

Faster and Enhanced Secure ID's through Next Generation Technologies

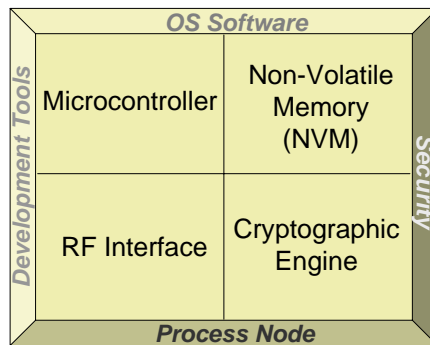


Photo: Ramtron Corporation

Presented by Joseph Pearson
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Technology Architecture Contactless Chip



Core Functional Components

- **Microcontroller** – processing
- **NVM** – stores data
- **RF Interface** – analog front-end for power and communications
- **Cryptographic Engine** – encrypts, decrypts and authenticates data

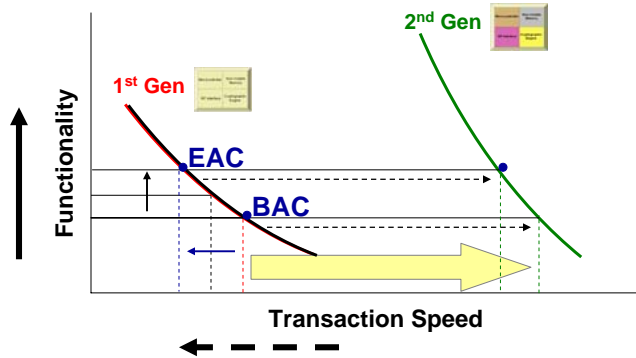
Others

- OS Software
- Development Tools
- Process Node
- Security



Why new technologies?

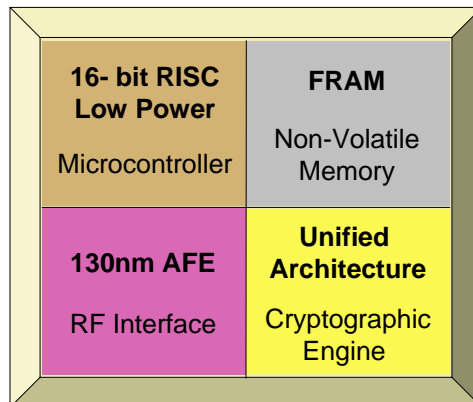
Technology Architecture *Functionality vs. Speed*



Next Generation Technologies

Deliver ...

- Power Efficiency
- Fast Execution
- Security



FRAM (Ferroelectric Random Access Memory) Non-Volatile Memory

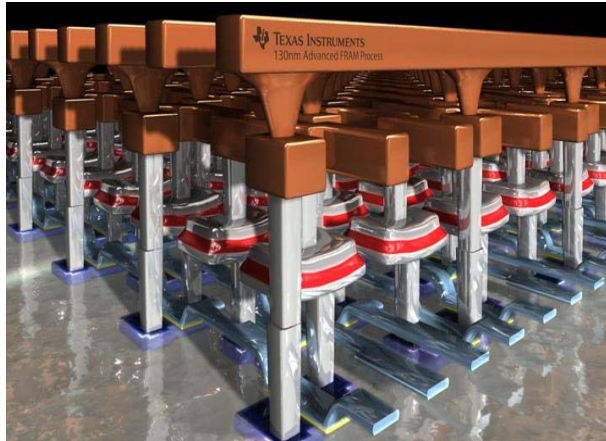
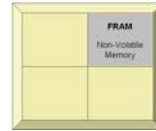
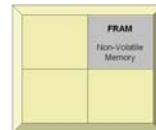


