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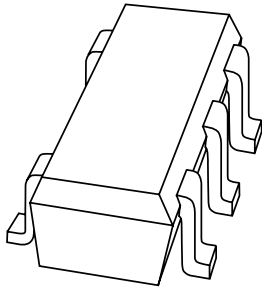
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Kind regards,

Team Nexperia

# DATA SHEET



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

Product data sheet  
Supersedes data of 2000 May 01

2000 Sep 25

# 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.

### DESCRIPTION

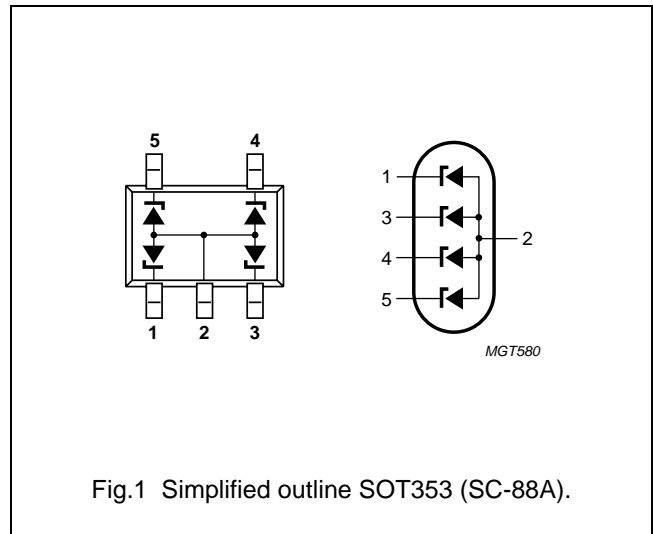
Monolithic transient voltage suppressor diode in a five lead SOT353 (SC-88A) package for 4-bit wide ESD transient suppression.

### MARKING

TYPE NUMBER	MARKING CODE
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 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
<b>Per diode</b>					
$I_Z$	working current	$T_{amb} = 25\text{ °C}$	–	note 1	mA
$I_F$	continuous forward current	$T_{amb} = 25\text{ °C}$	–	200	mA
$I_{FSM}$	non-repetitive peak forward current	$t_p = 1\text{ ms}$ ; square pulse	–	3.75	A
$P_{tot}$	total power dissipation	$T_{amb} = 25\text{ °C}$	–	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

