



Hermetic STT-MRAM (spin-torque transfer magneto-resistive random-access memory), provides true random read/write access and inherently high resistance to magnetic flux & radiation...mitigating the need for shielding. Near infinite endurance and best-in-class non-volatile memory data retention.



## KEY FEATURES

### Technology

- pMTJ STT-MRAM (Perpendicular Magnetic Tunnel Junction)
- Inherently Rad-Tolerant
- 16Mb / 64Mb Products Based on Gen-2, 40nm
- 1Gb / 4Gb Parallel Based on Gen-3, 22nm

### Performance

- 16Mb, 64Mb, 1Gb, & 4Gb Parallel STT-MRAM Available in Small, Low-Profile Packages
- Parallel Access Performance: 45ns min.

### Operating & Environmental Specifications

- Quality Flows
  - Space: MIL-PRF-38535, QML-V, /V (Certification in Process) & Micross Space Flow, /S
  - Military: MIL-PRF-38535, QML-Q, /Q, Micross Military, /M
  - Extended Temp: Mil-Temp, -55°C – 125°C
- Irradiation Effects Performance: VCC ≤ 3.0V
  - RAD Hard (RH): 300K RAD TID
  - RAD Tolerant (RT): 100K RAD TID
  - Non-RAD
- Excellent Single Event Effect (SEE) Performance: VCC ≤ 3.0V
  - SEE ≥ 72.4 MeV cm<sup>2</sup>/mg
- Operating Voltage Range: VCC: 2.70V - 3.60V

## BENEFITS

### Optimal Design

- Smallest Hermetic Rad-Hard 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

### Flexible Package Options

- LGA, CGA, & BGA Ceramic Packages Available

## APPLICATIONS

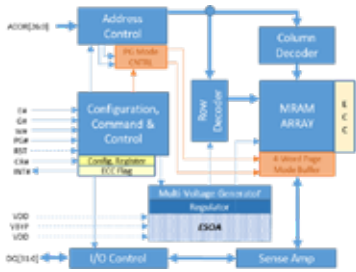
- Space Grade Processor Based Systems and FPGA Boards
- LEO, MEO, GEO, and HEO Space Missions
- Satellites
- Launch Vehicles
- Space Systems and Vehicles
- Aerospace Systems

# Smallest & Lowest Power Hi-Rel Non-Volatile Memory

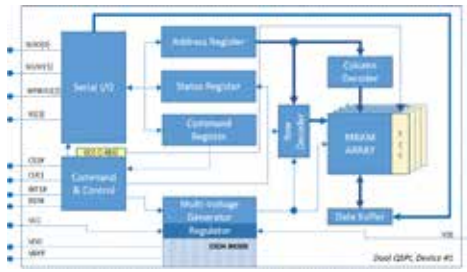
Micross, a leading global provider of mission-critical microelectronic components and services for high-reliability aerospace, defense, space and industrial applications has entered an exclusive partnership with Avalanche Technology, the leader in next generation MRAM Technology. With this collaboration, Micross is the exclusive supplier of die and hermetically sealed devices utilizing Avalanche's next-gen Spin Transfer Torque Magnetoresistive Random Access Memory (STT-MRAM).

Micross' SWaP optimized hermetic STT-MRAM devices offer inherent protection from harsh environments, magnetic flux and radiation, while providing the most compact and best power profile non-volatile memory. MRAM devices are ideally suited for high-speed non-volatile memory applications, such as program storage and data backup in space and aerospace systems. Micross and Avalanche are addressing the need for more compact and lower power solutions that are optimized for hi-reliability aerospace & space applications, and are introducing a series of memory devices based on this best-in-class technology.

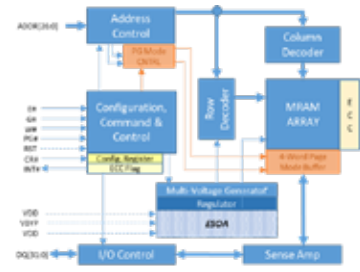
## MRAM BLOCK DIAGRAMS



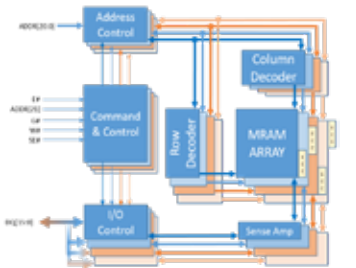
4Gb, 32M x 32



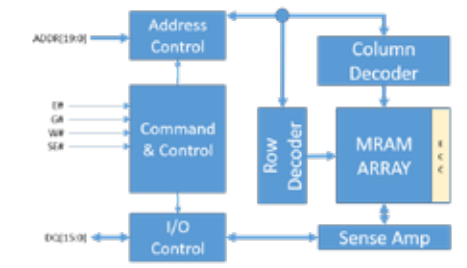
2/4/8Gb Dual QSPI



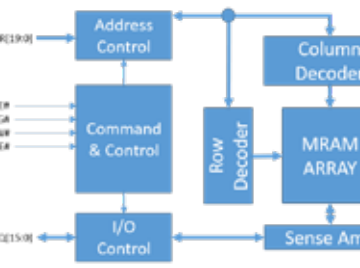
1Gb, 32M x 32



64Mb, 4M x 16



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 (QML-V, Certification in Process)
- MIL-STD-750, Laboratory Suitability
- MIL-STD-883, Laboratory Suitability
- EEE-INST-002



### Need Information?

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- General Requests: [micross.com/info](http://micross.com/info)
- Technical Support: [micross.com/tech-support](http://micross.com/tech-support)