General Semiconductor Industries, Inc.

TRANSZORB®
TRANSIENT VOLTAGE SUPPRESSORS

1N6356 THRU 1N6372	ICT-5 THRU ICT-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**
- **Hermetically sealed package**
- **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: 1.0 watt
- Repetition rate (duty cycle): .01%

MECHANICAL CHARACTERISTICS

- Standard DO-13 package, glass and metal hermetically sealed
- 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

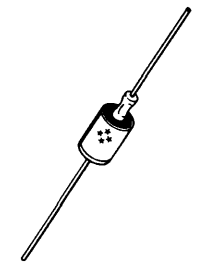
. . .a premium series of transient voltage suppressors specifically designed and tested to protect Bipolar, MOS and Schottky improved integrated circuits from electrical disturbances. Transients and noise pulses are generated by electromechanical switching, electro magnetic coupling, capacitive or inductive 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 units are hermetically sealed — capable of meeting the screening specifications of military requirements.

CASE DO-13



CASE OUTLINE

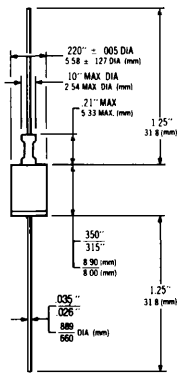


FIGURE 1—Peak Pulse Power vs Pulse Time

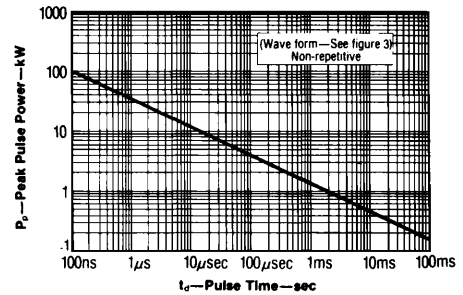
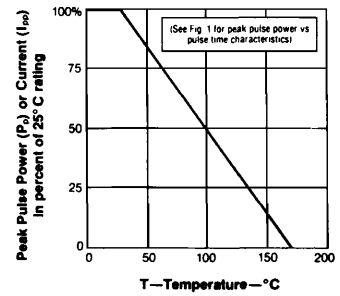


FIGURE 2—Derating Curve



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 uA	MAXIMUM CLAMPING VOLTAGE @I_{PP1} = 1A V_C VOLTS	MAXIMUM CLAMPING VOLTAGE @I_{PP2} = 10A V_C VOLTS	MAXIMUM PEAK PULSE CURRENT I_{PP3} A
1N6356	ICT-5*	5.0	6.0	300	7.1	7.5	160
1N6357	ICT-8	8.0	9.4	25	11.3	11.5	100
1N6358	ICT-10	10.0	11.7	2	13.7	14.1	90
1N6359	ICT-12	12.0	14.1	2	16.1	16.5	70
1N6360	ICT-15	15.0	17.6	2	20.1	20.6	60
1N6361	ICT-18	18.0	21.2	2	24.2	25.2	50
1N6362	ICT-22	22.0	25.9	2	29.8	32.0	40
1N6363	ICT-36	36.0	42.4	2	50.6	54.3	23
1N6364	ICT-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.

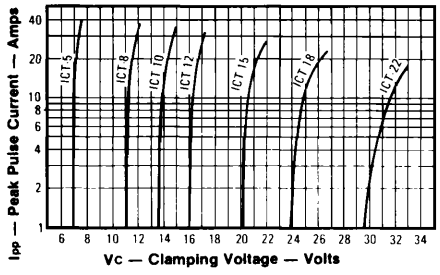
ELECTRICAL CHARACTERISTICS @ 25°C (Test Both Polarities)

1N6365	ICT-8C	8.0	9.4	50	11.4	11.6	100
1N6366	ICT-10C	10.0	11.7	2	14.1	14.5	90
1N6367	ICT-12C	12.0	14.1	2	16.7	17.1	70
1N6368	ICT-15C	15.0	17.6	2	20.8	21.4	60
1N6369	ICT-18C	18.0	21.2	2	24.8	25.5	50
1N6370	ICT-22C	22.0	25.9	2	30.8	32.0	40
1N6371	ICT-36C	36.0	42.4	2	50.6	54.3	23
1N6372	ICT-45C	45.0	52.9	2	63.3	70.0	19

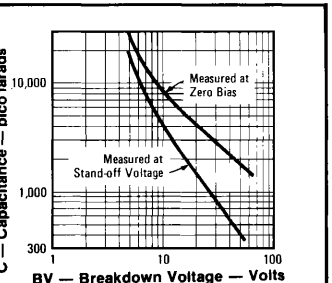
C Suffix indicates Bipolar

*ICT-5 not available as Bipolar.

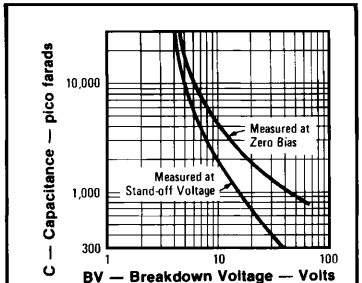
**The minimum breakdown voltage as shown takes into consideration the ± 1 volt tolerance normally specified for power supply regulation on most integrated circuit manufacturers data sheets. Similar TransZorb devices are available with reduced clamping voltages where tighter regulated power supply voltages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



Typical Characteristic Clamping Voltage vs Peak Pulse Current



Typical Capacitance vs Breakdown Voltage (Unidirectional Types)

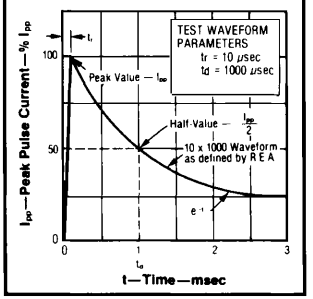


Typical Capacitance vs Breakdown Voltage (Bidirectional Types)

TRANSZORB* UNIDIRECTIONAL & BIDIRECTIONAL

1N6356 THRU 1N6372 — ICT-5 THRU ICT-45C

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_D Peak Pulse Power

I_R Reverse Leakage