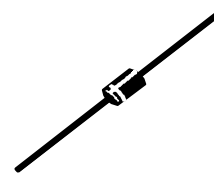


Transient Voltage Suppression Diodes Axial Leaded – 400W

Descriptions

Transient Voltage Suppressors (TVS) are semiconductor devices designed to provide protection against over voltage transients. When over voltage events occur, the silicon TVS activates from an very high impedance status to a very low impedance status by operating in the avalanche mode and uses a large junction area to absorb large transient currents in a fast response time, protecting voltage sensitive electronics equipment from damaging.

Boarden supplies unipolar and bipolar TVS devices with axial and SMD packages, with maximum working voltage 5V to 550V, maximum power dissipation from 200W-5000W.



DO-41

Features

- Glass passivated chip junction in DO-41 Package
- 400W peak pulse power @10/1000 μ s
- Typical I_R less than 1 μ A above 13V
- Low incremental surge resistance
- Excellent clamping capability
- Typical failure mode is short from over-specified voltage/current
- Fast response time: typically less than 1.0ps from 0V to BV min
- EFT protection of data lines in accordance with IEC 61000-4-4
- UL94V-0 Flammability Rating
- Halogen free and RoHS compliant

Applications

- Telecom and Network
- Industrial Products
- Business Machines
- Vehicles Electronics
- Power Adapter
- Consumer Products
- Security Protection

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

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation by 10/1000 μ s Test Waveform	P_{PPM}	400	W
Steady State Power Dissipation on Infinite Heat Sink at $T_L=75^\circ\text{C}$	P_D	1.5	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave Unidirectional Only ⁽¹⁾	I_{FSM}	40	A
Maximum Instantaneous Forward Voltage at 100A for Unidirectional Only ⁽²⁾	V_F	3.5/5.0	V
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 175	$^\circ\text{C}$
Typical Thermal Resistance Junction to Lead	$R_{\theta JL}$	60	$^\circ\text{C/W}$
Typical Thermal Resistance Junction to Ambient	$R_{\theta JA}$	100	$^\circ\text{C/W}$

Notes:

1) Measured on 8.3ms single half sine wave or equivalent square wave, duty cycle=4 per minute maximum.

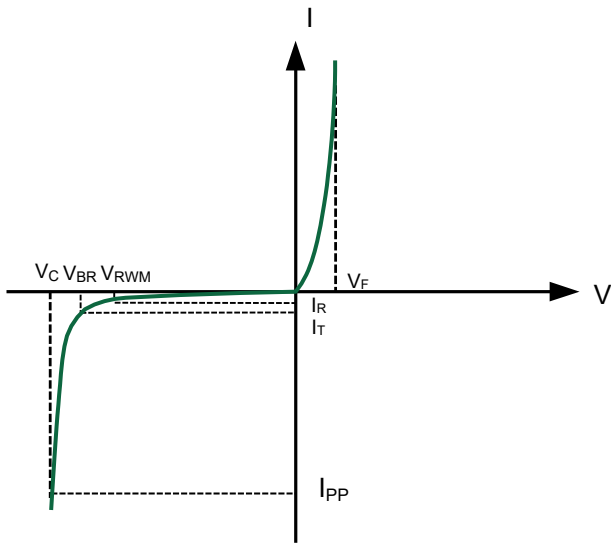
2) $V_F < 3.5V$ for devices of $V_{BR} \leq 200V$ and $V_F < 5.0V$ for devices of $V_{BR} \geq 201V$.

