

Varistor Products

High Surge Current, Radial Lead

UltraMOV™ Varistor Series



The UltraMOV Metal Oxide Varistor Series is designed for applications requiring high peak surge current ratings and high energy absorption capability. UltraMOV varistors are primarily intended for use in AC Line Voltage applications such as Transient Voltage Surge Suppressors (TVSS), Uninterruptable Power Supplies (UPS), AC Power Taps, AC Power Meters, or other products that require voltage clamping of high transient surge currents from sources such as lightning, inductive load switching, or capacitor bank switching.

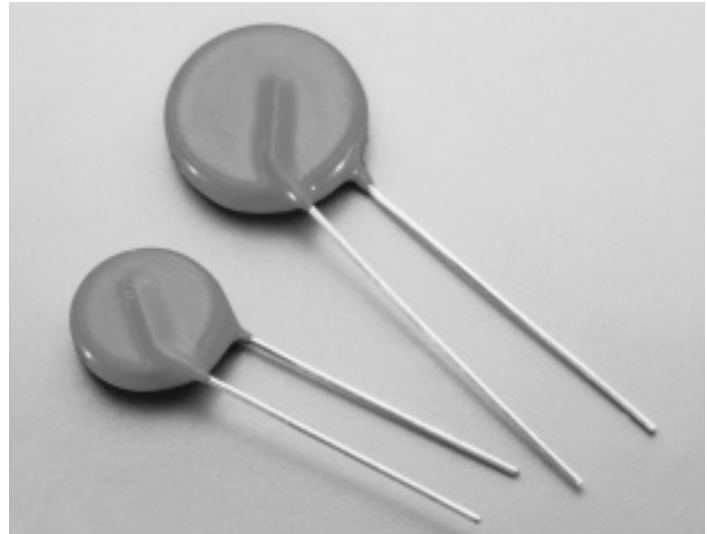
These devices are produced in radial lead package sizes of 7, 10, 14, and 20mm and offered in a variety of lead forms. UltraMOVs are manufactured with recognized epoxy encapsulation and are rated for ambient temperatures up to 85°C with no derating. This Series is LASER-branded and is supplied in bulk, ammo pack (fan-fold), or tape and reel packaging.

Features

- Lead-free and RoHS compliant option available. Please see the device and ratings specifications table for more information.
- High Peak Surge Current Rating (I_{TM}) Up to 10kA, Single 8 x 20 Pulse, (20mm)
- Standard Operating Voltage Range Compatible with Common AC Line Voltages (130VAC to 625VAC)
- Characterized for Maximum Standby Current (Leakage)
- Custom Voltage Types Available
- Standard Lead Form and Lead Space Options

AGENCY APPROVALS: Recognized under the components program of Underwriters Laboratories. Certified by CSA, VDE and CECC. VDE certification of Lead-free and RoHS compliant parts pending.

AGENCY FILE NUMBERS: UL E75961, CSA LR91788, VDE 116895E, CECC 42201-006.



**NEW LEAD-FREE AND
RoHS COMPLIANT PARTS
AVAILABLE**

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

Continuous:

Steady State AC Voltage Range ($V_{M(AC)RMS}$) 130 to 625V V

Transient:

Single-Pulse Peak Current (I_{TM}) 8x20μs Wave (See Figure 2) 1,750 to 10,000 A

Single-Pulse Energy Range (W_{TM}) 2ms Square Wave 12.5 to 400 J

Maximum Temporary Overvoltage of $V_{M(AC)}$

5 Minutes at 25°C 130 %

5 Minutes at 125°C 125 %

Operating Ambient Temperature Range (T_A) -55 to 85 °C

Storage Temperature Range (T_{STG}) -55 to 125 °C



Temperature Coefficient (α_V) of Clamping Voltage (V_C) at Specified Test Current <0.01 %/°C

Hi-Pot Encapsulation Isolation Voltage Capability, Per MIL-STD-202, Method 301 2500 V

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.

NOTE: 2MS SQ Wave Us. 100x1000 exponential condition for Ultra CIII, LA, TA and FCTC.

Device Ratings and Specifications

|   LEAD-FREE AND RoHS COMPLIANT MODELS | | STANDARD MODELS | | MAXIMUM RATING (85°C) | | | | | SPECIFICATIONS (25°C) | | | | |
|--|----------|------------------------|----------|-----------------------|-------------|------------|------------------------|--------------------|---|---------------|------------------------------------|----------|---------------------|
| | | | | CONTINUOUS | | TRANSIENT | | | VARISTOR VOLTAGE AT 1mA DC TEST CURRENT | | MAXIMUM CLAMPING VOLTAGE 8 x 20 μs | | TYPICAL CAPACITANCE |
| | | | | RMS VOLTS | DC VOLTS | ENERGY 2ms | PEAK CURRENT 8 x 20 μs | | | | | | |
| PART NUMBER | BRANDING | PART NUMBER | BRANDING | $V_{M(AC)}$ | $V_{M(DC)}$ | W_{TM} | I_{TM} 1 x PULSE | I_{TM} 2 x PULSE | V_{NOM} MIN | V_{NOM} MAX | V_C | I_{PK} | f = 1MHz |
| | | | | (V) | (V) | (J) | (A) | (A) | (V) | | (V) | (A) | (pF) |
| V07E130P | P7V130 | V07E130 | 7V130 | 130 | 170 | 12.5 | 1750 | 1200 | 184 | 226 | 340 | 10 | 180 |
| V10E130P | P10V130 | V10E130 | 10V130 | 130 | 170 | 25 | 3500 | 2500 | 184 | 226 | 340 | 25 | 450 |
| V14E130P | P14V130 | V14E130 | 14V130 | 130 | 170 | 50 | 6000 | 4500 | 184 | 226 | 340 | 50 | 1000 |
| V20E130P | P20V130 | V20E130 | 20V130 | 130 | 170 | 100 | 10000 | 6500 | 184 | 226 | 340 | 100 | 1900 |
| V07E140P | P7V140 | V07E140 | 7V140 | 140 | 180 | 13.5 | 1750 | 1200 | 200 | 240 | 360 | 10 | 160 |
| V10E140P | P10V140 | V10E140 | 10V140 | 140 | 180 | 27.5 | 3500 | 2500 | 200 | 240 | 360 | 25 | 400 |
| V14E140P | P14V140 | V14E140 | 14V140 | 140 | 180 | 55 | 6000 | 4500 | 200 | 240 | 360 | 50 | 900 |
| V20E140P | P20V140 | V20E140 | 20V140 | 140 | 180 | 110 | 10000 | 6500 | 200 | 240 | 360 | 100 | 1750 |
| V07E150P | P7V150 | V07E150 | 7V150 | 150 | 200 | 15 | 1750 | 1200 | 216 | 264 | 395 | 10 | 150 |
| V10E150P | P10V150 | V10E150 | 10V150 | 150 | 200 | 30 | 3500 | 2500 | 216 | 264 | 395 | 25 | 360 |
| V14E150P | P14V150 | V14E150 | 14V150 | 150 | 200 | 60 | 6000 | 4500 | 216 | 264 | 395 | 50 | 800 |
| V20E150P | P20V150 | V20E150 | 20V150 | 150 | 200 | 120 | 10000 | 6500 | 216 | 264 | 395 | 100 | 1600 |
| V07E175P | P7V175 | V07E175 | 7V175 | 175 | 225 | 17 | 1750 | 1200 | 243 | 297 | 455 | 10 | 130 |
| V10E175P | P10V175 | V10E175 | 10V175 | 175 | 225 | 35 | 3500 | 2500 | 243 | 297 | 455 | 25 | 350 |
| V14E175P | P14V175 | V14E175 | 14V175 | 175 | 225 | 70 | 6000 | 4500 | 243 | 297 | 455 | 50 | 700 |
| V20E175P | P20V175 | V20E175 | 20V175 | 175 | 225 | 135 | 10000 | 6500 | 243 | 297 | 455 | 100 | 1400 |
| V07E230P | P7V230 | V07E230 | 7V230 | 230 | 300 | 20 | 1750 | 1200 | 324 | 396 | 595 | 10 | 100 |
| V10E230P | P10V230 | V10E230 | 10V230 | 230 | 300 | 42 | 3500 | 2500 | 324 | 396 | 595 | 25 | 250 |
| V14E230P | P14V230 | V14E230 | 14V230 | 230 | 300 | 80 | 6000 | 4500 | 324 | 396 | 595 | 50 | 550 |
| V20E230P | P20V230 | V20E230 | 20V230 | 230 | 300 | 160 | 10000 | 6500 | 324 | 396 | 595 | 100 | 1100 |

