Express-MG

COM Express® Module with Intel® Core™2 Duo Processor and GM45 / ICH9M Chipset



Features

- Intel® Core™2 Duo processor (up to 2.53 GHz)
- Intel® GM45 and ICH9M chipset
- Dual SODIMM for up to 8 GB DDR3 at 1066 MHz
- Five PCIe x1, one PCIe x16 for graphics (or general purpose x8, x4 or x1)
- Single/dual channel 18/24-bit LVDS and TV-out (SDTV and HDTV)
- SATA 3 Gb/s, IDE (PATA), Gigabit LAN, USB 2.0

Specifications

Core System

CPU	**Socket P**
	Intel® Core™2 Duo T9400, FSB 1067, 2.53 GHz with 6-MByte L2 cache, 35 Watt
	Intel® Core™2 Duo P8400, FSB 1067, 2.26 GHz with 3-MByte L2 cache, 25 Watt
	Intel® Dual Celeron® M T3100, FSB 800, 1.90 GHz with 1-MByte L2 cache, 35 Watt
	Intel® Celeron® M 575, FSB 667, 2.00 GHz with 1-MByte L2 cache, 31 Watt
Memory	Two SODIMM sockets (one on top, one on bottom) supporting dual channel memory, up to 8 GB of non-ECC, 800/1067 MHz DDR3
Chipset	Intel® GM45 Express Graphics Memory Controller Hub and Intel® I/O Controller Hub 82801IEM (ICH9M-E)
L2 Cache	1 MB (Celeron® M), 6/3 MB (Core™2 Duo)
BIOS	AMIBIOS®8 with CMOS backup in 16 Mbit SPI flash
Hardware Monitor	Supply voltages and CPU temperature
Watchdog Timer	Programmable timer ranges to generate RESET
Expansion Busses	Graphics PCI Express x16 bus or SDVO/HDMI/DisplayPort or general purpose PCI Express (x8/x4/x1)
	6 PCI Express x1: Lanes 0/1/2/3/4 are free, lane 5 is occupied by GbE LAN; lanes 0/1/2/3 x1 can be optionally configure as 1 x4
	32-bit PCI: PCI Rev. 2.3 at 33MHz, supporting 4 bus masters
	LPC bus, SMBus (system), I²C (user)

Video

Chipset	GM45 GMCH integrated Mobile Intel® Graphics Media Accelerator X4500 with core render clock 533-MHz @ 1.05 Vcore
Integrated Video	Intel® Dynamic Video Memory Technology (Intel® DVMT 5.0)
Feature Support	Video capture via x1 concurrent PCI Express port
	PAVP (Protected Audio-Video Path) support for Protected Intel® HD Audio Playback
	High performance MPEG-2 decoding
	WMV9 (VC-1) and H.264 (AVC) support
	Hardware acceleration for MPEG2 VLD/iDCT
	Microsoft DirectX 10 support
	OpenGL 2.1 support
	Blu-ray support @ 40 Mb/s
	Hardware motion compensation
	Intermediate Z in classic rendering
VGA Interface	Analog VGA support by 300-MHz DAC
	Analog monitor support up to QXGA and support for VGA hot plug
LVDS Interface	Single / Dual channel 18- or 24-bit panels
TV-out	NSTC/PAL up to 1024x768 resolution supported HDTV 480p/720p/1080i/1080p modes supported (without Macrovision)

Audio

Chipset	Integrated on Intel® I/O Controller Hub 9 Mobile (ICH9M)
Audio Codec	On Express-BASE carrier (ALC888)
HDMI	Audio routed to HDMI interface

LAN

Chipset	Integrated on ICH9M with Intel 82567LM PHY
Interface	10/100/1000 Mbps Ethernet

Multi I/O

Chipset	Integrated on Intel® I/O Controller Hub 9 Mobile (ICH9M)
USB	Supports up to eight ports USB v. 2.0
SATA	Four ports SATA 3 Gb/s with optional support for RAID 0,1,5,10
PATA	SATA to PATA JM330 controller on SATA channel 3, Master only (can be removed to free up fourth SATA channel)

Super I/O

	Connected to LPC bus on carrier if needed

TPM

Chipset	Infineon SLB9635TT1.2 (optional)
Type	TPM 1.2

Power Specifications

Input Power	AT mode (12 V +/- 5%) and ATX mode (12 V and 5 Vsb +/- 5%)
Power States	Supports S0, S1, S3, S4, S5
Power Consumption	23 W (with Core™2 Duo P8400 at 2.26 GHz and 2 GB memory, typical)
Smart Battery Support	Yes

