Transient Voltage Suppressors (TVS) Data Sheet

Features

- Glass passivated junction
- Low zener impedance
- Excellent clamping capability
- 400W peak pulse power capability at 10/1000μs waveform, repetition rate (duty cycle):0.01%
- Fast response time
- Typical I_R less than 1μA above 13V.
- Plastic package has underwriters laboratory flammability 94V-0
- Meets MSL level 1, per J-STD-020.

Mechanical Data

- Case: JEDEC DO-214AC 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

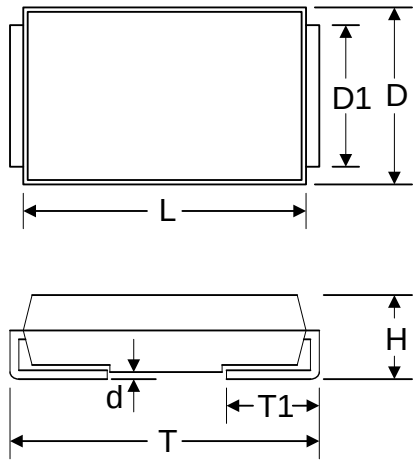
Ratings at 25℃ ambient temperature unless otherwise specified.

Rating	Symbol	Value	Units
Peak pulse power dissipation at 10/1000μs waveform (Note1, Fig.1)	P_{PPM}	Minimum 400	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℃ (Fig.4)	$P_{M(AV)}$	3.3	Watts
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load, (JEDEC Method) (Note2)	I_{FSM}	40	Amps
Operating junction and Storage Temperature Range.	T_J,T_{STG}	-55 to +150	℃
Typical thermal resistance junction to lead	$R_{\theta JL}$	30	℃/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	120	℃/W

Notes: 1. Non-repetitive current pulse, per Fig.3 and derated above T_A=25℃ per Fig.2.

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

Dimensions (DO-214AC/SMA)



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
L	3.90	4.50	0.154	0.177
D	2.40	2.80	0.094	0.110
D1	1.30	1.70	0.051	0.067
T	4.80	5.30	0.189	0.208
T1	0.76	1.52	0.030	0.060
d	0.10	0.20	0.003	0.008
H	2.00	2.50	0.078	0.098

Electrical Characteristics (T_A=25℃)

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)
SMAJ5.0A	SMAJ5.0CA	AE	WE	5.0	6.4~7.0	10	9.2	43.5	800
SMAJ6.0A	SMAJ6.0CA	AG	WG	6.0	6.7~7.4	10	10.3	38.8	800
SMAJ6.5A	SMAJ6.5CA	AK	WK	6.5	7.2~8.0	10	11.2	35.7	500
SMAJ7.0A	SMAJ7.0CA	AM	WM	7.0	7.8~8.6	10	12.0	33.3	200
SMAJ7.5A	SMAJ7.5CA	AP	WP	7.5	8.3~9.2	1	12.9	31.0	100
SMAJ8.0A	SMAJ8.0CA	AR	WR	8.0	8.9~9.8	1	13.6	29.4	50
SMAJ8.5A	SMAJ8.5CA	AT	WT	8.5	9.4~10.4	1	14.4	27.8	10
SMAJ9.0A	SMAJ9.0CA	AV	WV	9.0	10.0~11.0	1	15.4	26.0	5
SMAJ10A	SMAJ10CA	AX	WX	10.0	11.1~12.3	1	17.0	23.5	5
SMAJ11A	SMAJ11CA	AZ	WZ	11.0	12.2~13.5	1	18.2	22.0	1
SMAJ12A	SMAJ12CA	BE	XE	12.0	13.3~14.7	1	19.9	20.1	1
SMAJ13A	SMAJ13CA	BG	XG	13.0	14.4~15.9	1	21.5	18.6	1
SMAJ14A	SMAJ14CA	BK	XK	14.0	15.6~17.2	1	23.2	17.2	1
SMAJ15A	SMAJ15CA	BM	XM	15.0	16.7~18.5	1	24.4	16.4	1
SMAJ16A	SMAJ16CA	BP	XP	16.0	17.8~19.7	1	26.0	15.4	1
SMAJ17A	SMAJ17CA	BR	XR	17.0	18.9~20.9	1	27.6	14.5	1
SMAJ18A	SMAJ18CA	BT	XT	18.0	20.0~22.1	1	29.2	13.7	1
SMAJ19A	SMAJ19CA	BW	XW	19.0	21.1~23.3	1	30.8	13.0	1
SMAJ20A	SMAJ20CA	BV	XV	20.0	22.2~24.5	1	32.4	12.4	1
SMAJ22A	SMAJ22CA	BX	XX	22.0	24.4~26.9	1	35.5	11.3	1
SMAJ24A	SMAJ24CA	BZ	XZ	24.0	26.7~29.5	1	38.9	10.3	1
SMAJ26A	SMAJ26CA	CE	YE	26.0	28.9~31.9	1	42.1	9.5	1