Electrical Characteristics (TA=25°C unless otherwise noted)

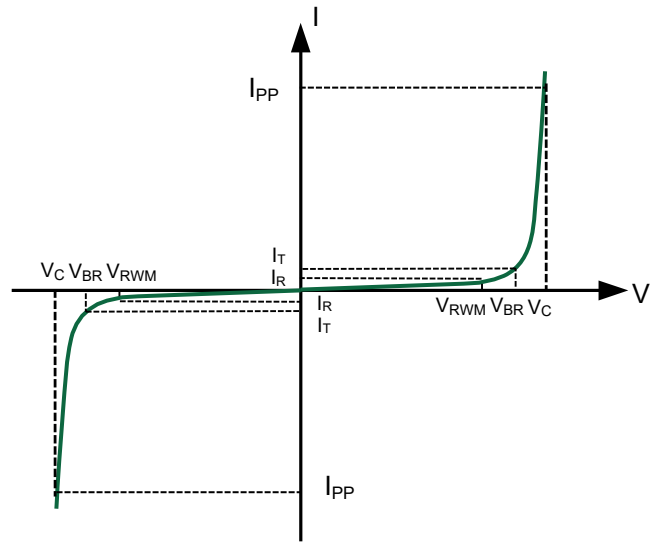
Type Number		V _{RMW}	I _R @V _{RMW}	V _{BR} @I _T (V)			I _T	V _C @I _{PP}	I _{PP} MAX
Uni	Bi	(V)	(μA)	Min	Nom	Max	(mA)	(V)	(A)
P4KE6.8A	P4KE6.8CA	5.8	1000	6.45	6.8	7.14	10	10.5	39.0
P4KE7.5A	P4KE7.5CA	6.4	500	7.13	7.5	7.88	10	11.3	36.3
P4KE8.2A	P4KE8.2CA	7.0	200	7.79	8.2	8.61	10	12.1	33.9
P4KE9.1A	P4KE9.1CA	7.8	50	8.65	9.1	9.55	1	13.4	30.6
P4KE10A	P4KE10CA	8.6	10	9.5	10	10.5	1	14.5	28.3
P4KE11A	P4KE11CA	9.4	5	10.5	11	11.6	1	15.6	26.3
P4KE12A	P4KE12CA	10.2	5	11.4	12	12.6	1	16.7	24.6
P4KE13A	P4KE13CA	11.1	1	12.4	13	13.7	1	18.2	22.5
P4KE15A	P4KE15CA	12.8	1	14.3	15	15.8	1	21.2	19.3
P4KE16A	P4KE16CA	13.6	1	15.2	16	16.8	1	22.5	18.2
P4KE18A	P4KE18CA	15.3	1	17.1	18	18.9	1	25.2	16.1
P4KE20A	P4KE20CA	17.1	1	19.0	20	21.0	1	27.7	14.8
P4KE22A	P4KE22CA	18.8	1	20.9	22	23.1	1	30.6	13.4
P4KE24A	P4KE24CA	20.5	1	22.8	24	25.2	1	33.2	12.3
P4KE27A	P4KE27CA	23.1	1	25.7	27	28.4	1	37.5	10.9
P4KE30A	P4KE30CA	25.6	1	28.5	30	31.5	1	41.4	9.9
P4KE33A	P4KE33CA	28.2	1	31.4	33	34.7	1	45.7	9.0
P4KE36A	P4KE36CA	30.8	1	34.2	36	37.8	1	49.9	8.2
P4KE39A	P4KE39CA	33.3	1	37.1	39	41.0	1	53.9	7.6
P4KE43A	P4KE43CA	36.8	1	40.9	43	45.2	1	59.3	6.9
P4KE47A	P4KE47CA	40.2	1	44.7	47	49.4	1	64.8	6.3
P4KE51A	P4KE51CA	43.6	1	48.5	51	53.6	1	70.1	5.8
P4KE56A	P4KE56CA	47.8	1	53.2	56	58.8	1	77	5.3
P4KE62A	P4KE62CA	53.0	1	58.9	62	65.1	1	85	4.8
P4KE68A	P4KE68CA	58.1	1	64.6	68	71.4	1	92	4.5
P4KE75A	P4KE75CA	64.1	1	71.3	75	78.8	1	103	4.0
P4KE82A	P4KE82CA	70.1	1	77.9	82	86.1	1	113	3.6
P4KE91A	P4KE91CA	77.8	1	86.5	91	95.5	1	125	3.3
P4KE100A	P4KE100CA	85.5	1	95	100	105	1	137	3.0
P4KE110A	P4KE110CA	94.0	1	105	110	116	1	152	2.7
P4KE120A	P4KE120CA	102.0	1	114	120	126	1	165	2.5
P4KE130A	P4KE130CA	111.0	1	124	130	137	1	179	2.3
P4KE150A	P4KE150CA	128.0	1	143	150	158	1	207	2.0
P4KE160A	P4KE160CA	136.0	1	152	160	168	1	219	1.9
P4KE170A	P4KE170CA	145.0	1	162	170	179	1	234	1.8
P4KE180A	P4KE180CA	154.0	1	171	180	189	1	246	1.7
P4KE200A	P4KE200CA	171.0	1	190	200	210	1	274	1.5
P4KE220A	P4KE220CA	185.0	1	209	220	231	1	328	1.3
P4KE250A	P4KE250CA	214.0	1	237	250	263	1	344	1.2
P4KE300A	P4KE300CA	256.0	1	285	300	315	1	414	1.0
P4KE350A	P4KE350CA	300.0	1	332	350	368	1	482	0.85
P4KE400A	P4KE400CA	342.0	1	380	400	420	1	548	0.75
P4KE440A	P4KE440CA	376.0	1	418	440	462	1	602	0.68
P4KE480A	P4KE480CA	408.0	1	456	480	504	1	658	0.61
P4KE510A	P4KE510CA	434.0	1	485	510	535	1	698	0.57
P4KE530A	P4KE530CA	477.0	1	503.5	530	556.5	1	725	0.55
P4KE540A	P4KE540CA	486.0	1	513	540	567	1	740	0.54
P4KE550A	P4KE550CA	495.0	1	522.5	550	577.5	1	760	0.52

