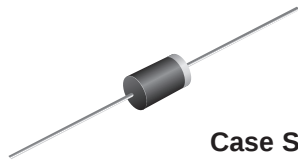
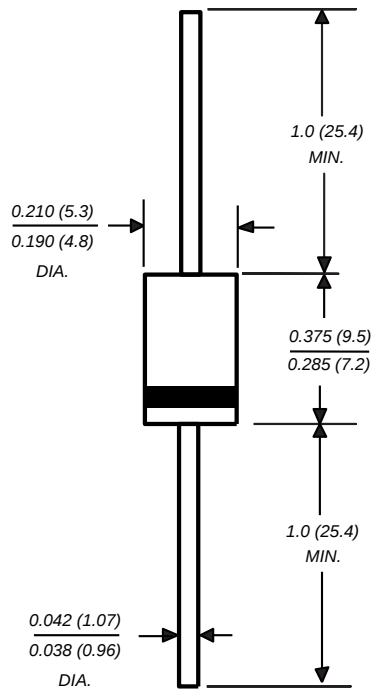
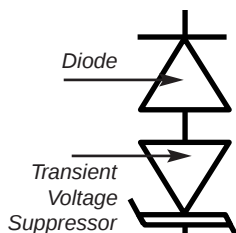


**Low Capacitance TRANSZORB®  
Transient Voltage Suppressors****Peak Pulse Power** 1500W  
**Stand-off Voltage** 6.5 to 28V**Case Style 1.5KE**

Dimensions in inches and (millimeters)

**Schematic****Features**

- Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- Glass passivated junction
- 1500W peak pulse power capability with a 10/1000 $\mu$ s waveform, repetition rate (duty cycle): 0.05%
- Excellent clamping capability
- Low incremental surge resistance
- Very fast response time
- Ideal for data line applications
- High temperature soldering guaranteed: 265°C/10 seconds, 0.375" (9.5mm) lead length, 5lbs. (2.3 kg) tension

**Mechanical Data****Case:** Molded plastic body over passivated junction**Terminals:** Plated axial leads, solderable per MIL-STD-750, Method 2026**Polarity:** Color band denotes TVS cathode**Mounting Position:** Any**Weight:** 0.045 oz., 1.2 g**Packaging Codes – Options (Antistatic):**

51 – 1K per Bulk box, 10K/carton

54 – 1.4K per 13" paper Reel  
(52mm horiz. tape), 4.2K/carton

73 – 1K per horiz. tape &amp; Ammo box, 10K/carton

**Maximum Ratings and Thermal Characteristics** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

| Parameter                                                                                    | Symbol                            | Limit                          | Unit |
|----------------------------------------------------------------------------------------------|-----------------------------------|--------------------------------|------|
| Peak pulse power dissipation with a 10/1000 $\mu$ s waveform                                 | P <sub>PPM</sub>                  | Minimum 1500 <sup>(1)(2)</sup> | W    |
| Steady state power dissipation, at $T_L = 75^\circ\text{C}$ with lead lengths 0.375" (9.5mm) | P <sub>M(AV)</sub>                | 6.5                            | W    |
| Peak power pulse surge current with a 10/1000 $\mu$ s waveform <sup>(1)(3)</sup>             | I <sub>PPM</sub>                  | See Next Table                 | A    |
| Operating junction and storage temperature range                                             | T <sub>J</sub> , T <sub>STG</sub> | -65 to +175                    | °C   |

