



# MMSZ4678 THRU MMSZ4717

## Silicon Planar Power Zener Diodes

### Features

- Zener Voltage : 1.8V~43V
- Wide Zener Reverse Voltage Range
- Small Package Size for High Density Applications

### Maximum Ratings (T<sub>A</sub>=25°C unless otherwise Specified)

| Parameter                               | Symbol                           | Value    | Unit |
|-----------------------------------------|----------------------------------|----------|------|
| Forward Voltage@I <sub>F</sub> =10mA    | V <sub>F</sub>                   | 0.9      | V    |
| Power Dissipation                       | P <sub>D</sub>                   | 350      | mW   |
| Operating and Storage Temperature Range | T <sub>J</sub> ,T <sub>STG</sub> | -55~+150 | °C   |
| Operating and Storage Temperature Range | R <sub>θJA</sub>                 | 357      | °C/W |

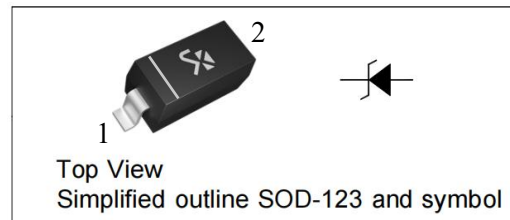
Notes:Device mounted on ceramic PCB;5.0mm x 7.0mm with pad areas 35mm<sup>2</sup>

### Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise Specified)

| Type     | Marking | Zenner Voltage Range <sup>(1)</sup>   |     |       |                 | Leakage Current                     |                |
|----------|---------|---------------------------------------|-----|-------|-----------------|-------------------------------------|----------------|
|          |         | V <sub>ZT</sub> (at I <sub>ZT</sub> ) |     |       | I <sub>ZT</sub> | I <sub>R</sub> (at V <sub>R</sub> ) | V <sub>R</sub> |
|          |         | Min                                   | Nom | Max   | μA              | μA                                  | V              |
| MMSZ4678 | CC      | 1.71                                  | 1.8 | 1.89  | 50              | 7.5                                 | 1              |
| MMSZ4679 | CD      | 1.90                                  | 2.0 | 2.10  | 50              | 5                                   | 1              |
| MMSZ4680 | CE      | 2.09                                  | 2.2 | 2.31  | 50              | 4                                   | 1              |
| MMSZ4681 | CF      | 2.28                                  | 2.4 | 2.52  | 50              | 2                                   | 1              |
| MMSZ4682 | CH      | 2.565                                 | 2.7 | 2.835 | 50              | 1                                   | 1              |
| MMSZ4683 | CJ      | 2.85                                  | 3.0 | 3.15  | 50              | 0.8                                 | 1              |
| MMSZ4684 | CK      | 3.13                                  | 3.3 | 3.47  | 50              | 7.5                                 | 1.5            |
| MMSZ4685 | CM      | 3.42                                  | 3.6 | 3.78  | 50              | 7.5                                 | 2              |
| MMSZ4686 | CN      | 3.70                                  | 3.9 | 4.10  | 50              | 5                                   | 2              |
| MMSZ4687 | CP      | 4.09                                  | 4.3 | 4.52  | 50              | 4                                   | 2              |
| MMSZ4688 | CT      | 4.47                                  | 4.7 | 4.94  | 50              | 10                                  | 3              |

### PINNING

| PIN | DESCRIPTION |
|-----|-------------|
| 1   | Cathode     |
| 2   | Anode       |





