

# PMEG2010AEJ

20 V, 1 A very low  $V_F$  MEGA Schottky barrier rectifier in SOD323F package

Rev. 02 — 14 October 2005

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 SOD323F (SC-90) very small and flat lead Surface Mounted Device (SMD) plastic package.

### 1.2 Features

- Forward current:  $\leq 1$  A
- Reverse voltage:  $\leq 20$  V
- Very low forward voltage
- Very small and flat lead SMD plastic package

### 1.3 Applications

- Low voltage rectification
- High efficiency DC-to-DC conversion
- Switch mode power supply
- Inverse 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		-	-	20	V
$V_F$	forward voltage	$I_F = 1000$ mA	[1] -	480	550	mV

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

## 2. Pinning information

**Table 2: Pinning**

Pin	Description	Simplified outline	Symbol
1	cathode		 sym001
2	anode		

[1] The marking bar indicates the cathode.

## 3. Ordering information

**Table 3: Ordering information**

Type number	Package		
	Name	Description	Version
PMEG2010AEJ	SC-90	plastic surface mounted package; 2 leads	SOD323F

## 4. Marking

**Table 4: Marking codes**

Type number	Marking code
PMEG2010AEJ	EM

## 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		-	20	V	
$I_F$	forward current	$T_{sp} \leq 55\text{ }^\circ\text{C}$	-	1	A	
$I_{FRM}$	repetitive peak forward current	$t_p \leq 1\text{ ms}; \delta \leq 0.25$	-	5.5	A	
$I_{FSM}$	non-repetitive peak forward current	square wave; $t_p = 8\text{ ms}$	-	10	A	
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ }^\circ\text{C}$	[1]	-	360	mW
			[2]	-	830	mW
$T_j$	junction temperature		-	150	$^\circ\text{C}$	
$T_{amb}$	ambient temperature		-65	+150	$^\circ\text{C}$	
$T_{stg}$	storage temperature		-65	+150	$^\circ\text{C}$	

[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 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]	-	-	350	K/W
			[1] [3]	-	-	150	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[4]	-	-	55	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. Nomograms for determining the reverse power losses  $P_R$  and  $I_{F(AV)}$  rating are available on request.
- [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] Solder point of cathode tab.

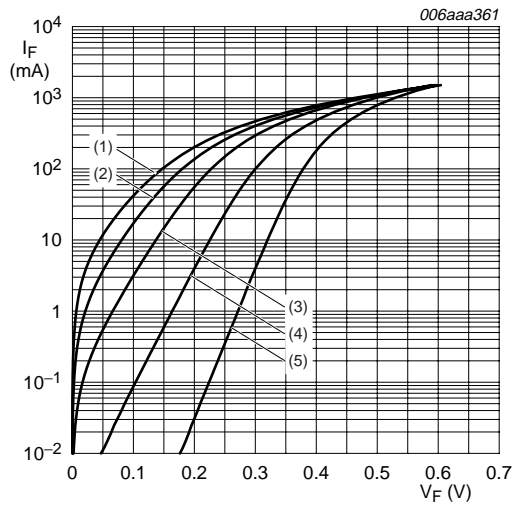
## 7. Characteristics

**Table 7: Characteristics**

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

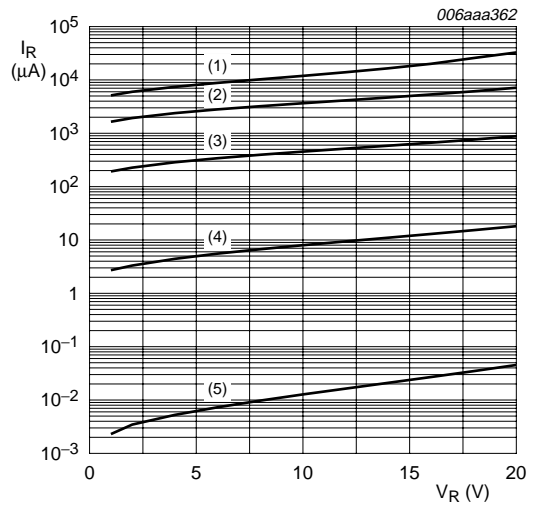
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_F$	forward voltage		[1]			
		$I_F = 10\text{ mA}$	-	240	270	mV
		$I_F = 100\text{ mA}$	-	300	350	mV
		$I_F = 500\text{ mA}$	-	400	460	mV
		$I_F = 1000\text{ mA}$	-	480	550	mV
$I_R$	reverse current	$V_R = 5\text{ V}$	-	5	10	$\mu\text{A}$
		$V_R = 8\text{ V}$	-	7	20	$\mu\text{A}$
		$V_R = 10\text{ V}$	-	8	30	$\mu\text{A}$
		$V_R = 15\text{ V}$	-	10	50	$\mu\text{A}$
		$V_R = 20\text{ V}$	-	15	70	$\mu\text{A}$
$C_d$	diode capacitance	$V_R = 1\text{ V}; f = 1\text{ MHz}$	-	40	50	pF

