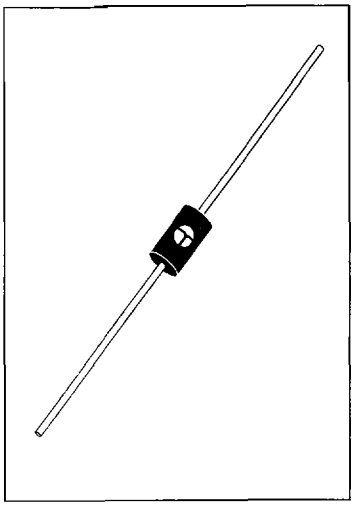
PRO TEK DEVICES®

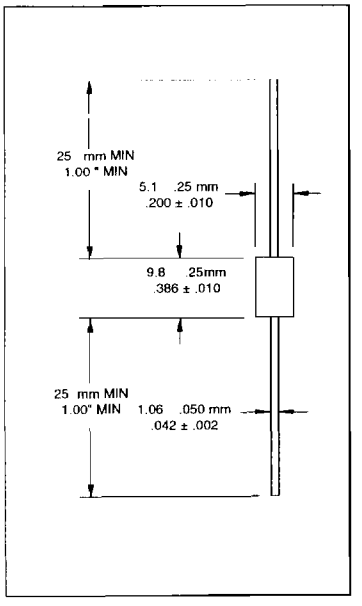
.....Engineered solutions for the transient environment

TVS
Transient Voltage Suppressors

1N6373 thru 1N6389

ICTE-5 thru ICTE-45C





DESCRIPTION

This specification sheet defines a premium series of Silicon Transient Voltage Suppressors specifically designed and tested to protect Bipolar, MOS and Schotky improved integrated circuits from electrical disturbances. Transients and noise pulses are generated by electromechanical switching, electromagnetic coupling, capacitive or inductive load switching, voltage reversals, and electrostatic discharge.

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 absorbtion, and low clamping factor.

Providing protection for the most popular IC voltage levels, these devices are available for either unidirectional or bidirectional applications. These units are hermetically sealed - capable of meeting the screening specifications of military requirements. 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 5.0 to 45 volts**
- **Transient protection for CMOS, MOS and BIPOLAR MICROPROCESSORS**
- **Low clamping factor**
- **Plastic 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
- Forward surge rating: half cycle 200 amps, 1/120 second at 25°C (Unipolar only)
- Steady State (Average) power dissipation: 5.0 watt at T_L of 75°C
- Repetition rate (duty cycle): .01%
- $t_{clamping}$ (0 volts to V_{BR} min): Less than 1 nano-second

MECHANICAL CHARACTERISTICS

- Molded Case
- Weight: 1.5 grams (approximate)
- Positive terminal marked with band
- Body marked with Logo and type number

ELECTRICAL CHARACTERISTICS

- Clamping Factor: 1.33 at full rated power
  1.20 at 50% rated power

Clamping Factor = The ratio of the actual V_C (Clamping Voltage) to the BV (Breakdown Voltage) as measured on a specific device.

FIGURE 1
PEAK PULSE POWER vs PULSE TIME

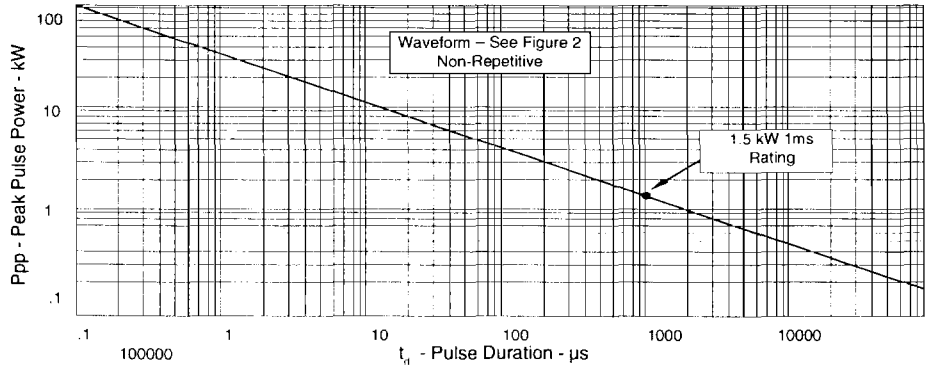
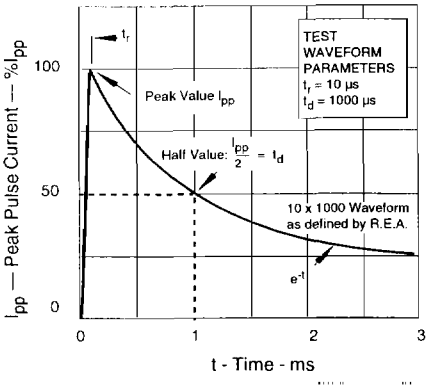


