PMEG2010BEA-Q

1 A very 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 a very small SOD323 (SC-76) Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Forward current: 1 A
- Reverse voltage: 20 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

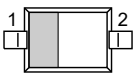
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_F	forward current	$T_{sp} \leq$ 55 °C	[1]	-	-	1	A
V_R	reverse voltage	T_j = 25 °C		-	-	20	V
V_F	forward voltage	I_F = 1000 mA; T_{amb} = 25 °C	[2]	-	420	500	mV
I_R	reverse current	V_R = 20 V; T_{amb} = 25 °C	[2]	-	40	200	µA

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.
[2] Pulsed test: $t_p \leq 300$ µs; $\delta \leq 0.02$

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
PMEG2010BEA-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
PMEG2010BEA-Q	V1

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	T_j = 25 °C		-	20	V
I_F	forward current	$T_{sp} \leq$ 55 °C	[1]	-	1	A
I_{FRM}	repetitive peak forward current	$t_p \leq$ 1 ms; $\delta \leq$ 0.5		-	3.5	A
I_{FSM}	non-repetitive peak forward current	t_p = 8 ms; square wave		-	10	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
			[1] [3]	-	-	210	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[4]	-	-	90	K/W

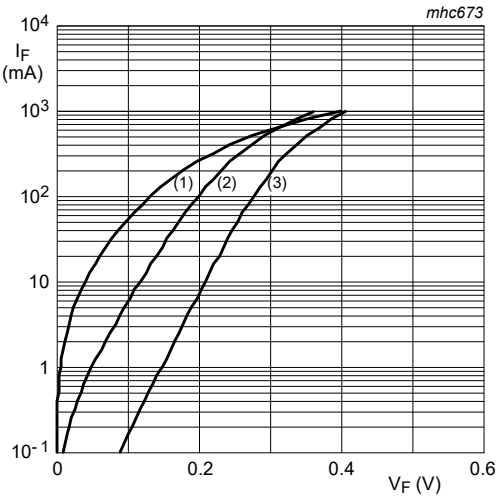
[1] For Schottky barrier diodes thermal runaway has to be considered, as in some applications the reverse power losses P_R are a significant part of the total power losses. Nomograms for determining the reverse power losses P_R and $I_{F(AV)}$ rating will be available on request.
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm^2.
[4] Soldering point of cathode tab.

10. Characteristics

Table 7. Characteristics

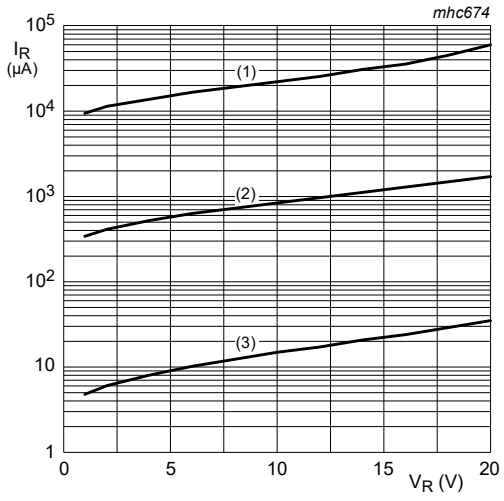
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	I_F = 0.1 mA; T_{amb} = 25 °C	[1]	-	90	130	mV
		I_F = 1 mA; T_{amb} = 25 °C	[1]	-	150	190	mV
		I_F = 10 mA; T_{amb} = 25 °C	[1]	-	210	240	mV
		I_F = 100 mA; T_{amb} = 25 °C	[1]	-	280	330	mV
		I_F = 500 mA; T_{amb} = 25 °C	[1]	-	355	390	mV
		I_F = 1000 mA; T_{amb} = 25 °C	[1]	-	420	500	mV
I_R	reverse current	V_R = 10 V; T_{amb} = 25 °C	[1]	-	15	40	µA
		V_R = 20 V; T_{amb} = 25 °C	[1]	-	40	200	µA
C_d	diode capacitance	V_R = 1 V; f = 1 MHz; T_{amb} = 25 °C		-	66	80	pF

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



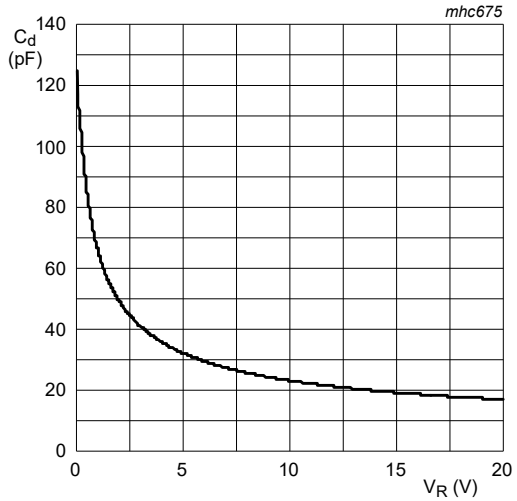
Pulsed condition
(1) T_{amb} = 150 °C
(2) T_{amb} = 85 °C
(3) T_{amb} = 25 °C

