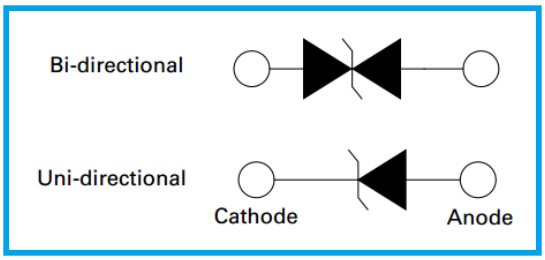
TVS Diode – SA Series

Features

- Plastic package, excellent insulation strength.
- Glass passivated chip junction in DO-15 package.
- Excellent voltage clamping capability.
- Low Zener impedance.
- 500W peak pulse power capability on 10/1000μs waveform.
- Typical leakage current less than 1μA above 13V.
- Very fast response time, typically less than 1.0ps from 0 volt to V_{BR} minimum.
- High temperature soldering guaranteed: 265°C/10 sec.
- MSL: JEDEC-J-STD-020, Level 1



Applications

- I/O interface, V_{CC} bus
- Telecom
- Industrial and consumer electronic applications.
- Relay and electromagnetic valve surge absorption.

Agency Approval

- UL file no.: E474915

Mechanical and Physical Data

- Case: JEDEC DO-15 molded plastic.
- Axial leaded, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denoted cathode except bidirectional.

Maximum Ratings and Thermal Characteristics

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation on 10/1000μs waveform (Note 1, Fig.1).	P_{PPM}	Min 500	Watt
Peak Pulse Current of 10/1000μs waveform (Note 1, Fig.3).	I_{PPM}	See Table	Amp
Steady State Power Dissipation at TL = 75°C, Lead lengths 0.375", (9.5mm) (Fig.5).	$P_{M(AV)}$	3.0	Watt
Peak Forward Surge Current, 8.3 ms Single Half Sine Wave Superimposed on Rated Load (Note 2, Fig.6).	I_{FSM}	100	Amp
Operating Junction and Storage Temperature Range.	T_J, T_{STG}	-55~175	°C

Note:

1. Non-repetitive current pulse, per Fig.3 and derated above T_A = 25°C per Fig.2.
2. 8.3ms single half sine wave, or equivalent square wave, Duty cycle = 4 pulses per minutes maximum.

Part Number Code

SA □□□ C A - □

- Packaging Code (T: Tape & Reel; B: Bulk)
- V_{BR} Voltage tolerance (A: 5%; Blank: 10%)
- C: Bi-directional; Blank: Uni-directional
- Reverse Stand-Off Voltage
- SA Series (500W)

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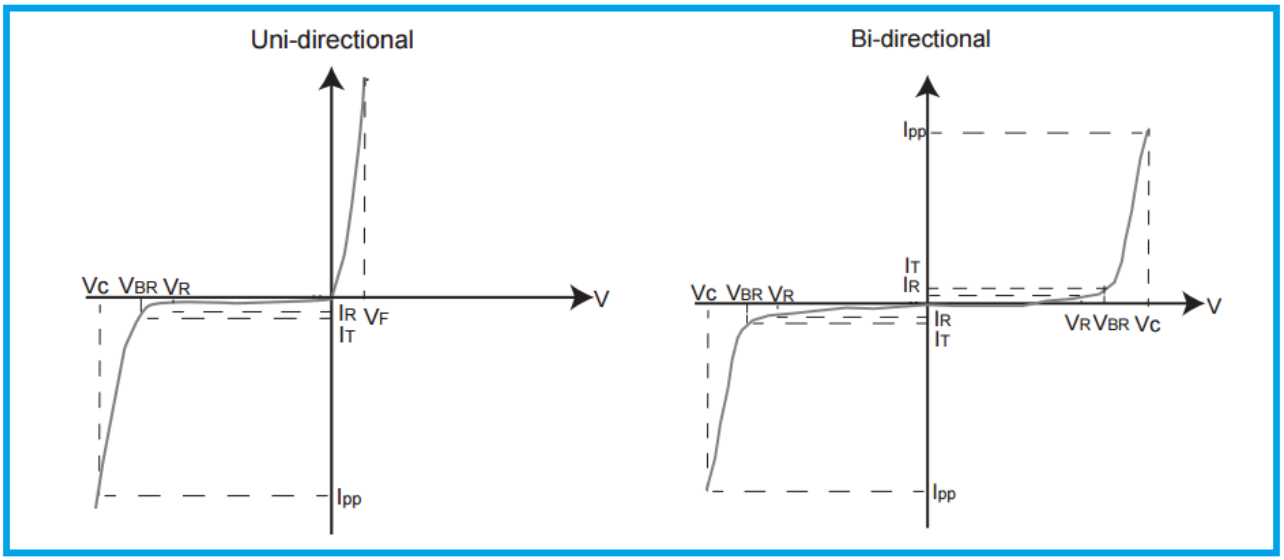
I-V Curve Characteristics



