



# BAS28

## High-speed double diode

Rev. 3 — 22 July 2010

Product data sheet

## 1. Product profile

### 1.1 General description

Two high-speed switching diodes fabricated in planar technology, and encapsulated in a small SOT143B Surface-Mounted Device (SMD) plastic package. The diodes are not connected.

### 1.2 Features and benefits

- High switching speed:  $t_{rr} \leq 4$  ns
- Reverse voltage:  $V_R \leq 75$  V
- Repetitive peak reverse voltage:  $V_{RRM} \leq 85$  V
- Repetitive peak forward current:  $I_{FRM} \leq 500$  mA
- AEC-Q101 qualified
- Small SMD package

### 1.3 Applications

- High-speed switching in e.g. surface-mounted circuits

### 1.4 Quick reference data

Table 1. Quick reference data

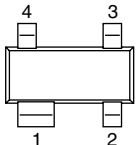
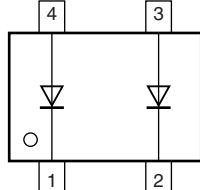
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per diode</b>						
$I_F$	forward current		[1] -	-	215	mA
$I_R$	reverse current	$V_R = 75$ V	-	-	1	$\mu$ A
$V_R$	reverse voltage		-	-	75	V
$t_{rr}$	reverse recovery time		[2] -	-	4	ns

[1] Device mounted on an FR4 Printed-Circuit Board (PCB).

[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	Graphic symbol
1	cathode (diode 1)		
2	cathode (diode 2)		
3	anode (diode 2)		
4	anode (diode 1)		

006aab100

## 3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAS28	-	plastic surface-mounted package; 4 leads	SOT143B

## 4. Marking

Table 4. Marking codes

Type number	Marking code <sup>[1]</sup>
BAS28	JT*

- [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
<b>Per diode</b>					
$V_{RRM}$	repetitive peak reverse voltage		-	85	V
$V_R$	reverse voltage		-	75	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	[3]		
		$t_p = 1 \mu\text{s}$	-	4	A
		$t_p = 1 \text{ms}$	-	1	A
		$t_p = 1 \text{s}$	-	0.5	A
<b>Per device</b>					
$P_{tot}$	total power dissipation	$T_{amb} = 25 \text{ }^\circ\text{C}$	[1][2]	250	mW
$T_j$	junction temperature		-	150	$^\circ\text{C}$
$T_{stg}$	storage temperature		-65	+150	$^\circ\text{C}$

[1] Device mounted on an FR4 PCB.

[2] One diode loaded.

[3]  $T_j = 25 \text{ }^\circ\text{C}$  prior to surge.

## 6. Thermal characteristics

**Table 6. Thermal characteristics**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per device; one diode loaded</b>						
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	500	K/W
$R_{th(j-t)}$	thermal resistance from junction to tie-point		-	-	360	K/W

[1] Device mounted on an FR4 PCB.

**7. Characteristics**

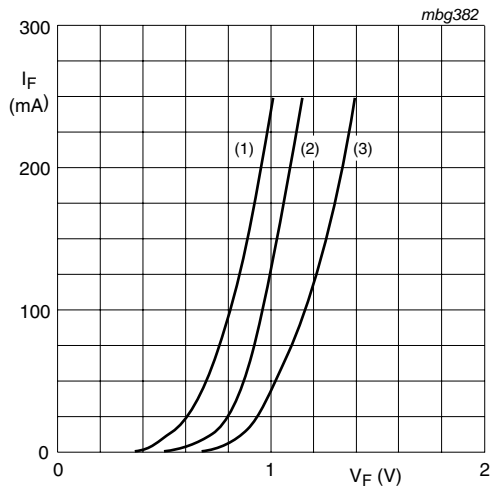
**Table 7. Characteristics**

$T_{amb} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per diode</b>						
$V_F$	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	$V_R = 25\text{ V}$	-	-	30	nA
		$V_R = 75\text{ V}$	-	-	1	$\mu\text{A}$
		$V_R = 25\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$	-	-	30	$\mu\text{A}$
		$V_R = 75\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$	-	-	50	$\mu\text{A}$
$C_d$	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

