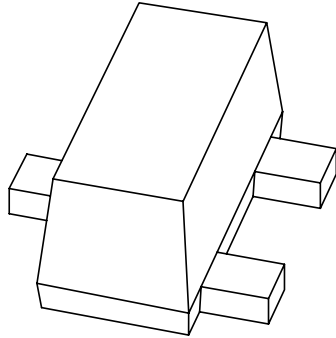


# DATA SHEET



**1PS89SS04; 1PS89SS05;  
1PS89SS06**

High-speed double diodes

Preliminary specification  
Supersedes data of 1999 Mar 01

1999 Jun 08

# High-speed double diodes

## 1PS89SS04; 1PS89SS05; 1PS89SS06

### FEATURES

- Power dissipation comparable to SOT23
- Ultra 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

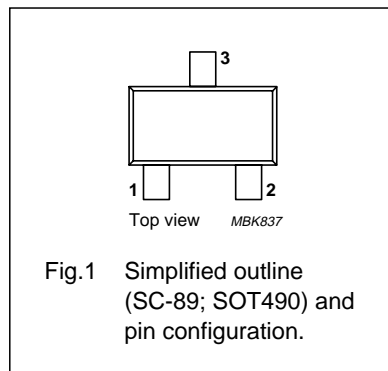
- High speed switching in e.g. surface mounted circuits.

### DESCRIPTION

Two high-speed switching diodes in planar technology, with different configurations, in an ultra small SC-89 (SOT490) plastic SMD package.

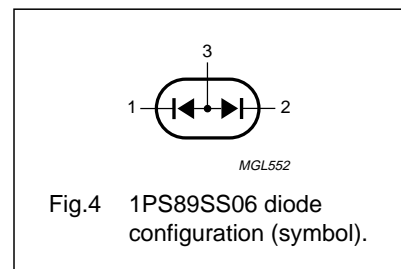
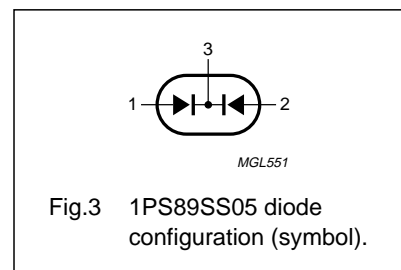
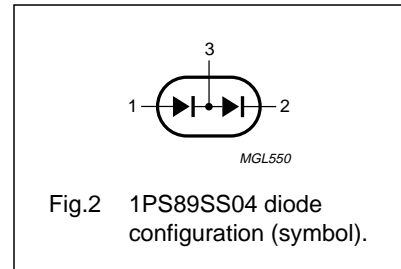
### PINNING

| PIN | 1PS89SS..                       |                                 |                                 |
|-----|---------------------------------|---------------------------------|---------------------------------|
|     | 04                              | 05                              | 06                              |
| 1   | a <sub>1</sub>                  | a <sub>1</sub>                  | k <sub>1</sub>                  |
| 2   | k <sub>2</sub>                  | a <sub>2</sub>                  | k <sub>2</sub>                  |
| 3   | k <sub>1</sub> , a <sub>2</sub> | k <sub>1</sub> , k <sub>2</sub> | a <sub>1</sub> , a <sub>2</sub> |



### MARKING

| TYPE NUMBER | MARKING CODE |
|-------------|--------------|
| 1PS89SS04   | S4           |
| 1PS89SS05   | S5           |
| 1PS89SS06   | S6           |



### LIMITING VALUES

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

| SYMBOL                                      | PARAMETER                           | CONDITIONS   | MIN. | MAX. | UNIT |
|---|-------------------------------------|--|------|------|------|
| <b>Per diode</b> unless otherwise specified |                                     |  |      |      |      |
| V <sub>RRM</sub>                            | repetitive peak reverse voltage     |  | –    | 85   | V    |
| V <sub>R</sub>                              | continuous reverse voltage          |  | –    | 80   | V    |
| I <sub>F</sub>                              | continuous forward current          | T <sub>amb</sub> = 25 °C; note 1; see Fig.5<br>single diode loaded | –    | 200  | mA   |
|   |                                     | both diodes loaded   | –    | 125  | mA   |
| I <sub>FRM</sub>                            | repetitive peak forward current     |  | –    | 500  | mA   |
| I <sub>FSM</sub>                            | non-repetitive peak forward current | square wave; T <sub>j</sub> = 25 °C prior to surge; see Fig.7      |      |      |      |
|   |                                     | t = 1 μs   | –    | 4    | A    |
|   |                                     | t = 1 s  | –    | 0.5  | A    |

