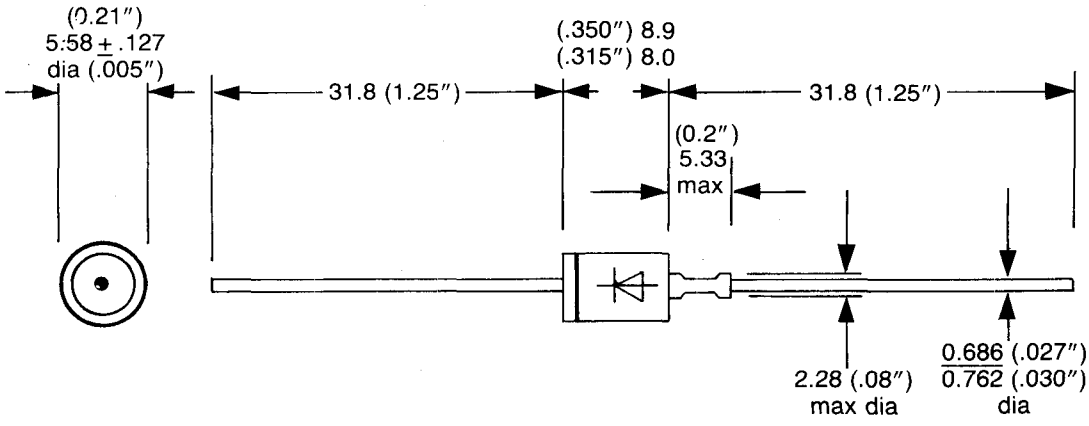
# 1.5KW Transient Absorption Zener Diode

**A range of unipolar Protection diodes in a hermetically sealed metal and glass DO13 package.**

| | |
|---|---|
| $P_{surge}$ | 1.5KW; 1mS expo |
| $P_{max\ cont}$ | 1W |
| $V_Z$ | 6.8-200V |
| $t_{on}$ | $\leqslant 10^{-12}$S |
| $T_{op\ \&\ stg}$ | −65 to +175°C |




Case Outline dim in mm DO13

# L13 Series

**Electrical Characteristics at 25°C**

| JEDEC Type No. | SEMITRON Type No. | Breakdown Voltage $V_{BR}$ Volts | | | Breakdown Current $I_t$ mA | Reverse stand-off voltage $V_R$ Volts | Max reverse leakage @ $V_R$ $I_R$µA | Max clamping voltage $V_{CL}$ Volts | Max peak pulse current Izsm | Temp coef %/°C | Typical capacitance at 0 Volts f= 1MHZ pF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Nominal | ±5% Voltage Tol | | | | | | | | |
| **IN5629A** | L13B6v8 | 6.8 | 6.45 | 7.14 | 10 | 5.80 | 1000 | 10.5 | 143 | +.057 | 22000 |
| **IN5630A** | L13B7v5 | 7.5 | 7.13 | 7.88 | 10 | 6.40 | 500 | 11.3 | 132 | +.061 | 19200 |
| **IN5631A** | L13B8v2 | 8.2 | 7.79 | 8.61 | 10 | 7.02 | 200 | 12.1 | 124 | +.065 | 17400 |
| **IN5632A** | L13B9v1 | 9.1 | 8.65 | 9.55 | 1 | 7.78 | 50 | 13.4 | 112 | +.068 | 14800 |
| **IN5633A** | L13B10 | 10 | 9.5 | 10.5 | 1 | 8.55 | 10 | 14.5 | 103 | +.073 | 13000 |
| **IN5634A** | L13B11 | 11 | 10.5 | 11.6 | 1 | 9.40 | 5 | 15.6 | 96.0 | +.075 | 11400 |
| **IN5635A** | L13B12 | 12 | 11.4 | 12.6 | 1 | 10.2 | 5 | 16.7 | 90.0 | +.078 | 10200 |
| **IN5636A** | L13B13 | 13 | 12.4 | 13.7 | 1 | 11.1 | 5 | 18.2 | 82.0 | +.081 | 8800 |
| **IN5637A** | L13B15 | 15 | 14.3 | 15.8 | 1 | 12.8 | 5 | 21.2 | 71.0 | +.084 | 7800 |
| **IN5638A** | L13B16 | 16 | 15.2 | 16.8 | 1 | 13.6 | 5 | 22.5 | 67.0 | +.086 | 7000 |
| **IN5639A** | L13B18 | 18 | 17.1 | 18.9 | 1 | 15.3 | 5 | 25.2 | 59.5 | +.088 | 6200 |
| **IN5640A** | L13B20 | 20 | 19.0 | 21.0 | 1 | 17.1 | 5 | 27.7 | 54.0 | +.090 | 5700 |
| **IN5641A** | L13B22 | 22 | 20.9 | 23.1 | 1 | 18.8 | 5 | 30.6 | 49.0 | +.092 | 5100 |
| **IN5642A** | L13B24 | 24 | 22.8 | 25.2 | 1 | 20.5 | 5 | 33.2 | 45.0 | +.094 | 4600 |
| **IN5643A** | L13B27 | 27 | 25.7 | 28.4 | 1 | 23.1 | 5 | 37.5 | 40.0 | +.096 | 4200 |
| **IN5644A** | L13B30 | 30 | 28.5 | 31.5 | 1 | 25.6 | 5 | 41.4 | 36.0 | +.097 | 3700 |
| **IN5645A** | L13B33 | 33 | 31.4 | 34.7 | 1 | 28.2 | 5 | 45.7 | 33.0 | +.098 | 3250 |
| **IN5646A** | L13B36 | 36 | 34.2 | 37.8 | 1 | 30.8 | 5 | 49.9 | 30.0 | +.099 | 2900 |
| **IN5647A** | L13B39 | 39 | 37.1 | 41.0 | 1 | 33.3 | 5 | 53.9 | 28.0 | +.100 | 2700 |
| **IN5648A** | L13B43 | 43 | 40.9 | 45.2 | 1 | 36.8 | 5 | 59.3 | 25.3 | +.101 | 2400 |
| **IN5649A** | L13B47 | 47 | 44.7 | 49.4 | 1 | 40.2 | 5 | 64.8 | 23.2 | +.101 | 2200 |
| **IN5650A** | L13B51 | 51 | 48.5 | 53.6 | 1 | 43.6 | 5 | 70.1 | 21.4 | +.102 | 2000 |
| **IN5651A** | L13B56 | 56 | 53.2 | 58.8 | 1 | 47.8 | 5 | 77.0 | 19.5 | +.103 | 1850 |
| **IN5652A** | L13B62 | 62 | 58.9 | 65.1 | 1 | 53.0 | 5 | 85.0 | 19.5 | +.104 | 1650 |
| **IN5653A** | L13B68 | 68 | 64.6 | 71.4 | 1 | 58.1 | 5 | 92.0 | 16.3 | +.104 | 1500 |
| **IN5654A** | L13B75 | 75 | 71.3 | 78.8 | 1 | 64.1 | 5 | 103 | 14.6 | +.105 | 1350 |
| **IN5655A** | L13B82 | 82 | 77.9 | 86.1 | 1 | 70.1 | 5 | 113 | 13.3 | +.105 | 1250 |
| **IN5656A** | L13B91 | 91 | 86.5 | 95.5 | 1 | 77.8 | 5 | 125 | 12.0 | +.106 | 1100 |
| **IN5657A** | L13B100 | 100 | 95.0 | 105 | 1 | 85.5 | 5 | 137 | 11.0 | +.106 | 1000 |
| **IN5658A** | L13B110 | 110 | 105 | 116 | 1 | 94.0 | 5 | 152 | 9.9 | +.107 | 920 |
| **IN5659A** | L13B120 | 120 | 114 | 126 | 1 | 102 | 5 | 165 | 9.1 | +.107 | 840 |
| **IN5660A** | L13B130 | 130 | 124 | 137 | 1 | 111 | 5 | 179 | 8.4 | +.107 | 780 |
| **IN5661A** | L13B150 | 150 | 143 | 158 | 1 | 128 | 5 | 207 | 7.2 | +.108 | 660 |
| **IN5662A** | L13B160 | 160 | 152 | 168 | 1 | 136 | 5 | 219 | 6.8 | +.108 | 620 |
| **IN5663A** | L13B170 | 170 | 162 | 179 | 1 | 145 | 5 | 234 | 6.4 | +.108 | 600 |
| **IN5664A** | L13B180 | 180 | 171 | 189 | 1 | 154 | 5 | 246 | 6.1 | +.108 | 560 |
| **IN5665A** | L13B200 | 200 | 190 | 210 | 1 | 171 | 5 | 274 | 5.5 | +.108 | 500 |

