

PMBD914

Single high-speed switching diode

Rev. 06 — 11 February 2009

Product data sheet

1. Product profile

1.1 General description

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

Table 1. Product overview

Type number ^[1]	Package	
	NXP	JEDEC
PMBD914	SOT23	TO-236AB
PMBD914/DG		

[1] /DG: halogen-free

1.2 Features

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

1.3 Applications

- High-speed switching

1.4 Quick reference data

Table 2. Quick reference data

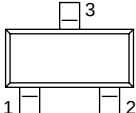
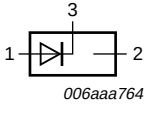
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_F	forward current	^[1]	-	-	215	mA
V_R	reverse voltage		-	-	100	V
t_{rr}	reverse recovery time	^[2]	-	-	4	ns

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

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

2. Pinning information

Table 3. Pinning

Pin	Description	Simplified outline	Graphic symbol
1	anode		
2	not connected		
3	cathode		

3. Ordering information

Table 4. Ordering information

Type number ^[1]	Package		
	Name	Description	Version
PMBD914	-	plastic surface-mounted package; 3 leads	SOT23
PMBD914/DG			

[1] /DG: halogen-free

4. Marking

Table 5. Marking codes

Type number	Marking code ^[1]
PMBD914	*5D
PMBD914/DG	YB*

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

5. Limiting values

Table 6. 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 6. 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 7. 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.

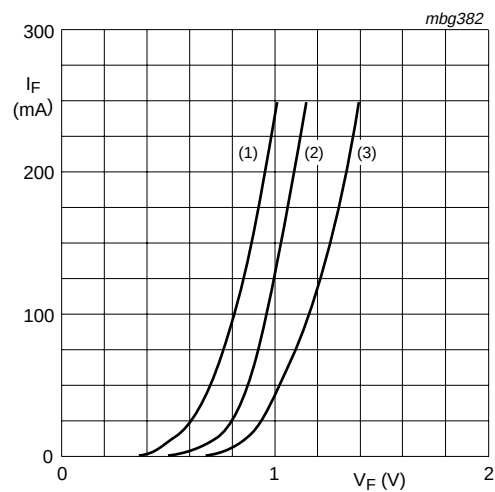
[2] Soldering point of cathode tab.

7. Characteristics

Table 8. Characteristics *$T_{amb} = 25\text{ °C}$ unless otherwise specified.*

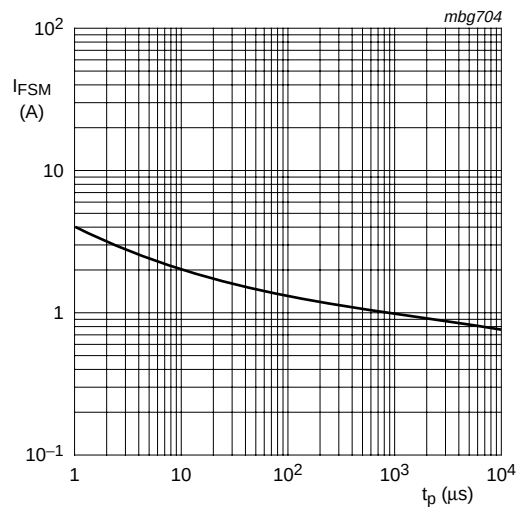
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_F	forward voltage	$I_F = 1\text{ mA}$	-	-	715	mV
		$I_F = 10\text{ mA}$	-	-	855	mV
		$I_F = 50\text{ mA}$	-	-	1	V
		$I_F = 150\text{ mA}$	-	-	1.25	V
I_R	reverse current	$V_R = 25\text{ V}$	-	-	25	nA
		$V_R = 75\text{ V}$	-	-	1	μA
		$V_R = 25\text{ V}; T_j = 150\text{ °C}$	-	-	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 $I_R = 10\text{ mA}$; $R_L = 100\text{ Ω}$; measured at $I_R = 1\text{ mA}$.[2] When switched from $I_F = 10\text{ mA}$; $t_r = 20\text{ ns}$.



