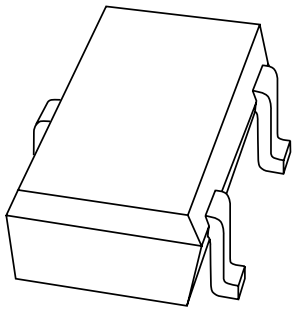
DATA SHEET



1PS301
High-speed double diode

Product data sheet
Supersedes data of 1996 Oct 04

1999 May 06

High-speed double diode 1PS301

FEATURES

- Very small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 80 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA.

APPLICATIONS

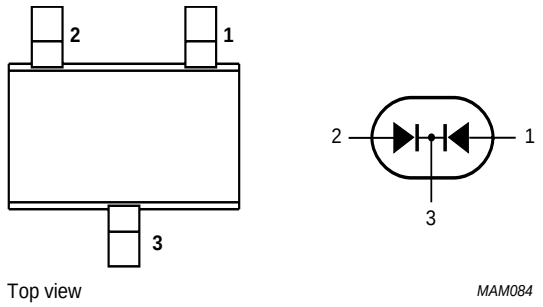
- High-speed switching in e.g. surface mounted circuits.

DESCRIPTION

The 1PS301 consists of two high-speed switching diodes with common cathodes, fabricated in planar technology, and encapsulated in the very small rectangular plastic SMD SC70-3 package.

PINNING

PIN	DESCRIPTION
1	anode (a1)
2	anode (a2)
3	common cathode



Marking code: B3.

Fig.1 Simplified outline (SOT323; SC70-3) and symbol.

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_{RRM}	repetitive peak reverse voltage		–	85	V
V_R	continuous reverse voltage		–	80	V
I_F	continuous forward current	single diode loaded; note 1; see Fig.2	–	250	mA
		double diode loaded; note 1; see Fig.2	–	160	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			
		t = 1 μs	–	4	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	300	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
Per diode					
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	610	–	mV
		I_F = 10 mA	740	–	mV
		I_F = 50 mA	–	1.0	V
		I_F = 100 mA	–	1.2	V
I_R	reverse current	see Fig.4			
		V_R = 25 V	–	30	nA
		V_R = 80 V	–	0.5	μA
		V_R = 25 V; T_j = 150 °C	–	30	μA
		V_R = 80 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.5	–	1.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.6	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.7	–	1.75	V

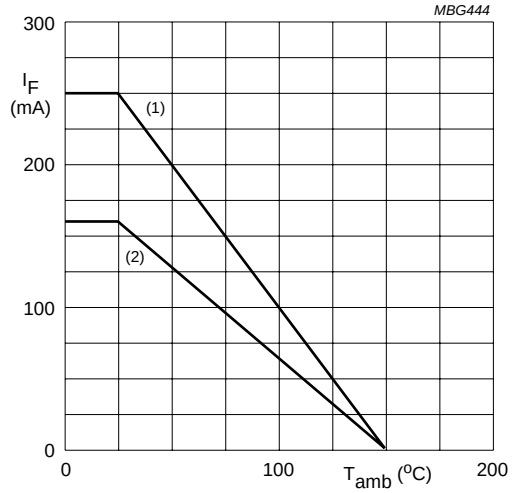
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		200	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	415	K/W

Note

1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA

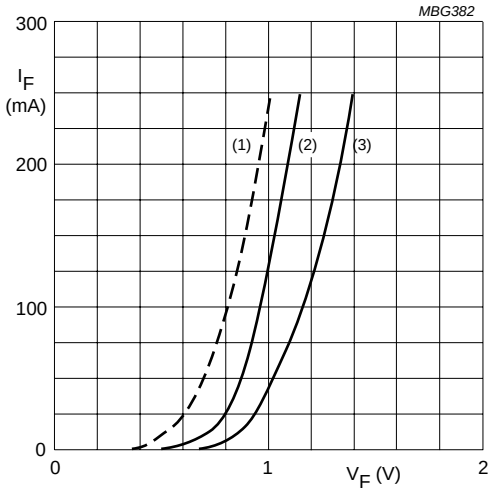


Device mounted on an FR4 printed-circuit board.

(1) Single diode loaded.

