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.

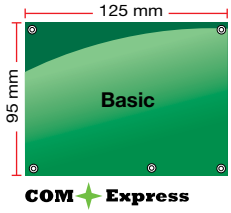
COM Express pinout types and supported features

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

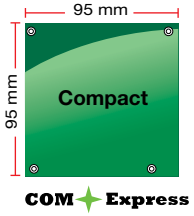
☐ Rev. 1 Pinouts ■ Rev. 2 Pinouts

The Right Size for the Right Job

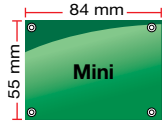
The COM Express specification also defines three module sizes: the Compact Module, Basic Module and the Extended Module. A fourth "Mini" size module supporting only type 1 and type 10 pinouts has been presented to PICMG for inclusion in a future release of the specification.



Basic **125 x 95**
Type 2/6 compatible pinout



Compact **95 x 95**
Type 2/6 compatible pinout



Mini **84 x 55**
Type 1/10 compatible pinout

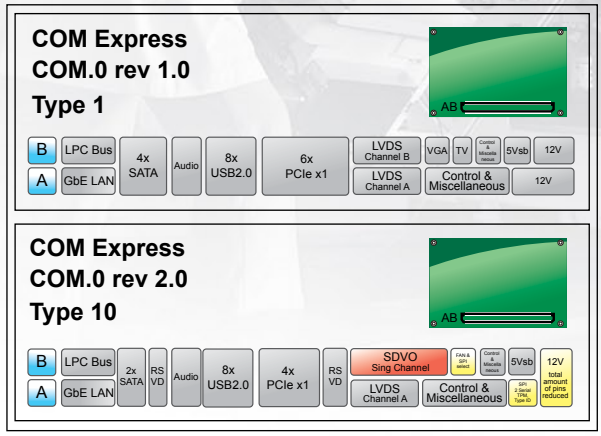
ADLINK – We Know COM Express

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.

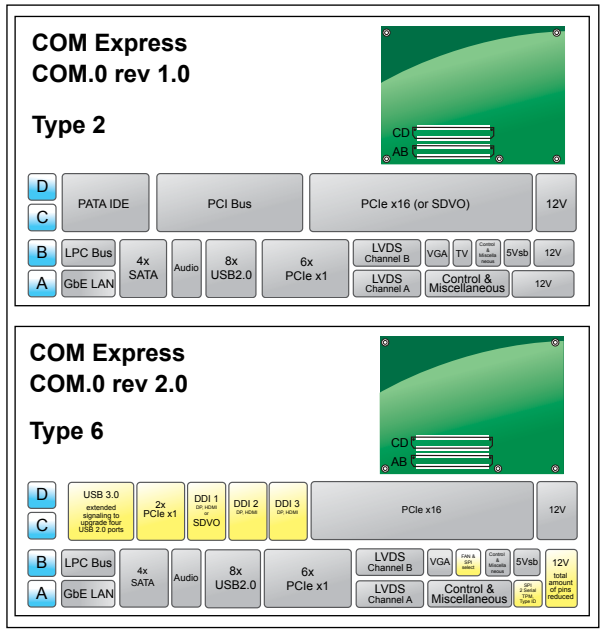
New with COM.0 Rev. 2.0 – Type 6 and Type 10 Pinouts

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 "Mini" 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

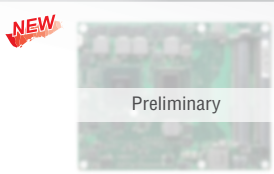


Selection Guide

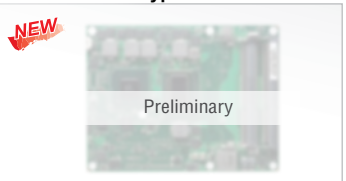
COM Express®

Basic (125 x 95 mm)

Type 6



Type 2



	Express-IB	Express-HR	Express-IB2
CPU Type	3rd Generation Intel® Core™ Processor up 2.7 GHz with 6 MB L3 cache	Intel® Core™ i7/i5/i3 (Sandy Bridge) up 2.53 GHz with 6 MB L3 cache	3rd Generation Intel® Core™ Processor up 2.7 GHz with 6 MB L3 cache
CPU Package	BGA1023	BGA1288	BGA1023
CPU Models / Speeds	-	Core™ i7 (quad core): i7-2715QE; Core™ i7/i5/i3 (dual core): i7-2655LE, i7-2610UE, i5-2515E, 2310E, 2340UE; Celeron®: B810E, 847E	-
FSB Speed	1600/1333	1333/1066	1600/1333
Main Chipset	Intel® 7-Series Chipset	Intel® PCH QM67	Intel® 7-Series Chipset
System Memory	16 GB (max), dual channel	16 GB (max), dual channel	16 GB (max), dual channel
Memory Type	DDR3 non ECC at 1600/1333	DDR3 non ECC at 1333	DDR3 non ECC at 1600/1333
Soldered Memory	-	-	-
Socket Memory	Max 16 GB on two 200-pin SODIMM	Max 16 GB on two 200-pin SODIMM	Max 16 GB on two 200-pin SODIMM
Cache (L3)	L3 depends on processor type 3MB, 4MB or 6MB	L3 depends on processor type 3MB, 4MB or 6MB	L3 depends on processor type 3MB, 4MB or 6MB
BIOS Type	AMI EFI	AMI EFI	AMI EFI
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	16 Mbit Flash SPI	16 Mbit Flash SPI	16 Mbit Flash SPI
Graphics Controller	HD Graphics 4000	HD Graphics 3000	HD Graphics 4000
Graphics Memory	Max 829 MB UMA	Max 829 MB UMA	Max 829 MB UMA
Integrated Display Support	VGA (QXGA) single/dual 18/24-bit LVDS (UXGA) 3 DDI ports for HDMI/DVI/DP & SDVO	VGA (QXGA) single/dual 18/24-bit LVDS (UXGA) 3 DDI ports for HDMI/DVI/DP & SDVO	VGA (QXGA) single/dual 18/24-bit LVDS (UXGA)
External Graphics Bus	PCIe x16 Graphics port	PCIe x16 Graphics port	PCIe x16 Graphics port or switch for SDVO port
Compatibillity	OpenGL 3.1, DirectX 11	OpenGL 3.0, DirectX 10.1	OpenGL 3.1, DirectX 11
Parallel ATA (IDE)	-	-	one channel, one device
Serial ATA	two SATA 3 Gb/s, two SATA 6 Gb/s	two SATA 3 Gb/s, two SATA 6 Gb/s	two SATA 3 Gb/s, two SATA 6 Gb/s
Matrix Storage Support	Yes	Yes	Yes
Ethernet	integrated Intel GbE (10/100/1000)	integrated Intel GbE (10/100/1000)	integrated Intel GbE (10/100/1000)
USB	4 ports USB 3.0, 4 ports USB 2.0	8 ports USB 2.0	4 ports USB 3.0, 4 ports USB 2.0
Audio	Intel® HD Audio	Intel® HD Audio	Intel® HD Audio
Watchdog	Yes	Yes	Yes
TPM	Yes, Ver. 1.2	Yes, Ver. 1.2	Yes, Ver. 1.2
PCI Express Support	6x PCI-Express x1 (or 1 x4) PCIe two x8, x4 or x1 (on PEG)	6x PCI-Express x1 (or 1 x4) PCIe two x8, x4 or x1 (on PEG)	6x PCI-Express x1 (or 1 x4) PCIe two x8, x4 or x1 (on PEG)
PCI Suport	-	-	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)	12V only (AT), 12V and 5Vsb (ATX)
Power States	S0 S1 S3 S4 S5	S0 S1 S3 S4 S5	S0 S1 S3 S4 S5
Power Consumption	TBD	TBD	TBD
Operating Temperature	0°C ~ +60°C	0°C ~ +60°C	0°C ~ +60°C
Extended Temperature	TBD	TBD	TBD
Compatibillity	PICMG COM.0 R2.1, Type 6	PICMG COM.0 R2.0, Type 6	PICMG COM.0 R2.1, Type 2
Dimensions	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	optional SATA SSD 4~16 GB
BSP & Software Support	Windows® 7 Linux, AIDI library	Windows® XP/Xpe, Windows® 7 Linux 2.6.x, AIDI library	Windows® 7 Linux, AIDI library
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Basic (125 x 95 mm)
Type 2

	Express-CB/CBE	Express-MV	Express-MG
CPU Type	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	BGA956	PGA478
CPU Models / Speeds	Core™ i3/i5/i7 (Arrandale) i7-610E 620LE 620UE i5-520E i3-330E Celeron® M P4505, U3405	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	1066/800	1066/800	1066/800
Main Chipset	Intel® PCH QM57	Intel® GS45 with ICH9M (SFF)	Intel® GM45 with ICH9M
System Memory	8 GB (max), dual channel	8 GB (max), dual channel	8 GB (max), dual channel
Memory Type	DDR3 non ECC (CB) or ECC (CBE)	DDR3 at 1066/800/667	DDR3 at 1066/800/667
Soldered Memory	-	-	-
Socket Memory	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 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	AMIBIOS®8	AMIBIOS®8
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	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
Integrated Display Support	VGA (QXGA) single/dual 18/24-bit LVDS (UXGA)	VGA (QXGA) single/dual 18/24-bit LVDS (UXGA) TV-out (PAL/NTSC/HDTV)	VGA (QXGA) single/dual 18/24-bit LVDS (UXGA) TV-out (PAL/NTSC/HDTV)
External Graphics Bus	PCIe x16 Graphics port	PCIe x16 Graphics port or SDVO port	PCIe x16 Graphics port or SDVO port
Compatibillity	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
Serial ATA	four SATA 3 Gb/s	three SATA 3 Gb/s	three SATA 3 Gb/s
Matrix Storage Support	Yes	optional	optional
Ethernet	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
Audio	Intel® HD Audio	Intel® HD Audio	Intel® HD Audio
Watchdog	Yes	Yes	Yes
TPM	Yes, Ver. 1.2	Yes, Ver. 1.2	Yes, Ver. 1.2
PCI Express Support	6x PCI-Express x1 (or 1 x4) PCI-Express x8, x4 or x1 (on PEG)	5x PCI-Express x1 (or 1 x4) PCI-Express x8, x4 or x1 (on PEG)	5x PCI-Express x1 (or 1 x4) 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
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)	12V only (AT), 12V and 5Vsb (ATX)
Power States	S0 S1 S3 S4 S5	S0, S1, S3, S4, S5	S0, S1, S3, S4, S5
Power Consumption	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
Extended Temperature	selected modules: -20°C ~ +70°C	selected modules: -20°C ~ +70°C	-
Compatibillity	PICMG COM.0 R2.0, Type 2	PICMG COM.0 R1.0, Type 2	PICMG COM.0 R1.0, Type 2
Dimensions	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	-	-
BSP & Software Support	Windows® XP/Xpe, Vista, Windows® 7 Linux® 2.6.x, AIDI library	Windows® XP/Xpe, Windows® Vista, Windows® 7, Windows® CE, Linux® 2.6.x, AIDI library	Windows® XP/Xpe, Windows® Vista, Windows® 7, Windows® CE, Linux® 2.6.x, AIDI library
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COM Express®

	Basic (125 x 95 mm) Type 2			Compact (95 x 95 mm) Type 6
				
	Express-MC800	**Express-NR**	**Express-AT**	**Express-GFC**
CPU Type	Intel® Core™2 Duo (Merom) up 2.2 GHz with 4 MB L2 cache	Intel® Core™2 Duo (Merom/Yonah) up to 2.2 GHz with 4MB L2 cache	Intel® Atom™ up to 1.6 GHz with 512 KB L2 cache	AMD Fusion™ up to dual-core 1.65GHz with 1MB L2 cache
CPU Package	PPGA478 (socket-P) or PBGA479	µFC-PGA (socket-M) or µFC-BGA	µFC-BGA	BGA-413
CPU Models / Speeds	Celeron® M 550 (socket) Core™2 Duo (Meron) U7500, L7500 Core™2 Duo T7500 (socket)	Celeron® M 423, 440/530 Core™2 Duo L7400, U7500, U2500 Core™2 Duo T7400 (socket)	Intel® Atom™ N270 at 1.6 GHz	AMD Fusion™ G-T56N, G-T40N, G-T52R, G-T44R
FSB Speed	800/667/533	667/533	533	1066/1333
Main Chipset	Intel® GME965 with ICH8M	Intel® 945GME with ICH7M	Intel® 945GSE with ICH7M	AMD Fusion™ Controller Hub A50M
System Memory	4 GB (max), dual channel	4 GB (max), dual channel	2 GB (max), single channel	8 GB (max), single channel
Memory Type	DDR2 at 667/533	DDR2 at 667/533	DDR2 at 533	DDR3 at 1066/1333
Soldered Memory	-	-	-	-
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 8GB on two 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 512KB or 1MB
BIOS Type	AMIBIOS®8	AMIBIOS®8	AMIBIOS®8	AMI APTIO UEFI
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	16 Mbit Flash SPI
Graphics Controller	Intel® GMA X3100	Intel® GMA 950	Intel® GMA 950	UVD and 3D Engine integrated on G-series processor
Graphics Memory	Max 384 MB UMA	Max 256 MB UMA	Max 256 MB UMA	-
Integrated Display Support	VGA (QXGA) single/dual 18/24-bit LVDS (UXGA) TV-out (PAL/NTSC/HDTV)	VGA (QXGA) single/dual 18/24-bit LVDS (UXGA) TV-out (PAL/NTSC/HDTV)	VGA (QXGA) single/dual 18/24-bit LVDS (UXGA) TV-out (PAL/NTSC/HDTV)	VGA (QXGA) single/dual 24-bit LVDS (UXGA) Two DDI ports for DP/HDMI/DVI/SDVO
External Graphics Bus	PCIe x16 Graphics Port, or dual SDVO ports	PCIe x16 Graphics Port, or dual SDVO ports	Single SDVO port	-
Compatibillity	OpenGL 2.0, DirectX 10	OpenGL 1.4, DirectX* 9.0c	OpenGL 1.4, DirectX* 9.0c	DirectX 11 and UVD3
Parallel ATA (IDE)	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	four SATA 6 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)	Realtek RTL8111E GbE (10/100/1000)
USB	8 ports USB 2.0	8 ports USB 2.0	8 ports USB 2.0	2 ports USB 3.0, 8 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	Yes, Ver. 1.2
PCI Express Support	5x PCI-Express x1 (or 1 x4) PCI-Express x8, x4 or x1 (on PEG)	5x PCI-Express x1 (or 1 x4) PCI-Express x1 (on PEG)	3x PCI-Express x1 (optional 5 PCI Express x1)	2x PCI-Express x1 4x PCI-Express x1 or PCIe one x4 (on APU)
PCI Suport	4x PCI rev. 2.3, 32-bit, 33MHz	4x PCI Ver. 2.3, 32-bit, 33MHz	4x PCI Ver. 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	TBD
Operating Temperature	0°C ~ +60°C	0°C ~ +60°C	0°C ~ +60°C	0°C ~ +70°C
Extended Temperature	-	selected modules: -20°C ~ +70°C	selected modules: -20°C ~ +70°C	TBD
Compatibillity	PICMG COM.0 R1.0, Type 2	PICMG COM.0 R1.0, Type 2	PICMG COM.0 R1.0, Type 2	PICMG COM.0 R2.0, Type 6
Dimensions	Basic Form Factor (95x125 mm)	Basic Form Factor (95x125 mm)	Basic Form Factor (95x125 mm)	Compact Form Factor (95x95 mm)
Solid State Disk on Module	-	-	optional PATA SSD 512 MB up to 4 GB	-
BSP & Software Support	Windows® XP/Xpe, Windows® Vista Linux® 2.6.x, AIDI library	Windows® XP/Xpe, Windows® Vista Windows® CE, Linux® 2.6.x, AIDI library	Windows® XP/Xpe, Windows® Vista Windows® CE, Linux® 2.6.x, AIDI library	Windows® XP/Xpe, Windows® 7 Windows® CE, Linux® 2.6.x, AIDI library
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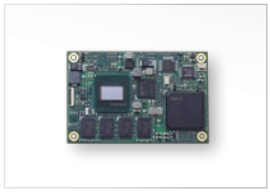
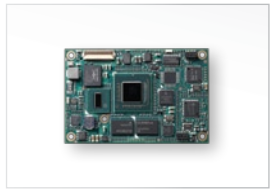
	Compact (95 x 95 mm)		Mini (84 x 55 mm)	
	Type 2		Type 10	Type 1
				
