



# PMEG4010BEA-Q

1 A very low VF MEGA Schottky barrier rectifier

15 September 2021

Product data sheet

## 1. General description

Planar Maximum Efficiency General Application (MEGA) Schottky barrier rectifier with an integrated guard ring for stress protection, encapsulated in a very small SOD323 (SC-76) Surface-Mounted Device (SMD) plastic package.

## 2. Features and benefits

- Forward current: 1 A
- Reverse voltage: 40 V
- Very low forward voltage
- Very small plastic SMD package
- Qualified according to AEC-Q101 and recommended for use in automotive applications

## 3. Applications

- High efficiency DC-to-DC conversion
- Voltage clamping
- Protection circuits
- Low voltage rectification
- Blocking diode
- Low power consumption applications

## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$I_F$	forward current	$T_{sp} \leq 55\text{ °C}$	[1]	-	-	1	A
$V_R$	reverse voltage			-	-	40	V

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode	 SOD323	 K  A sym001
2	A	anode		

## 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMEG4010BEA-Q	SOD323	plastic, surface-mounted package; 2 leads; 1.3 mm pitch; 1.7 mm x 1.25 mm x 0.95 mm body	SOD323

## 7. Marking

Table 4. Marking codes

Type number	Marking code
PMEG4010BEA-Q	V3

## 8. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions		Min	Max	Unit
$V_R$	reverse voltage			-	40	V
$I_F$	forward current	$T_{sp} \leq 55\text{ °C}$	[1]	-	1	A
$I_{FRM}$	repetitive peak forward current	$t_p \leq 1\text{ ms}$ ; $\delta \leq 0.5$		-	3.5	A
$I_{FSM}$	non-repetitive peak forward current	square-wave pulse; $t_p = 8\text{ ms}$		-	10	A
$T_j$	junction temperature			-	150	°C
$T_{amb}$	ambient temperature			-65	150	°C
$T_{stg}$	storage temperature			-65	150	°C

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

## 9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1] [2]	-	-	450	K/W
			[1] [3]	-	-	210	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[4]	-	-	90	K/W

[1] For Schottky barrier diodes thermal runaway has to be considered, as in some applications the reverse power losses  $P_R$  are a significant part of the total power losses.

[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

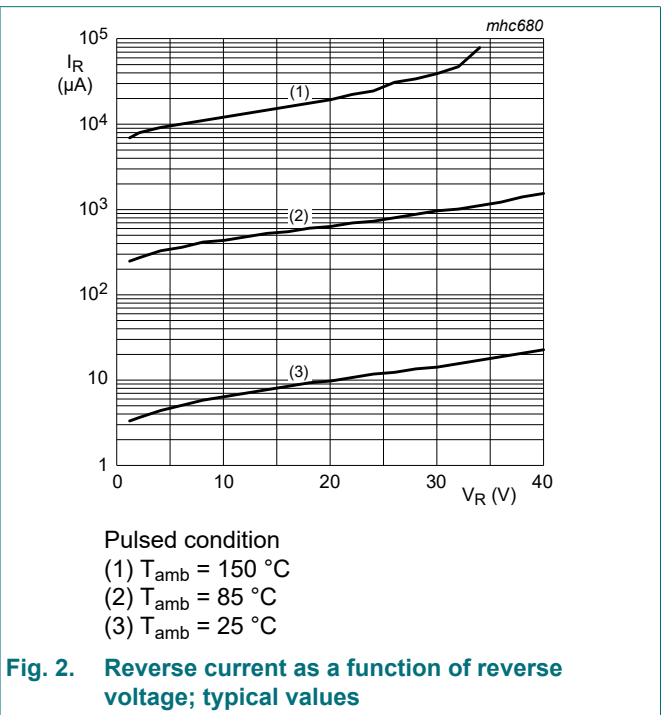
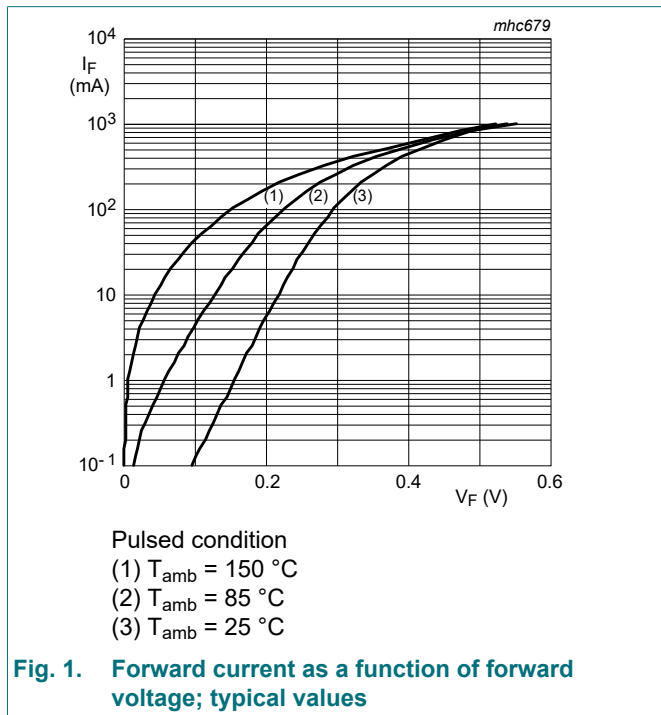
[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm<sup>2</sup>.

