



COM 
Express

ADLINK
We Know COM Express

| Focus on your Core Competency

A Computer-On-Module (COM) provides a convenient solution for OEMs that need computing functionality but are not interested in investing the time and resources into designing a single board computer. There are several COM standards, one of the more popular being COM Express (also referred to as COM.0). COM Express modules contain the CPU, memory, common peripherals (USB, SATA) and an I/O interface (PCI and PCI Express). OEMs that use COM Express modules design a carrier board that contains any required I/O interfaces not found on the COM Express module as well as connectors for external I/O. A COM based solution allows an OEM to focus on their core competency and not the design and maintenance of a single board computer.

A COM Express based solution with a custom carrier board offers several advantages:

- The carrier can contain more rugged types of connectors for external I/O. It is not limited to traditional connectors such as USB, Ethernet, and video.
- The carrier can contain value added silicon such as FPGAs or other types of peripherals. Placing these devices on the carrier eliminates the need for traditional PCI Express or PCI expansion cards and the mechanics associated with them.
- The CPU function is decoupled from the I/O so that different processors can be used for different applications, ranging from low power and cost Atom™ based compute modules to Core™ i7 or other high performance multicore processor modules.
- The design and maintenance of the compute module no longer becomes a task for the OEM.
- The use of industry standard modules brings with it availability from multiple vendors which provides alternative solutions.

| The COM Express Standard – Adaptable to Your Specific Needs

COM Express was developed and is maintained by PICMG (PCI Industrial Computer Manufacturers Group). COM Express was released in the summer of 2005 and is the most widely used COM standard. The standard defines the physical size, interconnect, and thermal interface for a COM. The original COM Express specification was written to support peripherals that were available at the time of release – including USB 2.0, SATA, PATA, Ethernet, VGA, LVDS, SDVO, PCI, and PCI Express Gen 1. Several pinout types were defined by PICMG with each one having a specific combination of peripherals, expansion interfaces and connector layout. The most widely used COM Express module is a type 2, followed by type 1. The table on the following page shows the features for modules defined in revision 1 of the COM Express specification.

| COM.0 Rev. 2.0 – Future Proof

In 2009, PICMG formed a subcommittee to update the COM Express specification based on the changes in peripherals used in modern systems. This included support for Super Speed USB 3.0, PCI Express Gen 2 signaling, as well as additional video interfaces such as DVI, HDMI and DisplayPort. The spec update created two new types to support the I/O changes: type 6 and 10. Backwards compatibility with existing type 2 and 1 modules was a main objective of the specification update.

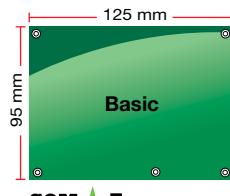
COM Express pinout types and supported features

Types	PCI Express Lanes	PEG/SDVO	PCI	IDE Ports	SATA Ports	LAN Ports	USB 2.0 / USB 3.0	Display Interfaces
Type 1 AB connector	Up to 6	-	-	-	4	1	8 / 0	VGA, LVDS
Type 2 AB/CD connectors	Up to 22	1/2	32-bit	1	4	1	8 / 0	VGA, LVDS, PEG/SDVO
Type 3 AB/CD connectors	Up to 22	1/2	32-bit	-	4	3	8 / 0	VGA, LVDS, PEG/SDVO
Type 6 AB/CD connectors	Up to 24	1/NA	-	-	4	1	8 / 4	VGA, LVDS, PEG, 3x DDI
Type 10 AB connector	Up to 4	-/1	-	-	2	1	8 / 0	1x DDI

Rev. 1 Pinouts Rev. 2 Pinouts

The Right Size for the Right Job

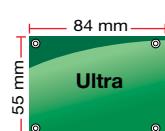
The COM Express specification also defines three module sizes: the Compact Module, Basic Module and the Extended Module. A fourth “Ultra” size module supporting only type 1 and type 10 pinouts has been presented to PICMG for inclusion in a future release of the specification.



Basic 125 x 95
Type 2/6 compatible pinout



Compact 95 x 95
Type 2/6 compatible pinout



Ultra 84 x 55
Type 1/10 compatible pinout

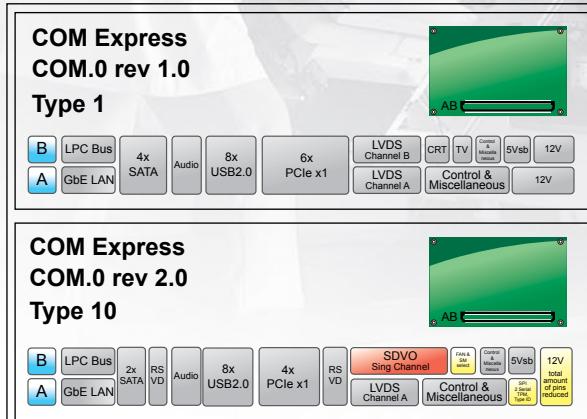
ADLINK – We Know COM Express

Although many companies develop COM Express modules, most are not actively involved in the development of the COM Express specification. In contrast, ADLINK has heavily invested in the development and maintenance of the PICMG COM Express specification over the years. ADLINK recently chaired the PICMG subcommittee that was tasked with defining the specification update known as COM Express COM.0 Revision 2.0. As a leading participant in the creation of the specification, ADLINK is in a unique position to influence its direction. By doing so, ADLINK has a deep understanding of the meaning and intention of the specification and applies this knowledge in the design of our COM Express products.

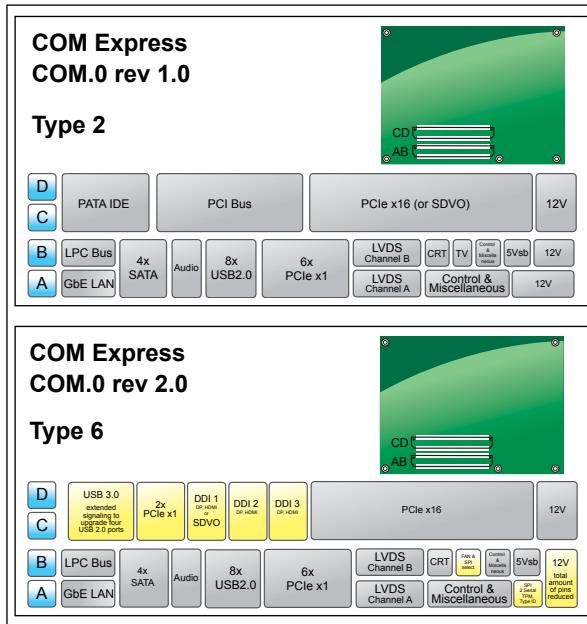
New with COM.0 Rev. 2.0 – Type 6 and Type 10 Pinouts

The release of COM Express™ COM.0 Revision 2.0 brings Computer-on-Modules in line with current and future technology trends by providing for the latest graphics interfaces (DisplayPort/DVI/HDMI), PCI Express Gen 2, and SuperSpeed USB 3.0. The new Type 6 pinout is based on the popular Type 2 pinout, but with legacy functions replaced by Digital Display Interfaces (DDI), additional PCI Express lanes, and reserved pins for future technologies. The new Type 10 pinout is based on the Type 1 pinout with only the A-B connector that is used in the “Ultra” form factor. The Type 10 pinout provides additional flexibility for developers by freeing up pins reserved for SATA and PCIe for future technologies and using the second LVDS channel, VGA and TV-out pins to support SDVO (via DDI). Both of the new Type 6 and Type 10 pinouts support the SPI Interface, which was unavailable in COM.0 Rev. 1.0.

COM Express Type 1 vs. Type 10 comparison



COM Express Type 2 vs. Type 6 comparison



COM Applications

DataComm	Gaming	Transport	Medical	Instrument
<ul style="list-style-type: none"> ▶ Routers ▶ Firewalls ▶ Filtering ▶ Storage 	<ul style="list-style-type: none"> ▶ Lobbies ▶ Slot Machines ▶ Game Consoles 	<ul style="list-style-type: none"> ▶ Board Computers ▶ Navigation ▶ GSM Stations ▶ Car Info Systems 	<ul style="list-style-type: none"> ▶ Information ▶ Support Systems ▶ Monitoring ▶ Mobile Computing 	<ul style="list-style-type: none"> ▶ Robotics ▶ Measurement ▶ Control ▶ Surveillance 
<ul style="list-style-type: none"> ● Gaming and Entertainment ● Medical Equipment ● Storage ● Communications 	<ul style="list-style-type: none"> ● Transport ● Government ● Retail and Advertising 		<ul style="list-style-type: none"> ● Industrial Automation ● Test and Measurement ● Consumer Devices 	

Embedded from A to Z

The Economics of Modularity

Reusability is key to protection of your investment. Computer-On-Module offer it all, from reusable design, scalability and fast time to the market to a lower total cost of ownership.



Green because we care

We provide lead-free designs not only to satisfy future regulatory standards but also to reflect our real concern about the environment – an environment that has to be shared by all of us. Proof of ADLINK's commitment is with ISO-14001 certification. ISO-14001, the international environmental management standard is a voluntary initiative aimed at improving company environmental performance.

Expertise for Carrier Board Design Support

With product divisions that are front runners in fields such as: Data Acquisition, Test and Measurement, AdvancedTCA, CompactPCI and Video Surveillance, ADLINK can offer you a broad portfolio of technical knowledge to assist you in your application specific carrier board projects.

Firmware Support (BIOS)

Adding active components to the carrier boards usually requires a BIOS modification. We offer a whole team of BIOS engineers who can extend and tune the firmware on our boards to let them behave exactly the way you want. We use the AMIBIOS8® provides us with excellent embedded functions such as: custom logo, OEM CMOS defaults, flat panel control, serial port console redirection, CMOS backup and trusted core support.

Drivers and BSP

All modules come standard with BSP's for Windows CE, Windows XP Embedded, Linux, and VxWorks. Support for additional components on your application specific carrier board under the above operating systems can be developed on request.



Longevity is Designed in

ADLINK's COM modules represent an optimized Total Cost of Ownership. They have longevity designed in by only using components from the embedded roadmaps of strategic suppliers that are backed by value-added technical services such as life cycle management, revision control and end-of-life (EOL) support.

Manufacturing and Quality

ADLINK has its own SMT production line that supports the production of leadfree products. ADLINK has been ISO-9001 certified since Many 1999. ADLINK also adheres to 6 Sigma, a set of statistics and methods for improving everything a company does, from designing, manufacturing to service. By applying the rigorous practices of 6 Sigma, we've been approved by industry-leading partners, and achieved breakthroughs in quality performance to deliver better services to our customers.

Selection Guide

COM Express™



Basic (125 x 95 mm)			
Type 6	Type 2		
NEW	NEW		

CPU Type	Express-HR	Express-CB/CBE	Express-MV	Express-MG
CPU Type	Intel® Core™ i7/i5 (Sandy Bridge) up 2.53 GHz with 6 MB L3 cache	Intel® Core™ i7/i5/i3 (Arrandale) up 2.53 GHz with 4 MB L2 cache	Intel® Core™2 Duo (Penryn) up 2.26 GHz with 6 MB L2 cache	Intel® Core™2 Duo (Penryn) up 2.53 GHz with 6 MB L2 cache
CPU Package	BGA1288	BGA1288	BGA956	PGA478
CPU Models / Speeds	Core™ i7 (quad core): i7-2715QE; Core™ i7 (dual core): i7-2655LE, i7-2610UE, i5-2515E	Core™ i3/i5/i7 (Arrandale) i7-610E 620LE i5-520E i3-330E Celeron® M P4505	Celeron® M 722, 723 Core™2 Duo (Penryn) SP9300, SL9400, SL9380, SU9300	Celeron® M 575, T3100 (dual core) Core™2 Duo (Penryn) T9400, P8400
FSB Speed	1333/1066	1066/800	1066/800	1066/800
Main Chipset	Intel® PCH QM67	Intel® PCH QM57	Intel® GS45 with ICH9M (SFF)	Intel® GM45 with ICH9M
System Memory	16 GB (max), dual channel	8 GB (max), dual channel	8 GB (max), dual channel	8 GB (max), dual channel
Memory Type	DDR3 non ECC at 1333	DDR3 non ECC (CB) or ECC (CBE)	DDR3 at 1066/800/667	DDR3 at 1066/800/667
Soldered Memory	-	-	-	-
Socket Memory	Max 16 GB on two 200-pin SODIMM	Max 8 GB on two 200-pin SODIMM	Max 8 GB on two 200-pin SODIMM	Max 8 GB on two 200-pin SODIMM
Cache (L2)	L2 depends on processor type 3MB, 4MB or 6MB	L2 depends on processor type 2MB, 3MB or 4MB	L2 depends on processor type 1MB, 3MB or 6MB	L2 depends on processor type 1MB, 3MB or 6MB
BIOS Type	AMI EFI, American Megatrend	AMI EFI, American Megatrend	AMIBIOS®8, American Megatrend	AMIBIOS®8, American Megatrend
BIOS Features	Serial Console redirection EEPROM CMOS backup, USB boot/legacy, PXE support	Serial Console redirection EEPROM CMOS backup, USB boot/legacy, PXE support	Serial Console redirection EEPROM CMOS backup, USB boot/legacy, PXE support	Serial Console redirection EEPROM CMOS backup, USB boot/legacy, PXE support
BIOS Flash	8 Mbit Flash SPI	8 Mbit Flash SPI	8 Mbit Flash SPI	8 Mbit Flash SPI
Graphics Controller	HD Graphics 3000	GMA HD with 12 execution units	Intel® GMA X4500 at 533/320 MHz	Intel® GMA X4500 at 533 MHz
Graphics Memory	Max 829 MB UMA	Max 829 MB UMA	Max 829 MB UMA	Max 829 MB UMA
Integrated Display Support	CRT (QXGA) single/dual 18/24-bit LVDS (UXGA) 3 DDI ports for HDMI/DVI/DP & SDVO	CRT (QXGA) single/dual 18/24-bit LVDS (UXGA)	CRT (QXGA) single/dual 18/24-bit LVDS (UXGA) TV-out (PAL/NTSC/HDTV)	CRT (QXGA) single/dual 18/24-bit LVDS (UXGA) TV-out (PAL/NTSC/HDTV)
External Graphics Bus	PCIe x16 Graphics port	PCIe x16 Graphics port	PCIe x16 Graphics port or SDVO port	PCIe x16 Graphics port or SDVO port
Compatibility	OpenGL 3.0, DirectX 10.1	OpenGL 2.1, DirectX 10	OpenGL 2.0, DirectX 10	OpenGL 2.0, DirectX 10
Parallel ATA (IDE)	one channel, one device	one channel, one device	one channel, one device	one channel, one device
Serial ATA	two SATA 3 Gb/s, two SATA 6 Gb/s	four SATA 3 Gb/s	three SATA 3 Gb/s	three SATA 3 Gb/s
Matrix Storage Support	Yes	Yes	optional	optional
Ethernet	integrated Intel GbE (10/100/1000)	integrated Intel GbE (10/100/1000)	integrated Intel® GbE (10/100/1000)	integrated Intel® GbE (10/100/1000)
USB	8 ports USB 2.0	8 ports USB 2.0	8 ports USB 2.0	8 ports USB 2.0
Audio	Intel® HD Audio	Intel® HD Audio	Intel® HD Audio	Intel® HD Audio
Watchdog	Yes	Yes	Yes	Yes
TPM	Yes, Ver. 1.2	Yes, Ver. 1.2	Yes, Ver. 1.2	Yes, Ver. 1.2
PCI Express Support	6x PCI-Express x1 (or 1x4) PCIe two x8, x4 or x1 (on PEG)	6x PCI-Express x1 (or 1x4) PCI-Express x8, x4 or x1 (on PEG)	5x PCI-Express x1 (or 1x4) PCI-Express x8, x4 or x1 (on PEG)	5x PCI-Express x1 (or 1x4) PCI-Express x8, x4 or x1 (on PEG)
PCI Suport	4x PCI rev. 2.3, 32-bit, 33MHz	4x PCI rev. 2.3, 32-bit, 33MHz	4x PCI rev. 2.3, 32-bit, 33MHz	4x PCI rev. 2.3, 32-bit, 33MHz
LPC Support	Yes	Yes	Yes	Yes
Management Bus	I²C, SMBus	I²C, SMBus	I²C, SMBus	I²C, SMBus
Power	12V only (AT), 12V and 5Vsb (ATX)	12V only (AT), 12V and 5Vsb (ATX)	12V only (AT), 12V and 5Vsb (ATX)	12V only (AT), 12V and 5Vsb (ATX)
Power States	S0 S1 S3 S4 S5	S0 S1 S3 S4 S5	S0, S1, S3, S4, S5	S0, S1, S3, S4, S5
Power Consumption	TBD	21 W with Core™ i7-620UE at 1.2 GHz and 2 GB memory typical	18 W with Core™ 2 Duo SU9300 at 1.2 GHz and 2 GB memory typical	23 W with Core™ 2 Duo P8400 at 2.26 GHz and 2 GB memory typical
Operating Temperature	0°C ~ +60°C	0°C ~ +60°C	0°C ~ +60°C	0°C ~ +60°C
Extended Temperature	TBD	selected modules: -20°C ~ +70°C	selected modules: -20°C ~ +70°C	-
Compatibility	PICMG COM.0 R2.0, Type 6	PICMG COM.0 R2.0, Type 2	PICMG® COM Express™ R1.0, Type 2	PICMG® COM Express™ R1.0, Type 2
Dimensions	Basic Form Factor (95x125 mm)	Basic Form Factor (95x125 mm)	Basic Form Factor (95x125 mm)	Basic Form Factor (95x125 mm)
Solid State Disk on Module	optional SATA SSD 4-16 GB	optional SATA SSD 4-16 GB	-	-
BSP & Software Support	Windows® XP/Xpe, Windows® 7 Linux® 2.6.x, ALDI library	Windows® XP/Xpe, Vista, Windows® 7 Linux® 2.6.x, ALDI library	Windows® XP/Xpe, Windows® Vista, Windows® 7, Windows® CE, Linux® 2.6.x, ALDI library	Windows® XP/Xpe, Windows® Vista, Windows® 7, Windows® CE, Linux® 2.6.x, ALDI library
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Selection Guide

COM Express™



Basic (125 x 95 mm)

