NOT RECOMMENDED FOR NEW DESIGN
USE MMBZ27VALAQ-7, MMBZ27VALAQ-13, MMBZ27VALA-7

Lead-free Green

MMBZ27VAL

24W AND 40W PEAK POWER DUAL SURFACE-MOUNT TVS

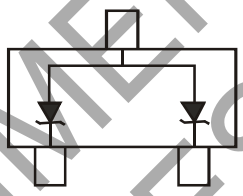
Features

- 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 is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**
  https://www.diodes.com/quality/product-definitions/

Mechanical Data

- Package: SOT23
- Package 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
  Lead Free Plating (Matte Tin Finish Annealed over Alloy 42 Leadframe). (e3)
- Polarity: See Diagram
- Weight: 0.008 grams (Approximate)

Top View



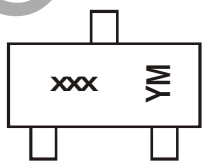
Device Schematic

Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
MMBZ27VAL-7-F	SOT23	3000	Tape & Reel
MMBZ27VALQ-7-F	SOT23	3000	Tape & Reel
MMBZ27VALQ-13-F	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: K = 2023)
M = Month (ex: 7 = July)

Date Code Key

Year	2006	-	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Code	T	-	K	L	M	N	P	R	S	T	U	V

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°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	Typ	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 Incorporated's 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.

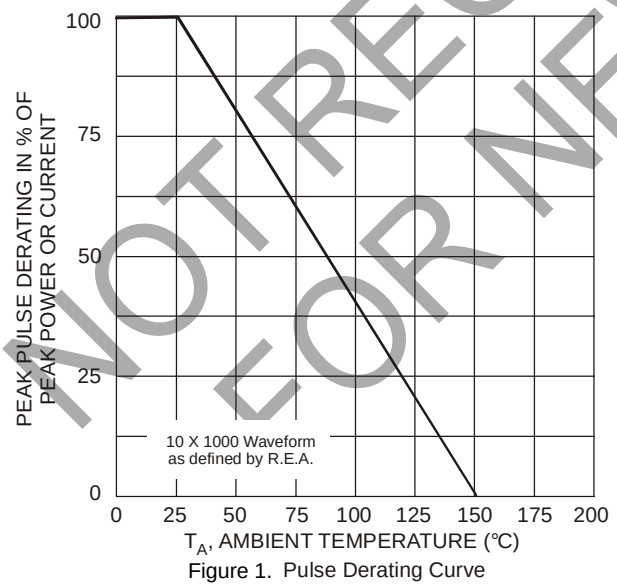


Figure 1. Pulse Derating Curve

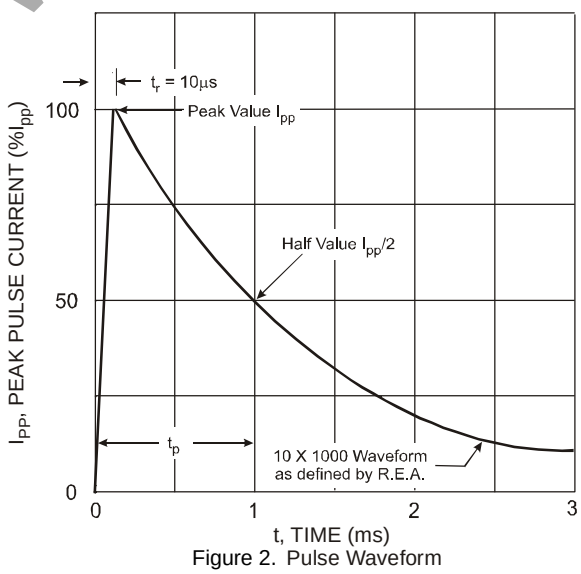


Figure 2. Pulse Waveform

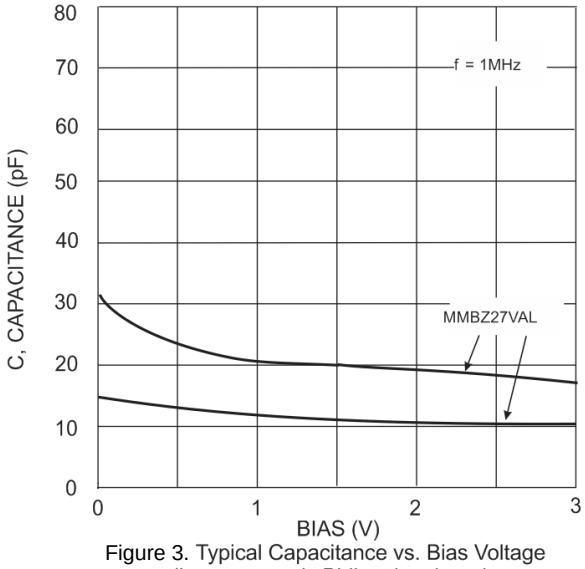


Figure 3. Typical Capacitance vs. Bias Voltage
(Lower curve is Bidirectional mode,
Upper curve is Unidirectional mode)

