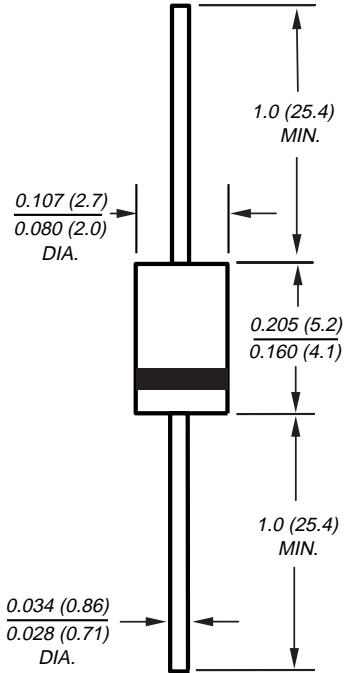


TRANSZORB® Transient Voltage Suppressors

Peak Pulse Power 400W
Stand-off Voltage 5.8 to 376V



Dimensions in inches and (millimeters)

Devices for Bidirectional Applications

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

Features

- Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- Glass passivated 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
- Very fast response time
- Typical I_D 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 body 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 oz., 0.3 g

Packaging Codes – Options (Antistatic):

- 51 – 1K per Bulk box, 10K/carton
- 54 – 5.5K per 13" paper Reel (52mm horiz. tape), 16.5K/carton
- 73 – 3K per horiz. tape & Ammo box, 30K/carton

Maximum Ratings and Thermal Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Peak pulse power dissipation with a 10/1000 μ s waveform (Note 1, Fig. 1)	PPPM	Minimum 400	W
Peak pulse current with a 10/1000 μ s waveform (Note 1)	IPPM	See Next Table	A
Steady state power dissipation at $T_L = 75^\circ\text{C}$, lead lengths 0.375" (9.5mm) (Note 2)	PM(AV)	1.0	W
Peak forward surge current, 8.3ms single half sine-wave unidirectional only (Note 3)	IFSM	40	A
Maximum instantaneous forward voltage at 25A for unidirectional only (Note 4)	V _F	3.5/5.0	V
Operating junction and storage temperature range	T _J , T _{STG}	-55 to +175	°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) Measured on 8.3ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum
(4) $V_F = 3.5\text{V}$ for BZW04P(-)188 & below; $V_F = 5.0\text{V}$ for BZW04P(-)213 & above

BZW04P-5V8 thru BZW04-376



Vishay Semiconductors
formerly General Semiconductor

Electrical Characteristics Ratings at 25°C ambient temperature unless otherwise specified.

