



# PMEG2010ET

20 V, 1 A very low VF Schottky barrier rectifier

8 October 2024

Product data sheet

## 1. General description

Planar Schottky barrier rectifier with an integrated guard ring for stress protection, encapsulated in small SOT23 Surface-Mounted Device (SMD) plastic package.

## 2. Features and benefits

- Forward current:  $I_F \leq 1 \text{ A}$
- Reverse voltage:  $V_R \leq 20 \text{ V}$
- Very low forward voltage
- Small SMD plastic package

## 3. Applications

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

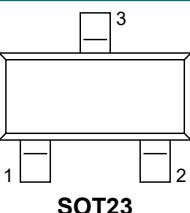
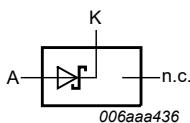
## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_F$	forward current	$T_{sp} \leq 55 \text{ }^\circ\text{C}$	-	-	1	A
$V_R$	reverse voltage		-	-	20	V
$V_F$	forward voltage	$I_F = 1 \text{ A}$ ; pulsed; $t_p \leq 300 \text{ } \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$	-	420	500	mV

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A	anode	 SOT23	
2	n.c.	not connected		
3	K	cathode		

## 6. Ordering information

**Table 3. Ordering information**

Type number	Package		
	Name	Description	Version
PMEG2010ET	SOT23	plastic, surface-mounted package; 3 terminals; 1.9 mm pitch; 2.9 mm x 1.3 mm x 1 mm body	SOT23

## 7. Marking

**Table 4. Marking codes**

Type number	Marking code <sup>[1]</sup>
PMEG2010ET	%AU

[1] % = placeholder for manufacturing site code

## 8. 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			-	20	V
$I_F$	forward current	$T_{sp} \leq 55^\circ\text{C}$		-	1	A
$I_{FRM}$	repetitive peak forward current	$t_p \leq 1\text{ ms}; \delta \leq 0.25$		-	5	A
$I_{FSM}$	non-repetitive peak forward current	$t_p = 8\text{ }\mu\text{s}; \text{square wave}$		-	9	A
$P_{tot}$	total power dissipation	$T_{amb} \leq 25^\circ\text{C}$	[1]	-	280	mW
			[2]	-	420	mW
$T_j$	junction temperature			-	150	$^\circ\text{C}$
$T_{amb}$	ambient temperature			-65	150	$^\circ\text{C}$
$T_{stg}$	storage temperature			-65	150	$^\circ\text{C}$

[1] Device mounted on an FR4 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 1cm<sup>2</sup>.

## 9. 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] [2]	-	-	440	K/W
			[1] [3]	-	-	300	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[4]	-	-	120	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<sup>2</sup>.

[4] Soldering point of cathode tab.

## 10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$V_F$	forward voltage	$I_F = 0.1 \text{ mA}; \text{ pulsed}; t_p \leq 300 \mu\text{s}; \bar{\delta} \leq 0.02; T_{\text{amb}} = 25^\circ\text{C}$		-	90	130	mV
		$I_F = 1 \text{ mA}; \text{ pulsed}; t_p \leq 300 \mu\text{s}; \bar{\delta} \leq 0.02; T_{\text{amb}} = 25^\circ\text{C}$		-	150	190	mV
		$I_F = 10 \text{ mA}; \text{ pulsed}; t_p \leq 300 \mu\text{s}; \bar{\delta} \leq 0.02; T_{\text{amb}} = 25^\circ\text{C}$		-	210	240	mV
		$I_F = 100 \text{ mA}; \text{ pulsed}; t_p \leq 300 \mu\text{s}; \bar{\delta} \leq 0.02; T_{\text{amb}} = 25^\circ\text{C}$		-	280	330	mV
		$I_F = 500 \text{ mA}; \text{ pulsed}; t_p \leq 300 \mu\text{s}; \bar{\delta} \leq 0.02; T_{\text{amb}} = 25^\circ\text{C}$		-	355	390	mV
		$I_F = 1 \text{ A}; \text{ pulsed}; t_p \leq 300 \mu\text{s}; \bar{\delta} \leq 0.02; T_{\text{amb}} = 25^\circ\text{C}$		-	420	500	mV
$I_R$	reverse current	$V_R = 10 \text{ V}; T_{\text{amb}} = 25^\circ\text{C}$		-	15	40	$\mu\text{A}$
		$V_R = 20 \text{ V}; T_{\text{amb}} = 25^\circ\text{C}$		-	40	200	$\mu\text{A}$
$C_d$	diode capacitance	$V_R = 1 \text{ V}; f = 1 \text{ MHz}; T_{\text{amb}} = 25^\circ\text{C}$		-	66	80	$\text{pF}$

