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6 Lake Street, Lawrence, MA 01841
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TECHNICAL DATA SHEET

SURFACE MOUNT 1500 Watt
Transient Voltage Suppressor

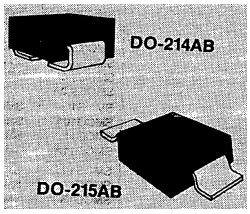
- **High Reliability controlled devices**
- **Unidirectional (A) and Bidirectional (CA) construction**
- **Available in both J-bend and Gull-wing terminations**
- **Selections for 5.0 to 170 V standoff voltages (V_{WM})**

DEVICES **MSMCJ5.0A thru MSMCJ170CA, e3 and MSMCG5.0A thru MSMCG170CA, e3**

LEVELS
M, MA, MX, MXL

FEATURES

- High reliability controlled devices with fabrication and assembly lot traceability
- 100 % surge tested devices
- Optional upscreening available by replacing the M prefix with MA, MX or MXL prefixes. 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 1.5KE6.8A to 1.5KE200CA or 1N6267 thru 1N6303A and 1N5908 (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

- Protection from switching transients and induced RF
- Protection from ESD and EFT per IEC 61000-4-2 and IEC 61000-4-4
- Secondary lightening protection per IEC 61000-4-5 with 42 Ohms source impedance:
  - Class 1: MSMC5.0A to MSMC170CA
  - Class 2: MSMC5.0A to MSMC150CA
  - Class 3: MSMC5.0A to MSMC75CA
  - Class 4: MSMC5.0A to MSMC36CA
- Secondary lightening protection per IEC 61000-4-5 with 12 Ohms source impedance:
  - Class 1: MSMC5.0A to MSMC90CA
  - Class 2: MSMC5.0A to MSMC45CA
  - Class 3: MSMC5.0A to MSMC24CA
  - Class 4: MSMC5.0A to MSMC11CA
- Secondary lightening protection per IEC 61000-4-5 with 2 Ohms source impedance:
  - Class 2: MSMC5.0A to MSMC22CA
  - Class 3: MSMC5.0A to MSMC10CA

MAXIMUM RATINGS

- Peak Pulse Power dissipation at 25 ºC: 1500 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 volts 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: 20 ºC/W junction to lead, or 80 ºC/W junction to ambient when mounted on FR4 PC board (1oz Cu) with recommended footprint (see page 2)
- Steady-State Power dissipation: 6 watts at TL = 30 ºC, or 1.56 watts at TA = 25 ºC when mounted on FR4 PC board with recommended footprint (see page 2)
- Forward Surge: 200 Amps peak impulse of 8.3 ms half-sine wave at 25 ºC (unidirectional only)
- Solder temperatures: 260 ºC for 10 s (maximum)

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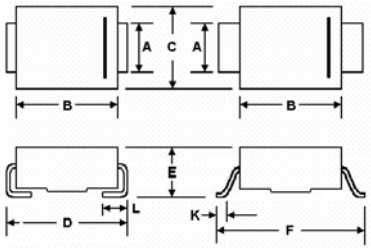
TECHNICAL DATA SHEET

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 devices on 7 inch reel or up to 2500 devices on 13 inch reel per EIA-481-1-A with 12 mm tape. Add “TR” suffix to part number.
- Weight: 0.25 grams (approximately)

PACKAGE DIMENSIONS

SMCJ SMCG

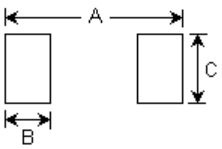


(DO-214AB) (DO-215AB)

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



SMCJ (DO-214AB)