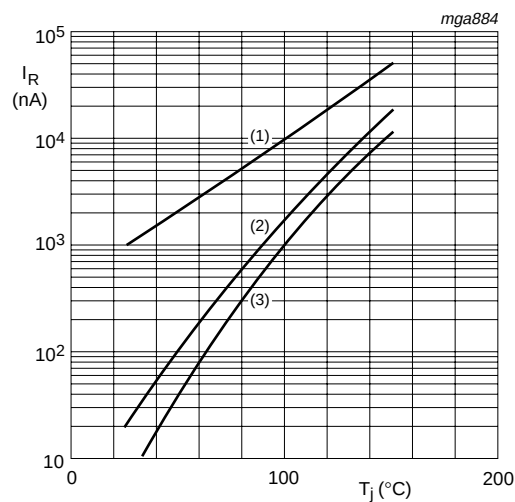
- (1) $T_{amb} = 150\text{ }^{\circ}\text{C}$; typical values
- (2) $T_{amb} = 25\text{ }^{\circ}\text{C}$; typical values
- (3) $T_{amb} = 25\text{ }^{\circ}\text{C}$; maximum values

Fig 1. Forward current as a function of forward voltage



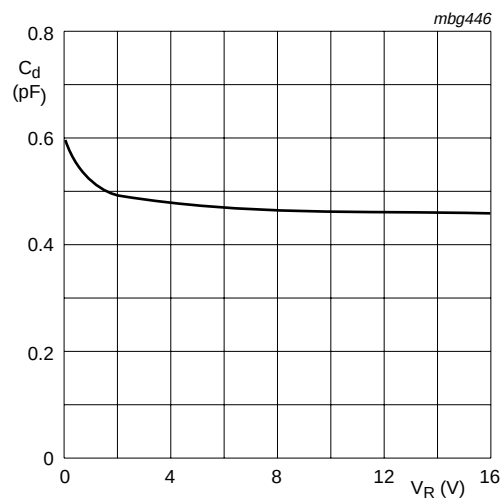
Based on square wave currents.
 $T_j = 25\text{ }^{\circ}\text{C}$; prior to surge

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



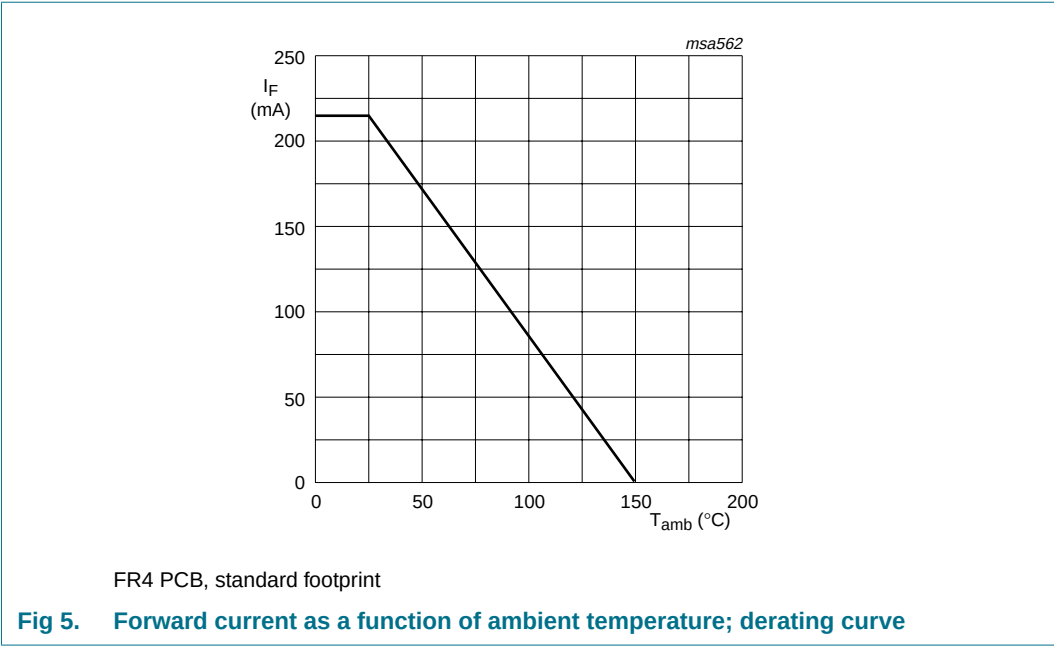
- (1) $V_R = 75\text{ V}$; maximum values
- (2) $V_R = 75\text{ V}$; typical values
- (3) $V_R = 25\text{ V}$; typical values