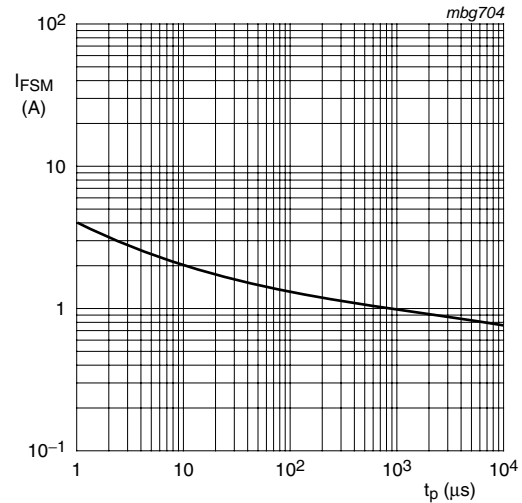
[1] When switched from  $I_F = 10\text{ mA}$  to  $I_R = 10\text{ mA}$ ;  $R_L = 100\ \Omega$ ; measured at  $I_R = 1\text{ mA}$ .

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



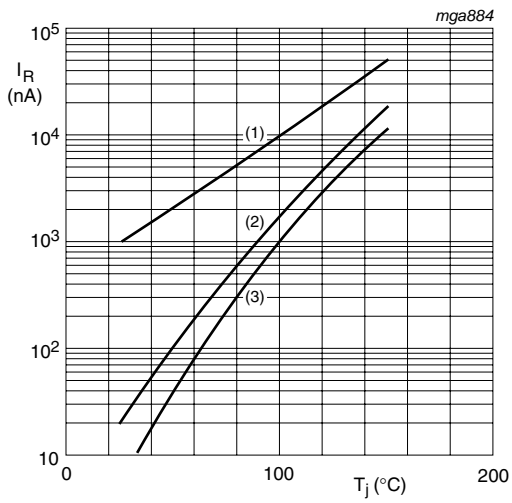
- (1)  $T_j = 150\text{ }^{\circ}\text{C}$ ; typical values
- (2)  $T_j = 25\text{ }^{\circ}\text{C}$ ; typical values
- (3)  $T_j = 25\text{ }^{\circ}\text{C}$ ; maximum values

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



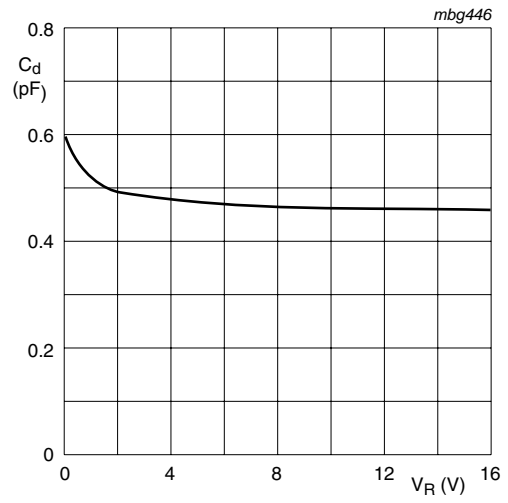
Based on square wave currents.  
 $T_j = 25\text{ }^{\circ}\text{C}$ ; prior to surge

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



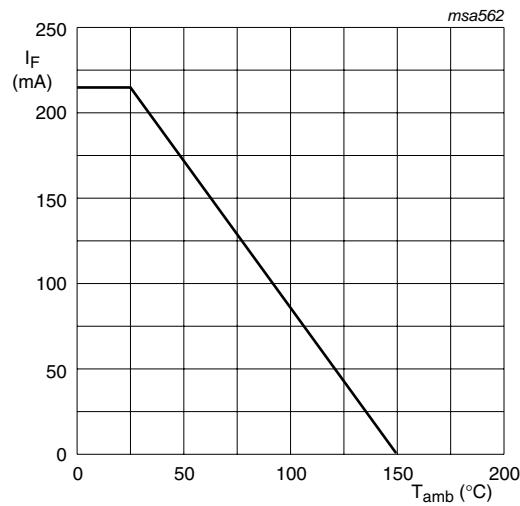
$V_R = V_{Rmax}$   
 (1)  $V_R = 75\text{ V}$ ; maximum values  
 (2)  $V_R = 75\text{ V}$ ; typical values  
 (3)  $V_R = 25\text{ V}$ ; typical values

