

# PMEG1020EA

2 A ultra low  $V_F$  MEGA Schottky barrier rectifier

Rev. 04 — 30 December 2008

Product data sheet

## 1. Product profile

### 1.1 General description

Planar Maximum Efficiency General Application (MEGA) Schottky barrier rectifier with an integrated guard ring for stress protection, encapsulated in SOD323 (SC-76) very small Surface-Mounted Device (SMD) plastic package.

### 1.2 Features

- Forward current:  $I_F \leq 2$  A
- Reverse voltage:  $V_R \leq 10$  V
- Ultra low forward voltage
- Very small SMD plastic package

### 1.3 Applications

- Low voltage rectification
- High efficiency DC-to-DC conversion
- Switch Mode Power Supply (SMPS)
- Reverse polarity protection
- Low power consumption applications

### 1.4 Quick reference data



Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_F$	forward current	$T_{sp} \leq 55$ °C	-	-	2	A
$V_R$	reverse voltage		-	-	10	V
$V_F$	forward voltage	$I_F = 1$ A	[1] -	280	350	mV

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

## 2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
1	cathode	[1]	1  2
2	anode		<i>sym001</i>

[1] The marking bar indicates the cathode.

## 3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMEG1020EA	SC-76	plastic surface-mounted package; 2 leads	SOD323

## 4. Marking

Table 4. Marking codes

Type number	Marking code
PMEG1020EA	E2

## 5. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
$V_R$	reverse voltage		-	10	V
$I_F$	forward current	$T_{sp} \leq 55 \text{ }^\circ\text{C}$	-	2	A
$I_{FRM}$	repetitive peak forward current	$t_p \leq 1 \text{ ms}$ ; $\delta \leq 0.5$	-	3.2	A
$I_{FSM}$	non-repetitive peak forward current	square wave; $t_p = 8 \text{ ms}$	-	9	A
$T_j$	junction temperature		-	150	$^\circ\text{C}$
$T_{amb}$	ambient temperature		-65	+150	$^\circ\text{C}$
$T_{stg}$	storage temperature		-65	+150	$^\circ\text{C}$

## 6. Thermal characteristics

**Table 6. Thermal characteristics**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	450	K/W
			[2]	-	-	210	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[3]	-	-	90	K/W

[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 with copper clad 10 × 10 mm.

[3] Soldering point of cathode tab.

## 7. Characteristics

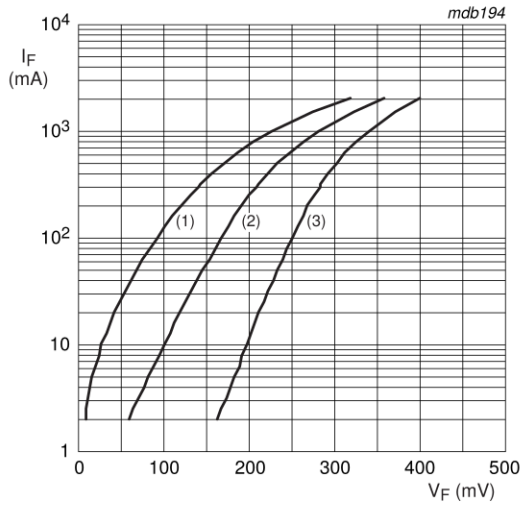
**Table 7. Characteristics**

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_F$	forward voltage		[1]			
		$I_F = 0.01\text{ A}$	-	100	130	mV
		$I_F = 0.1\text{ A}$	-	170	200	mV
		$I_F = 1\text{ A}$	-	280	350	mV
$I_R$	reverse current		[2]			
		$V_R = 5\text{ V}$	-	0.7	2	mA
		$V_R = 8\text{ V}$	-	1	2.5	mA
		$V_R = 10\text{ V}$	-	1.2	3	mA
$C_d$	diode capacitance	$V_R = 5\text{ V}; f = 1\text{ MHz}$	-	37	45	pF

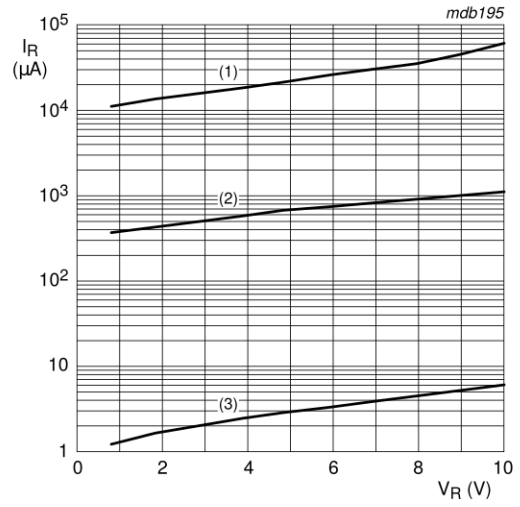
[1] Pulse test:  $t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.02$ .

