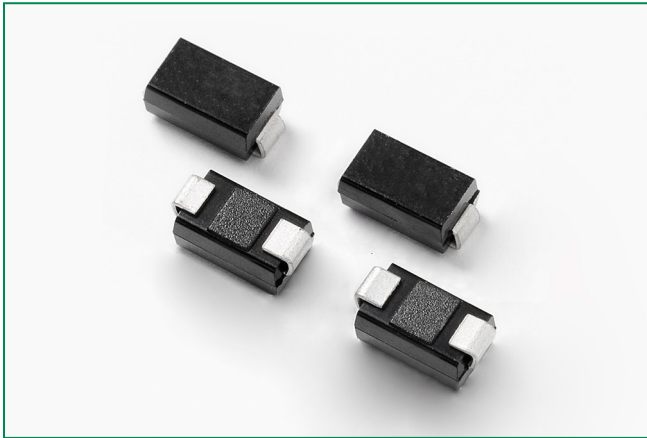




**THE DATASHEET OF
1SMA16CAT3G**



1SMA10CAT3G Series, SZ1SMA10CAT3G Series



Description

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 the Littelfuse exclusive, cost-effective, highly reliable 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
- SZ Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These are Pb-Free Devices

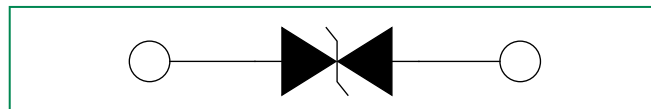
Maximum Ratings and Thermal Characteristics

Parameter	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)	P_D	1.5	W
Derate Above 75°C		20	mW/ $^\circ\text{C}$
Thermal Resistance from Junction-to-Lead	R_{JL}	50	$^\circ\text{C}/\text{W}$
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	mW/ $^\circ\text{C}$
		250	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{stg}	-65 to +150	$^\circ\text{C}$

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. 10 X 1000 μs , non-repetitive.
2. 1 in square copper pad, FR-4 board.
3. FR-4 board, using Littelfuse minimum recommended footprint, as shown in 403B case outline dimensions spec.

Functional Diagram



Additional Information



Datasheet

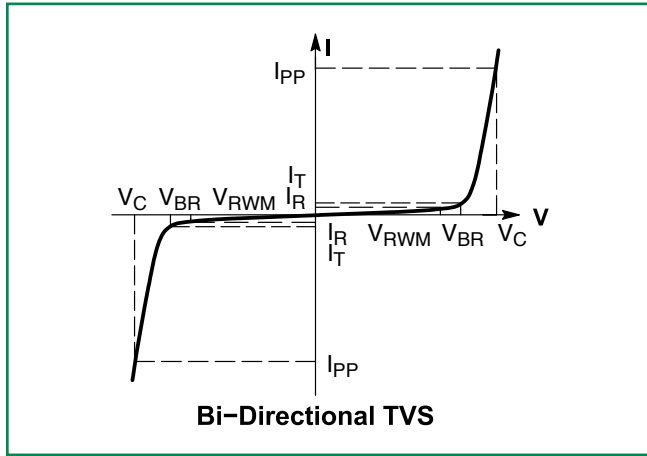


Resources



Samples

I-V Curve Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted, $V_F = 3.5\text{ V Max @ } I_F = 100\text{ A}$) (Note 5)



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
I_F	Forward Current
V_F	Forward Voltage @ I_F
VF	Forward Voltage @ I_F

Electrical Characteristics (TA = 25°C unless otherwise noted)

