

High-speed diode

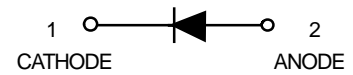
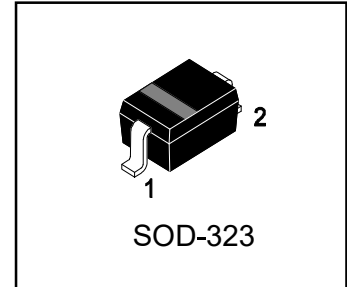
DESCRIPTION

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.

BAS316
S-BAS316



APPLICATIONS

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

ORDERING INFORMATION

Device	Marking	Shipping
BAS316 S-BAS316	Z9	3000 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	μA
		$V_R = 25 \text{ V}; T_j = 150^{\circ}\text{C}$	30	μA
		$V_R = 75 \text{ V}; T_j = 150^{\circ}\text{C};$	50	μA
C_d	diode capacitance	$f = 1 \text{ MHz}; V_R = 0; \text{ see Fig.5}$	2	pF
t_{rr}	reverse recovery time	when switched from $I_F = 10 \text{ mA}$ to $I_R = 10 \text{ mA};$ $R_L = 100 \Omega; \text{ measured at } I_R = 1 \text{ mA}; \text{ see Fig.6}$	4	ns
V_{fr}	forward recovery voltage	when switched from $I_F = 10 \text{ mA}; t_r = 20 \text{ ns}; \text{ see Fig.7}$	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	$^\circ\text{C/W}$
T_{stg}	storage temperature		-55	+150	$^\circ\text{C}$
T_j	junction temperature		–	150	$^\circ\text{C}$

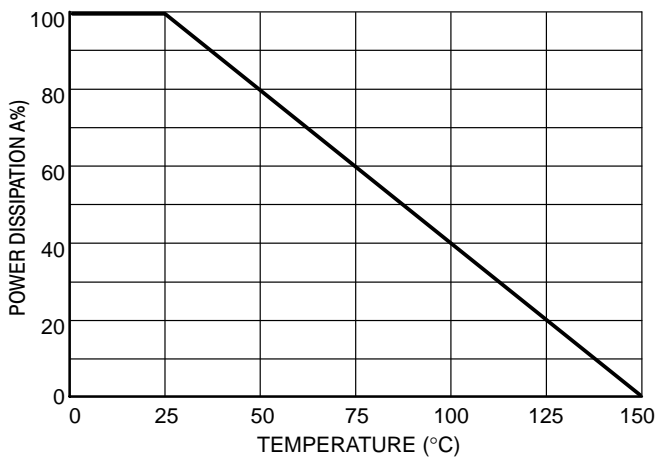


Fig.1 Steady State Power Derating

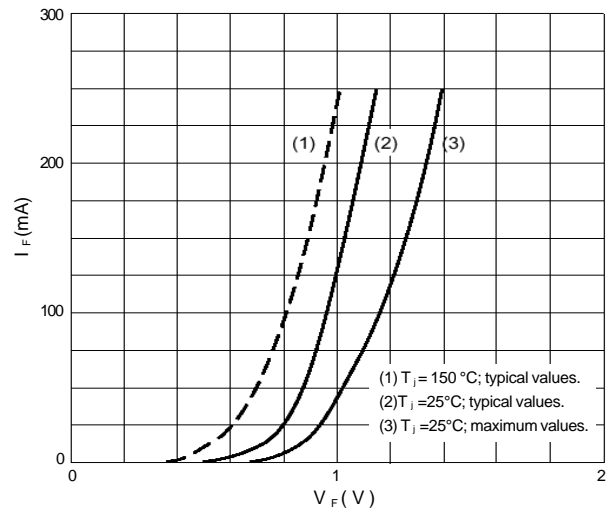


Fig.2 Forward current as a function of forward voltage.

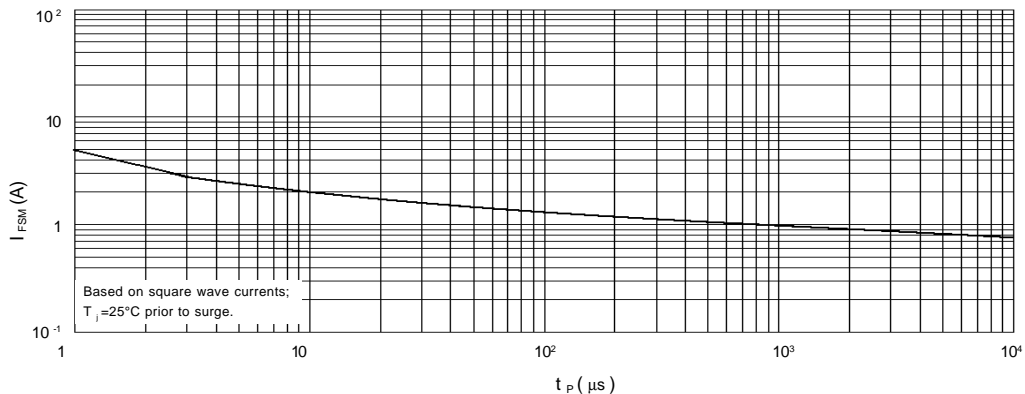


Fig.3 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



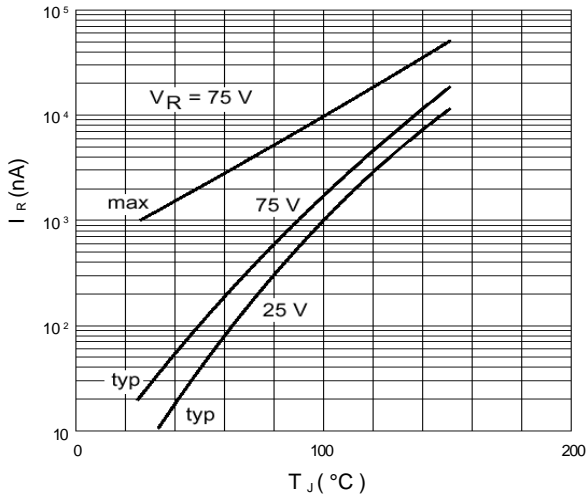


Fig.4 Reverse current as a function of junction temperature.

