

PMEG2005EL-Q

20 V, 0.5 A ultra low VF Schottky barrier rectifier

2 October 2024 Product data sheet

1. General description

Planar Schottky barrier diode with an integrated guard ring for stress protection encapsulated in a SOD882 leadless ultra small plastic package.

2. Features and benefits

- Forward current: 0.5 A
- Reverse voltage: 20 V
- Very low forward voltage
- Leadless ultra small plastic package
- Power dissipation comparable to SOT23
- Qualified according to AEC-Q101 and recommended for use in automotive applications

3. Applications

- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Low voltage rectification
- High efficiency DC-to-DC conversion
- Low power consumption applications

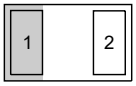
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_F	forward current			-	-	0.5	A
V_R	reverse voltage	T_j = 25 °C		-	-	20	V
V_F	forward voltage	I_F = 500 mA; T_j = 25 °C		-	450	500	mV
I_R	reverse current	V_R = 10 V; T_j = 25 °C		-	4	30	µA

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode	 Transparent top view **DFN1006-2 (SOD882)**	 *sym001*
2	A	anode		

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6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMEG2005EL-Q	DFN1006-2	plastic, leadless ultra small package; 2 terminals; 0.65 mm pitch; 1 mm x 0.6 mm x 0.48 mm body	SOD882

7. Marking

Table 4. Marking codes

Type number	Marking code
PMEG2005EL-Q	F5

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			-	0.5	A
I_{FRM}	repetitive peak forward current	$t_p \leq$ 1 ms; $\delta \leq$ 0.25		-	2.5	A
I_{FSM}	non-repetitive peak forward current	square-wave pulse; t_p = 8 ms; $T_{j(init)}$ = 25 °C		-	3	A
T_j	junction temperature		[1]	-	150	°C
T_{amb}	ambient temperature		[1]	-65	150	°C
T_{stg}	storage temperature			-65	150	°C

[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.

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]	-	-	500	K/W

[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.

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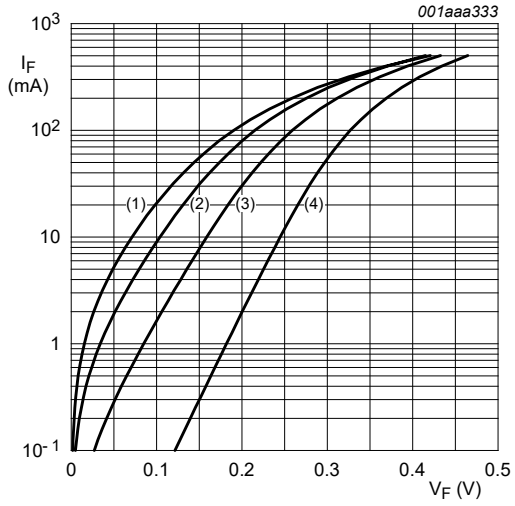
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10. Characteristics

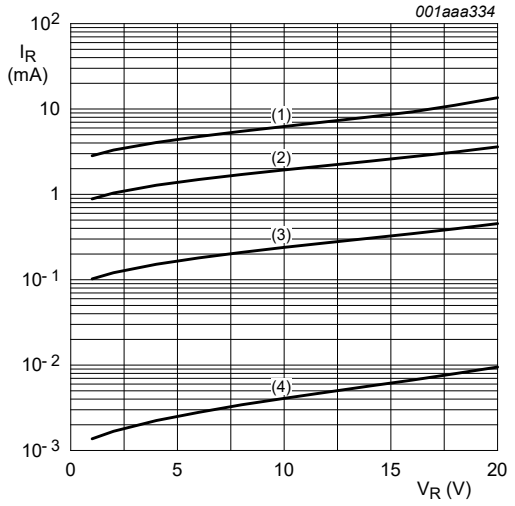
Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	I_F = 0.1 mA; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_j = 25 °C		-	125	180	mV
		I_F = 1 mA; T_j = 25 °C		-	185	240	mV
		I_F = 10 mA; T_j = 25 °C		-	250	290	mV
		I_F = 100 mA; T_j = 25 °C		-	325	380	mV
		I_F = 500 mA; T_j = 25 °C		-	450	500	mV
I_R	reverse current	V_R = 10 V; T_j = 25 °C		-	4	30	µA
C_d	diode capacitance	V_R = 1 V; f = 1 MHz; T_j = 25 °C		-	24	30	pF



pulsed condition
(1) T_j = 150 °C
(2) T_j = 125 °C
(3) T_j = 85 °C
(4) T_j = 25 °C

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



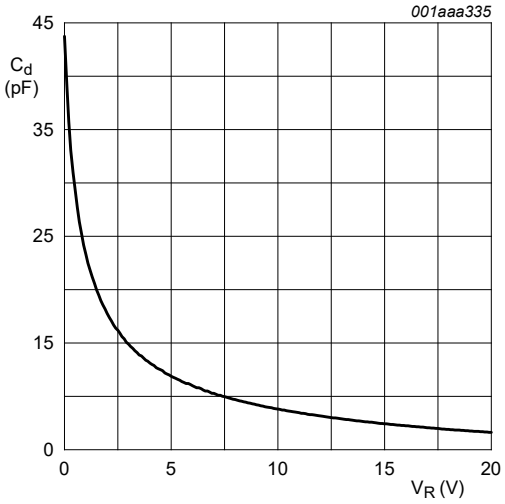
pulsed condition
(1) T_j = 150 °C
(2) T_j = 125 °C
(3) T_j = 85 °C
(4) T_j = 25 °C

