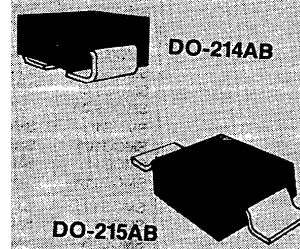


DESCRIPTION

The SMLJ5.0-170A or SMLG5.0-170A series of 3000 W Transient Voltage Suppressors (TVSs) protects a variety of voltage-sensitive components from destruction or degradation. It is available in J-bend design (SMLJ) with the DO-214AB package for greater PC board mounting density or in a Gull-wing design (SMLG) in the DO-215AB for visible solder connections. Selections include unidirectional and bidirectional. They can protect from secondary lightning effects per IEC61000-4-5 and class levels defined herein, or for inductive switching environments and induced RF protection. Since their response time is virtually instantaneous, they can also be used in protection from ESD and EFT per IEC61000-4-2 and IEC61000-4-4.

IMPORTANT: For the most current data, consult MICROSEMI's website: <http://www.microsemi.com>

APPEARANCE

FEATURES

- Economical surface mount TVS design in both J-bend or Gull-wing terminations with fast response
- Available in both Unidirectional and Bidirectional construction with a C or CA suffix
- Selections for 5.0 to 170 volts standoff voltages (V_{WM})
- Optional 100% screening for avionics grade is available by adding MA prefix to part number for added 100% temperature cycle -55°C to +125°C (10X) as well as surge (3X) and 24 hours HTRB with post test V_Z & I_R (in the operating direction for unidirectional or both directions for bidirectional)
- Options for screening in accordance with MIL-PRF-19500 for JANTX are available by adding MX prefix to the part number.
- Axial-lead packages for thru-hole mounting available as 5KP5.0-110A with 5000 W rating (consult factory for other surface mount options)
- RoHS Compliant devices available by adding e3 suffix
- Moisture classification is Level 1 with no dry pack required per IPC/JEDEC J-STD-020B

APPLICATIONS / BENEFITS

- Suppresses transients up to 3000 watts @ 10/1000 μ s
- Protection from switching transients and induced RF
- Protection from ESD, and EFT per IEC 61000-4-2 and IEC 61000-4-4
- Secondary lightning protection per IEC61000-4-5 with 42 Ohms source impedance:
 - Class 1 & 2: SML 5.0 to SML 170A or CA
 - Class 3: SML 5.0 to SML 150A or CA
 - Class 4: SML 5.0 to SML 75A or CA
- Secondary lightning protection per IEC61000-4-5 with 12 Ohms source impedance:
 - Class 1: SML 5.0 to SML 170A or CA
 - Class 2: SML 5.0 to SML 90A or CA
 - Class 3: SML 5.0 to SML 48A or CA
 - Class 4: SML 5.0 to SML 24A or CA
- Secondary lightning protection per IEC61000-4-5 with 2 Ohms source impedance:
 - Class 2: SML 5.0 to SML 43A or CA
 - Class 3: SML 5.0 to SML 22A or CA
 - Class 4: SML 5.0 to SML 10A or CA

MAXIMUM RATINGS

- Peak Pulse Power dissipation at 25°C: 3000 watts at 10/1000 μ s (also see Fig 1,2, and 3)
- Impulse repetition rate (duty factor): 0.01%
- $t_{clamping}$ (0 volts to $V_{(BR)}$ min.): < 100 ps theoretical for unidirectional and < 5 ns for bidirectional
- Operating and Storage temperature: -65°C to +150°C
- Thermal resistance: 17.5°C/W junction to lead, or 77.5°C/W junction to ambient when mounted on FR4 PC board (1 oz Cu) with recommended footprint
Steady-State Power dissipation: 6 watts at $T_L = 45^\circ\text{C}$, or 1.61 watts at $T_A = 25^\circ\text{C}$ when mounted on FR4 PC board with recommended footprint
- Forward Surge at 25°C: 200 Amps peak impulse of 8.3 ms half-sine wave (unidirectional only)
- Solder temperatures: 260°C for 10 s (maximum)

