

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.
- AEC-Q101 Qualified

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	$^{\circ}\text{C}$
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.

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

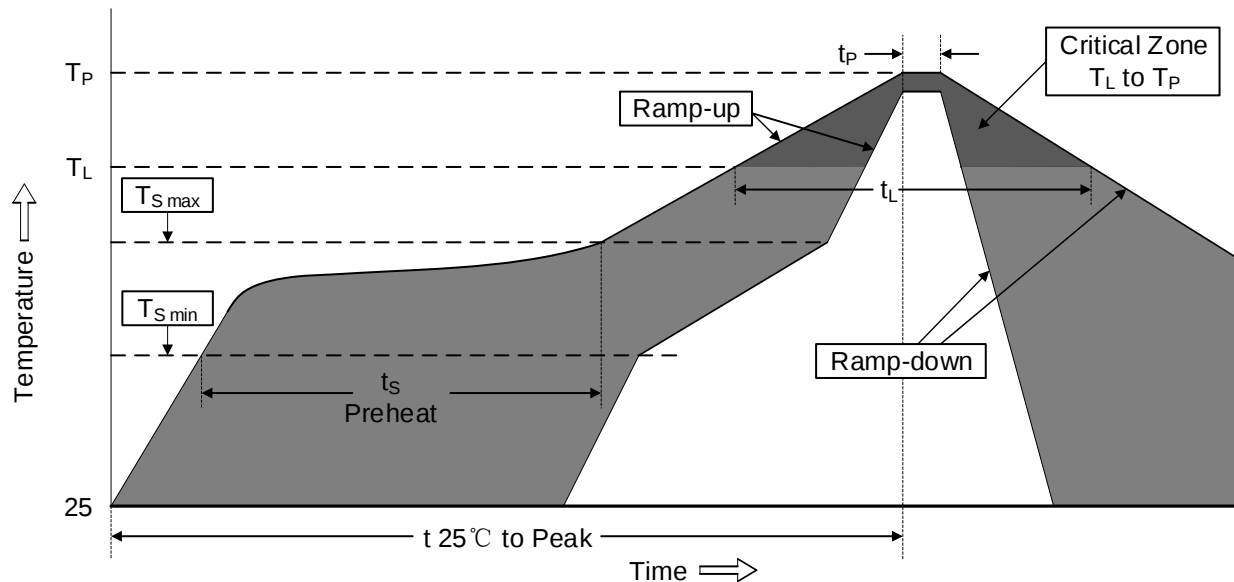
Electrical Characteristics (TA=25°C)