**Note:** (1) Non-repetitive current pulse, per Fig.3 and derated above  $T_A = 25^\circ\text{C}$  per Fig. 2

(2) See Figure 1

(3) See Figure 3

# LCE6.5 thru LCE28A Series

Vishay Semiconductors  
formerly General Semiconductor



## Electrical Characteristics (T<sub>A</sub> = 25°C unless otherwise noted)

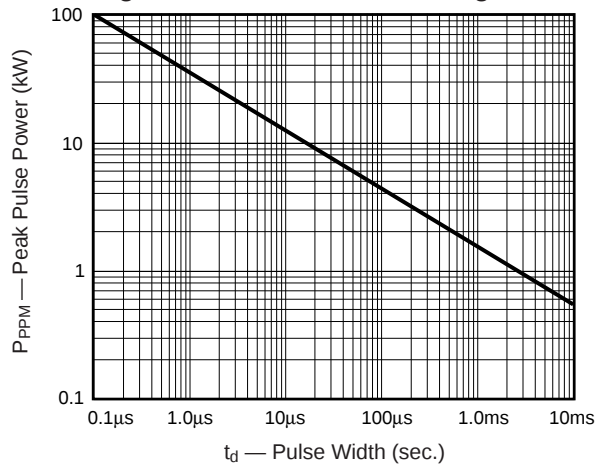
| Part Number | Stand-off Voltage V <sub>WM</sub> (V) | Breakdown Voltage V <sub>(BR)</sub> (V) |      | Test Current at I <sub>T</sub> mA | Maximum Reverse Leakage at V <sub>WM</sub> I <sub>D</sub> (μA) | Maximum Clamping Voltage at I <sub>PP</sub> V <sub>C</sub> (V) | Maximum Peak Pulse Current (Fig 3) I <sub>PPM</sub> (A) | Maximum Junction Capacitance at 0 (V) (pF) | Working Inverse Blocking Voltage V <sub>WIB</sub> (V) | Maximum Inverse Blocking Leakage Current at V <sub>WIB</sub> I <sub>D</sub> (mA) | Minimum Peak Inverse Blocking Voltage V <sub>PIB</sub> (V) |
|-------------|---------------------------------------|-----------------------------------------|------|-----------------------------------|----------------------------------------------------------------|----------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------------|------------------------------------------------------------|
|             |                                       | Min                                     | Max  |                                   |                                                                |                                                                |                                                         |                                            |                                                       |                                                                                  |                                                            |
| LCE6.5      | 6.5                                   | 7.22                                    | 8.82 | 10.0                              | 1000                                                           | 12.3                                                           | 100                                                     | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE6.5A     | 6.5                                   | 7.22                                    | 7.98 | 10.0                              | 1000                                                           | 11.2                                                           | 100                                                     | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE7.0      | 7.0                                   | 7.78                                    | 9.51 | 10.0                              | 500                                                            | 13.3                                                           | 100                                                     | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE7.0A     | 7.0                                   | 7.78                                    | 8.60 | 10.0                              | 500                                                            | 12.0                                                           | 100                                                     | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE7.5      | 7.5                                   | 8.33                                    | 10.2 | 10.0                              | 250                                                            | 14.3                                                           | 100                                                     | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE7.5A     | 7.5                                   | 8.33                                    | 9.21 | 10.0                              | 250                                                            | 12.9                                                           | 100                                                     | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE8.0      | 8.0                                   | 8.89                                    | 10.9 | 1.0                               | 100                                                            | 15.0                                                           | 100                                                     | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE8.0A     | 8.0                                   | 8.89                                    | 9.83 | 1.0                               | 100                                                            | 13.6                                                           | 100                                                     | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE8.5      | 8.5                                   | 9.44                                    | 11.5 | 1.0                               | 50.0                                                           | 15.9                                                           | 94                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE8.5A     | 8.5                                   | 9.44                                    | 10.4 | 1.0                               | 50.0                                                           | 14.4                                                           | 100                                                     | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE9.0      | 9.0                                   | 10.0                                    | 12.2 | 1.0                               | 10.0                                                           | 16.9                                                           | 89                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE9.0A     | 9.0                                   | 10.0                                    | 11.1 | 1.0                               | 10.0                                                           | 15.4                                                           | 97                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE10       | 10                                    | 11.1                                    | 13.6 | 1.0                               | 5.0                                                            | 18.8                                                           | 80                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE10A      | 10                                    | 11.1                                    | 12.3 | 1.0                               | 5.0                                                            | 17.0                                                           | 88                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE11       | 11                                    | 12.2                                    | 14.9 | 1.0                               | 5.0                                                            | 20.1                                                           | 74                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE11A      | 11                                    | 12.2                                    | 13.5 | 1.0                               | 5.0                                                            | 18.2                                                           | 82                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE12       | 12                                    | 13.3                                    | 16.3 | 1.0                               | 5.0                                                            | 22.0                                                           | 68                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE12A      | 12                                    | 13.3                                    | 14.7 | 1.0                               | 5.0                                                            | 19.9                                                           | 75                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE13       | 13                                    | 14.4                                    | 17.6 | 1.0                               | 5.0                                                            | 23.8                                                           | 63                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE13A      | 13                                    | 14.4                                    | 15.9 | 1.0                               | 5.0                                                            | 21.5                                                           | 70                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE14       | 14                                    | 15.6                                    | 19.1 | 1.0                               | 5.0                                                            | 25.8                                                           | 58                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE14A      | 14                                    | 15.6                                    | 17.2 | 1.0                               | 5.0                                                            | 23.2                                                           | 65                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE15       | 15                                    | 16.7                                    | 20.4 | 1.0                               | 5.0                                                            | 26.9                                                           | 56                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE15A      | 15                                    | 16.7                                    | 18.5 | 1.0                               | 5.0                                                            | 24.4                                                           | 61                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE16       | 16                                    | 17.8                                    | 21.8 | 1.0                               | 5.0                                                            | 28.8                                                           | 52                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE16A      | 16                                    | 17.8                                    | 19.7 | 1.0                               | 5.0                                                            | 26.0                                                           | 57                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE17       | 17                                    | 18.9                                    | 23.1 | 1.0                               | 5.0                                                            | 30.5                                                           | 49                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE17A      | 17                                    | 18.9                                    | 20.9 | 1.0                               | 5.0                                                            | 27.6                                                           | 54                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE18       | 18                                    | 20.0                                    | 24.4 | 1.0                               | 5.0                                                            | 32.2                                                           | 46                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE18A      | 18                                    | 20.0                                    | 22.1 | 1.0                               | 5.0                                                            | 29.2                                                           | 51                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE20       | 20                                    | 22.2                                    | 27.1 | 1.0                               | 5.0                                                            | 35.8                                                           | 42                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE20A      | 20                                    | 22.2                                    | 24.5 | 1.0                               | 5.0                                                            | 32.4                                                           | 46                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE22       | 22                                    | 24.4                                    | 29.8 | 1.0                               | 5.0                                                            | 39.4                                                           | 38                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE22A      | 22                                    | 24.4                                    | 26.9 | 1.0                               | 5.0                                                            | 35.5                                                           | 42                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE24       | 24                                    | 26.7                                    | 32.6 | 1.0                               | 5.0                                                            | 43.0                                                           | 35                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE24A      | 24                                    | 26.7                                    | 29.5 | 1.0                               | 5.0                                                            | 38.9                                                           | 39                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE26       | 26                                    | 28.9                                    | 35.3 | 1.0                               | 5.0                                                            | 46.6                                                           | 32                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE26A      | 26                                    | 28.9                                    | 31.9 | 1.0                               | 5.0                                                            | 42.1                                                           | 36                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE28       | 28                                    | 31.1                                    | 38.0 | 1.0                               | 5.0                                                            | 50.1                                                           | 30                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |
| LCE28A      | 28                                    | 31.1                                    | 34.4 | 1.0                               | 5.0                                                            | 45.5                                                           | 33                                                      | 100                                        | 75                                                    | 1.0                                                                              | 100                                                        |