## High-speed double diodes

1PS89SS04; 1PS89SS05;  
1PS89SS06

| SYMBOL    | PARAMETER                             | CONDITIONS   | MIN. | MAX. | UNIT               |
|-----------|---------------------------------------|--|------|------|--------------------|
| $P_{tot}$ | total power dissipation (per package) | $T_{amb} \leq 25\text{ }^{\circ}\text{C}$ ; note 1 | –    | 250  | mW                 |
| $T_{stg}$ | storage temperature                   |  | –65  | +150 | $^{\circ}\text{C}$ |
| $T_j$     | junction temperature                  |  | –    | +150 | $^{\circ}\text{C}$ |

**Note**

1. Refer to SC-89 (SOT490) standard mounting conditions.

**ELECTRICAL CHARACTERISTICS** $T_j = 25\text{ }^{\circ}\text{C}$  unless otherwise specified.

| SYMBOL           | PARAMETER                | CONDITIONS  | TYP.      | MAX. | UNIT          |    |
|------------------|--------------------------|---|-----------|------|---------------|----|
| <b>Per diode</b> |                          |   |           |      |               |    |
| $V_F$            | forward voltage          | see Fig.6   |           |      |               |    |
|                  |                          | $I_F = 1\text{ mA}$   | 610       | –    | mV            |    |
|                  |                          | $I_F = 10\text{ mA}$  | 740       | –    | mV            |    |
|                  |                          | $I_F = 50\text{ mA}$  | –         | 1    | V             |    |
|                  |                          | $I_F = 100\text{ mA}$   | –         | 1.2  | V             |    |
| $I_R$            | reverse current          | see Fig.8   |           |      |               |    |
|                  |                          | $V_R = 25\text{ V}$   | –         | 30   | nA            |    |
|                  |                          | $V_R = 80\text{ V}$   | –         | 0.5  | $\mu\text{A}$ |    |
|                  |                          | $V_R = 25\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$  | –         | 30   | $\mu\text{A}$ |    |
|                  |                          | $V_R = 80\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$  | –         | 100  | $\mu\text{A}$ |    |
| $C_d$            | diode capacitance        | $f = 1\text{ MHz}; V_R = 0$ ; see Fig.9   |           |      |               |    |
|                  |                          |   | 1PS89SS04 | –    | 1.5           | pF |
|                  |                          |   | 1PS89SS05 | –    | 1.5           | pF |
|                  | 1PS89SS06                | –   | 2         | pF   |               |    |
| $t_{rr}$         | reverse recovery time    | switched from $I_F = 10\text{ mA}$ to $I_R = 10\text{ mA}$ ;<br>$R_L = 100\text{ }\Omega$ ; measured at $I_R = 1\text{ mA}$ ;<br>see Fig.10 | –         | 4    | ns            |    |
| $V_{fr}$         | forward recovery voltage | switched to $I_F = 10\text{ mA}$ ; $t_r = 20\text{ ns}$ ;<br>see Fig.11   | –         | 1.75 | V             |    |

**THERMAL CHARACTERISTICS**

| SYMBOL        | PARAMETER   | CONDITIONS         | VALUE     | UNIT |     |
|---------------|---|--------------------|-----------|------|-----|
| $R_{th\ j-s}$ | thermal resistance from junction to soldering point | both diodes loaded |           |      |     |
|               |   |                    | 1PS89SS04 | 55   | K/W |
|               |   |                    | 1PS89SS05 | 70   | K/W |
|               | 1PS89SS06   | 70                 | K/W       |      |     |
| $R_{th\ j-a}$ | thermal resistance from junction to ambient         | note 1             | 500       | K/W  |     |

