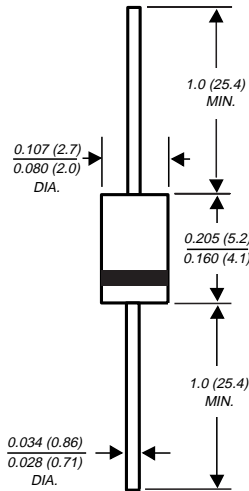


BZW04P-5V8 THRU BZW04-376

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

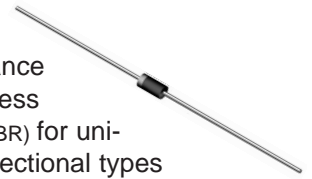
DO204AL



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 μ 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_p less than 1 μ 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 μ s waveform (NOTE 1, FIG. 1) | PPPM | Minimum 400 | Watts |
| Peak pulse current with a 10/1000 μ 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 (TA=25°C unless otherwise noted) TABLE 1

| Device Type | Breakdown Voltage V(BR) Volts (NOTE 1) | | Test Current at Ir (mA) | Stand-off Voltage VWM (Volts) | Maximum Reverse Leakage at VWM Id (µA) (NOTE4) | Maximum Peak Pulse Current IPPM (Amps) (NOTE 2) | Maximum Clamping Voltage at IPPM Vc (Volts) | Maximum Temperature Coefficient of V(BR) (% / 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 (TA=25°C unless otherwise noted) TABLE 1 (Cont'd)

| Device Type | Breakdown Voltage V _(BR) Volts (NOTE 1) | | Test Current at I _T (mA) | Stand-off Voltage V _{WM} (Volts) | Maximum Reverse Leakage at V _{WM} I _D (μA) (NOTE4) | Maximum Peak Pulse Current I _{PPM} (Amps) (NOTE 2) | Maximum Clamping Voltage at I _{PPM} V _C (Volts) | Maximum Temperature Coefficient of V _(BR) (% / 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_(BR) measured after I_T applied for 300μs I_T=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_{WM} of 10 Volts and less, the I_D limit is doubled

