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TECHNICAL DATA SHEET

SURFACE MOUNT 3000 Watt
Transient Voltage Suppressor

- **High Reliability controlled devices**
- **Unidirectional (A) and Bidirectional (CA) construction**
- **Available in both J-bend and Gull-wing terminations**
- **Selections for 5.0 to 170 V standoff voltages (V_{WM})**

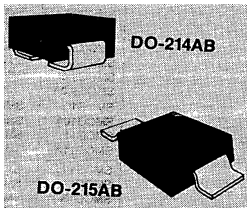
DEVICES

MSMLJ5.0A thru MSMLJ170CA, e3 and MSMLG5.0A thru MSMLG170CA, e3

LEVELS
M, MA, MX, MXL

FEATURES

- High reliability controlled devices with wafer fabrication and assembly lot traceability
- 100 % surge tested devices
- Optional upscreening available by replacing the M prefix with MA, MX or MXL. These prefixes specify various screening and conformance inspection options based on MIL-PRF-19500. Refer to MicroNote 129 for more details on the screening options.
- Axial-lead equivalent packages for thru-hole mounting available as M5KP5.0A to M5KP110CA with 5000 W rating, (consult factory for other surface mount options)
- Moisture classification is Level 1 with no dry pack required per IPC/JEDEC J-STD-020B
- RoHS compliant devices available by adding an “e3” suffix
- 3σ lot norm screening performed on Standby Current I_D



Refer to table below for dimensions

APPLICATIONS / BENEFITS

- Suppresses transients up to 3000 watts @ 10/1000 µs
- 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: MSML5.0A to MSML 170ACA
  - Class 3: MSML5.0A to MSML150CA
  - Class 4: MSML5.0A to MSML75CA
- Secondary lightning protection per IEC61000-4-5 with 12 Ohms source impedance:
  - Class 1: MSML5.0A to MSML170CA
  - Class 2: MSML5.0A to MSML90CA
  - Class 3: MSML5.0A to MSML48CA
  - Class 4: MSML5.0A to MSML24CA
- Secondary lightning protection per IEC61000-4-5 with 2 Ohms source impedance:
  - Class 2: MSML5.0A to MSML43CA
  - Class 3: MSML5.0A to MSML22CA
  - Class 4: MSML5.0A to MSML10CA

MAXIMUM RATINGS

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

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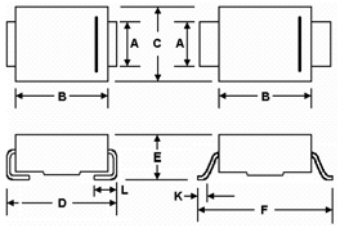
MECHANICAL AND PACKAGING

- Void-free transfer molded thermosetting epoxy body meeting UL94V-0
- Gull-wing or J-bend tin-lead (90 % Sn, 10 % Pb) or RoHS (100 % Sn) compliant annealed matte-tin plating solderable per MIL-STD-750, method 2026
- Cathode indicated by band. No cathode band on bi-directional devices.
- Part number marked on package
- Available in bulk or custom tape-and-reel packaging
- TAPE-AND-REEL option available with up to 750 per 7 inch reel or up to 2500 per 13 inch reel EIA-481-B with 16 mm tape. Add "TR" suffix to part number.
- Weight: 0.25 gram (approximately)

PACKAGE DIMENSIONS

(SMLJ) (SMLG)

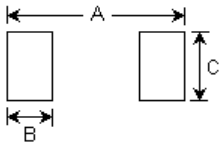


(DO-214AB) (DO-215AB)

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	.110	.400	.040	.060
DIMENSIONS IN MILLIMETERS								
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	2.80	10.16	1.016	1.520

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

PAD LAYOUT



SMLJ (DO-214AB)

	INCHES	mm
A	0.390	9.90
B	0.110	2.79
C	0.150	3.81

SMLG (DO-215AB)

	INCHES	mm
A	0.510	12.95
B	0.110	2.79
C	0.150	3.81

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		

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ELECTRICAL CHARACTERISTICS @ 25°C

