PMEG3010CEH; PMEG3010CEJ

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
	NXP	JEITA	
PMEG3010CEH	SOD123F	-	single
PMEG3010CEJ	SOD323F	SC-90	single

1.2 Features

- Forward current: $I_F \leq 1$ A
- Reverse voltage: $V_R \leq 30$ 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			-	-	30	V
V_F	forward voltage	$I_F = 1$ A	[1]	-	450	520	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
1	cathode [1]	 001aab540	 sym001
2	anode		

[1] The marking bar indicates the cathode.

3. Ordering information

Table 4. Ordering information

Type number	Package		
	Name	Description	Version
PMEG3010CEH	-	plastic surface-mounted package; 2 leads	SOD123F
PMEG3010CEJ	SC-90	plastic surface-mounted package; 2 leads	SOD323F

4. Marking

Table 5. Marking codes

Type number	Marking code
PMEG3010CEH	C8
PMEG3010CEJ	EN

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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			-	30	V
I_F	forward current	$T_{sp} \leq 55$ °C		-	1	A
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ ms; $\delta \leq 0.25$		-	7	A
I_{FSM}	non-repetitive peak forward current	square wave; $t_p = 8$ ms				
	PMEG3010CEH			-	9	A
	PMEG3010CEJ			-	10	A
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C				
	PMEG3010CEH		[1]	-	375	mW
			[2]	-	830	mW
	PMEG3010CEJ		[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^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]				
	PMEG3010CEH		[2]	-	-	330	K/W
			[3]	-	-	150	K/W
	PMEG3010CEJ		[2]	-	-	350	K/W
			[3]	-	-	150	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[4]				
	PMEG3010CEH			-	-	60	K/W
	PMEG3010CEJ			-	-	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^2.

[4] Soldering point of cathode tab.

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7. Characteristics

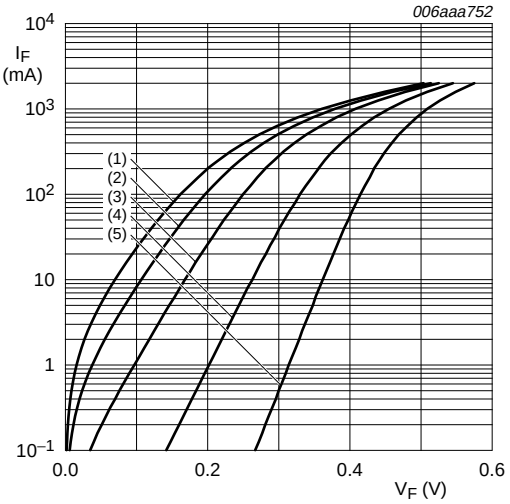
Table 8. Characteristics

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

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage		[1]				
		I_F = 1 mA		-	200	240	mV
		I_F = 10 mA		-	260	310	mV
		I_F = 100 mA		-	330	390	mV
		I_F = 500 mA		-	400	440	mV
		I_F = 700 mA		-	420	450	mV
		I_F = 1 A		-	450	520	mV
I_R	reverse current	V_R = 5 V		-	1.2	-	µA
		V_R = 10 V		-	1.8	-	µA
		V_R = 30 V		-	10	50	µA
C_d	diode capacitance	V_R = 1 V; f = 1 MHz		-	90	100	pF

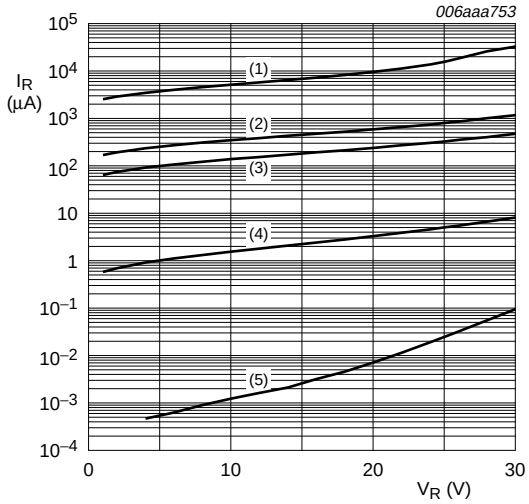
[1] Pulse test: $t_p \leq 300$ µs; $\delta \leq 0.02$.

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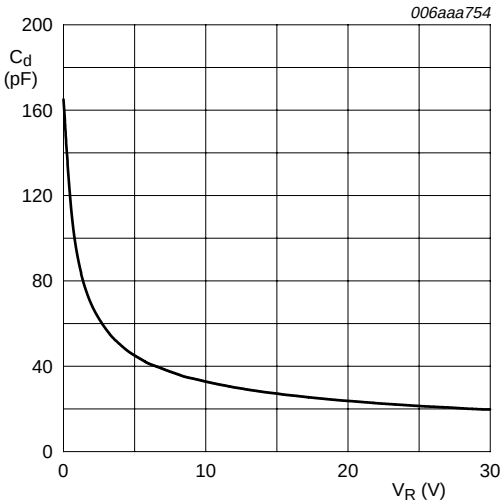
(1) T_{amb} = 150 °C
(2) T_{amb} = 125 °C
(3) T_{amb} = 85 °C
(4) T_{amb} = 25 °C
(5) T_{amb} = –40 °C

