PLAD30KP10 thru PLAD30KP400CA, e3

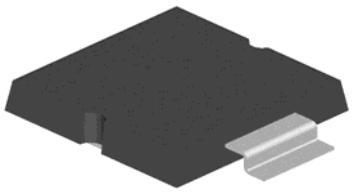
30kW Surface Mount Transient Voltage Suppressor

Microsemi
SCOTTSDALE DIVISION

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 10 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 10 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, and JANTXV are available by adding MQ, MX, or MV 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 an "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: PLAD30KP10 - PLAD30KP400A or CA
  Class 5: PLAD30KP10 - PLAD30KP400A or CA (short distance)
  Class 5: PLAD30KP10 - PLAD30KP220A or CA (long distance)
- Secondary lightning protection per IEC61000-4-5 with 12 Ohms source impedance:
  Class 1,2, 3: PLAD30KP10 to PLAD30KP400A or CA
  Class 4: PLAD30KP10 to PLAD30KP220A or CA
- Secondary lightning protection per IEC61000-4-5 with 2 Ohms source impedance:
  Class 2: PLAD30KP10 to PLAD30KP400A or CA
  Class 3: PLAD30KP10 to PLAD30KP220A or CA
  Class 4: PLAD30KP10 to PLAD30KP110A 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: 0.5°C/W junction to case, or 50°C/W junction to ambient when mounted on FR4 PC board with recommended mounting pad with 1 oz Cu (see last page)
- Steady-State Power dissipation: 250 watts at T_c = 25°C, or 2.5 watts at T_A = 25°C when mounted on FR4 PC board as described for thermal resistance above
- Forward Surge: 1500 Amps (theoretical) at 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: For unidirectional devices, the cathode is on the metal backside (package bottom)
- WEIGHT: 1.7-2.0 grams (approximate)
- TAPE & REEL option: Standard per EIA-296 for axial package (add "TR" suffix to part number)
- See package dimension on last page

