



PMEG4005EJ-Q

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

6 August 2021

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 small SOD323F (SC-90) Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Very low forward voltage
- Flat lead SMD 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
- Reverse polarity protection
- Low power consumption applications

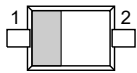

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_F	forward current	$T_{sp} \leq 55\text{ }^\circ\text{C}$	-	-	0.5	A
V_R	reverse voltage	$T_{amb} = 25\text{ }^\circ\text{C}$	-	-	40	V
V_F	forward voltage	$I_F = 500\text{ mA}; t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.02;$ pulsed; $T_{amb} = 25\text{ }^\circ\text{C}$	-	420	470	mV

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode ^[1]	 SC-90 (SOD323F)	 sym001
2	A	anode		

[1] The marking bar indicates the cathode.

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMEG4005EJ-Q	SC-90	plastic, surface-mounted package; 2 leads; 1.7 mm x 1.25 mm x 0.7 mm body	SOD323F

7. Marking

Table 4. Marking codes

Type number	Marking code
PMEG4005EJ-Q	CE

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	$T_{amb} = 25\text{ °C}$		-	40	V
I_F	forward current	$T_{sp} \leq 55\text{ °C}$		-	0.5	A
I_{FRM}	repetitive peak forward current	$t_p \leq 1\text{ ms}; \delta \leq 0.25$		-	7	A
I_{FSM}	non-repetitive peak forward current	$t_p = 8\text{ ms}; \text{square wave}; T_{j(\text{init})} = 25\text{ °C}$		-	10	A
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ °C}$	[1]	-	360	mW
			[2]	-	830	mW
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			-65	150	°C
T_{stg}	storage temperature			-65	150	°C

[1] Device mounted on an FR4 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	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1] [2]	-	-	350	K/W
			[1] [3]	-	-	150	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point			-	-	55	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 determination of 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.

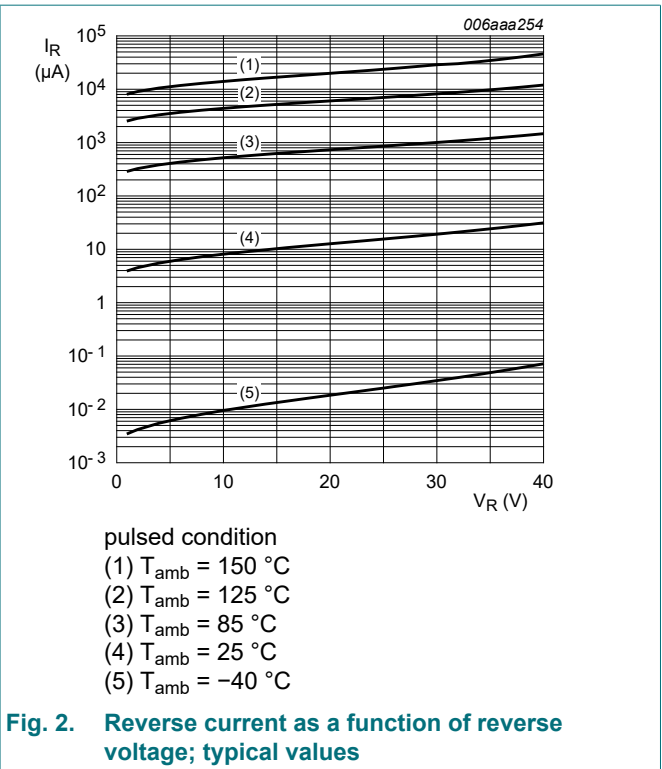
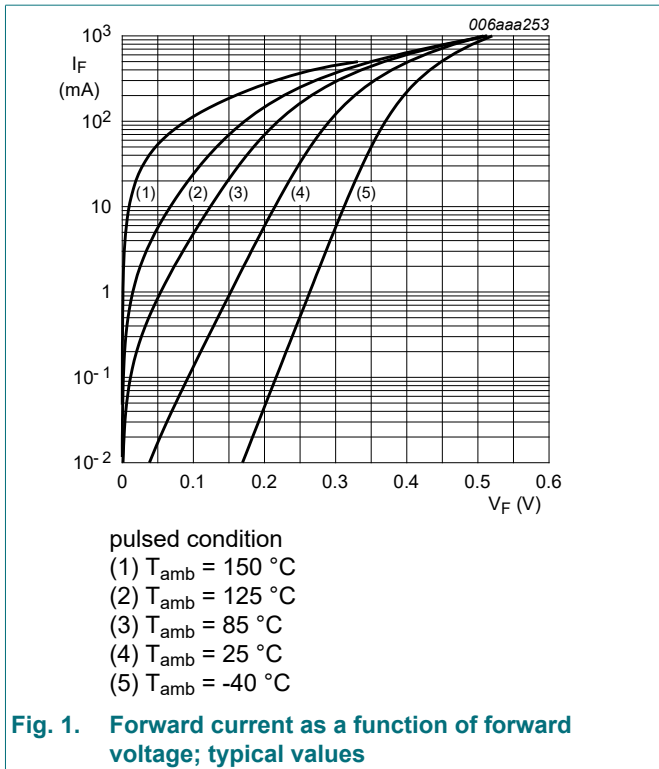
[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm².

