



# 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 <sup>[1]</sup>	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

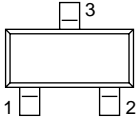
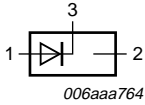
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_F$	forward current		<sup>[1]</sup> -	-	215	mA
$V_R$	reverse voltage		-	-	100	V
$t_{rr}$	reverse recovery time		<sup>[2]</sup> -	-	4	ns

[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 3. Pinning**

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

## 3. Ordering information

**Table 4. Ordering information**

Type number <sup>[1]</sup>	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 <sup>[1]</sup>
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		<sup>[1]</sup> -	215	mA
$I_{FRM}$	repetitive peak forward current		-	500	mA
$I_{FSM}$	non-repetitive peak forward current	square wave	<sup>[2]</sup>		
		$t_p = 1 \mu s$	-	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.

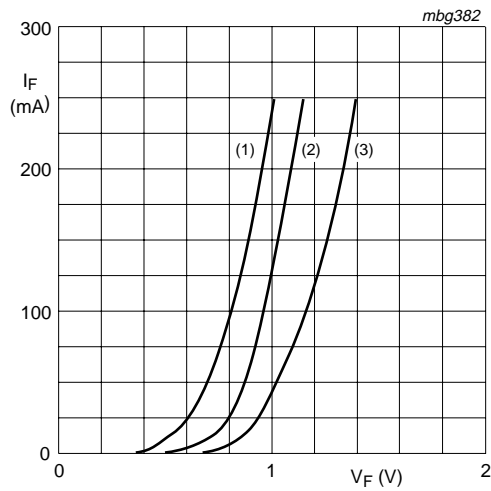
[2] Soldering point of cathode tab.

## 7. Characteristics

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

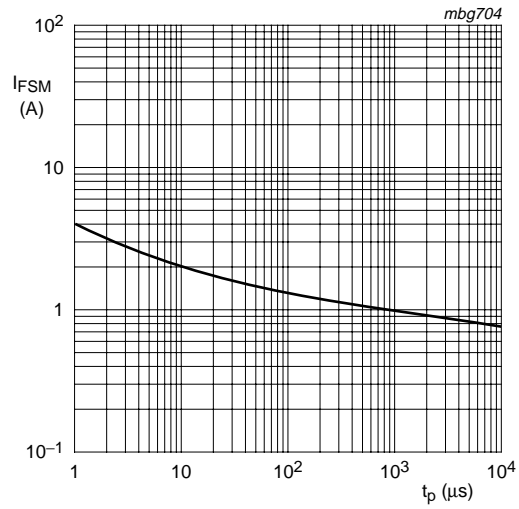
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_F$	forward voltage	$I_F = 1\text{ mA}$	-	-	715	mV
		$I_F = 10\text{ mA}$	-	-	855	mV
		$I_F = 50\text{ mA}$	-	-	1	V
		$I_F = 150\text{ mA}$	-	-	1.25	V
$I_R$	reverse current	$V_R = 25\text{ V}$	-	-	25	nA
		$V_R = 75\text{ V}$	-	-	1	μA
		$V_R = 25\text{ V};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



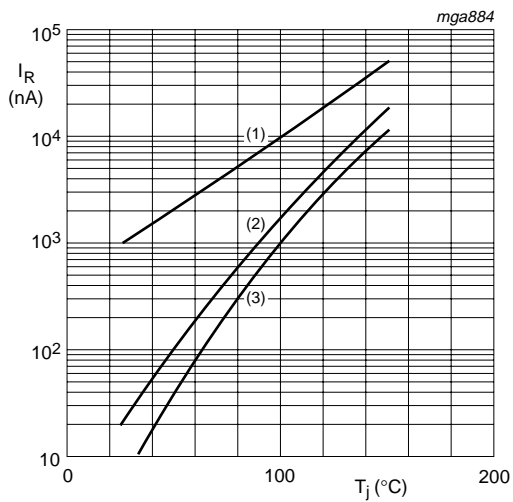
- (1)  $T_{amb} = 150\text{ }^\circ\text{C}$ ; typical values
- (2)  $T_{amb} = 25\text{ }^\circ\text{C}$ ; typical values
- (3)  $T_{amb} = 25\text{ }^\circ\text{C}$ ; maximum values

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



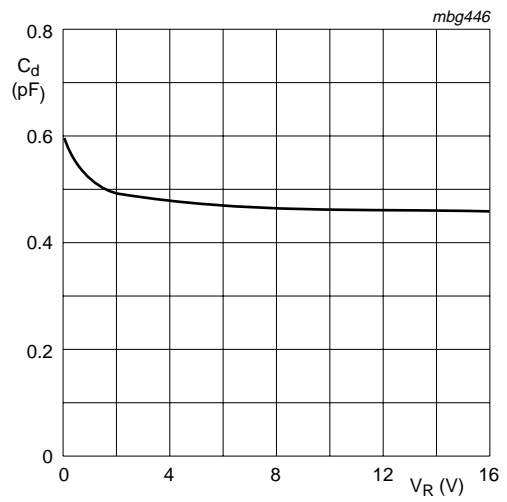
Based on square wave currents.  
 $T_j = 25\text{ }^\circ\text{C}$ ; prior to surge

