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TECHNICAL DATA SHEET

15,000W Transient Voltage Suppressor

- **High Reliability controlled devices**
- **Unidirectional (A) and Bidirectional (CA) construction**
- **Plastic encapsulated TVS series for Thru Hole mounting**
- **Selections for 22.0 to 280 V standoff voltages (V_{WM})**

DEVICES **M15KP22A thru M15KP280CA, e3** **LEVELS M, MA, MX, MXL**

FEATURES

- High reliability controlled devices with wafer fabrication and assembly lot traceability
- 100 % surge tested devices
- Suppresses transients up to 15 kW @ 10/1000 µs and 100 kW @ 8/20 µs (see Figure 1)
- Optional upscreening available by replacing 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
- Moisture classification is Level 1 with no dry pack required per IPC/JEDEC J-STD-020B
- RoHS Compliant devices available by adding "e3" suffix
- 3σ lot norm screening performed on Standby Current I_D

CASE 5A (DO-204AR)

APPLICATIONS / BENEFITS

- Protection from switching transients and induced RF
- Fast response
- Protection from ESD, and EFT per IEC 61000-4-2 and IEC 61000-4-4
- Secondary lightning protection per IEC 61000-4-5 with 42 Ohms source impedance:
  - Class 1,2,3,4: M15KP22A to M15KP280CA
  - Class 5: M15KP22A to M15KP280CA (short distance)
  - Class 5: M15KP22A to M15KP110CA (long distance)
- Secondary lightning protection per IEC 61000-4-5 with 12 Ohms source impedance:
  - Class 1 & 2: M15KP22A to M15KP280CA
  - Class 3: M15KP22A to M15KP240CA
  - Class 4: M15KP22A to M15KP120CA
- Secondary lightning protection per IEC 61000-4-5 with 2 Ohms source impedance:
  - Class 2: M15KP22A to M15KP220CA
  - Class 3: M15KP22A to M15KP110CA
  - Class 4: M15KP22A to M15KP54CA

MAXIMUM RATINGS

- Peak Pulse Power dissipation at 25 ºC: 15,000 watts at 10/1000 µs (also see Figures 1 and 2) with impulse repetition rate (duty factor) of 0.05 % 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: 20 ºC/W junction to lead, or 80ºC/W junction to ambient when mounted on FR4 PC board with 4 mm^2 copper pads (1oz) and track width 1 mm, length 25 mm
- Steady-State Power dissipation: 6 watts at T_L = 30°C, or 1.56 watts at T_A = 25ºC when mounted on FR4 PC board described for thermal resistance
- Forward Surge: 200 Amps 8.3 ms half-sine wave for unidirectional devices only
- Solder temperatures: 260 ºC for 10 s (maximum)

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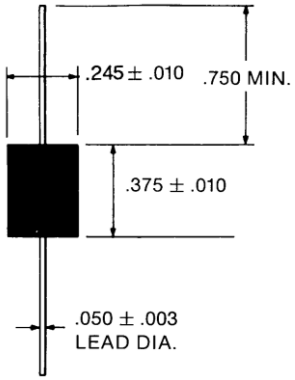
MECHANICAL AND PACKAGING

- Void-free transfer molded thermosetting epoxy body meeting UL94V-0 requirements
- Tin-Lead (90 % Sn, 10 % Pb) or RoHS (100% Sn) Compliant annealed matte-Tin plating readily solderable per MIL-STD-750, method 2026
- Body marked with part number
- Band denotes cathode. Bidirectional not marked.
- Available in Bulk or custom tape-and-reel packaging
- TAPE-AND-REEL standard per EIA-296 for axial package (add "TR" suffix to part number)
- Weight: 1.4 grams (approximate)

PACKAGE DIMENSIONS



CASE 5A

Dimensions in inches

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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TECHNICAL DATA SHEET

ELECTRICAL CHARACTERISTICS @ 25°C

MICROSEMI PART NUMBER (Note 2)	REVERSE STAND-OFF VOLTAGE V_{WM} (Note 1)	MINIMUM BREAKDOWN VOLTAGE V_{BR} @ I_{BR}		MAXIMUM CLAMPING VOLTAGE V_C @ I_{PP}	MAXIMUM STANDBY CURRENT I_D @ V_{WM}	MAXIMUM PEAK PULSE CURRENT I_{PP} (FIG. 2)	MAXIMUM VOLTAGE TEMPERATURE VARIATION $\alpha_{V(BR)}$
	V	V	mA	V	µA	A	mV/ °C
M15KP22A	22	24.4	10	37.1	500	404	24
M15KP24A	24	26.7	5	40.7	150	369	27
M15KP26A	26	28.9	5	44.0	50	341	29
M15KP28A	28	31.1	5	47.5	25	316	31
M15KP30A	30	33.3	5	50.7	15	296	34
M15KP33A	33	36.7	5	54.8	10	274	38
M15KP36A	36	40.0	5	59.7	10	251	41
M15KP40A	40	44.4	5	65.8	10	228	46
M15KP43A	43	47.8	5	69.7	10	215	50
M15KP45A	45	50.0	5	73.0	10	205	52
M15KP48A	48	53.3	5	77.7	10	193	56
M15KP51A	51	56.7	5	82.8	10	181	60
M15KP54A	54	60.0	5	87.5	10	171	63
M15KP58A	58	64.4	5	94.0	10	160	68
M15KP60A	60	66.7	5	97.3	10	154	71
M15KP64A	64	71.1	5	104	10	144	76
M15KP70A	70	77.8	5	114	10	132	83
M15KP75A	75	83.3	5	122	10	123	89
M15KP78A	78	86.7	5	126	10	119	93
M15KP85A	85	94.4	5	137	10	109	102
M15KP90A	90	100	5	146	10	103	109
M15KP100A	100	111	5	162	10	93	121
M15KP110A	110	122	5	178	10	84	133
M15KP120A	120	133	5	193	10	78	145
M15KP130A	130	144	5	209	10	72	157
M15KP150A	150	167	5	243	10	62	183
M15KP160A	160	178	5	259	10	58	195
M15KP170A	170	189	5	275	10	55	207
M15KP180A	180	200	5	291	10	52	219
M15KP200A	200	222	5	322	10	47	243
M15KP220A	220	245	5	356	10	42	269
M15KP240A	240	267	5	388	10	39	293
M15KP260A	260	289	5	419	10	36	317
M15KP280A	280	311	5	452	10	33	342

