



# MMSZ5221BS-AU SERIES

## SURFACE MOUNT SILICON ZENER DIODES

**VOLTAGE** 2.4 to 51 Volt      **POWER** 200 mWatt

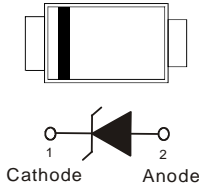
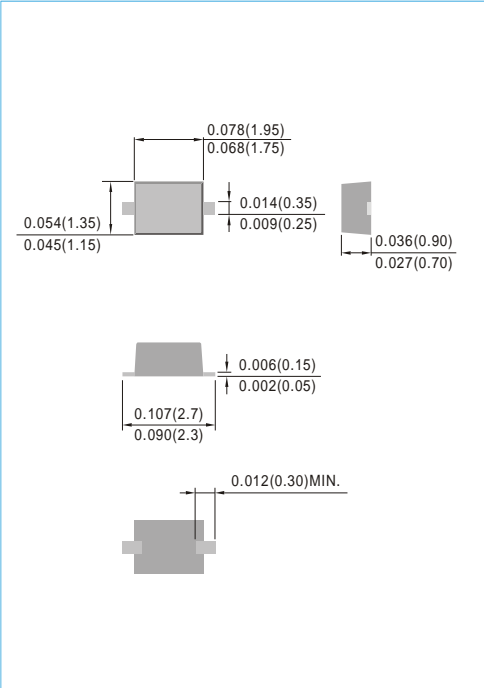
**SOD-323**      Unit : inch(mm)

### FEATURES

- Planar Die construction
- 200mW Power Dissipation
- Ideally Suited for Automated Assembly Processes
- Acquire quality system certificate : TS16949
- AEC-Q101 qualified
- Lead free in compliance with EU RoHS 2011/65/EU directive
- Green molding compound as per IEC61249 Std. . (Halogen Free)

### MECHANICAL DATA

- Case: SOD-323, Molded Plastic
- Terminals: Solderable per MIL-STD-750, Method 2026
- Polarity: Color band denotes cathode end
- Appox Weight : 0.00014 ounces, 0.0041 grams



### MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

| Parameter   | Symbol | Value       | Units              |
|---|--------|-------------|--------------------|
| Power Dissipation @ $T_A=25^{\circ}\text{C}$ (Note A) | $P_D$  | 200         | mW                 |
| Operating Junction and Storage Temperature Range      | $T_J$  | -55 to +150 | $^{\circ}\text{C}$ |

