

# MLA1812NR Varistor Series

## Automotive Qualified > Surface Mount



### Description

Littelfuse MLA1812NR Varistor Series is an AEC-Q200 qualified surface-mount Multilayer Varistor (MLV) with ultra-high surge current handling capability, which will protect integrated circuits and other components at the circuit board level to ensure reliable performance of the circuitry. It consists of stack of intercalating ceramic/electrode and nickel barrier termination.

### Features

- High transient current absorption withstanding capability to meet IEC61000-4-5
- AEC-Q200 qualified
- High operating temperature: 125 °C
- RoHS compliant, Halogen-free, and Pb-free

### Benefits

- Enhance product reliability and lifespan
- Meets requirements of auto graded product and suitable for automotive applications
- More reliable and suitable for high operating temperature applications
- Environment-friendly

### Applications

- Automotive electronics (Infotainment, safety, body, and comfort)
- Industrial automation
- LED Lighting
- Building Applications

### Web Resources



Download ECAD models, order samples, and find technical resources at [www.littelfuse.com](http://www.littelfuse.com)

## Device Ratings and Characteristics

| Part Number       | Specifications (25 °C)             |            |  |            |  |                                    |                            |
|-------------------|------------------------------------|------------|--|------------|--|------------------------------------|----------------------------|
|                   | Maximum Continuous Working Voltage |            | Nominal Voltage Test Current @ 1 mA DC |            | Maximum Non-repetitive Surge Current (8/20 μs) | Maximum Clamping Voltage (8/20 μs) | Capacitance (Typical) 1KHz |
|                   | $V_M$ (AC)                         | $V_M$ (DC) | $V_N$ (DC)                             | $V_N$ (DC) | $I_{TM}$                                       | $V_C$ @ 5A                         | $C_p$                      |
|                   | (V)                                | (V)        | Min (V)                                | Max (V)    | (A)  | (V)                                | pF                         |
| V14MLA1812NRAUTO  | 10                                 | 14         | 16                                     | 22         | 800  | 42                                 | 8400                       |
| V26MLA1812NRAUTO  | 18                                 | 26         | 31                                     | 38         | 800  | 62                                 | 3200                       |
| V30MLA1812NRAUTO  | 21                                 | 30         | 37                                     | 46         | 800  | 70                                 | 3950                       |
| V38MLA1812NRAUTO  | 30                                 | 38         | 46                                     | 54         | 800  | 80                                 | 2500                       |
| V45MLA1812NRAUTO  | 35                                 | 45         | 50                                     | 62         | 500  | 90                                 | 1800                       |
| V56MLA1812NRAUTO  | 40                                 | 56         | 67                                     | 84         | 800  | 135                                | 1800                       |
| V65MLA1812NRAUTO  | 50                                 | 65         | 73                                     | 91         | 800  | 140                                | 1500                       |
| V85MLA1812NRAUTO  | 60                                 | 85         | 90                                     | 110        | 400  | 145                                | 1100                       |
| V100MLA1812NRAUTO | 75                                 | 100        | 108                                    | 132        | 500  | 200                                | 700                        |

**Notes:**

1. RoHS compliant
2. Qualified based on AEC-Q200
3. Meet IEC61000-4-5 standard
4. Operating Ambient Temperature Range (TA): -40 °C to +125 °C
5. Storage temperature Range (on board): -40 °C to +125 °C
6. Moisture Sensitivity Level: Level 1
7. S=1000pcs/reel
8. Quick response time: <1 ns
9. Storage Time: 12 months max. Storage Temperature: 5 to 40 °C, Relative Humidity: 65% max.