Part Number		Breakdown Voltage $V_{(BR)}$ at $I_T^{(1)}$ (V)		Test Current I_T (mA)	Stand-off Voltage V_{WM} (Volts)	Maximum Reverse Leakage at V_{WM} I_D (μA) ⁽⁴⁾	Maximum Peak Pulse Current I_{PPM} (Amps) ⁽²⁾	Maximum Clamping Voltage at I_{PPM} V_C (Volts)	Maximum Temperature Coefficient of $V_{(BR)}$ (% / °C)
		Min.	Max.						
BZW04P5V8	BZW04P5V8B	6.45	7.48	10.0	5.80	1000	38.0	10.5	0.057
BZW04-5V8	BZW04-5V8B	6.45	7.14	10.0	5.80	1000	38.0	10.5	0.057
BZW04P6V4	BZW04P6V4B	7.13	8.25	10.0	6.40	500	35.4	11.3	0.061
BZW04-6V4	BZW04-6V4B	7.13	7.88	10.0	6.40	500	35.4	11.3	0.061
BZW04P7V0	BZW04P7V0B	7.79	9.02	10.0	7.02	200	33.0	12.1	0.065
BZW04-7V0	BZW04-7V0B	7.79	8.61	10.0	7.02	200	33.0	12.1	0.065
BZW04P7V8	BZW04P7V8B	8.65	10.0	1.0	7.78	50	30.0	13.4	0.068
BZW04-7V8	BZW04-7V8B	8.65	9.55	1.0	7.78	50	30.0	13.4	0.073
BZW04P8V5	BZW04P8V5B	9.50	11.0	1.0	8.55	10	27.6	14.5	0.07
BZW04-8V5	BZW04-8V5B	9.50	10.5	1.0	8.55	10	27.6	14.5	0.075
BZW04P9V4	BZW04P9V4B	10.5	12.1	1.0	9.4	5.0	25.7	15.6	0.075
BZW04-9V4	BZW04-9V4B	10.5	11.6	1.0	9.4	5.0	25.7	15.6	0.075
BZW0P10	BZW0P10B	11.4	13.2	1.0	10.2	5.0	24.0	16.7	0.078
BZW04-10	BZW04-10B	11.4	12.6	1.0	10.2	5.0	24.0	16.7	0.078
BZW04P11	BZW04P11B	12.4	14.3	1.0	11.1	5.0	22.0	18.2	0.081
BZW04-11	BZW04-11B	12.4	13.7	1.0	11.1	5.0	22.0	18.2	0.081
BZW04P13	BZW04P13B	14.3	16.5	1.0	12.8	5.0	19.0	21.2	0.084
BZW04-13	BZW04-13B	14.3	15.8	1.0	12.8	5.0	19.0	21.2	0.084
BZW04P14	BZW04P14B	15.2	17.6	1.0	13.6	1.0	17.8	22.5	0.086
BZW04-14	BZW04-14B	15.2	16.8	1.0	13.6	1.0	17.8	22.5	0.086
BZW04P15	BZW04P15B	17.1	19.8	1.0	15.3	1.0	16.0	25.2	0.088
BZW04-15	BZW04-15B	17.1	18.9	1.0	15.3	1.0	16.0	25.2	0.088
BZW04P17	BZW04P17B	19.0	22.0	1.0	17.1	1.0	14.5	27.7	0.090
BZW04-17	BZW04-17B	19.0	21.0	1.0	17.1	1.0	14.5	27.7	0.090
BZW04P19	BZW04P19B	20.9	24.2	1.0	18.8	1.0	13.0	30.6	0.092
BZW04-19	BZW04-19B	20.9	23.1	1.0	18.8	1.0	13.0	30.6	0.092
BZW04P20	BZW04P20B	22.8	26.4	1.0	20.5	1.0	12.0	33.2	0.094
BZW04-20	BZW04-20B	22.8	25.2	1.0	20.5	1.0	12.0	33.2	0.094
BZW04P23	BZW04P23B	25.7	29.7	1.0	23.1	1.0	10.7	37.5	0.096
BZW04-23	BZW04-23B	25.7	28.4	1.0	23.1	1.0	10.7	37.5	0.096
BZW04P26	BZW04P26B	28.5	33.0	1.0	25.6	1.0	9.6	41.5	0.097
BZW04-26	BZW04-26B	28.5	31.5	1.0	25.6	1.0	9.6	41.5	0.097
BZW04P28	BZW04P28B	31.4	36.3	1.0	28.2	1.0	8.8	45.7	0.098
BZW04-28	BZW04-28B	31.4	34.7	1.0	28.2	1.0	8.8	45.7	0.098
BZW04P31	BZW04P31B	34.2	39.6	1.0	30.8	1.0	8.0	49.9	0.099
BZW04-31	BZW04-31B	34.2	37.8	1.0	30.8	1.0	8.0	49.9	0.099
BZW04P33	BZW04P33B	37.1	42.9	1.0	33.3	1.0	7.4	53.9	0.100
BZW04-33	BZW04-33B	37.1	41.0	1.0	33.3	1.0	7.4	53.9	0.100
BZW04P37	BZW04P37B	40.9	47.3	1.0	36.8	1.0	6.7	59.3	0.101
BZW04-37	BZW04-37B	40.9	45.2	1.0	36.8	1.0	6.7	59.3	0.101
BZW04P40	BZW04P40B	44.7	51.7	1.0	40.2	1.0	6.2	64.8	0.101
BZW04-40	BZW04-40B	44.7	49.4	1.0	40.2	1.0	6.2	64.8	0.101
BZW04P44	BZW04P44B	48.5	56.1	1.0	43.6	1.0	5.7	70.1	0.102
BZW04-44	BZW04-44B	48.5	53.6	1.0	43.6	1.0	5.7	70.1	0.102
BZW04P48	BZW04P48B	53.2	61.6	1.0	47.8	1.0	5.2	77.0	0.103
BZW04-48	BZW04-48B	53.2	58.8	1.0	47.8	1.0	5.2	77.0	0.103



Electrical Characteristics (Con't.) Ratings at 25°C ambient temperature unless otherwise specified.

