Features

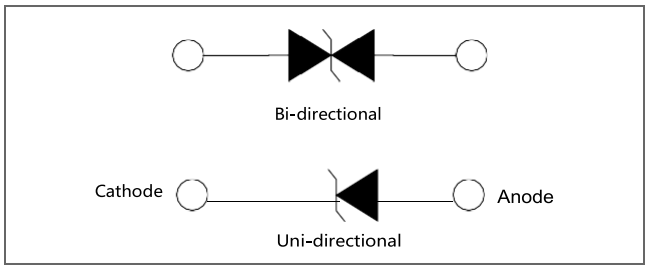
RoHS Compliant

- 400W peak pulse power capability at 10/1000μs waveform, repetition rate (duty cycles):0.01%
- Excellent clamping capability
- Typical failure mode is a short circuit condition for current events exceeding component rating
- Plastic package is flammability rated V-0 per UL-94
- IEC61000-4-2 +/-30kV both contact and air
- IEC61000-4-4 50A(5/50nS)

Applications

TVS components are ideal for the protection of I/O interfaces, VCC bus and other vulnerable circuits used in telecom, computer, industrial ICT equipment and consumer electronic applications.

Function Diagram



Maximum Ratings and Thermal Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation at T_A=25 °C by 10/1000μs Waveform (Fig.3)--single die	P_{PPM}	400	W
Peak Pulse Power Dissipation at T_A=25 °C by 10/1000μs Waveform (Fig.3)--stack die	P_{PPM}	600	W
Power Dissipation on Infinite Heat Sink at T_L=50°C	P_D	1.5	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 1)	I_{FSM}	60	A
Maximum Instantaneous Forward Voltage at 50A for Unidirectional Only(Note 2)	V_F	3.5/5	V
Operating Temperature Range	T_J	-55 to 150	°C
Storage Temperature Range	T_{STG}	-55 to 150	°C

AGENCY	AGENCY FILE NUMBER
®VU	Pending

Notes:

1. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum.
2. 3.5V for single die, 5V for stack die

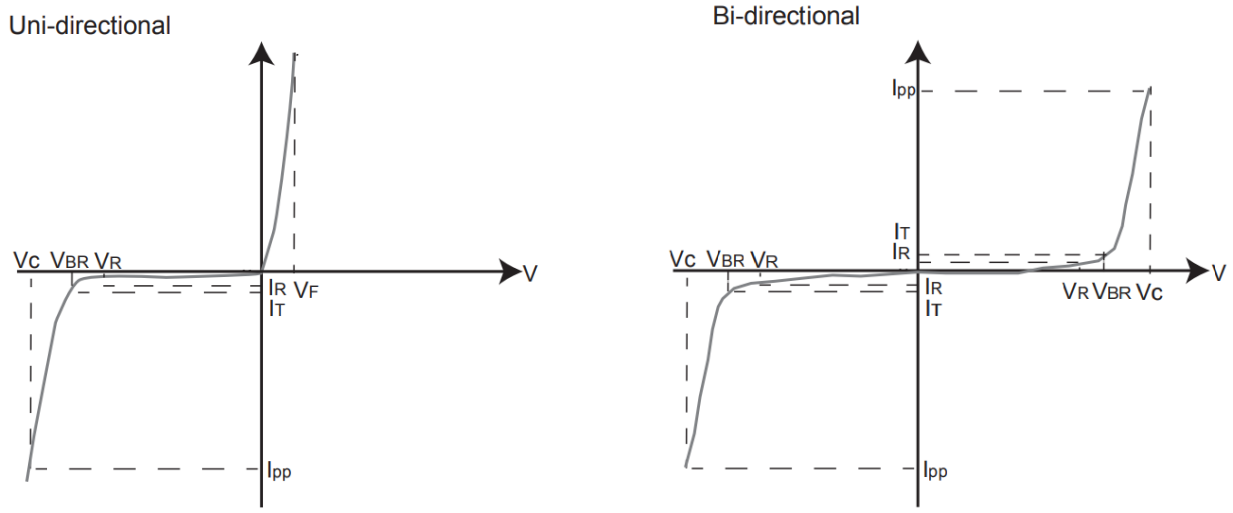
Characteristics (T =25°C unless otherwise noted)

