



## A New Era of Storage Innovation for a Content Rich World

The future of electronics innovation depends on storage innovation. But traditional flash memory is running out of steam, with resistive RAM (RRAM) widely acknowledged as the leading contender to replace it.

As a leader in the race to develop RRAM technology, Crossbar has pioneered RRAM breakthroughs in performance, reliability, capacity and power consumption that will usher in a new wave of electronic device innovation.



### Performance

100X lower read latency than NAND, 20X faster write than NAND without any block erase design constraints and timing limitations



### Density

Up to 1 TB of data storage on a single chip, 3D stackable and scalable to sub-10nm



### Energy

20X lower power consumption than NAND



### Manufacturability

Easy integration into semiconductor fabs and processes

## CROSSBAR RRAM TRANSFORMS THE FUTURE OF ELECTRONICS

By 2018, the demand for non-volatile memory is expected to reach \$60 billion. By inventing a new class of low latency, high-density RRAM storage solutions that can be manufactured by any semiconductor foundry, Crossbar is enabling a game changing transformation of the memory industry. Crossbar's RRAM technology will be integrated into a wide variety of devices and enable increasingly small form factors in a wide variety of applications:



### Consumer Electronics

Stream and access your entire library of high-definition videos and games with super-dense, and fast storage



### Internet of Things

Connect a wide range of extremely integrated devices and sensors to store and share information, all while lasting years on a single battery charge



### Enterprise Storage

Enable high-speed computing and big data analytics with denser rack space and ultra low latency solid-state drives



### Mobile Computing

Enjoy faster web queries and content creation with any cloud-based application data



### Industrial/Auto/Medical

Ensure reliable, fast and secure access to critical machine, sensor and car data across a wide temperature range



### Wearables

Create sleek new devices integrating wellness, fitness data and a content-rich world from your pocket to your body

### Crossbar Fast Facts:

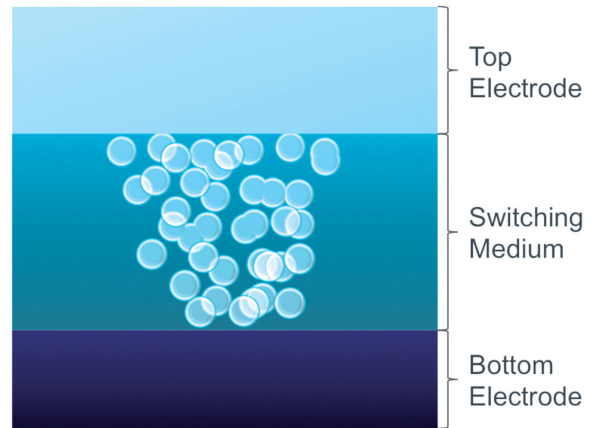
- Dr. George Minassian, CEO
- Founded 2010
- Based in Santa Clara, California
- 50 employees, over 500+ years of non-volatile memory experience
- Privately held company, backed by Artiman Ventures, Kleiner Perkins Caufield & Byers, Northern Light Venture Capital, Tyche Partners, SAIF Partners, Korea Investment Partners, CBC-Capital, Oriza Holdings, Cheerful Link, Tao Invest, University of Michigan and Correlation Ventures
- Exclusive licensee of University of Michigan's RRAM patents
- 190 patents filed, 100 issued

**CROSSBAR RRAM:  
SIMPLY FAST. SIMPLY SCALABLE. SIMPLY RELIABLE.**

Crossbar RRAM technology is based on a non-conductive switching layer as the host material for a metallic filament formation. The switching mechanism is based on an electric field, making Crossbar RRAM cell behavior very stable across a wide temperature range.

The simple structure of Crossbar RRAM cell, its commonly used materials, process steps and manufacturing tools enable any semiconductor foundry to enter the memory business by licensing Crossbar RRAM technology and producing storage class memory chips.

Crossbar RRAM technology has proven its manufacturability with a working array produced in a commercial fab. This working silicon is a fully integrated monolithic CMOS controller and memory array chip. The company is currently completing the characterization and optimization of this device and plans to bring its first product to market in the embedded SoC market while continuing the development of high-density storage class solutions in advanced process geometries.



**Crossbar RRAM Technology  
Simple Implementation for Low-Cost Manufacturability**

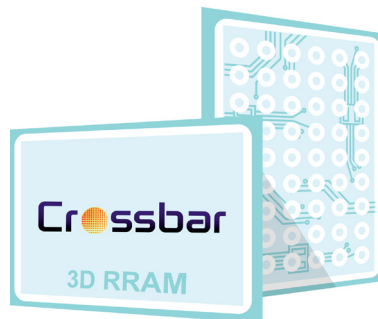
The resistance switching mechanism of Crossbar's technology is based on the formation of a filament in the silicon-based switching material when a voltage is applied between the two electrodes.

**Redefine what's possible for your next  
embedded application with Crossbar RRAM.**



**IP Licensing**

Crossbar RRAM technology is available as non-volatile, low latency, low power embedded memory IP blocks.



**3D RRAM**

Crossbar RRAM low latency, high-density memory chips are in the works and hold the promise of how storage will be redefined.

**Contact us for:**

- Customer Design Services
- Technical Support
- Datasheets
- Tools
- Order Samples

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**Follow us on:**



Crossbar Inc. is the leader in RRAM technology, widely accepted as the front runner to replace traditional Flash technology in future storage systems. Delivering terabyte storage on a postage stamp-sized chip, with power low enough for massive adoption throughout the Internet of Things, Crossbar RRAM is easy to tailor for a broad range of applications. From embedded memory on SOCs for wearables, to very high density SSDs for cloud data centers, Crossbar is ushering in a new era of storage innovation. For more information, visit [www.crossbar-inc.com](http://www.crossbar-inc.com) or follow us on Twitter, LinkedIn and Google+.

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