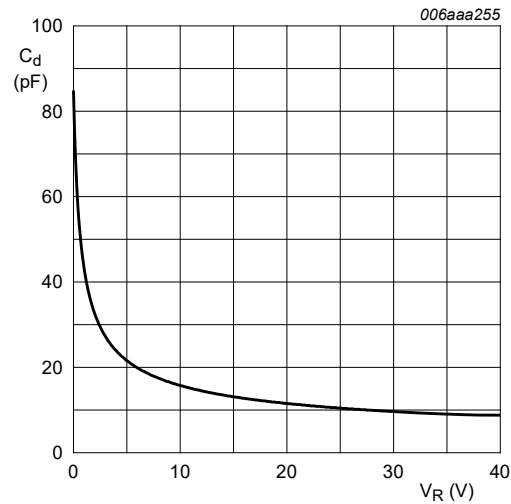
10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V _F	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 ≤ 300 μs; δ ≤ 0.02; pulsed; T _{amb} = 25 °C	-	155	210	mV
		I _F = 10 mA; t _p ≤ 300 μs; δ ≤ 0.02; pulsed; T _{amb} = 25 °C	-	220	270	mV
		I _F = 100 mA; t _p ≤ 300 μs; δ ≤ 0.02; pulsed; T _{amb} = 25 °C	-	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 _p ≤ 300 μs; δ ≤ 0.02; pulsed; T _{amb} = 25 °C	[1]	7	20	μA
		V _R = 40 V; t _p ≤ 300 μs; δ ≤ 0.02; pulsed; T _{amb} = 25 °C	[1]	30	100	μA
C _d	diode capacitance	V _R = 1 V; f = 1 MHz; T _{amb} = 25 °C	-	43	50	pF

[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 determination of the reverse power losses P_R and I_{F(AV)} rating will be available on request.





