

### HMOV™ Varistor Series



#### Description



The HMOV™ Varistor Series is specifically designed for applications requiring high surge energy absorption and high operating temperature of 125°C.

The maximum peak surge current is rated up to 10kA (8/20µs pulse) to protect against indirect lightning strikes, switching surge transients, and abnormally fast transients.

#### Features

- High operating temperature combined with high isolation voltage capability: 125°C and 2500V, respectively
- High surge current withstanding capability up to 10kA (8/20µs pulse)
- Complies with 1000 cycle, -55°C to 125°C, Thermal Shock Cycling Test
- Wide operating voltage range
- Three disc sizes available: 10mm, 14mm, and 20mm
- Lead-free, Halogen-free, and RoHS compliant

#### Agency Approvals

| Agency   | Agency Approval                                | Agency File Number            |
|--|--|-------------------------------|
|   | UL1449   | E320116                       |
|  | IEC 60950-1(Annex Q)<br>IECQ CS 042200 GB 0001 | IECQ-C BSI 15.0013<br>E1291/F |

#### Additional Information



Datashheet



Resources



Samples

#### Applications

- LED lighting
- Security System (fire alarm or smoke detector)
- Solar Power Inverter
- Automation control
- Power Supply Unit (outdoor and industrial)

#### Absolute Maximum Ratings

• See Device Ratings and Specifications chart for ratings of individual members of a series.

|  | Low Voltage Series | Units |
|--|--------------------|-------|
| <b>Continuous:</b>   |                    |       |
| <b>Steady State Applied Voltage:</b>   |                    |       |
| AC Voltage Range ( $V_{MACRMS}$ )  | 11 to 625          | V     |
| DC Voltage Range ( $V_{MDC}$ )   | 14 to 825          | V     |
| <b>Transient:</b>  |                    |       |
| Non-Repetitive Surge Current, 8/20µs Waveform ( $I_{TM}$ )                                     | 800 to 10,000      | A     |
| Non-Repetitive Energy Capability, 2ms Waveform ( $W_{TM}$ )                                    | 0.8 to 150         | J     |
| Operating Ambient Temperature Range ( $T_A$ )  | -55 to +125        | °C    |
| Storage Temperature Range ( $T_{STG}$ )  | -55 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)  | 2500               | V     |
| Silicone Coating Insulation Resistance   | >1,000             | MΩ    |

