



# PMBD914

Single high-speed switching diode

Rev. 05 — 26 November 2007

Product data sheet

## 1. Product profile

### 1.1 General description

Single high-speed switching diode, fabricated in planar technology, and encapsulated in a SOT23 (TO-236AB) small Surface-Mounted Device (SMD) plastic package.

### 1.2 Features

- High switching speed:  $t_{rr} \leq 4$  ns
- Low leakage current
- Repetitive peak reverse voltage:  $V_{RRM} \leq 100$  V
- Low capacitance:  $C_d \leq 1.5$  pF
- Reverse voltage:  $V_R \leq 100$  V
- Small SMD plastic package

### 1.3 Applications

- High-speed switching

### 1.4 Quick reference data

Table 1. Quick reference data

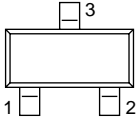
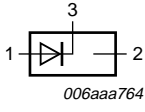
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_F$	forward current		[1] -	-	215	mA
$V_R$	reverse voltage		-	-	100	V
$t_{rr}$	reverse recovery time		[2] -	-	4	ns

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

[2] When switched from  $I_F = 10$  mA to  $I_R = 10$  mA;  $R_L = 100$   $\Omega$ ; measured at  $I_R = 1$  mA.

## 2. Pinning information

**Table 2. Pinning**

Pin	Description	Simplified outline	Symbol
1	anode		 006aaa764
2	not connected		
3	cathode		

## 3. Ordering information

**Table 3. Ordering information**

Type number	Package		Version
	Name	Description	
PMBD914	-	plastic surface-mounted package; 3 leads	SOT23

## 4. Marking

**Table 4. Marking codes**

Type number	Marking code <sup>[1]</sup>
PMBD914	*5D

- [1] \* = -: made in Hong Kong  
 \* = p: made in Hong Kong  
 \* = t: made in Malaysia  
 \* = W: made in China

## 5. Limiting values

**Table 5. Limiting values**

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

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{RRM}$	repetitive peak reverse voltage		-	100	V
$V_R$	reverse voltage		-	100	V
$I_F$	forward current		[1] -	215	mA
$I_{FRM}$	repetitive peak forward current		-	500	mA
$I_{FSM}$	non-repetitive peak forward current	square wave	[2]		
		$t_p = 1 \mu s$	-	4	A
		$t_p = 1 ms$	-	1	A
		$t_p = 1 s$	-	0.5	A

**Table 5. Limiting values ...continued**  
*In accordance with the Absolute Maximum Rating System (IEC 60134).*

Symbol	Parameter	Conditions	Min	Max	Unit
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$	[1][3] -	250	mW
$T_j$	junction temperature		-	150	°C
$T_{stg}$	storage temperature		-65	+150	°C

- [1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
- [2]  $T_j = 25\text{ °C}$  prior to surge.
- [3] Soldering point of cathode tab.

## 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] -	-	500	K/W
$R_{th(j-t)}$	thermal resistance from junction to tie-point		[2] -	-	330	K/W

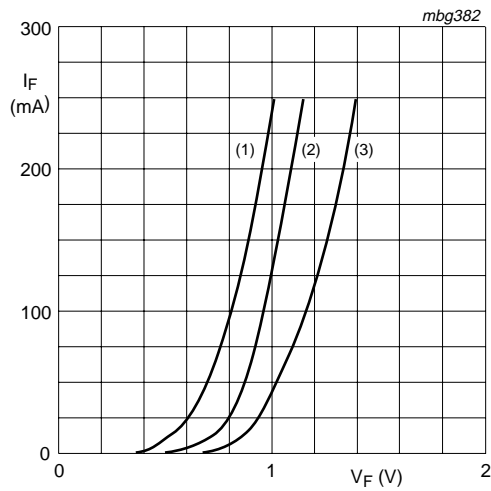
- [1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
- [2] Soldering point of cathode tab.

