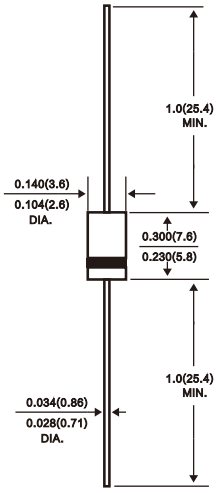
FEATURES

- Glass passivated chip junction
- Available in uni-directional and bi-directional
- 600 W peak pulse power capability with a 10/1000 µs waveform, repetitive rate (duty cycle): 0.01 %
- Excellent clamping capability
- Very fast response time
- Low incremental surge resistance
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified

DO−15(DO−204AC)



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: DO-204AC, molded epoxy over passivated chip
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Note

- P6KE250A to P6KE540A and P6KE250CA to P6KE440CA for commercial grade only

DEVICES FOR BI-DIRECTION APPLICATIONS

For bi-directional types, use CA suffix (e.g. P6KE440CA).
Electrical characteristics apply in both directions.

PRIMARY CHARACTERISTICS	
V_{WM}	5.8 V to 459 V
V_{BR} uni-directional	6.8 V to 540 V
V_{BR} bi-directional	6.8 V to 440 V
P_{PPM}	600 W
P_D	5.0 W
I_{FSM} (uni-directional only)	100 A
T_J max.	175 °C
Polarity	Uni-directional, bi-directional
Package	DO-204AC (DO-15)

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

PARAMETER	SYMBOL	VALUE	UNIT
Peak pulse power dissipation with a 10/1000 µs waveform (1) (fig. 1)	P_{PPM}	600	W
Peak pulse current with a 10/1000 µs waveform (1)	I_{PPM}	See next table	A
Power dissipation on infinite heatsink at T_L = 75 °C (fig. 5)	P_D	5.0	W
Peak forward surge current 8.3 ms single half sine-wave (2)	I_{FSM}	100	A
Maximum instantaneous forward voltage at 50 A for uni-directional only (3)	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 °C per fig. 2
(2) Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum
(3) V_F = 3.5 V for P6KE220A and below; V_F = 5.0 V for P6KE250A and above

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

DEVICE TYPE	BREAKDOWN VOLTAGE V_{BR} AT I_T (1) (V)		TEST CURRENT I_T (mA)	STAND-OFF VOLTAGE V_{WM} (V)	MAXIMUM REVERSE LEAKAGE AT V_{WM} (3) I_D (μA)	MAXIMUM PEAK PULSE CURRENT I_{PPM} (2) (A)	MAXIMUM CLAMPING VOLTAGE AT I_{PPM} V_C (V)	MAXIMUM TEMPERATURE COEFFICENT AT V_{BR} (%/°C)
	MIN.	MAX.						
P6KE6.8A(CA)	6.45	7.14	10	5.80	1000	57.1	10.5	0.057
P6KE7.5A(CA)	7.13	7.88	10	6.40	500	53.1	11.3	0.061
P6KE8.2A(CA)	7.79	8.61	10	7.02	200	49.6	12.1	0.065
P6KE9.1A(CA)	8.65	9.55	1.0	7.78	50	44.8	13.4	0.068
P6KE10A(CA)	9.50	10.5	1.0	8.55	10	41.4	14.5	0.073
P6KE11A(CA)	10.5	11.6	1.0	9.40	5.0	38.5	15.6	0.075
P6KE12A(CA)	11.4	12.6	1.0	10.2	5.0	35.9	16.7	0.078
P6KE13A(CA)	12.4	13.7	1.0	11.1	5.0	33.0	18.2	0.081
P6KE15A(CA)	14.3	15.8	1.0	12.8	1.0	28.3	21.2	0.084
P6KE16A(CA)	15.2	16.8	1.0	13.6	1.0	26.7	22.5	0.086
P6KE18A(CA)	17.1	18.9	1.0	15.3	1.0	23.8	25.2	0.088
P6KE20A(CA)	19.0	21.0	1.0	17.1	1.0	21.7	27.7	0.090
P6KE22A(CA)	20.9	23.1	1.0	18.8	1.0	19.6	30.6	0.092
P6KE24A(CA)	22.8	25.2	1.0	20.5	1.0	18.1	33.2	0.094
P6KE27A(CA)	25.7	28.4	1.0	23.1	1.0	16.0	37.5	0.096
P6KE30A(CA)	28.5	31.5	1.0	25.6	1.0	14.5	41.4	0.097
P6KE33A(CA)	31.4	34.7	1.0	28.2	1.0	13.1	45.7	0.098
P6KE36A(CA)	34.2	37.8	1.0	30.8	1.0	12.0	49.9	0.099
P6KE39A(CA)	37.1	41.0	1.0	33.3	1.0	11.1	53.9	0.100
P6KE43A(CA)	40.9	45.2	1.0	36.8	1.0	10.1	59.3	0.101
P6KE47A(CA)	44.7	49.4	1.0	40.2	1.0	9.3	64.8	0.101
P6KE51A(CA)	48.5	53.6	1.0	43.6	1.0	8.6	70.1	0.102
P6KE56A(CA)	53.2	58.8	1.0	47.8	1.0	7.8	77.0	0.103
P6KE62A(CA)	58.9	65.1	1.0	53.0	1.0	7.1	85.0	0.104
P6KE68A(CA)	64.6	71.4	1.0	58.1	1.0	6.5	92.0	0.104
P6KE75A(CA)	71.3	78.8	1.0	64.1	1.0	5.8	103	0.105
P6KE82A(CA)	77.9	86.1	1.0	70.1	1.0	5.3	113	0.105
P6KE91A(CA)	86.5	95.5	1.0	77.8	1.0	4.8	125	0.106
P6KE100A(CA)	95.0	105	1.0	85.5	1.0	4.4	137	0.106
P6KE110A(CA)	105	116	1.0	94.0	1.0	3.9	152	0.107
P6KE120A(CA)	114	126	1.0	102	1.0	3.6	165	0.107
P6KE130A(CA)	124	137	1.0	111	1.0	3.4	179	0.107
P6KE150A(CA)	143	158	1.0	128	1.0	2.9	207	0.108
P6KE160A(CA)	152	168	1.0	136	1.0	2.7	219	0.108
P6KE170A(CA)	162	179	1.0	145	1.0	2.6	234	0.108
P6KE180A(CA)	171	189	1.0	154	1.0	2.4	246	0.108
P6KE200A(CA)	190	210	1.0	171	1.0	2.2	274	0.108
P6KE220A(CA)	209	231	1.0	185	1.0	1.8	328	0.108
P6KE250A(CA)	237	263	1.0	214	1.0	1.7	344	0.110
P6KE300A(CA)	285	315	1.0	256	1.0	1.4	414	0.110
P6KE350A(CA)	333	368	1.0	300	1.0	1.2	482	0.110
P6KE400A(CA)	380	420	1.0	342	1.0	1.1	548	0.110
P6KE440A(CA)	418	462	1.0	376	1.0	1.00	602	0.110