Mechanical and Environmental

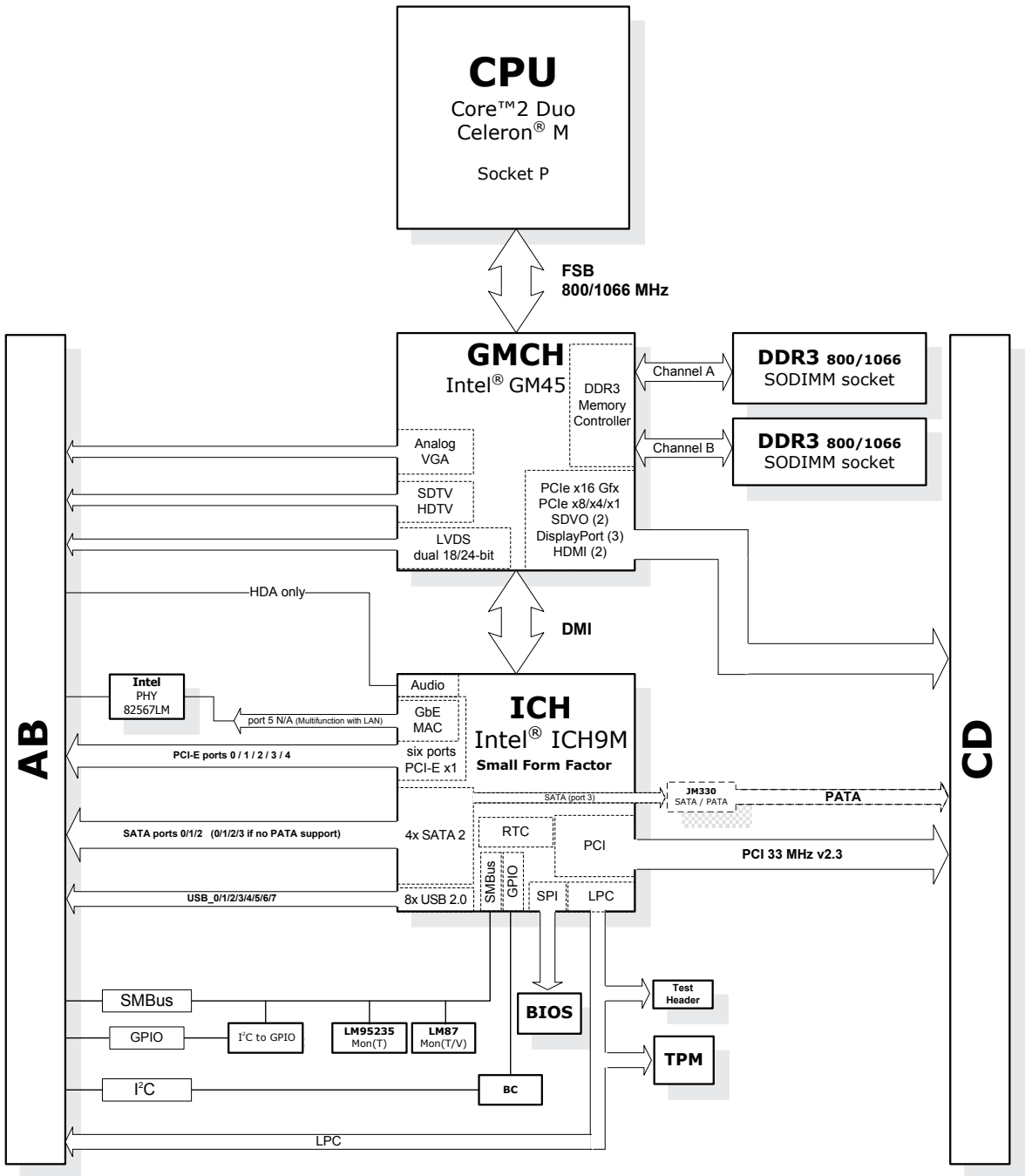
Operating Temp	0°C to 60°C
Storage Temp	-20°C to 80°C
Humidity	90% at 60°C
Shock	15G peak-to-peak, 11ms duration, non-operation
Vibration	Non-operating: 1.88 Grms, 5-500 Hz, each axis
	Operating: 0.5 Grms, 5-500 Hz, each axis
Compatibility	COM Express® Type 2, Basic form factor 125 mm x 95 mm
Certification	CE, FCC

Operating Systems

Standard Support	Windows® XP(e) / Vista / Windows® 7
	Linux®
Extended Support (BSP)	Embedded XP support package
	Linux® 2.6.x BSP (with Xorg OpenGL setup instructions)
	VxWorks 6.x BSP (on request)
	AIDI Library for Windows® and Linux®

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Functional Diagram



Ordering Information

Modules

Model Number	Description/Configuration
Express-MG-S	COM Express® Module with socket type for Intel® Core™2 Duo processor with GM45 and ICH9M chipset
Express-MG-S/T9400	COM Express® Module with socket type Intel® Core™2 Duo processor T9400 at 2.53 GHz
Express-MG-S/P8400	COM Express® Module with socket type Intel® Core™2 Duo processor P8400 at 2.26 GHz
Express-MG-S/T3100	COM Express® Module with socket type Intel® Dual Core Celeron® processor T3100 at 1.90 GHz
Express-MG-S / 575	COM Express® Module with socket type Intel® Celeron® processor 575 at 2.00 GHz

Accessories

Model Number	Description/Configuration
Heat Spreaders	
HTS-MG-S	Heatspreader for Express-MG (socket CPU) with threaded standoffs
Passive Heatsinks	
THS-MG-S	Low Profile Heatsink for Express-MG (socket CPU) with threaded standoffs
Heatsink with Active Cooling	
THSF-MG-S	High Performance Heatsink with FAN for Express-MG (socket CPU) with threaded standoffs

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