



# e.MMC

The Global Leader in Specialized Storage and Memory Solutions



## Key Features

- AEC-Q100 Grade 2 (-40°C~105°C) Compliant\*
- AEC-Q100 Grade 3 (-40°C~85°C) Compliant\*
- Extra-high endurance: 2-3X higher than standard e.MMC\*
- Complies with JEDEC e.MMC v5.1 Standard (JESD84-B51)
- 153-ball FBGA (RoHS compliant, "green package")
- LDPC ECC engine\*

\* May vary by product and project support

The ATP industrial e.MMC is an advanced storage solution that integrates NAND flash memory, a sophisticated flash controller, and a fast MultiMedia Card (MMC) interface in the same package. By incorporating these components in an integrated package, ATP e.MMC manages all background operations internally, freeing the host from handling low-level flash operations for faster and more efficient processing.

Smaller than a typical postage stamp, ATP e.MMC comes in a 153-ball fine pitch ball grid array (FBGA package). The tiny footprint makes it perfectly suitable for embedded systems with space constraints but require rugged endurance, reliability and durability in harsh environments.

ATP e.MMC is built to meet the tough demands of industrial applications. As a soldered-down solution, it is secure against constant vibrations. Its industrial temperature rating means that severe scenarios from freezing cold -40°C to blistering hot 105°C will not cause adverse impact on the device or the data in it.

Compliant with the latest JEDEC e.MMC 5.1 Standard (JESD84-B51), ATP e.MMC features Command Queuing and Cache Barrier to enhance random read/write performance; High Speed 400 (HS400) DDR Mode for a bandwidth of up to 400 MB/s; and field firmware update (FFU). Cache Flushing Report ensures the data integrity on cache blocks; Enhanced Strobe in HS400 Mode facilitates faster synchronization between the host and the e.MMC device; and, Secure Write Protection ensures that only trusted entities can protect or unprotect the e.MMC device.

It is backward compatible with previous versions (v4.4.1/v4.5/v5.0), supporting features such as power-off notifications, packed commands, cache, boot or replay protected memory block (RPMB) partitions, high priority interrupt (HPI), and hardware (HW) reset.

Technologies & Add-On Services	S.M.A.R.T.	Firmware-based Power Loss Protection	AutoRefresh	Advanced Wear Leveling	Dynamic Data Refresh	End-to-End Data Path Protection	Auto-Read Calibration	Secure Erase	Industrial Temperature	SiP	Vibration-Proof BGA Package	Complete Drive Test	Joint Validation
Premium	○	○	○	○	○	○	○	○	○	○	○	○	▲
Superior	○	○	○	○	○	○	○	○	○	○	○	○	▲
Value	○	○	○	○	○	○	○	○	▲	○	○	○	▲

▲: Customization option available on a project basis.

# Specifications

e.MMC									
Product Line	Extended Industrial Grade		Automotive Grade 2		Automotive Grade 3		Industrial Grade		
	Premium	Superior	Premium	Superior	Premium	Superior	Premium		
	E700Pa	E600Sa	E700Paa	E600Saa	E700Pia	E600Sia	E750Pi	E700Pi	E700Pi
Flash Type	3D MLC (pSLC mode)	3D MLC	3D MLC (pSLC mode)	3D MLC	3D MLC (pSLC mode)	3D MLC	3D TLC (pSLC mode)	3D MLC (pSLC mode)	3D TLC (pSLC mode)
IC Package	153-ball FBGA								
JEDEC Specification	v5.1, HS400								
Power Loss Protection Options	Firmware Based								
Operating Temperature	-40°C to 105°C		-40°C to 105°C		-40°C to 85°C		-40°C to 85°C		
Capacity*	8 GB to 64 GB	16 GB to 128 GB	8 GB to 64 GB	16 GB to 128 GB	8 GB to 64 GB	16 GB to 128 GB	10 GB to 21 GB	8 GB to 64 GB	10 GB to 40 GB
Performance									
Sequential Read/Write up to (MB/s) (Max.)**	300 / 240	300 / 170	300 / 240	300 / 170	300 / 240	300 / 170	295 / 215	300 / 240	290 / 225
Bus Speed Modes	x1 / x4 / x8								
ICC (Typical RMS in Read/Write) mA (Max.)	145 / 175	125 / 175	145 / 175	125 / 175	145 / 175	125 / 175	95.5 / 92	145 / 175	100 / 110
ICCQ (Typical RMS in Read/Write) mA (Max.)	120 / 100	115 / 95	120 / 100	115 / 95	110 / 95	115 / 95	104 / 87.5	120 / 100	105 / 100
Endurance and Reliability									
Endurance TBW** (Max.)	1,213 TB	309 TB	1,213 TB	309 TB	1,320 TB	824 TB	1,034 TB	1,320 TB	1,364 TB
Reliability MTBF @ 25°C	>2,000,000 hours								
Others									
Dimensions (mm)	11.5 x 13.0 x 1.3								
Certifications	AEC-Q100, RoHS, REACH							RoHS, REACH	
Warranty	One Year								

e.MMC									
Product Line	Industrial Grade			Commercial Grade			Value		
	Superior	Superior	Premium	Premium	Superior	Superior	Value	Value	
	E650Si	E600Si	E600Si	E750Pc	E700Pc	E650Sc	E600Vc	E600Vc	
Flash Type	3D TLC	3D MLC	3D TLC	3D TLC (pSLC mode)		3D TLC	3D TLC		
IC Package	153-ball FBGA								
JEDEC Specification	v5.1, HS400								
Power Loss Protection Options	Firmware Based								
Operating Temperature	-40°C to 85°C				-25°C to 85°C				
Capacity*	32 GB to 64 GB	16 GB to 128 GB	32 GB to 128 GB	10 GB to 21 GB	10 GB to 40 GB	32 GB to 64 GB	32 GB to 128 GB	32 GB	
Performance									
Sequential Read/Write up to (MB/s)**	270 / 215	300 / 170	290 / 225	295 / 215	290 / 225	270 / 215	290 / 225	250 / 135	
Bus Speed Modes	x1 / x4 / x8								
ICC (Typical RMS in Read/Write) mA (Max.)	69.5 / 68.5	125 / 175	100 / 110	95.5 / 92	100 / 110	69.5 / 68.5	100 / 110	81.5 / 49.5	
ICCQ (Typical RMS in Read/Write) mA (Max.)	88 / 85.5	110 / 100	105 / 100	104 / 87.5	105 / 100	88 / 85.5	105 / 100	80.5 / 61.5	
Endurance and Reliability									
Endurance TBW** (Max.)	70 TB	824 TB	52 TB	1,034 TB	1,364 TB	70 TB	52 TB	8.3 TB	
Reliability MTBF @ 25°C	>2,000,000 hours								
Others									
Dimensions (mm)	11.5 x 13.0 x 1.0							9.0 x 10.0 x 0.8	
Certifications	RoHS, REACH								
Warranty	One Year								

\* Low-density parity-check error correcting code. By product support.

\*\* All performance is collected or measured using ATP proprietary test environment, without file system overhead.



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## WE BUILD WITH YOU

Product spec and its related information are subject to change without advance notice.

Please refer to [www.atpinc.com](http://www.atpinc.com) for latest information

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