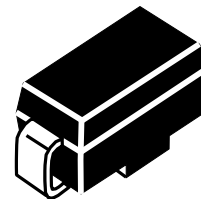


Transient Voltage Suppression Diodes Surface Mount – 400W

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.



**SMA
(JEDEC DO-214AC)**

Features

- Glass passivated chip junction in SMA 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	3.3	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	$R_{\theta JL}$	20	$^\circ\text{C/W}$
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.

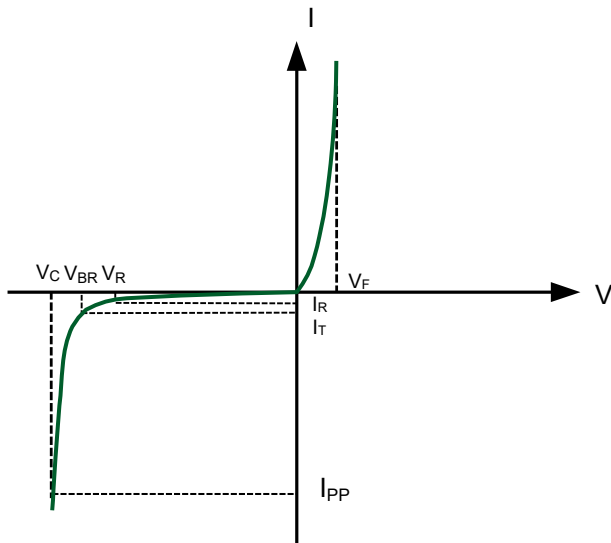
2) $V_F < 3.5V$ for devices of $V_{BR} \leq 200V$ and $V_F < 5.0V$ for devices of $V_{BR} \geq 201V$.

