PMEG4010EH; PMEG4010EJ; PMEG4010ET

1 A very low V_F MEGA Schottky barrier rectifiers

Rev. 04 — 21 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	JEDEC	
PMEG4010EH	SOD123F	-	-	single
PMEG4010EJ	SOD323F	SC-90	-	single
PMEG4010ET	SOT23	-	TO-236AB	single

1.2 Features

- Forward current: $I_F \leq 1$ A
- Reverse voltage: $V_R \leq 40$ 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

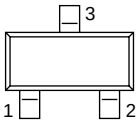
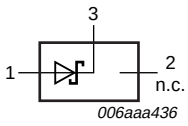
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_F	forward current	$T_{sp} \leq 55$ °C		-	-	1	A
V_R	reverse voltage			-	-	40	V
V_F	forward voltage	$I_F = 1000$ mA	[1]	-	540	640	mV

[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; SOD323F				
1	cathode	[1]	 001aab540	 sym001
2	anode			
SOT23				
1	anode			 006aaa436
2	n.c.			
3	cathode			

[1] The marking bar indicates the cathode.

3. Ordering information

Table 4. Ordering information

Type number	Package		
	Name	Description	Version
PMEG4010EH	-	plastic surface-mounted package; 2 leads	SOD123F
PMEG4010EJ	SC-90	plastic surface-mounted package; 2 leads	SOD323F
PMEG4010ET	-	plastic surface-mounted package; 3 leads	SOT23

4. Marking

Table 5. Marking codes

Type number	Marking code[1]
PMEG4010EH	AB
PMEG4010EJ	AL
PMEG4010ET	*AW

[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			-	40	V
I_F	forward current	$T_{sp} \leq 55$ °C		-	1	A
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ ms; $\delta \leq 0.25$				
	PMEG4010EH			-	7	A
	PMEG4010EJ			-	7	A
	PMEG4010ET			-	5	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				
	PMEG4010EH		[1][3]	-	375	mW
			[2][3]	-	830	mW
	PMEG4010EJ		[1][3]	-	350	mW
			[2][3]	-	830	mW
	PMEG4010ET		[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.

[3] Reflow soldering is the only recommended soldering method.

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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]				
	PMEG4010EH		[2][4]	-	-	330	K/W
			[3][4]	-	-	150	K/W
	PMEG4010EJ		[2][4]	-	-	350	K/W
			[3][4]	-	-	150	K/W
	PMEG4010ET		[2]	-	-	440	K/W
			[3]	-	-	300	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[5]				
	PMEG4010EH			-	-	60	K/W
	PMEG4010EJ			-	-	55	K/W
	PMEG4010ET			-	-	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] Reflow soldering is the only recommended soldering method.

[5] Soldering point of cathode tab.

7. Characteristics

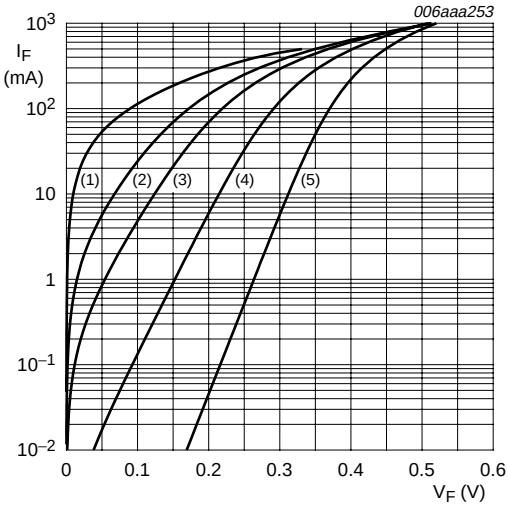
Table 8. Characteristics

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

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage		[1]				
		I_F = 0.1 mA		-	95	130	mV
		I_F = 1 mA		-	155	210	mV
		I_F = 10 mA		-	220	270	mV
		I_F = 100 mA		-	295	350	mV
		I_F = 500 mA		-	420	470	mV
		I_F = 1000 mA		-	540	640	mV
I_R	reverse current	V_R = 10 V		-	7	20	µA
		V_R = 40 V		-	30	100	µA
C_d	diode capacitance	V_R = 1 V; f = 1 MHz		-	43	50	pF

