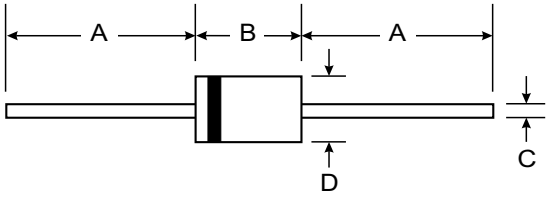
BZW04 SERIES

400 Watts Axial Leaded Transient Voltage Suppressor

Features

- Plastic package has underwriters laboratory flammability classification 94V-0
- Glass passivated junction
- 400W peak pulse power capability with a 10/1000μs waveform, repetition rate (duty cycle): 0.01%
- Excellent clamping capability
- Fast response time: typically less than 1.0ps from 0 Volts to $V_{(BR)}$ for uni-directional and 5.0ns for bi-directional types
- Devices with $V_{(BR)} \geq 10V$ I_D are typically I_D less than 1.0 μA
- High temperature soldering guaranteed:265 ℃/ 10 seconds, 0.375"(9.5mm) lead length, 5lbs. (2.3kg) tension



DO-41		
Dim	**Min**	**Max**
A	25.40	—
B	4.06	5.21
C	0.71	0.864
D	2.00	2.72
All Dimensions in mm		

Mechanical Data

- Case:JEDEC DO--41, molded plastic body over passivated junction
- Terminals: axial leads, solderable per MIL-STD-750, method 2026
- Polarity: foruni-directional types the color band denotes the cathode, which is postitive with respect to the anode under normal TVS operation
- Weight: 0.012 ounces, 0.34 grams
- Mounting position: any

Maximum Ratings and Electrical Characteristics

@ T_A = 25°C unless otherwise specified

	SYMBOL	VALUE	UNIT
Peak power dissipation with a 10/1000μs waveform (NOTE 1, FIG.1)	P_{PPM}	Minimum 400	W
Peak pulse current with a 10/1000μs waveform (NOTE 1)	I_{PPM}	See table 1	A
Steady state power dissipation at T_L=75 ℃ Lead lengths 0.375"(9.5mm) (NOTE 2)	$P_{M(AV)}$	1.0	W
Peak forward surge current, 8.3ms single half Sine-wave superimposed on rated load (JEDEC Method) (NOTE 3)	I_{FSM}	40.0	A
Maximum instantaneous forward voltage at 25A for unidirectional only (NOTE 4)	V_F	3.5/6.5	V
Operating junction and storage temperature range	T_J, T_{STG}	-50---+175	℃

NOTES: (1) Non-repetitive current pules, per Fig. 3 and derated above T_A=25℃ per Fig. 2
(2) Mounted on copper pad area of 1.6" x 1.6"(40 x40mm^2) per Fig. 5
(3) Measured of 8.3ms single half sine-wave or equare wave, duty cycle=4 pulses per minute maximum
(4) V_F=3.5 Volt max. for devices of $V_{(BR)} \leqslant 220V$, and V_F=5.0 Volt max. for devices of $V_{(BR)}$ >220V