Varistor Products

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Device Ratings and Specifications (Continued)

| <div><div>RoHS</div><div>Pb</div></div> <div>LEAD-FREE AND RoHS COMPLIANT MODELS</div> | | STANDARD MODELS | | MAXIMUM RATING (85°C) | | | | | SPECIFICATIONS (25°C) | | | | |
|--|----------|--------------------|----------|-----------------------|--------------------|-----------------|------------------------------|------------------------------|---|-------------------------|--|-----------------|-----------------------------|
| | | | | CONTINUOUS | | TRANSIENT | | | VARISTOR VOLTAGE AT 1mA DC TEST CURRENT | | MAXIMUM CLAMPING VOLTAGE 8 x 20 μs | | TYPICAL CAPACI- TANCE |
| | | | | RMS VOLTS | DC VOLTS | ENERGY 2ms | PEAK CURRENT 8 x 20 μs | | | | | | |
| PART NUMBER | BRANDING | PART NUMBER | BRANDING | V _{M(AC)} | V _{M(DC)} | W _{TM} | I _{TM} 1 x PULSE | I _{TM} 2 x PULSE | V _{NOM} MIN | V _{NOM} MAX | V _C | I _{PK} | f = 1MHz |
| | | | | (V) | (V) | (J) | (A) | (A) | (V) | | (V) | (A) | (pF) |
| V07E250P | P7V250 | V07E250 | 7V250 | 250 | 320 | 25 | 1750 | 1200 | 351 | 429 | 650 | 10 | 90 |
| V10E250P | P10V250 | V10E250 | 10V250 | 250 | 320 | 50 | 3500 | 2500 | 351 | 429 | 650 | 25 | 220 |
| V14E250P | P14V250 | V14E250 | 14V250 | 250 | 320 | 100 | 6000 | 4500 | 351 | 429 | 650 | 50 | 500 |
| V20E250P | P20V250 | V20E250 | 20V250 | 250 | 320 | 170 | 10000 | 6500 | 351 | 429 | 650 | 100 | 1000 |
| V07E275P | P7V275 | V07E275 | 7V275 | 275 | 350 | 28 | 1750 | 1200 | 387 | 473 | 710 | 10 | 80 |
| V10E275P | P10V275 | V10E275 | 10V275 | 275 | 350 | 55 | 3500 | 2500 | 387 | 473 | 710 | 25 | 200 |
| V14E275P | P14V275 | V14E275 | 14V275 | 275 | 350 | 110 | 6000 | 4500 | 387 | 473 | 710 | 50 | 450 |
| V20E275P | P20V275 | V20E275 | 20V275 | 275 | 350 | 190 | 10000 | 6500 | 387 | 473 | 710 | 100 | 900 |
| V07E300P | P7V300 | V07E300 | 7V300 | 300 | 385 | 30 | 1750 | 1200 | 423 | 517 | 775 | 10 | 70 |
| V10E300P | P10V300 | V10E300 | 10V300 | 300 | 385 | 60 | 3500 | 2500 | 423 | 517 | 775 | 25 | 180 |
| V14E300P | P14V300 | V14E300 | 14V300 | 300 | 385 | 125 | 6000 | 4500 | 423 | 517 | 775 | 50 | 400 |
| V20E300P | P20V300 | V20E300 | 20V300 | 300 | 385 | 250 | 10000 | 6500 | 423 | 517 | 775 | 100 | 800 |
| V07E320P | P7V320 | V07E320 | 7V320 | 320 | 420 | 32 | 1750 | 1200 | 459 | 561 | 840 | 10 | 65 |
| V10E320P | P10V320 | V10E320 | 10V320 | 320 | 420 | 67 | 3500 | 2500 | 459 | 561 | 840 | 25 | 170 |
| V14E320P | P14V320 | V14E320 | 14V320 | 320 | 420 | 136 | 6000 | 4500 | 459 | 561 | 840 | 50 | 380 |
| V20E320P | P20V320 | V20E320 | 20V320 | 320 | 420 | 273 | 10000 | 6500 | 459 | 561 | 840 | 100 | 750 |
| V07E385P | P7V385 | V07E385 | 7V385 | 385 | 505 | 36 | 1750 | 1200 | 558 | 682 | 1025 | 10 | 60 |
| V10E385P | P10V385 | V10E385 | 10V385 | 385 | 505 | 75 | 3500 | 2500 | 558 | 682 | 1025 | 25 | 160 |
| V14E385P | P14V385 | V14E385 | 14V385 | 385 | 505 | 150 | 6000 | 4500 | 558 | 682 | 1025 | 50 | 360 |
| V20E385P | P20V385 | V20E385 | 20V385 | 385 | 505 | 300 | 10000 | 6500 | 558 | 682 | 1025 | 100 | 700 |
| V07E420P | P7V420 | V07E420 | 7V420 | 420 | 560 | 40 | 1750 | 1200 | 612 | 748 | 1120 | 10 | 55 |
| V10E420P | P10V420 | V10E420 | 10V420 | 420 | 560 | 80 | 3500 | 2500 | 612 | 748 | 1120 | 25 | 140 |
| V14E420P | P14V420 | V14E420 | 14V420 | 420 | 560 | 160 | 6000 | 4500 | 612 | 748 | 1120 | 50 | 300 |
| V20E420P | P20V420 | V20E420 | 20V420 | 420 | 560 | 320 | 10000 | 6500 | 612 | 748 | 1120 | 100 | 600 |
| V07E440P | P7V440 | V07E440 | 7V440 | 440 | 585 | 44 | 1750 | 1200 | 643 | 787 | 1180 | 10 | 50 |
| V10E440P | P10V440 | V10E440 | 10V440 | 440 | 585 | 85 | 3500 | 2500 | 643 | 787 | 1180 | 25 | 130 |
| V14E440P | P14V440 | V14E440 | 14V440 | 440 | 585 | 170 | 6000 | 4500 | 643 | 787 | 1180 | 50 | 260 |
| V20E440P | P20V440 | V20E440 | 20V440 | 440 | 585 | 340 | 10000 | 6500 | 643 | 787 | 1180 | 100 | 500 |
| V07E460P | P7V460 | V07E460 | 7V460 | 460 | 615 | 48 | 1750 | 1200 | 675 | 825 | 1240 | 10 | 45 |
| V10E460P | P10V460 | V10E460 | 10V460 | 460 | 615 | 90 | 3500 | 2500 | 675 | 825 | 1240 | 25 | 120 |
| V14E460P | P14V460 | V14E460 | 14V460 | 460 | 615 | 180 | 6000 | 4500 | 675 | 825 | 1240 | 50 | 220 |
| V20E460P | P20V460 | V20E460 | 20V460 | 460 | 615 | 360 | 10000 | 6500 | 675 | 825 | 1240 | 100 | 400 |
| V10E510P | P10V510 | V10E510 | 10V510 | 510 | 670 | 80 | 3500 | 2500 | 738 | 902 | 1355 | 25 | 110 |
| V14E510P | P14V510 | V14E510 | 14V510 | 510 | 670 | 165 | 6000 | 4500 | 738 | 902 | 1355 | 50 | 200 |
| V20E510P | P20V510 | V20E510 | 20V510 | 510 | 670 | 325 | 10000 | 6500 | 738 | 902 | 1355 | 100 | 350 |

