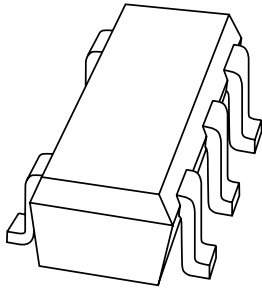


DATA SHEET



BZA800A-series Quadruple ESD transient voltage suppressor

Preliminary specification

2000 Apr 18

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

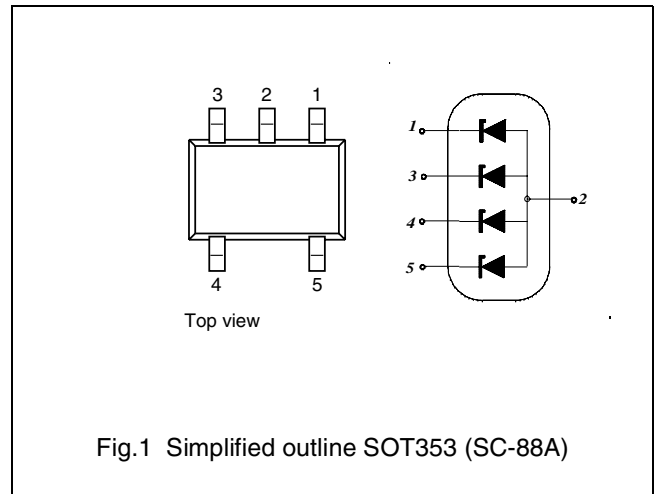
Monolithic transient voltage suppressor diode in a five lead SOT353 (SC-88A) package for 4-bit wide ESD transient suppression.

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 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
I_Z	working current	$T_a = 25\text{ °C}$	–	note 1	mA
I_F	continuous forward current	$T_a = 25\text{ °C}$	–	200	mA
I_{FSM}	non-repetitive peak forward current	$t_p = 1\text{ ms}$; square pulse	–	3.75	A
P_{tot}	total power dissipation	$T_a = 25\text{ °C}$	–	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	$V_R = 4.3\text{ V}$	200	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} (Ω) 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	–0.2	240	3.2
BZA862A	5.89	6.2	6.51	300	1.8	200	2.9
BZA868A	6.46	6.8	7.14	200	3	180	2.6
BZA820A	19	20	21	125	16	50	0.6

Quadruple ESD transient voltage suppressor

BZA800A-series

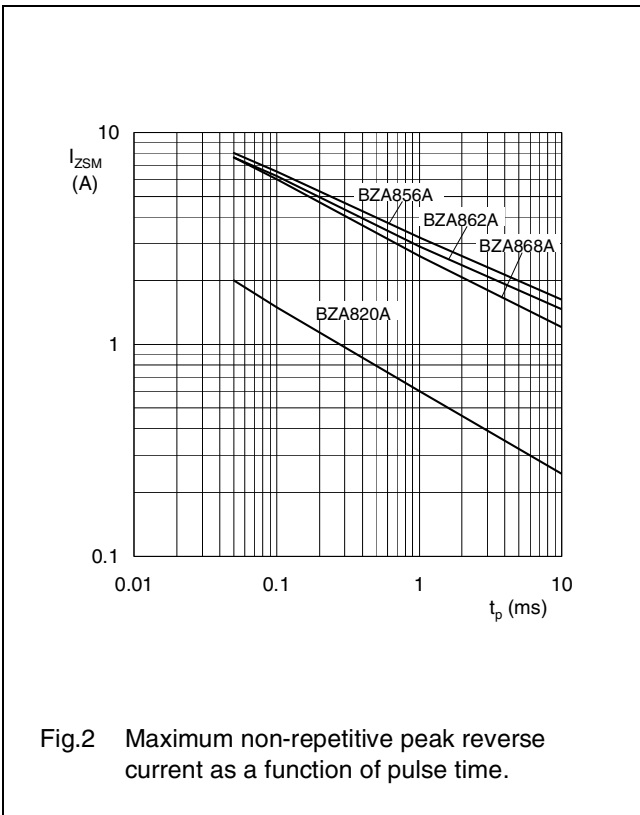
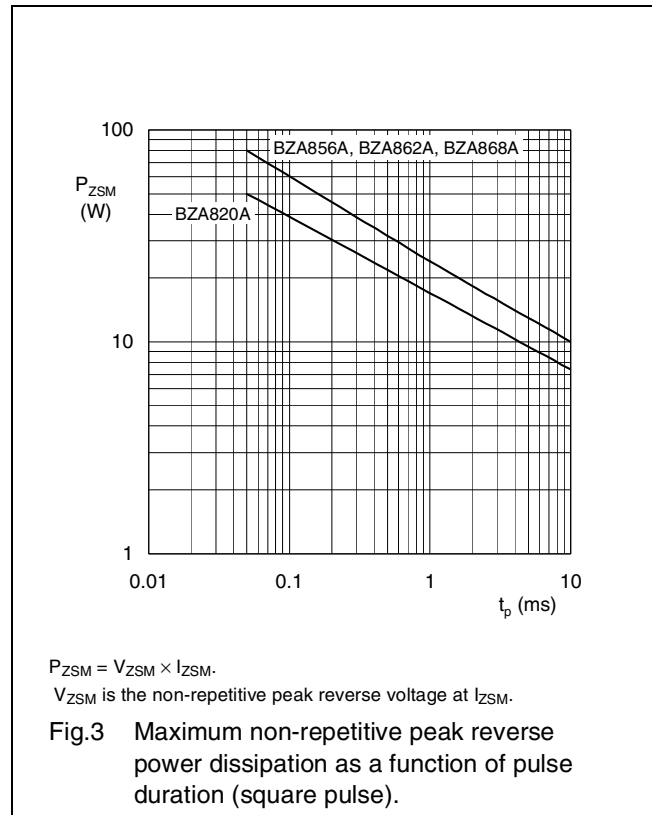


