



## 9

## Mechanical Data

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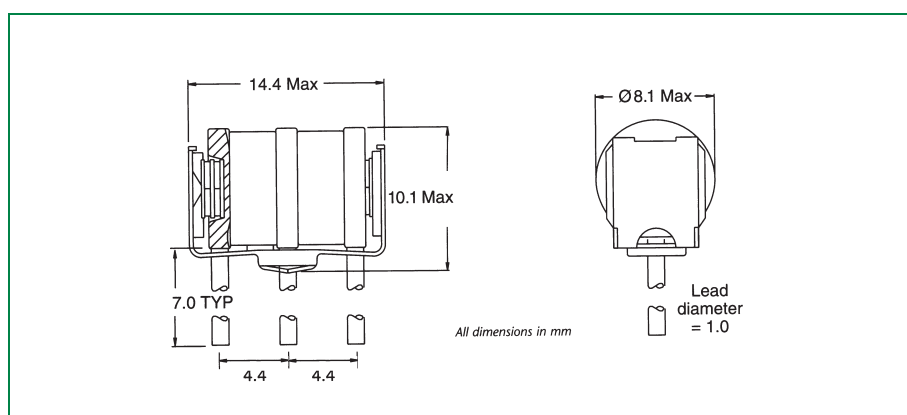
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## Gas Plasma Arresters—Package Dimensions/Specifications

The following illustrations show package dimensions and mechanical specifications for each of the gas plasma arresters.

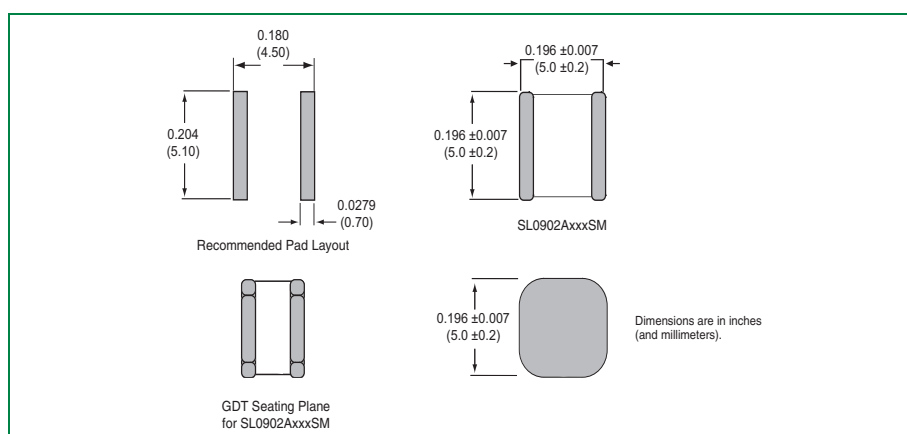
### SL1122A Series

The SL1122A series device weighs 2.7 grams (0.095 ounces). Body material is ceramic. The electrode base is made of nickel iron alloy, and the electrode plating material is bright Sn. Each device is marked with an LF logo, voltage, and date code.



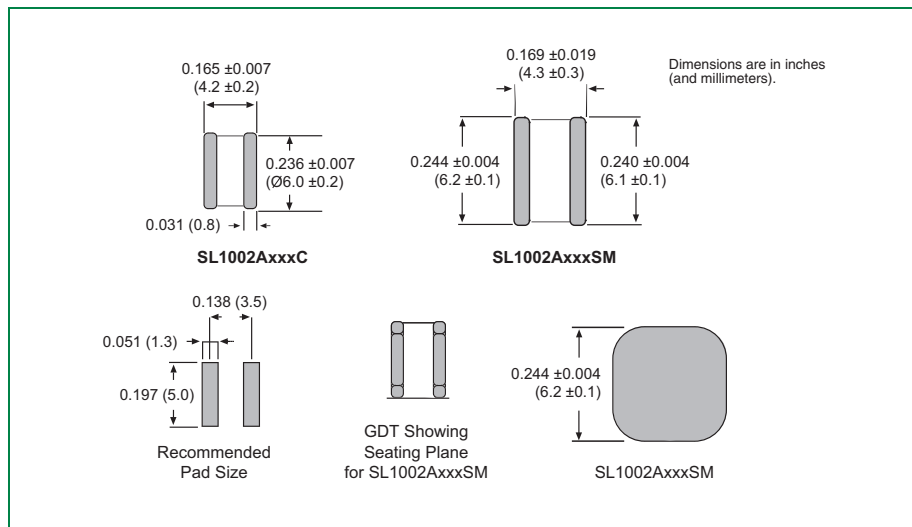
### SL0902A Series

The SL0902A series device weighs 0.33 grams (0.011 ounces). Body material is ceramic. The electrode base is made of copper alloy, and the electrode plating material is bright Sn. Each device is marked with an LF logo, voltage, and date code.



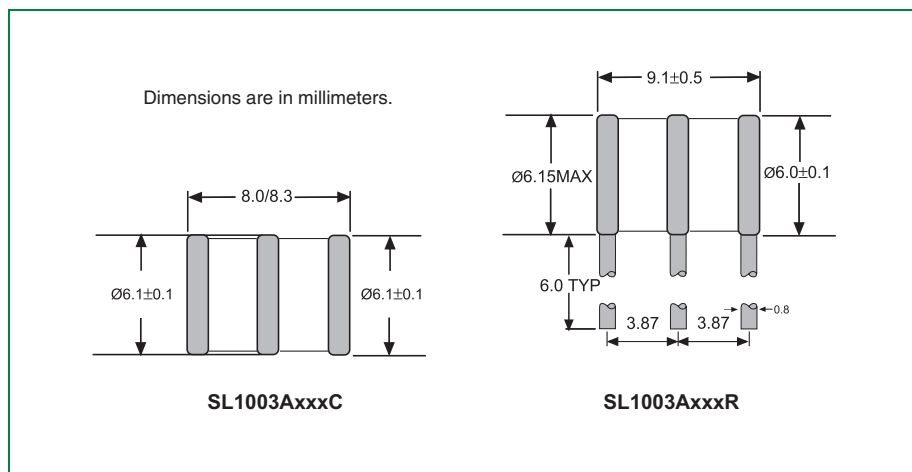
## SL1002A Series

The SL1002A series device weighs 0.63 grams (0.022 ounces). Body material is ceramic. The electrode base is made of nickel iron alloy, and the electrode plating material is bright Sn. Each device is marked with an LF logo, voltage, and date code.



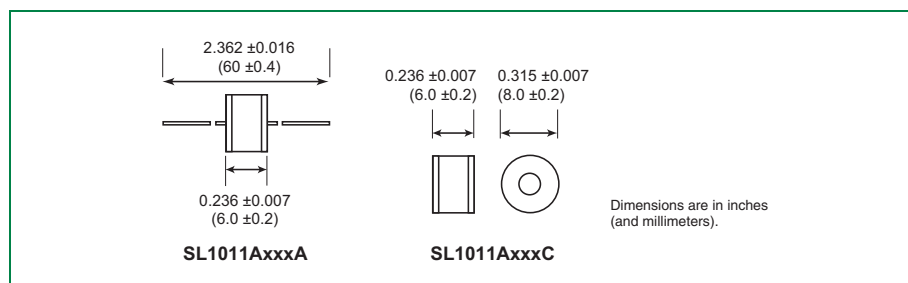
## SL1003A Series

The SL1003A series device weighs 1.5 grams (0.083 ounces). Body material is ceramic. The electrode base is made of nickel iron alloy, and the electrode plating material is bright Sn. Each device is marked with an LF logo, voltage, and date code.