Fig 3. Reverse current as a function of junction temperature

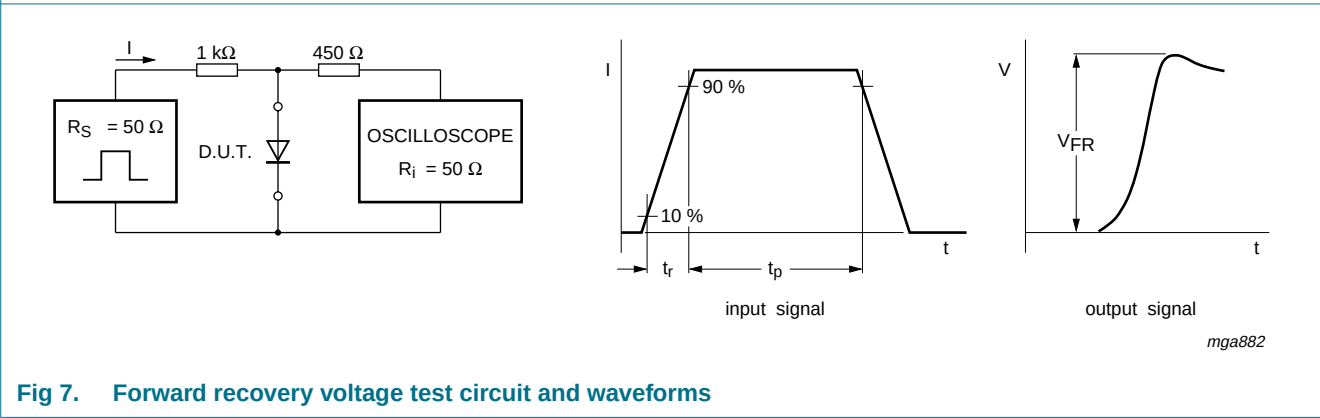
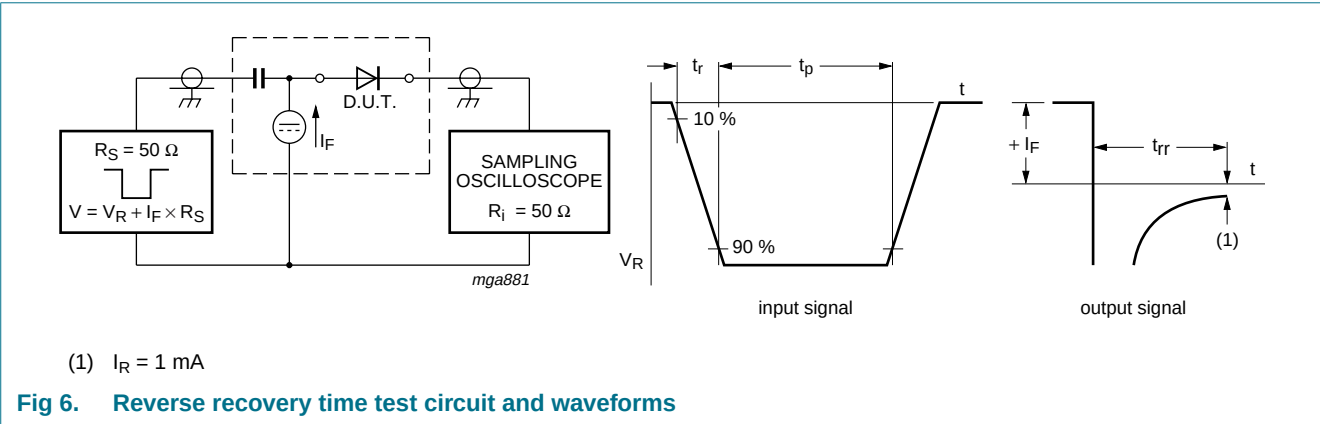


