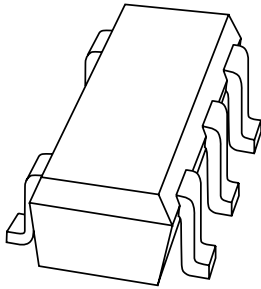


# DATA SHEET



## **BZA800A-series** Quadruple ESD transient voltage suppressor

Preliminary specification

1999 Nov 15

# Quadruple ESD transient voltage suppressor

## BZA800A-series

### FEATURES

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

### APPLICATIONS

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

### DESCRIPTION

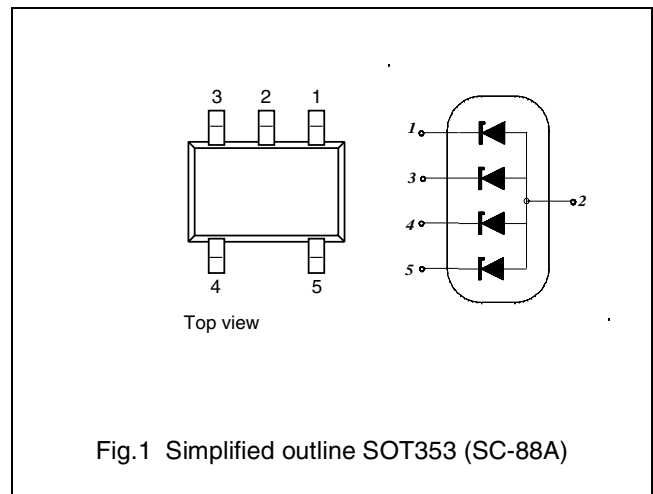
Monolithic transient voltage suppressor diode in a six lead SOT353 (SC-88A) package for 4-bit wide ESD transient suppression.

### MARKING

TYPE NUMBER	MARKING CODE
BZA856A	Z1
BZA862A	Z2
BZA868A	Z3
BZA820A	Z4

### PINNING

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



## Quadruple ESD transient voltage suppressor

## BZA800A-series

**LIMITING VALUES**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
<b>Per diode</b>					
$I_Z$	working current	$T_a = 25\text{ °C}$	–	note 1	mA
$I_F$	continuous forward current	$T_a = 25\text{ °C}$	–	100	mA
$I_{FSM}$	non-repetitive peak forward current	$t_p = 1\text{ ms}$ ; square pulse	–	3.75	A
$P_{tot}$	total power dissipation	$T_a = 25\text{ °C}$	–	335	mW
$P_{ZSM}$	non repetitive peak reverse power dissipation BZA856A, BZA862A, BZA868A BZA820A	square pulse; $t_p = 1\text{ ms}$ ; see Fig.3	–	24	W
			–	17	W
$T_{stg}$	storage temperature		–65	+150	°C
$T_j$	junction temperature		–	150	°C

**Notes**

- DC working current limited by  $P_{tot\ max}$ .