	Express-LPC	Express-ATC	nanoX-TC	nanoX-ML
CPU Type	Single / Dual Intel® Atom™ up to 1.8 GHz with 1 MB L2 cache	Intel® Atom™ up to 1.6 GHz with 512 KB L2 cache	Intel® Atom™ Processor E6xx from 600 MHz up to 1.6 GHz	Intel® Atom™ Processor Z5xx from 1.1 GHz up to 1.6 GHz
CPU Package	FCBGA559	PBGA437	FC-BGA 676	BGA 441
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	Intel® Atom™ Z530 at 1.6 GHz Intel® Atom™ Z510 at 1.1 GHz
FSB Speed	-	533	-	533/400
Main Chipset	ICH8M	Intel® 945GSE with ICH7M	Intel® PCH EG20T	Intel® SCH US15W
System Memory	4 GB (max), single channel	2 GB (max), single channel	2 GB (max), single channel	1 GB (max), single channel
Memory Type	DDR3 at 667/800	DDR2 533	DDR2 800	DDR2 400/533
Soldered Memory	-	-	512 MB up 2 GB DDR2 at 800 MHz	512 MB or 1 GB DDR2 466/533 MHz
Socket Memory	Max 4 GB on two 200-pin SODIMMs	Max 2 GB on single 200-pin SODIMM	-	-
Cache (L2)	L2 cache 512 KB (N455/D425) L2 cache 1 MB (D525)	L2 cache 512 KB	L2 cache 512 KB	L2 cache 512 KB
BIOS Type	AMIBIOS®8, American Megatrend	AMIBIOS®8, American Megatrend	AMI EFI, 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	FWH, 8 Mbit Flash
Graphics Controller	Intel® GMA 3150	Intel® GMA 950	Intel® GMA 600	Intel® GMA 500
Graphics Memory	Max 384 MB UMA	Max 256 MB UMA	Max 64 MB UMA	Max 256 MB UMA
Integrated Display Support	VGA (QXGA) 2048x1536 single 18 LVDS (WXGA) 1366x768	VGA (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	single channel 18/24-bit LVDS (WXGA) supports HDTV/DHD decode and MPEG, H.264, hardware decoding
External Graphics Bus	-	Single SDVO port	Single SDVO max 1920x1080@50Hz	Single SDVO port
Compatibillity	OpenGL 1.5, DirectX 9.0c	OpenGL 1.4, DirectX* 9.0c	OpenGL 2.1, DirectX 9.0c	OpenGL 2.0, DirectX 9.0c
Parallel ATA (IDE)	one channel, two devices	one channel, two devices	-	one channel, one device
Serial ATA	two SATA 1.5 Gb/s	two SATA 1.5 Gb/s	two SATA 1.5 Gb/s	one 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)	Realtek RTL8111C GbE (10/100/1000)
USB	6 ports USB 2.0	6 ports USB 2.0	6 ports USB 2.0, 1 client port	8 ports USB 2.0
Audio	Intel® HD Audio	Intel® HD Audio and AC'97	Intel® HD Audio	Intel® HD Audio
Watchdog	Yes	Yes	Yes	Yes
TPM	Yes	Yes	Yes	Yes
PCI Express Support	5x PCI-Express x1	3x PCI-Express x1 (optional 5 PCI Express x1)	3x PCIe x1 (optional 4x PCIe without PCH EG20T)	1x PCIe x1 (optional 2x PCIe without LAN function)
PCI Suport	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)	4.75V – 14V wide range (5Vsb optional for ATX function)	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	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	5 W with Atom®Z510 at 1.1 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	selected modules: -20°C ~ +70°C	selected modules: -20°C ~ +70°C
Compatibillity	PICMG COM.0 R2.0, Type 2	PICMG COM.0 R1.0, Type 2	PICMG COM.0 R2.0, Type 10	PICMG COM.0 R1.0, Type 1
Dimensions	Compact Form Factor (95x95 mm)	Compact Form Factor (95x95 mm)	Mini Form Factor (84x55 mm)	Mini 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	-	optional SSD 1 GB up to 8 GB
BSP & Software Support	Windows® XP/Xpe, Windows® Vista Windows® CE, Linux® 2.6.x, AIDI library	Windows® XP/Xpe, Windows® Vista Windows® CE, Linux® 2.6.x, AIDI library	Windows® XP/Xpe, Windows® CE, Win7 Embedded, Linux®, AIDI library	Windows® XP/Xpe, Windows® CE, Linux®, AIDI library
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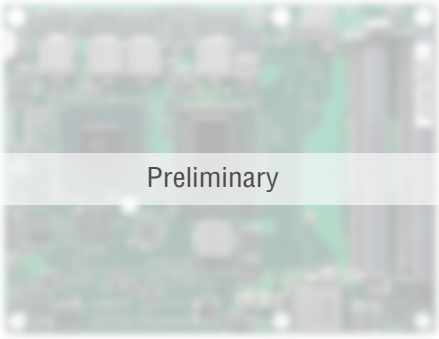
Express-IB

COM Express® Type 6 Module with 3rd Generation Intel® Core™ Processor-based Mobile Platform



Features

- 3rd Generation Intel® Core™ Processor
- Intel® 7-Series 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 (Gen3) for graphics (or general purpose x8/4/1)
- Two SATA 3 Gb/s, two SATA 6 Gb/s, Gigabit LAN, four USB 3.0, four USB 2.0

Specifications

Core System

CPU	**22nm process, BGA type**
	3rd Generation Intel® Core™ Processor
Memory	Dual channel 1333/1600 MHz DDR3 non-ECC memory up to 16GB in dual stacked SODIMM socket
Chipset	Intel® 7-Series Chipset
L3 Cache	-
BIOS	AMI EFI with CMOS backup in 16 Mbit SPI flash
Hardware Monitor	Supply voltages and CPU temperature
Debug Interface	XDP SFF-26 extension for ICE debug
Watchdog Timer	Programmable timer range to generate RESET
Expansion Busses	PCI Express x16 (Gen3) bus for discrete graphics solution or general purpose PCI Express (2 x8 or 1 x8 with 2 x4)
	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	Intel® HD Graphics 4000 at 650–1200 MHz (depending on processor)
Integrated Video	DirectX 11, OpenGL 3.1, OpenCL 1.1
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
VGA Interface	Analog VGA support with 300 MHz DAC
	Analog monitor support up to QXGA (2048 x 1536) and VGA 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® 7-Series Chipset
Audio Codec	On Express-BASE6 carrier (ALC888)

LAN

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

Multi I/O

Chipset	Integrated on Intel® 7-Series Chipset
USB	4 ports USB 3.0 (USB0~3) and 4 ports USB 2.0 (USB4~7)
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 (optional)
Type	TPM 1.2

Power Specifications

Input Power	AT mode (12 V +/- 5%) and ATX mode (12 V and 5 Vsb +/- 5%)
Power States	Supports S0, S1, S3, S4, S5
Power Consumption	TBD
Smart Battery Support	Yes

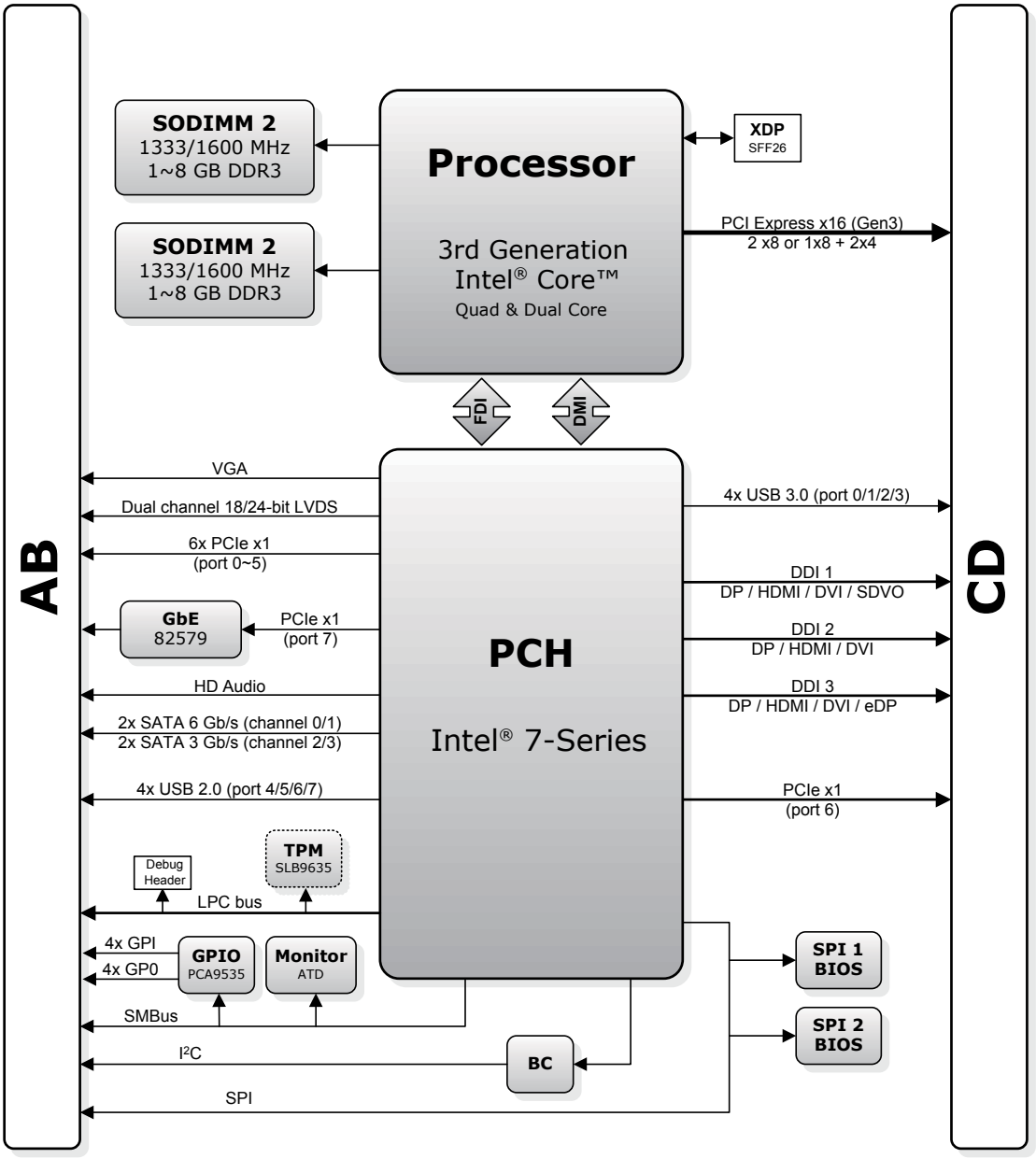
Mechanical and Environmental

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

Functional Diagram



Ordering Information

Modules

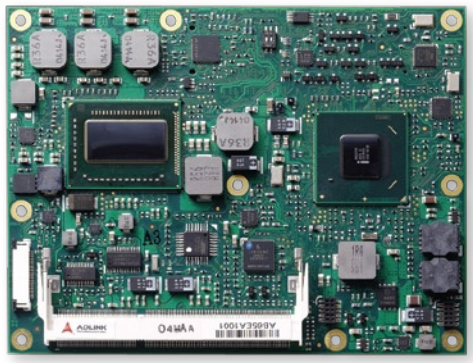
Model Number	Description/Configuration
Express-IB-i7-3615QE	COM Express® Type 6 module with 4C 3rd Generation Intel® Core™ Processor with 7-Series Chipset
Express-IB-i7-3612QE	COM Express® Type 6 module with 4C 3rd Generation Intel® Core™ Processor with 7-Series Chipset
Express-IB-i7-3555LE	COM Express® Type 6 module with 2C 3rd Generation Intel® Core™ Processor with 7-Series Chipset
Express-IB-i7-3517UE	COM Express® Type 6 module with 2C 3rd Generation Intel® Core™ Processor with 7-Series Chipset
Express-IB-i5-3610ME	COM Express® Type 6 module with 2C 3rd Generation Intel® Core™ Processor with 7-Series Chipset
Express-IB-i3-3120ME	COM Express® Type 6 module with 2C 3rd Generation Intel® Core™ Processor with 7-Series Chipset
Express-IB-i3-3217UE	COM Express® Type 6 module with 2C 3rd Generation Intel® Core™ Processor with 7-Series Chipset

Accessories

Model Number	Description/Configuration
Passive Heatsinks	
THSH-IB-B	High Profile Heatsink for Express-IB with threaded standoffs
Heat Spreaders	
HTS-IB-B	Heatspreader for Express-IB with threaded standoffs
Heatsink with Active Cooling	
THSF-IB-B	High Performance Heatsink with Fan for Express-IB 2C with threaded standoffs
THSF-IB-B-4C	High Performance Heatsink with Fan for Express-IB 4C with threaded standoffs

Express-HR

COM Express® Type 6 Module with Intel® Core™ i7/i5/i3 Processor and QM67 Chipset



Features

- Intel® Quad or Dual Core™ i7/i5/i3 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 (4C)
	Intel® Core i7-2655LE 2.2 GHz (2.9 GHz Turbo), 4MB L3 cache, 25W (2C)
	Intel® Core™ i7-2610UE 1.5 GHz (2.4 GHz Turbo), 4MB L3 cache, 17W (2C)
	Intel® Core™ i5-2515E 2.5 GHz (3.2 GHz Turbo), 3MB L3 cache, 35W (2C)
	Intel® Core™ i3-2310E 2.1 GHz, 3MB L3 Cache, 35W (2C)
	Intel® Core™ i3-2340UE 1.3 GHz, 3MB L3 Cache, 17W (2C)
	Intel® Celeron® B810E 1.6 GHz, 2MB L3 Cache, 35W (2C)
	Intel® Celeron® 847E 1.1 GHz, 2MB L3 Cache, 17W (2C)
Memory	Dual channel non-ECC 1066/1333 MHz DDR3 memory up to 16 GB in dual SODIMM socket
Chipset	Intel® Mobile QM67 Express Chipset
L3 Cache	6MB (i7-2715QE), 4MB(i7-2655LE and i7-2610UE), 3MB (i5-2515E)
BIOS	AMI EFI with CMOS backup in 16 Mbit SPI flash
Hardware Monitor	Supply voltages and CPU temperature
Debug Interface	XDP SFF-26 extension for ICE debug
Watchdog Timer	Programmable timer range to generate RESET
Expansion Busses	PCI Express x16 (Gen2) bus for discrete graphics solution or general purpose PCI Express (2 x8 or 1 x8 with 2 x4)
	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
VGA Interface	Analog VGA support with 300 MHz DAC
	Analog monitor support up to QXGA (2048 x 1536) and VGA hot plug
LVDS Interface	Dual channel 18/24-bit LVDS
Digital Display Interface	Three DDI ports supporting HDMI / DVT / DisplayPort or SDVO

Audio

Chipset	Integrated on Intel® PCH QM67
Audio Codec	On Express-BASE6 carrier (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 (optional)
Type	TPM 1.2

Power Specifications

Input Power	AT mode (12 V +/- 5%) and ATX mode (12 V and 5 Vsb +/- 5%)
Power States	Supports S0, S1, S3, S4, S5
Power Consumption	22 W with Core™ i7-2610UE at 1.5 GHz and 2 GB memory typical
Smart Battery Support	Yes

