General Semiconductor Industries, Inc.

TRANSZORB®
TRANSIENT VOLTAGE SUPPRESSORS

1N6373 THRU 1N6389	ICTE-5 THRU ICTE-45C

FEATURES

- **1500 watts Peak Pulse Power dissipation**
- **Available in ranges from 5.0 to 45 volts**
- **Transient protection for CMOS, MOS and BIPOLAR MICROPROCESSORS**
- **Low clamping factor**
- **Each device 100% tested**

MAXIMUM RATINGS

- 1500 Watts of Peak Pulse Power dissipation at 25° C (see derating curve)
- $t_{clamping}$ (0 volts to BV min): Unipolar, Less than 1×10^{-12} second; Bidirectional, Less than 5×10^{-9} second
- Operating and Storage temperatures: −65° to +175° C
- Forward surge rating: half cycle 200amps, 1/120 second at 25° C
  (Applies to Unipolar or single direction only)
- Steady State power dissipation: 5.0W at T_L = 75° C, Lead Length = 3/8"
- Repetition rate (duty cycle): .05%

MECHANICAL CHARACTERISTICS

- Molded Case
- Weight: 1.5 grams (approximate)
- Positive terminal marked with band (except Bidirectional types)
- 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.

APPLICATION

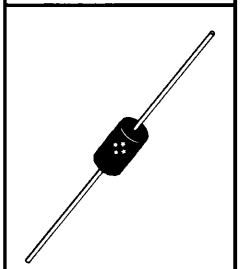
. . .a premium series of transient voltage suppressors specifically designed and tested to protect Bipolar, MOS and Schottky improved integrated circuits from electrical disturbances. Transients and noise pulses are generated by electromechanical switching, electromagnetic coupling, capacitive or inductive load switching, voltage reversals, and electrostatic discharge.

DESCRIPTION

The TransZorb is desired over a crowbar circuit, a 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.

Providing protection for the most popular IC voltage levels, these devices are available for either unidirectional or bidirectional applications. These devices are designed to dissipate 1500 watts of peak pulse power for 1 millisecond.

CASE 1



CASE OUTLINE

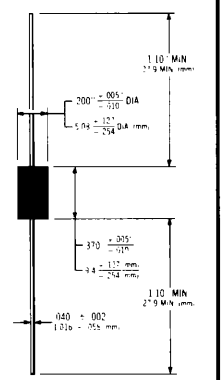


FIGURE 1—Peak Pulse Power vs Pulse Time

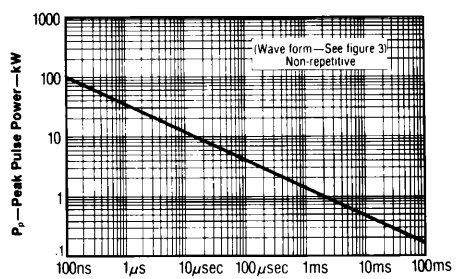
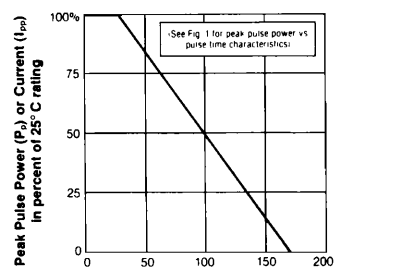


FIGURE 2—Derating Curve



TRANSZORB® UNIDIRECTIONAL & BIDIRECTIONAL

1N6373 THRU 1N6389 — ICTE-5 THRU ICTE-45C

ELECTRICAL CHARACTERISTICS @ 25°C (JEDEC Registered Data)

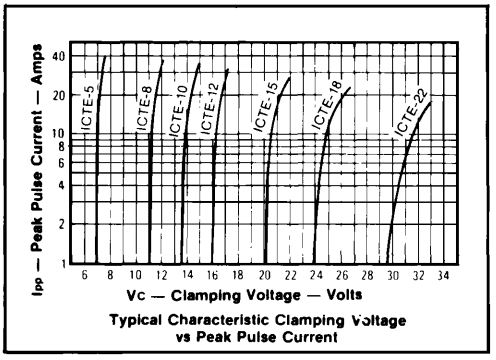
JEDEC TYPE NUMBER	GENERAL SEMICONDUCTOR PART NUMBER	REVERSE STAND-OFF VOLTAGE (NOTE 1) V_R VOLTS	MINIMUM** BREAKDOWN VOLTAGE @ 1mA BV(min) VOLTS	MAXIMUM REVERSE LEAKAGE @ V_R I_R µA	MAXIMUM CLAMPING VOLTAGE @ I_{PP} = 1A V_C VOLTS	MAXIMUM CLAMPING VOLTAGE @ I_{PP} = 10A V_C VOLTS	MAXIMUM PEAK PULSE CURRENT 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

V_f at 100 amps peak, 8.3 msec sine wave = 3.5 volts maximum.

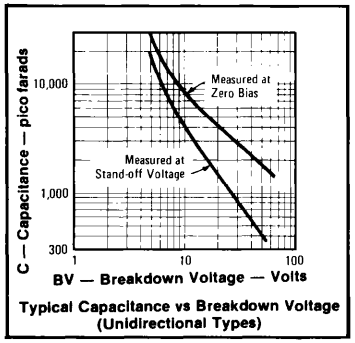
ELECTRICAL CHARACTERISTICS @ 25°C (Test Both Polarities)

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

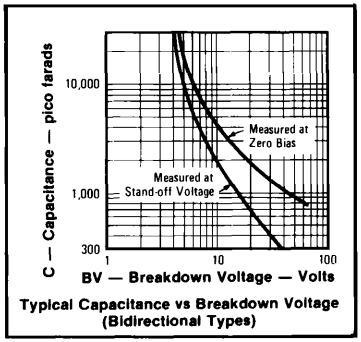
C Suffix indicates Bipolar
*ICTE-5 not available as Bipolar.
**The minimum breakdown voltage as shown takes into consideration the ± 1 volt tolerance normally specified for power supply regulation on most integrated circuit manufacturers data sheets. Similar TransZorb devices are available with reduced clamping voltages where tighter regulated power supply voltages are employed.



Typical Characteristic Clamping Voltage vs Peak Pulse Current

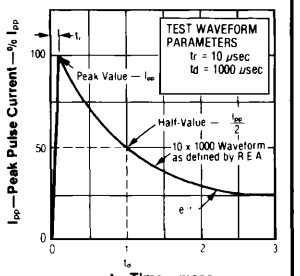


Typical Capacitance vs Breakdown Voltage (Unidirectional Types)



Typical Capacitance vs Breakdown Voltage (Bidirectional Types)

FIGURE 3—Pulse Waveform



NOTES

Note 1: A TransZorb is normally selected according to the reverse "Stand Off Voltage" (V_R) which should be equal to or greater than the DC or continuous peak operating voltage level

ABBREVIATIONS & SYMBOLS

- V_R Stand-Off Voltage: Applied Reverse Voltage to assure a nonconductive condition. (See Note 1)
- BV(min) This is the minimum Breakdown Voltage the device will exhibit and is used to assure that conduction does not occur prior to this voltage level at 25°C.
- V_C(max) Maximum Clamping Voltage. The maximum peak voltage appearing across the TransZorb when subjected to the peak pulse current in a one millisecond time interval. The peak pulse voltages are the combination of voltage rise due to both the series resistance and thermal rise
- I_{PP} Peak Pulse Current — See Figure 3
- P_P Peak Pulse Power
- I_R Reverse Leakage