P_{PPM} Peak Pulse Power Dissipation – Maximum power dissipation

V_R Stand-off Voltage – Maximum voltage that can be applied to the TVS without operation

V_{BR} Breakdown Voltage – Maximum voltage that flows through the TVS at a specified test current (I_T)

V_C Clamping Voltage – Peak voltage measured across the TVS at a specified I_{PPM} (Peak Impulse Current)

I_R Reverse Leakage Current – Current measured at V_R

V_F Forward Voltage Drop for Uni-directional

Electrical Characteristics

Part Number		Reverse Stand Off Voltage V_R	Breakdown Voltage V_{BR} (V) @ I_T		Test Current I_T	Maximum Clamping Voltage	Maximum Peak Pulse Current	Maximum Reverse Leakage
Uni	Bi	(V)	Min.	Max.	(mA)	V_C (V) @ I_{PP}	I_{PP} (A)	I_R (μA) @ V_R
SA5.0A	SA5.0CA	5.0	6.40	7.00	10	9.2	54.3	800
SA6.0A	SA6.0CA	6.0	6.67	7.37	10	10.3	48.5	800
SA6.5A	SA6.5CA	6.5	7.22	7.98	10	11.2	44.7	500
SA7.0A	SA7.0CA	7.0	7.78	8.60	10	12.0	41.7	200
SA7.5A	SA7.5CA	7.5	8.33	9.21	1	12.9	38.8	100
SA8.0A	SA8.0CA	8.0	8.89	9.83	1	13.6	36.7	50
SA8.5A	SA8.5CA	8.5	9.44	10.40	1	14.4	34.7	20
SA9.0A	SA9.0CA	9.0	10.00	11.10	1	15.4	32.5	10
SA10A	SA10CA	10	11.10	12.30	1	17.0	29.4	5
SA11A	SA11CA	11	12.20	13.50	1	18.2	27.4	1
SA12A	SA12CA	12	13.30	14.70	1	19.9	25.1	1
SA13A	SA13CA	13	14.40	15.90	1	21.5	23.2	1
SA14A	SA14CA	14	15.60	17.20	1	23.2	21.5	1
SA15A	SA15CA	15	16.70	18.50	1	24.4	20.6	1
SA16A	SA16CA	16	17.80	19.70	1	26.0	19.2	1
SA17A	SA17CA	17	18.90	20.90	1	27.6	16.1	1
SA18A	SA18CA	18	20.00	22.10	1	29.2	17.2	1
SA20A	SA20CA	20	22.20	24.50	1	32.4	15.4	1

