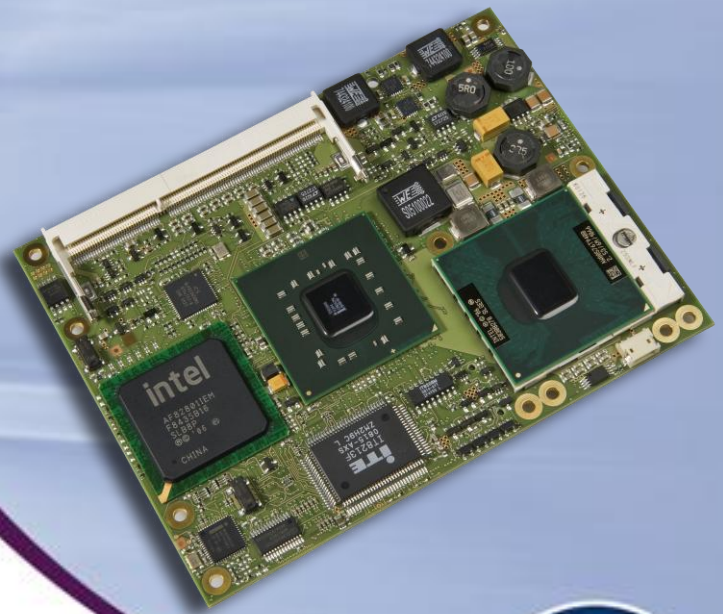


# Product Sheet



## COM Express™ Family

### Intel® Core™ 2 Duo Basic

**COM Express™**, an open specification of the PICMG (PCI Industrial Computer Manufacturer Group), is a module concept to bring PCI Express and other latest technologies like SATA, USB 2.0 and LVDS on a COM (Computer On Module).

COM Express is plugged onto an application-specific base board similar to the ETX concept, but offers more options and a growth path to future CPU technologies. Utilizing different sizes, COM Express can be used for highly embedded solutions up to high performance platforms.

The design of the **MSC CXB-GM45** module is based on Intel's 45nm dual core CPU technology enabling you to boost your embedded application to highest performance levels.

#### Features

- Intel® Celeron 575 (2.00GHz), Intel® Core™ 2 Duo T9400 (2,53GHz) Intel® Core™ 2 Duo P8400 (2,26GHz)
- Intel® GM45 Chipset (GL40 with Celeron processors) with integrated Mobile Intel® Graphics Media Accelerator 4500MHD and Intel® Clear Video Technology
- PCI Express™ x16 (PEG) support
- Up to 2x 4GB DDR3 SDRAM, dual channel
- Four SATA-300 mass storage interfaces
- One Enhanced IDE port
- 10/100/1000 Base-TX Ethernet interface
- LVDS interface (24 Bit, dual channel)
- CRT interface

Different Core 2 Duo and Celeron processors are supported by this design. Besides an extensive set of interfaces and features, the **MSC CXB-GM45** offers hardware and BIOS based security compliant to the requirements of TCG (Trusted Computing Group).

The widely adopted "basic" form factor together with standard voltage processor models and dual channel DDR3 memory allow powerful system designs at reasonable costs for various embedded or industrial applications.

For evaluation and design-in of the COM Express™ modules we provide evaluation baseboards and develop motherboards providing the interface infrastructure for the COM Express™ module offering PC type connectors for external access.

Special starter kits for Linux are available on request.

