General Semiconductor Industries, Inc.

TRANSZORB®
TRANSIENT VOLTAGE SUPPRESSORS
LOW CAPACITANCE
LC6.5 THRU LC90A

FEATURES

- **1500 watts Peak Pulse Power dissipation**
- **Available in ranges from 6.5 to 90**
- **Low capacitance ac signal protection**
- **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): Less than 5×10^{-9} second (theoretical)
- Operating and Storage temperatures: -65° to +175° C
- 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)
- Polarity band on cathode end of the TransZorb (positive potential applied)
- Body marked with Logo and type number

ELECTRICAL CHARACTERISTICS

Clamping Factor: 1.40 at full rated power
1.30 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

Note: When pulse testing, test in TransZorb Avalanche direction. DO NOT pulse in forward direction.

APPLICATION

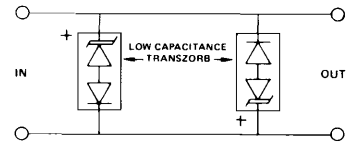
This specification sheet defines a series of low-capacitance silicon transient suppressors for the protection of ac signal line. This series employs a standard TransZorb* in series with a rectifier with the same transient capabilities as the TransZorb. The rectifier is also used to reduce the effective capacitance up thru 100MHz with a minimum amount of signal loss or deformation. The low-capacitance TransZorb may be applied directly across the signal line to prevent induced transients from lightning, power interruptions, or static discharge.

DESCRIPTION

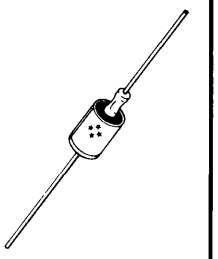
This series of device types is manufactured in a hermetic seal, DO-13 package. They are capable of being screened to the military specification.

If bipolar transient capability is required, two low-capacitance TransZorbs must be used in parallel, opposite in polarity for complete ac protection. For additional reduction in capacitance, these units can be used in conjunction with a bridge network. This will allow a lower capacitance with no change in peak pulse power capability of 1500 watts.

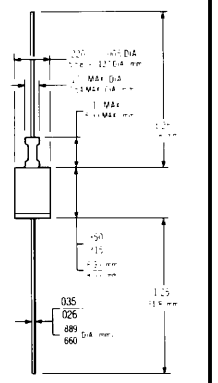
APPLICATION NOTE: Devices must be used with two units in parallel, opposite in polarity as shown in circuit for AC Signal Line protection



CASE DO-13



CASE OUTLINE



SCHEMATIC

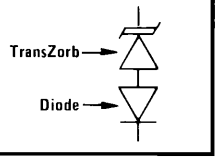


FIGURE 1—Peak Pulse Power vs Pulse Time

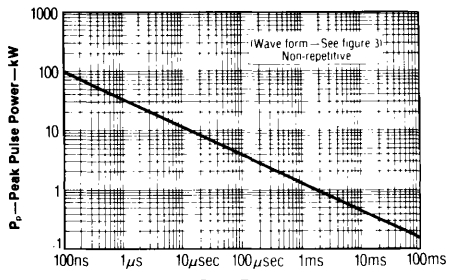
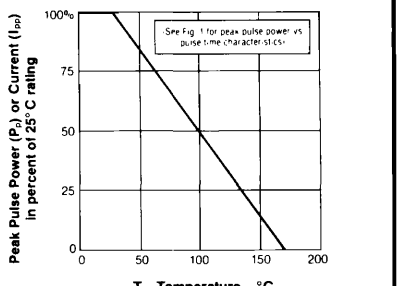


