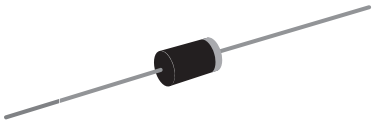
TRANSZORB® Transient Voltage Suppressors



DO-204AC (DO-15)

FEATURES

- Glass passivated chip junction
- Available in uni-directional and bi-directional
- 500 W peak pulse power capability with a 10/1000 µs waveform, repetitive rate (duty cycle): 0.01 %
- Excellent clamping capability
- Very fast response time
- Low incremental surge resistance
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
V_{WM}	5.0 V to 170 V
P_{PPM}	500 W
P_D	3.0 W
I_{FSM} (uni-directional only)	70 A
T_J max.	175 °C

DEVICES FOR BI-DIRECTION APPLICATIONS

For bi-directional types, use C or CA suffix (e.g. SA5.0C, SA170CA).

Electrical characteristics apply in both directions.

TYPICAL APPLICATIONS

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units for consumer, computer, industrial and telecommunication.

MECHANICAL DATA

Case: DO-204AC, molded epoxy over passivated chip

Molding compound meets UL 94 V-0 flammability rating

Base P/N-E3 - RoHS compliant, commercial grade

Base P/NHE3 - RoHS compliant, high reliability/ automotive grade (AEC Q101 qualified)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: For uni-directional types the color band denotes cathode end, no marking on bi-directional types

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**VALUE**	**UNIT**
Peak pulse power dissipation with a 10/1000 µs waveform (1) (Fig. 1)	P_{PPM}	500	W
Peak pulse current with a 10/1000 µs waveform (1)	I_{PPM}	See next table	A
Power dissipation on infinite heatsink at T_A = 75 °C (Fig. 5)	P_D	3.0	W
Peak forward surge current, 10 ms single half sine-wave uni-directional only	I_{FSM}	70	A
Maximum instantaneous forward voltage at 35 A for uni-directional only (2)	V_F	3.5	V
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 175	°C

Notes:

(1) Non-repetitive current pulse, per Fig. 3 and derated above T_A = 25 °C per Fig. 2

