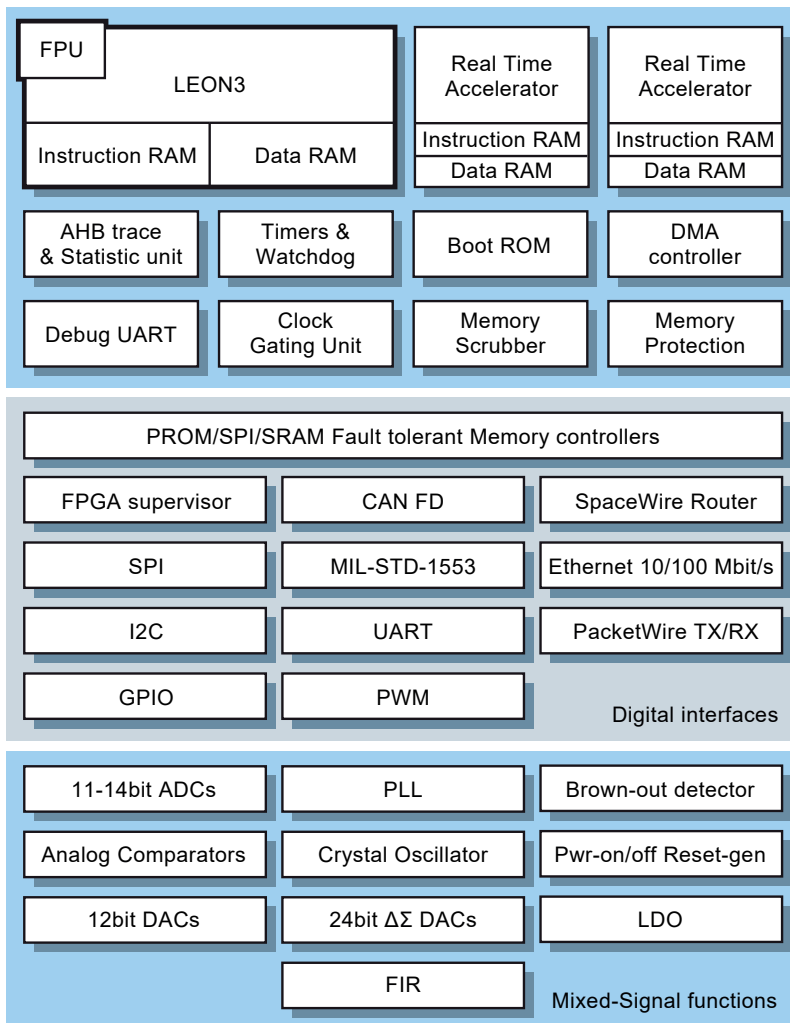
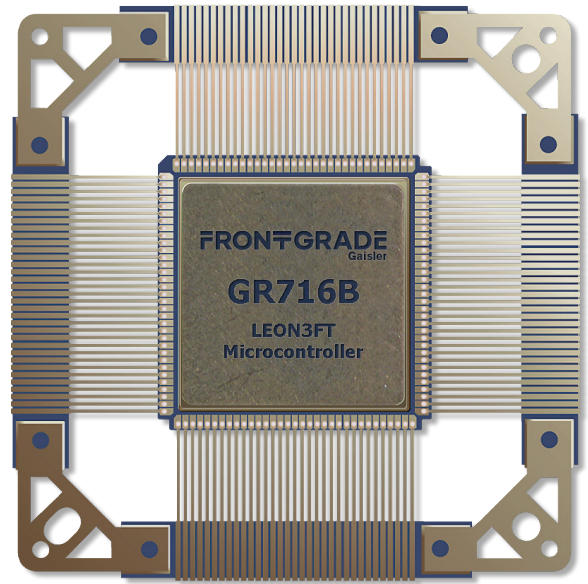


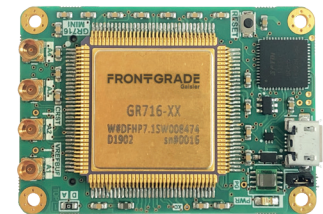
GR716B

The GR716B is a radiation-hardened, fault-tolerant mixed-signal microcontroller specifically designed for high-reliability space applications, with a focus on satellite supervision and monitoring. The micro-controller is well-suited for tasks such as controlling DC/DC converters, motors, and magnetorquer drivers. Additionally, it incorporates hardware features for the supervision and control of SRAM FPGAs in space environments.

