

5000W Surface Mount Transient Voltage Suppressors

Features

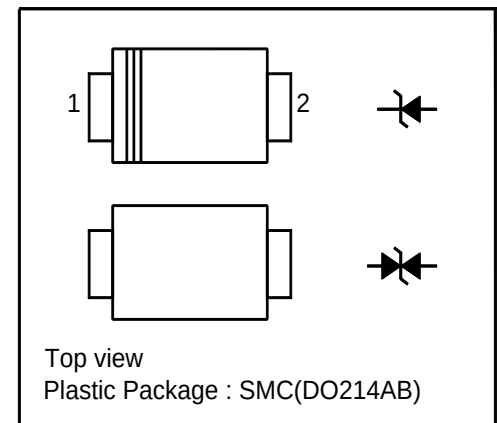
- AEC-Q101 Qualified
- 5000W peak pulse power capability at 10/1000µs waveform, Repetition rate (duty cycle):0.01%
- For surface mounted applications to optimize board space
- Low incremental surge impedance
- Excellent clamping capability
- Photo Glass and LPCVD process
- Fast response time: typically less than 1ps from 0V to BV min.
- Typical IR less than 2µA above 12V.
- High Temperature soldering guaranteed: 260°C/40 seconds at terminals
- Plastic package has underwriters laboratory flammability 94V-0
- Meets MSL level 1, per J-STD-020.
- Meet Halogen free and RoHS compliant.



SMC(DO-214AB)

PINNING

PIN	DESCRIPTION
1	Cathode
2	Anode



PRIMARY CHARACTERISTICS	
VBR	13.3V to 209V
VWM	12V to 170V
PPPM (10 x 1000 us)	5000 W
TJ max.	150 °C
Polarity	Uni & bidirectional
Package	SMC (DO-214AB)

Typical Applications

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units for consumer, computer, industrial, telecommunication and automotive.

Maximum Ratings and Electrical Characteristics

Parameters at 25°C ambient temperature unless otherwise Noted.

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation with a 10/1000 µs Waveform ¹⁾²⁾ (Fig.1)	P _{PPM}	5000	W
Peak Pulse Current with a 10/1000 µs Waveform ¹⁾ (Fig.3)	I _{PPM}	See Table	A
Peak Forward Surge Current, 8.3 ms Single Half Sine-wave superimposed on rated load, (JEDEC Method) ³⁾ (Fig.6)	I _{FSM}	300	A
Steady state power dissipation at T _A =50°C (Fig.5)	P _{M(AV)}	6.5	W
Maximum Instantaneous Forward Voltage at 100A for Unidirectional	V _F	4.0	V
Operating Junction and Storage Temperature Range	T _j , T _{stg}	- 55 to + 150	°C

1.Non-repetitive current pulse, per Fig.3 and derated above T_A=25°C per Fig.2

2.Mounted on 8.0mm×8.0mm copper pads to each terminal.

3.8.3ms single half sine-wave, or equivalent square wave, duty cycle=4 pulses per minutes maximum.

Electrical Characteristics ($T_a = 25^\circ\text{C}$ unless otherwise specified)