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

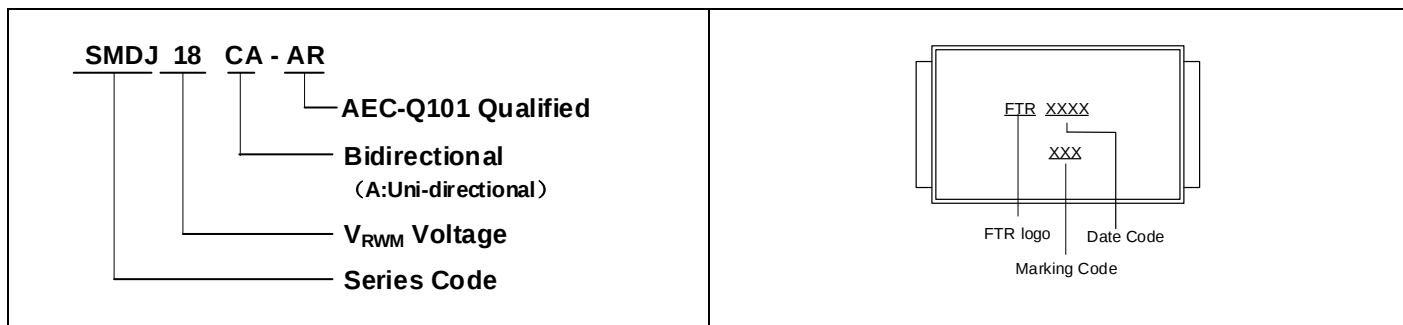
Reflow Soldering



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

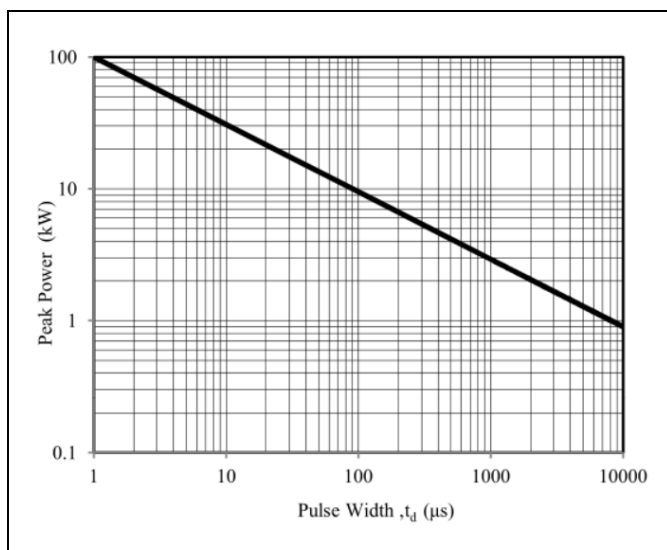


Figure 2. Pulse Derating Curve

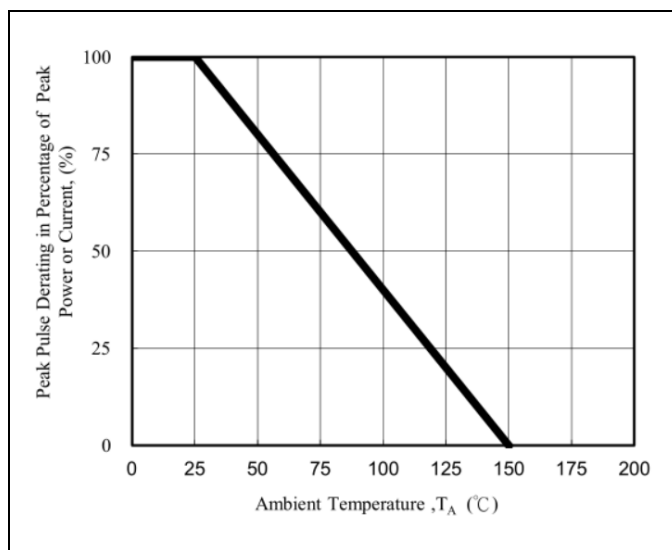


Figure 3. Pulse Waveform

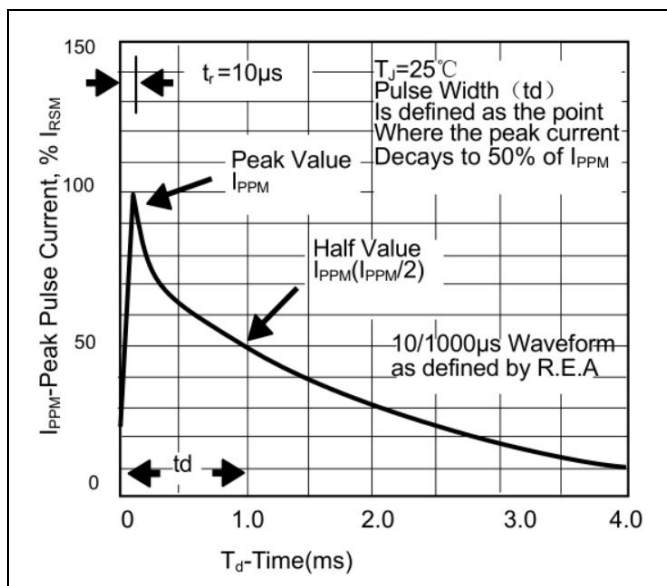
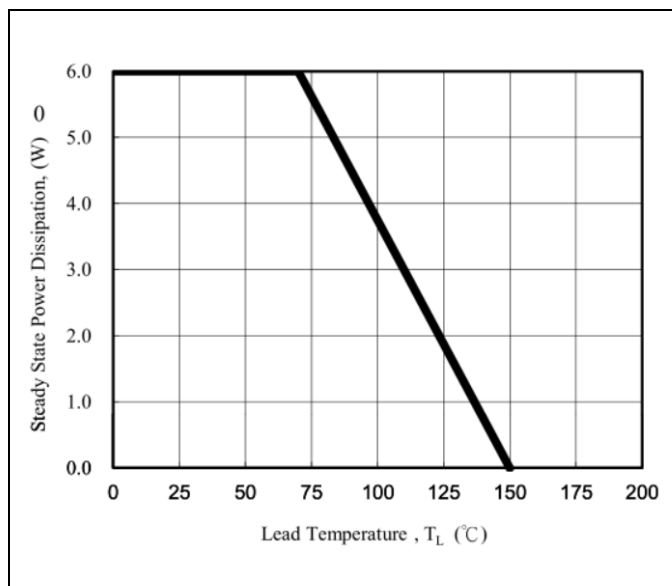


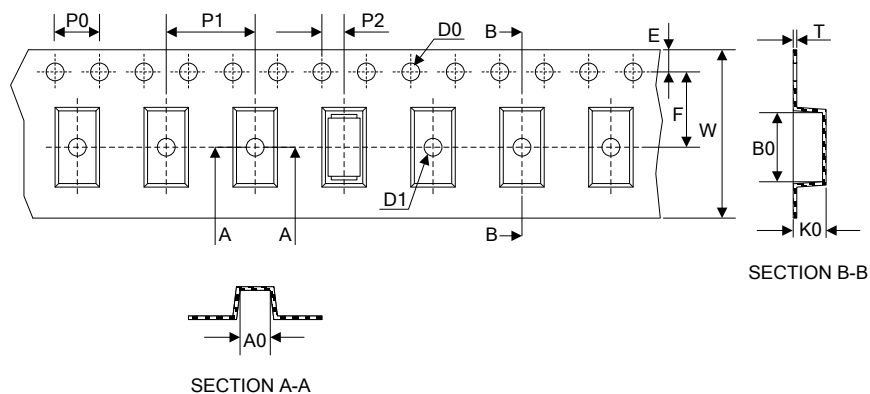
Figure 4. Steady State Power Dissipation Derating Curve



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

Tape



Reel

