

High-speed diode

FEATURES

- Ultra small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA.

APPLICATIONS

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

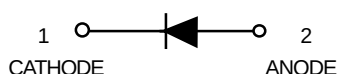
DESCRIPTION

The BAS516 is a high-speed switching diode fabricated in planar technology, and encapsulated in the SOD523 (SC79) SMD plastic package.

BAS516



SOD523 SC-79



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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		—	85	V
V_R	continuous reverse voltage		—	75	V
I_F	continuous forward current	$T_s=90^{\circ}\text{C}$; note 1; see Fig.1	—	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			
		$t=1\mu\text{s}$	—	4	A
		$t=1\text{ ms}$	—	1	A
		$t=1\text{ s}$	—	0.5	A
P_{tot}	total power dissipation	$T_s=90^{\circ}\text{C}$; note 1	—	500	mW
T_{stg}	storage temperature		-65	+150	$^{\circ}\text{C}$
T_j	junction temperature		—	150	$^{\circ}\text{C}$

Note

1. T_s is the temperature at the soldering point of the cathode tab.

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	$f=1\text{ MHz}$; $V_R=0$; see Fig.5	1	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

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R_{thj-s}	thermal resistance from junction to soldering point	note 1	120	K/W

Note 1. Soldering point of the cathode tab.

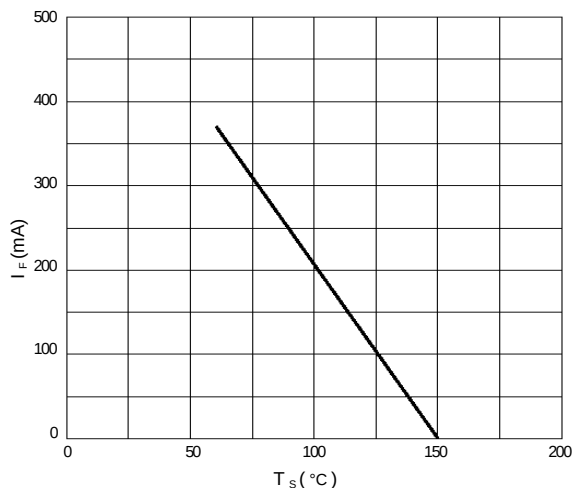
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Fig.1 Maximum permissible continuous forward current as a function of soldering point temperature.

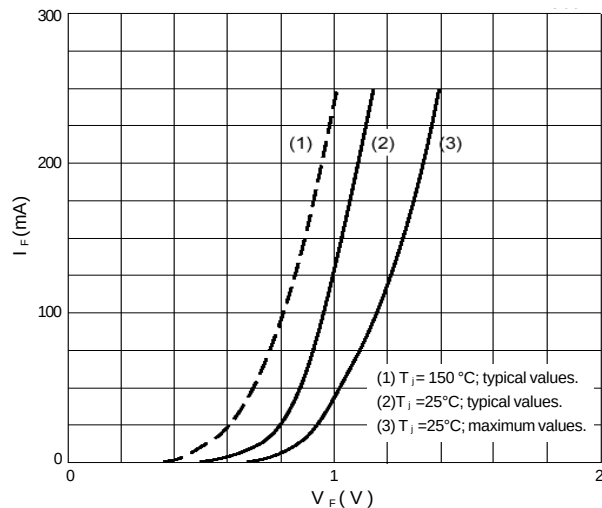


Fig.2 Forward current as a function of forward voltage.

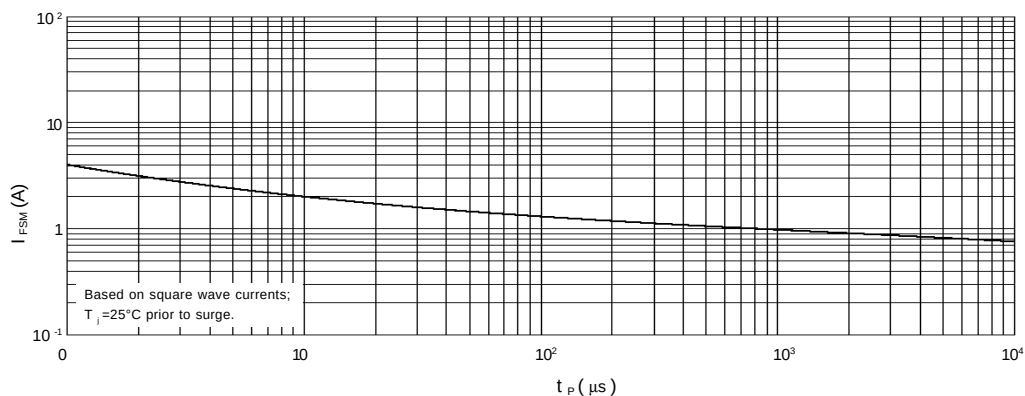


Fig.3 Maximum permissible non-repetitive peak forward current as a function of pulse duration.