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|          |    |       |     |       |    |      |      |
|----------|----|-------|-----|-------|----|------|------|
| MMSZ4689 | CU | 4.85  | 5.1 | 5.36  | 50 | 10   | 3    |
| MMSZ4690 | CV | 5.32  | 5.6 | 5.88  | 50 | 10   | 4    |
| MMSZ4691 | CA | 5.89  | 6.2 | 6.51  | 50 | 10   | 5    |
| MMSZ4692 | CX | 6.46  | 6.8 | 7.14  | 50 | 10   | 5.1  |
| MMSZ4693 | CY | 7.13  | 7.5 | 7.88  | 50 | 10   | 5.7  |
| MMSZ4694 | CZ | 7.79  | 8.2 | 8.61  | 50 | 1    | 6.2  |
| MMSZ4695 | DC | 8.27  | 8.7 | 9.14  | 50 | 1    | 6.6  |
| MMSZ4696 | DD | 8.65  | 9.1 | 9.56  | 50 | 1    | 6.9  |
| MMSZ4697 | DE | 9.50  | 10  | 10.50 | 50 | 1    | 7.6  |
| MMSZ4698 | DF | 10.45 | 11  | 11.55 | 50 | 0.05 | 8.4  |
| MMSZ4699 | DH | 11.40 | 12  | 12.60 | 50 | 0.05 | 9.1  |
| MMSZ4700 | DJ | 12.35 | 13  | 13.65 | 50 | 0.05 | 9.8  |
| MMSZ4701 | DM | 13.30 | 14  | 14.70 | 50 | 0.05 | 10.6 |
| MMSZ4702 | DK | 14.25 | 15  | 15.75 | 50 | 0.05 | 11.4 |
| MMSZ4703 | DN | 15.20 | 16  | 16.80 | 50 | 0.05 | 12.1 |
| MMSZ4704 | DP | 16.15 | 17  | 17.85 | 50 | 0.05 | 12.9 |
| MMSZ4705 | DT | 17.10 | 18  | 18.90 | 50 | 0.05 | 13.6 |
| MMSZ4706 | DU | 18.05 | 19  | 19.95 | 50 | 0.05 | 14.4 |
| MMSZ4707 | DV | 19.00 | 20  | 21.00 | 50 | 0.01 | 15.2 |
| MMSZ4708 | DA | 20.90 | 22  | 23.10 | 50 | 0.01 | 16.7 |
| MMSZ4709 | DX | 22.80 | 24  | 25.20 | 50 | 0.01 | 18.2 |
| MMSZ4710 | DY | 23.75 | 25  | 26.25 | 50 | 0.01 | 19.0 |
| MMSZ4711 | EA | 25.65 | 27  | 28.35 | 50 | 0.01 | 20.4 |
| MMSZ4712 | EC | 26.60 | 28  | 29.40 | 50 | 0.01 | 21.2 |
| MMSZ4713 | ED | 28.50 | 30  | 31.50 | 50 | 0.01 | 22.8 |
| MMSZ4714 | EE | 31.35 | 33  | 34.65 | 50 | 0.01 | 25.0 |
| MMSZ4715 | EF | 34.20 | 36  | 37.80 | 50 | 0.01 | 27.3 |
| MMSZ4716 | EH | 37.05 | 39  | 40.95 | 50 | 0.01 | 29.6 |
| MMSZ4717 | EJ | 40.85 | 43  | 45.15 | 50 | 0.01 | 32.6 |

Note:

(1) Nominal Zener voltage is measured with the device junction in thermal equilibrium at  $T_L = 30^\circ\text{C} \pm 1^\circ\text{C}$