**Note:** All the above devices are UL listed for Telecom application protection 497B, file number E136766.

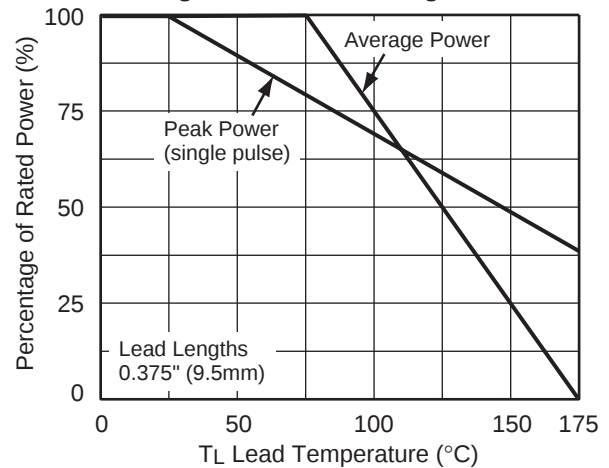


## Ratings and Characteristic Curves ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

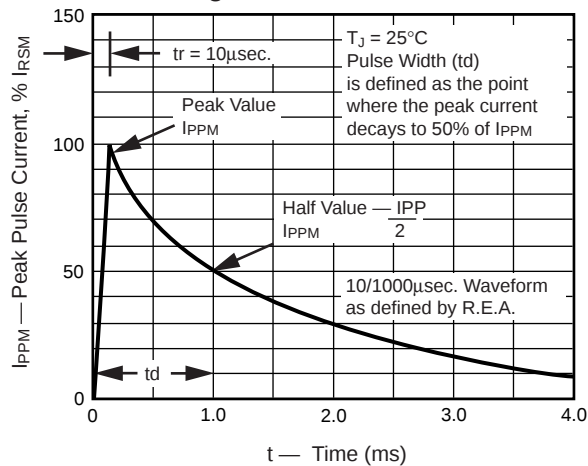
**Fig. 1 – Peak Pulse Power Rating Curve**



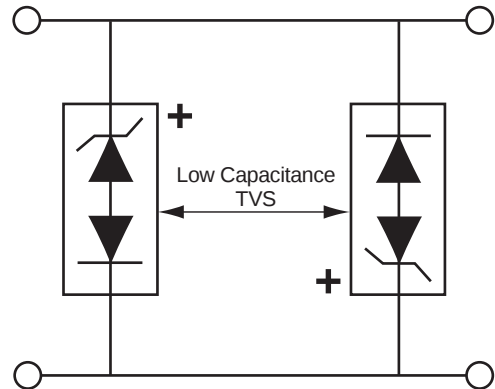
**Fig. 2 - Power Derating Curve**



**Fig. 3 – Pulse Waveform**



**Fig. 4 - AC Line Protection Application**



**Application Note:** Device must be used with two units in parallel, opposite in polarity as shown in circuit for AC signal line protection.