

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

FEATURES

- AEC-Q101 qualified
- 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

- Voltage regulating
- Reference voltage
- Protection circuit

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
$T_{J\ MAX}$	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°C	P_D	3	W
		40	mW/°C
DC power dissipation at $T_A=25^\circ\text{C}$ Derate above 25°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 _Z @I _{ZT}				I _{ZT}	Z _{ZT} @ I _{ZT}	Z _{ZK} @I _{ZK}		I _R @V _R		I _{ZM}	
		V				mA	Ω	Ω	mA	μA		V	mA(DC)
		Min	Nom (Note 2)	Max									
1SMB5926H	926B	10.45	11	11.55	34.1	5.5	550	0.25	1	8.4	136		
1SMB5927H	927B	11.40	12	12.60	31.2	6.5	550	0.25	1	9.1	125		
1SMB5928H	928B	12.35	13	13.65	28.8	7.0	550	0.25	1	9.9	115		
1SMB5929H	929B	14.25	15	15.75	25.0	9.0	600	0.25	1	11.4	100		
1SMB5930H	930B	15.20	16	16.80	23.4	10.0	600	0.25	1	12.2	94		
1SMB5931H	931B	17.10	18	18.90	20.8	12.0	650	0.25	1	13.7	83		
1SMB5932H	932B	19.00	20	21.00	18.7	14.0	650	0.25	1	15.2	75		
1SMB5933H	933B	20.90	22	23.10	17.0	17.5	650	0.25	1	16.7	68		
1SMB5934H	934B	22.80	24	25.20	15.6	19	700	0.25	1	18.2	63		
1SMB5935H	935B	25.65	27	28.35	13.9	23	700	0.25	1	20.6	56		
1SMB5936H	936B	28.50	30	31.50	12.5	26	750	0.25	1	22.8	50		
1SMB5937H	937B	31.35	33	34.65	11.4	33	800	0.25	1	25.1	45		
1SMB5938H	938B	34.20	36	37.80	10.4	38	850	0.25	1	27.4	42		
1SMB5939H	939B	37.05	39	40.95	9.6	45	900	0.25	1	29.7	38		
1SMB5940H	940B	40.85	43	45.15	8.7	53	950	0.25	1	32.7	35		
1SMB5941H	941B	44.65	47	49.35	8.0	67	1000	0.25	1	35.8	32		
1SMB5942H	942B	48.45	51	53.55	7.3	70	1100	0.25	1	38.8	29		
1SMB5943H	943B	53.20	56	58.80	6.7	86	1300	0.25	1	42.6	27		
1SMB5944H	944B	58.90	62	65.10	6.0	100	1500	0.25	1	47.1	24		
1SMB5945H	945B	64.60	68	71.40	5.5	120	1700	0.25	1	51.7	22		
1SMB5946H	946B	71.25	75	78.75	5.0	140	2000	0.25	1	56.0	20		
1SMB5947H	947B	77.90	82	86.10	4.6	160	2500	0.25	1	62.2	18		
1SMB5948H	948B	86.45	91	95.55	4.1	200	3000	0.25	1	69.2	16		
1SMB5949H	949B	95.00	100	105.00	3.7	250	3100	0.25	1	76.0	15		
1SMB5950H	950B	104.50	110	115.50	3.4	300	4000	0.25	1	83.6	13		
1SMB5951H	951B	114.00	120	126.00	3.1	360	4500	0.25	1	91.2	12		
1SMB5952H	952B	123.50	130	136.50	2.9	450	5000	0.25	1	98.8	11		
1SMB5953H	953B	142.50	150	157.50	2.5	600	6000	0.25	1	114.0	10		
1SMB5954H	954B	152.00	160	168.00	2.3	700	6500	0.25	1	121.6	9		
1SMB5955H	955B	171.00	180	189.00	2.1	900	7000	0.25	1	136.8	8		
1SMB5956H	956B	190.00	200	210.00	1.9	1200	8000	0.25	1	152.0	7		

Notes:

- Tolerance and type number designation the type numbers listed indicate a tolerance of 5%
- Zener voltage (V_Z) measurement: Nominal Zener voltage is measured with the device junction in thermal equilibrium with ambient temperature 25°C
- Zener impedance (Z_Z) derivation : Z_{ZT} and Z_{ZK} are measured 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 = 60 Hz

ORDERING INFORMATION

ORDERING CODE⁽¹⁾	PACKAGE	PACKING
1SMB59xH	DO-214AA (SMB)	3,000 / Tape & Reel

Notes:

1. "x" defines voltage from 11V(1SMB5926H) to 200V(1SMB5956H)

CHARACTERISTICS CURVES

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

Fig.1 Steady State Power Derating

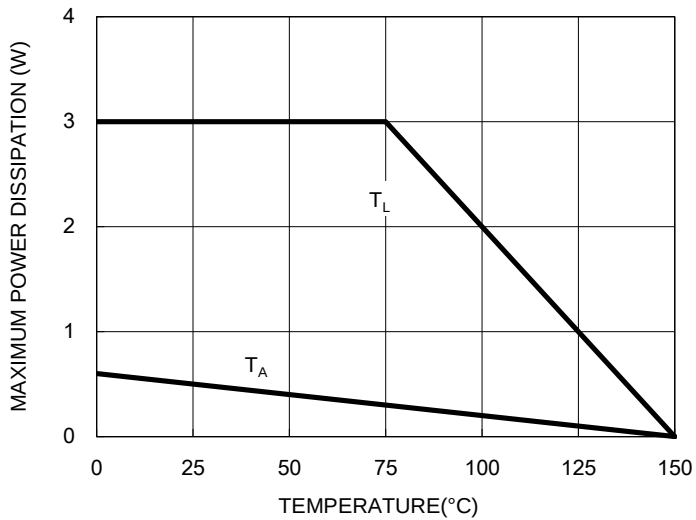


Fig.2 Maximum Surge Power

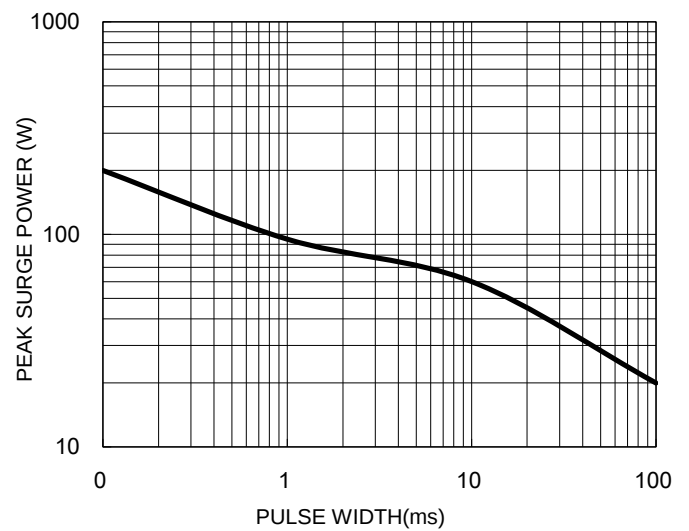


Fig.3 Zener Voltage vs. Temperature Coefficient

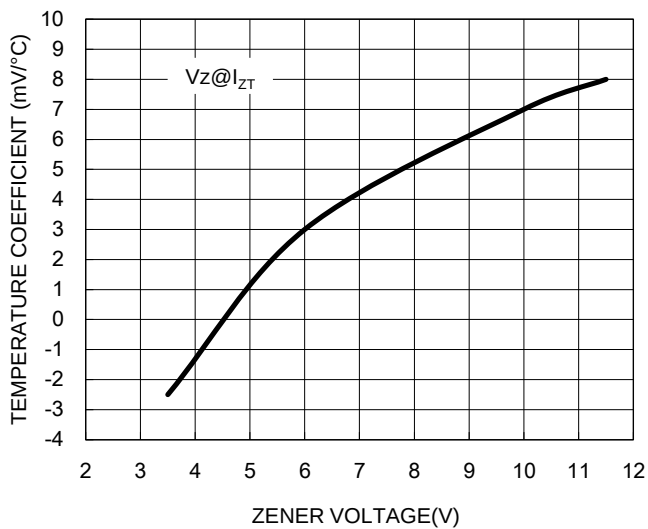
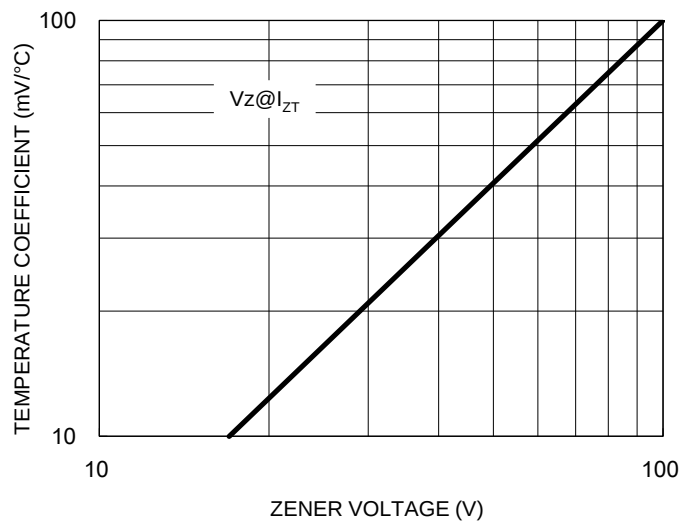


