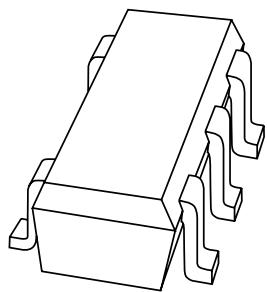


DATA SHEET



BZA800AVL series Quadruple low capacitance ESD suppressor

Product specification

2003 Apr 01

Quadruple low capacitance ESD suppressor**BZA800AVL series****FEATURES**

- Low diode capacitance
- Low leakage current
- SOT353 (SC-88A) surface mount package
- Common anode configuration.

APPLICATIONS

- Communication systems
- Computers and peripherals
- Audio and video 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
BZA856AVL	R3
BZA862AVL	R2
BZA868AVL	R1

PINNING

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

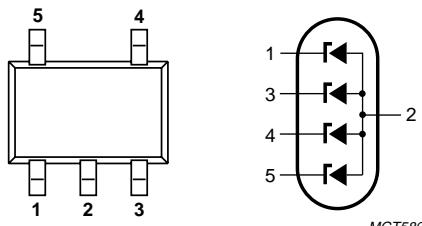


Fig.1 Simplified outline (SOT353; SC-88A) and symbol.

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LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
I_Z	working current	$T_{amb} = 25 \text{ }^{\circ}\text{C}$	–	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	–	3.5	A
P_{tot}	total power dissipation	$T_{amb} = 25 \text{ }^{\circ}\text{C}$; note 2; see Fig.5	–	300	mW
P_{ZSM}	non repetitive peak reverse power dissipation	square pulse; $t_p = 1 \text{ ms}$	–	6	W
T_{stg}	storage temperature		–65	+150	$^{\circ}\text{C}$
T_j	junction temperature		–	150	$^{\circ}\text{C}$
ESD	electrostatic discharge	IEC 61000-4-2 (contact discharge)	30	–	kV
		HBM MIL-Std 883	10	–	kV

Notes

1. DC working current limited by $P_{tot(max)}$.
2. Device mounted on standard printed-circuit board.

ESD STANDARDS COMPLIANCE

STANDARD	CONDITIONS
IEC 61000-4-2, level 4 (ESD)	>15 kV (air); >8 kV (contact discharge)
HBM MIL-Std 883, class 3	>4 kV

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th j-a}$	thermal resistance from junction to ambient	all diodes loaded	410	K/W
$R_{th j-s}$	thermal resistance from junction to solder point; note 1	one diode loaded	200	K/W
		all diodes loaded	185	K/W

Note

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

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ELECTRICAL CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	$I_F = 200 \text{ mA}$	—	—	1.2	V
I_R	reverse current	$V_R = 3 \text{ V}$	—	—	200	nA
	BZA856AVL		—	—	100	nA
	BZA862AVL		—	—	20	nA
V_Z	working voltage	$I_Z = 1 \text{ mA}$	5.32	5.6	5.88	V
	BZA856AVL		5.89	6.2	6.51	V
	BZA862AVL		6.46	6.8	7.14	V
r_{dif}	differential resistance	$I_Z = 1 \text{ mA}$	—	—	200	Ω
	BZA856AVL		—	—	150	Ω
	BZA862AVL		—	—	100	Ω
S_Z	temperature coefficient	$I_Z = 1 \text{ mA}$	—	1.3	—	mV/K
	BZA856AVL		—	2.4	—	mV/K
	BZA862AVL		—	2.9	—	mV/K
C_d	diode capacitance	$f = 1 \text{ MHz}; V_R = 0$	—	22	28	pF
	BZA856AVL		—	18	22	pF
	BZA862AVL		—	16	19	pF
	diode capacitance	$f = 1 \text{ MHz}; V_R = 5 \text{ V}$	—	12	17	pF
	BZA856AVL		—	9	12	pF
	BZA862AVL		—	8	11	pF
	I_{ZSM}	$t_p = 1 \text{ ms}; T_{amb} = 25^\circ\text{C}$	—	—	0.90	A
			—	—	0.85	A
			—	—	0.80	A

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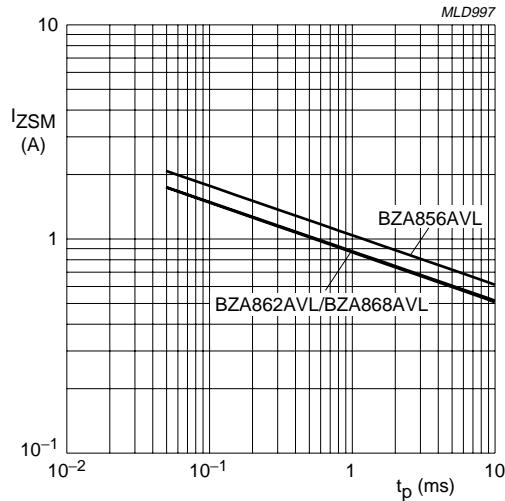


Fig.2 Maximum non-repetitive peak reverse current as a function of pulse time.

