

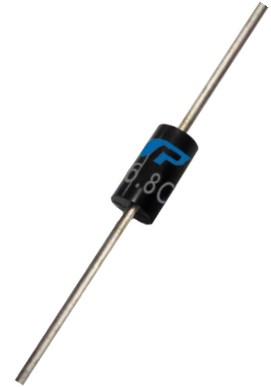
# Glass Passivated Junction Transient Voltage Suppressor

## Stand-Off Voltage - 5.0 to 180 Volts

## 500 Watt Peak Pulse Power

### Features

- Plastic package
- Glass passivated chip junction in DO-15 Package
- 600W surge capability at 10/1000  $\mu$ s wave form
- Excellent clamping capability
- Low zener impedance
- Fast response time: typically less than 1.0ps from 0 Volts to  $B_V$  min.
- Typical IR less than 1 $\mu$ A above 10V
- High temperature soldering guaranteed: 265°C/10 seconds/.375", (9.5mm) lead length, 5lbs., (2.3kg) tension
- Pb-free plated



### Mechanical Data

- **Case:** JEDEC DO-15 Molded plastic
- **Terminals:** Solderable per MIL-STD-750, Method 2026
- **Polarity:** Color band denotes cathode except Bipolar
- **Mounting Position:** Any
- **Weight:** 0.015 ounce, 0.4 grams

### Devices For Bipolar Application

- For Bidirectional use C or CA Suffix for types SA5.0 thru types SA180 (e.g. SA5.0C , SA180CA)
- Electrical characteristics apply in both directions

### Maximum Ratings And Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.

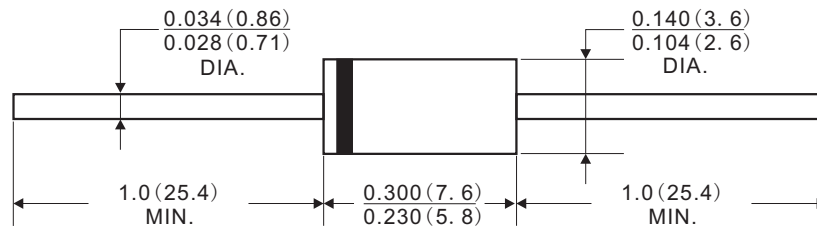
RATING	SYMBOL	VALUE	UNITS
Peak Pulse Power Dissipation at $T_A = 25^\circ\text{C}$ , $T_P = 1\text{ms}$ (Note 1)	$P_{PPM}$	Minimum 500	Watts
Steady State Power Dissipation at $T_L = 75^\circ\text{C}$ , Lead lengths. 375", (9.5mm) (Note 2)	$P_{M(AV)}$	5	Watts
Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load, (JEDEC Method) (Note3)	$I_{FSM}$	70	Amps
Operating junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to +175	°C

#### Notes :

1. Non-repetitive current pulse , per Fig. 3 and derated above  $T_A = 25^\circ\text{C}$  per Fig. 2 .
2. Mounted on Copper Pad area of 1.6×1.6" (40×40mm) per Fig. 5
3. 8.3ms single half sine-wave , or equivalent square wave, Duty cycle = 4 pulses per minutes maximum.

## Dimensions (DO-15)

DO-204AC(DO-15)



Dimensions in inches and (millimeters)

## Electrical Characteristics

TABLE 1

\*\*Stand for commonly used models

SA Part Number		Reverse Stand-Off Voltage	Breakdown Voltage @IT	Breakdown Voltage @IT	Test Current	Maximum Clamping Voltage @Ipp	Peak Pulse Current	Reverse Leakage @VRWM
UNI-Polar	BI-Polar	VRWM(V)	VBR(V)Min.	VBR(V)Max.	IT(mA)	Vc(V)	Ipp(A)	IR(μA)
SA5.0A	* SA5.0CA	5.0	6.40	7.00	10	9.2	55.4	120
* SA6.0A	SA6.0CA	6.0	6.67	7.37	10	10.3	49.5	120
SA6.5A	SA6.5CA	6.5	7.22	7.98	10	11.2	45.5	100
SA7.0A	SA7.0CA	7.0	7.78	8.60	10	12.0	42.5	100
SA7.5A	SA7.5CA	7.5	8.33	9.21	1	12.9	39.5	20
* SA8.0A	* SA8.0CA	8.0	8.89	9.83	1	13.6	37.5	15
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	1
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

