

KIOXIA

# Together, we drive the Future of Automotive Applications

High performance, high density storage for today's connected car



## KIOXIA: The Memory Supplier Supporting Continued Automotive Industry Innovation

The automobile industry currently has many demands being placed upon it. Vehicle manufacturers need to develop models that have a greater breadth of features and functionality. These models must also be better able to ensure the safety of road users and have improved environmental credentials too.

The data that the average car produces/actions has gone up by several orders of magnitude over the last decade. Inclusion of numerous cameras and sensor components, along with x-by-wire, telematics and diagnostics functionality, plus numerous infotainment and communication features have all added to the data load. Furthermore, this trend is only going to keep on accelerating in the years ahead, as more sophisticated imaging technologies (such as LiDAR) are incorporated, in order to facilitate the migration to autonomous driving. It is estimated that fully autonomous vehicles will be responsible for the generation and consumption of close to 4TB of data every hour, so having the capacity to store and rapidly access such data will be essential.

Automotive manufacturers need to be able to specify memories that deliver elevated levels of performance, with both high densities and fast interface speeds. These devices must also offer strong operational robustness - with resilience to extreme environmental conditions.

# The Value of e-MMCs to Automotive

AEC-Q100 Grade 3 compliant, the [e-MMC](#) managed Flash memories from [KIOXIA](#) are optimised for automotive deployment. They utilise the company's [BiCS FLASH™3D](#) flash memory technology - which allows multiple Flash layers to be stacked together within a single package, thereby boosting storage capacity. Built-in control functionality includes bad block management, wear levelling and error correction code (ECC) support, which all contribute to assured long-term reliability.



## Key features of KIOXIA's automotive e-MMCs include:

- JEDEC-compliant e-MMC interface version: 5.1
- Maximum data rate: 400MB/s
- Supply voltages: VCC 2.7V to 3.6V; VCCQ 1.70V to 1.95V, 2.7V to 3.6V
- Wide operating temperature range: -40°C to 85°C
- Package size:
  - 11.5mm x 13.0mm x 1.0mm (8GB)
  - 11.5mm x 13.0mm x 1.2mm (16GB-64GB)
- Support for PPAP (to ensure consistent production quality is upheld)
- Ultra-low failure rates
- Special automotive features (including enhanced solder ball reliability, over-temperature protection)

[Find out more >](#)

# UFS - A Vital Element of Next Generation Connected Cars

In addition to e-MMCs, KIOXIA also offers Universal Flash Storage (UFS) memories that are specifically intended for automotive use. UFS devices combine a high-capacity NAND Flash reserve plus an accompanying controller IC in a single package. Among the places that they will be applicable are within infotainment, wireless communication and advanced driver assistance system (ADAS) implementations. Supplied in compact packages with standardised interfaces that facilitate their integration, these devices support much faster read/write speeds than competing data storage solutions.



## Key features of KIOXIA's automotive e-MMCs include:

- AEC-Q100 qualified High-speed serial interface
- Ultra-reliable, robust technology (based on 15nm NAND and BiCS FLASH™ 3D topologies)
- Integrated memory management:
  - ECC mechanisms
  - Bad block management
  - Wear levelling
  - Garbage collection
- Automotive specific functions (including built-in diagnostics, refresh, thermal throttling, pre-programming, etc.)
- Power management functions to conserve electricity consumption
- Compliant with IATF16949

- Wide operating temperature range: -40°C to +105°C

Find out more >

[More information on KIOXIA's Automotive solutions](#)

# KIOXIA

**KIOXIA Europe GmbH**

Hansaallee 181, 40549 Düsseldorf, Germany

Tel +49-211-36877-0

[www.kioxia.com](http://www.kioxia.com)