FIGURE 2—Derating Curve

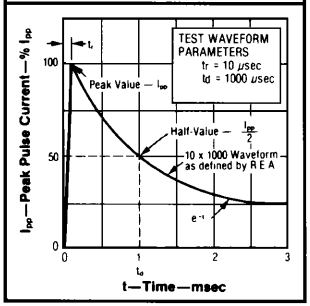


TRANSZORB®
UNIDIRECTIONAL
LOW CAPACITANCE
LC6.5 THRU LC90A

ELECTRICAL CHARACTERISTICS @ 25 C

GENERAL SEMI. PART NUMBER	REVERSE STAND-OFF VOLTAGE (NOTE 1) V_R VOLTS	BREAKDOWN VOLTAGE BV VOLTS Min.	Max.	@ I_T mA	MAXIMUM REVERSE LEAKAGE @ V_R I_R µA	MAXIMUM CLAMPING VOLTAGE @ I_{pp} V_C VOLTS	MAX. PEAK PULSE CURRENT (FIG.3) I_{pp} AMPS	CAPACITANCE @ 0 VOLTS pF	WORKING INVERSE BLOCKING VOLTAGE V_{WIB} VOLTS	INVERSE BLOCKING LEAKAGE CURRENT @ Vwib Iib mA (Max)	PEAK INVERSE BLOCKING VOLTAGE V_{PIB} VOLTS
LC6.5	6.5	7.22	8.82	10	1000	12.3	100	100	75	1	100
LC6.5A	6.5	7.22	7.98	10	1000	11.2	100	100	75	1	100
LC7.0	7.0	7.78	9.51	10	500	13.3	100	100	75	1	100
LC7.0A	7.0	7.78	8.60	10	500	12.0	100	100	75	1	100
LC7.5	7.5	8.33	10.2	10	250	14.3	100	100	75	1	100
LC7.5A	7.5	8.33	9.21	10	250	12.9	100	100	75	1	100
LC8.0	8.0	8.89	10.9	1	100	15.0	100	100	75	1	100
LC8.0A	8.0	8.89	9.83	1	100	13.6	100	100	75	1	100
LC8.5	8.5	9.44	11.5	1	50	15.9	94	100	75	1	100
LC8.5A	8.5	9.44	10.4	1	50	14.4	100	100	75	1	100
LC9.0	9.0	10.0	12.2	1	10	16.9	89	100	75	1	100
LC9.0A	9.0	10.0	11.1	1	10	15.4	97	100	75	1	100
LC10	10	11.1	13.6	1	5	18.8	80	100	75	1	100
LC10A	10	11.1	12.3	1	5	17.0	88	100	75	1	100
LC11	11	12.2	14.9	1	5	20.1	74	100	75	1	100
LC11A	11	12.2	13.5	1	5	18.2	82	100	75	1	100
LC12	12	13.3	16.3	1	5	22.0	68	100	75	1	100
LC12A	12	13.3	14.7	1	5	19.9	75	100	75	1	100
LC13	13	14.4	17.6	1	5	23.8	63	100	75	1	100
LC13A	13	14.4	15.9	1	5	21.5	70	100	75	1	100
LC14	14	15.6	19.1	1	5	25.8	58	100	75	1	100
LC14A	14	15.6	17.2	1	5	23.2	65	100	75	1	100
LC15	15	16.7	20.4	1	5	26.9	56	100	75	1	100
LC15A	15	16.7	18.5	1	5	24.4	61	100	75	1	100
LC16	16	17.8	21.8	1	5	28.8	52	100	75	1	100
LC16A	16	17.8	19.7	1	5	26.0	57	100	75	1	100
LC17	17	18.9	23.1	1	5	30.5	49	100	75	1	100
LC17A	17	18.9	20.9	1	5	27.6	54	100	75	1	100
LC18	18	20.0	24.4	1	5	32.2	46	100	75	1	100
LC18A	18	20.0	22.1	1	5	29.2	51	100	75	1	100
LC20	20	22.2	27.1	1	5	35.8	42	100	75	1	100
LC20A	20	22.2	24.5	1	5	32.4	46	100	75	1	100
LC22	22	24.4	29.8	1	5	39.4	38	100	75	1	100
LC22A	22	24.4	26.9	1	5	35.5	42	100	75	1	100
LC24	24	26.7	32.6	1	5	43.0	35	100	75	1	100
LC24A	24	26.7	29.5	1	5	38.9	39	100	75	1	100
LC26	26	28.9	35.3	1	5	46.6	32	100	75	1	100
LC26A	26	28.9	31.9	1	5	42.1	36	100	75	1	100
LC28	28	31.1	38.0	1	5	50.1	30	100	75	1	100
LC28A	28	31.1	34.4	1	5	45.5	33	100	75	1	100
LC30	30	33.3	40.7	1	5	53.5	28	100	75	1	100
LC30A	30	33.3	36.8	1	5	48.4	31	100	75	1	100
LC33	33	36.7	44.9	1	5	59.0	25.4	100	75	1	100
LC33A	33	36.7	40.6	1	5	53.3	28.1	100	75	1	100
LC36	36	40.0	48.9	1	5	64.3	23.3	100	75	1	100
LC36A	36	40.0	44.2	1	5	58.1	25.8	100	75	1	100
LC40	40	44.4	54.3	1	5	71.4	21.0	100	75	1	100
LC40A	40	44.4	49.1	1	5	64.5	23.3	100	75	1	100
LC43	43	47.8	58.4	1	5	76.7	19.5	100	150	1	200
LC43A	43	47.8	52.8	1	5	69.4	21.6	100	150	1	200
LC45	45	50.0	61.1	1	5	80.3	18.7	100	150	1	200
LC45A	45	50.0	55.3	1	5	72.7	20.6	100	150	1	200
LC48	48	53.3	65.1	1	5	85.5	17.5	100	150	1	200
LC48A	48	53.3	58.9	1	5	77.4	19.4	100	150	1	200
LC51	51	56.7	69.3	1	5	91.1	16.5	100	150	1	200
LC51A	51	56.7	62.7	1	5	82.4	18.2	100	150	1	200
LC54	54	60.0	73.3	1	5	96.3	15.6	100	150	1	200
LC54A	54	60.0	66.3	1	5	87.1	17.2	100	150	1	200
LC58	58	64.4	78.7	1	5	103.0	14.6	100	150	1	200
LC58A	58	64.4	71.2	1	5	93.6	16.0	100	150	1	200
LC60	60	66.7	81.5	1	5	107.0	14.0	90	150	1	200
LC60A	60	66.7	73.7	1	5	96.8	15.5	90	150	1	200
LC64	64	71.1	86.9	1	5	114.0	13.2	90	150	1	200
LC64A	64	71.1	78.6	1	5	103.0	14.6	90	150	1	200
LC70	70	77.8	95.1	1	5	125	12.0	90	150	1	200
LC70A	70	77.8	86.0	1	5	113	13.3	90	150	1	200
LC75	75	83.3	102.0	1	5	134	11.2	90	150	1	200
LC75A	75	83.3	92.1	1	5	121	12.4	90	150	1	200
LC80	80	88.7	108	1	5	142	10.6	90	150	1	200
LC80A	80	88.7	98.0	1	5	129	11.6	90	150	1	200
LC90	90	100	122	1	5	160	9.4	90	300	1	200
LC90A	90	100	111	1	5	146	10.3	90	300	1	200

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