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

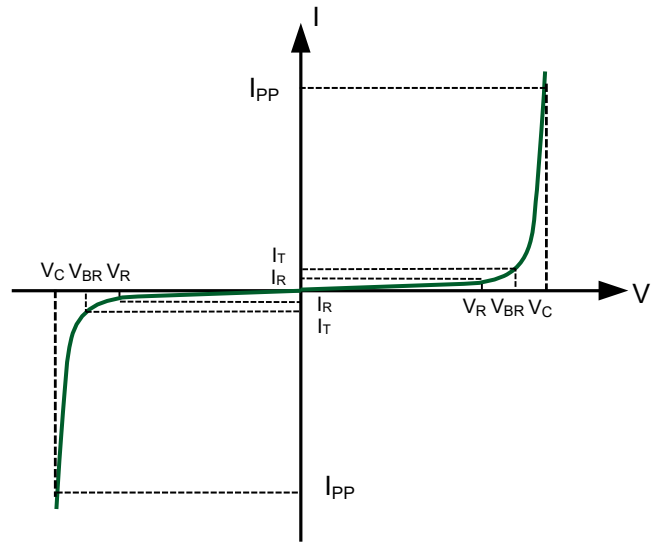
Type Number		V _R	I _R @V _R	V _{BR} @I _T (V)			I _T	V _C @I _{PP}	I _{PP} MAX
Uni	Bi	(V)	(μA)	Min	Nom	Max	(mA)	(V)	(A)
P4SMA6.8A	P4SMA6.8CA	5.8	1000	6.48	6.8	7.13	10	10.5	39.0
P4SMA7.5A	P4SMA7.5CA	6.4	500	7.16	7.5	7.87	10	11.3	36.3
P4SMA8.2A	P4SMA8.2CA	7.02	200	7.82	8.2	8.60	10	12.1	33.9
P4SMA9.1A	P4SMA9.1CA	7.78	50	8.68	9.1	9.54	1	13.4	30.6
P4SMA10A	P4SMA10CA	8.55	10	9.54	10	10.49	1	14.5	28.3
P4SMA11A	P4SMA11CA	9.40	5	10.54	11	11.59	1	15.6	26.3
P4SMA12A	P4SMA12CA	10.2	5	11.45	12	12.59	1	16.7	24.6
P4SMA13A	P4SMA13CA	11.1	1	12.45	13	13.69	1	18.2	22.5
P4SMA15A	P4SMA15CA	13.0	1	14.36	15	15.79	1	21.2	19.3
P4SMA16A	P4SMA16CA	14.4	1	15.26	16	16.79	1	22.5	18.2
P4SMA18A	P4SMA18CA	16.2	1	17.17	18	18.89	1	25.2	16.1
P4SMA20A	P4SMA20CA	18.0	1	19.08	20	20.99	1	27.7	14.8
P4SMA22A	P4SMA22CA	19.8	1	20.98	22	23.08	1	30.6	13.4
P4SMA24A	P4SMA24CA	21.6	1	22.89	24	25.18	1	33.2	12.3
P4SMA27A	P4SMA27CA	24.35	1	25.80	27	28.38	1	37.5	10.9
P4SMA30A	P4SMA30CA	27.0	1	28.61	30	31.48	1	41.4	9.9
P4SMA33A	P4SMA33CA	29.75	1	31.53	33	34.68	1	45.7	9.0
P4SMA36A	P4SMA36CA	32.4	1	34.34	36	37.77	1	49.9	8.2
P4SMA39A	P4SMA39CA	35.15	1	37.25	39	40.97	1	53.9	7.6
P4SMA43A	P4SMA43CA	38.75	1	41.06	43	45.17	1	59.3	6.9
P4SMA47A	P4SMA47CA	42.35	1	44.88	47	49.37	1	64.8	6.3
P4SMA51A	P4SMA51CA	45.95	1	48.69	51	53.56	1	70.1	5.8
P4SMA56A	P4SMA56CA	50.4	1	53.41	56	58.76	1	77	5.3
P4SMA62A	P4SMA62CA	55.8	1	59.14	62	65.05	1	85	4.8
P4SMA68A	P4SMA68CA	61.2	1	64.86	68	71.35	1	92	4.5
P4SMA75A	P4SMA75CA	67.95	1	71.59	75	78.74	1	103	4.0
P4SMA82A	P4SMA82CA	74.31	1	78.21	82	86.04	1	113	3.6
P4SMA91A	P4SMA91CA	82.47	1	86.85	91	95.43	1	125	3.3
P4SMA100A	P4SMA100CA	90.63	1	95.38	100	104.93	1	137	3.0
P4SMA110A	P4SMA110CA	99.64	1	105.42	110	115.92	1	152	2.7
P4SMA120A	P4SMA120CA	108.1	1	114.46	120	125.91	1	165	2.5
P4SMA130A	P4SMA130CA	117.7	1	124.5	130	136.90	1	179	2.3
P4SMA150A	P4SMA150CA	135.7	1	143.57	150	157.89	1	207	2.0
P4SMA160A	P4SMA160CA	144.2	1	152.61	160	167.88	1	219	1.9
P4SMA170A	P4SMA170CA	153.7	1	162.65	170	178.87	1	234	1.8
P4SMA180A	P4SMA180CA	163.2	1	171.69	180	188.87	1	246	1.7
P4SMA200A	P4SMA200CA	179.4	1	190.76	200	209.85	1	274	1.5
P4SMA220A	P4SMA220CA	195.3	1	209.84	220	230.84	1	328	1.3
P4SMA250A	P4SMA250CA	214.0	1	237.00	250	263.00	1	344	1.2
P4SMA300A	P4SMA300CA	256.0	1	285.00	300	315.00	1	414	1.0
P4SMA350A	P4SMA350CA	300.0	1	332.00	350	368.00	1	482	0.85
P4SMA400A	P4SMA400CA	342.0	1	380.00	400	420.00	1	548	0.75
P4SMA440A	P4SMA440CA	376.0	1	418.00	440	462.00	1	602	0.68
P4SMA480A	P4SMA480CA	408.0	1	456.00	480	504.00	1	658	0.61
P4SMA510A	P4SMA510CA	434.0	1	485.00	510	535.00	1	698	0.57
P4SMA530A	P4SMA530CA	451.0	1	503.50	530	556.50	1	725	0.55
P4SMA540A	P4SMA540CA	459.0	1	513.00	540	567.00	1	740	0.54
P4SMA550A	P4SMA550CA	495.0	1	522.50	550	577.50	1	760	0.52

