

## Transient Voltage Suppressors (TVS) Data Sheet

### Features

- Glass passivated junction
- Low zener impedance
- Excellent clamping capability
- 3000W 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 3000	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)	$I_{FSM}$	300	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)

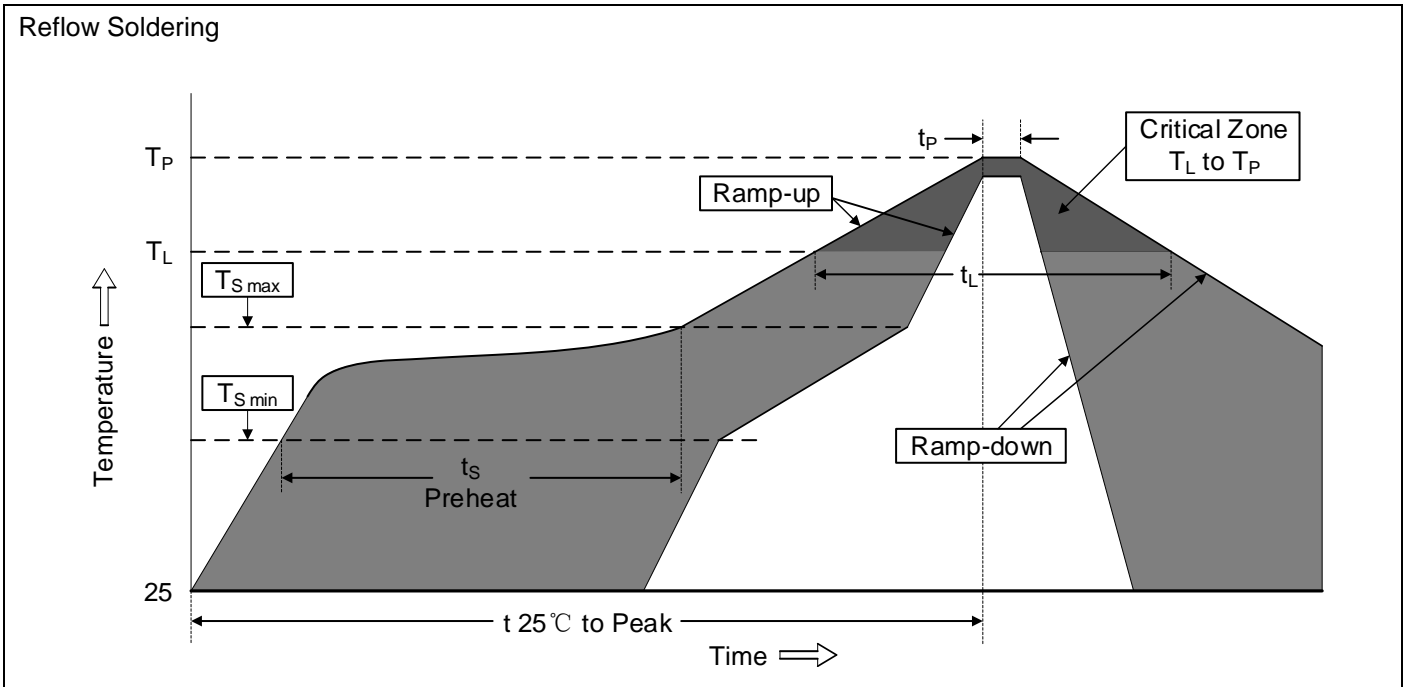
Part Number		Device Marking Code		Reverse Stand-Off Voltage	Breakdown Voltage @I <sub>T</sub>	Test Current	Maximum Clamping Voltage @I <sub>PP</sub>	Peak Pulse Current	Reverse Leakage @V <sub>RWM</sub>
Unidirectional	Bidirectional	UNI	BI	V <sub>RWM</sub> (V)	V <sub>BR</sub> (V)	I <sub>T</sub> (mA)	V <sub>C</sub> (V)	I <sub>PP</sub> (A)	I <sub>R</sub> (μA)
SMDJ5.0A	SMDJ5.0CA	RDE	DDE	5.0	6.4~7.0	10	9.2	326.1	800
SMDJ6.0A	SMDJ6.0CA	RDG	DDG	6.0	6.7~7.4	10	10.3	291.3	800
SMDJ6.5A	SMDJ6.5CA	RDK	DDK	6.5	7.2~8.0	10	11.2	267.9	500
SMDJ7.0A	SMDJ7.0CA	PDM	DDM	7.0	7.8~8.6	10	12.0	250.0	200
