

## 600W, 12.8V - 376V Transient Voltage Suppressor

### FEATURES

- AEC-Q101 qualified available
- Excellent clamping capability
- Low dynamic impedance
- 600W surge capability at 10/1000 $\mu$ s waveform
- Fast response time: Typically less than 1.0ps from 0 volt to  $V_{BR}$  for unidirectional and 5.0ns for bidirectional
- Typical  $I_R$  less than 1 $\mu$ A above 10V
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

### APPLICATIONS

- Protect sensitive circuit from damage by high voltage transients
- Lighting, ESD transient voltage protection of IC, system
- Inductive switching load protection of IC, system
- Electrical Fast Transient Immunity protection of IC, system

### MECHANICAL DATA

- Case: DO-204AC (DO-15)
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Pure tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: As marked
- Weight: 0.400g (approximately)

KEY PARAMETERS		
PARAMETER	VALUE	UNIT
$V_{WM}$	12.8 - 376	V
$V_{BR}$ (uni - directional)	14.3 - 462	V
$V_{BR}$ (bi - directional)	14.3 - 462	V
$P_{PK}$	600	W
$T_{JMAX}$	175	$^{\circ}$ C
Package	DO-204AC (DO-15)	



**DO-204AC (DO-15)**

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^{\circ}$ C unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Peak power dissipation at $T_A = 25^{\circ}$ C, $T_p = 1ms^{(1)}$	$P_{PK}$	600	W
Steady state power dissipation at $T_L = 75^{\circ}$ C lead lengths .375", 9.5mm <sup>(2)</sup>	$P_D$	1.7	W
Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load <sup>(3)</sup>	$I_{FSM}$	100	A
Operating junction temperature range	$T_J$	-55 to +175	$^{\circ}$ C
Storage temperature range	$T_{STG}$	-55 to +175	$^{\circ}$ C

#### Note:

1. Non-repetitive current pulse per Fig.3

THERMAL PERFORMANCE			
PARAMETER	SYMBOL	TYP	UNIT
Junction-to-lead thermal resistance	$R_{\theta JL}$	60	$^{\circ}$ C/W
Junction-to-ambient thermal resistance, L lead = 10mm	$R_{\theta JA}$	100	$^{\circ}$ C/W

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)												
Part Number		Breakdown voltage $V_{BR}@I_T$ (V) <sup>(1)</sup>			Test current $I_T$ (mA)	Working stand-off voltage $V_{WM}$ (V)	Reverse leakage @ $V_{WM}$ $I_D$ ( $\mu$ A)	Clamping Voltage @ $I_{PPM}$ (10/1000us)		Clamping Voltage @ $I_{PPM}$ (8/20us)		Maximum temperature coefficient <sup>(2)</sup>
		$V_{BR}$						$I_T$	$V_{WM}$	$I_R$	$V_C$	
		Uni	Bi	Min	Nom	Max						
BZW06-13	BZW06-13B	14.3	15	15.8	1	12.8	5	21.2	28.0	27.2	147	0.084
BZW06-15	BZW06-15B	17.1	18	18.9	1	15.3	1	25.2	24.0	32.5	123	0.088
BZW06-19	BZW06-19B	20.9	22	23.1	1	18.8	1	30.6	19.6	39.3	102	0.092
BZW06-20	BZW06-20B	22.8	24	25.2	1	20.5	1	33.2	28.0	42.8	93	0.094
BZW06-23	BZW06-23B	25.7	27	28.4	1	23.1	1	37.5	16.0	48.3	83	0.096
BZW06-26	BZW06-26B	28.5	30	31.5	1	25.6	1	41.5	14.5	53.5	75	0.097
BZW06-28	BZW06-28B	31.4	33	34.7	1	28.2	1	45.7	13.1	59.0	68	0.098
BZW06-31	BZW06-31B	34.2	36	37.8	1	30.8	1	49.9	12.0	64.3	62	0.099
BZW06-33	BZW06-33B	37.1	39	47.0	1	33.3	1	53.9	11.1	69.7	57	0.100
BZW06-37	BZW06-37B	40.9	43	45.2	1	36.8	1	59.3	10.1	75.0	52	0.101
BZW06-40	BZW06-40B	44.7	47	49.4	1	40.2	1	64.8	9.3	84.0	48	0.101
BZW06-48	BZW06-48B	53.2	56	58.8	1	47.8	1	77.0	7.8	100	40	0.103
BZW06-58	BZW06-58B	64.6	68	71.4	1	58.1	1	92.0	6.5	121	33	0.104
BZW06-70	BZW06-70B	77.9	82	86.1	1	70.1	1	113	5.3	146	27	0.105
BZW06-85	BZW06-85B	95	100	105	1	85.5	1	137	4.4	178	23	0.106
BZW06-102	BZW06-102B	114	120	126	1	102	1	165	3.6	212	19	0.107
BZW06-128	BZW06-128B	143	150	158	1	128	1	207	2.9	265	15	0.108
BZW06-154	BZW06-154B	171	180	189	1	154	1	246	2.4	317	13	0.108
BZW06-171	BZW06-171B	190	200	210	1	171	1	274	2.2	353	11	0.108
BZW06-188	BZW06-188B	209	220	231	1	188	1	301	2.0	388	10.3	0.108
BZW06-213	BZW06-213B	237	250	263	1	213	1	344	2.0	442	9.0	0.110
BZW06-256	BZW06-256B	285	300	315	1	256	1	414	1.6	529	7.6	0.110
BZW06-273	BZW06-273B	304	320.0	336	1	273	1	438	1.6	564	7.1	0.110
BZW06-299	BZW06-299B	332	350.0	368	1	299	1	482	1.6	618	6.5	0.110
BZW06-342	BZW06-342B	380	400	420	1	342	1	548	1.3	706	5.7	0.110
BZW06-376	BZW06-376B	418	440	462	1	376	1	603	1.3	776	5.7	0.110

