

SA5.0CA Series

500 Watt Peak Power MiniMOSORB™ Zener Transient Voltage Suppressors

Bidirectional*

The SA5.0CA 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 SA5.0CA 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:

- Working Peak Reverse Voltage Range – 5.0 to 170 V
- Peak Power – 500 Watts @ 1 ms
- ESD Rating of Class 3 (>16 KV) per Human Body Model
- Maximum Clamp Voltage @ Peak Pulse Current
- Low Leakage < 1 μ A above 8.5 V
- UL 497B for Isolated Loop Circuit Protection
- 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

MAXIMUM LEAD TEMPERATURE FOR SOLDERING PURPOSES:

230°C, 1/16" from the case for 10 seconds

POLARITY: Cathode band does not imply polarity

MOUNTING POSITION: Any

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Power Dissipation (Note 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	3.0	Watts
		30	mW/°C
Thermal Resistance, Junction-to-Lead	$R_{\theta JL}$	33.3	°C/W
Operating and Storage Temperature Range	T_J, T_{stg}	- 55 to +175	°C

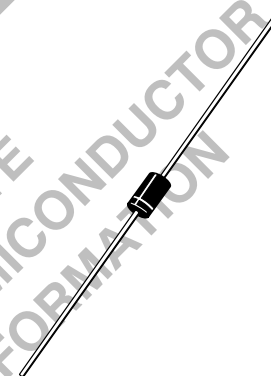
1. Nonrepetitive current pulse per Figure 3 and derated above $T_A = 25^\circ\text{C}$ per Figure 2.

*Please see SA5.0A to SA170A for Unidirectional devices.

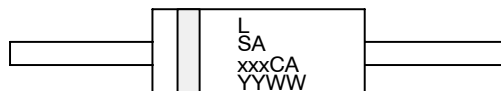


ON Semiconductor®

<http://onsemi.com>



AXIAL LEAD
CASE 59
PLASTIC



L = Assembly Location
SAxxxCA = ON Device Code
YY = Year
WW = Work Week

ORDERING INFORMATION

Device	Package	Shipping
SAxxxCA	Axial Lead	1000 Units/Box
SAxxxCARL*	Axial Lead	5000/Tape & Reel

*SA6.5CA, SA48CA, SA64CA, and SA78CA Not Available in 5000/Tape & Reel

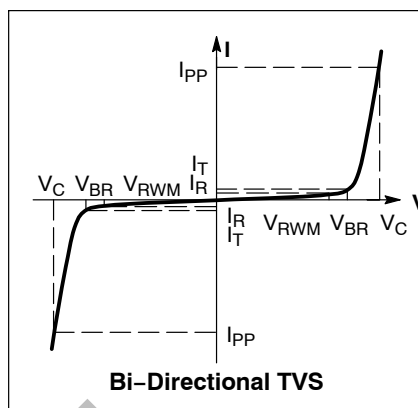
Devices listed in **bold, italic** are ON Semiconductor **Preferred** devices. Preferred devices are recommended choices for future use and best overall value.

SA5.0CA Series

ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Working Peak Reverse Voltage
I_R	Maximum Reverse Leakage Current @ V_{RWM}
V_{BR}	Breakdown Voltage @ I_T
I_T	Test Current
ΘV_{BR}	Maximum Temperature Variation of V_{BR}



