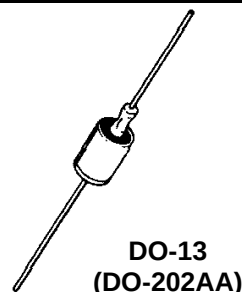


## DESCRIPTION

This hermetically sealed Transient Voltage Suppressor (TVS) product family includes a rectifier diode element in series and opposite direction to achieve low capacitance performance below 100 pF (see Figure 2). The low level of TVS capacitance may be used for protecting higher frequency applications in inductive switching environments or electrical systems involving secondary lightning effects per IEC61000-4-5 as well as RTCA/DO-160D or ARINC 429 for airborne avionics. With virtually instantaneous response, they also protect from ESD and EFT per IEC61000-4-2 and IEC61000-4-4. If bipolar transient capability is required, two of these low capacitance TVS devices may be used in parallel in opposite directions (anti-parallel) for complete ac protection as shown in Figure 4.

**IMPORTANT:** For the most current data, consult MICROSEMI's website: <http://www.microsemi.com>



## FEATURES

- Unidirectional low-capacitance TVS series for flexible thru-hole mounting (for bidirectional see Figure 4)
- Suppresses transients up to 1500 watts @ 10/1000  $\mu$ s (see Figure 1)\*
- Clamps transient in less than 100 pico seconds
- Working voltage ( $V_{WM}$ ) range 6.5 V to 170 V
- Hermetic sealed DO-13 metal package
- Options for screening in accordance with MIL-PRF-19500 for JAN, JANTX, JANTXV, and JANS are also available by adding MQ, MX, MV, MSP prefixes respectively to part numbers, e.g. MXLC6.5A, etc.
- Surface mount equivalent packages also available as SMCJLCE6.5 - SMCJLCE170A or SMCGLCE6.5 - SMCGLCE170A in separate data sheet (consult factory for other surface mount options)
- Plastic axial-leaded equivalents available in the LCE6.5 - LCE170A series in separate data sheet
- RoHS Compliant devices available by adding "e3" suffix

## MAXIMUM RATINGS

- 1500 Watts at 10/1000  $\mu$ s with repetition rate of 0.01% or less\* at lead temperature ( $T_L$ ) 25°C (see Figs. 1, 2, & 4)
- Operating & Storage Temperatures: -65° to +175°C
- THERMAL RESISTANCE: 50°C/W (Typical) junction to lead at 0.375 inches (10 mm) from body or 110°C/W junction to ambient when mounted on FR4 PC board with 4 mm<sup>2</sup> copper pads (1 oz) and track width 1 mm, length 25 mm
- DC Power Dissipation\*: 1 Watt at  $T_L \leq +125^\circ\text{C}$  3/8" (10 mm) from body (see derating in Fig 3 and note below)
- Solder Temperatures: 260 ° C for 10 s (maximum)

## APPLICATIONS / BENEFITS

- Protection from switching transients and induced RF
- Low capacitance for data line protection up to 1 MHz
- Protection for aircraft fast data rate lines up to Level 5 Waveform 4 and Level 2 Waveform 5A in RTCA/DO-160D (also see MicroNote 130) & ARINC 429 with bit rates of 100 kb/s (per ARINC 429, Part 1, par 2.4.1.1)
- ESD & EFT protection per IEC 61000-4-2 and -4-4
- Secondary lightning protection per IEC61000-4-5 with 42 Ohms source impedance:
  - Class 1: LC6.5 to LC170A
  - Class 2: LC6.5 to LC150A
  - Class 3: LC6.5 to LC70A
  - Class 4: LC6.5 to LC36A
- Secondary lightning protection per IEC61000-4-5 with 12 Ohms source impedance:
  - Class 1 : LC6.5 to LC90A
  - Class 2: LC6.5 to LC45 A
  - Class 3: LC6.5 to LC22A
  - Class 4: LC6.5 to LC11A
- Secondary lightning protection per IEC61000-4-5 with 2 Ohms source impedance:
  - Class 2: LC6.5 to LC20A
  - Class 3: LC6.5 to LC10A
- Inherently radiation hard per Microsemi MicroNote 050