Varistor Products

High Surge Current, Radial Lead

RoHS Pb **UltraMOV™ Varistor Series**

Device Ratings and Specifications (Continued)

| <div><div>RoHS</div><div>Pb</div></div> <div>LEAD-FREE AND RoHS COMPLIANT MODELS</div> | | STANDARD MODELS | | MAXIMUM RATING (85°C) | | | | | SPECIFICATIONS (25°C) | | | | |
|--|----------|--------------------|----------|-----------------------|--------------------|-----------------|------------------------------|------------------------------|---|-------------------------|--|-----------------|-----------------------------|
| | | | | CONTINUOUS | | TRANSIENT | | | VARISTOR VOLTAGE AT 1mA DC TEST CURRENT | | MAXIMUM CLAMPING VOLTAGE 8 x 20 μs | | TYPICAL CAPACI- TANCE |
| | | | | | | | | | | | | | |
| PART NUMBER | BRANDING | PART NUMBER | BRANDING | V _{M(AC)} | V _{M(DC)} | W _{TM} | I _{TM} 1 x PULSE | I _{TM} 2 x PULSE | V _{NOM} MIN | V _{NOM} MAX | V _C | I _{PK} | f = 1MHz |
| | | | | (V) | (V) | (J) | (A) | (A) | (V) | | (V) | (A) | (pF) |
| V10E550P | P10V550 | V10E550 | 10V550 | 550 | 745 | 90 | 3500 | 2500 | 819 | 1001 | 1500 | 25 | 100 |
| V14E550P | P14V550 | V14E550 | 14V550 | 550 | 745 | 180 | 6000 | 4500 | 819 | 1001 | 1500 | 50 | 180 |
| V20E550P | P20V550 | V20E550 | 20V550 | 550 | 745 | 360 | 10000 | 6500 | 819 | 1001 | 1500 | 100 | 300 |
| V10E625P | P10V625 | V10E625 | 10V625 | 625 | 825 | 100 | 3500 | 2500 | 900 | 1100 | 1650 | 25 | 90 |
| V14E625P | P14V625 | V14E625 | 14V625 | 625 | 825 | 200 | 6000 | 4500 | 900 | 1100 | 1650 | 50 | 160 |
| V20E625P | P20V625 | V20E625 | 20V625 | 625 | 825 | 400 | 10000 | 6500 | 900 | 1100 | 1650 | 100 | 250 |

NOTE:

1. Average power dissipation of transients should not exceed 0.25W, 0.4W, 0.6W and 1.0W for 7mm, 10mm, 14mm, and 20mm model sizes, respectively.

Power Dissipation Ratings

Should transients occur in rapid succession, the average power dissipation is the energy (watt-seconds) per pulse times the number of pulses per second. The power so developed must be within the specifications shown on the Device Ratings and Specifications table for the specific device. Furthermore, the operating values need to be derated at high temperatures as shown in Figure 1. Because varistors can only dissipate a relatively small amount of average power they are, therefore, not suitable for repetitive applications that involve substantial amounts of average power dissipation.

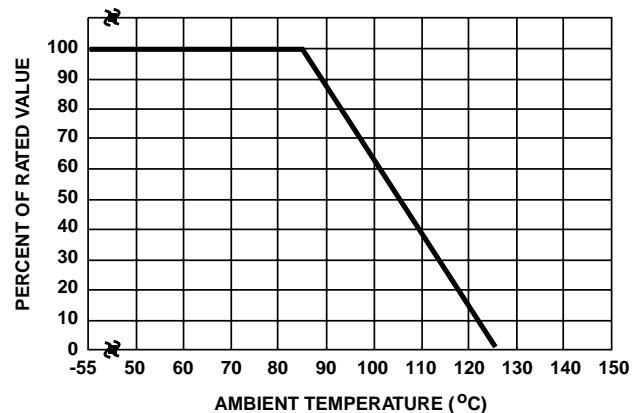


FIGURE 1. CURRENT, ENERGY AND POWER DERATING CURVE

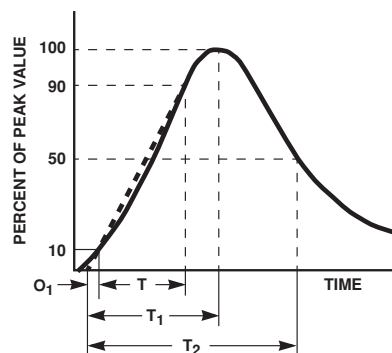


FIGURE 2. PEAK PULSE CURRENT TEST WAVEFORM

O₁ = Virtual Origin of Wave
 T = Time From 10% to 90% of Peak
 T₁ = Virtual Front time = 1.25 • t
 T₂ = Virtual Time to Half Value (Impulse Duration)
 Example: For an 8/20 μ s Current Waveform:
 8 μ s = T₁ = Virtual Front Time
 20 μ s = T₂ = Virtual Time to Half Value

Varistor Products

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RoHS UltraMOV™ Varistor Series

Transient V-I Characteristic Curves

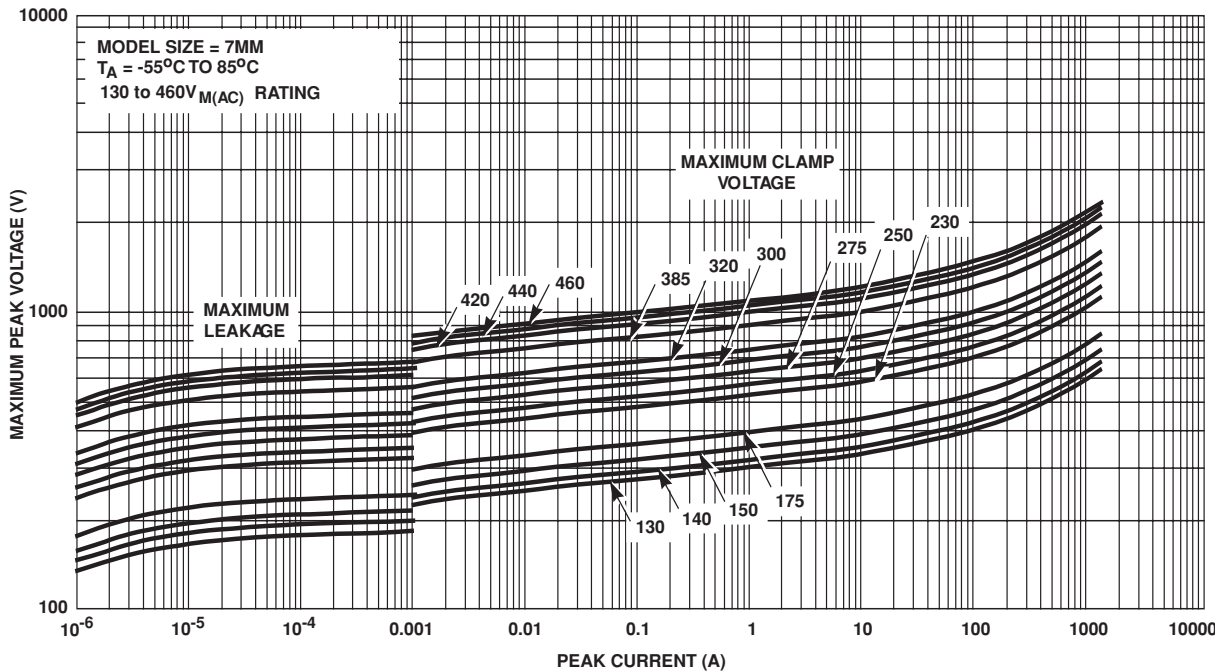


FIGURE 3. Clamping Voltage for V7E130(P)- V7E460(P)

