SMMBZ33VALT1G
Dual Common Anode Zener for ESD Protection

Description：

These dual monolithic silicon Zener diodes are designed for applications requiring transient over voltage protection capability. They are intended for use in voltage and ESD sensitive equipment such as computers, printers, business machines, communication systems, medicalequipment and other applications.Their dual junction common anode design protects two separate lines using only one package. These devices are ideal for situations where board space is at a premium.

SOT−23

Features：

Pb−Free Packages are Available

SOT−23 Package Allows Either Two Separate Unidirectional Configurations or a Single Bidi rectional Configuration

Working Peak Reverse Voltage Range−3Vto26V

Standard Zener Breakdown Voltage Range−5.6V to 33V

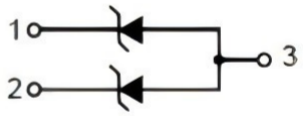
Peak Power−24 or 40Watts@1.0ms(Unidirectional),per Figure 5 Waveform

ESD Rating of Class N(exceeding16kV)per the Human Body Model

Maximum Clamping Voltage@Peak Pulse Current

Low Leakage<5.0_A

Flamm ability RatingUL 94V−O



MechanicalCharacteristics：

CASE: Void-free,transfer-molded,the rmosetting plasticcase

FINISH: Corrosion resistant finish, easily solderable

MAXIMUM CASE TEMPERATURE FOR SOLDERING PURPOSES: 260°C for 10 Seconds

Package designed for optimal automated board assembly

Small package size for high density applications

Available in 8 mm Tap and Reel

Use the Device Number to order the 7 inch/3,000 unit reel.
Replace the"T1" with"T3" in the Device Number to order the 13inch/10,000 unit reel.

MAXIMUM RATINGS

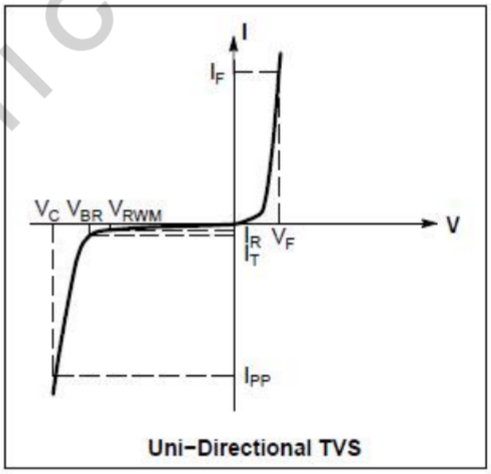
Rating	Symbol	Value	Unit
Peak Power Dissipation @1.0ms(Note 1) SMMBZ5V6ALT1G thru SMMBZ10VALT1G @TL≤25℃ SMMBZ12VALTIG thru SMMBZ33VALT1G	PPk	24 40	Watts
Total Power Dissipationon FR-5 Board (Note2)@TA=25℃	PD	225	mW
Derate above 25℃		1.8	mW/℃
Thermal Resistance Junction-to-Ambient	RθJA	556	℃W
Total Power Dissipation on Aumina Substrate (Note 3)@TA=25°℃	PD	300	mW
Derate above 25°℃		2.4	mW/℃
Thermal Resistance Junction-lo-Ambient	RθJA	417	℃W
Junction and Storage Temperature Range	Tj.Tstg	-55 to +150	℃
Lead SolderTemperature-Maximum(10 Second Duration)	TL	260	℃

Maximum ratings are those values beyond which device damage can occur.Maximum raings applied to the device are individual stress limit values(not nomal operating conditons)and are not valid simultaneously. If these limits are exceeded,device functional operation is not implied damage may occur and reliability may be affected.

1.Non-repetitive current pulse per Figure 5 and derate above TA=25℃ per Figure6.
2.FR-5=1.0x0.75x0.62 in.
3.Alumina=0.4x0.3x0.024 in,99.5%alumina
*Other voltages may be available upon request.

