

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
	NXP	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


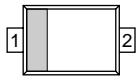
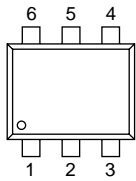
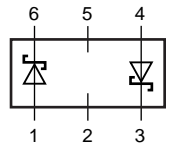
Table 2. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per diode						
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: $t_p \leq 300$ μ s; $\delta \leq 0.02$.

2. Pinning information

Table 3. Pinning

Pin	Description	Simplified outline	Symbol
SOD523			
1	cathode	[1]	 sym001
2	anode		
SOT666			
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	
Per diode						
V_R	reverse voltage		-	60	V	
I_F	forward current	$T_{amb} \leq 25\text{ °C}$	-	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	$T_{amb} \leq 25\text{ °C}$				
			PMEG6002EB	[1] -	300	mW
			PMEG6002TV	[1] -	200	mW
				[2] -	300	mW
Per device						
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ °C}$				
			PMEG6002TV	[1] -	300	mW
				[2] -	400	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 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 cm².

6. Thermal characteristics

Table 7. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit		
Per device								
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air						
			PMEG6002EB	[1][2]	-	-	400	K/W
			PMEG6002TV	[1][2]	-	-	416	K/W
			[1][3]	-	-	318	K/W	
$R_{th(j-sp)}$	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 cm².

[4] Soldering point of cathode tab.

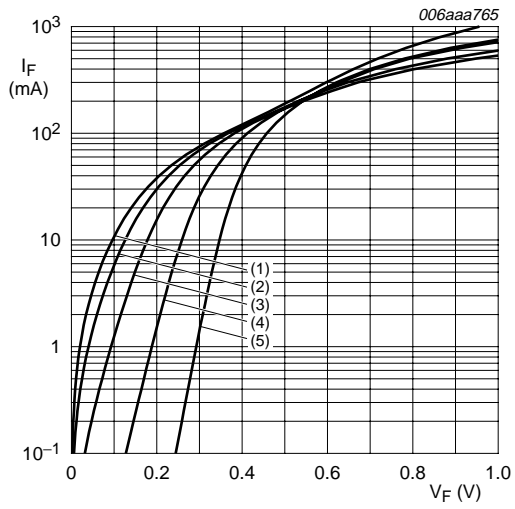
7. Characteristics

Table 8. Characteristics

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

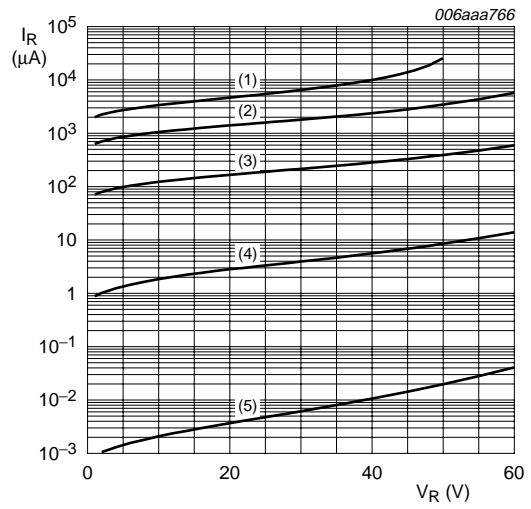
Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
Per diode							
V_F	forward voltage		[1]				
		$I_F = 0.1\text{ mA}$		-	130	170	mV
		$I_F = 1\text{ mA}$		-	190	230	mV
		$I_F = 10\text{ mA}$		-	260	300	mV
		$I_F = 100\text{ mA}$		-	420	470	mV
		$I_F = 200\text{ mA}$		-	540	600	mV
I_R	reverse current	$V_R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

