

DATA SHEET

TRANSIENT VOLTAGE SUPPRESSORS

AC/DC POWER SUPPLY

SA series

RoHS compliant & Halogen free

Product specification— June 30, 2023 V.3



Transient Voltage Suppressors (TVS) Data Sheet

Features

- Glass passivated junction
- Low inductance
- Excellent clamping capability
- 500W peak pulse power capability at 10/1000 μ s waveform, repetition rate (duty cycle): 0.01%
- Fast response time
- Typical I_R less than 1 μ A above 10V
- High Temperature soldering guaranteed: 265 $^{\circ}$ C/10 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
- Safety certification: UL
- IEC61000-4-2 ESD 30KV Air, 30KV contact compliance



Mechanical Data

- Case: JEDEC DO-15 Moulded plastic
- Terminal: Axial leads, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denotes cathode except bi-directional models
- Mounting Position: Any
- Weight: 0.42g

Applications

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

Maximum Ratings and Characteristics

Ratings at 25 $^{\circ}$ C ambient temperature unless otherwise specified.

Rating	Symbol	Value	Units
Peak pulse power dissipation at 10/1000 μ s waveform (Note1, Fig.1)	P_{PPM}	Minimum 500	Watts
Peak pulse current of at 10/1000 μ s waveform (Note 1, Fig.3)	I_{PPM}	See Table	Amps
Steady state power dissipation at $T_L=75^{\circ}$ C (Fig.5)	$P_{M(AV)}$	3.0	Watts
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load, (JEDEC Method) (Note2, Fig.6)	I_{FSM}	70	Amps
Operating junction and Storage Temperature Range.	T_J, T_{STG}	-55 to +150	$^{\circ}$ C
Typical thermal resistance junction to lead	$R_{\theta JL}$	20	$^{\circ}$ C/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	75	$^{\circ}$ C/W

Notes: 1. Non-repetitive current pulse, per Fig.3 and derated above $T_A=25^{\circ}$ C per Fig.2.

2. 8.3ms single half sine-wave, or equivalent square wave, duty cycle=4 pulses per minutes maximum.

Dimensions (DO-204AC/DO-15)

	Symbol	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
s	0.71	0.86	0.028	0.034	

Electrical Characteristics (T_A=25°C)

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 (μA)
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	10.00~11.10	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
SA26A	SA26CA	26.0	28.90~31.90	1	42.1	12.1	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

Transient Voltage Suppressors

SA

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	$V_{RWM}(V)$	$V_{BR}(V)$	$I_T(mA)$	$V_C(V)$	$I_{PP}(A)$	$I_R(\mu A)$
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	SA43CA	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
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	201.00~222.00	1	292.0	1.7	1
SA190A	SA190CA	190.0	211.00~233.00	1	308.0	1.6	1
SA200A	SA200CA	200.0	224.00~247.00	1	324.0	1.5	1
SA210A	SA210CA	210.0	237.00~263.00	1	340.0	1.5	1
SA220A	SA220CA	220.0	246.00~272.00	1	356.0	1.4	1

