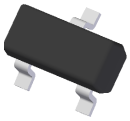
Features

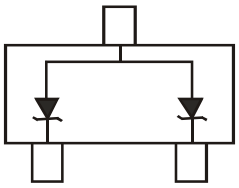
- Dual TVS in Common Anode Configuration
- 40W Peak Power Dissipation Rating @ 1.0ms (Unidirectional)
- 225mW Power Dissipation
- Ideally Suited for Automated Insertion
- Low Leakage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The MMBZ27VALQ-7-F and MMBZ27VALQ-13-F are suitable for automotive applications requiring specific change control; these parts are AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.** https://www.diodes.com/quality/product-definitions/

Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic "Green" Molding Compound. UL Flammability Classification 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Solderable per MIL-STD-202, Method 208 e3
- Polarity: See Diagram
- Lead Free Plating (Matte Tin Finish Annealed over Alloy 42 Leadframe).
- Weight: 0.008 grams (Approximate)



Top View



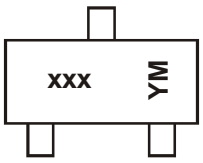
Device Schematic

Ordering Information (Note 4)

Part Number	Qualification	Case	Packaging
MMBZ27VAL-7-F	Commercial	SOT23	3,000/Tape & Reel
MMBZ27VALQ-7-F	Automotive	SOT23	3,000/Tape & Reel
MMBZ27VALQ-13-F	Automotive	SOT23	10,000/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. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information



xxx = Product Type Marking Code (See Electrical Characteristics Table)
YM = Date Code Marking
Y = Year (ex: I = 2021)
M = Month (ex: 9 = September)

Date Code Key

Year	2006	.....	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Code	T	.....	I	J	K	L	M	N	O	P	R	S

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 6)	P_{PK}	40	W

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	225	mW
Thermal Resistance, Junction to Ambient Air (Note 5)	$R_{\theta JA}$	556	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

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

40 Watt (V_F = 0.9V max @ I_F = 10mA)

Type Number	Marking Code	V_{RWM}	Max. Reverse Current, I_R @ V_{RWM} (Note 7)	Breakdown Voltage				Max. Clamping Voltage, V_C @ I_{PP} (Note 6)		Typical Temperature Coefficient of Reverse Voltage
				V_{BR} (Note 7) (V)			@ I_T	V_C	I_{PP}	
		Volts	nA	Min	Nom	Max	mA	V	A	T_C (%/°C)
MMBZ27VAL	K9Q	22	50	25.65	27	28.35	1.0	40	1.0	+0.090

Notes:
5. Device mounted on FR-4 PCB pad layout (2oz copper) as shown on Diodes website at http://www.diodes.com/package-outlines.html.
6. Non-repetitive current pulse, per Figure 2, and derate above T_A = +25°C, per Figure 2.
7. Short duration pulse test used to minimize self-heating effect.