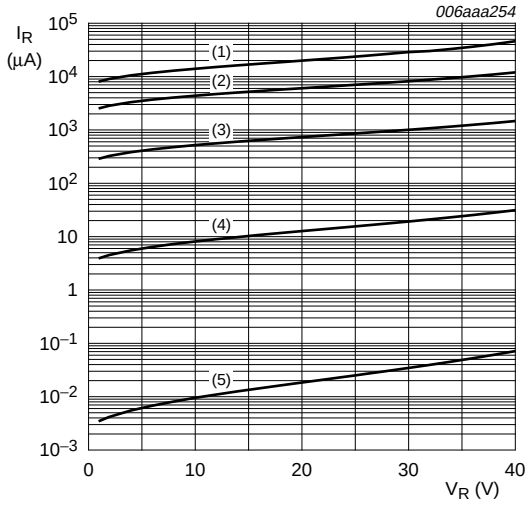
[1] Pulse test: $t_p \leq 300$ µs; $\delta \leq 0.02$.

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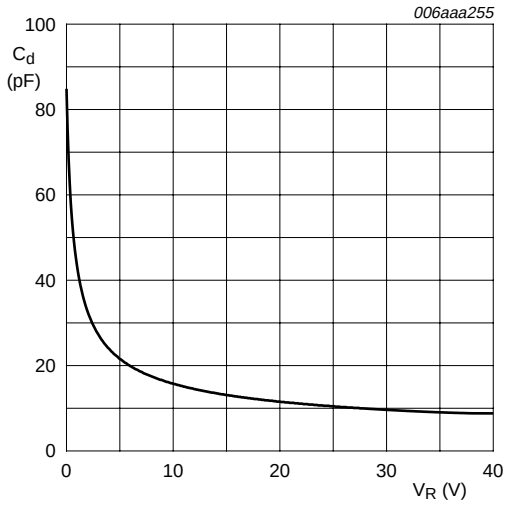
(1) T_{amb} = 150 °C
(2) T_{amb} = 125 °C
(3) T_{amb} = 85 °C
(4) T_{amb} = 25 °C
(5) T_{amb} = –40 °C

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



(1) T_{amb} = 150 °C
(2) T_{amb} = 125 °C
(3) T_{amb} = 85 °C
(4) T_{amb} = 25 °C
(5) 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

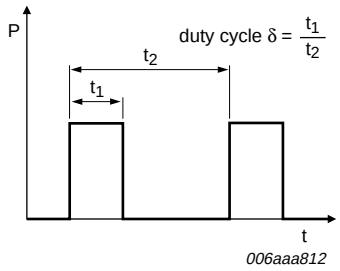


Fig 4. Duty cycle definition

9. Package outline

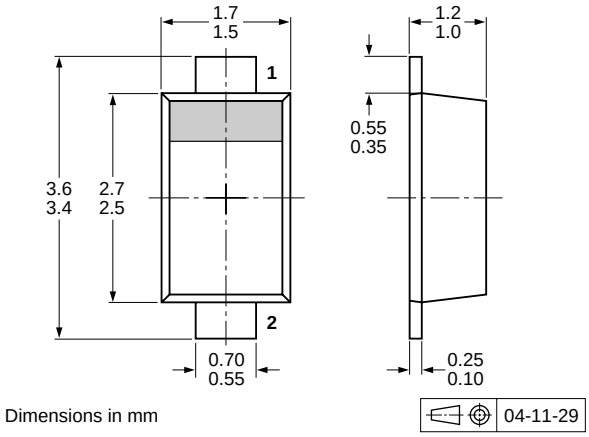


Fig 5. Package outline SOD123F

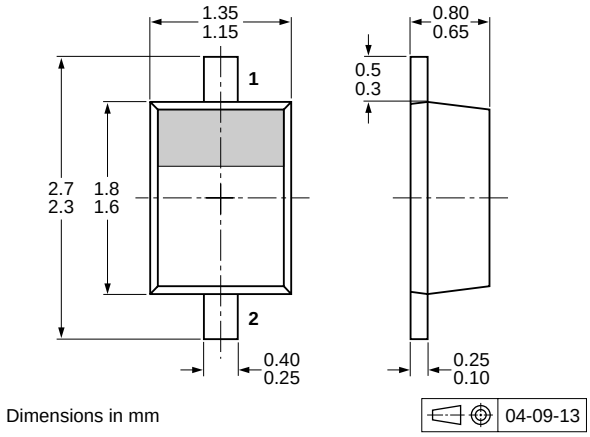


Fig 6. Package outline SOD323F (SC-90)

