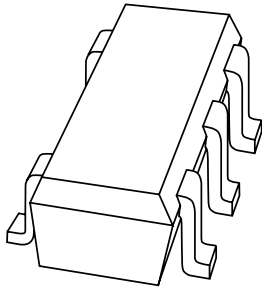


DATA SHEET



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

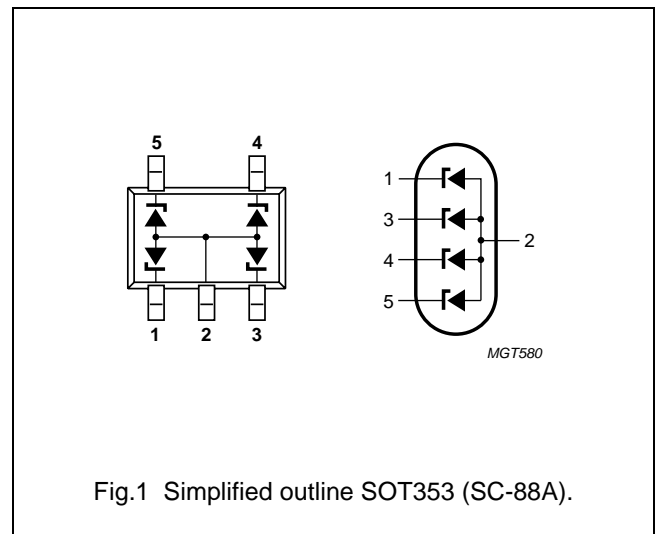
Monolithic transient voltage suppressor diode in a five lead SOT353 (SC-88A) package for 4-bit wide ESD transient suppression.

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 |
|------------------|---|---|------|--------|------|
| Per diode | | | | | |
| 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