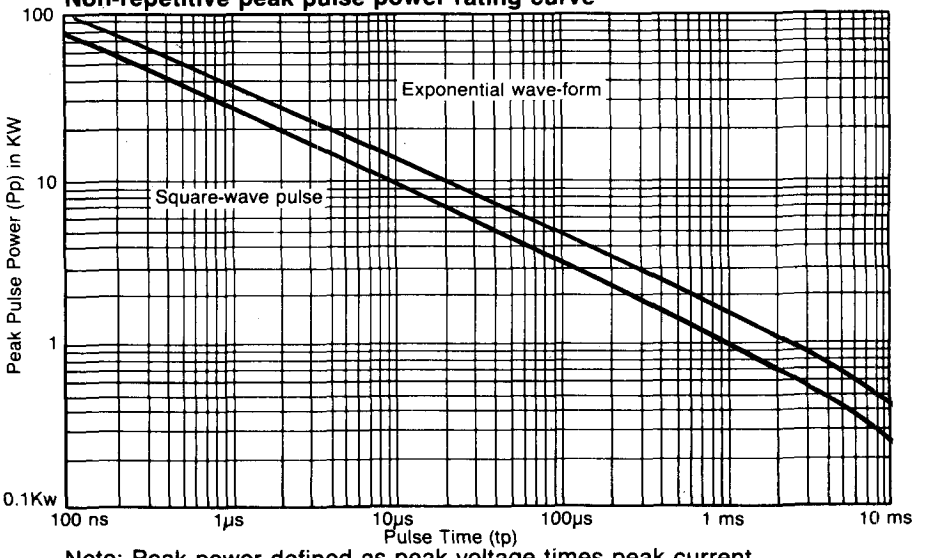
# Transient Absorption Zener Diode

# L13 Series

**Electrical Characteristics at 25°C**

| JEDEC Type No. | SEMITRON Type No. | Breakdown Voltage $V_{BR}$ Volts | | | Break-down Current $I_t$ mA | Reverse stand-off voltage $V_R$ Volts | Max reverse leakage @ $V_R$ IRμA | Max clamping voltage $V_{CL}$ Volts | Max peak pulse current $I_{ZSM}$ | Temp coef %/°C | Typical capacitance at 0 Volts f= 1MHZ pF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Nominal | ±10% Voltage Tol | | | | | | | | |
| **IN5629** | L13C6v8 | 6.8 | 6.12 | 7.48 | 10 | 5.50 | 1000 | 10.8 | 139 | +.057 | 22000 |
| **IN5630** | L13C7v5 | 7.5 | 6.75 | 8.25 | 10 | 6.05 | 500 | 11.7 | 128 | +.061 | 19200 |
| **IN5631** | L13C8v2 | 8.2 | 7.38 | 9.02 | 10 | 6.63 | 200 | 12.5 | 120 | +.065 | 17400 |
| **IN5632** | L13C9v1 | 9.1 | 8.19 | 10.00 | 1 | 7.37 | 50 | 13.8 | 109 | +.068 | 14800 |
| **IN5633** | L13C10 | 10 | 9.00 | 11.0 | 1 | 8.10 | 10 | 15.0 | 100 | +.073 | 13000 |
| **IN5634** | L13C11 | 11 | 9.90 | 12.1 | 1 | 8.92 | 5 | 16.2 | 93 | +.075 | 11400 |
| **IN5635** | L13C12 | 12 | 10.8 | 13.2 | 1 | 9.72 | 5 | 17.3 | 87 | +.078 | 10200 |
| **IN5636** | L13C13 | 13 | 11.7 | 14,3 | 1 | 10.5 | 5 | 19.0 | 79 | +.081 | 8800 |
| **IN5637** | L13C15 | 15 | 13.5 | 16.5 | 1 | 12.1 | 5 | 22.0 | 68 | +.084 | 7800 |
| **IN5638** | L13C16 | 16 | 14.4 | 17.6 | 1 | 12.9 | 5 | 23.5 | 64 | +.086 | 7000 |
| **IN5639** | L13C18 | 18 | 16.2 | 19.8 | 1 | 14.5 | 5 | 26.5 | 56.5 | +.088 | 6200 |
| **IN5640** | L13C20 | 20 | 18.0 | 22.0 | 1 | 16.2 | 5 | 29.1 | 51.5 | +.090 | 5700 |
| **IN5641** | L13C22 | 22 | 19.8 | 24.2 | 1 | 17.8 | 5 | 31.9 | 47 | +.092 | 5100 |
| **IN5642** | L13C24 | 24 | 21.6 | 26.4 | 1 | 19.4 | 5 | 34.7 | 43 | +.094 | 4600 |
| **IN5643** | L13C27 | 27 | 24.3 | 29.7 | 1 | 21.8 | 5 | 39.1 | 38.5 | +.096 | 4200 |
| **IN5644** | L13C30 | 30 | 27.0 | 33.0 | 1 | 24.3 | 5 | 43.5 | 34.5 | +.097 | 3700 |
| **IN5645** | L13C33 | 33 | 29.7 | 36.3 | 1 | 26.8 | 5 | 47.7 | 31.5 | +.098 | 3250 |
| **IN5646** | L13C36 | 36 | 32.4 | 39.6 | 1 | 29.1 | 5 | 52.0 | 29 | +.099 | 2900 |
| **IN5647** | L13C39 | 39 | 35.1 | 42.9 | 1 | 31.6 | 5 | 56.4 | 26.5 | +.100 | 2700 |
| **IN5648** | L13C43 | 43 | 38.7 | 47.3 | 1 | 34.8 | 5 | 61.9 | 24 | +.101 | 2400 |
| **IN5649** | L13C47 | 47 | 42.3 | 51.7 | 1 | 38.1 | 5 | 67.8 | 22.2 | +.101 | 2200 |
| **IN5650** | L13C51 | 51 | 45.9 | 56.1 | 1 | 41.3 | 5 | 73.5 | 20.4 | +.102 | 2000 |
| **IN5651** | L13C56 | 56 | 50.4 | 61.6 | 1 | 45.4 | 5 | 80.5 | 18.6 | +.103 | 1850 |
| **IN5652** | L13C62 | 62 | 55.8 | 68.2 | 1 | 50.2 | 5 | 89.0 | 16.9 | +.104 | 1650 |
| **IN5653** | L13C68 | 68 | 61.2 | 74.8 | 1 | 55.1 | 5 | 98.0 | 15.3 | +.104 | 1500 |
| **IN5654** | L13C75 | 75 | 67.5 | 82.5 | 1 | 60.7 | 5 | 108 | 13.9 | +.105 | 1350 |
| **IN5655** | L13C82 | 82 | 73.8 | 90.2 | 1 | 66.4 | 5 | 118 | 12.7 | +.105 | 1250 |
| **IN5656** | L13C91 | 91 | 81.9 | 100 | 1 | 73.7 | 5 | 131 | 11.4 | +.106 | 1100 |
| **IN5657** | L13C100 | 100 | 90.0 | 110 | 1 | 81.0 | 5 | 144 | 10.4 | +.106 | 1000 |
| **IN5658** | L13C110 | 110 | 99.0 | 121 | 1 | 89.2 | 5 | 158 | 9.5 | +.107 | 920 |
| **IN5659** | L13C120 | 120 | 108 | 132 | 1 | 97.2 | 5 | 173 | 8.7 | +.107 | 840 |
| **IN5660** | L13C130 | 130 | 117 | 143 | 1 | 105 | 5 | 187 | 8.0 | +.107 | 780 |
| **IN5661** | L13C150 | 150 | 135 | 165 | 1 | 121 | 5 | 215 | 7.0 | +.108 | 660 |
| **IN5662** | L13C160 | 160 | 144 | 176 | 1 | 130 | 5 | 230 | 6.5 | +.108 | 620 |
| **IN5663** | L13C170 | 170 | 153 | 187 | 1 | 138 | 5 | 244 | 6.2 | +.108 | 600 |
| **IN5664** | L13C180 | 180 | 162 | 198 | 1 | 146 | 5 | 258 | 5.8 | +.108 | 560 |
| **IN5665** | L13C200 | 200 | 180 | 220 | 1 | 162 | 5 | 287 | 5.2 | +.108 | 500 |

