

# MDE Semiconductor, Inc.

78-150 Calle Tampico, Unit 210, La Quinta, CA., USA 92253 Tel: 760-564-8656 • Fax: 760-564-2414  
1-800-831-4881 Email: sales@mdesemiconductor.com Web: www.mdesemiconductor.com

## BZW04 SERIES

### GLASS PASSIVATED JUNCTION TRANSIENT VOLTAGE SUPPRESSOR VOLTAGE-6.8 TO 376 Volts 400 Watt Peak Pulse Power

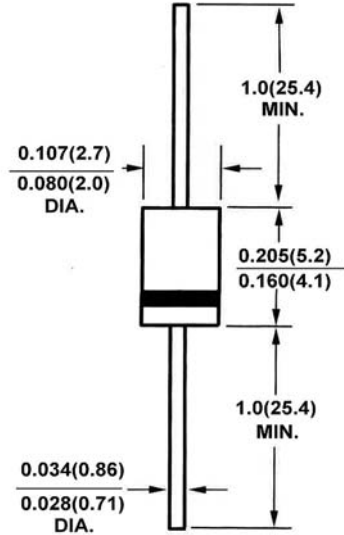
#### FEATURES

- Plastic package has Underwriters Laboratory Flammability Classification 94 V-O
- Glass passivated chip junction in DO-41 package
- 400W surge capability at 1ms
- Excellent clamping capability
- Low zener impedance
- Low incremental surge resistance
- Excellent clamping capability
- Fast response time: typically less than 1.0 ps from 0 volts to BV min
- Typical IR less than 1µA above 10V
- High temperature soldering guaranteed: 300°C/10 seconds/ .375", (9.5mm) lead length, 5lbs., (2.3kg) tension

#### MECHANICAL DATA

Case: JEDEC DO-41 Molded plastic  
Terminals: Axial leads, solderable per MIL-STD-750, Method 2026  
Polarity: Color band denoted positive end (cathode) except Bipolar  
Mounting Position: Any  
Weight: 0.012 ounces, 0.3 grams

DO-204AL (DO-41 Plastic)



Dimensions in inches (millimeters)

#### DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use C or CA Suffix for types BZW-04-5V8 thru types BZW04-376 (e.g. BZW04-5V8B, BZW04-376B)  
Electrical characteristics apply in both directions.

#### MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Single phase, half wave, 60Hz, resistive or inductive load.

For Capacitive load, derate current by 20%

RATING	SYMBOL	VALUE	UNITS
Peak Pulse Power Dissipation at TA = 25 °C, TP = 1ms (NOTE 1)	P <sub>PPM</sub>	Minimum 400	Watts
Peak Pulse Current of on 10/1000 µs waveform (Note 1)	I <sub>ppm</sub>	SEE TABLE 1	Amps
Steady State Power Dissipation at TL = 75°C lengths .375", 9.5mm (Note 2)	P <sub>M(AV)</sub>	1.0	Watts
Peak Forward Surge Current, 8.3ms Single Half Sine-wave Superimposed on Rated Load, (JEDEC Method)(Note 3)	I <sub>FSM</sub>	40	Amps
Operatings and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 +175	°C

NOTES:

1. Non-repetitive current pulse, per Fig.3 and derated above Ta=25 °C per Fig.2.
2. Mounted on Copper Pad area of 1.6x1.6" (40x40mm) per Fig.5.
3. 8.3ms single half sine-wave, or equivalent square wave, Duty cycle=4 pulses per minutes maximum.