**NOTE :**

A. Mounted on 5.0mm<sup>2</sup>(.013mm thick) land areas.



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| Part Number                    | Nominal Zener Voltage            |        |        | Max. Zener Impedance              |      |                                   |      | Max Reverse Leakage Current     |      | Marking Code |
|--------------------------------|----------------------------------|--------|--------|-----------------------------------|------|-----------------------------------|------|---------------------------------|------|--------------|
|                                | V <sub>Z</sub> @ I <sub>ZT</sub> |        |        | Z <sub>TT</sub> @ I <sub>ZT</sub> |      | Z <sub>ZK</sub> @ I <sub>ZK</sub> |      | I <sub>R</sub> @ V <sub>R</sub> |      |              |
|                                | Nom. V                           | Min. V | Max. V | Ω                                 | mA   | Ω                                 | mA   | μA                              | V    |              |
| <b>200 mWatts Zener Diodes</b> |                                  |        |        |                                   |      |                                   |      |                                 |      |              |
| MMSZ5221BS-AU                  | 2.4                              | 2.28   | 2.52   | 30                                | 20.0 | 1200                              | 0.25 | 100                             | 1.0  | C1           |
| MMSZ5222BS-AU                  | 2.5                              | 2.38   | 2.63   | 30                                | 20.0 | 1250                              | 0.25 | 100                             | 1.0  | C2           |
| MMSZ5223BS-AU                  | 2.7                              | 2.57   | 2.84   | 30                                | 20.0 | 1300                              | 0.25 | 75                              | 1.0  | C3           |
| MMSZ5225BS-AU                  | 3                                | 2.85   | 3.15   | 30                                | 20.0 | 1600                              | 0.25 | 50                              | 1.0  | C5           |
| MMSZ5226BS-AU                  | 3.3                              | 3.14   | 3.47   | 28                                | 20.0 | 1600                              | 0.25 | 25                              | 1.0  | D1           |
| MMSZ5227BS-AU                  | 3.6                              | 3.42   | 3.78   | 24                                | 20.0 | 1700                              | 0.25 | 15                              | 1.0  | D2           |
| MMSZ5228BS-AU                  | 3.9                              | 3.71   | 4.10   | 23                                | 20.0 | 1900                              | 0.25 | 10                              | 1.0  | D3           |
| MMSZ5229BS-AU                  | 4.3                              | 4.09   | 4.52   | 22                                | 20.0 | 2000                              | 0.25 | 5.0                             | 1.0  | D4           |
| MMSZ5230BS-AU                  | 4.7                              | 4.47   | 4.94   | 19                                | 20.0 | 1900                              | 0.25 | 5.0                             | 2.0  | D5           |
| MMSZ5231BS-AU                  | 5.1                              | 4.85   | 5.36   | 17                                | 20.0 | 1600                              | 0.25 | 5.0                             | 2.0  | E1           |
| MMSZ5232BS-AU                  | 5.6                              | 5.32   | 5.88   | 11                                | 20.0 | 1600                              | 0.25 | 5.0                             | 3.0  | E2           |
| MMSZ5234BS-AU                  | 6.2                              | 5.89   | 6.51   | 7                                 | 20.0 | 1000                              | 0.25 | 5.0                             | 4.0  | E4           |
| MMSZ5235BS-AU                  | 6.8                              | 6.46   | 7.14   | 5                                 | 20.0 | 750                               | 0.25 | 3.0                             | 5.0  | E5           |
| MMSZ5236BS-AU                  | 7.5                              | 7.13   | 7.88   | 6                                 | 20.0 | 500                               | 0.25 | 3.0                             | 6.0  | F1           |
| MMSZ5237BS-AU                  | 8.2                              | 7.79   | 8.61   | 8                                 | 20.0 | 500                               | 0.25 | 3.0                             | 6.0  | F2           |
| MMSZ5238BS-AU                  | 8.7                              | 8.27   | 9.14   | 8                                 | 20.0 | 600                               | 0.25 | 3.0                             | 6.5  | F3           |
