



# PMEG1020EA

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:  $I_F \leq 2$  A
- Reverse voltage:  $V_R \leq 10$  V
- Ultra low forward voltage
- Very small SMD plastic package
- AEC-Q101 qualified

## 3. Applications

- Low voltage rectification
- High efficiency DC-to-DC conversion
- Switch Mode Power Supply (SMPS)
- Reverse polarity protection
- Low power consumption applications

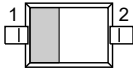

## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_F$	forward current	$T_{sp} \leq 55$ °C	-	-	2	A
$V_R$	reverse voltage		-	-	10	V
$V_F$	forward voltage	$I_F = 1$ A; pulsed; $t_p \leq 300$ $\mu$ s; $\delta \leq 0.02$ ; $T_{amb} = 25$ °C	-	280	350	mV

## 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
PMEG1020EA	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	E2

8. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC60134)

Symbol	Parameter	Conditions		Min	Max	Unit
V <sub>R</sub>	reverse voltage			-	10	V
I <sub>F</sub>	forward current	T <sub>sp</sub> ≤ 55 °C		-	2	A
I <sub>FRM</sub>	repetitive peak forward current	t <sub>p</sub> ≤ 1 ms; δ ≤ 0.5		-	3.2	A
I <sub>FSM</sub>	non-repetitive peak forward current	t <sub>p</sub> = 8 ms; square wave		-	9	A
T <sub>j</sub>	junction temperature			-	150	°C
T <sub>amb</sub>	ambient temperature			-65	150	°C
T <sub>stg</sub>	storage temperature			-65	150	°C

9. Thermal characteristics

Table 6. Thermal characteristics

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

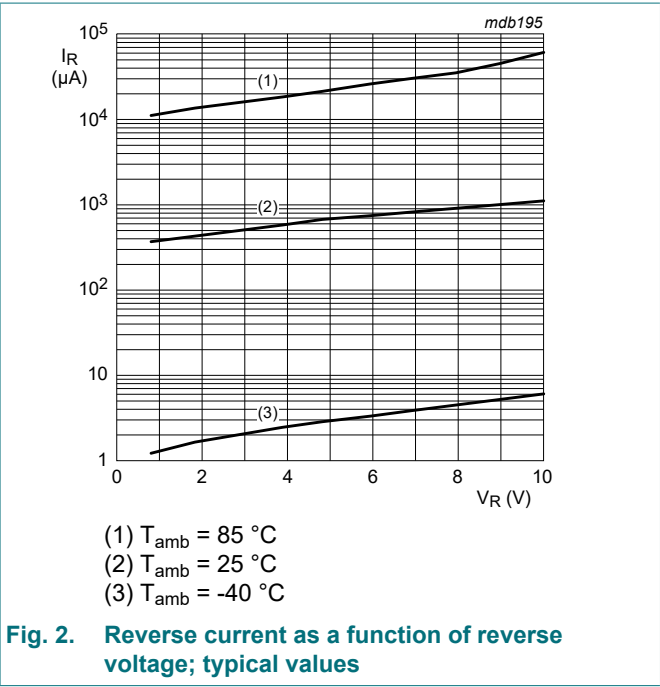
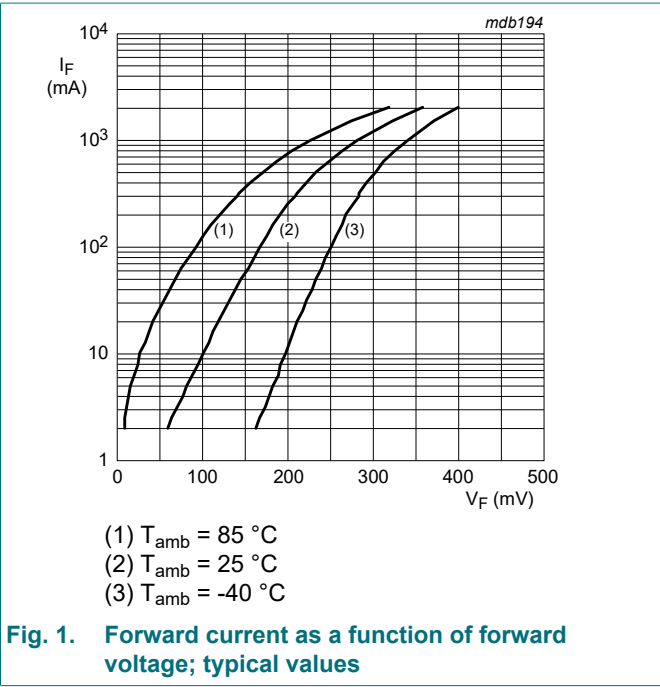
- [1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.  
[2] Device mounted on an FR4 PCB with copper clad 10 x 10 mm.  
[3] Soldering point of cathode tab.

