

How RRAM is Changing the Landscape of Wearable and IoT applications

Corporate Overview

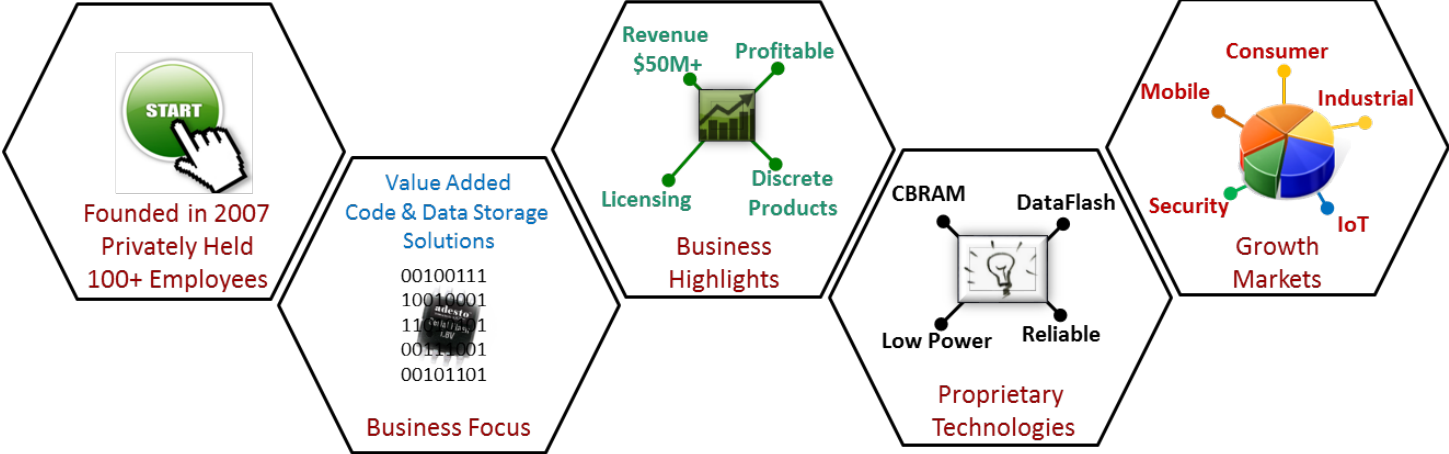
Adesto Technologies Develops and Markets

Differentiated

Application-Specific

Code and Data Memory Solutions

Targeted for Integrated, Connected, Low Power Applications





Adesto Technologies: Leading CBRAM Commercialization

Adesto is Shipping the World's First Discrete RRAM Device

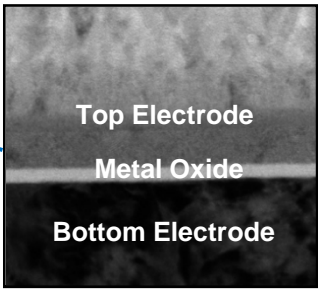
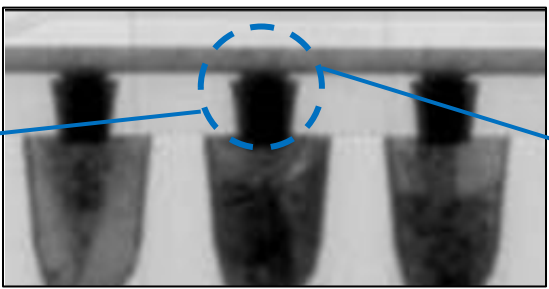
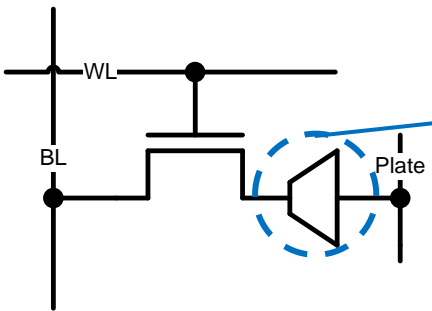
PRESS RELEASE
June 18, 2014, 2:11 p.m. EDT
Adesto Technologies Announces CBRAM® One Million Unit Shipment Milestone
Disruptive, ultra-low power semiconductor technology establishes presence in memory applications