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

ELECTRICAL CHARACTERISTICS

MICROSEMI PART NUMBER (Note 2)	REVERSE STAND-OFF VOLTAGE V_{WM} (Note 1)	BREAKDOWN VOLTAGE $V_{(BR)}$		MAXIMUM CLAMPING VOLTAGE V_C @ I_{PP}	MAXIMUM STANDBY CURRENT I_D @ V_{WM}	MAXIMUM PEAK PULSE CURRENT I_{PP} (FIG. 3)	MAXIMUM TEMPERATURE COEFFICIENT OF $V_{(BR)}$ $\alpha_{V(BR)}$
	VOLTS	$V_{(BR)}$ @ VOLTS	$I_{(BR)}$ mA	VOLTS	µA	A	mV/ ºC
PLAD30KP10	10	12.8– 14.6	150	19.2	15,000	1560	8.0
PLAD30KP10A	10	12.8– 14.0	150	18.4	15,000	1629	8.0
PLAD30KP11	11	13.0 – 15.5	150	22.4	15,000	1490	8.0
PLAD30P11A	11	13.0 – 14.5	150	19.2	15,000	1560	8.0
PLAD30KP12	12	13.3 – 16.3	150	22.8	15,000	1317	8.0
PLAD30KP12A	12	13.3 – 14.7	150	20.6	15,000	1455	8.0
PLAD30KP13	13	14.4 – 17.6	150	24.6	6000	1221	8.0
PLAD30KP13A	13	14.4 – 15.9	150	22.4	6000	1341	8.0
PLAD30KP14	14	15.6 – 19.1	150	26.6	3000	1134	10
PLAD30KP14A	14	15.6 – 17.2	150	24.0	3000	1251	10
PLAD30KP15	15	16.7 – 20.4	5	28.6	750	1350	12
PLAD30KP15A	15	16.7 – 18.5	5	25.8	750	1164	12
PLAD30KP16	16	17.8 – 21.8	5	30.0	450	999	13
PLAD30KP16A	16	17.8 – 19.7	5	27.2	450	1101	12
PLAD30KP17	17	18.9 – 23.1	5	31.8	150	942	15
PLAD30KP17A	17	18.9 – 20.9	5	28.8	150	1041	14
PLAD30KP18	18	20.0 – 24.4	5	33.8	120	885	17
PLAD30KP18A	18	20.0 – 22.1	5	30.8	60	975	16
PLAD30KP20	20	22.2 – 27.1	5	37.6	45	798	19
PLAD30KP20A	20	22.2 – 24.5	5	34.0	45	882	18
PLAD30KP22	22	24.4 – 29.8	5	40.2	10	747	22
PLAD30KP22A	22	24.4 – 26.9	5	36.4	10	822	20
PLAD30KP24	24	26.7 – 32.6	5	44.0	10	681	24
PLAD30KP24A	24	26.7 – 29.5	5	39.8	10	753	22
PLAD30KP26	26	28.9 – 35.3	5	47.6	10	630	27
PLAD30KP26A	26	28.9 – 31.9	5	43.0	10	696	24
PLAD30KP28	28	31.1 – 38.0	5	51.6	10	582	29
PLAD30KP28A	28	31.1 – 34.4	5	46.4	10	645	26
PLAD30KP30	30	33.3 – 40.7	5	53.8	10	564	36
PLAD30KP30A	30	33.3 – 36.8	5	48.8	10	618	30
PLAD30KP33	33	36.7 – 44.9	5	59.0	10	510	37
PLAD30KP33A	33	36.7 – 40.6	5	53.3	10	564	35
PLAD30KP36	36	40.0 – 48.9	5	64.3	10	468	40
PLAD30KP36A	36	40.0 – 44.2	5	58.1	10	516	38
PLAD30KP40	40	44.4 – 54.3	5	71.4	10	420	48
PLAD30KP40A	40	44.4 – 49.1	5	64.5	10	468	44
PLAD30KP43	43	47.8 – 58.4	5	76.7	10	390	53
PLAD30KP43A	43	47.8 – 52.8	5	69.4	10	432	50
PLAD30KP45	45	50.0 – 61.1	5	80.3	10	372	54
PLAD30KP45A	45	50.0 – 55.3	5	72.7	10	414	51
PLAD30KP48	48	53.3 – 65.1	5	85.5	10	348	60
PLAD30KP48A	48	53.3 – 58.9	5	77.4	10	390	54
PLAD30KP51	51	56.7 – 69.3	5	91.1	10	330	65
PLAD30KP51A	51	56.7 – 62.7	5	82.4	10	366	58
PLAD30KP54	54	60.0 – 73.3	5	96.3	10	312	68
PLAD30KP54A	54	60.0 – 66.3	5	87.1	10	342	64
PLAD30KP58	58	64.4 – 78.7	5	103.0	10	294	75
PLAD30KP58A	58	64.4 – 71.2	5	93.6	10	318	70
PLAD30KP60	60	66.7 – 81.5	5	107.0	10	282	80
PLAD30KP60A	60	66.7 – 73.7	5	96.8	10	312	72
PLAD30KP64	64	71.1 – 86.9	5	114.0	10	264	85
PLAD30KP64A	64	71.1 – 78.6	5	103.0	10	294	75

