

# 1SMA10CAT3 Series

## 400 Watt Peak Power Zener Transient Voltage Suppressors

### Bidirectional\*

The SMA series is designed to protect voltage sensitive components from high voltage, high energy transients. They have excellent clamping capability, high surge capability, low zener impedance and fast response time. The SMA series is supplied in ON Semiconductor's exclusive, cost-effective, highly reliable Surmetic™ package and is ideally suited for use in communication systems, automotive, numerical controls, process controls, medical equipment, business machines, power supplies and many other industrial/consumer applications.

#### Specification Features:

- Working Peak Reverse Voltage Range – 10 V to 78 V
- Standard Zener Breakdown Voltage Range – 11.7 V to 91.3 V
- Peak Power – 400 Watts @ 1 ms
- ESD Rating of Class 3 (> 16 kV) per Human Body Model
- Response Time is Typically < 1 ns
- Flat Handling Surface for Accurate Placement
- Package Design for Top Slide or Bottom Circuit Board Mounting
- Low Profile Package

#### Mechanical Characteristics:

**CASE:** Void-free, transfer-molded plastic

**FINISH:** All external surfaces are corrosion resistant and leads are readily solderable

#### MAXIMUM CASE TEMPERATURE FOR SOLDERING PURPOSES:

260°C for 10 Seconds

**POLARITY:** Cathode polarity notch does not indicate polarity

**MOUNTING POSITION:** Any

#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Power Dissipation (Note 1) @ $T_L = 25^\circ\text{C}$ , Pulse Width = 1 ms	$P_{PK}$	400	W
DC Power Dissipation @ $T_L = 75^\circ\text{C}$ Measured Zero Lead Length (Note 2) Derate Above 75°C	$P_D$	1.5	W
Thermal Resistance from Junction to Lead	$R_{\theta JL}$	20 50	mW/°C °C/W
DC Power Dissipation (Note 3) @ $T_A = 25^\circ\text{C}$ Derate Above 25°C	$P_D$	0.5	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	4.0 250	mW/°C °C/W
Operating and Storage Temperature Range	$T_J, T_{stg}$	-65 to +150	°C

1. 10 X 1000  $\mu\text{s}$ , non-repetitive
2. 1" square copper pad, FR-4 board
3. FR-4 board, using ON Semiconductor minimum recommended footprint, as shown in 403B case outline dimensions spec.

\*Please see 1SMA5.0AT3 to 1SMA78AT3 for Unidirectional devices.



ON Semiconductor®

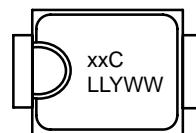
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### PLASTIC SURFACE MOUNT ZENER OVERVOLTAGE TRANSIENT SUPPRESSORS 10-78 VOLTS $V_R$ 400 WATTS PEAK POWER



SMA  
CASE 403B  
PLASTIC

#### MARKING DIAGRAM



xxC = Specific Device Code  
(See Table Next Page)

LL = Assembly Location

Y = Year

WW = Work Week

#### ORDERING INFORMATION

Device †	Package	Shipping
1SMAxxCAT3	SMA	5000/Tape & Reel

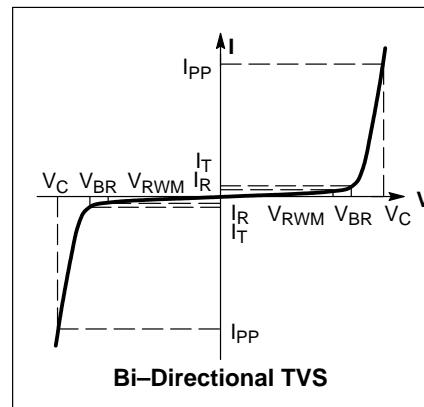
†The "T3" suffix refers to a 13 inch reel.

