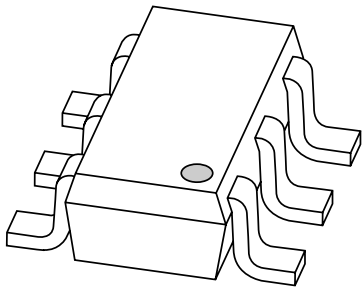


# DATA SHEET



## **BZA418A** Quadruple ESD transient voltage suppressor

Product specification

2002 Sep 02

# Quadruple ESD transient voltage suppressor

# BZA418A

## FEATURES

- ESD rating >8 kV, according to IEC1000-4-2
- SOT457 surface mount package
- Common anode configuration
- Non-clamping range -0.5 to 18 V
- Maximum reverse peak power dissipation:  
19.6 W at  $t_p = 1$  ms
- Maximum clamping voltage at peak pulse current:  
27 V at  $I_{ZSM} = 0.7$  A.

## APPLICATIONS

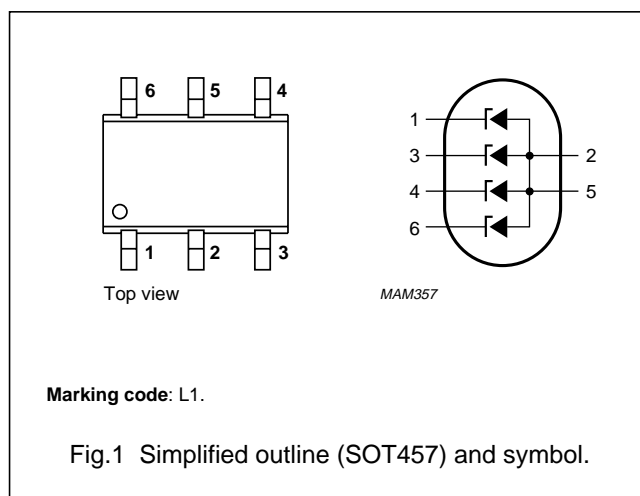
- Computers and peripherals
- Audio and video equipment
- Communication systems
- Medical equipment.

## DESCRIPTION

Monolithic transient voltage suppressor diode in a six lead SOT457 (SC-74) package for 4-bit wide ESD transient suppression at 18 V level.

## PINNING

PIN	DESCRIPTION
1	cathode 1
2	common
3	cathode 2
4	cathode 3
5	common
6	cathode 4



## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
<b>Per diode</b>					
$I_Z$	working current	$T_s = 60$ °C; note 1	-	note 2	mA
$I_F$	continuous forward current	$T_s = 60$ °C	-	100	mA
$I_{FSM}$	non-repetitive peak forward current	$t_p = 1$ ms; square pulse	-	3.75	A
$I_{ZSM}$	non-repetitive peak reverse current	$t_p = 1$ ms; square pulse; see Fig.2	-	0.7	A
$P_{tot}$	total power dissipation	$T_s = 60$ °C; see Fig.3	-	720	mW
$P_{ZSM}$	non repetitive peak reverse power dissipation	square pulse; $t_p = 1$ ms; see Fig.4	-	19.6	W
$T_{stg}$	storage temperature		-65	+150	°C
$T_j$	junction temperature		-65	+150	°C

## Notes

1.  $T_s$  is the temperature at the soldering point of the anode pin.
2. DC working current limited by  $P_{tot\ max}$ .