Device type	Breakdown voltage $V_{(BR)}$ (V)(NOTE1)		Test current at I_T (mA)	Stand-off voltage V_{WM} (V)	Maximum reverse leakge at V_{WM} I_D (NOTE3)(μA)	Maximum peak pulse I_{PPM}(NOTE2) (A)	Maximum clamping voltage at I_{PPM} V_C(V)	Maximum temperature coefficient of $V_{(BR)}$ (%/℃)
	Min	Max						
BZW04P5V8CA	6.45	7.48	10	5.80	1000	38.0	10.5	0.057
BZW04-5V8CA	6.45	7.14	10	5.80	1000	38.0	10.5	0.057
BZW04P5V8A	6.45	7.48	10	5.80	1000	38.0	10.5	0.057
BZW04-5V8A	6.45	7.14	10	5.80	1000	38.0	10.5	0.057
BZW04P6V4CA	7.13	8.25	10	6.40	500	35.4	11.3	0.061
BZW04-6V4CA	7.13	7.88	10	6.40	500	35.4	11.3	0.061
BZW04P6V4A	7.13	8.25	10	6.40	500	35.4	11.3	0.061
BZW04-6V4A	7.13	7.88	10	6.40	500	35.4	11.3	0.061
BZW04P7V0CA	7.79	9.02	10	7.02	200	33.0	12.1	0.065
BZW04-7V0CA	7.79	8.61	10	7.02	200	33.0	12.1	0.065
BZW04P7V0A	7.79	9.02	10	7.02	200	33.0	12.1	0.065
BZW04-7V0A	7.79	8.61	10	7.02	200	33.0	12.1	0.065
BZW04P7V8CA	8.65	10.0	1.0	7.78	50	30.0	13.4	0.068
BZW04-7V8CA	8.65	9.55	1.0	7.78	50	30.0	13.4	0.073
BZW04P7V8A	8.65	10.0	1.0	7.78	50	30.0	13.4	0.068
BZW04-7V8A	8.65	9.55	1.0	7.78	50	30.0	13.4	0.073
BZW04P8V5CA	9.50	11.0	1.0	8.55	10	27.6	14.5	0.070
BZW04-8V5CA	9.50	10.5	1.0	8.55	10	27.6	14.5	0.075
BZW04P8V5A	9.50	11.0	1.0	8.55	10	27.6	14.5	0.070
BZW04-8V5A	9.50	10.5	1.0	8.55	10	27.6	14.5	0.075
BZW04P9V4CA	10.05	12.1	1.0	9.40	5.0	25.7	15.6	0.075
BZW04-9V4CA	10.05	11.6	1.0	9.40	5.0	25.7	15.6	0.075
BZW04P9V4A	10.05	12.1	1.0	9.40	5.0	25.7	15.6	0.075
BZW04-9V4A	10.05	11.6	1.0	9.40	5.0	25.7	15.6	0.075
BZW04P10CA	11.4	13.2	1.0	10.2	5.0	24.0	16.7	0.078
BZW04-10CA	11.4	12.6	1.0	10.2	5.0	24.0	16.7	0.078
BZW04P10A	11.4	13.2	1.0	10.2	5.0	24.0	16.7	0.078
BZW04-10A	11.4	12.6	1.0	10.2	5.0	24.0	16.7	0.078
BZW04P11CA	12.4	14.3	1.0	11.1	5.0	22.0	18.2	0.081
BZW04-11CA	12.4	13.7	1.0	11.1	5.0	22.0	18.2	0.081
BZW04P11A	12.4	14.3	1.0	11.1	5.0	22.0	18.2	0.081
BZW04-11A	12.4	13.7	1.0	11.1	5.0	22.0	18.2	0.081
BZW04P13CA	14.3	16.5	1.0	12.8	5.0	19.0	21.2	0.084
BZW04-13CA	14.3	15.8	1.0	12.8	5.0	19.0	21.2	0.084
BZW04P13A	14.3	16.5	1.0	12.8	5.0	19.0	21.2	0.084
BZW04-13A	14.3	15.8	1.0	12.8	5.0	19.0	21.2	0.084
BZW04P14CA	15.2	17.6	1.0	13.6	1.0	17.8	22.5	0.086
BZW04-14CA	15.2	16.8	1.0	13.6	1.0	17.8	22.5	0.086
BZW04P14A	15.2	17.6	1.0	13.6	1.0	17.8	22.5	0.086
BZW04-14A	15.2	16.8	1.0	13.6	1.0	17.8	22.5	0.086
BZW04P15CA	17.1	19.8	1.0	15.3	1.0	16.0	25.2	0.088
BZW04-15CA	17.1	18.9	1.0	15.3	1.0	16.0	25.2	0.088
BZW04P15A	17.1	19.8	1.0	15.3	1.0	16.0	25.2	0.088
BZW04-15A	17.1	18.9	1.0	15.3	1.0	16.0	25.2	0.088

