

Host Chipset Compatibility List for Swissbit's EM-30 e.MMC Series

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1 e.MMC and Host Compatibility

Are you losing time by testing various e.MMC™ devices just to find out that they are incompatible with your host chip? And not just time; e.MMCs must be soldered onto the PCB and cannot be exchanged easily in a test setup, so potentially you need to build several test systems, or you must invest in Grypper sockets. The costs to find a compatible e.MMC accumulate.

To assist you in your search for a fitting e.MMC, we have created a list of host chips that are compatible with our EM-30 series. This list should serve as an orientation but is by no means complete. In other words: if you would like to use a host chip that is not listed, please feel free to reach out and we will investigate. We hope that this helps you save time and costs in your journey to build an efficient and reliable system.

2 About the EM-30 Series

The EM-30 series is designed for industrial applications as well as other applications with challenging use cases. The increasing demands of embedded systems for ultra-small, vibration-resistant designs with escalating memory capacity requirements have been answered with the EM-30 series. To deliver high durability and a temperature range of -40 up to +105 °C, the BGA device uses industrial grade 3D-NAND and is available in capacities from 4 to 256 GB.

The EM-30 series also offers additional features over and above the e.MMC standard. These include a remote secure firmware update option and an extended lifetime expectation, making the EM-30 product series ideal for a wide range of applications from routers, switches, and POS/POI terminals to solutions for industrial automation, the Internet of Things (IoT), automotive or medical systems.



As the only European company with the ability to manufacture e.MMCs, we have the service and tools to modify e.MMCs as well as other data storage devices to fit your application seamlessly and to serve request regarding firmware as well as hardware adaptations.

2.1 EM-30 Series Technical Details

The Swissbit EM-30 series is an e.MMC flash-based device series which offers an industry compatible solution following the JEDEC e.MMC 5.1 standard (JESD84-B51A).

		EM-30	EM-36
Interface, Data Transfer Mode		e.MMC 1-bit, 4-bit, 8-bit up to HS400	
Package		153-ball BGA, 0.5mm pitch 100-ball BGA, 1mm pitch	
Flash Type		3D TLC	3D pSLC / enhanced mode
Density Range		4-256 GB	5-80 GB
Endurance (P/E Cycles)		3k @ TLC mode 30k @ enhanced mode Gen3 Flash 100k @ enhanced mode Gen5 Flash	
Operating Temperature		Industrial: -40°C to +85°C Automotive: -40°C to +105°C	
Performance	Sequential Read (MB/s)	up to 320	up to 330
	Sequential Write (MB/s)	up to 240	up to 250
	Random 4KB Read (IOPS)	up to 4,600	up to 4,500
	Random 4KB Write (IOPS)	up to 2,910	up to 2,900
Features & Tools		Sophisticated Wear Levelling & Read Disturb Management Command Queue Feature Production State Awareness Proven Power Fail Safety Security features – secure erase & RPMB Detailed lifetime info AEC-Q Grade 2 and 3 Swissbit is ISO 27001 and IATF 16949 certified	

Table 1: Information about the EM-30 series

3 Compatibility Test Set-up

In order to verify the compatibility with existing host controllers the EM-30 series has been tested with various host controller chipsets. The following list shows the specific device configurations that have been used for the tests.

Series Variation	Density	Flash Technology	Mode	Part Number
EM-30	16GB	BiCS 3 NAND Flash	TLC Mode	SFEM016GB2ED1T0-I-5E-111-STD
EM-30	256GB			SFEM256GB2ED1T0-I-8H-111-STD
EM-30	64GB	BiCS 5 NAND Flash	TLC Mode	SFEM064GB2ED1TB-I-CE-111-STD
EM-30	256GB			SFEM256GB2ED1TB-I-VG-111-STD
EM-36	20GB	BiCS 5 NAND Flash	pSLC Mode	SFEM020GB2ED1TB-I-CE-11P-STD
EM-36	80GB			SFEM080GB2ED1TB-I-VG-11P-STD

Table 2: The compatibility tests have been conducted on the above EM-30 series device configurations.

