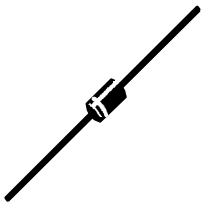
Transient Voltage Suppression Diodes
Axial Leaded – 1500W

Descriptions

Transient Voltage Suppressors (TVS) are semiconductor devices designed to provide protection against over voltage transients. When over voltage events occur, the silicon TVS actives 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-201

Features

- Glass passivated chip junction in DO-201 Package
- 1500W peak pulse power @10/1000μs
- Typical I_R less than 1μA 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 10/1000μs Test Waveform	P_{PPM}	1500	W
Steady State Power Dissipation on Infinite Heat Sink at T_L=75°C	P_D	6.5	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave Unidirectional Only (1)	I_{FSM}	200	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	°C
Typical Thermal Resistance Junction to Lead	R_{uJL}	15	°C/W
Typical Thermal Resistance Junction to Ambient	R_{uJA}	75	°C/W

Notes:

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

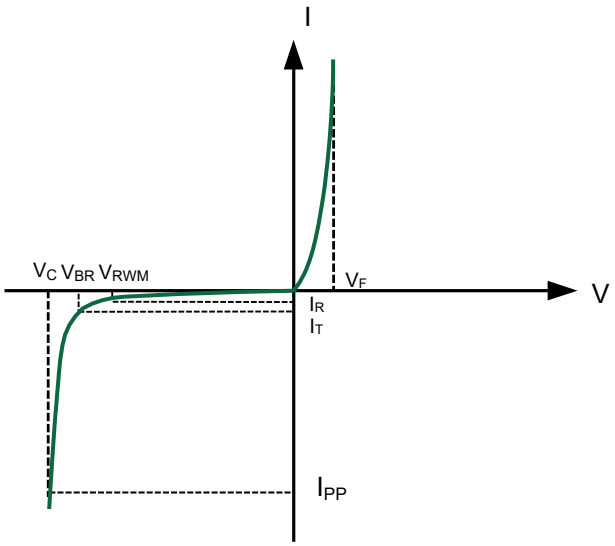
2) V_F<3.5V for devices of $V_{BR} \leqslant$200V and V_F<5.0V for devices of $V_{BR} \geqslant$201V.

