



Product Brief

Universal Flash Storage (UFS)

Designed to support the demanding requirements of mobile devices, KIOXIA's UFS brings high speed, greater power efficiency and increased storage capacity to smartphones and a wide range of applications.

KIOXIA's UFS solution is available in JEDEC/UFS Version 3.1/4.0/4.1 and integrates the company's BiCS FLASH™ 3D flash memory and controller in a JEDEC standard package. The latest controller supports the highest UFS interface speed today (46.4Gbps), enhanced error correction, wear leveling, logical to physical address translation, and bad-block management for a simplified system development.

KIOXIA was the first to sample UFS technology and continues to innovate its UFS product offering.



Key Features

- KIOXIA controller¹
- Fast serial interface speed
- High performance for reads and writes
- Optimal power efficiency
- Support for full duplexing
- Low pin count
- 9 x13mm and 11 x 13mm BGA packages
- JEDEC standard

Applications

- Smartphones
- AR/VR
- Tablets / 2 in 1
- Streaming media
- Smart speakers
- Many others

Densities

- 1TB
- 512GB
- 256GB
- 128GB

Design Considerations

UFS v4.0 / v4.1



supports
4640MB/s

Use UFS When:

- **Higher densities are needed** (from 128GB to 1TB)²
- **Enhanced performance** is desired (UFS provides high-speed read/write performance with good power efficiency)
- **SoCs that interface** to UFS are available

UFS v3.1



supports
2320MB/s

¹Applies to v.4.0 and 4.1 only

²Please see part number table for currently available densities.

Product image may differ from the actual product.



BiCS FLASH™

UFS | Universal Flash Storage

Part Number	Capacity	UFS Version	Max Data Rate (MB/s)	Supply Voltage			Operating Temp °C	Package (mm)
				V _{cc} (V)	V _{cco} (V)	V _{cco2} (V)		
Consumer Grade	THGJFPT0E18BAIP	128GB	3.1	2,320	2.4 to 2.7	1.14 to 1.26	-25 to 85	11.0 x 13.0 x 0.8
	THGJFPT1E28BAIP	256GB						11.0 x 13.0 x 0.8
	THGJFPT2E48BAIP	512GB						11.0 x 13.0 x 0.8
	THGJFMT1E45BATV	256GB	4.0	4,640	2.4 to 2.7	1.14 to 1.26	-25 to 85	9.0 x 13.0 x 0.8
	THGJFMT2E46BATV	512GB						9.0 x 13.0 x 0.8
	THGJFMT3E86BATZ	1TB						9.0 x 13.0 x 0.9
	THGJFRT1E45BATV	256GB	4.1	4,640	2.4 to 2.7	1.14 to 1.26	-25 to 85	9.0 x 13.0 x 0.8
	THGJFRT2E48BATV	512GB						9.0 x 13.0 x 0.8
	THGJFRT3E88BATW	1TB						9.0 x 13.0 x 0.85

³ Dual-supply operation at V_{cc} and V_{cco}. V_{cco2} need not be supplied.

While UFS performance is higher Ver 4.1 > 4.0 > 3.1, the SoC will likely determine which version UFS is required. JEDEC intends each UFS version to be backward compatible with previous versions, but please confirm by evaluating the power supply voltage and SoC.

Universal Flash Storage (UFS) is a product category for a class of embedded memory products built to the JEDEC UFS standard specification. 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. The definition of 1GB = 2³⁰ bytes = 1,073,741,824 bytes.

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 1 KB = 2¹⁰ bytes = 1,024 bytes. The definition of 1 Gb = 2³⁰ bits = 1,073,741,824 bits. The definition of 1 GB = 2³⁰ bytes = 1,073,741,824 bytes. 1 Tb = 2⁴⁰ bits = 1,099,511,627,776 bits. 1 TB = 2⁴⁰ bytes = 1,099,511,627,776 bytes.

Read and write speeds are the best values obtained in a specific test environment at KIOXIA Corporation and KIOXIA Corporation warrants neither read nor write speeds in individual devices. Read and write speed may vary depending on a device used and file size read or written.

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