**Notes:**

1. Pulse test :  $t_p < 50ms$
2.  $\Delta V_{BR} = \alpha T * (T_{amb} - 25) * V_{BR}(25^\circ C)$
3.  $V_R = 0V$ ,  $F = 1MHz$ , For bidirectional types, capacitance value is divided by 2.

<b>ORDERING INFORMATION</b>		
<b>ORDERING CODE<sup>(1)(2)</sup></b>	<b>PACKAGE</b>	<b>PACKING</b>
BZW06-x	DO-204AC (DO-15)	3,500 / Tape & Reel
BZW06-x A0G	DO-204AC (DO-15)	1,500 / Ammo box
BZW06-xH	DO-204AC (DO-15)	3,500 / Tape & Reel
BZW06-xHA0G	DO-204AC (DO-15)	1,500 / Ammo box

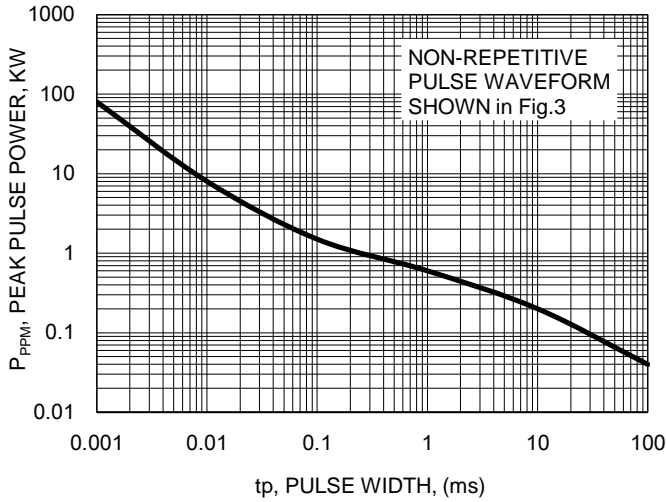
**Notes:**

1. "x" defines voltage from 12.8V (BZW06-13) to 376V (BZW06-376)
2. "H" means AEC-Q101 qualified

