



Operating Guide

EPIA MII-Series Mini-ITX Mainboard

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VIA EPIA MII-Series Overview

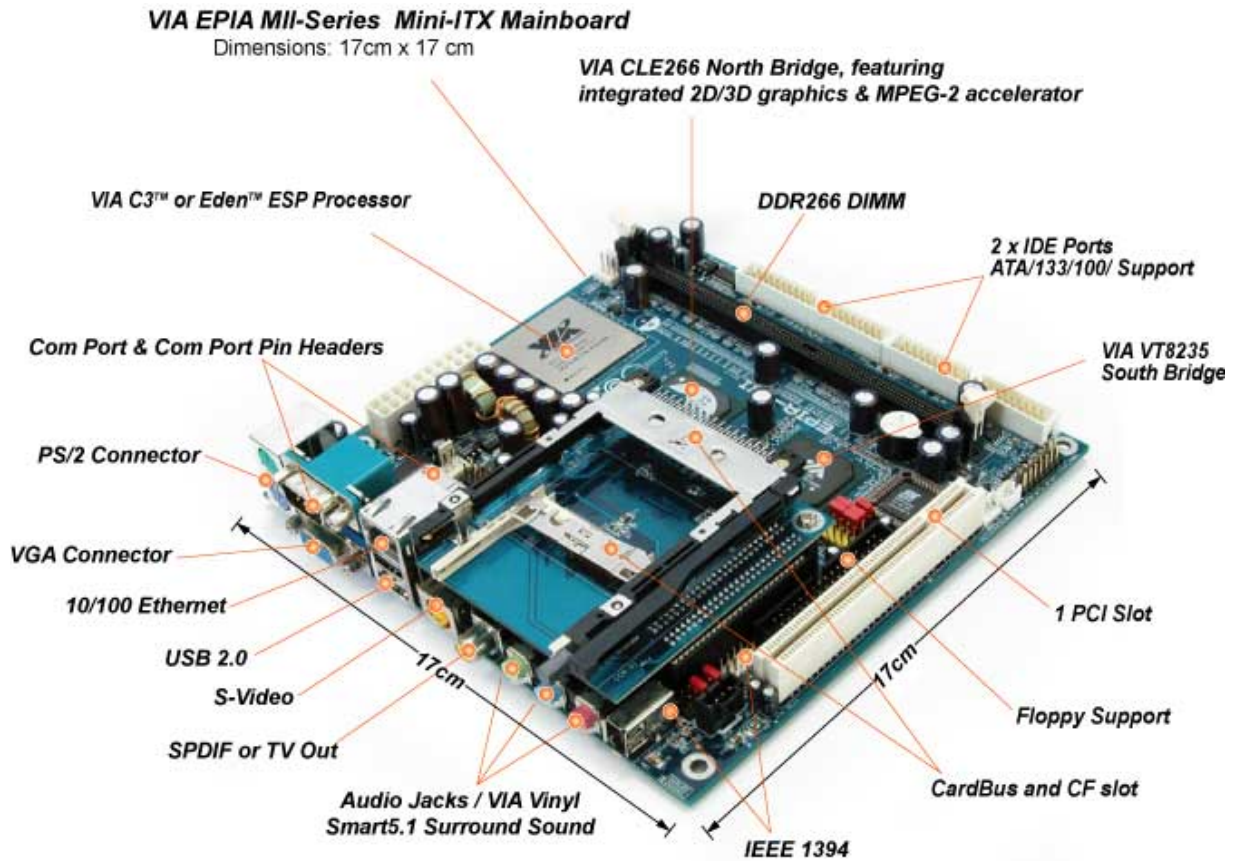
The VIA EPIA MII-Series Mini-ITX Mainboard is an ultra compact x86 digital home platform with unprecedented expandability and versatility for today's ever-growing need of CardBus + CF applications. The VIA EPIA MII features more connectivity options than any other EPIA mainboard opening up a vast range of applications in the digital home entertainment, SOHO, public places, and access point. Measuring a mere 17 x 17 cm, the VIA EPIA MII-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 wireless network environment.

The VIA EPIA MII-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 MII-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 and two IEEE1394 connections, as well as 2 COM ports and one 10/100 Fast Ethernet port for extended broadband connectivity. The VIA EPIA MII-series also offers support for a number of LVDS embedded LCD panels, has one PCI slot for expandability options, The VIA EPIA MII-series is compatible with a full range of Mini-ITX chassis as well as FlexATX and MicroATX enclosures and power supplies.

