Space-Grade QED MRAM

16Mb MRAM (10 x 10mm)
1Gb MRAM (17 x 15mm)
4Gb MRAM (17 x 15mm)
2/4/8Gb MRAM (20 x 20mm)

QED space-grade MRAM utilizes spin-torque transfer (STT) magneto-resistive random-access memory in a plastic BGA, qualified to NASA/Goddard Space EEE-INST-002, Level 2 PEM. STT-MRAM provides true random read/write access and inherently high resistance to magnetic flux & radiation.

KEY FEATURES

Technology

- 22nm pMTJ STT-MRAM (Perpendicular Magnetic Tunnel Junction)
- Inherently Rad-Hard MRAM Technology

Performance

- Up to 8Gb of Spin-Torque Persistent MRAM in a Single, Small Footprint & Low-Profile Package
- Density Organization: 16Mb (1M x 16), 1Gb (32M x 32), 4Gb (128M x 32), 2/4/8Gb (1Gb x 2, 2Gb x 2, 4Gb x 2, DQSPI)
- Advanced ECC with Configuration Register
- Asynchronous Page Mode Feature
- Access Performance: 45ns min.

Operating & Environmental Specifications

- Quality Flows
  - Qualified Encapsulated Device (QED) to NASA EEE-INST-002, Sec. M4, Level-2 PEM
- Irradiation Effects Performance
  - Rad-Tolerant (RT): 100K RAD TID
  - Non-Rad
- Excellent Single Event Effect (SEE) Performance
  - SEE $\geq$ 72.4 MeV cm^2/mg
- Operating Voltage Range: VCC: 2.70V - 3.60V
- Temperature Range: -55°C +125°C

BENEFITS

Optimal Design

- Smallest Plastic Rad-Tolerant MRAM Package Available
- Spin-Torque Transfer Technology MRAM is Highly Resistant to Magnetic Flux, Mitigating the Need for Radiation Shielding
- Spin-Torque Transfer Technology has Near Infinite Endurance and Data Retention Greater than 10 years
- MRAM Memory Offers the Fastest Access Time of Non-Volatile Memories
- Best Power Profile of All Non-Volatile Memories

Package Options

- Plastic BGA: Qualified Encapsulated Device (QED)

APPLICATIONS

- Space Grade Processor Based Systems and FPGA Boards
- LEO, MEO, GEO, and HEO Space Missions
- Satellites
- Launch Vehicles
- Space Systems and Vehicles
- Aerospace Systems

Smallest & Lowest Power
Hi-Rel Non-Volatile Memory

Micross' qualified encapsulated space-grade MRAM utilizing Avalanche Technologies STT-MRAM, is a plastic encapsulated microcircuit screened and qualified to NASA's electrical, electronic and electromechanical Instructions. The 1Gb QED MRAM offers true random read/write access while being inherently highly resistant to magnetic flux & radiation, mitigating the need for radiation shielding while providing near infinite endurance and best-in-class non-volatile data retention. This MRAM device architecture is analogous to Flash technology with an SRAM compatible read/write interface with ECC and a Asynchronous Page Mode feature for enhanced performance.
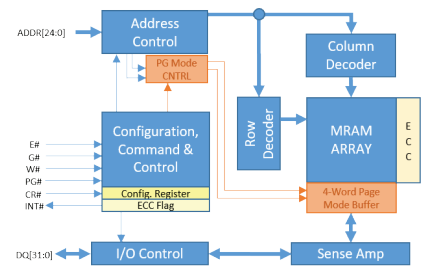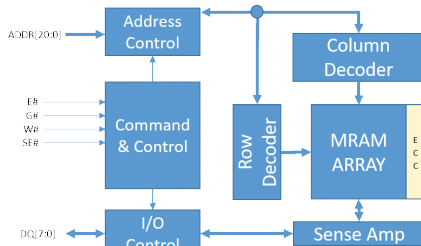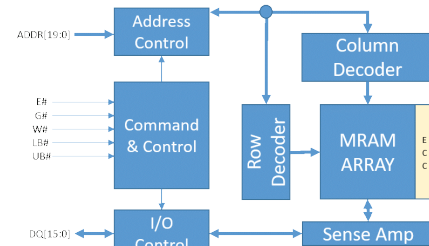
MRAM BLOCK DIAGRAMS
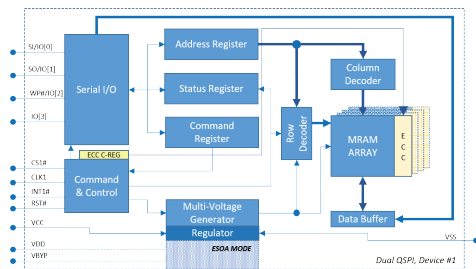
2/4/8Gb, 4Gb x 2
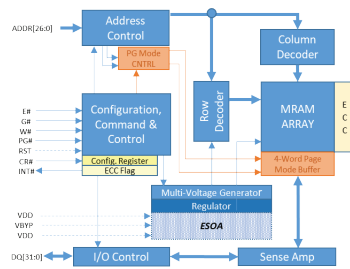
4Gb, 128M x 32

1Gb, 32M x 32

16Mb, 2M x 8

16Mb, 1M x 16

PROGRAM PARTICIPATION

- Cassini
- NPOESS
- AEHF1-6
- Milstar
- Astrolink
- Gallileo
- Aerion
- SWARM
- Sentinel
- Earthcare
- Metop 2nd Generation
- TerraSAR-X

SPACE QUALIFICATION CAPABILITIES

- ANSI/ESD-S20.20:2014
- AS9100:2016/ISO 9001:2015
- MIL-PRF-38534, Class H
- MIL-PRF-38535, Class Q & V
- MIL-STD-750, Laboratory Suitability
- MIL-STD-883, Laboratory Suitability
- EEE-INST-002

About Micross

Micross is the most complete provider of advanced microelectronic services and component, die and wafer solutions. With the broadest authorized access to die & wafer suppliers, an extensive portfolio of hi-rel power, RF, optoelectronics, memory, data bus, logic, and SMD/5962 qualified products, and the most comprehensive advanced packaging, assembly, modification, upscreening, and test capabilities, Micross is uniquely positioned to provide unparalleled high-reliability solutions, from bare die, to fully packaged devices including hermetic ICs/MCMs, PEMs, ASICs, FPGAs, and PCBs, to complete program life-cycle sustainment. For more than 40 years, Micross has been a trusted source for the aerospace, defense, space, medical, energy, communications, and industrial markets.

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