Uni-directional / Bi-directional Type	Marking		Stand-off Voltage VWM	Breakdown Voltage ¹⁾		Test Current IT	Maximum Clamping Voltage	Maximum Peak Pulse Current I _{PPM}	Maximum Reverse Leakage IR at VR
	UNI	BI	(V)	Min. (V)	Max. (V)	(mA)	V _C (V) at I _{PPM}	(A)	(μA)
5.0SMDJ12A / CA	5PEP	5BEP	12.0	13.30	14.70	10	19.9	252.00	800
5.0SMDJ13A / CA	5PEQ	5BEQ	13.0	14.40	15.90	10	21.5	233.00	500
5.0SMDJ14A / CA	5PER	5BER	14.0	15.60	17.20	10	23.2	216.00	200
5.0SMDJ15A / CA	5PES	5BES	15.0	16.70	18.50	1	24.4	205.00	100
5.0SMDJ16A / CA	5PET	5BET	16.0	17.80	19.70	1	26.0	193.00	50
5.0SMDJ17A / CA	5PEU	5BEU	17.0	18.90	20.90	1	27.6	181.00	20
5.0SMDJ18A / CA	5PEV	5BEV	18.0	20.00	22.10	1	29.2	172.00	10
5.0SMDJ20A / CA	5PEW	5BEW	20.0	22.20	24.50	1	32.4	155.00	5
5.0SMDJ22A / CA	5PEX	5BEX	22.0	24.40	26.90	1	35.5	141.00	5
5.0SMDJ24A / CA	5PEZ	5BEZ	24.0	26.70	29.50	1	38.9	129.00	5
5.0SMDJ26A / CA	5PFE	5BFE	26.0	28.90	31.90	1	42.1	119.00	5
5.0SMDJ28A / CA	5PFG	5BFG	28.0	31.10	34.40	1	45.4	110.00	5
5.0SMDJ30A / CA	5PFK	5BFK	30.0	33.30	36.80	1	48.4	103.00	5
5.0SMDJ33A / CA	5PFM	5BFM	33.0	36.70	40.60	1	53.3	93.90	5
5.0SMDJ36A / CA	5PFP	5BFP	36.0	40.00	44.20	1	58.1	86.10	5
5.0SMDJ40A / CA	5PFR	5BFR	40.0	44.40	49.10	1	64.5	77.60	5
5.0SMDJ43A / CA	5PFT	5BFT	43.0	47.80	52.80	1	69.4	72.10	5
5.0SMDJ45A / CA	5PFV	5BFV	45.0	50.00	55.30	1	72.7	68.80	5
5.0SMDJ48A / CA	5PFX	5BFX	48.0	53.30	58.90	1	77.4	64.70	5
5.0SMDJ51A / CA	5PFZ	5BFZ	51.0	56.70	62.70	1	82.4	60.70	5
5.0SMDJ54A / CA	5RGE	5RGE	54.0	60.00	66.30	1	87.1	57.50	5
5.0SMDJ58A / CA	5PGG	5BGG	58.0	64.40	71.20	1	93.6	53.50	5
5.0SMDJ60A / CA	5PGK	5BGK	60.0	66.70	73.70	1	96.8	51.70	5
5.0SMDJ64A / CA	5PGM	5BGM	64.0	71.10	78.60	1	103.0	48.60	5
5.0SMDJ70A / CA	5PGP	5BGP	70.0	77.80	86.00	1	113.0	44.30	5
5.0SMDJ75A / CA	5PGR	5BGR	75.0	83.30	92.10	1	121.0	41.40	5
5.0SMDJ78A / CA	5PGT	5BGT	78.0	86.70	95.80	1	126.0	39.70	5
5.0SMDJ85A / CA	5PGV	5BGV	85.0	94.40	104.00	1	137.0	36.50	5
5.0SMDJ90A / CA	5PGX	5BGX	90.0	100.00	111.00	1	146.0	34.30	5
5.0SMDJ100A / CA	5PGZ	5BGZ	100.0	111.00	123.00	1	162.0	30.90	5
5.0SMDJ110A / CA	5PHE	5BHE	110.0	122.00	135.00	1	177.0	28.30	5
5.0SMDJ120A / CA	5PHG	5BHG	120.0	133.00	147.00	1	193.0	26.00	5
5.0SMDJ130A / CA	5PHK	5BHK	130.0	144.00	159.00	1	209.0	24.00	5
5.0SMDJ140A / CA	5PHB	5BHB	140.0	155.00	171.00	1	226.8	22.20	5
5.0SMDJ150A / CA	5PHM	5BHM	150.0	167.00	185.00	1	243.0	20.60	5
5.0SMDJ160A / CA	5PHP	5BHP	160.0	178.00	197.00	1	259.0	19.30	5
5.0SMDJ170A / CA	5PHR	5BHR	170.0	189.00	209.00	1	275.0	18.20	5

Notes: For bidirectional type having VRWM of 10V and less, the IR limit is double.