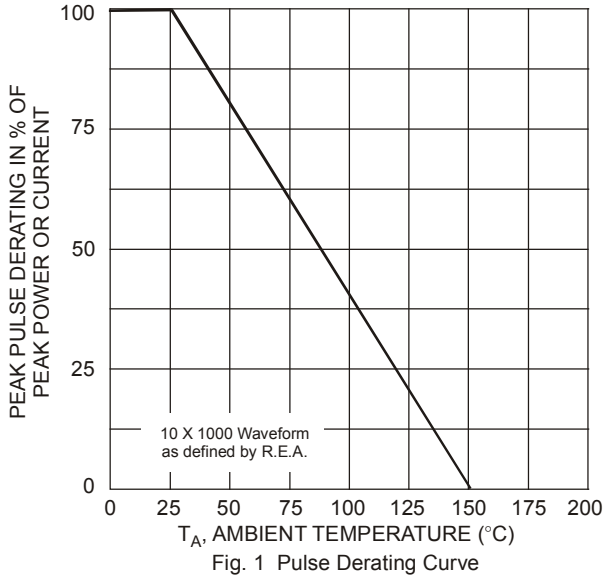

Fig. 1 Pulse Derating Curve

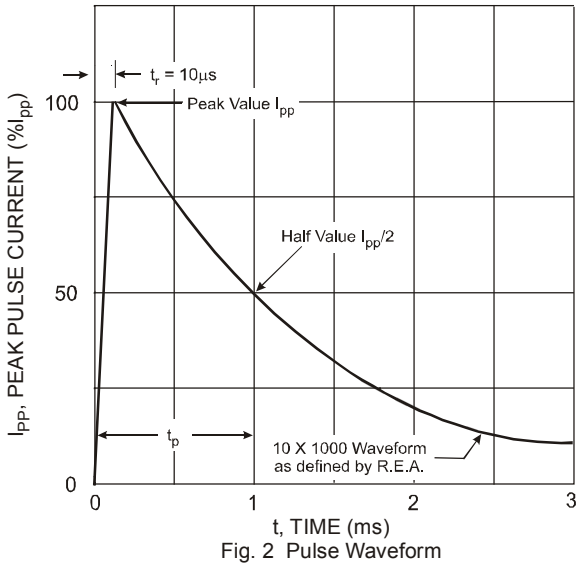

Fig. 2 Pulse Waveform

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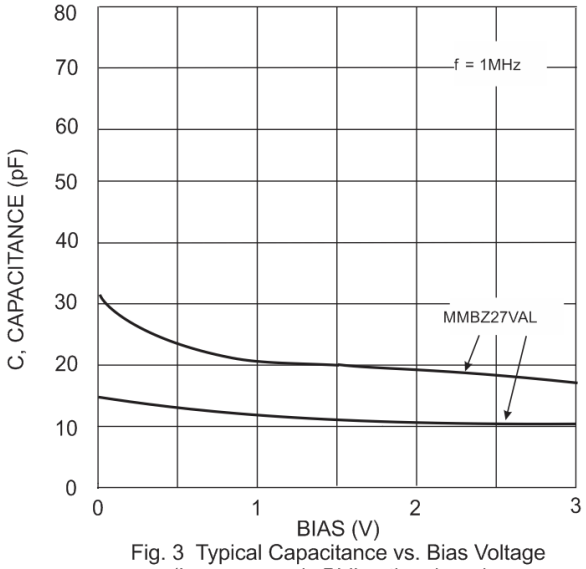

Fig. 3 Typical Capacitance vs. Bias Voltage
(Lower curve is Bidirectional mode,
Upper curve is Unidirectional mode)

