

# MODCOM 450

## Dual-Core Intel® Core™ 2 Duo Processor CPU Board

For Windows, Linux, and Real-time operating systems

- COM Express CPU module
- Dual-Core processor
- Passive cooling

→ advanced

### III Main Features

- Dual-Core Intel Core 2 Duo processor COM Express CPU board
- Computer-On-Module COM Express
- Up to 4 GB DDR memory on two DIMM modules
- 10/100/1000 Mbps network interface, attached to PCI-X
- Two x8 and one x4 PCI Express interfaces
- PCI 32-bit/33-MHz
- On-board graphics up to 1280\*1024
- COM Express format with PCI and PCI Express interfaces
- USB 2.0, SATA, IDE interfaces

### III Technical Details

The EUROCOM 450 is a Dual-Core Intel Core 2 Duo -based single board computer on a COM Express board for compact industrial real-time systems. The board is based on the Intel chip set E7520 (Lindenhurst) for Xeon systems, which is on Intel’s Embedded Program for long-lifetime products. The COM module contains all of a CPU’s logic, user-specific I/O can be implemented on an easy-to-do carrier board.

### III CPU

A Dual-Core Intel Core 2 Duo processor (Merom 667) is supported; this Dual-Core is the successor of the Core Duo CPU. CPU clocks between 1.5 and 2.16 GHz are supported. The CPU has FPU, MMU, first level cache (32kB each for instruction and data) and a L2 cache (4 MB unified) on the chip. Each of the two cores contains dual integer units that can operate in parallel for certain instructions. Special care has been taken to achieve a low power consumption and a good relationship between clock and computing performance: the new CPUs do not increase clock speeds while increasing power consumption;

instead, they use a parallel implementation with relatively low consumption. The second-level cache, due to its location in the CPU itself, runs with the full CPU clock.

The Core 2 Duo CPU supports VT virtualization as well as 64 bit functionality.

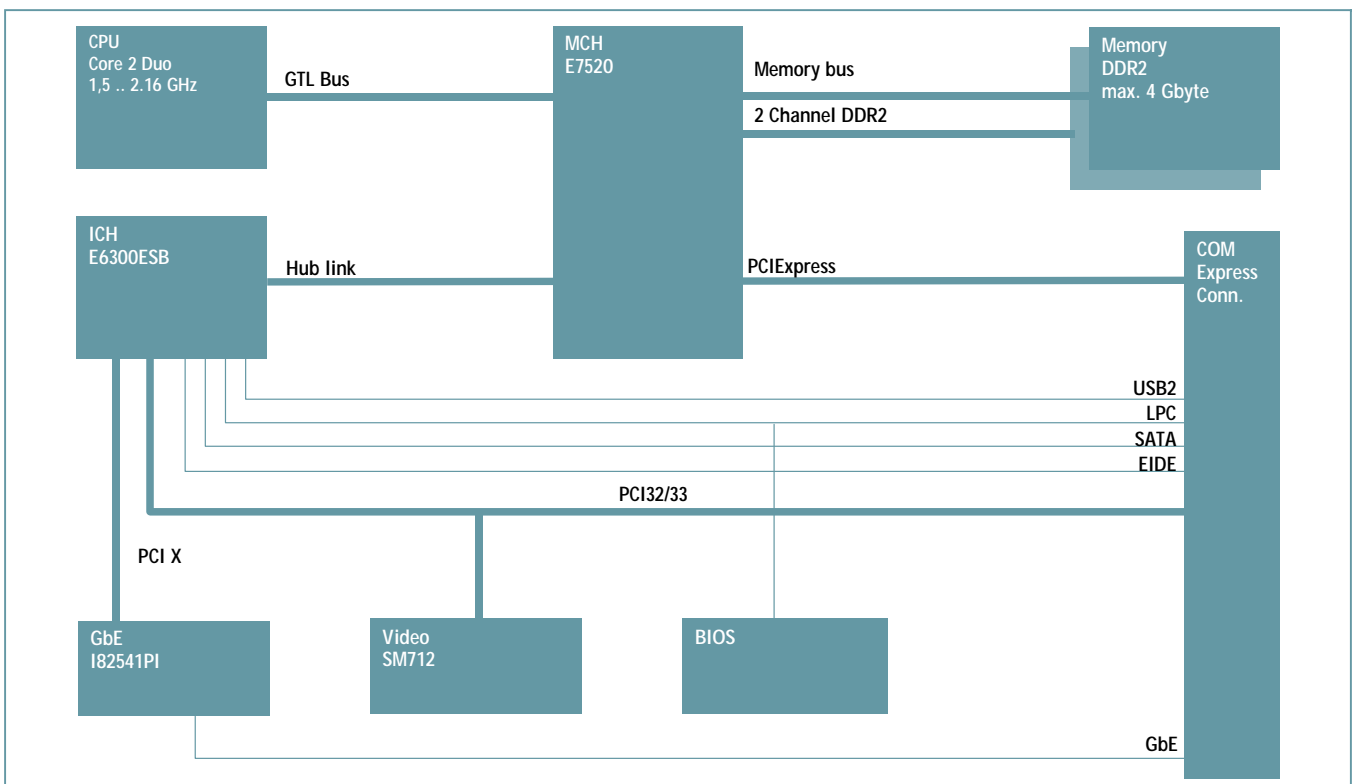
CPU	Core 2 Duo	Core 2 Duo LV
CPU speed	2.16 GHz	1.5 GHz
L1 cache (Instr/Data)	32/32 kB	32/32 kB
L2 cache	4 MB on-chip, shared	4 MB on-chip, shared
Bus speed (FSB)	667 MHz	667 MHz
CPU core	dual	dual
VT virtualization support	x	x
EM64T 64 bit support	x	x
Speed step	x	x
Power consumption	34 W	17 W