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

I-V Curve Characteristics



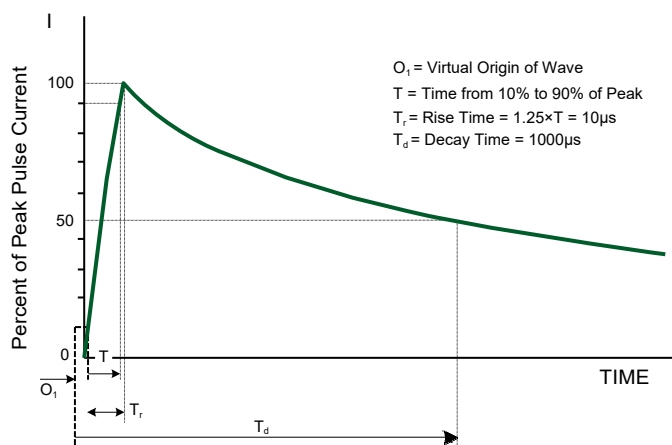
Uni-Directional TVS



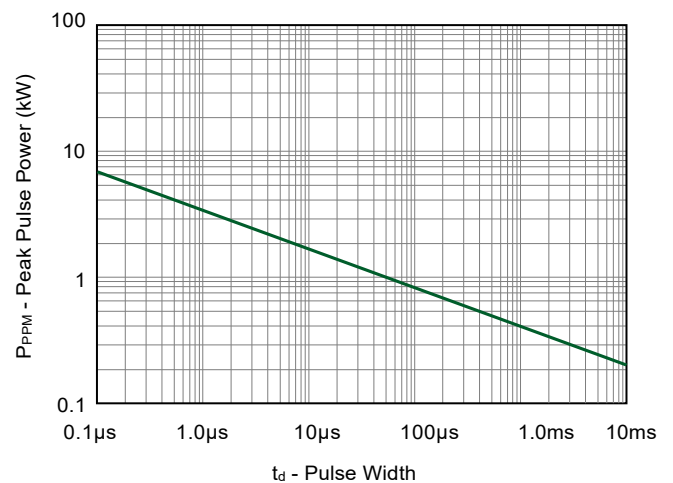
Bi-Directional TVS

- V_R - Stand-Off Voltage** - Maximum voltage that can be applied to the TVS without operation
- 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_R
- V_F - Forward Voltage** - Drop for Uni-directional

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

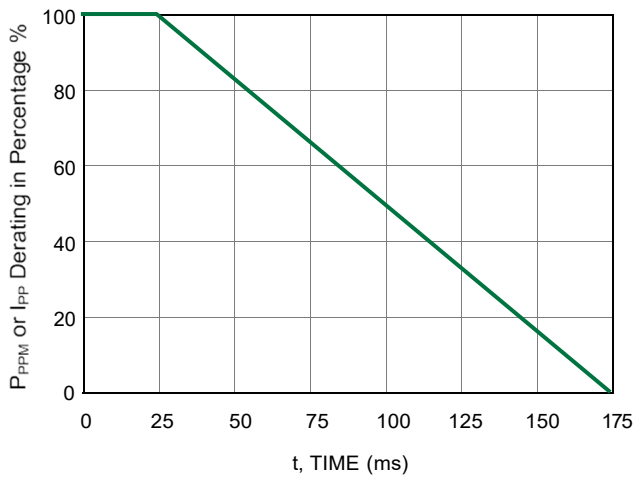


Pulse Waveform- 10/1000µs

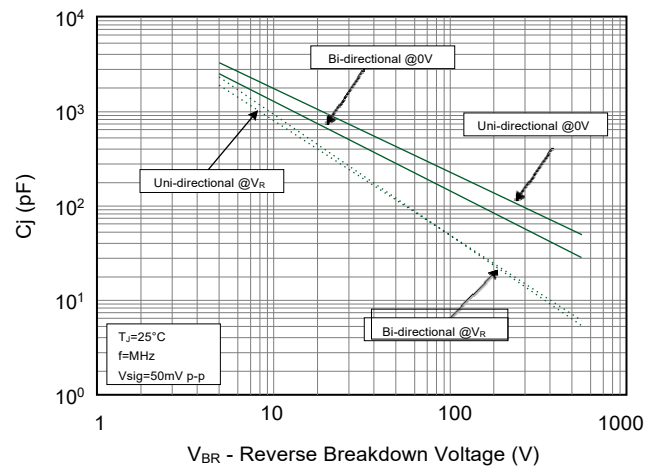


Peak Pulse Power Rating Curve

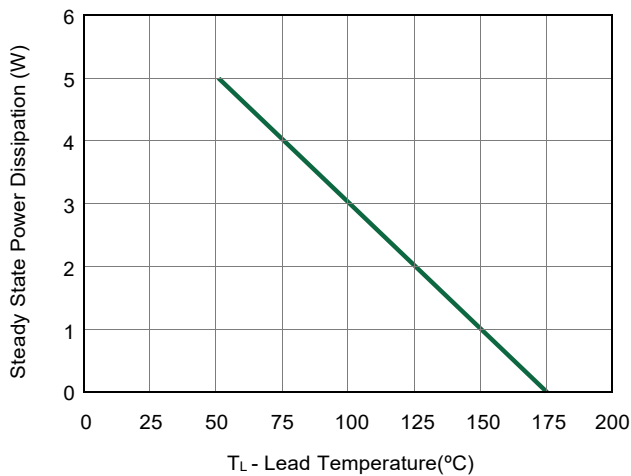
Ratings and Characteristic Curves (TA=25°C unless otherwise noted)