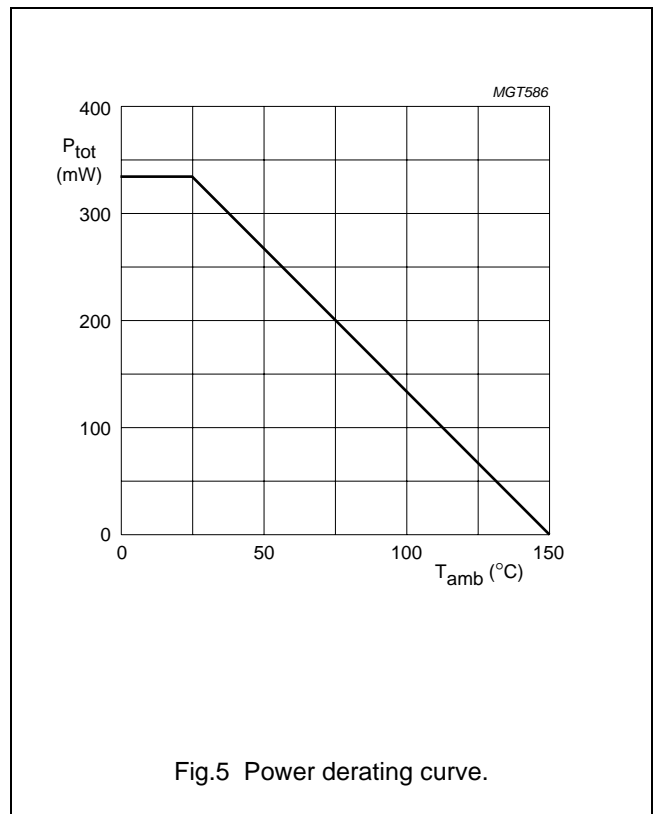
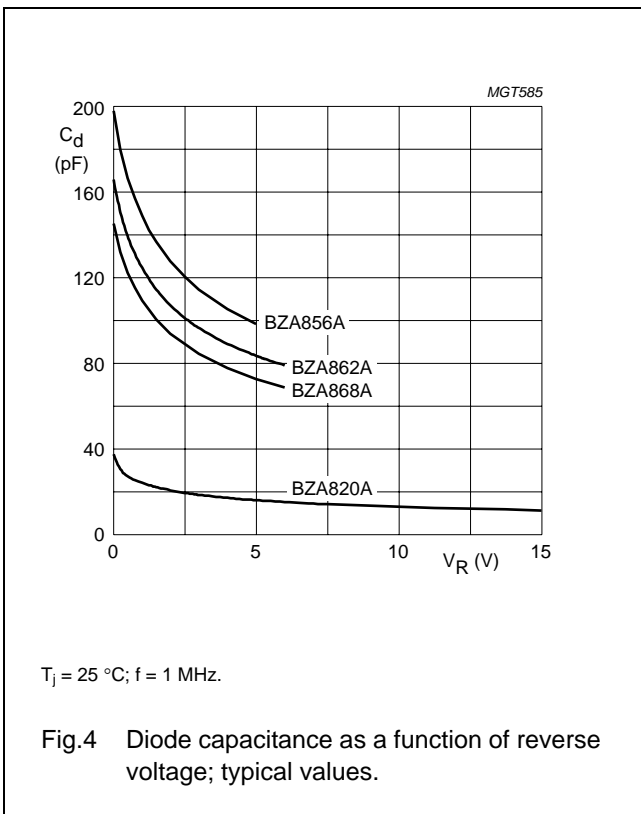
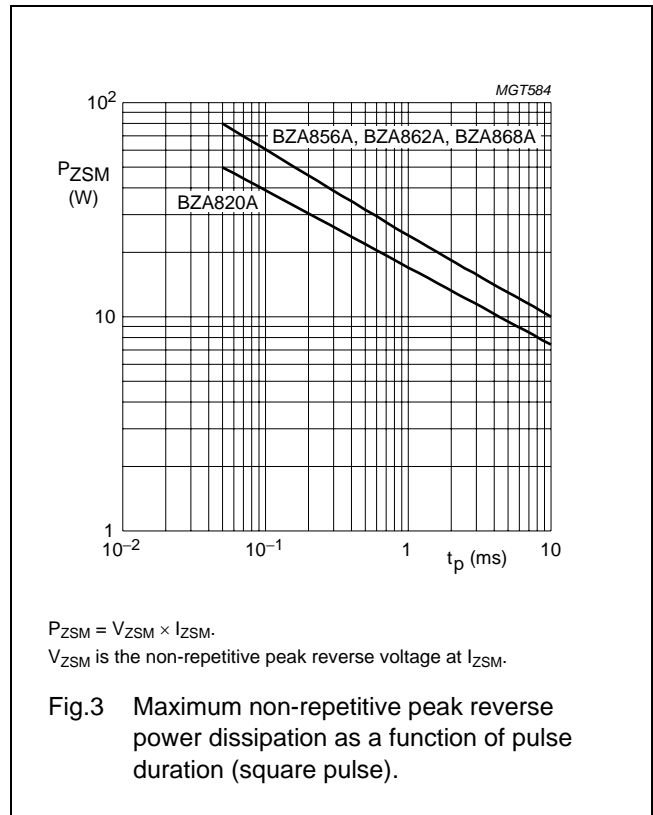
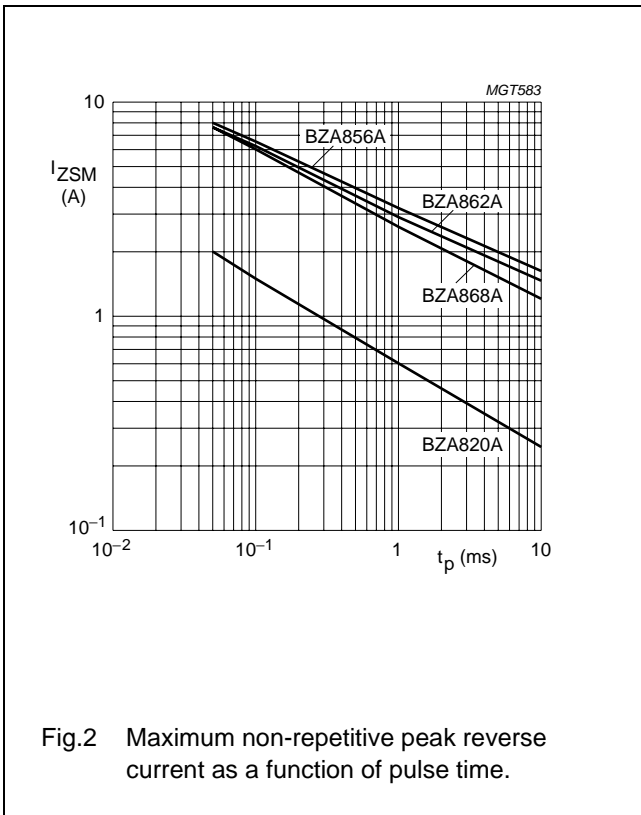
ELECTRICAL CHARACTERISTICS