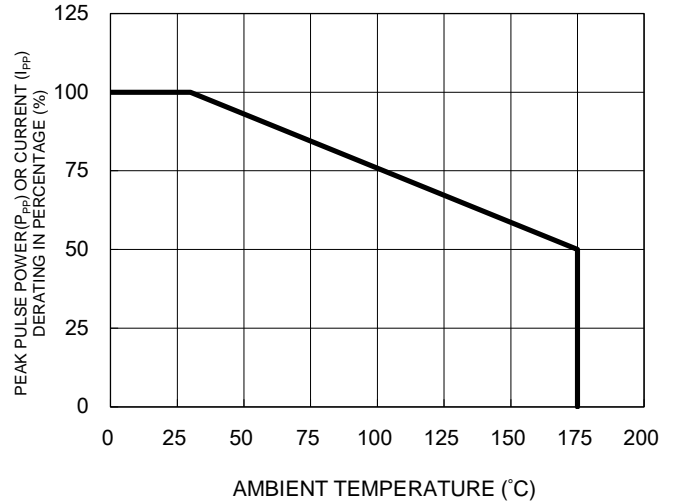
**CHARACTERISTICS CURVES**

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

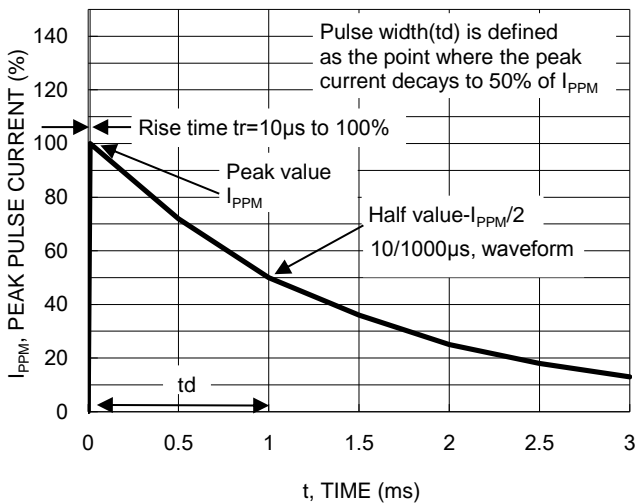
**Fig.1 Peak Pulse Power Rating Curve**



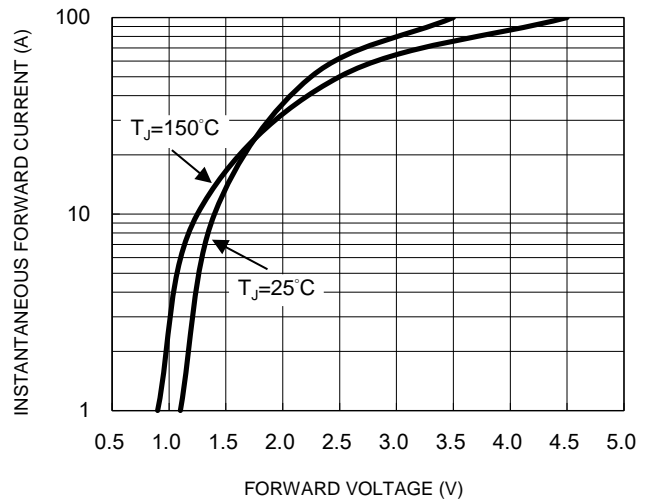
**Fig.2 Pulse Derating Curve**



**Fig.3 