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
Per diode							
I_F	forward current		[1]	-	-	215	mA
I_R	reverse current	V_R = 75 V		-	-	1	μA
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 Ω; measured at I_R = 1 mA.

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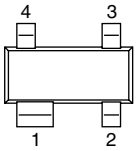
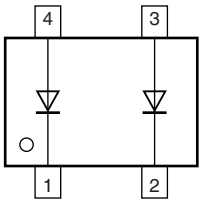
2. Pinning information

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[1]
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
Per diode						
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 μs		-	4	A
		t_p = 1 ms		-	1	A
		t_p = 1 s		-	0.5	A
Per device						
P_{tot}	total power dissipation	T_{amb} = 25 °C	[1][2]	-	250	mW
T_j	junction temperature			-	150	°C
T_{stg}	storage temperature			−65	+150	°C

[1] Device mounted on an FR4 PCB.

[2] One diode loaded.

[3] T_j = 25 °C prior to surge.

6. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per device; one diode loaded							
$R_{th(j-a)}$	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

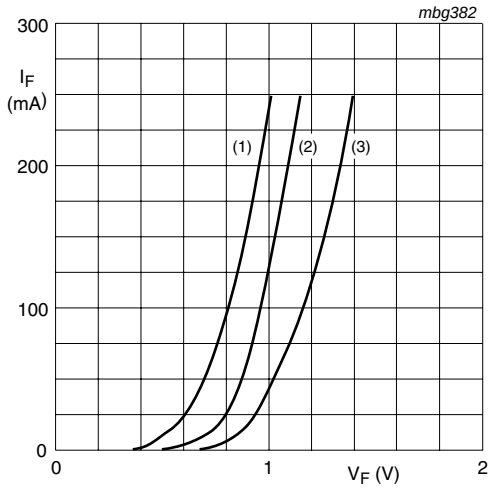
Table 7. Characteristics

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

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
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		-	-	30	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.

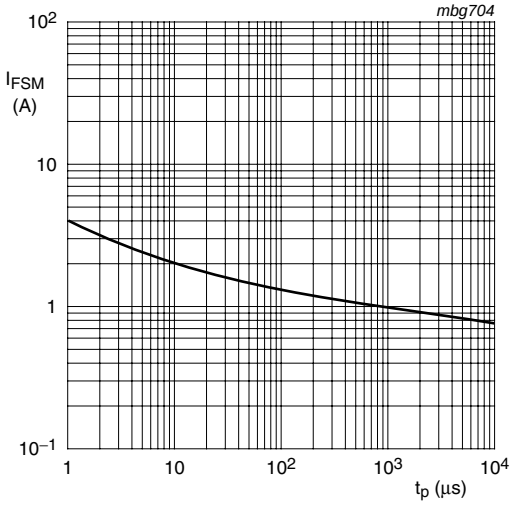


(1) T_j = 150 °C; typical values

(2) T_j = 25 °C; typical values

(3) T_j = 25 °C; maximum values

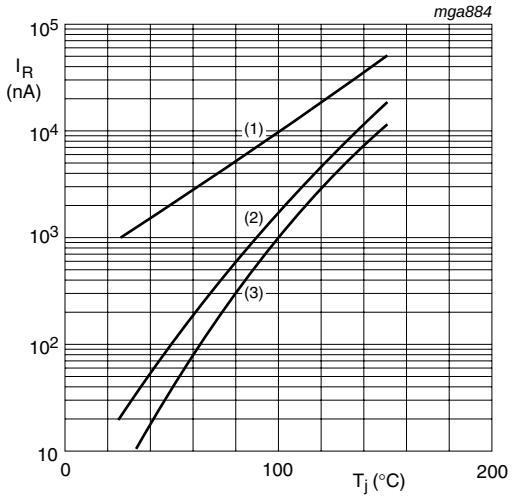
Fig 1. Forward current as a function of forward voltage



