

# 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.

#### 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
- Pb-Free Packages are Available

#### 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



**ON Semiconductor®**

<http://onsemi.com>

**PLASTIC SURFACE MOUNT  
ZENER OVERVOLTAGE  
TRANSIENT SUPPRESSORS  
10–78 V  $V_R$   
400 W PEAK POWER**



**SMA  
CASE 403B  
PLASTIC**

#### MARKING DIAGRAM



- xxC = Device Code (Refer to page 3)
- A = Assembly Location
- Y = Year
- WW = Work Week
- = Pb-Free Package

#### ORDERING INFORMATION

Device*	Package	Shipping†
1SMAxxCAT3	SMA	5000/Tape & Reel
1SMAxxCAT3G	SMA (Pb-Free)	5000/Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

\*The "T3" suffix refers to a 13 inch reel.

#### DEVICE MARKING INFORMATION

See specific marking information in the device marking column of the Electrical Characteristics table on page 3 of this data sheet.

# 1SMA10CAT3 Series

## 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 $75^\circ\text{C}$	$P_D$	1.5	W
Thermal Resistance from Junction-to-Lead	$R_{\theta JL}$	20	mW/ $^\circ\text{C}$
		50	$^\circ\text{C}/\text{W}$
DC Power Dissipation (Note 3) @ $T_A = 25^\circ\text{C}$ Derate Above $25^\circ\text{C}$	$P_D$	0.5	W
Thermal Resistance from Junction-to-Ambient	$R_{\theta JA}$	4.0	mW/ $^\circ\text{C}$
		250	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	$T_J, T_{stg}$	-65 to +150	$^\circ\text{C}$

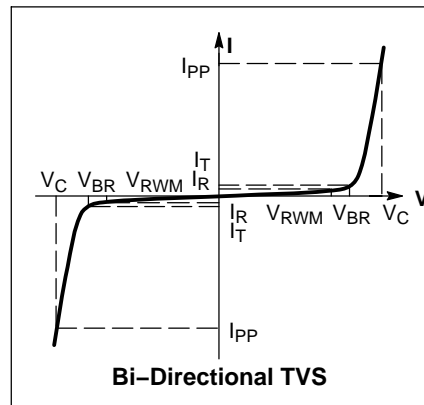
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

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

## 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



# 1SMA10CAT3 Series

## ELECTRICAL CHARACTERISTICS

Device*	Device Marking	V <sub>RWM</sub> (Note 4) Volts	I <sub>R</sub> @ V <sub>RWM</sub> μA	Breakdown Voltage				V <sub>C</sub> @ I <sub>PP</sub> (Note 6)	
				V <sub>BR</sub> (Volts) (Note 5)			@ I <sub>T</sub>	V <sub>C</sub>	I <sub>PP</sub>
				Min	Nom	Max	mA	Volts	Amps
1SMA10CAT3, G	QXC	10	2.5	11.1	11.69	12.27	1.0	17.0	23.5
1SMA11CAT3, G	QZC	11	2.5	12.2	12.84	13.48	1.0	18.2	22.0
1SMA12CAT3, G	REC	12	2.5	13.3	14.00	14.70	1.0	19.9	20.1
1SMA13CAT3, G	RGC	13	2.5	14.4	15.16	15.92	1.0	21.5	18.6
1SMA14CAT3, G	RKC	14	2.5	15.6	16.42	17.24	1.0	23.2	17.2
1SMA15CAT3, G	RMC	15	2.5	16.7	17.58	18.46	1.0	24.4	16.4
1SMA16CAT3, G	RPC	16	2.5	17.8	18.74	19.67	1.0	26.0	15.4
1SMA18CAT3, G	RTC	18	2.5	20	21.06	22.11	1.0	29.2	13.7
1SMA20CAT3, G	RVC	20	2.5	22.2	23.37	24.54	1.0	32.4	12.3
1SMA22CAT3, G	RXC	22	2.5	24.4	25.69	26.97	1.0	35.5	11.3
1SMA24CAT3, G	RZC	24	2.5	26.7	28.11	29.51	1.0	38.9	10.3
1SMA26CAT3, G	SEC	26	2.5	28.9	30.42	31.94	1.0	42.1	9.5
1SMA28CAT3, G	SGC	28	2.5	31.1	32.74	34.37	1.0	45.4	8.8
1SMA30CAT3, G	SKC	30	1.0	33.3	35.06	36.81	1.0	48.4	8.3
1SMA33CAT3, G	SMC	33	2.5	36.7	38.63	40.56	1.0	53.3	7.5
1SMA36CAT3, G	SPC	36	2.5	40	42.11	44.21	1.0	58.1	6.9
1SMA40CAT3, G	SRC	40	2.5	44.4	46.74	49.07	1.0	64.5	6.2
1SMA43CAT3, G	STC	43	2.5	47.8	50.32	52.83	1.0	69.4	5.8
1SMA48CAT3, G	SXC	48	2.5	53.3	56.11	58.91	1.0	77.4	5.2
1SMA51CAT3, G	SZC	51	2.5	56.7	59.69	62.67	1.0	82.4	4.9
1SMA54CAT3, G	TEC	54	2.5	60	63.16	66.32	1.0	87.1	4.6
1SMA58CAT3, G	TGC	58	2.5	64.4	67.79	71.18	1.0	93.6	4.3
1SMA60CAT3, G	TKC	60	2.5	66.7	70.21	73.72	1.0	96.8	4.1
1SMA64CAT3, G	TMC	64	2.5	71.1	74.84	78.58	1.0	103	3.9
1SMA70CAT3, G	TPC	70	2.5	77.8	81.90	85.99	1.0	113	3.5
1SMA78CAT3, G	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<sub>RWM</sub>), which should be equal to or greater than the DC or continuous peak operating voltage level

5. V<sub>BR</sub> measured at pulse test current I<sub>T</sub> at an ambient temperature of 25°C

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

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

\* The "G" suffix indicates Pb-Free package available.