### Note

- 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

# Quadruple ESD transient voltage suppressor

## BZA800A-series

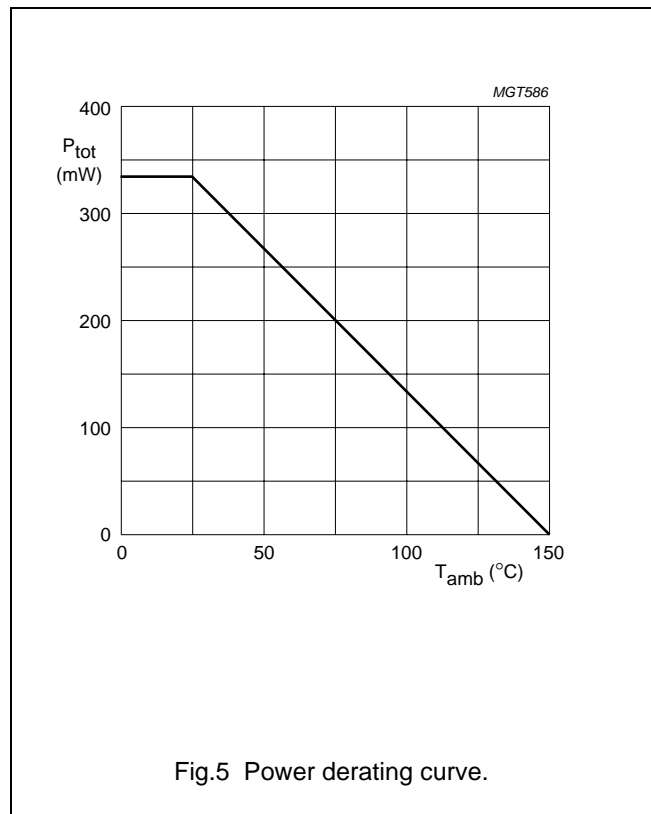
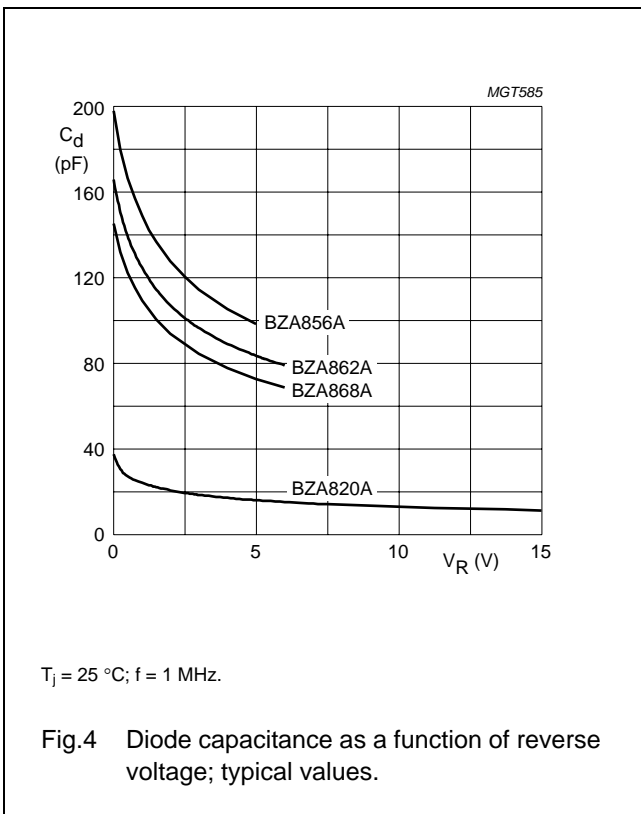
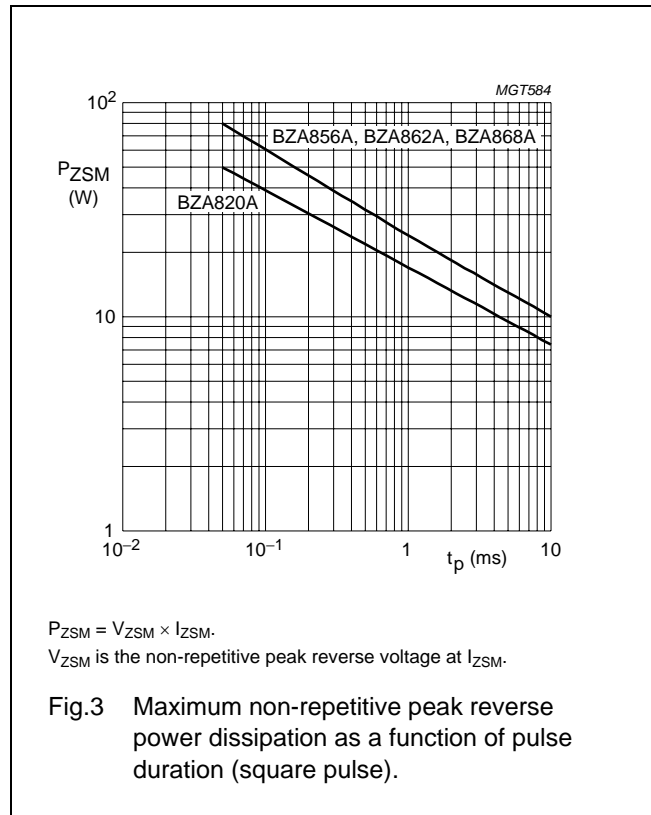
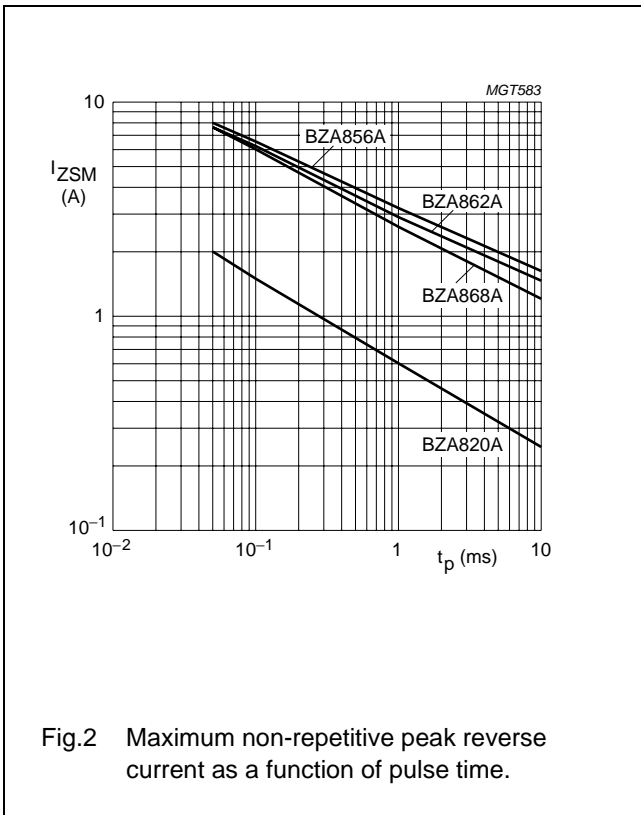
### ELECTRICAL CHARACTERISTICS

