

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)**
- **PPAP Capable (Note 4)**

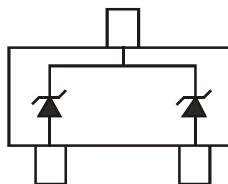
Mechanical Data

- 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^{e3}
Lead-Free Plating (Matte Tin Finish Annealed over Alloy 42
Leadframe)
- Polarity: See Diagram
- Weight: 0.008 grams (Approximate)

SOT23



Top View



Device Schematic

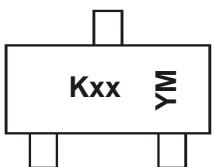
Ordering Information (Note 5 & 6)

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

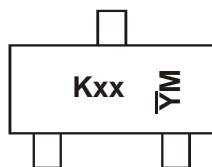
Notes:

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See <https://www.diodes.com/quality/lead-free/> 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: G = 2019)
 M = Month (ex: 9 = September)



xx = Product Type Marking Code
 YM = Date Code Marking for Chengdu
 Assembly / Test site
 Y = Year (ex: G = 2019)
 M = Month (ex: 9 = September)

Date Code Key

Year	2006	2007	2019	2020	2021	2022	2023	2024	2025	2026	2027
Code	T	U	G	H	I	J	K	L	M	N	O
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	V_C	I_{PP}			
				Volts	nA	Min	Nom	Max	mA	V	A	T_C (°C)
MMBZ15VDL	KVJ	12.8	100	14.3	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	V_C	I_{PP}			
				Volts	nA	Min	Nom	Max	mA	V	A	T_C (°C)
MMBZ27VCL	KVP	22	50	25.65	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 $1.0 \times 0.75 \times 0.062$ 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.