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	all diodes loaded	370	K/W

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

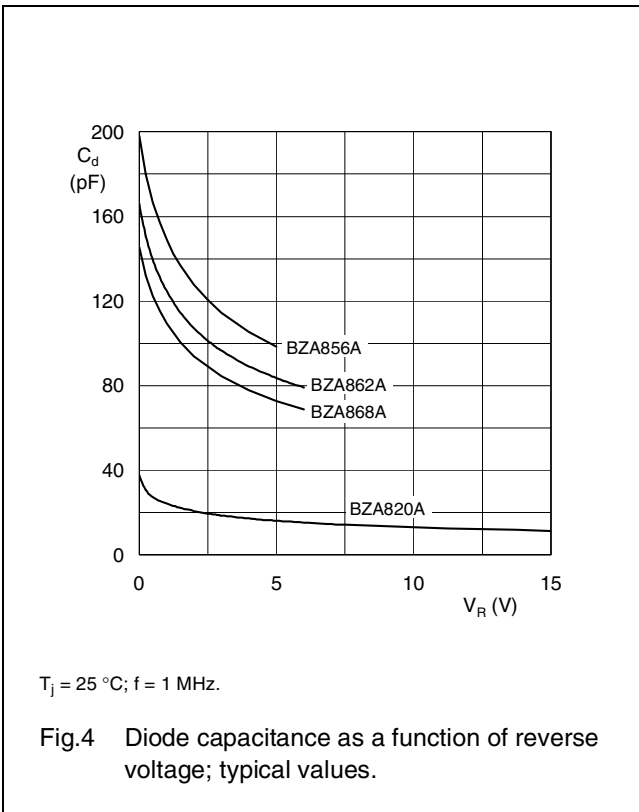
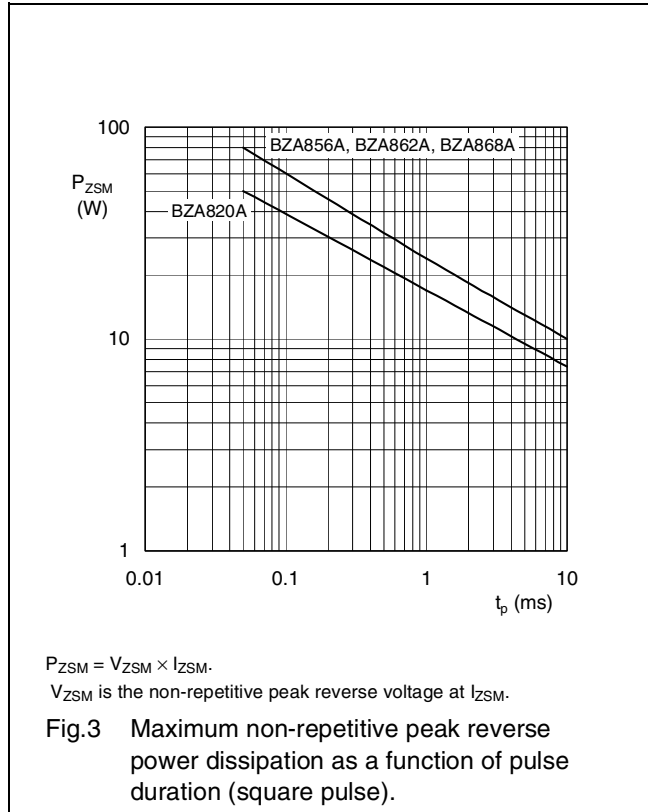
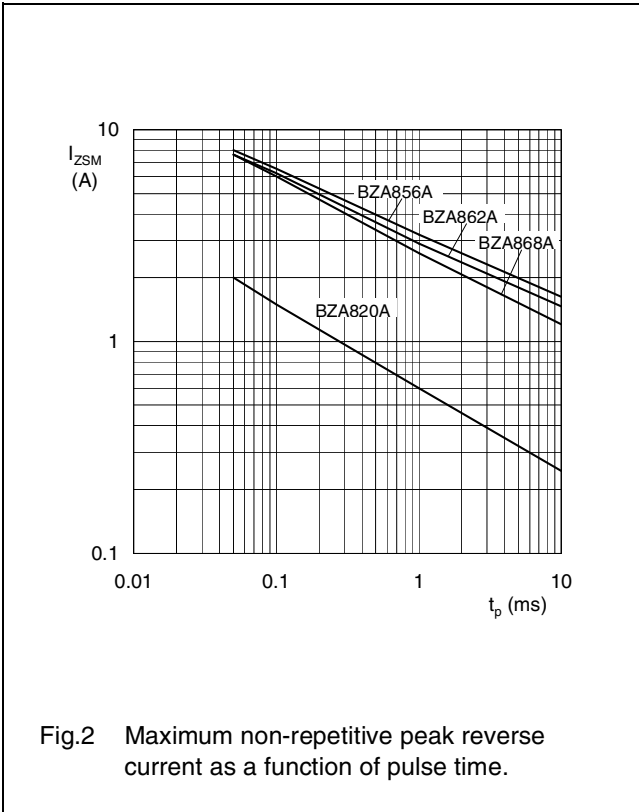
SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
$V_F$	forward voltage	$I_F = 200\text{ mA}$	1.3	V
$I_R$	reverse current			
	BZA856A	$V_R = 3\text{ V}$	2000	nA
	BZA862A	$V_R = 4\text{ V}$	700	nA
	BZA868A	$V_R = 4.3\text{ V}$	500	nA
	BZA820A	$V_R = 15\text{ V}$	100	nA