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



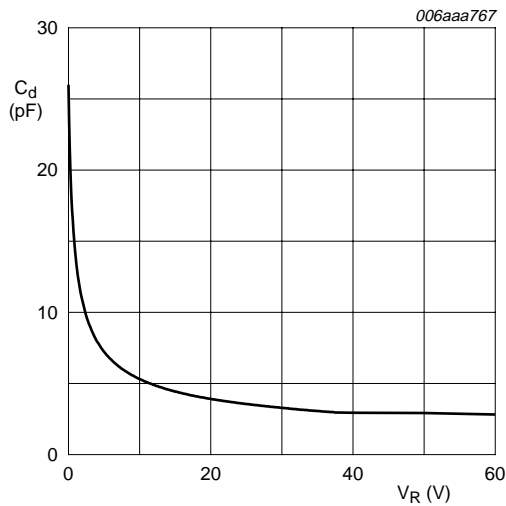
- (1) $T_{amb} = 150\text{ °C}$
- (2) $T_{amb} = 125\text{ °C}$
- (3) $T_{amb} = 85\text{ °C}$
- (4) $T_{amb} = 25\text{ °C}$
- (5) $T_{amb} = -40\text{ °C}$

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

8. Test information

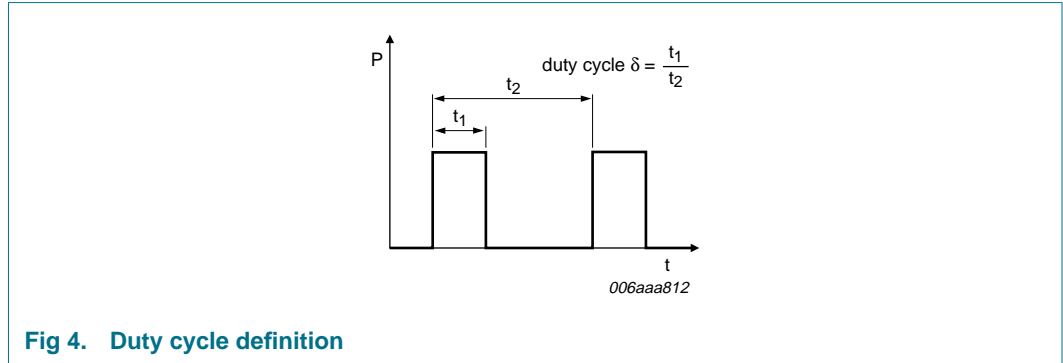


Fig 4. Duty cycle definition

9. Package outline

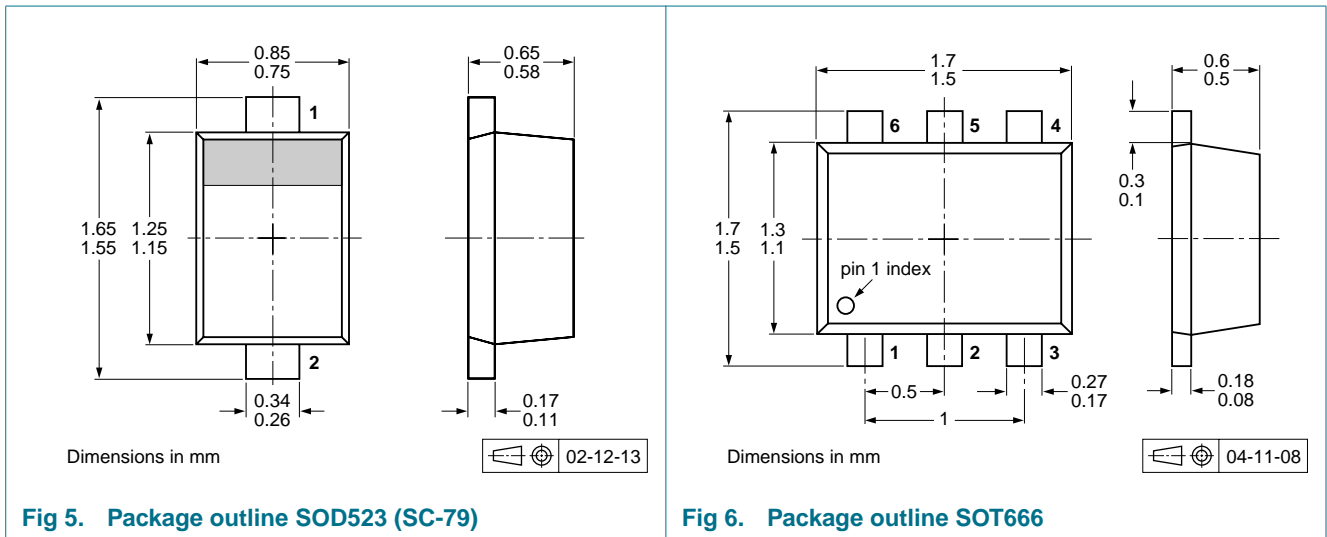


Fig 5. Package outline SOD523 (SC-79)

