

DATA SHEET

TRANSIENT VOLTAGE SUPPRESSORS

AC/DC POWER SUPPLY

SMA6L SERIES

RoHS compliant & Halogen free

Product specification— December 03, 2023 V.2



Transient Voltage Suppressors (TVS) Data Sheet

Features

- Glass passivated chip junction in SMAF Package
- Excellent clamping capability
- 600W peak pulse power capability on 10/1000 μ s waveform
- Fast response time: typically less than 1.0ps from 0 Volts to BV min
- High temperature soldering guaranteed: 265 $^{\circ}$ C/10 seconds
- Matte tin lead-free plated

Mechanical Data

- Case: JEDEC SMF Molded Plastic
- Terminals: axial leads, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denoted cathode except bidirectional
- Mounting Position: any

Maximum Ratings and Characteristics

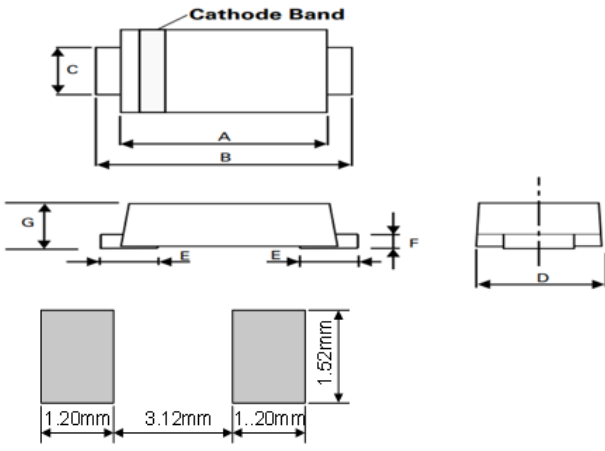
Ratings at 25 $^{\circ}$ C ambient temperature unless otherwise specified.

Rating	Symbol	Value	Units
Peak pulse power dissipation with 10/1000 μ s waveform	P_{PPM}	600	W
Peak pulse current with 10/1000 μ s waveform	$I_{PPM}^{(1)}$	See next table	A
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +150	$^{\circ}$ C

Notes:

(1). Non-repetitive current pulse derated above $T_A=25^{\circ}$ C

Dimensions (SMAF)

	Symbol	Millimeters		Inches	
		Min.	Max.	Min.	Max.
A		3.30	3.70	0.130	0.146
B		4.35	4.85	0.171	0.191
C		1.30	1.60	0.051	0.063
D		2.40	2.80	0.094	0.110
E		0.60	1.20	0.024	0.047
F		0.10	0.30	0.004	0.012
G		1.00	1.40	0.039	0.055

Electrical Characteristics (T_A=25°C)

