

# PMEG4010CEH; PMEG4010CEJ

1 A very low  $V_F$  MEGA Schottky barrier rectifiers

Rev. 02 — 22 March 2007

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 small and flat lead Surface-Mounted Device (SMD) plastic packages.

Table 1. Product overview

Type number	Package		Configuration
	Nexperia	JEITA	
PMEG4010CEH	SOD123F	-	single
PMEG4010CEJ	SOD323F	SC-90	single

### 1.2 Features

- Forward current:  $I_F \leq 1$  A
- Reverse voltage:  $V_R \leq 40$  V
- Very low forward voltage
- 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

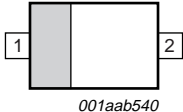
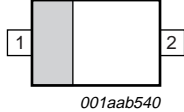
Table 2. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_F$	forward current	$T_{sp} \leq 55$ °C	-	-	1	A
$V_R$	reverse voltage		-	-	40	V
$V_F$	forward voltage	$I_F = 1$ A	[1] -	490	570	mV

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

## 2. Pinning information

Table 3. Pinning

Pin	Description	Simplified outline	Symbol
1	cathode	[1]	1  2
2	anode		<i>sym001</i>

[1] The marking bar indicates the cathode.

## 3. Ordering information

Table 4. Ordering information

Type number	Package		
	Name	Description	Version
PMEG4010CEH	-	plastic surface-mounted package; 2 leads	SOD123F
PMEG4010CEJ	SC-90	plastic surface-mounted package; 2 leads	SOD323F

## 4. Marking

Table 5. Marking codes

Type number	Marking code
PMEG4010CEH	C9
PMEG4010CEJ	EP

## 5. Limiting values

**Table 6. Limiting values**

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

Symbol	Parameter	Conditions	Min	Max	Unit		
$V_R$	reverse voltage		-	40	V		
$I_F$	forward current	$T_{sp} \leq 55\text{ °C}$	-	1	A		
$I_{FRM}$	repetitive peak forward current	$t_p \leq 1\text{ ms};$ $\delta \leq 0.25$	-	7	A		
$I_{FSM}$	non-repetitive peak forward current	square wave; $t_p = 8\text{ ms}$					
			PMEG4010CEH	-	9	A	
			PMEG4010CEJ	-	10	A	
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$					
			PMEG4010CEH	[1]	-	375	mW
				[2]	-	830	mW
			PMEG4010CEJ	[1]	-	350	mW
				[2]	-	830	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 cm<sup>2</sup>.

## 6. Thermal characteristics

**Table 7. Thermal characteristics**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit		
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]					
			PMEG4010CEH	[2]	-	-	330	K/W
				[3]	-	-	150	K/W
			PMEG4010CEJ	[2]	-	-	350	K/W
				[3]	-	-	150	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[4]					
			PMEG4010CEH	-	-	60	K/W	
			PMEG4010CEJ	-	-	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.

[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.

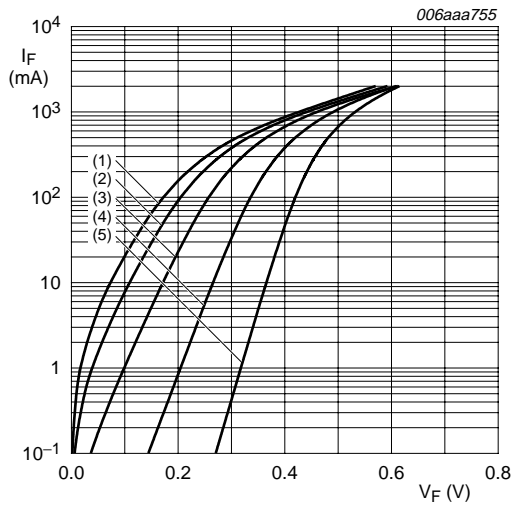
## 7. Characteristics

**Table 8. Characteristics**

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

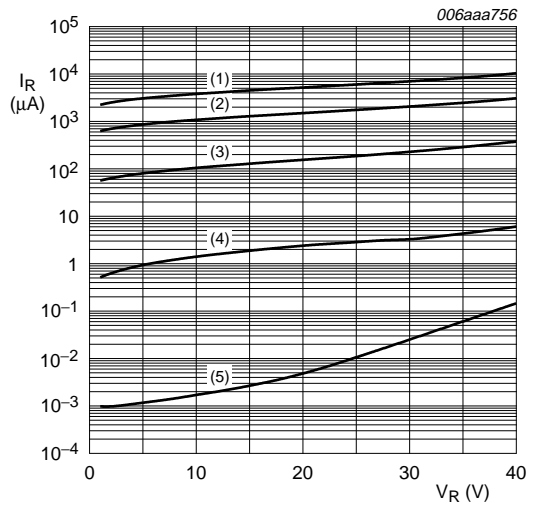
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_F$	forward voltage		[1]			
		$I_F = 1\text{ mA}$	-	210	240	mV
		$I_F = 10\text{ mA}$	-	270	310	mV
		$I_F = 100\text{ mA}$	-	340	390	mV
		$I_F = 500\text{ mA}$	-	420	490	mV
		$I_F = 700\text{ mA}$	-	450	520	mV
		$I_F = 1\text{ A}$	-	490	570	mV
$I_R$	reverse current	$V_R = 5\text{ V}$	-	0.8	-	$\mu\text{A}$
		$V_R = 10\text{ V}$	-	1.1	-	$\mu\text{A}$
		$V_R = 40\text{ V}$	-	6	50	$\mu\text{A}$
$C_d$	diode capacitance	$V_R = 1\text{ V}; f = 1\text{ MHz}$	-	69	77	pF

