

# Surface Mount TRANSZORB® Transient Voltage Suppressors


**DO-215AB (SMCG)**

**RoHS**  
COMPLIANT

**FEATURES**

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- Available in uni-directional and bi-directional
- Excellent clamping capability
- Very fast response time
- Low incremental surge resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

**TYPICAL APPLICATIONS**

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units for consumer, computer, industrial, automotive, and telecommunication.

**MECHANICAL DATA**

**Case:** DO-215AB (SMCG)

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-E3 - RoHS compliant, commercial grade  
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

E3 suffix meets JESD 201 class 2 whisker test, HE3 suffix meets JESD 201 class 2 whisker test

**Polarity:** For uni-directional types the band denotes cathode end, no marking on bi-directional types

**PRIMARY CHARACTERISTICS**

$V_{BR}$ uni-directional	6.40 V to 231 V
$V_{BR}$ bi-directional	6.40 V to 231 V
$V_{WM}$	5.0 V to 188 V
$P_{PPM}$	1500 W
$P_D$	6.5 W
$I_{FSM}$ (uni-directional only)	200 A
$T_J$ max.	150 °C
Polarity	Uni-directional, bi-directional
Package	DO-215AB (SMCG)

**DEVICES FOR BI-DIRECTION APPLICATIONS**

For bi-directional devices use CA suffix (e.g. SMCG188CA).  
Electrical characteristics apply in both directions.

**MAXIMUM RATINGS** ( $T_A = 25\text{ °C}$  unless otherwise noted)

PARAMETER	SYMBOL	VALUE	UNIT
Peak pulse power dissipation with a 10/1000 $\mu$ s waveform <sup>(1)(2)</sup>	$P_{PPM}$	1500	W
Peak pulse current with a 10/1000 $\mu$ s waveform <sup>(1)</sup>	$I_{PPM}$	See next table	A
Peak forward surge current 8.3 ms single half sine-wave uni-directional only <sup>(2)</sup>	$I_{FSM}$	200	A
Power dissipation on infinite heatsink, $T_A = 50\text{ °C}$	$P_D$	6.5	W
Operating junction and storage temperature range	$T_J, T_{STG}$	- 55 to + 150	°C

**Notes**

<sup>(1)</sup> Non-repetitive current pulse, per fig. 3 and derated above  $T_A = 25\text{ °C}$  per fig. 2.

<sup>(2)</sup> Mounted on 0.31" x 0.31" (8.0 mm x 8.0 mm) copper pads to each terminal

