400W, 5.8V - 376V Transient Voltage Suppressor

FEATURES

- AEC-Q101 qualified available
- Excellent clamping capability
- Low impedance surge resistance
- 400W surge capability at 10/1000μs waveform
- Very fast response time
- Typical I_R less than 1μA 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-204AL (DO-41)
- 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: 0.300g (approximately)

KEY PARAMETERS		
PARAMETER	**VALUE**	**UNIT**
V_{WM}	5.8 - 376	V
V_{BR} (uni - directional)	6.45 - 462	V
V_{BR} (bi - directional)	6.45 - 462	V
P_{PK}	400	W
$T_{J\,MAX}$	175	°C
Package	DO-204AL (DO-41)	

Pb-Free RoHS COMPLIANT HALOGEN FREE

DO-204AL (DO-41)

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

PARAMETER	SYMBOL	VALUE	UNIT
Peak power dissipation at T_A = 25°C, Tp = 1ms[1]	P_{PK}	400	W
Steady state power dissipation at T_L = 75°C lead lengths .375", 9.5mm[2]	P_D	1	W
Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load[3]	I_{FSM}	40	A
Operating junction temperature range	T_J	-55 to +175	°C
Storage temperature range	T_{STG}	-55 to +175	°C

Note:

1. Non-repetitive current pulse per Fig.3 and Derated above T_A = 25°C per Fig.2
2. Mounted on 5 x 5 mm copper pads to each terminal
3. 8.3ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum

THERMAL PERFORMANCE

PARAMETER	SYMBOL	TYP	UNIT
Junction-to-lead thermal resistance	$R_{\Theta JL}$	60	°C/W
Junction-to-ambient thermal resistance on printed circuit, L lead=10mm	$R_{\Theta JA}$	100	°C/W

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)

Device[1]		Breakdown voltage V_{BR}@I_T (V)		Test current I_T (mA)	Working stand-off voltage V_{WM} (V)	Reverse leakage current @ V_{WM} I_D (uA)[3]	Maximum peak impulse current I_{PP} (A)	Maximum clamping voltage V_C@I_{PP} (V)	Maximum temperature coefficient
		V_{BR}		I_T	V_{WM}	I_D	I_{PPM}	Vc	V_{BR}
		V		mA	V	μA	A	V	%/°C
Unidirectional	Bidirectional	Min	Max						
BZW04-5V8	BZW04-5V8B	6.45	7.14	10	5.80	1000	38.0	10.5	0.057
BZW04-6V4	BZW04-6V4B	7.13	7.88	10	6.40	500	35.4	11.3	0.061
BZW04-7V0	BZW04-7V0B	7.79	8.61	10	7.02	200	33.0	12.1	0.065
BZW04-7V8	BZW04-7V8B	8.65	9.55	1	7.78	50	30.0	13.4	0.068
BZW04-8V5	BZW04-8V5B	9.50	10.5	1	8.55	10	27.6	14.5	0.073
BZW04-9V4	BZW04-9V4B	10.5	11.6	1	9.40	5	25.7	15.6	0.075
BZW04-10	BZW04-10B	11.4	12.6	1	10.2	5	24.0	16.7	0.078
BZW04-11	BZW04-11B	12.4	13.7	1	11.1	5	22.0	18.2	0.081
BZW04-13	BZW04-13B	14.3	15.8	1	12.8	5	19.0	21.2	0.084
BZW04-14	BZW04-14B	15.2	16.8	1	13.6	1	17.8	22.5	0.083
BZW04-15	BZW04-15B	17.1	18.9	1	15.3	1	16.0	25.2	0.088
BZW04-17	BZW04-17B	19.0	21.0	1	17.1	1	14.5	27.7	0.090
BZW04-19	BZW04-19B	20.9	23.1	1	18.8	1	13.0	30.6	0.092
BZW04-20	BZW04-20B	22.8	25.2	1	20.5	1	12.0	33.2	0.094
BZW04-23	BZW04-23B	25.7	28.4	1	23.1	1	10.7	37.5	0.096
BZW04-26	BZW04-26B	28.5	31.5	1	25.6	1	9.6	41.5	0.097
BZW04-28	BZW04-28B	31.4	34.7	1	28.2	1	8.8	45.7	0.098
BZW04-31	BZW04-31B	34.2	37.8	1	30.8	1	8.0	49.9	0.099
BZW04-33	BZW04-33B	37.1	41.0	1	33.3	1	7.4	53.9	0.100
BZW04-37	BZW04-37B	40.9	45.2	1	36.8	1	6.7	59.3	0.101
BZW04-40	BZW04-40B	44.7	49.4	1	40.2	1	6.2	64.8	0.101
BZW04-44	BZW04-44B	48.5	53.6	1	43.6	1	5.7	70.1	0.102
BZW04-48	BZW04-48B	53.2	58.8	1	47.8	1	5.2	77.0	0.103
BZW04-53	BZW04-53B	58.9	65.1	1	53.0	1	4.7	85.0	0.104
BZW04-58	BZW04-58B	64.6	71.4	1	58.1	1	4.3	92.0	0.104
BZW04-64	BZW04-64B	71.3	78.8	1	64.1	1	3.9	103	0.105
BZW04-70	BZW04-70B	77.9	86.1	1	70.1	1	3.5	113	0.105
BZW04-78	BZW04-78B	86.5	95.5	1	78.0	1	3.2	125	0.105
BZW04-85	BZW04-85B	95	105	1	85.5	1	2.9	137	0.106
BZW04-94	BZW04-94B	105	116	1	94.0	1	2.6	152	0.107
BZW04-102	BZW04-102B	114	126	1	102	1	2.4	165	0.107
BZW04-110	BZW04-110B	124	137	1	111	1	2.2	179	0.107
BZW04-128	BZW04-128B	143	158	1	128	1	2.0	207	0.108
BZW04-136	BZW04-136B	152	168	1	136	1	1.8	219	0.108

