



# THE DATASHEET OF SMDJ24



# Transient Voltage Suppressors DO-214AB/SMC Package

SMDJ Series

MERITEK

## FEATURE

- Breakdown Voltage from 5.0 to 440V
- 3000W peak pulse power capability with a 10/1000µs waveform, repetitive rate (duty cycle): 0.01%
- Glass passivated chip
- Excellent clamping capability, fast response time.
- Low incremental surge resistance, Low profile package
- Terminal: Solderable per MIL-STD-750, Method 2026
- Epoxy: UL 94V-0 rate flame retardant
- UL/cUL safety approved: certification No: E223045



## ELECTRICAL CHARACTERISTICS



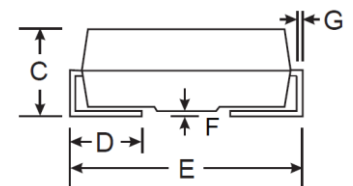
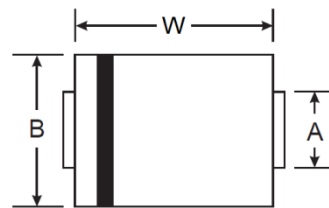
Parameter	Symbols	Value	Unit
Peak power dissipation with a 10/1000µs waveform(1)	P <sub>PP</sub>	3000	Watts
Peak pulse current with a 10/1000µs waveform(1)	I <sub>PP</sub>	See Next Table	Amps
Power dissipation on infinite heatsink at TL = 75 °C	P <sub>D</sub>	6.0	Watts
Peak forward surge current, 8.3 ms single half sine-wave unidirectional only. Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum.	I <sub>FSM</sub>	300	Amps
Maximum instantaneous forward voltage at 25 A for unidirectional only. VF <3.5V for devices of VBR <200V and VF <5.0V for devices of VBR >201V	V <sub>F</sub>	3.5/5.0	Volts
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

Rating at 25°C, ambient temperature unless otherwise specified. Single phase, half wave, 60 Hz, resistive or inductive load. For capacitive load, derate current by 20%.

1.Non-repetitive current pulse per Fig.5 and derated above TA=25°C per Fig.1

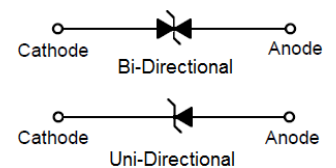
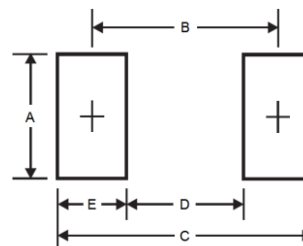
## DIMENSIONS

Item	DO-214AB(SMC)	
	Millimeters	
	Min.	Max.
W	6.52	7.11
A	2.75	3.25
B	5.52	6.22
C	2.00	2.62
D	0.76	1.52
E	7.64	8.13
F	-	0.203
G	0.152	0.305



## SOLDERING PAD LAYOUT

A	B	C	D	E
3.3	6.9	9.3	4.4	2.5



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## ELECTRICAL CHARACTERISTICS(Continued)