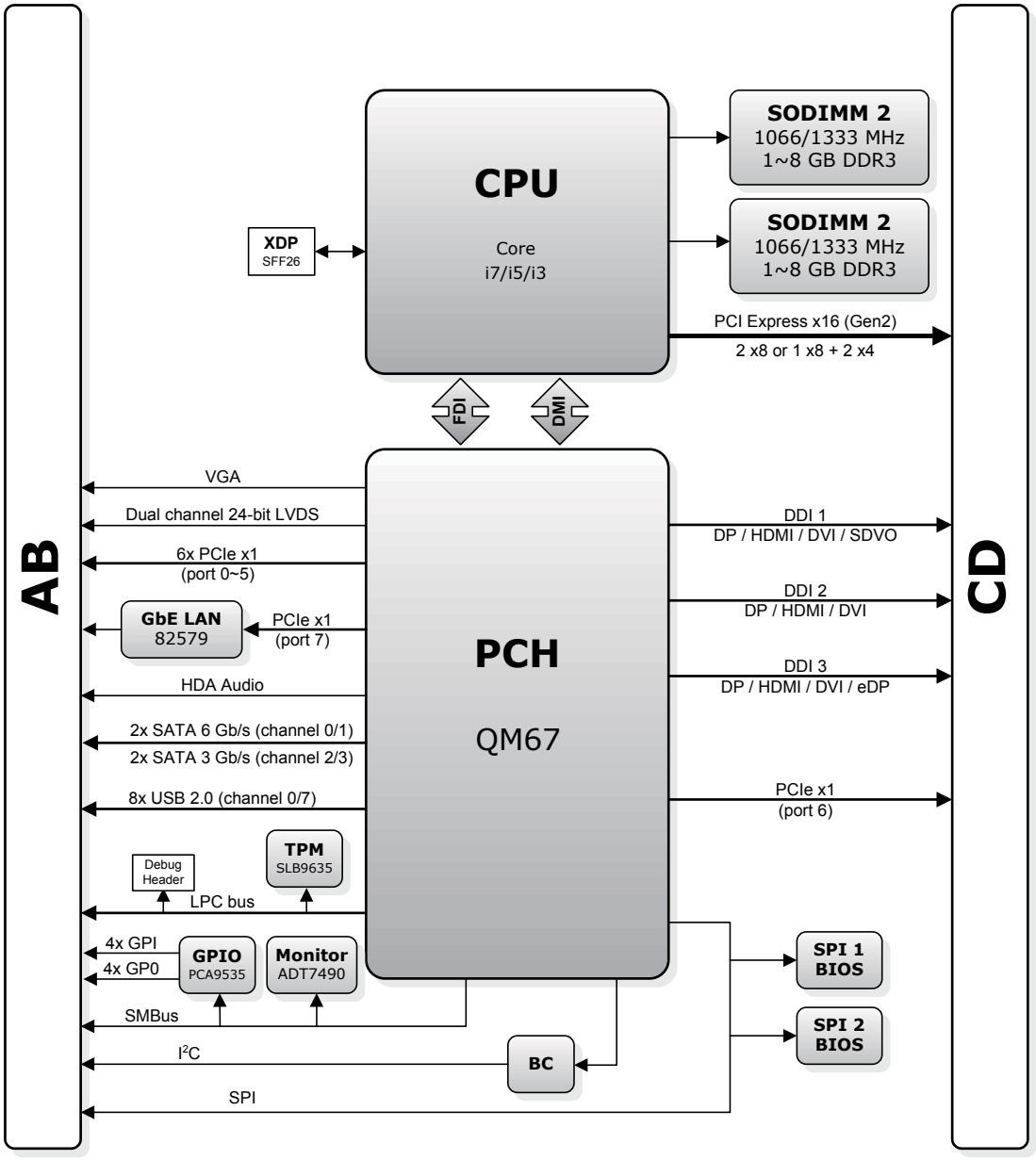
Mechanical and Environmental

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-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

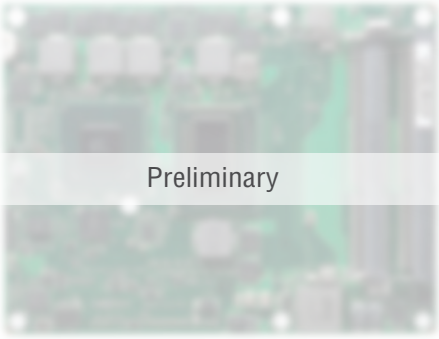
Model Number	Description/Configuration
Express-HR-i7-2715QE	COM Express® Type 6 module with 4C Intel® Core i7-2715QE SV processor at 2.1GHz with QM67 chipset
Express-HR-i7-2655LE	COM Express® Type 6 module with 2C Intel® Core i7-2655LE LV processor at 2.2GHz with QM67 chipset
Express-HR-i7-2610UE	COM Express® Type 6 module with 2C Intel® Core i7-2610UE ULV processor at 1.5 GHz with QM67 Chipset
Express-HR-i5-2515E	COM Express® Type 6 module with 2C Intel® Core i5-2515E SV processor at 2.5 GHz with QM67 Chipset
Express-HR-i3-2310E	COM Express® Type 6 module with 2C Intel® Core i3-2310E SV processor at 2.1 GHz with QM67 Chipset
Express-HR-i3-2340UE	COM Express® Type 6 module with 2C Intel® Core i3-2340UE ULV processor at 1.3 GHz with QM67 Chipset
Express-HR-B810E	COM Express® Type 6 module with 2C Intel® Celeron® B810E SV processor at 1.6 GHz with QM67 Chipset
Express-HR-B-847E	COM Express® Type 6 module with 2C Intel® Celeron® B847E ULV processor at 1.1 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-B	Heatspreader for Express-HR with threaded standoffs
Heatsink with Active Cooling	
THSF-HR-BL	High Performance Heatsink with Fan for Express-HR with threaded standoffs
THSF-HR-BL-QC	High Performance Heatsink with Fan for Express-HR Quad-Core CPU with threaded standoffs

Express-IB2

COM Express® Type 2 Module with 3rd Generation Intel® Core™ Processor-based Mobile Platform



Features

- 3rd Generation Intel® Core™ Processor
- Intel® 7-Series Chipset
- Up to 16GB Dual Channel DDR3 SDRAM at 1333MHz
- 18/24-bit LVDS and SDVO
- Five PCIe x1, one PCIe x16 (Gen3) 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	**22nm process, BGA type**
	3rd Generation Intel® Core™ Processor
Memory	Dual channel 1333/1600 MHz DDR3 non-ECC memory up to 16GB in dual stacked SODIMM socket
Chipset	Intel® 7-Series Chipset
L3 Cache	-
BIOS	AMI EFI with CMOS backup in 16 Mbit SPI flash
Hardware Monitor	Supply voltages and CPU temperature
Debug Interface	XDP SFF-26 extension for ICE debug
Watchdog Timer	Programmable timer range to generate RESET
Expansion Busses	PCI Express x16 (Gen3) bus for discrete graphics solution or general purpose PCI Express (2 x8 or 1 x8 with 2 x4)
	5 PCI Express x1: Lanes 0/1/2/3/4 are free, lane 5 is occupied by PATA, lane 6 is occupied by PCI bus and lane 7 is occupied by GbE
	LPC bus, SMBus (system) , I²C (user)

Video

Integrated in Processor	Intel® HD Graphics 4000 at 650–1200 MHz (depending on processor)
Integrated Video	DirectX 11, OpenGL 3.1, OpenCL 1.1
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
VGA Interface	Analog VGA support with 300 MHz DAC
	Analog monitor support up to QXGA (2048 x 1536) and VGA hot plug
LVDS Interface	Dual channel 18/24-bit LVDS
SDVO Interface	SDVO multiplexed with PCIe x16 lane 0-7

Audio

Chipset	Integrated on Intel® 7-Series Chipset
Audio Codec	On Express-BASE carrier (ALC888)

LAN

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

Multi I/O

Chipset	Integrated on Intel® 7-Series Chipset
USB	8 ports USB 2.0 (USB0~7)
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 (optional)
Type	TPM 1.2

Power Specifications

Input Power	AT mode (12 V +/- 5%) and ATX mode (12 V and 5 Vsb +/- 5%)
Power States	Supports S0, S1, S3, S4, S5
Power Consumption	TBD
Smart Battery Support	Yes

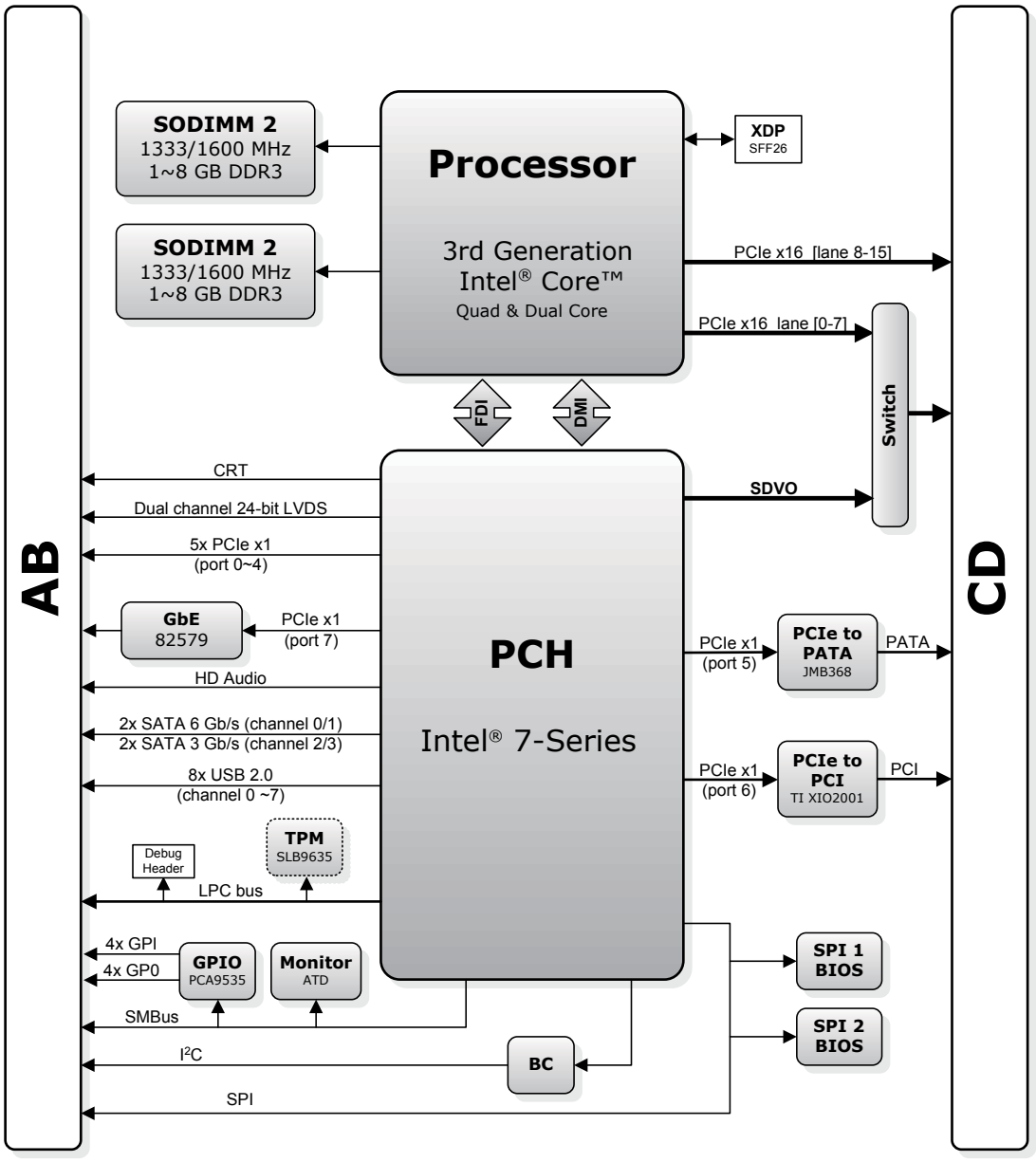
Mechanical and Environmental

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 2, Basic form factor 125mm x 95mm
Certification	CE, FCC, HALT

Operating Systems

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

Functional Diagram



Ordering Information

Modules

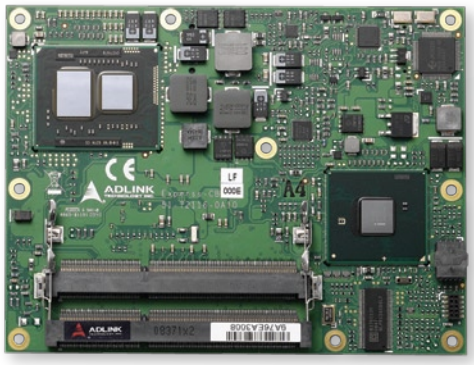
Model Number	Description/Configuration
Express-IB2-i7-3615QE	COM Express® Type 2 module with 4C 3rd Generation Intel® Core™ Processor with 7-Series Chipset
Express-IB2-i7-3612QE	COM Express® Type 2 module with 4C 3rd Generation Intel® Core™ Processor with 7-Series Chipset
Express-IB2-i7-3555LE	COM Express® Type 2 module with 2C 3rd Generation Intel® Core™ Processor with 7-Series Chipset
Express-IB2-i7-3517UE	COM Express® Type 2 module with 2C 3rd Generation Intel® Core™ Processor with 7-Series Chipset
Express-IB2-i5-3610ME	COM Express® Type 2 module with 2C 3rd Generation Intel® Core™ Processor with 7-Series Chipset
Express-IB2-i3-3120ME	COM Express® Type 2 module with 2C 3rd Generation Intel® Core™ Processor with 7-Series Chipset
Express-IB2-i3-3217UE	COM Express® Type 2 module with 2C 3rd Generation Intel® Core™ Processor with 7-Series Chipset

Accessories

Model Number	Description/Configuration
Passive Heatsinks	
THSH-IB2-B	High Profile Heatsink for Express-IB2 with threaded standoffs
Heat Spreaders	
HTS-IB2-B	Heatspreader for Express-IB2 with threaded standoffs
Heatsink with Active Cooling	
THSF-IB2-B	High Performance Heatsink with Fan for Express-IB2 2C with threaded standoffs
THSF-IB2-B-4C	High Performance Heatsink with Fan for Express-IB2 4C with threaded standoffs

Express-CB/CBE

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



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

Specifications

Core System

CPU	**Arrandale BGA type**
	Intel® Core™ i7-610E Processor (4M Cache, 2.53 GHz) 35 W
	Intel® Core™ i5-520E Processor (3M Cache, 2.40 GHz) 35 W
	Intel® Core™ i7-620LE Processor (4M Cache, 2.00 GHz) 25 W
	Intel® Core™ i7-620UE Processor (4M Cache, 1.06 GHz) 18 W
	Intel® Core™ i3-330E Processor (3M Cache, 2.13 GHz) 35W
	Intel® Celeron® Processor P4505 (2M Cache, 1.86 GHz) 35 W
	Intel® Celeron® Processor U3405 (2M Cache, 1.06GHz) 18W
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 flash
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 Feature Support	DirectX 10 and OpenGL 2.1
	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
VGA Interface	Analog VGA support by 300 MHz DAC
	Analog monitor support up to QXGA (2048 X 1536)
LVDS Interface	Single / Dual channel 18- or 24-bit panels

Audio

Chipset	Integrated on Intel® PCH QM57
Audio Codec	On Express-BASE 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 (optional)
Type	TPM 1.2

Power Specifications

Input Power	AT mode (12 V +/- 5%) and ATX mode (12 V and 5 Vsb +/- 5%)
Power States	Supports S0, S1, S3, S4, S5
Power Consumption	21 W with Core™ i7-620UE at 1.2 GHz and 2 GB memory typical
Smart Battery Support	Yes

