Solution Guide

Embedded Computer

English

2009

DIGITAL-LOGIC

smart embedded computers

MEMBERSHIPS

AWARDS

FDP KMU-Award 2001

Finalist as Entrepreneur of the Year 2003

2003
PLATINUM VENDOR:
PC/104 FAMILY

2004
GOLD VENDOR:
PC/104 FAMILY

2009

GENERAL INFORMATION

PRODUCT INFORMATION

DIRECTIONS | CONTACTS

Felix Kunz, Chairman and CEO

World leader

DIGITAL-LOGIC is a worldwide leading developer and manufacturer of embedded computer technology that markets miniature computer systems. A so-called embedded computer, similar to the human brain, serves as a control unit for devices and is not visible to the user.

Technology leader

DIGITAL-LOGIC is a high-tech company that responds to strong market growth by developing innovative products.

DIGITAL-LOGIC markets high-quality embedded computers in diverse market segments through subsidiaries and distribution partners throughout the world. DIGITAL-LOGIC defines standards such as PCI/104-*Express*.

Universal use

DIGITAL-LOGIC embedded computers have a proven track record going back many years with applications in the areas of navigation, telecommunications, medical technology, measurement engineering, Internet applications, production control systems, point-of-sale and information terminals, and an array of other areas.

Product diversity

DIGITAL-LOGIC's varied line of products range from the world's smallest Pentium® computer the size of a credit card (smartModule) to MICROSPACE® single and board computers (PC/104, Slot PC, EBX, 3.5" SBC, PCI/104-*Express*, COM Express) to customer-specific embedded computers and computer systems for highly individual requirements.

Global networking

Embedded computers offer global networking thanks to Internet linking via GSM, ISDN and LAN connections.

The DIGITAL-LOGIC embedded computer functions as a web server and empowers machines, household appliances, users and service providers to communicate with each other through the Internet.

MADE SWISS

The company

Founded in 1992, DIGITAL-LOGIC is a world leader in technology. The company develops and produces miniature computer systems based on the Intel® architecture, primarily with x 86 and Pentium® processor performance. The product portfolio comprises the standard products with embedded computer boards, embedded computer modules and the MICROSPACE® computer systems. DIGITAL-LOGIC is ISO 9001 certified.

Subsidiary

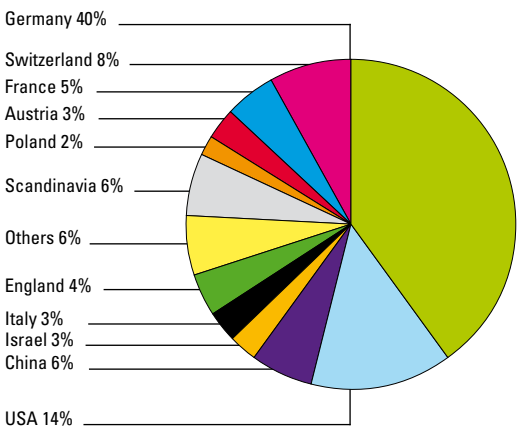
Team Germany

Sales

Represented around the world through subsidiaries and partner companies, DIGITAL-LOGIC is excellently positioned for sales in the high-growth embedded computer market. Experienced sales specialists and engineers provide on-site customer care and supply customers with appropriate products and customer-specific, individualized embedded computers.

Export countries

As of 01. 2009



Production

All DIGITAL-LOGIC embedded computers are manufactured in-house in Luterbach, Switzerland. Cutting-edge production facilities include three SMT lines (surface mounted technology) as well as various systems for mounting, functional testing, coating and burning-in.

RoHS conformity

DIGITAL-LOGIC has successfully installed the lead-free solder process in its production processes. All MICROSPACE® products conform to RoHS since June 30, 2006.

Technical support

DIGITAL-LOGIC customers are afforded technical support by the Luterbach Support Center and by its subsidiary in Germany. Specially trained engineers consult with customers to ensure that the right DIGITAL-LOGIC product is selected and implemented in the shortest possible time. Repair processing is quick and customer-friendly.

The standard warranty period is 24 months. Support specialists not only have circuit diagrams ready at hand but also the source code of all BIOS programs in use.

Internet

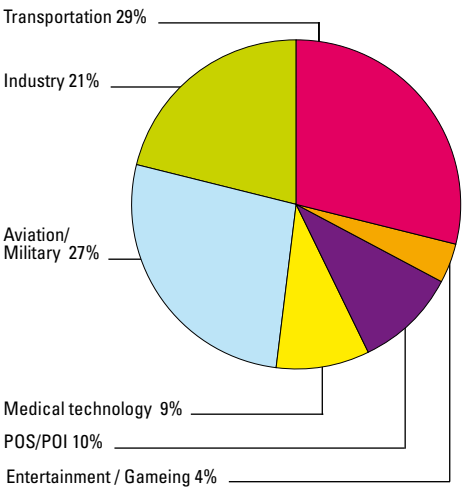
DIGITAL-LOGIC uses the Internet as a powerful communication tool for its online support center. The website provides users around the world with access to technical support and information. Customers can now track the status of their returned material authorization (RMA) online. Also, the DIGITAL-LOGIC website (www.digitallogic.com) has an extensive download area that provides technical specifications, drivers and tools, and a FAQ section with answers to the most important frequently asked questions.

MICROSPACE® Computer market segments Systems and usage examples

Point of sale, Point of interest	Cash register systems, ATMs, vending machines, information terminals
Medical engineering	Respiration equipment, heart monitors, blood analysis equipment, brain activity analysis equipment, x-ray equipment, computer tomography, data loggers
Traffic and transport	Train control systems, traffic systems, telematics, passenger information, navigation
Industry	Control technology, machine controllers, display and operating systems, programmable logical controllers (PLCs)
Aviation/military	Passenger entertainment, aircraft navigation, flight calculators for unmanned flight equipment, communication servers, and additional extremely rugged military applications
Multimedia	Media center application solutions, multimedia
Telecommunications	Test systems

Sales by industry

As of 01. 2009



Reliability

We guarantee over 50,000 hours MTBF (Mean Time Between Failure) thanks to thorough functional and stress tests of each and every component. All relevant measurements are performed and documented on our own testing and simulation systems. Before embedded computers are delivered, they must pass rigid acceptance tests and are seasoned through continuous operation in the environmental test chamber. Every product receives a test certificate.

Product service life

Products have a service life of at least 5 years from the start of production. In the event of an unexpected component discontinuation, DIGITAL-LOGIC carries out a form & functional compatible redesign so that the application is scarcely influenced.

ISO 9001 certification

All process data, including data codes of the individual components, is recorded in a quality information database (QIS). All test results, as well as support and repair work, are fully registered in the database making it possible to trace back each and every process.

Performed measurements

Immunity:	EN61000-6-3/-6-2, EN55022/55024
ESD:	EN50082-1/-2, EN61000-4-2
Temperature:	IEC60068-2-1, MIL-STD-810
RoHS/WEEE:	Directive 2002/96/EC
Humidity:	IEC60068-2-78, MIL-STD-810
Vibration/Shock:	IEC60068-2-6/-27, MIL-STD-810
Security:	EN60950, UL
e1:	Vehicle accreditation
EN60601:	Technical medical accreditation
EN50155	Railway technology Accreditation

Advantages of embedded computers

Most embedded computer applications have little in common with each other; some have special functions that a normal office PC does not. A variety of extended functions is available for DIGITAL-LOGIC products to be able to withstand harsh environmental conditions. These include solid state disks, extended ambient working temperature, remote access and more.

Solid state disk

Environmental conditions or the type of application often do not permit the use of mechanical data media such as hard disks or diskettes. As an alternative, however, a semiconductor disk that emulates a hard disk can be utilized. The solid state disk variants include onboard flash disk, DiskOnChip, CompactFlash card, IDE flash disk and PCCard flash card.

Operation without batteries

For an application independent of batteries, all DIGITAL-LOGIC BIOS store the setup parameters in an EEPROM in addition to RTC RAM. The EEPROM reserves 1024 bytes for the customer application. The battery acts only as a backup for the real time clock.

Operating temperature

DIGITAL-LOGIC standard products are designed for a temperature range of -25°C to +60°C and in some cases up to +70°C. An extended temperature range of -40°C to +85°C can be provided upon request.

Low power consumption

All DIGITAL-LOGIC products use specially selected components to ensure that the overall system consumes as little current as possible. This means significant advantages for the customer – no active cooling system, optimized operating time and operational assurance.

Passive Cooling

All products are available with passive cooling; a fan is not required.

Remote access

Remote control of the computer is accomplished by means of a serial interface from a host PC. This is especially useful for embedded systems without monitors and keyboards. The console IOs are redirected through the serial interface and controlled remotely from a host PC. In addition to direct routing of the console IOs, the diskette may also be redirected to the host PC. If the diskette can be redirected, booting from the host PC is possible, which enables complete remote file management (format, copy, execute). The remote handlers that work with Windows require a HyperTerminal (in Linux, a minicom) and a standard null modem cable. Depending on the product group (chipset), a number of remote functions are available:

Integrated in the standard BIOS:

	Console Redirection	Floppy disk Redirection	DOS	WIN	max. Baud
ELAN520 BIOS	yes	yes	yes	no	115kBd
Pentium®-III BIOS	yes	yes	yes	no	115kBd
Geode™ LX800 BIOS	no	no	-	-	-
855/915 BIOS	yes	no	yes	yes	115kBd
945 BIOS	yes	no	yes	yes	115kBd

DIGITAL-LOGIC remote-BIOS extension:

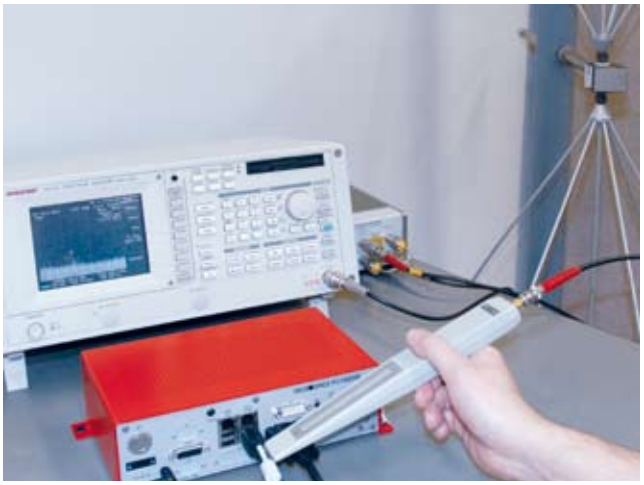
	Console Redirection	Floppy disk Redirection	DOS	WIN	Baud COM1
Geode™ LX800 BIOS	yes	yes	yes	yes	115kBd
855/915 BIOS	yes	yes	yes	yes	115kBd
945 BIOS	yes	yes	yes	yes	115kBd

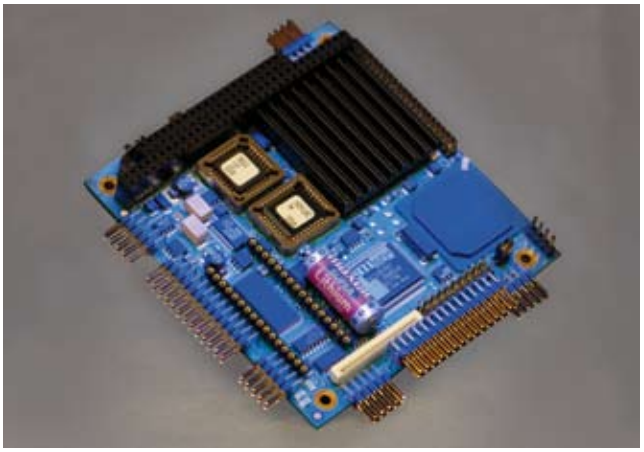
AMT4.0

Remote via LAN access, in accordance with AMT4.0, is integrated in the latest products (SMXG45, SMCG45). Using AMT4.0, the system can be remotely turned on or off over LAN and a Reset can be generated. Operating systems, programs and BIOSes may be installed using the LAN remote control.

AMT-Support:

	Console over IP	Drive over IP
G45-BIOS	yes	yes





Compliance testing

All new USB, SATA, LVDS, and PCI Express interfaces act as differential interfaces. To guarantee the greatest possible functional security of these differential interfaces, all signal parameters are gauged with an eye diagram. The design is optimized to ensure maximum signal integrity. In so doing, the signal propagation delay, attenuation and reflections of both differential signals are measured. The instrument used for this is the Tektronix DSO with 20GS and 6GHz probes and certified software. The figures show examples of the USB and 1GB LAN measurements. DIGITAL-LOGIC also uses a spectrum analyzer and measurement antennas to perform pre-compliance measurements. The subsequent EMC/EMI measurement is carried out in the certified measurement laboratories of Swisscom, Schaffner and RUAG.For mechanical and environmental stress tests, there are shock and vibration simulators available, as well as environmental test chambers.

Selective Coating (807700, 807703)

All DIGITAL-LOGIC products can be ordered with an optional selective coating. This is extra protection from condensation and dirt.

Intel® processors (availability until at least 2014)

Product	CPU clock (GHz)	FSB (MHz)	L2 cache	Max. output loss	available until	Housing
90nm process technology I 32bit CPU						
Celeron® M 373ULV	1.0	400	512kB	5.5W	2014	uFC-BGA
Prozessor 140 ULV	1.0	400	0kB	5.0W	2014	uFC-BGA
90nm process technology I 32bit CPU						
Pentium® M 745	1.8	400	2MB	21W	2014	uFC-PGA
Pentium® M 738LV	1.4	400	2MB	10W	2014	uFC-BGA
65nm process technology I 32bit CPU						
Core™Duo L2400 LV	2x 1.6	667	2MB	15W	2016	uFC-BGA
Core™ 2 Duo L7400 LV	2x 1.5	667	4MB	17W	2016	uFC-BGA
45nm process technology I 64bit CPU						
Core™2 Extreme Processor QX9300	4x 2.5	1066	4x 3MB	45W	2018	uFC-PGA
Core™2 Extreme Processor SL9400	2x 1.9	1066	4x 3MB	17W	2018	uFC-BGA
Intel® Atom processors I 45nm Hi-k processor technology CPU						
Atom Z510	1.1	533	512kB	~1W	2016	SFF
Atom Z530	1.6	533	512kB	~1W	2016	SFF

AMD processors long-life status

Product	CPU clock (MHz)	FSB internal	L2 cache	Output loss	available until	Housing
ELAN520	133	66MHz	0kB	2W	2011	BGA
Geode™ LX800	500	333MHz	128kB	2W	2016	BGA
Geode™ LX900	600	333MHz	128kB	2.5W	2016	BGA

Extended temperature screening

Option code	min. °C	max. °C	Part no.
E27	-25 °C	+70 °C	807711
E28	-25 °C	+85 °C	807712
E47	-40 °C	+70 °C	807714
E48	-40 °C	+85 °C	807713

Must be ordered separatley.

Screening for Extended Temperature

With the extended temperature screening process, the embedded computer boards or modules are verified for ordinary operation at operating temperatures outside the standard range (Extended Temperature Screening). Process description: Basic CPU functional test before screening. Connection to screening platform. Cool down in off mode to the lower temperature and held for 30 minutes. CPU switch on, boot and run the following test programs from a CompactFlash IDE-device: Motherboard System Test, COM1 Signals, COM2 Signals, LPT1 Signals, System Memory Test, Video Memory Test, HDD Test. The test results are stored in the CompactFlash. After these tests, the chamber is heated up to the upper temperature and stays at the upper temperature for 30 minutes.

During the heat-up and dwell period, the above described tests are running randomly. After 30 minutes at upper temperature, the chamber is cooled down to room temperature. The chamber will be de-charged and the test protocol of each embedded computer will be read out. Total process time is 180 minutes.

This service is only available with a CPU board and module involved. Note: The heat dissipation concept in the application of the customer must keep the following CPU temperature (Tcase):

Intel CPUs below 100°C, AMD CPUs below 85°C.

The electronics must be protected by conformal coating in case of condensing humidity by fast temperature changes.

DIGITAL-LOGIC Compact Flash

CompactFlash Standard Grade-Temperature Range 0°C to +70°C, DIGITAL-LOGIC Brand, SLC-NAND, Ultra DMA, Fixed Disk, 2 Mio. h MTBF, 5 Mio. write cycles

Article	No.	Description / Application
CF 256MB	890021	CompactFlash Card 256MB, Type 256-XIC4
CF 1.0GB	890022	CompactFlash Card 1024MB, Type 1GO-XIC4
CF 2.0GB	890023	CompactFlash Card 2048MB, Type 2GO-XIC4

CompactFlash Industrial Grade-Temperature Range -40°C to +85°C, SLC-NAND, Ultra DMA, Fixed Disk, 4 Mio. h MTBF, 5 Mio. write cycles

Article	No.	Description / Application
CF 128MB-IG-E48	890032	CompactFlash Card 128MB, Type SSD-CnnMI-3512
CF 512MB-IG-E48	890034	CompactFlash Card 512MB-IG, Type SSD-CnnMI-3512
CF 1.0GB-IG-E48	890036	CompactFlash Card 1024MB-IG, Type SSD-CnnMI-3512
CF 2.0GB-IG-E48	890038	CompactFlash Card 2048MB-IG, Type SSD-CnnMI-3512

DIGITAL-LOGIC DRAM-Module

RAM/SDRAM 2x32 bit Special for AMD ELAN SC520 Products MSN586Sxx and SM520PCx

Article	No.	Description / Application
SDRAM32M	890655	SDRAM-SODIMM32 Module 32MB, 144pin
SDRAM64M	890654	SDRAM-SODIMM32 Module 64MB, 144pin
SDRAM128M	890656	SDRAM-SODIMM32 Module 128MB, 144pin

RAM/DDR-RAM for Intel® 855 and AMD LX products

Article	No.	Description / Application
DDR-RAM 128MB	890669	DDR-RAM-SODIMM Module 128MB, 200pin, 333MHz
DDR-RAM 128MB	890670	DDR-RAM-SODIMM Module 256MB, 200pin, 333MHz
DDR-RAM 512MB	890671	DDR-RAM-SODIMM Module 512MB, 200pin, 333MHz
DDR-RAM 1024MB	890672	DDR-RAM-SODIMM Module 1024MB, 200pin, 333MHz

RAM/DDR2-RAM for Intel® G45 and 945 products

Article	No.	Description / Application
DDR2-RAM 256MB	890674	DDR2-RAM-SODIMM Module 256MB, 200pin, 533MHz, non ECC
DDR2-RAM 512MB	890675	DDR2-RAM-SODIMM Module 512MB, 200pin, 533MHz, non ECC
DDR2-RAM1024MB	890676	DDR2-RAM-SODIMM Module 1024MB, 200pin, 533MHz, non ECC
DDR2-RAM 2048MB	890677	DDR2-RAM-SODIMM Module 2048MB, 200pin, 533MHz, non ECC

Operating systems evaluation

Pre-installed operating systems on USB sticks or CompactFlash cards are available for most products.

The data carrier is inserted into the system and the boot process begins.

Article on USB-Stick 2GB	No.	Operating system	Suitable for the following products:
EVOSXPLX800USB	816015	Windows XP Embedded	all LX800/900 products
EVOSCE6LX800USB	816051	Windows CE 6.0	all LX800/900 products
EVOSXP855USB	816011	Windows XP Embedded	all 855 products
EVOSXP945USB	816013	Windows XP Embedded	all 945 products
EVOSXPA200USB	816061	Windows XP Embedded	all A200 products
EVOSCE6A200USB	816071	Windows CE 6.0	all A200 products
USB-BOOT DOS/Linux	814350	Linux + DOS 1GB	all LX800/900 products

Article on CompactFlash 2GB	No.	Operating system	Suitable for the following products:
EVOSXPLX800CF	816014	Windows XP Embedded	all LX800/900 products
EVOSCE6LX800CF	816050	Windows CE 6.0	all LX800/900 products
EVOSXP855CF	816010	Windows XP Embedded	all 855 products
EVOSXP945CF	816012	Windows XP Embedded	all 945 products
EVOSXPA200CF	816060	Windows XP Embedded	all A200 products
EVOSCE6A200CF	816070	Windows CE 6.0	all A200 products
EVOS Linux LX800CF	816030	Linux + DOS	all LX800/900 products

Board Support Package (BSP)

Board Support Packages are free of charge and may be downloaded from our website or ordered using the following part numbers.

BSPs contain all drivers and installation tools for most operating systems:

Article	No.	Operating system	Product Range
BSP-CD855	816210	DOS, Linux, WIN-XP	Intel 855GME
BSP-CD945	816212	Linux, WIN-XP, Vista	Intel 945GME
BSP-CDLX800	816213	DOS, Linux, WIN-XP, CE5	AMD LX800/900
BSP-CDP5T3	816214	DOS, Linux, WIN-XP	Intel Tualatin, AMD ELAN520
BSP-CD200	816216	Linux, WIN-XP, Vista, CE6	Atom Z510, Z530
BSP-CDG45	816217	Linux, WIN-XP, Vista	Intel G45

The embedded PC as component

smartModules are multi-chip modules. They include the entire functionality of a normal PC. All signals and interfaces are contained on a single bus, the smartBus, so that no wiring is necessary. The smartBus functions as the technology interface which makes the application independent of the dynamic development of PC architecture. Future smartModules will remain mechanically, electrically, and functionally compatible.

System design with smartModules

A development kit is available for each smartModule. It consists of diagrams, documentation and a development board with smartModules ready for operation.

If requested, the customer receives support from the DIGITAL-LOGIC DesignIn Center when creating circuit diagrams and commissioning the system.

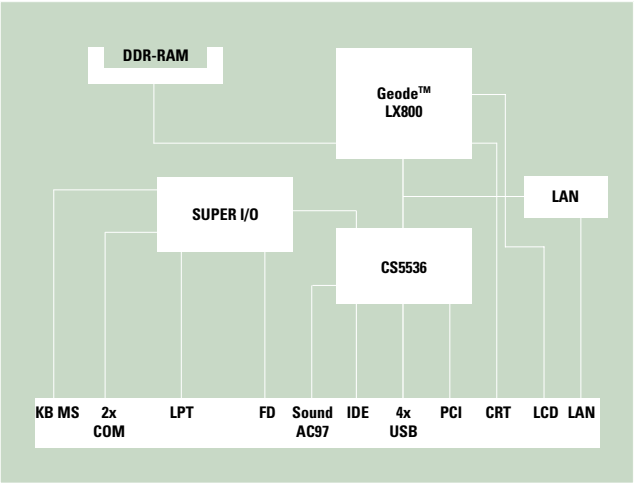
The customer is then able to produce electronic boards and to equip the PC like a normal electronic component.

The new embedded standard

smartModule PCs provide the easiest, most time-saving and inexpensive integration of an embedded PC in a customer-specific application. This means less development overhead, lower design costs and minimal commissioning risks. Some smartModules have an integrated flash disk that, when delivered with a ROM DOS, are formatted and ready to boot. The user sticks the smartModule PC onto the carrier board, screws down the module with four screws, switches on the power supply, and the PC is ready to start up.

COM Express

smartModuleExpress offers full PC functionality. The new, fast serial buses (PCIe, SATA, PEG) require a new connector definition such as COM Express. COM Express is an open industry standard from PICMG. A TYCO connector with a maximum frequency of 6GHz is used as an adapter for the COMexpress bus and is sufficient for all of today's known LVDS signals. DIGITAL-LOGIC also offers a reliable thermal connection and the smallest form factor for embedded computer modules (COMs).



SM800PC/X

Description

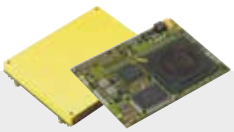
The SM800PC/X smartModule is based on the AMD LX800 and performs at 500MHz. All interfaces, the 16 bit ISA bus and the PCI bus, are contactable via the 480 pin smartBus. The SM800PC smartModule is one of the smallest computers on module (COM) and enables integration of the personal computer in very small devices and environments. The product is characterized by very low power consumption (8W), a broad temperature range, and an excellent price/performance ratio.

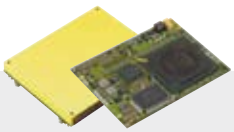
Applications

_ Information terminals
_ Control of interactive devices
_ Play systems with music output
_ Measuring instruments
_ Telecommunication devices

Ordering information (Option/accessories)

Article	No.	Description
SM480-CON7	807127	Connector 240pin,h=7mm, 2unit needed, packsize=6
SM480 passiv cooler	807120	for SM480 modules
SODIMM DDR 128MB	890669	333MHz, 200pin, noECC
SODIMM DDR 256MB	890670	333MHz, 200pin, noECC
SODIMM DDR 512MB	890671	333MHz, 200pin, noECC
SODIMM DDR 1GB	890672	333MHz, 200pin, noECC
SM800DK	805220	SM800 DevelopmentKit incl. SM800PCX, 256MB-RAM, HD, CD, Doc's, Cables

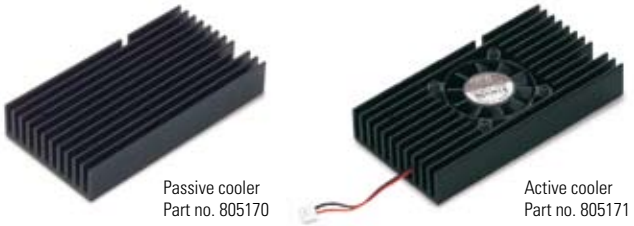




Technical data

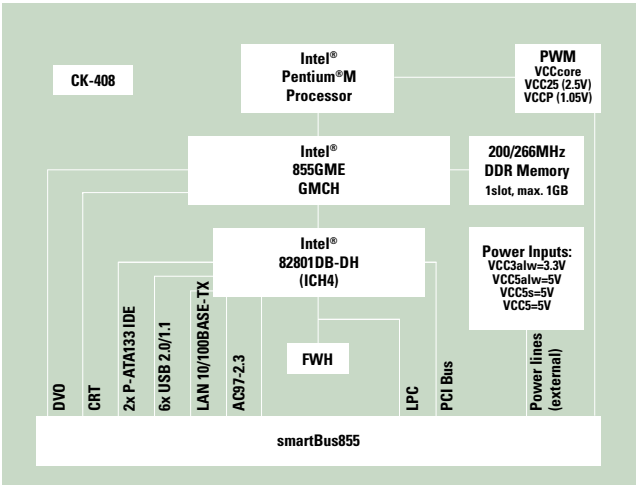
Type	SM800PCX	SM800PC
CPU	AMD Geode™ LX800	AMD Geode™ LX800
ISA-BUS	8/16-bit	8/16-bit
PCI-BUS	32bit	32bit
PCI Express-BUS	-	-
2nd Level cache (kB)	128	128
Performance (MHz)	500	500
DRAM Min-Max (MB)	128-1024	128-1024
CompactFlash socket	-	-
Keyboard, mouse (PS/2)	yes	yes
Boot drive	FD, HD, LAN, CF, USB	FD, HD, CF, USB
Floppy interface	yes	yes
IDE interface P-ATA	1x	1x
IDE interface S-ATA	-	-
COM1	TTL	TTL
COM2	TTL	TTL
COM3	-	-
COM4	-	-
LPT1	-	-
USB (V2.0)	4x	4x
LAN port 1 (ext. transformer)	10/100BASE-T	-
LAN port 2	-	-
Audio	yes (AC97)	yes (AC97)
Video controller	LX800	LX800
Video memory (MB)	16 (UMA)	16 (UMA)
LCD interface	24bit, 240x 320 to 1600x 1200	24bit, 240x 320 to 1600x 1200
DVI interface	-	-
CRT interface	yes	yes
Video input	-	-
Watchdog	yes	yes
Power normal (typ.)	5V/8W	5V/8W
Power suspend	-	-
Power management	yes	yes
RTC battery onboard	external	external
Cooling type	passive	passive
Operating temperature	-25°C to +70°C*	-25°C to +70°C*
Extended operating temperature (E48)	-40°C to +85°C*	-40°C to +85°C*
Size (W x L x H in mm), h = 7mm	66 x 85 x 16	66 x 85 x 16
Weight	110 g	110 g
MTBF	>300'000h	>300'000h
Special features 1	-	-
Special features 2	-	-
Special features 3	-	-
Part no.	805212	805210

*The maximum values require appropriate cooling methods.



Passive cooler
Part no. 805170

Active cooler
Part no. 805171



SM855-Pentium® M

Description

The smartModule SM855 –Pxxx is based on the Intel® Pentium® M CPU with a clock speed of 1000-1800MHz. The product is characterized by the optimal thermal interface and large number of interfaces. Functional extensions are possible via the PCI bus and the 16 bit ISA bus (with a bridge). The copper core conveys, with negligible loss, the thermal output to the heat dissipator and housing. The robust, flat-ground housing protects the computer from vibrations and holds the SODIMM RAM module firmly in the base. The SM855 is the smallest Pentium® M computer and fits, for example, on a PC/104 standard board.

Applications

_ Networked interactive multimedia applications
_ Dual screen applications
_ Information displays
_ Measurement engineering
_ Telecommunications

Ordering information (Option/accessories)

Article	No.	Description
SODIMM DDR 128MB	890669	333MHz, 200pin, noECC
SODIMM DDR 256MB	890670	333MHz, 200pin, noECC
SODIMM DDR 512MB	890671	333MHz, 200pin, noECC
SODIMM DDR 1GB	890672	333MHz, 200pin, noECC
SM855-CON7*	807107	Connector 160pin,h=7mm, 2unit needed, packsize=9
SM855-CON10	807110	Connector 160pin,h=10mm, 2unit needed, packsize=9
SM855-DK	805027	SM855 DevelopmentKit without SM855 and RAM, HD, CD, Doc's, Cables, PS, w.passive + active cooler
SM855 Cooler passive	805170	for SM855 modules
SM855 Cooler active	805171	for SM855 modules

*Alternate heights are 6mm and 9mm (MOLEX).



Technical data

Type	SM855-C140	SM855-P738	SM855-P745
CPU	Intel® Processor M	Intel® Pentium® M	Intel® Pentium® M
ISA-BUS	1)	1)	1)
PCI-BUS	32bit	32bit	32bit
PCI Express-BUS	-	-	-
2nd Level cache (kB)	2048	2048	0
Performance (MHz)	1000	1400	1800
DRAM Min-Max (MB)	128-1024	128-1024	128-1024
CompactFlash socket	-	-	-
Keyboard, mouse (PS/2)	ext. SIO	ext. SIO	ext. SIO
Boot drive	FD, HD, USB, LAN	FD, HD, USB, LAN	FD, HD, USB, LAN
Floppy interface	ext. SIO	ext. SIO	ext. SIO
IDE interface P-ATA	2x	2x	2x
IDE interface S-ATA	-	-	-
COM1	ext. SIO	ext. SIO	ext. SIO
COM2	ext. SIO	ext. SIO	ext. SIO
COM3	-	-	-
COM4	-	-	-
LPT1	ext. SIO	ext. SIO	ext. SIO
USB (2.0)	6x	6x	6x
LAN port 1 (ext. transformer)	10/100BASE-T	10/100BASE-T	10/100BASE-T
LAN port 2	-	-	-
Audio	AC97-5.1	AC97-5.1	AC97-5.1
Video controller	i855GME	i855GME	i855GME
Video memory (MB)	16-64 (UMA)	16-64 (UMA)	16-64 (UMA)
LCD interface	ext. 18/24bit LVDS	ext. 18/24bit LVDS	ext. 18/24bit LVDS
DVI interface	ext. 24bit DVO to DVI bridge	ext. 24bit DVO to DVI bridge	ext. 24bit DVO to DVI bridge
CRT interface	yes	yes	yes
AMT 4.0	-	-	-
Watchdog	yes	yes	yes
Power normal (typ.)	9W (@1000MHz), 8V-30V	10W (@600MHz)-20W, 8-30V	10W (@600MHz)-26W, 8-30V
Power suspend (typ.)	0.1W	0.1W	0.1W
Power management	yes	yes, SpeedStep	yes, SpeedStep
RTC battery onboard	external	external	external
Cooling type	passive	passive/active	passive/active
Operating temperature	-25°C to +70°C	-25°C to +60°C	-25°C to +50°C
Extended operating temperature (E47)	-40°C to +70°C	-40°C to +70°C	-40°C to +50°C
Size (W x L x H in mm), h = 7mm	117 x 70 x 17	117 x 70 x 17	117 x 70 x 17
Weight	170 g	170 g	170 g
MTBF	>200'000h	>200'000h	>200'000h
Special features 1	-	-	-
Special features 2	-	-	-
Special features 3	-	-	-
Part no. (without DDR-RAM-module)	805192	805164	805168

1) External with PCI to ISA-Bridge.

COM Express type 2 BUS of smartModuleExpress connector AB and CD

Pin	Series A	Series B	Series C	Series D
1	GND	GND	GND	GND
2	LAN_MDI3-(NC)[1]	LAN_ACT#	IDE_D7	IDE_D5
3	LAN_MDI3+(NC)[1]	LPC_FRAME#	IDE_D6	IDE_D10
4	LAN_SPEED100#	LPC_AD0	IDE_D3	IDE_D11
5	LAN_SPEED1000#	LPC_AD1	IDE_D15	IDE_D12
6	LAN_MDI2-(NC)[1]	LPC_AD2	IDE_D8	IDE_D4
7	LAN_MDI2+ (NC)[1]	LPC_AD3	IDE_D9	IDE_D0
8	LAN_LINK#	LPC_DRQ0#	IDE_D2	IDE_REQ
9	LAN_MDI1-(RXN)[1]	LPC_DRQ1#	IDE_D13	IDE_IOW#
10	LAN_MDI1+(RXP)[1]	LPC_CLK	IDE_D1	IDE_ACK
11	LAN_GND	GND	GND	GND
12	LAN_MDI0-(TXN)[1]	PM_PWRBTN#	IDE_D14	IDE_IRQ
13	LAN_MDI0+(TXP)[1]	SMB_CLK	IDE_IORDY	IDE_A0
14	LAN_CT-Ref	SMB_DAT	IDE_IOR#	IDE_A1
15	PM_SUS_S3#	SMB_ALERT#	PCI_PME#	IDE_A2
16	SATA0-TX+	SATA1-TX+(NC)[1]	PCI_GNT2#	IDE_CS1#
17	SATA0-TX-	SATA1-TX(NC)[1]	PCI_REQ2#	IDE_CS3#
18	PM_SUS_S4#	SUS_STAT#	PCI_GNT1#	IDE_RESET#
19	SATA0-RX+	SATA1-RX+(NC)[1]	PCI_REQ1#	PCI_GNT3#
20	SATA0-RX-	SATA1-RX-(NC)[1]	PCI_GNT0#	PCI_REQ3#
21	GND	GND	GND	GND
22	SATA2-TX+	SATA3-TX+(NC)[1]	PCI_REQ0#	PCI_AD1
23	SATA2-TX-	SATA3-TX(NC)[1]	PCI_RESET#	PCI_AD3
24	PM_SUS_S5#	PWR_OK	PCI_AD0	PCI_AD5
25	SATA2-RX+	SATA3-RX+(NC)[1]	PCI_AD2	PCI_AD7
26	SATA2-RX-	SATA3-RX(NC)[1]	PCI_AD4	PCI_C/BE0#
27	BATLOW#	WDT(NC)[1]	PCI_AD6	PCI_AD9
28	ATA_ATC#	AC_SDIN2	PCI_AD8	PCI_AD11
29	AC_SYNCH	AC_SDIN1	PCI_AD10	PCI_AD13
30	AC_RST#	AC_SDIN0	PCI_AD12	PCI_AD15
31	GND	GND	GND	GND
32	AC_BITCLK	Speaker Out	PCI_AD14	PCI_PAR
33	AC_SDOUT	I2C-CK(TVS0)[1]	PCI_C/BE1#	PCI_SERR#
34	BIOS_DISABLE#	I2C-DAT(TVS1)[1]	PCI_PERR#	PCI_STOP#
35	THRMTRIP#	THRM#	PCI_LOCK#	PCI_TRDY#
36	USB6-	USB7-	PCI_DEVSEL#	PCI_FRAME#
37	USB6+	USB7+	PCI_IRDY#	PCI_AD16
38	USB_6_7_OC#	USB_4_5_OC#	PCI_C/BE2#	PCI_AD18
39	USB4-	USB5-	PCI_AD17	PCI_AD20
40	USB4+	USB5+	PCI_AD19	PCI_AD22
41	GND	GND	GND	GND
42	USB2-	USB3-	PCI_AD21	PCI_AD24
43	USB2+	USB3+	PCI_AD23	PCI_AD26
44	USB_2_3_OC#	USB_0_1_OC#	PCI_C/BE3#	PCI_AD28
45	USB0-	USB1-	PCI_AD25	PCI_AD30
46	USB0+	USB1+	PCI_AD27	PCI_IRQC#
47	VCC_RTC	EXCD1_PERST#	PCI_AD29	PCI_IRQD#
48	EXCD0_PERST#	EXCD1_CPPE#	PCI_AD31	PCI_CLKRUN#
49	EXCD0_CPPE#	SYS_RESET#	PCI_IRQA#	PCI_M66EN
50	LPC_SERIRQ	CB_RESET#	PCI_IRQB#	PCI_CLK
51	GND	GND	GND	GND
52	PCIe_TX5+	PCIe_RX5+	PEG_RX0+	PEG_TX0+
53	PCIe_TX5-	PCIe_RX5-	PEG_RX0-	PEG_TX0-
54	GPI0(MAIN_SW)[1]	GPO1	FWH_TBL / TYPE0	PEG_LANE_RV#
55	PCIe_TX4+	PCIe_RX4+	PEG_RX1+	PEG_TX1+
56	PCIe_TX4-	PCIe_RX4-	PEG_RX1-	PEG_TX1-
57	GND	GPO 2	TYPE1#	GNT4#
58	PCIe_TX3+	PCIe_RX3+	PEG_RX2+	PEG_TX2+
59	PCIe_TX3-	PCIe_RX3-	PEG_RX2-	PEG_TX2-
60	GND	GND	GND	GND
61	PCIe_TX2+	PCIe_RX2+	PEG_RX3+	PEG_TX3+
62	PCIe_TX2-	PCIe_RX2-	PEG_RX3-	PEG_TX3-
63	GPI1(EXTSMI#)[1]	GPO 3	PCI_IRQE#	PCI_IRQG#
64	PCIe_TX1+	PCIe_RX1+	PCI_IRQF#	PCI_IRQH#
65	PCIe_TX1-	PCIe_RX1-	PEG_RX4+	PEG_TX4+
66	GND	PM_WAKE0#	PEG_RX4-	PEG_TX4-
67	GPI2(PM_RI#)[1]	PM_WAKE1#	Reserved	GND
68	PCIe_TX0+	PCIe_RX0+	PEG_RX5+	PEG_TX5+
69	PCIe_TX0-	PCIe_RX0-	PEG_RX5-	PEG_TX5-
70	GND	GND	GND	GND
71	LVDS_A0+	LVDS_B0+	PEG_RX6+	PEG_TX6+
72	LVDS_A0-	LVDS_B0-	PEG_RX6-	PEG_TX6-
73	LVDS_A1+	LVDS_B1+	SDVO_DATA	SDVO_CLK
74	LVDS_A1-	LVDS_B1-	PEG_RX7+	PEG_TX7+
75	LVDS_A2+	LVDS_B2+	PEG_RX7-	PEG_TX7-
76	LVDS_A2-	LVDS_B2-	GND	GND
77	LVDS_VDDENA	PCI_CLK4	REQ4#	PATA_Detect#
78	48MHz OUT	14MHz OUT	PEG_RX8+	PEG_TX8+
79	CLKSIO_33MHz OUT	LVDS_BKLENA	PEG_RX8-	PEG_TX8-
80	GND	GND	GND	GND
81	LVDS_A_CLK+	LVDS_B_CLK+	PEG_RX9+	PEG_TX9+
82	LVDS_A_CLK-	LVDS_B_CLK	PEG_RX9-	PEG_TX9-
83	LVDS_I2C_CK	LVDS_BKL_CTRL	REQ5#	GNT5#
84	LVDS_I2C_DAT	VCC5V_ALW_IN	GND	GND
85	GPI3	VCC5V_ALW_IN	PEG_RX10+	PEG_TX10+
86	KBD_RST#	VCC5V_ALW_IN	PEG_RX10-	PEG_TX10-
87	KBD_A20Gate	VCC5V_ALW_IN	GND	GND
88	PCIe_CK_REF+	RSVD	PEG_RX11+	PEG_TX11+
89	PCIe_CK_REF-	VGA_RED	PEG_RX11-	PEG_TX11-
90	GND	GND	GND	GND
91	RSVD	VGA_GREEN	PEG_RX12+	PEG_TX12+
92	RSVD	VGA_BLUE	PEG_RX12-	PEG_TX12
93	GPO0	VGA_HSYNCH	GND	GND
94	(3.3V Always)*	VGA_VSYNCH	PEG_RX13+	PEG_TX13+
95	(3.3V Always)*	VGA_I2C_CLK	PEG_RX13-	PEG_TX13-
96	GND	VGA_I2C_DAT	GND	GND
97	+12Volt	TV_DAC_A	LPC_FWH_INIT#	PEG_ENABLE#
98	+12Volt	TV_DAC_B	PEG_RX14+	PEG_TX14+
99	+12Volt	TV_DAC_C	PEG_RX14-	PEG_TX14-
100	GND	GND	GND	GND
101	+12Volt_IN	+12Volt_IN	PEG_RX15+	PEG_TX15+
102	+12Volt_IN	+12Volt_IN	PEG_RX15-	PEG_TX15-
103	+12Volt_IN	+12Volt_IN	GND	GND
104	+12Volt_IN	+12Volt_IN	+12Volt_IN	+12Volt_IN
105	+12Volt_IN	+12Volt_IN	+12Volt_IN	+12Volt_IN
106	+12Volt_IN	+12Volt_IN	+12Volt_IN	+12Volt_IN
107	+12Volt_IN	+12Volt_IN	+12Volt_IN	+12Volt_IN
108	+12Volt_IN	+12Volt_IN	+12Volt_IN	+12Volt_IN
109	+12Volt_IN	+12Volt_IN	+12Volt_IN	+12Volt_IN
110	GND	GND	GND	GND

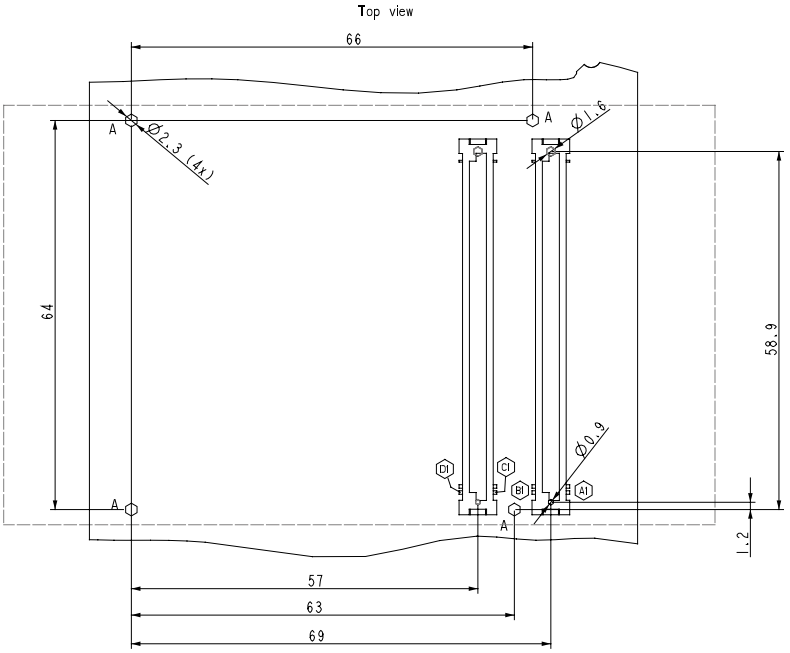
*Output of the internally generated voltages. [1] Specific for SMX945.

6.2.4 SDVO / PEG multiplexed signals

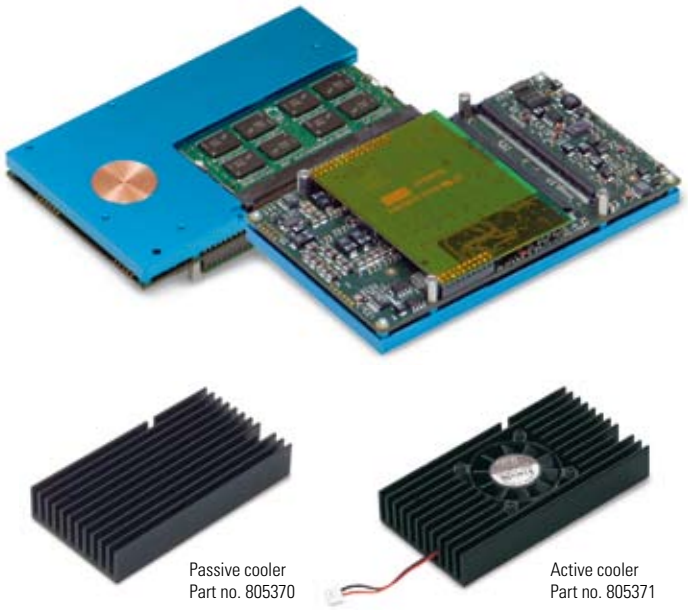
Pin	PEG-function:	SDVO-function:
D78	PEG_TX8+	SDVO_Cannel_C_CLK+
D79	PEG_TX8-	SDVO_Cannel_C_CLK-
D81	PEG_TX9+	SDVO_Cannel_C_Blue+
D82	PEG_TX9-	SDVO_Cannel_C_Blue-
D85	PEG_TX10+	SDVO_Cannel_C_Green+
D86	PEG_TX10-	SDVO_Cannel_C_Green-
D88	PEG_TX11+	SDVO_Cannel_C_Red+
D89	PEG_TX11-	SDVO_Cannel_C_Red-
C85	PEG_RX10+	SDVO_Chanel_C_INT+
C86	PEG_RX10-	SDVO_Chanel_C_INT-
D91	PEG_TX12+	SDVO_Cannel_B_CLK+
D92	PEG_TX12-	SDVO_Cannel_B_CLK-
D94	PEG_TX13+	SDVO_Cannel_B_Blue+
D95	PEG_TX13-	SDVO_Cannel_B_Blue-
D98	PEG_TX14+	SDVO_Cannel_B_Green+
D99	PEG_TX14-	SDVO_Cannel_B_Green-
D101	PEG_TX15+	SDVO_Cannel_B_Red+
D102	PEG_TX15-	SDVO_Cannel_B_Red-
C98	PEG_RX14+	SDVO_Chanel_B_INT+
C99	PEG_RX14-	SDVO_Chanel_B_INT-
C101	PEG_RX15+	SDVO_TVCLK_Input+
C102	PEG_RX15-	SDVO_TVCLK_Input-
C94	PEG_RX13+	SDVO_STALL+
C95	PEG_RX13-	SDVO_STALL-
D97	1K-Pulldown	Open
C73	SDVO	SDVO_DATA
D73	SDVO	SDVO_CLK

Input voltage: 12V

COM Express connector placement

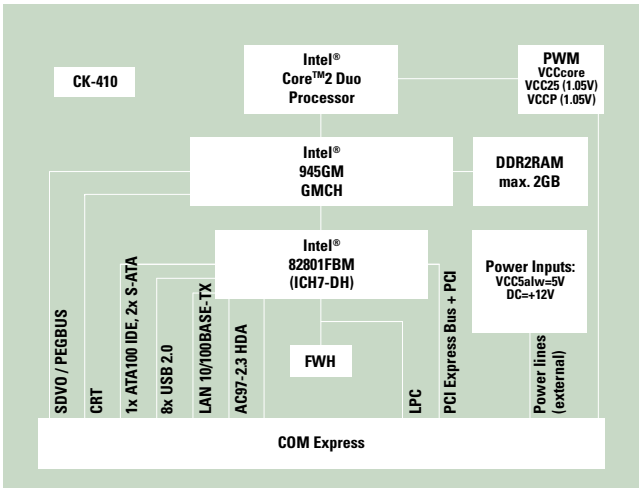


A = holes for fixing on motherboard



Passive cooler
Part no. 805370

Active cooler
Part no. 805371



SMX945 COM Express

Description

The smartModule SMX945-xxx is based on the Intel® Core™ Duo CPU with a clock speed of 2x 1600MHz. In addition to the properties of the SM855, it offers a faster CPU, PCI Express, 2x SATA, 8-channel sound output and an accelerated video controller. The product is characterized by the efficient thermal interface and large number of interfaces. The copper core conveys, with negligible loss, the thermal output to the heat dissipator and housing. The robust, flat-ground housing protects the computer from vibrations and holds the SO-DIMM RAM module firmly in the base. The SMX945 is the smallest Core™2 Duo computer and fits, for example, on a PC/104 standard board.

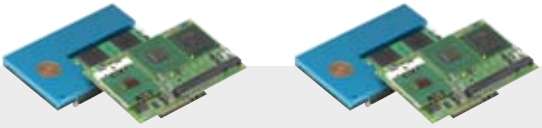
Ordering information (Option/accessories)

Article	No.	Description
SODIMM DDR2 256MB	890674	200pin, 533MHz, noECC
SODIMM DDR2 512MB	890675	200pin, 533MHz, noECC
SODIMM DDR2 1GB	890676	200pin, 533MHz, noECC
SODIMM DDR2 2GB	890677	200pin, 533MHz, noECC
SMX-CON8	807138	Connector 220pin, h=8mm, 2 needed, packsize=90
SMX945-DK	805390	SMX945 DevelopmentKit without SMX945 and RAM, HD, CD, Doc's,Cables,PS, w.passive & active cooler
SMX9/G45 passive cooler	805370	incl. assemblymat.
SMX9/G45 active cooler	805371	incl. assemblymat.

Applications

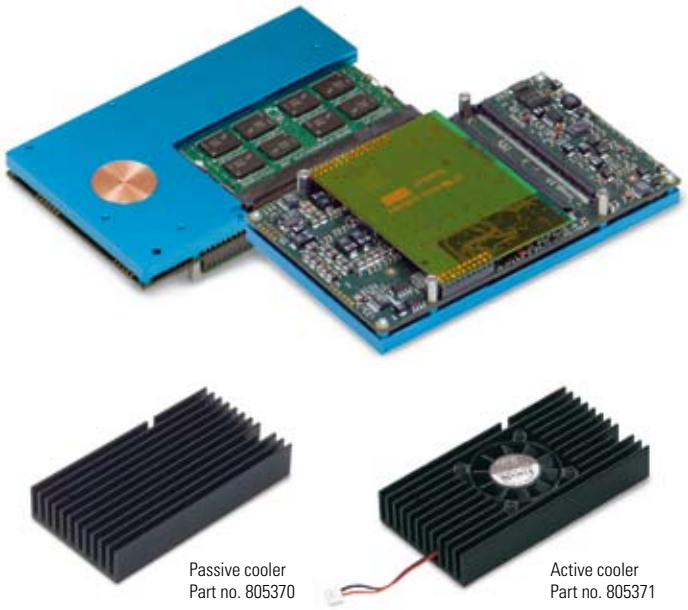
_ Networked interactive multimedia applications
_ Dual screen applications
_ Picture recognition
_ Measurement engineering
_ Media center, extender

COM Express BUS | PCI | PCIe | Core™ Duo | 2 x 1.6GHz | max. 2GB RAM | 1x LAN | RoHS



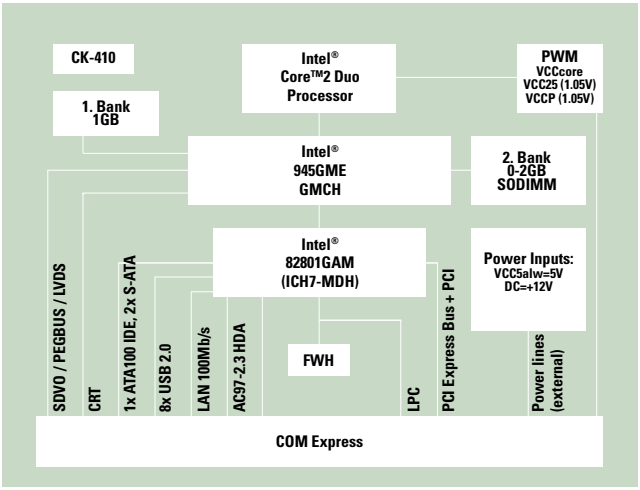
Technical data

Type	SMX945-L2400	SMX945-L7400
CPU	Intel® Core™ Duo L2400	Intel® Core™2 Duo L7400
ISA-BUS	-	-
PCI-BUS	32bit	32bit
PCI Express-BUS	6x 1 lane	6x 1 lane
2nd Level cache (kB)	2048	4096
Performance (MHz)	2x 1600, FSB667	2x 1500, FSB667
DRAM Min-Max (MB)	256-2048	256-2048
CompactFlash socket	-	-
Keyboard, mouse (PS/2)	ext. SIO	ext. SIO
Boot drive	FD, HD, USB, LAN	FD, HD, USB, LAN
Floppy interface	ext. SIO	ext. SIO
IDE interface P-ATA	1x	1x
IDE interface S-ATA (300Mbit/s), RAID 0/1	2x	2x
COM1	ext. SIO	ext. SIO
COM2	ext. SIO	ext. SIO
COM3	-	-
COM4	-	-
LPT1	ext. SIO	ext. SIO
USB (2.0)	8x	8x
LAN port 1 (ext. transformer)	10/100BASE-T	10/100BASE-T
LAN port 2	-	-
Audio	HDA-7.1, 192kHz	HDA-7.1, 192kHz
Video controller	i945GME	i945GME
Video memory (MB)	8-224 (UMA)	8-224 (UMA)
LCD interface	ext. 18bit LVDS	ext. 18bit LVDS
DVI interface	ext. 2x SDVO	ext. 2x SDVO
CRT interface	yes	yes
AMT 4.0	-	-
Watchdog	yes	yes
Power normal (typ.)	20W, 12V	24W, 12V
Power suspend (typ.)	0.1W	0.1W
Power management	yes, SpeedStep	yes, SpeedStep
RTC battery onboard	external	external
Cooling type	passive/active	passive/active
Operating temperature	-25°C to +70°C	-25°C to +70°C
Extended operating temperature (E47)	-40°C to +70°C	-40°C to +70°C
Size (W x L x H in mm)	117 x 70 x 18	117 x 70 x 18
Weight	175 g	175 g
MTBF	>200'000h	>200'000h
Special features 1	-	-
Special features 2	-	-
Special features 3	-	-
Part no. (without DDR2RAM-module)	805350	805352



Passive cooler
Part no. 805370

Active cooler
Part no. 805371



SMX945B COM Express

Description

The smartModule SMX945B-xxx is based on the Intel® Core™ Duo CPU with a clock speed of 2x 1600MHz. The SMX945B has 1GB of soldered-on memory (DDR2) and a SODIMM holder for maximum 2GB memory (for a maximum total of 3GB RAM). The product is characterized by an efficient thermal interface and large number of interfaces. The copper core conveys, with negligible loss, the thermal output to the heat dissipator and housing. The robust, flat-ground housing protects the computer from vibrations and holds the SODIMM RAM module firmly in the base. The SMX945B is the smallest Core™2 Duo computer with 3GB-RAM and fits, for example, on a PC/104 board.

Applications

_ Networked interactive multimedia applications
_ Dual screen applications
_ Picture recognition
_ Measurement engineering
_ Media center, extender

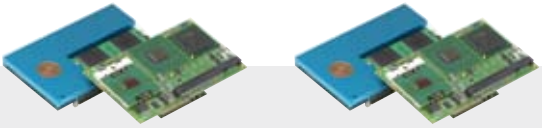
Ordering information (Option/accessories)

Article	No.	Description
SODIMM DDR2 512MB	890675	200pin, 533MHz, noECC
SODIMM DDR2 1GB	890676	200pin, 533MHz, noECC
SODIMM DDR2 2GB	890677	200pin, 533MHz, noECC
SMX-CON8	807138	Connector 220pin, h=8mm, 2 needed, packsize=90
SMX945-DK	805390	SMX945 DevelopmentKit without SMX945 and RAM, HD, CD, Doc's,Cables,PS, w.passive & active cooler
SMX9/G45 passive cooler	805370	incl. assemblymat.
SMX9/G45 active cooler	805371	incl. assemblymat.

*

Onboard RAM	SODIMM	Total Capacity
1GB	0GB	1GB
1GB	0.5GB	1.5GB
1GB	1GB	2GB + opt. Performance
1GB	2GB	3GB

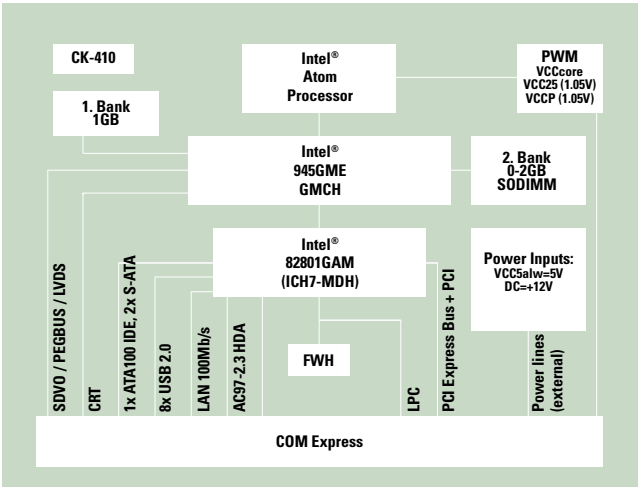
COM Express BUS | PCI | PCIe | Core™2 Duo | 2 x 1.6GHz | max. 3GB RAM | 1x LAN | RoHS



Technical data

Type	SMX945B-L2400	SMX945B-L7400
CPU	Intel® Core™ Duo L2400	Intel® Core™2 Duo L7400
ISA-BUS	-	-
PCI-BUS	32bit	32bit
PCI Express-BUS	6x 1 lane	6x 1 lane
2nd Level cache (kB)	2048	4096
Performance (MHz)	2x 1600, FSB667	2x 1500, FSB667
DRAM (GB) soldered	1GB	1GB
DRAM SODIMM min-max*	0-2GB	0-2GB
Keyboard, mouse (PS/2)	ext. SIO	ext. SIO
Boot drive	FD, HD, USB, LAN	FD, HD, USB, LAN
Floppy interface	ext. SIO	ext. SIO
IDE interface P-ATA	1x	1x
IDE interface S-ATA (300Mbit/s)	2x (sw RAID)	2x (sw RAID)
COM1	ext. SIO	ext. SIO
COM2	ext. SIO	ext. SIO
COM3	-	-
COM4	-	-
LPT1	ext. SIO	ext. SIO
USB (2.0)	8x	8x
LAN port 1 (ext. transformer)	10/100BASE-T	10/100BASE-T
LAN port 2	-	-
Audio	HDA-7.1, 192kHz	HDA-7.1, 192kHz
Video controller	i945GME	i945GME
Video memory (MB)	8-224 (UMA)	8-224 (UMA)
LCD interface	ext. 18bit LVDS	ext. 18bit LVDS
DVI interface	ext. 2x SDVO	ext. 2x SDVO
CRT interface	yes	yes
AMT 4.0	-	-
Watchdog	yes	yes
Power normal (typ.)	20W, 12V	24W, 12V
Power suspend (typ.)	0.1W	0.1W
Power management	yes, SpeedStep	yes, SpeedStep
RTC battery onboard	external	external
Cooling type	passive/active	passive/active
Operating temperature	-25°C to +60°C	-25°C to +60°C
Extended operating temperature (E47)	-40°C to +70°C	-40°C to +70°C
Size (W x L x H in mm)	117 x 70 x 18	117 x 70 x 18
Weight	180 g	180 g
MTBF	>200'000h	>200'000h
Special features 1	-	-
Special features 2	-	-
Special features 3	-	-
Part no. (without DDR2RAM-module)	805450	805452

Passive cooler
Part no. 805370



SMX945B-N270

Description

The smartModule SMX945B-xxx is based on the Intel® Atom™ CPU with a clock speed of 1600MHz. The SMX945B has 1GB of soldered-on memory (DDR2) and a SODIMM holder for maximum 2GB memory (for a maximum total of 3GB RAM). The product is characterized by an efficient thermal interface and large number of interfaces. The copper core conveys, with negligible loss, the thermal output to the heat dissipator and housing. The robust, flat-ground housing protects the computer from vibrations and holds the SODIMM RAM module firmly in the base.

Applications

_ Networked interactive multimedia applications
_ Dual screen applications
_ Picture recognition
_ Measurement engineering
_ Media center, extender

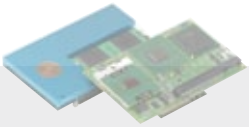
Ordering information (Option/accessories)

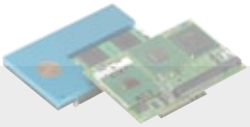
Article	No.	Description
SODIMM DDR2 512MB	890675	200pin, 533MHz, noECC
SODIMM DDR2 1GB	890676	200pin, 533MHz, noECC
SODIMM DDR2 2GB	890677	200pin, 533MHz, noECC
SMX-CON8	807138	Connector 220pin, h=8mm, 2 needed, packsize=90
SMX945-DK	805390	SMX945 DevelopmentKit without SMX945 and RAM, HD, CD, Doc's,Cables,PS, w.passive & active cooler
SMX9/G45 passive cooler	805370	incl. assemblymat.
SMX9/G45 active cooler	805371	incl. assemblymat.

*

Onboard RAM	SODIMM	Total Capacity
1GB	0GB	1GB
1GB	0.5GB	1.5GB
1GB	1GB	2GB + opt. Performance
1GB	2GB	3GB

COM Express BUS | PCI | PCIe | Atom™ | 1.6GHz | max. 3GB RAM | 1x LAN | RoHS





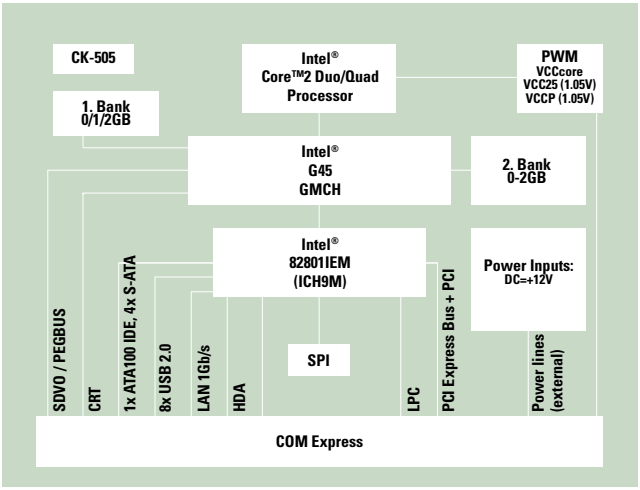
Technical data***

Type	SMX945B-N270	SMX945B-N270-1GB
CPU	Intel® Atom N270	Intel®Atom N270
ISA-BUS	-	-
PCI-BUS	32bit	32bit
PCI Express-BUS	6x 1 lane	6x 1 lane
2nd Level cache (kB)	512	512
Performance (MHz)	1600	1600
DRAM (GB) soldered	0GB	1GB
DRAM SODIMM min-max*	0-2GB	0-2GB
Keyboard, mouse (PS/2)	ext. SIO	ext. SIO
Boot drive	FD, HD, USB, LAN	FD, HD, USB, LAN
Floppy interface	ext. SIO	ext. SIO
IDE interface P-ATA	1x	1x
IDE interface S-ATA (300Mbit/s)	2x (sw RAID)	2x (sw RAID)
COM1	ext. SIO	ext. SIO
COM2	ext. SIO	ext. SIO
COM3	-	-
COM4	-	-
LPT1	ext. SIO	ext. SIO
USB (2.0)	8x	8x
LAN port 1 (ext. transformer)	10/100BASE-T	10/100BASE-T
LAN port 2	-	-
Audio	HDA-7.1, 192kHz	HDA-7.1, 192kHz
Video controller	i945GME	i945GME
Video memory (MB)	8-224 (UMA)	8-224 (UMA)
LCD interface	ext. 18bit LVDS	ext. 18bit LVDS
DVI interface	ext. 2x SDVO	ext. 2x SDVO
CRT interface	yes	yes
AMT 4.0	-	-
Watchdog	yes	yes
Power normal (typ.)	10W	10W
Power suspend (typ.)	0.1W	0.1W
Power management	yes	yes
RTC battery onboard	external	external
Cooling type	passive	passive
Operating temperature	-25°C to +60°C	-25°C to +60°C
Extended operating temperature (E47)	-40°C to +70°C	-40°C to +70°C
Size (W x L x H in mm)	117 x 70 x 18	117 x 70 x 18
Weight	180 g	180 g
MTBF	>200'000h	>200'000h
Special features 1	-	-
Special features 2	-	-
Special features 3	-	-
Part no. (without DDR2RAM-module)	805470	805472

***As this product is still in development, changes to the technical data are possible.

Passive cooler
Part no. 805370

Active cooler
Part no. 805371



SMXG45 COM Express

Description

The smartModule SMXG45 is based on the Intel® Core™ 2 Extreme Processor with up to 4x 2.5GHz. The SMX-G45 has 1 slot for DDR2RAM-modules and selectively 0/1/2GB soldered-on DDR2 memory (max. 4GB RAM). The product is characterized by an efficient thermal interface and large number of interfaces. The copper core conveys, with negligible loss, the thermal output to the heat dissipator and housing. The robust, flat-ground housing protects the computer from vibrations and holds the SODIMM RAM module firmly in the base. The SMXG45 is the smallest Core™2 Quad computer with 4GB-RAM and fits, for example, on a PC/104 board.

Applications

_ Networked interactive multimedia applications
_ Dual screen applications
_ Picture recognition
_ Measurement engineering
_ Media center, extender

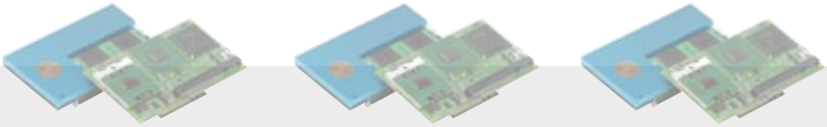
Ordering information (Option/accessories)

Article	No.	Description
SODIMM DDR2	890678	1GB 667M G45
SODIMM DDR2	890679	2GB 667M G45
SMX-CON8	807138	Connector 220pin, h=8mm, 2 needed, packsize=90
SMX9/G45 passive cooler	805370	incl. assemblymat.
SMX9/G45 active cooler	805371	incl. assemblymat.
SMXG45-DK	805650	SMXG45 DevelopmentKit without SMXG45 and RAM, HD, CD, Doc's, Cables, PS, w.passive + active cooler

*

Soldered RAM	SODIMM RAM	Total Capacity
2GB	0GB	2GB
2GB	1GB	3GB
2GB	2GB	4GB + opt. Performance
1GB	0GB	1GB
1GB	1GB	2GB + opt. Performance
1GB	2GB	3GB
0GB	0GB	0GB
0GB	1GB	1GB
0GB	2GB	2GB

COM Express BUS | PCI | PCIe | Core™2 Quad | 4x 2.5GHz | max. 4GB RAM | 1x LAN | RoHS



Technical data***

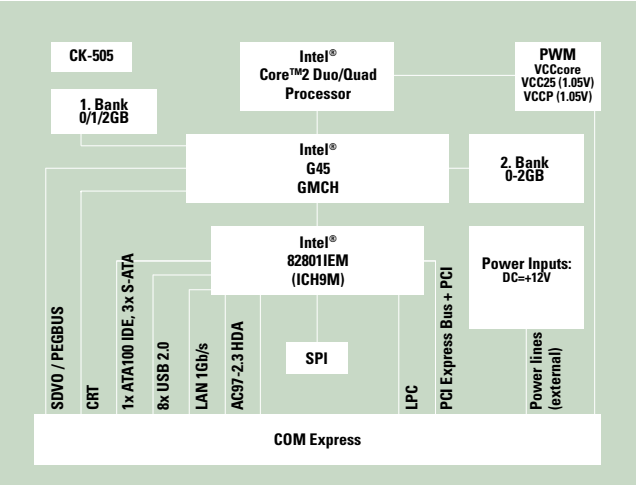
Type	SMXG45-1GB	SMXG45-2GB	SMXG45-0GB
CPU	Intel® Core™2 Duo/Quad	Intel® Core™2 Duo/Quad	Intel® Core™2 Duo/Quad
ISA-BUS	-	-	-
PCI-BUS	32bit	32bit	32bit
PCI Express-BUS	5x 1 lane	5x 1 lane	5x 1 lane
2nd Level cache (MB)**	6/12	6/12	6/12
Performance (GHz)**	2x 1.9GHz/4x 2.5GHz	2x 1.9GHz/4x 2.5GHz	2x 1.9GHz/4x 2.5GHz
DRAM (GB) soldered	1GB soldered	2GB soldered	-
DRAM SODIMM min-max*	0-2GB	0-2GB	0-2GB
Keyboard, mouse (PS/2)	ext. SIO	ext. SIO	ext. SIO
Boot drive	FD, HD, USB, LAN	FD, HD, USB, LAN	FD, HD, USB, LAN
Floppy interface	ext. SIO	ext. SIO	ext. SIO
IDE interface P-ATA (from USB9)	1x	1x	1x
IDE interface S-ATA (300Mbit/s)	4x	4x	4x
COM1	ext. SIO	ext. SIO	ext. SIO
COM2	ext. SIO	ext. SIO	ext. SIO
COM3	-	-	-
COM4	-	-	-
LPT1	ext. SIO	ext. SIO	ext. SIO
USB (2.0)	8x	8x	8x
LAN port 1 (ext. transformer)	1GE	1GE	1GE
LAN port 2	-	-	-
Audio	HDA, 192kHz	HDA, 192kHz	HDA, 192kHz
Video controller	Intel®-Gfx	Intel®-Gfx	Intel®-Gfx
Video memory (MB)	up to 512MB (UMA)	up to 512MB (UMA)	up to 512MB (UMA)
LCD interface	ext. 18bit LVDS	ext. 18bit LVDS	ext. 18bit LVDS
DVI interface	ext. 2x SDVO	ext. 2x SDVO	ext. 2x SDVO
CRT interface	yes	yes	yes
AMT 4.0	yes	yes	yes
Watchdog	yes	yes	yes
Power normal (typ.)**	25-60W, 12V	25-60W, 12V	25-60W, 12V
Power suspend (typ.)	0.1W	0.1W	0.1W
Power management	yes, SpeedStep	yes, SpeedStep	yes, SpeedStep
RTC battery onboard	external	external	external
Cooling type	passive/active	passive/active	passive/active
Operating temperature	-25°C to +60°C	-25°C to +60°C	-25°C to +60°C
Extended operating temperature	tbd	tbd	tbd
Size (W x L x H in mm)	117 x 70 x 18	117 x 70 x 18	117 x 70 x 18
Weight	180 g	180 g	180 g
MTBF	>200'000h	>200'000h	>200'000h
Special features 1	AMT 4.0	AMT 4.0	AMT 4.0
Special features 2	-	-	-
Special features 3	-	-	-
Part no. (without DDR2RAM-module)	↴	↴	↴

**CPUs

Article	Description	No.	No.	No.
SMXG45-xGB-SL9400	smartModule Express 1.86GHz 17W	805610	805620 *(not from stock)*	805600
SMXG45-xGB-QX9300	smartModule Express 4x 2.5GHz 45W	805611	805621 *(not from stock)*	805601

***As this product is still in development, changes to the technical data are possible.

IN DEVELOPMENT, AVAILABLE FROM 02/09



SMCG45 COM Express

Description

The smartModule SCE-G45 is based on the Intel® Core™ 2 Extreme Processor with up to 4x 2.5GHz. The SMCG45 has 1 slot for DDR2RAM-modules and selectively 0/1/2GB soldered-on DDR2 memory (max. 4GB RAM). The product is characterized by the efficient thermal interface and large number of interfaces. The copper core conveys, with negligible loss, the thermal output to the heat dissipator and housing. The robust, flat-ground housing protects the computer from vibrations and holds the SODIMM RAM module firmly in the base.

Applications

_ Networked interactive multimedia applications
_ Dual screen applications
_ Picture recognition
_ Measurement engineering
_ Media center, extender

Ordering information (Option/accessories)

Article	No.	Description
SODIMM DDR2	890678	1GB 667M G45
SODIMM DDR2	890679	2GB 667M G45
SMX-CON8	807138	Connector 220pin, h=8mm, 2 needed, packsize=90
Opt. Passiv Cooler SMCG45	805730	SCEG45 Cooler
Opt. Activ Cooler SMCG45	805732	SCEG45 Cooler
SCEG45-DK	805750	SCEG45 DevelopmentKit without SCEG45 and RAM, HD, CD, Doc's,Cables,PS, w.passive + active cooler

*

Soldered RAM	SODIMM RAM	Total Capacity
2GB	0GB	2GB
2GB	1GB	3GB
2GB	2GB	4GB + opt. Performance
1GB	0GB	1GB
1GB	1GB	2GB + opt. Performance
1GB	2GB	3GB
0GB	0GB	0GB
0GB	1GB	1GB
0GB	2GB	2GB

COM Express | PCI | PCIe | Core™2 Quad | 4x 2.5GHz | max. 4GB RAM | 1x LAN | RoHS

Technical data***

Type	SMCG45-1GB	SMCG45-2GB	SMCG45-0GB
CPU	Intel® Core™2 Duo/Quad	Intel® Core™2 Duo/Quad	Intel® Core™2 Duo/Quad
ISA-BUS	-	-	-
PCI-BUS	32bit	32bit	32bit
PCI Express-BUS	5x 1 Lane	5x 1 Lane	5x 1 Lane
2nd Level cache (MB)**	6/12	6/12	6/12
Performance (GHz)**	2x 1.3GHz/4x 2.5GHz	2x 1.3GHz/4x 2.5GHz	2x 1.3GHz/4x 2.5GHz
DRAM (GB) soldered	1GB soldered	2GB soldered	none
DRAM SODIMM min-max*	0-2GB	0-2GB	0-2GB
Keyboard, mouse (PS/2)	ext. SIO	ext. SIO	ext. SIO
Boot drive	FD, HD, USB, LAN	FD, HD, USB, LAN	FD, HD, USB, LAN
Floppy interface	ext. SIO	ext. SIO	ext. SIO
IDE interface P-ATA (from USB9)	1x	1x	1x
IDE interface S-ATA (300Mbit/s)	4x	4x	4x
COM1	ext. SIO	ext. SIO	ext. SIO
COM2	ext. SIO	ext. SIO	ext. SIO
COM3	-	-	-
COM4	-	-	-
LPT1	ext. SIO	ext. SIO	ext. SIO
USB (2.0)	8x	8x	8x
LAN port 1 (ext. transformer)	1GE	1GE	1GE
LAN port 2	-	-	-
Audio	HDA, 192kHz	HDA, 192kHz	HDA, 192kHz
Video controller	Intel®-Gfx	Intel®-Gfx	Intel®-Gfx
Video memory (MB)	up to 512MB (UMA)	up to 512MB (UMA)	up to 512MB (UMA)
LCD interface	ext. 24bit LVDS	ext. 24bit LVDS	ext. 24bit LVDS
DVI interface	ext. 2x SDVO	ext. 2x SDVO	ext. 2x SDVO
CRT interface	yes	yes	yes
AMT 4.0	yes	yes	yes
Watchdog	yes	yes	yes
Power normal (typ.)**	60W/12V	60W/12V	60W/12V
Power suspend (typ.)	0.1W	0.1W	0.1W
Power management	yes, SpeedStep	yes, SpeedStep	yes, SpeedStep
RTC battery onboard	external	external	external
Cooling type	passive/active	passive/active	passive/active
Operating temperature	-25°C to +60°C	-25°C to +60°C	-25°C to +60°C
Extended operating temperature	tbd	tbd	tbd
Size (W x L x H in mm)	125 x 95 x 21	125 x 95 x 21	125 x 95 x 21
Weight	220 g	220 g	220 g
MTBF	>200'000h	>200'000h	>200'000h
Special features 1	AMT 4.0	AMT 4.0	AMT 4.0
Special features 2	-	-	-
Special features 3	-	-	-
Part no. (without DDR2RAM-module)	↴	↴	↴

**CPUs

Article	Description	No.	No.	No.
SMCG45-xGB-X9100	COMex, 2x 3.1GHz, 6MB, 44W	805710	805720 *(not from stock)*	805700
SMCG45-xGB-QX9300	COMex, 4x 2.5GHz, 12MB, 45W	805711	805721 *(not from stock)*	805701

***As this product is still in development, changes to the technical data are possible.

smartCoreExpress Connector Pinout, BUS on the smartCoreExpress – Connectors A / B: Pins 1-55

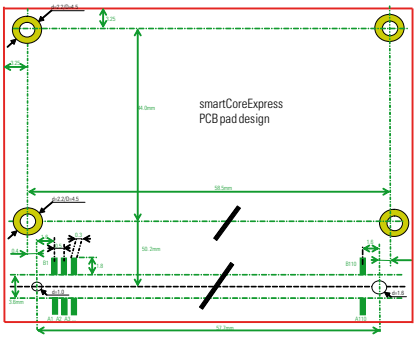
Pin	Signal	BUS	Type	Remarks
A1	GND			
A2	PCIe_TX0_N	PCIe	Dif	AC
A3	PCIe_TX0_P	PCIe	Dif	AC
A4	PCIe_CLK0_N	PCIe	Dif	AC
A5	PCIe_CLK0_P	PCIe	Dif	AC
A6	GND			
A7	PCIe_TX1_N	PCIe	Dif	AC
A8	PCIe_TX1_P	PCIe	Dif	AC
A9	PCIe_TX2_N	PCIe	Dif	AC
A10	PCIe_TX2_P	PCIe	Dif	AC
A11	GND			
A12	PCIe_CLK2_N	PCIe	Dif	AC
A13	PCIe_CLK2_P	PCIe	Dif	AC
A14	PCIe_TX3_N	PCIe	Dif	AC
A15	PCIe_TX3_P	PCIe	Dif	AC
A16	GND			
A17	PCIe_REQ0#	PCIe	3.3V-O	Clk request
A18	PCIe_REQ2#	PCIe	3.3V-O	Clk request
A19	SDVO_CLK_N	SDVO	Dif	AC
A20	SDVO_CLK_P	SDVO	Dif	AC
A21	GND			
A22	SDVO_GREEN_N	SDVO	Dif	AC
A23	SDVO_GREEN_P	SDVO	Dif	AC
A24	SDVO_TVCLK_N	SDVO	Dif	AC
A25	SDVO_TVCLK_P	SDVO	Dif	AC
A26	GND			
A27	SDVO_RED_N	SDVO	Dif	AC
A28	SDVO_RED_P	SDVO	Dif	AC
A29	LVDS_D0_P	LVDS	Dif	LV
A30	LVDS_D0_N	LVDS	Dif	LV
A31	GND			
A32	LVDS_D2_P	LVDS	Dif	LV
A33	LVDS_D2_N	LVDS	Dif	LV
A34	LVDS_D3_P	LVDS	Dif	LV
A35	LVDS_D3_N	LVDS	Dif	LV
A36	GND			
A37	LVDS_DDC_DAT	LVDS	3.3V	
A38	LVDS_DDC_CLK	LVDS	3.3V	
A39	USB_0_P	USB	Dif	LV
A40	USB_0_N	USB	Dif	LV
A41	GND			
A42	USB_2_P	USB	Dif	LV
A43	USB_2_N	USB	Dif	LV
A44	USB_4_P	USB	Dif	LV
A45	USB_4_N	USB	Dif	LV
A46	GND			
A47	USB_6_P	USB	Dif	LV
A48	USB_6_N	USB	Dif	LV
A49	USB_OC01#	USB	3.3V	
A50	USB_OC45#	USB	3.3V	
A51	GND			
A52	GE_CLK	GE-LAN		
A53	GE_TX0	GE-LAN		
A54	GE_TX1	GE-LAN		
A55	GE_TX2	GE-LAN		

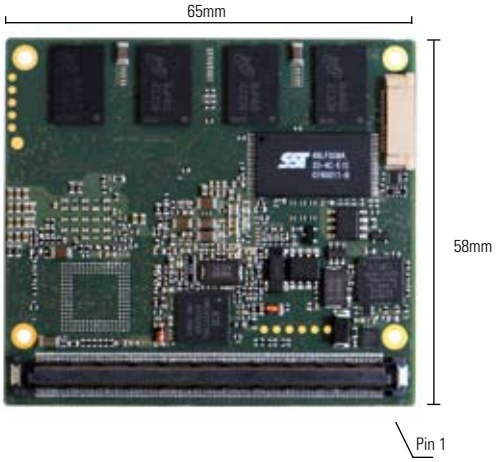
Pin	Signal	BUS	Type	Remarks
B1	GND			
B2	PCIe_RX0_N	PCIe	Dif	AC
B3	PCIe_RX0_P	PCIe	Dif	AC
B4	PCIe_CLK1_N	PCIe	Dif	AC
B5	PCIe_CLK1_P	PCIe	Dif	AC
B6	GND			
B7	PCIe_RX1_N	PCIe	Dif	AC
B8	PCIe_RX1_P	PCIe	Dif	AC
B9	PCIe_RX2_N	PCIe	Dif	AC
B10	PCIe_RX2_P	PCIe	Dif	AC
B11	GND			
B12	PCIe_CLK3_N	PCIe	Dif	AC
B13	PCIe_CLK3_P	PCIe	Dif	AC
B14	PCIe_RX3_N	PCIe	Dif	AC
B15	PCIe_RX3_P	PCIe	Dif	AC
B16	GND			
B17	PCIe_REQ1#	PCIe	3.3V-O	Clock request
B18	PCIe_REQ3#	PCIe	3.3V-O	Clock request
B19	SDVO_INT_N	SDVO	Dif	AC
B20	SDVO_INT_P	SDVO	Dif	AC
B21	GND			
B22	SDVO_BLUE_N	SDVO	Dif	AC
B23	SDVO_BLUE_P	SDVO	Dif	AC
B24	SDVO_STALL_N	SDVO	Dif	AC
B25	SDVO_STALL_P	SDVO	Dif	AC
B26	GND			
B27	SDVO_DDC_CLK	SDVO	3.3V	Bidir.
B28	SDVO_DDC_DAT	SDVO	3.3V	Bidir.
B29	LVDS_D1_P	LVDS	Dif	LV
B30	LVDS_D1_N	LVDS	Dif	LV
B31	GND			
B32	LVDS_CLK_P	LVDS	Dif	LV
B33	LVDS_CLK_N	LVDS	Dif	LV
B34	LVDS_BKL_CTR	LVDS	3.3V	
B35	LVDS_BKL_EN	LVDS	3.3V	
B36	LVDS_DETECT#	LVDS	3.3V	
B37	LVDS_VDD_EN	LVDS	3.3V	
B38	USB_C_DEV	USB	3.3V	
B39	USB_1_P	USB	Dif	LV
B40	USB_1_N	USB	Dif	LV
B41	GND			
B42	USB_3_P	USB	Dif	LV
B43	USB_3_N	USB	Dif	LV
B44	USB_5_P	USB	Dif	LV
B45	USB_5_N	USB	Dif	LV
B46	GND			
B47	USB_7_P	USB	Dif	LV
B48	USB_7_N	USB	Dif	LV
B49	USB_OC23#	USB	3.3V	
B50	USB_OC67#	USB	3.3V	
B51	GND			
B52	GE_RTS	GE-LAN		
B53	GE_RX0	GE-LAN		
B54	GE_RX1	GE-LAN		
B55	GE_RX2	GE-LAN		

BUS on the smartCoreExpress – Connectors A / B: Pins 56-110

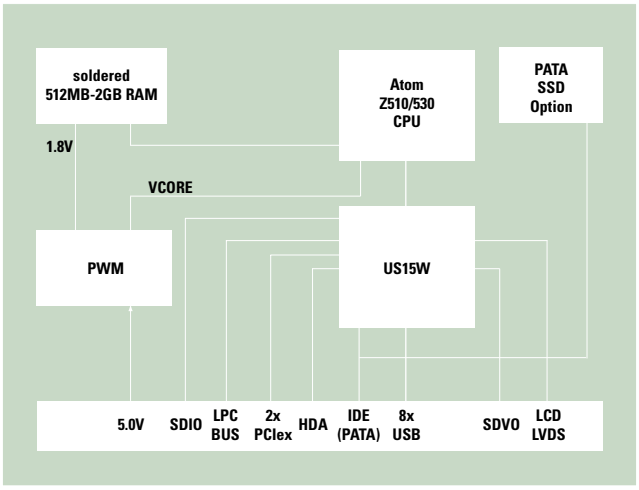
Pin	Signal	BUS	Type	Remarks
A56	SMB_CLK	SMB	3.3V	bidir
A57	SMB_DAT	SMB	3.3V	bidir
A58	SMB_ALERT#	SMB	3.3V	bidir
A59	IDE_LED#/SATA_LED#	SAT	3.3V	o
A60	GND			
A61	IDE_D3 / SATA_Tx0P	HD	5 /Dif	
A62	IDE_A0 / SATA_Tx0N	HD	5 /Dif	
A63	IDE_A2 / SATA_Rx0P	HD	5 /Dif	
A64	IDE_D8 / SATA_Rx0N	HD	5/Dif	
A65	IDERQ / GND	HD		
A66	IDE_A1 / SATA_Tx2P	HD	5 /Dif	
A67	IDE_D13 / SATA_Tx2N	HD	5 /Dif	
A68	IDE_D1 / SATA_Rx2P	HD	5 /Dif	
A69	IDE_IRQ / SATA_Rx2N	HD	5 /Dif	
A70	GND			
A71	IDE_D11 / PCIE_TX4_N	HD	5/Dif	
A72	IDE_D5 / PCIE_TX4_N	HD	5 /Dif	
A73	IDE_RD# / PCIE_REQ4	HD	5 / 3	
A74	IDE_D14/ PCIE_CK4_N	HD	5/Dif	
A75	IDE_CS1/ PCIE_CK4_N	HD	5 /Dif	
A76	LPC_AD3	LPC	3.3V	
A77	LPC_AD1	LPC	3.3V	
A78	LPC_AD0	LPC	3.3V	
A79	LPC_FRAME#	LPC	3.3V	
A80	GND			
A81	SD_WP	SDIO	3.3V	
A82	SD_CD#	SDIO	3.3V	
A83	SD_CLK	SDIO	3.3V	
A84	SD_DATA1	SDIO	3.3V	
A85	SD_DATA3	SDIO	3.3V	
A86	SD_DATA5	SDIO	3.3V	
A87	SD_DATA6	SDIO	3.3V	
A88	LVDS_CTLB_DAT	LVDS	3.3Vo	
A89	LVDS_CTLB_CLK	LVDS	3.3Vo	
A90	GND			
A91	AC97_DOCK_EN#	HDA	3.3Vi	
A92	AC97_SDATAIN1	HDA	3.3V	
A93	AC97_SDATAOUT	HDA	3.3V	
A94	AC97_RST#	HDA	3.3Vo	
A95	IDE_PCSEL	HD	5V	
A96	GPIO0	SYS	3.3V	
A97	GPIO1	SYS	3.3V	
A98	GPIO2	SYS	3.3V	
A99	GPIO3	SYS	3.3V	
A100	GND			
A101	Reset_Output#	SYS	3.3Vo	
A102	Reset_Input#	SYS	3.3Vi	
A103	WAKE_Input#	SYS	3.3Vi	
A104	+5Volt Supply Input	PWR	5Vi	
A105	+5Volt Supply Input	PWR	5Vi	
A106	+5Volt Supply Input	PWR	5Vi	
A107	+5Volt Supply Input	PWR	5Vi	
A108	+5Volt Supply Input	PWR	5Vi	
A109	+5Volt Supply Input	PWR	5Vi	
A110	GND			

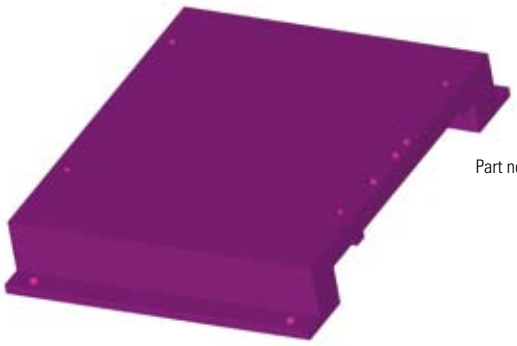
Pin	Signal	BUS	Type	Remarks
B56	SPI_MISO	SPI	3.3V	Bidir.
B57	SPI_MOSI	SPI	3.3V	Bidir
B58	SPI-CS#	SPI	3.3Vo	
B59	SPI_CLK	SPI	3.3Vo	
B60	GND			
B61	IDE_CS3 / SATA_Tx0P	HD	5 /Dif	
B62	IDE_DAK / SATA_Tx0N	HD	5 /Dif	
B63	IDE_D4 / SATA_Rx0P	HD	5 /Dif	
B64	IDE_D2 / SATA_Rx0N	HD	5 /Dif	
B65	IDEIORDY / GND	HD	5 /	
B66	IDE_D10 / SATA_Tx2P	HD	5 /Dif	
B67	IDE_D6 / SATA_Tx2N	HD	5 /Dif	
B68	IDE_D12 / SATA_Rx2P	HD	5 /Dif	
B69	IDE_D9 / SATA_Rx2N	HD	5 /Dif	
B70	GND			
B71	IDE_D15 / PCIE_RX4_N	HD	5 /Dif	
B72	IDE_D0 / PCIE_RX4_N	HD	5 /Dif	
B73	IDE_D7	HD	5	
B74	IDE_WR#/ CAN_TX	HD	5 /Dif	
B75	IDE_DET / CAN_RX	HD	5 /Dif	
B76	LPC_CLK0	LPC	3.3Vo	33MHz
B77	LPC_CLK1	LPC	3.3Vo	33MHz
B78	LPC_SERIRQ	LPC	3.3V	
B79	LPC_AD2	LPC	3.3V	
B80	GND			
B81	SD_DATA7	SDIO	3.3V	
B82	SD_PWR*	SDIO	3.3V	
B83	SD_DATA2	SDIO	3.3V	
B84	SD_LED	SDIO	3.3V	
B85	SD_DATA4	SDIO	3.3V	
B86	SD_DATA0	SDIO	3.3V	
B87	SD_CMD	SDIO	3.3V	
B88	BIOS_Recovery / WDO	SYS	3.3Vo	
B89	Speaker Output	SYS	3.3Vo	
B90	GND			
B91	AC97_BITCLK	HDA	3.3Vo	
B92	AC97_DOCK_RST#	HDA	3.3Vo	
B93	AC97_SDATAIN0	HDA	3.3V	
B94	AC97_SYNC	HDA	3.3V	
B95	A20M#	SYS	5V	
B96	Powergood	SYS	5Vi	
B97	PSON#	SYS	3.3Vi	
B98	PWRBTN#	SYS	3.3Vi	
B99	SUS_S3#_Output	SYS	3.3Vo	
B100	GND			
B101	SUS_S4&5#_Output	SYS	3.3Vo	
B102	BIOS_Disable#	SYS	3.3Vi	
B103	Battery Supply 3.0-3.6V	SYS	3Vin	
B104	+5Volt_Always Input	PWR	5Vi	
B105	+5Volt Supply Input	PWR	5Vi	
B106	+5Volt Supply Input	PWR	5Vi	
B107	+5Volt Supply Input	PWR	5Vi	
B108	+5Volt Supply Input	PWR	5Vi	
B109	+5Volt Supply Input	PWR	5Vi	
B110	GND			





Part no. 805840





Part no. 805842

SMA200

Description

The smartCore®Express SMA200, based on Intel's Atom processor with the US15W chipset, has all of the standard high speed PC interfaces. The soldered-on memory results in added robustness. For functional expansion, PCI Express and USB interfaces are available. If required, the other interfaces can be generated over LPC SuperIO (COM1/2, LPT, PS2) and PCI bridge. Typical power consumption of 2W allows a passive cooling application for a very large working temperature range. BSPs, EvalOs and several development kits are available to help with the DesignIn.

Applications

_ Video entertainment in cars and airplanes
_ Information terminals with LiveVideo
_ Game systems with music output
_ Battery driven data capture
_ Ultra-mobile multimedia PC

Ordering information (Option/accessories)

Article	No.	Description
SMX-CON5	807139	Connector 220pin, h=5mm, 2 needed, packsize=90
SMX-CON8	807138	Connector 220pin, h=8mm, 2 needed, packsize=90
SMA200DK	805850	SMA200 DevelopmentKit without SMA200 and RAM, HD, CD, Doc's, Cables
SMA200-HS1	805840	Heatspreader norm. (40gr)
SMA200-HS2	805842	Heatspreader Junc. (70gr)

Technical data

Type	SMA200-11G-xxGB	SMA200-16G-xxGB	SMA204-16G-xxGB
CPU	Atom Z510	Atom Z530	Atom Z530
ISA-BUS	-	-	-
PCI-BUS	-	-	-
PCI Express-BUS	2 lanes	2 lanes	2 lanes
2nd Level cache (kB)	512	512	512
Performance (GHz)	1.1GHz	1.6GHz	1.6GHz
DRAM min-max (MB)	soldered 0.5-2GB	soldered 0.5-2GB	soldered 0.5-2GB
Onboard Solid State Disk	-	-	4GByte PATA
Keyboard, mouse (PS/2)	-	-	-
Boot drive	HD, USB	HD, USB	HD, USB, SSD
Floppy interface	-	-	-
IDE interface P-ATA	1x	1x	1x
IDE interface S-ATA	-	-	-
COM1	ext. SIO	ext. SIO	ext. SIO
COM2	ext. SIO	ext. SIO	ext. SIO
COM3	ext. SIO	ext. SIO	ext. SIO
COM4	ext. SIO	ext. SIO	ext. SIO
LPT1	ext. SIO	ext. SIO	ext. SIO
USB (2.0)	8x	8x	8x
LAN Port 1	-	-	-
LAN Port 2	-	-	-
Audio (requires ext. codec)	HDA-7.1	HDA-7.1	HDA-7.1
Video controller	internal, max. 1024 x 1248	internal, max. 1024 x 1248	internal, max. 1024 x 1248
Video memory (MB)	128	128	128
LCD interface	LVDS, dual screen	LVDS, dual screen	LVDS, dual screen
DVI interface	SDVO to DVI*	SDVO to DVI*	SDVO to DVI*
CRT interface	SDVO to VGA**	SDVO to VGA**	SDVO to VGA**
Video input	-	-	-
Watchdog	yes	yes	yes
Power normal (typ.)	5V/2W	5V/3W	5V/3W
Power suspend (typ.)	5V/0.1W	5V/0.1W	5V/0.1W
Power management	yes	yes	yes
RTC battery onboard	external	external	external
Cooling type	passive	passive	passive
Operating temperature without heatspreader	0°C to +50°C	0°C to +50°C	0°C to +50°C
Operating temperature with heatspreader	-25°C to +70°C	-25°C to +70°C	-25°C to +70°C
Extended operating temperature (E48)	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C
Size (W x L x H in mm), standoff 5/8mm	65 x 58 x 11/14	65 x 58 x 11/14	65 x 58 x 11/14
Weight	30 g	30 g	30 g
MTBF	>300'000h	>300'000h	>200'000h
Special features 1	soldered RAM	soldered RAM	soldered RAM
Special features 2	-	-	soldered SSD
Special features 3	1x SD/MMC	1x SD/MMC	1x SD/MMC
Part no. (incl. 0.5GB RAM)	805800	-	-
Part no. (incl. 1.0GB RAM)	805801	805811	805821 *(not from stock)*
Part no. (incl. 2.0GB RAM) *(not from stock)*	805802	805812	-

* needs an external converter chip to DVI

** needs an external converter chip to VGA

Development-Kits

All development kits are ready-to-use systems that boot from the hard disk. They are used for the evaluation and DesignIn of smartModules. The development kits for smartModules come with all documentation, including sample circuit diagrams for the motherboard. Also included is a 90W 110/220V power supply unit with 12-18V output. If required, other voltages are generated in the development kit. The smartModule and PC/104 development kits contain all periphery connector boards and cable kits so that the standard connector is available for all functions (USB, VGA, DVI, sound). For the EPIC and 3.5" SBC form factors, the MPCV8xx and MPC20 serve as development kits.

Technical data

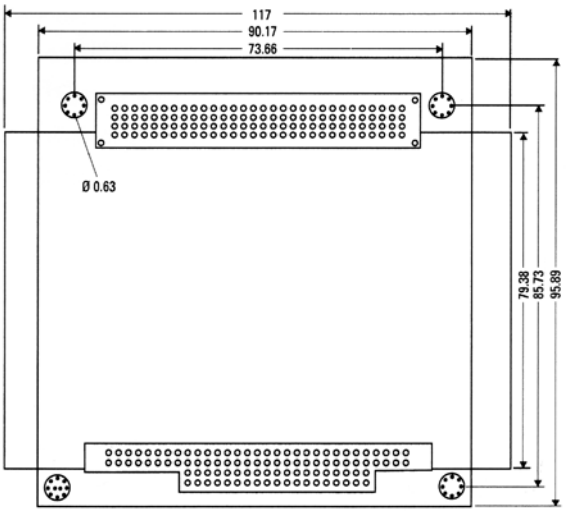
Specification	SM800DK	SMX945/G45DK	SMA200DK1	SMA200DK2
Part No.	805220	805390 / 805650	805850	805852
Module	SM800PC/X	SMX945/SMXG45	SMA200	SMA200
Basic board	MSEBX800	MSEBX945AP-E2	MSM200XU	SMA200DK2
Application	Industrial	Industrial	Industrial	Mobile
Mounted on	Aluminium base	Aluminium base	Aluminium base	Print 200x146mm
Incl. SmartModule	SM800PCX	ordered separately	ordered separately	SMA200-1.1G-1GB
Incl. Memory	512MB	ordered separately	on-module SMA200	Included 1GB
Supply	ATX-supply	19V supply	MSMPS104 & 19V	19V Supply
Schema to Cicuits	LAN contr.100Mb	LANcontr. 1Gb	LAN contr. 1Gb	LAN contr. 1Gb
		PCIex-switch	PCIex-switch	PCIex-switch
	ISA-bridge	-	PCI-bridge	PCI-bridge
	RS232	RS232,422/85	RS232, 422/85	RS232
	AC97 stereo	AC97, 7.1	AC97	AC97, 2x5W
	PWM	PWM 8V-18V	PWM	PWM 8V-55V
	LVDS converter	CRT, DVI, TV-Out	VGA-converter	DVI-converter
	POD (FPGA)	POD (FPGA)	LPC-POD	LPC-POD
	Video input	Video input	1x PCIeMiniCard	2x PCIeMiniCard
	LPC-SIO	LPC-SIO	LPC-SIO	LPC-SIO
	EMI-filter	LPC-UART (COM3/4)	LPC-UART (COM3/4)	SD Card adapter
		EMI-filter		ExpressCard contr.
				Battery charger
				EMV-filter
				Touch control
				TFT-LCD control
				2x speaker, 1x mic.
Devices				
Hard disk 2.5"	PATA 40GB	SATA >80GB	SATA >80GB	SATA 80GB onboard
CD/DVD-Drive	1	1	1	- (ext.USB)
Display TFT-LCD	-	-	-	ass. on PCB
Expansion	PCI-Slot, PC/104+	PCIe-Slot,PCI/104ex	PCI/104ex	PCI/104ex
Utilities	Cable kit (S/P)	Cable kit (S/P)	LPC-POD2, CF	LPC-POD2
Software	DOS/Linux	DOS/Linux	DOS/Linux	DOS/Linux/Vista
Interfaces / Connectors				
COMs	2	4	4	1
LPT	1	1	1	0
USB	4	6 + 2 internally used	4 + 3 internally used	4 + 4 internally used
LAN	1	2	1	1
PS2	1	1	1	0
PATA	1	1	1	1
SATA	-	4	2	2
CRT-VGA	1	1	1	-
DVI	-	1	-	1
LVDS	1x24Bit	1x 24Bit	1x 18Bit	1x 18Bit
TV Output	-	1	-	-
Sound	Stereo, SPDIf	7.1-HDA, SPDif	Stereo	Stereo Ampl.
WLAN	Minicard-WLAN	PCIex-MiniCard	PCIex-MiniCard	Opt. PCIex-MiniCard
GSM with SIM	-	-	-	Opt. PCIex-MiniCard
GPS	-	-	-	Opt. GPS-A1080 Mod.
Battery	-	-	-	Opt. NiMH9.6V BatPack

PC/104 connector

Pin	J1/P1	J1/P1	J2/P2 (1)	J2/P2 (1)
#	Series A	Series B	Series C	Series D
0			GND	GND
1	IOCHK#	GND	SBHE#	MEMCS16#
2	SD7	Reset	LA23	IOCS16#
3	SD6	+5V	LA22	IRQ10
4	SD5	IRQ9	LA21	IRQ11
5	SD4	-5V	LA20	IRQ12
6	SD3	DRQ2	LA19	IRQ15
7	SD2	-12V	LA18	IRQ14
8	SD1	SRDY#	LA17	DACK0#
9	SD0	+12V	MEMR#	DRQ0
10	IOCHRDY	NC	MEMW#	DACK5#
11	AEN	SMEMW#	SD8	DRQ5
12	SA19	SMEMR#	SD9	DACK6#
13	SA18	IOW#	SD10	DRQ6
14	SA17	IOR#	SD11	DACK7#
15	SA16	DACK3#	SD12	DRQ7
16	SA15	DRQ3	SD13	+5V
17	SA14	DACK1#	SD14	MASTER16#
18	SA13	DRQ1	SD15	GND
19	SA12	REFRESH#	NC	GND
20	SA11	BCLK		
21	SA10	IRQ7		
22	SA9	IRQ6		
23	SA8	IRQ5		
24	SA7	IRQ4		
25	SA6	IRQ3		
26	SA5	DACK2#		
27	SA4	TC		
28	SA3	BALE		
29	SA2	+5V		
30	SA1	OSC		
31	SA0	GND		
32	GND	GND		

PC/104-*Plus* signals

Pin	Series A	Series B	Series C	Series D
1	GND	res. (SIRQ)	+5	AD00
2	VI/O	AD02	AD01	+5V
3	AD05	GND	AD04	AD03
4	C/BE0#	AD07	GND	AD06
5	GND	AD09	AD08	GND
6	AD11	VI/O	AD10	M66EN
7	AD14	AD13	GND	AD12
8	+3.3V	C/BE1#	AD15	+3.3V
9	SERR#	GND	res. (REQ)	PAR
10	GND	PERR#	+3.3V	res. (GNT)
11	STOP#	+3.3V	LOCK#	GND
12	+3.3V	TRDY#	GND	DEVSEL#
13	FRAME#	GND	IRDY#	+3.3V
14	GND	AD16	+3.3V	C/BE2#
15	AD18	+3.3V	AD17	GND
16	AD21	AD20	GND	AD19
17	+3.3V	AD23	AD22	+3.3V
18	IDSEL0	GND	IDSEL1	IDSEL2
19	AD24	C/BE3#	VI/O	IDSEL3
20	GND	AD26	AD25	GND
21	AD29	+5V	AD28	AD27
22	+5V	AD30	GND	AD31
23	REQ0#	GND	REQ1#	VI/O
24	GND	REQ2#	+5V	GNT0#
25	GNT1#	VI/O	GNT2#	GND
26	+5V	CLK0	GND	CLK1
27	CLK2	+5V	CLK3	GND
28	GND	INTD#	+5V	RST#
29	+12V	INTA#	INTB#	INTC#
30	-12V	REQ3#	GNT3#	GND



MICROSPACE® PC/104

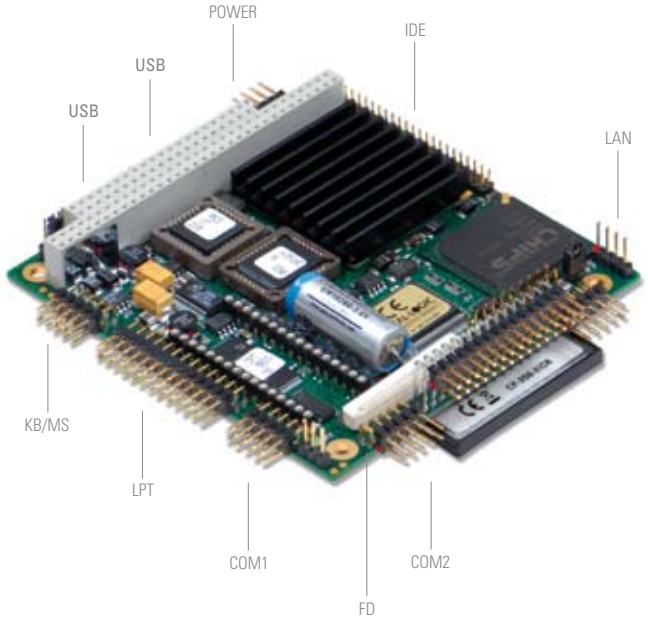
For building reliable embedded PCs, DIGITAL-LOGIC offers a broad selection of MICROSPACE® PC/104 modules. If the customer does not find the required computer module in the standard product portfolio, DIGITAL-LOGIC will develop and manufacture a custom computer system. Complete cable sets can be delivered with all CPU modules to facilitate the customer's entry into the world of PC/104. DIGITAL-LOGIC played a leading role in the development of the new, world-wide standard PCI/104-*Express* and presented it to the PC/104 Consortium (www.pc104.org) for adoption.

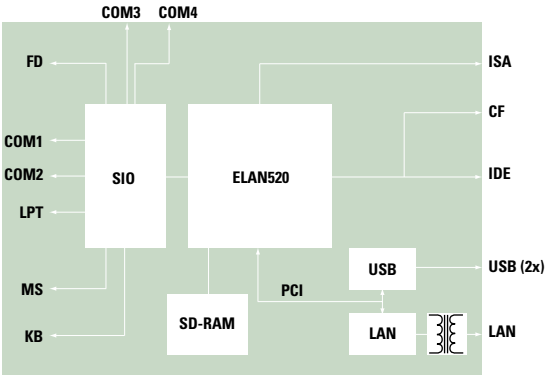
Macro components

As an alternative to the standalone PC/104 board, the PC/104 boards can be integrated directly in the application electronics practically as macro components. All DIGITAL-LOGIC PC/104 computers are available in the "stack through" version. This enables direct integration in the application electronics and eliminates wiring costs. The signal connections are robust and extremely dependable.

Advantages

- **Short development time**
- **Reduction of manufacturing costs**
- **Best price-performance ratio**
- **Full PC compatibility**
- **No wiring costs**
- **Maximum system reliability**
- **Extremely robust**
- **Vibration resistant**
- **Various processor performances**
- **Space-saving**
- **Lightweight**





MSM586SL/SEL

Description

The MICROSPACE® MSM586SL/SEL has all of the PC standard interfaces plus 4 serial interfaces (4x RS232/422/485), ethernet LAN and DiskOnChip socket (DOC) for a solid state disk. The permanently soldered-on memory of the MSM586SL makes the embedded computer extremely robust. The PC/104 bus (ISA) is available as a functional extension. The 4W power consumption permits passive cooling within a very broad ambient temperature range.

Applications

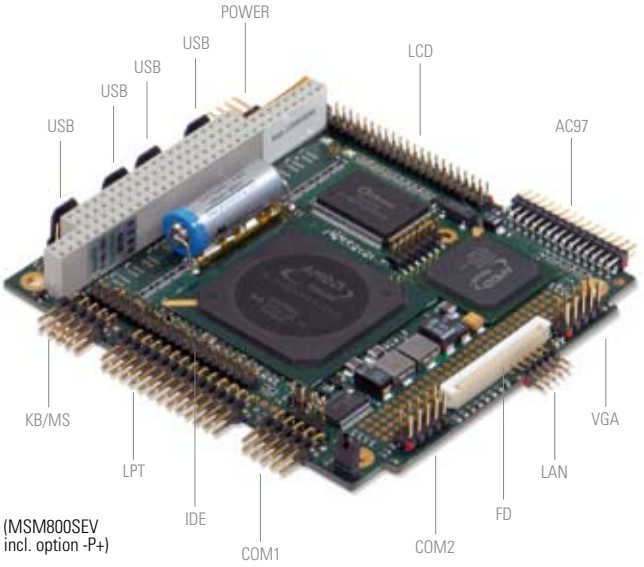
_ Control tasks
_ Remote controller (LAN, RS232)
_ Intelligent IO
_ Multi-serial protocol computer

Ordering information (Option/accessories)

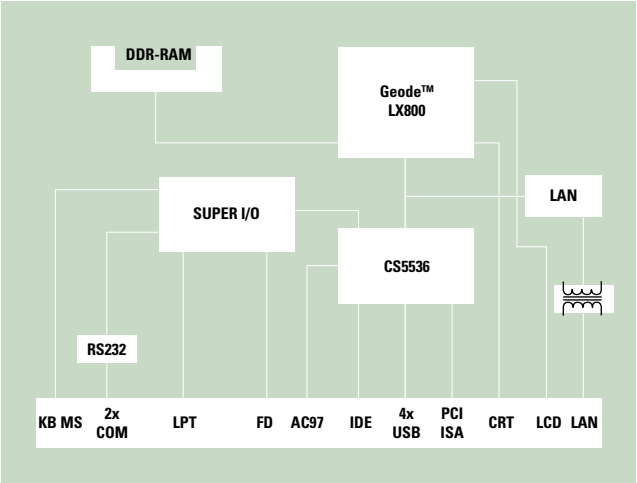
Article	No.	Description
Option -R3	807333	COM3 as RS485 on MSM586
Option -R4	807334	COM4 as RS485 on MSM586
MSM586-CK	802605	Cablekit for MSM586
MSFLOPPY	891001	Floppydrive, 26pin, black
MSFDCK	802600	Microfloppycable 150mm
SODIMM32 32Mb-32Bit	890655	144pin,noECC, for ELAN520
SODIMM32 64Mb-32Bit	890654	144pin,noECC, for ELAN520
SODIMM32 128Mb-32Bit	890656	144pin,noECC, for ELAN520

Technical data

Type	MSM586SL	MSM586SEL
CPU	AMD ELAN520	AMD ELAN520
ISA-BUS	8/16-bit	8/16-bit
PCI-BUS	-	-
PCI Express-BUS	-	-
2nd Level cache	-	-
Performance (MHz)	133	133
DRAM Min-Max (MB)	32-64 soldered	32-128, SODIMM
CompactFlash socket	yes (type 1)	yes (type 1)
Keyboard, mouse (PS/2)	yes	yes
Boot drive	FD, HD, DOC	FD, HD, DOC, LAN
Floppy interface	yes	yes
IDE interface P-ATA	1x	1x
IDE interface S-ATA	-	-
COM1	RS232C/RS422/485	RS232C/RS422/485
COM2	RS232C/RS422/485	RS232C/RS422/485
COM3	RS232C/RS422/485	RS232C/RS422/485
COM4	RS232C/RS422/485	RS232C/RS422/485
LPT1	yes	yes
USB (V1.1 / 2.0)	-	2x
LAN port 1 (onboard transformer)	-	10/100BASE-T
LAN port 2	-	-
Audio	-	-
Video controller	-	-
Video memory (MB)	-	-
LCD interface	-	-
DVI interface	-	-
CRT interface	-	-
Video input	-	-
Watchdog	yes	yes
Power normal (typ.)	5V/0.7Amp.	5V/0.7Amp.
Power suspend	-	-
Power management	-	-
RTC battery onboard (typ. 5 years)	400mAh	400mAh
Cooling type	passive	passive
Operating temperature	-25°C to +70°C	-25°C to +70°C
Extended operating temperature (E48)	-40°C to +85°C	-40°C to +85°C
Size (W x L in mm)	90 x 96	90 x 96
Weight	110 g	110 g
MTBF	>200'000h	>200'000h
Special features 1	DOC-socket 32pin	DOC-socket 32pin
Special features 2	soldered RAM	-
Special features 3	-	-
Part no.	801344 (with 32MB) / 801345 (with 64MB) *(not from stock)* *(not from stock)*	801380 (without SDRAM)



(MSM800SEV
incl. option -P+)



MSM800SEL/SEV/BEV

Description

The MICROSPACE® MSM800SEL/SEV/BEV has all of the standard PC interfaces plus ethernet LAN and a sound controller (SEV/BEV). In the BEV version, a PCI to ISA bridge is onboard and provides extensive ISA bus support. The SEV version uses an LPC to ISA bridge. The PC/104-*Plus* bus and 4 USB interfaces are available as functional extensions. The 8W power consumption permits passive cooling within a very broad ambient temperature range. The SEL version is a low-cost variant without battery, sound codec, cooler or ISA bus.

Applications

_ Information terminals
_ Control of interactive devices
_ Play systems with music output
_ Measuring instruments
_ Telecommunication devices

Ordering information (Option/accessories)

Article	No.	Description
Option L+	807006	PC/104plus Con. long not with Opt.CF (807007)
Option P+	807005	PC/104plus Con. short
Option CF2	807007	CF Socket Type II not with Opt.-L+ (807006)
MSM800-CKCON	803035	Cablekit with connector- print for USB, LAN, Sound, Cables:FD, COM, LPT, PWR, PS2
MSFLOPPY	891001	Floppydrive, 26pin, black
MSFDCK	802600	Microfloppycable 150mm
MSM800-LANCON	803046	LAN cable with RJ45 print
MSM800-DVICON	803042	Converter to DVI-D 24Bit, not for 802105
MSM800-LVDSCON	803044	Converter to LVDS
SODIMM DDR 128MB	890669	333MHz, 200pin, noECC
SODIMM DDR 256MB	890670	333MHz, 200pin, noECC
SODIMM DDR 512MB	890671	333MHz, 200pin, noECC
SODIMM DDR 1GB	890672	333MHz, 200pin, noECC
MSM800... smallcooler	807041	for -25°C to +70°C Air
MSM800... large cooler	807042	for -40°C to +85°C Air (not with 802100/802105)
MSM800...Th.Junction	807043	Thermal conduct. cooling (not with 802100/802105) needs screening opt.E48

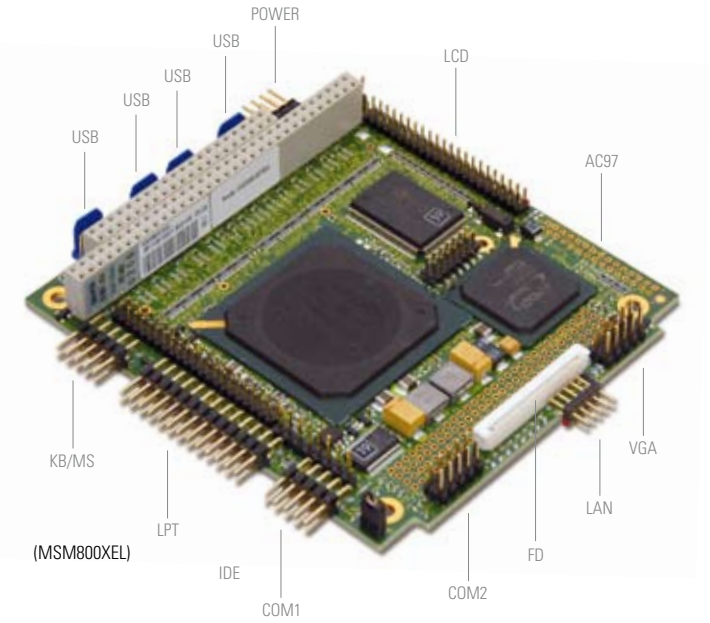
*Photos on page 44. Cooler must always be ordered separately.

PC/104-Plus

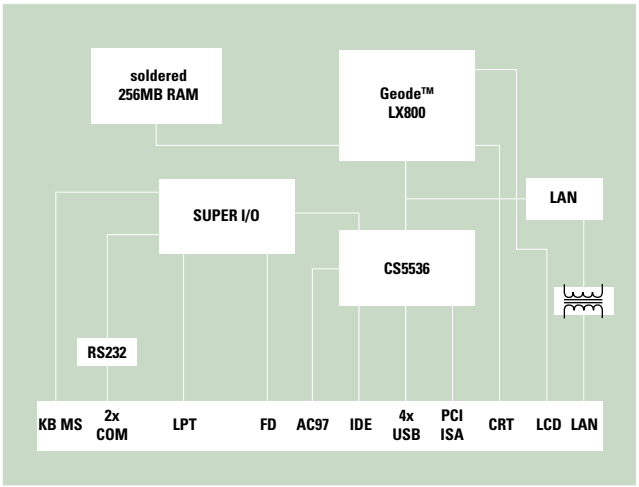
ISA | PCI | LX800 LX900 | 500MHz 600MHz | max. 1GB RAM | 1x LAN | RoHS

Technical data

Type	MSM800SEL	MSM800SEV	MSM800BEV	MSM900BEV
CPU	AMD Geode™ LX800	AMD Geode™ LX800	AMD Geode™ LX800	AMD Geode™ LX900
ISA-BUS (option 807006 or 807005)	PC/104-8bit	PC/104-8bit	PC/104-8/16-bit	PC/104-8/16-bit
PCI-BUS	Option (3slot)	Option (3slot)	Option (2slot)	Option (2slot)
PCI Express-BUS	-	-	-	-
2nd Level cache (kB)	128	128	128	128
Performance (MHz)	500	500	500	600
DRAM Min-Max (MB)	128-1024	128-1024	128-1024	128-1024
CompactFlash socket (option 807007)	Option type II	Option type II	Option type II	Option type II
Keyboard, mouse (PS/2)	yes	yes	yes	yes
Boot drive	FD, HD, LAN, CF, USB	FD, HD, LAN, CF, USB	FD, HD, LAN, CF, USB	FD, HD, LAN, CF, USB
Floppy interface	yes	yes	yes	yes
IDE interface P-ATA	1x	1x	1x	1x
IDE interface S-ATA	-	-	-	-
COM1	RS232C	RS232C	RS232C	RS232C
COM2	RS232C	RS232C	RS232C	RS232C
COM3	-	-	-	-
COM4	-	-	-	-
LPT1	yes	yes	yes	yes
USB (2.0)	4x	4x	4x	4x
LAN port 1 incl. transformer	10/100BASE-T	10/100BASE-T	10/100BASE-T	10/100BASE-T
LAN port 2	-	-	-	-
Audio	-	AC97	AC97	-
Video controller	LX800	LX800	LX800	LX900
Video memory (MB)	16 (UMA)	16 (UMA)	16 (UMA)	16 (UMA)
LCD interface	24bit, 240x 320 to 1600x 1200	24bit, 240x 320 to 1600x 1200	24bit, 240x 320 to 1600x 1200	24bit, 240x 320 to 1600x 1200
DVI interface	-	Option 803042	Option 803042	Option 803042
CRT interface	yes	yes	yes	yes
Video input	-	-	-	-
Watchdog	yes	yes	yes	yes
Power normal (typ.)	5V/8W	5V/8W	5V/8W	5V/9W
Power suspend (typ.)	3W	3W	3W	3W
Power management	yes	yes	yes	yes
RTC battery onboard (typ. 5 years)	external	400mAh	400mAh	400mAh
Cooling type	order separately	order separately	order separately	order separately
Operating temperature without cooler	0°C to +60°C	0°C to +60°C	0°C to +60°C	0°C to +60°C
Operating temperature with 807041	-25°C to +70°C	-25°C to +70°C	-25°C to +70°C	-25°C to +70°C
Extended operating temperature with 807042 + E48	-	-	-40°C to +85°C	-40°C to +70°C
Extended operating temperature with 807043 + E48	-	-	-40°C to +85°C	-40°C to +85°C
Size (W x L in mm)	90 x 96/99	90 x 96/99	90 x 96/99	90 x 96/99
Weight	90 g	95 g	100 g	100 g
MTBF	>200'000h	>200'000h	>200'000h	>200'000h
Special features 1	-	LVDS-option 803044	LVDS-option 803044	LVDS-option 803044
Special features 2	-	-	-	-
Special features 3	-	-	-	-
Part no. (*without DDR-RAM-Module) (without cooler)	802105*	802100*	802110*	802160*



(MSM800XEL)



MSM800XEL/XEV, MSM900XEV

Description

The MICROSPACE® MSM800XEL/XEV has all of the standard PC interfaces plus ethernet LAN and a sound controller (XEV). The 256MB memory is permanently soldered, adding increased robustness. In the XEV version a PCI to ISA bridge is onboard which supports the ISA bus. The PC/104-*Plus* bus (ISA & PCI) and 4 USB interfaces are available as functional extensions. The 8W power consumption permits passive cooling within a very broad ambient temperature range. The XEL version is a low-cost variant without battery, sound codec or ISA bus.

Applications

_ Used in cars and airplanes
_ Information terminals
_ Play systems with music output
_ Measuring instruments
_ Telecommunication devices

Ordering information (Option/accessories)

Article	No.	Description
Option L+	807006	PC/104plus Con. long not with Opt.CF (807007)
Option P+	807005	PC/104plus Con. short
Option CF2	807007	CF Socket Type II not with Opt.-L+ (807006)
MSM800-CKCON	803035	Cablekit with connector- print for USB, LAN, Sound, Cables:FD, COM, LPT, PWR, PS2
MSFLOPPY	891001	Floppydrive, 26pin, black
MSFDCK	802600	Microfloppycable 150mm
MSM800-LANCON	803046	LAN cable with RJ45 print
MSM800-DVICON	803042	Converter to DVI-D 24Bit, not for 802105
MSM800-LVDSCON	803044	Converter to LVDS
MSM800... smallcooler	807041	for -25°C to +70°C Air
MSM800... large cooler	807042	for -40°C to +85°C Air (not with 802100/802105)
MSM800... Th.Junction	807043	Thermal conduct. cooling (not with 802100/802105) needs screening opt.E48

*Photos on page 44.



Technical data

Type	MSM800XEL	MSM800XEV	MSM900XEV
CPU	AMD Geode™ LX800	AMD Geode™ LX800	AMD Geode™ LX900
ISA-BUS	PC/104-8/16-bit	PC/104-8/16-bit	PC/104-8/16-bit
PCI-BUS (option 807006 or 807005)	Option (2slot)	Option (2slot)	Option (2slot)
PCI Express-BUS	-	-	-
2nd Level cache (kB)	128	128	128
Performance (MHz)	500	500	600
DRAM Min-Max (MB)	soldered 256MB	soldered 256MB	soldered 256MB
CompactFlash socket (option 807007)	Option type II	Option type II	Option type II
Keyboard, mouse (PS/2)	yes	yes	yes
Boot drive	FD, HD, LAN, CF, USB	FD, HD, LAN, CF, USB	FD, HD, LAN, CF, USB
Floppy interface	yes	yes	yes
IDE interface P-ATA	1x	1x	1x
IDE interface S-ATA	-	-	-
COM1	RS232C	RS232C	RS232C
COM2	RS232C	RS232C	RS232C
COM3	-	-	-
COM4	-	-	-
LPT1	1x	1x	1x
USB (2.0)	4x	4x	4x
LAN port 1 incl. transformer	10/100BASE-T	10/100BASE-T	10/100BASE-T
LAN port 2	-	-	-
Audio	-	AC97	AC97
Video controller	LX800	LX800	LX900
Video memory (MB)	16 (UMA)	16 (UMA)	16 (UMA)
LCD interface	24bit, 240x 320 to 1600x 1200	24bit, 240x 320 to 1600x 1200	24bit, 240x 320 to 1600x 1200
DVI interface	-	Option 803042	Option 803042
CRT interface	yes	yes	yes
Video input	-	-	-
Watchdog	yes	yes	yes
Power normal (typ.)	5V/8W	5V/8W	5V/9W
Power suspend (typ.)	3W	3W	3W
Power management	yes	yes	yes
RTC battery onboard	external	400mAh (typ. 5 years)	400mAh (typ. 5 years)
Cooling type	order separately	order separately	order separately
Operating temperature without cooler	0°C to +60°C	0°C to +60°C	0°C to +60°C
Operating temperature with 807041	-25°C to +70°C	-25°C to +70°C	-25°C to +70°C
Extended operating temperature with 807042 + E47	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C
Extended operating temperature with 807043 + E48	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C
Size (W x L in mm)	90 x 96/99	90 x 96/99	90 x 96/99
Weight	105 g	120 g	120 g
MTBF	>300'000h	>200'000	>200'000
Special features 1	soldered RAM	soldered RAM	soldered RAM
Special features 2	-	LVDS-option 803044	LVDS-option 803044
Special features 3	-	-	-
Part no. (without cooler, incl. RAM)	802125	802120	802170 *(not from stock)*

Cooler models for the MSM800xxxx, MSM900xxx

Option 807041

for -25°C to +70°C

small cooler (35 x 37.5 x 6mm)

Example: mounted on an MSM800BEV

Option 807042

for -40°C to +85°C
(MSM800BEV)*
for -40°C to +70°C
(MSM900BEV, MSM800XEV,
MSM900XEV)**

*with screening E48
**with sceening E47

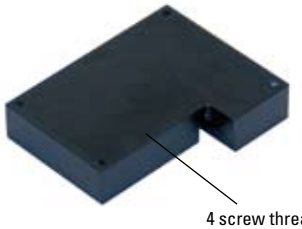
large cooler (79 x 79.5 x 8.5mm)

Example: mounted on an MSM800XEV

Option 807043

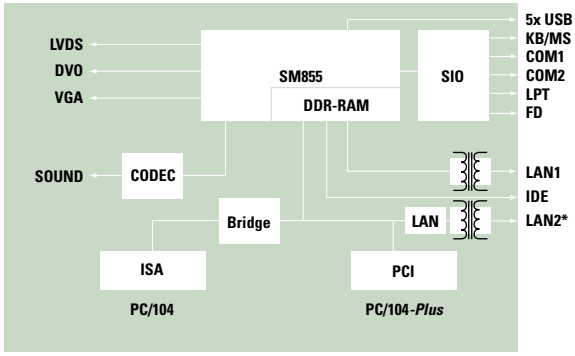
for direct thermal
coupling with casing
for -40°C to +85°C
with screening E48

thermojunction (64 x 50 x 13mm)



Example: mounted on an MSM800XEV

Our new Xrey inspection system



*LAN2 only on the MSM855B2

MSM855/B/B2

Description

The MICROSPACE® MSM855/B/B2 has all of the standard PC interfaces plus up to two ethernet LANs (B2 version), optional DVI and LVDS interfaces (dual screen) and a sound controller. In the B/B2 version a PCI to ISA bridge is onboard and provides full ISA bus support, whereas the standard version uses an LPC to ISA bridge. The PC/104-*Plus* bus (ISA & PCI) and 5 USB interfaces are available as functional extensions. Power consumption (12W to 25W), cooling method, ambient working temperature and performance are directly dependent on the smartModule855-xxxx in use.

Applications

_ Networked interactive multimedia applications
_ Dual screen applications
_ Image processing, video monitoring
_ Measurement data processing
_ Telecommunication devices

Ordering information (Option/accessories)

Article	No.	Description
Option L+	807006	PC/104plus Con. long not with Opt.CF (807007)
Option CF1	807008	CF Socket Type I not with Opt.-L+ (807006)
SODIMM DDR 128MB	890669	333MHz, 200pin, noECC
SODIMM DDR 256MB	890670	333MHz, 200pin, noECC
SODIMM DDR 512MB	890671	333MHz, 200pin, noECC
SODIMM DDR 1GB	890672	333MHz, 200pin, noECC
SM855 Cooler passive	805170	for SM855 modules
SM855 Cooler active	805171	for SM855 modules
MSM855-CKCON	803030	Cablekit with connector- print for USB, 1LAN,Sound, Cables: FD, COM, LPT, PWR, PS2 extern 900mAh BackupBat.
MSFLOPPY	891001	Floppydrive, 26pin, black
MSFDCK	802600	Microfloppycable 150mm
MSM855-LANCON	803020	LANcable with connector- print RJ45 and 900mAhBat, transformator
MSM855-DVICON	803040	Converter DVO to DVI-D, TV-Out, LVDS 18/24Bit, Connectors: DVI, LVDS, TV
MSM855B-LANCON	803021	LANcable with connector- print RJ45 and 900mAhBat



Technical data

Type	MSM855	MSM855B	MSM855B2
CPU	SM855-xxx	SM855-xxx	SM855-xxx
ISA-BUS PC/104	8bit	8/16bit + DMA	8/16bit + DMA
PCI-BUS (option 807006)	Option (4slot)	Option (3slot)	Option (3slot)
PCI Express-BUS	-	-	-
2nd Level cache (kB)	0-2048	0-2048	0-2048
Performance (MHz)	1000-1800	1000-1800	1000-1800
DRAM Min-Max (MB)	128-1024	128-1024	128-1024
CompactFlash socket (option 807008)	Option type I	Option type I	Option type I
Keyboard, mouse (PS/2)	yes	yes	yes
Boot drive	FD, HD, USB, LAN, CF	FD, HD, USB, LAN, CF	FD, HD, USB, LAN, CF
Floppy interface	yes	yes	yes
IDE interface P-ATA	1x	1x	1x
IDE interface S-ATA	-	-	-
COM1	RS232C	RS232C	RS232C
COM2	RS232C	RS232C	RS232C
COM3	-	-	-
COM4	-	-	-
LPT1	yes	yes	yes
USB (2.0)	5x	5x	5x
LAN port 1 onboard transformer	10/100BASE-T (803020 incl. transformer)	10/100BASE-T	10/100BASE-T
LAN port 2 onboard transformer	-	-	10/100BASE-T
Audio	AC97-5.1	AC97-5.1	AC97-5.1
Video controller	i855GME	i855GME	i855GME
Video memory (MB)	16-64	16-64	16-64
LCD interface	DVO	DVO	DVO
DVI interface (option 803040)	Option	Option	Option
CRT interface	yes	yes	yes
Video input	-	-	-
Watchdog	yes	yes	yes
Power normal (Vin = 5V) (typ.)	12W (1GHz)-25W	12W (1GHz)-25W	12W (1GHz)-25W
Power suspend	0.1W	0.1W	0.1W
Power management	yes	yes	yes
RTC battery onboard	external 900mAh [3]	80mAh [2] or external 900mAh [3]	80mAh [2] or external 900mAh [3]
Cooling type	passive/active	passive/active	passive/active
Operating temperature	-25°C to +70°C [1]	-25°C to +70°C [1]	-25°C to +70°C [1]
Extended operating temperature (E47)	see SM855-xxx	see SM855-xxx	see SM855-xxx
Size (W x L in mm)	90/117 x 96/99	90/117 x 96/99	90/117 x 96/99
Weight	250 g	250 g	250 g
MTBF	>200'000h	>200'000h	>200'000h
Special features 1	-	-	-
Special features 2	-	-	-
Special features 3	-	-	-
Part no.	803010 *(not from stock)*	803060	803062

CPUs

Article	Description	No.	No.	No.
SM855-C140	Intel® Celeron® M C140 (1.0GHz), 0MB RAM	805192	805192	805192
SM855-C373	Intel® Celeron® M C373 (1.0GHz), 0MB RAM	805163	805163	805163
SM855-P738	Intel® Pentium® M P738 (1.4GHz), 0MB RAM	805164	805164	805164
SM855-P745	Intel® Pentium® M P745 (1.8GHz), 0MB RAM	805168	805168	805168

[1] Depending on cooler and CPU-performance. [2] Typical service life of 1 year. [3] Typical service life of 10 years.

Possible alternatives for the PEG-BUS: x16 Link as two x8 or x4 Links

x16 Signal	x8 Signal	x4 Signal
PEx16_T(0)	PEx8_0T(0)	PEx4_0T(0)
PEx16_T(1)	PEx8_0T(1)	PEx4_0T(1)
PEx16_T(2)	PEx8_0T(2)	PEx4_0T(2)
PEx16_T(3)	PEx8_0T(3)	PEx4_0T(3)
PEx16_T(4)	PEx8_0T(4)	
PEx16_T(5)	PEx8_0T(5)	
PEx16_T(7)	PEx8_0T(7)	
PEx16_T(8)	PEx8_1T(0)	PEx4_1T(0)
PEx16_T(9)	PEx8_1T(1)	PEx4_1T(1)
PEx16_T(10)	PEx8_1T(2)	PEx4_1T(2)
PEx16_T(11)	PEx8_1T(3)	PEx4_1T(3)
PEx16_T(12)	PEx8_1T(4)	
PEx16_T(13)	PEx8_1T(5)	
PEx16_T(14)	PEx8_1T(6)	
PEx16_T(15)	PEx8_1T(7)	
PEx16_R(0)	PEx8_0R(0)	PEx4_0R(0)
PEx16_R(1)	PEx8_0R(1)	PEx4_0R(1)
PEx16_R(2)	PEx8_0R(2)	PEx4_0R(2)
PEx16_R(3)	PEx8_0R(3)	PEx4_0R(3)
PEx16_R(4)	PEx8_0R(4)	
PEx16_R(5)	PEx8_0R(5)	
PEx16_R(7)	PEx8_0R(7)	
PEx16_R(8)	PEx8_1R(0)	PEx4_1R(0)
PEx16_R(9)	PEx8_1R(1)	PEx4_1R(1)
PEx16_R(10)	PEx8_1R(2)	PEx4_1R(2)
PEx16_R(11)	PEx8_1R(3)	PEx4_1R(3)
PEx16_R(12)	PEx8_1R(4)	
PEx16_R(13)	PEx8_1R(5)	
PEx16_R(14)	PEx8_1R(6)	
PEx16_R(15)	PEx8_1R(7)	

PCI/104-*Express* Connector Signal Assignment

1	Reserved (USB_0C01#)			PCIe_RST#	2
3	3.3V		+5V	3.3V	4
5	Reserved (USB_1+)			Reserved (USB_0+)	6
7	Reserved (USB_1-)			Reserved (USB_0-)	8
9	GND			GND	10
11	PCIe_TX1x1+			PCIe_TX0x1+	12
13	PCIe_TX1x1-		+5V	PCIe_TX0x1-	14
15	GND			GND	16
17	PCIe_TX2x1+			PCIe_TX3x1+	18
19	PCIe_TX2x1-			PCIe_TX3x1-	20
21	GND			GND	22
23	PCIe_RX1x1+			PCIe_RX0x1+	24
25	PCIe_RX1x1-		+5V	PCIe_RX0x1-	26
27	GND			GND	28
29	PCIe_RX2x1+			PCIe_RX3x1+	30
31	PCIe_RX2x1-			PCIe_RX3x1-	32
33	GND		+5V	GND	34
35	PCIe_CLK1x1+			PCIe_CLK0x1+	36
37	PCIe_CLK1x1-			PCIe_CLK0x1-	38
39	5V_Always			5V_Always	40
41	PCIe_CLK2x1+			PCIe_CLK3x1+	42
43	PCIe_CLK2x1-		+5V	PCIe_CLK3x1-	44
45	CPU_DIR			PWRGOOD	46
47	SMB_DAT			PEGx16x8x4_CLK+	48
49	SMB_CLK			PEGx16x8x4_CLK-	50
51	SMB_ALERT			PSON#	52
53	Reserved / WOL		+5V	PEG_ENA#	54
55	GND			GND	56
57	PEG_TX8+			SDVO0_R+ / PEG_TX0+	58
59	PEG_TX8-			SDVO0_R- / PEG_TX0-	60
61	GND			GND	62
63	PEG_TX9+		+5V	SDVO0_G+ / PEG_TX1+	64
65	PEG_TX9-			SDVO0_G- / PEG_TX1-	66
67	GND			GND	68
69	PEG_TX10+			SDVO0_B+ / PEG_TX2+	70
71	PEG_TX10-			SDVO0_B- / PEG_TX2-	72
73	GND		+5V	GND	74
75	PEG_TX11+			SDVO0_Clk+ / PEG_TX3+	76
77	PEG_TX11-			SDVO0_Clk- / PEG_TX3-	78
79	GND			GND	80
81	PEG_TX12+			SDVO1_R+ / PEG_TX4+	82
83	PEG_TX12-		+5V	SDVO1_R- / PEG_TX4-	84
85	GND			GND	86
87	PEG_TX13+			SDVO1_G+ / PEG_TX5+	88
89	PEG_TX13-			SDVO1_G- / PEG_TX5-	90
91	GND			GND	92
93	PEG_TX14+		+5V	SDVO1_B+ / PEG_TX6+	94
95	PEG_TX14-			SDVO1_B- / PEG_TX6-	96
97	GND			GND	98
99	PEG_TX15+			SDVO1_Clk+ / PEG_TX7+	100
101	PEG_TX15-			SDVO1_Clk- / PEG_TX7-	102
103	GND		+5V	GND	104
105	SDVO_DAT			SDVO_CLK	106
107	GND			GND	108
109	PEG_RX8+			SDVO_TVCI+ / PEG_RX0+	110
111	PEG_RX8-		+12V	SDVO_TVCI- / PEG_RX0-	112
113	GND			GND	114
115	PEG_RX9+			SDVO0_INT+ / PEG_RX1+	116
117	PEG_RX9-			SDVO0_INT- / PEG_RX1-	118
119	GND			GND	120
121	PEG_RX10+			SDVO_STALL+ / PEG_RX2+	122
123	PEG_RX10		+12V	SDVO_STALL- / PEG_RX2-	124
125	GND			GND	126
127	PEG_RX11+			PEG_RX3+	128
129	PEG_RX11-			PEG_RX3-	130
131	GND			GND	132
133	PEG_RX12+			PEG_RX4+	134
135	PEG_RX12-		+12V	PEG_RX4-	136
137	GND			GND	138
139	PEG_RX13+			SDVO1_INT+ / PEG_RX5+	140
141	PEG_RX13-			SDVO1_INT- / PEG_RX5-	142
143	GND		+12V	GND	144
145	PEG_RX14+			PEG_RX6+	146
147	PEG_RX14-			PEG_RX6-	148
149	GND			GND	150
151	PEG_RX15+			PEG_RX7+	152
153	PEG_RX15-			PEG_RX7-	154
155	GND		+12V	GND	156

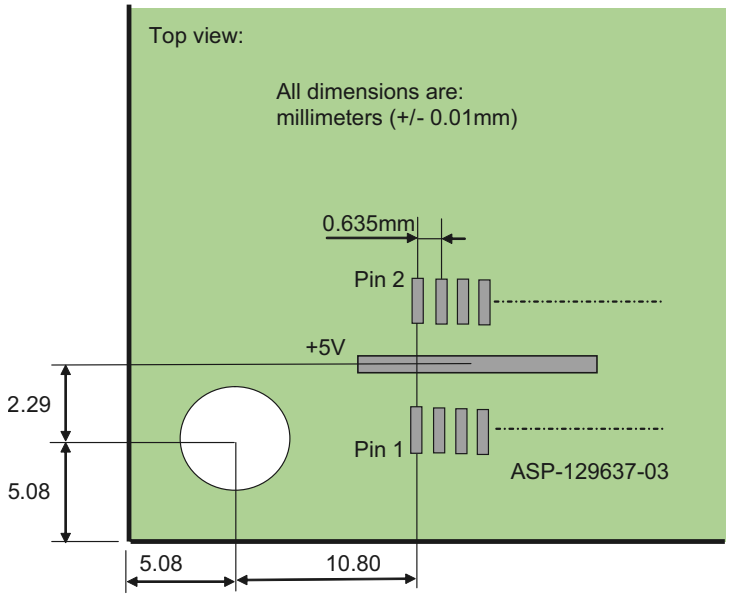
x16 Link as 2 channel SDVO

x16 Signal	SDVO Signal	x16 Signal	SDVO Signal
PEx16_T(0)	SDVO_0_RED	PEx16_R(0)	SDVO_TVCLKIN
PEx16_T(1)	SDVO_0_GREEN	PEx16_R(1)	SDVO_0_INT
PEx16_T(2)	SDVO_0_BLUE	PEx16_R(2)	SDVO_FLDSTALL
PEx16_T(3)	SDVO_0_CLK	PEx16_R(3)	
PEx16_T(4)	SDVO_1_RED	PEx16_R(4)	
PEx16_T(5)	SDVO_1_GREEN	PEx16_R(5)	SDVO_1_INT
PEx16_T(6)	SDVO_1_BLUE	PEx16_R(6)	
PEx16_T(7)	SDVO_1_CLK	PEx16_R(7)	
PEx16_T(8)		PEx16_R(8)	
PEx16_T(9)		PEx16_R(9)	
PEx16_T(10)		PEx16_R(10)	
PEx16_T(11)		PEx16_R(11)	

When using the x16 Link as SDVO, the PEG_ENA# signal must be left open.

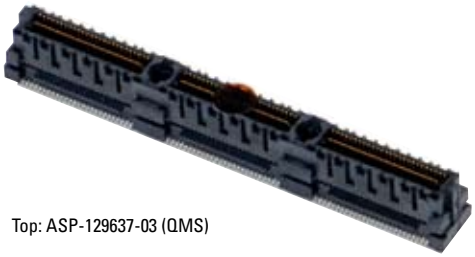
PCI/104-*Express* connector placement

The PCI/104-*Express* Bus conforms to the new standard which will be adapted by the PC/104 Consortium. Information is available at www.pc104.org.

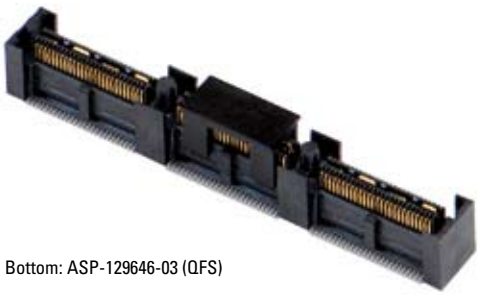


On the PCI/104-*Express* board, the PCI Express bus is located in place of the old ISA-bus connector. The PCI Express bus is stackable on both sides with a maximum of 4 peripheral boards. Interfaced on the new PCI/104-*Express* bus are 20 PCI Express lanes, SDVO, 2x USB and SMB signals.

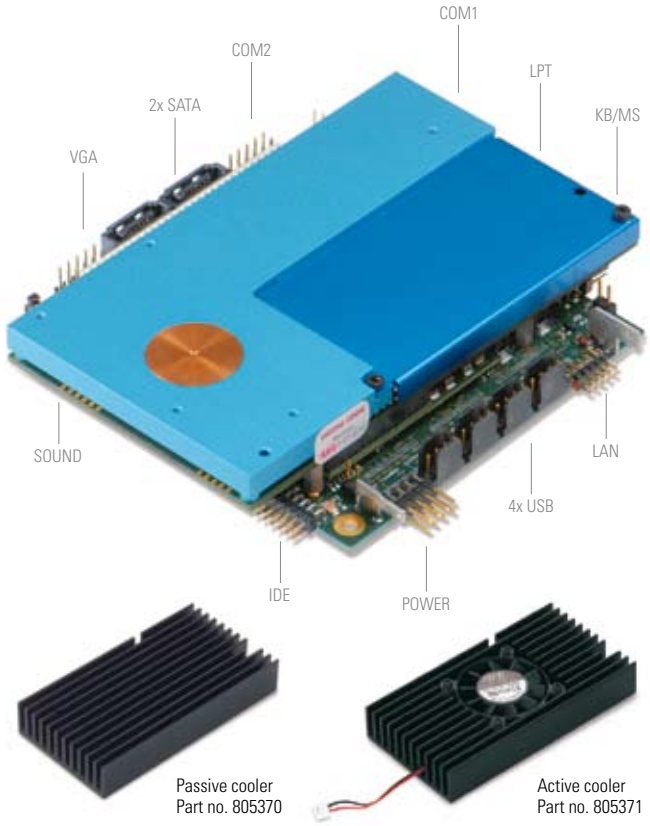
Connector part no. (Samtec)

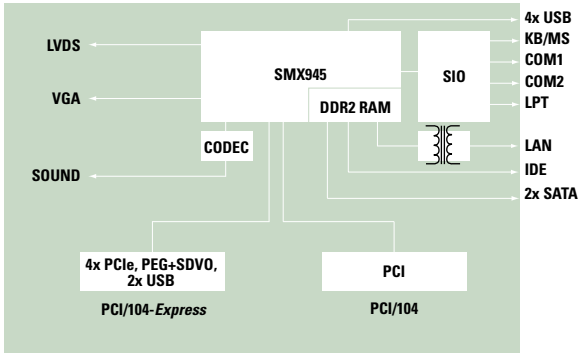


Top: ASP-129637-03 (QMS)



Bottom: ASP-129646-03 (QFS)





Passive cooler
Part no. 805370

Active cooler
Part no. 805371

MSM945-MMexp.
Part no. 803240

MSM945/P

Description

The MICROSPACE® MSM945 has all of the standard PC interfaces plus ethernet LAN, optional DVI and LVDS interfaces (dual screen) and a sound controller. Equipped with the CPU Intel® Core™2 Duo L7400 in the DIGITAL-LOGIC smartModule SMX945 with COMexpress, this product has the highest performance on the PC/104 form factor. The optional PCI/104-*Express* bus (PCI & PCI Express) and 6 USB interfaces are available as functional extensions. By means of a PC/104-*Plus* ISA bridge card, an 8 bit ISA bus can be emulated from the 32 bit PCI bus. Power consumption, cooling method, ambient working temperature and performance are directly dependent on the smartModule945-xxxx.

Applications

_ Video streaming for HD videos
_ Dual screen applications
_ Image processing, video monitoring
_ Calculation-intensive data processing

Ordering information (Option/accessories)

Article	No.	Description
SODIMM DDR2 256MB	890674	200pin, 533MHz, noECC
SODIMM DDR2 512MB	890675	200pin, 533MHz, noECC
SODIMM DDR2 1GB	890676	200pin, 533MHz, noECC
SODIMM DDR2 2GB	890677	200pin, 533MHz, noECC
SMX9/G45 passive cooler	805370	incl. assemblymat.
SMX9/G45 active cooler	805371	incl. assemblymat.
MSM9/G45-LANCON	803220	LAN-Cable with RJ45 on a print with 900mAh Bat.
MSM945-MMexp	803240	Multimedia converter, PCI/104ex board w. SPDIF, USB, Sound,DVI connectors (needs a MSM945P board)
MSM945CKCON	803230	Cablekit with connector- print for USB, 1LAN, Sound, Cables: FD, COM, LPT, PWR, PS2 extern 900mAh BackupBat.
Option CF1	807008	CF Socket Typ I

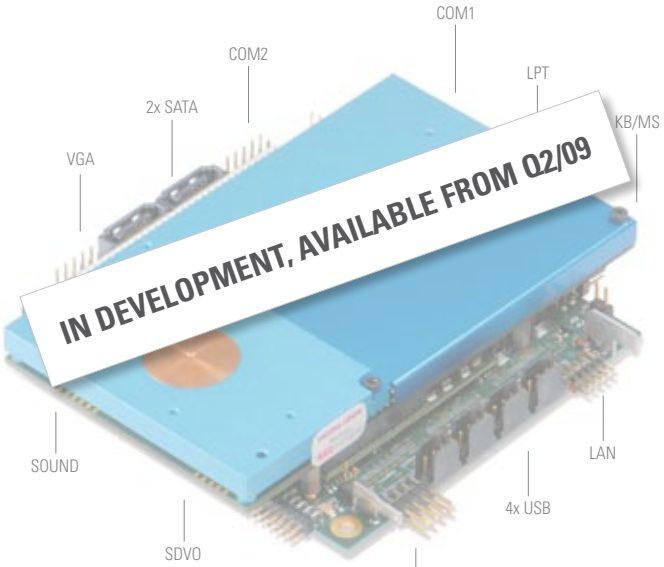
Technical data

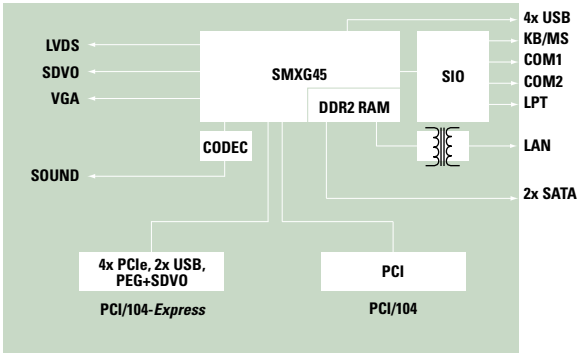
Type	MSM945	MSM945P
CPU	SMX945-xxx/SMX945B-xxx	SMX945-xxx/SMX945B-xxx
ISA-BUS (PCI/104)	-	-
PCI-BUS (option 807006 or 807005)	Option	Option
PCI Express-BUS (PCI/104-*Express*)	-	yes, on the bottom
2nd Level cache (kB)	1024-4096	1024-4096
Performance (MHz)	2x 1600, Atom N270	2x 1600, Atom N270
DRAM Min-Max (MB)	256-3072	512-3072
CompactFlash socket (807008)	option	option
Keyboard, mouse (PS/2)	yes	yes
Boot drive	FD, HD, CF, LAN, USB	FD, HD, CF, LAN, USB
Floppy interface	-	-
IDE interface P-ATA	1x	1x
IDE interface S-ATA	2x	2x
COM1	RS232C	RS232C
COM2	RS232C	RS232C
COM3	-	-
COM4	-	-
LPT1	yes	yes
USB (2.0)	4x	4x + 2x on PCI/104-*Express*
LAN port 1 onboard transformer	10/100BASE-T	10/100BASE-T
LAN port 2	-	-
Audio	AC97-7.1, HDA	AC97-7.1, HDA
Video controller	i945GME	i945GME
Video memory (MB)	8-224	8-224
LCD interface	SDVO	SDVO
DVI interface (option 803240)	Option	Option
CRT interface	yes	yes
Video input	-	-
Watchdog	yes	yes
Power normal (Vin = 5V) (typ.)	10-30W	10-30W
Power suspend	0.1W	0.1W
Power management	yes	yes
RTC battery onboard	80mAh [1] (or ext. 900mAh) [2]	80mAh [1] (or ext. 900mAh) [2]
Cooling type	active	active
Operating temperature	see SMX945/B	see SMX945/B
Extended operating temperature (E47)	see SMX945/B	see SMX945/B
Size (W x L in mm)	90/117 x 96/99	90/117 x 96/99
Weight	265 g	270 g
MTBF	>200'000h	>200'000h
Special features 1	TV-output	TV-output
Special features 2	-	-
Special features 3	-	-
Part no. (without SMX945)	803200**	803204**

**CPUs

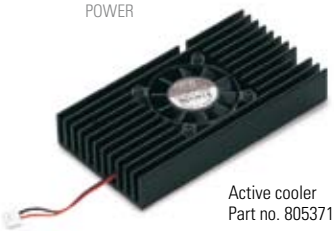
Article	Description	No.	No.
SMX945-L7400	Intel® Core™2 Duo-L7400, 0MB RAM	805352	805352
SMX945-L2400	Intel® Core™ Duo-L2400, 0MB RAM	805350	805350
SMX945-C423	Intel® Celeron® M 423, 0MB RAM	805360	805360
SMX945B-L7400	Intel® Core™2 Duo-L7400, 1MB RAM	805452	805452
SMX945B-N270	Intel® Atom, 1MB RAM	805472	805472

[2] Typical service life of 1 year. [3] Typical service life of 10 years.





Passive cooler
Part no. 805370



Active cooler
Part no. 805371

MSMG45/L/P

Description

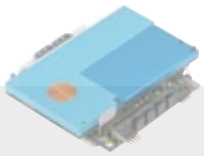
The MICROSPACE® MSMG45 has all of the standard PC interfaces plus ethernet LAN, optional DVI and LVDS interfaces (dual screen) and a sound controller. The PCI/104-*Express* bus (PCI & PCI Express) and 8 USB interfaces are available as functional extensions. Power consumption, cooling method, ambient working temperature and performance are directly dependent on the smartModule G45-xxxx.

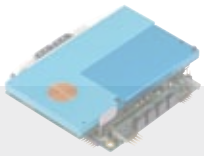
Applications

_ Video streaming for HD videos + HDMI
_ Dual screen applications
_ Image processing, video monitoring
_ Calculation-intensive data processing with 4 cores

Ordering information (Option/accessories)

Article	No.	Description
SODIMM DDR2 256MB	890674	200pin, 533MHz, noECC
SODIMM DDR2 512MB	890675	200pin, 533MHz, noECC
SODIMM DDR2 1GB	890676	200pin, 533MHz, noECC
SODIMM DDR2 2GB	890677	200pin, 533MHz, noECC
SMX9/G45 passive cooler	805370	incl. assemblymat.
SMX9/G45 active cooler	805371	incl. assemblymat.
MSM9/G45-LANCON	803220	LAN-Cable with RJ45 on a print with 900mAh Bat.
MSMG45-MMexp	803255	Multimedia converter, PCI/104ex board w. SPDIF, USB, Sound,DVI connectors (needs a MSMG45P board)
MSMG45-LVDSCON	803252	MSMG45-LVDSCON LVDS-Adapter for MSMG45
MSMG45CKCON	803250	Cablekit with connector- print for USB, 1LAN, Sound, Cables:FD, COM, LPT, PWR, PS2 extern 900mAh BackupBat.





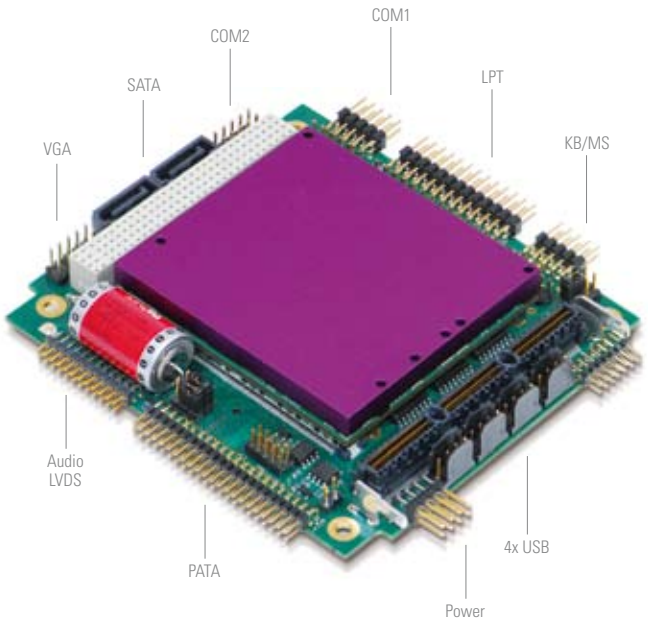
Technical data***

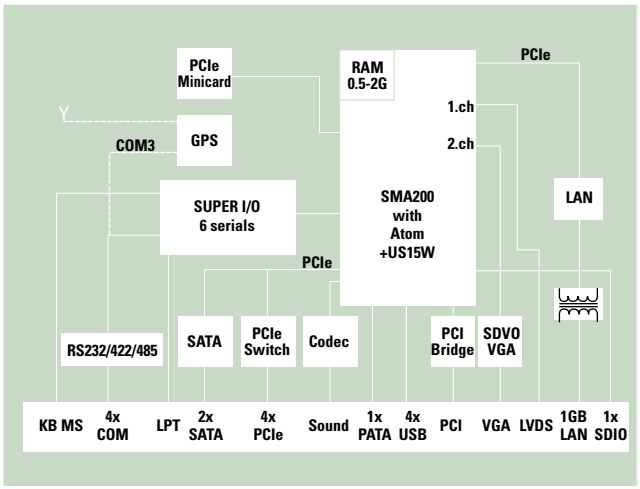
Type	MSMG45	MSMG45P
CPU	SMXG45-xGB-Duo/Quad	SMXG45-xGB-Duo/Quad
ISA-BUS (PCI/104)	-	-
PCI-BUS (option 807006 or 807005)	Option	Option
PCI Express-BUS (PCI/104-*Express*) 4 Lanes	-	yes, on the bottom
2nd Level cache (kB)	1024-4096	1024-4096
Performance (MHz)	-	-
DRAM Min-Max	0-2GB soldered*	0-2GB soldered*
SODIMM	0-2GB attached	0-2GB attached
CompactFlash socket	-	-
Keyboard, mouse (PS/2)	yes	yes
Boot drive	FD, HD, LAN, USB	FD, HD, LAN, USB
IDE interface P-ATA	-	-
IDE interface S-ATA	2x	2x
COM1	RS232C	RS232C
COM2	RS232C	RS232C
COM3	-	-
COM4	-	-
LPT1	yes	yes
USB (2.0)	4x	4x + 2x on PCI/104-*Express*
LAN port 1 onboard transformer	10/100BASE-T	10/100BASE-T
LAN port 2	-	-
Audio	AC97-7.1, HDA	AC97-7.1, HDA
Video controller	GMA X4500	GMA X4500
Video memory (MB)	512	512
LCD interface	SDVO	SDVO
DVI interface (option 803255)	Option	Option
CRT interface	yes	yes
Video input	-	-
Watchdog	yes	yes
Power normal (typ.)	20-50W	20-50W
Power suspend	0.1W	0.1W
Power management	yes	yes
RTC battery onboard	80mAh [1] (or ext. 900mAh) [2]	80mAh [1] (or ext. 900mAh) [2]
Cooling type	active	active
Operating temperature	see SMXG45	see SMXG45
Extended operating temperature (tbd)	see SMXG45	see SMXG45
Size (W x L in mm)	90/117 x 96/99	90/117 x 96/99
Weight	265 g	270 g
MTBF	>200'000h	>200'000h
Special features 1	AMT 4.0	AMT 4.0
Special features 2	-	-
Special features 3	-	-
Part no. (without SMXG45)**	803300**	803304**

**CPUs

Article	Description	No.	No.
SMXG45-1GB-Duo	1GB RAM soldered	805610	805610
SMXG45-1GB-Quad	1GB RAM soldered	805611	805611
SMXG45-2GB-Duo	2GB RAM soldered	805620	805620
SMXG45-2GB-Quad	2GB RAM soldered	805621	805621

[1] Typical service life of 1 year. [2] Typical service life of 10 years.
***As this product is still in development, changes to the technical data are possible.





MSM200X/XU/XP

Description

The MICROSPACE® MSM200X/XU/XP based on Intel's latest Atom processor has all of the standard PC interfaces plus Ethernet LAN and a sound controller. The permanently soldered up to 2GB memory results in added robustness. The PCI/104-*Express* bus (PCI + PCIe) , 4x COM, GPS, PCIe-Minicard and 4 USB interfaces are available as functional extensions. The typical 6W power consumption permits passive cooling within a very broad working temperature range. The XL version is a low-cost variation without battery or sound codec.

Applications

_ Used in battery powered mobile computers
_ Information terminals with video displays
_ Game systems with music output
_ Measuring instruments
_ Telecommunication devices

Ordering information (Option/accessories)

Article	No.	Description
Option L+	807006	PC/104plus Con. long not with Opt.CF (807007)
Option P+	807005	PC/104plus Con. short
MSM200-CKCON	803070	Cablekit with connector- print for USB,1LAN, Sound Cables: FD, COM, LPT, PWR, PS2
MSM200-LANCON	803024	1G LANcable with connector- print RJ45 and 900mAhBat
MSM200-GPS	803076	GPS Mod. on COM3 mounted, TYCO A1080 receiver
Option WLAN MCex	807414	MiniCard Expr. assembled, with antenna cable
Option GSM/UMTS MCex	807413	MiniCard Expr. assembled, with antenna cable

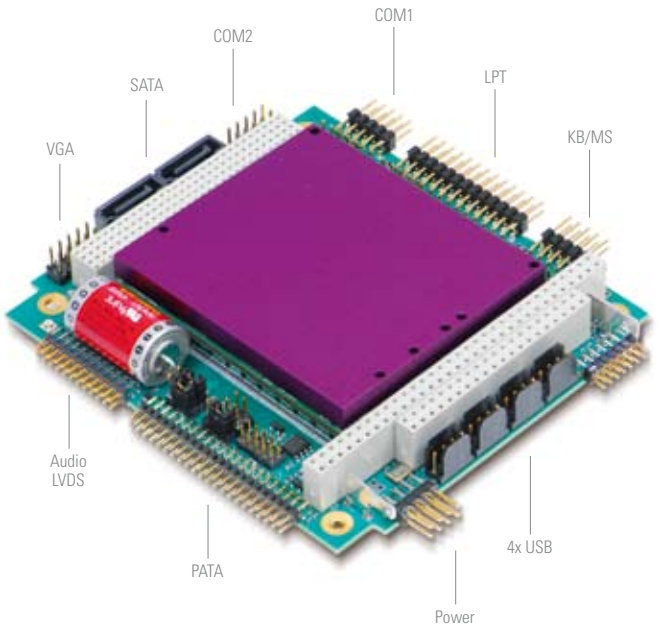


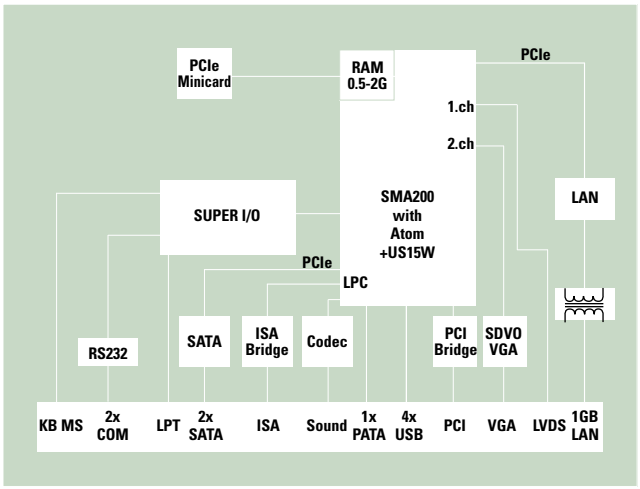
Technical data

Type	MSM200X	MSM200XP	MSM200XU
CPU*	SMA200, Atom Z510/Z530	SMA200, Atom Z510/Z530	SMA200, Atom Z510/Z530
ISA-BUS	-	-	-
PCI-BUS (Option 807006 or 807005)	Option	Option	Option
PCI Express-BUS	not assembled	yes, on the bottom	yes, on the top
2nd Level cache (kB)	512	512	512
Performance (GHz)*	1.1 / 1.6GHz	1.1 / 1.6GHz	1.1 / 1.6GHz
DRAM min-max (MB)*	soldered 0.5-2GB	soldered 0.5-2GB	soldered 0.5-2GB
PCIe-Minicard	1x	1x (for WLAN/GSM)	1x (for WLAN/GSM)
Keyboard, mouse (PS/2)	yes	yes	yes
Boot drive	HD, LAN, USB, SSD	HD, LAN, USB, SSD	HD, LAN, USB, SSD
IDE interface P-ATA	1x	1x	1x
IDE interface S-ATA (SIL 3132)	2x	2x	2x
COM1	RS232C	RS232C	RS232C
COM2	RS232C	RS232C	RS232C
COM4	RS232C/RS422/485	RS232C/RS422/485	RS232C/RS422/485
COM5	RS232C/RS422/485	RS232C/RS422/485	RS232C/RS422/485
LPT1	1x	1x	1x
USB (2.0)	4x	4x, 2x PCI104ex	4x, 2x PCI104ex
LAN Port 1 incl. transformer (Intel® 82574L)	1GB LAN	1GB LAN	1GB LAN
LAN Port 2	-	-	-
Audio (codec onboard)	HDA-ALC882, 7.1 channels	HDA-ALC882, 7.1 channels	HDA-ALC882, 7.1 channels
Video controller	internal, max. 1024 x 1248	internal, max. 1024 x 1248	internal, max. 1024 x 1248
Video memory (MB)	128	128	128
LCD interface	yes, 24bit LVDS	yes, 24bit LVDS	yes, 24bit LVDS
DVI interface	-	-	-
CRT interface	yes	yes	yes
Video input	-	-	-
Watchdog	yes	yes	yes
Power normal (typ.)	5V/6W	5V/6W	5V/6W
Power suspend	5V/0.1W	5V/0.1W	5V/0.1W
Power management	yes	yes	yes
RTC battery onboard (typ. 10 years)	900mAh	900mAh	900mAh
Cooling type	passive	passive	passive
Operating temperature	-25°C to +70°C	-25°C to +70°C	-25°C to +70°C
Extended operating temperature (E48)	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C
Size (W x L in mm)	90 x 96	90 x 96	90 x 96
Weight	115 g	120 g	120 g
MTBF	>200'000h	>200'000h	>200'000h
Special features 1	soldered RAM	soldered RAM	soldered RAM
Special features 2	GPS-Module	GPS-Module	GPS-Module
Special features 3	-	-	-
Part no. (without SMA20x)*	802370*	802372*	802371*

*smartCore®Express modules (see also page 33 for details)

Article	Description	No.	No.	No.
SMA200-11G-1GB	Atom Z510 incl. 1GB RAM	805801	805801	805801
SMA200-16G-1GB	Atom Z530 incl. 1GB RAM	805811	805811	805811
SMA200-16G-05GB	Atom Z530 incl. 1GB RAM	805810	805810	805810
SMA200-11G-05GB	Atom Z510 incl. 0.5GB RAM	805800	805800	805800





MSM200S

Description

The MICROSPACE® MSM200S based on Intel's latest Atom processor has all of the standard PC interfaces plus Ethernet LAN and a sound controller. The permanently soldered memory results in added robustness. The PC/104-*Plus* bus (PCI + 8bit ISA), PCI Express Minicard (WLAN, GSM), 4x COM, GPS and 4 USB interfaces are available as functional extensions. The typical 6W power consumption permits passive cooling within a very broad working temperature range.

Applications

_ Used in battery powered mobile computers
_ Information terminals with video displays
_ Game systems with music output
_ Measuring instruments
_ Telecommunication devices

Ordering information (Option/accessories)

Article	No.	Description
Option L+	807006	PC/104plus Con. long not with Opt.CF (807007)
Option P+	807005	PC/104plus Con. short
MSM200-CKCON	803070	Cablekit with connector- print for USB,1LAN, Sound Cables: FD, COM, LPT, PWR, PS2
MSM200-LANCON	803024	1G LANcable with connector- print RJ45 and 900mAhBat
Option WLAN MCex	807414	MiniCard Expr. assembled, with antenna cable
Option GSM/UMTS MCex	807413	MiniCard Expr. assembled, with antenna cable

PC/104-Plus

PCI

ISA

Atom™

1.6GHz

max. 2GB RAM

1x LAN

RoHS

Technical data

Type	**MSM200S**
CPU*	SMA200, Atom Z510/Z530
ISA-BUS (no DMA modes)	8bit (IRQ) no DMA
PCI-BUS (Option 807006 or 807005)	Option
PCI Express-BUS	-
2nd Level cache (kB)	512
Performance (GHz)*	1.1 / 1.6GHz
DRAM min-max (MB)*	soldered 0.5-2GB
PCI Express Minicard	1x (for WLAN/GSM/SSD)
Keyboard, mouse (PS/2)	yes
Boot drive	HD, LAN, USB, SSD
IDE interface P-ATA	44pin
IDE interface S-ATA (SIL 3132)	2x
COM1	RS232C
COM2	RS232C
COM3	-
COM4	-
LPT1	1x
USB (2.0)	4x
LAN Port 1 incl. transformer (Intel 82574L)	1GB LAN
LAN Port 2	-
Audio (codec onboard)	Stereo Line in/out ALC882
Video controller	internal
Video memory (MB)	128
LCD interface (1280 x 1024 x 85Hz)	yes, 24bit LVDS
DVI interface (1080 x 1920 x 60Hz)	-
CRT interface	yes
Video input	-
Watchdog	yes
Power normal (typ.)	5V/6W
Power suspend	5V/0.1W
Power management	yes
RTC battery onboard (typ. 10 years)	900mAh
Cooling type	passive
Operating temperature	-25°C to +70°C
Extended operating temperature (E48)	-40°C to +85°C
Size (W x L in mm)	90 x 96
Weight	130 g
MTBF	>200'000h
Special features 1	soldered RAM
Special features 2	-
Special features 3	-
Part no. (without SMA20x)*	802380*

*smartCore®Express modules (see also page 33 for details)

Article	Description	1GB RAM:
SMA200-11G-1GB	Atom Z510 incl. 1GB RAM	805801
SMA200-16G-1GB	Atom Z530 incl. 1GB RAM	805811
SMA200-16G-05GB	Atom Z530 incl. 1GB RAM	805810
SMA200-11G-05GB	Atom Z510 incl. 0.5GB RAM	805800

MSMGE104EX

The MICROSPACE® PCI/104-*Express* expansion card MSMGE104EX has a PCI Express 1GB LAN controller. The product permits connection to the 1GB/s Ethernet by means of the full utilization of the PCI Express bus bandwidth (2.5GB/s).

- _ 1GB-LAN
- _ PCI Express-Bus
- _ 2x USB
- _ PCI104: pass-through

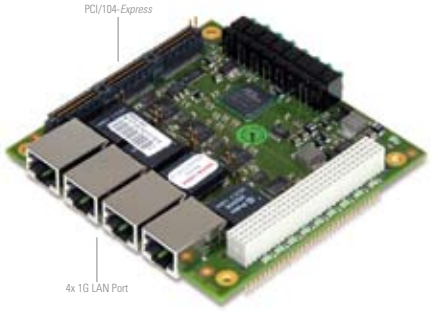
Technical data

Type	**MSMGE104EX**
Function	1GB-LAN
ISA-BUS	-
PCI-BUS	pass-through
PCI Express-BUS	yes, 1x Lane
BUS compatibility	PCI/104-*Express*
Controller	82573L Intel®
Memory	-
1st interface	1GB LAN
2nd interface	2x USB
3rd interface	-
Power normal (typ.)	5V, 3.3V/4W
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	-
Size (W x L x H in mm)	90 x 96 x 17
Weight	60 g
Software support	WINXP, Linux, VxWorks, QNX
MTBF	100'000h
Special features 1	-
Special features 2	-
Special features 3	-
Part no. (PCIe + PCI)	801730
Accessories	

MSM4E104EX

This MICROSPACE® PCI/104-*Express* expansion card contains four 1GB LAN controllers (825745L PCIe) which are connected over a PCIe switch to the Express bus lane of the PCI 104 bus.

- _ 4x 1Gb/s LAN
- _ 4x RJ45 interface
- _ PCI104: pass-through



Technical data

Type	MSM4E104EX
Function	4x 1GB LAN
ISA-BUS	-
PCI-BUS	pass-through
PCI Express-BUS	yes, 1x lane
BUS compatibility	PCI/104-*Express*
Controller	4x 82574L (Intel®)
PCIe-switch	PLX 8505
1st interface (standard)	4x RJ45, 1GB
2nd interface (alternative)	-
3rd interface	-
Power normal (typ.)	5V, 3.3V/4W
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	-40°C to +70°C
Size (W x L x H in mm)	90 x 96 x 17
Weight	80 g
Software support	WINXP, Linux
MTBF	100'000h
Bandwidth (Max.)	2.5Gbit/sec.
Special features 2	-
Special features 3	-
Part no. (PCIe + PCI)	801727
Accessories	

MSMEC104EX

The MICROSPACE® PCI/104-*Express* MSMEC104EX expansion card has an Express card/34+54 bracket allowing a PCI/104 stack functional expansion using any Express card function (frame grabber, TV, SCSI, modem, etc.).

- _ ExpressCard/34 + 54
- _ USB 2.0 + PCIe
- _ PCI104: pass-through

Technical data

Type	MSMEC104EX
Function	ExpressCard-Adapter
ISA-BUS	-
PCI-BUS	pass-through
PCI Express-BUS	yes, 1x lane
BUS compatibility	PCI/104-*Express*
Controller	-
Memory	-
1st interface	ExpressCard
2nd interface	-
Hot plug support	depending on BIOS/OS
Power normal (typ.)	5V/3W
Power management	yes
Operating temperature	-25°C to +70°C
Extended operating temperature	-
Size (W x L x H in mm)	90 x 96 x 17
Weight	65 g
Software support	XP, VISTA
MTBF	100'000h
Special features 1	Type 34 + 54
Special features 2	-
Special features 3	-
Part no. (PCIe + PCI)	801740
Accessories	

MSMMI104EX

The MSMMI104EX MICROSPACE® PCI/104-*Express* expansion card has a PCIe MiniCard bracket. This allows functional expansion with a WLAN, GMS or modem MiniCard. A SIM card bracket is for use with a GSM card.

- _ PCIe MiniCard
- _ USB 2.0 + PCIe
- _ PCI104: pass-through

Technical data

Type	MSMMI104EX
Function	PCIe MiniCard adapter
ISA-BUS	-
PCI-BUS	pass-through
PCI Express-BUS	yes, 1x lane
BUS compatibility	PCI/104-*Express*
Controller	-
Memory	-
1st interface	PCIe MiniCard
2nd interface	SIM card
Hot plug support	-
Power normal (typ.)	5V/8W
Power management	yes
Operating temperature	-25°C to +70°C
Extended operating temperature	-
Size (W x L x H in mm)	90 x 96 x 17
Weight	55 g
Software support	XP, VISTA
MTBF	100'000h
Special features 1	-
Special features 2	-
Special features 3	-
Part no. (PCIe + PCI)	801756
Accessories	WLAN-MC (807414)
	GSM-MC (807413)

MSMSA104EX

This MICROSPACE® PCI/104-*Express* expansion card has 2 SATA300 interfaces for connecting to any SATA storage media (AD/DVD). Further, 2 USB connectors are available.

- _ 2x SATA 300MByte/s
- _ PCI/104-*Express*
- _ 2x USB2
- _ PCI104: pass-through

Technical data

Type	MSMSA104EX
Function	2x SATA 300
ISA-BUS	-
PCI-BUS	-
PCI Express-BUS	yes
BUS compatibility	PCI/104-*Express*, 1x lane
Controller	SIL 3132
Bandwidth	2x 300MByte/s
1st interface	2x SATA
2nd interface	2x USB
3rd interface	-
Power normal (typ.)	5V, 3.3V/2W
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	-
Size (W x L x H in mm)	90 x 96 x 17
Weight	65 g
Software support	XP, VISTA, Linux
MTBF	200'000h
Special features 1	RAID 0/1
Special features 2	-
Special features 3	-
Part no. (PCIe + PCI)	801748
Accessories	

MSMFW104EX

The MICROSPACE® PCI/104-*Express* MSMFW104EX expansion card has a PCIe FireWire controller which has 2x 1EEE1394B and 1x 1EEE1394A connections and, thanks to a fast PCI/104-Express bus, offers a maximum bandwidth of 2000MB/s (2x 800 plus 1x 400).

- _ 2x IEEE1394B (800 MB/s)
- _ 1x IEEE1394A (400 MB/s)
- _ PCI104: pass-through

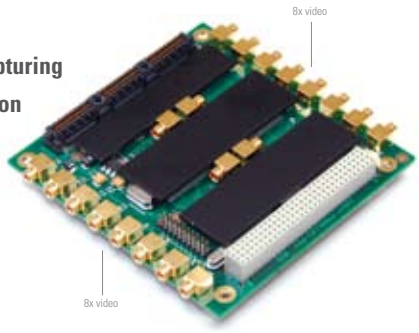
Technical data

Type	MSMFW104EX
Function	FireWire, IEEE1394B
ISA-BUS	-
PCI-BUS	pass-through
PCI Express-BUS	yes, 1x lane
BUS compatibility	PCI/104-*Express*
Controller	TI
PCIe switch	-
1st interface (standard)	1x IEEE1394A
2nd interface (alternative)	2x IEEE1394B
3rd interface	-
Power normal (typ.)	5V, 3.3V/1W
Power management	12V
Operating temperature	-25°C to +70°C
Extended operating temperature	-40°C to +70°C
Size (W x L x H in mm)	90 x 96 x 17
Weight	75 g
Software support	WINXP, Linux
MTBF	200'000h
Bandwidth (max.)	2.5x 800Mbit/Sek.
Special features 2	-
Special features 3	-
Part no. (PCIe + PCI)	801752
Accessories	

MSMG104EX

The MSMG104EX MICROSPACE® PCI/104-*Express* expansion card is equipped with four frame grabber controllers (BT878) which are directly connected to the PCI/104-*Express* bus over a PCI to PCIe bridge. This design allows simultaneous input of up to 4x 30 frames per second. Since each frame grabber has a 4 channel multiplexer available, a maximum of 16 video cameras can be connected (with 90° connectors).

- 4x Frame grabber BT878 (with PCIe/PCI Bridge)
- Up to 16 cameras
- PCI Express-Bus
- Banwidth for sim. capturing 3x PAL/NTSC resolution
- PCI104: pass-through



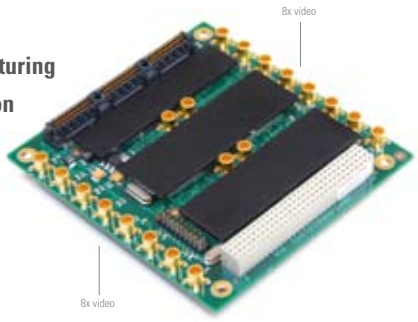
Technical data

Type	MSMG104EX
Function	4x Frame grabber
ISA-BUS	-
PCI-BUS	pass-through
PCI Express-BUS	yes, 1x lane
BUS compatibility	PCI/104-*Express*
Controller	4x BT878A, PAL, NTSC
Bandwidth	133MByte/sec. max.
1st interface (standard) 90°	16x Video, MCX
2nd interface (alternative)	4x SVideo, MCX
3rd interface	-
Power normal	5V, 3.3V/6W
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	tbd
Size (W x L x H in mm)	90 x 96 x 17
Weight	95 g
Software support	WIN, Linux
MTBF	100'000h
Special features 1	TTL i/o, 8bit
Special features 2	-
Special features 3	-
Part no. (PCIe + PCI)	801738
Accessories	MSMG104EX-Cable (MCX-BNC) (802610)

MSMG104EX-A

This MICROSPACE® PCI/104-*Express* expansion card is equipped with four frame grabber controllers (BT878) which are directly connected to the PCI/104-*Express* bus over a PCI to PCIe bridge. This design allows simultaneous input of up to 4x 30 frames per second. Since each frame grabber has a 4 channel multiplexer available, a maximum of 16 video cameras can be connected (with 180° connectors).

- 4x Frame grabber BT878 (with PCIe/PCI Bridge)
- Up to 16 cameras
- PCI Express-Bus
- Banwidth for sim. capturing 3x PAL/NTSC resolution
- PCI104: pass-through



Technical data

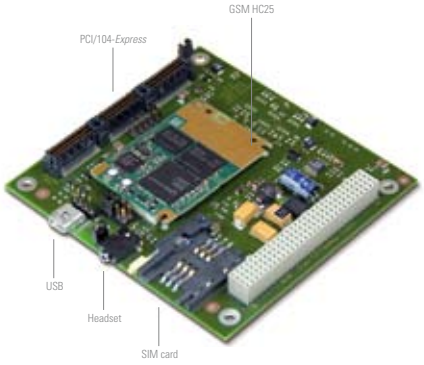
Type	MSMG104EX-A
Function	4x Frame grabber
ISA-BUS	-
PCI-BUS	pass-through
PCI Express-BUS	yes, 1x lane
BUS compatibility	PCI/104-*Express*
Controller	4x BT878A, PAL, NTSC
Bandwidth	133MByte/sec. max.
1st interface (standard) 180°	16x Video, MCX
2nd interface (alternative)	4x SVideo, MCX
3rd interface	-
Power normal	5V, 3.3V/6W
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	tbd
Size (W x L x H in mm)	90 x 96 x 17
Weight	95 g
Software support	WIN, Linux
MTBF	100'000h
Special features 1	TTL i/o, 8bit
Special features 2	-
Special features 3	-
Part no. (PCIe + PCI)	801739
Accessories	MSMG104EX-Cable (MCX-BNC) (802610)

MSMGS104EX

The MSMGS104EX MICROSPACE® PCI/104-*Express* expansion card has a slot for Siemens HC25-GSM/UMTS communication modules as well as a SIM card bracket. The Siemens GSM/UMTS module has its own part number and must be ordered separately.

_ Adapter for GSM module

_ GSM/UMTS HC25 (sep. order)



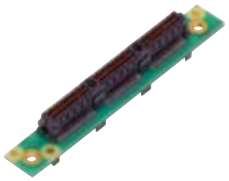
Technical data

Type	MSMGS104EX
Function	GSM-UMTS
ISA-BUS	-
PCI-BUS	pass-through
PCI Express-BUS	yes, 1x lane
BUS Compatibility	PCI/104-*Express*
Controller	HC-25
PCIe-Switch	
1st interface (standard)	GSM module
2nd interface (alternative)	SIM card
3rd interface	Headset
Power normal	5V, 3.3V/5W
Power management	yes
Operating temperature	-25°C to +70°C
Extended operating temperature	-40°C to +70°C
Size (W x L x H in mm)	90 x 96 x 17
Weight	65 g
Software support	WINXP, Linux
MTBF	100'000h
Bandwidth (max.) HSDPA	3.6 Mb/s
Special features 2, GSM-Edge	Quadband
Special features 3, UMTS	850/1900/2100MHz
Part no. (PCIe + PCI) (without HC25)	801754
Accessories	GSM/UMTS (801781)

MSMSP104EX

This MICROSPACE® PCI/104-*Express* spacer card allows a height increase of one PCI/104-*Express* unit (15.24mm + 1.6mm). Only 1 spacer card allowed per PCI/104-*Express* stack. Equivalent spacer kits are available for the PCI bus as well as the ISA bus (802050/51).

_ 1 Height unit expander for PCI/104-*Express* bus.



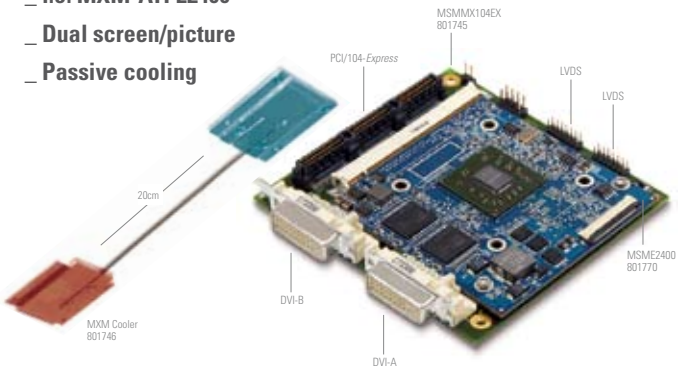
Technical data

Type	MSMSP104EX
Function	Spacer Kit for PCI/104e
ISA-BUS	-
PCI-BUS	-
PCI Express-BUS	-
Controller	-
Memory	-
Power feed (typ.)	-
1st interface	PCIe Bus expander
2nd interface	-
Power normal	-
Power management	-
Operating temperature	-
Extended operating temperature	-
Size (W x L x H in mm)	90 x 14 x 17
Weight	15 g
Software support	-
MTBF	500'000h
Complies to	PCI/104-*Express*
Part no. PCIe	802607
Part no. PCI	802051
Part no. ISA	802050

MSMMX104EX

The MICROSPACE® PCI/104-*Express* MSMMX104EX expansion card has a bracket for graphic modules conforming to the MXM norm. The MXM graphics module (must be ordered separately) uses an ATI X2400 graphics controller which connects to the CPU over a high performance PCIe graphics bus (PEG, 16 lanes x 2.5Gbit/s). A very flat heat pipe is used for cooling.

_ High performance video
_ i.e. MXM-ATI E2400
_ Dual screen/picture
_ Passive cooling



Technical data

Type	MSMMX104EX
Function	MXM adapter
ISA-BUS	-
PCI-BUS	-
PCI Express-BUS	PEG, 16x PCIe
BUS compatibility	PCI/104-*Express*
Controller on MXM board	ATI X2400
Memory on MXM board	256MB video RAM
1st interface	MXM type II
2nd interface	1. DVI + VGA
3rd interface	2. DVI + VGA
Power normal (typ.)	5V + 12V/3 Amp. (30W)
Power management	-
Operating temperature	-20°C to +70°C
Extended operating temperature	-
Size (W x L x H in mm)	90 x 96 x 17
Weight	60 g
Software support	XP, VISTA
MTBF	100'000h
Special features 1	TV out
Special features 2	-
Special features 3	-
Part no. (PCIe + PCI)	801745
Accessories	MSM-E2400 (801770) 60 g
	MXM-Cooler (801746) 60 g

MSM8C104EX

The MSM8C104EX MICROSPACE® PCI/104-*Express* expansion card has a choice of either 8 or 16 serial interfaces available. Each channel can be singly selected as RS232C (+/-9V) or as RS422/485 each with 4 paired wires (TxD, RxD, CTS, RTS).

_ 8 ch. serial high speed interface
_ 8x RS422/485 up to 2Mbit/s, 256 devices or 8x RS232C up to 115k baud, 128 byte TX/RX-FIFO
_ Software and FPGA configurable flow control
_ PCI104: pass-through

Technical data

Type	MSM8C104EX
Function	8 channel serial port
ISA-BUS	-
PCI-BUS	pass-through
PCI Express-BUS	1x lane
BUS compatibility	PCI/104-*Express*
Controller	8 ch. UART
Memory	-
Alternative interface 1	8 ch. RS232C (+/-9V)
Alternative interface 2	8 ch. RS422 (1/8 load)
Alternative interface 3	8 ch. RS485 (1/8 load)
Power normal (typ.)	5V/3W
Power management	
Operating temperature	-20°C to +70°C
Extended operating temperature	-40°C to +85°C
Size (W x L x H in mm)	90 x 96 x 17
Weight	70 g
Software support	XP, VISTA
MTBF	200'000h
Special features 1	RS422/85:TX, RX, CTS, RTS, +/-
Special features 2	8x onboard termination
Special features 3	Expandable to 16 channels
Part no. (PCIe + PCI) 8 channels	801725
Part no. (PCIe + PCI) 16 channels	801726
Part no. cable kit (4x DSUB9)	802036 (2x kit)

MSMCA104+

The MSMCA104+ MICROSPACE® PCI/104-*Plus* expansion card has two CAN controllers. The CAN controllers are compatible in design to the CAN cards from PEAK and therefore use licensed PEAK driver software for Windows and Linux.

- _ CAN controller 2x SAJ1000
- _ Ver. 2.0
- _ Max. 4 cards (8x CAN)
- _ PC/104: pass-through or only PCI

Technical data

Type	MSMCA104+
Function	CAN
ISA-BUS	-
PCI-BUS	yes
PCI Express-BUS	-
BUS compatibility	PC/104-*Plus*
Controller	Peak-CAN
Memory	-
1st interface	CAN 9p. DSUB, CiA DS102-1
2nd interface	CAN 9p. DSUB, CiA DS102-1
3rd interface	-
Power normal (typ.)	3.3V/5V/2W
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	tbd.
Size (W x L x H in mm)	90 x 96 x 17
Weight	80 g
Software support	Win, Linux
MTBF	200'000h
Special features 1	Reset using software commands
Special features 2	-
Special features 3	-
Part no. (ISA + PCI)* *(not from stock)*	801765*
Accessories	

MSMCA104+ISOL

The MICROSPACE® PCI/104-*Plus* MSMCA104+ISOL expansion card has two CAN controllers which are galvanically isolated (500Volt). The CAN controllers are compatible in design to the CAN cards from PEAK and therefore use licensed PEAK driver software for Windows and Linux.

- _ CAN controller 2x SAJ1000
- _ Ver. 2.0
- _ Max. 4 cards (8x CAN)
- _ 500V Isolation
- _ PC/104: pass-through or only PCI

Technical data

Type	MSMCA104+ISOL
Function	CAN
ISA-BUS	-
PCI-BUS	yes
PCI Express-BUS	-
BUS compatibility	PC/104-*Plus*
Controller	Peak-CAN
Memory	-
1st interface	CAN 9p. DSUB, CiA DS102-1
2nd interface	CAN 9p. DSUB, CiA DS102-1
3rd interface	-
Power normal (typ.)	3.3V, 5V/4W
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	tbd.
Size (W x L x H in mm)	90 x 96 x 17
Weight	30 g
Software support	Win, Linux
MTBF	200'000h
Special features 1	500V isolated
Special features 2	Reset using software commands
Special features 3	-
Part no. (ISA + PCI)* (only PCI)**	801760* 801762**

MSMG104+

The MICROSPACE® PC/104-*Plus* expansion card MSMG104+ has a BT878 frame grabber with a 4-channel video multiplexer. Three video cameras (CVBS) and a Svideo camera can be connected to the product. Bandwidth is PAL resolution with 30 frames/sec. (fps). PAL or NTSC can be toggled with software.

- _ Video frame grabber
- _ 4 channels PAL/NTSC
- _ PAL, 30fps
- _ Digital I/O programmable
- _ PC/104: pass-through or only PCI

Technical data

Type	MSMG104+
Function	Video frame grabber
ISA-BUS	-
PCI-BUS	yes
PCI Express-BUS	-
BUS compatibility	PC/104-*Plus*
Controller	BT878A
Memory	-
1st interface	1st channel CVBS
2nd interface	2nd channel CVBS
3rd interface	3nd channel CVBS /SVideo
Power normal (typ.)	5V/2W
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	-40°C to +85°C
Size (W x L x H in mm)	90 x 96 x 17
Weight	35 g
Software support	WIN, CE, Linux
MTBF	200'000h
Special features 1	Digital I/O
Special features 2	PAL, NTSC
Special features 3	-
Part no. (ISA + PCI)* (only PCI)**	801610* 801611**
Accessories	

MSMW104+

The MICROSPACE® PC/104-*Plus* expansion card MSMW104+ has an IEEE1394A Firewire controller. There are two 400 Mbit/s channels available. The drivers are already integrated in Windows and Linux. The peripheral systems are supplied with 12V. The card is connected to the 32 bit PCI bus and requires only one PCI resource.

- _ IEEE 1394 FireWire
- _ 2 channels
- _ 400Mbit/sec.
- _ Hotplug
- _ PC/104: pass-through

Technical data

Type	MSMW104+
Function	FireWire
ISA-BUS	-
PCI-BUS	yes
PCI Express-BUS	-
BUS compatibility	PC/104-*Plus*
Controller	TSB43AB22
Memory	-
1st interface	IEEE 1394 A
2nd interface	IEEE 1394 A
3rd interface	-
Power normal (typ.)	3.3V/3W
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	-40°C to +70°C
Size (W x L x H in mm)	90 x 96 x 17
Weight	70 g
Software support	WIN, Linux
MTBF	>200'000h
Special features 1	-
Special features 2	-
Special features 3	-
Part no. (ISA + PCI)* (only PCI)**	801650* 801652**
Accessories	

MSMC104+

The MICROSPACE® PC/104-*Plus* expansion card MSMC104+ has a VECTOR-compatible CAN controller. The product enables a 2-channel connection to the CAN bus. All VECTOR CAN interface modules can be attached. The licensed VECTOR driver for Windows is also available.

- _ CAN controller
- _ 2 channels
- _ VECTOR-CAN drivers
- _ Ver. 2.0
- _ Modular interface converter
- _ PC/104: pass-through

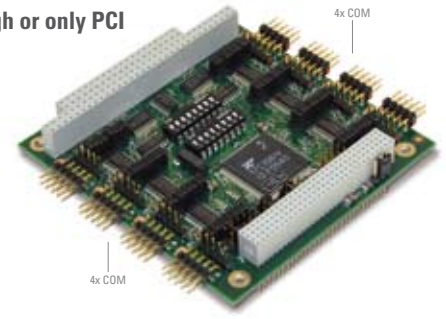
Technical data

Type	MSMC104+
Function	CAN
ISA-BUS	-
PCI-BUS	yes
PCI Express-BUS	-
BUS compatibility	PC/104-*Plus*
Controller	VECTOR
Memory	-
1st interface	1st channel
2nd interface	2nd channel
3rd interface	-
Power normal	3.3V/5V
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	tbd.
Size (W x L x H in mm)	90 x 96 x 17
Weight	75 g
Software support	WIN
MTBF	100'000h
Special features 1	Required 1-2x CAN piggy
Special features 2	-
Special features 3	-
Part no. (ISA + PCI)	801645
Accessories *(not from stock)*	CAN piggy 251 (814272)
	CAN piggy 1054 (814276)

MSMX104+

The MSMX104+ MICROSPACE® PCI/104-*Plus* expansion card has an 8 time UART controller from EXAR. There are 8 channels available with either RS232C or RS485 interfaces. Windows and Linux drivers are available. The card is coupled to the 32bit PCI-BUS and needs only one PCI resource.

- _ Serial communication
- _ 8 channels RS232C
- _ 8 channels RS485/RS422
- _ PC/104: pass-through or only PCI



Technical data

Type	MSMX104+
Function	8x serial
ISA-BUS	-
PCI-BUS	yes
PCI Express-BUS	PC/104-*Plus*
BUS compatibility	PCI
Controller	EXAR 17C158
Memory	-
Alternative Interface 1	8ch RS232C
Alternative Interface 2	8ch RS422
Alternative Interface 3	8ch RS485
Power normal (typ.)	3.3V/3W
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	-40°C to +85°C
Size (W x L x H in mm)	90 x 96 x 17
Weight	70 g
Software support	WIN, Linux
MTBF	>200'000h
Special features 1	8x 10pin header
Special features 2	-
Special features 3	-
Part no. (ISA + PCI)* (only PCI)**	801660* 801661**
Accessories	

MSME104+

The MICROSPACE® PC/104-*Plus* expansion card MSME104+ has a 100/10Mbit/s Ethernet controller from Intel®. The product can be connected to a 100/10Mbit Ethernet LAN using an RJ45 cable. The drivers for Windows, Linux and other operating systems are available.

- _ 100/10 Mbit/s Ethernet
- _ RJ45 connector
- _ LAN boot
- _ PC/104: pass-through or only PCI

Technical data

Type	MSME104+
Function	Ethernet LAN
ISA-BUS	-
PCI-BUS	yes
PCI Express-BUS	-
BUS compatibility	PC/104-*Plus*
Controller	i82551
Memory	32KB
1st interface	RJ45
2nd interface	-
3rd interface	-
Power normal (typ.)	3.3V/1W
Power management	-
Operating temperature	-25°C to + 70°C
Extended operating temperature	-40°C to + 85°C
Size (W x L x H in mm)	90 x 96 x 17
Weight	70 g
Software support	WIN, CE, Linux
MTBF	200'000h
Special features 1	100/10Mbit/sec.
Special features 2	-
Special features 3	-
Part no. (ISA + PCI)* (only PCI)**	801600*
Accessories	

MSMGE104+

The MICROSPACE® PC/104-*Plus* extension card MSMGE104+ has a 1GB LAN controller. The product can be connected to the 1GB/s ethernet and has a data transmission speed of 1000/100/10Mbit/sec. Drivers for Windows and Linux are available. The card is connected to the 32 bit PCI bus and requires only one PCI resource.

- _ 1Gbit/sec. Ethernet LAN
- _ Boot from LAN
- _ PC/104: pass-through or only PCI

Technical data

Type	MSMGE104+
Function	1Gigabit-LAN
ISA-BUS	-
PCI-BUS	yes
PCI Express-BUS	-
BUS compatibility	PC/104-*Plus*
Controller	i82541
Memory	32kB
1st interface	RJ45
2nd interface	-
3rd interface	-
Power normal (typ.)	3.3V/2W
Power management	-
Operating temperature	-25°C to + 70°C
Extended operating temperature	-40°C to + 85°C
Size (W x L x H in mm)	90 x 96 x 17
Weight	70 g
Software support	WIN, Linux
MTBF	100'000h
Special features 1	-
Special features 2	-
Special features 3	-
Part no. (ISA + PCI)* (only PCI)**	801690* 801692**
Accessories	

MSMJ104+

The MICROSPACE® PC/104-*Plus* expansion card MSMJ104+ has a PCCard bridge for 2 PCCard sockets. The product can take 2 type II PCCards or one type III PCCard. The drivers for the TI1520 PCCard bridge are already integrated in Windows and Linux.

- _ Dual PCMCIA / PCCard
- _ Type I/II
- _ Onboard 12V generator
- _ Hotplug
- _ PC/104: pass-through

Technical data

Type	MSMJ104+
Function	Dual PCMCIA
ISA-BUS	-
PCI-BUS	yes
PCI Express-BUS	-
BUS compatibility	PC/104-*Plus*
Controller	TI1520
Memory	-
1st interface	1st slot PCCard
2nd interface	2nd slot PCCard
3rd interface	-
Power normal	3.3V/5V
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	-40°C to +85°C
Size (W x L x H in mm)	90 x 96 x 17
Weight	100 g
Software support	WIN, CE, Linux
MTBF	100'000h
Special features 1	12Volt Generator
Special features 2	-
Special features 3	-
Part no. (ISA + PCI) EOL	801630
Accessories	

MSMP104+

The MICROSPACE® PC/104-*Plus* expansion card MSMP104+ has a MiniPCI base. The product can use any MiniPCI card (3.3V and 1.5V) on the PC/104-*Plus* bus. The status LEDs as well as support for 1.5V MiniPCI cards are onboard. The card is connected to the 32 bit PCI bus and requires only one PCI resource.

- _ MiniPCI III adapter
- _ Local 3.3V and 1.5V regulator
- _ LEDs for LAN status
- _ AC sound signal
- _ PC/104: pass-through or only PCI

Technical data

Type	MSMP104+
Function	MiniPCI adapter
ISA-BUS	-
PCI-BUS	yes
PCI Express-BUS	-
BUS compatibility	PC/104-*Plus*
Controller	-
Memory	-
1st interface	MiniPCI Type 3
2nd interface	-
3rd interface	-
Power normal	3.3V/5V
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	-40°C to +85°C
Size (W x L x H in mm)	90 x 96 x 17
Weight	70 g
Software support	-
MTBF	200'000h
Special features 1	-
Special features 2	-
Special features 3	-
Part no. (ISA + PCI)* (only PCI)**	801680* 801681**
Accessories	

MSME104

The PC/104 LAN card is based on the SMC91C96 LAN controller. The 10Mbit/s Ethernet LAN is integrated both as an RJ45 and as a coaxial connection. Drivers for DOS, Windows and Linux are available.

- 10Mbit/s Ethernet LAN
- RJ45 10Base-T interface
- Coaxial 10Base-2 interface
- PC/104-ISA bus

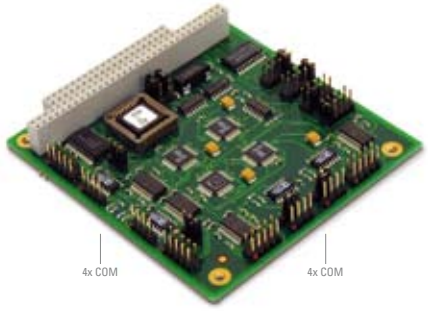
Technical data

Type	MSME104R
Function	10MB-LAN
ISA-BUS	yes (16bit)
PCI-BUS	-
PCI Express-BUS	-
BUS compatibility	PC/104
Controller	SMC91C96
Memory	-
1st interface	10 BASE-2 (coaxial)
2nd interface	10 BASE-T (RJ45)
3rd interface	-
Power normal (typ.)	5V/2W
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	-40°C to +85°C
Size (W x L x H in mm)	90 x 96 x 17
Weight	80 g
Software support	DOS, Linux, WIN
MTBF	100'000h
Special features 1	-
Special features 2	-
Special features 3	-
Part no. (ISA)	806018
Accessories *(not from stock)*	MSME104B (806008)

MSMX104

The MICROSPACE® PC/104 expansion card MSMX104 has a 4x UART controller. There are 4 channels available; RS232C or RS485 interfaces can be selected. Drivers are available for Windows and Linux. The card is connected to the 16 bit ISA bus.

- 4-channel serial interface
- RS232C, RS422, RS485
- ISA bus



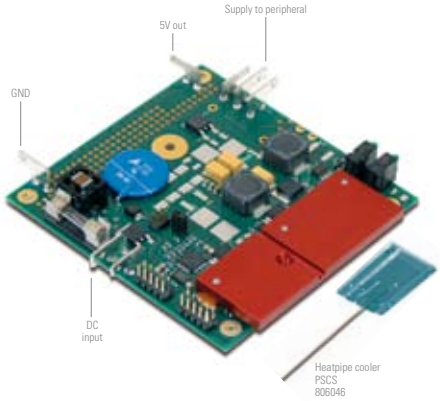
Technical data

Type	MSMX104
Function	4x serial
ISA-BUS	yes (8bit)
PCI-BUS	-
PCI Express-BUS	-
BUS compatibility	PC/104
Controller	4x 16C550
Memory	-
1st interface	4x COM RS232
2nd interface	-
3rd interface	-
Power normal (typ.)	5V/2W
Power management	-
Operating temperature	-25°C to +70°C
Extended operating temperature	-40°C to +85°C
Size (W x L x H in mm)	90 x 96 x 17
Weight	80 g
Software support	DOS, WIN, Linux
MTBF	100'000h
Special features 1	-
Special features 2	-
Special features 3	-
Part no. *(not from stock)*	806011
Accessories	

MSMPS104A

The MICROSPACE® PC104 MSMPS104A expansion card has 5V and 12V outputs which are generated from an 8-20V input voltage range using an efficient voltage regulator switch. This card fulfills the safety regulations for vehicles. A very effective, flat heat pipe is used for cooling. The power supply can be turned on and off using a remote function (i.e., ignition signal).

_ **Wide range power input 8-20V (30V in peak @ 2sec.)**
_ **Performance 75W**
_ **e1**
_ **5V/12V outputs**



Technical data

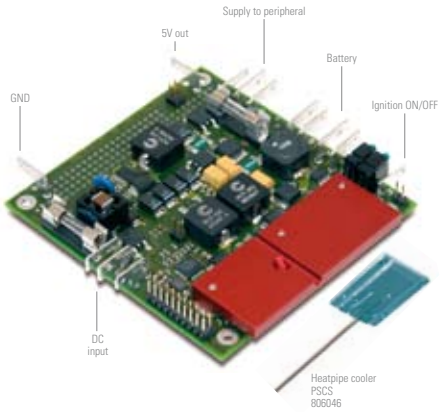
Type	**MSMPS104A**
Function	Power supply
ISA-BUS	not mounted
Protective features	Reverse polarity, Fuse, Overload
BUS compatibility	-
Controller	Monitor
Vinput (nom.)	12V (8V-20V)
1st output	5V, 10Amp
2nd output	12V, 1Amp
Power normal	75W, n=90%
Remote on/off input	optoisolated (ignition)
Power monitoring	Uin, Uout
Operating temperature	-25°C to +60°C
Extended operating temperature	-40°C to +85°C*
Size (W x L x H in mm)	90 x 96 x 17
Weight	85 g
Software support	-
MTBF	100'000h
Complies to	e1, EN60950
Special features 1	EN60950
Part no.	806040
Accessories Heatpipe cooler	PSCS (806046)

* reduced power to 50W

MSMPS104B

The MSMPS104B MICROSPACE® PC104 expansion card has the same outputs available as the A version but with an input voltage range of 20-55V. Furthermore, a rechargeable lead-acid battery can be connected which serves as a back-up power supply in case of power failure. A microcontroller provides for a monitored recharge of the battery.

_ **Wide range power input 20-55V (68Vin peak @ 2 sec.)**
_ **UPS FUNCTION with battery 12V/2Ah**
_ **Performance 75W**
_ **EN50155, e1**
_ **5V/12V outputs**
_ **Reverse polarity protection and overload protection**



Technical data

Type	**MSMPS104B**
Function	Power supply, UPS option
ISA-BUS	not mounted
Protective features	Reverse polarity, Fuse, Overload
Charger regulator interface	COM/SMB interface
Controller	Battery controller, monitor
Vinput (typ.)	24, 36, 42, 48V (20-55V)
1st output	5V, 10Amp
2nd output	12V, 1Amp
Power normal	75W, n=80%
Power monitoring	Uin, Uout, Charger
Remote on/off input	optoisolated (ignition)
Operating temperature	-25°C to +60°C
Extended operating temperature	-40°C to +85°C*
Size (W x L x H in mm)	90 x 96 x 17
Weight	100 g
Software support	UPS management
MTBF	100'000h
Load voltage range	20V-55V
Rechargeable battery	Pb, Pb-Gel
Complies to	EN50155, IEC62040-3, e1, EN60950
Part no.	806042
Accessories Battery	PS12BAT (806044)
Heatpipe cooler	PSCS (806046)

* reduced power to 50W

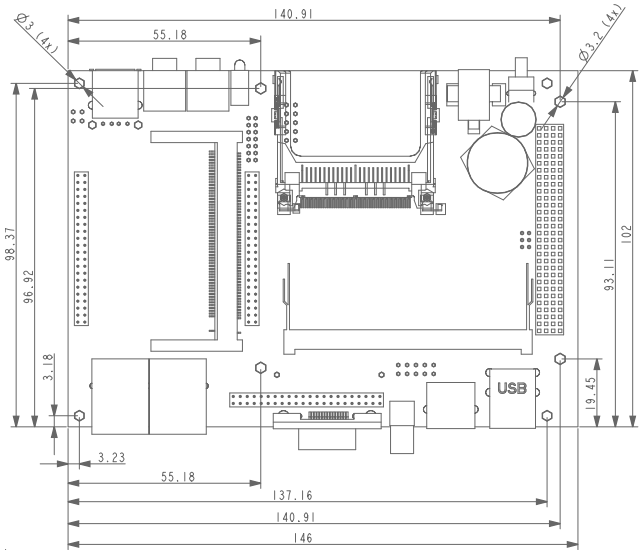
Special services

Article	No.	Description
License label PXE-LanBoot	809108	The BIOS extension is to activate the PXE Boot from LAN. One (1) License per LAN MAC address required. The PXE-Function must be licensed before it can be enabled. To order, fill out the license order form in the respective product manual on the product CD.
Burn-In Cycling E48	807721	With the extended temperature cycling (burn-in) process, the embedded computer boards or modules are running a stress-test to avoid early defects of the electronics. Process description: Basic product function test before temperature cycling. Run six (6) times the temperature cycles in power off mode ,from -40°C to +85°C, during 12 hours. A temperature cycle (from -40° to +85°C) takes two (2) hours. After 12 hours the test is completed, the product runs again all standard function tests. This service is only available for a CPU board.

Conformal Coating

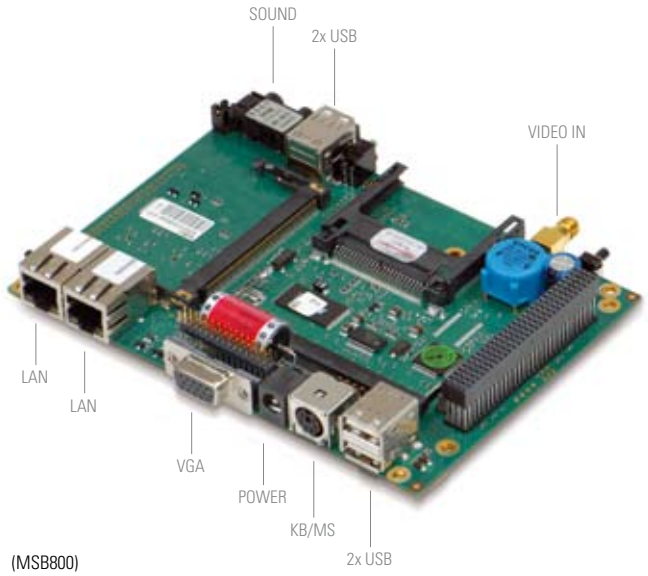
Flexible transparent acrylic coating for the protection of electronic circuitry. The High Performance Acrylic material is designed to be removed and is approved to US MIL-1-46058C. With fluoresces under UV light as an aid to inspection, wide temperature range -55°C to +130°C, resistant to mould growth, compatible with other high specification acrylic coatings, excellent dielectric properties. Order Information: The service shall be ordered with the total price for coating of every individual item (e.g. PC/104 + smartCore + SDRAM) summarized under the Part No. 807700.

Article	No.	Description
Coating PC104	807700	Coating PC/104 product
Coating EBX,MAS,PCC	807701	Coating EBX,MAS,PCC products
Coating smartCore	807702	Coating smartCore products
Coating smartModule	807703	Coating smartModule product
Coating Accessories	807704	Coating Accessories
Warranty Upgrade Systems	999600	The Guarantee time is 24 months after date of delivery. The Guarantee includes free repair or exchange of defective or faulty parts during the guarantee period. Not covered by the guarantee are: Prototypes in hardware and software / wear and tear parts, connectors, batteries, accumulators, etc. / damages by any handling or use other than described in the product manual / any other claims for compensation of damages. No Guarantee when a product was modified or soldered by a third party (incl. modification of connectors, coating etc).
Handling charges	999900	Cost per shipment ex works (EXW Incoterm 2000) CH-Luterbach/Switzerland for the following services: Paperwork for international shipments, forwarder and delivery service. Selection of forwarder. Organization of transport.

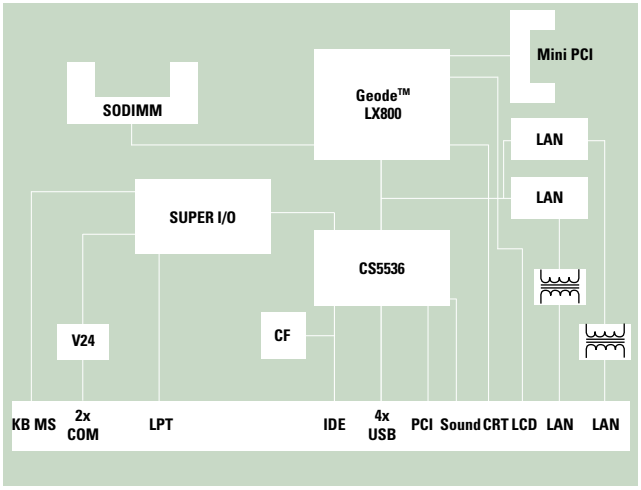


3.5" SBC form factor

The 3.5" SBC boards differ from the PC/104 board primarily in that, for all interfaces, the standard EMC-filtered plug is on the board. This means that wiring is not necessary as it on PC/104 boards. The form factor is derived from the size of a 3.5" hard disk and has practically become a standard. With dimensions of 102 x 146 mm, the 3.5" SBCs are the smallest single board computers and can be almost wirelessly integrated in a housing. To optimize cooling, the processor is located on the underside of the board, enabling a direct connection to the housing so passive cooling does not have to be set up. For evaluation of the 3.5" SBC, the CE/EMC certified MPC20-26 systems are available, each of which is integrated into an MSB board.



(MSB800)



MSB800LVDS
View: bottom

MSB800

Description

The MICROSPACE® MSB800 3.5" single board computer has all of the standard PC interfaces plus a second ethernet LAN, video input for a video camera, and stereo sound controller. In contrast to the PC/104-*Plus* cards, all interfaces are connected to standard plugs; this means low-cost, cable free housing integration. The PCI/104 bus (32 bit PCI), MiniPCI base and 4 USB interfaces are available as functional extensions. Wide range power supply is also onboard so that cost-effective power supply units can be used.

Applications

_ Information terminals
_ Control of interactive devices
_ Game systems with music output
_ Measuring instruments
_ Telecommunication devices

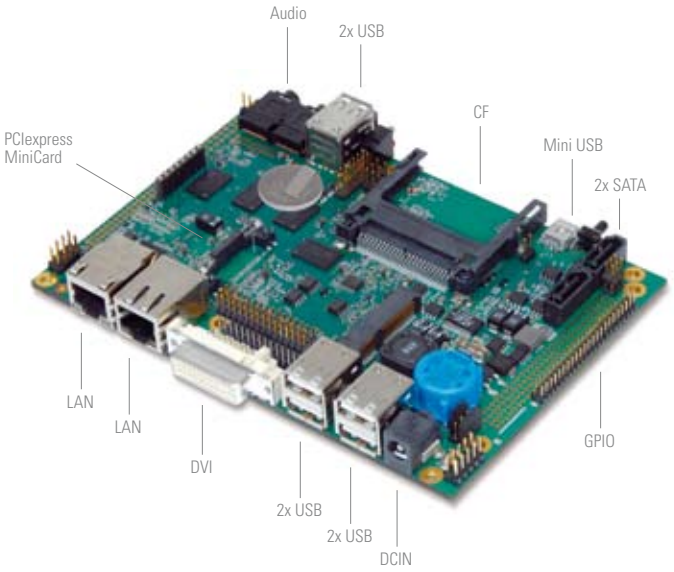
Ordering information (Option/accessories)

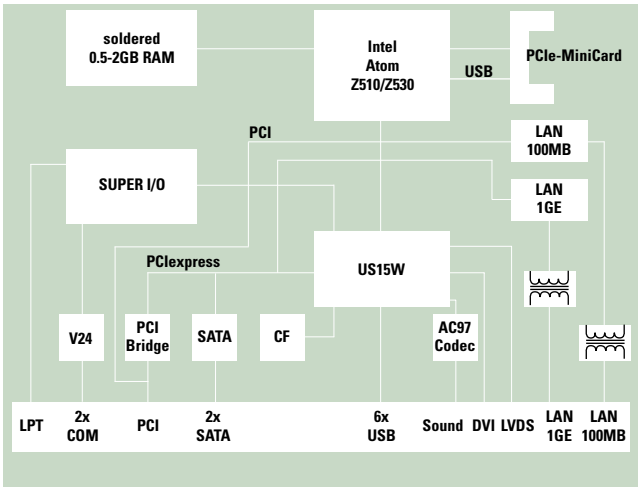
Article	No.	Description
SODIMM DDR 128MB	890669	333MHz, 200pin, noECC
SODIMM DDR 256MB	890670	333MHz, 200pin, noECC
SODIMM DDR 512MB	890671	333MHz, 200pin, noECC
SODIMM DDR 1GB	890672	333MHz, 200pin, noECC
MSB800CON	802205	Connectorboard f. MSB800, DSub to COM1 and LPT1
MSB800CK	802208	Cableset: 1xIDE (20cm), 1x COM2 (30cm) to DSub9
MSB800 Heatspreader	807045	Thermal conduct. cooling (not with 802204)
PowerSupply 19V/60W	812029	ACin:110-240V,60W Uout:19V,3Amp. without: powercord (order no. 693061/62/63)
Powercord Euro	693061	2 wire for AC-Supply
Powercord USA/JP	693062	2 wire for AC-Supply
Powercord GB	693063	2 wire for AC-Supply

Technical data

Type	MSB800	MSB800LVDS
CPU	LX800	LX800
ISA-BUS	-	-
PCI-BUS	yes (PCI/104), short	yes (PCI/104)
PCI Express-BUS	-	-
2nd Level cache (kB)	128	128
Performance (MHz)	500	500
DRAM Min-Max (MB)	128-1024	128-1024
CompactFlash socket	yes, type II	yes, type II
Keyboard, mouse (PS/2)	yes	
Boot drive	HD, CF, USB, LAN	HD, CF, USB, LAN
Floppy interface	-	-
IDE interface P-ATA	1x	1x
IDE interface S-ATA	-	-
COM1	RS232C (802205)	RS232C (802205)
COM2	RS232C (802205)	RS232C (802205)
COM3	-	-
COM4	-	-
LPT1	yes (802205)	yes (802205)
USB (2.0)	4x	4x
LAN port 1 incl. onboard transformer	10/100BASE-T	10/100BASE-T
LAN port 2 incl. onboard transformer	10/100BASE-T	10/100BASE-T
Audio	Stereo In/Out	Stereo In/Out
Video controller	LX800	LX800
Video memory (MB)	16 (UMA)	16 (UMA)
LCD interface	-	LVDS 24bit
DVI interface	-	-
CRT interface	yes	yes
Video input	yes	-
Watchdog	yes	yes
Power normal (typ.)	8V-30V/10W	8V-30V/10W
Power suspend	0.1W	0.1W
Power management	yes	yes
RTC battery onboard	900mAh (>10 years)	900mAh (>10 years)
Cooling type	passive	passive
Operating temperature	-25°C to +70°C*	-25°C to +70°C*
Extended operating temperature* (E48)	-40°C to +85°C*	-40°C to +85°C*
Size (W x L x H in mm)	146 x 102 x 20	146 x 102 x 20
Weight	165 g	165 g
MTBF	>200'000h	>200'000h
Special features 1	MiniPCI-socket	MiniPCI-socket
Special features 2	-	-
Special features 3	-	-
Part no. LX800	802200	802204 *(not from stock)*

*With thermal coupling of the CPU to the metal housing or using 807045.





MSB200

Description

The MICROSPACE® MSB200 3.5" single board computer is based on Intel's latest Atom processor and has all of the standard PC interfaces plus a second Ethernet LAN and a stereo sound controller. In contrast to the PC/104-*Plus* cards, all interfaces are connected using standard plugs; this means low-cost cable-free housing integration. The PCI/104 bus (32bit PCI), MiniPCI socket and 6 USB interfaces are available as functional extensions. A wide range power feed is also onboard so that cost-effective power supply units can be used.

Applications

_ Information terminals with video streaming
_ MPEG 4 play back
_ Game systems with music output
_ Battery powered measuring instruments
_ Telecommunication devices

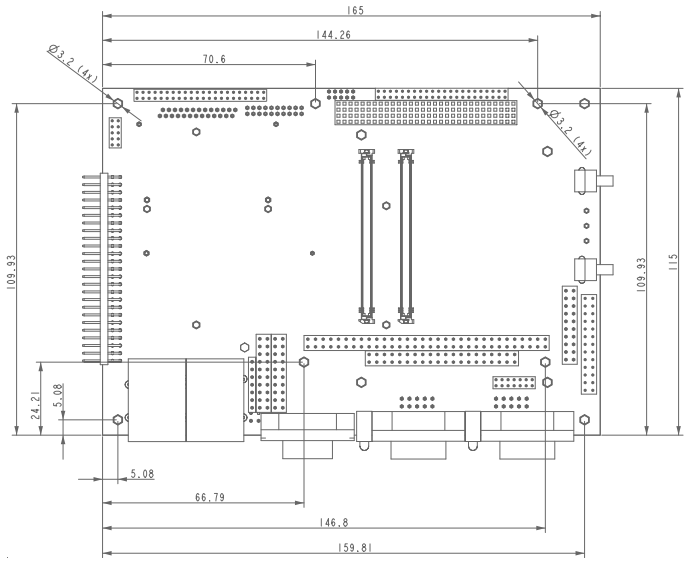
Ordering information (Option/accessories)

Article	No.	Description
MSB200CON	802277	Connectorboard f. MSB200, DSub to COM1 and LPT1
MSB200CK	802218	Cableset: 2xSATA (30cm), 1x COM2 (30cm) to DSub9
PowerSupply 19V/60W	812029	ACin:110-240V, 60W Uout:19V, 3Amp. without: powercord (order no. 693061/62/63)
Powercord Euro	693061	2 wire for AC-Supply
Powercord USA/JP	693062	2 wire for AC-Supply
Powercord GB	693063	2 wire for AC-Supply
MSB200 Heatspreader	807046	Thermal conduct. cooling 146x 102x 4mm
Option: MSB200-LVDS	802276	LVDS Connector mounted
Option P+	807005	PC/104plus CON short

Technical data

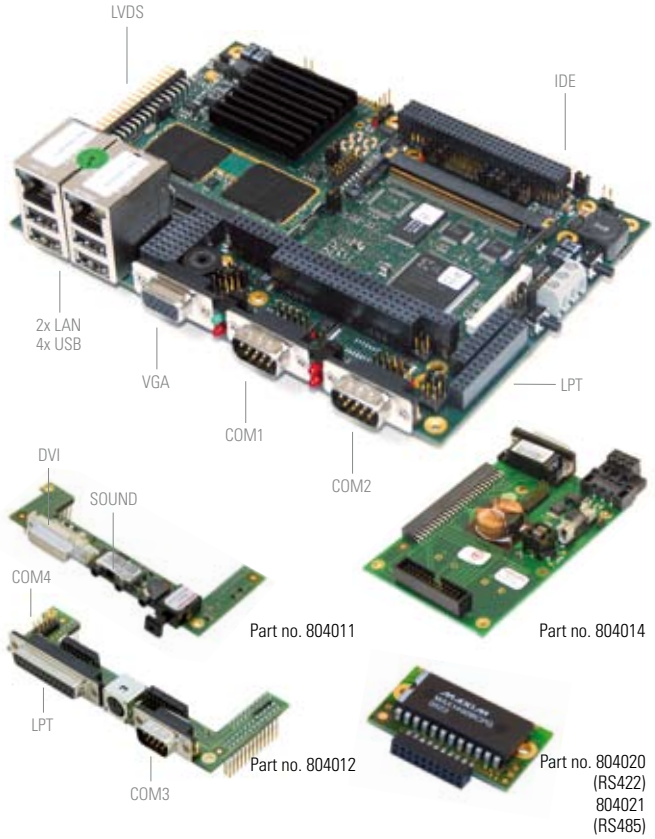
Type	MSB200-16G-xxGB	MSB200-11G-xxGB
CPU	Atom Z530	Atom Z510
ISA-BUS	-	-
PCI-BUS	yes (short)	yes (short)
PCI Express-BUS	-	-
2nd Level cache (kB)	512	512
Performance (GHz)	1.6GHz	1.1GHz
DRAM soldered	0.5 - 2GB	0.5 - 2GB
CompactFlash socket	yes, type II	yes, type II
Keyboard, mouse (PS/2)	-	-
Boot drive	HD, CF, USB, LAN	HD, CF, USB, LAN
Floppy interface	-	-
IDE interface P-ATA	CF	CF
IDE interface S-ATA	2x	2x
COM1	RS232C	RS232C
COM2	RS232C	RS232C
COM3	-	-
COM4	-	-
LPT1	yes	yes
USB (2.0)	6x, 1x client	6x, 1x client
LAN Port 1 incl. onboard transformer	10/100BASE-T	10/100BASE-T
LAN Port 2 incl. onboard transformer	1GB-LAN	1GB-LAN
Audio	Stereo In/Out	Stereo In/Out
Video controller	internal	internal
Video Memory (MB)	128 (UMA)	128 (UMA)
LCD interface (option 802276)	yes	yes
DVI interface	yes	yes
CRT interface	-	-
Video input	-	-
Watchdog	yes	yes
Power normal (typ.)	8V-30V/12W	8V-30V/10W
Power suspend	0.1W	0.1W
Power management	yes	yes
RTC battery onboard (typ. 5 years)	235mAh	235mAh
Cooling type	passive	passive
Operating temperature	-25°C to +70°C*	-25°C to +70°C
Extended operating temperature (E48)	-40°C to +85°C*	-40°C to +85°C
Size (W x L x H in mm)	146 x 102 x 22	146 x 102 x 22
Weight	150 g	150 g
MTBF	>200'000h	>200'000h
Special features 1	PCIe MiniCard socket	PCIe MiniCard socket
Special features 2	-	-
Special features 3	-	-
Part no. (incl. 0.5GB RAM)	802270	802273
Part no. (incl. 1.0GB RAM)	802271	802274
Part no. (incl. 2.0GB RAM) *(not from stock)*	802272	802275

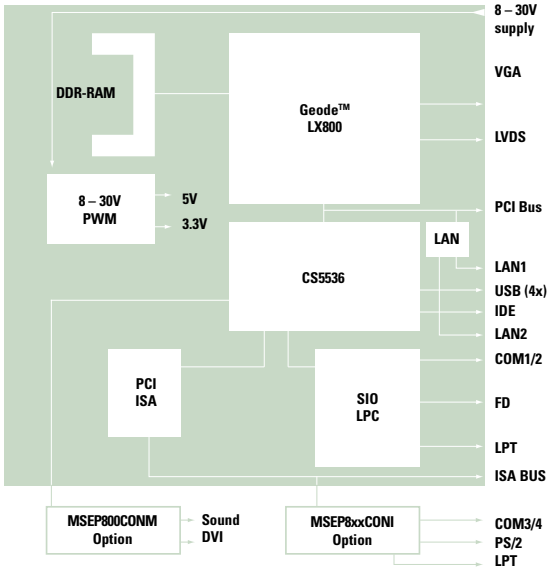
*With appropriate cooler or thermal coupling of the CPU to the housing or using 807046.



EPIC form factor

The EPIC form factor is a new, open industry standard for embedded computers. Size: 115 x 165 mm. As with the 3.5" SBC boards, all interface plugs are integrated on the board as EMC-filtered standardized plugs. This means that wiring is not necessary as it is on PC/104 boards. On DIGITAL-LOGIC's EPIC single board computer there is a PC/104-*Plus* slot which permits up to 3 ISA and/or PCI-PC/104-*Plus* cards. The EPIC boards are available with a wide range of performance bandwidths, from the AMD® LX800 (500MHz) to the Intel® Core™ Duo (2x 1.6GHz). The EPIC boards can be integrated in a housing almost without using cables. The filtered and polarity-protected power supply covers a wide voltage range, thereby saving costs and complying with EMC standards. For cooling, passive heat dissipaters or heat pipes can be fitted to the housing. For evaluation of the EPIC embedded single board computers, the CE/EMC certified MPCV800/855/945 complete systems are available, each of which has an integrated DIGITAL-LOGIC EPIC board.





MSEP800

Description

The MICROSPACE® EPIC single board computer has all standard PC functions plus a second LAN, digital and analogue IOs and an expansion bus (PC/104-*Plus* and MiniPCI). All interfaces are connected by means of standardized plugs so that housing integration is nearly cable-less. The typical power consumption of 10W means that no fan is necessary. The wide range power supply saves power costs.

Applications

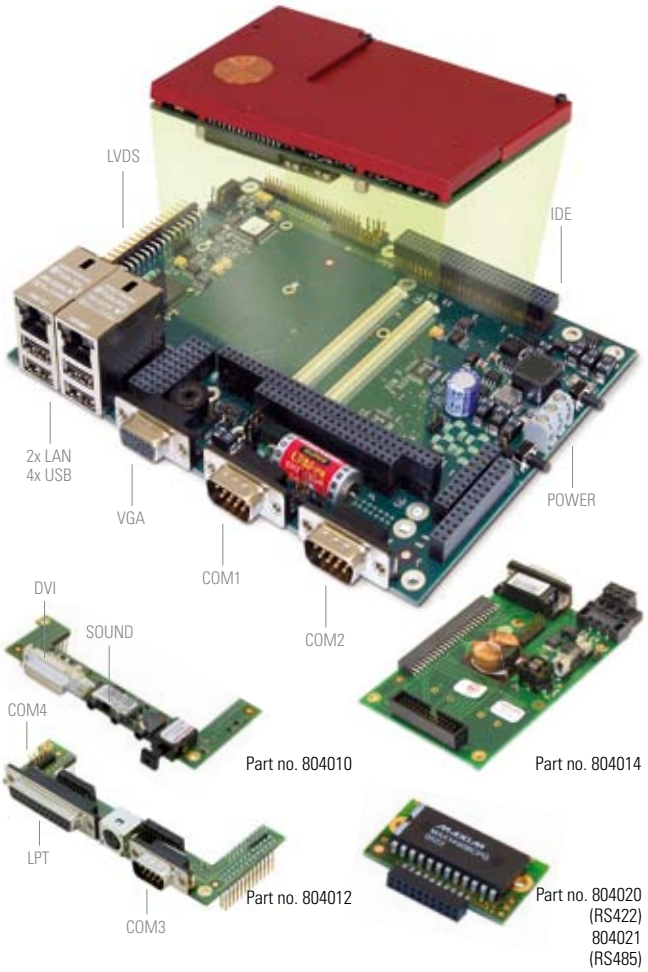
_ Security technology (video input)
_ Control technology (field bus)
_ Measurement engineering

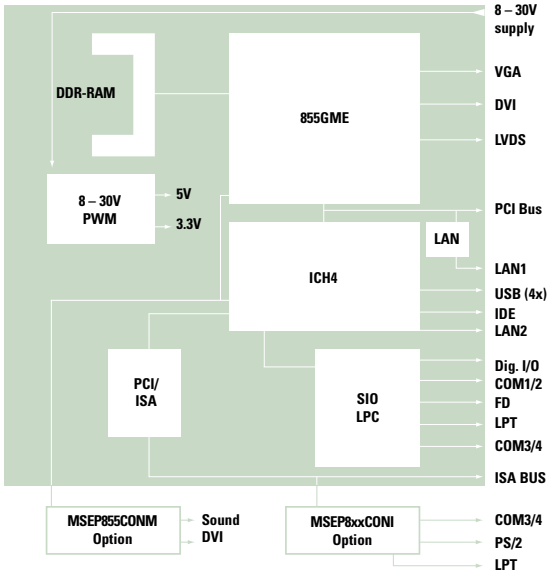
Ordering information (Option/accessories)

Article	No.	Description
SODIMM DDR 256MB	890670	333MHz, 200pin, noECC
SODIMM DDR 512MB	890671	333MHz, 200pin, noECC
SODIMM DDR 1GB	890672	333MHz, 200pin, noECC
MSEP8xx-CK	802250	Cableset: IDE (20cm), 1x MicroFD-Cable
Opt. MSEP800 CONM	804011	Multimedia Board Con: DVI, Stereo I/O, Mic., for stacking on MSEP800
Opt. MSEP8xx CONI	804012	Industrial Board Con: COM3/4 ,LPT1, PS2-M/K, for stacking on MSEP8xx
MSEP8xxPWR	804014	Industr. filtered supply, Con: DC-PowerIn, LVDS, for stacking to MSEP8xx
Option RS422 MSEP/MPCV	804020	Optoisol.RS422 1 Channel
Option RS485 MSEP/MPCV	804021	Optoisol.RS485 1 Channel
MSEP800 Option Video Inp	804055	3ch VideoInput mounted

Technical data

Type	**MSEP800**
CPU	LX800
ISA-BUS	8/16bit
PCI-BUS	yes
PCI Express-BUS	-
2nd Level cache (kB)	128
Performance (MHz)	500
DRAM Min-Max (MB)	128-1024
CompactFlash socket	yes
Keyboard, mouse (PS/2) (option 804012)	Option
Boot drive	HD, CF, USB, LAN, FD
Floppy interface	yes
IDE interface P-ATA	1x
IDE interface S-ATA	-
COM1	RS232C (9pin DSub), RS422/485
COM2	RS232C (9pin DSub), RS422/485
COM3 (option 804012 and option 804020/804021)	RS232C, RS485/22
COM4 (option 804012 and option 804020/804021)	RS232C, RS485/22
LPT1 (option 804012)	yes
USB (2.0)	4x
LAN port 1 onboard transformer	10/100BASE-T
LAN port 2 onboard transformer	1GB-LAN
Audio (option 804011)	Stereo In/Out, MIC, SPDIF
Video controller	LX800
Video memory (MB)	16 (UMA)
LCD interface	18bit-LVDS (1600 x 1200)
DVI interface (option 804011)	Option
CRT interface	yes
Video input	Option 804055
Watchdog	yes
Power normal (typ.)	8V-30V/10W
Power suspend	0.1W
Power management	yes
RTC battery onboard	900mAh (>10 years)
Cooling type	passive
Operating temperature	-25°C to +70°C
Extended operating temperature (E48)	-40°C to +85°C
Size (W x L x H in mm)	165 x 115 x 25
Weight	235 g
MTBF	>200'000h
Special features 1	MiniPCI-socket, POD80
Special features 2	8ch x 8bit analog input
Special features 3	24 Digital I/O
Part no.	804050





MSEP855

Description

The MICROSPACE® EPIC single board computer has all standard PC functions plus a second LAN, digital IOs and an expansion bus (PC/104-*Plus* and MiniPCI). All interfaces are connected by means of standardized plugs so that housing integration is nearly cable-free. The cooling design depends on the choice of processor and its power loss. The wide range power supply saves power costs.

Applications

_ Dual screen applications
_ DVI, analogue QXGA
_ Control technology (field bus)
_ Network technology (2 LAN channels)

Ordering information (Option/accessories)

Article	No.	Description
SODIMM DDR 256MB	890670	333MHz, 200pin, noECC
SODIMM DDR 512MB	890671	333MHz, 200pin, noECC
SODIMM DDR 1GB	890672	333MHz, 200pin, noECC
MSEP855 Cooler Passive	804030	incl. assembly mat.
MSEP855 Cooler active	804031	incl. assembly mat.
MSEP8xx-CK	802250	Cableset: IDE (20cm), 1x MicroFD-Cable
Opt. MSEP855 CONM	804010	Multimedia Board Con: DVI, Stereo I/O, Mic., for stacking on MSEP855
Opt. MSEP8xx CONI	804012	Industrial Board Con: COM3/4 ,LPT1, PS2-M/K, for stacking on MSEP8xx
MSEP8xxPWR	804014	Industr. filtered supply, Con: DC-PowerIn, LVDS, for stacking to MSEP8xx
Option RS422 MSEP/MPCV	804020	Optoisol.RS422 1 Channel
Option RS485 MSEP/MPCV	804021	Optoisol.RS485 1 Channel

ISA | PCI | Pentium® M | 1.0-1.8GHz | max. 1GB RAM | 2x LAN | RoHS

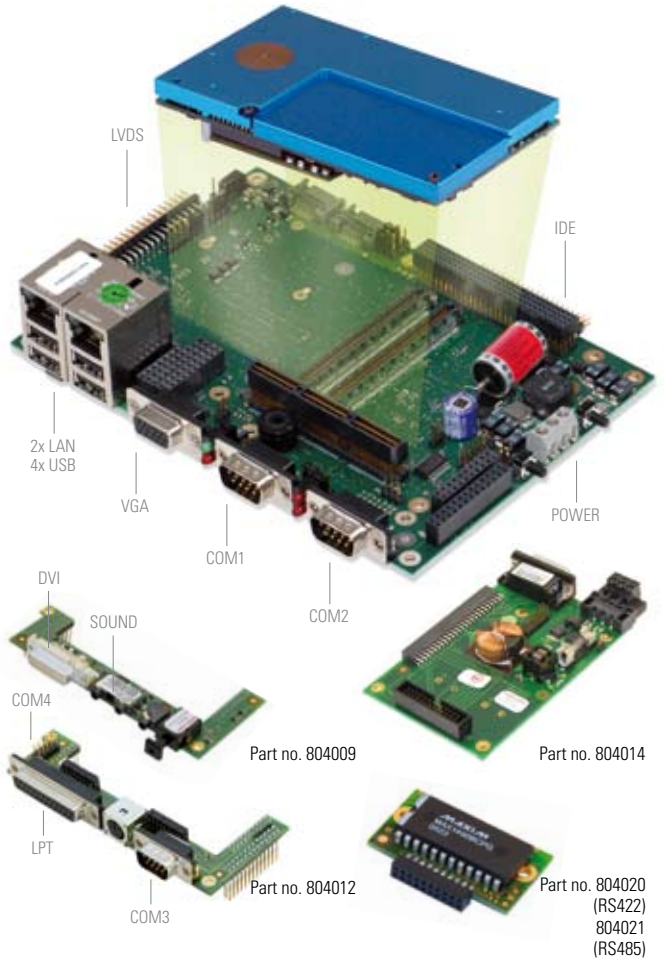
Technical data

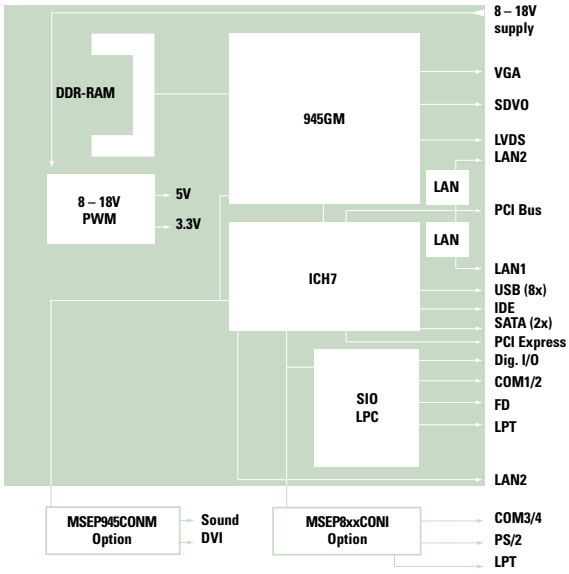
Type	**MSEP855**
CPU	SM855-xxx
ISA-BUS	8/16bit
PCI-BUS	yes, PC/104-*Plus*
PCI Express-BUS	-
2nd Level cache (kB)	0-2048
Performance (MHz)	1000-1800
DRAM Min-Max (MB)	128-1024
CompactFlash socket	yes
Keyboard, mouse (PS/2) (option 804012)	Option
Boot drive	HD, CF, USB, LAN, FD
Floppy interface	yes
IDE interface P-ATA	2x
IDE interface S-ATA	-
COM1	RS232C (9pin DSub)
COM2	RS232C (9pin DSub)
COM3 (option 804012 and option 804020/21)	RS232C, RS485/22
COM4 (option 804012 and option 804020/21)	RS232C, RS485/22
LPT1 (option 804012)	yes
USB (2.0)	6x
LAN port 1 onboard transformer	10/100BASE-T
LAN port 2 onboard transformer	1GB-LAN
Audio (option 804010)	Stereo, mic, SPDIF
Video controller	855GME
Video memory (MB)	16-64
LCD interface	18bit-LVDS (1600 x 1200)
DVI interface (option 804010)	Option
CRT interface	yes
Video input	-
Watchdog	yes
Power normal (typ.)	8V-30V/10W-20W
Power suspend	0.1W
Power management	yes
RTC battery onboard	900mAh (>10 years)
Cooling type	passive/active
Operating temperature	-25°C to +70°C [1]
Extended operating temperature (E47)	see SM855-xxx
Size (W x L x H in mm)	165 x 115 x 25
Weight (with smart)	400 g
MTBF	>200'000h
Special features 1	MiniPCI-socket, POD80
Special features 2	24 Digital I/O
Special features 3	-
Part no. (without DDR-RAM-Module, without SM855)	804000

CPUs

Article	Description	No.
SM855-C140	Intel® Celeron® M C140 (1.0GHz), OMB RAM	805192
SM855-C373	Intel® Celeron® M C373 (1.0GHz), OMB RAM	805163
SM855-P738	Intel® Pentium® M P738 (1.4GHz), OMB RAM	805164
SM855-P745	Intel® Pentium® M P745 (1.8GHz), OMB RAM	805168

[1] Depending on cooler and CPU-performance.





MSEP945/P

Description

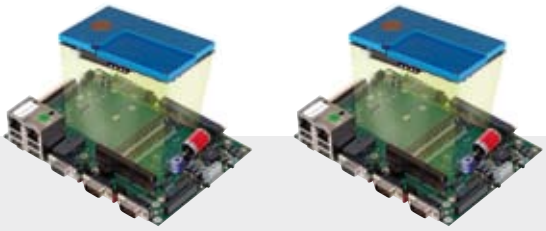
The MICROSPACE® EPIC single board computer has all standard PC functions plus a second LAN, and an expansion bus (PC/104-*Express* and MiniPCI). All interfaces are connected by means of standardized plugs so that housing integration is nearly cable-free. The cooling design depends on the choice of processor and its power loss. The wide range power supply saves power costs.

Applications

_ Dual screen applications
_ DVI, analogue QXGA
_ Up to 4x PCI/104-*Express* expansion cards for high-performance IO applications

Ordering information (Option/accessories)

Article	No.	Description
SODIMM DDR2 256MB	890674	200pin, 533MHz, noECC
SODIMM DDR2 512MB	890675	200pin, 533MHz, noECC
SODIMM DDR2 1GB	890676	200pin, 533MHz, noECC
SODIMM DDR2 2GB	890677	200pin, 533MHz, noECC
MSEP945 Cooler Passive	804032	incl. assembly mat.
MSEP945 Cooler Active	804033	incl. assembly mat.
MSEP945-CK	802251	Cableset: 2x SATA (30cm), 1x IDE (20cm)
MSEP945CONM	804009	Multimedia Board Con: DVI,Stereo I/O, Mic., for stacking on MSEP945
Opt. MSEP8xx CONI	804012	Industrial Board Con: COM3/4,LPT1, PS2-M/K, for stacking on MSEP8xx
MSEP8xxPWR	804014	Industr. filtered supply, Con: DC-PowerIn, LVDS, for stacking to MSEP8xx
Option RS422 MSEP/MPCV	804020	Optoisol.RS422 1 Channel
Option RS485 MSEP/MPCV	804021	Optoisol.RS485 1 Channel



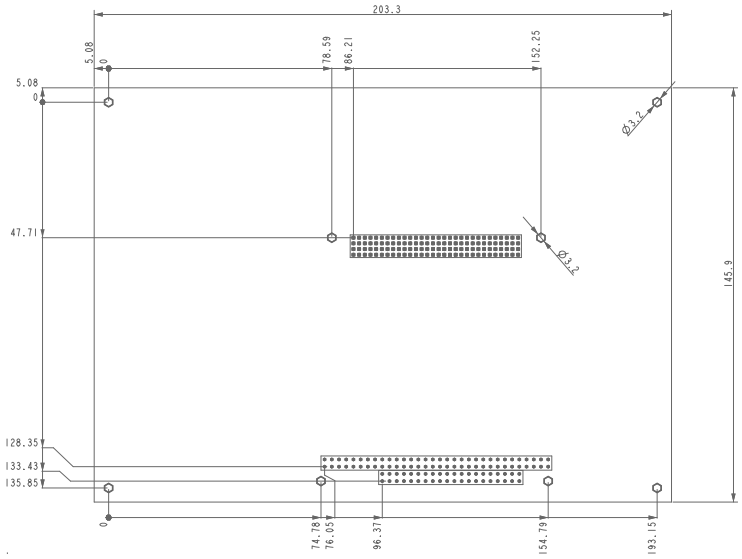
Technical data

Type	MSEP945	MSEP945P
CPU	SMX945/B	SMX945/B
ISA-BUS	-	-
PCI-BUS	yes	yes
PCI Express-BUS	-	yes, on the top
2nd Level cache (kB)	0-4096	0-4096
Performance (MHz)	2x 1600, Atom N270	2x 1600, Atom N270
DRAM Min-Max (MB)	256-2048/3072	256-2048/3072
CompactFlash socket	yes	yes
Keyboard, mouse (PS/2) (Option 804012)	Option	Option
Boot drive	FD, HD, USB, LAN, CF	FD, HD, USB, LAN, CF
Floppy interface	-	-
IDE interface P-ATA	1x	1x
IDE interface S-ATA	2x	2x
COM1	RS232C	RS232C
COM2	RS232C	RS232C
COM3 (Option 804012)	RS232C [3) 4)]	RS232C [3) 4)]
COM4 (Option 804012)	RS232C [3) 4)]	RS232C [3) 4)]
LPT1	yes	yes
USB (2.0)	6x [2)]	6x [2)] + 2x on PCI/104-*Express*
LAN port 1 onboard transformer	10/100BASE-T	10/100BASE-T
LAN port 2 onboard transformer	1GB-LAN PCIe	1GB-LAN (PCIe)
Audio (option 804009)	AC97-7.1 option	AC97-7.1 option
Video controller	i945GME	i945GME
Video memory (MB)	16-256	16-256
LCD interface	LVDS	LVDS
DVI interface (option 804009)	Option	Option
CRT interface	yes	yes
Video input	-	-
Watchdog	yes	yes
Power normal (typ.)	8V-18V/25W	8V-18V/25W
Power suspend	0.1W	0.1W
Power management	yes	yes
RTC battery onboard	900mAh (10 years)	900mAh (10 years)
Cooling type	passive/active	passive/active
Operating temperature	-25°C to +70°C [1)]	-25°C to +70°C [1)]
Extended operating temperature (E47)	see SMX945-xxx	see SMX945B-xxx
Size (W x L x H in mm)	165 x 115 x 25	165 x 115 x 25
Weight (with smart)	380 g	385 g
MTBF	>200'000h	>200'000h
Special features 1	MiniPCI-socket	MiniPCI-socket
Special features 2	-	-
Special features 3	-	-
Part no. (without RAM, without SMX945)	804070	804074

CPUs

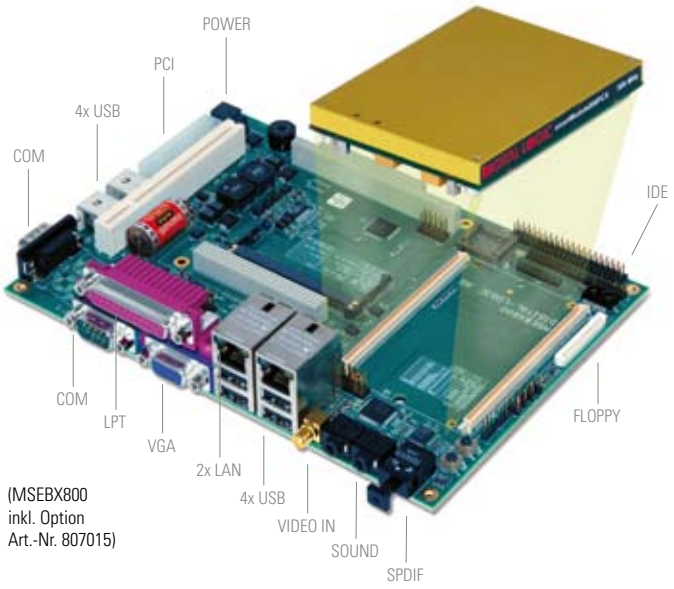
Article	Description	No.	No.
SMX945-L7400	Intel® Core™2 Duo-L7400, 0MB RAM	805352	805352
SMX945-L2400	Intel® Core™ Duo-L2400, 0MB RAM	805350	805350
SMX945B-L2400	Intel® Core™2 Duo-L7400, 1MB RAM	805450	805450
SMX945B-L7400	Intel® Core™2 Duo-L7400, 1MB RAM	805452	805452
SMX945B-N270	Intel® Atom, 1MB RAM	805472	805472

[1)] Depending on cooler and CPU-performance. [2)] 4x USB on connectors (cable) and 2x on the header (internal).
[3)] With option 804021: RS485 is possible. [4)] With option 804020: RS422 is possible.

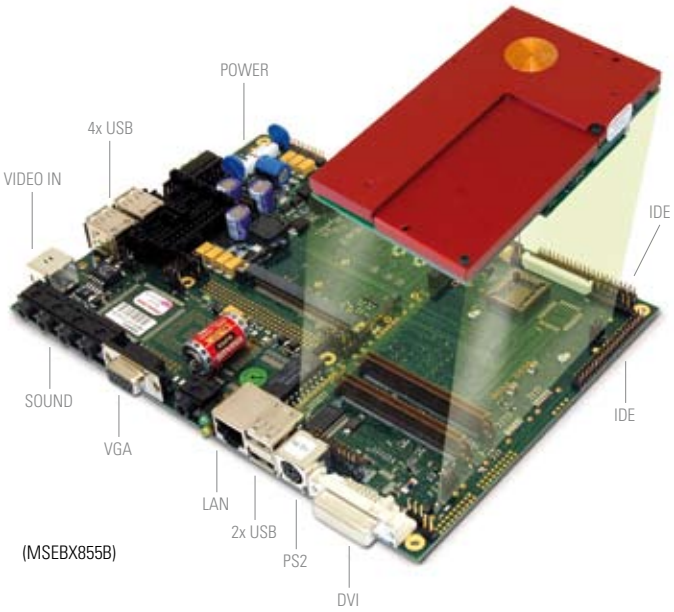


EBX form factor

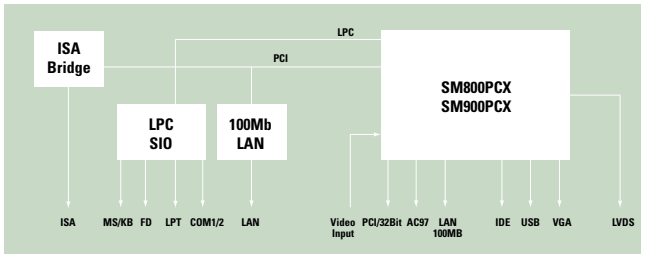
The EBX form factor is a well-known open industry standard for embedded computers since 1992. Size: 146 x 203 mm. Like the EPIC boards, all interface plugs are integrated on the board as EMC-filtered standardized plugs. This makes them nearly cable-free. On DIGITAL-LOGIC's EBX single board computer there is a PC/104-*Plus* slot which permits up to 4 ISA and/or PCI-PC/104-*Plus* cards. The new MSEBX945P provides a PCI/104-*Express* expansion slot. The EBX boards are available in a wide performance bandwidth, from the AMD LX800 for the Intel® Processor M (1000MHz) to Core™2 Duo (2x 1.6 GHz and 3GB RAM). Different configuration variants can be ordered in each performance class. The EBX boards can be integrated in a housing with virtually no cables. The power supply is available in a broad, cost-saving voltage range. For cooling, passive heat dissipaters or heat pipes can be fitted to the housing.

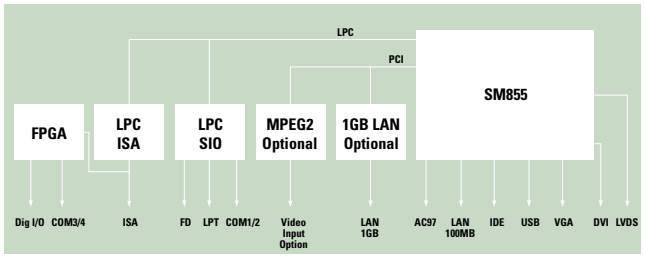


(MSEBX800
inkl. Option
Art.-Nr. 807015)



(MSEBX855B)





MSEBX800/855

Description

The MICROSPACE® EBX embedded computer board MSEBX8xx has all of the standard PC interfaces plus a second ethernet LAN, a video input for connecting a video camera, COM3/4, 24 bit digital IO, dual screen video (DVI, LVDS, VGA) and an AC97-5.1 sound controller. In contrast to the PC/104-*Plus* cards, all interfaces are connected to standard plugs; this means low-cost, cable-free housing integration. The PC/104-*Plus* bus (32 bit PCI, ISA), the MiniPCI base and 6 USB interfaces are available as functional extensions. The power consumption (12W to 25W), the cooling method, the ambient working temperature, and performance are all directly related to the choice of smartModule855-xxxx.

Applications

_ Image processing
_ Dual screen information terminals
_ Control of interactive devices via USB or up to 4x COM

Ordering information (Option/accessories)

Article	No.	Description
SODIMM DDR 256MB	890670	333MHz, 200pin, noECC
SODIMM DDR 512MB	890671	333MHz, 200pin, noECC
SODIMM DDR 1GB	890672	333MHz, 200pin, noECC
SM855 Cooler passive	805170	for SM855 modules
SM855 Cooler active	805171	for SM855 modules
Option L+	807006	PC/104plus Con. long not with Opt.CF (807007)
Option P+	807005	PC/104plus Con. short
Option-IShort	807015	PC/104 ISA Connect.short
Option-ILong	807016	PC/104 ISA Connect.long
Option CF2	807007	CF Socket Type II not with Opt.-L+ (807006)
MSEBX855-PCICONV-V02	811205	MSEBX855-PCICONV PCI-Raisercard for PCI standart adapters
MSEBX855-CK	811212	Cablekit: 1xLPT,FD-Cable, 4xCOM, 2xIDE (20cm)

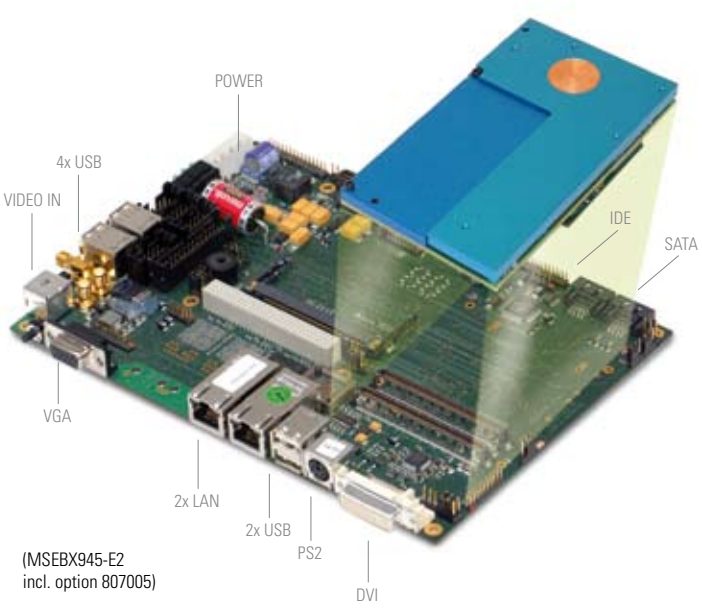
Technical data

Type	MSEBX800	MSEBX855-B
CPU	SM800PCX	SM855-xxx
ISA-BUS (option 807015/807016)	16bit, PC/104 option	8bit, PC/104 option
PCI-BUS (option 807005//807006)	(5slot) PC/104-*Plus* option	(4slot) PC/104-*Plus* option
PCI Express-BUS (PCI/104-***Express***)	-	-
2nd Level cache (kB)	128	0-2048
Performance (MHz)	500	1000-1800
DRAM Min-Max (MB)	1024	256-1024
CompactFlash socket (option 807007)	-	Option
Keyboard, mouse (PS/2)	yes	yes
Boot drive	FD, HD, USB, LAN	FD, HD, USB, LAN, CF
Floppy interface	yes	yes
IDE interface P-ATA	1x	2 x
IDE interface S-ATA	-	-
COM1	RS232C	RS232C
COM2	RS232C	RS232C
COM3	-	RS232C/RS422/485
COM4	-	RS232C/RS422/485
LPT1	yes	yes
USB (2.0)	4x	6 x
LAN port 1 onboard transformer	10/100BASE-T	10/100BASE-T
LAN port 2 onboard transformer	10/100BASE-T	-
Audio	Stereo	AC97-5.1
Video controller	internal, LX800	i855GME
Video memory (MB)	16	16-64
LCD interface	LVDS, 24bit, 1600 x 1200	LVDS, 18bit, 1600 x 1200
DVI interface	-	yes
CRT interface	yes	yes
Video input	yes	-
Watchdog	yes	yes
Power normal (typ.)	10V-30V/10W	10V-30V/12-25W
Power suspend	0.1W	0.1W
Power management	yes	yes
RTC battery onboard	900mAh (10 years)	900mAh (10 years)
Cooling type	passive	passive/active
Operating temperature	-25°C to +70°C [1]	-25°C to +70°C [1]
Extended operating temperature (E47)	see SM800/SM900 PCX	see SM855-xxx
Size (W x L in mm)	203 x 146 x 29	203 x 146 x 29
Weight (with smart)	410 g	470 g
MTBF	>200'000h	>200'000h
Special features 1	POD	POD
Special features 2	-	24bit Digital I/O
Special features 3	-	-
Part no. (without RAM, without SM855)	811060	811200

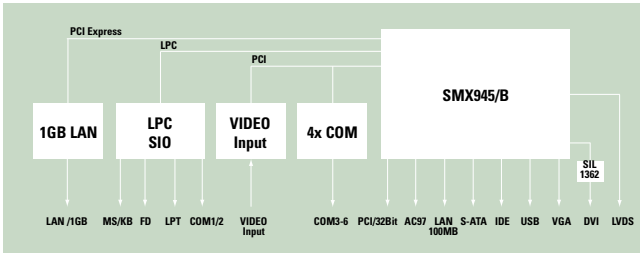
CPUs

Article	Description	No.	No.
SM855-C140	Intel® Celeron® M C140 (1.0GHz), 0MB RAM	-	805192
SM855-C373	Intel® Celeron® M C373 (1.0GHz), 0MB RAM	-	805163
SM855-P738	Intel® Pentium® M P738 (1.4GHz), 0MB RAM	-	805164
SM855-P745	Intel® Pentium® M P745 (1.8GHz), 0MB RAM	-	805168
SM800PCX	AMD Geode LX800, 0MB RAM	805212	-

[1] Depending on cooler and CPU-performance.



(MSEBX945-E2
incl. option 807005)



Option A2 (811350)

Option A8 DVI (811352)

MSEBX945/A/AU

Description

The MICROSPACE® EBX embedded computer board MSEBX945 has all of the standard PC interfaces plus up to 4 ethernet LANs (incl. 3x 1GB), a 3-channel input for connecting a video camera, COM3/4/5/6, SATA interface, dual screen video (2x DVI, LVDS, VGA) and an AC97-7.1 sound controller. All interfaces are connected by means of standardized plugs, enabling cost-efficient, cable-free housing integration. The PC/104 Express bus (32 bit PCI, PCI Express), the MiniPCI base and 8 USB interfaces are available as functional extensions. The power consumption (12W to 25W), the cooling method, the ambient working temperature, and performance are all directly related to the choice of smartModule945-xxxx.

Applications

_ Image processing
_ Dual screen multimedia information terminals
_ Control of interactive devices

Ordering information (Option/accessories)

Article	No.	Description
SODIMM DDR2 256MB	890674	200pin, 533MHz, noECC
SODIMM DDR2 512MB	890675	200pin, 533MHz, noECC
SODIMM DDR2 1GB	890676	200pin, 533MHz, noECC
SODIMM DDR2 2GB	890677	200pin, 533MHz, noECC
SMX9/G45 passive cooler	805370	incl. assemblymat.
SMX9/G45 active cooler	805371	incl. assemblymat.
MSEBX945-A2	811350	Connectorboard: Stereo -Sound I/O for E2-Boards
MSEBX945-A8DVI	811352	Connectorboard: 2nd DVI, 8channel Sound HDA
Option CF2	807007	CF Socket Type II not with Opt.-L+ (807006)
Option L+	807006	PC/104plus Con. long not with Opt.CF (807007)
Option P+	807005	PC/104plus Con. short
MSEBX945-CK	811347	Cablekit: 1xLPT, FD, 4x COM(DSub9), 2xSATA

PCI | PCIe | Core™2 Duo Atom™ | 2x 1.6GHz | max. 3GB RAM | 4x LAN | RoHS



Technical data

Type	MSEBX945-E2	MSEBX945A-E4	MSEBX945AU-E2
CPU	SMX945-xxx/SMX945B-xxx	SMX945-xxx/SMX945B-xxx	SMX945-xxx/SMX945B-xxx
ISA-BUS	-	-	-
PCI-BUS (Option 807005/807006)	Option (3 slot)	Option (3 slot)	Option (3 slot)
PCI Express-BUS (PCI/104-*Express*)	-	-	yes, on the top
2nd Level cache (kB)	0-4096	0-4096	0-4096
Performance (MHz)	2x 1600, Atom N270	2x 1600, Atom N270	2x 1600, Atom N270
DRAM Min-Max (MB)	256-3072 (SMX945B)	256-3072 (SMX945B)	256-3072 (SMX945B)
CompactFlash socket (option 807007)	Option	Option	Option
Keyboard, mouse (PS/2)	yes	yes	yes
Boot drive	FD, HD, USB, LAN, CF	FD, HD, USB, LAN, CF	FD, HD, USB, LAN, CF
Floppy interface	yes	yes	yes
IDE interface P-ATA	1x	1x	1x
IDE interface S-ATA	2x	4x	4x
COM1	RS232C/RS422/485	RS232C/RS422/485	RS232C/RS422/485
COM2	RS232C/RS422/485	RS232C/RS422/485	RS232C/RS422/485
COM3/4	RS232C	RS232C	RS232C
COM5/6	TTL	TTL	TTL
LPT1	yes	yes	yes
USB (2.0)	8x	8x	6x + 2x on PCI/104-*Express*
LAN port 1 onboard transformer	10/100BASE-T	10/100BASE-T	10/100BASE-T
LAN port 2 (+3/4)	1x 1GB-LAN PCIe (82573)	3x 1GB-LAN PCIe (82574)	1x 1GB-LAN PCIe (82574)
Audio	AC97-7.1 option	AC97-7.1 option	AC97-7.1 option
Video controller	i945GME	i945GME	i945GME
Video memory (MB)	8-224	8-224	8-224
LCD interface	LVDS	LVDS	LVDS
DVI interface	yes (Option 2.DVI)	yes (Option 2.DVI)	yes (Option 2.DVI)
CRT interface	yes	yes	yes
Video input	BT878, 3 channels	BT878, 3 channels	BT878, 3 channels
Watchdog	yes	yes	yes
Power normal (Single 12Volt supply) (typ.)	8V-18V/25W	8V-30V/25W	8V-30V/25W
Power suspend (Single 12Volt supply)	0.1W	0.1W	0.1W
Power management	yes	yes	yes
RTC battery onboard	900mAh (10 years)	900mAh (10 years)	900mAh (10 years)
Cooling type	passive/active	passive/active	passive/active
Operating temperature	-25°C to +70°C[1)]	-25°C to +70°C[1)]	-25°C to +70°C[1)]
Extended operating temperature (E47)	see SMX945-xxx	see SMX945-xxx	see SMX945-xxx
Size (W x L in mm)	204 x 146 x 29	204 x 146 x 29	204 x 146 x 29
Weight (with smart)	460 g	480 g	465 g
MTBF	>200'000h	>200'000h	>200'000h
Special features 1	-	LPC-POD	LPC-POD
Special features 2	8bit Digital I/O	8bit Digital I/O	8bit Digital I/O
Special features 3	COM5/6 (TTL)	COM5/6 (TTL)	COM5/6 (TTL)
Part no. (without RAM, without SMX945)	811341	811372	811376

CPUs

Article	Description	No.	No.	No.
SMX945-L7400	Intel® Core™2 Duo-L7400, 0MB RAM	805352	805352	805352
SMX945-L2400	Intel® Core™ Duo-L2400, 0MB RAM	805350	805350	805350
SMX945B-L2400	Intel® Core™2 Duo-L7400, 1MB RAM	805450	805450	805450
SMX945B-L7400	Intel® Core™2 Duo-L7400, 1MB RAM	805452	805452	805452
SMX945B-N270	Intel® Atom, 1MB RAM	805472	805472	805472

[1)] Depending on cooler and CPU-performance.

MSM855CKCON (Part no. 803030)

Cable (Part no. 802032)

2x **LAN for CON** | 80mm | Part no. 802030

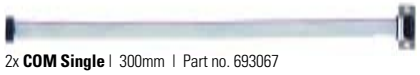
IDE | 100mm | Part no. 802601

Sound for CON | 150mm | Part no. 693064

Micro-Floppy | 150mm | Part no. 802600

VGA | 300mm | Part no. 693065

LPT | 300mm | Part no. 693066



2x **COM Single** | 300mm | Part no. 693067

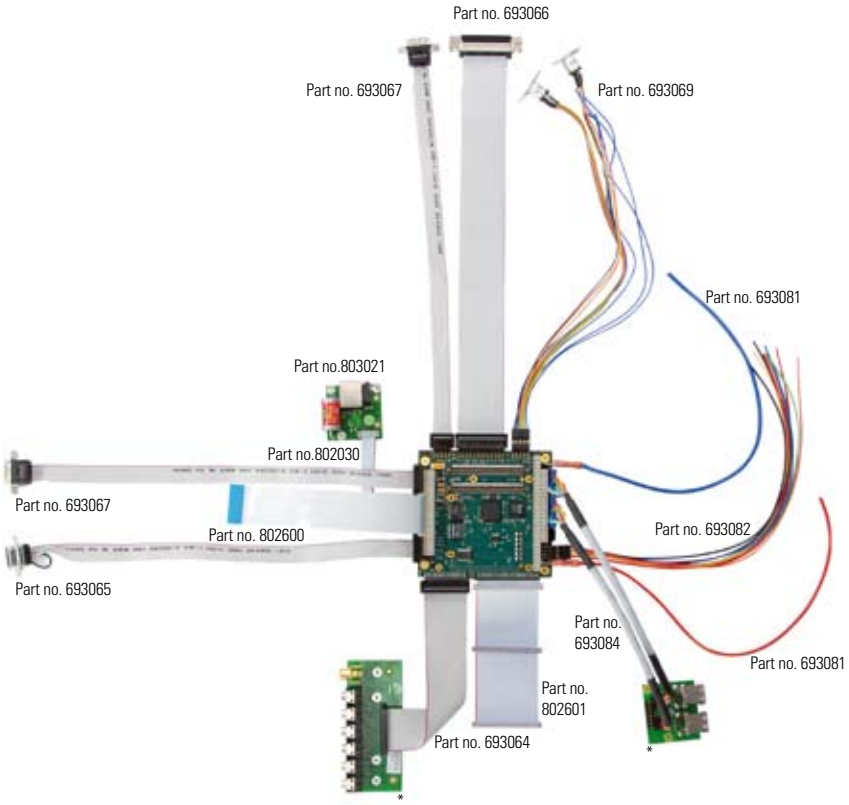
2x **USB for CON** | 220mm | Part no. 693084

8 pin | 300mm | Part no. 693082

KB/MS | 300mm | Part no. 693069

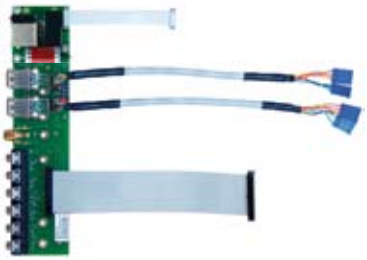
Feed | 300mm | Part no. 693081

Example MSM855B



* Segmants from part no. 803031, separated.

PCB connectors



MSM855CON | Part no. 803031

MSM855BLANCON | Part no. 803022 for MSM855B2

MSM855LANCON | Part no. 803020 for MSM855B

MSM855BLANCON | Part no. 803021 for MSM855B

MSM800CKCON (Part no. 803035)

Cable (Part no. 802035)

1x **LAN for CON** | 80mm | Part no. 802030

IDE | 100mm | Part no. 802601

Sound for CON | 150mm | Part no. 693064

Micro-Floppy | 150mm | Part no. 802600

VGA | 300mm | Part no. 693065

LPT | 300mm | Part no. 693066

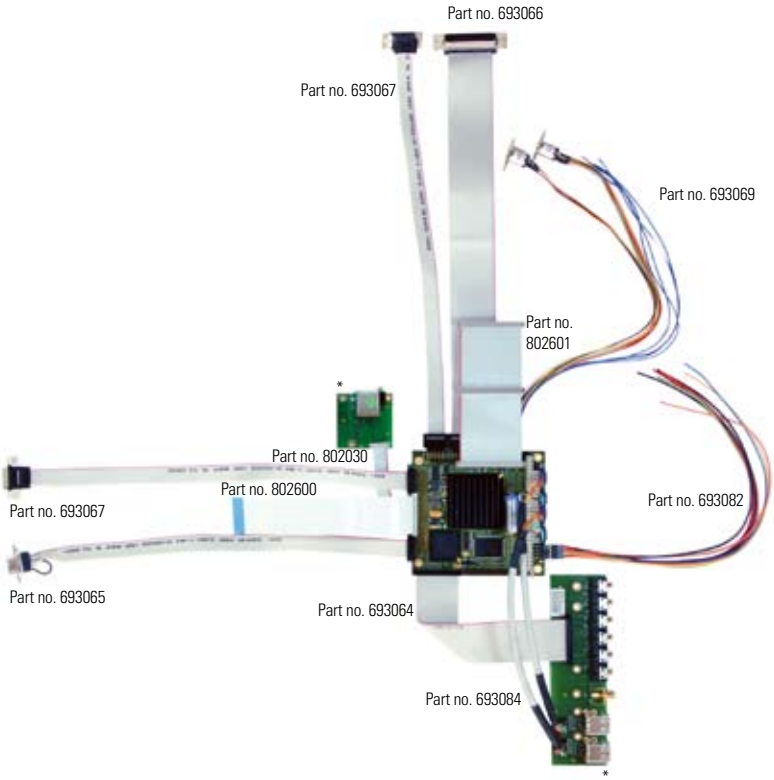
2x **COM Single** | 300mm | Part no. 693067

2x **USB for CON** | 220mm | Part no. 693084

8 pin | 300mm | Part no. 693082

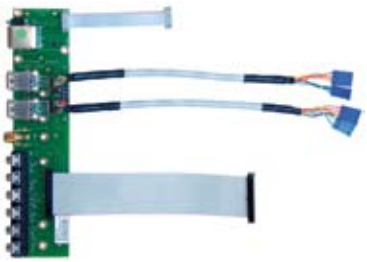
KB/MS | 300mm | Part no. 693069

Example MSM800SEV (or MSM900BEV/XEV)



* Segments from part no. 803036, separated.

PCB connectors



MSM800CON | Part no. 803036

MSM800LANCON | Part no. 803046

MSM945CKCON (Part no. 803230)

Cable (Part no. 802005)

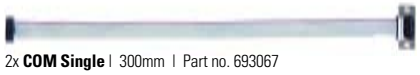
2x **LAN for CON** | 80mm | Part no. 802030

IDE | 100mm | Part no. 802601

2x **SATA** | 300mm | Part no. 693087

VGA | 300mm | Part no. 693065

LPT | 300mm | Part no. 693066

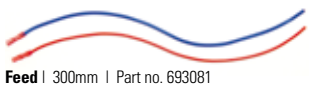


2x **COM Single** | 300mm | Part no. 693067

2x **USB for CON** | 220mm | Part no. 693084

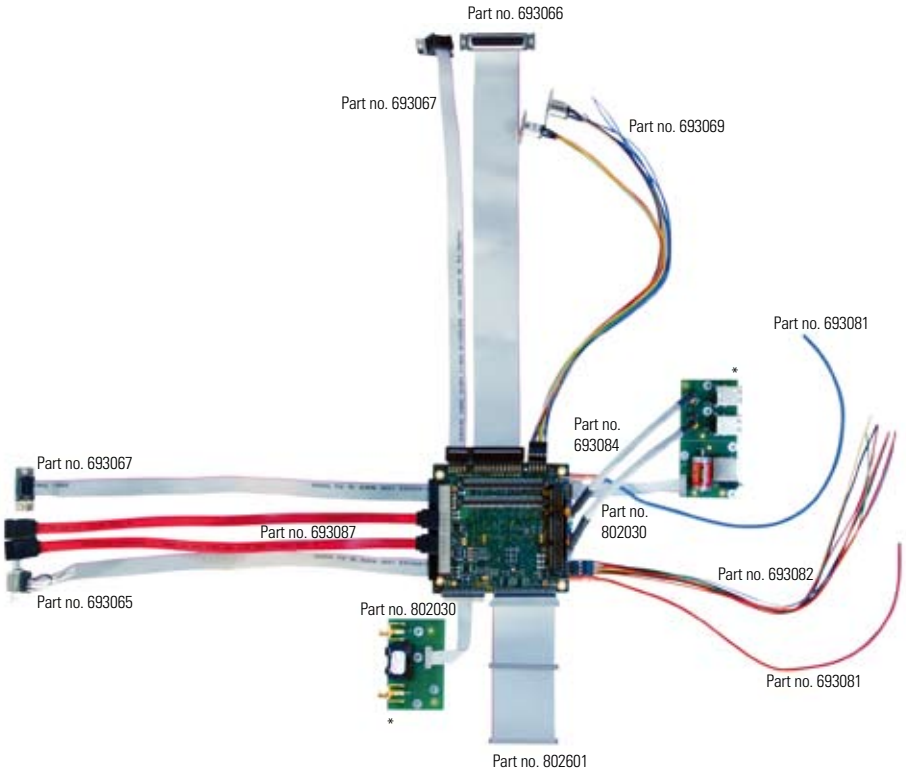
8 pin | 300mm | Part no. 693082

KB/MS | 300mm | Part no. 693069



Feed | 300mm | Part no. 693081

Example MSM945



* Segments from part no. 803231, separated.

PCB connectors

MSM945CON | Part no. 803231

MSM945LANCON | Part no. 803220

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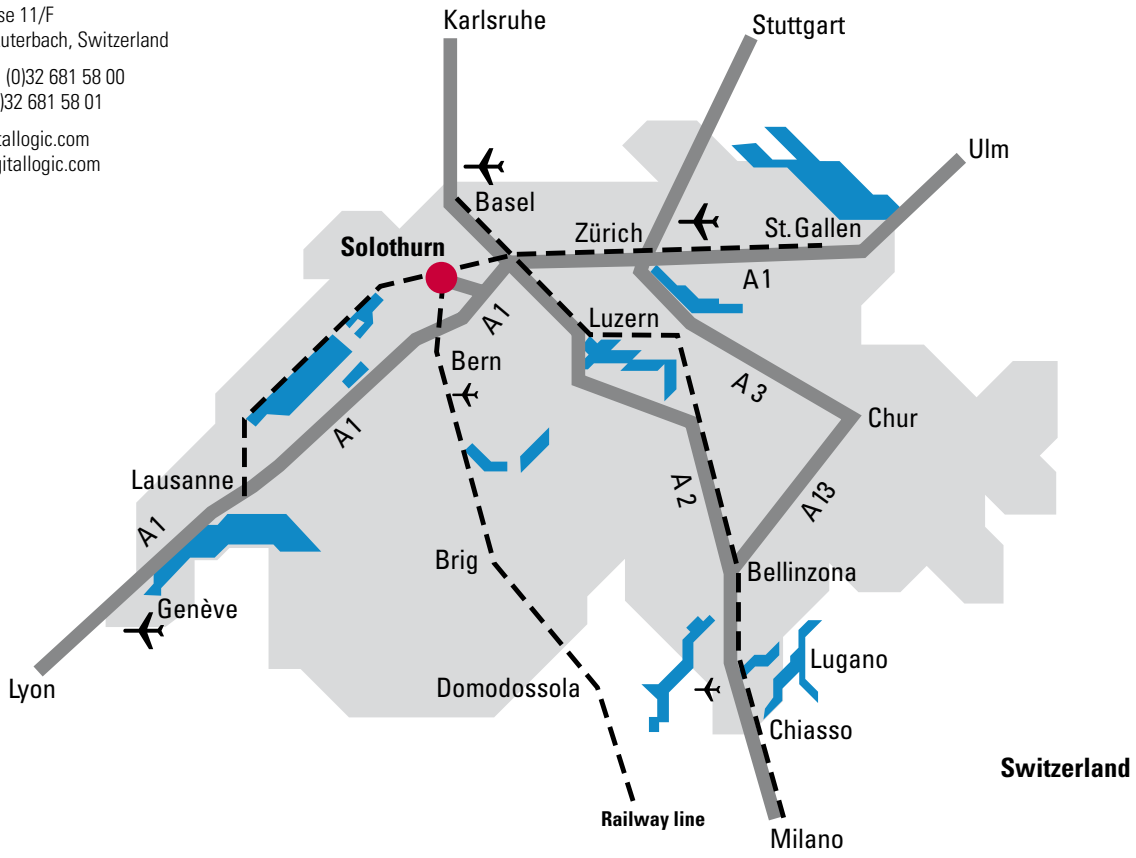

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