

# PMEG3020EH; PMEG3020EJ

30 V, 2 A ultra low  $V_F$  MEGA Schottky barrier rectifiers

Rev. 04 — 4 February 2010

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 SMD plastic packages.

Table 1. Product overview

Type number	Package		Configuration
	Nexperia	JEITA	
PMEG3020EH	SOD123F	-	single isolated diodes
PMEG3020EJ	SOD323F	SC-90	single isolated diodes

### 1.2 Features

- Forward current: 2 A
- Reverse voltage: 30 V
- Ultra low forward voltage
- Small and flat lead SMD package

### 1.3 Applications

- Low voltage rectification
- High efficiency DC-to-DC conversion
- Switched-mode power supply
- Inverse polarity protection
- Low power consumption applications

### 1.4 Quick reference data

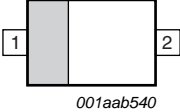

Table 2. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_F$	forward current	$T_{sp} \leq 55 \text{ }^\circ\text{C}$	-	-	2	A
$V_R$	reverse voltage		-	-	30	V
$V_F$	forward voltage	$I_F = 2000 \text{ mA}$	[1] -	510	620	mV

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

## 2. Pinning information

Table 3. Pinning

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

[1] The marking bar indicates the cathode.

## 3. Ordering information

Table 4. Ordering information

Type number	Package		
	Name	Description	Version
PMEG3020EH	-	plastic surface mounted package; 2 leads	SOD123F
PMEG3020EJ	SC-90	plastic surface mounted package; 2 leads	SOD323F

## 4. Marking

Table 5. Marking codes

Type number	Marking code
PMEG3020EH	A7
PMEG3020EJ	E9

## 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	$T_{sp} \leq 55\text{ °C}$	-	2	A
$I_{FRM}$	repetitive peak forward current	$t_p \leq 1\text{ ms}$ ; $\delta \leq 0.25$	-	4.5	A
$I_{FSM}$	non-repetitive peak forward current	$t = 8\text{ ms}$ ; square wave	[1] -	9	A
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$	[1] -	375	mW
			[2] -	830	mW
			[1] -	360	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<sup>2</sup>.

## 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][2] -	-	330	K/W
			[2][3] -	-	150	K/W
			[1][2] -	-	350	K/W
			[2][3] -	-	150	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		-	-	60	K/W
			-	-	55	K/W
			-	-	55	K/W

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

[2] For Schottky barrier diodes thermal run-away has to be considered, as in some applications the reverse power losses  $P_R$  are a significant part of the total power losses. Nomograms for determining the reverse power losses  $P_R$  and  $I_{F(AV)}$  rating will be available on request.

[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm<sup>2</sup>.

