



# PMEG2020AEA

20 V, 2 A very low VF MEGA Schottky barrier rectifier in SOD323 (SC-76) package

23 September 2020

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 SOD323 (SC-76) very small SMD plastic package.

## 2. Features and benefits

- Forward current: 2 A
- Reverse voltage: 20 V
- Very low forward voltage
- Very small SMD package.
- AEC-Q101 qualified

## 3. Applications

- Low voltage rectification
- High efficiency DC/DC conversion
- Switch mode power supply
- Inverse polarity protection
- Low power consumption applications.

## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_F$	forward current	$T_{sp} \leq 55\text{ °C}$	-	-	2	A
$V_R$	reverse voltage	$T_j = 25\text{ °C}$	-	-	20	V
$V_F$	forward voltage	$I_F = 2\text{ A}; t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.02; \text{pulsed}; T_j = 25\text{ °C}$	-	450	525	mV

[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	 sym001
2	A	anode		

## 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMEG2020AEA	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
PMEG2020AEA	S3

## 8. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC60134)

Symbol	Parameter	Conditions	Min	Max	Unit
$V_R$	reverse voltage	$T_j = 25\text{ °C}$	-	20	V
$I_F$	forward current	$T_{sp} \leq 55\text{ °C}$	[1]	2	A
$I_{FRM}$	repetitive peak forward current	$t_p \leq 1\text{ ms}$ ; $\delta \leq 0.25$	-	7	A
$I_{FSM}$	non-repetitive peak forward current	$t_p = 8\text{ ms}$ ; square wave	-	9	A
$T_j$	junction temperature	[2]	-	150	°C
$T_{amb}$	ambient temperature	[2]	-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.

[2] 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. Nomograms for determining the reverse power losses  $P_R$  and  $I_{F(AV)}$  rating will be available on request.

## 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
			[3] [4]	-	-	210	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[5]	-	-	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. Nomograms for determining the reverse power losses  $P_R$  and  $I_{F(AV)}$  rating will be available on request.

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

[3] 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. Nomograms for determining the reverse power losses  $P_R$  and  $I_{F(AV)}$  rating will be available on request.

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

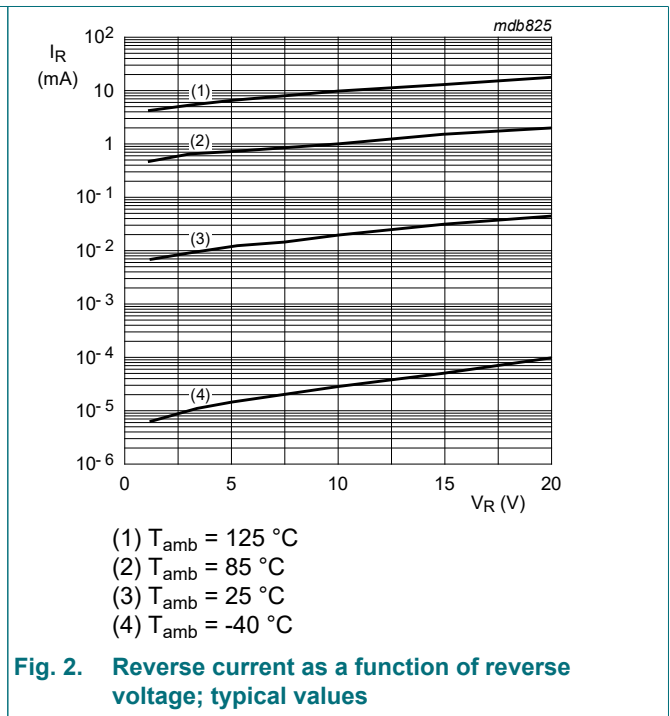
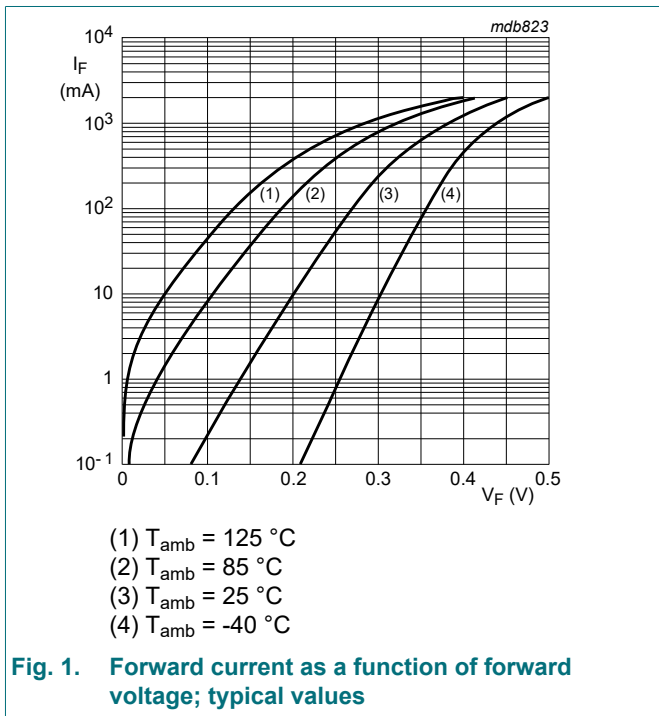
[5] Soldering point of cathode tab.

