



# THE DATASHEET OF SAC45



# SAC Series

## Axial Leaded – 500W



### Additional Information



Resources



Accessories



Samples

### Agency Approvals

Agency	Agency File Number
	E230531

### Maximum Ratings and Thermal Characteristics

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

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation by 10/1000 $\mu\text{s}$ Test Waveform (Fig.1) (Note 1)	$P_{\text{PPM}}$	500	W
Steady State Power Dissipation on Infinite Heat Sink at $T_L=75^{\circ}\text{C}$	$P_D$	3.0	W
Operating Junction and Storage Temperature Range	$T_J, T_{\text{STG}}$	-65 to 175	$^{\circ}\text{C}$
Typical Thermal Resistance Junction to Lead	$R_{\theta\text{JL}}$	20	$^{\circ}\text{C}/\text{W}$
Typical Thermal Resistance Junction to Ambient	$R_{\theta\text{JA}}$	75	$^{\circ}\text{C}/\text{W}$

#### Note:

1. Non-repetitive current pulse, per Fig. 3 and derated above  $T_J(\text{initial}) = 25^{\circ}\text{C}$  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.

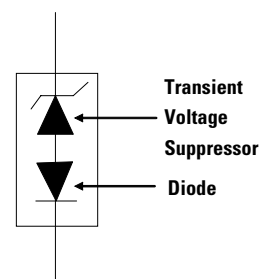
### Features & Benefits

- 500W peak pulse power capability at 10/1000 $\mu\text{s}$  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 $^{\circ}\text{C}/30\text{sec}$  / 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, VCC bus and other vulnerable circuits used in telecom, computer, industrial and consumer electronic applications.


### Schematic



# SAC Series

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

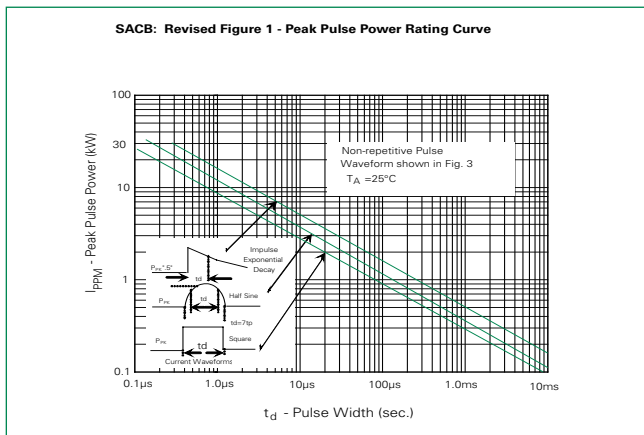
Part Number	Reverse Stand off Voltage $V_R$ (V)	Breakdown Voltage $V_{BR}$ (V)		Maximum Reverse Leakage $I_R @ V_R$ ( $\mu\text{A}$ )	Maximum Clamping Voltage $V_C @ I_{PP}$ (V)	Maximum Peak Pulse Current (Fig.3) $I_{PP}$ (A)	Maximum Junction Capacitance @ 0Volts (pF)	Working Inverse Blocking Voltage $V_{WIB}$ (V)	Inverse Blocking Leakage Current at $I_{IB}$ @ $V_{WIB}$ (mA)	Peak Inverse Blocking Voltage $V_{PIB}$ (V)	Agency Approval 
		MIN	MAX								
SAC5.0	5.0	7.6	8.3	300	13.2	46.2	50	700	1	800	X
SAC6.0	6.0	7.9	9.3	300	12.2	43.1	50	700	1	800	X
SAC7.0	7.0	8.3	10.5	300	13.7	39.9	50	700	1	800	X
SAC8.0	8.0	8.9	10.9	100	13.9	37.8	50	700	1	800	X
SAC8.5	8.5	9.4	11.5	50	14.7	35.7	50	700	1	800	X
SAC10	10	11.1	13.6	5	17.2	30.5	50	700	1	800	X
SAC12	12	13.3	16.3	1	20.0	26.3	50	700	1	800	X
SAC15	15	16.7	20.4	1	25.0	21.0	50	700	1	800	X
SAC18	18	20.0	24.4	1	33.3	15.8	50	700	1	800	X
SAC22	22	24.4	29.8	1	35.7	14.7	50	700	1	800	X
SAC26	26	28.9	35.3	1	45.0	11.7	50	700	1	800	X
SAC30	30	33.3	41.1	1	50.0	10.5	50	700	1	800	X
SAC36	36	40.0	48.9	1	58.1	9.0	50	700	1	800	X
SAC45	45	50.0	61.1	1	73.5	7.1	50	700	1	800	X
SAC50	50	55.5	66.6	1	86.2	6.1	50	700	1	800	X
SAC55	55	60.5	66.9	1	87.0	5.7	50	700	1	800	X
SAC60	60	66.0	72.9	1	95.0	5.3	50	700	1	800	X
SAC65	65	71.5	79.0	1	103.0	4.9	50	700	1	800	X
SAC70	70	77.0	85.1	1	111.0	4.5	50	700	1	800	X
SAC75	75	82.5	91.2	1	119.0	4.2	50	700	1	800	X
SAC80	80	88.0	97.2	1	127.0	3.9	50	700	1	800	X
SAC85	85	93.5	103.3	1	135.0	3.7	45	700	1	800	X
SAC90	90	99.0	109.4	1	143.0	3.5	45	700	1	800	X
SAC95	95	104.5	115.5	1	151.0	3.3	45	700	1	800	X
SAC100	100	110.0	121.0	1	158.0	3.2	40	700	1	800	X
SAC110	110	120.0	133.0	1	173.0	2.9	40	700	1	800	X
SAC120	120	131.0	145.0	1	189.0	2.6	40	700	1	800	X
SAC130	130	142.0	160.0	1	209.0	2.4	35	700	1	800	X
SAC140	140	153.0	170.0	1	219.0	2.3	35	700	1	800	X
SAC150	150	164.0	182.0	1	237.0	2.1	35	700	1	800	X