SMDJ7.5A	SMDJ7.5CA	PDP	DDP	7.5	8.3~9.2	1	12.9	232.6	100
SMDJ8.0A	SMDJ8.0CA	PDR	DDR	8.0	8.9~9.8	1	13.6	220.6	50
SMDJ8.5A	SMDJ8.5CA	PDT	DDT	8.5	9.4~10.4	1	14.4	208.3	20
SMDJ9.0A	SMDJ9.0CA	PDV	DDV	9.0	10.0~11.0	1	15.4	194.8	10
SMDJ10A	SMDJ10CA	PDX	DDX	10.0	11.1~12.3	1	17.0	176.5	5
SMDJ11A	SMDJ11CA	PDZ	DDZ	11.0	12.2~13.5	1	18.2	164.8	2
SMDJ12A	SMDJ12CA	PEE	DEE	12.0	13.3~14.7	1	19.9	150.8	2
SMDJ13A	SMDJ13CA	PEG	DEG	13.0	14.4~15.9	1	21.5	139.5	2
SMDJ14A	SMDJ14CA	PEK	DEK	14.0	15.6~17.2	1	23.2	129.3	2
SMDJ15A	SMDJ15CA	PEM	DEM	15.0	16.7~18.5	1	24.4	123.0	2
SMDJ16A	SMDJ16CA	PEP	DEP	16.0	17.8~19.7	1	26.0	115.4	2
SMDJ17A	SMDJ17CA	PER	DER	17.0	18.9~20.9	1	27.6	108.7	2
SMDJ18A	SMDJ18CA	PET	DET	18.0	20.0~22.1	1	29.2	102.8	2
SMDJ19A	SMDJ19CA	PEW	DEW	19.0	21.1~23.3	1	30.8	97.5	2
SMDJ20A	SMDJ20CA	PEV	DEV	20.0	22.2~24.5	1	32.4	92.6	2
SMDJ22A	SMDJ22CA	PEX	DEX	22.0	24.4~26.9	1	35.5	84.5	2
SMDJ24A	SMDJ24CA	PEZ	DEZ	24.0	26.7~29.5	1	38.9	77.1	2
SMDJ26A	SMDJ26CA	PFE	DFE	26.0	28.9~31.9	1	42.1	71.3	2

