P6KE SERIES

List

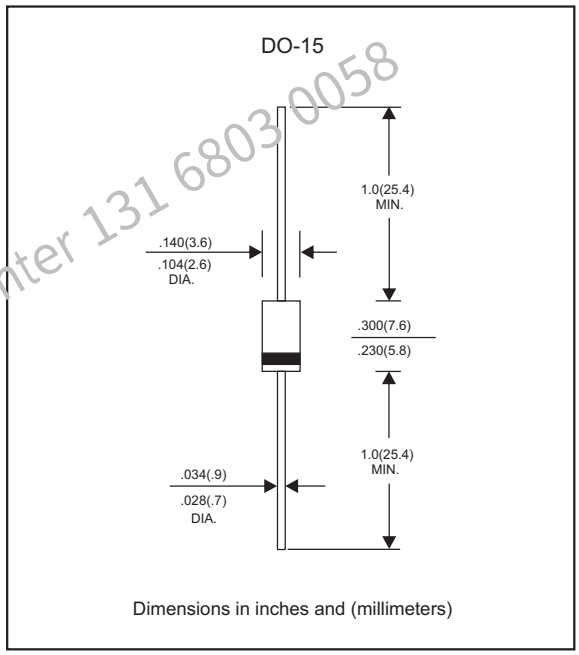
P6KE SERIES

600W Axial Lead Transient Voltage Suppressors - 6.8V-440V

Features

- Axial lead type devices for through hole design.
- 600W peak pulse power capability with a 10/1000us waveform, repetition rate (duty cycle): 0.01%.
- Excellent clamping capability.
- Low incremental surge resistance.
- Fast response time from 0V to V_{BR}, typically less than 1 pS for uni-directional & 5 nS for bi-directional types.
- Ultra high-speed switching.
- Glass passivated chip junction.
- Lead-free parts meet environmental standards of MIL-STD-19500 /228
- Suffix "-H" indicates Halogen free parts, ex. P6KE6.8A-H

Package outline



Dimensions in inches and (millimeters)

Mechanical data

- Epoxy : UL94-V0 rated flame retardant
- Case : Molded plastic, DO-15
- Lead : Axial leads, solderable per MIL-STD-202, Method 208 guaranteed
- Polarity: Color band denotes cathode end
- Mounting Position : Any
- Weight : Approximated 0.40 gram

Maximum ratings (AT T_A=25°C unless otherwise noted)

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Peak power dissipation	with a 10/1000 us waveform, Note 1 & Fig. 1	P_{PPM}			600	W
Peak pulse current	with a 10/1000 us waveform	I_{PPM}	See table 1			A
Steady state power dissipation	at T_L=75°C lead length 0.375" (9.5 mm)	$P_{M(AV)}$			5.0	W
Peak forward surge current	8.3ms single half sine-wave superimposed on rated load (jedec method), note 2	I_{FSM}			100	A
Maximum instantaneours forward voltage	for uni-directional types only, at 50A, see note 3	V_F			3.5/5.0	V
Operating temperature		T_J	-55		+150	°C
Storage temperature		T_{STG}	-65		+175	°C

Note 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=3.5V max. for devices of V_{BR} <200V, and V_F=5.0V max. for devices of V_{BR}>201V

