

## 3W, 11V - 200V Surface Mount Zener Diode

### FEATURES

- Ideal for automated placement
- Glass passivated chip junction
- Low inductance
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

### APPLICATIONS

- Switching mode power supply (SMPS)
- Adapters
- Lighting application
- On-board DC/DC converter

### MECHANICAL DATA

- Case: DO-214AA (SMB)
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: Indicated by cathode band
- Weight: 0.100g (approximately)

KEY PARAMETERS		
PARAMETER	VALUE	UNIT
$V_Z$	11 - 200	V
Test current $I_{ZT}$	1.9 - 34.1	mA
$P_{tot}$	3	W
$T_{JMAX}$	150	°C
Package	DO-214AA (SMB)	
Configuration	Single die	



DO-214AA (SMB)



### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	VALUE	UNIT
DC power dissipation at $T_L=75^\circ\text{C}$ , measure at zero lead length (Note 1) derate above $75^\circ\text{C}$	$P_D$	3	W
		40	mW/°C
DC power dissipation at $T_A=25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	550	mW
		4.4	mW/°C
Junction temperature	$T_J$	-55 to +150	°C
Storage temperature	$T_{STG}$	-55 to +150	°C

#### Note:

1. Mounted on Cu-Pad size 5mm x 5mm on PCB

### THERMAL PERFORMANCE

PARAMETER	SYMBOL	TYP	UNIT
Junction-to-lead thermal resistance	$R_{\theta JL}$	25	°C/W
Junction-to-ambient thermal resistance	$R_{\theta JA}$	226	°C/W

**ELECTRICAL SPECIFICATIONS** (TA = 25°C unless otherwise noted)

Device (Note 1)	Device Marking Code	Nominal Zener Voltage			Test current	Zener Impedance (Note 3)			Leakage Current		Maximum DC Zener Current
		V <sub>Z</sub> @I <sub>ZT</sub>				I <sub>ZT</sub>	Z <sub>ZT</sub> @ I <sub>ZT</sub>	Z <sub>ZK</sub> @I <sub>ZK</sub>		I <sub>R</sub> @V <sub>R</sub>	
		V			mA	Ω	Ω	mA	μA	V	mA(DC)
		Min	Nom (Note 2)	Max							
1SMB5926	926B	10.45	11	11.55	34.1	5.5	550	0.25	1	8.4	136
1SMB5927	927B	11.40	12	12.60	31.2	6.5	550	0.25	1	9.1	125
1SMB5928	928B	12.35	13	13.65	28.8	7.0	550	0.25	1	9.9	115
1SMB5929	929B	14.25	15	15.75	25.0	9.0	600	0.25	1	11.4	100
1SMB5930	930B	15.20	16	16.80	23.4	10.0	600	0.25	1	12.2	94
1SMB5931	931B	17.10	18	18.90	20.8	12.0	650	0.25	1	13.7	83
1SMB5932	932B	19.00	20	21.00	18.7	14.0	650	0.25	1	15.2	75
1SMB5933	933B	20.90	22	23.10	17.0	17.5	650	0.25	1	16.7	68
1SMB5934	934B	22.80	24	25.20	15.6	19	700	0.25	1	18.2	63
1SMB5935	935B	25.65	27	28.35	13.9	23	700	0.25	1	20.6	56
1SMB5936	936B	28.50	30	31.50	12.5	26	750	0.25	1	22.8	50
1SMB5937	937B	31.35	33	34.65	11.4	33	800	0.25	1	25.1	45
1SMB5938	938B	34.20	36	37.80	10.4	38	850	0.25	1	27.4	42
1SMB5939	939B	37.05	39	40.95	9.6	45	900	0.25	1	29.7	38
1SMB5940	940B	40.85	43	45.15	8.7	53	950	0.25	1	32.7	35
1SMB5941	941B	44.65	47	49.35	8.0	67	1000	0.25	1	35.8	32
1SMB5942	942B	48.45	51	53.55	7.3	70	1100	0.25	1	38.8	29
1SMB5943	943B	53.20	56	58.80	6.7	86	1300	0.25	1	42.6	27
1SMB5944	944B	58.90	62	65.10	6.0	100	1500	0.25	1	47.1	24
1SMB5945	945B	64.60	68	71.40	5.5	120	1700	0.25	1	51.7	22
1SMB5946	946B	71.25	75	78.75	5.0	140	2000	0.25	1	56.0	20
1SMB5947	947B	77.90	82	86.10	4.6	160	2500	0.25	1	62.2	18
1SMB5948	948B	86.45	91	95.55	4.1	200	3000	0.25	1	69.2	16
1SMB5949	949B	95.00	100	105.00	3.7	250	3100	0.25	1	76.0	15
1SMB5950	950B	104.50	110	115.50	3.4	300	4000	0.25	1	83.6	13
1SMB5951	951B	114.00	120	126.00	3.1	360	4500	0.25	1	91.2	12
1SMB5952	952B	123.50	130	136.50	2.9	450	5000	0.25	1	98.8	11
1SMB5953	953B	142.50	150	157.50	2.5	600	6000	0.25	1	114.0	10
1SMB5954	954B	152.00	160	168.00	2.3	700	6500	0.25	1	121.6	9
1SMB5955	955B	171.00	180	189.00	2.1	900	7000	0.25	1	136.8	8
1SMB5956	956B	190.00	200	210.00	1.9	1200	8000	0.25	1	152.0	7

