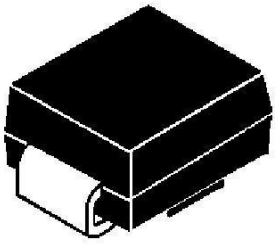
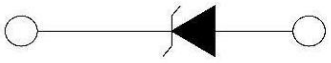
Surface Mount Unidirectional and Bidirectional Transient Voltage Suppressors

Features

- For surface mounted applications in order to optimize board space
- Low profile space
- Glass passivated chip
- Low inductance
- Excellent clamping capability
- Very fast response time
- Typical ID less than 1μA at V_{RWM}
- 5000 W peak pulse power capability with a 10/1000 μs waveform
- Component in accordance to RoHS 2002/95/1 and WEEE 2002/96/EC



SMC (DO-214AB)



Uni-directional

Bi-directional

Mechanical Date

- **Case**: JEDEC DO-214AB molded plastic body over glass passivated chip
- **Terminal**s: Solder plated, solderable per MIL-STD-750 Method 2026
- **Polarity**: For uni-directional types the band by laser denotes the cathode, which is positive with respect to the anode under normal TVS operation

Devices for Bidirectional Applications

- For bi-directional devices, use suffix C or CA (e.g.5.0SMDJ12C, 5.0SMDJ12CA). Electrical characteristics apply in both directions.

Major Ratings and Characteristics

P_{PPM}	**5000 W**
V_{RRM}	**11 V to 190 V**
I_{FSM}	**300 A**
T_j max.	**150 °C**

Maximum Ratings & Thermal Characteristics (T_A = 25 °C unless otherwise noted)

Items	Symbol	Value	UNIT
Peak pulse power dissipation with a 10/1000μs waveform (see fig. 1)	P_{PPM}	5000	W
Peak pulse current with a waveform (see fig. 3 , single pulse)	I_{PPM}	See Next Table	A
Peak forward surge current 8.3ms single half sine-wave uni-directional only	I_{FSM}	300	A
Typical thermal resistance, junction to ambient(1)	$R_{\theta JA}$	75	°C / W
Typical thermal resistance, junction to lead(1)	$R_{\theta JL}$	15	°C / W
Operating junction and storage temperature range	T_J, T_{STG}	–55 to +150	°C

Note 1: Mounted on P.C.B. with 0.32 x 0.32” (8.0 x 8.0mm) copper pad areas.

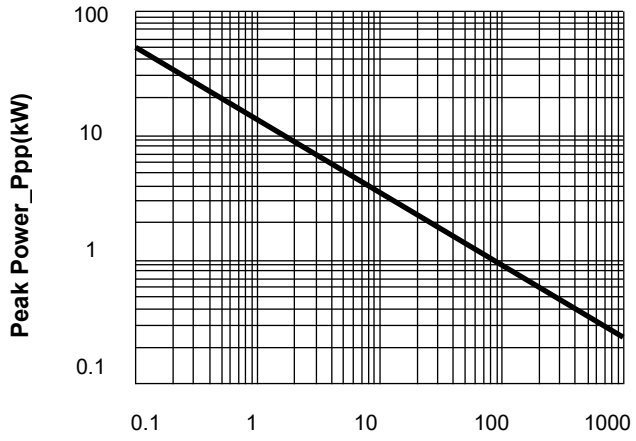
Electrical Characteristics T_A =25℃ unless otherwise noted