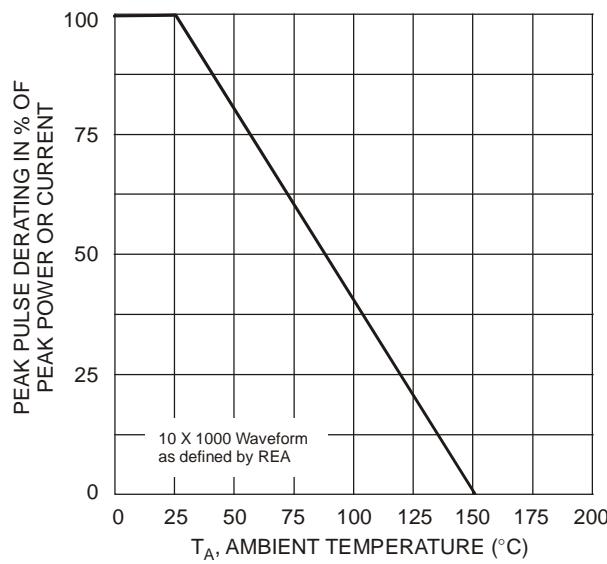


Figure 1 Pulse Derating Curve

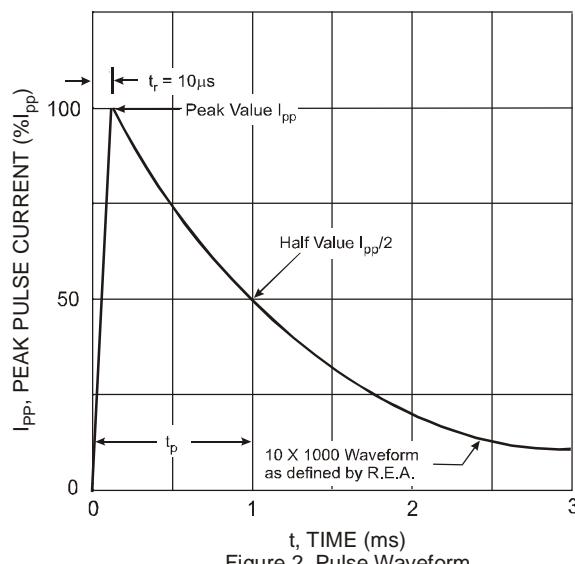


Figure 2 Pulse Waveform

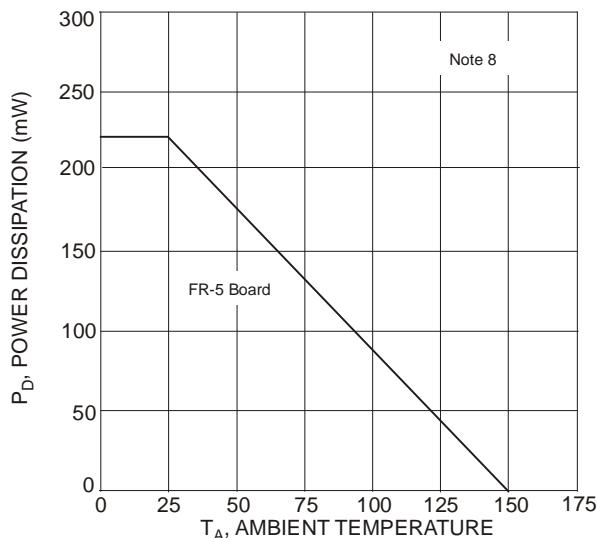


Figure 3 Steady State Power Derating Curve

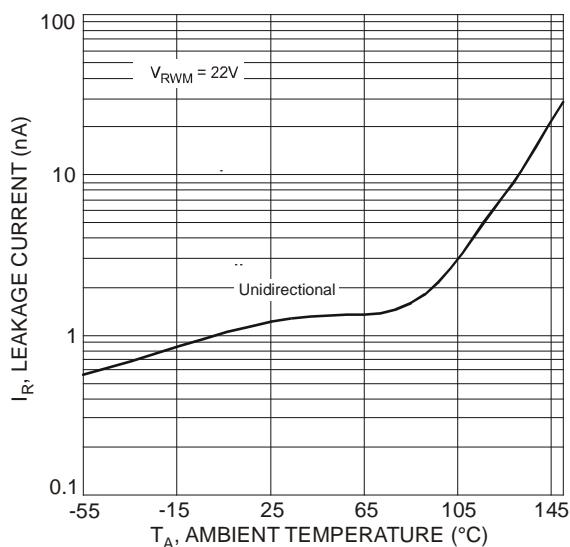


Figure 5 Typical Leakage Current vs. Temperature (MMBZ27VCL)

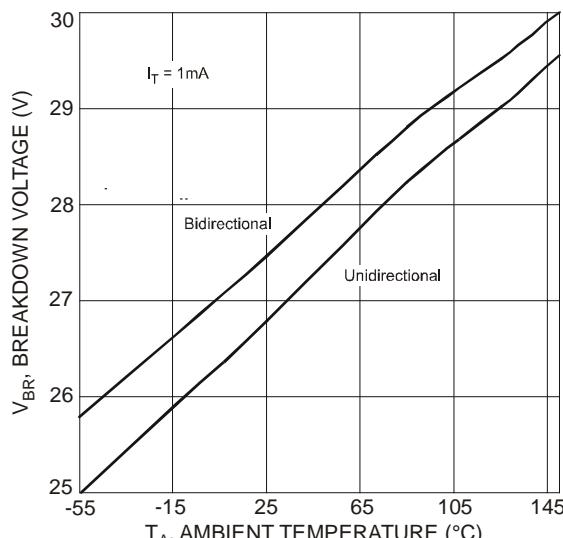


Figure 4 Typical Breakdown Voltage vs. Temperature (MMBZ27VCL)

