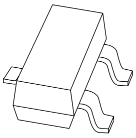


PMBD914

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: $t_{rr} \leq 4$ 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 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

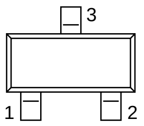
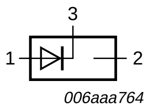
[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

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

founded by Philips

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 µs	-	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	$T_{amb} \leq 25$ °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] $T_j = 25$ °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

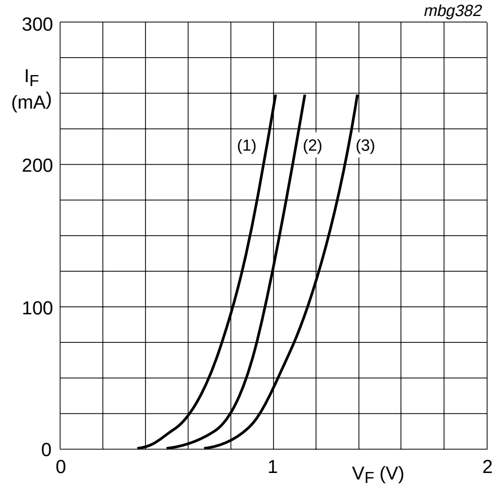
Table 8. Characteristics

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

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

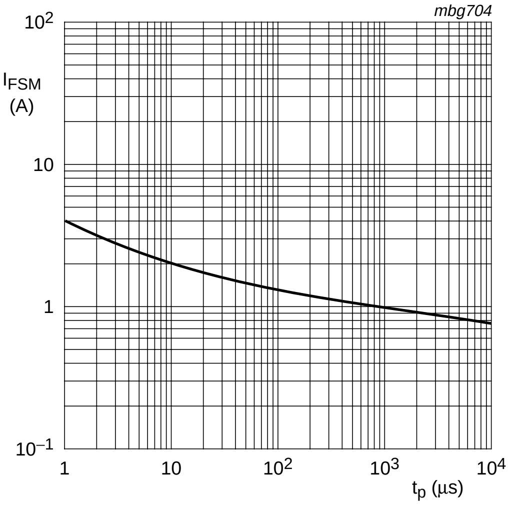
[1] When switched from $I_F = 10$ mA to $I_R = 10$ mA; $R_L = 100$ Ω; measured at $I_R = 1$ mA.

[2] When switched from $I_F = 10$ mA; $t_r = 20$ ns.



(1) T_{amb} = 150 °C; typical values
(2) T_{amb} = 25 °C; typical values
(3) T_{amb} = 25 °C; maximum values

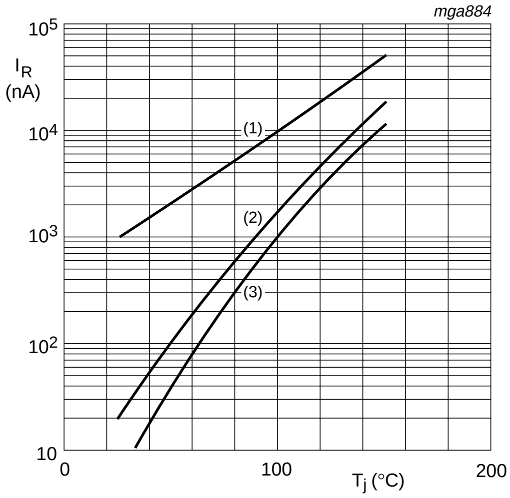
Fig 1. Forward current as a function of forward voltage



Based on square wave currents.

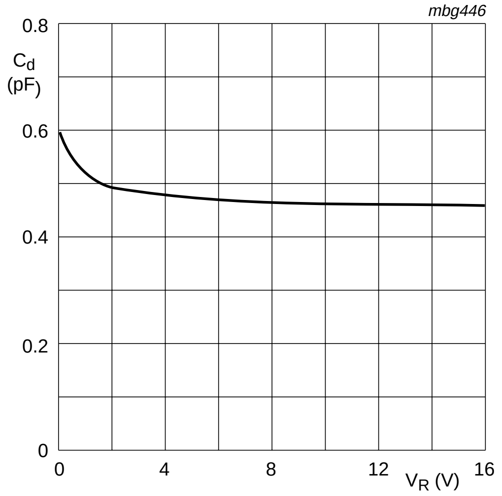
T_j = 25 °C; prior to surge

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



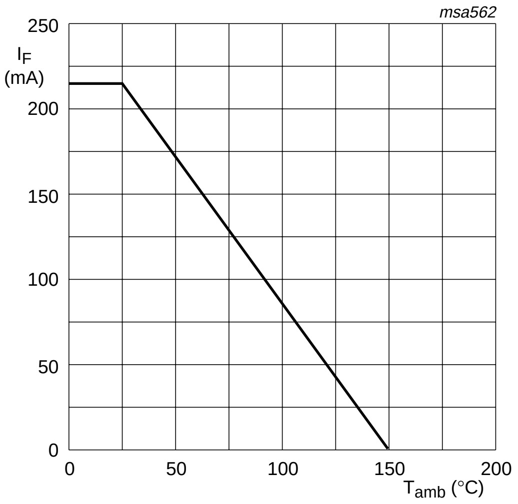
(1) V_R = 75 V; maximum values
(2) V_R = 75 V; typical values
(3) V_R = 25 V; typical values