ELECTRICAL CHARACTERISTICS
(T_A = 25°C unless otherwise noted)
UNIDIRECTIONAL (Circuit tied to Pins 1 and 3 or 2 and 3)

Symbol	Parameter
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Working Peak Reverse Voltage
I_R	Maximum Reverse Leakage Current @ V_{RWM}
V_{BR}	Breakdown Voltage @ I_T
I_T	Test Current
ΘV_{BR}	Maximum Temperature Coefficient of V_{BR}
I_F	Forward Current
V_F	Forward Voltage @ I_F
Z_{ZT}	Maximum Zener Impedance @ I_{ZT}
I_{ZK}	Reverse Current
Z_{ZK}	Maximum Zener Impedance @ I_{ZK}



Uni-Directional TVS

ELECTRICAL CHARACTERISTICS(T_A=25℃ unless otherwise noted)

UNIDIRECTIONAL(Circutfed tied to Pins 1 and 3 or Pins 2 and 3)

(V_F=0.9V Max@I_F=10 mA **24 WATTS**

Device	V_{RWM}	I_R@ V_{RWM}	Breakdown Voltage				Max Zener Impedance (Note5)			V_C@I_{PP} (Note 6)		θV_{BR}
			V_{BR}(Note 4)(V)			@I_T	Z_{ZT} @ I_{ZT}	Z_{ZK}@ I_{ZK}		V_C	I_{PP}	
	Volts	μA	Min	Nom	Max	mA	Ω	Ω	mA	V	A	mV/℃
SMMBZ5V6AL	3.0	5.0	5.32	5.6	5.88	20	11	1600	0.25	8.0	3.0	1.26
SMMBZ6V2AL	3.0	0.5	5.89	6.2	6.51	1.0	—	—	—	8.7	2.76	2.80
SMMBZ6V8AL	4.5	0.5	6.46	6.8	7.14	1.0	—	—	—	9.6	2.5	34
SMMBZ9V1AL	6.0	0.3	8.65	9.1	9.56	1.0	—	—	—	14	1.7	7.5
SMMBZ10VAL	6.5	0.3	9.5	10	10.5	1.0	—	—	—	14.2	1.7	7.5

(V_F=0.9V Max@I_F=10 mA **40 WATTS**

Device	V_{RWM}	I_R@ V_{RWM}	Breakdown Voltage				Vc@Ipp(Note 6)		θV_{BR}
			V_{BR}(Note 4)(V)			@I_T	Vc	Ipp	
	Volts	nA	Min	Nom	Max	mA	V	A	mV/℃
SMMBZ12VAL	8.5	200	11.40	12	12.60	1.0	17	2	7.5
SMMBZ13VAL	10.5	50	12.35	13	13.65	1.0	18	2.1	10.8
SMMBZ15VAL	12	50	14.25	15	15.75	1.0	21	1.9	12
SMMBZ18VAL	14.5	50	17.10	18	18.90	1.0	25	1.6	15.3
SMMBZ20VAL	17	50	19.00	20	21.00	1.0	28	1.4	172
SMMBZ27VAL	22	50	25.65	27	28.35	1.0	40	1.0	24.3
SMMBZ33VAL	26	50	31.35	33	34.65	1.0	46	0.87	30

1.V_{BR} measured at pulse test current I_T at an ambient temperature of 25℃.

2.Z_{ZT} and Z_{ZK} are meaured by dividing the AC voltage drop across the device by the AC current applied. The specified limits are for $I_{Z(AC)}$=0.1$I_{Z(DC)}$,with the AC frequency=1.0kHz.

3.Surge current waveform per Figure 5 and derate per Figure6.

TYPICAL CHARACTERISTICS

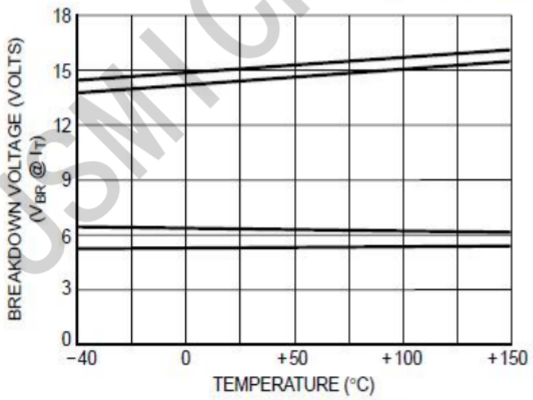


Figure 1. Typical Breakdown Voltage versus Temperature
(Upper curve for each voltage is bidirectional mode, lower curve is unidirectional mode)

