


### SAC Series



#### Agency Approvals

AGENCY	AGENCY FILE NUMBER
	E230531

#### Maximum Ratings and Thermal Characteristics (T<sub>A</sub> = 25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation by 10/1000µs Test Waveform (Fig.1) (Note 1)	P <sub>PPM</sub>	500	W
Steady State Power Dissipation on Infinite Heat Sink at T <sub>L</sub> = 75°C )	P <sub>D</sub>	3.0	W
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-65 to 175	°C
Typical Thermal Resistance Junction to Lead	R <sub>θJL</sub>	20	°C/W
Typical Thermal Resistance Junction to Ambient	R <sub>θJA</sub>	75	°C/W

**Note:**

1. Non-repetitive current pulse, per Fig. 3 and derated above T<sub>J</sub> (initial) = 25°C per Fig. 2.

#### Description

The SAC Series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.


#### Features

- 500W peak pulse power capability at 10/1000µs waveform, repetition rate (duty cycles):0.01%
- Glass passivated chip junction in DO-15 Package
- Fast response time: typically less than 1.0ps from 0 Volts to BV min
- Typical failure mode is short from over-specified voltage or current
- Whisker test is conducted based on JEDECJESD201A per its table 4a and 4c
- IEC-61000-4-2 ESD 30kV(Air), 30kV (Contact)
- ESD protection of data lines in accordance with IEC 61000-4-2
- Low incremental surge resistance
- EFT protection of data lines in accordance with IEC 61000-4-4
- High temperature to reflow soldering guaranteed: 260°C/40sec / 0.375"/(9.5mm) lead length, 5 lbs., (2.3kg) tension
- Plastic package is flammability rated V-0 per Underwriters Laboratories
- Matte tin lead-free plated
- Ideal for data line applications
- Halogen free and RoHS compliant
- Pb-free E3 means 2nd level interconnect is Pb-free and the terminal finish material is tin(Sn) (IPC/JEDEC J-STD-609A.01)

#### Applications

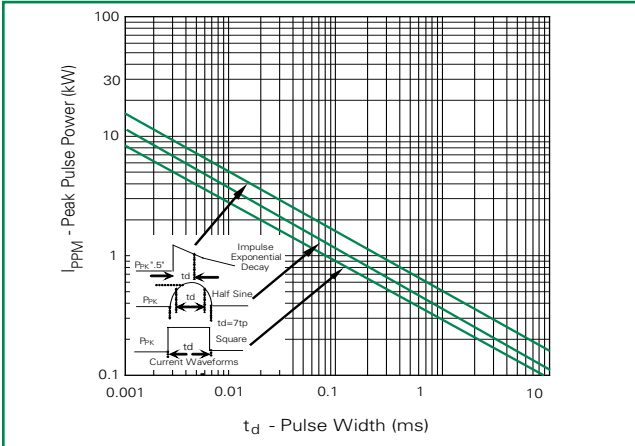
TVS devices are ideal for the protection of I/O interfaces, V<sub>CC</sub> bus and other vulnerable circuits used in telecom, computer, industrial and consumer electronic applications.

#### Electrical Characteristics (T<sub>A</sub> = 25°C unless otherwise noted)

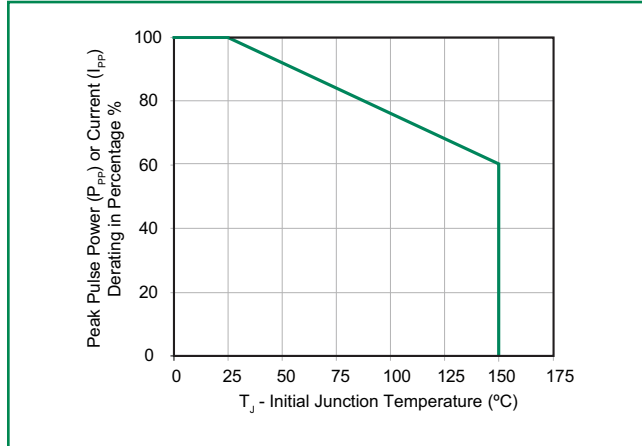
Part Number	Reverse Stand off Voltage V <sub>R</sub> (V)	Breakdown Voltage V <sub>BR</sub> (V)	Maximum Reverse Leakage I <sub>R</sub> @ V <sub>R</sub> (µA)	Maximum Clamping Voltage at I <sub>PP</sub> = 5.0A V <sub>C</sub> (V)	Maximum Peak Pulse Current (Fig.3) I <sub>PP</sub> (A)	Maximum Junction Capacitance @ 0 Volts (pF)	Working Inverse Blocking Voltage V <sub>WIB</sub> (V)	Inverse Blocking Leakage Current at I <sub>IB</sub> @ V <sub>WIB</sub> (mA)	Peak Inverse Blocking Voltage V <sub>PIB</sub> (V)	Agency Approval 
		MIN								
SAC5.0	5.0	7.60	300	10.0	44.0	50	75	1.0	100	X
SAC6.0	6.0	7.90	300	11.2	41.0	50	75	1.0	100	X
SAC7.0	7.0	8.33	300	12.6	38.0	50	75	1.0	100	X
SAC8.0	8.0	8.89	100	13.4	36.0	50	75	1.0	100	X
SAC8.5	8.5	9.44	50	14.0	34.0	50	75	1.0	100	X
SAC10	10.0	11.10	5	16.3	29.0	50	75	1.0	100	X
SAC12	12.0	13.30	1	19.0	25.0	50	75	1.0	100	X
SAC15	15.0	16.70	1	23.6	20.0	50	75	1.0	100	X
SAC18	18.0	20.00	1	28.8	15.0	50	75	1.0	100	X
SAC22	22.0	24.40	1	35.4	14.0	50	75	1.0	100	X
SAC26	26.0	28.90	1	42.3	11.1	50	75	1.0	100	X
SAC30	30.0	33.30	1	48.6	10.0	50	75	1.0	100	X
SAC36	36.0	40.00	1	60.0	8.6	50	75	1.0	100	X
SAC45	45.0	50.00	1	77.0	6.8	50	150	1.0	200	X
SAC50	50.0	55.50	1	88.0	5.8	50	150	1.0	200	X