**Notes:**

1. Tolerance and type number designation the type numbers listed indicate a tolerance of 5%
2. Zener voltage (V<sub>Z</sub>) measurement: Nominal Zener voltage is measured with the device junction in thermal equilibrium with ambient temperature 25°C
3. Zener impedance (Z<sub>Z</sub>) derivation : Z<sub>ZT</sub> and Z<sub>ZK</sub> are measured by dividing the AC voltage drop across the device by the AC current applied.
4. The specified limits are for I<sub>Z</sub>(AC) = 0.1 I<sub>Z</sub>(DC) with the AC frequency = 60Hz

**ORDERING INFORMATION**

<b>ORDERING CODE<sup>(1)</sup></b>	<b>PACKAGE</b>	<b>PACKING</b>
1SMB59x	DO-214AA (SMB)	3,000 / Tape & Reel

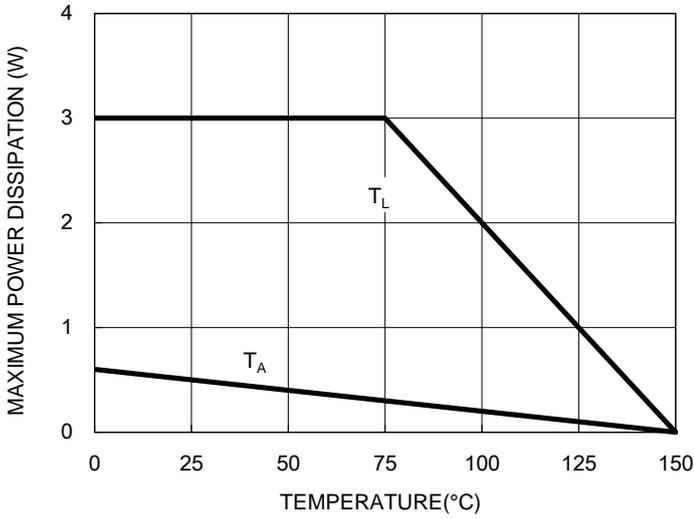
**Notes:**

1. "x" defines voltage from 11V(1SMB5926) to 200V(1SMB5956)