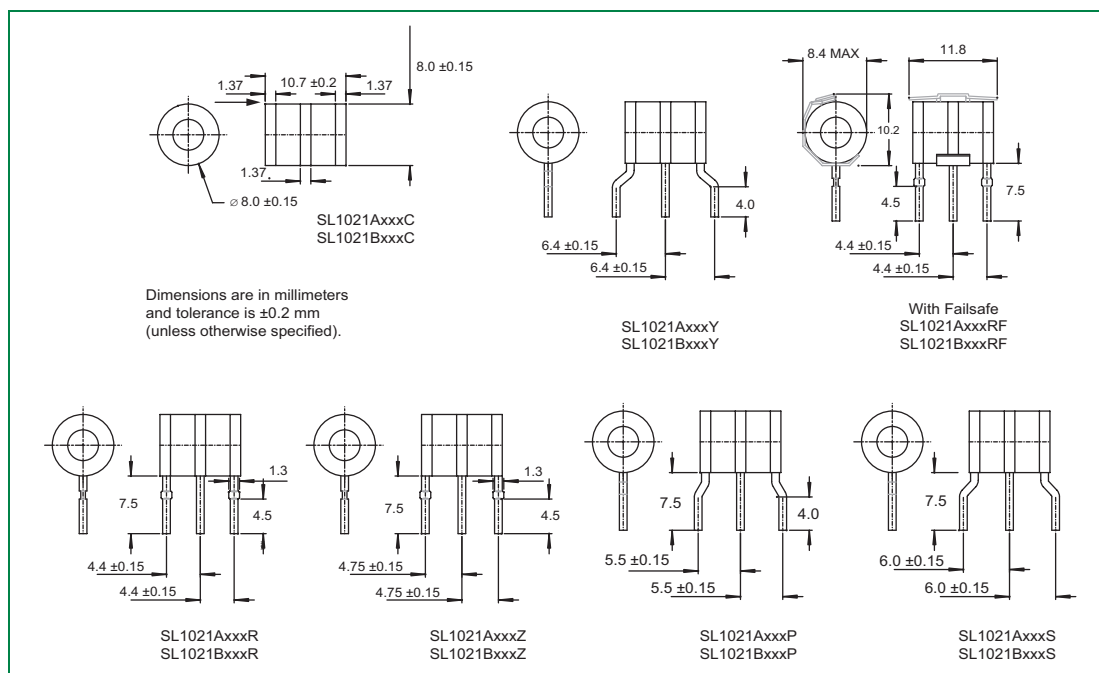
## SL1011A and SL1011B Series

The SL1011A series device and the SL1011B series device weigh 2.7 grams (0.095 ounces). Body material is ceramic. The electrode base is made of nickel iron alloy, and the electrode plating material is bright Sn. Each device is marked with an LF logo, voltage, and date code.



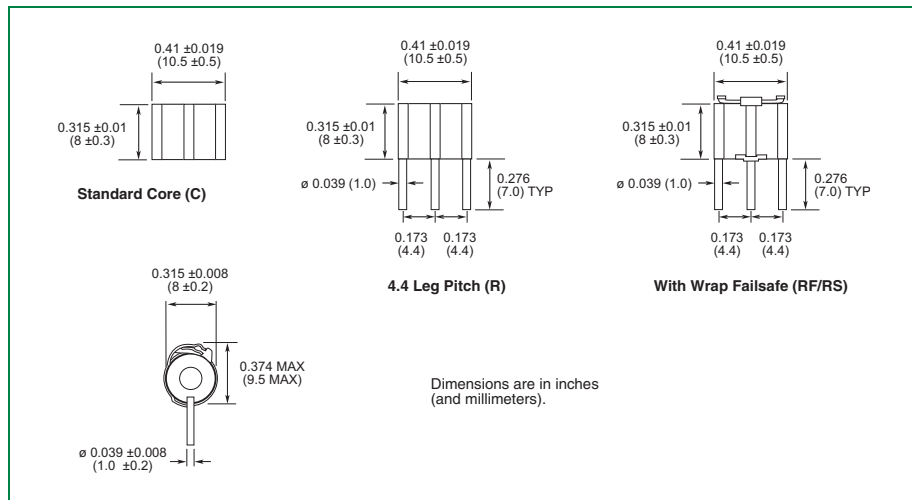
## SL1021A and SL1021B Series

The SL1021A series device weighs 2.7 grams (0.095 ounces). The SL1021B series device weighs 0.63 grams (0.022 ounces). Body material is ceramic. The electrode base is made of nickel iron alloy, and the electrode plating material is bright Sn. Each device is marked with an LF logo, voltage, and date code. The SL1021B series markings are in blue.



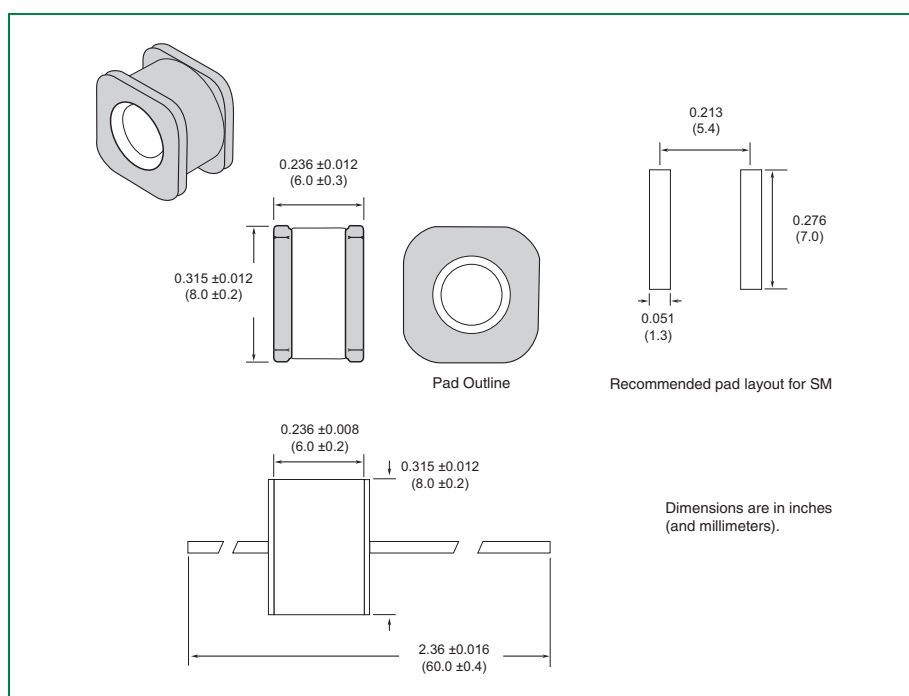
## SL1024A and SL1024B Series

The SL1024A series device and the SL1024B series device weigh 2.7 grams (0.095 ounces). Body material is ceramic. The electrode base is made of nickel iron alloy, and the electrode plating material is bright Sn. Each device is marked with an LF logo, voltage, and date code in red.



## SL1411A Series

The SL1411A series device weighs 2.7 grams (0.095 ounces). Body material is ceramic. The electrode base is made of nickel iron alloy, and the electrode plating material is bright Sn. Each device is marked with an LF logo, voltage, and date code.



## SIDACTor® DO-214AA Package Symbolization

Note: Date code is located below the symbolized part number.

| Part Number |            |
|-------------|------------|
| Catalog     | Symbolized |
| P0080SAL    | P-8A       |
| P0080SAMCL  | P-8AM      |
| P0080SBL    | P-8B       |
| P0080SCL    | P-8C       |
| P0080SDL    | P-8D       |
| P0080SCMCL  | P-8CM      |
| P0300SAL    | P03A       |
| P0300SAMCL  | P03AM      |
| P0300SBL    | P03B       |
| P0300SCL    | P03C       |
| P0300SCMCL  | P03CM      |
| P0640SAL    | P06A       |
| P0640SBL    | P06B       |
| P0640SCL    | P06C       |
| P0640SDL    | P06D       |
| P0640SCMCL  | P06CM      |
| P0641CA2L   | P62A       |
| P0641SAL    | P61A       |
| P0641SCL    | P61C       |
| P0720SAL    | P07A       |
| P0720SBL    | P07B       |
| P0720SCL    | P07C       |
| P0720SDL    | P07D       |
| P0720SCMCL  | P07CM      |
| P0721CA2L   | P72A       |
| P0721SAL    | P71A       |
| P0721SCL    | P71C       |
| P0900SAL    | P09A       |
| P0900SBL    | P09B       |
| P0900SCL    | P09C       |
| P0900SDL    | P09D       |
| P0900SCMCL  | P09CM      |
| P0901CA2L   | P92A       |
| P0901SAL    | P91A       |
| P0901SCL    | P91C       |
| P1100SAL    | P11A       |
| P1100SBL    | P11B       |
| P1100SCL    | P11C       |
| P1100SDL    | P11D       |
| P1100SCMCL  | P11CM      |
| P1101CA2L   | P02A       |
| P1101SAL    | P01A       |

| Part Number |            |
|-------------|------------|
| Catalog     | Symbolized |
| P1101SCL    | P01C       |
| P1200SAL    | P12A       |
| P1200SBL    | P12B       |
| P1200SCL    | P12C       |
| P1200SDL    | P12D       |
| P1200SCMCL  | P12CM      |
| P1300SAL    | P13A       |
| P1300SBL    | P13B       |
| P1300SCL    | P13C       |
| P1300SDL    | P13D       |
| P1300SCMCL  | P13CM      |
| P1302SAL    | P132A      |
| P1402CAL    | P14A       |
| P1500SAL    | P15A       |
| P1500SBL    | P15B       |
| P1500SCL    | P15C       |
| P1500SDL    | P15D       |
| P1500SCMCL  | P15CM      |
| P1502SAL    | P152A      |
| P1602CAL    | P16A       |
| P1800SAL    | P18A       |
| P1800SBL    | P18B       |
| P1800SCL    | P18C       |
| P1800SDL    | P18D       |
| P1800SCMCL  | P18CM      |
| P1802SAL    | P182A      |
| P2000SAL    | P20A       |
| P2000SBL    | P20B       |
| P2000SCL    | P20C       |
| P2000SCMCL  | P20CM      |
| P2202CAL    | P22A       |
| P2300SAL    | P23A       |
| P2300SBL    | P23B       |
| P2300SCL    | P23C       |
| P2300SDL    | P23D       |
| P2300SCMCL  | P23CM      |
| P2302SAL    | P232A      |
| P2500SAL    | P25A       |
| P2500SBL    | P25B       |
| P2500SCL    | P25C       |
| P2500SDL    | P25D       |
| P2500SCMCL  | P25CM      |