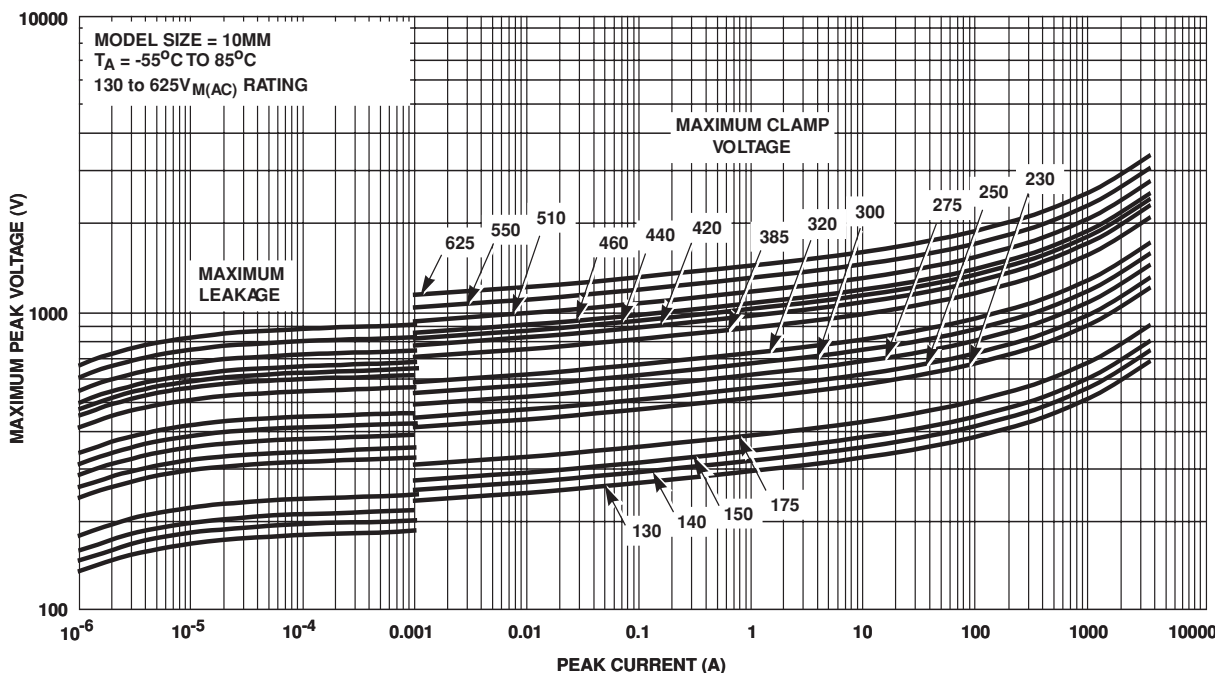


FIGURE 4. Clamping Voltage for V10E130(P)- V10E625(P)

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High Surge Current, Radial Lead

RoHS Pb **UltraMOV™ Varistor Series**

Transient V-I Characteristic Curves (Continued)

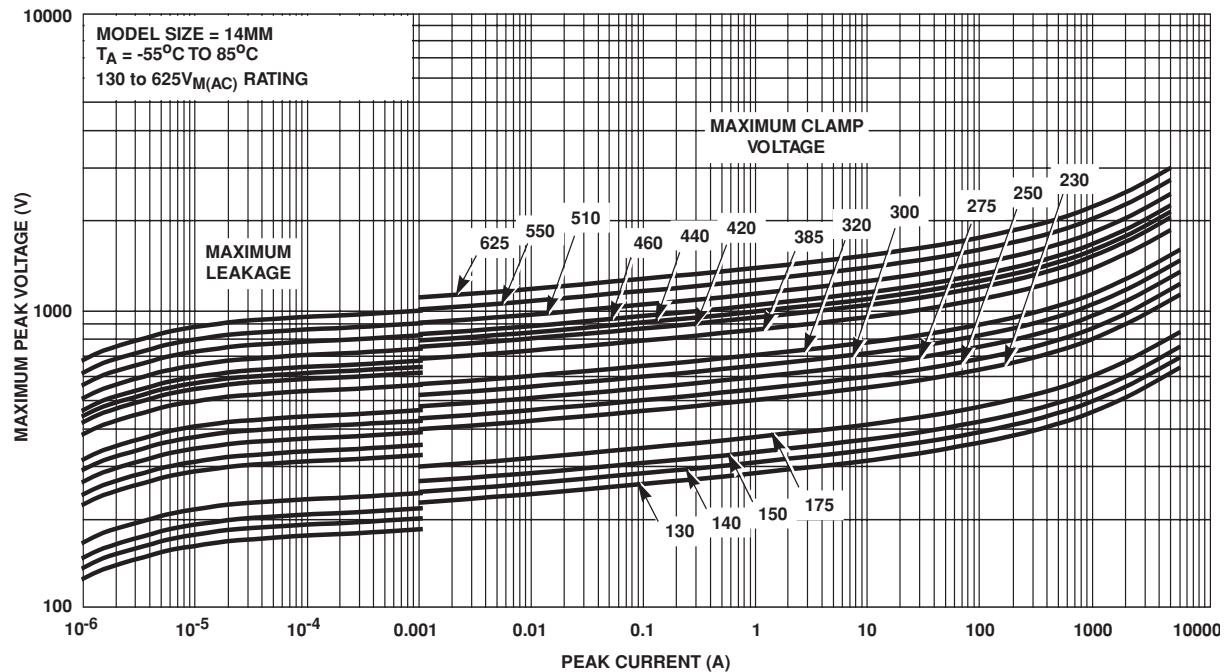


FIGURE 5. Clamping Voltage V14E130(P) - V14E625(P)

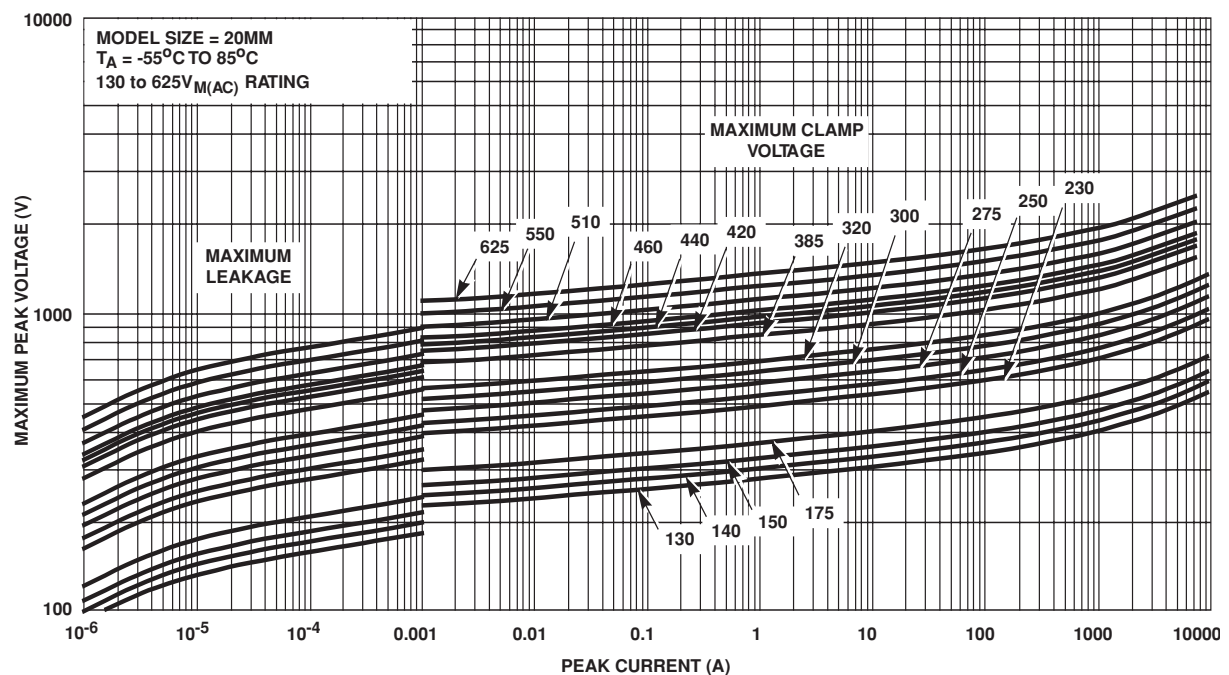


FIGURE 6. Clamping Voltage V20E130(P) - V20E625(P)

