

Avalanche Technology, headquartered in Fremont, California, is the world leader in Spin Transfer Torque Magnetic RAM (STT-MRAM) non-volatile memory leveraging perpendicular magnetic tunnel junction (pMTJ) cell structure manufactured on 300mm standard CMOS process.

Discrete MRAM

Avalanche's Persistent SRAM (P-SRAM) is a non-volatile memory utilizing an advanced pMTJ STT-MRAM technology and is offered with either a Serial Peripheral Interface (SPI) or a parallel interface (x8/x16). Ideal for the following applications:



Aerospace*



Aerospace & Defence*



Industrial

Radiation-hardened, general-purpose, multi-core processors and FPGAs are used in on-board computing for applications such as military surveillance and weapons systems, human-rated spacecraft, habitats and vehicles, and robotic science and exploration platforms. System applications range from small satellites to large flagship-class missions. These processors and FPGAs need highly reliable boot code and configuration memory. Avalanche's **Gen 3 P-SRAM** using our 22nm high reliability pMTJ STT-MRAM enables the next generation of distributed edge processing in space for Low Earth Orbit Satellites. Ideal for aerospace and defense applications.

Serial High Performance

1Mb, 4Mb, 8Mb, 16Mb

1.8V (1.71V to 2.00V)
3.0V (2.70V to 3.60V)

8-pad WSON, 8-pin SOIC, 24-ball FBGA

Industrial (-40°C to 85°C),
Industrial Plus (-40°C to 105°C)

	Serial QSPI Space Grade (Gen 1)
Densities	4Mb, 8Mb
Voltages	1.8V (1.70V to 2.00V)
Packages	8-pin WSON, 16-pin SOIC
Temperature Ranges	Aerospace (-40°C to 105°C)

	Serial QSPI Space Grade (Gen 3)
Densities	512Mb, 1Gb
Voltages	1.8V (1.71V to 2.00V) 3.0V (2.70V to 3.60V)
Packages	36-ball FBGA
Temperature Ranges	Aerospace (-40°C to 125°C)

	Serial SPI
Densities	1Mb, 4Mb, 8Mb, 16Mb
Voltages	3.0V (2.70V to 3.60V)
Packages	8-pad WSON, 8-pin SOIC
Temperature Ranges	Industrial (-40°C to 85°C), Industrial Plus (-40°C to 105°C)

	Serial Space Grade (Gen 2)
Densities	16Mb
Voltages	1.8V (1.71V to 2.00V) 3.0V (2.70V to 3.60V)
Packages	8-pin WSON, 8-pin SOIC
Temperature Ranges	Aerospace (-40°C to 125°C)

	Parallel x32 Space Grade (Gen 3)
Densities	512Mb, 1Gb, 2Gb, 4Gb
Voltages	3.0V (2.70V to 3.60V)
Packages	142-ball FBGA
Temperature Ranges	Aerospace (-40°C to 125°C)

	Parallel x8
Densities	1Mb, 4Mb, 8Mb, 16Mb, 32Mb
Voltages	3.0V (2.70V to 3.60V)
Packages	44-pin TSOP, 48-ball FBGA
Temperature Ranges	Industrial (-40°C to 85°C), Industrial Plus (-40°C to 105°C)

	Parallel x16 Space Grade (Gen 2)
Densities	16Mb, 32Mb, 64Mb
Voltages	3.0V (2.70V to 3.60V)
Packages	48-ball FBGA
Temperature Ranges	Aerospace (-40°C to 125°C)



	Parallel x16
Densities	1Mb, 4Mb, 8Mb, 16Mb
Voltages	3.0V (2.70V to 3.60V)
Packages	44-pin TSOP, 54-pin TSOP, 48-ball FBGA
Temperature Ranges	Industrial (-40°C to 85°C), Industrial Plus (-40°C to 105°C)

* Applicable to India region only

Internet of Things

	Serial Ultra Low Power
Densities	1Mb, 4Mb, 8Mb, 16Mb
Voltages	1.8V (1.71V to 2.00V) 3.0V (2.70V to 3.60V)
Packages	8-pad WSON, 8-pin SOIC
Temperature Ranges	Industrial (-40°C to 85°C), Industrial Plus (-40°C to 105°C)



