



# XCR14

## 2<sup>nd</sup> Generation Intel® Core™ i7 Based Rugged CPCI Single Board Computer

### Features

- Single slot 6U CPCI universal System/Peripheral board
- Support for Hot Swap
- 2nd Generation Intel Core i7 dual and quad core processors
- Integrated two channels up to 16 GB soldered DDR3 SDRAM with ECC
- Up to 6 MB shared cache
- Up to 8 GB NAND Flash (soldered)
- Dual on-board Expansion Sites: two PCI-X PMC and one x4, one x8 PCIe XMC
- Front I/O:
  - 2x Gigabit Ethernet ports
  - 1x VGA
  - 1x USB
  - 1x COM port
- Rear I/O:
  - 2x Gigabit Ethernet ports (PICMG 2.16)
  - 1x SDVO/VGA (2 ports possible if front IO not required)
  - 2x DVI
  - Up to 4x SATA ports
  - 2x COM ports
  - 4x USB ports
  - 1x Audio
  - 13x GPIO
  - 2x PCI-X PMC (1333 MHz 64-bit I/O signals per site)

- BIOS backup Flash
- Optional on-board SATA HDD
- Optional conduction cooling
- Optional extended operating temperature range
- Deployed Test Software
- Windows®, Linux® and Real-Time OS support

The XCR14 Rugged Single Board Computer (SBC) from GE Intelligent Platforms features the high performance, highly integrated 2<sup>nd</sup> Generation Core i7 processor platform from Intel.

2nd Generation Core i7 offers integrated graphics and memory controller plus dual and quad core processing up to 2.5 GHz all in one device. Coupled with the Mobile Intel QM67 Express Chipset this provides an unmatched level of I/O bandwidth for both on-board and off-board functions.

### Features of the 2<sup>nd</sup> Gen. Core i7 processor

- Intel Intelligent Power Technology allows processors to operate at optimal frequency and power.
- Advanced Vector Extensions (AVX) signal processing
  - Intel's AVX doubles the vector register size from 128 to 256 bits for up to a 2x FLOP improvement
- 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

In addition to a comprehensive range of onboard I/O features, the XCR14 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 16 GB DDR3 SDRAM, 8 GB NAND Flash, optional SATA hard drive, BIOS Flash and BIOS backup Flash.

The XCR14 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.

A rich software choice is planned for the XCR14, including comprehensive Deployed Test Software (BIT and BCS) plus OS support for Windows 7, Open Linux, Wind River Linux, VxWorks®.

### Specifications

#### Processor

- Intel 2<sup>nd</sup> Gen. Core i7 Processor, options include but are not limited to
  - i7-2715QE (Quad core) @ 2.1 GHz (45W)
  - i5-2515E (Dual core) @, 2.5 GHz (35W)
  - i7-2655LE (Dual core) @, 2.2 GHz (25W)
  - i7-2610UE (Dual core) @, 1.5 GHz (17W) (Actual speed/power is dependent on environment)
- 32nm monolithic die processing technology
- Last Level Cache
  - 6 MB (Quad i7)
  - 4 MB (Dual i7)
  - 3 MB (Dual i5)

#### SDRAM

- Maximum memory configuration of dual channels up to 16 GB DDR3 SDRAM soldered with ECC



# XCR14 Intel 2<sup>nd</sup> Generation Core i7 Based Rugged CPCI Single Board Computer

## Specifications (continued)

### Flash Memory

- Soldered NAND flash array up to 8 GB

### BIOS

- 1x 16 Mb for BIT and BIOS plus 1x 16 Mb for redundancy

### 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

- Four USB 2.0 ports routed to rear J4 connector
- One USB 2.0 port routed to front panel

### 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 RS-232 (COM3)
- Two routed to J5, with user selectable RS-232/422/485
- Ports feature independent 16-byte FIFO supporting baud rates up to 115 Kbaud

### PMC/XMC Expansion

- Up to two on-board mezzanine expansion sites
  - Site 1 PMC (PCI-X up to 64-bit /133 MHz) and XMC (x8 PCIe Gen 2) capable; routed to J3
  - Site 2 PMC (PCI-X up to 64-bit /133 MHz) and XMC (x4 PCIe Gen 2) capable; routed to J5
- PCI signaling is 3.3V, 5V tolerant; +/- 12V mezzanine only
- 25W per site capable mezzanine power supply

