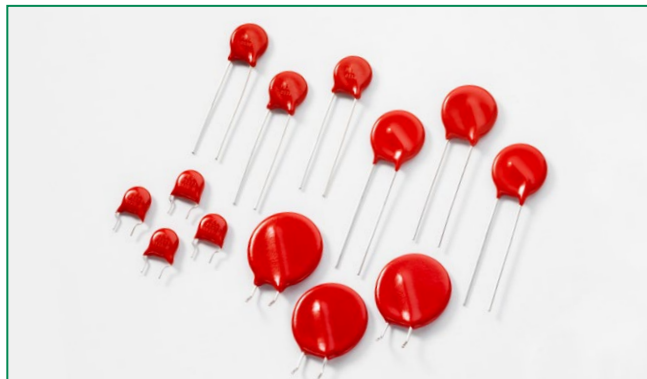


LA Varistor Series



Agency Approvals

| Agency | Agency Approval | Agency File Number |
|--------|--|--------------------|
| | UL1449 | E320116 |
| | CECC 42201-006 IEC 61051-1 IEC 61051-2 IEC 60950-1 (Annex Q) for 14mm and 20mm only | 116895 |
| | 22.2-1 | 91788 |
| | CECC 42201-006 IEC 61051-1 IEC 61051-2 IEC 60950-1 (Annex Q) for 14mm and 20mm only | E1273/F |

Description

The LA Varistor Series of transient voltage surge suppressors are radial leaded varistors (MOVs) that are designed to be operated continuously across AC power lines. These UL recognized varistors require very little mounting space, and are offered in various standard lead form options.

The LA Varistor Series are available in four model sizes: 7mm, 10mm, 14mm and 20mm; and have a $V_{M(AC)RMS}$ voltage range from 130V to 1000V, and an energy absorption capability up to 360J. Some LA Series model numbers are available with clamping voltage selections, designated by a model number suffix of either A or B. The 'A' selection is the standard model; the 'B' selection provides a lower clamping voltage. See LA Series Device Ratings and Specifications Table for part number and brand information.

Features

- Lead-free, Halogen-Free and RoHS compliant.
- No derating up to 85°C ambient
- Energy absorption capability (W_{TM}) up to 360J
- Available in tape and reel or bulk pack
- Wide operating voltage range $V_{M(AC)RMS}$ 130V to 1000V

Additional Information



Datasheet



Resources



Samples

Absolute Maximum Ratings

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

| Continuous | LA Series | Units |
|--|--------------|------------|
| Steady State Applied Voltage: | | |
| AC Voltage Range ($V_{M(AC)RMS}$) | 130 to 1000 | V |
| DC Voltage Range ($V_{M(DC)}$) | 175 to 1200 | V |
| Transients: | | |
| Peak Pulse Current (I_{TM}) | | |
| For 8/20 μ s Current Wave (See Figure 2) | 1200 to 6500 | A |
| Single Pulse Energy Range | | |
| For 10/1000 μ s Current Wave (W_{TM}) | 11 to 360 | J |
| Operating Ambient Temperature Range (T_A) | -55 to +85 | °C |
| Storage Temperature Range (T_{STG}) | -55 to +125 | °C |
| Temperature Coefficient (α) of Clamping Voltage (V_c) at Specified Test Current | <0.01 | %/°C |
| Hi-Pot Encapsulation (COATING Isolation Voltage Capability) (Dielectric must withstand indicated DC voltage for one minute per MIL-STD 202, Method 301) | 2500 | V |
| COATING Insulation Resistance | 1000 | M Ω |

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.

