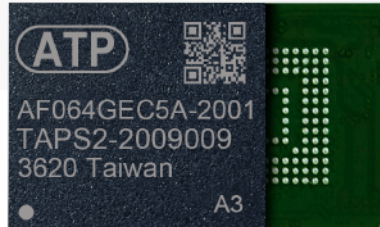# e.MMC Automotive

The Global Leader in Specialized Storage and Memory Solutions

KEY FEATURES

- AEC-Q100 Grade 2 (-40°C to 105°C), and Grade 3 (-40°C to 85°C) compliant*
- Robust Data Integrity* (AutoRefresh and Dynamic Data Refresh)
- 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

ATP Electronics shifts into high gear with automotive grade e.MMC solutions.These soldered-down solutions are constructed for maximum reliability on the road. They deliver consistent, stable performance amidst the challenging and unpredictable conditions that vehicles are commonly subjected to, such as intense shocks and vibrations, temperature variability, and constricted spaces.Infotainment systems, advanced driver assistance system (ADAS), telematics, and other automotive applications will benefit greatly from the extra-high endurance, which is 2-3X higher than standard e.MMC.

The automotive grade e.MMC solutions are compliant with AEC-Q100 and are available in two temperature grades for peace-of-mind journeys, whether in sub-zero winters or in scorching summers. Automotive Grade 3 (AG3) typically covers an operating range of -40°C to 85°C), while Automotive Grade 2 (AG2) offers an extended range for even more extreme conditions with elevated temperatures, from -40°C to 105°C.
ATP's automotive grade e.MMC solutions incorporate low-density parity-check error correction codes (LDPC ECC) to maintain data accuracy over their rated lifespan and beyond. AutoRefresh and Dynamic Data Refresh technologies prevent read disturb errors in often-accessed (hot zone) areas as well as seldom-accessed areas (cold zone).

Technologies	S.M.A.R.T/ Life Monitor	Industrial Temperature	SiP	Vibration-Proof BGA Package	Firmware-Based Power Loss Protection	Advanced Wear Leveling	AutoRefresh	Dynamic Data Refresh	Auto-Read Calibration	ETEDP
Premium	○	○	○	○	○	○	○	○	▲	○
Superior	○	○	○	○	○	○	○	○	▲	○

▲: Customization option available on a project basis.

Specifications

Product Line	Automotive Grade 2				Automotive Grade 3			
	Premium		Superior		Premium		Superior	
	E700Paa	E700Paa	E600Saa	E600Saa	E700Pia	E700Pia	E600Sia	E600Sia
Flash Type	3D MLC (pSLC mode)	2D MLC (pSLC mode)	3D MLC	2D MLC	3D MLC (pSLC mode)	2D MLC (pSLC mode)	3D MLC	2D MLC
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 85°C			
Capacity[1]	8 GB to 64 GB	4 GB to 8 GB	16 GB to 128 GB	8 GB to 16 GB	8 GB to 64 GB	4 GB to 8 GB	16 GB to 128 GB	8 GB to 16 GB
Performance								
Sequential Read/ Write up to (MB/s)[2]	300 / 240	230 / 100	300 / 170	230 / 100	300 / 240	230 / 100	300 / 170	230 / 100
Bus Speed Modes	x1 / x4 / x8							
ICC (Typical RMS in Read/Write) mA (Max.)	145 / 175	85 / 65	125 / 175	85 / 50	145 / 175	85 / 65	125 / 175	85 / 50
ICCQ (Typical RMS in Read/Write) mA (Max.)	120 / 100	60 / 45	115 / 95	60 / 30	120 / 100	60 / 45	115 / 95	60 / 30
Endurance and Reliability								
Endurance TBW[2] (Max.)	1,213 TB	200 TB	824 TB	40 TB	1,213 TB	200 TB	824 TB	40 TB
Reliability MTBF @ 25°C	>2,000,000 hours	>3,000,000 hours	>2,000,000 hours	>3,000,000 hours	>2,000,000 hours	>3,000,000 hours	>2,000,000 hours	>3,000,000 hours
Others								
Dimensions (mm)	11.5 x 13.0 x 1.3	11.5 x 13.0 x 1.0	11.5 x 13.0 x 1.3	11.5 x 13.0 x 1.0	11.5 x 13.0 x 1.3	11.5 x 13.0 x 1.0	11.5 x 13.0 x 1.3	11.5 x 13.0 x 1.0
Certifications	AEC-Q100, RoHS, REACH							
Warranty	One Year							

1 Low-density parity-check error correcting code. By product support.
2 All performance is collected or measured using ATP proprietary test environment, without file system overhead.

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