$T_j = 25\text{ °C}$  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					
	BZA856A	$V_R = 3\text{ V}$	–	–	2000	nA
	BZA862A	$V_R = 4\text{ V}$	–	–	700	nA
	BZA868A	$V_R = 4.3\text{ V}$	–	–	200	nA
$V_Z$	working voltage	$I_Z = 1\text{ mA}$				
	BZA856A		5.32	5.6	5.88	V
	BZA862A		5.89	6.2	6.51	V
	BZA868A		6.46	6.8	7.14	V
$r_{diff}$	differential resistance	$I_Z = 1\text{ mA}$				
	BZA856A		–	–	400	$\Omega$
	BZA862A		–	–	300	$\Omega$
	BZA868A		–	–	200	$\Omega$
$S_Z$	temperature coefficient	$I_Z = 1\text{ mA}$				
	BZA856A		–	–0.2	–	mV/K
	BZA862A		–	1.8	–	mV/K
	BZA868A		–	3	–	mV/K
$C_d$	diode capacitance	$f = 1\text{ MHz}; V_R = 0$				
	BZA856A		–	–	240	pF
	BZA862A		–	–	200	pF
	BZA868A		–	–	180	pF
$I_{ZSM}$	non-repetitive peak reverse current	$t_p = 1\text{ ms}; T_{amb} = 25\text{ °C}$				
	BZA856A		–	–	3.2	A
	BZA862A		–	–	2.9	A
	BZA868A		–	–	2.6	A
	BZA820A		–	–	0.6	A

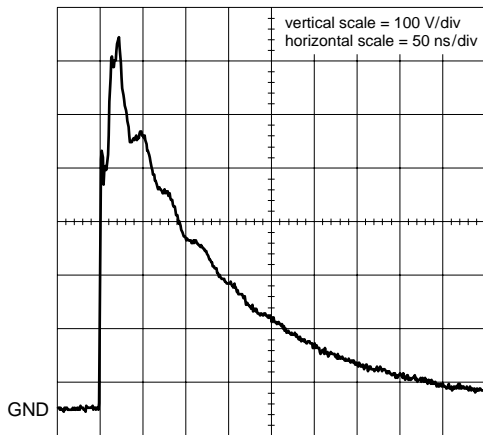
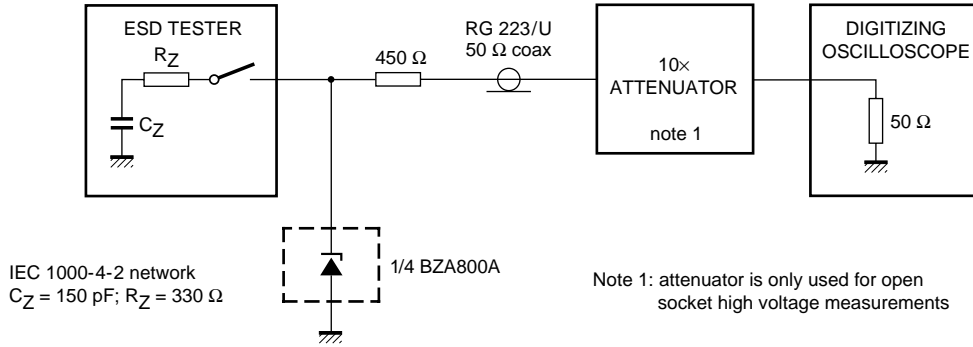
Quadruple ESD transient voltage suppressor

