



Application brief

EXCELON™ Auto F-RAM memory

Performance, reliability, and instant nonvolatility in low-pin-count memory

Automotive systems require memories to continuously log and instantly capture sensor data in the event of power loss. Such harsh operating environments with demanding requirements for cycling endurance and data retention need the most-robust performance possible, while supporting efficient low-pin-count and high-speed interfaces. EXCELON™ AEC-Q100 1, 2, and 3-qualified mission-critical memories support up to 108 MHz QSPI interface with 100 trillion cycle write endurance, fast writes, and instant nonvolatility.

EXCELON™ F-RAM advantages

EXCELON™ F-RAM memories combine nonvolatile data storage with the fast speed of RAM. F-RAM has three distinct advantages over traditional nonvolatile memories:

- › Fast write speed with NoWrite delay
- › Virtually unlimited endurance
- › Industry's most energy-efficient NVRAM

EXCELON™ F-RAM operates with the same host processor interfaces and timing as other memories such as SRAM, EEPROM, and serial Flash, but takes advantage of its fast write speed to eliminate write delays due to “soak time” or page/sector buffering required of other technologies. Instant writes eliminate “data at risk” resulting from unexpected power loss.

Applications

Infineon's EXCELON™ Auto F-RAM is an ideal solution for a variety of automotive applications, including:

- › Camera and sensor data capture for ADAS systems
- › Event data recorders
- › ECUs
- › Infotainment
- › Body control

Key features

High performance

- › 40/50 MHz SPI and 108 MHz SDR QSPI interfaces
- › NoWrite delay
- › True RAM performance; no data polling before writes

Reliable

- › Instant nonvolatility
- › 100 trillion (10^{14}) cycle endurance
- › No wear-leveling required
- › 100+ year data retention
- › No battery or capacitor required

Automotive ready

- › -40 to +85°C/+105°C/+125°C Automotive Grade
- › AEC-Q100 Grade 1, 2, and 3
- › ISO 26262 functional-safety compliant
- › Embedded ECC

Automated Driver-Assist Systems (ADAS)



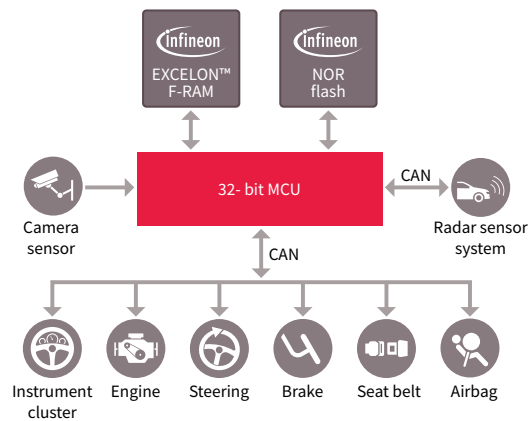
Problem

I must reliably capture the last camera and sensor data instantly on power loss, while meeting automotive quality and long life cycles.

Solution

EXCELON™ Auto captures data instantly with no soak time requirement and without any additional back-up components. It supports endurance cycling of 100-trillion write cycles to log data for 20 years, and provides AEC-Q100-qualified and functional-safety compliant-memory components.

Block diagram



Tachograph



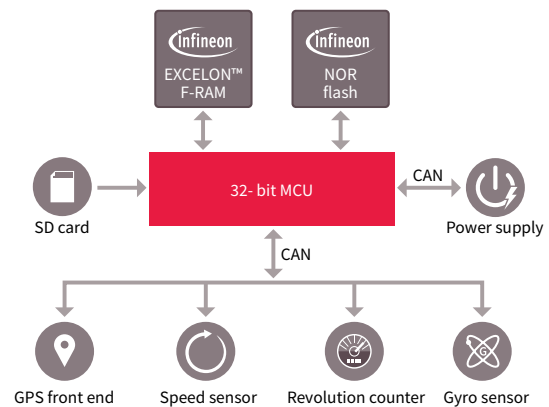
Problem

I need a fixed-function system to track driving speed and work-related operations on a vehicle. The low-power data-logging memory must offer high reliability.

Solution

EXCELON™ Auto logs data instantly and provides endurance for 100 trillion write cycles for exceptional reliability. It's also AEC-Q100 qualified and functional safety compliant.

Block diagram



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