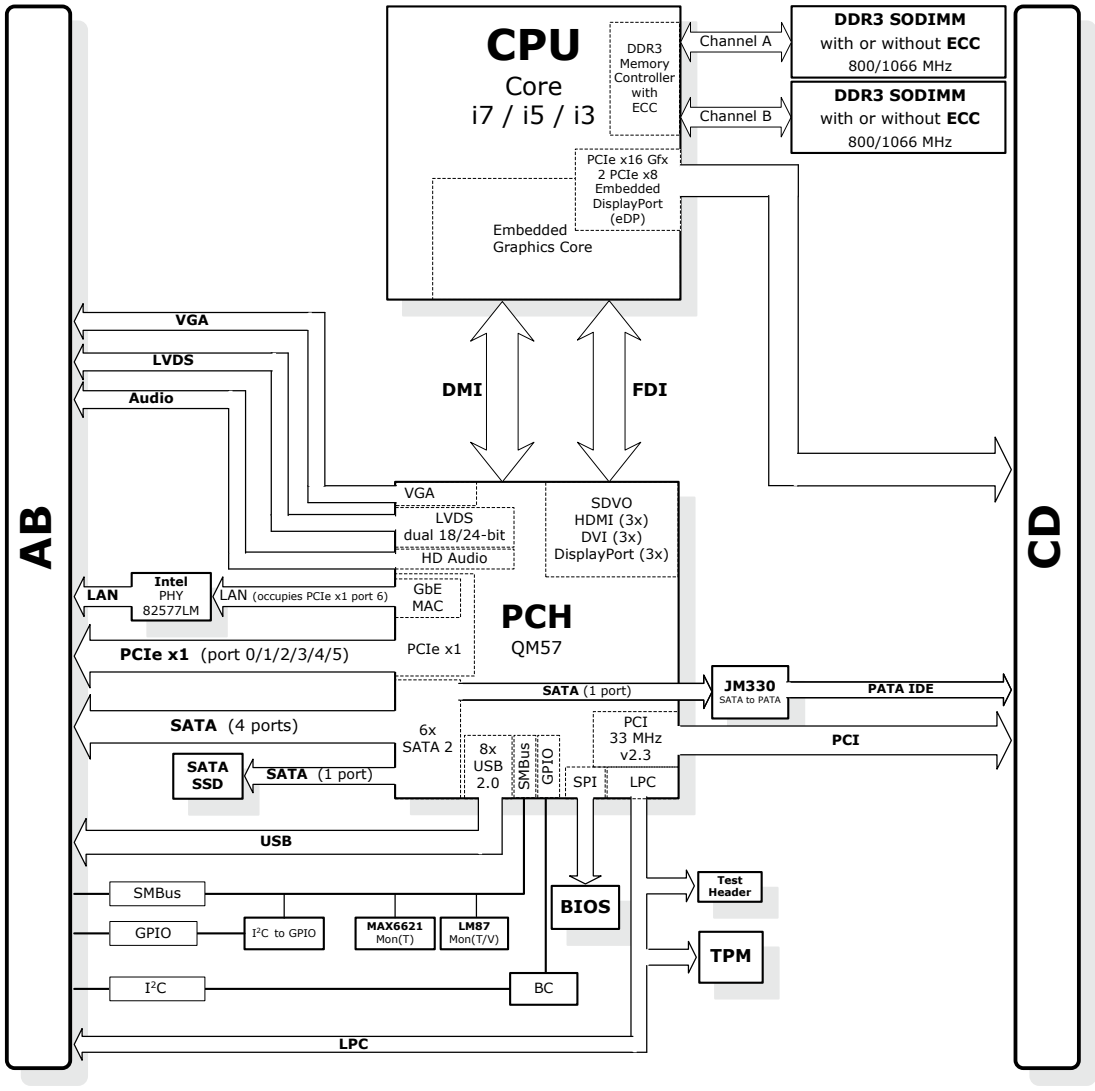
Mechanical and Environmental

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

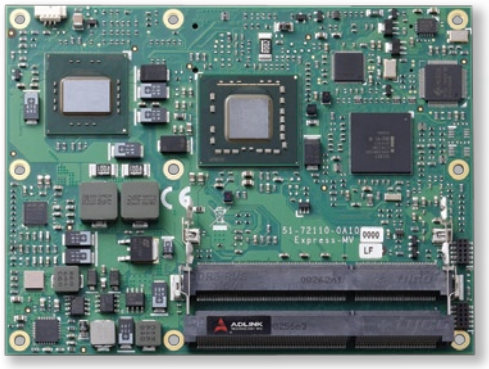
Non-ECC Model Number	ECC Model Number	Description/Configuration
Express-CB-i7-610E	**Express-CBE-i7-610E**	COM Express® module with Intel® Core i7-610E SV processor at 2.53 GHz with QM57 chipset
Express-CB-i5-520E	**Express-CBE-i5-520E**	COM Express® module with Intel® Core i5-520 SV processor at 2.4 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-i3-330E	**Express-CBE-i3-330E**	COM Express® module with Intel® Core i3-330E SV processor at 2.13 GHz with QM57 chipset
Express-CB-P4505	**Express-CBE-P4505**	COM Express® module with Intel® Celeron® P4505 SV processor at 1.86 GHz with QM57 chipset
Express-CB-U3405	**Express-CBE-U3405**	COM Express® module with Intel® Celeron® U3405 ULV processor at 1.06 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



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

Specifications

Core System

CPU	**Penryn SFF BGA type**
	Intel® Core™2 Duo SP9300, 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
BIOS	AMIBIOS®8 with CMOS backup in 16 Mbit SPI flash
Hardware Monitor	Supply voltages and CPU temperature
Watchdog Timer	Programmable timer ranges to generate RESET
Expansion Busses	Graphics PCI Express x16 bus for SDVO/HDMI/DisplayPort or general purpose PCI Express (x8 / x4 / x1)
	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
Integrated Video	Intel® Dynamic Video Memory Technology (Intel® DVMT 5.0)
Feature Support	Video capture via x1 concurrent PCI Express port
	PAVP (Protected Audio-Video Path) support for Protected Intel® HD Audio Playback
	High performance MPEG-2 decoding
	WMV9 (VC-1) and H.264 (AVC) support
	Hardware acceleration for MPEG2 VLD/iDCT
	Microsoft DirectX 10 support
	Blu-ray support @ 40 Mb/s
	Hardware motion compensation
	Intermediate Z in classic rendering
VGA Interface	Analog VGA support by 300MHz DAC
	Analog monitor support up to QXGA, supports VGA 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

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 (optional)
Type	TPM 1.2

Power Specifications

Input Power	AT mode (12 V +/- 5%) and ATX mode (12 V and 5 Vsb +/- 5%)
Power States	Supports S0, S1, S3, S4, S5
Power Consumption	18 W (with Core™2 Duo SU9300 at 1.2 GHz and 2 GB memory typical)

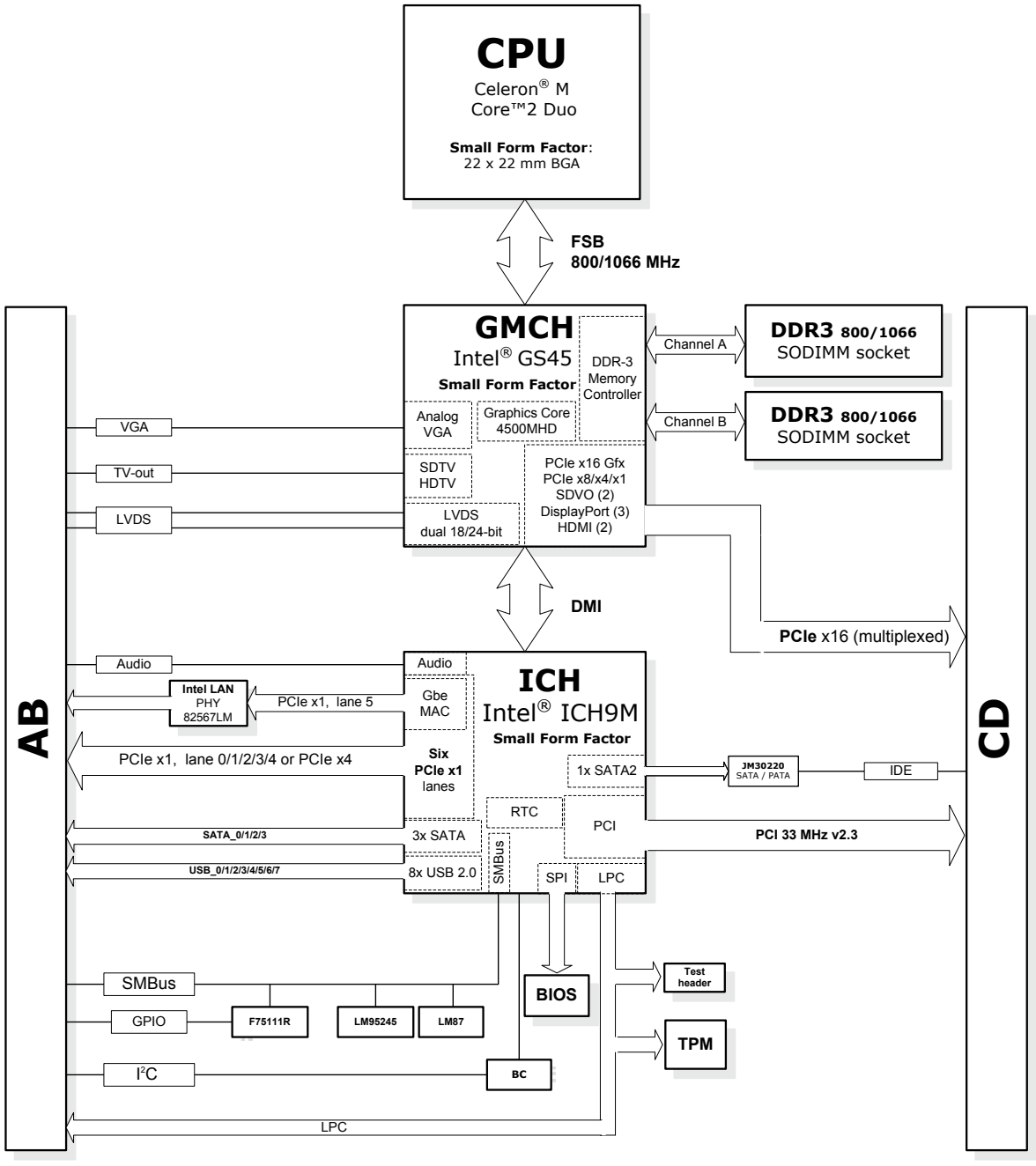
Mechanical and Environmental

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

Features

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

Specifications

Core System

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

Video

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

Audio

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

LAN

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

Multi I/O

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

Super I/O

	Connected to LPC bus on carrier if needed

TPM

Chipset	Infineon SLB9635TT1.2 (optional)
Type	TPM 1.2

Power Specifications

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

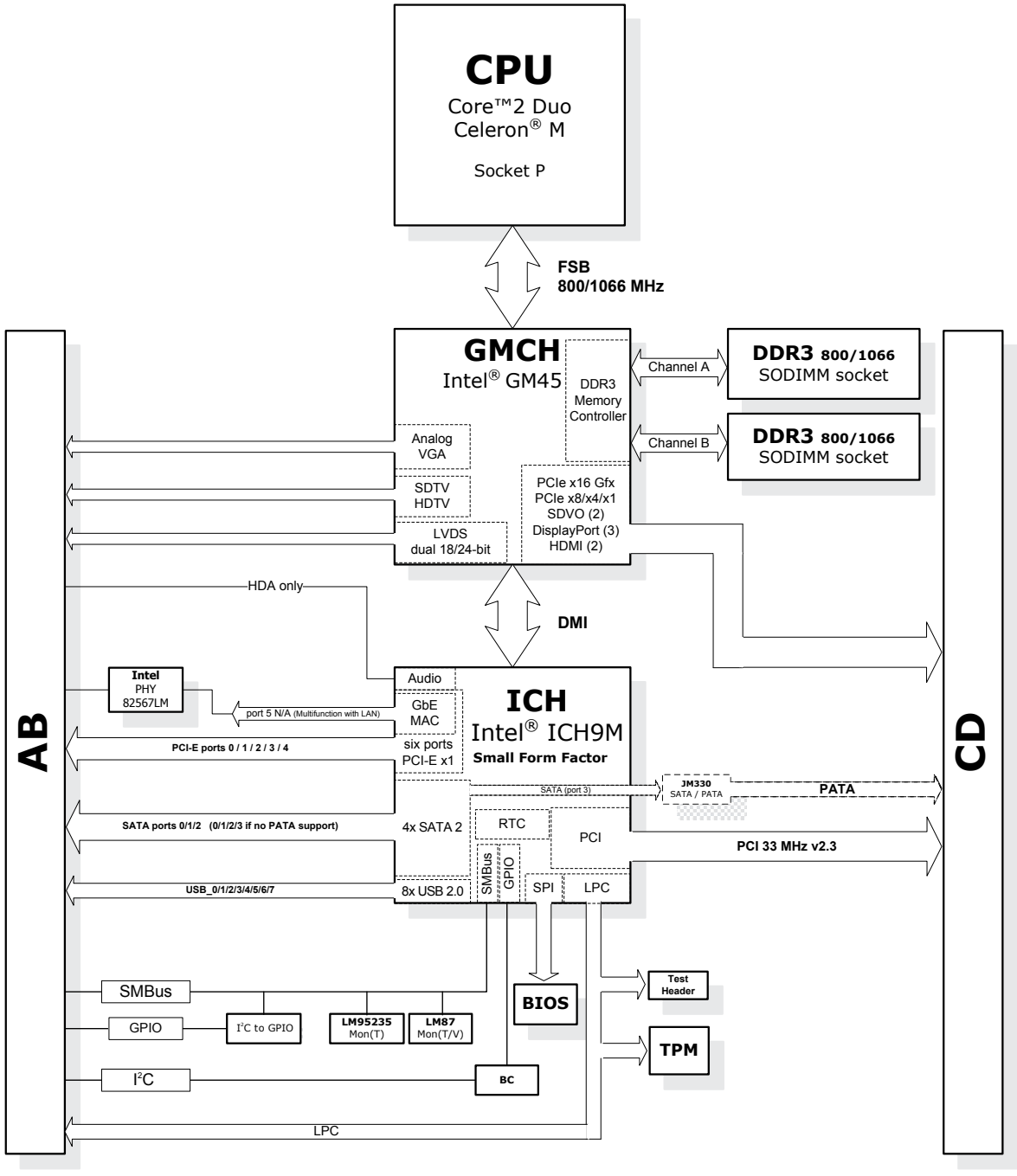
Mechanical and Environmental

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

Operating Systems

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

Functional Diagram



Ordering Information

Modules

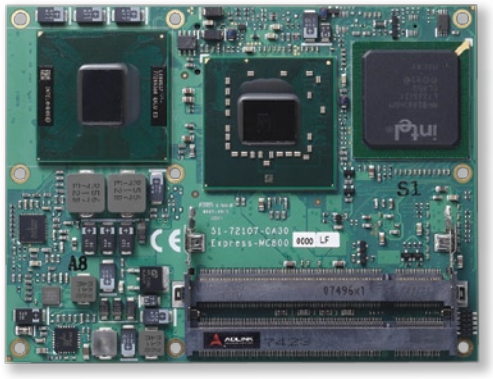
Model Number	Description/Configuration
Express-MG-S	COM Express® Module with socket type for Intel® Core™2 Duo processor with GM45 and ICH9M chipset
Express-MG-S/T9400	COM Express® Module with socket type Intel® Core™2 Duo processor T9400 at 2.53 GHz
Express-MG-S/P8400	COM Express® Module with socket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

Accessories

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

Express-MC800

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



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

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®8 with CMOS backup in 8 Mbit SPI flash
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
VGA Interface	Analog VGA 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
Interface	10/100/1000 Mbps with Wake-on-LAN and Alert on LAN support

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 (optional)
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)