BZA800A-series

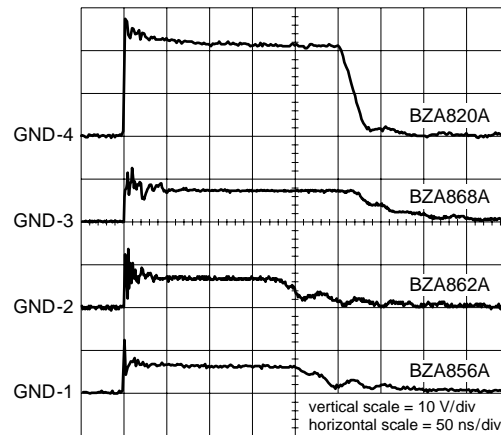


# Quadruple ESD transient voltage suppressor

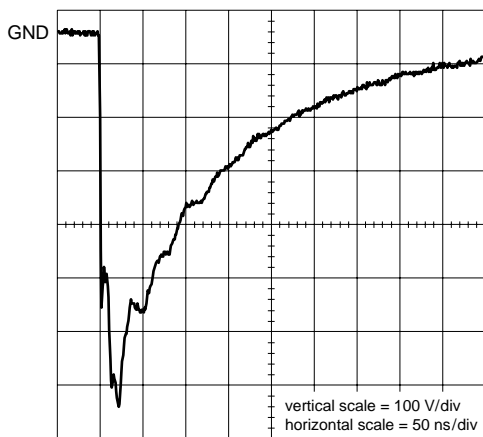
## BZA800A-series



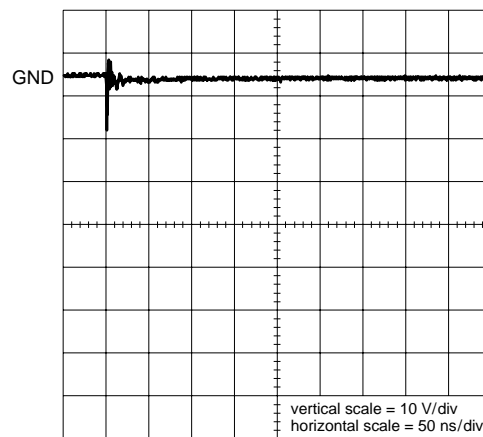
unclamped +1 kV ESD voltage waveform (IEC 1000-4-2 network)



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)

