

Transient Voltage Suppressors (TVS) Data Sheet

Features

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

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 $^{\circ}$ C ambient temperature unless otherwise specified.

Rating	Symbol	Value	Units
Peak pulse power dissipation at 10/1000 μ s waveform (Note1, Fig.1)	P_{PPM}	Minimum 1500	Watts
Peak pulse current of at 10/1000 μ s waveform (Note 1, Fig.3)	I_{PPM}	See Table	Amps
Steady state power dissipation at $T_L=75^{\circ}$ 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	$^{\circ}$ C
Maximum instantaneous forward voltage @ 50A forunidirectional only (Note3)	V_F	3.5/5.0	V
Typical thermal resistance junction to lead	$R_{\theta JL}$	15	$^{\circ}$ C/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	75	$^{\circ}$ C/W

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

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

3. $V_F = 3.5$ V for devices of V (BR) < 220V, and $V_F = 5.0$ 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°C)

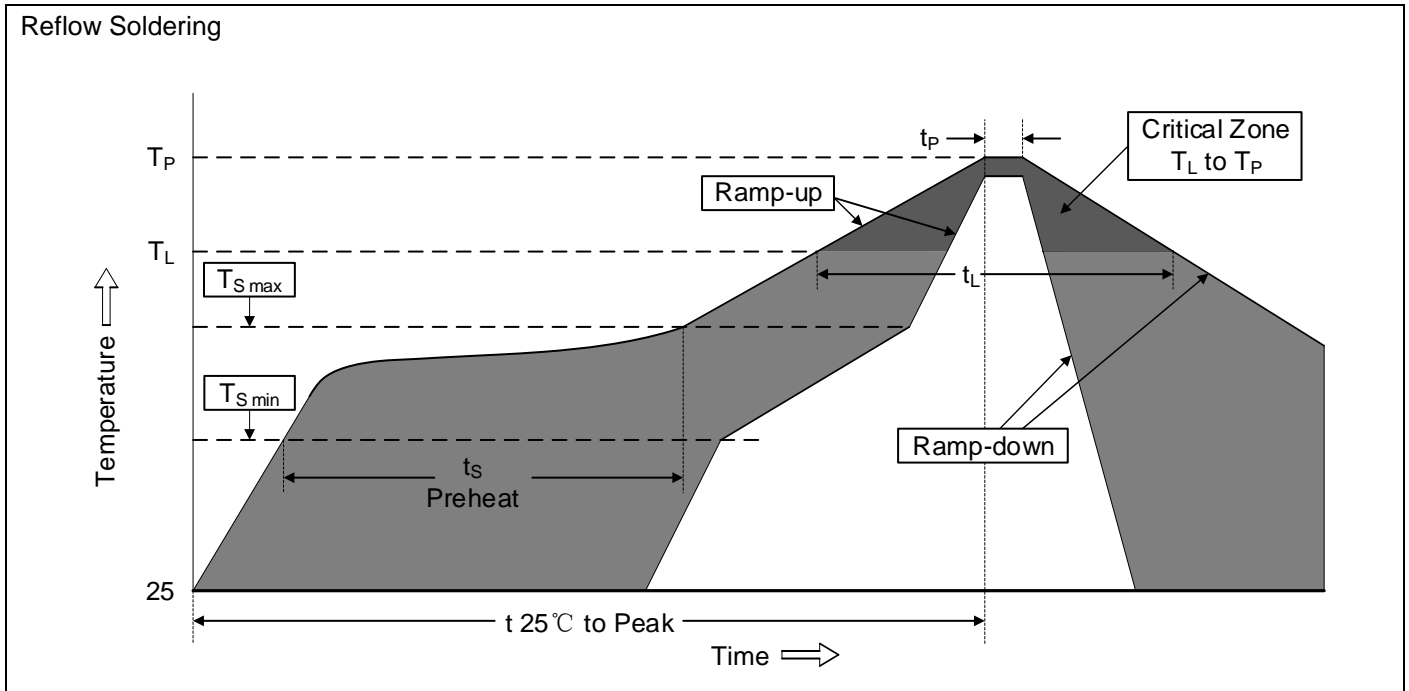
Part Number		Device Marking Code		Reverse Stand-Off Voltage	Breakdown Voltage @I _T	Test Current	Maximum Clamping Voltage@I _{PP}	Peak Pulse Current	Reverse Leakage @V _{RWM}
Unidirectional	Bidirectional	UNI	BI	V _{RWM} (V)	V _{BR} (V)	I _T (mA)	V _C (V)	I _{PP} (A)	I _R (μA)
1.5SMC6.8A	1.5SMC6.8CA	6V8A	6V8C	5.80	6.45~7.14	10	10.5	144.8	1000
1.5SMC7.5A	1.5SMC7.5CA	7V5A	7V5C	6.40	7.13~7.88	10	11.3	134.5	500
1.5SMC8.2A	1.5SMC8.2CA	8V2A	8V2C	7.02	7.79~8.61	10	12.1	125.6	200
1.5SMC9.1A	1.5SMC9.1CA	9V1A	9V1C	7.78	8.65~9.55	1	13.4	113.4	50
1.5SMC10A	1.5SMC10CA	10A	10C	8.55	9.5~10.5	1	14.5	104.8	10
1.5SMC11A	1.5SMC11CA	11A	11C	9.40	10.5~11.6	1	15.6	97.4	5
1.5SMC12A	1.5SMC12CA	12A	12C	10.2	11.4~12.6	1	16.7	91.0	5
1.5SMC13A	1.5SMC13CA	13A	13C	11.1	12.4~13.7	1	18.2	83.5	5
1.5SMC15A	1.5SMC15CA	15A	15C	12.8	14.3~15.8	1	21.2	71.7	1
1.5SMC16A	1.5SMC16CA	16A	16C	13.6	15.2~16.8	1	22.5	67.6	1
1.5SMC18A	1.5SMC18CA	18A	18C	15.3	17.1~18.9	1	25.2	60.3	1
1.5SMC20A	1.5SMC20CA	20A	20C	17.1	19.0~21.0	1	27.7	54.9	1
1.5SMC22A	1.5SMC22CA	22A	22C	18.8	20.9~23.1	1	30.6	49.7	1
