

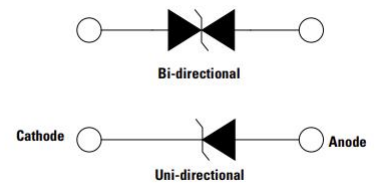


TVS Diodes SA series

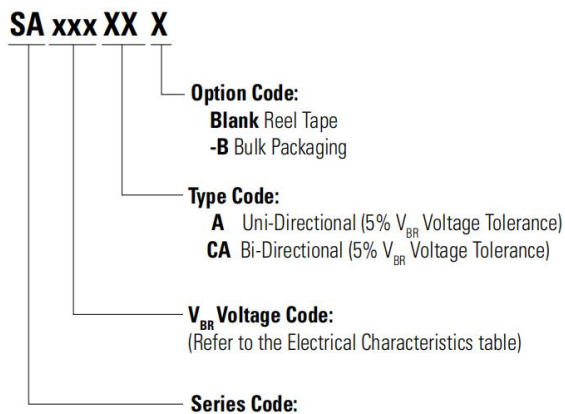
Transient Voltage Suppressors

Features

- ◆ 500W peak pulse power capability at 10/1000μs waveform, repetition rate (duty cycle): 0.01%
- ◆ Low incremental surge impedance
- ◆ Excellent clamping capability
- ◆ Typical I_R less than 1μA when $V_{BR} \max > 13V$
- ◆ High Temperature soldering guaranteed: 265°C/40 seconds/.375", (9.5mm) lead length, 5lbs (2.3kg) tension.
- ◆ Plastic package has underwriters laboratory flammability 94V-0
- ◆ Meets MSL level 1, per J-STD-020.
- ◆ Meet HF and RoHS compliant



Part Number Coding System



Applications

- ◆ I/O interface
- ◆ AC/DC power supply
- ◆ Low frequency signal transmission line(RS232,RS485,etc.)

Mechanical Data

- ◆ Case: JEDEC DO-15 Moulded plastic, Axial lead
- ◆ Polarity: Color band denotes positive end (cathode) except bi-directional models
- ◆ Weight: About 0.4g

Maximum Rating and Characteristics

Parameters at 25°C ambient temperature unless otherwise Noted.

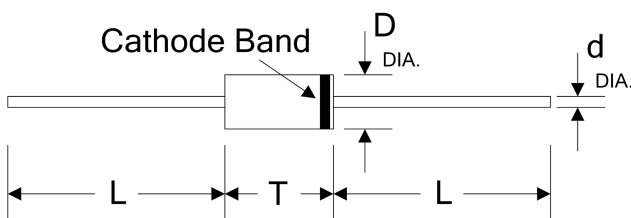
Rating	Symbol	Value	Unit
Peak Pulse Power Dissipation by 10/1000μs Test Waveform (Note 1)	P_{PPM}	Minimum 500	Watts
Peak pulse current of at 10/1000μs waveform (Note 1, Fig.2)	I_{PPM}	See Table	Amps
Steady State Power Dissipation on Infinite Heat Sink at $T_L = 75^\circ\text{C}$	P_D	3.0	Watts
Maximum Instantaneous Forward Voltage at 35A for Unidirectional Only	V_F	3.5	V
Peak Forward Surge Current, 8.3ms Single Half Sine Wave Unidirectional Only (Note 2)	I_{FSM}	70	Amps
Operating junction and Storage Temperature Range.	T_J, T_{STG}	-55 to +175	$^\circ\text{C}$

Notes:

- 1.Non-repetitive current pulse , per Fig. 2 and derated above T_J (initial) = 25°C per Fig. 1.
2. Measured on 8.3ms single half sine wave or equivalent square wave, duty cycle=4 per minute maximum.

