

## Transient Voltage Suppressors (TVS) Data Sheet

### Features

- Glass passivated junction
- Low inductance
- Excellent clamping capability
- 400W peak pulse power capability at 10/1000µs waveform, repetition rate (duty cycle): 0.01%
- Fast response time
- Typical  $I_R$  less than 1µA above 12V
- High Temperature soldering guaranteed: 265°C/10 seconds/.375", (9.5mm) lead length, 5lbs (2.3kg) tension
- Plastic package has underwriters laboratory flammability 94V-0
- Meets MSL level 1, per J-STD-020
- Safety certification: UL: E244458



### Mechanical Data

- Case: JEDEC DO-41 Moulded plastic
- Terminal: Axial leads, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denotes cathode except bi-directional models
- Mounting Position: Any
- Weight: 0.33g

### Applications

- I/O interface
- AC/DC power supply
- Low frequency signal transmission line (RS232, RS485, etc.)

### Maximum Ratings and Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.

Rating	Symbol	Value	Units
Peak pulse power dissipation at 10/1000µs waveform (Note1, Note2, Fig.1)	$P_{PPM}$	Minimum 400	Watts
Peak pulse current of at 10/1000µs waveform (Note 1, Fig.3)	$I_{PPM}$	See Table	Amps
Steady state power dissipation at $T_A=50^\circ\text{C}$ (Fig.5)	$P_{M(AV)}$	1.5	Watts
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load, (JEDEC Method) (Note3, Fig.6)	$I_{FSM}$	40	Amps
Operating junction and Storage Temperature Range.	$T_J, T_{STG}$	-55 to +150	°C
Typical thermal resistance junction to lead	$R_{\theta JL}$	60	°C/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	100	°C/W

Notes: 1. Non-repetitive current pulse, per Fig.3 and derated above  $T_A=25^\circ\text{C}$  per Fig.2.

2. 8.3ms single half sine-wave, or equivalent square wave, duty cycle=4 pulses per minutes maximum.

**Dimensions (DO-204AL/DO-41)**

	Symbol	Millimeters		Inches	
		Min.	Max.	Min.	Max.
L	25.40	-	1.000	-	
T	4.10	5.20	0.160	0.205	
d	2.00	2.70	0.080	0.107	
s	0.71	0.86	0.028	0.034	