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



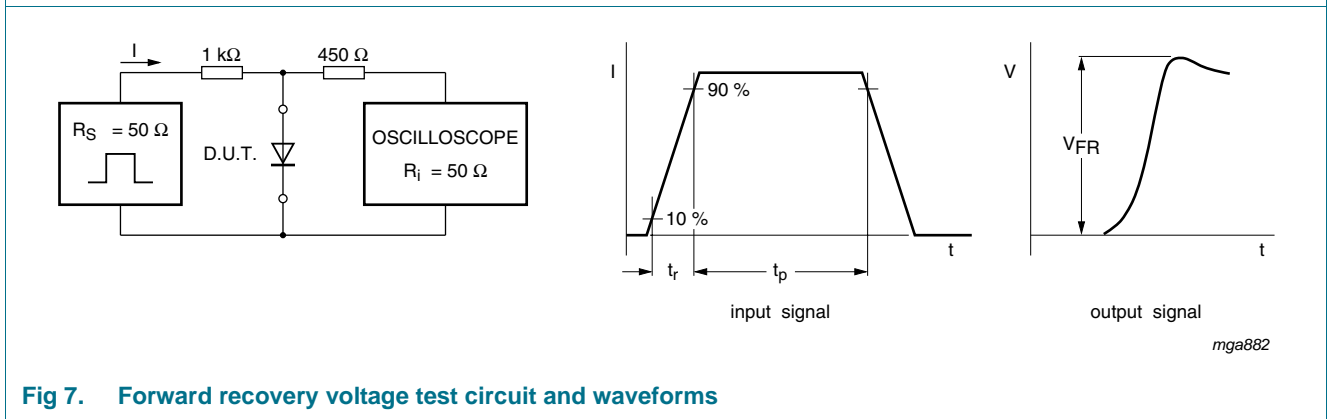
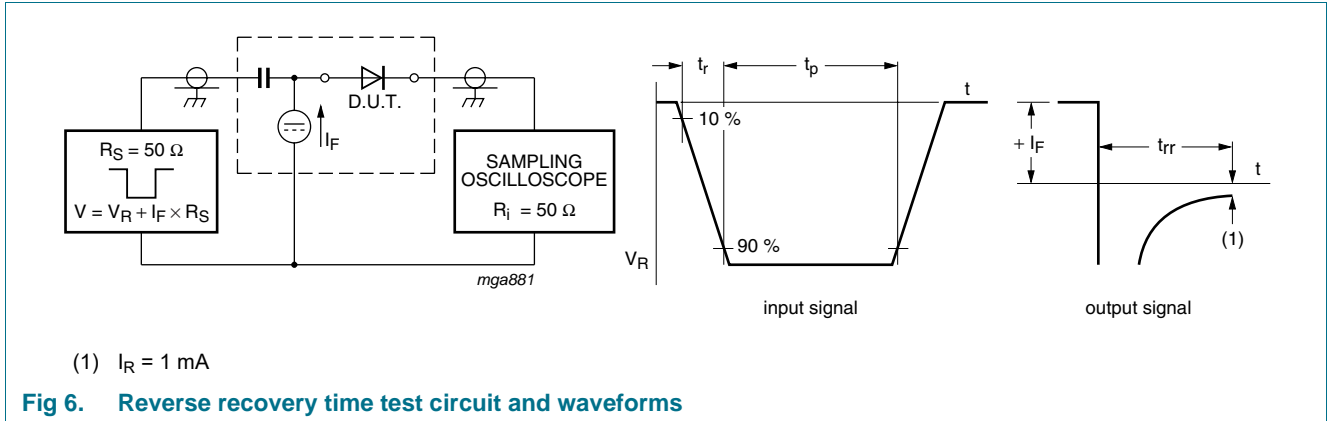
$f = 1\text{ MHz}$ ;  $T_j = 25\text{ °C}$