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

Figure 1. Peak Pulse Power Rating Curve

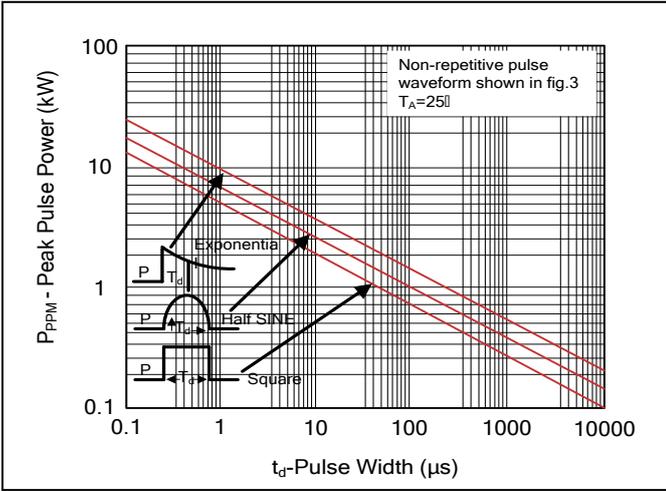


Figure 2. Pulse Derating Curve

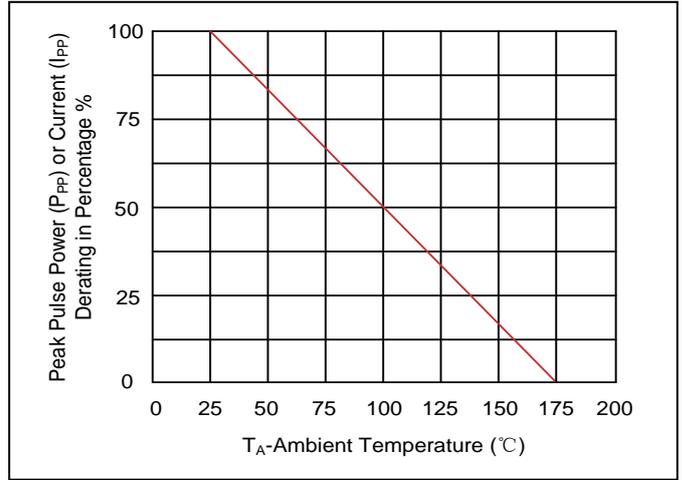


Figure 3. Pulse Waveform

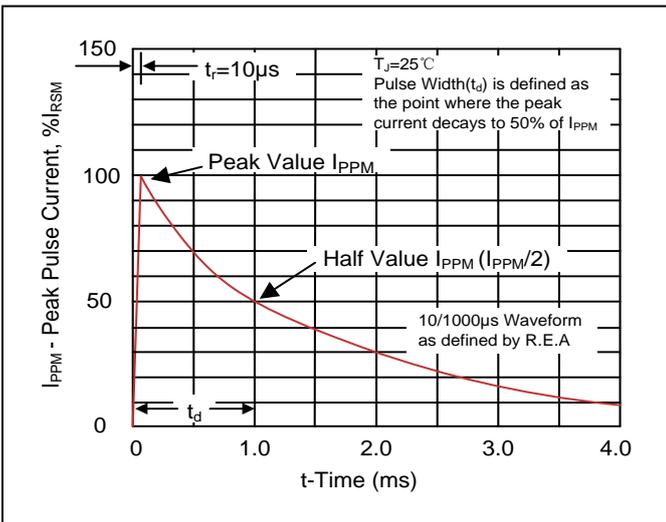