Device type	Breakdown voltage $V_{(BR)}$ (V)(NOTE1)		Test current at I_T (mA)	Stand-off voltage V_{WM} (V)	Maximum reverse leakge at V_{WM} $I_{D\ (NOTE3)}(\mu A)$	Maximum peak pulse $I_{PPM(NOTE2)}$ (A)	Maximum clamping voltage at I_{PPM} V_C(V)	Maximum temperature coefficient of $V_{(BR)}$ (%/℃)
	Min	Max						
BZW04P17CA	19.0	22.0	1.0	17.1	1.0	14.5	27.7	0.090
BZW04-17CA	19.0	21.0	1.0	17.1	1.0	14.5	27.7	0.090
BZW04P17A	19.0	22.0	1.0	17.1	1.0	14.5	27.7	0.090
BZW04-17A	19.0	21.0	1.0	17.1	1.0	14.5	27.7	0.090
BZW04P19CA	20.9	20.2	1.0	18.8	1.0	13.0	30.6	0.092
BZW04-19CA	20.9	23.1	1.0	18.8	1.0	13.0	30.6	0.092
BZW04P19A	20.9	20.2	1.0	18.8	1.0	13.0	30.6	0.092
BZW04-19A	20.9	23.1	1.0	18.8	1.0	13.0	30.6	0.092
BZW04P20CA	22.8	26.4	1.0	20.5	1.0	12.0	33.2	0.094
BZW04-20CA	22.8	25.2	1.0	20.5	1.0	12.0	33.2	0.094
BZW04P20A	22.8	26.4	1.0	20.5	1.0	12.0	33.2	0.094
BZW04-20A	22.8	25.2	1.0	20.5	1.0	12.0	33.2	0.094
BZW04P23CA	25.7	28.7	1.0	23.1	1.0	10.7	37.5	0.096
BZW04-23CA	25.7	28.4	1.0	23.1	1.0	10.7	37.5	0.096
BZW04P23A	25.7	28.7	1.0	23.1	1.0	10.7	37.5	0.096
BZW04-23A	25.7	28.4	1.0	23.1	1.0	10.7	37.5	0.096
BZW04P26CA	28.5	33.0	1.0	25.6	1.0	9.6	41.5	0.097
BZW04-26CA	28.5	31.5	1.0	25.6	1.0	9.6	41.5	0.097
BZW04P26A	28.5	33.0	1.0	25.6	1.0	9.6	41.5	0.097
BZW04-26A	28.5	31.5	1.0	25.6	1.0	9.6	41.5	0.097
BZW04P28CA	31.4	36.3	1.0	28.2	1.0	8.8	45.7	0.098
BZW04-28CA	31.4	34.7	1.0	28.2	1.0	8.8	45.7	0.098
BZW04P28A	31.4	36.3	1.0	28.2	1.0	8.8	45.7	0.098
BZW04-28A	31.4	34.7	1.0	28.2	1.0	8.8	45.7	0.098
BZW04P31CA	34.2	39.6	1.0	30.8	1.0	8.0	49.9	0.099
BZW04-31CA	34.2	37.8	1.0	30.8	1.0	8.0	49.9	0.099
BZW04P31A	34.2	39.6	1.0	30.8	1.0	8.0	49.9	0.099
BZW04-31A	34.2	37.8	1.0	30.8	1.0	8.0	49.9	0.099
BZW04P33CA	37.1	42.9	1.0	33.3	1.0	7.4	53.9	0.100
BZW04-33CA	37.1	41.0	1.0	33.3	1.0	7.4	53.9	0.100
BZW04P33A	37.1	42.9	1.0	33.3	1.0	7.4	53.9	0.100
BZW04-33A	37.1	41.0	1.0	33.3	1.0	7.4	53.9	0.100
BZW04P37CA	40.9	47.3	1.0	36.8	1.0	6.7	59.3	0.101
BZW04-37CA	40.9	45.2	1.0	36.8	1.0	6.7	59.3	0.101
BZW04P37A	40.9	47.3	1.0	36.8	1.0	6.7	59.3	0.101
BZW04-37A	40.9	45.2	1.0	36.8	1.0	6.7	59.3	0.101
BZW04P40CA	44.7	51.7	1.0	40.2	1.0	6.2	64.8	0.101
BZW04-40CA	44.7	49.4	1.0	40.2	1.0	6.2	64.8	0.101
BZW04P40A	44.7	51.7	1.0	40.2	1.0	6.2	64.8	0.101
BZW04-40A	44.7	49.4	1.0	40.2	1.0	6.2	64.8	0.101
BZW04P44CA	48.5	56.1	1.0	43.6	1.0	5.7	70.1	0.102
BZW04-44CA	48.5	53.6	1.0	43.6	1.0	5.7	70.1	0.102
BZW04P44A	48.5	56.1	1.0	43.6	1.0	5.7	70.1	0.102
BZW04-44A	48.5	53.6	1.0	43.6	1.0	5.7	70.1	0.102
BZW04P48CA	53.2	61.6	1.0	47.8	1.0	5.2	77.0	0.103
BZW04-48CA	53.2	58.8	1.0	47.8	1.0	5.2	77.0	0.103
BZW04P48A	53.2	61.6	1.0	47.8	1.0	5.2	77.0	0.103
BZW04-48A	53.2	58.8	1.0	47.8	1.0	5.2	77.0	0.103

Device type	Breakdown voltage $V_{(BR)}$ (V)(NOTE1)		Test current at I_T (mA)	Stand-off voltage V_{WM} (V)	Maximum reverse leakge at V_{WM} I_D (NOTE3)(μA)	Maximum peak pulse I_{PPM}(NOTE2) (A)	Maximum clamping voltage at I_{PPM} V_C(V)	Maximum temperature coefficient of $V_{(BR)}$ (%/℃)
	Min	Max						
BZW04P53 CA	58.9	68.2	1.0	53.0	1.0	4.7	85.0	0.104
BZW04-53 CA	58.9	65.1	1.0	53.0	1.0	4.7	85.0	0.104
BZW04P53 A	58.9	68.2	1.0	53.0	1.0	4.7	85.0	0.104
BZW04-53 A	58.9	65.1	1.0	53.0	1.0	4.7	85.0	0.104
BZW04P58 CA	74.8	74.8	1.0	58.1	1.0	4.3	92.0	0.104
BZW04-58 CA	74.8	71.4	1.0	58.1	1.0	4.3	92.0	0.104
BZW04P58 A	74.8	74.8	1.0	58.1	1.0	4.3	92.0	0.104
BZW04-58 A	74.8	71.4	1.0	58.1	1.0	4.3	92.0	0.104
BZW04P64 CA	71.3	82.5	1.0	64.1	1.0	3.9	103	0.105
BZW04-64 CA	71.3	78.8	1.0	64.1	1.0	3.9	103	0.105
BZW04P64 A	71.3	82.5	1.0	64.1	1.0	3.9	103	0.105
BZW04-64 A	71.3	78.8	1.0	64.1	1.0	3.9	103	0.105
BZW04P70 CA	77.9	90.2	1.0	70.1	1.0	3.5	113	0.105
BZW04-70 CA	77.9	86.1	1.0	70.1	1.0	3.5	113	0.105
BZW04P70 A	77.9	90.2	1.0	70.1	1.0	3.5	113	0.105
BZW04-70 A	77.9	86.1	1.0	70.1	1.0	3.5	113	0.105
BZW04P78 CA	86.5	100	1.0	78.0	1.0	3.2	125	0.105
BZW04-78 CA	86.5	95.5	1.0	78.0	1.0	3.2	125	0.105
BZW04P78 A	86.5	100	1.0	78.0	1.0	3.2	125	0.105
BZW04-78 A	86.5	95.5	1.0	78.0	1.0	3.2	125	0.105
BZW04P85CA	95.0	110	1.0	85.5	1.0	2.9	137	0.106
BZW04-85CA	95.0	105	1.0	85.5	1.0	2.9	137	0.106
BZW04P85 A	95.0	110	1.0	85.5	1.0	2.9	137	0.106
BZW04-85 A	95.0	105	1.0	85.5	1.0	2.9	137	0.106
BZW04P94CA	105	121	1.0	94.0	1.0	2.6	152	0.107
BZW04-94CA	105	116	1.0	94.0	1.0	2.6	152	0.107
BZW04P94A	105	121	1.0	94.0	1.0	2.6	152	0.107
BZW04-94 A	105	116	1.0	94.0	1.0	2.6	152	0.107
BZW04P102CA	114	132	1.0	102.0	1.0	2.4	165	0.107
BZW04-102 CA	114	126	1.0	102	1.0	2.4	165	0.107
BZW04P102 A	114	132	1.0	102.0	1.0	2.4	165	0.107
BZW04-102 A	114	126	1.0	102	1.0	2.4	165	0.107
BZW04P110CA	124	143	1.0	111	1.0	2.2	179	0.107
BZW04-110 CA	124	137	1.0	111	1.0	2.2	179	0.107
BZW04P110 A	124	143	1.0	111	1.0	2.2	179	0.107
BZW04-110 A	124	137	1.0	111	1.0	2.2	179	0.107
BZW04P128CA	143	165	1.0	128	1.0	2.0	207	0.108
BZW04-128 CA	143	158	1.0	128	1.0	2.0	207	0.108
BZW04P128 A	143	165	1.0	128	1.0	2.0	207	0.108
BZW04-128 A	143	158	1.0	128	1.0	2.0	207	0.108
BZW04P136CA	152	176	1.0	136	1.0	1.8	219	0.108
BZW04-136CA	152	168	1.0	136	1.0	1.8	219	0.108
BZW04P136 A	152	176	1.0	136	1.0	1.8	219	0.108
BZW04-136 A	152	168	1.0	136	1.0	1.8	219	0.108

