

swissbit®

Product Data Sheet
Addendum for 100-ball BGA

Industrial e•MMC Memory

EM-30 Series

JEDEC e•MMC 5.1 compliant,
BGA 100-ball

Industrial and Automotive
Temperature Grade

Date: March 13, 2025
Revision: 1.03

EM-30 Series – Industrial embedded MMC 5.1 16 – 256 GBytes, 100-ball BGA

1. Ordering Information

The following Table 1 lists the part number associated with the changes identified in this document.

Table 1: Available Part Numbers

Capacity	Part Number	Temperature
16 GBytes	SFEM016GB1ED1T0-I-5E-311-STD	Industrial
32 GBytes	SFEM032GB1ED1T0-I-5E-311-STD	Industrial
64 GBytes	SFEM064GB1ED1T0-I-6F-311-STD	Industrial
64 GBytes	SFEM064GB1ED1TB-I-CE-311-STD	Industrial
64 GBytes	SFEM064GB1ED1TB-A-CE-311-STD	Automotive
128 GBytes	SFEM128GB1ED1TB-I-EF-311-STD	Industrial
128 GBytes	SFEM128GB1ED1TB-A-EF-311-STD	Automotive
256 GBytes	SFEM256GB1ED1TB-I-VG-311-STD	Industrial
256 GBytes	SFEM256GB1ED1TB-A-VG-311-STD	Automotive

2. Product Changes

The 100-ball Industrial e-MMC 5.1 is identical to the Swissbit standard EM-30 device with the exceptions defined in the following section.

2.1 Mechanical Specifications

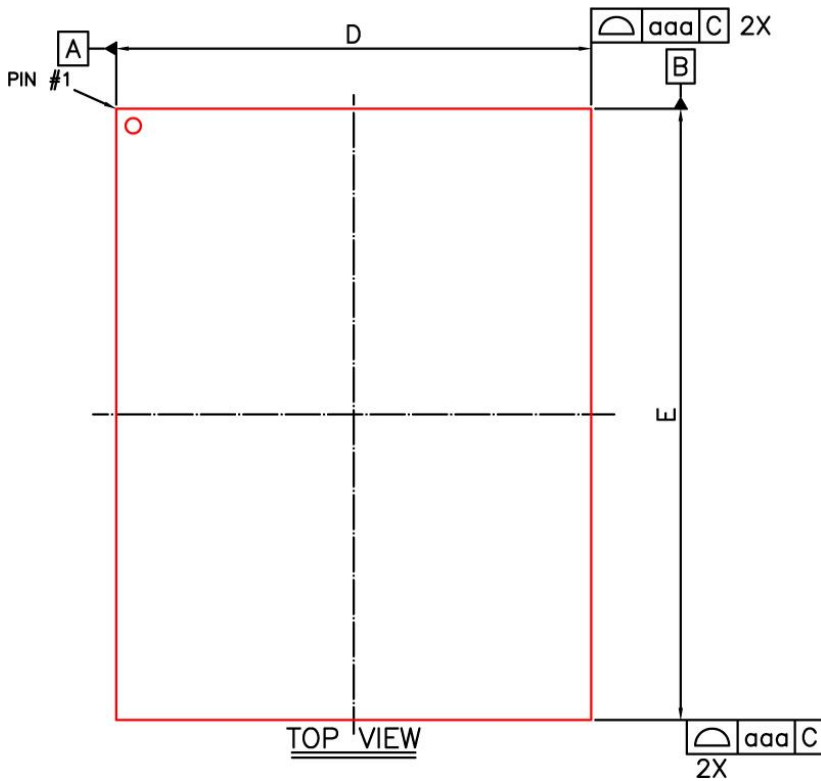
Table 2: Physical Dimensions

Physical Dimensions		Unit
Length	14±0.1	mm
Width	18±0.1	
Thickness (Max)	1.4 max.	
Weight (Max Capacity)	< 1	g

