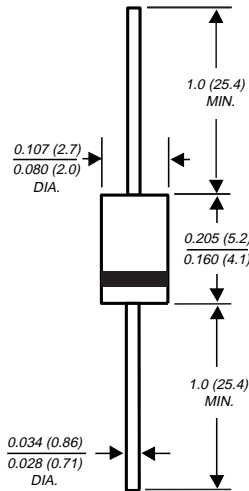


# BZW04P-5V8 THRU BZW04-376

**TRANSZORB™ TRANSIENT VOLTAGE SUPPRESSOR**  
*Stand-off Voltage - 5.8 to 376 Volts      Peak Pulse Power - 400 Watts*

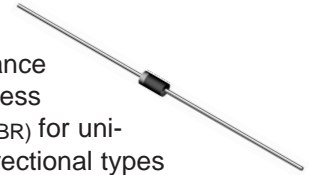
## DO204AL



Dimensions are in inches  
and  
(millimeters)

## FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated chip junction
- ◆ 400W peak pulse power capability with a 10/1000 $\mu$ s waveform, repetition rate (duty cycle): 0.01%
- ◆ Excellent clamping capability
- ◆ Low incremental surge resistance
- ◆ Fast response time: typically less than 1.0 ps from 0 Volts to  $V_{(BR)}$  for uni-directional and 5.0ns for bi-directional types
- ◆ Typical  $I_D$  less than 1 $\mu$ A above 10V rating
- ◆ High temperature soldering guaranteed: 265°C/10 seconds, 0.375" (9.5mm) lead length, 5lbs. (2.3 kg) tension



## MECHANICAL DATA

**Case:** JEDEC DO-204AL molded plastic over passivated junction

**Terminals:** Plated axial leads, solderable per MIL-STD-750, Method 2026

**Polarity:** For unidirectional types the color band denotes the cathode, which is positive with respect to the anode under normal TVS operation

**Mounting Position:** Any

**Weight:** 0.012 ounce, 0.3 gram

## DEVICES FOR BIDIRECTIONAL APPLICATIONS

For bi-directional use add suffix Letter "B" (e.g. BZW04P-6V4B).  
Electrical characteristics apply in both directions.

## MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

	SYMBOL	VALUE	UNITS
Peak pulse power dissipation with a 10/1000 $\mu$ s waveform (NOTE 1, FIG. 1)	PPPM	Minimum 400	Watts
Peak pulse current with a 10/1000 $\mu$ s waveform (NOTE 1)	IPPM	SEE TABLE 1	Amps
Steady state power dissipation at $T_L=75^\circ\text{C}$ lead lengths, 0.375" (9.5mm) (NOTE 2)	$P_{M(AV)}$	1.0	Watts
Peak forward surge current, 8.3ms single half Sine-wave superimposed on rated load (JEDEC Method) (NOTE 3) unidirectional only	$I_{FSM}$	40.0	Amps
Maximum instantaneous forward voltage at 25A (NOTE 4) uni-directional only	$V_F$	3.5/5.0	Volts
Operating junction and storage temperature range	$T_J, T_{STG}$	-55 to +175	$^\circ\text{C}$

### NOTES:

- (1) Non-repetitive current pulse, per Fig. 3 and derated above  $T_A=25^\circ\text{C}$  per Fig. 2
- (2) Mounted on copper pad area of 1.6 x 1.6" (40 x 40mm) per Fig. 5
- (3) 8.3ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per minute maximum
- (4)  $V_F=3.5\text{V}$  max. for devices of  $V_{(BR)}\leq 220\text{V}$  and  $V_F=5.0$  Volt max. for devices of  $V_{(BR)}>220\text{V}$

