

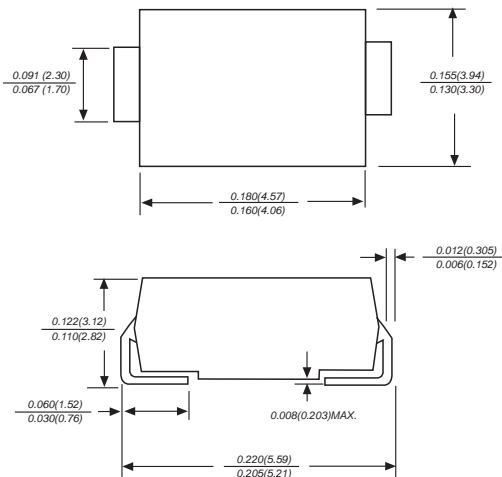


# SMBJ5.0 THRU SMBJ170CA

## SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

Breskdown voltage: 5.0-170 Volts Peak pulse power: 600 Wallts

### DO-214AA/SMB



Dimensions in inches and (millimeters)

### FEATURE

- ◆ Optimized for LAN protection applications
- ◆ Ideal for ESD protection of data lines in accordance with IEC 1000-4-2(IEC801-2)
- ◆ Ideal for EFT protection of data lines in accordance with IEC1000-4-4(IEC801-2)
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated junction
- ◆ 600w peak pulse power capability
- ◆ Excellent clamping capability
- ◆ Low incremental surge resistance
- ◆ Fast response time: typically less than 1.0ps from 0v to  $V_{(BR)}$  min
- ◆ High temperature soldering guaranteed: 265°C/10S at terminals

### MECHANICAL DATA

**Case:** JEDEC DO-214AA molded plastic body over passivated junction

**Terminals:** Solder plated , solderable per MIL-STD 750, method 2026

**Polarity:** Color band denotes cathode except for bidirectional types

**Mounting Position:** Any

**Weight:** 0.005 ounce,0.138 grams

### DEVICES FOR BIDIRECTIONAL APPLICATIONS

For bidirectional use suffix C or CA for types SMBJ5.0 thru SMBJ170 (e.g. SMBJ5.0C,SMBJ170CA)  
Electrical characteristics apply in both directions.

### MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

	SYMBOLS	VALUE	UNITS
Peak pulse power dissipation with a 10/1000µs wavetorm(NOTE 1,2,FIG.1)	P <sub>PPM</sub>	Minimum 600	Watts
Peak forward surge current (Note 1,2,3)	I <sub>FSM</sub>	100.0	Amps
Peak pulse current with a 10/1000µs waveform(NOTE 1)	I <sub>PPM</sub>	See Table 1	Amps
Steady state power dissipation (Note 3)	P <sub>M(AV)</sub>	5.0	Watts
Maximum instantaneous forward voltage at 50A(Note 3,4) unidirectional only	V <sub>F</sub>	3.5/5.0	Volts
Operating junction and storage temperature range	T <sub>STG</sub> ,T <sub>J</sub>	-55 to + 150	°C

**Notes:** 1.Non-repetitive current pulse,per Fig.3 and derated above T<sub>A</sub>=25°C per Fig.2

2.Mounted on 5.0mm<sup>2</sup> copper pads to each terminal

3.Measured on 8.3ms single half sine-wine.For uni-directional devices only.

4.V<sub>F</sub>=3.5V on SMB-5.0 thru SMB-90 devices and V<sub>F</sub>=5.0V on SMB-100 thru SMB-170 devices

