

# 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

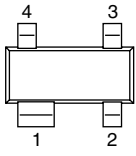
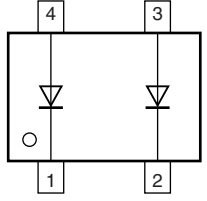
[1] Device mounted on an FR4 Printed-Circuit Board (PCB).

[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**

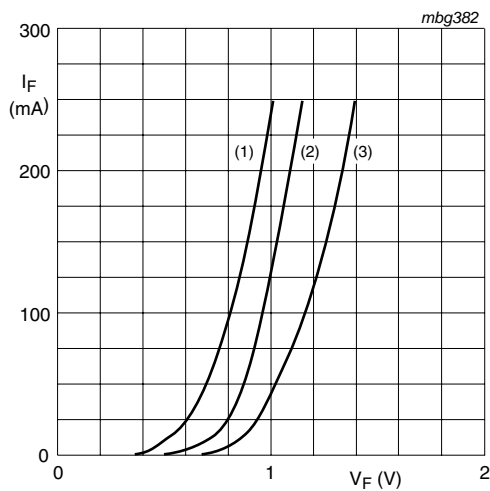
**Table 7. Characteristics**

*T<sub>amb</sub> = 25 °C unless otherwise specified.*

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per diode</b>						
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 1 mA	-	-	715	mV
		I <sub>F</sub> = 10 mA	-	-	855	mV
		I <sub>F</sub> = 50 mA	-	-	1	V
		I <sub>F</sub> = 150 mA	-	-	1.25	V
I <sub>R</sub>	reverse current	V <sub>R</sub> = 25 V	-	-	30	nA
		V <sub>R</sub> = 75 V	-	-	1	μA
		V <sub>R</sub> = 25 V; T <sub>j</sub> = 150 °C	-	-	30	μA
		V <sub>R</sub> = 75 V; T <sub>j</sub> = 150 °C	-	-	50	μA
C <sub>d</sub>	diode capacitance	f = 1 MHz; V <sub>R</sub> = 0 V	-	-	1.5	pF
t <sub>rr</sub>	reverse recovery time		[1]	-	4	ns
V <sub>FR</sub>	forward recovery voltage		[2]	-	1.75	V

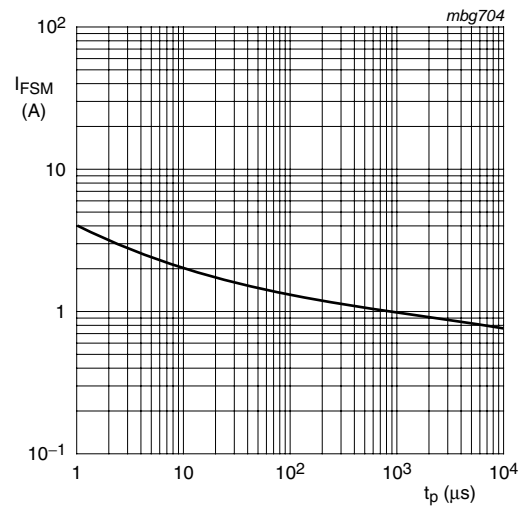
[1] When switched from I<sub>F</sub> = 10 mA to I<sub>R</sub> = 10 mA; R<sub>L</sub> = 100 Ω; measured at I<sub>R</sub> = 1 mA.

[2] When switched from I<sub>F</sub> = 10 mA; t<sub>r</sub> = 20 ns.



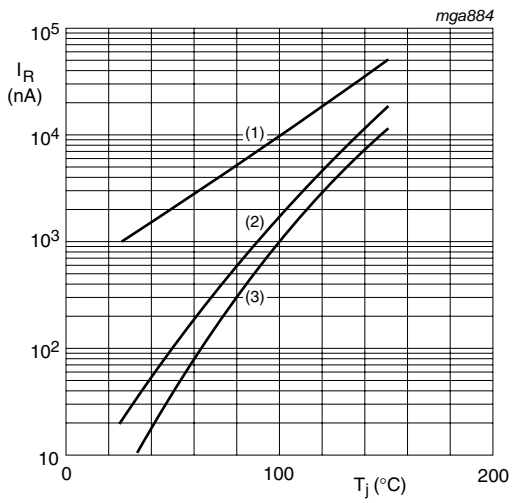
- (1) T<sub>j</sub> = 150 °C; typical values
- (2) T<sub>j</sub> = 25 °C; typical values
- (3) T<sub>j</sub> = 25 °C; maximum values

