

3SMB5913B-3SMB5957B

Silicon Zener Diodes



V_Z : 3.3 - 240 Volts
P_D : 3.0 Watts

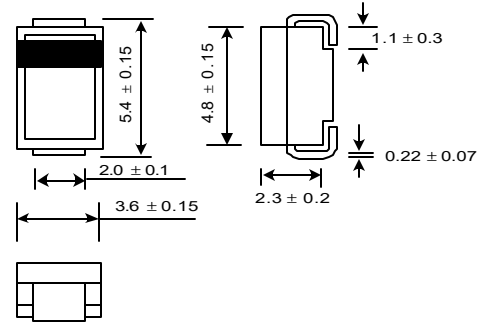
SMB (DO-214AA)

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 _L = 75 °C (Note1) | P _D | 3.0 | Watts |
| Maximum Forward Voltage at I _F = 200 mA | V _F | 1.5 | Volts |
| Junction Temperature Range | T _J | - 55 to + 150 | °C |
| Storage Temperature Range | T _s | - 55 to + 150 | °C |

Note :

(1) T_L = Lead temperature at 5.0 mm² (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 _Z @ I _{ZT} | I _{ZT} | Z _{ZT} @ I _{ZT} | Z _{ZK} @ I _{ZK} | I _{ZK} | I _R @ V _R | | I _{ZM} |
| | (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