MECHANICAL AND PACKAGING

- CASE: Void-free transfer molded thermosetting epoxy body meeting UL94V-0
- TERMINALS: Gull-wing or C-bend (modified J-bend) leads with tin-lead or RoHS Compliant annealed matte-Tin plating solderable per MIL-STD-750, method 2026
- POLARITY: Cathode indicated by band. No marking on bidirectional devices
- MARKING: Part number without SM and G or J prefix (e.g. L5.0, L5.0A, L5.0Ae3, L5.0CA, L36, L36A, L36Ae3, L36CAe3, etc.)
- TAPE & REEL option: Standard per EIA-481-2 with 16 mm tape, 750 per 7 inch reel or 2500 per 13 inch reel (add "TR" suffix to part number)
- WEIGHT: 0.25 grams

ELECTRICAL CHARACTERISTICS @ 25°C

MICROSEMI PART NUMBER		REVERSE STANDOFF VOLTAGE V _{WM}	BREAKDOWN VOLTAGE V _(BR) @ I _(BR) Volts		MAXIMUM CLAMPING VOLTAGE V _C @ I _{PP} Volts	PEAK PULSE CURRENT (See Fig. 2) I _{PP} Amps	MAXIMUM STANDBY CURRENT @ V _{WM} I _D μA
GULL-WING LEAD	MODIFIED “J” BEND LEAD		MIN.	MAX.			
SMLG5.0	SMLJ5.0	5.0	6.40 – 7.30	10	9.6	312.5	1000
SMLG5.0A	SMLJ5.0A	5.0	6.40 – 7.00	10	9.2	326.0	1000
SMLG6.0	SMLJ6.0	6.0	6.67 – 8.15	10	11.4	263.2	1000
SMLG6.0A	SMLJ6.0A	6.0	6.67 – 7.37	10	10.3	291.3	1000
SMLG6.5	SMLJ6.5	6.5	7.22 – 8.82	10	12.3	243.9	500
SMLG6.5A	SMLJ6.5A	6.5	7.22 – 7.98	10	11.2	267.9	500
SMLG7.0	SMLJ7.0	7.0	7.78 – 9.51	10	13.3	225.6	200
SMLG7.0A	SMLJ7.0A	7.0	7.78 – 8.60	10	12.0	250.0	200
SMLG7.5	SMLJ7.5	7.5	8.33 – 10.2	1	14.3	209.8	100
SMLG7.5A	SMLJ7.5A	7.5	8.33 – 9.21	1	12.9	232.6	100
SMLG8.0	SMLJ8.0	8.0	8.89 – 10.9	1	15.0	200.0	50
SMLG8.0A	SMLJ8.0A	8.0	8.89 – 9.83	1	13.6	220.6	50
SMLG8.5	SMLJ8.5	8.5	9.44 – 11.5	1	15.9	188.6	25
SMLG8.5A	SMLJ8.5A	8.5	9.44 – 10.4	1	14.4	208.4	25
SMLG9.0	SMLJ9.0	9.0	10.0 – 12.2	1	16.9	177.4	10
SMLG9.0A	SMLJ9.0A	9.0	10.0 – 11.1	1	15.4	194.8	10