Figure 4. Typical Junction Capacitance

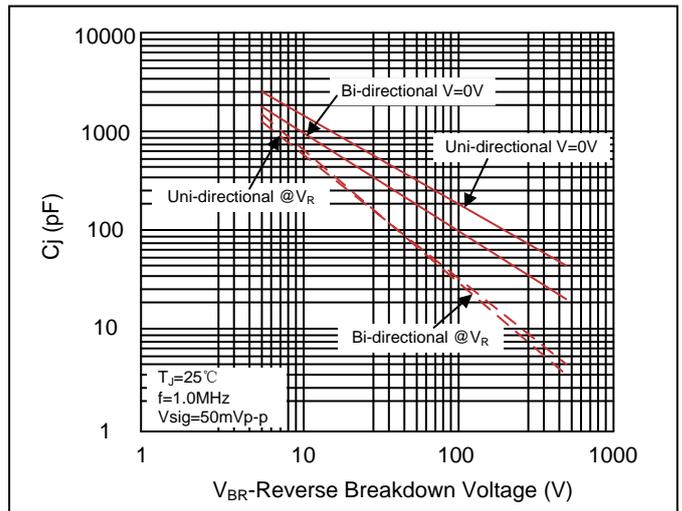


Figure 5. Steady State Power Dissipation Derating Curve

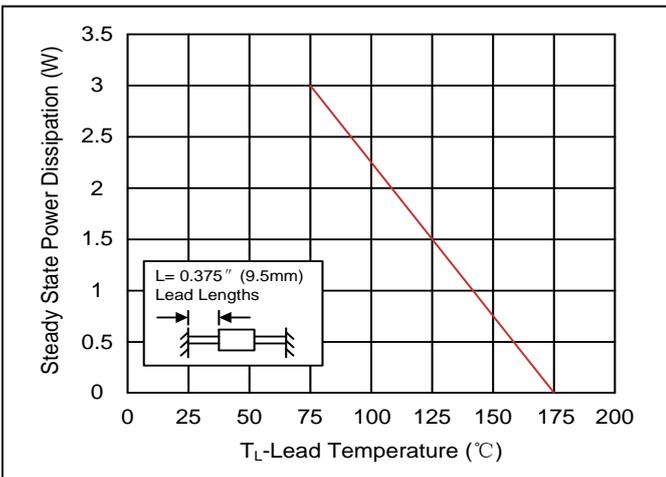
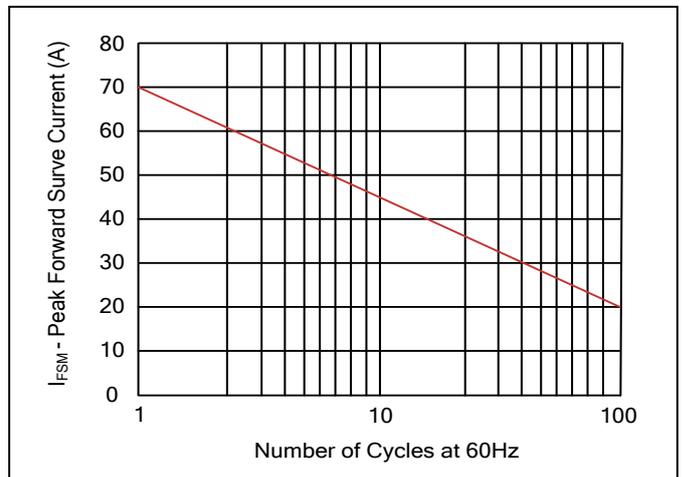
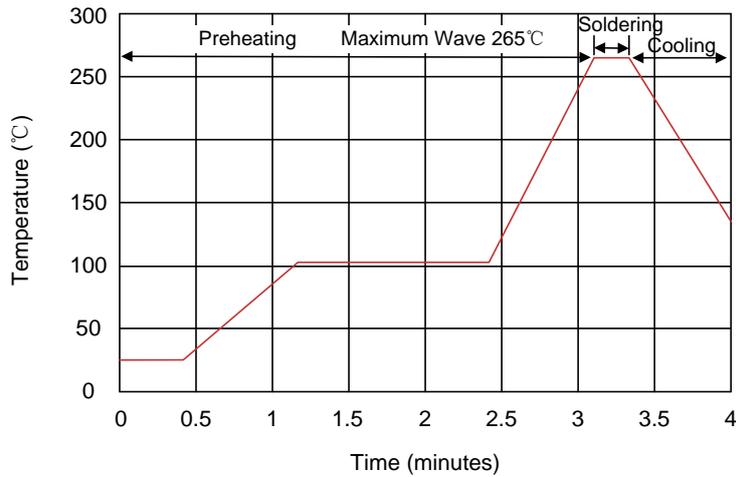


