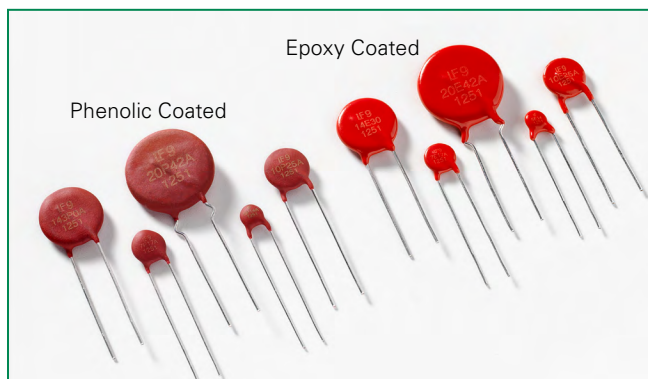


### LV UltraMOV™ Varistor Series



#### Agency Approvals

| Agency | Agency File Number          |
|--------|-----------------------------|
|        | E320116 (only Epoxy Coated) |

#### Description

The Littelfuse LV UltraMOV™ Series of low voltage, high surge current, radial leaded varistors provides an ideal circuit protection solution for lower DC voltage applications by offering higher surge ratings than ever before available in such small discs.

The maximum peak surge current rating can reach up to 8KA (8/20  $\mu$ s pulse) to protect against high peak surges, including indirect lightning strike interference, system switching transients and abnormal fast transients from the power source.

Available in five model sizes: 5mm, 7mm, 10mm, 14mm and 20mm, these device feature a wide VAC voltage range of 11V to 40V, and VDC voltage range of 14V to 56V.

#### Features

- Breakthrough in low voltage varistor design provides high peak surge current rating
- Reduced footprint and volume required for surge protection
- Optional phenolic coating
- High peak surge current rating up to 8KA (8/20  $\mu$ s pulse)
- Wide operating voltage range  $V_{M(AC)RMS}$  11V to 40V and  $V_{M(DC)}$  14V to 56V
- High operating temperature range up to 125°C
- 5 model sizes available: 5, 7, 10, 14, and 20mm
- Standard lead options
- Lead-free, Halogen-Free and RoHS compliant

#### Applications

- LED lighting drivers
- Cordless phones
- Wireless base stations
- Audio devices
- Mobile phone chargers
- Security systems
- Fire alarm systems
- Automation Control Systems (PLCs)
- Industrial Control Contact Relay
- Surge Protection Devices

#### Absolute Maximum Ratings

• For ratings of individual members of a series, see Device Ratings and Specifications chart

|                                                                                                | Low Voltage Series | Units      |
|------------------------------------------------------------------------------------------------|--------------------|------------|
| <b>Continuous:</b>                                                                             |                    |            |
| <b>Steady State Applied Voltage:</b>                                                           |                    |            |
| AC Voltage Range ( $V_{M(AC)RMS}$ )                                                            | 11 to 40           | V          |
| DC Voltage Range ( $V_{M(DC)}$ )                                                               | 14 to 56           | V          |
| <b>Transient:</b>                                                                              |                    |            |
| Non-Repetitive Surge Current, 8/20 $\mu$ s Waveform ( $I_{TM}$ )                               | 500 to 8,000       | A          |
| Non-Repetitive Energy Capability, 2ms Waveform ( $W_{TM}$ )                                    | 0.8 to 140         | J          |
| Operating Ambient Temperature Range ( $T_A$ ) for Epoxy coated                                 | -40 to +85         | °C         |
| Operating Ambient Temperature Range ( $T_A$ ) for Phenolic coated                              | -40 to +125        | °C         |
| Storage Temperature Range ( $T_{STG}$ ) for Epoxy coated                                       | -40 to +125        | °C         |
| Storage Temperature Range ( $T_{STG}$ ) for Phenolic coated                                    | -40 to +150        | °C         |
| Temperature Coefficient ( $\alpha V$ ) of Clamping Voltage ( $V_C$ ) at Specified Test Current | < 0.01 %           | °C         |
| Hi-Pot Encapsulation (Isolation Voltage Capability) for Epoxy coated                           | 2500               | V          |
| Hi-Pot Encapsulation (Isolation Voltage Capability) for Phenolic coated                        | 500                | V          |
| Epoxy Coating Insulation Resistance                                                            | >1,000             | M $\Omega$ |

