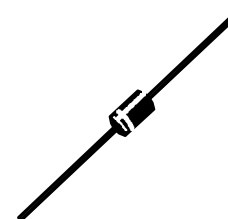


Transient Voltage Suppression Diodes Axial Leaded – 500W

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-15

Features

- Glass passivated chip junction in DO-15 Package
- 500W 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 voltag/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}	500	W
Steady State Power Dissipation on Infinite Heat Sink at T _L =75°C	P _D	3.0	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave Unidirectional Only ⁽¹⁾	I _{FSM}	70	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}	20	°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.

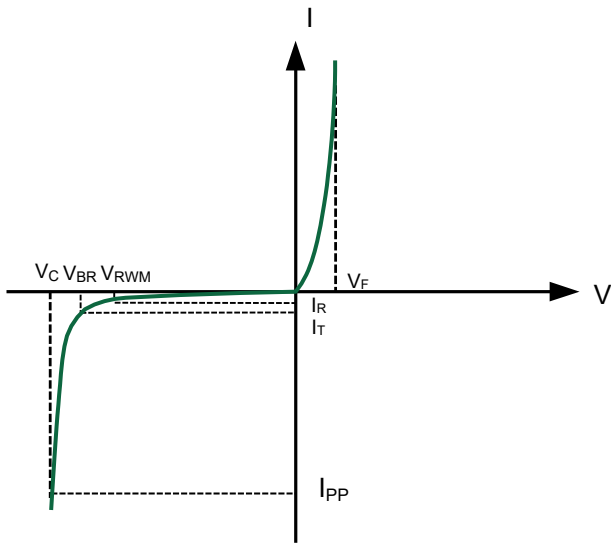
2) V_F<3.5V for devices of V_{BR}≤200V and V_F<5.0V for devices of V_{BR} ≥201V.