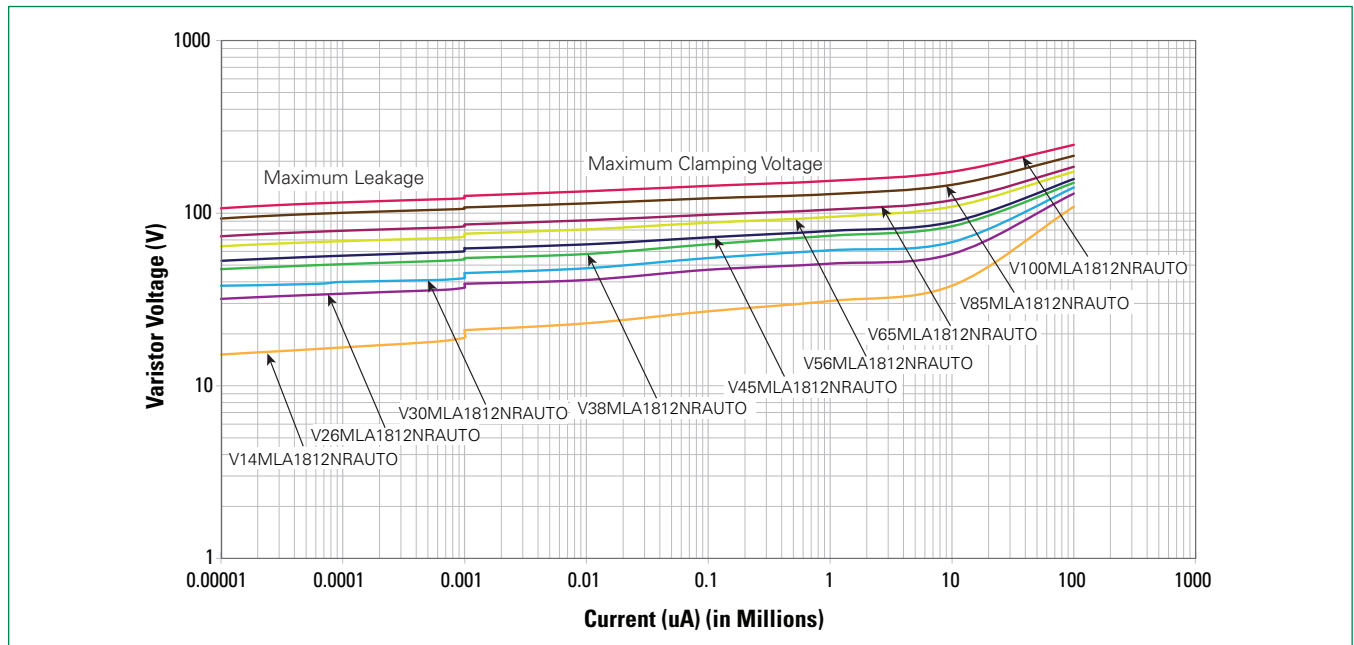
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## Maximum Clamping Voltage

| Part Number       | 10uA | 100uA | 1mA  | 10mA  | 100mA  | 1A      | 10A      | 100A      | 1000A      |
|-------------------|------|-------|------|-------|--------|---------|----------|-----------|------------|
|                   | 10   | 100   | 1000 | 10000 | 100000 | 1000000 | 10000000 | 100000000 | 1000000000 |
| V14MLA1812NRAUTO  |      |       | 21   | 23    | 27     | 31      | 38       | 109       |            |
| V26MLA1812NRAUTO  |      |       | 39   | 41    | 47     | 51      | 58       | 130       |            |
| V30MLA1812NRAUTO  |      |       | 45   | 48    | 55     | 61      | 68       | 141       |            |
| V38MLA1812NRAUTO  |      |       | 55   | 58    | 66     | 74      | 84       | 150       |            |
| V45MLA1812NRAUTO  |      |       | 62.5 | 66    | 72.5   | 79      | 89       | 158       |            |
| V56MLA1812NRAUTO  |      |       | 76   | 80.5  | 88     | 95      | 109      | 174       |            |
| V65MLA1812NRAUTO  |      |       | 86   | 91    | 98     | 105     | 119      | 186       |            |
| V85MLA1812NRAUTO  |      |       | 108  | 114   | 122    | 129     | 146      | 215       |            |
| V100MLA1812NRAUTO |      |       | 126  | 134   | 144    | 154     | 174      | 249       |            |

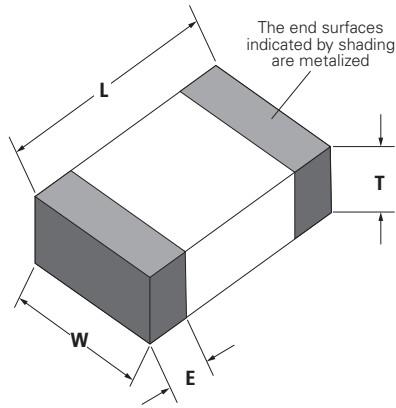
## Limit V-I Characteristics



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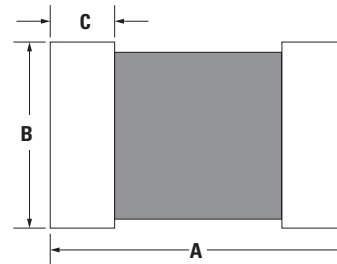
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## Mechanical Dimensions



| Dimension | Specification (mm) |
|-----------|--------------------|
| L         | 4.50 +/- 0.4       |
| W         | 3.20 +/- 0.30      |
| T         | 2.5 Max            |
| E         | 0.60 +/- 0.30      |