Part Number		Breakdown Voltage $V_{(BR)}$ at $I_T^{(1)}$ (V)		Test Current I_T (mA)	Stand-off Voltage V_{WM} (Volts)	Maximum Reverse Leakage at V_{WM} I_D (μA) ⁽⁴⁾	Maximum Peak Pulse Current I_{PPM} (Amps) ⁽²⁾	Maximum Clamping Voltage at I_{PPM} V_C (Volts)	Maximum Temperature Coefficient of $V_{(BR)}$ (% / °C)
		Min.	Max.						
BZW04P53	BZW04P53B	58.9	68.2	1.0	53.0	1.0	4.7	85.0	0.104
BZW04-53	BZW04-53B	58.9	65.1	1.0	53.0	1.0	4.7	85.0	0.104
BZW04P58	BZW04P58B	64.6	74.8	1.0	58.1	1.0	4.3	92.0	0.104
BZW04-58	BZW04-58B	64.6	71.4	1.0	58.1	1.0	4.3	92.0	0.104
BZW04P64	BZW04P64B	71.3	82.5	1.0	64.1	1.0	3.9	103	0.105
BZW04-64	BZW04P64B	71.3	78.8	1.0	64.1	1.0	3.9	103	0.105
BZW04P70	BZW04P70B	77.9	90.2	1.0	70.1	1.0	3.5	113	0.105
BZW04-70	BZW04-70B	77.9	86.1	1.0	70.1	1.0	3.5	113	0.105
BZW04P78	BZW04P78B	86.5	100	1.0	78.0	1.0	3.2	125	0.105
BZW04-78	BZW04-78B	86.5	95.5	1.0	78.0	1.0	3.2	125	0.105
BZW04P85	BZW04P85B	95.0	110	1.0	85.5	1.0	2.9	137	0.106
BZW04-85	BZW04-85B	95.0	105	1.0	85.5	1.0	2.9	137	0.106
BZW04P94	BZW04P94B	105	121	1.0	94.0	1.0	2.6	152	0.107
BZW04-94	BZW04-94B	105	116	1.0	94.0	1.0	2.6	152	0.107
BZW04P102	BZW04P102B	114	132	1.0	102	1.0	2.4	165	0.107
BZW04-102	BZW04-102B	114	126	1.0	102	1.0	2.4	165	0.107
BZW04P110	BZW04P110B	124	143	1.0	111	1.0	2.2	179	0.107
BZW04-110	BZW04-110B	124	137	1.0	111	1.0	2.2	179	0.107
BZW04P128	BZW04P128B	143	165	1.0	128	1.0	2.0	207	0.108
BZW04-128	BZW04-128B	143	158	1.0	128	1.0	2.0	207	0.108
BZW04P136	BZW04P136B	152	176	1.0	136	1.0	1.8	219	0.108
BZW404-136	BZW404-136B	152	168	1.0	136	1.0	1.8	219	0.108
BZW04P145	BZW04P145B	161	187	1.0	145	1.0	1.7	234	0.108
BZW04-145	BZW04-145B	161	179	1.0	145	1.0	1.7	234	0.108
BZW04P154	BZW04P154B	171	198	1.0	154	1.0	1.6	246	0.108
BZW04-154	BZW04-154B	171	189	1.0	154	1.0	1.6	246	0.108
BZW04P171	BZW04P171B	190	220	1.0	171	1.0	1.5	274	0.108
BZW04-171	BZW04-171B	190	210	1.0	171	1.0	1.5	274	0.108
BZW04P188	BZW04P188B	209	242	1.0	188	1.0	1.4	301	0.108
BZW04-188	BZW04-188B	209	231	1.0	188	1.0	1.4	301	0.108
BZW04P213	BZW04P213B	237	275	1.0	213	1.0	1.2	344	0.110
BZW04-213	BZW04-213B	237	263	1.0	213	1.0	1.2	344	0.110
BZW04P239	BZW04P239B	266	308	1.0	239	1.0	1.1	384	0.110
BZW04-239	BZW04-239B	266	294	1.0	239	1.0	1.1	384	0.110
BZW04P256	BZW04P256B	285	330	1.0	256	1.0	1.0	414	0.110
BZW04-256	BZW04-256B	285	315	1.0	256	1.0	1.0	414	0.110
BZW04P273	BZW04P273B	304	352	1.0	273	1.0	0.90	438	0.110
BZW04-273	BZW04-273B	304	336	1.0	273	1.0	0.90	438	0.110
BZW04P299	BZW04P299B	332	385	1.0	299	1.0	0.80	482	0.110
BZW04-299	BZW04-299B	332	368	1.0	299	1.0	0.80	482	0.110
BZW04P342	BZW04P342B	380	440	1.0	342	1.0	0.75	548	0.110
BZW04-342	BZW04-342B	380	420	1.0	342	1.0	0.75	548	0.110
BZW04P376	BZW04P376B	418	484	1.0	376	1.0	0.67	603	0.110
BZW04-376	BZW04-376B	418	462	1.0	376	1.0	0.67	603	0.110