Electrical characteristics (at T_A=25°C unless otherwise noted) Table 1

Part No.	Absolute Maximum Rating(T_A = 25°C)					Electricity Characteristics(T_A = 25°C)		
	V_{RWM}	$V_{BR\ Min}$	$V_{BR\ Max}$	I_T	I_{FSM}	Max. V_c@I_{PPM}		Max. I_R@V_{RWM}
	Volts	Volts	Volts	mA	(A)@8.3ms	Volts	I_{PPM}(A)	
P6KE6.8(C)A	5.80	6.45	7.14	10	100	10.5	57.0	1000
P6KE7.5(C)A	6.40	7.13	7.88	10	100	11.3	53.0	500
P6KE8.2(C)A	7.02	7.79	8.61	10	100	12.1	50.0	200
P6KE9.1(C)A	7.78	8.65	9.55	1.0	100	13.4	45.0	50
P6KE10(C)A	8.55	9.50	10.5	1.0	100	14.5	41.0	10
P6KE11(C)A	9.40	10.5	11.6	1.0	100	15.6	38.0	5
P6KE12(C)A	10.2	11.4	12.6	1.0	100	16.7	36.0	5
P6KE13(C)A	11.1	12.4	13.7	1.0	100	18.2	33.0	5
P6KE15(C)A	12.8	14.3	15.8	1.0	100	21.2	28.0	5
P6KE16(C)A	13.6	15.2	16.8	1.0	100	22.5	27.0	5
P6KE18(C)A	15.3	17.1	18.9	1.0	100	25.5	24.0	5
P6KE20(C)A	17.1	19.0	21.0	1.0	100	27.7	22.0	5
P6KE22(C)A	18.8	20.9	23.1	1.0	100	30.6	20.0	5
P6KE24(C)A	20.5	22.8	25.2	1.0	100	33.2	18.0	5
P6KE27(C)A	23.1	25.7	28.4	1.0	100	37.5	16.0	5
P6KE30(C)A	25.6	28.5	31.5	1.0	100	41.4	14.4	5
P6KE33(C)A	28.2	31.4	34.7	1.0	100	45.7	13.2	5
P6KE36(C)A	30.8	34.2	37.8	1.0	100	49.9	12.0	5
P6KE39(C)A	33.3	37.1	41.0	1.0	100	53.9	11.2	5
P6KE43(C)A	36.8	40.9	45.2	1.0	100	59.3	10.1	5
P6KE47(C)A	40.2	44.7	49.4	1.0	100	64.8	9.3	5
P6KE51(C)A	43.6	48.5	53.6	1.0	100	70.1	8.6	5
P6KE56(C)A	47.8	53.2	58.8	1.0	100	77.0	7.8	5
P6KE62(C)A	53.0	58.9	65.1	1.0	100	85.0	7.1	5
P6KE68(C)A	58.1	61.6	71.4	1.0	100	92.0	6.5	5
P6KE75(C)A	64.1	71.3	78.8	1.0	100	103.0	5.8	5
P6KE82(C)A	70.1	77.9	86.1	1.0	100	113.0	5.3	5
P6KE91(C)A	77.8	86.5	95.5	1.0	100	125.0	4.8	5
P6KE100(C)A	85.5	95.0	105.0	1.0	100	137.0	4.4	5
P6KE110(C)A	94.0	105.0	116.0	1.0	100	152.0	4.0	5
P6KE120(C)A	102.0	114.0	126.0	1.0	100	165.0	3.6	5
P6KE130(C)A	111.0	124.0	137.0	1.0	100	179.0	3.3	5
P6KE150(C)A	128.0	143.0	158.0	1.0	100	207.0	2.9	5
P6KE160(C)A	136.0	152.0	168.0	1.0	100	219.0	2.7	5
P6KE170(C)A	145.0	162.0	179.0	1.0	100	234.0	2.6	5
P6KE180(C)A	154.0	171.0	189.0	1.0	100	246.0	2.4	5
P6KE200(C)A	171.0	190.0	210.0	1.0	100	274.0	2.20	5
P6KE220(C)A	185.0	209.0	231.0	1.0	100	328.0	1.83	5
P6KE250(C)A	214.0	237.0	263.0	1.0	100	344.0	1.75	5
P6KE300(C)A	256.0	285.0	315.0	1.0	100	414.0	1.45	5
P6KE350(C)A	300.0	332.0	368.0	1.0	100	482.0	1.25	5
P6KE400(C)A	342.0	380.0	420.0	1.0	100	548.0	1.10	5
P6KE440(C)A	378.0	418.0	462.0	1.0	100	600.0	1.00	5