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

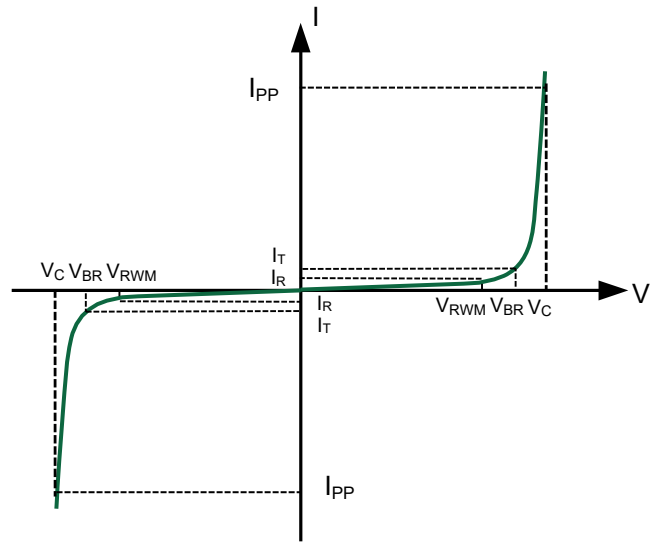
Type Number		V _{RMW}	I _R @V _{RMW}	V _{BR} @I _T (V)			I _T	V _C @I _{PP}	I _{PP} MAX
Uni	Bi	(V)	(μA)	Min	Nom	Max	(mA)	(V)	(A)
SA5.0A	SA5.0CA	5.0	600	6.40	6.7	7.00	10	9.2	55.4
SA6.0A	SA6.0CA	6.0	600	6.67	7.0	7.37	10	10.3	49.5
SA6.5A	SA6.5CA	6.5	400	7.22	7.6	7.98	10	11.2	45.5
SA7.0A	SA7.0CA	7.0	150	7.78	8.2	8.60	10	12.0	42.5
SA7.5A	SA7.5CA	7.5	50	8.33	8.8	9.21	1	12.9	39.5
SA8.0A	SA8.0CA	8.0	25	8.89	9.4	9.83	1	13.6	37.5
SA8.5A	SA8.5CA	8.5	10	9.44	9.9	10.4	1	14.4	35.4
SA9.0A	SA9.0CA	9.0	5	10.0	10.6	11.1	1	15.4	33.1
SA10A	SA10CA	10	3	11.1	11.7	12.3	1	17.0	30.0
SA11A	SA11CA	11	1	12.2	12.9	13.5	1	18.2	28.0
SA12A	SA12CA	12	1	13.3	14.0	14.7	1	19.9	25.6
SA13A	SA13CA	13	1	14.4	15.2	15.9	1	21.5	23.7
SA14A	SA14CA	14	1	15.6	16.4	17.2	1	23.2	22.0
SA15A	SA15CA	15	1	16.7	17.6	18.5	1	24.4	20.9
SA16A	SA16CA	16	1	17.8	18.8	19.7	1	26.0	19.6
SA17A	SA17CA	17	1	18.9	19.9	20.9	1	27.6	18.5
SA18A	SA18CA	18	1	20.0	21.1	22.1	1	29.2	17.5
SA20A	SA20CA	20	1	22.2	23.4	24.5	1	32.4	15.7
SA22A	SA22CA	22	1	24.4	25.7	26.9	1	35.5	14.4
SA24A	SA24CA	24	1	26.7	28.1	29.5	1	38.9	13.1
SA26A	SA26CA	26	1	28.9	30.4	31.9	1	42.1	12.1
SA28A	SA28CA	28	1	31.1	32.8	34.4	1	45.4	11.2
SA30A	SA30CA	30	1	33.3	35.1	36.8	1	48.4	10.5
SA33A	SA33CA	33	1	36.7	38.7	40.6	1	53.3	9.6
SA36A	SA36CA	36	1	40.0	42.1	44.2	1	58.1	8.8
SA40A	SA40CA	40	1	44.4	46.8	49.1	1	64.5	7.9
SA43A	SA43CA	43	1	47.8	50.3	52.8	1	69.4	7.3
SA45A	SA45CA	45	1	50.0	52.7	55.3	1	72.7	7.0
SA48A	SA48CA	48	1	53.3	56.1	58.9	1	77.4	6.6
SA51A	SA51CA	51	1	56.7	59.7	62.7	1	82.4	6.2
SA54A	SA54CA	54	1	60.0	63.2	66.3	1	87.1	5.9
SA58A	SA58CA	58	1	64.4	67.8	71.2	1	93.6	5.4
SA60A	SA60CA	60	1	66.7	70.2	73.7	1	96.8	5.3
SA64A	SA64CA	64	1	71.1	74.9	78.6	1	103	5.0
SA70A	SA70CA	70	1	77.8	81.9	86.0	1	113	4.5
SA75A	SA75CA	75	1	83.3	87.7	92.1	1	121	4.2
SA78A	SA78CA	78	1	86.7	91.3	95.8	1	126	4.0
SA85A	SA85CA	85	1	94.4	99.2	104	1	137	3.7
SA90A	SA90CA	90	1	100	105.5	111	1	146	3.5
SA100A	SA100CA	100	1	111	117.0	123	1	162	3.1
SA110A	SA110CA	110	1	122	128.5	135	1	177	2.9
SA120A	SA120CA	120	1	133	140.0	147	1	193	2.6
SA130A	SA130CA	130	1	144	151.5	159	1	209	2.4
SA150A	SA150CA	150	1	167	176.0	185	1	243	2.1
SA160A	SA160CA	160	1	178	187.5	197	1	259	2.0
SA170A	SA170CA	170	1	189	199.0	209	1	275	1.9
SA180A	SA180CA	180	1	200	210.5	221	1	289	1.7

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

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

V_{BR} - Breakdown Voltage - Maximum current that flows through 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 I_{ppm} (peak impulse current)

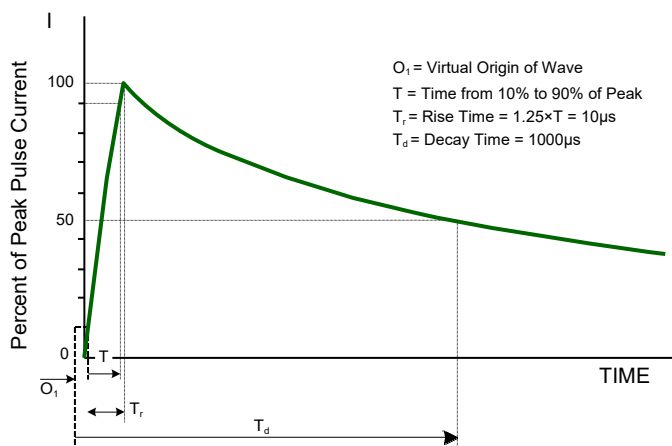
I_{PP} - Peak Pulse Current - Maximum Reverse Peak Pulse Current