**Electrical Characteristics (T<sub>A</sub>=25°C)**

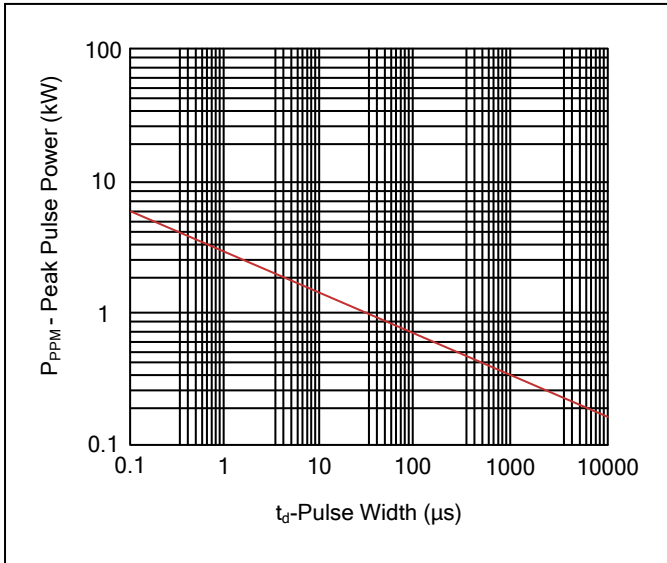
Part Number		Reverse Stand-Off Voltage	Breakdown Voltage @I <sub>T</sub>	Test Current	Maximum Clamping Voltage @I <sub>PP</sub>	Peak Pulse Current	Reverse Leakage @V <sub>RWM</sub>
Unidirectional	Bidirectional	V <sub>RWM</sub> (V)	V <sub>BR</sub> (V)	I <sub>T</sub> (mA)	V <sub>C</sub> (V)	I <sub>PP</sub> (A)	I <sub>R</sub> (μA)
P4KE6.8A	P4KE6.8CA	5.80	6.45~7.14	10	10.5	39.0	1000
P4KE7.5A	P4KE7.5CA	6.40	7.13~7.88	10	11.3	36.3	500
P4KE8.2A	P4KE8.2CA	7.02	7.79~8.61	10	12.1	33.9	200
P4KE9.1A	P4KE9.1CA	7.78	8.65~9.55	1	13.4	30.6	50
P4KE10A	P4KE10CA	8.55	9.50~10.50	1	14.5	28.3	10
P4KE11A	P4KE11CA	9.40	10.50~11.60	1	15.6	26.3	5
P4KE12A	P4KE12CA	10.20	11.40~12.60	1	16.7	24.6	5
P4KE13A	P4KE13CA	11.10	12.40~13.70	1	18.2	22.5	1
P4KE15A	P4KE15CA	12.80	14.30~15.80	1	21.2	19.3	1
P4KE16A	P4KE16CA	13.60	15.20~16.80	1	22.5	18.2	1
P4KE18A	P4KE18CA	15.30	17.10~18.90	1	25.2	16.1	1
P4KE20A	P4KE20CA	17.10	19.00~21.00	1	27.7	14.8	1
P4KE22A	P4KE22CA	18.80	20.90~23.10	1	30.6	13.4	1
P4KE24A	P4KE24CA	20.50	22.80~25.20	1	33.2	12.3	1
P4KE27A	P4KE27CA	23.10	25.70~28.40	1	37.5	10.9	1
P4KE30A	P4KE30CA	25.60	28.50~31.50	1	41.4	9.9	1
P4KE33A	P4KE33CA	28.20	31.40~34.70	1	45.7	9.0	1
P4KE36A	P4KE36CA	30.80	34.20~37.80	1	49.9	8.2	1
P4KE39A	P4KE39CA	33.30	37.10~41.00	1	53.9	7.6	1
P4KE43A	P4KE43CA	36.80	40.90~45.20	1	59.3	6.9	1
P4KE47A	P4KE47CA	40.20	44.70~49.40	1	64.8	6.3	1
P4KE51A	P4KE51CA	43.60	48.50~53.60	1	70.1	5.8	1
P4KE56A	P4KE56CA	47.80	53.20~58.80	1	77.0	5.3	1

