



# 1SMB5913B THRU 1SMB5956B

## Surface Mount Power Voltage-Regulating Diodes

### Surface Mount Zener Voltage Regulators

#### FEATURES

- Total power dissipation: Max. 2 W.
- Wide zener reverse voltage range 3.3V to 200V.
- Small plastic package suitable for surface mounted design.

#### MECHANICAL DATA

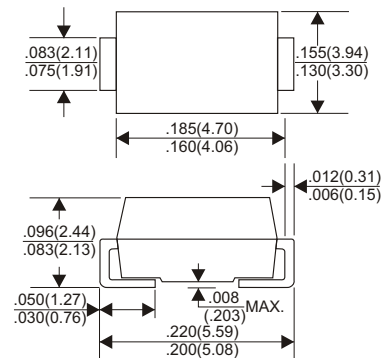
- Case: SMB
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.095g / 0.0034oz

### VOLTAGE RANGE

3.3 to 200 Volts

2000mW

#### DO-214AA(SMB)



Dimensions in inches and (millimeters)

## MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Rating 25°C ambient temperature unless otherwise specified.  
Single phase half wave, 60Hz, resistive or inductive load.  
For capacitive load, derate current by 20%.

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

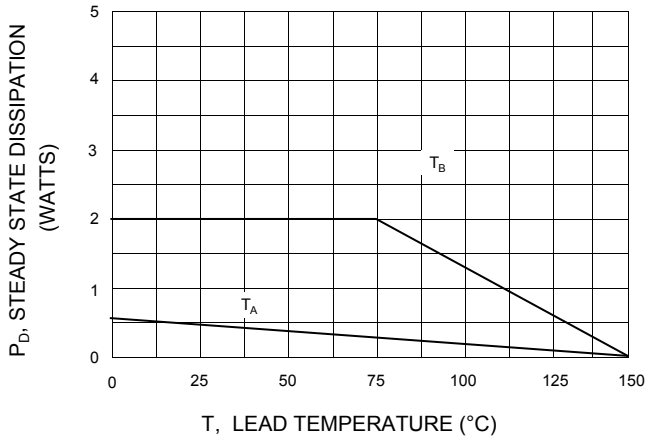
PARAMETER	SYMBOL	VALUE	UNIT
Maximum steady state power dissipation at $T_L = 75^\circ\text{C}$ (fig. 1) <sup>(1)</sup>	$P_{tot}$	2000	mW
Maximum steady state power dissipation at $T_A = 25^\circ\text{C}$ (fig. 1) <sup>(2)</sup>	$P_{tot}$	550	mW
Maximum instantaneous forward voltage at 200 mA for all types <sup>(3)</sup>	$V_F$	1.2	V
Operating junction and storage temperature range	$T_J, T_{STG}$	-65 to +150	°C
Typical thermal resistance, junction to lead	$R_{\theta JL}$ <sup>(1)</sup>	226	°C/W
Typical thermal resistance, junction to ambient	$R_{\theta JA}$ <sup>(2)</sup>	25	°C/W

#### Notes

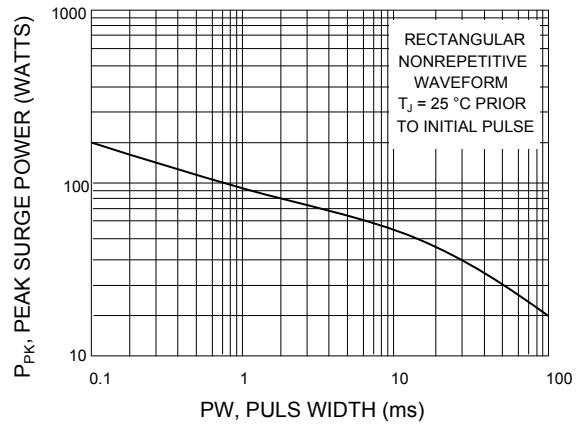
- <sup>(1)</sup> Mounted on PCB with 5.0 mm x 5.0 mm copper pads attached to each terminal
- <sup>(2)</sup> Mounted on minimum recommended pad layout
- <sup>(3)</sup> Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle

# 1SMB5913B THRU 1SMB5956B

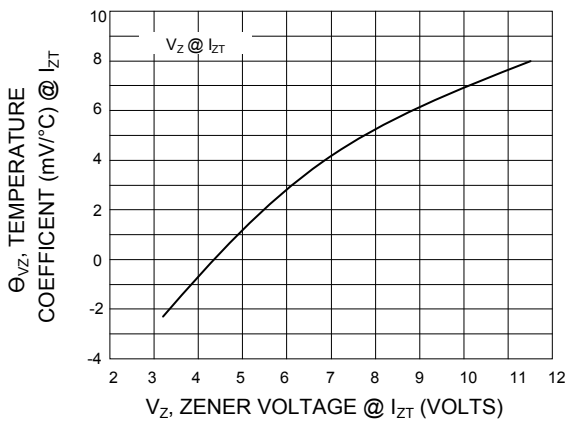
**FIG. 1 - POWER TEMPERATURE DERATING CURVE**



