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
	NXP	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

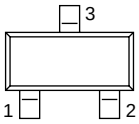
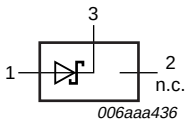
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_F	forward current	$T_{sp} \leq 55$ °C		-	-	1	A
V_R	reverse voltage			-	-	20	V
V_F	forward voltage	$I_F = 1$ A	[1]	-	380	430	mV

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

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2. Pinning information

Table 3. Pinning

Pin	Description	Simplified outline	Symbol
SOD123F			
1	cathode [1]		
2	anode		
SOT23			
1	anode		
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[1]
PMEG2010AEH	AF
PMEG2010AET	*AX

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

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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	$T_{sp} \leq 55$ °C		-	1	A
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ ms; $\delta \leq 0.25$				
	PMEG2010AEH			-	7	A
	PMEG2010AET			-	6	A
I_{FSM}	non-repetitive peak forward current	square wave; $t_p = 8$ ms		-	9	A
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °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^2.

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^2.

[4] Soldering point of cathode tab.

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7. Characteristics

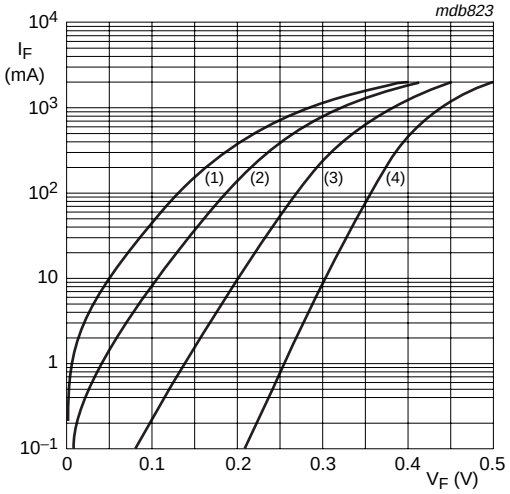
Table 8. Characteristics

T_{amb} = 25 °C unless otherwise specified.

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

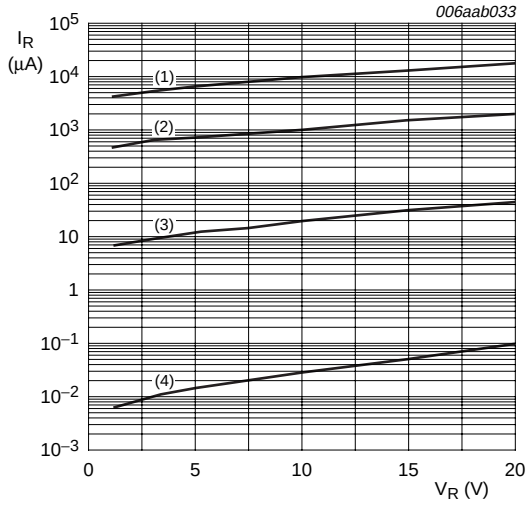
[1] Pulse test: $t_p \leq 300$ µs; $\delta \leq 0.02$.

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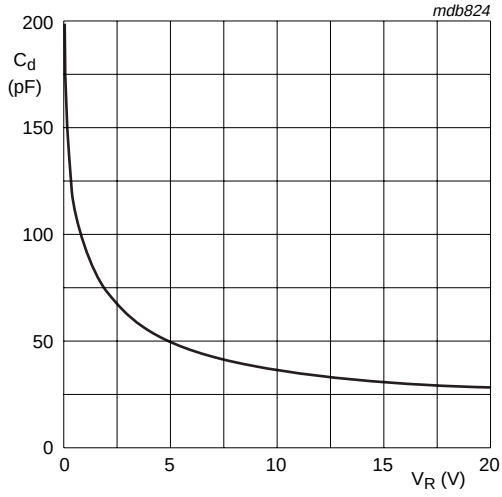
(1) T_{amb} = 125 °C
(2) T_{amb} = 85 °C
(3) T_{amb} = 25 °C
(4) T_{amb} = −40 °C