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



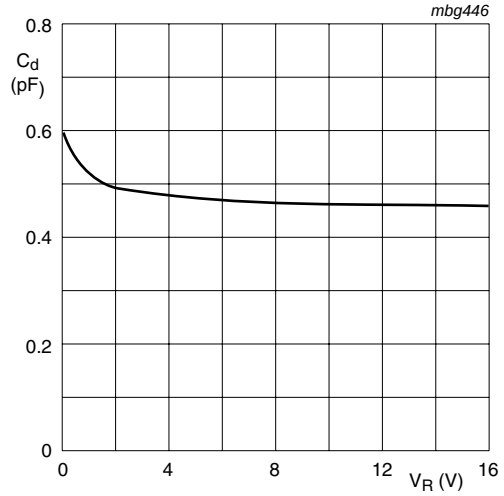
$V_R = V_{Rmax}$

(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_j = 25 °C

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

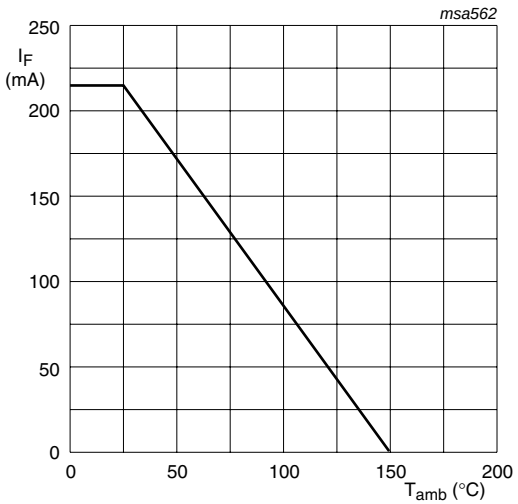
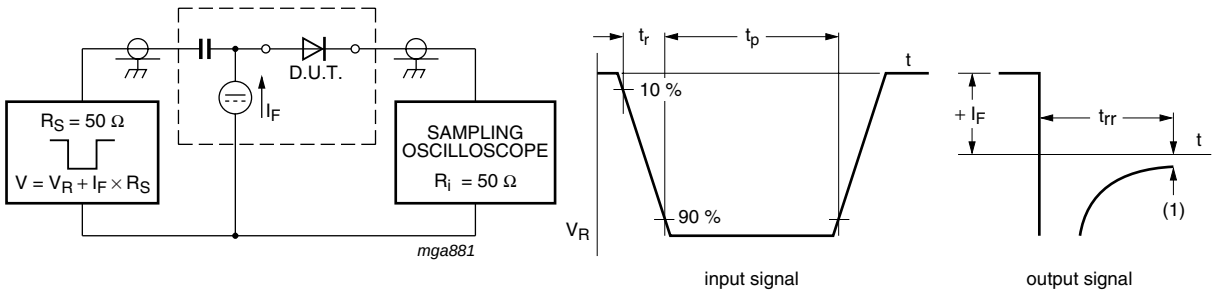


Fig 5. Forward current as a function of ambient temperature; derating curve

8. Test information



(1) I_R = 1 mA

Fig 6. Reverse recovery time test circuit and waveforms

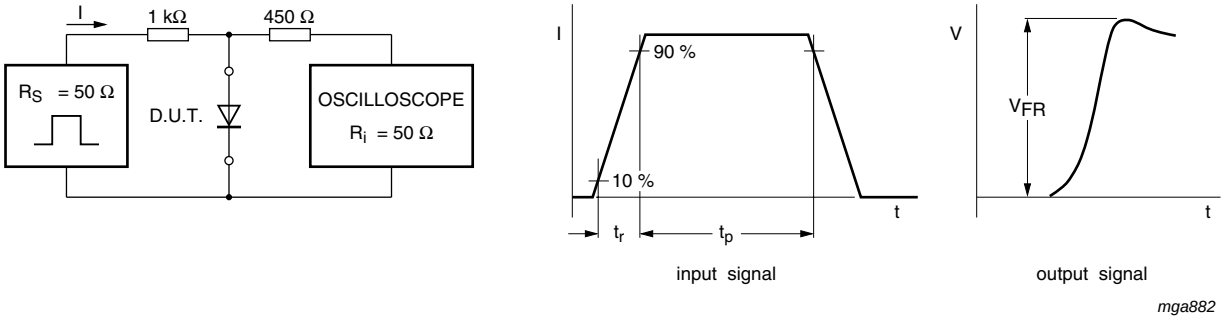


Fig 7. Forward recovery voltage test circuit and waveforms

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

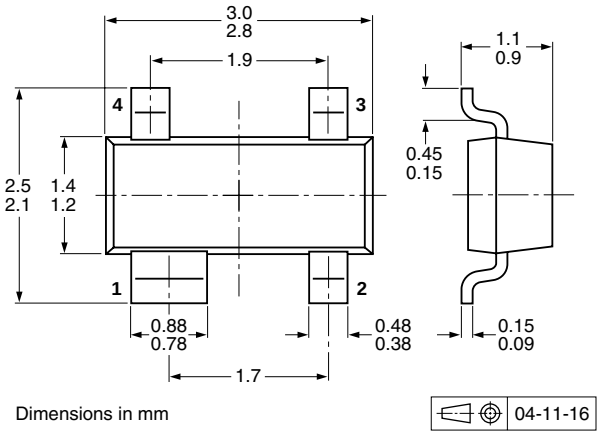


Fig 8. Package outline BAS28 (SOT143B)

10. Packing information

Please refer to packing information on www.nexperia.com.