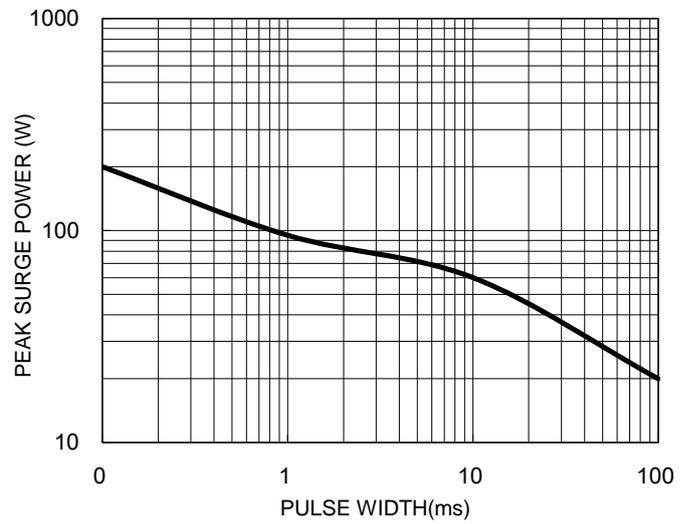
**CHARACTERISTICS CURVES**

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

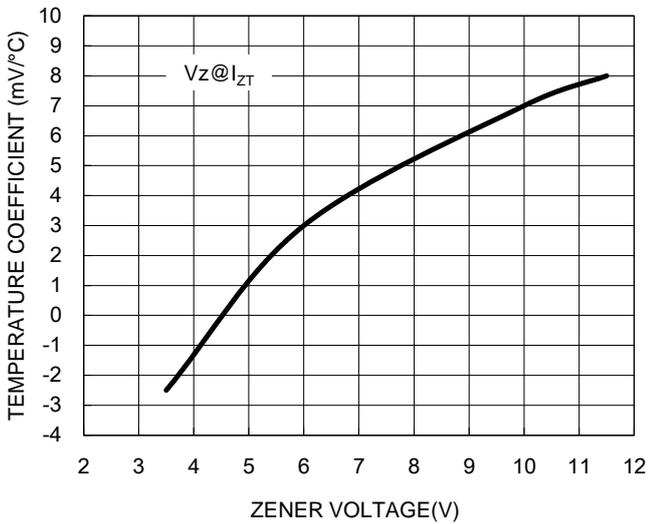
**Fig.1 Steady State Power Derating**



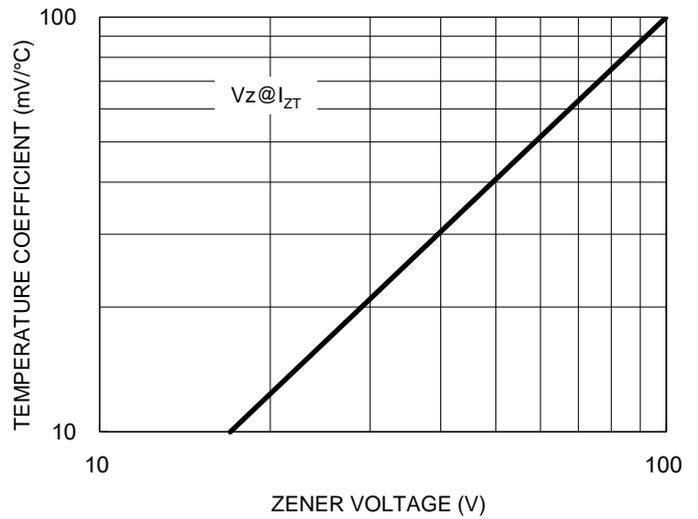
**Fig.2 Maximum Surge Power**



**Fig.3 Zener Voltage vs. Temperature Coefficient**



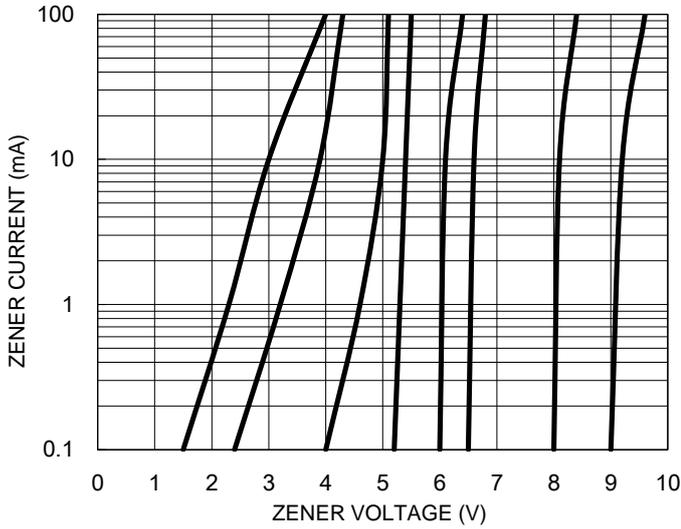
