

# High-speed Diode

## DESCRIPTION

The LBAS516T1 is a high-speed switching diode fabricated in planar technology and encapsulated in the SOD523(SC79) SMD plastic package.

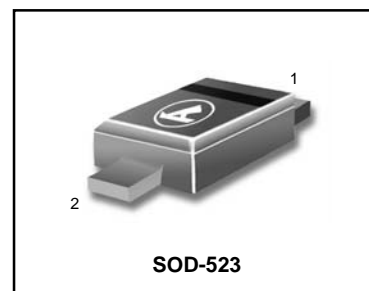
## FEATURES

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

**LBAS516T1G**  
**S-LBAS516T1G**



## ORDERING INFORMATION

Device	Marking	Shipping
LBAS516T1G S-LBAS516T1G	6	3000 Tape & Reel
LBAS516T3G S-LBAS516T3G	6	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	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
$R_{th-j-s}$	thermal resistance from junction to soldering point	note 1	120	K/W

**Note** 1. Soldering point of the cathode tab.

**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.

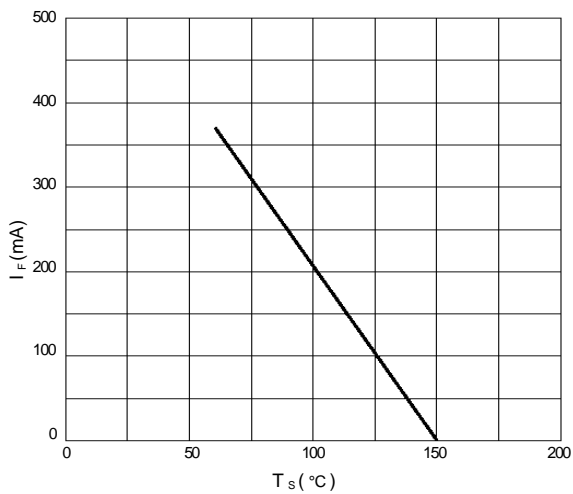


Fig.1 Maximum permissible continuous forward current as a function of soldering point temperature.

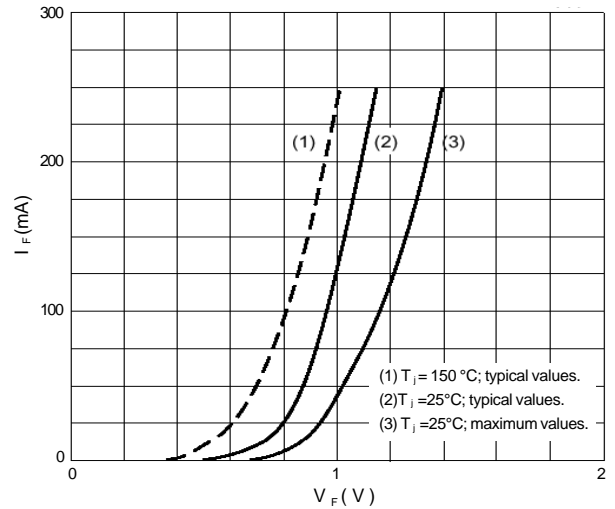


Fig.2 Forward current as a function of forward voltage.

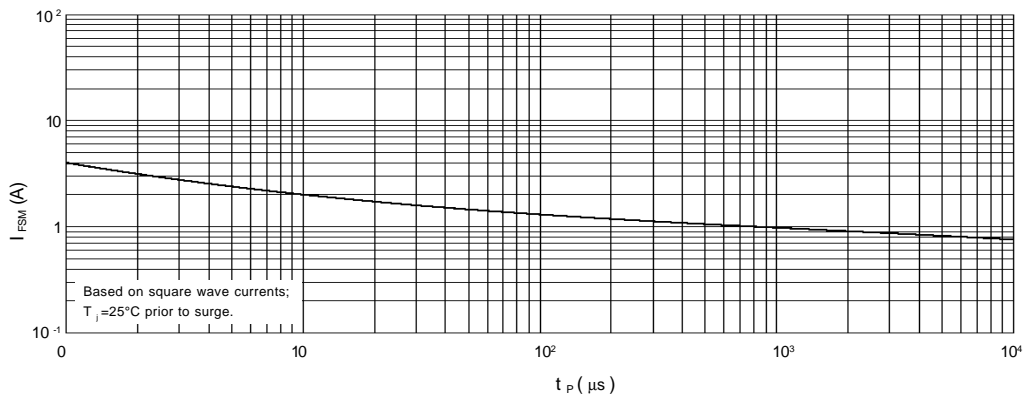


Fig.3 Maximum permissible non-repetitive peak forward current as a function of pulse duration.