## 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)
SMDJ28A	SMDJ28CA	PFG	DFG	28.0	31.1~34.4	1	45.4	66.1	2
SMDJ30A	SMDJ30CA	PFK	DFK	30.0	33.3~36.8	1	48.4	62.0	2
SMDJ33A	SMDJ33CA	PFM	DFM	33.0	36.7~40.6	1	53.3	56.3	2
SMDJ36A	SMDJ36CA	PFP	DFP	36.0	40.0~44.2	1	58.1	51.6	2
SMDJ40A	SMDJ40CA	PFR	DFR	40.0	44.4~49.1	1	64.5	46.5	2
SMDJ43A	SMDJ43CA	PFT	DFT	43.0	47.8~52.8	1	69.4	43.2	2
SMDJ45A	SMDJ45CA	PFV	DFV	45.0	50.0~55.3	1	72.7	41.3	2
SMDJ48A	SMDJ48CA	PFX	DFX	48.0	53.3~58.9	1	77.4	38.8	2
SMDJ51A	SMDJ51CA	PFZ	DFZ	51.0	56.7~62.7	1	82.4	36.4	2
SMDJ54A	SMDJ54CA	RGE	DGE	54.0	60.0~66.3	1	87.1	34.4	2
SMDJ58A	SMDJ58CA	PGG	DGG	58.0	64.4~71.2	1	93.6	32.1	2
SMDJ60A	SMDJ60CA	PGK	DGK	60.0	66.7~73.7	1	96.8	31.0	2
SMDJ64A	SMDJ64CA	PGM	DGM	64.0	71.1~78.6	1	103.0	29.1	2
SMDJ70A	SMDJ70CA	PGP	DGP	70.0	77.8~86.0	1	113.0	26.6	2
SMDJ75A	SMDJ75CA	PGR	DGR	75.0	83.3~92.1	1	121.0	24.8	2
SMDJ78A	SMDJ78CA	PGT	DGT	78.0	86.7~95.8	1	126.0	23.8	2
SMDJ80A	SMDJ80CA	PGW	DGW	80.0	88.8~97.6	1	129.6	23.2	2
SMDJ85A	SMDJ85CA	PGV	DGV	85.0	94.4~104	1	137.0	21.9	2
SMDJ90A	SMDJ90CA	PGX	DGX	90.0	100~111	1	146.0	20.6	2
SMDJ100A	SMDJ100CA	PGZ	DGZ	100.0	111~123	1	162.0	18.5	2
SMDJ110A	SMDJ110CA	PHE	DHE	110.0	122~135	1	177.0	17.0	2
SMDJ120A	SMDJ120CA	PHG	DHG	120.0	133~147	1	193.0	15.5	2
SMDJ130A	SMDJ130CA	PHK	DHK	130.0	144~159	1	209.0	14.4	2
SMDJ140A	SMDJ140CA	PHW	DHW	140.0	155~171	1	227.0	13.2	2
SMDJ150A	SMDJ150CA	PHM	DHM	150.0	167~185	1	243.0	12.4	2
SMDJ160A	SMDJ160CA	PHP	DHP	160.0	178~197	1	259.0	11.6	2
SMDJ170A	SMDJ170CA	PHR	DHR	170.0	189~209	1	275.0	10.9	2
SMDJ180A	SMDJ180CA	PHT	DHT	180.0	200~220	1	291.0	10.3	2
SMDJ190A	SMDJ190CA	PHX	DHX	190.0	211~232	1	308.0	9.8	2
SMDJ200A	SMDJ200CA	PHZ	DHZ	200.0	224~247	1	324.0	9.3	2
SMDJ220A	SMDJ220CA	PKE	DKE	220.0	246~272	1	356.0	8.4	2
SMDJ250A	SMDJ250CA	PKG	DKG	250.0	279~309	1	405.0	7.4	2
SMDJ300A	SMDJ300CA	PKM	DKM	300.0	335~371	1	486.0	6.2	2
SMDJ350A	SMDJ350CA	PKP	DKP	350.0	391~432	1	567.0	5.3	2
SMDJ400A	SMDJ400CA	PKZ	DKZ	400.0	447~494	1	648.0	4.6	2
SMDJ440A	SMDJ440CA	PPE	DPE	440.0	492~543	1	713.0	4.2	2