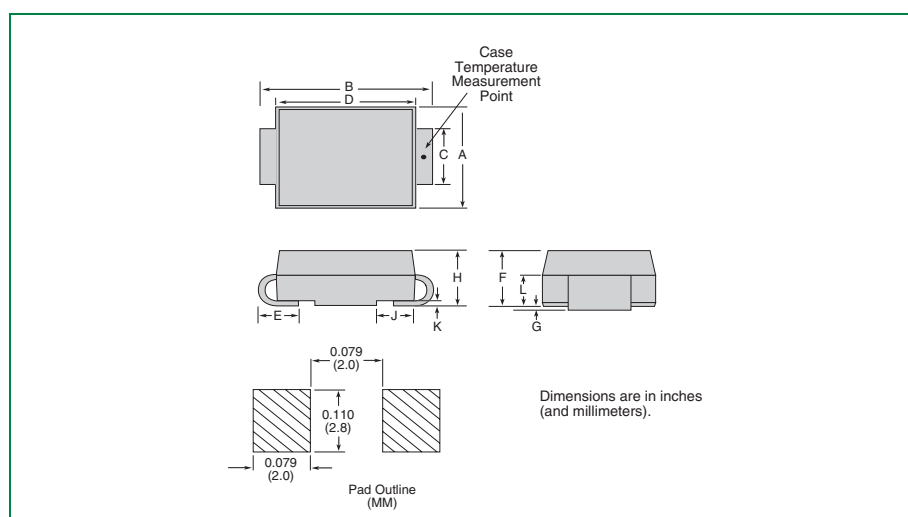
| Part Number |            |
|-------------|------------|
| Catalog     | Symbolized |
| P2600SAL    | P26A       |
| P2600SBL    | P26B       |
| P2600SCL    | P26C       |
| P2600SDL    | P26D       |
| P2600SCMCL  | P26CM      |
| P2602SAL    | P262A      |
| P2702CAL    | P27A       |
| P3002CAL    | P30A       |
| P3002CBL    | P30B       |
| P3002SAL    | P30A       |
| P3002SBL    | P30B       |
| P3100SAL    | P31A       |
| P3100SBL    | P31B       |
| P3100SCL    | P31C       |
| P3100SDL    | P31D       |
| P3100SCMCL  | P31CM      |
| P3500SAL    | P35A       |
| P3500SBL    | P35B       |
| P3500SCL    | P35C       |
| P3500SDL    | P35D       |
| P3500SCMCL  | P35CM      |
| P3502SAL    | P352A      |
| P3602CAL    | P36A       |
| P4202CAL    | P42A       |
| P4202SAL    | P422A      |
| P4802CAL    | P48A       |
| P4802SAL    | P482A      |
| P6002CAL    | P60A       |
| P6002CBL    | P60B       |
| P6002SAL    | P602A      |
| B1100CAL    | B10A       |
| B1100CCL    | B10C       |
| B1160CAL    | B16A       |
| B1160CCL    | B16C       |
| B1200CAL    | B12A       |
| B1200CCL    | B12C       |
| B2050CAL    | B25A       |
| B2050CCL    | B25C       |



## SIDACTor® Devices—Package Dimensions

### DO-214AA

The DO-214AA package is designed to meet mechanical standards as set forth in JEDEC publication number 95, except for F and G dimensions.



Note: A stripe is marked on some parts, to indicate the cathode. IPC-SM-782 recommends 2.4 instead of 2.0.

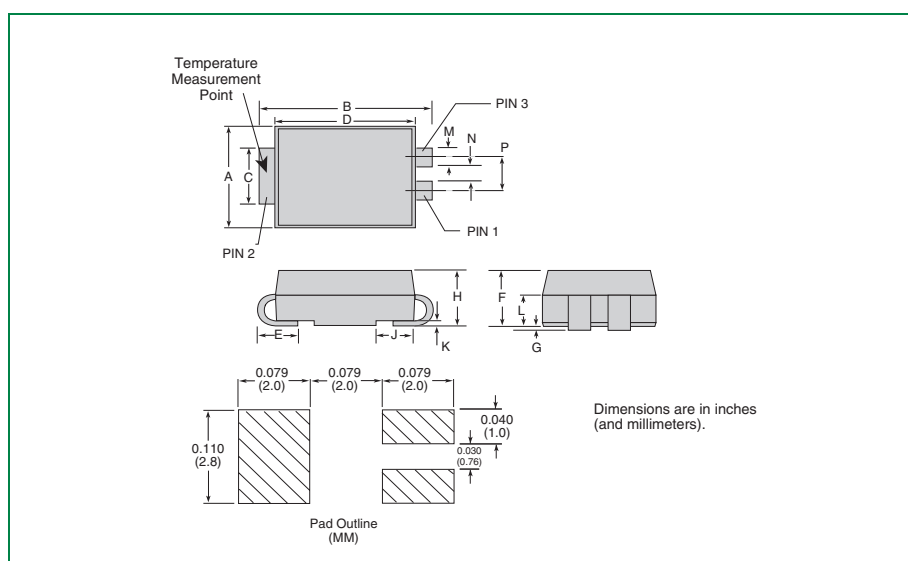
| Dimension | Inches |       | Millimeters |      |
|-----------|--------|-------|-------------|------|
|           | MIN    | MAX   | MIN         | MAX  |
| A         | 0.140  | 0.155 | 3.56        | 3.94 |
| B         | 0.205  | 0.220 | 5.21        | 5.59 |
| C         | 0.077  | 0.083 | 1.96        | 2.11 |
| D         | 0.166  | 0.180 | 4.22        | 4.57 |
| E         | 0.036  | 0.063 | 0.91        | 1.60 |
| F         | 0.066  | 0.083 | 1.67        | 2.11 |
| G         | 0.004  | 0.008 | 0.10        | 0.20 |
| H         | 0.077  | 0.086 | 1.95        | 2.18 |
| J         | 0.043  | 0.053 | 1.09        | 1.35 |
| K         | 0.008  | 0.012 | 0.20        | 0.30 |
| L         | 0.027  | 0.049 | 0.69        | 1.24 |

#### Notes:

- Dimensions and tolerances per ASME Y14.5M-1994
- Mold flash shall not exceed 0.13 mm per side.
- Dimensions B and C apply to plated leads.
- All leads are insulated from case. Case is electrically non-conductive. (Rated at 1600 V ac rms for one minute from leads to case over the operating temperature range)
- Dimension C is measured on the flat section of the lead.

## Modified DO-214AA

The Modified DO-214AA package is a three-leaded surface mount (SM) package.



Note: A stripe is marked on some parts, to indicate the cathode. IPC-SM-782 recommends 2.4 instead of 2.0.

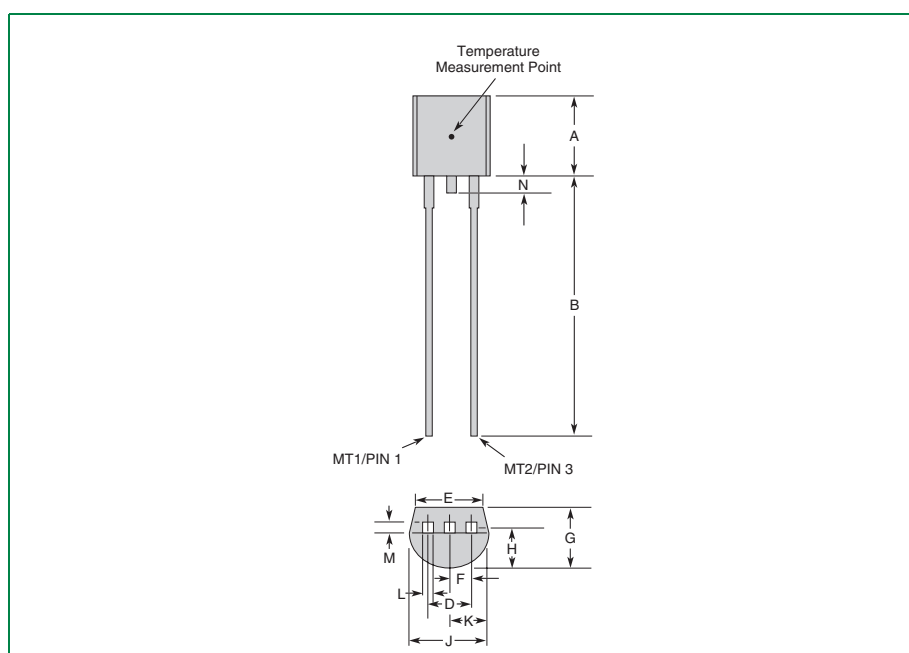
| Dimension | Inches |       | Millimeters |      |
|-----------|--------|-------|-------------|------|
|           | MIN    | MAX   | MIN         | MAX  |
| A         | 0.140  | 0.155 | 3.56        | 3.94 |
| B         | 0.205  | 0.220 | 5.21        | 5.59 |
| C         | 0.077  | 0.083 | 1.96        | 2.11 |
| D         | 0.166  | 0.180 | 4.22        | 4.57 |
| E         | 0.036  | 0.063 | 0.91        | 1.60 |
| F         | 0.066  | 0.083 | 1.67        | 2.11 |
| G         | 0.004  | 0.008 | 0.10        | 0.20 |
| H         | 0.077  | 0.086 | 1.95        | 2.18 |
| J         | 0.043  | 0.053 | 1.09        | 1.35 |
| K         | 0.008  | 0.012 | 0.20        | 0.30 |
| L         | 0.027  | 0.049 | 0.69        | 1.24 |
| M         | 0.022  | 0.028 | 0.56        | 0.71 |
| N         | 0.027  | 0.033 | 0.69        | 0.84 |
| P         | 0.052  | 0.058 | 1.32        | 1.47 |

