

## 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 11V.
- Plastic package has underwriters laboratory flammability 94V-0
- Meets MSL level 1, per J-STD-020.

### Mechanical Data

- Case: JEDEC DO-214AB Moulded plastic
- Terminal: solderplated, 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	°C
Typical thermal resistance junction to lead	$R_{\theta JL}$	15	°C/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	75	°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.

## Dimensions (DO-214AB/SMC)

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 (TA=25°C)

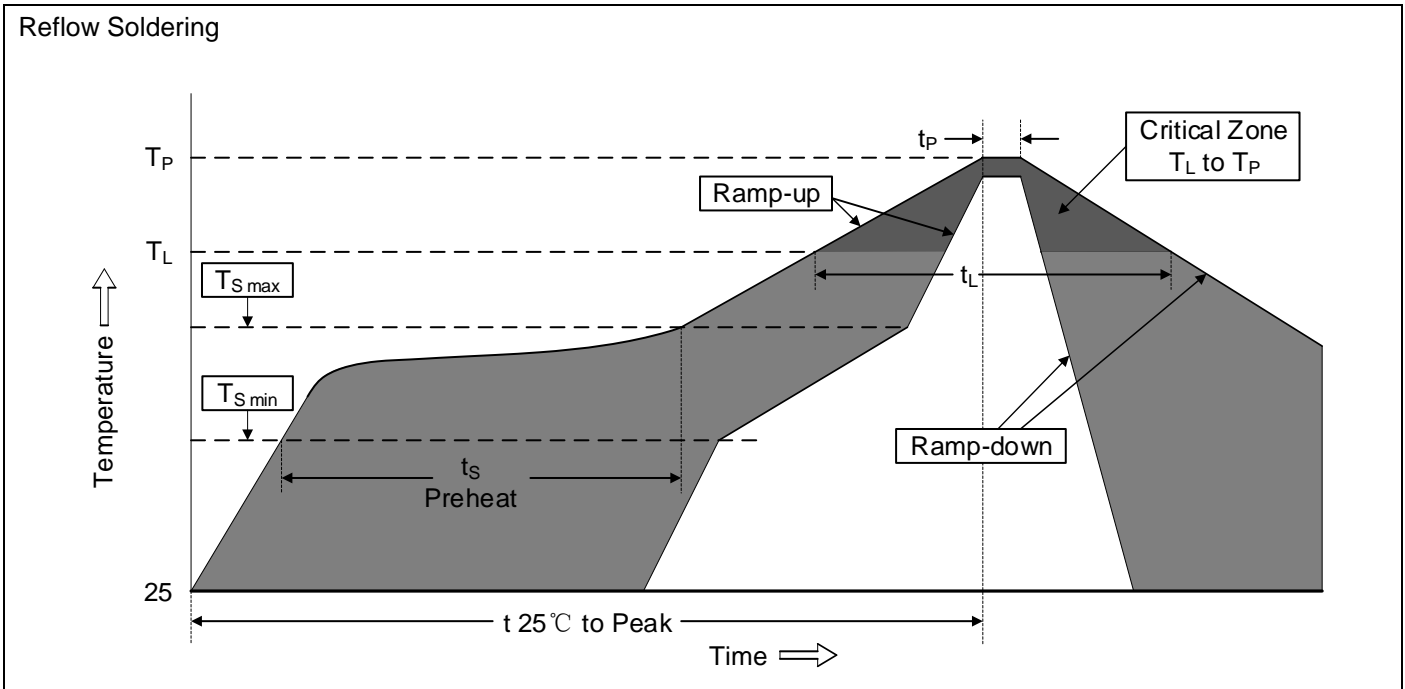
Part Number		Device Marking Code		Reverse Stand-Off Voltage	Breakdown Voltage @I <sub>T</sub>	Test Current	Maximum Clamping Voltage @I <sub>PP</sub>	Peak Pulse Current	Reverse Leakage @V <sub>RWM</sub>
Unidirectional	Bidirectional	UNI	BI	V <sub>RWM</sub> (V)	V <sub>BR</sub> (V)	I <sub>T</sub> (mA)	V <sub>C</sub> (V)	I <sub>PP</sub> (A)	I <sub>R</sub> (μA)
SMCJ5.0A	SMCJ5.0CA	GDE	BDE	5.0	6.4~7.0	10	9.2	163.0	800
SMCJ6.0A	SMCJ6.0CA	GDG	BDG	6.0	6.7~7.4	10	10.3	145.6	800
SMCJ6.5A	SMCJ6.5CA	GDK	BDK	6.5	7.2~8.0	10	11.2	133.9	500
SMCJ7.0A	SMCJ7.0CA	GDM	BDM	7.0	7.8~8.6	10	12.0	125.0	200
SMCJ7.5A	SMCJ7.5CA	GDP	BDP	7.5	8.3~9.2	1	12.9	116.3	100
SMCJ8.0A	SMCJ8.0CA	GDR	BDR	8.0	8.9~9.8	1	13.6	110.3	50
SMCJ8.5A	SMCJ8.5CA	GDT	BDT	8.5	9.4~10.4	1	14.4	104.2	20
SMCJ9.0A	SMCJ9.0CA	GDV	BDV	9.0	10.0~11.0	1	15.4	97.4	10
SMCJ10A	SMCJ10CA	GDX	BDX	10.0	11.1~12.3	1	17.0	88.3	5
SMCJ11A	SMCJ11CA	GDZ	BDZ	11.0	12.2~13.5	1	18.2	82.4	1
SMCJ12A	SMCJ12CA	GEE	BEE	12.0	13.3~14.7	1	19.9	75.4	1
SMCJ13A	SMCJ13CA	GEG	BEG	13.0	14.4~15.9	1	21.5	69.8	1
SMCJ14A	SMCJ14CA	GEK	BEK	14.0	15.6~17.2	1	23.2	64.7	1
SMCJ15A	SMCJ15CA	GEM	BEM	15.0	16.7~18.5	1	24.4	61.5	1
SMCJ16A	SMCJ16CA	GEP	BEP	16.0	17.8~19.7	1	26.0	57.7	1
SMCJ17A	SMCJ17CA	GER	BER	17.0	18.9~20.9	1	27.6	54.4	1
SMCJ18A	SMCJ18CA	GET	BET	18.0	20.0~22.1	1	29.2	51.4	1
SMCJ19A	SMCJ19CA	GEW	BEW	19.0	21.1~23.3	1	30.8	48.7	1
SMCJ20A	SMCJ20CA	GEV	BEV	20.0	22.2~24.5	1	32.4	46.3	1
SMCJ22A	SMCJ22CA	GEX	BEX	22.0	24.4~26.9	1	35.5	42.3	1
SMCJ24A	SMCJ24CA	GEZ	BEZ	24.0	26.7~29.5	1	38.9	38.6	1
SMCJ26A	SMCJ26CA	GFE	BFE	26.0	28.9~31.9	1	42.1	35.6	1