(2) 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 per minute maximum

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
DEVICE TYPE	**BREAKDOWN VOLTAGE V_{BR} AT I_T (1) (V)**		**TEST CURRENT I_T (mA)**	**STAND-OFF VOLTAGE V_{WM} (V)**	**MAXIMUM REVERSE LEAKAGE AT V_{WM} I_D (3) (μA)**	**MAXIMUM PEAK PULSE CURRENT I_{PPM} (2) (A)**	**MAXIMUM CLAMPING VOLTAGE AT I_{PPM} V_C (V)**	**MAXIMUM TEMPERATURE COEFFICIENT OF V_{BR} (mV/°C)**
	MIN.	**MAX.**						
SA5.0	6.40	7.30	10	5.0	600	52.1	9.6	5.0
SA5.0A(4)	6.4	7.07	10	5.0	600	54.3	9.2	5.0
SA6.0	6.67	8.15	10	6.0	600	43.9	11.4	5.0
SA6.0A	6.67	7.37	10	6.0	600	48.5	10.3	5.0
SA6.5	7.22	8.82	10	6.5	400	40.7	12.3	5.0
SA6.5A	7.22	7.98	10	6.5	400	44.7	11.2	5.0
SA7.0	7.78	9.51	10	7.0	150	37.6	13.3	6.0
SA7.0A	7.78	8.60	10	7.0	150	41.7	12.0	6.0
SA7.5	8.33	10.2	1.0	7.5	50	35.0	14.3	7.0
SA7.5A	8.33	9.21	1.0	7.5	50	38.8	12.9	7.0
SA8.0	8.89	10.9	1.0	8.0	25	33.3	15.0	7.0
SA8.0A	8.89	9.83	1.0	8.0	25	36.8	13.6	7.0
SA8.5	9.44	11.5	1.0	8.5	10	31.4	15.9	8.0
SA8.5A	9.44	10.4	1.0	8.5	10	34.7	14.4	8.0
SA9.0	10.0	12.2	1.0	9.0	5.0	29.6	16.9	9.0
SA9.0A	10.0	11.1	1.0	9.0	5.0	32.5	15.4	9.0
SA10	11.1	13.6	1.0	10	1.0	26.6	18.8	10
SA10A	11.1	12.3	1.0	10	1.0	29.4	17.0	10
SA11	12.2	14.9	1.0	11	1.0	24.9	20.1	11
SA11A	12.2	13.5	1.0	11	1.0	27.5	18.2	11
SA12	13.3	16.3	1.0	12	1.0	22.7	22.0	12
SA12A	13.3	14.7	1.0	12	1.0	25.1	19.9	12
SA13	14.4	17.6	1.0	13	1.0	21.0	23.8	13
SA13A	14.4	15.9	1.0	13	1.0	23.3	21.5	13
SA14	15.6	19.1	1.0	14	1.0	19.4	25.8	14
SA14A	15.6	17.2	1.0	14	1.0	21.6	23.2	14
SA15	16.7	20.4	1.0	15	1.0	18.6	26.9	16
SA15A	16.7	18.5	1.0	15	1.0	20.5	24.4	16
SA16	17.8	21.8	1.0	16	1.0	17.4	28.8	19
SA16A	17.8	19.7	1.0	16	1.0	19.2	26.0	17
SA17	18.9	23.1	1.0	17	1.0	16.4	30.5	20
SA17A	18.9	20.9	1.0	17	1.0	18.1	27.6	19
SA18	20.0	24.4	1.0	18	1.0	15.5	32.2	21
SA18A	20.0	22.1	1.0	18	1.0	17.1	29.2	20
SA20	22.2	27.1	1.0	20	1.0	14.0	35.8	25
SA20A	22.2	24.5	1.0	20	1.0	15.4	32.4	23
SA22	24.4	29.8	1.0	22	1.0	22.7	39.4	28
SA22A	24.4	26.9	1.0	22	1.0	14.1	35.5	25
SA24	26.7	32.6	1.0	24	1.0	11.6	43.0	31
SA24A	26.7	29.5	1.0	24	1.0	12.9	38.9	28
SA26	28.9	35.3	1.0	26	1.0	10.7	46.6	31
SA26A	28.9	31.9	1.0	26	1.0	11.9	42.1	30
SA28	31.1	38.0	1.0	28	1.0	10.0	50.1	35
SA28A	31.1	34.4	1.0	28	1.0	11.0	45.4	31
SA30	33.3	40.7	1.0	30	1.0	9.3	53.5	39
SA30A	33.3	36.8	1.0	30	1.0	10.0	48.4	36
SA33	36.7	44.9	1.0	33	1.0	8.5	59.0	42
SA33A	36.7	40.6	1.0	33	1.0	9.4	53.3	39
SA36	40.0	48.9	1.0	36	1.0	7.8	64.3	46
SA36A	40.0	44.2	1.0	36	1.0	8.6	58.1	41