Part Number		Reverse Stand-Off Voltage	Breakdown Voltage @ $I_T$	Test Current	Maximum Clamping Voltage @ $I_{PP}$	Peak Pulse Current	Reverse Leakage @ $V_{RWM}$
Unidirectional	Bidirectional	$V_{RWM}(V)$	$V_{BR}(V)$	$I_T(mA)$	$V_C(V)$	$I_{PP}(A)$	$I_R(\mu A)$
P4KE62A	P4KE62CA	53.00	58.90~65.10	1	85.0	4.8	1
P4KE68A	P4KE68CA	58.10	64.60~71.40	1	92.0	4.5	1
P4KE75A	P4KE75CA	64.10	71.30~78.80	1	103.0	4.0	1
P4KE82A	P4KE82CA	70.10	77.90~86.10	1	113.0	3.6	1
P4KE91A	P4KE91CA	77.80	86.50~95.50	1	125.0	3.3	1
P4KE100A	P4KE100CA	85.50	95.00~105.00	1	137.0	3.0	1
P4KE110A	P4KE110CA	94.00	105.00~116.00	1	152.0	2.7	1
P4KE120A	P4KE120CA	102.00	114.00~126.00	1	165.0	2.5	1
P4KE130A	P4KE130CA	111.00	124.00~137.00	1	179.0	2.3	1
P4KE150A	P4KE150CA	128.00	143.00~158.00	1	207.0	2.0	1
P4KE160A	P4KE160CA	136.00	152.00~168.00	1	219.0	1.9	1
P4KE170A	P4KE170CA	145.00	162.00~179.00	1	234.0	1.8	1
P4KE180A	P4KE180CA	154.00	171.00~189.00	1	246.0	1.7	1
P4KE200A	P4KE200CA	171.00	190.00~210.00	1	274.0	1.5	1
P4KE220A	P4KE220CA	185.00	209.00~231.00	1	328.0	1.3	1
P4KE250A	P4KE250CA	214.00	237.00~263.00	1	344.0	1.2	1
P4KE300A	P4KE300CA	256.00	285.00~315.00	1	414.0	1.0	1
P4KE350A	P4KE350CA	300.00	332.00~368.00	1	482.0	0.85	1
P4KE400A	P4KE400CA	342.00	380.00~420.00	1	548.0	0.75	1
P4KE440A	P4KE440CA	376.00	418.00~462.00	1	602.0	0.68	1
P4KE480A	P4KE480CA	408.00	456.00~504.00	1	658.0	0.61	1
P4KE510A	P4KE510CA	434.00	485.00~535.00	1	698.0	0.57	1
P4KE530A	P4KE530CA	450.00	503.50~556.50	1	725.0	0.55	1
P4KE540A	P4KE540CA	459.00	513.00~567.00	1	740.0	0.54	1
P4KE550A	P4KE550CA	467.00	522.50~577.50	1	760.0	0.52	1

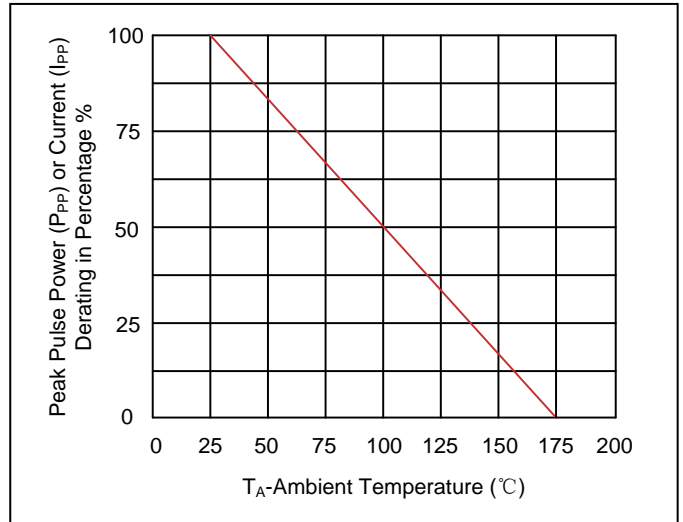
Notes: For bidirectional type having  $V_{RWM}$  of 10V and less, the  $I_R$  limit is double.

**Ratings and Characteristic Curves ( $T_A=25^\circ\text{C}$  unless otherwise noted)**

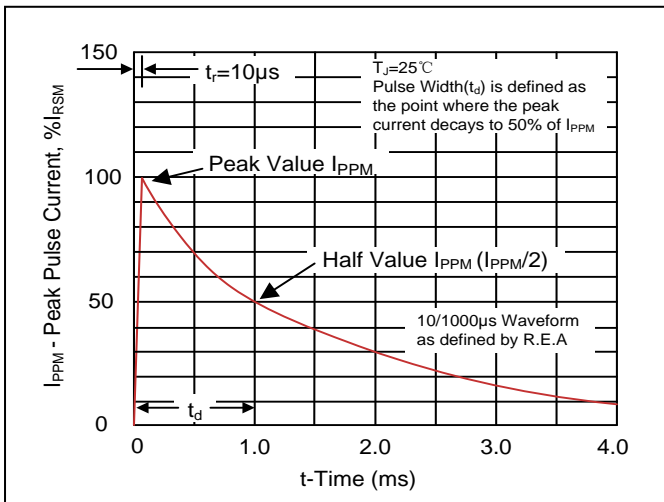
**Figure 1. Peak Pulse Power Rating Curve**