# 1SMA10CAT3 Series

## RATING AND TYPICAL CHARACTERISTIC CURVES

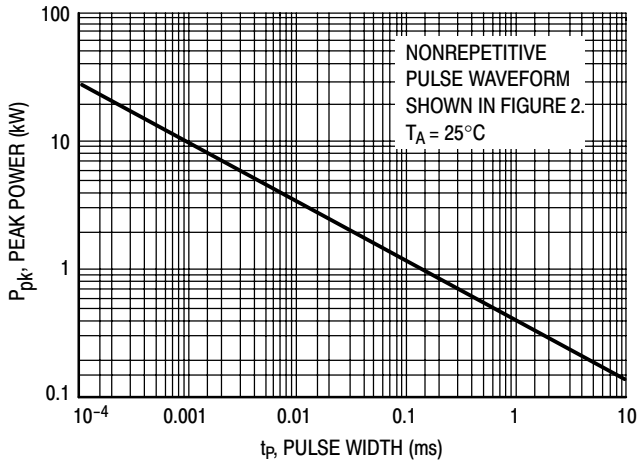


Figure 1. Pulse Rating Curve

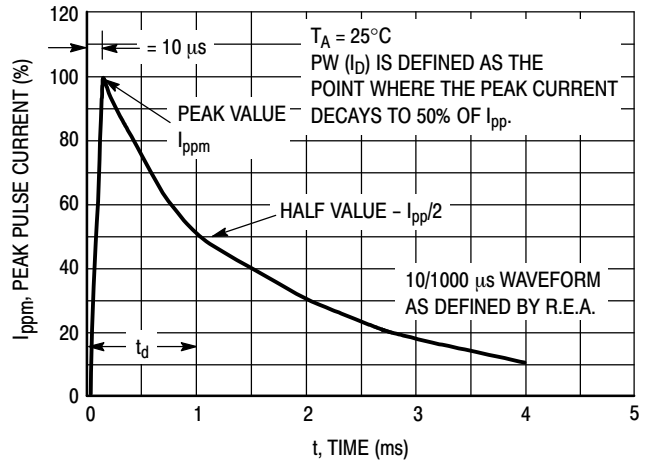


Figure 2. Pulse Waveform

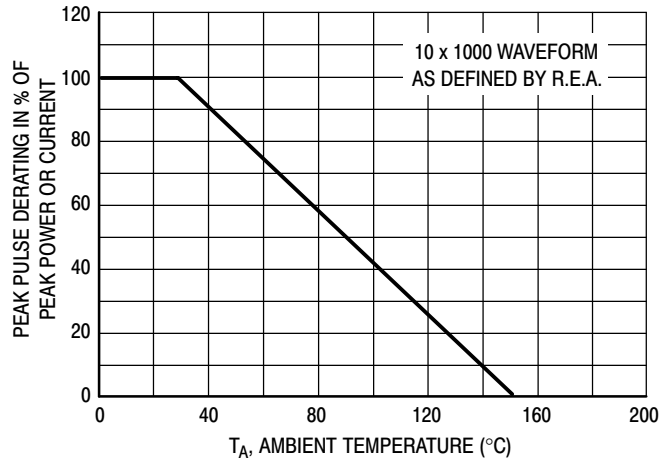
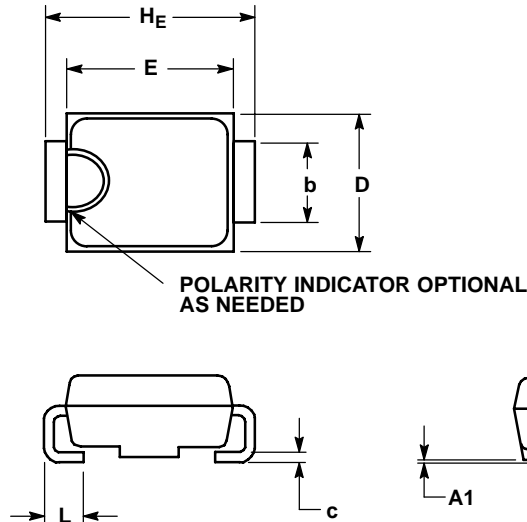


Figure 3. Pulse Derating Curve

# 1SMA10CAT3 Series

## PACKAGE DIMENSIONS

SMA  
CASE 403B-02  
ISSUE D

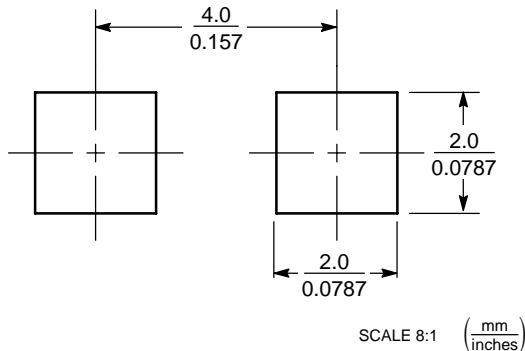


NOTES:

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

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.91	2.16	2.41	0.075	0.085	0.095
A1	0.05	0.10	0.15	0.002	0.004	0.006
b	1.27	1.45	1.63	0.050	0.057	0.064
c	0.15	0.28	0.41	0.006	0.011	0.016
D	2.29	2.60	2.92	0.090	0.103	0.115
E	4.06	4.32	4.57	0.160	0.170	0.180
HE	4.83	5.21	5.59	0.190	0.205	0.220
L	0.76	1.14	1.52	0.030	0.045	0.060

### SOLDERING FOOTPRINT\*



\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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