Figure 6. Maximum Non-Repetitive Forward Surge Current Uni-Directional Only



Recommended Soldering Conditions

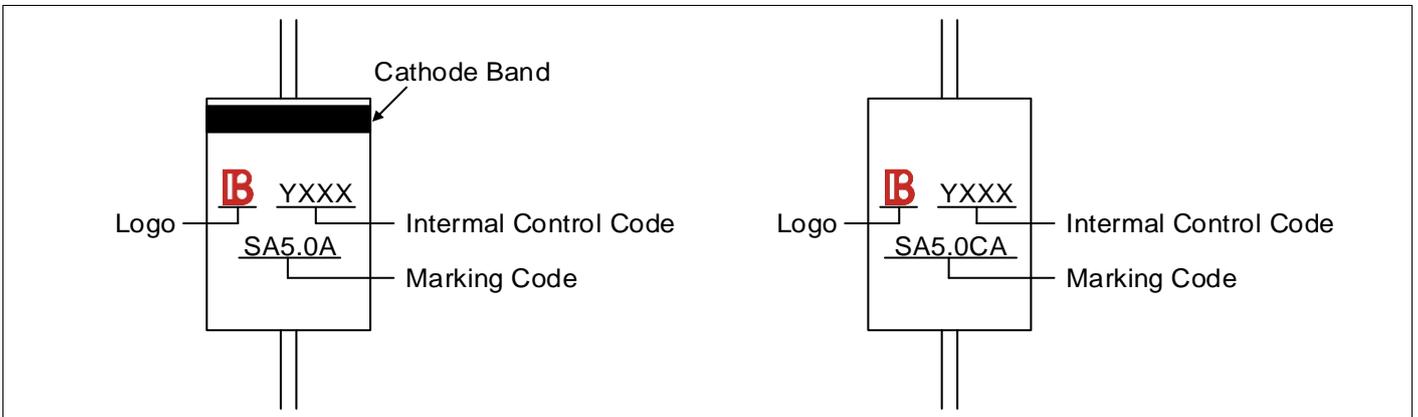
Wave Soldering



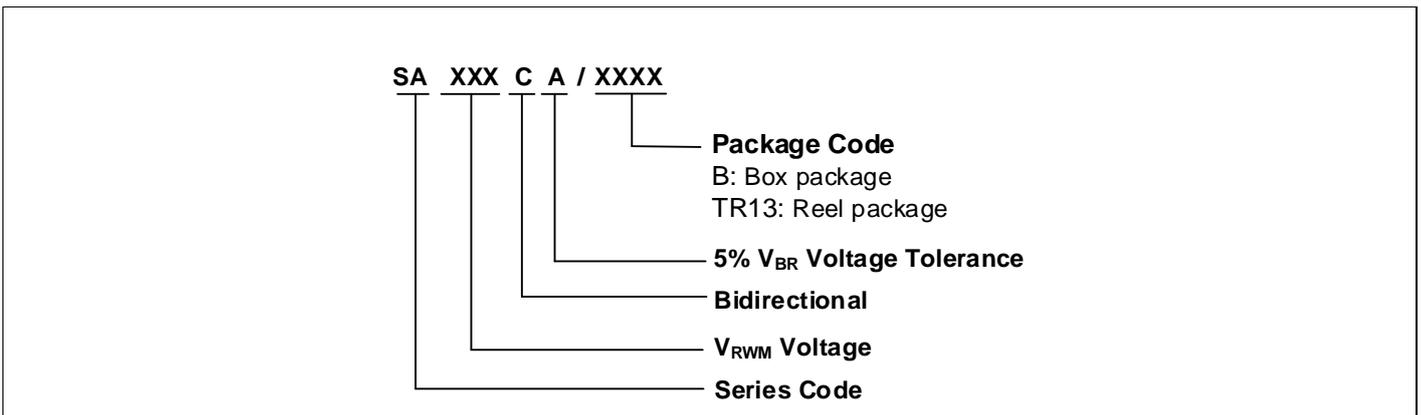
Recommended Conditions

Item	Conditions
Peak Temperature	265°C
Dipping Time	10 seconds
Soldering	1 time

Marking Code



Part Number Code

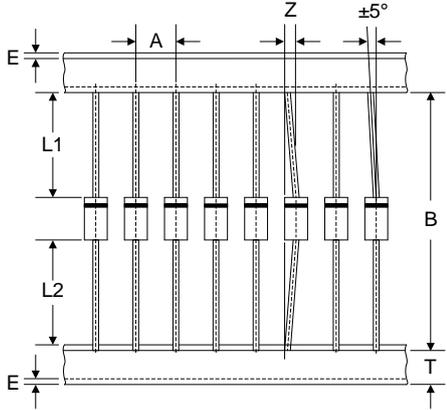
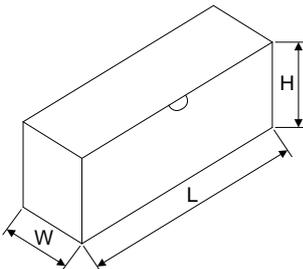
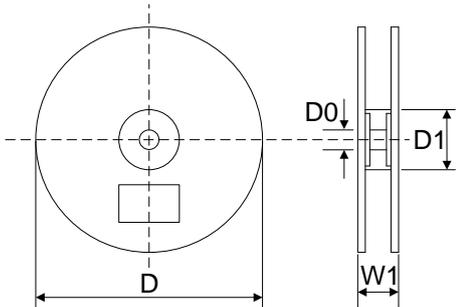


Ordering Code for Different Package

Box package: Add suffix "/B" at the end of the part number, such as SAXXXCA/B

Reel package: Add suffix "/TR13" at the end of the part number, such as SAXXXCA/TR13

Packaging

Tape	Symbol Dimension (mm)	
	A	5.0±0.5
	B	53.0±1.0
	Z	1.2Max.
	T	6.0±0.4
	E	0.8Max.
	L1-L2	1.0Max.
		L
W		75.0±5.0
H		114.0±5.0
Quantity: 2000PCS		
	D	330.0±3.0
	D0	16.4±2.0
	D1	86.0±2.0
	W1	76.0±3.0
	Quantity: 4000PCS	

LEGAL DISCLAIMER

YAGEO, its distributors and agents (collectively, "YAGEO"), hereby disclaims any and all liabilities for any errors, inaccuracies or incompleteness contained in any product related information, including but not limited to product specifications, datasheets, pictures and/or graphics. YAGEO may make changes, modifications and/or improvements to product related information at any time and without notice.

YAGEO makes no representation, warranty, and/or guarantee about the fitness of its products for any particular purpose or the continuing production of any of its products. To the maximum extent permitted by law, YAGEO disclaims (i) any and all liability arising out of the application or use of any YAGEO product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for a particular purpose, non-infringement and merchantability.

YAGEO products are designed for general purpose applications under normal operation and usage conditions. Please contact YAGEO for the applications listed below which require especially high reliability for the prevention of defects which might directly cause damage to the third party's life, body or property: Aerospace equipment (artificial satellite, rocket, etc.), Atomic energy-related equipment, Aviation equipment, Disaster prevention equipment, crime prevention equipment, Electric heating apparatus, burning equipment, Highly public information network equipment, data-processing equipment, Medical devices, Military equipment, Power generation control equipment, Safety equipment, Traffic signal equipment, Transportation equipment and Undersea equipment, or for any other application or use in which the failure of YAGEO products could result in personal injury or death, or serious property damage. Particularly **YAGEO Corporation and its affiliates do not recommend the use of commercial, automotive, and/or COTS grade products for high reliability applications or manned space flight.**

Information provided here is intended to indicate product specifications only. YAGEO reserves all the rights for revising this content without further notification, as long as products are unchanged. Any product change will be announced by PCN.