



PROTEK DEVICES®

.....Engineered solutions for the transient environment

TVS
Transient Voltage
Suppressors
Low Capacitance
LC 6.5
thru
LC 90A

DESCRIPTION

This specification sheet defines a premium series of Silicon Transient Voltage Suppressors (TVS) specifically designed with low capacitance for protection on data lines up to 300 kB. Transients and noise pulses are generated by electromechanical switching, electromagnetic coupling, capacitive or inductive load switching, voltage reversals, and electrostatic discharge. These devices will clamp the voltage transient without affecting data transmission.

The TVS is desired over a crowbar circuit, an LC or RC network, and a catch or clamping diode because of: fewer components; speed of response; high power or energy absorption, and low clamping factor.

For bidirectional data line applications, two of these devices are required in parallel, opposite in polarity. (See application note.) These units are hermetically sealed, capable of meeting the screening specifications of military requirements. Contact the factory for parallel matching conditions. This is only one of many series of Transient Voltage Suppressors available from ProTek Devices.

FEATURES

- 1500 watts Peak Power dissipation
- Available in ranges from 6.5 to 90 volts
- Low Capacitance for Data Line Protection up to 300 kB
- Hermetically sealed package
- Each device 100% tested

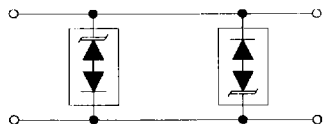
MAXIMUM RATINGS

- 1500 Watts of Peak Pulse Power dissipation at 25°C (see Figure 1)
- Operating and Storage temperatures: -65° to +175°C
- Steady State (Average) power dissipation: 1.0 watt at T_L of 75°C
- Repetition rate (duty cycle): .01%
- t_{clamping} (0 volts to V_{BR} min): Less than 4 nano-second

MECHANICAL CHARACTERISTICS

- Standard DO-13 package, glass and metal hermetically sealed
- Weight: 1.5 grams (approximate)
- Positive terminal marked with band
- Body marked with Logo and type number

APPLICATION:



Devices must be used with two units in parallel, opposite in polarity as shown in circuit for AC Signal Line Protection

SCHEMATIC

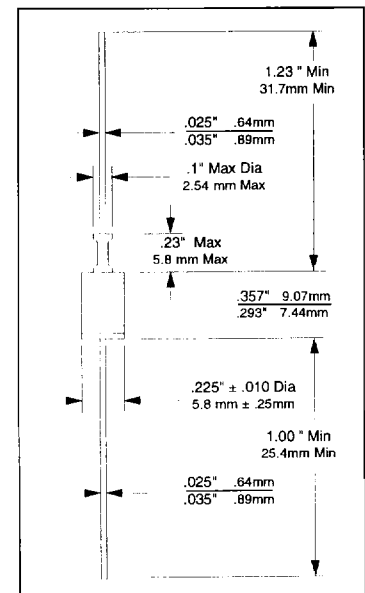
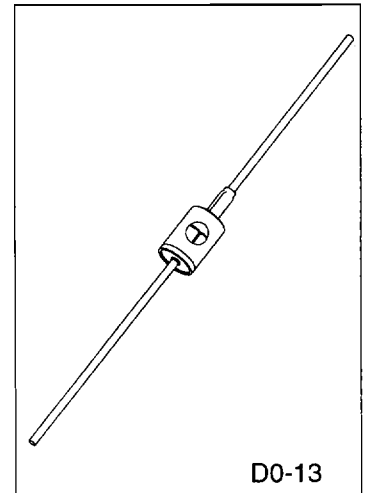


FIGURE 1
PEAK PULSE POWER vs PULSE TIME

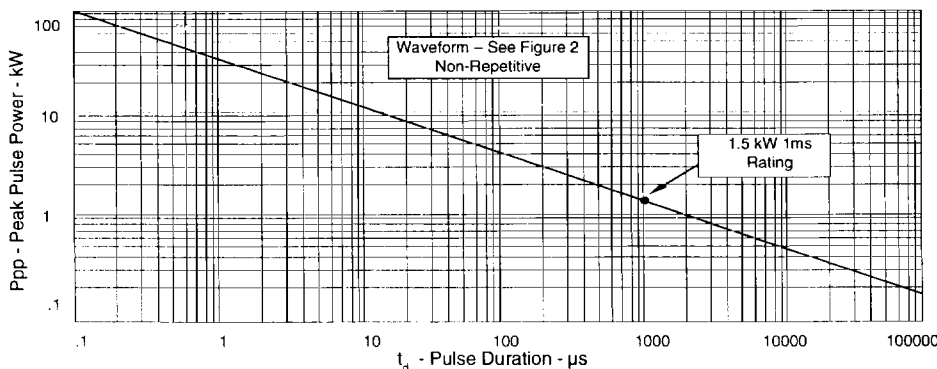
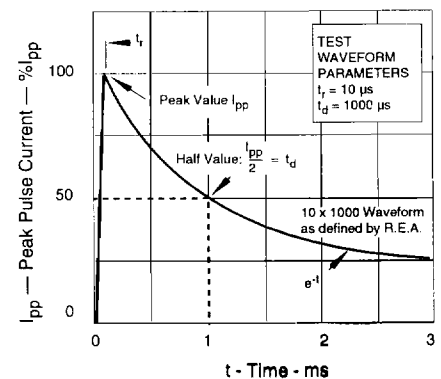


