swissbit®

Product Fact Sheet

Industrial e·MMC Memory

EM-20 Series

JEDEC e·MMC 5.0 compliant,
BGA 153 ball

made in germany

Embedded MMC 5.0

EM-20 Industrial e·MMC Memory 4GB to 64GB

Main Features

- Fully compliant with JEDEC e·MMC 5.0 Standard (JESD84-B50)
- 153-ball BGA, 0.5mm pitch
  11.5 x 13mm, RoHS compliant
- MLC NAND base technology
- Multiple MLC or enhanced/reliable mode partitions user configurable according to e·MMC Spec 5.0
- High performance e·MMC 5.0 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
  - Up to 250MB/s sequential read and up to 90MB/s sequential write in MLC mode
- 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 guaranteed
  - 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 5.0
  - Field Firmware update according to e·MMC Spec 5.0
  - 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.
  - 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.
  - Intensive write applications should use the enhanced/reliable mode
  - Industrial Temperature range, -40° up to 85°C
- Controlled BOM & PCN process

Order Information for EM-20

Density	Part Number	Temp. Range	Flash Technology
4GB	SFEM4096B1EA1T0-I-GE-111-STD	-40°C to 85°C	MLC NAND Flash
8GB	SFEM008GB1EA1T0-I-GE-111-STD		
16GB	SFEM016GB1EA1T0-I-GE-111-STD		
32GB	SFEM032GB1EA1T0-I-LF-111-STD		
64GB	SFEM064GB1EA1T0-I-HG-111-STD		

System Performance

System Performance	Typ. Sustained	Max. MLC	Max. reliable mode	Unit
Burst Data transfer Rate HS400 (max clock 200MHz)		400		MB/s
Sequential Read	175	up to 250	up to 270	
Sequential Write	21	up to 90	up to 160	

Current Consumption, 64GB device, HS400	Typ. ICCQ current @ VCCQ 1.8V	Typ. ICC current @ VCC 3.3V	Unit
Write	105	80	mA
Read	180	38	
Idle	-	0.2	

Physical Dimensions

Physical Dimensions	Value	Unit
Length	13±0.1	mm
Width	11.5±0.1	
Thickness	1.0 max.	

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 strives to create innovative technologies for future market opportunities utilizing a highly skilled in-house product research and development team. Swissbit maintains a marketing edge by continuing to manufacture world-class high quality memory products and providing customers with both high value and low cost of ownership achieved through efficient processes and procedures.