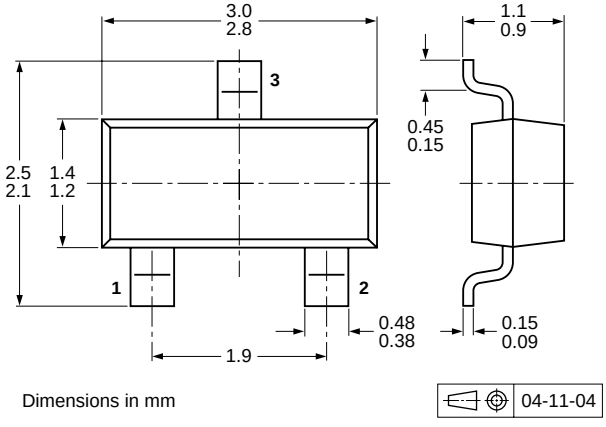


Fig 7. Package outline SOT23 (TO-236AB)

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10. Packing information

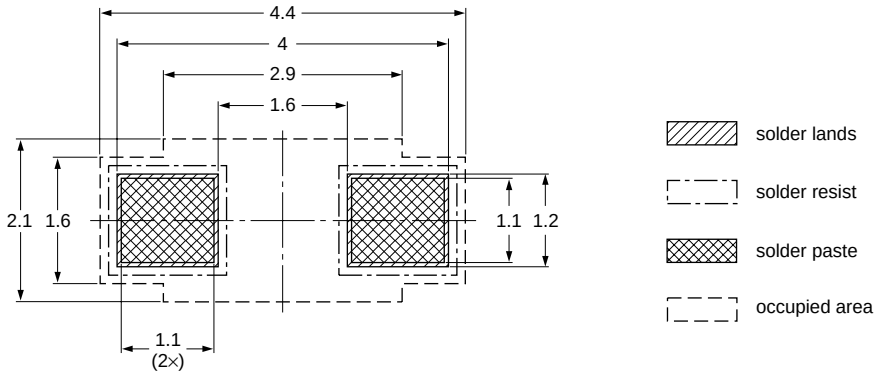
Table 9. Packing methods

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

Type number	Package	Description	Packing quantity	
			3000	10000
PMEG4010EH	SOD123F	4 mm pitch, 8 mm tape and reel	-115	-135
PMEG4010EJ	SOD323F	4 mm pitch, 8 mm tape and reel	-115	-135
PMEG4010ET	SOT23	4 mm pitch, 8 mm tape and reel	-215	-235

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

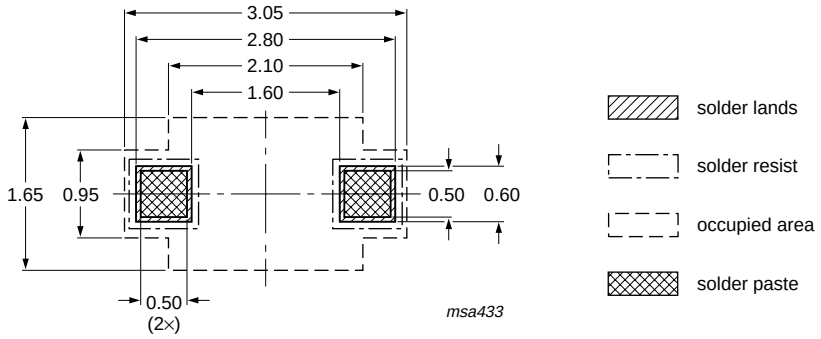
11. Soldering



Reflow soldering is the only recommended soldering method.

