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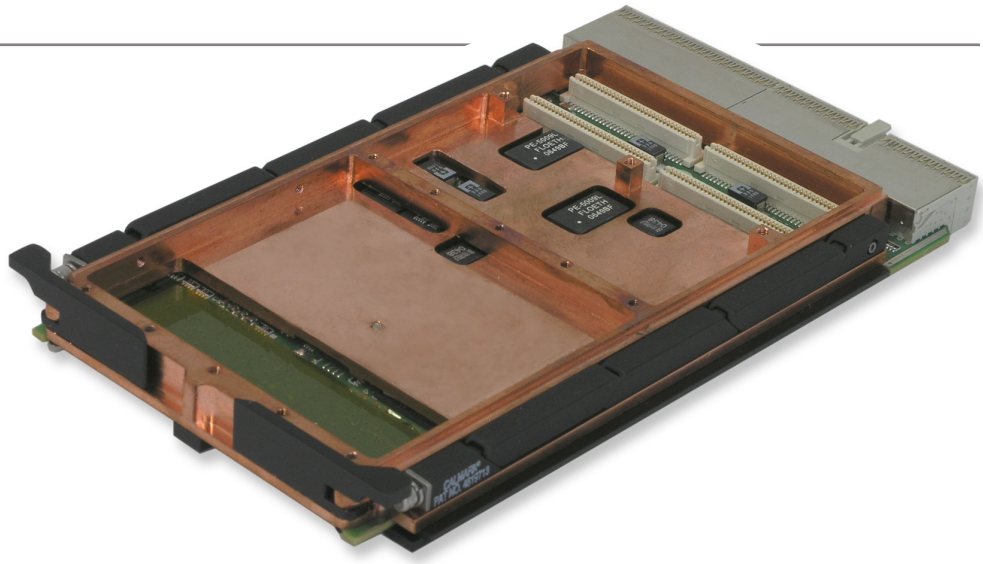
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CM6

PowerPC® MPC 8641D 3U CompactPCI™ Embedded Computer

The CM6 is a 3U CompactPCI CPU board with integrated dual core or single core Freescale MPC8641 processor. The MPC8641D follows the system on a chip approach by integrating the memory controller, Ethernet channels, PCI Express as well as UARTs and timers.

The processor includes one or two execution cores in a single processor case, each core with its own L1 and L2 cache including AltiVec support. This enables execution of parallel threads or applications on separate cores with dedicated CPU resources.

CM6 is designed to meet the requirements of markets such as telecom, simulation/ training, test and measurement, military and aerospace.

Based on the Freescale MPC8641D, the platform is designed to support processor speed up to 1.33 GHz. Rugged needs are addressed with an optional extended temperature range of -40 °C to +85 °C and conformal coating. Shock and vibration immunity is designed in with stiffener bars, wedge locks and conduction cooling.

The CM6 provides a unique feature set, including up to 1 Gbyte of DDR2 SDRAM with ECC, system and non-system mode support for the CPCI backplane, one PMC interface (64-bit/100 MHz). A high level of functional integration (two Gigabit Ethernet, two serial interfaces (RS-232 and RS-422/485), Flash and GPIOs) within a single slot gives users the freedom to use the PMC for their application-specific I/O.

Supported operating systems are Linux®, and VxWorks®. LynxOS® and Integrity are available on request.

The CM6 is designed for RoHS compliance.

FEATURES:

- Freescale™ PowerPC® MPC8641 in single or dual core with AltiVec™
- Freescale 8640/8640D ready
- Up to 1333 MHz
- Integrated 64 Kbyte L1 and 1 Mbyte L2 cache per core
- Ultra compact, one slot
- System and non-system functionality
- Up to 1 Gbyte DDR2 SDRAM with ECC
- Up to 256 Mbyte Flash
- 128 Kbyte nvSRAM
- 32-bit/66 MHz CPCI backplane
- Two Gigabit Ethernet ports on rear
- One PMC extension Slot (64-bit/100 MHz)
- Two UART serial controller
  - 1x RS-232
  - 1x RS-422/485
- Four 32-bit timer/counter
- Eight General Purpose I/Os
- RTC, watchdog, temperature sensors
- Optional –40 °C to +85 °C
- Optional conduction cooled
- High shock and vibration immunity with stiffener bars and wedge locks
- Conformal coating on request
- Customer specific, low cost assembly versions
- RoHS compliant

abaco SYSTEMS

CM6 *PowerPC® MPC 8641D 3U CompactPCI™ Embedded Computer*

Specifications

Processor – PowerPC MPC8641

- Single or dual core PowerPC e600
- 1000 MHz to 1333 MHz
- Integrated L2 cache with ECC
- High efficiency on-board switching regulator (DC/DC)
- COP interface at rear I/O
- Fanless cooling with heat sink

