



# 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:  $t_p \leq 300$   $\mu$ s;  $\delta \leq 0.02$

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode <sup>[1]</sup>	 <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.

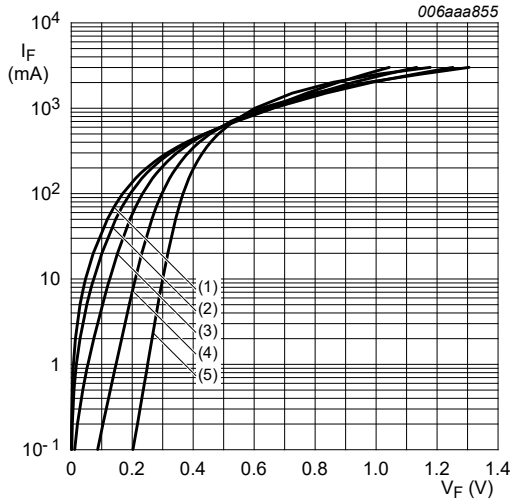
## 10. Characteristics

**Table 7. Characteristics**

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

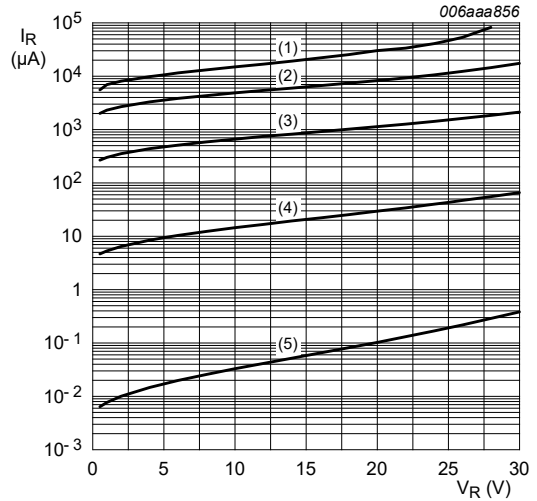
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$V_F$	forward voltage	$I_F = 0.1\text{ mA}$	[1]	-	90	180	mV
		$I_F = 1\text{ mA}$	[1]	-	150	200	mV
		$I_F = 10\text{ mA}$	[1]	-	210	270	mV
		$I_F = 100\text{ mA}$	[1]	-	295	360	mV
		$I_F = 500\text{ mA}$	[1]	-	430	500	mV
$I_R$	reverse current	$V_R = 10\text{ V}$		-	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:  $t_p \leq 300\text{ μs}; \delta \leq 0.02$



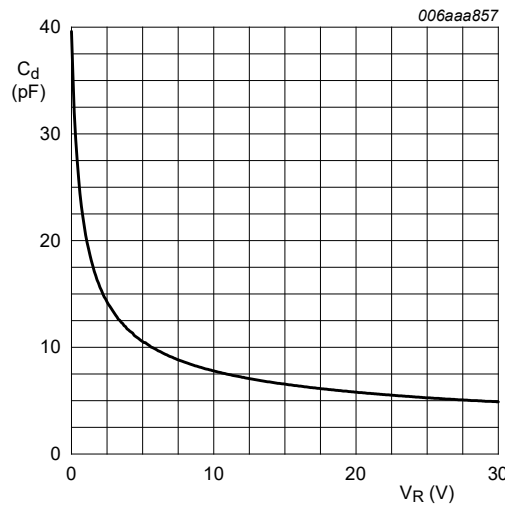
- (1)  $T_{amb} = 150\text{ °C}$
- (2)  $T_{amb} = 125\text{ °C}$
- (3)  $T_{amb} = 85\text{ °C}$
- (4)  $T_{amb} = 25\text{ °C}$
- (5)  $T_{amb} = -40\text{ °C}$