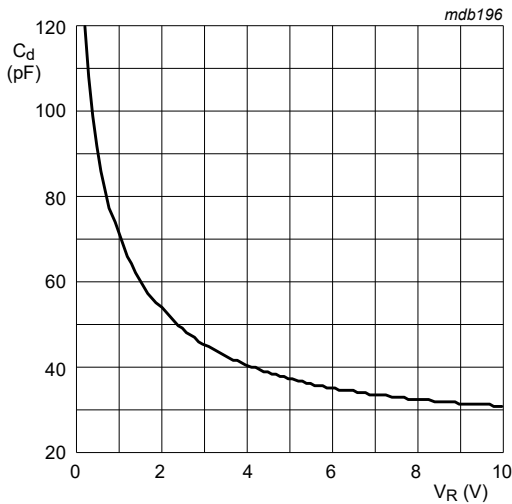
10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 0.01 A; pulsed; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C		-	100	130	mV
		I <sub>F</sub> = 0.1 A; pulsed; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C		-	170	200	mV
		I <sub>F</sub> = 1 A; pulsed; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C		-	280	350	mV
		I <sub>F</sub> = 2 A; pulsed; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C		-	350	460	mV
I <sub>R</sub>	reverse current	V <sub>R</sub> = 5 V; T <sub>amb</sub> = 25 °C	[1]	-	0.7	2	mA
		V <sub>R</sub> = 8 V; T <sub>amb</sub> = 25 °C	[1]	-	1	2.5	mA
		V <sub>R</sub> = 10 V; T <sub>amb</sub> = 25 °C	[1]	-	1.2	3	mA
C <sub>d</sub>	diode capacitance	V <sub>R</sub> = 5 V; f = 1 MHz; T <sub>amb</sub> = 25 °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.





