

# PMEG6002EB; PMEG6002TV

0.2 A very low  $V_F$  MEGA Schottky barrier rectifiers

Rev. 01 — 24 November 2006

Product data sheet

## 1. Product profile

### 1.1 General description

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

Table 1. Product overview

Type number	Package		Configuration
	Nexperia	JEITA	
PMEG6002EB	SOD523	SC-79	single
PMEG6002TV	SOT666	-	dual isolated

### 1.2 Features

- Forward current:  $I_F \leq 0.2$  A
- Reverse voltage:  $V_R \leq 60$  V
- Very low forward voltage
- Ultra small and flat lead SMD plastic packages

### 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 2. Quick reference data

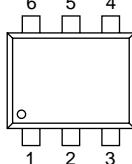
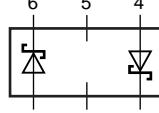
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per diode</b>						
$I_F$	forward current	$T_{amb} \leq 25$ °C	-	-	0.2	A
$V_R$	reverse voltage		-	-	60	V
$V_F$	forward voltage	$I_F = 200$ mA	[1]	-	540	600
					mV	

[1] Pulse test:  $t_p \leq 300$  µs;  $\delta \leq 0.02$ .

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## 2. Pinning information

Table 3. Pinning

Pin	Description	Simplified outline	Symbol
<b>SOD523</b>			
1	cathode		 sym001
2	anode		
<b>SOT666</b>			
1	anode (diode 1)		 006aaa440
2	not connected		
3	cathode (diode 2)		
4	anode (diode 2)		
5	not connected		
6	cathode (diode 1)		

[1] The marking bar indicates the cathode.

## 3. Ordering information

Table 4. Ordering information

Type number	Package		
	Name	Description	Version
PMEG6002EB	SC-79	plastic surface-mounted package; 2 leads	SOD523
PMEG6002TV	-	plastic surface-mounted package; 6 leads	SOT666

## 4. Marking

Table 5. Marking codes

Type number	Marking code
PMEG6002EB	B2
PMEG6002TV	1B

## 5. Limiting values

**Table 6. Limiting values**

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
<b>Per diode</b>					
$V_R$	reverse voltage		-	60	V
$I_F$	forward current	$T_{amb} \leq 25^\circ C$	-	0.2	A
$I_{FRM}$	repetitive peak forward current	$t_p \leq 1 \text{ ms}; \delta \leq 0.25$	-	2	A
$I_{FSM}$	non-repetitive peak forward current	square wave; $t_p = 8 \text{ ms}$	[1] -	2.5	A
$P_{tot}$	total power dissipation	$T_{amb} \leq 25^\circ C$			
	PMEG6002EB		[1] -	300	mW
	PMEG6002TV		[1] -	200	mW
			[2] -	300	mW
<b>Per device</b>					
$P_{tot}$	total power dissipation	$T_{amb} \leq 25^\circ C$			
	PMEG6002TV		[1] -	300	mW
			[2] -	400	mW
$T_j$	junction temperature		-	150	°C
$T_{amb}$	ambient temperature		-65	+150	°C
$T_{sig}$	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 cm<sup>2</sup>.

## 6. Thermal characteristics

**Table 7. Thermal characteristics**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per device</b>						
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air				
	PMEG6002EB		[1][2]	-	-	400
	PMEG6002TV		[1][2]	-	-	416
			[1][3]	-	-	318
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[4]			
	PMEG6002EB		-	-	75	K/W
	PMEG6002TV		-	-	195	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 cm<sup>2</sup>.

[4] Soldering point of cathode tab.

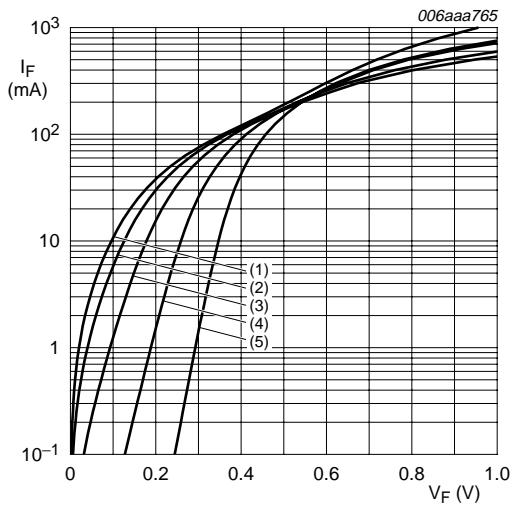
## 7. Characteristics

**Table 8. Characteristics**

$T_{amb} = 25^\circ C$  unless otherwise specified.