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

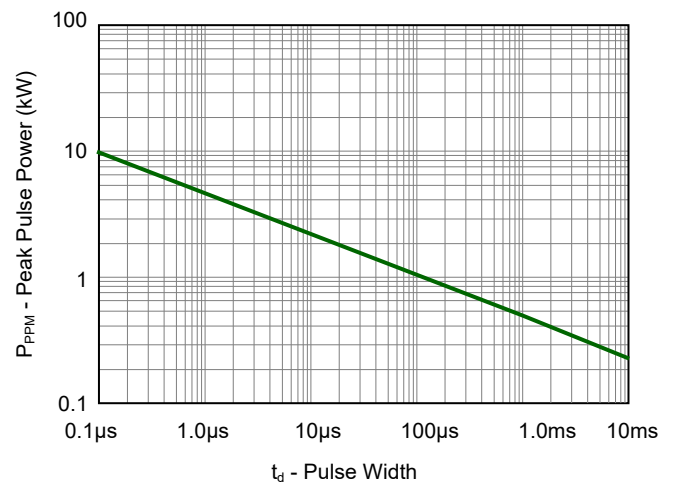
I_R - Reverse Leakage Current - Current measured at V_{RWM}

V_F - Forward Voltage - Drop for Uni-directional

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

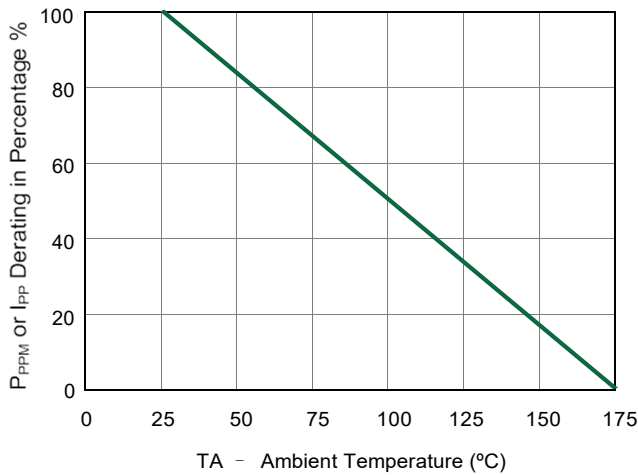


Pulse Waveform- 10/1000 μ s

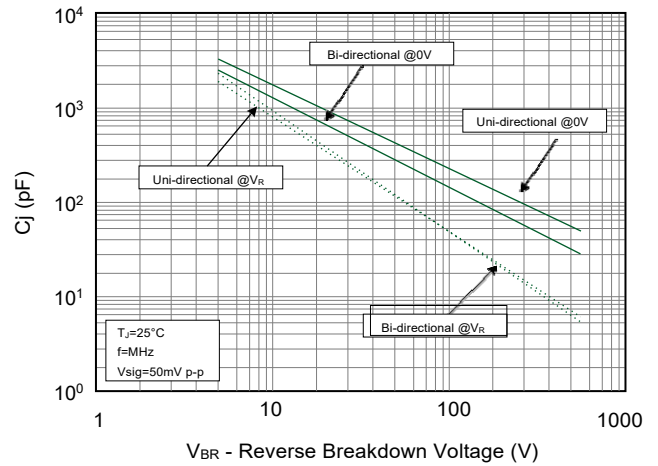


Peak Pulse Power Rating Curve

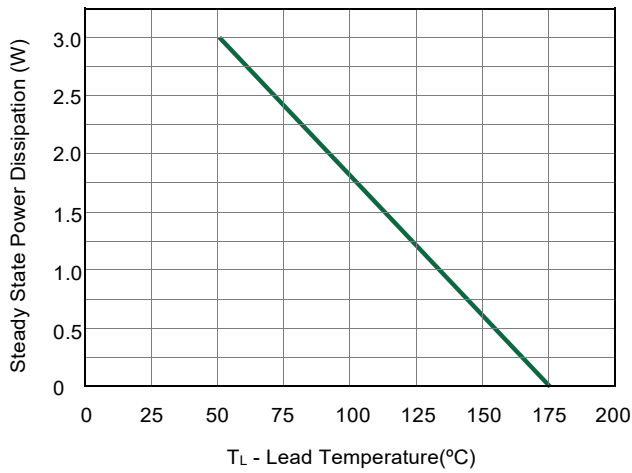
Ratings and Characteristic Curves (TA=25°C unless otherwise noted)



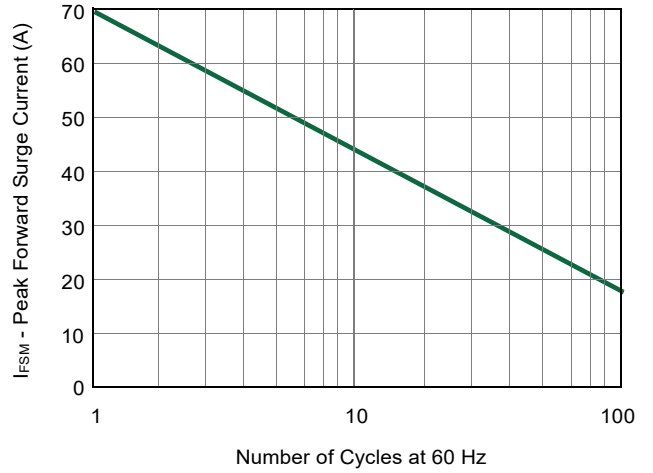