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

DEVICE TYPE MODIFIED GULL WING	DEVICE MARKING CODE		BREAKDOWN VOLTAGE $V_{BR}$ AT $I_T$ <sup>(1)</sup> (V)		TEST CURRENT $I_T$ (mA)	STAND-OFF VOLTAGE $V_{WM}$ (V)	MAXIMUM REVERSE LEAKAGE AT $V_{WM}$ $I_D$ ( $\mu\text{A}$ ) <sup>(3)</sup>	MAXIMUM PEAK PULSE SURGE CURRENT $I_{PPM}$ (A) <sup>(2)</sup>	MAXIMUM CLAMPING VOLTAGE AT $I_{PPM}$ $V_C$ (V)
	UNI	BI	MIN.	MAX.					
(+)SMCG5.0A <sup>(5)</sup>	GDE	GDE	6.40	7.07	10	5.0	1000	163.0	9.20
(+)SMCG6.0A	GDG	GDG	6.67	7.37	10	6.0	1000	145.6	10.3
(+)SMCG6.5A	GDK	BDK	7.22	7.98	10	6.5	500	133.9	11.2
(+)SMCG7.0A	GDM	GDM	7.78	8.60	10	7.0	200	125.0	12.0
(+)SMCG7.5A	GDP	BDP	8.33	9.21	1.0	7.5	100	116.3	12.9
(+)SMCG8.0A	GDR	BDR	8.89	9.83	1.0	8.0	50	110.3	13.6
(+)SMCG8.5A	GDT	BDT	9.44	10.4	1.0	8.5	20	104.2	14.4
(+)SMCG9.0A	GDV	BDV	10.0	11.1	1.0	9.0	10	97.4	15.4
(+)SMCG10A	GDX	BDX	11.1	12.3	1.0	10	5.0	88.2	17.0
(+)SMCG11A	GDZ	GDZ	12.2	13.5	1.0	11	5.0	82.4	18.2
(+)SMCG12A	GEE	BEE	13.3	14.7	1.0	12	5.0	75.4	19.9
(+)SMCG13A	GEG	GEG	14.4	15.9	1.0	13	1.0	69.8	21.5
(+)SMCG14A	GEK	BEK	15.6	17.2	1.0	14	1.0	64.7	23.2
(+)SMCG15A	GEM	BEM	16.7	18.5	1.0	15	1.0	61.5	24.4
(+)SMCG16A	GEP	GEP	17.8	19.7	1.0	16	1.0	57.7	26.0
(+)SMCG17A	GER	GER	18.9	20.9	1.0	17	1.0	54.3	27.6
(+)SMCG18A	GET	BET	20.0	22.1	1.0	18	1.0	51.4	29.2
(+)SMCG20A	GEV	BEV	22.2	24.5	1.0	20	1.0	46.3	32.4
(+)SMCG22A	GEX	BEX	24.4	26.9	1.0	22	1.0	42.3	35.5
(+)SMCG24A	GEZ	BEZ	26.7	29.5	1.0	24	1.0	38.6	38.9
(+)SMCG26A	GFE	BFE	28.9	31.9	1.0	26	1.0	35.6	42.1
(+)SMCG28A	GFG	BFG	31.1	34.4	1.0	28	1.0	33.0	45.4
(+)SMCG30A	GFK	BFK	33.3	36.8	1.0	30	1.0	31.0	48.4
(+)SMCG33A	GFM	BFM	36.7	40.6	1.0	33	1.0	28.1	53.3
(+)SMCG36A	GFP	BFP	40.0	44.2	1.0	36	1.0	25.8	58.1
(+)SMCG40A	GFR	BFR	44.4	49.1	1.0	40	1.0	23.3	64.5
(+)SMCG43A	GFT	BFT	47.8	52.8	1.0	43	1.0	21.6	69.4
(+)SMCG45A	GFV	GFV	50.0	55.3	1.0	45	1.0	20.6	72.7
(+)SMCG48A	GFX	GFX	53.3	58.9	1.0	48	1.0	19.4	77.4
(+)SMCG51A	GFZ	GFZ	56.7	62.7	1.0	51	1.0	18.2	82.4
(+)SMCG54A	GGE	GGE	60.0	66.3	1.0	54	1.0	17.2	87.1
(+)SMCG58A	GGG	GGG	64.4	71.2	1.0	58	1.0	16.0	93
(+)SMCG60A	GGK	GGK	66.7	73.7	1.0	60	1.0	15.5	96
(+)SMCG64A	GGM	GGM	71.1	78.6	1.0	64	1.0	14.6	103
(+)SMCG70A	GGP	GGP	77.8	86.0	1.0	70	1.0	13.3	113
(+)SMCG75A	GGR	GGR	83.3	92.1	1.0	75	1.0	12.4	121
(+)SMCG78A	GGT	GGT	86.7	95.8	1.0	78	1.0	11.9	126
(+)SMCG85A	GGV	GGV	94.4	104	1.0	85	1.0	10.9	137
(+)SMCG90A	GGX	GGX	100	111	1.0	90	1.0	10.3	146
(+)SMCG100A	GGZ	GGZ	111	123	1.0	100	1.0	9.3	162
(+)SMCG110A	GHE	GHE	122	135	1.0	110	1.0	8.5	177
(+)SMCG120A	GHG	GHG	133	147	1.0	120	1.0	7.8	193
(+)SMCG130A	GHK	GHK	144	159	1.0	130	1.0	7.2	209
(+)SMCG150A	GHM	GHM	167	185	1.0	150	1.0	6.2	243
(+)SMCG160A	GHP	GHP	178	197	1.0	160	1.0	5.8	259
(+)SMCG170A	GHR	GHR	189	209	1.0	170	1.0	5.5	275
SMCG188A	GHS	GHS	209	231	1.0	188	1.0	4.6	328