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

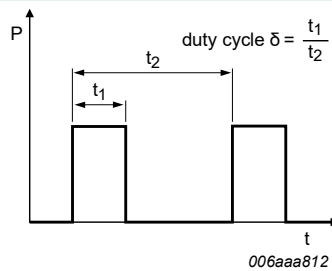


Fig. 4. Duty cycle definition

**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**

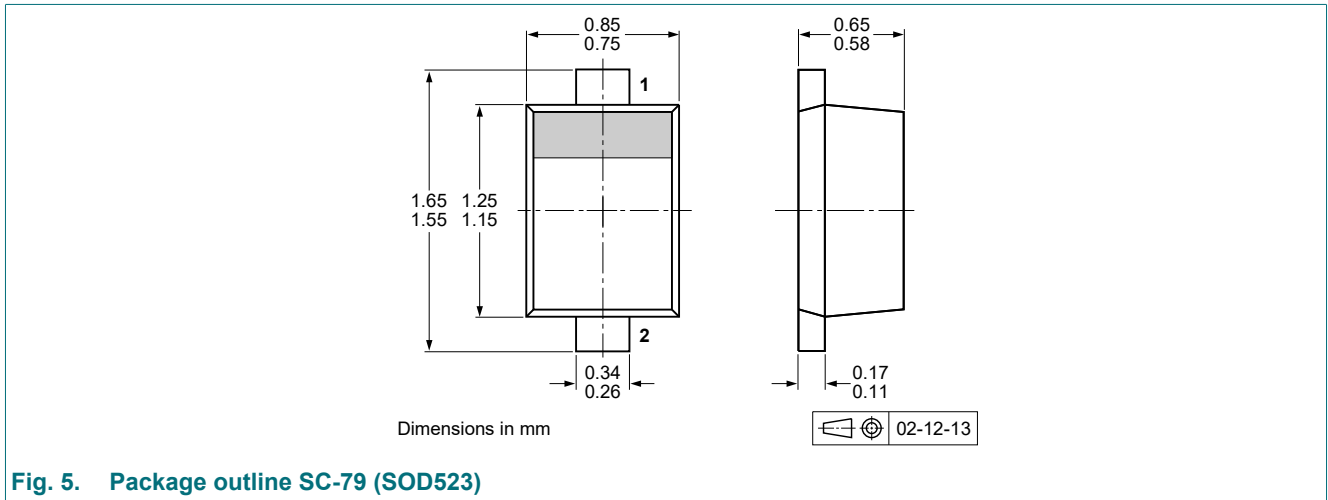


Fig. 5. Package outline SC-79 (SOD523)

**13. Soldering**

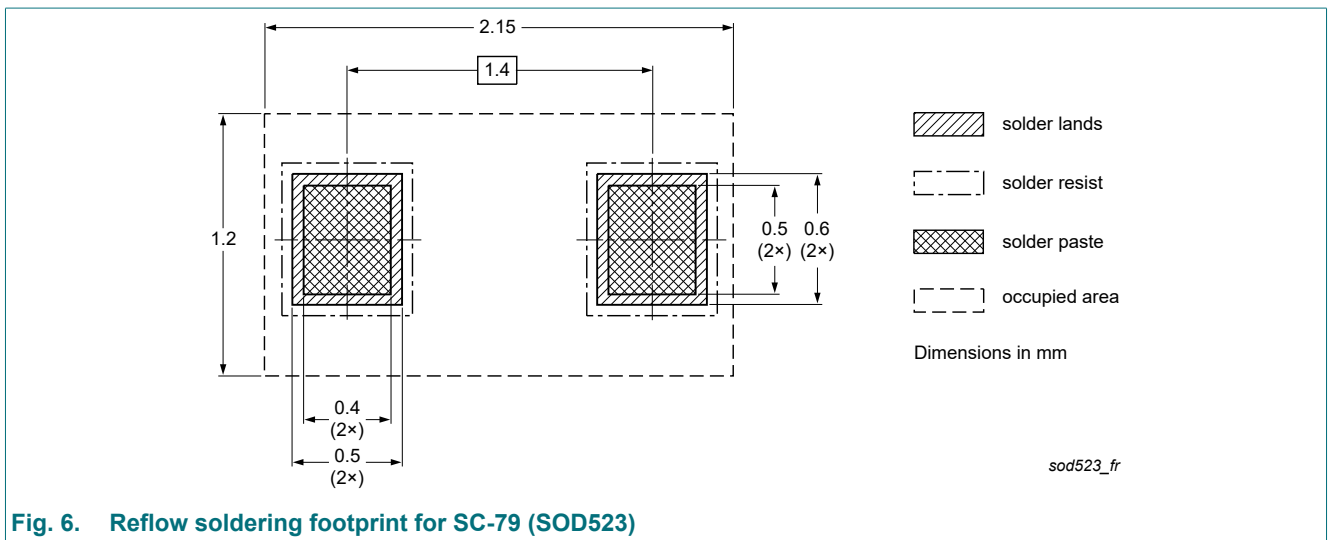


Fig. 6. Reflow soldering footprint for SC-79 (SOD523)

## 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"><li>• Data sheet separated into two data sheets</li><li>• Packing information: section removed</li><li>• Soldering: Figure 6: "Reflow soldering footprint for SOD523" updated</li><li>• Changed to AEC-Q101 qualified status in sections: "Limiting values", "Test information" and "Legal information"</li></ul>			
PMEG3005EB_PMEG3005EL v.1	20061129	Product data sheet	-	-

## 0.5 A very low VF MEGA Schottky barrier rectifier

## 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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