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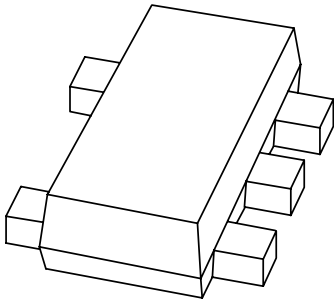
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Kind regards,

Team Nexperia

# DATA SHEET



## **BZA900A-series** Quadruple ESD transient voltage suppressor

Product data sheet

2001 Sep 03

# Quadruple ESD transient voltage suppressor

## BZA900A-series

### FEATURES

- ESD rating >8 kV, according to IEC61000-4-2
- SOT665 surface mount package
- Common anode configuration.

### APPLICATIONS

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

### DESCRIPTION

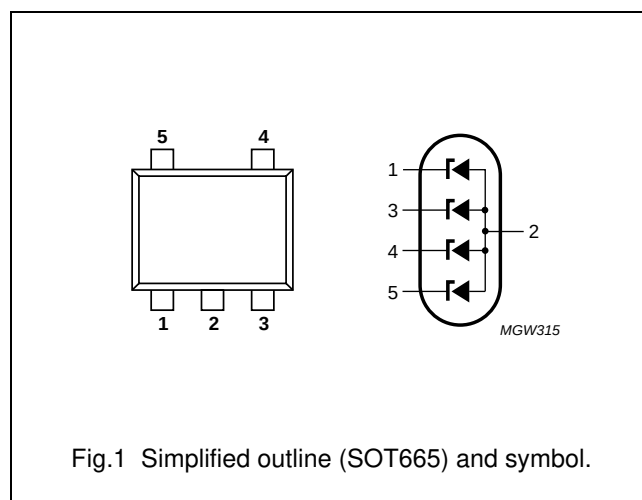
Monolithic transient voltage suppressor diode in a five lead SOT665 package for 4-bit wide ESD transient suppression.

### MARKING

| TYPE NUMBER | MARKING CODE |
|-------------|--------------|
| BZA956A     | Z1           |
| BZA962A     | Z2           |
| BZA968A     | Z3           |

### PINNING

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



### 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 | —           | 335            | mW                 |
| $P_{ZSM}$        | non repetitive peak reverse power dissipation:<br>BZA956A<br>BZA962A<br>BZA968A | square pulse; $t_p = 1\text{ ms}$ ; see Fig.3              | —<br>—<br>— | 16<br>15<br>14 | W<br>W<br>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

BZA900A-series

## THERMAL CHARACTERISTICS

| SYMBOL        | PARAMETER                                                | CONDITIONS        | VALUE | UNIT |
|---------------|----------------------------------------------------------|-------------------|-------|------|
| $R_{th\ j-a}$ | thermal resistance from junction to ambient              | all diodes loaded | 370   | K/W  |
| $R_{th\ j-s}$ | thermal resistance from junction to solder point; note 1 | one diode loaded  | 135   | K/W  |
|               |                                                          | all diodes loaded | 125   | K/W  |

### Note

- Solder point of common anode (pin 2).

## ELECTRICAL CHARACTERISTICS

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

| SYMBOL | PARAMETER       | CONDITIONS            | MAX. | UNIT |
|--------|-----------------|-----------------------|------|------|
| $V_F$  | forward voltage | $I_F = 200\text{ mA}$ | 1.3  | V    |
| $I_R$  | reverse current |                       |      |      |
|        | BZA956A         | $V_R = 3\text{ V}$    | 1000 | nA   |
|        | BZA962A         | $V_R = 4\text{ V}$    | 500  | nA   |
|        | BZA968A         | $V_R = 4.3\text{ V}$  | 100  | nA   |