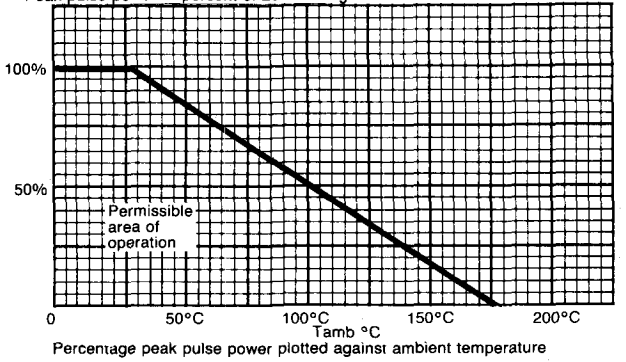
## Non-repetitive peak pulse power rating curve




Note: Peak power defined as peak voltage times peak current

## Peak Power derating curve

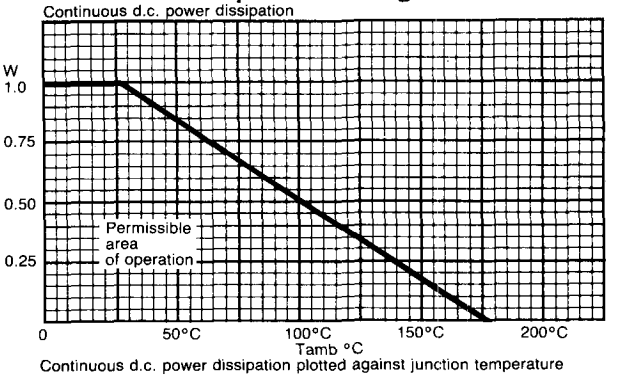
Peak pulse power in percent of 25°C rating




Percentage peak pulse power plotted against ambient temperature

## Continuous d.c. power derating curve

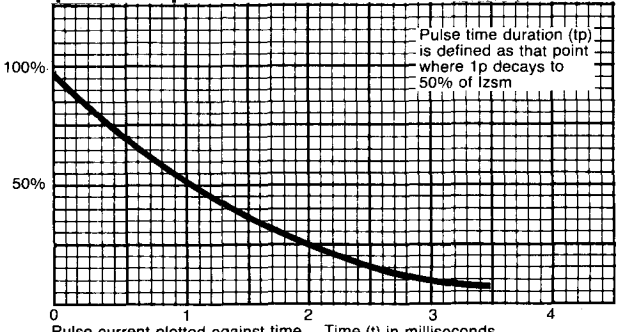
Continuous d.c. power dissipation




Continuous d.c. power dissipation plotted against junction temperature

## Exponential pulse waveform

Pulse current (Ip) in percent of Izsm




Pulse current plotted against time  Time (t) in milliseconds

# Transient Absorption Zener Diodes

# L13 Series

## Mechanical Characteristics

CASE: Hermetically sealed metal and glass DO13
FINISH: All external surfaces are corrosion resistant and leads solderable
POLARITY: Cathode connected to case
IDENTIFICATION: Body marked with Type no., logo and zener symbol
THERMAL RESISTANCE: 100°C/W junction to ambient
WEIGHT: 1.4 grammes approximately

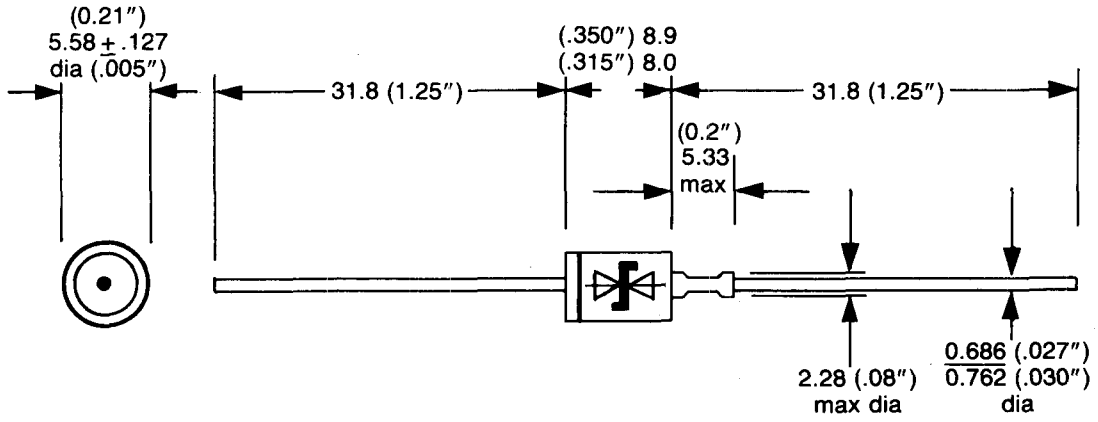
## Electrical Characteristics

FORWARD SURGE CURRENT: 167 Amps max for 10mS
PULSE REPETITION RATE: 0.01%
FORWARD VOLTAGE: Vf 1.2V @ If $\leq$ 1 Amp
$V_{BR}$ measured with pulse = 20mS

# 1.5KW Bi-directional Transient Absorption Zener Diode

**A range of bipolar protection diodes in a hermetically sealed metal and glass DO13 package**

| | |
|---|---|
| $P_{surge}$ | 1.5KW; 1mS expo |
| $P_{max\ cont}$ | 1W |
| $V_Z$ | 7.5-200V |
| $T_{on}$ | $\leq 5x10^{-12}S$ |
| $T_{op\ \&\ stg}$ | −65 to +175°C |




