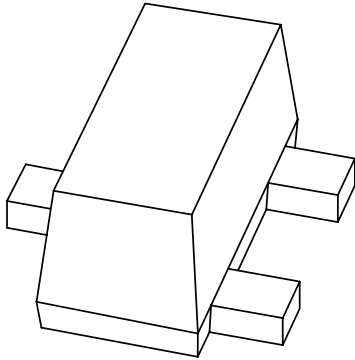


DATA SHEET



**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 ₁	a ₁	k ₁
2	k ₂	a ₂	k ₂
3	k ₁ , a ₂	k ₁ , k ₂	a ₁ , a ₂

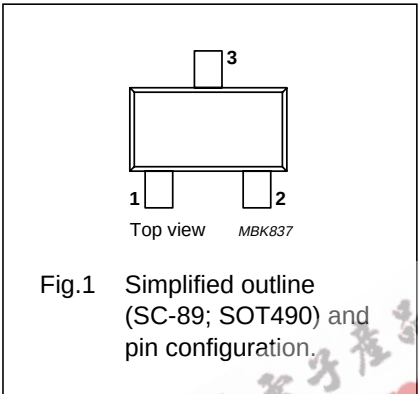


Fig.1 Simplified outline (SC-89; SOT490) and pin configuration.

MARKING

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

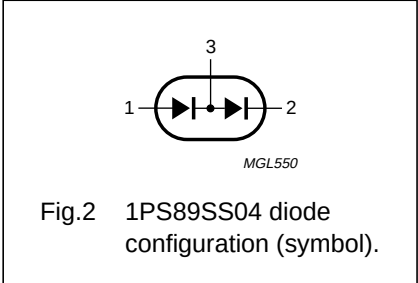


Fig.2 1PS89SS04 diode configuration (symbol).

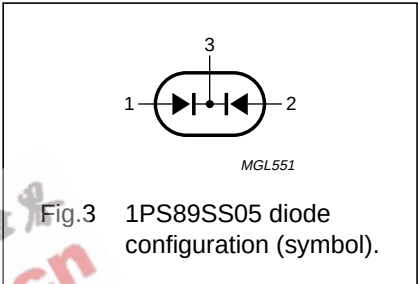


Fig.3 1PS89SS05 diode configuration (symbol).

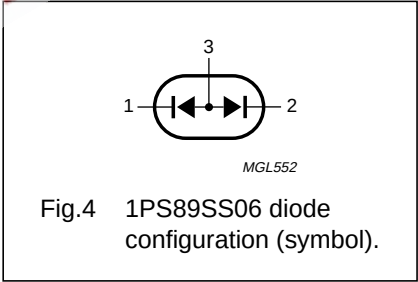


Fig.4 1PS89SS06 diode configuration (symbol).

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode unless otherwise specified					
V _{RRM}	repetitive peak reverse voltage		–	85	V
V _R	continuous reverse voltage		–	80	V
I _F	continuous forward current	T _{amb} = 25 °C; note 1; see Fig.5 single diode loaded both diodes loaded	– –	200 125	mA 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.7 t = 1 μs t = 1 s	– –	4 0.5	A A

High-speed double diodes

1PS89SS04; 1PS89SS05;
1PS89SS06

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

Note

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

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

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
Per diode					
V_{F}	forward voltage	see Fig.6 $I_{\text{F}} = 1\text{ mA}$ $I_{\text{F}} = 10\text{ mA}$ $I_{\text{F}} = 50\text{ mA}$ $I_{\text{F}} = 100\text{ mA}$	610 740 – –	– – 1 1.2	mV mV V V
I_{R}	reverse current	see Fig.8 $V_{\text{R}} = 25\text{ V}$ $V_{\text{R}} = 80\text{ V}$ $V_{\text{R}} = 25\text{ V}; T_{\text{j}} = 150\text{ °C}$ $V_{\text{R}} = 80\text{ V}; T_{\text{j}} = 150\text{ °C}$	– – – –	30 0.5 30 100	nA μA μA μA
C_{d}	diode capacitance	$f = 1\text{ MHz}; V_{\text{R}} = 0$; see Fig.9			
	1PS89SS04		–	1.5	pF
	1PS89SS05		–	1.5	pF
	1PS89SS06		–	2	pF
t_{rr}	reverse recovery time	switched from $I_{\text{F}} = 10\text{ mA}$ to $I_{\text{R}} = 10\text{ mA}$; $R_{\text{L}} = 100\text{ }\Omega$; measured at $I_{\text{R}} = 1\text{ mA}$; see Fig.10	–	4	ns
V_{fr}	forward recovery voltage	switched to $I_{\text{F}} = 10\text{ mA}$; $t_{\text{r}} = 20\text{ ns}$; see Fig.11	–	1.75	V