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
DEVICE TYPE	BREAKDOWN VOLTAGE V_{BR} AT I_T (1) (V)		TEST CURRENT I_T (mA)	STAND-OFF VOLTAGE V_{WM} (V)	MAXIMUM REVERSE LEAKAGE AT V_{WM} I_D (3) (µA)	MAXIMUM PEAK PULSE CURRENT I_{PPM} (2) (A)	MAXIMUM CLAMPING VOLTAGE AT I_{PPM} V_C (V)	MAXIMUM TEMPERATURE COEFFICIENT OF V_{BR} (mV/°C)
	MIN.	MAX.						
SA40	44.4	54.3	1.0	40	1.0	7.0	71.4	51
SA40A	44.4	49.1	1.0	40	1.0	7.8	64.5	46
SA43	47.8	58.4	1.0	43	1.0	6.5	76.7	55
SA43A	47.8	52.8	1.0	43	1.0	7.2	69.4	50
SA45	50.0	61.1	1.0	45	1.0	6.2	80.3	58
SA45A	50.0	55.3	1.0	45	1.0	6.9	72.7	52
SA48	53.3	65.2	1.0	48	1.0	5.8	85.5	63
SA48A	53.3	58.9	1.0	48	1.0	6.5	77.4	56
SA51	56.7	69.3	1.0	51	1.0	5.5	91.1	66
SA51A	56.7	62.7	1.0	51	1.0	6.1	82.4	61
SA54	60.0	73.3	1.0	54	1.0	5.2	96.3	71
SA54A	60.0	66.3	1.0	54	1.0	5.7	87.1	65
SA58	64.4	78.7	1.0	58	1.0	4.9	103	78
SA58A	64.4	71.2	1.0	58	1.0	5.3	93.6	70
SA60	66.7	81.5	1.0	60	1.0	4.7	107	80
SA60A	66.7	73.7	1.0	60	1.0	5.2	96.8	71
SA64	71.1	86.9	1.0	64	1.0	4.4	114	86
SA64A	71.1	78.6	1.0	64	1.0	4.9	103	76
SA70	77.8	95.1	1.0	70	1.0	4.0	125	94
SA70A	77.8	86.0	1.0	70	1.0	4.4	113	85
SA75	83.3	102	1.0	75	1.0	3.7	134	101
SA75A	83.3	92.1	1.0	75	1.0	4.1	121	91
SA78	86.7	106	1.0	78	1.0	3.6	139	105
SA78A	86.7	95.8	1.0	78	1.0	4.0	126	95
SA85	94.4	115	1.0	85	1.0	3.3	151	114
SA85A	94.4	104	1.0	85	1.0	3.6	137	103
SA90	100	122	1.0	90	1.0	3.1	160	121
SA90A	100	111	1.0	90	1.0	3.4	146	110
SA100	111	136	1.0	100	1.0	2.8	179	135
SA100A	111	123	1.0	100	1.0	3.1	162	123
SA110	122	149	1.0	110	1.0	2.6	196	148
SA110A	122	135	1.0	110	1.0	2.8	177	133
SA120	133	163	1.0	120	1.0	2.3	214	162
SA120A	133	147	1.0	120	1.0	2.6	193	146
SA130	144	176	1.0	130	1.0	2.2	230	175
SA130A	144	159	1.0	130	1.0	2.4	209	158
SA150	167	204	1.0	150	1.0	1.9	268	203
SA150A	167	185	1.0	150	1.0	2.1	243	184
SA160	178	218	1.0	160	1.0	1.7	257	217
SA160A	178	197	1.0	160	1.0	1.9	259	196
SA170	189	231	1.0	170	1.0	1.6	304	230
SA170A	189	209	1.0	170	1.0	1.8	275	208

Notes:

(1) Pulse test: $t_p \leq 50$ ms

(2) Surge current waveform per Fig. 3 and derate per Fig. 2

(3) For bi-directional types with V_{WM} of 10 V and less, the I_D limit is doubled

(4) For the bi-directional SA5.0CA, the maximum V_{BR} is 7.25 V

(5) All terms and symbols are consistent with ANSI/IEEE C62.35

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SA5.0A-E3/54	0.432	54	4000	13" diameter paper tape and reel
SA5.0AHE3/54 (1)	0.432	54	4000	13" diameter paper tape and reel

Note:

(1) Automotive grade AEC Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

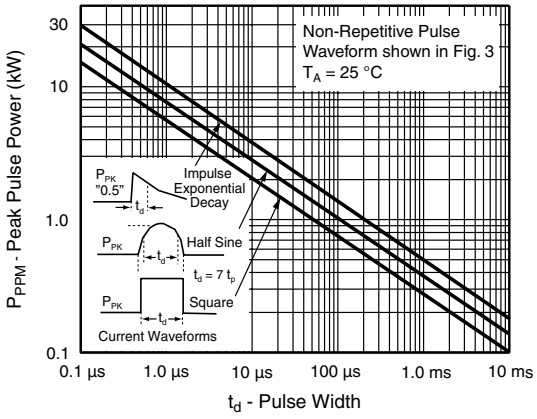


Figure 1. Peak Pulse Power Rating Curve

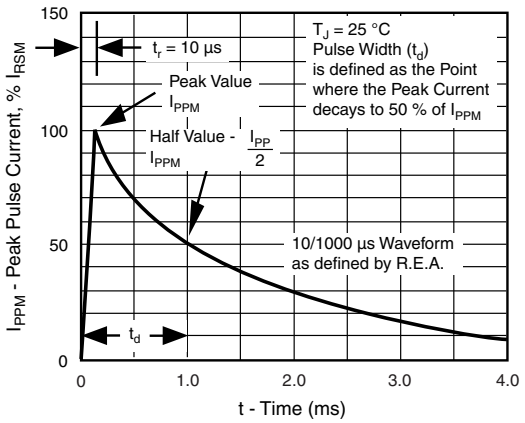


Figure 3. Pulse Waveform

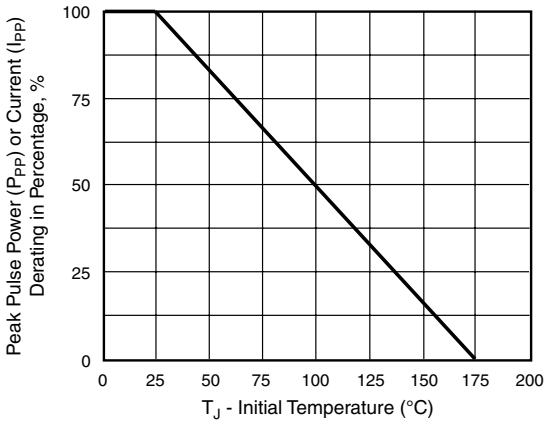


Figure 2. Pulse Derating Curve

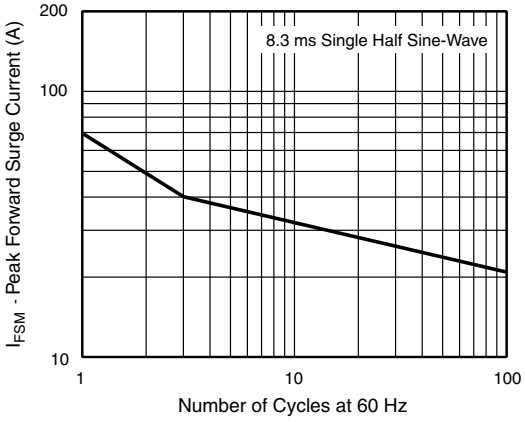


Figure 4. Maximum Non-Repetitive Forward Surge Current
Uni-Directional Only

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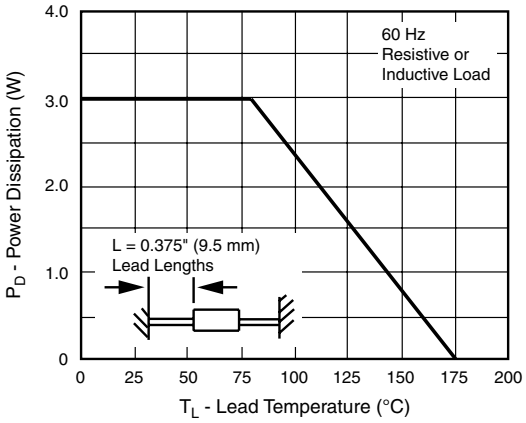


