

# 3SMB5913B-3SMB5957B

Silicon Zener Diodes



**V<sub>Z</sub> : 3.3 - 240 Volts**  
**P<sub>D</sub> : 3.0 Watts**

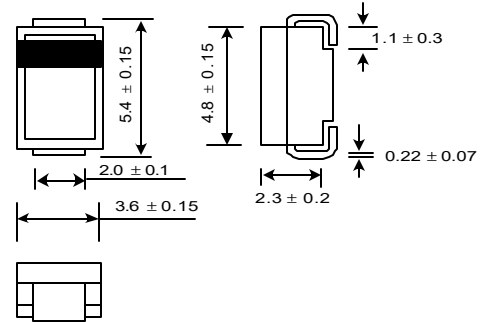
**SMB (DO-214AA)**

## Features

- \* Complete Voltage Range 3.3 to 240 Volts
- \* High peak reverse power dissipation
- \* High reliability
- \* Low leakage current

## Mechanical Data

- \* Case : SMB (DO-214AA) Molded plastic
- \* Epoxy : UL94V-O rate flame retardant
- \* Lead : Lead formed for Surface mount
- \* Polarity : Color band denotes cathode end
- \* Mounting position : Any
- \* Weight : 0.093 gram



Dimensions in millimeter

## MAXIMUM RATINGS

Rating at 25 °C ambient temperature unless otherwise specified

Rating	Symbol	Value	Unit
DC Power Dissipation at T <sub>L</sub> = 75 °C (Note1)	P <sub>D</sub>	3.0	Watts
Maximum Forward Voltage at I <sub>F</sub> = 200 mA	V <sub>F</sub>	1.5	Volts
Junction Temperature Range	T <sub>J</sub>	- 55 to + 150	°C
Storage Temperature Range	T <sub>s</sub>	- 55 to + 150	°C

### Note :

(1) T<sub>L</sub> = Lead temperature at 5.0 mm<sup>2</sup> ( 0.013 mm thick ) copper land areas.

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## ELECTRICAL CHARACTERISTICS

