

Transient Voltage Suppressors (TVS) Data Sheet

Features

- Glass passivated junction
- Low zener impedance
- Excellent clamping capability
- 1500W peak pulse power capability at 10/1000μs waveform, repetition rate (duty cycle):0.01%
- Fast response time
- Typical I_R less than 1μA above 13V.
- Plastic package has underwriters laboratory flammability 94V-0
- Meets MSL level 1, per J-STD-020.
- AEC-Q101 Qualified

Mechanical Data

- Case: JEDEC DO-201Moulded plastic
- Terminal: Axial leads, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denotes cathode except bi-directional models
- Mounting Position: Any

Applications

- I/O interface
- AC/DC power supply
- Low frequency signal transmission line (RS232, RS485, etc.)

Maximum Ratings and Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.

Rating	Symbol	Value	Units
Peak pulse power dissipation at 10/1000μs waveform (Note1, Fig.1)	P_{PPM}	Minimum 1500	Watts
Peak pulse current of at 10/1000μs waveform (Note 1, Fig.3)	I_{PPM}	See Table	Amps
Steady state power dissipation at $T_L=75^{\circ}\text{C}$ (Fig.4)	$P_{M(AV)}$	6.5	Watts
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load, (JEDEC Method) (Note2)	I_{FSM}	200	Amps
Operating junction and Storage Temperature Range.	T_J, T_{STG}	-55 to +150	$^{\circ}\text{C}$
Maximum instantaneous forward voltage @ 50A for unidirectional only (Note3)	V_F	3.5/5.0	V
Typical thermal resistance junction to lead	$R_{\theta JL}$	15	$^{\circ}\text{C/W}$
Typical thermal resistance junction to ambient	$R_{\theta JA}$	75	$^{\circ}\text{C/W}$

Notes: 1. Non-repetitive current pulse, per Fig.3 and derated above $T_A=25^{\circ}\text{C}$ per Fig.2.

2. 8.3ms single half sine-wave, or equivalent square wave, duty cycle=4 pulses per minutes maximum.

3. $V_F=3.5\text{ V}$ for devices of V (BR) < 220V, and $V_F=5.0\text{ Volt max.}$ for devices of V (BR) >220V

Dimensions (DO-201)

Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
L	6.60	7.71	0.260	0.280
D	5.59	6.22	0.220	0.245
D1	2.9	3.20	0.114	0.126
T	7.75	8.13	0.305	0.320
T1	0.76	1.52	0.030	0.060
d	-	0.20	-	0.008
H	2.06	2.62	0.079	0.103

Electrical Characteristics ($T_A=25^{\circ}\text{C}$)