Part Number	Marking	Breakdown Voltage VBR (Volts) @ IT		Test Current IT(mA)	Reverse Stand off Voltage VR(V)	Maximum Reverse Leakage @ VR IR(μA)	Maximum Peak Pulse Current Ipp (A)	Maximum Clamping Voltage @Ipp VC (V)
		Min.	Max.					
SMA6L5.0A	AE	6.4	7	10	5	800	65.3	9.2
SMA6L6.0A	AG	6.67	7.37	10	6	800	58.3	10.3
SMA6L6.5A	AK	7.22	7.98	10	6.5	500	53.6	11.2
SMA6L7.0A	AM	7.78	8.6	10	7	200	50.0	12
SMA6L7.5A	AP	8.33	9.21	1	7.5	100	46.6	12.9
SMA6L8.0A	AR	8.89	9.83	1	8	50	44.2	13.6
SMA6L8.5A	AT	9.44	10.4	1	8.5	20	41.7	14.4
SMA6L9.0A	AV	10	11.1	1	9	10	39.0	15.4
SMA6L10A	AX	11.1	12.3	1	10	5	35.3	17
SMA6L11A	AZ	12.2	13.5	1	11	1	33.0	18.2
SMA6L12A	BE	13.3	14.7	1	12	1	30.2	19.9
SMA6L13A	BG	14.4	15.9	1	13	1	28.0	21.5
SMA6L14A	BK	15.6	17.2	1	14	1	25.9	23.2
SMA6L15A	BM	16.7	18.5	1	15	1	24.6	24.4
SMA6L16A	BP	17.8	19.7	1	16	1	23.1	26
SMA6L17A	BR	18.9	20.9	1	17	1	21.8	27.6
SMA6L18A	BT	20	22.1	1	18	1	20.6	29.2
SMA6L20A	BV	22.2	24.5	1	20	1	18.6	32.4
SMA6L22A	BX	24.4	26.9	1	22	1	16.9	35.5
SMA6L24A	BZ	26.7	29.5	1	24	1	15.5	38.9
SMA6L26A	CE	28.9	31.9	1	26	1	14.3	42.1
SMA6L28A	CG	31.1	34.4	1	28	1	13.3	45.4
SMA6L30A	CK	33.3	36.8	1	30	1	12.4	48.4
SMA6L33A	CM	36.7	40.6	1	33	1	11.3	53.3
SMA6L36A	CP	40	44.2	1	36	1	10.4	58.1
SMA6L40A	CR	44.4	49.1	1	40	1	9.3	64.5
SMA6L43A	CT	47.8	52.8	1	43	1	8.7	69.4
SMA6L45A	CV	50	55.3	1	45	1	8.3	72.7
SMA6L48A	CX	53.3	58.9	1	48	1	7.8	77.4
SMA6L51A	CZ	56.7	62.7	1	51	1	7.3	82.4
SMA6L54A	RE	60	66.3	1	54	1	6.9	87.1
SMA6L58A	RG	64.4	71.2	1	58	1	6.5	93.6
SMA6L60A	RK	66.7	73.7	1	60	1	6.2	96.8
SMA6L64A	RM	71.1	78.6	1	64	1	5.9	103
SMA6L70A	RP	77.8	86	1	70	1	5.3	113
SMA6L75A	RR	83.3	92.1	1	75	1	5.0	121
SMA6L78A	RT	86.7	95.8	1	78	1	4.8	126
SMA6L85A	RV	94.4	104	1	85	1	4.4	137

Part Number	Marking	Breakdown Voltage VBR (Volts) @ IT		Test Current IT(mA)	Reverse Stand off Voltage VR(V)	Maximum Reverse Leakage @ VR IR(μ A)	Maximum Peak Pulse Current Ipp (A)	Maximum Clamping Voltage @Ipp VC (V)
		Min.	Max.					
SMA6L90A	RX	100	111	1	90	1	4.1	146
SMA6L100A	RZ	111	123	1	100	1	3.7	162
SMA6L110A	SE	122	135	1	110	1	3.4	177
SMA6L120A	SG	133	147	1	120	1	3.1	193
SMA6L130A	SK	144	159	1	130	1	2.9	209
SMA6L150A	SM	167	185	1	150	1	2.5	243
SMA6L160A	SP	178	197	1	160	1	2.3	259
SMA6L170A	SR	189	209	1	170	1	2.2	275
SMA6L180A	ST	201	222	1	180	1	2.1	292
SMA6L185A	SU	209	231	1	185	1	2	303
SMA6L200A	SV	224	247	1	200	1	1.9	324
SMA6L220A	SX	246	272	1	220	1	1.7	356
SMA6L250A	SZ	279	309	1	250	1	1.5	405

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

Figure 1. TVS Transients Clamping Waveform

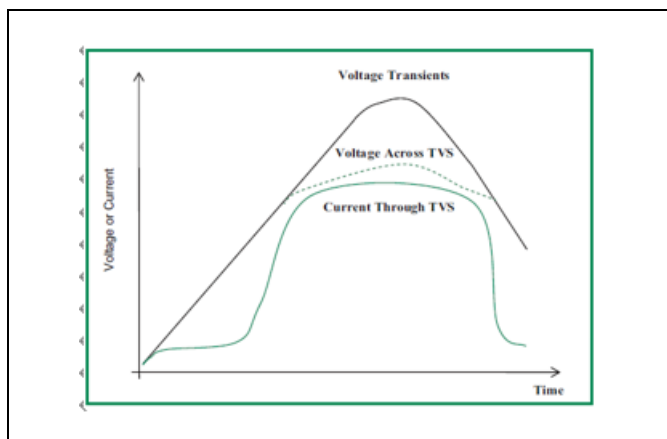
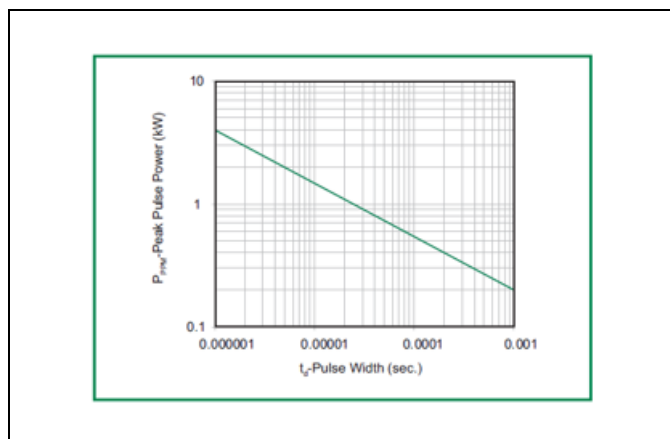


