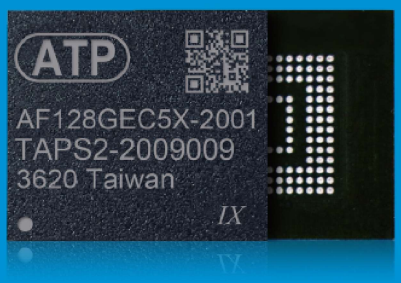
ATP e.MMC v5.1
Embedded Flash Storage Solution

Industrial-Grade Performance, Extreme Endurance & Reliability



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

* Low-density parity-check error correcting code. By product 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 (v4.41/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.

Technologies & Add-On Services	Life Monitor	Sudden Power-Off Recovery (SPOR)	AutoRefresh	Advanced Wear Leveling	Dynamic Data Refresh	End-to-End Data 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								
	Extended Industrial Grade		Automotive Grade 2		Automotive Grade 3		Industrial Grade	
Product Line	Premium	Superior	Premium	Superior	Premium	Superior	Premium	
	E700Pa	E600Sa	E700Paa	E600Saa	E700Pia	E600Sia	E750Pi	E700Pi
Flash Type	3D Pseudo SLC	3D MLC	3D Pseudo SLC	3D MLC	3D Pseudo SLC	3D MLC	3D Pseudo SLC	
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
Performance								
Sequential Read/Write up to (MB/s)**	300 / 240	300 / 170	300 / 240	300 / 170	300 / 240	300 / 170	295/ 215	300 / 240
Bus Speed Modes	x1 / x4 / x8							
ICC (Typical RMS in Read/Write) mA	135 / 155	135 / 180	135 / 155	135 / 180	135 / 155	135 / 180	95.5 / 92	135 / 155
ICCQ (Typical RMS in Read/Write) mA	110 / 95	110 / 100	110 / 95	110 / 100	110 / 95	110 / 100	104 / 87.5	110 / 95
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
Reliability MTBF @ 25°C	>2,000,000 hours							
Others								
Dimensions: L x W x H (mm)	11.5 x 13.0 x 1.3							
Certifications	AEC-Q100, RoHS, REACH						RoHS, REACH	
Warranty	One Year							

e.MMC								
	Industrial Grade				Commercial Grade			
Product Line	Premium	Superior			Premium		Superior	Value
	E700Pi	E650Si	E600Si	E600Si	E750Pc	E700Pc	E650Sc	E600Vc
Flash Type	3D Pseudo SLC	3D TLC	3D MLC	3D TLC	3D Pseudo SLC		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		-40°C to 85°C		-25°C to 85°C			
Capacity*	10 GB to 21 GB	32 GB to 64 GB	16 GB to 128 GB	32 GB to 64 GB	10 GB to 21 GB		32 GB to 64 GB	
Performance								
Sequential Read/Write up to (MB/s)**	290 / 220	290 / 205	300 / 170	290 / 220	295 / 215	290 / 220	290 / 205	290 / 220
Bus Speed Modes	x1 / x4 / x8							
ICC (Typical RMS in Read/Write) mA	80 / 99	69.5 / 68.5	135 / 180	100 / 73	95.5 / 92	80 / 99	69.5 / 68.5	100 / 73
ICCQ (Typical RMS in Read/Write) mA	109 / 94	88 / 85.5	110 / 100	108 / 90	104 / 87.5	109 / 94	88 / 85.5	108 / 90
Endurance and Reliability								
Endurance TBW** (Max.)	682 TB	70 TB	824 TB	20 TB	1,034 TB	682 TB	70 TB	20 TB
Reliability MTBF @ 25°C	>2,000,000 hours							
Others								
Dimensions: L x W x H (mm)	11.5 x 13.0 x 1.0							
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.

Product spec and its related information are subject to change without advance notice.
Please refer to www.atpinc.com for latest information

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