**Technical Data**
**Data Sheet N0205, Rev. C**

RoHS HF

# MMSZ5221B-MMSZ5267B ZENER DIODES

SOD-123

## Features

- Planar Die Construction
- 500mW Power Dissipation
- 2.4V- 75V Standoff Voltage
- 5% Nominal Zener Voltage
- Designed for Surface Mount Application
- Plastic Material-UL Recognition Flammability Classification 94V-O
- "-A" suffix is for Automotive qualified
- This is a Halogen Free Device
- All SMC parts are traceable to the wafer lot
- Additional testing can be offered upon request

## Circuit Diagram


## Mechanical Data

- Case: SOD-123, Molded Plastic
- Terminals: Plated Leads Solderable per MIL-STD-202, Method 208
- Polarity: Cathode Band
- Weight: 0.01 grams(approx)

## Maximum Ratings @$T_A$=25°C unless otherwise specified

| Characteristic | Symbol | Value | Units |
|---|---|---|---|
| Power Dissipation (Note 1) | $P_D$ | 500 | mW |
| Forward Voltage (Note 2) @ $I_F$ = 10mA | $V_F$ | 0.9 | V |
| Typical Thermal resistance junction to Ambient Air | $R_{\theta JA}$ | 357 | °C/W |
| Operating Junction and Storage Temperature Range | $T_J$,$T_{STG}$ | -55 to 150 | °C |

Notes: 1. Device mounted on ceramic PCB; 7.6 mm x 9.4 mm x 0.87 mm with pad areas 25 $mm^2$.
2. Tested with pulses, Tp≤1.0ms.

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## Electrical Characteristics @$T_A$=25°C unless otherwise specified

