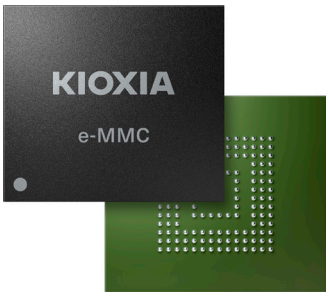
KIOXIA



Product Brief

e-MMC MANAGED FLASH

KIOXIA's broad, high-performance lineup of e-MMC products integrates flash memory and an e-MMC controller in a single BGA package to perform functions such as error correction, wear leveling, logical-to-physical address translation, and bad-block management. These solutions support a high-speed memory interface compliant with JEDEC Version 5.0/5.1 and eliminate the need for the host to directly control the flash memory.



e-MMC remains an important solution for many applications that are not able to migrate to the latest generation UFS, either because the densities needed are at the lower GB range, or because the processor does not yet support a UFS interface. Fabricated with solutions that utilize either 15nm process technology or our more advanced BiCS FLASH™ 3D flash memory, our e-MMC products are well-suited for a wide range of applications that continue to need e-MMC as an embedded memory solution.

Advantages

- Easy adoption for SoCs
- Widely supported MultiMediaCard (MMC) interface
- Multiple boot partitions
- Strong on-board ECC
- Low power consumption
- Small footprint

Key Features

- KIOXIA controller
- Parallel interface
- BiCS FLASH™ 3D flash memory
- Standard & extended temperature ranges
- JEDEC standard (v5.0/v5.1)
- 11.5 x 13mm 153 ball BGA (11 x 10mm 4GB package option)

Applications

- IoT devices
- Smartphones
- Smart TVs
- Tablets/2-in-1
- Automotive
- Streaming Media
- Smart Speakers

Densities

- 128GB
- 64GB
- 32GB
- 16GB
- 8GB*
- 4GB*

*Based on 15nm 2D flash memory

Design Considerations

UFS v4.0 supports **4640MB/s**

UFS v3.1 supports **2320MB/s**

e-MMC v5.1 supports **400MB/s**

Use UFS When:

- **Higher densities are needed** (from 32GB to 1TB)*
- **Enhanced performance** is desired (UFS provides high-speed read/write performance with good power efficiency)
- **SoCs that interface** to UFS are available

*Please see part number table for currently available densities.

Use e-MMC When:

- **Lower densities are needed** (4GB, 8GB, 16GB)
- **SoC-supporting UFS** interface is not available

BiCS FLASH™

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e-MMC | Managed Flash

	Part Number	Capacity	e-MMC Version	Process	Max Data Rate (MB/s)	Supply Voltage		Operating Temp °C	Package (mm)
						V_{cc}(V)	V_{ccq}(V)		
Consumer Grade	THGBMNG5D1LBAIT	4 GB	5.0	FG NAND	400	2.7 to 3.6	1.70 to 1.95, 2.7 to 3.6	-25 to 85	11 × 10 × 0.8
	THGBMTG5D1LBAIL								11.5 × 13 × 0.8
	THGBMUG6C1LBAIL	8GB	5.1						
	THGBMUG7C1LBAIL	16GB							
	THGBMUG8C2LBAIL	32GB							
	THGAMVG7T13BAIL	16GB	5.1	BiCS FLASH™	400	2.7 to 3.6	1.70 to 1.95		11.5 × 13 × 0.8
	THGAMVG8T13BAIL	32GB							
	THGAMVG9T23BAIL	64GB							
	THGAMVT0T43BAIR	128GB							11.5 × 13 × 1.0
	THGAMSG9T24BAIL	64GB	5.1	BiCS FLASH™	400	2.7 to 3.6	1.70 to 1.95		11.5 × 13 × 0.8
	THGAMST0T24BAIL	128GB							
Industrial Grade	THGBMJG6C1LBAU7	8GB	5.1	FG NAND	400	2.7 to 3.6	1.70 to 1.95, 2.7 to 3.6	-40 to 105[1]	11.5 x 13 x 1.0
	THGBMJG7C2LBAU8	16GB							11.5 × 13 × 1.2
	THGBMJG8C4LBAU8	32GB							
	THGBMJG9C8LBAU8	64GB							

(1) Tc=115°C max. Contact your KIOXIA sales representative for sample schedule.

Definition of capacity: KIOXIA Corporation defines a megabyte (MB) as 1,000,000 bytes, a gigabyte (GB) as 1,000,000,000 bytes and a terabyte (TB) as 1,000,000,000,000 bytes. A computer operating system, however, reports storage capacity using powers of 2 for the definition of 1GB = 2^{30} = 1,073,741,824 bytes and therefore shows less storage capacity. Available storage capacity (including examples of various media files) will vary based on file size, formatting, settings, software and operating system, such as Microsoft Operating System and/or pre- installed software applications, or media content. Actual formatted capacity may vary.

JEDEC is a registered trademark of JEDEC Solid State Technology Association.

Product image may differ from the actual product.

In every mention of a KIOXIA product: Product density is identified based on the density of memory chip(s) within the Product, not the amount of memory capacity available for data storage by the end user. Consumer-usable capacity will be less due to overhead data areas, formatting, bad blocks, and other constraints, and may also vary based on the host device and application. For details, please refer to applicable product specifications. The definition of 1KB = 2^10 bytes = 1,024 bytes. The definition of 1Gb = 2^30 bits = 1,073,741,824 bits. The definition of 1GB = 2^30 bytes = 1,073,741,824 bytes. 1Tb = 2^40 bits = 1,099,511,627,776 bits.

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