### III Memory Configuration

The 64-bit wide memory allows configurations of up to 4 GBytes with DDR2-400 RAMs in two DIMM modules, error detection and single-bit error correction is supported. The DIMMs must be registered and with ECC.

### III Chip Set

The chip set, an Intel E7520, contains the DDR2 RAM memory controller with ECC, the interrupt controller, three 8-lane (x8) PCI Express ports and the PCI host bridge for 32-bit/33-MHz PCI, as well as for PCI-X. Additionally, it has logic to access an 8-bit ROM, it has timers, a DMA controller, and it generates clocks.



### III Graphics

The on-board graphics controller is a PCI-based chip (SM 712); it has 4 MB internal graphics memory. Maximum display resolution (typ.) is 1280 \* 1024 \* 60 Hz @32 bit/pixel. The maximum guaranteed resolution is 1024 \* 768.

Resolution	Fps (frames per second)
800 x 600	60, 75, 85
1024 x 768	60, 75, 85
1280 x 1024	60

### III Boot PROM

Boot code is stored in a Flash EPROM (size 1024 kB) which enables easy code updates. The boot proms contains the BIOS, supplied by AMI with PXE net boot.

### III Ethernet Interface

The network interface uses a PCI-X-based Ethernet controller i82541 PI for 10/100/1000 Mbps transfers with 10BaseT (twisted pair) or 100/1000Base TX connectivity.

Automatic speed detection is included. A Link Signal and an Activity Signal allow a connection of LEDs for an easy first check if the Ethernet connection works.

### III COM Express Interface

The COM Express interface is implemented as type 2. The COM Express interface uses the signals: two x8 PCI Express, one x4 PCIe, one x1 PCIe, PCI

33/32, VGA, one Ethernet port, IDE (1\*), serial ATA (2\*), four USB 2.0.

### III Timer

The EUROCOM 450 has three standard PC programmable timers for timing interrupts in the 1 us to 1000 ms range.

### III Operating Systems

As a Xeon-based CPU board with a complete BIOS, the EUROCOM 450 can of course be run under Windows 2000 and XP.