### Notes:

- Dimensions and tolerancing per ASME Y14.5M-1994
- Mold flash shall not exceed 0.13 mm per side.
- Dimensions B and C apply to plated leads.
- All leads are insulated from case. Case is electrically non-conductive. (Rated at 1600 V ac rms for one minute from leads to case over the operating temperature range)

## TO-92

The TO-92 is designed to meet mechanical standards as set forth in JEDEC publication number 95.



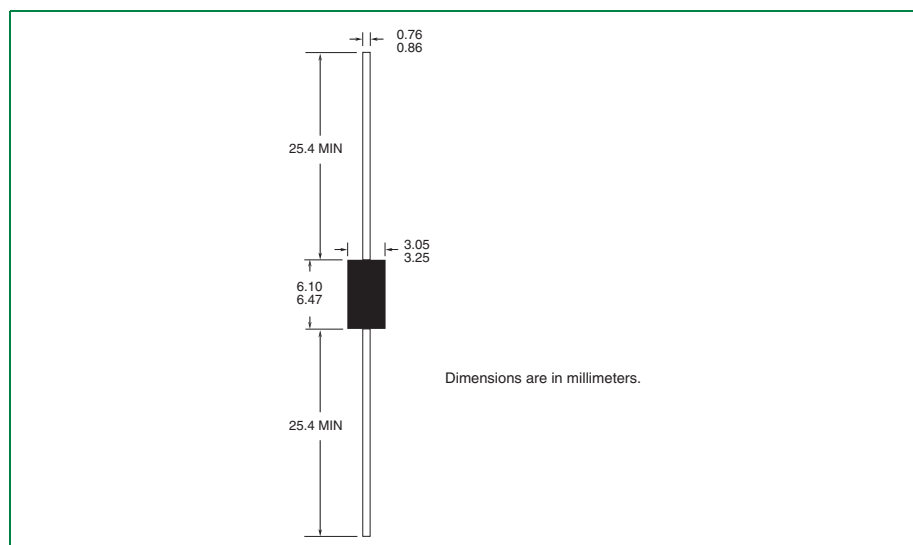
| Dimension | Inches |       | Millimeters |      |
|-----------|--------|-------|-------------|------|
|           | MIN    | MAX   | MIN         | MAX  |
| A         | 0.176  | 0.196 | 4.47        | 4.98 |
| B         | 0.500  |       | 12.70       |      |
| D         | 0.095  | 0.105 | 2.41        | 2.67 |
| E         | 0.150  |       | 3.81        |      |
| F         | 0.046  | 0.054 | 1.16        | 1.37 |
| G         | 0.135  | 0.145 | 3.43        | 3.68 |
| H         | 0.088  | 0.096 | 2.23        | 2.44 |
| J         | 0.176  | 0.186 | 4.47        | 4.73 |
| K         | 0.088  | 0.096 | 2.23        | 2.44 |
| L         | 0.013  | 0.019 | 0.33        | 0.48 |
| M         | 0.013  | 0.017 | 0.33        | 0.43 |
| N         |        | 0.060 |             | 1.52 |

**Notes:**

- Type 70 lead form as shown is standard for the E package.
- All leads are insulated from case. Case is electrically non-conductive. (Rated at 1600 V ac rms for one minute from leads to case over the operating temperature range)
- Mold flash shall not exceed 0.13 mm per side.

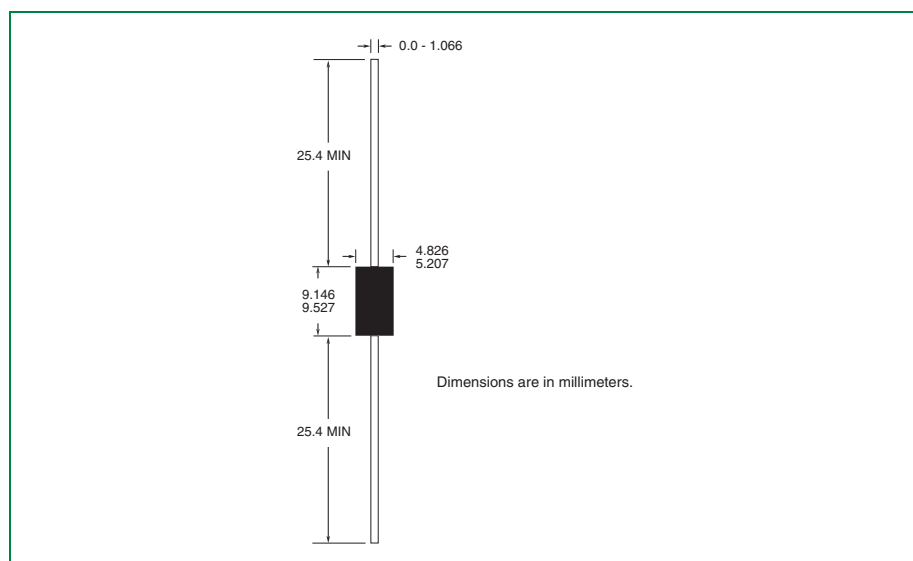
## T10A

The T10A device is designed to meet mechanical standards as set forth in JEDEC publication number 95.



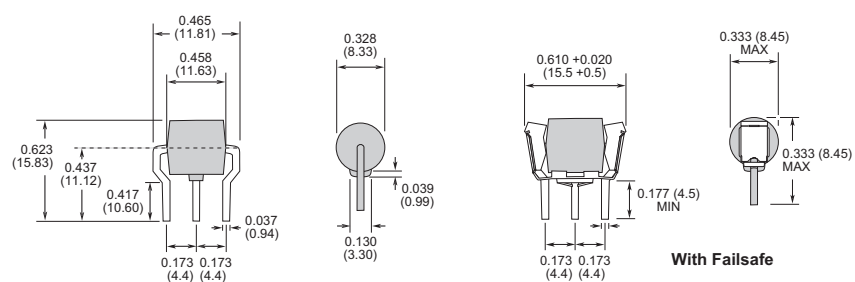
## T10B

The T10B device is designed to meet mechanical standards as set forth in JEDEC publication number 95.



## T10C

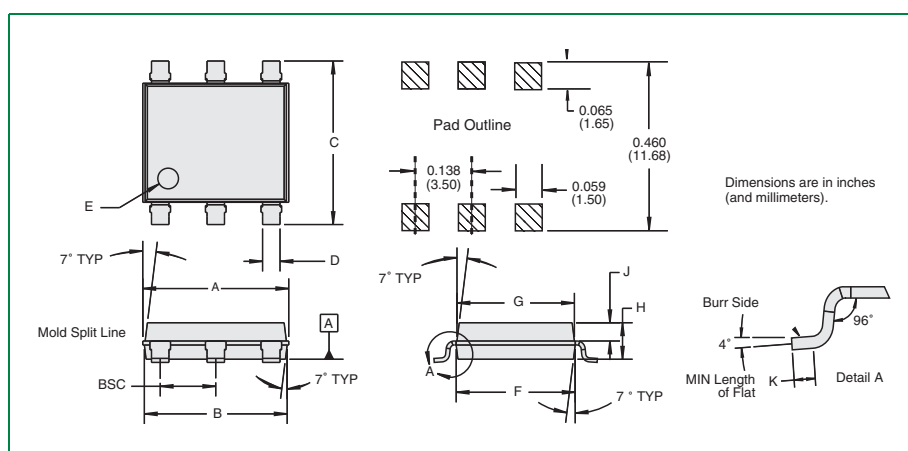
The T10C device design is not referenced to any JEDEC standard.



Dimensions are in inches  
(and millimeters).

## Modified MS-013

The Modified MS-013 is designed to meet mechanical standards as set forth in JEDEC publication number 95.



