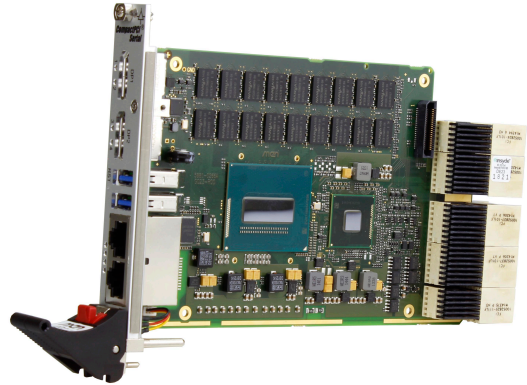


G23

Embedded Single Board Computer with Intel Core i3 / i5 / i7

3U CompactPCI Serial

- » Intel Core i7, 4th generation
- » Quad-core 64-bit processor
- » 4 HP system master and peripheral slot
- » PICMG CPCI-S.0 CompactPCI Serial
- » Up to 32 GB DDR3 DRAM soldered, ECC
- » mSATA and microSD card slots
- » Standard front I/O: 2 DisplayPorts, 2 Gb Ethernet, 2 USB 3.0
- » Standard rear I/O: 7 PCIe, 8 USB 2.0, 2 USB 3.0, 5 SATA, DisplayPort/HDMI
- » Rear I/O via mezzanine board: up to 8 Gigabit Ethernet
- » Intel Turbo Boost, Hyper-Threading, AMT 9.0
- » Open CL support



The G23 is a versatile 4HP/3U single-board computer supporting a multitude of modern serial interfaces according to the CompactPCI Serial standard. It is thus perfectly suited for data-intensive applications which require high computing-power. The CPU card is equipped with the Intel fourth-generation Core i7 processor running at up to 3.4 GHz maximum turbo frequency and offering the latest multi-core processor architecture from Intel with full 64-bit support. The processor frequency can be stepped down via the BIOS to lower power consumption and make the board more suitable for high temperatures. The G23 supports the Intel Active Management technology which makes it possible to access the board via the network even when it is in soft-off or standby state.

For system security, a Trusted Platform Module is assembled on the board.

The memory configuration of the G23 includes a state-of-the-art fast DDR3 DRAM which is soldered to the board to guarantee optimum shock and vibration resistance. An mSATA disk connected via a SATA channel and a microSD card device which is connected via a USB interface offer nearly unlimited space for user applications.

The board delivers an excellent graphics performance. Two DisplayPort interfaces are accessible at the board front.

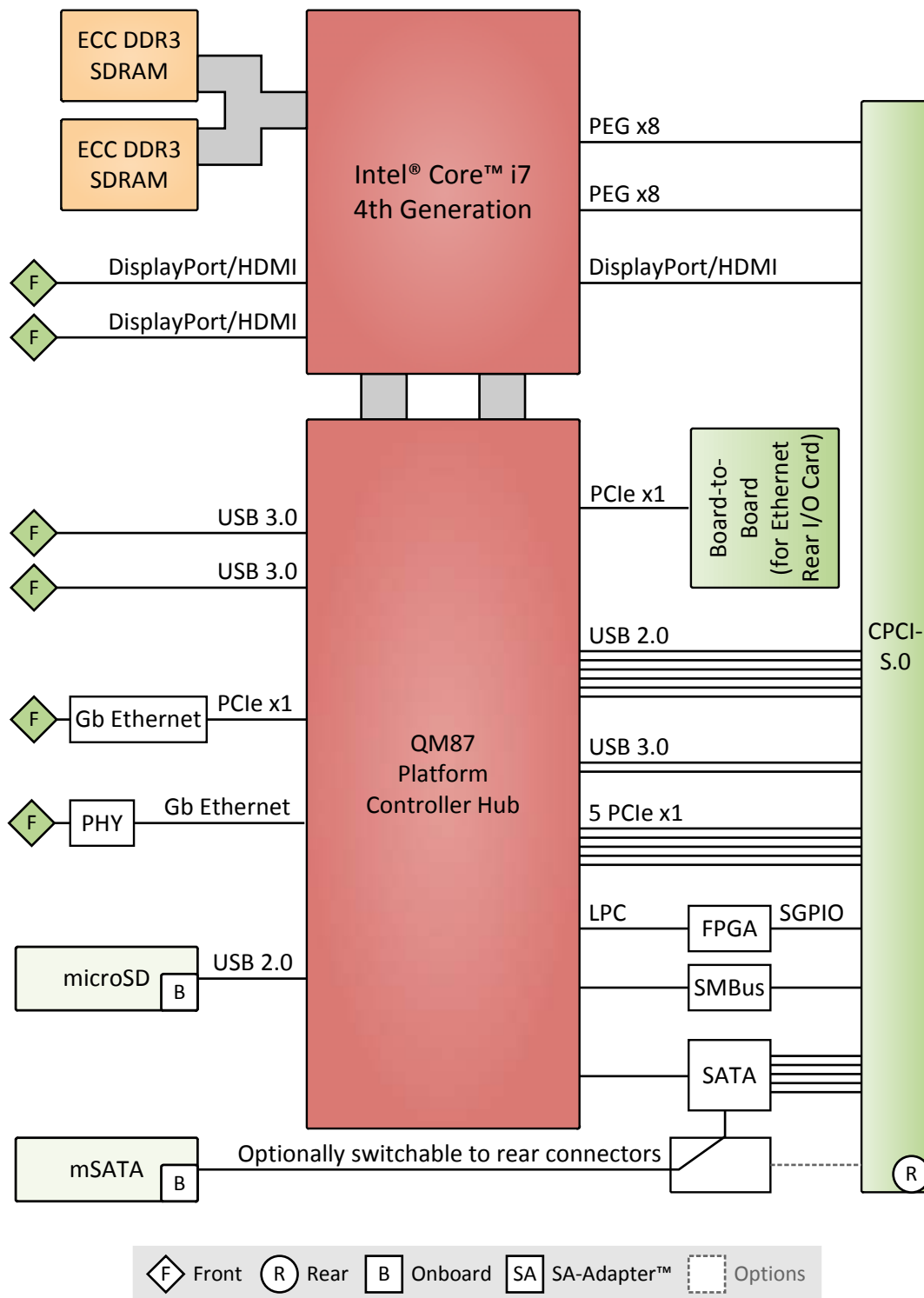
Using an external adapter two HDMI or two DVI ports can also be realized. In addition the standard front I/O comprises two PCIe-driven Gigabit Ethernet and two USB 3.0 ports.