Device Type (Uni)	Device Type (Bi)	Marking Code		Breakdown Voltage VBR@IT			Working Peak Reverse Voltage VRWM(V)	Maximum Reverse Leakage IR @ VRWM(V)	Maximum Reverse Surge Current Ipp(A)	Maximum Clamping Voltage VC@Ipp
		Uni	Bi	Min(V)	Max(V)	IT(mA)				
SMDJ5.0	SMDJ5.0C	RDD	DDD	6.40	7.30	50	5.0	5000	312.50	9.6
SMDJ5.0A	SMDJ5.0CA	RDE	DDE	6.40	7.00	50	5.0	5000	326.09	9.2
SMDJ6.0	SMDJ6.0C	RDF	DDF	6.67	8.15	50	6.0	5000	263.16	11.4
SMDJ6.0A	SMDJ6.0CA	RDG	DDG	6.67	7.37	50	6.0	5000	291.26	10.3
SMDJ6.5	SMDJ6.5C	RDH	DDH	7.22	8.82	50	6.5	2000	243.90	12.3
SMDJ6.5A	SMDJ6.5CA	RDK	DDK	7.22	7.98	50	6.5	2000	267.86	11.2
SMDJ7.0	SMDJ7.0C	RDL	DDL	7.78	9.51	50	7.0	1000	225.56	13.3
SMDJ7.0A	SMDJ7.0CA	PDM	DDM	7.78	8.60	50	7.0	1000	250.00	12.0
SMDJ7.5	SMDJ7.5C	PDN	DDN	8.33	10.20	5	7.5	250	209.79	14.3
SMDJ7.5A	SMDJ7.5CA	PDP	DDP	8.33	9.21	5	7.5	250	232.56	12.9
SMDJ8.0	SMDJ8.0C	PDQ	DDQ	8.89	10.90	5	8.0	150	200.00	15.0
SMDJ8.0A	SMDJ8.0CA	PDR	DDR	8.89	9.83	5	8.0	150	220.59	13.6
SMDJ8.5	SMDJ8.5C	PDS	DDS	9.44	11.50	5	8.5	50	188.68	15.9
SMDJ8.5A	SMDJ8.5CA	PDT	DDT	9.44	10.40	5	8.5	50	208.33	14.4
SMDJ9.0	SMDJ9.0C	PDU	DDU	10.00	12.20	5	9.0	20	177.51	16.9
SMDJ9.0A	SMDJ9.0CA	PDV	DDV	10.00	11.10	5	9.0	20	194.81	15.4
SMDJ10	SMDJ10C	PDW	DDW	11.10	13.60	5	10.0	15	159.57	18.8
SMDJ10A	SMDJ10CA	PDX	DDX	11.10	12.30	5	10.0	15	176.47	17.0
SMDJ11	SMDJ11C	PDY	DDY	12.20	14.90	5	11.0	2	149.25	20.1
SMDJ11A	SMDJ11CA	PDZ	DDZ	12.20	13.50	5	11.0	2	164.84	18.2
SMDJ12	SMDJ12C	PED	DED	13.30	16.30	5	12.0	2	136.36	22.0
SMDJ12A	SMDJ12CA	PEE	DEE	13.30	14.70	5	12.0	2	150.75	19.9