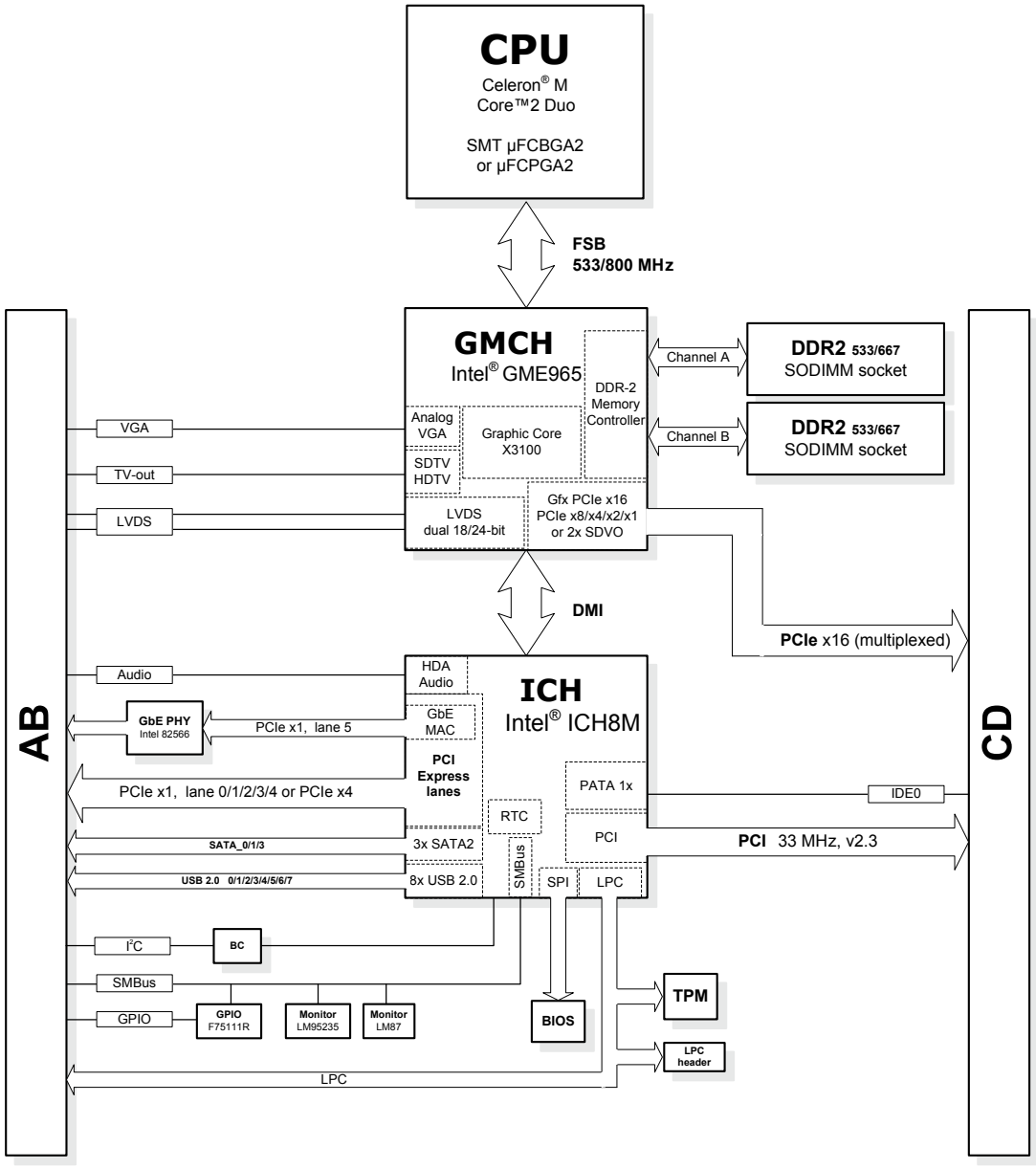
Mechanical and Environmental

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: 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

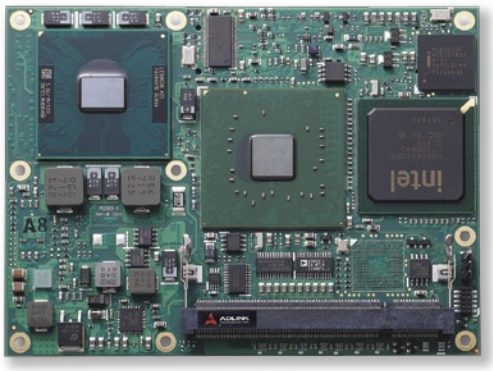
Model Number	Description/Configuration
Express-MC800-S	COM Express® Module with socket for Celeron® M or Core™2 Duo processor (for Intel® Core™2 Duo T7500 processor at 2.2 GHz or Intel® Celeron® M 550 processor at 2.0 GHz)
Express-MC800-L7500	COM Express® Module with LV Intel® Core™2 Duo L7500 processor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

Express-NR

COM Express® Module with Intel® Core™2 Duo Processor and 945GME / ICH7-M Chipset



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

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 flash
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
VGA 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

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 (optional)
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)

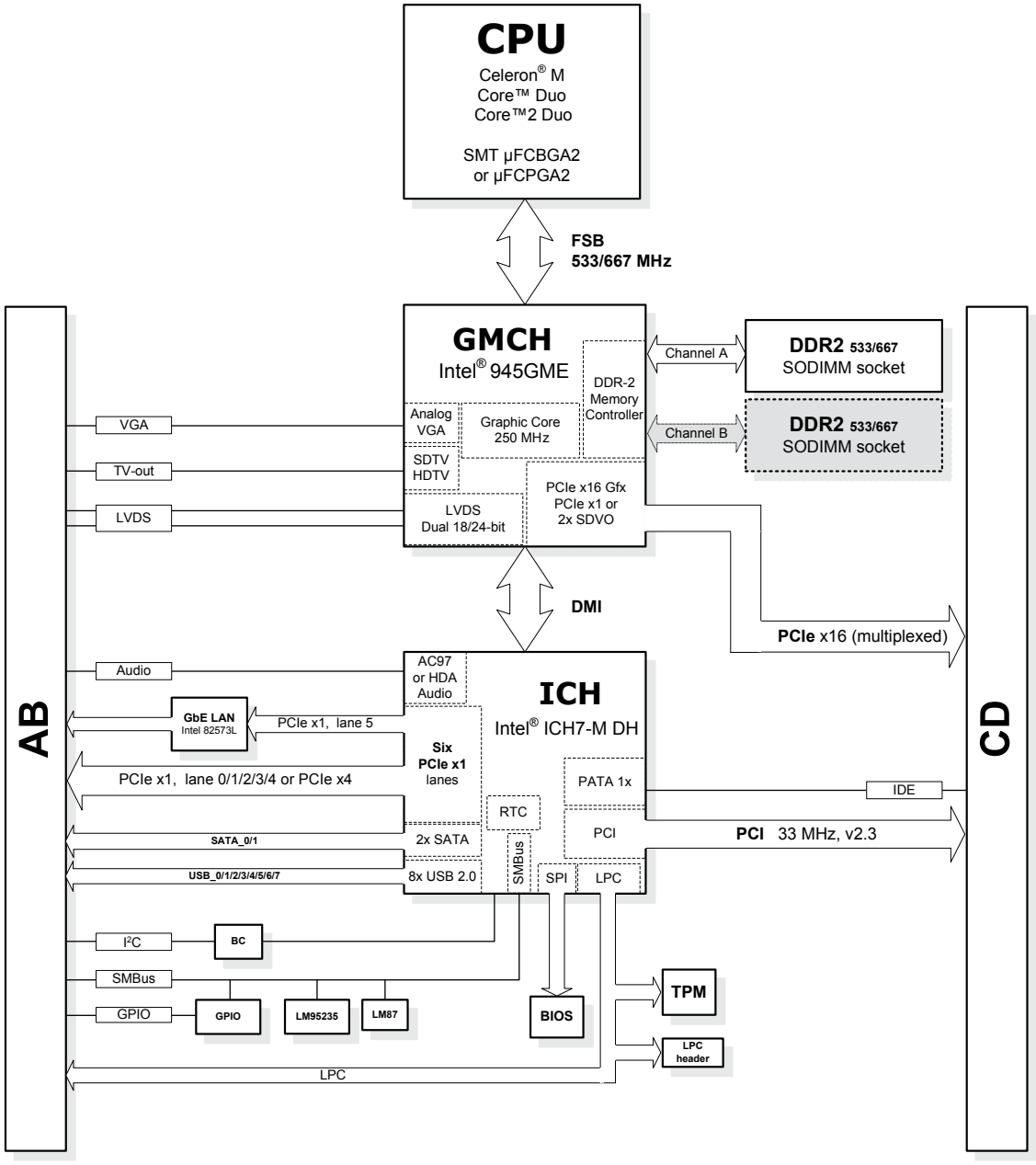
Mechanical and Environmental

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

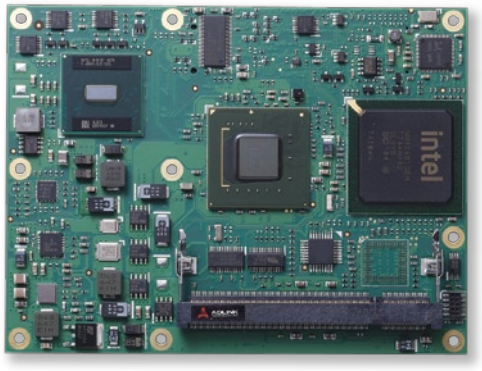
Model Number	Description/Configuration
Express-NR-S	COM Express® Module with socket for Celeron® M / Core™ Duo / Core™2 Duo processor (for Intel® Core™2 Duo T7400 processor at 2.16 GHz or Intel® Celeron® M 440 processor at 1.86 GHz)
Express-NR-L7400	COM Express® Module with LV Intel® Core™2 Duo L7400 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	
HTS-NR-B	Heatspreader for Express-NR (BGA CPU) with threaded standoffs
Passive Heatsinks	
THS-NR-B	Low Profile Heatsink for Express-NR (BGA CPU) with threaded standoffs
THSH-NR-B	High Heatsink for Express-NR (BGA CPU) with threaded standoffs
Heatsink with Active Cooling	
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 VGA, 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®8 with CMOS backup in 8 Mbit SPI flash
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
VGA Interface	Analog VGA 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 (optional)
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)

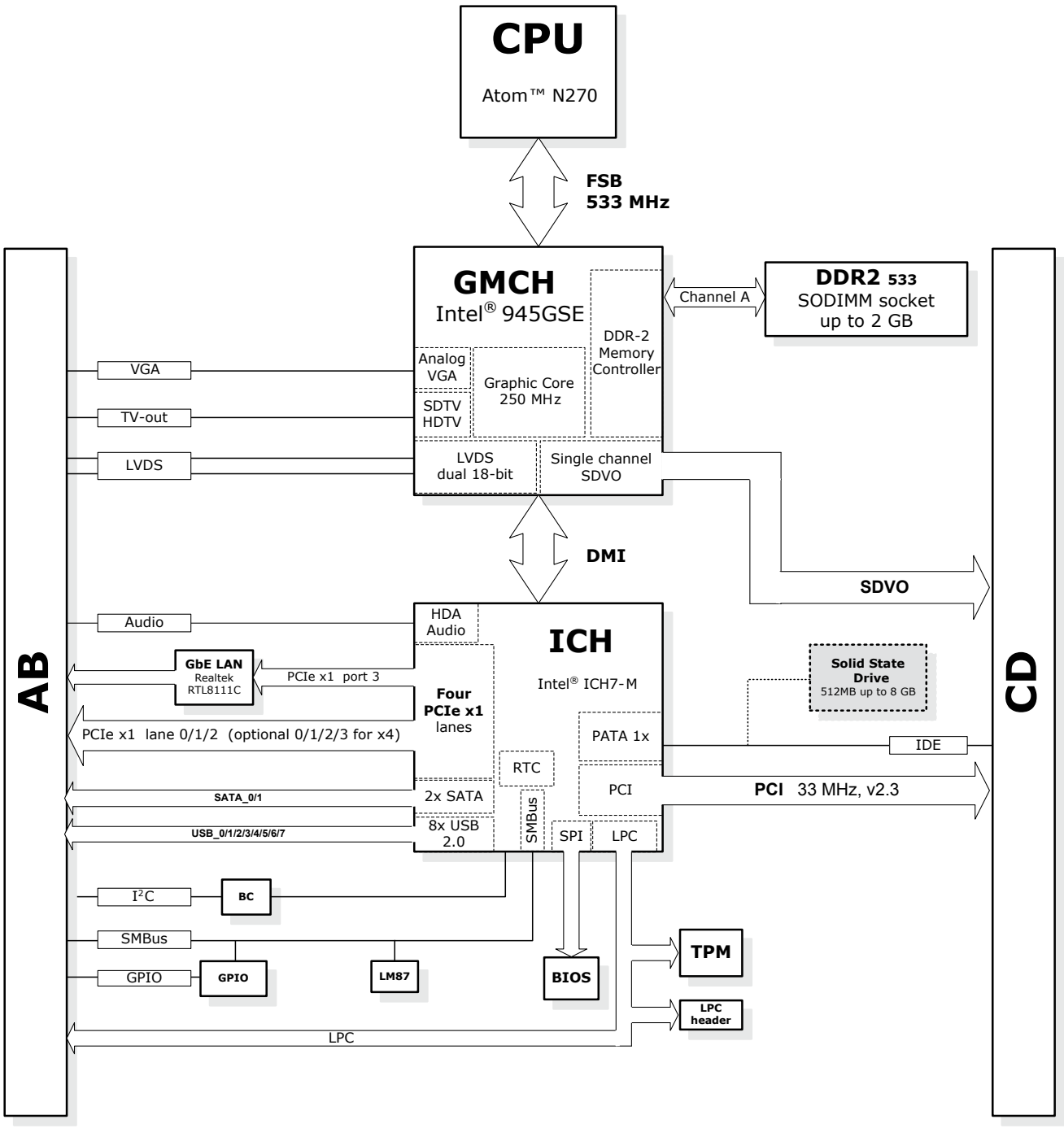
Mechanical and Environmental

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
	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-bit
	Windows® Vista 32-bit
	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-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-GFC

Compact COM Express® Type 6 Module with AMD Fusion™ G-Series Processor and A55M Controller Hub

Features

- AMD Fusion™ G-Series Processor
- AMD A55M Controller Hub
- Up to 8GB Dual Channel DDR3 SDRAM at 1333MHz
- Two DDI (Digital Display Interface) for DP/HDMI/DVI/SDVO
- Six free PCIe x1 lanes (optional PCIe x4)
- Four SATA 6 Gb/s, Gigabit Ethernet
- Two USB 3.0, eight USB 2.0

Specifications

Core System

CPU	**BGA Type**
	AMD G-T56N dual-core 1.65 GHz (1MB L2 cache, 18W)
	AMD G-T40N dual-core 1.0 GHz (1MB L2 cache, 9W)
	AMD G-T52R 1.5 GHz (512KB L2 cache, 18W)
	AMD G-T44R 1.2 GHz (512KB L2 cache, 9W)
Memory	Single channel non-ECC 1066/1333 MHz DDR3 memory up to 8 GB in dual stacked SODIMM socket
Chipset	AMD A55M Control Hub
L2 Cache	1MB for G-T56N and G-T40N
	512KB for G-T52R and G-T44R
BIOS	AMI APTIO UEFI in 16 Mbit SPI flash
Hardware Monitor	Temperature and supply voltages only
Watchdog Timer	Programmable timer range to generate RESET
Expansion Busses	6 PCI Express x1: Lanes 0/1/2/3/4/5/6 are free, lane 0 is occupied by GbE; lane 1 is occupied by USB 3.0
	LPC bus, SMBus (system) , I²C (user)

Video

Integrated in Processor	UVD and 3D Engine integrated with G-series processor
Integrated Video	DirectX 11 and UVD3
Feature Support	DirectX Video Acceleration (DXVA) support for full AVC/VC1/MPEG2 Hardware Decode
	UVD3 includes support for DivX and Xvid via MPEG-4 Part 2 decoding, Blu-ray 3D via MVC and 120Hz stereo 3D support
VGA Interface	Analog VGA support by 300 MHz DAC
	Analog monitor support up to 2560x1600 resolution
LVDS Interface	Dual channel 24-bit LVDS
Embedded Display Port	eDP interface supports link-speeds of 1.62 Gbps and 2.7 Gbps on 1, 2 or 4 data lanes; eDP supports -0.5% SSC and non-SSC clock settings

Audio

Chipset	Integrated on AMD A55M
Audio Codec	On Express-BASE6 carrier (ALC888)

LAN

Chipset	Realtek RTL8111E
Interface	10/100/1000 Mbps Ethernet

Multi I/O and Storage

Chipset	Integrated on AMD A55M
USB	Two ports USB 3.0 and eight ports USB 2.0
SATA	Four ports SATA 6 Gb/s with support for RAID 0,1,5,10

