



PMEG3005EB

0.5 A very low VF MEGA Schottky barrier rectifier

7 April 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 an ultra small SOD523 (SC-79) Surface-Mounted Device (SMD) flat lead plastic package.

2. Features and benefits

- Forward current: $I_F \leq 0.5$ A
- Reverse voltage: $V_R \leq 30$ V
- Very low forward voltage
- Ultra small SMD plastic package
- AEC-Q101 qualified

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	$T_{sp} \leq 55$ °C	-	-	0.5	A
V_R	reverse voltage	$T_j = 25$ °C	-	-	30	V
V_F	forward voltage	$I_F = 500$ mA	[1]	430	500	mV

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

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode ^[1]	 <p>SC-79 (SOD523)</p>	 <p>sym001</p>
2	A	anode		

[1] The marking bar indicates the cathode

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMEG3005EB	SC-79	plastic, surface-mounted package; 2 leads; 1.2 mm x 0.8 mm x 0.6 mm body	SOD523

7. Marking

Table 4. Marking codes

Type number	Marking code
PMEG3005EB	KB

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	$T_j = 25\text{ °C}$		-	30	V
I_F	forward current	$T_{sp} \leq 55\text{ °C}$		-	0.5	A
I_{FRM}	repetitive peak forward current	$t_p \leq 1\text{ ms}; \delta \leq 0.25$		-	1	A
I_{FSM}	non-repetitive peak forward current	$t_p = 8\text{ ms};$ square wave		-	3	A
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ °C}$	[1]	-	310	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.

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]	-	-	400	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[3]	-	-	75	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] Soldering point of cathode tab.

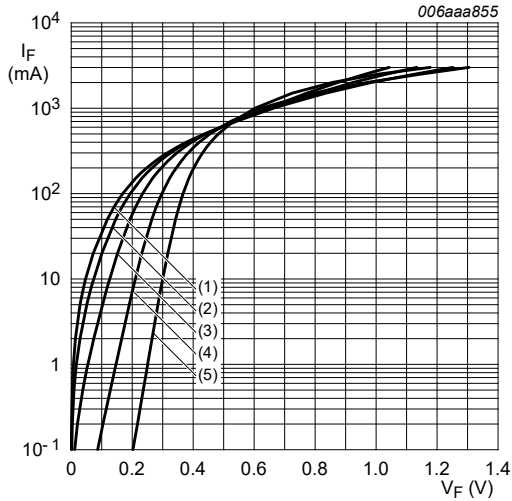
10. Characteristics

Table 7. Characteristics

$T_{amb} = 25\text{ °C}$ unless otherwise specified

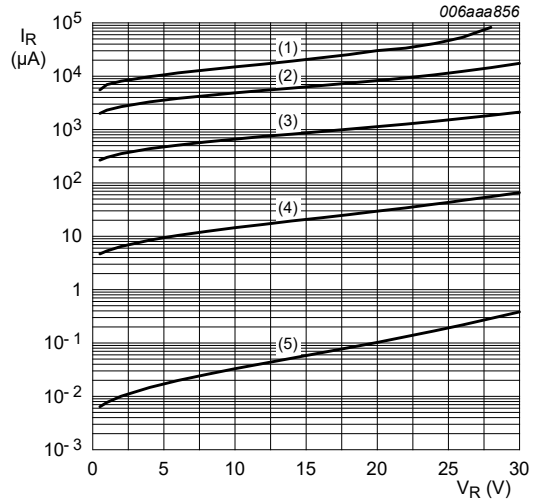
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	$I_F = 0.1\text{ mA}$	[1]	-	90	180	mV
		$I_F = 1\text{ mA}$	[1]	-	150	200	mV
		$I_F = 10\text{ mA}$	[1]	-	210	270	mV
		$I_F = 100\text{ mA}$	[1]	-	295	360	mV
		$I_F = 500\text{ mA}$	[1]	-	430	500	mV
I_R	reverse current	$V_R = 10\text{ V}$		-	15	200	μA
		$V_R = 30\text{ V}$		-	70	500	μA
C_d	diode capacitance	$V_R = 1\text{ V}; f = 1\text{ MHz}$		-	24	30	pF

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



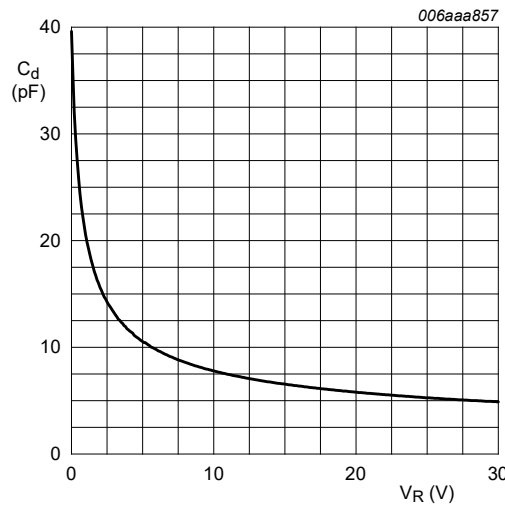
- (1) $T_{amb} = 150\text{ °C}$
- (2) $T_{amb} = 125\text{ °C}$
- (3) $T_{amb} = 85\text{ °C}$
- (4) $T_{amb} = 25\text{ °C}$
- (5) $T_{amb} = -40\text{ °C}$

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



- (1) $T_{amb} = 150\text{ °C}$
- (2) $T_{amb} = 125\text{ °C}$
- (3) $T_{amb} = 85\text{ °C}$
- (4) $T_{amb} = 25\text{ °C}$
- (5) $T_{amb} = -40\text{ °C}$

