General Semiconductor Industries, Inc.

SQUARE D COMPANY

TRANSZORB® TRANSIENT VOLTAGE SUPPRESSORS

ICT-5 THRU ICT-45C

T-11-23

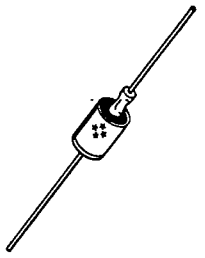
FEATURES

- **1500 watts Peak Pulse Power dissipation**
- **Available in ranges from 5.0 to 45 volts**
- **Transient protection for CMOS, MOS, Bidirectional ICs (TTL, ECL, DTL, RTL and Linear Functions)**
- **Low clamping factor**
- **Hermetically sealed package**
- **Each device 100% tested**

APPLICATION

...a premium series of transient voltage suppressors specifically designed and tested to protect bidirectional, 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.

CASE DO-13



MAXIMUM RATINGS

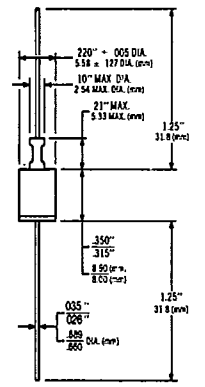
- 1500 Watts of Peak Pulse Power dissipation at 25° C (see derating curve)
- $t_{clamping}$ (0 volts to BV min): Unidirectional, less than 1×10^{-12} sec; Bidirectional, less than 5×10^{-9} second
- Operating and Storage temperatures: -65° to +175° C
- Forward surge rating: half cycle 200amps, 1/120 second at 25° C (Applies to Unipolar or single direction only)
- Steady State power dissipation: 1.0 watt
- Repetition rate (duty cycle): .01%

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 the military requirements.

CASE OUTLINE



MECHANICAL CHARACTERISTICS

- Standard DO-13 package, glass and metal hermetically sealed
- Weight: 1.5 grams (approximate)
- Positive terminal marked with band (except Bidirectional types)
- Unidirectional—std polarity—cathode to case
- 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

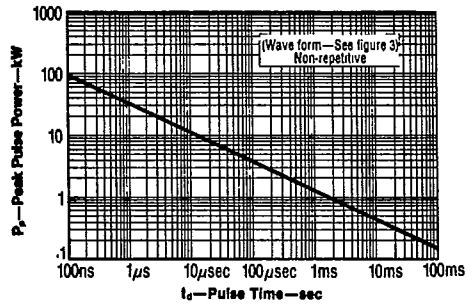
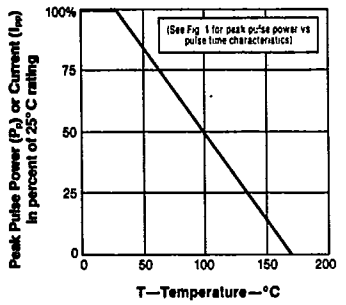


FIGURE 2—Derating Curve



TRANSZORB® UNIDIRECTIONAL & BIDIRECTIONAL ICT-5 THRU ICT-45C

T-11-23

TRANSZORB® VOLTAGE SUPPRESSORS

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ELECTRICAL CHARACTERISTICS @ 25 C

GENERAL SEMICONDUCTOR PART NUMBER	REVERSE STAND-OFF VOLTAGE (NOTE 1) V_R VOLTS	MAXIMUM REVERSE LEAKAGE @V_R I_R uA	MINIMUM* BREAKDOWN VOLTAGE @ 1mA BV(min) VOLTS	MAXIMUM CLAMPING VOLTAGE @I_{PP1} = 1A (FIG. 3) V_{C1} VOLTS	MAXIMUM CLAMPING VOLTAGE @I_{PP2} = 10A (FIG. 3) V_{C2} VOLTS	MAXIMUM PEAK PULSE CURRENT I_{PP2} A.
ICT-5	5.0	300	6.0	7.1	7.5	160
ICT-8	8.0	25	9.4	11.3	11.5	100
ICT-10	10.0	2	11.7	13.7	14.1	90
ICT-12	12.0	2	14.1	16.1	16.5	70
ICT-15	15.0	2	17.6	20.1	20.6	60
ICT-18	18.0	2	21.2	24.2	25.2	50
ICT-22	22.0	2	25.9	29.8	32.0	40
ICT-36	36.0	2	42.4	50.6	54.3	23
ICT-45	45.0	2	52.9	63.3	70.0	19