Notes :

1. For bidirectional type having VRWM of 10 volts and less, the IR limit is double
2. For parts with A, the VBR is ± 5%

**Electrical Characteristics**
**TABLE 1**

\*\*\*Stand for commonly used models

SA Part Number		Reverse Stand-Off Voltage	Breakdown Voltage @IT	Breakdown Voltage @IT	Test Current	Maximum Clamping Voltage @Ipp	Peak Pulse Current	Reverse Leakage @VRWM
UNI-Polar	BI-Polar	VRWM(V)	VBR(V)Min.	VBR(V)Max.	IT(mA)	Vc(V)	Ipp(A)	IR(μA)
* 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	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	200.00	233.00	1	289.0	1.7	1

**Notes :**

- 1.For bidirectional type having VRWM of 10 volts and less, the IR limit is double
- 2.For parts with A , the VBR is ± 5%

Rating And Characteristic Curves

Fig.1 Peak Pulse Power Rating Curve

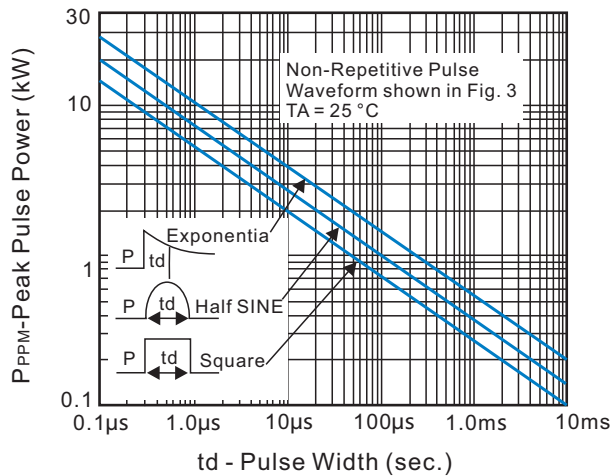


Fig.2 Pulse Derating Curve

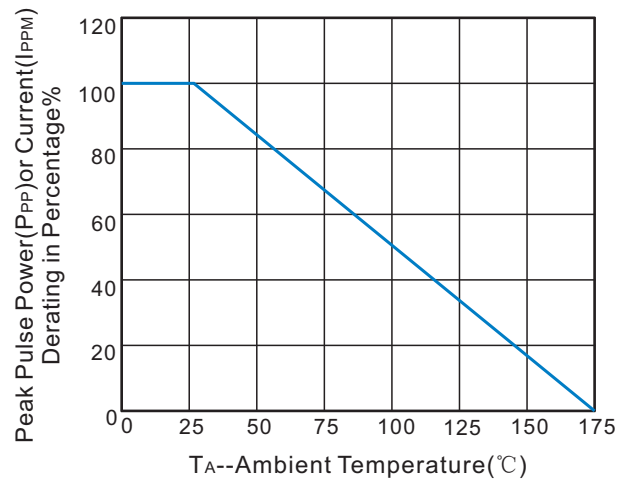


Fig.3 Pulse Waverform

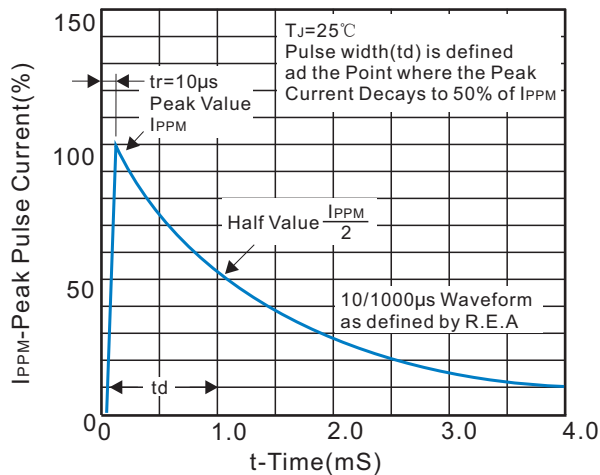


Fig.4 Maximum Non-Repetitive Peak Forward Surge Current Uni-Directional Only

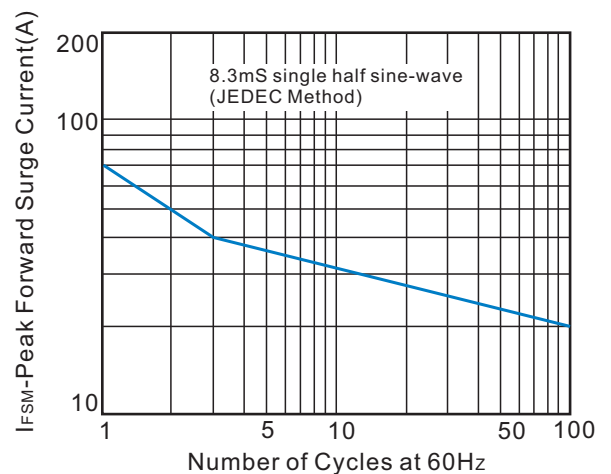


Fig.5 Steady State Power Dissipation Derating Curve

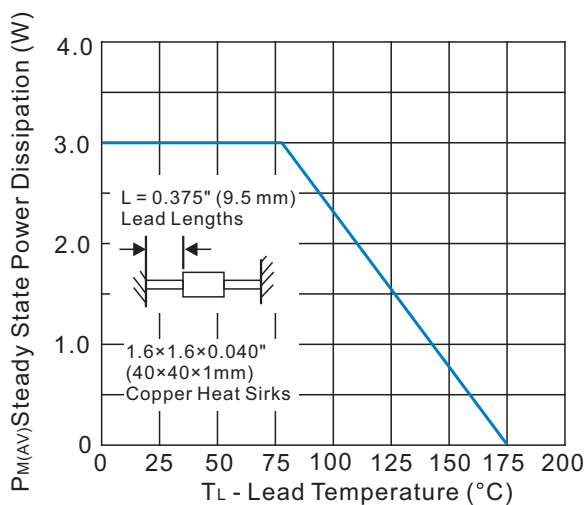
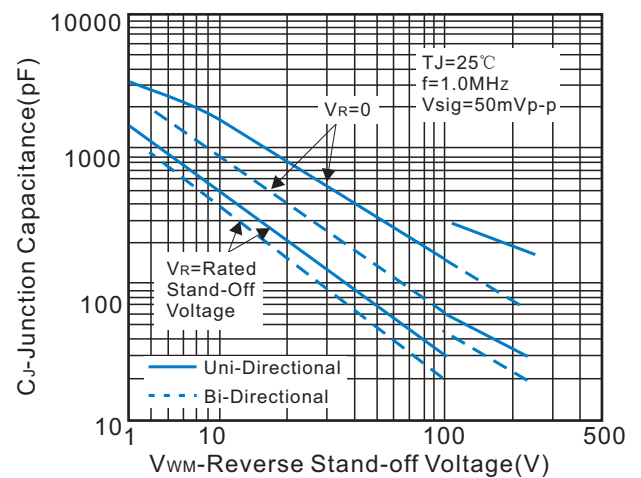