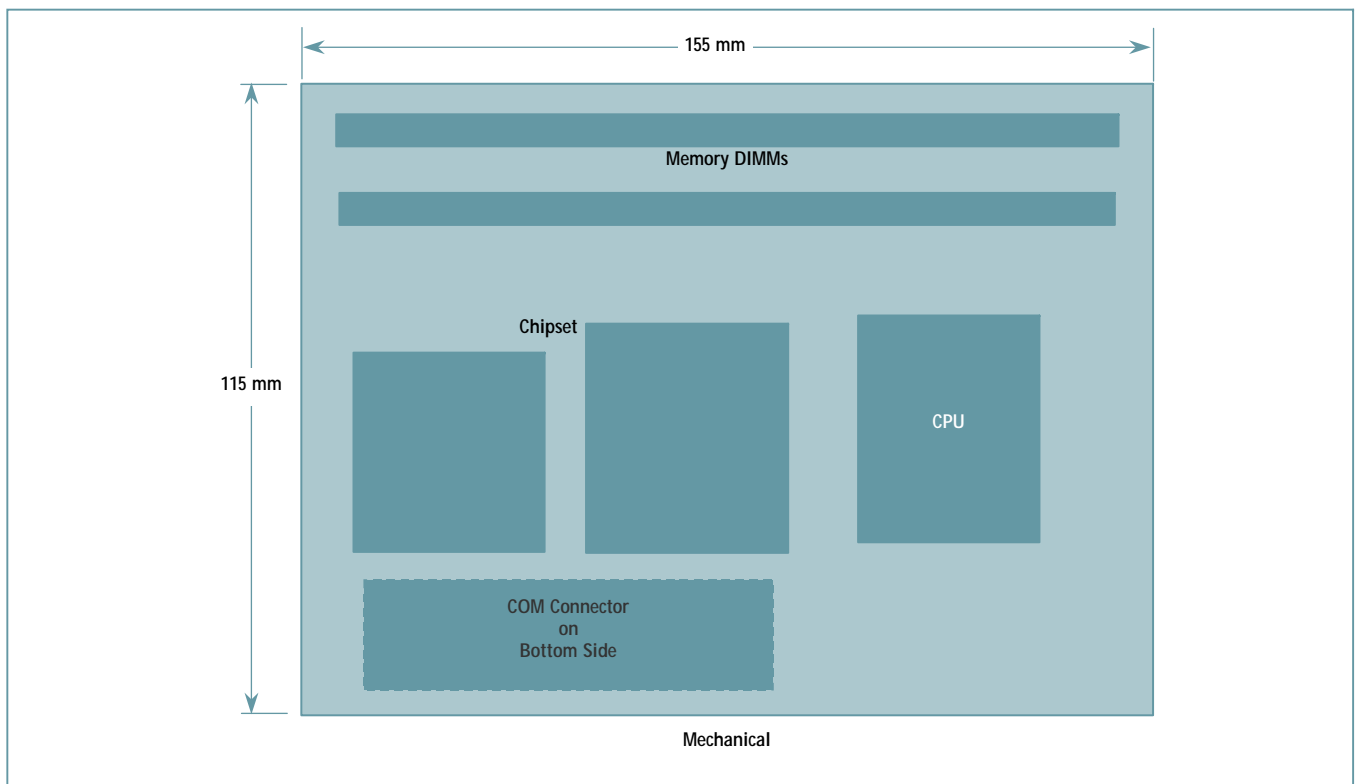
Compliant with the ELTEC Linux Initiative, the EUROCOM 450 additionally supports implementations of Standard and Embedded Linux - applications for all operating systems can be designed under Linux. Linux is best when a full operating system is needed. Embedded Linux is for embedded applications with the smallest footprint.

### III Carrier Board

The EUROCOM 450 COM module needs a carrier board for I/O connectivity. ELTEC supplies a standard carrier board with all I/O signal routed to the appropriate connectors: LAN, VGA, USB, sATA, IDE, as well as PCI and PCI Express slots. This board can be used for evaluation or for deployment.

### III Industry-grade Case

As an option, the EUROCOM 450 can be ordered in an industrial-grade case. This case has a motherboard-style carrier with three free PCI-Express x 8 Slots and two free PCI slots; it has a power supply with sufficient cooling fans for the EUROCOM 450 and the peripheral boards.



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### III Specifications

Extended form factor

12 V operation

Type 2 connector

Passive cooling of CPU (t.b.d.).

### III Environmental Conditions

Storage Temperature: -40 °C – 70 °C, at 10% - 100% non-condensing

Operating Temperature: 0 °C – 55 °C (2 m/s forced air cooling). This temperature is measured on the air intake of the PC case

Maximum Operating Humidity: 85 % relative

### III Power Requirements (CPU board only)

7 A max. 5.0 A typ. at + 12 VDC ± 5 %

### III MTBF Values

T.b.d. hrs (computed after MIL HDBK-217F) t.b.d. hrs (realistic value from industry stand experience)

### III Connectors

COM Express connector, type 2

### III Regulatory

CE: EN50082-2, EN50081-1, EN55011

### III Documentation

Hardware / Software – free / internet

Please contact your local sales office for detailed information.

