

### Everspin MRAM Features:

SRAM read/write cycle time  
Unlimited read/write endurance  
Non-volatile for greater than 20-years  
Commercial, industrial, extended, and automotive temperature options

### Everspin MRAM Benefits:

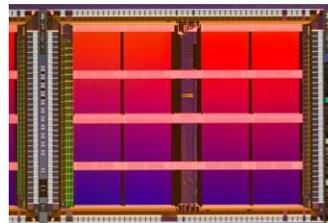
Small footprint up to 16 Mb in one chip  
Fast, simple interfaces Parallel SRAM or Serial SPI  
Cost effective simple one transistor, one magnetic tunnel junction (1T-1MTJ) bit cell  
Best-in-class soft error rate significantly better than other memories  
RoHS compliant no battery, no lead (Pb)  
Replaces multiple memories Combines functions of Flash, SRAM, EEPROM, nvRAM, BBSRAM

For more Information or Datasheets, please contact:

**Protec GmbH**  
Rosenheimer Landstraße 117  
85521 Ottobrunn  
Phone: 089/6602923  
eMail: c.mayer@protec-semi.de

### Protec GmbH is proud to announce Partnership with Everspin for Avionic and HighRel Applications.

MRAM is a revolutionary memory that uses the magnetism of electron spin to provide non-volatility without wear-out. Everspin MRAM stores information in magnetic material integrated with silicon circuitry to deliver the speed of SRAM with the non-volatility of Flash in a single unlimited-endurance device. Everspin MRAM devices are designed to combine the best features of non-volatile memory and RAM to enable "instant-on" capability and power loss protection for an increasing number of electronic systems.



### The MRAM Advantage

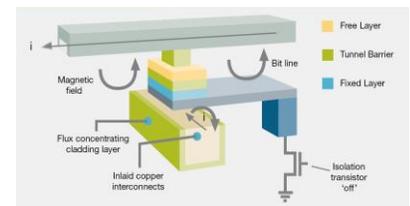
Simple Interfaces Parallel MRAMs (8 & 16-bit) have SRAM read and write cycle times and asynchronous timing interfaces that use standard SRAM controllers. Serial MRAMs have the same SPI interface as Flash and EEPROM but with fast 40 MHz clock speed and no write delays.

### Superior Soft Error Rate

Flash, SRAM, BBSRAM and nvSRAM storage technologies are increasingly susceptible to soft errors. MRAM technology is unaffected by alpha and neutron particles. This assures soft error rates two orders of magnitude better than competing non-volatile storage.

### Wide Temperature Range and Superior Reliability

MRAM delivers a 3-volt high-density non-volatile RAM that operates over wide temperature ranges. Data is always retained for more than 20-years after each write without backup cycles or battery backup. MRAM does not exhibit the charge storage failure modes that limit the data retention and endurance of other technologies.



### Applications for MRAMs:

Transportation, Military and Avionics Systems. Highly reliable system operation is ensured over extreme temperature conditions and environments.

### MRAM Product Families available for Avionic and Military Applications:

- 8 Parallel Bit Memory Interface Family
- 16 Parallel Bit Memory Interface Family
- SPI Memory Interface Family