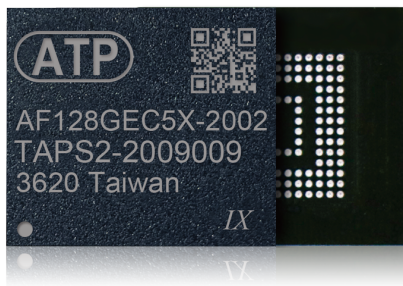




ATP e.MMC v5.1 Embedded Flash Storage Solution

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 | | | | | |
|---|---------------------------|--------------------------|----------------------------------|-----------------|-----------------------------------|-----------------|
| | 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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Authorized Distributor

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