CBRAM Advantage Over Today's Solutions

 + 

Faster Storage Low Power Consumption

CBRAM Basics

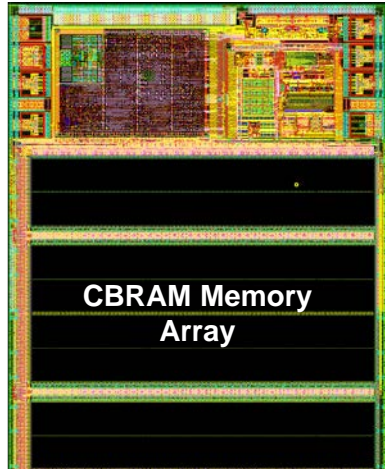


Storage element scalable to <10 nanometers

Cell Structure: 1T1R
T = Std Logic Transistor
R = CBRAM Resistive Storage Element

Current Product Highlights

- Over 50,000 Write Endurance Cycles (at die level)
- 10x faster Byte Write than today's ETOX based Flash
- VPP < 2V (no high voltage requirement)
- Solder Reflow Process Compatible (high temp reliable)
- Guarantee 10 years retention at 85°C

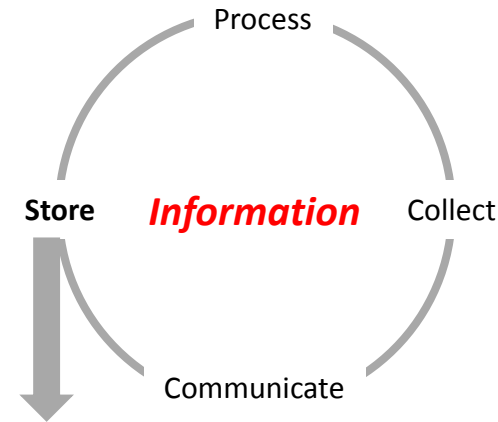


- Bit Addressable (Read/Write) Serial NVM Device (32Kb to 1Mb)
- Integrated on industry standard Logic CMOS Technology: Embedded Memory Solution
- Porting to sub 55 nm to enable higher density products

NOT SINGLE CELLS ONLY, THESE ARE PRODUCT LEVEL SPECS

Low Power Sensors: Powered by Battery/Energy Harvesting

Intelligence in *Things* =



Adesto CBRAM®

Sports and Fitness:



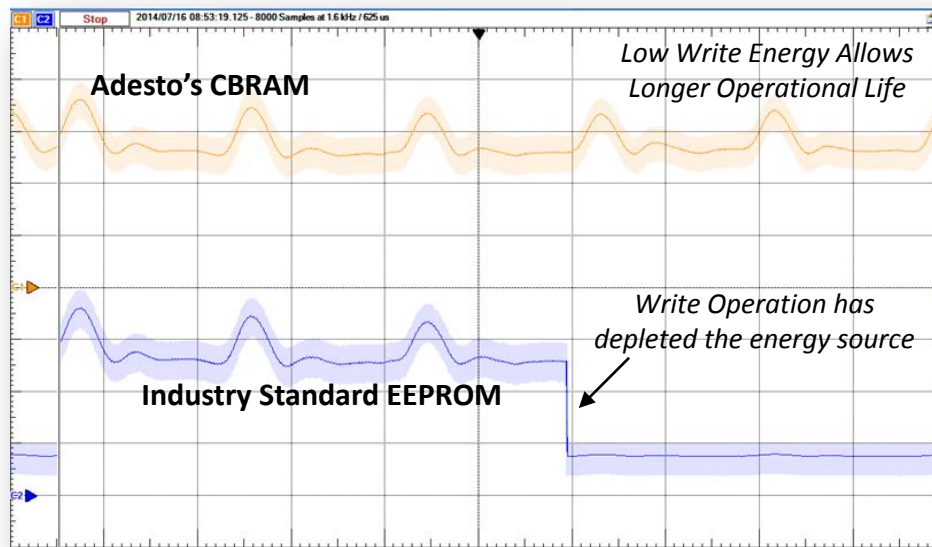
Home Automation:



Medical Sensors:

Blood Pressure
Glucose Monitor
Pancreatic Monitor
Muscle Activity
Electrocardiogram
... and more

Side-by-Side Energy Consumption: CBRAM vs EEPROM



Heart Rate Monitor:
Recording of Heart Rate on a
Serial NVM Device Using a Finite
Reservoir of Energy



Adesto CBRAM®



EEPROM #1



EEPROM #2

CBRAM as Application Specific Memory for Low Power Applications

CBRAM: World's Lowest Energy Non-Volatile Memory Technology Ever Demonstrated

Adesto Technologies Demonstrates Non Volatile Memory Operating at sub 1V in a Body Sensor Chip

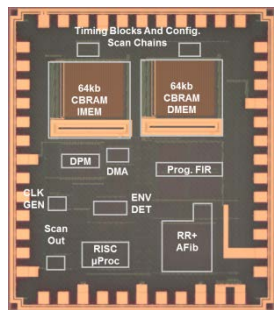
- VLSI Symposium 2013

SENSOR CHIP with embedded CBRAM OPERATING by ENERGY HARVESTING

Battery Operated Wearable Electronics

Ultra Low Power Embedded Devices

Energy Harvesting Body Sensors



Parameter	Adesto's CBRAM	Today's Flash	Improvements
Core Read Voltage (V)	0.35	1	60% Lower
Read Energy Per Bit (fJ)	50	500	10x Lower
Core Write Voltage (V)	0.6	10	17x Lower
Write Energy Per Bit (pJ)	1	100	100x Lower

CBRAM as Application Specific Memory For Medical Applications

Application

Storage of code and data in medical equipment and health care:

Examples: Orthopedics, Blood Bags, Catheters, Glucose Meters, Wireless Patient Monitoring

Problem

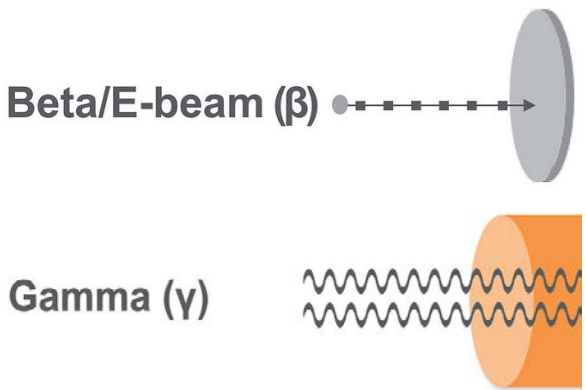
Today's Flash memories are not compatible with medical sterilization

Methods of Sterilization include Irradiation, Thermal, Chemical.

Solution

CBRAM technology is proven to maintain data integrity after sterilization processes.

CBRAM's Demonstrated Immunity to Standard Sterilization Processes



Data Integrity of Serial Non Volatile Memory Devices After Gamma and e-Beam Irradiation

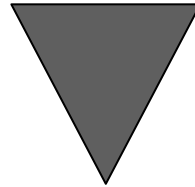
DOSE	Adesto CBRAM ⁽¹⁾	Traditional FLASH ⁽²⁾
1.3 kGy	●	●
15 kGy	●	●
25 kGy	●	●
50 kGy	●	●
200 kGy	●	●

Typical Dose for Medical Sterilization

- Pass – Full Data Integrity and Functionality Preserved
- Fail – Data Loss

Tests Performed by leading medical companies and nordion

Adesto Technologies



Re-inventing **Memory** for **Things™**