

# 157 Series

## Standard Nano<sup>2®</sup> Fuse and Clip Assembly



### Additional Information



Resources



Accessories



Samples

### Description

The 157 Series – Standard Nano Fuse/Clip assembly is a small, square, very fast-acting surface mount fuse that is assembled in surface mountable fuse clips. The fuse clip and pre-installed fuse combination can be automatically placed in PC Board in one efficient manufacturing operation. It permits quick and easy replacement of fuses without performing desoldering process, even in the field and without exposing the PC Board to detrimental effects of rework solder heat.

### Features & Benefits

- Surface Mountable
- Very Fast-Acting Fuse
- Fully compatible with RoHS/ Pb-Free solder alloys and higher temperature profiles associated with leadfree assembly.
- Easily replaceable on PC Board (Field Replaceable)
- RoHS compliant and Halogen Free
- Available in ratings of 0.062 ~ 10 Amperes.

### Applications

- Instrumentation
- Base Stations
- Telecommunications

### Electrical Characteristics for Series

| % of Ampere Rating | Opening Time at 25°C |
|--------------------|----------------------|
| 100%               | 4 hours Minimum      |
| 200%               | 5 secs. Maximum      |

### Electrical Specifications by Item

| Ampere Rating (A) | Amp Code | Max Voltage Rating (V) | Interrupting Rating (A)                      | Fuse Furnished | Nominal Cold Resistance (Ohms) | Nominal Melting P <sub>t</sub> (A <sup>2</sup> sec) | Agency Approvals |   |
|-------------------|----------|------------------------|----------------------------------------------|----------------|--------------------------------|-----------------------------------------------------|------------------|---|
|                   |          |                        |                                              |                |                                |                                                     |                  |   |
| 0.062             | 0.062    | 125                    | 50A @ 125 VAC/VDC<br>300A @ 32 VDC           | 451.062        | 5.5372                         | 0.00019                                             | X                | - |
| 0.08              | 0.08     | 125                    |                                              | 451.08         | 4.0500                         | 0.00033                                             | X                | - |
| 0.1               | 0.1      | 125                    |                                              | 451.1          | 3.1000                         | 0.00138                                             | X                | - |
| 0.125             | 0.125    | 125                    |                                              | 451.125        | 1.7059                         | 0.00286                                             | X                | - |
| 0.16              | 0.16     | 125                    |                                              | 453.16         | 1.2157                         | 0.0048                                              | X                | - |
| 0.2               | 0.2      | 125                    |                                              | 453.2          | 1.3971                         | 0.00652                                             | X                | - |
| 0.25              | 0.25     | 125                    |                                              | 453.25         | 1.0496                         | 0.01126                                             | X                | - |
| 0.315             | 0.315    | 125                    |                                              | 453.315        | 0.3881                         | 0.0311                                              | X                | - |
| 0.375             | 0.375    | 125                    |                                              | 453.375        | 0.4518                         | 0.0442                                              | X                | - |
| 0.4               | 0.4      | 125                    |                                              | 453.4          | 0.4212                         | 0.0551                                              | X                | - |
| 0.5               | 0.5      | 125                    |                                              | 453.5          | 0.3031                         | 0.0824                                              | X                | - |
| 0.63              | 0.63     | 125                    |                                              | 453.63         | 0.2012                         | 0.1381                                              | X                | - |
| 0.75              | 0.75     | 125                    |                                              | 453.75         | 0.1437                         | 0.2143                                              | X                | - |
| 0.8               | 0.8      | 125                    |                                              | 453.8          | 0.1348                         | 0.2654                                              | X                | - |
| 1.0               | 1.0      | 125                    |                                              | 453001.0       | 0.0776                         | 0.6029                                              | X                | X |
| 1.25              | 1.25     | 125                    |                                              | 4531.25        | 0.078                          | 0.664                                               | X                | X |
| 1.5               | 1.5      | 125                    |                                              | 45301.5        | 0.0634                         | 0.853                                               | X                | X |
| 1.6               | 1.6      | 125                    |                                              | 45301.6        | 0.0580                         | 1.06                                                | X                | X |
| 2.0               | 2.0      | 125                    |                                              | 453002.0       | 0.0373                         | 0.53                                                | X                | X |
| 2.5               | 2.5      | 125                    |                                              | 45302.5        | 0.0288                         | 1.029                                               | X                | X |
| 3.0               | 3.0      | 125                    |                                              | 453003.0       | 0.0229                         | 1.65                                                | X                | X |
| 3.15              | 3.15     | 125                    |                                              | 4533.15        | 0.0215                         | 1.92                                                | X                | X |
| 3.5               | 3.5      | 125                    |                                              | 45303.5        | 0.0203                         | 2.469                                               | X                | X |
| 4.0               | 4.0      | 125                    |                                              | 453004.0       | 0.0163                         | 3.152                                               | X                | X |
| 5.0               | 5.0      | 125                    |                                              | 453005.0       | 0.0127                         | 5.566                                               | X                | X |
| 6.3               | 6.3      | 125                    |                                              | 45306.3        | 0.0098                         | 9.17                                                | X                | X |
| 7.0               | 7.0      | 125                    |                                              | 453007.0       | 0.0092                         | 10.32                                               | X                | X |
| 8.0               | 8.0      | 125                    |                                              | 453008.0       | 0.0079                         | 20.23                                               | X                | X |
| 10.0              | 10.0     | 125                    | 35A @ 125 VAC / 50A @125 VDC<br>300A @ 32VDC | 453010.0       | 0.0058                         | 26.46                                               | X                | X |