$f = 1\text{ MHz}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$

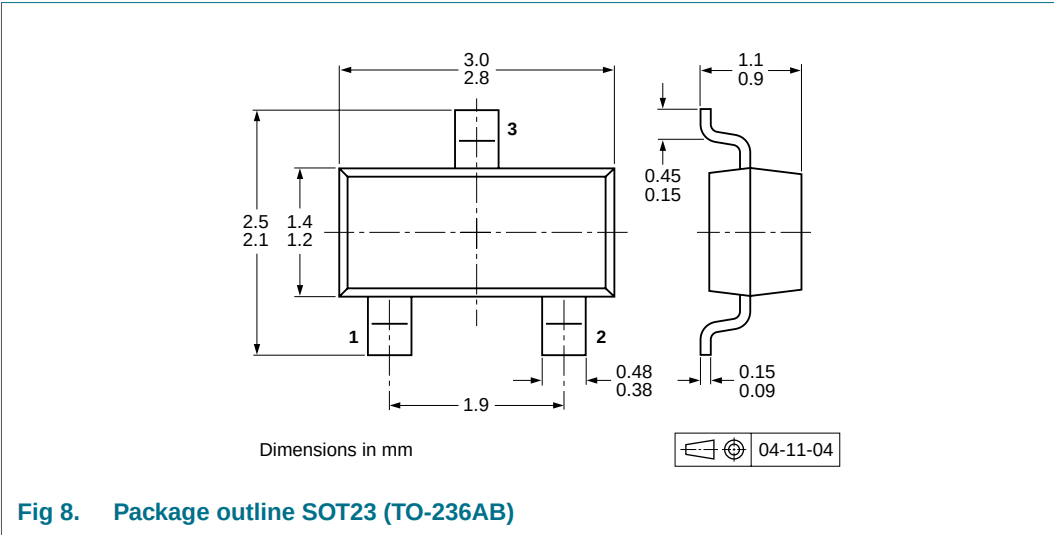
Fig 4. Diode capacitance as a function of reverse voltage; typical values



8. Test information



9. Package outline



10. Packing information

Table 9. Packing methods				
The indicated -xxx are the last three digits of the 12NC ordering code. ^[1]				
Type number ^[2]	Package	Description	Packing quantity	
			3000	10000
PMBD914	SOT23	4 mm pitch, 8 mm tape and reel	-215	-235
PMBD914/DG				