Serial interfaces at the rear I/O connectors are 6 USB 2.0, 2 USB 3.0, 5 SATA interfaces, one DisplayPort or HDMI, 5 PCI Express x1 links, and two PEG x8 links. Up to eight Gigabit Ethernet interfaces can be implemented using a **rear I/O adapter board**.

A board management controller provides thermal supervision of the processor and a watchdog for the operating system.

The G23 operates in Windows and Linux environments as well as under real-time operating systems that support Intel's multi-core architecture. The InsydeH2O EFI BIOS was specially designed for embedded system applications.

The G23 comes with a tailored passive heat sink within 4 HP height. All components are soldered for protection against shock and vibration according to applicable DIN, EN or IEC industry standards. As an option, the board can be equipped with an M12 Ethernet connector. The G23 is also ready for coating so that it can be used in humid and dusty environments and has a guaranteed minimum standard availability of 7 years. These features make the G23 perfectly suited for harsh environments.



CPU

- Intel Core i7-4700EQ
 - 2.4 GHz processor core frequency
 - 3.4 GHz maximum turbo frequency
- Chipset
 - QM87 Platform Controller Hub (PCH)

Board Management Controller

- Power supervision and watchdog
- Temperature measurement
- 2 board status LEDs
- 2 user LEDs
- Reset button

Memory

- 6 MB last level cache integrated in i7 processor
- Up to 32 GB SDRAM system memory
 - Soldered
 - DDR3 with ECC support
 - Up to 1600 MHz memory bus frequency
- 128 Mbits boot Flash
- Serial EEPROM 2 KB for factory settings
- mSATA disk slot
 - Connected via one SATA port from the PCH
- Serial GPIO (SGPIO)
 - One interface via CPCI-S.0 rear connector
 - Compliant with SFF 8485 specification
- One microSD card slot
 - Via USB

Mass Storage

- Serial ATA (SATA)
 - Five channels via rear I/O (six if the link to the mSATA disk is not required, can be switched in BIOS)
 - Four ports with transfer rates up to 6 Gbit/s (SATA Revision 3.x)
 - Two ports with transfer rates up to 3 Gbit/s (SATA Revision 2.x)
 - RAID level 0/1/5/10 support
 - Hot-plug together with G501

Graphics

- Integrated in QM87 chipset
 - Maximum resolution: 4096 x 2304 @ 24 Hz
- Two DisplayPort connectors at front panel
 - Optionally two DVI/HDMI ports via external adapter
- One DisplayPort at CPCI-S.0 rear connector
 - Optionally SDVO or DVI/HDMI port

I/O

- USB 2.0
 - Up to eight USB 2.0 host ports via CPCI-S.0 rear connector (depending on the number of used USB 3.0 ports)
 - Two USB 2.0 host ports for connection of the rear I/O card
 - EHCI implementation
 - Data rates up to 480 Mbit/s
- USB 3.0
 - Two USB 3.0 host ports via Type A connector at front panel
 - Two USB 3.0 host ports via CPCI-S.0 rear connector
 - Data rate up to 5 Gbit/s
- Ethernet
 - Two 10/100/1000Base-T Ethernet channels at the front
 - RJ45 connectors at front panel
 - Ethernet controllers are connected by two x1 PCIe links
 - Two LEDs to signal LAN link, activity status and connection speed