Part Number (Uni)	Part Number (Bi)	Reverse Stand off Voltage V_R (Volts)	Breakdown Voltage V_{BR} (Volts) @ I_T MIN	MAX	Test Current I_T (mA)	Maximum Clamping Voltage V_C @ I_{pp} (V)	Maximum Peak Pulse Current I_{pp} (A)	Maximum Reverse Leakage I_R @ V_R (μA)	Agency Approval
P4KE6.8A	P4KE6.8CA	5.80	6.45	7.14	10	10.5	39.00	1000	
P4KE7.5A	P4KE7.5CA	6.40	7.13	7.88	10	11.3	36.30	500	
P4KE8.2A	P4KE8.2CA	7.02	7.79	8.61	10	12.1	33.90	200	
P4KE9.1A	P4KE9.1CA	7.78	8.65	9.55	1	13.4	30.60	50	
P4KE10A	P4KE10CA	8.55	9.50	10.50	1	14.5	28.30	10	
P4KE11A	P4KE11CA	9.40	10.50	11.60	1	15.6	26.30	5	
P4KE12A	P4KE12CA	10.20	11.40	12.60	1	16.7	24.60	5	
P4KE13A	P4KE13CA	11.10	12.40	13.70	1	18.2	22.50	1	
P4KE15A	P4KE15CA	12.80	14.30	15.80	1	21.2	19.30	1	
P4KE16A	P4KE16CA	13.60	15.20	16.80	1	22.5	18.20	1	
P4KE18A	P4KE18CA	15.30	17.10	18.90	1	25.5	16.10	1	
P4KE20A	P4KE20CA	17.10	19.00	21.00	1	27.7	14.80	1	
P4KE22A	P4KE22CA	18.80	20.90	23.10	1	30.6	13.40	1	
P4KE24A	P4KE24CA	20.50	22.80	25.20	1	33.2	12.30	1	
P4KE27A	P4KE27CA	23.10	25.70	28.40	1	37.5	10.90	1	
P4KE30A	P4KE30CA	25.60	28.50	31.50	1	41.4	9.90	1	
P4KE33A	P4KE33CA	28.20	31.40	34.70	1	45.7	9.00	1	
P4KE36A	P4KE36CA	30.80	34.20	37.80	1	49.9	8.20	1	
P4KE39A	P4KE39CA	33.30	37.10	41.00	1	53.9	7.60	1	
P4KE43A	P4KE43CA	36.80	40.90	45.20	1	59.3	6.90	1	
P4KE47A	P4KE47CA	40.20	44.70	49.40	1	64.8	6.30	1	
P4KE51A	P4KE51CA	43.60	48.50	53.60	1	70.1	5.80	1	
P4KE56A	P4KE56CA	47.80	53.20	58.80	1	77.0	5.30	1	
P4KE62A	P4KE62CA	53.00	58.90	65.10	1	85.0	4.80	1	
P4KE68A	P4KE68CA	58.10	64.60	71.40	1	92.0	4.50	1	
P4KE75A	P4KE75CA	64.10	71.30	78.80	1	103.0	4.00	1	
P4KE82A	P4KE82CA	70.10	77.90	86.10	1	113.0	3.60	1	
P4KE91A	P4KE91CA	77.80	86.50	95.50	1	125.0	3.30	1	
P4KE100A	P4KE100CA	85.50	95.00	105.00	1	137.0	3.00	1	
P4KE110A	-	94.00	105.00	116.00	1	152.0	2.70	1	
-	P4KE110CA*	94.00	105.00	116.00	1	152.0	4.00	1	
P4KE120A	-	102.00	114.00	126.00	1	165.0	2.50	1	
-	P4KE120CA*	102.00	114.00	126.00	1	165.0	3.70	1	
P4KE130A	-	111.00	124.00	137.00	1	179.0	2.30	1	
-	P4KE130CA*	111.00	124.00	137.00	1	179.0	3.40	1	
P4KE150A	-	128.00	143.00	158.00	1	207.0	2.00	1	
-	P4KE150CA*	128.00	143.00	158.00	1	207.0	2.90	1	
P4KE160A	-	136.00	152.00	168.00	1	219.0	1.90	1	
-	P4KE160CA*	136.00	152.00	168.00	1	219.0	2.80	1	
P4KE170A	-	145.00	162.00	179.00	1	234.0	1.80	1	
-	P4KE170CA*	145.00	162.00	179.00	1	234.0	2.60	1	
P4KE180A	-	154.00	171.00	189.00	1	246.0	1.70		
-	P4KE180CA*	154.00	171.00	189.00	1	246.0	2.50	1	
P4KE200A	-	171.00	190.00	210.00	1	274.0	1.50	1	
-	P4KE200CA*	171.00	190.00	210.00	1	274.0	2.20	1	
P4KE220A	-	185.00	209.00	231.00	1	328.0	1.30	1	
-	P4KE220CA*	185.00	209.00	231.00	1	328.0	1.90	1	
P4KE250A	-	214.00	237.00	263.00	1	344.0	1.20	1	
-	P4KE250CA*	214.00	237.00	263.00	1	344.0	1.80	1	
P4KE300A	-	256.00	285.00	315.00	1	414.0	1.00	1	
-	P4KE300CA*	256.00	285.00	315.00	1	414.0	1.50	1	
P4KE350A*	P4KE350CA*	300.00	332.00	368.00	1	482.0	1.30	1	
P4KE400A*	P4KE400CA*	342.00	380.00	420.00	1	548.0	1.10	1	
P4KE440A*	P4KE440CA*	376.00	418.00	462.00	1	602.0	1.00	1	

