

# DIGITRON SEMICONDUCTORS

15KP17 – 15KP280

15,000W TRANSIENT VOLTAGE SUPPRESSOR

## FEATURES

- Available Non-RoHS (standard) or RoHS compliant (add PBF suffix)
- Available in both unidirectional and bidirectional construction (Bidirectional C or CA suffix)
- Available in both axial-leaded and radial packages (include "R" prefix for radial packages)
- Axial and radial available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number
- Selections for 17 to 280 volts standoff voltages
- Suppressors transients up to 15kW @ 10/10000µs and 100kW @ 8/20µs
- Fast response

## MAXIMUM RATINGS

<b>Peak pulse power dissipation @ 25°C:</b>	15,000 W @ 10/1000µs
<b>Impulse repetition rate (duty factor):</b>	0.05%
<b>t<sub>clamping</sub> (0 volts to V<sub>(BR)</sub> min):</b>	< 100ps theoretical for unidirectional and < 5ns for bidirectional
<b>Operating and storage temperature:</b>	-65 to +150°C
<b>Thermal resistance:</b>	20°C/W junction to lead, or 80°C/W junction to ambient when mounted on FR4 PC board with 4mm <sup>2</sup> copper pads and track width 1mm, length 25mm
<b>Steady-state power dissipation:</b>	6 W @ T <sub>L</sub> = 30°C or 1.56 W @ T <sub>A</sub> = 25°C when mounted on FR4 PC board described for thermal resistance
<b>Forward surge:</b>	200 A, 8.3ms half-sine wave
<b>Solder temperatures:</b>	260°C for 10 s(maximum)

## ELECTRICAL CHARACTERISTICS

Type Number	Reverse Standoff Voltage V <sub>WM</sub> (Note 1)	Breakdown Voltage V <sub>(BR)</sub> @ I <sub>(BR)</sub>		Maximum Clamping Voltage V <sub>C</sub> @ I <sub>PP</sub>	Maximum Standby Current I <sub>D</sub> @ V <sub>WM</sub>	Maximum Pulse Current I <sub>PP</sub>	Maximum Temperature Coefficient of V <sub>(BR)</sub> α <sub>V(BR)</sub>
	Volts	Volts	mA	Volts	µA	A	mV/°C
		Min					
15KP17	17	18.9	50	32.3	5000	464	19
15KP17A	17	18.9	50	29.3	5000	512	17
15KP18	18	20.0	50	34.2	5000	439	20
15KP18A	18	20.0	50	30.9	5000	485	18
15KP20	20	22.2	20	37.9	1500	396	24
15KP20A	20	22.2	20	34.3	1500	437	21
15KP22	22	24.4	10	41.1	500	365	27
15KP22A	22	24.4	10	37.1	500	404	24
15KP24	24	26.7	5	45.0	150	333	30
15KP24A	24	26.7	5	40.7	150	369	27
15KP26	26	28.9	5	48.7	50	308	32
15KP26A	26	28.9	5	44.0	50	341	29
15KP28	28	31.1	5	52.4	25	286	35
15KP28A	28	31.1	5	47.5	25	316	31
15KP30	30	33.3	5	56.2	15	267	27

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Type Number	Reverse Standoff Voltage	Breakdown Voltage		Maximum Clamping Voltage	Maximum Standby Current	Maximum Pulse Current	Maximum Temperature Coefficient of
	$V_{WM}$ (Note 1)	$V_{(BR)} @ I_{(BR)}$		$V_C @ I_{PP}$	$I_D @ V_{WM}$	$I_{PP}$	$V_{(BR)}$ $\alpha_{V(BR)}$
	Volts	Volts	mA	Volts	$\mu A$	A	mV/°C
15KP30A	30	33.3	5	50.7	15	296	34
15KP33	33	36.7	5	60.6	10	248	42
15KP33A	33	36.7	5	54.8	10	274	38
15KP36	36	40.0	5	66.0	10	227	46
15KP36A	36	40.0	5	59.7	10	251	41
15KP40	40	44.4	5	72.8	10	206	51
15KP40A	40	44.4	5	65.8	10	228	46
15KP43	43	47.8	5	77.1	10	195	55
15KP43A	43	47.8	5	69.7	10	215	50
15KP45	45	50.0	5	80.7	10	186	57
15KP45A	45	50.0	5	73.0	10	205	52
15KP48	48	53.3	5	85.9	10	175	62
15KP48A	48	53.3	5	77.7	10	193	56
15KP51	51	56.7	5	91.5	10	164	66
15KP51A	51	56.7	5	82.8	10	181	60
15KP54	54	60.0	5	96.8	10	155	70
15KP54A	54	60.0	5	87.5	10	171	63
15KP58	58	64.4	5	104.0	10	144	76
15KP58A	58	64.4	5	94.0	10	160	68
15KP60	60	66.7	5	107.0	10	140	78
15KP60A	60	66.7	5	97.3	10	154	71
15KP64	64	71.1	5	115	10	130	84
15KP64A	64	71.1	5	104	10	144	76
15KP70	70	77.8	5	126	10	119	92
15KP70A	70	77.8	5	114	10	132	83
15KP75	75	83.3	5	135	10	111	100
15KP75A	75	83.3	5	122	10	123	89
15KP78	78	86.7	5	140	10	107	104
15KP78A	78	86.7	5	126	10	119	93
15KP85	85	94.4	5	152	10	99	113