Pulse Derating Curve



Typical Junction Capacitance



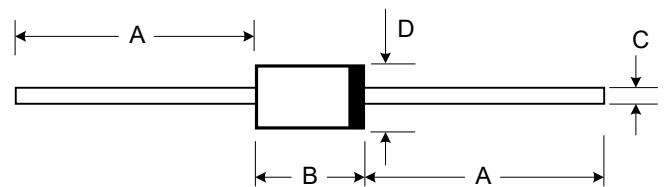
Steady State Power Derating Curve



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

Product Dimensions

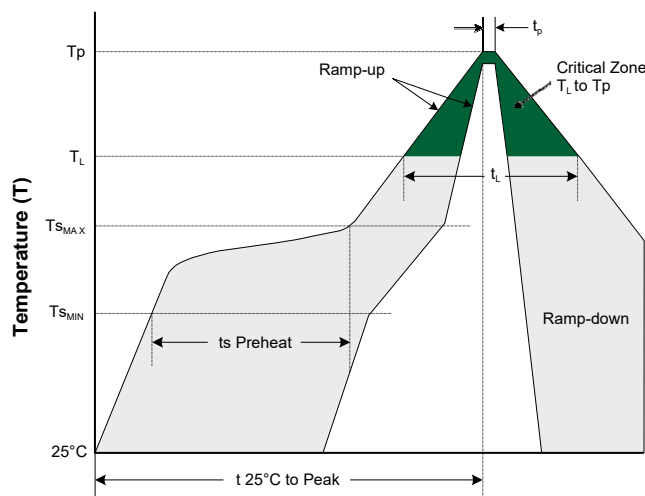
Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	1.000	-	25.40	-
B	0.230	0.300	5.80	7.60
C	0.028	0.034	0.71	0.86
D	0.104	0.140	2.60	3.60



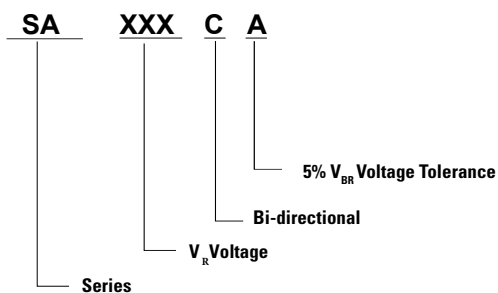
DO-15 (DO-204AC)

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
SA series	DO-15	2000	Box