Case outline DM in mm DO13

# L13 Series

**Electrical Characteristics at 25°C**

| JEDEC Type No. | SEMITRON Type No. | Breakdown Voltage $V_{BR}$ Volts | | | Break-down Current $I_T$ mA | Reverse stand-off voltage $V_R$ Volts | Max reverse leakage AT $V_R$ $I_R\mu A$ | Max clamping voltage $V_{CL}$ Volts | Max peak pulse current Izsm | Temp coef %/°C | Typical capacitance at 0 Volts f= 1MHZ pF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Nominal | ±5% Voltage Tol | | | | | | | | |
| **IN6036A** | L13B7v5C | 7.5 | 7.13 | 7.88 | 10 | 6.0 | 1000 | 11.3 | 132 | +.061 | 9600 |
| **IN6037A** | L13B8v2C | 8.2 | 7.79 | 8.61 | 10 | 7.0 | 500 | 12.1 | 124 | +.065 | 8700 |
| **IN6038A** | L13B9v1C | 9.1 | 8.65 | 9.55 | 10 | 7.5 | 200 | 13.4 | 112 | +.068 | 7400 |
| **IN6039A** | L13B10C | 10 | 9.5 | 10.5 | 1 | 8.5 | 50 | 14.5 | 103 | +.073 | 6500 |
| **IN6040A** | L13B11C | 11 | 10.5 | 11.6 | 1 | 9.0 | 10 | 15.6 | 96 | +.075 | 5700 |
| **IN6041A** | L13B12C | 12 | 11.4 | 12.6 | 1 | 10.0 | 5 | 16.7 | 90 | +.078 | 5100 |
| **IN6042A** | L13B13C | 13 | 12.4 | 13.7 | 1 | 11.0 | 5 | 18.2 | 82 | +.081 | 4400 |
| **IN6043A** | L13B15C | 15 | 14.3 | 15.8 | 1 | 12.0 | 5 | 21.2 | 71 | +.084 | 3900 |
| **IN6044A** | L13B16C | 16 | 15.2 | 16.8 | 1 | 13.0 | 5 | 22.5 | 67 | +.086 | 3500 |
| **IN6045A** | L13B18C | 18 | 17.1 | 18.9 | 1 | 15.0 | 5 | 25.2 | 59.5 | +.088 | 3100 |
| **IN6046A** | L13B20C | 20 | 19.0 | 21.0 | 1 | 17.0 | 5 | 27.7 | 54 | +.090 | 2850 |
| **IN6047A** | L13B22C | 22 | 20.9 | 23.1 | 1 | 18.0 | 5 | 30.6 | 49 | +.092 | 2550 |
| **IN6048A** | L13B24C | 24 | 22.8 | 25.2 | 1 | 20.0 | 5 | 33.2 | 45 | +.094 | 2300 |
| **IN6049A** | L13B27C | 27 | 25.7 | 28.4 | 1 | 22.0 | 5 | 37.5 | 40 | +.096 | 2100 |
| **IN6050A** | L13B30C | 30 | 28.5 | 31.5 | 1 | 25.0 | 5 | 41.4 | 36 | +.097 | 1850 |
| **IN6051A** | L13B33C | 33 | 31.4 | 34.7 | 1 | 28.0 | 5 | 45.7 | 33 | +.098 | 1600 |
| **IN6052A** | L13B36C | 36 | 34.2 | 37.8 | 1 | 30.0 | 5 | 49.9 | 30 | +.099 | 1450 |
| **IN6053A** | L13B39C | 39 | 37.1 | 41.0 | 1 | 33.0 | 5 | 53.9 | 28 | +.100 | 1350 |
| **IN6054A** | L13B43C | 43 | 40.9 | 45.2 | 1 | 36.0 | 5 | 59.3 | 25.3 | +.101 | 1200 |
| **IN6055A** | L13B47C | 47 | 44.7 | 49.4 | 1 | 40.0 | 5 | 64.8 | 23.2 | +.101 | 1100 |
| **IN6056A** | L13B51C | 51 | 48.5 | 53.6 | 1 | 43.0 | 5 | 70.1 | 21.4 | +.102 | 1000 |
| **IN6057A** | L13B56C | 56 | 53.2 | 58.8 | 1 | 47.0 | 5 | 77.0 | 19.5 | +.103 | 920 |
| **IN6058A** | L13B62C | 62 | 58.9 | 65.1 | 1 | 53.0 | 5 | 85.0 | 17.7 | +.104 | 8200 |
| **IN6059A** | L13B68C | 68 | 64.6 | 71.4 | 1 | 58.0 | 5 | 92.0 | 16.3 | +.104 | 750 |
| **IN6060A** | L13B75C | 75 | 71.3 | 78.8 | 1 | 64.0 | 5 | 103 | 14.6 | +.105 | 670 |
| **IN6061A** | L13B82C | 82 | 77.9 | 86.1 | 1 | 70.0 | 5 | 113 | 13.3 | +.105 | 620 |
| **IN6062A** | L13B91C | 91 | 86.5 | 95.5 | 1 | 75.0 | 5 | 125 | 12.0 | +.106 | 550 |
| **IN6063A** | L13B100C | 100 | 95 | 105 | 1 | 82.0 | 5 | 137 | 11.0 | +.106 | 500 |
| **IN6064A** | L13B110C | 110 | 105 | 116 | 1 | 94.0 | 5 | 152 | 9.9 | +.107 | 460 |
| **IN6065A** | L13B120C | 120 | 114 | 126 | 1 | 100 | 5 | 168 | 8.9 | +.107 | 420 |
| **IN6066A** | L13B130C | 130 | 124 | 137 | 1 | 110 | 5 | 182 | 8.2 | +.107 | 390 |
| **IN6067A** | L13B150C | 150 | 143 | 158 | 1 | 128 | 5 | 213 | 7.0 | +.108 | 330 |
| **IN6068A** | L13B170C | 170 | 162 | 179 | 1 | 145 | 5 | 245 | 6.1 | +.108 | 310 |
| **IN6069A** | L13B180C | 180 | 171 | 189 | 1 | 150 | 5 | 261 | 5.7 | +.108 | 300 |
| **IN6070A** | L13B190C | 190 | 181 | 200 | 1 | 160 | 5 | 278 | 5.4 | +.108 | 280 |
| **IN6071A** | L13B200C | 200 | 190 | 210 | 1 | 170 | 5 | 294 | 5.1 | +.108 | 250 |
| **IN6072A** | L13B220C | 220 | 209 | 231 | 1 | 185 | 5 | 328 | 4.6 | +.108 | 230 |