Dimensions (DO-204AC/DO-15)

Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
L	25.40	-	1.000	-
T	5.80	7.60	0.230	0.300
D	2.60	3.60	0.104	0.140
d	0.71	0.86	0.028	0.034



Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Part Number		Reverse Stand-Off Voltage	Breakdown Voltage @ I_T	Test Current	Maximum Clamping Voltage @ I_{PP}	Peak Pulse Current	Reverse Leakage @ V_{RWM}
Unidirectional	Bidirectional	$V_{RWM}(V)$	$V_{BR}(V)$	$I_T(mA)$	$V_C(V)$	$I_{PP}(A)$	$I_R(\mu A)$
SA5.0A	SA5.0CA	5.0	6.40~7.00	10	9.2	55.4	600
SA6.0A	SA6.0CA	6.0	6.67~7.37	10	10.3	49.5	600
SA6.5A	SA6.5CA	6.5	7.22~7.98	10	11.2	45.5	400
SA7.0A	SA7.0CA	7.0	7.78~8.60	10	12.0	42.5	150
SA7.5A	SA7.5CA	7.5	8.33~9.21	1	12.9	39.5	50
SA8.0A	SA8.0CA	8.0	8.89~9.83	1	13.6	37.5	25
SA8.5A	SA8.5CA	8.5	9.44~10.40	1	14.4	35.4	10
SA9.0A	SA9.0CA	9.0	10.0~11.10	1	15.4	33.1	5
SA10A	SA10CA	10.0	11.10~12.30	1	17.0	30.0	3
SA11A	SA11CA	11.0	12.20~13.50	1	18.2	28.0	1
SA12A	SA12CA	12.0	13.30~14.70	1	19.9	25.6	1
SA13A	SA13CA	13.0	14.40~15.90	1	21.5	23.7	1
SA14A	SA14CA	14.0	15.60~17.20	1	23.2	22.0	1
SA15A	SA15CA	15.0	16.70~18.50	1	24.4	20.9	1
SA16A	SA16CA	16.0	17.80~19.70	1	26.0	19.6	1
SA17A	SA17CA	17.0	18.90~20.90	1	27.6	18.5	1
SA18A	SA18CA	18.0	20.00~22.10	1	29.2	17.5	1
SA20A	SA20CA	20.0	22.20~24.50	1	32.4	15.7	1
SA22A	SA22CA	22.0	24.40~26.90	1	35.5	14.4	1
SA24A	SA24CA	24.0	26.70~29.50	1	38.9	13.1	1
SA28A	SA28CA	28.0	31.10~34.40	1	45.4	11.2	1
SA30A	SA30CA	30.0	33.30~36.80	1	48.4	10.5	1
SA33A	SA33CA	33.0	36.70~40.60	1	53.3	9.6	1
SA36A	SA36CA	36.0	40.00~44.20	1	58.1	8.8	1
SA40A	SA40CA	40.0	44.40~49.10	1	64.5	7.9	1
SA43A	SA36CA	43.0	47.80~52.80	1	69.4	7.3	1
SA45A	SA45CA	45.0	50.00~55.30	1	72.7	7.0	1
SA48A	SA48CA	48.0	53.30~58.90	1	77.4	6.6	1
SA51A	SA51CA	51.0	56.70~62.70	1	82.4	6.2	1
SA54A	SA54CA	54.0	60.00~66.30	1	87.1	5.9	1
SA58A	SA58CA	58.0	64.40~71.20	1	93.6	5.4	1
SA60A	SA60CA	60.0	66.70~73.70	1	96.8	5.3	1

Part Number		Reverse Stand-Off Voltage	Breakdown Voltage @ I_T	Test Current	Maximum Clamping Voltage @ I_{PP}	Peak Pulse Current	Reverse Leakage @ V_{RWM}
Unidirectional	Bidirectional	$V_{RWM}(V)$	$V_{BR}(V)$	$I_T(mA)$	$V_C(V)$	$I_{PP}(A)$	$I_R(\mu A)$
SA64A	SA64CA	64.0	71.10~78.60	1	103.0	5.0	1
SA70A	SA70CA	70.0	77.80~86.00	1	113.0	4.5	1
SA75A	SA75CA	75.0	83.30~92.10	1	121.0	4.2	1
SA78A	SA78CA	78.0	86.70~95.80	1	126.0	4.0	1
SA85A	SA85CA	85.0	94.40~104.00	1	137.0	3.7	1
SA90A	SA90CA	90.0	100.00~111.00	1	146.0	3.5	1
SA100A	SA100CA	100.0	111.00~123.00	1	162.0	3.1	1
SA110A	SA110CA	110.0	122.00~135.00	1	177.0	2.9	1
SA120A	SA120CA	120.0	133.00~147.00	1	193.0	2.6	1
SA130A	SA130CA	130.0	144.00~159.00	1	209.0	2.4	1
SA150A	SA150CA	150.0	167.00~185.00	1	243.0	2.1	1
SA160A	SA160CA	160.0	178.00~197.00	1	259.0	2.0	1
SA170A	SA170CA	170.0	189.00~209.00	1	275.0	1.9	1
SA180A	SA180CA	180.0	200.00~221.00	1	289.0	1.7	1

Notes: 1.For bidirectional type having VRWM of 10V and less, the IR limit is double.