# Quadruple ESD transient voltage suppressor

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## THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-s}$	thermal resistance from junction to soldering point	one or more diodes loaded	125	K/W

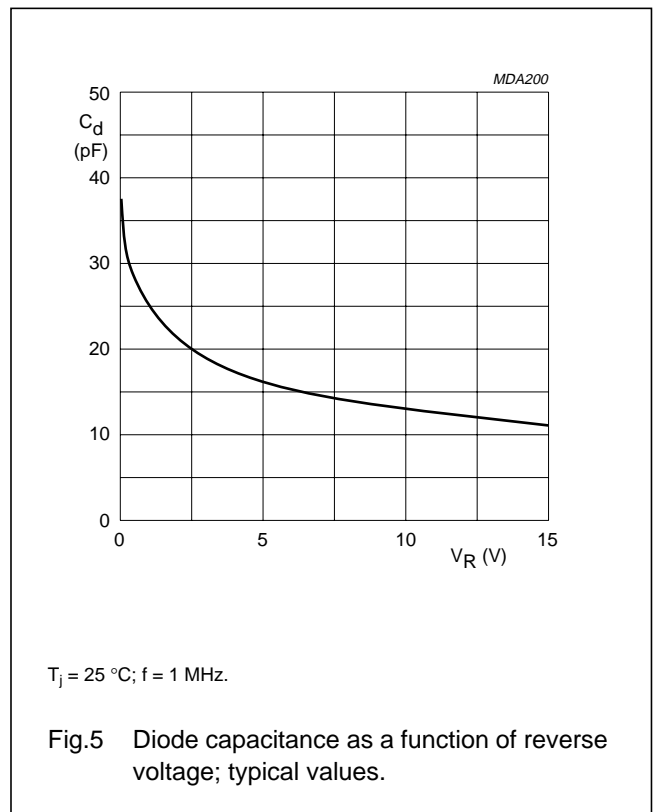
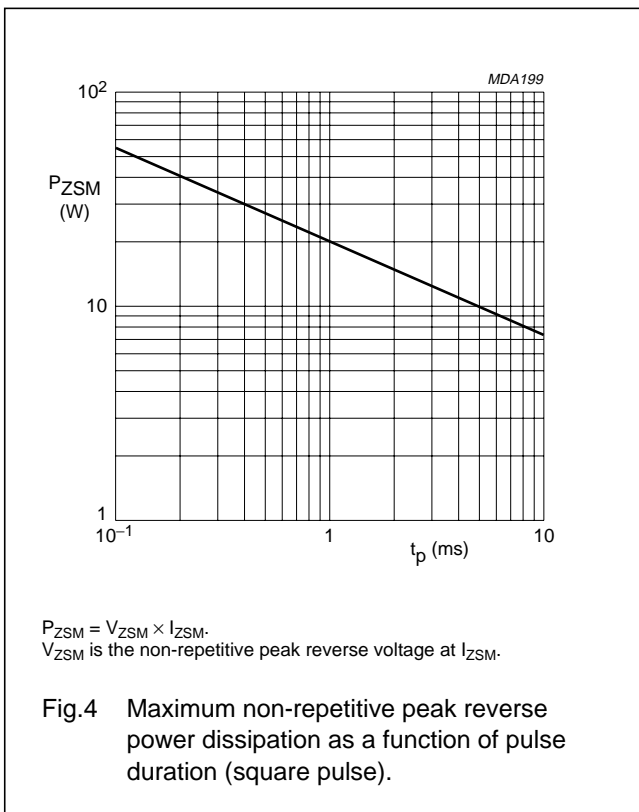
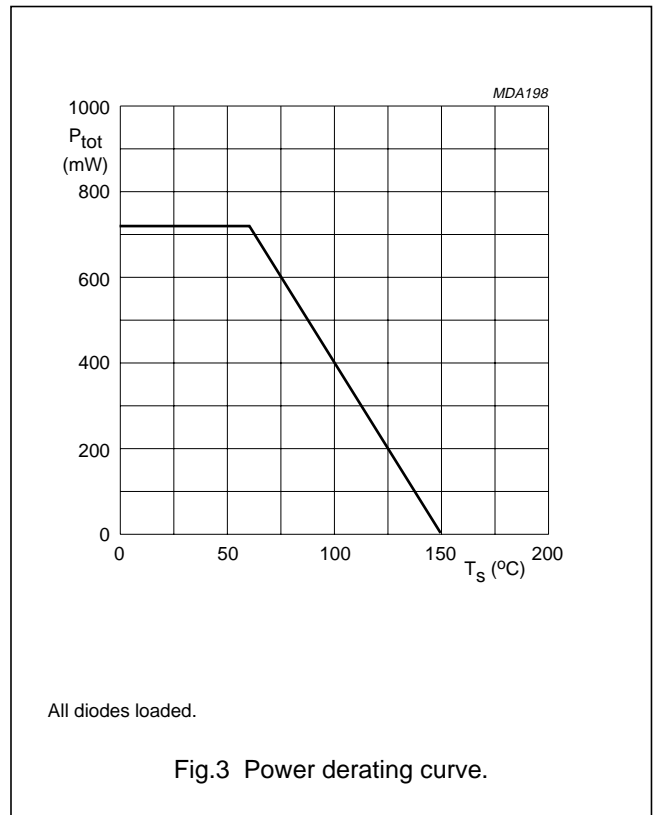
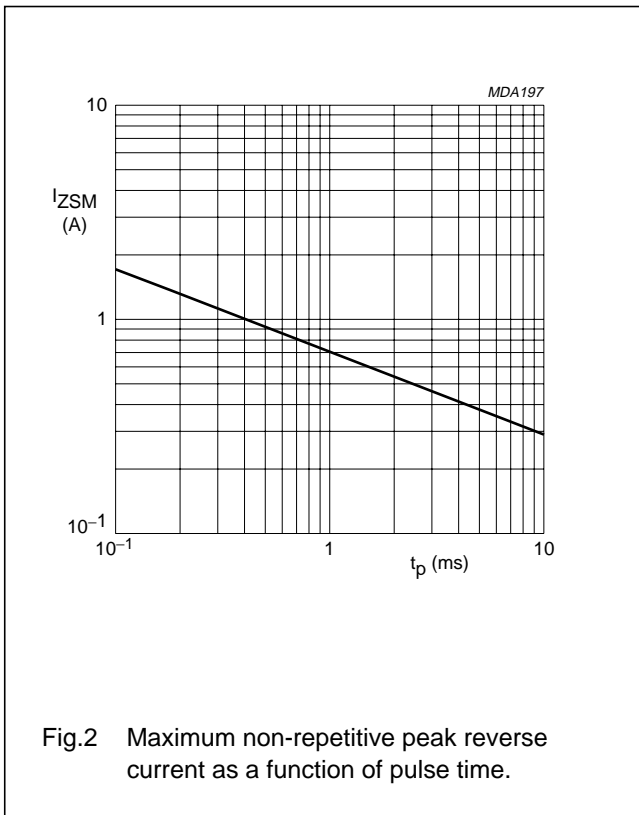
## ELECTRICAL CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Per diode</b>						
$V_Z$	working voltage	$I_Z = 1\text{ mA}$	17.1	18	18.9	V
$V_F$	forward voltage	$I_F = 200\text{ mA}$	–	–	1.3	V
$V_{ZSM}$	non-repetitive peak reverse voltage	$I_{ZSM} = 0.7\text{ A}; t_p = 1\text{ ms}$	–	–	27	V
$I_R$	reverse current	$V_R = 14\text{ V}$	–	–	75	nA
$r_{dif}$	differential resistance	$I_Z = 1\text{ mA}$	–	–	125	$\Omega$
$S_Z$	temperature coefficient of working voltage	$I_Z = 5\text{ mA}$	–	14.4	–	mV/K
$C_d$	diode capacitance	see Fig.5				
		$V_R = 0; f = 1\text{ MHz}$	–	–	48	pF
		$V_R = 13\text{ V}; f = 1\text{ MHz}$	–	–	14	pF