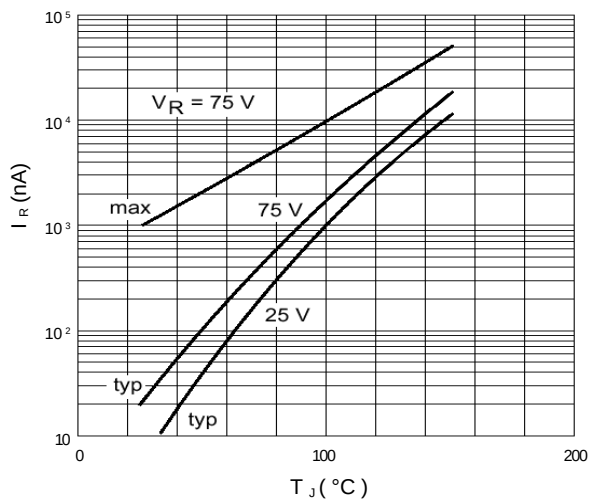


Fig.4 Reverse current as a function of junction temperature.

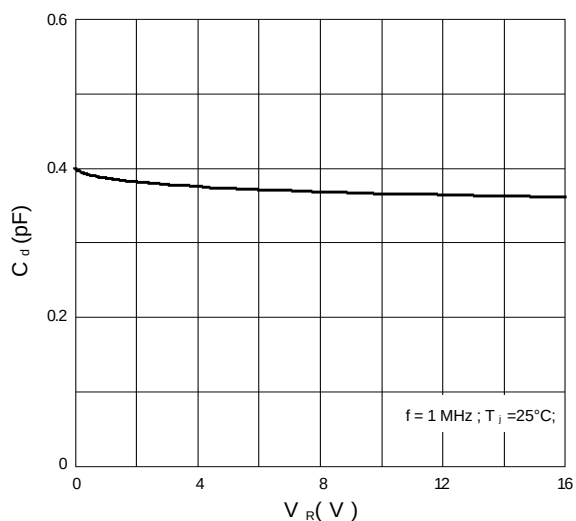
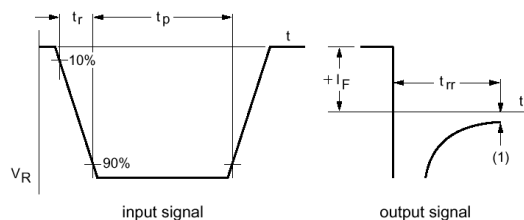
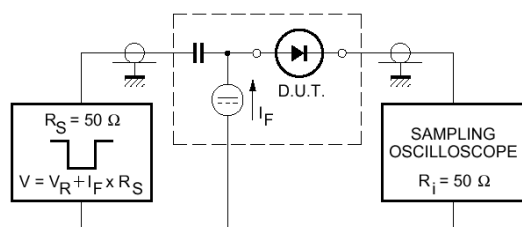


Fig.5 Diode capacitance as a function of reverse voltage; typical values.

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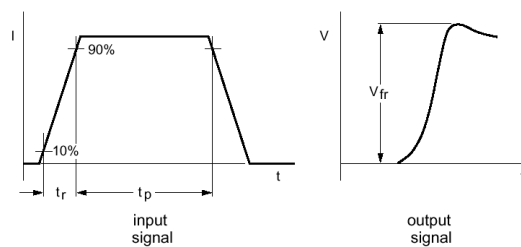
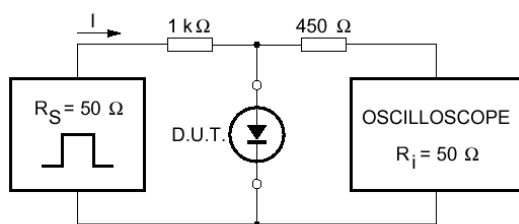


(1) $I_R = 1 \text{ mA}$.

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.