

# Thunderbird-GM45

Mini-ITX Single Board Computer  
Intel® Core™ 2 Duo Processor

## Features

Intel Core 2 Duo with GM45 chipset

Max. 4 GB DDR2 RAM

Integrated graphics controller

DVI, 1600 x 1200 pixels

LVDS, 24/18 bits, 1600 x 1200 pixels

Gigabit LAN

11x USB 2.0

4 x SATA

Adaptive-I/O™ Interface

LEMT management functions

Low power consumption

Opt. ext. temperature range -40°C...+85°C



 Adaptive-I/O™

The next generation Thunderbird-GM45 is built around the latest generation of Intel CPU's and chipsets, the Intel Core 2 Duo. This Mini-ITX board is equipped with the familiar standard interfaces. It utilizes the Intel GM45 chipset, which comes with an integrated graphics controller and uses DVI-I and LVDS for the display connection. The Mini-ITX board features four SATA adapters, a Gigabit LAN interface, and 11 USB 2.0 host ports. The chipset supports up to 4 GB DDR2 RAM.

In addition to the standard interfaces listed above, the Thunderbird-GM45 comes with an Adaptive-I/O™ connector, which allow to combine the basic Mini-ITX board with application specific I/O interfaces. Using an Adaptive-I/O board instead of a garden-variety PCI card allows to build mechanically stable systems. Because of the sturdy connector and the possibility to fix the I/O card with screws to the Mini-ITX board, very robust assemblies can be built.

The Thunderbird-GM45 features the LiPPERT Enhanced Management Technology, (LEMT) based on an integrated system management controller (SMC). It handles the power sequencing, several other management tasks, and provides a protected flash area for miscellaneous user information.

LiPPERT is an independent design house and manufacturer that develops and builds special customer solutions. Please ask for a specific quotation.



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**LiPPERT**  
THE EMBEDDED PC COMPANY

# Thunderbird-GM45

Mini-ITX Single Board Computer  
Intel® Core™ 2 Duo Processor

## Technical Data

**Board Format** Mini-ITX, 170 mm x 170 mm

**Processor** Intel Core 2 Duo T9400  
Intel Core 2 Duo L7500

**CPU Speed** 2.53 MHz

**Core Logic** Mobile Intel GM45

**FSB Clock** 1066 MHz

**RAM (max.)** 4 GB DDR2 DIMM  
(667 / 800MHz)

**Graphics** GMA X4500  
up to 384 MB video memory

**DVI** 1600 x 1200 pixels

**LVDS** Dual/single channel, 18 and 24 bits  
1600 x 1200 pixel at 60 Hz max.

**USB** 11 x USB 2.0 host ports  
- 4 external standard USB  
connectors  
- 7 internal ports

**LAN** 1000/100/10 MBit Ethernet  
with Intel® 82567

**SATA** 4 host adapters

**Watchdog** Yes (LEMT)

**uDiskOnChip** 2x pin header with USB available

**Status LED** HDD, power, standby, power mode,  
live, 2x Ethernet, watchdog,  
mini PCI express

**PCI Express** 1 Mini-PCI Express slot  
(MiniCard)

**PCI Bus** Standard PCI slot

**RTC Backup** Integrated Lithium battery

**Power Supply** 12V ±5 % from ATX connector  
All necessary voltages are generated  
on-board.

**Power Consumption** 15W typical  
< 40W maximum

**Cooling** Either an active cooler or a suitable  
passive cooling solution is required.

**Operating temperature** -20 °C ... +60 °C (industrial)  
-40 °C ... +85 °C (extended, optional)

**MTBF** 143.737 hours at 25 °C

**BIOS** Phoenix FirstBIOS  
BIOS settings are saved in Flash

**System Support Functions** LiPPERT Enhanced Management  
Technology LEMT

**Remote Management** Intel AMT  
(Advanced Management Technology)

**Supported OS** Windows XP, XP Embedded,  
Windows CE, Linux, QNX

 **Adaptive-IO™**

**Board Format** 165 x 68 mm

**Connector** Samtec QTH-060-01-F-D-A

**Interfaces**

- 4 x PCI Express x1 lanes or  
1 PCIe x4 lane
- 4 x USB 2.0
- SDVO
- HD audio
- Low Pin Count bus (LPC)
- System Management Bus (SMB)
- Control signals



## Ordering Information

Ordering Number	Description
805-0008-10	Mini-ITX CPU board with Intel 2 Core Duo T9400 (2.53GHz) Includes support CD.
805-0013-10	Mini-ITX CPU board with Intel 2 Core Duo L7500 (1.6 GHz). Processor soldered down, passively cooled. Includes support CD.

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