* Contact factory for latest CPU versions

Processor	Level 1	Level 2 Cache
MPC8641	32 Kbyte	1 Mbyte
MPC8641D	32 Kbyte	2x 1 Mbyte

CompactPCI

- PICMG® 2.0 R3.0 compliant CPCI 32-bit/66 MHz local bus standard
- System/non-system PCIe-PCI bridge from Pericom for up to 7 slots
- J1+2, 2 mm pin and socket connectors (IEC-1076-4-101)

Chipset – System-on-Chip MPC8641

- Up to 600 MHz internal MPX bus
- DDR2 memory interface up to 667 MHz data rate
- PCI Express
- Ethernet MAC controllers
- Multi processor interrupt controller
- Four channel DMA controller

Memory – DDR2 667

- High-speed up to 667 MHz (PC5400) DDR2 SDRAM
- 64 bit wide with optional ECC
- Up to 1 Gbyte with soldered components

PCI express to PCI

- PCI buses provided through PCIe/PCI bridges Pericom PI7C9110 and PI7C9X130

PMC Extension Slot - IEEE P1386/1386.1

- 64-bit/100 MHz PCI-X
- With front panel I/O and partly rear I/O
- 100 MHz operation with 3.3 V I/O
- 33 MHz operation with 5 V I/O tolerance
- Supports ccPMC Draft Standard VITA 20 – 199x with style 8

Gigabit Ethernet

- MPC8641 integrated Ethernet MAC controller
- Transmit and receive FIFO
- MV88E1118 PHYs with GMII interface
- Two 10/100/1000BaseX with auto-negotiation
- Available at rear

Flash

- Up to 256 Mbyte 32-bit wide Flash for boot and application code
- Software and hardware write protected

nvSRAM and RTC

- Simtek STK17TA8 device
- 128 Kbyte autostore nvSRAM
- Real time clock (no backup)

Serial I/O - RS232/485

- Integrated in MPC8641
- Two async. 16550 compatible full duplex serial channels
- Available on the rear
- High-speed transfer up to 115.2 Kbaud with 16 byte FIFOs
- COM1 with RS-232 and COM2 with RS-422/485 driver
- Each interface with RxD, TxD, RTS, CTS

General Purpose Inputs/Outputs

- eight GPIO (input or output) pins with interrupt capability
- Available at rear I/O shared with PMC I/O signals

EEPROM

- 1 Mbit (128 Kbyte) serial EEPROMs for non-volatile user data

Watchdog

- Can drive interrupt or reset
- Configurable granularity from 256 ms to 16 s

Temperature Sensors

- CPU die and heat sink temperature software readable in the range of –55 °C to +127 °C

Front and Onboard I/O

Function	On-board I/O	Rear I/O
Gigabit Ethernet 0		√
Gigabit Ethernet 1	-	√
COM 1 & 2		√
PMC I/O or GPIO		√
Reset		√
COP		√
LED	√	
Board Fail		√
Write Protect		√
Config Detect		√

Boot Loader

- VxWorks Boot Loader
- Alternatively PMON Boot Loader and functions

Software

- The following software is supported to the extended list below.

OS	On Request	Planned
VxWorks	-	√
Linux	-	√
Integrity	√	
LynxOS	√	

Power Requirements

- +5 V, +3.3 V — Required
- -12 V, +12 V — If required by mounted PMC module

Power Consumption - typical operating current (estimated)

- 512 Mbyte memory bank and without PMC module.

MPC8641	5 V	3.3 V	Total Power
1.0 GHz LV Dual	3.4 A	4.0 A	26 W
1.33 GHz Dual	6.4 A	4.0 A	41 W

Operating estimated at VxWorks prompt, no power saving

Power Allowances - PMC slot

- +5 V, +3.3 V: Total power max. 7.5 W
- ±12 V: 100mA each

Styles

Function	Style 1	Style 3	Style 8
Front Panel	yes	yes	no
Front Stiffener	no	no	yes
Middle Stiffener	no	no	yes
Wedge Locks	no	no	yes
Parts Soldered	yes	yes	yes
Ext. Temperature	no	yes	yes
Conformal Coating	no	no	yes
Conduction Cooled	no	no	yes

Mechanical – PICMG 2.0

- 3U, 1 slot wide, (100 x 160 x 20 mm)

Temperature

Note: For detailed information about the operating temperature behavior of the board of any style it is absolutely necessary to consult the manual. The processor type and speed, altitude, the use or not use of Ethernet, ambient conditions and the type of cooling influence the board temperature range.