Part Number		Device Marking Code		Reverse Stand-Off Voltage	Breakdown Voltage @ I_T	Test Current	Maximum Clamping Voltage@ I_{PP}	Peak Pulse Current	Reverse Leakage @ V_{RWM}
Unidirectional	Bidirectional	UNI	BI	$V_{RWM}(V)$	$V_{BR}(V)$	$I_T(mA)$	$V_C(V)$	$I_{PP}(A)$	$I_R(\mu A)$
1.5SMC6.8A-AR	1.5SMC6.8CA-AR	6V8A	6V8C	5.80	6.45~7.14	10	10.5	144.8	1000
1.5SMC7.5A-AR	1.5SMC7.5CA-AR	7V5A	7V5C	6.40	7.13~7.88	10	11.3	134.5	500
1.5SMC8.2A-AR	1.5SMC8.2CA-AR	8V2A	8V2C	7.02	7.79~8.61	10	12.1	125.6	200
1.5SMC9.1A-AR	1.5SMC9.1CA-AR	9V1A	9V1C	7.78	8.65~9.55	1	13.4	113.4	50
1.5SMC10A-AR	1.5SMC10CA-AR	10A	10C	8.55	9.5~10.5	1	14.5	104.8	10
1.5SMC11A-AR	1.5SMC11CA-AR	11A	11C	9.40	10.5~11.6	1	15.6	97.4	5
1.5SMC12A-AR	1.5SMC12CA-AR	12A	12C	10.2	11.4~12.6	1	16.7	91.0	5
1.5SMC13A-AR	1.5SMC13CA-AR	13A	13C	11.1	12.4~13.7	1	18.2	83.5	5
1.5SMC15A-AR	1.5SMC15CA-AR	15A	15C	12.8	14.3~15.8	1	21.2	71.7	1
1.5SMC16A-AR	1.5SMC16CA-AR	16A	16C	13.6	15.2~16.8	1	22.5	67.6	1
1.5SMC18A-AR	1.5SMC18CA-AR	18A	18C	15.3	17.1~18.9	1	25.2	60.3	1
1.5SMC20A-AR	1.5SMC20CA-AR	20A	20C	17.1	19.0~21.0	1	27.7	54.9	1
1.5SMC22A-AR	1.5SMC22CA-AR	22A	22C	18.8	20.9~23.1	1	30.6	49.7	1
1.5SMC24A-AR	1.5SMC24CA-AR	24A	24C	20.5	22.8~25.2	1	33.2	45.8	1
1.5SMC27A-AR	1.5SMC27CA-AR	27A	27C	23.1	25.7~28.4	1	37.5	40.5	1
1.5SMC30A-AR	1.5SMC30CA-AR	30A	30C	25.6	28.5~31.5	1	41.4	36.7	1
1.5SMC33A-AR	1.5SMC33CA-AR	33A	33C	28.2	31.4~34.7	1	45.7	33.3	1
1.5SMC36A-AR	1.5SMC36CA-AR	36A	36C	30.8	34.2~37.8	1	49.9	30.5	1
1.5SMC39A-AR	1.5SMC39CA-AR	39A	39C	33.3	37.1~41.0	1	53.9	28.2	1
1.5SMC43A-AR	1.5SMC43CA-AR	43A	43C	36.8	40.9~45.2	1	59.3	25.6	1
1.5SMC47A-AR	1.5SMC47CA-AR	47A	47C	40.2	44.7~49.4	1	64.8	23.5	1
1.5SMC51A-AR	1.5SMC51CA-AR	51A	51C	43.6	48.5~53.6	1	70.1	21.7	1

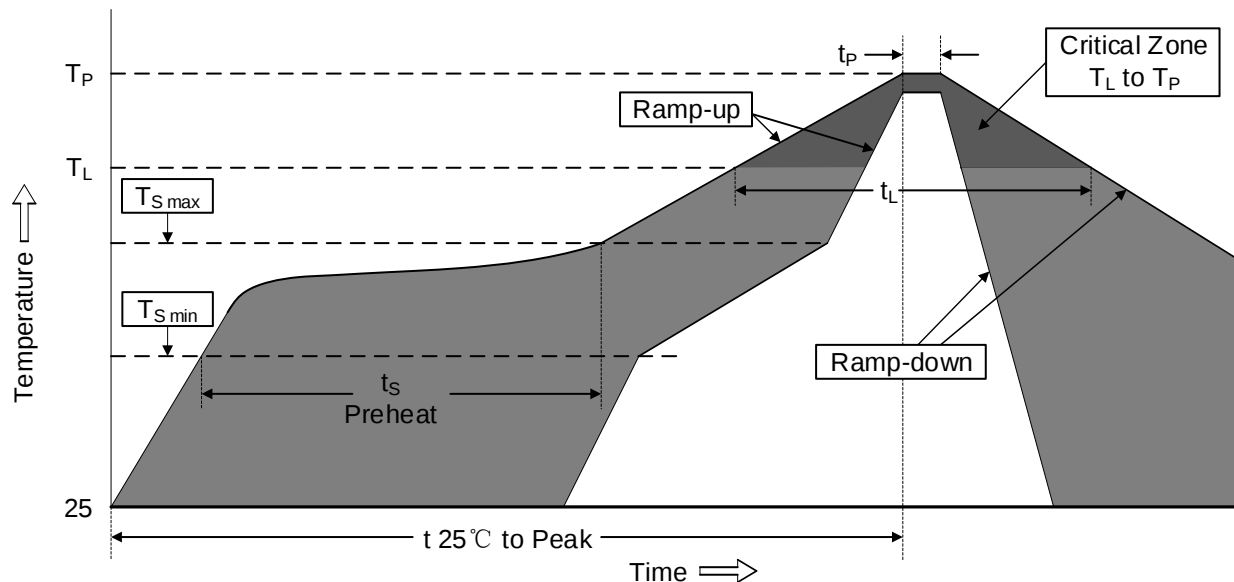
Electrical Characteristics (T_A=25°C)

