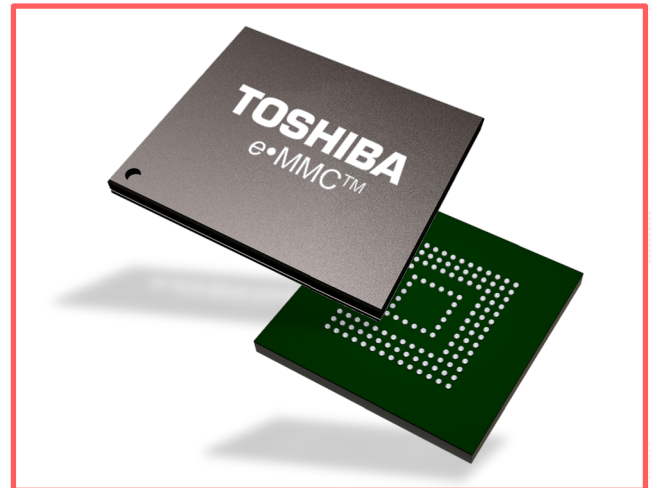


## > e•MMC™ Cost Effective Mass Storage

e•MMC™ is a family of advanced and highly efficient NAND flash memory with an integrated controller and enhanced memory management. Based on an interface standardized by JEDEC, Toshiba's e•MMC™ offers the optimal solution for applications where higher data volume needs to be stored in a cost efficient way. It is fully compliant with the Multimedia Card Association (MMCA) high speed memory interface standard.

## NAND FLASH MEMORY



### > APPLICATIONS

- Industrial Applications
- Consumer Electronics
- Multimedia Applications
- Smart Metering & Intelligent Lighting



### > FEATURES

- 4GByte – 128GByte
- 15nm
- MLC and TLC technology
- Conforms to the latest JEDEC Version 5.0 and 5.1
- Integrated memory management
  - Error correction code
  - Bad block management
  - Wear-leveling
  - Garbage collection
- Standard and extended temperature range of up to 105°C
- FBGA package

### > ADVANTAGES

- Higher Interface speed HS400 according to JEDEC 5.x
- Managed memory
- Package, interface, features, commands etc. are standard
- Utilizing high quality Toshiba MLC/TLC NAND flash memory in combination with a Toshiba origin developed controller
- Produced in the world's largest, leading edge technology flash factory

### > BENEFITS

- Easy to integrate storage solution due to established standards
- Cost efficient design in
- Optimal relation between price, density and performance
- Reliable storage solution based on high quality NAND memory and optimized controller
- Extended production capacity to fulfil customers demand

### > SPECIFICATIONS

Product / Features	e•MMC™	Extended Temp. e•MMC™
Density	4GByte – 128GByte	8GByte – 64GByte
Technology	15nm	15nm
JEDEC Version	5.0 / 5.1	5.1
Temperature	-25°C to +85°C	-40°C to +105°C
Package	FBGA	

## > e•MMC™ – PRODUCT LIST

Density	Item Name	Technology	JEDEC Standard	Temperature	Package
4GByte	THGBMDG5D1LBAIT	15nm	JEDEC 5.0	-25°C to 85°C	153FBGA 11x10
	THGBMDG5D1LBAIL	15nm	JEDEC 5.0	-25°C to 85°C	153FBGA 11.5x13
8GByte	THGBMHG6C1LBAIL	15nm	JEDEC 5.1	-25°C to 85°C	153FBGA 11.5x13
	THGBMHG6C1LBAU6	15nm	JEDEC 5.1	-40°C to 105°C	153FBGA 11.5x13
16GByte	THGBMKG7N1LBAIL	15nm	JEDEC 5.1	-25°C to 85°C	153FBGA 11.5x13
	THGBMHG7C2LBAU7	15nm	JEDEC 5.1	-40°C to 105°C	153FBGA 11.5x13
32GByte	THGBMKG8N2LBAIL	15nm	JEDEC 5.1	-25°C to 85°C	153FBGA 11.5x13
	THGBMHG8C4LBAU7	15nm	JEDEC 5.1	-40°C to 105°C	153FBGA 11.5x13
64GByte	THGBMKG9N4LBAIR	15nm	JEDEC 5.1	-25°C to 85°C	153FBGA 11.5x13
	THGBMHG9C8LBAU8	15nm	JEDEC 5.1	-40°C to 105°C	153FBGA 11.5x13
	THGBMGG9U4LBAIR	15nm TLC	JEDEC 5.1	-25°C to 85°C	153FBGA 11.5x13
128GByte	THGBMKT0N8LBAIR	15nm	JEDEC 5.1	-25°C to 85°C	153FBGA 11.5x13
	THGBMGT0U8LBAIG	15nm TLC	JEDEC 5.1	-25°C to 85°C	153FBGA 11.5x13

Valid Q4 2016

## > NEW INDUSTRIAL TEMPERATURE e•MMC™

For industrial applications requiring an e•MMC™ to perform at extended temperatures, Toshiba is now offering a new generation of industrial e•MMC™ from 8GByte to 64GByte supporting a an operational range of -40°C to +105°C (Ta).

## > e•MMC™ – DESIGN GUIDELINE & DESIGN CHECK SHEET

To support your e•MMC™ design, Toshiba offers a design guideline and a design check sheet. The design guideline highlights some of the key topics to be considered when selecting and utilizing a Toshiba e•MMC™. The design check sheet can be used by the developer to share more detailed information about the individual usage scenario with Toshiba. Both files are available at your local Toshiba representative or qualified distributor.

## > e•MMC™ – ENHANCED USER DATA AREA

Toshiba e•MMC™ products support the JEDEC compliant “Enhanced User Data Area”, also called “pseudo-SLC”. For applications requiring the memory to perform with higher write/erase cycles than MLC or TLC NAND can offer, the e•MMC™ provides the option to build a partition which offers “pseudo-SLC” performance.

## > INNOVATION IS OUR TRADITION: FLASH MEMORY AND MORE

In 1984, Toshiba developed a new type of semiconductor memory called flash memory, leading the industry into the next generation ahead of its competitors. Some time later in 1987, NAND flash memory was developed, and this has since been used in a variety of memory cards and electronic equipment. The NAND flash market has grown rapidly, with flash memory becoming an internationally standardized memory device. Toshiba, the inventor of flash memory, has carved out a path to a new era in which we are all able to carry videos, music and data with us wherever we go.