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)									
Device[1]		**Breakdown voltage V_{BR}@I_T (V)**		**Test current I_T (mA)**	**Working stand-off voltage V_{WM} (V)**	**Reverse leakage current @ V_{WM} I_D (uA)**[3]	**Maximum peak impulse current I_{PP} (A)**	**Maximum clamping voltage V_C@I_{PP} (V)**	**Maximum temperature coefficient**
		V_{BR}		I_T	V_{WM}	I_D	I_{PPM}	Vc	V_{BR}
		V		mA	V	μA	A	V	%/°C
Unidirectional	Bidirectional	Min	Max						
BZW04-145	BZW04-145B	161	179	1	145	1	1.7	234	0.108
BZW04-154	BZW04-154B	171	189	1	154	1	1.6	246	0.108
BZW04-171	BZW04-171B	190	210	1	171	1	1.5	274	0.108
BZW04-188	BZW04-188B	209	231	1	188	1	1.4	301	0.108
BZW04-213	BZW04-213B	237	263	1	213	1	1.2	344	0.110
BZW04-239	BZW04-239B	266	294	1	239	1	1.1	384	0.110
BZW04-256	BZW04-256B	285	315	1	256	1	1.0	414	0.110
BZW04-273	BZW04-273B	304	336	1	273	1	0.9	438	0.110
BZW04-299	BZW04-299B	332	368	1	299	1	0.8	482	0.110
BZW04-342	BZW04-342B	380	420	1	342	1	0.75	548	0.110
BZW04-376	BZW04-376B	418	462	1	376	1	0.67	603	0.110

Notes:

1. Pulse test：tp<50ms
2. All terms and symbols are consistent with ANSI/IEEE C62.35
3. For bipolar types having V_{WM} of 10 volts and less, the I_D limit is doubled.

ORDERING INFORMATION

ORDERING CODE[1][2]	PACKAGE	PACKING
BZW04-x	DO-204AL (DO-41)	5,000 / Tape & Reel
BZW04-x A0G	DO-204AL (DO-41)	3,000 / Ammo box
BZW04-xH	DO-204AL (DO-41)	5,000 / Tape & Reel
BZW04-xHA0G	DO-204AL (DO-41)	3,000 / Ammo box

Notes:

1. “x” defines voltage from 5.8V (BZW04-5V8) to 376V (BZW04-376)
2. “H” means AEC-Q101 qualified

CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

Fig.1 Peak Pulse Power Rating Curve

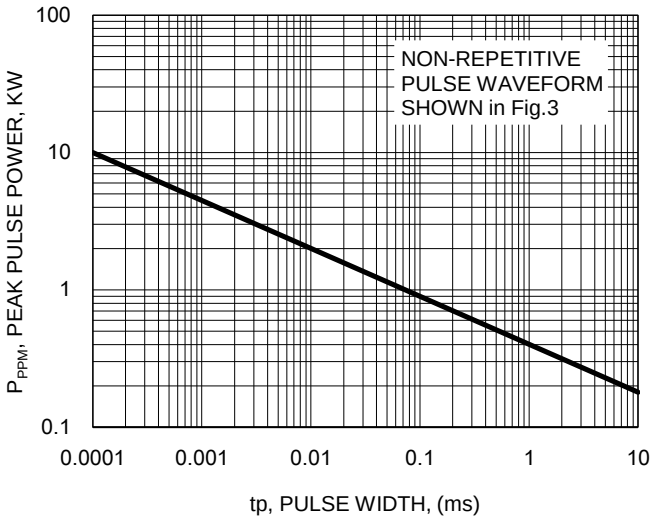


Fig.2 Pulse Derating Curve

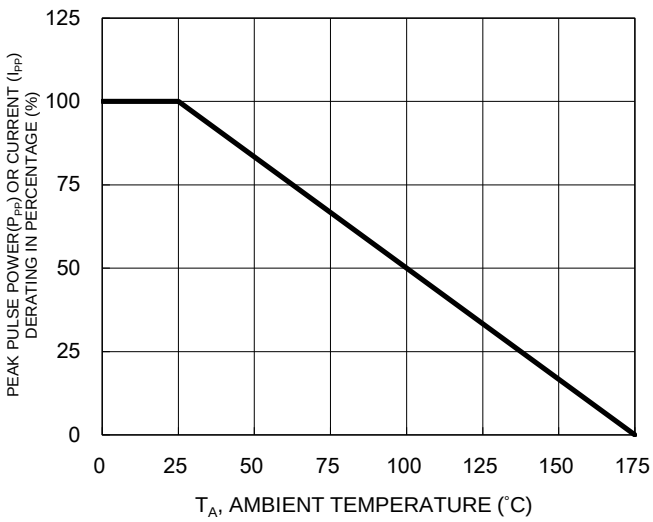


Fig.3 Clamping Power Pulse Waveform

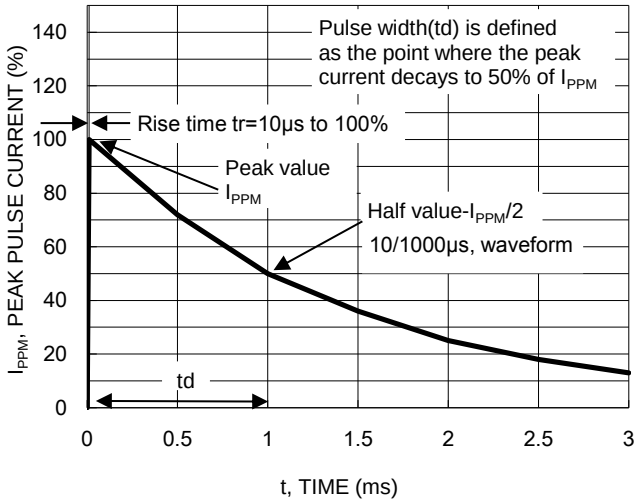
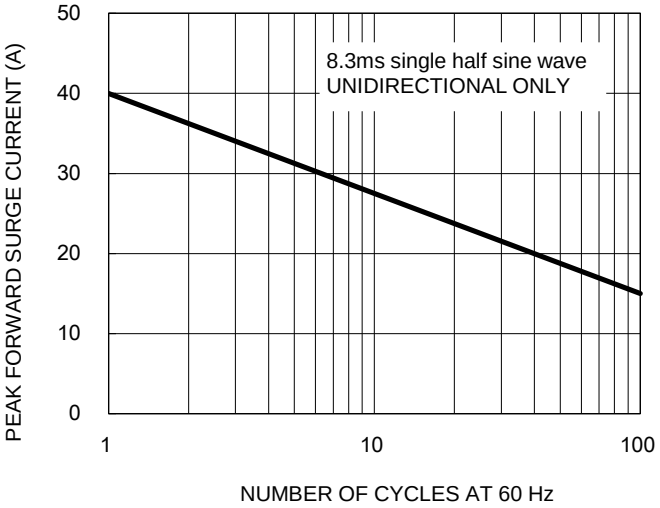


