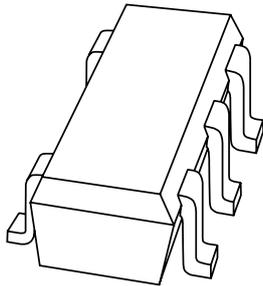


# DATA SHEET



## **BZA800AL series** Quadruple ESD transient voltage suppressor

Product specification

2002 Jan 11

# Quadruple ESD transient voltage suppressor

# BZA800AL series

### FEATURES

- ESD rating >8 kV contact discharge, according to IEC1000-4-2
- SOT353 (SC-88A) surface mount package
- Common anode configuration.

### APPLICATIONS

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

### DESCRIPTION

Monolithic transient voltage suppressor diode in a five lead SOT353 (SC-88A) package for 4-bit wide ESD transient suppression.

### MARKING

TYPE NUMBER	MARKING CODE
BZA856AL	M1
BZA862AL	M2
BZA868AL	M3

### PINNING

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

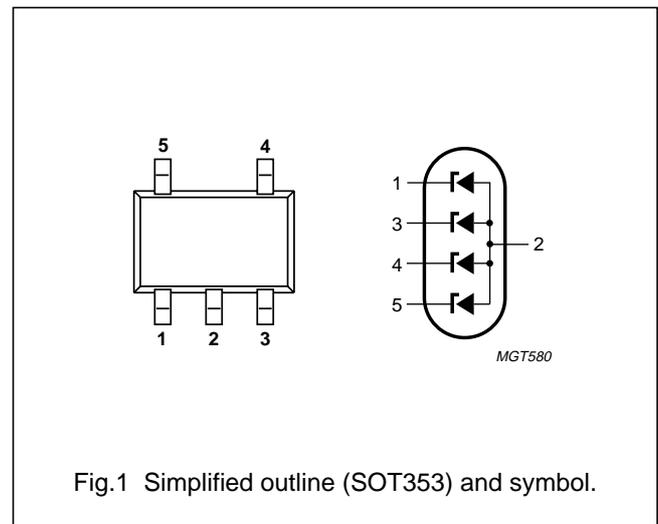


Fig.1 Simplified outline (SOT353) and symbol.

### 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	$T_{amb} = 25\text{ }^\circ\text{C}$	–	note 1	mA
$I_F$	continuous forward current	$T_{amb} = 25\text{ }^\circ\text{C}$	–	200	mA
$I_{FSM}$	non-repetitive peak forward current	$t_p = 1\text{ ms}$ ; square pulse	–	4	A
$P_{tot}$	total power dissipation	$T_{amb} = 25\text{ }^\circ\text{C}$ ; note 2; see Fig.5	–	300	mW
$P_{ZSM}$	non repetitive peak reverse power dissipation: BZA856AL BZA862AL BZA868AL	square pulse; $t_p = 1\text{ ms}$ ; see Fig.3	–	16	W
			–	15	W
			–	14	W
$T_{stg}$	storage temperature		–65	+150	$^\circ\text{C}$
$T_j$	junction temperature		–	150	$^\circ\text{C}$

### Notes

1. DC working current limited by  $P_{tot(max)}$ .
2. Device mounted on standard printed-circuit board.

## Quadruple ESD transient voltage suppressor

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## THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	all diodes loaded	410	K/W
$R_{th\ j-s}$	thermal resistance from junction to solder point; note 1	one diode loaded	200	K/W
		all diodes loaded	185	K/W