[2] 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.



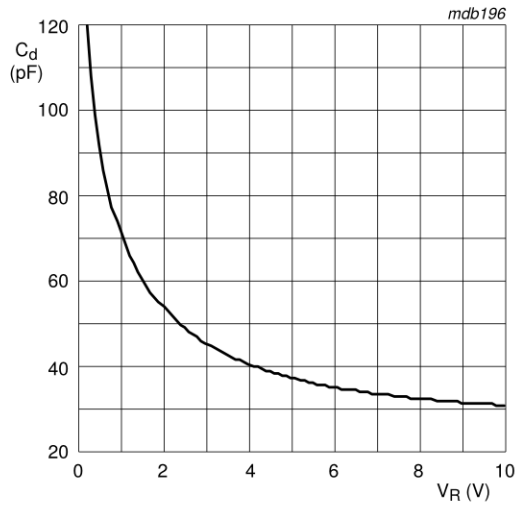
- (1)  $T_{amb} = 85\text{ }^\circ\text{C}$
- (2)  $T_{amb} = 25\text{ }^\circ\text{C}$
- (3)  $T_{amb} = -40\text{ }^\circ\text{C}$

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



- (1)  $T_{amb} = 85\text{ }^\circ\text{C}$
- (2)  $T_{amb} = 25\text{ }^\circ\text{C}$
- (3)  $T_{amb} = -40\text{ }^\circ\text{C}$

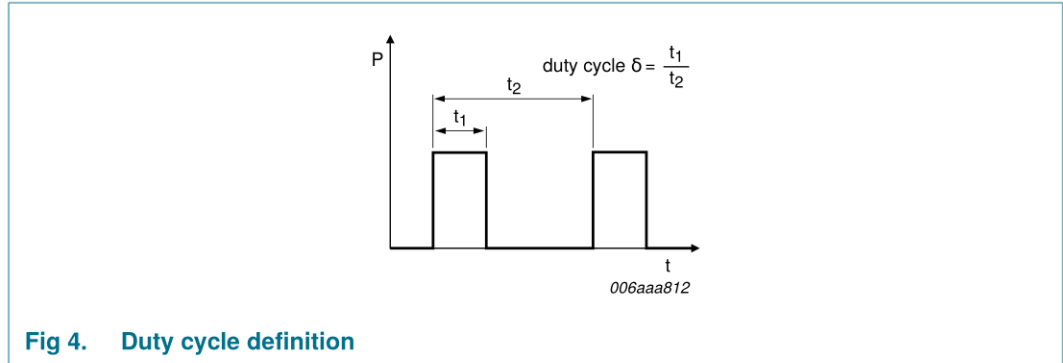
**Fig 2. Reverse current as a function of reverse voltage; typical values**



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

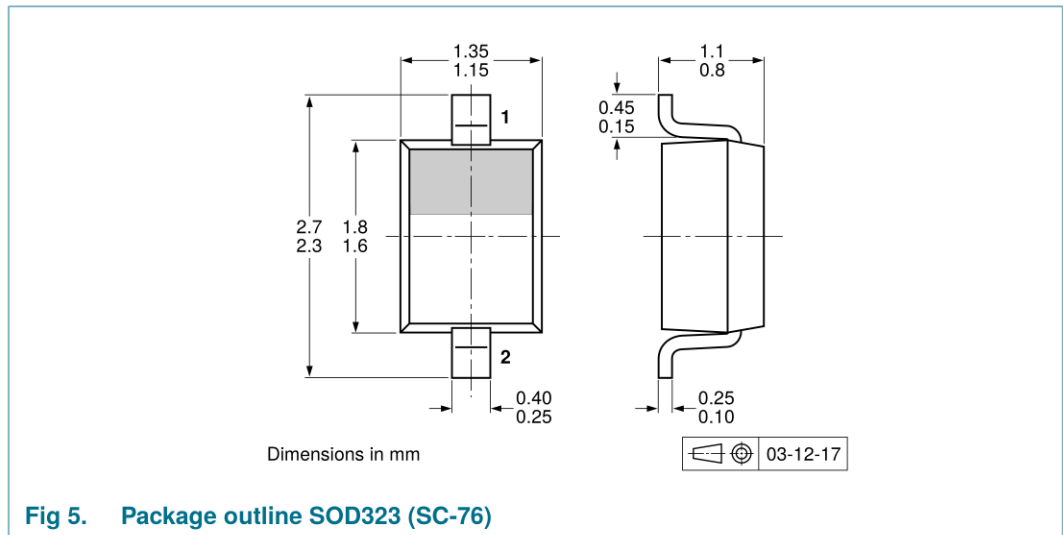
**Fig 3. Diode capacitance as a function of reverse voltage; typical values**

