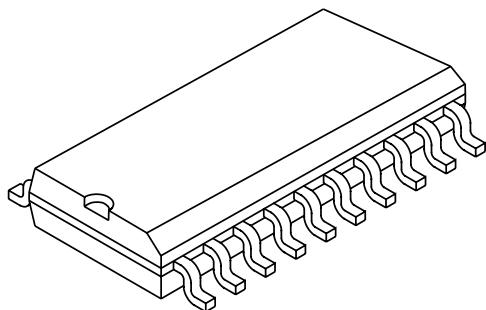


# DATA SHEET



## **BZA100**

### 18-fold ESD transient voltage suppressor

Product data sheet  
Supersedes data of 1996 Mar 21

1997 Dec 02

# 18-fold ESD transient voltage suppressor

BZA100

## FEATURES

- SO20 SMD package allows 18 separate voltage regulator diodes in a common anode configuration
- Working voltage: typ. 6.8 V
- Forward voltage: max. 1.3 V
- Maximum reverse peak power dissipation: 27.5 W at  $t_p = 1$  ms
- Maximum clamping voltage at peak pulse current: 11 V at 2.5 A
- Low leakage current: max. 2  $\mu$ A
- ESD rating >8 kV, according IEC 801-2.

## APPLICATIONS

- Where transient overvoltage protection in voltage and ESD sensitive equipment is required such as:
  - Computers
  - Printers
  - Business machines
  - Communication systems
  - Medical equipment.

## DESCRIPTION

18-fold monolithic transient voltage suppressor. Its 18-fold junction common anode design protects 18 separate lines using only one package. This device is ideal for situations where board space is a premium.

## PINNING

PIN	DESCRIPTION
1 to 5	cathode ( $k_1$ to $k_5$ )
6 and 16	common anode ( $a_1$ ; $a_2$ )
7 to 15	cathode ( $k_6$ to $k_{14}$ )
17 to 20	cathode ( $k_{15}$ to $k_{18}$ )

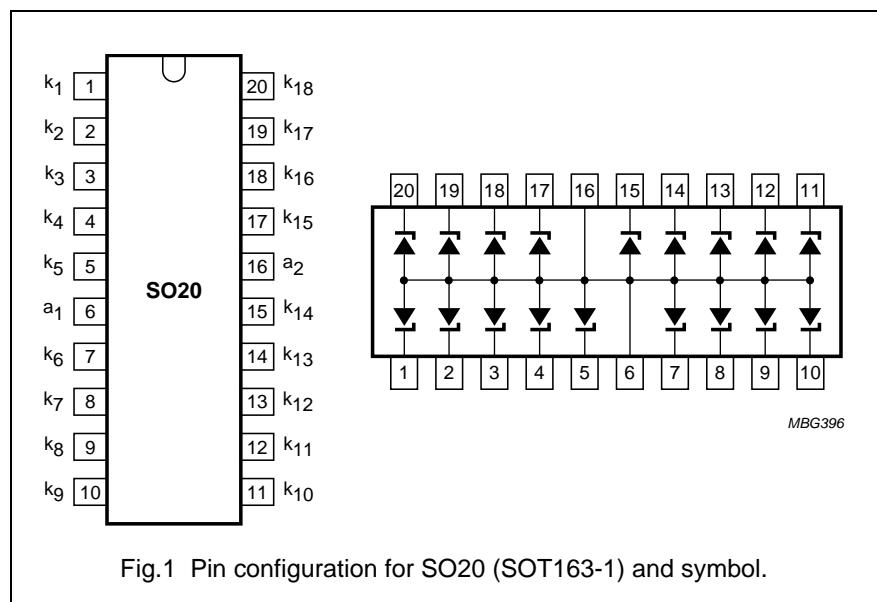


Fig.1 Pin configuration for SO20 (SOT163-1) and symbol.

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_Z$	working current		–	note 1	mA
$I_F$	continuous forward current		–	200	mA
$I_{FSM}$	non-repetitive peak forward current	$t_p = 1$ ms; square pulse	–	4	A
$I_{ZSM}$	non-repetitive peak reverse current	$t_p = 1$ ms; square pulse; see Fig.2	–	2.5	A
$P_{tot}$	total power dissipation	see Fig.3 up to $T_s = 60$ °C; note 2 up to $T_{amb} = 25$ °C; note 3	–	1.6	W
$P_{ZSM}$	non-repetitive peak reverse power dissipation	$t_p = 1$ ms; square pulse; see Fig.4	–	1.25	W
$T_{stg}$	storage temperature		-65	+150	°C
$T_j$	operating junction temperature		–	150	°C

## Notes

1. DC working current limited by  $P_{tot}$  max.
2. One or more diodes loaded;  $T_s$  is the temperature at the soldering point.
3. One or more diodes loaded; device mounted on a printed-circuit board with  $R_{th\ a-s} = 43.5$  K/W.