## Note

1. Solder point of common anode (pin 2).

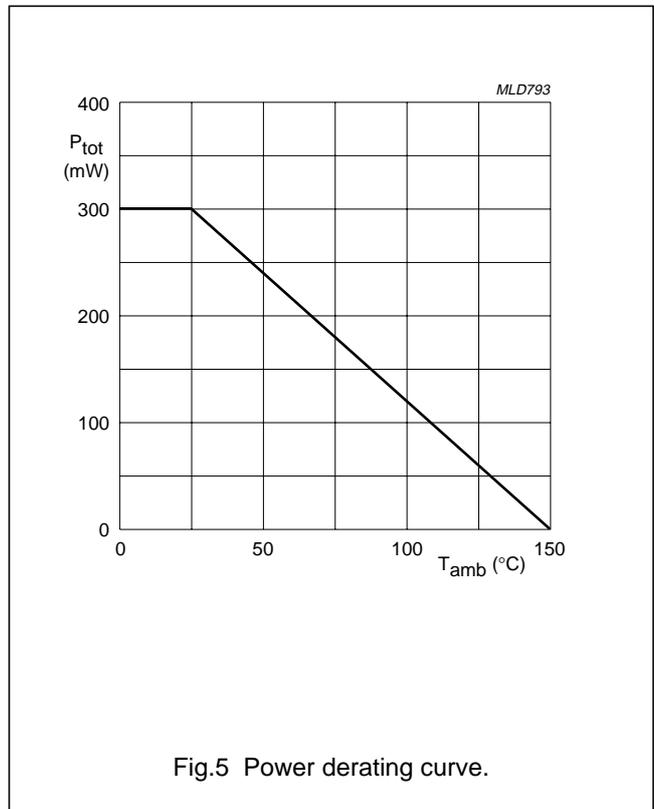
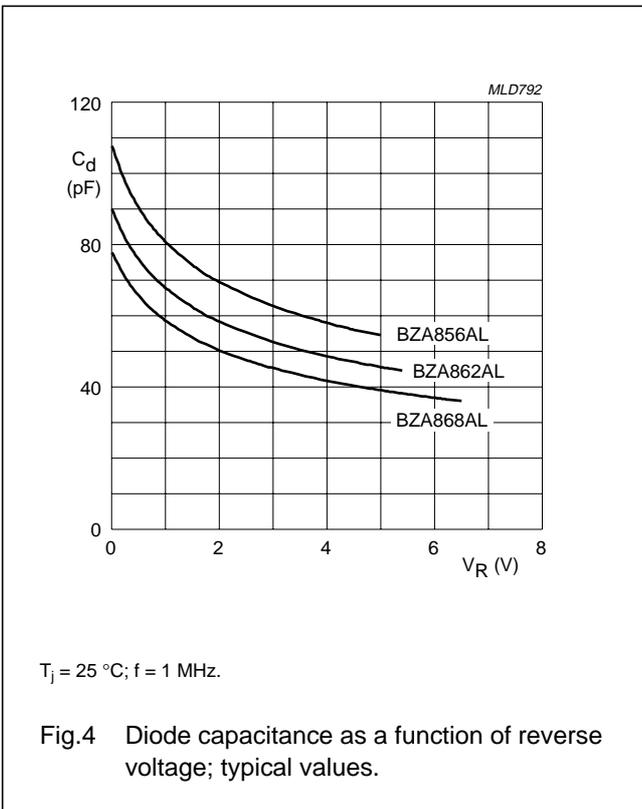
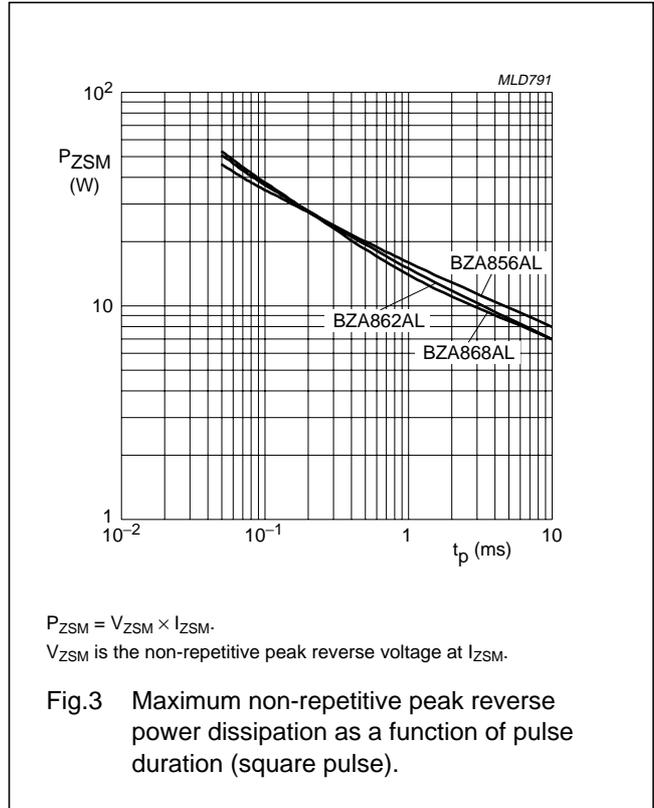
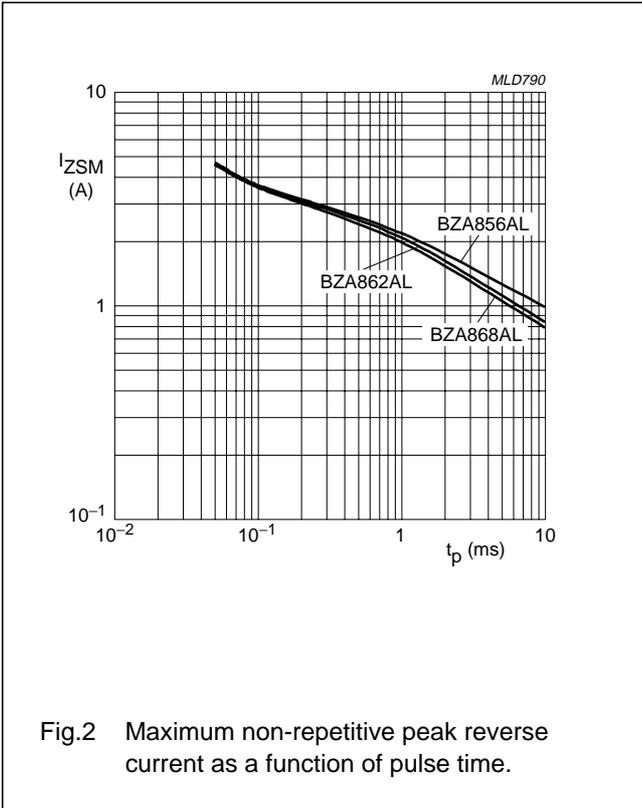
## ELECTRICAL CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_F$	forward voltage	$I_F = 200\text{ mA}$	–	–	1.3	V
$I_R$	reverse current					
	BZA856AL	$V_R = 3\text{ V}$	–	–	1 000	nA
	BZA862AL	$V_R = 4\text{ V}$	–	–	500	nA
	BZA868AL	$V_R = 4.3\text{ V}$	–	–	100	nA
$V_Z$	working voltage	$I_Z = 1\text{ mA}$				
	BZA856AL		5.32	5.6	5.88	V
	BZA862AL		5.89	6.2	6.51	V
	BZA868AL		6.46	6.8	7.14	V
$r_{dif}$	differential resistance	$I_Z = 1\text{ mA}$				
	BZA856AL		–	–	400	$\Omega$
	BZA862AL		–	–	300	$\Omega$
	BZA868AL		–	–	200	$\Omega$
$S_Z$	temperature coefficient	$I_Z = 1\text{ mA}$				
	BZA856AL		–	0.3	–	mV/K
	BZA862AL		–	1.6	–	mV/K
	BZA868AL		–	2.2	–	mV/K
$C_d$	diode capacitance	$f = 1\text{ MHz}; V_R = 0$				
	BZA856AL		–	–	125	pF
	BZA862AL		–	–	105	pF
	BZA868AL		–	–	90	pF
$I_{ZSM}$	non-repetitive peak reverse current	$t_p = 1\text{ ms}; T_{amb} = 25\text{ °C}$				
	BZA856AL		–	–	2.2	A
	BZA862AL		–	–	2.1	A
	BZA868AL		–	–	2	A