**MDD ELECTRONIC**

# ELECTRICAL CHARACTERISTICS (at Ta=25°C unless otherwise noted)

Device Uni-directional	Device Bi-directional	Device Marking code		Working Peak Reverse Voltage VRWM (volts)	Breakdown Voltage VBR Volts			Maximum Reverse Voltage at IRSM (Clamping Voltage) VRSM (volts)	Maximum Reverse Surge Current IRSM (Amps)	Maximum Reverse Leakage at VRWM IR (µA)
		(UNI)	(BI)		Min(V)	Max(V)	@ IT(mA)			
SMBJ5.0	SMBJ5.0C	KD	AD	5.0	6.40	7.55	10	9.6	62.5	800
SMBJ5.0A	SMBJ5.0CA	KE	AE	5.0	6.40	7.25	10	9.2	65.2	800
SMBJ6.0	SMBJ6.0C	KF	AF	6.0	6.67	8.45	10	11.4	52.3	800
SMBJ6.0A	SMBJ6.0CA	KG	AG	6.0	6.67	7.67	10	10.3	58.3	800
SMBJ6.5	SMBJ6.5C	KH	AH	6.5	7.22	9.14	10	12.3	48.7	500
SMBJ6.5A	SMBJ6.5CA	KK	AK	6.5	7.22	8.30	10	11.2	53.6	500
SMBJ7.0	SMBJ7.0C	KL	AL	7.0	7.78	9.86	10	13.3	45.1	200
SMBJ7.0A	SMBJ7.0CA	KM	AM	7.0	7.78	8.95	10	12.0	50.0	200
SMBJ7.5	SMBJ7.5C	KN	AN	7.5	8.33	10.80	1.0	14.3	42.0	100
SMBJ7.5A	SMBJ7.5CA	KP	AP	7.5	8.33	9.58	1.0	12.9	46.5	100
SMBJ8.0	SMBJ8.0C	KQ	AQ	8.0	8.89	11.30	1.0	15.0	40.0	50
SMBJ8.0A	SMBJ8.0CA	KR	AR	8.0	8.89	10.20	1.0	13.6	44.1	50
SMBJ8.5	SMBJ8.5C	KS	AS	8.5	9.44	11.90	1.0	15.9	37.7	20
SMBJ8.5A	SMBJ8.5CA	KT	AT	8.5	9.44	10.80	1.0	14.4	41.7	20
SMBJ9.0	SMBJ9.0C	KU	AU	9.0	10.00	12.80	1.0	16.9	35.5	10
SMBJ9.0A	SMBJ9.0CA	KV	AV	9.0	10.00	11.50	1.0	15.4	39.0	10
SMBJ10	SMBJ10C	KW	AW	10.0	11.10	14.10	1.0	18.8	31.9	5.0
SMBJ10A	SMBJ10CA	KX	AX	10.0	11.10	12.80	1.0	17.0	35.3	5.0
SMBJ11	SMBJ11C	KY	AY	11.0	12.20	15.40	1.0	20.1	29.9	5.0
SMBJ11A	SMBJ11CA	KZ	AZ	11.0	12.20	14.40	1.0	18.2	33.0	5.0
SMBJ12	SMBJ12C	LD	BD	12.0	13.30	16.90	1.0	22.0	27.3	5.0