## MECHANICAL AND PACKAGING

- CASE: DO-13 (DO-202AA), welded, hermetically sealed metal and glass
- FINISH: All external metal surfaces are Tin-Lead plated and solderable per MIL-STD-750 method 2026
- POLARITY: Cathode connected to case as shown by diode symbol (cathode positive for normal operation)
- MARKING: Part number and polarity diode symbol
- WEIGHT: 1.4 grams. (Approx)
- TAPE & REEL option: Standard per EIA-296 (add "TR" suffix to part number)
- See package dimension on last page

\* TVS devices are not typically used for dc power dissipation and are instead operated  $\leq V_{WM}$  (rated standoff voltage) except for transients that briefly drive the device into avalanche breakdown ( $V_{BR}$  to  $V_C$  region) of the TVS element. Also see Figures 3 and 4 for further protection details in rated peak pulse power for unidirectional and bidirectional configurations respectively.

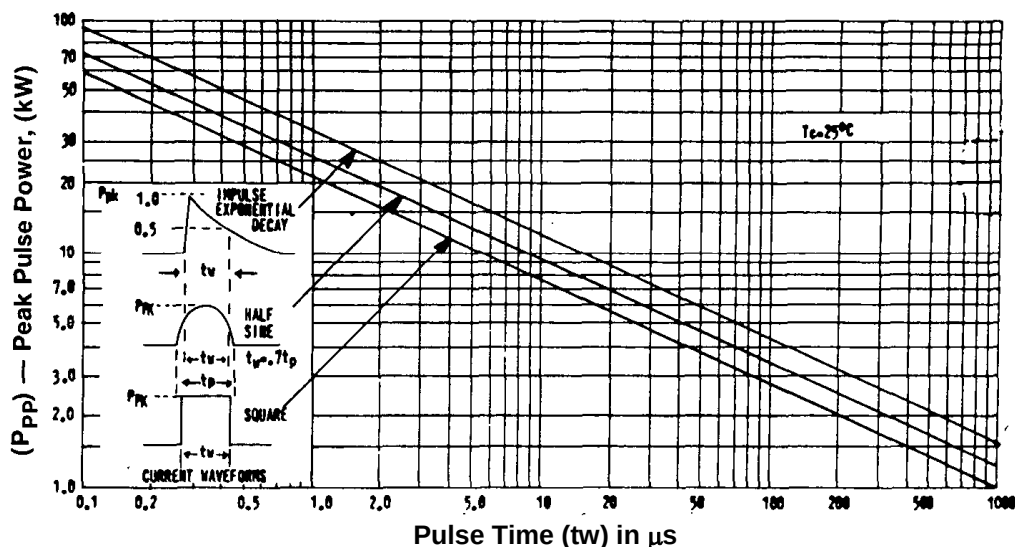
**ELECTRICAL CHARACTERISTICS @ 25°C**

| MICROSEMI<br>PART<br>NUMBER | REVERSE<br>STANDOFF<br>VOLTAGE<br>$V_{WM}$<br>VOLTS | BREAKDOWN VOLTAGE   |      | @<br>$I_{(BR)}$<br>mA | MAXIMUM<br>STANDBY<br>CURRENT<br>$I_D @ V_{WM}$<br>$\mu A$ | MAXIMUM<br>CLAMPING<br>VOLTAGE<br>$V_C @ I_{PP}$<br>VOLTS | MAXIMUM<br>PEAK<br>PULSE<br>CURRENT<br>$I_{PP} @$<br>10/1000 $\mu s$<br>AMPS | MAXIMUM<br>CAPACITANCE<br>@ 0 Volts,<br>$f = 1$ MHz<br>pF | WORKING<br>INVERSE<br>BLOCKING<br>VOLTAGE<br>$V_{WIB}$<br>VOLTS | INVERSE<br>BLOCKING<br>LEAKAGE<br>CURRENT<br>$I_{IB} @ V_{WIB}$<br>$\mu A$ | PEAK<br>INVERSE<br>BLOCKING<br>VOLTAGE<br>$V_{PIB}$<br>VOLTS |
|-----------------------------|-----------------------------------------------------|---------------------|------|-----------------------|------------------------------------------------------------|-----------------------------------------------------------|------------------------------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------------|----------------------------------------------------------------------------|--------------------------------------------------------------|
|                             |                                                     | $V_{(BR)}$<br>VOLTS |      |                       |                                                            |                                                           |                                                                              |                                                           |                                                                 |                                                                            |                                                              |
| LC6.5                       | 6.5                                                 | 7.22                | 8.82 | 10                    | 1000                                                       | 12.3                                                      | 100                                                                          | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC6.5A                      | 6.5                                                 | 7.22                | 7.98 | 10                    | 1000                                                       | 11.2                                                      | 100                                                                          | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC7.0                       | 7.0                                                 | 7.78                | 9.51 | 10                    | 500                                                        | 13.3                                                      | 100                                                                          | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC7.0A                      | 7.0                                                 | 7.78                | 8.60 | 10                    | 500                                                        | 12.0                                                      | 100                                                                          | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC7.5                       | 7.5                                                 | 8.33                | 10.2 | 10                    | 250                                                        | 14.3                                                      | 100                                                                          | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC7.5A                      | 7.5                                                 | 8.33                | 9.21 | 10                    | 250                                                        | 12.9                                                      | 100                                                                          | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC8.0                       | 8.0                                                 | 8.89                | 10.9 | 1                     | 100                                                        | 15.0                                                      | 100                                                                          | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC8.0A                      | 8.0                                                 | 8.89                | 9.83 | 1                     | 100                                                        | 13.6                                                      | 100                                                                          | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC8.5                       | 8.5                                                 | 9.44                | 11.5 | 1                     | 50                                                         | 15.9                                                      | 94                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC8.5A                      | 8.5                                                 | 9.44                | 10.4 | 1                     | 50                                                         | 14.4                                                      | 100                                                                          | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC9.0                       | 9.0                                                 | 10.0                | 12.2 | 1                     | 10                                                         | 16.9                                                      | 89                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC9.0A                      | 9.0                                                 | 10.0                | 11.1 | 1                     | 10                                                         | 15.4                                                      | 97                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC10                        | 10                                                  | 11.1                | 13.6 | 1                     | 5                                                          | 18.8                                                      | 80                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC10A                       | 10                                                  | 11.1                | 12.3 | 1                     | 5                                                          | 17.0                                                      | 88                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC11                        | 11                                                  | 12.2                | 14.9 | 1                     | 5                                                          | 20.1                                                      | 74                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC11A                       | 11                                                  | 12.2                | 13.5 | 1                     | 5                                                          | 18.2                                                      | 82                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC12                        | 12                                                  | 13.3                | 16.3 | 1                     | 5                                                          | 22.0                                                      | 68                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC12A                       | 12                                                  | 13.3                | 14.7 | 1                     | 5                                                          | 19.9                                                      | 75                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC13                        | 13                                                  | 14.4                | 17.6 | 1                     | 5                                                          | 23.8                                                      | 63                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC13A                       | 13                                                  | 14.4                | 15.9 | 1                     | 5                                                          | 21.5                                                      | 70                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC14                        | 14                                                  | 15.6                | 19.1 | 1                     | 5                                                          | 25.8                                                      | 58                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC14A                       | 14                                                  | 15.6                | 17.2 | 1                     | 5                                                          | 23.2                                                      | 65                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC15                        | 15                                                  | 16.7                | 20.4 | 1                     | 5                                                          | 26.9                                                      | 56                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC15A                       | 15                                                  | 16.7                | 18.5 | 1                     | 5                                                          | 24.4                                                      | 61                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC16                        | 16                                                  | 17.8                | 21.8 | 1                     | 5                                                          | 28.8                                                      | 52                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC16A                       | 16                                                  | 17.8                | 19.7 | 1                     | 5                                                          | 26.0                                                      | 57                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC17                        | 17                                                  | 18.9                | 23.1 | 1                     | 5                                                          | 30.5                                                      | 49                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC17A                       | 17                                                  | 18.9                | 20.9 | 1                     | 5                                                          | 27.6                                                      | 54                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC18                        | 18                                                  | 20.0                | 24.4 | 1                     | 5                                                          | 32.2                                                      | 46                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC18A                       | 18                                                  | 20.0                | 22.1 | 1                     | 5                                                          | 29.2                                                      | 51                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC20                        | 20                                                  | 22.2                | 27.1 | 1                     | 5                                                          | 35.8                                                      | 42                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC20A                       | 20                                                  | 22.2                | 24.5 | 1                     | 5                                                          | 32.4                                                      | 46                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC22                        | 22                                                  | 24.4                | 29.8 | 1                     | 5                                                          | 39.4                                                      | 38                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC22A                       | 22                                                  | 24.4                | 26.9 | 1                     | 5                                                          | 35.5                                                      | 42                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC24                        | 24                                                  | 26.7                | 32.6 | 1                     | 5                                                          | 43.0                                                      | 35                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC24A                       | 24                                                  | 26.7                | 29.5 | 1                     | 5                                                          | 38.9                                                      | 39                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC26                        | 26                                                  | 28.9                | 35.3 | 1                     | 5                                                          | 46.6                                                      | 32                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC26A                       | 26                                                  | 28.9                | 31.9 | 1                     | 5                                                          | 42.1                                                      | 36                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC28                        | 28                                                  | 31.1                | 38.0 | 1                     | 5                                                          | 50.1                                                      | 30                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC28A                       | 28                                                  | 31.1                | 34.4 | 1                     | 5                                                          | 45.4                                                      | 33                