**CAUTION:** Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

### LV UltraMOV™ Series Device Ratings & Specifications

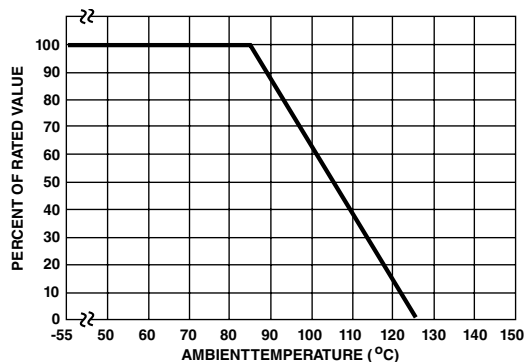
| Epoxy Coated Models     |          | Phenolic Coated Models  |          | Size Disc Dia. (mm) | Max Continuous Voltage |                    | Varistor Voltage at 1mA |                      |                      | Maximum Clamping Voltage |                 | Max Peak Current (8 x 20µS 1 pulse) | Energy Rating (2ms, 1pulse) | Typical Capacitance f = 1MHz |
|-------------------------|----------|-------------------------|----------|---------------------|------------------------|--------------------|-------------------------|----------------------|----------------------|--------------------------|-----------------|-------------------------------------|-----------------------------|------------------------------|
| Part Number (Base part) | Branding | Part Number (Base part) | Branding |                     | V <sub>M(AO)RMS</sub>  | V <sub>M(DC)</sub> | V <sub>NOM Min</sub>    | V <sub>NOM Nom</sub> | V <sub>NOM Max</sub> | V <sub>C</sub>           | I <sub>PK</sub> | I <sub>TM</sub>                     | W <sub>TM</sub>             | C                            |
|                         |          |                         |          |                     | (V)                    | (V)                | (V)                     | (V)                  | (V)                  | (V)                      | (A)             | (A)                                 | (J)                         | (pF)                         |
| V05E11P                 | P5E11    | V05P11P                 | P5P11    | 5                   | 11                     | 14                 | 16.2                    | 18.0                 | 19.8                 | 36                       | 1               | 500                                 | 0.8                         | 1300                         |
| V07E11P                 | P7E11    | V07P11P                 | P7P11    | 7                   | 11                     | 14                 | 16.2                    | 18.0                 | 19.8                 | 36                       | 2.5             | 1000                                | 2.0                         | 2900                         |
| V10E11P                 | P10E11   | V10P11P                 | P10P11   | 10                  | 11                     | 14                 | 16.2                    | 18.0                 | 19.8                 | 36                       | 5               | 2000                                | 4.2                         | 5450                         |
| V14E11P                 | P14E11   | V14P11P                 | P14P11   | 14                  | 11                     | 14                 | 16.2                    | 18.0                 | 19.8                 | 36                       | 10              | 4000                                | 8                           | 12000                        |
| V20E11P                 | P20E11   | V20P11P                 | P20P11   | 20                  | 11                     | 14                 | 16.2                    | 18.0                 | 19.8                 | 36                       | 20              | 8000                                | 25                          | 26000                        |
| V05E14P                 | P5E14    | V05P14P                 | P5P14    | 5                   | 14                     | 18                 | 19.8                    | 22.0                 | 24.2                 | 43                       | 1               | 500                                 | 1                           | 1100                         |
| V07E14P                 | P7E14    | V07P14P                 | P7P14    | 7                   | 14                     | 18                 | 19.8                    | 22.0                 | 24.2                 | 43                       | 2.5             | 1000                                | 2.2                         | 2450                         |
| V10E14P                 | P10E14   | V10P14P                 | P10P14   | 10                  | 14                     | 18                 | 19.8                    | 22.0                 | 24.2                 | 43                       | 5               | 2000                                | 5                           | 4650                         |
| V14E14P                 | P14E14   | V14P14P                 | P14P14   | 14                  | 14                     | 18                 | 19.8                    | 22.0                 | 24.2                 | 43                       | 10              | 4000                                | 10                          | 10200                        |
| V20E14P                 | P20E14   | V20P14P                 | P20P14   | 20                  | 14                     | 18                 | 19.8                    | 22.0                 | 24.2                 | 43                       | 20              | 8000                                | 28                          | 22200                        |
| V05E17P                 | P5E17    | V05P17P                 | P5P17    | 5                   | 17                     | 22                 | 24.3                    | 27.0                 | 29.7                 | 53                       | 1               | 500                                 | 1.4                         | 950                          |
| V07E17P                 | P7E17    | V07P17P                 | P7P17    | 7                   | 17                     | 22                 | 24.3                    | 27.0                 | 29.7                 | 53                       | 2.5             | 1000                                | 2.8                         | 2100                         |
| V10E17P                 | P10E17   | V10P17P                 | P10P17   | 10                  | 17                     | 22                 | 24.3                    | 27.0                 | 29.7                 | 53                       | 5               | 2000                                | 6.5                         | 3900                         |
| V14E17P                 | P14E17   | V14P17P                 | P14P17   | 14                  | 17                     | 22                 | 24.3                    | 27.0                 | 29.7                 | 53                       | 10              | 4000                                | 13                          | 8700                         |
| V20E17P                 | P20E17   | V20P17P                 | P20P17   | 20                  | 17                     | 22                 | 24.3                    | 27.0                 | 29.7                 | 53                       | 20              | 8000                                | 35                          | 18750                        |
| V05E20P                 | P5E20    | V05P20P                 | P5P20    | 5                   | 20                     | 26                 | 29.7                    | 33.0                 | 36.3                 | 65                       | 1               | 500                                 | 2                           | 850                          |
| V07E20P                 | P7E20    | V07P20P                 | P7P20    | 7                   | 20                     | 26                 | 29.7                    | 33.0                 | 36.3                 | 65                       | 2.5             | 1000                                | 4.2                         | 1750                         |
| V10E20P                 | P10E20   | V10P20P                 | P10P20   | 10                  | 20                     | 26                 | 29.7                    | 33.0                 | 36.3                 | 65                       | 5               | 2000                                | 10                          | 3400                         |
| V14E20P                 | P14E20   | V14P20P                 | P14P20   | 14                  | 20                     | 26                 | 29.7                    | 33.0                 | 36.3                 | 65                       | 10              | 4000                                | 20                          | 7500                         |
| V20E20P                 | P20E20   | V20P20P                 | P20P20   | 20                  | 20                     | 26                 | 29.7                    | 33.0                 | 36.3                 | 65                       | 20              | 8000                                | 58                          | 15000                        |
| V05E23P                 | P5E23    | V05P23P                 | P5P23    | 5                   | 23                     | 28                 | 32.4                    | 36.0                 | 39.6                 | 71                       | 1               | 500                                 | 2.2                         | 800                          |
| V07E23P                 | P7E23    | V07P23P                 | P7P23    | 7                   | 23                     | 28                 | 32.4                    | 36.0                 | 39.6                 | 71                       | 2.5             | 1000                                | 5.0                         | 1650                         |
| V10E23P                 | P10E23   | V10P23P                 | P10P23   | 10                  | 23                     | 28                 | 32.4                    | 36.0                 | 39.6                 | 71                       | 5               | 2000                                | 12                          | 3200                         |
| V14E23P                 | P14E23   | V14P23P                 | P14P23   | 14                  | 23                     | 28                 | 32.4                    | 36.0                 | 39.6                 | 71                       | 10              | 4000                                | 23                          | 7000                         |
| V20E23P                 | P20E23   | V20P23P                 | P20P23   | 20                  | 23                     | 28                 | 32.4                    | 36.0                 | 39.6                 | 71                       | 20              | 8000                                | 70                          | 14000                        |
| V05E25P                 | P5E25    | V05P25P                 | P5P25    | 5                   | 25                     | 31                 | 35.1                    | 39.0                 | 42.9                 | 77                       | 1               | 500                                 | 2.5                         | 750                          |
| V07E25P                 | P7E25    | V07P25P                 | P7P25    | 7                   | 25                     | 31                 | 35.1                    | 39.0                 | 42.9                 | 77                       | 2.5             | 1000                                | 5.5                         | 1500                         |
| V10E25P                 | P10E25   | V10P25P                 | P10P25   | 10                  | 25                     | 31                 | 35.1                    | 39.0                 | 42.9                 | 77                       | 5               | 2000                                | 13                          | 2900                         |
| V14E25P                 | P14E25   | V14P25P                 | P14P25   | 14                  | 25                     | 31                 | 35.1                    | 39.0                 | 42.9                 | 77                       | 10              | 4000                                | 25                          | 6200                         |
| V20E25P                 | P20E25   | V20P25P                 | P20P25   | 20                  | 25                     | 31                 | 35.1                    | 39.0                 | 42.9                 | 77                       | 20              | 8000                                | 77                          | 13500                        |
| V05E30P                 | P5E30    | V05P30P                 | P5P30    | 5                   | 30                     | 38                 | 42.3                    | 47.0                 | 51.7                 | 93                       | 1               | 500                                 | 3.1                         | 650                          |
| V07E30P                 | P7E30    | V07P30P                 | P7P30    | 7                   | 30                     | 38                 | 42.3                    | 47.0                 | 51.7                 | 93                       | 2.5             | 1000                                | 7                           | 1350                         |
| V10E30P                 | P10E30   | V10P30P                 | P10P30   | 10                  | 30                     | 38                 | 42.3                    | 47.0                 | 51.7                 | 93                       | 5               | 2000                                | 15.5                        | 2550                         |
| V14E30P                 | P14E30   | V14P30P                 | P14P30   | 14                  | 30                     | 38                 | 42.3                    | 47.0                 | 51.7                 | 93                       | 10              | 4000                                | 32                          | 5550                         |
| V20E30P                 | P20E30   | V20P30P                 | P20P30   | 20                  | 30                     | 38                 | 42.3                    | 47.0                 | 51.7                 | 93                       | 20              | 8000                                | 90                          | 12000                        |
| V05E35P                 | P5E35    | V05P35P                 | P5P35    | 5                   | 35                     | 45                 | 50.4                    | 56.0                 | 61.6                 | 93                       | 1               | 500                                 | 4                           | 550                          |
| V07E35P                 | P7E35    | V07P35P                 | P7P35    | 7                   | 35                     | 45                 | 50.4                    | 56.0                 | 61.6                 | 110                      | 2.5             | 1000                                | 9                           | 1200                         |
| V10E35P                 | P10E35   | V10P35P                 | P10P35   | 10                  | 35                     | 45                 | 50.4                    | 56.0                 | 61.6                 | 110                      | 5               | 2000                                | 20                          | 2200                         |
| V14E35P                 | P14E35   | V14P35P                 | P14P35   | 14                  | 35                     | 45                 | 50.4                    | 56.0                 | 61.6                 | 110                      | 10              | 4000                                | 40                          | 5000                         |
| V20E35P                 | P20E35   | V20P35P                 | P20P35   | 20                  | 35                     | 45                 | 50.4                    | 56.0                 | 61.6                 | 110                      | 20              | 8000                                | 115                         | 10500                        |
| V05E40P                 | P5E40    | V05P40P                 | P5P40    | 5                   | 40                     | 56                 | 61.2                    | 68.0                 | 74.8                 | 135                      | 1               | 500                                 | 5                           | 500                          |
| V07E40P                 | P7E40    | V07P40P                 | P7P40    | 7                   | 40                     | 56                 | 61.2                    | 68.0                 | 74.8                 | 135                      | 2.5             | 1000                                | 11                          | 1000                         |
| V10E40P                 | P10E40   | V10P40P                 | P10P40   | 10                  | 40                     | 56                 | 61.2                    | 68.0                 | 74.8                 | 135                      | 5               | 2000                                | 25                          | 1850                         |
| V14E40P                 | P14E40   | V14P40P                 | P14P40   | 14                  | 40                     | 56                 | 61.2                    | 68.0                 | 74.8                 | 135                      | 10              | 4000                                | 50                          | 4000                         |
| V20E40P                 | P20E40   | V20P40P                 | P20P40   | 20                  | 40                     | 56                 | 61.2                    | 68.0                 | 74.8                 | 135                      | 20              | 8000                                | 140                         | 8500                         |