Type 2



CPU Type	Express-MC800	Express-NR	Express-AT	Express-IA533
CPU Package	PPGA478 (socket-P) or PBGA479	μFC-PGA (socket-M) or μFC-BGA	μFC-BGA	μFC-PGA (socket) or μFC-BGA
CPU Models / Speeds	Celeron® M 550 (socket) Core™2 Duo (Merom) U7500, L7500 Core™2 Duo T7500 (socket)	Core™2 Duo M 423, 440/530 Core™2 Duo L7400, U7500, U2500 Core™2 Duo T7400 (socket)	Intel® Atom™ N270 at 1.6 GHz	Celeron® M: 600MHz up to 1.5GHz Pentium® M: 1.1GHz up to 2.0GHz
FSB Speed	800/667/533	667/533	533	533/400
Main Chipset	Intel® GME965 with ICH8M	Intel® 945GME with ICH7M	Intel® 945GSE with ICH7M	Intel® 915GM with ICH6-M
System Memory	4 GB (max), dual channel	4 GB (max), dual channel	2 GB (max), single channel	2 GB (max), dual channel
Memory Type	DDR2 at 667/533	DDR2 at 667/533	DDR2 at 533	DDR2 at 400/533
Soldered Memory	-	-	-	512MB soldered onboard
Socket Memory	Max 4 GB on two 200-pin SODIMM	Max 4 GB on two 200-pin SODIMM	Max 2 GB on single 200-pin SODIMM	Max 1 GB on 200-pin SODIMM
Cache (L2)	L2 depends on processor type 2MB or 4MB	L2 depends on processor type 1MB, 2MB or 4MB	L2 cache 512 KB	L2 depends on processor type 0KB, 512KB, 1MB or 2MB
BIOS Type	AMIBIOS®8, American Megatrend	AMIBIOS®8, American Megatrend	AMIBIOS®8, American Megatrend	Phoenix® Award
BIOS Features	Serial Console redirection EEPROM CMOS backup, USB boot/legacy, PXE support	Serial Console redirection EEPROM CMOS backup, USB boot/legacy, PXE support	Serial Console redirection EEPROM CMOS backup, USB boot/legacy, PXE support	Serial Console redirection EEPROM CMOS backup, USB boot/legacy, PXE support
BIOS Flash	8 Mbit Flash SPI	8 Mbit Flash SPI	8 Mbit Flash SPI	FWH, 4 Mbit Flash
Graphics Controller	Intel® GMA X3100	Intel® GMA 950	Intel® GMA 950	Intel® GMA 900
Graphics Memory	Max 384 MB UMA	Max 256 MB UMA	Max 256 MB UMA	Max 128 MB UMA
Integrated Display Support	CRT (QXGA) single/dual 18/24-bit LVDS (UXGA) TV-out (PAL/NTSC/HDTV)	CRT (QXGA) single/dual 18/24-bit LVDS (UXGA) TV-out (PAL/NTSC/HDTV)	CRT (QXGA) single/dual 18/24-bit LVDS (UXGA) TV-out (PAL/NTSC/HDTV)	CRT (QXGA) Dual channel 18-bit LVDS (UXGA) TV-out (PAL/NTSC/HDTV) optional
External Graphics Bus	PCIe x16 Graphics Port, or dual SDVO ports	PCIe x16 Graphics Port, or dual SDVO ports	Single SDVO port	PCIe x16 Graphics Port, or dual SDVO ports
Compatibility	OpenGL 2.0, DirectX 10	OpenGL 1.4, DirectX* 9.0c	OpenGL 1.4, DirectX* 9.0c	OpenGL 1.4, DirectX* 9.0
Parallel ATA (IDE)	one channel, two devices	one channel, two devices	one channel, two devices	one channel, two devices
Serial ATA	three SATA 3 Gb/s	two SATA 1.5 Gb/s	two SATA 1.5 Gb/s	two SATA 1.5 Gb/s
Matrix Storage Support	optional (ICH8EM)	optional (ICH7MDH)	-	-
Ethernet	integrated Intel® GbE (10/100/1000)	Intel® 82573 GbE Ethernet (10/100/1000)	Realtek RTL8111C GbE (10/100/1000)	Marvell Yukon GbE (10/100/1000)
USB	8 ports USB 2.0	8 ports USB 2.0	8 ports USB 2.0	6 ports USB 2.0
Audio	Intel® HD Audio	Intel® HD Audio and AC'97	Intel® HD Audio and AC'97	Intel® HD Audio and AC'97
Watchdog	Yes	Yes	Yes	Yes
TPM	Yes, Ver. 1.2	Yes, Ver. 1.2	Yes, Ver. 1.2	-
PCI Express Support	5x PCI-Express x1 (or 1x4) PCI-Express x8, x4 or x1 (on PEG)	5x PCI-Express x1 (or 1x4) PCI-Express x1 (on PEG)	3x PCI-Express x1 (optional 5 PCI Express x1)	3x PCI-Express x1 1x PCI-Express x1 (on PEG)
PCI Support	4x PCI rev. 2.3, 32-bit, 33MHz	4x PCI Ver. 2.3, 32-bit, 33MHz	4x PCI Ver. 2.3, 32-bit, 33MHz	4x PCI rev. 2.3, 32-bit, 33MHz
LPC Support	Yes	Yes	Yes	Yes
Management Bus	I²C, SMBus	I²C, SMBus	I²C, SMBus	I²C, SMBus
Power	12V only (AT), 12V and 5Vsb (ATX)	12V only (AT), 12V and 5Vsb (ATX)	12V only (AT), 12V and 5Vsb (ATX)	12V only (AT), 12V and 5Vsb (ATX)
Power States	S0, S1, S3, S4, S5	S0, S1, S3, S4, S5	S0, S1, S3, S4, S5	S0, S1, S3, S4, S5
Power Consumption	19 W with Core™2 Duo U7500 at 1.06 GHz and 2 GB memory typical	16 W with Core™2 Duo U7500 at 1.06 GHz and 1 GB memory typical	9 W with Atom® N270 at 1.6GHz and 1 GB DDR2 typical	12 W with Celeron® M 373 at 1.0 GHz and 512 MB DDR2 typical
Operating Temperature	0°C ~ +60°C	0°C ~ +60°C	0°C ~ +60°C	0°C ~ +60°C
Extended Temperature	-	selected modules: -20°C ~ +70°C	selected modules: -20°C ~ +70°C	-
Compatibility	PICMG® COM Express™ R1.0, Type 2	PICMG® COM Express™ R1.0, Type 2	PICMG® COM Express™ R1.0, Type 2	PICMG® COM Express™ R1.0, Type 2
Dimensions	Basic Form Factor (95x125 mm)	Basic Form Factor (95x125 mm)	Basic Form Factor (95x125 mm)	Basic Form Factor (95x125 mm)
Solid State Disk on Module	-	-	optional PATA SSD 512 MB up to 4 GB	-
BSP & Software Support	Windows® XP/Xp, Windows® Vista Linux® 2.6.x, ALDI library	Windows® XP/Xp, Windows® Vista Windows® CE, Linux® 2.6.x, ALDI library	Windows® XP/Xp, Windows® Vista Windows® CE, Linux® 2.6.x, ALDI library	Windows® XP/Xp Linux® 2.6.x, ALDI library
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Compact (95 x 95 mm)		Ultra (84 x 55 mm)	
	Type 2	Type 10	Type 1
CPU Type	Single / Dual Intel® Atom™ up to 1.8 GHz with 1 MB L2 cache	Intel® Atom™ up to 1.6 GHz with 512 KB L2 cache	Intel® Atom™ Processor E6xx from 600 MHz up to 1.6 GHz
CPU Package	FCBGA559	PBGA437	FC-BGA 676
CPU Models / Speeds	Atom™ N455 at 1.66 GHz Atom™ D425 at 1.8 GHz Atom™ D525 at 1.8 GHz (dual core)	Intel® Atom™ N270 at 1.6 GHz	E680 at 1.6 GHz, E660 at 1.3 GHz, E640 at 1.1 GHz, E620 at 600 MHz
FSB Speed	-	533	-
Main Chipset	ICH8M	Intel® 945GSE with ICH7M	Intel® PCH EG20T (extended temp)
System Memory	4 GB (max), single channel	2 GB (max), single channel	2 GB (max), single channel
Memory Type	DDR3 at 667/800	DDR2 533	DDR2 400/533
Soldered Memory	-	-	512 MB up 2 GB DDR2 at 800 MHz
Socket Memory	Max 4 GB on two 200-pin SODIMMs	Max 2 GB on single 200-pin SODIMM	512 MB or 1 GB DDR2 466/533 MHz
Cache (L2)	L2 cache 512 KB (N455/D425) L2 cache 1 MB (D525)	L2 cache 512 KB	L2 cache 512 KB
BIOS Type	AMIBIOS®8, American Megatrend	AMIBIOS®8, American Megatrend	AMI EFI, American Megatrend
BIOS Features	Serial Console redirection EEPROM CMOS backup, USB boot/legacy, PXE support	Serial Console redirection EEPROM CMOS backup, USB boot/legacy, PXE support	Serial Console redirection EEPROM CMOS backup, USB boot/legacy, PXE support
BIOS Flash	8 Mbit Flash SPI	8 Mbit Flash SPI	8 Mbit Flash SPI
Graphics Controller	Intel® GMA 3150	Intel® GMA 950	Intel® GMA 600
Graphics Memory	Max 384 MB UMA	Max 256 MB UMA	Max 64 MB UMA
Integrated Display Support	CRT (QXGA) 2048x1536 single 18 LVDS (WXGA) 1366x768	CRT (QXGA) single/dual 18/24-bit LVDS (UXGA) TV-out (PAL/NTSC/HDTV)	18/24-bit LVDS max 1280x768@60Hz Encode : MPEG4, H.263, H.264; Decode : MPEG2/4, VC1, WMV9, H.264
External Graphics Bus	-	Single SDVO port	Single SDVO max 1920x1080@50Hz
Compatibility	OpenGL 1.5, DirectX 9.0c	OpenGL 1.4, DirectX® 9.0c	OpenGL 2.1, DirectX 9.0c
Parallel ATA (IDE)	one channel, two devices	one channel, two devices	-
Serial ATA	two SATA 1.5 Gb/s	two SATA 1.5 Gb/s	two SATA 1.5 Gb/s
Matrix Storage Support	-	-	-
Ethernet	Intel® 82583V GbE (10/100/1000)	Realtek RTL8111C GbE (10/100/1000)	integrated Intel GbE (10/100/1000)
USB	6 ports USB 2.0	6 ports USB 2.0	6 ports USB 2.0, 1 client port
Audio	Intel® HD Audio	Intel® HD Audio and AC'97	Intel® HD Audio
Watchdog	Yes	Yes	Yes
TPM	Yes	Yes	Yes
PCI Express Support	5x PCI-Express x1	3x PCI-Express x1 (optional 5x PCI Express x1)	3x PCIe x1 (optional 4x PCIe without PCH EG20T)
PCI Support	4x PCI rev. 2.3, 32-bit, 33MHz	4x PCI rev. 2.3, 32-bit, 33MHz	-
LPC Support	Yes	Yes	Yes
Management Bus	I²C, SMBus	I²C, SMBus	I²C, SMBus
Power	12V only (AT), 12V and 5Vsb (ATX)	12V only (AT), 12V and 5Vsb (ATX)	4.75V – 14V wide range (5Vsb optional for ATX function)
Power States	S0 S1 S3 S4 S5	S0, S1, S3, S4, S5	S0 S1 S3 S4 S5
Power Consumption	8 W with Atom® N455 at 1.66 GHz and 1 GB DDR3 typical	9 W with Atom® N270 at 1.6GHz and 1 GB DDR2 typical	4.5 W with E620 at 600 MHz and 512 MB DDR2 typical
Operating Temperature	0°C ~ +60°C	0°C ~ +60°C	0°C ~ +60°C
Extended Temperature	selected modules: -20°C ~ +70°C	selected modules: -20°C ~ +70°C	-40°C ~ +85°C (with CPU "T" versions)
Compatibility	PICMG® COM Express™ R2.0, Type 2	PICMG® COM Express™ R1.0, Type 2	PICMG® COM Express™ R2.0, Type 10
Dimensions	Compact Form Factor (95x95 mm)	Compact Form Factor (95x95 mm)	Ultra Form Factor (84x55 mm)
Solid State Disk on Module	optional SSD 4 GB up to 8 GB	optional SSD 4 GB up to 8 GB	TBD
BSP & Software Support	Windows® XP/Xpe, Windows® Vista Windows® CE, Linux® 2.6.x, ALDI library	Windows® XP/Xpe, Windows® Vista Windows® CE, Linux® 2.6.x, ALDI library	Windows® XP/Xpe, Windows® CE, Win7 Embedded, Linux®, ALDI library
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Express-HR

COM Express™ Type 6 Module with
Intel® Core™ i7/i5 processor and QM67 Chipset



Features

- Intel® Quad or Dual Core™ i7/i5 Processor
- Intel® QM67 Chipset
- Up to 16GB Dual Channel DDR3 SDRAM at 1333MHz
- Three Digital Display Interfaces (DDI) for DisplayPort /HDMI/DVI/SDVO
- Seven PCIe x1, one PCIe x16 (Gen2) for graphics (or general purpose x8/4/1)
- Two SATA 3 Gb/s, two SATA 6 Gb/s, Gigabit LAN, eight USB 2.0

Specifications

Core System

CPU

Sandy Bridge 32 nm process, BGA type
Intel® Core™ i7-2715QE 2.1 GHz (3.0 GHz Turbo), 6MB L3 cache, 45W
Intel® Core i7-2655LE 2.2 GHz (2.9 GHz Turbo), 4MB L3 cache, 25W
Intel® Core™ i7-2610UE 1.5 GHz (2.4 GHz Turbo), 4MB L3 cache, 17W
Intel® Core™ i5-2515E 2.5 GHz (3.2 GHz Turbo), 3MB L3 cache, 35W
Dual channel non-ECC 1066/1333 MHz DDR3 memory up to 16 GB in dual stacked SODIMM socket
Intel® Mobile QM67 Express Chipset
6MB (i7-2715QE), 4MB(i7-2655LE and i7-2610UE), 3MB (i5-2515E)
AMI EFI with CMOS backup in 16 Mbit SPI BIOS
Supply voltages and CPU temperature
XDP SFF-26 extension for ICE debug
Programmable timer range to generate RESET
PCI Express x16 (Gen2) bus for discrete graphics solution or general purpose PCI Express (2 x8 or 1 x8 with 2 x4) or Embedded DisplayPort (eDP)
8 PCI Express x1: Lanes 0/1/2/3/4/5/6 are free, lane 7 is occupied by GbE
LPC bus, SMBus (system) , I²C (user)

Video

Integrated in Processor	HD Graphics 3000 at 650-1300 MHz
Integrated Video	DirectX 10.1 and OpenGL 3.0
Feature Support	Intel Clear Video HD Technology Advanced Scheduler 2.0, 1.0, XPDM support DirectX Video Acceleration (DXVA) support for full AVC/VC1/ MPEG2 hardware decode
CRT Interface	Analog CRT support with 300 MHz DAC Analog monitor support up to QXGA (2048 x 1536) and CRT hot plug
LVDS Interface	Dual channel 18/24-bit LVDS
Digital Display Interface	Three DDI ports supporting HDMI / DVI / DisplayPort or SDVO

Audio

Chipset	Integrated on Intel® PCH QM67
Audio Codec	On Express-BASE6 (ALC888)

LAN

Chipset	Intel® Gigabit LAN PHY WG82579LM
Interface	10/100/1000 Mbps Ethernet

Multi I/O

Chipset	Integrated on QM67
USB	Supports up to eight ports USB 2.0
SATA	Supports two SATA ports at 6 Gb/s and two ports at 3 Gb/s with support for RAID 0,1,5,10
SSD	Optional SATA based Solid State Disk 8/16/32 GB

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	TBD
Smart Battery Support	Yes

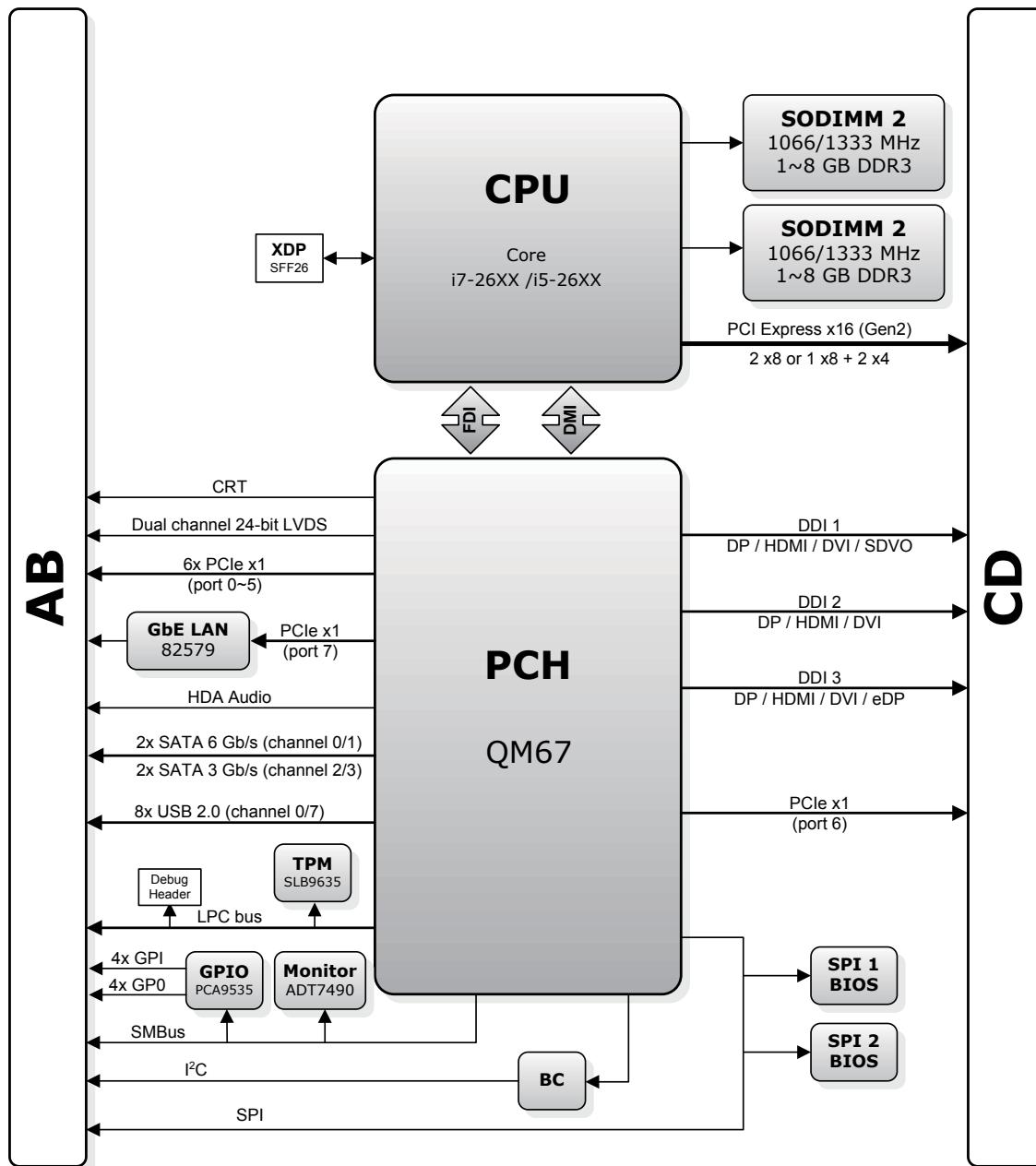
Mechanical and Environmental

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-operating
Vibration	Non-operating: 1.88Grms, 5-500Hz, each axis Operating: 0.5Grms, 5-500Hz, each axis
Compatibility	COM Express Type 6, Basic form factor 125mm x 95mm
Certification	CE, FCC, HALT

Operating Systems

Standard Support	Windows® XP(e) / Windows® 7 Linux®
Extended Support (BSP)	Embedded XP support package Linux® 2.6.x BSP VxWorks 6.x AIDI Library for Windows® and Linux®

Functional Diagram



Ordering Information

Modules

Model Number	Description/Configuration
Express-HR-i7-2715QE	COM Express™ Type 6 module with Intel® Core i7-2715QE SV processor at 2.1GHz with QM67 chipset
Express-HR-i7-2655LE	COM Express™ Type 6 module with Intel® Core i7-2655LE LV processor at 2.2GHz with QM67 chipset
Express-HR-i7-2610UE	COM Express™ Type 6 module with Intel® Core i7-2610UE ULV processor at 1.5 GHz with QM67 Chipset
Express-HR-i5-2515E	COM Express™ Type 6 module with Intel® Core i5-2515E SV processor at 2.5 GHz with QM67 Chipset

Accessories

Model Number	Description/Configuration
Passive Heatsinks	
THSH-HR-BL	High Profile Heatsink for Express-HR with threaded standoffs
Heat Spreaders	
HTS-HR-RL	Heatspreader for Express-HR with threaded standoffs
Heatsink with Active Cooling	
THSFH-HR-BL	High Performance Heatsink with Fan for Express-HR with threaded standoffs

Express-CB/CBE

COM Express™ Module with Intel® Core i7/i5/i3 Processor and QM57 Chipset



Specifications

Core System

CPU

Arrandale BGA type

Intel® Core™ i7-6100 Processor (4M Cache, 2.53 GHz) 35 W
Intel® Core™ i5-5200 Processor (3M Cache, 2.40 GHz) 35 W
Intel® Core™ i7-6200LE Processor (4M Cache, 2.00 GHz) 25 W
Intel® Core™ i7-6200UE Processor (4M Cache, 1.06 GHz) 18 W
Intel® Core™ i3-3300 Processor (3M Cache, 2.13 GHz) 35W
Intel® Celeron® Processor P4505 (2M Cache, 1.86 GHz) 35 W

Memory

Dual channel 800/1066 MHz DDR3 memory up to 8 GB in dual stacked SODIMM socket; ECC memory for CBE series only

