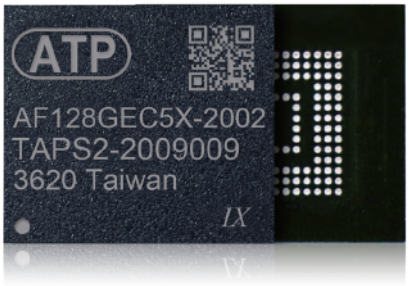
ATP e.MMC v5.1
Embedded Flash Storage Solution

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°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 (v4.41/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°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*
- 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						
		Industrial Grade			Automotive Grade 3		Automotive Grade 2	
Product Line		Premium	Premium	Superior	Premium	Superior	Premium	Superior
Naming		E800Pi	E700Pi	E600Si	E700Pia	E600Sia	E700Paa	E600Saa
IC Package		153-ball FBGA						
JEDEC Specification		V4.41+ (SDR-8 bit)	v5.1, HS400					
Flash Type		Native SLC	3D SLC Mode	3D NAND	3D SLC Mode	3D NAND	3D SLC Mode	3D NAND
Density*		1 GB to 2 GB	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)	35 / 25	300 / 240	300 / 170	300 / 240	300 / 170	300 / 240	300 / 170
	Random Read/Write up to (IOPS)	900 / 1100	15K / 30K					
Operating Temperature		-40°C to 85°C (Industrial)			-40°C to 85°C (AEC-Q100 Grade 3)		-40°C to 105°C (AEC-Q100 Grade 2)	
Reliability	Max. TBW**	90 TB	1320 TB	824 TB	1320 TB	824 TB	1213 TB	309 TB
	MTBF @ 25°C	> 2,000,000 Device hours						
ICC (Typical RMS in Read/Write) mA		TBD	135 / 155	135 / 180	135 / 155	135 / 180	135 / 155	135 / 180
ICCQ (Typical RMS in Read/Write) mA		TBD	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.)						

*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)	Data Path Protection	AutoRefresh	Vibration-Proof BGA Package	Dynamic Data Refresh	Industrial Temperature	SiP (System in Package)	Complete Drive Test
Product Line	Premium	Δ	●	●	●	●	●	●	●	●
	Superior	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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