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



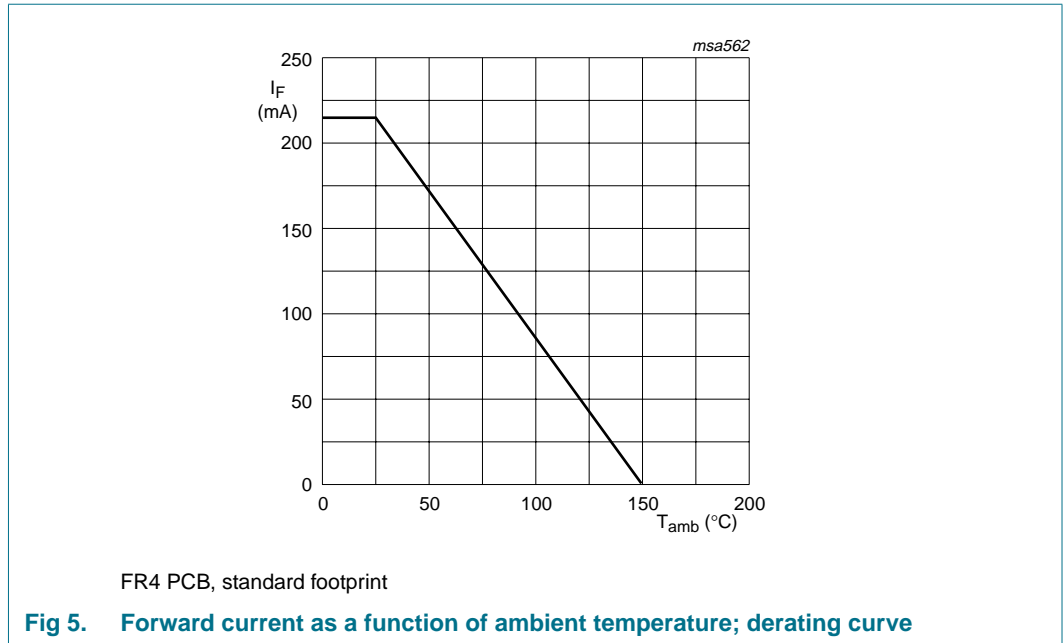
- (1)  $V_R = 75\text{ V}$ ; maximum values
- (2)  $V_R = 75\text{ V}$ ; typical values
- (3)  $V_R = 25\text{ V}$ ; typical values

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

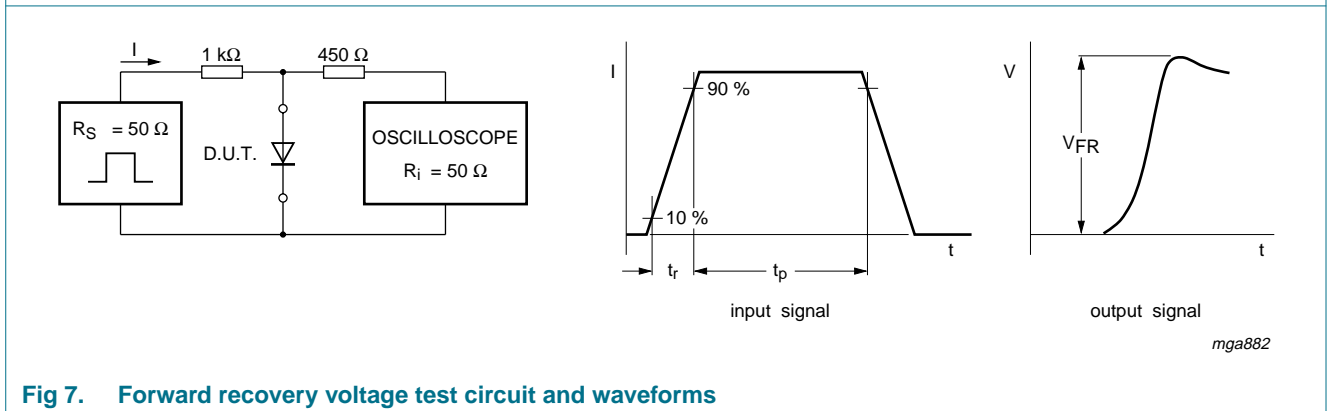
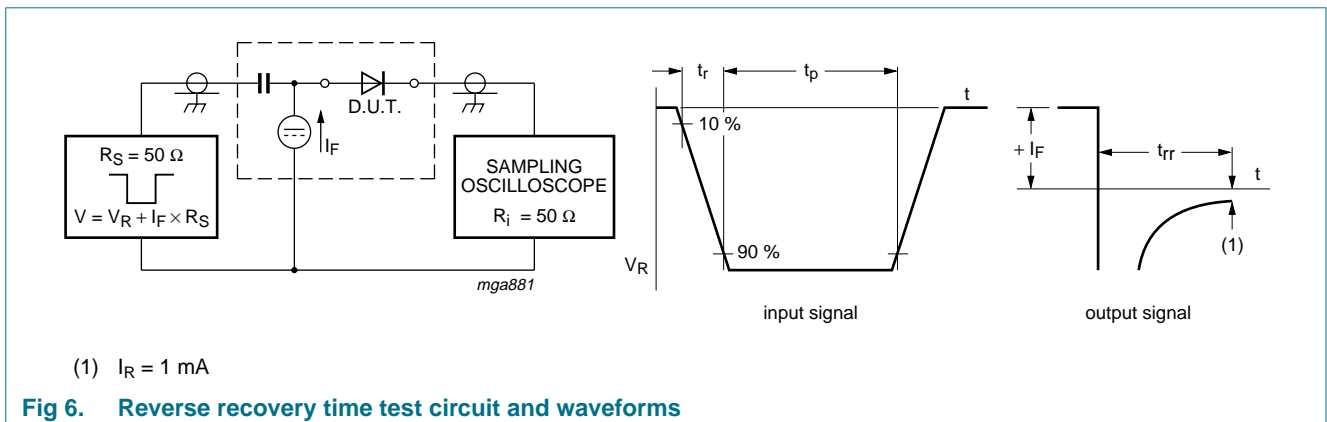


