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OBC- 1411

On Board Computer for LEO



OBC- 1411 single board computer with integrated communications, redundancy capabilities and security features is designed for robust operation in Low Earth Orbit (LEO) environments.

Module main characteristics:

LEON3 SPARC V8 processor over FPGA PROASIC3 A3PE3000L, error-correcting code memory, mass storage, redundancy capabilities, and multiple data interfaces in a compact form factor 3U (100mm x 160mm), and 263 grams of mass.

Parts used in OBC- 1411 are based on new space and engineering techniques to survey in LEO orbit. If this module is integrated in EBOX-1401 housing, the expected life in orbit is higher than 5 years.

Flight Experience:

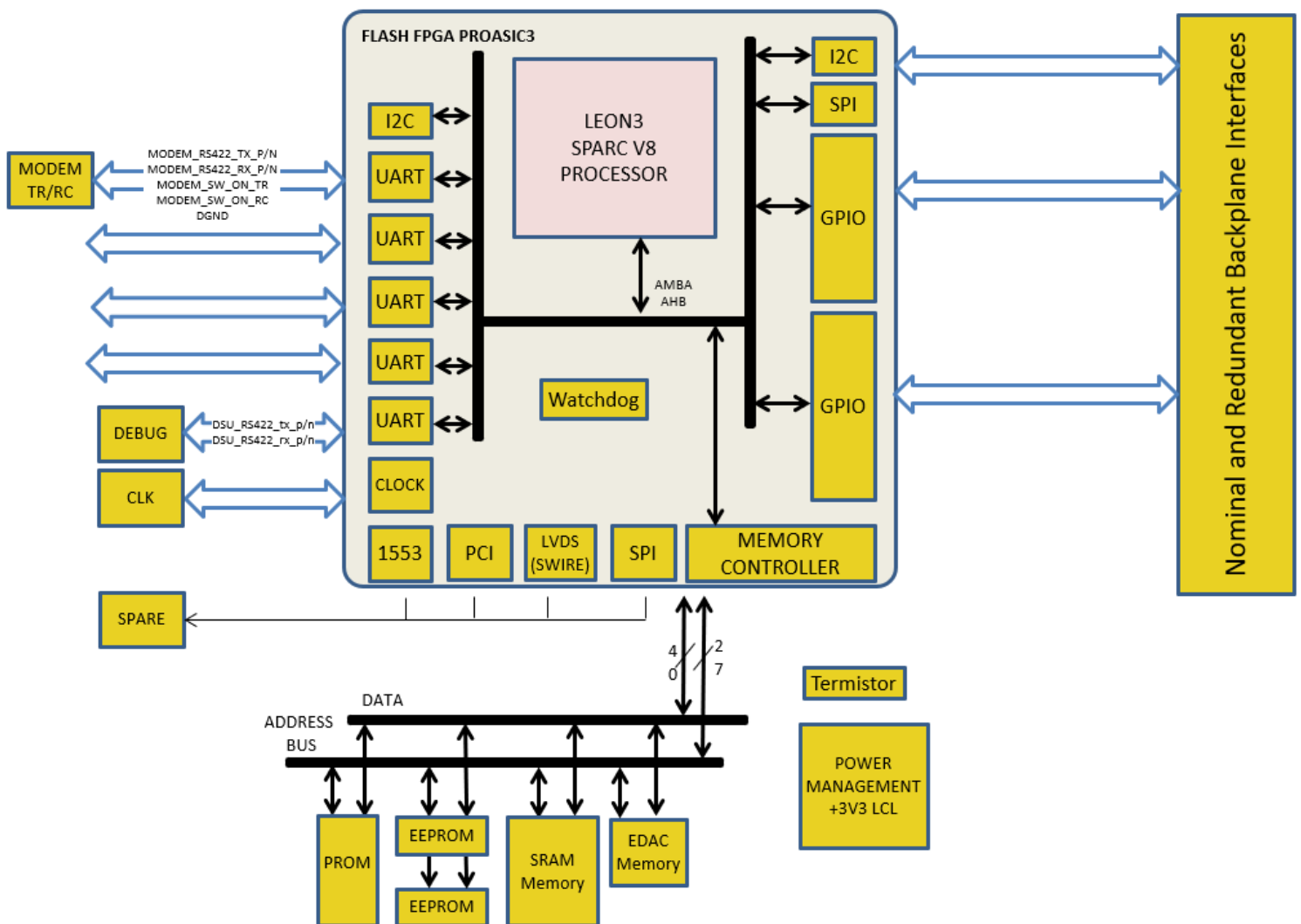
This module is working in LEO applications from SEP-2020. Qualified in vacuum chamber, vibration, and shock.

