
# Operating Guide

## EPIA CN-Series Mini-ITX Mainboard

March 27, 2006

Version 1.0

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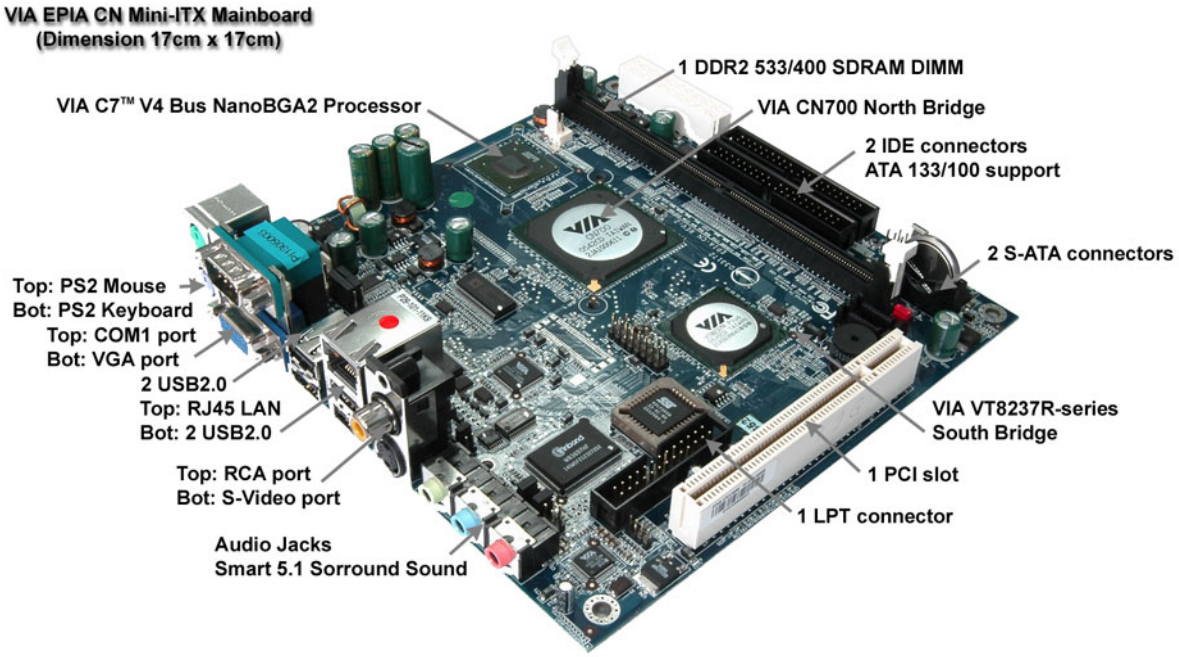
# VIA EPIA CN-Series Overview

The VIA EPIA CN-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 DDR2 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 EPIA CN-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 EPIA CN-Series also has one PCI slot for expandability options. The VIA EPIA CN-Series is compatible with a full range of Mini-ITX chassis as well as FlexATX and MicroATX enclosures and power supplies.