THERMAL CHARACTERISTICS

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

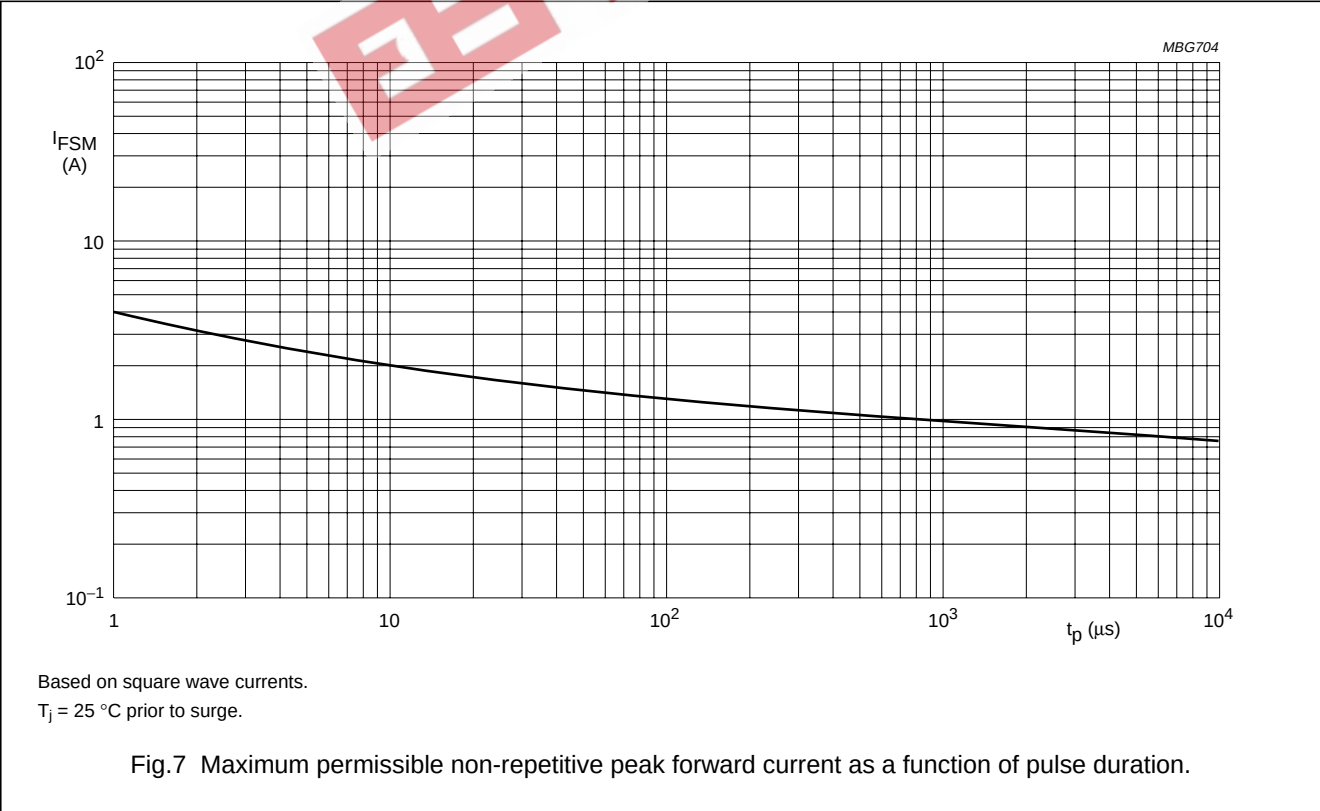
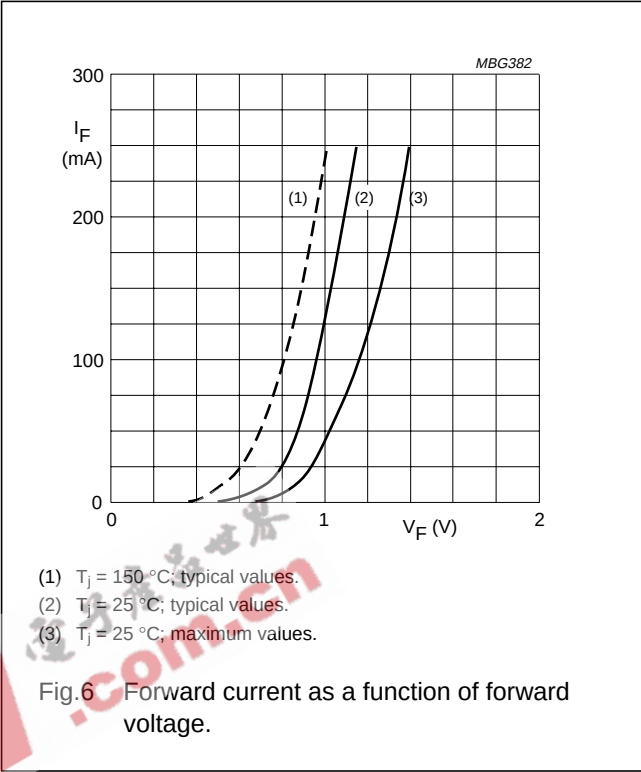
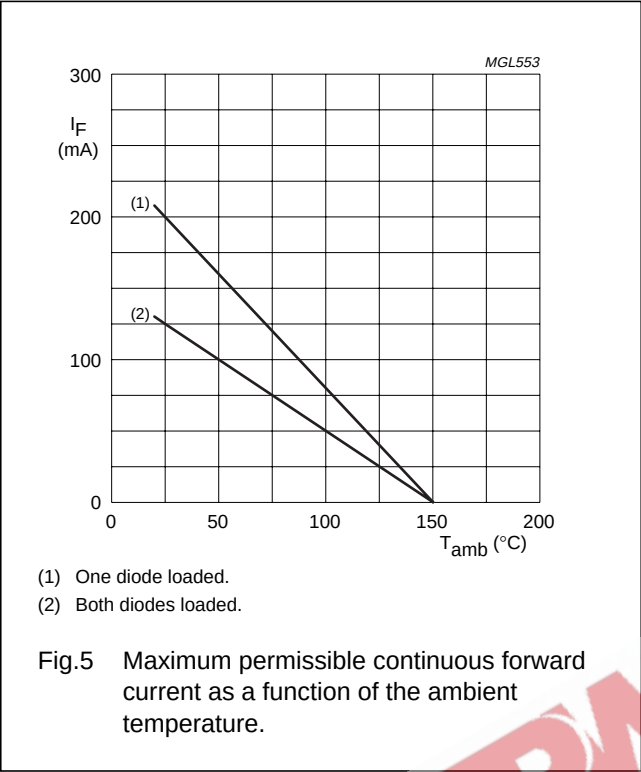
Note

