



MMBZ15VDL, MMBZ27VCL

40W PEAK POWER DUAL SURFACE MOUNT TVS

Features

- Dual TVS in Common Cathode Configuration for ESD Protection
- 40 Watt Peak Power Dissipation @1.0ms (Unidirectional)
- 225mW Power Dissipation
- Ideally Suited for Automated Insertion
- Low Leakage
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3 & 4)

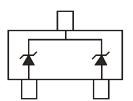
Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic. UL Flammability Rating Classification 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Solderable per MIL-STD-202, Method 208 Lead Free
 Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Polarity: See Diagram
- Weight: 0.008 grams (approximate)









Device Schematic

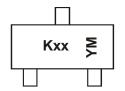
Ordering Information (Note 5 & 6)

| Part Number | Compliance | Case | Packaging |
|----------------|------------|-------|------------------|
| MMBZ15VDL-7-F | Standard | SOT23 | 3000/Tape & Reel |
| MMBZ27VCL-7-F | Standard | SOT23 | 3000/Tape & Reel |
| MMBZ15VDLQ-7-F | Automotive | SOT23 | 3000/Tape & Reel |
| MMBZ27VCLQ-7-F | Automotive | SOT23 | 3000/Tape & Reel |

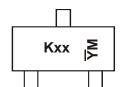
Notes:

- 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- 2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
- 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
- 4. Product manufactured with Date Code V9 (week 33, 2008) and newer are built with Green Molding Compound. Product manufactured prior to Date Code V9 are built with Non-Green Molding Compound and may contain Halogens or Sb₂O₃ Fire Retardants.
- 5. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified.
- 6. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



xx = Product Type Marking Code YM = Date Code Marking for Shanghai Assembly / Test site Y = Year (ex: A = 2013) M = Month (ex: 9 = September)



xx = Product Type Marking Code $\overline{Y}M$ = Date Code Marking for Chengdu Assembly / Test site \overline{Y} = Year (ex: A = 2013) M = Month (ex: 9 = September)

Date Code Key

| Year | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | Т | U | V | W | Х | Υ | Z | Α | В | С | D | Е |
| | | | | | | | | | | | | |
| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |



Maximum Ratings (@TA = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|---------------------------------|-----------------|-------|------|
| Peak Power Dissipation (Note 7) | P _{PK} | 40 | W |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation (Note 8) | P_{D} | 225 | mW |
| Thermal Resistance, Junction to Ambient Air (Note 8) | $R_{	heta JA}$ | 556 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -65 to +150 | °C |

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

V_F = 0.9V max @ I_F = 10mA

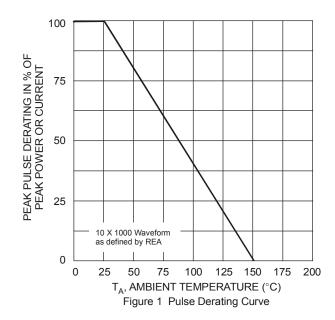
| Type | To a Marking | | Max Reverse | | Breakdown Voltage | | | | amping V _c @ I _{PP} te 7) | Typical Temperature |
|-----------|-----------------|------------------|--|------|----------------------------|------|------------------|------|---|------------------------|
| Number | Marking Code | V _{RWM} | Leakage I _R @ V _{RWM} (Note 9) | V | / _{BR} (Note 9) (| V) | @ I _T | Vc | I _{PP} | Coefficient |
| | | Volts | nA | Min | Nom | Max | mA | ٧ | Α | T _C (%/°C) |
| MMBZ15VDL | KVJ | 12.8 | 100 | 14.3 | 15 | 15.8 | 1.0 | 21.2 | 1.9 | +0.080 |

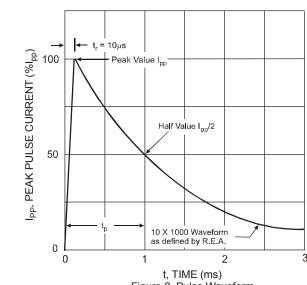
V_F = 1.1V max @ I_F = 200mA

| Town Marking | | | Max Reverse | Breakdown Voltage | | | | Max. Clamping Voltage V _C @ I _{PP} (Note 7) | | Typical Temperature |
|----------------|-----------------|------------------|--|-------------------|--------------------------|-------|------------------|---|-----------------|------------------------|
| Type Number | Marking Code | V _{RWM} | Leakage I _R @ V _{RWM} (Note 9) | V | _{BR} (Note 9) (| V) | @ I _⊤ | Vc | I _{PP} | Coefficient |
| | | Volts | nA | Min | Nom | Max | mA | ٧ | Α | T _C (%/°C) |
| MMBZ27VCL | KVP | 22 | 50 | 25.65 | 27 | 28.35 | 1.0 | 38 | 1.0 | +0.090 |