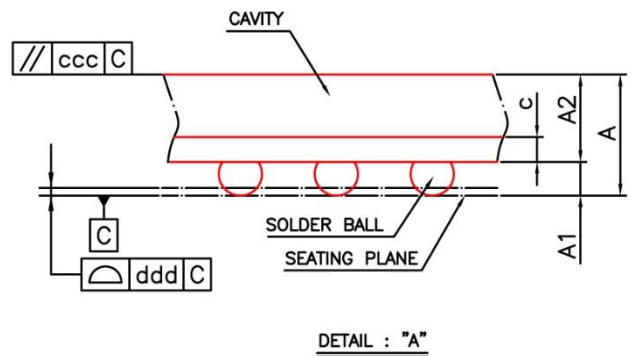
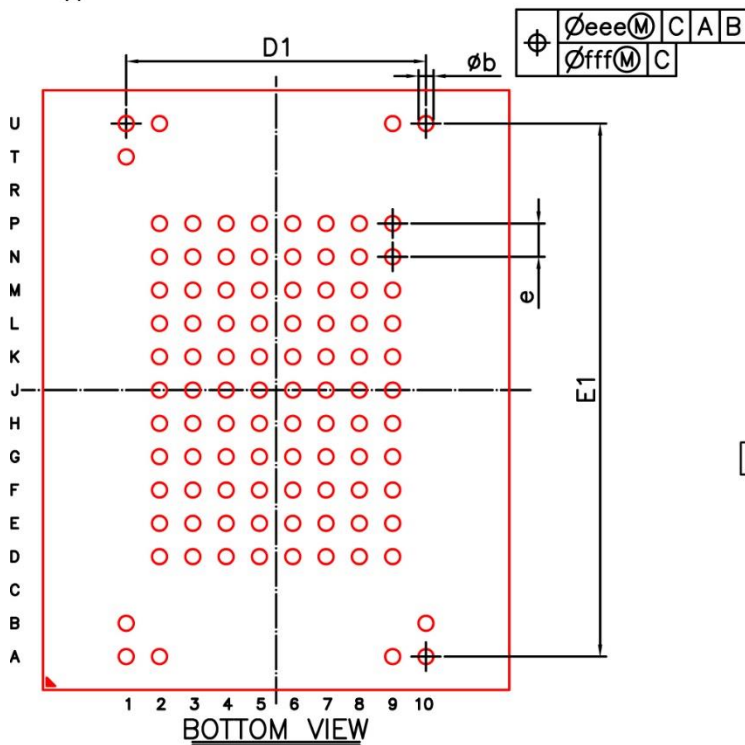
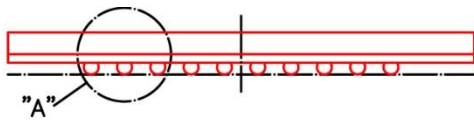
2.2 Physical description

Figure 1: Mechanical dimensions eMMC

Package Mechanical (14 x 18 x 1.4mm)



Symbol	Dimension in mm		
	MIN	NOM	MAX
A	---	---	1.40
A1	0.30	0.35	0.40
A2	0.86	0.91	0.96
c	0.22	0.26	0.30
D	13.90	14.00	14.10
E	17.90	18.00	18.10
D1	---	9.00	---
E1	---	16.00	---
e	---	1.00	---
b	0.40	0.45	0.50
aaa	0.15		
ccc	0.15		
ddd	0.12		
eee	0.15		
fff	0.08		



2.3 Pinout

Figure 2: Ball assignment (top view, ball down)

