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

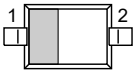
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_F	forward current	$T_{sp} \leq 55$ °C	[1]	-	-	2	A
V_R	reverse voltage	$T_j = 25$ °C		-	-	20	V
V_F	forward voltage	$I_F = 2$ A; $t_p \leq 300$ µs; $\delta \leq 0.02$; pulsed; $T_j = 25$ °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 °C		-	20	V
I_F	forward current	$T_{sp} \leq$ 55 °C	[1]	-	2	A
I_{FRM}	repetitive peak forward current	$t_p \leq$ 1 ms; $\delta \leq$ 0.25		-	7	A
I_{FSM}	non-repetitive peak forward current	t_p = 8 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

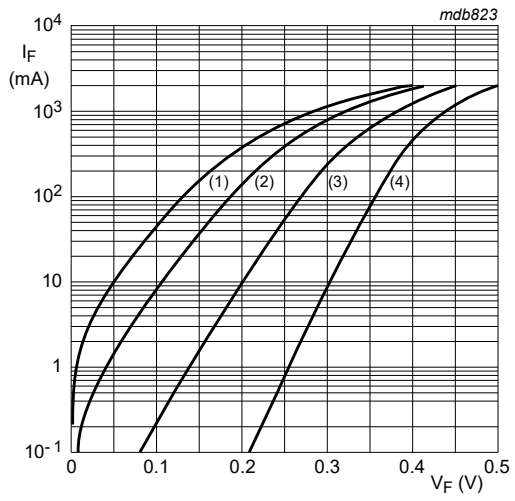
[1] For Schottky barrier diodes thermal runaway has to be considered, as in some applications, the reverse power losses P_R are a significant part of the total power losses. Nomograms for determining the reverse power losses P_R and $I_{F(AV)}$ rating will be available on request.
[2] Device mounted 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^2.
[5] Soldering point of cathode tab.

10. Characteristics

Table 7. Characteristics

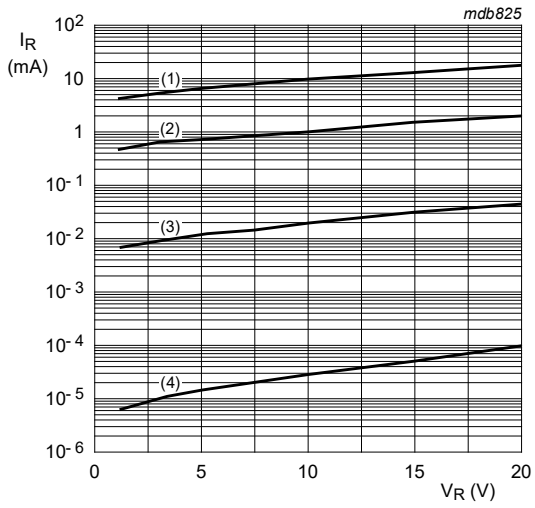
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	I_F = 0.01 A; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_j = 25 °C		-	200	220	mV
		I_F = 0.1 A; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_j = 25 °C		-	265	290	mV
		I_F = 1 A; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_j = 25 °C		-	380	430	mV
		I_F = 2 A; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; pulsed; T_j = 25 °C		-	450	525	mV
I_R	reverse current	V_R = 5 V; pulsed; T_j = 25 °C		-	15	50	µA
		V_R = 10 V; T_j = 25 °C	[1]	-	20	80	µA
		V_R = 20 V; T_j = 25 °C		-	50	200	µA
C_d	diode capacitance	V_R = 5 V; f = 1 MHz; T_j = 25 °C		-	55	70	pF

[1] Pulsed test: $t_p \leq 300$ µs; $\delta \leq 0.02$



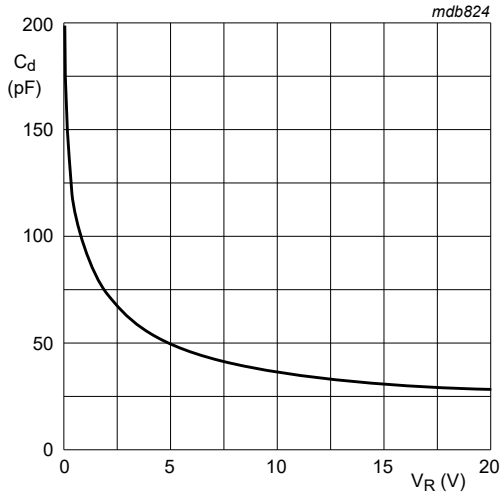
(1) T_{amb} = 125 °C
(2) T_{amb} = 85 °C
(3) T_{amb} = 25 °C
(4) T_{amb} = -40 °C

