

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                         | Symbol          | Value | Unit |
|--------------------------------------------------------|-----------------|-------|------|
| Peak Power Dissipation: MMBZ5V6AL - MMBZ10VAL (Note 7) | P <sub>PK</sub> | 24    | W    |
| Peak Power Dissipation: MMBZ15VAL - MMBZ33VAL (Note 7) | P <sub>PK</sub> | 40    | W    |

**Thermal Characteristics**

| Characteristic                                       | Symbol                            | Value       | Unit |
|------------------------------------------------------|-----------------------------------|-------------|------|
| Power Dissipation (Note 6)                           | P <sub>D</sub>                    | 225         | mW   |
| Thermal Resistance, Junction to Ambient Air (Note 6) | R <sub>θJA</sub>                  | 556         | °C/W |
| Operating and Storage Temperature Range              | T <sub>J</sub> , T <sub>STG</sub> | -65 to +150 | °C   |

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

**24 Watt (V<sub>F</sub> = 0.9V max @ I<sub>F</sub> = 10mA)**

| Type Number | Marking Code | V <sub>RWM</sub> | Max Reverse Current, I <sub>R</sub> @ V <sub>RWM</sub> (Note 8) | Breakdown Voltage            |     |      |                  | Max. Clamping Voltage, V <sub>C</sub> @ I <sub>PP</sub> (Note 7) |                 | Typical Temperature Coefficient of Reverse Voltage |
|-------------|--------------|------------------|-----------------------------------------------------------------|------------------------------|-----|------|------------------|------------------------------------------------------------------|-----------------|----------------------------------------------------|
|             |              |                  |                                                                 | V <sub>BR</sub> (Note 8) (V) |     |      | @ I <sub>T</sub> | V <sub>C</sub>                                                   | I <sub>PP</sub> |                                                    |
|             |              | Volts            | μA                                                              | Min                          | Nom | Max  | mA               | V                                                                | A               | T <sub>C</sub> (mV/°C)                             |
| MMBZ5V6AL   | K9A          | 3                | 5.0                                                             | 5.32                         | 5.6 | 5.88 | 20               | 8.0                                                              | 3.0             | 1.8                                                |

**24 Watt (V<sub>F</sub> = 0.9V max @ I<sub>F</sub> = 10mA)**

| Type Number | Marking Code | V <sub>RWM</sub> | Max Reverse Current, I <sub>R</sub> @ V <sub>RWM</sub> (Note 8) | Breakdown Voltage            |     |      |                  | Max. Clamping Voltage, V <sub>C</sub> @ I <sub>PP</sub> (Note 7) |                 | Typical Temperature Coefficient of Reverse Voltage |
|-------------|--------------|------------------|-----------------------------------------------------------------|------------------------------|-----|------|------------------|------------------------------------------------------------------|-----------------|----------------------------------------------------|
|             |              |                  |                                                                 | V <sub>BR</sub> (Note 8) (V) |     |      | @ I <sub>T</sub> | V <sub>C</sub>                                                   | I <sub>PP</sub> |                                                    |
|             |              | Volts            | µA                                                              | Min                          | Nom | Max  | mA               | V                                                                | A               | T <sub>C</sub> (%/°C)                              |
| MMBZ6V2AL   | K9B          | 3.0              | 0.5                                                             | 5.89                         | 6.2 | 6.51 | 1.0              | 8.7                                                              | 2.76            | +0.04                                              |
| MMBZ6V8AL   | K9C          | 4.5              | 0.5                                                             | 6.46                         | 6.8 | 7.14 | 1.0              | 9.6                                                              | 2.5             | +0.045                                             |
| MMBZ9V1AL   | K9D          | 6.0              | 0.3                                                             | 8.65                         | 9.1 | 9.56 | 1.0              | 14                                                               | 1.7             | +0.065                                             |
| MMBZ10VAL   | K9E          | 6.5              | 0.3                                                             | 9.50                         | 10  | 10.5 | 1.0              | 14.2                                                             | 1.7             | +0.065                                             |