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## THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-s}$	thermal resistance from junction to soldering point	one or more diodes loaded	56.5	K/W
$R_{th\ j-a}$	thermal resistance from junction to ambient		100	K/W

## ELECTRICAL CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Per diode</b>						
$V_Z$	working voltage	$I_Z = 5\text{ mA}$	6.4	6.8	7.2	V
$V_F$	forward voltage	$I_F = 200\text{ mA}$	—	—	1.3	V
$V_{ZSM}$	non-repetitive peak reverse voltage	$t_p = 1\text{ ms}; I_{ZSM} = 2.5\text{ A}$	—	—	11	V
$I_R$	reverse current	$V_R = 5.25\text{ V}$	—	—	2	$\mu\text{A}$
$r_{dif}$	differential resistance	$I_Z = 1\text{ mA}$	—	—	40	$\Omega$
		$I_Z = 5\text{ mA}$	—	—	8	$\Omega$
$S_Z$	temperature coefficient of working voltage	$I_Z = 5\text{ mA}$	—	3	—	$\text{mV/K}$
$C_d$	diode capacitance	see Fig.5 $V_R = 0; f = 1\text{ MHz}$ $V_R = 5.25\text{ V}; f = 1\text{ MHz}$	—	—	120 60	pF

## 18-fold ESD transient voltage suppressor

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## GRAPHICAL DATA

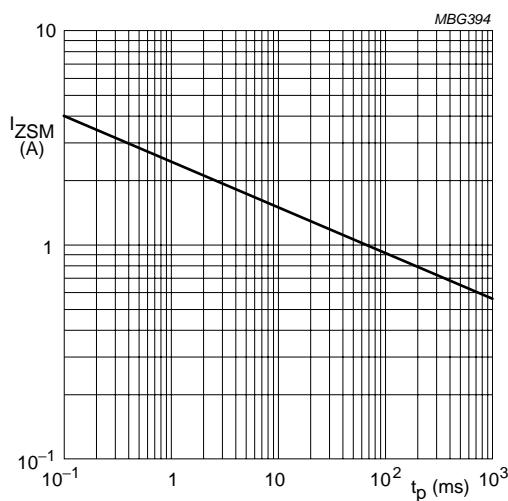
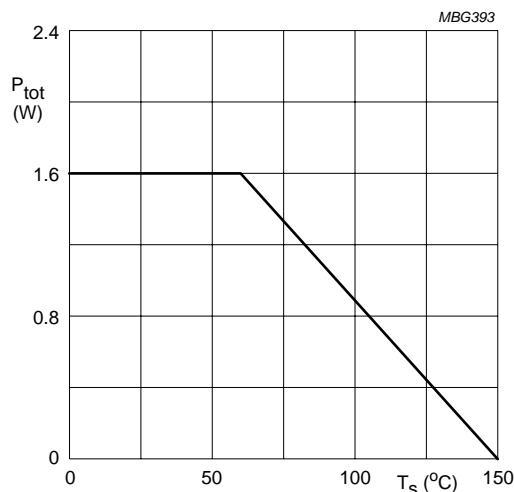
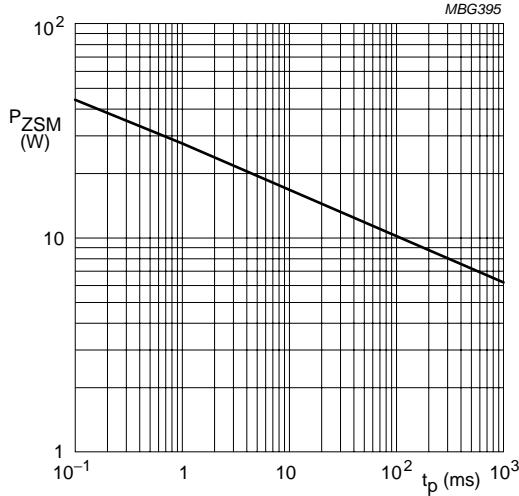


Fig.2 Maximum non-repetitive peak reverse current as a function of pulse time.



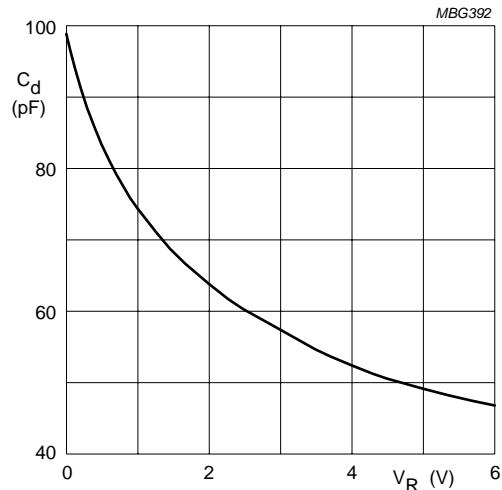
All diodes loaded.

Fig.3 Power derating curve.