Fig. 1. Forward current as a function of forward voltage; typical values



(1) T_{amb} = 125 °C
(2) T_{amb} = 85 °C
(3) T_{amb} = 25 °C
(4) T_{amb} = -40 °C

Fig. 2. Reverse current as a function of reverse voltage; typical values



f = 1 MHz; T_{amb} = 25 °C

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

11. Test information

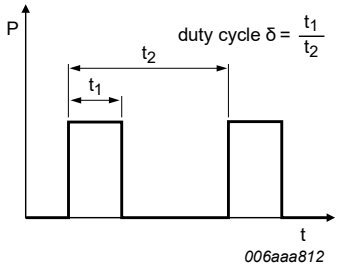


Fig. 4. Duty cycle definition

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

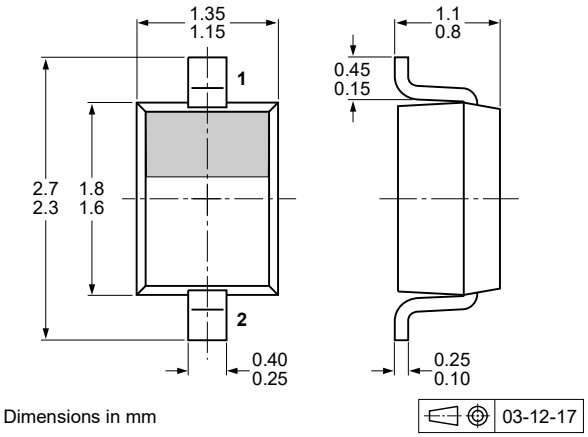


Fig. 5. Package outline SOD323

13. Soldering

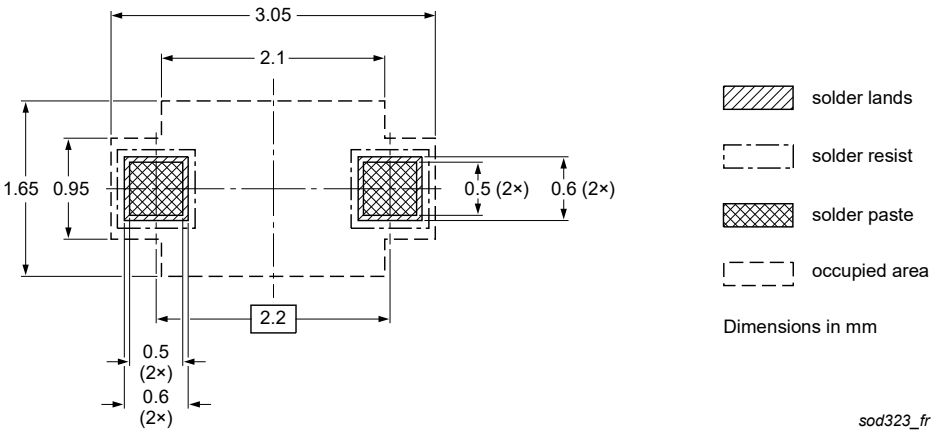


Fig. 6. Reflow soldering footprint for SOD323

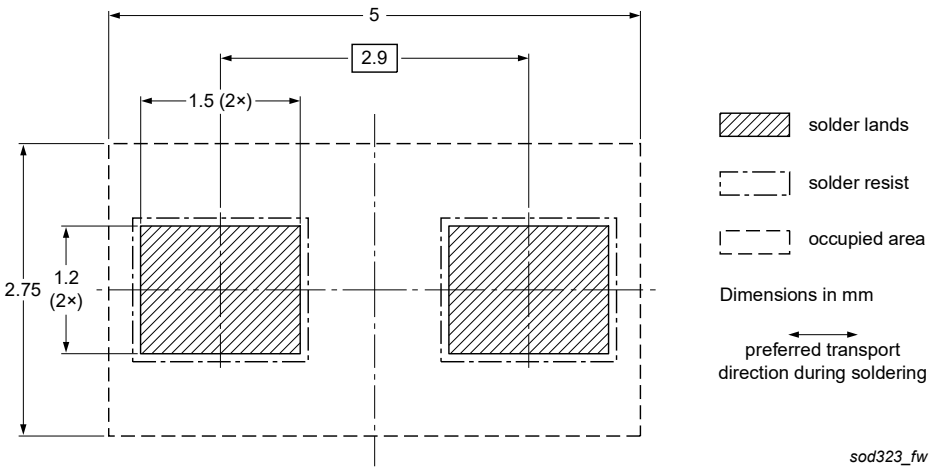


Fig. 7. Wave soldering footprint for SOD323

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:	• The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia. • Legal texts have been adapted to the new company name where appropriate. • Automotive qualification added in sections: Features and benefits,Test information and Legal information			
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".
[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the internet at https://www.nexperia.com.

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