

SA5.0A Series

Zener Transient Voltage Suppressors

Unidirectional and Bidirectional

The SA5.0A series is designed to protect voltage sensitive components from high voltage, high energy transients. They have excellent clamping capability, high surge capability, low zener impedance and fast response time. The SA5.0A series is supplied in ON Semiconductor's exclusive, cost-effective, highly reliable Surmetic axial leaded package and is ideally-suited for use in communication systems, numerical controls, process controls, medical equipment, business machines, power supplies and many other industrial/consumer applications.

Specification Features:

- Stand-off Zener Voltage Range — 5 to 170 V
- Peak Power — 500 Watts @ 1 ms
- Maximum Clamp Voltage @ Peak Pulse Current
- Low Leakage < 1 μ A Above 8.5 V
- Maximum Temperature Coefficient Specified
- Response Time is Typically < 1 ns

Mechanical Characteristics:

CASE: Void-free, transfer-molded, thermosetting plastic

FINISH: All external surfaces are corrosion resistant and leads are readily solderable

POLARITY: Cathode indicated by polarity band. When operated in zener mode, will be positive with respect to anode

MOUNTING POSITION: Any

WAFER FAB LOCATION: Phoenix, Arizona

ASSEMBLY/TEST LOCATION: Guadalajara, Mexico

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Power Dissipation (1) @ $T_L \leq 25^\circ\text{C}$	P_{PK}	500	Watts
Steady State Power Dissipation @ $T_L \leq 75^\circ\text{C}$, Lead Length = 3/8" Derated above $T_L = 75^\circ\text{C}$	P_D	3	Watts
		30	mW/ $^\circ\text{C}$
Forward Surge Current (2) @ $T_A = 25^\circ\text{C}$	I_{FSM}	70	Amps
Operating and Storage Temperature Range	T_J, T_{stg}	-55 to +175	$^\circ\text{C}$

Lead temperature not less than 1/16" from the case for 10 seconds: 230 $^\circ\text{C}$

NOTES: 1. Nonrepetitive current pulse per Figure 4 and derated above $T_A = 25^\circ\text{C}$ per Figure 2.

2. 1/2 sine wave (or equivalent square wave), PW = 8.3 ms, duty cycle = 4 pulses per minute maximum.



ON Semiconductor

Formerly a Division of Motorola

<http://onsemi.com>

MINI-MOSORB ZENER OVERVOLTAGE TRANSIENT SUPPRESSORS 5-170 VOLT 500 WATT PEAK POWER 3 WATT STEADY STATE



PLASTIC
CASE 59

ORDERING INFORMATION

Device	Package	Shipping
SAXXXA	CASE 59	1000 Units/Box
SAXXXARL	CASE 59	Tape and Reel 5000 Units/Reel
SAXXXCA Bidirectional	CASE 59	1000 Units/Box
SAXXXCARL Bidirectional	CASE 59	Tape and Reel 5000 Units/Reel

Devices listed in **bold, italic** are ON Semiconductor **Preferred** devices. **Preferred** devices are recommended choices for future use and best overall value.

SA5.0A Series

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) $V_F = 3.5\text{ V Max}$, $I_F^* = 35\text{ A}$ (except bidirectional devices).