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	VOLTS	$V_{(BR)}$ @ VOLTS	$I_{(BR)}$ mA	VOLTS	µA	A	$\alpha_{V(BR)}$ mV/ °C
PLAD30KP70	70	77.8 – 95.1	5	125	10	240	93
PLAD30KP70A	70	77.8 – 86.0	5	113	10	264	84
PLAD30KP75	75	83.3 – 102.0	5	134	10	222	100
PLAD30KP75A	75	83.3 – 92.1	5	121	10	246	90
PLAD30KP78	78	86.7 – 106.0	5	139	10	216	104
PLAD30KP78A	78	86.7 – 95.8	5	126	10	240	95
PLAD30KP85	85	94.4 – 115.0	5	151	10	198	115
PLAD30KP85A	85	94.4 – 104.0	5	137	10	216	104
PLAD30KP90	90	100 – 122	5	160	10	186	120
PLAD30KP90A	90	100 – 111	5	146	10	204	109
PLAD30KP100	100	111 – 136	5	179	10	168	134
PLAD30KP100A	100	111 – 123	5	162	10	186	122
PLAD30KP110	110	122 – 149	5	196	10	156	147
PLAD30KP110A	110	122 – 135	5	177	10	168	132
PLAD30KP120	120	133 – 163	5	214	10	140	161
PLAD30KP120A	120	133 – 147	5	193	10	156	145
PLAD30KP130	130	144 – 176	5	231	10	130	174
PLAD30KP130A	130	144 – 159	5	209	10	142	157
PLAD30KP150	150	167 – 204	5	268	10	112	202
PLAD30KP150A	150	167 – 185	5	243	10	124	183
PLAD30KP160	160	178 – 218	5	287	10	104	216
PLAD30KP160A	160	178 – 197	5	259	10	116	195
PLAD30KP170	170	189 – 231	5	304	10	98	229
PLAD30KP170A	170	189 – 209	5	275	10	110	207
PLAD30KP180	180	200 – 244	5	321	10	94	242
PLAD30KP180A	180	200 – 221	5	291	10	104	219
PLAD30KP200	200	222 – 271	5	356	10	84	269
PLAD30KP200A	200	222 – 245	5	322	10	94	243
PLAD30KP220	220	245 – 299	5	293	10	76	297
PLAD30KP220A	220	245 – 271	5	356	10	84	269
PLAD30KP250	250	278 – 308	5	403	10	74	306
PLAD30KP260A	260	289 – 320	5	419	10	71	318
PLAD30KP280A	280	311 – 345	5	451	10	66	344
PLAD30KP300A	300	333 – 369	5	483	10	62	368
PLAD30KP350A	350	389 – 431	5	564	10	53	430
PLAD30KP400A	400	444 - 492	5	644	10	46	490

NOTE 1: Transient Voltage Suppressors are normally selected with reverse "Stand Off 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 C or 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		