**ELECTRICAL CHARACTERISTICS at (T<sub>A</sub>=25°C unless otherwise noted) TABLE 1**

Device Type	Breakdown Voltage V <sub>(BR)</sub> Volts (NOTE 1)		Test Current at I <sub>r</sub> (mA)	Stand-off Voltage V <sub>WM</sub> (Volts)	Maximum Reverse Leakage at V <sub>WM</sub> I <sub>D</sub> (μA) (NOTE4)	Maximum Peak Pulse Current I <sub>PPM</sub> (Amps) (NOTE 2)	Maximum Clamping Voltage at I <sub>PPM</sub> V <sub>c</sub> (Volts)	Maximum Temperature Coefficient of V <sub>(BR)</sub> (% / C)
	MIN	MAX						
BZW04P5V8	6.45	7.48	10.0	5.80	1000	38.0	10.5	0.057
BZW04-5V8	6.45	7.14	10.0	5.80	1000	38.0	10.5	0.057
BZW04P6V4	7.13	8.25	10.0	6.40	500	35.4	11.3	0.061
BZW04-6V4	7.13	7.88	10.0	6.40	500	35.4	11.3	0.061
BZW04P7V0	7.79	9.02	10.0	7.02	200	33.0	12.1	0.065
BZW04-7V0	7.79	8.61	10.0	7.02	200	33.0	12.1	0.065
BZW04P7V8	8.65	10.0	1.0	7.78	50.0	30.0	13.4	0.068
BZW04-7V8	8.65	9.55	1.0	7.78	50.0	30.0	13.4	0.073
BZW04P8V5	9.50	11.0	1.0	8.55	10.0	27.6	14.5	0.073
BZW04-8V5	9.50	10.5	1.0	8.55	10.0	27.6	14.5	0.075
BZW04P9V4	10.5	12.1	1.0	9.4	5.0	25.7	15.6	0.075
BZW04-9V4	10.5	11.6	1.0	9.4	5.0	25.7	15.6	0.075
BZW0P10	11.4	13.2	1.0	10.2	5.0	24.0	16.7	0.078
BZW04-10	11.4	12.6	1.0	10.2	5.0	24.0	16.7	0.078
BZW04P11	12.4	14.3	1.0	11.1	5.0	22.0	18.2	0.081
BZW04-11	12.4	13.7	1.0	11.1	5.0	22.0	18.2	0.081
BZW04P13	14.3	16.5	1.0	12.8	5.0	19.0	21.2	0.084
BZW04-13	14.3	15.8	1.0	12.8	5.0	19.0	21.2	0.084
BZW04P14	15.2	17.6	1.0	13.6	5.0	17.8	22.5	0.086
BZW04-14	15.2	16.8	1.0	13.6	5.0	17.8	22.5	0.086
BZW04P15	17.1	19.8	1.0	15.3	5.0	16.0	25.2	0.088
BZW04-15	17.1	18.9	1.0	15.3	5.0	16.0	25.2	0.088
BZW04P17	19.0	22.0	1.0	17.1	5.0	14.5	27.7	0.090
BZW04-17	19.0	21.0	1.0	17.1	5.0	14.5	27.7	0.090
BZW04P19	20.9	24.2	1.0	18.8	5.0	13.0	30.6	0.092
BZW04-19	20.9	23.1	1.0	18.8	5.0	13.0	30.6	0.092
BZW04P20	22.8	26.4	1.0	20.5	5.0	12.0	33.2	0.094
BZW04-20	22.8	25.2	1.0	20.5	5.0	12.0	33.2	0.094
BZW04P23	25.7	29.7	1.0	23.1	5.0	10.7	37.5	0.096
BZW04-23	25.7	28.4	1.0	23.1	5.0	10.7	37.5	0.096
BZW04P26	28.5	33.0	1.0	25.6	5.0	9.6	41.5	0.097
BZW04-26	28.5	31.5	1.0	25.6	5.0	9.6	41.5	0.097
BZW04P28	31.4	36.3	1.0	28.2	5.0	8.8	45.7	0.098
BZW04-28	31.4	34.7	1.0	28.2	5.0	8.8	45.7	0.098
BZW04P31	34.2	39.6	1.0	30.8	5.0	8.0	49.9	0.099
BZW04-31	34.2	37.8	1.0	30.8	5.0	8.0	49.9	0.099
BZW04P33	37.1	42.9	1.0	33.3	5.0	7.4	53.9	0.100
BZW04-33	37.1	41.0	1.0	33.3	5.0	7.4	53.9	0.100
BZW04P37	40.9	47.3	1.0	36.8	5.0	6.7	59.3	0.101
BZW04-37	40.9	45.2	1.0	36.8	5.0	6.7	59.3	0.101
BZW04P40	44.7	51.7	1.0	40.2	5.0	6.2	64.8	0.101
BZW04-40	44.7	49.4	1.0	40.2	5.0	6.2	64.8	0.101
BZW04P44	48.5	56.1	1.0	43.6	5.0	5.7	70.1	0.102
BZW04-44	48.5	53.6	1.0	43.6	5.0	5.7	70.1	0.102
BZW04P48	53.2	61.6	1.0	47.8	5.0	5.2	77.0	0.103
BZW04-48	53.2	58.8	1.0	47.8	5.0	5.2	77.0	0.103