Chipset

Intel® Mobile QM57

L2 Cache

2 MB (Celeron® M), 4/3 MB (Intel® Core™ i7 / i5)

BIOS

AMI EFI with CMOS backup in 16 Mbit SPI BIOS

Hardware Monitor

Supply voltages and CPU temperature

Watchdog Timer

Programmable timer ranges to generate RESET

Expansion Busses

PCI Express x16 bus for discrete graphics solution or general purpose PCI Express (2 x8 or 2 x4 or 2 x1) or Embedded Display Port (eDP)

7 PCI Express x1: Lanes 0/1/2/3/4/5 are free, lane 6 is occupied by GbE; can be optionally configured as 1 x4 (on 0/1/2/3) and 2 x1 (4/5)

32-bit PCI: PCI Rev. 2.3 at 33MHz, supporting 4 bus masters

LPC bus, SMBus (system), I²C (user)

Video

Integrated in Processor

Gen 5.75 with 12 execution units

Integrated Video

DirectX 10 and OpenGL 2.1

Feature Support

Intel® Dynamic Video Memory Technology (Intel® DVMT 5.0)

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

Analog CRT support by 300 MHz DAC

Analog monitor support up to QXGA (2048 X 1536)

Single / Dual channel 18- or 24-bit panels

CRT Interface

LVDS Interface

Features

- Intel® Core™ i7/i5/i3 Processor
- Intel® QM57 chipset
- Up to 8 GB Dual Channel DDR3 SDRAM at 1066 MHz (optional ECC)
- Six PCIe x1, one PCIe x16 for graphics (or general purpose x8/4/1)
- 18/24-bit LVDS and Embedded DisplayPort
- SATA 3 Gb/s IDE (PATA), Gigabit LAN, USB 2.0

Audio

Chipset Integrated on Intel® PCH QM57
Audio Codec On carrier (ALC888)

LAN

Chipset Integrated on QM57 with 82577LM PHY
Interface 10/100/1000 Mbps Ethernet

Multi I/O

Chipset Integrated on Intel® PCH QM57
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
SSD Optional SATA based Solid State Disk 8/16/32 GB
PATA SATA to PATA bridge on SATA channel 1, Master only

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 21 W with Core™ i7-6200UE at 1.2 GHz and 2 GB memory typical
Smart Battery Support Yes

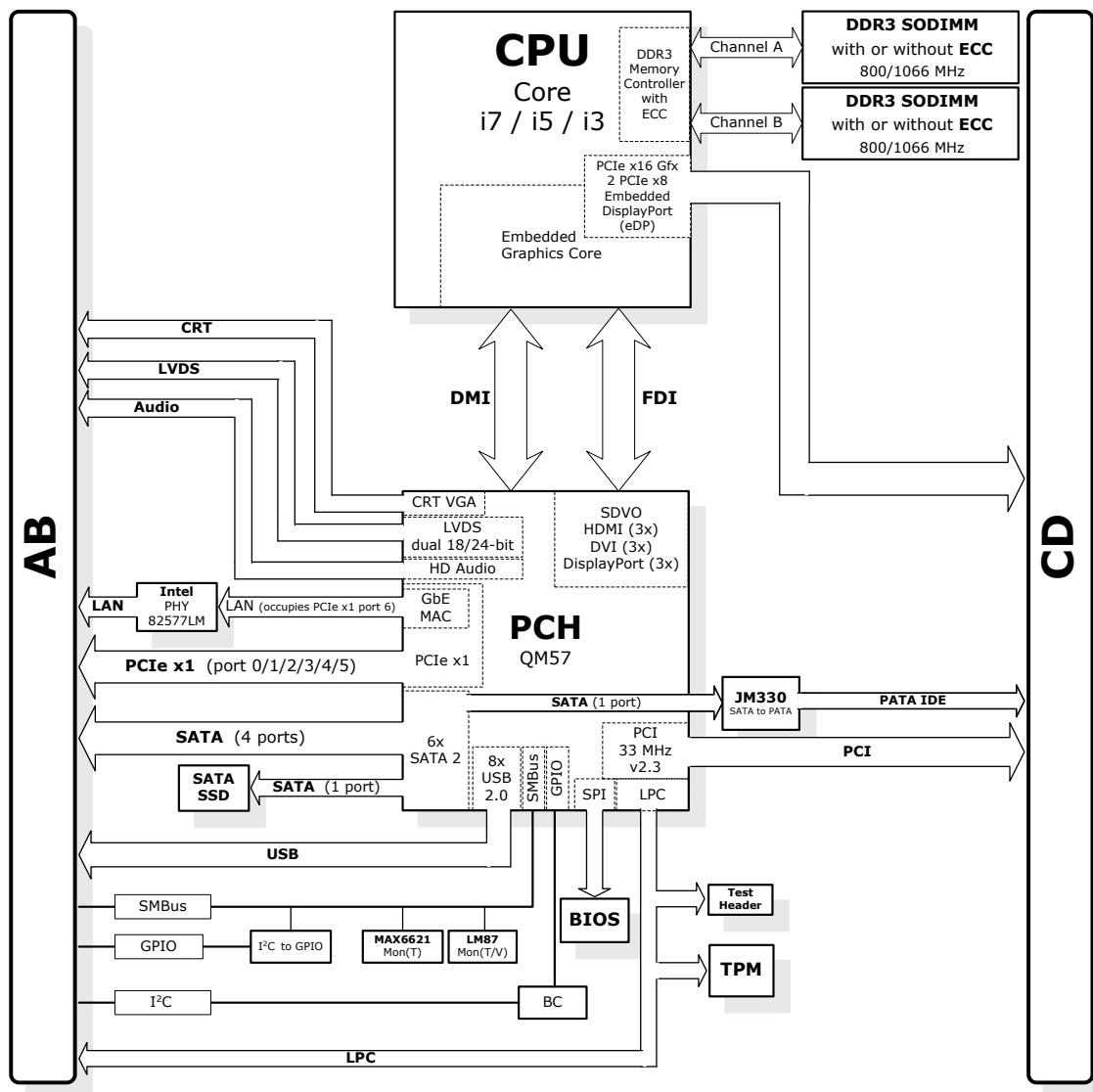
Mechanical and Environmental

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
Vxworks 6.x BSP
AIDI Library for Windows® and Linux®

Functional Diagram



Ordering Information

Modules

Non-ECC Model Number	ECC Model Number	Description/Configuration
Express-CB-i7-610E	Express-CBE-i7-610E	COM Express™ module with Intel® Core i7-610E SV processor at 2.53 GHz with QM57 chipset
Express-CB-i5-520E	Express-CBE-i5-520E	COM Express™ module with Intel® Core i5-520 SV processor at 2.4 GHz with QM57 chipset
Express-CB-i7-620LE	Express-CBE-i7-620LE	COM Express™ module with Intel® Core i7-620LE LV processor at 2.0 GHz with QM57 chipset
Express-CB-i7-620UE	Express-CBE-i7-620UE	COM Express™ module with Intel® Core i7-620UE ULV processor at 1.07 GHz with QM57 chipset
Express-CB-i7-P4505	Express-CBE-i7-P4505	COM Express™ module with Intel® Celeron® P4505 SV processor at 1.86 GHz with QM57 chipset
Express-CB-i3-330E	Express-CBE-i3-330E	COM Express™ module with Intel® Core i3-330E SV processor at 2.13 GHz with QM57 chipset

Accessories

Model Number	Description/Configuration
Heat Spreaders	
HTS-CB-B	Heatspreader with threaded standoffs for Express-CB/CBE
Heatsink with Active Cooling	
THSF-CB-B	Heatsink with fan and threaded standoffs for Express-CB/CBE

Express-MV

COM Express™ Module with Intel® Core™2 Duo Processor and GS45 / ICH9M-SFF Chipset



Specifications

Core System

CPU

Penryn SFF BGA type

Intel® Core™2 Duo SU9300, FSB 1066, 2.26 GHz with 6MB L2 cache, 25 Watt

Intel® Core™2 Duo SL9400, FSB 1066, LV 1.86 GHz with 6MB L2 cache, 17 Watt

Intel® Core™2 Duo SU9300, FSB 800, ULV 1.2 GHz with 3MB L2 cache, 10 Watt

Intel® Celeron® M 722, FSB 800, ULV 1.2GHz with 1MB L2 cache, 5.5 Watt

Memory

Dual stacked SODIMM sockets supporting dual channel memory, up to 8 GB of non-ECC, 800/1066 MHz DDR3

Chipset

Intel® GS45 Express Graphics Memory Controller Hub SFF (Small Form Factor) and Intel® I/O Controller Hub ICH9M-SFF

AMIBIOS®8 with CMOS backup in 16 Mbit SPI Flash

BIOS

Supply voltages and CPU temperature

Hardware Monitor

Programmable timer ranges to generate RESET

Watchdog Timer

Graphics PCI Express x16 bus for SDVO/HDMI/DisplayPort or general purpose PCI Express (x8 / x4 / x1)

Expansion Busses

6 PCI Express x1: 0/1/2/3/4 are free, 5 is occupied by GbE; 0/1/2/3 x1 can be optionally configured as 1 x4

32-bit PCI 2.3 at 33MHz, supporting 4 bus masters

LPC, SMBus, I²C

Video

Chipset

GS45 GMCH integrated Mobile Intel® Graphics Media Accelerator 4500MHD with core render clock 533 MHz @ 1.05-V core voltage or 266 MHz @ 1.025 L.P. Mode

Intel® Dynamic Video Memory Technology (Intel® DVMT 5.0)

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

Blu-ray support @ 40 Mb/s

Hardware motion compensation

Intermediate Z in classic rendering

CRT Interface

Analog CRT support by 300MHz DAC

Analog monitor support up to QXGA, supports CRT hot plug

LVDS Interface

Single / Dual channel 18/24-bit at 25~112 MHz

TV-out

NTSC/PAL up to 1024x768 resolution supported

HDTV 480p/720p/1080i/1080p modes supported (without Macrovision)

Audio

Chipset

Integrated on Intel® ICH9M

Audio Codec

HDA codec on carrier

HDMI

Audio routed to HDMI interface

Features

- Intel® Core™2 Duo processor (up to 2.26 GHz)
- Intel® GS45 and ICH9M-SFF 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

LAN

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

Multi I/O

Chipset Integrated on Intel® 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 JM20330 controller on SATA channel 3, Master only

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 18 W (with Core™2 Duo SU9300 at 1.2 GHz and 2 GB memory typical)

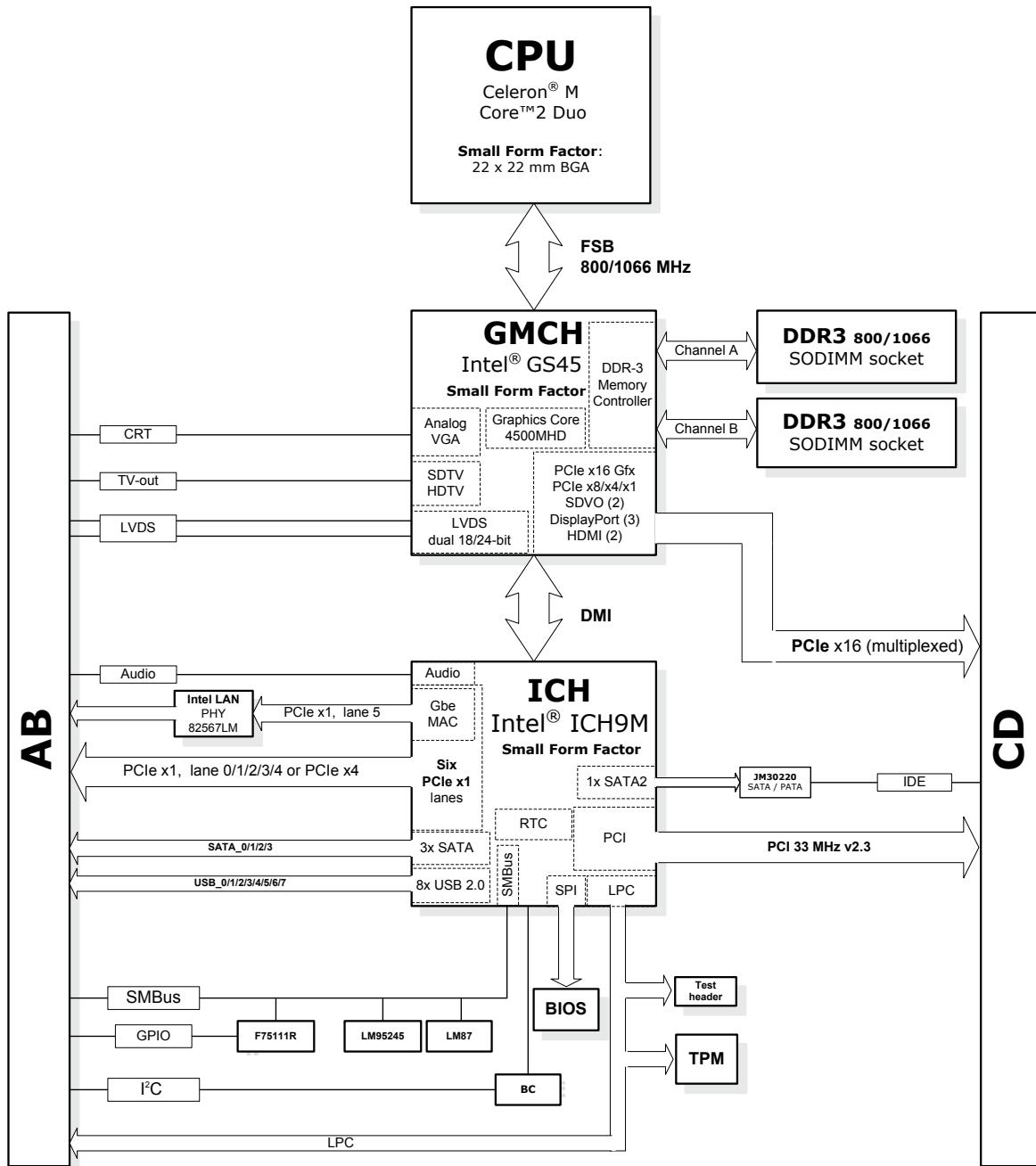
Mechanical and Environmental

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
Form Factor COM Express™ Type 2, Basic form factor, 95 mm x 125 mm
Certifications CE, FCC

Operating Systems

Standard Support Windows® XP 32/64-bit
Windows® Vista 32/64-bit
Windows® Server 2003/2008
Linux® 2.6.x
Extended Support Embedded XP BSP
Linux® 2.6.x BSP
WinCE 6.0 BSP
AIDI Library for Win32, WinCE and Linux®

Functional Diagram



Ordering Information

Modules

Model Number	Description/Configuration
Express-MV-SP9300	COM Express™ Module with Intel® Core™2 Duo processor SP9300 at 2.26 GHz
Express-MV-SL9400	COM Express™ Module with LV Intel® Core™2 Duo processor SL9400 at 1.86 GHz
Express-MV-SU9300	COM Express™ Module with ULV Intel® Core™2 Duo processor SU9300 at 1.20 GHz
Express-MV-722	COM Express™ Module with ULV Intel® Celeron® M processor 722 at 1.20 GHz

Accessories

Model Number	Description/Configuration
Heat Spreaders	
HTS-MV-B	Heatspreader for Express-MV (BGA CPU) with threaded standoffs
Passive Heatsinks	
THS-MV-BL	Low Profile Heatsink for Express-MV (BGA CPU) with threaded standoffs for bottom mounting with long cooling fins (incl screws for 5 and 8 mm btb)
Heatsink with Active Cooling	
THSF-MV-B	High Performance Heatsink with Fan for Express-MV (BGA CPU) with threaded standoffs

Express-MG

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



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® 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 configured 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)
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)

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

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

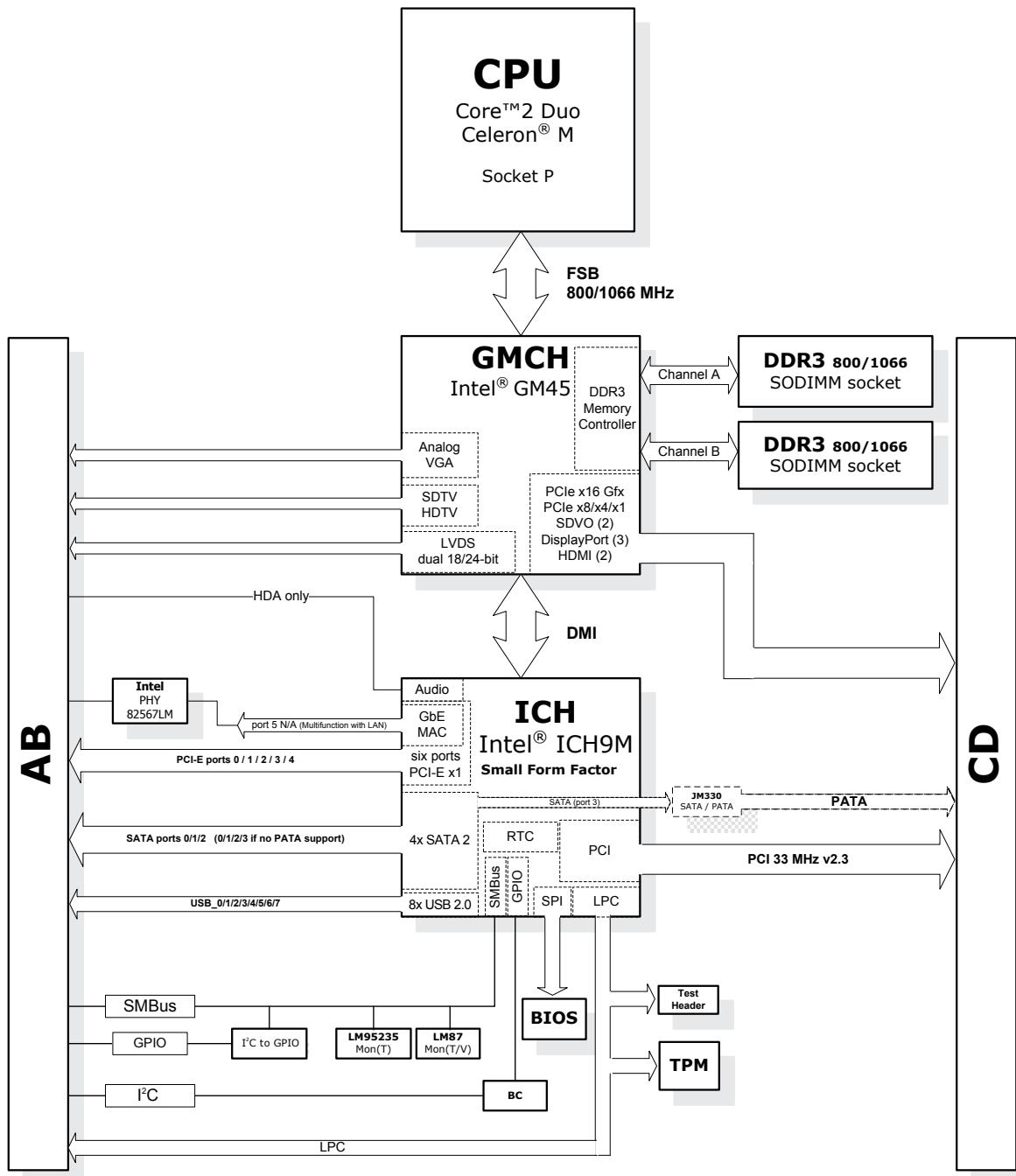
Mechanical and Environmental

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

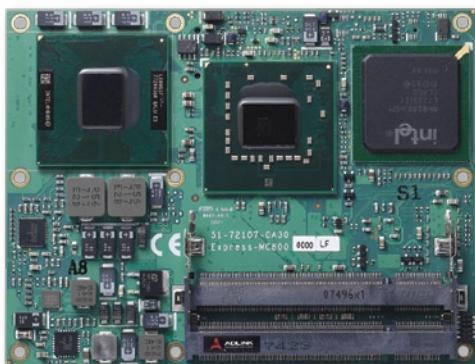
Model Number	Description/Configuration
Express-MG-S	COM Express™ Module with socket type for Intel® Core™2 Duo processor with GM45 and ICH9M chipset
Express-MG-S/T9400	COM Express™ Module with socket type Intel® Core™2 Duo processor T9400 at 2.53 GHz
Express-MG-S/P8400	COM Express™ Module with socket 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
Heat Spreaders	Heatspreader for Express-MG (socket CPU) with threaded standoffs
HTS-MG-S	Heatspreader for Express-MG (socket CPU) with threaded standoffs
Passive Heatsinks	Low Profile Heatsink for Express-MG (socket CPU) with threaded standoffs
THS-MG-S	Low Profile Heatsink for Express-MG (socket CPU) with threaded standoffs
Heatsink with Active Cooling	High Performance Heatsink with FAN for Express-MG (socket CPU) with threaded standoffs
THSF-MG-S	High Performance Heatsink with FAN for Express-MG (socket CPU) with threaded standoffs

