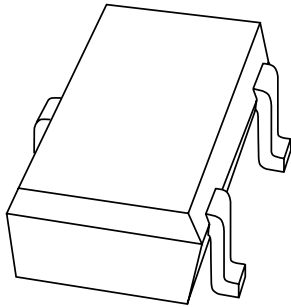


DATA SHEET



1PS301

High-speed double diode

Product specification
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

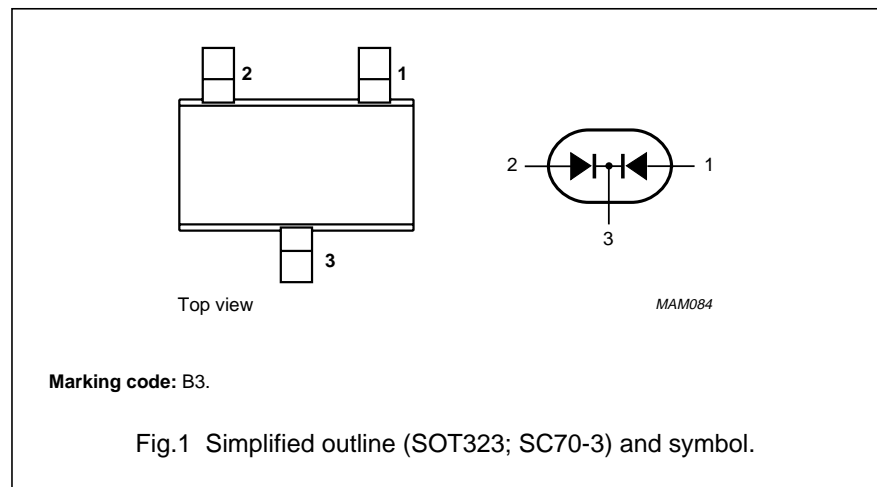
- High-speed switching in e.g. surface mounted circuits.

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 |



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; $T_j = 25\text{ °C}$ prior to surge | – | 4 | A |
| | | $t = 1\ \mu\text{s}$ $t = 1\ \text{s}$ | – | 0.5 | A |
| P_{tot} | total power dissipation | $T_{amb} = 25\text{ °C}$; 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.

High-speed double diode

1PS301

ELECTRICAL CHARACTERISTICS $T_j = 25\text{ °C}$ unless otherwise specified.

| SYMBOL | PARAMETER | CONDITIONS | TYP. | MAX. | UNIT |
|------------------|--------------------------|---|------|------|---------------|
| Per diode | | | | | |
| V_F | forward voltage | see Fig.3 | | | |
| | | $I_F = 1\text{ mA}$ | 610 | – | mV |
| | | $I_F = 10\text{ mA}$ | 740 | – | mV |
| | | $I_F = 50\text{ mA}$ | – | 1.0 | V |
| | | $I_F = 100\text{ mA}$ | – | 1.2 | V |
| I_R | reverse current | see Fig.4 | | | |
| | | $V_R = 25\text{ V}$ | – | 30 | nA |
| | | $V_R = 80\text{ V}$ | – | 0.5 | μA |
| | | $V_R = 25\text{ V}; T_j = 150\text{ °C}$ | – | 30 | μA |
| | | $V_R = 80\text{ V}; T_j = 150\text{ °C}$ | – | 100 | μA |
| C_d | diode capacitance | $f = 1\text{ MHz}; V_R = 0$; see Fig.5 | – | 1.5 | 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 |
|----------------|---|------------|-------|------|
| $R_{th\ j-tp}$ | thermal resistance from junction to tie-point | | 200 | K/W |
| $R_{th\ j-a}$ | thermal resistance from junction to ambient | note 1 | 415 | K/W |