NOTE 1: Transient Voltage Suppressors are normally selected with reverse “Standoff Voltage” V_{WM} which should be equal to or greater than the dc or continuous peak operating voltage level.

NOTE 2: For bidirectional construction, indicate a CA suffix after the part number.

** Consult factory for availability of the 17 and 18 Volt devices on a special order basis.

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GRAPHS

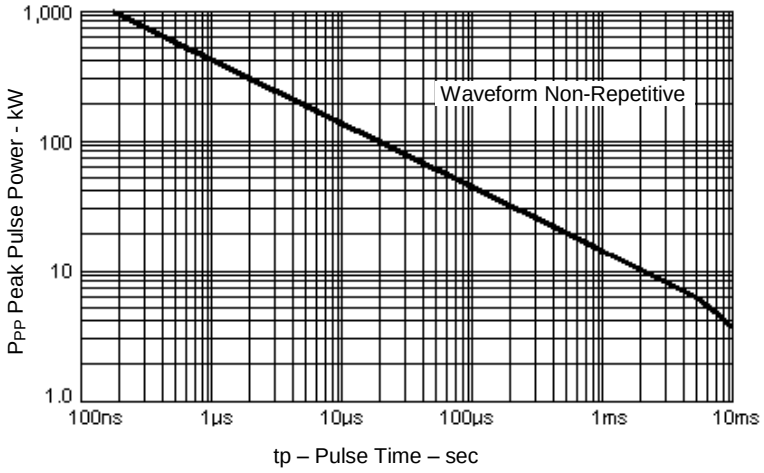
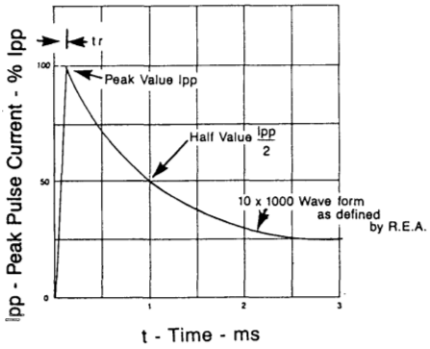


FIGURE 1
Peak Pulse Power vs. Pulse Time to 50% of Exponentially Decaying Pulse



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

FIGURE 2 : Pulse Waveform

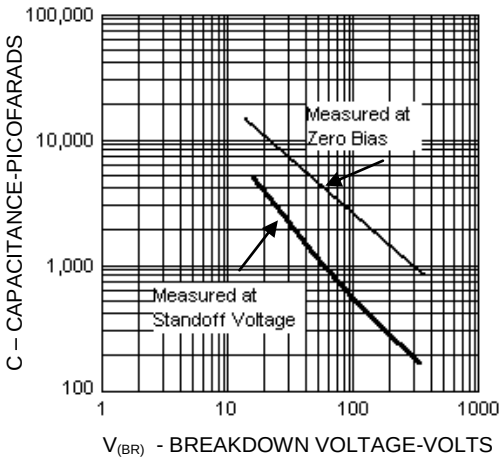


FIGURE 3 Typical Capacitance vs. Breakdown Voltage

NOTE: For Bidirectional Construction, indicate a C or CA suffix after part number. Capacitance will be one-half that shown in Figure 3.

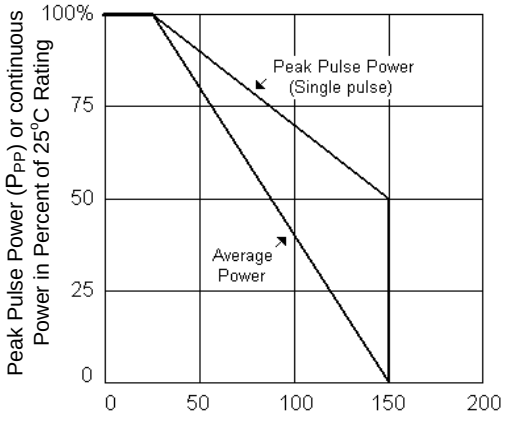


FIGURE 4 Derating