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



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

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

11. Test information

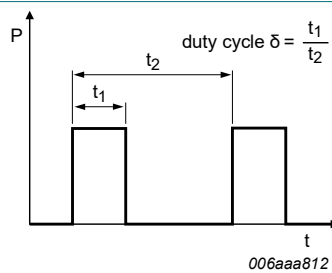


Fig. 4. Duty cycle definition

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

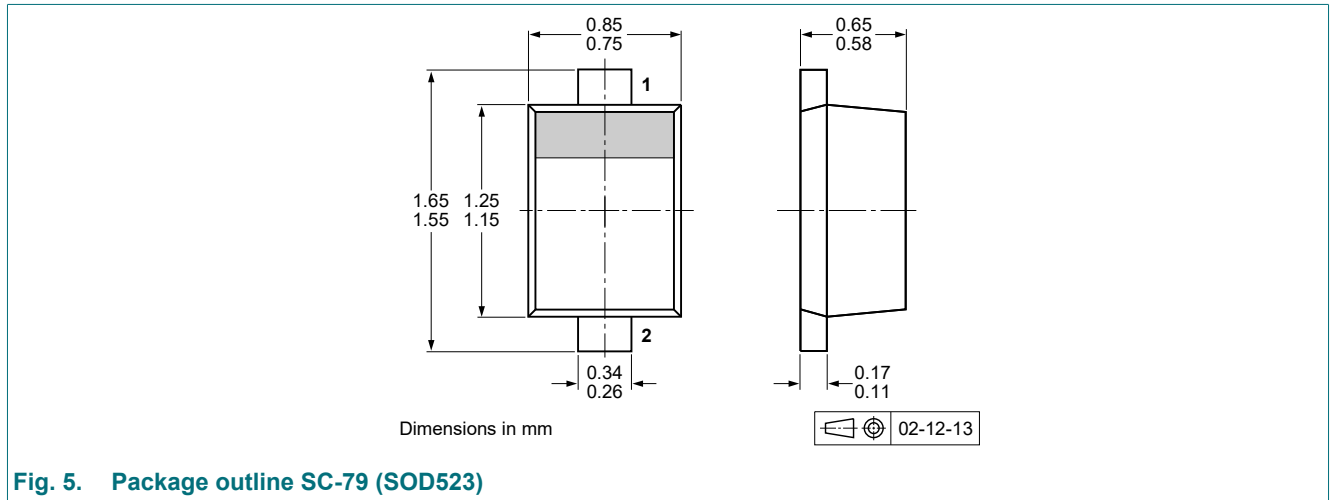


Fig. 5. Package outline SC-79 (SOD523)

13. Soldering

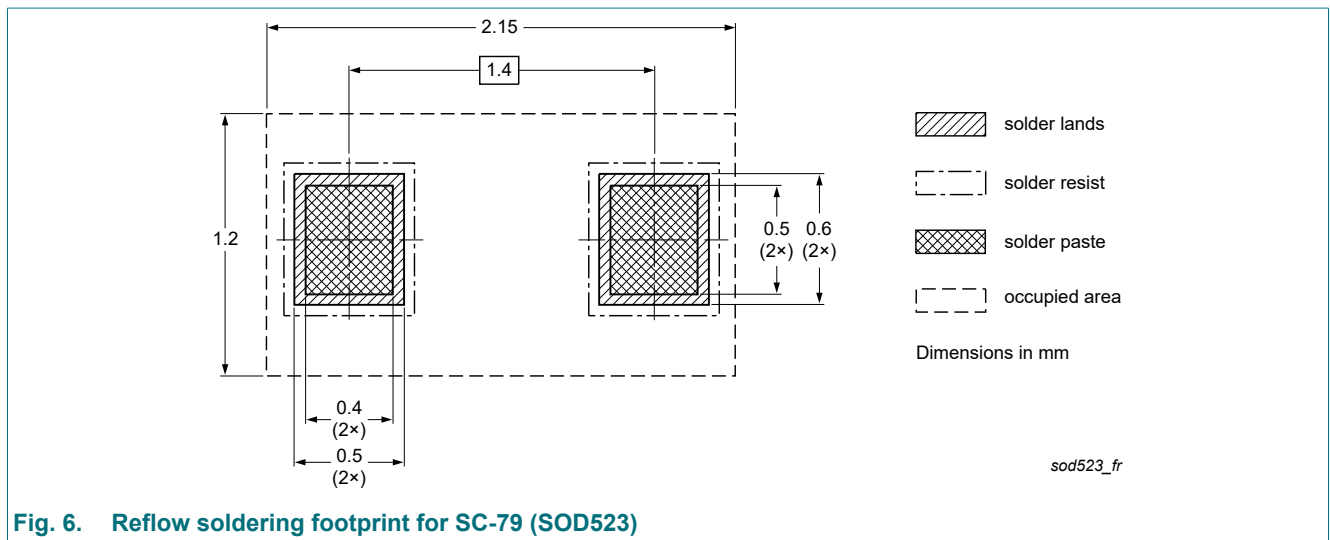


Fig. 6. Reflow soldering footprint for SC-79 (SOD523)

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMEG3005EB v.2	20210407	Product data sheet	-	PMEG3005EB_PMEG3005EL v.1
Modifications:	<ul style="list-style-type: none">• Data sheet separated into two data sheets• Packing information: section removed• Soldering: Figure 6: "Reflow soldering footprint for SOD523" updated• Changed to AEC-Q101 qualified status in sections: "Limiting values", "Test information" and "Legal information"			
PMEG3005EB_PMEG3005EL v.1	20061129	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.

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- [2] The term 'short data sheet' is explained in section "Definitions".
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Date of release: 7 April 2021
