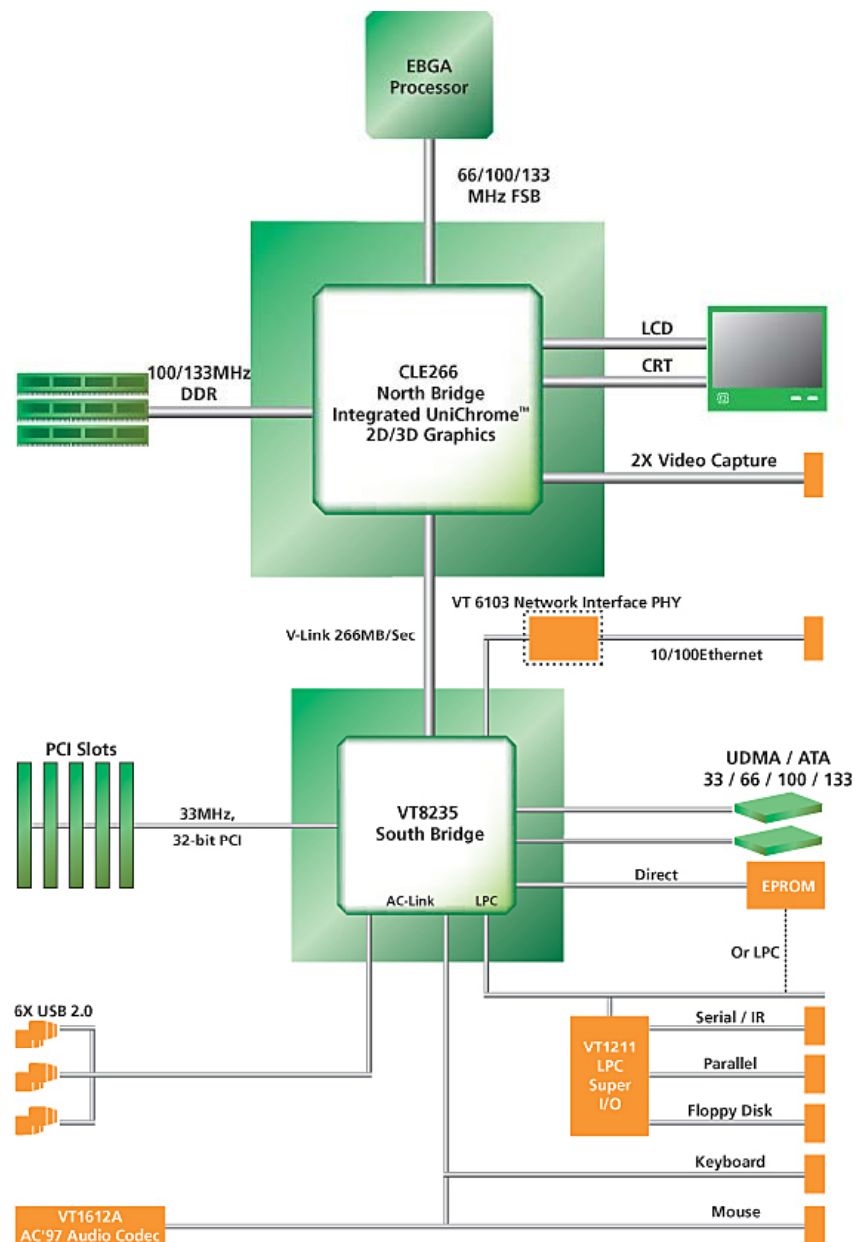
Suitable for fanless systems
with low heat and ultra-low
power requirements