Note 1. V_{BR} measured after I_T applied for 300us, I_T=square wave pulse or equivalent
2. Surge current waveform per Fig. 3 and derated per Fig. 2
3. For bi-directional types having V_{RWM} of 10 volts and less, the I_R limit is doubled
4. Suffix 'C' denotes bi-directional devices. Suffix 'A' denotes 5% tolerance devices, no suffix denotes 10% tolerance devices.
5. All terms and symbols are consistent with ANS/IEEE C62.35

Rating and characteristic curves (P6KE SERIES)

Fig.1 - PEALK PULSE POWER RATING CURVE

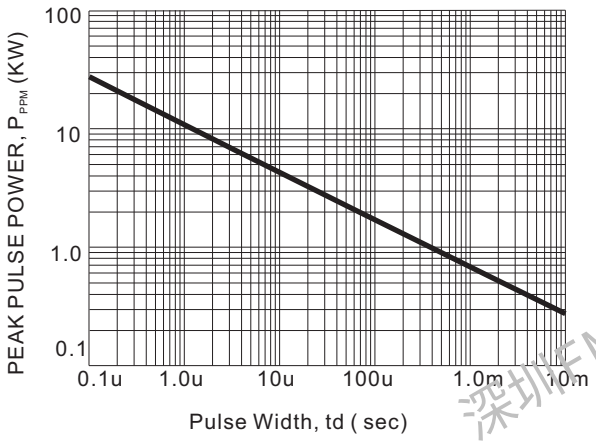


Fig.2 - PULSE DERATING CURVE

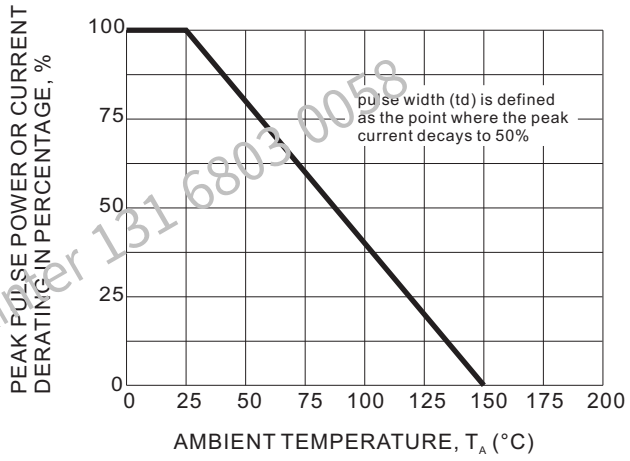


Fig.3 - PULSE WAVEFORM

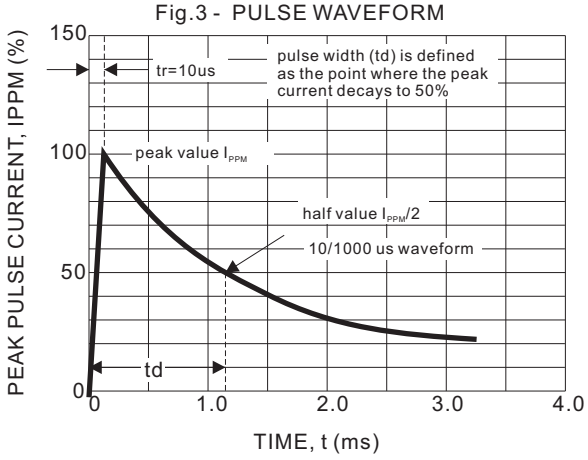


Fig.4 - TYPICAL JUNCTION CAPACITANCE

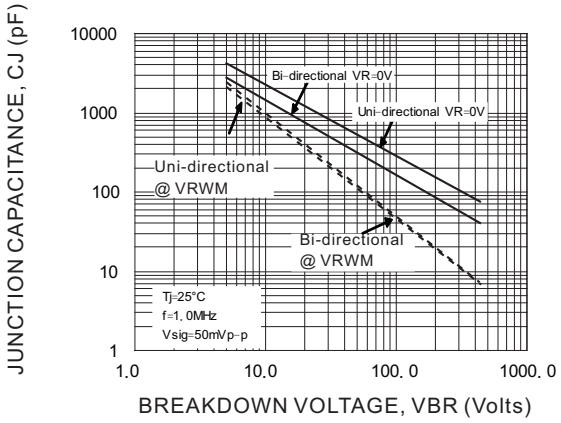


Fig.5 - STEADY STATE POWER DERATING CURVE

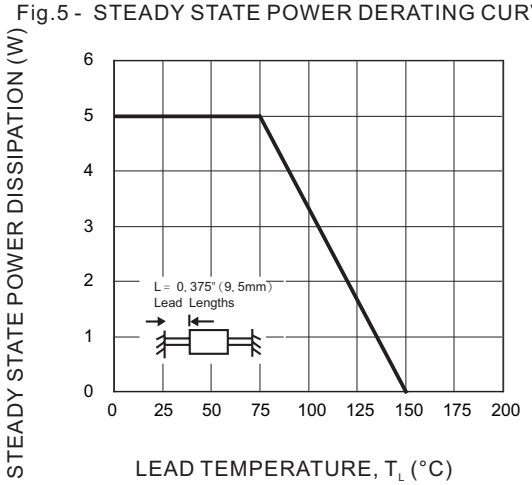
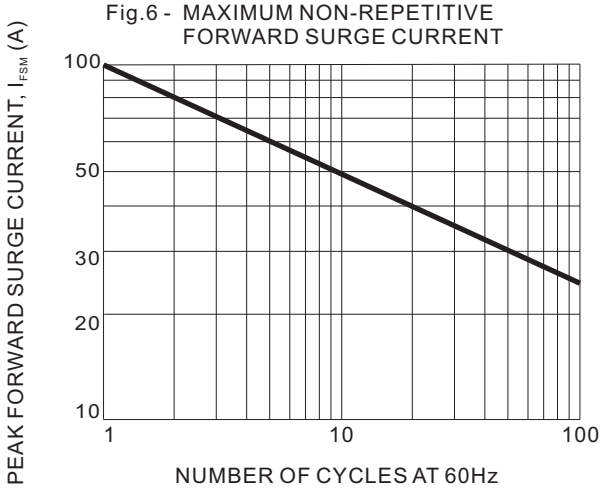