- Resolution up to 2.048 x 1.536
- Dual Independent Display supported
- Five PCI Express™ x1 lanes
- Eight USB 2.0 interfaces
- HD audio interface
- Infineon TPM 1.2
- Phoenix SecureCore BIOS
- System monitoring, watchdog
- ACPI power management
- Fully COM Express™ Type 2 compliant
- "Basic" form factor (125 x 95 mm)
- Windows Vista, XP (embedded) and Linux supported

Product description	Order numbers
Intel® Core™ 2 Duo T9400 (soldered), GM45, 10/100/1000Base-TX, TPM 1.2	MSC CXB-GM45-T9400-1100
Intel® Core™ 2 Duo P8400 (PGA, socketed), GM45, 10/100/1000Base-TX, TPM 1.2	MSC CXB-GM45-P8400-1101
Intel® Celeron 575 (PGA, socketed), GL40, 10/100/1000Base-TX, TPM 1.2	MSC CXB-GL40-575-1101

## Technical Data – MSC CXB-GM45/-GL40

### Core Logic, Memory

**CPU:** Intel® Celeron 575 (2.00GHz, 1MB L2 cache, 31W TDP),  
Core™ 2 Duo P8400 (2.26GHz, 3MB L2 cache, 25W TDP)  
Core™ 2 Duo T9400 (2.53GHz, 6MB L2 cache, 35W TDP)

**Intel® Technologies:** AMT 4.0, Intel® 64,  
Intel® Virtualization Technology\*, VT-d Virtualized I/O Support\*,  
Intel® Trusted Execution Technology\*

**Chipset:** Intel® GM45, ICH9M or  
Intel® GL40, ICH9M (with Celeron models)

**Memory:** 2x 204-pin SO-DIMM socket for up to 8GB DDR3 SDRAM  
(DDR667/800/1066 ); dual channel operation

### Drives

**SATA:** 4x SATA-2 channels (up to 300MB/s)

**PATA:** 1x Enhanced IDE port (ATA/UDMA166)

### Standard Interfaces

**USB:** 8x USB 2.0

### Bus Interfaces

**COM Express™:** Type 2 interface, fully compliant

**PCI Express™:** Six channels PCI Express x1 (one channel reserved  
for Gbit Ethernet), one PCI Express Graphics (PEG) x 16

**PCI Bus:** 32 Bit, 33MHz standard interface (PCI 2.3)

**LPC:** Low Pin Count bus for legacy interfaces

### Flat Panel / CRT Interface

**Graphics Controller:** Mobile Intel® Graphics Media Accelerator  
4500MHD and Intel® Clear Video Technology (integrated in Intel®  
GM45/GL40), DirectX 10 and OpenGL 2.0 supported

**Video Memory:** UMA, up to 384MB

**LCD Interface:** LVDS 18/24 Bit, dual channel

**CRT Interface:** Resolution up to 2048 x 1536

### Miscellaneous

**Watchdog Timer:** Initiates system reset, (programmable, 0.4s ...  
10min)

**Fan Supply:** 3-pin header (12V), fan speed control

**Battery:** External

**System Monitoring:** Voltage, Temperature, CPU Fan

\* not on Celeron 575 model

### LAN Interface

**Ethernet:** 10/100/1000Base-TX (integrated in Intel® GS45 chipset)

### Sound Interface

HD audio

### Security Device

Infineon Trusted Platform Module

### Bios

Phoenix SecureCore

**Boot Options:** Quick Boot, MultiBoot XP (HD, CD, LAN, USB), Boot  
without keyboard, LAN Boot via PXE (RPL optional), Wake on LAN  
supported

**Security:** TPM 1.2 support, MSeC Secure Boot Technology

**Power Management:** ACPI (S3, S4, S5 supported), Enhanced Intel  
SpeedStep® technology\*, CPU fan control

**USB:** USB legacy support (keyboard, mouse, storage)

**Video Setup:** Video BIOS with flat panel extensions (EPI), CMOS  
configuration

**HW Programming I/F:** UspEpc (Universal board support package for  
embedded PCs)

### Power Supply

**Power:** Power +12V +/-10%, 5V Stby optional

**Power Consumption:** 35W (typ.) up to 50 W (typ.)

### Environment

**Ambient:** 0° ... 60°C (operating)

**Temperature:** -25° ... 85°C (storage)

**Humidity:** 5 ... 95% (operating, non-condensing),  
5 ... 95% (storage, non-condensing)

### Mechanical

**Dimensions:** 125mm x 95mm x13mm

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