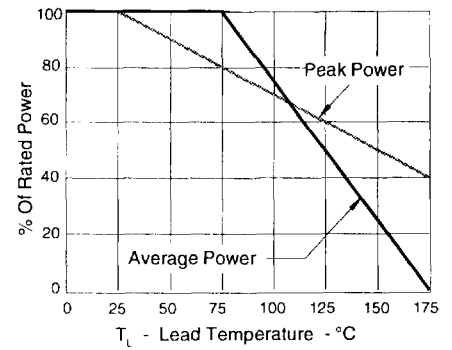
FIGURE 2
PULSE WAVEFORM



ELECTRICAL CHARACTERISTICS AT 25° C

PROTEK TYPE NUMBER	RATED STAND-OFF VOLTAGE (See Note 1) V_{WM} VOLTS	BREAKDOWN VOLTAGE V_{BR} @ I_T mA		MAXIMUM STANDBY CURRENT @ V_{WM} ID μ A	MAXIMUM CLAMPING VOLTAGE @ I_{PP} (See Fig. 2) V_C VOLTS	MAXIMUM PEAK PULSE CURRENT (See Fig. 2) I_{PP} A	CAPACITANCE @ 0 VOLTS C pF	WORKING INVERSE BLOCKING VOLTAGE V_{WIB} VOLTS	INVERSE BLOCKING LEAKAGE CURRENT @ V_{WIB} mA	PEAK INVERSE BLOCKING VOLTAGE V_{PIB} VOLTS
		Min	Max							
LC6.5	6.5	7.22	8.82	10	12.3	100	100	75	1	100
LC6.5A	6.5	7.22	7.98	10	1000	100	100	75	1	100
LC7.0	7.0	7.78	9.51	10	500	100	100	75	1	100
LC7.0A	7.0	7.78	8.60	10	500	100	100	75	1	100
LC7.5	7.5	8.33	10.2	10	250	100	100	75	1	100
LC7.5A	7.5	8.33	9.21	10	250	100	100	75	1	100
LC8.0	8.0	8.89	10.9	1	100	100	100	75	1	100
LC8.0A	8.0	8.89	9.83	1	100	100	100	75	1	100
LC8.5	8.5	9.44	11.5	1	50	94	100	75	1	100
LC8.5A	8.5	9.44	10.4	1	50	144	100	75	1	100
LC9.0	9.0	10.0	12.2	1	10	89	100	75	1	100
LC9.0A	9.0	10.0	11.1	1	10	97	100	75	1	100
LC10	10	11.1	13.6	1	5	80	100	75	1	100
LC10A	10	11.1	12.3	1	5	88	100	75	1	100
LC11	11	12.2	14.9	1	5	74	100	75	1	100
LC11A	11	12.2	13.5	1	5	82	100	75	1	100
LC12	12	13.3	16.3	1	5	68	100	75	1	100
LC12A	12	13.3	14.7	1	5	75	100	75	1	100
LC13	13	14.4	17.6	1	5	63	100	75	1	100
LC13A	13	14.4	15.9	1	5	70	100	75	1	100
LC14	14	15.6	19.1	1	5	58	100	75	1	100
LC14A	14	15.6	17.2	1	5	65	100	75	1	100
LC15	15	16.7	20.4	1	5	56	100	75	1	100
LC15A	15	16.7	18.5	1	5	61	100	75	1	100
LC16	16	17.8	21.8	1	5	52	100	75	1	100
LC16A	16	17.8	19.7	1	5	57	100	75	1	100
LC17	17	18.9	23.1	1	5	49	100	75	1	100
LC17A	17	18.9	20.9	1	5	54	100	75	1	100
LC18	18	20.0	24.4	1	5	46	100	75	1	100
LC18A	18	20.0	22.1	1	5	51	100	75	1	100
LC20	20	22.2	27.1	1	5	42	100	75	1	100
LC20A	20	22.2	24.5	1	5	46	100	75	1	100
LC22	22	24.4	29.8	1	5	38	100	75	1	100
LC22A	22	24.4	26.9	1	5	42	100	75	1	100
LC24	24	26.7	32.6	1	5	35	100	75	1	100
LC24A	24	26.7	29.5	1	5	39	100	75	1	100
LC26	26	28.9	35.3	1	5	32	100	75	1	100
LC26A	26	28.9	31.9	1	5	36	100	75	1	100
LC28	28	31.1	38.0	1	5	30	100	75	1	100
LC28A	28	31.1	34.4	1	5	33	100	75	1	100
LC30	30	33.3	40.7	1	5	28	100	75	1	100
LC30A	30	33.3	36.8	1	5	31	100	75	1	100
LC33	33	36.7	44.9	1	5	25.4	100	75	1	100
LC33A	33	36.7	40.6	1	5	28.1	100	75	1	100
LC36	36	40.0	48.9	1	5	23.3	100	75	1	100
LC36A	36	40.0	44.2	1	5	25.8	100	75	1	100
LC40	40	44.4	54.3	1	5	21.0	100	75	1	100
LC40A	40	44.4	49.1	1	5	23.3	100	75	1	100
LC43	43	47.8	58.4	1	5	19.5	100	150	1	200
LC43A	43	47.8	52.8	1	5	21.6	100	150	1	200
LC45	45	50.0	61.1	1	5	18.7	100	150	1	200
LC45A	45	50.0	55.3	1	5	20.6	100	150	1	200
LC48	48	53.3	65.1	1	5	17.5	100	150	1	200
LC48A	48	53.3	58.9	1	5	19.4	100	150	1	200
LC51	51	56.7	69.3	1	5	16.5	100	150	1	200
LC51A	51	56.7	62.7	1	5	18.2	100	150	1	200
LC54	54	60.0	73.3	1	5	15.6	100	150	1	200
LC54A	54	60.0	66.3	1	5	17.2	100	150	1	200
LC58	58	64.4	78.7	1	5	14.6	100	150	1	200
LC58A	58	64.4	71.2	1	5	16.0	100	150	1	200
LC60	60	66.7	81.5	1	5	14.0	90	150	1	200
LC60A	60	66.7	73.7	1	5	15.5	90	150	1	200
LC64	64	71.1	86.9	1	5	13.2	90	150	1	200
LC64A	64	71.1	78.6	1	5	14.6	90	150	1	200
LC70	70	77.8	95.1	1	5	12.0	90	150	1	200
LC70A	70	77.8	86.0	1	5	13.3	90	150	1	200
LC75	75	83.3	102.0	1	5	11.2	90	150	1	200
LC75A	75	83.3	92.1	1	5	12.4	90	150	1	200
LC80	80	88.7	108	1	5	10.6	90	150	1	200
LC80A	80	88.7	98.0	1	5	11.6	90	150	1	200
LC90	90	100	122	1	5	9.4	90	300	1	200
LC90A	90	100	111	1	5	10.3	90	300	1	200