Express-MC800

COM Express™ Module with Intel® Core™2 Duo Processor and GME965 / ICH8-M Chipset



Specifications

Core System

CPU

Socket P type

Intel® Core™2 Duo T7500, FSB 800, 2.2 GHz with 4MB L2 cache, 34 W

Intel® Celeron® M 550, FSB 533, 2.0 GHz, with 1MB L2 cache 27 W

BGA type

Intel® Core™2 Duo T7500, FSB 800, 2.2 GHz with 4MB L2 cache, 34 W

Intel® Core™2 Duo L7500, FSB 800, LV 1.5 GHz with 4MB L2 cache, 17 W

Intel® Core™2 Duo U7500, FSB 533, ULV 1.06 GHz with 2MB L2 cache, 10 W

Memory

Dual stacked SODIMM sockets supporting dual channel memory, up to 4 GB of non-ECC, 533/667 MHz DDR2

Chipset

Intel® GME965 GMCH and ICH8-M

BIOS

AMIBIOS® with CMOS backup in 8 Mbit SPI BIOS

Hardware Monitor

Supply voltages and CPU temperature

Watchdog Timer

Programmable timer ranges to generate RESET

Expansion Busses

6 PCI Express x1 (0 – 4 free, 5 occupied by GbE), optional configurable as x4

Graphics PCI Express x16 or PCI Express x8/x4/x1, or SDVO digital video bus
32-bit PCI 2.3 at 33MHz, supporting 6 bus masters

LPC, SMBus, I²C

Video

Chipset

GME965 integrated Mobile Intel® GMA X3100

CRT Interface

Analog CRT support up to 2048 x1536 at 60 Hz, 32-bpp

LVDS Interface

Single / Dual channel 18/24-bit at 25–112 MHz

TV-out

NTSC/PAL up to 1024x768 resolution,
HDTV 480p/720p/1080i/1080p modes supported
(without Macrovision)

Audio

Chipset

Integrated on Intel® ICH8-M

Audio Codec

HDA codec on carrier

LAN

Chipset

ICH8-M integrated GbE MAC with Intel® 82566 PHY
10/100/1000 Mbps with Wake-on-LAN and Alert on LAN support

Features

- Intel® Core™2 Duo processor (up to 2.2 GHz)
- Intel® GME965 / ICH8M chipset
- Dual SODIMM for up to 4 GB DDR2 at 800MHz
- Five PCIe x1, one PCIe x16 graphic (or x8)
- Dual-channel 24-bit LVDS, TV-out
- SATA 3 Gb/s, PATA, Gigabit LAN, USB 2.0

Multi I/O

Chipset

Intel® ICH8-M

IDE (PATA)

Single channel IDE with Ultra ATA 100/66/33 support

SATA

Three ports SATA 3 Gb/s

USB

Up to eight ports USB 2.0

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) and ATX mode (12 V and 5 Vsb)

Power States

Supports S0, S1, S3, S4, S5

Power Consumption

19 W (with Core™2 Duo U7500 at 1.06 GHz and 2 GB memory, typical)

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

Operating: 0.5 Grms, 5–500 Hz, each axis

Form Factor

COM Express™ Type 2, Basic form factor, 95 mm x 125 mm

Certifications

CE, FCC

Operating Systems

Standard Support

Windows® XP 32/64-bit

Windows® Vista 32/64-bit

Windows® Server 2003

Linux® 2.6.x

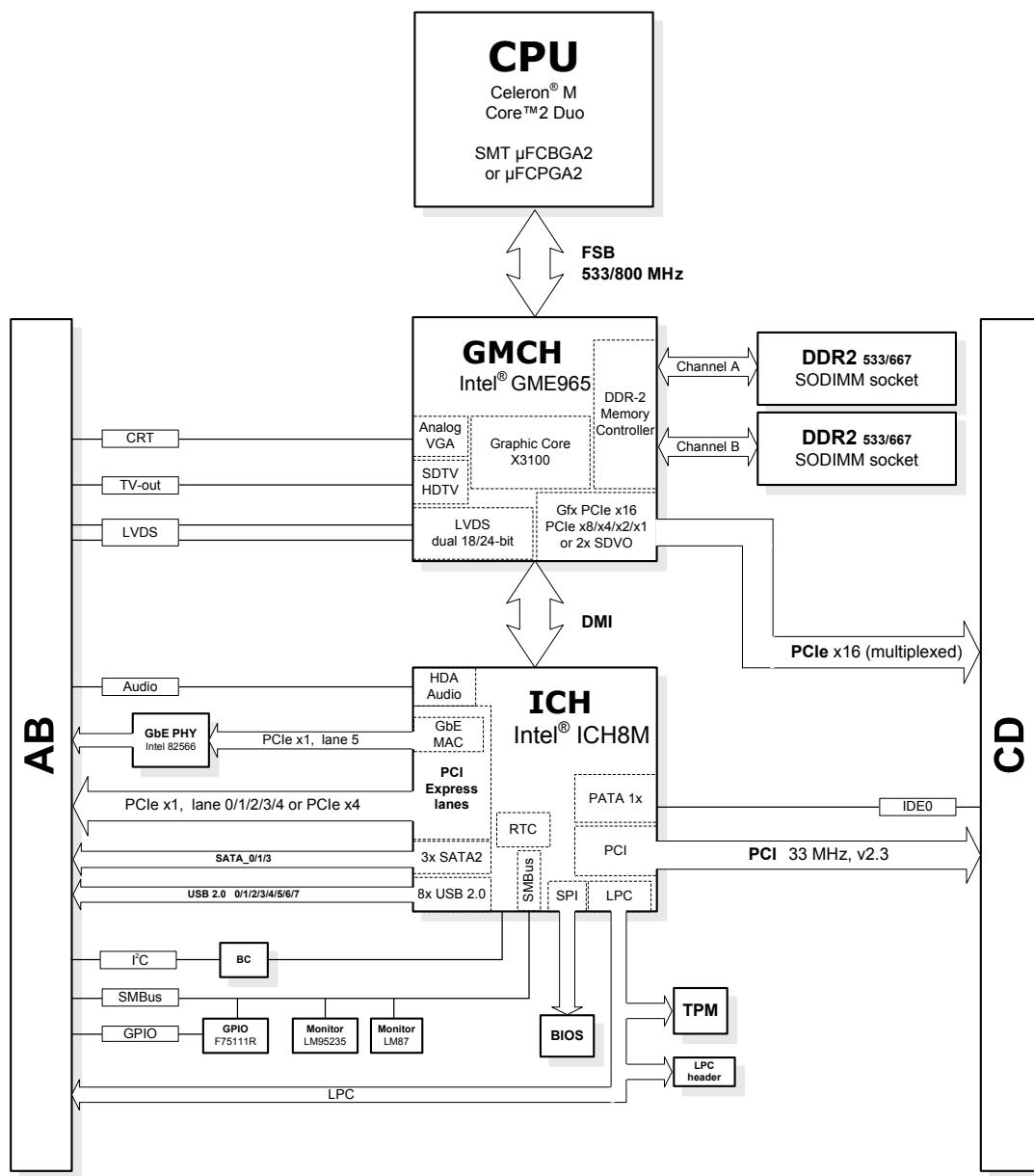
Extended Support

Embedded XP BSP

Linux® 2.6.x BSP

AIDI Library for Win32, WinCE and Linux®

Functional Diagram



Ordering Information

Modules

Model Number	Description/Configuration
Express-MC800-S	COM Express™ Module with socket for Celeron® M or Core™2 Duo processor (for Intel® Core™2 Duo T7500 processor at 2.2 GHz or Intel® Celeron® M 550 processor at 2.0 GHz)
Express-MC800-L7500	COM Express™ Module with LV Intel® Core™2 Duo L7500 processor at 1.6 GHz
Express-MC800-U7500	COM Express™ Module with ULV Intel® Core™2 Duo U7500 processor at 1.06 GHz

Accessories

Model Number	Description/Configuration
Heat Spreaders	
HTS-MC800-B	Heatspreader for Express-MC800 (BGA CPU) with threaded standoffs
Passive Heatsinks	
THS-MC800-B	Low Profile Heatsink for Express-MC800 (BGA CPU) with threaded standoffs
THSH-MC800-B	High Heatsink for Express-MC800 (BGA CPU) with threaded standoffs
Heatsink with Active Cooling	
THSF-MC800-S	High Performance Heatsink with Fan for Express-MC800 (socket CPU) with threaded standoffs



Specifications

Core System

CPU

Merom Core socket type

Intel® Core™2 Duo T7400, 2.16GHz with 4MB L2 cache, 34 W
Intel® Celeron® M 530, 1.73GHz with 1MB L2 cache, 27 W

Merom Core BGA type

Intel® Core™2 Duo L7400, 1.5 GHz with 4MB L2 cache, 17 W
Intel® Core™2 Duo U7500, 1.06 GHz with 2MB L2 cache, 10 W

Yonah Core socket type

Intel® Core™ Duo T2500, 2.0 GHz with 2MB L2 cache, 31 W
Intel® Celeron® M 440, 1.86 GHz with 1MB L2 cache, 27 W

Yonah Core BGA type

Intel® Core™ Duo L2400, 1.66GHz with 2MB L2 cache, 15 W
Intel® Core™ Duo U2500, 1.2 GHz with 2MB L2 cache, 9 W
Intel® Celeron® M 423, 1.06GHz with 1MB L2 cache, 5.5 W

Memory

Dual SODIMM sockets supporting dual channel memory, up to 4 GB of non-ECC, 533/667 MHz DDR2

Chipset

Intel® 945GME Express Graphics Memory Controller Hub
Intel® I/O Controller Hub 7 Mobile (ICH7-M DH)

BIOS

AMIBIOS®8 with CMOS backup in 8 Mbit SPI BIOS

Hardware Monitor

Supply voltages and CPU temperature

Watchdog Timer

Programmable timer ranges to generate RESET

Expansion Busses

6 PCI Express x1 (0 – 4 free, 5 occupied by GbE LAN), optional configurable as x4
Graphics PCI Express x16, or SDVO digital video bus
32-bit PCI 2.3 at 33MHz, supporting 6 bus masters
LPC, SMBus, I²C

Video

Chipset

945GME GMCH integrated graphics supports dual independent displays

CRT Interface

Analog VGA support up to 2048 x1536 resolution

LVDS Interface

Single / Dual channel 18/24-bit

TV-out

NTSC/PAL up to 1024x768 resolution, HDTV 480p/720p/1080i/1080p modes supported (without Macrovision)

Audio

Chipset

Integrated on Intel® ICH7-M DH

Audio Codec

HDA (Azalia) or AC'97 codec on carrier

LAN

Chipset

PCIe type Intel® 82573L

Interface

10/100/1000 Mbps

Features

- Intel® Core™2 Duo processor (up to 2.1 GHz)
- Intel® 945GME / ICH7-M chipset
- Dual SODIMM for up to 4 GB DDR2 at 667 MHz
- One PCIe® x16, five PCIe® x1 (or one x4)
- Single/dual 18/24-bit LVDS, TV-out
- SATA, PATA, Gigabit LAN, USB 2.0

Multi I/O

Chipset	Intel® ICH7-M
IDE (PATA)	Single channel IDE with UDMA 100 support
SATA	Three SATA 1.5 Gb/s ports
USB	Up to eight USB 2.0 ports

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) and ATX mode (12 V and 5 Vsb)
Power States	Supports S0, S1, S3, S4, S5
Power Consumption	16 W typical (with Core™2 Duo U7500 and 1 GB memory)

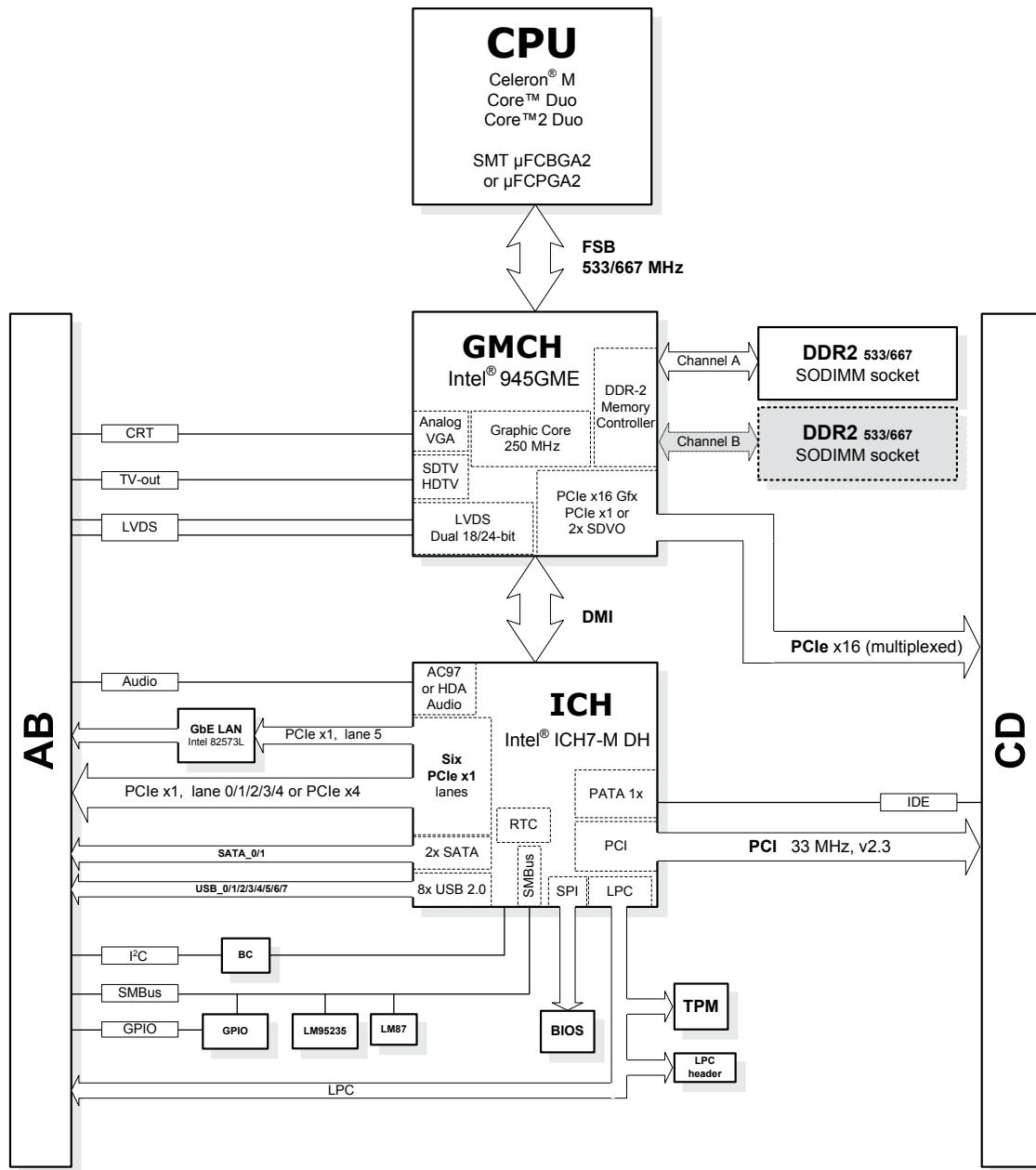
Mechanical and Environmental

Operating Temp.	0°C to 60°C
Storage Temp.	-20°C to 80°C
Humidity	up to 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
Form Factor	COM Express™ Type 2, Basic form factor, 95 mm x 125 mm
Certifications	CE, FCC

Operating Systems

Standard Support	Windows® XP 32/64-bit Windows® Vista 32/64-bit Windows® Server 2003 Linux® 2.6.x
Extended Support	Embedded XP BSP WinCE BSP Linux® 2.6.x BSP AIDI Library for Win32, WinCE and Linux®

Functional Diagram



Ordering Information

Modules

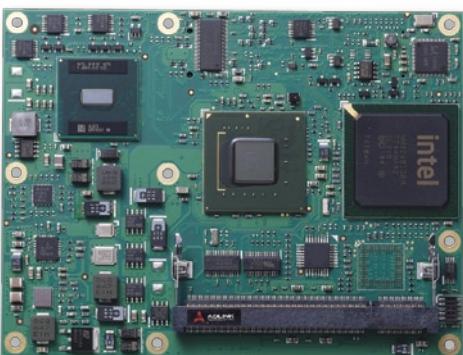
Model Number	Description/Configuration
Express-NR-S	COM Express™ Module with socket for Celeron® M / Core™ Duo / Core™2 Duo processor (for Intel® Core™2 Duo T7400 processor at 2.16 GHz or Intel® Celeron® M 440 processor at 1.86 GHz)
Express-NR-L7400	COM Express™ Module with LV Intel® Core™2 Duo L7400 processor at 1.5 GHz
Express-NR-L2400	COM Express™ Module with LV Intel® Core™ Duo L2400 processor at 1.66 GHz
Express-NR-U7500	COM Express™ Module with ULV Intel® Core™2 Duo U7500 processor at 1.06 GHz
Express-NR-423	COM Express™ Module with ULV Intel® Celeron® M 423 processor at 1.06 GHz

Accessories

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

Express-AT

COM Express™ Module with Intel® Atom™ Processor N270 and 945GSE/ICH7-M Chipset



Features

- Intel® Atom™ processor N270 at 1.6 GHz
- Intel® 945GSE / ICH7-M chipset
- SODIMM for up to 2 GB DDR2 at 533 MHz
- Three PCIe x1 (optional 4 x1 or 1 x4)
- High resolution CRT, single/dual 18-bit LVDS and TV-out (SDTV and HDTV)
- SATA, IDE (PATA), Gigabit LAN, USB 2.0
- Optional 512MB~8GB IDE-based Solid State Disk

Specifications

Core System

CPU

BGA type

Intel® Atom™ N270, FSB 533, 1.6 GHz with 512 KB L2 cache, 2.5 W, on-die primary 32-kB instruction cache and 24 kB write-back data cache

Hyper-Threading support (2-threads)

Advanced gunning transceiver logic (AGTL+) bus driver technology

Enhanced Intel® SpeedStep® Technology

Source synchronous double-pumped (2x) Address

Source synchronous quad-pumped (4x) Data

C0 - C4 low power states supported

Memory

Single SODIMM socket memory, up to 2 GB of non-ECC, 400/533 MHz DDR2

Chipset

Intel® 945GSE Express Graphic Memory Controller Hub and Intel® I/O Controller Hub 7 Mobile (ICH7-M)

BIOS

AMIBIOS® with CMOS backup in 8 Mbit SPI BIOS

Hardware Monitor

Supply voltages and CPU temperature

Watchdog Timer

Programmable timer ranges to generate RESET

Expansion Busses

4 PCI Express x1 (0/1/2 are free, 3 is occupied by GbE LAN) optionally configured as x4

Serial Digital Video Out (SDVO)

32-bit PCI 2.3 at 33MHz, supporting 4 bus masters

LPC, SMBus, I²C

Video

Chipset

Intel® Graphics Media Accelerator 950 integrated into 945GSE GMCH supporting dual independent displays

CRT Interface

Analog CRT support up to 1600 x 1200

LVDS Interface

Single / Dual channel 18-bit (optional 24-bit on carrier through SDVO)

TV-out

NTSC/PAL up to 1024x768 resolution supported, HDTV 480p/720p/1080i/1080p modes supported (without Macrovision)

Audio

Chipset

Integrated on Intel® I/O Controller Hub 7 Mobile (ICH7-M)

Audio Codec

HDA (Azalia) or AC'97 codec on carrier

LAN

Chipset

PCIe x1 Realtek RTL8111C

Interface

10/100/1000 Mbps

Multi I/O

Chipset

Intel® ICH7-M

IDE (PATA)

Single IDE channel with UDMA100 with optional 512MB - 8GB IDE-based Solid State Disk

SATA

Two port SATA 1.5 Gb/s

USB

Up to eight ports USB 2.0

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) and ATX mode (12 V and 5 Vsb)

Power States

Supports S0, S1, S3, S4, S5

Power Consumption

9 W typical (with Atom™ N270 and 1 GB memory)

Mechanical and Environmental

Operating Temp.