Part Number		Marking Code		Breakdown Voltage at I_T $V_{(BR)}$ (V)		Test Current	Stand-off Voltage	Maximum Reverse Leakage at V_{RWM}	Maximum Peak Pulse Surge Current	Maximum Clamping Voltage at I_{PPM}
UNI	BI	UNI	BI	Min	Max	I_T (mA)	V_{RWM} (V)	I_D (μA)	I_{PPM} (A)	V_C (V)
5.0SMDJ11	5.0SMDJ11C	5PDW	5BDW	12.2	14.9	1	11	800	251.2	20.1
5.0SMDJ11A	5.0SMDJ11CA	5PDX	5BDX	12.2	13.5	1	11	800	277.5	18.2
5.0SMDJ12	5.0SMDJ12C	5PDY	5BDY	13.3	16.3	1	12	800	229.5	22.0
5.0SMDJ12A	5.0SMDJ12CA	5PDZ	5BDZ	13.3	14.7	1	12	800	253.8	19.9
5.0SMDJ13	5.0SMDJ13C	5PED	5BED	14.4	17.6	1	13	500	212.1	23.8
5.0SMDJ13A	5.0SMDJ13CA	5PEE	5BEE	14.4	15.9	1	13	500	234.9	21.5
5.0SMDJ14	5.0SMDJ14C	5PEF	5BEF	15.6	19.1	1	14	200	195.7	25.8
5.0SMDJ14A	5.0SMDJ14CA	5PEG	5BEG	15.6	17.2	1	14	200	217.7	23.2
5.0SMDJ15	5.0SMDJ15C	5PEH	5BEH	16.7	20.4	1	15	100	187.7	26.9
5.0SMDJ15A	5.0SMDJ15CA	5PEK	5BEK	16.7	18.5	1	15	100	207.0	24.4
5.0SMDJ16	5.0SMDJ16C	5PEL	5BEL	17.8	21.8	1	16	50	175.3	28.8
5.0SMDJ16A	5.0SMDJ16CA	5PEM	5BEM	17.8	19.7	1	16	50	194.2	26.0
5.0SMDJ17	5.0SMDJ17C	5PEN	5BEN	18.9	23.1	1	17	20	165.6	30.5
5.0SMDJ17A	5.0SMDJ17CA	5PEP	5BEP	18.9	20.9	1	17	20	183.0	27.6
5.0SMDJ18	5.0SMDJ18C	5PEQ	5BEQ	20.0	24.4	1	18	10	156.8	32.2
5.0SMDJ18A	5.0SMDJ18CA	5PER	5BER	20.0	22.1	1	18	10	172.9	29.2
5.0SMDJ19	5.0SMDJ19C	5PES	5BES	21.1	25.8	1	19	10	148.5	34.0
5.0SMDJ19A	5.0SMDJ19CA	5PET	5BET	21.1	23.3	1	19	10	164.1	30.8
5.0SMDJ20	5.0SMDJ20C	5PEU	5BEU	22.2	27.1	1	20	5	141.1	35.8
5.0SMDJ20A	5.0SMDJ20CA	5PEV	5BEV	22.2	24.5	1	20	5	155.9	32.4
5.0SMDJ22	5.0SMDJ22C	5PEW	5BEW	24.4	29.8	1	22	5	128.2	39.4
5.0SMDJ22A	5.0SMDJ22CA	5PEX	5BEX	24.4	26.9	1	22	5	142.3	35.5
5.0SMDJ24	5.0SMDJ24C	5PEY	5BEY	26.7	32.6	1	24	5	117.4	43.0
5.0SMDJ24A	5.0SMDJ24CA	5PEZ	5BEZ	26.7	29.5	1	24	5	129.8	38.9
5.0SMDJ26	5.0SMDJ26C	5PFD	5BFD	28.9	35.3	1	26	5	108.4	46.6
5.0SMDJ26A	5.0SMDJ26CA	5PFF	5BFF	28.9	31.9	1	26	5	120.0	42.1
5.0SMDJ28	5.0SMDJ28C	5PFF	5BFF	31.1	38.0	1	28	5	101.0	50.0
5.0SMDJ28A	5.0SMDJ28CA	5PFG	5BFG	31.1	34.4	1	28	5	111.2	45.4
5.0SMDJ30	5.0SMDJ30C	5PFH	5BFH	33.3	40.7	1	30	5	94.4	53.5
5.0SMDJ30A	5.0SMDJ30CA	5PFK	5BFK	33.3	36.8	1	30	5	104.3	48.4
5.0SMDJ33	5.0SMDJ33C	5PFL	5BFL	36.7	44.9	1	33	5	85.6	59.0
5.0SMDJ33A	5.0SMDJ33CA	5PFM	5BFM	36.7	40.6	1	33	5	94.7	53.3

