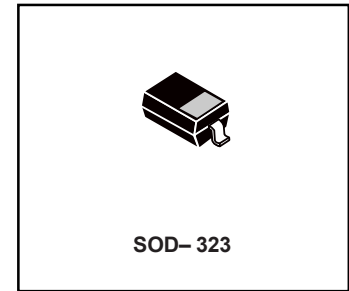


# High-speed diode

**P/b** Lead(Pb)-Free

## DESCRIPTION

The BAS316 is a high-speed switching diode fabricated in planar technology, and encapsulated in the SOD323(SC76) SMD plastic package.



## FEATURES

- Ultra small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 100 V
- Repetitive peak forward current: max. 500 mA.
- We declare that the material of product compliance with RoHS requirements.
- S- Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.



## APPLICATIONS

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

## ORDERING INFORMATION

Device	Marking	Shipping
BAS316 S-BAS316	Z9	3000 Tape & Reel
BAS316 S-BAS316	Z9	10000 Tape & Reel

## ELECTRICAL CHARACTERISTICS $T_j=25^\circ\text{C}$ unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
$V_F$	forward voltage	see Fig.2 $I_F = 1 \text{ mA}$	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	see Fig.4 $V_R = 25 \text{ V}$	30	nA
		$V_R = 75 \text{ V}$	1	$\mu\text{A}$
		$V_R = 25 \text{ V}; T_j = 150^\circ\text{C}$	30	$\mu\text{A}$
		$V_R = 75 \text{ V}; T_j = 150^\circ\text{C};$	50	$\mu\text{A}$
$C_d$	diode capacitance	$f = 1 \text{ MHz}; V_R = 0$ ; see Fig.5	2	pF
$t_{rr}$	reverse recovery time	when switched from $I_F = 10 \text{ mA}$ to $I_R = 10 \text{ mA}$ ; $R_L = 100\Omega$ ; measured at $I_R = 1 \text{ mA}$ ; see Fig.6	4	ns
$V_{fr}$	forward recovery voltage	when switched from $I_F = 10 \text{ mA}$ ; $t_r = 20 \text{ ns}$ ; see Fig.7	1.75	V

**LIMITING VALUES** In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{RRM}$	repetitive peak reverse voltage		–	100	V
$V_R$	continuous reverse voltage		–	75	V
$V_{R(RMS)}$	RMS reverse voltage		–	53	V
$I_F$	continuous forward current		–	250	mA
$I_{FRM}$	repetitive peak forward current		–	500	mA
$I_{FSM}$	non-repetitive peak forward current	square wave; $T_j=25^\circ\text{C}$ prior to surge; see Fig.3			
		$t = 1\mu\text{s}$	–	5	A
		$t = 1\text{ ms}$	–	1	A
		$t = 1\text{ s}$	–	0.5	A
$P_{tot}$	total power dissipation		–	200	mW
$R_{\theta JA}$	thermal resistance junction to ambient air		–	625	$^\circ\text{C}/\text{W}$
$T_{stg}$	storage temperature		-55	+150	$^\circ\text{C}$
$T_j$	junction temperature		–	150	$^\circ\text{C}$

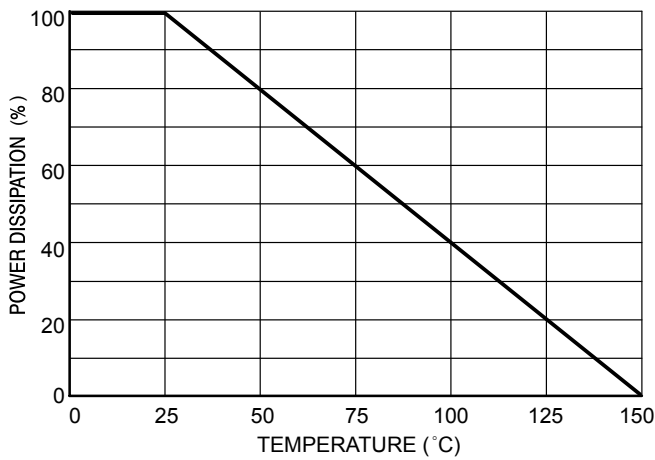


Fig.1 Steady State Power Derating

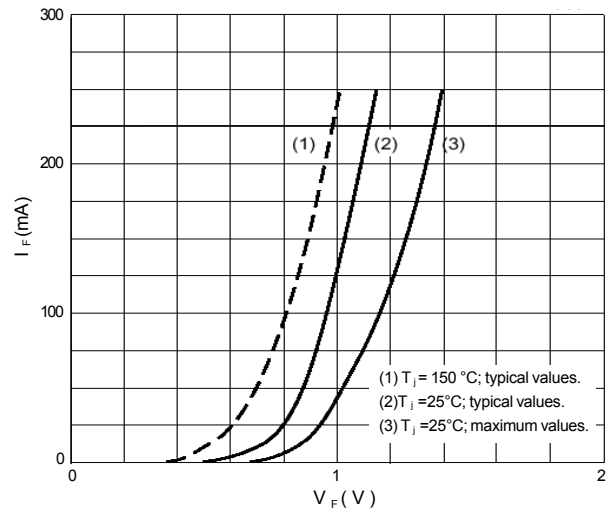


Fig.2 Forward current as a function of forward voltage.