**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.

**HMOV<sup>™</sup> Series Device Ratings and Specifications**

| Silicone Coated Models  |          | Size Disc Dia. (mm) | Maximum Rating (125°C) |                    |                           |                            |                              | Specifications (25°C)   |                      |                                     |                 |                              |
|-------------------------|----------|---------------------|------------------------|--------------------|---------------------------|----------------------------|------------------------------|-------------------------|----------------------|-------------------------------------|-----------------|------------------------------|
|                         |          |                     | Max Continuous Voltage |                    | Max Peak Current (8/20µs) |                            | Energy Rating (2ms, 1 pulse) | Varistor Voltage at 1mA |                      | Maximum Clamping Voltage (8 x 20µs) |                 | Typical Capacitance f = 1MHz |
|                         |          |                     | V <sub>M(AC) RMS</sub> | V <sub>M(DC)</sub> | I <sub>TM</sub> 1 x Pulse | I <sub>TM</sub> 2 x Pulses | W <sub>TM</sub>              | V <sub>NOM</sub> Min    | V <sub>NOM</sub> Max | V <sub>C</sub>                      | I <sub>PK</sub> | C                            |
|                         |          |                     | (V)                    | (V)                | (A)                       | (A)                        | (J)                          | (V)                     | (V)                  | (V)                                 | (A)             | (pF)                         |
| Part Number (Base part) | Branding |                     |                        |                    |                           |                            |                              |                         |                      |                                     |                 |                              |
| V10H11P                 | P10H11   | 10                  | 11                     | 14                 | 1500                      | 800                        | 4.2                          | 16.2                    | 19.8                 | 36                                  | 5               | 5450                         |
| V14H11P                 | P14H11   | 14                  | 11                     | 14                 | 3000                      | 1800                       | 8                            | 16.2                    | 19.8                 | 36                                  | 10              | 12000                        |
| V20H11P                 | P20H11   | 20                  | 11                     | 14                 | 5000                      | 3000                       | 25                           | 16.2                    | 19.8                 | 36                                  | 20              | 26000                        |
| V10H14P                 | P10H14   | 10                  | 14                     | 18                 | 1500                      | 800                        | 5                            | 19.8                    | 24.2                 | 43                                  | 5               | 4650                         |
| V14H14P                 | P14H14   | 14                  | 14                     | 18                 | 3000                      | 1800                       | 10                           | 19.8                    | 24.2                 | 43                                  | 10              | 10200                        |
| V20H14P                 | P20H14   | 20                  | 14                     | 18                 | 5000                      | 3000                       | 28                           | 19.8                    | 24.2                 | 43                                  | 20              | 22200                        |
| V10H17P                 | P10H17   | 10                  | 17                     | 22                 | 1500                      | 800                        | 6.5                          | 24.3                    | 29.7                 | 53                                  | 5               | 3900                         |
| V14H17P                 | P14H17   | 14                  | 17                     | 22                 | 3000                      | 1800                       | 13                           | 24.3                    | 29.7                 | 53                                  | 10              | 8700                         |
| V20H17P                 | P20H17   | 20                  | 17                     | 22                 | 5000                      | 3000                       | 35                           | 24.3                    | 29.7                 | 53                                  | 20              | 18750                        |
| V10H20P                 | P10H20   | 10                  | 20                     | 26                 | 1500                      | 800                        | 10                           | 29.7                    | 36.3                 | 65                                  | 5               | 3400                         |
| V14H20P                 | P14H20   | 14                  | 20                     | 26                 | 3000                      | 1800                       | 20                           | 29.7                    | 36.3                 | 65                                  | 10              | 7500                         |
| V20H20P                 | P20H20   | 20                  | 20                     | 26                 | 5000                      | 3000                       | 58                           | 29.7                    | 36.3                 | 65                                  | 20              | 15000                        |
| V10H23P                 | P10H23   | 10                  | 23                     | 28                 | 1500                      | 800                        | 12                           | 32.4                    | 39.6                 | 71                                  | 5               | 3200                         |
| V14H23P                 | P14H23   | 14                  | 23                     | 28                 | 3000                      | 1800                       | 23                           | 32.4                    | 39.6                 | 71                                  | 10              | 7000                         |
| V20H23P                 | P20H23   | 20                  | 23                     | 28                 | 5000                      | 3000                       | 70                           | 32.4                    | 39.6                 | 71                                  | 20              | 14000                        |
| V10H25P                 | P10H25   | 10                  | 25                     | 31                 | 1500                      | 800                        | 13                           | 35.1                    | 42.9                 | 77                                  | 5               | 2900                         |
| V14H25P                 | P14H25   | 14                  | 25                     | 31                 | 3000                      | 1800                       | 25                           | 35.1                    | 42.9                 | 77                                  | 10              | 6200                         |
| V20H25P                 | P20H25   | 20                  | 25                     | 31                 | 5000                      | 3000                       | 77                           | 35.1                    | 42.9                 | 77                                  | 20              | 13500                        |
| V10H30P                 | P10H30   | 10                  | 30                     | 38                 | 1500                      | 800                        | 15.5                         | 42.3                    | 51.7                 | 93                                  | 5               | 2550                         |
| V14H30P                 | P14H30   | 14                  | 30                     | 38                 | 3000                      | 1800                       | 32                           | 42.3                    | 51.7                 | 93                                  | 10              | 5550                         |
| V20H30P                 | P20H30   | 20                  | 30                     | 38                 | 5000                      | 3000                       | 90                           | 42.3                    | 51.7                 | 93                                  | 20              | 12000                        |
| V10H35P                 | P10H35   | 10                  | 35                     | 45                 | 1500                      | 800                        | 20                           | 50.4                    | 61.6                 | 110                                 | 5               | 2200                         |
| V14H35P                 | P14H35   | 14                  | 35                     | 45                 | 3000                      | 1800                       | 40                           | 50.4                    | 61.6                 | 110                                 | 10              | 5000                         |
| V20H35P                 | P20H35   | 20                  | 35                     | 45                 | 5000                      | 3000                       | 115                          | 50.4                    | 61.6                 | 110                                 | 20              | 10500                        |
| V10H40P                 | P10H40   | 10                  | 40                     | 56                 | 1500                      | 800                        | 25                           | 61.2                    | 74.8                 | 135                                 | 5               | 1850                         |
| V14H40P                 | P14H40   | 14                  | 40                     | 56                 | 3000                      | 1800                       | 50                           | 61.2                    | 74.8                 | 135                                 | 10              | 4000                         |
| V20H40P                 | P20H40   | 20                  | 40                     | 56                 | 5000                      | 3000                       | 140                          | 61.2                    | 74.8                 | 135                                 | 20              | 8500                         |
| V10H50P                 | P10H50   | 10                  | 50                     | 65                 | 3500                      | 3000                       | 20                           | 73.8                    | 90.2                 | 135                                 | 25              | 1400                         |
| V14H50P                 | P14H50   | 14                  | 50                     | 65                 | 6500                      | 5000                       | 40                           | 73.8                    | 90.2                 | 145                                 | 50              | 3000                         |
| V20H50P                 | P20H50   | 20                  | 50                     | 65                 | 10000                     | 7000                       | 80                           | 73.8                    | 90.2                 | 145                                 | 100             | 6000                         |
| V10H60P                 | P10H60   | 10                  | 60                     | 85                 | 3500                      | 3000                       | 24                           | 90                      | 110                  | 165                                 | 25              | 1200                         |
| V14H60P                 | P14H60   | 14                  | 60                     | 85                 | 6500                      | 5000                       | 50                           | 90                      | 110                  | 175                                 | 50              | 2500                         |
| V20H60P                 | P20H60   | 20                  | 60                     | 85                 | 10000                     | 7000                       | 100                          | 90                      | 110                  | 175                                 | 100             | 5200                         |
| V10H75P                 | P10H75   | 10                  | 75                     | 100                | 3500                      | 3000                       | 29                           | 108                     | 132                  | 200                                 | 25              | 1100                         |
| V14H75P                 | P14H75   | 14                  | 75                     | 100                | 6500                      | 5000                       | 60                           | 108                     | 132                  | 210                                 | 50              | 2300                         |
| V20H75P                 | P20H75   | 20                  | 75                     | 100                | 10000                     | 7000                       | 120                          | 108                     | 132                  | 210                                 | 100             | 4800                         |
| V10H95P                 | P10H95   | 10                  | 95                     | 125                | 3500                      | 3000                       | 36                           | 135                     | 165                  | 250                                 | 25              | 800                          |
| V14H95P                 | P14H95   | 14                  | 95                     | 125                | 6500                      | 5000                       | 75                           | 135                     | 165                  | 250                                 | 50              | 1700                         |
| V20H95P                 | P20H95   | 20                  | 95                     | 125                | 10000                     | 7000                       | 150                          | 135                     | 165                  | 250                                 | 100             | 3700                         |
| V10H115P                | P10H115  | 10                  | 115                    | 153                | 3500                      | 3000                       | 30                           | 162                     | 198                  | 300                                 | 25              | 465                          |
| V14H115P                | P14H115  | 14                  | 115                    | 153                | 6500                      | 5000                       | 50                           | 162                     | 198                  | 300                                 | 50              | 1190                         |
| V20H115P                | P20H115  | 20                  | 115                    | 153                | 10000                     | 7000                       | 120                          | 162                     | 198                  | 300                                 | 100             | 2400                         |
| V10H130P                | P10H130  | 10                  | 130                    | 170                | 3500                      | 3000                       | 40                           | 184.5                   | 225.5                | 340                                 | 25              | 450                          |
| V14H130P                | P14H130  | 14                  | 130                    | 170                | 6500                      | 5000                       | 60                           | 184.5                   | 225.5                | 340                                 | 50              | 1000                         |
| V20H130P                | P20H130  | 20                  | 130                    | 170                | 10000                     | 7000                       | 145                          | 184.5                   | 225.5                | 340                                 | 100             | 1900                         |
| V10H140P                | P10H140  | 10                  | 140                    | 180                | 3500                      | 3000                       | 45                           | 198                     | 242                  | 360                                 | 25              | 400                          |