2.For parts without A , the V_{BR} is $\pm 10\%$ and V_C is 5% higher than with A parts, the parts without A are currently available, but not recommended for new designs. The parts with A are preferred.

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

Figure 1. Peak Pulse Power Derating Curve

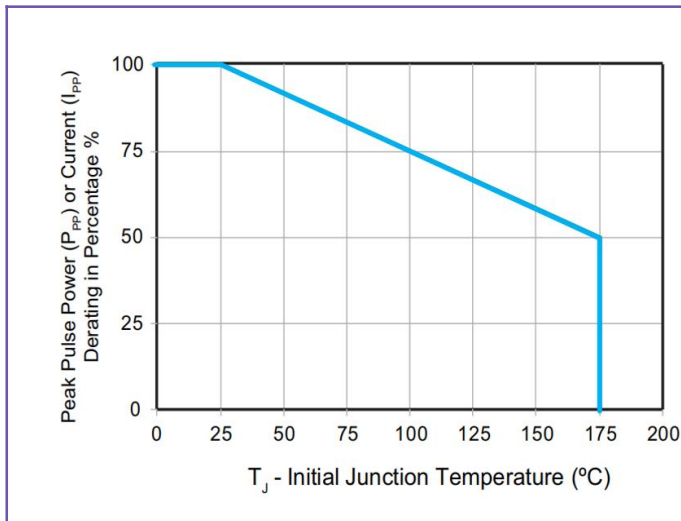


Figure 2. Pulse Waveform

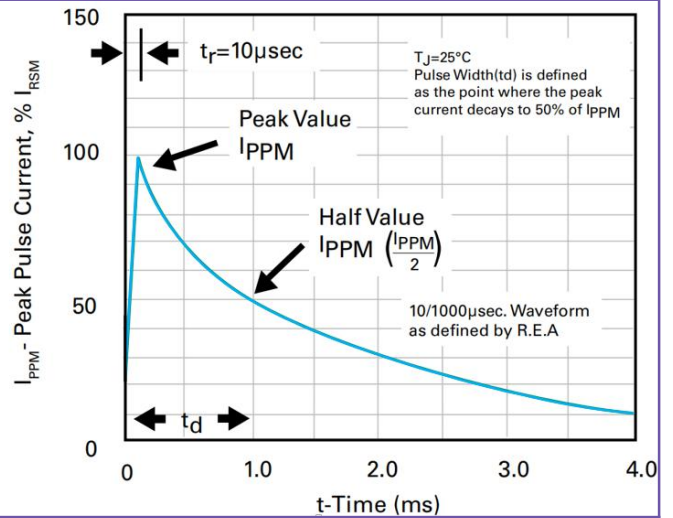