Super I/O

	Connected to LPC bus on carrier if needed

TPM

Chipset	Infineon SLB9635TT1.2 (optional)
Type	TPM 1.2

Power Specifications

Input Power	AT mode (12 V +/- 5%) and ATX mode (12 V and 5 Vsb +/- 5%)
Power States	Supports S0, S1, S3, S4, S5
Power Consumption	TBD
Smart Battery Support	Yes

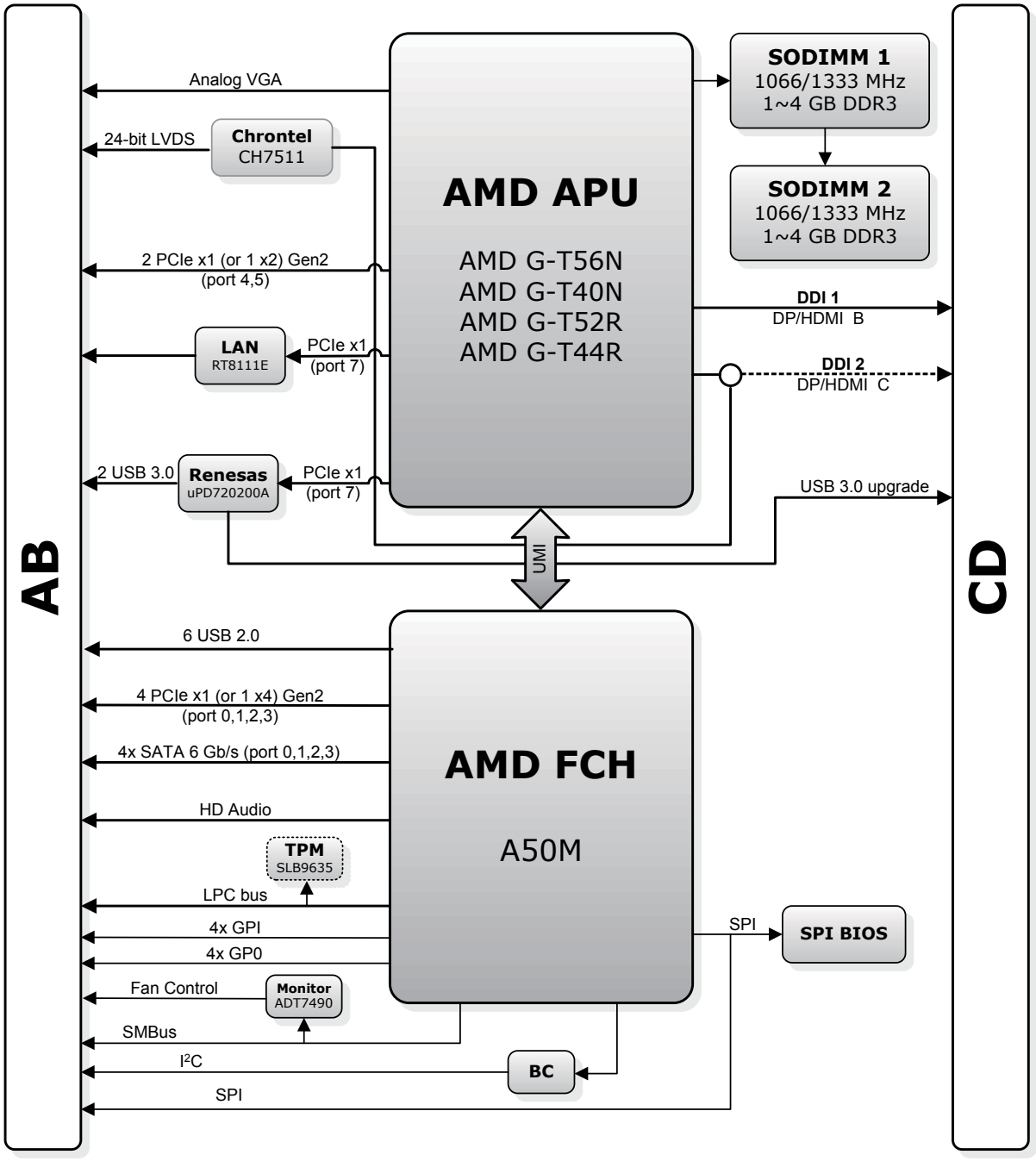
Mechanical and Environmental

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: 1.88 Grms, 5-500 Hz, each axis
	Operating: 0.5 Grms, 5-500 Hz, each axis
Compatibility	COM Express Type 2, COM.0 R2.0
	Compact form factor 95 mm x 95 mm
Certification	CE, FCC

Operating Systems

Standard Support	Windows XP(e) / Windows 7
	Linux
Extended Support (BSP)	Embedded XP/2009, WES7 support package
	Linux 2.6.x BSP (with Xorg OpenGL setup instruction)
	VxWorks 6.x (on request)
	AIDI I²C Library for Windows and Linux

Functional Diagram



Ordering Information

Modules

Model Number	Description/Configuration
Express-GFC-T56N	Compact COM Express Type 6 module with AMD Fusion G-T56N dual-core processor at 1.65 GHz and A55M Controller Hub
Express-GFC-T40N	Compact COM Express Type 6 module with AMD Fusion G-T40N dual-core processor at 1.0 GHz and A55M Controller Hub
Express-GFC-T52R	Compact COM Express Type 6 module with AMD Fusion G-T52R processor at 1.5 GHz and A55M Controller Hub
Express-GFC-T44R	Compact COM Express Type 6 module with AMD Fusion G-T44R processor at 1.2 GHz and A55M Controller Hub

Accessories

Model Number	Description/Configuration
Passive Heatsinks	
THSH-GFC-BL	High Profile Heatsink for Express-GFC with threaded standoffs
Heat Spreaders	
HTS-GFC-BL	Low Profile Heatsink for Express-LPC with threaded standoffs
Heatsink with Active Cooling	
THSF-GFC-BL	High Performance Heatsink with Fan for Express-GFC 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)
- VGA 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
Memory	Dual SODIMM sockets support up to 4 GB of non-ECC 667/800 MHz DDR3 memory (N455 supports max. 2 GB)
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 flash 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 Feature Support	Intel® Dynamic Video Memory Technology 4.0 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
VGA 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 (optional)
Type	TPM 1.2

Power Specifications

Input Power	AT mode (12 V +/- 5%) and ATX mode (12 V and 5 Vsb +/- 5%)
Power States	Supports S0, S1, S3, S4, S5
Power Consumption	10 W (with N455 CPU and 2 GB memory typical)
Smart Battery Support	Yes

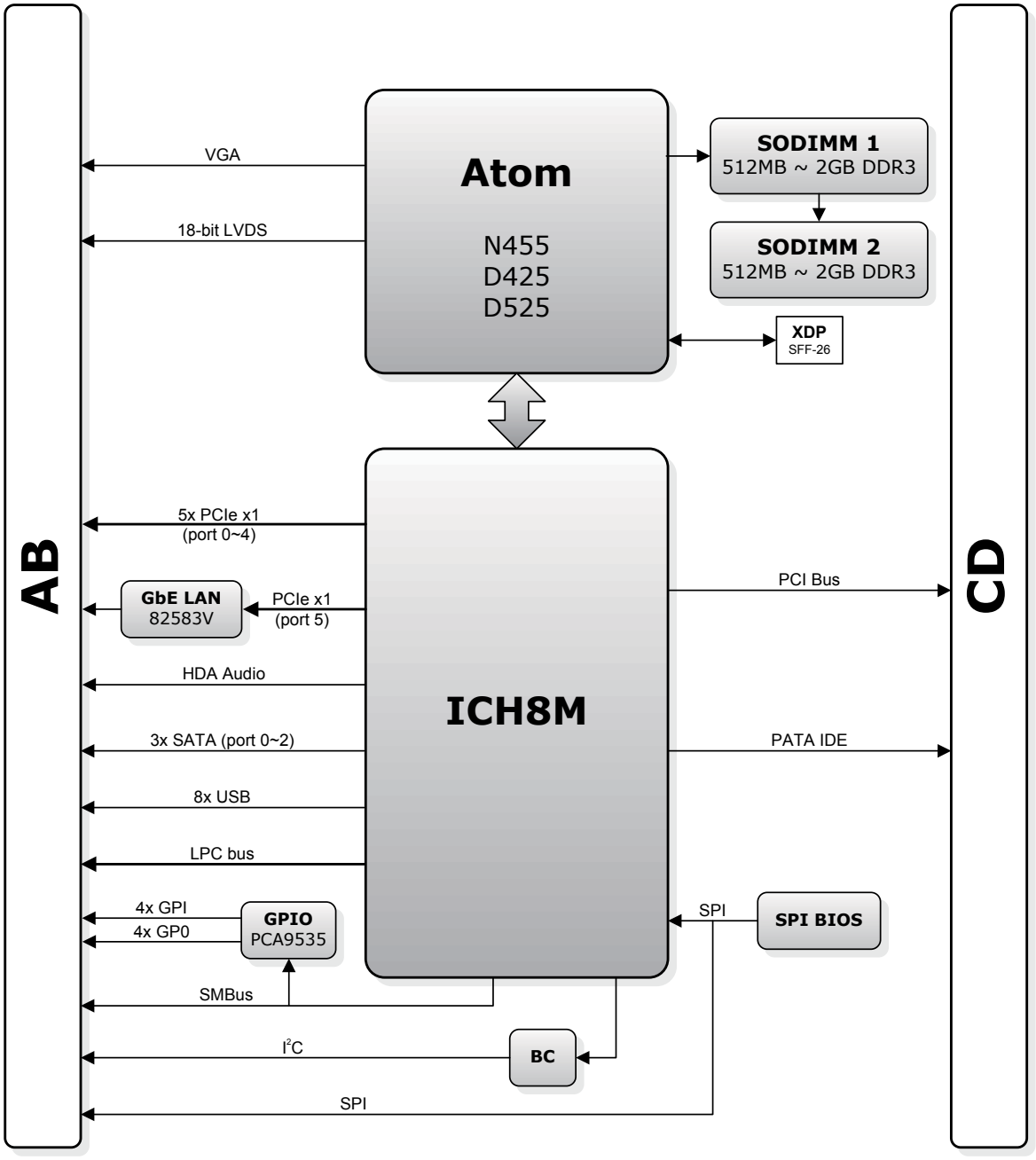
Mechanical and Environmental

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
	Operating: 0.5 Grms, 5-500 Hz, each axis
Compatibility	COM Express® Type 2, COM.0 R2.0
	Compact form factor 95 mm x 95 mm
Certification	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

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 VGA, 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 flash
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, I^2C

Video

Chipset	Intel® Graphics Media Accelerator 950 integrated into 945GSE GMCH supporting dual independent displays
VGA Interface	Analog VGA 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 (optional)
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)

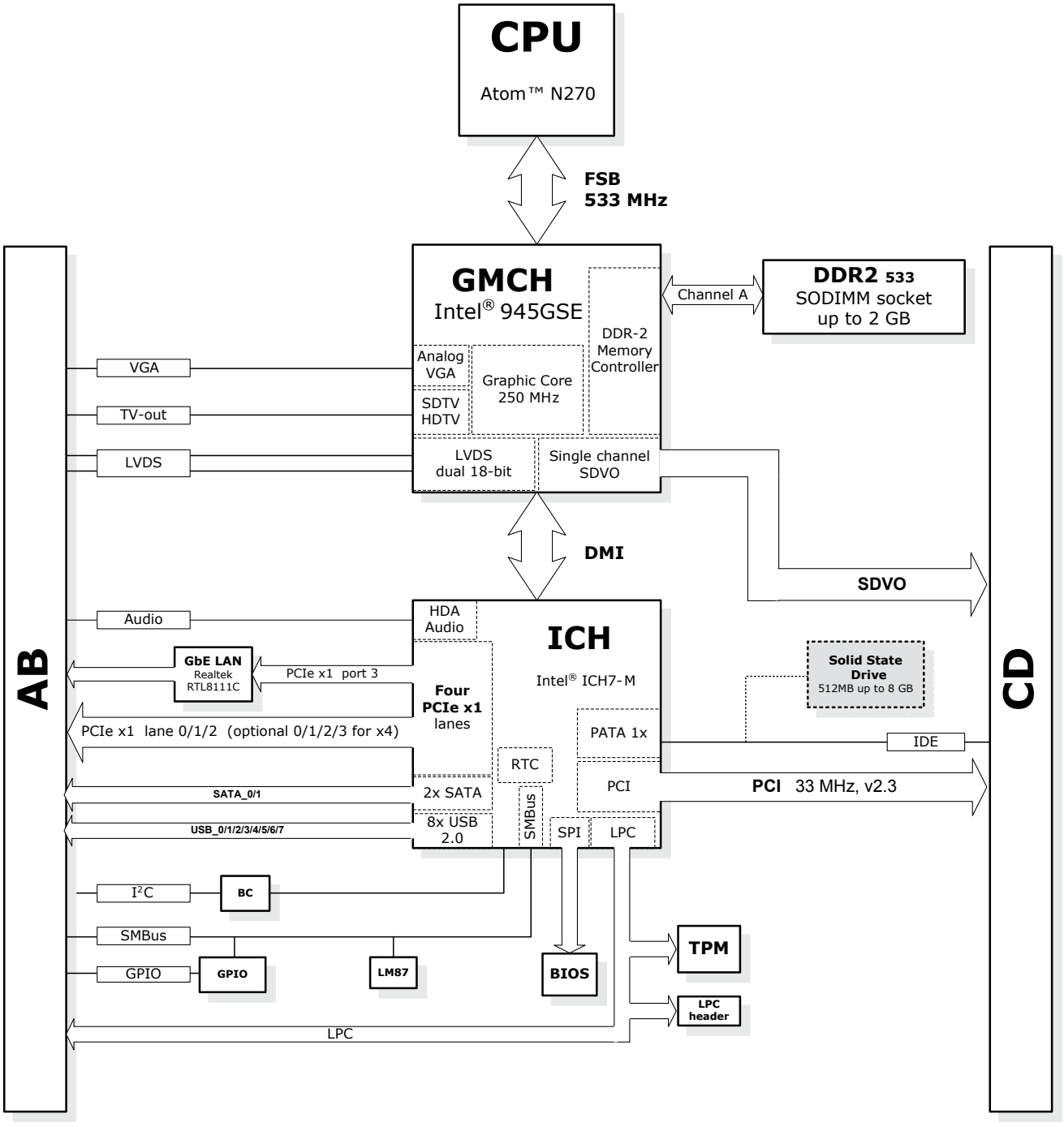
Mechanical and Environmental

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
	Operating: 0.5 Grms, 5-500 Hz, each axis
Form Factor	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
Extended Support	Embedded XP BSP
	WinCE BSP
	Linux® 2.6.x BSP
	AIDI Library for Win32, WinCE and Linux®

Functional Diagram



Ordering Information

Modules

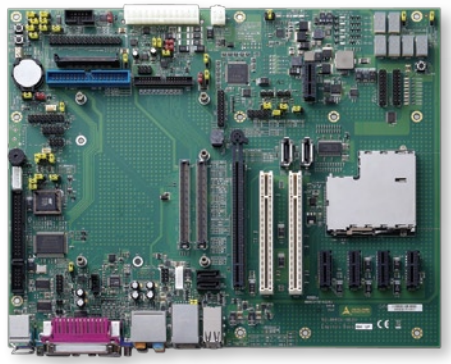
Model Number	Description/Configuration
Express-ATC-N270	Compact COM Express® module with Intel® Atom™ N270 processor at 1.6 GHz
Express-ATC-N270-4G	Compact COM Express® module with Intel® Atom™ N270 processor at 1.6 GHz with 4GB SSD Solid State Disk
Express-ATC-N270-8G	Compact COM Express® module with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

Accessories

Model Number	Description/Configuration
Heat Spreaders	
HTS-ATC-B	Heatspreader for Express-ATC (BGA CPU) with threaded standoffs
Passive Heatsinks	
THS-ATC-B	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
	Supports Type 2 modules in Basic or Compact form factor
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

