



Transient Voltage Suppressors (TVS) Data Sheet

Features

- For surface mounted applications in order to optimize board space
- Low profile package
- Glass passivated junction
- Low inductance
- Excellent clamping capability
- 400W peak pulse power capability at 10/1000 μ s waveform, repetition rate (duty cycle): 0.01%
- Fast response time
- Typical I_R less than 1 μ A above 10V
- High Temperature soldering: 260°C/10 seconds at terminals
- Plastic package has underwriters laboratory flammability 94V-0
- Meets MSL level 1, per J-STD-020
- IEC61000-4-2 ESD 30KV Air, 30KV contact compliance

Mechanical Data

- Case: JEDEC DO-214AC. Molded plastic over glass passivated junction
- Terminal: Tin plated, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denotes cathode except bi-directional models
- Standard Packaging: 12mm tape (EIA STD RS-481)
- Weight: 0.07g

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 10/1000 μ s waveform (Note1, Note2, Fig.1)	P_{PPM}	Minimum 400	Watts
Peak pulse current of at 10/1000 μ s waveform (Note 1, Fig.3)	I_{PPM}	See Table	Amps
Steady state power dissipation at $T_A=50^\circ\text{C}$ (Fig.5)	$P_{M(AV)}$	3.3	Watts
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load, (JEDEC Method) (Note3, Fig.6)	I_{FSM}	40	Amps
Operating junction and Storage Temperature Range.	T_J, T_{STG}	-55 to +150	°C
Typical thermal resistance junction to lead	$R_{\theta JL}$	30	°C/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	120	°C/W

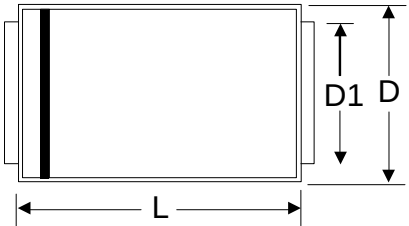
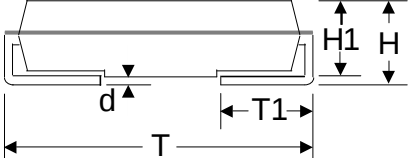
Notes: 1. Non-repetitive current pulse, per Fig.3 and derated above $T_A=25^\circ\text{C}$ per Fig.2.

2. Mounted on 5.0mm×5.0mm (0.03mm thick) copper pads to each terminal.

3. 8.3ms single half sine-wave, or equivalent square wave, duty cycle=4 pulses per minutes maximum.

SMAJ5.0A THRU SMAJ440CA

Dimensions (SMA/DO-214AC)

	Symbol	Millimeters		Inches	
		Min.	Max.	Min.	Max.
	L	3.99	4.50	0.157	0.177
	D	2.54	2.79	0.100	0.110
	D1	1.25	1.65	0.049	0.065
	T	4.93	5.28	0.194	0.208
	T1	0.76	1.52	0.030	0.060
	d	-	0.203	-	0.008
	H	2.00	2.50	0.079	0.098
	H1	1.98	2.29	0.078	0.090