$P_{ZSM} = V_{ZSM} \times I_{ZSM}$ .  
 $V_{ZSM}$  is the non-repetitive peak reverse voltage at  $I_{ZSM}$ .

Fig.4 Maximum non-repetitive peak reverse power dissipation as a function of pulse duration (square pulse).



$T_j = 25$  °C;  $f = 1$  MHz.

Fig.5 Diode capacitance as a function of reverse voltage; typical values.

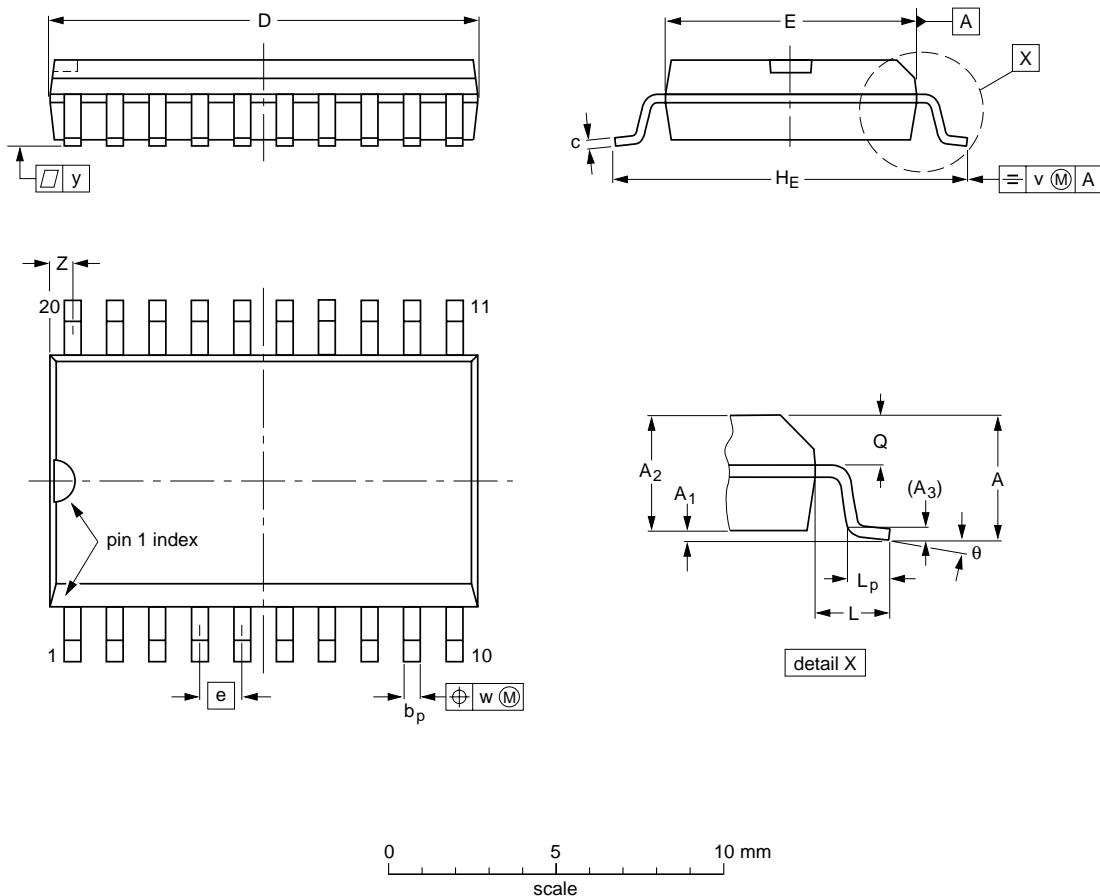
## 18-fold ESD transient voltage suppressor

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## PACKAGE OUTLINE

SO20: plastic small outline package; 20 leads; body width 7.5 mm

SOT163-1



## DIMENSIONS (inch dimensions are derived from the original mm dimensions)

UNIT	A max.	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	b <sub>p</sub>	c	D <sup>(1)</sup>	E <sup>(1)</sup>	e	H <sub>E</sub>	L	L <sub>p</sub>	Q	v	w	y	z <sup>(1)</sup>	θ
mm	2.65	0.3 0.1	2.45 2.25	0.25	0.49 0.36	0.32 0.23	13.0 12.6	7.6 7.4	1.27	10.65 10.00	1.4	1.1 0.4	1.1 1.0	0.25	0.25	0.1	0.9 0.4	8° 0°
inches	0.1	0.012 0.004	0.096 0.089	0.01	0.019 0.014	0.013 0.009	0.51 0.49	0.30 0.29	0.05	0.419 0.394	0.055	0.043 0.016	0.043 0.039	0.01	0.01	0.004	0.035 0.016	

## Note

1. Plastic or metal protrusions of 0.15 mm (0.006 inch) maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT163-1	075E04	MS-013				-99-12-27 03-02-19

## 18-fold ESD transient voltage suppressor

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## 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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## **Contact information**

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

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