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Part Number		Reverse Stand Off Voltage V_R (V)	Breakdown Voltage V_{BR} (V) @ I_T		Test Current I_T (mA)	Maximum Clamping Voltage V_C (V) @ I_{PP}	Maximum Peak Pulse Current I_{PP} (A)	Maximum Reverse Leakage I_R (μA) @ V_R
Uni	Bi		Min.	Max.				
SA22A	SA22CA	22	24.4	26.9	1	35.5	14.1	1
SA24A	SA24CA	24	26.7	29.5	1	38.9	12.8	1
SA26A	SA26CA	26	28.9	31.9	1	42.1	11.9	1
SA28A	SA28CA	28	31.1	34.4	1	45.4	11.0	1
SA30A	SA30CA	30	33.3	36.8	1	48.4	10.3	1
SA33A	SA33CA	33	36.7	40.6	1	53.3	9.4	1
SA36A	SA36CA	36	40.0	44.2	1	58.1	8.6	1
SA40A	SA40CA	40	44.4	49.1	1	64.5	7.8	1
SA43A	SA43CA	43	47.8	52.8	1	69.4	7.2	1
SA45A	SA45CA	45	50.0	55.3	1	72.7	6.9	1
SA48A	SA48CA	48	53.3	58.9	1	77.4	6.5	1
SA51A	SA51CA	51	56.7	62.7	1	82.4	6.1	1
SA54A	SA54CA	54	60.0	66.3	1	87.1	5.7	1
SA58A	SA58CA	58	64.4	71.2	1	93.6	5.3	1
SA60A	SA60CA	60	66.7	73.7	1	96.8	5.2	1
SA64A	SA64CA	64	71.1	78.6	1	103.0	4.9	1
SA70A	SA70CA	70	77.8	86.0	1	113.0	4.4	1
SA75A	SA75CA	75	83.3	92.1	1	121.0	4.1	1
SA78A	SA78CA	78	86.7	95.8	1	126.0	4.0	1
SA85A	SA85CA	85	94.4	104.0	1	137.0	3.6	1
SA90A	SA90CA	90	100.0	111.0	1	146.0	3.4	1
SA100A	SA100CA	100	111.0	123.0	1	162.0	3.1	1
SA110A	SA110CA	110	122.0	135.0	1	177.0.	2.8	1
SA120A	SA120CA	120	133.0	147.0	1	193.0	2.0	1
SA130A	SA130CA	130	144.0	159.0	1	209.0	2.4	1
SA150A	SA150CA	150	167.0	185.0	1	243.0	2.1	1
SA160A	SA160CA	160	178.0	197.0	1	259.0	1.9	1
SA170A	SA170CA	170	189.0	209.0	1	275.0	1.8	1
SA180A	SA180CA	180	201.0	222.0	1	292.0	1.7	1
SA190A	SA190CA	190	209.0	243.0	1	308.0	1.6	1
SA200A	SA200CA	200	224.0	247.0	1	324.0	1.5	1
SA220A	SA220CA	220	246.0	272.0	1	356.0	1.4	1

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Ratings and Characteristic Curves