Note: 1. Average power dissipation of transients not to exceed 0.2W, 0.25W, 0.4W, 0.6W or 1W for model sizes 5mm, 7mm, 10mm, 14mm and 20mm, respectively.

### Current Energy and Power Dissipation Ratings

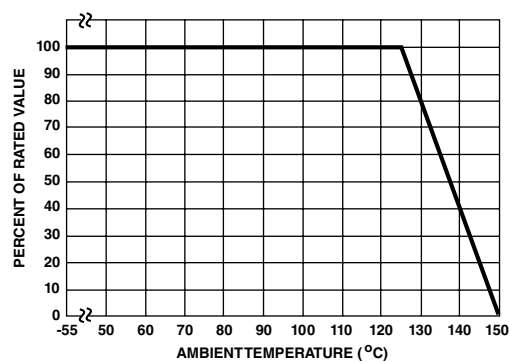
**Figure 1A - Power Derating for Epoxy Coated**

For applications exceeding 85°C ambient temperature, the peak surge current and energy ratings must be reduced as shown below.

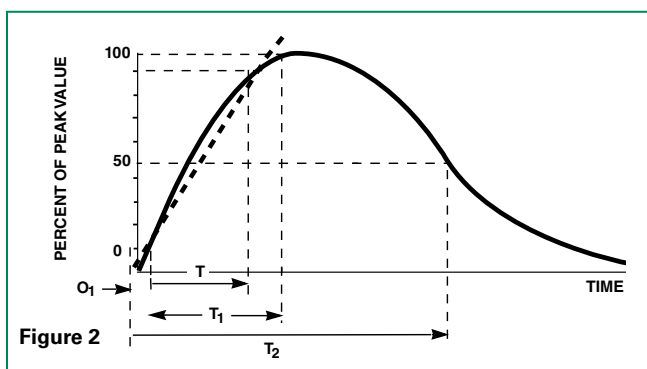


**Figure 1B - Power Derating for Phenolic Coated**

For applications exceeding 125°C ambient temperature, the peak surge current and energy ratings must be reduced as shown below.