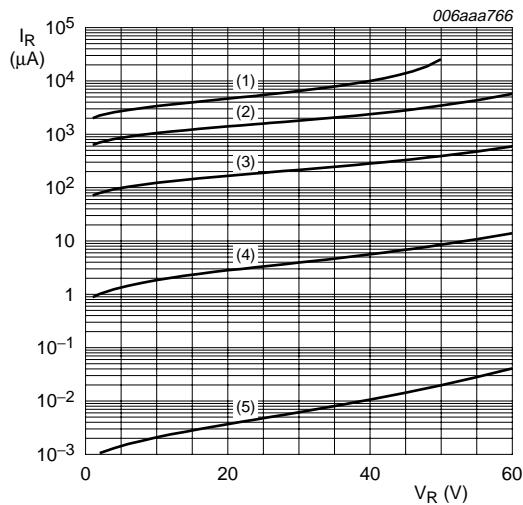
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per diode</b>						
$V_F$	forward voltage		[1]			
		$I_F = 0.1$ mA	-	130	170	mV
		$I_F = 1$ mA	-	190	230	mV
		$I_F = 10$ mA	-	260	300	mV
		$I_F = 100$ mA	-	420	470	mV
		$I_F = 200$ mA	-	540	600	mV
$I_R$	reverse current					
		$V_R = 10$ V	-	2	10	$\mu A$
		$V_R = 60$ V	-	20	100	$\mu A$
		$V_R = 10$ V; $T_{amb} = 100$ °C	-	310	-	$\mu A$
$C_d$	diode capacitance	$V_R = 1$ V; $f = 1$ MHz	-	14	20	pF

[1] Pulse test:  $t_p \leq 300$   $\mu s$ ;  $\delta \leq 0.02$ .



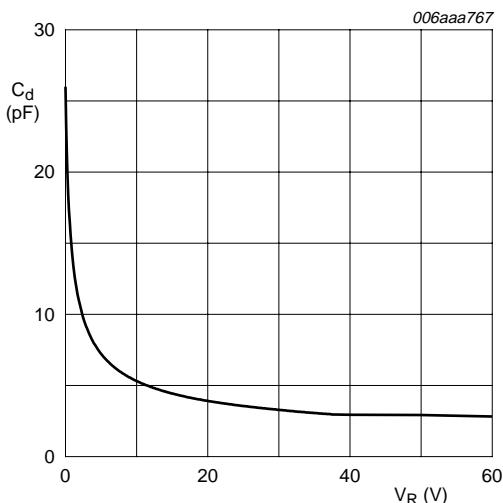
- (1)  $T_{amb} = 150 \text{ }^{\circ}\text{C}$
- (2)  $T_{amb} = 125 \text{ }^{\circ}\text{C}$
- (3)  $T_{amb} = 85 \text{ }^{\circ}\text{C}$
- (4)  $T_{amb} = 25 \text{ }^{\circ}\text{C}$
- (5)  $T_{amb} = -40 \text{ }^{\circ}\text{C}$

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



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

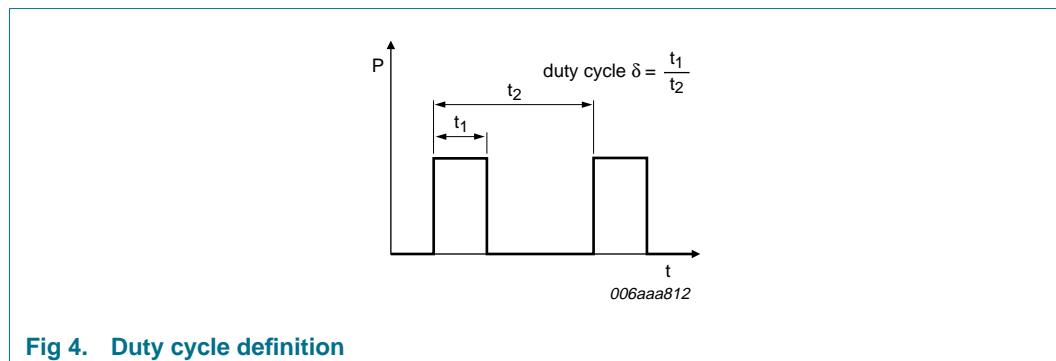
**Fig 2. Reverse current as a function of reverse voltage; typical values**