Electrical Characteristics (T_A=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)
SMAJ5.0A	SMAJ5.0CA	5.0A	5.0CA	5.0	6.40~7.00	10	9.2	43.5	800
SMAJ6.0A	SMAJ6.0CA	6.0A	6.0CA	6.0	6.67~7.37	10	10.3	38.8	800
SMAJ6.5A	SMAJ6.5CA	6.5A	6.5CA	6.5	7.22~7.98	10	11.2	35.7	500
SMAJ7.0A	SMAJ7.0CA	7.0A	7.0CA	7.0	7.78~8.60	10	12.0	33.3	200
SMAJ7.5A	SMAJ7.5CA	7.5A	7.5CA	7.5	8.33~9.21	1	12.9	31.0	100
SMAJ8.0A	SMAJ8.0CA	8.0A	8.0CA	8.0	8.89~9.83	1	13.6	29.4	50
SMAJ8.5A	SMAJ8.5CA	8.5A	8.5CA	8.5	9.44~10.40	1	14.4	27.8	20
SMAJ9.0A	SMAJ9.0CA	9.0A	9.0CA	9.0	10.00~11.10	1	15.4	26.0	10
SMAJ10A	SMAJ10CA	10A	10CA	10.0	11.10~12.30	1	17.0	23.5	5
SMAJ11A	SMAJ11CA	11A	11CA	11.0	12.20~13.50	1	18.2	22.0	1
SMAJ12A	SMAJ12CA	12A	12CA	12.0	13.30~14.70	1	19.9	20.1	1
SMAJ13A	SMAJ13CA	13A	13CA	13.0	14.40~15.90	1	21.5	18.6	1
SMAJ14A	SMAJ14CA	14A	14CA	14.0	15.60~17.20	1	23.2	17.2	1
SMAJ15A	SMAJ15CA	15A	15CA	15.0	16.70~18.50	1	24.4	16.4	1
SMAJ16A	SMAJ16CA	16A	16CA	16.0	17.80~19.70	1	26.0	15.4	1
SMAJ17A	SMAJ17CA	17A	17CA	17.0	18.90~20.90	1	27.6	14.5	1
SMAJ18A	SMAJ18CA	18A	18CA	18.0	20.00~22.10	1	29.2	13.7	1
SMAJ20A	SMAJ20CA	20A	20CA	20.0	22.20~24.50	1	32.4	12.3	1
SMAJ22A	SMAJ22CA	22A	22CA	22.0	24.40~26.90	1	35.5	11.3	1
SMAJ24A	SMAJ24CA	24A	24CA	24.0	26.70~29.50	1	38.9	10.3	1

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Unidirectional	Bidirectional	UNI	BI	V _{RWM} (V)	V _{BR} (V)	I _T (mA)	V _C (V)	I _{PP} (A)	I _R (μA)
SMAJ26A	SMAJ26CA	26A	26CA	26.0	28.90~31.90	1	42.1	9.5	1
SMAJ28A	SMAJ28CA	28A	28CA	28.0	31.10~34.40	1	45.4	8.8	1
SMAJ30A	SMAJ30CA	30A	30CA	30.0	33.30~36.80	1	48.4	8.3	1
SMAJ33A	SMAJ33CA	33A	33CA	33.0	36.70~40.60	1	53.3	7.5	1
SMAJ36A	SMAJ36CA	36A	36CA	36.0	40.00~44.20	1	58.1	6.9	1
SMAJ40A	SMAJ40CA	40A	40CA	40.0	44.40~49.10	1	64.5	6.2	1
SMAJ43A	SMAJ43CA	43A	43CA	43.0	47.80~52.80	1	69.4	5.8	1