SMDJ13	SMDJ13C	PEF	DEF	14.40	17.60	5	13.0	2	126.05	23.8
SMDJ13A	SMDJ13CA	PEG	DEG	14.40	15.90	5	13.0	2	139.53	21.5
SMDJ14	SMDJ14C	PEH	DEH	15.60	19.10	5	14.0	2	116.28	25.8
SMDJ14A	SMDJ14CA	PEK	DEK	15.60	17.20	5	14.0	2	129.31	23.2
SMDJ15	SMDJ15C	PEL	DEL	16.70	20.40	5	15.0	2	111.52	26.9
SMDJ15A	SMDJ15CA	PEM	DEM	16.70	18.50	5	15.0	2	122.95	24.4
SMDJ16	SMDJ16C	PEN	DEN	17.80	21.80	5	16.0	2	104.17	28.8
SMDJ16A	SMDJ16CA	PEP	DEP	17.80	19.70	5	16.0	2	115.38	26.0
SMDJ17	SMDJ17C	PEQ	DEQ	18.90	23.10	5	17.0	2	98.36	30.5
SMDJ17A	SMDJ17CA	PER	DER	18.90	20.90	5	17.0	2	108.70	27.6
SMDJ18	SMDJ18C	PES	DES	20.00	24.40	5	18.0	2	93.17	32.2
SMDJ18A	SMDJ18CA	PET	DET	20.00	22.10	5	18.0	2	102.74	29.2
SMDJ19	SMDJ19C	PEA	DEA	21.10	25.76	5	19.0	2	88.21	34.0
SMDJ19A	SMDJ19CA	PEB	DEB	21.10	23.30	5	19.0	2	97.47	30.8
SMDJ20	SMDJ20C	PEU	DEU	22.20	27.10	5	20.0	2	83.80	35.8
SMDJ20A	SMDJ20CA	PEV	DEV	22.20	24.50	5	20.0	2	92.59	32.4
SMDJ22	SMDJ22C	PEW	DEW	24.40	29.80	5	22.0	2	76.14	39.4
SMDJ22A	SMDJ22CA	PEX	DEX	24.40	26.90	5	22.0	2	84.51	35.5
SMDJ24	SMDJ24C	PEY	DEY	26.70	32.60	5	24.0	2	69.77	43.0
SMDJ24A	SMDJ24CA	PEZ	DEZ	26.70	29.50	5	24.0	2	77.12	38.9
SMDJ26	SMDJ26C	PFD	DFD	28.90	35.30	5	26.0	2	64.38	46.6
SMDJ26A	SMDJ26CA	PFE	DFE	28.90	31.90	5	26.0	2	71.26	42.1
SMDJ28	SMDJ28C	PFF	DFE	31.10	38.00	5	28.0	2	60.00	50.0
SMDJ28A	SMDJ28CA	PFG	DFG	31.10	34.40	5	28.0	2	66.08	45.4
SMDJ30	SMDJ30C	PFH	DFH	33.30	40.70	5	30.0	2	56.07	53.5
SMDJ30A	SMDJ30CA	PFK	DFK	33.30	36.80	5	30.0	2	61.98	48.4
SMDJ33	SMDJ33C	PFL	DFL	36.70	44.90	5	33.0	2	50.85	59.0