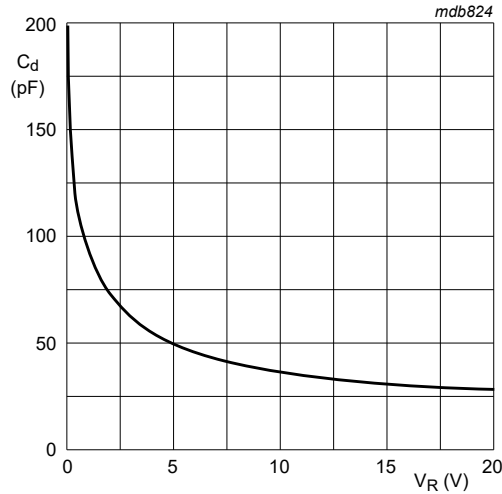
### 10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 0.01 A; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>j</sub> = 25 °C	-	200	220	mV
		I <sub>F</sub> = 0.1 A; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>j</sub> = 25 °C	-	265	290	mV
		I <sub>F</sub> = 1 A; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>j</sub> = 25 °C	-	380	430	mV
		I <sub>F</sub> = 2 A; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; pulsed; T <sub>j</sub> = 25 °C	-	450	525	mV
I <sub>R</sub>	reverse current	V <sub>R</sub> = 5 V; pulsed; T <sub>j</sub> = 25 °C	-	15	50	μA
		V <sub>R</sub> = 10 V; T <sub>j</sub> = 25 °C	[1]	20	80	μA
		V <sub>R</sub> = 20 V; T <sub>j</sub> = 25 °C	-	50	200	μA
C <sub>d</sub>	diode capacitance	V <sub>R</sub> = 5 V; f = 1 MHz; T <sub>j</sub> = 25 °C	-	55	70	pF

