ETL SEMICONDUCTOR

High-speed diode

BAS516

FEATURES

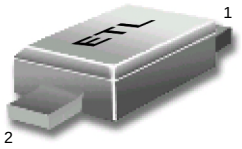
- Ultra small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA.

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.



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°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°C prior to surge; see Fig.3			
		t =1µs	–	4	A
		t =1 ms	–	1	A
		t =1 s	–	0.5	A
P_{tot}	total power dissipation	T_s =90°C; note 1	–	500	mW
T_{stg}	storage temperature		-65	+150	°C
T_j	junction temperature		–	150	°C

Note

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

ELECTRICAL CHARACTERISTICS T_j=25°C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	see Fig.2 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	see Fig.4 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; see Fig.5	1	pF
t_{rr}	reverse recovery time	when switched from I_F=10mA to I_R = 10mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.6	4	ns
V_{fr}	forward recovery voltage	when switched from IF = 10 mA; tr = 20 ns; see Fig.7	1.75	V

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}s}$	thermal resistance from junction to soldering point	note 1	120	K/W

Note 1. Soldering point of the cathode tab.

BAS516

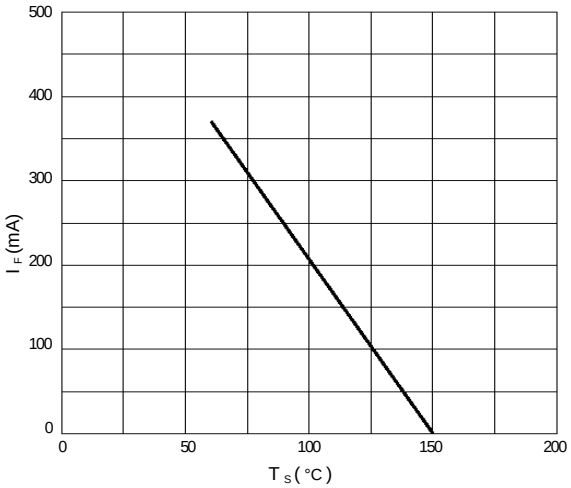


Fig.1 Maximum permissible continuous forward current as a function of soldering point temperature.

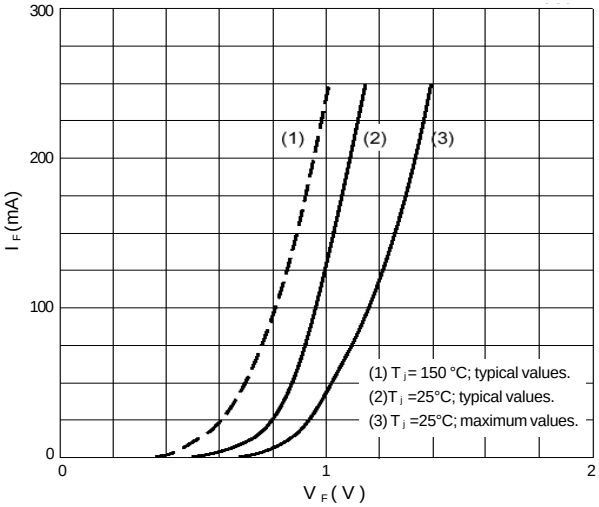


Fig.2 Forward current as a function of forward voltage.

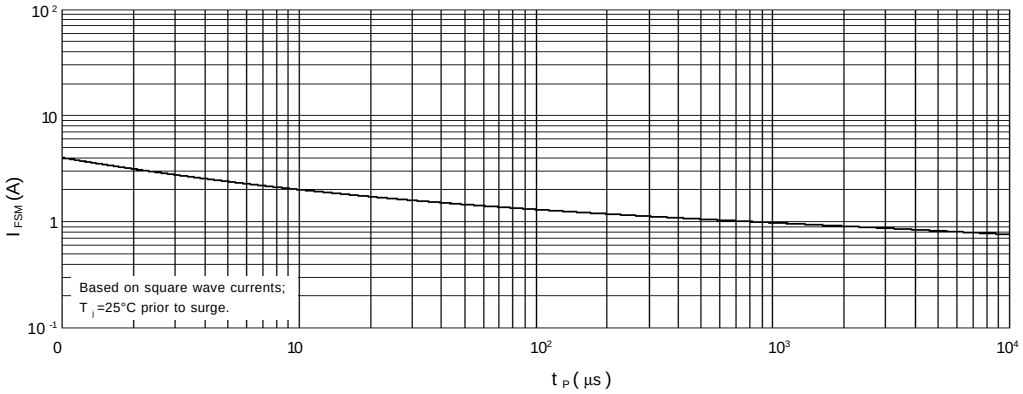


Fig.3 Maximum permissible non-repetitive peak forward current as a function of pulse duration.