## 7. Characteristics

**Table 7. Characteristics**  
 *$T_{amb} = 25\text{ °C}$  unless otherwise specified.*

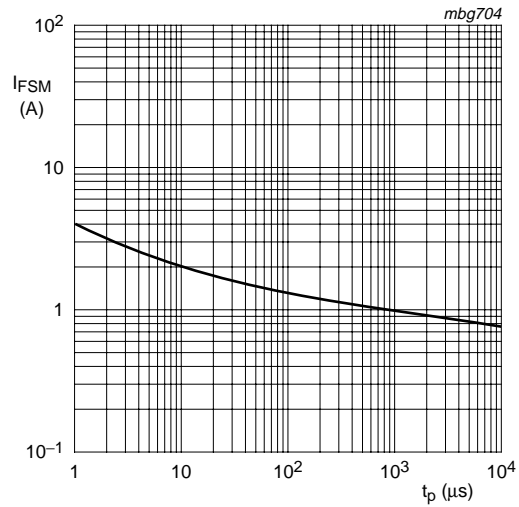
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_F$	forward voltage	$I_F = 1\text{ mA}$	-	-	715	mV
		$I_F = 10\text{ mA}$	-	-	855	mV
		$I_F = 50\text{ mA}$	-	-	1	V
		$I_F = 150\text{ mA}$	-	-	1.25	V
$I_R$	reverse current	$V_R = 25\text{ V}$	-	-	25	nA
		$V_R = 75\text{ V}$	-	-	1	µA
		$V_R = 25\text{ V}; T_j = 150\text{ °C}$	-	-	30	µA
		$V_R = 75\text{ V}; T_j = 150\text{ °C}$	-	-	50	µA
$C_d$	diode capacitance	$f = 1\text{ MHz}; V_R = 0\text{ V}$	-	-	1.5	pF
$t_{rr}$	reverse recovery time		[1] -	-	4	ns
$V_{FR}$	forward recovery voltage		[2] -	-	1.75	V

- [1] When switched from  $I_F = 10\text{ mA}$  to  $I_R = 10\text{ mA}$ ;  $R_L = 100\text{ }\Omega$ ; measured at  $I_R = 1\text{ mA}$ .
- [2] When switched from  $I_F = 10\text{ mA}$ ;  $t_r = 20\text{ ns}$ .



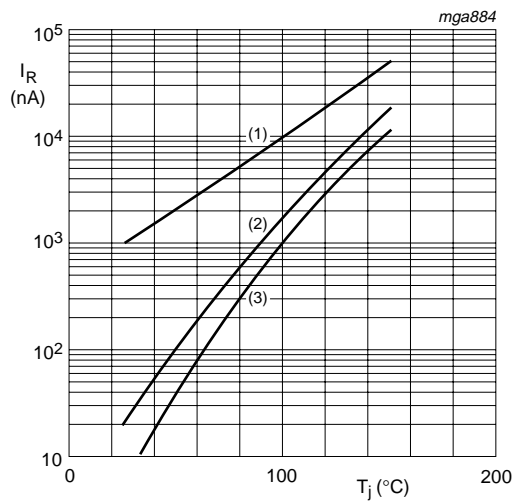
- (1)  $T_{amb} = 150\text{ }^\circ\text{C}$ ; typical values
- (2)  $T_{amb} = 25\text{ }^\circ\text{C}$ ; typical values
- (3)  $T_{amb} = 25\text{ }^\circ\text{C}$ ; maximum values

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



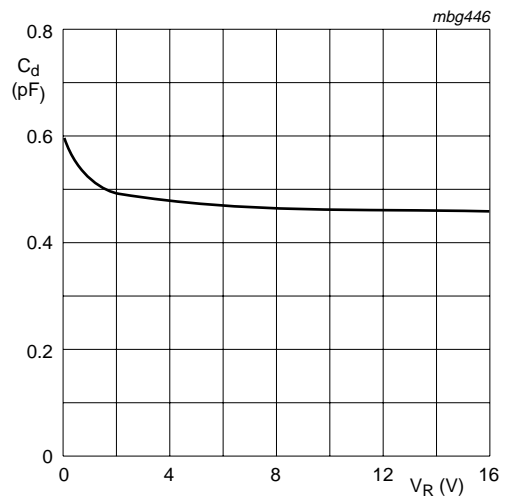
Based on square wave currents.  
 $T_j = 25\text{ }^\circ\text{C}$ ; prior to surge