MGT587

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

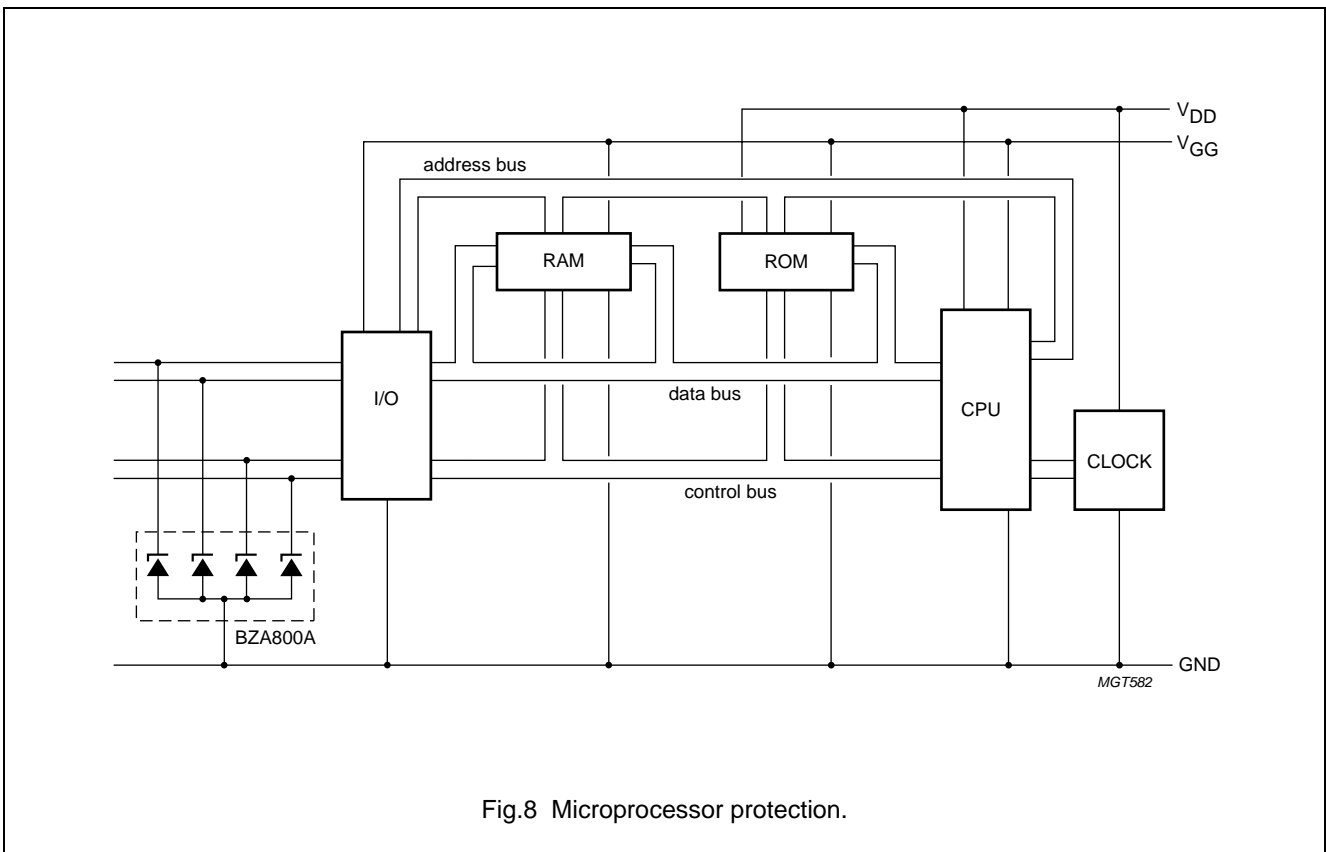
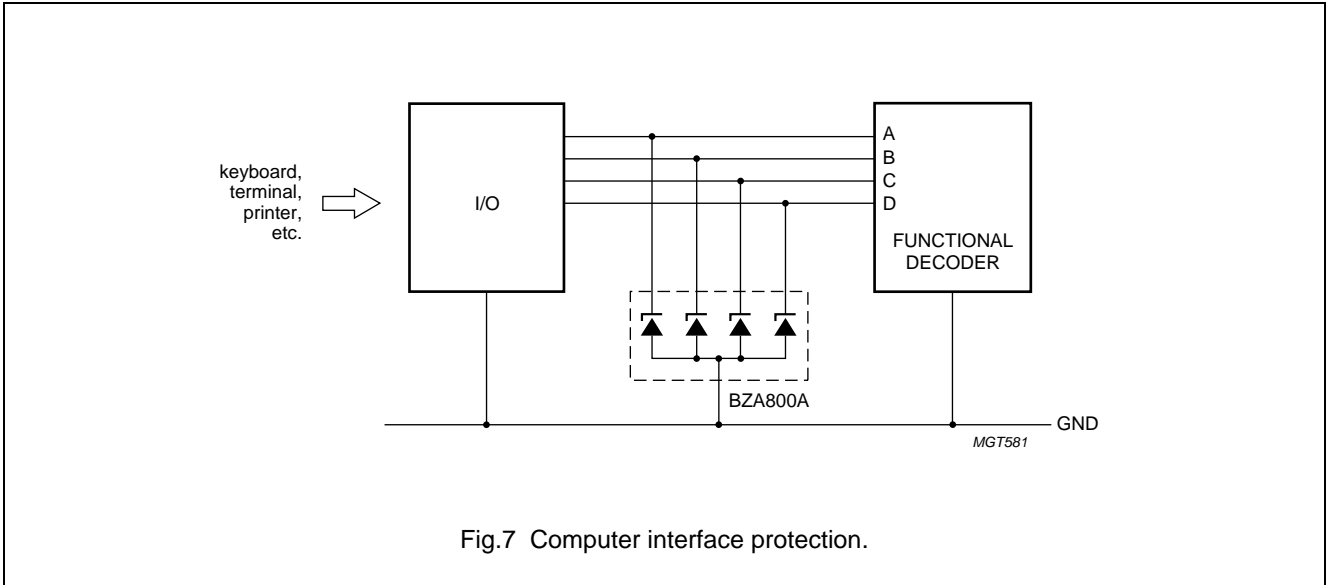
# Quadruple ESD transient voltage suppressor