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



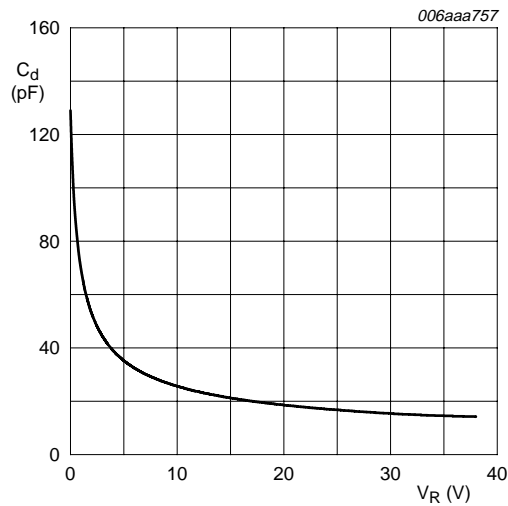
- (1)  $T_{amb} = 150\text{ °C}$
- (2)  $T_{amb} = 125\text{ °C}$
- (3)  $T_{amb} = 85\text{ °C}$
- (4)  $T_{amb} = 25\text{ °C}$
- (5)  $T_{amb} = -40\text{ °C}$

**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)  $T_{amb} = -40\text{ °C}$

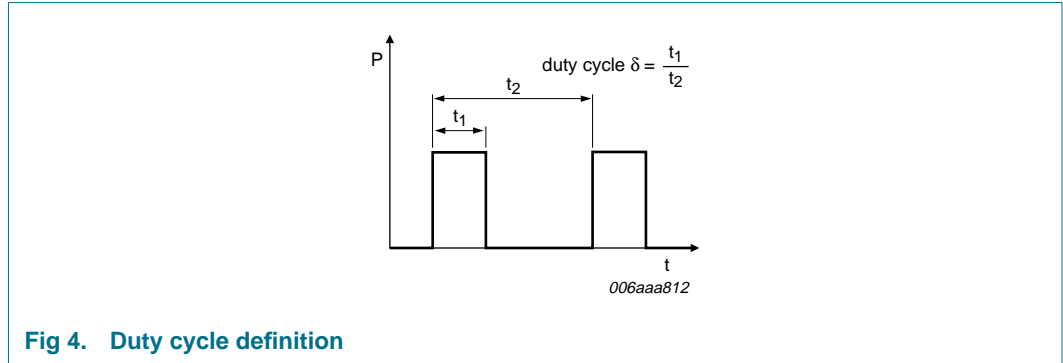
**Fig 2. Reverse current as a function of reverse voltage; typical values**



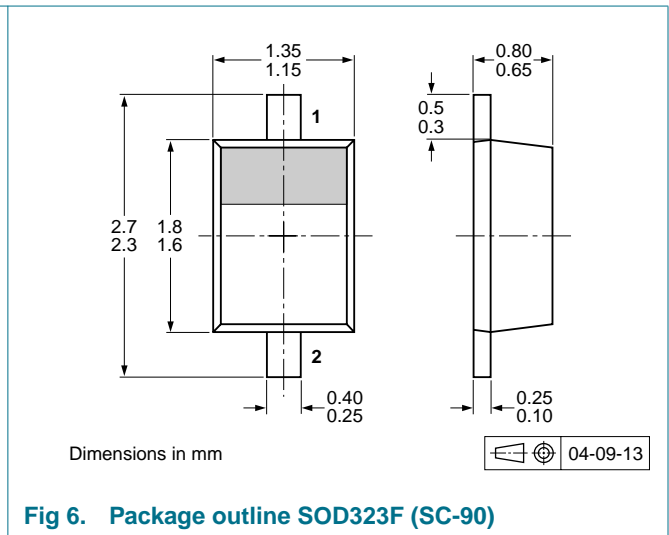
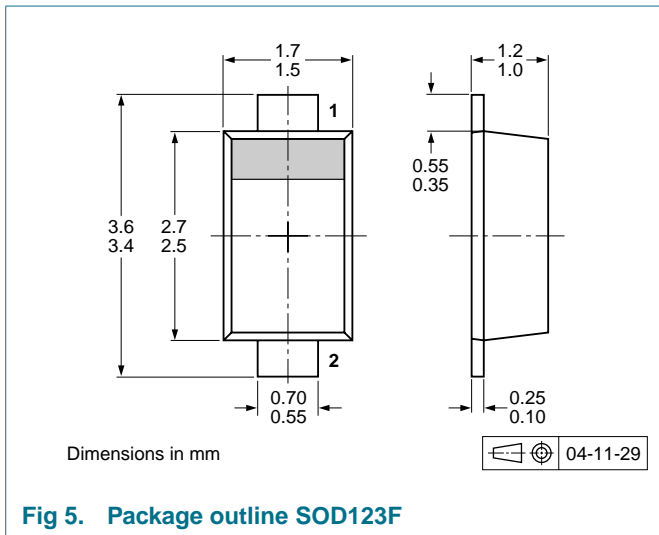
$f = 1\text{ MHz}; T_{amb} = 25\text{ °C}$