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

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

11. Test information

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

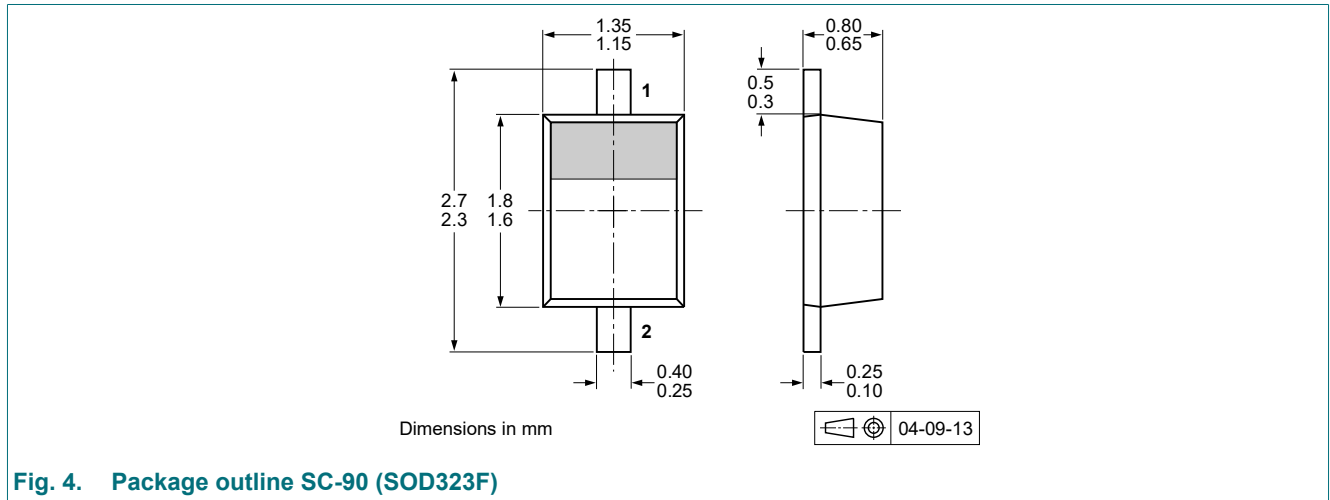


Fig. 4. Package outline SC-90 (SOD323F)

13. Soldering

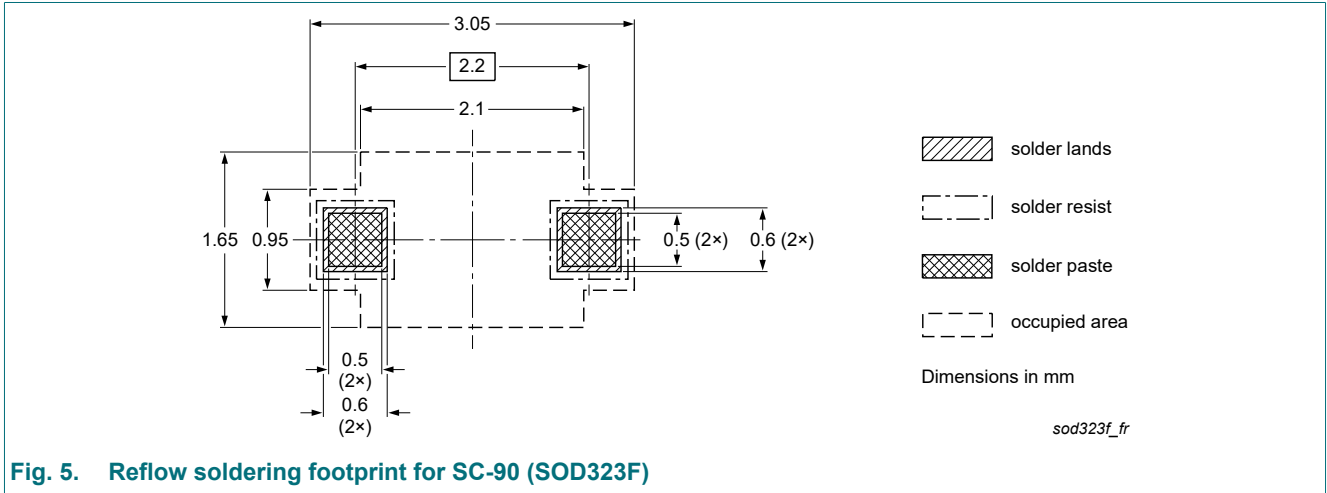


Fig. 5. Reflow soldering footprint for SC-90 (SOD323F)

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMEG4005EJ-Q v.1	20210806	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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