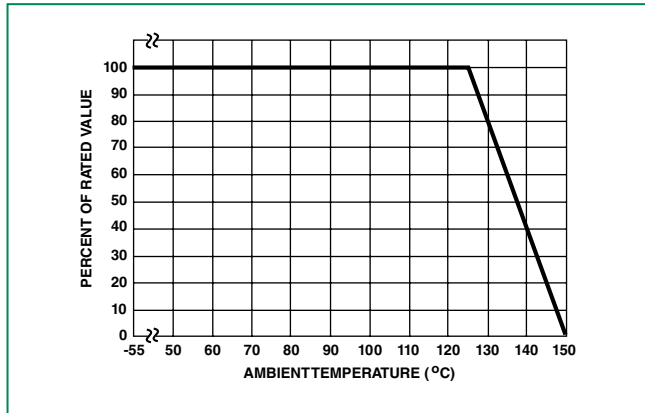
Note: 1. Average power dissipation of transients not to exceed 0.4W, 0.6W or 1W for model sizes 10mm, 14mm, and 20mm, respectively.

### HMOV™ Series Device Ratings and Specifications

|                         |          | Maximum Rating (125°C) |                        |             |                                |                                 |                              | Specifications (25°C)   |                       |                                     |          |                              |
|-------------------------|----------|------------------------|------------------------|-------------|--------------------------------|---------------------------------|------------------------------|-------------------------|-----------------------|-------------------------------------|----------|------------------------------|
|                         |          | Size Disc Dia. (mm)    | Max Continuous Voltage |             | Max Peak Current (8/20µs)      |                                 | Energy Rating (2ms, 1 pulse) | Varistor Voltage at 1mA |                       | Maximum Clamping Voltage (8 x 20µs) |          | Typical Capacitance f = 1MHz |
| Part Number (Base part) | Branding |                        | $V_{M(AC) RMS}$        | $V_{M(DC)}$ | $I_{TM} 1 \times \text{Pulse}$ | $I_{TM} 2 \times \text{Pulses}$ | $W_{TM}$                     | $V_{NOM} \text{ Min}$   | $V_{NOM} \text{ Max}$ | $V_C$                               | $I_{PK}$ | C                            |
|                         |          |                        | (V)                    | (V)         | (A)                            | (A)                             | (J)                          | (V)                     | (V)                   | (V)                                 | (A)      | (pF)                         |
| V14H140P                | P14H140  | 14                     | 140                    | 180         | 6500                           | 5000                            | 65                           | 198                     | 242                   | 360                                 | 50       | 900                          |
| V20H140P                | P20H140  | 20                     | 140                    | 180         | 10000                          | 7000                            | 155                          | 198                     | 242                   | 360                                 | 100      | 1750                         |
| V10H150P                | P10H150  | 10                     | 150                    | 200         | 3500                           | 3000                            | 50                           | 216                     | 264                   | 395                                 | 25       | 360                          |
| V14H150P                | P14H150  | 14                     | 150                    | 200         | 6500                           | 5000                            | 70                           | 216                     | 264                   | 395                                 | 50       | 800                          |
| V20H150P                | P20H150  | 20                     | 150                    | 200         | 10000                          | 7000                            | 165                          | 216                     | 264                   | 395                                 | 100      | 1600                         |
| V10H175P                | P10H175  | 10                     | 175                    | 225         | 3500                           | 3000                            | 55                           | 243                     | 297                   | 455                                 | 25       | 350                          |
| V14H175P                | P14H175  | 14                     | 175                    | 225         | 6500                           | 5000                            | 80                           | 243                     | 297                   | 455                                 | 50       | 700                          |
| V20H175P                | P20H175  | 20                     | 175                    | 225         | 10000                          | 7000                            | 180                          | 243                     | 297                   | 455                                 | 100      | 1400                         |
| V10H230P                | P10H230  | 10                     | 230                    | 300         | 3500                           | 3000                            | 60                           | 324                     | 396                   | 595                                 | 25       | 250                          |
| V14H230P                | P14H230  | 14                     | 230                    | 300         | 6500                           | 5000                            | 105                          | 324                     | 396                   | 595                                 | 50       | 550                          |
| V20H230P                | P20H230  | 20                     | 230                    | 300         | 10000                          | 7000                            | 225                          | 324                     | 396                   | 595                                 | 100      | 1100                         |
| V10H250P                | P10H250  | 10                     | 250                    | 320         | 3500                           | 3000                            | 65                           | 351                     | 429                   | 650                                 | 25       | 220                          |
| V14H250P                | P14H250  | 14                     | 250                    | 320         | 6500                           | 5000                            | 115                          | 351                     | 429                   | 650                                 | 50       | 500                          |
| V20H250P                | P20H250  | 20                     | 250                    | 320         | 10000                          | 7000                            | 240                          | 351                     | 429                   | 650                                 | 100      | 1000                         |
| V10H275P                | P10H275  | 10                     | 275                    | 350         | 3500                           | 3000                            | 70                           | 387                     | 473                   | 710                                 | 25       | 200                          |
| V14H275P                | P14H275  | 14                     | 275                    | 350         | 6500                           | 5000                            | 130                          | 387                     | 473                   | 710                                 | 50       | 450                          |
| V20H275P                | P20H275  | 20                     | 275                    | 350         | 10000                          | 7000                            | 260                          | 387                     | 473                   | 710                                 | 100      | 900                          |
| V10H300P                | P10H300  | 10                     | 300                    | 385         | 3500                           | 3000                            | 75                           | 423                     | 517                   | 775                                 | 25       | 180                          |
| V14H300P                | P14H300  | 14                     | 300                    | 385         | 6500                           | 5000                            | 140                          | 423                     | 517                   | 775                                 | 50       | 400                          |