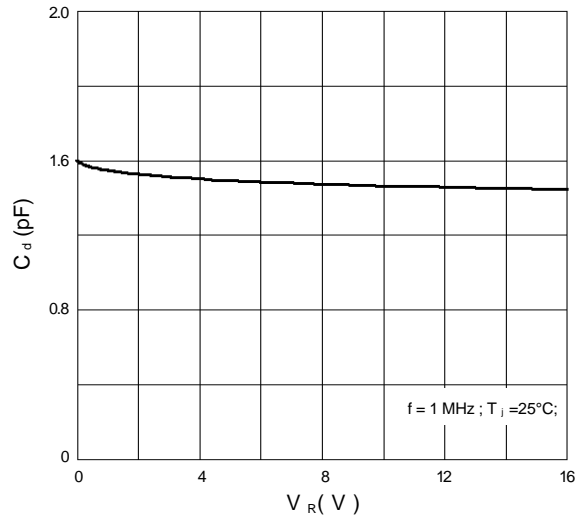
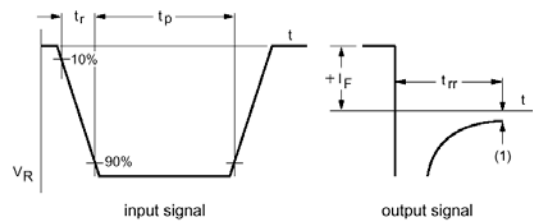
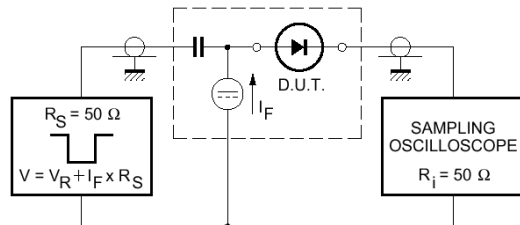
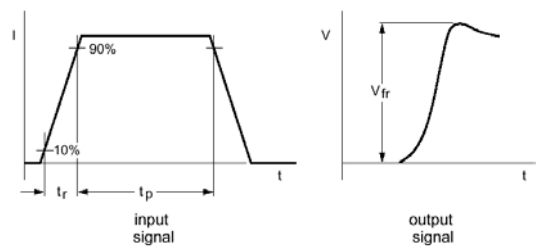
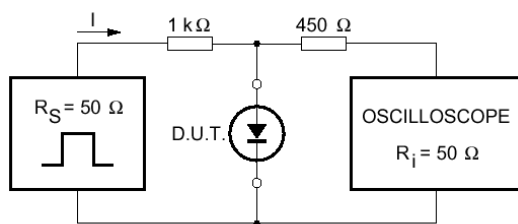


Fig.5 Diode capacitance as a function of reverse voltage; typical values.



(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 $\delta = 0.05$;
 Oscilloscope: rise time $t_r = 0.35 \text{ ns}$.

Fig.6 Reverse recovery voltage test circuit and waveforms.



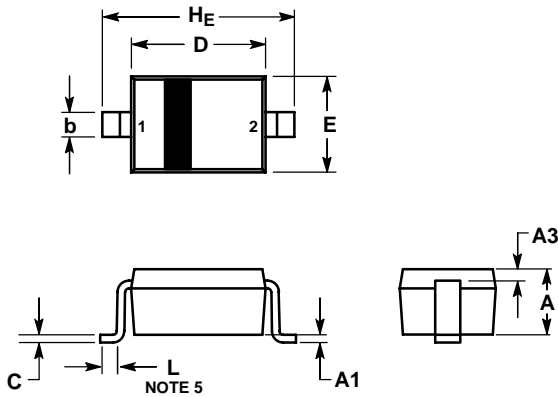
Input signal: forward pulse rise time $t_r = 20 \text{ ns}$; forward current pulse duration $t_p \geq 100 \text{ ns}$; duty factor $\delta \leq 0.005$.

Fig.7 Forward recovery voltage test circuit and waveforms.



PACKAGE DIMENSIONS

SOD-323



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. LEAD THICKNESS SPECIFIED PER L/F DRAWING WITH SOLDER PLATING.
4. DIMENSIONS A AND B DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.
5. DIMENSION L IS MEASURED FROM END OF RADIUS.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	0.90	1.00	0.031	0.035	0.040
A1	0.00	0.05	0.10	0.000	0.002	0.004
A3	0.15 REF			0.006 REF		
b	0.25	0.32	0.4	0.010	0.012	0.016
C	0.089	0.12	0.177	0.003	0.005	0.007
D	1.60	1.70	1.80	0.062	0.066	0.070
E	1.15	1.25	1.35	0.045	0.049	0.053
L	0.08			0.003		
HE	2.30	2.50	2.70	0.090	0.098	0.105

SOLDERING FOOTPRINT*

