

PMEG4010CEH; PMEG4010CEJ

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
	Nexperia	JEITA	
PMEG4010CEH	SOD123F	-	single
PMEG4010CEJ	SOD323F	SC-90	single

1.2 Features

- Forward current: $I_F \leq 1$ A
- Reverse voltage: $V_R \leq 40$ 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		-	-	40	V
V_F	forward voltage	$I_F = 1$ A	[1] -	490	570	mV

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

2. Pinning information

Table 3. Pinning

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

[1] The marking bar indicates the cathode.

3. Ordering information

Table 4. Ordering information

Type number	Package		
	Name	Description	Version
PMEG4010CEH	-	plastic surface-mounted package; 2 leads	SOD123F
PMEG4010CEJ	SC-90	plastic surface-mounted package; 2 leads	SOD323F

4. Marking

Table 5. Marking codes

Type number	Marking code
PMEG4010CEH	C9
PMEG4010CEJ	EP

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	$T_{sp} \leq 55\text{ °C}$	-	1	A		
I_{FRM}	repetitive peak forward current	$t_p \leq 1\text{ ms};$ $\delta \leq 0.25$	-	7	A		
I_{FSM}	non-repetitive peak forward current	square wave; $t_p = 8\text{ ms}$					
			PMEG4010CEH	-	9	A	
			PMEG4010CEJ	-	10	A	
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ °C}$					
			PMEG4010CEH	[1]	-	375	mW
				[2]	-	830	mW
			PMEG4010CEJ	[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 cm².

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]					
			PMEG4010CEH	[2]	-	-	330	K/W
				[3]	-	-	150	K/W
			PMEG4010CEJ	[2]	-	-	350	K/W
				[3]	-	-	150	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[4]					
			PMEG4010CEH	-	-	60	K/W	
			PMEG4010CEJ	-	-	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 cm².

[4] Soldering point of cathode tab.

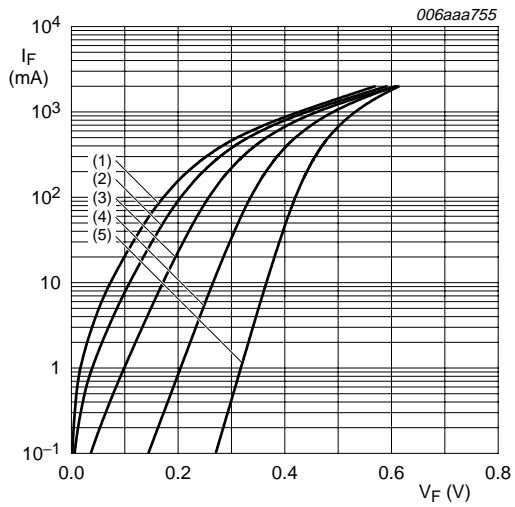
7. Characteristics

Table 8. Characteristics

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

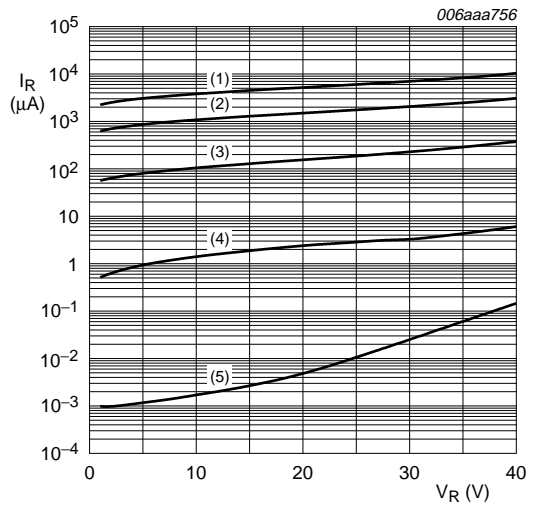
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_F	forward voltage		[1]			
		$I_F = 1\text{ mA}$	-	210	240	mV
		$I_F = 10\text{ mA}$	-	270	310	mV
		$I_F = 100\text{ mA}$	-	340	390	mV
		$I_F = 500\text{ mA}$	-	420	490	mV
		$I_F = 700\text{ mA}$	-	450	520	mV
		$I_F = 1\text{ A}$	-	490	570	mV
I_R	reverse current	$V_R = 5\text{ V}$	-	0.8	-	μA
		$V_R = 10\text{ V}$	-	1.1	-	μA
		$V_R = 40\text{ V}$	-	6	50	μA
C_d	diode capacitance	$V_R = 1\text{ V}; f = 1\text{ MHz}$	-	69	77	pF