| V20H300P                | P20H300  | 20                     | 300                    | 385         | 10000                          | 7000                            | 290                          | 423                     | 517                   | 775                                 | 100      | 800                          |
| V10H320P                | P10H320  | 10                     | 320                    | 420         | 3500                           | 3000                            | 80                           | 459                     | 561                   | 840                                 | 25       | 170                          |
| V14H320P                | P14H320  | 14                     | 320                    | 420         | 6500                           | 5000                            | 150                          | 459                     | 561                   | 840                                 | 50       | 380                          |
| V20H320P                | P20H320  | 20                     | 320                    | 420         | 10000                          | 7000                            | 320                          | 459                     | 561                   | 840                                 | 100      | 750                          |
| V10H385P                | P10H385  | 10                     | 385                    | 505         | 3500                           | 3000                            | 85                           | 558                     | 682                   | 1025                                | 25       | 160                          |
| V14H385P                | P14H385  | 14                     | 385                    | 505         | 6500                           | 5000                            | 175                          | 558                     | 682                   | 1025                                | 50       | 360                          |
| V20H385P                | P20H385  | 20                     | 385                    | 505         | 10000                          | 7000                            | 325                          | 558                     | 682                   | 1025                                | 100      | 700                          |
| V10H420P                | P10H420  | 10                     | 420                    | 560         | 3500                           | 3000                            | 90                           | 612                     | 748                   | 1120                                | 25       | 140                          |
| V14H420P                | P14H420  | 14                     | 420                    | 560         | 6500                           | 5000                            | 185                          | 612                     | 748                   | 1120                                | 50       | 300                          |
| V20H420P                | P20H420  | 20                     | 420                    | 560         | 10000                          | 7000                            | 330                          | 612                     | 748                   | 1120                                | 100      | 600                          |
| V10H440P                | P10H440  | 10                     | 440                    | 585         | 3500                           | 3000                            | 95                           | 643.5                   | 786.5                 | 1180                                | 25       | 130                          |
| V14H440P                | P14H440  | 14                     | 440                    | 585         | 6500                           | 5000                            | 185                          | 643.5                   | 786.5                 | 1180                                | 50       | 260                          |
| V20H440P                | P20H440  | 20                     | 440                    | 585         | 10000                          | 7000                            | 340                          | 643.5                   | 786.5                 | 1180                                | 100      | 500                          |
| V10H460P                | P10H460  | 10                     | 460                    | 615         | 3500                           | 3000                            | 95                           | 675                     | 825                   | 1240                                | 25       | 120                          |
| V14H460P                | P14H460  | 14                     | 460                    | 615         | 6500                           | 5000                            | 190                          | 675                     | 825                   | 1240                                | 50       | 220                          |
| V20H460P                | P20H460  | 20                     | 460                    | 615         | 10000                          | 7000                            | 370                          | 675                     | 825                   | 1240                                | 100      | 400                          |
| V10H510P                | P10H510  | 10                     | 510                    | 670         | 3500                           | 3000                            | 98                           | 738                     | 902                   | 1355                                | 25       | 110                          |
| V14H510P                | P14H510  | 14                     | 510                    | 670         | 6500                           | 5000                            | 205                          | 738                     | 902                   | 1355                                | 50       | 200                          |
| V20H510P                | P20H510  | 20                     | 510                    | 670         | 10000                          | 7000                            | 410                          | 738                     | 902                   | 1355                                | 100      | 350                          |
| V10H550P                | P10H550  | 10                     | 550                    | 745         | 3500                           | 3000                            | 98                           | 819                     | 1001                  | 1500                                | 25       | 100                          |
| V14H550P                | P14H550  | 14                     | 550                    | 745         | 6500                           | 5000                            | 210                          | 819                     | 1001                  | 1500                                | 50       | 180                          |
| V20H550P                | P20H550  | 20                     | 550                    | 745         | 10000                          | 7000                            | 450                          | 819                     | 1001                  | 1500                                | 100      | 300                          |
| V10H625P                | P10H625  | 10                     | 625                    | 825         | 3500                           | 3000                            | 110                          | 900                     | 1100                  | 1650                                | 25       | 90                           |
| V14H625P                | P14H625  | 14                     | 625                    | 825         | 6500                           | 5000                            | 235                          | 900                     | 1100                  | 1650                                | 50       | 160                          |
| V20H625P                | P20H625  | 20                     | 625                    | 825         | 10000                          | 7000                            | 490                          | 900                     | 1100                  | 1650                                | 100      | 250                          |