$T_j = 25\text{ °C}$ 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 | Ω |
| | BZA862A | | – | – | 300 | Ω |
| | BZA868A | | – | – | 200 | Ω |
| 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 |

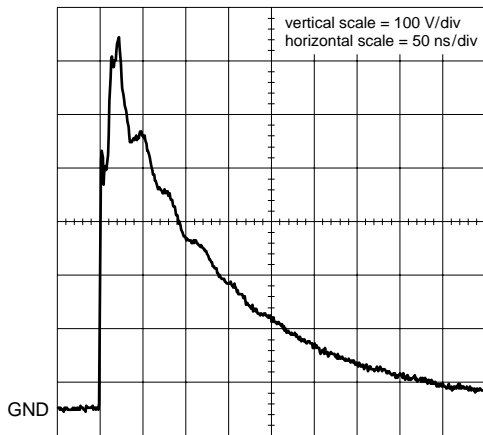
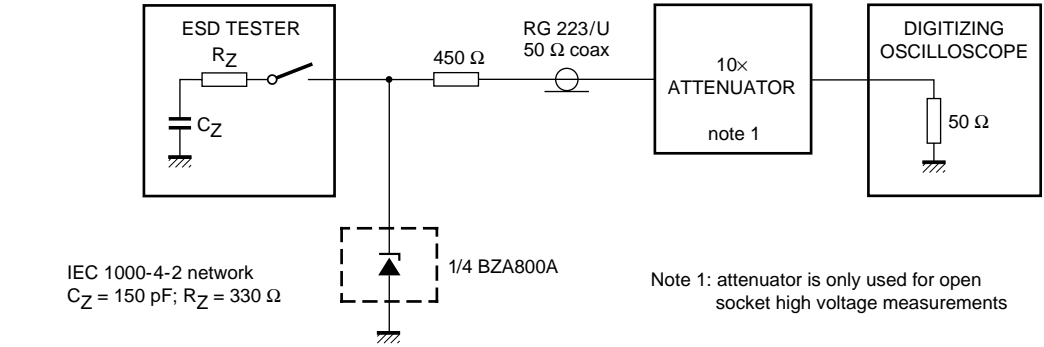
Quadruple ESD transient voltage suppressor