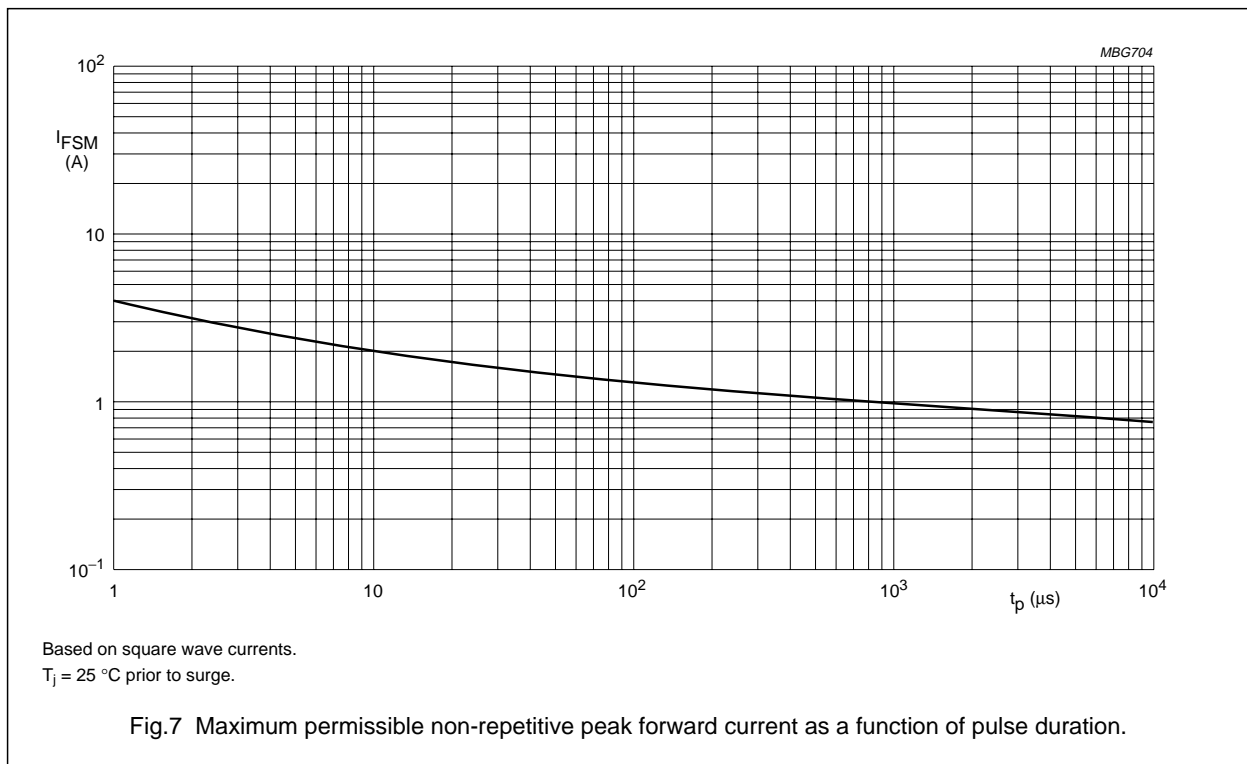
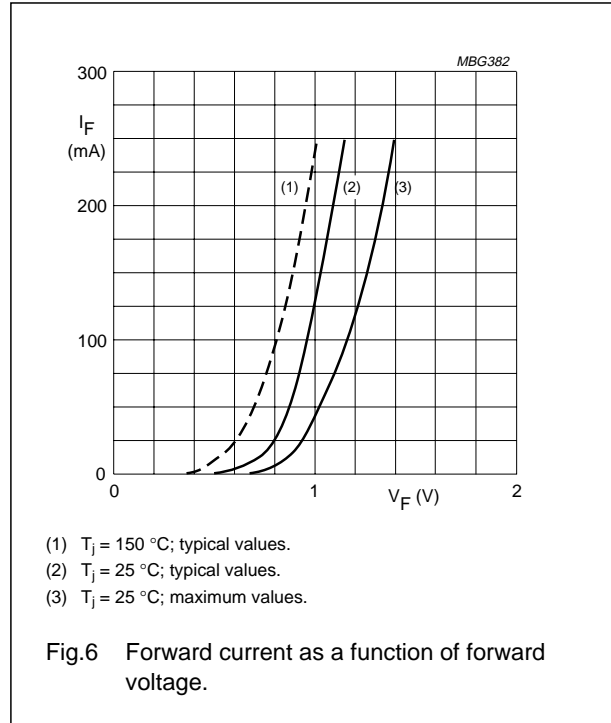
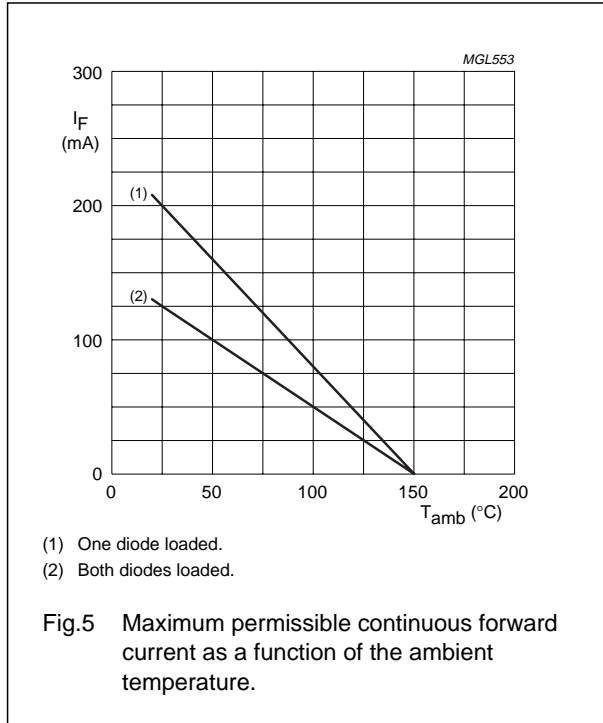
**Note**