Part Number		Device Marking Code		Reverse Stand-Off Voltage	Breakdown Voltage @I _T	Test Current	Maximum Clamping Voltage@I _{PP}	Peak Pulse Current	Reverse Leakage @V _{RWM}
Unidirectional	Bidirectional	UNI	BI	V _{RWM} (V)	V _{BR} (V)	I _T (mA)	V _C (V)	I _{PP} (A)	I _R (μA)
1.5SMC56A-AR	1.5SMC56CA-AR	56A	56C	47.8	53.2~58.8	1	77.0	19.7	1
1.5SMC62A-AR	1.5SMC62CA-AR	62A	62C	53.0	58.9~65.1	1	85.0	17.9	1
1.5SMC68A-AR	1.5SMC68CA-AR	68A	68C	58.1	64.6~71.4	1	92.0	16.5	1
1.5SMC75A-AR	1.5SMC75CA-AR	75A	75C	64.1	71.3~78.8	1	103.0	14.8	1
1.5SMC82A-AR	1.5SMC82CA-AR	82A	82C	70.1	77.9~86.1	1	113.0	13.5	1
1.5SMC91A-AR	1.5SMC91CA-AR	91A	91C	77.8	86.5~95.5	1	125.0	12.2	1
1.5SMC100A-AR	1.5SMC100CA-AR	100A	100C	85.5	95~105	1	137.0	11.1	1
1.5SMC110A-AR	1.5SMC110CA-AR	110A	110C	94.0	105~116	1	152.0	10.0	1
1.5SMC120A-AR	1.5SMC120CA-AR	120A	120C	102	114~126	1	165.0	9.2	1
1.5SMC130A-AR	1.5SMC130CA-AR	130A	130C	111	124~137	1	179.0	8.5	1
1.5SMC150A-AR	1.5SMC150CA-AR	150A	150C	128	143~158	1	207.0	7.3	1
1.5SMC160A-AR	1.5SMC160CA-AR	160A	160C	136	152~168	1	219.0	6.9	1
1.5SMC170A-AR	1.5SMC170CA-AR	170A	170C	145	162~179	1	234.0	6.5	1
1.5SMC180A-AR	1.5SMC180CA-AR	180A	180C	154	171~189	1	246.0	6.2	1
1.5SMC200A-AR	1.5SMC200CA-AR	200A	200C	171	190~210	1	274.0	5.5	1
1.5SMC220A-AR	1.5SMC220CA-AR	220A	220C	185	209~231	1	328.0	4.6	1
1.5SMC250A-AR	1.5SMC250CA-AR	250A	250C	214	237~263	1	344.0	4.4	1
1.5SMC300A-AR	1.5SMC300CA-AR	300A	300C	256	285~315	1	414.0	3.7	1
1.5SMC350A-AR	1.5SMC350CA-AR	350A	350C	300	333~368	1	482.0	3.2	1
1.5SMC400A-AR	1.5SMC400CA-AR	400A	400C	342	380~420	1	548.0	2.8	1
1.5SMC440A-AR	1.5SMC440CA-AR	440A	440C	376	418~462	1	602.0	2.5	1
1.5SMC480A-AR	1.5SMC480CA-AR	480A	480C	408	456~504	1	658.0	2.3	1
1.5SMC510A-AR	1.5SMC510CA-AR	510A	510C	434	485~535	1	698.0	2.1	1
1.5SMC530A-AR	1.5SMC530CA-AR	530A	530C	450	503~556	1	725.0	2.1	1
1.5SMC540A-AR	1.5SMC540CA-AR	540A	540C	459	513~567	1	740.0	2.0	1
1.5SMC550A-AR	1.5SMC550CA-AR	550A	550C	467	523~577	1	760.0	2.0	1