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## RATINGS AND CHARACTERISTIC CURVES BZW04 SERIES

### Ratings and

### Characteristic Curves ( $T_A=25^\circ\text{C}$ unless otherwise noted)

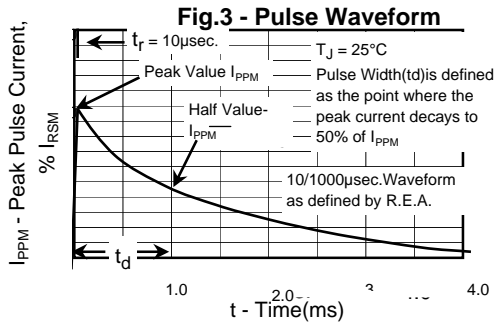
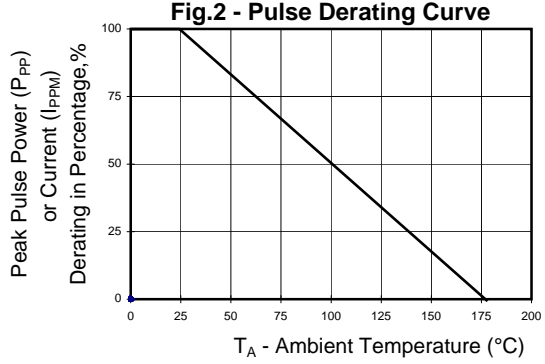
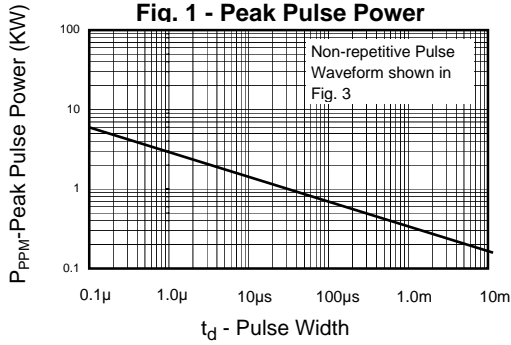


Fig. 4 - Typ. Junction Capacitance Uni-Directional

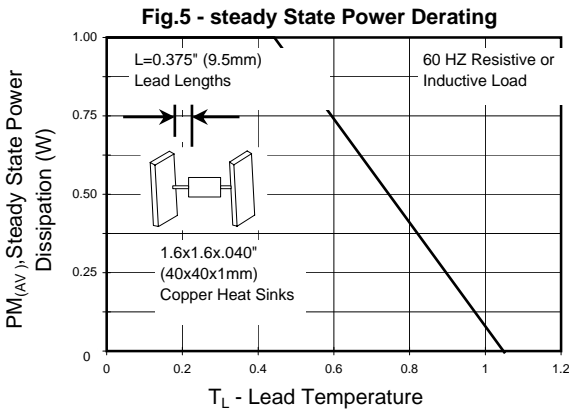
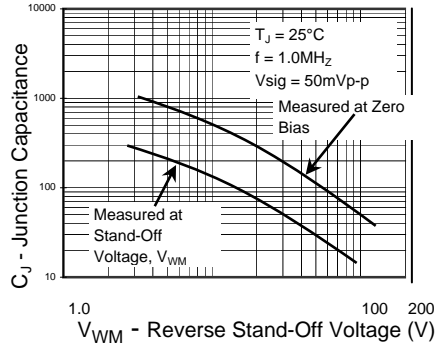


Fig. 6 - Maximum Non-Repetitive Forward Surge Current Uni-Directional Only

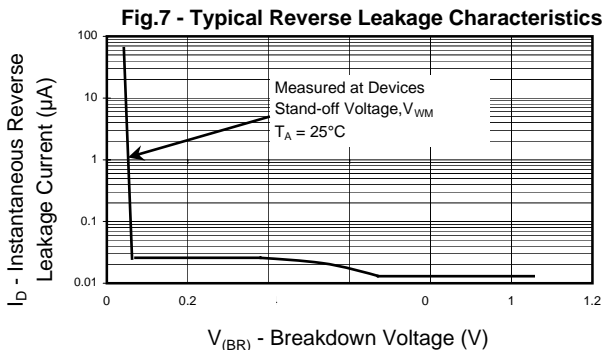
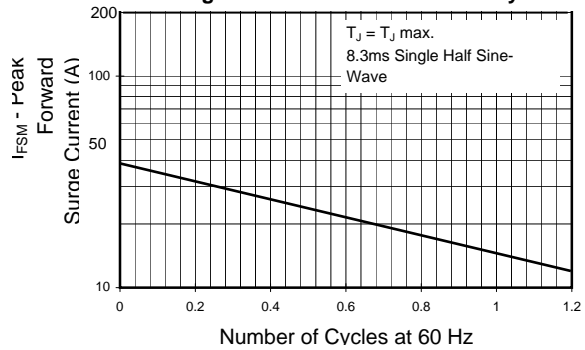
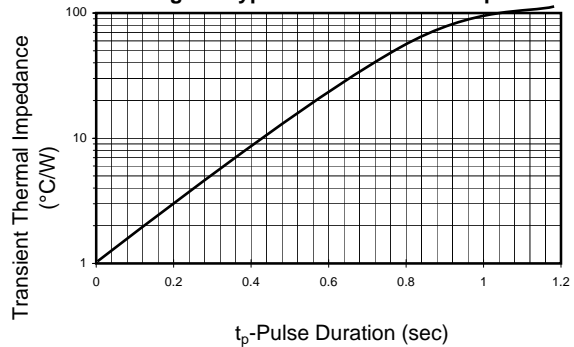


