1 A very low V_F MEGA Schottky barrier rectifiers Rev. 02 — 22 March 2007 Pro

Product data sheet

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 ≤ 1 A

Reverse voltage: V_R ≤ 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	Тур	Max	Unit
I_{F}	forward current	$T_{sp} \le 55 ^{\circ}C$	-	-	1	Α
V_R	reverse voltage		-	-	30	V
V_{F}	forward voltage	$I_F = 1 A$	<u>[1]</u> _	450	520	mV

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



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2. Pinning information

Table 3. Pinning

Pin	Description	Simplified outline	Symbol
1	cathode	[1]	. 84
2	anode	001aab540	1 2 sym001

^[1] The marking bar indicates the cathode.

3. Ordering information

Table 4. Ordering information

Type number	Package	ackage			
	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	$T_{sp} \le 55 ^{\circ}C$	-	1	Α
I _{FRM}	repetitive peak forward current	$\begin{array}{l} t_p \leq 1 \text{ ms;} \\ \delta \leq 0.25 \end{array}$	-	7	Α
I _{FSM}	non-repetitive peak forward current	square wave; $t_p = 8 \text{ ms}$			
	PMEG3010CEH		-	9	Α
	PMEG3010CEJ		-	10	Α
P _{tot}	total power dissipation	$T_{amb} \le 25 ^{\circ}C$			
	PMEG3010CEH		<u>[1]</u> _	375	mW
			[2] _	830	mW
	PMEG3010CEJ		<u>[1]</u> -	350	mW
			[2] _	830	mW
Tj	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.

6. Thermal characteristics

Table 7. Thermal characteristics

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	<u>[1]</u>			
	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		<u>[4]</u>			
	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, mounting pad for cathode 1 cm².

^[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 cm².

^[4] Soldering point of cathode tab.

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7. Characteristics

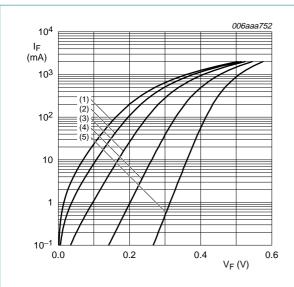
Table 8. Characteristics

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

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
V_{F}	forward voltage		<u>[1]</u>			
		$I_F = 1 \text{ mA}$	-	200	240	mV
		$I_F = 10 \text{ mA}$	-	260	310	mV
		I _F = 100 mA	-	330	390	mV
		$I_F = 500 \text{ mA}$	-	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	-	μΑ
		V _R = 10 V	-	1.8	-	μΑ
		V _R = 30 V	-	10	50	μΑ
C _d	diode capacitance	$V_R = 1 V$; $f = 1 MHz$	-	90	100	pF

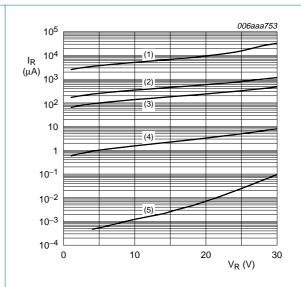
^[1] Pulse test: $t_p \le 300~\mu s;~\delta \le 0.02.$

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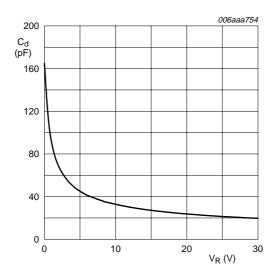
- (1) $T_{amb} = 150 \, ^{\circ}C$
- (2) $T_{amb} = 125 \, ^{\circ}C$
- (3) $T_{amb} = 85 \, ^{\circ}C$
- (4) $T_{amb} = 25 \, ^{\circ}C$
- (5) $T_{amb} = -40 \, ^{\circ}C$

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



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

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

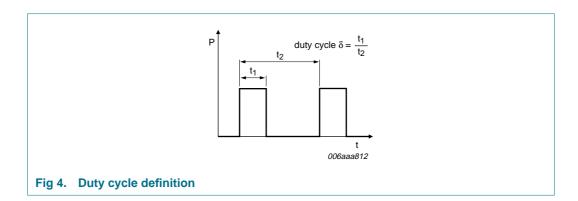


 $f = 1 \text{ MHz}; T_{amb} = 25 \,^{\circ}\text{C}$

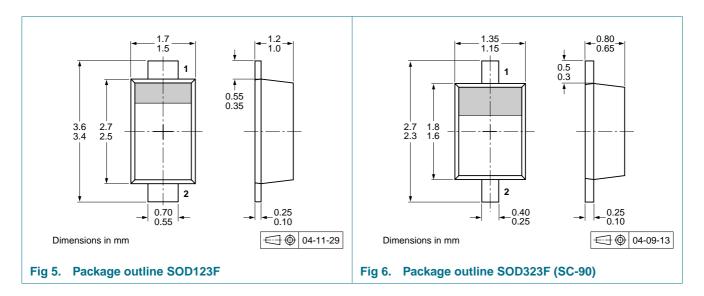
Fig 3. Diode capacitance as a function of reverse voltage; typical values

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8. Test information



9. Package outline



10. Packing information

Table 9. Packing methods

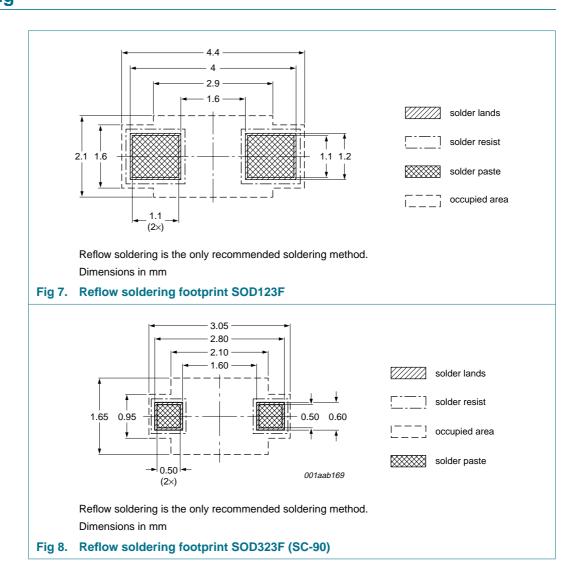
The indicated -xxx are the last three digits of the 12NC ordering code.[1]

Type number	Package	Description	Packing of	_l uantity
			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



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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:		of this data sheet has beel delines of NXP Semicondu	en redesigned to comply with the new uctors.			
	 Legal texts 	have been adapted to the	new company name	where appropriate.		
	 Type numb 	er PMEG3010CEH added				
	Section 1.1	"General description": am	ended			
	 Table 1 "President of the second of the secon	oduct overview": added				
	• Table 7 "Th	ermal characteristics": Tab	le note 1 amended			
	 Table 8 "Ch 	naracteristics": V _F forward v	oltage maximum valu	ues 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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PMEG3010CEH; PMEG3010CEJ

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