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## Typical Characteristics

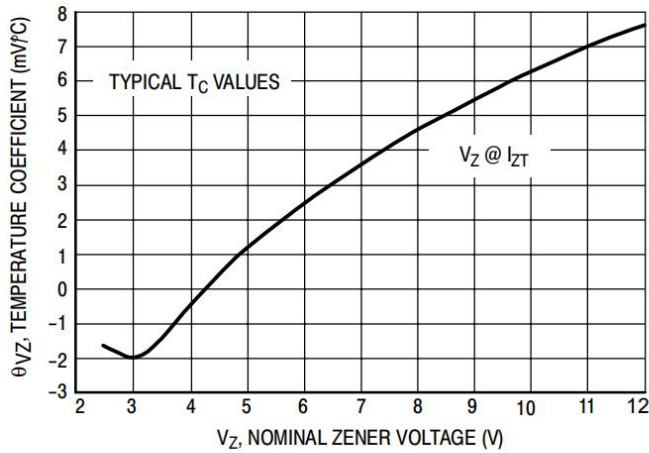


**Figure 1. Temperature Coefficients**  
(Temperature Range -55°C to +150°C)

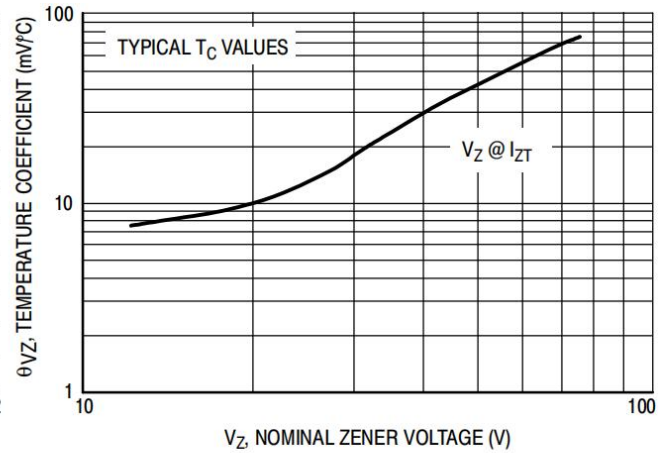


**Figure 2. Temperature Coefficients**  
(Temperature Range -55°C to +150°C)

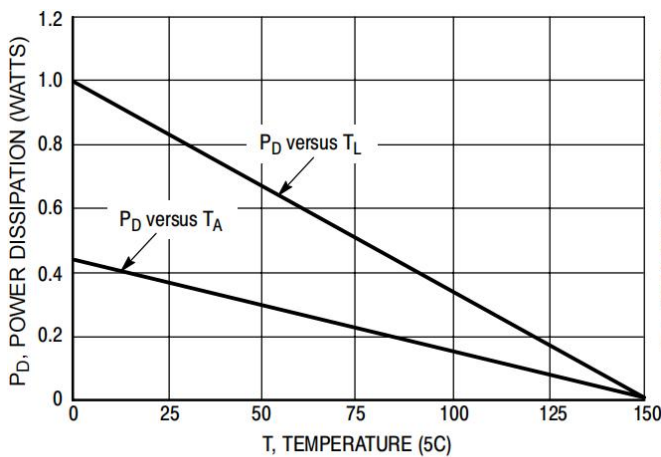


**Figure 3. Steady State Power Derating**

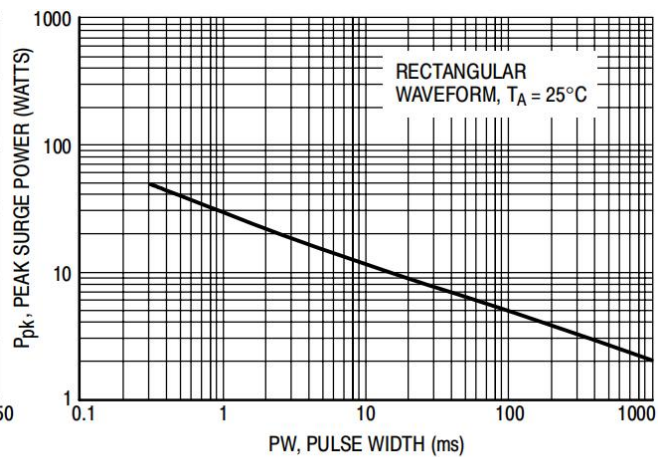


**Figure 4. Maximum Nonrepetitive Surge Power**

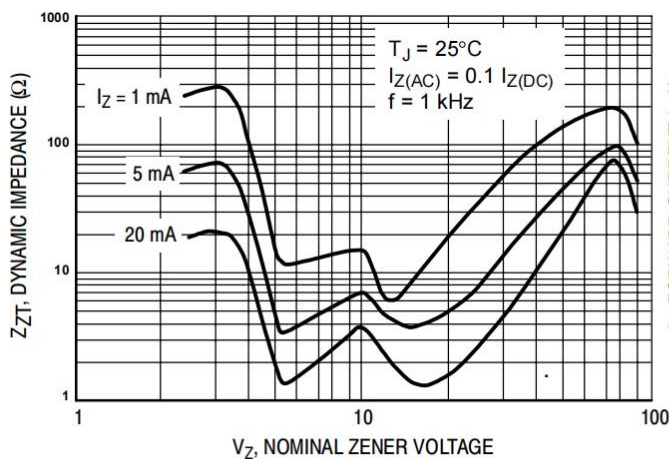


