G52A

QorIQ Enhanced Network CPU Board

CompactPCI Serial

- » *Freescale QorIQ, up to 12 cores*
- » *Up to 12 GB DDR3 DRAM soldered, ECC*
- » *Standard front I/O: 2 10 Gb Ethernet, 1 Gb Ethernet, 1 USB 2.0 host, 1 USB configuration port (RS232)*
- » *Standard rear I/O: 14 PCIe lanes, 1 USB 2.0, 2 SATA, 3 Gb Ethernet*
- » *4 HP system master and peripheral slot*
- » *PICMG CPCI-S.0 CompactPCI Serial*
- » *microSD card slot*
- » *CPU TDP from 32W to 61W*
- » *Board Management Controller*
- » *Watchdog*

New Generation of CPU Boards

The G52A is a high-performance multicore CPU platform based on Freescale QorIQ T4x series. The G52A is a new branch of CPU boards for CompactPCI Serial specifically designed for high data bandwidth based on PCIe 3.0, PCIe 2.0 and Gigabit Ethernet via the backplane. The G52A provides high data bandwidth on the front panel via two 10 Gigabit Ethernet interfaces on M12 connectors or on RJ45 connectors (on request). The G52A paired with I/O cards can be ideally used for transferring data from and to storage media, the Internet via LTE, WiFi, copper or optical Ethernet. Its up to 12 processor cores make the board ideally suited for virtualization applications. Serial interfaces at the rear I/O connectors are one USB 2.0, two SATA interfaces, three PCI Express x4 links and one PCI Express x2 link and three Gigabit Ethernet interfaces.
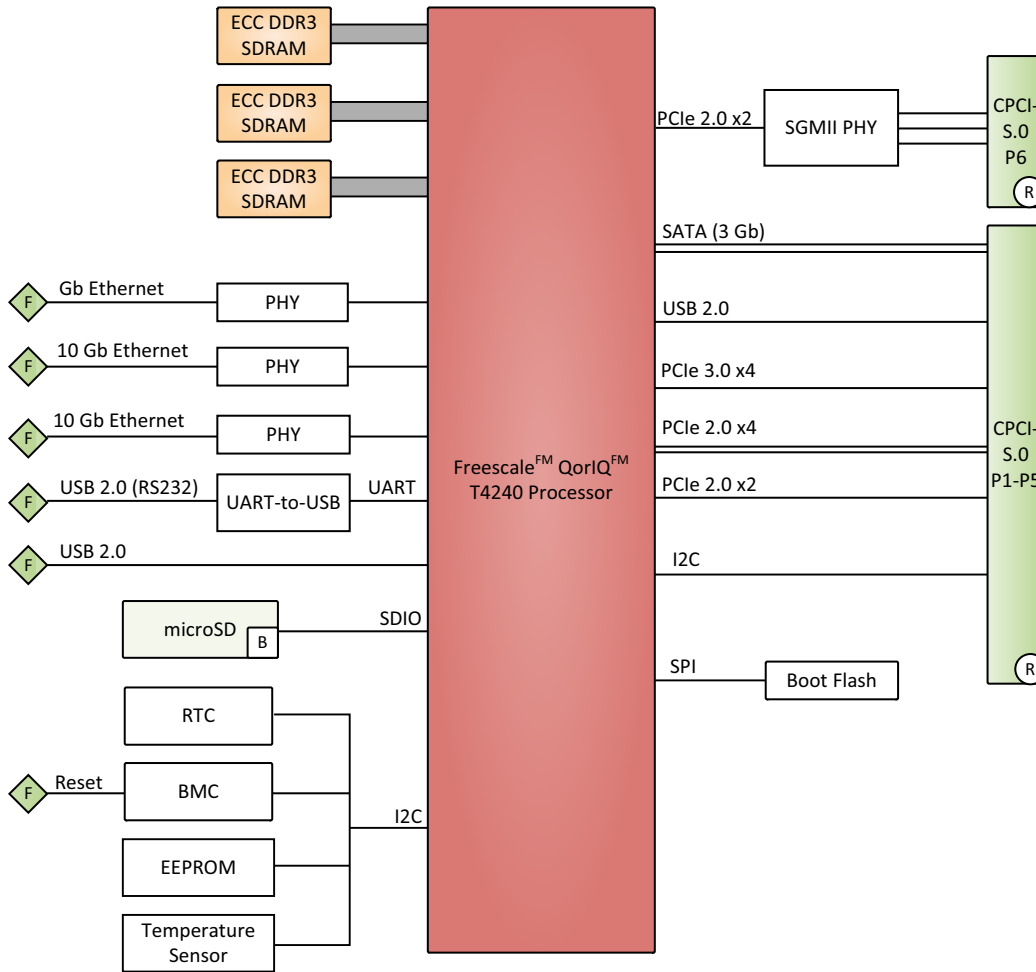
Three-channel DDR3 DRAM

The memory configuration of the G52A includes a fast DDR3 DRAM with ECC which is soldered to the board to guarantee optimum shock and vibration resistance. A microSD card device offers space for user applications or can be used as a local boot medium.

Board Supervision

A board management controller provides thermal supervision of the processor and a watchdog for the operating system.
The G52A operates in Linux environments or as a development option in VxWorks or QNX environments.

Perfect for Harsh Environments

The G52A comes with a tailored 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. The G52A is also ready for coating so that it can be used in humid and dusty environments and has a guaranteed minimum standard availability of 15 years. These features make the G52A perfectly suited for harsh environments.