1. Refer to SC-89 (SOT490) standard mounting conditions.

High-speed double diodes

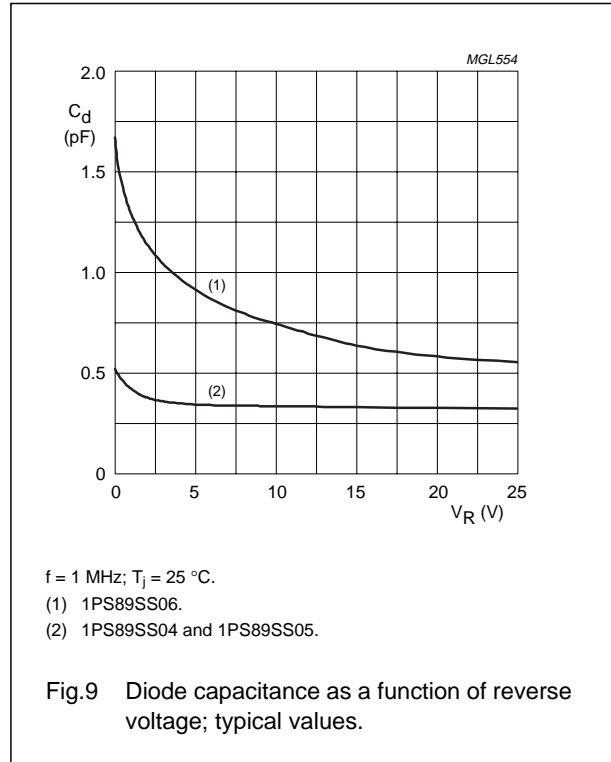
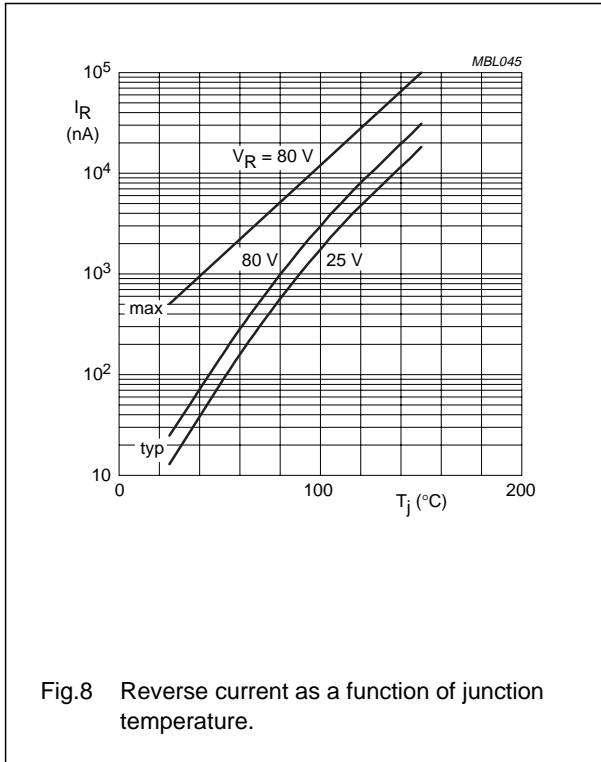
1PS89SS04; 1PS89SS05;  
1PS89SS06