Front Connections

- Two DisplayPort
- Two USB 3.0 (Type A)
- Two Ethernet (RJ45)

Rear I/O

- 5 SATA (6 switchable in BIOS)
- 1 DisplayPort
- 6 USB 2.0
- 2 USB 3.0
- 5 PCI Express x1 links
- 2 PEG x8 links
- SGPIO

PCI Express

- Two x8 PCI Express graphics links via CPCI-S.0 rear connector
 - Data rate 985 MB/s (8 Gbit/s per lane)
- Five x1 PCIe links via CPCI-S.0 rear connector
 - Data rate 500 MB/s (5 Gbit/s per lane)
- Two x1 PCIe links to connect local 1000Base-T Ethernet controllers
 - Data rate 250 MB/s (2.5 Gbit/s per lane)
- One x1 PCIe link via for connection of the rear I/O card
 - Data rate 500 MB/s (5 Gbit/s per lane)

Miscellaneous

- Real-time clock with supercapacitor backup, battery-buffered

CompactPCI Serial

- Compliance with CompactPCI Serial PICMG CPCI-S.0 Specification
- System or peripheral slot

Electrical Specifications

- Supply voltage/power consumption:
 - +12V (9.5..15.5V), 4 A nominal, 6 A maximum
 - +5V (-5%/+5%) standby voltage optional

Mechanical Specifications

- Dimensions: conforming to CompactPCI Serial specification for 3U boards
- Front panel: 4HP with ejector
- Weight:
 - 208 g (w/o heat sink)
 - 398 g (with heat sink and mSATA adapter)

Environmental Specifications

- Temperature range (operation):
 - Depends on system configuration (CPU, hard disk, heat sink...)
 - Maximum: +85°C
 - Minimum: -40°C (all processors)
 - Airflow: min. 1.5 m/s, typical power dissipation tbd, with Windows XP operating system, 1 Gb Ethernet, without CPU clock reduction
- Temperature range (storage): -40..+85°C
- Relative humidity (operation): max. 95% non-condensing
- Relative humidity (storage): max. 95% non-condensing
- Altitude: -300 m to + 3,000 m
- Shock: 50 m/s², 30 ms
- Vibration (function): 1 m/s², 5 Hz - 150 Hz
- Vibration (lifetime): 7.9 m/s², 5 Hz - 150 Hz

MTBF

- 362 455 h @ 40°C according to IEC/TR 62380 (RDF 2000)

Safety

- Flammability (PCBs)
 - UL 94 V-0
- Electrical Safety
 - Insulation measurement test according to EN 50155 (12.2.9.1)
 - Voltage withstand test according to EN 50155 (12.2.9.2)
 - Information technology equipment test according to EN 60950

EMC Conformity

- EN 55022 (radio disturbance)
- IEC 61000-4-2 (ESD)
- IEC 61000-4-3 (electromagnetic field immunity)
- IEC 61000-4-4 (burst)
- IEC 61000-4-5 (surge)
- IEC 61000-4-6 (conducted disturbances)

BIOS

- InsydeH2O UEFI Framework

Intel Active Management Technology

- Out of Band (OOB) Access
 - Power off Access
 - Independent of OS status
 - Power status control
 - Keyboard-Video-Mouse (KVM) Viewer (VNC-compatible)
 - IDE-Redirect
 - Serial-over-LAN
- Manageability Engine in Chipset
- Network Filters in Chipset
- Dedicated Flash Storage Area

Software Support

- Windows
- Linux
- VxWorks (on request)
- QNX
- For more information on supported operating system versions and drivers see Software.

Options

CPU

- Intel Core i7
- Intel Core i5
- Intel Core i3
- Intel Celeron
- For more details please see the overview matrix of supported processor types

Memory

- System RAM
 - 4 GB, 8 GB, 16 GB or 32 GB
- mSATA disk
 - 0 MB up to maximum available
- microSD card
 - 0 MB up to maximum available

I/O

- Ethernet
 - One Gigabit Ethernet on M12 connector instead of two interfaces on RJ45

Rear I/O

- PCI Express
 - 8 PCI Express lanes
- Ethernet
 - Up to eight Gigabit Ethernet interfaces on the backplane using rear I/O card (e.g. GM1)

Operating Temperature

- Depends on system configuration (CPU, hard disk, heat sink...)
- Maximum: +85°C
- Minimum: -50°C

Cooling Concept

- Also available with conduction cooling in MEN CCA frame

Some of these options may only be available for large volumes.

- Please ask our sales staff for more information.

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