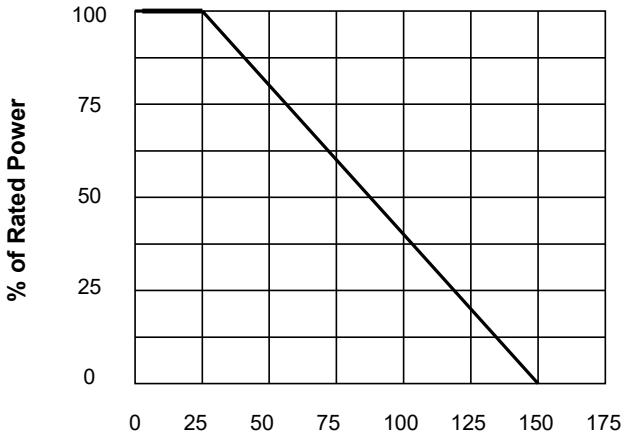
Part Number		Marking Code		Breakdown Voltage at I_T $V_{(BR)}$ (V)		Test Current	Stand-of Voltage	Maximum Reverse Leakage at V_{RWM}	Maximum Peak Pulse Surge Current	Maximum Clamping Voltage at I_{PPM}
UNI	BI	UNI	BI	Min	Max	I_T (mA)	V_{RWM} (V)	I_D (μA)	I_{PPM} (A)	V_C (V)
5.0SMDJ36	5.0SMDJ36C	5PFN	5BFN	40.0	48.9	1	36	5	78.5	64.3
5.0SMDJ36A	5.0SMDJ36CA	5PFP	5BFP	40.0	44.2	1	36	5	86.9	58.1
5.0SMDJ40	5.0SMDJ40C	5PFQ	5BFQ	44.4	54.3	1	40	5	70.7	71.4
5.0SMDJ40A	5.0SMDJ40CA	5PFR	5BFR	44.4	49.1	1	40	5	78.3	64.5
5.0SMDJ43	5.0SMDJ43C	5PFS	5BFS	47.8	58.4	1	43	5	65.8	76.7
5.0SMDJ43A	5.0SMDJ43CA	5PFT	5BFT	47.8	52.8	1	43	5	72.8	69.4
5.0SMDJ45	5.0SMDJ45C	5PFU	5BFU	50.0	61.1	1	45	5	62.9	80.3
5.0SMDJ45A	5.0SMDJ45CA	5PFV	5BFV	50.0	55.3	1	45	5	69.5	72.7
5.0SMDJ48	5.0SMDJ48C	5PFW	5BFW	53.3	65.1	1	48	5	59.1	85.5
5.0SMDJ48A	5.0SMDJ48CA	5PFX	5BFX	53.3	58.9	1	48	5	65.2	77.4
5.0SMDJ51	5.0SMDJ51C	5PFY	5BFY	56.7	69.3	1	51	5	55.4	91.1
5.0SMDJ51A	5.0SMDJ51CA	5PFZ	5BFZ	56.7	62.7	1	51	5	61.3	82.4
5.0SMDJ54	5.0SMDJ54C	5PGD	5BGD	60.0	73.3	1	54	5	52.4	96.3
5.0SMDJ54A	5.0SMDJ54CA	5PGG	5BGG	60.0	66.3	1	54	5	58.0	87.1
5.0SMDJ58	5.0SMDJ58C	5PGF	5BGF	64.4	78.7	1	58	5	49.0	103
5.0SMDJ58A	5.0SMDJ58CA	5PGG	5BGG	64.4	71.2	1	58	5	54.0	93.6
5.0SMDJ60	5.0SMDJ60C	5PGH	5BGH	66.7	81.5	1	60	5	47.2	107
5.0SMDJ60A	5.0SMDJ60CA	5PGK	5BGK	66.7	73.7	1	60	5	52.2	96.8
5.0SMDJ64	5.0SMDJ64C	5PGL	5BGL	71.1	86.9	1	64	5	44.3	114
5.0SMDJ64A	5.0SMDJ64CA	5PGM	5BGM	71.1	78.6	1	64	5	49.0	103
5.0SMDJ70	5.0SMDJ70C	5PGN	5BGN	77.8	95.1	1	70	5	40.4	125
5.0SMDJ70A	5.0SMDJ70CA	5PGP	5BGP	77.8	86.0	1	70	5	44.7	113
5.0SMDJ75	5.0SMDJ75C	5PGQ	5BGQ	83.3	102	1	75	5	37.7	134
5.0SMDJ75A	5.0SMDJ75CA	5PGR	5BGR	83.3	92.1	1	75	5	41.7	121
5.0SMDJ78	5.0SMDJ78C	5PGS	5BGS	86.7	106	1	78	5	36.3	139
5.0SMDJ78A	5.0SMDJ78CA	5PGT	5BGT	86.7	95.8	1	78	5	40.1	126
5.0SMDJ80	5.0SMDJ80C	5PGA	5BGA	89.0	109	1	80	5	35.3	143
5.0SMDJ80A	5.0SMDJ80CA	5PGB	5BGB	88.8	97.6	1	80	5	39.0	130
5.0SMDJ85	5.0SMDJ85C	5PGU	5BGU	94.4	115	1	85	5	33.4	151
5.0SMDJ85A	5.0SMDJ85CA	5PGV	5BGV	94.4	104	1	85	5	36.9	137
5.0SMDJ90	5.0SMDJ90C	5PGW	5BGW	100	122	1	90	5	31.6	160
5.0SMDJ90A	5.0SMDJ90CA	5PGX	5BGX	100	111	1	90	5	34.6	146
5.0SMDJ100	5.0SMDJ100C	5PGY	5BGY	111	136	1	100	5	28.2	179