$f = 1\text{ MHz}$ ;  $T_{amb} = 25\text{ }^\circ\text{C}$

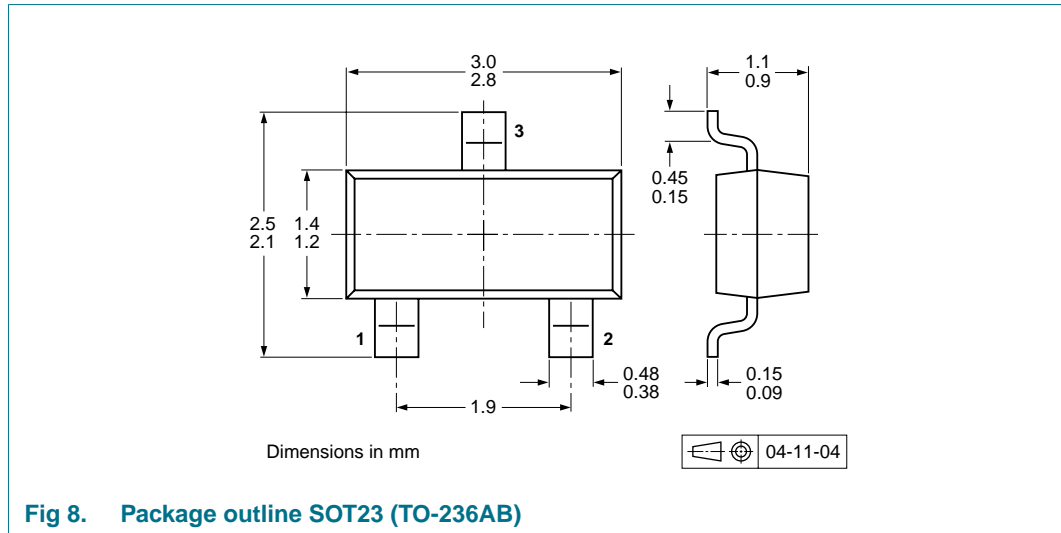
**Fig 4. Diode capacitance as a function of reverse voltage; typical values**