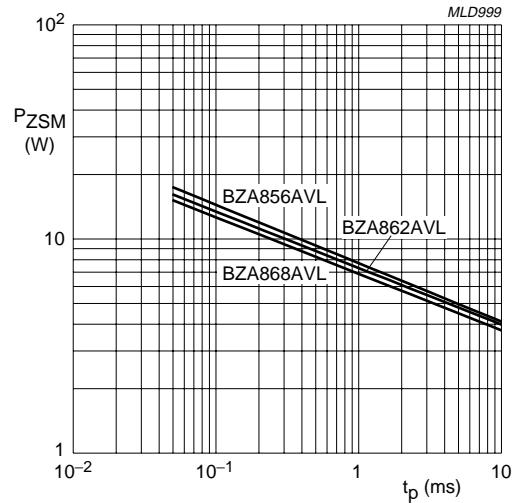
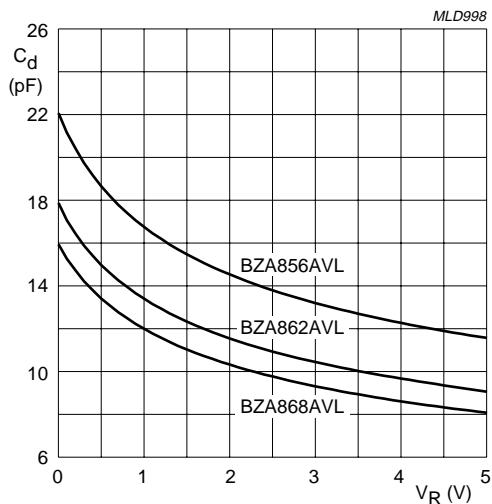


Fig.3 Maximum non-repetitive peak reverse power dissipation as a function of pulse duration (square pulse).



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

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

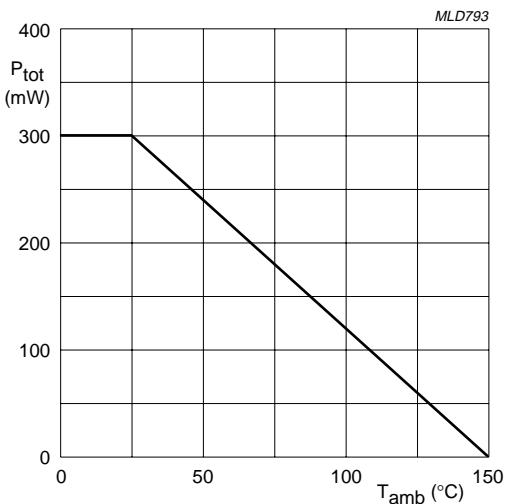


Fig.5 Power derating curve.