Rating at = 25 °C ambient temperature unless otherwise specified

TYPE	Nominal Zener Voltage		Maximum Zener Impedance			Maximum Reverse 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>ZK</sub>	I <sub>R</sub> @ V <sub>R</sub>		I <sub>ZM</sub>
	(V)	(mA)	(Ω)	(Ω)	(mA)	(μA)	(V)	(mA)
3SMB5913B	3.3	113.6	10	500	1.0	100	1.0	454
3SMB5914B	3.6	104.2	9.0	500	1.0	75	1.0	416
3SMB5915B	3.9	96.1	7.5	500	1.0	25	1.0	384
3SMB5916B	4.3	87.2	6.0	500	1.0	5.0	1.0	348
3SMB5917B	4.7	79.8	5.0	500	1.0	5.0	1.5	319
3SMB5918B	5.1	73.5	4.0	500	1.0	5.0	2.0	294
3SMB5919B	5.6	66.9	2.0	250	1.0	5.0	3.0	267
3SMB5920B	6.2	60.5	2.0	200	1.0	5.0	4.0	241
3SMB5921B	6.8	55.1	2.5	200	1.0	5.0	5.2	220
3SMB5922B	7.5	50.0	3.0	400	0.5	5.0	6.0	200
3SMB5923B	8.2	45.7	3.5	400	0.5	5.0	6.5	182
3SMB5924B	9.1	41.2	4.0	500	0.5	5.0	7.0	164
3SMB5925B	10	37.5	4.5	500	0.25	5.0	8.0	150
3SMB5926B	11	34.1	5.5	550	0.25	1.0	8.4	136
3SMB5927B	12	31.2	6.5	550	0.25	1.0	9.1	125
3SMB5928B	13	28.8	7.0	550	0.25	1.0	9.9	115
3SMB5929B	15	25.0	9.0	600	0.25	1.0	11.4	100
3SMB5930B	16	23.4	10	600	0.25	1.0	12.2	93
3SMB5931B	18	20.8	12	650	0.25	1.0	13.7	83
3SMB5932B	20	18.7	14	650	0.25	1.0	15.2	75
3SMB5933B	22	17.0	17.5	650	0.25	1.0	16.7	68
3SMB5934B	24	15.6	19	700	0.25	1.0	18.2	62
3SMB5935B	27	13.9	23	700	0.25	1.0	20.6	55
3SMB5936B	30	12.5	28	750	0.25	1.0	22.8	50
3SMB5937B	33	11.4	33	800	0.25	1.0	25.1	45
3SMB5938B	36	10.4	38	850	0.25	1.0	27.4	41
3SMB5939B	39	9.6	45	900	0.25	1.0	29.7	38
3SMB5940B	43	8.7	53	950	0.25	1.0	32.7	34
3SMB5941B	47	8.0	67	1000	0.25	1.0	35.8	31
3SMB5942B	51	7.3	70	1100	0.25	1.0	38.8	29
3SMB5943B	56	6.7	86	1300	0.25	1.0	42.6	26
3SMB5944B	62	6.0	100	1500	0.25	1.0	47.1	24
3SMB5945B	68	5.5	120	1700	0.25	1.0	51.7	22
3SMB5946B	75	5.0	140	2000	0.25	1.0	56.0	20
3SMB5947B	82	4.6	160	2500	0.25	1.0	62.2	18
3SMB5948B	91	4.1	200	3000	0.25	1.0	69.2	16
3SMB5949B	100	3.7	250	3100	0.25	1.0	76.0	15
3SMB5950B	110	3.4	300	4000	0.25	1.0	83.6	13
3SMB5951B	120	3.1	380	4500	0.25	1.0	91.2	12
3SMB5952B	130	2.9	450	5000	0.25	1.0	98.8	11
3SMB5953B	150	2.5	600	6000	0.25	1.0	114.0	10
3SMB5954B	160	2.3	700	6500	0.25	1.0	121.6	9.0
3SMB5955B	180	2.1	900	7000	0.25	1.0	136.8	8.0
3SMB5956B	200	1.9	1200	8000	0.25	1.0	152.0	7.0
3SMB5957B	240	1.5	1600	9000	0.25	1.0	182.4	6.0

Note :

( 1 ) Suffix " A " indicates ± 10% tolerance, suffix " B " indicates ± 5.0% tolerance.

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## RATING AND CHARACTERISTICS CURVES