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

TYPE	WORKING VOLTAGE $V_Z$ (V) at $I_Z = 1\text{ mA}$			DIFFERENTIAL RESISTANCE $r_{dif}$ ( $\Omega$ ) at $I_Z = 1\text{ mA}$	TEMP. COEFF. $S_Z$ (mV/K) at $I_Z = 1\text{ mA}$	DIODE CAP. $C_d$ (pF) at $f = 1\text{ MHz}$ ; $V_R = 0\text{ V}$	NON-REPETITIVE PEAK REVERSE CURRENT $I_{ZSM}$ (A) at $t_p = 1\text{ ms}$ ; $T_{amb} = 25\text{ °C}$
	MIN.	TYP.	MAX.	MAX.	TYP.	MAX.	MAX.
BZA856A	5.32	5.6	5.88	400	0.5	240	3.2
BZA862A	5.89	6.2	6.51	300	1.2	200	2.9
BZA868A	6.46	6.8	7.14	300	3	180	2.6
BZA820A	19	20	21	125	16	50	0.6

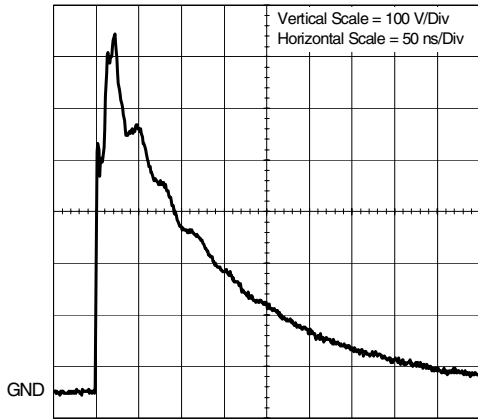
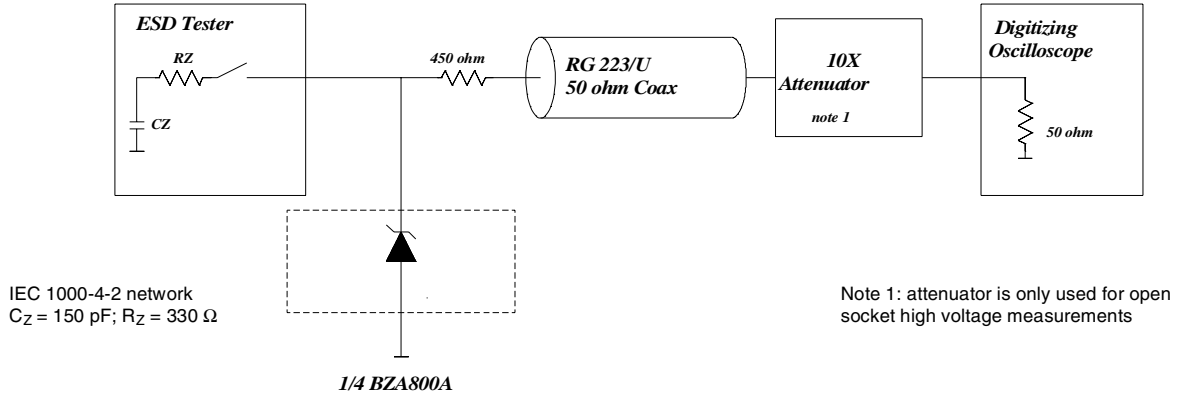
Quadruple ESD transient voltage suppressor