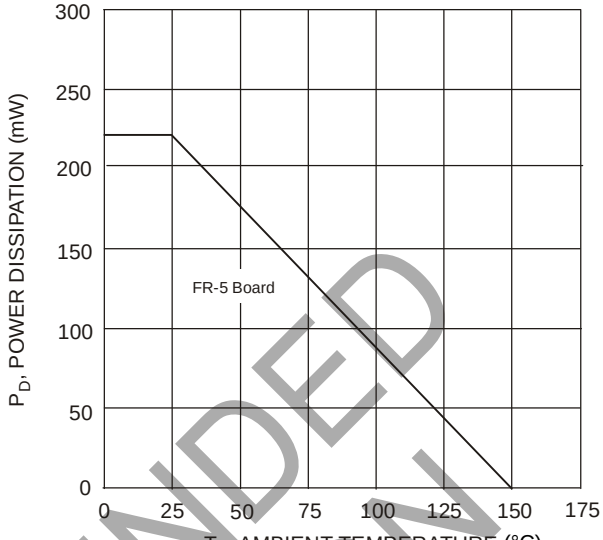


Figure 4. Steady State Power Derating Curve

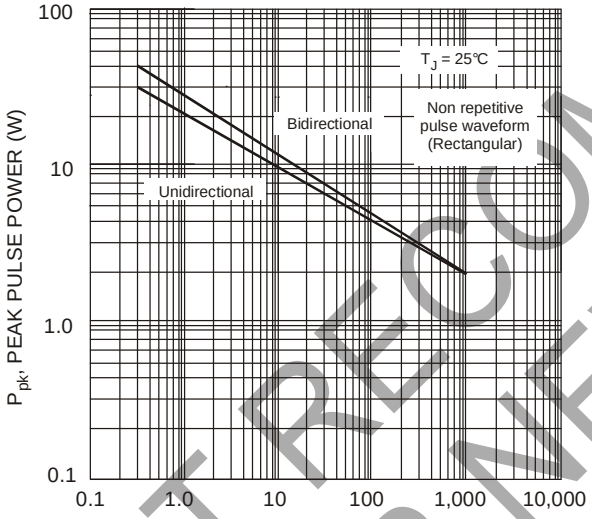


Figure 5. Pulse Rating Curve,
P_{pk} (W) vs. Pulse Width (ms)
Power is defined as $P_{pk} = V_C \times I_{pp}$

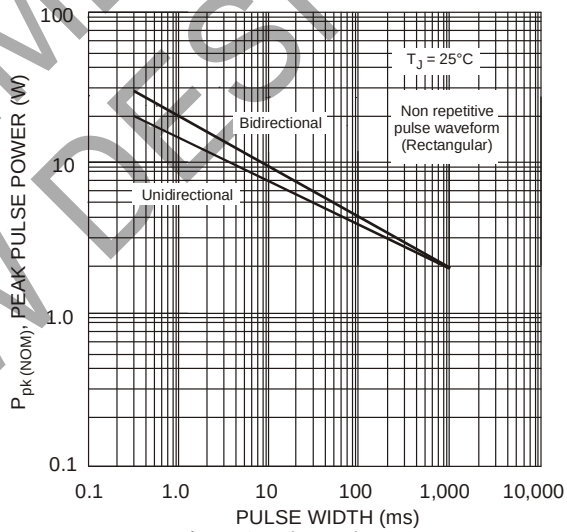
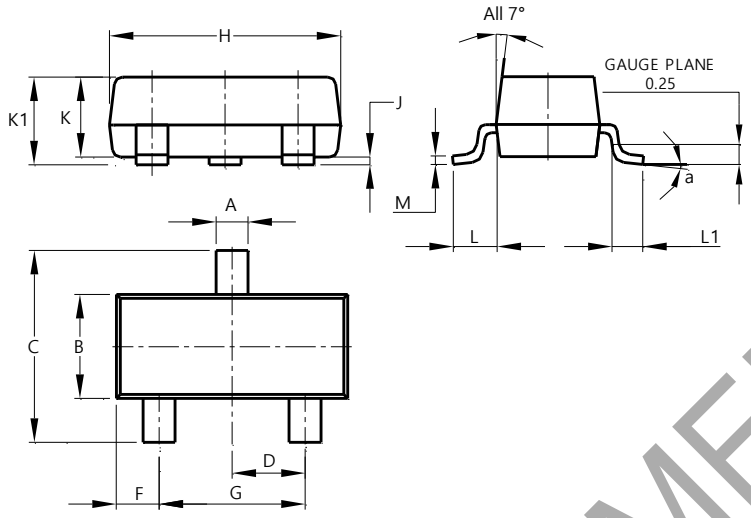


Figure 6. Pulse Rating Curve,
$P_{pk\ (NOM)}$ (W) vs. Pulse Width (ms)
Power is defined as $P_{pk(NOM)} = V_{BR(NOM)} \times I_{pp}$
where $V_{BR(NOM)}$ is the nominal reverse breakdown voltage
measured at the low test current used
for voltage classification

Package Outline Dimensions

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

SOT23

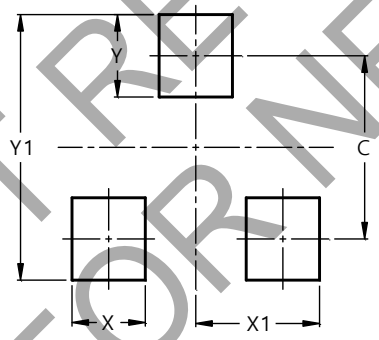


SOT23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

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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