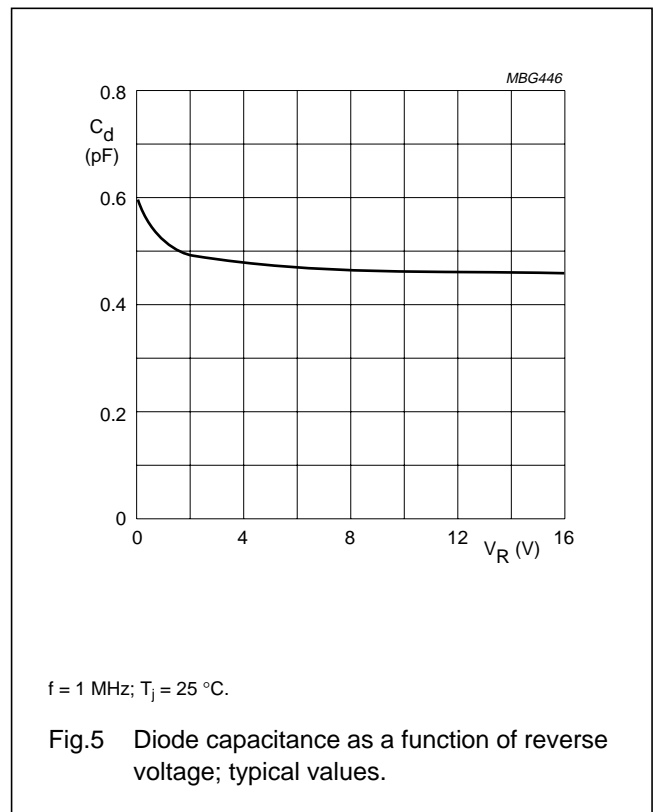
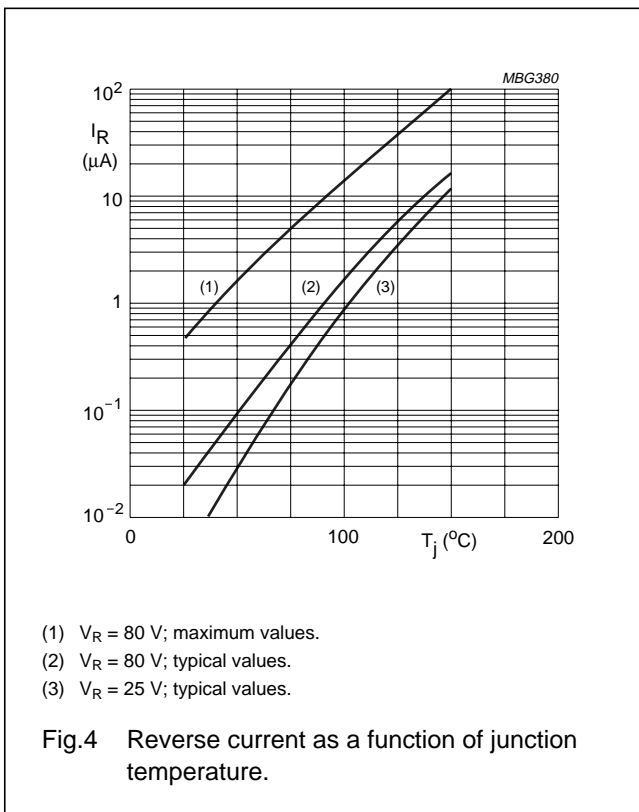
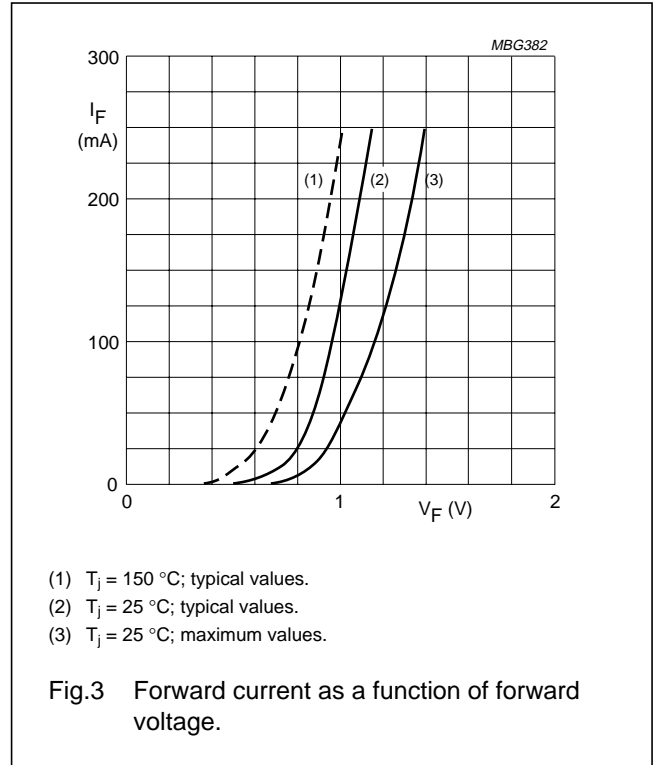
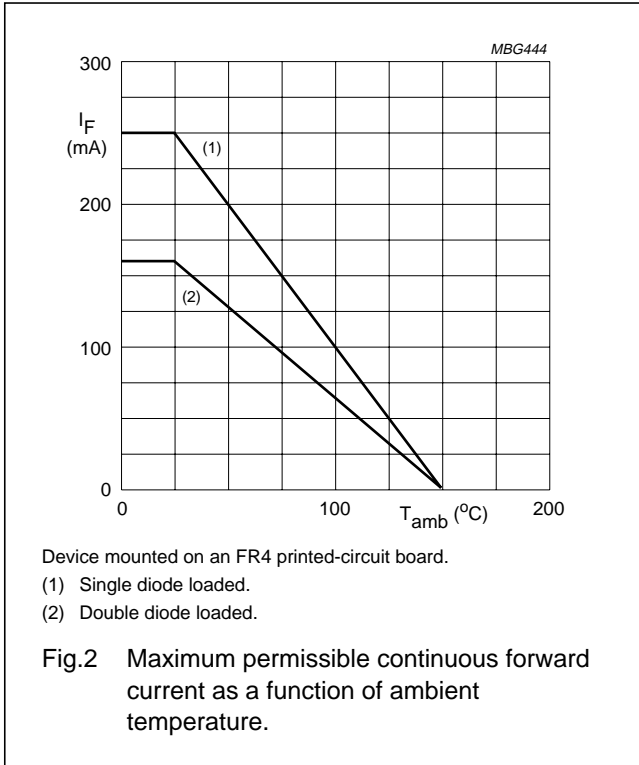
Note