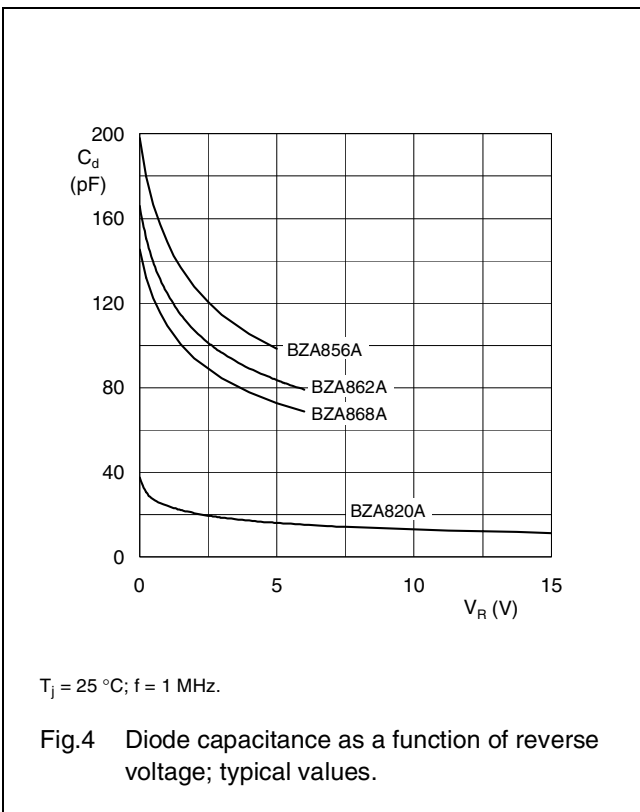
Fig.2 Maximum non-repetitive peak reverse current as a function of pulse time.



$P_{ZSM} = V_{ZSM} \times I_{ZSM}$.

V_{ZSM} is the non-repetitive peak reverse voltage at I_{ZSM} .

Fig.3 Maximum non-repetitive peak reverse power dissipation as a function of pulse duration (square pulse).



$T_j = 25^\circ\text{C}; f = 1\text{ MHz}$.

Fig.4 Diode capacitance as a function of reverse voltage; typical values.