Device	Breakdown Voltage			Working Peak Reverse Voltage V_{RWM}^{**} (Volts)	Maximum Reverse Leakage @ V_{RWM} I_R (μA)	Maximum Reverse Surge Current I_{RSM}^\dagger (Amps)	Maximum Reverse Voltage @ I_{RSM} (Clamping Voltage) V_{RSM} (Volts)	Maximum Voltage Temperature Variation of V_{BR} $\text{mV}/^\circ\text{C}$
	$V_{BR}^{\dagger\dagger}$ (Volts)		@ I_T (mA)					
	Min	Max						
SA5.0A	6.4	7	10	5	600	54.3	9.2	5
SA6.0A	6.67	7.37	10	6	600	48.5	10.3	5
SA6.5A	7.22	7.98	10	6.5	400	44.7	11.2	5
SA7.0A	7.78	8.6	10	7	150	41.7	12	6
SA7.5A	8.33	9.21	1	7.5	50	38.8	12.9	7
SA8.0A	8.89	9.83	1	8	25	36.7	13.6	7
SA8.5A	9.44	10.4	1	8.5	5	34.7	14.4	8
SA9.0A	10	11.1	1	9	1	32.5	15.4	9
SA10A	11.1	12.3	1	10	1	29.4	17	10
SA11A	12.2	13.5	1	11	1	27.4	18.2	11
SA12A	13.3	14.7	1	12	1	25.1	19.9	12
SA13A	14.4	15.9	1	13	1	23.2	21.5	13
SA14A	15.6	17.2	1	14	1	21.5	23.2	14
SA15A	16.7	18.5	1	15	1	20.6	24.4	16
SA16A	17.8	19.7	1	16	1	19.2	26	17
SA17A	18.9	20.9	1	17	1	18.1	27.6	19
SA18A	20	22.1	1	18	1	17.2	29.2	20
SA20A	22.2	24.5	1	20	1	15.4	32.4	23
SA24A	26.7	29.5	1	24	1	12.8	38.9	28
SA26A	28.9	31.9	1	26	1	11.9	42.1	30
SA28A	31.1	34.4	1	28	1	11	45.4	31
SA30A	33.3	36.8	1	30	1	10.3	48.4	36
SA33A	36.7	40.6	1	33	1	9.4	53.3	39
SA36A	40	44.2	1	36	1	8.6	58.1	41
SA40A	44.4	49.1	1	40	1	7.8	64.5	46
SA43A	47.8	52.8	1	43	1	7.2	69.4	50
SA45A	50	55.3	1	45	1	6.9	72.7	52
SA48A	53.3	58.9	1	48	1	6.5	77.4	56
SA51A	56.7	62.7	1	51	1	6.1	82.4	61
SA58A	64.4	71.2	1	58	1	5.3	93.6	70
SA60A	66.7	73.7	1	60	1	5.2	96.8	71
SA64A	71.1	78.6	1	64	1	4.9	103	76
SA70A	77.8	86	1	70	1	4.4	113	85
SA78A	86.7	95.8	1	78	1	4	126	95
SA90A	100	111	1	90	1	3.4	146	110
SA100A	111	123	1	100	1	3.1	162	123
SA120A	133	147	1	120	1	2.5	193	146
SA130A	144	159	1	130	1	2.4	209	158
SA150A	167	185	1	150	1	2.1	243	184
SA160A	178	197	1	160	1	1.9	259	196
SA170A	189	209	1	170	1	1.8	275	208

Devices listed in bold, italic are ON Semiconductor Preferred devices.

* 1/2 sine wave (or equivalent square wave), $PW = 8.3\text{ ms}$, duty cycle = 4 pulses per minute maximum.

(continued)

** MOSORB transient suppressors are normally selected according to the maximum reverse stand-off voltage (V_{RWM}), which should be equal to or greater than the dc or continuous peak operating voltage level.

† Surge current waveform per Figure 4 and derate per Figure 2.

†† V_{BR} measured at pulse test current I_T at an ambient temperature of 25°C .

FOR BIDIRECTIONAL APPLICATIONS

USE CA SUFFIX for SA6.0CA through SA170CA

Electrical characteristics apply in both directions.

