

# PMEG2010AEH; PMEG2010AET

1 A very low  $V_F$  MEGA Schottky barrier rectifiers

Rev. 03 — 28 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 Surface-Mounted Device (SMD) plastic packages.

Table 1. Product overview

Type number	Package		Configuration
	Nexperia	JEITA	
PMEG2010AEH	SOD123F	-	single
PMEG2010AET	SOT23	-	single

### 1.2 Features

- Forward current:  $I_F \leq 1$  A
- Reverse voltage:  $V_R \leq 20$  V
- Very low forward voltage
- Small 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



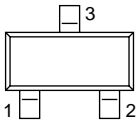
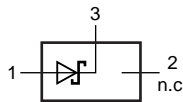
Table 2. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_F$	forward current	$T_{sp} \leq 55$ °C	-	-	1	A
$V_R$	reverse voltage		-	-	20	V
$V_F$	forward voltage	$I_F = 1$ A	[1] -	380	430	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
<b>SOD123F</b>			
1	cathode	[1]	 sym001
2	anode		
<b>SOT23</b>			
1	anode		 006aaa436
2	not connected		
3	cathode		

[1] The marking bar indicates the cathode.

## 3. Ordering information

Table 4. Ordering information

Type number	Package		
	Name	Description	Version
PMEG2010AEH	-	plastic surface-mounted package; 2 leads	SOD123F
PMEG2010AET	-	plastic surface-mounted package; 3 leads	SOT23

## 4. Marking

Table 5. Marking codes

Type number	Marking code <sup>[1]</sup>
PMEG2010AEH	AF
PMEG2010AET	*AX

[1] \* = -: made in Hong Kong  
 \* = p: made in Hong Kong  
 \* = t: made in Malaysia  
 \* = W: made in China

## 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		-	20	V		
$I_F$	forward current	$T_{sp} \leq 55\text{ °C}$	-	1	A		
$I_{FRM}$	repetitive peak forward current	$t_p \leq 1\text{ ms};$ $\delta \leq 0.25$					
			PMEG2010AEH	-	7	A	
			PMEG2010AET	-	6	A	
$I_{FSM}$	non-repetitive peak forward current	square wave; $t_p = 8\text{ ms}$	-	9	A		
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$					
			PMEG2010AEH	[1]	-	375	mW
				[2]	-	830	mW
			PMEG2010AET	[1]	-	280	mW
				[2]	-	420	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]					
			PMEG2010AEH	[2]	-	-	330	K/W
				[3]	-	-	150	K/W
			PMEG2010AET	[2]	-	-	440	K/W
				[3]	-	-	300	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[4]					
			PMEG2010AEH	-	-	60	K/W	
			PMEG2010AET	-	-	120	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.