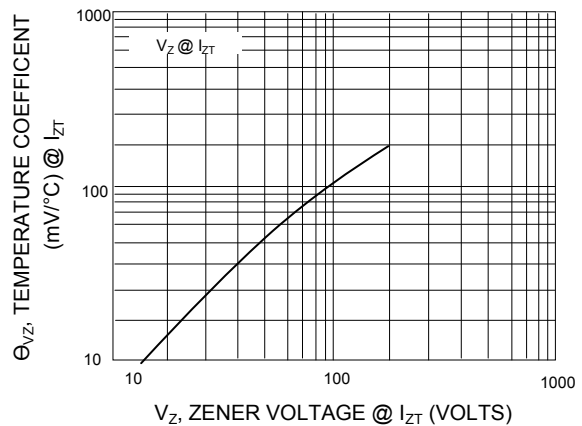
**FIG. 3 - MAXIMUM SURGE POWER**



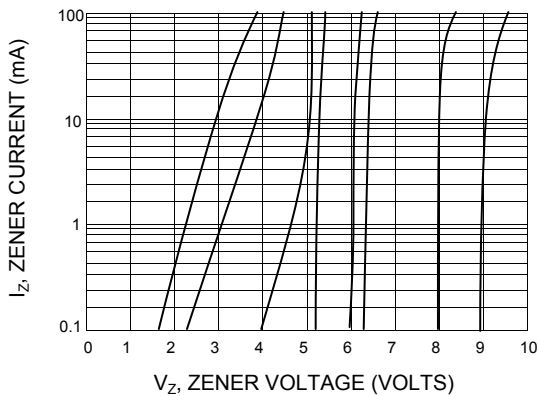
**FIG. 5 - TEMPERATURE COEFFICIENT RANGES UNITS TO 12 VOLTS**



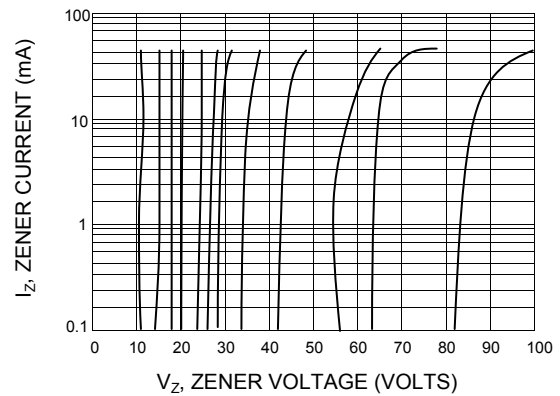
**FIG. 6 - TEMPERATURE COEFFICIENT RANGES UNITS 10 TO 400 VOLTS**



**FIG. 7 - ZENER VOLTAGE VS. ZENER CURRENT V<sub>Z</sub> = 3.3 thru 10 VOLTS**



**FIG. 8 - ZENER VOLTAGE VS. ZENER CURRENT V<sub>Z</sub> = 12 thru 82 VOLTS**

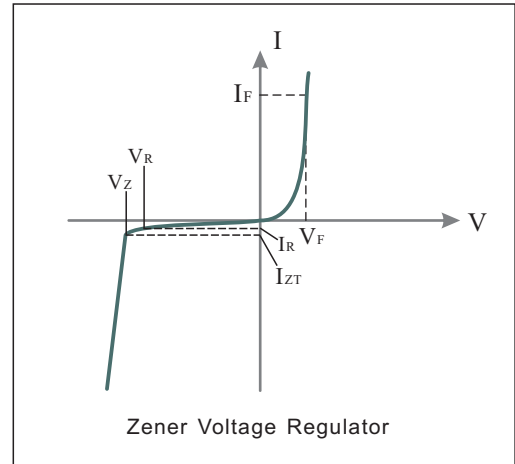


# 1SMB5913B THRU 1SMB5956B

## ELECTRICAL CHARACTERISTICS

( $T_L = 30^\circ\text{C}$  unless otherwise noted,  
 $V_F = 1.5\text{ V Max. @ } I_F = 200\text{ mA(DC)}$  for all types)

Symbol	Parameter
$V_Z$	Reverse Zener Voltage @ $I_{ZT}$
$I_{ZT}$	Reverse Current
$Z_{ZT}$	Maximum Zener Impedance @ $I_{ZT}$
$I_{ZK}$	Reverse Current
$Z_{ZK}$	Maximum Zener Impedance @ $I_{ZK}$
$I_R$	Reverse Leakage Current @ $V_R$
$V_R$	Reverse Voltage
$I_F$	Forward Current
$V_F$	Forward Voltage @ $I_F$
$I_{ZM}$	Maximum DC Zener Current



### Notes On Page 3:

1. Tolerance and type number designation the type numbers listed indicate a tolerance of 5%
2. Zener voltage ( $V_Z$ ) measurement  
 Nominal Zener voltage is measured with the device junction in thermal equilibrium with ambient temperature  $25^\circ\text{C}$
3. 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  $I_Z(\text{AC}) = 0.1 I_Z(\text{DC})$  with the AC frequency = 60 Hz