| MMSZ5239BS-AU                  | 9.1                              | 8.65   | 9.56   | 10                                | 20.0 | 600                               | 0.25 | 3.0                             | 6.5  | F4           |
| MMSZ5240BS-AU                  | 10                               | 9.50   | 10.50  | 17                                | 20.0 | 600                               | 0.25 | 3.0                             | 8.0  | F5           |
| MMSZ5241BS-AU                  | 11                               | 10.45  | 11.55  | 22                                | 20.0 | 600                               | 0.25 | 2.0                             | 8.4  | H1           |
| MMSZ5242BS-AU                  | 12                               | 11.40  | 12.60  | 30                                | 20.0 | 600                               | 0.25 | 1.0                             | 9.1  | H2           |
| MMSZ5243BS-AU                  | 13                               | 12.35  | 13.65  | 13                                | 9.5  | 600                               | 0.25 | 0.5                             | 9.9  | H3           |
| MMSZ5244BS-AU                  | 14                               | 13.30  | 14.70  | 15                                | 9.0  | 600                               | 0.25 | 0.1                             | 10.5 | H4           |
| MMSZ5245BS-AU                  | 15                               | 14.25  | 15.75  | 16                                | 8.5  | 600                               | 0.25 | 0.1                             | 11.0 | H5           |
| MMSZ5246BS-AU                  | 16                               | 15.20  | 16.80  | 17                                | 7.8  | 600                               | 0.25 | 0.1                             | 12.0 | J1           |
| MMSZ5247BS-AU                  | 17                               | 16.15  | 17.85  | 19                                | 7.5  | 600                               | 0.25 | 0.1                             | 13.0 | J2           |
| MMSZ5248BS-AU                  | 18                               | 17.10  | 18.90  | 21                                | 7.0  | 600                               | 0.25 | 0.1                             | 14.0 | J3           |
| MMSZ5250BS-AU                  | 20                               | 19.00  | 21.00  | 25                                | 6.2  | 600                               | 0.25 | 0.1                             | 15.0 | J5           |
| MMSZ5251BS-AU                  | 22                               | 20.90  | 23.10  | 29                                | 5.6  | 600                               | 0.25 | 0.1                             | 17.0 | K1           |
| MMSZ5252BS-AU                  | 24                               | 22.80  | 25.20  | 33                                | 5.2  | 600                               | 0.25 | 0.1                             | 18.0 | K2           |
| MMSZ5254BS-AU                  | 27                               | 25.65  | 28.35  | 41                                | 5.0  | 600                               | 0.25 | 0.1                             | 21.0 | K4           |
| MMSZ5255BS-AU                  | 28                               | 26.60  | 29.40  | 44                                | 4.5  | 600                               | 0.25 | 0.1                             | 21.0 | K5           |
| MMSZ5256BS-AU                  | 30                               | 28.50  | 31.50  | 49                                | 4.2  | 600                               | 0.25 | 0.1                             | 23.0 | M1           |
| MMSZ5257BS-AU                  | 33                               | 31.35  | 34.65  | 58                                | 3.8  | 700                               | 0.25 | 0.1                             | 25.0 | M2           |
| MMSZ5258BS-AU                  | 36                               | 34.20  | 37.80  | 70                                | 3.4  | 700                               | 0.25 | 0.1                             | 27.0 | M3           |
| MMSZ5259BS-AU                  | 39                               | 37.05  | 40.95  | 80                                | 3.2  | 800                               | 0.25 | 0.1                             | 30.0 | M4           |
| MMSZ5260BS-AU                  | 43                               | 40.85  | 45.15  | 93                                | 3.0  | 900                               | 0.25 | 0.1                             | 33.0 | M5           |
| MMSZ5261BS-AU                  | 47                               | 44.65  | 49.35  | 105                               | 2.7  | 1000                              | 0.25 | 0.1                             | 36.0 | N1           |
| MMSZ5262BS-AU                  | 51                               | 48.45  | 53.55  | 125                               | 2.5  | 1100                              | 0.25 | 0.1                             | 39.0 | N2           |