### 8. Test information



## 9. Package outline



## 10. Packing information

**Table 9. Packing methods**

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

Type number <sup>[2]</sup>	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

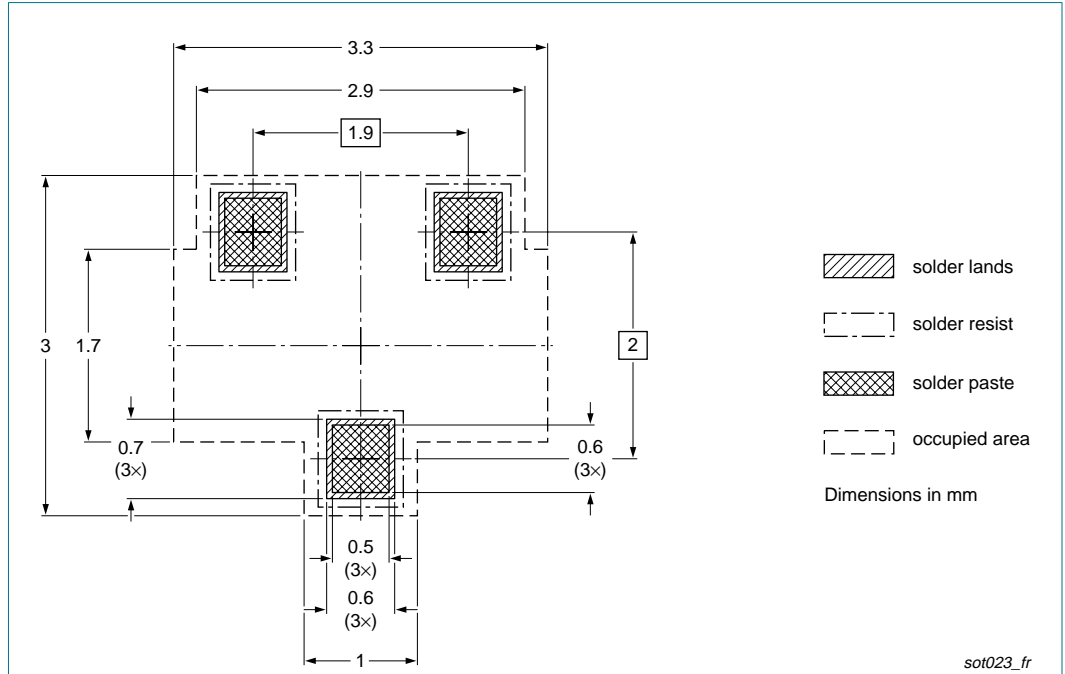


Fig 9. Reflow soldering footprint SOT23 (TO-236AB)

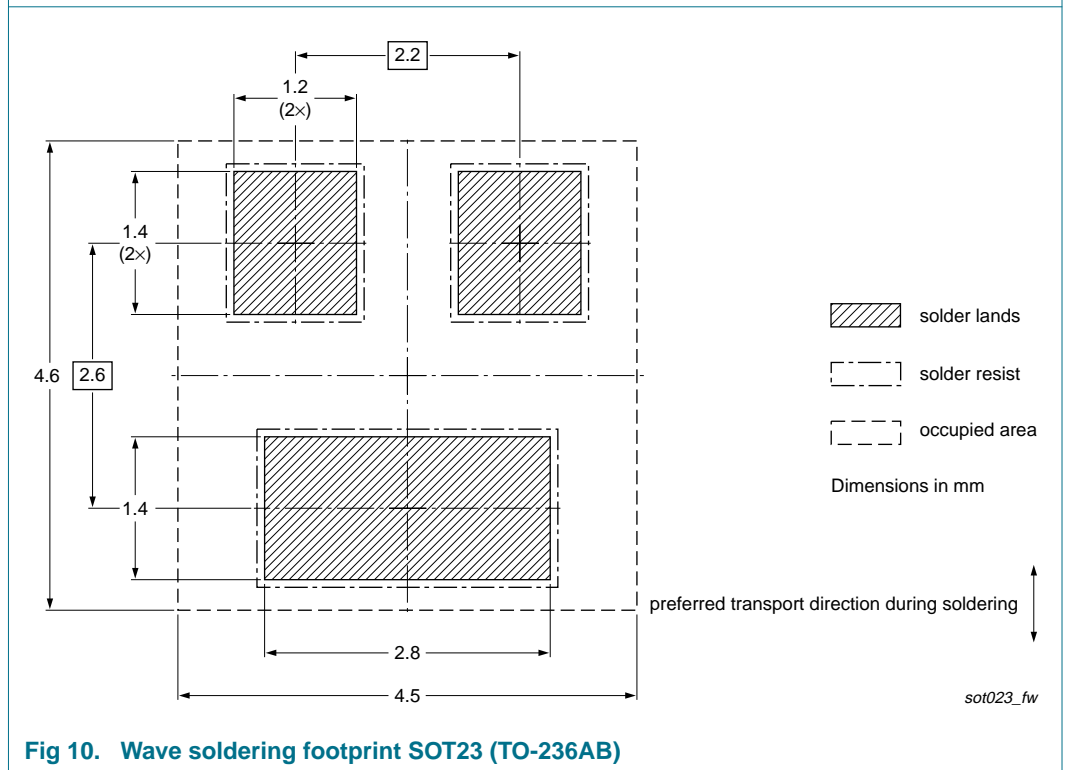


Fig 10. Wave soldering footprint SOT23 (TO-236AB)

## 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:	<ul style="list-style-type: none"><li>Type number PMBD914/DG added</li><li><a href="#">Section 13 "Legal information"</a>: updated</li></ul>			
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 <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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## 15. Contents

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

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