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High Surge Current, Radial Lead

UltraMOV™ Varistor Series

Pulse Rating Curves

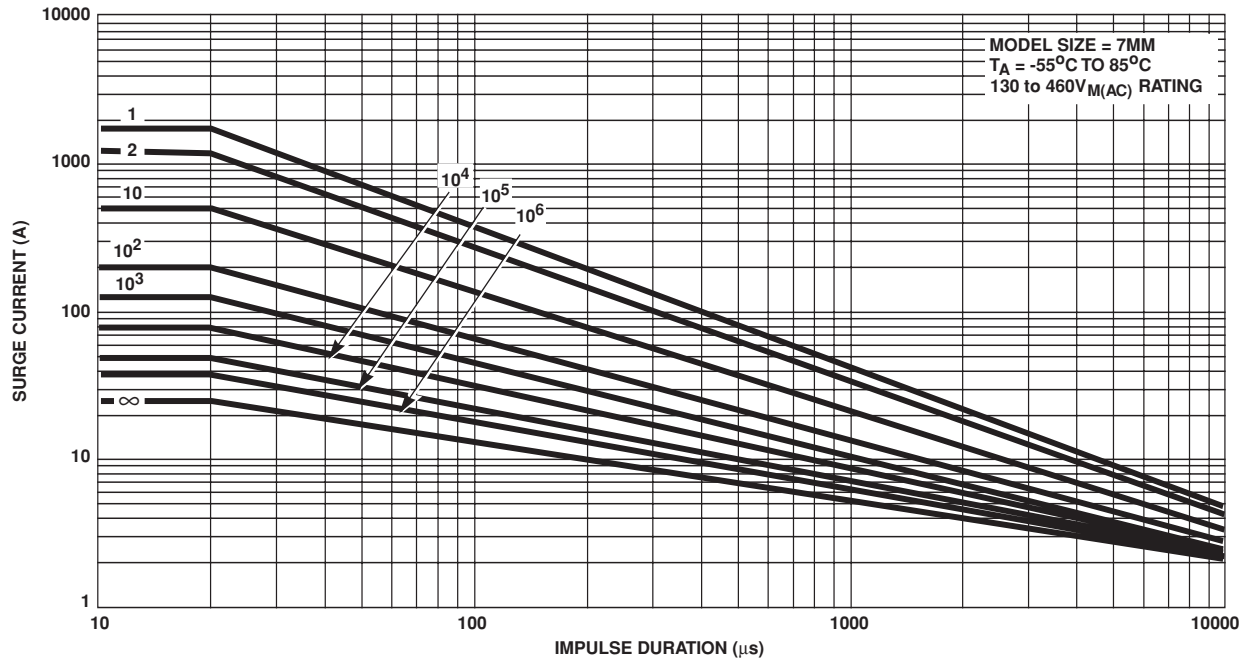


FIGURE 7. Clamping Voltage for V7E130(P) - V7E460(P)

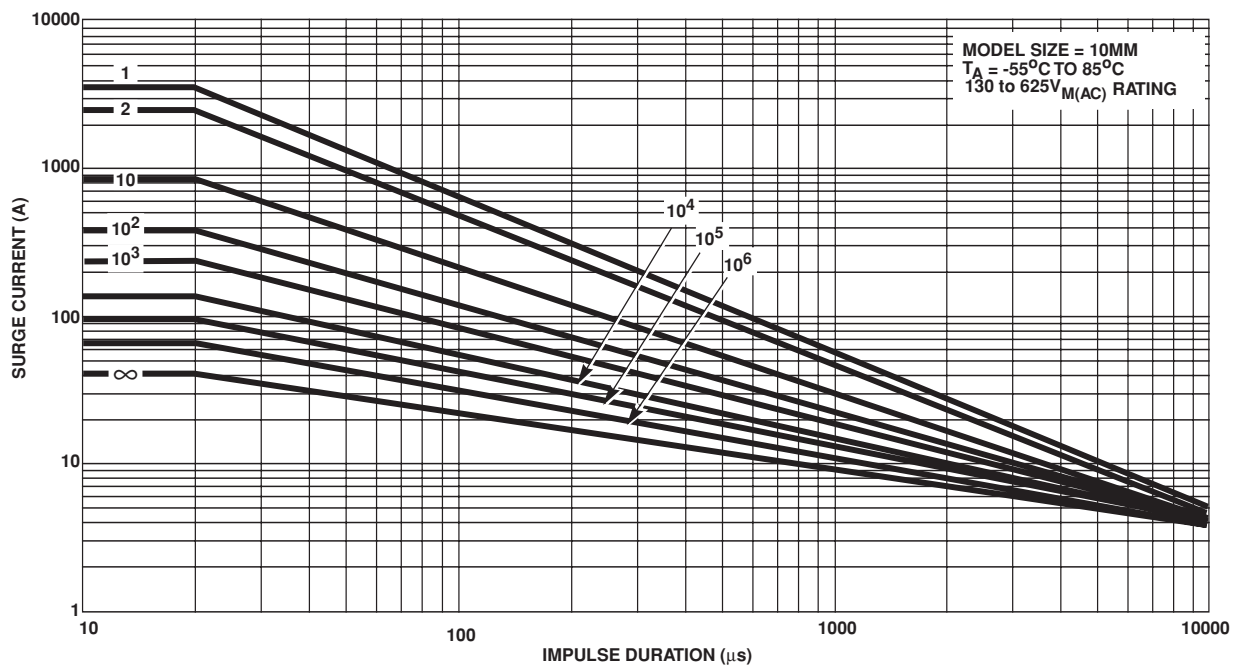


FIGURE 8. Clamping Voltage for V10E130(P) - V10E625(P)

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High Surge Current, Radial Lead

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Pulse Rating Curves (Continued)