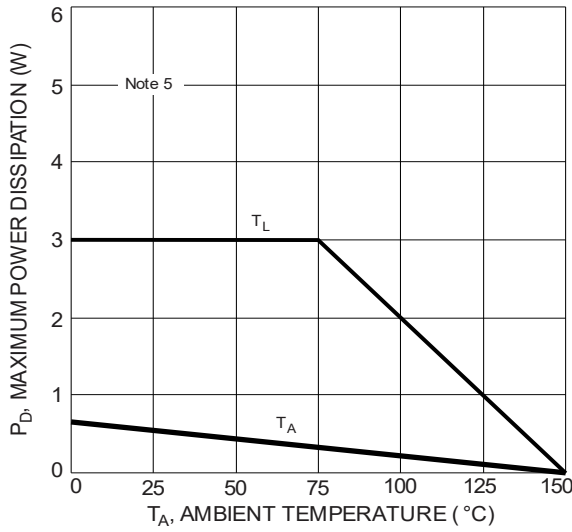


Figure 1 Power Dissipation vs. Ambient Temperature

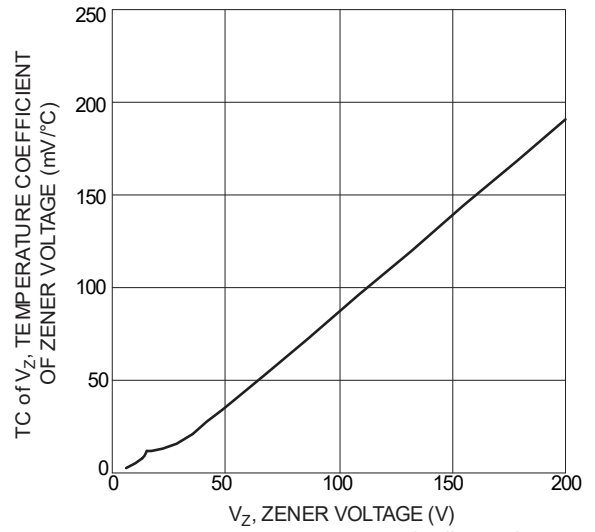


Figure 2 Typical Temperature Coefficient of Zener Voltage vs. Zener Voltage

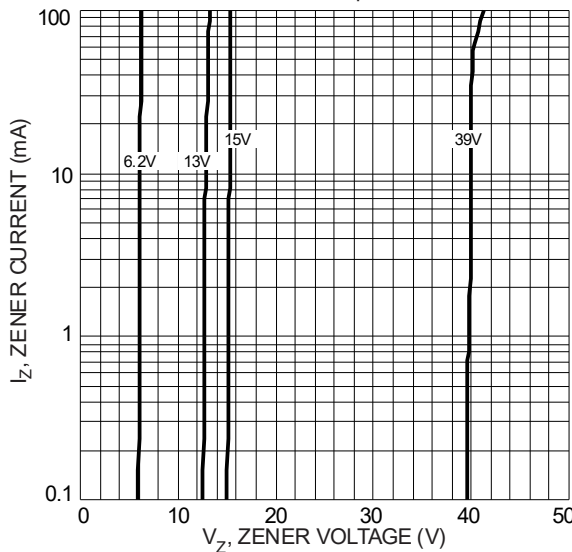


Figure 3 Typical Zener Breakdown Characteristics