Clamping Power Pulse Waveform**



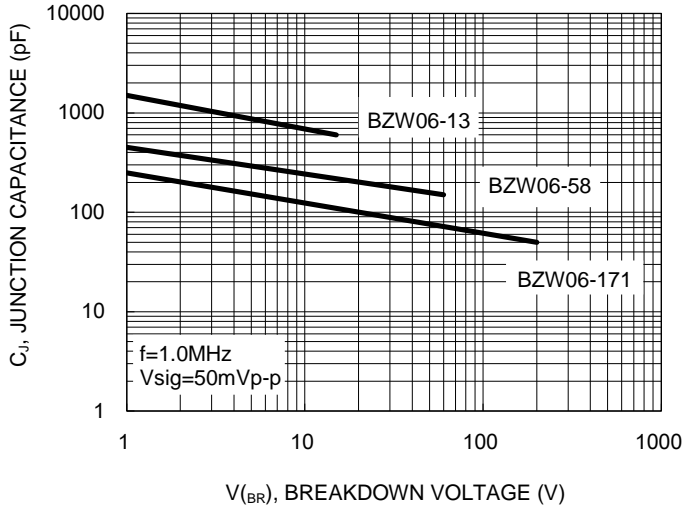
**Fig.4 Typical Junction Capacitance**



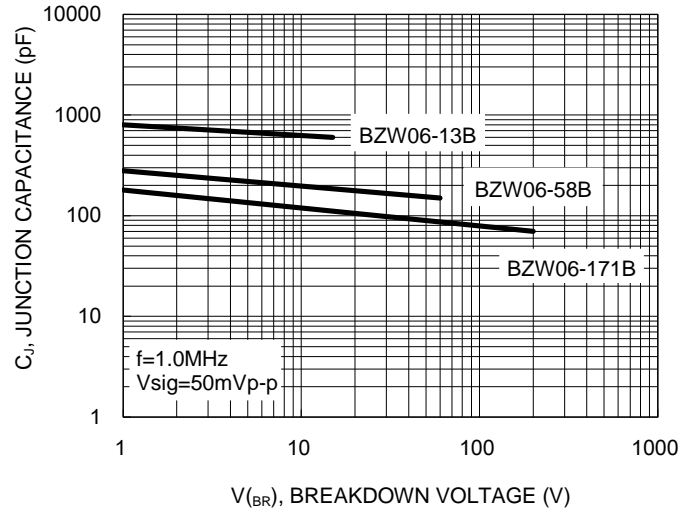
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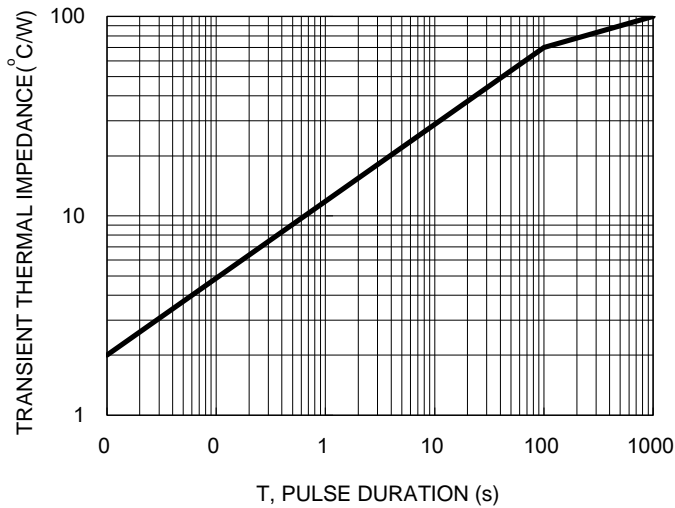
**Fig.5 Typical Junction Capacitance**



