

**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**

- Available in both Unidirectional and Bidirectional construction (Bidirectional with C or CA suffix)
- Selections for 33 to 400 volt standoff voltages  $V_{WM}$
- Suppresses transients up to 30 kW @ 10/1000  $\mu$ s and 200 kW @ 8/20  $\mu$ s (see Figure 1)
- Fast response
- Options for screening in accordance with MIL-PRF-19500 for JAN, JANTX, JANTXV, and JANS are available by adding MQ, MX, MV, or MSP prefixes respectively to part numbers.
- Moisture classification is Level 1 with no dry pack required per IPC/JEDEC J-STD-020B

**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: 30KP33A - 30KP400A or CA  
Class 5: 30KP33A - 30KP400A or CA (short distance)  
Class 5: 30KP33A - 30KP220A or CA (long distance)
- Secondary lightning protection per IEC61000-4-5 with 12 Ohms source impedance:  
Class 1,2, 3: 30KP33A to 30KP400A or CA  
Class 4: 30KP33A to 30KP220A or CA
- Secondary lightning protection per IEC61000-4-5 with 2 Ohms source impedance:  
Class 2: 30KP33A to 30KP400A or CA  
Class 3: 30KP33 to 30KP220A or CA  
Class 4: 30KP33 to 30KP110A or CA

**MAXIMUM RATINGS**

- Peak Pulse Power dissipation at 25°C: 30,000 watts at 10/1000  $\mu$ 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 mm<sup>2</sup> 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: 250 Amps 8.3 ms half-sine wave
- Solder temperatures: 260°C for 10 s (maximum)

**MECHANICAL AND PACKAGING**

- CASE: Void-free transfer molded thermosetting epoxy body meeting UL94V-0
- FINISH: Tin-Lead plated readily solderable per MIL-STD-750, method 2026
- MARKING: Body marked with part number
- POLARITY: Band denotes cathode. Bidirectional not marked for polarity
- WEIGHT: 1.8 grams.
- TAPE & REEL option: Standard per EIA-296 for axial package (add "TR" suffix to part number)
- See package dimension on last page

**ELECTRICAL CHARACTERISTICS**

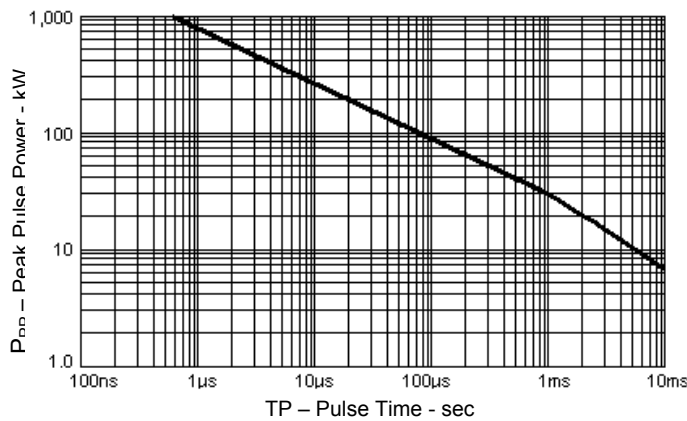
Part Number	Rated Stand-off Voltage $V_{WM}$	Breakdown Voltage $V_{(BR)}$ Volts @ $I_{(BR)}$		Maximum Clamping @ $I_{PP}$ 10/1000 $\mu$ s $V_C$	Maximum Reverse Leakage @ $V_{WM}$ $I_D$	Maximum Peak Pulse Current $I_{PP}$	Maximum $V_{(BR)}$ temperature Coefficient $\alpha_{VZ}$
	VOLTS	VOLTS	mA	VOLTS	$\mu$ Amps	Amps	mV/ $^{\circ}$ C
30KP33	33	36.7-44.9	50	64.6	5000	496	42
30KP33A	33	36.7-40.6	50	58.6	5000	548	38
30KP36	36	40.0-48.9	50	68.2	5000	454	46
30KP36A	36	40.0-44.2	50	61.8	5000	502	41
30KP40	40	44.4-54.3	20	75.8	1500	412	51
30KP40A	40	44.4-49.1	20	68.6	1500	456	46
30KP43	43	47.8-58.4	10	79.0	500	380	55
30KP43A	43	47.8-52.8	10	71.0	500	430	50
30KP45	45	50.0-61.1	5	80.7	150	372	57
30KP45A	45	50.0-55.3	5	73.0	150	410	52
30KP48	48	53.3-65.1	5	85.9	150	350	62
30KP48A	48	53.3-58.9	5	77.7	150	386	56
30KP51	51	56.7-69.3	5	91.5	50	328	66
30KP51A	51	56.7-62.7	5	82.8	50	362	60
30KP54	54	60.0-73.3	5	96.8	25	310	70
30KP54A	54	60.0-66.3	5	87.5	25	342	63
30KP58	58	64.4-78.7	5	104	15	288	76
30KP58A	58	64.4-71.2	5	94.0	15	320	68
30KP60	60	66.7-81.5	5	107	15	280	78
30KP60A	60	66.7-73.7	5	97.3	15	304	71
30KP64	64	71.1-86.9	5	115	10	260	84
30KP64A	64	71.1-78.6	5	104	10	288	76
30KP70	70	77.8-95.1	5	126	10	238	92
30KP70A	70	77.8-86.0	5	114	10	264	83
30KP75	75	83.3-102.0	5	135	10	222	100
30KP75A	75	83.3-92.1	5	122	10	246	89
30KP78	78	86.7-106.0	5	140	10	214	104
30KP78A	78	86.7-95.8	5	126	10	238	93
30KP85	85	94.4-115	5	152	10	198	113
30KP85A	85	94.4-104	5	137	10	218	102
30KP90	90	100-122	5	160	10	188	120
30KP90A	90	100-111	5	146	10	206	109
30KP100	100	111-136	5	179	10	168	134
30KP100A	100	111-123	5	162	10	186	121
30KP110	110	122-149	5	196	10	154	147
30KP110A	110	122-135	5	178	10	168	133
30KP120	120	133-163	5	214	10	140	161
30KP120A	120	133-147	5	193	10	156	145
30KP130	130	144-176	5	231	10	130	174
30KP130A	130	144-159	5	209	10	142	157
30KP150	150	167-204	5	268	10	112	202
30KP150A	150	167-185	5	243	10	124	183
30KP160	160	178-218	5	287	10	104	216
30KP160A	160	178-197	5	259	10	116	195
30KP170	170	189-231	5	304	10	98	229
30KP170A	170	189-209	5	275	10	110	207
30KP180	180	200-244	5	321	10	94	242
30KP180A	180	200-221	5	291	10	104	219
30KP200	200	222-271	5	356	10	84	269
30KP200A	200	222-245	5	322	10	94	243
30KP220	220	245-299	5	393	10	76	297
30KP220A	220	245-271	5	356	10	84	269
30KP250A	250	278-308	5	403	10	74	306
30KP260A	260	289-320	5	419	10	71	318
30KP280A	280	311-345	5	451	10	66	344
30KP300A	300	333-369	5	483	10	62	368
30KP350A	350	389-431	5	564	10	53	430
30KP400A	400	444-492	5	644	10	46	490

