swissbit®

Product Fact Sheet

Industrial
e·MMC Memory

EM-36 Series
**JEDEC e·MMC 5.1 compliant,
BGA 153 ball, Enhanced Mode (pSLC)**

Industrial Temperature Grade

Date: October 12, 2021
Revision: 1.02

Made in Germany

swissbit®

Product Summary

- **Capacities:** 5 GBytes, 10 GBytes, 20 GBytes, 40 GBytes, 80 GBytes
- **Operating Temperature Range[1]:** Industrial Operating Temperature -40 to 85°C
- **Endurance in TeraBytes Written (TBW) @ Max Capacity[2]:** up to 2652

Product Features

- Fully compliant with JEDEC e·MMC 5.1 Standard (JESD84-B51)
- 153-ball BGA, 0.5mm pitch
- 11.5 x 13mm, RoHS compliant
- 3D TLC NAND base technology in Enhanced Mode (pSLC)
- Industrial Operating Temperature -40 to 85°C
- Single enhanced mode partition
- High performance e·MMC 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 e·MMC 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 e·MMC 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 e·MMC Spec 5.1, and detailed Lifetime Monitor data (Swissbit proprietary, accessible through standard e·MMC commands).
  - Field Firmware update[3] according to e·MMC 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 (JESD47I), 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.

Swissbit AG
Industriestrasse 4
CH-9552 Bronschhofen
Switzerland

www.swissbit.com
industrial@swissbit.com

Revision: 1.02
Template: Doc-3581
File: EM-36_fact_sheet_Rev102
Page 2 of 3

1 Order Information for EM-36

Density	Part Number	Temp. Range	Firmware	Flash Technology
5GB	SFEM005GB1ED1TO-I-5E-11P-STD			
10GB	SFEM010GB1ED1TO-I-5E-11P-STD			
20GB	SFEM020GB1ED1TO-I-6F-11P-STD	-40°C to 85°C	FW1: default	3D TLC NAND Flash in pSLC Mode
40GB	SFEM040GB1ED1TO-I-7G-11P-STD			
80GB	SFEM080GB1ED1TO-I-8H-11P-STD			

1.1 System Performance

System Performance, HS400	Max. reliable mode	Unit
Burst Data transfer Rate HS400 (max clock 200MHz)	400	
Sequential Read	up to 300	MB/s
Sequential Write	up to 230	

1.2 Current Consumption

Current Consumption, HS400, Max. Density	Typ. ICCQ current @ VCCQ 1.8V	Typ. ICC current @ VCC 3.3V	Unit
Write	99	97	
Read	138	108	mA
Sleep	0.07	0.07	

1.3 Physical Dimensions

Physical Dimensions	Value	Unit
Length	13±0.1	
Width	11.5±0.1	mm
Thickness	1.2 max.	

1.4 Recommended Temperature Conditions

Parameter	Min.	Typ.	Max.	Unit
Industrial Operating Temperature	-40	25	85	°C
Storage Temperature	-40	25	85	°C

* High temperature storage without operation reduces the data retention, in operation the data will be refreshed, if data error issues were detected

For more information on e·MMC interface, please visit JEDEC homepage (www.jedec.org)

Why Swissbit?

Swissbit is focused on the design, development, manufacture, and support of leading edge memory and storage solutions for the worldwide OEM/ODM marketplace. As a global supplier, Swissbit recognizes and addressees the higher level of application requirements of today's industrial, Netcom, and automotive customers by providing best-in-class products and services, with uncompromised attention to driving overall value and quality.

Swissbit AG
Industriestrasse 4
CH-9552 Bronschhofen
Switzerland

www.swissbit.com
industrial@swissbit.com

Revision: 1.02
Template: Doc-3581
File: EM-36_fact_sheet_Rev102
Page 3 of 3

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for eMMC *category:*

Click to view products by Swissbit *manufacturer:*

Other Similar products are found below :

MTFC32GAPALBH-IT MTFC64GAPALBH-IT GLS85VM1004G-S-I-LFWE-ND232 GLS85VM1016C-M-I-BZYE-ND231 S40FC004C1B2I00300 SDINBDG4-8G SDINBDG4-8G-XI1 THGBMNG5D1LBAIL SDINBDG4-64G-XI1 SDINADF4-128G SDINBDG4-8G-XA SDINBDG4-32G-XI1 SDINBDA4-32G SDINBDG4-32G-I1 SDINBDG4-64G SDINBDG4-64G-ZA GLS85VM1032C-M-I-BZYE-ND231 GLS85VM1008Q-S-I-BZYE-ND235 GLS85VM1008E-S-I-BZYE-ND237 GLS85VM1008C-M-I-LFWE-ND230 GLS85VM1008C-M-I-BZYE-ND231 THGBMJG7C1LBAIL THGBMJG8C2LBAIL MTFC32GAZAQHD-WT TR MTFC32GAZAQHD-WT MTFC32GAZAQHD-AAT MTFC8GAMALGT-AIT MTFC16GAPALNA-AIT MTFC4GACAJCN-1M WT MTFC64GAPALBH-AAT MTFC8GAKAJCN-1M WT MTFC4GLGDQ-AIT A SDINADF4-128G-H SDINBDA4-256G SDINBDA6-256G-ZA SDINBDG4-16G-XI2 SDINBDG4-32G-XI2 SDINBDG4-16G-XI1 SDINBDG4-8G-I1T SDINADF4-64G-H SDINBDA4-128G S40FC004C1B2C00000 S40FC004C1B1C00000 S40FC004C1B2I00000 S40FC004C1B1I00000 SH9MCGP1ATI01 SH9MBGP1ATI01 SFEM128GB1ED1TO-I-7G-111-STD SFEM080GB1ED1TO-I-8H-11P-STD SFEM064GB1ED1TO-I-6F-111-STD