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



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

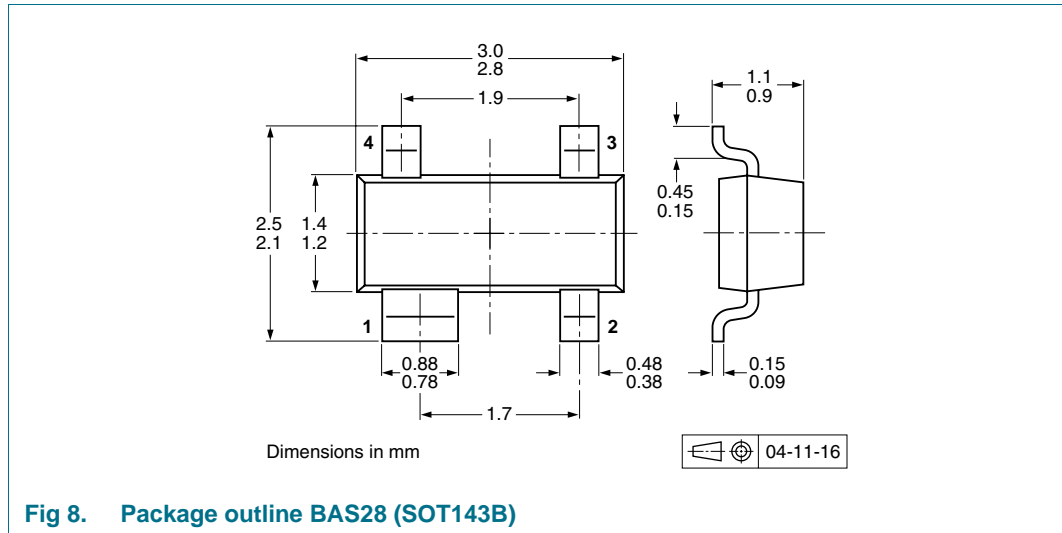
**8. Test information**



**8.1 Quality information**

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard *Q101 - Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

