1.5SMCxxAT3G

OBSOLETE/EOL

DATE June/30/2018 **PCN/ECN#** LFPCN41246
REPLACED BY 1.5SMC Series

Maximum Ratings and Thermal Characteristics

Parameter	Symbol	Value	Unit
Peak Power Dissipation (Note 1) @T_L = 25°C, Pulse Width = 1 ms	P_{PK}	1500	W
DC Power Dissipation @T_L = 75°C Measured Zero Lead Length (Note 2)	PD	4.0	W
Derate Above 75°C		54.6	mW/°C
Thermal Resistance from Junction–to–Lead	R_{JL}	18.3	°C/W
DC Power Dissipation (Note 3) @T_A =	P_D	0.75	W
25°C Derate Above 25°C		6.1	mW/°C
Thermal Resistance from Junction–to– Ambient	$R_{\theta JA}$	165	°C/W
Forward Surge Current (Note 4) @T_A = 25°C	I_{FSM}	200	A
Operating and Storage Temperature Range	T_J, T_{stg}	-65 to +150	°C

Stresses exceeding Maximum Ratings may damage the component. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect component reliability.

1. 10 x 1000 µs, non–repetitive.
2. 1 in square copper pad, FR–4 board.
3. FR–4 board, using Littelfuse minimum recommended footprint, as shown in 403-03 case outline dimensions spec.
4. 1/2 sine wave (or equivalent square wave), PW = 8.3 ms, duty cycle = 4 pulses per minute maximum.

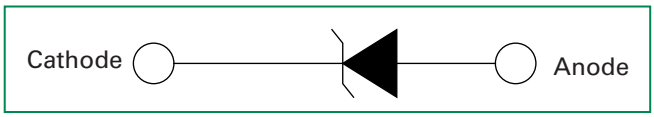
Description

The 1.5SMCxxAT3G series is designed to protect voltage sensitive components from high voltage, high energy transients. They have excellent clamping capability, high surge capability, low zener impedance and fast response time. This 1.5SMCxxAT3G series is provided in an SMC package ideally suited for small form factor requirements found in communication , automotive, process control, medical equipment and many other industrial and consumer applications.

Features

- Working Peak Reverse Voltage Range – 5.8 V to 78 V
- Nominal Breakdown Voltage Range – 6.8 V to 91V
- Peak Power – 1500 W @ 1 ms
- ESD Rating of Class 3 (> 16 kV) per Human Body Model
- Low Leakage < 5 µA Above 10 V
- Maximum Temperature Coefficient Specified
- Response Time is Typically < 1 ns
- Pb–Free Packages are Available

Functional Diagram



Additional Information

Datasheet | Resources | Samples

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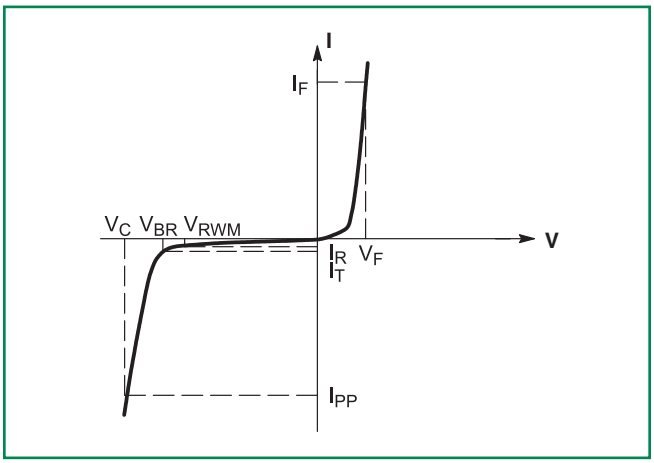
Revised: 02/23/18

I-V Curve Characteristics (T_A = 25°C unless otherwise noted, V_F = 3.5 V Max @ I_F = 100 A) (Note 5)



Symbol	Parameter
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Working Peak Reverse Voltage
I_R	Maximum Reverse Leakage Current @ V_{RWM}
V_{BR}	Breakdown Voltage @ I_T
I_T	Test Current
I_F	Forward Current
V_F	Forward Voltage @ I_F

5. 1/2 sine wave (or equivalent square wave), PW = 8.3 ms, non–repetitive duty cycle.