For bidirectional type having V_{RMW} of 10 volts and less, the I_R limit is double.

I-V Curve Characteristics



Uni-Directional TVS



Bi-Directional TVS

VRWM - Reverse Stand-Off Voltage - Working Peak Reverse Voltage

VBR - Breakdown Voltage - Maximum current that flows through the TVS at a specified test current (I_T)

IT - Test Current - Test Current

Vc - Clamping Voltage - Peak voltage measured across the suppressor at a specified I_{ppm} (peak impulse current)

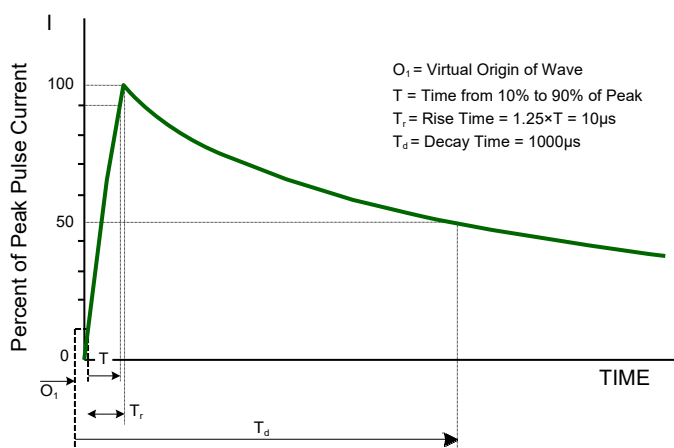
IPP - Peak Pulse Current - Maximum Reverse Peak Pulse Current

PPP - Peak Pulse Power Dissipation - Max power dissipation

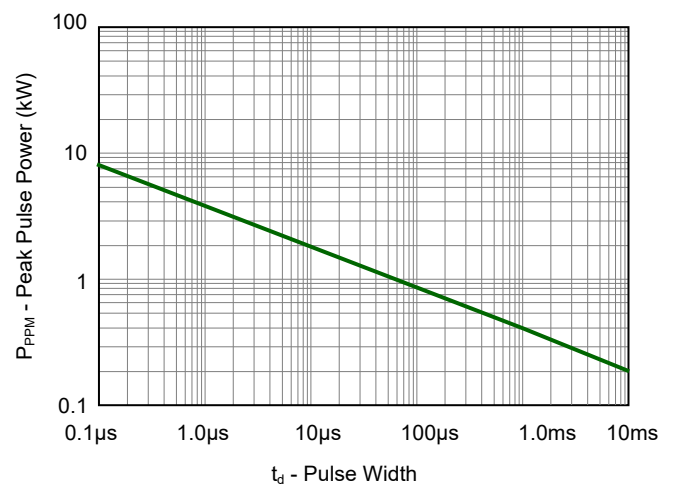
IR - Reverse Leakage Current - Current measured at V_{RWM}