1.5SMC24A	1.5SMC24CA	24A	24C	20.5	22.8~25.2	1	33.2	45.8	1
1.5SMC27A	1.5SMC27CA	27A	27C	23.1	25.7~28.4	1	37.5	40.5	1
1.5SMC30A	1.5SMC30CA	30A	30C	25.6	28.5~31.5	1	41.4	36.7	1
1.5SMC33A	1.5SMC33CA	33A	33C	28.2	31.4~34.7	1	45.7	33.3	1
1.5SMC36A	1.5SMC36CA	36A	36C	30.8	34.2~37.8	1	49.9	30.5	1
1.5SMC39A	1.5SMC39CA	39A	39C	33.3	37.1~41.0	1	53.9	28.2	1
1.5SMC43A	1.5SMC43CA	43A	43C	36.8	40.9~45.2	1	59.3	25.6	1
1.5SMC47A	1.5SMC47CA	47A	47C	40.2	44.7~49.4	1	64.8	23.5	1
1.5SMC51A	1.5SMC51CA	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	1.5SMC56CA	56A	56C	47.8	53.2~58.8	1	77.0	19.7	1
1.5SMC62A	1.5SMC62CA	62A	62C	53.0	58.9~65.1	1	85.0	17.9	1
1.5SMC68A	1.5SMC68CA	68A	68C	58.1	64.6~71.4	1	92.0	16.5	1
1.5SMC75A	1.5SMC75CA	75A	75C	64.1	71.3~78.8	1	103.0	14.8	1
1.5SMC82A	1.5SMC82CA	82A	82C	70.1	77.9~86.1	1	113.0	13.5	1
1.5SMC91A	1.5SMC91CA	91A	91C	77.8	86.5~95.5	1	125.0	12.2	1
1.5SMC100A	1.5SMC100CA	100A	100C	85.5	95~105	1	137.0	11.1	1
1.5SMC110A	1.5SMC110CA	110A	110C	94.0	105~116	1	152.0	10.0	1
1.5SMC120A	1.5SMC120CA	120A	120C	102	114~126	1	165.0	9.2	1
1.5SMC130A	1.5SMC130CA	130A	130C	111	124~137	1	179.0	8.5	1
1.5SMC150A	1.5SMC150CA	150A	150C	128	143~158	1	207.0	7.3	1
1.5SMC160A	1.5SMC160CA	160A	160C	136	152~168	1	219.0	6.9	1
1.5SMC170A	1.5SMC170CA	170A	170C	145	162~179	1	234.0	6.5	1
1.5SMC180A	1.5SMC180CA	180A	180C	154	171~189	1	246.0	6.2	1
1.5SMC200A	1.5SMC200CA	200A	200C	171	190~210	1	274.0	5.5	1
1.5SMC220A	1.5SMC220CA	220A	220C	185	209~231	1	328.0	4.6	1
1.5SMC250A	1.5SMC250CA	250A	250C	214	237~263	1	344.0	4.4	1
1.5SMC300A	1.5SMC300CA	300A	300C	256	285~315	1	414.0	3.7	1
1.5SMC350A	1.5SMC350CA	350A	350C	300	333~368	1	482.0	3.2	1
1.5SMC400A	1.5SMC400CA	400A	400C	342	380~420	1	548.0	2.8	1
1.5SMC440A	1.5SMC440CA	440A	440C	376	418~462	1	602.0	2.5	1
1.5SMC480A	1.5SMC480CA	480A	480C	408	456~504	1	658.0	2.3	1
1.5SMC510A	1.5SMC510CA	510A	510C	434	485~535	1	698.0	2.1	1
1.5SMC530A	1.5SMC530CA	530A	530C	450	503~556	1	725.0	2.1	1
1.5SMC540A	1.5SMC540CA	540A	540C	459	513~567	1	740.0	2.0	1
1.5SMC550A	1.5SMC550CA	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.

