

LEON3-FT

RTAX2000S/SL



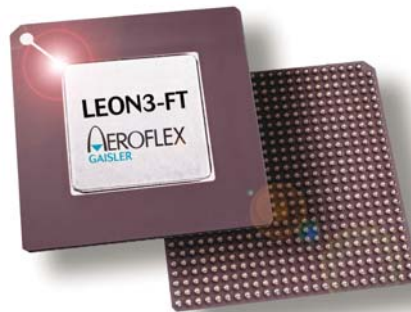
Introduction

The LEON3-FT processor is available as a standard component using the Actel RTAX2000S/SL Field Programmable Gate Array. The fault tolerant design of the processor in combination with the radiation tolerant FPGA gives a total immunity to radiation effects. This makes it ideally suited for space and other high-rel applications.

The LEON3-FT is a 32-bit processor based on the SPARC V8 architecture. The floating point unit provides support for both single- and double-precision floating point operations. A unique debug interface allows non-intrusive hardware debugging and provides access to all on-chip registers and memory.

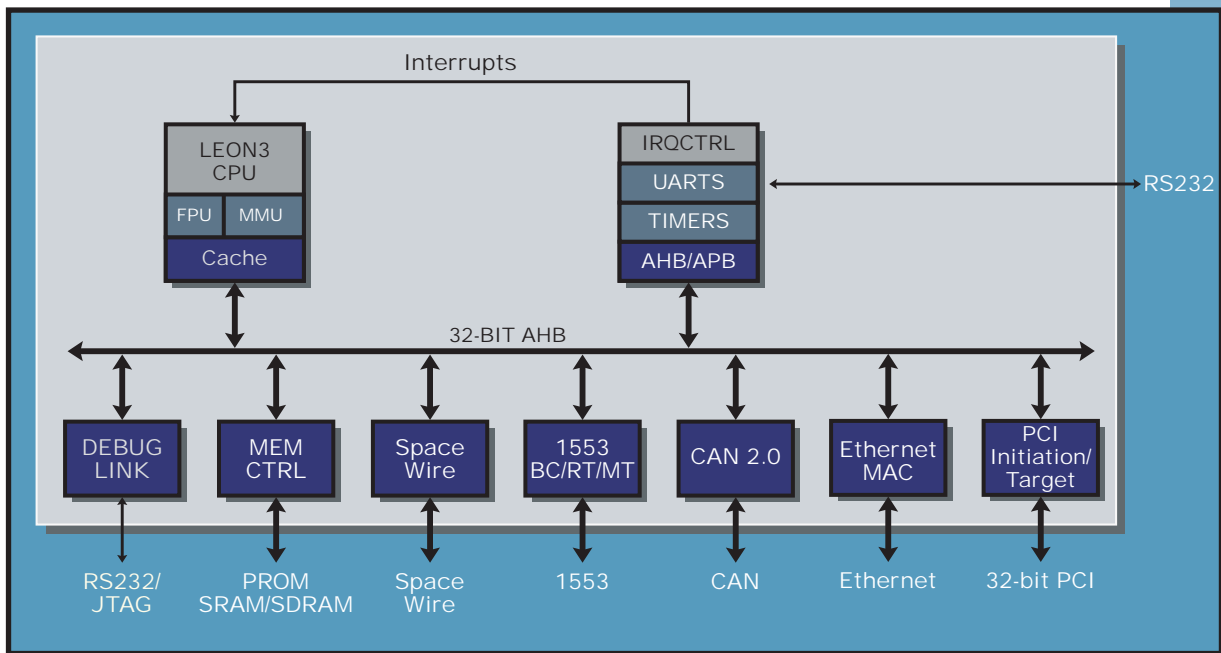
The processor is currently used in European and international space programmes and has been successfully validated and qualified. A complete software development environment including compilers, debuggers and operating systems is freely available for download at www.aeroflex.com/gaisler.

Prototyping is possible using the commercial FPGA version (AX2000) on GR-CPCI-RTAX development board.



Main Features

- SPARC V8 integer unit with 7-stage pipeline
- Hardware multiply and divide
- Separate instruction and data caches
- Memory management unit
- Double precision IEEE-754 compliant floating point unit
- EDAC protected interface to 8/16/32-bit PROM/SRAM/SDRAM
- Advanced on-chip debug support unit
- UART, timer unit, GPIO port
- Mil-Std-1553B, SpaceWire and CAN 2.0B bus
- Ethernet MAC
- PCI Initiator/Target/Arbiter
- Power down mode



Availability

The LEON3-FT on the Actel RTAX2000S/SL is available in several different standard configurations tailored for spacecraft and instrument control. Other configurations can be offered on request. The components are pre-programmed and are shipped with a complete data sheet and user's manual. For evaluation and prototyping the commercial version (AX2000) of the FPGA is available. The high-rel version is available in B, E and EV flows. For price and ordering please contact Aeroflex Gaisler.

Standard configurations

| Configuration name | Instrument Controller -1 | Instrument Controller -2 | Spacecraft Controller -1 | Spacecraft Controller -2 | Spacecraft Controller -3 | Spacecraft Controller -4 | Payload Controller -1 | Payload Controller -2 |
|-------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-----------------------|-----------------------|
| Configuration ID (CID) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| LEON3FT Integer Unit | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Hardware multiply & divide | | | | | Yes | Yes | | Yes |
| Power down mode | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Memory Management Unit | | | | | Yes | Yes | | |
| Floating Point Unit | Yes | Yes | Yes | | | | Yes | Yes |
| Debug Support Unit | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| UART Debug Link | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| JTAG Debug Link | | | | | | | | |
| On-Chip Memory | 4 kBytes | | 4 kBytes | | | | | |
| 1553 RT | 1 | | | | | | | |
| 1553 BC/RT/MT | | | 1 | | | | | |
| SpaceWire | | 2 | | 3 | 2 | | 2 | |
| CAN 2.0B | 1 | | | | 1 | | | |
| PCI Initiator/Target/Arbiter | | | | | | Yes | | |
| Ethernet MAC | | | | | | 1 | | 2 |
| Memory Controller | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| SDRAM Controller | | | | Yes | Yes | Yes | Yes | Yes |
| Reed/Solomon for SDRAM option | | | | Yes | Yes | Yes | Yes | |
| Standard Peripherals | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Package | CQFP352 | CQFP352 | CQFP352 | CCGA624 | CCGA624 | CCGA624 | CQFP352 | CQFP352 |

| Specifications | |
|--------------------------------------|---|
| Clock speed | 20 / 25 MHz / 33 MHz PCI |
| Integer Performance | 20 DMIPS |
| Floating Point Performance | 4 MFLOPS |
| Power consumption | 500 mW |
| Package | CQ352 / CG624 |
| Total Ionizing Dose | Up to 300 krad (Si) |
| Single-Event Latch-Up Immunity (SEL) | LET _{TH} > 104 MeV-cm ² /mg |
| Immune to Single-Event Upsets (SEU) | LET _{TH} > 37 MeV-cm ² /mg |
| Supply Voltage | 1.5V & 3.3V |



CONTACT INFORMATION

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