1. Cold resistance measured at less than 10% of rated current at 23°C.

2. P<sub>t</sub> values stated for 8ms opening time.

3. Agency Approval Table Key: X=Approved or Certified, P=Pending and Blank=Not Approved

4. Have special electrical characteristic needs? Contact Littelfuse to learn more about application specific options.

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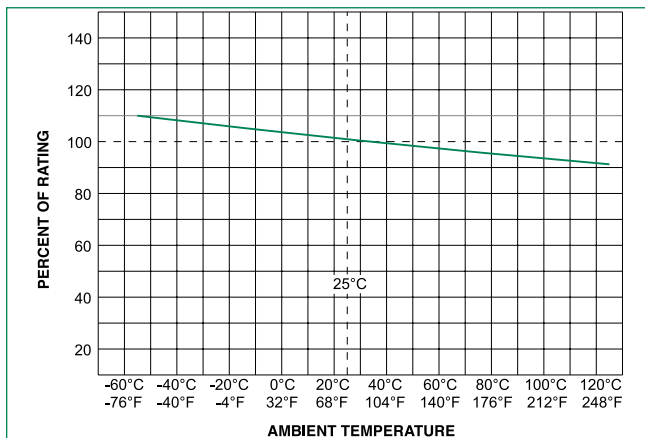
## Standard Nano<sup>2®</sup> Fuse and Clip Assembly

### Agency Approvals

| Agency                                                                            | Agency File Number                                          | Ampere Range                       |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------|------------------------------------|
|  | E14721                                                      | 0.062A - 10A                       |
|  | NBK030205-E10480A<br>NBK030205-E10480B<br>NBK101105-E184655 | 1A - 1.6A<br>2A - 5A<br>6.3A - 10A |

**Note:** PSE/METI Certification is only applicable to the fuse. Clips do not require certification for the Japanese Market.

