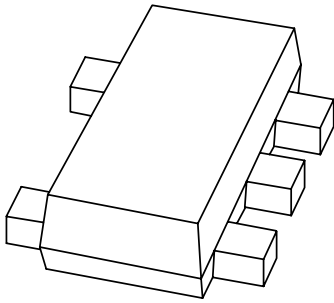


# DATA SHEET



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

Product specification

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

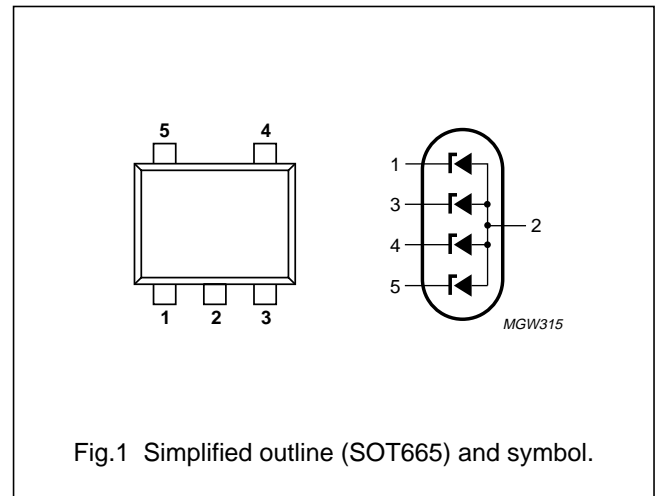


Fig.1 Simplified outline (SOT665) and symbol.

### 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: BZA956A BZA962A BZA968A	square pulse; $t_p = 1\text{ ms}$ ; see Fig.3	–	16	W
			–	15	W
			–	14	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