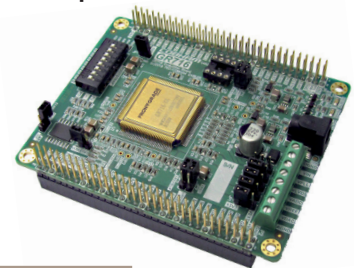
A comprehensive development environment is provided, complete with development boards, a debugger (GRMON3), and a simulator (TSIM3). The software ecosystem includes toolchains and board support packages, including both bare-metal and real-time operating system (RTOS) options.



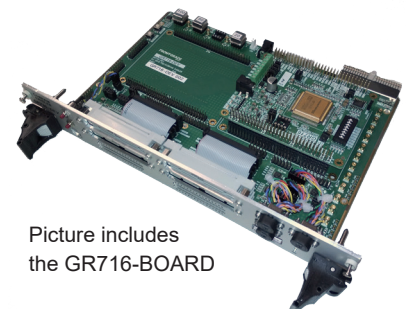
GR716 MINI Evaluation Board



GR716-BOARD-Daughter Development Board



GR-CPCI-GR716-DEV-Mother Interface Board



Picture includes the GR716-BOARD

More information about the boards: gaisler.com/GR716-boards

GR716B

Specification

- System frequency up-to 100 MHz
- SpaceWire links up-to 200 Mbps
- CQFP132 hermetically sealed ceramic package or (TBC) PBGA-400 plastic package
- Support for single 3.3V supply
- Total Ionizing Dose (TID) up to 300 krad (Si) (TBC)
 - Analog performance guaranteed up to 100 krad(Si) (TBC)
- Single-Event Latch-up Immunity (SEL) to LETTH > 118 MeV-cm²mg (TBC)
- Single-Event Upset (SEU) < 1E-5 event/device/day (TBC) in space environment

Integrated Analog functions

- 4x ADC: 11/14bit resolution, 500/80kSps, 4 diff or 8 single channels
- 4xDAC: 12bit, 3 Msps, digital ramp generation up to 25 MS/s
- 8x DAC: 24bit $\Delta\Sigma$, up to 25MHz
- 20x Fast Analogue Comparator
- Rad Hard PLL
- Crystal oscillator, with external XTAL
- Precision Reference 1.9 V Output
- LDO for Core & PLL supply
- Power-on-Reset and Brown-out-detection
- 1.8V and 3.3V voltage monitors
- Temperature sensor

Features

- LEON3FT - Fault-tolerant SPARC V8 32-bit processor, 100 MHz
 - 16-bit instruction set extension: LEON-REX for improved code density
 - Double precision IEEE-754 pipelined floating point unit
 - Memory protection units
 - Determinism: Multi-bus, fixed interrupt latency, cache-less architecture
- 2x Real Time Accelerator (RTA)
 - Offload main LEON3 of demanding real-time tasks
- 192 KiB EDAC Protected On-Chip RAM
- Memory scrubber to prevent error accumulation
- External EDAC protected 8-bit PROM/SRAM memory
- SPI memory protected by EDAC and dual memory redundancy
- On-chip Boot ROM for low-level initialization and optional self-testing, standby and application loading
 - Enables also remote boot through SpaceWire RMAP, CANOpen, SPI slave or UART
- FPGA Supervisor designed for FPGA programming and scrubbing, compatible with Xilinx Virtex-5 and Kintex UltraScale devices.
- Programmable PWM interface with Analog/Digital Voltage control and motor control loop support
- DMA controllers with support for conditional operations
- Timer units with seven 32-bit timers including watchdog
- 8x digital FIR filters

Interfaces

- 2-Port SpaceWire Router with time distribution support, 200 Mbps max bitrate
 - LVDS with extended common-mode, Cold-Spare and Fail-Safe support
- 10/100 Mbit/s Ethernet
- MIL-STD-1553B interface
- CAN-FD controller interface with CANopen support for remote boot
- PacketWire with CRC acceleration support
- SPI with SPI-for-Space protocols
- UARTs, I2C, GPIO
- Configurable I/O selection matrix with support for mixed signals, internal pull-up/pull-down resistors, schmitt-trigger input.

Software

The software ecosystem comprises tool-chains and board support packages, offering both bare metal and Zephyr RTOS options. Peripheral drivers are integrated with the toolchains.

Simulator

TSIM3-GR716 serves as a cycle-accurate simulator for the GR716B. The simulation environment encompasses the LEON3, the RTAs, and also on-chip peripherals.

More information:
gaisler.com/GR716B