Lead-free Green

MMBZ15VDL, MMBZ27VCL

40W PEAK POWER DUAL SURFACE MOUNT TVS

Features

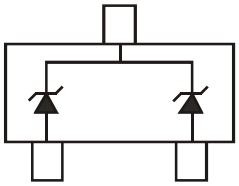
- Dual TVS in Common Cathode Configuration for ESD Protection
- 40 Watt Peak Power Dissipation @1.0ms (Unidirectional)
- 225mW Power Dissipation
- Ideally Suited for Automated Insertion
- Low Leakage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device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

SOT23

Top View



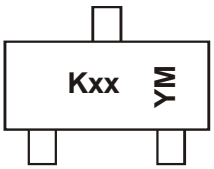
Device Schematic

Ordering Information (Note 5 & 6)

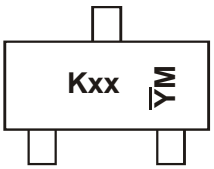
Part Number	Compliance	Case	Packaging
MMBZ15VDL-7-F	Standard	SOT23	3000/Tape & Reel
MMBZ27VCL-7-F	Standard	SOT23	3000/Tape & Reel
MMBZ15VDLQ-7-F	Automotive	SOT23	3000/Tape & Reel
MMBZ27VCLQ-7-F	Automotive	SOT23	3000/Tape & Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) 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 Sb_2O_3 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	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

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Maximum Ratings (@T_A = +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)	$R_{\theta JA}$	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 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	15	15.8	1.0	21.2	1.9	+0.080

V_F = 1.1V max @ I_F = 200mA

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	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.

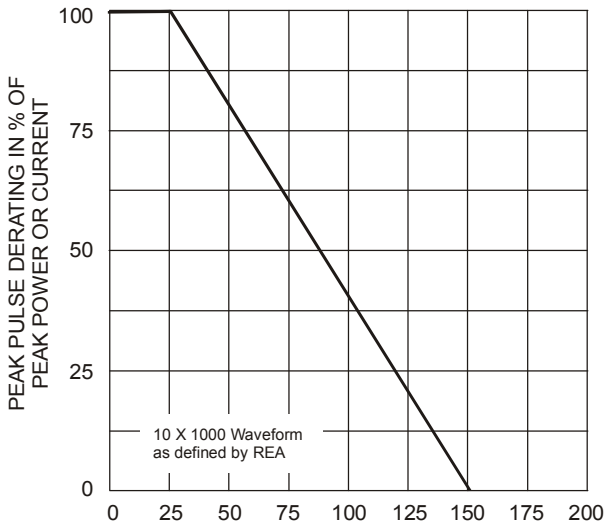

Figure 1 Pulse Derating Curve

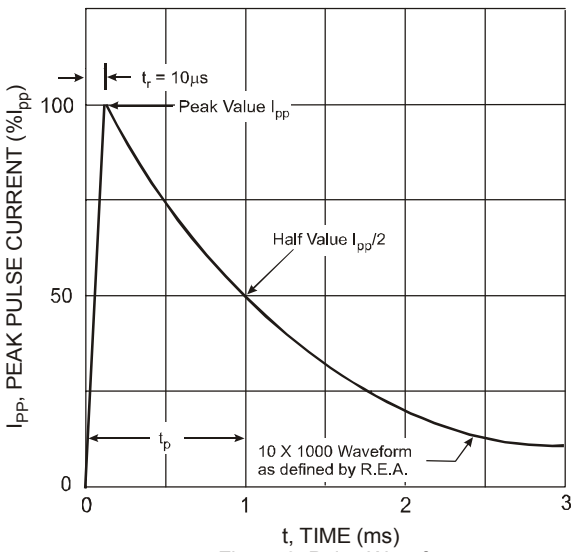

Figure 2 Pulse Waveform

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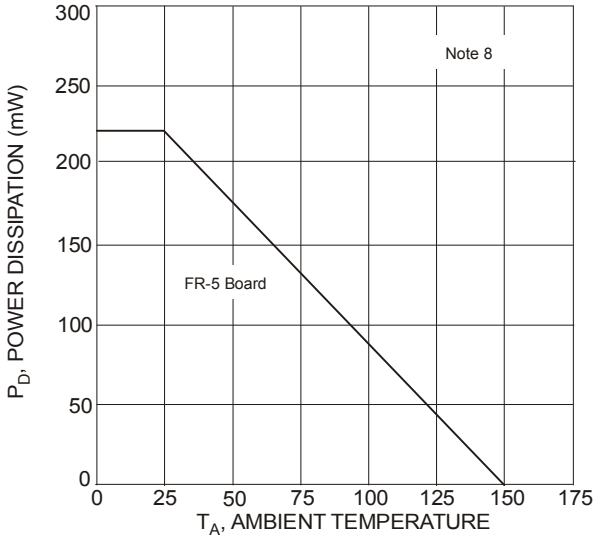

Figure 3 Steady State Power Derating Curve

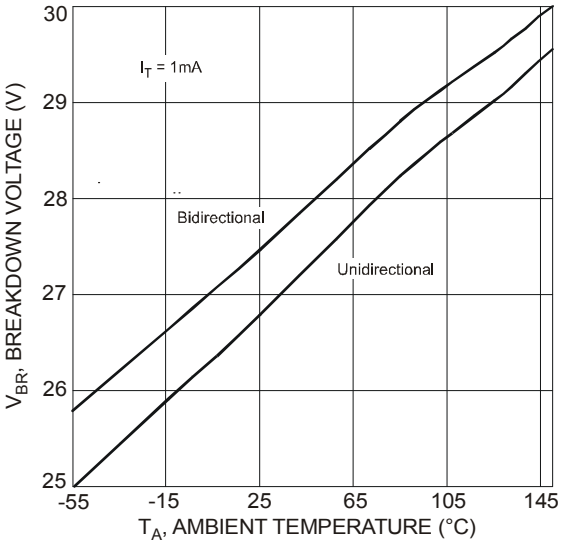

Figure 4 Typical Breakdown Voltage vs. Temperature (MMBZ27VCL)