RATINGS AND CHARACTERISTIC CURVES BZW04P5V8 THRU BZW04-376

FIG. 1 - PEAK PULSE POWER RATING CURVE

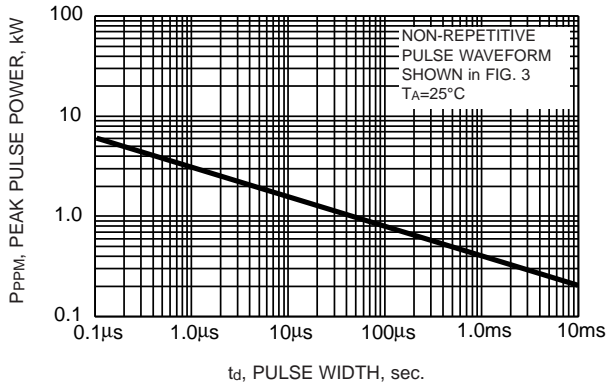


FIG. 2 - PULSE DERATING CURVE

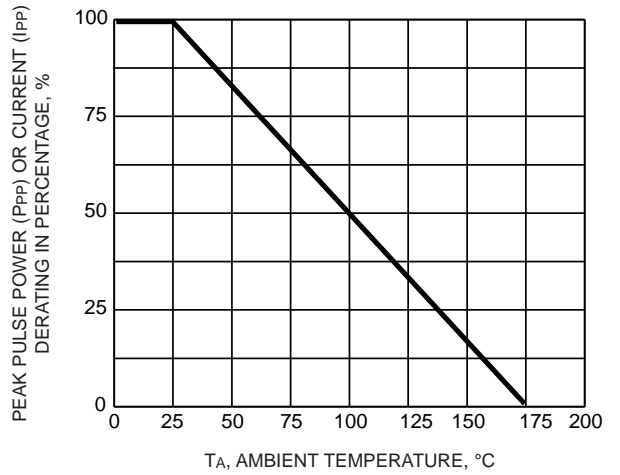


FIG. 3 - PULSE WAVEFORM

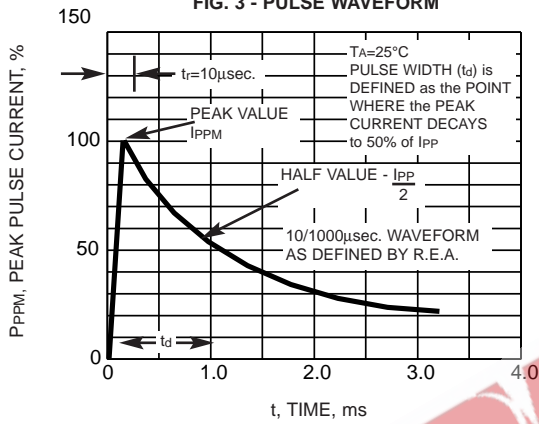


FIG. 4 - TYPICAL JUNCTION CAPACITANCE UNIDIRECTIONAL

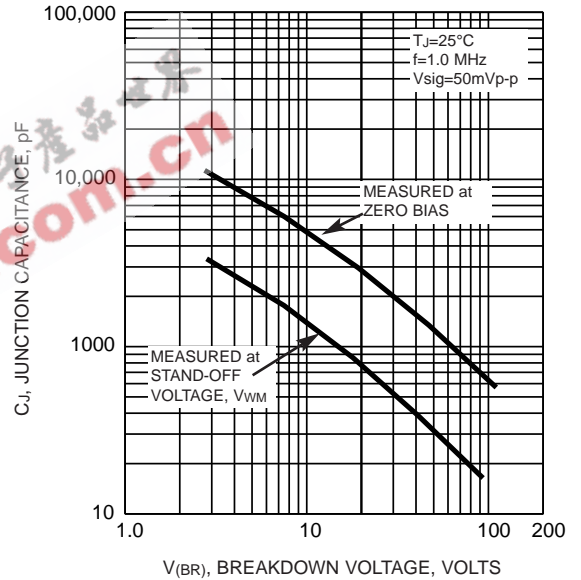


FIG. 5 - STEADY STATE POWER DERATING CURVE

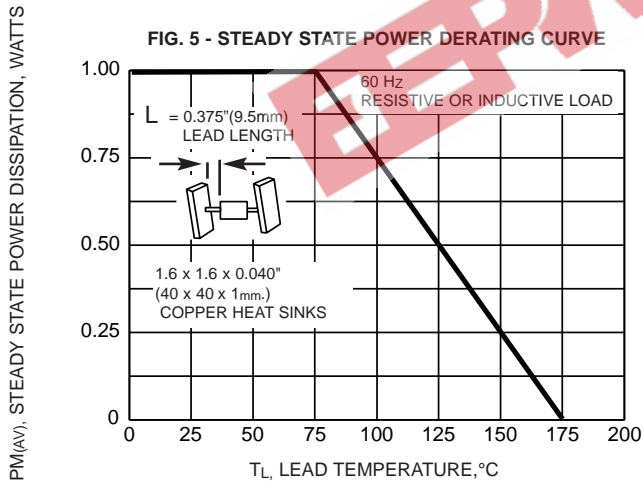


FIG. 6 - MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL

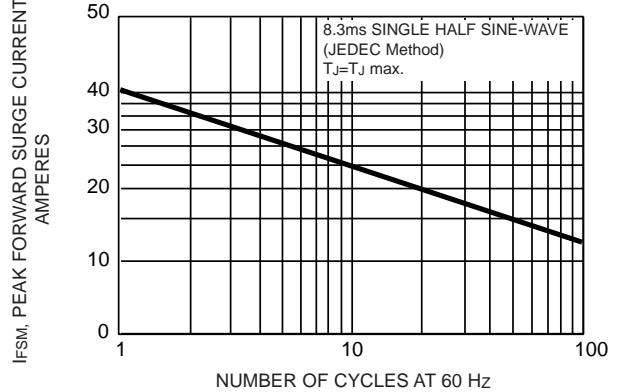


FIG. 7 - TYPICAL REVERSE LEAKAGE CHARACTERISTICS