BZA800A-series

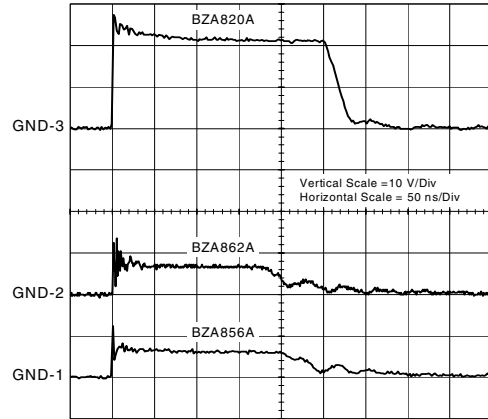


Quadruple ESD transient voltage suppressor

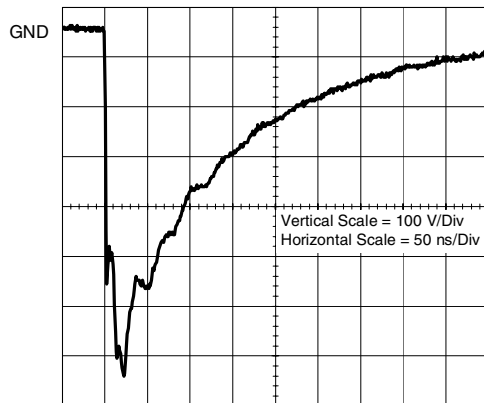
BZA800A-series



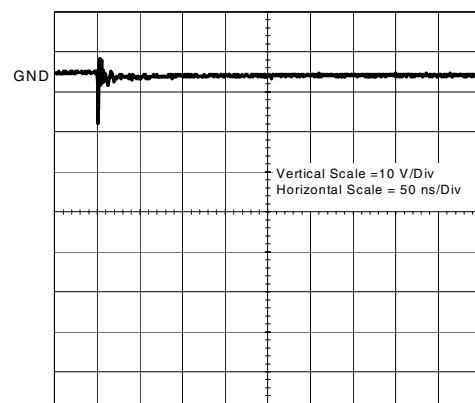
unclamped +1 kV ESD voltage waveform  
 (IEC 1000-4-2 network)



clamped +1 kV ESD voltage waveform  
 (IEC 1000-4-2 network)



unclamped -1 kV ESD voltage waveform  
 (IEC 1000-4-2 network)



clamped -1 kV ESD voltage waveform  
 (IEC 1000-4-2 network)

Fig.5 ESD clamping test set-up and waveforms.