**Table 1** Per type; BZ956A to BZA968A

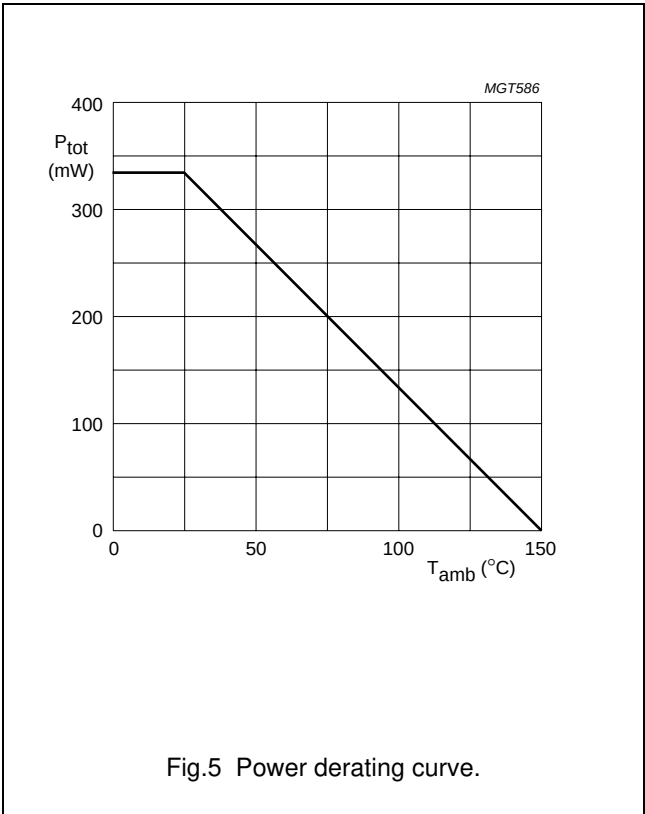
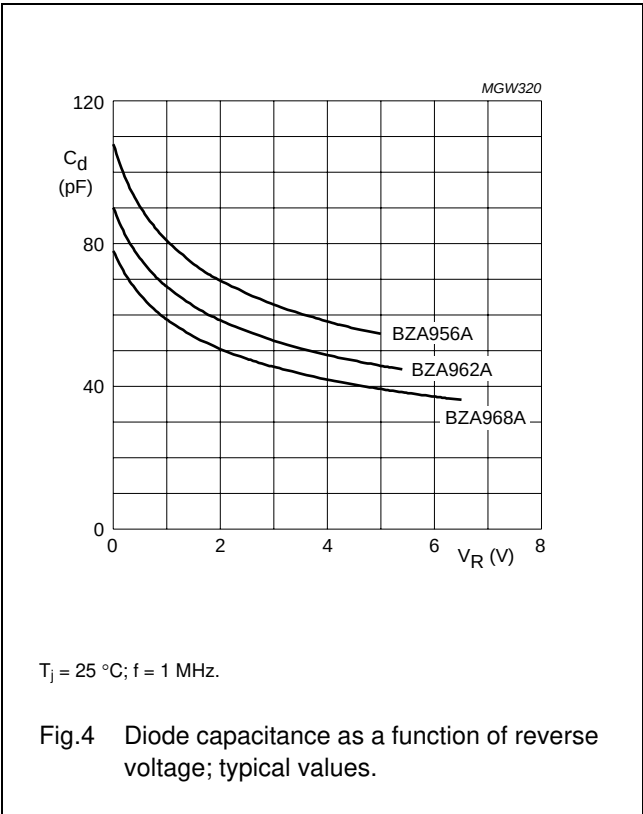
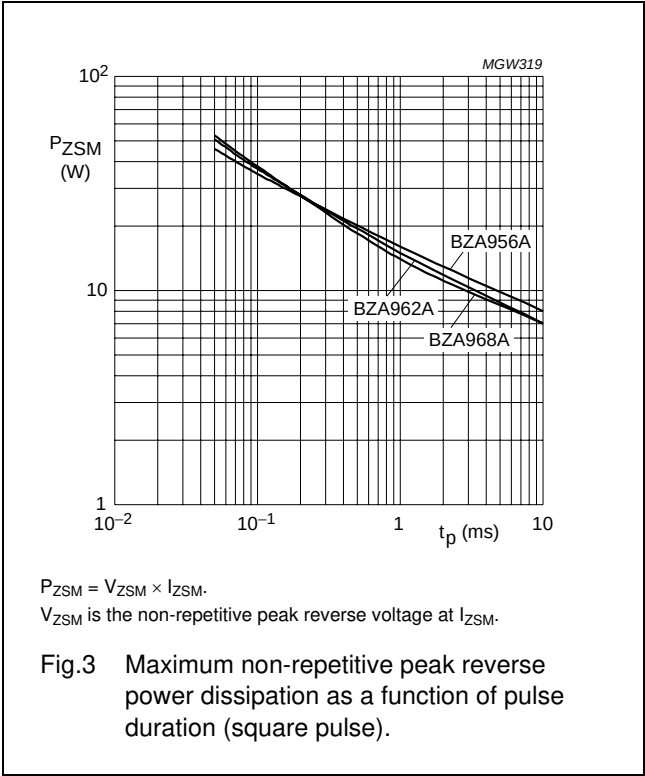
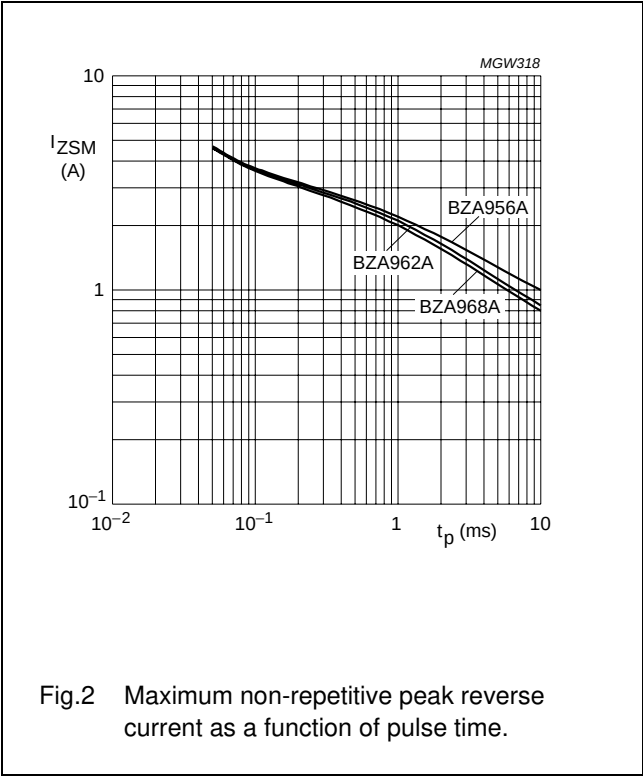
$T_j = 25\text{ }^{\circ}\text{C}$  unless otherwise specified.

