

swissbit®

Product Fact Sheet

Industrial e•MMC Memory

EM-36 Series

JEDEC e•MMC 5.1 compliant,
BGA 100 ball, Enhanced Mode (pSLC)

Industrial Temperature Grade

Date: June 24, 2022
Revision: 1.00



Product Summary

- **Capacities:** 5 GBytes, 10 GBytes, 20 GBytes, 40 GBytes, 80 GBytes
- **Operating Temperature Range¹:** Industrial Operating Temperature -40 to 85°C
- **Endurance in TeraBytes Written (TBW) @ Max Capacity²:** up to 2652

Product Features

- Fully compliant with JEDEC eMMC 5.1 Standard (JESD84-B51)
- 100-ball BGA, 1.0mm pitch
- 14 x 18mm, RoHS compliant
- 3D TLC NAND base technology in Enhanced Mode (pSLC)
- Industrial Operating Temperature -40 to 85°C
- Single enhanced mode partition
- High performance eMMC 5.1 specification
 - Eleven-wire bus (clock, Data Strobe, 1 bit command, 8 bit data bus) and a hardware reset
 - Three different data bus width modes: 1-bit (default), 4-bit, and 8-bit
 - Clock frequencies 0-200MHz, High Speed Mode HS400
 - Command Queue Feature according to eMMC Spec 5.1
 - Up to 300MB/s sequential read and up to 230MB/s sequential write
- Power Supply: (Low-power CMOS technology)
 - VCCQ 1.7V...1.95V or 2.7V...3.6V eMMC supply
 - VCC 2.7V...3.6V NAND Flash supply
- Optimized FW algorithms
 - Power-fail data loss protection
 - Wear Leveling technology
Equal wear leveling of static and dynamic data. The wear leveling assures that dynamic data as well as static data is balanced evenly across the memory. With that the maximum write endurance of the device is ensured
 - Read Disturb Management
The read commands per region are monitored and the content is conditionally refreshed when critical levels have occurred
 - Auto Read Refresh
The interruptible background process maintains the user data for Read Disturb effects or Retention degradation due to high temperature effects
 - Diagnostic features with Device Health Report according to eMMC Spec 5.1, and detailed Lifetime Monitor data (Swissbit proprietary, accessible through standard eMMC commands).
 - Field Firmware update³ according to eMMC Spec 5.1
 - Discard and Sanitize, Trim
 - Boot Operation Mode and Alternative Boot Operation Mode
 - Replay Protected Memory Block (RPMB)
- High reliability
 - Designed with sophisticated firmware architecture for industrial and embedded markets.
 - Enhanced Mode (pSLC) with higher write performance and endurance than 3D TLC configured products (EM-30).
 - Ideal for application like POS/POI, PLC, IoT, gaming, medical and use as general boot medium for embedded applications.
 - The product is optimized for long life cycle that requires superior data retention as well as power fail safety.
 - Controlled BOM & PCN process



¹ Adequate airflow is required to ensure the temperature does not exceed 85°C (industrial temperature drive)

² According to JEDEC (JESD471), the time to write the full TBW is a minimum of 18 months. Higher average daily data volume reduces the specified TBW. The values listed are estimates and are subject to change without notice.

³ The support of In-Field FW update capabilities on host systems is recommended.