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



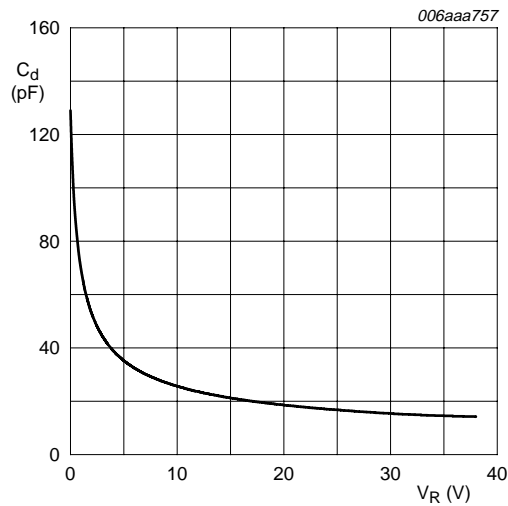
- (1) $T_{amb} = 150\text{ °C}$
- (2) $T_{amb} = 125\text{ °C}$
- (3) $T_{amb} = 85\text{ °C}$
- (4) $T_{amb} = 25\text{ °C}$
- (5) $T_{amb} = -40\text{ °C}$

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



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

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

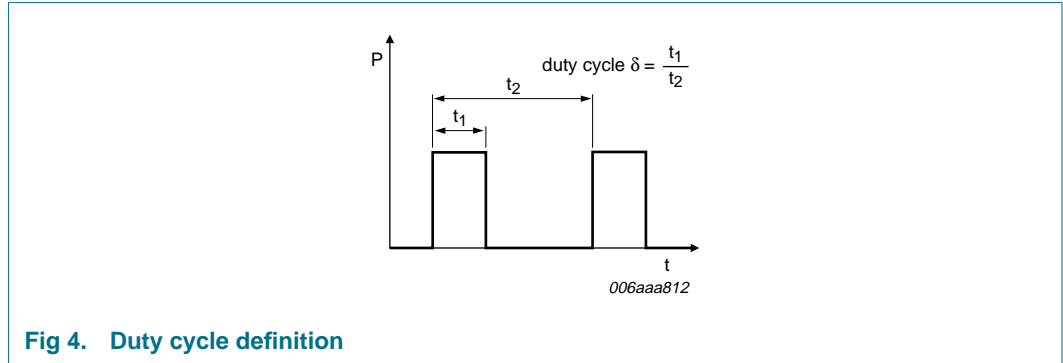


Fig 4. Duty cycle definition

9. Package outline

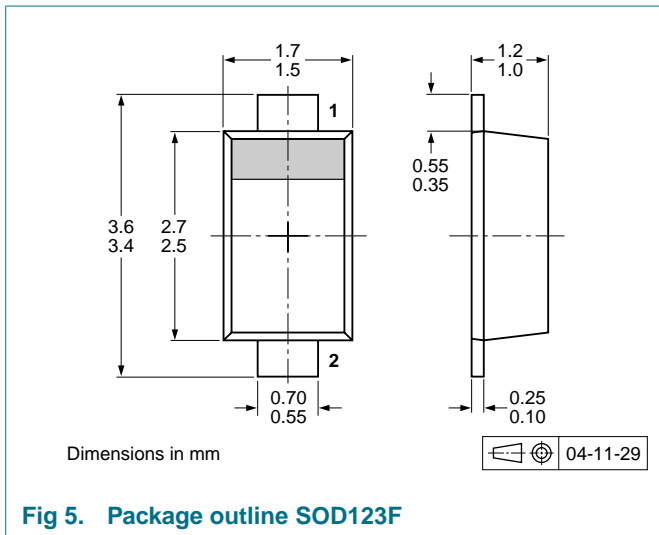


Fig 5. Package outline SOD123F

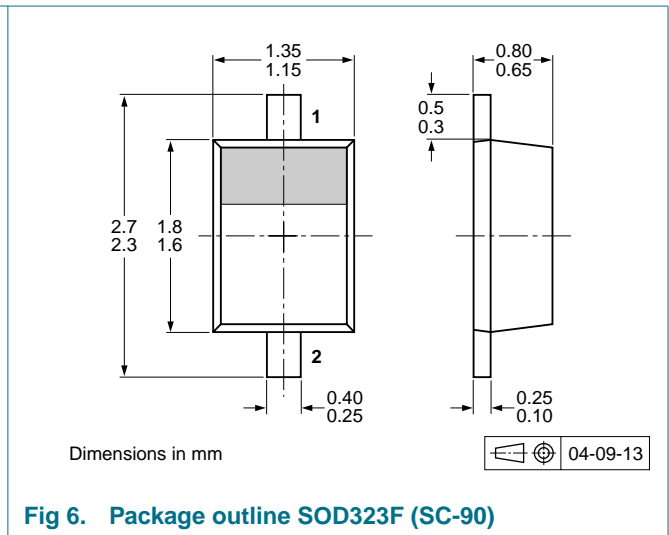


Fig 6. Package outline SOD323F (SC-90)