## Electrical Characteristics (TA=25°C)

Part Number		Device Marking Code		Reverse Stand-Off Voltage	Breakdown Voltage @IT	Test Current	Maximum Clamping Voltage @ I <sub>PP</sub>	Peak Pulse Current	Reverse Leakage @ V <sub>RWM</sub>
Unidirectional	Bidirectional	UNI	BI	V <sub>RWM</sub> (V)	V <sub>BR</sub> (V)	I <sub>T</sub> (mA)	V <sub>C</sub> (V)	I <sub>PP</sub> (A)	I <sub>R</sub> (μA)
SMCJ28A	SMCJ28CA	GFG	BFG	28.0	31.1~34.4	1	45.4	33.1	1
SMCJ30A	SMCJ30CA	GFK	BFK	30.0	33.3~36.8	1	48.4	31.0	1
SMCJ33A	SMCJ33CA	GFM	BFM	33.0	36.7~40.6	1	53.3	28.1	1
SMCJ36A	SMCJ36CA	GFP	BFP	36.0	40.0~44.2	1	58.1	25.8	1
SMCJ40A	SMCJ40CA	GFR	BFR	40.0	44.4~49.1	1	64.5	23.3	1
SMCJ43A	SMCJ43CA	GFT	BFT	43.0	47.8~52.8	1	69.4	21.6	1
SMCJ45A	SMCJ45CA	GFV	BFV	45.0	50.0~55.3	1	72.7	20.6	1
SMCJ48A	SMCJ48CA	GFX	BFX	48.0	53.3~58.9	1	77.4	19.4	1
SMCJ51A	SMCJ51CA	GFZ	BFZ	51.0	56.7~62.7	1	82.4	18.2	1
SMCJ54A	SMCJ54CA	GGE	BGE	54.0	60.0~66.3	1	87.1	17.2	1
SMCJ58A	SMCJ58CA	GGG	BGG	58.0	64.4~71.2	1	93.6	16.0	1
SMCJ60A	SMCJ60CA	GGK	BGK	60.0	66.7~73.7	1	96.8	15.5	1
SMCJ64A	SMCJ64CA	GGM	BGM	64.0	71.1~78.6	1	103.0	14.6	1
SMCJ70A	SMCJ70CA	GGP	BGP	70.0	77.8~86.0	1	113.0	13.3	1
SMCJ75A	SMCJ75CA	GGR	BGR	75.0	83.3~92.1	1	121.0	12.4	1
SMCJ78A	SMCJ78CA	GGT	BGT	78.0	86.7~95.8	1	126.0	11.9	1
SMCJ80A	SMCJ80CA	GGW	BGW	80.0	88.8~97.6	1	129.6	11.6	1
SMCJ85A	SMCJ85CA	GGV	BGV	85.0	94.4~104	1	137.0	11.0	1
SMCJ90A	SMCJ90CA	GGX	BGX	90.0	100~111	1	146.0	10.3	1
SMCJ100A	SMCJ100CA	GGZ	BGZ	100.0	111~123	1	162.0	9.3	1
SMCJ110A	SMCJ110CA	GHE	BHE	110.0	122~135	1	177.0	8.5	1
SMCJ120A	SMCJ120CA	GHG	BHG	120.0	133~147	1	193.0	7.8	1
SMCJ130A	SMCJ130CA	GHK	BHK	130.0	144~159	1	209.0	7.2	1
SMCJ140A	SMCJ140CA	GHL	BHL	140.0	155~171	1	227.0	6.6	1
SMCJ150A	SMCJ150CA	GHM	BHM	150.0	167~185	1	243.0	6.2	1
SMCJ160A	SMCJ160CA	GHP	BHP	160.0	178~197	1	259.0	5.8	1
SMCJ170A	SMCJ170CA	GHR	BHR	170.0	189~209	1	275.0	5.5	1
SMCJ180A	SMCJ180CA	GHT	BHT	180.0	200~220	1	291.0	5.1	1
SMCJ190A	SMCJ190CA	GHW	BHW	190.0	211~232	1	308.0	4.9	1
SMCJ200A	SMCJ200CA	GHV	BHV	200.0	224~247	1	324.0	4.6	1
SMCJ220A	SMCJ220CA	GHX	BHX	220.0	246~272	1	356.0	4.2	1
SMCJ250A	SMCJ250CA	GHZ	BHZ	250.0	279~309	1	405.0	3.7	1
SMCJ300A	SMCJ300CA	GJE	BJE	300.0	335~371	1	486.0	3.1	1
SMCJ350A	SMCJ350CA	GJG	BJG	350.0	391~432	1	567.0	2.6	1
SMCJ400A	SMCJ400CA	GJK	BJK	400.0	447~494	1	648.0	2.3	1
SMCJ440A	SMCJ440CA	GJM	BJM	440.0	492~543	1	713.0	2.1	1