LA Series Ratings & Specifications

| Part Number | Branding | Model Size Disc Dia. (mm) | 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 f = 1MHz |
| | | | V _{RMS} | V _{DC} | Energy 10 x 1000 μs | Peak Current 8 x 20 μs | | | | | |
| | | | V _{M(AC)} | V _{M(DC)} | W _{TM} | I _{TM} | V _{NOM} Min | V _{NOM} Max | V _C | I _{PK} | C |
| (V) | (V) | (J) | (A) | (V) | (V) | (V) | (A) | (pF) | | | |
| V130LA1P | P1301 | 7 | 130 | 175 | 11 | 1200 | 198 | 242 | 390 | 10 | 180 |
| V130LA2P | P1302 | 7 | 130 | 175 | 11 | 1200 | 184.5 | 225.5 | 340 | 10 | 180 |
| V130LA5P | P1305 | 10 | 130 | 175 | 20 | 2500 | 184.5 | 225.5 | 340 | 25 | 450 |
| V130LA10AP | P130L10 | 14 | 130 | 175 | 38 | 4500 | 184.5 | 225.5 | 340 | 50 | 1000 |
| V130LA20AP | P130L20 | 20 | 130 | 175 | 70 | 6500 | 184.5 | 225.5 | 340 | 100 | 1900 |
| V130LA20BP | P130L20B | 20 | 130 | 175 | 70 | 6500 | 190 | 220 | 325 | 100 | 1900 |
| V140LA2P | P1402 | 7 | 140 | 180 | 12 | 1200 | 198 | 242 | 360 | 10 | 160 |
| V140LA5P | P1405 | 10 | 140 | 180 | 22 | 2500 | 198 | 242 | 360 | 25 | 400 |
| V140LA10AP | P140L10 | 14 | 140 | 180 | 42 | 4500 | 198 | 242 | 360 | 50 | 900 |
| V140LA20AP | P140L20 | 20 | 140 | 180 | 75 | 6500 | 198 | 242 | 340 | 100 | 1750 |
| V150LA1P | P1501 | 7 | 150 | 200 | 13 | 1200 | 225 | 275 | 430 | 10 | 150 |
| V150LA2P | P1502 | 7 | 150 | 200 | 13 | 1200 | 216 | 264 | 395 | 10 | 150 |
| V150LA5P | P1505 | 10 | 150 | 200 | 25 | 2500 | 216 | 264 | 395 | 25 | 360 |
| V150LA10AP | P150L10 | 14 | 150 | 200 | 45 | 4500 | 216 | 264 | 395 | 50 | 800 |
| V150LA20AP | P150L20 | 20 | 150 | 200 | 80 | 6500 | 216 | 264 | 395 | 100 | 1600 |
| V150LA20BP | P150L20B | 20 | 150 | 200 | 80 | 6500 | 216 | 243 | 360 | 100 | 1600 |
| V175LA2P | P1752 | 7 | 175 | 225 | 15 | 1200 | 243 | 297 | 455 | 10 | 130 |
| V175LA5P | P1755 | 10 | 175 | 225 | 30 | 2500 | 243 | 297 | 455 | 25 | 350 |
| V175LA10AP | P175L10 | 14 | 175 | 225 | 55 | 4500 | 243 | 297 | 455 | 50 | 700 |
| V175LA20AP | P175L20 | 20 | 175 | 225 | 90 | 6500 | 243 | 297 | 455 | 100 | 1400 |