### Peak Pulse Current Test Waveform for Clamping Voltage



$O_1$  = Virtual Origin of Wave

$T$  = Time from 10% to 90% of Peak

$T_1$  = Rise Time =  $1.25 \times T$

$T_2$  = Decay Time

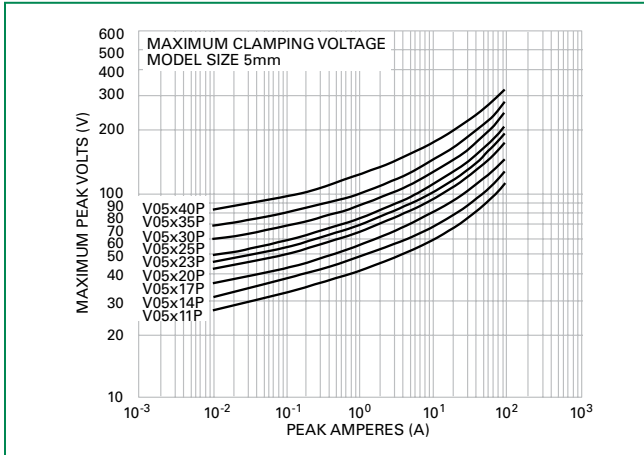
**Example** - For an 8/20  $\mu s$  Current Waveform:

$8\mu s = T_1$  = Rise Time

$20\mu s = T_2$  = Decay Time

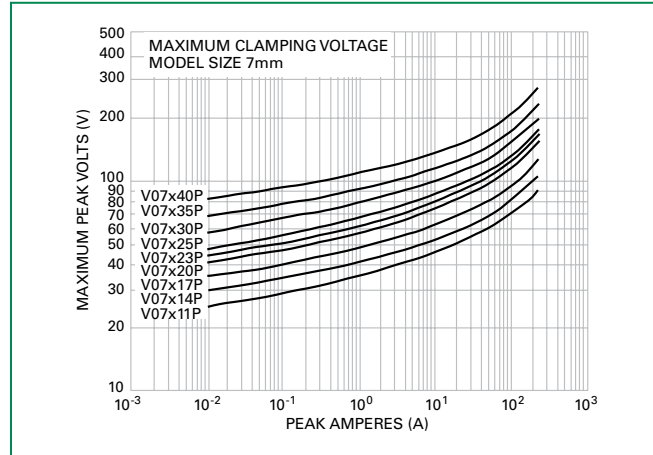
### Maximum Clamping Voltage for 5mm Parts

V05x11P - V05x40P



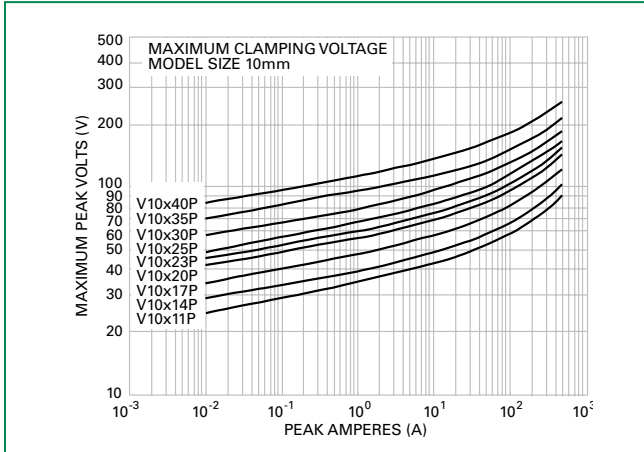
### Maximum Clamping Voltage for 7mm Parts

V07x11P - V07x40P



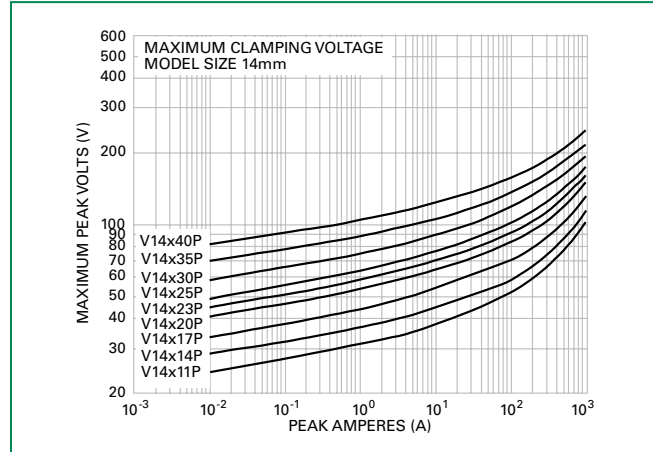
### Maximum Clamping Voltage for 10mm Parts

V10x11P - V10x40P



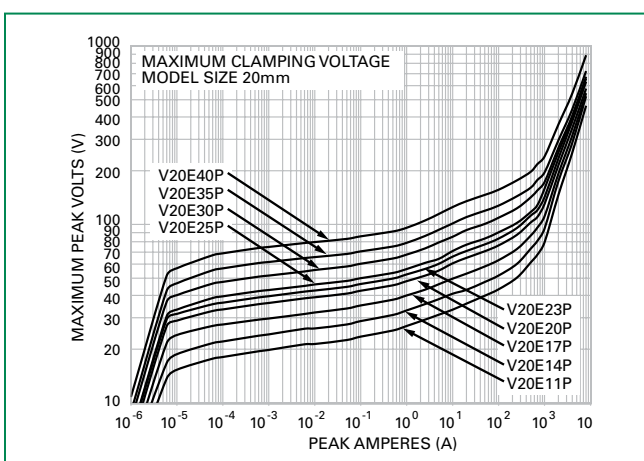
### Maximum Clamping Voltage for 14mm Parts

