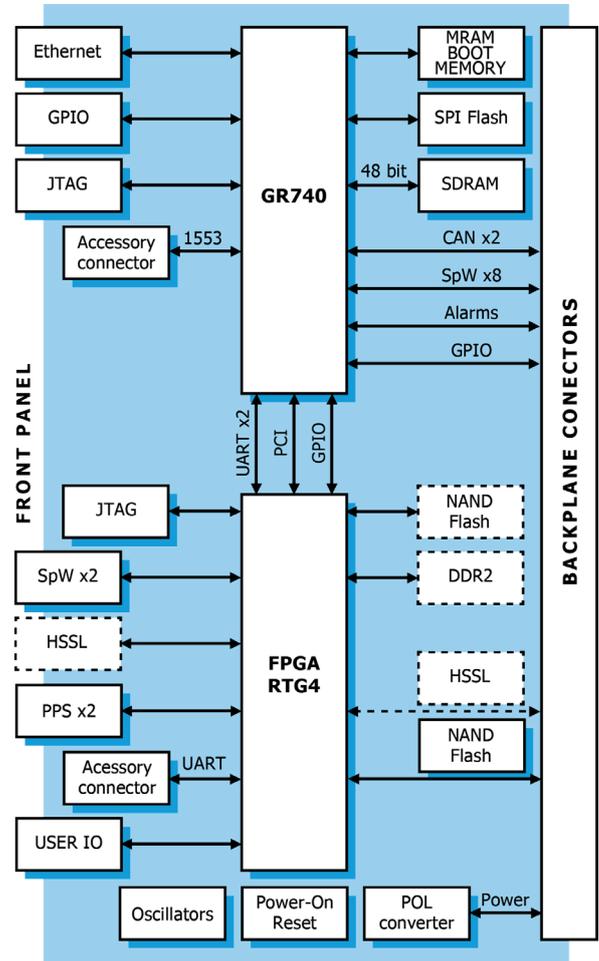
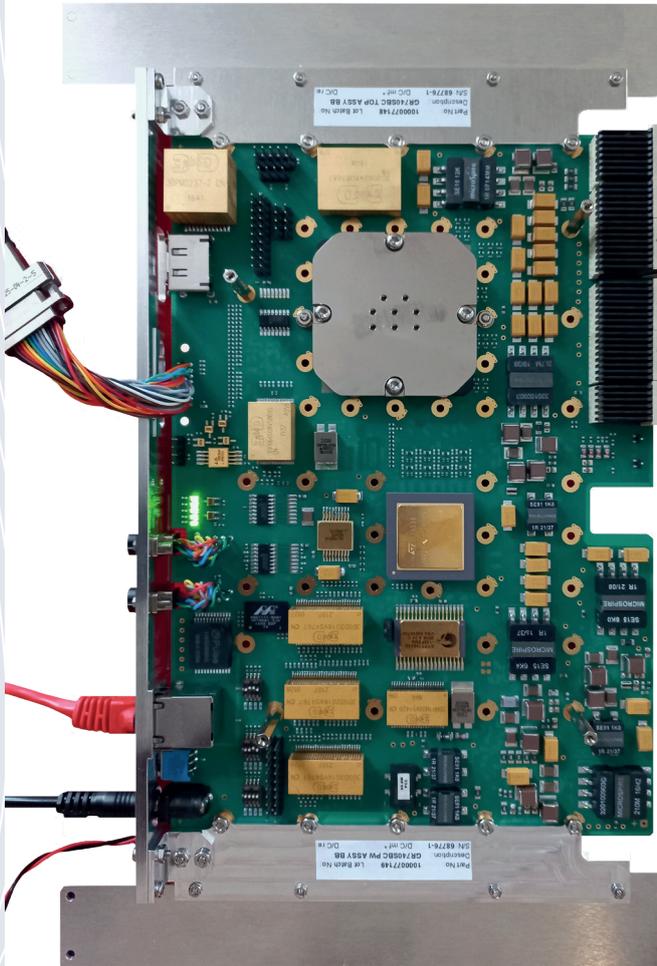


# GR740-SBC



**High-Performance Single Board Computer based on the GR740 Quad-Core 32-bit LEON4FT SPARC V8 processor and the Microchip RTG4 radiation tolerant FPGA.**

The SBC provides an extensive set of memories and redundant interfaces to support the needs of current and future on-board computers and Data Handling platforms.



# GR740-SBC

## Processing capabilities

- GR740 radiation-hardened SoC
  - Fault-tolerant quad-core LEON4FT SPARC V8 processor, 4x4 KiB instruction and 4x4 KiB data caches
  - 2 MiB Level-2 cache
  - Performance: 250 MHz system clock, 1.84 DMIPS/MHz
  - Parallel boot: MRAM 64 KiB
  - Application storage: SPI Flash memory 32 MiB
  - Volatile working memory: SDRAM 512 MiB + ECC check bits
  - PCI, UART and GPIO, interfaces connected to the RTG4 FPGA
- Microchip RTG4 radiation tolerant FPGA
  - Adds optional memory interfaces and high-speed serial link (HSSL) capability to the SBC
    - Volatile working memory: 3D PLUS DDR2 SDRAM, 512 MiB data RAM plus ECC
    - Data Storage: 3D PLUS NAND FLASH, 8 GiB
  - Implements glue logic required to be compatible with the CPCI-S.1 R1.0 standard
  - More than 70 % of the FPGA resources are available for user defined functions

## Backplane

- Compact PCI Serial Space backplane standard (CPCI-S.1 R1.0)
  - 6U form factor
  - Can be tailored to fit into both system or payload slot
  - Dual star network, 8x SpaceWire links with GR740
  - Redundant CAN bus with GR740
  - Full mesh network with High-Speed Serial Links (SpaceFibre) with RTG4
  - I<sup>2</sup>C with RTG4
  - Alarms and other utility signals

## Front panel

- 2x SpaceWire links
- 10/100/1000 Mbit/s Ethernet
- 2x Pulse Per Second (PPS) inputs for synchronization
- GPIO
- JTAG debug links

## Software

- GRBOOT - Flight Software Boot Loader
  - Developed in accordance with standards ECSS-E-ST-40C and ECSS-Q-ST-80C, software criticality category B.
  - Provides initialization, self-test and application loading functionality
- RTEMS Peripherals Drivers
- Test application and EGSE software
  - Developed to verify the board interfaces and memories on a functional level
  - Can be reused and extended for a specific implementation of the GR740 SBC platform simplifying functional verification of the hardware



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