SMLG10	SMLJ10	10	11.1 – 13.6	1	18.8	159.6	5
SMLG10A	SMLJ10A	10	11.1 – 12.3	1	17.0	176.4	5
SMLG11	SMLJ11	11	12.2 – 14.9	1	20.1	149.2	5
SMLG11A	SMLJ11A	11	12.2 – 13.5	1	18.2	164.8	5
SMLG12	SMLJ12	12	13.3 – 16.3	1	22.0	136.4	5
SMLG12A	SMLJ12A	12	13.3 – 14.7	1	19.9	150.6	5
SMLG13	SMLJ13	13	14.4 – 17.6	1	23.8	126.0	5
SMLG13A	SMLJ13A	13	14.4 – 15.9	1	21.5	139.4	5
SMLG14	SMLJ14	14	15.6 – 19.1	1	25.8	116.2	2
SMLG14A	SMLJ14A	14	15.6 – 17.2	1	23.2	129.4	2
SMLG15	SMLJ15	15	16.7 – 20.4	1	26.9	111.6	2
SMLG15A	SMLJ15A	15	16.7 – 18.5	1	24.4	123.0	2
SMLG16	SMLJ16	16	17.8 – 21.8	1	28.8	104.2	2
SMLG16A	SMLJ16A	16	17.8 – 19.7	1	26.0	115.4	2
SMLG17	SMLJ17	17	18.9 – 23.1	1	30.5	98.4	2
SMLG17A	SMLJ17A	17	18.9 – 20.9	1	27.6	106.6	2
SMLG18	SMLJ18	18	20.0 – 24.4	1	32.2	93.2	2
SMLG18A	SMLJ18A	18	20.0 – 22.1	1	29.2	102.8	2
SMLG20	SMLJ20	20	22.2 – 27.1	1	35.8	83.8	2
SMLG20A	SMLJ20A	20	22.2 – 24.5	1	32.4	92.6	2
SMLG22	SMLJ22	22	24.4 – 29.8	1	39.4	76.2	2
SMLG22A	SMLJ22A	22	24.4 – 26.9	1	35.5	84.4	2
SMLG24	SMLJ24	24	26.7 – 32.6	1	43.0	69.8	2
SMLG24A	SMLJ24A	24	26.7 – 29.5	1	38.9	77.2	2
SMLG26	SMLJ26	26	28.9 – 35.3	1	46.6	64.4	2
SMLG26A	SMLJ26A	26	28.9 – 31.9	1	42.1	71.2	2
SMLG28	SMLJ28	28	31.1 – 38.0	1	50.0	60.0	2
SMLG28A	SMLJ28A	28	31.1 – 34.4	1	45.4	66.0	2
SMLG30	SMLJ30	30	33.3 – 40.7	1	53.5	56.0	2
SMLG30A	SMLJ30A	30	33.3 – 36.8	1	48.4	62.0	2
SMLG33	SMLJ33	33	36.7 – 44.9	1	59.0	50.4	2
SMLG33A	SMLJ33A	33	36.7 – 40.6	1	53.3	56.2	2
SMLG36	SMLJ36	36	40.0 – 48.9	1	64.3	46.6	2
SMLG36A	SMLJ36A	36	40.0 – 44.2	1	58.1	51.6	2
SMLG40	SMLJ40	40	44.4 – 54.3	1	71.4	42.0	2
SMLG40A	SMLJ40A	40	44.4 – 49.1	1	64.5	46.4	2
SMLG43	SMLJ43	43	47.8 – 58.4	1	76.7	39.2	2
SMLG43A	SMLJ43A	43	47.8 – 52.8	1	69.4	43.2	2
SMLG45	SMLJ45	45	50.0 – 61.1	1	80.3	37.4	2
SMLG45A	SMLJ45A	45	50.0 – 55.3	1	72.7	41.2	2