BIOS / Debug

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

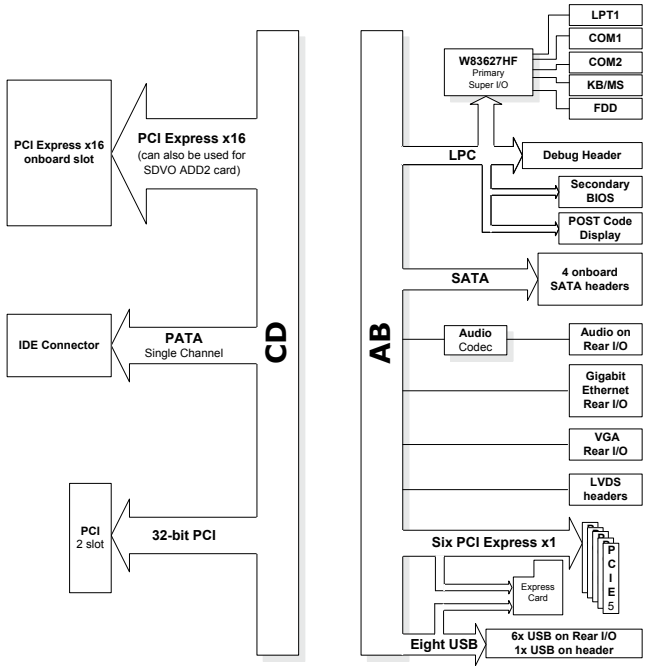
Active Components

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

Connectors

COM Express™	Two x 220-pin (Type 2)
VGA	DB15 on Rear I/O panel for VGA 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

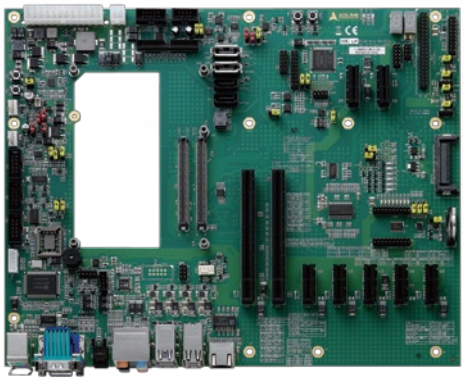
COM Express Carrier Design Guide

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 x 1 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
	Supports Type 6 modules in Basic or Compact form factor
Dimensions	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

BIOS / Debug

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

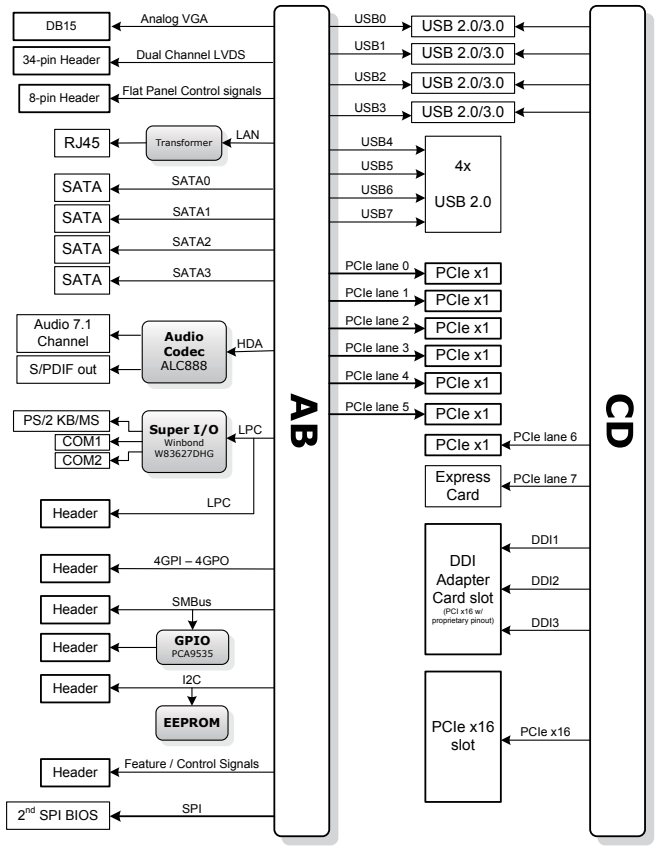
Active Components

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)
VGA	DB15 on Rear I/O panel for VGA 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*

Type 6 Starter Kit - COM Express

This Type 6 Computer-on-Module Starter Kit gets you going with Carrier Board Design and Software Verification in no time

Features

- COM Express Type 6 Module
- CPU, Memory
- Express-BASE6 Reference Carrier Board
- Thermal Solution (heatspreader and heatsink)
- Schematics, Design Guide, and User Manuals
- ADLINK USB stick with Documentation, Drivers, BSPs, Libraries

The Starter Kit consists of a COM Express Type 6 core module with ATX size reference carrier board that offers one PCIe x16 Express slot with proprietary pinout for DDI Adapter card, one PCI Express graphics slot x16, seven PCI Express x1 slot, Serial ATA, VGA, LVDS, USB 2,0, Gigabit LAN, and Super I/O. All necessary cables are included.

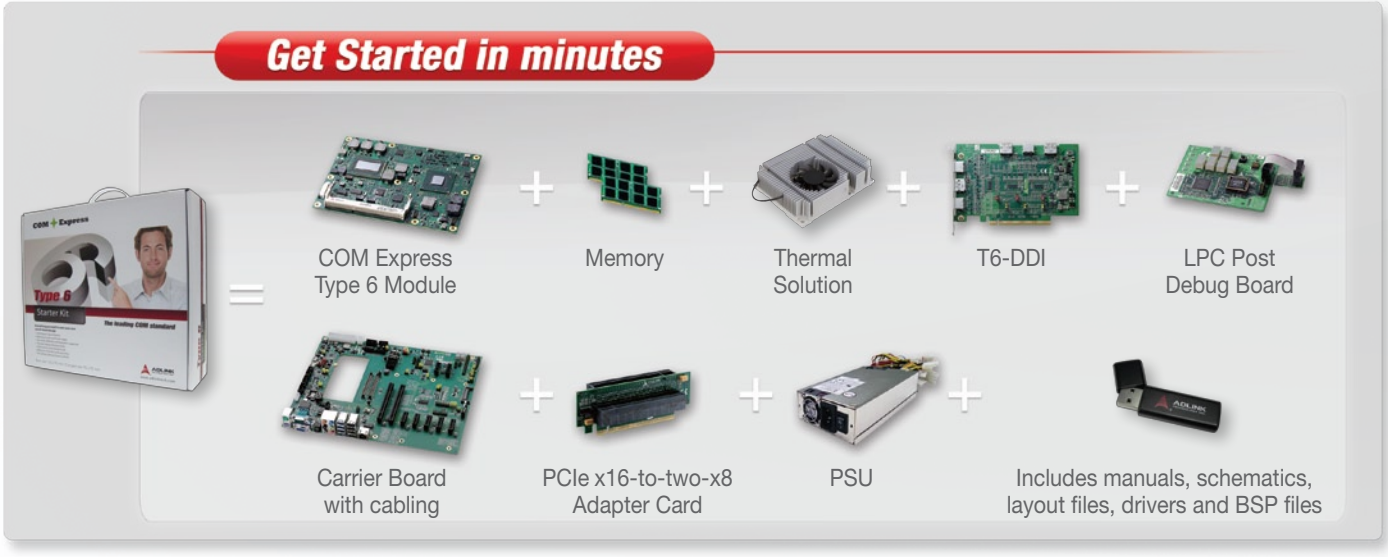
Contents

Standard Items

- Express-BASE6 reference carrier board
- Accessory kit:
  - DisplayPort to DVI adapter cable
  - SATA cable
  - T6-DDI Video Adapter Card
  - PCIe x16-to-two-x8 Adapter card
  - LPC POST Debug Board
  - USB Stick with documentation, drivers, libraries, and BSPs for Linux, Windows CE, XPe and WES7
  - Carrier Design Guide and product manuals

Optional Items

- COM Express Type 6 module with 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 1-45 for detailed information

Flat Panel Transfer Board

Please refer to page 1-45 for detailed information

Type 2 Starter Kit - COM Express

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

Features

- COM Express Type 2 Module
- CPU, Memory
- Express-BASE Reference Carrier Board
- Thermal Solution (heatspreader and heatsink)
- Schematics, Design Guide, and User Manuals
- ADLINK USB stick with Documentation, Drivers, BSPs, Libraries

The Starter Kit consists of a COM Express Type 2 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, VGA, LVDS, TV-out, USB 2,0, Gigabit LAN, and Super I/O. All necessary cables are included.

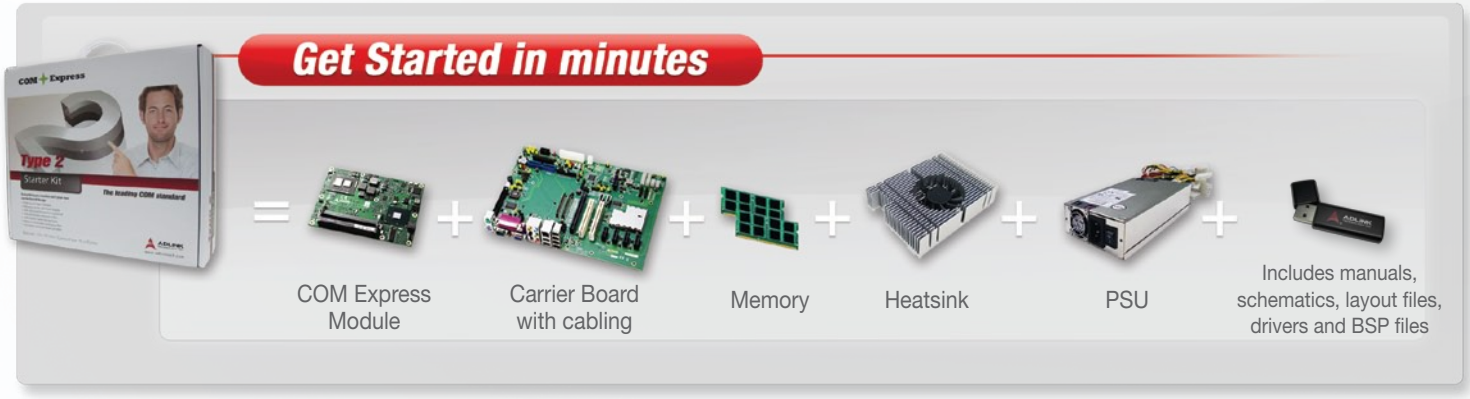
Contents

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 BSPs for Linux, Windows CE, XPe
  - Carrier Design Guide and product manuals

Optional Items

- COM Express Type 2 module with CPU of your choice
- Memory of your choice
- Thermal solution of your choice (heatspreader, heatsink)



How to order Starter Kit – COM Express

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

BattMan Smart Battery Management Reference System

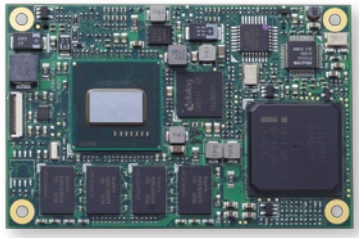
Please refer to page 1-45 for detailed information

Flat Panel Transfer Board

Please refer to page 1-45 for detailed information

nanoX-TC

Mini size COM Express® Type 10 Pinout Compatible Module with Intel® Atom™ Processor E6xx and EG20T PCH



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
- Mini form factor 84 mm x 55 mm

Specifications

Core System

CPU	Intel® Atom™ E680, 1.6 GHz, 3.9 W TDP
	Intel® Atom™ E660, 1.3 GHz, 3.3W TDP
	Intel® Atom™ E640, 1.0 GHz, 3.3W TDP
	Intel® Atom™ E620, 600 MHz, 2.7W TDP
	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 flash
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 VGA. 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, selectable in the BIOS setup)
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

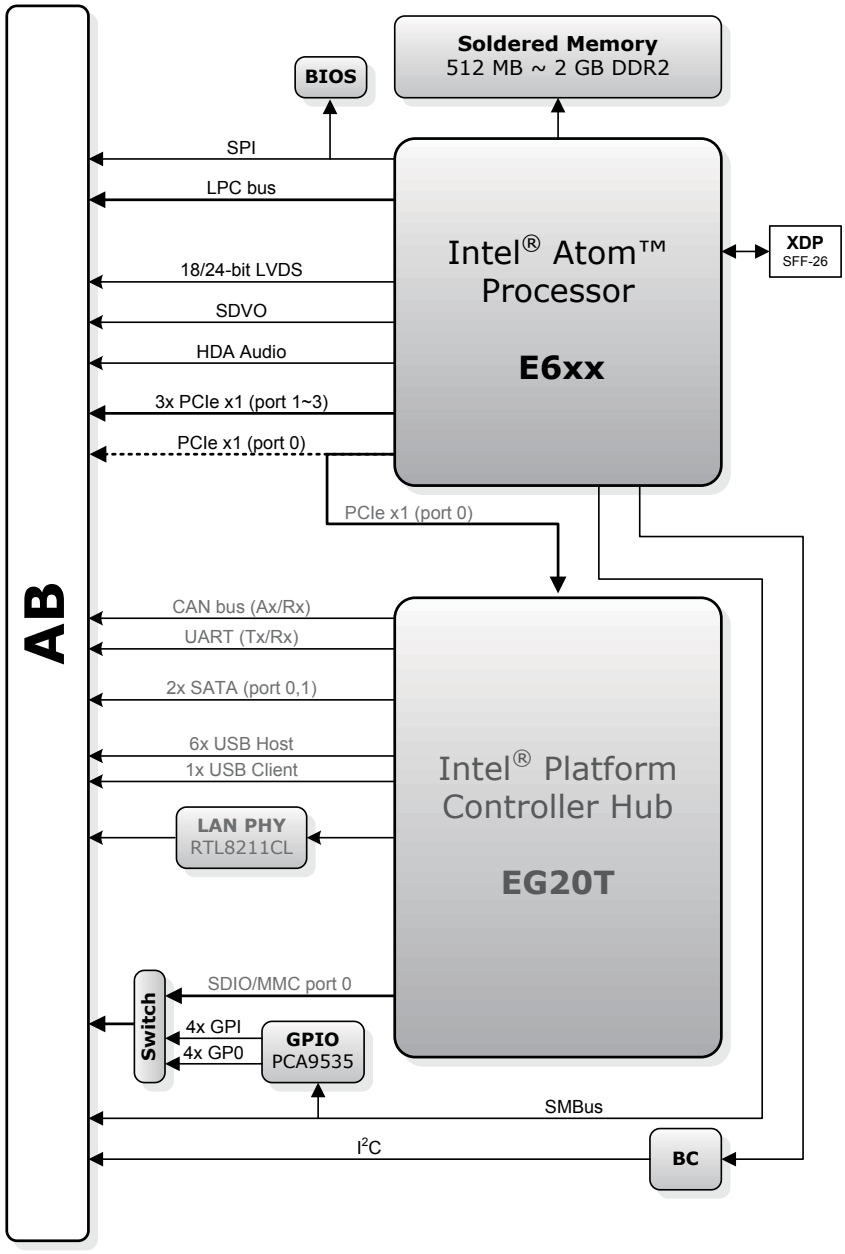
Mechanical and Environmental

Operating Temp	0°C to 70°C
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	PICMG COM Express® COM.0 R2.0 Type 10
Mechanical	Mini 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

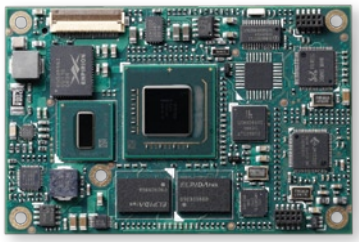
Model Number	Description
nanoX-TC-E680-1G	Mini size COM Express Type 10 Module with Intel® Atom™ E680 processor at 1.6GHz, PCH EG20T and 1 GB soldered DDR2 SDRAM
nanoX-TC-E660-1G	Mini size COM Express Type 10 Module with Intel® Atom™ E660 processor at 1.3GHz, PCH EG20T, and 1 GB soldered DDR2 SDRAM
nanoX-TC-E640-1G	Mini size COM Express Type 10 Module with Intel® Atom™ E640 processor at 1.0GHz, PCH EG20T, and 1 GB soldered DDR2 SDRAM
nanoX-TC-E620-1G	Mini size COM Express Type 10 Module with Intel® Atom™ E620 processor at 600 MHz, PCH EG20T, and 1 GB soldered DDR2 SDRAM