Part Number		Marking Code		Breakdown Voltage at I_T $V_{(BR)}$ (V)		Test Current	Stand-off Voltage	Maximum Reverse Leakage at V_{RWM}	Maximum Peak Pulse Surge Current	Maximum Clamping Voltage at I_{PPM}
UNI	BI	UNI	DI	Min	Max	I_T (mA)	V_{RWM} (V)	I_D (μA)	I_{PPM} (A)	V_C (V)
5.0SMDJ100A	5.0SMDJ100CA	5PGZ	5BGZ	111	123	1	100	5	31.2	162
5.0SMDJ110	5.0SMDJ110C	5PHD	5BHD	122	149	1	110	5	25.8	196
5.0SMDJ110A	5.0SMDJ110CA	5PHH	5BHH	122	135	1	110	5	28.5	177
5.0SMDJ120	5.0SMDJ120C	5PHF	5BHF	133	163	1	120	5	23.6	214
5.0SMDJ120A	5.0SMDJ120CA	5PHG	5BHG	133	147	1	120	5	26.2	193
5.0SMDJ130	5.0SMDJ130C	5PHH	5BHH	144	176	1	130	5	21.9	231
5.0SMDJ130A	5.0SMDJ130CA	5PHK	5BHK	144	159	1	130	5	24.2	209
5.0SMDJ140	5.0SMDJ140C	5PHA	5BHA	156	190	1	140	5	20.2	251
5.0SMDJ140A	5.0SMDJ140CA	5PHB	5BHB	155	171	1	140	5	22.3	227
5.0SMDJ150	5.0SMDJ150C	5PHL	5BHL	167	204	1	150	5	18.8	268
5.0SMDJ150A	5.0SMDJ150CA	5PHM	5BHM	167	185	1	150	5	20.8	243
5.0SMDJ160	5.0SMDJ160C	5PHN	5BHN	178	218	1	160	5	17.6	287
5.0SMDJ160A	5.0SMDJ160CA	5PHP	5BHP	178	197	1	160	5	19.5	259
5.0SMDJ170	5.0SMDJ170C	5PHQ	5BHQ	189	231	1	170	5	16.6	304
5.0SMDJ170A	5.0SMDJ170CA	5PHR	5BHR	189	209	1	170	5	18.4	275
5.0SMDJ180	5.0SMDJ180C	5PHS	5BHS	200	245	1	180	5	15.7	322
5.0SMDJ180A	5.0SMDJ180CA	5PHT	5BHT	200	220	1	180	5	17.3	292
5.0SMDJ190	5.0SMDJ190C	5PHU	5BHU	211	258	1	190	5	14.8	340
5.0SMDJ190A	5.0SMDJ190CA	5PHV	5BHV	211	232	1	190	5	16.4	308