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

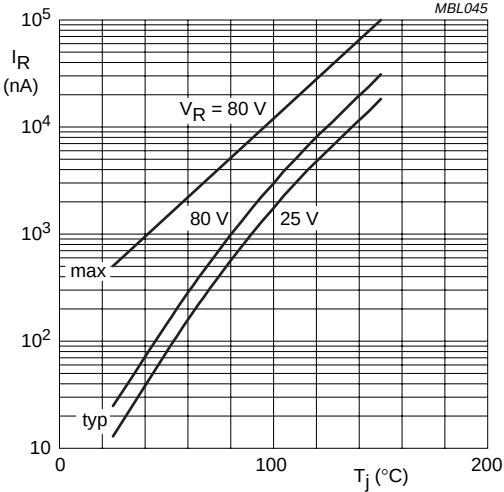
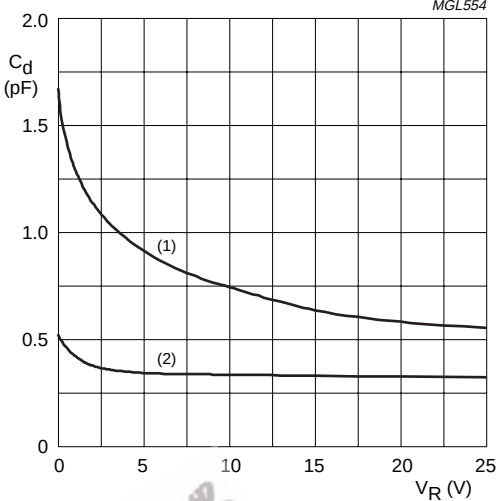