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

# VIA EPIA CN-Series Layout



## VIA EPIA CN-Series Specifications

| Model Name | EPIA CN13000 | EPIA CN10000E |
|---|---|---|
| Processor | VIA C7 1.3GHz NanoBGA2 | VIA C7 1.0GHz NanoBGA2 |
| Chipset | - VIA CN700 North Bridge<br>- VIA VT8237R-Series South Bridge | |
| System Memory | - 1 DDR2 400/533 DIMM slot<br>- Up to 1GB memory size | |
| VGA | - Integrated VIA UniChrome™ Pro AGP graphics with MPEG-2 acceleration | |
| Expansion Slots | - 1 PCI | |
| Onboard IDE | - 2 UltraDMA 133/100/66 Connectors | |
| Onboard LAN | - VIA VT6103 10/100 PHY | |
| Onboard Audio | - VIA VT1618 8 channel AC'97 Codec | |
| Onboard TV Out | - VIA VT1625M HDTV Encoder | |
| Onboard I/O Connectors | - 1 USB pin header for 4 additional USB 2.0 ports<br>- 1 Front-panel audio pin header (Mic-in and Line-out)<br>- 2 S-ATA Connectors<br>- 1 LPT connector<br>- 1 CD-In pin header<br>- 1 CIR pin header (Switchable for KB/MS)<br>- 2 Fan connectors: CPU/Sys FAN<br>- 1 Front-Panel pin header<br>- 1 ATX Power Connector | |
| Back Panel I/O | - 1 PS2 Mouse port<br>- 1 PS2 Keyboard port<br>- 1 VGA port<br>- 1 Serial port<br>- 1 RJ-45 LAN port<br>- 4 USB 2.0 ports<br>- 1 RCA port (S/PDIF or TV out)<br>- 1 S-Video port<br>- 3 Audio jacks: line-out, line-in and mic-in (Horizontal, Smart 5.1 Support) | |
| BIOS | Award BIOS, LPC 4/8Mbit flash memory | |
| Operating System | Windows 2000 / XP, Linux, Win CE, XPe | |
| System Monitoring & Management | - CPU voltage monitoring<br>- Wake-on-LAN, Keyboard-Power-on, Timer-Power-on<br>- System power management, AC power failure recovery | |
| Operating Temperature | 0 ~ 50°C | |
| Operating Humidity | 0% ~ 95% (relative humidity; non-condensing) | |
| Form Factor | - Mini-ITX (4-layer)<br>- 17 cm x 17 cm | |

* The specification is subject to change without prior notice.

## VIA EPIA CN Processor SKUs

The VIA EPIA CN-Series is available in 1.0GHz and 1.3GHz speed grades. The VIA EPIA CN10000E and the VIA EPIA CN13000 both utilize the most efficient VIA C7™ V4 Bus NanoBGA2 processor.