Fig. 8 - Typ. Transient Thermal Impedance



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## 400 Watt TVS

BZW04		REVERSE STAND- OFF VOLTAGE $V_{RWM}(V)$	BREAKDOWN VOLTAGE $V_{BR}(V)$ MIN. @ $I_T$	BREAKDOWN VOLTAGE $V_{BR}(V)$ MAX. @ $I_T$	TEST CURRENT $I_T$ (mA)	MAXIMUM CLAMPING VOLTAGE @ $I_{pp}$ $V_c(V)$	PEAK PULSE CURRENT $I_{pp}$ (A)	REVERSE LEAKAGE @ $V_{RWM}$ $I_R(\mu A)$
UNI- POLAR	BI-POLAR							
BZW 04P5V8	BZW 04P5V8B	5.80	6.45	7.48	10.0	10.5	38.00	900
BZW 04-5V8	BZW 04-5V8B	5.90	6.45	7.14	10.0	10.5	38.00	900
BZW 04P6V4	BZW 04P6V4B	6.40	7.13	8.25	10.0	11.3	35.00	500
BZW 04-6V4	BZW 04-6V4B	6.40	7.13	7.88	10.0	11.3	35.00	500
BZW 04P7V0	BZW 04P7V0B	7.02	7.79	9.02	1.0	12.1	33.00	200
BZW 04-7V0	BZW 04-7V0B	7.02	7.79	8.61	1.0	12.1	33.00	200
BZW 04P7V8	BZW 04P7V8B	7.78	8.65	10.00	1.0	13.4	30.00	50
BZW 04-7V8	BZW 04-7V8B	7.78	8.65	9.55	1.0	13.4	30.00	50
BZW 04P8V5	BZW 04P8V5B	8.55	9.50	11.00	1.0	14.5	28.00	10.0
BZW04-8V5	BZW04-8V5B	8.55	9.50	10.50	1.0	14.5	28.00	10.0
BZW 04P9V4	BZW 04P9V4B	9.40	10.50	12.10	1.0	15.6	25.70	5.0
BZW 04-9V4	BZW 04-9V4B	9.40	10.50	11.60	1.0	15.6	25.70	5.0
BZW 04P10	BZW 04P10B	10.20	11.40	13.20	1.0	16.7	24.00	5.0
BZW 04-10	BZW 04-10B	10.20	11.40	12.60	1.0	16.7	24.00	5.0
BZW 04P11	BZW 04P11B	11.10	12.40	14.30	1.0	18.2	22.00	5.0
BZW 04-11	BZW 04-11B	11.10	12.40	13.70	1.0	18.2	22.00	5.0
BZW 04P13	BZW 04P13B	12.80	14.30	16.50	1.0	21.2	19.00	5.0
BZW 04-13	BZW 04-13B	12.80	14.30	15.80	1.0	21.2	19.00	5.0
BZW 04P14	BZW 04P14B	13.60	15.20	17.60	1.0	22.5	17.80	5.0
BZW 04-14	BZW 04-14B	13.60	15.20	16.80	1.0	22.5	17.80	5.0
BZW 04P15	BZW 04P15B	15.30	17.10	19.80	1.0	25.2	16.00	5.0
BZW 04-15	BZW 04-15B	15.30	17.10	18.90	1.0	25.2	16.00	5.0
BZW 04P17	BZW 04P17B	17.10	19.00	22.00	1.0	27.7	14.50	5.0
BZW 04-17	BZW 04-17B	17.10	19.00	21.00	1.0	27.7	14.50	5.0
BZW 04P19	BZW 04P19B	18.80	20.90	24.20	1.0	30.6	13.00	5.0
BZW 04-19	BZW 04-19B	18.80	20.90	23.10	1.0	30.6	13.00	5.0
BZW 04P20	BZW 04P20B	20.50	22.80	26.40	1.0	33.2	12.00	5.0
BZW 04-20	BZW 04-20B	20.50	22.80	25.20	1.0	33.2	12.00	5.0
BZW 04P23	BZW 04P23B	23.10	25.70	29.70	1.0	37.5	10.70	5.0
BZW 04-23	BZW 04-23B	23.10	25.70	28.40	1.0	37.5	10.70	5.0
BZW 04P26	BZW 04P26B	26.50	28.50	33.00	1.0	41.5	9.60	5.0
BZW 04-26	BZW 04-26B	26.50	28.50	31.50	1.0	41.5	9.60	5.0
BZW 04 P28	BZW 04P28B	28.20	31.40	36.30	1.0	45.7	8.80	5.0
BZW 04-28	BZW 04-28B	28.20	31.40	34.70	1.0	45.7	8.80	5.0
BZW 04P31	BZW 04P31B	30.80	34.20	39.60	1.0	49.9	8.00	5.0
BZW 04-31	BZW 04-31B	30.80	34.20	37.80	1.0	49.9	8.00	5.0
BZW 04P33	BZW 04P33B	33.35	37.10	42.90	1.0	53.9	7.40	5.0
BZW 04-33	BZW 04-33B	33.35	37.10	41.00	1.0	53.9	7.40	5.0
BZW 04P37	BZW 04P37B	36.80	40.90	47.30	1.0	59.3	6.70	5.0
BZW 04-37	BZW 04-37B	36.80	40.90	45.20	1.0	59.3	6.70	5.0
BZW 04P40	BZW 04P40B	40.20	44.70	51.70	1.0	64.8	6.20	5.0
BZW 04-40	BZW 04-40B	40.20	44.70	49.40	1.0	64.8	6.20	5.0
BZW 04P44	BZW 04P44B	43.60	48.50	56.10	1.0	70.1	5.70	5.0
BZW 04-44	BZW 04-44B	43.60	48.50	53.60	1.0	70.1	5.70	5.0