Fig.6 - MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT



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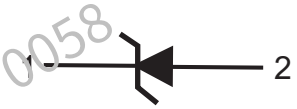
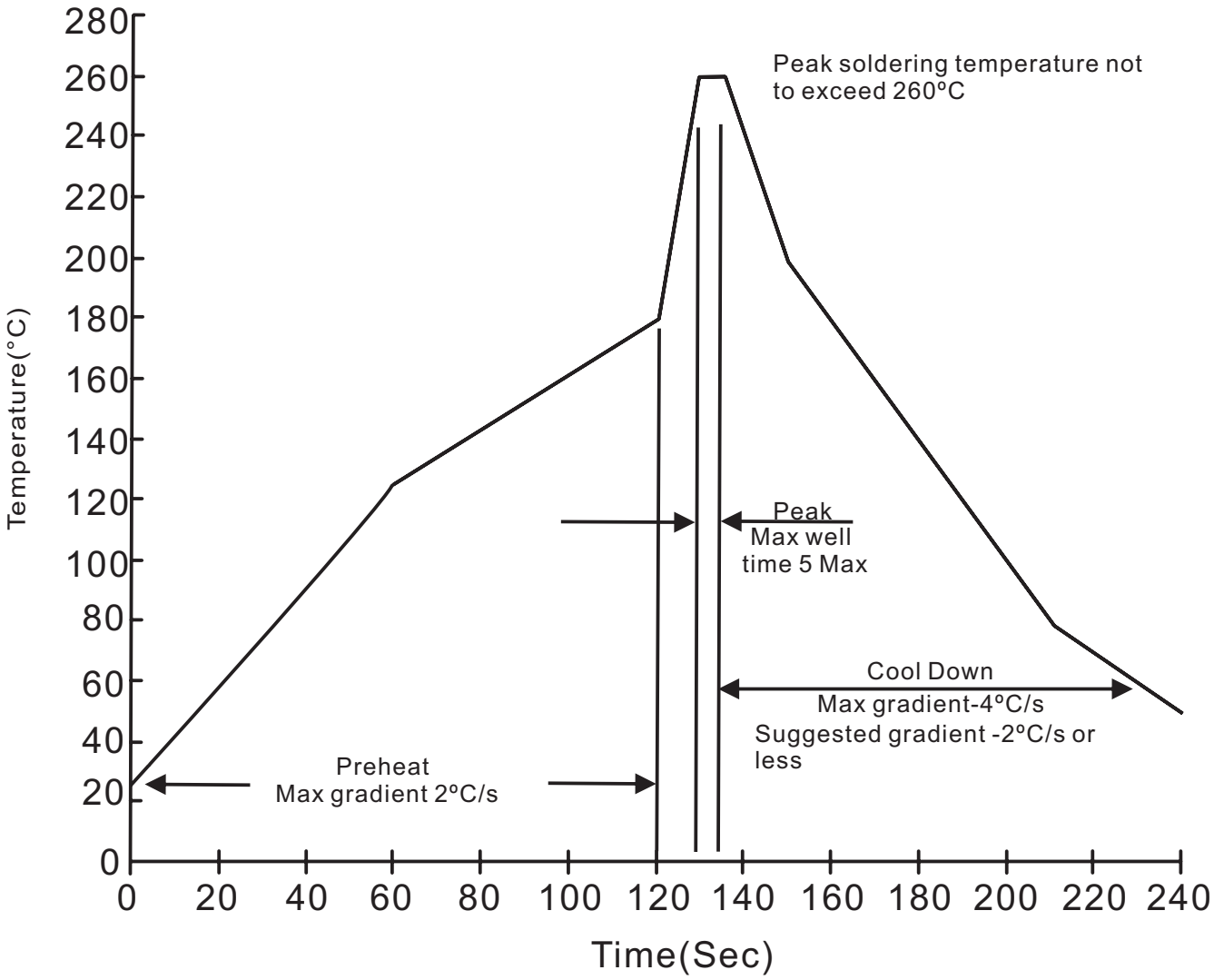
Pinning information

Pin	Simplified outline	Symbol
Uni-Directional Pin1 cathode Pin2 anode		
Bi-Directional		

Suggested thermal profiles for soldering processes

1.Lead free temperature profile wave-soldering



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High reliability test capabilities

Item Test	Conditions	Reference
1. Solder Resistance	at 260±5°C for 10±2sec. immerse body into solder 1/16"±1/32"	MIL-STD-750D METHOD-2031
2. Solderability	at 245±5°C for 5 sec.	MIL-STD-202F METHOD-208
3. Pull Test	1.0kg in axial lead direction for 10 sec.	MIL-STD-750D METHOD-2036
4. Bend Lead	1.0kg weight applied to each lead bending arc 90°±5° for 3 times.	MIL-STD-750D METHOD-2036
5. High Temperature Reverse Bias	V_{RWM}=80% rate at T_J=150°C for 168 hrs.	MIL-STD-750D METHOD-1038
8. Pressure Cooker	$15P_{SIG}$ at T_A=121°C for 4 hrs.	JESD22-A102
7. Temperature Cycling	-55°C to +125°C dwelled for 30 min. and transferred for 5min. total 10 cycles.	MIL-STD-750D METHOD-1051
8. Thermal Shock	0°C for 5 min. rise to 100°C for 5 min. total 10 cycles.	MIL-STD-750D METHOD-1056
9. Humidity	at T_A=85°C, RH=85% for 1000hrs.	MIL-STD-750D METHOD-1021
10. High Temperature Storage Life	at 175°C for 1000 hrs.	MIL-STD-750D METHOD-1031