Quadruple ESD transient voltage suppressor

BZA800A-series

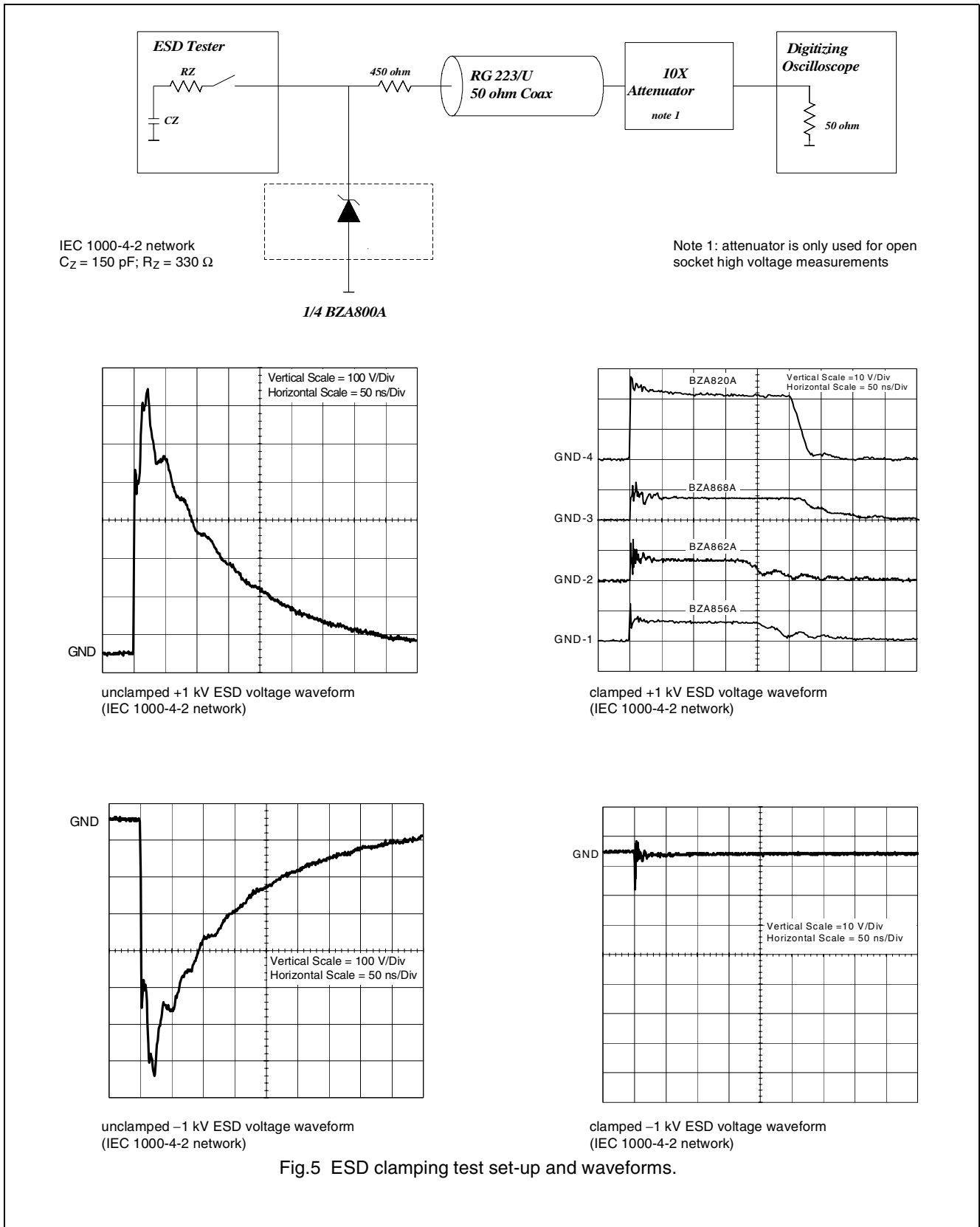


Fig.5 ESD clamping test set-up and waveforms.