Notes:

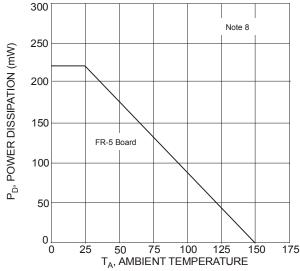
- 7. Non-repetitive current pulse per Figure 2 and derate above T_A = +25°C per Figure 1.
- 8. Device mounted on FR-5 PCB 1.0 x 0.75 x 0.062 inch pad layout as shown on Diodes Inc. suggested pad layout AP02001, which can be found on our website at http://www.diodes.com. 200mW per element must not be exceeded.
- 9. Short duration pulse test used to minimize self-heating effect.



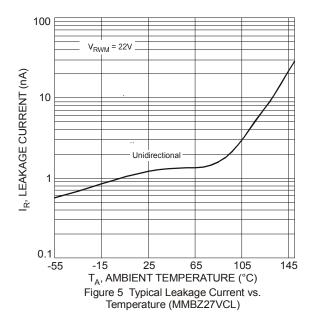




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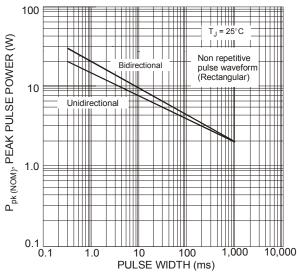


Figure 7 Pulse Rating Curve, $P_{pk \text{ (NOM)}}$ (W) vs. Pulse Width (ms) Power is defined as $P_{pk \text{ (NOM)}} = V_{BR \text{(NOM)}} \times I_{pp}$ where $V_{BR \text{(NOM)}}$ is the nominal breakdown voltage

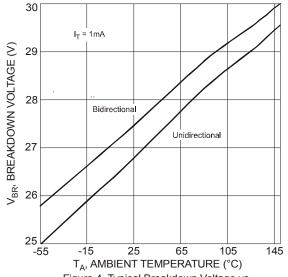


Figure 4 Typical Breakdown Voltage vs. Temperature (MMBZ27VCL)

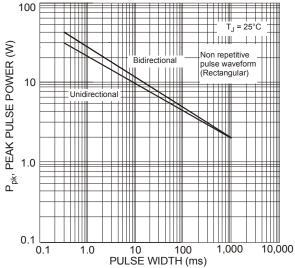
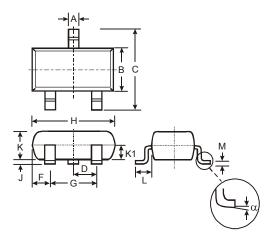


Figure 6 Pulse Rating Curve, $P_{pk}(W)$ vs. Pulse Width (ms) Power is defined as $P_{pk} = V_C \times I_{pp}$



Package Outline Dimensions

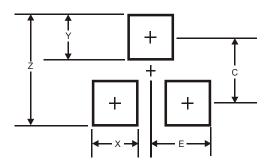
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



| | SOT23 | | | | | | | |
|-----|----------------------|------|-------|--|--|--|--|--|
| Dim | Min | Max | Тур | | | | | |
| Α | 0.37 | 0.51 | 0.40 | | | | | |
| В | 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 | | | | | |
| 7 | 0.013 | 0.10 | 0.05 | | | | | |
| K | 0.903 | 1.10 | 1.00 | | | | | |
| K1 | - | - | 0.400 | | | | | |
| L | 0.45 | 0.61 | 0.55 | | | | | |
| М | 0.085 | 0.18 | 0.11 | | | | | |
| α | 0° | 8° | - | | | | | |
| All | All Dimensions in mm | | | | | | | |

Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



| Dimensions | Value (in mm) |
|------------|---------------|
| Z | 2.9 |
| Х | 0.8 |
| Υ | 0.9 |
| С | 2.0 |
| E | 1.35 |



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