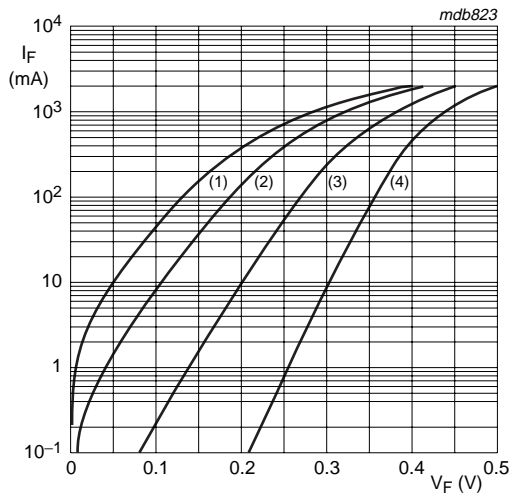
## 7. Characteristics

**Table 8. Characteristics**

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

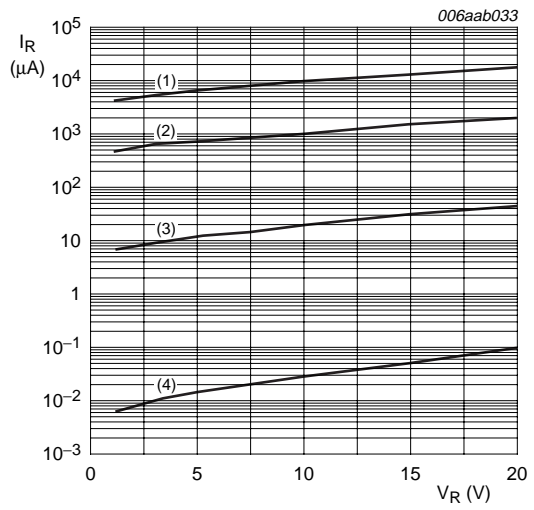
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_F$	forward voltage		[1]			
		$I_F = 10\text{ mA}$	-	200	220	mV
		$I_F = 100\text{ mA}$	-	265	290	mV
		$I_F = 1\text{ A}$	-	380	430	mV
$I_R$	reverse current	$V_R = 5\text{ V}$	-	15	50	$\mu\text{A}$
		$V_R = 10\text{ V}$	-	20	80	$\mu\text{A}$
		$V_R = 20\text{ V}$	-	50	200	$\mu\text{A}$
$C_d$	diode capacitance	$V_R = 5\text{ V}; f = 1\text{ MHz}$	-	55	70	pF

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



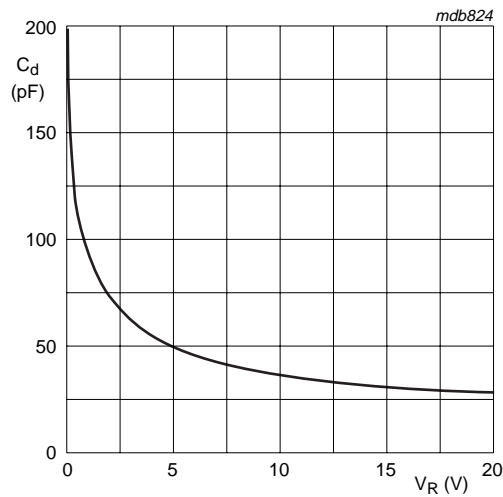
- (1)  $T_{amb} = 125\text{ °C}$
- (2)  $T_{amb} = 85\text{ °C}$
- (3)  $T_{amb} = 25\text{ °C}$
- (4)  $T_{amb} = -40\text{ °C}$

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



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

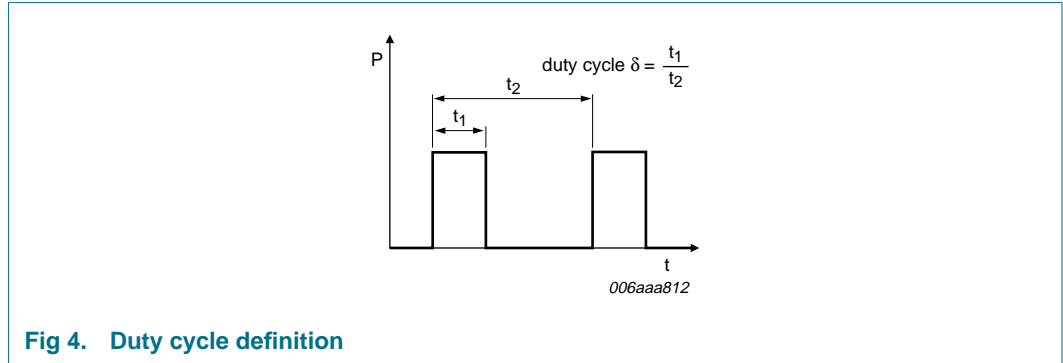
**Fig 2. Reverse current as a function of reverse voltage; typical values**