V14x11P - V14x40P



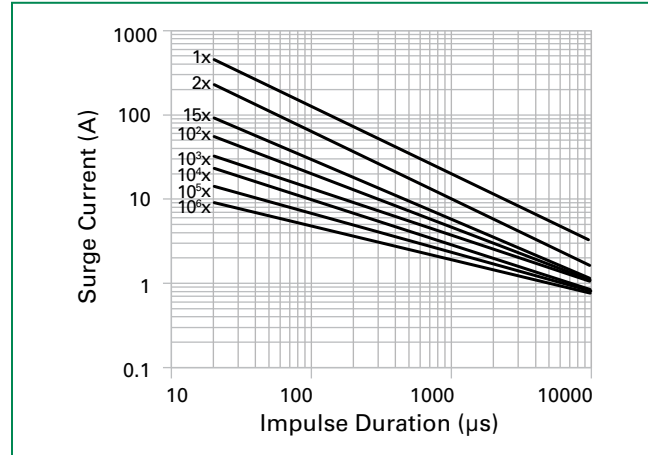
### Maximum Clamping Voltage for 20mm Parts

V20x11P - V20x40P



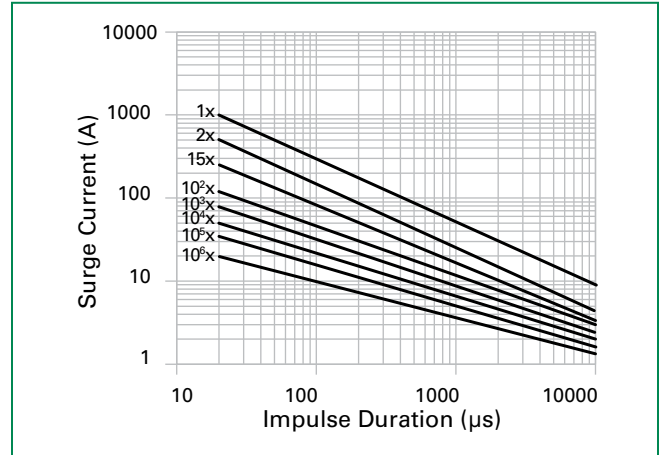
### Repetitive Surge Capability for 5mm Parts

V05x11P - V05x40P



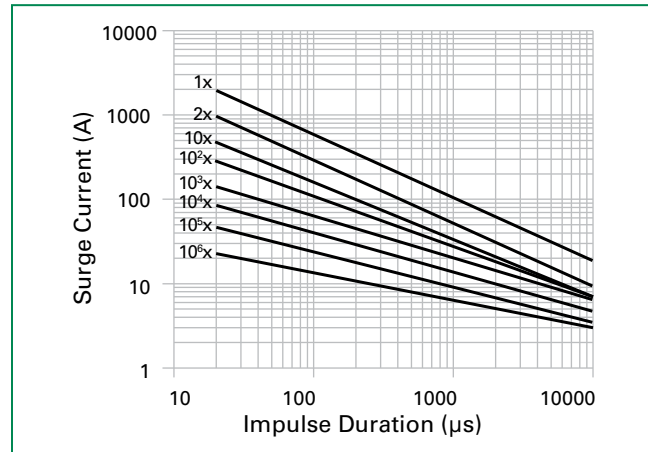
### Repetitive Surge Capability for 7mm Parts

V07x11P - V07x40P



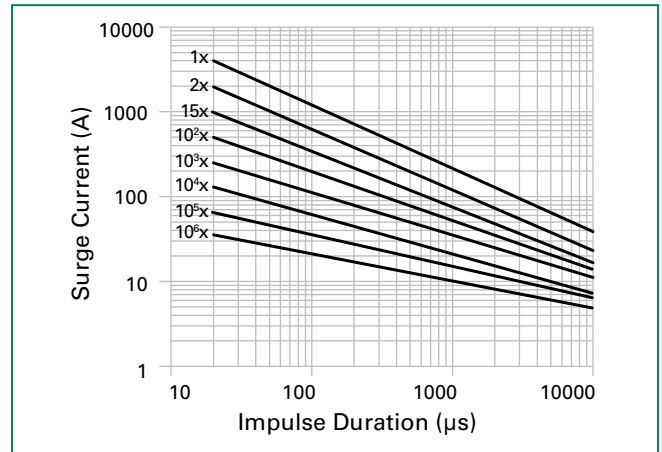
### Repetitive Surge Capability for 10mm Parts

V10x11P - V10x40P



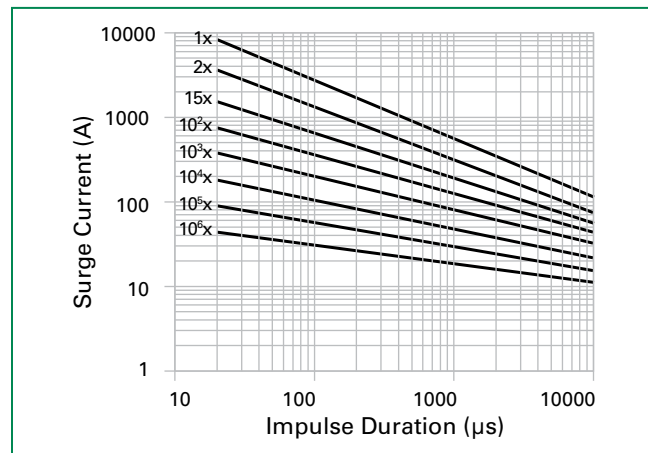
### Repetitive Surge Capability for 14mm Parts