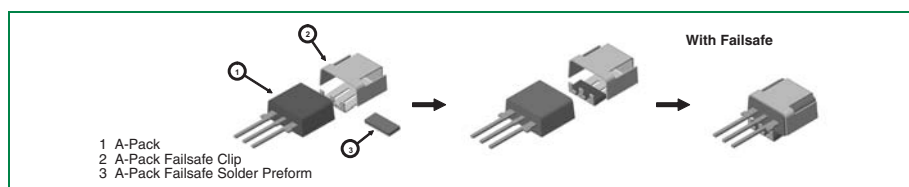
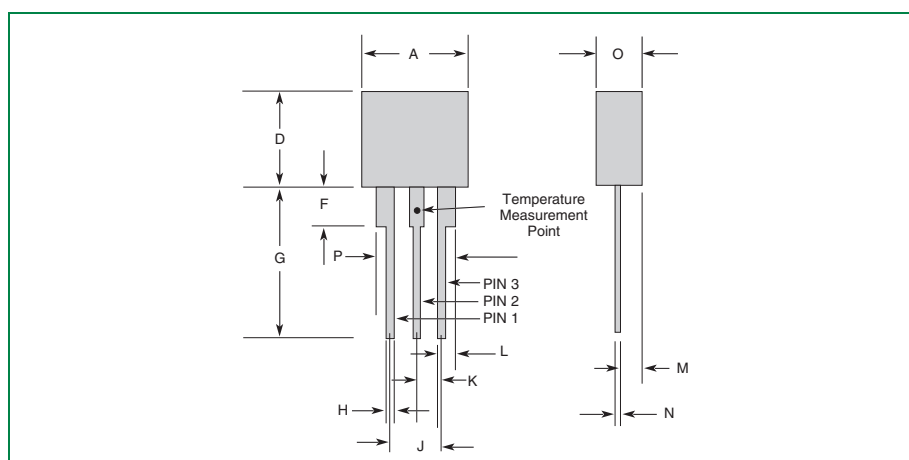
| Dimension | Inches |       | Millimeters |       |
|-----------|--------|-------|-------------|-------|
|           | MIN    | MAX   | MIN         | MAX   |
| A         | 0.360  | 0.364 | 9.14        | 9.25  |
| B         | 0.352  | 0.356 | 8.94        | 9.04  |
| C         | 0.400  | 0.412 | 10.16       | 10.46 |
| D         | 0.043  | 0.043 | 1.09        | 1.09  |
| E         | 0.047  | 0.055 | 1.19        | 1.40  |
| F         | 0.293  | 0.297 | 7.44        | 7.54  |
| G         | 0.289  | 0.293 | 7.34        | 7.44  |
| H         | 0.089  | 0.093 | 2.26        | 2.36  |
| J         | 0.041  | 0.049 | 1.04        | 1.24  |
| K         | 0.020  |       | 0.51        |       |
| BSC       | 0.133  | 0.143 | 3.38        | 3.63  |

### Notes:

- Dimensions and tolerances per ASME Y14.5M-1982
- Mold flash shall not exceed 0.13 mm per side.
- All leads are insulated from case. Case is electrically non-conductive. (Rated at 1600 V ac rms for one minute from leads to case over the operating temperature range)
- D dimension tolerance is  $\pm 0.005$  in (0.127 mm).

## Modified TO-220

The Modified TO-220 package is designed to meet mechanical standards as set forth in JEDEC publication number 95.



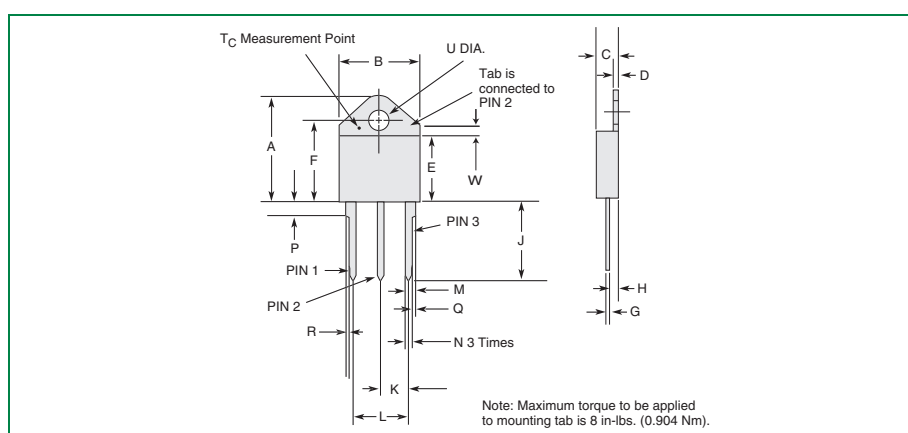
| Dimension | Inches |       | Millimeters |       |
|-----------|--------|-------|-------------|-------|
|           | MIN    | MAX   | MIN         | MAX   |
| A         | 0.400  | 0.410 | 10.16       | 10.42 |
| D         | 0.360  | 0.375 | 9.14        | 9.53  |
| F         | 0.110  | 0.130 | 2.80        | 3.30  |
| G         | 0.540  | 0.575 | 13.71       | 14.61 |
| H         | 0.025  | 0.035 | 0.63        | 0.89  |
| J         | 0.195  | 0.205 | 4.95        | 5.21  |
| K         | 0.095  | 0.105 | 2.41        | 2.67  |
| L         | 0.075  | 0.085 | 1.90        | 2.16  |
| M         | 0.070  | 0.085 | 1.78        | 2.16  |
| N         | 0.018  | 0.024 | 0.46        | 0.61  |
| O         | 0.178  | 0.188 | 4.52        | 4.78  |
| P         | 0.290  | 0.310 | 7.37        | 7.87  |

### Notes:

- All leads are insulated from case. Case is electrically non-conductive. (Rated at 1600 V ac rms for one minute from leads to case over the operating temperature range)
- Mold flash shall not exceed 0.13 mm per side.

## TO-218

The TO-218 package is designed to meet mechanical standards as set forth in JEDEC publication number 95.



| Dimension | Inches |       | Millimeters |       |
|-----------|--------|-------|-------------|-------|
|           | MIN    | MAX   | MIN         | MAX   |
| A         | 0.810  | 0.835 | 20.57       | 21.21 |
| B         | 0.610  | 0.630 | 15.49       | 16.00 |
| C         | 0.178  | 0.188 | 4.52        | 4.78  |
| D         | 0.055  | 0.070 | 1.40        | 1.78  |
| E         | 0.487  | 0.497 | 12.37       | 12.62 |
| F         | 0.635  | 0.655 | 16.13       | 16.64 |
| G         | 0.022  | 0.029 | 0.56        | 0.74  |
| H         | 0.075  | 0.095 | 1.91        | 2.41  |
| J         | 0.575  | 0.625 | 14.61       | 15.88 |
| K         | 0.211  | 0.219 | 5.36        | 5.56  |
| L         | 0.422  | 0.437 | 10.72       | 11.10 |
| M         | 0.100  | 0.110 | 2.54        | 2.79  |
| N         | 0.045  | 0.055 | 1.14        | 1.40  |
| P         | 0.095  | 0.115 | 2.41        | 2.92  |
| R         | 0.008  | 0.016 | 0.20        | 0.41  |
| S         | 0.038  | 0.048 | 0.97        | 1.22  |
| T         | 0.025  | 0.032 | 0.64        | 0.81  |
| U         | 0.159  | 0.163 | 4.04        | 4.14  |
| V         | 0.090  | 0.100 | 2.29        | 2.54  |

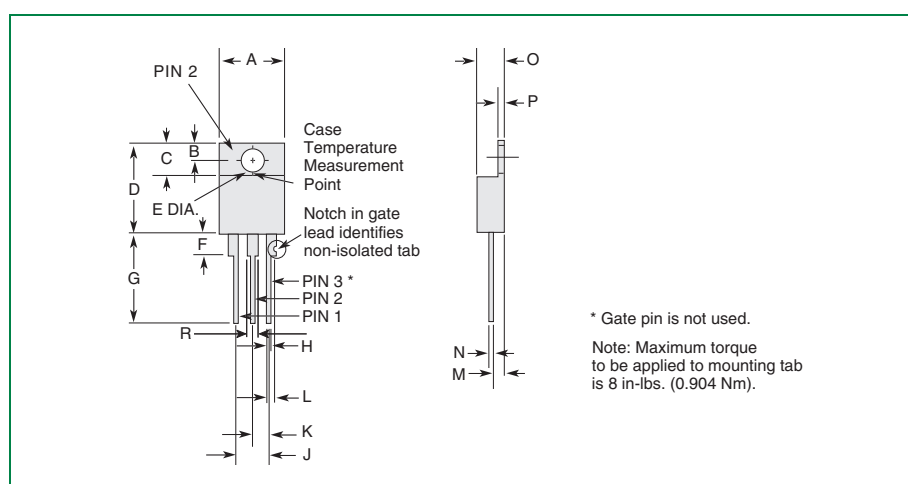
### Notes:

- Mold flash shall not exceed 0.13 mm per side.
- Maximum torque to be applied to mounting tab is 8 in-lbs. (0.904 Nm).
- Pin 3 has no connection.
- Tab is non-isolated (connects to middle pin).