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



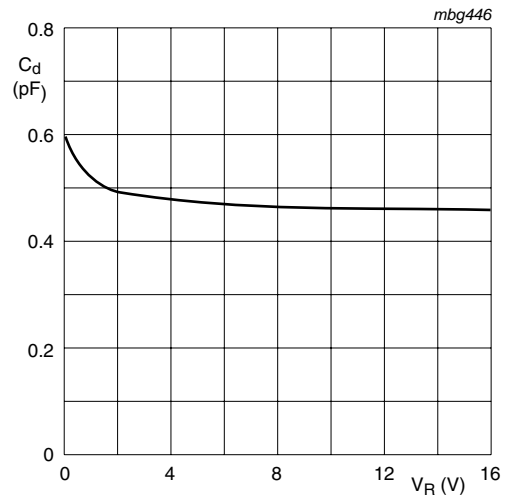
Based on square wave currents.  
T<sub>j</sub> = 25 °C; prior to surge

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



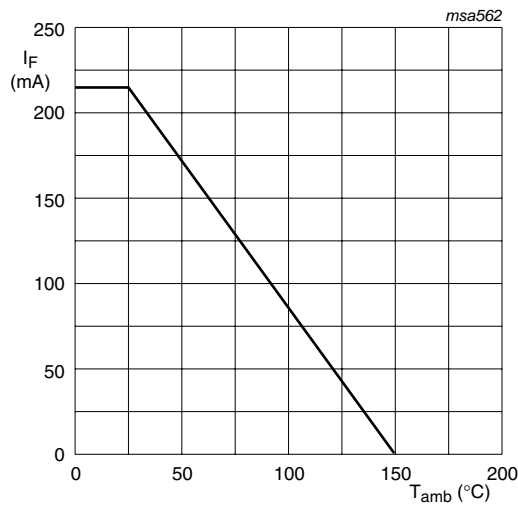
$V_R = V_{Rmax}$   
 (1)  $V_R = 75\text{ V}$ ; maximum values  
 (2)  $V_R = 75\text{ V}$ ; typical values  
 (3)  $V_R = 25\text{ V}$ ; typical values

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



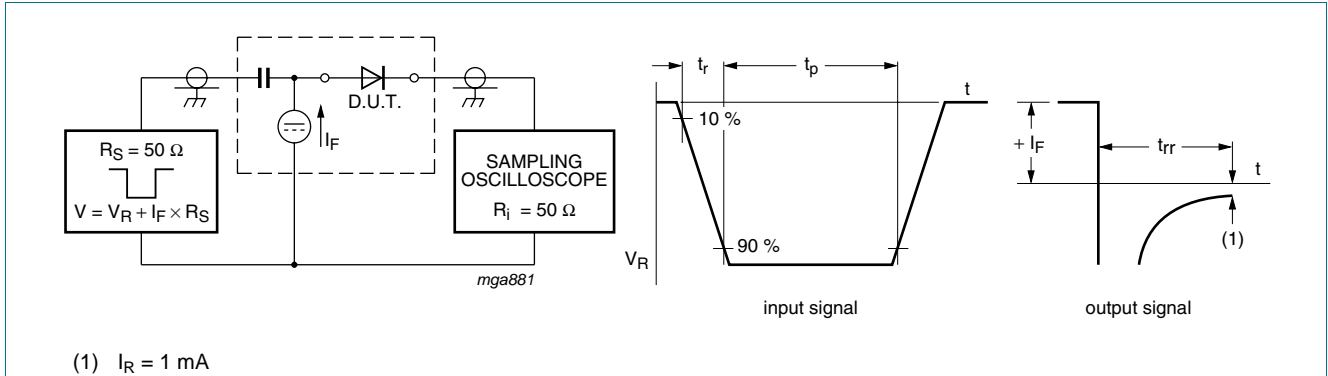
$f = 1\text{ MHz}$ ;  $T_j = 25\text{ °C}$