VIA EPIA MII-Series Layout



VIA EPIA MII-Series Specifications

Processor	<ul style="list-style-type: none"> VIA C3™/ VIA Eden™ ESP processor
Chipset	<ul style="list-style-type: none"> VIA CLE266 North Bridge VIA 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 UniChrome AGP graphics
Expansion Slots	<ul style="list-style-type: none"> 1 PCI
Onboard CardBus/CompactFlash	<ul style="list-style-type: none"> CardBus Type I and II Ricoh R5C476 II CardBus controller
Onboard IDE	<ul style="list-style-type: none"> 2 x UltraDMA 133/100/66 connectors
Onboard Floppy	<ul style="list-style-type: none"> 1 FDD Connector
Onboard LAN	<ul style="list-style-type: none"> VIA VT6103 10/100 base Ethernet PHY
Onboard Audio	<ul style="list-style-type: none"> VIA VT16166-channel AC'97 codec
Onboard IEEE 1394	<ul style="list-style-type: none"> VIA VT6307S IEEE 1394 (optional)
Onboard TV-out	<ul style="list-style-type: none"> VIA VT1622A TV-out chipset
Back Panel I/O	<ul style="list-style-type: none"> 1 PS2 mouse port 1 PS2 keyboard port 1 RJ-45 LAN port 1 Serial port 2 USB 2.0 ports 1 VGA port 1 1394 port 1 CardBus Type I and II + 1 CompactFlash slot 1 RCA port (SPDIF / TV-out) 1 S-video port 3 Audio jacks: line-out, line-in and mic-in
Onboard I/O Connectors	<ul style="list-style-type: none"> 1 USB connectors for 2 additional USB 2.0 ports 1 Front-panel audio connectors (mic-in and line-out) 1 IEEE 1394 connector (optional) 1 CD audio connector SM Bus connector FIR connector CIR connector (Switchable for KB/MS) 1 LPT port-connector Wake-on-LAN connector 3 Fan connectors CPU/Sys FAN/Fan 3 1 LVDS module connector 1 Serial port header
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 (6 layers) 17cm x 17cm

VIA EPIA MII Processor SKUs

The VIA EPIA MII-Series is available in two different speed grades. The VIA EPIA MII6000E utilizes VIA's ultra low power VIA Eden™ ESP processor while the VIA EPIA MII10000 utilizes the robust VIA C3™ processor.



EPIA MII6000E

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



EPIA MII10000

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



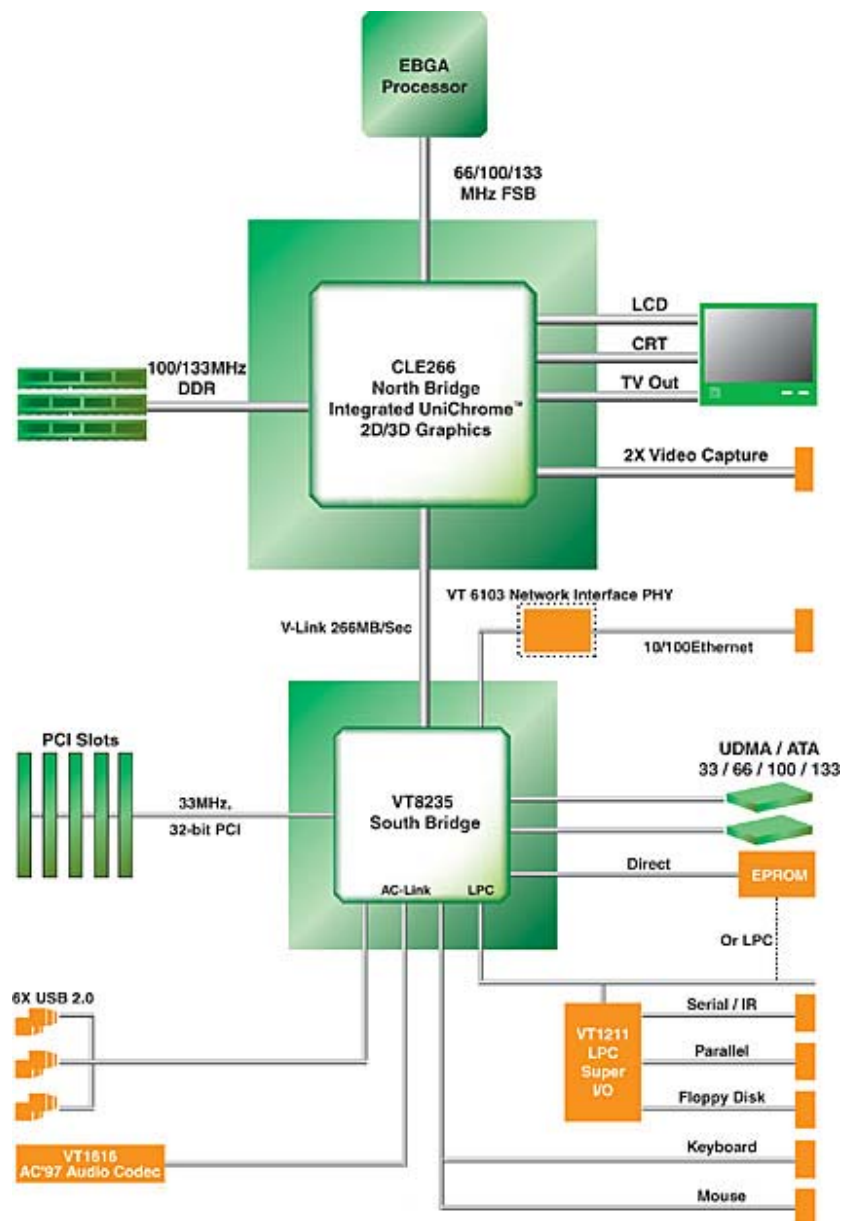
Suitable for fanless systems with low heat and ultra low-power requirements