MICROSEMI PART NUMBER		REVERSE STANDOFF VOLTAGE V_{WM}	BREAKDOWN VOLTAGE $V_{(BR)}$ @ $I_{(BR)}$ Volts		MAXIMUM CLAMPING VOLTAGE V_C @ I_{PP} Volts	PEAK PULSE CURRENT (See Fig. 2) I_{PP} Amps	MAXIMUM STANDBY CURRENT @ V_{WM} I_D μA
GULL-WING LEAD	MODIFIED "J" BEND LEAD		MIN.	MAX.			
SMLG48	SMLJ48	48	53.3 – 65.1	1	85.5	35.0	2
SMLG48A	SMLJ48A	48	53.3 – 58.9	1	77.4	38.8	2
SMLG51	SMLJ51	51	56.7 – 69.3	1	91.1	37.0	2
SMLG51A	SMLJ51A	51	56.7 – 62.7	1	82.4	36.4	2
SMLG54	SMLJ54	54	60.0 – 73.3	1	96.3	31.2	2
SMLG54A	SMLJ54A	54	60.0 – 66.3	1	87.1	34.4	2
SMLG58	SMLJ58	58	64.4 – 78.7	1	103.0	29.2	2
SMLG58A	SMLJ58A	58	64.4 – 71.2	1	93.6	32.0	2
SMLG60	SMLJ60	60	66.7 – 81.5	1	107.0	28.0	2
SMLG60A	SMLJ60A	60	66.7 – 73.7	1	96.8	31.0	2
SMLG64	SMLJ64	64	71.1 – 86.9	1	114.0	26.4	2
SMLG64A	SMLJ64A	64	71.1 – 78.6	1	103.0	29.2	2
SMLG70	SMLJ70	70	77.8 – 95.1	1	125	24.0	2
SMLG70A	SMLJ70A	70	77.8 – 86.0	1	113	26.6	2
SMLG75	SMLJ75	75	83.3 – 102.0	1	134	22.4	2
SMLG75A	SMLJ75A	75	83.3 – 92.1	1	121	24.8	2
SMLG78	SMLJ78	78	86.7 – 106.0	1	139	21.6	2
SMLG78A	SMLJ78A	78	86.7 – 95.8	1	126	22.8	2
SMLG85	SMLJ85	85	94.4 – 115.0	1	151	19.8	2
SMLG85A	SMLJ85A	85	94.4 – 104.0	1	137	20.8	2
SMLG90	SMLJ90	90	100 – 122	1	160	18.8	2
SMLG90A	SMLJ90A	90	100 – 111	1	146	20.6	2
SMLG100	SMLJ100	100	111 – 136	1	179	16.8	2
SMLG100A	SMLJ100A	100	111 – 123	1	162	18.6	2
SMLG110	SMLJ110	110	122 – 149	1	196	15.4	2
SMLG110A	SMLJ110A	110	122 – 135	1	177	16.8	2
SMLG120	SMLJ120	120	133 – 163	1	214	14.0	2
SMLG120A	SMLJ120A	120	133 – 147	1	193	15.6	2
SMLG130	SMLJ130	130	144 – 176	1	231	13.0	2
SMLG130A	SMLJ130A	130	144 – 159	1	209	14.4	2
SMLG150	SMLJ150	150	167 – 204	1	268	11.2	2
SMLG150A	SMLJ150A	150	167 – 185	1	243	12.4	2
SMLG160	SMLJ160	160	178 – 218	1	287	10.4	2
SMLG160A	SMLJ160A	160	178 – 197	1	259	11.6	2
SMLG170	SMLJ170	170	189 – 231	1	304	9.8	2
SMLG170A	SMLJ170A	170	189 – 209	1	275	11.0	2

