

# 1SMB5.0A(CA) - 1SMB440A(CA)

## SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR DIODE

**VOLTAGE RANGE: 5.0 - 440 V**  
**POWER: 600Watts**

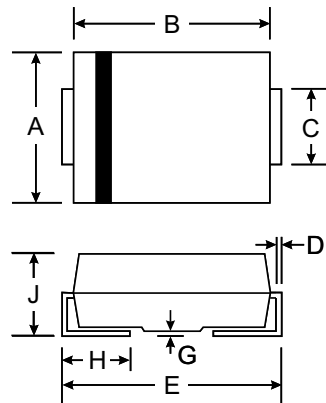
### Features

- Glass Passivated Die Construction
- Uni- and Bi-Directional Versions Available
- Excellent Clamping Capability
- Fast Response Time
- Plastic Material: UL Flammability Classification Rating 94V-0



### Mechanical Data

- Case: DO-214AA(SMB), Transfer Molding Epoxy
- Terminals: Solderable per MIL-STD-202, Method 208
- Polarity Indicator: Cathode Band  
(Note: Bi-directional devices have no polarity indicator.)
- Weight: 0.093 grams (approx.)



SMB(DO-214AA)		
Dim	Min	Max
A	3.30	3.94
B	4.06	4.70
C	1.91	2.21
D	0.15	0.31
E	5.00	5.59
G	0.10	0.20
H	0.76	1.52
J	2.00	2.62
All Dimensions in mm		



### Maximum Ratings and Electrical Characteristics @ $T_A=25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Peak Pulse Power Dissipation (Non repetitive current pulse derated above $T_A = 25^\circ\text{C}$ ) (Note 1)	$P_{PK}$	600	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave Superimposed on Rated Load (JEDEC Method) (Notes 1, 2, & 3)	$I_{FSM}$	100	A
Instantaneous Forward Voltage @ $I_{PP} = 35\text{A}$ (Notes 1, 2, & 3)	$V_F$	$V_{BR} < 100\text{V}$ : 3.5 $V_{BR} \geq 100\text{V}$ : 5.0	V V
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

- Notes:
1. Valid provided that terminals are kept at ambient temperature.
  2. Measured with 8.3ms single half sine-wave. Duty cycle = 4 pulses per minute maximum.
  3. Unidirectional units only.

TYPE		Reverse Stand-Off Voltage	Breakdown Voltage Min. @I <sub>T</sub>	Breakdown Voltage Max. @ I <sub>T</sub>	Test Current	Maximum Clamping Voltage @I <sub>PP</sub>	Peak Pulse Current	Reverse Leakage @V <sub>RWM</sub>
(Uni)	(Bi)	V <sub>RWM</sub> (V)	V <sub>BR</sub> MIN(V)	V <sub>BR</sub> MAX(V)	I <sub>T</sub> (mA)	V <sub>C</sub> (V)	I <sub>PP</sub> (A)	I <sub>R</sub> (uA)
1SMB5.0	1SMB5.0C	5.0	6.40	7.55	10	9.6	62.5	800.0
1SMB5.0A	1SMB5.0CA	5.0	6.40	7.25	10	9.2	65.2	800.0
1SMB6.0	1SMB6.0C	6.0	6.67	8.45	10	11.4	52.6	800.0
1SMB6.0A	1SMB6.0CA	6.0	6.67	7.67	10	10.3	58.3	800.0
1SMB6.5	1SMB6.5C	6.5	7.22	9.14	10	12.3	48.8	500.0
1SMB6.5A	1SMB6.5CA	6.5	7.22	8.30	10	11.2	53.6	500.0
1SMB7.0	1SMB7.0C	7.0	7.78	9.86	10	13.3	45.1	200.0
1SMB7.0A	1SMB7.0CA	7.0	7.78	8.95	10	12.0	50.0	200.0
1SMB7.5	1SMB7.5C	7.5	8.33	10.67	1.0	14.3	42.0	100.0
1SMB7.5A	1SMB7.5CA	7.5	8.33	9.58	1.0	12.9	46.5	100.0
1SMB8.0	1SMB8.0C	8.0	8.89	11.3	1.0	15.0	40.0	50.0
1SMB8.0A	1SMB8.0CA	8.0	8.89	10.23	1.0	13.6	44.1	50.0
1SMB8.5	1SMB8.5C	8.5	9.44	11.92	1.0	15.9	37.7	20.0
1SMB8.5A	1SMB8.5CA	8.5	9.44	10.82	1.0	14.4	41.7	20.0
1SMB9.0	1SMB9.0C	9.0	10.0	12.6	1.0	16.9	35.5	10.0
1SMB9.0A	1SMB9.0CA	9.0	10.0	11.5	1.0	15.4	39.0	10.0
1SMB10	1SMB10C	10	11.1	14.1	1.0	18.8	31.9	5.0
1SMB10A	1SMB10CA	10	11.1	12.8	1.0	17.0	35.3	5.0
1SMB11	1SMB11C	11	12.2	15.4	1.0	20.1	29.9	5.0
1SMB11A	1SMB11CA	11	12.2	14.0	1.0	18.2	33.0	5.0
1SMB12	1SMB12C	12	13.3	16.9	1.0	22.0	27.3	5.0
1SMB12A	1SMB12CA	12	13.3	15.3	1.0	19.9	30.2	5.0
1SMB13	1SMB13C	13	14.4	18.2	1.0	23.8	25.2	5.0
1SMB13A	1SMB13CA	13	14.4	16.5	1.0	21.5	27.9	5.0
1SMB14	1SMB14C	14	15.6	19.8	1.0	25.8	23.3	5.0
1SMB14A	1SMB14CA	14	15.6	17.9	1.0	23.2	25.9	5.0
1SMB15	1SMB15C	15	16.7	21.1	1.0	26.9	22.3	5.0
1SMB15A	1SMB15CA	15	16.7	19.2	1.0	24.4	24.6	5.0
1SMB16	1SMB16C	16	17.8	22.6	1.0	28.8	20.8	5.0
1SMB16A	1SMB16CA	16	17.8	20.5	1.0	26.0	23.1	5.0
1SMB17	1SMB17C	17	18.9	23.9	1.0	30.5	19.7	5.0
1SMB17A	1SMB17CA	17	18.9	21.7	1.0	27.6	21.7	5.0
1SMB18	1SMB18C	18	20.0	25.3	1.0	32.2	18.6	5.0
1SMB18A	1SMB18CA	18	20.0	23.3	1.0	29.2	20.5	5.0
1SMB20	1SMB20C	20	22.2	28.1	1.0	35.8	16.8	5.0
1SMB20A	1SMB20CA	20	22.2	25.5	1.0	32.4	18.5	5.0
1SMB22	1SMB22C	22	24.4	30.9	1.0	39.4	15.2	5.0
1SMB22A	1SMB22CA	22	24.4	28.0	1.0	35.5	16.9	5.0