Suitable for compact systems running multimedia applications

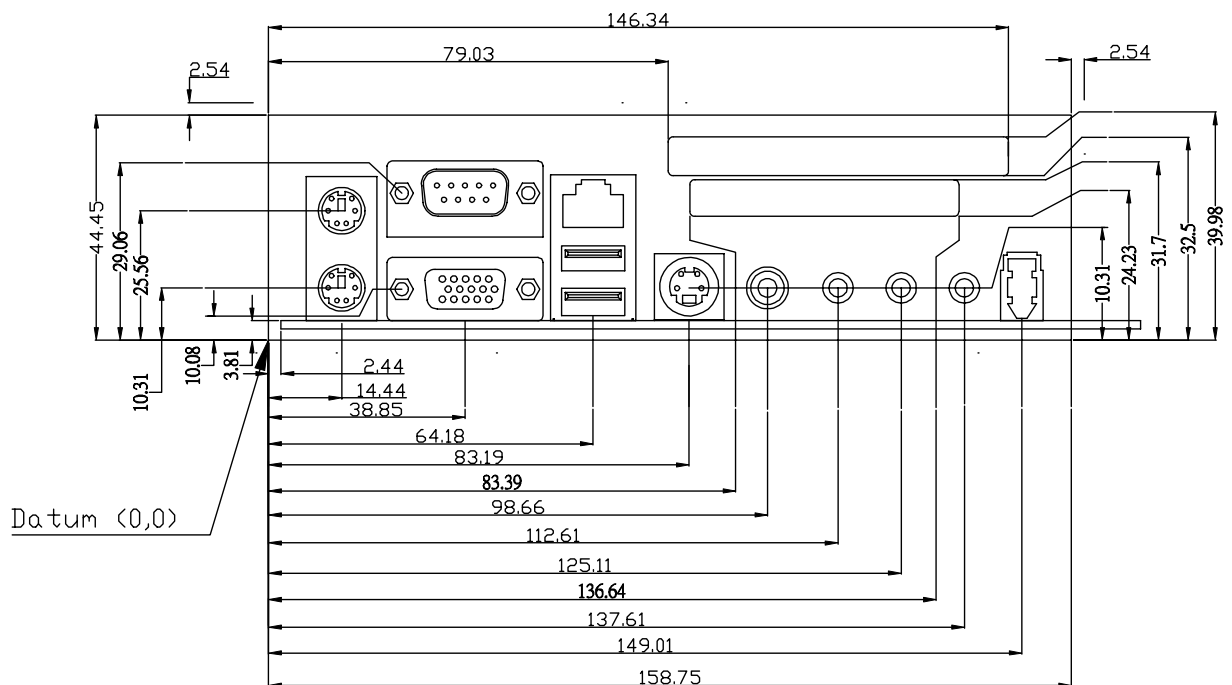
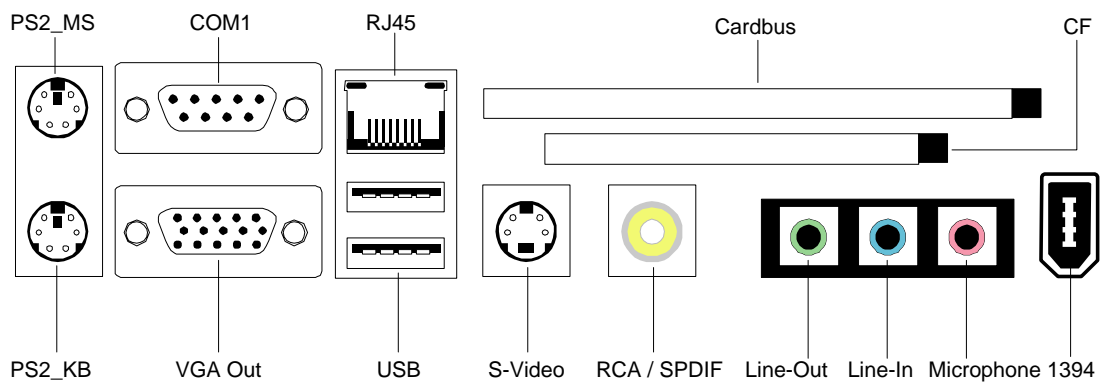
VIA CLE266 Chipset Overview