**ELECTRICAL CHARACTERISTICS at (T<sub>A</sub>=25°C unless otherwise noted) TABLE 1 (Cont'd)**

Device Type	Breakdown Voltage V <sub>(BR)</sub> Volts (NOTE 1)		Test Current at I <sub>T</sub> (mA)	Stand-off Voltage V <sub>WM</sub> (Volts)	Maximum Reverse Leakage at V <sub>WM</sub> I <sub>D</sub> (μA) (NOTE4)	Maximum Peak Pulse Current I <sub>PPM</sub> (Amps) (NOTE 2)	Maximum Clamping Voltage at I <sub>PPM</sub> V <sub>c</sub> (Volts)	Maximum Temperature Coefficient of V <sub>(BR)</sub> (% / C)
	MIN	MAX						
BZW04P53	58.9	68.2	1.0	53.0	5.0	4.7	85.0	0.104
BZW04-53	58.9	65.1	1.0	53.0	5.0	4.7	85.0	0.104
BZW04P58	64.6	74.8	1.0	58.1	5.0	4.3	92.0	0.104
BZW04-58	64.6	71.4	1.0	58.1	5.0	4.3	92.0	0.104
BZW04P64	71.3	82.5	1.0	64.1	5.0	3.9	103	0.105
BZW04-64	71.3	78.8	1.0	64.1	5.0	3.9	103	0.105
BZW04P70	77.9	90.2	1.0	70.1	5.0	3.5	113	0.105
BZW04-70	77.9	86.1	1.0	70.1	5.0	3.5	113	0.105
BZW04P78	86.5	100	1.0	78.0	5.0	3.2	125	0.105
BZW04-78	86.5	95.5	1.0	78.0	5.0	3.2	125	0.105
BZW04P85	95.0	110	1.0	85.5	5.0	2.9	137	0.106
BZW04-85	95.0	105	1.0	85.5	5.0	2.9	137	0.106
BZW04P94	105	121	1.0	94.0	5.0	2.6	152	0.107
BZW04-94	105	116	1.0	94.0	5.0	2.6	152	0.107
BZW04P102	114	132	1.0	102	5.0	2.4	165	0.107
BZW04-102	114	126	1.0	102	5.0	2.4	165	0.107
BZW04P110	124	143	1.0	111	5.0	2.2	179	0.107
BZW04-110	124	137	1.0	111	5.0	2.2	179	0.107
BZW04P128	143	165	1.0	128	5.0	2.0	207	0.108
BZW04-128	143	158	1.0	128	5.0	2.0	207	0.108
BZW04P136	152	176	1.0	136	5.0	1.8	219	0.108
BZW404-136	152	168	1.0	136	5.0	1.8	219	0.108
BZW04P145	161	187	1.0	145	5.0	1.7	234	0.108
BZW04-145	161	179	1.0	145	5.0	1.7	234	0.108
BZW04P154	171	198	1.0	154	5.0	1.6	246	0.108
BZW04-154	171	189	1.0	154	5.0	1.6	246	0.108
BZW04P171	190	220	1.0	171	5.0	1.5	274	0.108
BZW04-171	190	210	1.0	171	5.0	1.5	274	0.108
BZW04P188	209	242	1.0	188	5.0	1.4	301	0.108
BZW04-188	209	231	1.0	188	5.0	1.4	301	0.108
BZW04P213	237	275	1.0	213	5.0	1.5	344	0.110
BZW04-213	237	263	1.0	213	5.0	1.5	344	0.110
BZW04P239	266	308	1.0	239	5.0	1.5	384	0.110
BZW04-239	266	294	1.0	239	5.0	1.5	384	0.110
BZW04P256	285	330	1.0	256	5.0	1.2	414	0.110
BZW04-256	285	315	1.0	256	5.0	1.2	414	0.110
BZW04P273	304	352	1.0	273	5.0	1.2	438	0.110
BZW04-273	304	336	1.0	273	5.0	1.2	438	0.110
BZW04P299	332	385	1.0	299	5.0	0.90	482	0.110
BZW04-299	332	368	1.0	299	5.0	0.90	482	0.110
BZW04P342	380	440	1.0	342	5.0	0.90	548	0.110
BZW04-342	380	420	1.0	342	5.0	0.90	548	0.110
BZW04P376	418	484	1.0	376	5.0	0.80	603	0.110
BZW04-376	418	462	1.0	376	5.0	0.80	603	0.110