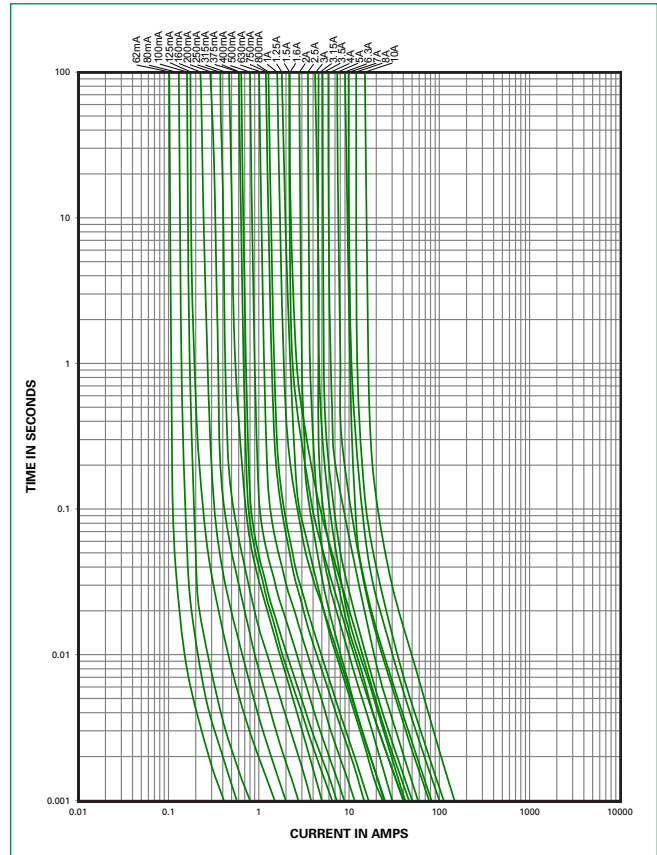
### Temperature Re-rating Curve



**Note:**

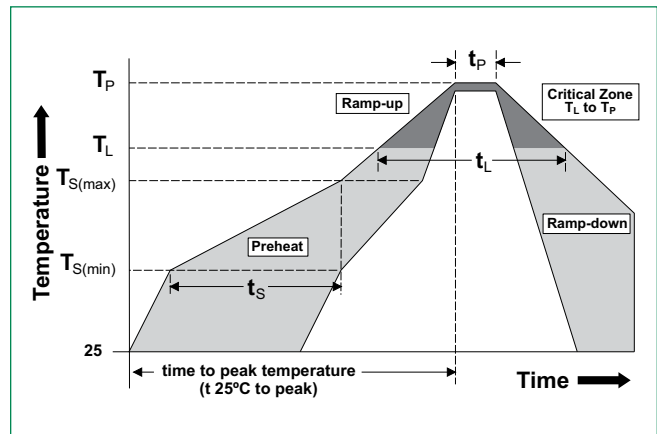
1. Rerating depicted in this curve is in addition to the standard derating of 25% for continuous operation.

### Average Time Current Curves



### 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 (Liquidus Temp (<math>T_L</math>) to peak)</b> |                                    | 5°C/second max.         |
| <b><math>T_{s(max)}</math> to <math>T_L</math> - Ramp-up Rate</b>      |                                    | 5°C/second max.         |
| <b>Reflow</b>                                                          | - Temperature ( $T_L$ ) (Liquidus) | 217°C                   |
|                                                                        | - Temperature ( $t_L$ )            | 60 – 150 seconds        |
| <b>Peak Temperature (<math>T_p</math>)</b>                             |                                    | 260 <sup>+0/-5</sup> °C |
| <b>Time within 5°C of actual peak Temperature (<math>t_p</math>)</b>   |                                    | 20 – 40 seconds         |
| <b>Ramp-down Rate</b>                                                  |                                    | 5°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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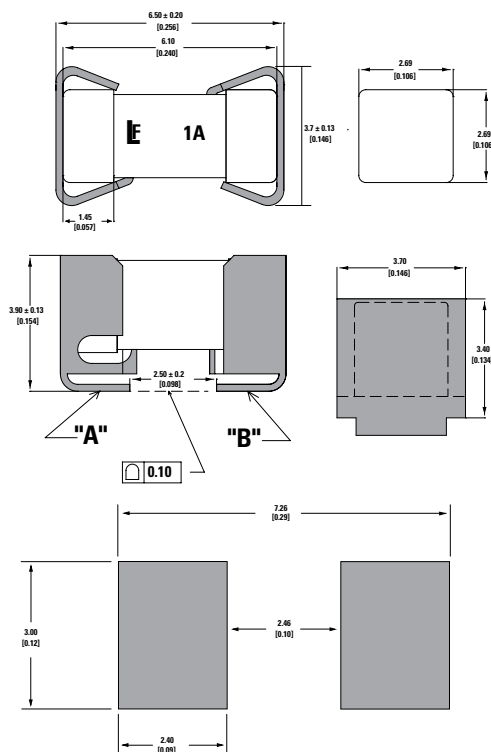
## Standard Nano<sup>2</sup>® Fuse and Clip Assembly