MICROSEMI PART NUMBER		REVERSE STAND-OFF VOLTAGE V_{WM}	BREAKDOWN VOLTAGE V_{BR} @ I_{BR}		MAXIMUM CLAMPING VOLTAGE V_C @ I_{PP}	PEAK PULSE CURRENT (see Fig. 2) I_{PP}	MAXIMUM STANDBY CURRENT I_D @ V_{WM}
GULL-WING	**J- BEND**	**V**	**V**	**mA**	**V**	**A**	**µA**
MSMLG5.0A	MSMLJ5.0A	5.0	6.40 – 7.00	10	9.2	326.0	1000
MSMLG6.0A	MSMLJ6.0A	6.0	6.67 – 7.37	10	10.3	291.3	1000
MSMLG6.5A	MSMLJ6.5A	6.5	7.22 – 7.98	10	11.2	267.9	500
MSMLG7.0A	MSMLJ7.0A	7.0	7.78 – 8.60	10	12.0	250.0	200
MSMLG7.5A	MSMLJ7.5A	7.5	8.33 – 9.21	1	12.9	232.6	100
MSMLG8.0A	MSMLJ8.0A	8.0	8.89 – 9.83	1	13.6	220.6	50
MSMLG8.5A	MSMLJ8.5A	8.5	9.44 – 10.4	1	14.4	208.4	25
MSMLG9.0A	MSMLJ9.0A	9.0	10.0 – 11.1	1	15.4	194.8	10
MSMLG10A	MSMLJ10A	10	11.1 – 12.3	1	17.0	176.4	5
MSMLG11A	MSMLJ11A	11	12.2 – 13.5	1	18.2	164.8	5
MSMLG12A	MSMLJ12A	12	13.3 – 14.7	1	19.9	150.6	5
MSMLG13A	MSMLJ13A	13	14.4 – 15.9	1	21.5	139.4	5
MSMLG14A	MSMLJ14A	14	15.6 – 17.2	1	23.2	129.4	2
MSMLG15A	MSMLJ15A	15	16.7 – 18.5	1	24.4	123.0	2
MSMLG16A	MSMLJ16A	16	17.8 – 19.7	1	26.0	115.4	2
MSMLG17A	MSMLJ17A	17	18.9 – 20.9	1	27.6	106.6	2
MSMLG18A	MSMLJ18A	18	20.0 – 22.1	1	29.2	102.8	2
MSMLG20A	MSMLJ20A	20	22.2 – 24.5	1	32.4	92.6	2
MSMLG22A	MSMLJ22A	22	24.4 – 26.9	1	35.5	84.4	2
MSMLG24A	MSMLJ24A	24	26.7 – 29.5	1	38.9	77.2	2
MSMLG26A	MSMLJ26A	26	28.9 – 31.9	1	42.1	71.2	2
MSMLG28A	MSMLJ28A	28	31.1 – 34.4	1	45.4	66.0	2
MSMLG30A	MSMLJ30A	30	33.3 – 36.8	1	48.4	62.0	2
MSMLG33A	MSMLJ33A	33	36.7 – 40.6	1	53.3	56.2	2
MSMLG36A	MSMLJ36A	36	40.0 – 44.2	1	58.1	51.6	2
MSMLG40A	MSMLJ40A	40	44.4 – 49.1	1	64.5	46.4	2
MSMLG43A	MSMLJ43A	43	47.8 – 52.8	1	69.4	43.2	2
MSMLG45A	MSMLJ45A	45	50.0 – 55.3	1	72.7	41.2	2
MSMLG48A	MSMLJ48A	48	53.3 – 58.9	1	77.4	38.8	2
MSMLG51A	MSMLJ51A	51	56.7 – 62.7	1	82.4	36.4	2
MSMLG54A	MSMLJ54A	54	60.0 – 66.3	1	87.1	34.4	2
MSMLG58A	MSMLJ58A	58	64.4 – 71.2	1	93.6	32.0	2
MSMLG60A	MSMLJ60A	60	66.7 – 73.7	1	96.8	31.0	2
MSMLG64A	MSMLJ64A	64	71.1 – 78.6	1	103.0	29.2	2
MSMLG70A	MSMLJ70A	70	77.8 – 86.0	1	113	26.6	2
MSMLG75A	MSMLJ75A	75	83.3 – 92.1	1	121	24.8	2
MSMLG78A	MSMLJ78A	78	86.7 – 95.8	1	126	22.8	2
MSMLG85A	MSMLJ85A	85	94.4 – 104.0	1	137	20.8	2
MSMLG90A	MSMLJ90A	90	100 – 111	1	146	20.6	2
MSMLG100A	MSMLJ100A	100	111 – 123	1	162	18.6	2
MSMLG110A	MSMLJ110A	110	122 – 135	1	177	16.8	2
MSMLG120A	MSMLJ120A	120	133 – 147	1	193	15.6	2
MSMLG130A	MSMLJ130A	130	144 – 159	1	209	14.4	2
MSMLG150A	MSMLJ150A	150	167 – 185	1	243	12.4	2
MSMLG160A	MSMLJ160A	160	178 – 197	1	259	11.6	2
MSMLG170A	MSMLJ170A	170	189 – 209	1	275	11.0	2

NOTE 1: For Bidirectional device types indicate a CA suffix after the part number (i.e. MSMLG170CA). Bidirectional capacitance is half that shown in Figure 4 at zero volts.

NOTE 2: 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.