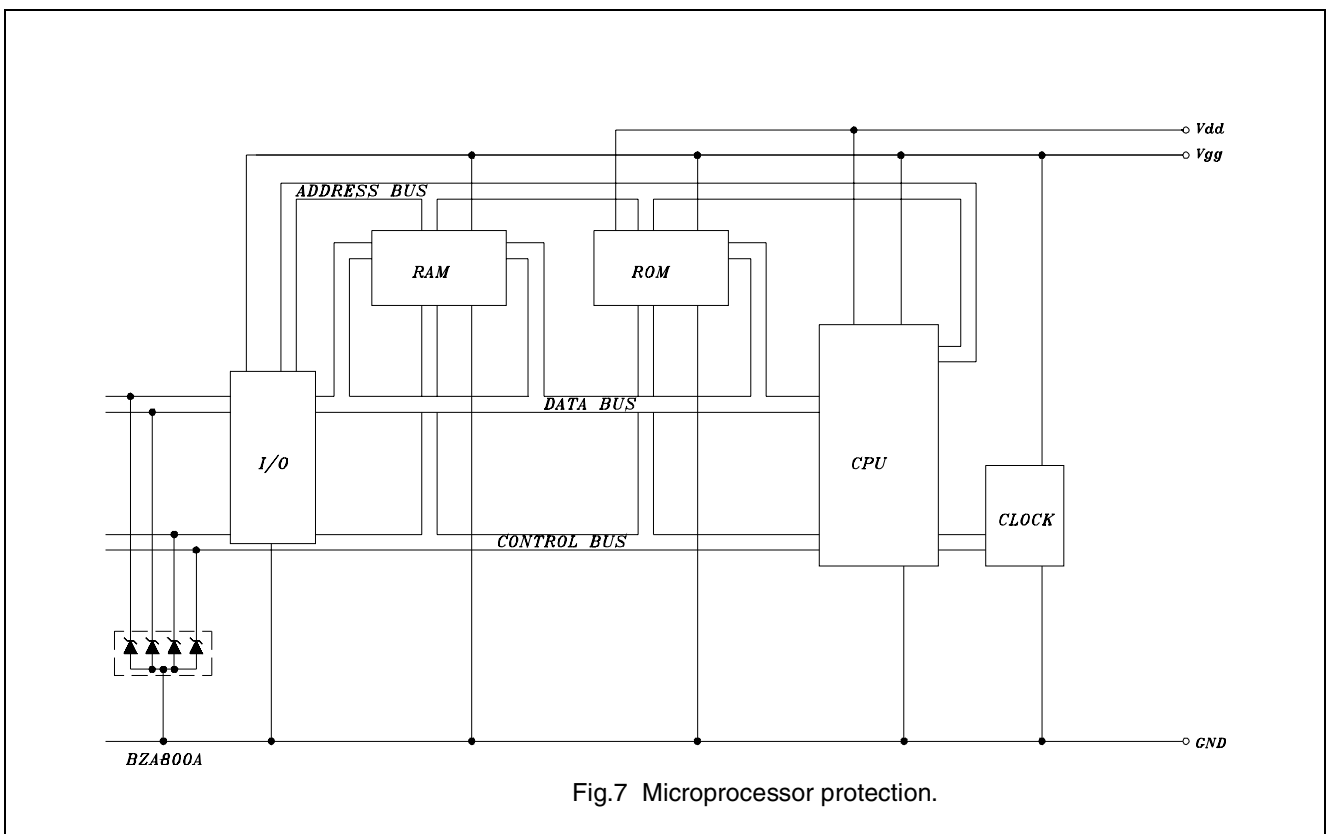
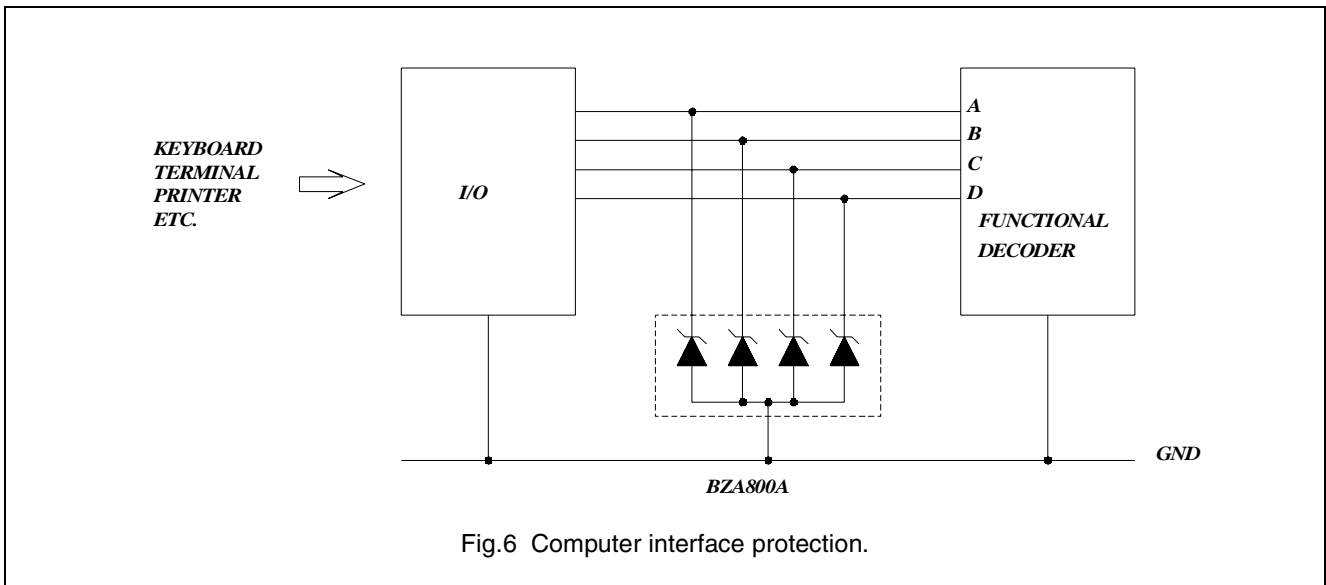
Quadruple ESD transient voltage suppressor

BZA800A-series

APPLICATION INFORMATION

Typical common anode application

A quadruple transient suppressor in a SOT353 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

## BZA800A-series

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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 BZA800A 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.