SMAJ45A	SMAJ45CA	45A	45CA	45.0	50.00~55.30	1	72.7	5.5	1
SMAJ48A	SMAJ48CA	48A	48CA	48.0	53.30~58.90	1	77.4	5.2	1
SMAJ51A	SMAJ51CA	51A	51CA	51.0	56.70~62.70	1	82.4	4.9	1
SMAJ54A	SMAJ54CA	54A	54CA	54.0	60.00~66.30	1	87.1	4.6	1
SMAJ58A	SMAJ58CA	58A	58CA	58.0	64.40~71.20	1	93.6	4.3	1
SMAJ60A	SMAJ60CA	60A	60CA	60.0	66.70~73.70	1	96.8	4.1	1
SMAJ64A	SMAJ64CA	64A	64CA	64.0	71.10~78.60	1	103.0	3.9	1
SMAJ70A	SMAJ70CA	70A	70CA	70.0	77.80~86.00	1	113.0	3.5	1
SMAJ75A	SMAJ75CA	75A	75CA	75.0	83.30~92.10	1	121.0	3.3	1
SMAJ78A	SMAJ78CA	78A	78CA	78.0	86.70~95.80	1	126.0	3.2	1
SMAJ85A	SMAJ85CA	85A	85CA	85.0	94.40~104.00	1	137.0	2.9	1
SMAJ90A	SMAJ90CA	90A	90CA	90.0	100.00~111.00	1	146.0	2.7	1
SMAJ100A	SMAJ100CA	100A	100CA	100.0	111.00~123.00	1	162.0	2.5	1
SMAJ110A	SMAJ110CA	110A	110CA	110.0	122.00~135.00	1	177.0	2.3	1
SMAJ120A	SMAJ120CA	120A	120CA	120.0	133.00~147.00	1	193.0	2.1	1
SMAJ130A	SMAJ130CA	130A	130CA	130.0	144.00~159.00	1	209.0	1.9	1
SMAJ150A	SMAJ150CA	150A	150CA	150.0	167.00~185.00	1	243.0	1.6	1
SMAJ160A	SMAJ160CA	160A	160CA	160.0	178.00~197.00	1	259.0	1.5	1
SMAJ170A	SMAJ170CA	170A	170CA	170.0	189.00~209.00	1	275.0	1.5	1
SMAJ180A	SMAJ180CA	180A	180CA	180.0	201.00~222.00	1	292.0	1.4	1
SMAJ190A	SMAJ190CA	190A	190CA	190.0	211.00~233.00	1	308.0	1.3	1
SMAJ200A	SMAJ200CA	200A	200CA	200.0	224.00~247.00	1	324.0	1.2	1
SMAJ210A	SMAJ210CA	210A	210CA	210.0	237.00~263.00	1	340.0	1.2	1
SMAJ220A	SMAJ220CA	220A	220CA	220.0	246.00~272.00	1	356.0	1.1	1
SMAJ250A	SMAJ250CA	250A	250CA	250.0	279.00~309.00	1	405.0	1.0	1
SMAJ300A	SMAJ300CA	300A	300CA	300.0	335.00~371.00	1	486.0	0.8	1
SMAJ350A	SMAJ350CA	350A	350CA	350.0	391.00~432.00	1	567.0	0.7	1
SMAJ400A	SMAJ400CA	400A	400CA	400.0	447.00~494.00	1	648.0	0.6	1
SMAJ440A	SMAJ440CA	440A	440CA	440.0	492.00~543.00	1	713.0	0.6	1