V14x11P - V14x40P



### Repetitive Surge Capability for 20mm Parts

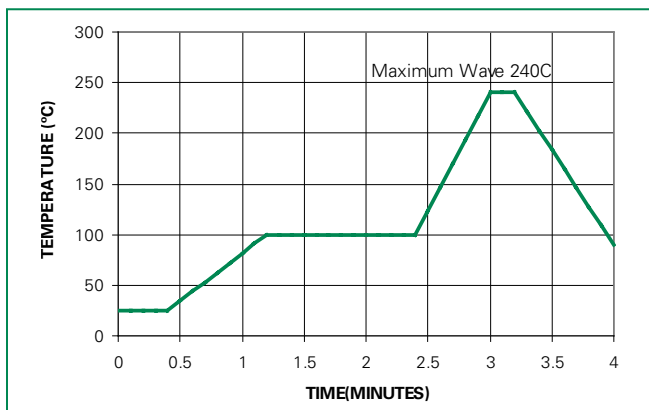
V20x11P - V20x40P



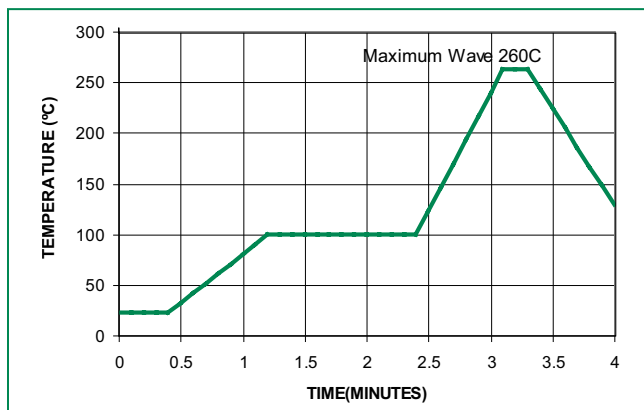
NOTE: If pulse ratings are exceeded, a shift of  $V_{NIDCI}$  (at specified current) of more than  $\pm 10\%$  could result. This type of shift, which normally results in a decrease of  $V_{NIDCI}$ , may result in the device not meeting the original published specifications, but does not prevent the device from continuing to function, and to provide ample protection.

### Wave Solder Profile

#### Non Lead-free Profile



#### Lead-free Profile



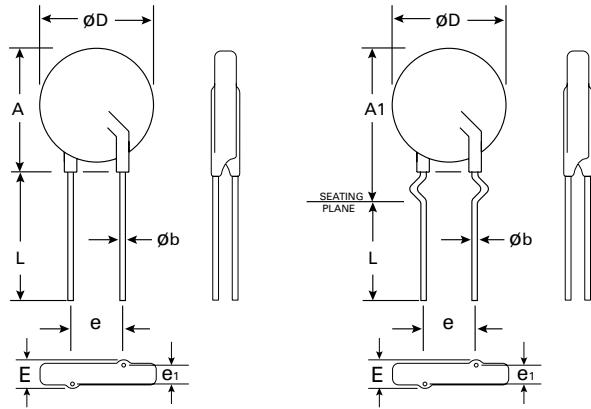
### Physical Specifications

|                                  |                                                                 |
|----------------------------------|-----------------------------------------------------------------|
| <b>Lead Material</b>             | Copper Clad Steel Wire                                          |
| <b>Soldering Characteristics</b> | Solderability per MIL-STD-202, Method 208E                      |
| <b>Insulating Material</b>       | Cured, flame retardant epoxy polymer meets UL94V-0 requirements |
| <b>Device Labeling</b>           | Marked with LF, voltage and date code                           |

### Environmental Specifications

|                             |                                                            |
|-----------------------------|------------------------------------------------------------|
| <b>Humidity Aging</b>       | +85°C, 85% RH, 1000 hours<br>+/-10% typical voltage change |
| <b>Thermal Shock</b>        | +85°C to -40°C 10 times<br>+/-10% typical voltage change   |
| <b>Solvent Resistance</b>   | MIL-STD-202, Method 215F                                   |
| <b>Moisture Sensitivity</b> | Level 1, J-STD-020C                                        |

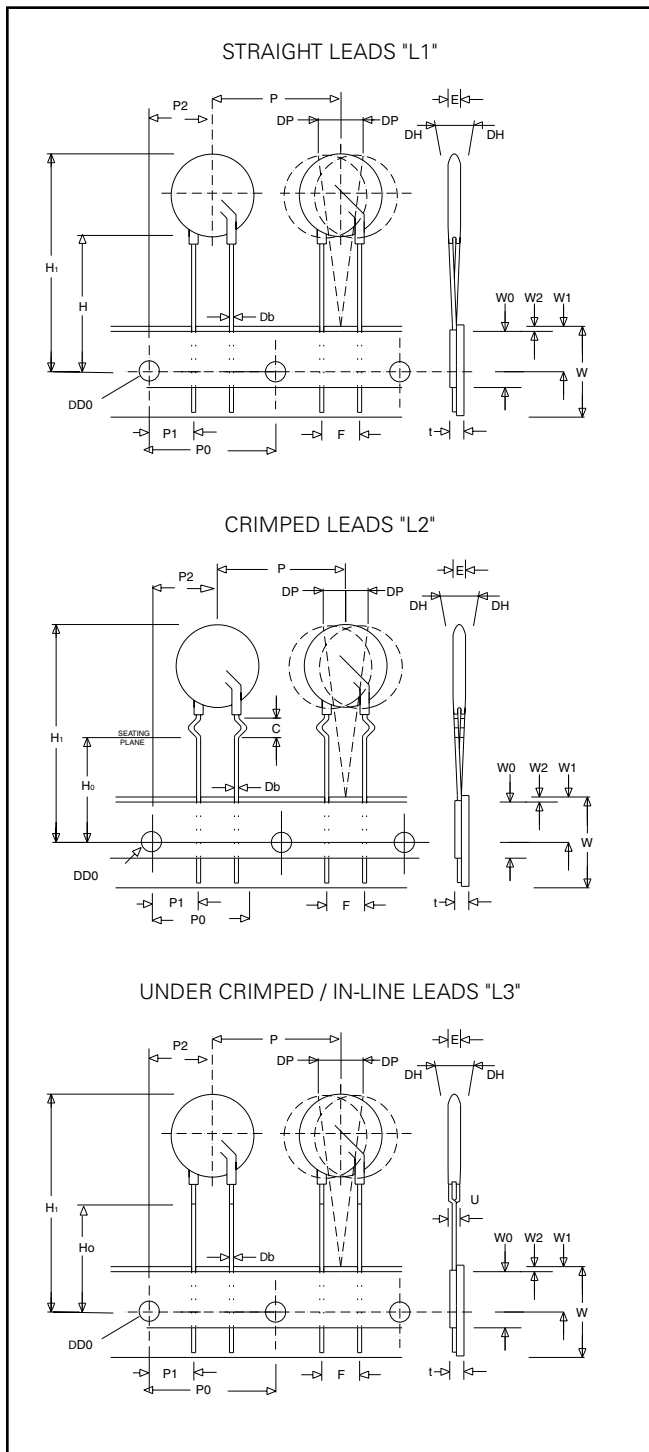
### Product Dimensions (mm)