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

[2] /DG: halogen-free

11. Soldering

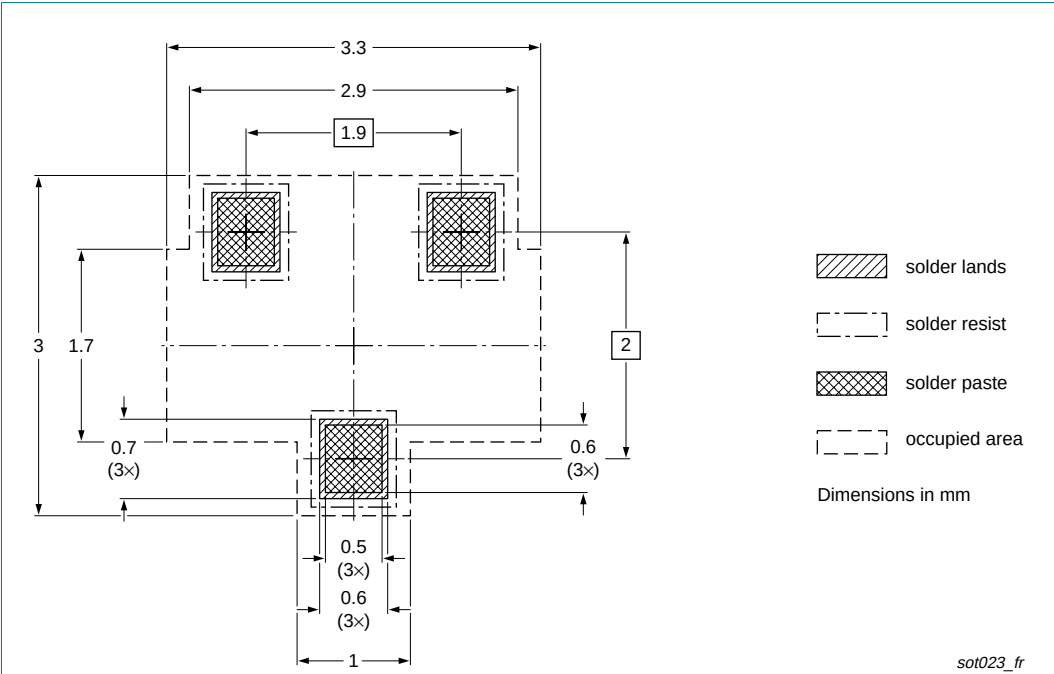


Fig 9. Reflow soldering footprint SOT23 (TO-236AB)

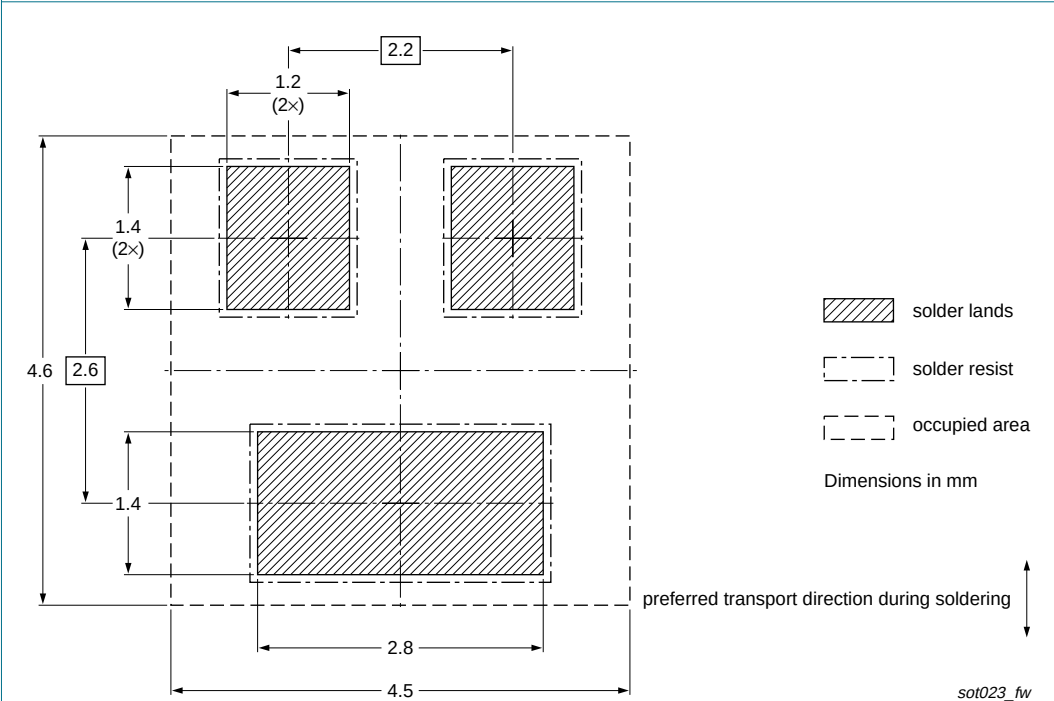


Fig 10. Wave soldering footprint SOT23 (TO-236AB)

12. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PMBD914_6	20090211	Product data sheet	-	PMBD914_5
Modifications:	- Type number PMBD914/DG added Section 13 "Legal information": updated			
PMBD914_5	20071126	Product data sheet	-	PMBD914_4
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 ^{[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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15. Contents

1	Product profile	1
1.1	General description.	1
1.2	Features	1
1.3	Applications	1
1.4	Quick reference data.	1
2	Pinning information	2
3	Ordering information	2
4	Marking	2
5	Limiting values	2
6	Thermal characteristics	3
7	Characteristics	3
8	Test information	5
9	Package outline	6
10	Packing information	6
11	Soldering	7
12	Revision history	8
13	Legal information	9
13.1	Data sheet status	9
13.2	Definitions.	9
13.3	Disclaimers	9
13.4	Trademarks.	9
14	Contact information	9
15	Contents	10

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