**Note:**

- (1) V<sub>BR</sub> measured after I<sub>T</sub> applied for 300 μs., I<sub>T</sub> = square wave pulse or equivalent.
- (2) Surge Current Waveform per Figure 5 and Derate per Figure 1
- (3) A Transient suppressor is normally selected according to the reverse " Stand-off Voltage " (V<sub>RWM</sub>) which should be equal to or greater than the D.C. or continuous peak operating voltage level.

TYPE		Reverse Stand-Off Voltage	Breakdown Voltage Min. @I <sub>T</sub>	Breakdown Voltage Max. @ I <sub>T</sub>	Test Current	Maximum Clamping Voltage @I <sub>PP</sub>	Peak Pulse Current	Reverse Leakage @V <sub>RWM</sub>
(Uni)	(Bi)	V <sub>RWM</sub> (V)	V <sub>BR MIN</sub> (V)	V <sub>BR MAX</sub> (V)	I <sub>T</sub> (mA)	V <sub>C</sub> (V)	I <sub>PP</sub> (A)	I <sub>R</sub> (uA)
1SMB24	1SMB24C	24	26.7	33.8	1.0	43.0	14.0	5.0
1SMB24A	1SMB24CA	24	26.7	30.7	1.0	38.9	15.4	5.0
1SMB26	1SMB26C	26	28.9	36.6	1.0	46.6	12.9	5.0
1SMB26A	1SMB26CA	26	28.9	33.2	1.0	42.1	14.3	5.0
1SMB28	1SMB28C	28	31.1	39.4	1.0	50.0	12.0	5.0
1SMB28A	1SMB28CA	28	31.1	35.8	1.0	45.4	13.2	5.0
1SMB30	1SMB30C	30	33.3	42.2	1.0	53.5	11.2	5.0
1SMB30A	1SMB30CA	30	33.3	38.3	1.0	48.4	12.4	5.0
1SMB33	1SMB33C	33	36.7	46.5	1.0	59.0	10.2	5.0
1SMB33A	1SMB33CA	33	36.7	42.2	1.0	53.3	11.3	5.0
1SMB36	1SMB36C	36	40.0	50.7	1.0	64.3	9.3	5.0
1SMB36A	1SMB36CA	36	40.0	46.0	1.0	58.1	10.3	5.0
1SMB40	1SMB40C	40	44.4	56.3	1.0	71.4	8.4	5.0
1SMB40A	1SMB40CA	40	44.4	51.1	1.0	64.5	9.3	5.0
1SMB43	1SMB43C	43	47.8	60.5	1.0	76.7	7.8	5.0
1SMB43A	1SMB43CA	43	47.8	54.9	1.0	69.4	8.6	5.0
1SMB45	1SMB45C	45	50.0	63.3	1.0	80.3	7.5	5.0
1SMB45A	1SMB45CA	45	50.0	57.5	1.0	72.7	8.3	5.0
1SMB48	1SMB48C	48	53.3	67.5	1.0	85.5	7.0	5.0
1SMB48A	1SMB48CA	48	53.3	61.3	1.0	77.4	7.8	5.0
1SMB51	1SMB51C	51	56.7	71.8	1.0	91.1	6.6	5.0
1SMB51A	1SMB51CA	51	56.7	65.2	1.0	82.4	7.3	5.0
1SMB54	1SMB54C	54	60.0	76.0	1.0	96.3	6.2	5.0
1SMB54A	1SMB54CA	54	60.0	69.0	1.0	87.1	6.9	5.0
1SMB58	1SMB58C	58	64.4	81.6	1.0	103	5.8	5.0
1SMB58A	1SMB58CA	58	64.4	74.1	1.0	93.6	6.4	5.0
1SMB60	1SMB60C	60	66.7	84.5	1.0	107	5.6	5.0
1SMB60A	1SMB60CA	60	66.7	76.7	1.0	96.8	6.2	5.0
1SMB64	1SMB64C	64	71.1	90.1	1.0	114	5.3	5.0
1SMB64A	1SMB64CA	64	71.1	81.8	1.0	103	5.8	5.0
1SMB70	1SMB70C	70	77.8	98.6	1.0	125	4.8	5.0
1SMB70A	1SMB70CA	70	77.8	89.5	1.0	113	5.3	5.0
1SMB75	1SMB75C	75	83.0	105.7	1.0	134	4.5	5.0
