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Memory Orbit Radiation Experiment
for OOV on TET-1
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Overview

- Goals of MORE
- Test philosophy
- Main Features
- Hardware description

Goals of the MOVE Experiment

- In-orbit measurement of radiation effects in NAND flash devices
 - Static /dynamic SEUs
 - SELs
 - SEFIs
- Measurement on different device types
 - 32 Gbit Samsung K9WBG08U1M
 - 8 Gbit Micron MT29F8G08AAAWP
- Comparison with available test results at heavy ion accelerators
- Qualification (TRL \geq 5) for use of NAND flash devices in future solid state mass memories
 - ESA + national Missions: EO + Science Platforms
 - Instrument applications: Image Buffers for Space Cameras

Test philosophy

- Operation similar to real mass memory
 - Long Term Static Error Collection in Storage Mode (biased /unbiased)
 - Write operation once per day
 - Error Collection once per day
 - Verification of Countermeasures against SEFIs

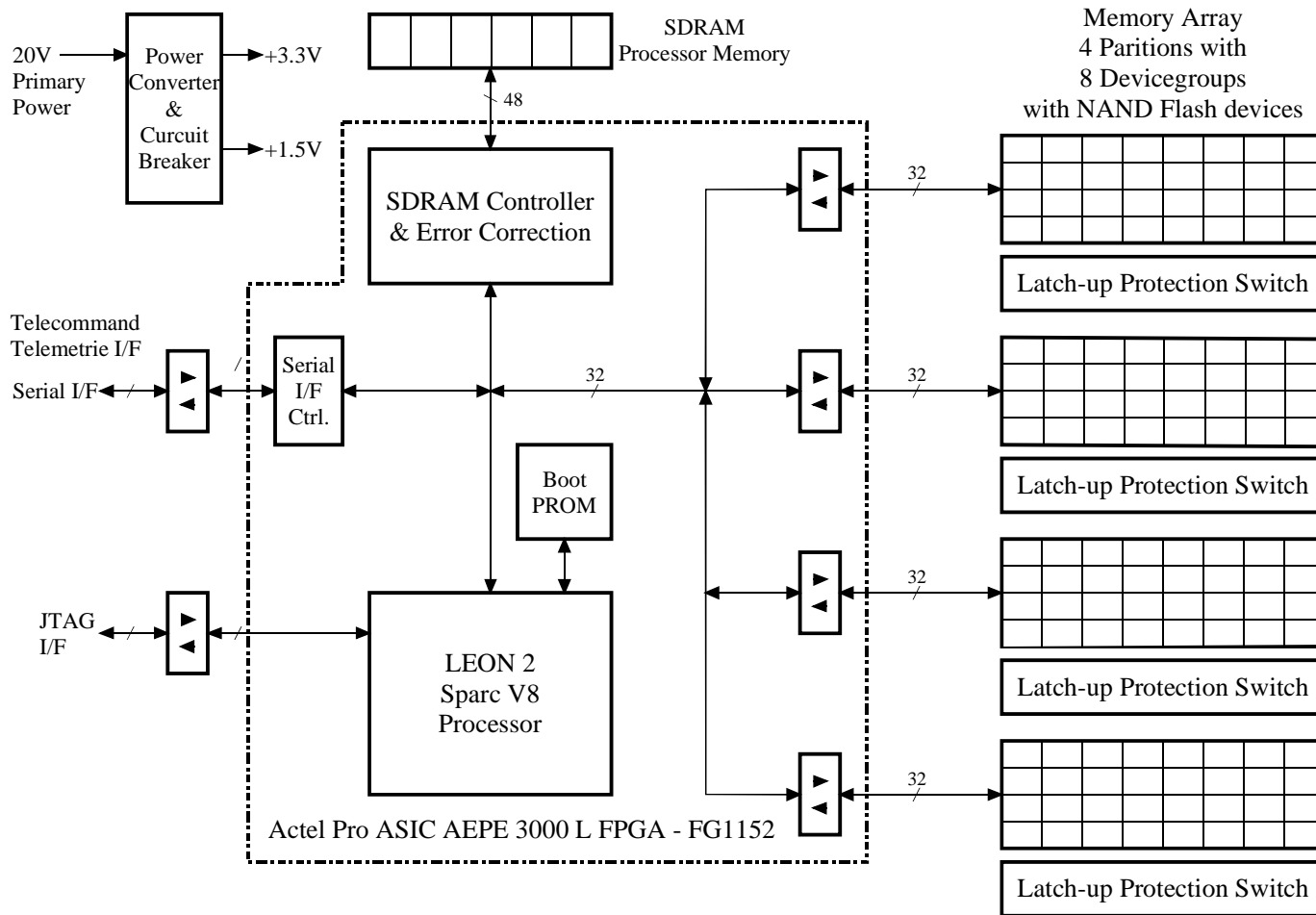
Design: Main Features (Hardware)

