



PMEG1020EA-Q

2 A ultra low VF Schottky barrier rectifier

1 September 2023

Product data sheet

1. General description

Planar Schottky barrier rectifier with an integrated guard ring for stress protection, encapsulated in an SOD323F (SC-76) very small Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Average forward current: $I_F \leq 2 \text{ A}$
- Reverse voltage: $V_R \leq 10 \text{ V}$
- Ultra low forward voltage
- Very small SMD plastic package
- Qualified according to AEC-Q101 and recommended for use in automotive applications

3. Applications

- Low voltage rectification
- High efficiency DC-to-DC conversion
- Switch Mode Power Supply (SMPS)
- Reverse 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	$T_{sp} \leq 55 \text{ }^\circ\text{C}$	-	-	2	A
V_R	reverse voltage		-	-	10	V
V_F	forward voltage	$I_F = 1 \text{ A}$; pulsed; $t_p \leq 300 \text{ } \mu\text{s}$; $\delta \leq 0.02$; $T_{amb} = 25 \text{ }^\circ\text{C}$	-	280	350	mV

5. Pinning information

Table 2. Pinning information

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

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMEG1020EA-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
PMEG1020EA-Q	E2

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			-	10	V
I_F	forward current	$T_{sp} \leq 55^\circ\text{C}$		-	2	A
I_{FRM}	repetitive peak forward current	$t_p \leq 1 \text{ ms}; \delta \leq 0.5$		-	3.2	A
I_{FSM}	non-repetitive peak forward current	$t_p = 8 \text{ ms}; \text{square wave}$		-	9	A
T_j	junction temperature			-	150	$^\circ\text{C}$
T_{amb}	ambient temperature			-65	150	$^\circ\text{C}$
T_{stg}	storage temperature			-65	150	$^\circ\text{C}$

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]	-	-	450	K/W
			[2]	-	-	210	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[3]	-	-	90	K/W

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

[2] Device mounted on an FR4 PCB with copper clad 10 x 10 mm.

[3] Soldering point of cathode tab.

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	$I_F = 0.01 \text{ A}$; pulsed; $t_p \leq 300 \mu\text{s}$; $\delta \leq 0.02$; $T_{\text{amb}} = 25^\circ\text{C}$		-	100	130	mV
		$I_F = 0.1 \text{ A}$; pulsed; $t_p \leq 300 \mu\text{s}$; $\delta \leq 0.02$; $T_{\text{amb}} = 25^\circ\text{C}$		-	170	200	mV
		$I_F = 1 \text{ A}$; pulsed; $t_p \leq 300 \mu\text{s}$; $\delta \leq 0.02$; $T_{\text{amb}} = 25^\circ\text{C}$		-	280	350	mV
		$I_F = 2 \text{ A}$; pulsed; $t_p \leq 300 \mu\text{s}$; $\delta \leq 0.02$; $T_{\text{amb}} = 25^\circ\text{C}$		-	350	460	mV
I_R	reverse current	$V_R = 5 \text{ V}$; $T_{\text{amb}} = 25^\circ\text{C}$	[1]	-	0.7	2	mA
		$V_R = 8 \text{ V}$; $T_{\text{amb}} = 25^\circ\text{C}$	[1]	-	1	2.5	mA
		$V_R = 10 \text{ V}$; $T_{\text{amb}} = 25^\circ\text{C}$	[1]	-	1.2	3	mA
C_d	diode capacitance	$V_R = 5 \text{ V}$; $f = 1 \text{ MHz}$; $T_{\text{amb}} = 25^\circ\text{C}$		-	37	45	pF