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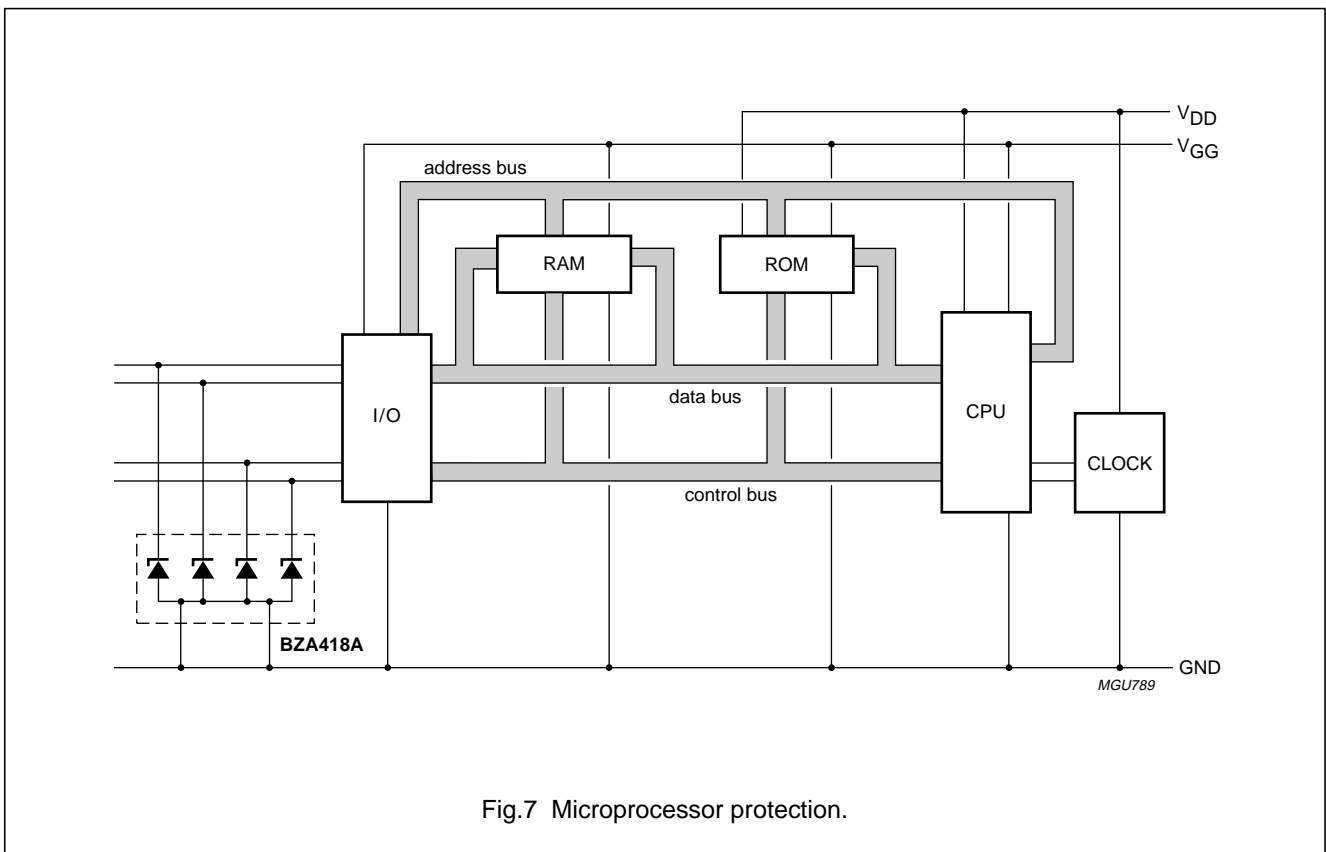