| V230LA4P | P2304 | 7 | 230 | 300 | 20 | 1200 | 324 | 396 | 595 | 10 | 100 |
| V230LA10P | P230L | 10 | 230 | 300 | 35 | 2500 | 324 | 396 | 595 | 25 | 250 |
| V230LA20AP | P230L20 | 14 | 230 | 300 | 70 | 4500 | 324 | 396 | 595 | 50 | 550 |
| V230LA40AP | P230L40 | 20 | 230 | 300 | 122 | 6500 | 324 | 396 | 595 | 100 | 1100 |
| V250LA2P | P2502 | 7 | 250 | 330 | 21 | 1200 | 369 | 451 | 730 | 10 | 90 |
| V250LA4P | P2504 | 7 | 250 | 330 | 21 | 1200 | 351 | 429 | 650 | 10 | 90 |
| V250LA10P | P250L | 10 | 250 | 330 | 40 | 2500 | 351 | 429 | 650 | 25 | 220 |
| V250LA20AP | P250L20 | 14 | 250 | 330 | 72 | 4500 | 351 | 429 | 650 | 50 | 500 |
| V250LA40AP | P250L40 | 20 | 250 | 330 | 130 | 6500 | 351 | 429 | 650 | 100 | 1000 |
| V250LA40BP | P250L40B | 20 | 250 | 330 | 130 | 6500 | 354 | 413 | 620 | 100 | 1000 |
| V275LA2P | P2752 | 7 | 275 | 369 | 23 | 1200 | 405 | 495 | 775 | 10 | 80 |
| V275LA4P | P2754 | 7 | 275 | 369 | 23 | 1200 | 387 | 473 | 710 | 10 | 80 |
| V275LA10P | P275L | 10 | 275 | 369 | 45 | 2500 | 387 | 473 | 710 | 25 | 200 |
| V275LA20AP | P275L20 | 14 | 275 | 369 | 75 | 4500 | 387 | 473 | 710 | 50 | 450 |
| V275LA40AP | P275L40 | 20 | 275 | 369 | 140 | 6500 | 387 | 473 | 710 | 100 | 900 |
| V275LA40BP | P275L40B | 20 | 275 | 369 | 140 | 6500 | 389 | 453 | 680 | 100 | 900 |
| V300LA2P | P3002 | 7 | 300 | 405 | 25 | 1200 | 441 | 539 | 870 | 10 | 70 |
| V300LA4P | P3004 | 7 | 300 | 405 | 25 | 1200 | 423 | 517 | 775 | 10 | 70 |
| V300LA10P | P300L | 10 | 300 | 405 | 46 | 2500 | 423 | 517 | 775 | 25 | 180 |
| V300LA20AP | P300L20 | 14 | 300 | 405 | 77 | 4500 | 423 | 517 | 775 | 50 | 400 |
| V300LA40AP | P300L40 | 20 | 300 | 405 | 165 | 6500 | 423 | 517 | 775 | 100 | 800 |
| V320LA7P | P3207 | 7 | 320 | 420 | 25 | 1200 | 459 | 561 | 850 | 10 | 65 |
| V320LA10P | P320L | 10 | 320 | 420 | 48 | 2500 | 459 | 561 | 850 | 25 | 170 |
| V320LA20AP | P320L20 | 14 | 320 | 420 | 80 | 4500 | 459 | 561 | 850 | 50 | 380 |
| V320LA40BP | P320L40 | 20 | 320 | 420 | 150 | 6500 | 462 | 540 | 810 | 100 | 750 |
| V385LA7P | P3857 | 7 | 385 | 505 | 27 | 1200 | 558 | 682 | 1025 | 10 | 60 |