Ratings and Characteristic Curves ($T_A=25^{\circ}\text{C}$ unless otherwise noted)
SMAJ5.0A THRU SMAJ440CA

Figure 1. Peak Pulse Power Rating Curve

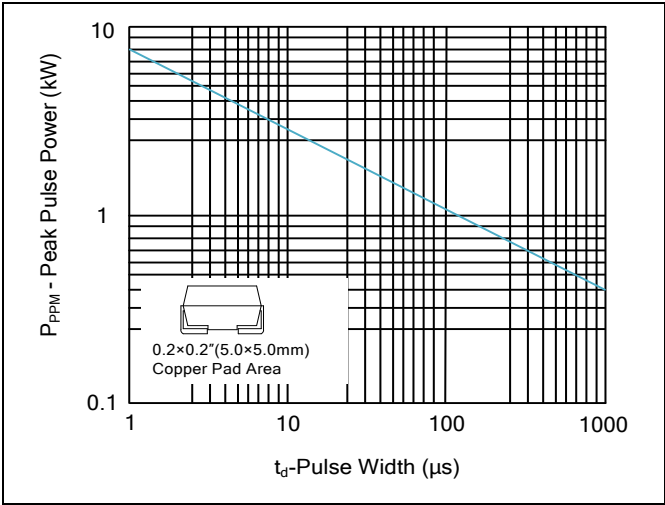


Figure 2. Pulse Derating Curve

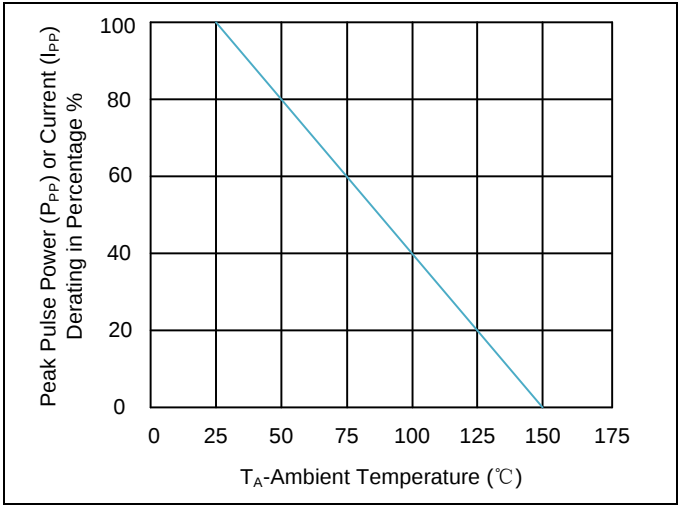


Figure 3. Pulse Waveform

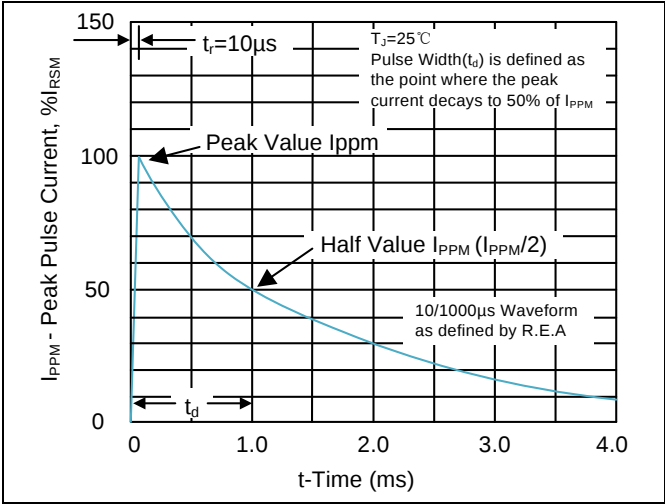


Figure 4. Typical Junction Capacitance

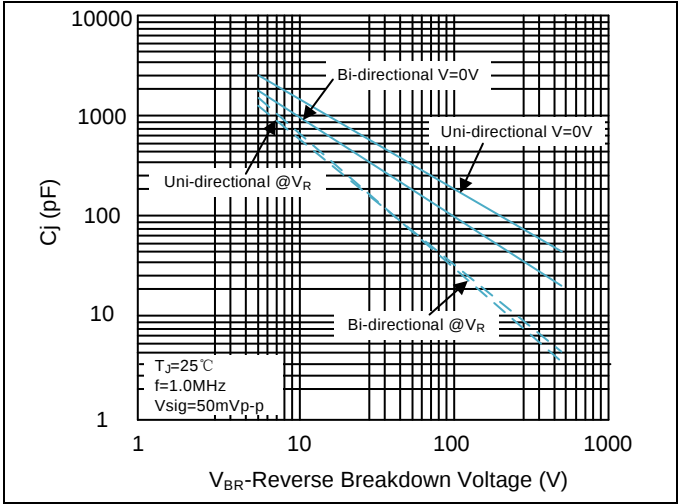


Figure 5. Steady State Power Dissipation Derating Curve

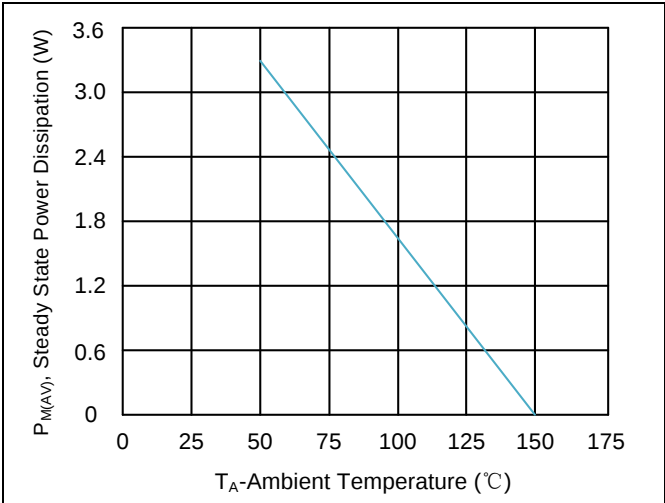


Figure 6. Maximum Non-Repetitive Forward Surge Current Uni-Directional Only