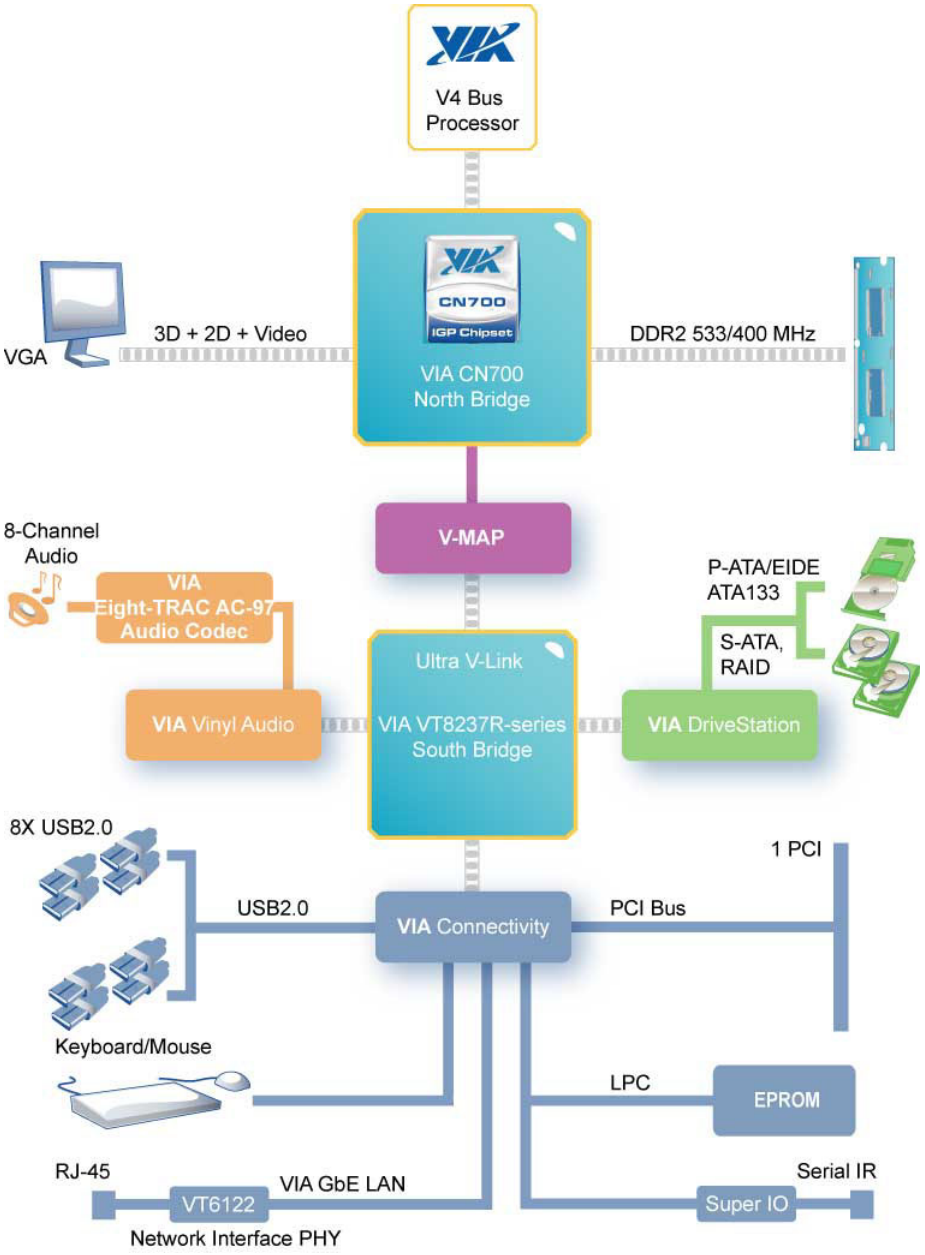


Suitable for small, low power, ultra efficient and secure x86 platform.


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

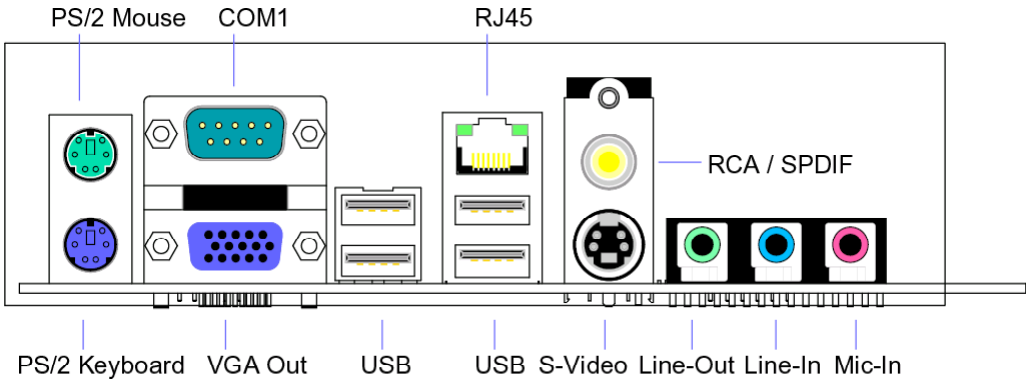
## VIA CN700 Chipset Overview

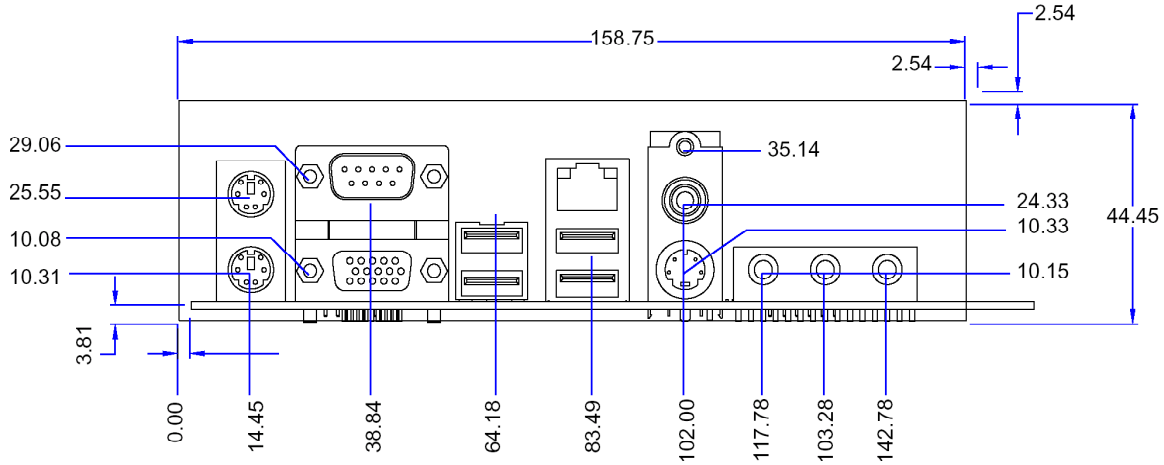
The VIA CN700 Chipset is designed to enable high quality digital video streaming and DVD playback in a new generation of fanless, small form factor PCs and IA devices. The CN700 features the embedded VIA UniChrome™ Pro 2D/3D MPEG-2 acceleration, DDR2 533/400MHz support, motion compensation and duo-view support to ensure a rich overall entertainment experience. Outstanding connectivity features include USB 2.0, 10/100 LAN and ATA/133.