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

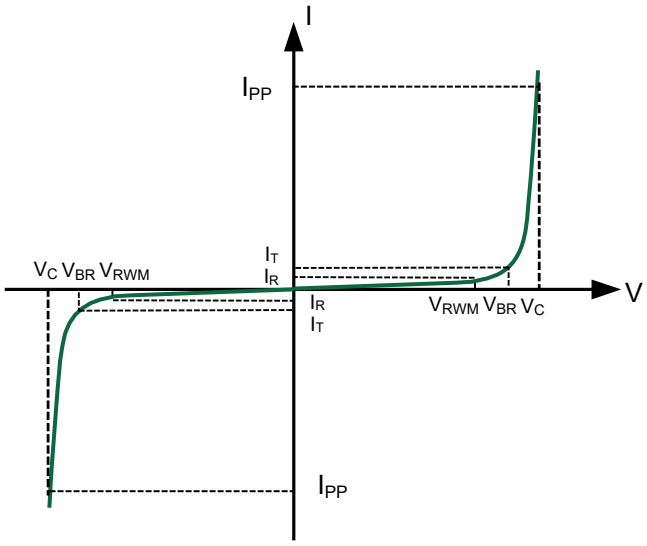
Type Number		V_{RMW}	I_R @V_{RMW}	V_{BR} @I_T (V)			I_T	V_C @I_{PP}	I_{PP} MAX
Uni	Bi	(V)	(μA)	Min	Nom	Max	(mA)	(V)	(A)
1.5KE6.8A	1.5KE6.8CA	5.8	1000	6.45	6.8	7.14	10	10.5	144.8
1.5KE7.5A	1.5KE7.5CA	6.4	500	7.13	7.5	7.88	10	11.3	134.5
1.5KE8.2A	1.5KE8.2CA	7.2	200	7.79	8.2	8.61	10	12.1	125.6
1.5KE9.1A	1.5KE9.1CA	7.7	50	8.65	9.1	9.55	1	13.4	113.4
1.5KE10A	1.5KE10CA	8.5	10	9.50	10	10.5	1	14.5	104.8
1.5KE11A	1.5KE11CA	9.4	5	10.5	11	11.6	1	15.6	97.4
1.5KE12A	1.5KE12CA	10.2	5	11.4	12	12.6	1	16.7	91.0
1.5KE13A	1.5KE13CA	11.1	1	12.4	13	13.7	1	18.2	83.5
1.5KE15A	1.5KE15CA	12.8	1	14.3	15	15.8	1	21.2	71.7
1.5KE16A	1.5KE16CA	13.6	1	15.2	16	16.8	1	22.5	67.6
1.5KE18A	1.5KE18CA	15.3	1	17.1	18	18.9	1	25.2	60.3
1.5KE20A	1.5KE20CA	17.1	1	19.0	20	21.0	1	27.7	54.9
1.5KE22A	1.5KE22CA	18.8	1	20.9	22	23.1	1	30.6	49.7
1.5KE24A	1.5KE24CA	20.5	1	22.8	24	25.2	1	33.2	45.8
1.5KE27A	1.5KE27CA	23.1	1	25.7	27	28.4	1	37.5	40.5
1.5KE30A	1.5KE30CA	25.6	1	28.5	30	31.5	1	41.4	36.7
1.5KE33A	1.5KE33CA	28.2	1	31.4	33	34.7	1	45.7	33.3
1.5KE36A	1.5KE36CA	30.8	1	34.2	36	37.8	1	49.9	30.5
1.5KE39A	1.5KE39CA	33.3	1	37.1	39	41	1	53.9	28.2
1.5KE43A	1.5KE43CA	36.8	1	40.9	43	45.2	1	59.3	25.6
1.5KE47A	1.5KE47CA	40.2	1	44.7	47	49.4	1	64.8	23.5
1.5KE51A	1.5KE51CA	43.6	1	48.5	51	53.6	1	70.1	21.7
1.5KE56A	1.5KE56CA	47.8	1	53.2	56	58.8	1	77	19.7
1.5KE62A	1.5KE62CA	53.0	1	58.9	62	65.1	1	85	17.9
1.5KE68A	1.5KE68CA	58.1	1	64.6	68	71.4	1	92	16.5
1.5KE75A	1.5KE75CA	64.1	1	71.3	75	78.8	1	103	14.8
1.5KE82A	1.5KE82CA	70.1	1	77.9	82	86.1	1	113	13.5
1.5KE91A	1.5KE91CA	77.8	1	86.5	91	95.5	1	125	12.2
1.5KE100A	1.5KE100CA	85.5	1	95	100	105	1	137	11.1
1.5KE110A	1.5KE110CA	94	1	105	110	116	1	152	10.0
1.5KE120A	1.5KE120CA	102	1	114	120	126	1	165	9.2
1.5KE130A	1.5KE130CA	111	1	124	130	137	1	179	8.5
1.5KE150A	1.5KE150CA	128	1	143	150	158	1	207	7.3
1.5KE160A	1.5KE160CA	136	1	152	160	168	1	219	6.9
1.5KE170A	1.5KE170CA	145	1	162	170	179	1	234	6.5
1.5KE180A	1.5KE180CA	154	1	171	180	189	1	246	6.2
1.5KE200A	1.5KE200CA	171	1	190	200	210	1	274	5.5
1.5KE220A	1.5KE220CA	185	1	209	220	231	1	328	4.6
1.5KE250A	1.5KE250CA	214	1	237	250	263	1	344	4.4
1.5KE300A	1.5KE300CA	256	1	285	300	315	1	414	3.7
1.5KE350A	1.5KE350CA	300	1	332	350	368	1	482	3.2
1.5KE400A	1.5KE400CA	342	1	380	400	420	1	548	2.8
1.5KE440A	1.5KE440CA	376	1	418	440	462	1	602	2.5
1.5KE480A	1.5KE480CA	408	1	456	480	504	1	658	2.3
1.5KE510A	1.5KE510CA	434	1	485	510	535	1	698	2.1
1.5KE530A	1.5KE530CA	477	1	503.5	530	556.5	1	725	2.1
1.5KE540A	1.5KE540CA	486	1	513.0	540	567.0	1	740	2.0
1.5KE550A	1.5KE550CA	495	1	522.5	550	577.5	1	760	2.0

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

I-V Curve Characteristics



Uni-Directional TVS



Bi-Directional TVS

V_{RWM} - Reverse Stand-Off Voltage - Working Peak Reverse Voltage

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

I_T - Test Current - Test Current

V_C - Clamping Voltage - Peak voltage measured across the suppressor at a specified Ippm (peak impulse current)

