



# conga-B945

COM Express / Intel® Core™ 2 Duo / Dual Channel Memory



**COM Express**

### ■ High End

The conga-B945 features many processors up to the latest Intel® Core™ 2 Duo 2x 2.16 GHz with 4 MByte shared cache. It offers a rich feature set including 5x1 PCI Express and 1x16 PCI Express Graphic lanes.

### ■ Dual Channel Memory

Thanks to the two DRAM sockets, the conga-B945 provides maximum memory performance. Graphics based applications that utilize the onboard graphics interface (with UMA) achieve much better performance when in dual channel memory configuration.

### ■ Gigabit Ethernet

The conga-B945 features Gigabit Ethernet via the COM Express connectors to enable fast communication links.

### ■ Lead-free Design (RoHS)

As of July 2006, all electronic products are required to be environmentally friendly. All congatec AG products fulfill these requirements.

### ■ Mass Storage

Two serial ATA® drives can be connected as fast mass storage devices. High performance RAID 0 and RAID 1 levels are supported. In order to support economical and robust CompactFlash cards, parallel ATA is also available.

### ■ Connectivity

Thanks to the 8x **USB 2.0**, 2x **SATA®**, 5x PCI Express Lanes, PCI Express Graphic (PEG), **PCI**, **I²C**,... the conga-B945 offers more connectivity than most other computer modules.

### ■ Graphics Efficiency

The integrated Intel® Graphics Media Accelerator 950 features the latest 3D, 2D and video capabilities. It supports up to 224 MByte frame buffer using Dynamic Video Memory Technology (DVMT). With EPI support the conga-B945 automatically recognizes almost every available flat panel display and sets all parameters accordingly. Additional displays can be connected using the analog VGA interface or the DVO port. TV-Out is also supported.

### ■ Sound

conga-B945 can utilize several high definition audio (HDA) codecs. This allows for the easy implementation of telephone and audio applications that require the highest sound quality and numerous channels.

### ■ Security

The conga-B945 can be equipped optionally with a "Trusted Platform Module" (TPM). This TPM includes coprocessors to calculate efficient hash- and RSA-algorithms with key lengths up to 2,048 bits as well as a real random number generator. Security sensitive applications like gaming and ecommerce will benefit also with improved authentication, integrity and confidence levels.

### ■ Software and Driver Support

congatec offers advanced Board-Support-Packages for the conga-B945, which include both the latest tested drivers from silicon vendors and the congatec specific drivers for accessing all of our additional embedded BIOS features. This will help our customers reduce their time-to-market.

### ■ Embedded BIOS Features

The conga-B945 is equipped with the congatec Embedded BIOS and supports the following features:

- ACPI Power Management
- ACPI Battery Support
- Supports Customer Specific CMOS Defaults
- Multistage Watchdog
- User Data Storage
- Manufacturing Data and Board Information
- OEM Splash Screen
- Flat Panel Auto Detection
- BIOS Setup Data Backup
- Fast Mode I²C Bus
- Headless Operation

### ■ Design-In Support

congatec support begins with your product idea and philosophy and continues throughout the series phase all the way up to the next product generation. This commitment to support helps our customers keep system development costs low and speeds up time-to-market.

### ■ System Integration

An important factor for each system integration is the thermal design. The heatspreader is a thermal coupling interface that makes fanless and rugged solutions possible.