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



Pulsed condition
(1) T_{amb} = 150 °C
(2) T_{amb} = 85 °C
(3) T_{amb} = 25 °C

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



T_{amb} = 25 °C; f = 1 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

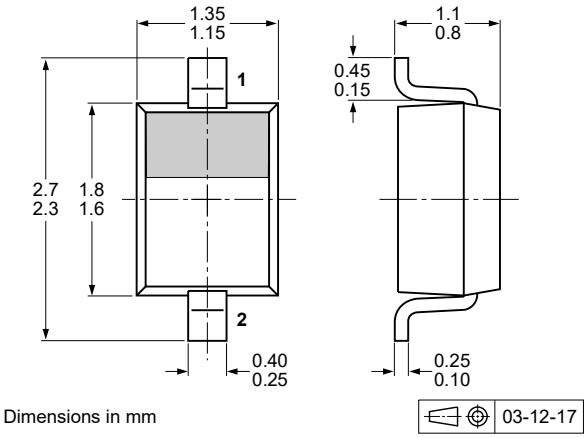


Fig. 4. Package outline SOD323

13. Soldering

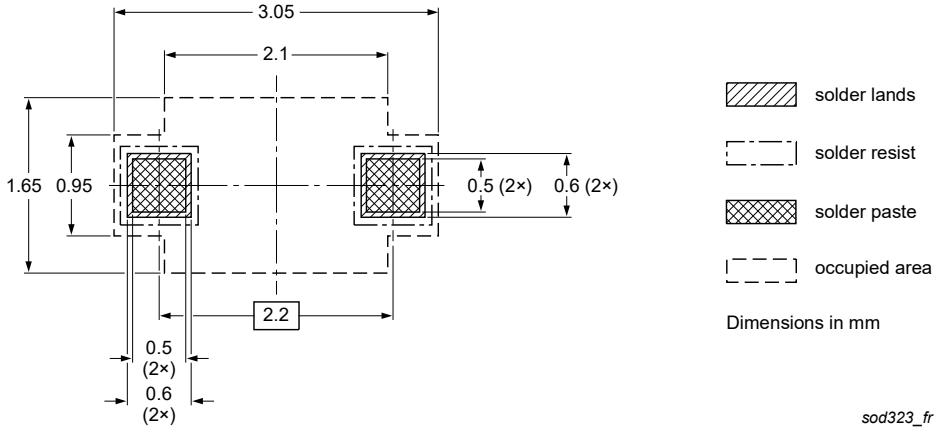


Fig. 5. Reflow soldering footprint for SOD323

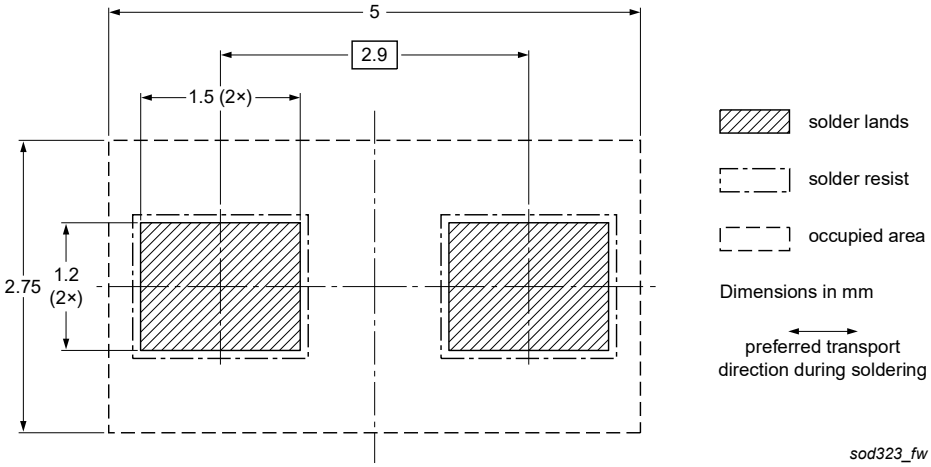


Fig. 6. Wave soldering footprint for SOD323

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMEG2010BEA-Q v.3	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.

[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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