

### 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	<b>Socket P</b> 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), I <sup>2</sup> C (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
CRT Interface	Analog CRT support by 300-MHz DAC Analog monitor support up to QXGA and support for CRT 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 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
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

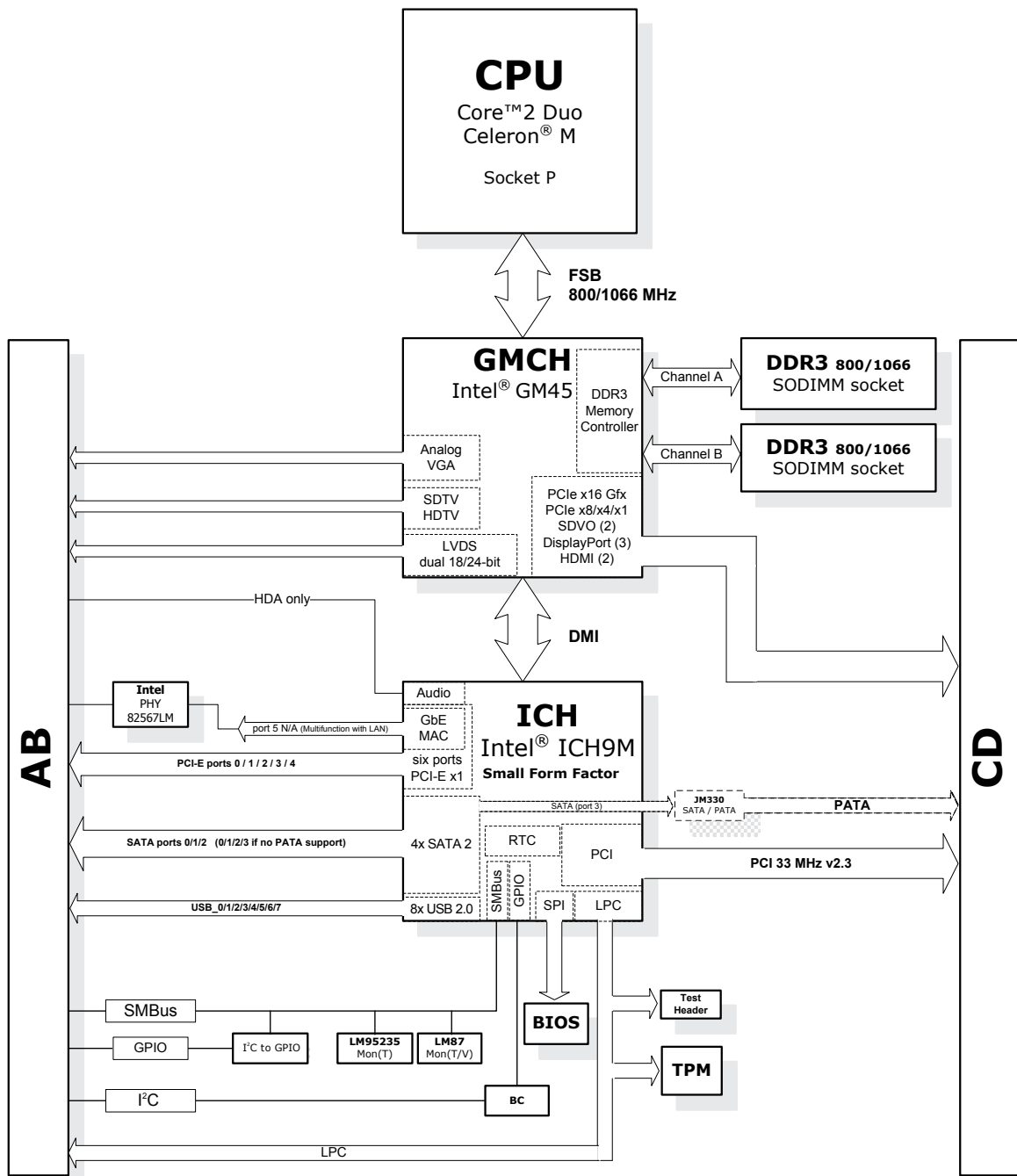
#### Mechanical and Environmental

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®

## 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
<b>Heat Spreaders</b>	
HTS-MG-S	Heatspreader for Express-MG (socket CPU) with threaded standoffs
<b>Passive Heatsinks</b>	
THS-MG-S	Low Profile Heatsink for Express-MG (socket CPU) with threaded standoffs
<b>Heatsink with Active Cooling</b>	
THSF-MG-S	High Performance Heatsink with FAN for Express-MG (socket CPU) with threaded standoffs