LA Series Ratings & Specifications (Continued...)

| Part Number | Branding | Model Size Disc Dia. (mm) | 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 f = 1MHz | |
| | | | V _{RMS} | V _{DC} | Energy 10 x 1000 μs | Peak Current 8 x 20 μs | | V _{NOM Min} | V _{NOM Max} | | V _C |
| | | | V _{M(AC)} | V _{M(DC)} | W _{TM} | I _{TM} | (V) | (V) | (V) | (A) | C |
| (V) | (V) | (J) | (A) | (V) | (V) | (V) | (A) | (pF) | | | |
| V385LA10P | P385L | 10 | 385 | 505 | 51 | 2500 | 558 | 682 | 1025 | 25 | 160 |
| V385LA20AP | P385L20 | 14 | 385 | 505 | 85 | 4500 | 558 | 682 | 1025 | 50 | 360 |
| V385LA40BP | P385L40 | 20 | 385 | 505 | 160 | 6500 | 558 | 682 | 1025 | 100 | 700 |
| V420LA7P | P4207 | 7 | 420 | 560 | 30 | 1200 | 612 | 748 | 1120 | 10 | 55 |
| V420LA10P | P420L | 10 | 420 | 560 | 55 | 2500 | 612 | 748 | 1120 | 25 | 140 |
| V420LA20AP | P420L20 | 14 | 420 | 560 | 90 | 4500 | 612 | 748 | 1120 | 50 | 300 |
| V420LA40BP | P420L40 | 20 | 420 | 560 | 160 | 6500 | 610 | 720 | 1060 | 100 | 600 |
| V460LA7P | P4607 | 7 | 460 | 615 | 37 | 1200 | 643.5 | 786.5 | 1190 | 10 | 55 |
| V460LA10P | P460L | 10 | 460 | 615 | 56 | 2500 | 643.5 | 786.5 | 1190 | 25 | 120 |
| V460LA20AP | P460L20 | 14 | 460 | 615 | 100 | 4500 | 643.5 | 786.5 | 1190 | 50 | 280 |
| V460LA40BP | P460L40 | 20 | 460 | 615 | 170 | 6500 | 643.5 | 755.5 | 1110 | 100 | 560 |
| V480LA7P | P4807 | 7 | 480 | 640 | 35 | 1200 | 675 | 825 | 1240 | 10 | 50 |
| V480LA10P | P480L | 10 | 480 | 640 | 60 | 2500 | 675 | 825 | 1240 | 25 | 120 |
| V480LA40AP | P480L40 | 14 | 480 | 640 | 105 | 4500 | 675 | 825 | 1240 | 50 | 270 |
| V480LA80BP | P480L80 | 20 | 480 | 640 | 180 | 6500 | 675 | 790 | 1160 | 100 | 550 |
| V510LA10P | P510L | 10 | 510 | 675 | 63 | 2500 | 738 | 902 | 1350 | 25 | 100 |
| V510LA40AP | P510L40 | 14 | 510 | 675 | 110 | 4500 | 738 | 902 | 1350 | 50 | 250 |
| V510LA80BP | P510L80 | 20 | 510 | 675 | 190 | 6500 | 738 | 860 | 1280 | 100 | 500 |
| V575LA10P | P575L | 10 | 575 | 730 | 65 | 2500 | 819 | 1001 | 1500 | 25 | 90 |
| V575LA40AP | P575L40 | 14 | 575 | 730 | 120 | 4500 | 819 | 1001 | 1500 | 50 | 220 |
| V575LA80BP | P575L80 | 20 | 575 | 730 | 220 | 6500 | 819 | 960 | 1410 | 100 | 450 |
| V625LA10P | P625L | 10 | 625 | 825 | 67 | 2500 | 900 | 1100 | 1650 | 25 | 80 |
| V625LA40AP | P625L40 | 14 | 625 | 825 | 125 | 4500 | 900 | 1100 | 1650 | 50 | 210 |
| V625LA80BP | P625L80 | 20 | 625 | 825 | 230 | 6500 | 900 | 1100 | 1650 | 100 | 425 |
| V680LA10P | P680L | 10 | 680 | 875 | 75 | 2500 | 990 | 1210 | 1875 | 25 | 65 |
| V680LA80AP | P680L80 | 14 | 680 | 875 | 145 | 4500 | 990 | 1210 | 1875 | 50 | 190 |
| V680LA100BP | P680L100 | 20 | 680 | 875 | 260 | 6500 | 990 | 1130 | 1700 | 100 | 380 |
| V660LA10P | P660L | 10 | 660 | 850 | 70 | 2500 | 972 | 1188 | 1820 | 25 | 70 |
| V660LA50AP | P660L50 | 14 | 660 | 850 | 140 | 4500 | 972 | 1188 | 1820 | 50 | 200 |
| V660LA100BP | P660L100 | 20 | 660 | 850 | 250 | 6500 | 940 | 1100 | 1650 | 100 | 400 |
| V1000LA80AP | P1000L8 | 14 | 1000 | 1200 | 220 | 4500 | 1500 | 1800 | 2700 | 50 | 130 |
| V1000LA160BP | P1000L16 | 20 | 1000 | 1200 | 360 | 6500 | 1425 | 1600 | 2420 | 100 | 250 |

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

Phenolic Coating Option -- LA Series Varistors for Hi-Temperature Operating Conditions:

- Phenolic-coated LA 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 LA Series except Hi-Pot Encapsulation (Isolation Voltage Capability) = 500V.
- These devices are not UL, CSA, VDE or CECC certified.
- To order: add X1347 to end of part number (e.g. V230LA20APX1347).
- Product marking:

