

F18E - 3U CompactPCI® Express Core 2 Duo SBC



- Intel® Core™ 2 Duo T7500, 2.2 GHz
- Dual core 64-bit processor
- 4 HP CompactPCI® Express system master
- PCI Express® 4x1 links on system slot
- Up to 4 GB DDR2 DRAM soldered
- CompactFlash® slot
- 3 SATA interfaces
- Video via VGA and SDVO
- Front: 1 Gigabit (PCIe®) and 1 Fast Ethernet
- Rear: 1 Gigabit Ethernet (PCIe®)(optional)
- 9 USB 2.0
- High Definition audio
- Board controller

The F18E is designed for performing system-slot functionality in a CompactPCI® Express system. Equipped with the Intel® high-performance Core 2 Duo processor T7500 running at 2.2 GHz, the F18E is a versatile 4HP/3U (single-slot, single-size Eurocard) single-board computer based on the latest multi-core processor architecture from Intel® with full 64-bit support. The board delivers an excellent graphics performance and is designed especially for embedded systems which require high computing performance with low power consumption.

A total of six PCI Express® lanes for high-speed communication (such as Gigabit Ethernet) are supported on the F18E. 1 x1 PCIe® link is used for one of the two onboard Ethernet interfaces. 4 x1 PCIe® links are available via rear I/O. 1 x1 link is available via the side card connector and can be used for connection of an additional Gigabit Ethernet via rear I/O.

The DDR2 DRAM is soldered to F18E to guarantee optimum shock and vibration resistance. A robust IDE CompactFlash® device offers nearly unlimited space for user applications. In addition to parallel ATA, three serial ATA lines are available.

The standard I/O available at the front panel of F18E includes graphics on a VGA connector, one Fast and one Gigabit Ethernet interface as well as two USB 2.0 ports. Three USB interfaces and one SATA line can be accessed via rear I/O.

The F18E can be extended by different side cards.

Additional functions include up to two digital video input for flat panel connection via DVI (multimedia), a variety of different UARTs or another four USB 2.0 ports, SATA for hard disk or RAID connection and HD audio.

Thermal supervision of the processor and a watchdog for the operating system complete the functionality of the F18E.

The F18E operates in Windows® and Linux environments as well as under real-time operating systems that support Intel®'s multi-core architecture. The Award BIOS was specially designed for embedded system applications.

Equipped with Intel® components exclusively from the Intel® Embedded Line, the F18E has a guaranteed minimum standard availability of 5 years.

The F18E is suited for a wide range of industrial applications, e.g. for monitoring, vision and control systems as well as test and measurement. Main target markets comprise industrial automation, multimedia, traffic and transportation, aerospace, shipbuilding, medical engineering and robotics.

The F18E comes with a tailored passive heat sink within 4 HP height. Anyhow, forced air cooling is always required inside the system. The robust design of the F18E make the board especially suited for use in rugged environments with regard to shock and vibration according to applicable DIN, EN or IEC industry standards. The F18E is also ready for coating so that it can be used in humid and dusty environments.

Technical Data

CPU

- Intel® Core™ 2 Duo T7500
 - Dual-core 64-bit processor
 - 2.2GHz processor core frequency
 - Up to 800MHz front-side bus frequency
- Chipset
 - Northbridge: Intel® 965GME Express
 - Southbridge: Intel® ICH8M-E (Enhanced)

Memory

- 4MB L2 cache integrated in Core 2 Duo
- Up to 4GB SDRAM system memory
 - Soldered
 - DDR2
 - 667MHz memory bus frequency
 - Dual-channel, 2x64 bits
- 8Mbits boot Flash
- Serial EEPROM 2kbits for factory settings
- CompactFlash® card interface
 - Via onboard IDE
 - Type I
 - True IDE
 - DMA support

Mass Storage

- Parallel IDE (PATA)
 - One IDE port for local CompactFlash®
- Serial ATA (SATA)
 - Two channels via side-card connector, one channel via rear I/O
 - Transfer rates up to 300MB/s
 - RAID level 0/1 support

Graphics

- Integrated in 965GME Express chipset
 - Up to 500MHz 256-bit graphics core
 - Maximum resolution: 2048 x 1536 pixels @ 60Hz, 32bpp reduced blanking timing (driver limited)
- VGA connector at front panel
- Two SDVO ports available via side-card connector
 - Two additional DVI connectors at front panel optional via side card

I/O

- USB
 - Two USB 2.0 ports via Series A connectors at front panel
 - Four USB 2.0 ports via side-card connector
 - Three USB 2.0 ports via rear I/O connector J4
 - UHCI implementation
 - Data rates up to 480Mbits/s
- Ethernet
 - One 10/100/1000Base-T Ethernet channel via RJ45 connector at front panel

- Ethernet controller connected by one x1 PCIe® link
- One 10/100Base-T Ethernet channel via RJ45 connector at front panel
- Connected to Southbridge via LCI
- One 10/100/1000Base-T Ethernet channel via rear I/O (optional)
- Connected via side-card connector
- Onboard LEDs to signal activity status and connection speed
- High Definition (HD) audio
 - Accessible via side-card connector

Front Connections (Standard)

- VGA
- Two USB 2.0 (Series A)
- Two Ethernet (RJ45)

Miscellaneous

- Board controller
- Real-time clock, buffered by a GoldCap or alternatively a battery (5 years life cycle)
- Watchdog timer
- Temperature measurement
- One user LED
- Reset button

PCI Express®

- One x1 link to connect local 1000Base-T Ethernet controller
 - Data rate 250MB/s in each direction (2.5 Gbits/s per lane)
- Four x1 links for rear I/O on J2/J3
 - Data rate up to 1GB/s in each direction (2.5 Gbits/s per lane)
- One x1 link via side-card connector
 - Data rate 250MB/s in each direction (2.5 Gbits/s per lane)

CompactPCI® Express

- Compliance with CompactPCI® Express PICMG EXP.0 R1.0 Specification
- CompactPCI® Express connector P1 for power supply
- CompactPCI® Express connectors J2 and J3 for four PCI Express® x1 links
- CompactPCI® Express connector J4 for rear I/O

Electrical Specifications

- Supply voltage/power consumption:
 - +5V (-3%/+5%), 3.22A (no load), 3.17A (load 66%), 3.16A (full load)
 - +12V (-10%/+10%), 0.39A (no load), 2.18A (load 66%), 2.87A (full load)
- MTBF: tbd @ 40°C according to IEC/TR 62380 (RDF2000)

Technical Data

Mechanical Specifications

- Dimensions: conforming to CompactPCI® Express specification for 3U boards
- Front panel: 4HP with ejector
- Weight: 420g

Environmental Specifications

- Temperature range (operation):
 - 2.2GHz Core 2 Duo T7500: 0..+60°C
 - Airflow: 1.5m/s
- Temperature range (storage): -40..+85°C
- Relative humidity (operation): max. 95% non-condensing
- Relative humidity (storage): max. 95% non-condensing
- Altitude: -300m to + 2,000m
- Shock: 15g/11ms
- Bump: 10g/16ms
- Vibration (sinusoidal): 1g/10..150Hz
- Conformal coating on request

Safety

- PCB manufactured with a flammability rating of 94V-0 by UL recognized manufacturers

EMC

- Tested according to EN 55022 (radio disturbance), IEC1000-4-2 (ESD) and IEC1000-4-4 (burst)

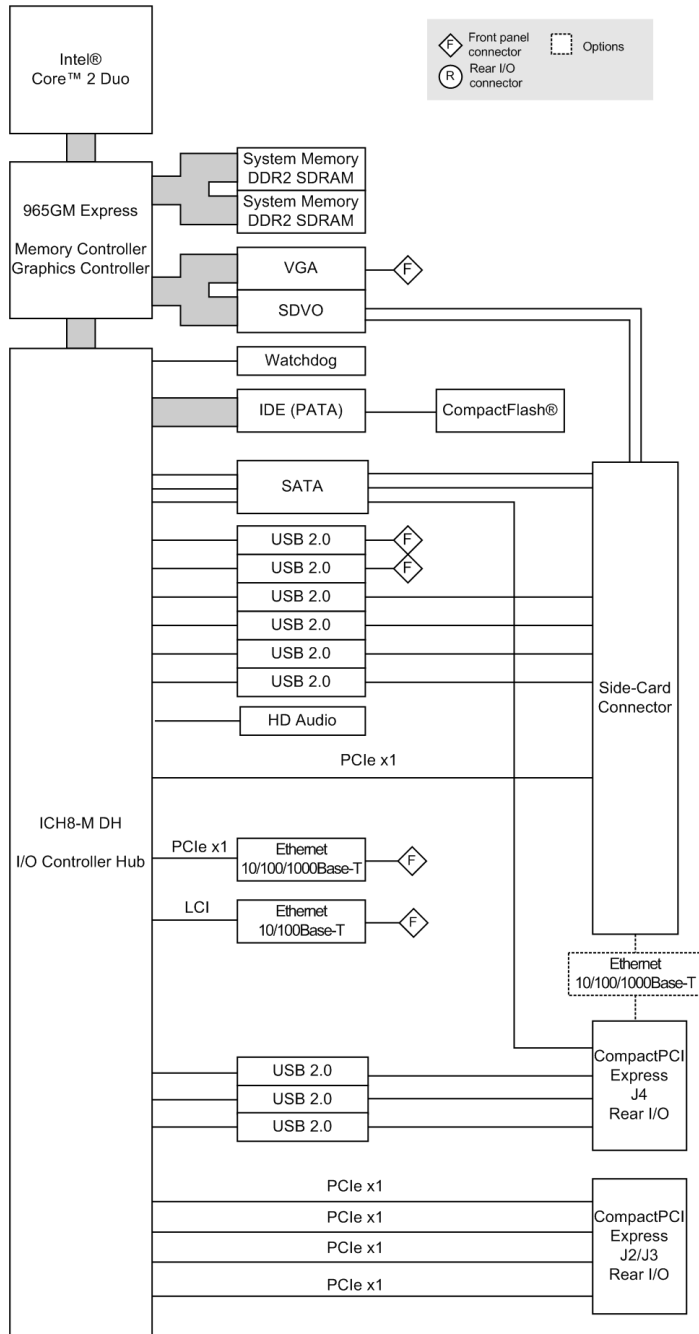
BIOS

- Award BIOS

Software Support

- Note that 64-bit hardware technology requires 64-bit operating system support
- Windows® (including Vista)
- Linux
- VxWorks® (on request)
- QNX® (on request)
- Intel® Virtualization Technology, allows a platform to run multiple operating systems and applications in independent partitions; one computer system can function as multiple "virtual" systems
- For more information on supported operating system versions and drivers see Software.

Diagram



Configuration & Options

Standard Configurations

Article No.	CPU Type	Clock	System RAM	CFlash	Side Card Slot	Operation Temperature
02F018E00	T7500	2.2 GHz	2 GB	0 MB	right	0..+60°C

Options

CPU

- Core 2 Duo T7500, 2.2GHz (35W)
- Core 2 Duo L7500 1.6 GHz (17W)
- Core 2 Duo U7500 1.06GHz (10W)

Memory

- System RAM
 - 256 MB, 512 MB, 1 GB, 2 GB or 4 GB
- CompactFlash®
 - 0 MB up to maximum available

Graphics

- One or two DVI-D connectors at front via side card
 - Simultaneous connection of two monitors

I/O

- Ethernet
 - 9-pin D-Sub connector with one or two 10/100Base-T ports instead of two RJ45 connectors

Rear I/O

- Ethernet
 - One additional Ethernet channel (via side-card connector, no side card can be used in this configuration)
 - Via one PCI Express® link on side board connector

Operation Temperature

- Depends on system configuration (CPU, hard disk, heat sink...)
- Maximum: +60°C
- Minimum: -40°C (all processors)

Please note that some of these options may only be available for large volumes. Please ask our sales staff for more information.

Ordering Information

Standard Hardware

02F018E00 Intel Core 2 Duo T7500, 2 GB DDR2 DRAM, 1 Gb Ethernet, 1 Fast Ethernet, 2 USB, VGA, CPCI Express with 4 PCIe links x1 on XJ2/XJ3, SATA x1 and USB x3 on rear I/O XJ4, 0..+60°C

Memory

0751-0032 CompactFlash card, 8 GB, Type I, -40..+85°C, fixed bit set

0751-0038 CompactFlash card, 256 MB, Type I, removable, -40..+85°C

0751-0039 CompactFlash card, 512 MB, Type I, removable, -40..+85°C

0751-0040 CompactFlash card, 1 GB, Type I, fixed bit set, -40..+85°C

0751-0041 CompactFlash card, 2 GB, Type I, fixed bit set, -40..+85°C

0751-0042 CompactFlash card, 4 GB, Type I, fixed bit set, -40..+85°C

Miscellaneous

Software: Windows

13T003-70 Windows chipset driver (Intel) for F14, F15, F17, F18, F18E, F19P, D9, D6, D7, D601, A19 and A20

Documentation

20F018E00 F18E User Manual

For the most up-to-date ordering information and direct links to other data sheets and downloads, see the F18E online data sheet under » www.men.de.

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