Figure 5. Steady State Power Derating Curve

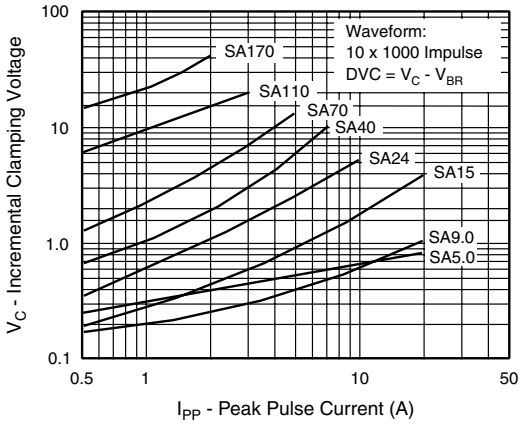


Figure 8. Incremental Clamping Voltage Curve Uni-Directional

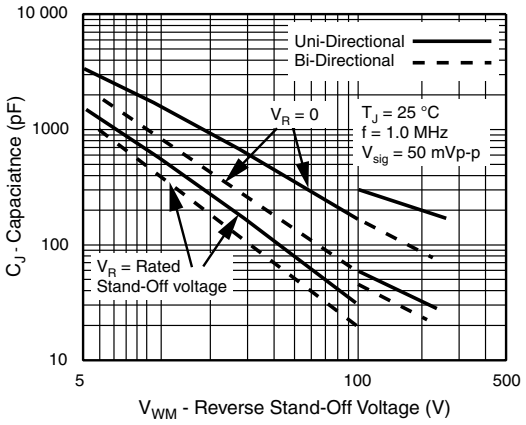


Figure 6. Capacitance

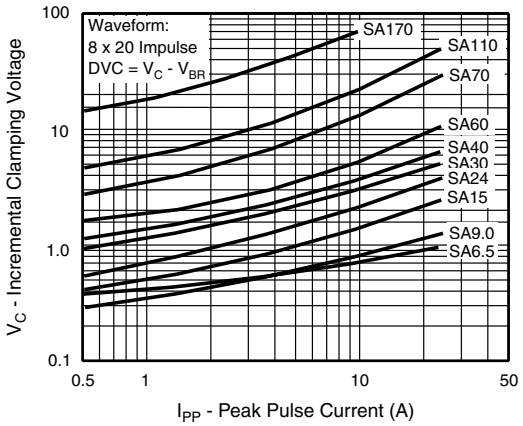


Figure 9. Incremental Clamping Voltage Curve Bi-Directional

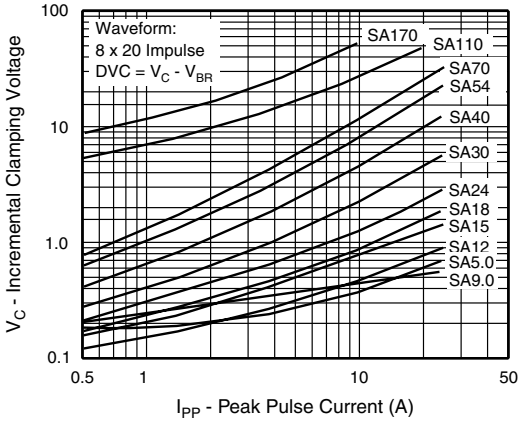


Figure 7. Incremental Clamping Voltage Curve Uni-Directional

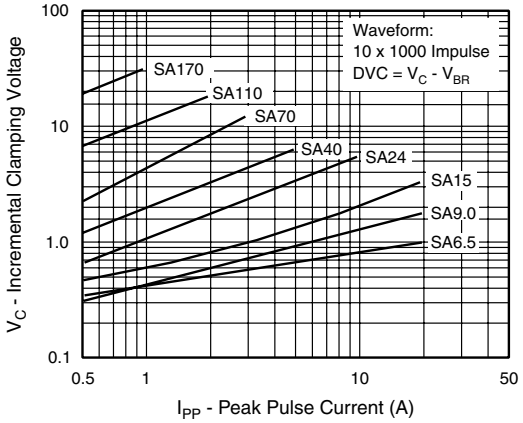


Figure 10. Incremental Clamping Voltage Curve Bi-Directional

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Document Number: 88378
Revision: 21-Oct-08

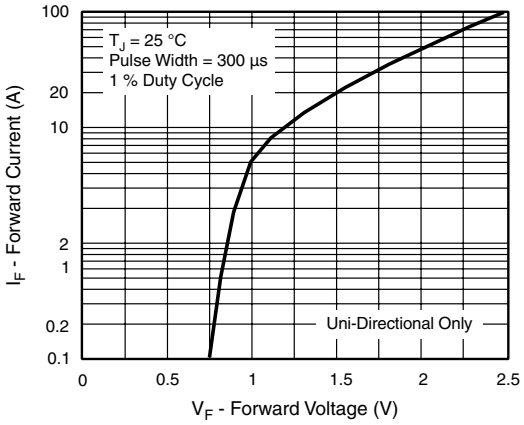


Figure 11. Typical Instantaneous Forward Voltage

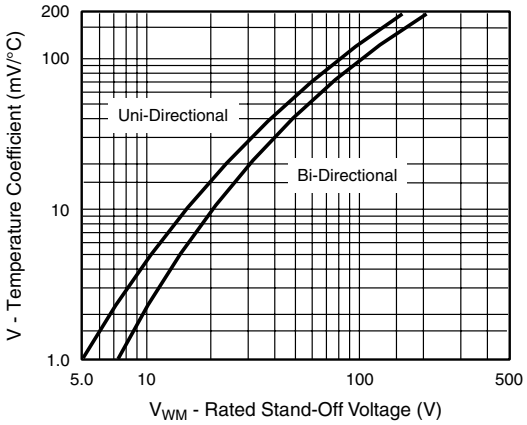
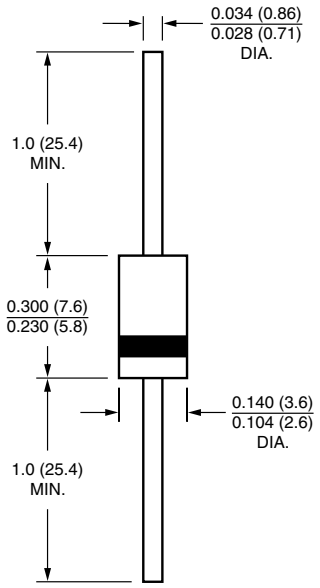


Figure 12. Breakdown Voltage Temperature Coefficient Curve

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AC (DO-15)



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