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



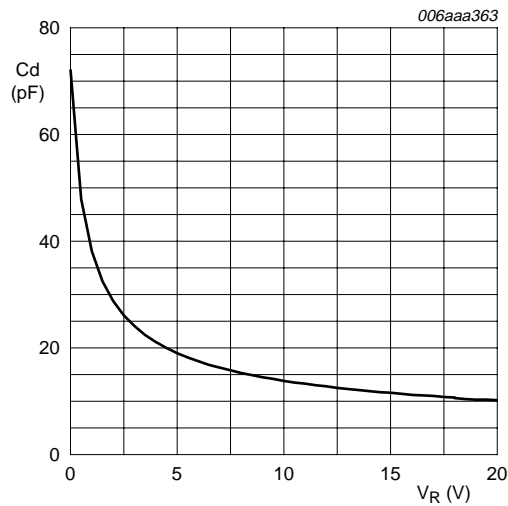
- (1)  $T_{amb} = 150\text{ }^{\circ}\text{C}$
- (2)  $T_{amb} = 125\text{ }^{\circ}\text{C}$
- (3)  $T_{amb} = 85\text{ }^{\circ}\text{C}$
- (4)  $T_{amb} = 25\text{ }^{\circ}\text{C}$
- (5)  $T_{amb} = -40\text{ }^{\circ}\text{C}$

**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**



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

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

## 8. Package outline

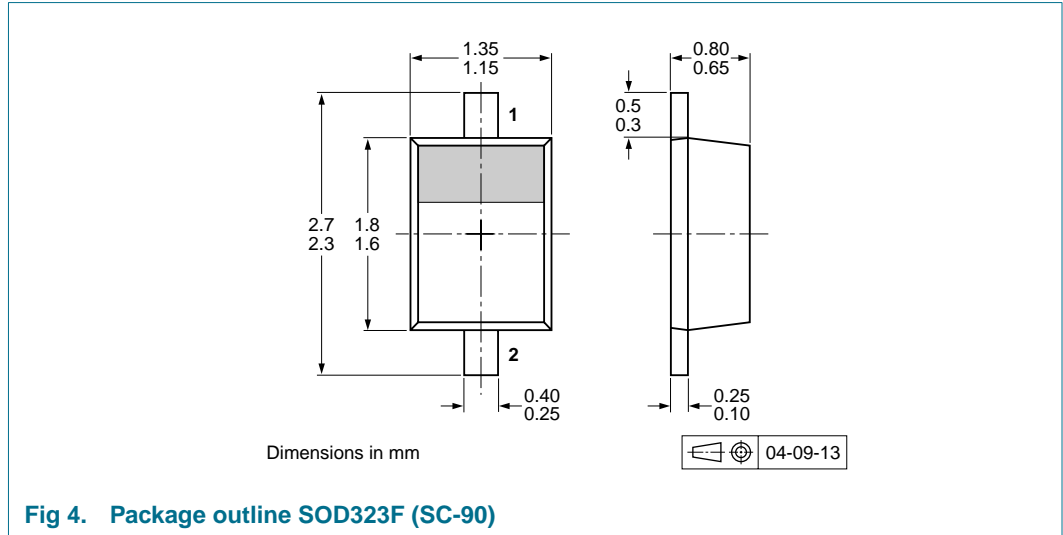


Fig 4. Package outline SOD323F (SC-90)