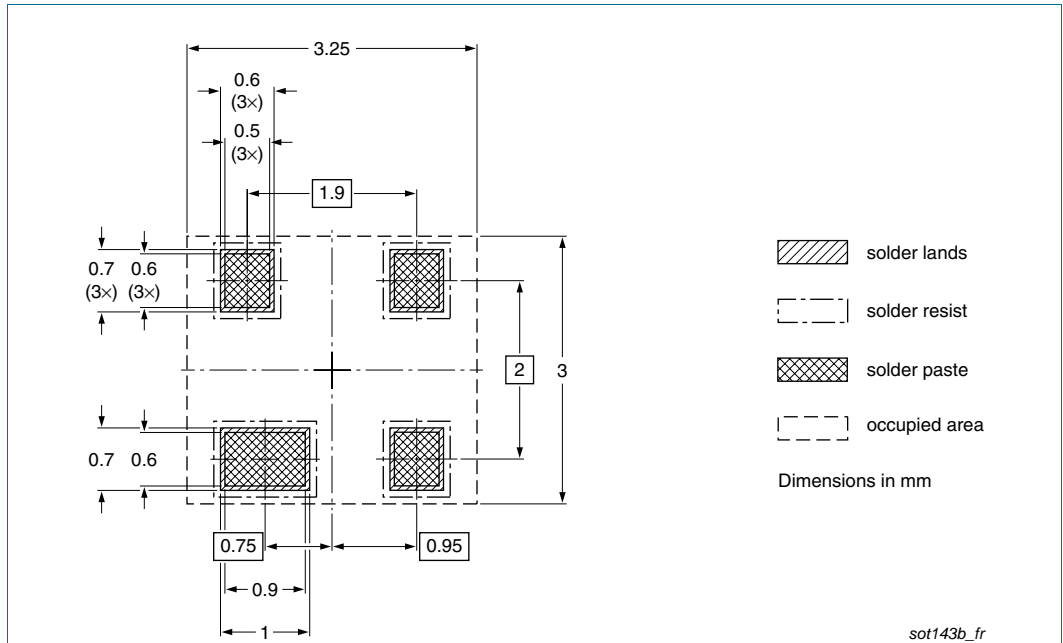
## 9. Package outline



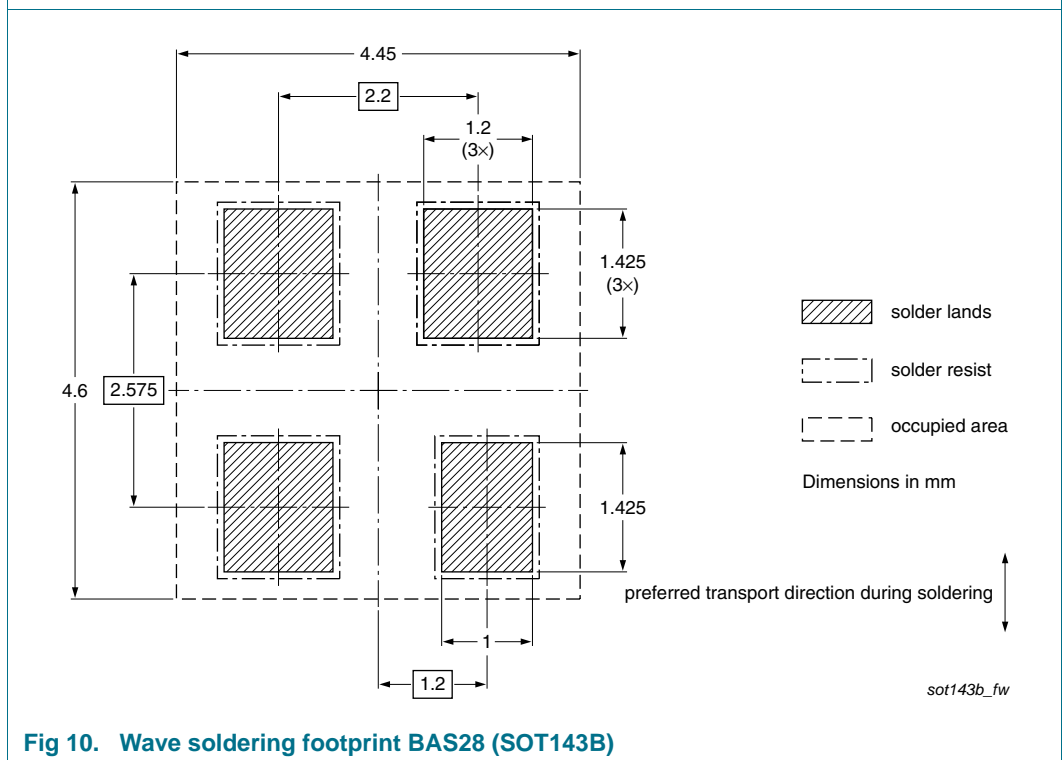
## 10. Packing information

Please refer to packing information on [www.nexperia.com](http://www.nexperia.com).

**11. Soldering**



**Fig 9. Reflow soldering footprint BAS28 (SOT143B)**



**Fig 10. Wave soldering footprint BAS28 (SOT143B)**



## 12. Revision history

**Table 9.** Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAS28 v.3	20100722	Product data sheet	-	BAS28_2
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 1.1 “General description”</a>: amended</li> <li>• <a href="#">Section 4 “Marking”</a>: updated</li> <li>• <a href="#">Table 1 “Quick reference data”</a>: added</li> <li>• <a href="#">Section 8 “Test information”</a>: added</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>			
BAS28_2	19960910	Product specification	-	BAS28_1
BAS28_1	19960403	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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