# Transient Absorption Zener Diode

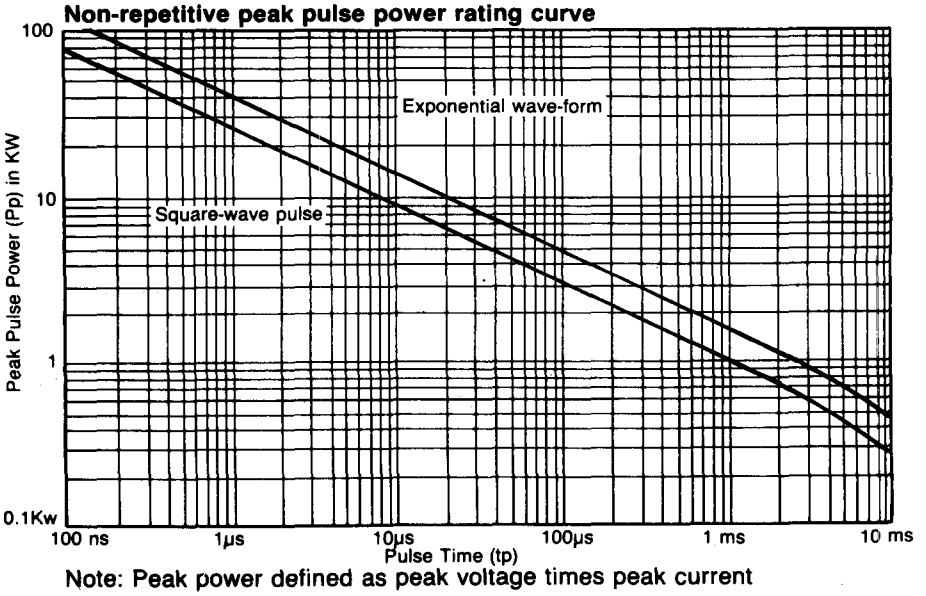
# L13 Series

**Electrical Characteristics at 25°C**

| JEDEC Type No. | SEMITRON Type No. | Breakdown Voltage $V_{BR}$ Volts | | | Break-down Current $I_t$ mA | Reverse stand-off voltage $V_R$ Volts | Max reverse leakage AT $V_R$ IRuA | Max clamping voltage $V_{CL}$ Volts | Max peak pulse current Izsm | Temp coef %/°C | Typical capacitance at 0 Volts f= 1MHZ pF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Nominal | +10% Voltage Tol | | | | | | | | |
| **IN6036** | L13C7v5C | 7.5 | 6.75 | 8.25 | 10 | 5.5 | 1000 | 11.7 | 128 | +.061 | 9600 |
| **IN6037** | L13C8v2C | 8.2 | 7.38 | 9.02 | 10 | 6.5 | 500 | 12.5 | 120 | +.065 | 8700 |
| **IN6038** | L13C9v1C | 9.1 | 8.19 | 10.0 | 10 | 7.0 | 200 | 13.8 | 109 | +.068 | 7400 |
| **IN6039** | L13C10C | 10 | 9.00 | 11.0 | 1 | 8.0 | 50 | 15.0 | 100 | +.073 | 6500 |
| **IN6040** | L13C11C | 11 | 9.9 | 12.1 | 1 | 8.5 | 10 | 16.2 | 93 | +.075 | 5700 |
| **IN6041** | L13C12C | 12 | 10.8 | 13.2 | 1 | 9.0 | 5 | 17.3 | 87 | +.078 | 5100 |
| **IN6042** | **L13C13C** | 13 | 11.7 | 14.3 | 1 | 10.0 | 5 | 19.0 | 79 | +.081 | 4400 |
| **IN6043** | L13C15C | 15 | 13.5 | 16.5 | 1 | 11.0 | 5 | 22.0 | 68 | +.084 | 3900 |
| **IN6044** | L13C16C | 16 | 14.4 | 17.6 | 1 | 12.0 | 5 | 23.5 | 64 | +.086 | 3500 |
| **IN6045** | L13C18C | 18 | 16.2 | 19.8 | 1 | 14.0 | 5 | 26.5 | 56.5 | +.088 | 3100 |
| **IN6046** | L13C20C | 20 | 18.0 | 22.0 | 1 | 16.0 | 5 | 29.1 | 51.5 | +.090 | 2850 |
| **IN6047** | L13C22C | 22 | 19.8 | 24.2 | 1 | 17.0 | 5 | 31.9 | 47 | +.092 | 2550 |
| **IN6048** | L13C24C | 24 | 21.6 | 26.4 | 1 | 19.0 | 5 | 34.7 | 43 | +.094 | 2300 |
| **IN6049** | L13C27C | 27 | 24.3 | 29.7 | 1 | 21.0 | 5 | 39.1 | 38.5 | +.096 | 2100 |
| **IN6050** | L13C30C | 30 | 27.0 | 33.0 | 1 | 24.0 | 5 | 43.5 | 34.5 | +.097 | 1850 |
| **IN6051** | L13C33C | 33 | 29.7 | 36.3 | 1 | 26.0 | 5 | 47.7 | 31.5 | +.098 | 1600 |
| **IN6052** | L13C36C | 36 | 32.4 | 39.6 | 1 | 29.0 | 5 | 52.0 | 29 | +.099 | 1450 |
| **IN6053** | L13C39C | 39 | 35.1 | 42.9 | 1 | 31.0 | 5 | 56.4 | 26.5 | +.100 | 1350 |
| **IN6054** | L13C43C | 43 | 38.7 | 47.3 | 1 | 34.0 | 5 | 61.9 | 24 | +.101 | 1200 |
| **IN6055** | L13C47C | 47 | 42.3 | 51.7 | 1 | 38.0 | 5 | 67.8 | 22.2 | +.101 | 1100 |
| **IN6056** | L13C51C | 51 | 45.9 | 56.1 | 1 | 41.0 | 5 | 73.5 | 20.4 | +.102 | 1000 |
| **IN6057** | L13C56C | 56 | 50.4 | 61.6 | 1 | 45.0 | 5 | 80.5 | 18.6 | +.103 | 920 |
| **IN6058** | L13C62C | 62 | 55.8 | 68.2 | 1 | 48.0 | 5 | 89.0 | 16.9 | +.104 | 820 |
| **IN6059** | L13C68C | 68 | 61.2 | 74.8 | 1 | 55.0 | 5 | 98.0 | 15.3 | +.104 | 750 |
| **IN6060** | L13C75C | 75 | 67.5 | 82.5 | 1 | 60.0 | 5 | 108 | 13.9 | +.105 | 670 |
| **IN6061** | L13C82C | 82 | 73.8 | 90.2 | 1 | 66.0 | 5 | 118 | 12.7 | +.105 | 620 |
| **IN6062** | L13C91C | 91 | 81.9 | 100 | 1 | 73.0 | 5 | 131 | 11.4 | +.106 | 550 |
| **IN6063** | L13C100C | 100 | 90.0 | 110 | 1 | 81.0 | 5 | 144 | 10.4 | +.106 | 500 |
| **IN6064** | L13C110C | 110 | 99.0 | 121 | 1 | 90.0 | 5 | 158 | 9.5 | +.107 | 460 |
| **IN6065** | L13C120C | 120 | 108 | 132 | 1 | 95.0 | 5 | 176 | 8.5 | +.107 | 420 |
| **IN6066** | L13C130C | 130 | 117 | 143 | 1 | 105 | 5 | 191 | 7.8 | +.107 | 390 |
| **IN6067** | L13C150C | 150 | 135 | 165 | 1 | 121 | 5 | 223 | 6.7 | +.108 | 330 |
| **IN6068** | L13C170C | 170 | 153 | 187 | 1 | 137 | 5 | 258 | 5.8 | +.108 | 310 |
| **IN6069** | L13C180C | 180 | 162 | 198 | 1 | 145 | 5 | 274 | 5.5 | +.108 | 300 |
| **IN6070** | L13C190C | 190 | 171 | 209 | 1 | 155 | 5 | 292 | 5.1 | +.108 | 280 |
| **IN6071** | L13C200C | 200 | 180 | 220 | 1 | 165 | 5 | 308 | 4.9 | +.108 | 250 |
| **IN6072** | L13C220C | 220 | 198 | 242 | 1 | 175 | 5 | 344 | 4.3 | +.108 | 230 |