11. Soldering

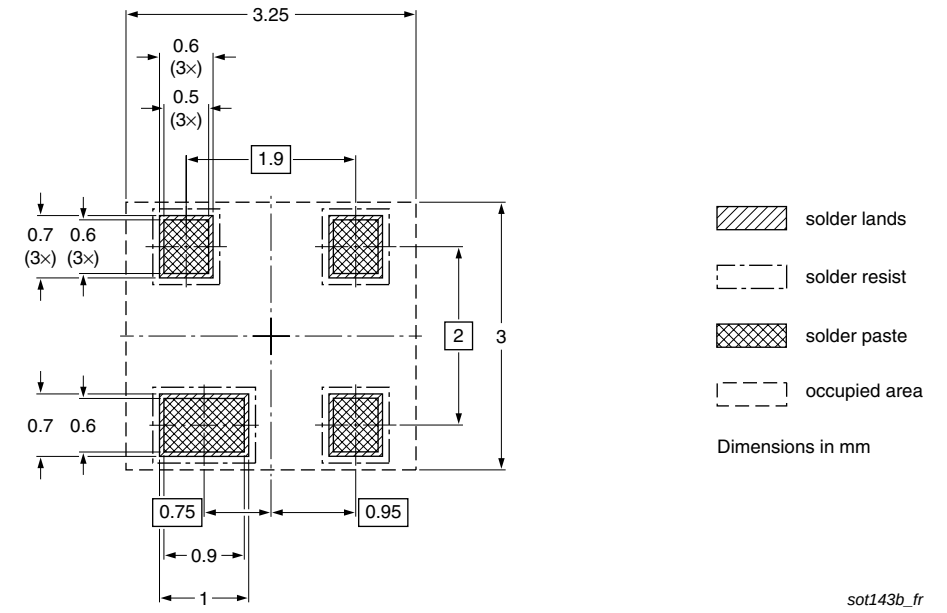


Fig 9. Reflow soldering footprint BAS28 (SOT143B)

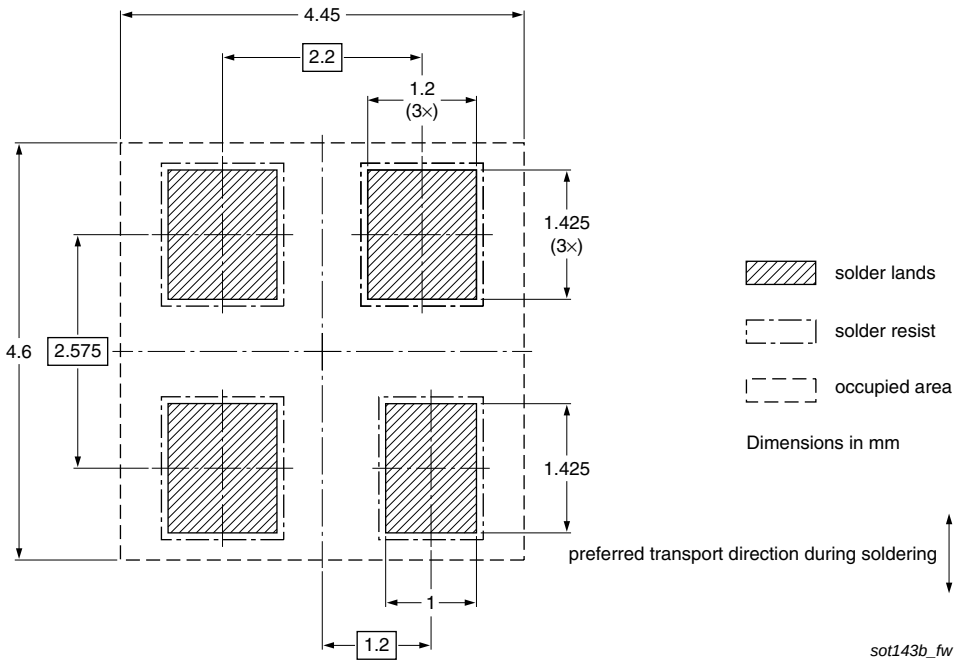


Fig 10. Wave soldering footprint BAS28 (SOT143B)

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:	• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors. • Legal texts have been adapted to the new company name where appropriate. • Section 1.1 “General description”: amended • Section 4 “Marking”: updated • Table 1 “Quick reference data”: added • Section 8 “Test information”: added • Figure 8: superseded by minimized package outline drawing • Section 10 “Packing information”: added • Section 11 “Soldering”: added • Section 13 “Legal information”: updated			
BAS28_2	19960910	Product specification	-	BAS28_1
BAS28_1	19960403	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.nexperia.com.

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14. Contents

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Date of release: 22 July 2010
Document identifier: BAS28