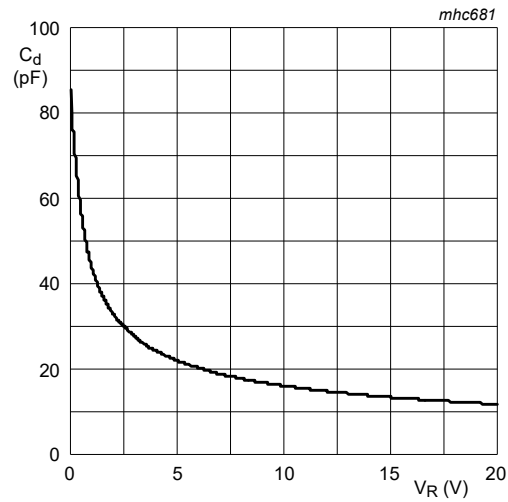
[4] Soldering point of cathode tab.

## 10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 0.1 mA; T <sub>amb</sub> = 25 °C	-	95	130	mV
		I <sub>F</sub> = 1 mA; T <sub>amb</sub> = 25 °C	-	155	210	mV
		I <sub>F</sub> = 10 mA; T <sub>amb</sub> = 25 °C	-	220	270	mV
		I <sub>F</sub> = 100 mA; T <sub>amb</sub> = 25 °C	-	295	350	mV
		I <sub>F</sub> = 500 mA; T <sub>amb</sub> = 25 °C	-	420	470	mV
		I <sub>F</sub> = 1000 mA; T <sub>amb</sub> = 25 °C	-	540	640	mV
I <sub>R</sub>	reverse current	V <sub>R</sub> = 10 V; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C	-	7	20	μA
		V <sub>R</sub> = 40 V; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C	-	30	100	μA
C <sub>d</sub>	diode capacitance	V <sub>R</sub> = 1 V; f = 1 MHz; T <sub>amb</sub> = 25 °C	-	43	50	pF





$T_{amb} = 25\text{ °C}; f = 1\text{ MHz}$

Fig. 3. Diode capacitance as a function of reverse voltage; typical values

## 11. Test information

### Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard Q101 - *Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