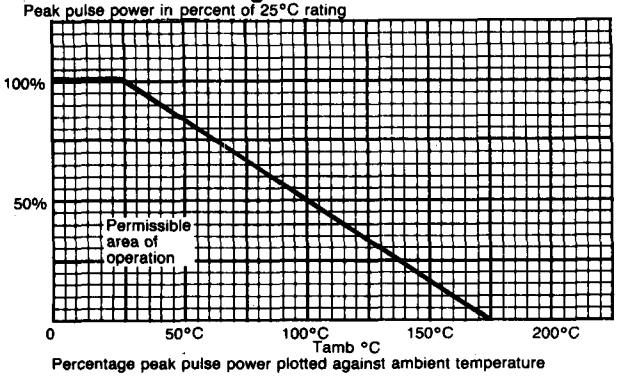
# L13 Series

## Non-repetitive peak pulse power rating curve



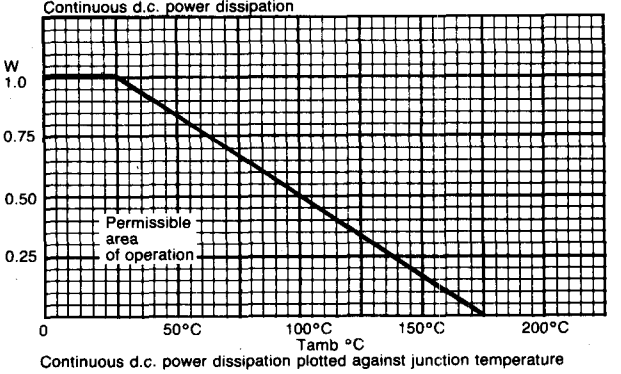

Note: Peak power defined as peak voltage times peak current

## Peak Power derating curve



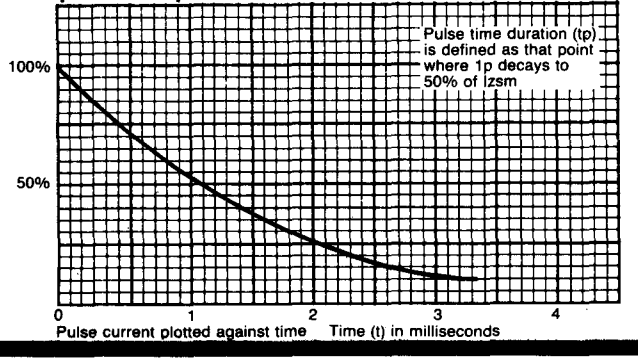

Percentage peak pulse power plotted against ambient temperature

## Continuous d.c. power derating curve




Continuous d.c. power dissipation plotted against junction temperature

## Exponential pulse waveform




Pulse current plotted against time

# Transient Absorption Zener Diode

# L13 Series

## Mechanical Characteristic

CASE: Hermetically sealed metal and glass DO13
FINISH: All external surfaces are corrosion resistant and leads solderable
IDENTIFICATION: Body marked with Type no., logo and zener symbol
THERMAL RESISTANCE: 100°C/W junction to ambient
WEIGHT: 1.4 grammes approximately

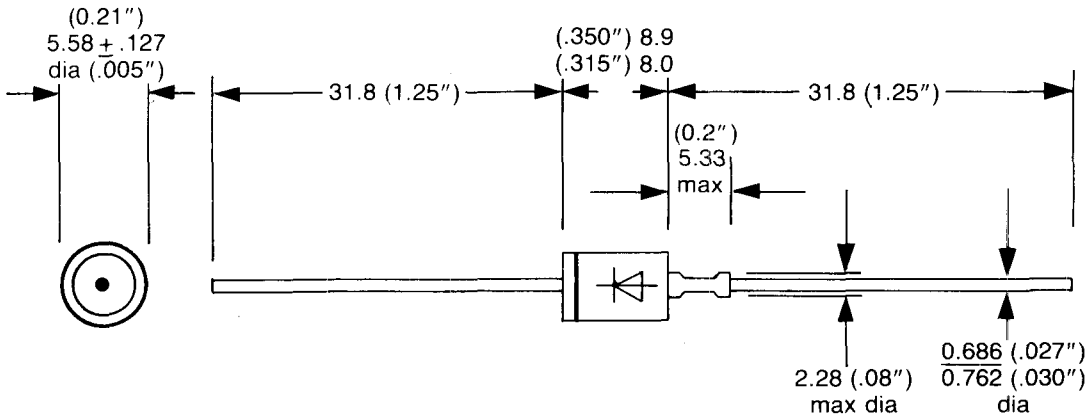
## Electrical Characteristics

PULSE REPETITION RATE: 0.01%
$V_{BR}$ measured with pulse = 20mS

# Low Capacitance 1.5KW Transient Absorption Zener Diode

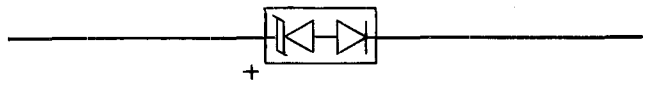
**A range of low capacitance unipolar protection diodes in a hermetically sealed metal and glass DO13 package**

| | |
|---|---|
| $P_{surge}$ | 1.5KW; 1mS expo |
| $P_{max\ cont}$ | 1W |
| $V_R$ | 6.5-170V |
| $T_{on}$ | $\leqslant 5x10^{-9}S$ |
| $T_{op\ \&\ stg}$ | −65 to +175°C |