Fig 6. Package outline SOT666

10. Packing information

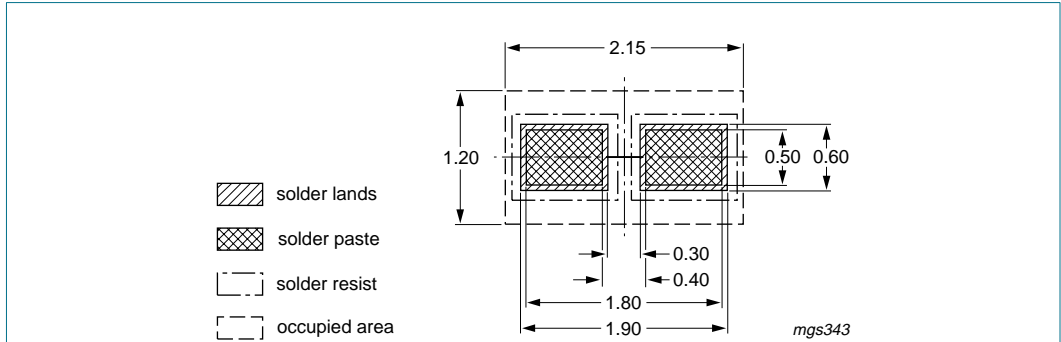
Table 9. Packing methods

The indicated -xxx are the last three digits of the 12NC ordering code.^[1]

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](#).

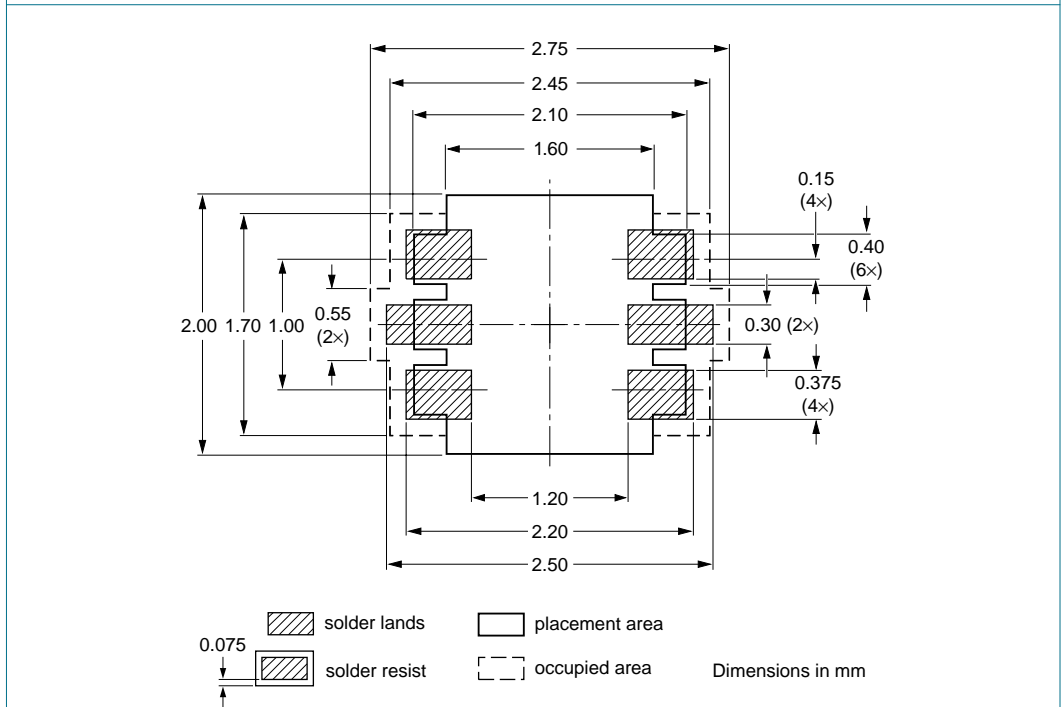
11. Soldering



Reflow soldering is the only recommended soldering method.

Dimensions in mm

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



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 ^{[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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Date of release: 24 November 2006

Document identifier: PMEG6002EB_PMEG6002TV_1