## 9. Packing information

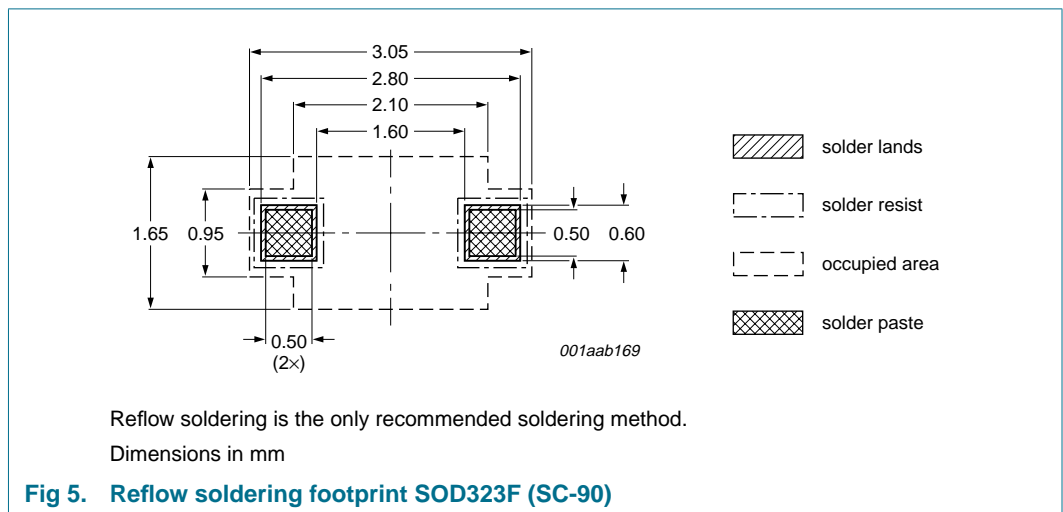
**Table 8: Packing methods**

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

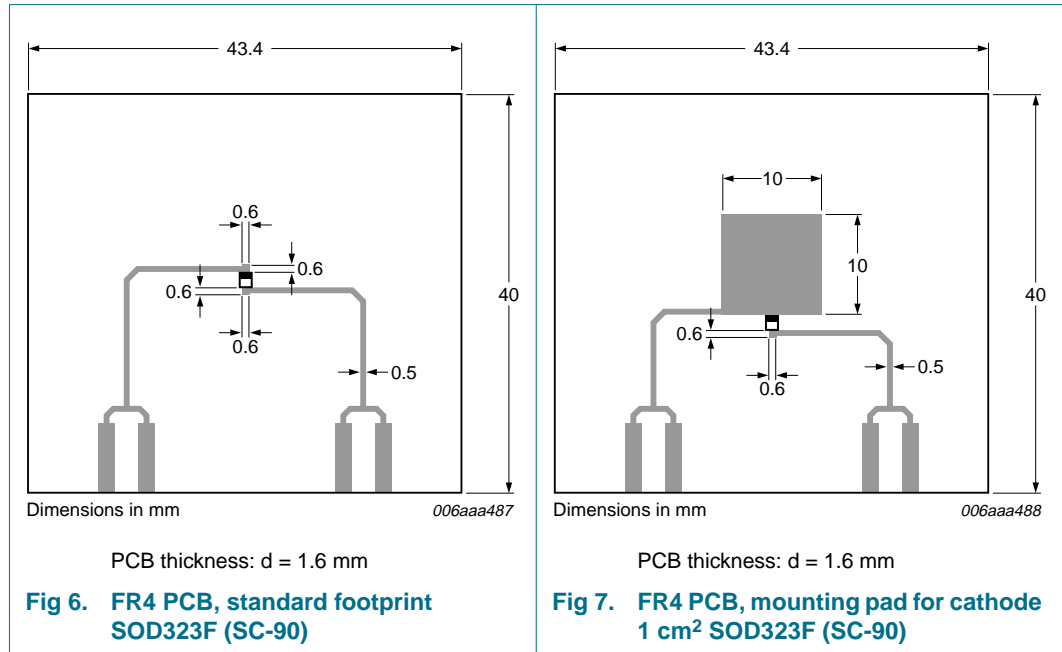
Type number	Package	Description	Packing quantity	
			3000	10000
PMEG2010AEJ	SOD323F	4 mm pitch, 8 mm tape and reel	-115	-135

[1] For further information and the availability of packing methods, see [Section 17](#).

## 10. Soldering



## 11. Mounting



## 12. Revision history

**Table 9: Revision history**

Document ID	Release date	Data sheet status	Change notice	Doc. number	Supersedes
PMEG2010AEJ_2	20051014	Product data sheet	-	-	PMEG2010AEJ_1
Modifications:					
<ul style="list-style-type: none"> <li>• <a href="#">Section 1.1 "General description"</a>: amended</li> <li>• <a href="#">Section 1.2 "Features"</a>: amended</li> <li>• <a href="#">Section 1.3 "Applications"</a>: amended</li> <li>• <a href="#">Table 5 "Limiting values"</a>: <math>I_{FSM}</math> non-repetitive peak forward current condition amended</li> <li>• <a href="#">Table 5 "Limiting values"</a>: typing error for value <math>P_{tot}</math> total power dissipation corrected</li> <li>• <a href="#">Table 6 "Thermal characteristics"</a>: <a href="#">Table note 1</a> amended</li> <li>• <a href="#">Table 6: Table note 4</a> added to <math>R_{th(j-sp)}</math> thermal resistance from junction to solder point</li> <li>• <a href="#">Figure 4 "Package outline SOD323F (SC-90)"</a>: superseded by minimized package outlines</li> <li>• <a href="#">Table 8 "Packing methods"</a>: table description amended</li> <li>• <a href="#">Section 11 "Mounting"</a>: added</li> <li>• <a href="#">Section 16 "Trademarks"</a>: added</li> </ul>					
PMEG2010AEJ_1	20050302	Product data sheet	-	9397 750 14595	-

## 13. Data sheet status

Level	Data sheet status <sup>[1]</sup>	Product status <sup>[2] [3]</sup>	Definition
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
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[3] For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

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