FIGURE 2
PULSE WAVE FORM



PROTEK DEVICES
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ELECTRICAL CHARACTERISTICS AT 25° C

PROTEK TYPE NUMBER	RATED STAND-OFF VOLTAGE (See Note 1) V_{WM} VOLTS	MINIMUM BREAKDOWN VOLTAGE @ I_T = 1 mA V_{BR} VOLTS	MAXIMUM STANDBY CURRENT @V_{WM} I_D µA	MAXIMUM CLAMPING VOLTAGE @I_{PP1} = 1A V_C VOLTS	MAXIMUM CLAMPING VOLTAGE @I_{PP2} = 10A V_C VOLTS	MAXIMUM PEAK PULSE CURRENT (See Fig. 2) I_{PP3} A
1N6373 ICTE-5*	5.0	6.0	300	7.1	7.5	160
1N6374 ICTE-8	8.0	9.4	25	11.3	11.5	100
1N6375 ICTE-10	10.0	11.7	2	13.7	14.1	90
1N6376 ICTE-12	12.0	14.1	2	16.1	16.5	70
1N6377 ICTE-15	15.0	17.6	2	20.1	20.6	60
1N6378 ICTE-18	18.0	21.2	2	24.2	25.2	50
1N6379 ICTE-22	22.0	25.9	2	29.8	32.0	40
1N6380 ICTE-36	36.0	42.4	2	50.6	54.3	23
1N6381 ICTE-45	45.0	52.9	2	63.3	70.0	19
Bidirectional Devices (Test in Both Polarities)						
1N6382 ICTE-8C	8.0	9.4	50	11.4	11.6	100
1N6383 ICTE-10C	10.0	11.7	2	14.1	14.5	90
1N6384 ICTE-12C	12.0	14.1	2	16.7	17.1	70
1N6385 ICTE-15C	15.0	17.6	2	20.8	21.4	60
1N6386 ICTE-18C	18.0	21.2	2	24.8	25.5	50
1N6387 ICTE-22C	22.0	25.9	2	30.8	32.0	40
1N6388 ICTE-36C	36.0	42.4	2	50.6	54.3	23
1N6389 ICTE-45C	45.0	52.9	2	63.3	70.0	19

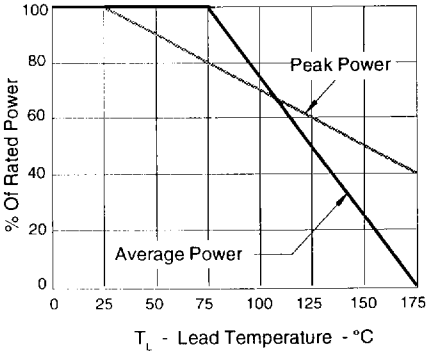
VF = 3.5V @ 100A, 8.3 ms sine wave (Unidirectional Devices Only)

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.

Note 2: C Suffix indicates Bidirectional device. * ICTE-5 not available as Bidirectional.

Note 3: The minimum breakdown voltage as shown takes into consideration the ± 1 volt tolerance normally specified for power supply regulation on most integrated circuit manufacturers data sheets. Similar TVS devices are availabe with reduced clamping voltages where tighter regulated power supply voltages are employed.

FIGURE 3
POWER DERATING CURVE



ABBREVIATIONS & SYMBOLS

V_{WM} 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} Minimum Breakdown Voltage: 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: 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_D Standby-Current

I_T Test Current

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