**NOTES:**

- (1) V<sub>(BR)</sub> measured after I<sub>T</sub> applied for 300μs I<sub>T</sub>=square wave pulse or equivalent
- (2) Surge current waveform per Fig. 3 and derated per Fig. 2
- (3) All terms and symbols are consistent with ANSI/IEEE C62.35
- (4) For bi-directional devices with V<sub>WM</sub> of 10 Volts and less, the I<sub>p</sub> limit is doubled



# RATINGS AND CHARACTERISTIC CURVES BZW04P5V8 THRU BZW04-376

FIG. 1 - PEAK PULSE POWER RATING CURVE

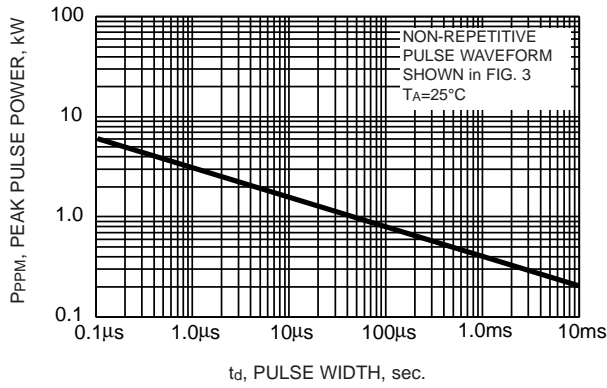