Electrical Characteristics Curves

Fig 1. Peak Pulse Power Rating Curve

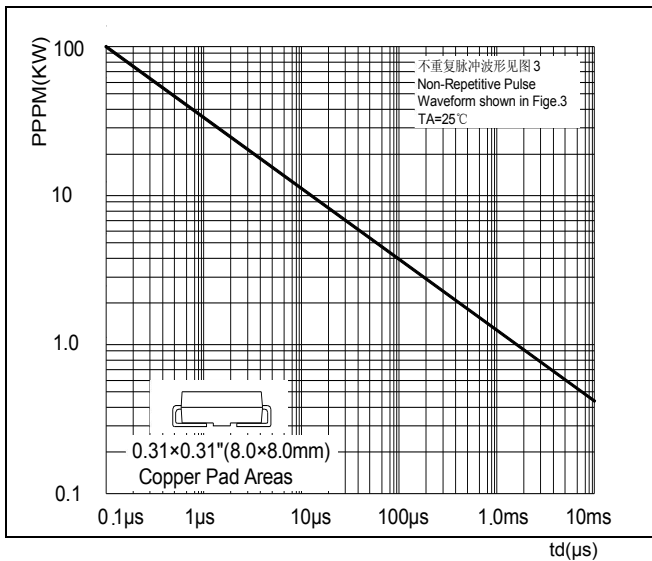


Fig 2. Pulse Derating Curve

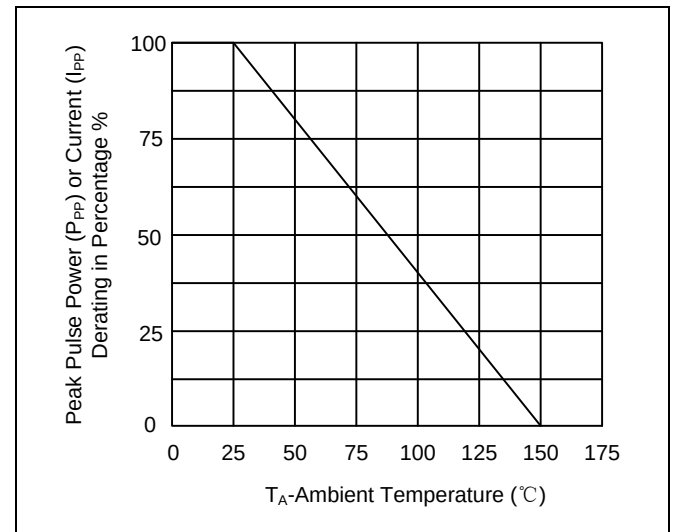


Fig 3. Pulse Waveform

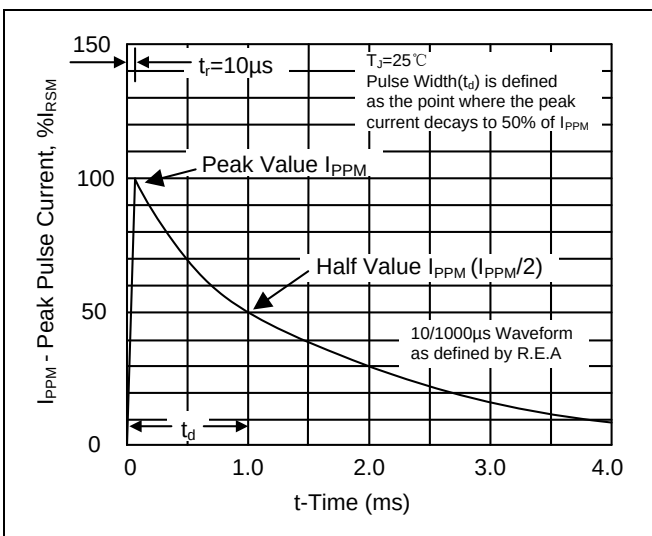