OBsolete

THIS DEVICE IS OBSOLETE
PLEASE CONTACT YOUR ON SEMICONDUCTOR
REPRESENTATIVE FOR INFORMATION

SA5.0CA Series

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

Device	Device Marking	V _{RWM} (Note 2)	I _R @ V _{RWM}	Breakdown Voltage				V _C @ I _{PP} (Note 4)		θV _{BR}
				V _{BR} (Note 3) (Volts)			@ I _T	V _C	I _{PP}	
		(Volts)	(μA)	Min	Nom	Max	(mA)	(Volts)	(A)	(mV/°C)
SA5.0CA	SA5.0CA	5	600	6.4	6.7	7	10	9.2	54.3	5
SA6.0CA	SA6.0CA	6	600	6.67	7.02	7.37	10	10.3	48.5	5
SA6.5CA*	SA6.5CA*	6.5	400	7.22	7.60	7.98	10	11.2	44.7	5
SA7.0CA	SA7.0CA	7	150	7.78	8.19	8.6	10	12	41.7	6
SA7.5CA	SA7.5CA	7.5	50	8.33	8.77	9.21	1	12.9	38.8	7
SA8.0CA	SA8.0CA	8	25	8.89	9.36	9.83	1	13.6	36.7	7
SA8.5CA	SA8.5CA	8.5	5	9.44	9.92	10.4	1	14.4	34.7	8
SA9.0CA	SA9.0CA	9	1	10	10.55	11.1	1	15.4	32.5	9
SA10CA	SA10CA	10	1	11.1	11.7	12.3	1	17	29.4	10
SA11CA	SA11CA	11	1	12.2	12.85	13.5	1	18.2	27.4	11
SA12CA	SA12CA	12	1	13.3	14	14.7	1	19.9	25.1	12
SA13CA	SA13CA	13	1	14.4	15.15	15.9	1	21.5	23.2	13
SA14CA	SA14CA	14	1	15.6	16.4	17.2	1	23.2	21.5	14
SA15CA	SA15CA	15	1	16.7	17.6	18.5	1	24.4	20.6	16
SA16CA	SA16CA	16	1	17.8	18.75	19.7	1	26	19.2	17
SA17CA	SA17CA	17	1	18.9	19.9	20.9	1	27.6	18.1	19
SA18CA	SA18CA	18	1	20	21.05	22.1	1	29.2	17.2	20
SA20CA	SA20CA	20	1	22.2	23.35	24.5	1	32.4	15.4	23
SA22CA	SA22CA	22	1	24.4	25.65	26.9	1	35.5	14.1	25
SA24CA	SA24CA	24	1	26.7	28.1	29.5	1	38.9	12.8	28
SA26CA	SA26CA	26	1	28.9	30.4	31.9	1	42.1	11.9	30
SA28CA	SA28CA	28	1	31.1	32.75	34.4	1	45.4	11	31
SA30CA	SA30CA	30	1	33.3	35.05	36.8	1	48.4	10.3	36
SA33CA	SA33CA	33	1	36.7	38.65	40.6	1	53.3	9.4	39
SA36CA	SA36CA	36	1	40	42.1	44.2	1	58.1	8.6	41
SA40CA	SA40CA	40	1	44.4	46.55	49.1	1	64.5	7.8	46
SA43CA	SA43CA	43	1	47.8	50.3	52.8	1	69.4	7.2	50
SA45CA	SA45CA	45	1	50	52.65	55.3	1	72.7	6.9	52
SA48CA*	SA48CA*	48	1	53.3	56.1	58.9	1	77.4	6.5	56
SA51CA	SA51CA	51	1	56.7	59.7	62.7	1	82.4	6.1	61
SA58CA	SA58CA	58	1	64.4	67.8	71.2	1	93.6	5.3	70
SA60CA	SA60CA	60	1	66.7	70.2	73.7	1	96.8	5.2	71
SA64CA*	SA64CA*	64	1	71.1	74.85	78.6	1	103	4.9	76
SA70CA	SA70CA	70	1	77.8	81.9	86	1	113	4.4	85
SA78CA*	SA78CA*	78	1	86.7	91.25	95.8	1	126	4.0	95
SA85CA	SA85CA	85	1	94.4	99.2	104	1	137	3.6	103
SA90CA	SA90CA	90	1	100	105.5	111	1	146	3.4	110
SA100CA	SA100CA	100	1	111	117	123	1	162	3.1	123
SA110CA	SA110CA	110	1	122	128.5	135	1	177	2.8	133
SA120CA	SA120CA	120	1	133	140	147	1	193	2.5	146
SA130CA	SA130CA	130	1	144	151.5	159	1	209	2.4	158
SA150CA	SA150CA	150	1	167	176	185	1	243	2.1	184

NOTES:

2. MiniMOSORB™ transient suppressors are normally selected according to the maximum working peak reverse voltage (V_{RWM}), which should be equal to or greater than the dc or continuous peak operating voltage level.
 3. V_{BR} measured at pulse test current I_T at an ambient temperature of 25°C.
 4. Surge current waveform per Figure 3 and derate per Figures 1 and 2.
- *Not Available in the 5,000/Tape & Reel.