Product Overview:

Use as a stand-alone computer or combine with other Tecnobit modules for a powerful, robust, redundancy capabilities, secure, and tightly integrated communications platform.

Key Hardware Features:

- Processor LEON3 SPARC V8 in FPGA PROASIC3 ([Irradiation test](#))
- 4 MBytes SRAM Memory (3D Plus memory module)
- 2 MBytes EEPROM Memory (3D Plus memory module)
- 1 MBytes SRAM for EDAC (error-correcting code memory of 3D Plus) (*1)
- 256K (32 KBytes) PROM Memory (*1)



Notes:

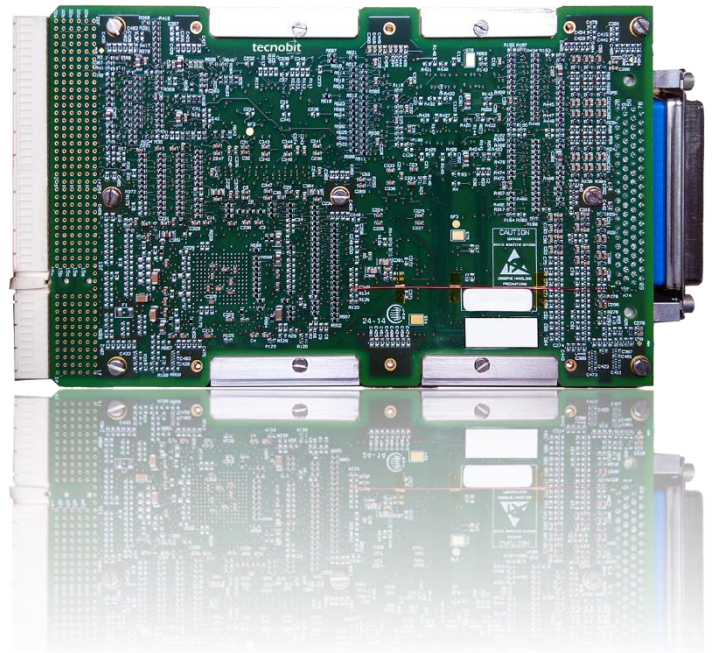
(*1) It is considered as an option. See Ordering information

Key Software Features:

- Available source code of HW drivers in ADA.
- Option for Linux: support for LEON3 is available in the LEON Linux 5.10 and 4.9 kernels distributed in the official Linux kernel (Kernel.org).
- Option for VxWorks®. VxWorks 7 SPARC architectural port (HAL), supporting LEON3.

Mechanical Features:

- Form factor Compact PCI 3U (100mm x 160mm). Available 3d model.
- Conductive thermal dissipation to external housing.
- Robust connectors: 78 pins sub-D connector in front side, and 110 pins 2mm in backplane side.
- Suitable for military and commercial use on LEO satellites.



Main characteristics:

- Form factor: CPCI 3U (100mm x 160mm)
- Mass 263 grams
- Main Power Supply: 3.3V
- Consumption: 174mA nominal, 400mA max
- Non-Operating Temperature: -55°C to +105°C
- Operating Temperature: de -40°C a +85°C

Qualification Tests:

- Random vibration test levels: (12.3 grms, 11.6 grms, 13.2 grms) in x, y & z axis, respectively.
- Shock test level: Designed for 40Gs 11msec, half sine.
- Vacuum temperature test range: -40 to 70°C(*2)

Notes:

(*2) Designed for this range, but only tested in vacuum chamber from -23°C to +58°C

Interfaces

External Interfaces (EMI filtered):