Fig 3. Reverse current as a function of junction temperature



f = 1 MHz; T_{amb} = 25 °C

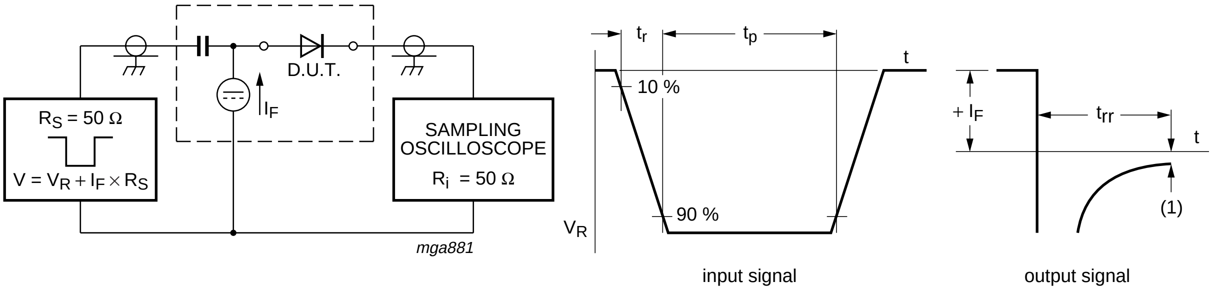
Fig 4. Diode capacitance as a function of reverse voltage; typical values



FR4 PCB, standard footprint

Fig 5. Forward current as a function of ambient temperature; derating curve

8. Test information



(1) $I_R = 1$ mA

Fig 6. Reverse recovery time test circuit and waveforms

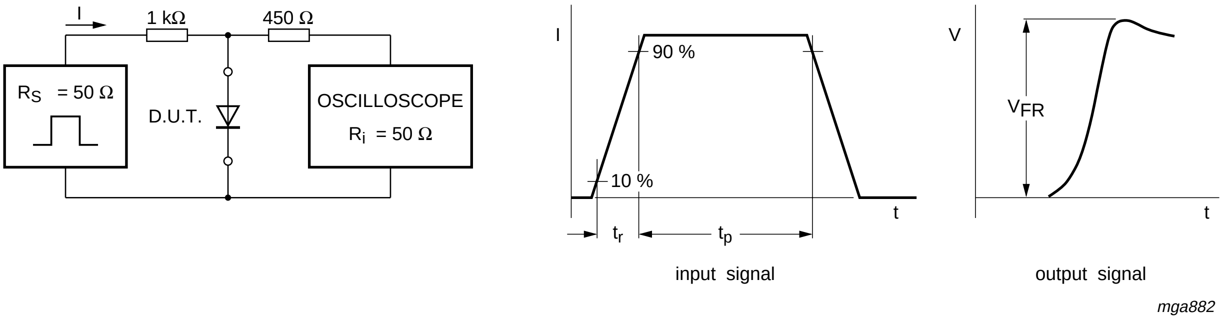


Fig 7. Forward recovery voltage test circuit and waveforms

9. Package outline

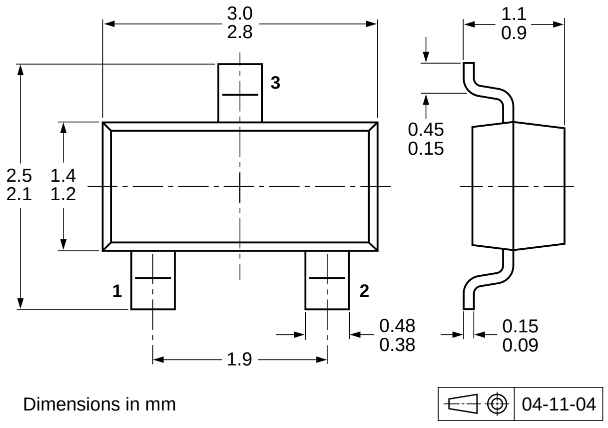


Fig 8. Package outline SOT23 (TO-236AB)