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

GRAPHS

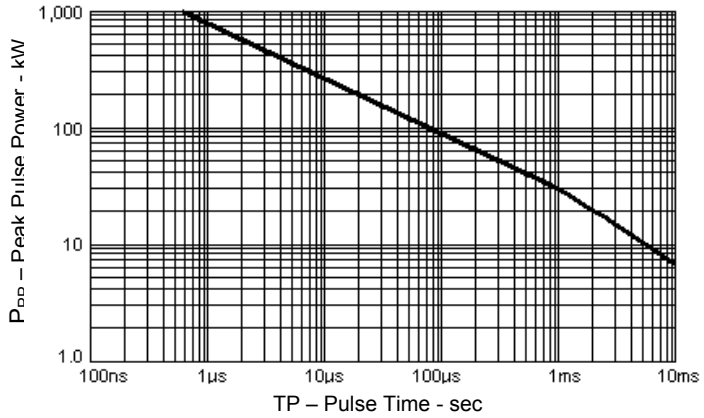


FIGURE 1
Peak Pulse Power vs. Pulse Time

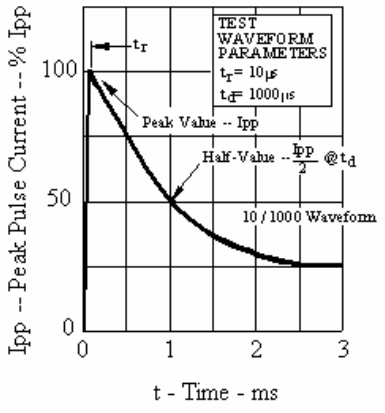


FIGURE 2
Pulse Wave Form

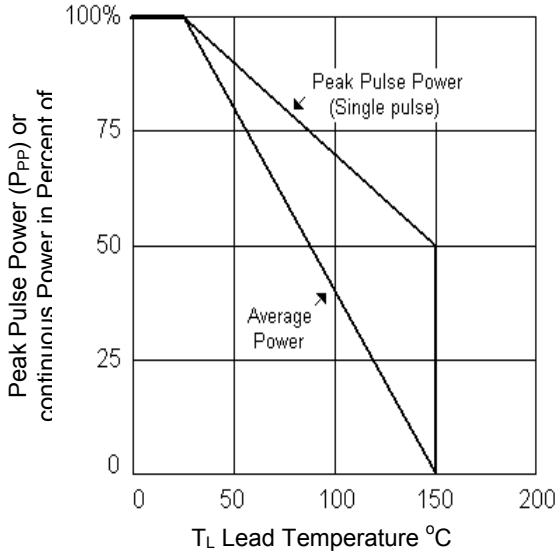
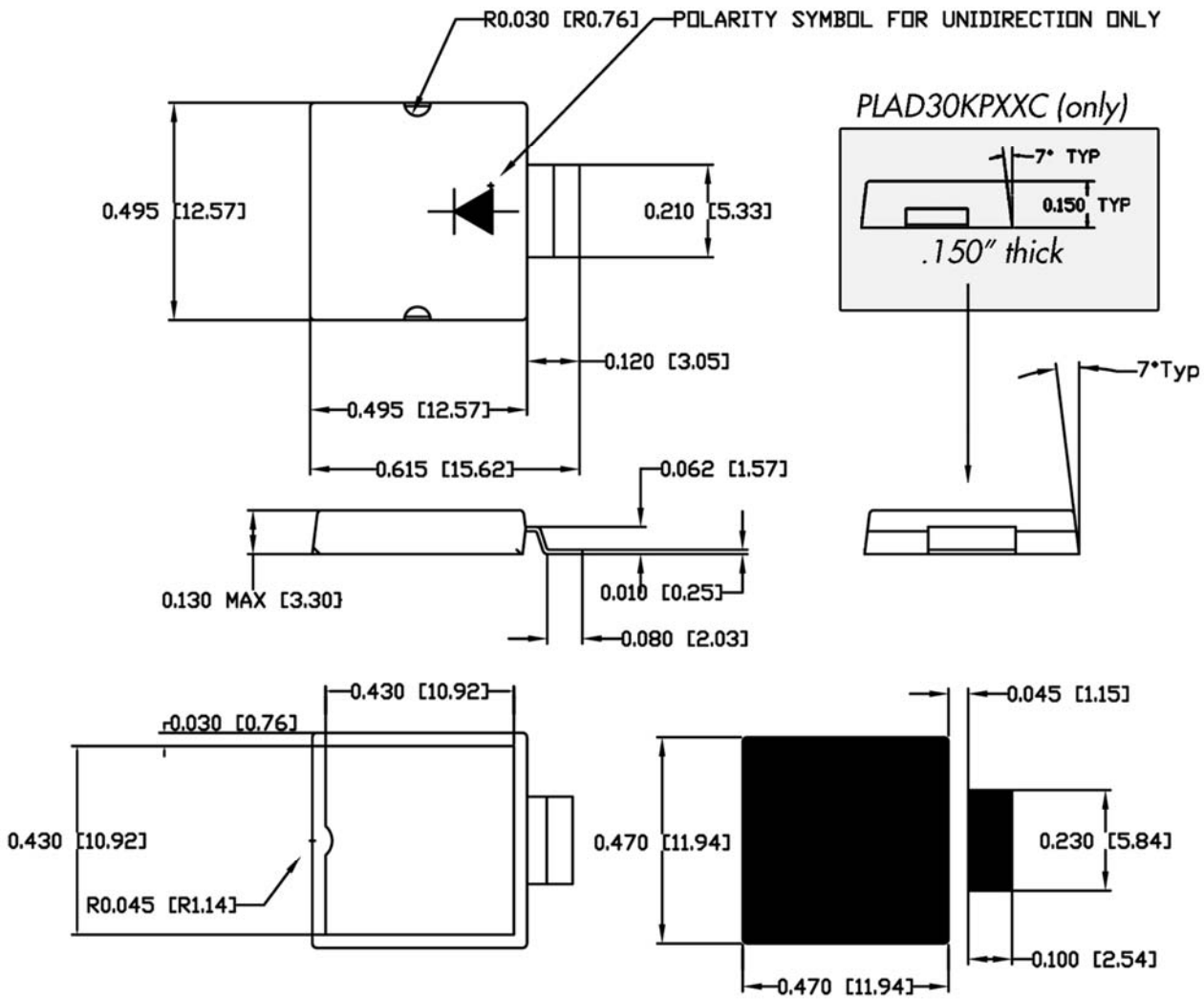


FIGURE 3
Derating Curve

PACKAGE AND MOUNTING PAD DIMENSIONS Inches [mm]



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