### Audio

- High Definition Audio Codec
- Stereo line in and stereo line out

### Video

- One VGA port routed to front panel
- One SDVO/VGA port routed to J4; can be two ports if front I/O not used)
- Two DVI ports routed to rear I/O J4/J5

### SATA

- Four SATA ports to rear I/O ; two on-board; one SATA/PATA

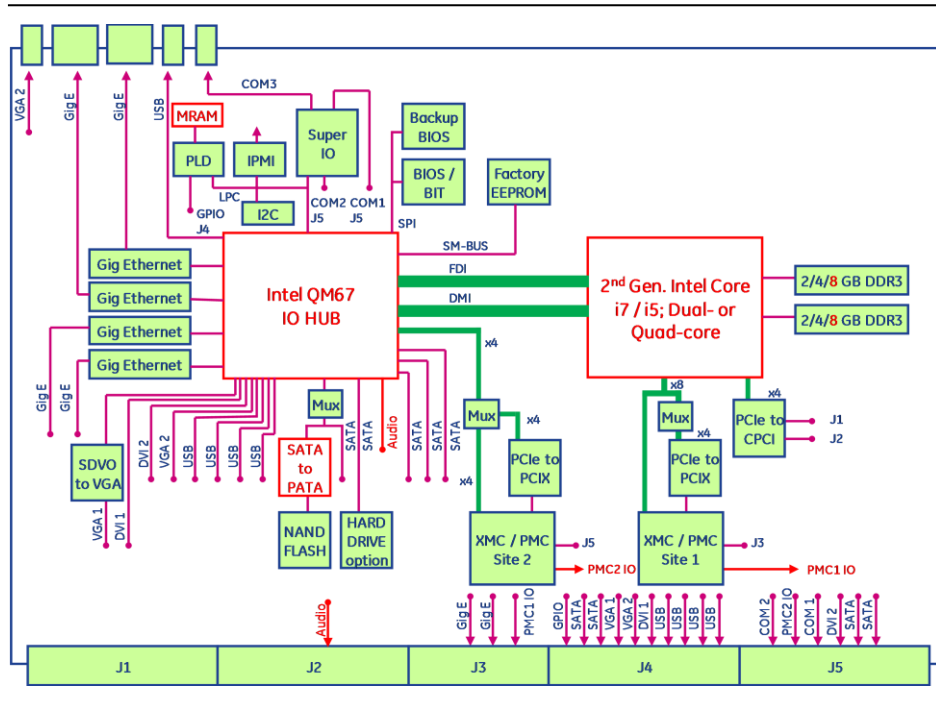
### GPIO

- 13 GPIO pins – software configurable

### On-board Hard Drive

- SATA hard drive or SSD can be optionally ordered (precludes use of PMC/XMC site 2)

## Block Diagram



### LED (not in conduction-cooled style)

- Three status LEDs and four BIT status on front panel
- Two status LEDs on rear

### Power Requirements

- +5, +3.3V
- +12V for mezzanine only

### MRAM / Watchdog/ Real-Time Clock/ TPM

- 512 kB non-volatile RAM (MRAM)
- SuperIO watchdog
- Real-time clock in Cougar Point PCH

### Temperature Sensor

- Onboard ambient temperature; CPU

### Other HW Features

- Hardware Write Protection
- Front power button LED
- IPMI 2.0 Controller (PICMG 2.9)

### Transition Module

- CTM20

### Certification

- CE

## 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 <sup>2</sup> /Hz*	0.002g <sup>2</sup> /Hz*	0.04g <sup>2</sup> /Hz**	0.1g <sup>2</sup> /Hz**	0.1g <sup>2</sup> /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](http://www.ge-ip.com).

## GE Intelligent Platforms Contact Information

Americas: 1 800 433 2682 or 1 434 978 5100

Global regional phone numbers are listed by location on our web site at [www.ge-ip.com/contact](http://www.ge-ip.com/contact)

[defense.ge-ip.com](http://defense.ge-ip.com)

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