Case Outline dim in mm DO13

## Circuit Configuration



# L13 Series

**Electrical Characteristics at 25°C**

| Part Number | Reverse Stand-off Voltage $V_R$ Volts | Breakdown Voltage $B_V$ @ $I_t$ Volts | | | Maxiumum Reverse leakage @ $V_R$ $I_R$ µA | Maximum clamping voltage @ Ipp $V_{CL}$ Volts | Max. Peak pulse current (Fig 3) Ipp Amps | Capacitance @ 0 Volts pF | Working Inverse Blocking Voltage $V_{WIB}$ Volts | Inverse Blocking Leakage Current @ $V_{RS}$ Ipp mA | Peak Inverse Blocking Voltage $V_{PIB}$ Volts |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Min. | Max. | mA | | | | | | | |
| L13B6v5L | 6.5 | 7.22 | 7.98 | 10 | 1000 | 11.2 | 100 | 100 | 75 | 1 | 100 |
| L13B7v0L | 7.0 | 7.78 | 8.60 | 10 | 500 | 12.0 | 100 | 100 | 75 | 1 | 100 |
| L13B7v5L | 7.5 | 8.33 | 9.21 | 10 | 250 | 12.9 | 100 | 100 | 75 | 1 | 100 |
| L13B8v0L | 8.0 | 8.89 | 9.83 | 1 | 100 | 13.6 | 100 | 100 | 75 | 1 | 100 |
| L13B8v5L | 8.5 | 9.44 | 10.4 | 1 | 50 | 14.4 | 100 | 100 | 75 | 1 | 100 |
| L13B9v0L | 9.0 | 10.0 | 11.1 | 1 | 10 | 15.4 | 97 | 100 | 75 | 1 | 100 |
| L13B10L | 10 | 11.1 | 12.3 | 1 | 5 | 17.0 | 88 | 100 | 75 | 1 | 100 |
| L13B11L | 11 | 12.2 | 13.5 | 1 | 5 | 18.2 | 82 | 100 | 75 | 1 | 100 |
| L13B12L | 12 | 13.3 | 14.7 | 1 | 5 | 19.9 | 75 | 100 | 75 | 1 | 100 |
| L13B13L | 13 | 14.4 | 15.9 | 1 | 5 | 21.5 | 70 | 100 | 75 | 1 | 100 |
| L13B14L | 14 | 15.6 | 17.2 | 1 | 5 | 23.2 | 65 | 100 | 75 | 1 | 100 |
| L13B15L | 15 | 16.7 | 18.5 | 1 | 5 | 24.4 | 61 | 100 | 75 | 1 | 100 |
| L13B16L | 16 | 17.8 | 19.7 | 1 | 5 | 26.0 | 57 | 100 | 75 | 1 | 100 |
| L13B17L | 17 | 18.9 | 20.9 | 1 | 5 | 27.6 | 54 | 100 | 75 | 1 | 100 |
| L13B18L | 18 | 20.0 | 22.1 | 1 | 5 | 29.2 | 51 | 100 | 75 | 1 | 100 |
| L13B20L | 20 | 22.2 | 24.5 | 1 | 5 | 32.4 | 46 | 100 | 75 | 1 | 100 |
| L13B22L | 22 | 24.4 | 26.9 | 1 | 5 | 35.5 | 42 | 100 | 75 | 1 | 100 |
| L13B24L | 24 | 26.7 | 29.5 | 1 | 5 | 38.9 | 39 | 100 | 75 | 1 | 100 |
| L13B26L | 26 | 28.9 | 31.9 | 1 | 5 | 42.1 | 36 | 100 | 75 | 1 | 100 |
| L13B28L | 28 | 31.1 | 34.4 | 1 | 5 | 45.5 | 33 | 100 | 75 | 1 | 100 |
| L13B30L | 30 | 33.3 | 36.8 | 1 | 5 | 48.4 | 31 | 100 | 75 | 1 | 100 |
| L13B33L | 33 | 36.7 | 40.6 | 1 | 5 | 53.3 | 28.1 | 100 | 75 | 1 | 100 |
| L13B36L | 36 | 40.0 | 44.2 | 1 | 5 | 58.1 | 25.8 | 100 | 75 | 1 | 100 |
| L13B40L | 40 | 44.4 | 49.1 | 1 | 5 | 64.5 | 23.3 | 100 | 75 | 1 | 100 |
| L13B43L | 43 | 47.8 | 52.8 | 1 | 5 | 69.4 | 21.6 | 100 | 150 | 1 | 200 |
| L13B45L | 45 | 50.0 | 55.3 | 1 | 5 | 72.7 | 20.6 | 100 | 150 | 1 | 200 |
| L13B48L | 48 | 53.3 | 58.9 | 1 | 5 | 77.4 | 19.4 | 100 | 150 | 1 | 200 |
| L13B51L | 51 | 56.7 | 62.7 | 1 | 5 | 82.4 | 18.2 | 100 | 150 | 1 | 200 |
| L13B54L | 54 | 60.0 | 66.3 | 1 | 5 | 87.1 | 17.2 | 100 | 150 | 1 | 200 |
| L13B58L | 58 | 64.4 | 71.2 | 1 | 5 | 93.6 | 16.0 | 100 | 150 | 1 | 200 |
| L13B60L | 60 | 66.7 | 73.7 | 1 | 5 | 96.8 | 15.5 | 90 | 150 | 1 | 200 |
| L13B64L | 64 | 71.1 | 78.6 | 1 | 5 | 103.0 | 14.6 | 90 | 150 | 1 | 200 |
| L13B70L | 70 | 77.8 | 86.0 | 1 | 5 | 113 | 13.3 | 90 | 150 | 1 | 200 |
| L13B75L | 75 | 83.3 | 92.1 | 1 | 5 | 121 | 12.4 | 90 | 150 | 1 | 200 |
| L13B80L | 80 | 88.7 | 98.0 | 1 | 5 | 129 | 11.6 | 90 | 150 | 1 | 200 |
| L13B90L | 90 | 100 | 111 | 1 | 5 | 146 | 10.3 | 90 | 300 | 1 | 200 |
| L13B100L | 100 | 111 | 123 | 1 | 5 | 162 | 9.3 | 90 | 300 | 1 | 200 |
| L13B110L | 110 | 122 | 135 | 1 | 5 | 178 | 8.4 | 90 | 300 | 1 | 400 |
| L13B120L | 120 | 133 | 147 | 1 | 5 | 193 | 7.8 | 90 | 300 | 1 | 400 |
| L13B130L | 130 | 144 | 159 | 1 | 5 | 209 | 7.2 | 90 | 300 | 1 | 400 |
| L13B150L | 150 | 167 | 185 | 1 | 5 | 243 | 6.2 | 90 | 300 | 1 | 400 |
| L13B160L | 160 | 178 | 197 | 1 | 5 | 259 | 5.8 | 90 | 300 | 1 | 400 |
| L13B170L | 170 | 189 | 209 | 1 | 5 | 275 | 5.4 | 90 | 300 | 1 | 400 |