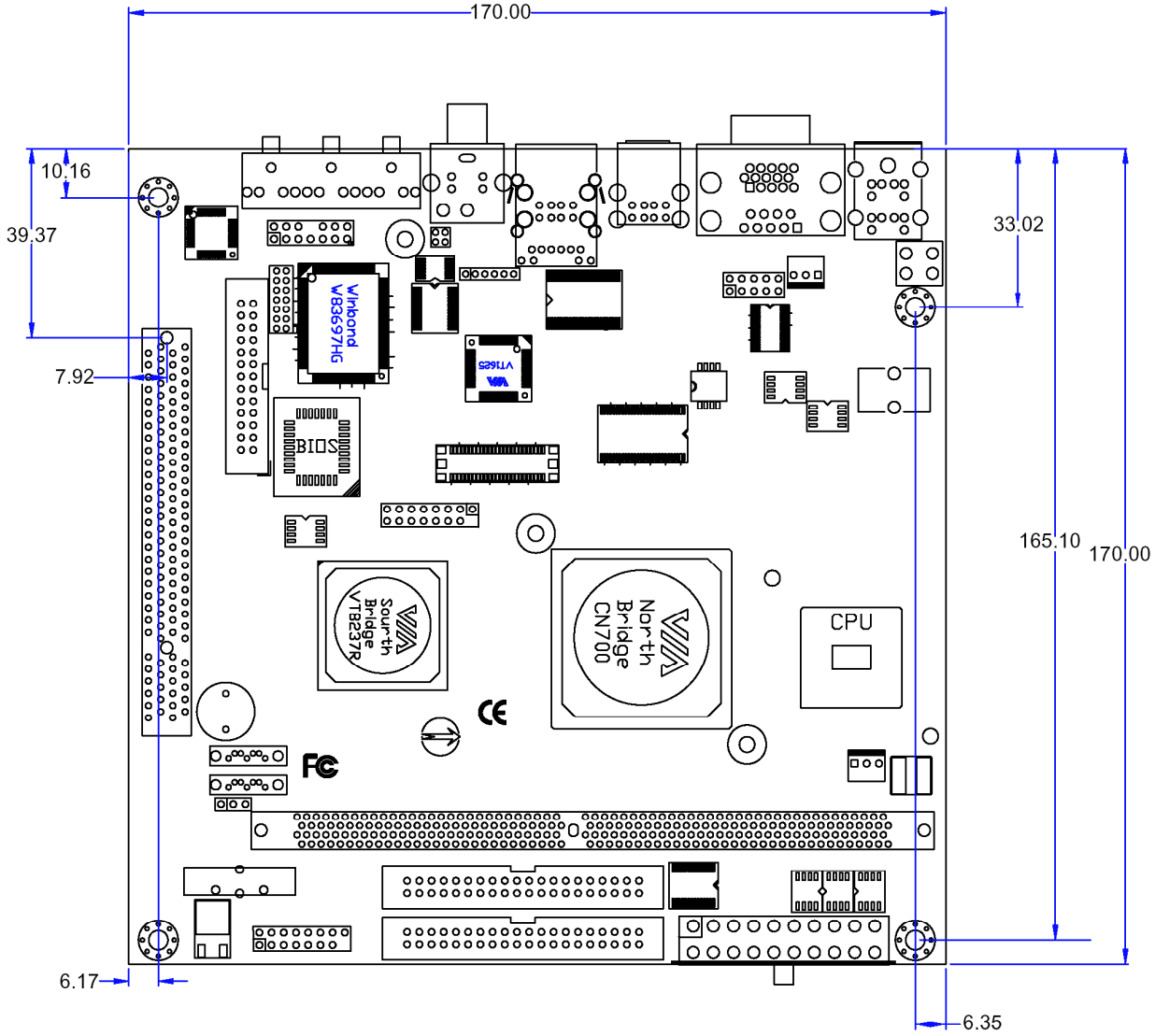
# VIA EPIA CN-Series I/O Back Panel Layout