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		Uni	Bi	Min(V)	Max(V)	IT(mA)				
SMDJ33A	SMDJ33CA	PFM	DFM	36.70	40.60	5	33.0	2	56.29	53.3
SMDJ36	SMDJ36C	PFN	DFN	40.00	48.90	5	36.0	2	46.66	64.3
SMDJ36A	SMDJ36CA	PPF	DFP	40.00	44.20	5	36.0	2	51.64	58.1
SMDJ40	SMDJ40C	PFQ	DFQ	44.40	54.30	5	40.0	2	42.02	71.4
SMDJ40A	SMDJ40CA	PFR	DFR	44.40	49.10	5	40.0	2	46.51	64.5
SMDJ43	SMDJ43C	PFS	DFS	47.80	58.40	5	43.0	2	39.11	76.7
SMDJ43A	SMDJ43CA	PFT	DFT	47.80	52.80	5	43.0	2	43.23	69.4
SMDJ45	SMDJ45C	PFU	DFU	50.00	61.10	5	45.0	2	37.36	80.3
SMDJ45A	SMDJ45CA	PFV	DFV	50.00	55.30	5	45.0	2	41.27	72.7
SMDJ48	SMDJ48C	PFW	DFW	53.30	65.10	5	48.0	2	35.09	85.5
SMDJ48A	SMDJ48CA	PFX	DFX	53.30	58.90	5	48.0	2	38.76	77.4
SMDJ51	SMDJ51C	PFY	DFY	56.70	69.30	5	51.0	2	32.93	91.1
SMDJ51A	SMDJ51CA	PFZ	DFZ	56.70	62.70	5	51.0	2	36.41	82.4
SMDJ54	SMDJ54C	RGD	DGD	60.00	73.30	5	54.0	2	31.15	96.3
SMDJ54A	SMDJ54CA	RGE	DGE	60.00	66.30	5	54.0	2	34.44	87.1
SMDJ58	SMDJ58C	RGF	DGF	64.40	78.70	5	58.0	2	29.13	103.0
SMDJ58A	SMDJ58CA	PGG	DGG	64.40	71.20	5	58.0	2	32.05	93.6
SMDJ60	SMDJ60C	RGH	DGH	66.70	81.50	5	60.0	2	28.04	107.0
SMDJ60A	SMDJ60CA	PGK	DGK	66.70	73.70	5	60.0	2	30.99	96.8
SMDJ64	SMDJ64C	PGL	DGL	71.10	86.90	5	64.0	2	26.32	114.0
SMDJ64A	SMDJ64CA	PGM	DGM	71.10	78.60	5	64.0	2	29.13	103.0
SMDJ70	SMDJ70C	PGN	DGN	77.80	95.10	5	70.0	2	24.00	125.0
SMDJ70A	SMDJ70CA	PGP	DGP	77.80	86.00	5	70.0	2	26.55	113.0
SMDJ75	SMDJ75C	PGQ	DGQ	83.30	102.00	5	75.0	2	22.39	134.0
SMDJ75A	SMDJ75CA	PGR	DGR	83.30	92.10	5	75.0	2	24.79	121.0
SMDJ78	SMDJ78C	PGS	DGS	86.70	106.00	5	78.0	2	21.58	139.0
SMDJ78A	SMDJ78CA	PGT	DGT	86.70	95.80	5	78.0	2	23.81	126.0
SMDJ80	SMDJ80C	PGA	DGA	88.96	108.80	5	80.0	2	20.95	143.2
SMDJ80A	SMDJ80CA	PGB	DGB	88.80	97.60	5	80.0	2	23.15	129.6
SMDJ85	SMDJ85C	PGU	DGU	94.40	115.00	5	85.0	2	19.87	151.0
SMDJ85A	SMDJ85CA	PGV	DGV	94.40	104.00	5	85.0	2	21.90	137.0
SMDJ90	SMDJ90C	PGW	DGW	100.00	122.00	5	90.0	2	18.75	160.0
SMDJ90A	SMDJ90CA	PGX	DGX	100.00	111.00	5	90.0	2	20.55	146.0
SMDJ100	SMDJ100C	PGY	DGY	111.00	136.00	5	100.0	2	16.76	179.0
SMDJ100A	SMDJ100CA	PGZ	DGZ	111.00	123.00	5	100.0	2	18.52	162.0
SMDJ110	SMDJ110C	PHD	DHD	122.00	149.00	5	110.0	2	15.31	196.0
SMDJ110A	SMDJ110CA	PHE	DHE	122.00	135.00	5	110.0	2	16.95	177.0
SMDJ120	SMDJ120C	PHF	DHF	133.00	163.00	5	120.0	2	14.02	214.0
SMDJ120A	SMDJ120CA	PHG	DHG	133.00	147.00	5	120.0	2	15.54	193.0
SMDJ130	SMDJ130C	PHH	DHH	144.00	176.00	5	130.0	2	12.99	231.0
SMDJ130A	SMDJ130CA	PHK	DHK	144.00	159.00	5	130.0	2	14.35	209.0
SMDJ140	SMDJ140C	PHA	DHA	155.68	190.40	5	140.0	2	11.97	250.6
SMDJ140A	SMDJ140CA	PHB	DHB	155.00	171.00	5	140.0	2	13.23	226.8
SMDJ150	SMDJ150C	PHL	DHL	167.00	204.00	5	150.0	2	11.19	268.0
SMDJ150A	SMDJ150CA	PHM	DHM	167.00	185.00	5	150.0	2	12.35	243.0
SMDJ160	SMDJ160C	PHN	DHN	178.00	218.00	5	160.0	2	10.45	287.0
SMDJ160A	SMDJ160CA	PHP	DHP	178.00	197.00	5	160.0	2	11.58	259.0
SMDJ170	SMDJ170C	PHQ	DHQ	189.00	231.00	5	170.0	2	9.87	304.0
SMDJ170A	SMDJ170CA	PHR	DHR	189.00	209.00	5	170.0	2	10.91	275.0