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Electrical Characteristics (T_A = 25°C unless otherwise noted)

Component*	Component Marking	V_{RWM} (Note 6)	I_R @ V_{RWM}	Breakdown Voltage				V_C @ I_{PP} (Note 8)		MV BR
				V_{BR} (V) (Note 6 & 7)			@ I_T	V_C	I_{PP}	
		Volts	µA	MIN	NOM	MAX	mA	Volts	Amps	%/ C
1.5SMC6.8AT3G	6V8A	5.8	1000	6.45	6.8	7.14	10	10.5	143	0.057
1.5SMC7.5AT3G	7V5A	6.4	500	7.13	7.5	7.88	10	11.3	132	0.061
1.5SMC8.2AT3G	8V2A	7.02	200	7.79	8.2	8.61	10	12.1	124	0.065
1.5SMC10AT3G	10A	8.55	10	9.5	10	10.5	1	14.5	103	0.073
1.5SMC12AT3G	12A	10.2	5	11.4	12	12.6	1	16.7	90	0.078
1.5SMC13AT3G	13A	11.1	5	12.4	13	13.7	1	18.2	82	0.081
1.5SMC15AT3G	15A	12.8	5	14.3	15	15.8	1	21.2	71	0.084
1.5SMC16AT3G	16A	13.6	5	15.2	16	16.8	1	22.5	67	0.086
1.5SMC18AT3G	18A	15.3	5	17.1	18	18.9	1	25.2	59.5	0.088
1.5SMC20AT3G	20A	17.1	5	19	20	21	1	27.7	54	0.09
1.5SMC22AT3G	22A	18.8	5	20.9	22	23.1	1	30.6	49	0.092
1.5SMC24AT3G	24A	20.5	5	22.8	24	25.2	1	33.2	45	0.094
1.5SMC27AT3G	27A	23.1	5	25.7	27	28.4	1	37.5	40	0.096
1.5SMC30AT3G	30A	25.6	5	28.5	30	31.5	1	41.4	36	0.097
1.5SMC33AT3G	33A	28.2	5	31.4	33	34.7	1	45.7	33	0.098
1.5SMC36AT3G	36A	30.8	5	34.2	36	37.8	1	49.9	30	0.099
1.5SMC39AT3G	39A	33.3	5	37.1	39	41	1	53.9	28	0.1
1.5SMC43AT3G	43A	36.8	5	40.9	43	45.2	1	59.3	25.3	0.101
1.5SMC47AT3G	47A	40.2	5	44.7	47	49.4	1	64.8	23.2	0.101
1.5SMC51AT3G	51A	43.6	5	48.5	51	53.6	1	70.1	21.4	0.102
1.5SMC56AT3G	56A	47.8	5	53.2	56	58.8	1	77	19.5	0.103
1.5SMC62AT3G	62A	53	5	58.9	62	65.1	1	85	17.7	0.104
1.5SMC68AT3G	68A	58.1	5	64.6	68	71.4	1	92	16.3	0.104
1.5SMC75AT3G	75A	64.1	5	71.3	75	78.8	1	103	14.6	0.105
1.5SMC82AT3G	82A	70.1	5	77.9	82	86.1	1	113	13.3	0.105
1.5SMC91AT3G	91A	77.8	5	86.5	91	95.5	1	125	12	0.106

6. A transient suppressor is normally selected according to the maximum working peak reverse voltage (V_{RWM}), which should be equal to or greater than the DC or continuous peak operating voltage level.
7. V_{BR} measured at pulse test current I_T at an ambient temperature of 25°C.
8. Surge current waveform per Figure 2 and derate per Figure 3 of the General Data – 1500 Watt at the beginning of this group.

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Ratings and Characteristic Curves