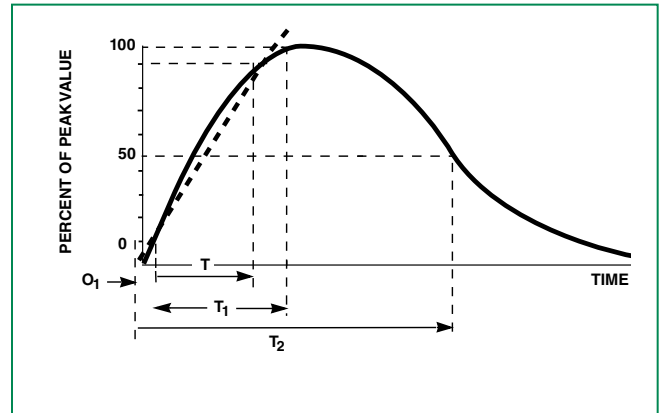
Note: 1. Average power dissipation of transients not to exceed 0.4W, 0.6W or 1W for model sizes 10mm, 14mm, and 20mm respectively..

### Current Energy and Power Dissipation Ratings



Note:  
The peak surge current and energy ratings must be reduced for applications exceeding 125°C ambient temperature.

### 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 10mm Parts

V10x11P - V10x40P



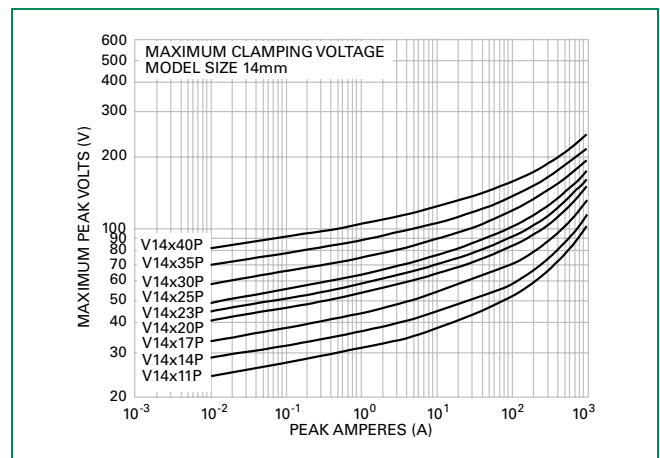
### Maximum Clamping Voltage for 20mm Parts

V20x11P - V20x40P



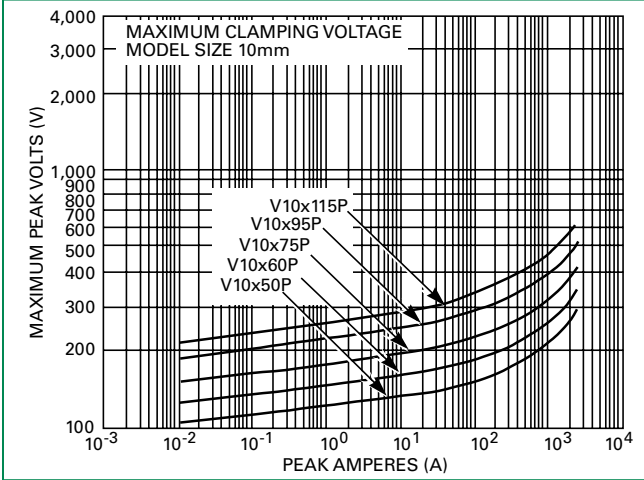
### Maximum Clamping Voltage for 14mm Parts

V14x11P - V14x40P



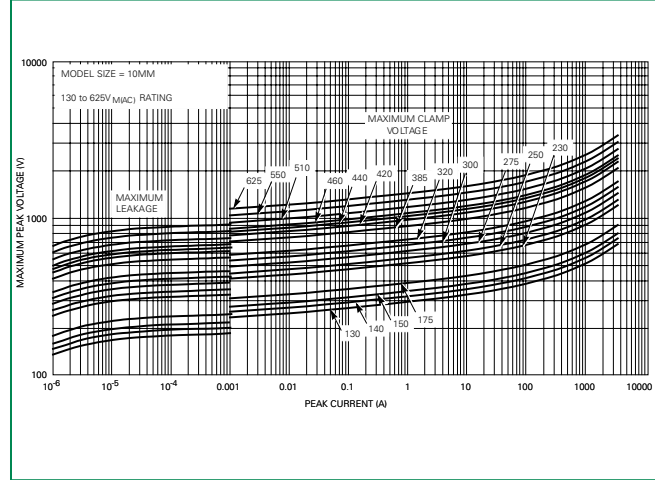
**Maximum Clamping Voltage for 10mm Parts**

V10x50P - V10x115P



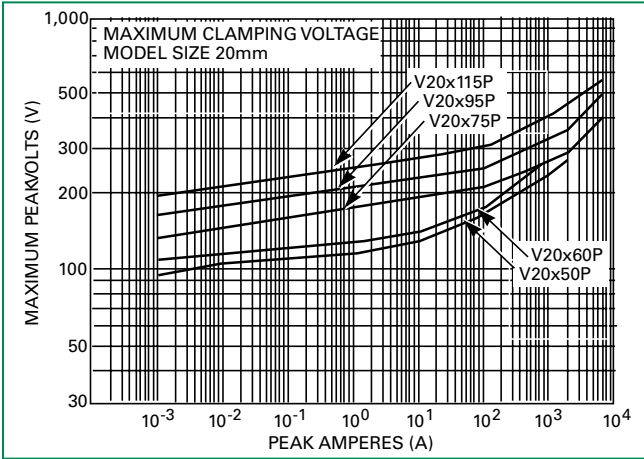
**Maximum Clamping Voltage for 10mm Parts**

V10x130P - V10x625P



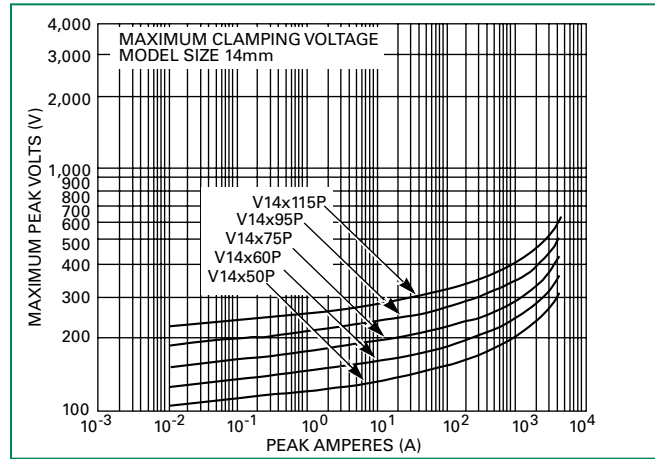
**Maximum Clamping Voltage for 20mm Parts**

V20x50P - V20x115P



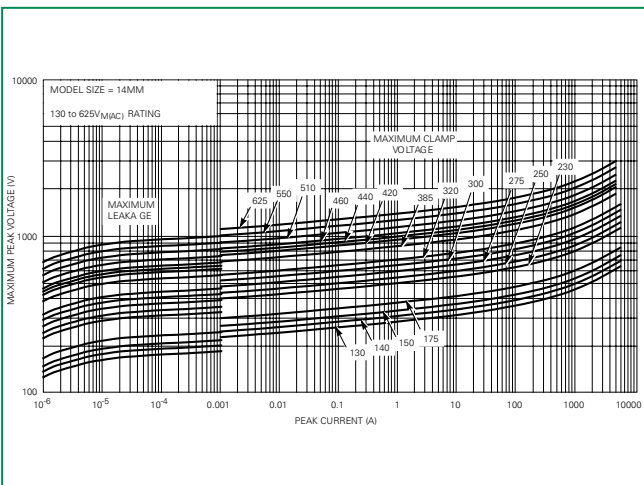
**Maximum Clamping Voltage for 14mm Parts**

