

## Features

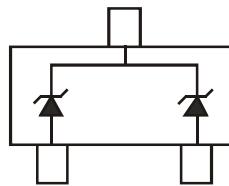
- Dual TVS in Common Cathode Configuration for ESD Protection
- 40 Watt Peak Power Dissipation @ 1.0ms (Unidirectional)
- 225mW Power Dissipation
- Ideally Suited for Automated Insertion
- Low Leakage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (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 e3 Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Polarity: See Diagram
- Weight: 0.008 grams (approximate)



Top View



Device Schematic

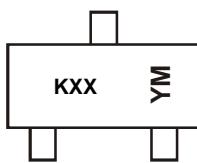
## Ordering Information (Note 5 & 6)

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

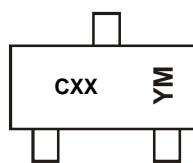
Notes:

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See <http://www.diodes.com> 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 Sb<sub>2</sub>O<sub>3</sub> 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>.

## Marking Information



K = SAT(Shanghai Assembly/Test site)  
 KXX = Product Type Marking Code:  
 KVJ = MMBZ15VDL  
 KVP = MMBZ27VCL  
 YM = Date Code Marking  
 Y = Year (ex: Z = 2012)  
 M = Month (ex: 9 = September)



C = CAT(Chengdu Assembly/Test site)  
 CXX = Product Type Marking Code:  
 CVJ = MMBZ15VDL  
 CVP = MMBZ27VCL  
 YM = Date Code Marking  
 Y = Year (ex: Z = 2012)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Code	T	U	V	W	X	Y	Z	A	B	C	D	E
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

**Maximum Ratings** (@ $T_A = +25^\circ\text{C}$ , 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)	$R_{\theta JA}$	556	°C/W
Operating and Storage Temperature Range	$T_J, T_{STG}$	-65 to +150	°C

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

 $V_F = 0.9\text{V}$  max @  $I_F = 10\text{mA}$ 

Type Number	Marking Code	$V_{RWM}$	Max. Reverse Leakage $I_R$ @ $V_{RWM}$ (Note 9)	Breakdown Voltage				Max. Clamping Voltage $V_C$ @ $I_{PP}$ (Note 7)	Typical Temperature Coefficient	
				$V_{BR}$ (Note 9) (V)			@ $I_T$			
Volts	nA	Min	Nom	Max	mA	V	A	$T_C$ (°C)		
MMBZ15VDL	KVJ or CVJ	12.8	100	14.3	15	15.8	1.0	21.2	1.9	+0.080

 $V_F = 1.1\text{V}$  max @  $I_F = 200\text{mA}$ 

Type Number	Marking Code	$V_{RWM}$	Max. Reverse Leakage $I_R$ @ $V_{RWM}$ (Note 9)	Breakdown Voltage				Max. Clamping Voltage $V_C$ @ $I_{PP}$ (Note 7)	Typical Temperature Coefficient	
				$V_{BR}$ (Note 9) (V)			@ $I_T$			
Volts	nA	Min	Nom	Max	mA	V	A	$T_C$ (°C)		
MMBZ27VCL	KVP or CVP	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  $T_A = +25^\circ\text{C}$  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.