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



(1) T_{amb} = 125 °C
(2) T_{amb} = 85 °C
(3) T_{amb} = 25 °C
(4) T_{amb} = −40 °C

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



f = 1 MHz; T_{amb} = 25 °C

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

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8. Test information

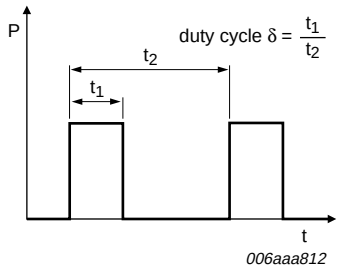


Fig 4. Duty cycle definition

9. Package outline

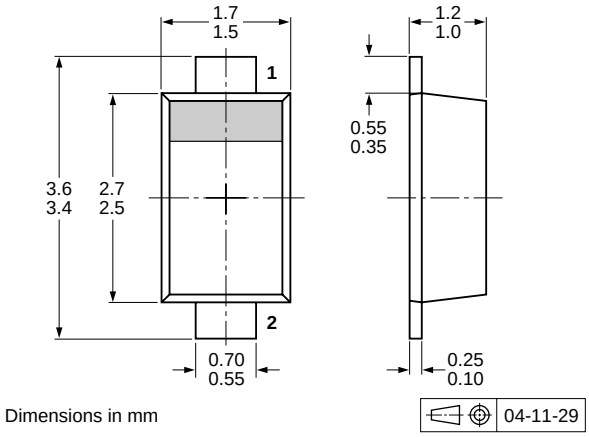


Fig 5. Package outline SOD123F

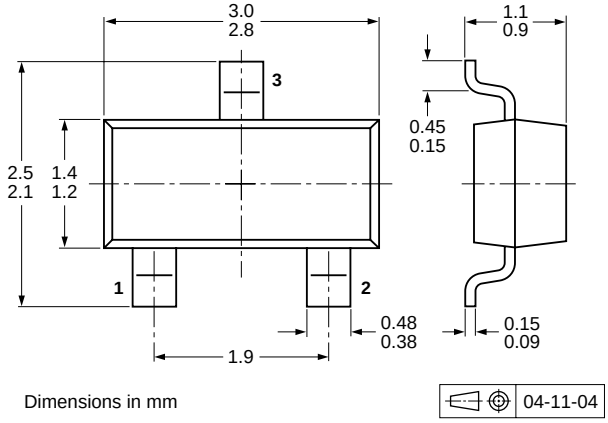


Fig 6. Package outline SOT23 (TO-236AB)

10. Packing information

Table 9. Packing methods

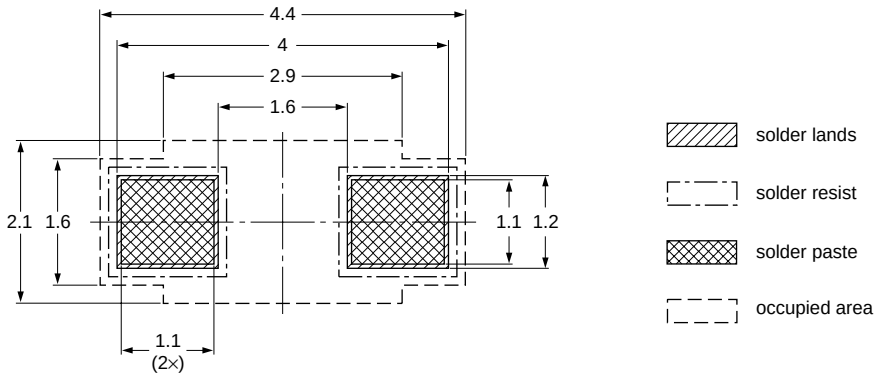
The indicated -xxx are the last three digits of the 12NC ordering code.[1]

Type number	Package	Description	Packing quantity	
			3000	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.

