



BGAE640 | eMMC | 153-ball/100-ball

SMART's BGAE640 eMMC is a soldered-down Flash storage solution that combines NAND Flash memory, an embedded MMC (MultiMediaCard) Controller, and advanced firmware in a small BGA (Ball Grid Array) package that provides stable, yet cost effective high-density embedded storage. The BGAE640 eMMC is designed to meet the rigid requirements of the industrial, medical and networking markets.

SMART's BGAE640 eMMC is compliant to eMMC v5.1 specifications and is available in the standard JEDEC 0.5mm pitch, 153-ball BGA package, as well 1.0mm pitch, 100-ball BGA package. The 100-ball package offers larger ball pitch and ball diameter enabling lower cost PCB designs and simplifies PCB routing with wider metal traces.

Features & Benefits

- Compliant to JEDEC v5.1 Standard
- BGAE640 TLC: Base eMMC, TLC NAND with Capacities from 16GB to 128GB
- BGAE640 pSLC: Pre-configured to pSLC Enhanced Storage Media Mode with User Capacities from 5GB to 40GB
- Industrial Temp (-40°C to +85°C)

Product Family Overview

Form Factor	Capacity	Sequential Performance
BGAE640 (TLC)	16GB to 128GB	Up to 320MB/s Read Up to 170MB/s Write
BGAE640 (pSLC)	5GB to 40GB	Up to 320MB/s Read Up to 250MB/s Write



Applications

- Factory Automation
- IIoT
- Medical Devices
- Networking Appliances
- POS Terminals
- RFID Scanners
- Single-Board Computers
- Telecom Infrastructure

Specifications (BGAE640 TLC)

	BGAE640 TLC 153-ball	BGAE640 TLC 100-ball
NAND Type	TLC	
Performance		
Host Interface Rate (maximum)	eMMC v5.1 (HS400)	
Capacities	16GB to 128GB	
Sequential Read (maximum)	Up to 320 MB/s	
Sequential Write (maximum)	Up to 170 MB/s	
Random Read (maximum)	Up to 3.7K IOPS	
Random Write (maximum)	Up to 6.5K IOPS	
Reliability		
Endurance	128GB: 100 TBW	
(JEDEC Sequential Workload)	64GB: 50 TBW	
	32GB: 25 TBW	
	16GB: 25 TBW	
Data Retention	10 years	
Error Correction	LDPC	
Power		
Input Voltage	3.3V ± 10%	
Environmental		
Operating Shock	1500 g half-sine, 0.5 msec, 1 shock along each axis, X, Y, Z in each direction	
Operating Vibration	20G 80-2000Hz, 1.52mm 20-80Hz, 3 axis	
Operating Temperature	Extended: -25°C to +85°C Industrial: -40°C to +85°C	
Storage Temperature	-40°C to +85°C	
Physical		
Length	11.5 mm	14 mm
Width	13 mm	18 mm
Height	1.0 mm	2.2 mm

Ordering Information (BGAE640 TLC)

Part Number	Density
BGAE640 TLC eMMC 153-ball Industrial Operating Temperature (-40°C to +85°C)	
KTMDGY1ASI01	128GB
KTMCGY1ASI01	64GB
KTMBGY1ASI01	32GB
KTMAGY1ASI01	16GB
BGAE640 TLC eMMC 153-ball Extended Operating Temperature (-25°C to +85°C)	
KTMDGY1ASE01	128GB
KTMCGY1ASE01	64GB
KTMBGY1ASE01	32GB
KTMAGY1ASE01	16GB
BGAE640 TLC eMMC 100-ball Industrial Operating Temperature (-40°C to +85°C)	
SP9QDGY1ASI01	128GB
SP9QCGY1ASI01	64GB
SP9QBGY1ASI01	32GB
SP9QAGY1ASI01	16GB

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Specifications (BGAE640 pSLC)

	BGAE640 pSLC 153-ball	BGAE640 pSLC 100-ball
NAND Type	pSLC	
Performance		
Host Interface Rate (maximum)	eMMC v5.1 (HS400)	
Capacities	5GB to 40GB	
Sequential Read (maximum)	Up to 320 MB/s	
Sequential Write (maximum)	Up to 250 MB/s	
Random Read (maximum)	Up to 3.7K IOPS	
Random Write (maximum)	Up to 6.5K IOPS	
Reliability		
Endurance	40GB: 768 TBW	
(JEDEC Sequential Workload)	20GB: 384 TBW	
	10GB: 192 TBW	
	5GB: 192 TBW	
Data Retention	10 years	
Error Correction	LDPC	
Power		
Input Voltage	3.3V ± 10%	
Environmental		
Operating Shock	1500 g half-sine, 0.5 msec, 1 shock along each axis, X, Y, Z in each direction	
Operating Vibration	20G 80-2000Hz, 1.52mm 20-80Hz, 3 axis	
Operating Temperature	Industrial: -40°C to +85°C	
Storage Temperature	-40°C to +85°C	
Physical		
Length	11.5 mm	14 mm
Width	13 mm	18 mm
Height	1.0 mm	2.2 mm

Ordering Information (BGAE640 pSLC)

Part Number	Density
BGAE640 pSLC eMMC 153-ball	
Industrial Operating Temperature (-40°C to +85°C)	
SP9MDGY1ASI11	40GB
SP9MCGY1ASI11	20GB
SP9MBGY1ASI11	10GB
SP9MAGY1ASI11	5GB
BGAE640 pSLC eMMC 100-ball	
Industrial Operating Temperature (-40°C to +85°C)	
SP9QDGY1ASI11	40GB
SP9QCGY1ASI11	20GB
SP9QBGY1ASI11	10GB
SP9QAGY1ASI11	5GB



For more information, please visit: www.smartm.com

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