- Notes: (1) Pulse test: $t_p \leq 50ms$
(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 bidirectional types having V_{WM} of 10 volts and less, the I_D limit is doubled

Vishay Semiconductors
formerly General Semiconductor

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

Fig. 1 – Peak Pulse Power Rating Curve

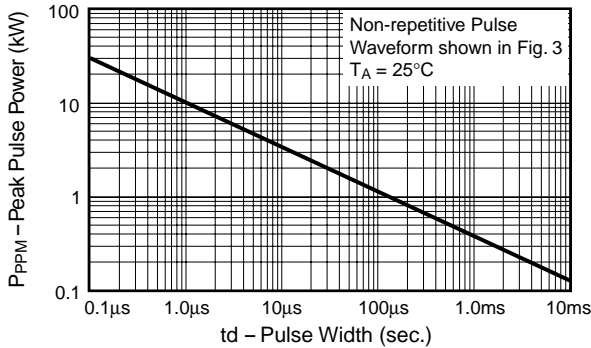


Fig. 2 – Pulse Derating Curve

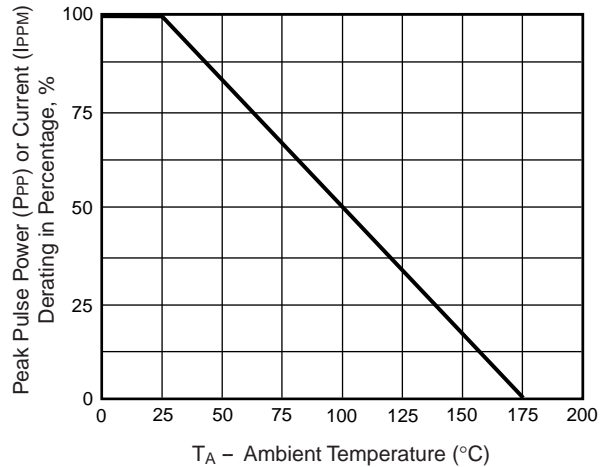


Fig. 3 – Pulse Waveform

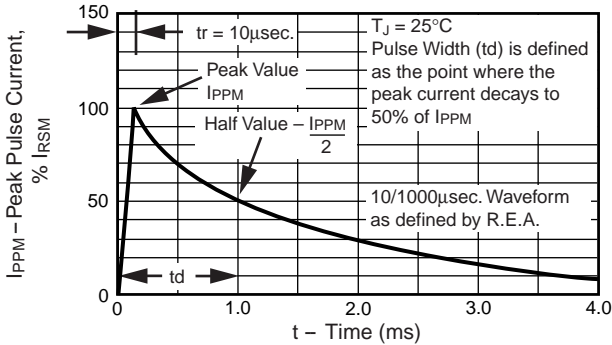


Fig. 4 – Typical Junction Capacitance

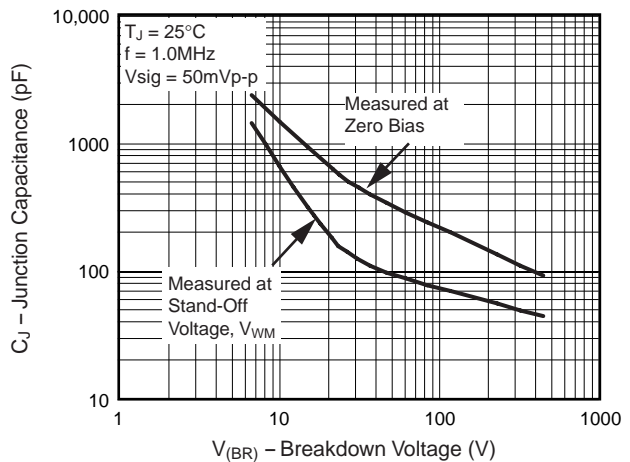


Fig. 5 – Steady State Power Derating Curve

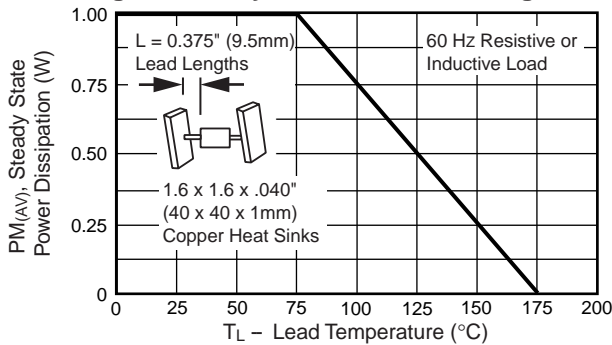