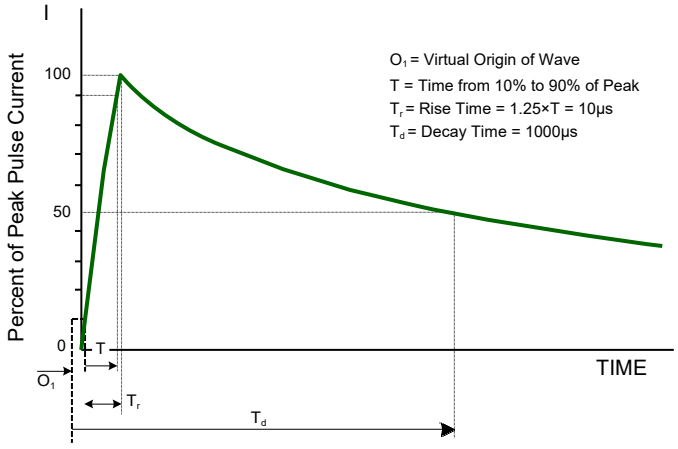
I_{PP} - Peak Pulse Current - Maximum Reverse Peak Pulse Current

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

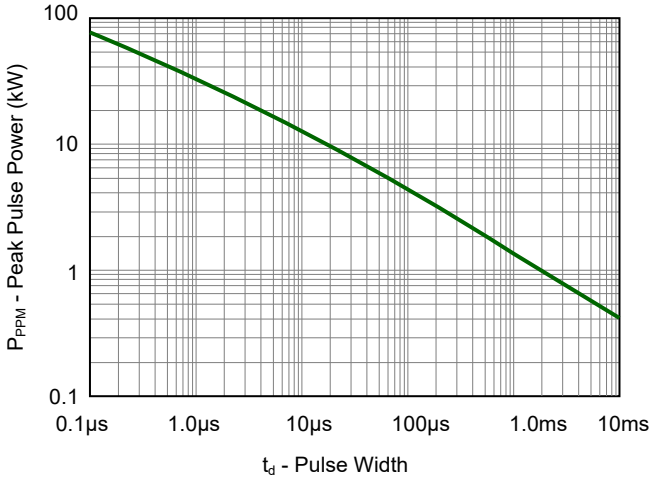
I_R - Reverse Leakage Current - Current measured at V_{RWM}