Figure 2. Peak Pulse Power Rating Curve



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

Figure 3. Pulse Derating Curve

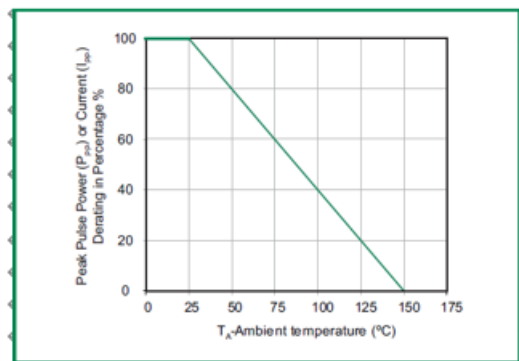


Figure 4. Pulse Waveform -10/1000us

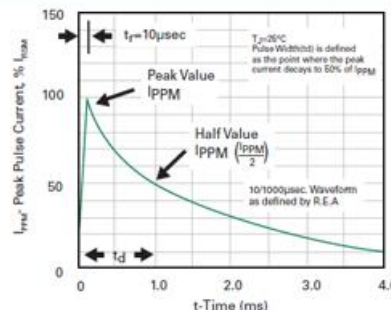


Figure 5. Steady State Power Dissipation Derating Curve

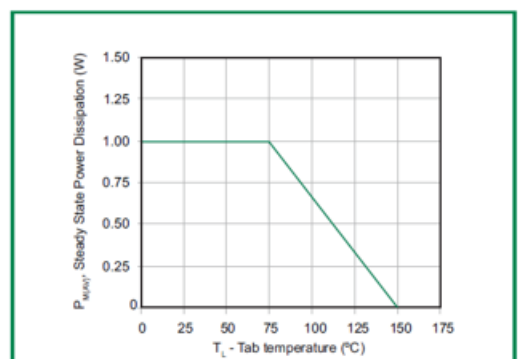
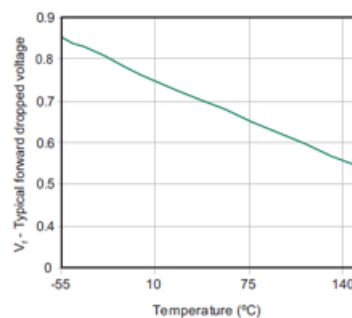
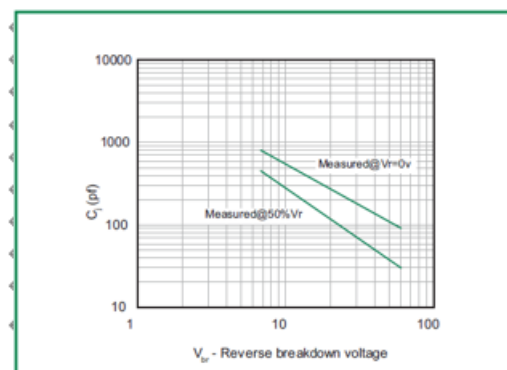
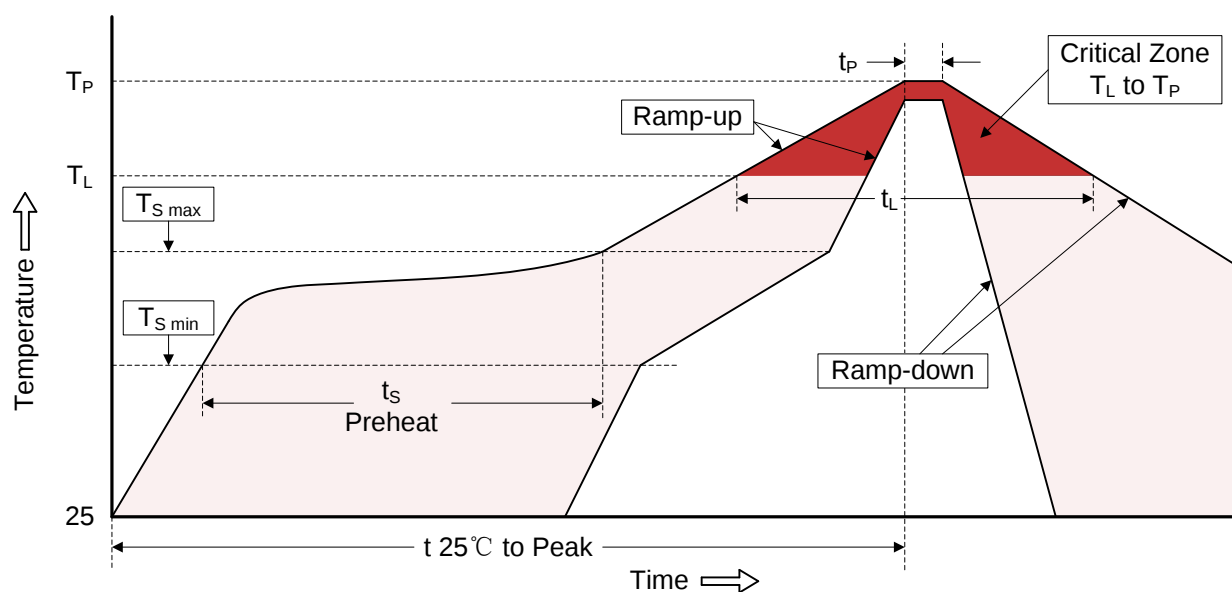