**40 Watt (V<sub>F</sub> = 0.9V max @ I<sub>F</sub> = 10mA)**

| Type Number | Marking Code | V <sub>RWM</sub> | Max. Reverse Current, I <sub>R</sub><br>@ V <sub>RWM</sub> (Note 8) | Breakdown Voltage            |     |       |                  | Max. Clamping Voltage, V <sub>C</sub> @ I <sub>PP</sub> (Note 7) |                 | Typical Temperature Coefficient of Reverse Voltage |
|-------------|--------------|------------------|---------------------------------------------------------------------|------------------------------|-----|-------|------------------|------------------------------------------------------------------|-----------------|----------------------------------------------------|
|             |              |                  |                                                                     | V <sub>BR</sub> (Note 8) (V) |     |       | @ I <sub>T</sub> | V <sub>C</sub>                                                   | I <sub>PP</sub> |                                                    |
|             |              | Volts            | nA                                                                  | Min                          | Nom | Max   | mA               | V                                                                | A               | T <sub>C</sub> (%/°C)                              |
| MMBZ15VAL   | K9K          | 12               | 50                                                                  | 14.25                        | 15  | 15.75 | 1.0              | 21                                                               | 1.9             | +0.080                                             |
| MMBZ18VAL   | K9L          | 14.5             | 50                                                                  | 17.10                        | 18  | 18.90 | 1.0              | 25                                                               | 1.6             | +0.090                                             |
| MMBZ20VAL   | K9N          | 17               | 50                                                                  | 19.00                        | 20  | 21.00 | 1.0              | 28                                                               | 1.4             | +0.090                                             |
| MMBZ27VAL   | K9Q          | 22               | 50                                                                  | 25.65                        | 27  | 28.35 | 1.0              | 40                                                               | 1.0             | +0.090                                             |
| MMBZ33VAL   | K9T          | 26               | 50                                                                  | 31.35                        | 33  | 34.65 | 1.0              | 46                                                               | 0.87            | +0.090                                             |

- Notes:
- Device mounted on FR-4 PCB pad layout (2oz copper) as shown on Diodes website at <http://www.diodes.com/package-outlines.html>.
  - Non-repetitive current pulse per Figure 2 and derate above T<sub>A</sub> = +25°C per Figure 2.
  - Short duration pulse test used to minimize self-heating effect.
  - MMBZ5V6AL and MMBZ15VAL exceed 16kV ESD rating, all other voltages exceed 8kV ESD rating.