VF - Forward Voltage - Drop for Uni-directional

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

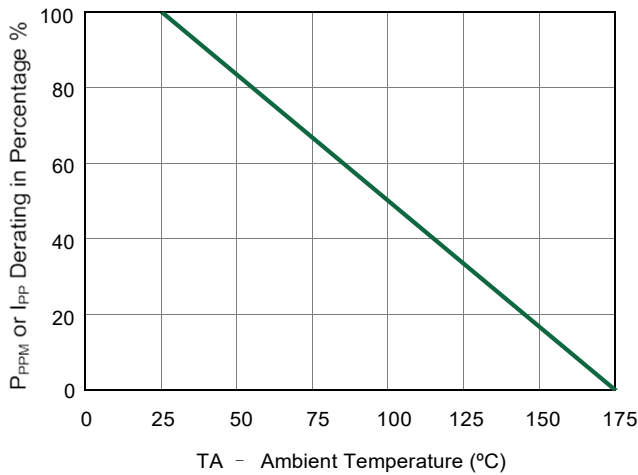


Pulse Waveform- 10/1000µs

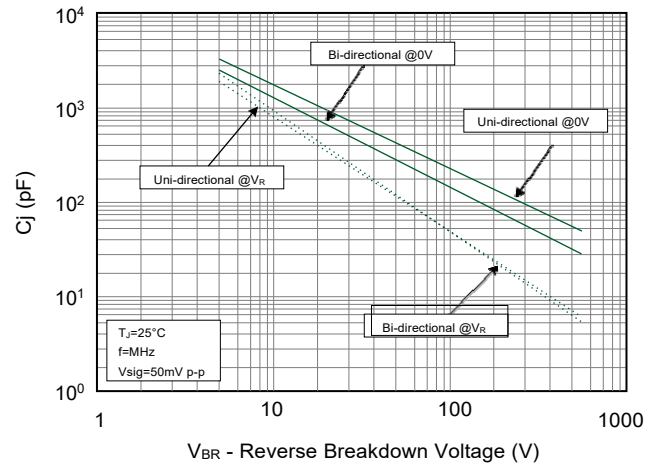


Peak Pulse Power Rating Curve

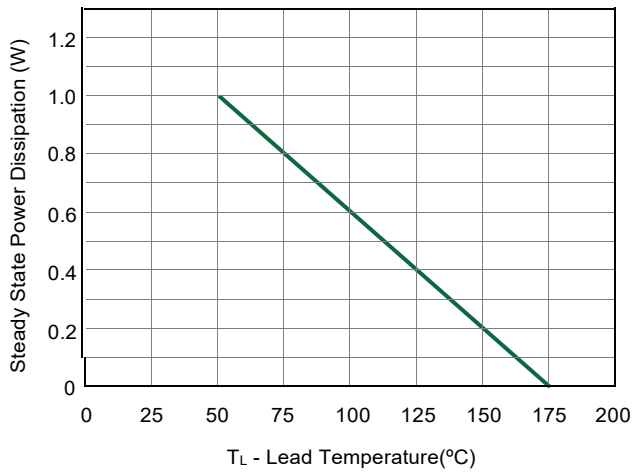
Ratings and Characteristic Curves (TA=25°C unless otherwise noted)