## Technical Data

## PRELIMINARY

| conga-B945                       |  |
|----------------------------------|--|
| <b>Formfactor</b>                | COM Express Basic, (95 x 125 mm), Type II Connector Layout   |
| <b>CPU</b>                       | Intel® Core™ 2 Duo T7400, 2.16 GHz, (4M cache, 667 MHz FSB, 65nm), Socket mPGA479M<br>Intel® Core™ 2 Duo L7400 LV, 1.5 GHz, (4M cache, 667 MHz FSB, 65nm)<br>Intel® Core™ Duo T2500, 2.0 GHz, (2M cache, 667 MHz FSB, 65nm), Socket mPGA479M<br>Intel® Core™ Duo L2400 LV, 1.66 GHz, (2M cache, 667 MHz FSB, 65nm)<br>Intel® Core™ Duo U2500 ULV, 1.2 GHz, (2M cache, 533 MHz FSB, 65nm)<br>Intel® Celeron® M440, 1.86 GHz, (1M cache, 533 MHz FSB, 65nm)<br>Intel® Celeron® M423 ULV, 1.06 GHz, (1M cache, 533 MHz FSB, 65nm) |
| <b>DRAM</b>                      | 2 Sockets, SO-DIMM DDR2 667 up to 4 GByte physical memory  |
| <b>Chipset</b>                   | Graphics & Memory Controller Hub: Intel® 945GM I/O Controller Hub: Intel® 82801GHM (ICH7M-DH)  |
| <b>Ethernet</b>                  | Gigabit Ethernet, Marvell 88E8056  |
| <b>I/O Interfaces</b>            | 5x PCI Express® Lanes, PCI Express Graphic (PEG x16), 2x Serial ATA® (AHCI) supporting RAID 0 and RAID 1, 1x EIDE (UDMA-66/100), 2x Express Card® (uses 2x USB & 2x PCI Express), 8x USB 2.0 (EHCI), PCI Bus 33 MHz Rev. 2.3, LPC Bus, I²C (Fast Mode, 400 kHz, Multi Master)  |
| <b>Sound</b>                     | AC'97 Rev.2.2 Compatible, Digital High Definition Audio Interface, with support for multiple Codecs  |
| <b>Graphic Interface</b>         | Enhanced 256 Bit 3D Video Controller, Intel® Graphics Media Accelerator 950, Up to 10.6 GB/sec memory bandwidth, 256-bit graphics core, max. 224 MByte 64 Bit Video RAM (DVMT 3.0), Dynamic Display Modes for flat-panel, wide-screen and Digital TV support   |
| Full Dual View                   | With two independent Pipelines   |
| Motion Video Support             | High Definition Hardware Motion Compensation to support high definition hi-bitrate MPEG2 media playback, Up and Down Scaling of Video Content, High Definition Content Decode, HDTV (1080i/p) Support  |
| Flat panel Interface             | 130 MHz LVDS Transmitter, Supports all 1x18, 2x18, 1x24, 2x24 Bit, VESA- and openLDI-Mappings, Resolutions 640x480 up to 1920x1200, Automatic Panel Detection via EPI, (Embedded Panel Interface, based on VESA EDID™ 1.3)   |
| CRT Interface                    | 400 MHz RAMDAC, Resolutions up to 2048x1536 @ 75 Hz, including 1920x1080 @ >85 Hz (HDTV)   |
| AUX Output                       | 2x SDVO (shared with PEG x16 pins)   |
| TV Out                           | Onboard TV encoder, supports HDTV (420p, 720p and 1080i), supports component and s-video   |
| <b>congatec Board Controller</b> | Multi Stage Watchdog, Non-volatile User Data Storage, Manufacturing and Board information, Board Statistics, BIOS Setup Data Backup, I²C (Fast Mode, 400 kHz, Multi Master)  |
| <b>Embedded BIOS Features</b>    | OEM Logo, OEM CMOS Defaults, LCD Control, (Auto Detection, Backlight Control), Flash Update, Based on AMIBIOS8®  |
| <b>Security (optional)</b>       | TPM 1.2/TCPA Security Functions, tor Hash, RSA, Keys and Random Numbers  |
| <b>Power Management</b>          | ACPI 2.0 with Battery support  |
| <b>Operating Systems</b>         | Microsoft® Windows® Vista, XP, 2000, Microsoft® Windows® XP embedded, Microsoft® Windows® CE 5.0 and 6.0, Windriver VxWorks, LINUX, QNX  |
| <b>Power Consumption</b>         | Typ. application: 10.5 W@12V, (1.66 GHz Core Duo), see manual for full details, CMOS Battery Backup  |
| <b>Temperature</b>               | Operating: 0 .. +60°C Storage: -20 .. +80°C  |
| <b>Humidity</b>                  | Operating: 10 - 90% r. H. non cond. Storage: 5 - 95% r. H. non cond.   |
| <b>Size</b>                      | 95 x 125 mm² (3.74" x 4.92")   |



© 2006 congatec AG. All rights reserved.

conga, congatec and XTX™ are registered trademarks of congatec AG. Intel and Pentium are registered trademarks of the Intel corporation. Express Card is a registered trademark of the Personal Computer Memory Card International Association (PCMCIA). PCI express is a registered trademark of the Peripheral Component Interconnect Special Interest Group (PCISIG). CompactFlash is a registered trademark of the Compact Flash Association. Winbond is a registered trademark of the Winbond Electronics corps. AVR is a registered trademark of the Atmel corporation. ETX is a registered trademark of Kontron Embedded Modules GmbH. AMICORE8 is a registered trademark of American Megatrends inc. Microsoft®, Windows®, Windows NT®, Windows CE and Windows XP® are registered trademarks of Microsoft corporation. VxWorks is a registered trademark of WindRiver. All product names and logos are property of the respective manufacturers.

All data is for information purposes only. Although all the information contained within this document is carefully checked no guarantee of correctness is implied or expressed.

# 6-060904

