

FOR

DESCRIPTION

These Microsemi 30 kW Transient Voltage Suppressors (TVSs) are designed for applications requiring protection of voltage-sensitive electronic devices that may be damaged by harsh or severe voltage transients including lightning per IEC61000-4-5 and class levels with various source impedances described herein. This series is available in 33 to 400 volt standoff voltages (V_{WM}) in both unidirectional and bi-directional with either 5% or 10% tolerances of the Breakdown Voltage (V_{BR}). Microsemi also offers numerous other TVS products to meet higher or lower power demands and special applications.

APPEARANCE



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

FEATURES @ 25°C UNLESS OTHERWISE SPECIFIED

- Available in both Unidirectional and Bidirectional construction (Bidirectional with a CA suffix)
- Suppresses transients up to 30 kW @ 10/1000 μ s and 200 kW @ 8/20 μ s (see Figure 1)
- Moisture classification is Level 1 with no dry pack required per IPC/JEDEC J-STD-020B
- Glass passivated chip junction in a P600 package
- Reverse leakage below 2 μ A for voltages above 73 volts V_{BR}
- 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.

RoHS Compliant devices available by adding "e3" suffix

MAXIMUM RATINGS

- Peak Pulse Power dissipation at 25°C: 30,000 watts at 10/1000 μ s (also see Figures 1 and 2)
- Impulse repetition rate (duty factor): 0.05%
- $t_{clamping}$ (0 volts to $V_{(BR)}$ min.): < 100 ps theoretical for unidirectional and < 5 ns for bidirectional
- Operating & 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 with 4 mm² copper pads (1oz) and track width 1 mm, length 25 mm
- Steady-State Power dissipation: 7 watts at $T_L = 27.5^\circ\text{C}$, or 1.61 watts at $T_A = 25^\circ\text{C}$ when mounted on FR4 PC board described for thermal resistance
- Forward Surge: 400 Amps 8.3 ms half-sine wave for unidirectional devices only
- Solder temperatures: 260°C for 10 s (maximum)

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 lightning protection per IEC61000-4-5 with 42 Ohms source impedance:
Class 1,2,3,4: 30KPA33A - 30KPA400A or CA
Class 5: 30KPA33A - 30KPA400A or CA
Class 5: 30KPA33A - 30KPA220A or CA (long distance)
- Secondary lightning protection per IEC61000-4-5 with 12 Ohms source impedance:
Class 1,2, 3: 30KPA33A to 30KPA400A or CA
Class 4: 30KPA33A to 30KPA220A or CA
- Secondary lightning protection per IEC61000-4-5 with 2 Ohms source impedance:
Class 2: 30KPA33A to 30KPA400A or CA
Class 3: 30KPA33A to 30KPA220A or CA
Class 4: 30KPA33A to 30KPA110A or CA

MECHANICAL AND PACKAGING

- CASE: Void-free transfer molded thermosetting epoxy P600 package meeting UL94V-0
- FINISH: Tin-Lead or RoHS compliant annealed matte-Tin plating readily solderable per MIL-STD-750, method 2026
- MARKING:
 - Polarity band when required
 - MSC Microsemi
 - Part Number 30KPAXX
 - WW/YY Date code
- POLARITY: Band denotes cathode. Bidirectional not marked for polarity
- WEIGHT: 0.07oz or 2.5grams (approximate)
- TAPE & REEL option: Standard per EIA-296 for axial package (add "TR" suffix to part number)
- See package dimension on last page