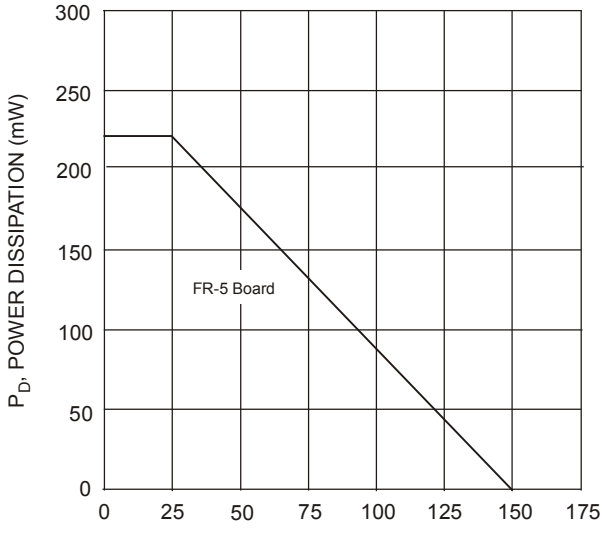

Fig. 4 Steady State Power Derating Curve

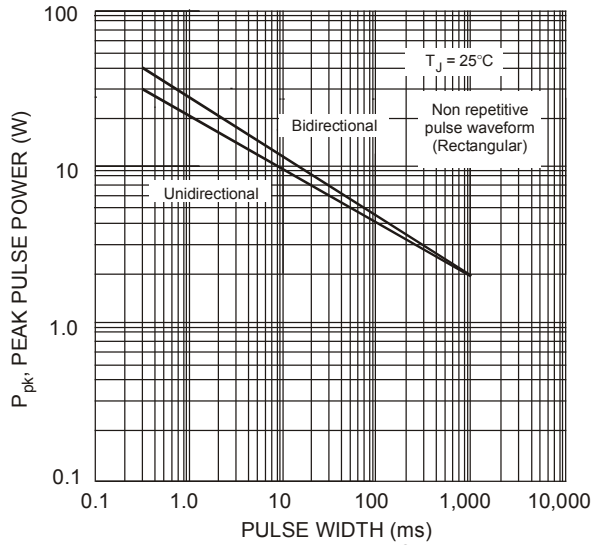

Fig. 5 Pulse Rating Curve,
P_{pk} (W) vs. Pulse Width (ms)

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

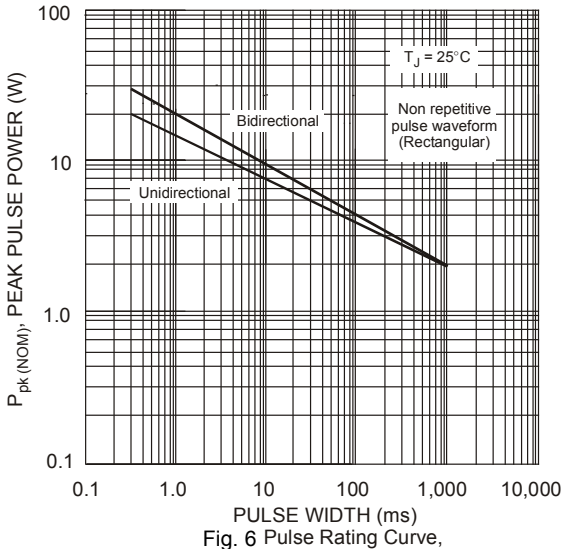

Fig. 6 Pulse Rating Curve,
$P_{pk\ (NOM)}$ (W) vs. Pulse Width (ms)

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

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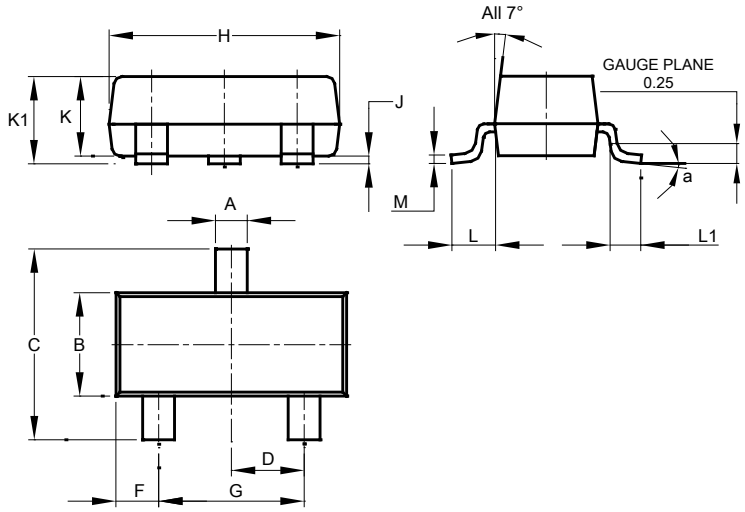
Package Outline Dimensions

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

SOT23

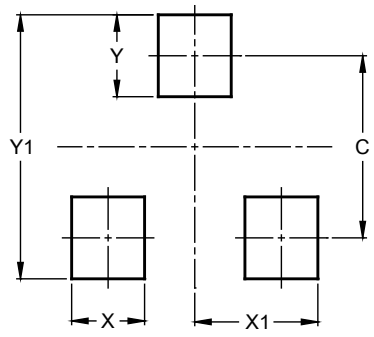


SOT23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

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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