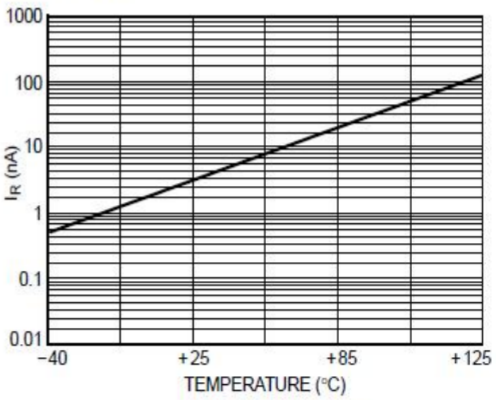


Figure 2. Typical Leakage Current versus Temperature

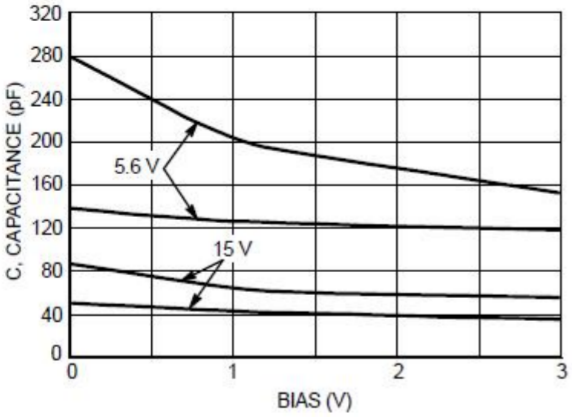


Figure 3. Typical Capacitance versus Bias Voltage
(Upper curve for each voltage is unidirectional mode, lower curve is bidirectional mode)