Fig.4 Zener Voltage vs. Temperature Coefficient



CHARACTERISTICS CURVES

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

Fig.5 $V_z = 3.3$ thru 10 V

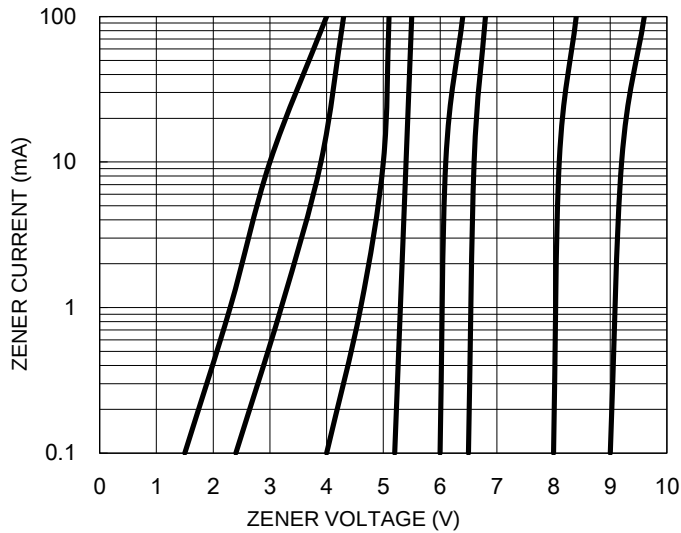


Fig.6 $V_z = 12$ thru 82 V

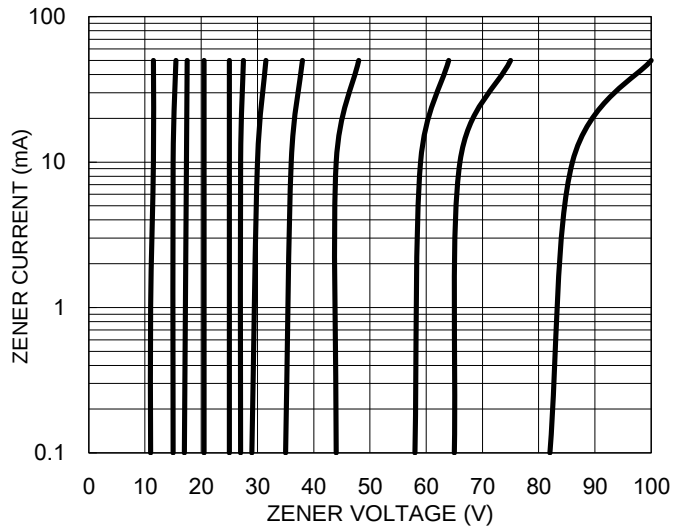


Fig.7 Effect Of Zener Voltage

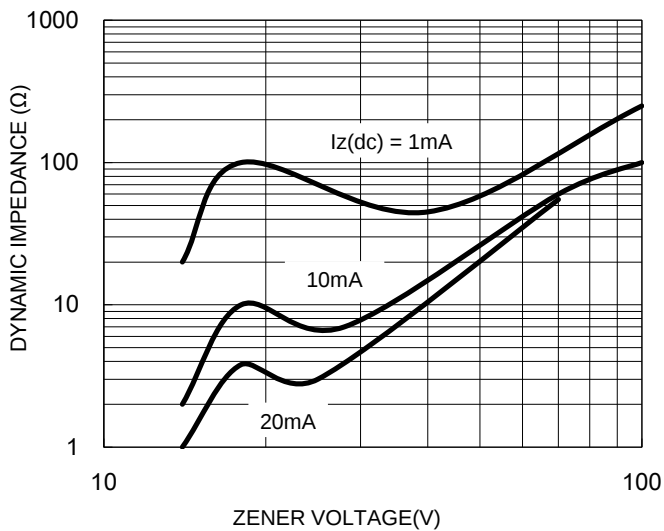
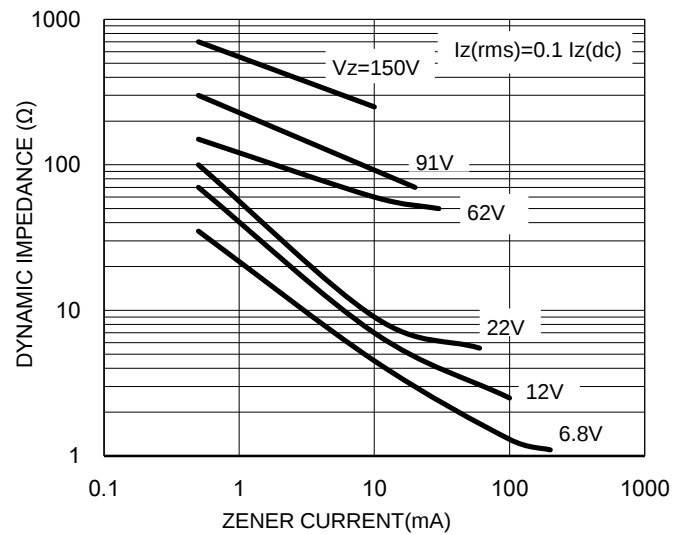