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

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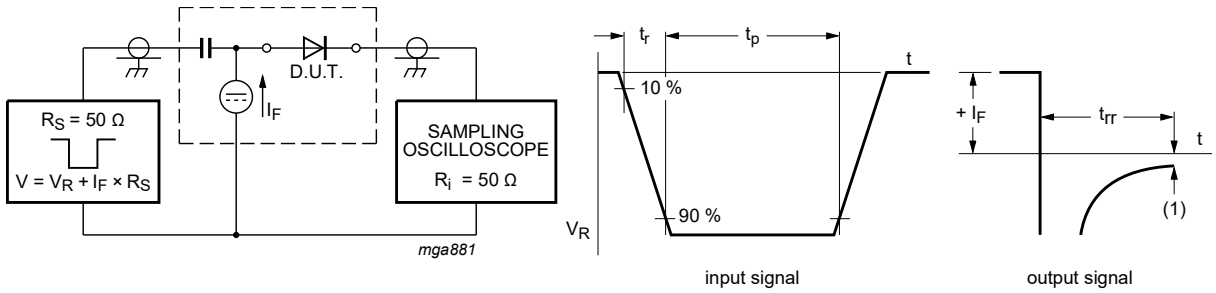
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f = 1 MHz; T_{amb} = 25 °C

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

11. Test information



(1) I_R = 1 mA

Fig. 4. Reverse recovery time: test circuit and waveforms

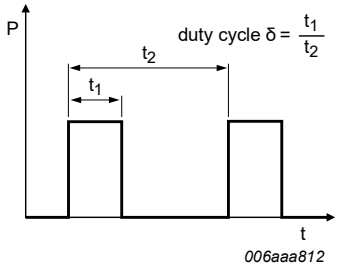


Fig. 5. Duty cycle definition

The current ratings for the typical waveforms are calculated according to the equations:

$I_{F(AV)} = I_M \times \delta$ with I_M defined as peak current

$I_{RMS} = I_{F(AV)}$ at DC

$I_{RMS} = I_M \times \sqrt{\delta}$ with I_{RMS} defined as RMS current

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.

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12. Package outline

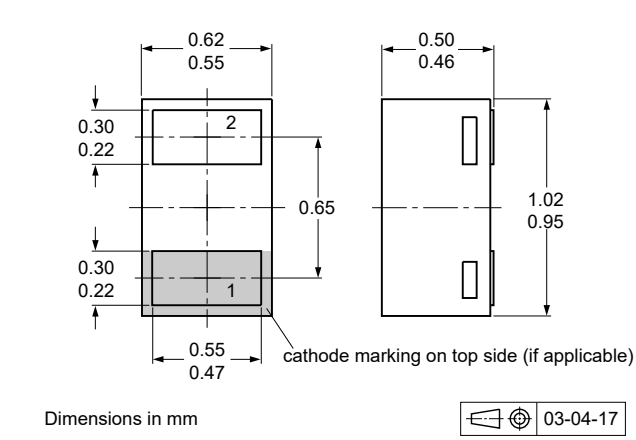


Fig. 6. Package outline DFN1006-2 (SOD882)

13. Soldering

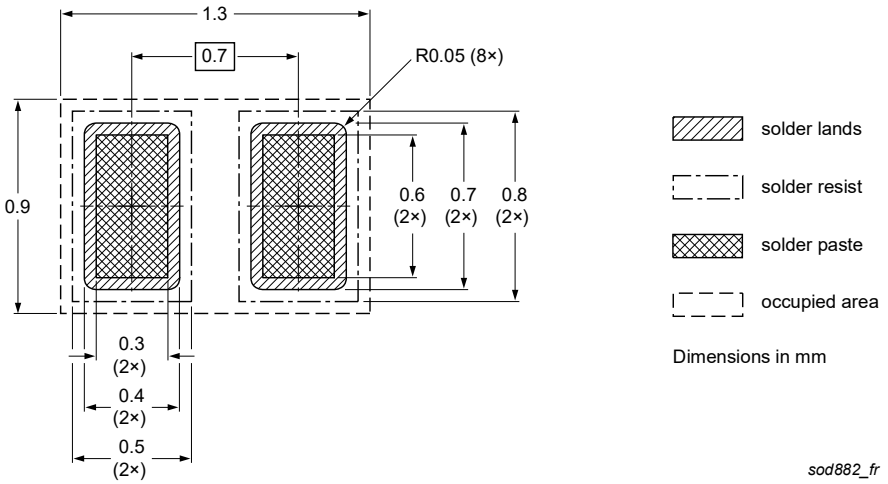


Fig. 7. Reflow soldering footprint for DFN1006-2 (SOD882)

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14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMEG2005EL-Q v.1	20241002	Product data sheet	-	-

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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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[2] The term 'short data sheet' is explained in section "Definitions".
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Contents

1. General description....1
2. Features and benefits....1
3. Applications....1
4. Quick reference data....1
5. Pinning information....1
6. Ordering information....2
7. Marking....2
8. Limiting values....2
9. Thermal characteristics....2
10. Characteristics....3
11. Test information....4
12. Package outline....5
13. Soldering....5
14. Revision history....6
15. Legal information....7

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