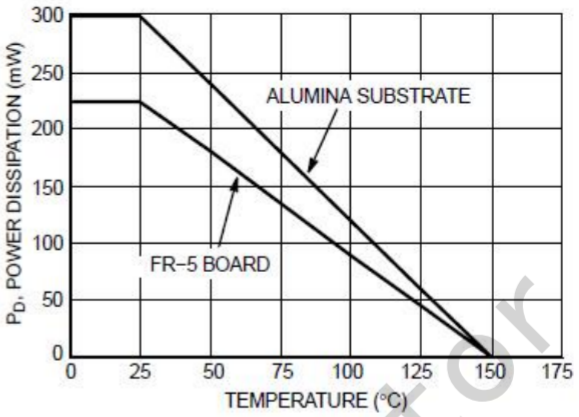


Figure 4. Steady State Power Derating Curve

TYPICAL CHARACTERISTICS

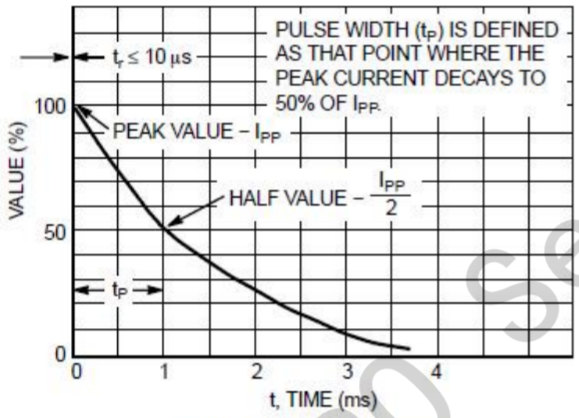


Figure 5. Pulse Waveform

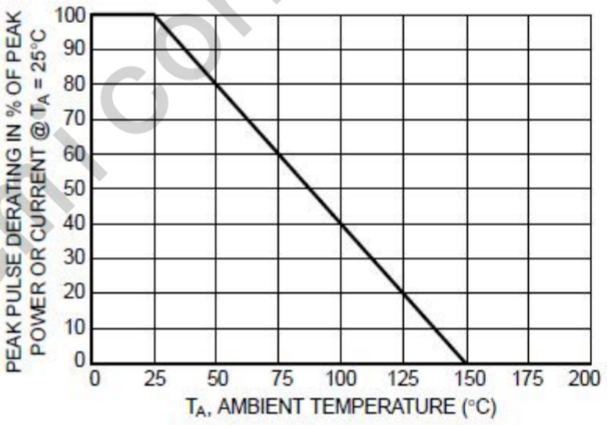


Figure 6. Pulse Derating Curve

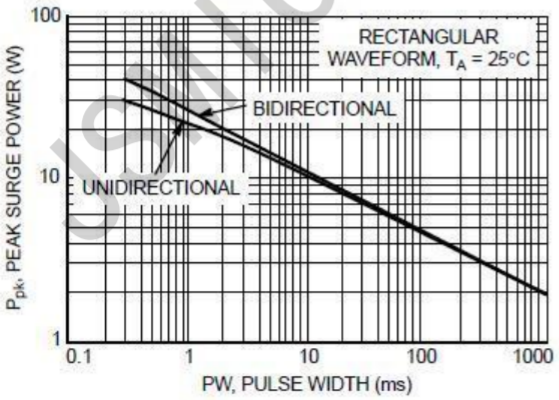


Figure 7. Maximum Non−repetitive Surge Power, P_{pk} versus PW

Power is defined as V_{RSM} x I_Z(pk) where V_{RSM} is the clamping voltage at I_Z(pk).

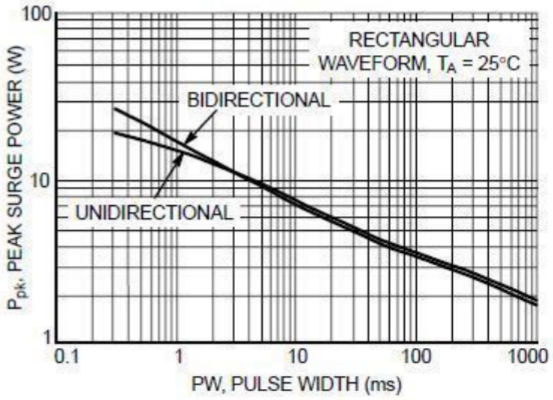


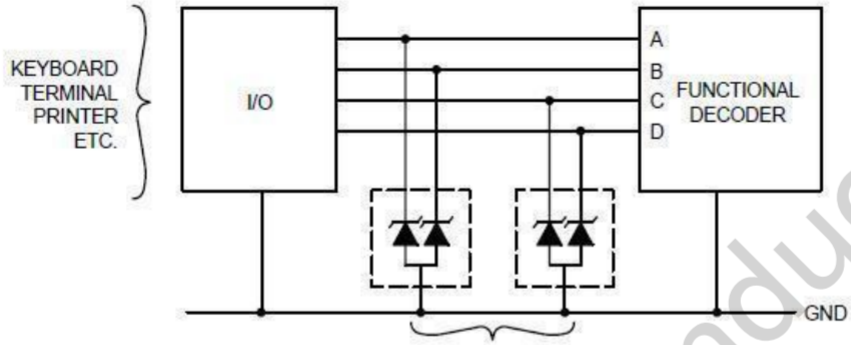
Figure 8. Maximum Non−repetitive Surge Power, P_{pk}(NOM) versus PW

Power is defined as V_Z(NOM) x I_Z(pk) where V_Z(NOM) is the nominal Zener voltage measured at the low test current used for voltage classification.