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.

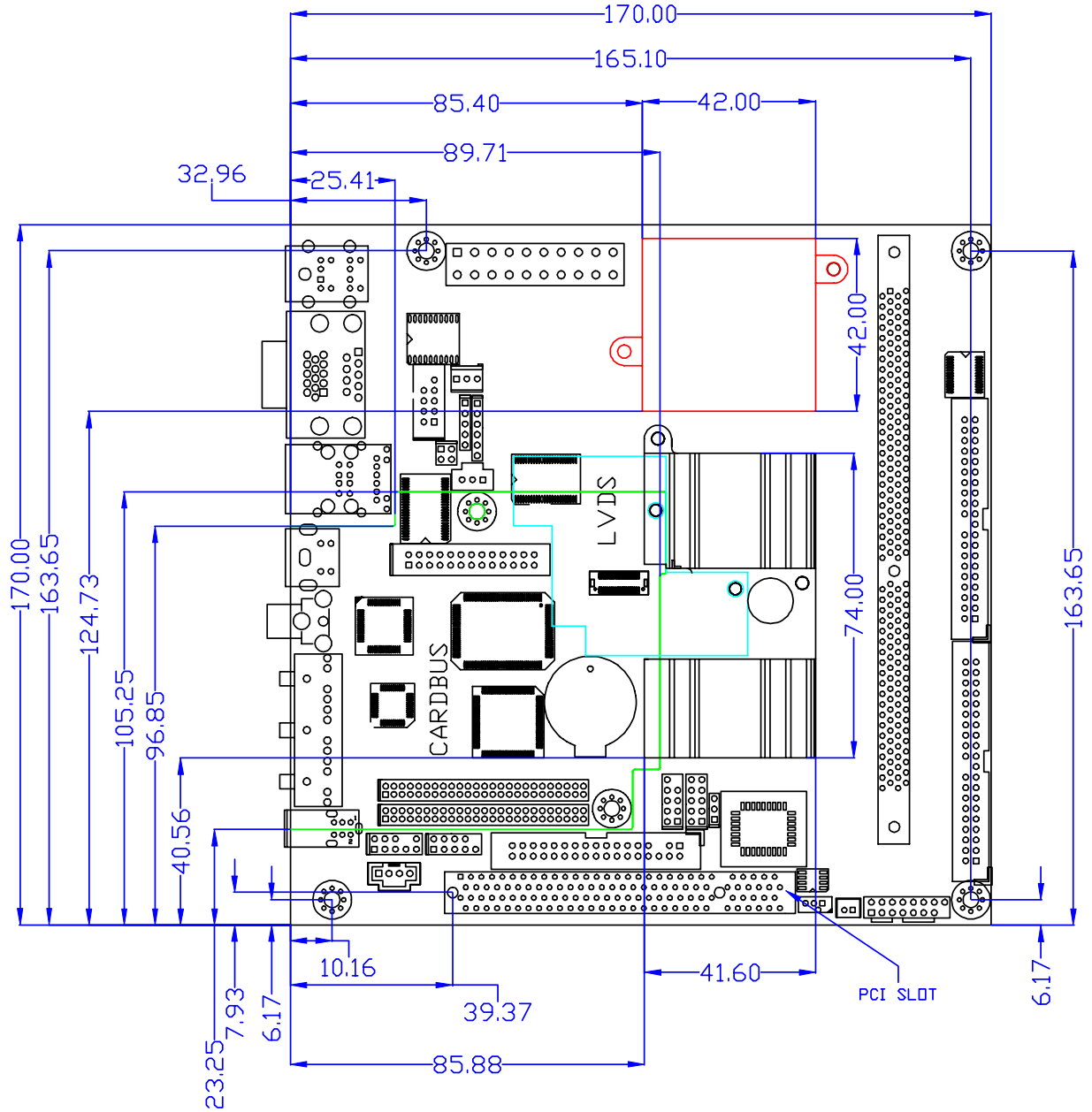


VIA EPIA MII-Series I/O Back Panel Layout

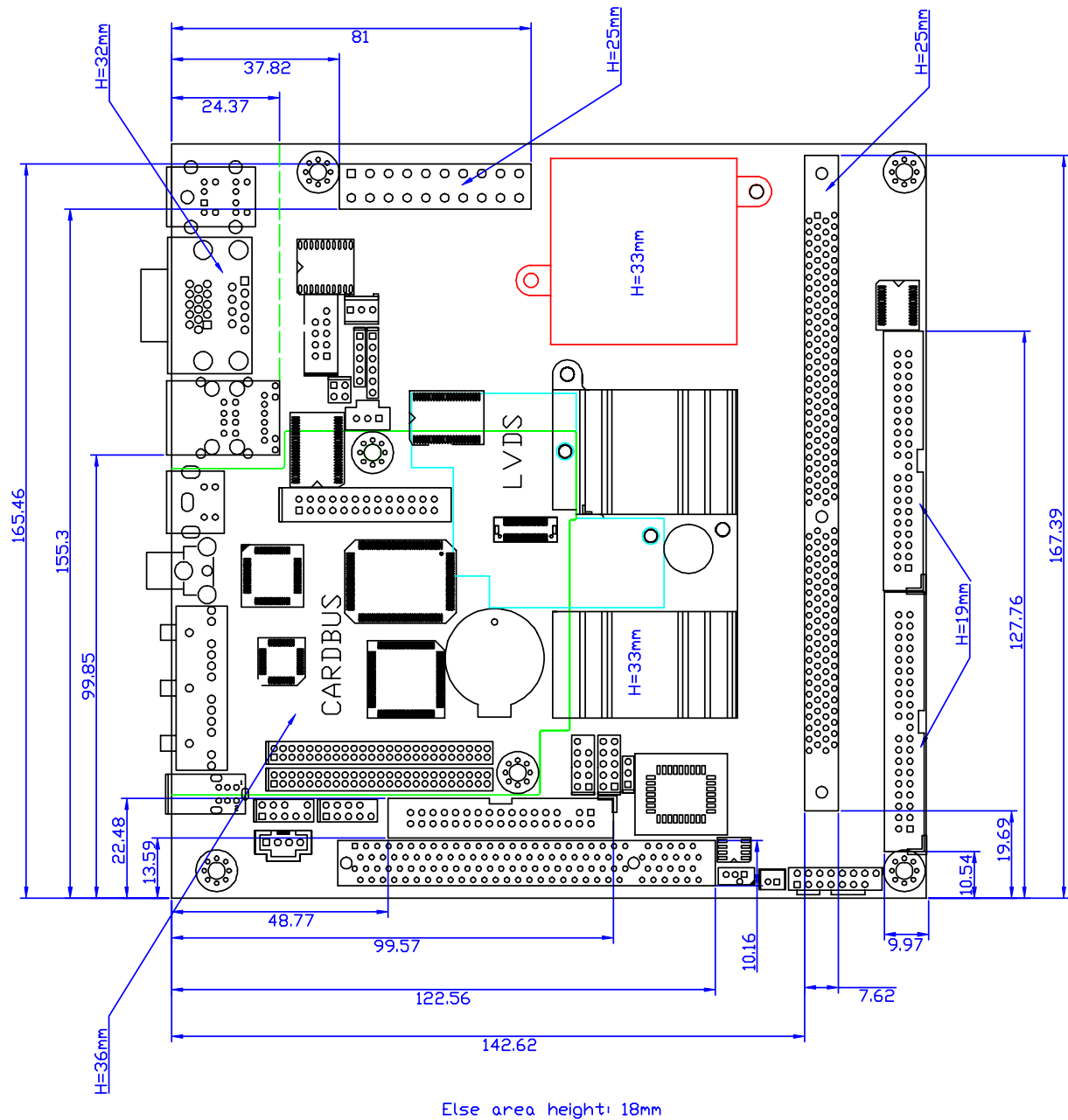
The EPIA MII's ultra compact 17cm x 17cm, integrated design supports all the standard legacy x86 connectivity options as well as Ethernet LAN, USB 2.0, IEEE 1394 and VIA Six-TRAC AC'97 audio. Video connectivity options are second to none and include a VGA port, RCA port (SPDIF or TV Out), and S-Video port.