| TYPE    | WORKING VOLTAGE<br>$V_Z$ (V)<br>at $I_Z = 1\text{ mA}$ |      |      | DIFFERENTIAL<br>RESISTANCE<br>$r_{dif}$ ( $\Omega$ )<br>at $I_Z = 1\text{ mA}$ | TEMP.<br>COEFF.<br>$S_Z$ (mV/K) at<br>$I_Z = 1\text{ mA}$ | DIODE CAP.<br>$C_d$ (pF)<br>at $f = 1\text{ MHz}$ ;<br>$V_R = 0$ | NON-REPETITIVE<br>PEAK REVERSE<br>CURRENT<br>$I_{ZSM}$ (A) at $t_p = 1\text{ ms}$ ;<br>$T_{amb} = 25\text{ }^{\circ}\text{C}$ |
|---------|--------------------------------------------------------|------|------|--------------------------------------------------------------------------------|-----------------------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
|         | MIN.                                                   | TYP. | MAX. | MAX.                                                                           | TYP.                                                      | MAX.                                                             | MAX.                                                                                                                          |
| BZA956A | 5.32                                                   | 5.6  | 5.88 | 400                                                                            | 0.3                                                       | 125                                                              | 2.2                                                                                                                           |
| BZA962A | 5.89                                                   | 6.2  | 6.51 | 300                                                                            | 1.6                                                       | 105                                                              | 2.1                                                                                                                           |
| BZA968A | 6.46                                                   | 6.8  | 7.14 | 200                                                                            | 2.2                                                       | 90                                                               | 2.0                                                                                                                           |