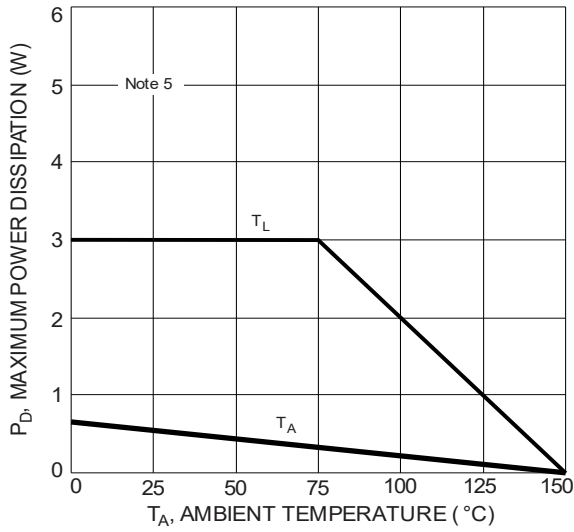


Figure 1 Power Dissipation vs. Ambient Temperature

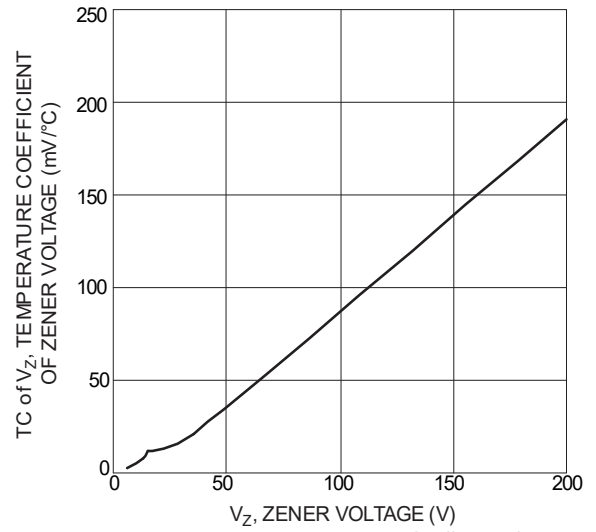


Figure 2 Typical Temperature Coefficient of Zener Voltage vs. Zener Voltage

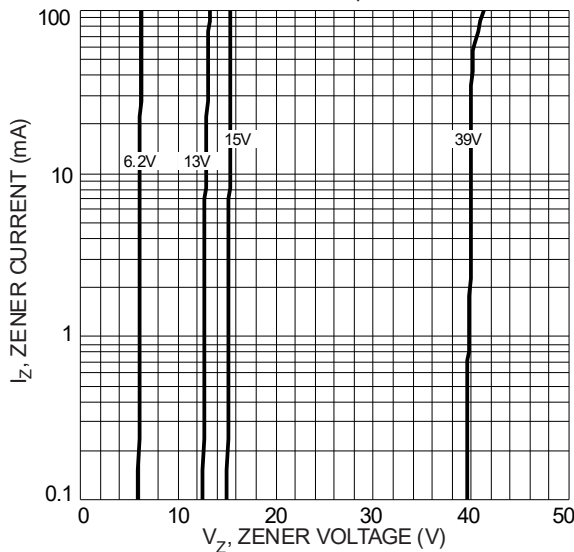


Figure 3 Typical Zener Breakdown Characteristics

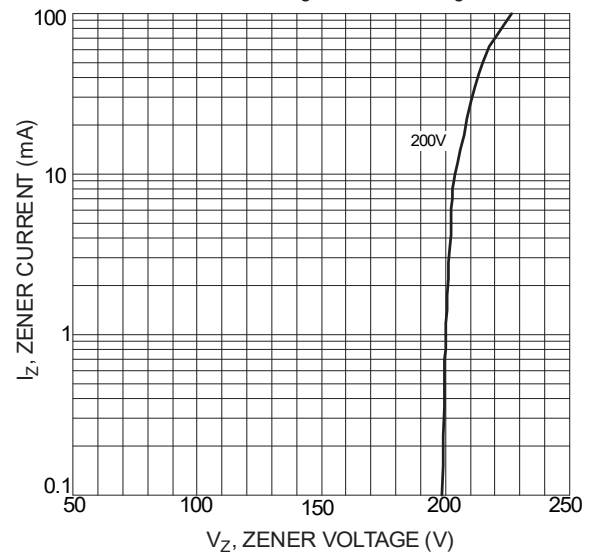


Figure 4 Typical Zener Breakdown Characteristics

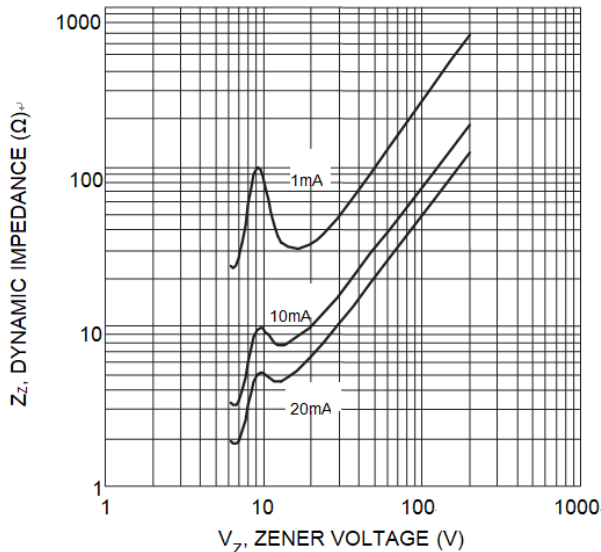


Figure 5 Effect of Zener Voltage

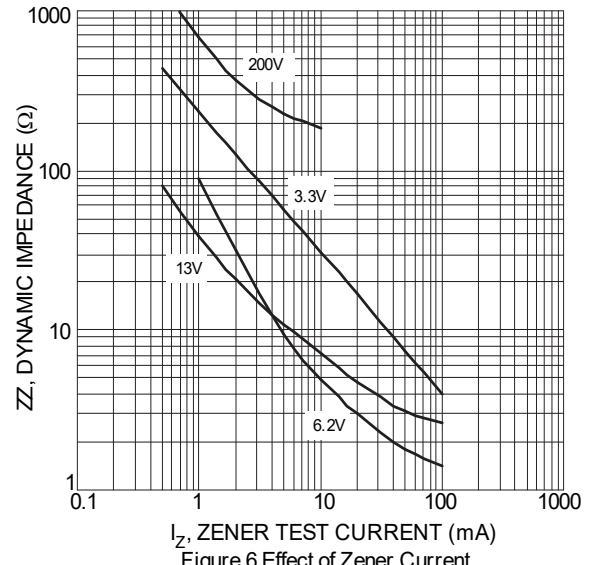
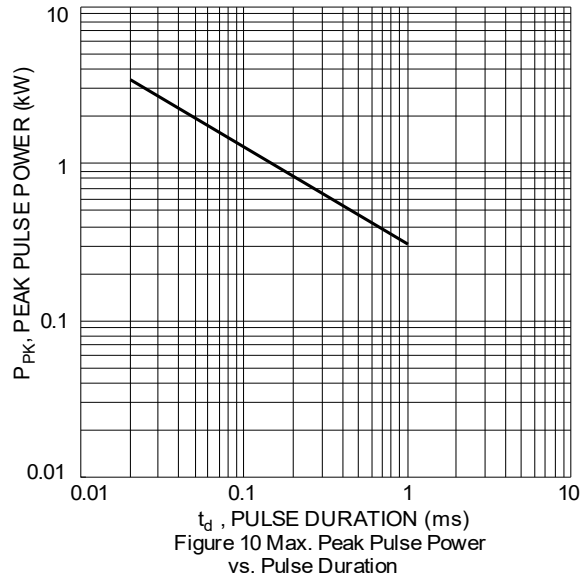