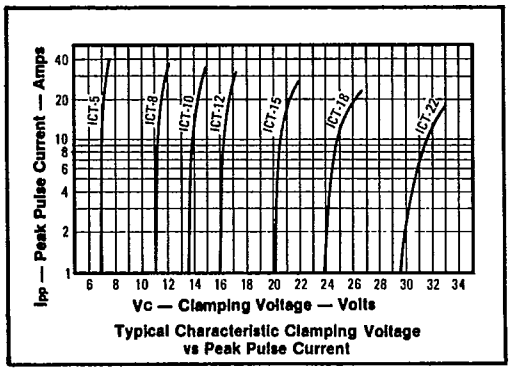
V_f at 100 amps peak, 8.3 msec sine wave = 3.5 volts maximum.

ELECTRICAL CHARACTERISTICS @ 25°C (Test Both Polarities)

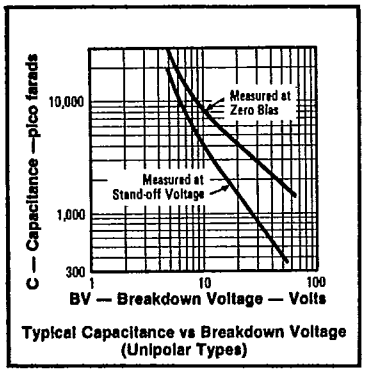
ICT-8C	8.0	50	9.4	11.4	11.6	100
ICT-10C	10.0	2	11.7	14.1	14.5	90
ICT-12C	12.0	2	14.1	16.7	17.1	70
ICT-15C	15.0	2	17.6	20.8	21.4	60
ICT-18C	18.0	2	21.2	24.8	25.5	50
ICT-22C	22.0	2	25.9	30.8	32.0	40
ICT-36C	36.0	2	42.4	50.6	54.3	23
ICT-45C	45.0	2	52.9	63.3	70.0	19

C Suffix indicates Bidirectional
ICT-5 not available as Bidirectional

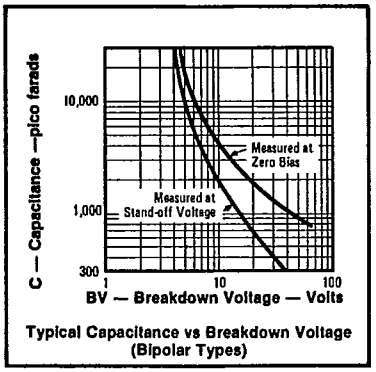
*The minimum breakdown voltage as shown takes into consideration the ±1 volt tolerance normally specified for power supply regulation on most integrated circuit manufacturers data sheets. Similar TransZorb devices are available with reduced clamping voltages where tighter regulated power supply voltages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



Typical Characteristic Clamping Voltage vs Peak Pulse Current

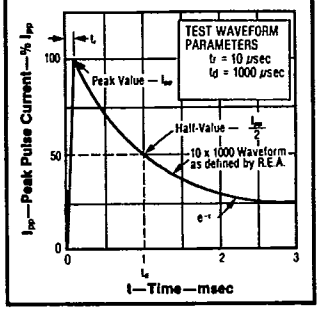


Typical Capacitance vs Breakdown Voltage (Unipolar Types)



Typical Capacitance vs Breakdown Voltage (Bipolar 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