Fig.6 Typical Junction Capacitance

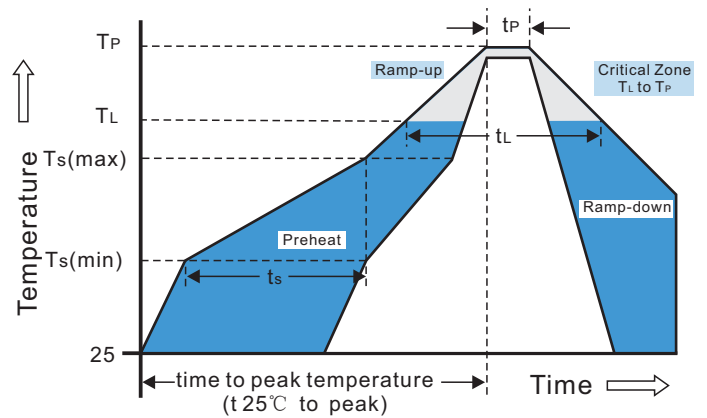


## Recommended Soldering Conditions

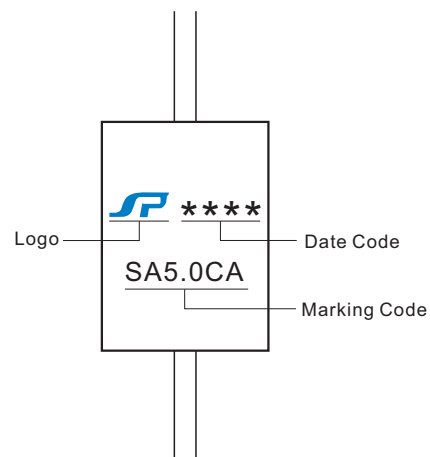
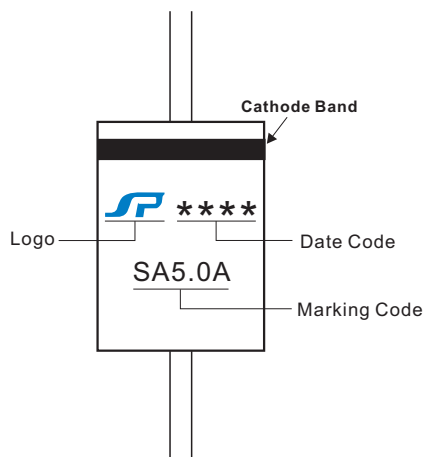
### Recommended Conditions

Reflow Condition		Pb-Free assembly (see Fig.1)
Pre Heat	-Temperature Min( $T_{s(min)}$ )	+150°C
	-Temperature Max( $T_{s(max)}$ )	+200°C
	-Time(Min to Max)( $t_s$ )	60-180secs
Average ramp up rate (Liquidus Temp( $T_L$ ) to peak)		3°C/sec.Max.
$T_{s(max)}$ to $T_L$ -Ramp-up Rate		3°C/sec.Max.
Reflow	-Temperature( $T_L$ )(Liquidus)	+217°C
	-Temperature( $t_L$ )	60-150secs
Peak Temp( $T_P$ )		+260(+0/-5)°C
Time within 5°C of actual Peak Temp( $t_P$ )		30 secs.Max.
Ramp-down Rate		6°C/sec.Max.
Time 25°C to Peak Temp( $T_P$ )		8 min.Max.
Do not exceed		+260°C

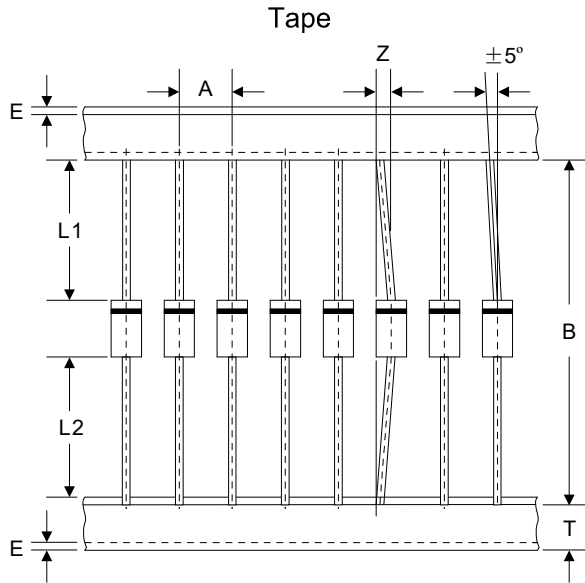
### Reflow Soldering



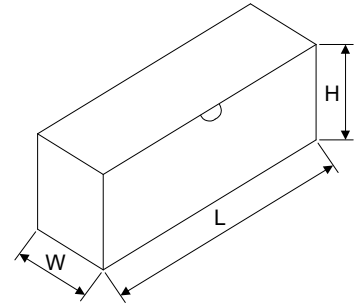
## Marking Code



Packaging



Box



Dimensions in millimeters

A	B	Z	T	E	L1-L2
$5.0 \pm 0.5$	$52.0 \pm 1.0$	1.2Max	$6.0 \pm 0.4$	3.0Max	1.0Max

L	W	H	Quantity
$250.0 \pm 5.0$	$78.0 \pm 5.0$	$114.0 \pm 5.0$	2000PCS