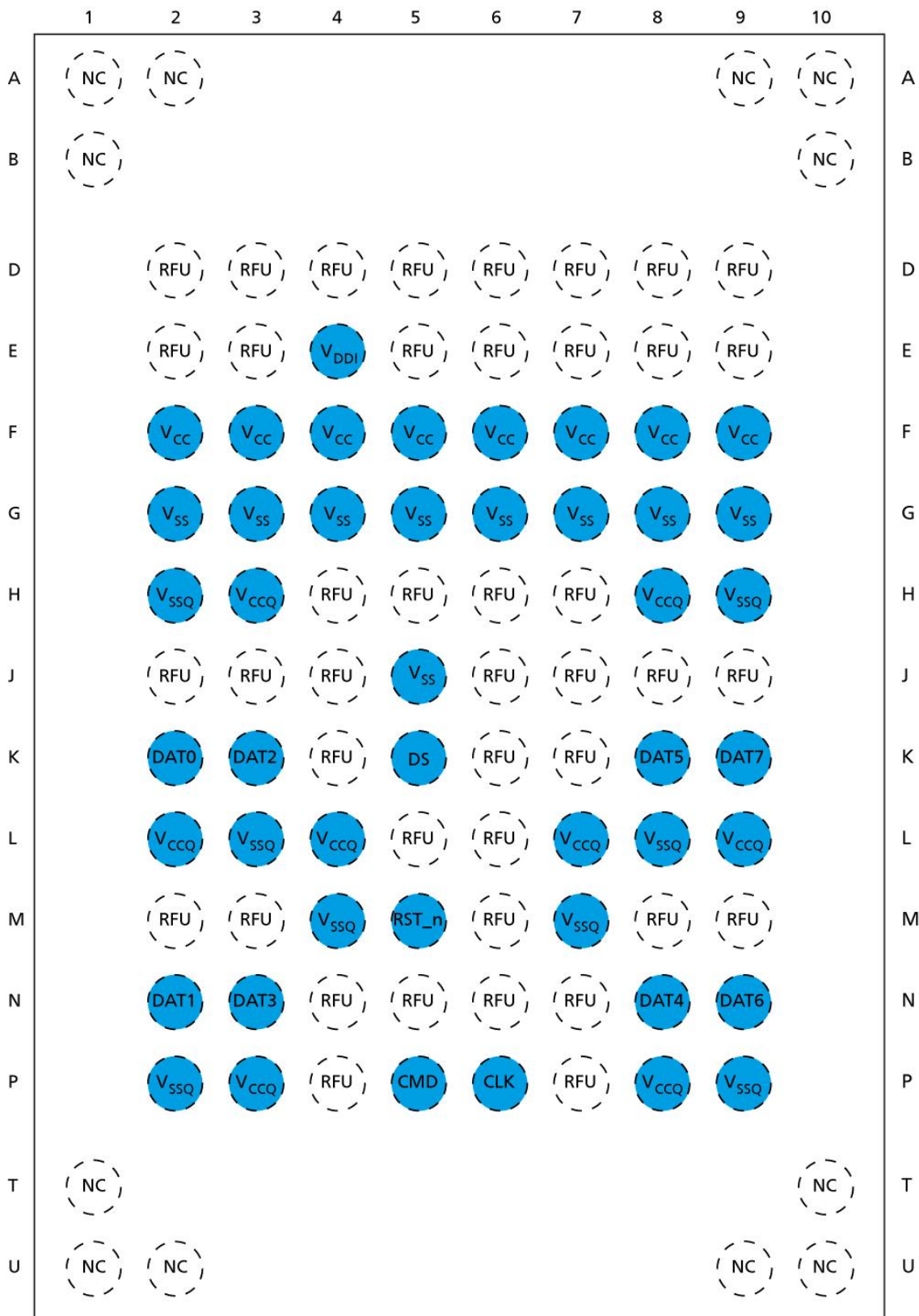


Table 3: Pinout

Name	Type	Ball No.	Description
CLK	I	P6	Clock: Each cycle directs a 1-bit transfer on the command and DAT lines.
CMD	I/O/PP/OD	P5	Command: A bidirectional channel used for device initialization and command transfer. Command has two operating modes: 1) Open-drain for initialization. 2) Push-pull for fast command transfer.
DAT0	I/O/PP	K2	Data I/O0: Bidirectional channel used for data transfer.
DAT1	I/O/PP	N2	Data I/O1: Bidirectional channel used for data transfer.
DAT2	I/O/PP	K3	Data I/O2: Bidirectional channel used for data transfer.
DAT3	I/O/PP	N3	Data I/O3: Bidirectional channel used for data transfer.
DAT4	I/O/PP	N8	Data I/O4: Bidirectional channel used for data transfer.
DAT5	I/O/PP	K8	Data I/O5: Bidirectional channel used for data transfer.
DAT6	I/O/PP	N9	Data I/O6: Bidirectional channel used for data transfer.
DAT7	I/O/PP	K9	Data I/O7: Bidirectional channel used for data transfer.
RST_n	I	M5	Reset signal pin
VCC	S	F2, F3, F4, F5, F6, F7, F8, F9	VCC: Flash memory I/F and Flash memory power supply.
VCCQ	S	H3, H8, L2, L4, L7, L9, P3, P8	VCCQ : Memory controller core and MMC interface I/O power supply.
VSS	S	G2, G3, G4, G5, G6, G7, G8, G9, J5	VSS: Flash memory I/F and Flash memory ground connection.
VSSQ	S	H2, H9, L3, L8, M4, M7, P2, P9	VSSQ: Memory controller core and MMC I/F ground connection.
VDDi		E4	VDDi : Connect capacitor Creg from VDDi to GND.
DS	O/PP	K5	Data Strobe: Newly assigned pin for HS400 mode.
NC			Not connected
RFU			Reserved for future use, leave floating