Device type	Breakdown voltage $V_{(BR)}$ (V)(NOTE1)		Test current at I_T (mA)	Stand-off voltage V_{WM} (V)	Maximum reverse leakge at V_{WM} I_D (NOTE3)(μA)	Maximum peak pulse I_{PPM}(NOTE2) (A)	Maximum clamping voltage at I_{PPM} V_C(V)	Maximum temperature coefficient of $V_{(BR)}$ (%/℃)
	Min	Max						
BZW04P145CA	161	187	1.0	145	1.0	1.7	234	0.108
BZW04-145CA	161	179	1.0	145	1.0	1.7	234	0.108
BZW04P145A	161	187	1.0	145	1.0	1.7	234	0.108
BZW04-145A	161	179	1.0	145	1.0	1.7	234	0.108
BZW04P154CA	171	198	1.0	154	1.0	1.6	246	0.108
BZW04-154CA	171	189	1.0	154	1.0	1.6	246	0.108
BZW04P154A	171	198	1.0	154	1.0	1.6	246	0.108
BZW04-154A	171	189	1.0	154	1.0	1.6	246	0.108
BZW04P171CA	190	220	1.0	171	1.0	1.5	274	0.108
BZW04-171CA	190	210	1.0	171	1.0	1.5	274	0.108
BZW04P171A	190	220	1.0	171	1.0	1.5	274	0.108
BZW04-171A	190	210	1.0	171	1.0	1.5	274	0.108
BZW04P188CA	209	242	1.0	188	1.0	1.4	301	0.108
BZW04-188CA	209	231	1.0	188	1.0	1.4	301	0.108
BZW04P188A	209	242	1.0	188	1.0	1.4	301	0.108
BZW04-188A	209	231	1.0	188	1.0	1.4	301	0.108
BZW04P213CA	237	275	1.0	213	1.0	1.5	344	0.110
BZW04-213CA	237	263	1.0	213	1.0	1.5	344	0.110
BZW04P213A	237	275	1.0	213	1.0	1.5	344	0.110
BZW04-213A	237	263	1.0	213	1.0	1.5	344	0.110
BZW04P239CA	266	308	1.0	239	1.0	1.5	384	0.110
BZW04-239CA	266	294	1.0	239	1.0	1.5	384	0.110
BZW04P239A	266	308	1.0	239	1.0	1.5	384	0.110
BZW04-239A	266	294	1.0	239	1.0	1.5	384	0.110
BZW04P256CA	285	330	1.0	256	1.0	1.20	414	0.110
BZW04-256CA	285	315	1.0	256	1.0	1.20	414	0.110
BZW04P256A	285	330	1.0	256	1.0	1.20	414	0.110
BZW04-256A	285	315	1.0	256	1.0	1.20	414	0.110
BZW04P273CA	304	352	1.0	273	1.0	1.20	438	0.110
BZW04-273CA	304	336	1.0	273	1.0	1.20	438	0.110
BZW04P273A	304	352	1.0	273	1.0	1.20	438	0.110
BZW04-273A	304	336	1.0	273	1.0	1.20	438	0.110
BZW04P299CA	332	385	1.0	299	1.0	0.90	482	0.110
BZW04-299CA	332	368	1.0	299	1.0	0.90	482	0.110
BZW04P299A	332	385	1.0	299	1.0	0.90	482	0.110
BZW04-299A	332	368	1.0	299	1.0	0.90	482	0.110
BZW04P342CA	380	440	1.0	342	1.0	0.90	548	0.110
BZW04-342CA	380	420	1.0	342	1.0	0.90	548	0.110
BZW04P342A	380	440	1.0	342	1.0	0.90	548	0.110
BZW04-342A	380	420	1.0	342	1.0	0.90	548	0.110
BZW04P376CA	418	484	1.0	376	1.0	0.80	603	0.110
BZW04-376CA	418	462	1.0	376	1.0	0.80	603	0.110
BZW04P376A	418	484	1.0	376	1.0	0.80	603	0.110
BZW04-376A	418	462	1.0	376	1.0	0.80	603	0.110