SMBJ12A	SMBJ12CA	LE	BE	12.0	13.30	15.30	1.0	19.9	30.2	5.0
SMBJ13	SMBJ13C	LF	BF	13.0	14.40	18.20	1.0	23.8	25.2	5.0
SMBJ13A	SMBJ13CA	LG	BG	13.0	14.40	16.50	1.0	21.5	27.9	5.0
SMBJ14	SMBJ14C	LH	BH	14.0	15.60	19.80	1.0	25.8	23.3	5.0
SMBJ14A	SMBJ14CA	LK	BK	14.0	15.60	17.90	1.0	23.2	25.8	5.0
SMBJ15	SMBJ15C	LL	BL	15.0	16.70	21.10	1.0	26.9	22.3	5.0
SMBJ15A	SMBJ15CA	LM	BM	15.0	16.70	19.20	1.0	24.4	24.0	5.0
SMBJ16	SMBJ16C	LN	BN	16.0	17.80	22.60	1.0	28.8	20.8	5.0
SMBJ16A	SMBJ16CA	LP	BP	16.0	17.80	20.50	1.0	26.0	23.1	5.0
SMBJ17	SMBJ17C	LQ	BP	17.0	18.90	23.90	1.0	30.5	19.7	5.0
SMBJ17A	SMBJ17CA	LR	BR	17.0	18.90	21.70	1.0	27.6	21.7	5.0
SMBJ18	SMBJ18C	LS	BS	18.0	20.00	25.30	1.0	32.2	18.6	5.0
SMBJ18A	SMBJ18CA	LT	BT	18.0	20.00	23.30	1.0	29.2	20.5	5.0
SMBJ20	SMBJ20C	LU	BU	20.0	22.20	28.10	1.0	35.8	16.7	5.0
SMBJ20A	SMBJ20CA	LV	BV	20.0	22.20	25.50	1.0	32.4	18.5	5.0
SMBJ22	SMBJ22C	LW	BW	22.0	24.40	30.90	1.0	39.4	15.2	5.0
SMBJ22A	SMBJ22CA	LX	BX	22.0	24.40	28.00	1.0	35.5	16.9	5.0
SMBJ24	SMBJ24C	LY	BY	24.0	26.70	33.80	1.0	43.0	14.0	5.0
SMBJ24A	SMBJ24CA	LZ	BZ	24.0	26.70	30.70	1.0	38.9	15.4	5.0
SMBJ26	SMBJ26C	MD	CD	26.0	28.90	36.80	1.0	46.6	12.4	5.0
SMBJ26A	SMBJ26CA	ME	CE	26.0	28.90	32.20	1.0	42.1	14.2	5.0
SMBJ28	SMBJ28C	MF	CF	28.0	31.10	39.40	1.0	50.0	12.0	5.0
SMBJ28A	SMBJ28CA	MG	CG	28.0	31.10	35.80	1.0	45.4	13.2	5.0
SMBJ30	SMBJ30C	MH	CH	30.0	33.30	42.40	1.0	53.5	11.2	5.0
SMBJ30A	SMBJ30CA	MK	CK	30.0	33.30	38.30	1.0	48.4	12.4	5.0
SMBJ33	SMBJ33C	ML	CL	33.0	36.70	46.90	1.0	59.0	10.2	5.0
SMBJ33A	SMBJ33CA	MM	CM	33.0	36.70	42.20	1.0	53.3	11.3	5.0