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## ELECTRICAL CHARACTERISTICS(Continued)

Device Type (Uni)	Device Type (Bi)	Marking Code		Breakdown Voltage VBR@IT			Working Peak Reverse Voltage VRWM(V)	Maximum Reverse Leakage IR @ VRWM(V)	Maximum Reverse Surge Current Ipp(A)	Maximum Clamping Voltage VC@Ipp
		Uni	Bi	Min(V)	Max(V)	IT(mA)				
SMDJ180	SMDJ180C	PHS	DHS	200.16	244.80	5	180.0	2	9.31	322.2
SMDJ180A	SMDJ180CA	PHT	DHT	200.00	220.00	5	180.0	2	10.29	291.6
SMDJ190	SMDJ190C	PHU	DHU	211.28	258.40	5	190.0	2	8.82	340.1
SMDJ190A	SMDJ190CA	PHV	DHV	211.00	232.00	5	190.0	2	9.75	307.8
SMDJ200A	SMDJ200CA	PHW	DHW	224.00	247.00	5	200.0	2	9.26	324.0
SMDJ220A	SMDJ220CA	PHX	DHX	246.00	272.00	5	220.0	2	8.43	356.0
SMDJ250A	SMDJ250CA	PHZ	DHZ	279.00	309.00	5	250.0	2	7.41	405.0
SMDJ300A	SMDJ300CA	PJE	DJE	335.00	371.00	5	300.0	2	6.17	486.0
SMDJ350A	SMDJ350CA	PJG	DJG	391.00	432.00	5	350.0	2	5.29	567.0
SMDJ400A	SMDJ400CA	PJK	DJK	447.00	494.00	5	400.0	2	4.63	648.0
SMDJ440A	SMDJ440CA	PJM	DJM	492.00	543.00	5	440.0	2	4.21	713.0

## CHARACTERISTICS CURVES

Fig.1 Pulse Derating Curve



Fig 2. Maximum Non-Repetitive Surge Current



Fig 3. Steady State Power Derating Curve



Fig 4. Peak Pulse Power Rating Curve



### CHARACTERISTICS CURVES(Continued)

Fig 5. Pulse Waveform

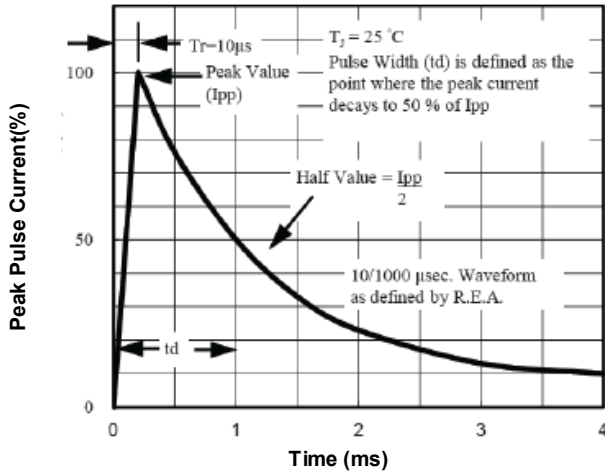
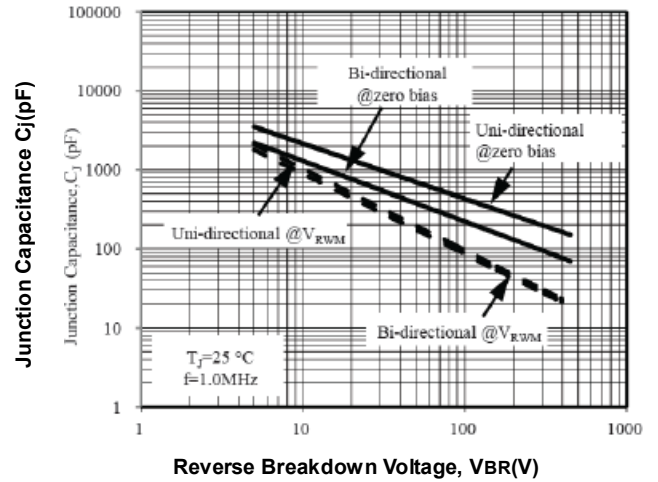
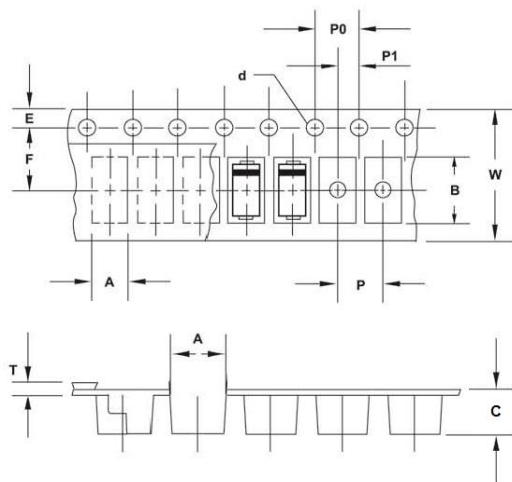


