

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 _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)
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

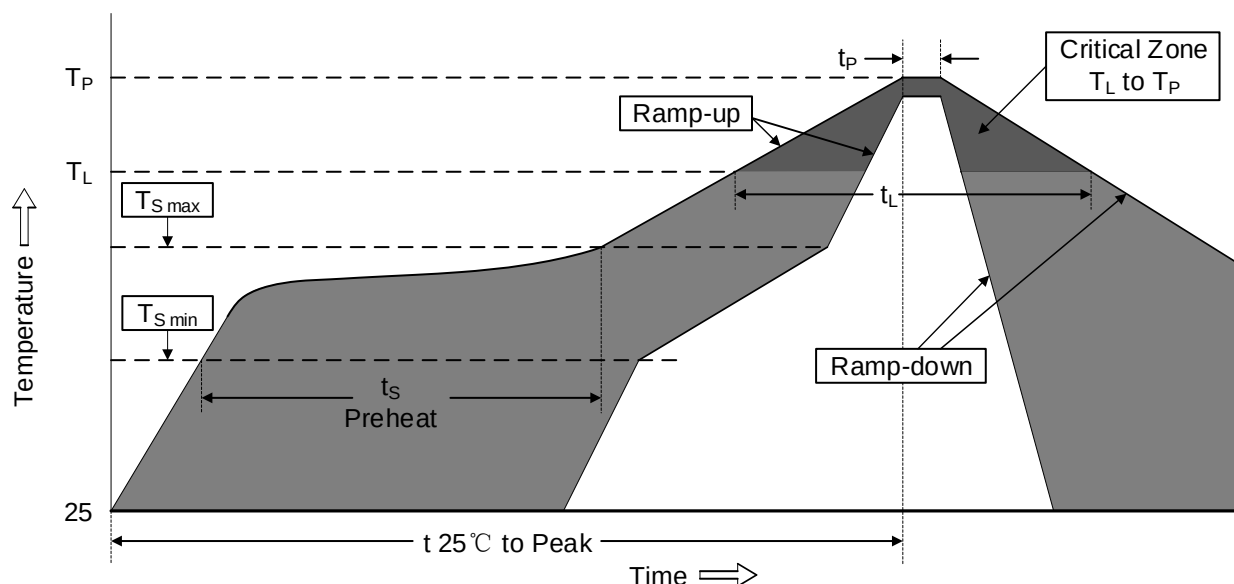
Electrical Characteristics (TA=25°C)

Part Number		Device Marking Code		Reverse Stand-Off Voltage	Breakdown Voltage @IT	Test Current	Maximum Clamping Voltage@ I _{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)
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

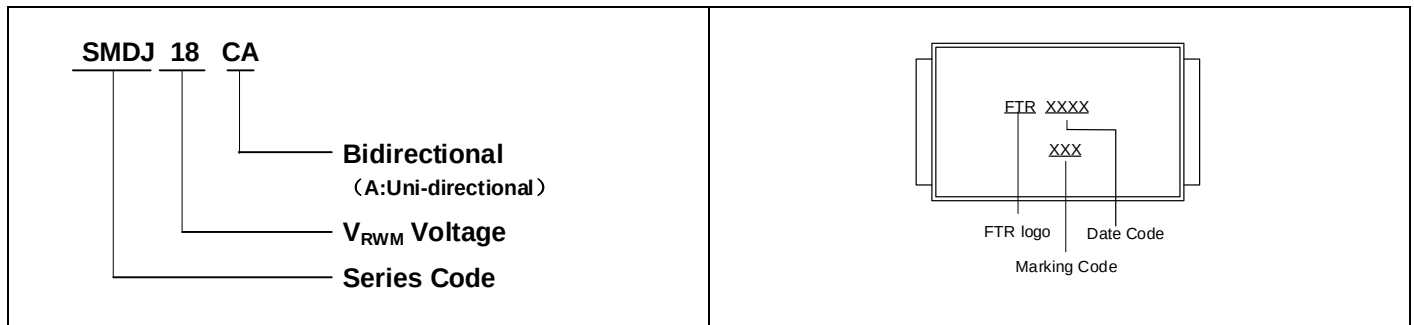
Reflow Soldering



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 ($T_A=25^\circ\text{C}$ unless otherwise noted)