V14x50P - V14x115P



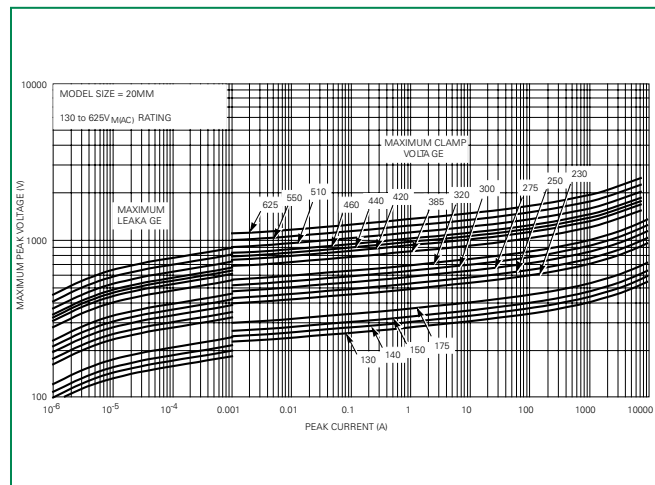
**Maximum Clamping Voltage for 14mm Parts**

V14x130P - V14x625P



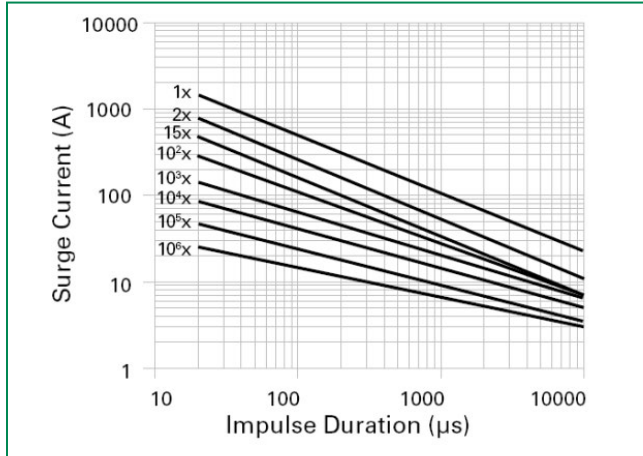
**Maximum Clamping Voltage for 20mm Parts**

V20x130P - V20x625P



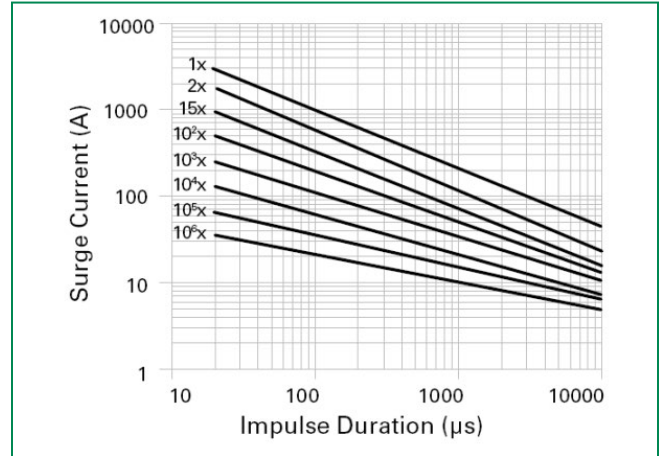
**Repetitive Surge Capability for 10mm Parts**

V10x11P - V10x40P



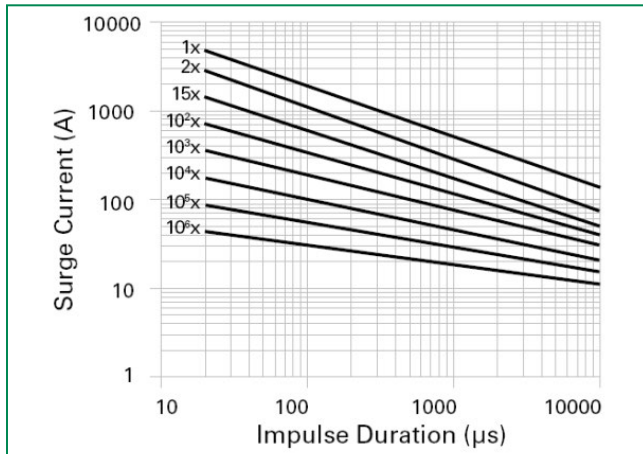
**Repetitive Surge Capability for 14mm Parts**

V14x11P - V14x40P



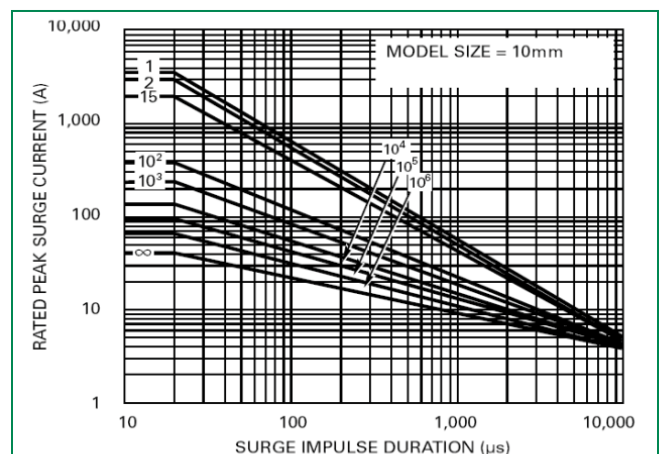
**Repetitive Surge Capability for 20mm Parts**

V20x11P - V20x40P



**Maximum Clamping Voltage 10mm Parts**

V10x115P - V10x625P



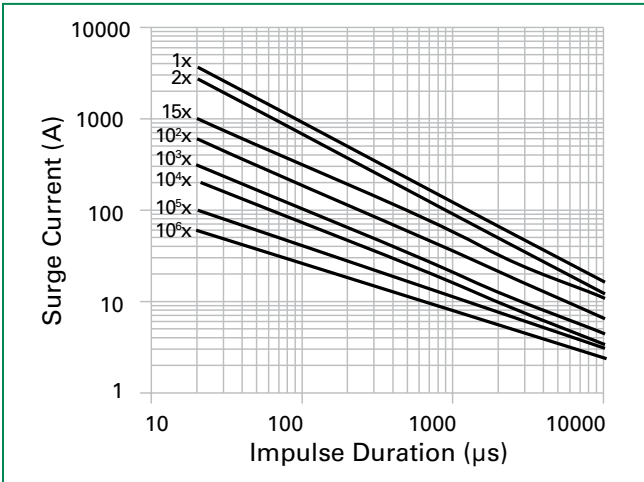
Note: Repetitive surge capability is qualified and tested based on 8/20us current waveform (not combination waveform) and UL1449 40.73 (Edition 4) test condition.