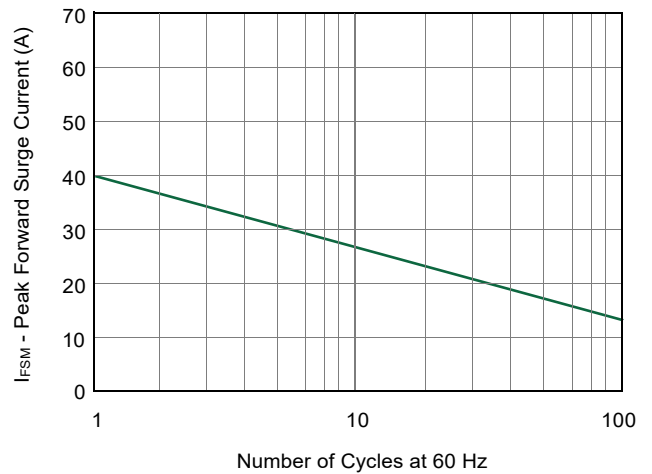
Pulse Derating Curve



Typical Junction Capacitance



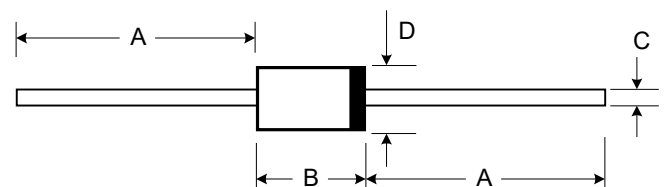
Steady State Power Derating Curve



Maximum Non-Repetitive Peak Forward Surge Current Uni-Directional Only

Product Dimensions

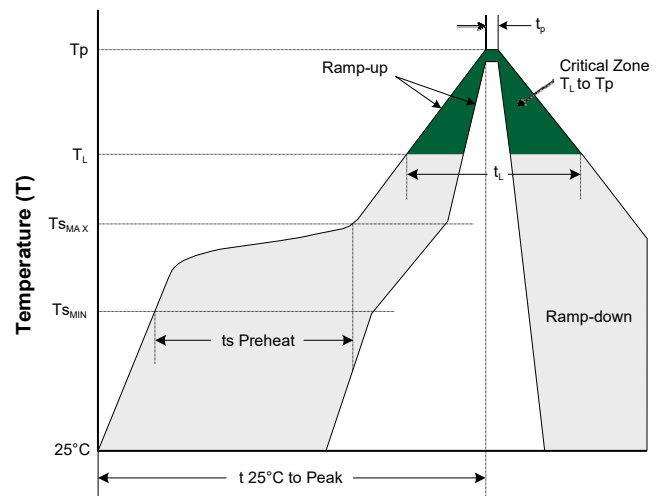
Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	1.000	-	25.40	-
B	0.160	0.205	4.10	5.20
C	0.028	0.034	0.71	0.86
D	0.080	0.107	2.00	2.70



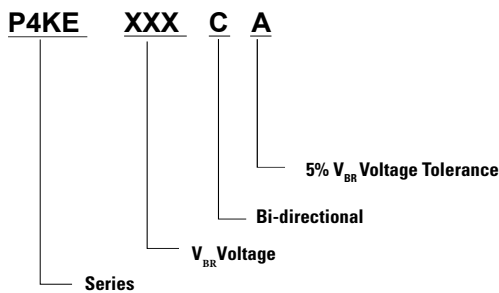
DO-41 (DO-204AL)

Soldering Parameters

Profile Feature	Lead-Free Assembly
Average Ramp-up Rate ($T_{S_{MAX}}$ to T_p) Average Ramp-down Rate (T_p to T_L)	3°C/second max. 6°C/second max.
Preheat • Temperature Min ($T_{S_{MIN}}$) • Temperature Max ($T_{S_{MAX}}$) • Time (t_s Preheat)	150°C 200°C 60-180 seconds
Time maintained above: • Temperature (T_L) • Time (t_L)	217°C 60-150 seconds
Peak/Classification Temperature • Temperature (T_p)	260 ^{+0/-5} °C
Time within 5°C of actual Peak Time (t_p)	20-40 seconds
Time 25°C to peak Temperature	8 minutes max
Do not exceed	260 °C



Part Numbering System



Order Information

Device	Package	Qty per Box	Packaging
P4KE series	DO-41	3000	Box