**Fig 2. Non-repetitive peak forward current as a function of pulse duration; maximum values**



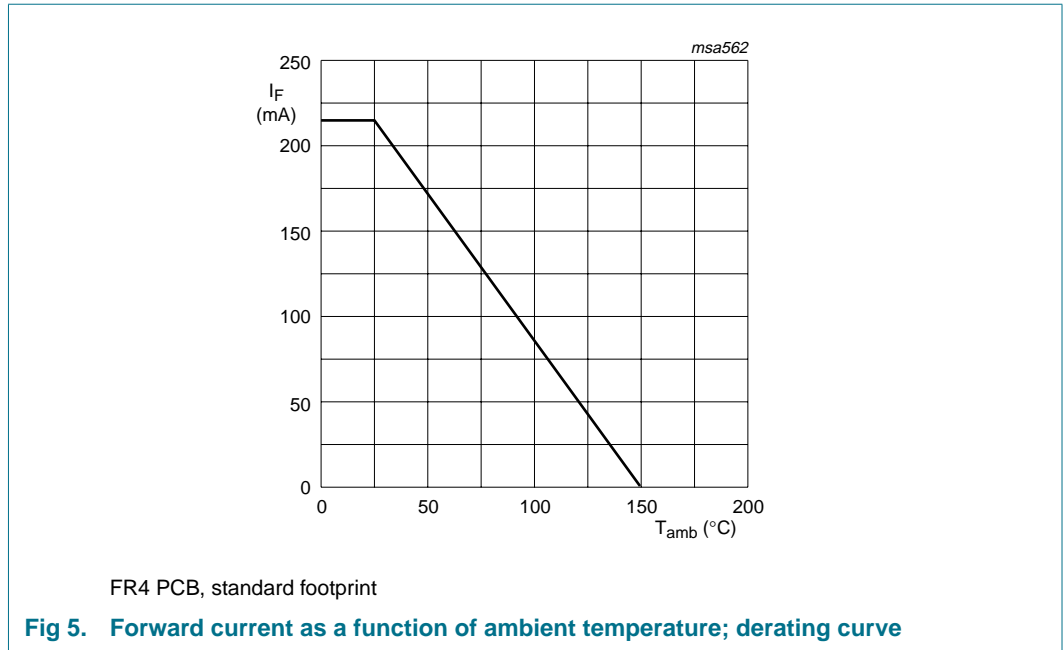
- (1)  $V_R = 75\text{ V}$ ; maximum values
- (2)  $V_R = 75\text{ V}$ ; typical values
- (3)  $V_R = 25\text{ V}$ ; typical values

**Fig 3. Reverse current as a function of junction temperature**

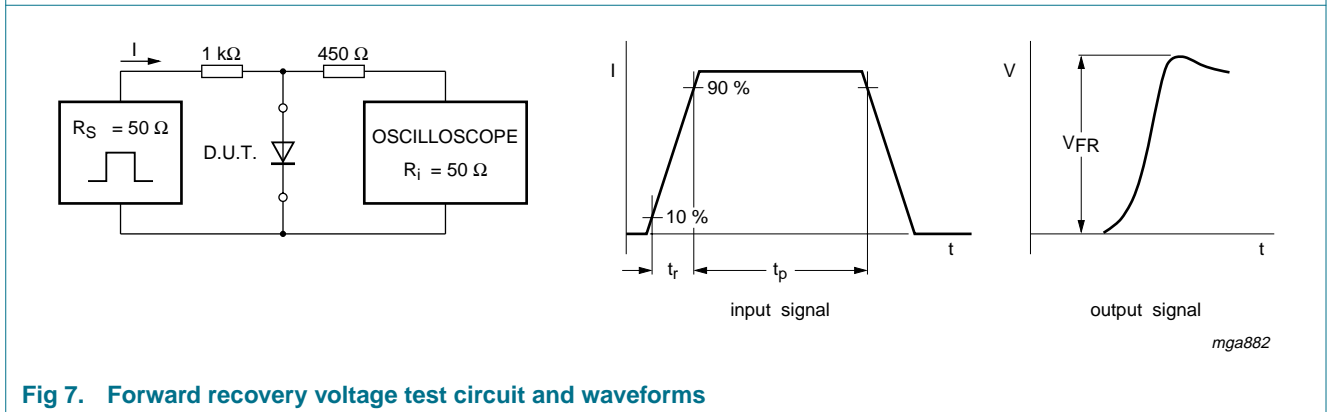
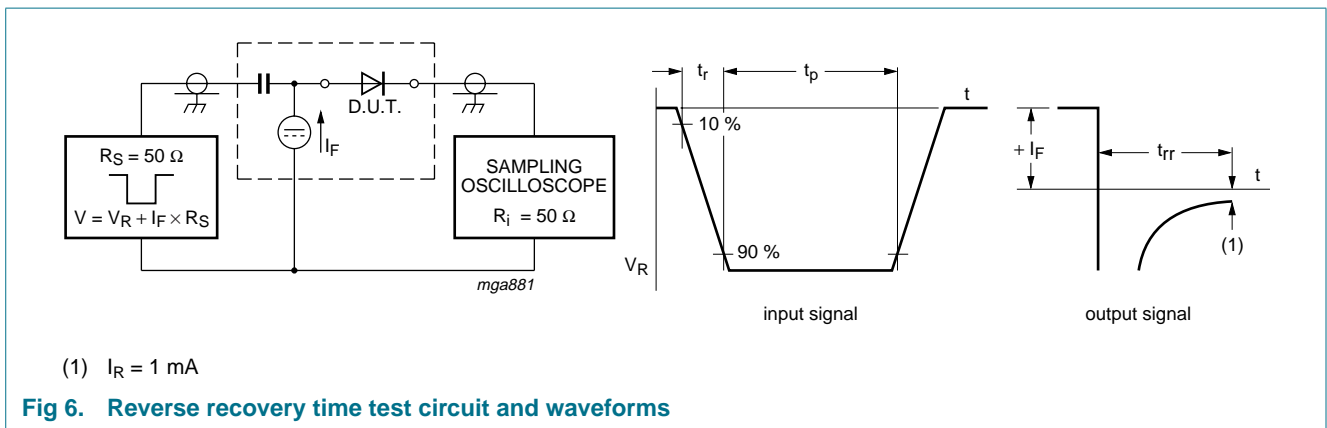