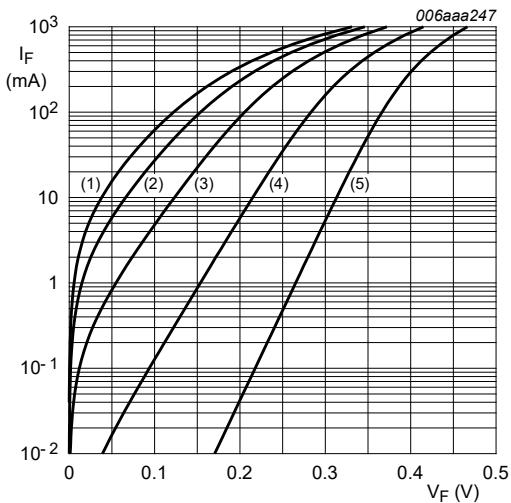


Fig. 1. Forward current as a function of forward voltage; typical values

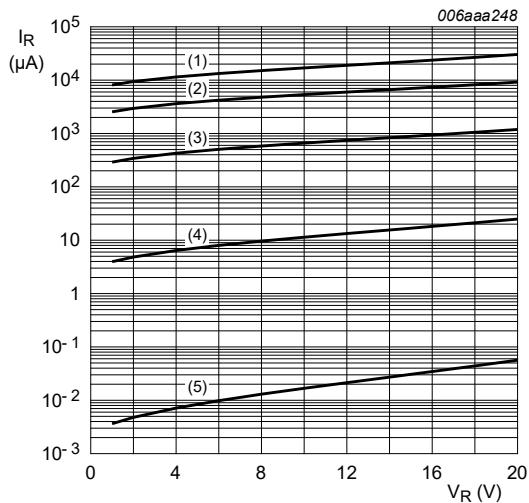
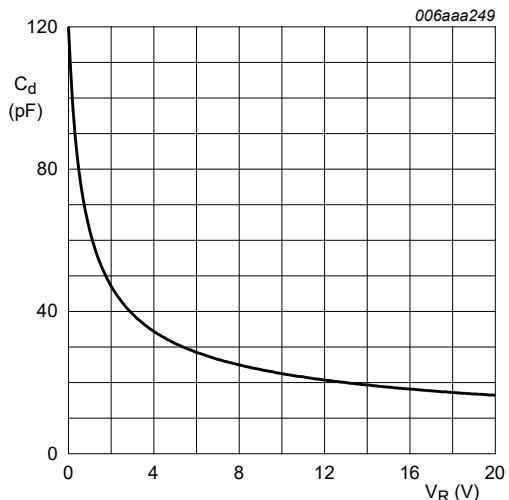