BZA800A-series

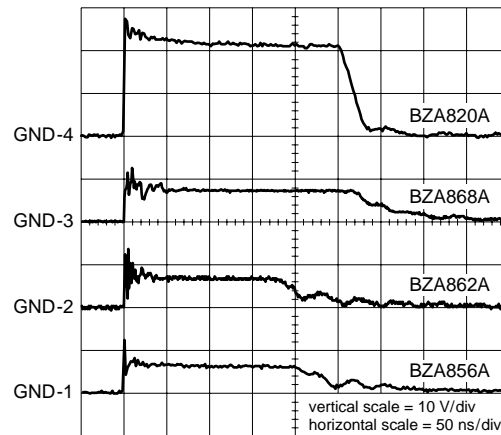


Quadruple ESD transient voltage suppressor

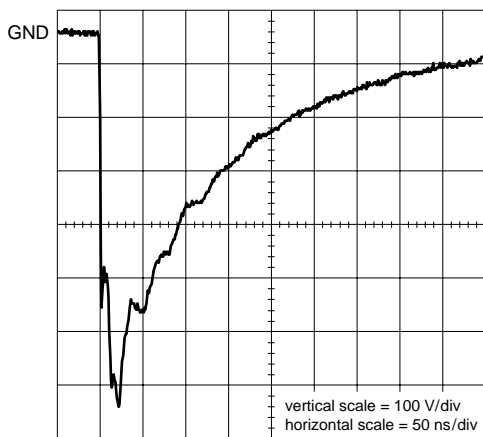
BZA800A-series



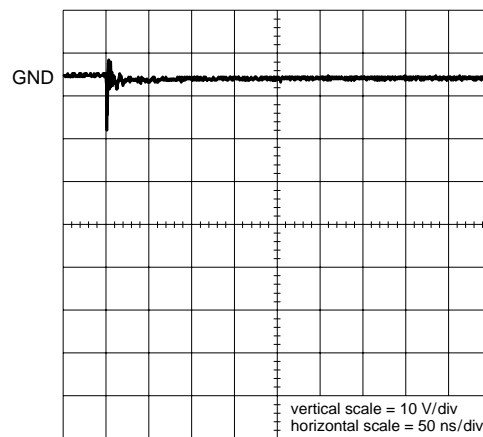
unclamped +1 kV ESD voltage waveform
(IEC 1000-4-2 network)



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.