	INCHES	mm
A	0.390	9.90
B	0.110	2.79
C	0.150	3.81

SMCG (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
MSMCG5.0A	MSMCJ5.0A	5.0	6.40 – 7.00	10	9.2	163.0	1000
MSMCG6.0A	MSMCJ6.0A	6.0	6.67 – 7.37	10	10.3	145.6	1000
MSMCG6.5A	MSMCJ6.5A	6.5	7.22 – 7.98	10	11.2	133.9	500
MSMCG7.0A	MSMCJ7.0A	7.0	7.78 – 8.60	10	12.0	125.0	200
MSMCG7.5A	MSMCJ7.5A	7.5	8.33 – 9.21	1	12.9	116.3	100
MSMCG8.0A	MSMCJ8.0A	8.0	8.89 – 9.83	1	13.6	110.3	50
MSMCG8.5A	MSMCJ8.5A	8.5	9.44 – 10.4	1	14.4	104.2	20
MSMCG9.0A	MSMCJ9.0A	9.0	10.0 – 11.1	1	15.4	97.4	10
MSMCG10A	MSMCJ10A	10	11.1 – 12.3	1	17.0	88.2	5
MSMCG11A	MSMCJ11A	11	12.2 – 13.5	1	18.2	82.4	5
MSMCG12A	MSMCJ12A	12	13.3 – 14.7	1	19.9	75.3	5
MSMCG13A	MSMCJ13A	13	14.4 – 15.9	1	21.5	69.7	1
MSMCG14A	MSMCJ14A	14	15.6 – 17.2	1	23.2	64.7	1
MSMCG15A	MSMCJ15A	15	16.7 – 18.5	1	24.4	61.5	1
MSMCG16A	MSMCJ16A	16	17.8 – 19.7	1	26.0	57.7	1
MSMCG17A	MSMCJ17A	17	18.9 – 20.9	1	27.6	53.3	1
MSMCG18A	MSMCJ18A	18	20.0 – 22.1	1	29.2	51.4	1
MSMCG20A	MSMCJ20A	20	22.2 – 24.5	1	32.4	46.3	1
MSMCG22A	MSMCJ22A	22	24.4 – 26.9	1	35.5	42.2	1
MSMCG24A	MSMCJ24A	24	26.7 – 29.5	1	38.9	38.6	1
MSMCG26A	MSMCJ26A	26	28.9 – 31.9	1	42.1	35.6	1
MSMCG28A	MSMCJ28A	28	31.1 – 34.4	1	45.4	33.0	1
MSMCG30A	MSMCJ30A	30	33.3 – 36.8	1	48.4	31.0	1
MSMCG33A	MSMCJ33A	33	36.7 – 40.6	1	53.3	28.1	1
MSMCG36A	MSMCJ36A	36	40.0 – 44.2	1	58.1	25.8	1
MSMCG40A	MSMCJ40A	40	44.4 – 49.1	1	64.5	23.2	1
MSMCG43A	MSMCJ43A	43	47.8 – 52.8	1	69.4	21.6	1
MSMCG45A	MSMCJ45A	45	50.0 – 55.3	1	72.7	20.6	1
MSMCG48A	MSMCJ48A	48	53.3 – 58.9	1	77.4	19.4	1
MSMCG51A	MSMCJ51A	51	56.7 – 62.7	1	82.4	18.2	1
MSMCG54A	MSMCJ54A	54	60.0 – 66.3	1	87.1	17.2	1
MSMCG58A	MSMCJ58A	58	64.4 – 71.2	1	93.6	16.0	1
MSMCG60A	MSMCJ60A	60	66.7 – 73.7	1	96.8	15.5	1
MSMCG64A	MSMCJ64A	64	71.1 – 78.6	1	103.0	14.6	1
MSMCG70A	MSMCJ70A	70	77.8 – 86.0	1	113	13.3	1
MSMCG75A	MSMCJ75A	75	83.3 – 92.1	1	121	12.4	1
MSMCG78A	MSMCJ78A	78	86.7 – 95.8	1	126	11.4	1
MSMCG85A	MSMCJ85A	85	94.4 – 104.0	1	137	10.4	1
MSMCG90A	MSMCJ90A	90	100 – 111	1	146	10.3	1
MSMCG100A	MSMCJ100A	100	111 – 123	1	162	9.3	1
MSMCG110A	MSMCJ110A	110	122 – 135	1	177	8.4	1
MSMCG120A	MSMCJ120A	120	133 – 147	1	193	7.8	1
MSMCG130A	MSMCJ130A	130	144 – 159	1	209	7.2	1
MSMCG150A	MSMCJ150A	150	167 – 185	1	243	6.2	1
MSMCG160A	MSMCJ160A	160	178 – 197	1	259	5.8	1
MSMCG170A	MSMCJ170A	170	189 – 209	1	275	5.5	1

NOTE 1: For Bidirectional device types indicate CA suffix after the part number. (i.e. MSMCJ170CA). Bidirectional capacitance is half that shown in Figure 4 at zero volts.