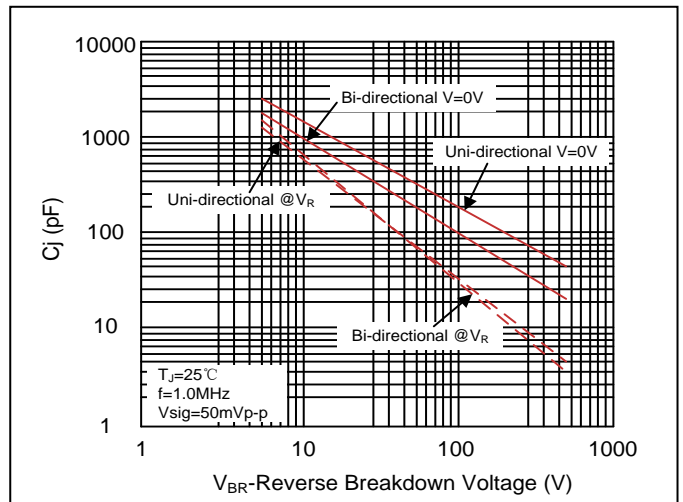
**Figure 2. Pulse Derating Curve**



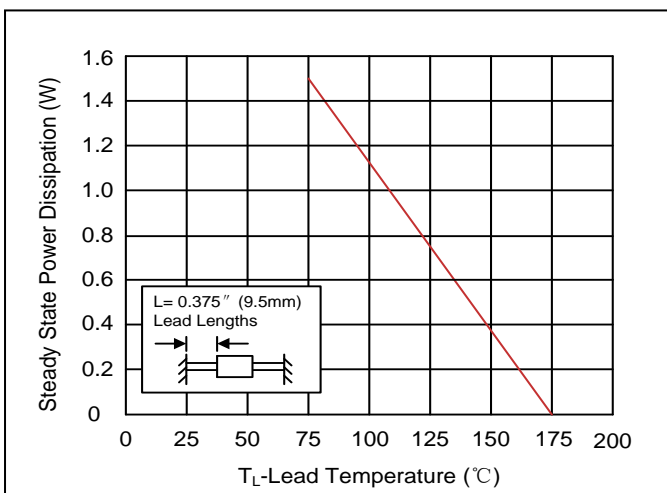
**Figure 3. Pulse Waveform**



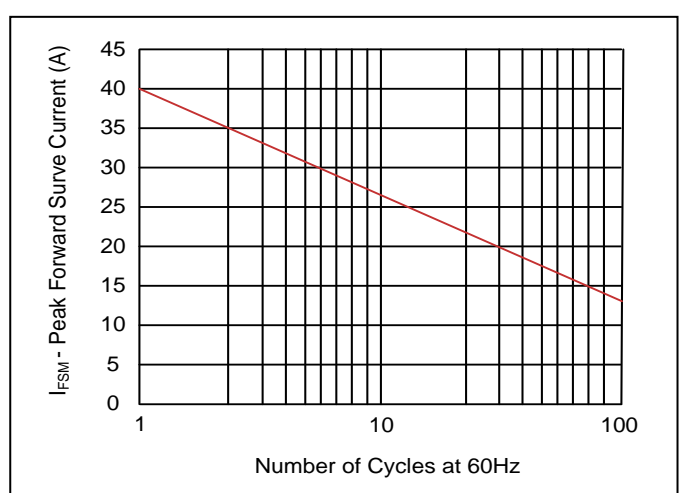
**Figure 4. Typical Junction Capacitance**



