

PMEG4005ET-Q

40 V, 0.5 A very low VF MEGA Schottky barrier rectifier

31 January 2022

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 SOT23 small Surface Mounted Device (SMD) plastic package.

2. Features and benefits

- Forward current: 0.5 A
- Very low forward voltage
- 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
- Inverse polarity protection
- Low power consumption applications

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
I _F	forward current		-	-	0.5	А
V _R	reverse voltage		-	-	40	V
V _F		$\label{eq:l_F} \begin{array}{l} I_F = 500 \text{ mA; } t_p \leq \ 300 \ \mus; \ \delta \leq \ 0.02; \\ pulsed; \ T_amb = 25 \ ^\circC \end{array}$	-	420	470	mV



5. Pinning information

Table 2	2. Pinning info	ormation		
Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A	anode	3	
2	n.c.	not connected		
3	К	cathode		1 n.c. 3

6. Ordering information

Table 3. Ordering information

Type number	Package				
	Name	Description	Version		
PMEG4005ET-Q	SOT23	plastic, surface-mounted package; 3 terminals; 1.9 mm pitch; 2.9 mm x 1.3 mm x 1 mm body	SOT23		

7. Marking

Table 4. Marking codes

Type number	Marking code[1]
PMEG4005ET-Q	P5%

[1] % = placeholder for manufacturing site code

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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			-	40	V
l _F	forward current			-	0.5	A
I _{FRM}	repetitive peak forward current	t _p ≤ 1 ms; δ ≤ 0.5		-	3.9	A
I _{FSM}	non-repetitive peak forward current	t _p = 8 ms; square wave	[1]	-	10	A
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	[1]	-	280	mW
			[2]	-	420	mW
Tj	junction temperature			-	150	°C
T _{amb}	ambient temperature			-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] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm².

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
ui(j-a)	thermal resistance from junction to ambient	in free air	[1] [2]	-	-	440	K/W
			[3] [1]	-	-	300	K/W

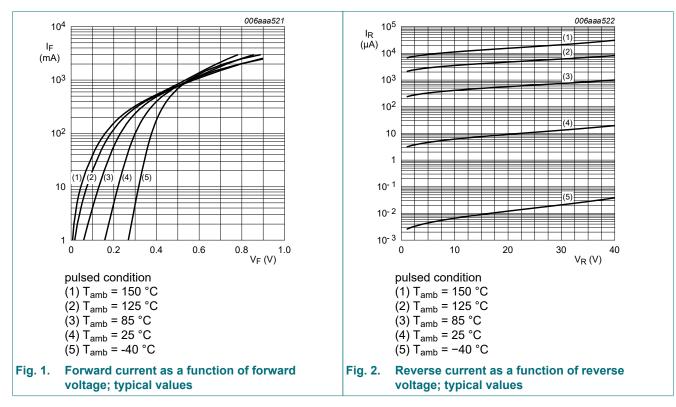
[1] For Schottky barrier diodes thermal runaway has to be considered, as in some applications the reverse power losses P_R are a significant part of the total power losses.

[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 cm².

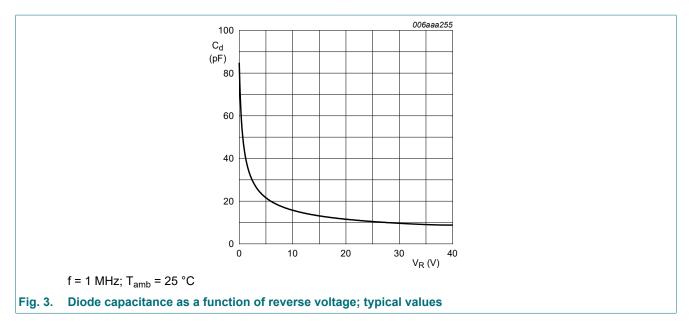
10. Characteristics

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
VF	forward voltage	I _F = 0.1 mA; t _p ≤ 300 μs; δ ≤ 0.02; pulsed; T _{amb} = 25 °C	-	95	130	mV
		I_F = 1 mA; $t_p \le 300 \ \mu$ s; δ ≤ 0.02 ; pulsed; T_{amb} = 25 °C	-	155	210	mV
		$\label{eq:IF} \begin{array}{l} I_F = 10 \text{ mA}; t_p \leq \ 300 \ \mus; \delta \leq \ 0.02; \\ pulsed; T_amb = 25 \ ^\circC \end{array}$	-	220	270	mV
		$\label{eq:IF} \begin{array}{l} I_F = 100 \text{ mA}; t_p \leq \ 300 \ \mus; \delta \leq \ 0.02; \\ pulsed; T_amb = 25 \ ^\circC \end{array}$	-	295	350	mV
		I_F = 500 mA; t _p ≤ 300 μs; δ ≤ 0.02; pulsed; T _{amb} = 25 °C	-	420	470	mV
I _R	reverse current	V _R = 10 V; T _{amb} = 25 °C	-	7	20	μA
		V _R = 40 V; T _{amb} = 25 °C	-	30	100	μA
C _d	diode capacitance	V _R = 1 V; f = 1 MHz; T _{amb} = 25 °C	-	43	50	pF



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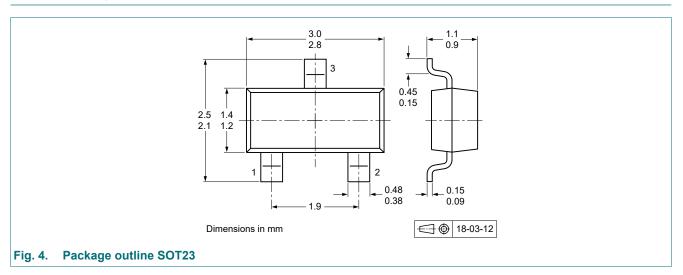


11. Test information

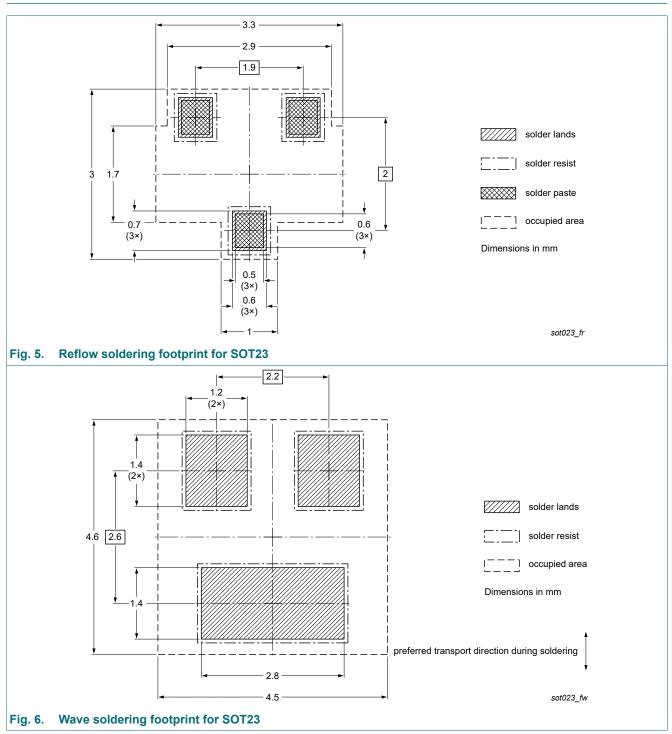
Quality information

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



13. Soldering



14. Revision history

Table 8. Revision history				
Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMEG4005ET-Q v.1	20220131	Product data sheet	-	-

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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.

 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 <u>https://www.nexperia.com</u>.

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