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

Recommended Soldering Conditions

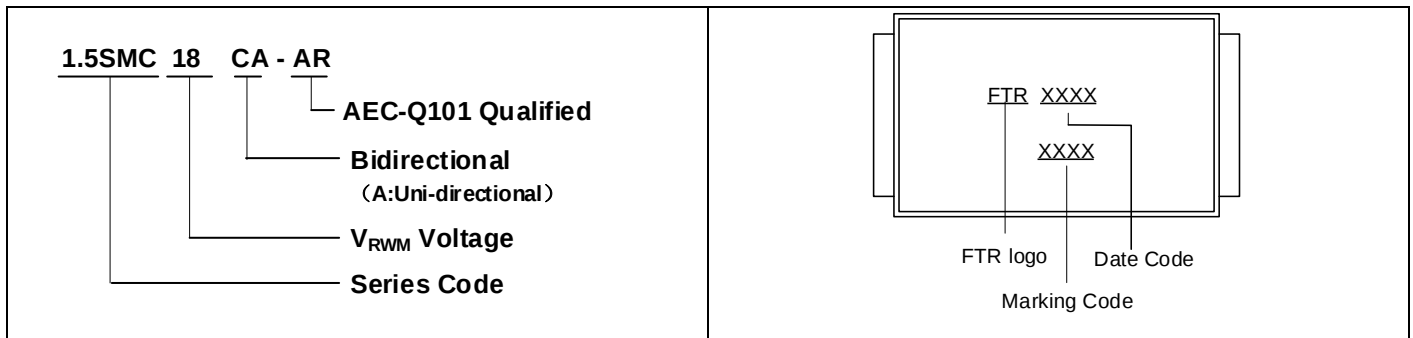
Reflow Soldering



Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate (T _L to T _P)	3°C/second max.
Preheat -Temperature Min (T_{S min}) -Temperature Max (T_{S max}) -Time (min to max) (t_S)	150°C 200°C 60-180 seconds
T _{S max} to T _L -Ramp-up Rate	3°C/second max.
Time maintained above: -Temperature (T_L) -Time (t_L)	217°C 60-150 seconds
Peak Temperature (T _P)	260°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.

Partnumber code



Ratings and Characteristic Curves (T_A=25°C unless otherwise noted)