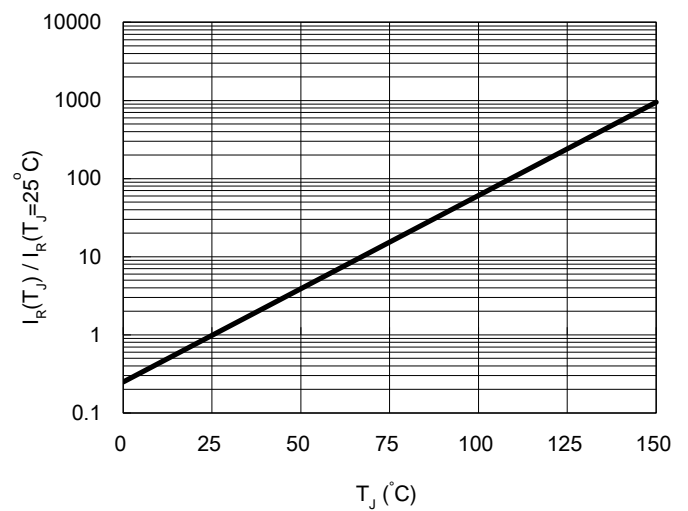
**Fig.6 Typical Junction Capacitance**



**Fig.7 Typical Transient Thermal Impedance**



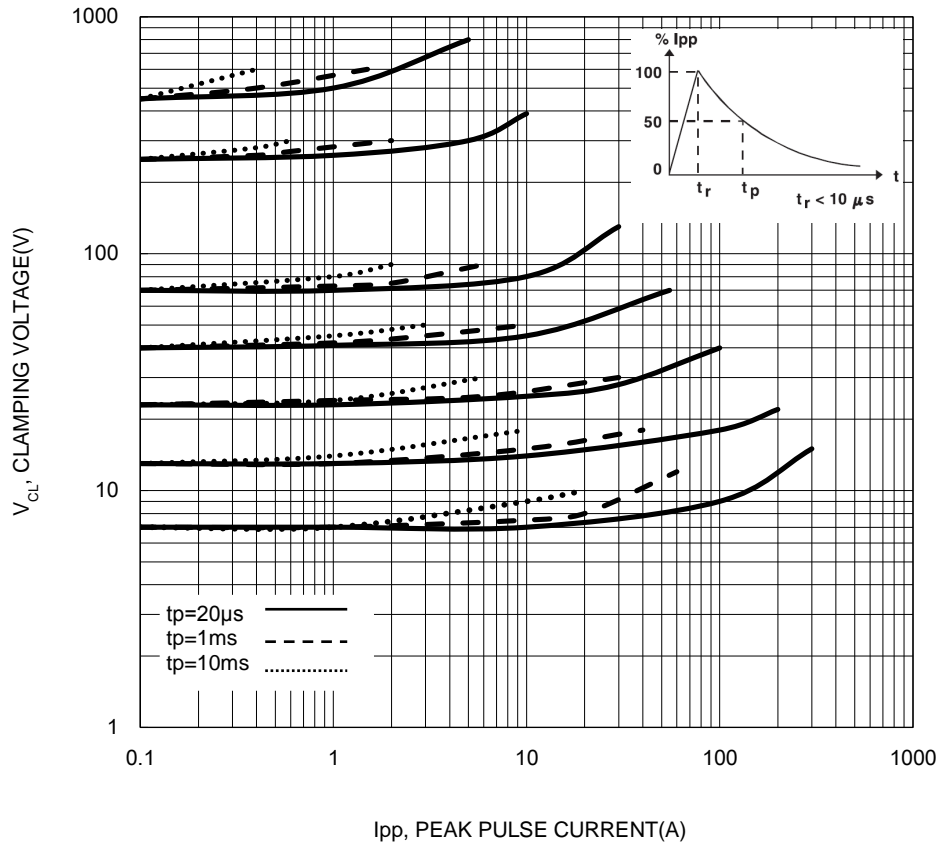
**Fig.8 Typical Junction Capacitance**



**CHARACTERISTICS CURVES**

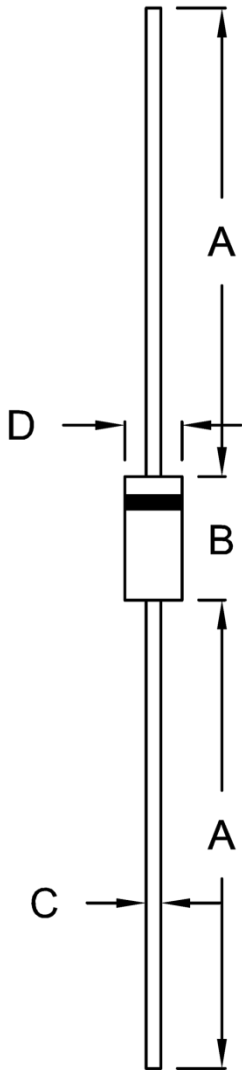
( $T_A = 25^\circ\text{C}$  unless otherwise noted)

**Fig.9 Clamping Voltage Curve**



**PACKAGE OUTLINE DIMENSIONS**

DO-204AC (DO-15)



DIM.	Unit (mm)		Unit (inch)	
	Min.	Max.	Min.	Max.
A	25.40	-	1.000	-
B	5.80	7.60	0.228	0.299
C	0.70	0.90	0.028	0.035
D	2.60	3.60	0.102	0.142

**MARKING DIAGRAM**

Cathode band for uni-directional products only



- P/N = Marking Code
- G = Green Compound
- YWW = Date Code
- F = Factory Code