## 12. Package outline

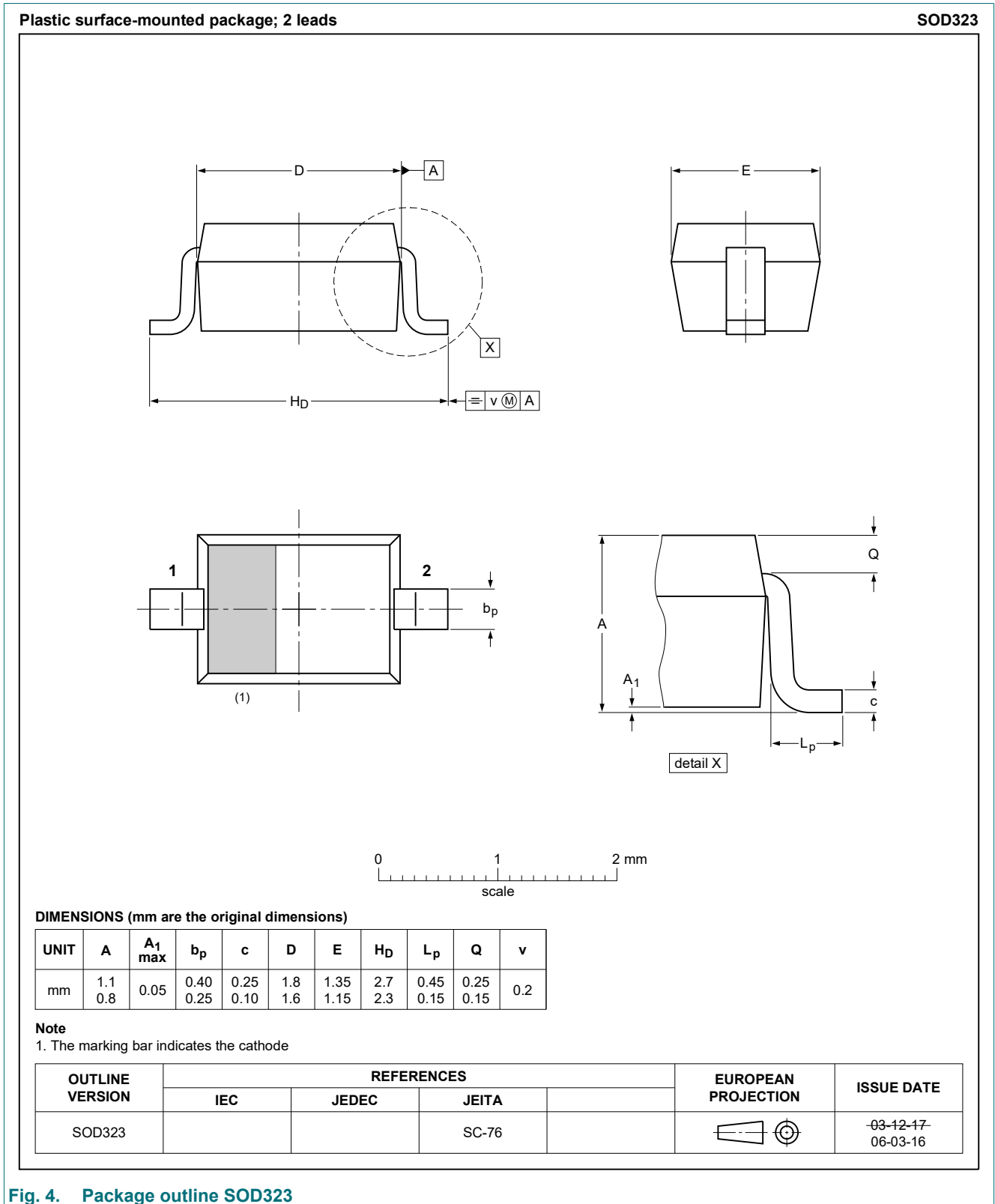


Fig. 4. Package outline SOD323

### 13. Soldering

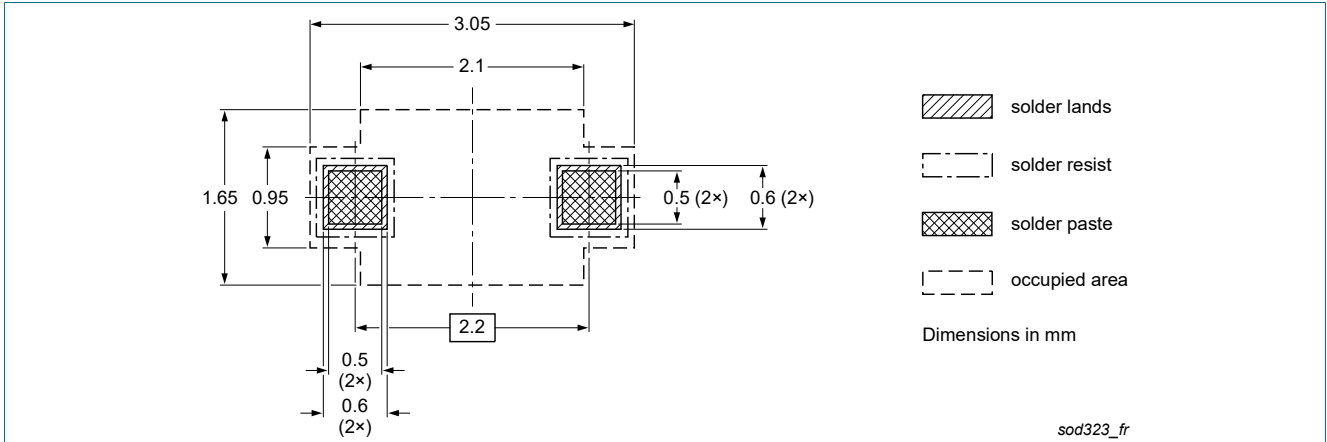


Fig. 5. Reflow soldering footprint for SOD323

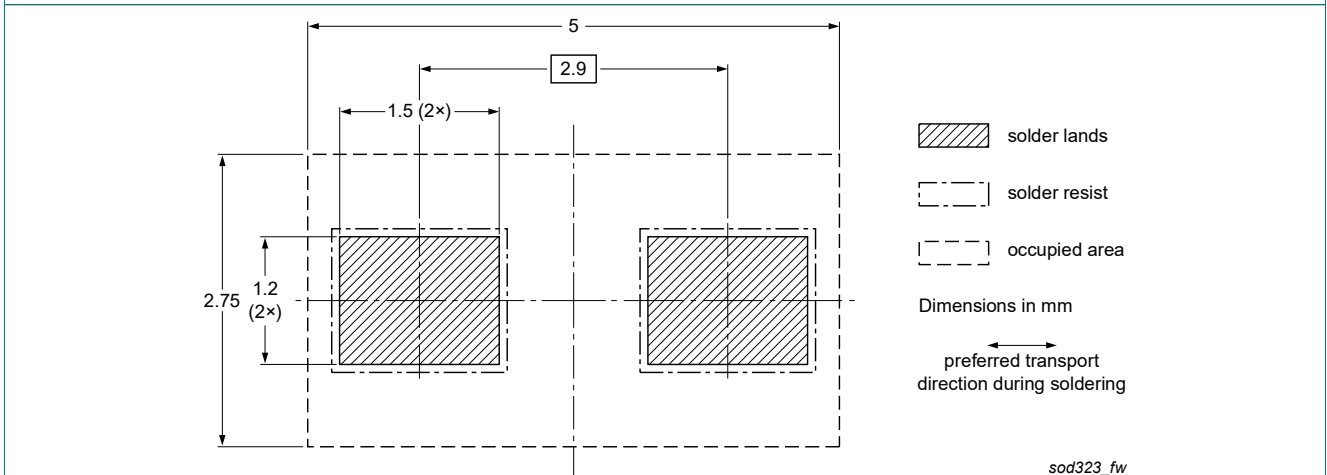


Fig. 6. Wave soldering footprint for SOD323

## 14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMEG4010BEA-Q v.1	20210915	Product data sheet	-	-

## 1 A very low VF MEGA Schottky barrier rectifier

## 15. Legal information

## Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

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