Fig 1 - Peak Pulse Power Rating Curve

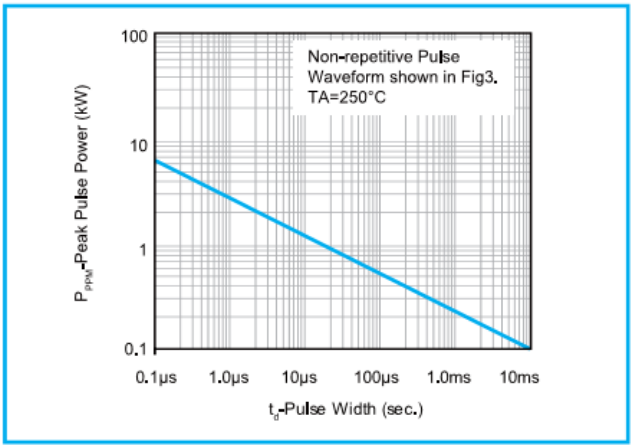


Fig 2 - Pulse Derating Curve

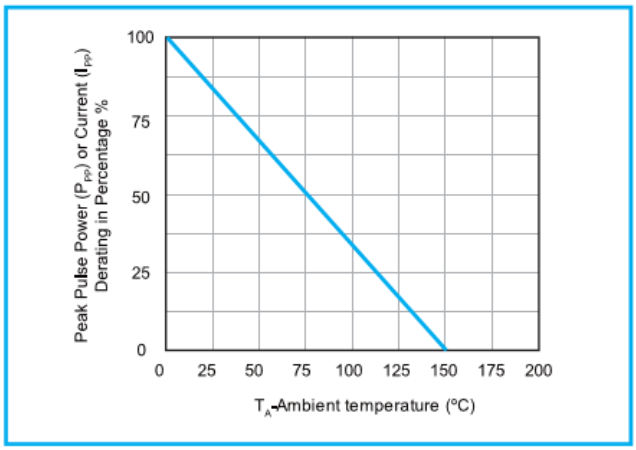


Fig 3 - Pulse Waveform

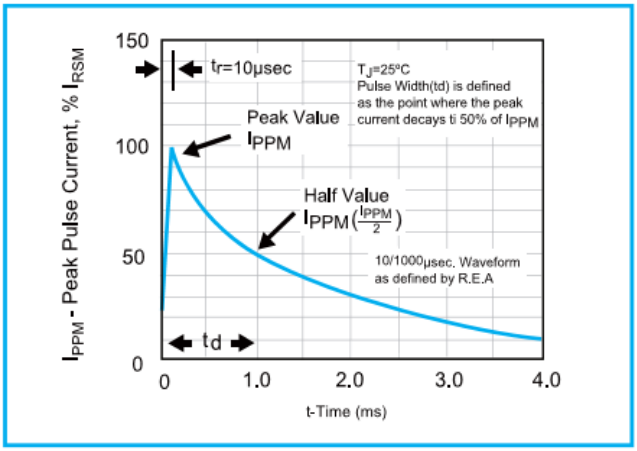


Fig 4 – Typical Junction Capacitance Uni-directional

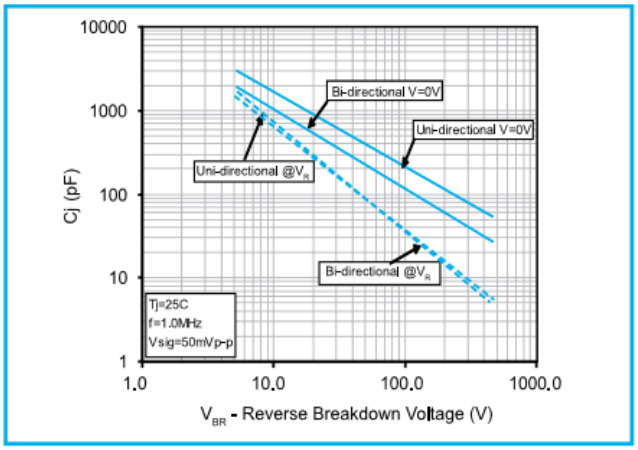


Fig 5 – Steady State Power Dissipation Derating Curve

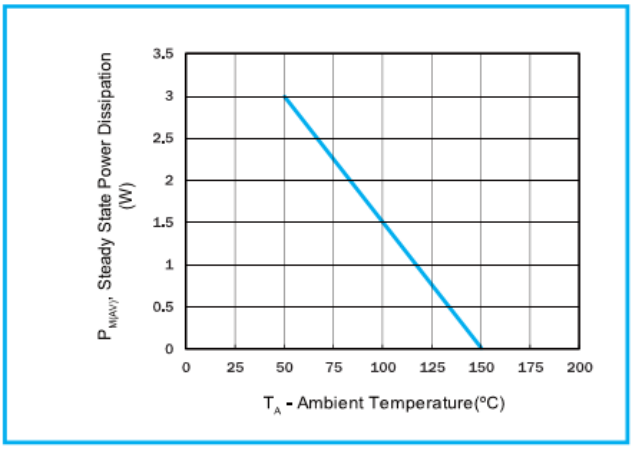
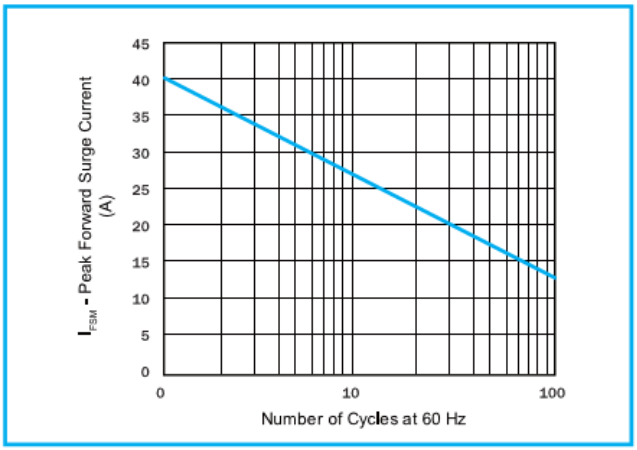


Fig 6 – Maximum Non-Repetitive Forward Surge Current (Uni-directional Only)