(2) Double diode loaded.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.

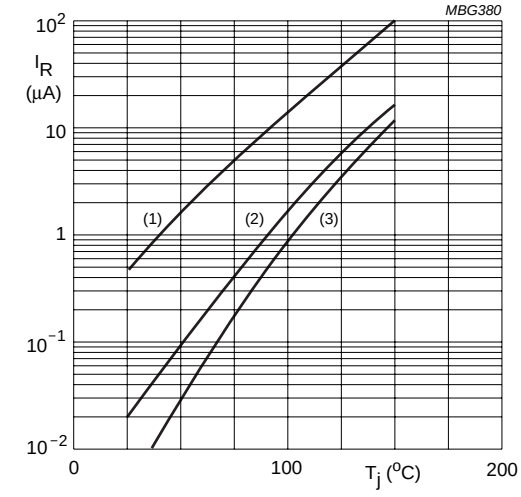


(1) T_j = 150 °C; typical values.

(2) T_j = 25 °C; typical values.

(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.

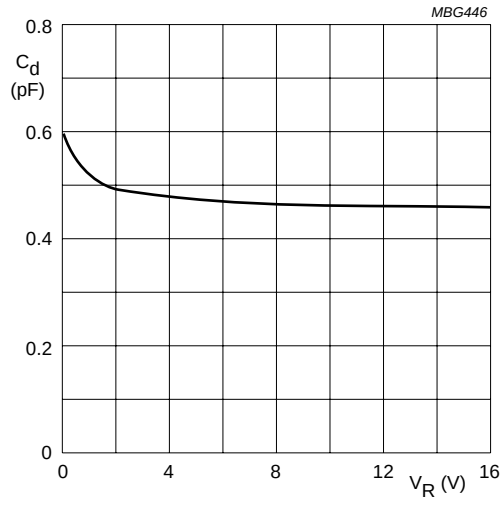


(1) V_R = 80 V; maximum values.

(2) V_R = 80 V; typical values.

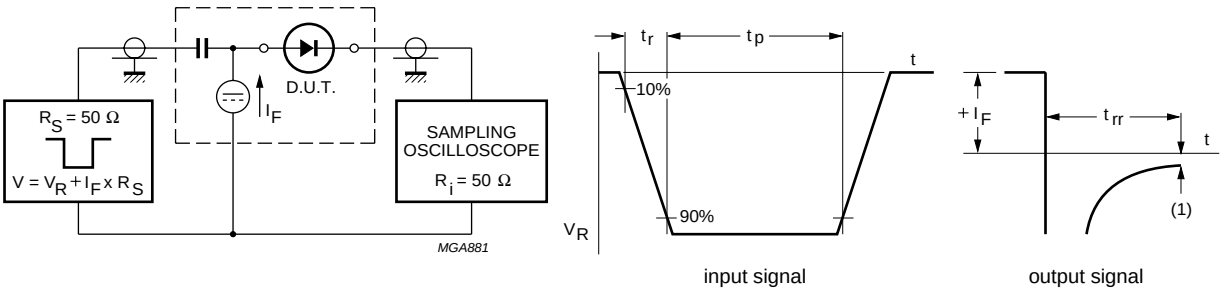
(3) V_R = 25 V; typical values.

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



f = 1 MHz; T_j = 25 °C.

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



(1) I_R = 1 mA.

Fig.6 Reverse recovery voltage test circuit and waveforms.