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Type Number	Reverse Standoff Voltage $V_{WM}$ (Note 1)	Breakdown Voltage $V_{(BR)}$ @ $I_{(BR)}$		Maximum Clamping Voltage $V_C$ @ $I_{PP}$	Maximum Standby Current $I_D$ @ $V_{WM}$	Maximum Pulse Current $I_{PP}$	Maximum Temperature Coefficient of $V_{(BR)}$ $\alpha_{V(BR)}$
	Volts	Volts	mA	Volts	$\mu A$	A	mV/°C
		Min					
15KP85A	85	94.4	5	137	10	109	102
15KP90	90	100	5	160	10	94	120
15KP90A	90	100	5	146	10	103	109
15KP100	100	111	5	179	10	84	134
15KP100A	100	111	5	162	10	93	121
15KP110	110	122	5	196	10	77	147
15KP110A	110	122	5	178	10	84	133
15KP120	120	133	5	214	10	70	161
15KP120A	120	133	5	193	10	78	145
15KP130	130	144	5	231	10	65	174
15KP130A	130	144	5	209	10	72	157
15KP150	150	167	5	268	10	56	202
15KP150A	150	167	5	243	10	62	183
15KP160	160	178	5	287	10	52	216
15KP160A	160	178	5	259	10	58	195
15KP170	170	189	5	304	10	49	229
15KP170A	170	189	5	275	10	55	207
15KP180	180	200	5	321	10	47	242
15KP180A	180	200	5	291	10	52	219
15KP200	200	222	5	356	10	42	269
15KP200A	200	222	5	322	10	47	243
15KP220	220	245	5	393	10	38	297
15KP220A	220	245	5	356	10	42	269
15KP240	240	267	5	428	10	35	324
15KP240A	240	267	5	388	10	39	293
15KP260	260	289	5	464	10	32	352
15KP260A	260	289	5	419	10	36	317
15KP280	280	311	5	500	10	30	378
15KP280A	280	311	5	452	10	33	342

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  
 2) For bidirectional construction, indicate a C or CA suffix after the part number

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## SYMBOLS AND DEFINITIONS

Symbol	Definition	Symbol	Definition	Symbol	Definition
$V_{WM}$	Working peak (stand-off voltage)	$I_{PP}$	Peak pulse current	$I_D$	Standby current
$P_{PP}$	Peak pulse power	$V_C$	Clamping voltage		
$V_{BR}$	Breakdown voltage	$I_{(BR)}$	Breakdown current for $V_{(BR)}$		

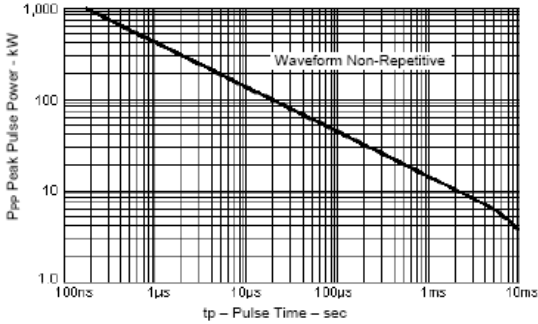
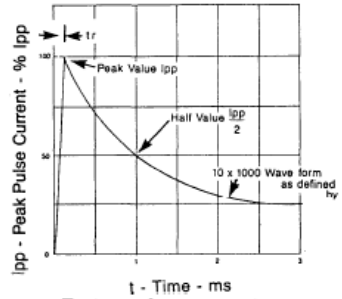


FIGURE 1  
Peak Pulse Power vs. Pulse Time to 50% of Exponentially Decaying Pulse



Test waveform parameters:  
 $t_r=10 \mu s$ ,  $t_p=1000 \mu s$   
FIGURE 2  
Pulse Waveform

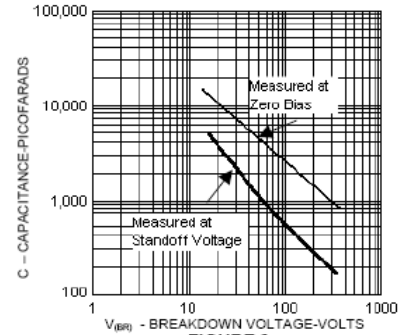
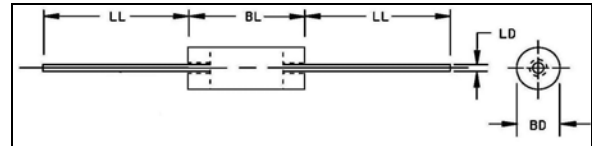
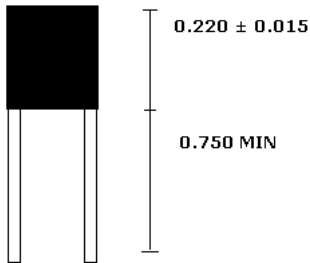


FIGURE 3  
Typical Capacitance vs. Breakdown Voltage

## MECHANICAL CHARACTERISTICS

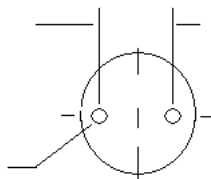
<b>Case</b>	Void free transfer molded thermosetting epoxy
<b>Marking</b>	Body-painted, alpha numeric
<b>Polarity</b>	Cathode band. Bidirectional not marked for polarity.

### CASE 5R



0.250 ± 0.015  
CENTERS

0.050 ± 0.003  
LEAD DIAMETER



0.350 ± 0.010  
DIAMETER

### DIMENSIONS IN INCHES

	Dimensions			
	DIGI I			
	Inches		Millimeters	
	Min	Max	Min	Max
<b>BD</b>	0.340	0.360	8.600	9.100
<b>BL</b>	0.340	0.360	8.600	9.100
<b>LD</b>	0.047	0.053	1.194	1.346
<b>LL</b>	1.000	-	25.400	-