Part Number (Uni)	Part Number (Bi)	Reverse Stand off Voltage V_R (Volts)	Breakdown Voltage V_{BR} (Volts) @ I_T MIN	MAX	Test Current I_T (mA)	Maximum Clamping Voltage V_C @ I_{PP} (V)	Maximum Peak Pulse Current I_{PP} (A)	Maximum Reverse Leakage I_R @ V_R (μA)	Agency Approval
P4KE480A*	P4KE480CA*	408.00	456.00	504.00	1	658.0	0.92	1	
P4KE510A*	P4KE510CA*	434.00	485.00	535.00	1	698.0	0.86	1	
P4KE530A*	P4KE530CA*	451.00	503.50	556.50	1	725.0	0.83	1	
P4KE540A*	P4KE540CA*	460.00	513.00	567.00	1	740.0	0.82	1	
P4KE550A*	P4KE550CA*	468.00	522.50	577.50	1	760.0	0.79	1	

For stacked-die parts,use * to label the part number.

I-V Curve Characteristics



P_{PPM} Peak Pulse Power Dissipation -- Max power dissipation

V_R Stand-off Voltage -- Maximum voltage that can be applied to the TVS without operation

V_{BR} Breakdown Voltage -- Maximum voltage that flows though the TVS at a specified test current (I_T)

V_C Clamping Voltage -- Peak voltage measured across the TVS at a specified I_{PPM} (peak impulse current)

I_R Reverse Leakage Current -- Current measured at V_R

V_F Forward Voltage Drop for Uni-directional

Ratings and Characteristic Curves (T =25°C unless otherwise noted)