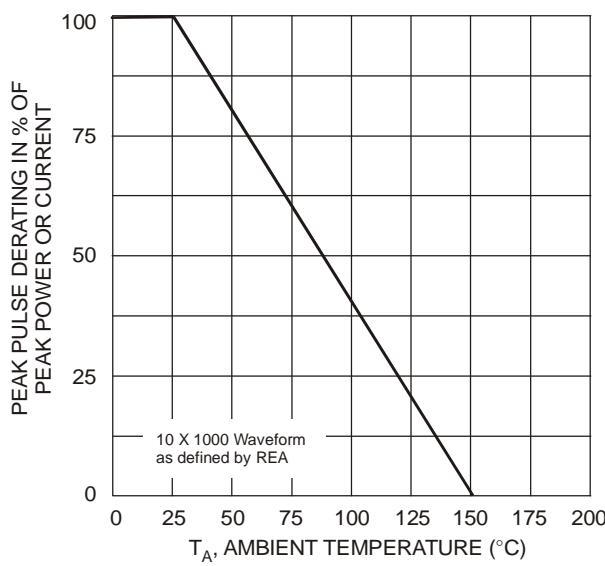


Figure 1 Pulse Derating Curve

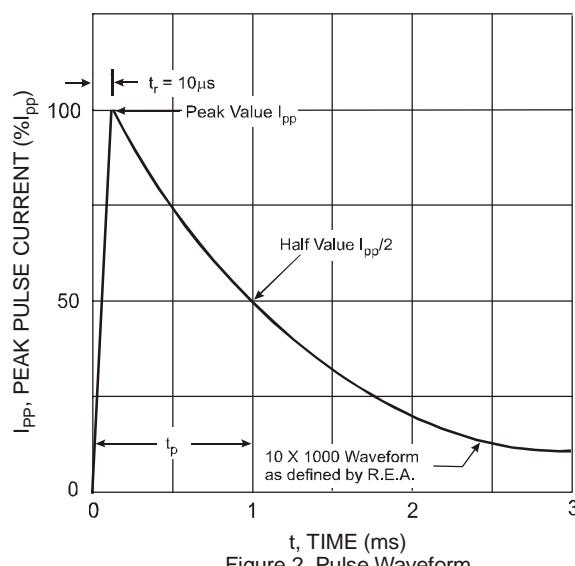


Figure 2 Pulse Waveform

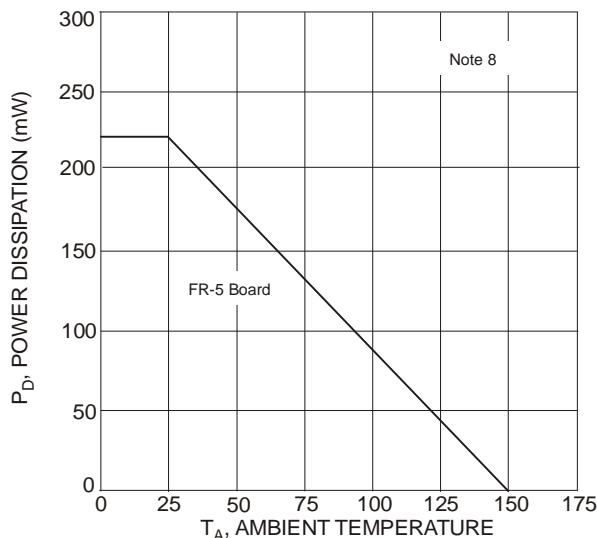


Figure 3 Steady State Power Derating Curve

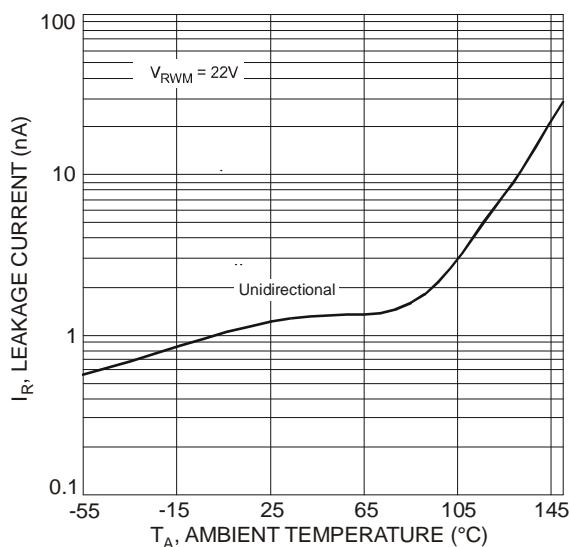


Figure 5 Typical Leakage Current vs. Temperature (MMBZ27VCL)

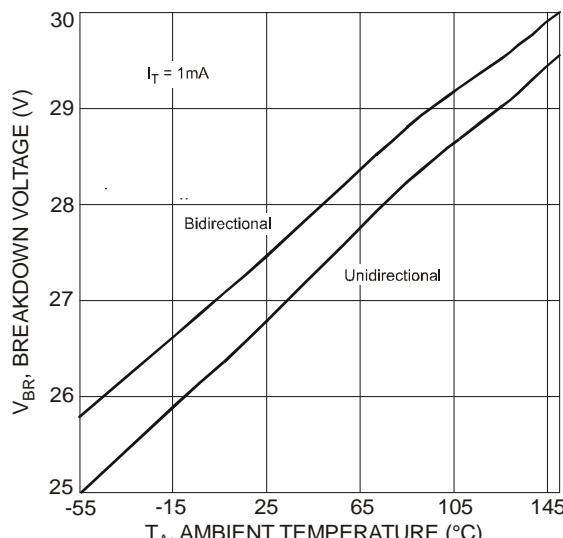


Figure 4 Typical Breakdown Voltage vs. Temperature (MMBZ27VCL)