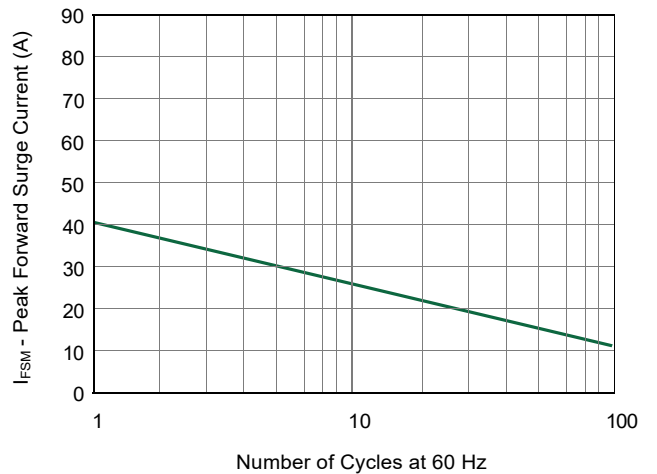
Pulse Derating Curve



Typical Junction Capacitance



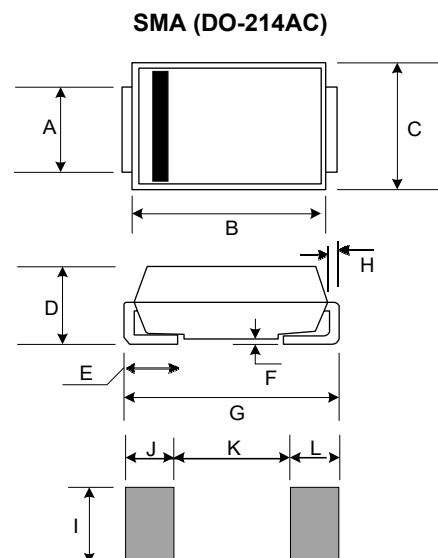
Steady State Power Derating Curve



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

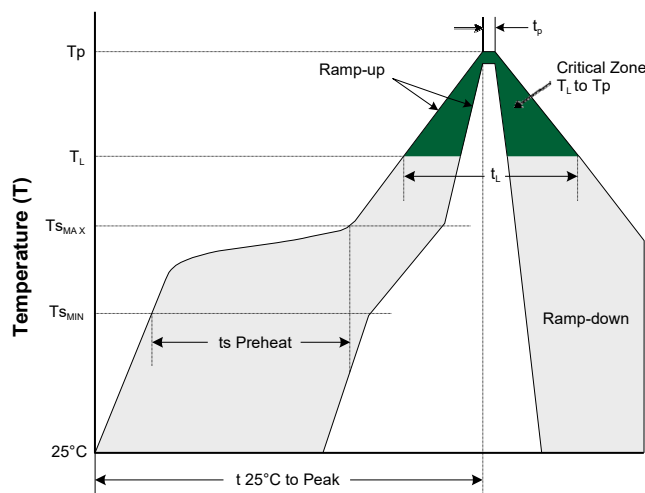
Product Dimensions

Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.047	0.065	1.200	1.650
B	0.157	0.181	3.990	4.600
C	0.095	0.114	2.400	2.900
D	0.075	0.096	1.900	2.440
E	0.030	0.060	0.780	1.520
F	-	0.008	-	0.203
G	0.189	0.208	4.800	5.280
H	0.006	0.012	0.152	0.305
I	0.070	-	1.800	-
J	0.082	-	2.100	-
K	-	0.090	-	2.300
L	0.082	-	2.100	-

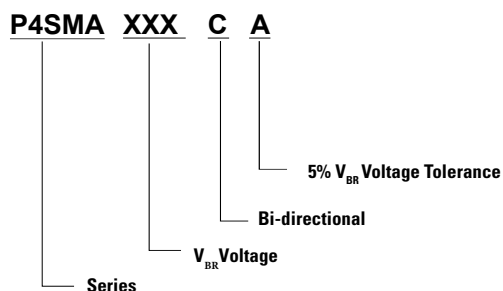


Soldering Parameters

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	Quantity	Tape
P4SMA series	SMA/DO-214AC	2000	7" Reel
P4SMA series	SMA/DO-214AC	5000	13" Reel