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

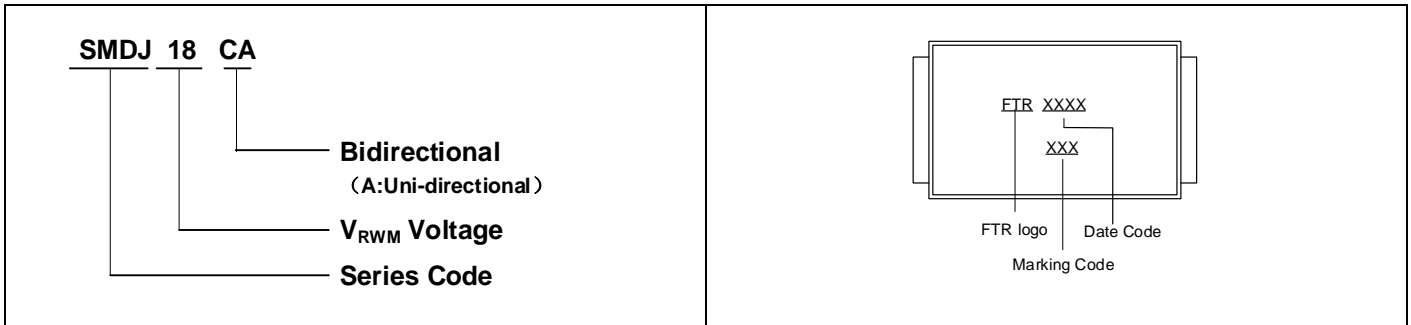
## Recommended Soldering Conditions



### 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

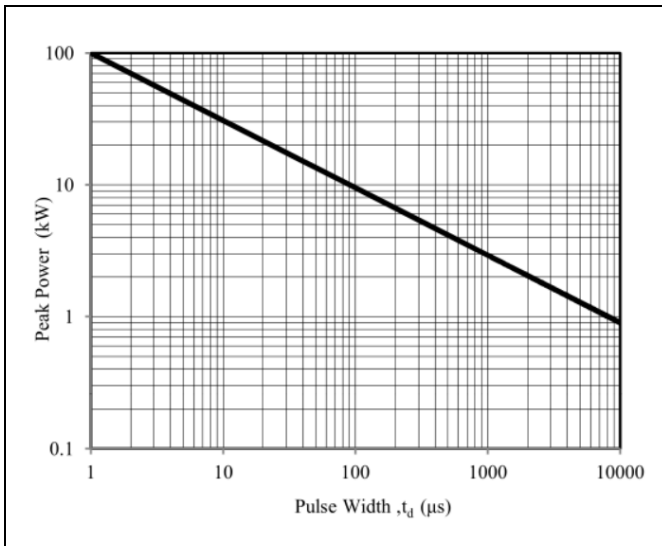


Figure 2. Pulse Derating Curve

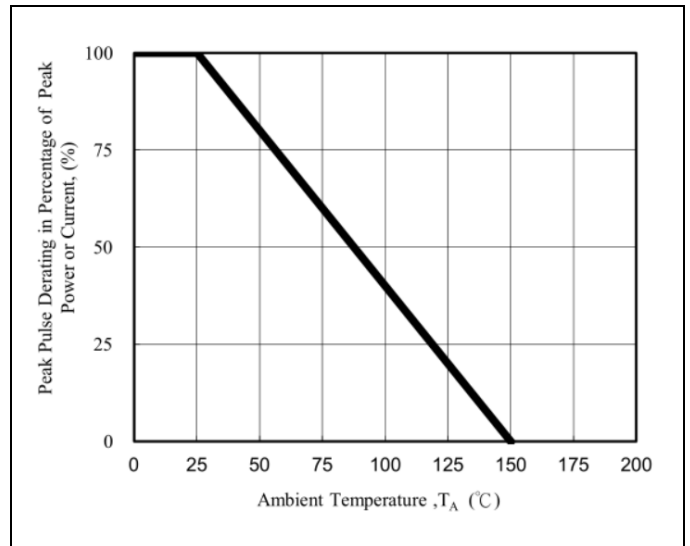


Figure 3. Pulse Waveform

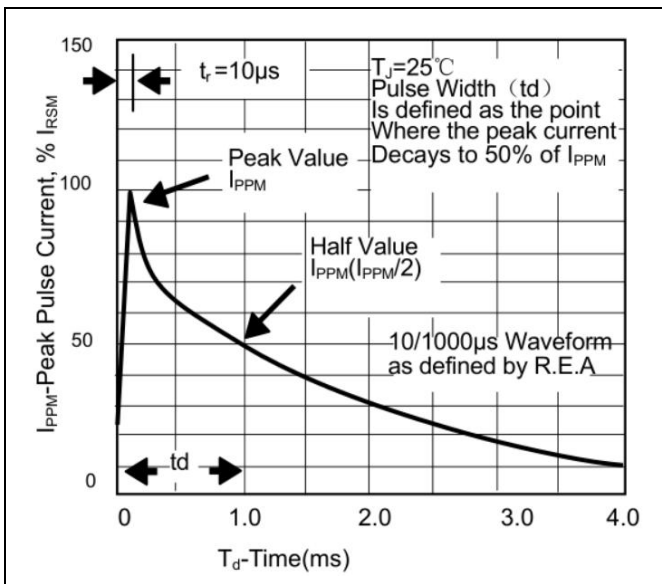
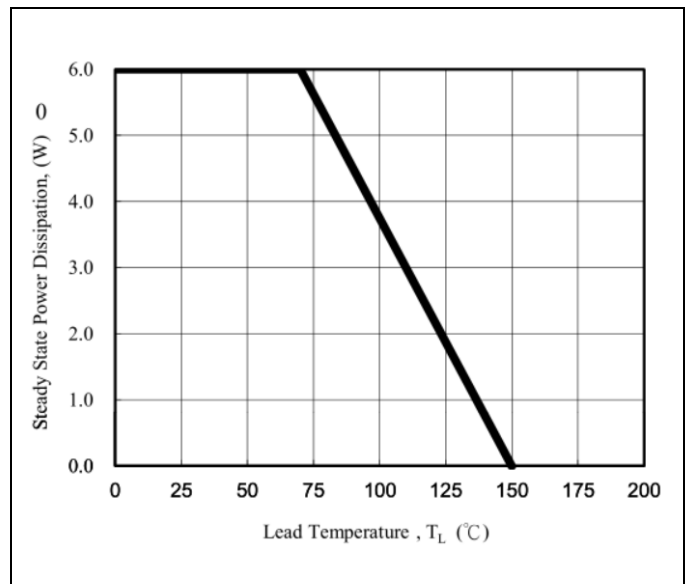
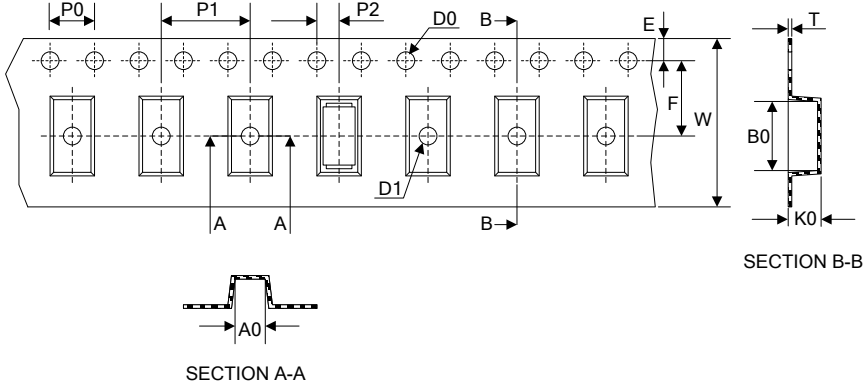
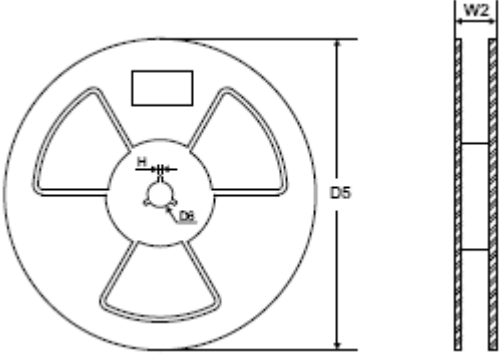


Figure 4. Steady State Power Dissipation Derating Curve



## Packaging

Tape		Symbol		Dimension (mm)	
		W	$16.00 \pm 0.10$ $4.00 \pm 0.10$ $8.00 \pm 0.10$ $2.00 \pm 0.10$ $\Phi 1.55 \pm 0.10$ $1.75 \pm 0.10$ $7.50 \pm 0.10$ $6.05 \pm 0.1$ $8.31 \pm 0.1$ $2.54 \pm 0.1$ $0.25 \pm 0.1$		
		P0			
		P1			
		P2			
		D0			
		E			
		F			
		A0			
		B0			
		K0			
T					
		D5	$\Phi 330.0 \pm 2.0$ $\Phi 13.5 \pm 0.5$ $2.5 \pm 1.0$ $20.0 \pm 2.0$		
		D6			
		H			
		W2			
		Quantity: 3000PCS			

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