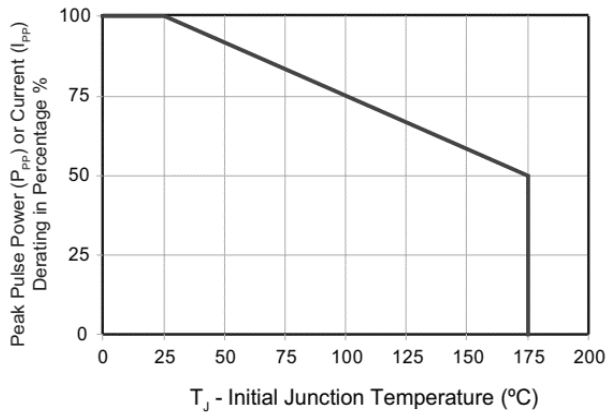


Figure 1. Peak pulse power derating curve

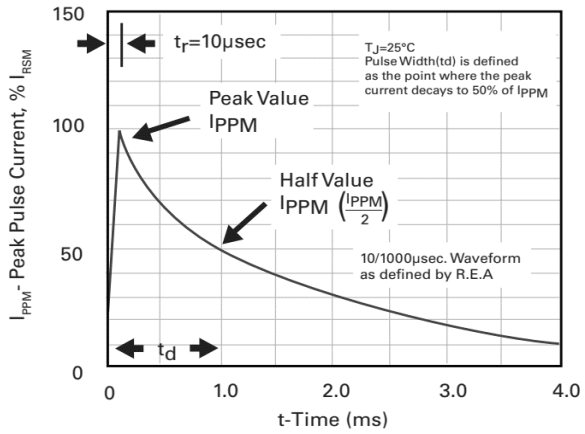


Figure2. Pulse waveform

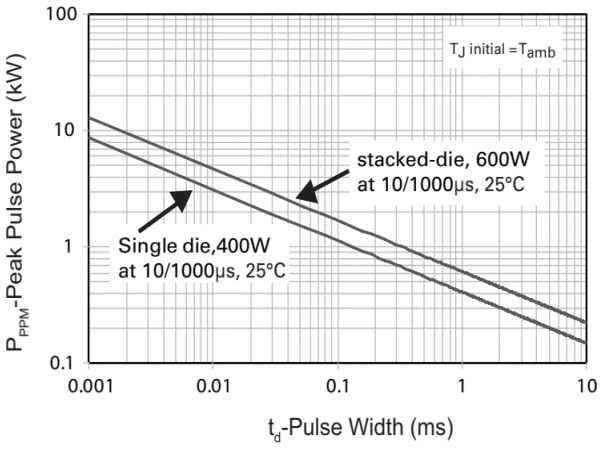


Figure 3. Peak pulse power rating curve

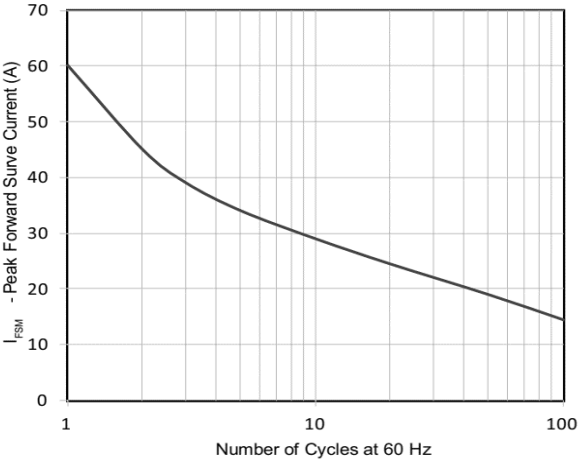
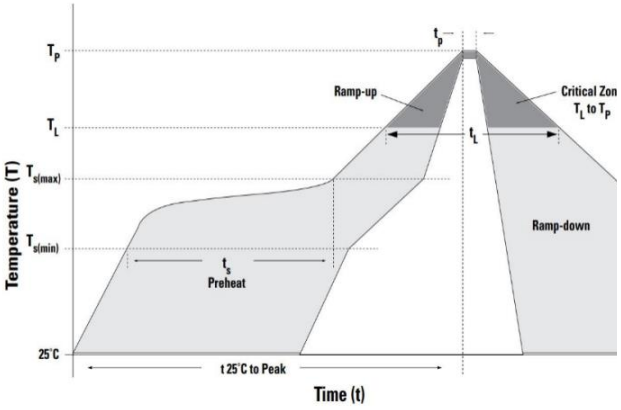


Figure 4. Maximum non-repetitive surge current

Soldering Parameters

Reflow Condition		Lead–free assembly
Pre Heat	- Temperature Min ($T_{s(min)}$)	150°C
	- Temperature Max ($T_{s(max)}$)	200°C
	- Time (min to max) (t_s)	60 – 120 secs
Average ramp up rate (Liquidus Temp (T_A) to peak		3°C/second max
$T_{S(max)}$ to T_A - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_A) (Liquidus)	217°C
	- Time (min to max) (t_s)	60 – 150 seconds
Peak Temperature (T_P)		$260^{+0/-5}$ °C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes Max.
Do not exceed		260°C

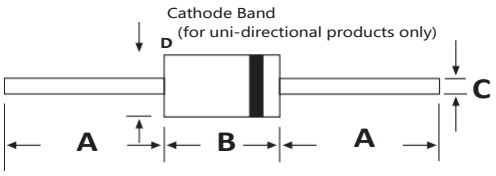
Soldering profile



Flow/Wave Soldering (Solder Dipping)