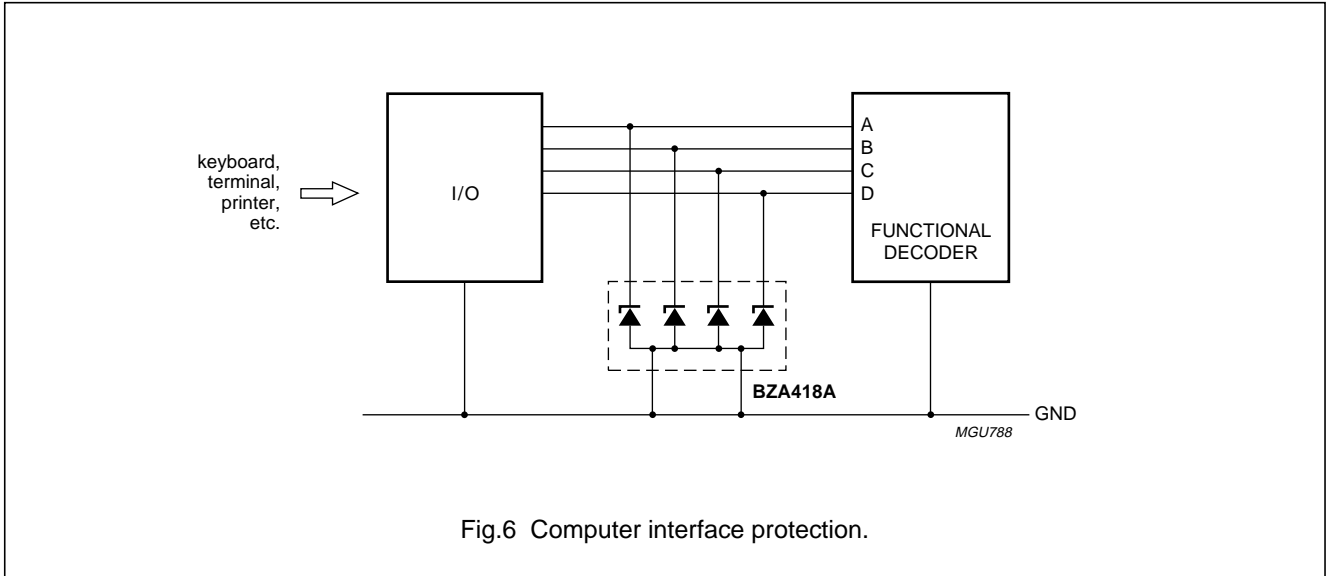
# Quadruple ESD transient voltage suppressor