Quadruple ESD transient voltage suppressor

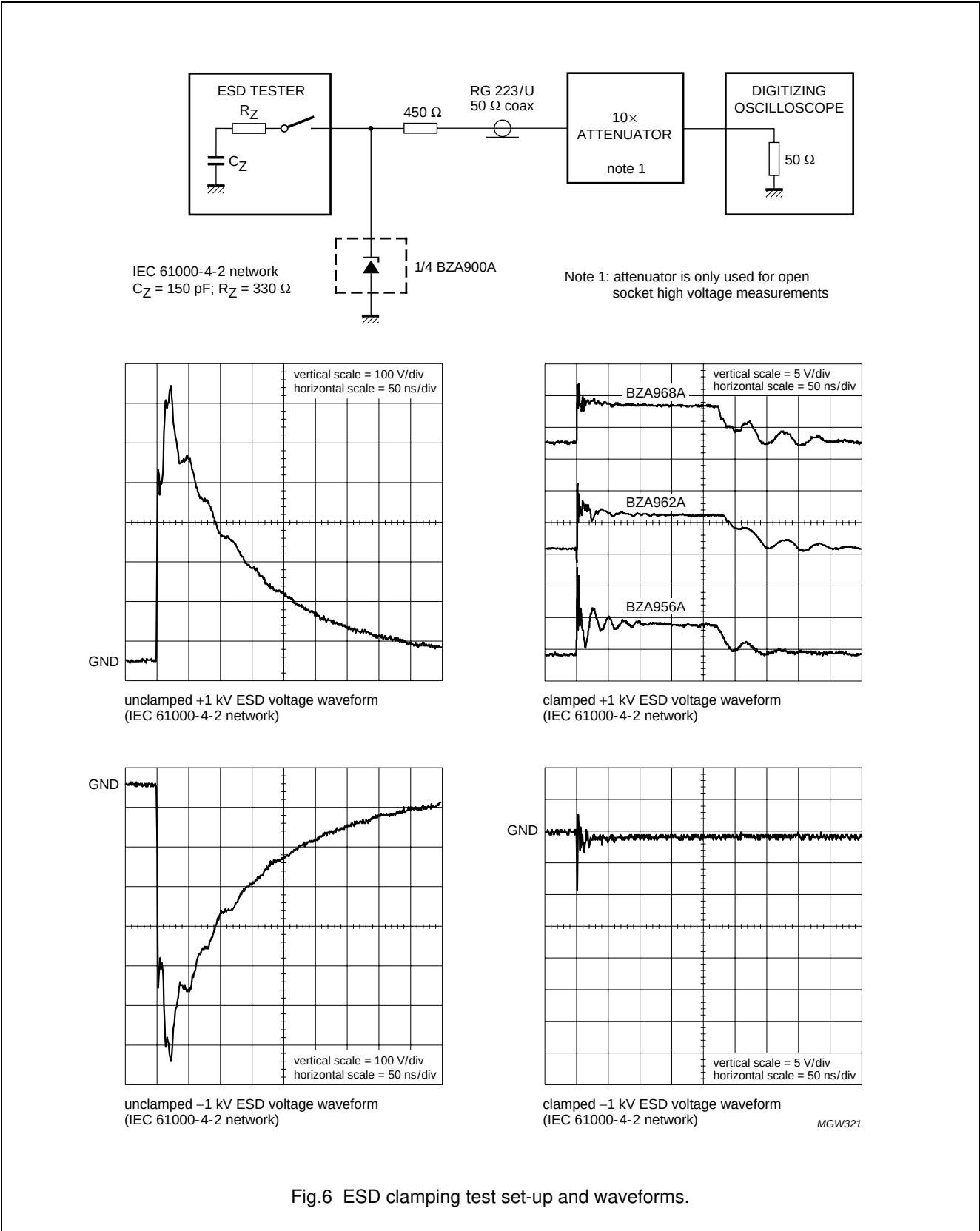
BZA900A-series

GRAPHICAL DATA



Quadruple ESD transient voltage suppressor

BZA900A-series



## Quadruple ESD transient voltage suppressor

**BZA900A-series**

### APPLICATION INFORMATION

#### Typical common anode application

A quadruple transient suppressor in a SOT665 package makes it possible to protect four separate lines using only one package. A simplified example is shown in Fig.7.

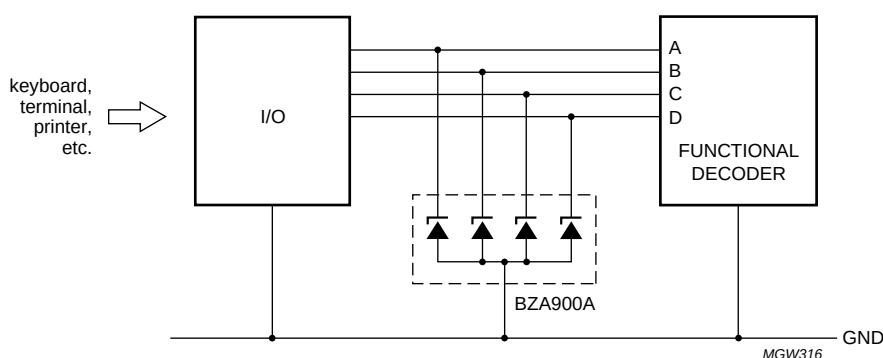


Fig.7 Computer interface protection.

#### Device placement and printed-circuit board layout

Circuit board layout is of extreme importance in the suppression of transients. The clamping voltage of the BZA900A 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.