Fig. 2. Reverse current as a function of reverse voltage; typical values



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

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

## 11. Test information

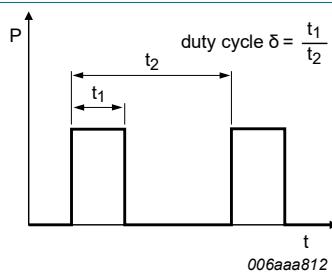


Fig. 4. Duty cycle definition

## 12. Package outline

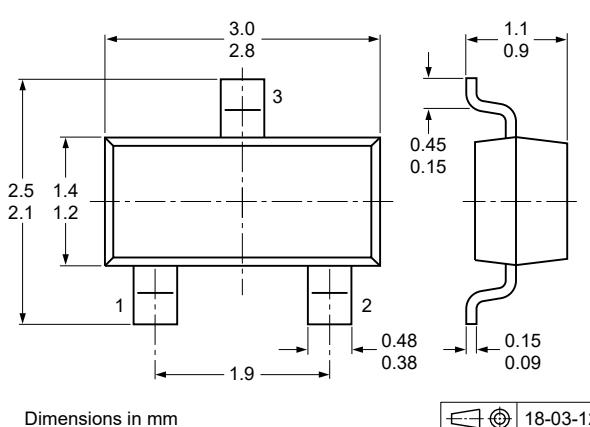


Fig. 5. Package outline SOT23

## 13. Soldering

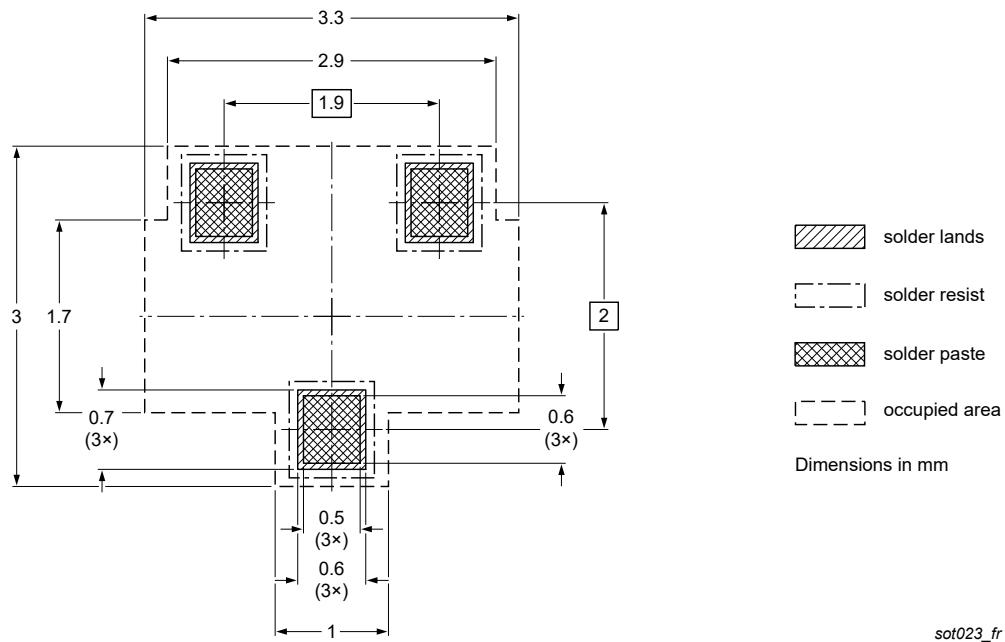


Fig. 6. Reflow soldering footprint for SOT23

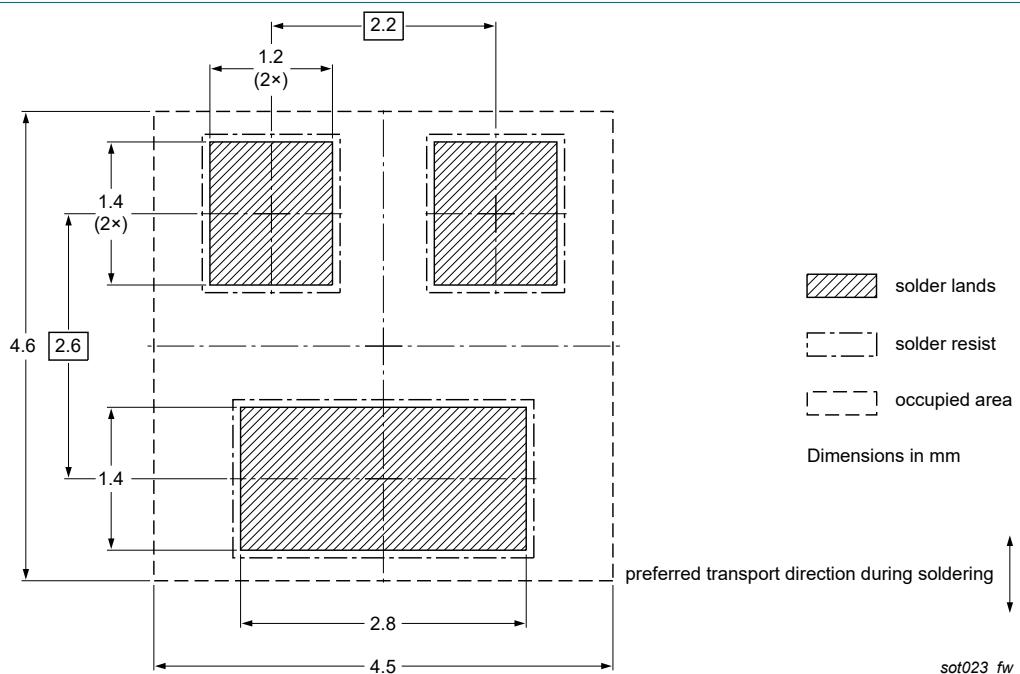


Fig. 7. Wave soldering footprint for SOT23

## 14. Revision history

**Table 8. Revision history**

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMEG2010ET v.6	20241008	Product data sheet	-	PMEG2010ET v.5
Modifications:	<ul style="list-style-type: none"><li>Product(s) changed to non-automotive qualification. Please refer to <a href="http://nexperia.com">nexperia.com</a> for automotive (-Q) product alternative(s).</li></ul>			
PMEG2010ET v.5	20230612	Product data sheet	-	PMEG2010EH_EJ_ET_4
PMEG2010EH_EJ_ET_4	20070320	Product data sheet	-	PMEGXX10EH_EJ_SE_R_3
PMEGXX10EH_EJ_SE_R_3	20050411	Product data sheet	-	PMEGXX10EJ_SER_2
PMEGXX10EJ_SER_2	20050131	Product data sheet	-	PMEGXX10EJ_SER_1
PMEGXX10EJ_SER_1	20040907	Objective data sheet	-	-

## 15. Legal information

### 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".
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