

# Zener Transient Voltage Suppressors

## Specification Features:

- Reverse Stand-Off Voltage Range: 5.0–78 V
- Peak Power — 400 Watts @ 1.0 ms
- ESD Rating of Class 3 (>16 kV) per Human Body Model
- Pico Seconds Response Time (0 V to BV)
- Flat Handling Surface for Accurate Placement
- Package Design for Top Side or Bottom Circuit Board Mounting
- Available in Tape and Reel
- Low Profile Package

## Mechanical Characteristics:

- Case: Void-free, transfer-molded plastic
- Maximum Case Temperature for Soldering Purposes: 260°C for 10 seconds
- Finish: All external surfaces are corrosion resistant with readily solderable leads
- Polarity: Cathode indicated by molded polarity notch
- Mounted Position: Any

**1SMA5.0AT3  
through  
1SMA78AT3**

**PLASTIC SURFACE MOUNT  
ZENER OVERVOLTAGE  
TRANSIENT SUPPRESSORS  
5.0–78 VOLTS  $V_R$   
400 WATTS PEAK POWER**



SMA  
CASE 403B-01  
PLASTIC

## MAXIMUM RATINGS AND CHARACTERISTICS

Rating	Symbol	Value	Unit
Peak Power Dissipation @ $T_L = 25^\circ\text{C}$ , $PW = 10/1000 \mu\text{s}$ (Note 1)	$P_{pk}$	400	Watts
Peak Forward Surge @ $T_A = 25^\circ\text{C}$ (JEDEC Method, Note 2)	$I_{FSM}$	40	Amps
Thermal Resistance from Junction to Lead	$R_{\theta JL}$	29	$^\circ\text{C}/\text{W}$
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	150	$^\circ\text{C}/\text{W}$
Instantaneous Forward Voltage @ 40 A	$V_F$	3.5	Volts
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	150	$^\circ\text{C}$

\* FR4 Board, using Motorola minimum recommended footprint, as shown in case 403B outline dimensions spec.

1. Non-repetitive current pulse.

2. Measured on 0.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulse per minute maximum.

## ELECTRICAL CHARACTERISTICS ( $V_F = 3.5$ Volts @ $I_F = 40$ A for all types)

Device	Reverse Stand-off Voltage $VRWM$ (Volts)	Breakdown Voltage		Maximum Reverse Voltage @ $I_{RSM}$ (Clamping Voltage) $VRSM$ (Volts)	Maximum Reverse Surge Current $I_{RSM}$ (Amps)	Maximum Reverse Leakage @ $V_{RWM}$ $I_R$ ( $\mu\text{A}$ )	Device Marking
		$V_{BR}$ Volts (Min)	$I_T$ mA				
1SMA5.0AT3	5.0	6.4	10	9.2	43.5	400	QE
1SMA6.0AT3	6.0	6.67	10	10.3	38.8	400	QG
1SMA6.5AT3	6.5	7.22	10	11.2	35.7	250	QK
1SMA7.0AT3	7.0	7.78	10	12.0	33.3	250	QM
1SMA7.5AT3	7.5	8.33	1	12.9	31.0	50	QP
1SMA8.0AT3	8.0	8.89	1	13.6	29.4	25	QR
1SMA8.5AT3	8.5	9.44	1	14.4	27.8	5.0	QT
1SMA9.0AT3	9.0	10	1	15.4	26.0	2.5	QV

\* TOLERANCE AND VOLTAGE DESIGNATION Tolerance designation – The type number listed indicates a tolerance of  $\pm 5\%$ . (continued)