Suitable for compact systems
running multimedia applications

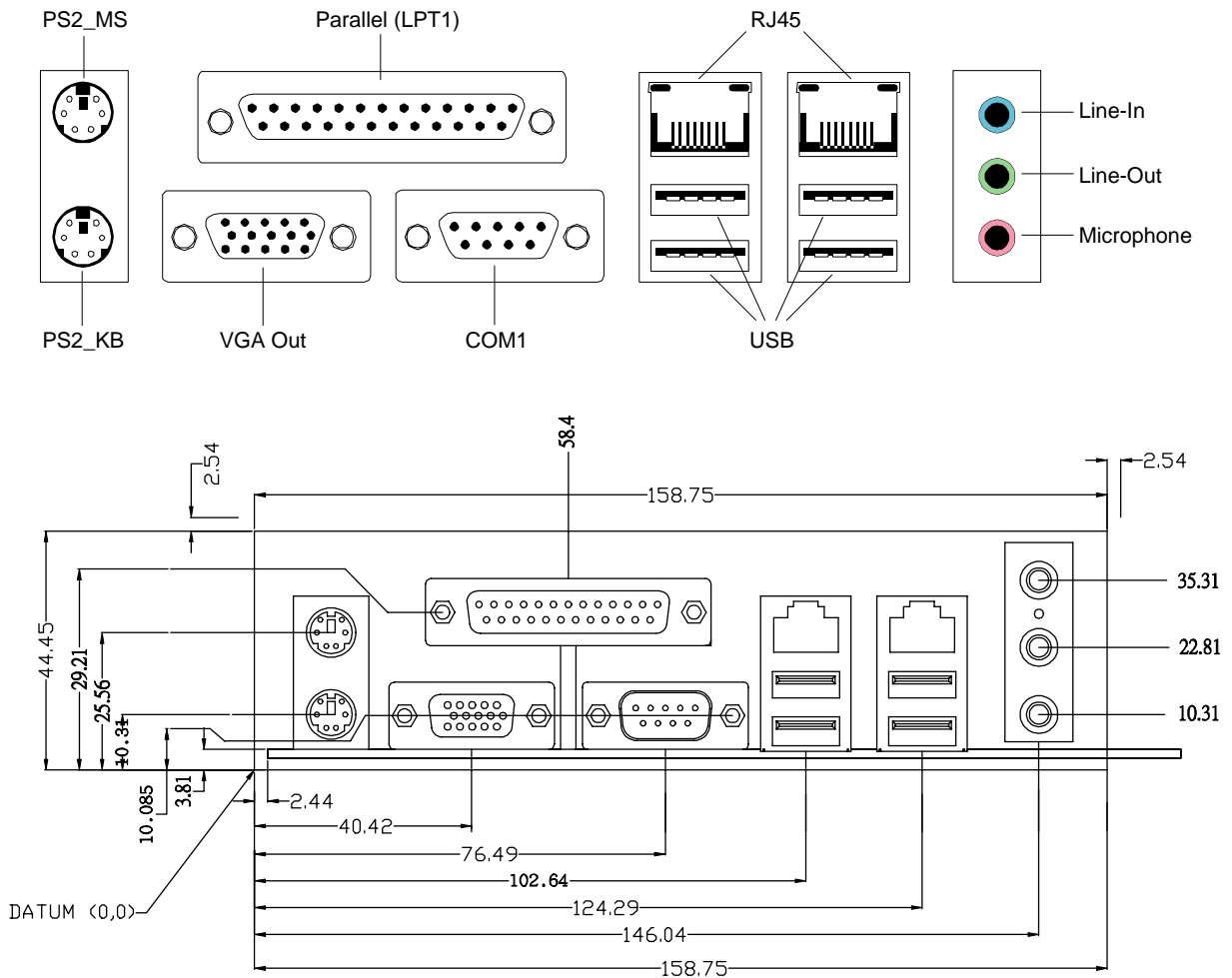
VIA CLE266 Chipset Overview

The VIA Apollo 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.