ELECTRICAL CHARACTERISTICS @ 25°C UNLESS OTHERWISE SPECIFIED

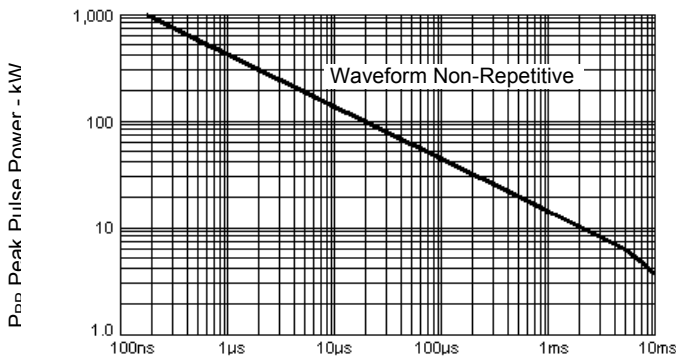
Part Number	Rated Stand-off Voltage V_{WM}	Breakdown Voltage $V_{(BR)}$ Volts @ $I_{(BR)}$		Maximum Clamping @ I_{PP} 10/1000 μ s V_C	Maximum Reverse Leakage @ V_{WM} I_D	Maximum Peak Pulse Current I_{PP}
		$V_{(BR)}$ VOLTS MIN	$I_{(BR)}$ mA			
30KPA28A	28	31.28	50	50.0	5000	606.0
30KPA30A	30	33.51	50	55.2	5000	548.9
30KPA33A	33	36.90	50	58.5	5000	517.9
30KPA36A	36	40.20	50	61.8	5000	490.3
30KPA39A	39	43.60	20	67.2	2000	450.9
30KPA42A	42	46.90	10	72.0	1000	420.8
30KPA43A	43	48.00	20	73.0	1000	415.1
30KPA45A	45	50.30	10	77.4	250	391.5
30KPA48	48	53.60	5	81.6	150	371.3
30KPA51A	51	57.00	5	86.4	50	350.7
30KPA54A	54	60.30	5	91.4	20	331.5
30KPA58A	58	64.80	5	92.4	20	327.9
30KPA60A	60	67.00	5	102.0	15	297.2
30KPA64A	64	71.50	5	104.0	10	291.3
30KPA66A	66	73.70	5	107.0	2	283.2
30KPA70A	70	78.20	5	109.0	2	278.0
30KPA71A	71	79.30	5	111.5	2	271.7
30KPA72A	72	80.40	5	114.0	2	265.8
30KPA75A	75	83.80	5	119.4	2	253.8
30KPA78A	78	87.10	5	129.0	2	234.9
30KPA184A	84	93.80	5	139.2	2	217.7
30KPA90A	90	100.50	5	146.4	2	207.0
30KPA96A	98	107.20	5	156.0	2	194.2
30KPA102A	102	113.90	5	165.6	2	183.0
30KPA108A	108	120.60	5	175.2	2	172.9
30KPA120A	120	134.00	5	194.4	2	155.9
30KPA132A	132	147.4	5	213.0	2	142.3
30KPA144A	144	160.80	5	223.2	2	135.8
30KPA150A	150	167.60	5	233.4	2	129.8
30KPA156A	156	174.30	5	245.0	2	123.7
30KPA160A	160	178.20	5	252.6	2	252.6
30KPA168A	168	187.70	5	272.4	2	272.4
30KPA170A	170	189.90	5	275.0	2	110.2
30KPA180A	180	201.10	5	290.4	2	104.3
30KPA198A	198	221.20	5	319.8	2	94.7
30KPA216A	216	241.30	5	346.6	2	86.9
30KPA240A	240	268.10	5	387.0	2	78.3
30KPA258A	258	288.20	5	416.4	2	72.8
30KPA260A	270	290.40	5	416.0	2	72.8
30KPA270A	270	301.60	5	436.2	2	69.5
30KPA280A	280	312.80	5	464.0	2	65.3
30KPA288A	288	321.70	5	469.9	2	64.5

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

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		

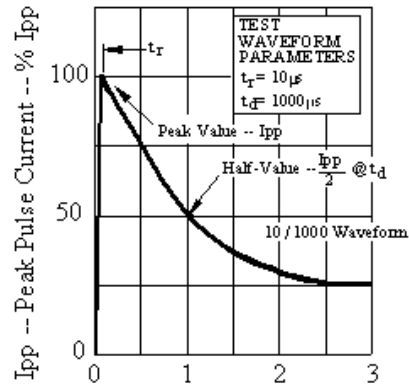
GRAPHS



tp - Pulse Time - sec

FIGURE 1

Peak Pulse Power vs. Pulse Time to 50% of



t - Time - ms

FIGURE 2

Pulse Waveform

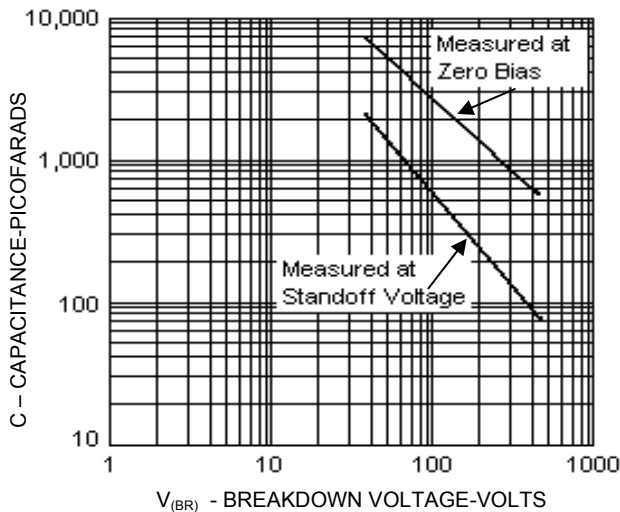
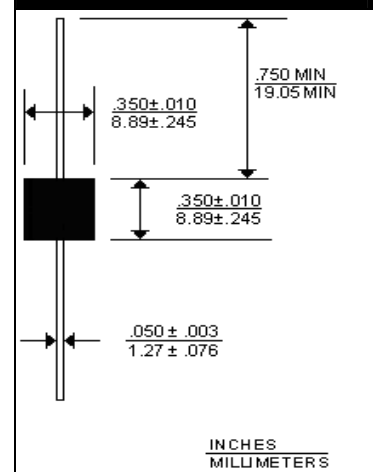


FIGURE 3

Typical Capacitance vs. Breakdown Voltage

DIMENSIONS



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