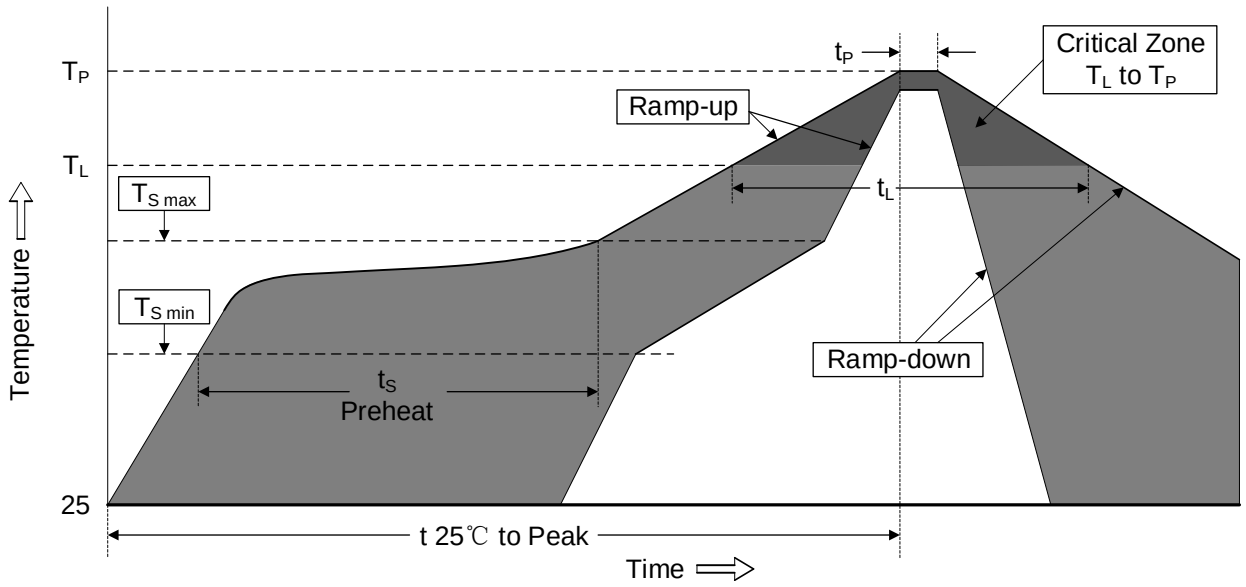
Electrical Characteristics (T_A=25℃)