Photo: Ramtron Corporation

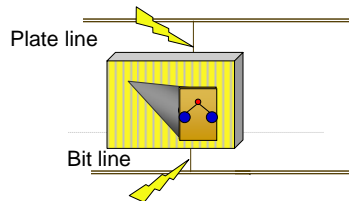


FRAM Eliminates EEPROM Write Time



FRAM Memory Cell

Read Data



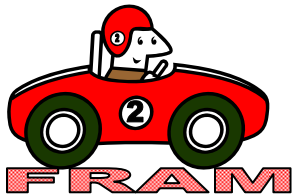
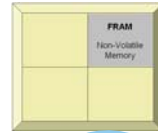
Data Write / Refresh



**FRAM Eliminates All Write Time
Associated with EEPROM**



FRAM leaves EEPROM in the dust



FRAM
Fast (Automatic) & 1 step process
• Single Command

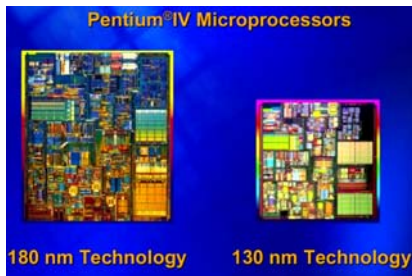


EEPROM
Slow (Manual) & 2 step process
• Write Command
• Read / Verify Command

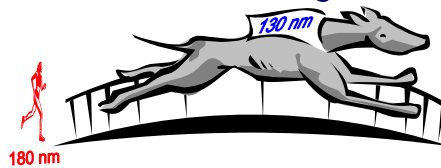
FINISH



130nm Analog Front-End (AFE) RF Interface



2 x Circuitry



72% Scale

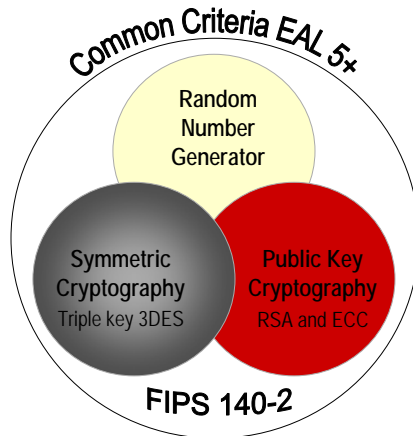
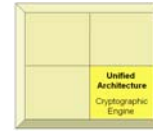
More Power

Efficient 130nm AFE power conversion

- More from less
- Faster



Unified Architecture Cryptographic Engine



Faster Operation

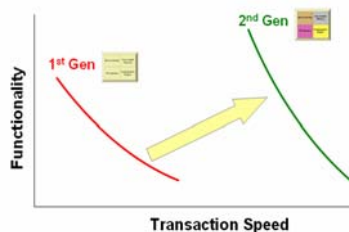
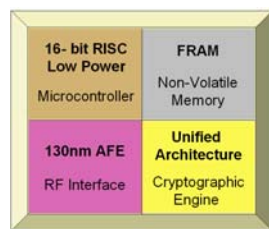
- Dual-core DES hardware cryptographic co-processor
- 256-bit ECC Public Key Cryptography

Low Power

- Hardware accelerated security functions
- Low power design architecture



Performance Expectations 2nd Generation Smart IC



Transaction Speed

- Faster Write
- Faster Read

Functionality

- **Better RF Power Conversion** – minimum 0.8 A/m (std is 1.5 A/m)
- **More User Memory Capacity for Contactless IC's** – up to 512 KB
- **Higher Security** – Supports Advanced ECC cryptography and no compromises with next generation technologies
- **Better Physical Reliability** – smaller die size of 8 mm² for 128KB memory



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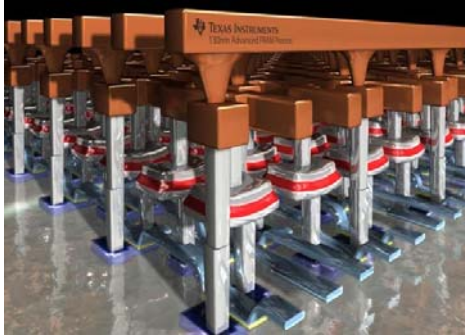


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See more at:

www.ti.com/govid