**8. Test information**



**Fig 4. Duty cycle definition**

**9. Package outline**



**Fig 5. Package outline SOD323 (SC-76)**

**10. Packing information**

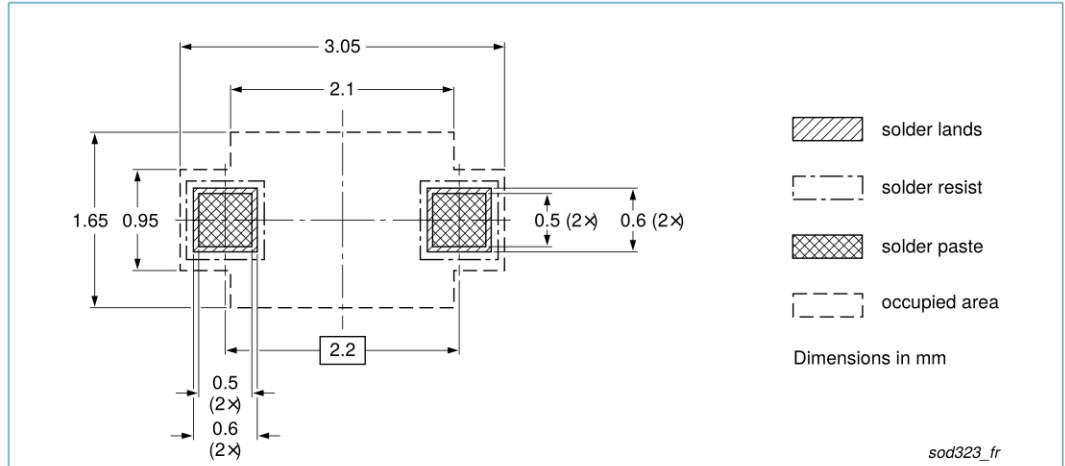
**Table 8. Packing methods**

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

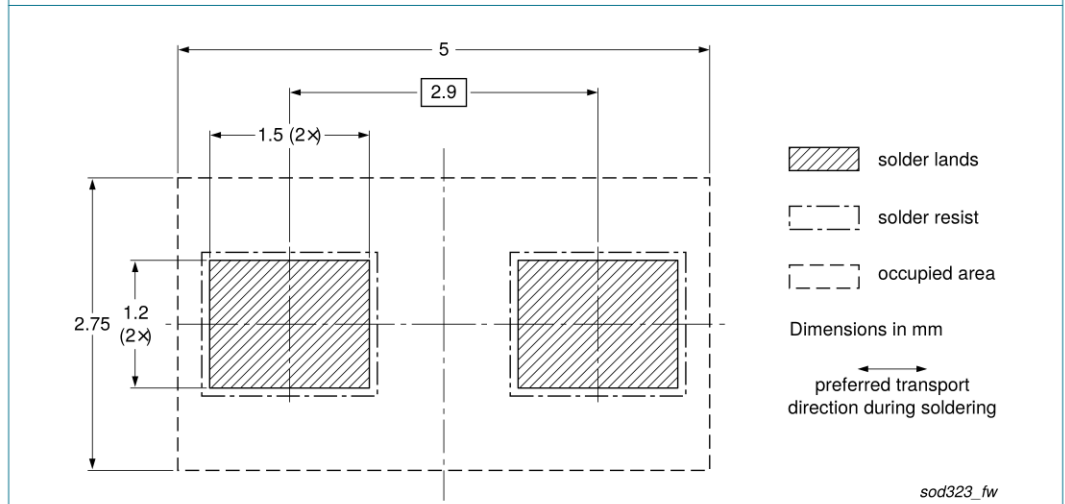
Type number	Package	Description	Packing quantity	
			3000	10000
PMEG1020EA	SOD323	4 mm pitch, 8 mm tape and reel	-115	-135

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

**11. Soldering**



**Fig 6. Reflow soldering footprint SOD323 (SC-76)**



**Fig 7. Wave soldering footprint SOD323 (SC-76)**

## 12. Revision history

**Table 9. Revision history**

Document ID	Release date	Data sheet status	Change notice	Supersedes
PMEG1020EA_4	20081230	Product data sheet	-	PMEG1020EA_3
Modifications:		<ul style="list-style-type: none"><li>The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.</li><li>Legal texts have been adapted to the new company name where appropriate.</li><li><a href="#">Section 13 "Legal information"</a>: updated</li></ul>		
PMEG1020EA_3	20040206	Product specification	-	PMEG1020EA_2
PMEG1020EA_2	20030715	Product specification	-	PMEG1020EA_1
PMEG1020EA_1	20030307	Preliminary specification	-	-

## 13. Legal information

### 13.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	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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