**ELECTRICAL CHARACTERISTICS — continued** (V<sub>F</sub> = 3.5 Volts @ I<sub>F</sub> = 40 A for all types)

Device	Reverse Stand-off Voltage V <sub>RWM</sub> (Volts)	Breakdown Voltage		Maximum Reverse Voltage @ I <sub>RSM</sub> (Clamping Voltage) V <sub>RSM</sub> (Volts)	Maximum Reverse Surge Current I <sub>RSM</sub> (Amps)	Maximum Reverse Leakage @ V <sub>RWM</sub> I <sub>R</sub> (µA)	Device Marking
		V <sub>BR</sub> Volts (Min)	I <sub>T</sub> mA				
1SMA10AT3	10	11.1	1	17.0	23.5	2.5	QX
1SMA11AT3	11	12.2	1	18.2	22.0	2.5	QZ
1SMA12AT3	12	13.3	1	19.9	20.1	2.5	RE
1SMA13AT3	13	14.4	1	21.5	18.6	2.5	RG
1SMA14AT3	14	15.6	1	23.2	17.2	2.5	RK
1SMA15AT3	15	16.7	1	24.4	16.4	2.5	RM
1SMA16AT3	16	17.8	1	26.0	15.4	2.5	RP
1SMA17AT3	17	18.9	1	27.6	14.5	2.5	RR
1SMA18AT3	18	20	1	29.2	13.7	2.5	RT
1SMA20AT3	20	22.2	1	32.4	12.3	2.5	RV
1SMA22AT3	22	24.4	1	35.5	11.3	2.5	RX
1SMA24AT3	24	26.7	1	38.9	10.3	2.5	RZ
1SMA26AT3	26	28.9	1	42.1	9.5	2.5	SE
1SMA28AT3	28	31.1	1	45.4	8.8	2.5	SG
1SMA30AT3	30	33.3	1	48.4	8.3	2.5	SK
1SMA33AT3	33	36.7	1	53.3	7.5	2.5	SM
1SMA36AT3	36	40	1	58.1	6.9	2.5	SP
1SMA40AT3	40	44.4	1	64.5	6.2	2.5	SR
1SMA43AT3	43	47.8	1	69.4	5.8	2.5	ST
1SMA45AT3	45	50	1	72.2	5.5	2.5	SV
1SMA48AT3	48	53.3	1	77.4	5.2	2.5	SX
1SMA51AT3	51	56.7	1	82.4	4.9	2.5	SZ
1SMA54AT3	54	60	1	87.1	4.6	2.5	TE
1SMA58AT3	58	64.4	1	93.6	4.8	2.5	TG
1SMA60AT3	60	66.7	1	96.8	4.1	2.5	TK
1SMA64AT3	64	71.1	1	103.0	3.9	2.5	TM
1SMA70AT3	70	77.8	1	113.0	3.5	2.5	TP
1SMA75AT3	75	83.3	1	121.0	3.3	2.5	TR
1SMA78AT3	78	86.7	1	126.0	3.2	2.5	TS

\* TOLERANCE AND VOLTAGE DESIGNATION Tolerance designation – The type number listed indicates a tolerance of  $\pm 5\%$ .

