

CR12

Intel® Core™ i7 Based Rugged CPCI Single Board Computer

Features

- 6U CPCI universal System/Peripheral board
- Support for Hot Swap
- Intel Core i7 Processor up to 2.53 GHz
- Integrated two channel DDR3-1067 memory controller with ECC
- Up to 4 MB shared cache
- Up to 8 GB soldered DDR3 SDRAM with ECC
- Up to 16 GB NAND Flash (soldered)
- Dual on-board Expansion Sites: 2x PCI-X PMC and 1 x4, 1 x8 PCIe XMC
- Front I/O:
 - 2x Gigabit Ethernet ports
 - 1x VGA
 - 1x USB
 - 1x COM port
- Rear IO:
 - 2x Gigabit Ethernet ports (PICMG 2.16)
 - 1x VGA (2 ports possible if front IO not required)
 - 2x DVI
 - 3x SATA2 (3 Gb/s) ports
 - 2x COM ports
 - 4x USB ports
 - 13x GPIO
 - 2x PMC (64 I/O signals per site)
- BIOS backup Flash
- Optional on-board SATA HDD
- Optional conduction cooling
- Optional extended operating temperature range
- Single slot 6U CPCI form factor
- Operating system support for VxWorks®, Linux®, and Windows®

The CR12 Rugged Single Board Computer (SBC) from GE Intelligent Platforms features the high performance, highly integrated Core i7 processor platform from Intel.

Core i7 offers integrated graphics and memory controller plus dual core processing up to 2.53 GHz all in one device. Coupled with the Mobile Intel QM57 Express Chipset this provides an unmatched level of I/O bandwidth for both on-board and off-board functions.

Features of the Core i7 processor

- Intel Intelligent Power Technology allows processors to operate at optimal frequency and power.
- Intelligent performance on-demand with Intel Turbo Boost Technology
- Multi-level shared cache improves performance and efficiency by reducing latency to frequently used data
- Hyper-Thread Technology – 2 threads per core
- Streaming SIMD extensions 4.1/4.2

In addition to a comprehensive range of onboard I/O features, the CR12 also offers two on-board mezzanine expansion sites for enhanced system flexibility, both of which offer PMC and XMC capability. Memory resources include up to 8 GB DDR3 SDRAM, 16 GB NAND Flash, optional SATA hard drive, BIOS Flash and BIOS backup Flash.

The CR12 is designed to meet the requirements of a wide range of applications from industrial through to fully rugged Defense and Aerospace programs. It offers extended temperature capability and a range of air and conduction cooled build levels.

Specifications

Processor

- Intel Core i7 32 nm Processor; options include but are not limited to:
 - ULV @ 1.06 GHz
 - LV @ 2.0 GHz
 - SV @ 2.53 GHz
- Up to 4 MB shared cache
- Integrated two channel DDR3-1067 memory controller with ECC

SDRAM

- Maximum memory configuration of up to 8 GB DDR3 SDRAM soldered with ECC

Flash Memory

- Soldered NAND flash array up to 16 GB

UEFI (replaces BIOS)

- The CR12 System UEFI includes all functions required by the processor core and chipset
- Will also support expansion ROM code for remote booting from either of the dual Ethernet ports

Ethernet

- Dual Gigabit Ethernet interface via two Intel 82574 Gigabit Ethernet controllers – routed to front panel
- Dual Gigabit Ethernet interface via two Intel 82574 Gigabit Ethernet controllers – routed to rear (PICMG® 2.16 compliant)

USB Ports

- Three USB 2.0 ports: one routed to front panel I/O, and two to rear P2 connector
- Keyboard and Mouse (PS2) emulation via USB

CompactPCI Backplane Interface

- PICMG 2.0 R3.0 compliant CPCI local bus standard

Serial Ports

- Three 16550 compatible full duplex async serial ports
- One routed to front panel RS232 (COM3)
- Two routed to P2, with user selectable RS232/422/485
- Ports feature independent 16-byte FIFO supporting baud rates up to 115 Kbaud



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Specifications (continued)

Processor - μ FCBGA, Low Power Design

- Up to 2 on-board mezzanine expansion sites
 - Site 1 PMC (PCI-X up to 64-bit /133 MHz) and XMC (x8 PCIe Gen 2) capable
 - Site 2 PMC (PCI-X up to 64-bit /133 MHz) and XMC (x4 PCIe Gen 2) capable
- PCI signaling is 3.3V, 5V tolerant

Video

- Provided via the integrated Intel Graphics Controller
- One VGA port routed to front panel (or optionally to rear panel)
- One VGA port plus two TMDS (DVI-D) ports routed to rear I/O (for use with CTM20)
- Any 2 ports can be used for dual display operation