Fig.4 Maximum Non-Repetitive Forward Surge Current



CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

Fig.5 Steady State Power Derating Curve

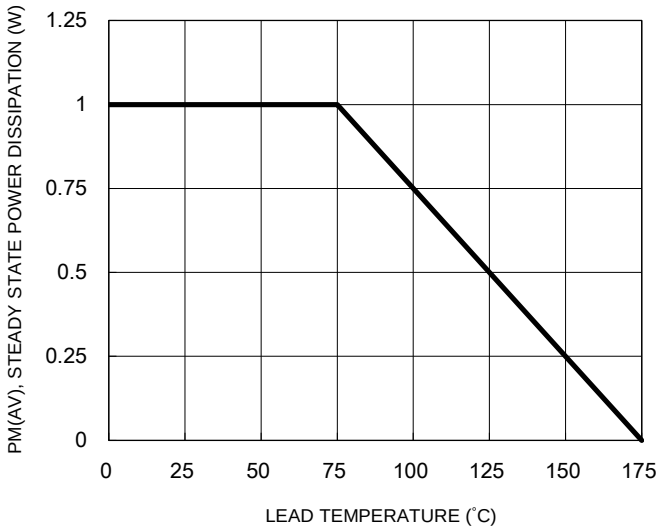


Fig.6 Typical Reverse Characteristics

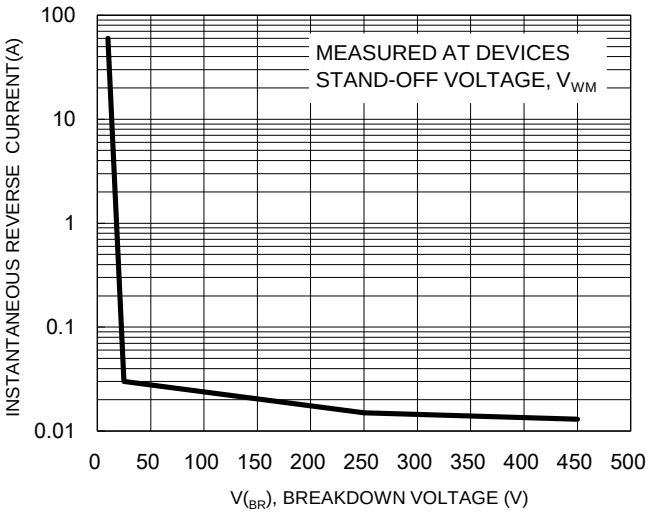
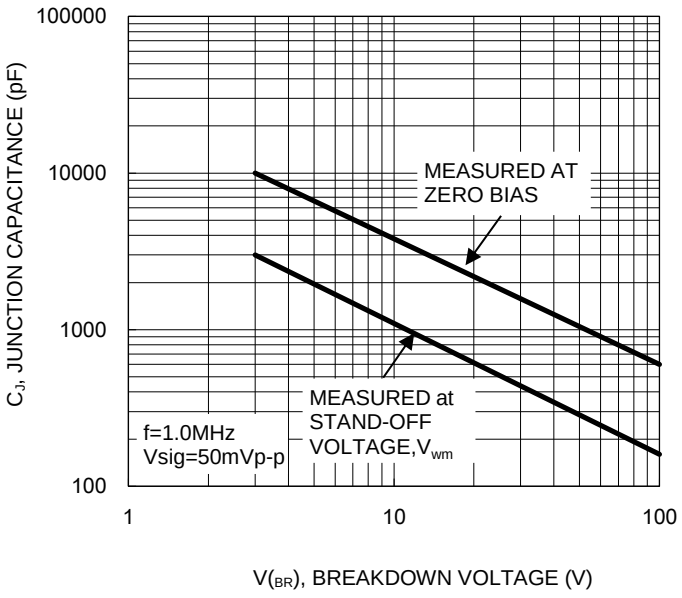
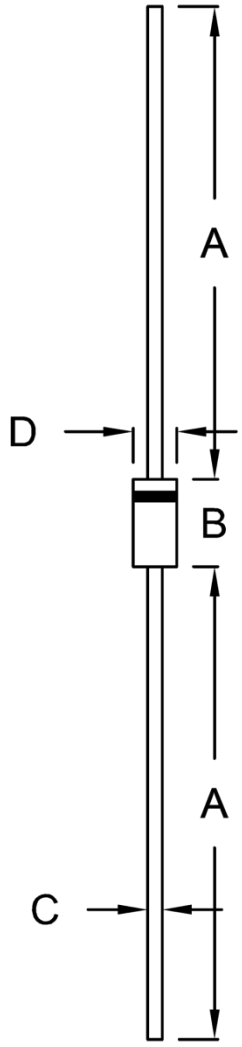


Fig.7 Typical Junction Capacitance



PACKAGE OUTLINE DIMENSIONS

DO-204AL (DO-41)



DIM.	Unit (mm)		Unit (inch)	
	Min.	Max.	Min.	Max.
A	25.40	-	1.000	-
B	4.20	5.20	0.165	0.205
C	0.71	0.86	0.028	0.034
D	2.00	2.70	0.079	0.106

MARKING DIAGRAM

Cathode band for uni-directional products only

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