# 1SMA10CAT3 Series

## ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter
$I_{PP}$	Maximum Reverse Peak Pulse Current
$V_C$	Clamping Voltage @ $I_{PP}$
$V_{RWM}$	Working Peak Reverse Voltage
$I_R$	Maximum Reverse Leakage Current @ $V_{RWM}$
$V_{BR}$	Breakdown Voltage @ $I_T$
$I_T$	Test Current



## ELECTRICAL CHARACTERISTICS

Device	Device Marking	$V_{RWM}$ (Note 4)	$I_R$ @ $V_{RWM}$	Breakdown Voltage			$V_C$ @ $I_{PP}$ (Note 6)		
				Volts	$\mu\text{A}$	Min	Nom	Max	
1SMA10CAT3	QXC	10	2.5	11.1	11.69	12.27	1.0	17.0	23.5
1SMA11CAT3	QZC	11	2.5	12.2	12.84	13.48	1.0	18.2	22.0
1SMA12CAT3	REC	12	2.5	13.3	14.00	14.70	1.0	19.9	20.1
1SMA13CAT3	RGC	13	2.5	14.4	15.16	15.92	1.0	21.5	18.6
1SMA14CAT3	RKC	14	2.5	15.6	16.42	17.24	1.0	23.2	17.2
1SMA15CAT3	RMC	15	2.5	16.7	17.58	18.46	1.0	24.4	16.4
1SMA16CAT3	RPC	16	2.5	17.8	18.74	19.67	1.0	26.0	15.4
1SMA18CAT3	RTC	18	2.5	20	21.06	22.11	1.0	29.2	13.7
1SMA20CAT3	RVC	20	2.5	22.2	23.37	24.54	1.0	32.4	12.3
1SMA22CAT3	RXC	22	2.5	24.4	25.69	26.97	1.0	35.5	11.3
1SMA24CAT3	RZC	24	2.5	26.7	28.11	29.51	1.0	38.9	10.3
1SMA26CAT3	SEC	26	2.5	28.9	30.42	31.94	1.0	42.1	9.5
1SMA28CAT3	SGC	28	2.5	31.1	32.74	34.37	1.0	45.4	8.8
1SMA30CAT3	SKC	30	2.5	33.3	35.06	36.81	1.0	48.4	8.3
1SMA33CAT3	SMC	33	2.5	36.7	38.63	40.56	1.0	53.3	7.5
1SMA36CAT3	SPC	36	2.5	40	42.11	44.21	1.0	58.1	6.9
1SMA40CAT3	SRC	40	2.5	44.4	46.74	49.07	1.0	64.5	6.2
1SMA43CAT3	STC	43	2.5	47.8	50.32	52.83	1.0	69.4	5.8
1SMA48CAT3	SXC	48	2.5	53.3	56.11	58.91	1.0	77.4	5.2
1SMA51CAT3	SZC	51	2.5	56.7	59.69	62.67	1.0	82.4	4.9
1SMA54CAT3	TEC	54	2.5	60	63.16	66.32	1.0	87.1	4.6
1SMA58CAT3	TGC	58	2.5	64.4	67.79	71.18	1.0	93.6	4.3
1SMA60CAT3	TKC	60	2.5	66.7	70.21	73.72	1.0	96.8	4.1
1SMA64CAT3	TMC	64	2.5	71.1	74.84	78.58	1.0	103	3.9
1SMA70CAT3	TPC	70	2.5	77.8	81.90	85.99	1.0	113	3.5
1SMA78CAT3	TTC	78	2.5	86.7	91.27	95.83	1.0	126	3.2

4. A transient suppressor is normally selected according to the working peak reverse voltage ( $V_{RWM}$ ), which should be equal to or greater than the DC or continuous peak operating voltage level

5.  $V_{BR}$  measured at pulse test current  $I_T$  at an ambient temperature of  $25^\circ\text{C}$