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

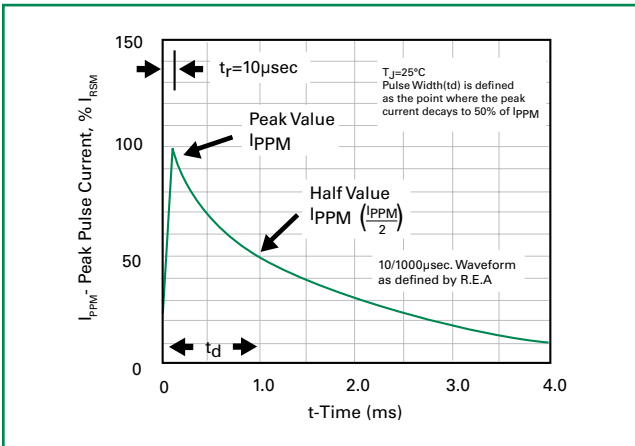
**Figure 1 - Peak Pulse Power Rating Curve**



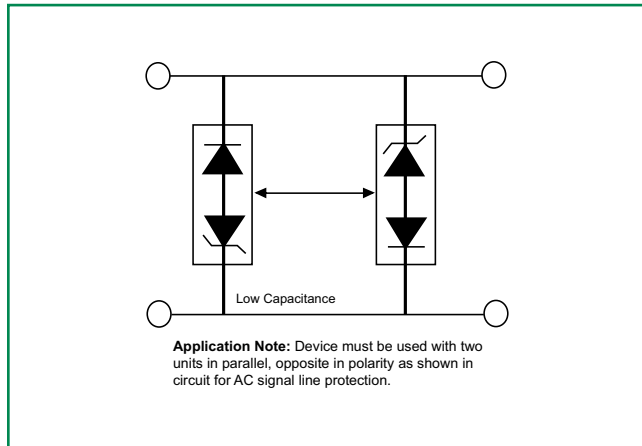
**Figure 2 - Peak Pulse Power Derating Curve**



**Figure 3 - Pulse Waveform**



**Figure 4 - AC Line Protection Application**



## Additional Information



Datasheet



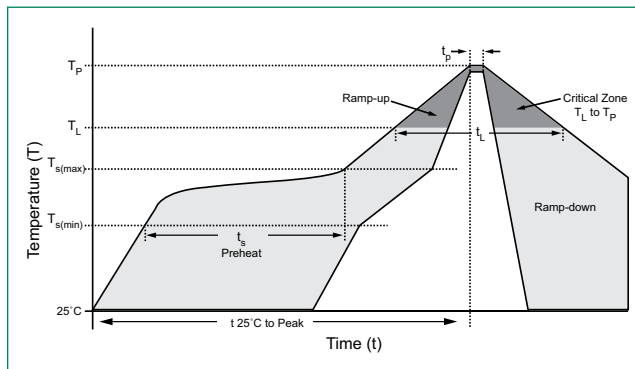
Resources



Samples

### Soldering Parameters

Reflow Condition		Lead-free assembly
Pre Heat	- Temperature Min ( $T_{s(min)}$ )	150°C
	- Temperature Max ( $T_{s(max)}$ )	200°C
	- Time (min to max) ( $t_s$ )	60 – 180 secs
Average ramp up rate (Liquidus Temp ( $T_A$ ) to peak)		3°C/second max
$T_{s(max)}$ to $T_A$ - Ramp-up Rate		3°C/second max
Reflow	- Temperature ( $T_A$ ) (Liquidus)	217°C
	- Time (min to max) ( $t_s$ )	60 – 150 seconds
Peak Temperature ( $T_p$ )		260 <sup>+0/-5</sup> °C
Time within 5°C of actual peak Temperature ( $t_p$ )		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature ( $T_p$ )		8 minutes Max.
Do not exceed		260°C