# Transient Absorption Zener Diode

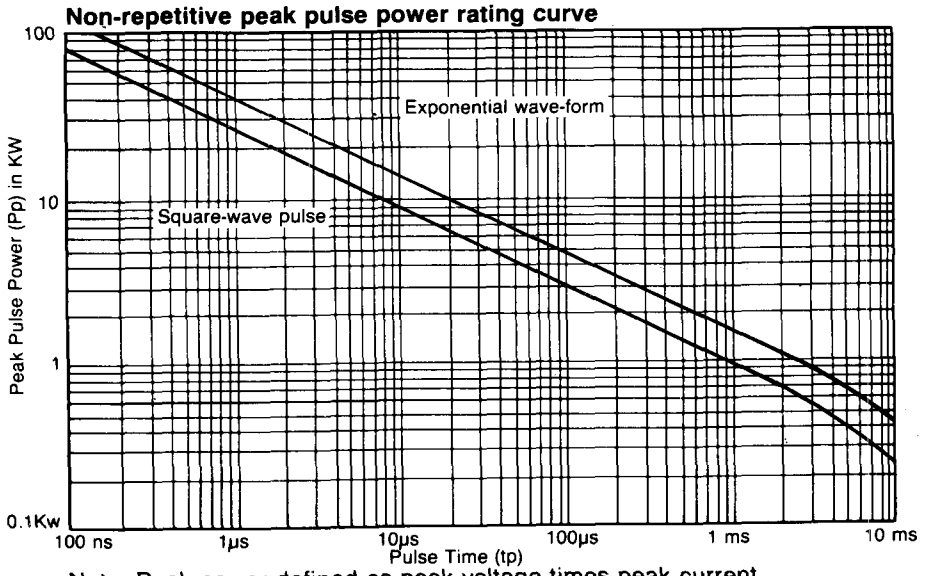
# L13 Series

**Electrical Characteristics at 25°C**

| Part Number | Reverse Stand-off Voltage $V_R$ Volts | Breakdown Voltage By @$I_t$ Volts | | | Maxiumum Reverse leakage @ $V_R$ $I_R$ µA | Maximum clamping voltage @ Ipp $V_{CL}$ Volts | Max. Peak pulse current (Fig 3) Ipp Amps | Capacitance @ 0 Volts pF | Working Inverse Blocking Voltage $V_{WIB}$ Volts | Inverse Blocking Leakage Current @ $V_{RS}$ Ipp mA | Peak Inverse Blocking Voltage $V_{PIB}$ Volts |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Min. | Max. | mA | | | | | | | |
| L13C7v0L | 7.0 | 7.78 | 9.51 | 10 | 500 | 13.3 | 100 | 100 | 75 | 1 | 100 |
| L13C7v5L | 7.5 | 8.33 | 10.2 | 10 | 250 | 14.3 | 100 | 100 | 75 | 1 | 100 |
| L13C8v0L | 8.0 | 8.89 | 10.9 | 1 | 100 | 15.0 | 100 | 100 | 75 | 1 | 100 |
| L13C8v5L | 8.5 | 9.44 | 11.5 | 1 | 50 | 15.9 | 94 | 100 | 75 | 1 | 100 |
| L13C9v0L | 9.0 | 10.0 | 12.2 | 1 | 10 | 16.9 | 89 | 100 | 75 | 1 | 100 |
| L13C10L | 10 | 11.1 | 13.6 | 1 | 5 | 18.8 | 80 | 100 | 75 | 1 | 100 |
| L13C11L | 11 | 12.2 | 14.9 | 1 | 5 | 20.1 | 74 | 100 | 75 | 1 | 100 |
| L13C12L | 12 | 13.3 | 16.3 | 1 | 5 | 22.0 | 68 | 100 | 75 | 1 | 100 |
| L13C13L | 13 | 14.4 | 17.6 | 1 | 5 | 23.8 | 63 | 100 | 75 | 1 | 100 |
| L13C14L | 14 | 15.6 | 19.1 | 1 | 5 | 25.8 | 58 | 100 | 75 | 1 | 100 |
| L13C15L | 15 | 16.7 | 20.4 | 1 | 5 | 26.9 | 58 | 100 | 75 | 1 | 100 |
| L13C16L | 16 | 17.8 | 21.8 | 1 | 5 | 28.8 | 52 | 100 | 75 | 1 | 100 |
| L13C17L | 17 | 18.9 | 23.1 | 1 | 5 | 30.5 | 49 | 100 | 75 | 1 | 100 |
| L13C18L | 18 | 20.0 | 24.4 | 1 | 5 | 32.2 | 46 | 100 | 75 | 1 | 100 |
| L13C20L | 20 | 22.2 | 27.1 | 1 | 5 | 35.8 | 42 | 100 | 75 | 1 | 100 |
| L13C22L | 22 | 24.4 | 29.8 | 1 | 5 | 39.4 | 38 | 100 | 75 | 1 | 100 |
| L13C24L | 24 | 26.7 | 32.6 | 1 | 5 | 43.0 | 35 | 100 | 75 | 1 | 100 |
| L13C26L | 26 | 28.9 | 35.3 | 1 | 5 | 46.6 | 32 | 100 | 75 | 1 | 100 |
| L13C28L | 28 | 31.1 | 38.0 | 1 | 5 | 50.1 | 30 | 100 | 75 | 1 | 100 |
| L13C30L | 30 | 33.3 | 40.7 | 1 | 5 | 53.5 | 28 | 100 | 75 | 1 | 100 |
| L13C33L | 33 | 36.7 | 44.9 | 1 | 5 | 59.0 | 25.4 | 100 | 75 | 1 | 100 |
| L13C36L | 36 | 40.0 | 48.9 | 1 | 5 | 64.3 | 23.3 | 100 | 75 | 1 | 100 |
| L13C40L | 40 | 44.4 | 54.3 | 1 | 5 | 71.4 | 21.0 | 100 | 75 | 1 | 100 |
| L13C43L | 43 | 47.8 | 58.4 | 1 | 5 | 76.7 | 19.5 | 100 | 150 | 1 | 200 |
| L13C45L | 45 | 50.0 | 61.1 | 1 | 5 | 80.3 | 18.7 | 100 | 150 | 1 | 200 |
| L13C48L | 48 | 53.3 | 65.1 | 1 | 5 | 85.5 | 17.5 | 100 | 150 | 1 | 200 |
| L13C51L | 51 | 56.7 | 69.3 | 1 | 5 | 91.1 | 16.5 | 100 | 150 | 1 | 200 |
| L13C54L | 54 | 60.0 | 73.3 | 1 | 5 | 96.3 | 15.6 | 100 | 150 | 1 | 200 |
| L13C58L | 58 | 64.4 | 78.7 | 1 | 5 | 103.0 | 14.6 | 100 | 150 | 1 | 200 |
| L13C60L | 60 | 66.7 | 81.5 | 1 | 5 | 107.0 | 14.0 | 90 | 150 | 1 | 200 |
| L13C64L | 64 | 71.1 | 86.9 | 1 | 5 | 114.0 | 13.2 | 90 | 150 | 1 | 200 |
| L13C70L | 70 | 77.8 | 95.1 | 1 | 5 | 125 | 12.0 | 90 | 150 | 1 | 200 |
| L13C75L | 75 | 83.3 | 102.0 | 1 | 5 | 134 | 11.2 | 90 | 150 | 1 | 200 |
| L13C80L | 80 | 88.7 | 108 | 1 | 5 | 142 | 10.6 | 90 | 150 | 1 | 200 |
| L13C90L | 90 | 100 | 122 | 1 | 5 | 160 | 9.4 | 90 | 300 | 1 | 200 |
| L13C100L | 100 | 111 | 136 | 1 | 5 | 179 | 8.4 | 90 | 300 | 1 | 200 |
| L13C110L | 110 | 122 | 149 | 1 | 5 | 196 | 7.7 | 90 | 300 | 1 | 400 |
| L13C120L | 120 | 133 | 163 | 1 | 5 | 214 | 7.0 | 90 | 300 | 1 | 400 |
| L13C130L | 130 | 144 | 176 | 1 | 5 | 213 | 6.5 | 90 | 300 | 1 | 400 |
| L13C150L | 150 | 167 | 204 | 1 | 5 | 268 | 5.6 | 90 | 300 | 1 | 400 |
| L13C160L | 160 | 178 | 218 | 1 | 5 | 287 | 5.2 | 90 | 300 | 1 | 400 |
| L13C170L | 170 | 189 | 231 | 1 | 5 | 304 | 4.9 | 90 | 300 | 1 | 400 |

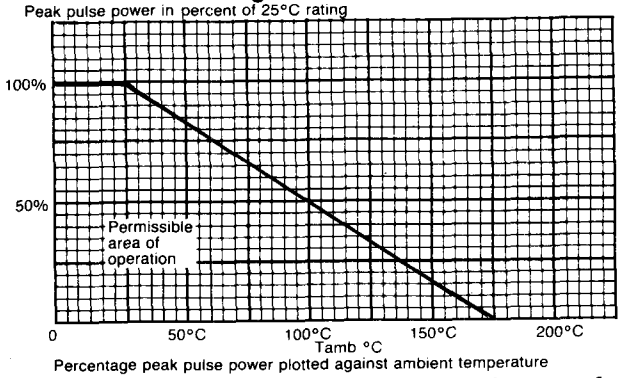
# L13 Series

## Non-repetitive peak pulse power rating curve



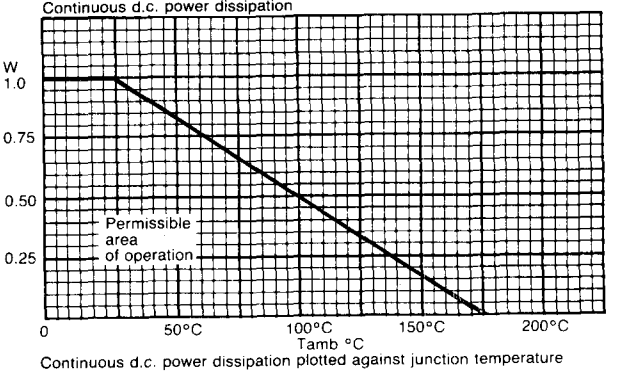

Note: Peak power defined as peak voltage times peak current

## Peak Power derating curve



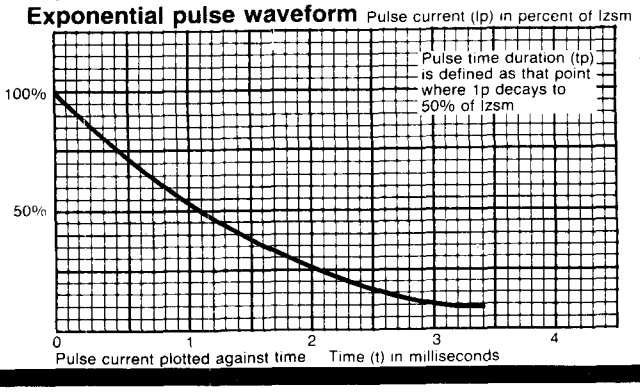

Percentage peak pulse power plotted against ambient temperature

## Continuous d.c. power derating curve




Continuous d.c. power dissipation plotted against junction temperature

## Exponential pulse waveform




Pulse current plotted against time Time (t) in milliseconds

# Transient Absorption Zener Diodes

# L13 Series

## Mechanical Characteristics

CASE: Hermetically sealed metal and glass DO13
FINISH: All external surfaces are corrosion resistant and leads solderable
POLARITY: Zener cathode connected to case
IDENTIFICATION: Body marked with Type no., logo and zener symbol
THERMAL RESISTANCE: 100°C/W junction to ambient
WEIGHT: 1.4 grammes approximately

## Electrical Characteristics

PULSE REPETITION RATE: 0.01%
$V_{BR}$ measured with pulse $\leq$ 20mS