

SAC Series



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 10x1000 μs Test Waveform (Fig.1) (Note 1)	P_{PPM}	500	W
Steady State Power Dissipation on Infinite Heat Sink at $T_L=75^{\circ}\text{C}$ (Fig. 5)	P_D	3.0	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 175	$^{\circ}\text{C}$

Note:

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

- Glass passivated chip junction in DO-15 Package
- 500W peak pulse power capability at 10x1000 μs waveform, repetition rate (duty cycles):0.01 %
- 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 15kV(Air), 8kV (Contact)
- ESD protection of data lines in accordance with IEC 61000-4-2 (IEC801-2)
- EFT protection of data lines in accordance with IEC 61000-4-4 (IEC801-4)
- Low incremental surge resistance
- High temperature soldering guaranteed: 260 $^{\circ}\text{C}$ /40 seconds / 0.375"(9.5mm) lead length, 5 lbs., (2.3kg) tension
- Plastic package has underwriters laboratory flammability classification 94V-0
- Matte tin lead-free plated
- Ideal for data line applications
- Halogen free and RoHS compliant

Applications

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

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 $I_R @ V_R$ (μA)	Maximum Clamping Voltage at $I_{\text{PP}}=5.0\text{A}$ V_C (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 $I_{\text{IB}} @ V_{\text{WIB}}$ (mA)	Peak Inverse Blocking Voltage V_{PIB} (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

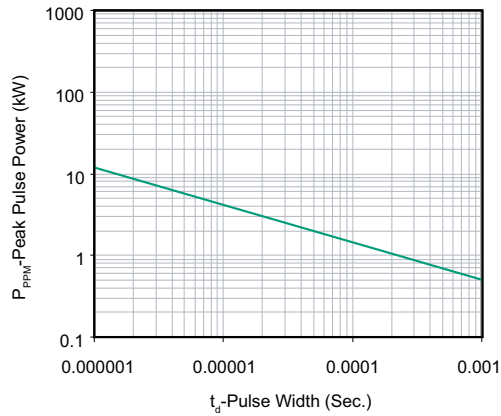


Figure 2 - Pulse Derating Curve

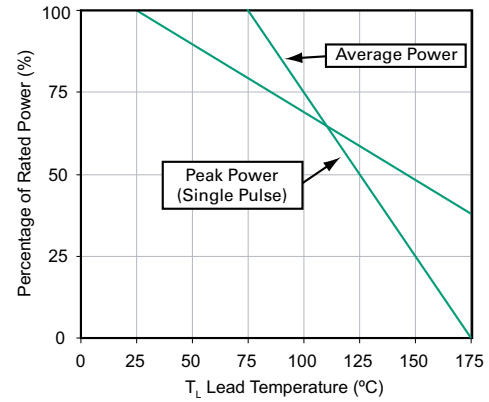


Figure 3 - Pulse Waveform

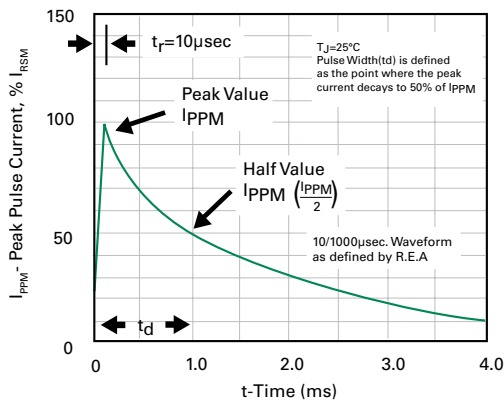


Figure 4 - AC Line Protection Application

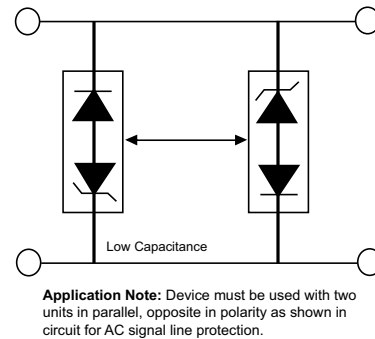
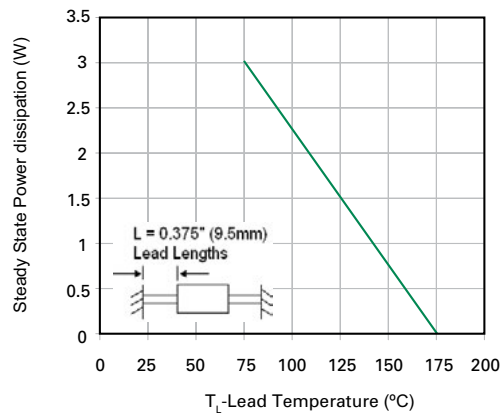
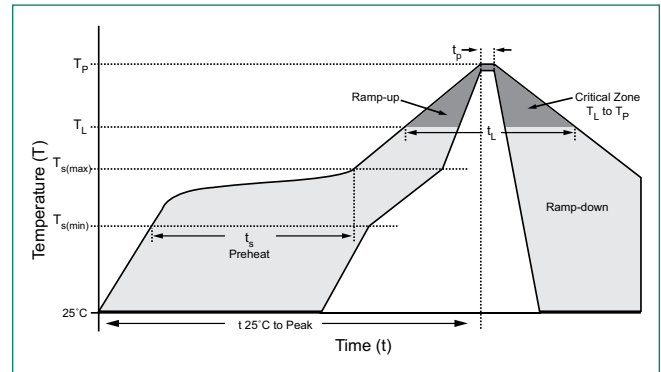