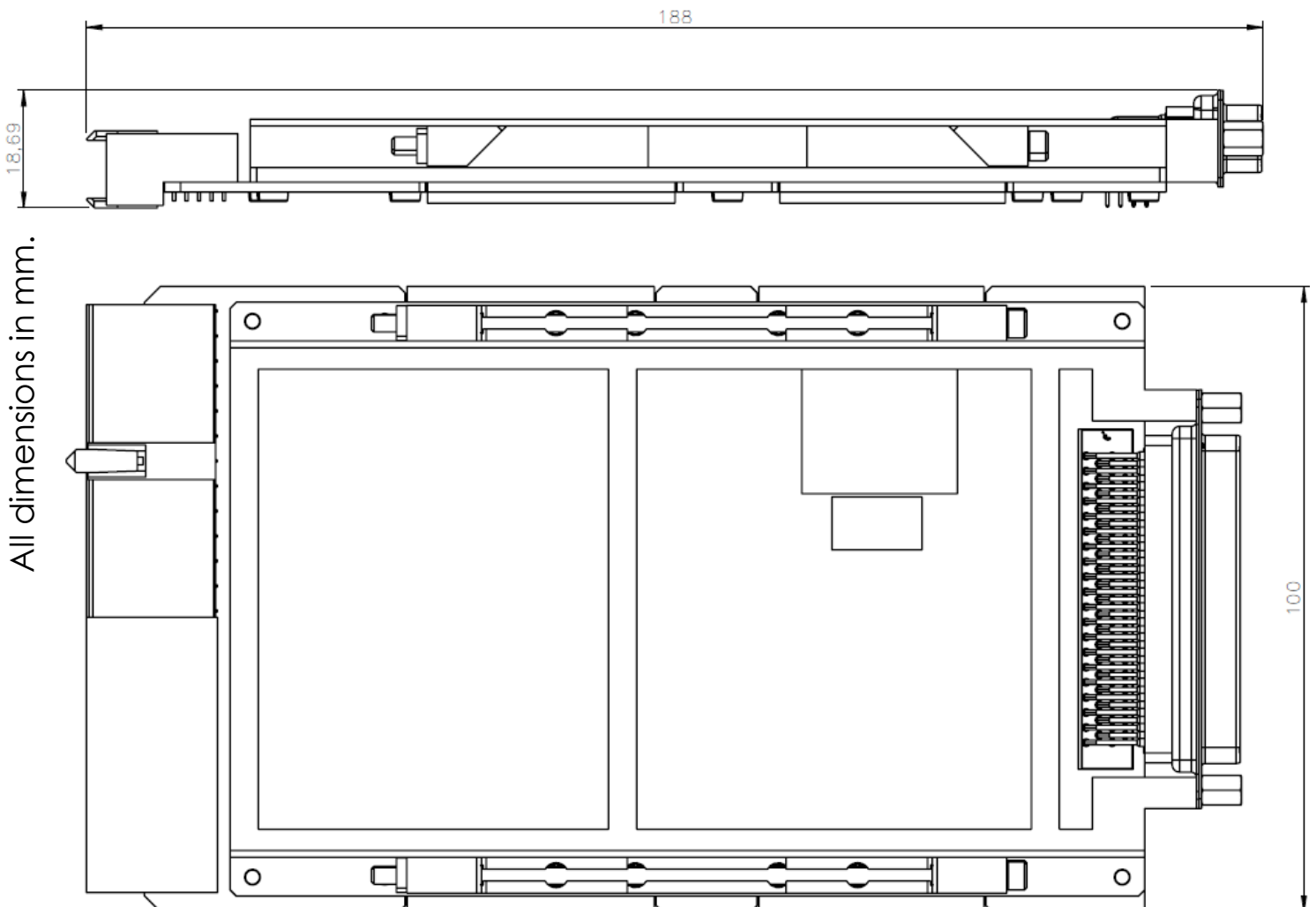
- 4x RS-422
- 1x I2C
- 28 GPIO LVTTTL 5962-9668601QXA
- 4x LVDS Inputs (*1)
- 4x LVDS Outputs (*1)
- HPC On (*1)
- HPC Off (*1)
- BSM Status (*1)
- 1xMIL-STD-1553 long stub (*1)

Internal Interfaces:

- Backplane Nominal Comms
- Main supply 3V3
- Auxiliary supplies 5V, +15V & -15V.
- CLK distribution
- Slot enable
- 1x SPI
- Termistor IF
- 1x I2C
- Serial Debugging IF

Note *1: Parts not mounted in standard reference. See ordering info.

Outline Drawing:



Ordering Information:

Standard Reference:

- Tecnobit Reference: 904MD110000

Options to be quoted:

- 01: Mount 1 MBytes SRAM for EDAC (error-correcting code memory of 3D Plus)
- 02: Mount 256K (32 KBytes) PROM Memory
- 03: Mount parts of LVDS
- 04: Mount parts of MIL-STD-1553
- 05: Mount parts of HPC On/Off
- 06: Mount parts of BSM
- 07: MIL-STD-1553 IP Core
- 08: S.WIRE IP Core
- 09: Drivers for Linux.
- 10: Drivers for VxWorks®

Final Reference:

- Standard reference – Op1 – Op2...
- Example: 904MD110000-01-06-09

Data Package:

- Electrical ICD
- User manual
- Source code of ADA drivers
- Outline 3D model.



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Open Frame
Hardware to final user
application

Optimum balance
between quality and
cost for LEO
applications

Flexibility adapting
OBC-1411 to the
requested interfaces
of end user

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