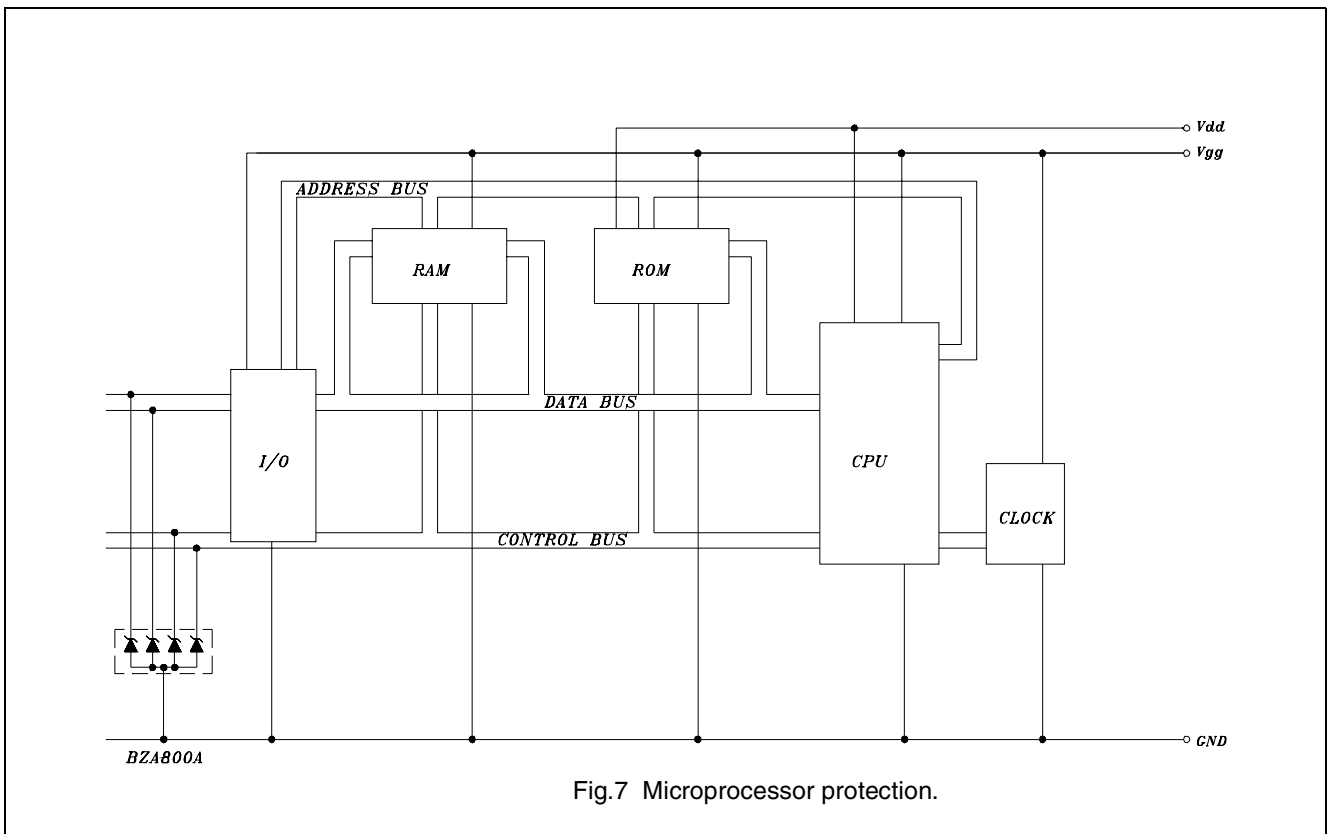
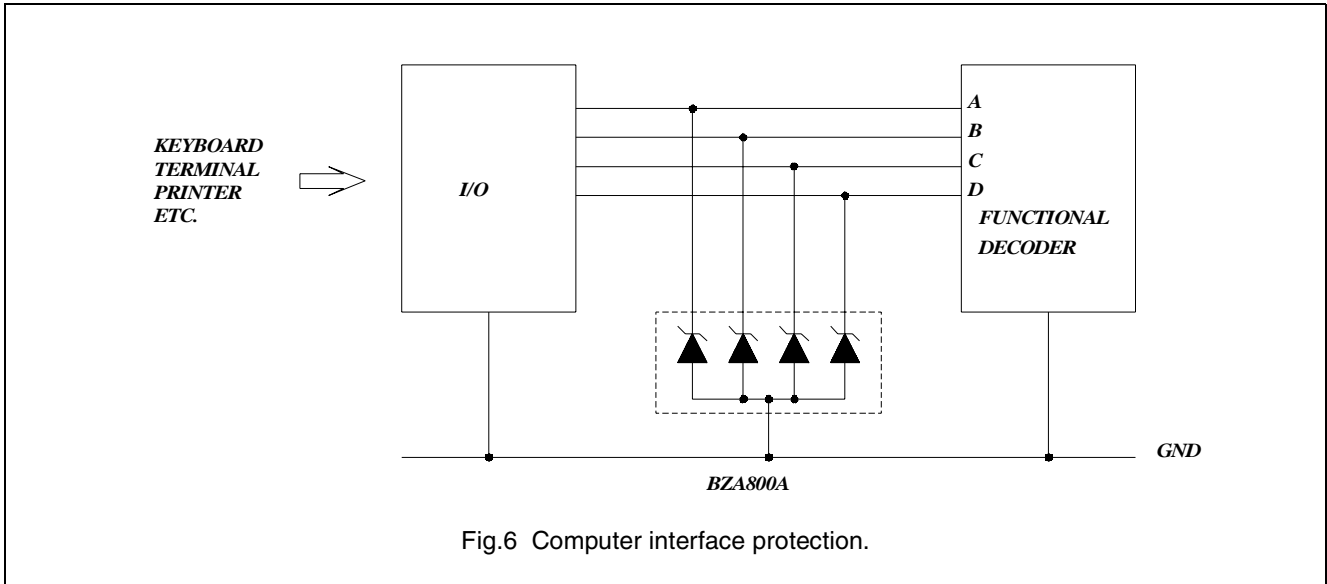
Quadruple ESD transient voltage suppressor

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.