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

High-speed double diode

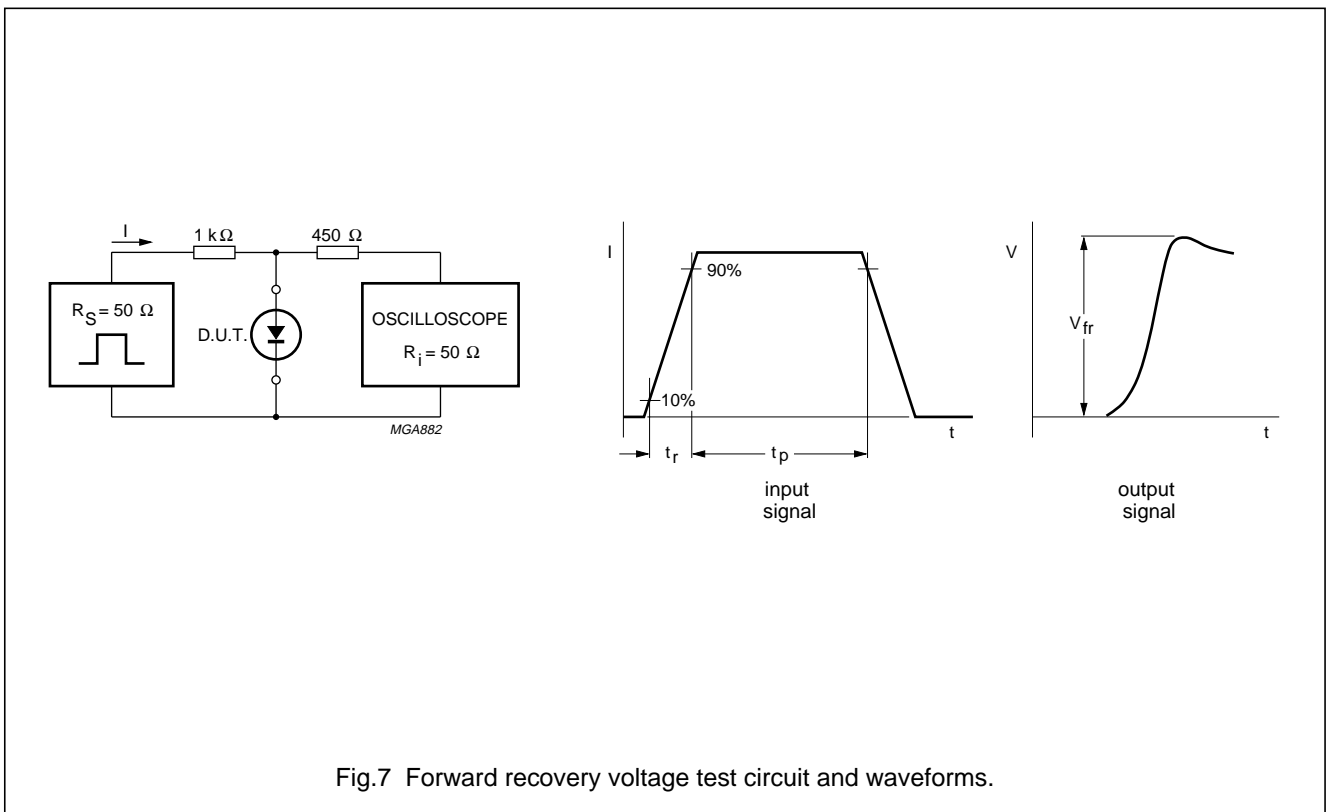
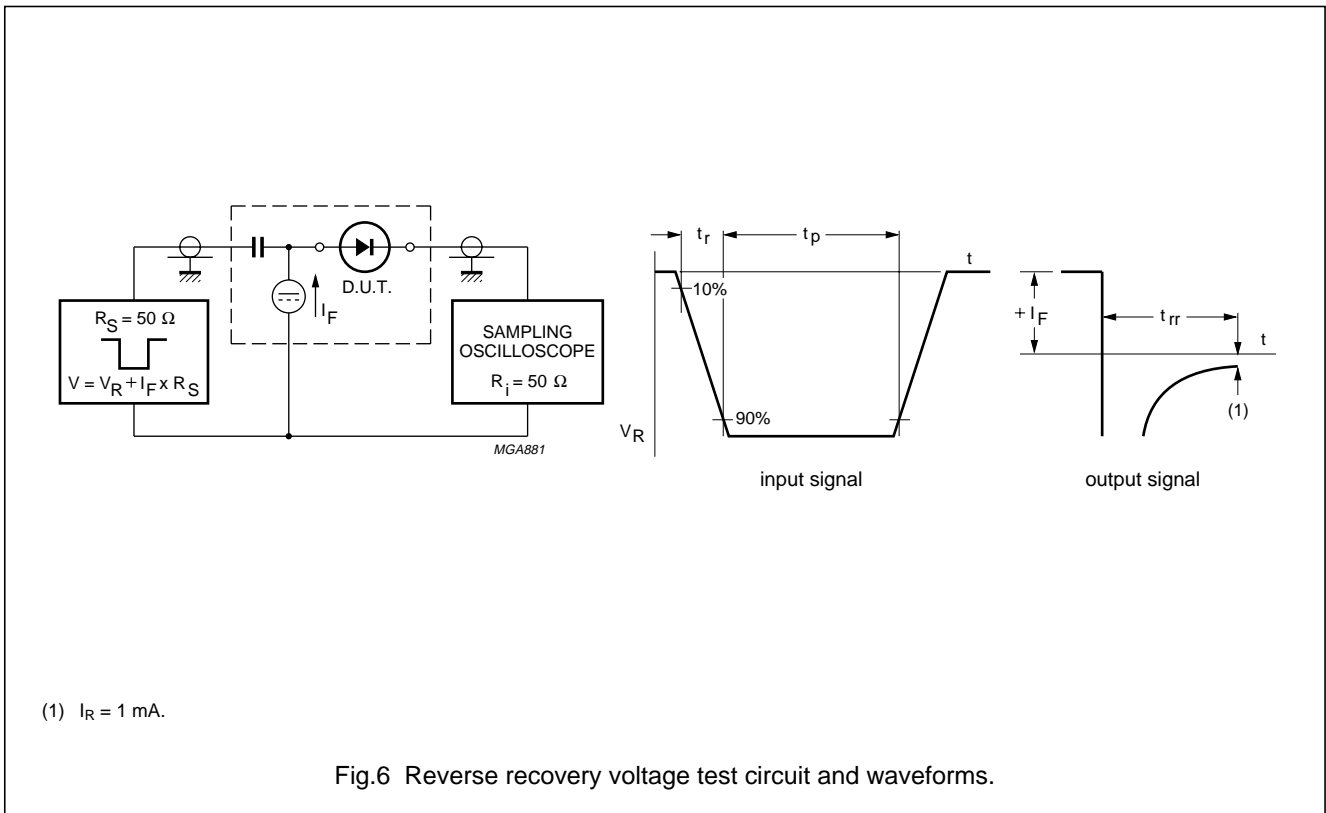
1PS301