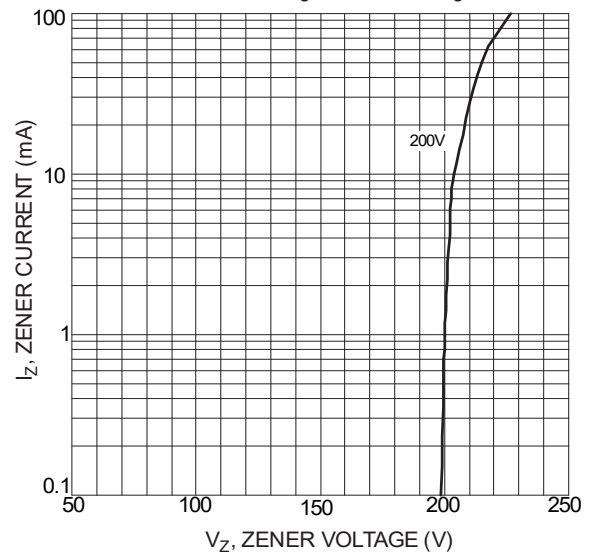


Figure 4 Typical Zener Breakdown Characteristics

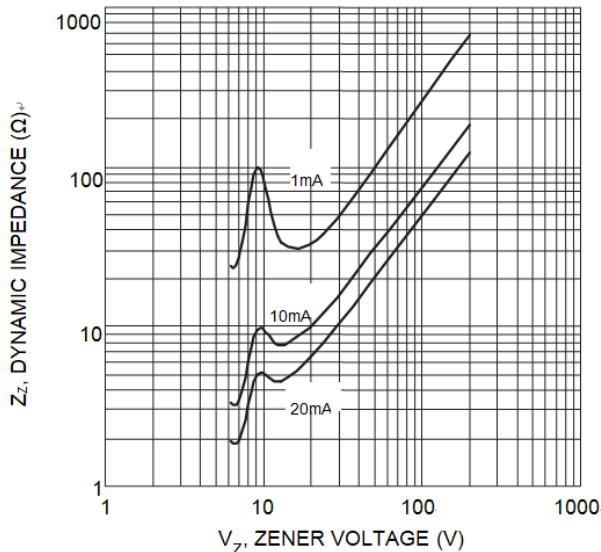


Figure 5 Effect of Zener Voltage

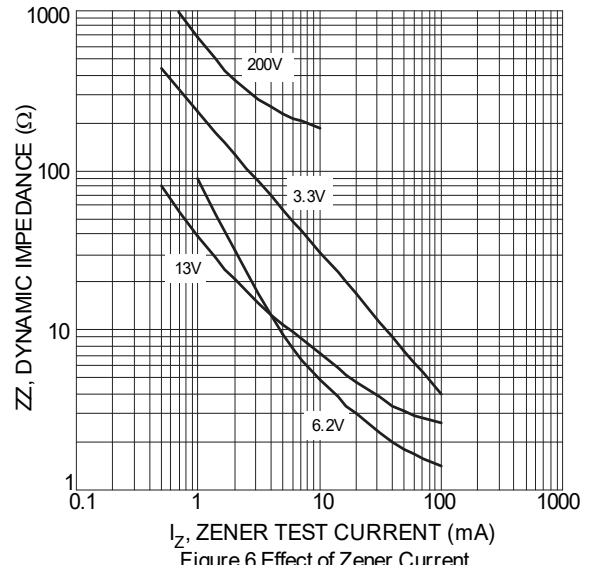


Figure 6 Effect of Zener Current

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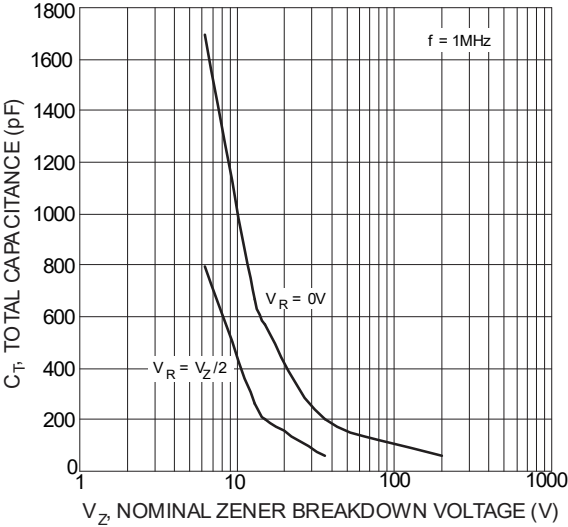