For bidirectional type having  $V_{RWM}$  of 10 volts and less, the IR limit is double.

For Part No. which use the character "p", the VBR is  $\pm 10\%$

Certified RoHS Compliant  
UL File # E223026

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BZW04		REVERSE STAND- OFF VOLTAGE $V_{RWM}(V)$	BREAKDOWN VOLTAGE $V_{BR}(V)$ MIN. @ $I_T$	BREAKDOWN VOLTAGE $V_{BR}(V)$ MAX. @ $I_T$	TEST CURRENT $I_T$ (mA)	MAXIMUM CLAMPING VOLTAGE @ $I_{pp}$ $V_c(V)$	PEAK PULSE CURRENT $I_{pp}$ (A)	REVERSE LEAKAGE @ $V_{RWM}$ $I_R(\mu A)$
UNI- POLAR	BI-POLAR							
BZW 04P48	BZW 04P48B	47.80	53.20	61.60	1.0	77.0	5.20	5.0
BZW 04-48	BZW 04-48B	47.80	53.20	58.80	1.0	77.0	5.20	5.0
BZW 04P53	BZW 04P53B	53.00	58.90	68.20	1.0	85.0	4.70	5.0
BZW 04-53	BZW 04-53B	53.00	58.90	65.10	1.0	85.0	4.70	5.0
BZW 04P58	BZW 04P58B	58.10	64.60	74.80	1.0	92.0	4.30	5.0
BZW 04-58	BZW 04-58B	58.10	64.60	71.40	1.0	92.0	4.30	5.0
BZW 04P64	BZW 04P64B	64.10	71.30	82.50	1.0	103.0	3.90	5.0
BZW 04-64	BZW 04-64B	64.10	71.30	78.80	1.0	103.0	3.90	5.0
BZW 04P70	BZW 04P70B	70.10	77.90	90.20	1.0	113.0	3.50	5.0
BZW 04-70	BZW 04-70B	70.10	77.90	86.10	1.0	113.0	3.50	5.0
BZW 04P78	BZW 04P78B	78.00	86.50	100.00	1.0	125.0	3.20	5.0
BZW 04-78	BZW 04-78B	78.00	86.50	95.50	1.0	125.0	3.20	5.0
BZW 04P85	BZW 04P85B	85.80	95.00	110.00	1.0	137.0	2.90	5.0
BZW 04-85	BZW 04-85B	85.50	95.00	105.00	1.0	137.0	2.90	5.0
BZW 04P94	BZW 04P94B	94.00	105.00	121.00	1.0	152.0	2.60	5.0
BZW 04-94	BZW 04-94B	94.00	105.00	116.00	1.0	152.0	2.60	5.0
BZW 04P102	BZW 04P102B	102.00	114.00	132.00	1.0	165.0	2.40	5.0
BZW 04-102	BZW 04-102B	102.00	114.00	126.00	1.0	165.0	2.40	5.0
BZW 04P110	BZW 04P110B	111.00	124.00	143.00	1.0	179.0	2.20	5.0
BZW 04-110	BZW 04-110B	111.00	124.00	137.00	1.0	179.0	2.20	5.0