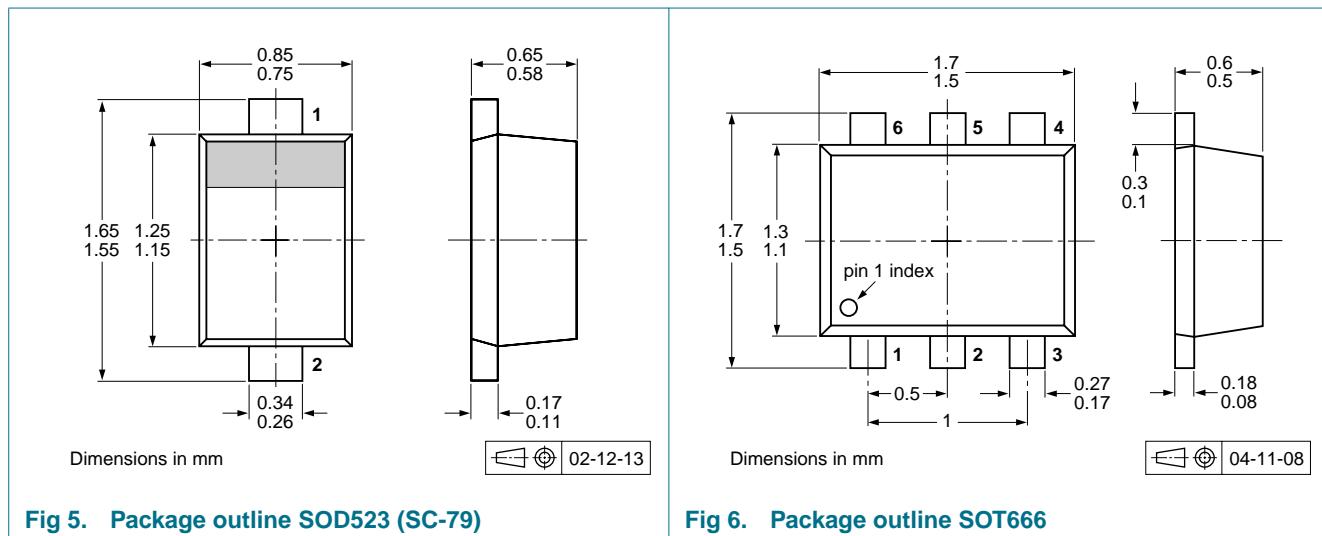
$f = 1 \text{ MHz}; T_{amb} = 25 \text{ }^{\circ}\text{C}$

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

## 8. Test information



## 9. Package outline



## 10. Packing information

Table 9. Packing methods

The indicated -xxx are the last three digits of the 12NC ordering code.<sup>[1]</sup>

Type number	Package	Description	Packing quantity			
			3000	4000	8000	10000
PMEG6002EB	SOD523	2 mm pitch, 8 mm tape and reel	-	-	-315	-
		4 mm pitch, 8 mm tape and reel	-115	-	-	-135
PMEG6002TV	SOT666	2 mm pitch, 8 mm tape and reel	-	-	-315	-
		4 mm pitch, 8 mm tape and reel	-	-115	-	-

[1] For further information and the availability of packing methods, see [Section 14](#).