### Flow/Wave Soldering (Solder Dipping)

<b>Peak Temperature :</b>	265°C
<b>Dipping Time :</b>	10 seconds
<b>Soldering :</b>	1 time

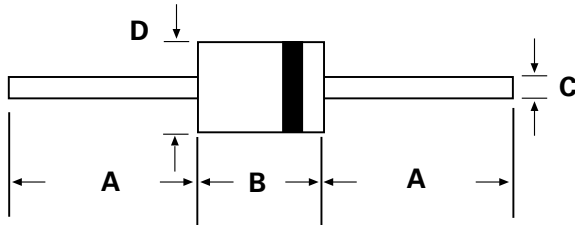
### Physical Specifications

<b>Weight</b>	0.015oz., 0.4g
<b>Case</b>	JEDEC DO-204AC (DO-15) molded plastic body over passivated junction.
<b>Polarity</b>	Color band denotes the cathode except Bipolar.
<b>Terminal</b>	Matte Tin axial leads, solderable per JESD22-B102.

### Environmental Specifications

<b>High Temp. Storage</b>	JESD22-A103
<b>HTRB</b>	JESD22-A108
<b>Temperature Cycling</b>	JESD22-A104
<b>H3TRB</b>	JESD22-A101
<b>RSH</b>	JESD22-B106

### Dimensions



DO-204AC (DO-15)

Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	1.000	-	25.40	-
B	0.230	0.300	5.80	7.60
C	0.028	0.034	0.71	0.86
D	0.104	0.140	2.60	3.60

### Part Numbering System

**SAC xxx X**

OPTION CODE:

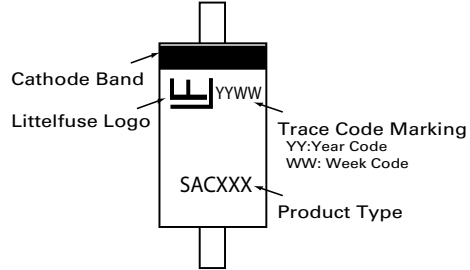
- BLANK Reel Tape
- B Bulk Packaging

V<sub>R</sub> VOLTAGE CODE

(Refer to the Electrical Characteristics table)

SERIES CODE

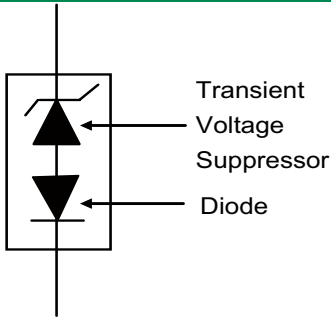
### Part Marking System



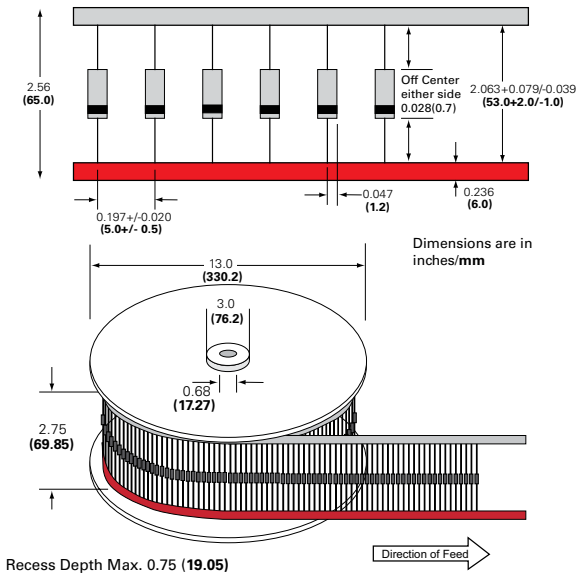
### Packaging

Part Number	Component Package	Quantity	Packaging Option	Packaging Specification
SACxxxXX	DO-204AC	4000	Tape & Reel	EIA STD RS-296
SACxxxXX-B	DO-204AC	1000	BULK	Littelfuse Spec.

### Schematic



### Tape and Reel Specification



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[SAC10](#) [SAC36](#) [SAC30](#) [SAC7.0](#) [SAC60](#) [SAC75](#) [SAC110](#) [SAC90](#) [SAC80](#) [SAC140](#) [SAC120](#) [SAC150](#) [SAC70](#)  
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