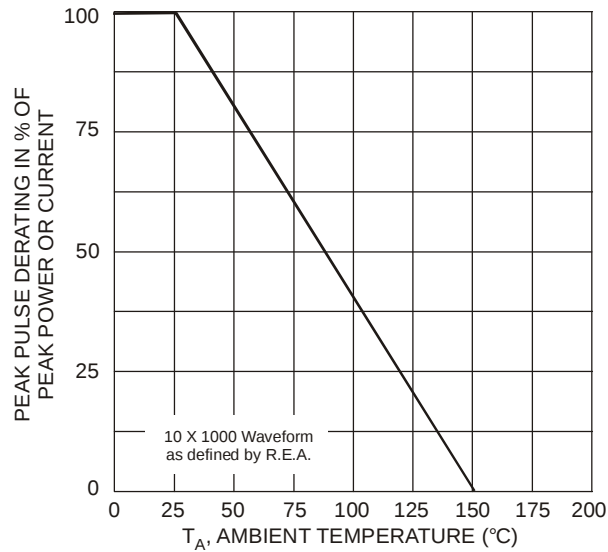


Fig. 1 Pulse Derating Curve

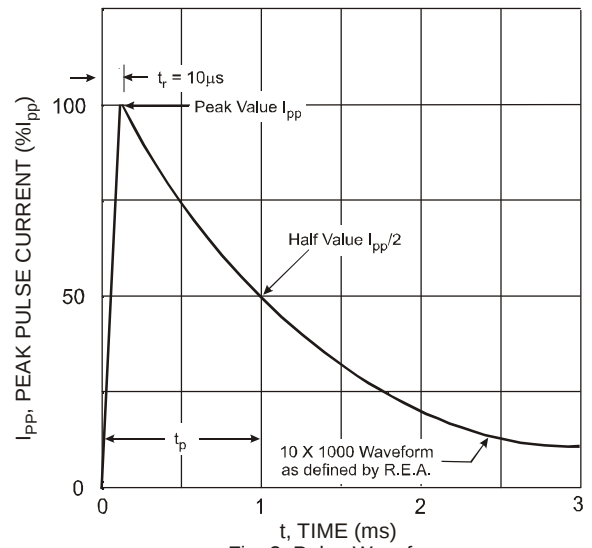


Fig. 2 Pulse Waveform

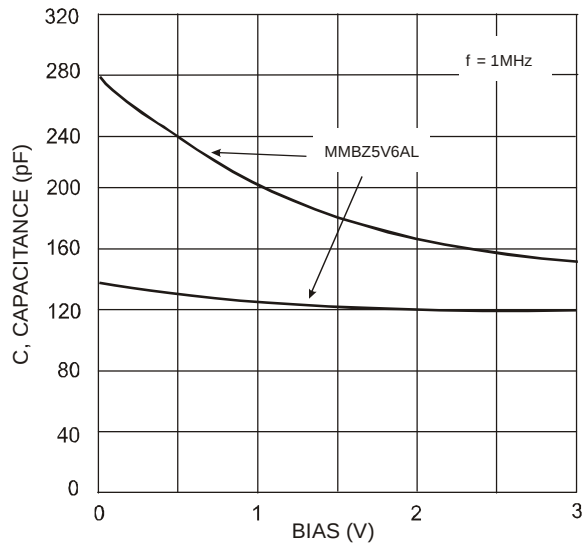


Fig. 3 Typical Capacitance vs. Bias Voltage  
(Lower curve is Bidirectional mode,  
Upper curve is Unidirectional mode)

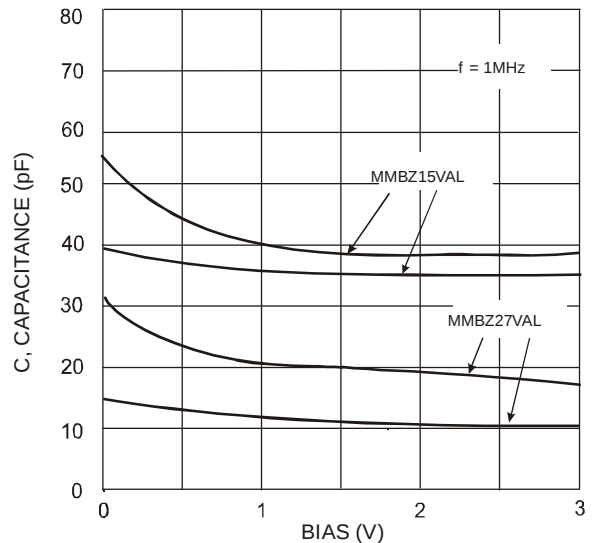
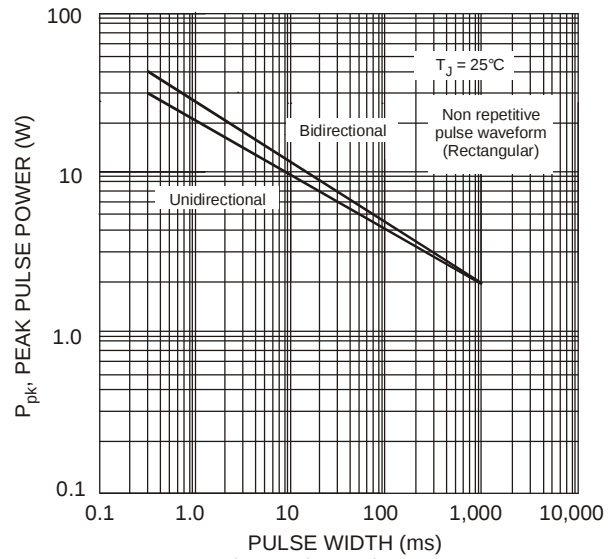
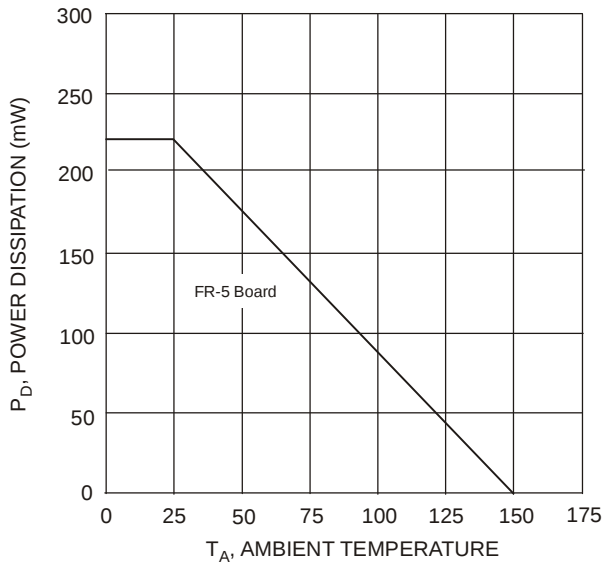
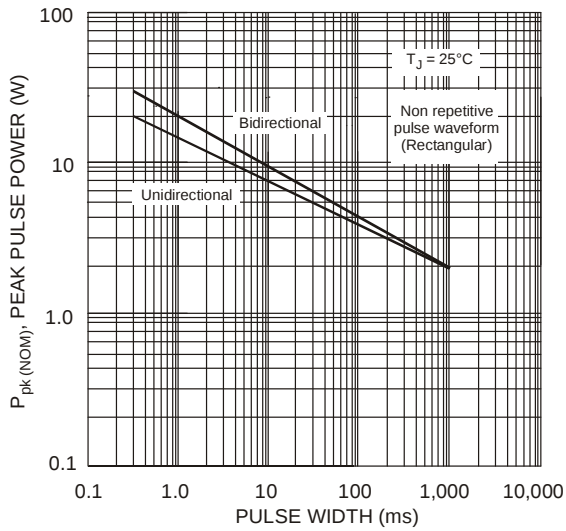