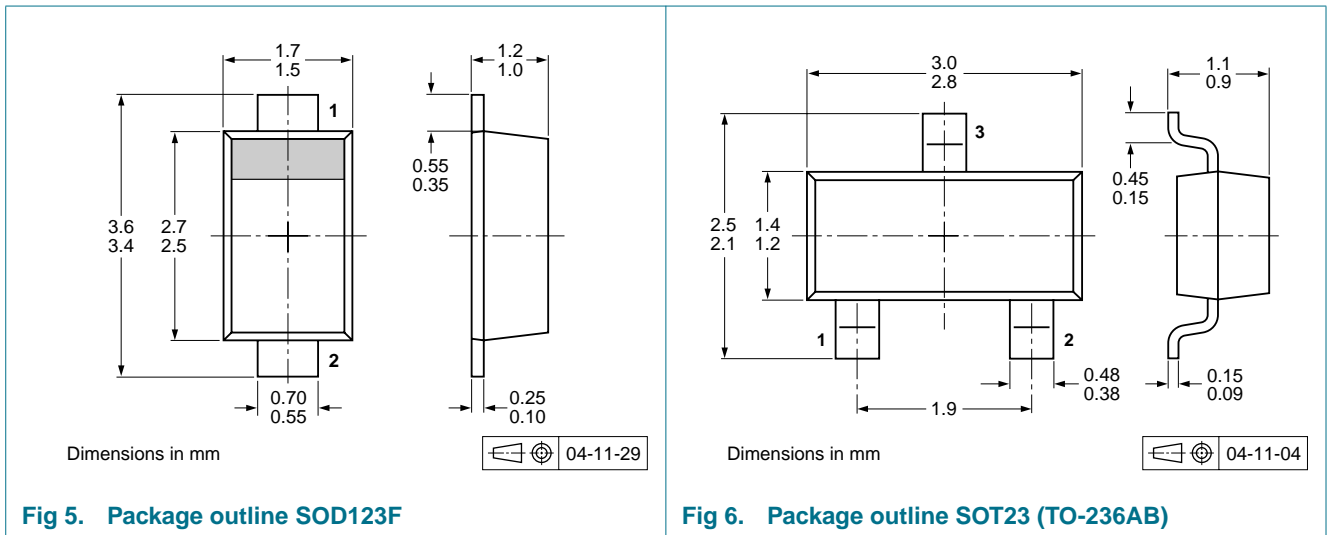
$f = 1\text{ MHz}; T_{amb} = 25\text{ °C}$

