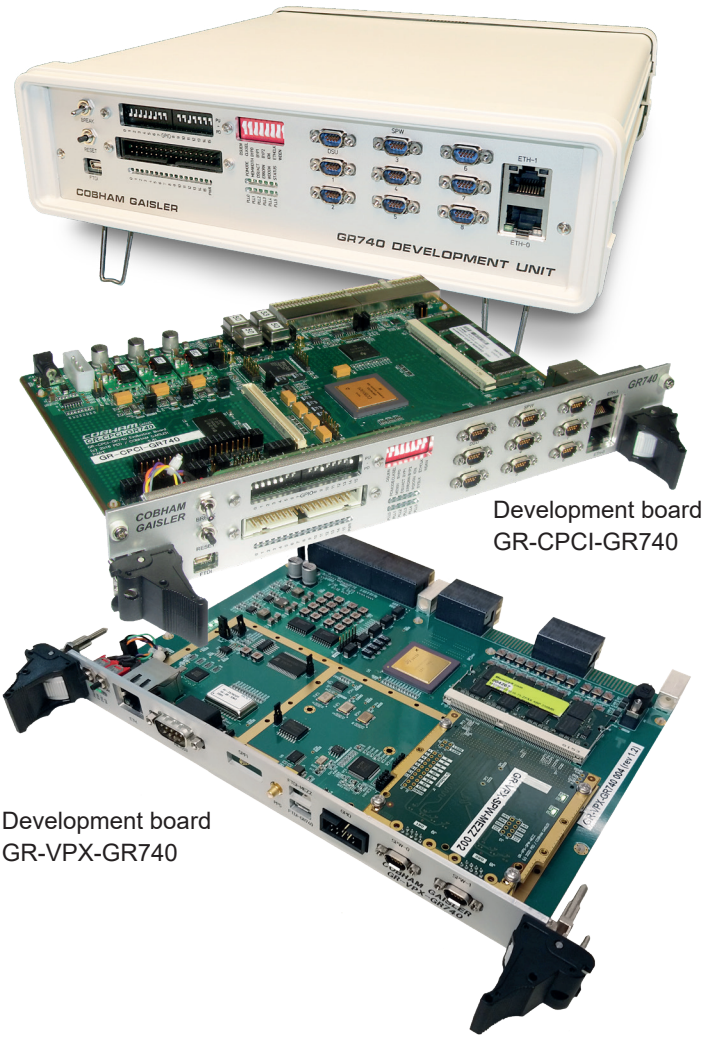
QUAD-CORE FAULT-TOLERANT LEON4 SPARC V8 PROCESSOR

GR740



Development board
GR-CPCI-GR740

Development board
GR-VPX-GR740

GRMON3 debugging made easy

TSIM3 Instruction-level simulator

The GR740 device is a radiation-hardened System-on-Chip (SoC) featuring a quad-core fault-tolerant LEON4 SPARC V8 processor, eight port SpaceWire router, PCI initiator/target interface, CAN 2.0 interfaces and 10/100/1000 Mbit Ethernet interfaces. The SoC has an excellent performance-to-watt ratio: less than 3W (typical) with 1000 MIPS (1800 DMIPS) performance. This state-of-the-art processor is both QML-V and QML-Q certified and ideal for spacecraft on-board computers, payload processing or other high reliability aerospace applications.

A complete development environment is available with development boards, debugger (GRMON3) and simulator (TSIM3). The software ecosystem includes partner software and software toolchains provided by Frontgrade, covering compilers, operating systems, and boot loaders.

The GR740 has been designed as the European Space Agency's Next Generation Microprocessor (NGMP). The GR740 is the first rad-hard implementation of the NGMP system-on-chip architecture.

PRODUCT BRIEF

RELEASED SEPTEMBER 2023

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GR740

Applications

The GR740 targets high-performance general-purpose processing.The architecture is suitable for both symmetric and asymmetric multiprocessing. Shared resources can be monitored to support mixed-criticality applications.