**Figure 5. Effect of Zener Voltage on**  
Zener Impedance

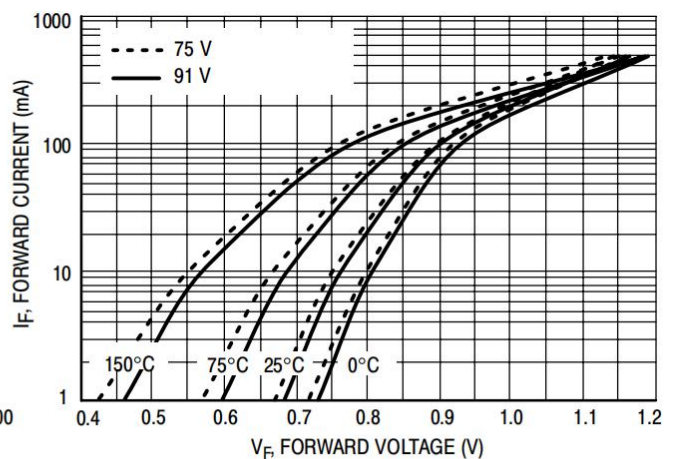


**Figure 6. Typical Forward Voltage**



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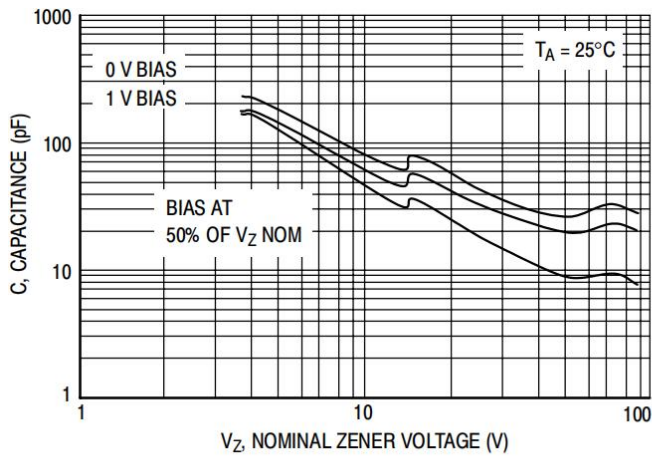


Figure 7. Typical Capacitance

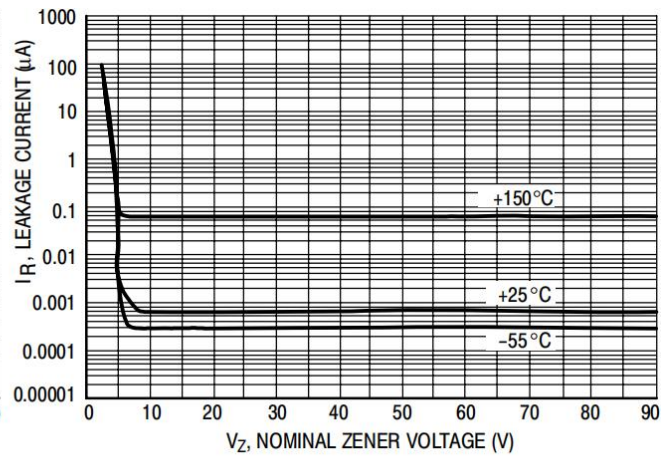


Figure 8. Typical Leakage Current

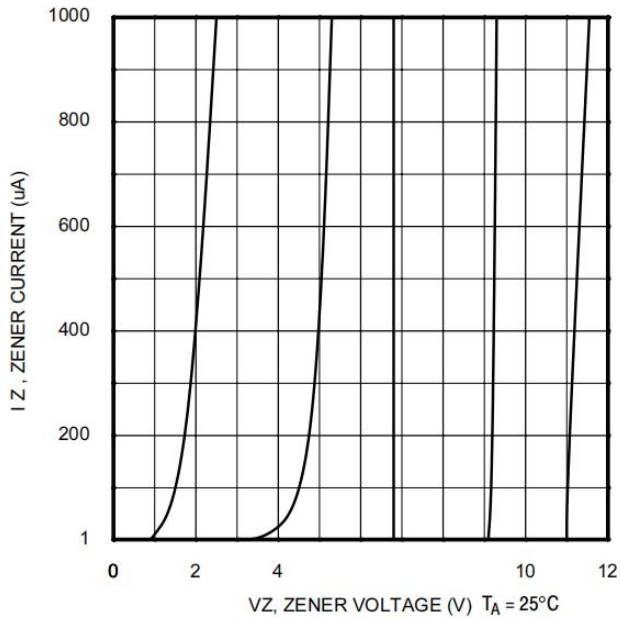


Figure 9. Zener Voltage versus Zener Current  
( $V_Z$  Up to 12 V)