## R Package—TO-220AB

The R Package TO-220 is designed to meet mechanical standards as set forth in JEDEC publication number 95 except for L and P dimensions.



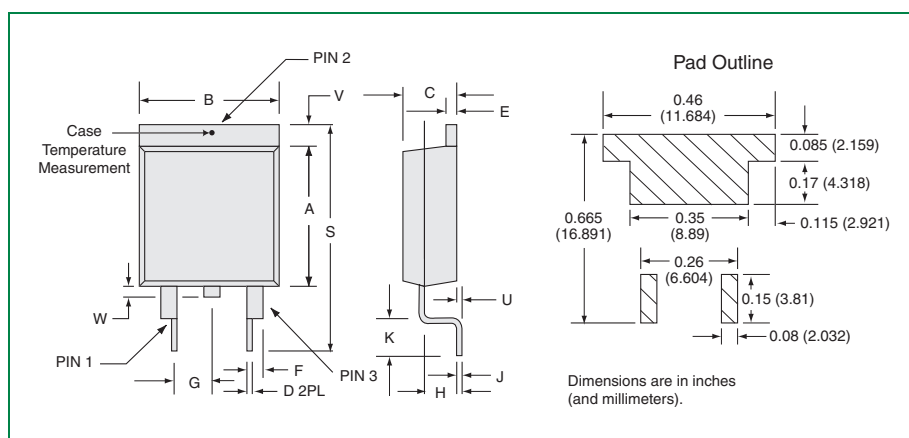
| Dimension | Inches |       | Millimeters |       |
|-----------|--------|-------|-------------|-------|
|           | MIN    | MAX   | MIN         | MAX   |
| A         | 0.380  | 0.420 | 9.65        | 10.67 |
| B         | 0.105  | 0.115 | 2.66        | 2.92  |
| C         | 0.230  | 0.250 | 5.85        | 6.35  |
| D         | 0.590  | 0.620 | 14.98       | 15.75 |
| E         | 0.142  | 0.147 | 3.61        | 3.73  |
| F         | 0.110  | 0.130 | 2.80        | 3.30  |
| G         | 0.540  | 0.575 | 13.71       | 14.60 |
| H         | 0.025  | 0.035 | 0.63        | 0.89  |
| J         | 0.195  | 0.205 | 4.95        | 5.21  |
| K         | 0.095  | 0.105 | 2.41        | 2.67  |
| L         | 0.060  | 0.075 | 1.52        | 1.91  |
| M         | 0.070  | 0.085 | 1.78        | 2.16  |
| N         | 0.018  | 0.024 | 0.45        | 0.61  |
| O         | 0.178  | 0.188 | 4.52        | 4.78  |
| P         | 0.045  | 0.060 | 1.14        | 1.53  |
| R         | 0.038  | 0.048 | 0.97        | 1.22  |

### Notes:

- Mold flash shall not exceed 0.13 mm per side.
- Maximum torque to be applied to mounting tab is 8 in-lbs. (0.904 Nm).
- Pin 3 has no connection.
- Tab is non-isolated (connects to middle pin).

## N Package—TO-263

The N Package TO-263 is designed to meet mechanical standards as set forth in JEDEC publication number 95 except for B and F dimensions.



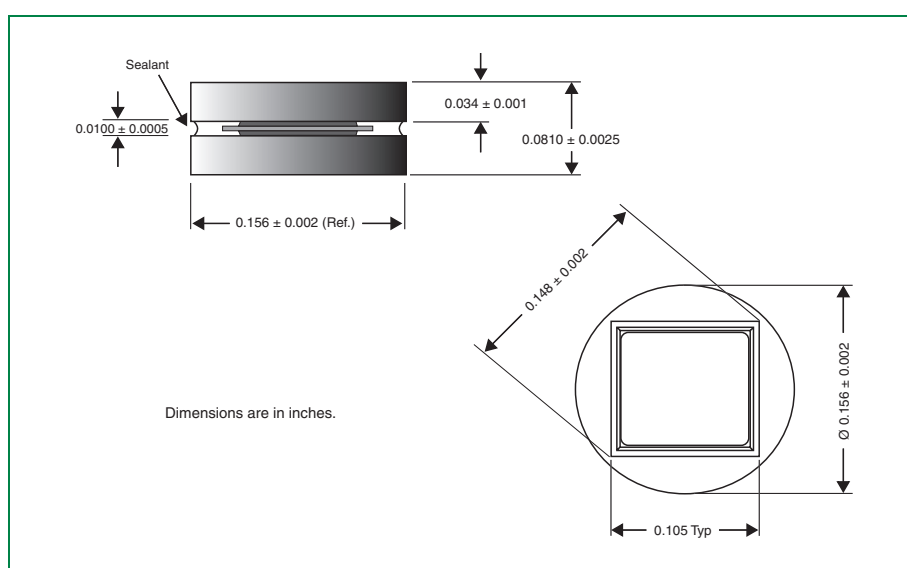
| Dimension | Inches |       | Millimeters |       |
|-----------|--------|-------|-------------|-------|
|           | MIN    | MAX   | MIN         | MAX   |
| A         | 0.360  | 0.370 | 9.14        | 9.40  |
| B         | 0.380  | 0.420 | 9.65        | 10.67 |
| C         | 0.178  | 0.188 | 4.52        | 4.78  |
| D         | 0.025  | 0.035 | 0.63        | 0.89  |
| E         | 0.048  | 0.055 | 1.22        | 1.40  |
| F         | 0.060  | 0.075 | 1.52        | 1.91  |
| G         | 0.095  | 0.105 | 2.41        | 2.67  |
| H         | 0.083  | 0.093 | 2.11        | 2.36  |
| J         | 0.018  | 0.024 | 0.46        | 0.61  |
| K         | 0.090  | 0.110 | 2.29        | 2.79  |
| S         | 0.590  | 0.625 | 14.99       | 15.87 |
| V         | 0.035  | 0.045 | 0.89        | 1.14  |
| U         | 0.002  | 0.010 | 0.05        | 0.25  |
| W         | 0.040  | 0.070 | 1.02        | 1.78  |

### Notes:

- Mold flash shall not exceed 0.13 mm per side.
- Maximum torque to be applied to mounting tab is 8 in.-lbs. (0.904 Nm).
- Pin 3 has no connection.
- Tab is non-isolated (connects to middle pin).

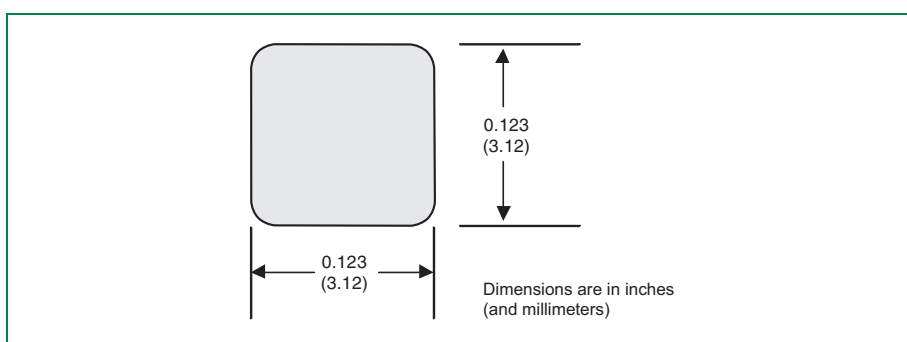
## SIDACtor® Cell

The following illustration shows the dimensions of the *SIDACtor* cell.

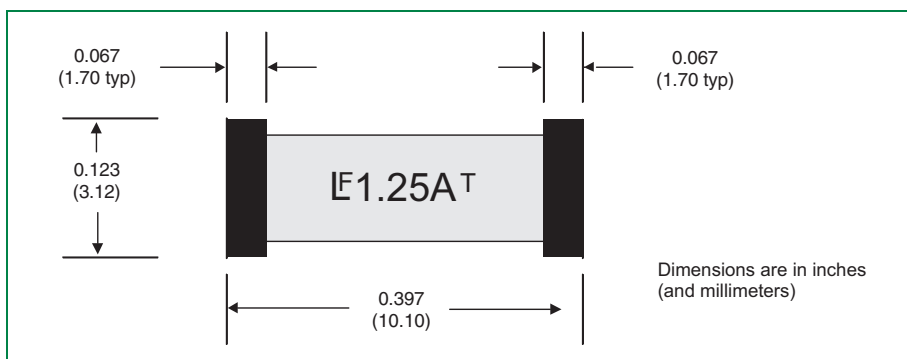


## TeleLink® Surface Mount Fuse—Package Dimensions

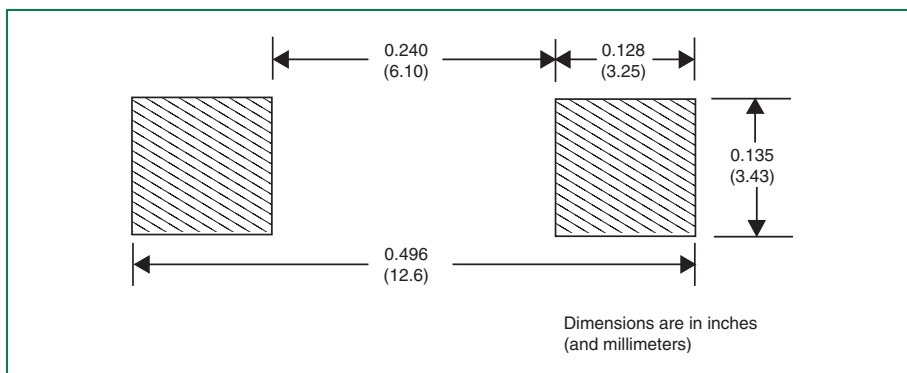
The following illustration shows the end view dimensions of a *TeleLink* fuse.