Interfaces

- SpaceWire router with eight SpaceWire links (300 Mbit/s)
- 2x 10/100/1000 Mbit Ethernet interfaces
- MIL-STD-1553B interface
- 2x CAN 2.0B controller interface
- 2x UART, SPI, Timers and watchdog, 16+22 pin GPIO
- PCI Initiator/Target interface
- Debug communication links: JTAG, Ethernet, SpaceWire

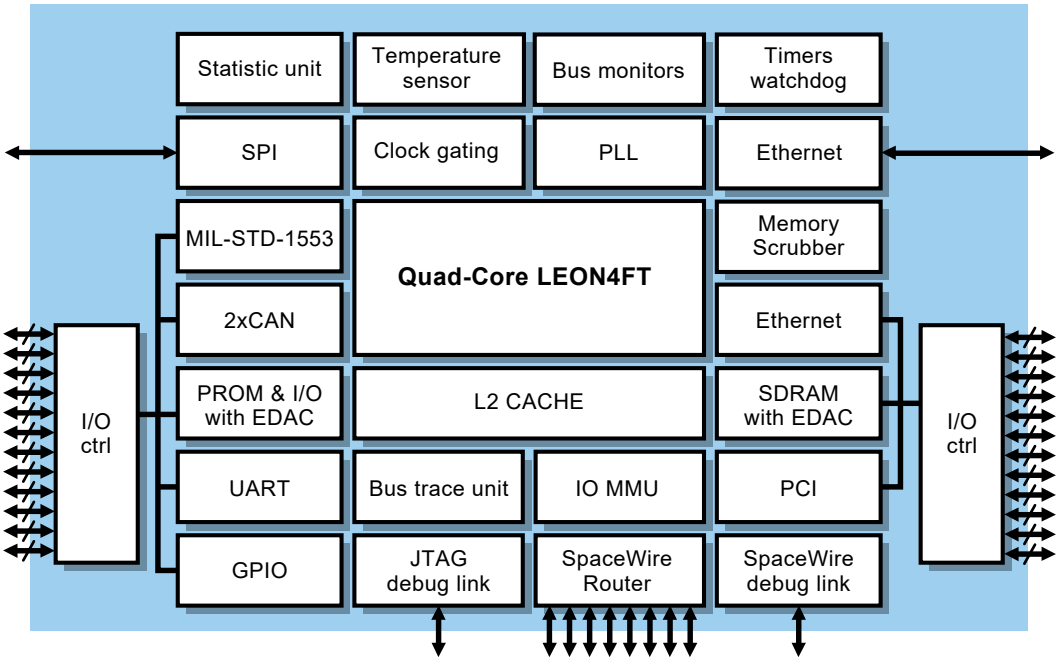
Development Boards

- GR-CPCI-GR740 gaisler.com/GR-CPCI-GR740
- GR-VPX-GR740 gaisler.com/GR-VPX-GR740

Features

- Fault-Tolerant quad-core LEON4 SPARC V8 with 7-stage pipeline, 8 register windows, 4x4 KiB instruction and 4x4 KiB data caches
- Double-precision IEEE-754 FPU (1 FPU/core)
- 250 MHz system clock
- 1000 MIPS (1800 DMIPS)
- Typical core power consumption <3 W
- 2 MiB Level-2 cache
- 64-bit PC100 SDRAM memory interface with Reed-Solomon EDAC
- 8/16-bit PROM/IO interface with EDAC
- CPU and I/O Memory Management Units
- Multi-processor interrupt controller with support for asymmetric and symmetric
- multiprocessing
- SpaceWire TDP controller and support for time synchronization
- Radiation performance: TID: 300 krad (Si), SEL: LET>125 MeV-cm2/mg
- More information: gaisler.com/GR740

PART NO.	PACKAGE	TEMP.RANGE	QUALIFICATION STATUS
GR740 SMD: 5962-21204	625-Pin Ceramic Land Grid Array Size: 29x29 mm, Pitch: 1mm	-40˚C / +125˚C (junction)	QML-Q/V qual. tests completed QML-Q/V approved
GR740 SMD: 5962-21204	625-Pin Ceramic Column Grid Array Size: 29x29 mm, Pitch: 1mm	-40˚C / +125˚C (junction)	QML-Q/V qual. tests completed QML-Q/V approved
GR740PBGA	625-Pin Plastic Ball Grid Array Size: 27x27 mm, Pitch: 1mm	-40˚C / +105˚C (case)	ESCC-Q-60-13C class 2 Flight parts available from Q2 2023



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