- For Bidirectional device types indicate a C or CA suffix after the part number. (i.e.: SMLG170CA or SMLJ170C). Bidirectional capacitance is half that shown in Figure 4 at zero volts.
- Microsemi Corp's SML series (3000W) surface mountable packages are designed specifically for transient voltage suppression. The wide leads assure a large surface contact for good heat dissipation, and a low resistance path for surge current flow to ground. These high-speed transient voltage suppressors can be used to effectively protect sensitive components such as integrated circuits and MOS devices.

SYMBOLS & DEFINITIONS

Symbol	Definition	Symbol	Definition
V_{WM}	Working Peak (Standoff) Voltage	I_{PP}	Peak Pulse Current
P_{PP}	Peak Pulse Power	V_C	Clamping Voltage
$V_{(BR)}$	Breakdown Voltage	$I_{(BR)}$	Breakdown Current for $V_{(BR)}$
I_D	Standby Current		

GRAPHS

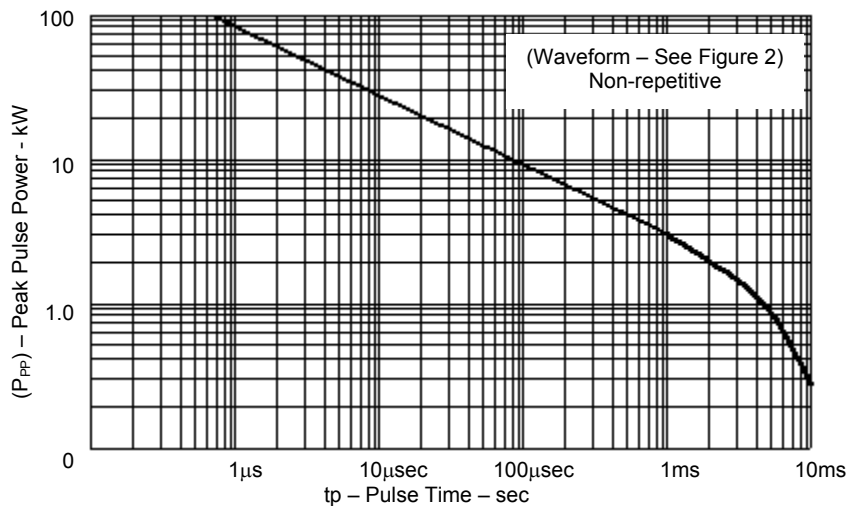


FIGURE 1 – Peak Pulse Power vs. Pulse Time

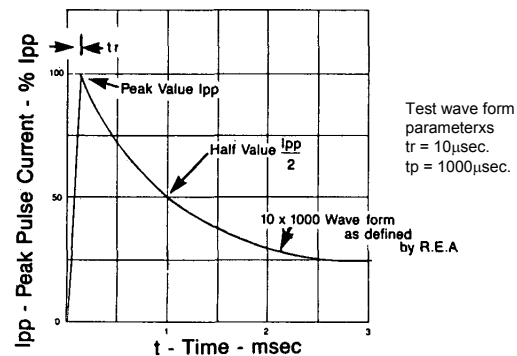


FIGURE 2 – PULSE WAVEFORM

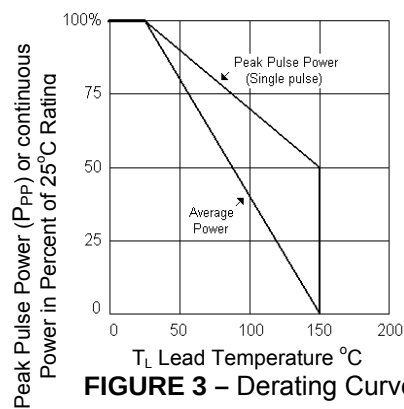


FIGURE 3 – Derating Curve

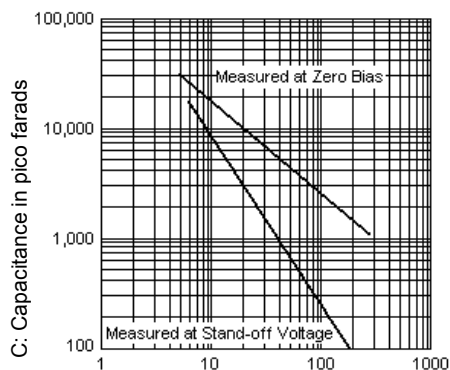
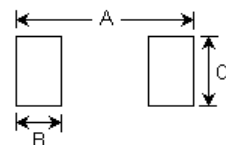


FIGURE 4
Typical Capacitance vs.
Breakdown Voltage

PAD LAYOUT



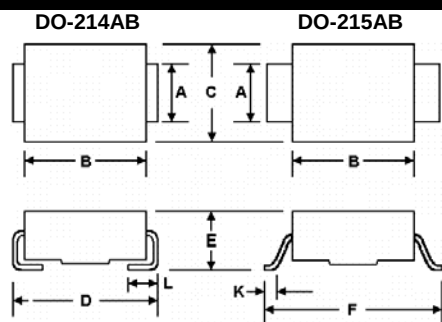
SMLJ

	INCHES	mm
A	.390	9.90
B	.110	2.79
C	.150	3.81

SMLG

	INCHES	mm
A	0.510	12.95
B	0.110	2.79
C	0.150	3.81

PACKAGE DIMENSIONS



DIMENSIONS IN INCHES								
	A	B	C	D	E	F	K	L
MIN	.115	.260	.220	.305	.077	.380	.025	.030
MAX	.121	.280	.245	.320	.104	.400	.040	.060
DIMENSIONS IN MILLIMETERS								
	A	B	C	D	E	F	K	L
MIN	2.92	6.60	5.59	7.75	1.95	9.65	0.635	.760
MAX	3.07	7.11	6.22	8.13	2.65	10.16	1.016	1.520

Typical Standoff Height: 0.004" – 0.008" (0.1mm – 0.2mm)