BZW 04P128	BZW 04P128B	128.00	143.00	165.00	1.0	207.0	2.00	5.0
BZW 04-128	BZW 04-128B	128.00	143.00	158.00	1.0	207.0	2.00	5.0
BZW 04P136	BZW 04P136B	136.00	152.00	176.00	1.0	219.0	1.80	5.0
BZW 04-136	BZW 04-136B	136.00	152.00	168.00	1.0	219.0	1.80	5.0
BZW 04P145	BZW 04P145B	145.00	161.00	187.00	1.0	234.0	1.70	5.0
BZW 04-145	BZW 04-145B	145.00	161.00	179.00	1.0	234.0	1.70	5.0
BZW 04P154	BZW 04P154B	154.00	171.00	198.00	1.0	246.0	1.60	5.0
BZW 04-154	BZW 04-154B	154.00	171.00	189.00	1.0	246.0	1.60	5.0
BZW 04P171	BZW 04P171B	171.00	190.00	220.00	1.0	274.0	1.50	5.0
BZW 04-171	BZW 04-171B	171.00	190.00	210.00	1.0	274.0	1.50	5.0
BZW 04P188	BZW 04P188B	188.00	209.00	242.00	1.0	301.0	1.40	5.0
BZW 04-188	BZW 04-188B	188.00	209.00	231.00	1.0	301.0	1.40	5.0
BZW 04P213	BZW 04P213B	213.00	237.00	275.00	1.0	344.0	1.50	5.0
BZW 04-213	BZW 04-213B	213.00	237.00	263.00	1.0	344.0	1.50	5.0
BZW 04P239	BZW 04P239B	239.00	266.00	308.00	1.0	384.0	1.50	5.0
BZW 04-239	BZW 04-239B	239.00	266.00	294.00	1.0	384.0	1.50	5.0
BZW 04P256	BZW 04P256B	256.00	285.00	330.00	1.0	414.0	1.20	5.0
BZW 04-256	BZW 04-256B	256.00	285.00	315.00	1.0	414.0	1.20	5.0
BZW 04P273	BZW 04P273B	273.00	304.00	352.00	1.0	438.0	1.20	5.0
BZW 04-273	BZW 04-273B	273.00	304.00	336.00	1.0	438.0	1.20	5.0
BZW 04P299	BZW 04P299B	299.00	332.00	385.00	1.0	482.0	0.90	5.0
BZW 04-299	BZW 04-299B	299.00	332.00	368.00	1.0	482.0	0.90	5.0
BZW 04P342	BZW 04P342B	342.00	380.00	440.00	1.0	548.0	0.90	5.0
BZW 04-342	BZW 04-342B	342.00	380.00	420.00	1.0	548.0	0.90	5.0
BZW 04P376	BZW 04P376B	376.00	418.00	484.00	1.0	603.0	0.80	5.0
BZW 04-376	BZW 04-376B	376.00	418.00	462.00	1.0	603.0	0.80	5.0

For bidirectional type having  $V_{RWM}$  of 10 volts and less, the IR limit is double.

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