



# PMEG3010EB

1 A very low VF MEGA Schottky barrier rectifier

Rev. 2 — 15 March 2012

Product data sheet

## 1. Product profile

### 1.1 General description

Planar Maximum Efficiency General Application (MEGA) Schottky barrier rectifier with an integrated guard ring for stress protection, encapsulated in a SOD523 ultra small and flat lead Surface-Mounted Device (SMD) plastic package.

### 1.2 Features and benefits

- Forward current:  $I_F \leq 1$  A
- Reverse voltage:  $V_R \leq 30$  V
- Very low forward voltage
- AEC-Q101 qualified
- Ultra small and flat lead SMD plastic package

### 1.3 Applications

- Low voltage rectification
- High efficiency DC-to-DC conversion
- Switch mode power supply
- Reverse polarity protection
- Low power consumption applications



### 1.4 Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_F$	forward current	$T_{sp} \leq 55$ °C	-	-	1	A
$V_R$	reverse voltage		-	-	30	V
$V_F$	forward voltage	$I_F = 1$ A; pulsed; $t_p \leq 300$ $\mu$ s; $\delta \leq 0.02$ ; $T_{amb} = 25$ °C	-	610	680	mV

## 2. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode <sup>[1]</sup>	 <p>SOD523</p>	 <p>sym001</p>
2	A	anode		

[1] The marking bar indicates the cathode.



### 3. Ordering information

Table 3. Ordering information

Type number	Package		Version
	Name	Description	
PMEG3010EB	-	plastic surface-mounted package; 2 leads	SOD523

### 4. Marking

Table 4. Marking codes

Type number	Marking code
PMEG3010EB	KA

### 5. 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		-	30	V
$I_F$	forward current	$T_{sp} \leq 55\text{ °C}$	-	1	A
$I_{FRM}$	repetitive peak forward current	$t_p \leq 1\text{ ms}$ ; $\delta \leq 0.25$	-	3	A
$I_{FSM}$	non-repetitive peak forward current	$t_p = 8\text{ ms}$ ; $T_{j(\text{init})} = 25\text{ °C}$ ; square wave	-	5	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.

### 6. 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.

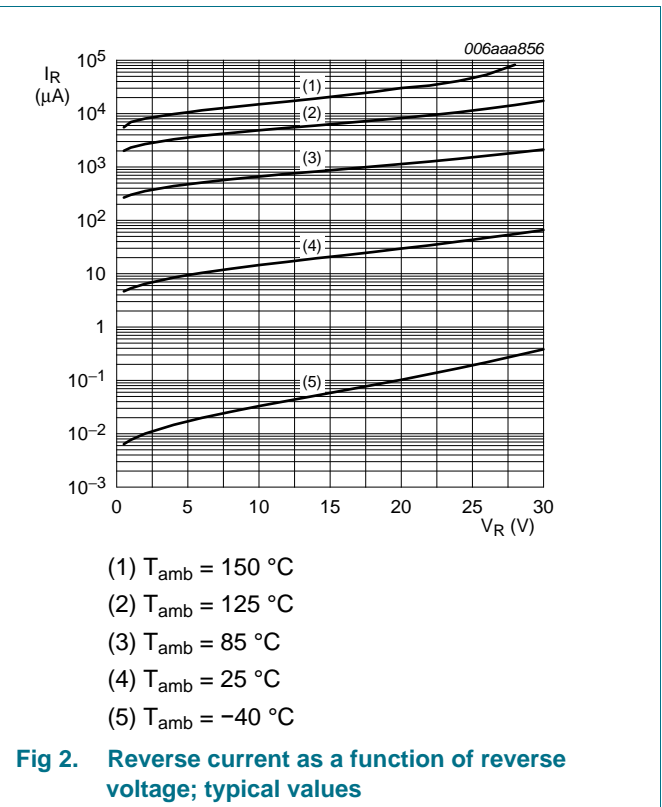
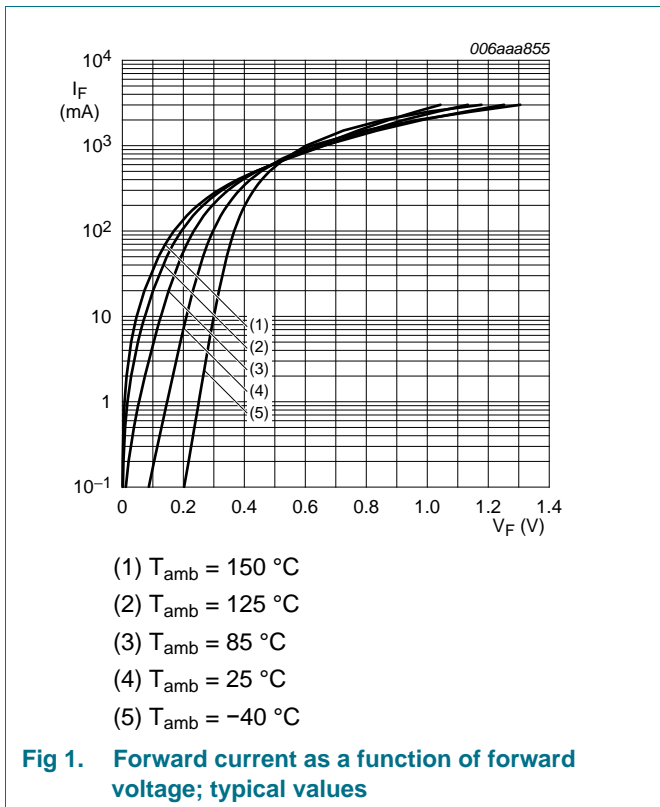
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