Storage

STT-MRAM

Instant access speed & non volatility characteristic
As a Level 3 cache to replace low performing NAND module
As a high density PCI RAID controller

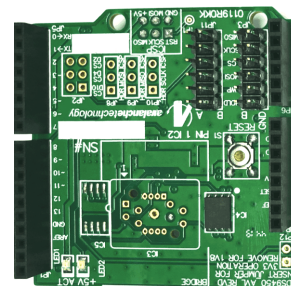
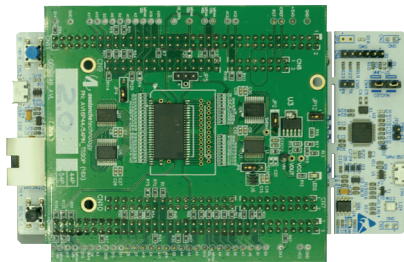
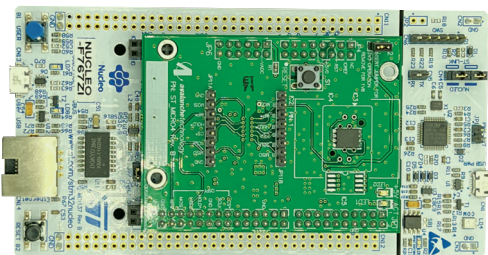


NASA Test Report
Space qualified parts for MRAM



Application Notes Link
Migration from Cypress, Everspin & Fujitsu to Avalanche Technology

P-SRAM Development Kits



Serial QSPI Evaluation Kit

Enables users to evaluate Avalanche's P-SRAM Serial QSPI product using a STMicro Nucleo motherboard connected to an Avalanche daughter card via a standard Asynchronous SRAM interface. The Avalanche daughter card is populated with a AS3016204-108. The STMicro Nucleo motherboard communicates with the computer using a USB 2.0 cable type A/B and terminal emulator software, using Avalanche's proprietary software application.

Download the
User Guide



Parallel Interface Evaluation Kit

Enables users to evaluate Avalanche's P-SRAM parallel interface product using a STMicro Nucleo motherboard connected to Avalanche's daughter card via a standard Asynchronous SRAM interface. The Avalanche parallel interface P-SRAM daughter card is populated with a AS3016316-035nX0I device. The STMicro Nucleo motherboard communicates with the computer using two USB 2.0 cables type A/B and terminal emulator software, using Avalanche's proprietary software application.

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User Guide



Arduino SPI Evaluation Board

Enables users to evaluate Avalanche's Serial P-SRAM products. The Avalanche P-SRAM evaluation board populated with a P-SRAM device can be connected to an Arduino UNO R3 or other host boards with compatible UNO R3 headers. Avalanche software bundled APIs and test program provide basic access to functionality of the Avalanche P-SRAM device.

Download the
User Guide



Embedded Perpendicular STT-MRAM Technology (epMRAM)

Avalanche's next generation epMRAM is fully integrated, energy efficient, has fast reads and writes, has no static leakage through MRAM bitcell and is ideal for IoT, storage and compute applications. epMRAM is offered in two flavors, namely, eMRAM and eSRAM.

epMRAM has excellent data endurance and retention characteristics; eMRAM: 1×10^{10} Write Cycles with 20 years data retention at 85°C, eSRAM: 1×10^{16} Write Cycles with 20 years data retention at 85°C.

Avalanche's epMRAM can seamlessly replace embedded Flash (eFlash) and embedded SRAM (eSRAM) which are widely used in modern SoCs. eFlash and eSRAM are both facing scaling challenges beyond 28nm; eFlash due to limitations in channel length and endurance whilst eSRAM due to excessive leakage. Avalanche's epMRAM has no such challenges and is easily scalable to lower geometries (sub-10nm nodes).

Avalanche's eMRAM macros are enabled using standard manufacturing processes in existing CMOS FABs on top of the metal layer with two additional masks.

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