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

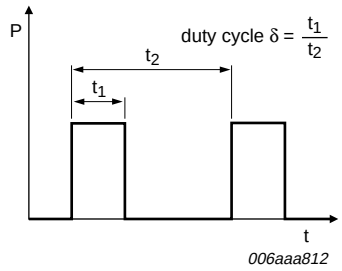


Fig 4. Duty cycle definition

9. Package outline

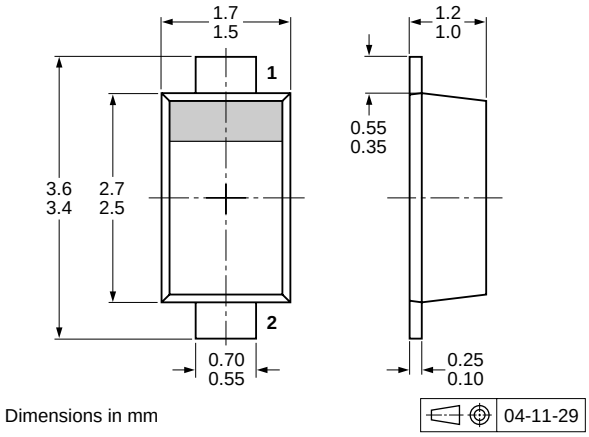


Fig 5. Package outline SOD123F

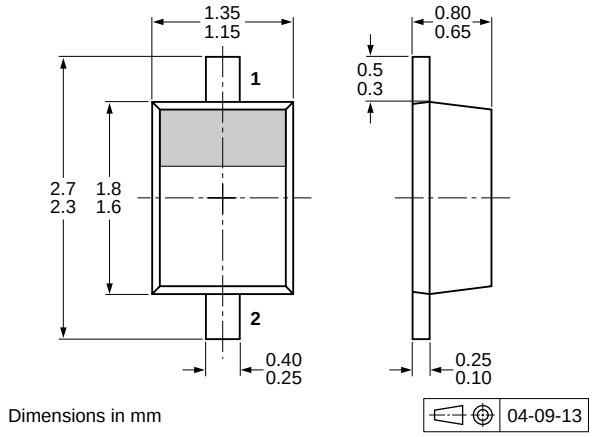


Fig 6. Package outline SOD323F (SC-90)

10. Packing information

Table 9. Packing methods

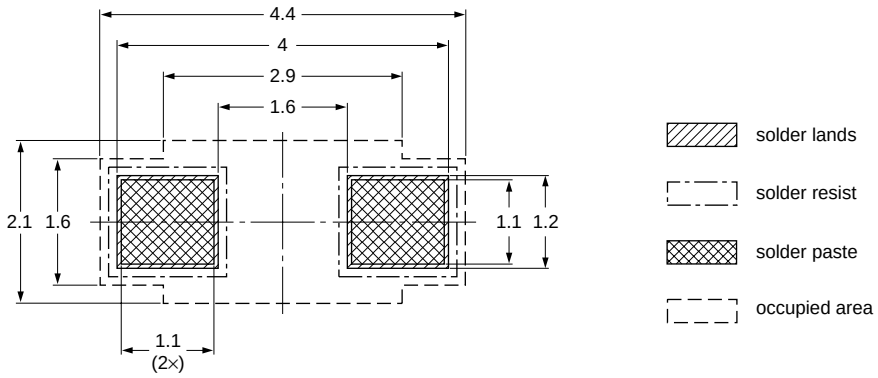
The indicated -xxx are the last three digits of the 12NC ordering code.[1]

Type number	Package	Description	Packing quantity	
			3000	10000
PMEG3010CEH	SOD123F	4 mm pitch, 8 mm tape and reel	-115	-135
PMEG3010CEJ	SOD323F			

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

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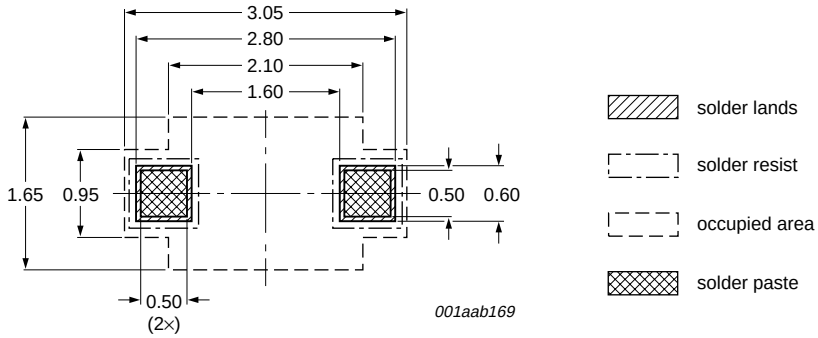
11. Soldering



Reflow soldering is the only recommended soldering method.

Dimensions in mm

Fig 7. Reflow soldering footprint SOD123F



Reflow soldering is the only recommended soldering method.

Dimensions in mm

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

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12. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PMEG3010CEH_PMEG3010CEJ_2	20070322	Product data sheet	-	PMEG3010CEJ_1
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 PMEG3010CEH added • Section 1.1 “General description”: amended • Table 1 “Product overview”: added • Table 7 “Thermal characteristics”: Table note 1 amended • Table 8 “Characteristics”: V_F forward voltage maximum values amended • Section 8 “Test information”: added			
PMEG3010CEJ_1	20060411	Product 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".

[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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15. Contents

1	**Product profile**	**1**
1.1	General description	1
1.2	Features	1
1.3	Applications	1
1.4	Quick reference data	1
2	**Pinning information**	**2**
3	**Ordering information**	**2**
4	**Marking**	**2**
5	**Limiting values**	**3**
6	**Thermal characteristics**	**3**
7	**Characteristics**	**4**
8	**Test information**	**6**
9	**Package outline**	**6**
10	**Packing information**	**6**
11	**Soldering**	**7**
12	**Revision history**	**8**
13	**Legal information**	**9**
13.1	Data sheet status	9
13.2	Definitions	9
13.3	Disclaimers	9
13.4	Trademarks	9
14	**Contact information**	**9**
15	**Contents**	**10**

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Date of release: 22 March 2007

Document identifier: PMEG3010CEH_PMEG3010CEJ_2

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