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 7 and 8.





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## Quadruple ESD transient voltage suppressor

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BZA800A-series

### 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.

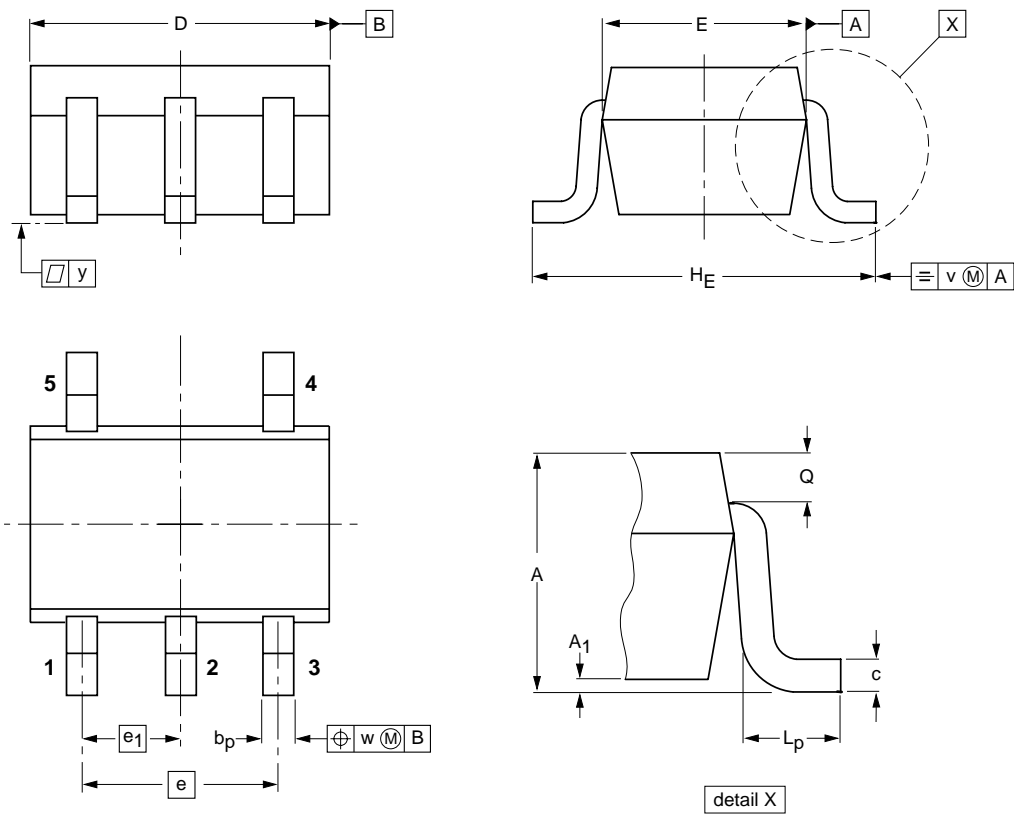
# Quadruple ESD transient voltage suppressor

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

# Quadruple ESD transient voltage suppressor

## BZA800A-series

### DATA SHEET STATUS

DOCUMENT STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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