Fig 4. Typical Junction Capacitance

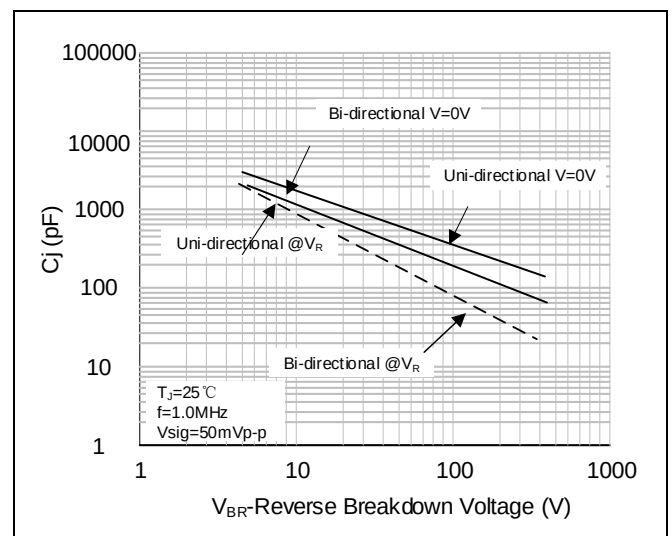


Fig 5. Steady State Power Dissipation

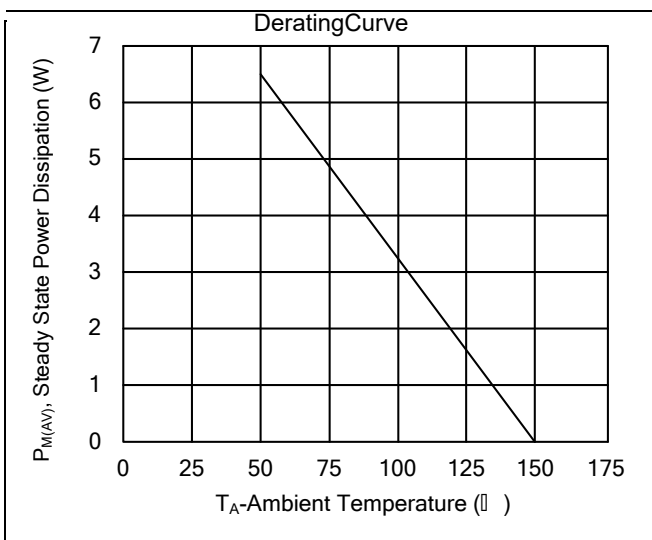
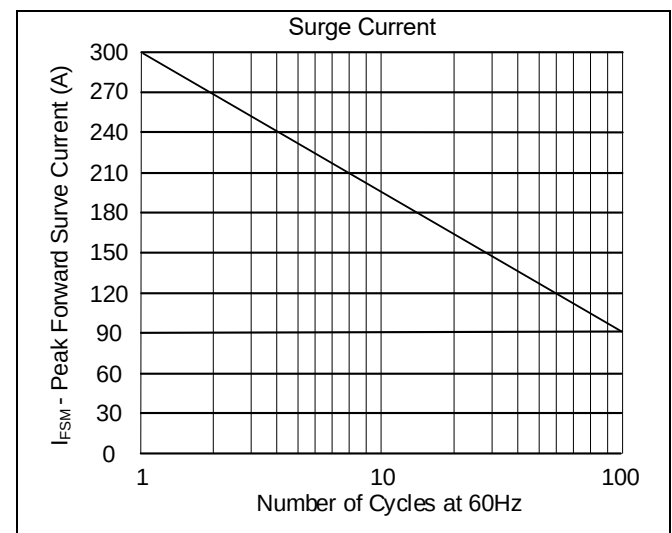
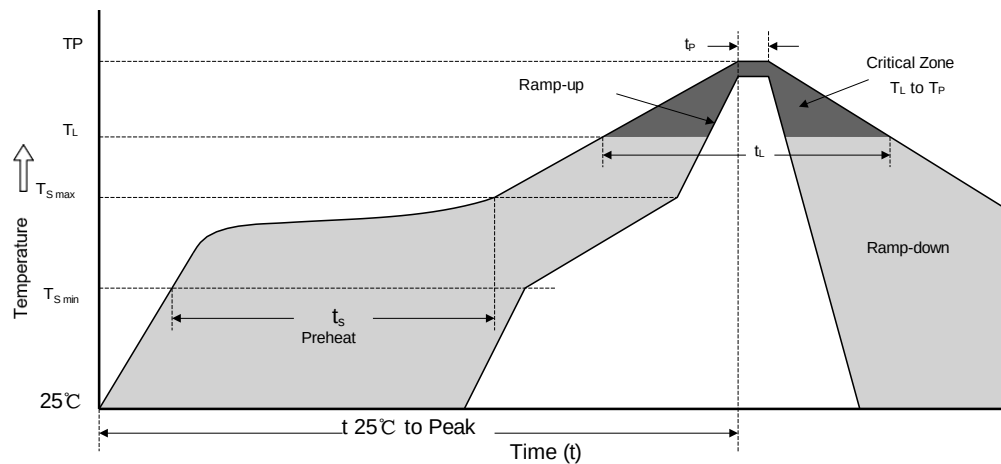