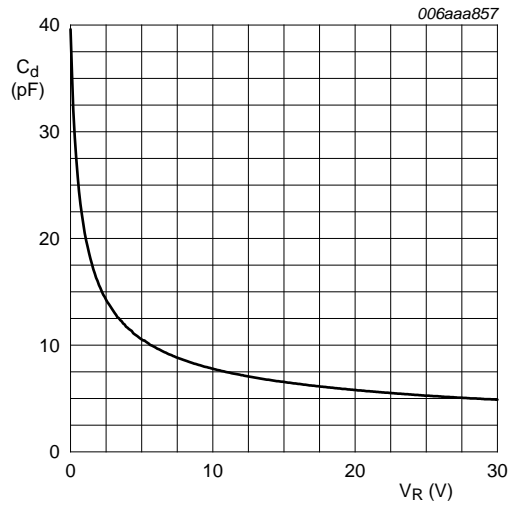
[3] Soldering point of cathode tab.

**7. Characteristics**

**Table 7. Characteristics**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_F$	forward voltage	$I_F = 0.1 \text{ mA}$ ; pulsed; $t_p \leq 300 \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	90	180	mV
		$I_F = 1 \text{ mA}$ ; pulsed; $t_p \leq 300 \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	150	200	mV
		$I_F = 10 \text{ mA}$ ; pulsed; $t_p \leq 300 \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	210	270	mV
		$I_F = 100 \text{ mA}$ ; pulsed; $t_p \leq 300 \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	295	360	mV
		$I_F = 500 \text{ mA}$ ; pulsed; $t_p \leq 300 \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	430	500	mV
		$I_F = 1 \text{ A}$ ; pulsed; $t_p \leq 300 \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	610	680	mV
$I_R$	reverse current	$V_R = 10 \text{ V}$ ; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	15	200	$\mu\text{A}$
		$V_R = 30 \text{ V}$ ; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	70	500	$\mu\text{A}$
$C_d$	diode capacitance	$V_R = 1 \text{ V}$ ; $f = 1 \text{ MHz}$ ; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	24	30	pF