Data Sheet

Block diagram:

- ECC DDR3 SDRAM → Freescale QorIQ T4240 Processor
- ECC DDR3 SDRAM → Freescale QorIQ T4240 Processor
- ECC DDR3 SDRAM → Freescale QorIQ T4240 Processor
- Gb Ethernet (F) → PHY → Processor
- 10 Gb Ethernet (F) → PHY → Processor
- 10 Gb Ethernet (F) → PHY → Processor
- USB 2.0 (RS232) (F) → UART-to-USB → UART → Processor
- USB 2.0 (F) → Processor
- microSD (B) → SDIO → Processor
- RTC, BMC, EEPROM, Temperature Sensor → I2C → Processor
- Reset (F) → BMC
- Processor → PCIe 2.0 x2 → SGMII PHY → CPCI-S.0 P6 (R)
- Processor → SATA (3 Gb) → CPCI-S.0 P1-P5
- Processor → USB 2.0 → CPCI-S.0 P1-P5
- Processor → PCIe 3.0 x4 → CPCI-S.0 P1-P5
- Processor → PCIe 2.0 x4 → CPCI-S.0 P1-P5
- Processor → PCIe 2.0 x2 → CPCI-S.0 P1-P5
- Processor → I2C → CPCI-S.0 P1-P5 (R)
- Processor → SPI → Boot Flash

Legend: ◇ F Front | Ⓡ Rear | B Onboard | SA SA-Adapter™ | ⬚ Options

Diagram

CPU	■ The following CPU types are available:
	  □ Freescale QorIQ T4240, twelve cores, 1.5 to 1.8 GHz
	  □ Freescale QorIQ T4160, eight cores, 1.5 to 1.8 GHz (on request)
	  □ Freescale QorIQ T4080, four cores, 1.5 to 1.667 GHz (on request)

Memory	■ System Memory
	  □ Soldered DDR3, ECC support
	  □ Up to 3 channels
	  □ Up to 12 GB
	■ Boot Flash
	  □ 16 MB

Mass Storage	■ The following mass storage device can be assembled: □ microSD card (up to 32 GB)

Front Interfaces	■ USB
	  □ One Series A connector, USB 2.0
	  □ One RS232 configuration port implemented as a USB 2.0 device interface
	■ Ethernet
	  □ Two 8-pin M12 connectors, X-coded, 10GBASE-T, or
	  □ Two RJ45 connectors, 10GBASE-T (on request)
	  □ One 8-pin M12 connector, X-coded, 1000BASE-T, or
	  □ One RJ45 connector, 1000BASE-T (on request)
	  □ One link and activity LED per Ethernet channel
	■ Front-panel LED for board status
	■ Hot-plug LED
	■ Reset button

Rear Interfaces	■ SATA
	  □ Two channels, SATA Revision 2.x
	■ USB
	  □ One channel, USB 2.0
	■ Ethernet
	  □ Three channels, 1000BASE-T
	■ PCI Express
	  □ Two x4 links, PCIe 2.x
	  □ One x2 link, PCIe 2.x
	  □ One x4 link, PCIe 3.x

Supervision and Control	■ Board controller ■ Watchdog timer ■ Temperature measurement ■ Real-time clock with supercapacitor or battery backup □ Data retention of supercapacitor: tbd
Backplane Standard	■ Compliance with CompactPCI Serial PICMG CPCI-S.0 Specification ■ System or peripheral slot

Electrical Specifications	■ Supply voltages
	  □ +12V (9.5..15.5V)
	■ Power consumption
	  □ The following values are valid for product model 02G052A00, which uses a T4240 processor.
	  □ +12V: 4 A nominal, 8 A maximum

Mechanical Specifications	■ Dimensions
	  □ 3U, 4 HP
	  □ Weight: tbd (model tbd)

Technical Data

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Environmental Specifications

- Temperature range (operation)
  - EN 50155 class T1, T2, T3 or TX
  - Airflow 2.5 m/s
  - Depends on system configuration (CPU, hard disk, heat sink...)
  - Temperature range (storage): -40°C to +85°C
- Cooling concept
  - Air-cooled, or
  - Conduction-cooled in MEN CCA frame
- Humidity: EN 60068-2-30, EN 50155
- Altitude: -300 m to +3000 m
- Shock: EN 50155 cat 1 class b
- Vibration: EN 50155 cat 1 class b

Reliability

- MTBF: tbd h @ 40°C according to IEC/TR 62380 (RDF2000) (model tbd)

Safety

- Flammability
  - UL 94V-0
- Electrical Safety
  - EN 62368-1 (former EN 60950-1)

EMC Conformity

- EN 55022 class B, EN 50121-3-2 (radiated and conducted emission)
- EN 55024, EN 50121-3-2 (immunity)

Software Support

- Linux
- For more information on supported operating system versions and drivers see Software.

BIOS

- U-Boot Universal Boot Loader

Contact Information

Germany

MEN Mikro Elektronik GmbH

Neuwieder Straße 3-7
90411 Nuremberg
Phone +49-911-99 33 5-0

sales@men.de
www.men.de

USA

MEN Micro Inc.

860 Penllyn Blue Bell Pike
Blue Bell, PA 19422
Phone 215-542-9575

sales@menmicro.com
www.menmicro.com

France

MEN Mikro Elektronik SAS

18, rue René Cassin
ZA de la Châtelaine
74240 Gaillard
Phone +33-450-955-312

sales@men-france.fr
www.men-france.fr

China

MEN Mikro Elektronik (Shanghai) Co., Ltd.

Room 808-809, Jiaxing Mansion, No. 877 Dongfang Road
200122 Shanghai
Phone +86-21-5058-0961

sales@men-china.cn
www.men-china.cn

Up-to-date information, documentation and ordering information:
www.men.de/products/g52a/