**FIGURE 3
DERATING CURVE**



ABBREVIATIONS & SYMBOLS

- V_R** Rated Stand-Off Voltage: Maximum working (continuous) DC or peak voltage which may be applied over the standard operating temperature range. (Note: V_{WM} is a selected device parameter and should be equal to or greater than the maximum operating voltage of the line to be protected.)
- V_{BR} (min)** Minimum Breakdown Voltage: This is the minimum voltage the device will exhibit and is used to assure that conduction does not occur prior to that voltage at 25°C.
- V_C** Maximum Clamping Voltage: The maximum peak voltage that appears across the TVS when subjected to the peak pulse current in a 1 ms time interval. The peak pulse voltages are the combination of voltage rise due to both the series resistance and the thermal rise.
- I_{PP}** Peak Pulse Current - See Figure 2
- P_p** Peak Pulse Power - See Figure 1
- I_R** Standby-Current
- I_T** Test Current
- V_{WIB}** Working Inverse Blocking voltage for the Compensating diode
- V_{PIB}** Peak Inverse Blocking Voltage of the Compensating diode
- I_{IB}** Inverse Blocking Leakage Current of the Compensating diode
- Device Selection:** A TVS diode is normally selected according to the Rated Standoff voltage (V_{WM}) which should be equal to or greater than the DC or continuous peak operating voltage level.

Note 1 A TVS is normally selected according to its Rated Stand-Off Voltage (V_{WM}) which should be equal to or greater than the continuous peak operating voltage level.

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