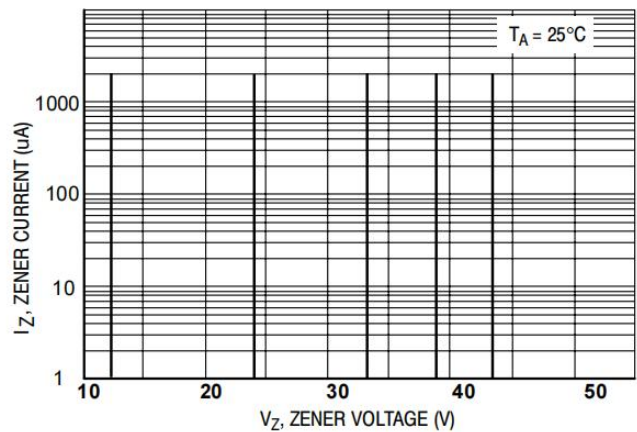


Figure 10. Zener Voltage versus Zener Current  
(12 to 43 V)

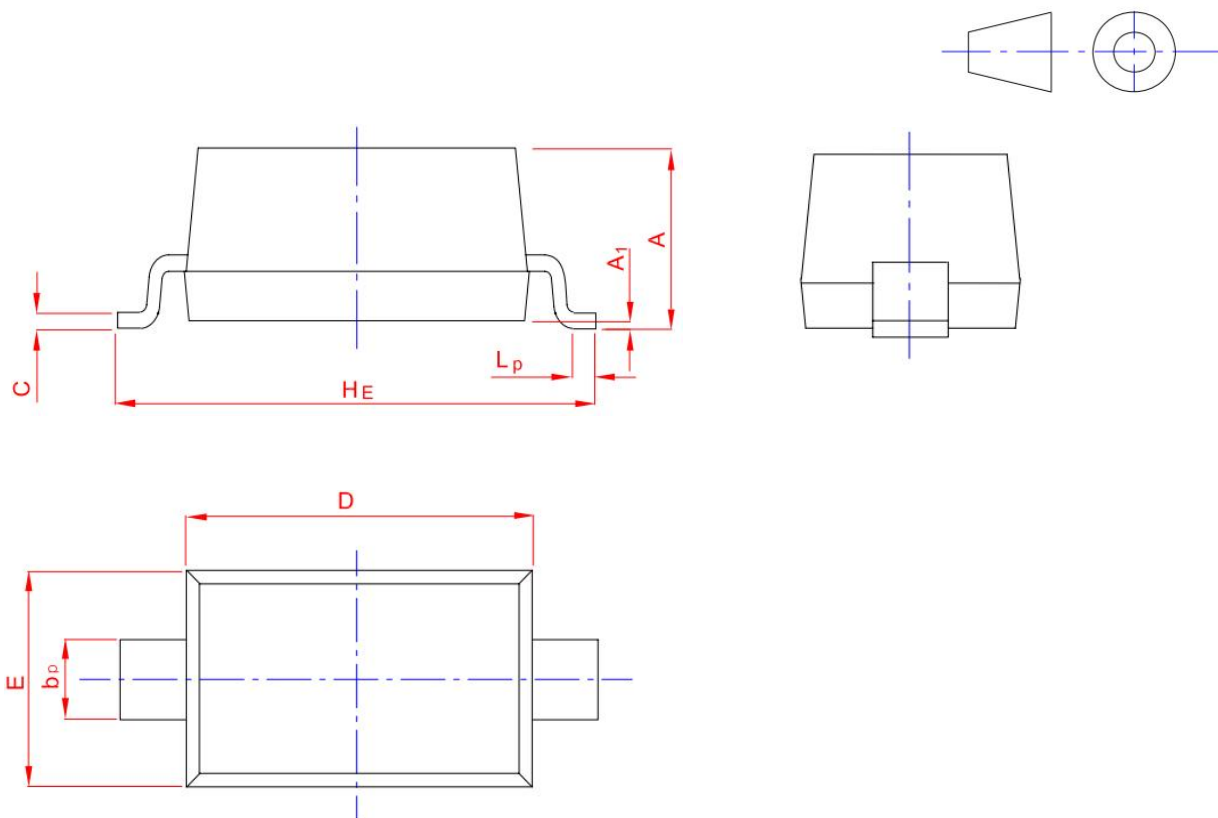


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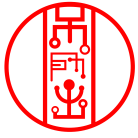
## Package Information

### SOD-123

### Dimensions in mm



| UNIT | A            | bp           | C              | D            | E            | HE           | A1           | Lp           |
|------|--------------|--------------|----------------|--------------|--------------|--------------|--------------|--------------|
| mm   | 1.20<br>0.90 | 0.60<br>0.50 | 0.135<br>0.100 | 2.75<br>2.55 | 1.65<br>1.55 | 3.85<br>3.55 | 0.10<br>0.01 | 0.50<br>0.20 |



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