Swissbit EM-30 series devices listed in table 2 have been tested by Swissbit for compatibility with a variety of hosts. To be listed as compatible with the host the e.MMC has to pass read/write, performance, file system tests and the OS has to boot successfully from the e.MMC. All tests have been conducted at ambient temperature.*

Compatible devices	Legend
SFEMdddGBgED1T0-t-xx-xxx-zzz	d = drive capacity g = generation t = temperature grade A or I
SFEMdddGBgED1TB-t-xx-xxx-zzz	x = configuration and options z = standard or customer specific

Table 3: EM-3x devices with identical controller and NAND flash as devices listed in table 2.

Good to know:

All devices with the part number codes listed in table 3 can be considered host compatible because they use the same controller and NAND flash technology.

For further information please visit our [website](#) or [contact us directly](#).

*The content of this document, including the compatibility list, serves as a reference. Even though we tested the hosts thoroughly with the EM-30 series, this document does not serve as a promise or guarantee. You must test the EM-30 series in your system to verify the functionality in your setup. If you should encounter any issues when testing the EM-30 series devices with one of the listed host systems, please do not hesitate to reach out to us, so we can investigate the issue.

4 EM-30 Series Chipset Compatibility List

4.1 White-list of EM-30 series compatible hosts:

Host SoC Manufacturer	Model	Instruction Set Architecture	OS	Board for testing	Comment
NXP	i.MX 8M Mini Quad Cortex-A53	ARM 64Bit	Yocto 2.7.1	Phytec i.MX 8M Mini P/N: KPB-02820-001.A0	
NXP	i.MX 8M Plus Cortex-A53	ARM 64Bit	Linux	Avnet SM2S- IMX8PLUS P/N: MSC SM2S- IMX8PLUS-QC- 14N0740I PCBFTX	
Broadcom	BCM2711 Cortex-A72	ARM 64Bit	RaspberryPi OS 64Bit Kernel version: 6.1 Debian version: 12	Raspberry Pi CM 4 P/N: Pi CM4 WiFi 2GB, 8GB	
Texas Instrument	TI AM335x Cortex-A8	ARM 64Bit	Debian Kernel: 5.10.168- ti-r71	BeagleBone Black P/N: BB Black Revision C	
Texas Instrument	TI SOC AM6548 HS	ARM 64Bit	Linux	Siemens IOT2050 P/N: IOT2050- 6ES7647-0BA00- 1YA2	
Rockchip	RK3288 Cortex-A17	ARM 64Bit	Debian 10	ASUS Tinker Board S R2.0 P/N: 90ME03H1- M0EAY0	
Intel	Cherry Trail Intel Atom x5-z8350	x86 64Bit	Windows 10 64Bit	UP Board 01/16 B10 P/N: UP-CHT01-A22- 0216-B10	Image was 32GB: only drives \geq 32GB have been tested
Intel	Elkhart Lake Intel Pentium J6426	x86 64Bit	Windows 10 64Bit	GENE AAEON GENE- EHL5 P/N: EHL5-A10-0005	Image was 32GB: only drives \geq 32GB have been tested
Intel	Gemini Lake Intel Celeron N4100	x86 64Bit	Windows 10 64Bit	LattePanda Delta P/N: DFR0544	Image was 32GB: only drives \geq 32GB have been tested
Intel	Gemini Lake Refresh Intel Celeron J4125	x86 64Bit	Windows 10 64Bit	Seed Odyssey P/N: X86J4512v2	Image was 32GB: only drives \geq 32GB have been tested

4.2 Black-list showing hosts known to be incompatible with EM-30 series:

Host SoC Manufacturer	Model	Instruction Set Architecture	OS	Board for testing	Comment

For further information please visit our [website](#) or [contact us directly](#).

5 Document History

Table 3: Document Revision History

Date	Revision	Details
28-February-2024	1	Initial release

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