SA5.0CA Series

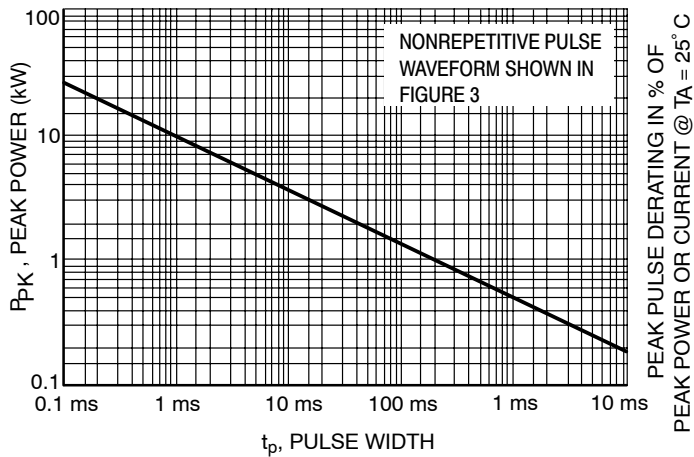


Figure 1. Pulse Rating Curve

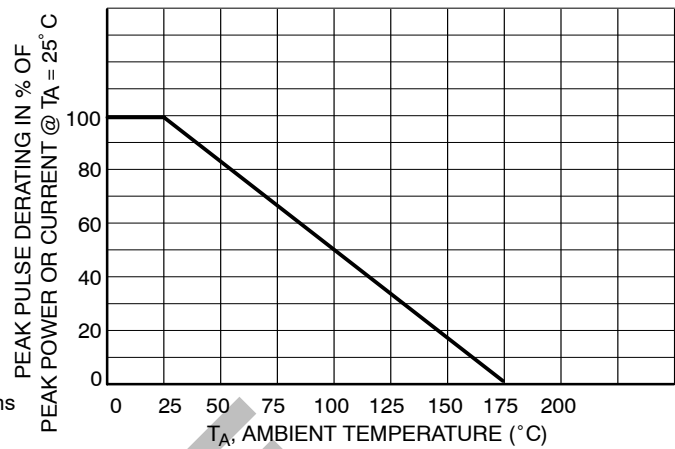


Figure 2. Pulse Derating Curve

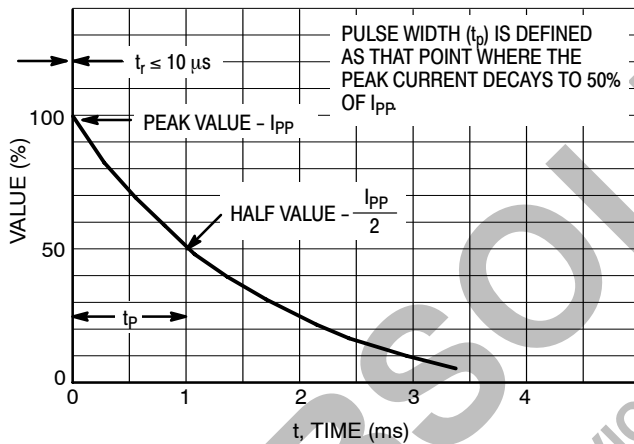


Figure 3. Pulse Waveform

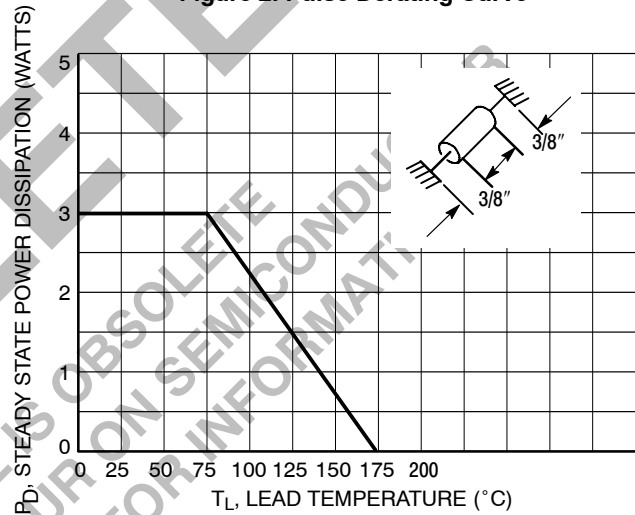


Figure 4. Steady State Power Derating

UL RECOGNITION*

The entire series including the bidirectional CA suffix has *Underwriters Laboratory Recognition* for the classification of protectors (QVGV2) under the UL standard for safety 497B and File #E 116110. Many competitors only have one or two devices recognized or have recognition in a non-protective category. Some competitors have no recognition at all. With the UL497B recognition, our parts successfully passed several tests including Strike Voltage

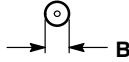
Breakdown test, Endurance Conditioning, Temperature test, Dielectric Voltage-Withstand test, Discharge test and several more.

Whereas, some competitors have only passed a flammability test for the package material, we have been recognized for much more to be included in their protector category.

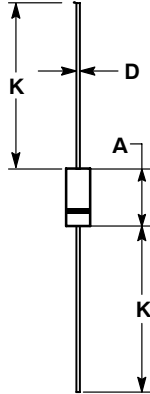
*Applies to SA5.0A, CA – SA170A, CA.

Transient Voltage Suppressors – Axial Leaded

500 Watt Peak Power MiniMOSORB™



MINI MOSORB
CASE 59-09
ISSUE S



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 59-04 OBSOLETE, NEW STANDARD 59-09.
4. 59-03 OBSOLETE, NEW STANDARD 59-10.
5. ALL RULES AND NOTES ASSOCIATED WITH JEDEC DO-41 OUTLINE SHALL APPLY.
6. POLARITY DENOTED BY CATHODE BAND.
7. LEAD DIAMETER NOT CONTROLLED WITHIN F DIMENSION.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.228	0.299	5.80	7.60
B	0.102	0.142	2.60	3.60
D	0.028	0.034	0.71	0.86
K	1.000	---	25.44	---

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