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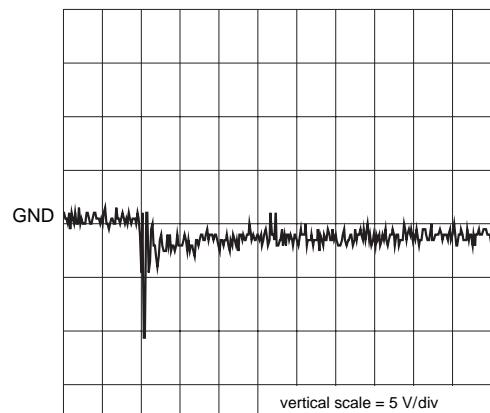
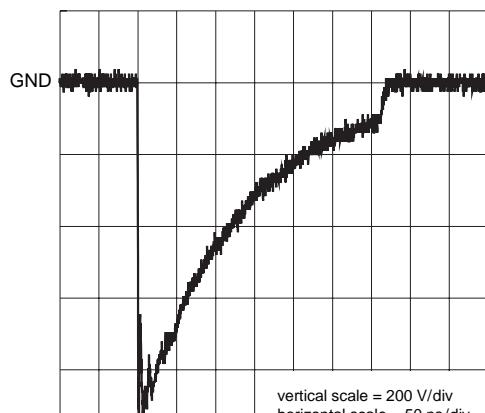
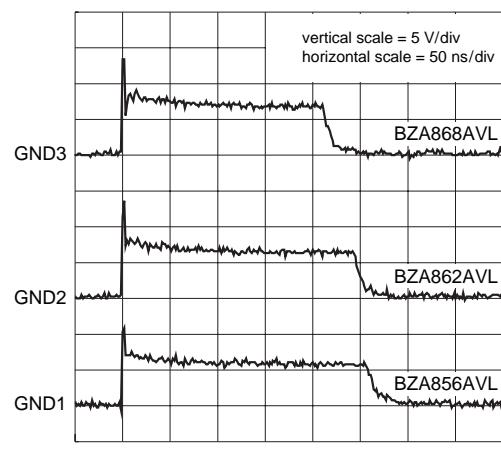
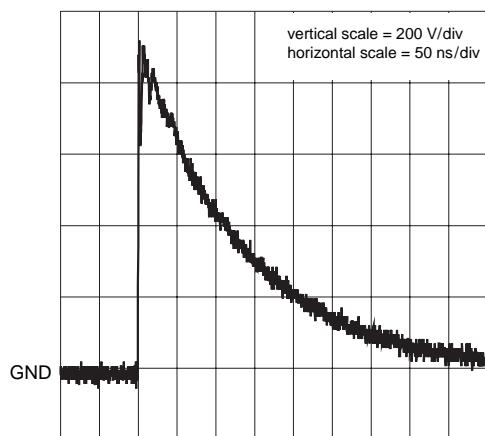
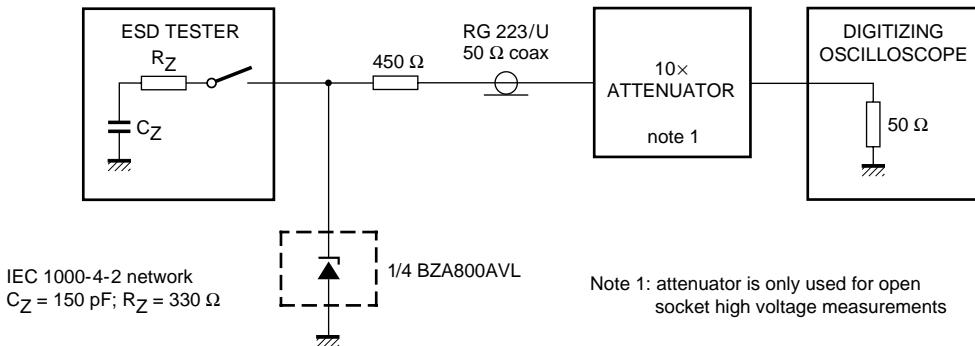


Fig.6 ESD clamping test set-up and waveforms.

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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.

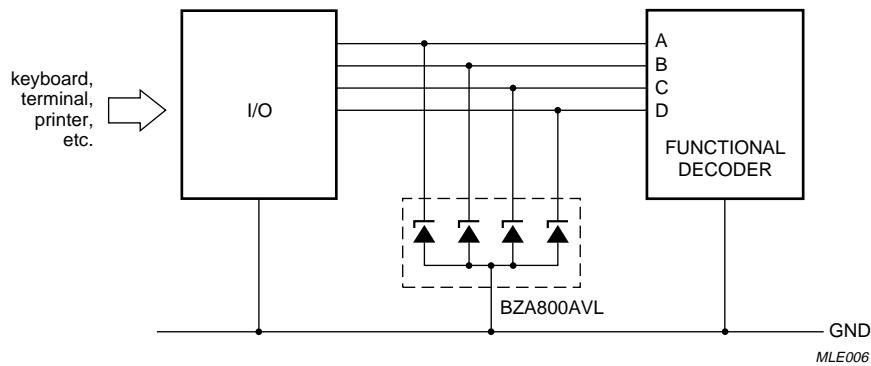


Fig.7 Computer interface protection.