0°C to 60°C

Storage Temp.

-20°C to 80°C

Humidity

Up to 90% at 60°C

Shock

15G peak-to-peak, 11ms duration, non-operation

Vibration

Non-operating: 1.88 Grms, 5-500 Hz, each axis

Form Factor

Operating: 0.5 Grms, 5-500 Hz, each axis

Certifications

COM Express™ Type 2, Basic form factor, 95 mm x 125 mm

CE, FCC

Operating Systems

Standard Support

Windows® XP 32-bit

Windows® Vista 32-bit

Linux® 2.6.x

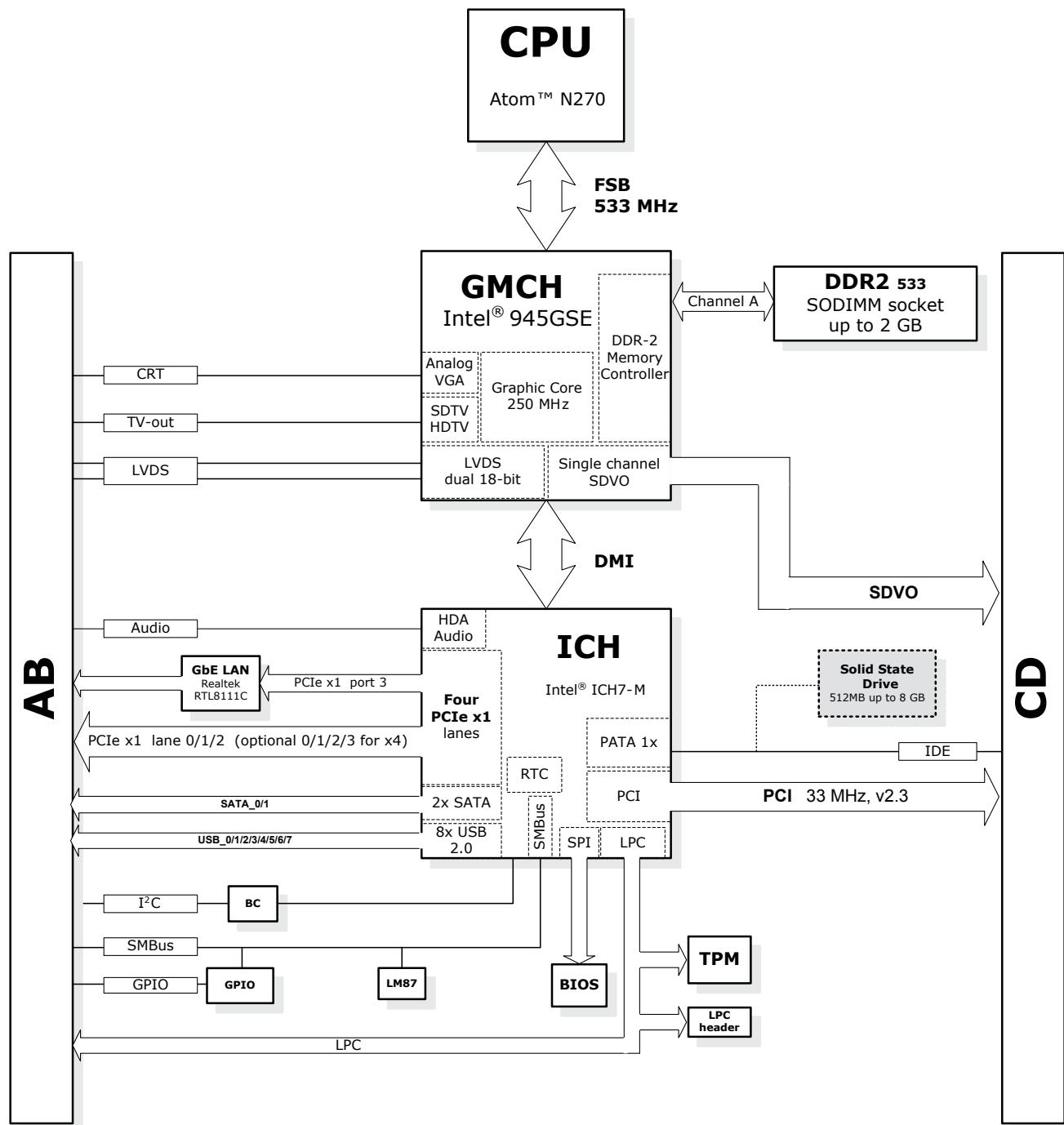
Embedded XP BSP

WinCE BSP

Linux® 2.6.x BSP

AIDI Library for Win32, WinCE and Linux®

Functional Diagram



Ordering Information

Modules

Model Number	Description/Configuration
Express-AT-N270	COM Express™ module with Intel® Atom™ N270 processor at 1.6 GHz
Express-AT-N270-4G	COM Express™ module with Intel® Atom™ N270 processor at 1.6 GHz 4GB SSD Solid State Disk

Accessories

Model Number	Description/Configuration
Heat Spreaders	HTS-CAT-B Heatspreader for Express-AT (BGA CPU) with threaded standoffs
Passive Heatsinks	THS-CAT-B Low Profile Heatsink for Express-AT (BGA CPU) with threaded standoffs

Express-IA533

COM Express™ Module with Intel® Pentium® M Processor and 915GME/ICH6-M Chipset



Features

- Intel® Pentium® M Processor up to 2.1 GHz
- Intel® 915GME Express chipset
- Dual-Channel DDR2 533 MHz
- Three PCI Express® x1 lanes and one PCI Express® x16 Graphics lane
- Onboard Gigabit Ethernet
- SATA, USB 2.0, LVDS, SDVO

Specifications

Core System

CPU

Socket 479 type

Intel® Pentium® M 760, 2.0 GHz, with 2MB L2 cache
Intel® Pentium® M 745, 1.8 GHz, with 2MB L2 cache

BGA type

Intel® Pentium® M 738, 1.4 GHz, with 2MB L2 cache
Intel® Celeron® M 373, 1.0 GHz, with 1MB L2 cache

Memory

400/533 MHz DDR2, non-ECC, unbuffered

Channel A: SO-DIMM socket for DDR2 memory, max 1 GB

Channel B: soldered DDR2 memory, max 512 MB

Chipset

Intel® 915GME Express Graphic Memory Controller Hub and Intel® I/O Controller Hub 6 Mobile (ICH6-M)

BIOS

Phoenix AWARD BIOS in 1 MB FWH with console redirection and CMOS EEPROM backup

Hardware Monitor

Supply voltages and CPU temperature

Watchdog Timer

Programmable timer ranges to generate RESET

Expansion Busses

Four PCI Express x1 lanes (one occupied by GbE LAN)

Six 32-bit PCI 2.3 Masters at 33/66 MHz

Low Pin Count (LPC) interface for Super I/O on carrier

SMBus 2.0 interface support

Video

Chipset

915GME GMCH integrated chipset supports dual independent displays

CRT Interface

Analog CRT support up to 2048 x1536

LVDS Interface

Dual channel 18-bit

Graphic Expansion busses

One PCI Express® x16 Graphics port

Two Serial DVO ports (multiplexed with PCI Express® x16)

Audio

Chipset

Integrated on Intel® ICH6-M

Audio Codec

Optional AC'97 codec on carrier

LAN

Chipset

Yukon-EC 88E8053 PCIe Gigabit Ethernet Controller

Interface

Triple speed 10/100/1000BASE-T IEEE 802.3 compliant with fully integrated ASF 2.0 functionality

Multi I/O

Chipset

Intel® ICH6-M

IDE (PATA)

One Ultra ATA 100/66/33 IDE port

SATA

Two SATA 1.5 Gb/s ports

USB

Up to eight USB 2.0 ports, supports legacy KB / Mouse

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) and ATX mode (12 V and 5 Vsb)

Power States

Supports S0, S1, S3, S4, S5

Power Consumption

18 W typical (with Pentium® M 738 and 1 GB memory)

Mechanical and Environmental

Operating Temp.

0°C to 60°C

Storage Temp.

-20°C to 80°C

Humidity

Up to 90% at 60°C

Shock

15G peak-to-peak, 11ms duration, non-operation

Vibration

Non-operating: 1.88 Grms, 5-500 Hz, each axis

Form Factor

Operating: 0.5 Grms, 5-500 Hz, each axis

Certifications

COM Express™ Type 2, Basic form factor, 95 mm x 125 mm

CE, FCC

Operating Systems

Standard Support

Windows® XP 32-bit

Linux® 2.6.x

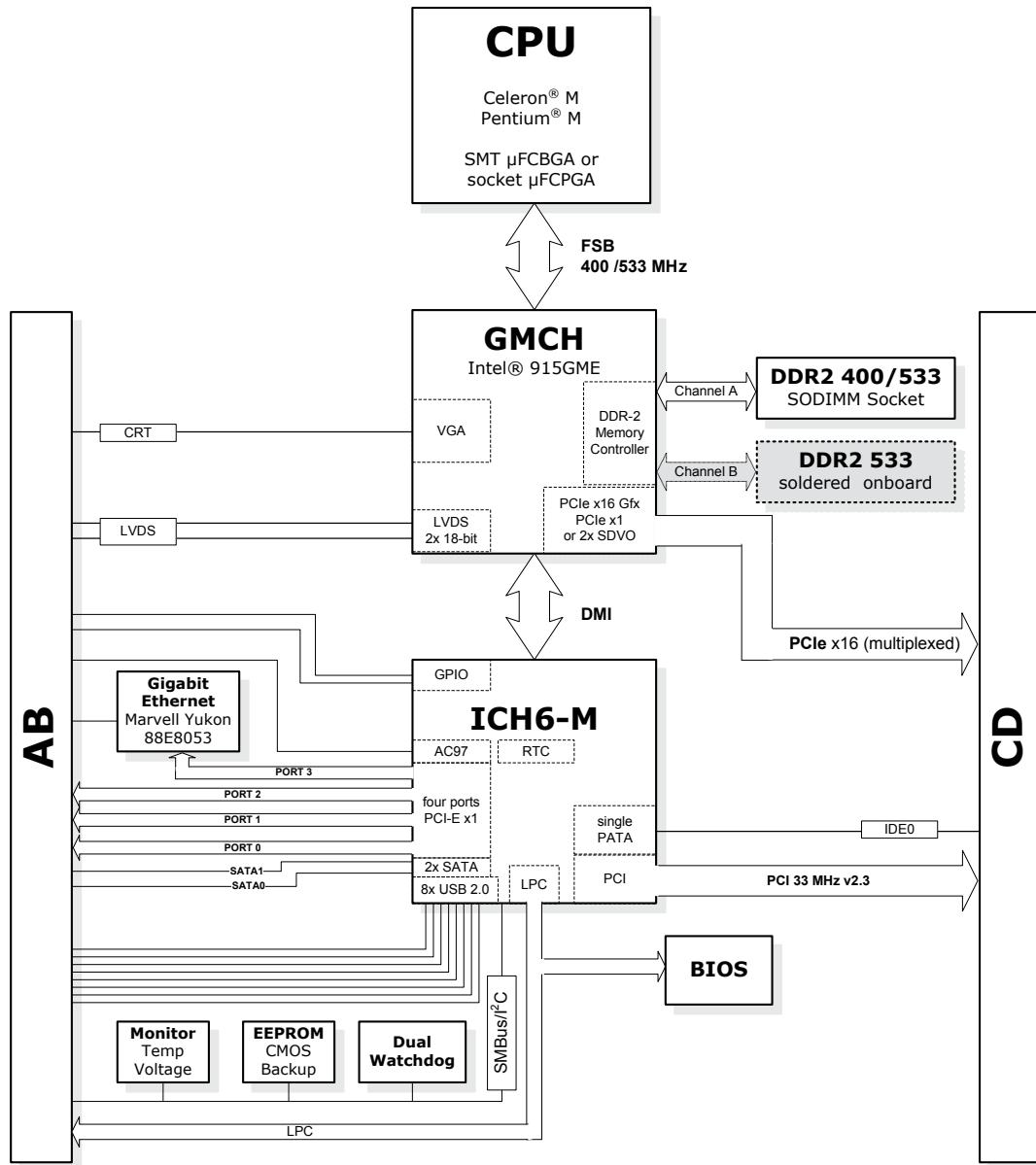
Extended Support

Embedded XP BSP

Linux® 2.6.x BSP

AIDI Library for Win32 and Linux®

Functional Diagram



Ordering Information

Modules

Model Number	Description/Configuration
Express-IA533-S/0	COM Express module with socket for Intel® Celeron®/Pentium® M processor
Express-IA533-760/0	COM Express module with Intel Pentium® M 760 at 2.0GHz
Express-IA533-745/0	COM Express module with Intel Pentium® M 745 at 1.8GHz
Express-IA533-738/0	COM Express module with Intel Pentium® M 738 at 1.4GHz
Express-IA533-373/0	COM Express module with Intel Celeron® M 373 at 1GHz

Note: All models optional soldered memory

Accessories

Model Number	Description/Configuration
Heat Spreaders	Heatspreaders for Express-IA533 (BGA CPU) with threaded standoffs
HTS-IA533-B	Heatspreader for Express-IA533 (BGA CPU) with threaded standoffs
Passive Heatsinks	Low Profile Heatsink for Express-IA533 (BGA CPU) with threaded standoffs
THS-IA533-B	Low Profile Heatsink for Express-IA533 (BGA CPU) with threaded standoffs
Heatsink with Active Cooling	High Performance Heatsink with Fan for Express-IA533 (socket CPU) with threaded standoffs
THSF-IA533-S	High Performance Heatsink with Fan for Express-IA533 (socket CPU) with threaded standoffs

Express-LPC

Compact COM Express™ Module with Single/Dual Core Intel® Atom™ Processor and ICH8M Chipset



Features

- Single/Dual Core Atom™ processor at 1.8 GHz
- Intel® I/O Controller Hub 8 Mobile
- Up to 4 GB DDR3 SDRAM at 800 MHz
- Five free PCIe x1 lanes (optional PCIe x4)
- CRT and LVDS support
- SATA 3 Gb/s, IDE (PATA), Gigabit LAN, USB 2.0



Specifications

Core System

CPU

Intel® Atom™ Processor
N455: Single Core Intel® Atom™ processor 1.66 GHz at 6.5 W
D425: Single Core Intel® Atom™ processor 1.80 GHz at 10 W
D525: Dual Core Intel® Atom™ processor 1.80 GHz at 13 W
N570: Dual Core Intel® Atom™ processor 1.66 GHz at 8.5 W

Memory

Dual SODIMM sockets support up to 4 GB of non-ECC 667/800 MHz DDR3 memory

Chipset

Intel® I/O Controller Hub 8 Mobile (ICH8-M)

L2 Cache

1 MB for D525, 512KB for N455 & D425

BIOS

AMIBIOS® 8 with CMOS backup in 16 Mbit SPI BIOS supports SPI BIOS on carrier (COM.0 R2.0)

Hardware Monitor

Supply voltages and CPU temperature

Debug Interface

XDP SFF-26 extension for ICE debug

Embedded Features

Instant on with Intel Bootloader support, OEM BIOS settings, Board Info & Statistics, ACPI 3.0, Smart Battery Management support, Watchdog with programmable timer ranges

Expansion Busses

6 PCI Express x1: 0/1/2/3/4 are free, 5 is occupied by GbE; 0/1/2/3 x1 can be optionally configured as 1 x4
32-bit PCI: PCI rev. 2.3 at 33MHz, supporting 4 bus masters
LPC bus, SMBus (system), I²C (user)

Video

GPU Core

Integrated in CPU with Gen3.5+ GFX Core and render core frequency at 200 MHz (N455) and 400 MHz (D425/D525)

Integrated Video

Intel® Dynamic Video Memory Technology 4.0 support

Feature Support

DirectX 9 compliant Pixel Shader v2.0

400 MHz render clock frequency

2 display ports: LVDS and RGB

Intel® Clear Video Technology

MPEG2 Hardware Acceleration, ProcAmp

CRT Interface

Analog RGB display, resolution up to 2048x1536@ 60 Hz

LVDS Interface

Single 18-bit channel, resolution up to 1366x768, 18bpp

Audio

Chipset

Integrated in Intel® I/O Controller Hub 8 Mobile (ICH8M)

Audio Codec

On carrier (ALC888)

LAN

Chipset

Intel® 82583V Gigabit Ethernet Controller

Interface

10/100/1000 Mbps Ethernet

Multi I/O and Storage

Chipset

Intel® I/O Controller Hub 8 Mobile (ICH8M)

USB

Supports up to eight ports USB 2.0

SATA

Three ports SATA 3 Gb/s

IDE (PATA)

Single IDE channel (UDMA100) with optional 4GB ~ 8GB IDE-based Solid State Drive

Super I/O

BIOS support for legacy free or legacy with two types of Super I/O (Winbond W83627HG and W83627DHG)

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

10 W (with N455 CPU 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-operating

Vibration

Non-operating: 1.88 Grms, 5-500 Hz, each axis

Compatibility

Operating: 0.5 Grms, 5-500 Hz, each axis

COM Express™ Type 2, COM.0 R2.0

Certification

Compact form factor 95 mm x 95 mm

CE, FCC

Operating Systems

Standard Support

Windows® XP(e) / Vista, Windows® 7

Linux®

Extended Support (BSP)