Dimensions in mm

Fig 8. Reflow soldering footprint SOD123F



Reflow soldering is the only recommended soldering method.

Dimensions in mm

Fig 9. Reflow soldering footprint SOD323F (SC-90)

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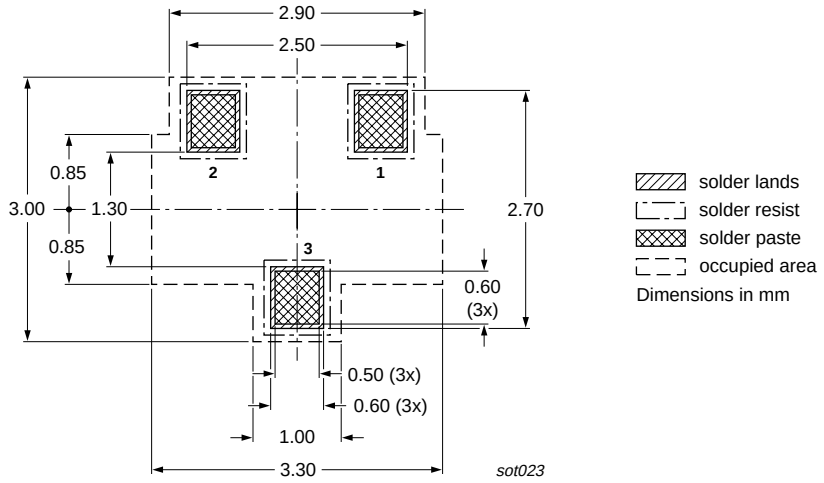


Fig 10. Reflow soldering footprint SOT23 (TO-236AB)

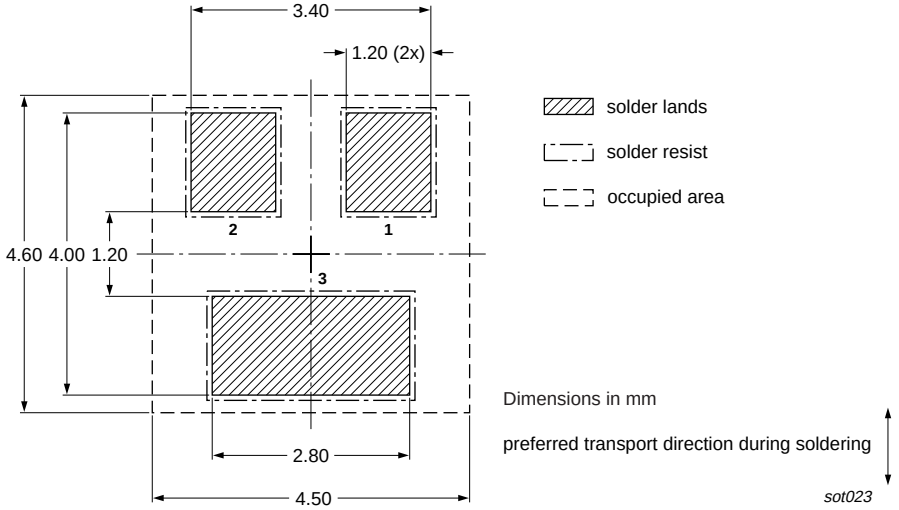


Fig 11. Wave soldering footprint SOT23 (TO-236AB)

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12. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PMEG4010EH_EJ_ET_4	20070321	Product data sheet	-	PMEGXX10EH_EJ_SER_3
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 numbers PMEG4010EH and PMEG4010EJ separated from data sheet PMEGXX10EH_EJ_SER_3 • Type number PMEG4010ET added • Section 1.1 “General description”: amended • Section 1.2 “Features”: amended • Section 1.3 “Applications”: amended • Section 8 “Test information”: added • Figure 7, 10 and 11: added • Section 13 “Legal information”: updated			
PMEGXX10EH_EJ_SER_3	20050411	Product data sheet	-	PMEGXX10EJ_SER_2
PMEGXX10EJ_SER_2	20050131	Product data sheet	-	PMEGXX10EJ_SER_1
PMEGXX10EJ_SER_1	20040907	Objective data sheet	-	-

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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: 21 March 2007

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