Figure 1. Pulse Rating Curve

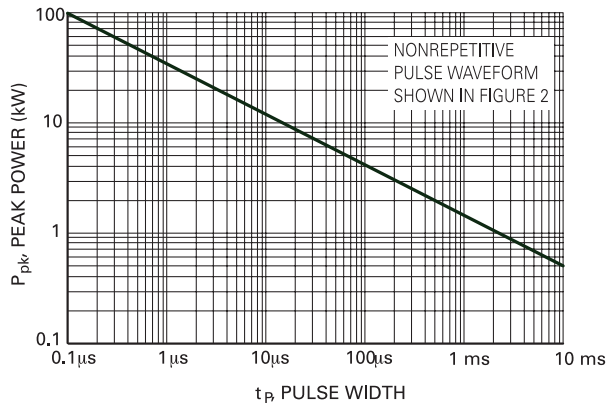


Figure 2. Pulse Waveform

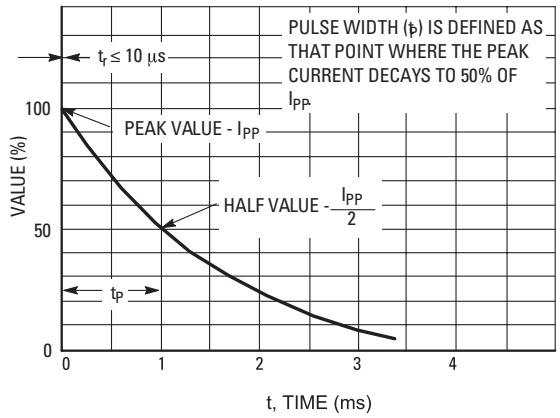


Figure 3. Pulse Derating Curve

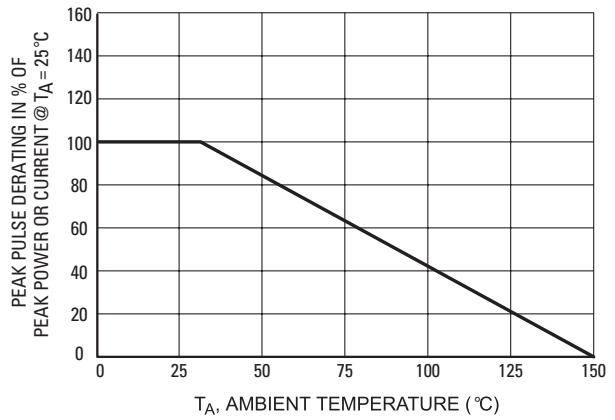
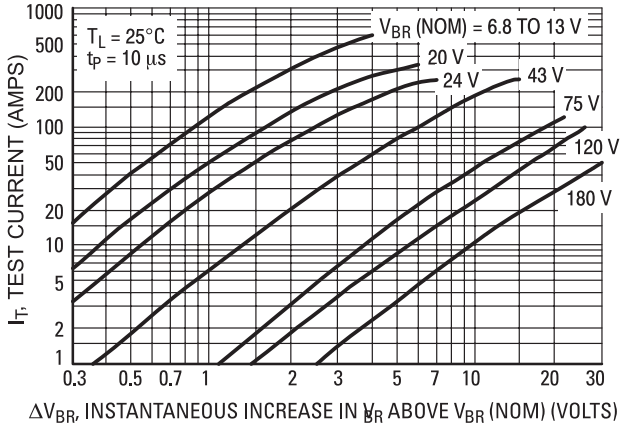


Figure 4. Dynamic Impedance



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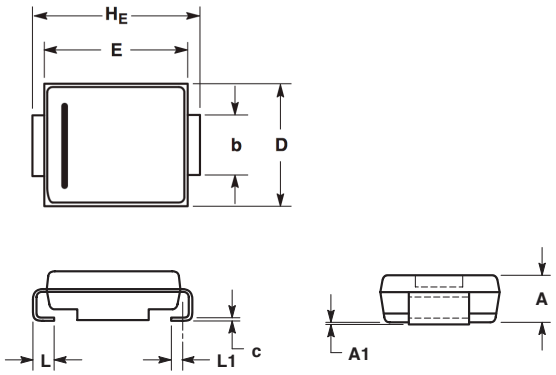
Dimensions



Dim	Inches			Millimeters		
	Min	Nom	Max	Min	Nom	Max
A	0.075	0.084	0.095	1.90	2.13	2.41
A1	0.002	0.004	0.006	0.05	0.10	0.15
b	0.115	0.118	0.121	2.92	3.00	3.07
c	0.006	0.009	0.012	0.15	0.23	0.30
D	0.220	0.230	0.240	5.59	5.84	6.10
E	0.260	0.270	0.280	6.60	6.86	7.11
H_E	0.305	0.313	0.320	7.75	7.94	8.13
L	0.030	0.040	0.050	0.76	1.02	1.27
L1	0.020 REF			0.51 REF		

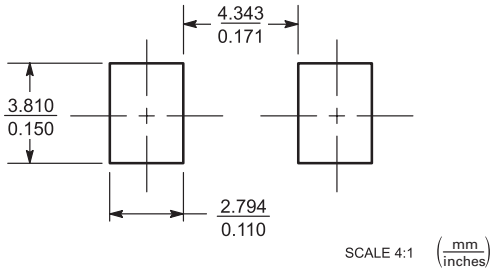
NOTES
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. D DIMENSION SHALL BE MEASURED WITHIN DIMENSION P.
4. 403-01 THRU -02 OBSOLETE, NEW STANDARD 403-03.

Part Marking System

xxxA = **Specific Component Code** (See Table on Page 3)
A = Assembly Location
Y = Year
WW = Work Week
▪ = Pb–Free Package

(Note: Microdot may be in either location)

Soldering Footprint



ORDERING INFORMATION

Component	Package	Shipping
1SMCxxAT3G	SMC (Pb–Free)	2,500 / Tape & Reel

Flow/Wave Soldering (Solder Dipping)

Peak Temperature :	260°C
Dipping Time :	10 seconds

Physical Specifications

Case	Void-free, transfer-molded, thermosetting plastic
Polarity	Cathode indicated by polarity band
Mounting Position	Any
Finish	All external surfaces are corrosion resistant and leads are readily solderable
Leads	Modified L–Bend providing more contact area to bond pads

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