1. Solder point of common anode (pin 2).

## 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			
	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

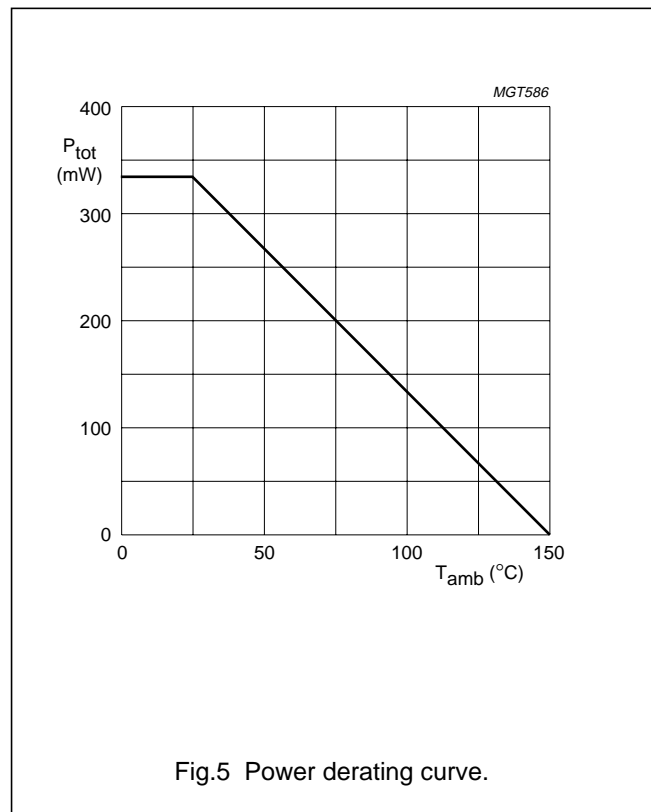
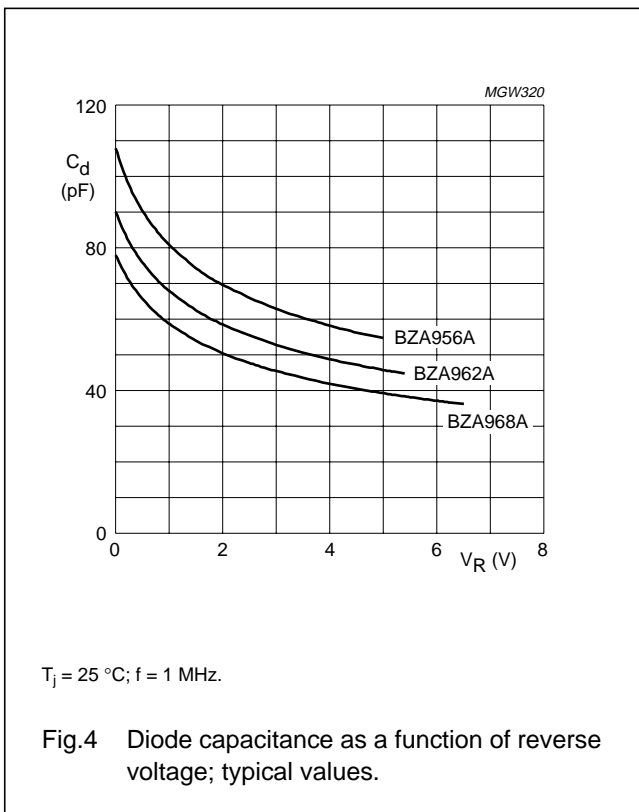
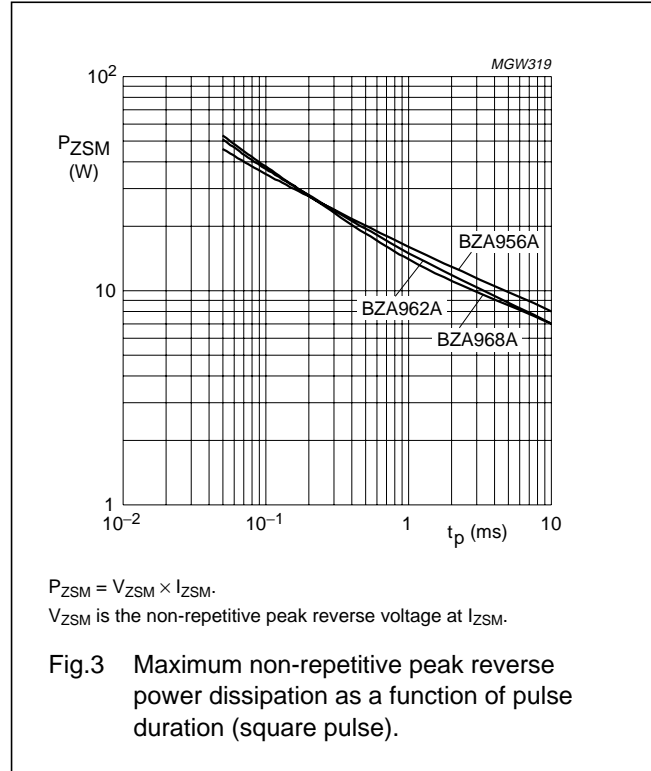
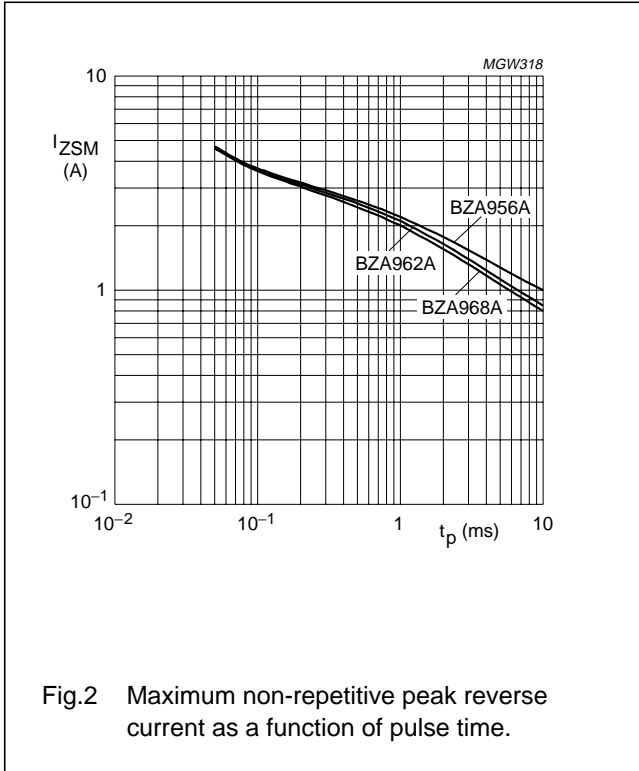
$T_j = 25\text{ °C}$  unless otherwise specified.

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 $f = 1\text{ MHz}$ ; $V_R = 0$	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.
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