6. Surge current waveform per Figure 2 and derate per Figure 3

# 1SMA10CAT3 Series

## RATING AND TYPICAL CHARACTERISTIC CURVES

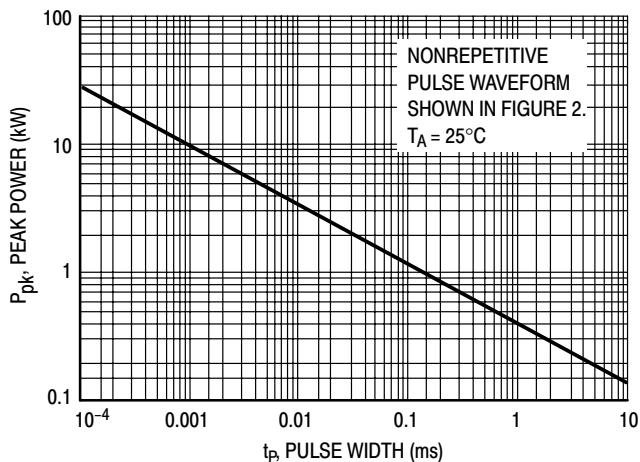


Figure 1. Pulse Rating Curve

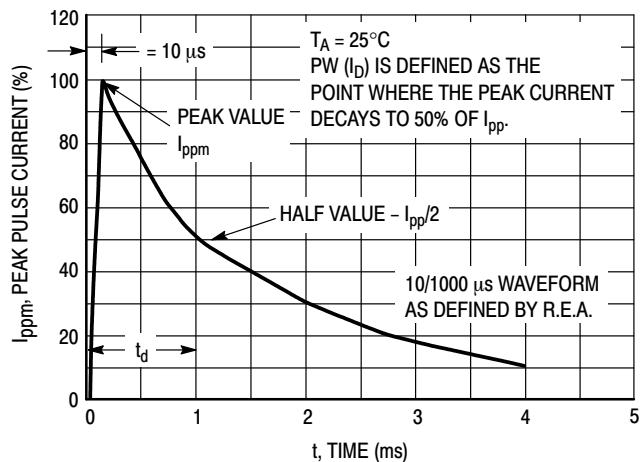


Figure 2. Pulse Waveform

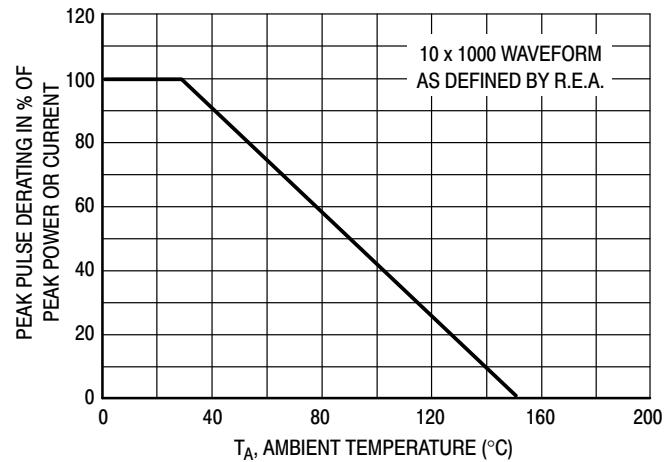
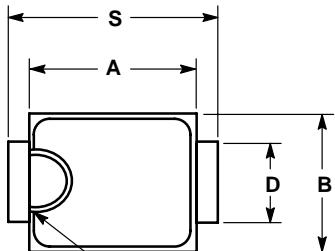


Figure 3. Pulse Derating Curve

## OUTLINE DIMENSIONS

## Transient Voltage Suppressors – Surface Mounted

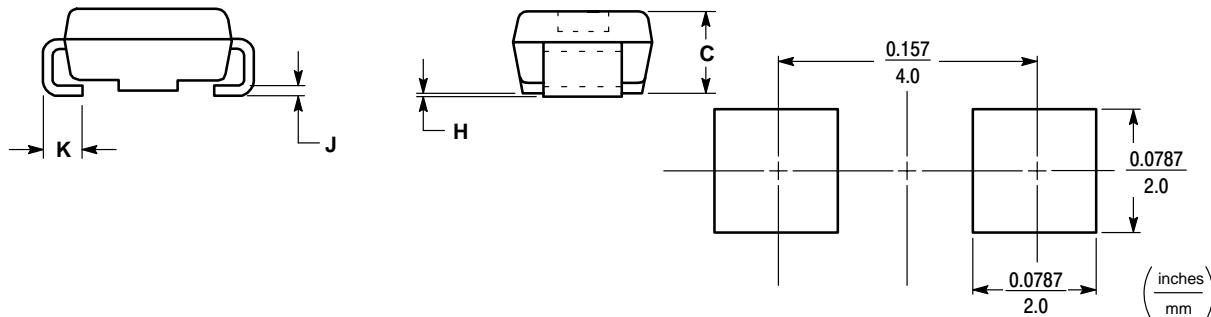
## 400 Watt Peak Power



**SMA**  
CASE 403B-02  
ISSUE C

NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: INCH.  
3. 403B-01 OBSOLETE, NEW STANDARD 403B-02.

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	0.095	1.91	2.41
D	0.050	0.064	1.27	1.63
H	0.002	0.006	0.05	0.15
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



SMA FOOTPRINT

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