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

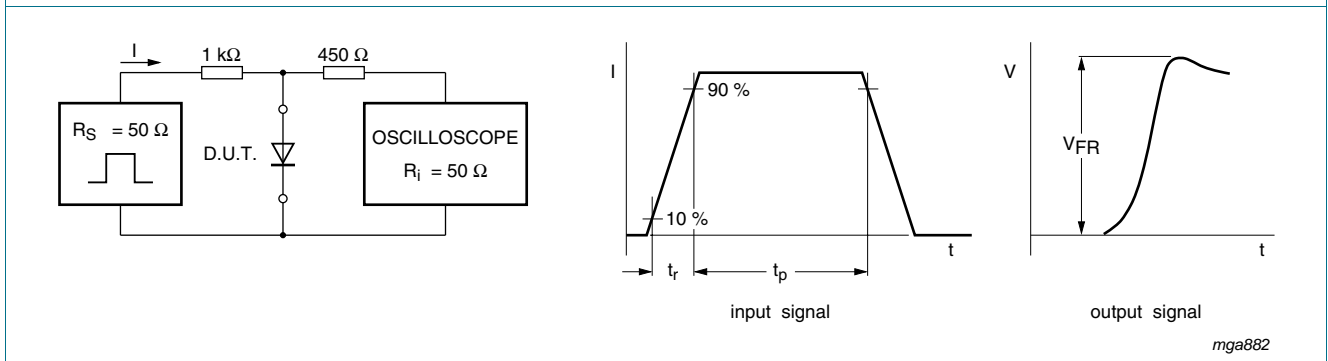


**Fig 5. Forward current as a function of ambient temperature; derating curve**

## 8. Test information



**Fig 6. Reverse recovery time test circuit and waveforms**

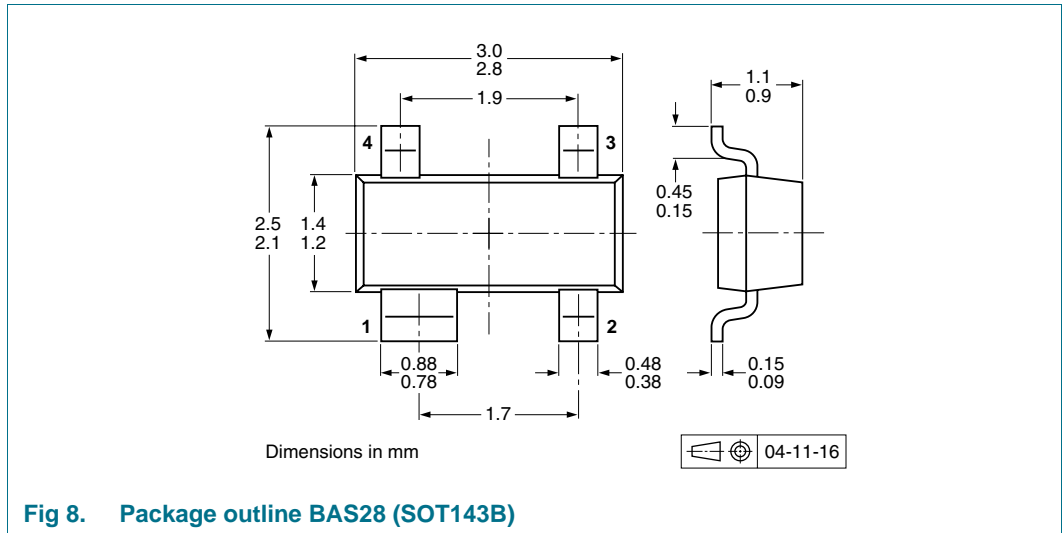


**Fig 7. Forward recovery voltage test circuit and waveforms**

### 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

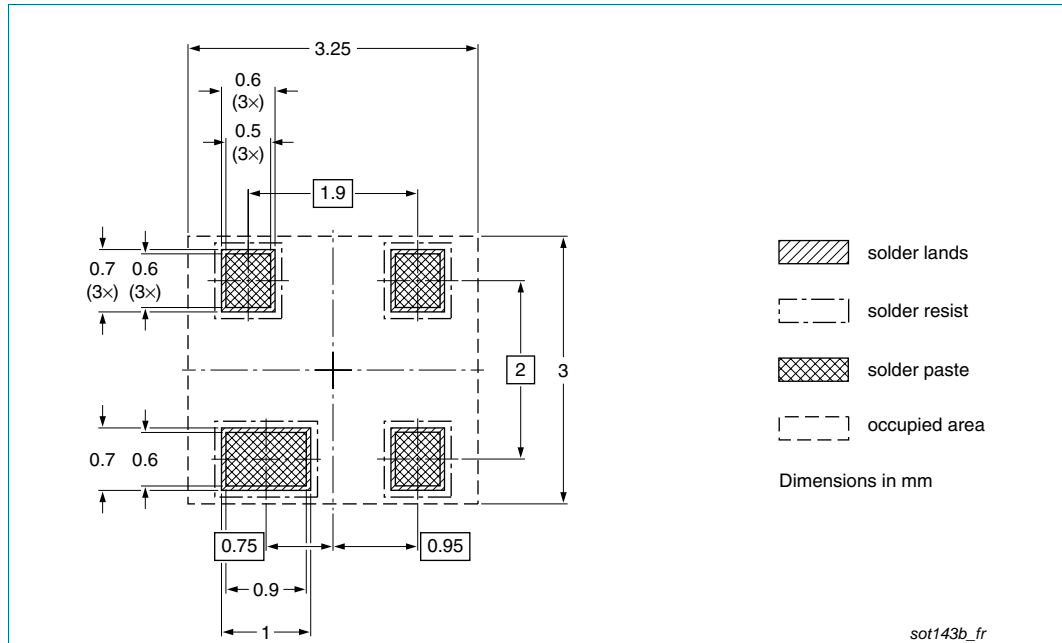