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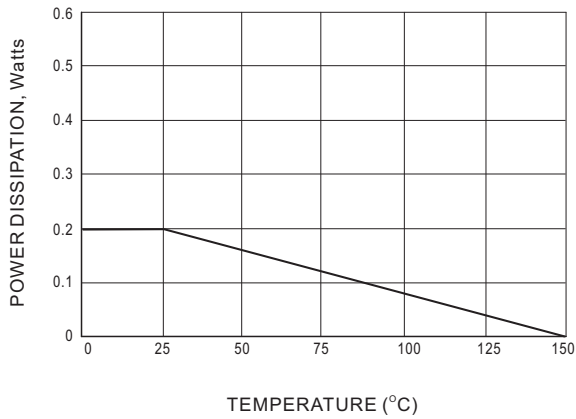


Fig.1 STEADY STATE POWER DERATING

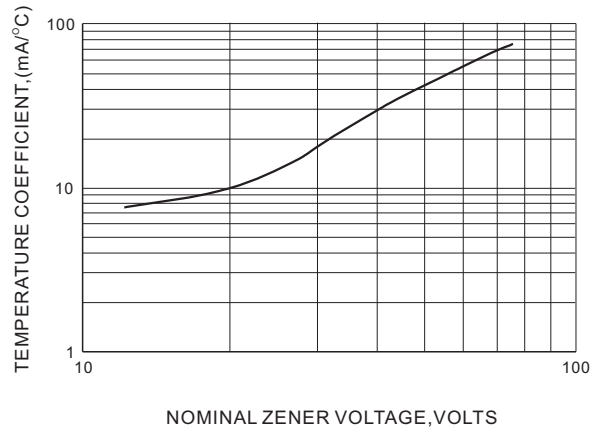


Fig.2 TEMPERATURE COEFFICIENTS

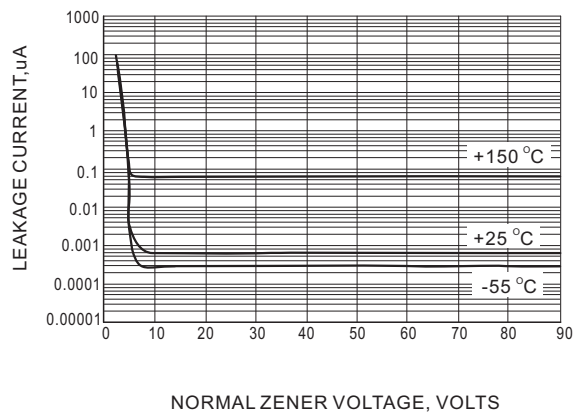


Fig.3 TYPICAL LEAKAGE CURRENT

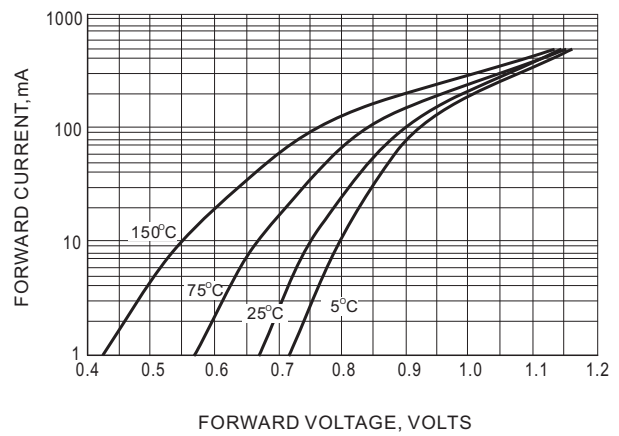
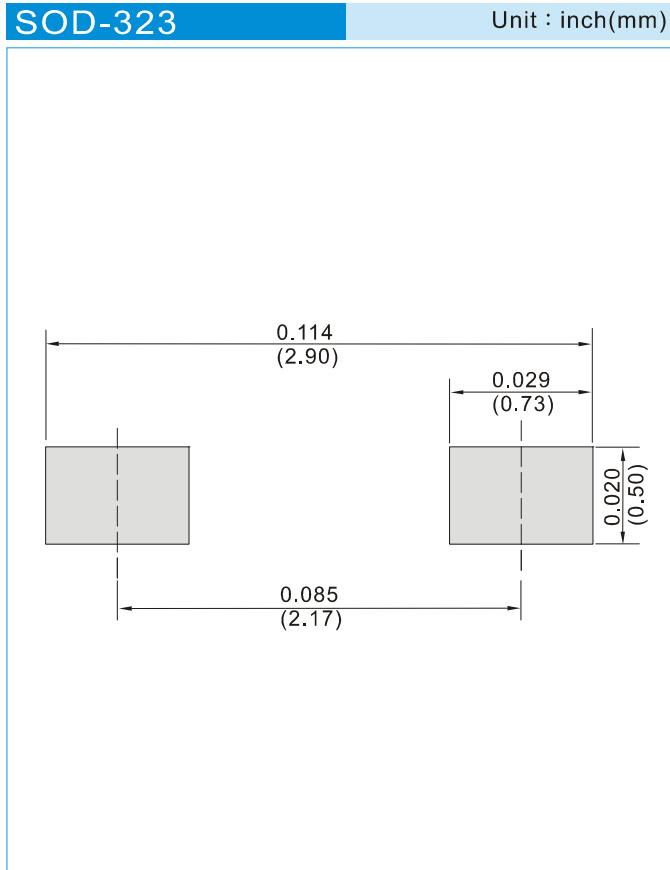


Fig.4 TYPICAL FORWARD VOLTAGE



## MMSZ5221BS-AU SERIES

### MOUNTING PAD LAYOUT



### ORDER INFORMATION

- Packing information  
T/R - 12K per 13" plastic Reel  
T/R - 5K per 7" plastic Reel



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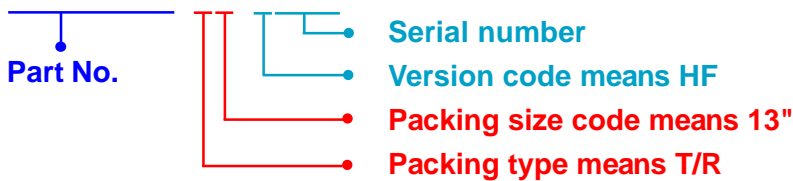
### Part No\_packing code\_Version

MMSZ5221BS-AU\_R1\_000A1

MMSZ5221BS-AU\_R2\_000A1

For example :

**RB500V-40\_R2\_00001**



| Packing Code <b>XX</b>               |                      |                                  |                      | Version Code <b>XXXXX</b> |                      |                                       |
|--------------------------------------|----------------------|----------------------------------|----------------------|---------------------------|----------------------|---------------------------------------|
| Packing type                         | 1 <sup>st</sup> Code | Packing size code                | 2 <sup>nd</sup> Code | HF or RoHS                | 1 <sup>st</sup> Code | 2 <sup>nd</sup> ~5 <sup>th</sup> Code |
| Tape and Ammunition Box (T/B)        | A                    | N/A                              | 0                    | HF                        | 0                    | serial number                         |
| Tape and Reel (T/R)                  | R                    | 7"                               | 1                    | RoHS                      | 1                    | serial number                         |
| Bulk Packing (B/P)                   | B                    | 13"                              | 2                    |                           |                      |                                       |
| Tube Packing (T/P)                   | T                    | 26mm                             | X                    |                           |                      |                                       |
| Tape and Reel (Right Oriented) (TRR) | S                    | 52mm                             | Y                    |                           |                      |                                       |
| Tape and Reel (Left Oriented) (TRL)  | L                    | PANASERT T/B CATHODE UP (PBCU)   | U                    |                           |                      |                                       |
| FORMING                              | F                    | PANASERT T/B CATHODE DOWN (PBCD) | D                    |                           |                      |                                       |



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