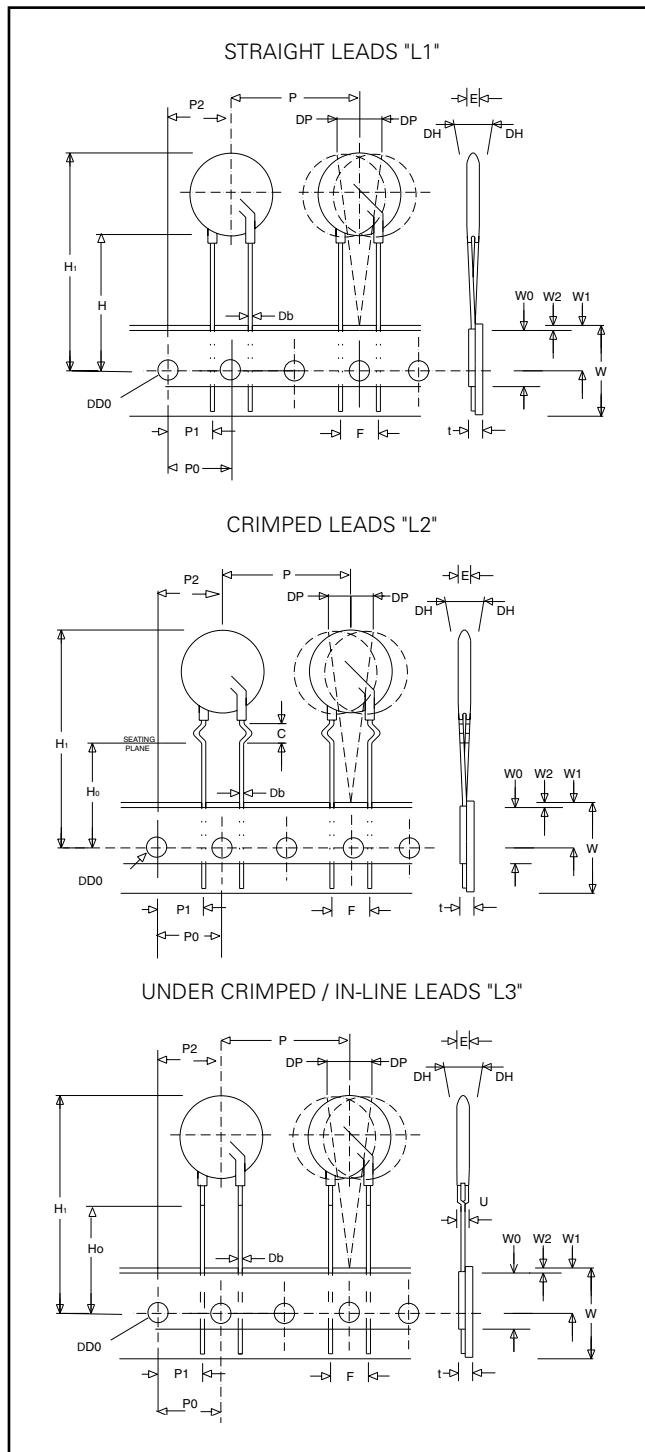
| Dimension               | V <sub>RMS</sub><br>Voltage Model | 5mm Size         |                  | 7mm Size         |                  | 10mm Size       |                 | 14mm Size       |                 | 20mm Size       |                 |
|-------------------------|-----------------------------------|------------------|------------------|------------------|------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                         |                                   | Min.<br>mm (in)  | Max.<br>mm (in)  | Min.<br>mm (in)  | Max.<br>mm (in)  | Min.<br>mm (in) | Max.<br>mm (in) | Min.<br>mm (in) | Max.<br>mm (in) | Min.<br>mm (in) | Max.<br>mm (in) |
| <b>A</b>                | All                               | -                | 10<br>(0.394)    | -                | 12<br>(0.472)    | -               | 16<br>(0.630)   | -               | 20<br>(0.787)   | -               | 26.5<br>(1.043) |
| <b>A1</b>               | All                               | -                | 13<br>(0.512)    | -                | 15<br>(0.591)    | -               | 19.5<br>(0.768) | -               | 22.5<br>(0.886) | -               | 29<br>(1.142)   |
| <b>ØD</b>               | All                               | -                | 7<br>(0.276)     | -                | 9<br>(0.354)     | -               | 12.5<br>(0.492) | -               | 17<br>(0.669)   | -               | 23<br>(0.906)   |
| <b>e</b>                | All                               | 4<br>(0.157)     | 6<br>(0.236)     | 4<br>(0.157)     | 6<br>(0.236)     | 6.5<br>(0.256)  | 8.5<br>(0.335)  | 6.5<br>(0.256)  | 8.5<br>(0.335)  | 6.5<br>(0.256)  | 8.5<br>(0.335)  |
| <b>e<sub>1</sub></b>    | 11 - 30                           | 1<br>(0.039)     | 3<br>(0.118)     | 1<br>(0.039)     | 3<br>(0.118)     | 1<br>(0.039)    | 3<br>(0.118)    | 1<br>(0.039)    | 3<br>(0.118)    | 1<br>(0.039)    | 3<br>(0.118)    |
|                         | 35 - 40                           | 1.5<br>(0.059)   | 3.5<br>(0.138)   | 1.5<br>(0.059)   | 3.5<br>(0.138)   | 1.5<br>(0.059)  | 3.5<br>(0.138)  | 1.5<br>(0.059)  | 3.5<br>(0.138)  | 1.5<br>(0.059)  | 3.5<br>(0.138)  |
| <b>E</b>                | 11 - 30                           | -                | 5.0<br>(0.197)   | -                | 5.0<br>(0.197)   | -               | 5.0<br>(0.197)  | -               | 5.0<br>(0.197)  | -               | 5.0<br>(0.197)  |
|                         | 35 - 40                           | -                | 5.6<br>(0.220)   | -                | 5.6<br>(0.220)   | -               | 5.6<br>(0.220)  | -               | 5.6<br>(0.220)  | -               | 5.6<br>(0.220)  |
| <b>Øb</b>               | All                               | 0.585<br>(0.023) | 0.685<br>(0.027) | 0.585<br>(0.023) | 0.685<br>(0.027) | 0.76<br>(0.030) | 0.86<br>(0.034) | 0.76<br>(0.030) | 0.86<br>(0.034) | 0.76<br>(0.030) | 0.86<br>(0.034) |
| <b>L</b>                | All                               | 25.4<br>(1.00)   | -                | 25.4<br>(1.00)   | -                | 25.4<br>(1.00)  | -               | 25.4<br>(1.00)  | -               | 25.4<br>(1.00)  | -               |
| <b>L<sub>TRIM</sub></b> | All                               | 2.41 (0.095)     | 4.69<br>(0.185)  | 2.41<br>(0.095)  | 4.69<br>(0.185)  | 2.41<br>(0.095) | 4.69<br>(0.185) | 2.41<br>(0.095) | 4.69<br>(0.185) | 2.41<br>(0.095) | 4.69<br>(0.185) |