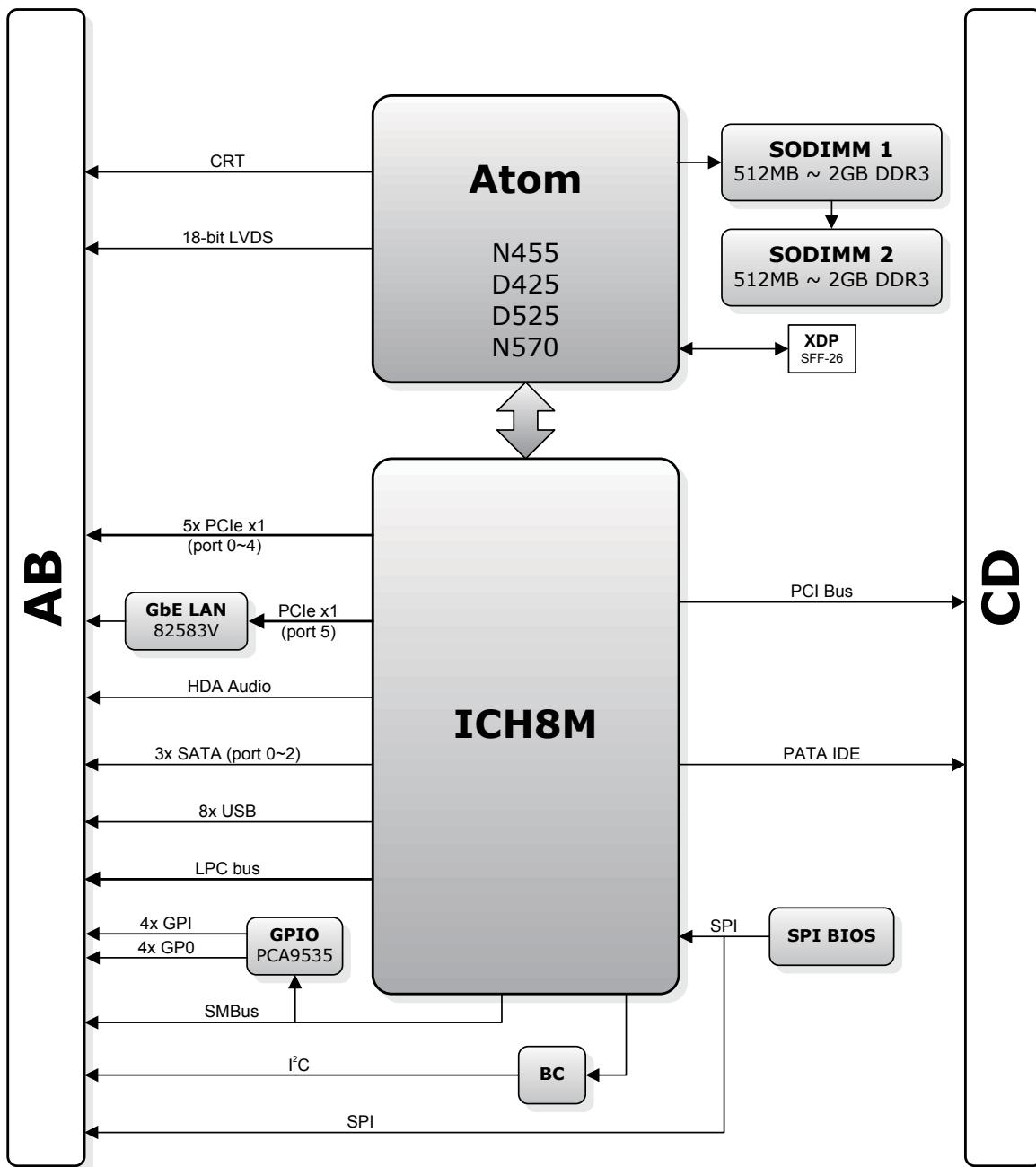
Embedded XP / 2009 support package

Linux® 2.6.x BSP

VxWorks 6.x BSP

AIDI Library for Windows® and Linux®

Functional Diagram



Ordering Information

Modules

Model Number	Description/Configuration
Express-LPC-N455	Compact COM Express™ Module with Intel® Atom™ Single Core Low Voltage Processor N455 at 1.66 GHz
Express-LPC-D425	Compact COM Express™ Module with Intel® Atom™ Single Core Processor D425 at 1.80 GHz
Express-LPC-D525	Compact COM Express™ Module with Intel® Atom™ Dual Core Processor D525 at 1.80 GHz
Express-LPC-N570	Compact COM Express™ Module with Intel® Atom™ Dual Core Low Voltage Processor N570 at 1.66 GHz

Accessories

Model Number	Description/Configuration
Heat Spreaders	
HTS-LPC-B	Heatspreader for Express-LPC with threaded standoffs
Passive Heatsinks	
THS-LPC-B	Low Profile Heatsink for Express-LPC with threaded standoffs
Active Heatsinks	
THSF-LPC-B	Heatsink with Fan for Express-LPC with threaded standoffs

Express-ATC

Compact COM Express™ Module with Intel® Atom™ Processor N270 and 945GSE/ICH7-M Chipset



Features

- Intel® Atom™ processor N270 at 1.6 GHz
- Intel® 945GSE/ICH7-M chipset
- SODIMM for up to 2 GB DDR2 at 533 MHz
- Three PCIe x1 (optional 4 x1 or 1 x4)
- High resolution CRT, single/dual 18-bit LVDS and TV-out (SDTV and HDTV)
- SATA, IDE (PATA), Gigabit LAN, USB 2.0
- Optional 1GB ~ 8GB IDE-based Solid State Drive

Specifications

Core System

CPU

BGA type

Intel® Atom™ N270, FSB 533, 1.6 GHz with 512 KB L2 cache, 2.5 W, on-die primary 32-kB instruction cache and 24 kB write-back data cache

Hyper-Threading support (2-threads)

Advanced gunning transceiver logic (AGTL+) bus driver technology

Enhanced Intel SpeedStep® Technology

Source synchronous double-pumped (2x) Address

Source synchronous quad-pumped (4x) Data

C0 - C4 low power states supported

Memory

Single SODIMM socket up to 2 GB of non-ECC, 400/533 MHz DDR2 memory

Chipset

Intel® 945GSE Express Graphic Memory Controller Hub and Intel® I/O Controller Hub 7 Mobile (ICH7-M)

BIOS

AMIBIOS®8 with CMOS backup in 8 Mbit SPI BIOS

Hardware Monitor

Supply voltages and CPU temperature

Watchdog Timer

Programmable timer ranges to generate RESET

Expansion Busses

4 PCI Express x1 (0/1/2 are free, 3 is occupied by GbE LAN) optionally configured as one PCIe x4

Serial Digital Video Out (SDVO)

32-bit PCI 2.3 at 33MHz, supporting 4 bus masters

LPC, SMBus, I²C

Video

Chipset

Intel® Graphics Media Accelerator 950 integrated into 945GSE GMCH supporting dual independent displays

CRT Interface

Analog CRT support up to 1600 x 1200

LVDS Interface

Single / Dual channel 18-bit (optional 24-bit on carrier through SDVO)

TV-out

NTSC/PAL up to 1024x768 resolution supported, HDTV 480p/720p/1080i/1080p modes supported (without Macrovision)

Audio

Chipset

Integrated on Intel® I/O Controller Hub 7 Mobile (ICH7-M)

Audio Codec

HDA (Azalia) or AC'97 codec on carrier

LAN

Chipset

PCIe x1 Realtek RTL8111C

Interface

10/100/1000 Mbps

Multi I/O

Chipset

Intel® ICH7-M

IDE (PATA)

Single IDE channel with UDMA100 with optional 1GB ~ 8GB IDE-based Solid State Drive

SATA

Two ports SATA 1.5 Gb/s

USB

Up to eight ports USB 2.0

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) and ATX mode (12 V and 5 Vsb)

Power States

Supports S0, S1, S3, S4, S5

Power Consumption

9 W typical (with Atom™ N270 and 1 GB memory)

Mechanical and Environmental

Operating Temp.

0°C to 60°C

Storage Temp.

-20°C to 80°C

Humidity

Up to 90% at 60°C

Shock

15G peak-to-peak, 11ms duration, non-operation

Vibration

Non-operating: 1.88 Grms, 5-500 Hz, each axis

Form Factor

Operating: 0.5 Grms, 5-500 Hz, each axis
COM Express™ Type 2, Compact form factor, 95 mm x 95 mm

Certifications

CE, FCC

Operating Systems

Standard Support

Windows® XP 32-bit

Windows® Vista 32-bit

Linux® 2.6.x

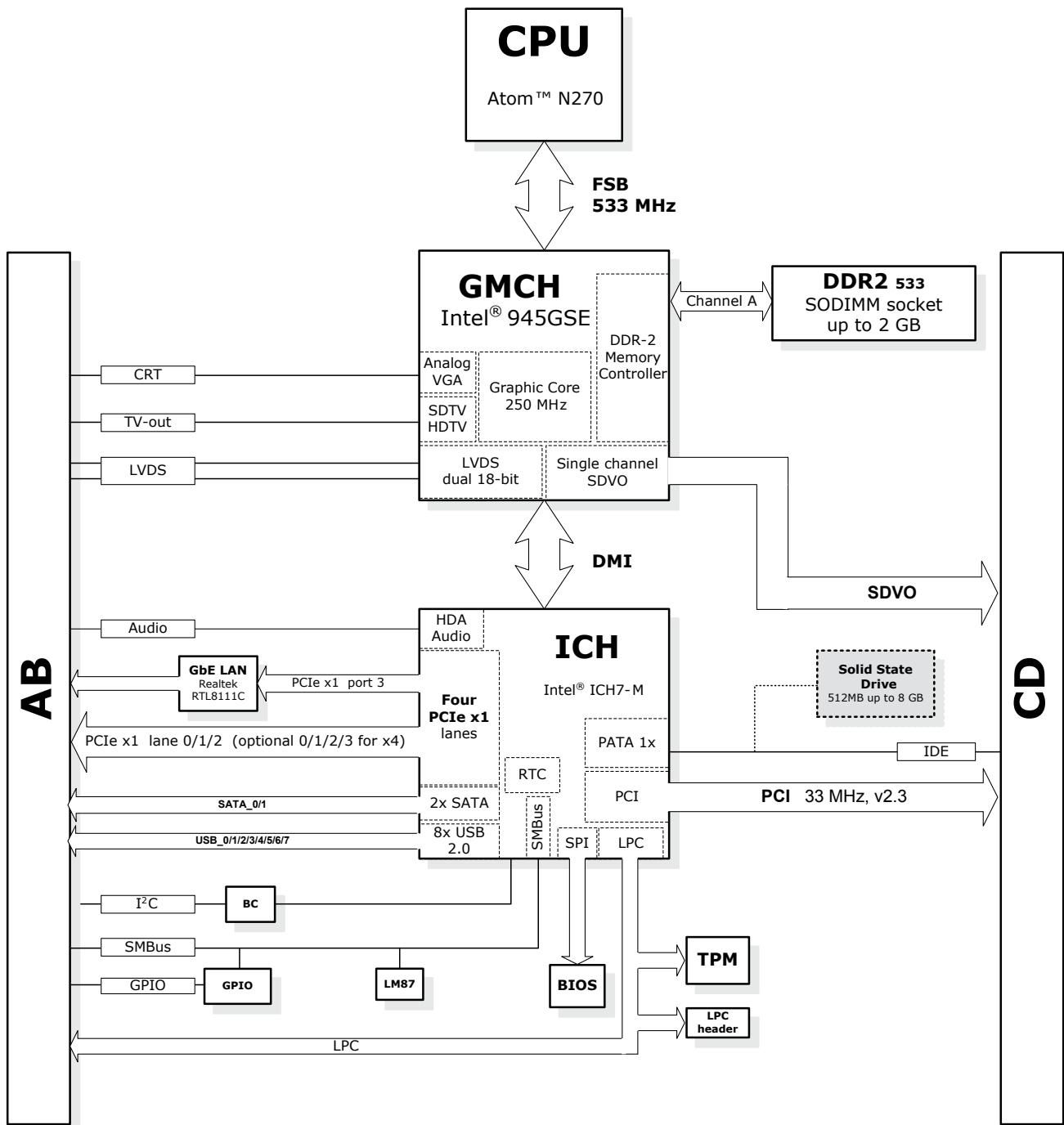
Embedded XP BSP

WinCE BSP

Linux® 2.6.x BSP

AIDI Library for Win32, WinCE and Linux®

Functional Diagram



Ordering Information

Modules

Model Number	Description/Configuration
Express-ATC-N270	Compact COM Express™ module with Intel® Atom™ N270 processor at 1.6 GHz
Express-ATC-N270-4G	Compact COM Express™ module with Intel® Atom™ N270 processor at 1.6 GHz with 4GB SSD Solid State Disk
Express-ATC-N270-8G	Compact COM Express™ module with Intel® Atom™ N270 processor at 1.6 GHz with 8GB SSD Solid State Disk

Accessories

Model Number	Description/Configuration
Heat Spreaders	HTS-ATC-B
Passive Heatsinks	HTS-ATC-B

Heatspreader for Express-ATC (BGA CPU) with threaded standoffs

Low Profile Heatsink for Express-ATC (BGA CPU) with threaded standoffs

Express-BASE

COM Express™ Reference Carrier Board
in ATX Form Factor



Features

- Five PCI Express® x1 slots
- PCI Express x16 Graphic slot / SDVO slot
- Two Legacy 32-bit PCI slots
- Dual LPC BIOS, single step execution
- LPC Super I/O (enable/disable)
- CF Card or Express Card
- Integrated POST Code
- ATX / AT or Battery Powered

Specifications

Form Factor

Core Module Interface	PICMG® COM Express™ Revision 2.0
Dimensions	305 mm x 244 mm (AT/ATX)
Expansion Busses	Two 32-bit PCI™ v2.3 slots Five PCI Express® x1 slots One PCI Express x16 / SDVO slot LPC bus header
POST LEDs	Onboard diagnostics for BIOS POST code data and address on LPC bus
Secondary BIOS	Allows single step BIOS execution Onboard sockets for secondary LPC & SPI BIOS

BIOS / Debug

POST LEDs	Onboard diagnostics for BIOS POST code data and address on LPC bus
Secondary BIOS	Allows single step BIOS execution Onboard sockets for secondary LPC & SPI BIOS

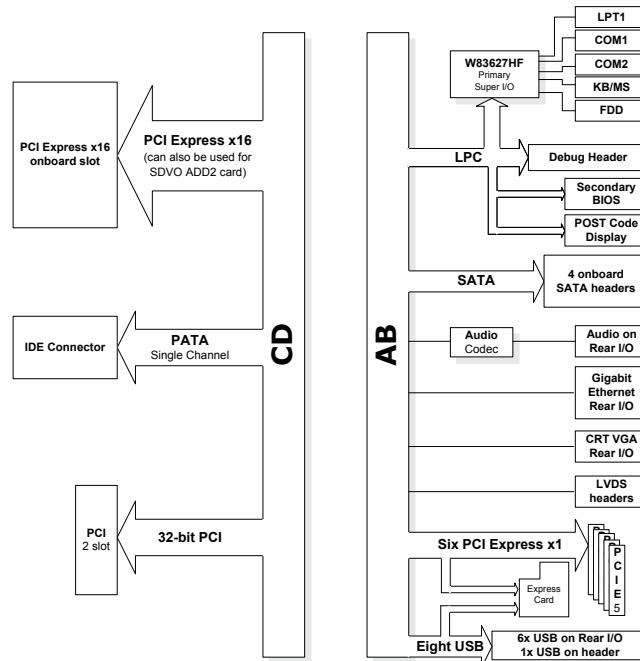
Active Components

Audio	ALC880 High Definition Audio Codec
Super I/O	Winbond WF83627HG on LPC

Connectors

COM Express™	Two x 220-pin (Type 2)
CRT	DB15 on Rear I/O panel for VGA/CRT displays
LVDS	Two onboard headers supporting dual channel LVDS
Audio	Mic/Line-in/Speakers on rear I/O panel, Mic/Line-in on header, S/PDIF on header
PATA IDE	One 40-pin header
SATA IDE	Four SATA connectors
PCIe Mini Card	One socket onboard
LAN	10/100/1000BASE-T compatible RJ45 on rear I/O panel
USB 2.0	Four + two on rear I/O panel, two on header and one through Mini Express Card
Serial Port	One DB-9 on rear I/O panel, one header onboard
Parallel Port	One DB-25 on rear I/O panel
FDD	34-pin header
Smart Battery	One header for Smart Battery management communications (connects to ADLINK BattMan board)
KB/Mouse	Two 6-pin mini DIN (on rear I/O panel)
Digital I/O	8-pin header
Feature Connectors	SMBus, I²C, module control signals, flat panel control signals
Miscellaneous	Reset, Power LED, HDD LED, Buzzer
Power	Standard ATX connector
Switches	Onboard RESET button and ATX mini switch

Functional Diagram



Ordering Information

Carrier

Model Number	Description/Configuration
Express-BASE	COM Express™ Reference Carrier Board in ATX form factor

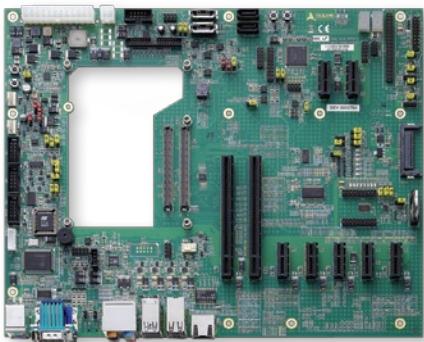
COM Express Carrier Design Guide

Provides detailed information on designing your own custom carrier board for COM Express modules.

Download from the Express-BASE product webpage at www.adlinktech.com

Express-BASE6

COM Express™ Type 6 Reference Carrier Board
in ATX Form Factor



Features

- Seven PCI Express x1 slots
- PCI Express x16 / SDVO slot
- Supports three Digital Display Interfaces (DDI) with HDMI/DVI/DisplayPort output
- LPC based Super I/O
- Dual BIOS (SPI and LPC)
- Conforms to COM Express™ Carrier Design Guide

Specifications

Form Factor

Core Module Interface	PICMG® COM Express™ Revision 2.0
Dimensions	Supports Type 6 Basic form factor modules 305 mm x 244 mm (ATX)
Expansion Busses	Seven PCI Express x1 slots One PCI Express Mini Card slot One PCI Express x16 / SDVO slot
POST LEDs	
Secondary BIOS	

BIOS / Debug

POST LEDs	Onboard diagnostics for BIOS POST code data and address on LPC bus
Secondary BIOS	Onboard sockets for secondary LPC & SPI BIOS

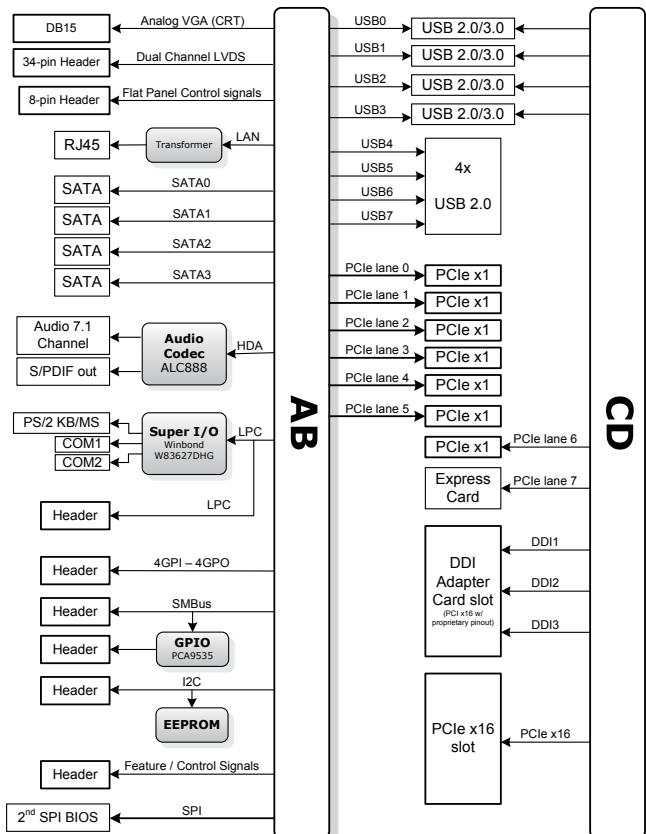
Active Components

Audio	Realtek ALC888 High Definition Audio Codec
Super I/O	Winbond WF83627DHG on LPC bus
Digital I/O	I²C to GPIO bridge PCA9535

Connectors

COM Express™	Two x 220-pin (Type 6)
CRT	DB15 on Rear I/O panel for VGA/CRT display
LVDS	Onboard 34-pin header
Digital Display Interface	Supports three DDI ports to HDMI/DVI/DisplayPort output by adapter card (PCIe x16 slot with proprietary pinout)
Flat Panel Control	Onboard 8-pin header
Audio	Mic/Line-in/Line-out on I/O panel
SATA	Four SATA connectors
PCIe Mini Card	One socket onboard
LAN	10/100/1000BASE-T compatible RJ45 on I/O panel
USB 2.0	Four USB 2.0 on I/O panel, Four USB 2.0/3.0 on I/O panel
Serial Port	One DB-9 on I/O panel One onboard 10-pin header
Smart Battery	One 10-pin header for Smart Battery management communications (connects to ADLINK BattMan board)
LPC Debug	Onboard 20-pin header
KB/Mouse	Two 6-pin mini DIN (on rear I/O panel)
Feature Connectors	SMBus, I²C, module control signals
Miscellaneous	Reset, Power LED, HDD LED, Buzzer

Functional Diagram



Ordering Information

Modules

Model Number	Description/Configuration
Express-BASE6	COM Express Type 6 Reference Carrier Board in ATX form factor

COM Express Carrier Design Guide

Provides detailed information on designing your own custom carrier board for COM Express modules.

Download from the Express-BASE6 product webpage at www.adlinktech.com

Starter Kit - COM Express

This Computer-on-Module Starter Kit gets you going with Carrier Board Design and Software Verification in no time



The Starter Kit consists of a COM Express™ core module with ATX size reference carrier board that offers one PCI Express graphics slot x16 , four PCI Express x1 slot, two PCI slots, Serial ATA, SDVO, CRT, LVDS, TV-out, USB 2.0, Gigabit LAN, and Super I/O. All necessary cables are included.