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)
SMAJ28A	SMAJ28CA	CG	YG	28.0	31.1~34.4	1	45.4	8.8	1
SMAJ30A	SMAJ30CA	CK	YK	30.0	33.3~36.8	1	48.4	8.3	1
SMAJ33A	SMAJ33CA	CM	YM	33.0	36.7~40.6	1	53.3	7.5	1
SMAJ36A	SMAJ36CA	CP	YP	36.0	40.0~44.2	1	58.1	6.9	1
SMAJ40A	SMAJ40CA	CR	YR	40.0	44.4~49.1	1	64.5	6.2	1
SMAJ43A	SMAJ43CA	CT	YT	43.0	47.8~52.8	1	69.4	5.8	1
SMAJ45A	SMAJ45CA	CV	YV	45.0	50.0~55.3	1	72.7	5.5	1
SMAJ48A	SMAJ48CA	CX	YX	48.0	53.3~58.9	1	77.4	5.2	1
SMAJ51A	SMAJ51CA	CZ	YZ	51.0	56.7~62.7	1	82.4	4.9	1
SMAJ54A	SMAJ54CA	RE	ZE	54.0	60.0~66.3	1	87.1	4.6	1
SMAJ58A	SMAJ58CA	RG	ZG	58.0	64.4~71.2	1	93.6	4.3	1
SMAJ60A	SMAJ60CA	RK	ZK	60.0	66.7~73.7	1	96.8	4.1	1
SMAJ64A	SMAJ64CA	RM	ZM	64.0	71.1~78.6	1	103.0	3.9	1
SMAJ70A	SMAJ70CA	RP	ZP	70.0	77.8~86.0	1	113.0	3.5	1
SMAJ75A	SMAJ75CA	RR	ZR	75.0	83.3~92.1	1	121.0	3.3	1
SMAJ78A	SMAJ78CA	RT	ZT	78.0	86.7~95.8	1	126.0	3.2	1
SMAJ80A	SMAJ80CA	RW	ZW	80.0	88.8~97.6	1	129.6	3.1	1
SMAJ85A	SMAJ85CA	RV	ZV	85.0	94.4~104	1	137.0	2.9	1
SMAJ90A	SMAJ90CA	RX	ZX	90.0	100~111	1	146.0	2.7	1
SMAJ100A	SMAJ100CA	RZ	ZZ	100.0	111~123	1	162.0	2.5	1
SMAJ110A	SMAJ110CA	SE	VE	110.0	122~135	1	177.0	2.3	1
SMAJ120A	SMAJ120CA	SG	VG	120.0	133~147	1	193.0	2.1	1
SMAJ130A	SMAJ130CA	SK	VK	130.0	144~159	1	209.0	1.9	1
SMAJ140A	SMAJ140CA	SW	VW	140.0	155~171	1	227.0	1.8	1
SMAJ150A	SMAJ150CA	SM	VM	150.0	167~185	1	243.0	1.7	1
SMAJ160A	SMAJ160CA	SP	VP	160.0	178~197	1	259.0	1.6	1
SMAJ170A	SMAJ170CA	SR	VR	170.0	189~209	1	275.0	1.5	1
SMAJ180A	SMAJ180CA	ST	VT	180.0	200~220	1	291.0	1.4	1
SMAJ190A	SMAJ190CA	SU	VU	190.0	211~232	1	308.0	1.3	1
SMAJ200A	SMAJ200CA	SV	VV	200.0	224~247	1	324.0	1.2	1
SMAJ220A	SMAJ220CA	SX	VX	220.0	246~272	1	356.0	1.1	1
SMAJ250A	SMAJ250CA	SZ	VZ	250.0	279~309	1	405.0	1.0	1
SMAJ300A	SMAJ300CA	TE	UE	300.0	335~371	1	486.0	0.8	1
SMAJ350A	SMAJ350CA	TG	UG	350.0	391~432	1	567.0	0.7	1
SMAJ400A	SMAJ400CA	TK	UK	400.0	447~494	1	648.0	0.6	1
SMAJ440A	SMAJ440CA	TM	UM	440.0	492~543	1	713.0	0.6	1

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

Recommended Soldering Conditions

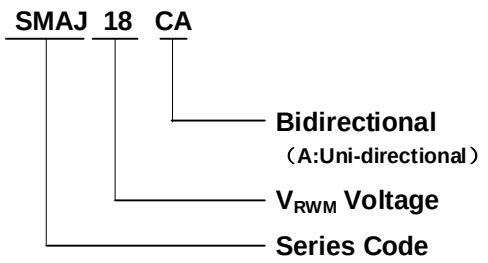
Reflow Soldering

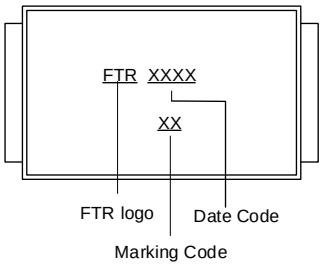


Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate ($T_L$to T_P)	3℃/second max.
Preheat -Temperature Min ($T_{S\,min}$) -Temperature Max ($T_{S\,max}$) -Time (min to max)(t_S)	 150℃ 200℃ 60-180 seconds
$T_{S\,max}$to T_L -Ramp-up Rate	 3℃/second max.
Time maintained above: -Temperature (T_L) -Time (t_L)	 217℃ 60-150 seconds
Peak Temperature (T_P)	260℃
Time within 5℃ of actual PeakTemperature (t_P)	20-40 seconds
Ramp-down Rate	6℃/second max.
Time 25℃ to Peak Temperature	8 minutes max.

