EXCELON™
Purpose-Built Memory for Mission-Critical Data-Logging

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EMBEDDED IN TOMORROW
The IoT is exploding, with more than 30 billion devices projected to be in service by 2020. Cypress’ IoT leadership is built upon world-class wireless technology, a broad portfolio of MCUs, memories, analog ICs and USB controllers. Our solutions are helping transform traditional markets like industrial, home appliances, medical, and consumer, producing next-generation smart devices and connected/autonomous vehicle applications.

From the entrepreneur building a revolutionary new product in a garage to the Fortune 500 engineering team tasked with making the impossible happen now, Cypress is today’s technology partner for tomorrow’s innovations.
INTRODUCING EXCELCOTM MISSION-CRITICAL MEMORY

An explosion of small form-factor personal devices, smart connected factories and automotive ADAS has created new challenges. Battery-operated portable medical and wearable devices, factory machinery, and cars with advanced driver assistance systems are becoming smart and connected. These devices require increased mission-critical data-logging capable of instant, reliable data capture to ensure efficient and safe operation without incurring power and form-factor penalties.

Ultra-Low-Power In Small Form Factor

Latest-generation portable medical and wearable devices need non-volatile memories to log an increasing amount of user and sensor data continuously and at the lowest power consumption to maximize battery life. Excelon enables this with instant write capabilities, unlimited endurance and ultra-low-power modes. These devices also need memories with the smallest package footprint provided by the newest and smallest GQFN package offering with Excelon.

Performance, Reliability And Instant Non-Volatility In Low-Pin-Count Memory

Industrial and automotive systems increasingly require memories to continuously log and instantly capture sensor data in the case of power loss. Harsh operating environments and demanding requirements for cycling endurance and data retention require the most robust performance possible, while supporting efficient low-pin-count, high-speed interfaces. Excelon mission critical memories support a 108-MHz low-pin-count QSPI interface with 1,000 trillion cycle write endurance, fast writes and instant non-volatility.
PORTABLE MEDICAL AND WEARABLE DEVICES

Problem
I’m developing a high-end wearable that has to maximize battery life while logging extensive data at a rapid duty cycle. The memory must be low power and highly reliable while fitting in a small form factor.

Solution
Excelon LP™ uses 200 times less energy than EEPROM and 3,000 times less energy than NOR Flash, with endurance for 1,000 trillion write cycles to reliably log data every millisecond for more than 3,000 years. It comes in a small footprint GQFN package.

AUTOMATED DRIVER ASSIST SYSTEM (ADAS)

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

Solution
Excelon Auto™ captures data instantly with no soak time requirement and without any additional back-up components. It supports virtually unlimited write cycles to log data continuously for 20 years. Provides 125C, AEC-Q100-qualified and Functional Safety compliant memory components.

INDUSTRIAL AUTOMATION SYSTEMS

Problem
My factory automation systems require high-performance, reliable data-logging memories at control-level in case of power disruption. Industrial IoT sensors collecting data at field-level need to continuously log data while using minimal battery power. These systems need to operate in harsh, high-temp environments and last 20 years.

Solution
Excelon Ultra™ offers a Low-Pin-Count 108-MHz QSPI interface to meet performance requirements with NoDelay™ writes to instantly and reliably capture data on power loss. Excelon-LP offers the lowest active and idle power to ensure maximum battery life. Reliability is assured with 1,000-trillion write cycles at 85°C.
TECHNOLOGY AND BENEFITS

Nonvolatile
The ferroelectric RAM (F-RAM) memory cell contains a thin film of lead zirconate titanate, (PZT). The central atom in the PZT crystal changes position when an electric field is applied. The two positions of the central atom are used as binary states for the memory to store one bit. When power is interrupted, the atom’s position is retained, protecting the data.

Fast Write
The memory cell writes data instantly to nonvolatile memory at bus speed, eliminating “data at risk.” There is no write delay due to soak times required by legacy technologies.

High Endurance
High Endurance – The memory cell offers 1,000 trillion (10¹⁵) write cycles, far exceeding the capabilities of legacy technologies, ensuring high reliability and long life.

FEATURES

HIGH DENSITY
2Mb – 16Mb

HIGH SPEED
50-MHz Serial Peripheral Interface (SPI)
54-MHz Double Data Rate (DDR)/108-MHz Single Data Rate (SDR) Quad SPI

ULTRA-LOW POWER
Operating voltage range: 1.71-1.89 V, 1.8-3.6 V
Ultra-low (0.1-µA) hibernate current
Ultra-low (2.3 µA) standby current
Ultra-low (2.4 mA) active current@40-MHz

HIGH RELIABILITY
1,000-trillion read/write cycle endurance
100-year data retention

OPERATING TEMPERATURES
Commercial: 0°C to +70°C
Industrial: -40°C to +85°C
Industrial Extended: -40°C to +105°C
Automotive grade A: -40°C to +85°C
Automotive grade S: -40°C to +105°C
Automotive grade E: -40°C to +125°C