Fig.8 Reverse current as a function of junction temperature.



$f = 1\text{ MHz}$; $T_j = 25\text{ °C}$.
(1) 1PS89SS06.
(2) 1PS89SS04 and 1PS89SS05.

Fig.9 Diode capacitance as a function of reverse voltage; typical values.

High-speed double diodes

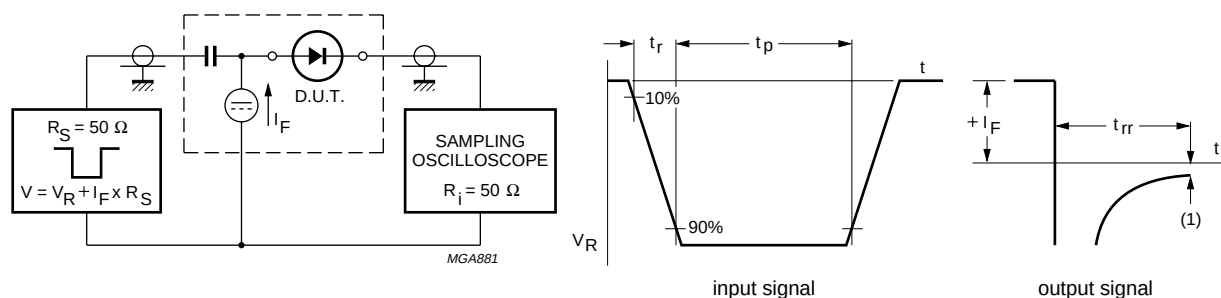
1PS89SS04; 1PS89SS05;
1PS89SS06(1) $I_R = 1 \text{ mA}$.Input signal: reverse pulse rise time $t_r = 0.6 \text{ ns}$; reverse voltage pulse duration $t_p = 100 \text{ ns}$; duty factor $\delta = 0.05$;
Oscilloscope: rise time $t_r = 0.35 \text{ ns}$.

Fig.10 Reverse recovery voltage test circuit and waveforms.

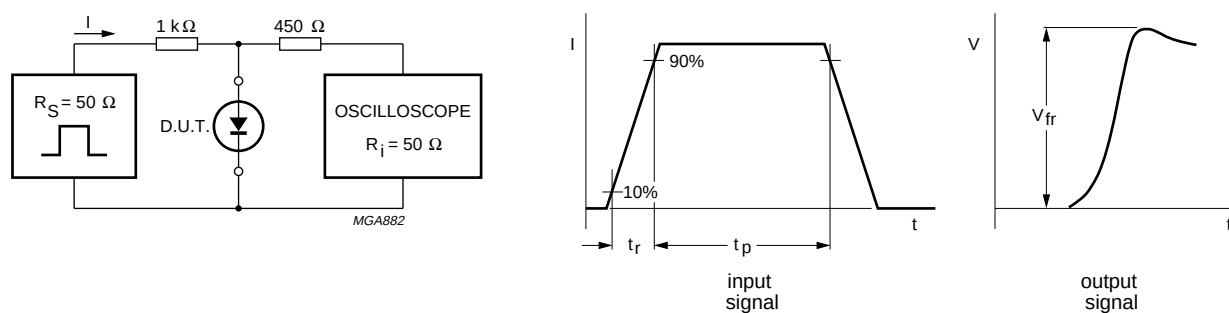
Input signal: forward pulse rise time $t_r = 20 \text{ ns}$; forward current pulse duration $t_p \geq 100 \text{ ns}$; duty factor $\delta \leq 0.005$.