## 11. Soldering

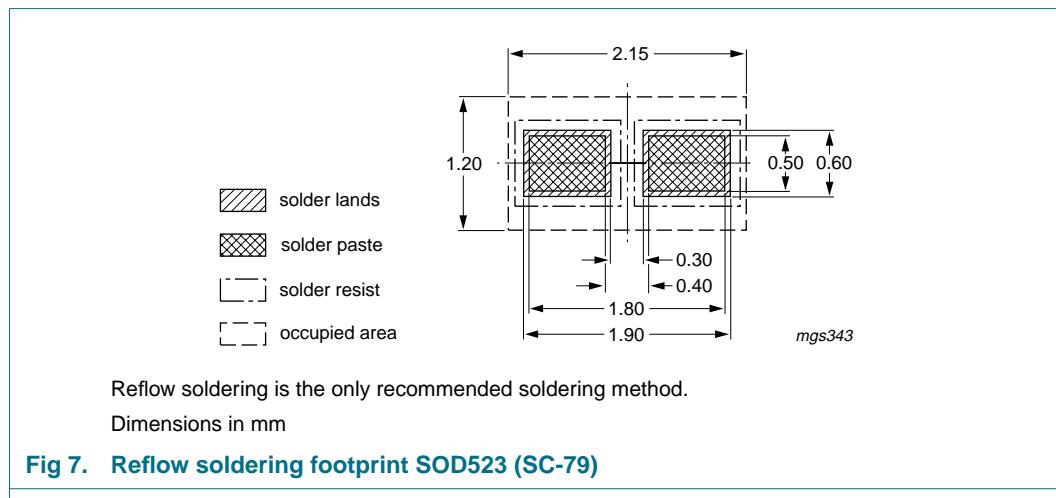
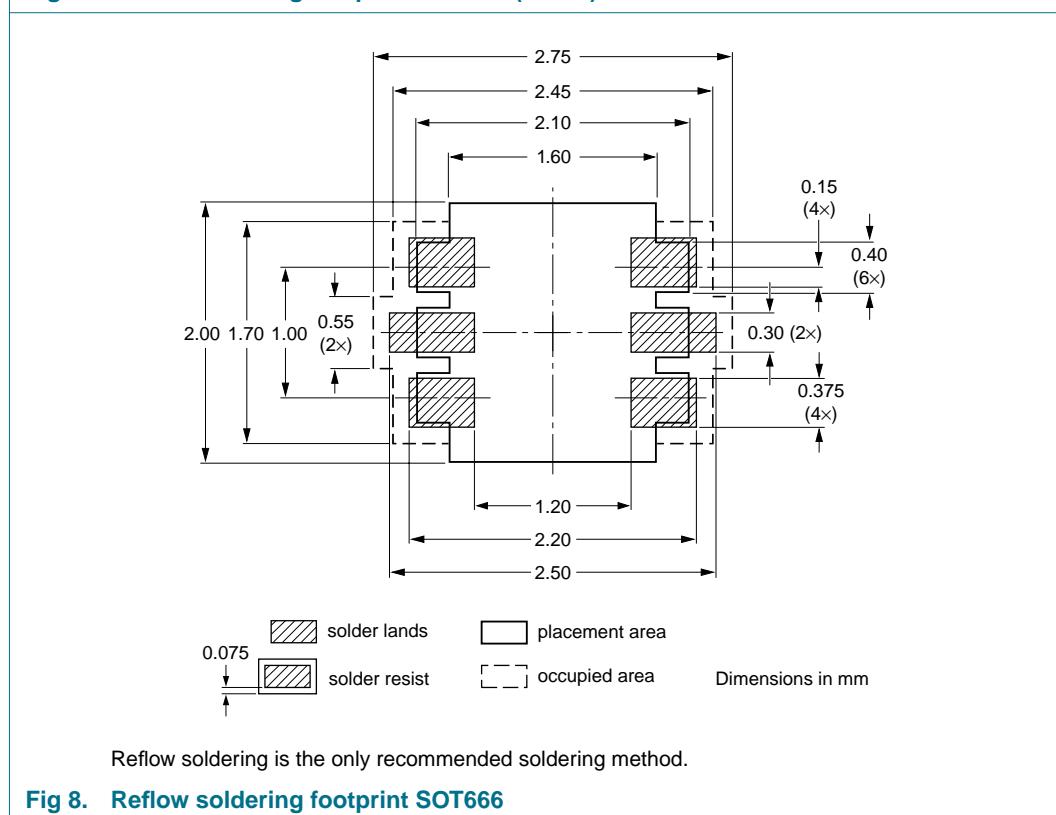


Fig 7. Reflow soldering footprint SOD523 (SC-79)

Dimensions in mm



Reflow soldering is the only recommended soldering method.

**Fig 8. Reflow soldering footprint SOT666**

## 12. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PMEG6002EB_PMEG6002TV_1	20061124	Product data sheet	-	-

## 13. Legal information

### 13.1 Data sheet status

Document status <sup>[1][2]</sup>	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.

[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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