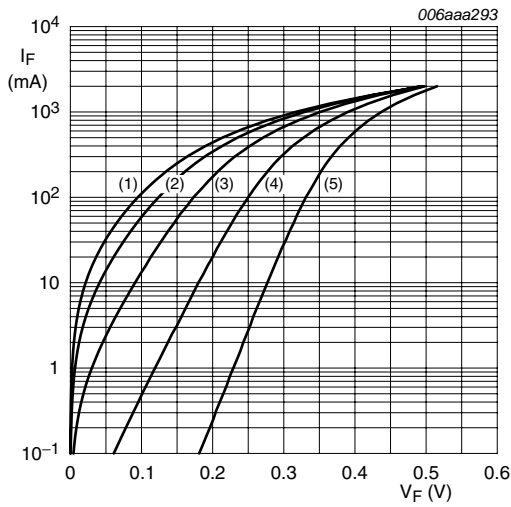
7. Characteristics

Table 8. Characteristics

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

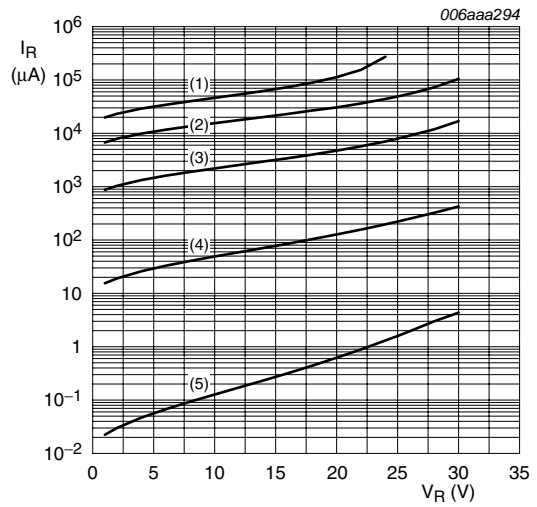
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_F$	forward voltage		[1]			
		$I_F = 1\text{ mA}$	-	125	160	mV
		$I_F = 10\text{ mA}$	-	185	220	mV
		$I_F = 100\text{ mA}$	-	255	290	mV
		$I_F = 500\text{ mA}$	-	330	380	mV
		$I_F = 1000\text{ mA}$	-	400	480	mV
		$I_F = 2000\text{ mA}$	-	510	620	mV
$I_R$	reverse current	$V_R = 10\text{ V}$	-	60	150	$\mu\text{A}$
		$V_R = 30\text{ V}$	-	400	1000	$\mu\text{A}$
$C_d$	diode capacitance	$V_R = 1\text{ V}; f = 1\text{ MHz}$	-	60	72	pF

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



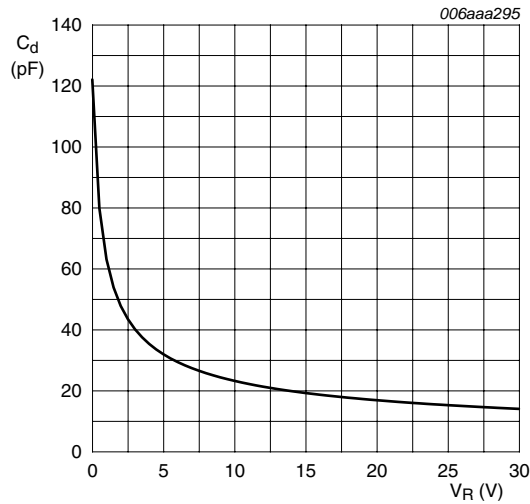
- (1)  $T_{amb} = 150\text{ °C}$
- (2)  $T_{amb} = 125\text{ °C}$
- (3)  $T_{amb} = 85\text{ °C}$
- (4)  $T_{amb} = 25\text{ °C}$
- (5)  $T_{amb} = -40\text{ °C}$

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)  $T_{amb} = 25\text{ °C}$
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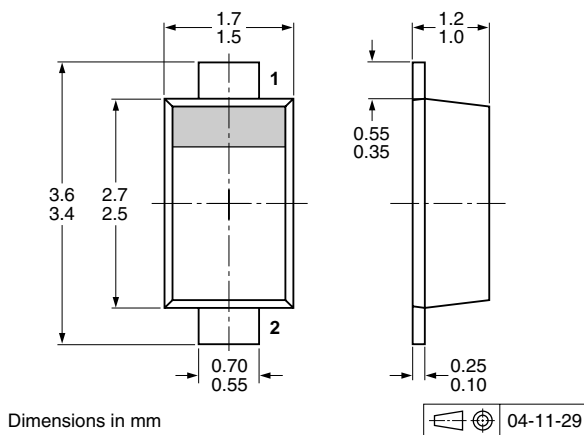
Fig 2. Reverse current as a function of reverse voltage; typical values



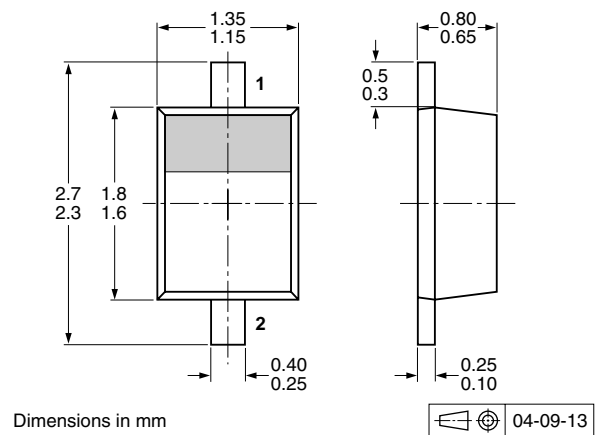
$T_{amb} = 25\text{ }^\circ\text{C}$ ;  $f = 1\text{ MHz}$