Fig.11 Forward recovery voltage test circuit and waveforms.

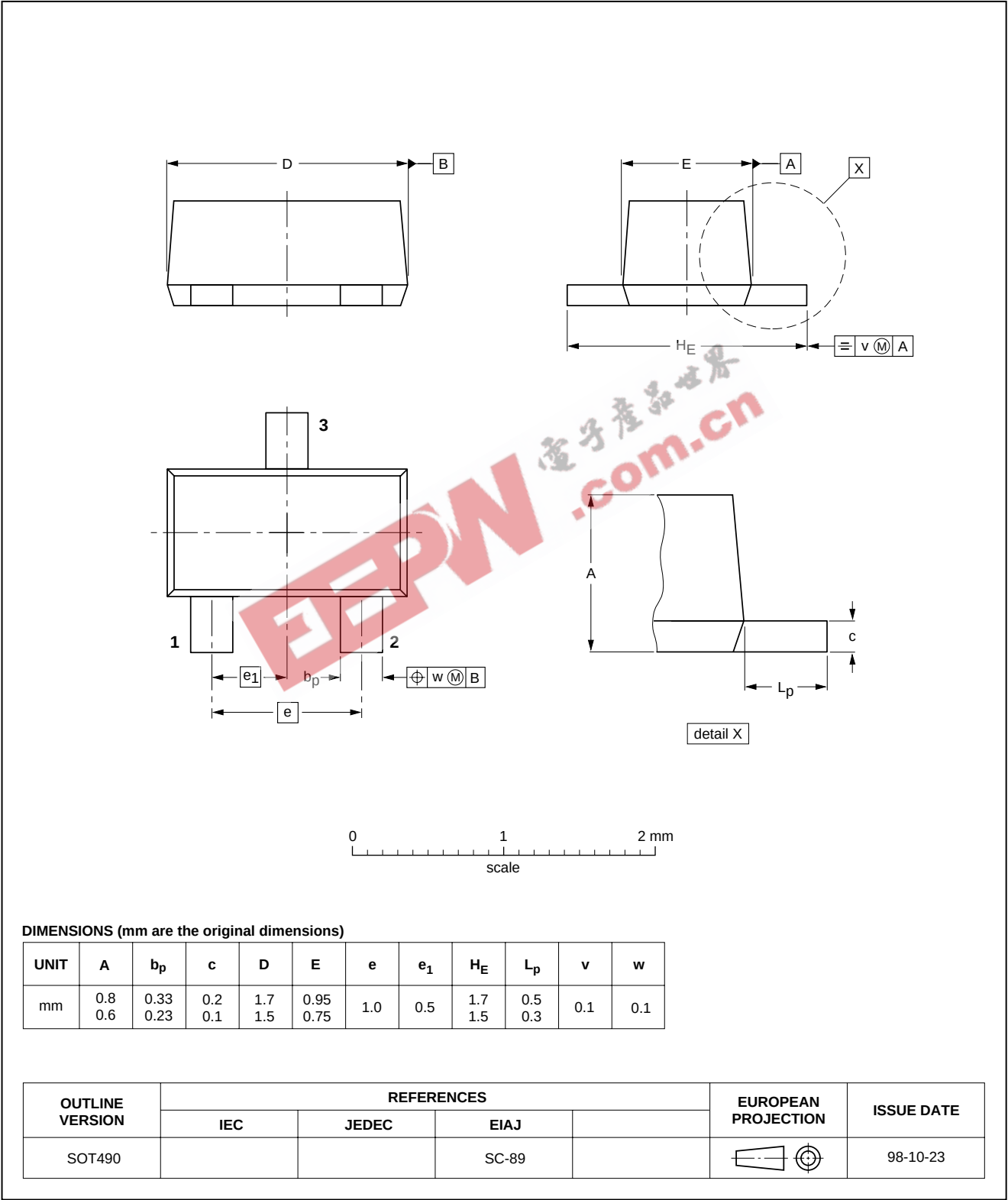
High-speed double diodes

1PS89SS04; 1PS89SS05;
1PS89SS06

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT490



High-speed double diodes

1PS89SS04; 1PS89SS05;
1PS89SS06

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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High-speed double diodes

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