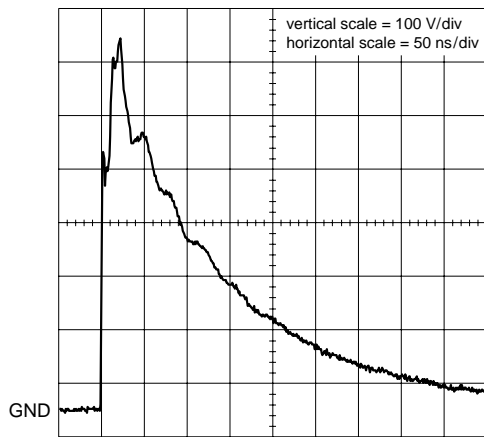
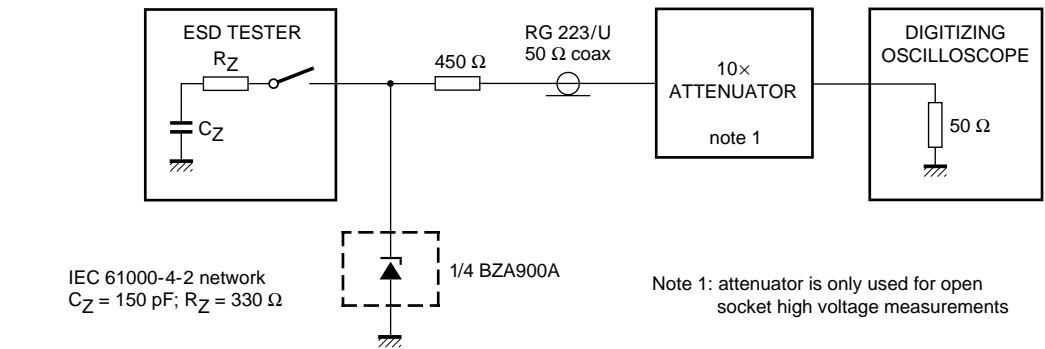
BZA900A-series

GRAPHICAL DATA

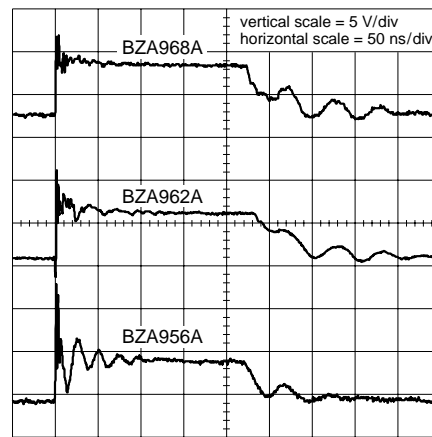


Quadruple ESD transient voltage suppressor

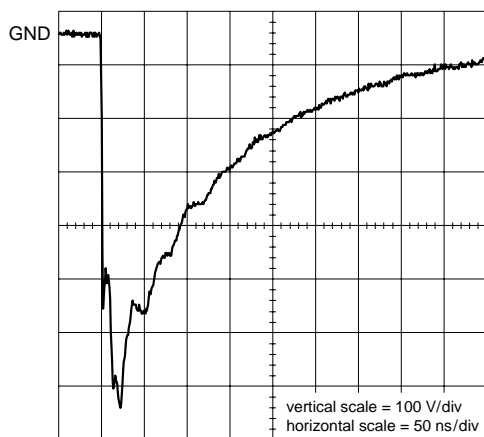
BZA900A-series



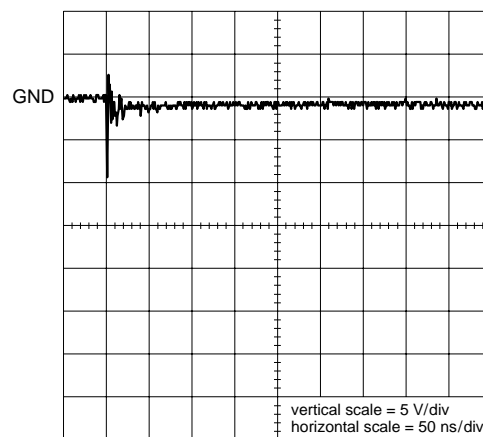
unclamped +1 kV ESD voltage waveform (IEC 61000-4-2 network)



clamped +1 kV ESD voltage waveform (IEC 61000-4-2 network)



unclamped -1 kV ESD voltage waveform (IEC 61000-4-2 network)



clamped -1 kV ESD voltage waveform (IEC 61000-4-2 network)