### Product Characteristics

|                               |                                                                                                                                                    |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Materials</b>              | <b>Body:</b> Ceramic<br><b>Cap:</b> For 0.062A ~ 0.125A – Au plated Brass For 0.200A ~ 10A – Silver plated Brass<br><b>Clip Plating:</b> Matte Tin |
| <b>Product Marking</b>        | <b>Body:</b> Brand Logo, Current Rating                                                                                                            |
| <b>Clip Retention</b>         | Force applied at fuse center, perpendicular to the long axis (@ 0.75 lbs. MIN)                                                                     |
| <b>Solderability</b>          | MIL-STD-202, Method 208 / IPC/ EIA / JEDEC J-STD-002, Test Condition A                                                                             |
| <b>Humidity Test</b>          | MIL -STD-202, Method 103 @ 85°C / 85%RH, 1000 hours                                                                                                |
| <b>Resistance to Solvents</b> | MIL-STD-202, Method 215 (3 solvent types)                                                                                                          |

|                               |                                                                                  |
|-------------------------------|----------------------------------------------------------------------------------|
| <b>Operating Temperature</b>  | -55°C to 125°C with proper derating                                              |
| <b>Thermal Shock</b>          | MIL-STD-202, Method 107, Test Condition B (5 cycles -65°C to +125°C)             |
| <b>Vibration</b>              | MIL-STD-202, Method 201 (10-55 Hz)                                               |
| <b>Moisture Resistance</b>    | MIL-STD-202, Method 106, 10 cycles                                               |
| <b>Salt Spray/ Atmosphere</b> | MIL-STD-202, Method 101, Test Condition B (48 hrs.), 5% NaCl in De-ionized Water |
| <b>Shock</b>                  | MIL-STD-202, Method 213, Test Condition I (100 G's peak for 6 milliseconds)      |

### Dimensions



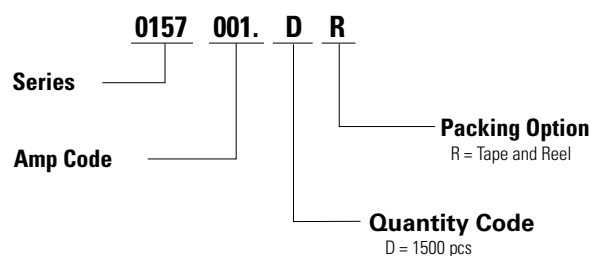
#### PCB Recommendation for Thermal Management

1. Minimum Copper Layer Thickness = 100um
2. Minimum Copper Trace Width = 10mm

#### Note:

Alternate methods of thermal management may be used. In such cases, under normal operations, the maximum temperature of the fuse body should not exceed 80°C in a 25°C ambient environment.

### Part Numbering System



### Packaging

| Packaging Option | Packaging Specification | Quantity | Quantity & Packaging Code |
|------------------|-------------------------|----------|---------------------------|
| Tape and Reel    | Surface Mount           | 1500     | DR                        |

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|                                   |                                   |                                   |                                   |                                   |                                   |                                   |                                   |
|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| <a href="#"><u>0157.315DR</u></a> | <a href="#"><u>0157.062DR</u></a> | <a href="#"><u>0157010.DR</u></a> | <a href="#"><u>015706.3DR</u></a> | <a href="#"><u>0157008.DR</u></a> | <a href="#"><u>0157001.DR</u></a> | <a href="#"><u>0157.250DR</u></a> | <a href="#"><u>0157.750DR</u></a> |
| <a href="#"><u>0157002.DR</u></a> | <a href="#"><u>0157.125DR</u></a> | <a href="#"><u>0157004.DR</u></a> | <a href="#"><u>0157.200DR</u></a> | <a href="#"><u>015701.5DR</u></a> | <a href="#"><u>0157003.DR</u></a> | <a href="#"><u>015702.5DR</u></a> | <a href="#"><u>0157.500DR</u></a> |
| <a href="#"><u>015703.5DR</u></a> | <a href="#"><u>0157005.DR</u></a> | <a href="#"><u>0157007.DR</u></a> | <a href="#"><u>0157.375DR</u></a> | <a href="#"><u>0157.080DR</u></a> | <a href="#"><u>0157.100DR</u></a> | <a href="#"><u>0157.160DR</u></a> | <a href="#"><u>0157.630DR</u></a> |
| <a href="#"><u>0157.800DR</u></a> | <a href="#"><u>015701.6DR</u></a> | <a href="#"><u>01573.15DR</u></a> | <a href="#"><u>01571.25DR</u></a> | <a href="#"><u>0157.400DR</u></a> |                                   |                                   |                                   |