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11. Soldering



Reflow soldering is the only recommended soldering method.

Dimensions in mm

Fig 7. Reflow soldering footprint SOD123F

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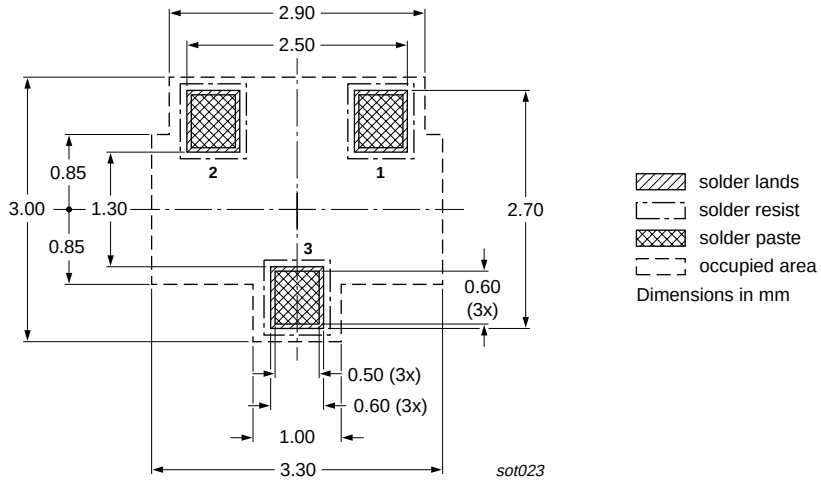


Fig 8. Reflow soldering footprint SOT23 (TO-236AB)

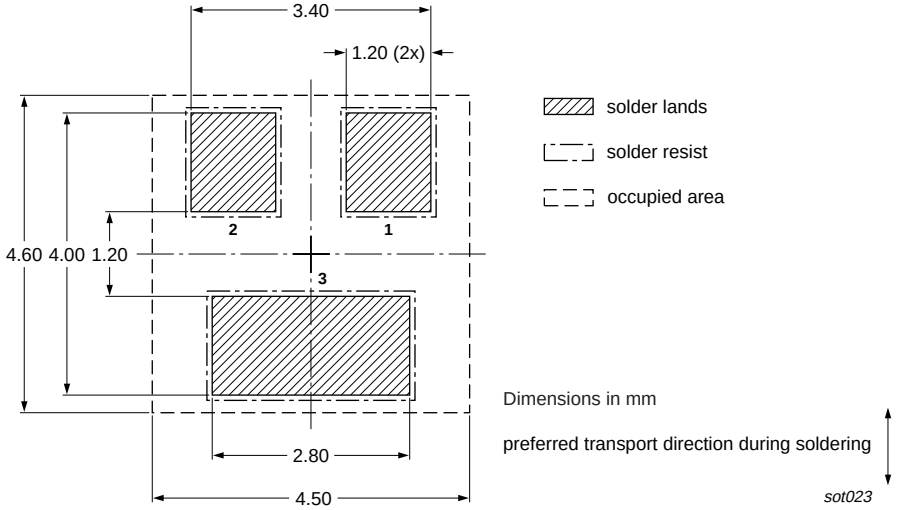


Fig 9. Wave soldering footprint SOT23 (TO-236AB)

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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:	• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors. • Legal texts have been adapted to the new company name where appropriate. • Type number PMEG2010AET added • Section 1.1 “General description”: amended • Table 1 “Product overview”: added • Table 7 “Thermal characteristics”: Table note 1 amended • Table 7 “Thermal characteristics”: Table note 4 added • Table 8 “Characteristics”: C_d diode capacitance conditions adapted • Figure 2: amended • Section 8 “Test information”: added • Section 13 “Legal information”: updated			
PMEG2010AEH_2	20050526	Product data sheet	-	PMEG2010AEH_1
PMEG2010AEH_1	20050406	Product data sheet	-	-

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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".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nxp.com.

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Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:
moschip.ru
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