# ELECTRICAL CHARACTERISTICS (at TA=25°C unless otherwise noted)

Device Uni-directional	Device Bi-directional	Device Marking code		Working Peak Reverse Voltage	Breakdown Voltage VBR Volts			Maximum Reverse Voltage at IRSM (Clamping Voltage)	Maximum Reverse Surge Current	Maximum Reverse Leakage at VRWM
		(UNI)	(BI)		VRWM (volts)	Min(V)	Max(V)			
SMBJ36	SMBJ36C	MN	CN	36.0	40.0	50.7	1.0	64.3	9.3	5.0
SMBJ36A	SMBJ36CA	MP	CP	36.0	40.0	46.0	1.0	58.1	10.3	5.0
SMBJ40	SMBJ40C	MQ	CQ	40.0	44.4	56.3	1.0	71.4	8.4	5.0
SMBJ40A	SMBJ40CA	MR	CR	40.0	44.4	51.1	1.0	64.5	9.3	5.0
SMBJ43	SMBJ43C	MS	CS	43.0	47.8	60.5	1.0	76.7	7.8	5.0
SMBJ43A	SMBJ43CA	MT	CT	43.0	47.8	54.9	1.0	69.4	8.6	5.0
SMBJ45	SMBJ45C	MU	CU	45.0	50.0	63.3	1.0	80.3	7.5	5.0
SMBJ45A	SMBJ45CA	MV	CV	45.0	50.0	57.5	1.0	72.7	8.3	5.0
SMBJ48	SMBJ48C	MW	CW	48.0	53.3	67.5	1.0	85.5	7.0	5.0
SMBJ48A	SMBJ48CA	MX	CX	48.0	53.3	61.3	1.0	77.4	7.7	5.0
SMBJ51	SMBJ51C	MY	CY	51.0	56.7	71.8	1.0	91.1	6.6	5.0
SMBJ51A	SMBJ51CA	MZ	CZ	51.0	56.7	65.2	1.0	82.4	7.3	5.0
SMBJ54	SMBJ54C	ND	DD	54.0	60.0	76.0	1.0	96.3	6.2	5.0
SMBJ54A	SMBJ54CA	NE	DE	54.0	60.0	69.0	1.0	87.1	6.9	5.0
SMBJ58	SMBJ58C	NF	DF	58.0	64.4	81.6	1.0	103.0	5.8	5.0
SMBJ58A	SMBJ58CA	NG	DG	58.0	64.4	74.6	1.0	93.6	6.4	5.0
SMBJ60	SMBJ60C	NH	DH	60.0	66.7	84.5	1.0	107.0	5.6	5.0
SMBJ60A	SMBJ60CA	NK	DK	60.0	66.7	76.7	1.0	96.8	6.2	5.0
SMBJ64	SMBJ64C	NL	DL	64.0	71.1	90.1	1.0	114.0	5.3	5.0
SMBJ64A	SMBJ64CA	NM	DM	64.0	71.1	81.8	1.0	103.0	5.8	5.0
SMBJ70	SMBJ70C	NN	DN	70.0	77.8	98.6	1.0	125.0	4.8	5.0
SMBJ70A	SMBJ70CA	NP	DP	70.0	77.8	89.5	1.0	113.0	5.3	5.0
SMBJ75	SMBJ75C	NQ	DQ	75.0	83.3	106.0	1.0	134.0	4.5	5.0
SMBJ75A	SMBJ75CA	NR	DR	75.0	83.3	95.8	1.0	121.0	4.9	5.0
SMBJ78	SMBJ78C	NS	DS	78.0	86.7	110.0	1.0	139.0	4.3	5.0
SMBJ78A	SMBJ78CA	NT	DT	78.0	86.7	99.7	1.0	126.0	4.7	5.0
SMBJ85	SMBJ85C	NU	DU	85.0	94.4	119.2	1.0	151.0	3.9	5.0
SMBJ85A	SMBJ85CA	NV	DV	85.0	94.4	108.2	1.0	137.0	4.4	5.0
SMBJ90	SMBJ90C	NW	DW	90.0	100.0	126.5	1.0	160.0	3.8	5.0
SMBJ90A	SMBJ90CA	NX	DX	90.0	100.0	115.5	1.0	146.0	4.1	5.0
SMBJ100	SMBJ100C	NY	DY	100.0	111.0	141.0	1.0	179.0	3.4	5.0
SMBJ100A	SMBJ100CA	NZ	DZ	100.0	111.0	128.0	1.0	162.0	3.7	5.0
SMBJ110	SMBJ110C	PD	ED	110.0	122.0	154.0	1.0	196.0	3.0	5.0
SMBJ110A	SMBJ110CA	PE	EE	110.0	122.0	140.0	1.0	177.0	3.4	5.0
SMBJ120	SMBJ120C	PF	EF	120.0	133.0	169.0	1.0	214.0	2.8	5.0
SMBJ120A	SMBJ120CA	PG	EG	120.0	133.0	153.0	1.0	193.0	3.1	5.0
SMBJ130	SMBJ130C	PH	EH	130.0	144.0	182.0	1.0	231.0	2.6	5.0
SMBJ130A	SMBJ130CA	PK	EK	130.0	144.0	165.0	1.0	209.0	2.9	5.0
SMBJ150	SMBJ150C	PL	EL	150.0	167.0	211.5	1.0	268.0	2.2	5.0
SMBJ150A	SMBJ150CA	PM	EM	150.0	167.0	192.0	1.0	243.0	2.5	5.0
SMBJ160	SMBJ160C	PN	EN	160.0	178.0	226.0	1.0	287.0	2.1	5.0
SMBJ160A	SMBJ160CA	PP	EP	160.0	178.0	205.0	1.0	259.0	2.3	5.0
SMBJ170	SMBJ170C	PQ	EQ	170.0	189.0	239.5	1.0	304.0	2.0	5.0
SMBJ170A	SMBJ170CA	PR	ER	170.0	189.0	217.5	1.0	275.0	2.2	5.0

**NOTES:** 1. V(BR) measured after It applied for 300μs, It=square wave pulse or equivalent  
2. Surge current waveform per Fig.3 and derated per Fig.2  
3. For bidirectional types having VWM of 10 volts and less, the Id limit is doubled  
4. All items and symbols are consistent with ANSI/IEEE C62.35