Fig 6. Maximum Non-Repetitive Forward



Reflow Soldering Parameters


Reflow Condition		Lead-free Assembly
Pre heat	-Temperature Min ($T_{S\ min}$)	150°C
	-Temperature Max ($T_{S\ max}$)	200°C
	-Time (min to max) (t_s)	60-180 seconds
Average ramp-up rate (T_L to T_P)		3°C/second max.
$T_{S\ max}$ to T_L -Ramp-up Rate		3°C/second max.
Reflow	-Temperature (T_L) (Liquidus)	217°C
	-Time (min to max) (t_s)	60-150 seconds
Peak Temperature (T_P)		260(+0/-5)°C
Time within 5°C of actual Peak Temperature (t_p)		20-40 seconds
Ramp-down Rate		6°C/second max.
Time 25°C to Peak Temperature		8 minutes max.
Do not exceed		280°C

Reliability

Items	Standards
Terminal strength	MIL-STD-750 Method 2036
Mechanical shock	JESD22-B104
Vibration	JESD22-B103
High Temp. Storage	JESD22-A103
High Temp Reverse Bias	JESD22-A108
Temperature Cycling	JESD22-A104
High Temp High Humidity Reverse Bias	JESD22-A101
Resistance to solder heat	JESD22-B106

Package Outline Dimensions in inches (millimeters)

SMC(DO-214AB)

Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.90	3.20	0.114	0.126
B	6.60	7.11	0.260	0.280
C	5.59	6.22	0.220	0.245
D	2.06	2.62	0.079	0.103
E	0.76	1.52	0.030	0.060
F	-	0.203	-	0.008
G	7.75	8.130	0.305	0.320
H	0.152	0.305	0.006	0.012
I	3.30	-	0.129	-
J	2.40	-	0.094	-
K	-	4.20	-	0.165

Packing Information

Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
SMC	16	8±0.1	0.315±0.004	330	13	3000

Marking information

" 5PEP " = Part No.

" YWW " = Date Code Marking

" Y " = Last digit of year (ex: 2 = 2022)

" WW " = Week Code (ex: 24 = the 24th week of the year)

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