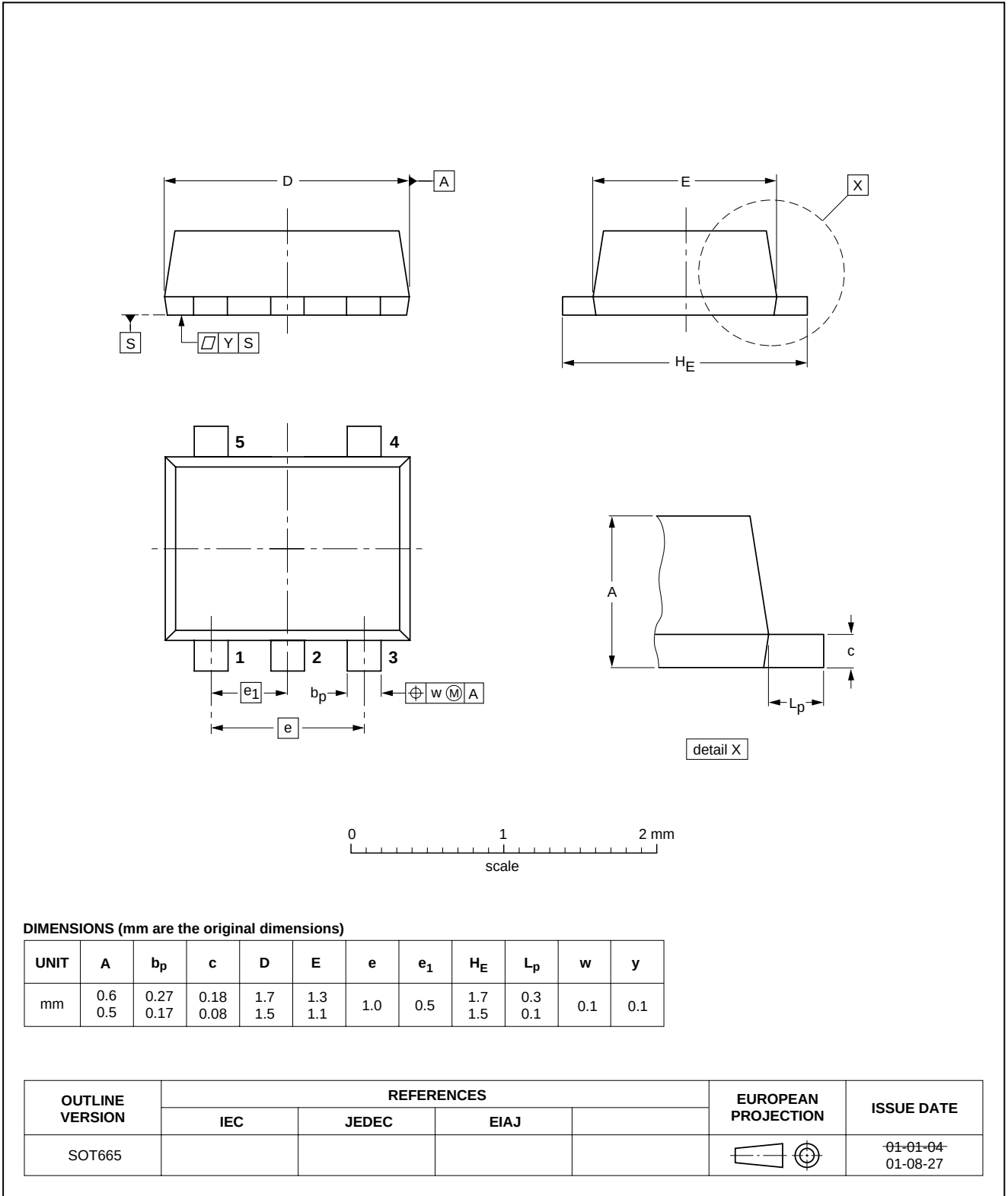
Quadruple ESD transient voltage suppressor

BZA900A-series

PACKAGE OUTLINE

Plastic surface mounted package; 5 leads

SOT665



# Quadruple ESD transient voltage suppressor

BZA900A-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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1. Please consult the most recently issued document before initiating or completing a design.
2. The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.nxp.com>.

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# ***NXP Semiconductors***

## **Customer notification**

This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content, except for package outline drawings which were updated to the latest version.

## **Contact information**

For additional information please visit: **<http://www.nxp.com>**

For sales offices addresses send e-mail to: **[salesaddresses@nxp.com](mailto:salesaddresses@nxp.com)**

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