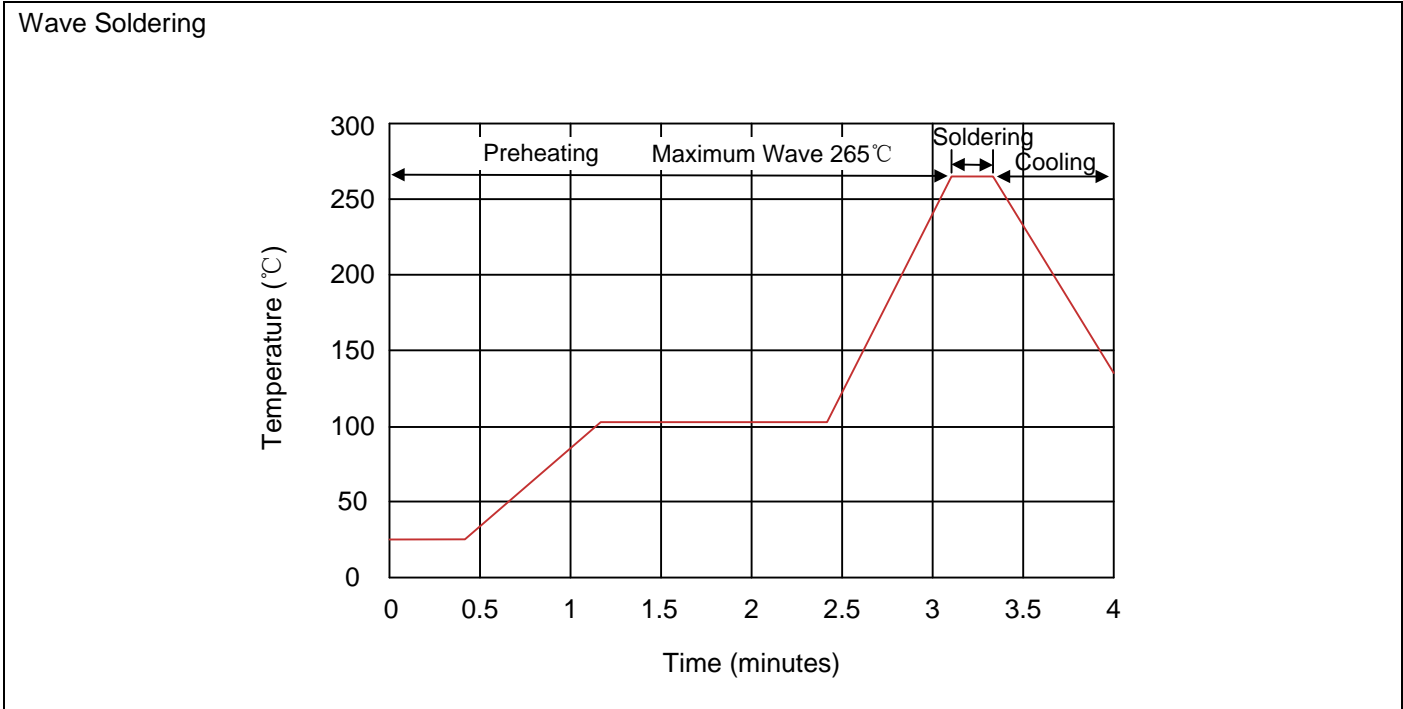
**Figure 5. Steady State Power Dissipation Derating Curve**