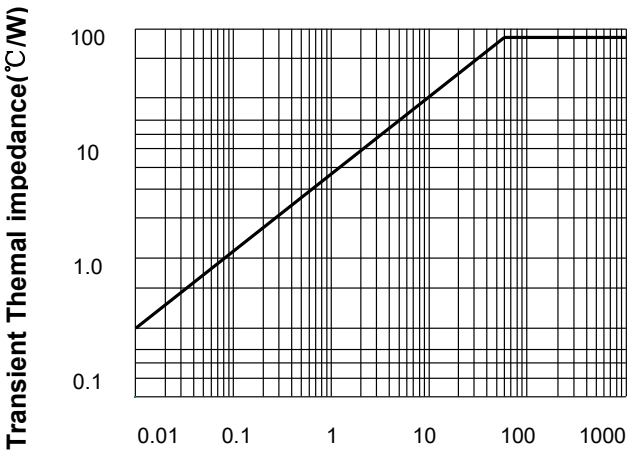
Typical Performance Characteristics (T_A=25°C unless otherwise Specified)



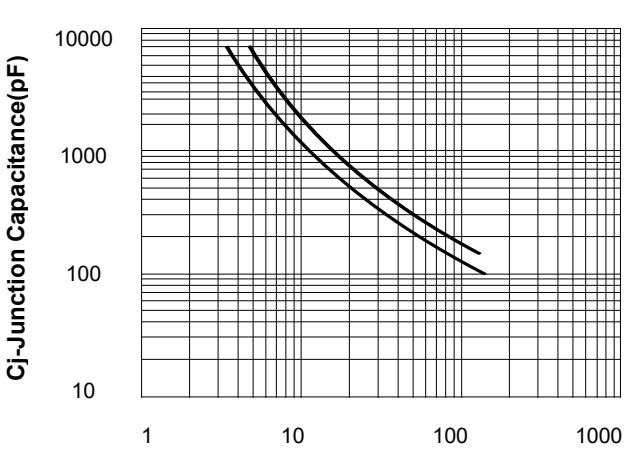
Peak Pulse Power vs. Pulse Time



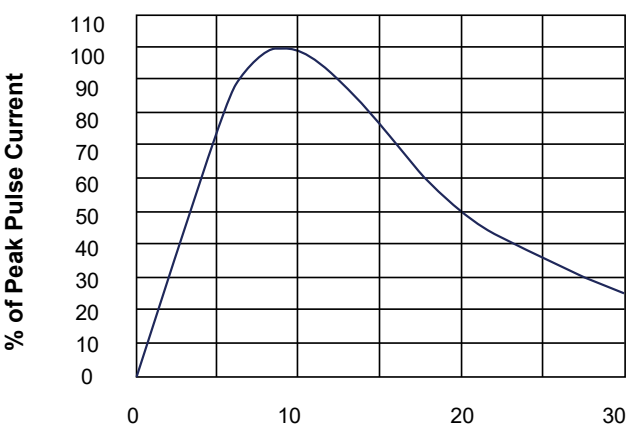
Pulse Derating Cure



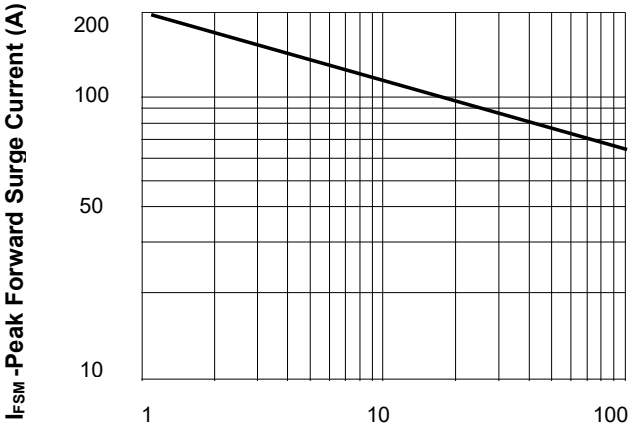
Typical Transient Themal impedance



Typical Junction Capacitance

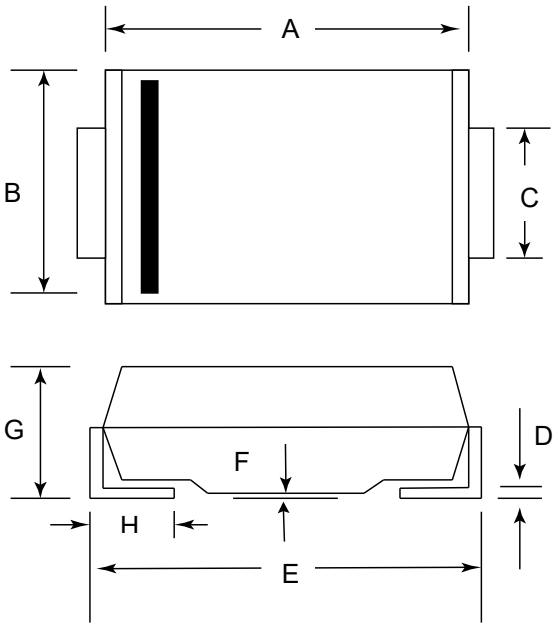


8 X 20uS Pulse Waveform