Figure 1. Peak Pulse Power Rating Curve

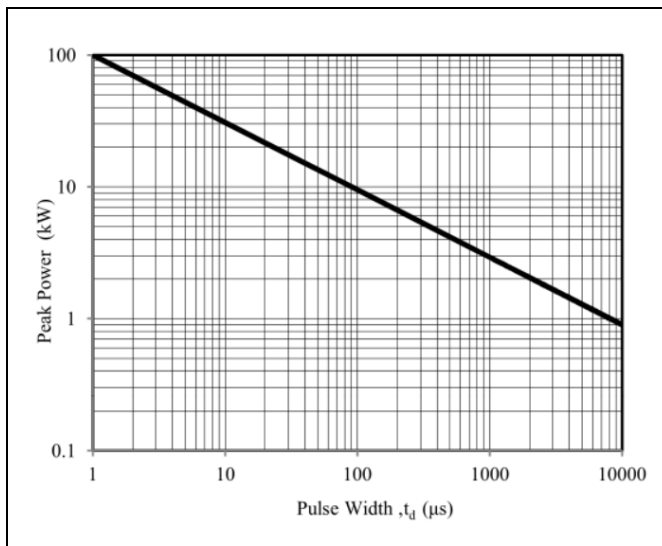


Figure 2. Pulse Derating Curve

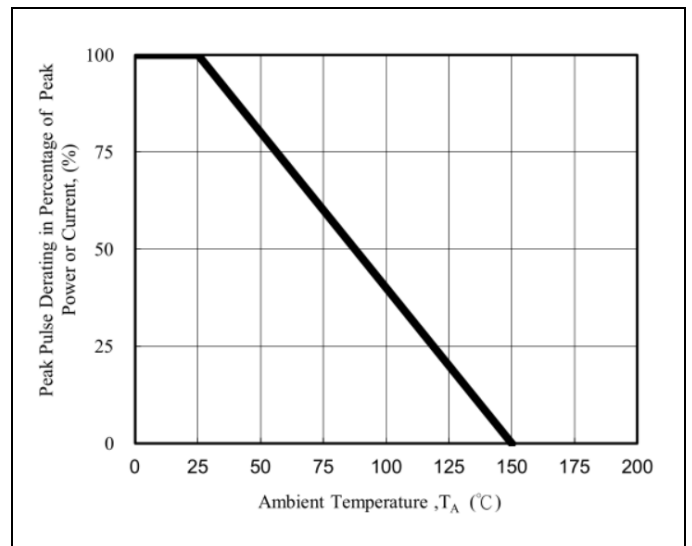


Figure 3. Pulse Waveform

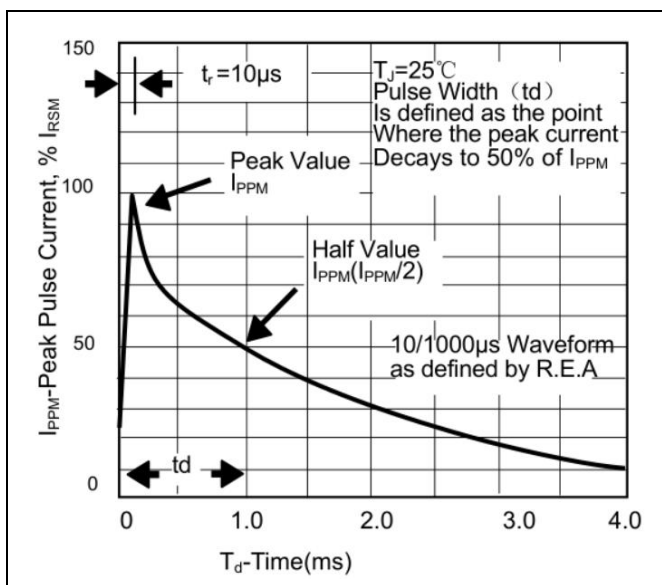
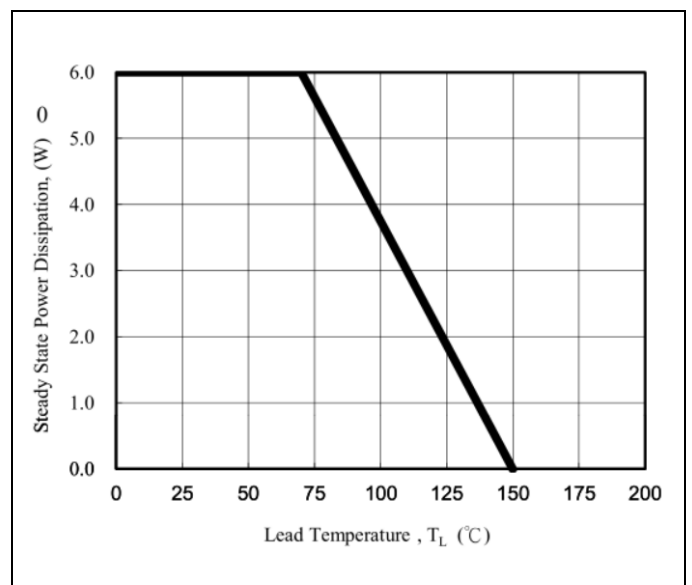
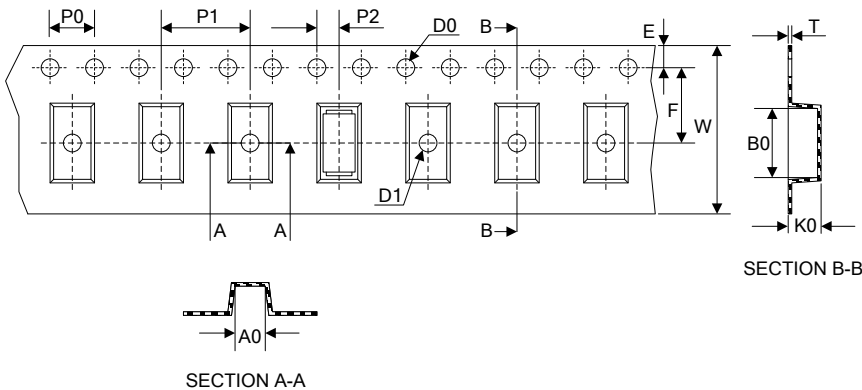
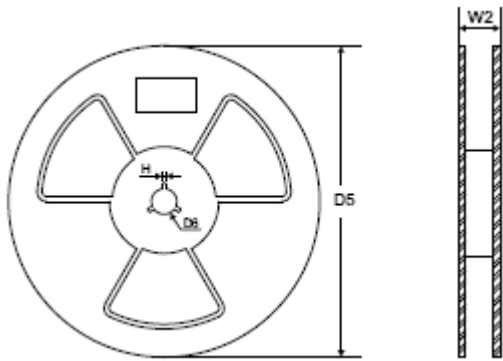


Figure 4. Steady State Power Dissipation Derating Curve



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
Reel		Symbol	Dimension (mm)
		D5	Φ330.0±2.0
		D6	Φ13.5±0.5
		H	2.5±1.0
		W2	20.0±2.0
		Quantity: 3000PCS	