GRAPHICAL DATA



High-speed double diode

1PS301



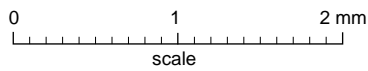
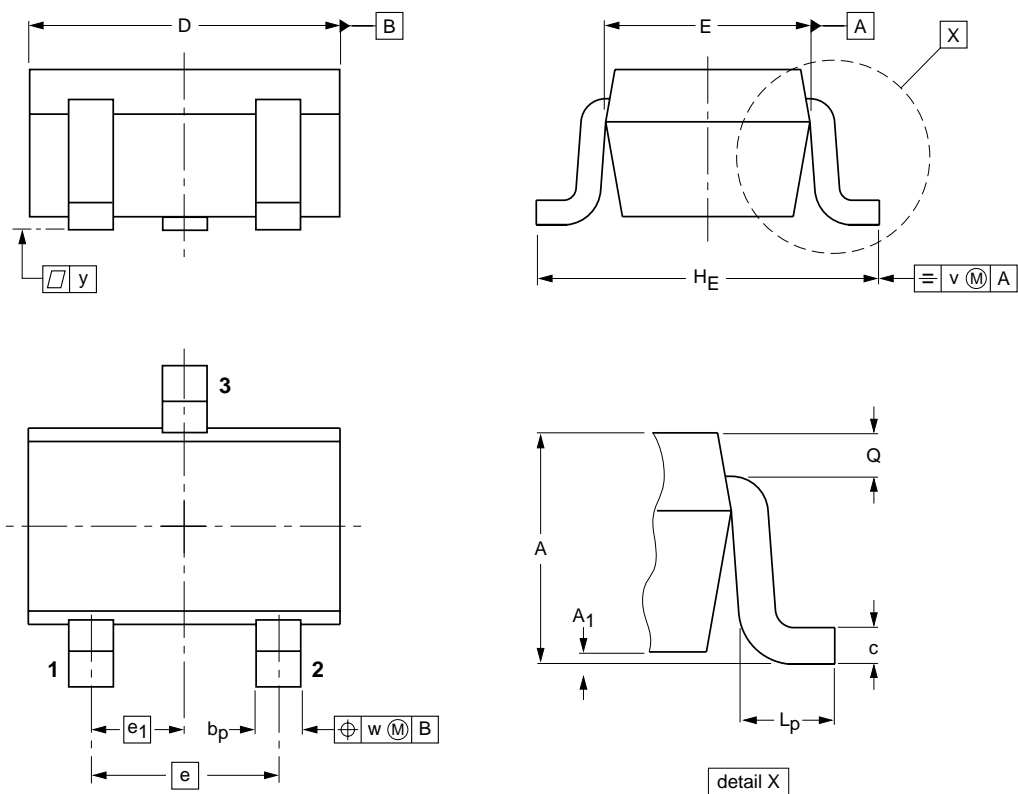
High-speed double diode

1PS301

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 |

High-speed double diode

1PS301

DEFINITIONS

| Data Sheet Status | |
|---|---|
| Objective specification | This data sheet contains target or goal specifications for product development. |
| Preliminary specification | This data sheet contains preliminary data; supplementary data may be published later. |
| Product specification | This data sheet contains final product specifications. |
| Limiting values | |
| Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability. | |
| Application information | |
| Where application information is given, it is advisory and does not form part of the specification. | |

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