- Single PCB layout
- Complete Control Logic incl. Processor in one FPGA
- Processor softcore @ 16 Mhz
- Reed-Solomon ECC protected Processor SDRAM
- 4 independent memory partitions equipped with
 - 96 32 Gbit NAND flash devices (3.375 Tbit)
 - 32 8 Gbit NAND flash devices (0.25)
 - Total 3.625 Terabit = 464 GByte
- All partitions directly connected to FPGA
- Each partition with 8 devicegroups (7 Samsung + 1 Micron) and individual LU protection switch
- Standard RS422 I/F
- Integrated power converter

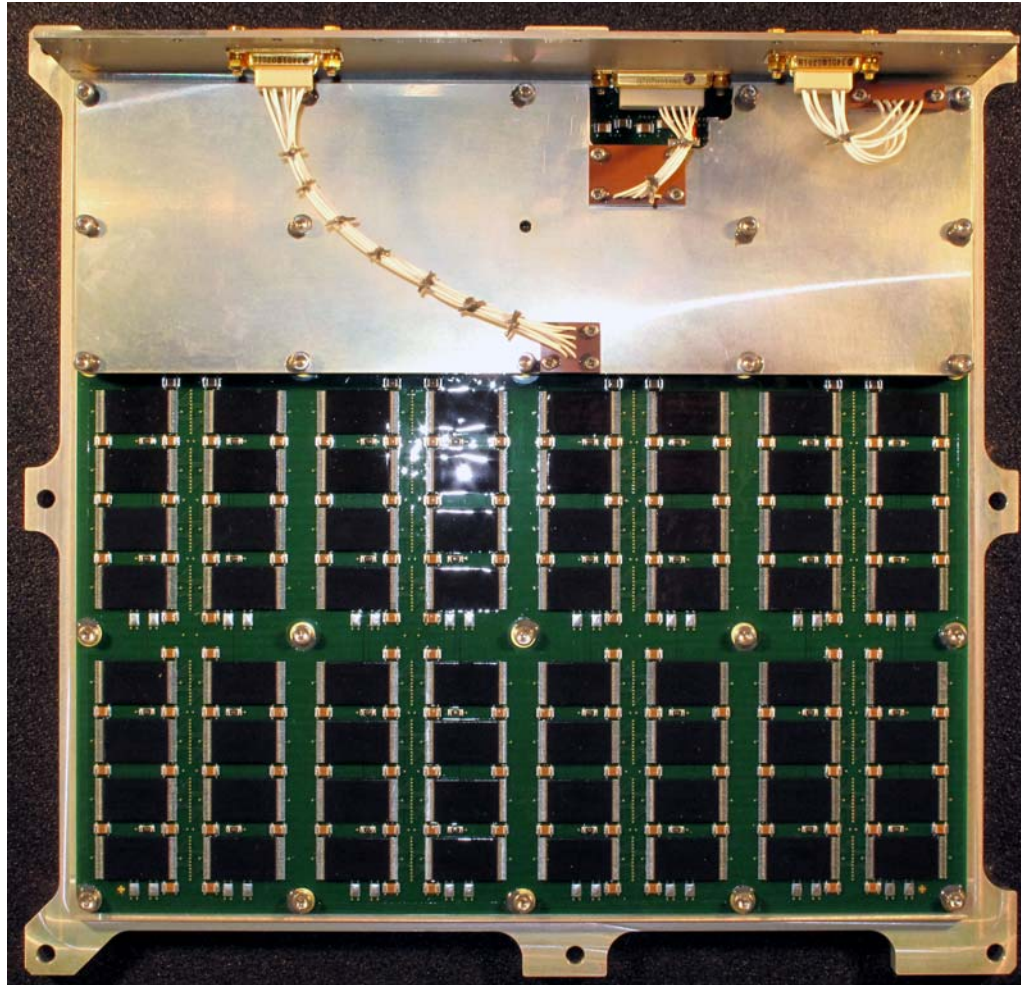
Main Features (Software)

- Bootloader hard-wired in FPGA
- Software upload supported
- Autonomous test operation of NAND flash devices in software
- Autonomous error recording & evaluation

Block Diagram of MORE



MORE PFM without cover



MORE PFM during Vibration Test