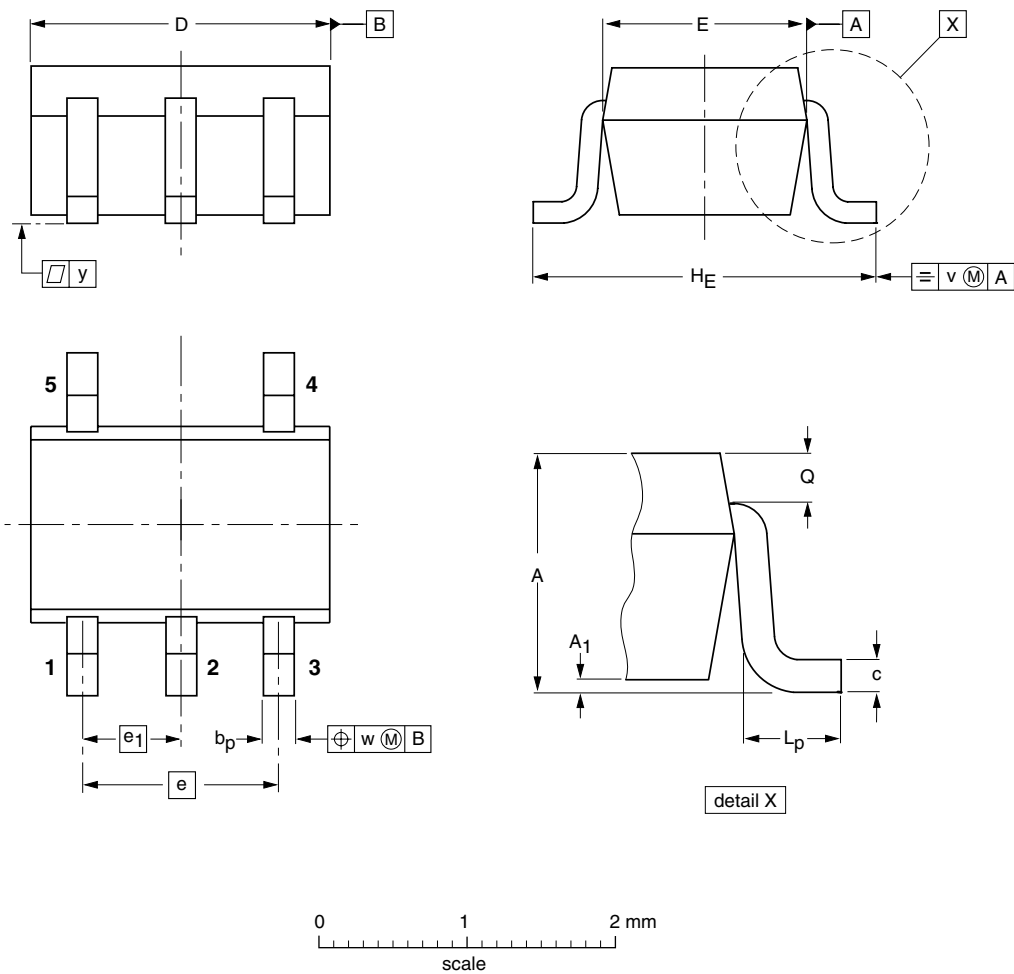
Quadruple ESD transient voltage suppressor

BZA800A-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



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**Quadruple ESD transient voltage suppressor**
**BZA800A-series**


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**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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**Austria:** Computerstr. 6, A-1101 WIEN, P.O. Box 213,  
Tel. +43 1 60 101 1248, Fax. +43 1 60 101 1210

**Belarus:** Hotel Minsk Business Center, Bld. 3, r. 1211, Volodarski Str. 6,  
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**Denmark:** Sydhavnsgade 23, 1780 COPENHAGEN V,  
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**Finland:** Sinikalliontie 3, FIN-02630 ESPOO,  
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**France:** 51 Rue Carnot, BP317, 92156 SURESNES Cedex,  
Tel. +33 1 4099 6161, Fax. +33 1 4099 6427

**Germany:** Hammerbrookstraße 69, D-20097 HAMBURG,  
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Gedung Philips, Jl. Buncit Raya Kav.99-100, JAKARTA 12510,  
Tel. +62 21 794 0040 ext. 2501, Fax. +62 21 794 0080

**Ireland:** Newstead, Clonskeagh, DUBLIN 14,  
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**Israel:** RAPAC Electronics, 7 Kehilat Saloniki St, PO Box 18053,  
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**Italy:** PHILIPS SEMICONDUCTORS, Via Casati, 23 - 20052 MONZA (MI),  
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**Japan:** Philips Bldg 13-37, Kohnan 2-chome, Minato-ku,  
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**Mexico:** 5900 Gateway East, Suite 200, EL PASO, TEXAS 79905,  
Tel. +9-5 800 234 7381, Fax +9-5 800 943 0087

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**Norway:** Box 1, Manglerud 0612, OSLO,  
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**Pakistan:** see Singapore

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