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

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

11. Test information

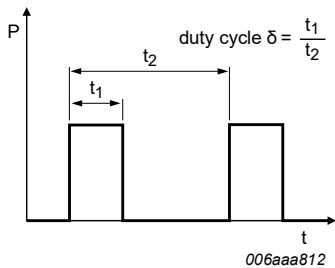


Fig. 4. Duty cycle definition

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

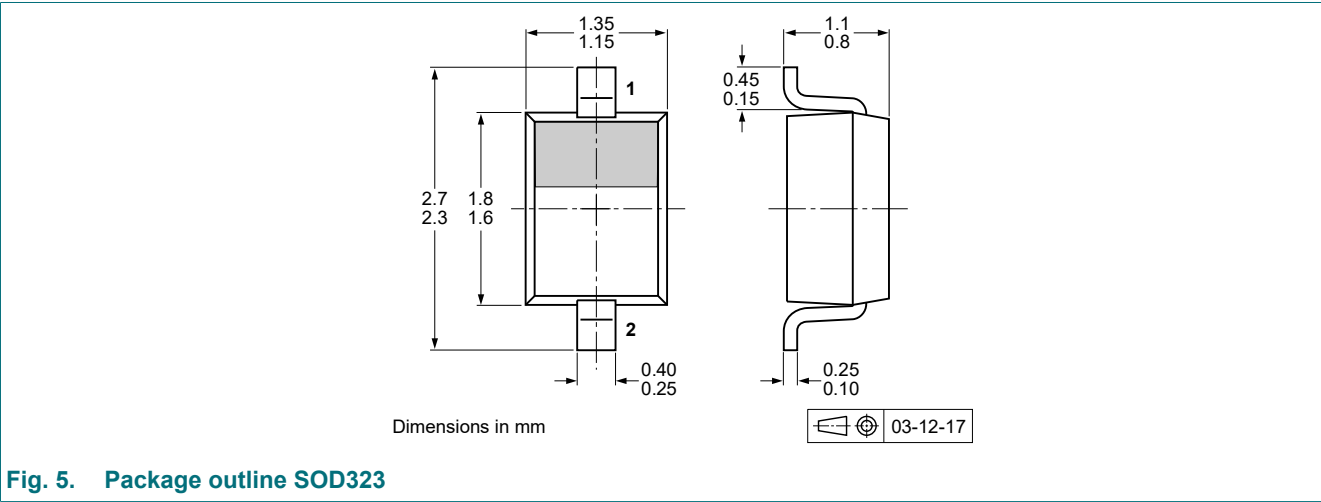


Fig. 5. Package outline SOD323

13. Soldering

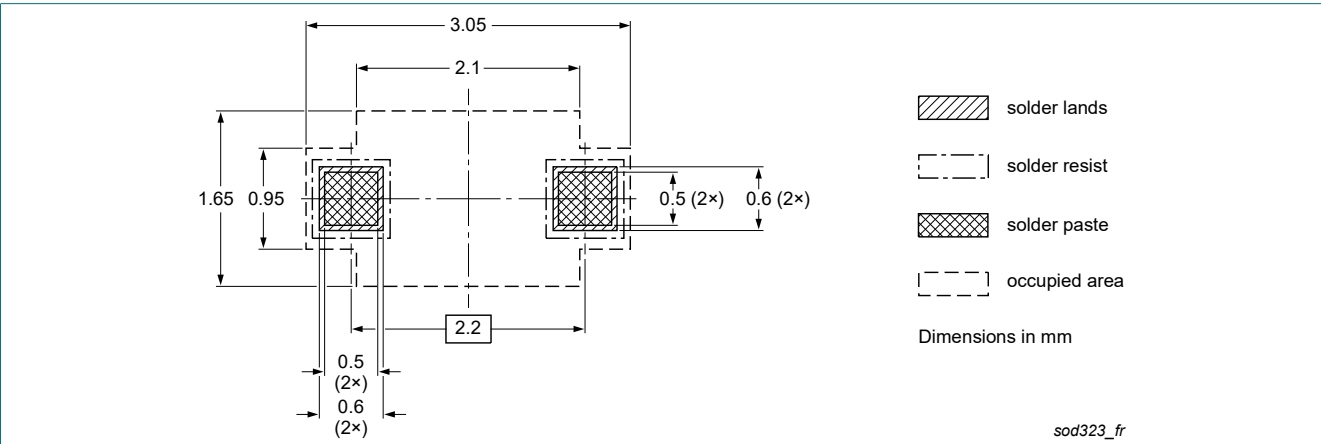


Fig. 6. Reflow soldering footprint for SOD323

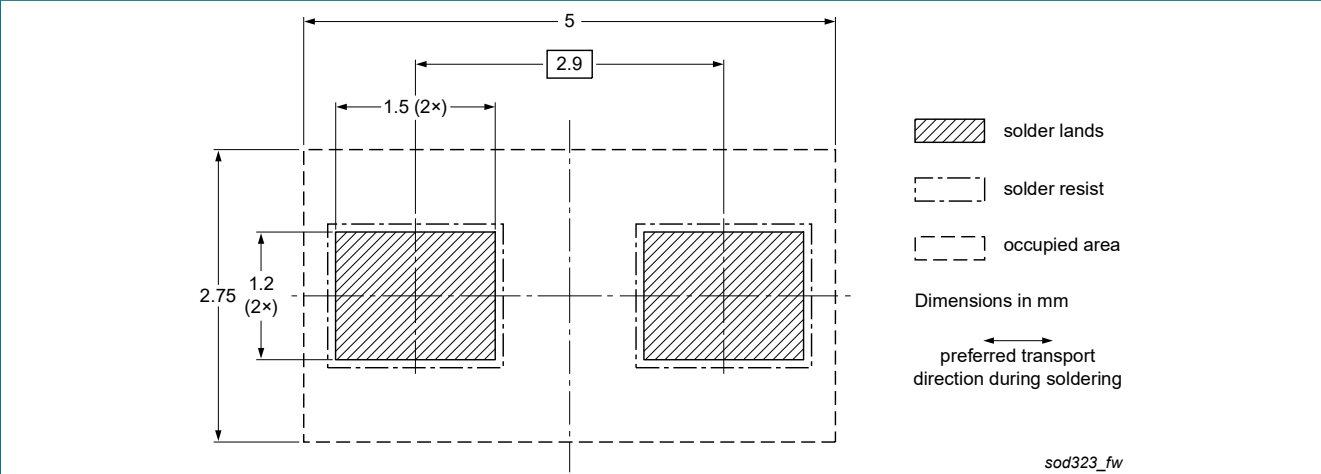


Fig. 7. Wave soldering footprint for SOD323

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMEG1020EA v.5	20230901	Product data sheet	-	PMEG1020EA_4
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>Section "Packing information" removed.</li></ul>			
PMEG1020EA_4	20081230	Product data sheet	-	PMEG1020EA_3
PMEG1020EA_3	20040206	Product specification	-	PMEG1020EA_2
PMEG1020EA_2	20030715	Product specification	-	PMEG1020EA_1
PMEG1020EA_1	20030307	Preliminary specification	-	-

## 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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