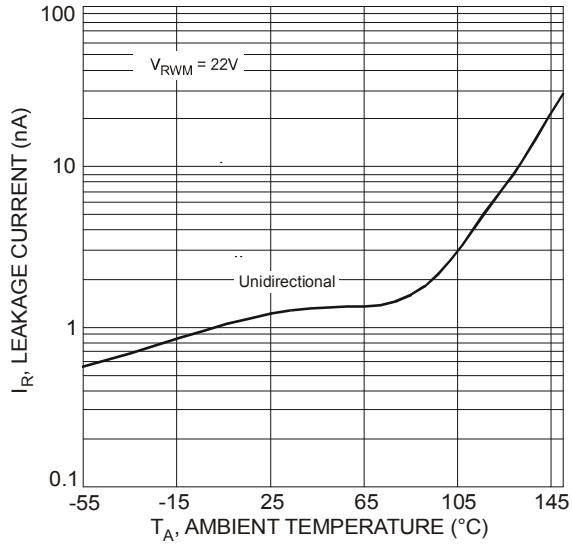

Figure 5 Typical Leakage Current vs. Temperature (MMBZ27VCL)

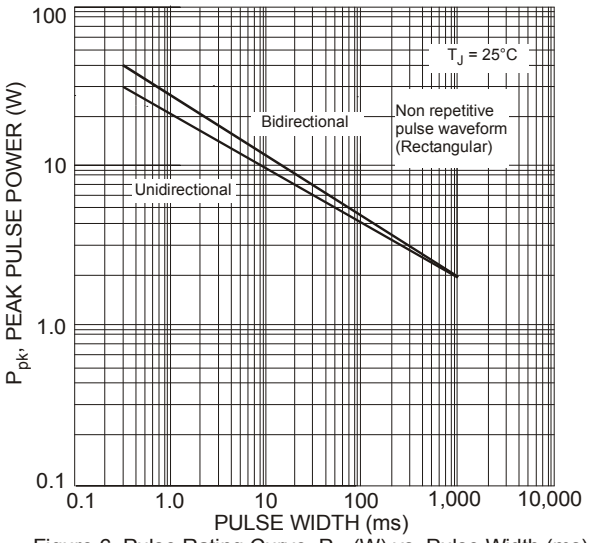

Figure 6 Pulse Rating Curve, P_{pk} (W) vs. Pulse Width (ms)
Power is defined as $P_{pk} = V_C \times I_{pp}$

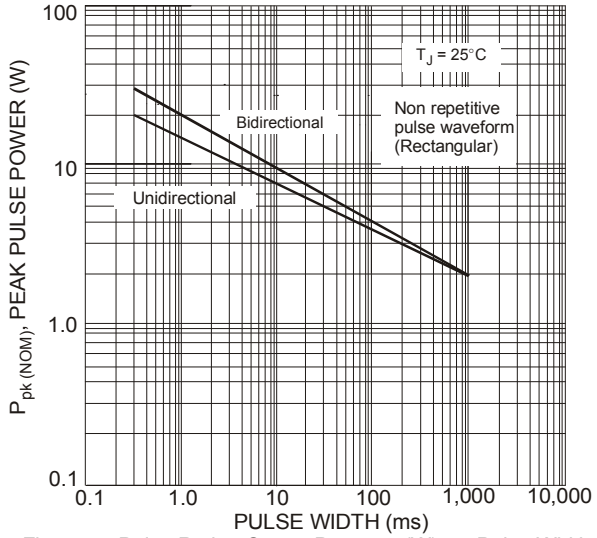

Figure 7 Pulse Rating Curve, $P_{pk\ (NOM)}$ (W) vs. Pulse Width (ms)
Power is defined as $P_{pk(NOM)} = V_{BR(NOM)} \times I_{pp}$
where $V_{BR(NOM)}$ is the nominal breakdown voltage

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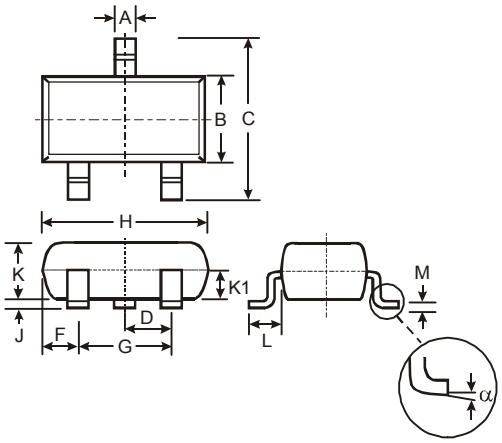
Package Outline Dimensions

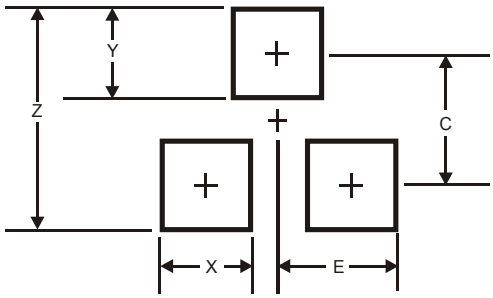
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



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	0.903	1.10	1.00
K1	-	-	0.400
L	0.45	0.61	0.55
M	0.085	0.18	0.11
α	0°	8°	-
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
X	0.8
Y	0.9
C	2.0
E	1.35

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