V_F - Forward Voltage - Drop for Uni-directional

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

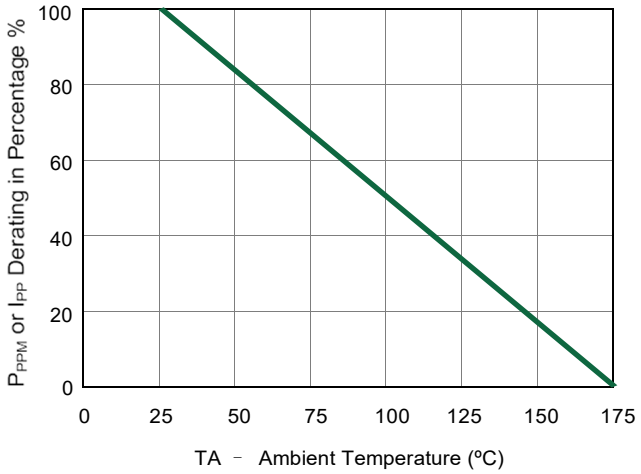


Pulse Waveform- 10/1000μs

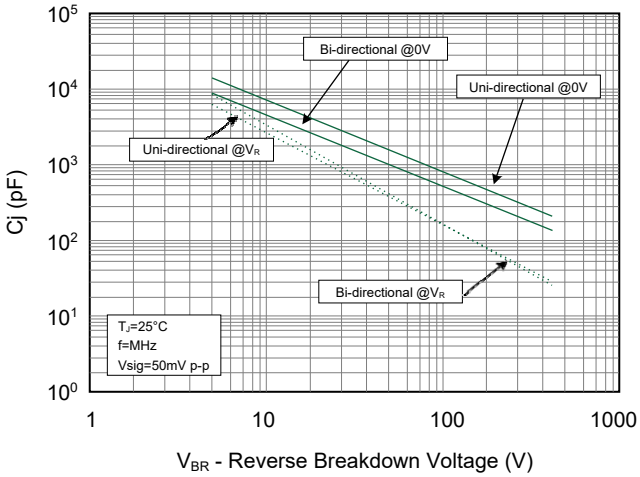


Peak Pulse Power Rating Curve

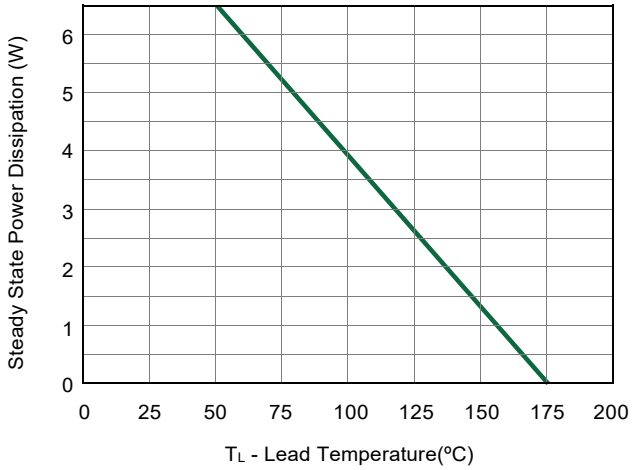
Ratings and Characteristic Curves (TA=25°C unless otherwise noted)



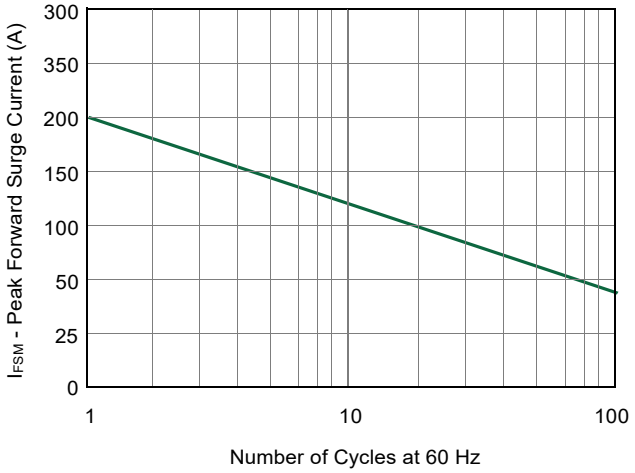
Pulse Derating Curve



Typical Junction Capacitance



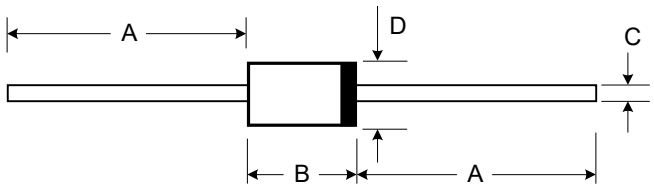
Steady State Power Derating Curve



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

Product Dimensions

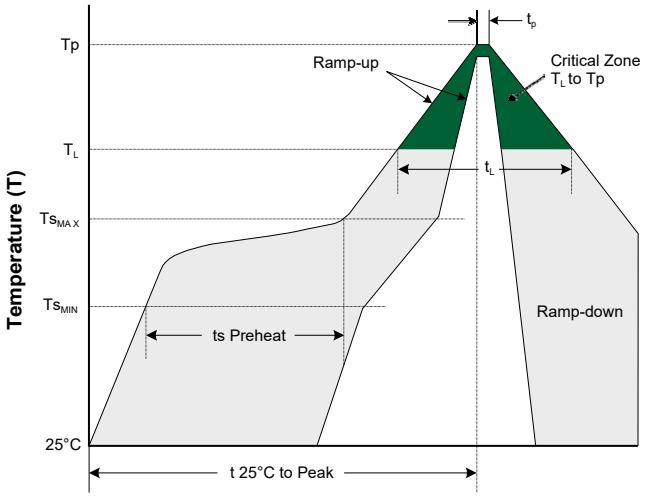
Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	1.000	-	25.40	-
B	0.285	0.375	7.20	9.50
C	0.037	0.042	0.94	1.07
D	0.190	0.210	4.80	5.30



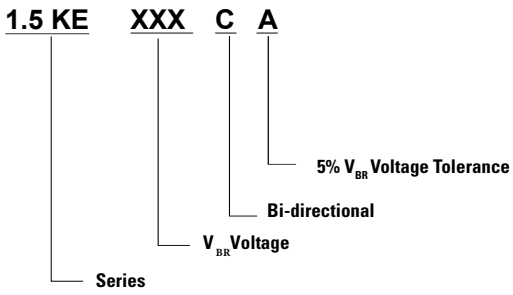
DO-201

Soldering Parameters

Profile Feature	Lead-Free Assembly
Average Ramp-up Rate (Ts_{MAX} to Tp) Average Ramp-down Rate (Tp to T_L)	3°C/second max. 6°C/second max.
Preheat • Temperature Min (Ts_{MIN}) • Temperature Max (Ts_{MAX}) • Time (ts 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 (Tp)	 $260^{+0/-5}$°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
1.5KEseries	DO-201	1000	Box