**Fig.4 Zener Voltage vs. Temperature Coefficient**



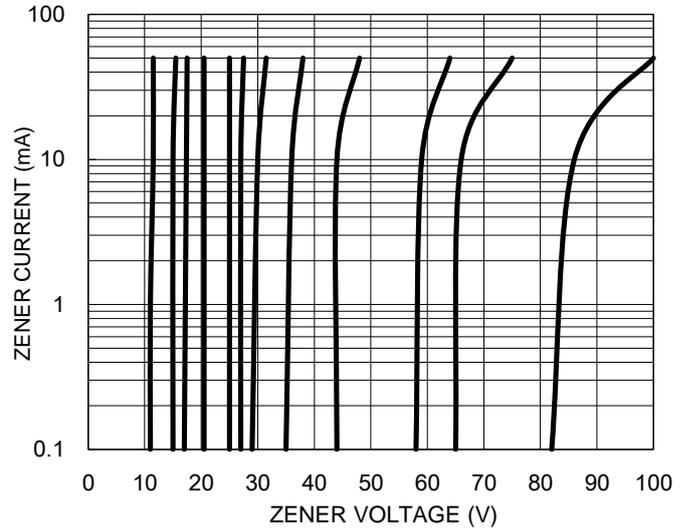
**CHARACTERISTICS CURVES**

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

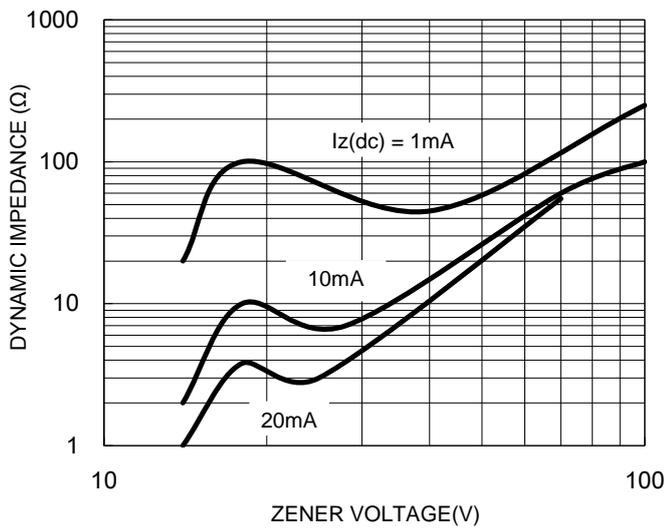
**Fig.5  $V_z = 3.3\text{V} - 10\text{V}$**



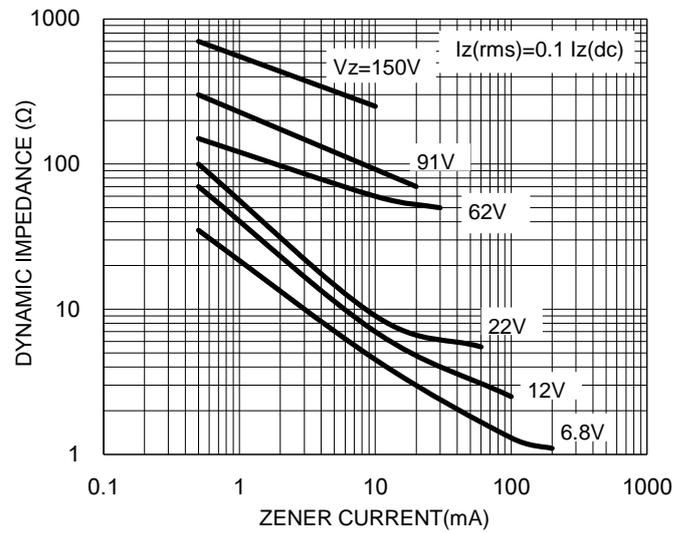
**Fig.6  $V_z = 12\text{V} - 82\text{V}$**