NOTE: If pulse ratings are exceeded, a shift of  $V_{NDCI}$  (at specified current) of more than +/-10% could result. This type of shift, which normally results in a decrease of  $V_{NDCI}$ , 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.



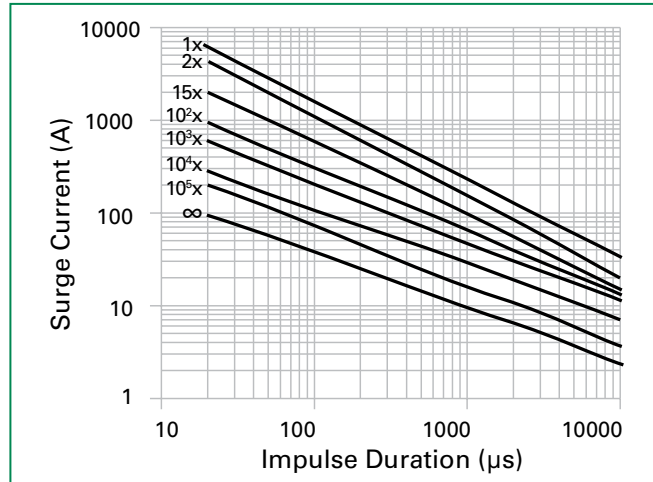
**Repetitive Surge Capability for 10mm Parts**

V10x50P - V10x95P



**Repetitive Surge Capability for 14mm Parts**

V14x50P - V14x95P



**Repetitive Surge Capability for 20mm Parts**

V20x50P - V20x95P



**Repetitive Surge Capability for 14mm Parts**

V14x115P - V14x625P



**Repetitive Surge Capability for 20mm Parts**

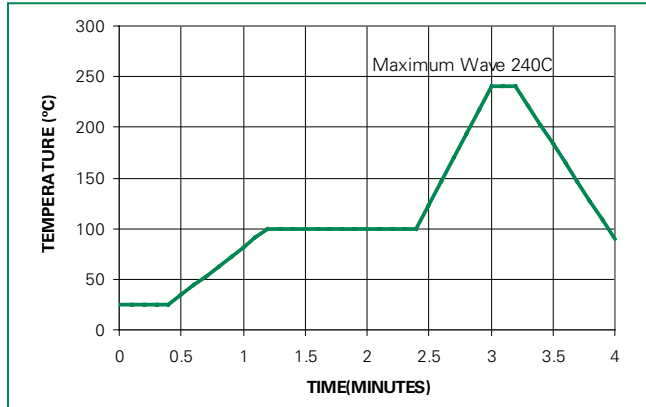
V20x115P - V20x625P



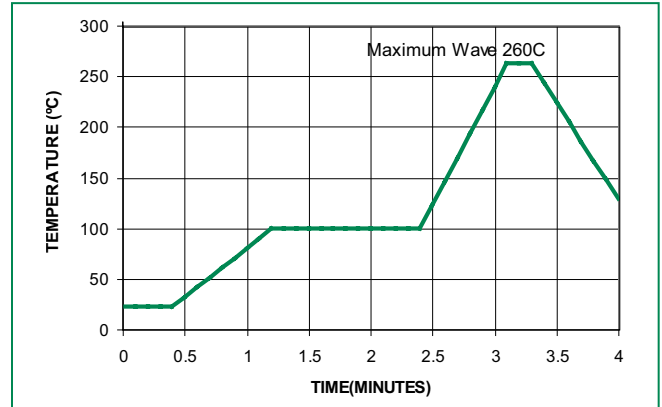
Note: Repetitive surge capability is qualified and tested based on 8/20us current waveform (not combination waveform) and UL1449 40.73 (Edition 4) test condition.

**Wave Solder Profile**

**Non Lead-free Profile**



**Lead-free Profile**



**Physical Specifications**

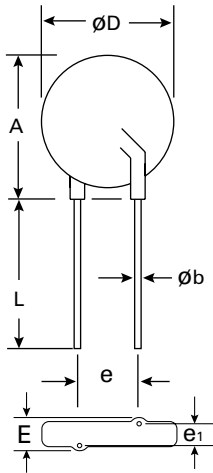
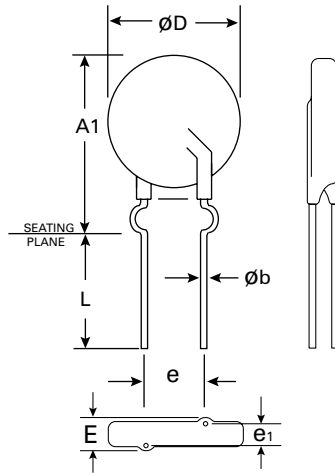
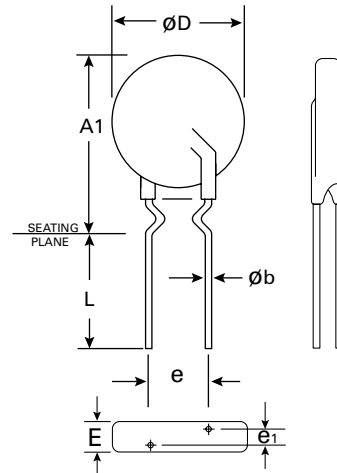
|                                  |  |
|----------------------------------|--|
| <b>Lead Material</b>             | Copper Clad Steel Wire                     |
| <b>Soldering Characteristics</b> | Solderability per MIL-STD-202, Method 208  |
| <b>Insulating Material</b>       | Cured, Silicone meets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