# SAC Series

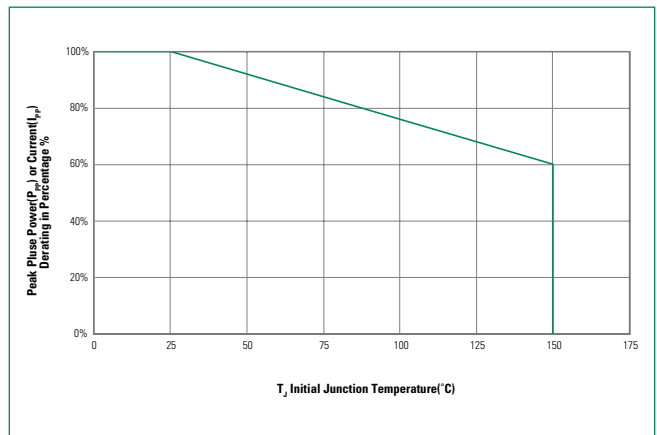
## Axial Leaded – 500W

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

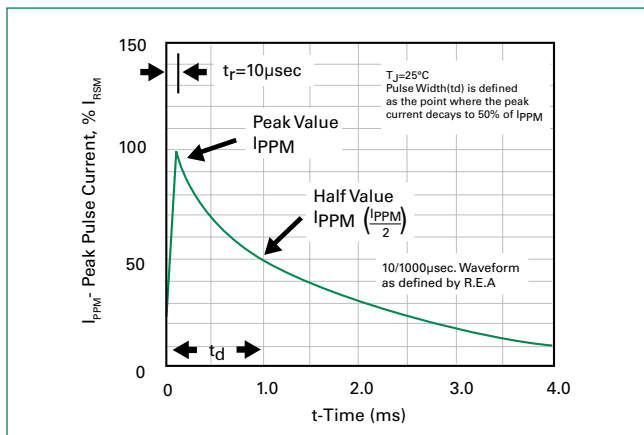
**Figure 1:**  
Peak Pulse Power Rating Curve



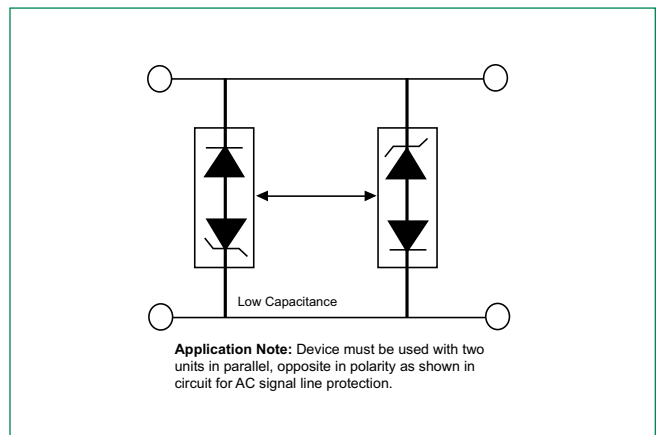
**Figure 2:**  
Peak Pulse Power Derating Curve