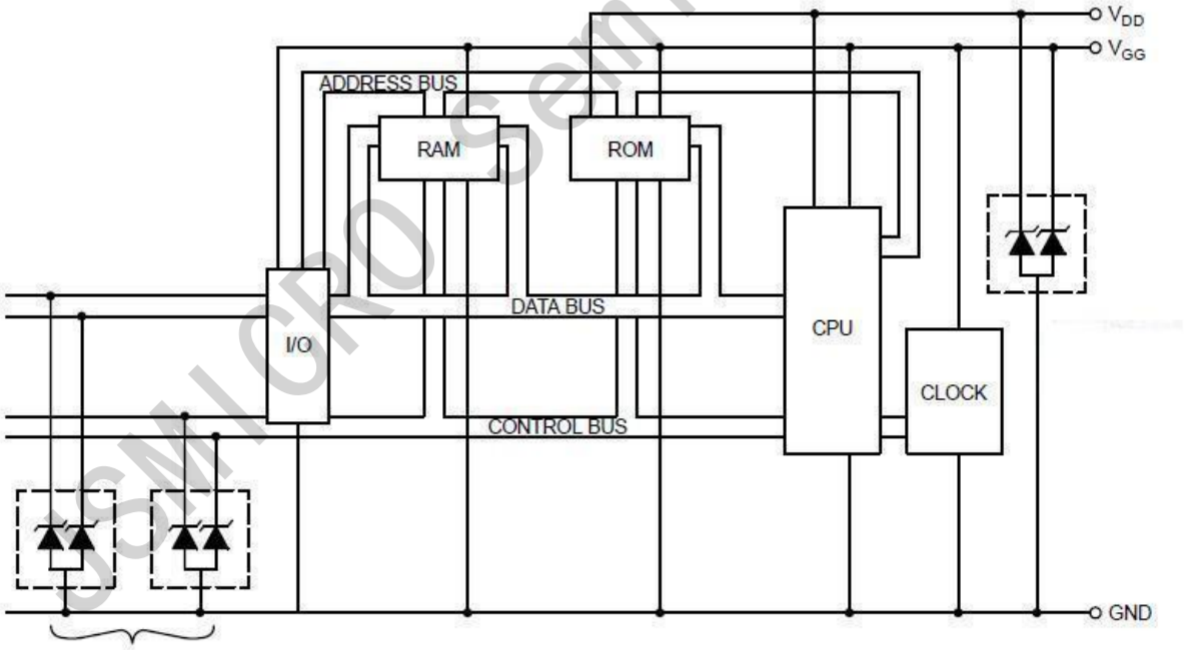
TYPICAL COMMON ANODE APPLICATIONS

A quad junction common anode design in a SOT−23 package protects four separate lines using only one package. This adds flexibility and creativity to PCB design especially when board space is at a premium. Two simplified examples of TVS applications are illustrated below.

Computer Interface Protection

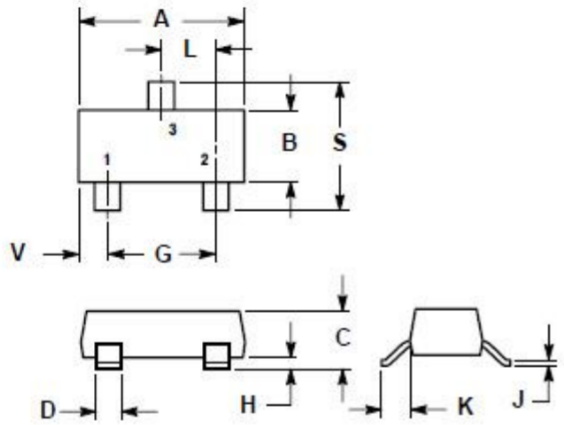


Microprocessor Protection



PACKAGE DIMENSIONS

SOT−23 (TO−236)
CASE 318−09
ISSUE AH

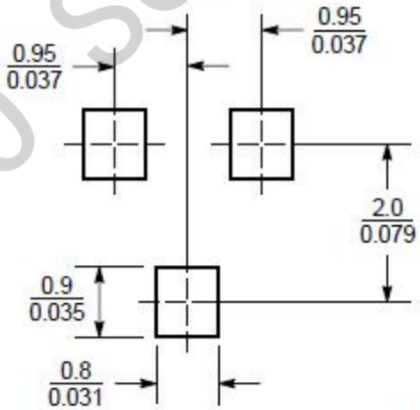


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIUMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318−01, −02, AND −06 OBSOLETE, NEW STANDARD 318−09.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.1102	0.1197	2.80	3.04
B	0.0472	0.0551	1.20	1.40
C	0.0385	0.0498	0.99	1.26
D	0.0140	0.0200	0.36	0.50
G	0.0670	0.0826	1.70	2.10
H	0.0040	0.0098	0.10	0.25
J	0.0034	0.0070	0.085	0.177
K	0.0180	0.0236	0.45	0.60
L	0.0350	0.0401	0.89	1.02
S	0.0830	0.0984	2.10	2.50
V	0.0177	0.0236	0.45	0.60

STYLE 12:
PIN 1. CATHODE
2. CATHODE
3. ANODE

SOLDERING FOOTPRINT*



SCALE 10:1 (mm / inches)

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

单击下面可查看定价，库存，交付和生命周期等信息

>>JSMSEMI(杰盛微)