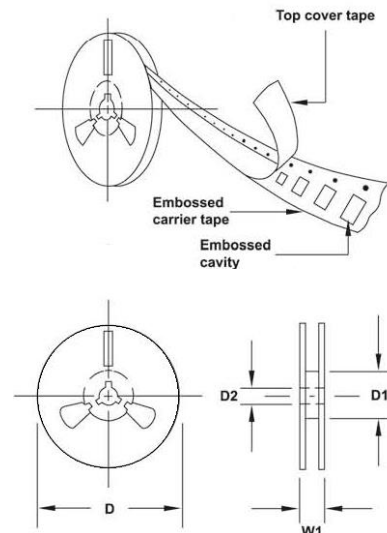
Fig 6. Typical Junction Capacitance



### PACKAGING SPECIFICATION- DO214AB (SMC) - Tape Carrier and Reel



DO-214AB(SMC) - Tape carrier



DO-214AB(SMC) - Reel

Item	Symbol	DO-214AB (SMC)	Item	Symbol	DO-214AB (SMC)
Carrier width	A	6.05 ± 0.10	Punch hole position	F	7.50 ± 0.10
Carrier length	B	8.31 ± 0.10	Punch hole pitch	P	8.00 ± 0.10
Carrier depth	C	2.54 ± 0.10	Sprocket hole pitch	P0	4.00 ± 0.10
Sprocket hole	d	1.55 ± 0.10	Embossment center	P1	2.00 ± 0.10
Reel outside diameter	D	330.0 ± 2.0	Overall tape thickness	T	Max 0.4
Reel inner diameter	D1	Min 50	Tape width	W	16.00 ± 0.30
Feed hole diameter	D2	13.00 ± 0.50	Reel width	W1	Max 22.40
Sprocket hole position	E	1.75 ± 0.10			

Unit: mm

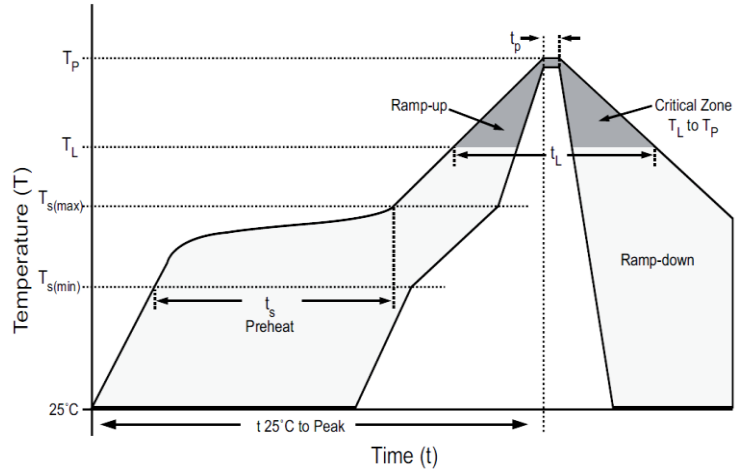
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## RECOMMENDED SOLDERING PROFILES

Reflow Condition		
Average Ramp-up Rate $T_L$ to $T_P$		3°C/second max.
Pre Heat	Temp. Min $T_{s(min)}$	150°C
	Tempe. Max $T_{s(max)}$	200°C
	Time (min. to max.) ( $t_s$ )	60-120 seconds
Ramp-up Rate $T_{s(max)}$ to $T_L$		3°C/second max.
Reflow	Temp. ( $T_L$ )	217°C
	Time ( $t_L$ )	60-260 seconds
Peak Temperature ( $T_P$ )		255 <sup>-0/+5</sup> °C
Time within 5°C of actual peak Temperature ( $t_p$ )		10-30 seconds
Ramp-down Rate		6°C/second max.
Time 25°C to peak Temp. ( $T_P$ )		6 minutes max.



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