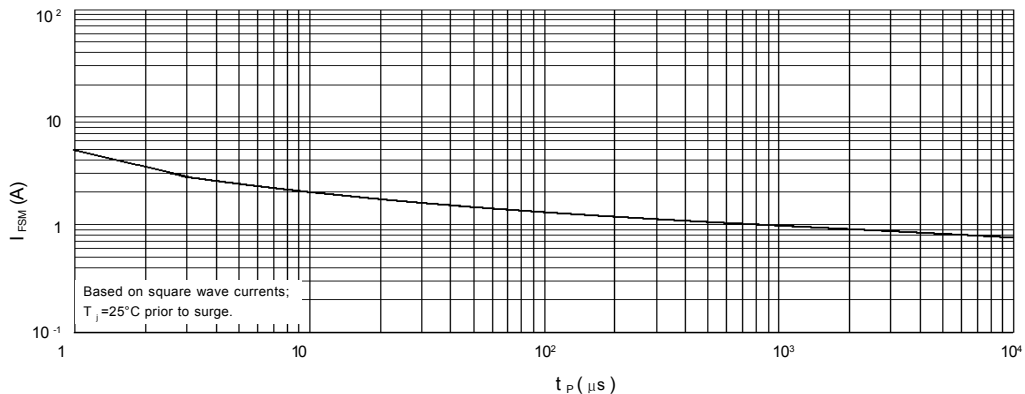


Fig.3 Maximum permissible non-repetitive peak forward current as a function of pulse duration.

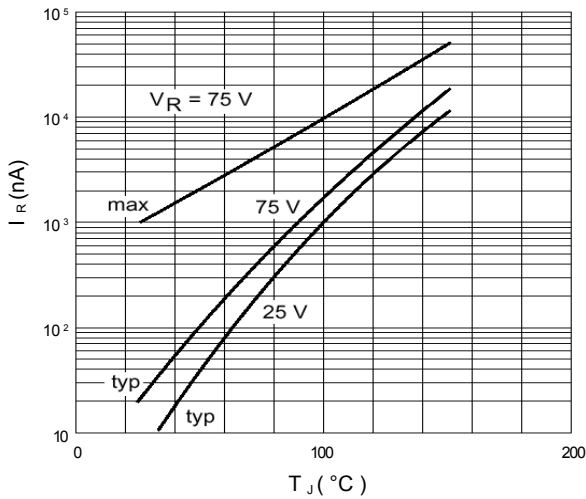


Fig.4 Reverse current as a function of junction temperature.

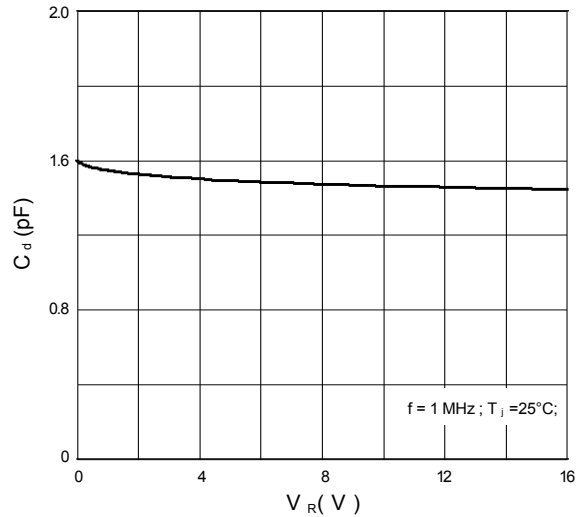
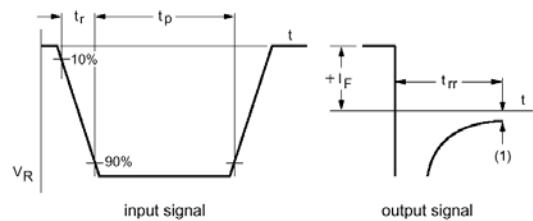
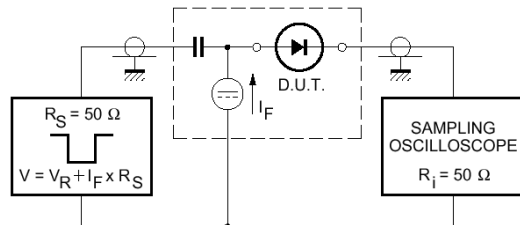
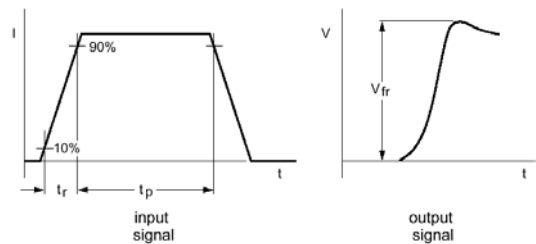
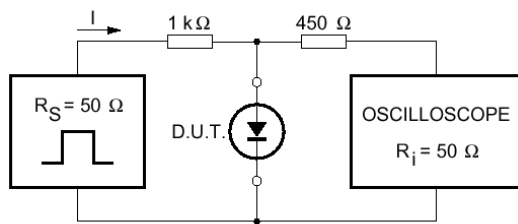


Fig.5 Diode capacitance as a function of reverse voltage; typical values.



(1)  $I_R = 1 \text{ mA}$ .  
 Input signal: reverse pulse rise time  $t_r = 0.6 \text{ ns}$ ; reverse voltage pulse duration  $t_p = 100 \text{ ns}$ ; duty factor  $\delta \approx 0.05$ ;  
 Oscilloscope: rise time  $t_r = 0.35 \text{ ns}$ .

Fig.6 Reverse recovery voltage test circuit and waveforms.



Input signal: forward pulse rise time  $t_r = 20 \text{ ns}$ ; forward current pulse duration  $t_p \geq 100 \text{ ns}$ ; duty factor  $\delta \leq 0.005$ .

Fig.7 Forward recovery voltage test circuit and waveforms.