## RATING AND TYPICAL CHARACTERISTIC CURVES

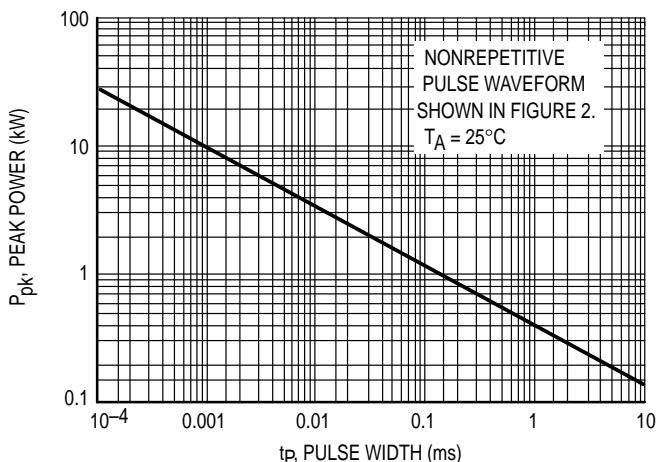


Figure 1. Pulse Rating Curve

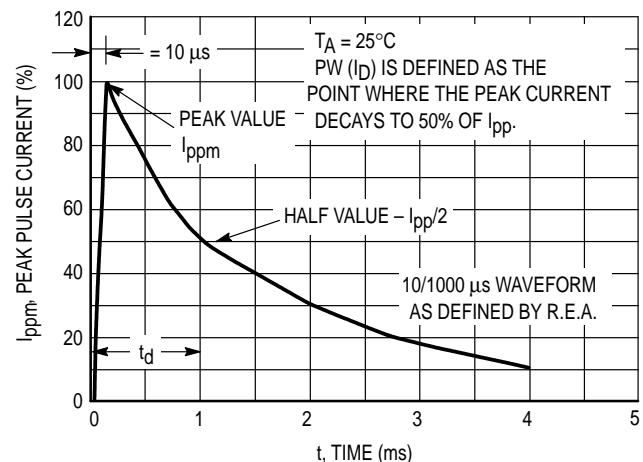


Figure 2. Pulse Waveform

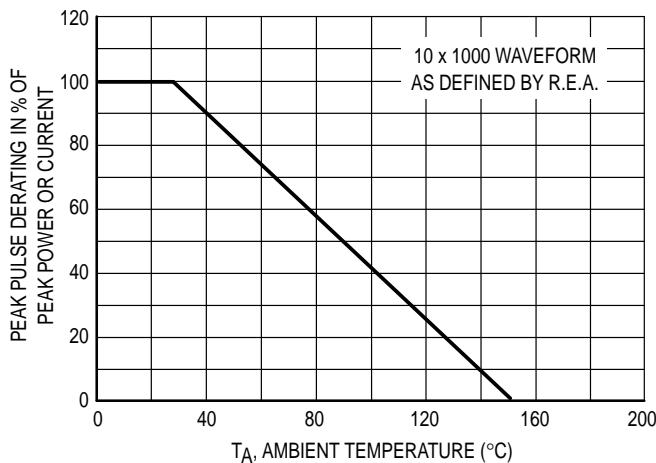


Figure 3. Pulse Derating Curve

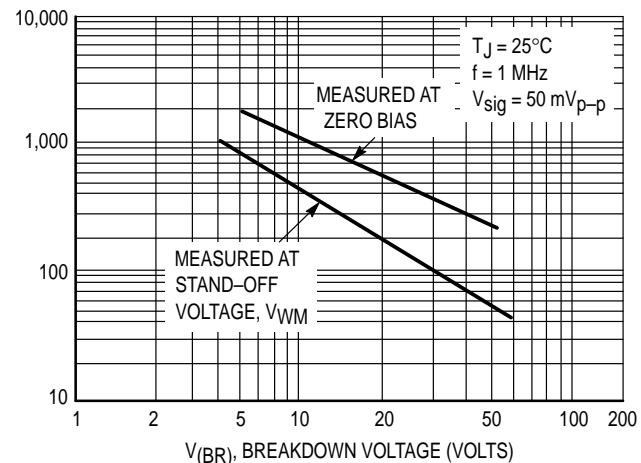


Figure 4. Typical Junction Capacitance

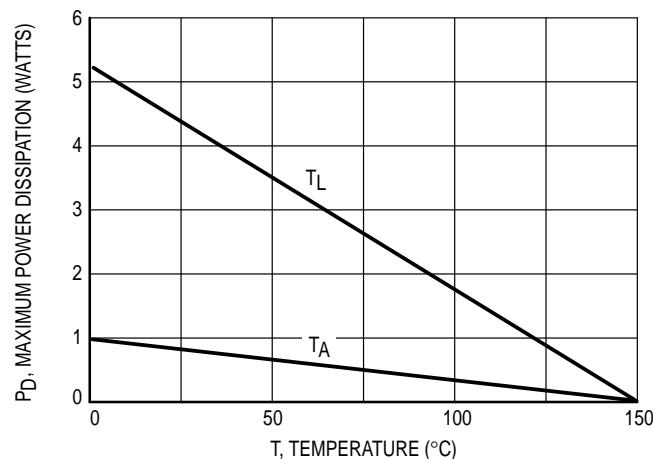
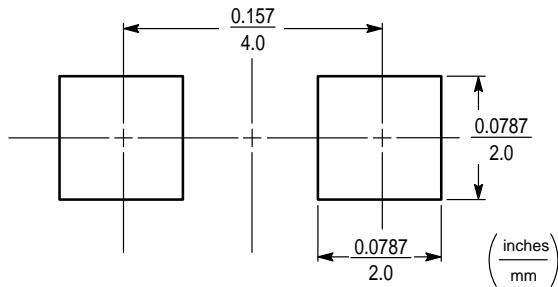
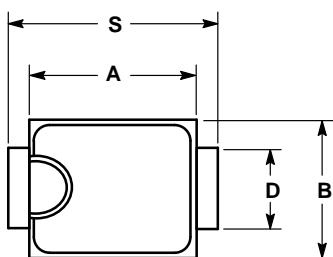
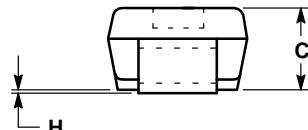
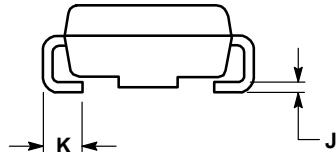


Figure 5. Steady State Power Derating

## OUTLINE DIMENSIONS



**SMA**



NOTES:  
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
 2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.160	0.180	4.06	4.57
B	0.090	0.115	2.29	2.92
C	0.075	0.105	1.91	2.67
D	0.050	0.064	1.27	1.63
H	0.004	0.008	0.10	0.20
J	0.006	0.016	0.15	0.41
K	0.030	0.060	0.76	1.52
S	0.190	0.220	4.83	5.59

**CASE 403B-01  
ISSUE O**

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