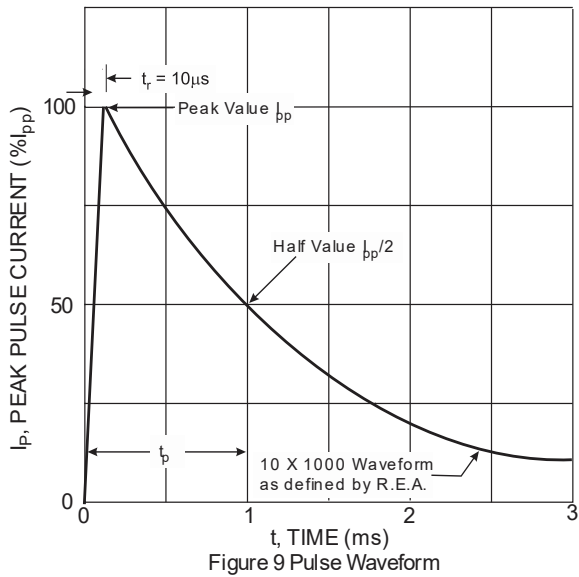
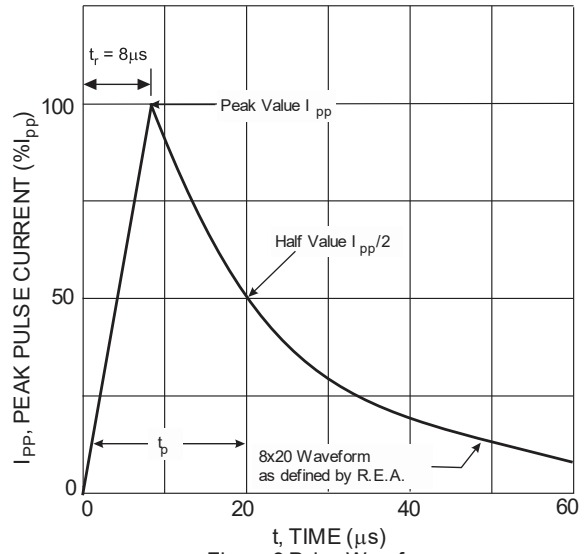
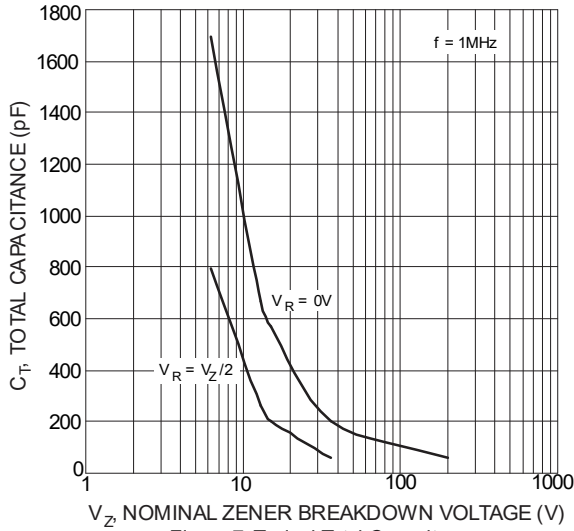


Figure 6 Effect of Zener Current



RATING AND CHARACTERISTICS CURVES



| 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 |

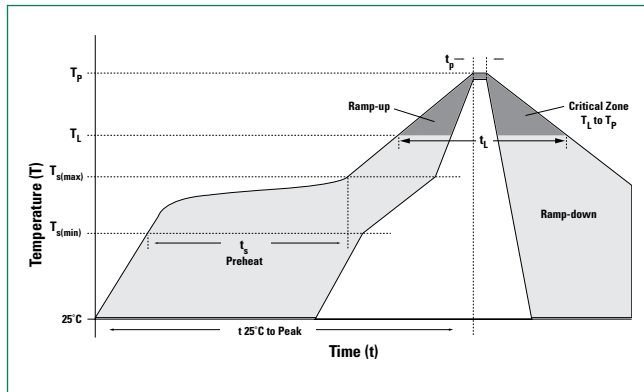
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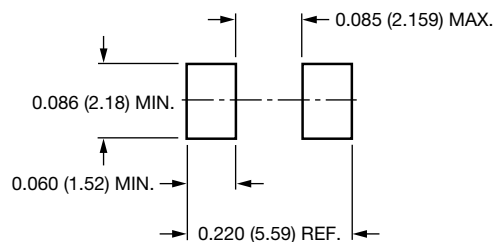


SOLDERING PARAMETERS

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



MOUNTING PAD LAYOUT



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