10. Packing information

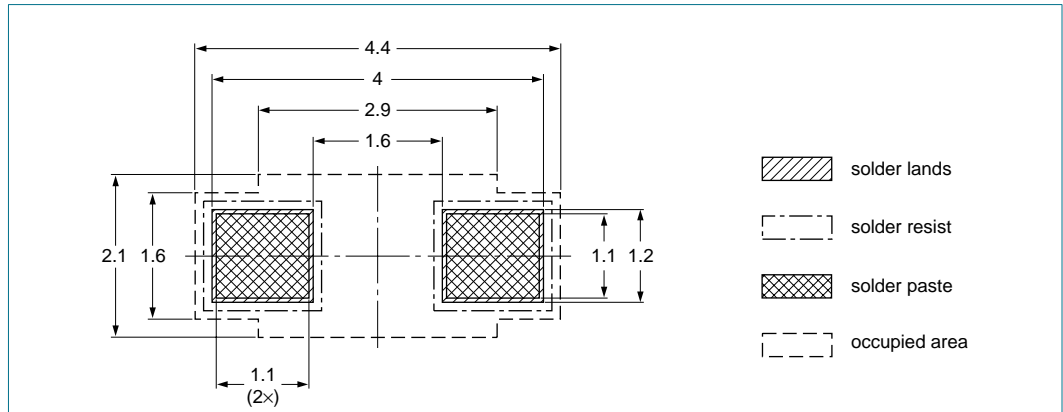
Table 9. Packing methods

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

Type number	Package	Description	Packing quantity	
			3000	10000
PMEG4010CEH	SOD123F	4 mm pitch, 8 mm tape and reel	-115	-135
PMEG4010CEJ	SOD323F			

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

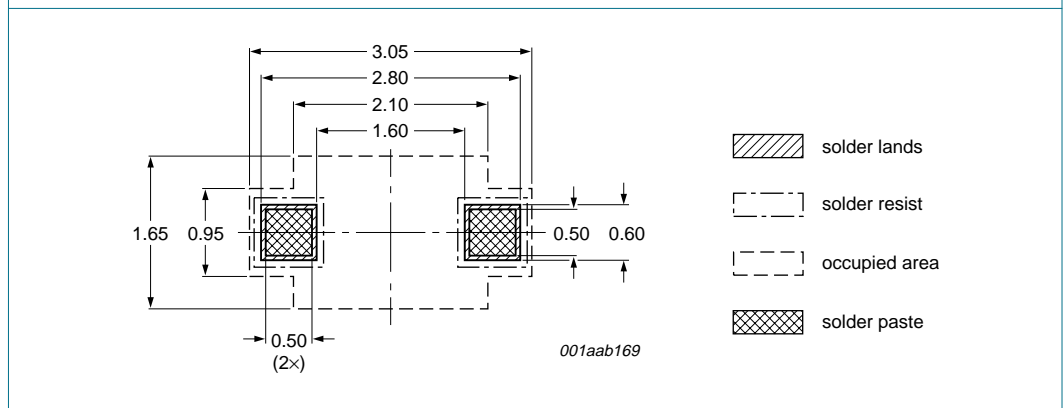
11. Soldering



Reflow soldering is the only recommended soldering method.

Dimensions in mm

Fig 7. Reflow soldering footprint SOD123F



Reflow soldering is the only recommended soldering method.

Dimensions in mm

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

12. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PMEG4010CEH_PMEG4010CEJ_2	20070322	Product data sheet	-	PMEG4010CEJ_1
Modifications:				
<ul style="list-style-type: none"> • 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 PMEG4010CEH added • Section 1.1 “General description”: amended • Table 1 “Product overview”: added • Table 7 “Thermal characteristics”: Table note 1 amended • Section 8 “Test information”: added 				
PMEG4010CEJ_1	20060413	Product data sheet	-	-

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.nexperia.com>.

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