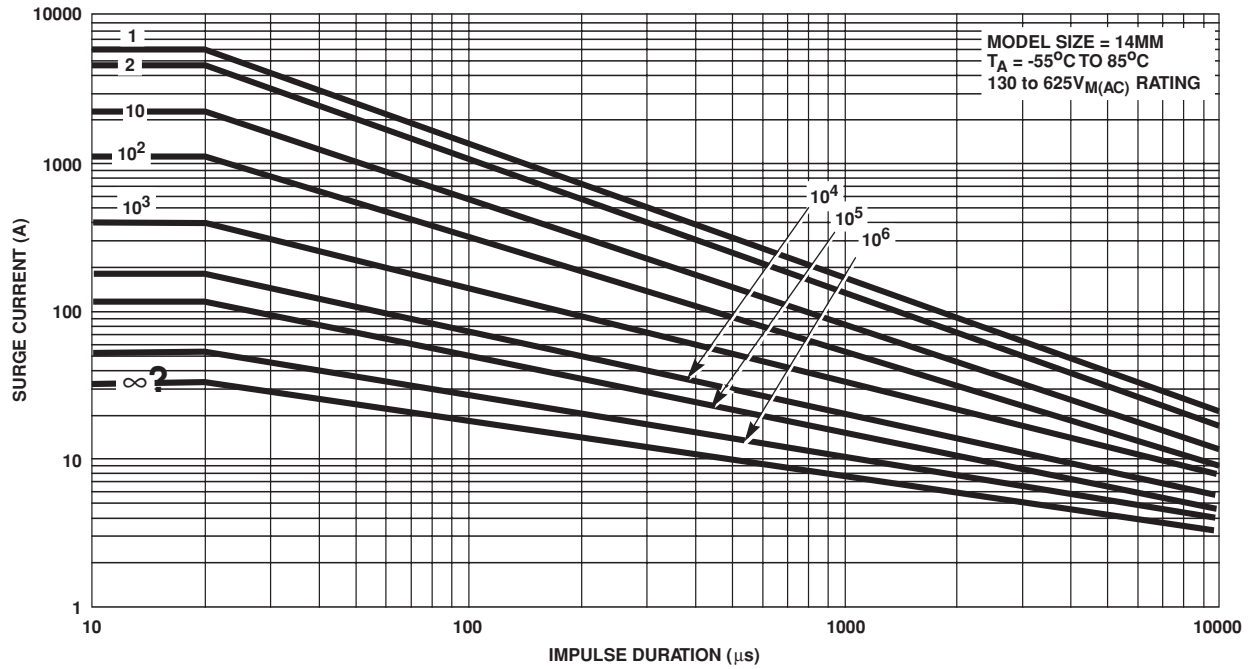


FIGURE 9. Clamping Voltage for V14E130(P) -V14E625(P)

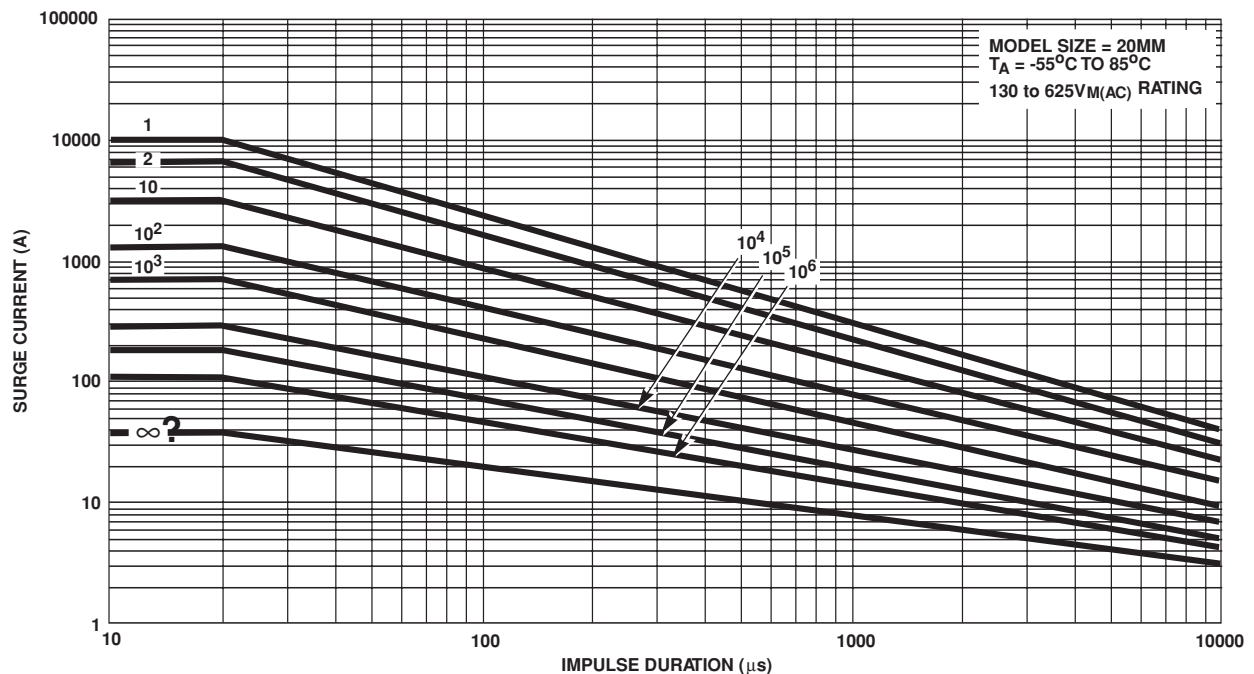


FIGURE 10. Clamping Voltage for V20E130(P) -V20E625(P)

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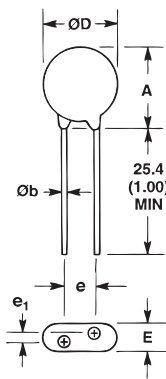
VARISTOR
PRODUCTS

Varistor Products

High Surge Current, Radial Lead

RoHS Pb UltraMOV™ Varistor Series

Package Outline Dimensions (Lead Form Options L1 and L3)

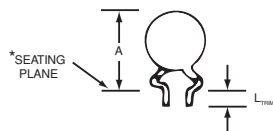


| SYMBOL | V _{RMS} VOLTAGE MODEL | VARISTOR MODEL SIZE | | | | | | | |
|----------------------------|--------------------------------------|---------------------|------------------|-----------------|-----------------|-----------------|-----------------|-----------------------------|-----------------------------|
| | | 7mm | | 10mm | | 14mm | | 20mm | |
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX |
| A | 130-320 | - | 12 (0.472) | - | 16 (0.630) | - | 20 (0.787) | - | 26.5 (1.043) |
| | 385-625 | - | 13 (0.512) | - | 17 (0.689) | - | 20.5 (0.807) | - | 28 (1.102) |
| ØD | All | - | 9 (0.354) | - | 12.5 (0.492) | - | 17 (0.669) | - | 23 (0.906) |
| e (Note 2) | All | 4 (0.157) | 6 (0.236) | 6.5 (0.256) | 8.5 (0.335) | 6.5 (0.256) | 8.5 (0.335) | 9 (0.354) | 11 (0.433) |
| e ₁ (Note 3) | 130-320 | 1.5 (0.059) | 3.5 (0.138) | 1.5 (0.059) | 3.5 (0.138) | 1.5 (0.059) | 3.5 (0.138) | 1.5 (0.059) | 3.5 (0.138) |
| | 385-625 | 2.5 (0.098) | 5.5 (0.217) | 2.5 (0.098) | 5.5 (0.217) | 2.5 (0.098) | 5.5 (0.217) | 2.5 (0.098) | 5.5 (0.217) |
| E | 130-320 | - | 5.6 (0.220) | - | 5.6 (0.220) | - | 5.6 (0.220) | - | 5.6 (0.220) |
| | 385-510 | - | 7.3 (0.287) | - | 7.3 (0.287) | - | 7.3 (0.287) | - | 7.3 (0.287) |
| | 575-625 | - | 8.3 (0.327) | - | 8.3 (0.327) | - | 8.3 (0.327) | - | 8.3 (0.327) |
| Øb | All | 0.585 (0.023) | 0.685 (0.027) | 0.76 (0.030) | 0.86 (0.034) | 0.76 (0.030) | 0.86 (0.034) | 0.76 (0.030) (Note 2) | 0.86 (0.034) (Note 2) |

NOTES:

1. Dimensions in millimeters, inches in parentheses.
2. Standard lead space.
3. For in-line lead option L3, dimension e₁ is "zero". Straight lead form option L1 shown.