The following illustration shows the top view or side view dimensions of a *TeleLink* fuse.



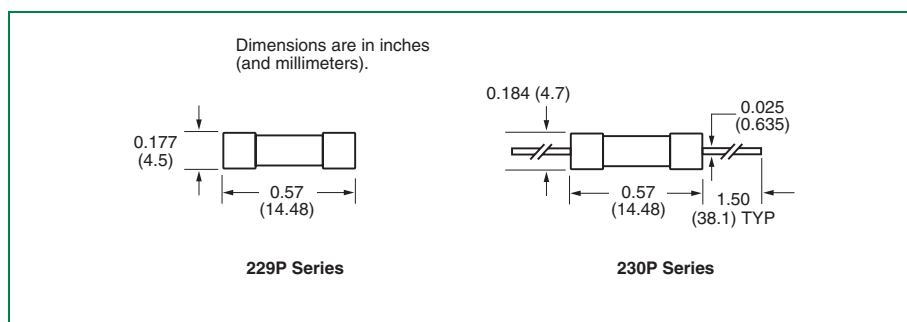
The following illustration shows the footprint dimensions of a *TeleLink* fuse.



## Electronic Fuses—Package Dimensions

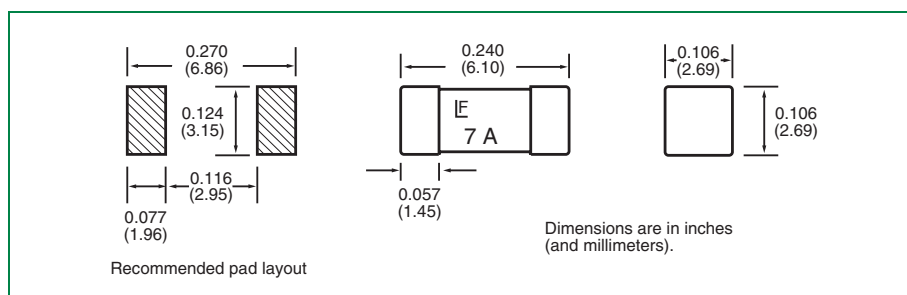
### 2AG *Slo-Blo*® Fuse—229P / 230P Series

The following illustration shows the dimensions of the 2AG *Slo-Blo* Fuse—229P / 230P series. The body is glass with nickel-plated brass fuse caps. Axial lead material is solder coated copper.



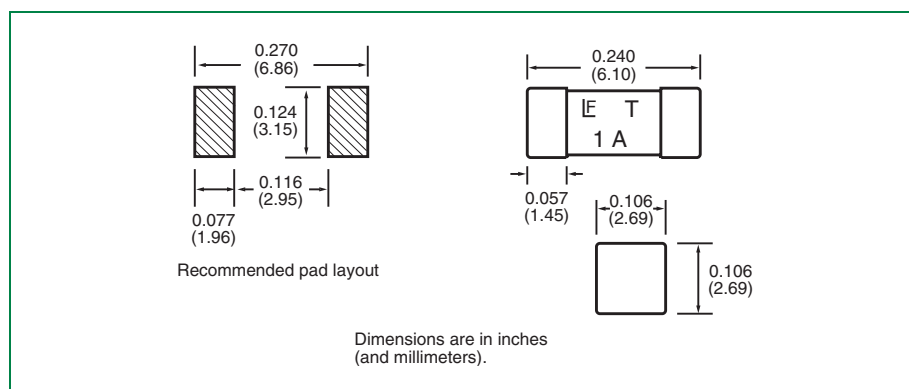
### NANO<sup>2</sup>® Fuse—451 / 453 Series

The following illustration shows the dimensions of a NANO<sup>2</sup> Fuse—451 / 453 series. The body is ceramic with tin-lead alloy or silver-plated caps. RoHS compliant terminations (451L series) are gold over nickel-plated caps.



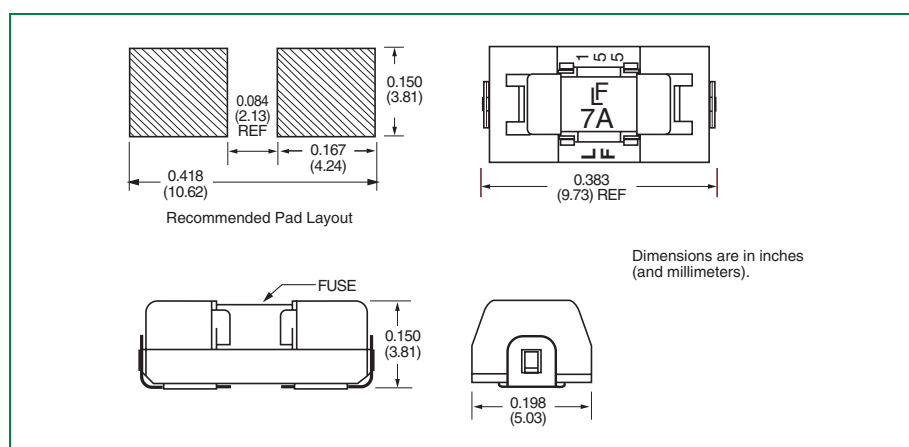
## NANO<sup>2</sup> Fuse—452 / 454 Series

The following illustration shows the dimensions of a NANO<sup>2</sup> Fuse—452 / 454 series. The body is ceramic with tin-lead alloy or silver-plated caps. RoHS compliant terminations (452L series) are gold over nickel-plated caps.



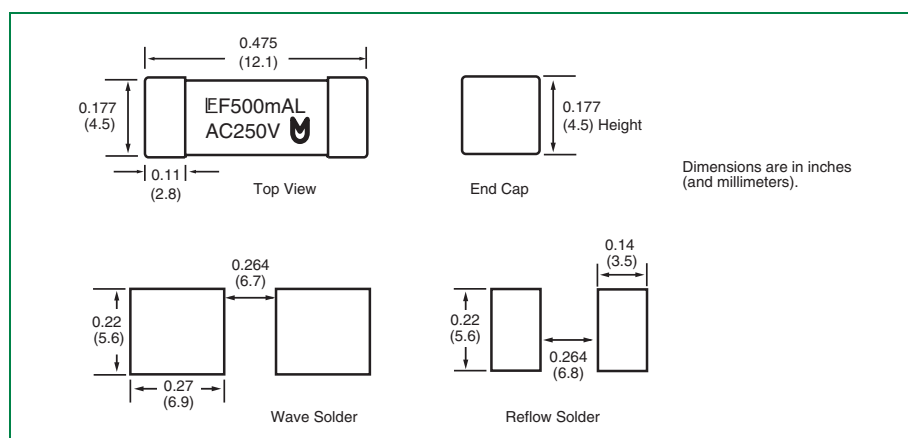
## SMF OMNI-BLOK<sup>®</sup> Fuse Block—154 Series

The following illustration shows the dimensions of the SMF OMNI-BLOK Fuse Block—154 series.



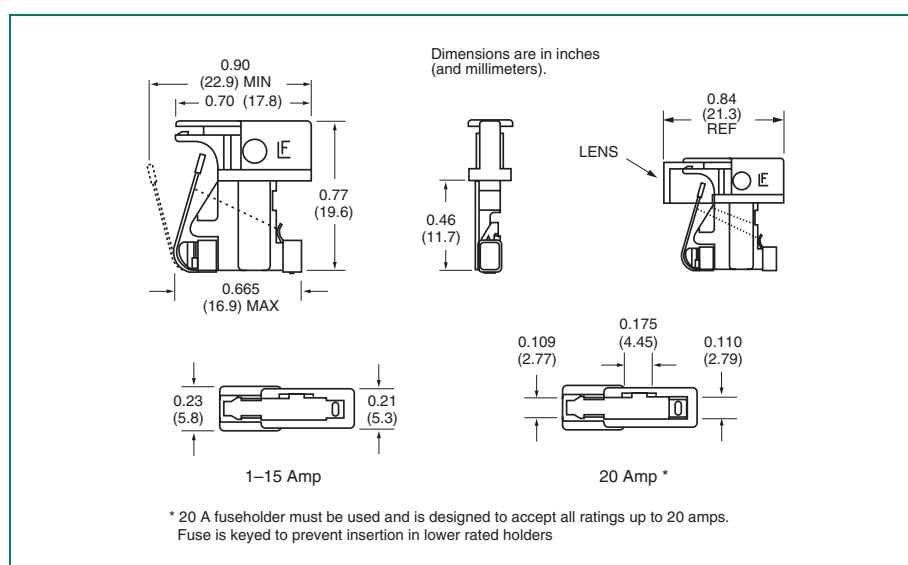
## NANO<sup>2</sup>® 250 V UMF Fuse—464 / 465 Series

The following illustration shows the dimensions of the NANO<sup>2</sup> 250 V Fuse—464 / 465 series. The body is high-performance ceramic, and the terminations are silver-plated brass.