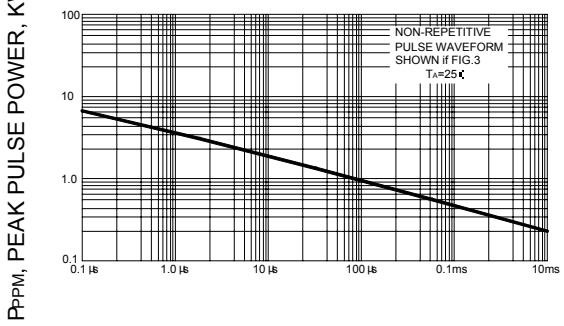
NOTE: (1) Pulse test: tp≤50ms.

(2) Surge current waveform per Fig. 3 and derated Fig. 2

(3) For bidirectional types having V_{WM} of 10 volts and less, the I_D limit is doubled

(4) All terms and symbols are consistent with ANSI/IEEE C62.35

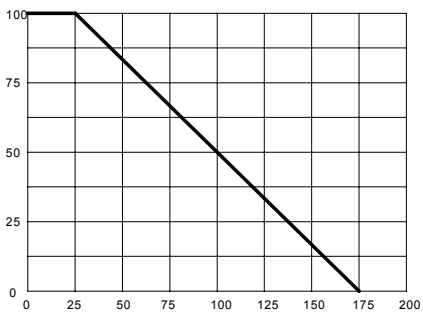
FIG.1 -- PEAK PULSE POWER RATING CURVE



PPPM, PEAK PULSE POWER, KW

tol, PULSE WIDTH, SEC.