**Notes**(1) Pulse test:  $t_p \leq 50$  ms

(2) Surge current waveform per fig. 3 and derate per fig. 2

(3) For bi-directional types having  $V_{WM}$  of 10 V and less, the  $I_D$  limit is doubled

(4) All terms and symbols are consistent with ANSI/IEEE C62.35

(5) For the bi-directional SMCG5.0CA, the maximum  $V_{BR}$  is 7.25 V(6)  $V_F = 3.5$  V at  $I_F = 100$  A (uni-directional only)

(\*) Underwriters laboratory recognition for the classification of protectors (QVGQ2) under the UL standard for safety 497B and file number E136766 for both uni-directional and bi-directional devices

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

PARAMETER	SYMBOL	VALUE	UNIT
Typical thermal resistance, junction to ambient <sup>(1)</sup>	$R_{\theta JA}$	75	$^{\circ}\text{C}/\text{W}$
Typical thermal resistance, junction to lead	$R_{\theta JL}$	15	

**Note**
<sup>(1)</sup> Measured on minimum recommended pad layout

**ORDERING INFORMATION** (Example)

PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SMCG5.0A-E3/57T	0.211	57T	850	7" diameter plastic tape and reel
SMCG5.0A-E3/9AT	0.211	9AT	3500	13" diameter plastic tape and reel
SMCG5.0AHE3/57T <sup>(1)</sup>	0.211	57T	850	7" diameter plastic tape and reel
SMCG5.0AHE3/9AT <sup>(1)</sup>	0.211	9AT	3500	13" diameter plastic tape and reel

**Note**
<sup>(1)</sup> AEC-Q101 qualified

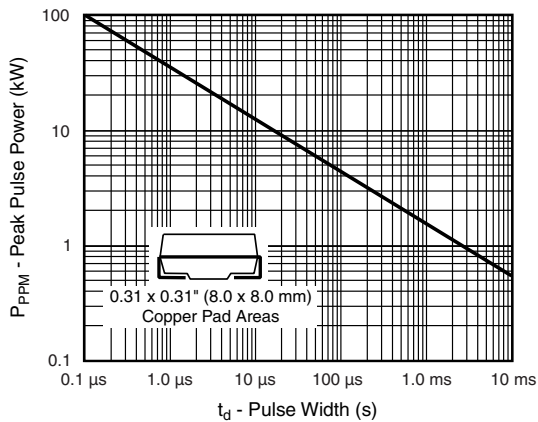
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Peak Pulse Power Rating Curve