Figure 6. Forward Voltage

Figure 7. C_j vs. Working Peak Reverse Voltage

Recommended Soldering Conditions

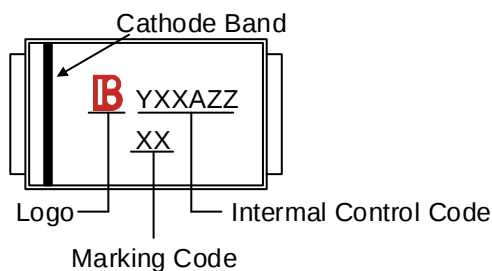
Reflow Soldering



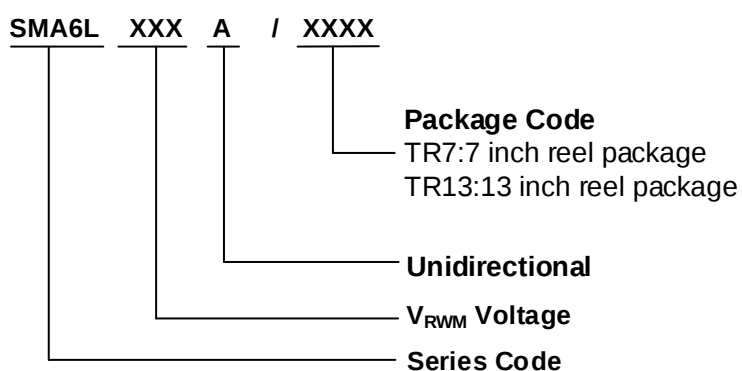
Recommended Conditions

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.

Marking Code



Part Number Code



Ordering Code for Different Package

7 inch reel package: Add suffix “ /TR7 ” at the end of the part number, such as SMA6LXXXX/TR7

13 inch reel package: Add suffix “ /TR13 ” at the end of the part number, such as SMA6LXXXX /TR13

Packaging

Tape		Symbol	Dimension (mm)
		W	12.0±0.2
		A	2.93±0.1
		B	5.00±0.1
		C	1.45±0.1
		d1	Max.:1.55
		d	1.55±0.1
		E	1.75±0.1
		F	5.50±0.1
		P	8.00±0.1
		P0	4.00±0.1
		T	0.23±0.1
7" Reel		D	178.0±0.5
		D1	Min.:74
		D2	13.0±0.2
		G	Min.:8.0
		W1	Min.:10.0
		Quantity: 3000PCS	
13" Reel		D	330mm±1mm
		D1	100mm±1mm
		D2	13mm±0.2mm
		G	12.4mm+4mm-1mm
		W1	16.4mm±0.2mm
		Quantity: 10000PCS	

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