The EPIA CN's ultra compact 17cm x 17cm, integrated design supports all the standard legacy x86 connectivity options as well as PS2 Mouse port, PS2 Keyboard port, VGA port, COM port, RJ45 LAN port, USB 2.0 ports, RCA port, S-Video port and AC'97 audio jacks.

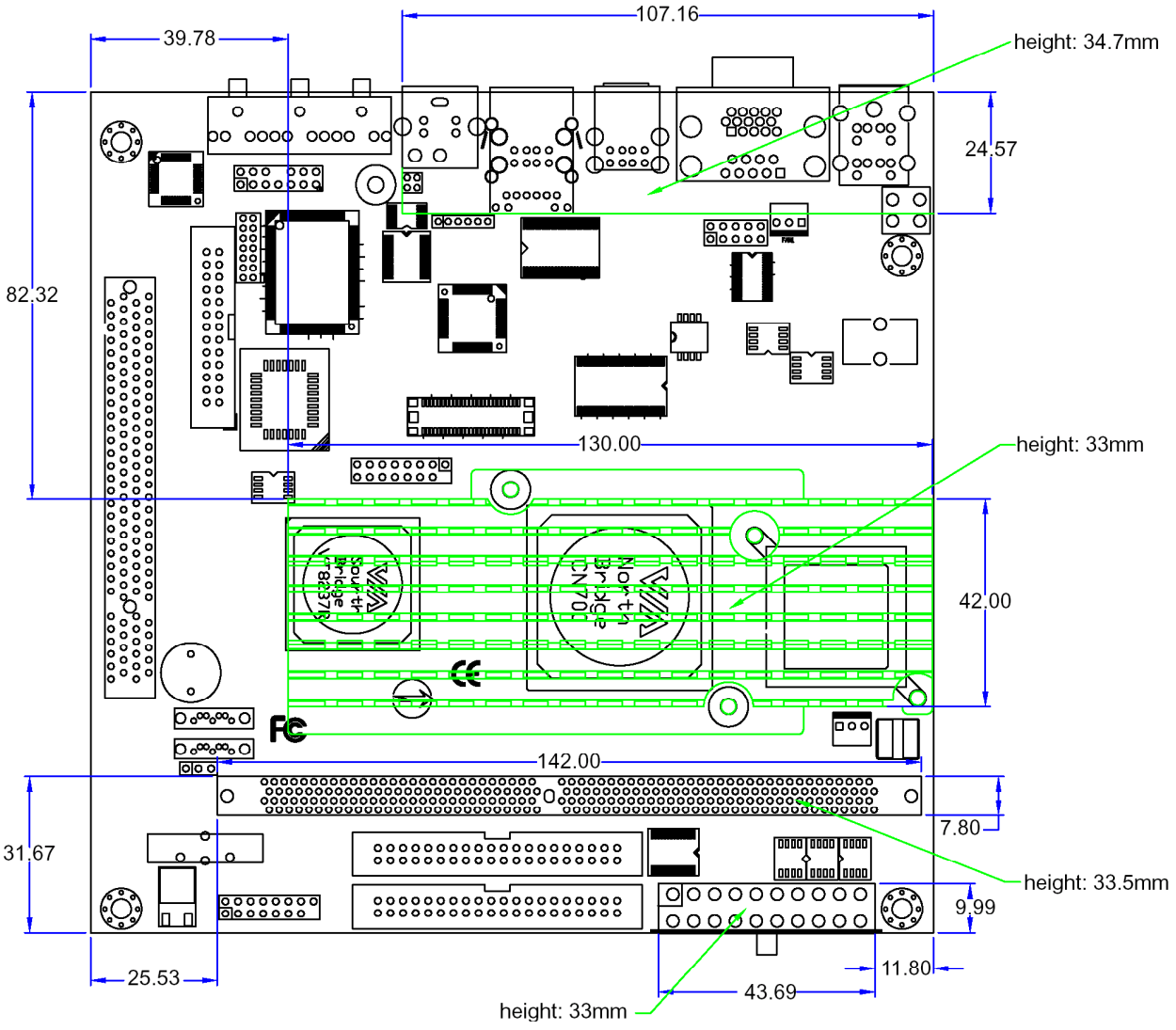


# VIA EPIA CN-Series Layout Diagram & Mounting Holes



# VIA EPIA CN-Series Layout Diagram & Height Distribution




Else, height under 21mm

# Power Consumption

Power consumption tests were carried out comparing the VIA EPIA CN10000E (running with the 1.0GHz VIA C7™ V4 Bus NanoBGA2 processor) and the VIA EPIA CN13000 (running with the 1.3GHz VIA C7™ V4 Bus NanoBGA2 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 CN10000E

**A. Run 3DMark2003**

| | Measured Voltage | Measured Amp. | Watts |
|---|---|---|---|
| Main Board +3.3V | 3.300 | 0.740 | 2.442 |
| Main Board +5V | 5.000 | 1.960 | 9.800 |
| Main Board 5VSB | 5.020 | 0.120 | 0.602 |
| Main Board +12V | 11.900 | 0.000 | 0.000 |
| **Main Board Power Consumption** | | | 12.844 |

**B. Run Pass Mark**

| | Measured Voltage | Measured Amp. | Watts |
|---|---|---|---|
| Main Board +3.3V | 3.280 | 0.800 | 2.624 |
| Main Board +5V | 5.060 | 1.410 | 7.135 |
| Main Board 5VSB | 5.040 | 0.110 | 0.554 |
| Main Board +12V | 11.700 | 0.000 | 0.000 |
| **Main Board Power Consumption** | | | 10.313 |

**C. Idle**

| | Measured Voltage | Measured Amp. | Watts |
|---|---|---|---|
| Main Board +3.3V | 3.320 | 0.740 | 2.457 |
| Main Board +5V | 5.040 | 1.180 | 5.947 |
| Main Board 5VSB | 5.040 | 0.110 | 0.554 |
| Main Board +12V | 11.700 | 0.030 | 0.351 |
| **Main Board Power Consumption** | | | 9.309 |

**D. Run C.C. Winstone 2004**

| | Measured Voltage | Measured Amp. | Watts |
|---|---|---|---|
| Main Board +3.3V | 3.320 | 0.760 | 2.523 |
| Main Board +5V | 5.000 | 2.180 | 10.900 |
| Main Board 5VSB | 5.080 | 0.110 | 0.559 |
| Main Board +12V | 11.900 | 0.000 | 0.000 |
| **Main Board Power Consumption** | | | 13.982 |

**E.**

| | Measured Voltage | Measured Amp. | Watts |
|---|---|---|---|
| Main Board +3.3V | 3.380 | 0.750 | 2.535 |
| Main Board +5V | 5.040 | 2.000 | 10.080 |
| Main Board 5VSB | 5.020 | 0.110 | 0.552 |
| Main Board +12V | 11.800 | 0.000 | 0.000 |
| **Main Board Power Consumption** | | | 13.167 |

**F. Run Samsung A.P.**

| | Measured Voltage | Measured Amp. | Watts |
|---|---|---|---|
| Main Board +3.3V | 3.320 | 0.760 | 2.523 |
| Main Board +5V | 5.000 | 2.010 | 10.050 |
| Main Board 5VSB | 5.080 | 0.110 | 0.559 |
| Main Board +12V | 11.700 | 0.000 | 0.000 |
| **Main Board Power Consumption** | | | 13.132 |