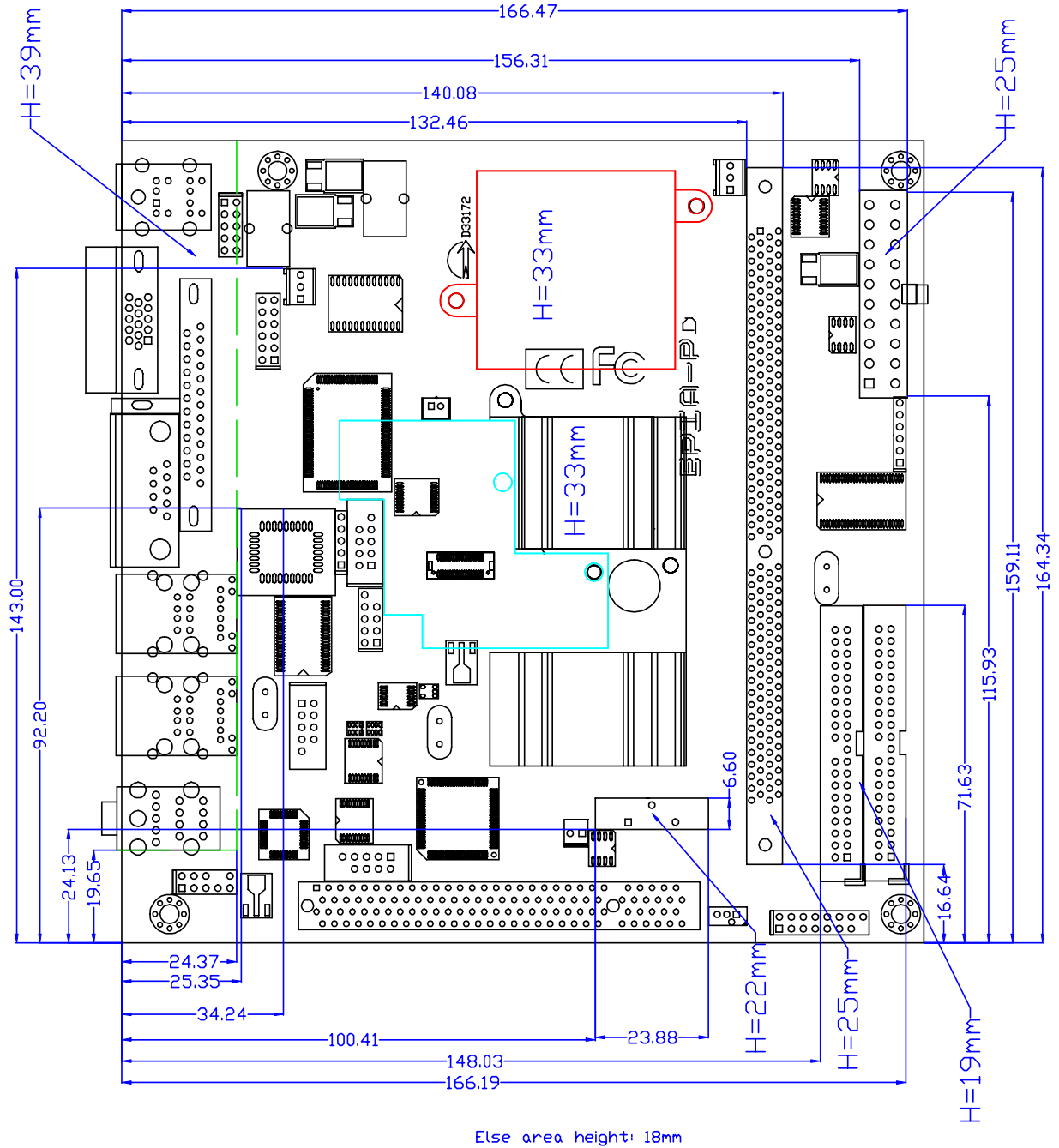


VIA EPIA PD-Series I/O Back Panel Layout

The EPIA PD's ultra compact 17cm x 17cm, integrated design supports all the standard legacy x86 connectivity options as well as Dual LAN, USB 2.0, serial port, parallel port and VIA two channel AC'97 audio. Video connectivity options are second to none and include a VGA port.



VIA EPIA PD-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 PD-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 PD6000E to 25dBA for the VIA EPIA PD10000, 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 PD6000E	0 dBA
Normal breathing	10 dBA
Whispering at 1 meter	20 dBA
VIA EPIA PD10000	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 PD10000 (running the 1.0GHz VIA C3™ processor) and the VIA EPIA PD6000E (running with the 600MHz VIA Eden™ ESP processor). The following tables are a comprehensive breakdown of the EPIA platform's voltage, amp and wattage values while running common system applications.

VIA EPIA PD 10000

Playing DVD			
Test Voltage	Measured Volts	Measured Amps	Watts
+3.3V	3.296V	2.820A	9.295W
+5V	4.971V	2.342A	11.642W
5VSB	4.927V	0.000A	0.000W
+12V	11.977V	0.208A	2.491W
Total Watts			23.428W

Playing MP3			
Test Voltage	Measured Volts	Measured Amps	Watts
+3.3V	3.310V	2.545A	8.424W
+5V	4.986V	2.070A	10.321W
5VSB	4.938V	0.000A	0.000W
+12V	11.988V	0.213A	2.553W
Total Watts			21.298W

Running Network Applications			
Test Voltage	Measured Volts	Measured Amps	Watts
+3.3V	3.305V	2.722A	8.996W
+5V	4.979V	2.422A	12.059W
5VSB	4.932V	0.000A	0.000W
+12V	11.986V	0.213A	2.553W
Total Watts			23.608W

Idle			
Test Voltage	Measured Volts	Measured Amps	Watts
+3.3V	3.326V	2.442A	8.122W
+5V	5.020V	1.040A	5.221W
5VSB	4.952V	0.000A	0.000W
+12V	11.977V	0.218A	2.611W
Total Watts			15.954W