Preferred Bidirectional Devices —

SA6.5CA

SA13CA

SA18CA

SA12CA

SA15CA

SA24CA

SA5.0A Series

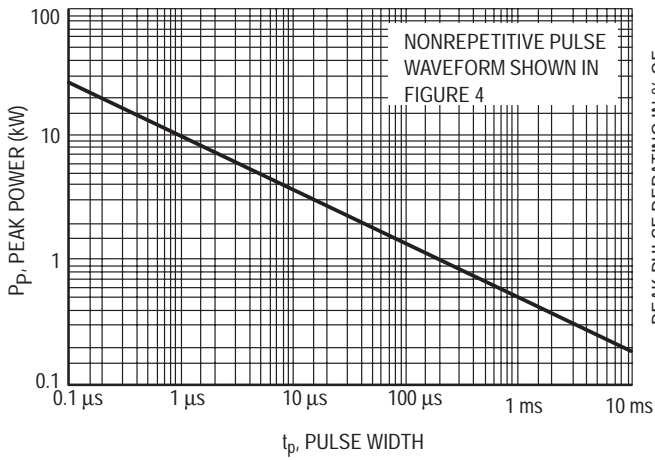


Figure 1. Pulse Rating Curve

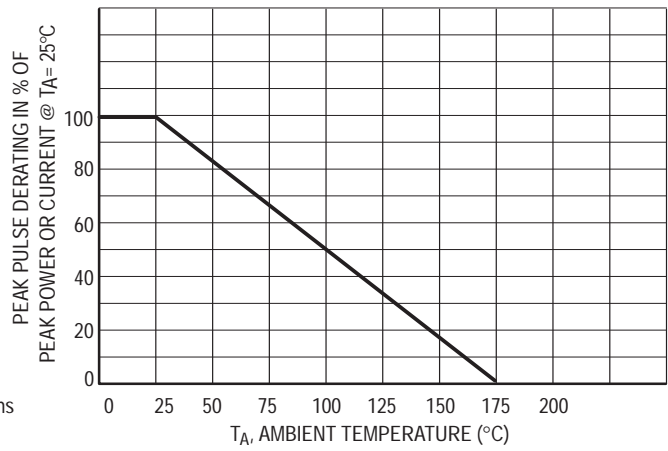


Figure 2. Pulse Derating Curve

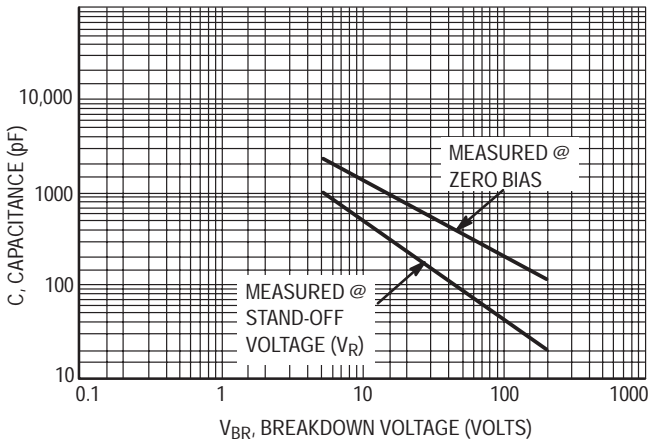


Figure 3. Capacitance versus Breakdown Voltage

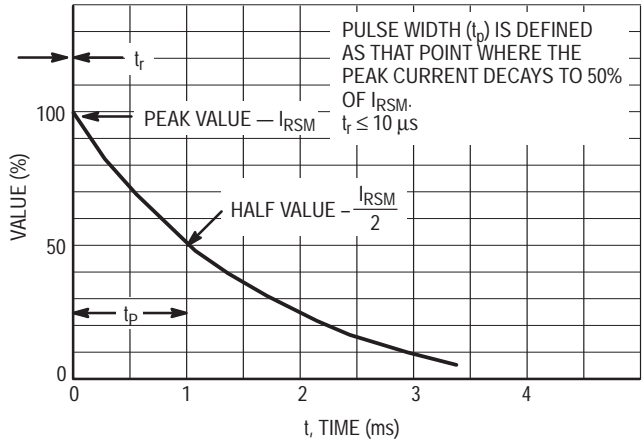


Figure 4. Pulse Waveform

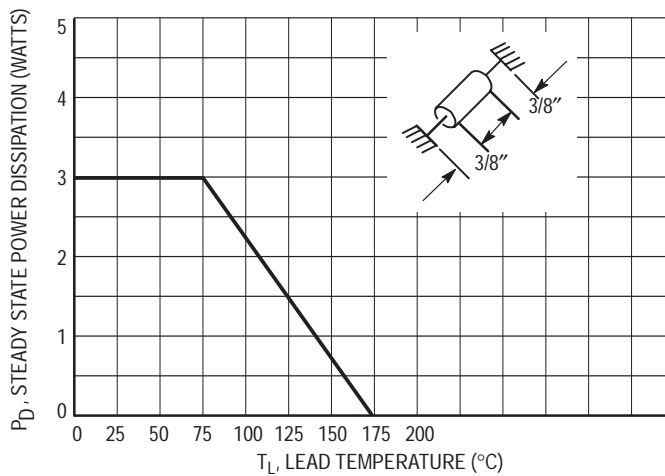


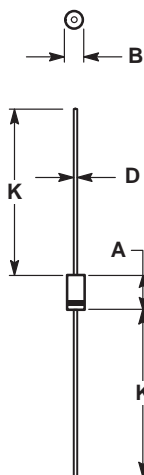
Figure 5. Steady State Power Derating

SA5.0A Series

OUTLINE DIMENSIONS

Transient Voltage Suppressors — Axial Leaded

500 Watt Peak Power




NOTES:

1. ALL RULES AND NOTES ASSOCIATED WITH JEDEC DO-41 OUTLINE SHALL APPLY.
2. POLARITY DENOTED BY CATHODE BAND.
3. LEAD DIAMETER NOT CONTROLLED WITHIN F DIMENSION.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	5.97	6.60	0.235	0.260
B	2.79	3.05	0.110	0.120
D	0.76	0.86	0.030	0.034
K	27.94	—	1.100	—

CASE 59-04 PLASTIC

(Refer to Section 10 of the TVS/Zener Data Book (DL150/D) for Surface Mount, Thermal Data and Footprint Information.)

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