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

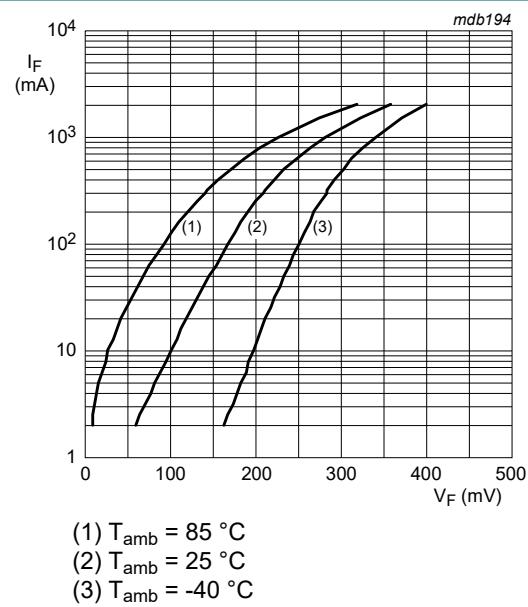


Fig. 1. Forward current as a function of forward voltage; typical values

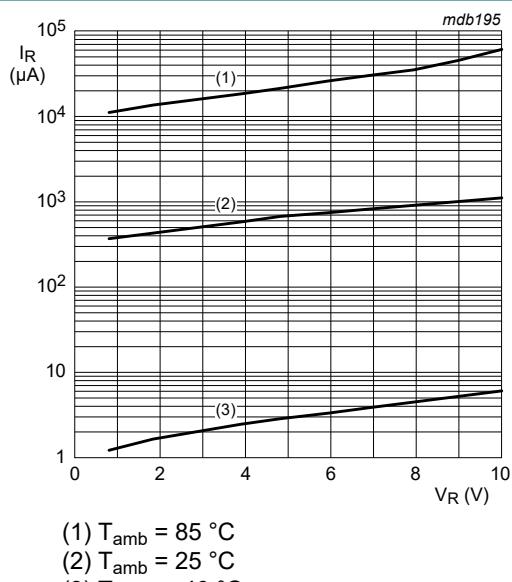
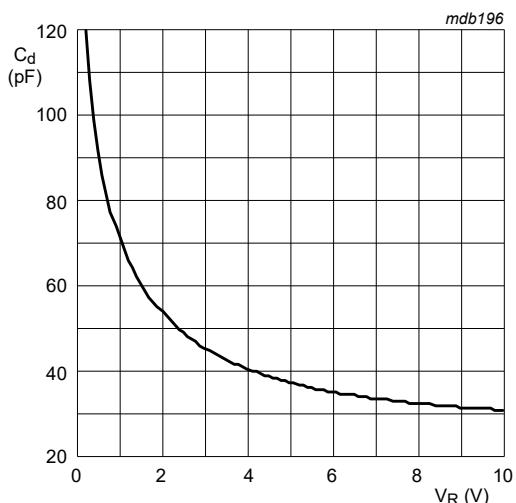


Fig. 2. Reverse current as a function of reverse voltage; typical values



$f = 1$ MHz; $T_{amb} = 25$ °C

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

11. Test information

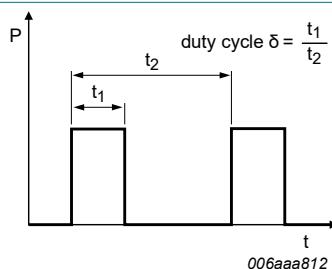


Fig. 4. Duty cycle definition

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

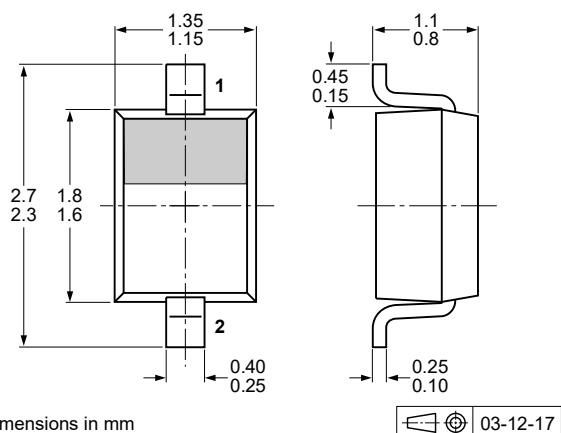


Fig. 5. Package outline SOD323

13. Soldering

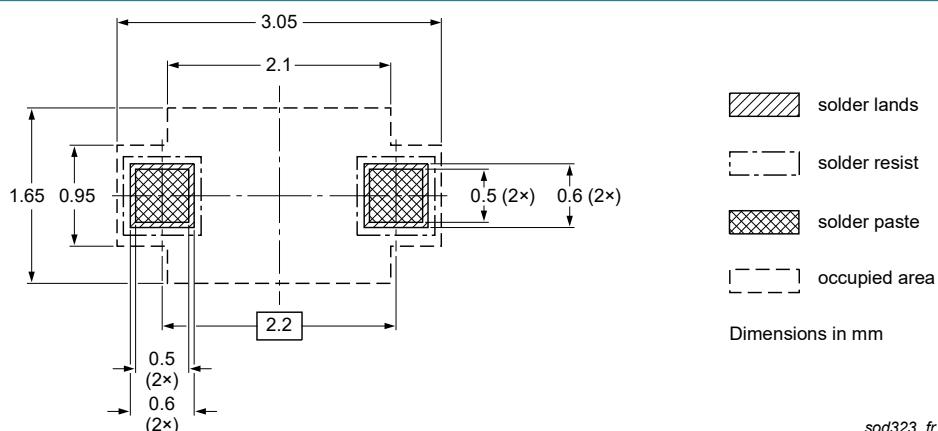


Fig. 6. Reflow soldering footprint for SOD323

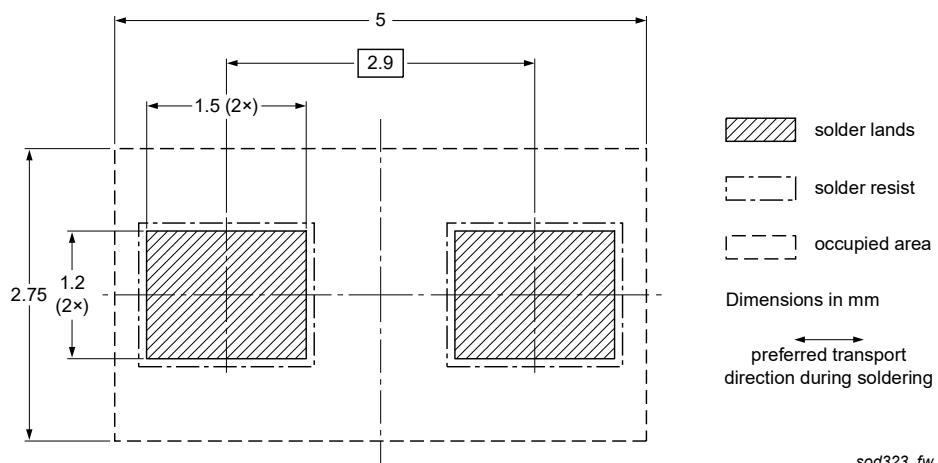


Fig. 7. Wave soldering footprint for SOD323

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMEG1020EA-Q v.1	20230901	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.

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