**Figure 6. Maximum Non-Repetitive Forward Surge Current Uni-Directional Only**



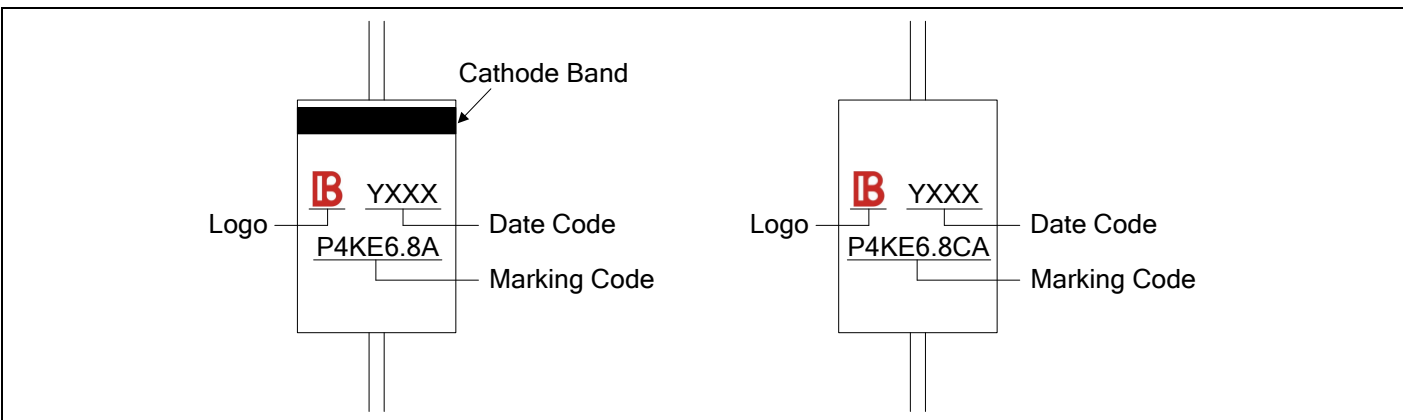
**Recommended Soldering Conditions**



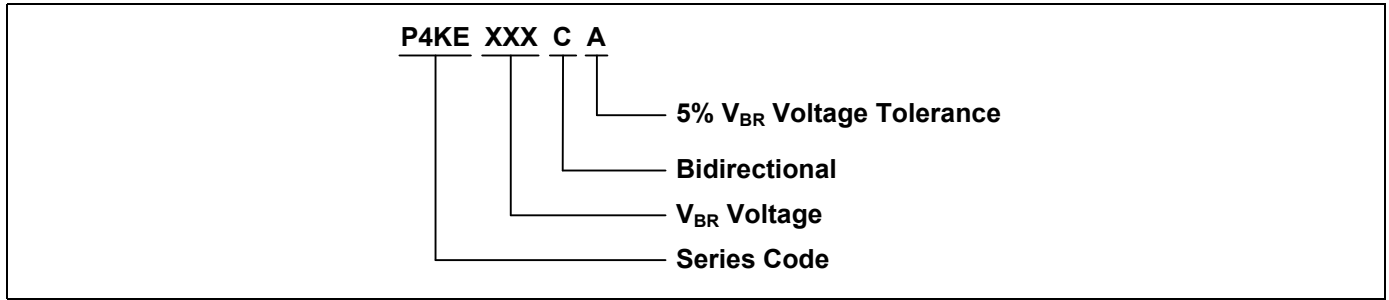
Recommended Conditions

Item	Conditions
Peak Temperature	265°C
Dipping Time	10 seconds
Soldering	1 time

**Marking Code**



**Part Number Code**



**Ordering Code for Different Package**

Box package: Add suffix "/B" at the end of the part number, such as P4KE10A/B

Reel package: Add suffix "/TR13" at the end of the part number, such as P4KE68CA/TR13

**Packaging**

	Symbol	Dimension (mm)	
<p>Tape</p>	A	5.0±0.5	
	B	53.0±1.0	
	Z	1.2Max.	
	T	6.0±0.4	
	E	0.8Max.	
	L1-L2	1.0Max.	
	<p>Box</p>	L	250.0±5.0
		W	75.0±5.0
		H	114.0±5.0
		Quantity: 3000PCS	
<p>Reel</p>	D	330.0±3.0	
	D0	16.4±2.0	
	D1	86.0±2.0	
	W1	76.0±3.0	
	Quantity: 5000PCS		