- All values under typical conditions without PMC.
- Range

	Operating	Storage
Standard	0 °C to +70 °C	–40 °C to +85 °C
Extended	–40 °C to +85 °C	–40 °C to +85 °C
Rugged	–40 °C to +85 °C	–55 °C to +105 °C

Humidity

- Operating: 5 – 95 % @ 40 °C
- Storage: 5 – 95 % @ 40 °C
- Non condensing

Altitude

- Operating: 15.000 ft. (4.5 km)
- Storage: 40.000 ft. (12 km)
- Vacuum for conduction cooled board (contact factory)

Shock (3 axis, up & down, 5 hits/direction)

- Styles 1, 3: 12 g / 6 ms
- Style 8: 100 g / 6 ms, 40 g / 11 ms

Vibration (60 minutes each axis)

- Styles 1, 3: 2 g rms @ 5 to 100 Hz
- Style 8: 14 g rms @ 5 to 2000 Hz

VITA 47

- Designed to meet VITA 47 class EAC1, EAC3 and ECC4

MTBF

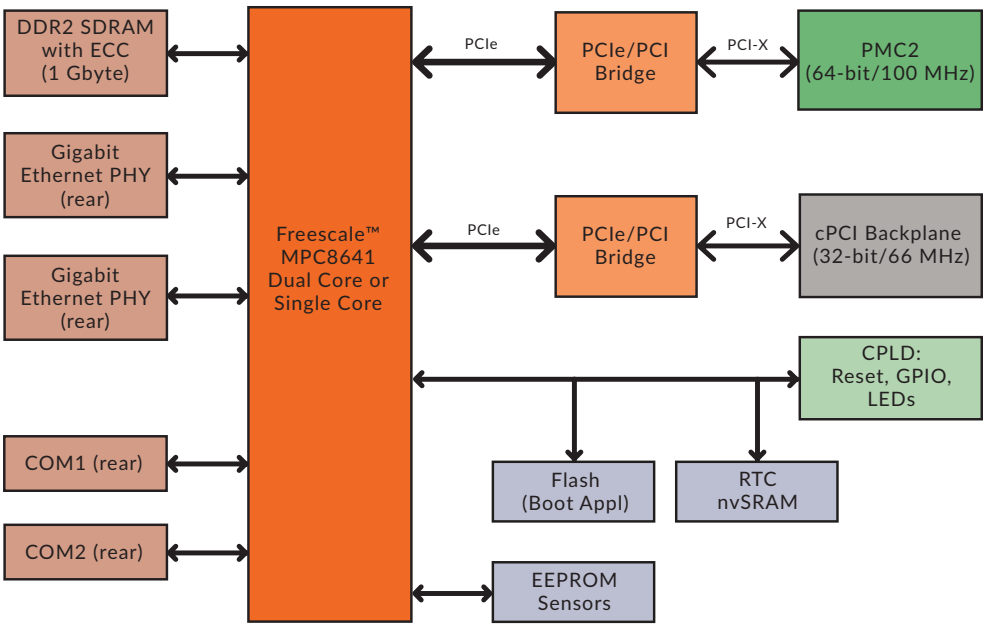
- Calculations are available in accordance with MIL-HDBK-217 FN2

Safety

- All PCBs are manufactured with flammability rating of 94V-0 by UL recognized manufacturer
- Designed to meet standard UL 60950

CM6 *PowerPC® MPC 8641D 3U CompactPCI™ Embedded Computer*

Block diagram



Ordering information

Hardware Accessories

CTM19	I/O transition module for 3U backplane (IEEE 1101.11-1998 compliant)
SC-484TB05CM6R	4U, 19” starter cage with 5 CPCI slots, backplane, power supply

Operating Systems

Extensive operating systems support is available, (see page 3 of this document).
Chassis with power supplies, backplanes and drives on request.
For detailed information and further options, contact Abaco Systems

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