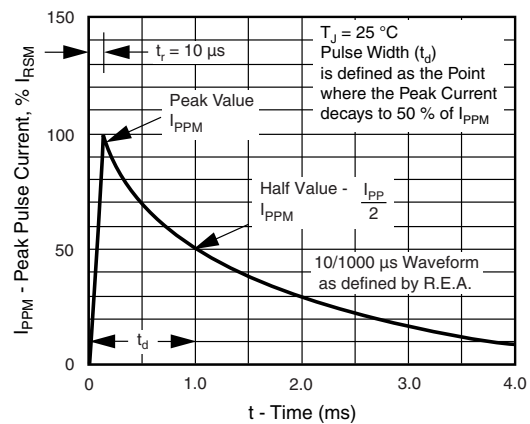


Fig. 3 - Pulse Waveform

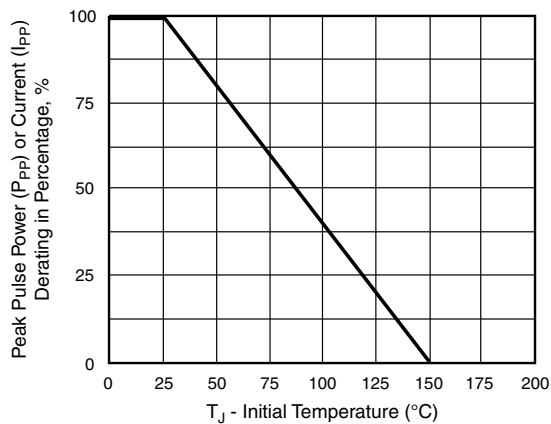


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

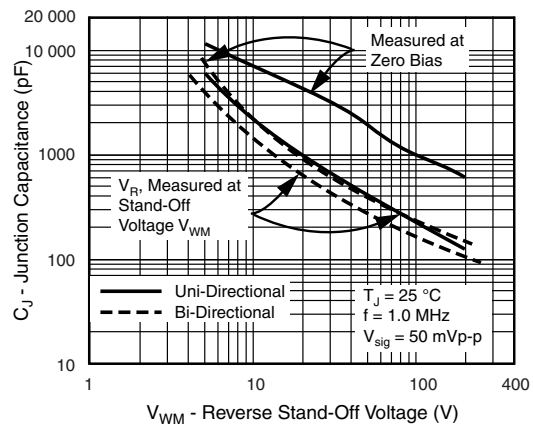


Fig. 4 - Typical Junction Capacitance Uni-Directional

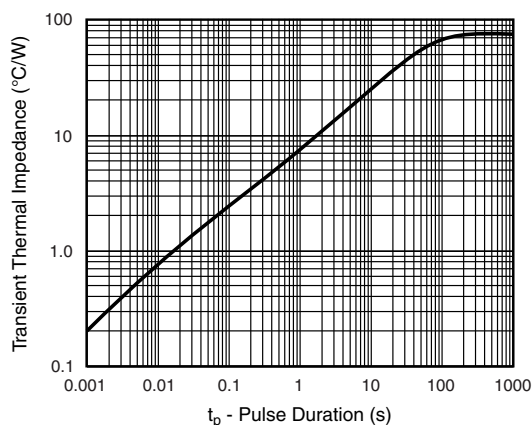
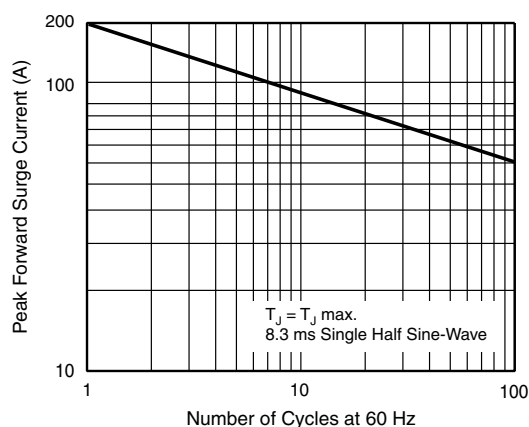
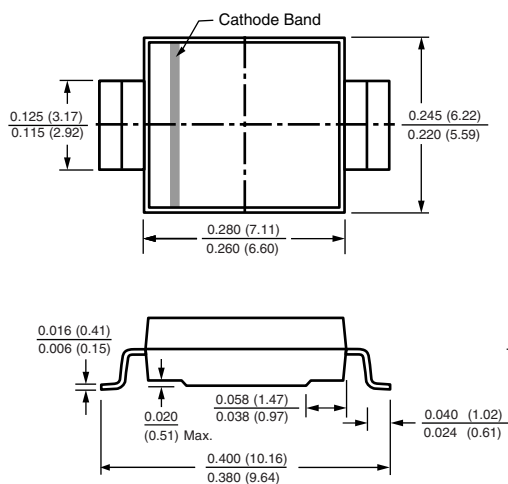
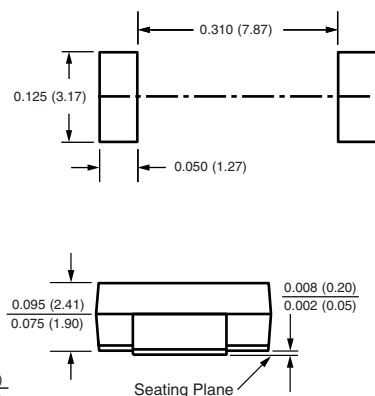


Fig. 5 - Typical Transient Thermal Impedance


Fig. 6 - Maximum Non-Repetitive Peak Forward Surge Current  
Uni-Directional Use Only

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**DO-215AB (SMCG)**

**Mounting Pad Layout**




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