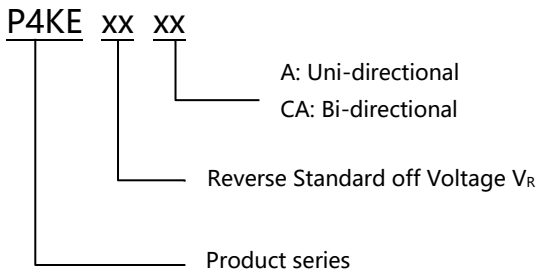
Peak Temperature:	260ºC
Dipping Time:	5 seconds
Soldering:	1 time

Dimensions

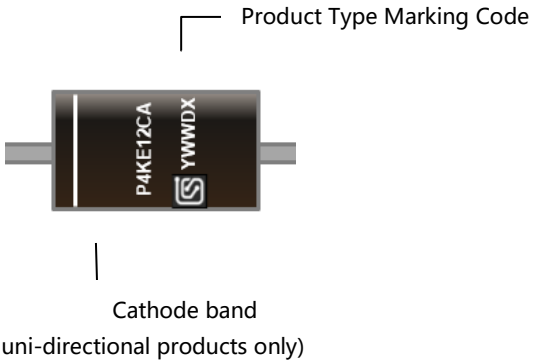


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	1.000	-	25.40	-
B	0.230	0.300	5.80	7.60
C	0.028	0.034	0.71	0.86
D	0.104	0.140	2.60	3.60

Part Numbering



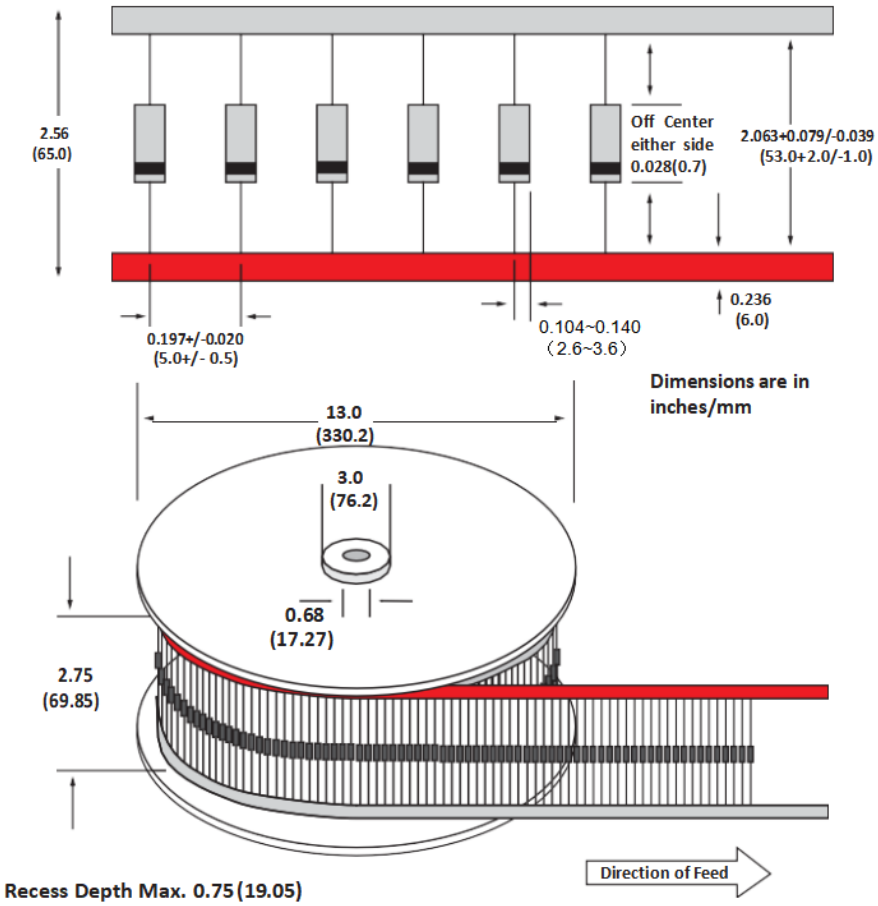
Part Marking



Packing

Part number	Package name	Small packing quantity	Packing method
P4KEXXXX	DO-41	5000	Tape & Reel

Tape and Reel Specification



Revision history of Specification

Version	Change Items	Effective Date
1.0	Initial Release	14-July-2021
1.1	Change marking logo location	27-May-2021