| Device | Device Marking Code | VZ@ $I_{ZT}$*1 | | | $I_{ZT}$ | $Z_{ZT}$ @ $I_{ZT}$ | $Z_{ZK}$ @ $I_{ZK}$ | $I_{ZK}$ | $I_R$ | $V_R$ |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Nom(V) | Min(V) | Max(V) | mA | Max(Ω) | Max(Ω) | mA | Max(uA) | V |
| MMSZ5221B | C1 | 2.4 | 2.28 | 2.52 | 20 | 30 | 1200 | 0.25 | 100 | 1 |
| MMSZ5222B | C2 | 2.5 | 2.38 | 2.63 | 20 | 30 | 1200 | 0.25 | 100 | 1 |
| MMSZ5223B | C3 | 2.7 | 2.57 | 2.84 | 20 | 30 | 1300 | 0.25 | 75 | 1 |
| MMSZ5225B | C5 | 3 | 2.85 | 3.15 | 20 | 30 | 1600 | 0.25 | 50 | 1 |
| MMSZ5226B | G1 | 3.3 | 3.14 | 3.47 | 20 | 28 | 1600 | 0.25 | 25 | 1 |
| MMSZ5227B | G2 | 3.6 | 3.42 | 3.78 | 20 | 24 | 1700 | 0.25 | 15 | 1 |
| MMSZ5228B | G3 | 3.9 | 3.71 | 4.10 | 20 | 23 | 1900 | 0.25 | 10 | 1 |
| MMSZ5229B | G4 | 4.3 | 4.09 | 4.52 | 20 | 22 | 2000 | 0.25 | 5 | 1 |
| MMSZ5230B | G5 | 4.7 | 4.47 | 4.94 | 20 | 19 | 1900 | 0.25 | 5 | 2 |
| MMSZ5231B | E1 | 5.1 | 4.85 | 5.36 | 20 | 17 | 1600 | 0.25 | 5 | 2 |
| MMSZ5232B | E2 | 5.6 | 5.32 | 5.88 | 20 | 11 | 1600 | 0.25 | 5 | 3 |
| MMSZ5233B | E3 | 6.0 | 5.70 | 6.30 | 20 | 7 | 1600 | 0.25 | 5 | 3.5 |
| MMSZ5234B | E4 | 6.2 | 5.89 | 6.51 | 20 | 7 | 1000 | 0.25 | 5 | 4 |
| MMSZ5235B | E5 | 6.8 | 6.46 | 7.14 | 20 | 5 | 750 | 0.25 | 3 | 5 |
| MMSZ5236B | F1 | 7.5 | 7.13 | 7.88 | 20 | 6 | 500 | 0.25 | 3 | 6 |
| MMSZ5237B | F2 | 8.2 | 7.79 | 8.61 | 20 | 8 | 500 | 0.25 | 3 | 6.5 |
| MMSZ5238B | F3 | 8.7 | 8.27 | 9.14 | 20 | 8 | 600 | 0.25 | 3 | 6.5 |
| MMSZ5239B | F4 | 9.1 | 8.65 | 9.56 | 20 | 10 | 600 | 0.25 | 3 | 7 |
| MMSZ5240B | F5 | 10 | 9.50 | 10.50 | 20 | 17 | 600 | 0.25 | 3 | 8 |
| MMSZ5241B | H1 | 11 | 10.45 | 11.55 | 20 | 22 | 600 | 0.25 | 2 | 8.4 |
| MMSZ5242B | H2 | 12 | 11.40 | 12.60 | 20 | 30 | 600 | 0.25 | 1 | 9.1 |
| MMSZ5243B | H3 | 13 | 12.35 | 13.65 | 9.5 | 13 | 600 | 0.25 | 0.5 | 9.9 |
| MMSZ5244B | H4 | 14 | 13.30 | 14.70 | 9 | 15 | 600 | 0.25 | 0.1 | 10 |
| MMSZ5245B | H5 | 15 | 14.25 | 15.75 | 8.5 | 16 | 600 | 0.25 | 0.1 | 11 |
| MMSZ5246B | J1 | 16 | 15.20 | 16.80 | 7.8 | 17 | 600 | 0.25 | 0.1 | 12 |
| MMSZ5247B | J2 | 17 | 16.15 | 17.85 | 7.4 | 19 | 600 | 0.25 | 0.1 | 13 |
| MMSZ5248B | J3 | 18 | 17.10 | 18.90 | 7 | 21 | 600 | 0.25 | 0.1 | 14 |
| MMSZ5250B | J5 | 20 | 19.00 | 21.00 | 6.2 | 25 | 600 | 0.25 | 0.1 | 15 |
| MMSZ5251B | K1 | 22 | 20.90 | 23.10 | 5.6 | 29 | 600 | 0.25 | 0.1 | 17 |
| MMSZ5252B | K2 | 24 | 22.80 | 25.20 | 5.2 | 33 | 600 | 0.25 | 0.1 | 18 |
| MMSZ5253B | K3 | 25 | 23.75 | 26.25 | 5 | 35 | 600 | 0.25 | 0.1 | 19 |
| MMSZ5254B | K4 | 27 | 25.65 | 28.35 | 5 | 41 | 600 | 0.25 | 0.1 | 21 |
| MMSZ5255B | K5 | 28 | 26.60 | 29.40 | 4.5 | 44 | 600 | 0.25 | 0.1 | 21 |
| MMSZ5256B | M1 | 30 | 28.50 | 31.50 | 4.2 | 49 | 600 | 0.25 | 0.1 | 23 |
| MMSZ5257B | M2 | 33 | 31.35 | 34.65 | 3.8 | 58 | 700 | 0.25 | 0.1 | 25 |
| MMSZ5258B | M3 | 36 | 34.20 | 37.80 | 3.4 | 70 | 700 | 0.25 | 0.1 | 27 |
| MMSZ5259B | M4 | 39 | 37.05 | 40.95 | 3.2 | 80 | 800 | 0.25 | 0.1 | 30 |
| MMSZ5260B | M5 | 43 | 40.85 | 45.15 | 3.0 | 93 | 900 | 0.25 | 0.1 | 33 |
| MMSZ5261B | N1 | 47 | 44.65 | 49.35 | 2.7 | 105 | 1000 | 0.25 | 0.1 | 36 |
| MMSZ5262B | N2 | 51 | 48.45 | 53.55 | 2.5 | 125 | 1100 | 0.25 | 0.1 | 39 |
| MMSZ5263B | M8 | 56 | 53.2 | 58.8 | 2.2 | 150 | 1300 | 0.25 | 0.1 | 43 |
| MMSZ5265B | N5 | 62 | 58.9 | 65.1 | 2.0 | 185 | 1400 | 0.25 | 0.1 | 47 |
| MMSZ5267B | P2 | 75 | 71.25 | 78.75 | 1.7 | 270 | 1700 | 0.25 | 0.1 | 56 |