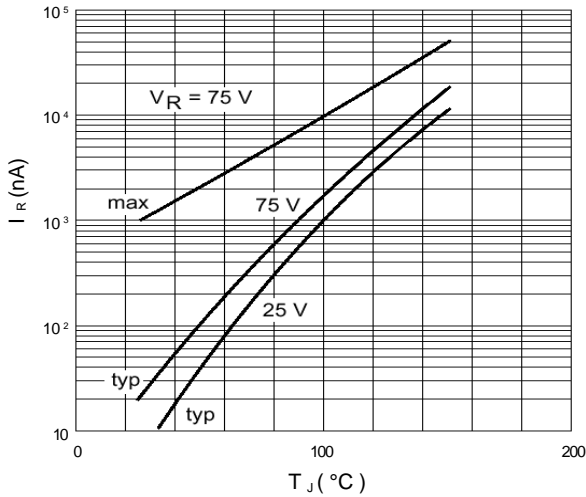


Fig.4 Reverse current as a function of junction temperature.

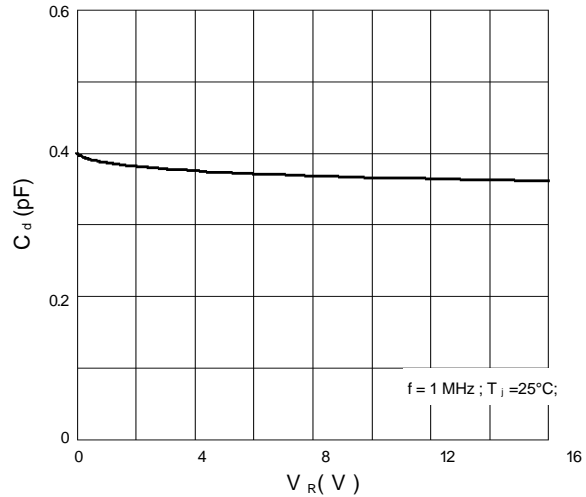
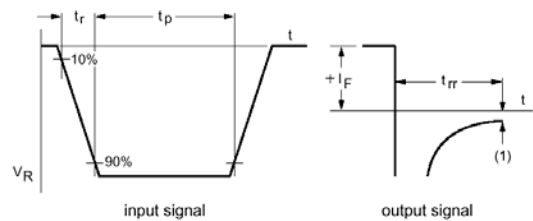
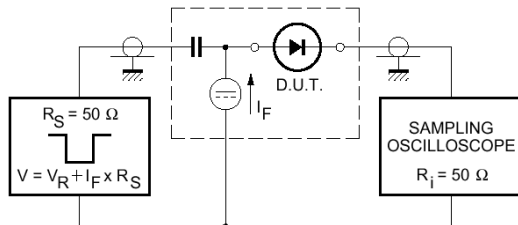
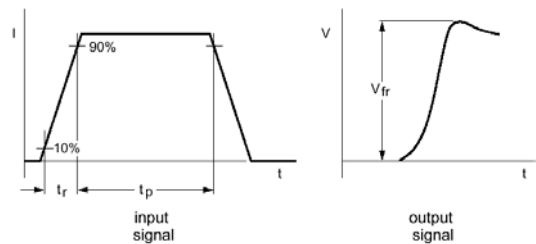
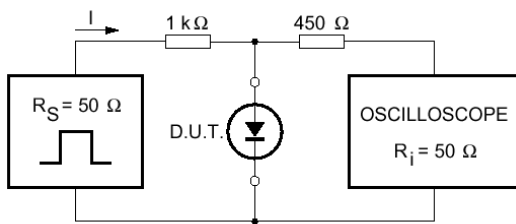


Fig.5 Diode capacitance as a function of reverse voltage; typical values.



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

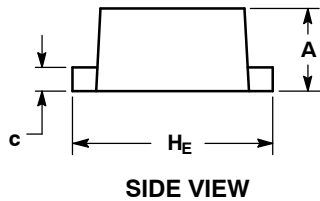
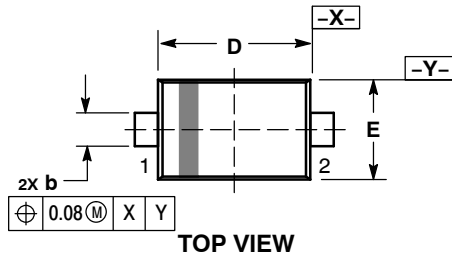


Input signal: forward pulse rise time  $t_r = 20 \text{ ns}$ ; forward current pulse duration  $t_p \geq 100 \text{ ns}$ ; duty factor  $\delta \leq 0.005$ .

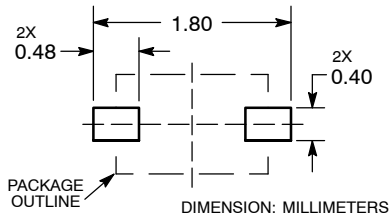
Fig.7 Forward recovery voltage test circuit and waveforms.

LBAS516T1G,S-LBAS516T1G

SOD-523



**RECOMMENDED  
SOLDERING FOOTPRINT\***



NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

DIM	MILLIMETERS		
	MIN	NOM	MAX
A	0.50	0.60	0.70
b	0.25	0.30	0.35
c	0.07	0.14	0.20
D	1.10	1.20	1.30
E	0.70	0.80	0.90
H <sub>E</sub>	1.50	1.60	1.70
L	0.30 REF		
L2	0.15	0.20	0.25