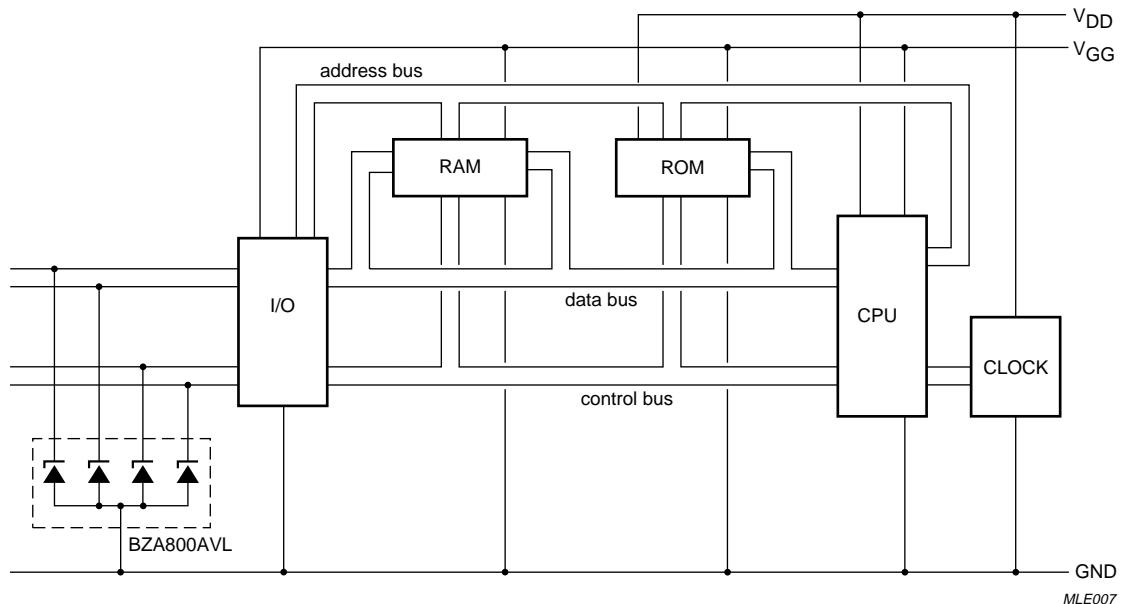


Fig.8 Microprocessor protection.

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Device placement and printed-circuit board layout

Circuit board layout is of extreme importance in the suppression of transients. The clamping voltage of the BZA800AVL 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.

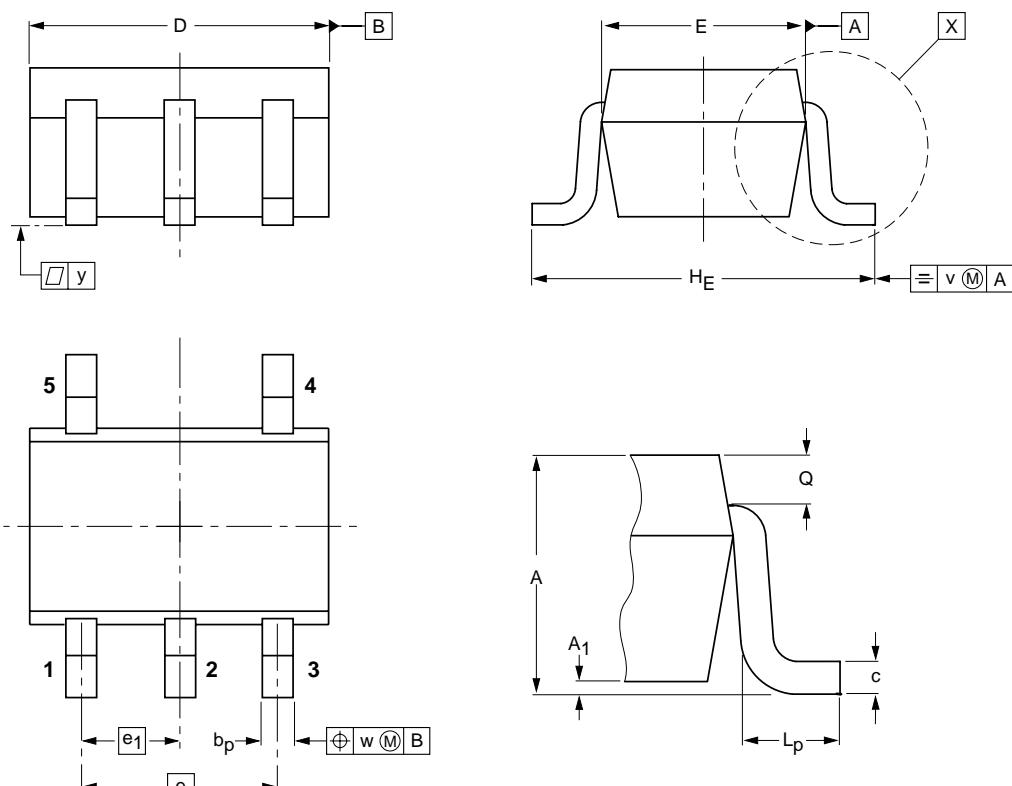
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PACKAGE OUTLINE

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

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DATA SHEET STATUS

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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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