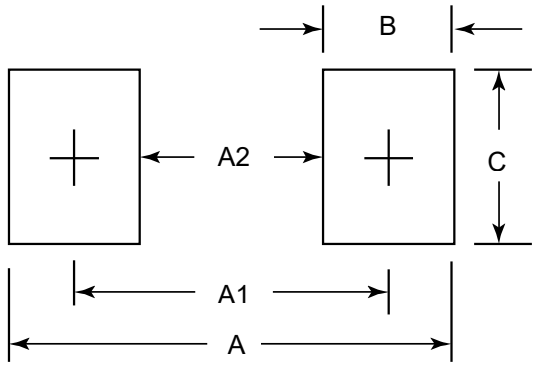
Maximum Non-Repetitive Forward Surge Current(Uni-directional only)

Package Dimensions



Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	6.60	7.11	0.260	0.280
B	5.59	6.22	0.220	0.245
C	2.90	3.20	0.114	0.126
D	0.152	0.305	0.006	0.012
E	7.75	8.13	0.305	0.320
F	----	0.203	----	0.008
G	2.06	2.62	0.081	0.103
H	0.76	1.52	0.030	0.060

Suggested Land Pattern



DIM	Millimeters
A	9.4
A1	6.9
A2	4.4
B	2.5
C	3.3