NOTE 2: Microsemi Corp's MSMC series (1500 W) 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 device.

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GRAPHS

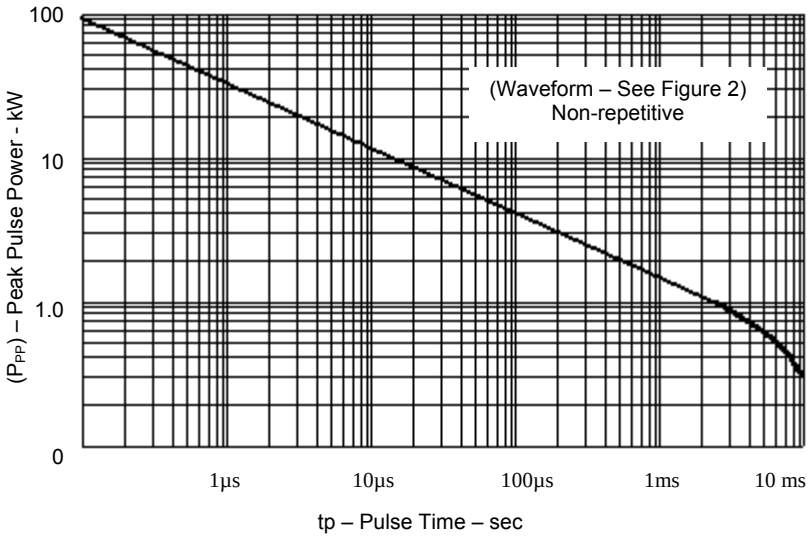
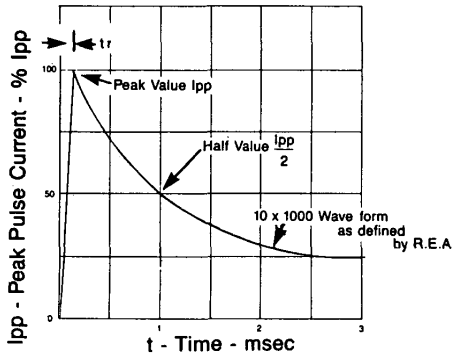


FIGURE 1 – Peak Pulse Power vs. Pulse Time



Test waveform parameters
tr = 10µs, tp = 1000µs

FIGURE 2 – Pulse Waveform

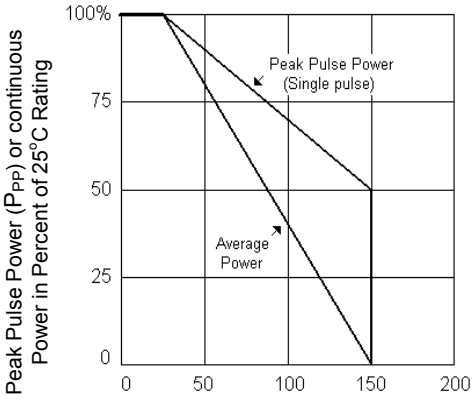


FIGURE 3 – Derating Curve

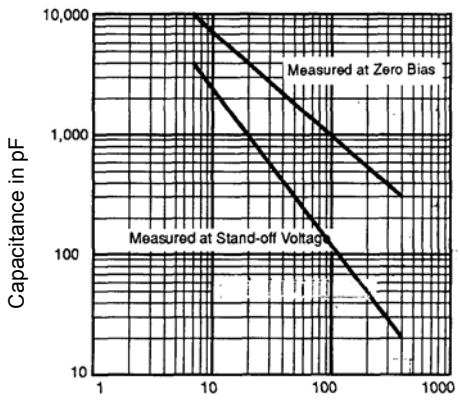


FIGURE 4 – Typical Capacitance vs. Breakdown