# RATINGS AND CHARACTERISTIC CURVES SMBJ5.0 THUR 170CA

FIG. 1-PEAK PULSE POWER RATING CURVE

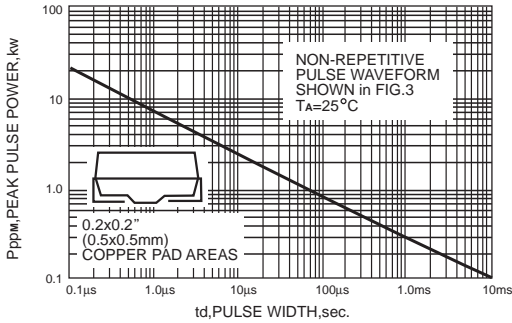


FIG. 2-PULSE DERATING CURVE

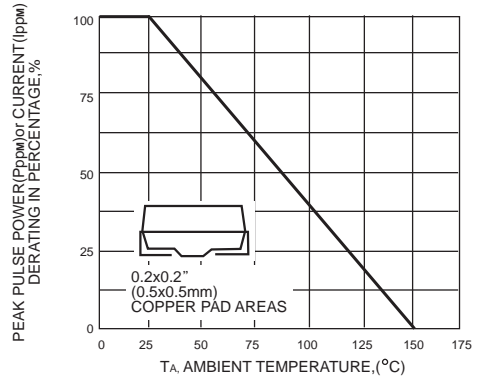


FIG. 3-PULSE WAVEFORM

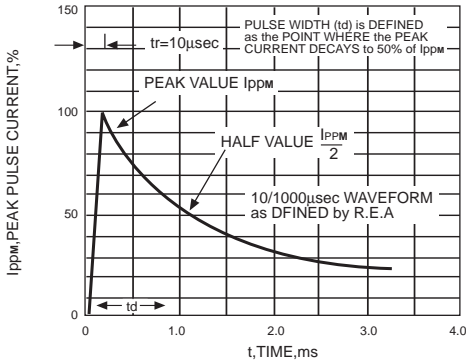


FIG. 4-TYPICAL JUNCTION CAPACITANCE UNIDIRECTIONAL

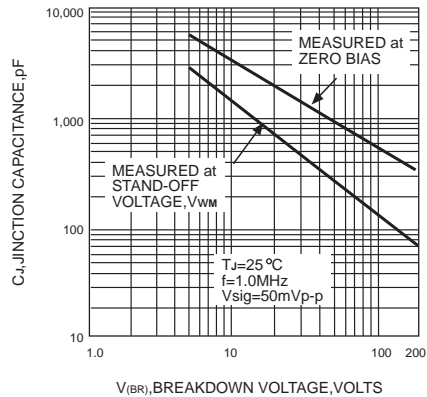


FIG. 5-STEADY STATE POWER DERATING CURVE

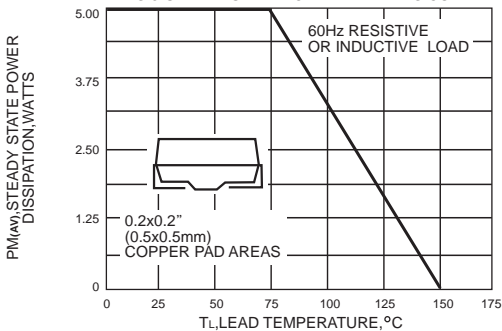
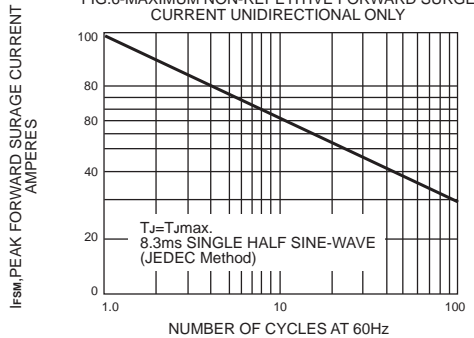


FIG. 6-MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL ONLY



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