Figure 7 Typical Total Capacitance vs. Nominal Zener Breakdown Voltage

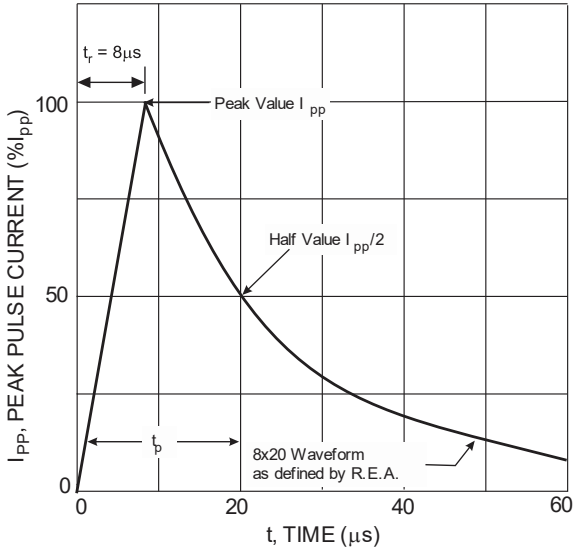


Figure 8 Pulse Waveform

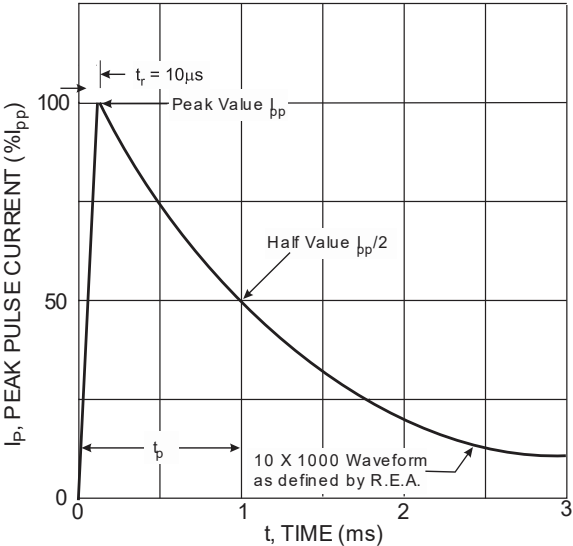


Figure 9 Pulse Waveform

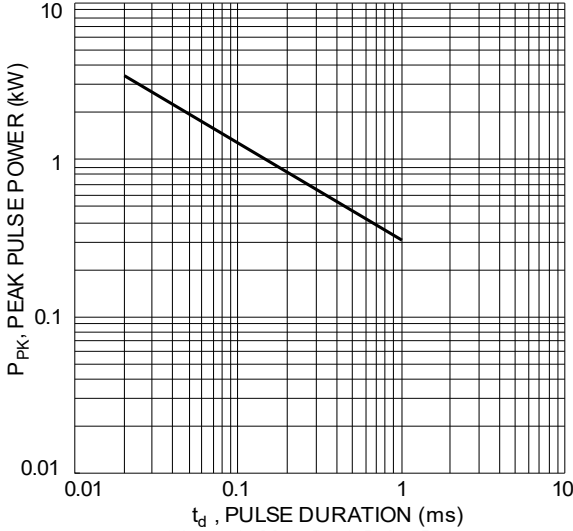


Figure 10 Max. Peak Pulse Power vs. Pulse Duration

PACKAGE	SPQ/PCS	CARTON SPQ/PCS	CARTON SIZE/CM	CARTON GW/KG	CARTON NW/KG
SMB	3000/REEL	48000	36X35.8X36.5	12.00	11.00

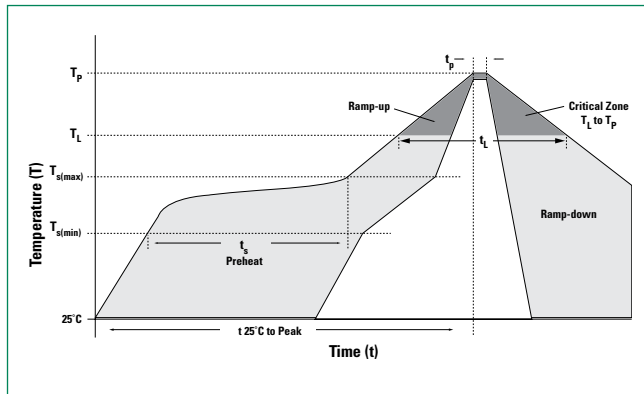
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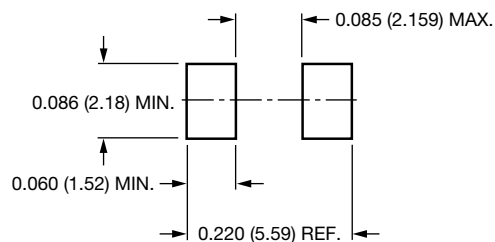


## SOLDERING PARAMETERS

<b>Reflow Condition</b>		Lead-free assembly
<b>Pre Heat</b>	- Temperature Min ( $T_{s(min)}$ )	150°C
	- Temperature Max ( $T_{s(max)}$ )	200°C
	- Time (min to max) ( $t_s$ )	60 – 180 secs
<b>Average ramp up rate (Liquidus Temp (<math>T_A</math>) to peak</b>		3°C/second max
<b><math>T_{s(max)}</math> to <math>T_A</math> - Ramp-up Rate</b>		3°C/second max
<b>Reflow</b>	- Temperature ( $T_A$ ) (Liquidus)	217°C
	- Time (min to max) ( $t_s$ )	60 – 150 seconds
<b>Peak Temperature (<math>T_p</math>)</b>		260 <sup>+0/-5</sup> °C
<b>Time within 5°C of actual peak Temperature (<math>t_p</math>)</b>		20 – 40 seconds
<b>Ramp-down Rate</b>		6°C/second max
<b>Time 25°C to peak Temperature (<math>T_p</math>)</b>		8 minutes Max.
<b>Do not exceed</b>		260°C



## MOUNTING PAD LAYOUT



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