[1] Pulsed test: t<sub>p</sub> ≤ 300 μs; δ ≤ 0.02





f = 1 MHz; T<sub>amb</sub> = 25 °C

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

## 11. Test information

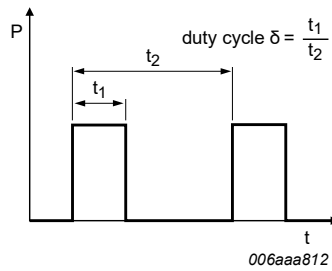


Fig. 4. Duty cycle definition

### 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

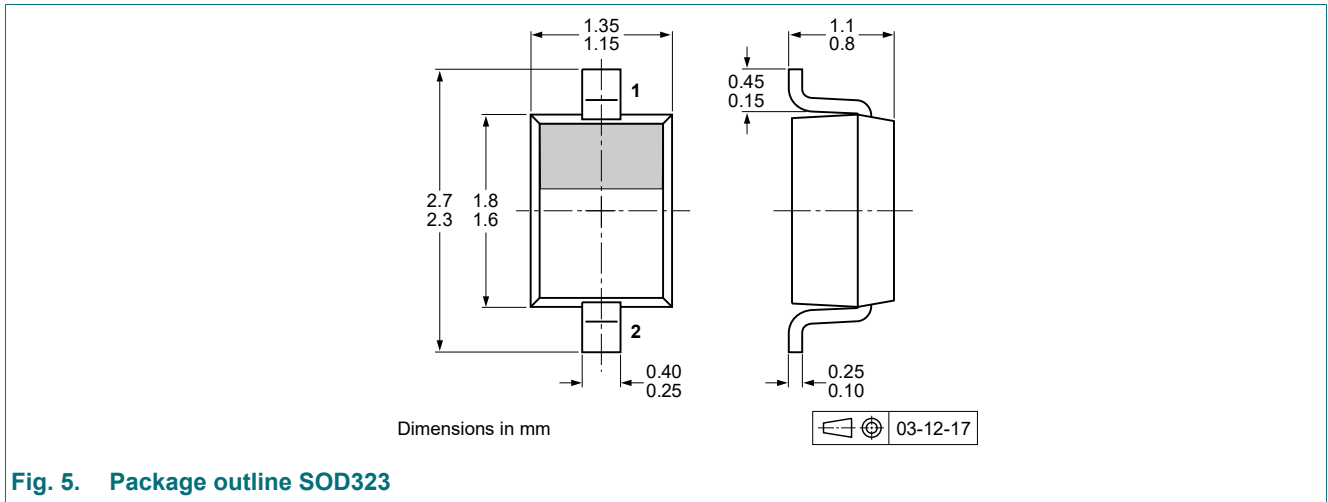


Fig. 5. Package outline SOD323

### 13. Soldering

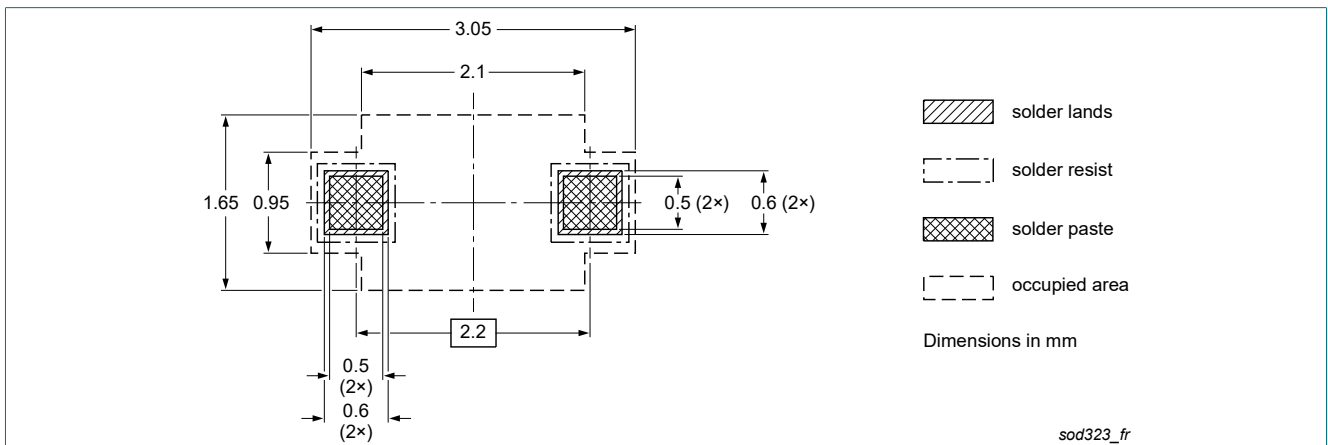


Fig. 6. Reflow soldering footprint for SOD323

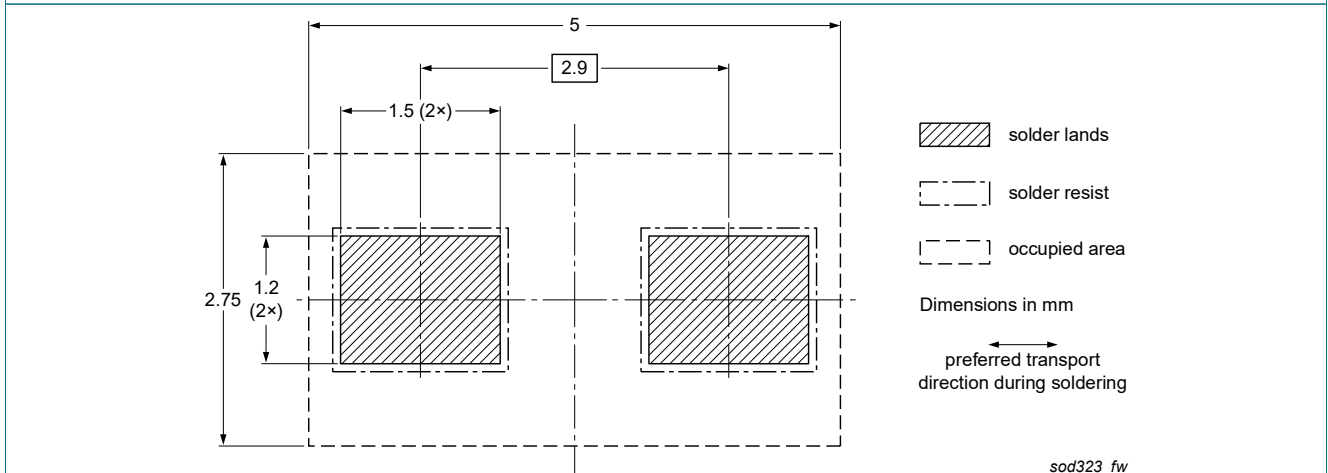


Fig. 7. Wave soldering footprint for SOD323

## 14. Revision history

**Table 8. Revision history**

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMEG2020AEA v.2	20200923	Product data sheet	-	PMEG2010BEA v.1
Modifications:	<ul style="list-style-type: none"><li>• The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.</li><li>• Legal texts have been adapted to the new company name where appropriate.</li><li>• Automotive qualification added in sections: Features and benefits, Test information and Legal information</li></ul>			
PMEG2020AEA v.2	20040226	Product data sheet	-	-

## 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.

- [1] Please consult the most recently issued document before initiating or completing a design.
- [2] The term 'short data sheet' is explained in section "Definitions".
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