Device*	Device Marking	V _{RWM} (Note 6)	I _R @ V _{RWM}	Breakdown Voltage				V _C @ I _{PP} (Note 8)		C Typ. (Note 7)
				V _{BR} (V) (Note 7)			@ I _T	V _C	I _{PP}	
				Volts	μA	MIN	NOM	MAX	mA	Volts
1SMA10CAT3G	QXC	10	2.5	11.1	11.69	12.27	1.0	17.0	23.5	580
1SMA12CAT3G	REC	12	2.5	13.3	14.00	14.70	1.0	19.9	20.1	490
1SMA13CAT3G	RGC	13	2.5	14.4	15.16	15.92	1.0	21.5	18.6	455
1SMA15CAT3G	RMC	15	2.5	16.7	17.58	18.46	1.0	24.4	16.4	400
1SMA16CAT3G	RPC	16	2.5	17.8	18.74	19.67	1.0	26.0	15.4	375
1SMA18CAT3G	RTC	18	2.5	20	21.06	22.11	1.0	29.2	13.7	335
1SMA20CAT3G	RVC	20	2.5	22.2	23.37	24.54	1.0	32.4	12.3	305
1SMA24CAT3G	RZC	24	2.5	26.7	28.11	29.51	1.0	38.9	10.3	260
1SMA26CAT3G	SEC	26	2.5	28.9	30.42	31.94	1.0	42.1	9.5	240
1SMA28CAT3G	SGC	28	2.5	31.1	32.74	34.37	1.0	45.4	8.8	225
1SMA30CAT3G	SKC	30	2.5	33.3	35.06	36.81	1.0	48.4	8.3	210
1SMA33CAT3G	SMC	33	2.5	36.7	38.63	40.56	1.0	53.3	7.5	190
1SMA36CAT3G	SPC	36	2.5	40	42.11	44.21	1.0	58.1	6.9	175
1SMA40CAT3G	SRC	40	2.5	44.4	46.74	49.07	1.0	64.5	6.2	160
1SMA48CAT3G	SXC	48	2.5	53.3	56.11	58.91	1.0	77.4	5.2	135
1SMA58CAT3G	TGC	58	2.5	64.4	67.79	71.18	1.0	93.6	4.3	115
1SMA60CAT3G	TKC	60	2.5	66.7	70.21	73.72	1.0	96.8	4.1	110
1SMA70CAT3G	TPC	70	2.5	77.8	81.90	85.99	1.0	113	3.5	95
1SMA78CAT3G	TTC	78	2.5	86.7	91.27	95.83	1.0	126	3.2	90

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°C

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

7. Bias voltage = 0 V, F = 1.0 MHz, T_j = 25°C.

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

* Include SZ-prefix devices where applicable.