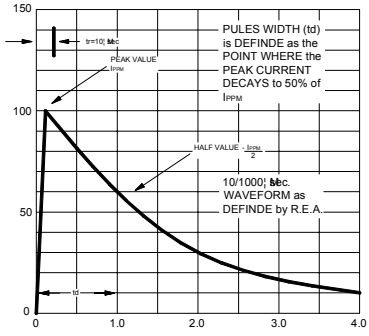
FIG.2 -- PULSE DERATING CURVE



PEAK PULSE POWER (PPP) OR CURRENT (IPPM) DERATING IN PERCENTAGE, %

TA, AMBIENT TEMPERATURE ℃

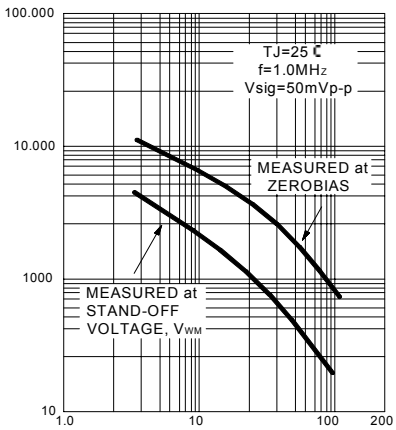
FIG.3 -- PULSE WAVEFORM



IPPM, PEAK PULSE CURRENT, %

t, TIME, ms

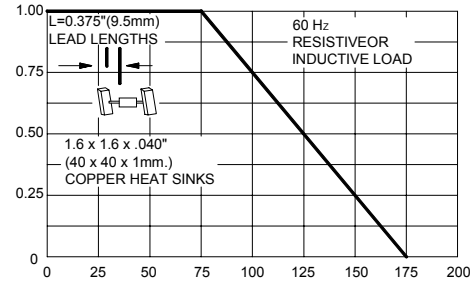
FIG.4 -- TYPICAL JUNCTION CAPACITANCE UNIDIRECTIONAL



CJ, JUNCTION CAPACITANCE, Pf

V(BR), BREAKDOWN VOLTAGE, V

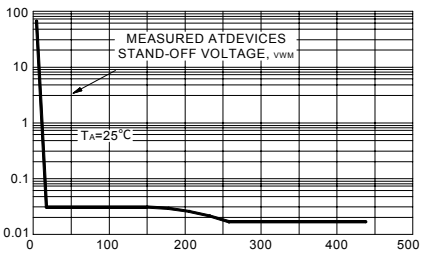
FIG.5 -- STEADY STATE POWER DERATING CURVE



PM(AV), STRADY STATE POWEI DISSIPATION, W

TL, LEAD TEMPERATURE, ℃

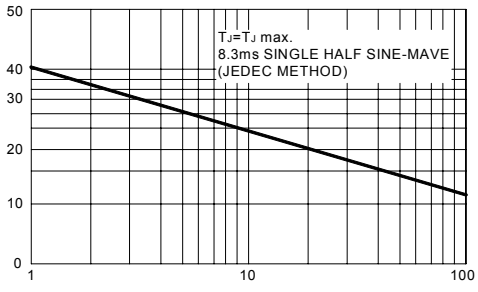
FIG.7 -- TYPICAL REVERSE LEAKAGE CHARACTERISTICS



ID, INSTANTANEOUS REVERSE LEAKAGE CURRENT, mA

V(BR), BREAKDOWN VOLTAGE, V

FIG.6 -- MAXIMUN NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL ONLY



IFSM, PEAK FORWARD SURGE CURRENT, A

NUMBER OF CYCLES AT 60 Hz