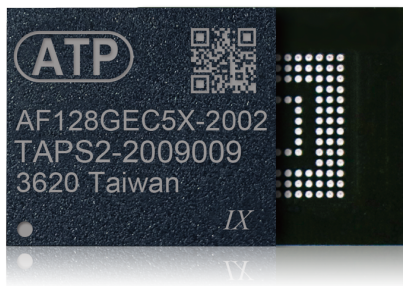




# ATP e.MMC v5.1 Embedded Flash Storage Solution

Industrial-Grade Performance, Extreme Endurance & Reliability



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  $-40^{\circ}\text{C}$  to blistering hot  $105^{\circ}\text{C}$  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 (v4.41/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.

## Key Features

- AEC-Q100 Grade 2 ( $-40^{\circ}\text{C}$ ~ $105^{\circ}\text{C}$ ) Compliant
- AEC-Q100 Grade 3 ( $-40^{\circ}\text{C}$ ~ $85^{\circ}\text{C}$ ) 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\*
- Designed with 3D NAND

## Applications

- Surveillance
- IoT Gateways / 5G Small Cell
- Automation
- Test and Measurement
- Embedded PCs
- Medical
- Drones
- Transportation
- Networking
- Mobile/Handheld Computers





## Specifications

Product Name	e.MMC					
	Extended Industrial Grade		Automotive Grade 3		Automotive Grade 2	
Product Line	Premium	Superior	Premium	Superior	Premium	Superior
Naming	E700Pa	E600Sa	E700Pia	E600Sia	E700Paa	E600Saa
IC Package	153-ball FBGA					
JEDEC Specification	v5.1, H5400					
Flash Type	Pseudo SLC	MLC	Pseudo SLC	MLC	Pseudo SLC	MLC
Density*	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
Bus Speed Modes	x1 / x4 / x8					
Performance** Seq. Read/Write up to (MB/s)	300 / 240	300 / 170	300 / 240	300 / 170	300 / 240	300 / 170
Operating Temperature	-40°C to 105°C		-40°C to 85°C (AEC-Q100 Grade 3)		-40°C to 105°C (AEC-Q100 Grade 2)	
Reliability	Max. TBW**	1213 TB	309 TB	1320 TB	824 TB	1213 TB
	MTBF @ 25°C	> 2,000,000 Device hours				
ICC (Typical RMS in Read/Write) mA	135 / 155	135 / 180	135 / 155	135 / 180	135 / 155	135 / 180
ICCQ (Typical RMS in Read/Write) mA	110 / 95	110 / 100	110 / 95	110 / 100	110 / 95	110 / 100
Dimensions: L x W x H (mm)	11.5 x 13.0 x 1.3 (max)					

Product Name	e.MMC					
	Industrial Grade		Industrial Grade		Commercial Grade	
Product Line	Premium	Superior	Premium	Superior	Premium	Value line
Naming	E700Pi	E600Si	E700Pi	E600Si	E700Pc	E600C
IC Package	153-ball FBGA					
JEDEC Specification	v5.1, H5400					
Flash Type	Pseudo SLC	MLC	Pseudo SLC	TLC	Pseudo SLC	TLC
Density*	8 GB to 64 GB	16 GB to 128 GB	10 GB to 21 GB	32 GB to 64 GB	10 GB to 21 GB	32 GB to 64 GB
Bus Speed Modes	x1 / x4 / x8					
Performance** Seq. Read/Write up to (MB/s)	300 / 240	300 / 170	290 / 220	290 / 220	290 / 220	290 / 220
Operating Temperature	-40°C to 85°C (Industrial)		-40°C to 85°C (Industrial)		-25°C to 85°C (Commercial)	
Reliability	Max. TBW**	1320 TB	824 TB	148 TB	13.46 TB	296 TB
	MTBF @ 25°C	> 2,000,000 Device hours				
ICC (Typical RMS in Read/Write) mA	135 / 155	135 / 180	80 / 99	100 / 73	80 / 99	100 / 73
ICCQ (Typical RMS in Read/Write) mA	110 / 95	110 / 100	109 / 94	108 / 90	109 / 94	108 / 90
Dimensions: L x W x H (mm)	11.5 x 13.0 x 1.3 (max)			11.5 x 13.0 x 1.0		

\* 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.

Technologies & Add-On Services	Life Monitor	Sudden Power-off Recovery (SPOR)	End-to-End Data Protection	AutoRefresh	Vibration-Proof BGA Package	Dynamic Data Refresh	Industrial Temperature	SiP (System in Package)	Complete Drive Test
Premium	Δ	●	Δ	●	●	●	●	●	●
Superior	Δ	●	●	●	●	●	●	●	●
Value	●	●	Δ	●	●	●	Δ	●	●

Δ: Customization option available on a project basis.

To learn more about this product, contact your ATP Representative.

### ATP Global Footprint

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