Lead Dimensions (Lead Form Options L2 and L4)



| SYMBOL | VARISTOR MODEL SIZE | | | | | | | |
|---------|---------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | 7mm | | 10mm | | 14mm | | 20mm | |
| | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX |
| A | - | 15 (0.591) | - | 19.5 (0.768) | - | 22.5 (0.886) | - | 29.0 (1.142) |
| L (L2) | 25.4 (1.00) | - | 25.4 (1.00) | - | 25.4 (1.00) | - | 25.4 (1.00) | - |
| *L (L4) | 2.41 (0.095) | 4.69 (0.185) | 2.41 (0.095) | 4.69 (0.185) | 2.41 (0.095) | 4.69 (0.185) | 2.41 (0.095) | 4.69 (0.185) |

*Seating plane interpretation
per IEC-717
(Not available on tape or ammo pack)

Dimensions in millimeters, inches in parentheses.

Standard Bulk Pack Quantity

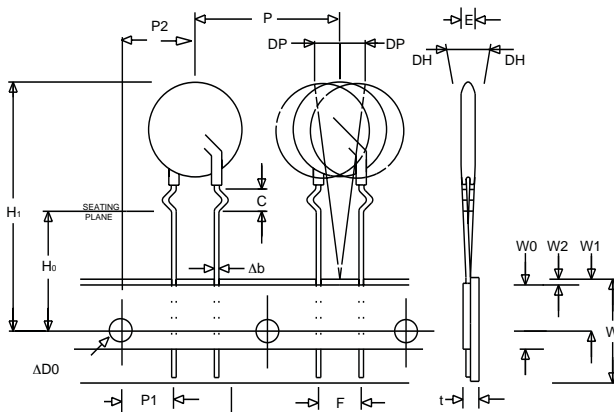
| VARISTOR VOLTAGE MODEL | STANDARD BULK PACK QUANTITY | | | |
|---------------------------|-----------------------------|------|------|------|
| | VARISTOR MODEL SIZE | | | |
| | 7mm | 10mm | 14mm | 20mm |
| 130-275 | 1500 | 1000 | 700 | 500 |
| 300-460 | 1500 | 700 | 600 | 400 |
| 510-625 | 1500 | 700 | 500 | 400 |

Varistor Products

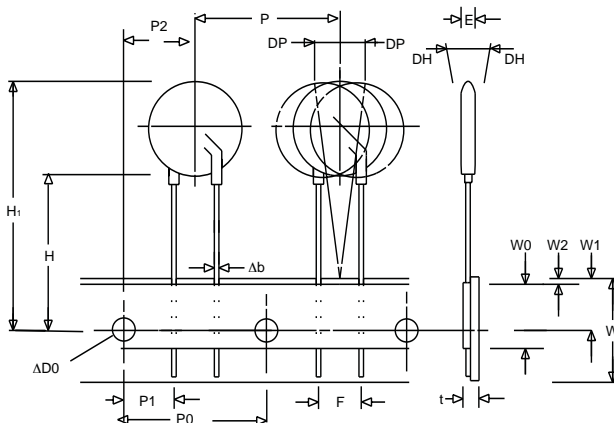
High Surge Current, Radial Lead

RoHS UltraMOV™ Varistor Series

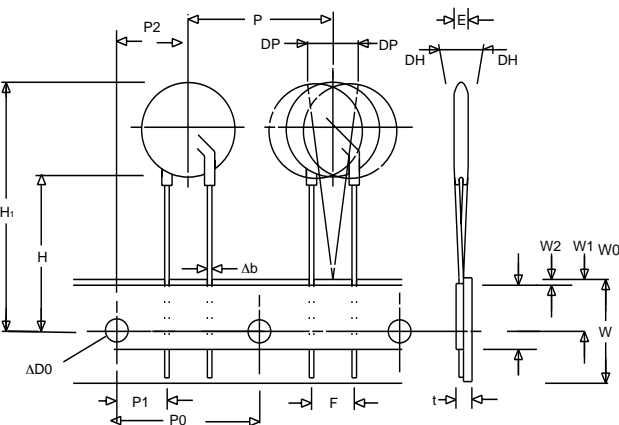
Tape Specifications for Reel or Ammo Pack (Fan-Fold) 7mm Devices



Crimped Leads "L2"

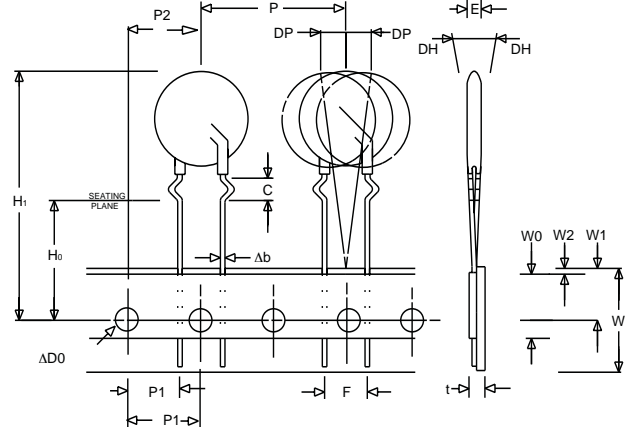


In Line Leads "L3"

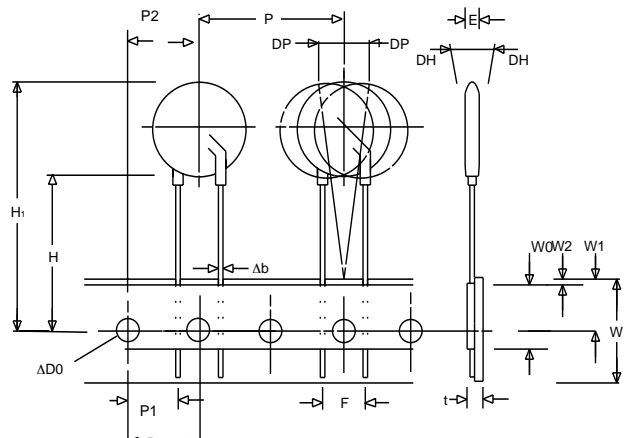


Straight Leads "L1"

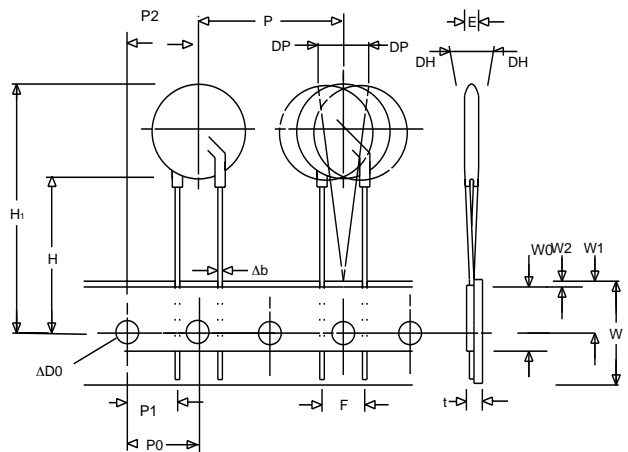
10, 14 and 20mm Devices



Crimped Leads "L2"



In Line Leads "L3"



Straight Leads "L1"