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

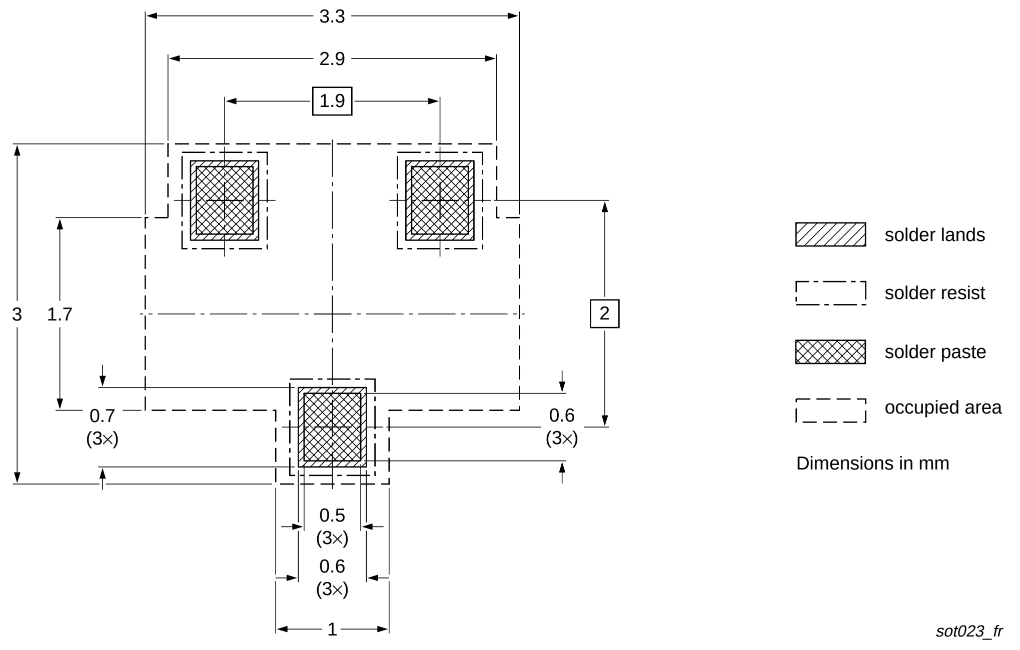


Fig 9. Reflow soldering footprint SOT23 (TO-236AB)

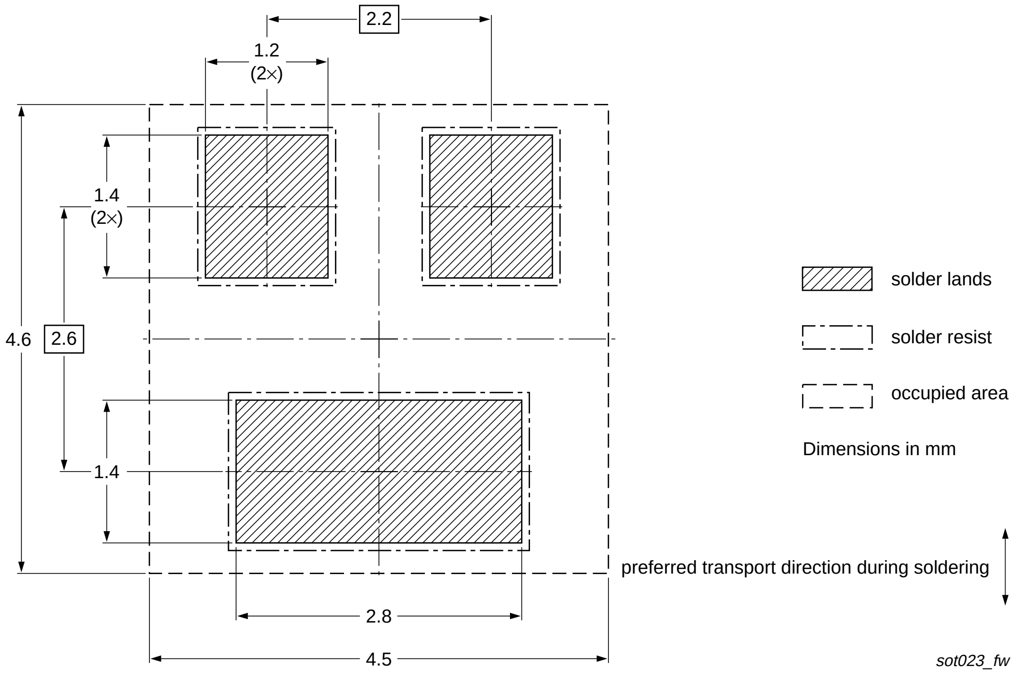


Fig 10. Wave soldering footprint SOT23 (TO-236AB)

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".

[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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Date of release: 11 February 2009
Document identifier: PMBD914_6