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 throughole standoffs for top mounting
Passive Heatsinks	
THS-nXTC-B	Multidirectional Heatsink for nanoX-TC with threaded standoffs for bottom mounting
THS-nXTC-BT	Multidirectional Heatsink for nanoX-TC with threaded standoffs for top mounting

nanoX-ML

Mini size COM Express® Type 1 Pinout Compatible Module with Intel® Atom™ Processor Z5xx and US15W Chipset



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
- Mini Compact 84 mm 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
VGA 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 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)

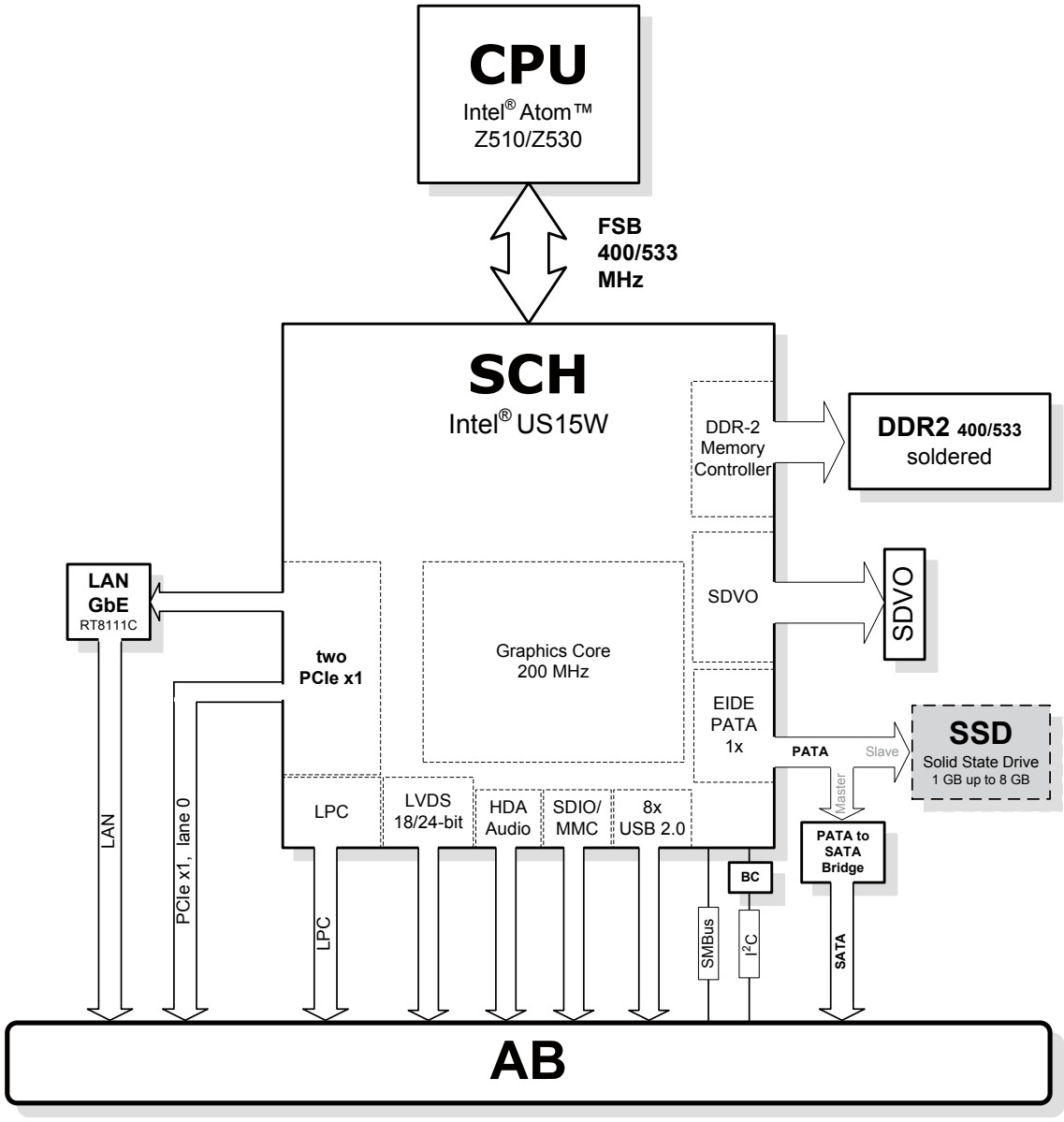
Mechanical and Environmental

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	Mini 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
	AIDI I²C Library for Win32, WinCE and Linux®

Functional Diagram



Ordering Information

Modules

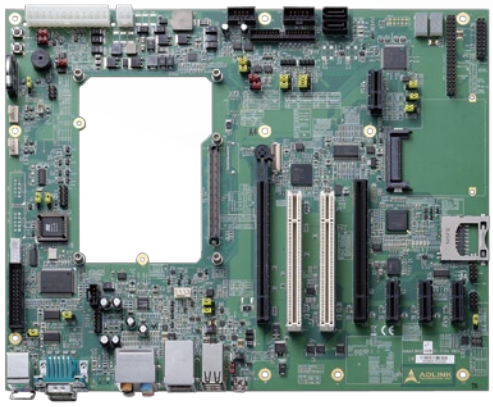
Model Number	Description
nanoX-ML-51/512-0	Mini COM Express® Type 1 compatible module with Intel® Atom™ processor Z510 at 1.1 GHz and 512 MB DDR2
nanoX-ML-53/512-0	Mini COM Express® Type 1 compatible module with Intel® Atom™ processor Z530 at 1.6 GHz and 512 MB DDR2
nanoX-ML-51-512/4G	Mini COM Express® 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	Mini 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	Mini 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	Mini 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	
HTS-nML-B	Heatspreader for nanoX-ML (BGA CPU) with threaded standoffs
Passive Heatsinks	
THS-nML-B	Low profile Heatsink for nanoX-ML (BGA CPU) with threaded standoffs

nanoX-BASE

COM Express® Type 1 Reference Carrier Board with onboard PCIe-to-PCI Bridge



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

Specifications

Form Factor

Core Module Interface	PICMG® COM Express® Revision 1.0
	Supports Type 1 and Type 10 pinouts
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 flash

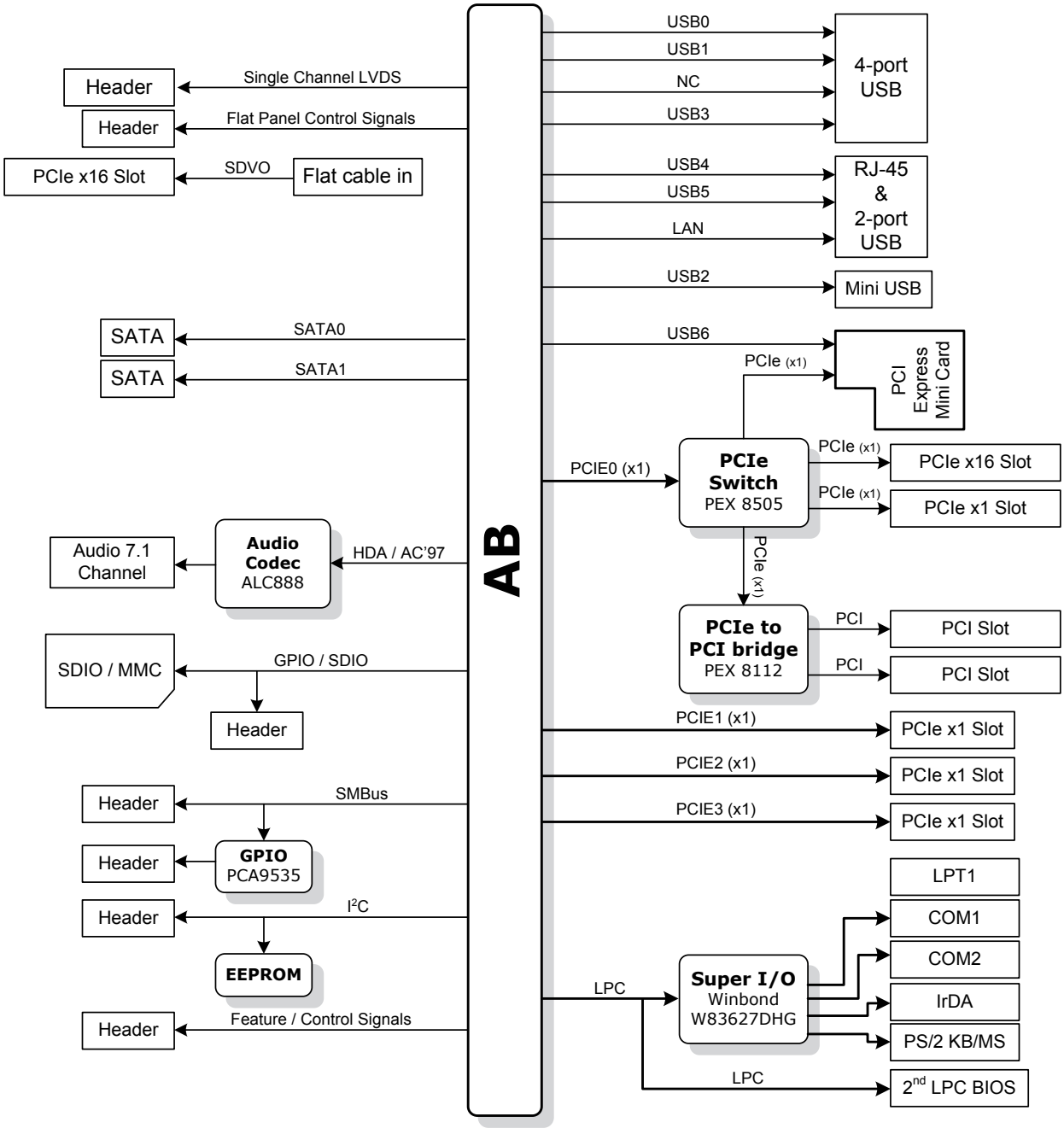
Active Components

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

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
nanoX-BASE	COM Express® Type 1 Reference Carrier Board with on-board PCIe to PCI bridge

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 1/10 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 1/10 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.

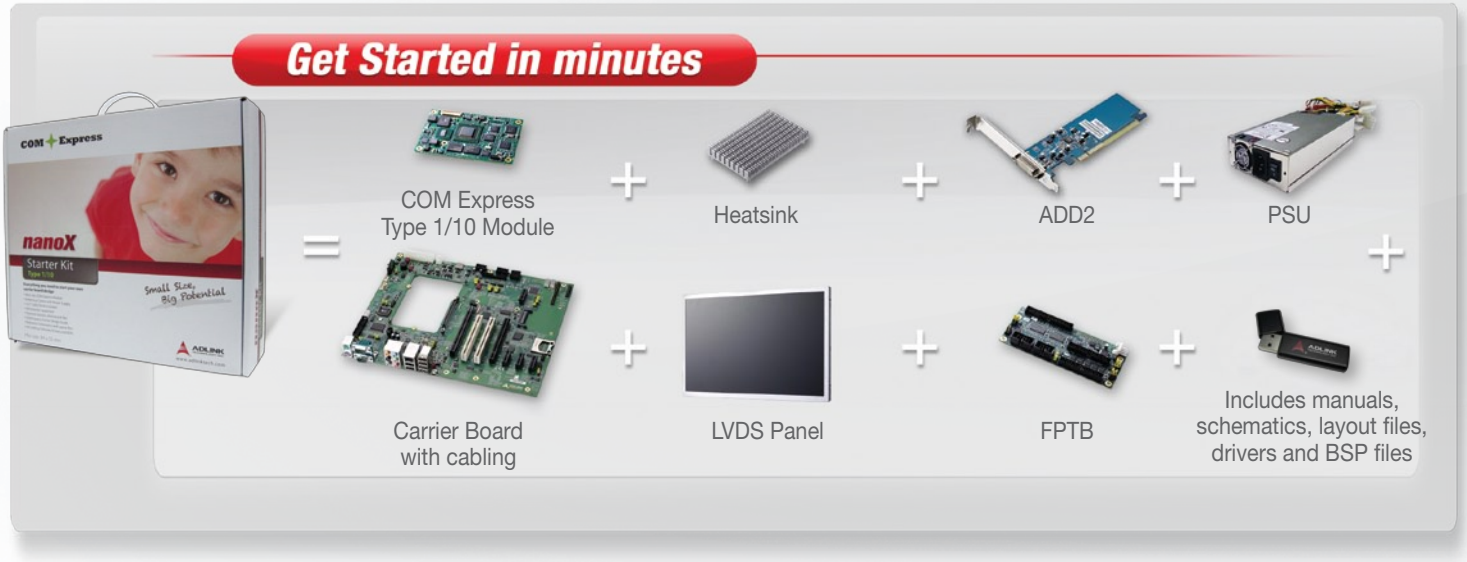
Contents

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 1/10 core module of your choice
- Thermal solution of your choice (heatspreader or heatsink)



How to order Starter Kit – nanoX

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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 1-45 for detailed information

LPC POST Debug Board

Please refer to page 1-46 for detailed information

Engineering Test Tools

Useful time saving tools to expedite your application development

BattMan

Smart Battery Management Reference Platform

The BattMan Smart Battery Management Reference Platform allows developers to first verify on a system level and then easily implement the same type of battery power design into their own carrier board. BattMan supports single battery mode or balanced loading and unloading using two batteries.

Contents

- Smart Battery management module
- Two Li-ion smart batteries at 14.V, 5200 mAh each
- 19V notebook type adapter (110/220Vac)
- USB key with schematics, BOM and manual

Ordering Information

Model Number	Description/Configuration
StarterKit-Battman	Smart Battery Management Reference Platform for COM Express® modules (includes two Smart Batteries, 19V adapter and USB key)

Flat Panel Transfer Board

The Flat Panel Transfer Board (FPTB) supports prototyping and verification of LVDS and TTL flat panel displays . The module includes an LVDS-to-TTL converter to allow users to implement TTL displays with COM modules 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
LVDS cable for FPTB	Reference carrier LVDS output to FPTB LVDS input cable (supports Express-BASE, Express-BASE6 and nanoX-BASE)

Note: Included in the Starter Kit - nanoX.

ADD2 DVI-D Adapter Card

The ADD2 DVI-D Adapter Card provides DVI-D display output (digital only) for modules that support SDVO output. This adapter plugs into the PEG x16 connector on Express-BASE, SDVO connector on nanoX-BASE, and DDI connector on Express-BASE6.

Ordering Information

Model Number	Description/Configuration
FI-7307(N16D)-F	ADD2 DVI-D Adapter

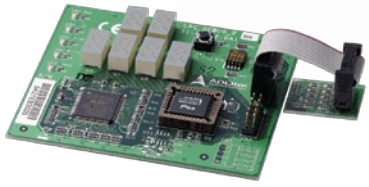
PCIe x16-to-two-x8 Adapter Card

The ADLINK PCIe x16-to-two-x8 adapter card can be used with modules that support bifurbication on the PEG x16 interface. The card reroutes the PCIe x16 to two x8 and allows testing of two independent PCIe add-on cards with x8/x4/x2/x1 width.

Ordering Information

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

LPC POST Debug Board



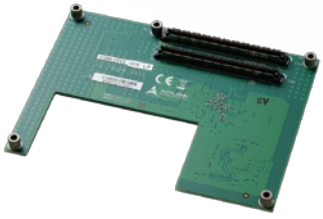
All ADLINK COM modules include an LPC debug connector. The LPC POST Debug Board connects to this connector and can provide monitoring of BIOS POST status. The LPC POST Debug Board connects directly to the module and can be used regardless of the carrier board being used.

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 tested on existing COM Express Type 2 carriers. The adapter board adds PATA IDE (via a SATA to PATA bridge) and PCI bus (via a PCIe-to-PCI bridge) to the signals on the CD connector. The SDVO port is rerouted to correspond to the Type 2 pin definition. PCIe x16 is not supported.

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. The card must be installed on the Express-BASE6 Type 6 carrier board using the second PCIe x16 slot with proprietary pinout. Jumper settings on the card configure output to either HDMI or DisplayPort. DVI can be tested by using a passive dongle connected to a DisplayPort output.

Ordering Information

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