**Environmental Specifications**

|                             |   |
|-----------------------------|---|
| <b>Humidity Aging</b>       | +85°C, 85% RH, 1500 hours<br>+/-10% typical voltage change    |
| <b>Thermal Shock</b>        | -55°C to +125°C, 1000 cycles<br>+/-10% typical voltage change |
| <b>Solvent Resistance</b>   | MIL-STD-202, Method 215                                       |
| <b>Moisture Sensitivity</b> | Level 1, J-STD-020  |



### Product Dimensions (mm)

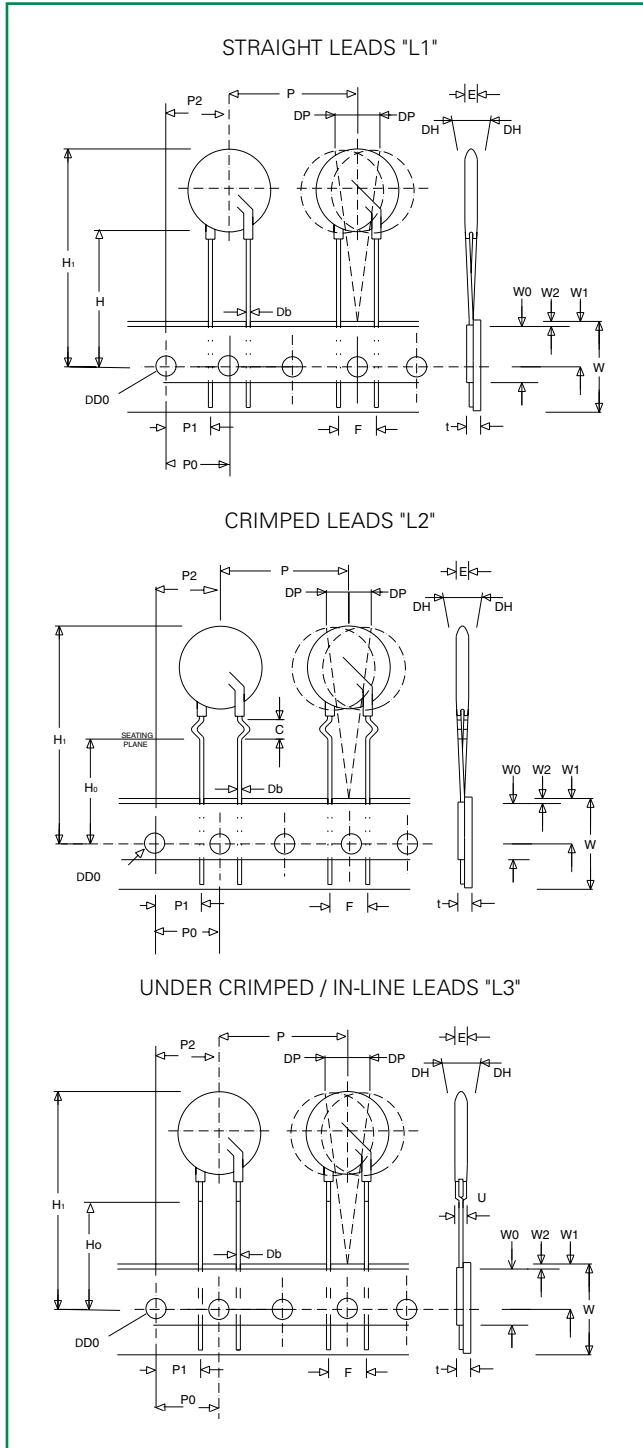
**Straight Lead Option**

**Outer Crimped Lead Option**

**Inner Crimped Lead Option**


| Dimension               | V <sub>RMS</sub> Voltage Model | 10mm Size    |              | 14mm Size    |              | 20mm Size    |              |
|-------------------------|--------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|
|                         |                                | Min. mm (in) | Max. mm (in) | Min. mm (in) | Max. mm (in) | Min. mm (in) | Max. mm (in) |
| <b>A</b>                | 11 - 320                       | -            | 16 (0.630)   | -            | 20 (0.787)   | -            | 26.5 (1.043) |
|                         | 385 - 625                      | -            | 17 (0.689)   | -            | 20.5 (0.807) | -            | 28.0 (1.102) |
| <b>A1</b>               | All                            | -            | 19.5 (0.768) | -            | 22.5 (0.886) | -            | 29.0 (1.142) |
| <b>ØD</b>               | All                            | -            | 12.5 (0.492) | -            | 17 (0.669)   | -            | 23.0 (0.906) |
| <b>e</b>                | 11 - 95                        | 6.5 (0.256)  | 8.5 (0.335)  | 6.5 (0.256)  | 8.5 (0.335)  | 6.5 (0.256)  | 8.5 (0.335)  |
|                         | ≥115                           |              |              |              |              | 9.0 (0.354)  | 11.0 (0.433) |
| <b>e<sub>1</sub></b>    | 11 - 30                        | 1.0 (0.039)  | 3.0 (0.118)  | 1.0 (0.039)  | 3.0 (0.118)  | 1.0 (0.039)  | 3.0 (0.118)  |
|                         | 35 - 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)  |
|                         | 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)  |
| <b>E</b>                | 11 - 30                        | -            | 5.0 (0.197)  | -            | 5.0 (0.197)  | -            | 5.0 (0.197)  |
|                         | 35 - 320                       | -            | 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)  |
|                         | 550 - 625                      | -            | 8.3 (0.327)  | -            | 8.3 (0.327)  | -            | 8.3 (0.327)  |
| <b>Øb</b>               | All                            | 0.76 (0.030) | 0.86 (0.034) | 0.76 (0.030) | 0.86 (0.034) | 0.76 (0.030) | 0.86 (0.034) |
| <b>L</b>                | All                            | 25.4 (1.00)  | -            | 25.4 (1.00)  | -            | 25.4 (1.00)  | -            |
| <b>L<sub>TRIM</sub></b> | All                            | 2.5 (0.098)  | 4.5 (0.177)  | 2.5 (0.098)  | 4.5 (0.177)  | 2.5 (0.098)  | 4.5 (0.177)  |

Note: Dimensions in Millimetres (Inches) are typical.

**Tape and Reel Specifications**

**10, 14, and 20mm Devices**



Refer next page for dimension measurement specifications.

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