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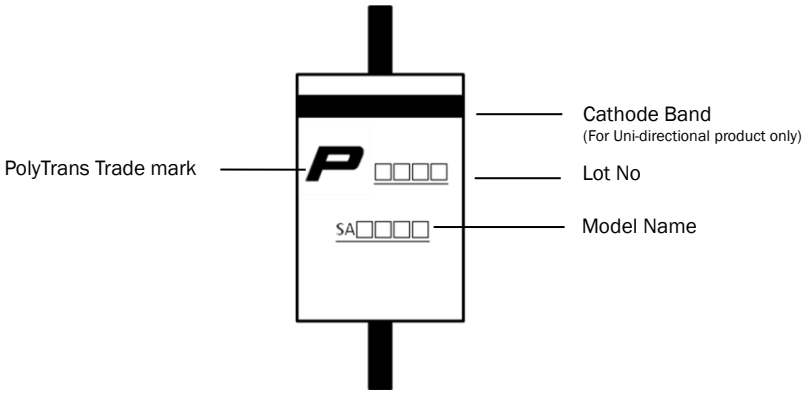
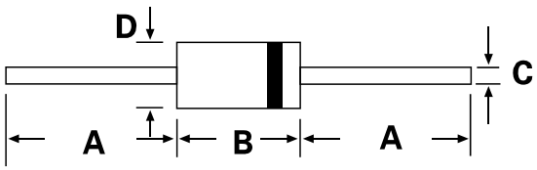
Marking Definitions



Physical Dimensions



DO-204AC (DO-15)

Dimension	Millimeters		Inches	
	Min	Max	Min	Max
A	25.4	-	1.000	-
B	4.10	5.20	0.160	0.205
C	0.71	0.86	0.028	0.034
D	2.60	2.70	0.080	0.140

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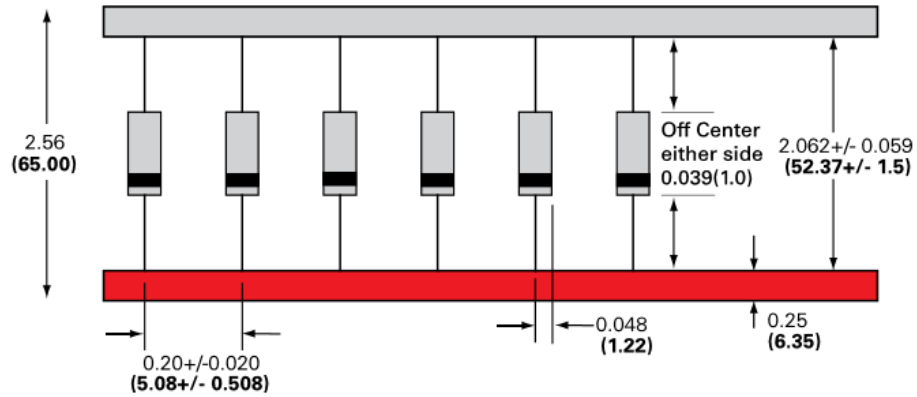
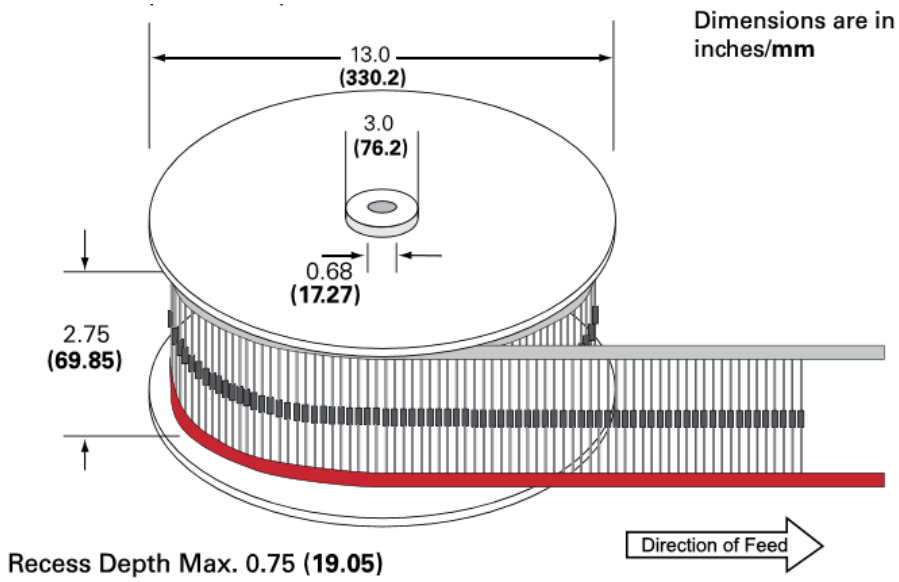
Packaging Information

Part Number	Packaging Code	Component Package	Quantity	Packaging Option	Packaging Specification
SA Series	T	DO-15	4000	Tape & Reel	EIA STD RS-296
SA Series	B	DO-15	500	Bulk	-

Tape and Reel Specifications





Recess Depth Max. 0.75 (**19.05**)