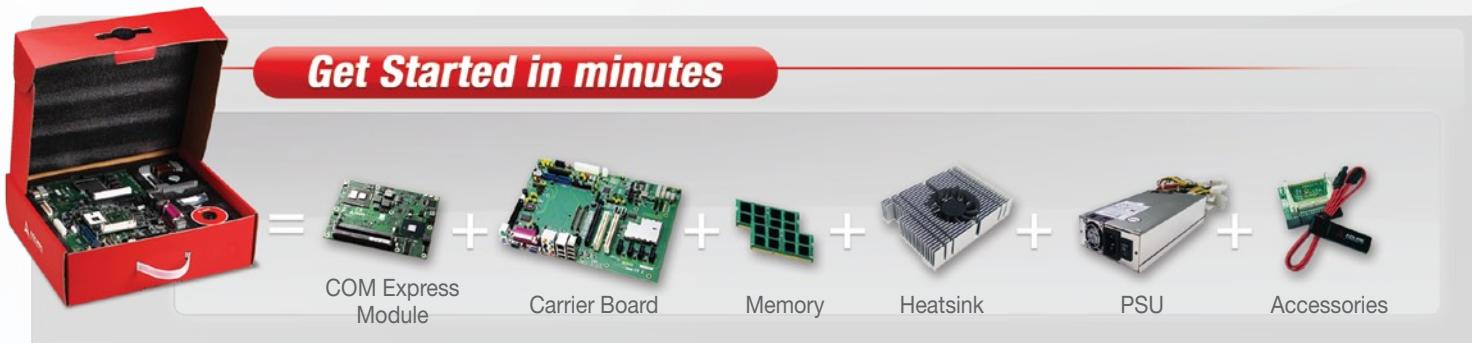
Contents

Standard Items

- Express-BASE reference carrier board
- Accessory kit:
 - IDE cable
 - SATA cable
 - TV out cable
 - CF adapter
 - PCI 2-slot riser card
- USB Stick with documentation, drivers, libraries, and BSP for Linux®, WinCE, Embedded XP
- Carrier Design Guide and product manuals

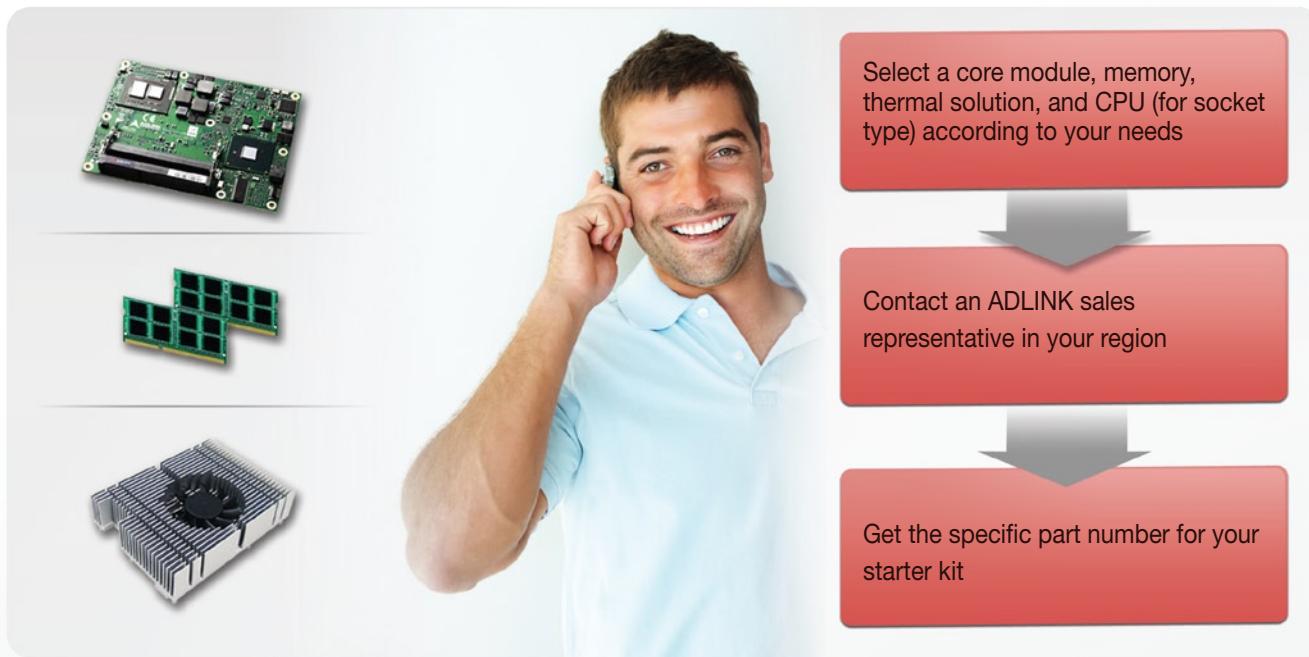
Optional Items

- COM Express™ module of your choice
- Socket-type CPU of your choice
- Memory of your choice
- Thermal solution of your choice (heatspreader, heatsink)



How to order Starter Kit – COM Express

ADLINK provides a “tailor made” Starter Kit service. We let you choose your preferred core module and thermal solution to suit your specific application development needs.



ADLINK also provides a set of Engineering Test Tools to save you time and expedite your application development

BattMan Smart Battery Management Reference System

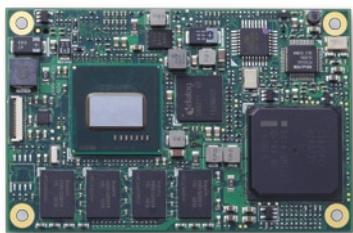


Please refer to page 9-39
for detailed information

Flat Panel Transfer Board



Please refer to page 9-39
for detailed information



Features

- Intel® Atom™ Processor E6xx from 600 MHz up to 1.6 GHz
- Up to 2 GB soldered DDR2 SDRAM at 800 MHz
- 24-bit LVDS and SDVO support
- 4x PCI Express x1 lanes
- Optional Intel® Platform Controller Hub EG20T for USB, LAN, SDIO, Serial & CAN bus and SATA
- COM Express™ COM.0 R2.0 Type 10 Pinout
- Ultra form factor 84 x 55 mm
- Operation at 0°C to +70°C or -40°C to +85°C

Specifications

Core System

CPU	Intel® Atom™ E680 / E680T*, 1.6 GHz, 3.9 W TDP Intel® Atom™ E660 / E660T*, 1.3 GHz, 3.3W TDP Intel® Atom™ E640 / E640T*, 1.0 GHz, 3.3W TDP Intel® Atom™ E620 / E620T*, 600 MHz, 2.7W TDP (* T versions support -40°C to +85°C wide operating temperature range) All processors support Intel® Hyper-Threading and Intel® Virtualization Technology
L2 cache	512 KB on all processors
Memory	Soldered 512 MB, 1 or 2 GB DDR2 at 800 MHz
BIOS	License-free bootloader or AMI UEFI BIOS
Hardware Monitor	Supply voltages and CPU temperature
Debug Interface	XDP SFF-26 extension for ICE debug
Embedded Features	Instant on with Intel Bootloader support, OEM BIOS settings, Board Info & Statistics, ACPI 3.0, Smart Battery Management support, Watchdog with programmable timer ranges
Expansion Busses	4 PCI Express x1 (0/1/2/3, port 3 is optionally used for EG20T PCH; no PCIe x4 support) LPC Bus, SMBus (system), I²C (user) 4 GPI and 4 GPO (shared with SDIO on optional EG20T) SPI (supports BIOS only)

Video

2D/3D Graphic Engine	Integrated in Intel® Atom™ Processor E6xx
Decoding	MPEG2, MPEG4, VC1, WMV9, H.264 and DivX
Encoding	MPEG4, H.264 (baseline at L3)
LVDS Interface	Single channel 18- or 24-bit pixel color depths with maximum resolution of up to 1280x768 @ 60 Hz. Pixel clock rate between 19.75 MHz (minimum) and 80 MHz (maximum).
SDVO	Serial digital video output supporting devices for DVI, TV-out, analog CRT. Maximum resolution of up to 1280x1024 @ 85 Hz and pixel clock rate up to 160 MHz.

Audio

High Definition Audio	Integrated in Intel® Atom™ Processor E6xx
Characteristics	Multi-channel audio stream, 32-bit sample depth, sample rate up to 192 kHz
Audio Codec	On carrier (standard support for ALC888)

Multi I/O and Storage

Chipset	Integrated in Intel® PCH EG20T
USB	Six USB 1.1/2.0 host ports and one USB 1.1/2.0 client port
SATA	Two ports supporting SATA 1.5 Gb/s and 3 Gb/s
SDIO port	SDIO/MMC supporting SDHC speed class 6 (shared with GPIO)
SDIO storage	TBD
Serial and CAN	One RS-232 (RX/TX) and one CAN (AX/RX) port (optional 2x RS-232 w/o CAN)

LAN

GbE MAC	Integrated in Intel® EG20T PCH
PHY	Realtek RTL8211CL
Speed	10/100/1000 Mbps

Power Specifications

Input Power	4.75 V – 21 V wide range, supports AT mode and ATX mode (with additional 5 Vsb)
Power States	Supports S0, S1, S3, S4, S5
Power Consumption	5W at 5V typical, 3W idle
Smart Battery Support	Yes

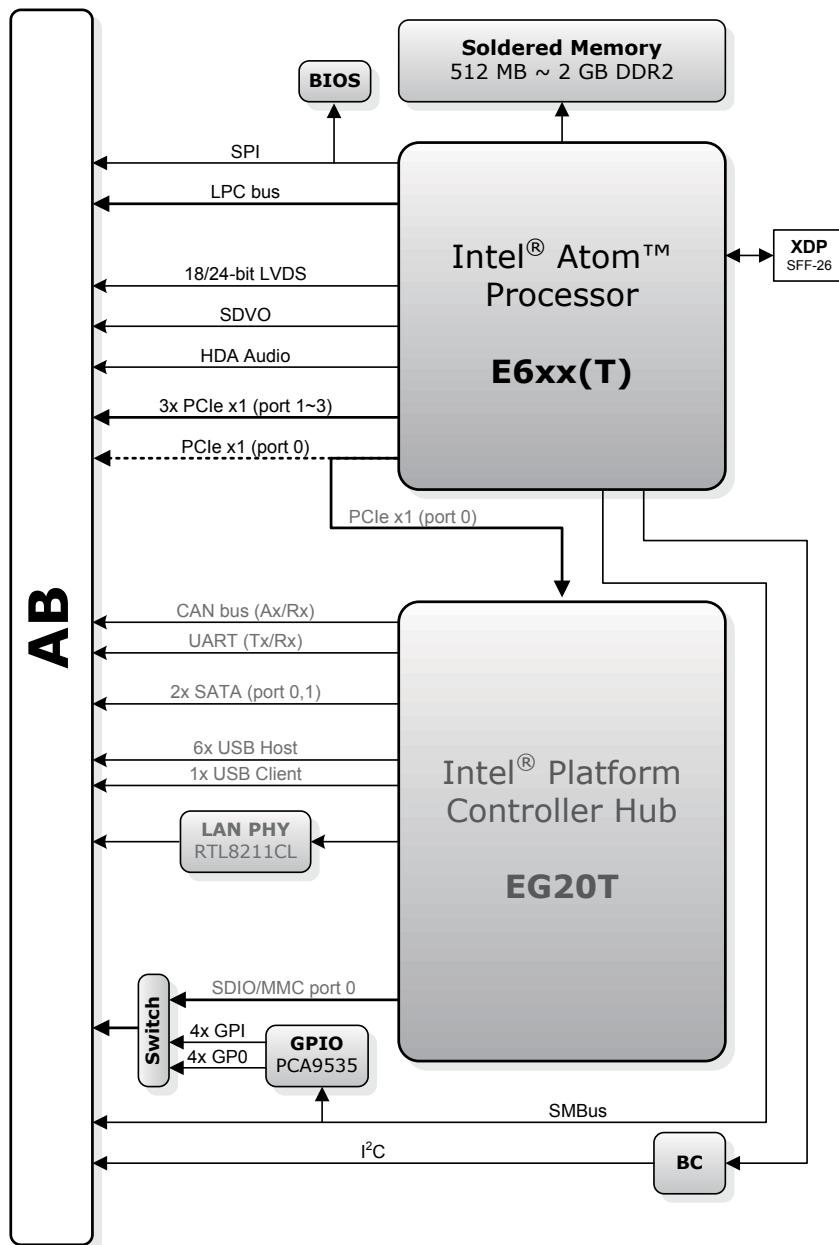
Mechanical and Environmental

Operating Temp	0°C to 70°C or industrial grade -40°C to 85°C
Storage Temp	-20°C to 80°C or industrial grade -40°C to 85°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	PICMG COM Express™ COM.0 R2.0 Type 10
Mechanical	Ultra size 84 mm x 55 mm (3.3" x 2.17")
Certification	CE, FCC, HALT

Operating Systems

Standard Support	Windows® XP / Windows® 7
	Linux®
Extended Support (BSP)	Embedded XP
	WinCE 6.0
	Linux® / Moblin
	VxWorks 6.x
	QNX
	AIDI Library

Functional Diagram



Ordering Information

Modules

Model Number	Description
nanoX-TC-E680-1G	Intel® Atom™ E680 processor at 1.6GHz with PCH EG20T
nanoX-TC-E680T-1G	Intel® Atom™ E680T processor at 1.6GHz with PCH EG20T, Industrial grade temperature range from -40°C to 85°C
nanoX-TC-E660-1G	Intel® Atom™ E660 processor at 1.3GHz with PCH EG20T
nanoX-TC-E660T-1G	Intel® Atom™ E660T processor at 1.3GHz with PCH EG20T, Industrial grade temperature range from -40°C to 85°C
nanoX-TC-E640-1G	Intel® Atom™ E640 processor at 1.1GHz with PCH EG20T
nanoX-TC-E640T-1G	Intel® Atom™ E640T processor at 1.1GHz with PCH EG20T, Industrial grade temperature range from -40°C to 85°C
nanoX-TC-E620-1G	Intel® Atom™ E620 processor at 600 MHz with PCH EG20T
nanoX-TC-E620T-1G	Intel® Atom™ E620T processor at 600 MHz with PCH EG20T, Industrial grade temperature range from -40°C to 85°C

Accessories

Model Number	Description
Heat Spreaders	
HTS-nXTC-B	Heatspreader for nanoX-TC with threaded standoffs for bottom mounting
HTS-nXTC-BT	Heatspreader for nanoX-TC with throughhole standoffs for top mounting
Passive Heatsinks	
THS-nXTC-B	Multidirectional Heatsink for nanoX-TC with threaded standoffs for bottom mounting



Features

- Intel® Atom™ Processor Z530/Z510
- Intel® System Controller Hub US15W
- One PCIe x1 (opt. 2 without LAN)
- 18/24-bit LVDS and SDVO
- GbE LAN, SATA, USB 2.0, SDIO, LPC
- AMIBIOS®8 BIOS
- Solid State Disk: 1 GB up to 8 GB
- Ultra Compact 84 x 55 mm footprint

Specifications

Core System

CPU	Intel® Atom™ processor Z530 at 1.6 GHz with 533 MHz FSB, 2.3 watts TDP, supports Hyper-Threading
	Intel® Atom™ processor Z510 at 1.1 GHz with 400 MHz FSB, 2.0 watts TDP
Memory	Soldered 512/1024 MB non-ECC, unbuffered 400/533 MHz DDR2
Chipset	Intel® System Controller Hub US15W
BIOS	AMIBIOS®8 with CMOS backup in 8 Mbit LPC Flash
Hardware Monitor	Supply voltages and CPU temperature
Watchdog Timer	Programmable timer ranges to generate RESET
Expansion Busses	Two PCI Express x1 LPC bus SMBus / I²C

Video

Chipset	GMA 500 integrated on Intel® on System Controller Hub US15W
Features	Ultra low power integrated 3D graphics core with full HD HW video decode engine and dual independent display support
CRT Interface	Analog VGA not supported
LVDS Interface	Single channel 18/24-bit at 25~112 MHz
SDVO	May be used for any external display device (HDMI/DVI, analog TV, VGA/CRT and LVDS); includes EDID and EDID-less support, and a 160 MHz pixel clock

Audio

Chipset	Integrated on Intel® System Controller Hub US15W
Type	Supports Intel® High Definition Audio codec on carrier board

LAN

Chipset	Realtek RTL8111C PCI Express Gigabit Ethernet Controller
Interface	10/100/1000 Mbps with Wake-on-LAN and Alert on LAN support

Multi I/O

IDE (PATA)	Single channel IDE with UDMA (33/66/100) connects to onboard Solid State Disk of 1 GB up to 8 GB
SATA	PATA to SATA bridge One SATA port
USB	Eight USB 2.0 ports capable of transfers up to 480 MB/s; one port optionally configurable as USB client

Power Specifications

Input Power	4.75V ~ 14V wide range input support, with optional 5Vsb for ATX support
Power States	Supports S0, S1, S3, S4, S5
Power Consumption	5 W (with Atom Z510 and 512 MB memory, typical)

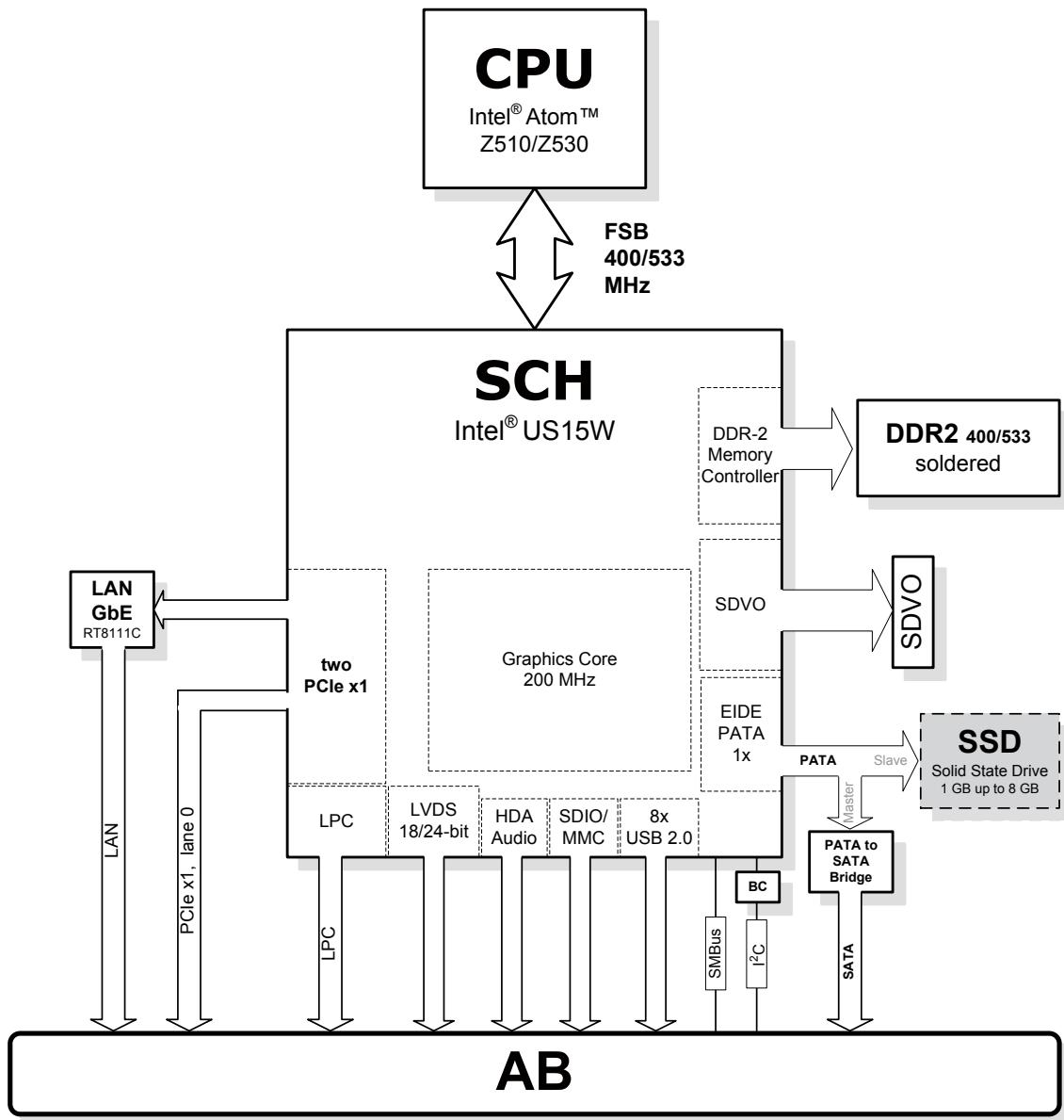
Mechanical and Environmental

Operating Temp.	0°C to 60°C
Storage Temp.	-20°C to 80°C
Humidity	10% to 90%, storage: 5% to 95% (non condensing)
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	PICMG COM Express™ COM.0 Type 1
Mechanical	Ultra size 84 mm x 55 mm (3.3" x 2.17")
Certifications	CE, FCC