GRAPHICAL DATA



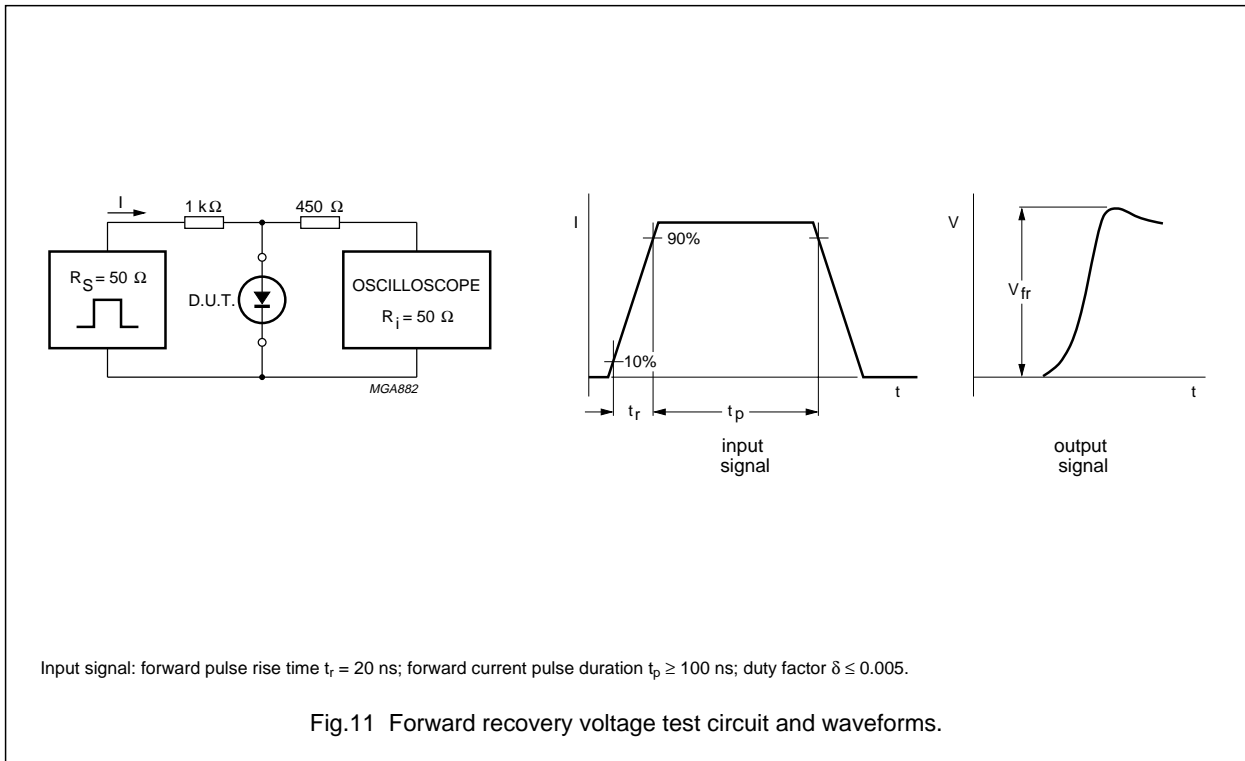