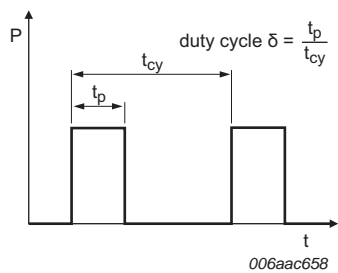




f = 1 MHz; T<sub>amb</sub> = 25 °C

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

## 8. Test information



**Fig 4. Duty cycle definition**

### 8.1 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.

## 9. Package outline

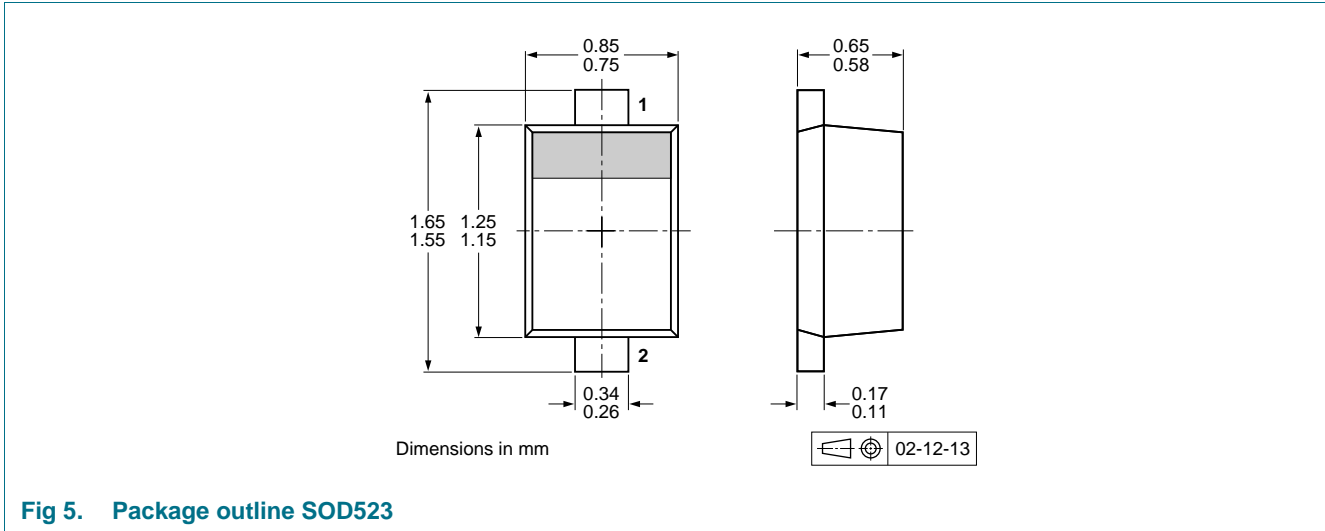


Fig 5. Package outline SOD523

## 10. Soldering

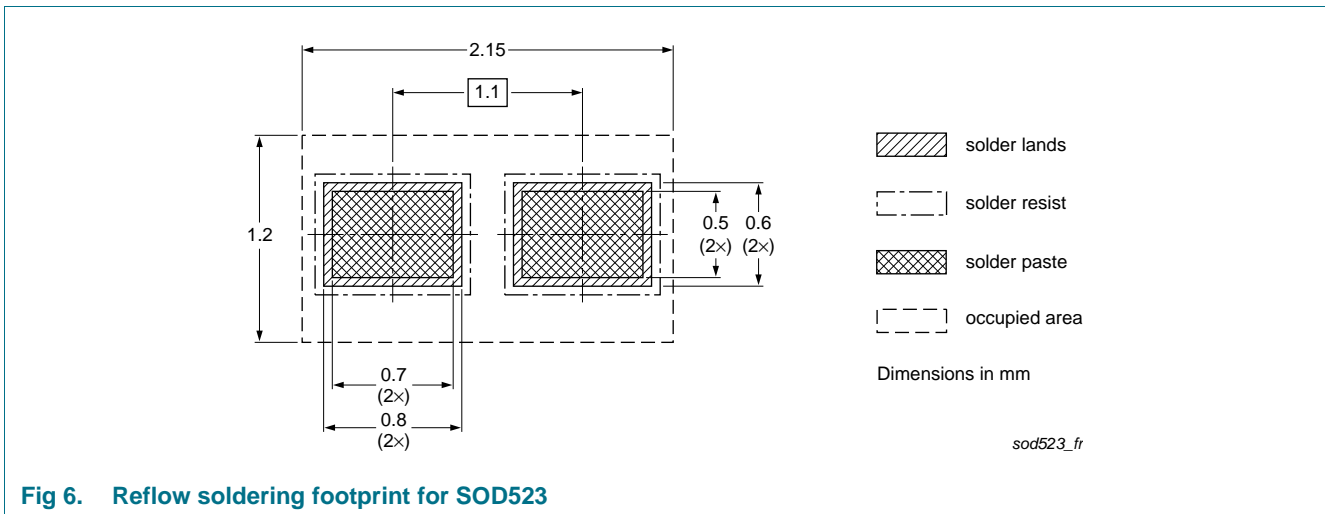


Fig 6. Reflow soldering footprint for SOD523

## 11. Revision history

Table 8. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PMEG3010EB v.2	20120315	Product data sheet	-	PMEG3010EB v.1
Modifications:	<ul style="list-style-type: none"><li>• <a href="#">1 "Product profile"</a> updated</li><li>• <a href="#">5 "Limiting values"</a>: <math>I_{FRM}</math> and <math>I_{FSM}</math> values corrected</li><li>• <a href="#">8 "Test information"</a> updated</li></ul>			
PMEG3010EB v.1	20061201	Product data sheet	-	-

## 12. Legal information

### 12.1 Data sheet status

Document status <sup>[1]</sup> [2]	Product status <sup>[3]</sup>	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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