## VIA EPIA CN13000

**A. Playing DVD – Power DVD 4.0**

| | Measured Voltage | Measured Amp. | Watts |
|---|---|---|---|
| Main Board +3.3V | 3.340 | 0.830 | 2.772 |
| Main Board +5V | 5.000 | 2.060 | 10.300 |
| Main Board 5VSB | 5.000 | 0.080 | 0.400 |
| Main Board +12V | 12.100 | 0.330 | 3.993 |
| **Main Board Power Consumption** | | | 17.465 |

**B. Run 3DMark2001**

| | Measured Voltage | Measured Amp. | Watts |
|---|---|---|---|
| Main Board +3.3V | 3.340 | 0.790 | 2.639 |
| Main Board +5V | 5.020 | 2.510 | 12.600 |
| Main Board 5VSB | 5.060 | 0.080 | 0.405 |
| Main Board +12V | 12.130 | 0.050 | 0.607 |
| **Main Board Power Consumption** | | | 16.250 |

**C. Run Pass Mark**

| | Measured Voltage | Measured Amp. | Watts |
|---|---|---|---|
| Main Board +3.3V | 3.340 | 0.800 | 2.672 |
| Main Board +5V | 5.020 | 2.060 | 10.341 |
| Main Board 5VSB | 5.080 | 0.070 | 0.356 |
| Main Board +12V | 12.050 | 0.330 | 3.977 |
| **Main Board Power Consumption** | | | 17.345 |

**D. Idle**

| | Measured Voltage | Measured Amp. | Watts |
|---|---|---|---|
| Main Board +3.3V | 3.340 | 0.790 | 2.639 |
| Main Board +5V | 5.040 | 1.600 | 8.064 |
| Main Board 5VSB | 5.080 | 0.090 | 0.457 |
| Main Board +12V | 12.110 | 0.300 | 3.633 |
| **Main Board Power Consumption** | | | 14.793 |

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

| | Measured Voltage | Measured Amp. | Watts |
|---|---|---|---|
| Main Board +3.3V | 3.340 | 0.810 | 2.705 |
| Main Board +5V | 5.100 | 2.760 | 14.076 |
| Main Board 5VSB | 5.060 | 0.070 | 0.354 |
| Main Board +12V | 12.100 | 0.030 | 0.363 |
| **Main Board Power Consumption** | | | 17.499 |

**F. Run Max98**

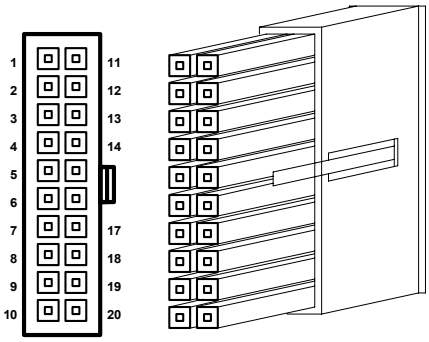
| | Measured Voltage | Measured Amp. | Watts |
|---|---|---|---|
| Main Board +3.3V | 3.340 | 0.780 | 2.605 |
| Main Board +5V | 5.020 | 2.790 | 14.006 |
| Main Board 5VSB | 5.060 | 0.090 | 0.455 |
| Main Board +12V | 12.310 | 0.050 | 0.616 |
| **Main Board Power Consumption** | | | 17.682 |

**G. Run Samsung A.P.**

| | Measured Voltage | Measured Amp. | Watts |
|---|---|---|---|
| Main Board +3.3V | 3.340 | 0.790 | 2.639 |
| Main Board +5V | 4.980 | 3.790 | 18.874 |
| Main Board 5VSB | 5.080 | 0.080 | 0.406 |
| Main Board +12V | 12.100 | 0.310 | 3.751 |
| **Main Board Power Consumption** | | | 25.670 |

## Power Specifications

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

## Microsoft Driver Support

VIA EPIA CN 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.

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.

## Linux Driver Support

VIA EPIA CN 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 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

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

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