Operating Systems

Standard Support	Windows® XP 32-bit Windows® Vista 32-bit Linux® 2.6.26 and up
Extended Support	Embedded XP BSP WinCE BSP Linux® 2.6.x BSP ADI I²C Library for Win32, WinCE and Linux®

Functional Diagram



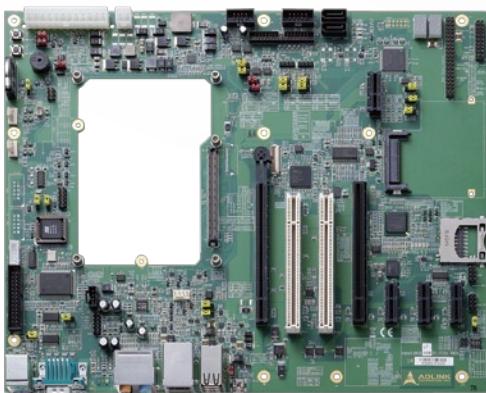
Ordering Information

Modules

Model Number	Description
nanoX-ML-51/512-0	Ultra COM Express™ Type 1 compatible module with Intel® Atom™ processor Z510 at 1.1 GHz and 512 MB DDR2
nanoX-ML-53/512-0	Ultra COM Express™ Type 1 compatible module with Intel® Atom™ processor Z530 at 1.6 GHz and 512 MB DDR2
nanoX-ML-51-512/4G	Ultra COM Express™ Type 1 compatible module with Intel® Atom™ Processor Z510 at 1.1 GHz, 512 MB memory and 4 GB SSD storage
nanoX-ML-53-512/4G	Ultra COM Express™ Type 1 compatible module with Intel® Atom™ Processor Z530 at 1.6 GHz, 512 MB memory and 4 GB SSD storage
nanoX-ML-51-1024/4G	Ultra COM Express™ Type 1 compatible module with Intel® Atom™ Processor Z510 at 1.1 GHz, 1GB memory and 4 GB SSD storage
nanoX-ML-53-1024/4G	Ultra COM Express™ Type 1 compatible module with Intel® Atom™ Processor Z530 at 1.6 GHz, 1GB memory and 4 GB SSD storage

Accessories

Model Number	Description
Heat Spreaders	Heatspreader for nanoX-ML (BGA CPU) with threaded standoffs
Passive Heatsinks	Low profile Heatsink for nanoX-ML (BGA CPU) with threaded standoffs



Specifications

Form Factor

Core Module Interface	PICMG® COM Express™ Revision 1.0
	Supports Type 1 Basic and Ultra form factor modules
Dimensions	305 mm x 240 mm (AT/ATX)
Expansion Busses	Five PCI Express® x1 slots
	Two 32-bit PCI™ v2.3 slots
	One PCI Express® Mini Card slot
	One SDVO ADD2 slot
	LPC bus header

BIOS / Debug

POST LEDs	Onboard diagnostics for BIOS POST code data and address on LPC bus
Secondary BIOS	Onboard sockets for secondary LPC & SPI BIOS

Active Components

PCI Express Switch	PLX PEX8505 switch with PCIE0 input from module
PCI Express to PCI Bridge	PLX PEX8112 bridge with PCIe x1 input from PEX8505 switch
Super I/O	Winbond WF83627DHG on LPC bus
Audio Codec	Realtek ALC888 High Definition Audio Codec
Digital I/O	I²C to GPIO bridge PCA9535

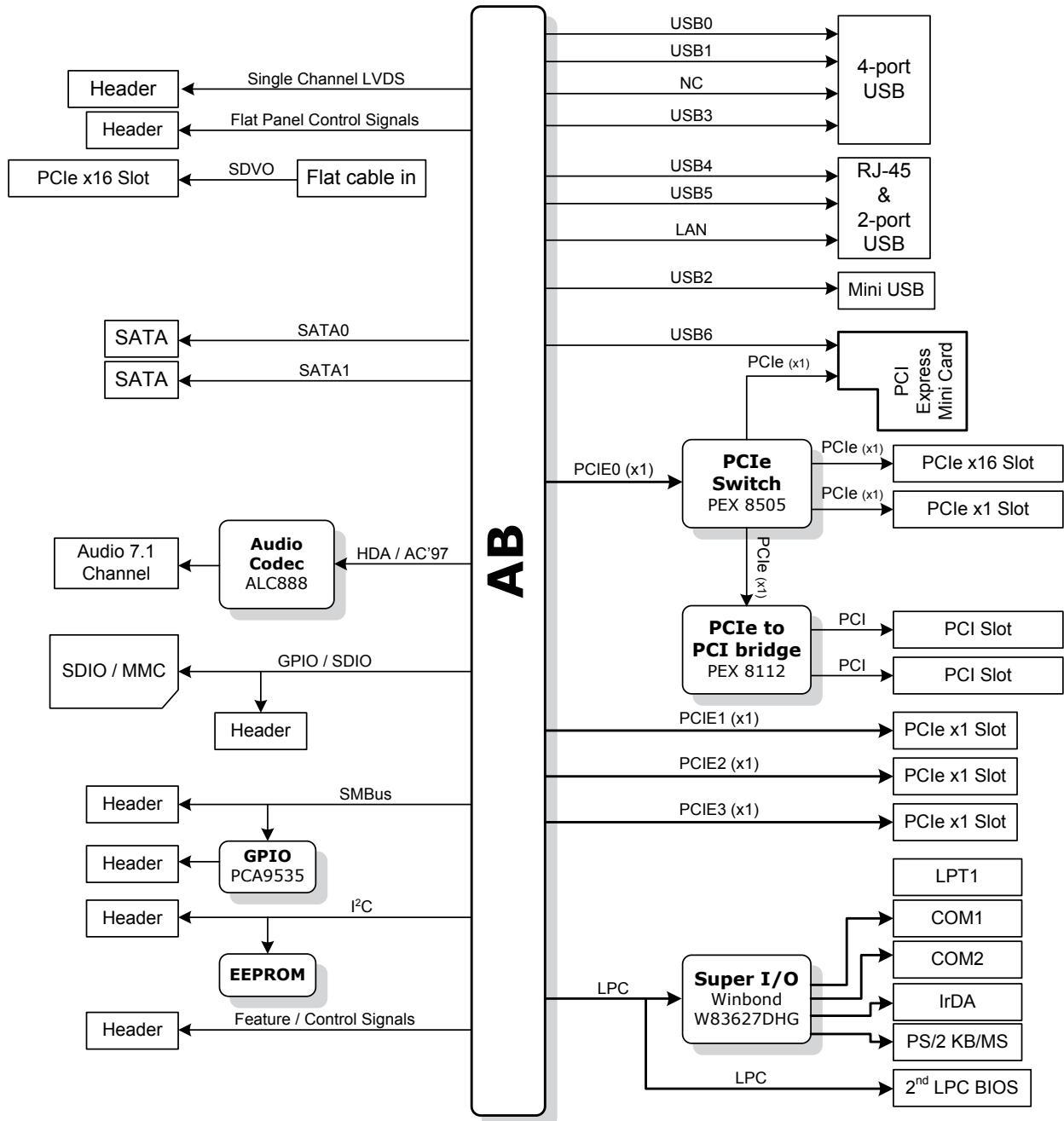
Features

- Six PCI Express® x1 (5 slots, 1 PCIe Mini Card slot)
- PCIe-to-PCI bridge, two PCI™ slots
- SDVO ADD2 card slot
- LPC based Super I/O (enable/disable)
- SDIO/MMC support, multiplexed on GPIO
- Dual BIOS (both LPC and SPI)
- Compatible with PICMG® COM Express™ Carrier Design Guide

Connectors

COM Express™	Connector AB only, one 220-pin (Type 1)
LVDS	Onboard 34-pin header
Audio	Mic/Line-in/Line-out on I/O panel
SATA	Two SATA connectors
PCIe Mini Card	One socket onboard (USB + PCIe x1)
LAN	10/100/1000BASE-T compatible RJ45 on I/O panel
USB 2.0	Five on I/O panel, one Mini-USB (client only) and one through PCIe Mini Card
Serial Port	Two DB-9 on I/O panel
Parallel Port	One header onboard
Smart Battery	One header for Smart Battery management communications (connects to ADLINK BattMan board)
KB/Mouse	Two 6-pin mini DIN (on rear I/O panel)
SDIO/MMC	SD socket for bootable storage or function extension
Feature Connectors	SMBus, I²C, module control signals, flat panel control signals
Miscellaneous	Reset, Power LED, HDD LED, Buzzer
Power	Standard ATX connector
Switches	Onboard RESET button and ATX mini switch

Functional Diagram



Ordering Information

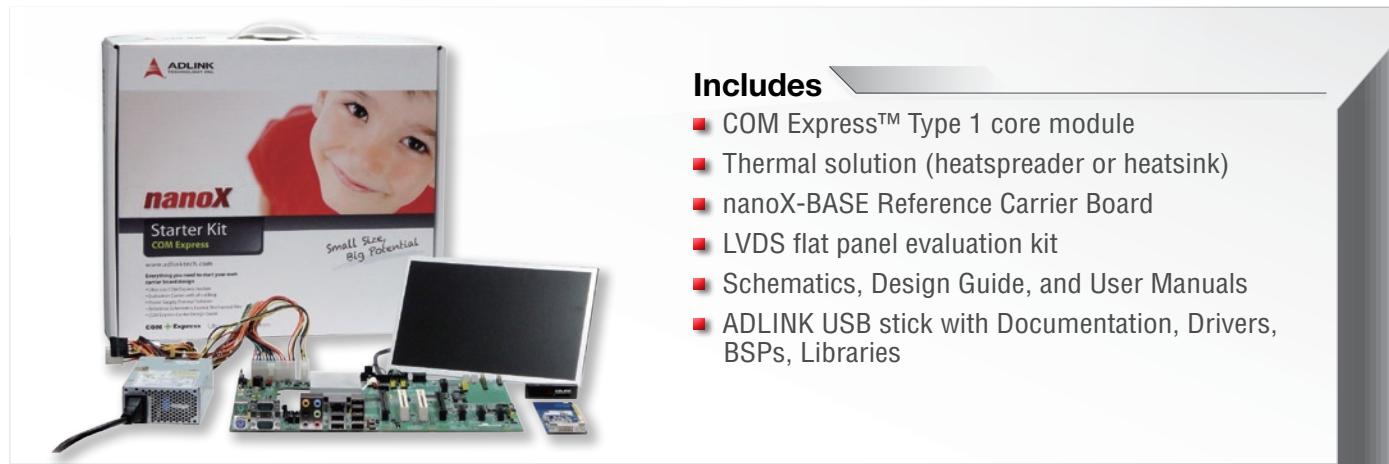
Carrier

Model Number	Description
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nanoX-BASE	COM Express™ Type 1 Reference Carrier Board with onboard PCIe to PCI bridge
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Starter Kit - nanoX

This Computer-on-Module Starter Kit gets you going with Carrier Board Design and Software Verification in no time



Includes

- COM Express™ Type 1 core module
- Thermal solution (heatspreader or heatsink)
- nanoX-BASE Reference Carrier Board
- LVDS flat panel evaluation kit
- Schematics, Design Guide, and User Manuals
- ADLINK USB stick with Documentation, Drivers, BSPs, Libraries

The nanoX Starter Kit consists of a COM Express™ Type 1 core module with ATX size reference carrier board that provides four PCI Express x1 slots, one PCI Express x16 slot (x1 link), two PCI slots, an SDVO/ADD2 slot, one PCIe Mini Card slot, one SDIO/MMC slot, USB 2.0, Gigabit LAN and Super I/O. ADLINK also provides additional development tools including a verified 10.1" LVDS panel, LVDS-to-TTL conversion board, ADD2 DVI card, power supply, thermal solution and cabling accessories.

Contents

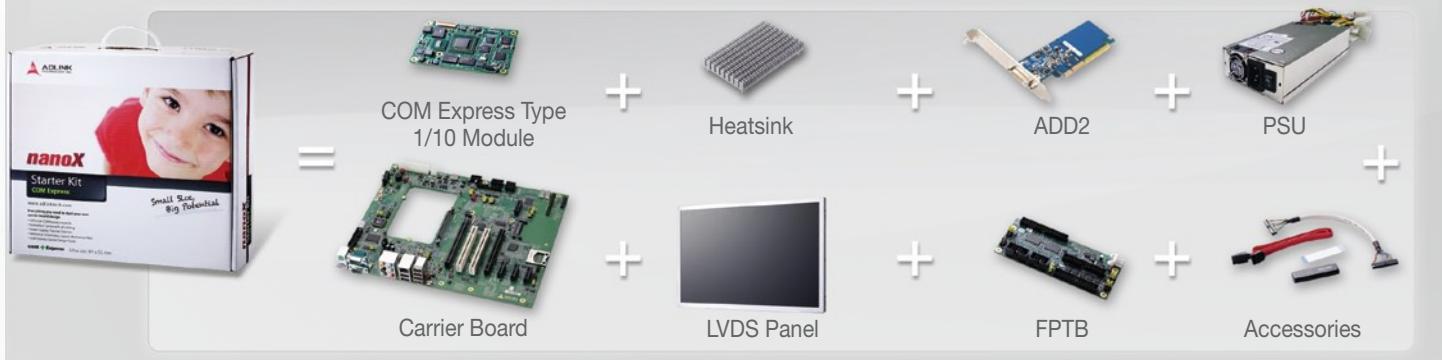
Standard Items

- nanoX-BASE reference carrier board
- 10.1" (1024 x 600) LVDS flat panel
- SDVO to DVI adapter
- Flat panel transfer board
- ATX power supply
- Accessory kit:
 - LVDS flat panel cabling
 - SATA, SDVO, USB cables
 - Power cord
 - USB stick with documentation, drivers, libraries, and BSP for Linux, Embedded XP
 - Carrier Design Guide and product manuals

Optional Items

- COM Express Type 1 core module of your choice
- Thermal solution of your choice (heatspreader or heatsink)

Get Started in minutes



How to order Starter Kit – nanoX

ADLINK provides a “tailor made” Starter Kit service. We let you choose your preferred core module and thermal solution to suit your specific application development needs.



ADLINK also provides a set of Engineering Test Tools to save you time and expedite your application development

BattMan Smart Battery Management Reference System



Please refer to page 9-39
for detailed information

LPC POST Debug Card



Please refer to page 9-40
for detailed information

Engineering Test Tools

Useful time saving tools to expedite your application development

BattMan Smart Battery Management Reference System



The BattMan Smart Battery Management Reference System supports two Smart Batteries and provides ATX power for COM Express mobile embedded systems. The BattMan system allows developers to easily implement battery power in COM Express based applications requiring high mobility.

Contents

- BattMan module
- Two Smart Batteries
- Power adapter and cabling
- USB disk with BattMan board reference schematic, drivers and documentation

Ordering Information

Model Number	Description/Configuration
StarterKit-Battman	Smart Battery Reference Platform for COM Express™ modules (includes two Smart Batteries)

Flat Panel Transfer Board



The Flat Panel Transfer Board (FPTB) supports prototyping and verification of LVDS and TTL flat panel displays with Express-BASE and nanoX-BASE carrier boards and is equipped with an LVDS-to-TTL converter to allow users to implement TTL displays with COM Express systems that support LVDS only. Onboard PWM circuitry supports backlight control for LVDS and TTL displays.

Ordering Information

Model Number	Description/Configuration
FPTB	Flat Panel Transfer Board for LVDS-to-TTL signal conversion
LCD 10.1" TFT	HannStar 10.1" LVDS flat panel display (HSD100IFW1-A00)
LVDS 30P to 34P+8P cable	LVDS cable to connect HannStar HSD100IFW1-A00 LVDS flat panel display to FPTB, Express-BASE, or nanoX-BASE
LVDS cable for FPTB	FPTB LVDS-to-LVDS cable

Note: Included in the Starter Kit - nanoX.

PCIe x16 MXM Carrier Board

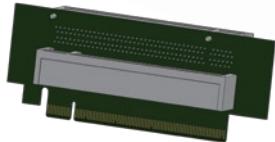


ADLINK's PCIe x16 MXM carrier boards allow for discrete PCIe graphics expansion using a Mobile PCI Express Module (MXM). The MXM carrier board series supports MXM-II and MXM-III graphics modules, allowing developers to evaluate, prototype and verify MXM graphics modules before full integration into the custom carrier board design.

Ordering Information

Model Number	Description/Configuration
MXM2CR	PEG x16 MXM-II carrier board (w/o MXM graphics module)
MXM3CR	PEG x16 MXM-III carrier board (w/o MXM graphics module)
MXM3-E4690	MXM-III module based on ATI Radeon™ E4690 GPU

PCIe x16-to-two-x8 Adapter Card

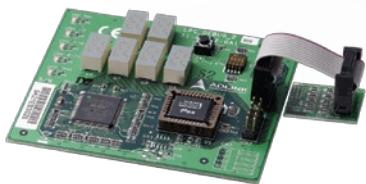


The ADLINK PCIe x16-to-two-x8 adapter card allows the use of two PCIe x8 add-on cards from a single PCIe x16 slot.

Ordering Information

Model Number	Description/Configuration
P16TO28	PCIe x16-to-two-x8 adapter card

LPC POST Debug Board



LPC POST debug board with secondary LPC BIOS and POST status LED. Can be easily connected to the LPC debug port on the Computer-on-Module to monitor BIOS POST status. A single step switch is provided for BIOS debug verification.

Ordering Information

Model Number	Description/Configuration
LPC_DEBUG_2	LPC POST debug board with secondary LPC BIOS

COM-T6T2 Adapter Board

COM Express Type 6 to Type 2 Conversion



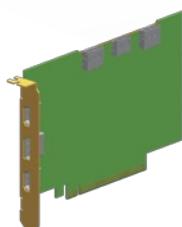
The COM-T6T2 adapter board allows COM Express Type 6 modules to be backwards compatible with Type 2 carrier boards. A SATA-to-PATA converter and PCIe-to-PCI bridge are onboard to provide signal conversion to the required COM Express Type 2 interfaces. The SDVO port is rerouted to correspond with the Type 2 pin definition (no PCIe x16).

Ordering Information

Model Number	Description/Configuration
COM-T6T2	COM Express Type 6 to Type 2 adapter card (w/ SDVO)

T6-DDI Video Adapter Card

COM Express Type 6 DDI to HDMI/DVI/DisplayPort



The T6-DDI Video Adapter Card provides connector access to COM Express Type 6 module Digital Display Interface (DDI) outputs. HDMI, DVI and DisplayPort outputs are provided. The T6-DDI is installed on the ADLINK Express-BASE6 Type 6 carrier board using a PCIe x16 slot with proprietary pinout.

Ordering Information

Model Number	Description/Configuration
T6-DDI	COM Express Type 6 DDI-to-HDMI/DVI/DisplayPort adapter card



**Стандарт
Электрон
Связь**

Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

Минимальные сроки поставки, гибкие цены, неограниченный ассортимент и индивидуальный подход к клиентам являются основой для выстраивания долгосрочного и эффективного сотрудничества с предприятиями радиоэлектронной промышленности, предприятиями ВПК и научно-исследовательскими институтами России.

С нами вы становитесь еще успешнее!

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