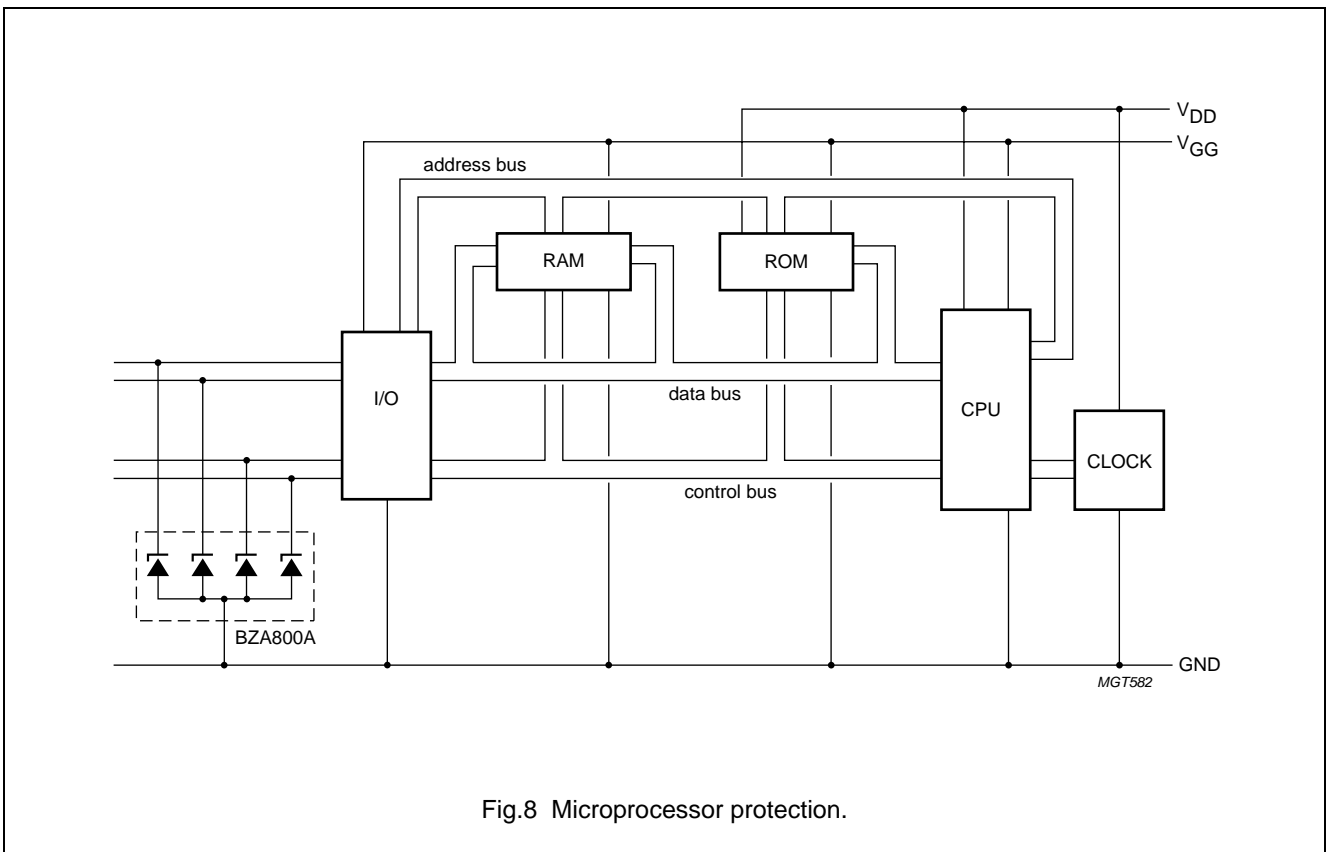
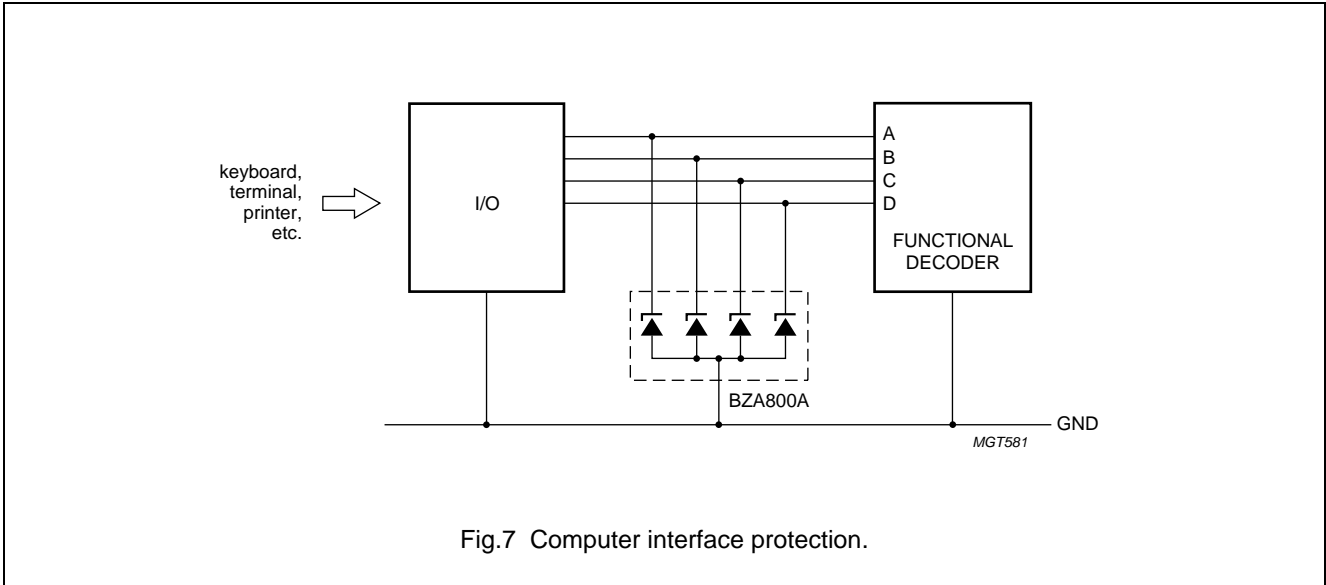
Quadruple ESD transient voltage suppressor

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.



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.