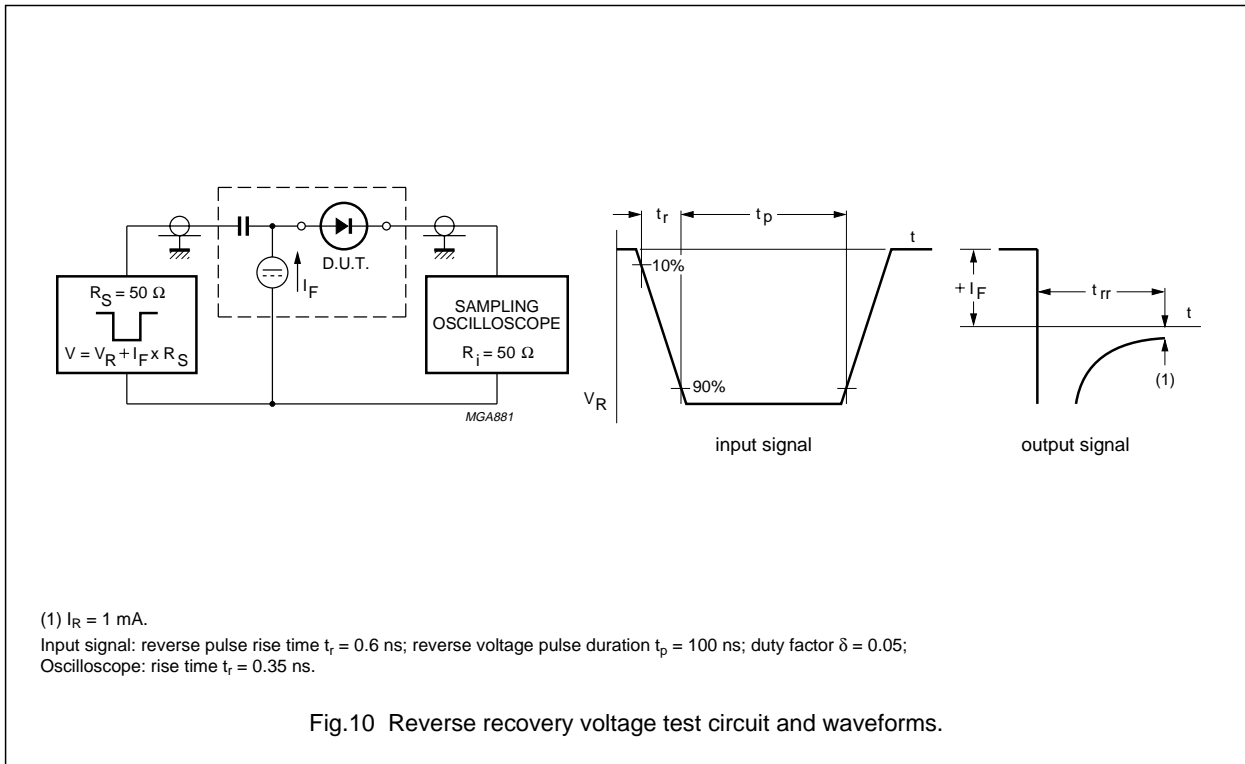
High-speed double diodes