**Table 8. Packing methods**

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

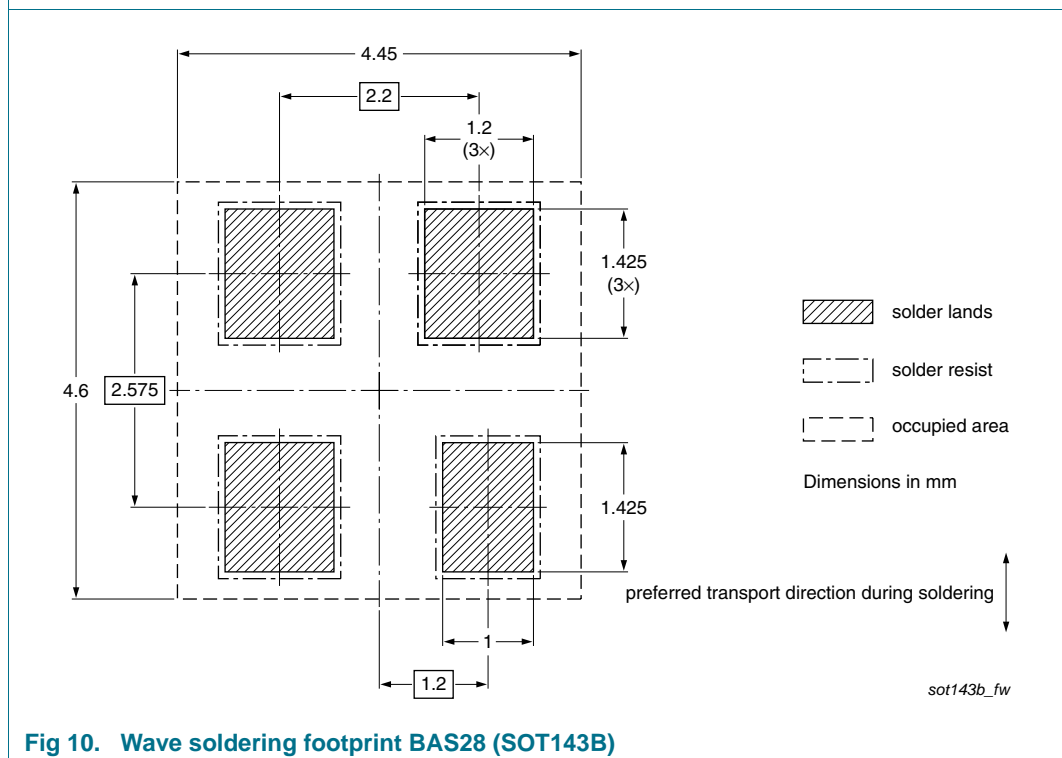
Type number	Package	Description	Packing quantity	
			3000	10000
BAS28	SOT143B	4 mm pitch, 8 mm tape and reel	-215	-235

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

**11. Soldering**



**Fig 9. Reflow soldering footprint 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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