Quadruple ESD transient voltage suppressor

BZA800AL series



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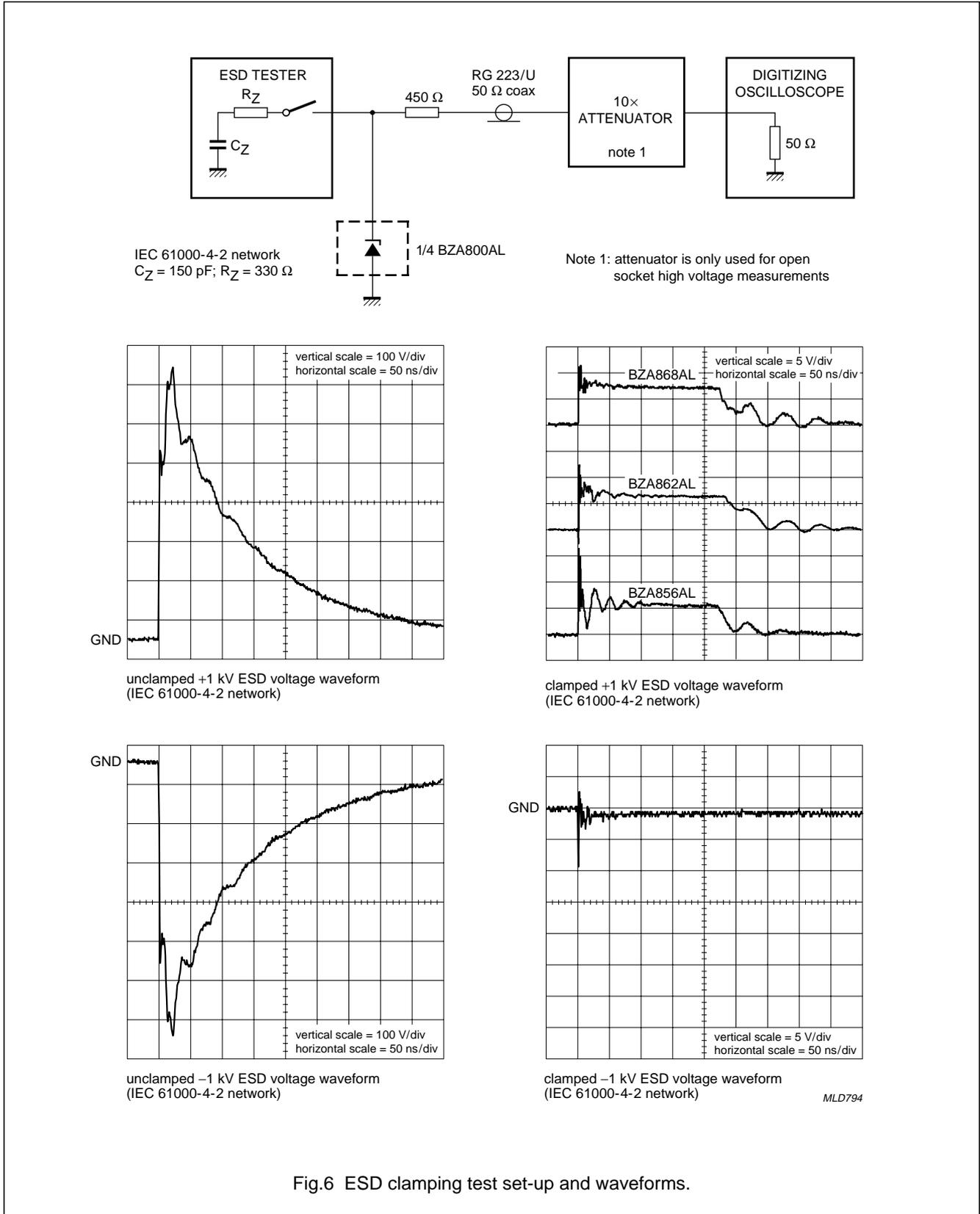


Fig.6 ESD clamping test set-up and waveforms.

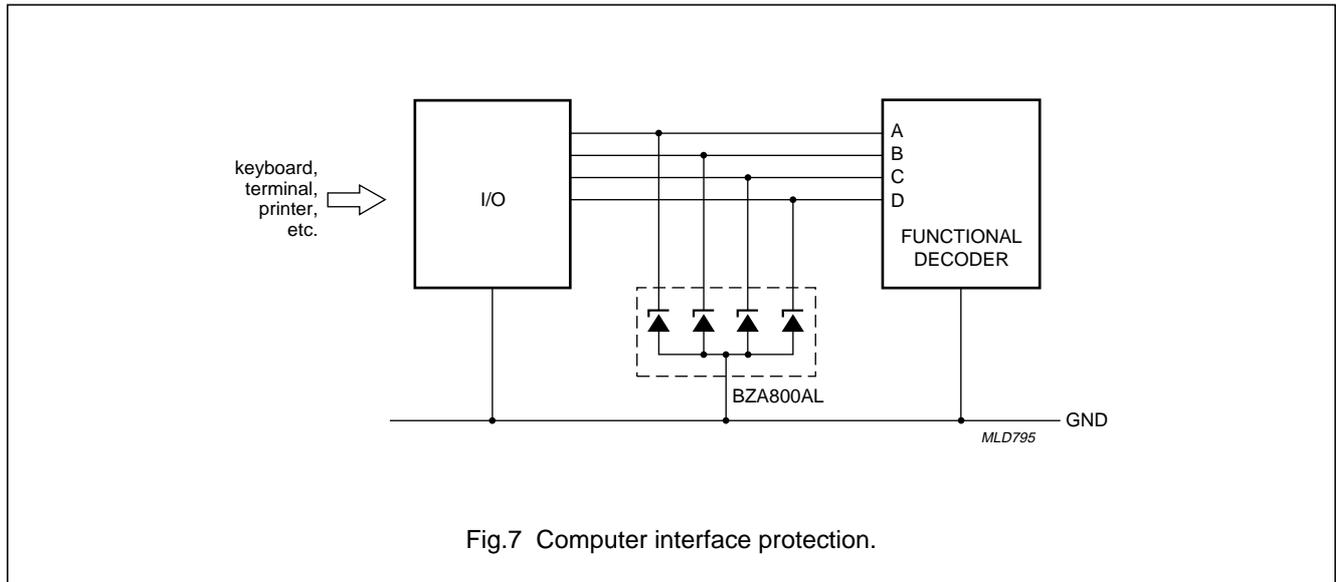
# Quadruple ESD transient voltage suppressor

# BZA800AL series

## APPLICATION INFORMATION

### Typical common anode application

A quadruple transient suppressor in a SOT353 (SC88A) package makes it possible to protect four separate lines using only one package. A simplified example is shown in Fig 7.