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC30                        | 30                                                  | 33.3                | 40.7 | 1                     | 5                                                          | 53.5                                                      | 28                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC30A                       | 30                                                  | 33.3                | 36.8 | 1                     | 5                                                          | 48.4                                                      | 31                                                                           | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC33                        | 33                                                  | 36.7                | 44.9 | 1                     | 5                                                          | 58.0                                                      | 25.4                                                                         | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC33A                       | 33                                                  | 36.7                | 40.6 | 1                     | 5                                                          | 53.3                                                      | 28.1                                                                         | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC36                        | 36                                                  | 40.0                | 48.9 | 1                     | 5                                                          | 64.3                                                      | 23.3                                                                         | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC36A                       | 36                                                  | 40.0                | 44.2 | 1                     | 5                                                          | 58.1                                                      | 25.8                                                                         | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC40                        | 40                                                  | 44.4                | 54.3 | 1                     | 5                                                          | 71.4                                                      | 21.0                                                                         | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC40A                       | 40                                                  | 44.4                | 49.1 | 1                     | 5                                                          | 64.5                                                      | 23.3                                                                         | 100                                                       | 75                                                              | 10                                                                         | 100                                                          |
| LC43                        | 43                                                  | 47.8                | 58.4 | 1                     | 5                                                          | 76.7                                                      | 19.5                                                                         | 100                                                       | 150                                                             | 10                                                                         | 200                                                          |
| LC43A                       | 43                                                  | 47.8                | 52.8 | 1                     | 5                                                          | 69.4                                                      | 21.6                                                                         | 100                                                       | 150                                                             | 10                                                                         | 200                                                          |
| LC45                        | 45                                                  | 50.0                | 61.1 | 1                     | 5                                                          | 80.3                                                      | 18.7                                                                         | 100                                                       | 150                                                             | 10                                                                         | 200                                                          |
| LC45A                       | 45                                                  | 50.0                | 55.3 | 1                     | 5                                                          | 72.7                                                      | 20.6                                                                         | 100                                                       | 150                                                             | 10                                                                         | 200                                                          |
| LC48                        | 48                                                  | 53.3                | 65.1 | 1                     | 5                                                          | 85.5                                                      | 17.5                                                                         | 100                                                       | 150                                                             | 10                                                                         | 200                                                          |
| LC48A                       | 48                                                  | 53.3                | 58.9 | 1                     | 5                                                          | 77.4                                                      | 19.4                                                                         | 100                                                       | 150                                                             | 10                                                                         | 200                                                          |
| LC51                        | 51                                                  | 56.7                | 69.3 | 1                     | 5                                                          | 91.1                                                      | 16.5                                                                         | 100                                                       | 150                                                             | 10                                                                         | 200                                                          |
| LC51A                       | 51                                                  | 56.7                | 62.7 | 1                     | 5                                                          | 82.4                                                      | 18.2                                                                         | 100                                                       | 150                                                             | 10                                                                         | 200                                                          |