**Figure 3:**  
Pulse Waveform



**Figure 4:**  
AC Line Protection Application

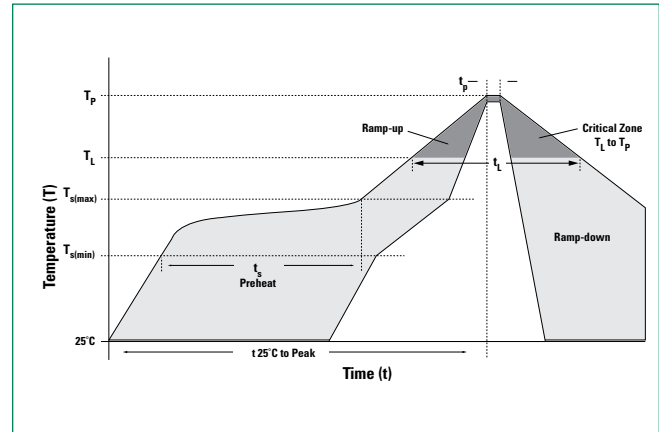


# SAC Series

## Axial Leaded – 500W

### Soldering Parameters

<b>Reflow Condition</b>		Lead-free assembly
<b>Pre Heat</b>	- Temperature Min ( $T_{s(min)}$ )	150°C
	- Temperature Max ( $T_{s(max)}$ )	200°C
	- Time (min to max) ( $t_s$ )	60 – 120 secs
<b>Average ramp up rate (Liquidus Temp (<math>T_A</math>) to peak)</b>		3°C/second max
<b><math>T_{s(max)}</math> to <math>T_A</math> - Ramp-up Rate</b>		3°C/second max
<b>Reflow</b>	- Temperature ( $T_A$ ) (Liquidus)	217°C
	- Time (min to max) ( $t_s$ )	60 – 150 seconds
<b>Peak Temperature (<math>T_p</math>)</b>		260 <sup>+0/-5</sup> °C
<b>Time within 5°C of actual peak Temperature (<math>t_p</math>)</b>		30 seconds max
<b>Ramp-down Rate</b>		6°C/second max
<b>Time 25°C to peak Temperature (<math>T_p</math>)</b>		8 minutes Max.
<b>Do not exceed</b>		260°C



### Flow/Wave Soldering (Solder Dipping)

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

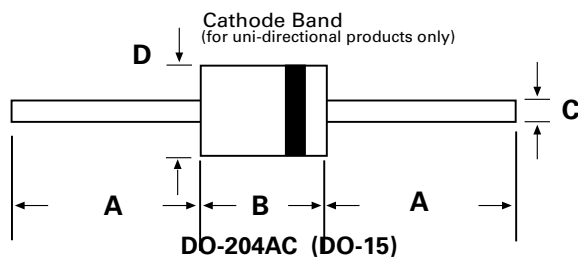
### Physical Specifications

<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

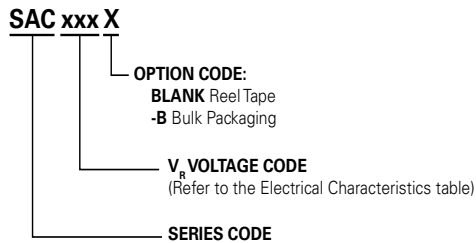


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	1.000	-	25.40	-
B	0.230	0.300	5.80	7.60
C	0.028	0.034	0.71	0.86
D	0.104	0.140	2.60	3.60

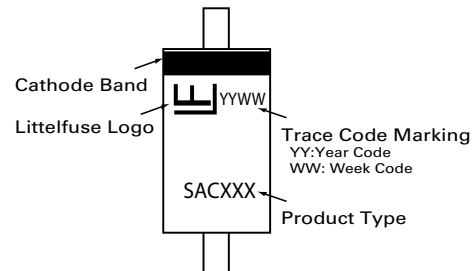
# SAC Series

## Axial Leaded – 500W

### Part Numbering System



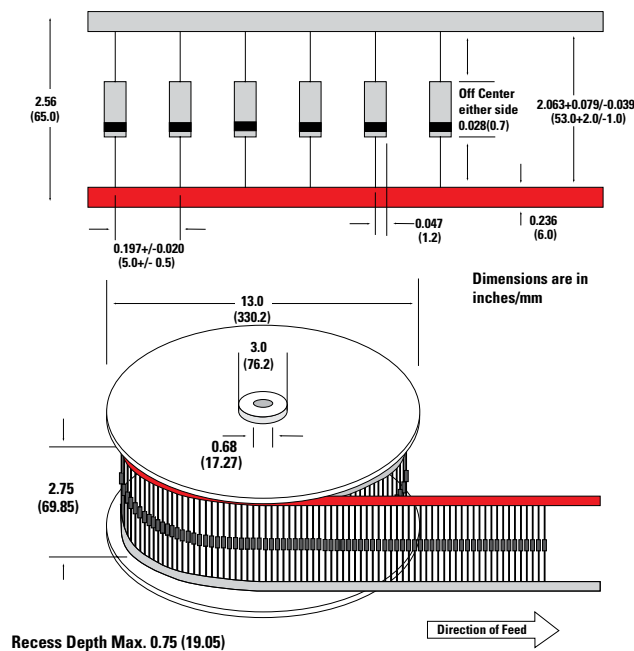
### Part Marking System



### 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.



### Tape and Reel Specification



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