

# Thunderbird/MM (Multimedia)

Mini-ITX board with Intel® Pentium® M  
1.4/1.6/1.8 GHz

## Features

Intel® Pentium® M processor 7xx

Digital media interfaces: DVI-I/DVO, S/PDIF

Dual channel LVDS

S-Video output

FireWire (IEEE 1394)

1 GB DDR-SDRAM

High performance 3D graphics controller

SXGA: 2048 x 1536 pixel

Fast Ethernet 100/10 BaseT

6 x USB 2.0

Passive cooling possible



### More Features

- Sound I/O AC97 compatible
- Watchdog  
(software configurable)
- Flash BIOS
- Battery buffered RTC
- 1 x 3.3 V PCI slot  
(V2.2 compliant)
- 1 Mini-PCI slot  
(V1.0 compliant)



The Thunderbird/MM is a compact, highly integrated low-power single board computer on a Mini-ITX sized board. It belongs to LiPPERT's family of Thunderbird computers, the appendix "MM" indicates its intended multi-media usage. The integrated DVI-I/DVO video interfaces and S/PDIF audio channels make it especially well suited for multimedia applications. Two FireWire ports allow fast and easy connection to cameras and other multimedia devices.

The core of the board is the Intel® Pentium® M processor 7xx running at up to 1.8 GHz, with higher speeds being possible as new processors become available. The accompanying 82855GME chipset features a high performance 3D graphics controller with Intel® Extreme Graphics-2, supporting dual independent displays. The integrated display controller comes with up to 64 MByte improved UMA VRAM and handles up to 2048 x 1536 pixels. Long distance yet interference-free display connections can be achieved using the dual channel LVDS interface.

The Thunderbird/MM comes with floppy, PS/2 keyboard and mouse, 2 x RS232C, Ultra ATA 100 EIDE and IrDA interface on-board. A Fast Ethernet port (100/10 BaseT) provides the network connectivity. Six independent USB 2.0 ports and AC-97 Sound I/O are also integrated. A mini-PCI slot is available for system expansion that can hold all types of mini-PCI modules, for instance wireless LAN interfaces. LiPPERT also offers a range of specialized Mini-PCI modules as well as adapter modules for the DVO ports. See our website for available types.

The on-board DIMM socket can hold up to 1 GB RAM.

The Thunderbird/MM with the 1.4 GHz processor works with a +5V-only supply and is available for operation in the extended temperature range from -40°C to +85°C.

Both Windows and Linux operating systems are supported.

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

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1.4/1.6/1.8 GHz

## Technical Specifications

<b>Board Format</b>	Mini-ITX, 170 mm x 170 mm	<b>Ethernet</b>	1 x 100/10 BaseT with i82801DB
<b>Processor</b>	Intel® Pentium® M processor 7xx	<b>Keyboard, Mouse</b>	PS/2 or USB
<b>Speed</b>	1.4 / 1.6 / 1.8 GHz	<b>IDE</b>	4 independent drives Primary and Secondary ports Ultra ATA 100/66/33 Mbyte/s, PIO modes
<b>FSB</b>	400+ MHz	<b>Sound I/O</b>	6 channel AC97 2.2, 18 bit full duplex S/PDIF interface, optical
<b>Core logic</b>	i82855 GME i82801 DB (ICH4) Super I/O: NSC PC87364	<b>RTC Backup</b>	Battery on board
<b>RAM (max.)</b>	1024 Mbyte DDR SDRAM (PC2700) One slot available (ECC is supported)	<b>Watchdog</b>	Software configurable, 1s ... 255 minutes
<b>RAM clock</b>	200 / 266 / 333 MHz	<b>Power Consumption (maximum)</b>	1.4 GHz: ~19 W (with +5 V-only supply) 1.6 GHz: ~30 W 1.8 GHz: ~34 W
<b>Graphics</b>	Integrated i82855 graphics controller 1600 x 1200 at 85 Hz 2048 x 1536 at 75 Hz	<b>Operating temperature</b>	Standard: -20°C ... +60°C Extended: -40°C ... +85°C available for the 1.4 GHz version
<b>CRT</b>	Analog VGA (on DVI-I connector)	<b>MTBF</b>	> 100.000 h at 30 °C (t.b.d.)
<b>DVI-I</b>	up to 165 Megapixel/second	<b>Cooling</b>	Passive cooling possible
<b>DVO</b>	2 ports at 165 MHz pixel clock each	<b>Status LED</b>	Power, Ethernet, IDE
<b>LVDS</b>	Dual channel 18-Bit interface for displays	<b>PCI Bus</b>	1 x Standard PCI slot, 3.3V V2.2 compliant 1 x Mini-PCI slot, V1.0 compliant, type IIIA
<b>S-Video</b>	TV output with TV connection detection	<b>Power Supply</b>	ATX. A +5 V only supply can be used optionally. All necessary voltages are generated on-board.
<b>Floppy</b>	up to 2.88 Mbyte	<b>BIOS</b>	Phoenix FirstBIOS. The BIOS parameters are also saved in FEPROM
<b>Serial</b>	2 x RS232C with hardware handshake	<b>Supported OS</b>	Windows® XP, Windows® XPE, Windows® CE, Linux®
<b>Infrared</b>	IrDA (SIR, Consumer IR) with TTL level to connect an external infrared transmitter		
<b>USB</b>	6 x USB 2.0		
<b>FireWire</b>	2 x IEEE1394		

## Ordering Information

Ordering Number	Description
805-0003-11	Mini-ITX board with socketed 1.8 GHz Pentium® M 745, max. 1GB DDR-RAM, 6xUSB 2.0, DVI-I/DVO, t-Video, IrDA, RTC, Battery, FDC, 2xIDE, 2xCOM, PS/2 keyboard and mouse, watchdog, PCI slot, miniPCI slot, Ethernet, 2xIEEE1394, LVDS, AC97 sound, S/PDIF, ATX power connector
805-0003-10	Like 805-0003-11 but with 1.6 GHz Pentium® M
805-0004-10	Like 805-0003-10 but with soldered 1.4 GHz Pentium® M 738, passive cooler and 5 volt single voltage supply

**Note:** t denotes the temperature range. Substitute with **8** for standard and **9** for extended temperature range

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