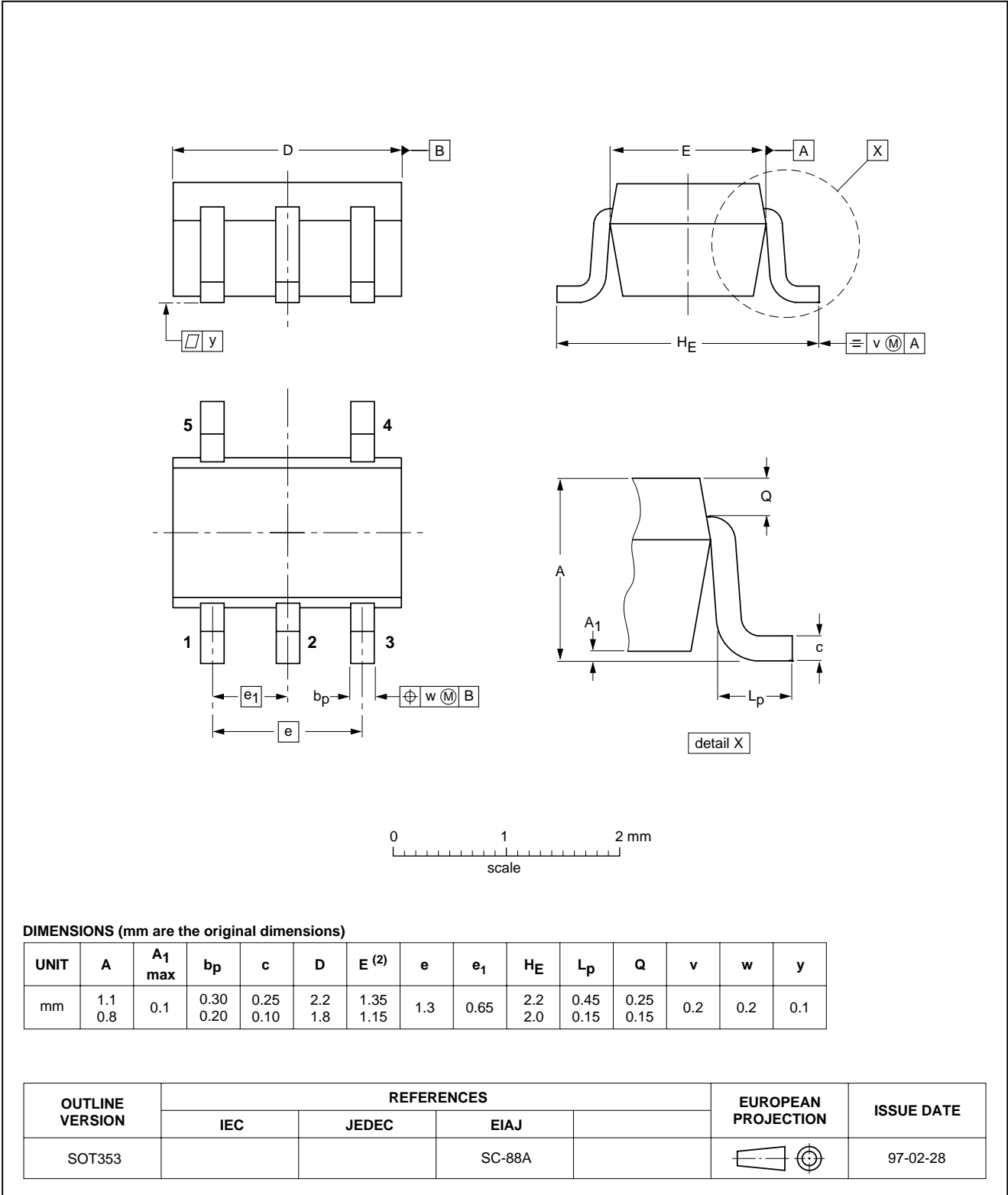
Quadruple ESD transient voltage suppressor

BZA800A-series

PACKAGE OUTLINE

Plastic surface mounted package; 5 leads

SOT353



Quadruple ESD transient voltage suppressor

BZA800A-series

DATA SHEET STATUS

| DOCUMENT STATUS ⁽¹⁾ | PRODUCT STATUS ⁽²⁾ | 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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