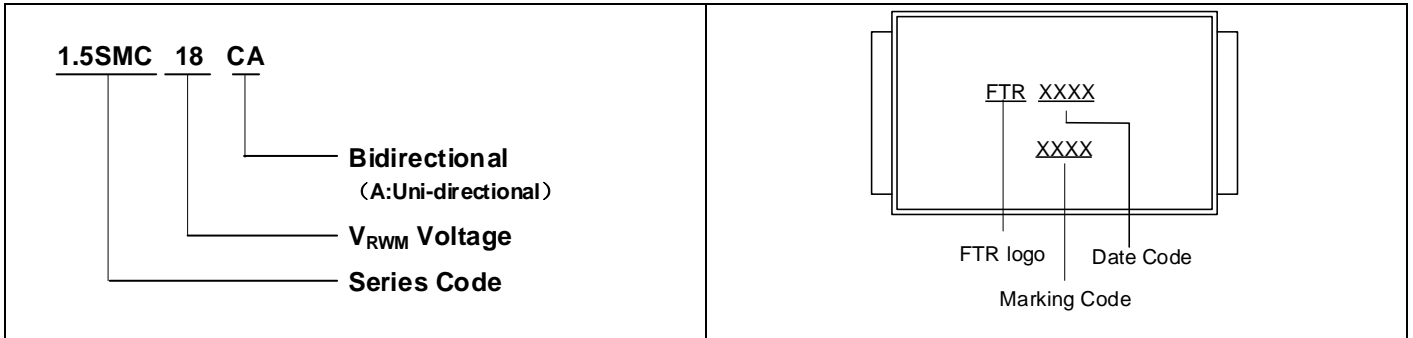
Recommended Soldering Conditions



Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	3°C/second max.
Preheat	
-Temperature Min ($T_{S\ min}$)	150°C
-Temperature Max ($T_{S\ max}$)	200°C
-Time (min to max) (t_s)	60-180 seconds
$T_{S\ max}$ to T_L	
-Ramp-up Rate	3°C/second max.
Time maintained above:	
-Temperature (T_L)	217°C
-Time (t_L)	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 ($T_A=25^\circ\text{C}$ unless otherwise noted)