1. I: input; O: output; PP: push-pull; OD: open-drain; NC: Not connected; S: power supply.

2.4 Part Number change

To differentiate, the BGA form factor is encoded in the part number:

SFEM016GB1ED1T0-I-5E-x11-STD
 SFEM032GB1ED1T0-I-5E-x11-STD
 SFEM064GB1ED1T0-I-6F-x11-STD
 SFEM064GB1ED1TB-I-CE-x11-STD
 SFEM064GB1ED1TB-A-CE-x11-STD
 SFEM128GB1ED1TB-I-EF-x11-STD
 SFEM128GB1ED1TB-A-EF-x11-STD
 SFEM256GB1ED1TB-I-VG-x11-STD
 SFEM256GB1ED1TB-A-VG-x11-STD

x = BGA form type

BGA form type	x
11.5 x 13mm, 153ball	1
14 x 18mm, 100ball	3

For further details about our Industrial e-MMC 5.1, see our standard product data sheet or fact sheet of the EM-30 Series (<http://www.swissbit.com>).

3. Revision History

Table 4: Document Revision History

Date	Revision	Description	Revision Details
18-Jan-2022	1.00	Initial Preliminary Release	Doc. req. no. 5160
05-Jul-2022	1.01	Final release	Doc. req. no. 5551
19-Sep-2023	1.02	Added solder ball / SMD ball pad information.	Doc. req. no. 6568
13-Mar-2025	1.03	Added new variants and adjusted physical description	-

Disclaimer:

No part of this document may be copied or reproduced in any form or by any means, or transferred to any third party, without the prior written consent of an authorized representative of Swissbit AG ("SWISSBIT"). The information in this document is subject to change without notice. SWISSBIT assumes no responsibility for any errors or omissions that may appear in this document and disclaims responsibility for any consequences resulting from the use of the information set forth herein. SWISSBIT makes no commitments to update or to keep current information contained in this document. The products listed in this document are not suitable for use in applications such as, but not limited to, aircraft control systems, aerospace equipment, submarine cables, nuclear reactor control systems and life support systems. Moreover, SWISSBIT does not recommend or approve the use of any of its products in life support devices or systems or in any application where failure could result in injury or death. If a customer wishes to use SWISSBIT products in applications not intended by SWISSBIT, said customer must contact an authorized SWISSBIT representative to determine SWISSBIT willingness to support a given application. The information set forth in this document does not convey any license under the copyrights, patent rights, trademarks or other intellectual property rights claimed and owned by SWISSBIT. The information set forth in this document is considered to be "Proprietary" and "Confidential" property owned by SWISSBIT.

ALL PRODUCTS SOLD BY SWISSBIT ARE COVERED BY THE PROVISIONS APPEARING IN SWISSBIT'S TERMS AND CONDITIONS OF SALE ONLY, INCLUDING THE LIMITATIONS OF LIABILITY, WARRANTY AND INFRINGEMENT PROVISIONS. SWISSBIT MAKES NO WARRANTIES OF ANY KIND, EXPRESS, STATUTORY, IMPLIED OR OTHERWISE, REGARDING INFORMATION SET FORTH HEREIN OR REGARDING THE FREEDOM OF THE DESCRIBED PRODUCTS FROM INTELLECTUAL PROPERTY INFRINGEMENT AND EXPRESSLY DISCLAIMS ANY SUCH WARRANTIES INCLUDING WITHOUT LIMITATION ANY EXPRESS, STATUTORY OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

© 2025 SWISSBIT AG All rights reserved.