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

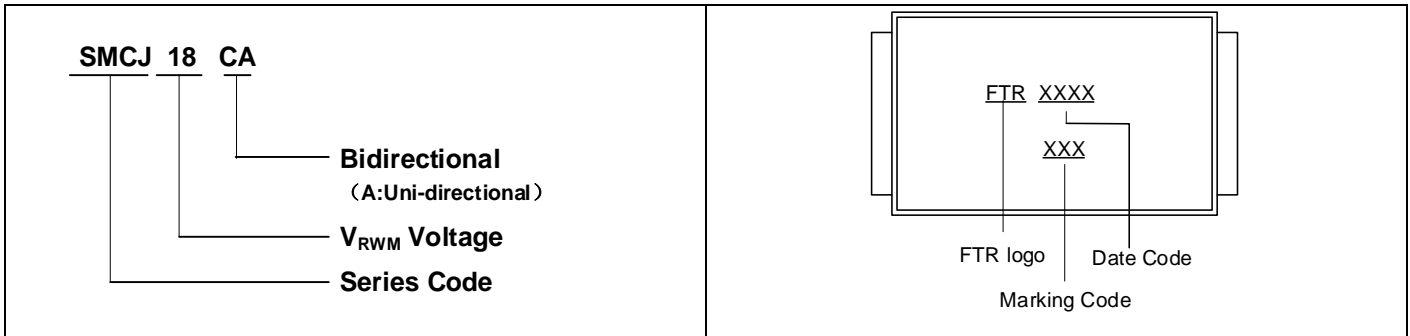
## Recommended Soldering Conditions



### Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate ( $T_L$ to $T_P$ )	3°C/second max.
Preheat -Temperature Min ( $T_{S\ min}$ ) -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 ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Figure 1. Peak Pulse Power Rating Curve