1SMB75A	1SMB75CA	75	83.0	95.8	1.0	121	5.0	5.0
1SMB78	1SMB78C	78	86.0	109.8	1.0	139	4.3	5.0
1SMB78A	1SMB78CA	78	86.0	99.7	1.0	126	4.8	5.0
1SMB85	1SMB85C	85	94.0	119.2	1.0	151	4.0	5.0
1SMB85A	1SMB85CA	85	94.0	108.2	1.0	137	4.4	5.0
1SMB90	1SMB90C	90	100	126.5	1.0	160	3.8	5.0

TYPE		Reverse Stand-Off Voltage	Breakdown Voltage Min. @I <sub>T</sub>	Breakdown Voltage Max. @ I <sub>T</sub>	Test Current	Maximum Clamping Voltage @I <sub>PP</sub>	Peak Pulse Current	Reverse Leakage @V <sub>RWM</sub>
(Uni)	(Bi)	V <sub>RWM</sub> (V)	V <sub>BR MIN</sub> (V)	V <sub>BR MAX</sub> (V)	I <sub>T</sub> (mA)	V <sub>C</sub> (V)	I <sub>PP</sub> (A)	I <sub>R</sub> ( $\mu$ A)
1SMB90A	1SMB90CA	90	100	115.5	1.0	146	4.1	5.0
1SMB100	1SMB100C	100	111	141.0	1.0	179	3.4	5.0
1SMB100A	1SMB100CA	100	111	128.0	1.0	162	3.7	5.0
1SMB110	1SMB110C	110	122	154.5	1.0	196	3.1	5.0
1SMB110A	1SMB110CA	100	122	140.5	1.0	177	3.4	5.0
1SMB120	1SMB120C	120	133	169.0	1.0	214	2.8	5.0
1SMB120A	1SMB120CA	120	133	153.0	1.0	193	3.1	5.0
1SMB130	1SMB130C	130	144	182.5	1.0	231	2.6	5.0
1SMB130A	1SMB130CA	130	144	165.5	1.0	209	2.9	5.0
1SMB150	1SMB150C	150	167	211.5	1.0	268	2.2	5.0
1SMB150A	1SMB150CA	150	167	192.5	1.0	243	2.5	5.0
1SMB160	1SMB160C	160	178	226.0	1.0	287	2.1	5.0
1SMB160A	1SMB160CA	160	178	205.0	1.0	259	2.3	5.0
1SMB170	1SMB170C	170	189	239.5	1.0	304	2.0	5.0
1SMB170A	1SMB170CA	170	189	217.5	1.0	275	2.2	5.0
1SMB180	1SMB180C	180	200	253.8	1.0	321	1.9	5.0
1SMB180A	1SMB180CA	180	200	230.4	1.0	290	2.1	5.0
1SMB190	1SMB190C	190	211	267.9	1.0	339	1.8	5.0
1SMB190A	1SMB190CA	190	211	243.2	1.0	306	2.0	5.0
1SMB200	1SMB200C	200	222	282.0	1.0	356	1.7	5.0
1SMB200A	1SMB200CA	200	222	256.0	1.0	322	1.9	5.0
1SMB210	1SMB210C	210	233	296.1	1.0	375	1.6	5.0
1SMB210A	1SMB210CA	210	233	268.8	1.0	339	1.8	5.0
1SMB220	1SMB220C	220	244	310.2	1.0	392	1.5	5.0
1SMB220A	1SMB220CA	220	244	281.6	1.0	355	1.7	5.0
1SMB250	1SMB250C	250	278	342.5	1.0	447	1.3	5.0
1SMB250A	1SMB250CA	250	278	309.0	1.0	403	1.5	5.0
1SMB300	1SMB300C	300	333	411.0	1.0	535	1.1	5.0
1SMB300A	1SMB300CA	300	333	371.0	1.0	484	1.2	5.0
1SMB350	1SMB350C	350	389	479.5	1.0	624	1.0	5.0
1SMB350A	1SMB350CA	350	389	432.0	1.0	565	1.1	5.0
1SMB400	1SMB400C	400	444	548.0	1.0	687	0.9	5.0
1SMB400A	1SMB400CA	400	444	494.0	1.0	645	0.9	5.0
1SMB440	1SMB440C	440	489	602.8	1.0	786	0.8	5.0
1SMB440A	1SMB440CA	440	489	543.0	1.0	710	0.8	5.0