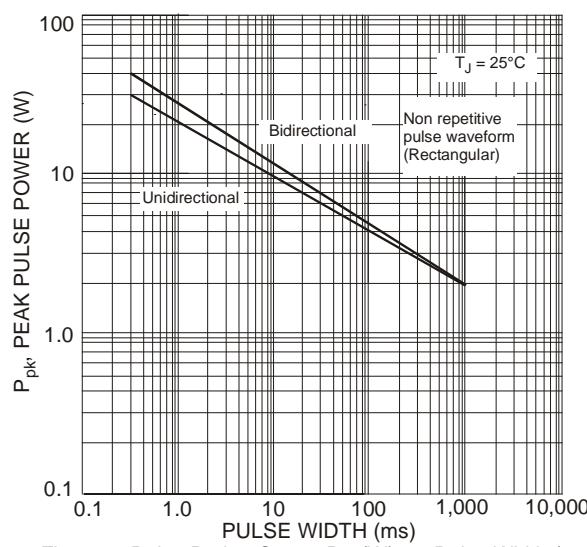


Figure 6 Pulse Rating Curve, P_{pk} (W) vs. Pulse Width (ms)
Power is defined as $P_{pk} = V_C \times I_{pp}$

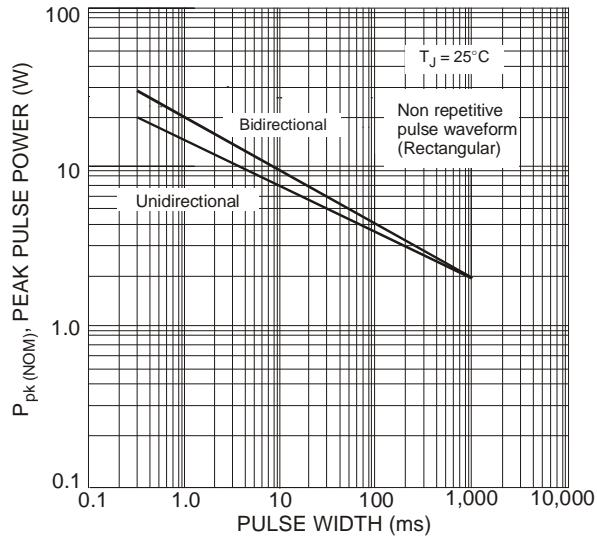
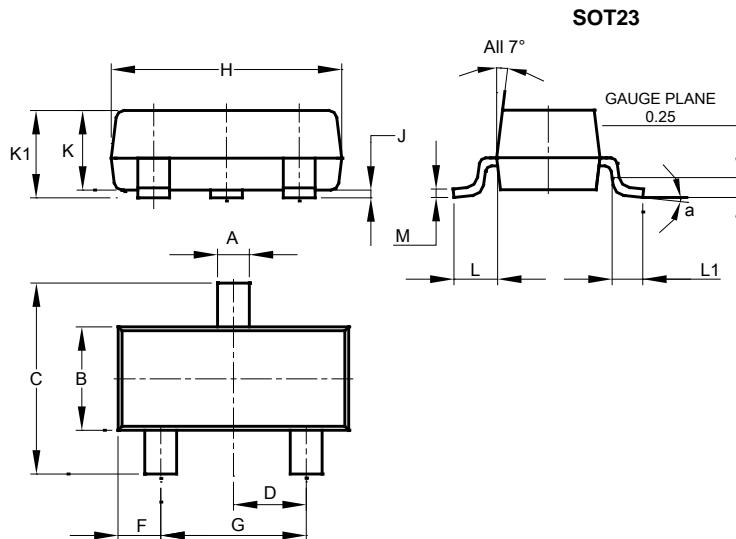


Figure 7 Pulse Rating Curve, P_{pk} (NOM) (W) vs. Pulse Width (ms)

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

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

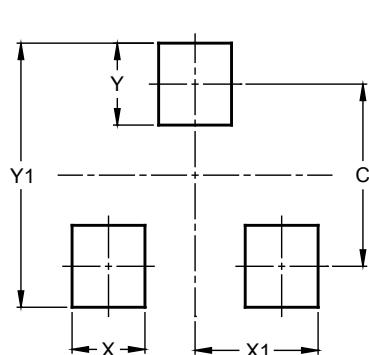


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	—

All Dimensions in mm

Suggested Pad Layout

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



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

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