SATA

- Three SATA2 (3 Gb/s) ports to rear I/O

GPIO

- 13 GPIO pins - software configurable

On-board Hard Drive

- 2.5" SATA hard drive or Flash disk can be optionally ordered (precludes use of PMC/XMC site 2)

Power Requirements

- +5, +3.3V, +12V (plus -12V if required by mounted PMC module)

EEPROM/Watchdog/RTC/Timers/Temp sensors

- 512 kbit serial EEPROM for non-volatile user data
- SuperIO watchdog
- 146818 RTC compatible with Li battery (battery not on Level C, D, E variants)
- Legacy PC-AT timer and HPET (High Precision Event Timer) provided from QM57
- CPU die and Chipset die, software readable

Other HW Features

- Hardware Write Protection (rear pin)
- Front power button (and rear)
- Three status LEDs and four BIT status LEDs at front, two status LEDs signals at rear
- IPMI 2.0 Controller (PICMG 2.9)

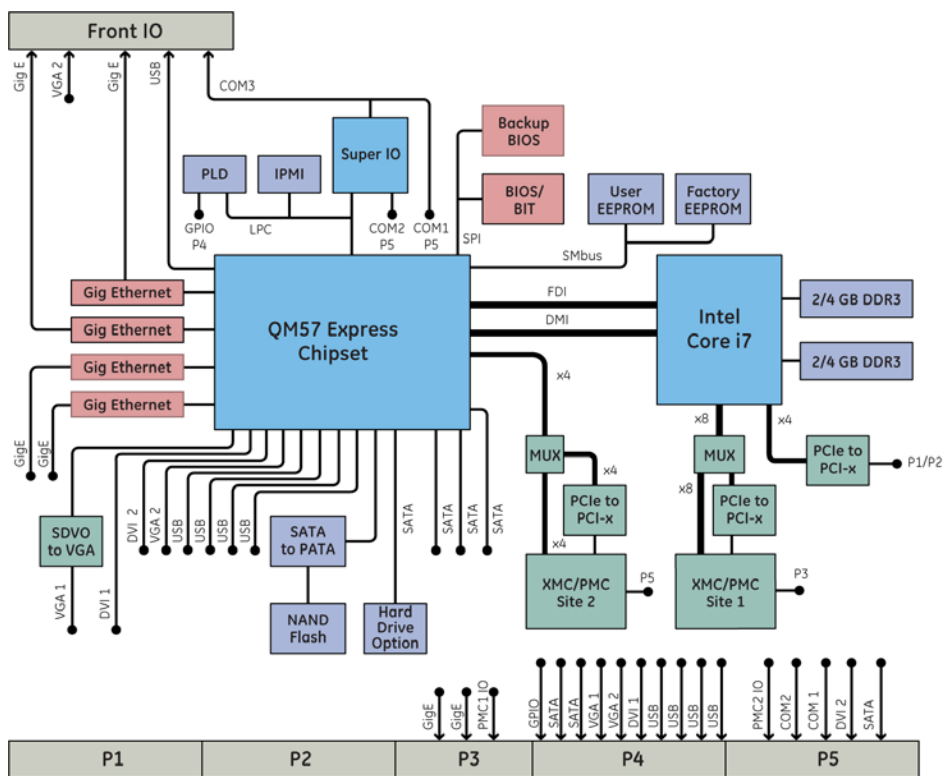
Transition Module

- CTM20

Software

- Support for Windows, Linux, VxWorks

Block Diagram



Environmental

	Level 1	Level 2	Level 3	Level 4	Level 5
Cooling Method	Convection	Convection	Convection	Conduction	Conduction
Conformal Coating	Optional	Standard	Standard	Standard	Standard
High/Low Temp	0 to +55° C	-20 to +65° C	-40 to +75° C	-40 to +75° C	-40 to +85° C
Operational	(300 ft/m)	(300 ft/m)	(600 ft/m)	At cold wall	At cold wall
Random Vibration	0.002g ² /Hz*	0.002g ² /Hz*	0.04g ² /Hz**	0.1g ² /Hz**	0.1g ² /Hz**
Shock	20g***	20g***	20g***	40g***	40g***

*With a flat response to 1000 Hz, 6 dB/Oct roll-off from 1000 to 2000 Hz ** From 10 to 1000 Hz *** Peak sawtooth 11 ms duration

About GE Intelligent Platforms

GE Intelligent Platforms, a General Electric Company (NYSE: GE), is an experienced high-performance technology company and a global provider of hardware, software, services, and expertise in automation and embedded computing. We offer a unique foundation of agile, advanced and ultra-reliable technology that provides customers a sustainable advantage in the industries they serve, including energy, water, consumer packaged goods, government and defense, and telecommunications. GE Intelligent Platforms is a worldwide company headquartered in Charlottesville, VA and is part of GE Home and Business Solutions. For more information, visit www.ge-ip.com.

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