Fig. 6 – Maximum Non-Repetitive Forward Surge Current Uni-Directional Only

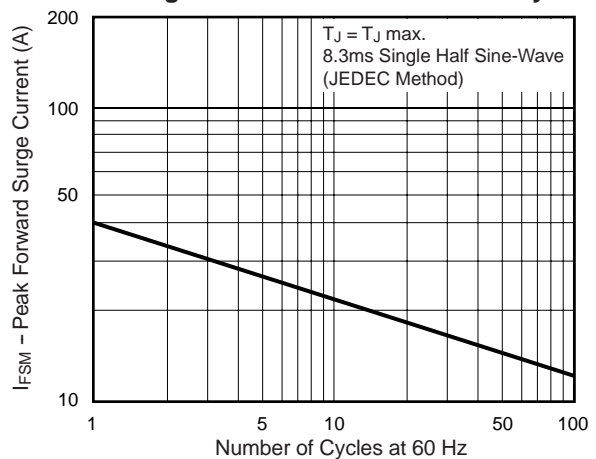
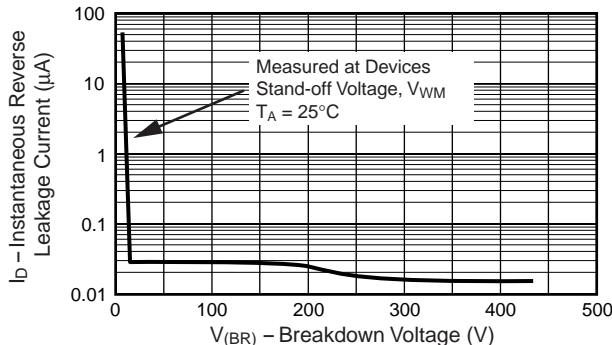


Fig. 7 – Typical Reverse Leakage Characteristics





Notice

Specifications of the products displayed herein are subject to change without notice. Vishay Intertechnology, Inc., or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document. Except as provided in Vishay's terms and conditions of sale for such products, Vishay assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of Vishay products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Vishay for any damages resulting from such improper use or sale.