1PS89SS04; 1PS89SS05;  
1PS89SS06



High-speed double diodes

1PS89SS04; 1PS89SS05;  
1PS89SS06



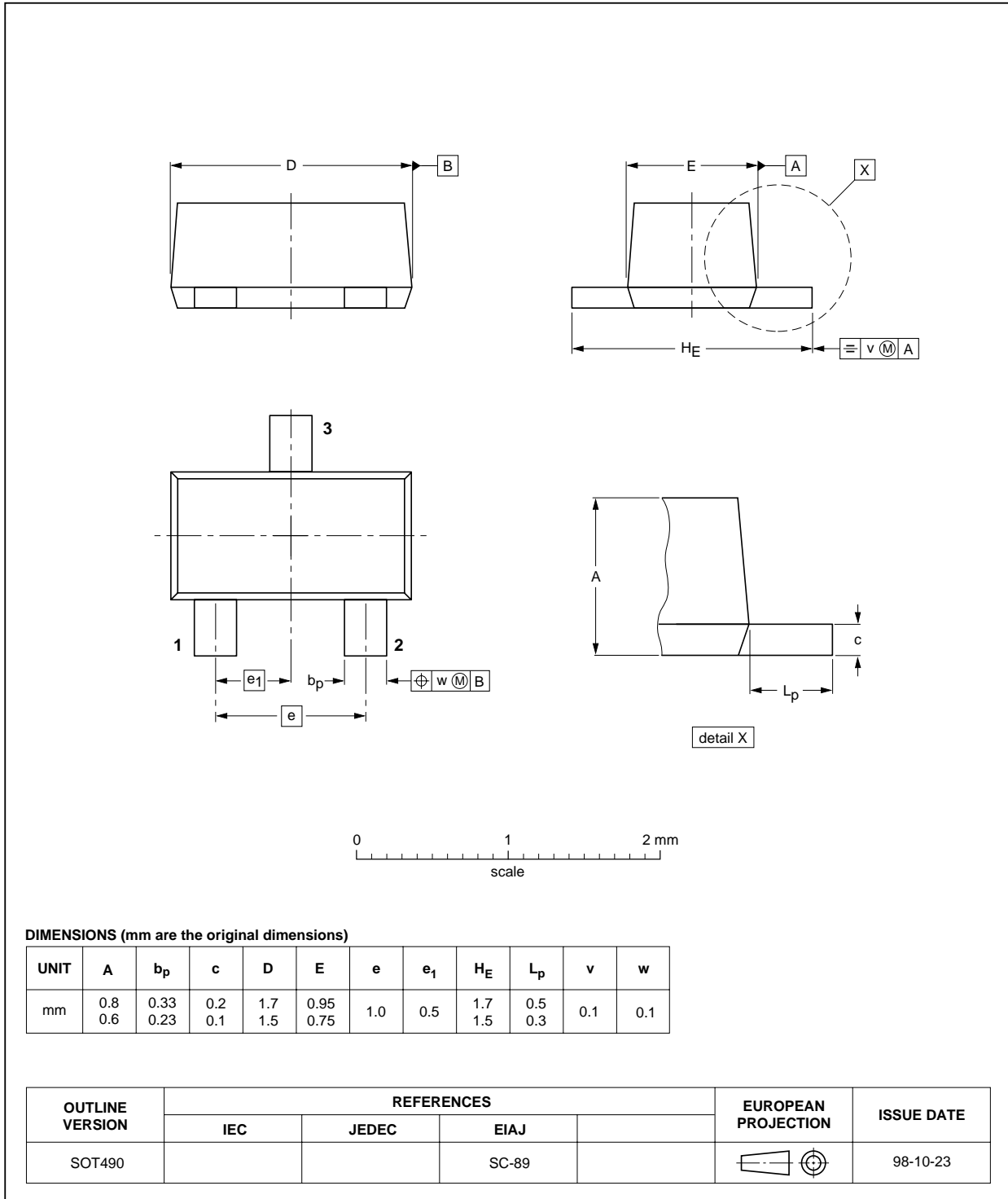
High-speed double diodes

1PS89SS04; 1PS89SS05;  
1PS89SS06

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT490



DIMENSIONS (mm are the original dimensions)

| UNIT | A          | b <sub>p</sub> | c          | D          | E            | e   | e <sub>1</sub> | H <sub>E</sub> | L <sub>p</sub> | v   | w   |
|------|------------|----------------|------------|------------|--------------|-----|----------------|----------------|----------------|-----|-----|
| mm   | 0.8<br>0.6 | 0.33<br>0.23   | 0.2<br>0.1 | 1.7<br>1.5 | 0.95<br>0.75 | 1.0 | 0.5            | 1.7<br>1.5     | 0.5<br>0.3     | 0.1 | 0.1 |

| OUTLINE VERSION | REFERENCES |       |       |  | EUROPEAN PROJECTION | ISSUE DATE |
|-----------------|------------|-------|-------|--|---------------------|------------|
|                 | IEC        | JEDEC | EIAJ  |  |                     |            |
| SOT490          |            |       | SC-89 |  |                     | 98-10-23   |

## High-speed double diodes

1PS89SS04; 1PS89SS05;  
1PS89SS06**DEFINITIONS**

| <b>Data Sheet Status</b>  |   |
|---|---|
| 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.                                |
| <b>Limiting values</b>  |   |
| 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. |   |
| <b>Application information</b>  |   |
| Where application information is given, it is advisory and does not form part of the specification.   |   |

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High-speed double diodes

1PS89SS04; 1PS89SS05;  
1PS89SS06

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**NOTES**

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High-speed double diodes

1PS89SS04; 1PS89SS05;  
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**NOTES**

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High-speed double diodes

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Printed in The Netherlands

115002/04/pp12

Date of release: 1999 Jun 08

Document order number: 9397 750 06077

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