Running CC Winstone2001			
Test Voltage	Measured Volts	Measured Amps	Watts
+3.3V	3.295V	2.631A	8.669W
+5V	4.946V	3.289A	16.267W
5VSB	4.922V	0.000A	0.000W
+12V	12.000V	0.212A	2.544W
Total Watts			27.481W

VIA EPIA PD 6000E

Playing DVD			
Test Voltage	Measured Volts	Measured Amps	Watts
+3.3V	3.319V	2.735A	9.077W
+5V	5.018V	0.906A	4.546W
5VSB	4.947V	0.000A	0.000W
+12V	11.973V	0.095A	1.137W
Total Watts			14.761W

Playing MP3			
Test Voltage	Measured Volts	Measured Amps	Watts
+3.3V	3.332V	2.492A	8.303W
+5V	5.034V	0.724A	3.645W
5VSB	4.957V	0.000A	0.000W
+12V	11.963V	0.102A	1.220W
Total Watts			13.168W

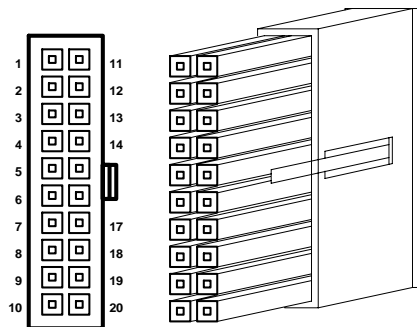
Running Network Applications			
Test Voltage	Measured Volts	Measured Amps	Watts
+3.3V	3.327V	2.634A	8.763W
+5V	5.025V	0.902A	4.533W
5VSB	4.953V	0.000A	0.000W
+12V	11.981V	0.104A	1.246W
Total Watts			14.542W

Idle			
Test Voltage	Measured Volts	Measured Amps	Watts
+3.3V	3.343V	2.305A	7.706W
+5V	5.063V	0.112A	0.567W
5VSB	4.965V	0.000A	0.000W
+12V	11.904V	0.105A	1.250W
Total Watts			9.523W

Running CC Winstone2001			
Test Voltage	Measured Volts	Measured Amps	Watts
+3.3V	3.330V	2.439A	8.122W
+5V	5.025V	0.931A	4.678W
5VSB	4.954V	0.000A	0.000W
+12V	11.984V	0.097A	1.162W
Total Watts			13.963W

Power Specifications

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



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

Note: NC = no connection

VIA EPIA PD-Series Linux & Microsoft Driver Support

Linux Driver Support

The VIA EPIA PD-Series 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
- Installing VIA's pre-compiled driver binary
- Compiling VIA's driver source code
- Installing a third party driver (such as the ALSA driver from the Advanced Linux Sound Architecture project for integrated audio)

Full instructions for the most popular distribution packages are updated monthly and are available for free download from the [Linux Arena](#) on www.viaarena.com. The [Linux Application notes](#) on VIA Arena also contains further useful information to optimize system performance, such as increasing IDE performance beyond the capabilities of an in-built driver, measuring hard disk performance, enabling hardware monitoring features and other practical guides such as installing CD re-writers, enabling the USB 2.0 controller, and much more.

For OEM clients and system integrators developing a product for long term production, other code and other resources may also be made available. You can submit a request either through the [Developers portal](#) on VIA Arena, or through your VEPA support contact. Alternatively, VIA in some circumstances will also work towards providing a driver to suite your specific needs.

The [Linux Arena](#) is updated at least once per month. Other information, notes and links to specific areas of interest can also be found on the [EPIA Mainboards driver page](#). Many OEMs and system integrators also find it valuable to discuss their development with other Linux users in the dedicated [Linux Category](#) of the [VIA Arena Forums](#), which is monitored by VIA staff.

Microsoft Driver Support

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

A Windows XP Embedded support package for VIA EPIA PD mainboards is available on the [WinXP Embedded Applications Notes](#) page, to facilitate evaluation and development. OEMs and System Integrators should, however, customize their own binary images according to their actual product specifications and application requirements. Sample component implementation for the CLE266 and Northbridge as well as integrated audio on the VT8235 Southbridge is also provided to assist in development. Updates to this support page are made on a monthly basis and further sample components will be released. Components of the VIA EPIA PD mainboard are also supported in Service Pack 1 (SP1).

Contact

For more information on the VIA EPIA PD-Series Mini ITX Mainboard contact your sales representative or visit our website at www.viaembedded.com

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