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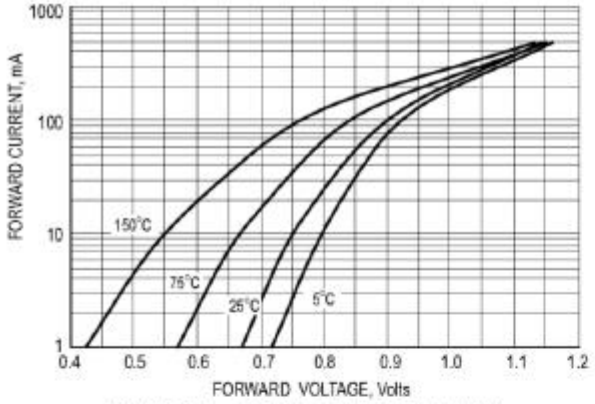
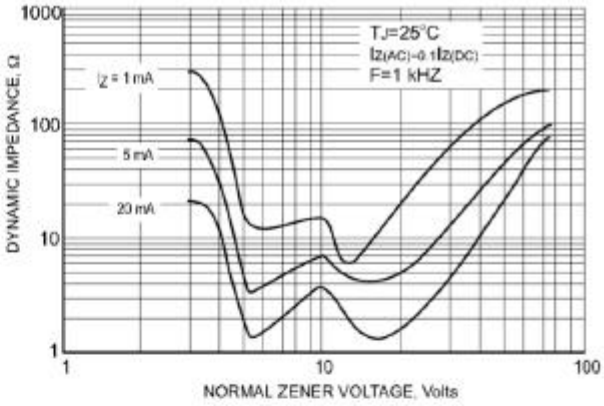
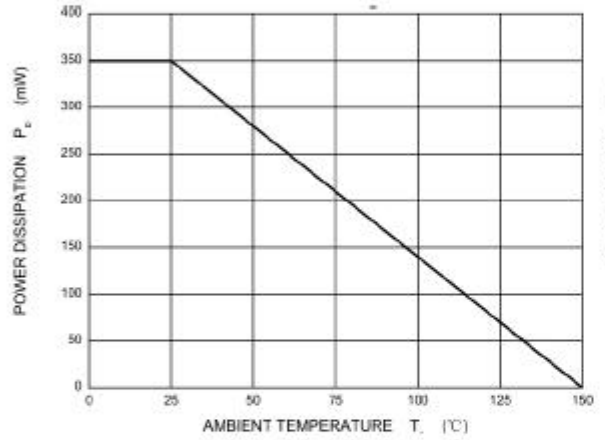
## Ratings and Characteristics Curves