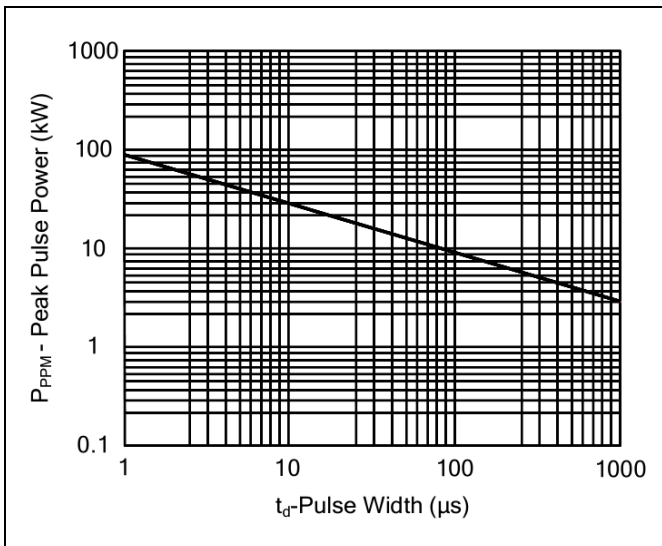


Figure 2. Pulse Derating Curve

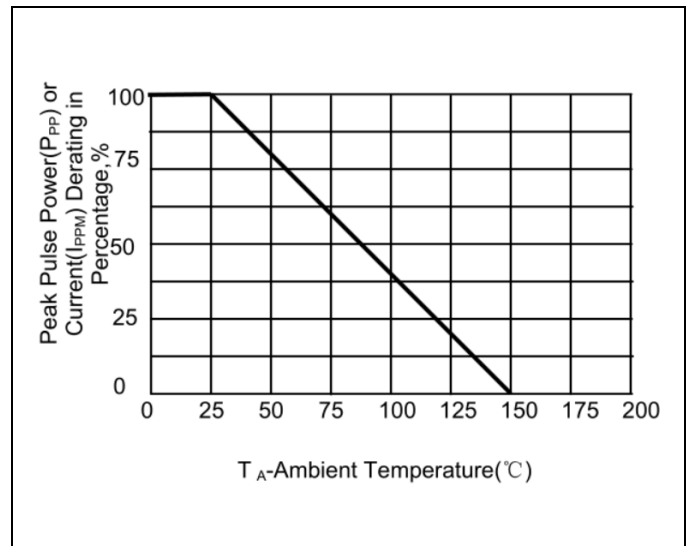


Figure 3. Pulse Waveform

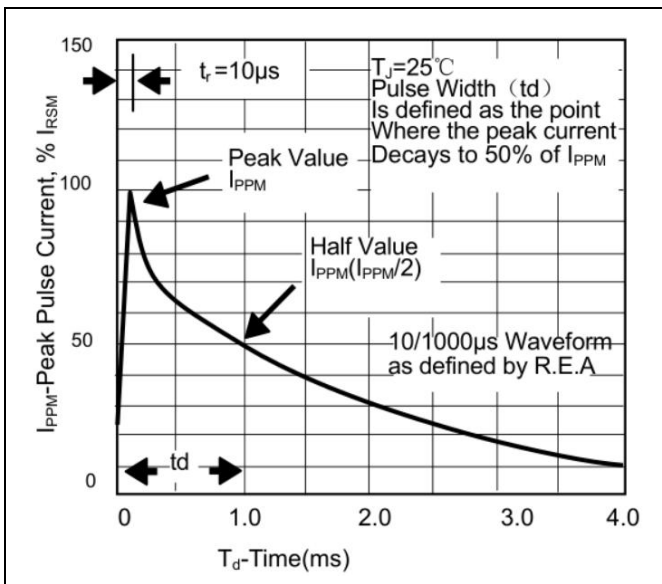
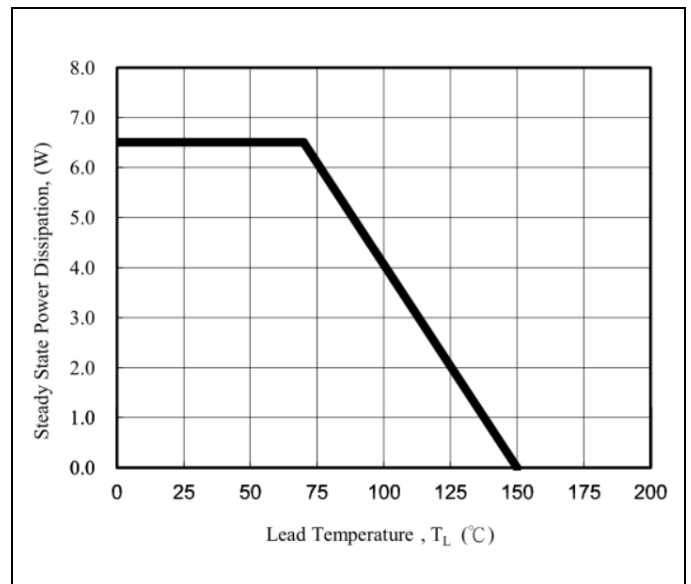