Quadruple ESD transient voltage suppressor

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.

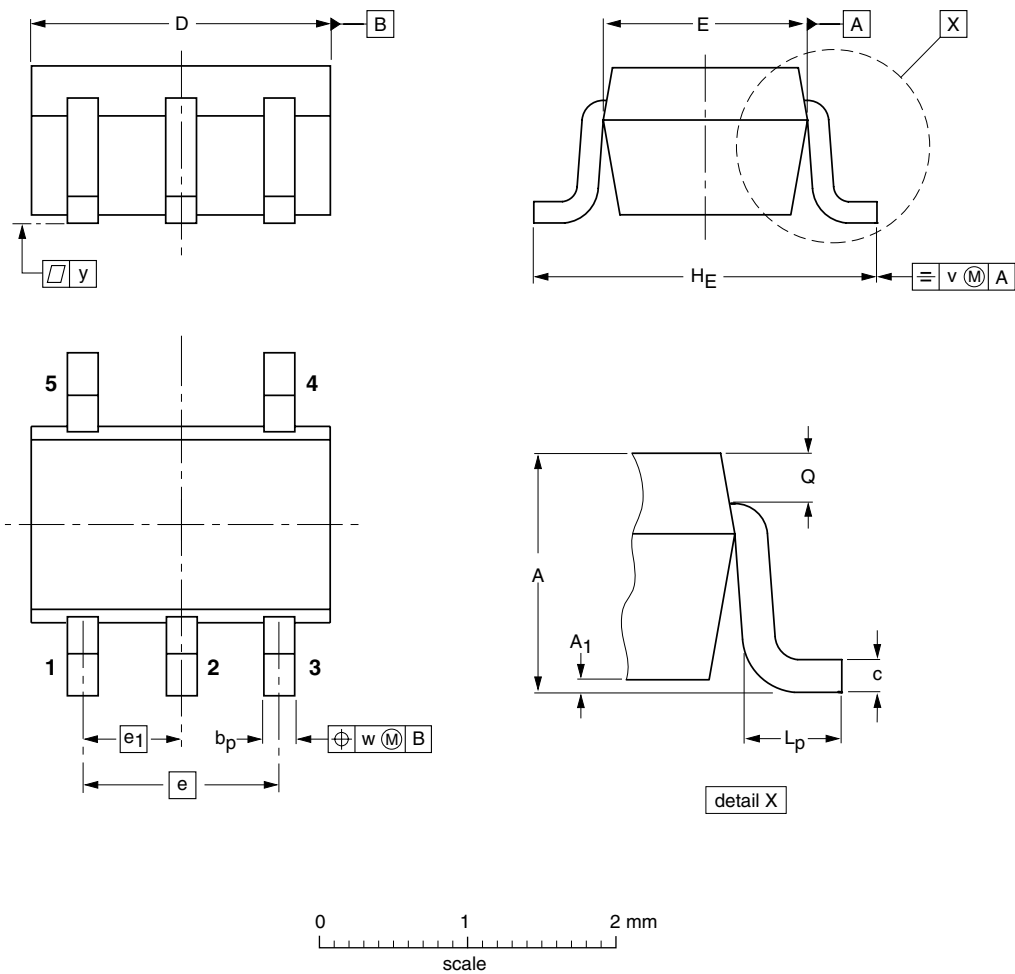
Quadruple ESD transient voltage suppressor

BZA800A-series

PACKAGE OUTLINE

Plastic surface mounted package; 5 leads

SOT353



DIMENSIONS (mm are the original dimensions)

UNIT	A	A ₁ max	b _p	c	D	E ⁽²⁾	e	e ₁	H _E	L _p	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

DATA SHEET STATUS	PRODUCT STATUS	DEFINITIONS ⁽¹⁾
Objective specification	Development	This data sheet contains the design target or goal specifications for product development. Specification may change in any manner without notice.
Preliminary specification	Qualification	This data sheet contains preliminary data, and supplementary data will be published at a later date. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.
Product specification	Production	This data sheet contains final specifications. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.

Note

1. Please consult the most recently issued data sheet before initiating or completing a design.

DEFINITIONS

Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). 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.

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