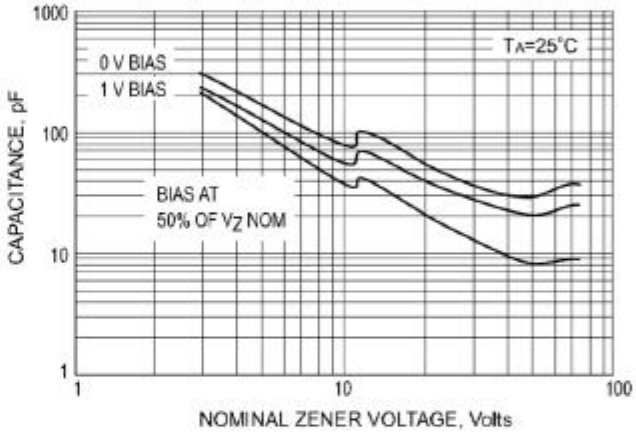

TYPICAL FORWARD VOLTAGE



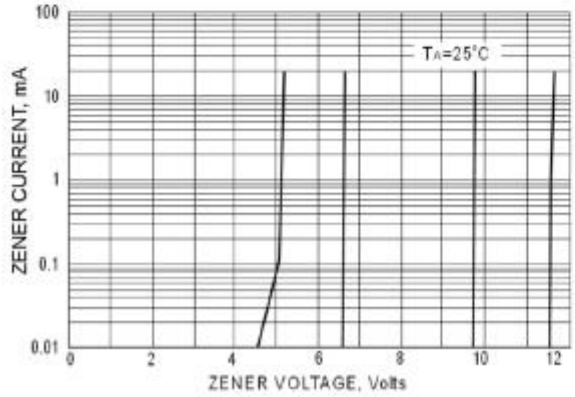

EFFECT OF ZENER VOLTAGE ON ZENER IMPEDANCE



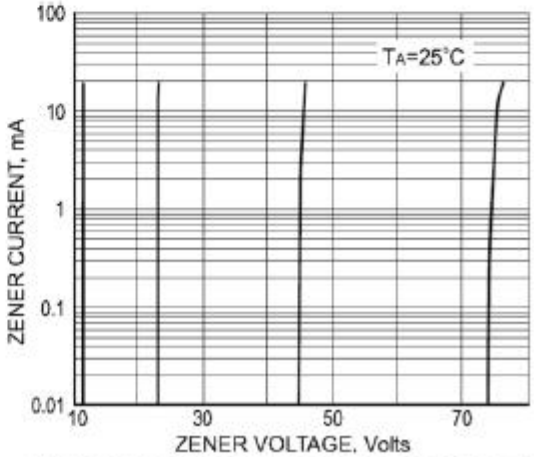

POWER DISSIPATION VS. AMBIENT TEMP




TYPICAL CAPACITANCE




ZENER BREAKDOWN CHARACTERISTICS

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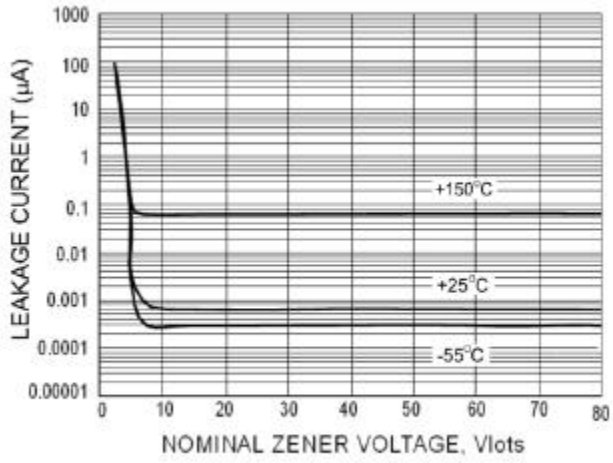
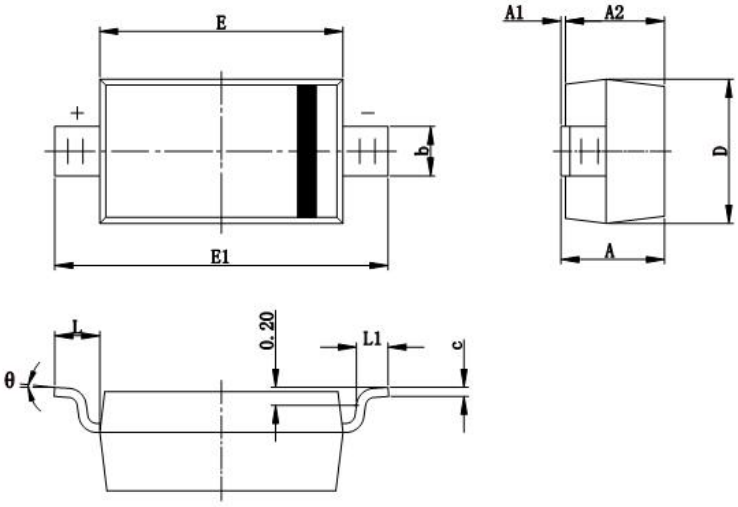



TYPICAL LEAKGE CURRENT

## Mechanical Dimensions SOD-123




| SYMBOL | Millimeters | | Inches | |
|---|---|---|---|---|
| | MIN. | MAX. | MIN. | MAX. |
| A | 1.050 | 1.250 | 0.041 | 0.049 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.050 | 1.150 | 0.041 | 0.045 |
| b | 0.450 | 0.650 | 0.018 | 0.026 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 1.500 | 1.700 | 0.059 | 0.067 |
| E | 2.600 | 2.800 | 0.102 | 0.110 |
| E1 | 3.550 | 3.850 | 0.140 | 0.152 |
| L | 0.500 REF. | | 0.020 REF. | |
| L1 | 0.250 | 0.450 | 0.010 | 0.018 |
| θ | 0° | 8° | 0° | 8° |

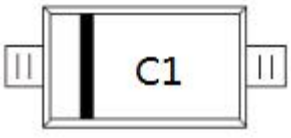
Note: If date code is before 2016 year, please contact with factory about marking.

## Ordering Information

| Device | Package | Shipping |
|---|---|---|
| MMSZ5221B-MMSZ5267B | SOD-123 | 3000pcs / reel |
| MMSZ5221BTR-MMSZ5267TR | SOD-123 | 3000pcs / reel |

For information on tape and reel specifications, including part orientation and tape sizes, please refer to our tape and reel packaging specification.

## Marking Diagram




C1 = Device Marking Code

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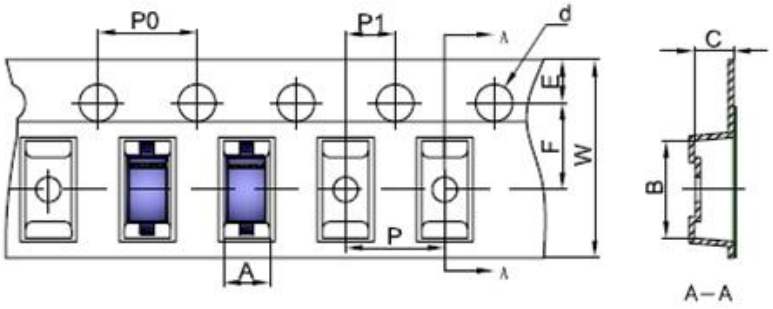
## Carrier Tape Specification SOD-123




| SYMBOL | Millimeters | |
|---|---|---|
| | Min. | Max. |
| A | 1.80 | 1.90 |
| B | 3.89 | 3.99 |
| C | 1.52 | 1.62 |
| d | 1.45 | 1.65 |
| E | 1.65 | 1.85 |
| F | 3.40 | 3.60 |
| P | 3.90 | 4.10 |
| P0 | 3.90 | 4.10 |
| P1 | 1.90 | 2.10 |
| W | 7.90 | 8.30 |