MGW321

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

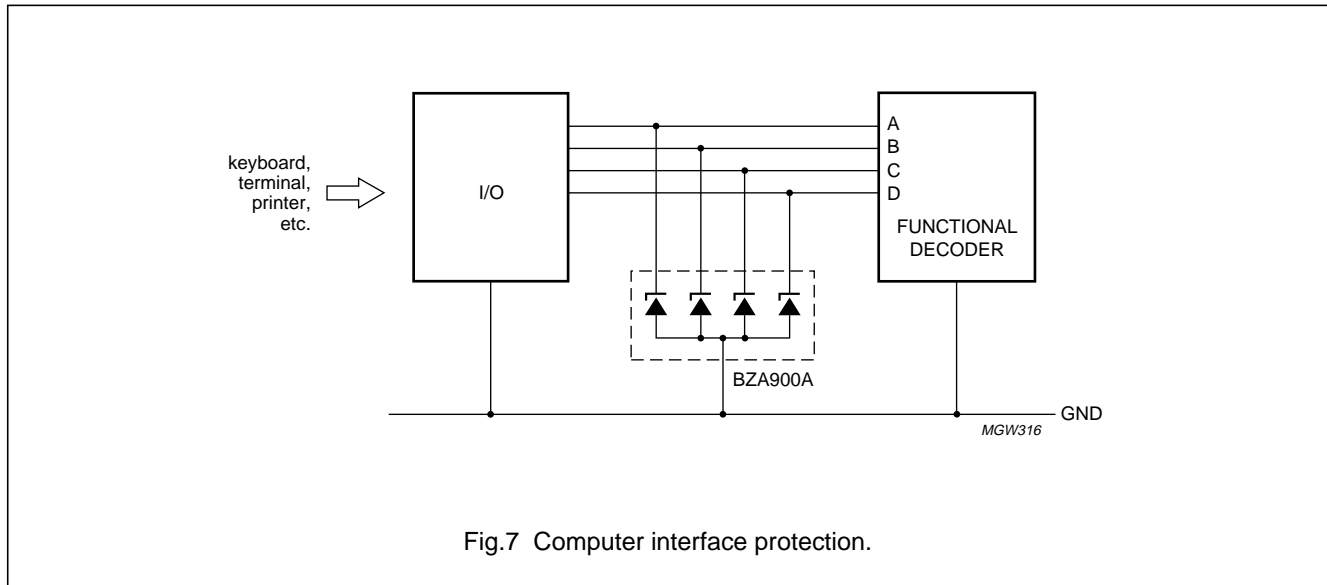
# Quadruple ESD transient voltage suppressor

# 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.



### 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.

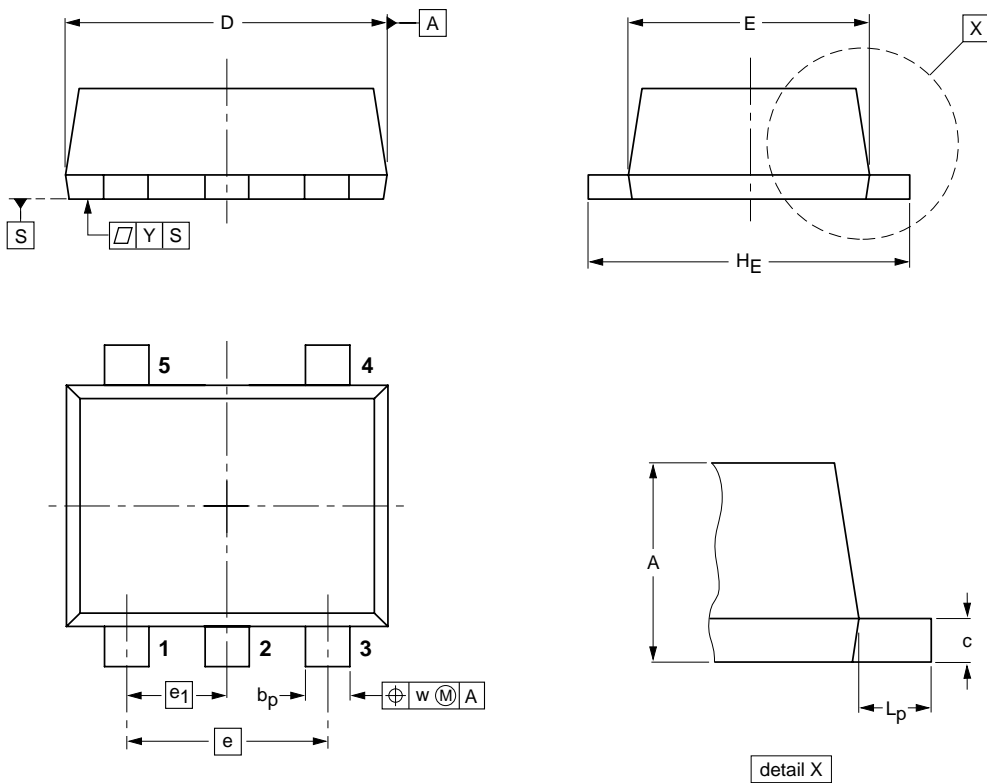
Quadruple ESD transient voltage suppressor

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PACKAGE OUTLINE

Plastic surface mounted package; 5 leads

SOT665



DIMENSIONS (mm are the original dimensions)

UNIT	A	$b_p$	c	D	E	e	$e_1$	$H_E$	$L_p$	w	y
mm	0.6 0.5	0.27 0.17	0.18 0.08	1.7 1.5	1.3 1.1	1.0	0.5	1.7 1.5	0.3 0.1	0.1	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT665						01-01-04 01-08-27

# Quadruple ESD transient voltage suppressor

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## DATA SHEET STATUS

DATA SHEET STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	DEFINITIONS
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**NOTES**

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**NOTES**

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