Partnumber code





Ratings and Characteristic Curves (T_A=25℃ unless otherwise noted)

Figure 1. Peak Pulse Power Rating Curve

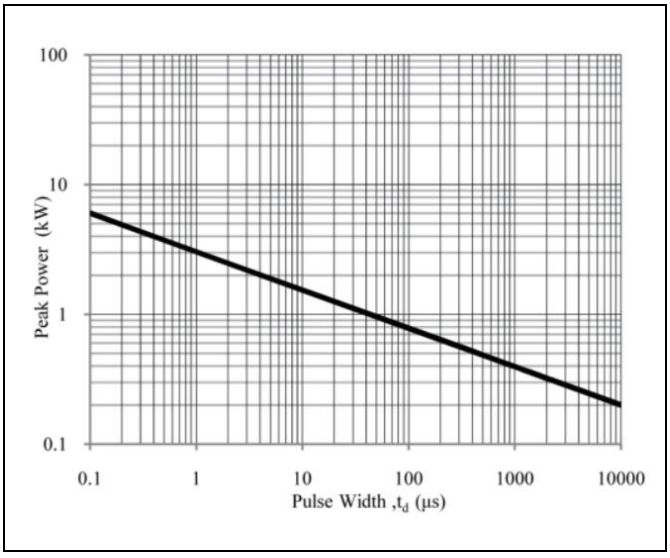


Figure 2. Pulse Derating Curve

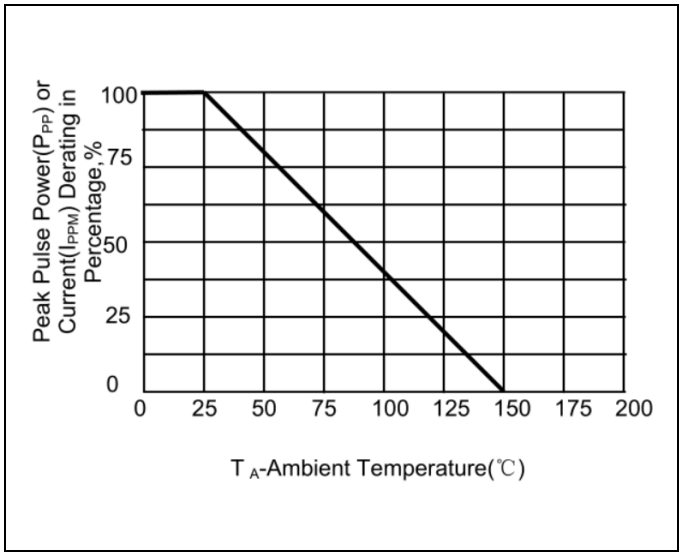


Figure 3. Pulse Waveform

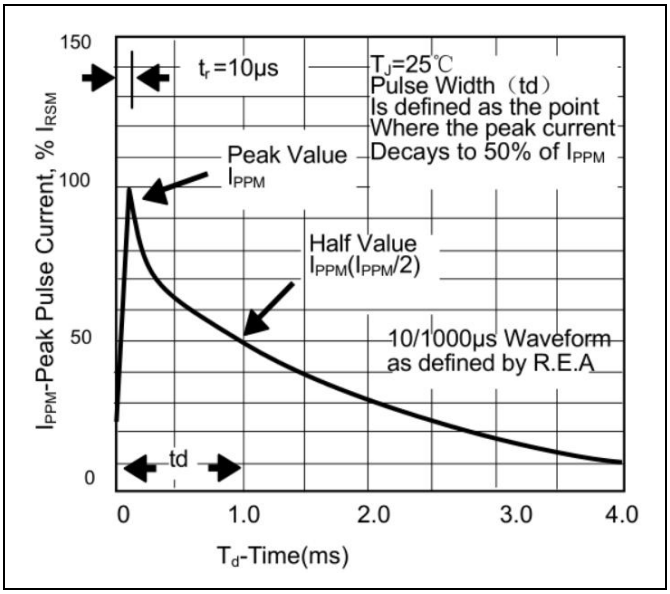
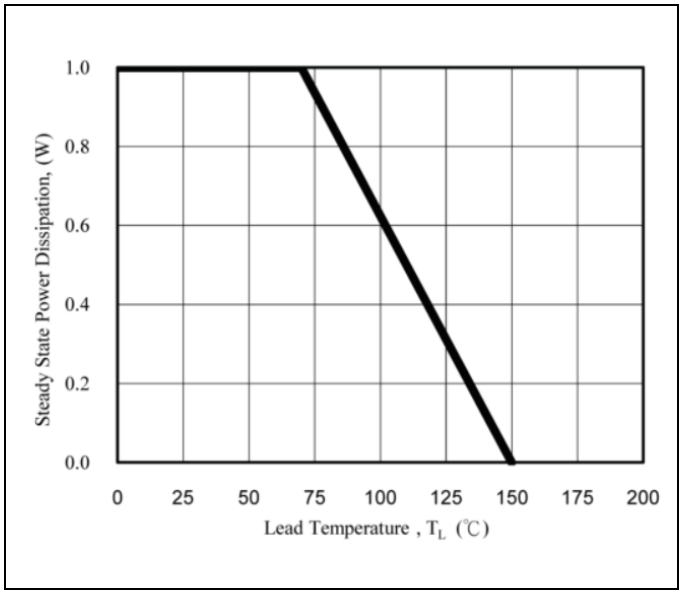
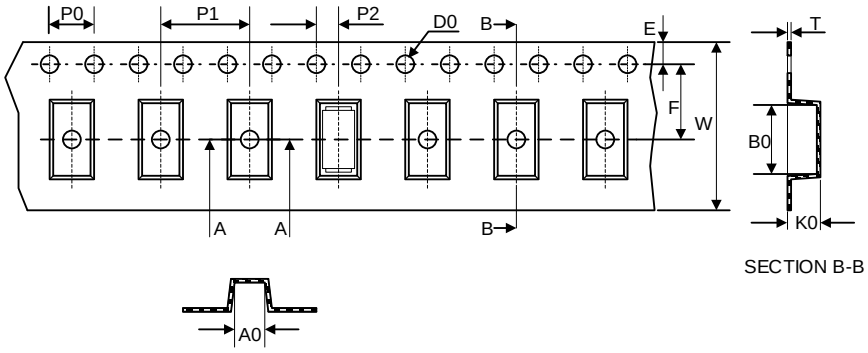


Figure 4. Steady State Power Dissipation Derating Curve



Packaging

Tape

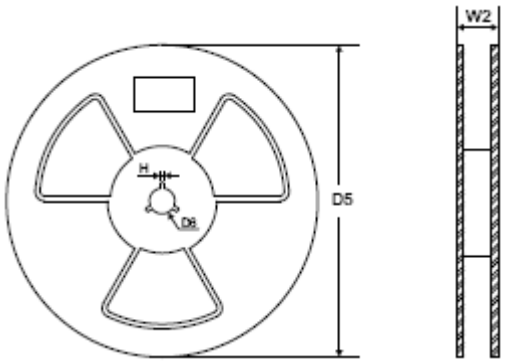


SECTION B-B

SECTION A-A

Symbol	Dimension (mm)
W	12.00±0.10
P0	4.00±0.10
P1	4.00±0.10
P2	2.00±0.10
D0	Φ1.55±0.10
E	1.75±0.10
F	5.50±0.10
A0	2.80±0.1
B0	5.30±0.1
K0	2.36±0.1
T	0.25±0.1

Reel



D5	Φ330.0±2.0
D6	Φ12.0±0.5
W2	14.0±2.0

Quantity: 5000PCS

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