$f = 1\text{ MHz}$ ;  $T_{amb} = 25\text{ }^\circ\text{C}$

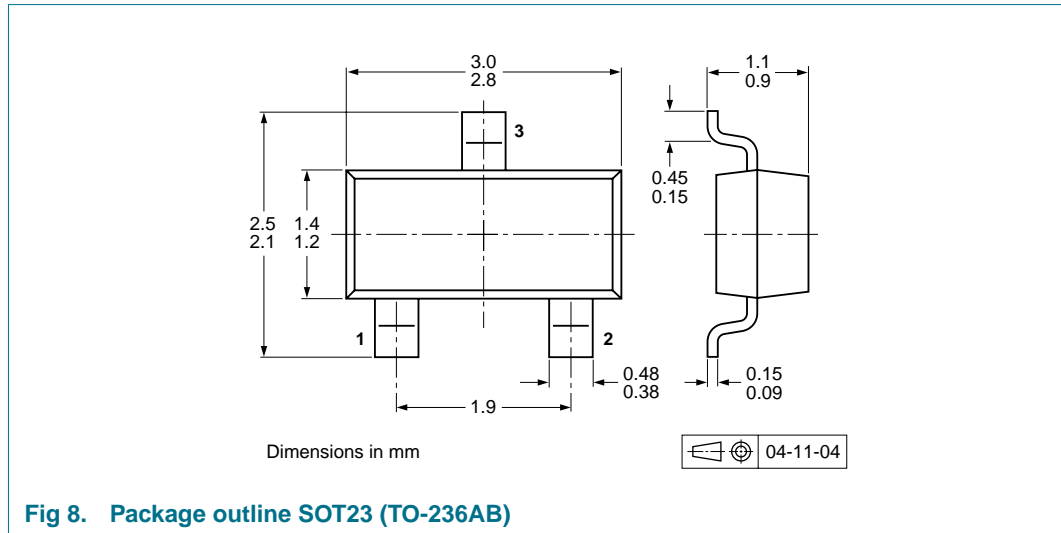
**Fig 4. Diode capacitance as a function of reverse voltage; typical values**