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

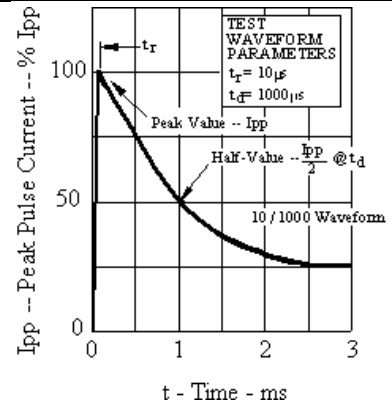
**SYMBOLS & DEFINITIONS**

Symbol	Definition
$V_{BR}$	Minimum Breakdown Voltage: The minimum voltage the device will exhibit at a specified current.
$V_{RWM}$	Working Peak Reverse Voltage: The maximum peak voltage that can be applied over the operating temperature range.
$V_F$	Maximum Forward Voltage: The maximum forward voltage the device will exhibit at a specified current.
$I_R$	Maximum Leakage Current: The maximum leakage current that will flow at the specified voltage and temperature.
C	Capacitance: The capacitance of the TVS as defined @ 0 volts at a frequency of 1 MHz and stated in picofarads.

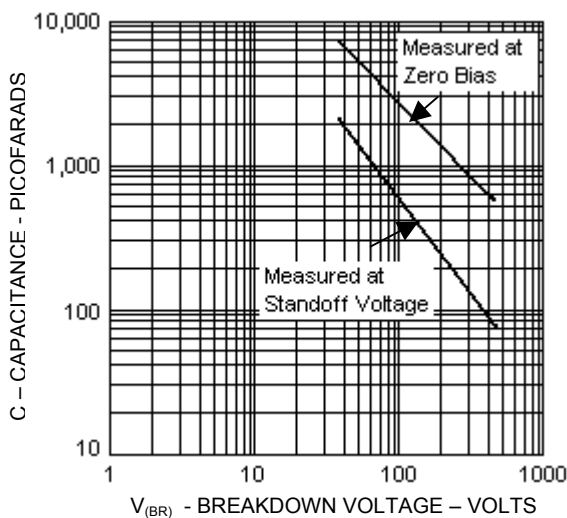
**OUTLINE AND CIRCUIT**



**FIGURE 1**  
Peak Pulse Power vs. Pulse Time



**FIGURE 2**  
Pulse Wave Form



**FIGURE 3**  
Typical Capacitance vs. Breakdown Voltage

**DIMENSIONS**