Notes

(1) Pulse test: $t_p \leq 50$ ms

(2) Surge current waveform per fig. 3 and derate per fig. 2

(3) For bi-directional types with V_{WM} of 10 V and less the I_D limit is doubled

(4) All terms and symbols are consistent with ANSI/EEE CA62.35

(+) Underwriters laboratory recognition for the classification of protectors (QVGQ2) under the UL standard for safety 497B and file number E136766 for both uni-directional and bi-directional devices

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**VALUE**	**UNIT**
Typical thermal resistance, junction to lead	$R_{\theta JL}$	20	°C/ W
Typical thermal resistance, junction to ambient	$R_{\theta JA}$	75	

ORDERING INFORMATION (Example)				
PREFERRED PIN	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
P6KE6.8A-E3/54	0.432	54	4000	13" diameter paper tape and reel
P6KE6.8AHE3/54 (1)	0.432	54	4000	13" diameter paper tape and reel

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

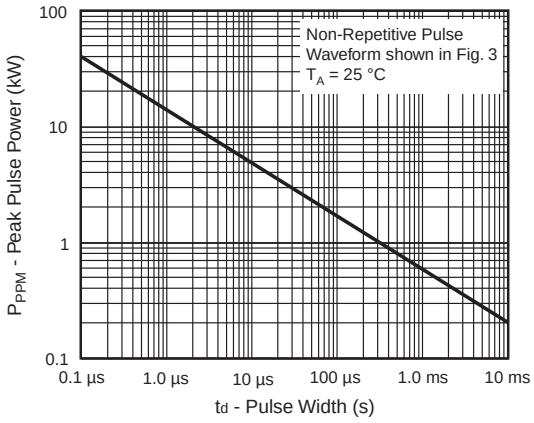


Fig. 1 - Peak Pulse Power Rating Curve

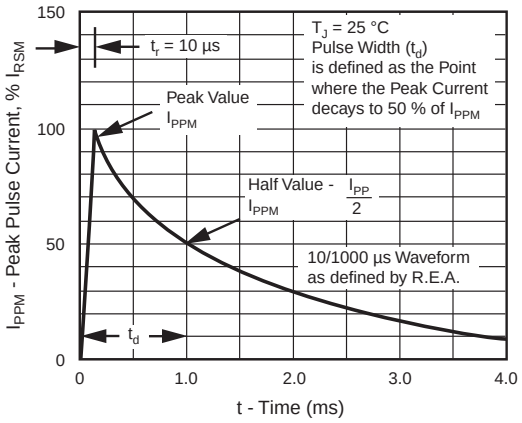


Fig. 3 - Pulse Waveform

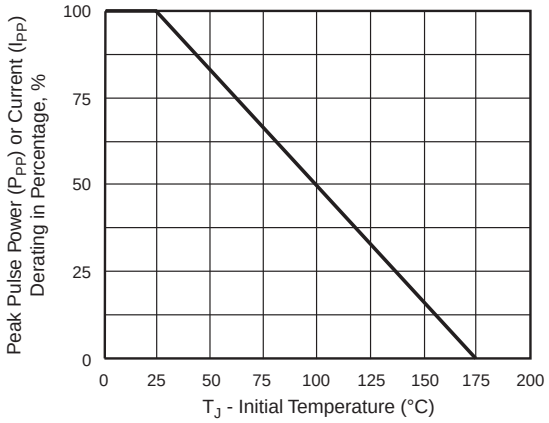


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

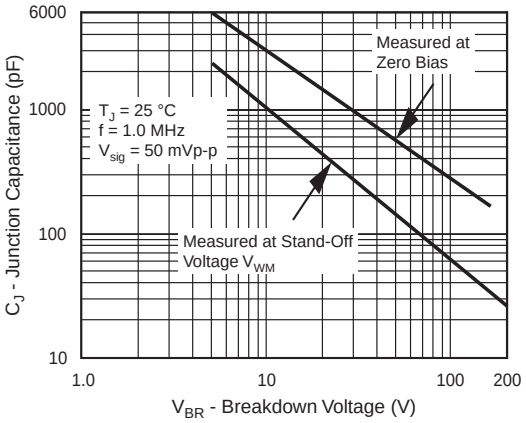


Fig. 4 - Typical Junction Capacitance Uni-Directional

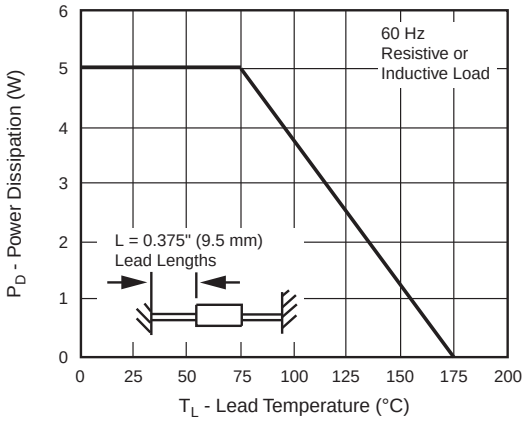


Fig. 5 - Power Derating Curve

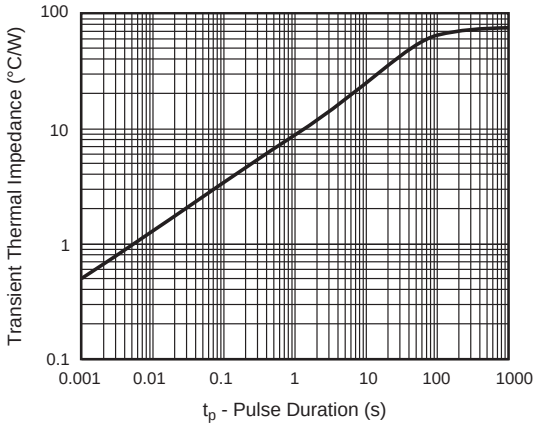


Fig. 7 - Typical Transient Thermal Impedance

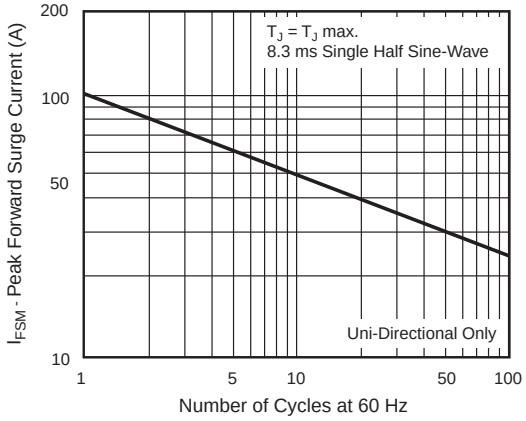


Fig. 6 - Maximum Non-Repetitive Forward Surge Current