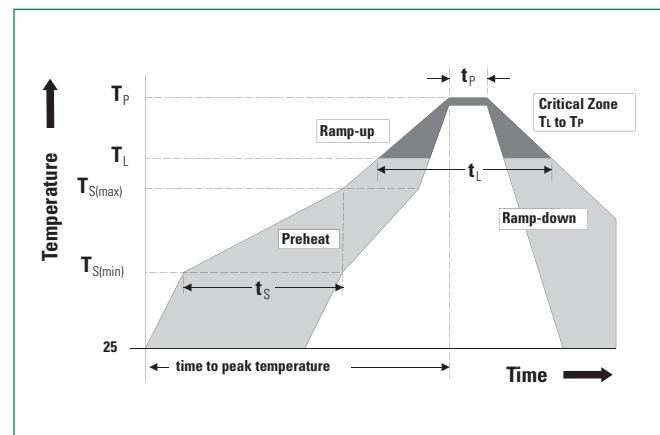
## Recommended Pad Size



| Dimension | Specification (mm) |
|-----------|--------------------|
| A         | 6.0                |
| B         | 3.6                |
| C         | 1.5                |

## Soldering Parameters

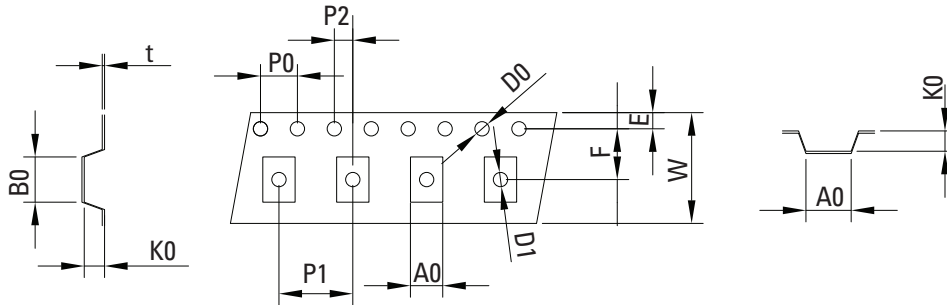
|   |                                    |                    |
|---|------------------------------------|--------------------|
| <b>Reflow Condition</b>   |                                    | Pb-free assembly   |
| <b>Pre Heat</b>   | - Temperature Min ( $T_{s(min)}$ ) | 150 °C             |
|   | - Temperature Max ( $T_{s(max)}$ ) | 200 °C             |
|   | - Time (Min to Max) ( $t_s$ )      | 60–180 secs        |
| <b>Average Ramp-Up Rate (<math>T_{s(max)}</math> to <math>T_p</math>)</b> |                                    | 3 °C / second max. |
| <b>Reflow</b>   | - Temperature ( $T_L$ ) (Liquidus) | 217 °C             |
|   | - Temperature ( $t_L$ )            | 60–150 secs        |
| <b>Peak Temperature (<math>T_p</math>)</b>                                |                                    | 260+0 / -5 °C      |
| <b>Time within 5 °C of actual peak Temperature (<math>t_p</math>)</b>     |                                    | 20–40 seconds      |
| <b>Ramp-down Rate</b>   |                                    | 6 °C / second max. |
| <b>Time 25 °C to peak Temperature (<math>T_p</math>)</b>                  |                                    | 8 minutes max.     |
| <b>Do not exceed</b>  |                                    | 260 °C             |



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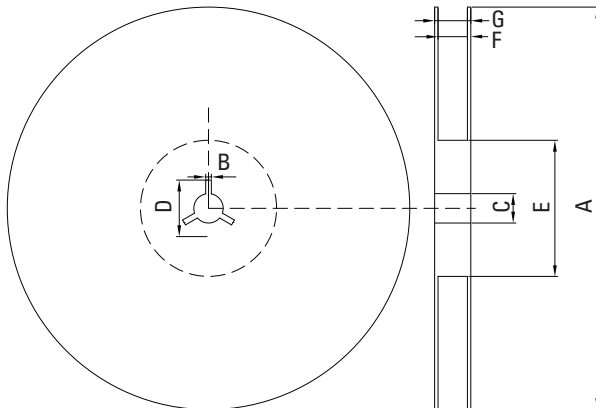
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## Reel Specifications (Unit: mm)



| Type | W              | E             | F            | D0            | D1            | P0            | P1            | P2            | B0            | A0            | K0           | t             |
|------|----------------|---------------|--------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------|---------------|
| 1812 | 12.00<br>±0.15 | 1.75<br>±0.10 | 5.5<br>±0.10 | 1.55<br>±0.10 | 1.55<br>±0.10 | 4.00<br>±0.10 | 8.00<br>±0.10 | 2.00<br>±0.10 | 4.90<br>±0.15 | 3.50<br>±0.10 | 2.2<br>±0.10 | 0.25<br>±0.05 |

## Tape Specifications (Unit: mm)



| Type | A         | B       | C        | D        | E        | F        | G        |
|------|-----------|---------|----------|----------|----------|----------|----------|
| 1812 | 178.0±1.0 | 2.5±0.5 | 13.0±0.5 | 25.0±0.5 | 60.2±0.5 | 13.0±0.5 | 16.0±0.5 |

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