Fig.8 Effect Of Zener Current



CHARACTERISTICS CURVES

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

Fig.9 Capacitance Curve

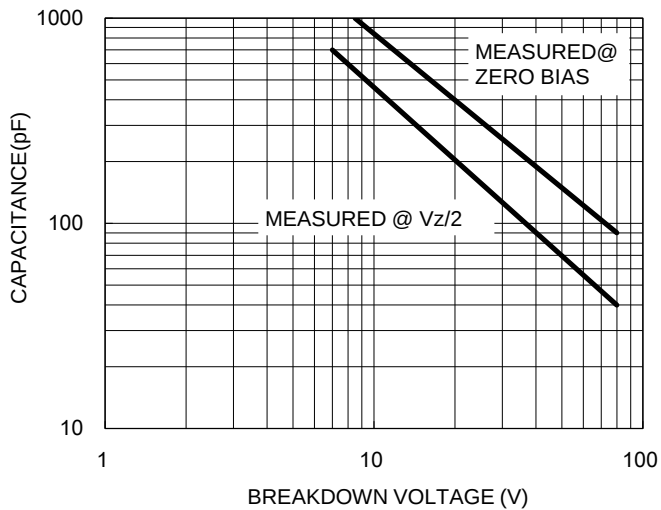


Fig.10 Typical Pulse Rating Curve

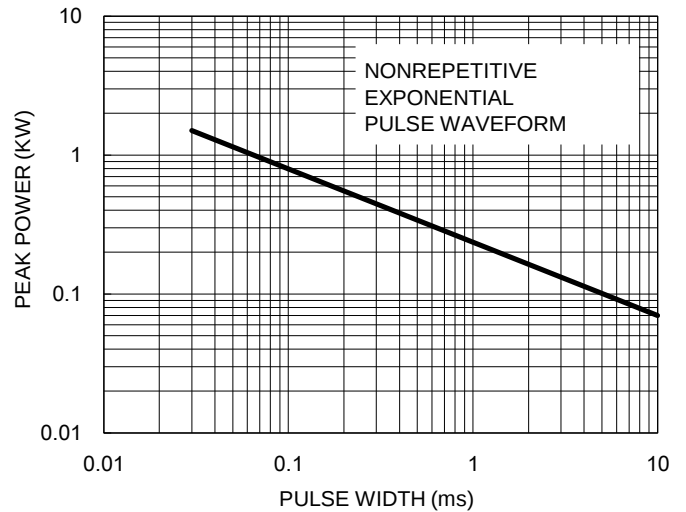


Fig.11 Pulse Waveform

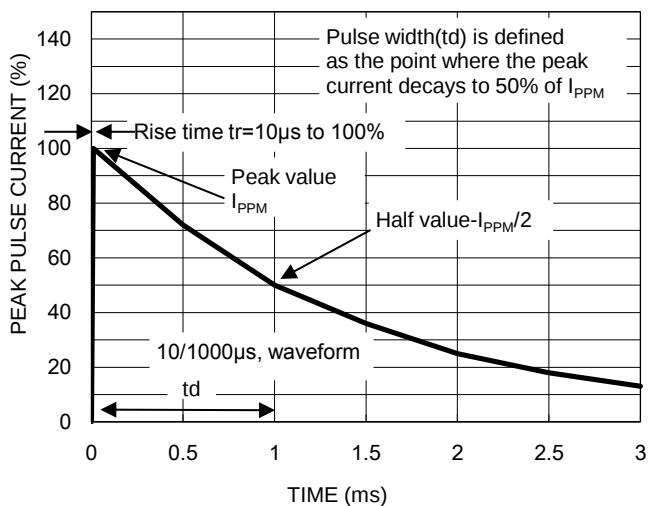
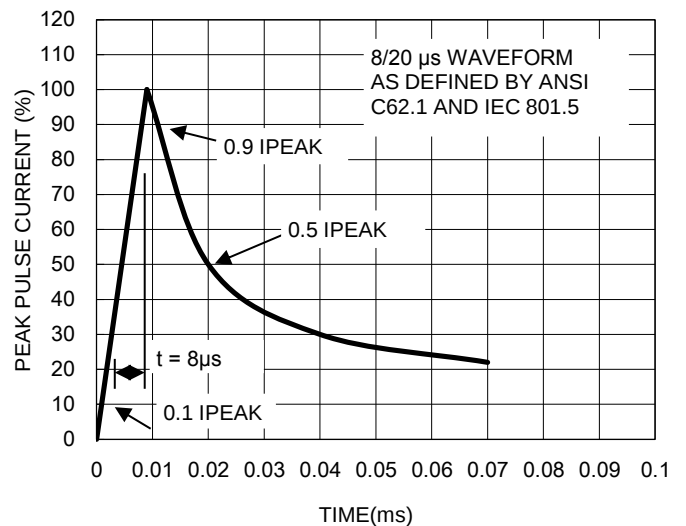
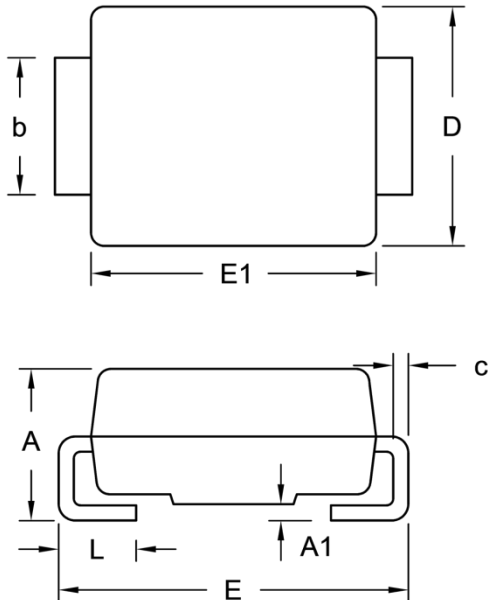


Fig.12 Pulse Waveform



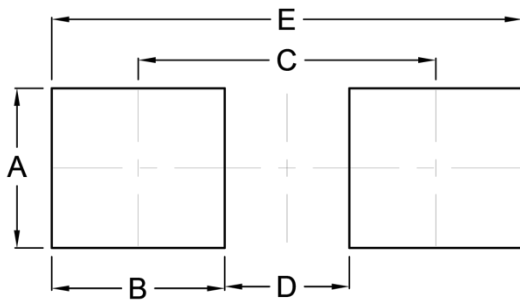
PACKAGE OUTLINE DIMENSIONS

DO-214AA (SMB)



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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<u>1SMB5926H</u>	<u>1SMB5927H</u>	<u>1SMB5928H</u>	<u>1SMB5929H</u>	<u>1SMB5930H</u>	<u>1SMB5931H</u>	<u>1SMB5932H</u>	<u>1SMB5933H</u>
<u>1SMB5934H</u>	<u>1SMB5935H</u>	<u>1SMB5936H</u>	<u>1SMB5937H</u>	<u>1SMB5938H</u>	<u>1SMB5939H</u>	<u>1SMB5940H</u>	<u>1SMB5941H</u>
<u>1SMB5942H</u>	<u>1SMB5943H</u>	<u>1SMB5944H</u>	<u>1SMB5945H</u>	<u>1SMB5946H</u>	<u>1SMB5947H</u>	<u>1SMB5948H</u>	<u>1SMB5949H</u>
<u>1SMB5950H</u>	<u>1SMB5951H</u>	<u>1SMB5952H</u>	<u>1SMB5953H</u>	<u>1SMB5954H</u>	<u>1SMB5955H</u>	<u>1SMB5956H</u>	