### 8. Test information



## 9. Package outline



## 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
PMBD914	SOT23	4 mm pitch, 8 mm tape and reel	-215	-235

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

### 11. Soldering

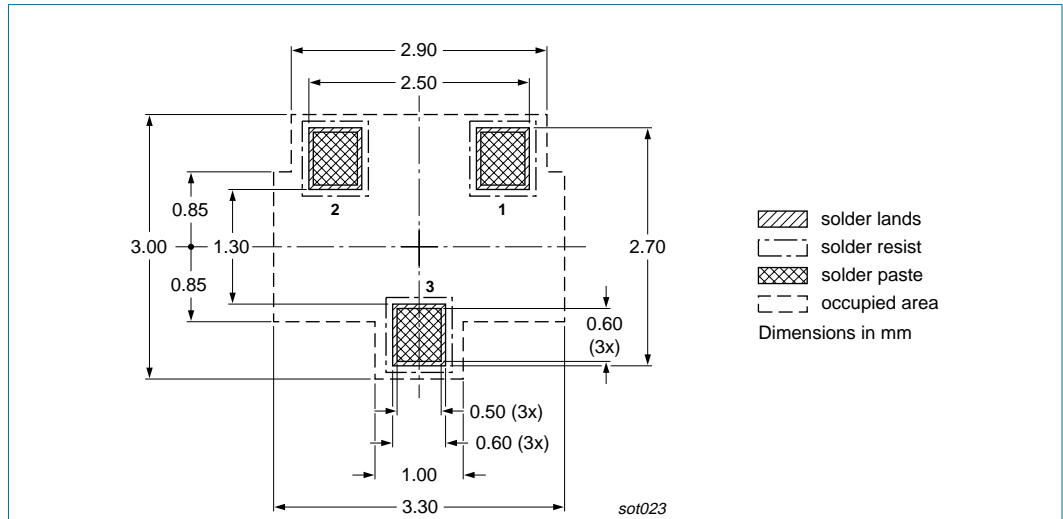


Fig 9. Reflow soldering footprint SOT23 (TO-236AB)

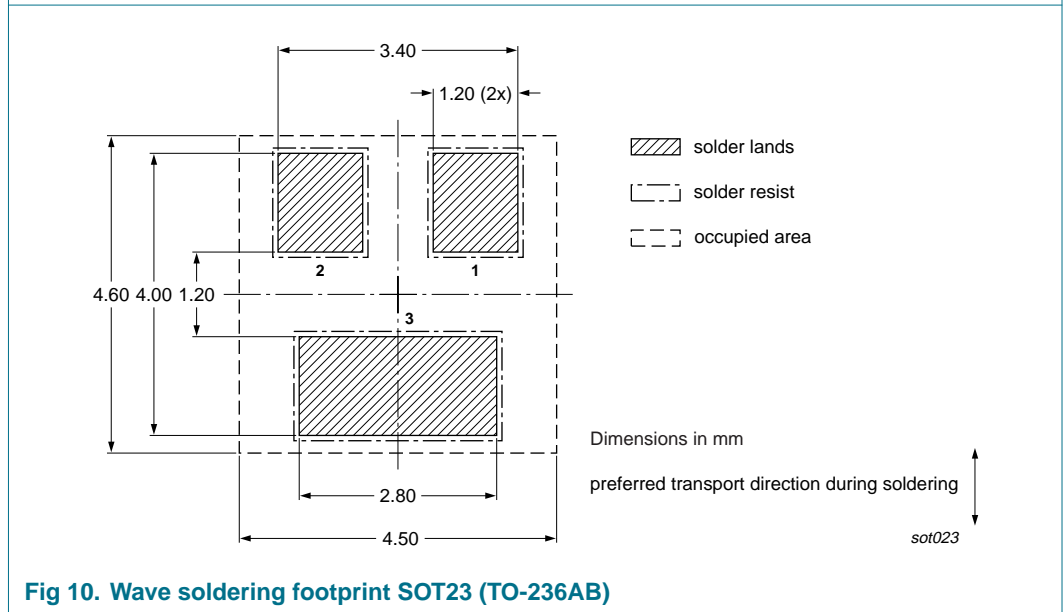


Fig 10. Wave soldering footprint SOT23 (TO-236AB)

## 12. Revision history

**Table 9.** Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PMBD914_5	20071126	Product data sheet	-	PMBD914_4
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 1.2 “Features”</a>: <math>V_{RRM}</math> maximum value changed from 85 V to 100 V</li> <li>• <a href="#">Section 1.2 “Features”</a>: <math>V_R</math> maximum value changed from 70 V to 100 V</li> <li>• <a href="#">Table 1 “Quick reference data”</a>: added</li> <li>• <a href="#">Table 5 “Limiting values”</a>: <math>V_{RRM}</math> maximum value changed from 85 V to 100 V</li> <li>• <a href="#">Table 5 “Limiting values”</a>: <math>V_R</math> maximum value changed from 70 V to 100 V</li> <li>• <a href="#">Figure 6</a>: figure title amended</li> <li>• <a href="#">Figure 8</a>: superseded by minimized package outline drawing</li> <li>• <a href="#">Section 10 “Packing information”</a>: added</li> <li>• <a href="#">Section 11 “Soldering”</a>: added</li> <li>• <a href="#">Section 13 “Legal information”</a>: updated</li> </ul>		
PMBD914_4	20040106	Product specification	-	PMBD914_3
PMBD914_3	19990511	Product specification	-	PMBD914_2
PMBD914_2	19960918	Product specification	-	PMBD914_1
PMBD914_1	19960404	Product 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".

[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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