Fig. 4 Typical Capacitance vs. Bias Voltage  
(Lower curve is Bidirectional mode,  
Upper curve is Unidirectional mode)



Power is defined as  $P_{pk} = V_C \times I_{pp}$

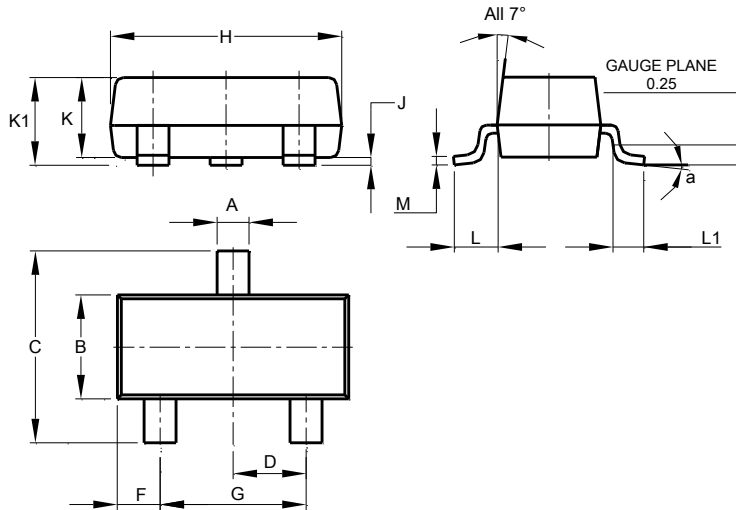


Power is defined as  $P_{pk(NOM)} = V_{BR(NOM)} \times I_{pp}$   
where  $V_{BR(NOM)}$  is the nominal reverse breakdown voltage measured at the low test current used for voltage classification

## Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT23

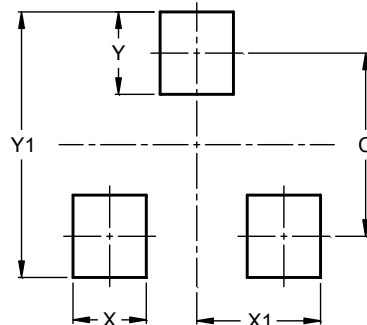


| SOT23                |       |       |       |
|----------------------|-------|-------|-------|
| Dim                  | Min   | Max   | Typ   |
| A                    | 0.37  | 0.51  | 0.40  |
| B                    | 1.20  | 1.40  | 1.30  |
| C                    | 2.30  | 2.50  | 2.40  |
| D                    | 0.89  | 1.03  | 0.915 |
| F                    | 0.45  | 0.60  | 0.535 |
| G                    | 1.78  | 2.05  | 1.83  |
| H                    | 2.80  | 3.00  | 2.90  |
| J                    | 0.013 | 0.10  | 0.05  |
| K                    | 0.890 | 1.00  | 0.975 |
| K1                   | 0.903 | 1.10  | 1.025 |
| L                    | 0.45  | 0.61  | 0.55  |
| L1                   | 0.25  | 0.55  | 0.40  |
| M                    | 0.085 | 0.150 | 0.110 |
| a                    | 0°    | 8°    | --    |
| All Dimensions in mm |       |       |       |

## Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT23



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 2.0           |
| X          | 0.8           |
| X1         | 1.35          |
| Y          | 0.9           |
| Y1         | 2.9           |

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