FIG. 2 - PULSE DERATING CURVE

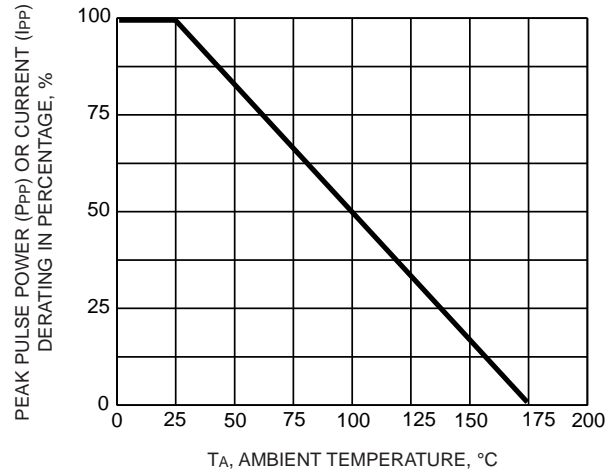


FIG. 3 - PULSE WAVEFORM

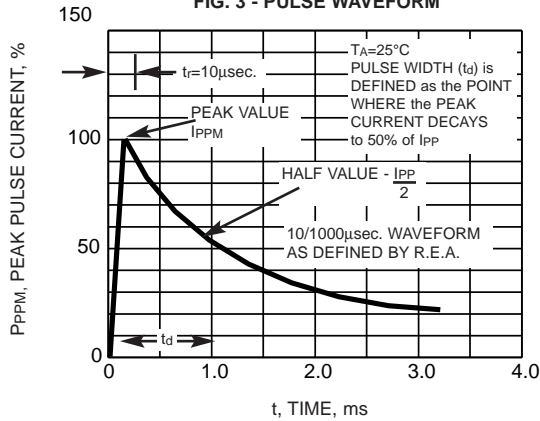


FIG. 4 - TYPICAL JUNCTION CAPACITANCE UNIDIRECTIONAL

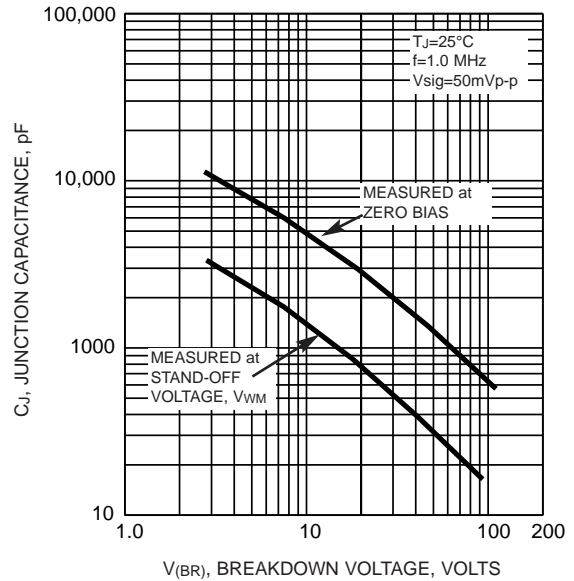


FIG. 5 - STEADY STATE POWER DERATING CURVE

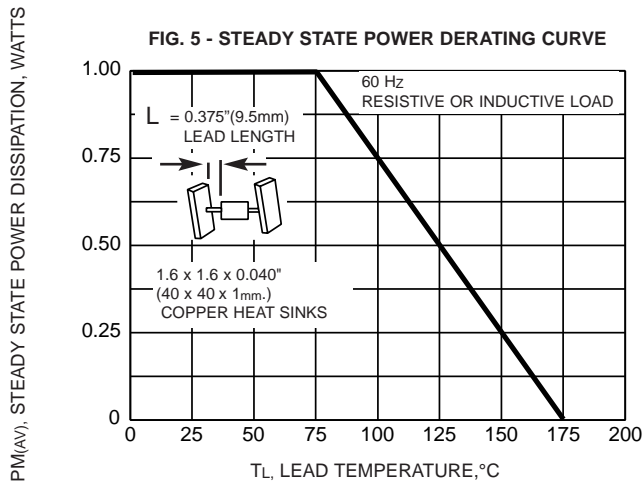


FIG. 6 - MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL

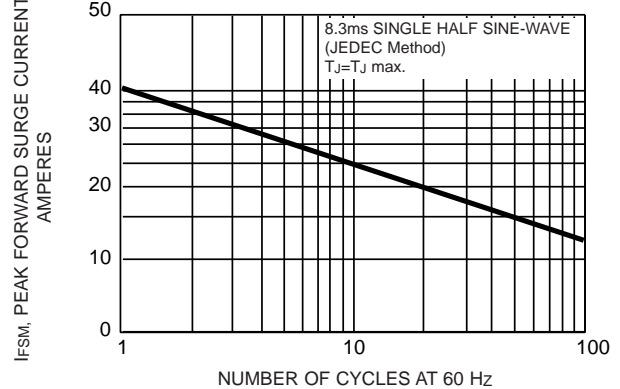


FIG. 7-TYPICAL REVERSE LEAKAGE CHARACTERISTICS