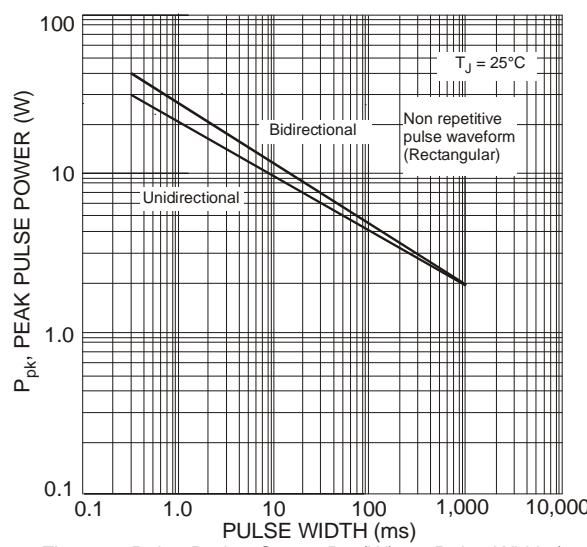


Figure 6 Pulse Rating Curve,  $P_{pk}$  (W) vs. Pulse Width (ms)  
Power is defined as  $P_{pk} = V_C \times I_{pp}$

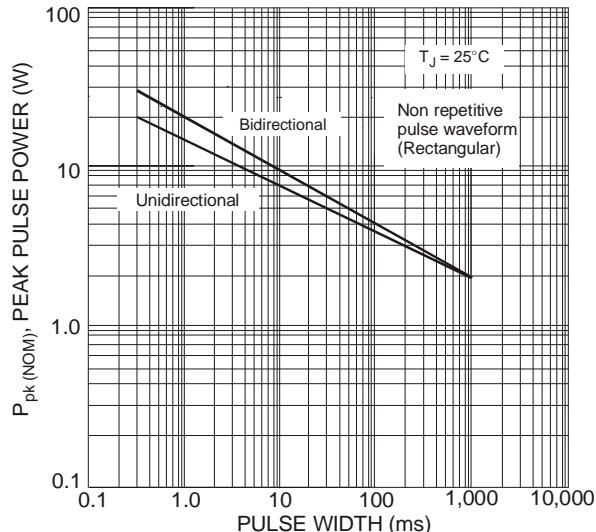
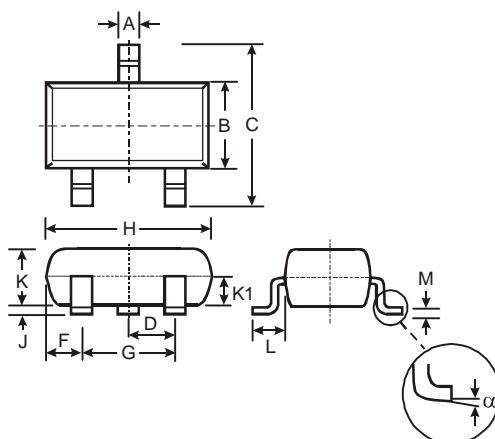


Figure 7 Pulse Rating Curve,  $P_{pk}$  (NOM) (W) vs. Pulse Width (ms)  
Power is defined as  $P_{pk(NOM)} = V_{BR(NOM)} \times I_{pp}$   
where  $V_{BR(NOM)}$  is the nominal breakdown voltage

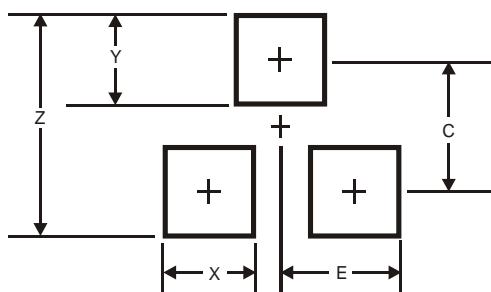
## Package Outline Dimensions



SOT23			
Dim	Min	Max	Typ
<b>A</b>	0.37	0.51	0.40
<b>B</b>	1.20	1.40	1.30
<b>C</b>	2.30	2.50	2.40
<b>D</b>	0.89	1.03	0.915
<b>F</b>	0.45	0.60	0.535
<b>G</b>	1.78	2.05	1.83
<b>H</b>	2.80	3.00	2.90
<b>J</b>	0.013	0.10	0.05
<b>K</b>	0.903	1.10	1.00
<b>K1</b>	-	-	0.400
<b>L</b>	0.45	0.61	0.55
<b>M</b>	0.085	0.18	0.11
$\alpha$	0°	8°	-

All Dimensions in mm

## Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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