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## APPLICATION INFORMATION

### Typical common anode application

A quadruple transient suppressor in a SOT457 package makes it possible to protect four separate lines using only one package. Two simplified examples are shown in Figs 6 and 7.



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## Quadruple ESD transient voltage suppressor

## BZA418A

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### Device placement and printed-circuit board layout

Circuit board layout is of extreme importance in the suppression of transients. The clamping voltage of the BZA418A is determined by the peak transient current and the rate of rise of that current ( $di/dt$ ). Since parasitic inductances can further add to the clamping voltage ( $V = L di/dt$ ) the series conductor lengths on the printed-circuit board should be kept to a minimum. This includes the lead length of the suppression element.

In addition to minimizing conductor length the following printed-circuit board layout guidelines are recommended:

1. Place the suppression element close to the input terminals or connectors
2. Keep parallel signal paths to a minimum
3. Avoid running protection conductors in parallel with unprotected conductors
4. Minimize all printed-circuit board loop areas including power and ground loops
5. Minimize the length of the transient return path to ground
6. Avoid using shared transient return paths to a common ground point.

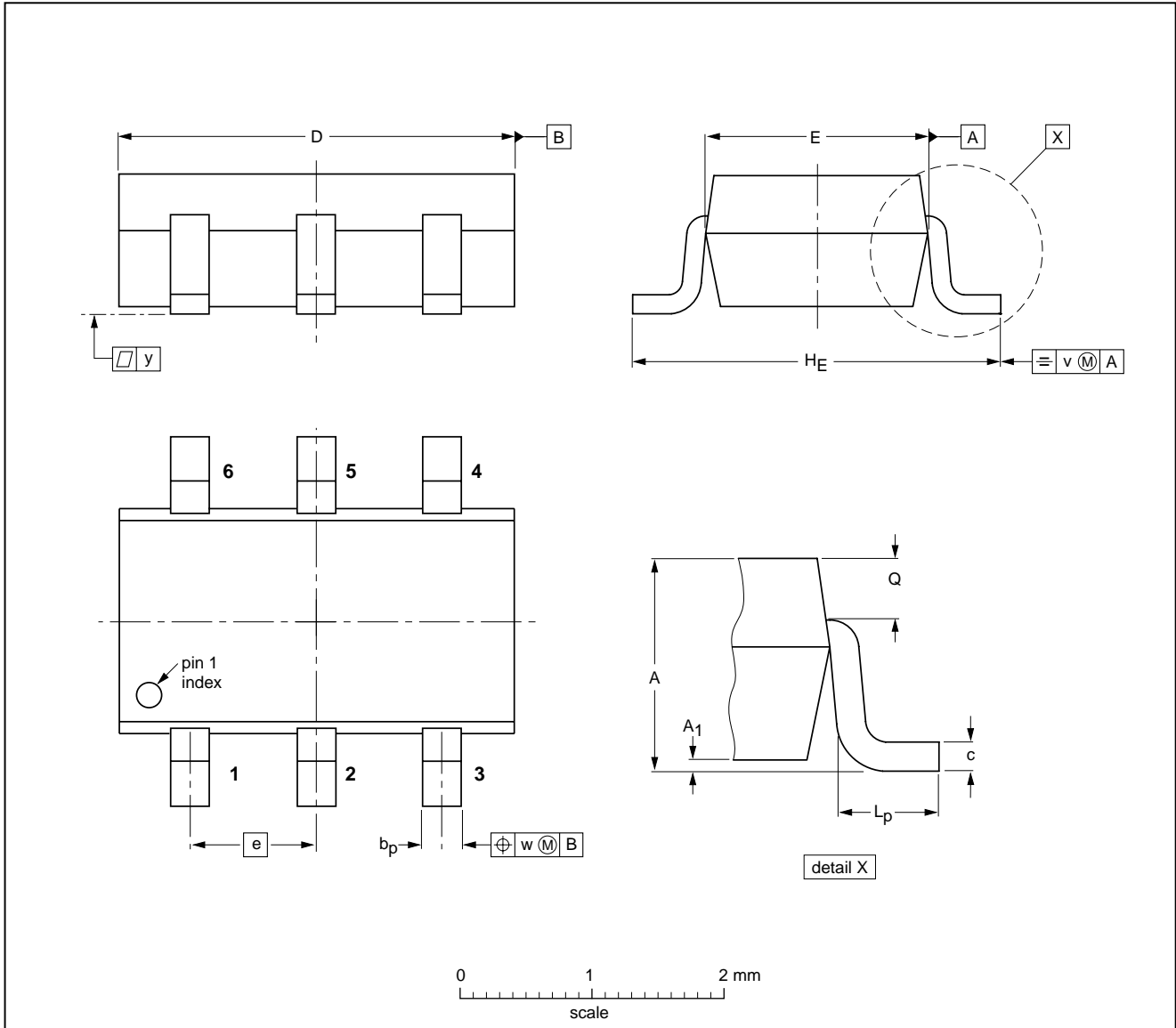
Quadruple ESD transient voltage suppressor

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PACKAGE OUTLINE

Plastic surface mounted package; 6 leads

SOT457



DIMENSIONS (mm are the original dimensions)

UNIT	A	A <sub>1</sub>	b <sub>p</sub>	c	D	E	e	H <sub>E</sub>	L <sub>p</sub>	Q	v	w	y
mm	1.1 0.9	0.1 0.013	0.40 0.25	0.26 0.10	3.1 2.7	1.7 1.3	0.95	3.0 2.5	0.6 0.2	0.33 0.23	0.2	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT457			SC-74			-97-02-28- 01-05-04

# Quadruple ESD transient voltage suppressor

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## DATA SHEET STATUS

DATA SHEET STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	DEFINITIONS
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Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
Product data	Production	This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Changes will be communicated according to the Customer Product/Process Change Notification (CPCN) procedure SNW-SQ-650A.

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**NOTES**

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**NOTES**

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**NOTES**

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Printed in The Netherlands

613514/01/pp12

Date of release: 2002 Sep 02

Document order number: 9397 750 10098

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