**Fig.7 Effect Of Zener Voltage**



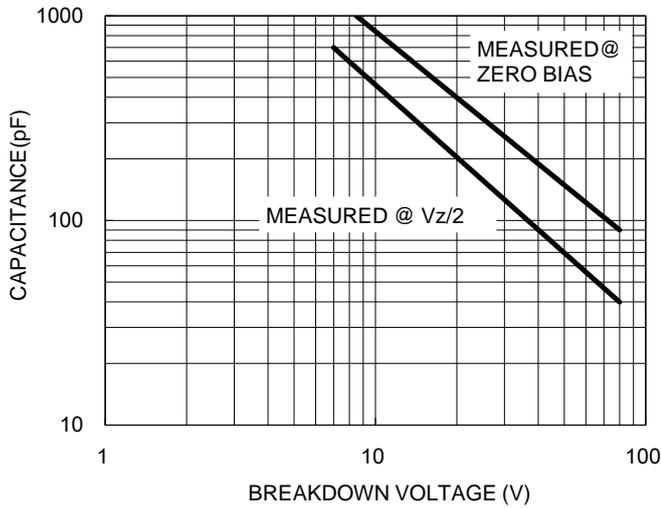
**Fig.8 Effect Of Zener Current**



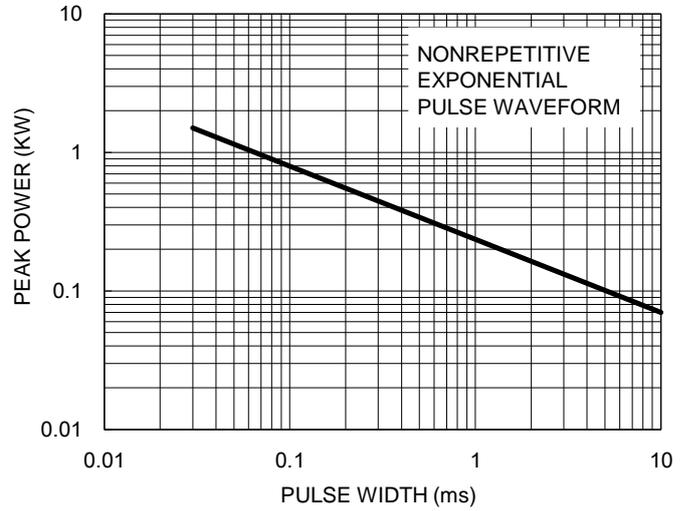
**CHARACTERISTICS CURVES**

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

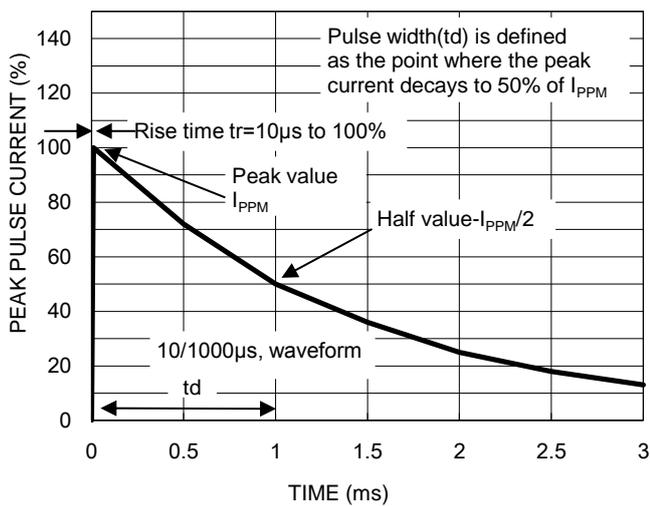
**Fig.9 Capacitance Curve**



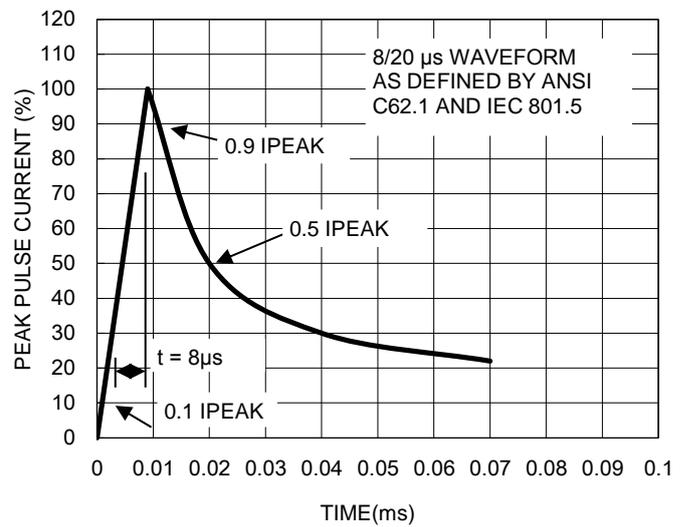
**Fig.10 Typical Pulse Rating Curve**



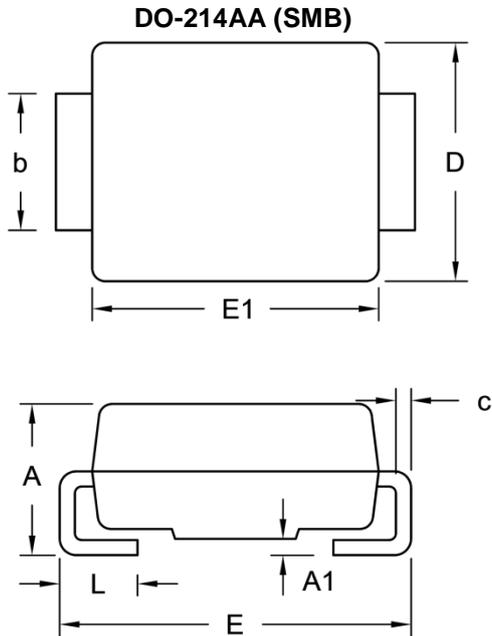
**Fig.11 Pulse Waveform**



**Fig.12 Pulse Waveform**

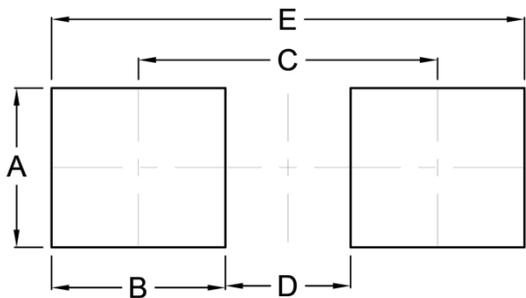


**PACKAGE OUTLINE DIMENSIONS**



DIM.	Unit (mm)		Unit (inch)	
	Min.	Max.	Min.	Max.
A	1.95	2.65	0.077	0.104
A1	0.05	0.20	0.002	0.008
b	1.95	2.20	0.077	0.087
c	0.15	0.31	0.006	0.012
D	3.30	3.95	0.130	0.156
E	5.10	5.60	0.201	0.220
E1	4.05	4.60	0.159	0.181
L	0.75	1.60	0.030	0.063

**SUGGESTED PAD LAYOUT**



Symbol	Unit (mm)	Unit (inch)
A	2.30	0.091
B	2.50	0.098
C	4.30	0.169
D	1.80	0.071
E	6.80	0.268

**MARKING DIAGRAM**



- P/N = Marking Code
- G = Green Compound
- YW = Date Code
- F = Factory Code

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