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

## 8. Test information



## 9. Package outline



## 10. Packing information

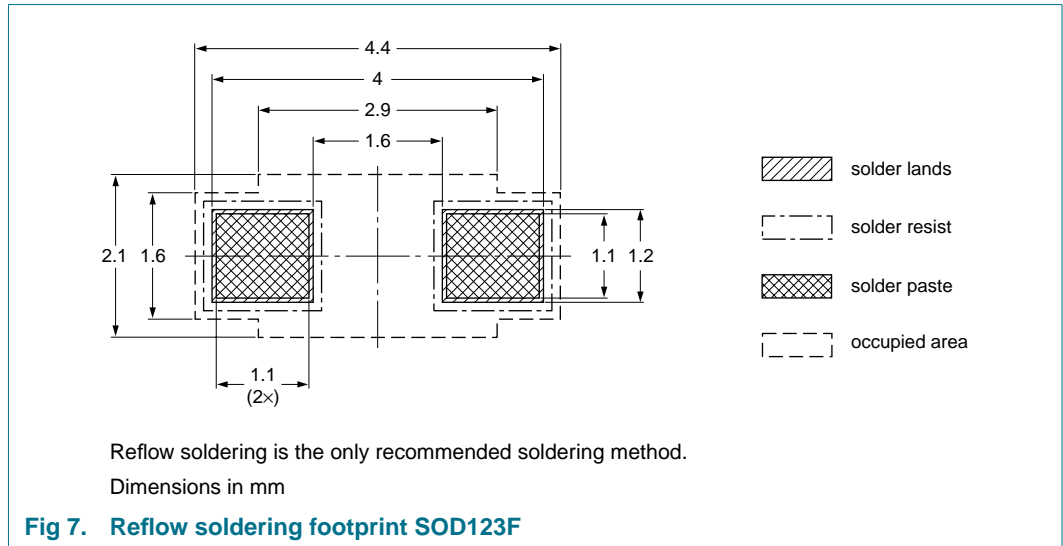
**Table 9. Packing methods**

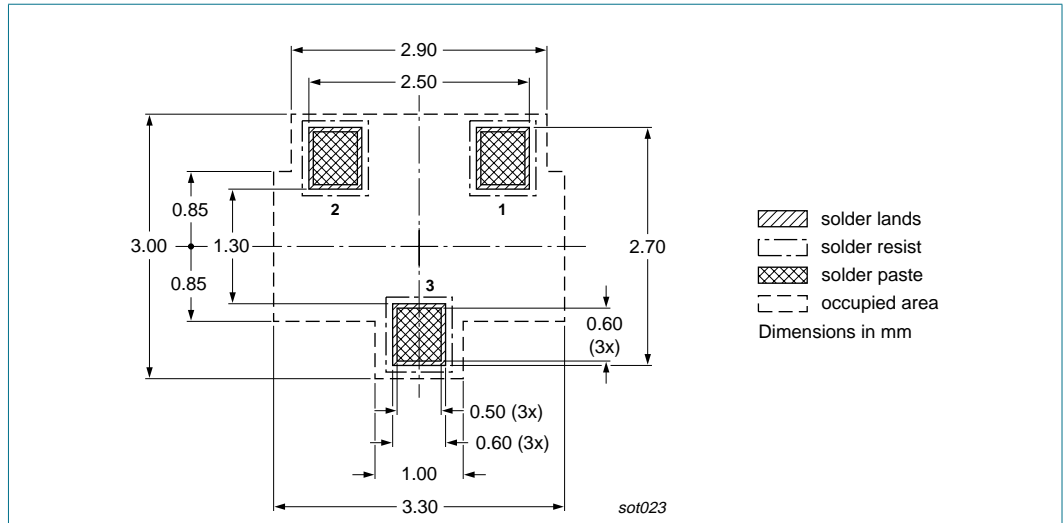
The indicated -xxx are the last three digits of the 12NC ordering code.<sup>[1]</sup>

Type number	Package	Description	Packing quantity	
			3000	10000
PMEG2010AEH	SOD123F	4 mm pitch, 8 mm tape and reel	-115	-135
PMEG2010AET	SOT23	4 mm pitch, 8 mm tape and reel	-215	-235

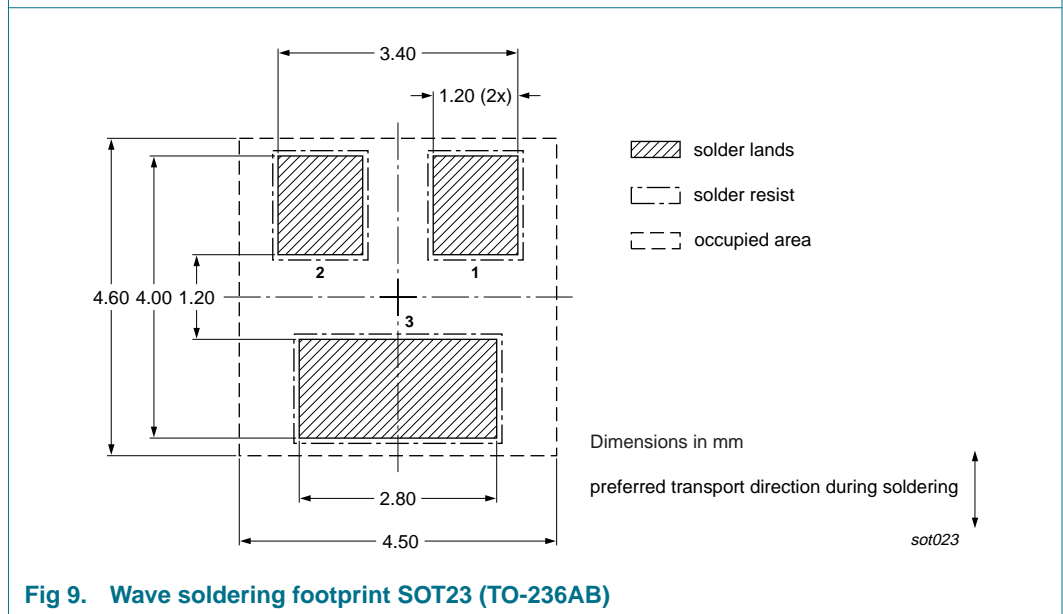
[1] For further information and the availability of packing methods, see [Section 14](#).

## 11. Soldering





**Fig 8. Reflow soldering footprint SOT23 (TO-236AB)**



**Fig 9. Wave soldering footprint SOT23 (TO-236AB)**



## 12. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PMEG2010AEH_PMEG2010AET_3	20070328	Product data sheet	-	PMEG2010AEH_2
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 PMEG2010AET 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="#">Table 7 “Thermal characteristics”</a>: <a href="#">Table note 4</a> added</li> <li>• <a href="#">Table 8 “Characteristics”</a>: <math>C_d</math> diode capacitance conditions adapted</li> <li>• <a href="#">Figure 2</a>: amended</li> <li>• <a href="#">Section 8 “Test information”</a>: added</li> <li>• <a href="#">Section 13 “Legal information”</a>: updated</li> </ul>				
PMEG2010AEH_2	20050526	Product data sheet	-	PMEG2010AEH_1
PMEG2010AEH_1	20050406	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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