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

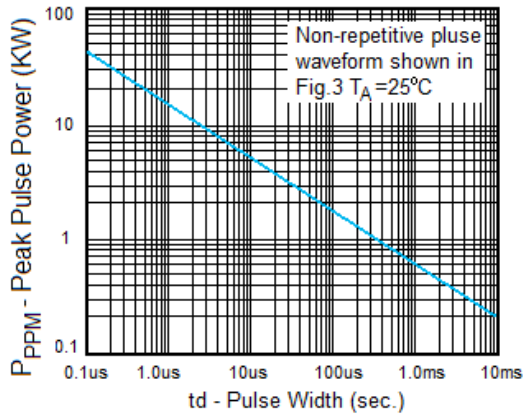


Fig. 1 Peak Pulse Power Rating

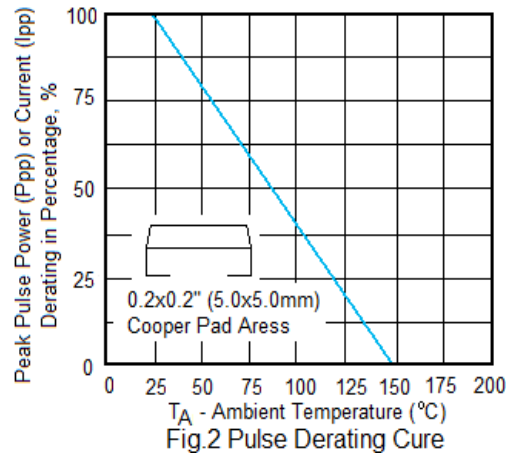


Fig. 2 Pulse Derating Curve

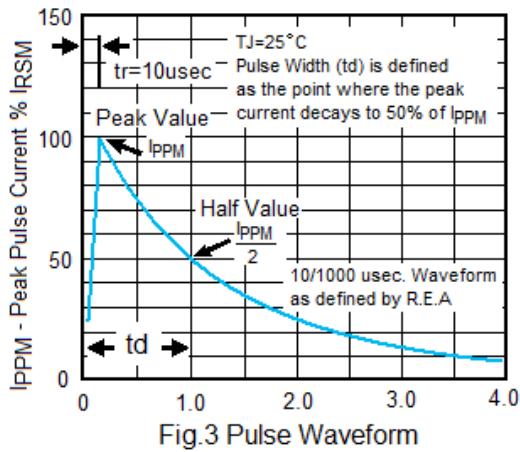


Fig. 3 Pulse Waveform

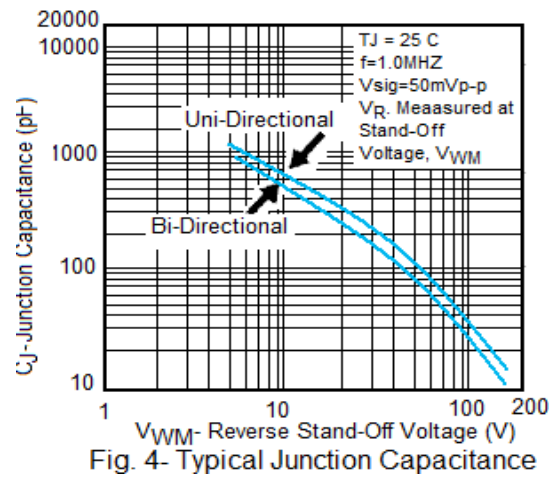


Fig. 4- Typical Junction Capacitance