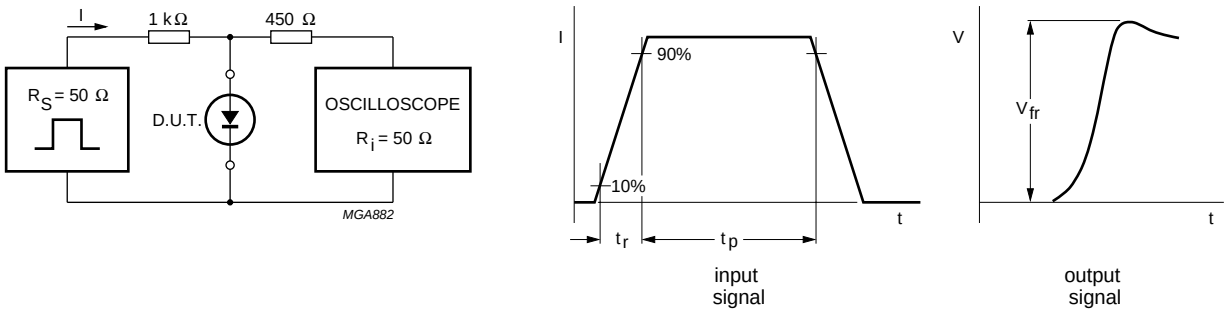
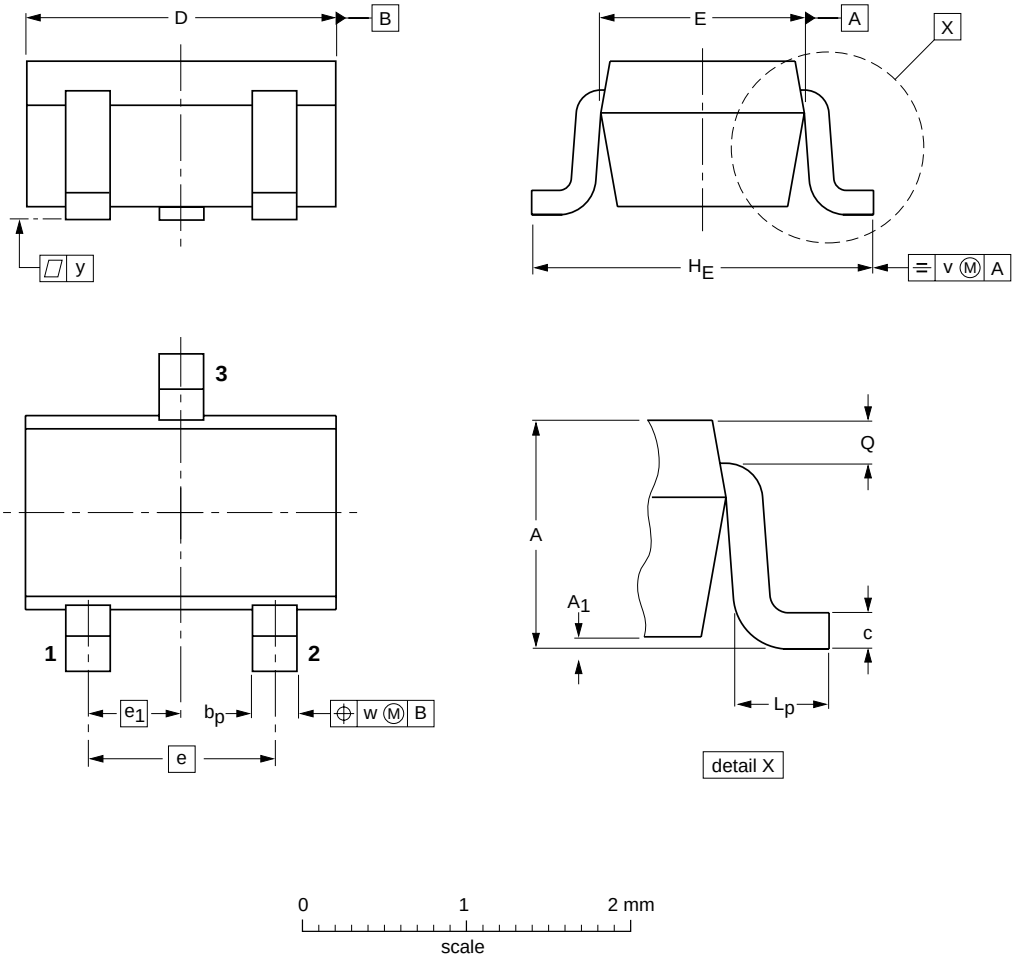


Fig.7 Forward recovery voltage test circuit and waveforms.

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads **SOT323**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w
mm	1.1 0.8	0.1	0.4 0.3	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.23 0.13	0.2	0.2

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT323			SC-70			97-02-28

DATA SHEET STATUS

DOCUMENT STATUS[1]	PRODUCT STATUS[2]	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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