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

## 8. Package outline



**Fig 4. Package outline SOD123F**



**Fig 5. Package outline SOD323F (SC-90)**

## 9. Packing information

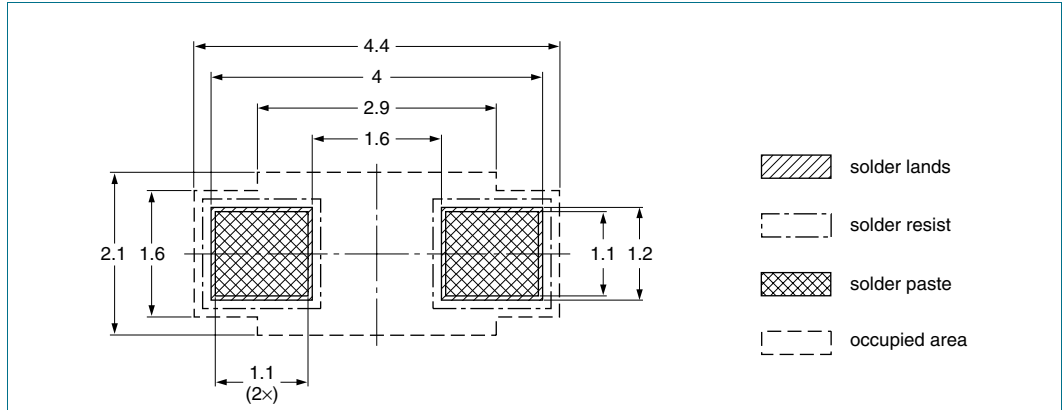
**Table 9. Packing methods**

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

Type number	Package	Description	Packing quantity	
			3000	10000
PMEG3020EH	SOD123F	4 mm pitch, 8 mm tape and reel	-115	-135
PMEG3020EJ	SOD323F	4 mm pitch, 8 mm tape and reel	-115	-135

[1] For further information and the availability of packing methods, see [Section 13](#).

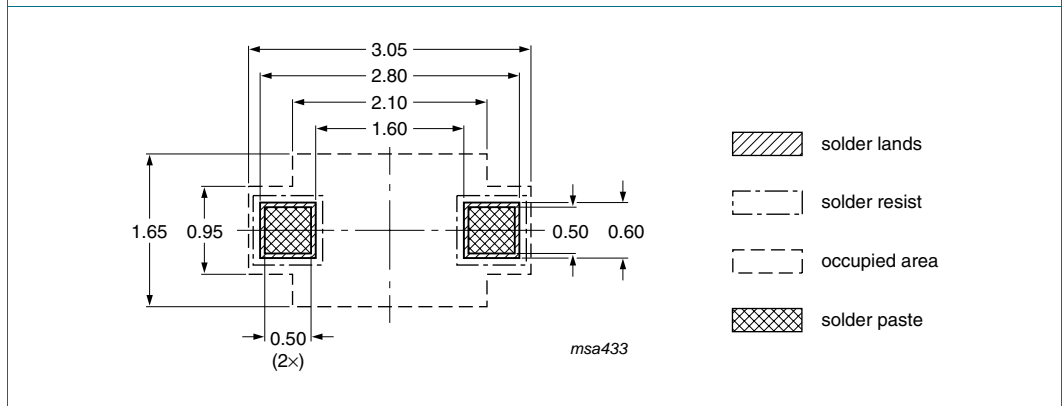
**10. Soldering**



Reflow soldering is the only recommended soldering method.

Dimensions in mm

**Fig 6. Reflow soldering footprint SOD123F**



Reflow soldering is the only recommended soldering method.

Dimensions in mm

**Fig 7. Reflow soldering footprint SOD323F (SC-90)**

## 11. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PMEG3020EH_EJ_4	20100204	Product data sheet	-	PMEG3020EH_EJ_3
Modifications:	<ul style="list-style-type: none"><li>This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content.</li></ul>			
PMEG3020EH_EJ_3	20050531	Product data sheet	-	PMEG3020EH_EJ_2
PMEG3020EH_EJ_2	20050404	Product data sheet	-	PMEG3020EJ_1
PMEG3020EJ_1	20050125	Product data sheet	-	-

## 12. Legal information

### 12.1 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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