VIA EPIA MII-Series Layout Diagram & Mounting Holes



VIA EPIA MII-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 MII-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 MII6000E to 25dBA for the VIA EPIA MII10000, 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 MII6000E	0 dBA
Normal breathing	10 dBA
Whispering at 1 meter	20 dBA
VIA EPIA MII10000	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.

DVD Playback Test

The table below compares VIA C3™ processor and CLE266 chipset DVD playback performance to that of a powerful Intel® Pentium 4 2.0 GHz and 845G chipset. Despite giving away 1.2 GHz of processor speed and competing with Geforce4 graphics the VIA CLE266 platform delivers equivalent performance at a fraction of the cost and required space and cooling. Note that this is a comparison of only the DVD playback performance, not a of overall system performance, as digital media performance is what counts for the lifestyle PC.

CPU	VIA C3™ 1.0GHz		Intel® Pentium 4 2.0GHz	
Platform	VIA Apollo CLE266		Intel 845G	
Vendor	InterVideo		InterVideo	
Player	WinDVD4.0		WinDVD4.0	
Performance	CPU usage	Dropped Frames	CPU Usage	Dropped Frames
Windows XP	28.48%	0.04	47.70%	0.03

Power Consumption

Power consumption tests were carried out comparing the VIA EPIA MII10000 (running the 1 GHz VIA C3™ processor) and the VIA EPIA MII60000E (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 MII 10000

Playing DVD			
Test Voltage	Measured Volts	Measured Amps	Watts
+3.3V	3.323V	2.690A	8.939W
+5V	5.008V	2.220A	11.118W
5VSB	4.950V	0.050A	0.248W
+12V	12.003V	0.200A	2.401W
Total Watts			22.705W

Playing MP3			
Test Voltage	Measured Volts	Measured Amps	Watts
+3.3V	3.330V	2.450A	8.159W
+5V	5.014V	2.040A	10.229W
5VSB	4.955V	0.050A	0.248W
+12V	12.013V	0.200A	2.403W
Total Watts			21.037W

Running Network Applications			
Test Voltage	Measured Volts	Measured Amps	Watts
+3.3V	3.336V	2.390A	7.973W
+5V	5.023V	1.620A	8.137W
5VSB	4.958V	0.060A	0.297W
+12V	12.009V	0.200A	2.402W
Total Watts			18.810W

Idle			
Test Voltage	Measured Volts	Measured Amps	Watts
+3.3V	3.341V	2.340A	7.818W
+5V	5.039V	1.020A	5.140W
5VSB	4.964V	0.060A	0.298W
+12V	11.996V	0.200A	2.399W
Total Watts			15.655W

Running CC Winstone2001			
Test Voltage	Measured Volts	Measured Amps	Watts
+3.3V	3.323V	2.440A	8.108W
+5V	4.989V	3.020A	15.067W
5VSB	4.948V	0.050A	0.247W
+12V	12.028V	0.190A	2.285W
Total Watts			25.708W

VIA EPIA MII 6000E

Playing DVD			
Test Voltage	Measured Volts	Measured Amps	Watts
+3.3V	3.328V	2.780A	9.252W
+5V	5.030V	1.080A	5.432W
5VSB	4.959V	0.050A	0.248W
+12V	11.994V	0.090A	1.079W
Total Watts			16.011W

Playing MP3			
Test Voltage	Measured Volts	Measured Amps	Watts
+3.3V	3.334V	2.550A	8.502W
+5V	5.035V	1.040A	5.236W
5VSB	4.959V	0.050A	0.248W
+12V	11.997V	0.090A	1.080W
Total Watts			15.066W

Running Network Applications			
Test Voltage	Measured Volts	Measured Amps	Watts
+3.3V	3.342V	2.410A	8.054W
+5V	5.045V	0.630A	3.178W
5VSB	4.963V	0.050A	0.248W
+12V	11.994V	0.010A	0.120W
Total Watts			11.601W