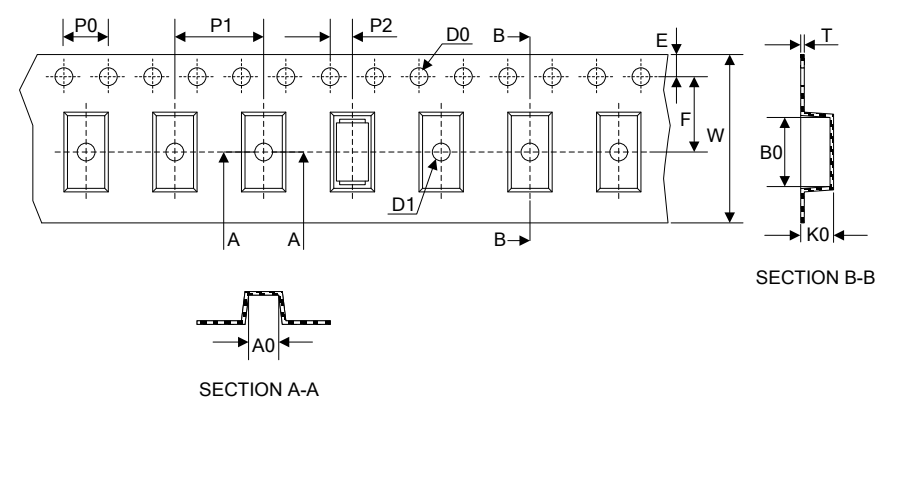
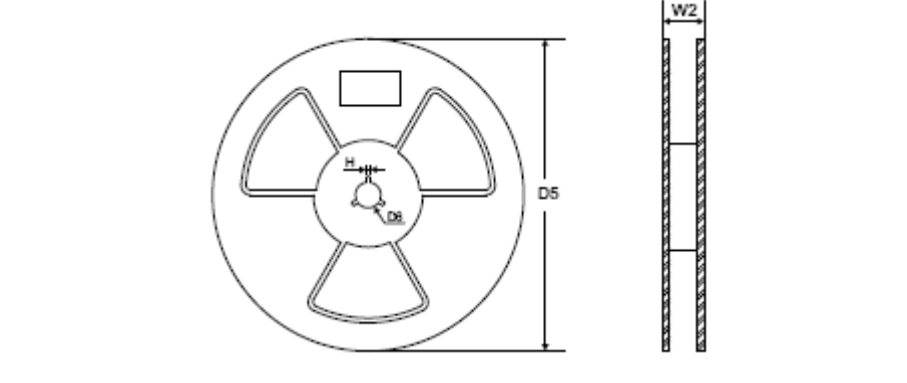


Figure 4. Steady State Power Dissipation Derating Curve



## 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	