Figure 3. Typical Junction Capacitance

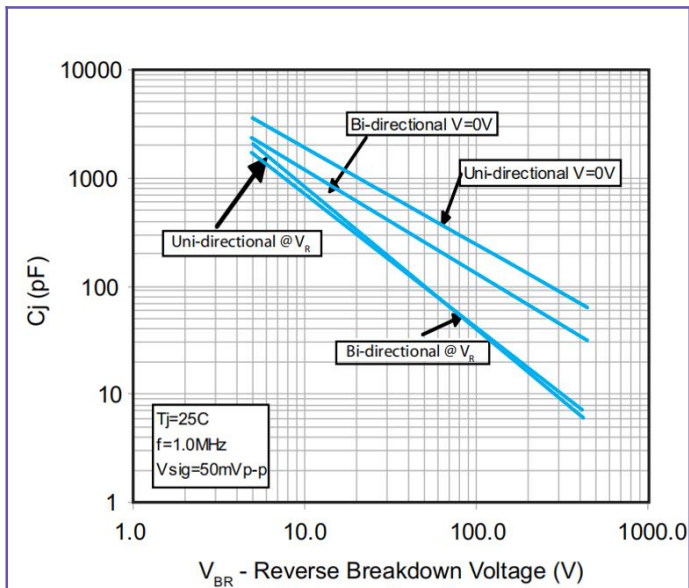


Figure 4. Typical Transient Thermal Impedance

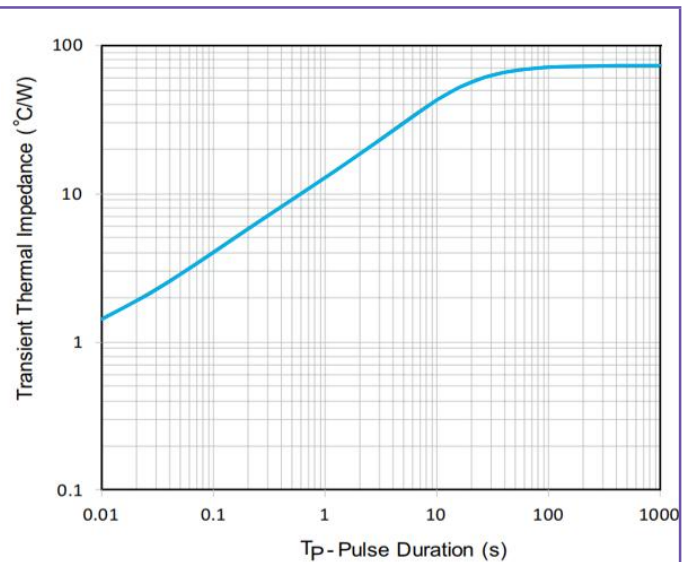


Figure 5. Maximum Non-Repetitive Forward Surge Current Uni-Directional Only

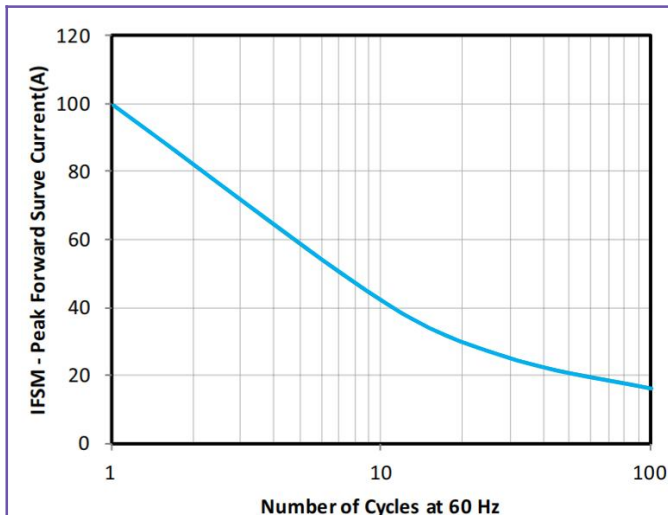
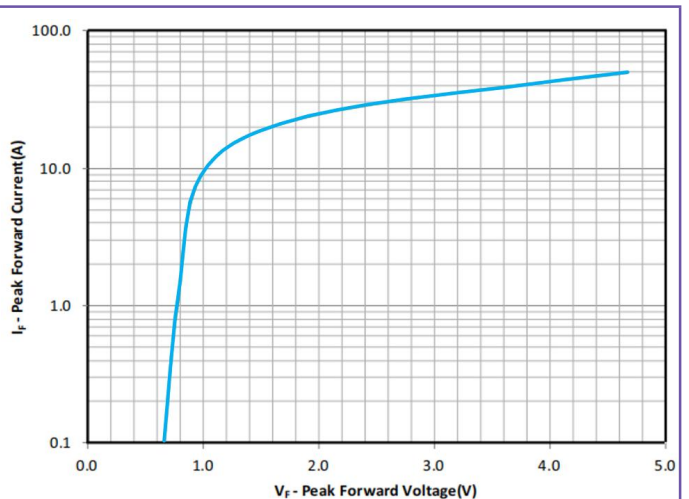
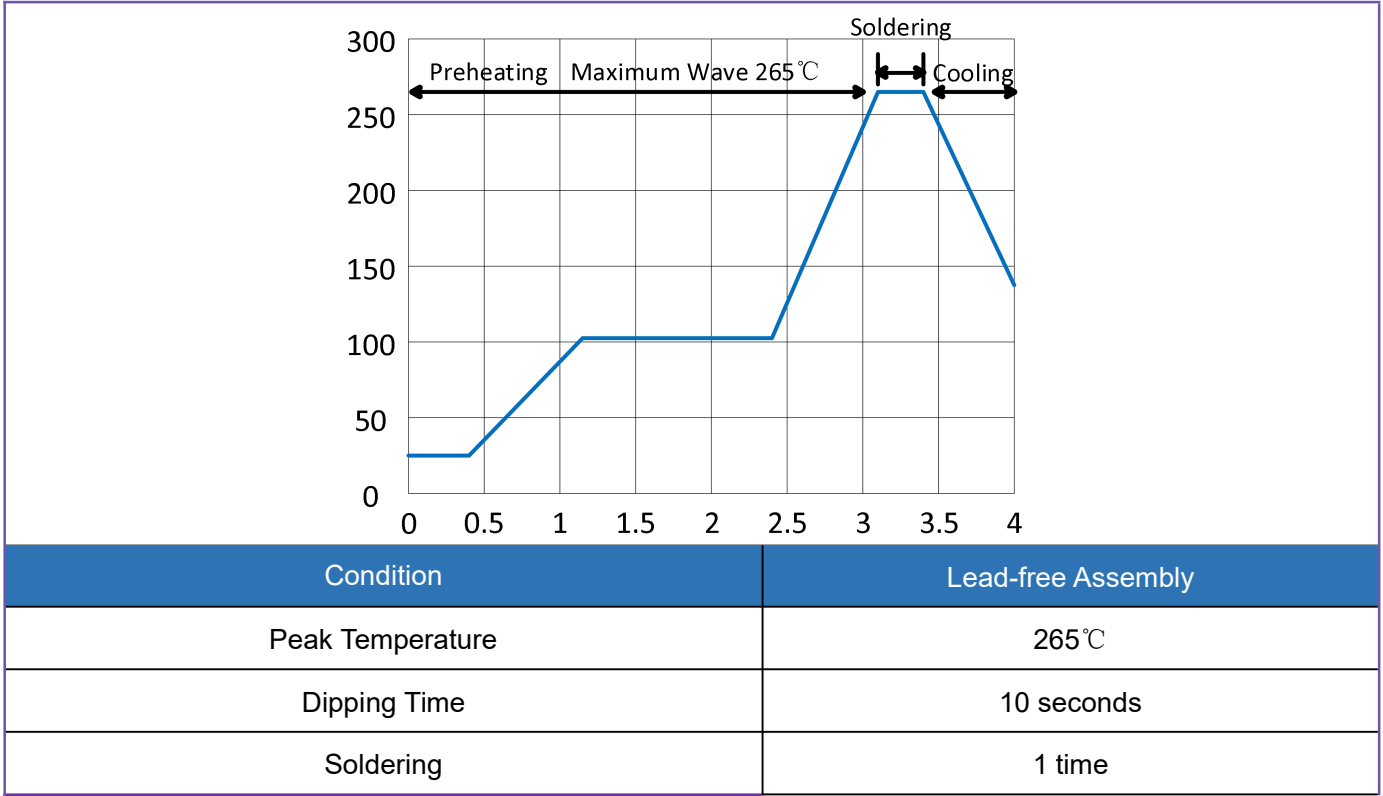


Figure 6. Peak Forward Voltage Drop vs Peak Forward Current (Typical Values)



Wave Soldering Parameters



Reliability

Items	Standards
Terminal strength	MIL-STD-750 Method 2036
Mechanical shock	JESD22-B104
Vibration	JESD22-B103
High Temp. Storage	JESD22-A103
High Temp Reverse Bias	JESD22-A108
Temperature Cycling	JESD22-A104
High Temp High Humidity Reverse Bias	JESD22-A101
Resistance to solder heat	JESD22-B106