Characteristics at Ta = 25°C (Devices listed in bold, italic are ON Semiconductor Preferred devices.)  
(TL = 30°C unless otherwise noted, VF = 1.5 V Max. @ IF = 200 mA(DC) for all types)

Type	Marking	Nominal Zener Voltage <sup>(3)</sup>				Zener Impedance <sup>(4)</sup>			Leakage Current		Maximum DC Zener Current
		V <sub>z</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>			
		Min (V)	Nom (V) <sup>(2)</sup>	Max (V)	(mA)	(Ω)	(Ω)	(mA)	(μA)	(V)	I <sub>zK</sub> (mA)(DC)
1SMB5913B	913B	3.13	3.3	3.47	113.6	10	500	1	100	1	454
1SMB5914B	914B	3.42	3.6	3.78	104.2	9	500	1	75	1	416
1SMB5915B	915B	3.70	3.9	4.10	96.1	7.5	500	1	25	1	384
1SMB5916B	916B	4.08	4.3	4.52	87.2	6	500	1	5	1	348
1SMB5917B	917B	4.46	4.7	4.94	79.8	5	500	1	5	1.5	319
1SMB5918B	918B	4.84	5.1	5.36	73.5	4	350	1	5	2	294
1SMB5919B	919B	5.32	5.6	5.88	66.9	2	250	1	5	3	267
1SMB5920B	920B	5.89	6.2	6.51	60.5	2	200	1	5	4	241
1SMB5921B	921B	6.46	6.8	7.14	55.1	2.5	200	1	5	5.2	220
1SMB5922B	922B	7.12	7.5	7.88	50	3	400	0.5	5	6	200
1SMB5923B	923B	7.79	8.2	8.61	45.7	3.5	400	0.5	5	6.5	182
1SMB5924B	924B	8.64	9.1	9.56	41.2	4	500	0.5	5	7	164
1SMB5925B	925B	9.5	10	10.5	37.5	4.5	500	0.25	5	8	150
1SMB5926B	926B	10.45	11	11.55	34.1	5.5	550	0.25	1	8.4	136
1SMB5927B	927B	11.4	12	12.6	31.2	6.5	550	0.25	1	9.1	125
1SMB5928B	928B	12.35	13	13.65	28.8	7	550	0.25	1	9.9	115
1SMB5929B	929B	14.25	15	15.75	25	9	600	0.25	1	11.4	100
1SMB5930B	930B	15.2	16	16.8	23.4	10	600	0.25	1	12.2	93
1SMB5931B	931B	17.1	18	18.9	20.8	12	650	0.25	1	13.7	83
1SMB5932B	932B	19	20	21	18.7	14	650	0.25	1	15.2	75
1SMB5933B	933B	20.9	22	23.1	17	17.5	650	0.25	1	16.7	68
1SMB5934B	934B	22.8	24	25.2	15.6	19	700	0.25	1	18.2	62
1SMB5935B	935B	25.65	27	28.35	13.9	23	700	0.25	1	20.6	55
1SMB5936B	936B	28.5	30	31.5	12.5	28	750	0.25	1	22.8	50
1SMB5937B	937B	31.35	33	34.65	11.4	33	800	0.25	1	25.1	45
1SMB5938B	938B	34.2	36	37.8	10.4	38	850	0.25	1	27.4	41
1SMB5939B	939B	37.05	39	40.95	9.6	45	900	0.25	1	29.7	38
1SMB5940B	940B	40.85	43	45.15	8.7	53	950	0.25	1	32.7	34
1SMB5941B	941B	44.65	47	49.35	8	67	1000	0.25	1	35.8	31
1SMB5942B	942B	48.45	51	53.55	7.3	70	1100	0.25	1	38.8	29
1SMB5943B	943B	53.2	56	58.8	6.7	86	1300	0.25	1	42.6	26
1SMB5944B	944B	58.9	62	65.1	6	100	1500	0.25	1	47.1	24
1SMB5945B	945B	64.6	68	71.4	5.5	120	1700	0.25	1	51.7	22
1SMB5946B	946B	71.25	75	78.75	5	140	2000	0.25	1	56	20
1SMB5947B	947B	77.9	82	86.1	4.6	160	2500	0.25	1	62.2	18
1SMB5948B	948B	86.45	91	95.55	4.1	200	3000	0.25	1	69.2	16
1SMB5949B	949B	95	100	105	3.7	250	3100	0.25	1	76	15
1SMB5950B	950B	104.5	110	115.5	3.4	300	4000	0.25	1	83.6	13
1SMB5951B	951B	114	120	126	3.1	380	4500	0.25	1	91.2	12
1SMB5952B	952B	123.5	130	136.5	2.9	450	5000	0.25	1	98.8	11
1SMB5953B	953B	142.5	150	157.5	2.5	600	6000	0.25	1	114	10
1SMB5954B	954B	152	160	168	2.3	700	6500	0.25	1	121.6	9
1SMB5955B	955B	171	180	189	2.1	900	7000	0.25	1	136.8	8
1SMB5956B	956B	190	200	210	1.9	1200	8000	0.25	1	152	7