Figure 1. Peak Pulse Power Rating Curve

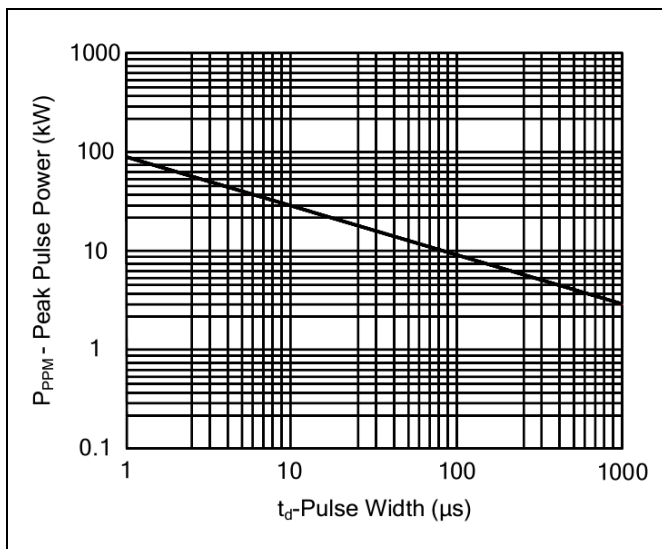


Figure 2. Pulse Derating Curve

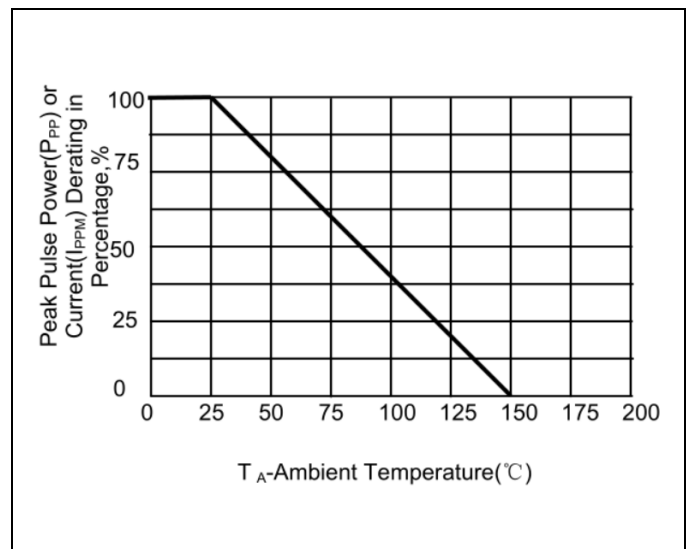


Figure 3. Pulse Waveform

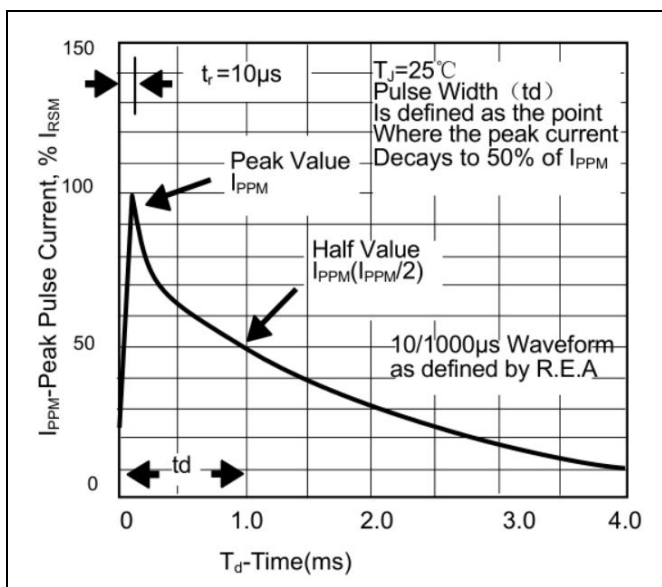
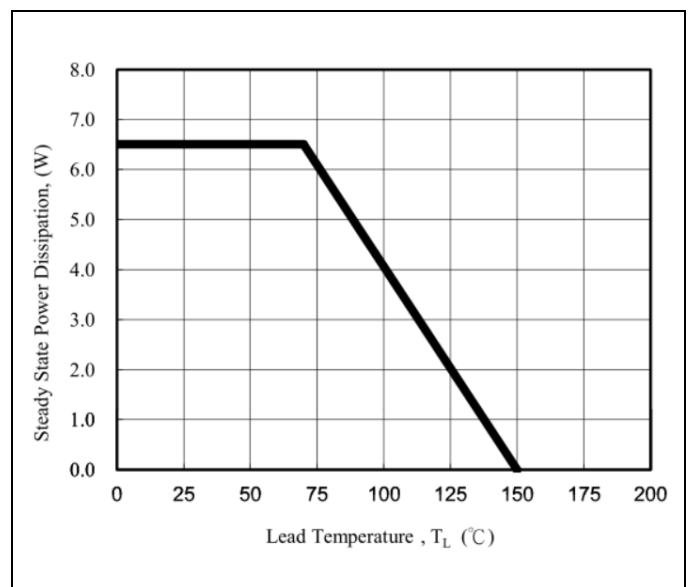


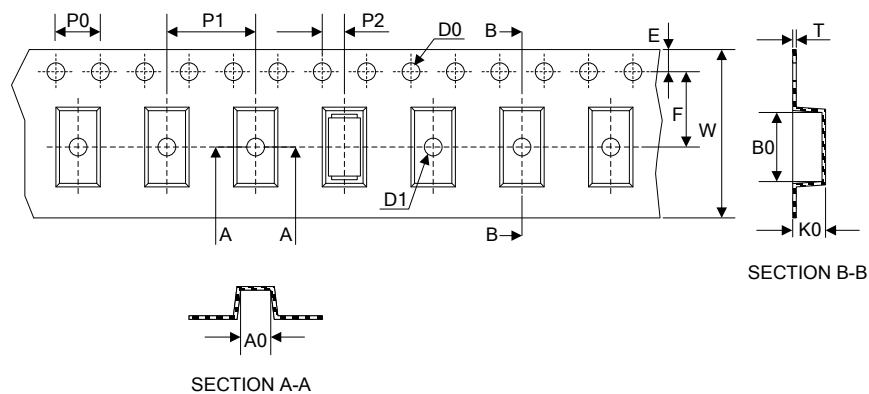
Figure 4. Steady State Power Dissipation Derating Curve



Packaging

Tape	Symbol	Dimension (mm)
	W	16.00±0.10
	P0	4.00±0.10
	P1	8.00±0.10
	P2	2.00±0.10
	D0	Φ1.55±0.10
	E	1.75±0.10
	F	7.50±0.10
	A0	6.05±0.1
	B0	8.31±0.1
Reel	K0	2.54±0.1
	T	0.25±0.1
	D5	Φ330.0±2.0
	D6	Φ13.5±0.5
	H	2.5±1.0
	W2	20.0±2.0
	Quantity: 3000PCS	

Tape



Reel