### Device placement and printed-circuit board layout

Circuit board layout is of extreme importance in the suppression of transients. The clamping voltage of the BZA800AL 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.

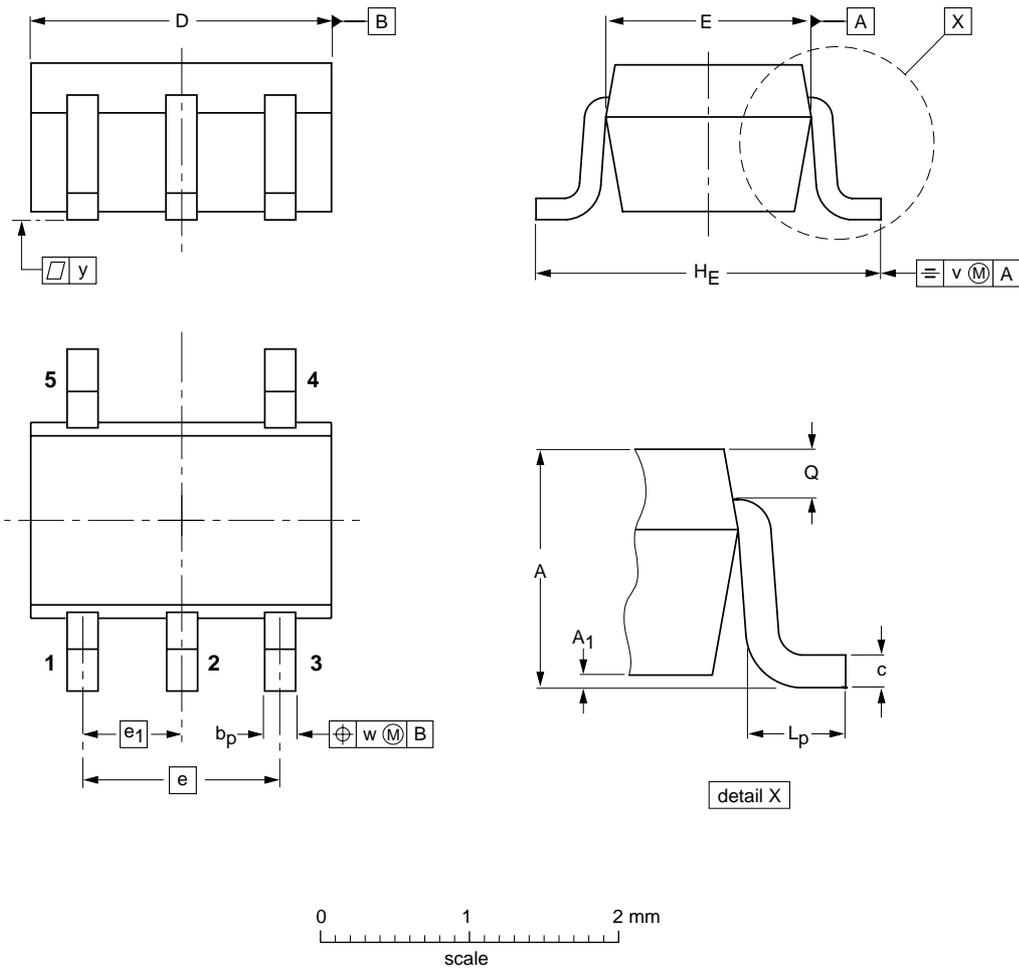
Quadruple ESD transient voltage suppressor

BZA800AL series

PACKAGE OUTLINE

Plastic surface mounted package; 5 leads

SOT353



DIMENSIONS (mm are the original dimensions)

UNIT	A	A <sub>1</sub> max	b <sub>p</sub>	c	D	E <sup>(2)</sup>	e	e <sub>1</sub>	H <sub>E</sub>	L <sub>p</sub>	Q	v	w	y
mm	1.1 0.8	0.1	0.30 0.20	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.25 0.15	0.2	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT353			SC-88A			97-02-28

# Quadruple ESD transient voltage suppressor

# BZA800AL series

## 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.
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**NOTES**

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**NOTES**

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