**Tape and Reel Specifications**

**5 and 7mm Devices**



**10, 14 and 20mm Devices**



Refer to next page for dimension measurement specifics.



### Tape and Reel Specifications (continued)

NOTES:

- Radial devices on tape are supplied with crimped leads, straight leads, or under-crimped leads
- Leads are offset by product dimension e1
- Conforms to ANSI and EIA specifications
- Can be supplied to IEC Publication 286-2

| SYMBOL               | DESCRIPTION                               | MODEL SIZE        |                   |                   |                   |                   |
|----------------------|-------------------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|                      |                                           | 5mm               | 7mm               | 10mm              | 14mm              | 20mm              |
| <b>P</b>             | Pitch of Component                        | 12.7 +/- 1.0      | 12.7 +/- 1.0      | 25.4 +/- 1.0      | 25.4 +/- 1.0      | 25.4 +/- 1.0      |
| <b>P<sub>0</sub></b> | Feed Hole Pitch                           | 12.7 +/- 0.2      | 12.7 +/- 0.2      | 12.7 +/- 0.2      | 12.7 +/- 0.2      | 12.7 +/- 0.2      |
| <b>P<sub>1</sub></b> | Feed Hole Center to Pitch                 | 3.85 +/- 0.7      | 3.85 +/- 0.7      | 8.85 +/- 0.7      | 8.85 +/- 0.7      | 8.85 +/- 0.7      |
| <b>P<sub>2</sub></b> | Hole Center to Component Center           | 6.35 +/- 1.0      | 6.35 +/- 1.0      | 12.7 +/- 0.7      | 12.7 +/- 0.7      | 12.7 +/- 0.7      |
| <b>F</b>             | Lead to Lead Distance                     | 5.0 +/- 1.0       | 5.0 +/- 1.0       | 7.5 +/- 1.0       | 7.5 +/- 1.0       | 7.5 +/- 1.0       |
| <b>h</b>             | Component Alignment                       | 2.0 Max           | 2.0 Max           | 2.0 Max           | 2.0 Max           | 2.0 Max           |
| <b>W</b>             | Tape Width                                | 18.0 +1.0 / -0.5  | 18.0 +1.0 / -0.5  | 18.0 +1.0 / -0.5  | 18.0 +1.0 / -0.5  | 18.0 +1.0 / -0.5  |
| <b>W<sub>0</sub></b> | Hold Down Tape Width                      | 12.0 +/- 0.3      | 12.0 +/- 0.3      | 12.0 +/- 0.3      | 12.0 +/- 0.3      | 12.0 +/- 0.3      |
| <b>W<sub>1</sub></b> | Hole Position                             | 9.0 +0.75 / -0.50 | 9.0 +0.75 / -0.50 | 9.0 +0.75 / -0.50 | 9.0 +0.75 / -0.50 | 9.0 +0.75 / -0.50 |
| <b>W<sub>2</sub></b> | Hold Down Tape Position                   | 0.5 Max           | 0.5 Max           | 0.5 Max           | 0.5 Max           | 0.5 Max           |
| <b>H</b>             | Height from Tape Center to Component Base | 18.0 +2.0 / -0.0  | 18.0 +2.0 / -0.0  | 18.0 +2.0 / -0.0  | 18.0 +2.0 / -0.0  | 18.0 +2.0 / -0.0  |
| <b>H<sub>0</sub></b> | Seating Plane Height                      | 16.0 +/- 0.5      | 16.0 +/- 0.5      | 16.0 +/- 0.5      | 16.0 +/- 0.5      | 16.0 +/- 0.5      |
| <b>H<sub>1</sub></b> | Component Height                          | 29.0 Max          | 32.0 Max          | 36.0 Max          | 40.0 Max          | 46.5 Max          |
| <b>D<sub>0</sub></b> | Feed Hole Diameter                        | 4.0 +/- 0.2       | 4.0 +/- 0.2       | 4.0 +/- 0.2       | 4.0 +/- 0.2       | 4.0 +/- 0.2       |
| <b>t</b>             | Total Tape Thickness                      | 0.7 +/- 0.2       | 0.7 +/- 0.2       | 0.7 +/- 0.2       | 0.7 +/- 0.2       | 0.7 +/- 0.2       |
| <b>U</b>             | Undercrimp Width                          | 8.0 Max           | 8.0 Max           | 8.0 Max           | 8.0 Max           | 8.0 Max           |
| <b>p</b>             | Component Alignment                       | 3° Max            | 3° Max            | 3° Max            | 3° Max            | 3° Max            |

### Part Numbering System