Idle			
Test Voltage	Measured Volts	Measured Amps	Watts
+3.3V	3.345V	2.500A	8.363W
+5V	5.074V	0.380A	1.928W
5VSB	4.969V	0.050A	0.248W
+12V	11.887V	0.110A	1.308W
Total Watts			11.847W

Running CC Winstone2001			
Test Voltage	Measured Volts	Measured Amps	Watts
+3.3V	3.335V	2.460A	8.204W
+5V	5.033V	1.050A	5.285W
5VSB	4.959V	0.050A	0.248W
+12V	12.002V	0.090A	1.080W
Total Watts			14.817W

Cardbus and Chipset Specifications

Vendor	Ricoh
Part No.	R5C476II
Specification	
PCI I/F Ver.	PCI Localbus 2.2
Mixed Voltage (IO/Core)	5V, 3.3V/3.3V or 2.5V
Support ZV Port	Yes, bypass
Performance (MB/S)	132 MB/s
FIFO Depth (Card Bus Only)	8KB
Flash Memory Card Support	
Socket Type (CompactFlash Card Only)	Dedicated
Regulation	
PC 2001	Yes
ACPI Ver.	Ver. 2.0
Power Consumption	
D0	35mA
D1	35mA
D2	30mA
D3 Hot	20mA
D3 Cold	60uA

Compatible Cardbus and Compactflash Card List

The cards listed below have only been tested using Windows 98 SE.

Network Adapters

- 3Com Etherlink III 3C589B-TP ¹
- 3Com Etherlink III 3C589C-TP ¹
- 3Com Etherlink III 3C589D-TP ¹
- 3Com 3C574-TX
- Allied Telesis LA-PCM-T Ethernet PC Card LAN Adapter ²
- Allied Telesis LA-PCM-T V2 ²
- Allied Telesis LA100-PCM-T V2 ²
- HARRIS WIRELESS LAN DSSS(2.4 GHz) PC Card
- IBM EtherJet PC Card 10BT
- IBM CREDIT CARD ADAPTER TOKEN-RING 16/4
- Madge Smart 16/4 PCMCIA Ringnode Mk2
- Melco PCMCIA LAN Card LPC-T
- RIOS PC Card II Ethernet
- SMC Elite Card PCMCIA Ethernet (SMC8016)
- TDK LACCD021 Ethernet
- TDK LAK-CD 021BX Ethernet
- Xircom Credit Card Ethernet Adapter 10/100CE3B-100BTX

¹ USB may be required to be disabled in some systems.

² Network connection will not be restored after suspend/resume. (caused by PC Card)

³ Modem and LAN functions do not work at the same time. (caused by PC Card)

⁴ SCSI devices will not be detected after suspend/resume. (caused by drivers)

⁵ “!” Mark in system property will appear when the card is inserted at boot even though the PC Card works properly.

Network Adapters - Cardbus

- 3Com Fast EtherLink XL PC Card 3C575-TX
- 3Com 3CCFE575BT
- Accton EN2220
- Allied Telesis LA100-CardBus-T
- Fujitsu FMV-J184B
- Digital EB143CS 10/100 Mbps Ethernet (ES)
- I/O Data CBET/TX
- Intel EtherExpress PRO/100 Mobile Adapter
- Melco 10/100 TX LAN Card LPC-TX-CB
- Olicom GOCARD OC-3250
- Panasonic AL-VEL311 10/100Base/TX
- Ratoc REX-CB80
- RIOS Cardbus
- SMC EtherPower 10/100 PC Card 8032DT
- TDK LAK-CB100X NetworkFlyer 100Mbps Ethernet
- Xircom CBE2-100

Multi-Function Cards

- 3Com EtherLink III LAN+33.6 Modem PC Card 3C562C/3C563C ¹
- 3Com Megahertz 10/100 LAN+56K Modem PC Card 3CCFEM556
- 3Com Megahertz 10/100 LAN+56K Modem PC Card 3CCFEM556B
- Action Tech ComNet 33.6 Ethernet + Modem
- Allied Telesis LAN + Fax/Modem LM33-PCM-T ^{2,3}
- Intel PRO/100 10/100LAN + 56K Modem
- Megahertz XJEM3336J Ethernet+Modem
- Panasonic SoundSCSI CF-JSC102 ⁴
- SMC EtherEZ with Modem 8020BTM/TM
- TDK DFL9610 (LAN+Cellular)
- TDK Global Networker DFL3410
- Xircom CreditCard Ethernet 10/100 + Modem 56K (CEM56)
- Xircom CardBus Ethernet 10/100+Modem56 CBEM56G-100
- Xircom RealPort RBEM56G-100