| MICROSEMI<br>PART<br>NUMBER | REVERSE<br>STANDOFF<br>VOLTAGE<br>$V_{WM}$<br>VOLTS | BREAKDOWN VOLTAGE |                   | @<br>$I_{(BR)}$<br>mA | MAXIMUM<br>STANDBY<br>CURRENT<br>$I_D @ V_{WM}$<br>$\mu A$ | MAXIMUM<br>CLAMPING<br>VOLTAGE<br>$V_C @ I_{PP}$<br>VOLTS | MAXIMUM<br>PEAK<br>PULSE<br>CURRENT<br>$I_{PP} @$<br>10/1000 $\mu s$<br>AMPS | CAPACI-<br>TANCE<br>@ 0<br>Volts<br>pF | WORKING<br>INVERSE<br>BLOCKING<br>VOLTAGE<br>$V_{WIB}$<br>VOLTS | INVERSE<br>BLOCKING<br>LEAKAGE<br>CURRENT<br>$I_{IB} @ V_{WIB}$<br>$\mu A$ | PEAK<br>INVERSE<br>BLOCKING<br>VOLTAGE<br>$V_{PIB}$<br>VOLTS |
|-----------------------------|-----------------------------------------------------|-------------------|-------------------|-----------------------|------------------------------------------------------------|-----------------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------|-----------------------------------------------------------------|----------------------------------------------------------------------------|--------------------------------------------------------------|
|                             |                                                     | $V_{(BR)}$<br>MIN | $V_{(BR)}$<br>MAX |                       |                                                            |                                                           |                                                                              |                                        |                                                                 |                                                                            |                                                              |
| LC54                        | 54                                                  | 60.0              | 73.3              | 1                     | 5                                                          | 96.3                                                      | 15.6                                                                         | 100                                    | 150                                                             | 10                                                                         | 200                                                          |
| LC54A                       | 54                                                  | 60.0              | 66.3              | 1                     | 5                                                          | 87.1                                                      | 17.2                                                                         | 100                                    | 150                                                             | 10                                                                         | 200                                                          |
| LC58                        | 58                                                  | 64.4              | 78.7              | 1                     | 5                                                          | 103.0                                                     | 14.6                                                                         | 100                                    | 150                                                             | 10                                                                         | 200                                                          |
| LC58A                       | 58                                                  | 64.4              | 71.2              | 1                     | 5                                                          | 93.6                                                      | 16.0                                                                         | 100                                    | 150                                                             | 10                                                                         | 200                                                          |
| LC60                        | 60                                                  | 66.7              | 81.5              | 1                     | 5                                                          | 107.0                                                     | 14.0                                                                         | 90                                     | 150                                                             | 10                                                                         | 200                                                          |
| LC60A                       | 60                                                  | 66.7              | 73.7              | 1                     | 5                                                          | 96.8                                                      | 15.5                                                                         | 90                                     | 150                                                             | 10                                                                         | 200                                                          |
| LC64                        | 64                                                  | 71.1              | 86.9              | 1                     | 5                                                          | 114.0                                                     | 13.2                                                                         | 90                                     | 150                                                             | 10                                                                         | 200                                                          |
| LC64A                       | 64                                                  | 71.1              | 78.6              | 1                     | 5                                                          | 103.0                                                     | 14.6                                                                         | 90                                     | 150                                                             | 10                                                                         | 200                                                          |
| LC70                        | 70                                                  | 77.8              | 95.1              | 1                     | 5                                                          | 125                                                       | 12.0                                                                         | 90                                     | 150                                                             | 10                                                                         | 200                                                          |
| LC70A                       | 70                                                  | 77.8              | 86.0              | 1                     | 5                                                          | 113                                                       | 13.3                                                                         | 90                                     | 150                                                             | 10                                                                         | 200                                                          |
| LC75                        | 75                                                  | 83.3              | 102.0             | 1                     | 5                                                          | 134                                                       | 11.2                                                                         | 90                                     | 150                                                             | 10                                                                         | 200                                                          |
| LC75A                       | 75                                                  | 83.3              | 92.1              | 1                     | 5                                                          | 121                                                       | 12.4                                                                         | 90                                     | 150                                                             | 10                                                                         | 200                                                          |
| LC80                        | 80                                                  | 88.7              | 108               | 1                     | 5                                                          | 142                                                       | 10.6                                                                         | 90                                     | 150                                                             | 10                                                                         | 200                                                          |
| LC80A                       | 80                                                  | 88.7              | 98.0              | 1                     | 5                                                          | 129                                                       | 11.6                                                                         | 90                                     | 150                                                             | 10                                                                         | 200                                                          |