Figure 5 - Steady State Power Derating Curve



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_L) to peak		3°C/second max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_L) (Liquidus)	217°C
	- Time (min to max) (t_s)	60 – 150 seconds
Peak Temperature (T_p)		260 ^{+0/-5} °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		280°C



Flow/Wave Soldering (Solder Dipping)

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

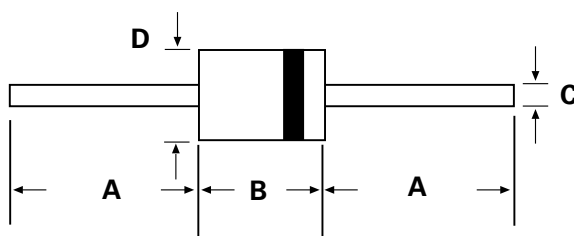
Physical Specifications

Weight	0.015oz., 0.4g
Case	JEDEC DO-204AC (DO-15) molded plastic body over passivated junction.
Polarity	Color band denotes the cathode except Bipolar.
Terminal	Matte Tin axial leads, solderable per JESD22-B102D.

Environmental Specifications

Temperature Cycle	JESD22-A104
Pressure Cooker	JESD 22-A102
High Temp. Storage	JESD22-A103
HTRB	JESD22-A108
Thermal Shock	JESD22-A106

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:

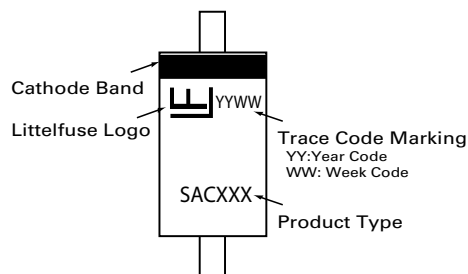
BLANK Reel Tape
-B Bulk Packaging

V_R VOLTAGE CODE

(Refer to the Electrical Characteristics table)

SERIES CODE

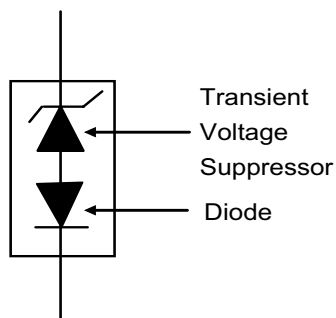
Part Marking System



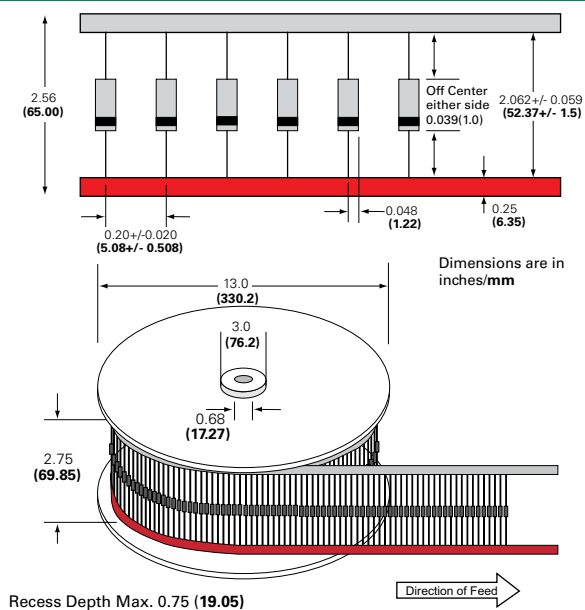
Packaging

Part Number	Component Package	Quantity	Packaging Option	Packaging Specification
SACxxxXX	DO-204AC	4000	Tape & Reel	EIA STD RS-296E
SACxxxXX-B	DO-204AC	1000	BULK	Littelfuse Concord Packing Spec. DM-0016

Schematic



Tape and Reel Specification



Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Littelfuse:

[SAC45](#) [SAC5.0](#) [SAC5.0-B](#) [SAC8.5](#) [SAC7.0-B](#) [SAC8.0](#) [SAC12](#) [SAC50](#) [SAC18](#) [SAC6.0](#) [SAC15](#) [SAC26](#) [SAC22](#)
[SAC10](#) [SAC36](#) [SAC30](#) [SAC7.0](#)