Figure 1. Peak Pulse Power Rating Curve

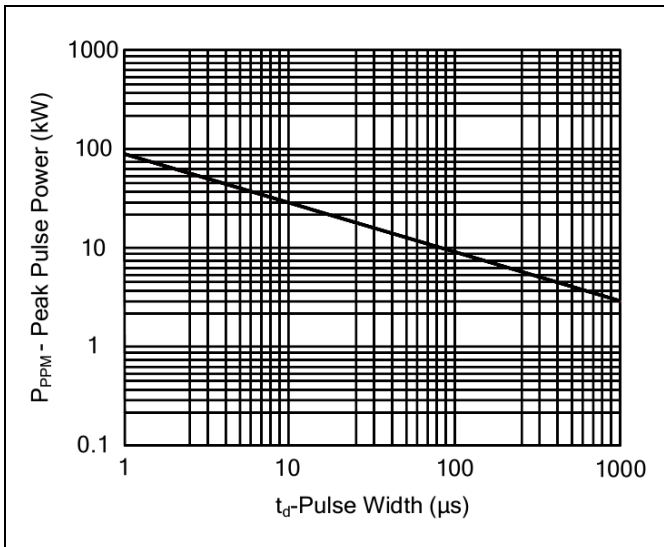


Figure 2. Pulse Derating Curve

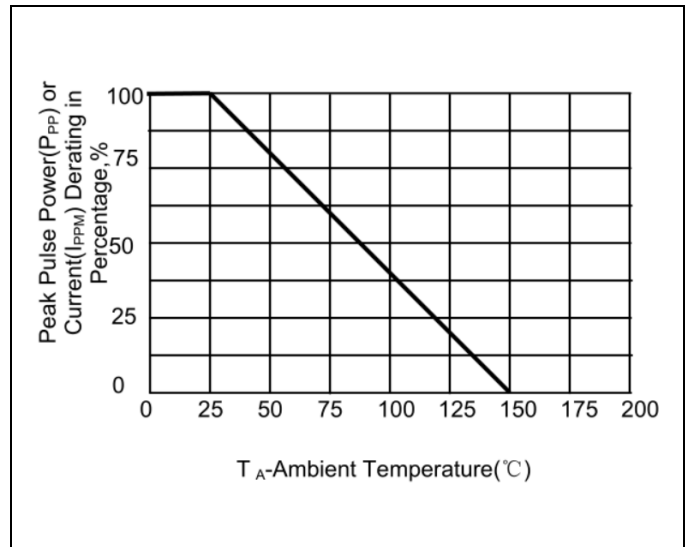


Figure 3. Pulse Waveform

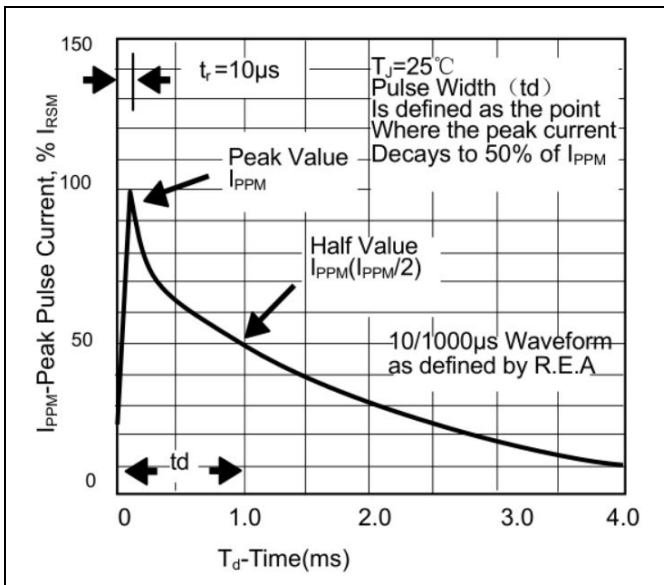
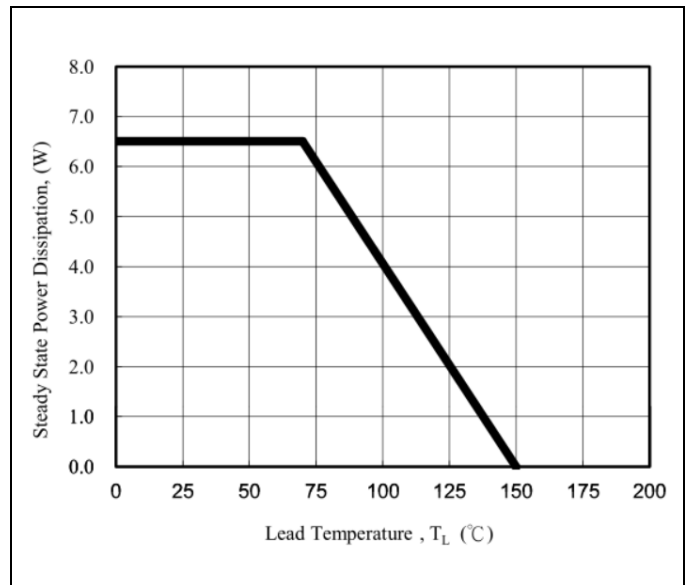


Figure 4. Steady State Power Dissipation Derating Curve



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
		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			

Reel