| LC90                        | 90                                                  | 100               | 122               | 1                     | 5                                                          | 160                                                       | 9.4                                                                          | 90                                     | 300                                                             | 10                                                                         | 200                                                          |
| LC90A                       | 90                                                  | 100               | 111               | 1                     | 5                                                          | 146                                                       | 10.3                                                                         | 90                                     | 300                                                             | 10                                                                         | 200                                                          |
| LC100                       | 100                                                 | 111               | 136               | 1                     | 5                                                          | 179                                                       | 8.4                                                                          | 90                                     | 300                                                             | 10                                                                         | 200                                                          |
| LC100A                      | 100                                                 | 111               | 123               | 1                     | 5                                                          | 162                                                       | 9.3                                                                          | 90                                     | 300                                                             | 10                                                                         | 200                                                          |
| LC110                       | 110                                                 | 122               | 149               | 1                     | 5                                                          | 196                                                       | 7.7                                                                          | 90                                     | 300                                                             | 10                                                                         | 400                                                          |
| LC110A                      | 110                                                 | 122               | 135               | 1                     | 5                                                          | 178                                                       | 8.4                                                                          | 90                                     | 300                                                             | 10                                                                         | 400                                                          |
| LC120                       | 120                                                 | 133               | 163               | 1                     | 5                                                          | 214                                                       | 7.0                                                                          | 90                                     | 300                                                             | 10                                                                         | 400                                                          |
| LC120A                      | 120                                                 | 133               | 147               | 1                     | 5                                                          | 193                                                       | 7.8                                                                          | 90                                     | 300                                                             | 10                                                                         | 400                                                          |
| LC130                       | 130                                                 | 144               | 176               | 1                     | 5                                                          | 231                                                       | 6.5                                                                          | 90                                     | 300                                                             | 10                                                                         | 400                                                          |
| LC130A                      | 130                                                 | 144               | 159               | 1                     | 5                                                          | 209                                                       | 7.2                                                                          | 90                                     | 300                                                             | 10                                                                         | 400                                                          |
| LC150                       | 150                                                 | 167               | 204               | 1                     | 5                                                          | 268                                                       | 5.6                                                                          | 90                                     | 300                                                             | 10                                                                         | 400                                                          |
| LC150A                      | 150                                                 | 167               | 185               | 1                     | 5                                                          | 243                                                       | 6.2                                                                          | 90                                     | 300                                                             | 10                                                                         | 400                                                          |
| LC160                       | 160                                                 | 178               | 218               | 1                     | 5                                                          | 287                                                       | 5.2                                                                          | 90                                     | 300                                                             | 10                                                                         | 400                                                          |
| LC160A                      | 160                                                 | 178               | 197               | 1                     | 5                                                          | 259                                                       | 5.8                                                                          | 90                                     | 300                                                             | 10                                                                         | 400                                                          |
| LC170                       | 170                                                 | 189               | 231               | 1                     | 5                                                          | 304                                                       | 4.9                                                                          | 90                                     | 300                                                             | 10                                                                         | 400                                                          |
| LC170A                      | 170                                                 | 189               | 209               | 1                     | 5                                                          | 275                                                       | 5.4                                                                          | 90                                     | 300                                                             | 10                                                                         | 400                                                          |