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

## 8. Test information



## 9. Package outline



## 10. Packing information

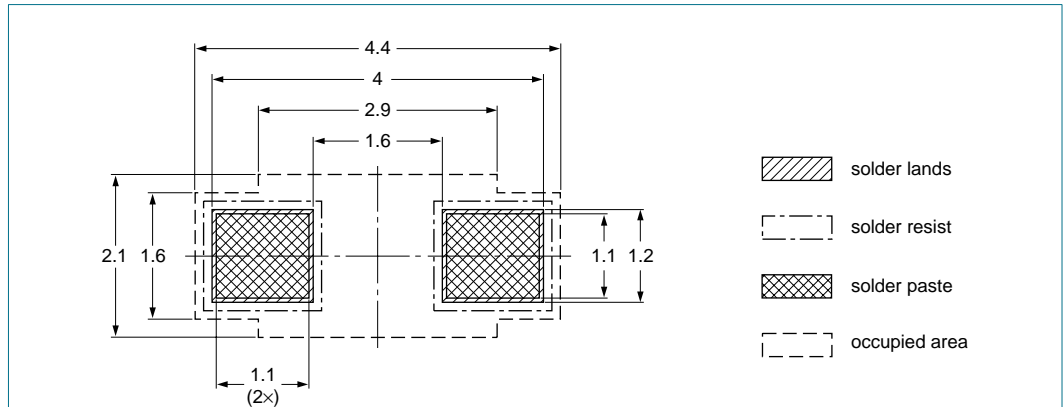
**Table 9. Packing methods**

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

Type number	Package	Description	Packing quantity	
			3000	10000
PMEG4010CEH	SOD123F	4 mm pitch, 8 mm tape and reel	-115	-135
PMEG4010CEJ	SOD323F			

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

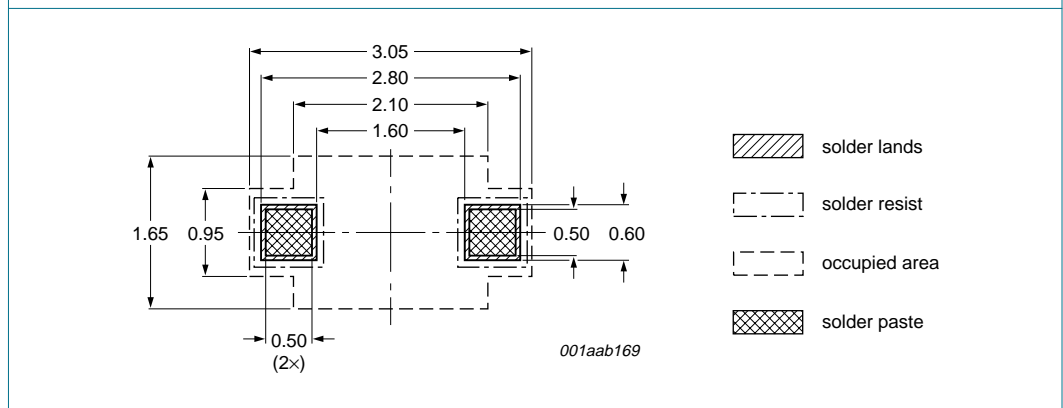
## 11. Soldering



Reflow soldering is the only recommended soldering method.

Dimensions in mm

**Fig 7. Reflow soldering footprint SOD123F**



Reflow soldering is the only recommended soldering method.

Dimensions in mm

**Fig 8. Reflow soldering footprint SOD323F (SC-90)**

## 12. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PMEG4010CEH_PMEG4010CEJ_2	20070322	Product data sheet	-	PMEG4010CEJ_1
Modifications:				
		<ul style="list-style-type: none"> <li>The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.</li> <li>Legal texts have been adapted to the new company name where appropriate.</li> <li>Type number PMEG4010CEH added</li> <li><a href="#">Section 1.1 "General description"</a>: amended</li> <li><a href="#">Table 1 "Product overview"</a>: added</li> <li><a href="#">Table 7 "Thermal characteristics"</a>: <a href="#">Table note 1</a> amended</li> <li><a href="#">Section 8 "Test information"</a>: added</li> </ul>		
PMEG4010CEJ_1	20060413	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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