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November 2014

# SMBJ5V0(C)A - SMBJ170(C)A 600 Watt Transient Voltage Suppressors

## Features

- Glass-Passivated Junction
- 600 W Peak Pulse Power Capability on 10/1000  $\mu$ s Waveform.
- Excellent Clamping Capability
- Low-Incremental Surge Resistance
- Fast Response Time: Typically Less than 1.0 ps from 0 V to BV minimum for Unidirectional and 5.0 ns for Bidirectional
- Typical  $I_R$  Less than 1.0  $\mu$ A Above 10 V
- UL Certificate #E258596



**SMB/DO-214AA**

Band denotes cathode on unidirectional devices only. No band on bi-directional devices. Bi-directional types have CA suffix where electrical characteristics apply in both directions suitable for bi-directional applications.

## Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Value	Unit
$P_{PPM}$	Peak Pulse Power Dissipation on 10/1000 $\mu$ s Waveform	600	W
$I_{PPM}$	Peak Pulse Current on 10/1000 $\mu$ s Waveform	See Table	A
$I_{FSM}$	Non-Repetitive Peak Forward Surge Current Superimposed on Rated Load (JEDEC Method) <sup>(1)</sup>	100	A
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

### Note:

1. Measured on 8.3 ms single half-sine wave or equivalent square wave: duty cycle = 4 pulses per minute maximum.

SMBJ5V0(C)A - SMBJ170(C)A — 600 Watt Transient Voltage Suppressors

## Electrical Characteristics

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Uni-Directional Bi-Directional (C) Device	Part Marking <sup>(2)</sup>	Reverse Stand-Off Voltage $V_{RWM}$ (V)	Breakdown Voltage $V_{BR}$ (V)		Test Current $I_T$ (mA)	Clamping Voltage at $I_{PPM}$ $V_C$ (V)	Peak Pulse Current $I_{PPM}$ (A)	Reverse Leakage at $V_{RWM}$ $I_R$ ( $\mu\text{A}$ ) <sup>(3)</sup>
			Min.	Max.				
SMBJ5V0(C)A	KE	5.0	6.40	7.00	10	9.2	65.2	800
SMBJ6V0(C)A	KG	6.0	6.67	7.37	10	10.3	58.3	800
SMBJ6V5(C)A	KK	6.5	7.22	7.98	10	11.2	53.6	500
SMBJ7V0(C)A	KM	7.0	7.78	8.60	10	12.0	50.0	200
SMBJ7V5(C)A	KP	7.5	8.33	9.21	1	12.9	46.5	100
SMBJ8V0(C)A	KR	8.0	8.89	9.83	1	13.6	44.1	50
SMBJ8V5(C)A	KT	8.5	9.44	10.4	1	14.4	41.7	20
SMBJ9V0(C)A	KV	9.0	10.0	11.1	1	15.4	39.0	10
SMBJ10(C)A	KX	10	11.1	12.8	1	17.0	35.3	5
SMBJ11(C)A	KZ	11	12.2	13.5	1	18.2	33.0	5
SMBJ12(C)A	LE	12	13.3	14.7	1	19.9	30.2	5
SMBJ13(C)A	LG	13	14.4	15.9	1	21.5	27.9	5
SMBJ14(C)A	LK	14	15.6	17.2	1	23.2	25.9	5
SMBJ15(C)A	LM	15	16.7	18.5	1	24.4	24.6	5
SMBJ16(C)A	LP	16	17.8	19.7	1	26.0	23.1	5
SMBJ17(C)A	LR	17	18.9	20.9	1	27.6	21.7	5
SMBJ18(C)A	LT	18	20.0	22.1	1	29.2	20.5	5
SMBJ20(C)A	LV	20	22.2	24.5	1	32.4	18.5	5
SMBJ22(C)A	LX	22	24.4	26.9	1	35.5	16.9	5
SMBJ24(C)A	LZ	24	26.7	29.5	1	38.9	15.4	5
SMBJ26(C)A	ME	26	28.9	31.9	1	42.1	14.3	5
SMBJ28(C)A	MG	28	31.1	34.4	1	45.4	13.2	5
SMBJ30(C)A	MK	30	33.3	36.8	1	48.4	12.4	5
SMBJ33(C)A	MM	33	36.7	40.6	1	53.3	11.3	5
SMBJ36(C)A	MP	36	40.0	44.2	1	58.1	10.3	5
SMBJ40(C)A	MR	40	44.4	49.1	1	64.5	9.3	5
SMBJ43(C)A	MT	43	47.8	52.8	1	69.4	8.6	5
SMBJ45(C)A	MV	45	50.0	55.3	1	72.7	8.3	5
SMBJ48(C)A	MX	48	53.3	58.9	1	77.4	7.8	5
SMBJ51(C)A	MZ	51	56.7	62.7	1	82.4	7.3	5
SMBJ54(C)A	NE	54	60.0	66.3	1	87.1	6.9	5
SMBJ58(C)A	NG	58	64.4	71.2	1	93.6	6.4	5
SMBJ60(C)A	NK	60	66.7	73.7	1	96.8	6.2	5
SMBJ64(C)A	NM	64	71.1	78.6	1	103.0	5.8	5
SMBJ70(C)A	NP	70	77.8	86.0	1	113.0	5.3	5
SMBJ75(C)A	NR	75	83.3	92.1	1	121.0	5.0	5
SMBJ78(C)A	NT	78	86.7	95.8	1	126.0	4.8	5

### Notes:

2. Color band denotes cathode on unidirectional devices only. No color band on bidirectional devices.
3. For bidirectional parts with  $V_{RWM} < 10$  V, the  $I_R$  max limit is doubled.

**Electrical Characteristics** (Continued)Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Uni-Directional Bi-Directional (C) Device	Part Marking <sup>(2)</sup>	Reverse Stand-Off Voltage $V_{RWM}$ (V)	Breakdown Voltage $V_{BR}$ (V)		Test Current $I_T$ (mA)	Clamping Voltage at $I_{PPM}$ $V_C$ (V)	Peak Pulse Current $I_{PPM}$ (A)	Reverse Leakage at $V_{RWM}$ $I_R$ ( $\mu\text{A}$ ) <sup>(3)</sup>
			Min.	Max.				
SMBJ85(C)A	NV	85	94.4	104.0	1	137.0	4.4	5
SMBJ90(C)A	NX	90	100.0	111.0	1	146.0	4.1	5
SMBJ100(C)A	NZ	100	111.0	123.0	1	162.0	3.7	5
SMBJ110(C)A	PE	110	122.0	135.0	1	177.0	3.4	5
SMBJ120(C)A	PG	120	133.0	147.0	1	193.0	3.1	5
SMBJ130(C)A	PK	130	144.0	159.0	1	209.0	2.9	5
SMBJ150(C)A	PM	150	167.0	185.0	1	243.0	2.5	5
SMBJ160(C)A	PP	160	178.0	197.0	1	259.0	2.3	5
SMBJ170(C)A	PR	170	189.0	209.0	1	275.0	2.2	5

**Notes:**

- Color band denotes cathode on unidirectional devices only. No color band on bidirectional devices.
- For bidirectional parts with  $V_{RWM} < 10$  V, the  $I_R$  max limit is doubled.

## Typical Performance Characteristics



Figure 1. Peak Pulse Power Rating Curve



Figure 2. Pulse Derating Curve



Figure 3. Pulse Waveform



Figure 4. Junction Capacitance



Figure 5. Non-Repetitive Surge Current



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