Modems

- AIWA PV-JF5605
- AIWA PV-JF56E1
- AIWA PV-JF56E5
- I/O Data PCML-560
- IBM 33.6Kbps International DATA/Fax Modem
- Megahertz CC3144 V.32bis PCMCIA Modem
- Silicom CardBus Modem 56
- TDK DF2814C
- TDK DVP3314
- TDK DF3314ES
- TDKDF5600DX K56flex/V.90
- TI JAPAN 24/SF
- Xircom Credit Card Modem 56K CM-56G

Flash Memories (ATA)

- ADTEC AD-CFD32 32MB (Compact Flash)
- Epson SEATA-A30 30MB
- Epson SECFA-A30 30MB (Compact Flash)
- I/O Data PCFDC IV-ADP + FC002A 2Mbytes
- KYOCERA Compact Flash 2MB
- Micron Compact Flash 10 MB
- NEC PC-FH04L 4Mbytes (SanDisk SDP-3B)
- Panasonic VQ-MAP1 + VQ-MMT4 (Multi Media Card)
- SanDisk 10MB FlashDisk (SDP5A-10)
- SONY HSAC-PC2 MSA-4A (Memory Stick)
- TDK SFD096MA 96Mbytes (ES)
- TDK SFD012MA 12Mbytes
- TDK Super Filing Chip FC901+FC002A 2Mbytes
- U-CONN Compact Flash 4MB

Hard Drives (ATA)

- I/O Data PCHD-520C
- INTEGRAL PERIPHERALS 1841PA 40MB
- Melco DPH-340 Hard Disk Card 340Mbytes
- IBM 105MB Hard Disk 8105PA
- TEAC PI-100E PCMCIA/IDE II CARD (CD-ROM)

SCSI Adapters

- Adaptec SlimSCSI APA-1460
- I/O Data CDPS-PX24 with PCSC-F (CD-ROM)
- I/O Data CBSC-II 16bit mode
- IBM PCMCIA SCSI (84G0790)
- Panasonic KXL-800A-N with PJWBL800AN (CD-ROM) ⁴
- Panasonic KXL-820AN with JDWBL820AN 16bit mode (CD-ROM) ⁴
- Panasonic KXL-RW10AN with JDWBLRW10AN 16bit mode (CD-R/RW) ⁴

SCSI Adapters – Cardbus

- Adaptec SlimSCSI APA-1480 Cardbus Ultra SCSI
- Adaptec SlimSCSI APA-1480A Cardbus Ultra SCSI
- I/O Data CBSC-A
- I/O Data CBSC-II CardBus mode
- Panasonic KXL-820AN with JDWBL820AN CardBus mode (CD-ROM)
- Panasonic KXL-RW10AN with JDWBLRW10AN CardBus mode (CD-R/RW)
- Ratoc REX-CB30

Memory Cards – SRAM, Flash

- Epson 1MB SRAM ⁵
- Epson 2MB SRAM ⁵
- Unknown 2MB SRAM ⁵

Zoomed Videos

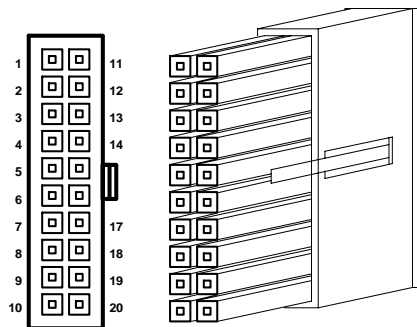
- Fuji Film Micro MPEG Playback RI7001 (ES)(Margi MpegToGo)
- Margi systems Capture to go
- Margi systems MPEG2 DVD to go
- PRETEC MagView RI7001
- SIGMA DESIGNS REALmagic Video Capture and MPEG Playback
- ViRT REALmagic Pocket

Specialty Cards

- I/O Data PCJOY2 (GamePort)
- I/O Data CBMLX (Secondary Monitor Output)

Power Specifications

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

Linux Driver Support

The VIA EPIA MII-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 MII offers full support for the complete range of Microsoft operating systems.

A Windows XP Embedded support package for VIA EPIA MII 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 MII mainboard are also supported in Service Pack 1 (SP1).

Contact

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

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