2

VARISTOR
PRODUCTS

Varistor Products

High Surge Current, Radial Lead

RoHS UltraMOV™ Varistor Series

| SYMBOL | PARAMETER | MODEL SIZE | | | |
|----------------|---|--------------------------|---------------------------|--------------------------|--------------------------|
| | | 7mm | 10mm | 14mm | 20mm |
| B ₁ | Component Top to Seating Plane | 15 Max | 19.5 Max | 22.5 Max | 29 Max |
| C | Crimp Length | 2.4 Typ | 2.6 Typ | 2.6 Typ | 2.6 Typ |
| P | Pitch of Component | 12.7 ± 1.0 | 25.4 ± 1.0 | 25.4 ± 1.0 | 25.4 ± 1.0 |
| P ₀ | Feed Hole Pitch | 12.7 ± 0.2 | 12.7 ± 0.2 | 12.7 ± 0.2 | 12.7 ± 0.2 |
| P ₁ | Feed Hole Center to Pitch | 3.85 ± 0.7 | 8.85 ± 0.7 | 8.85 ± 0.7 | 7.70 ± 0.7 |
| P ₂ | Hole Center to Component Center | 6.35 ± 0.7 | 12.7 ± 0.7 | 12.7 ± 0.7 | 12.7 ± 0.7 |
| F | Lead to Lead Distance | 5.0 ± 0.8 | 7.5 ± 0.8 | 7.5 ± 0.8 | 10.0 ± 0.8 |
| Δh | Component Alignment | 2.0 Max | 2.0 Max | 2.0 Max | 2.0 Max |
| W | Tape Width | 18.0 + 1.0 18.0 - 0.5 | 18.0 + 1.0 18.0 - 0.52 | 18.0 + 1.0 18.0 - 0.5 | 18.0 + 1.0 18.0 - 0.5 |
| W ₀ | Hold Down Tape Width | 12.0 ± 0.3 | 12.0 ± 0.3 | 12.0 ± 0.3 | 12.0 ± 0.3 |
| W ₁ | Hole Position | 9.0 + 0.75 9.0 - 0.50 | 9.0 + 0.75 9.0 - 0.50 | 9.0 + 0.75 9.0 - 0.50 | 9.0 + 0.75 9.0 - 0.50 |
| W ₂ | Hold Down Tape Position | 0.5 Max | 0.5 Max | 0.5 Max | 0.5 Max |
| H | Height from Tape Center to Component Base | 18.0 + 2.0 18.0 - 0.0 | 18.0 + 2.0 18.0 - 0.0 | 18.0 + 2.0 18.0 - 0.0 | 18.0 + 2.0 18.0 - 0.0 |
| H ₀ | Seating Plane Height | 16.0 ± 0.5 | 16.0 ± 0.5 | 16.0 ± 0.5 | 16.0 ± 0.5 |
| H ₁ | Component Height | 32.0 Max | 36.0 Max | 40.0 Max | 46.5 Max |
| D ₀ | Feed Hole Diameter | 4.0 ± 0.2 | 4.0 ± 0.2 | 4.0 ± 0.2 | 4.0 ± 0.2 |
| t | Total Tape Thickness | 0.7 ± 0.2 | 0.7 ± 0.2 | 0.7 ± 0.2 | 0.7 ± 0.2 |
| Δp | Component Alignment | 3° Max, 1.00mm | 3° Max, 1.00mm | 3° Max, 1.00mm | 3° Max |

Dimensions are in mm.

Tape Specifications for Reel or Ammo Pack

- Conforms to ANSI and EIA specifications.
- Can be supplied to IEC Publication 286-2.
- Radial devices on tape are offered with crimped leads, straight leads, or in-line leads. See Ordering Information.
- For 10mm devices 'P' (component pitch) is 12.7mm when 'F' (lead space) is 5mm.
- 7mm parts are available on tape and reel up to 460 VAC only
- 10mm parts are available on tape and reel up to 510 VAC only
- 14mm and 20mm parts are available on tape and reel up to 550 VAC only
- 7mm devices with 7.5mm lead spacing option will be taped at 25.4mm component pitch and 500 pieces per reel
- 10mm devices with 5.0mm lead spacing option will be taped at 12.7mm component pitch and 1000 pieces per reel

REEL CAPACITY 330MM (13IN.)

| DEVICE SIZE | SHIPPING QUANTITY PER REEL |
|-------------|----------------------------|
| 7 | 1000 |
| 10 | 500 |
| 14 | 500 |
| 20 | 500 |

Varistor Products

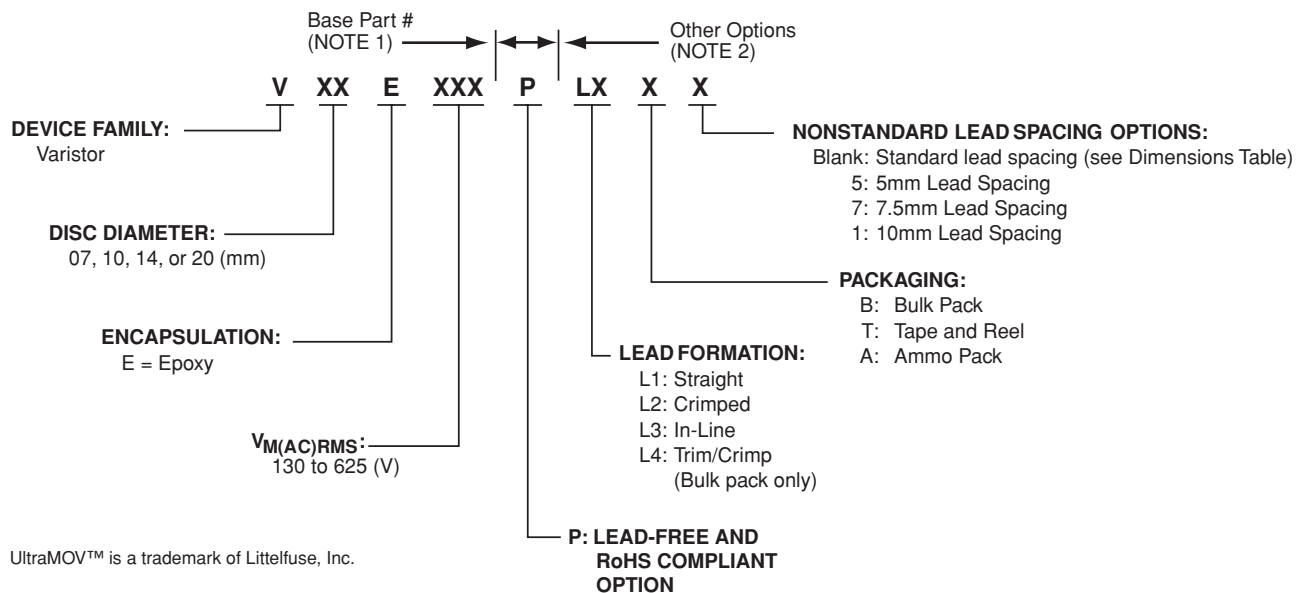
High Surge Current, Radial Lead

UltraMOV™ Varistor Series

Ultramov series varistors for Hi-Temperature operating conditions:

- Phenolic Coated Ultramov Series devices are available with improved maximum operating maximum temperature 125°C.
- These devices also have improved temperature cycling performance capability.
- Ratings and Specifications are as per standard Ultramov Series except Hi-Pot encapsulation Isolation Voltage Capability = 500V.
- To order: change 'E' in part number to 'P' (e.g. V20P230)
- These devices are not UL, CSA, VDE or CECC certified.
- Contact factory for further details.

Ordering Information



UltraMOV™ is a trademark of Littelfuse, Inc.

NOTE:

1. Standard Parts use base part number only.
2. Parts with additional options append base part number with form, packaging and lead space.
3. Additional optional lead form, packaging or lead spacing requirements are subject to availability and minimum order requirements. Please contact a Littelfuse sales representative for more information.
4. For Lead-free and RoHS compliant parts add the suffix 'P' after the base part number and before any optional suffix as shown above.
example: V14E130P
V14E130PL2T7

Standard Part Default Conditions

| DEVICE SIZE | PART # | LEAD SPACE | PACKAGING |
|-------------|--------|------------|-----------|
| 7 | V07E- | 5.0±1 | Bulk |
| 10 | V10E- | 7.5±1 | Bulk |
| 14 | V14E- | 7.5±1 | Bulk |
| 20 | V20E- | 10.0±1 | Bulk |