Ratings and Characteristic Curves

Figure 1. Pulse Rating Curve

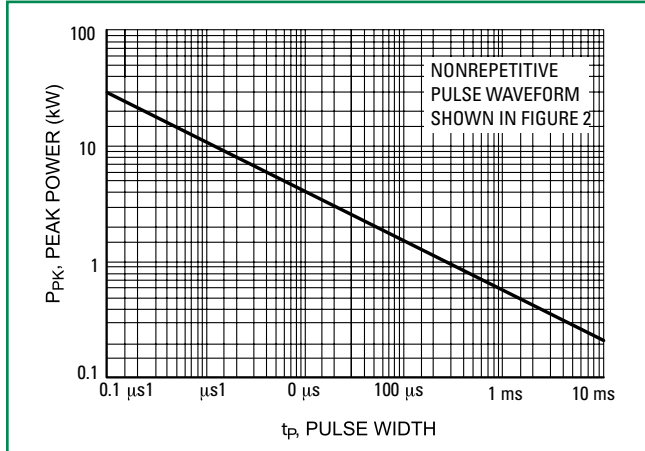


Figure 2. Pulse Waveform

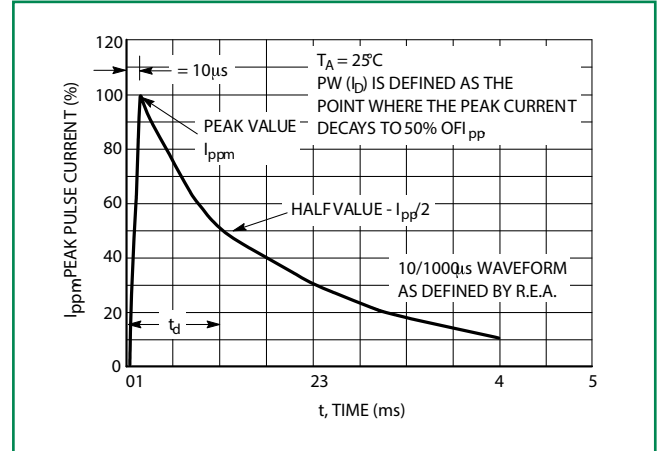


Figure 3. Pulse Derating Curve

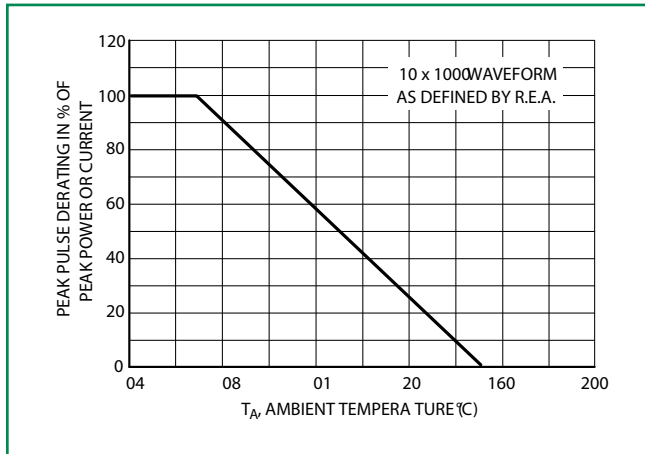
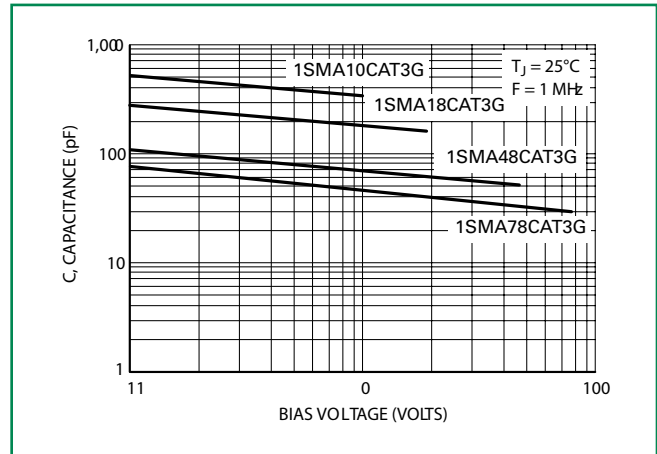
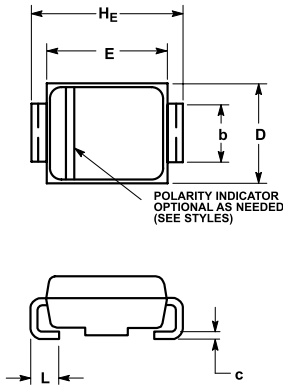


Figure 4. Dynamic Impedance



Dimensions



Dim	Inches			Millimeters		
	Min	Nom	Max	Min	Nom	Max
A	0.078	0.083	0.087	1.97	2.10	2.20
A1	0.002	0.004	0.008	0.05	0.10	0.20
b	0.050	0.057	0.064	1.27	1.45	1.63
c	0.006	0.011	0.016	0.15	0.28	0.41
D	0.090	0.103	0.115	2.29	2.60	2.92
E	0.160	0.170	0.180	4.06	4.32	4.57
HE	0.190	0.205	0.220	4.83	5.21	5.59
L	0.030	0.045	0.060	0.76	1.14	1.52
L1	0.020 REF			0.51 REF		

NOTES

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. D DIMENSION SHALL BE MEASURED WITHIN DIMENSION P.
4. 403-01 THRU -02 OBSOLETE, NEW STANDARD 403-03.

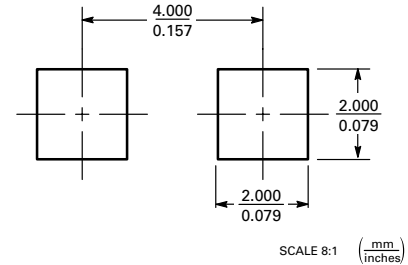
Part Marking System



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

*Bidirectional devices will not be available in this series.

Soldering Footprint



ORDERING INFORMATION

Device	Package	Shipping†
1SMAxxCAT3G	SMA (Pb-Free)	5,000 / Tape & Reel
SZ1SMAxxCAT3G	SMA (Pb-Free)	5,000 / Tape & Reel

Flow/Wave Soldering (Solder Dipping)

Peak Temperature :	260°C
Dipping Time :	10 seconds

Physical Specifications

Case	Void-free, transfer-molded, thermosetting plastic
Polarity	Cathode indicated by polarity band
Mounting Position	Any
Finish	All external surfaces are corrosion resistant and leads are readily solderable
Leads	Modified L-Bend providing more contact area to bond pads

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