**NOTE:** TVS are normally selected according to the reverse "Standoff Voltage" ( $V_{WM}$ ) that should be equal to or greater than the dc or continuous peak operating voltage level.

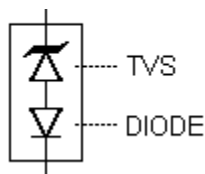
## GRAPHS



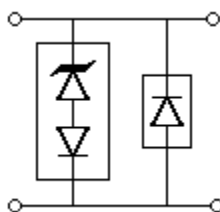
**FIGURE 1**  
Peak Pulse Power vs.  
Pulse Time ( $t_w$ ) in  $\mu s$

## SCHEMATIC APPLICATIONS

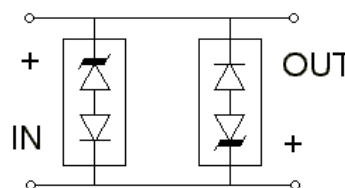
The TVS low capacitance device configuration is shown in Figure 2. As a further option for unidirectional applications, an additional low capacitance rectifier diode may be used in parallel in the same polarity direction as the TVS as shown in Figure 3. In applications where random high voltage transients occur, this will prevent reverse transients from damaging the internal low capacitance rectifier diode and also provide a low voltage conducting direction. The added rectifier diode should be of similar low capacitance and also have a higher reverse voltage rating than the TVS clamping voltage  $V_C$ . The Microsemi recommended rectifier part number is the "LCR80" for the application in Figure 5. If using two (2) low capacitance TVS devices in anti-parallel for bidirectional applications, this added protective feature for both directions (including the reverse of each rectifier diode) is also provided. The unidirectional and bidirectional configurations in Figure 3 and 4 will both result in twice the capacitance of Figure 2.



**FIGURE 2**  
TVS with internal Low  
Capacitance Diode

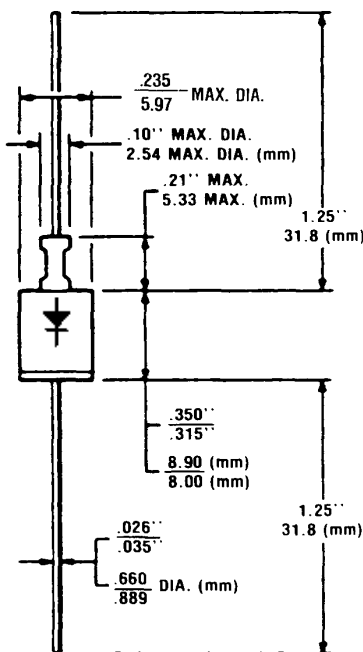


**FIGURE 3**  
Optional Unidirectional  
configuration (TVS and  
separate rectifier diode)  
in parallel)



**FIGURE 4**  
Optional Bidirectional  
configuration (two TVS  
devices in anti-parallel)

## PACKAGE DIMENSIONS



DO-13 (or DO-202AA)