PCN 2007-500

Microsemi Corp. Product Change

30KPxxx DATA SHEET MODIFICATION TO RT100KPxxx FORMAT

THE RT100KPxxx SERIES HAS THE SAME PHYSICAL CONSTRUCTION AS THE 30KPxxx SERIES

CHANGES MADE: From a 30 kW rated TVS @ 10/1000 µs up to a 100 kW rated TVS at 6.4/69 µs

MODIFICATION WAS MADE TO ACCOMMODATE AVIATION SPEC RTCS/DO-160E: When the 30KPxxx series was introduced 6 years ago, the format maintained uniformity with our other series of TVS devices including the 5KP and 15KP series. However, with the rapid growth of aircraft applications requiring conformance to RTCA/DO-160E, approximately 90 percent of the applications required recalculating the peak current to Waveform 4 of this spec having a 6.4/69 µs wave form. To simplify the use of this data sheet, it was reformatted to the aircraft specified Waveform 4, having a rise and fall time of 6.4 and 69 µs respectively. In this format, the designer can directly select the voltage and surge current parameters required for his application without calculations.

On the last sheet of this specification are the multiplying factors for converting the current surge rating for Waveforms 3 and 5.

For further information please contact Mel Clark at mclark@www.microsemi.com or Kent Walters at kwalters@www.microsemi.com

Microsemi
SCOTTSDALE DIVISION

30KP33 thru 30KP400CA, e3

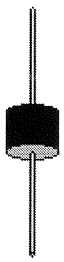
30kW Transient Voltage Suppressor

Replaced by RT100KP33A thru RT100KP400CA, e3

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 µs and 200 kW @ 8/20 µs (see Figure 1)
- Fast response
- 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 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
- RoHS Compliant devices available by adding "e3" suffix

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 µs (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^2 copper pads (1oz) and track width 1 mm, length 25 mm
- Steady-State Power dissipation: 7 watts at T_L = 27.5°C, or 1.61 watts at T_A = 25°C when mounted on FR4 PC board described for thermal resistance
- Forward Surge: 250 Amps 8.3 ms half-sine wave for unidirectional devices only
- 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 or RoHS compliant annealed matte-Tin plating readily solderable per MIL-STD-750, method 2026
- MARKING: Body marked with part number
- POLARITY: Band denotes cathode. Bidirectional not marked for polarity
- WEIGHT: 1.7 grams (approximate)
- TAPE & REEL option: Standard per EIA-296 for axial package (add "TR" suffix to part number)
- See package dimension on last page

Copyright © 2007

Microsemi
Scottsdale Division
8700 E. Thomas Rd. PO Box 1390, Scottsdale, AZ 85252 USA, (480) 941-6300, Fax: (480) 947-1503

ELECTRICAL CHARACTERISTICS

Part Number	Rated Stand-off Voltage V_{WM}	Breakdown Voltage $V_{(BR)}$ Volts @ $I_{(BR)}$		Maximum Clamping @ I_{PP} 10/1000µs V_C	Maximum Reverse Leakage @ V_{WM} I_D	Maximum Peak Pulse Current I_{PP}	Maximum $V_{(BR)}$ temperature Coefficient $\alpha_{V(BR)}$
	VOLTS	$V_{(BR)}$ VOLTS	$I_{(BR)}$ mA	VOLTS	µAmps	Amps	mV/°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.

Copyright © 2007

Microsemi
Scottsdale Division
8700 E. Thomas Rd. PO Box 1390, Scottsdale, AZ 85252 USA, (480) 941-6300, Fax: (480) 947-1503

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

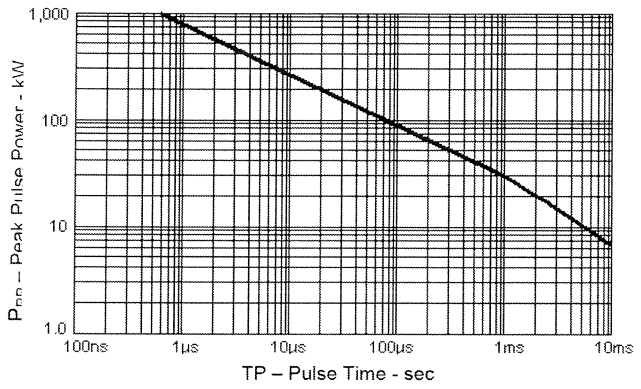


FIGURE 1
Peak Pulse Power vs. Pulse Time

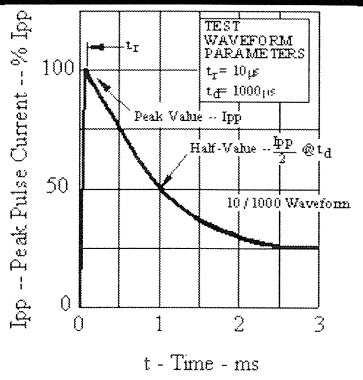


FIGURE 2
Pulse Wave Form

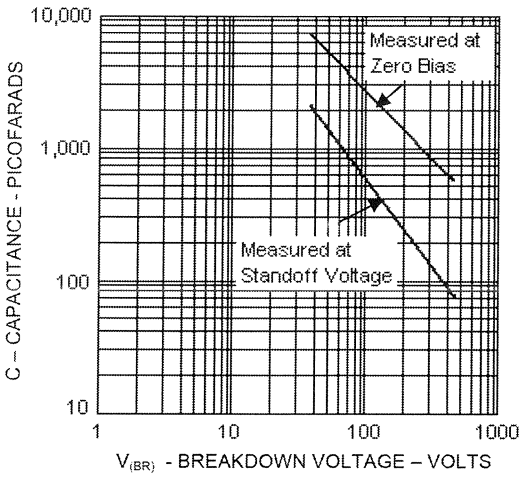
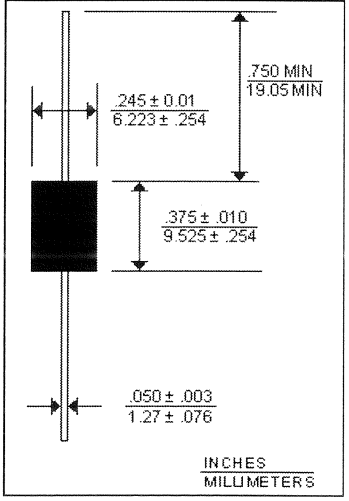


FIGURE 3
Typical Capacitance vs. Breakdown Voltage

DIMENSIONS



www.Microsemi.com

Copyright © 2007
8-21-2007 REV K