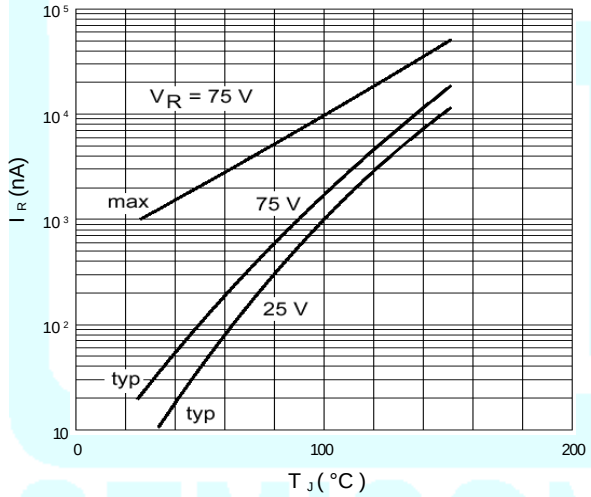


Fig.4 Reverse current as a function of junction temperature.

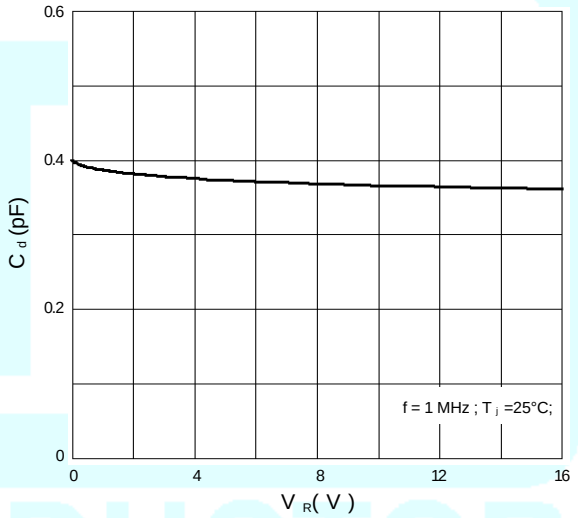
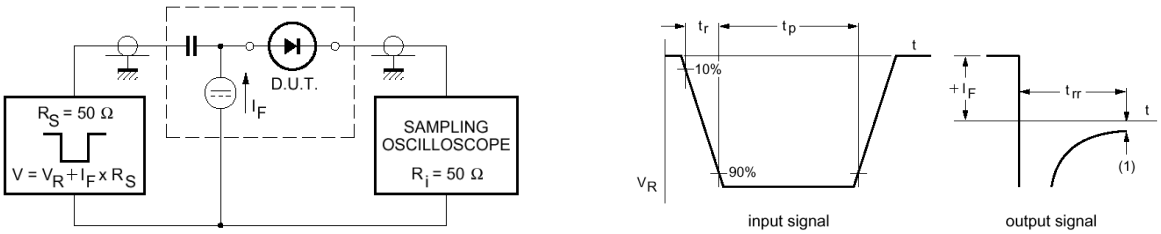
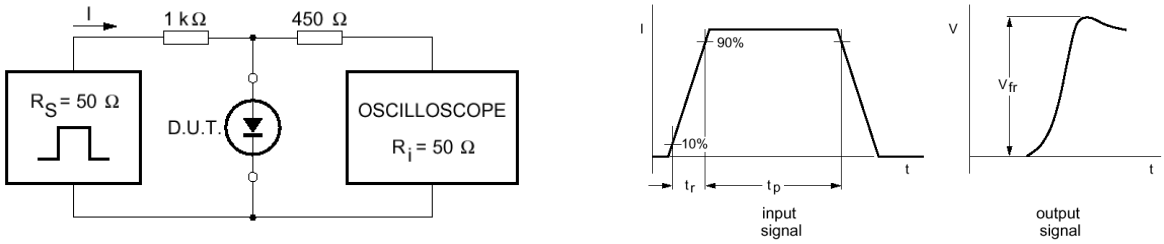


Fig.5 Diode capacitance as a function of reverse voltage; typical values.



(1) I_R = 1 mA.
Input signal: reverse pulse rise time t_r = 0.6 ns; reverse voltage pulse duration t_p = 100 ns; duty factor δ = 0.05;
Oscilloscope: rise time t_r = 0.35 ns.

Fig.6 Reverse recovery voltage test circuit and waveforms.



Input signal: forward pulse rise time t_r = 20 ns; forward current pulse duration $t_p \geq$ 100 ns; duty factor δ ≤ 0.005.

Fig.7 Forward recovery voltage test circuit and waveforms.