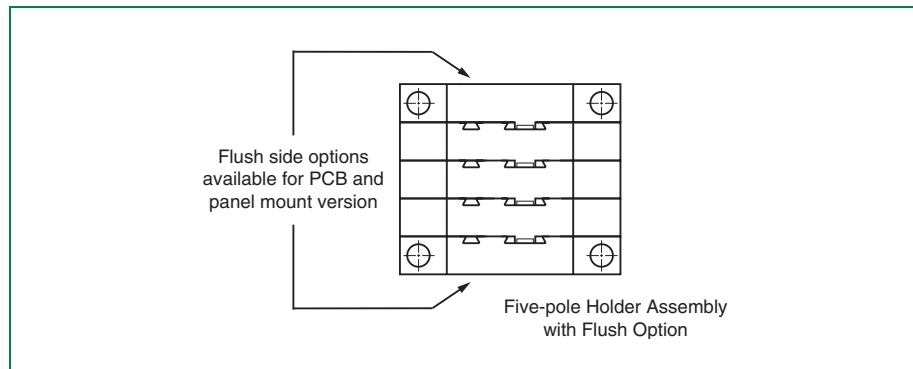
## 481 Series Alarm Indicating Fuse

The following illustration shows the dimensions of the 481 series alarm indicating fuse. The body is polyphenylene sulfide (UL94V0), and the terminations are beryllium copper / tin plated. Optional lens are nylon.



## 482 Series Alarm Indicating Fuseholder

The following illustration shows the 482 series alarm indicating fuseholder. The body is black phenolic. The fuse terminals are tin-plated beryllium copper, and the alarm terminal is tin-plated brass.



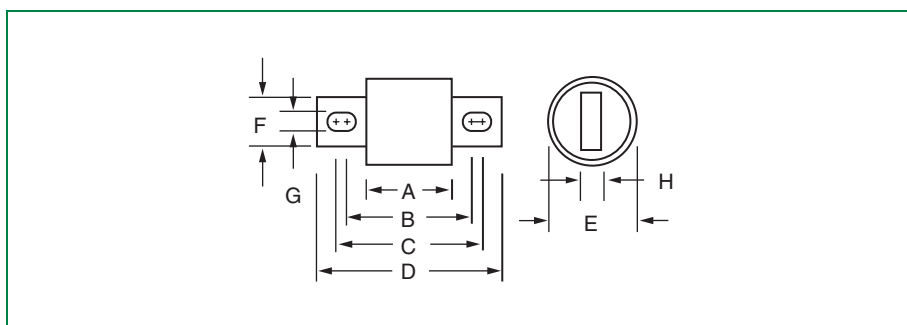


## DC Power Fuses—Package Dimensions

### L17T Series

The following illustration shows the dimensions of the L17T series telecommunications power fuse.

Contact Littelfuse for characteristic curves.

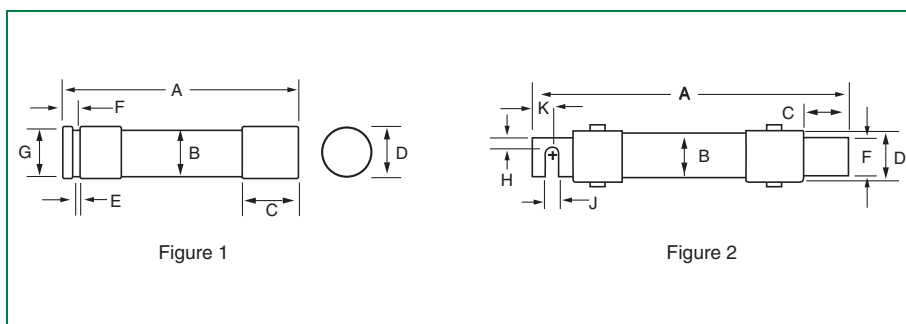


| Dimensions | 70 A – 250 A |             | 300 A – 800 A |             | 1000 A – 1200 A |             |
|------------|--------------|-------------|---------------|-------------|-----------------|-------------|
|            | Inches       | Millimeters | Inches        | Millimeters | Inches          | Millimeters |
| A          | 1.156        | 29.4        | 1.25          | 31.8        | 1.344           | 34          |
| B          | 1.875        | 47.6        | 1.938         | 49.2        | —               | —           |
| C          | 2.188        | 55.6        | 2.563         | 65.1        | —               | —           |
| D          | —            | 67.5        | 3.5           | 88.9        | 4.063           | 103.12      |
| E          | 1.656        | 25.4        | 1.5           | 38.1        | —               | —           |
| F          | 0.875        | 22.2        | 1             | 25.4        | 1.5             | 38.1        |
| G          | 0.313        | 7.9         | 0.406         | 10.3        | —               | —           |
| H          | 0.188        | 4.8         | 0.25          | 6.35        | 0.25            | 6.35        |

## TLN Series

The following illustrations show the dimensions of the TLN series telecommunications power fuse. (The TLN series replaces competitors' TPN and TGN series.)

Contact Littelfuse for characteristic curves.



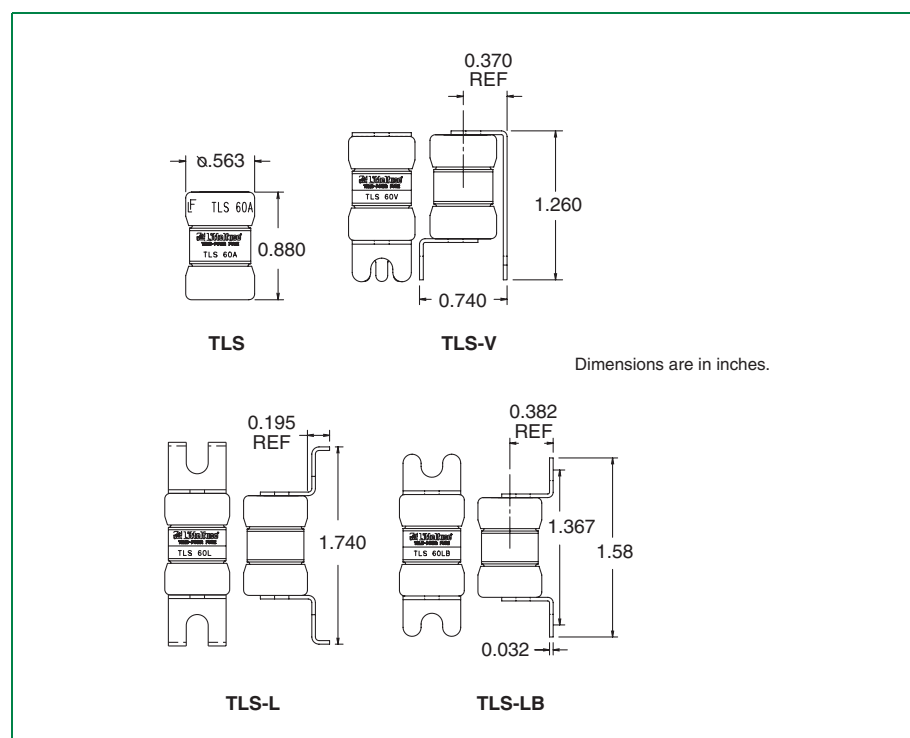
| Figure 1<br>Dimensions | 1 A – 30 A |             | 35 A – 60 A |             |
|------------------------|------------|-------------|-------------|-------------|
|                        | Inches     | Millimeters | Inches      | Millimeters |
| A                      | 2          | 50.8        | 3           | 76.2        |
| B                      | 0.5        | 12.7        | 0.75        | 19.1        |
| C                      | 0.5        | 12.7        | 0.625       | 15.9        |
| D                      | 0.563      | 14.3        | 0.813       | 20.6        |
| E                      | 0.078      | 2           | 0.094       | 2.4         |
| F                      | 0.156      | 4           | 0.188       | 4.8         |
| G                      | 0.375      | 9.5         | 0.625       | 15.9        |
| H                      | —          | —           | —           | —           |
| J                      | —          | —           | —           | —           |
| K                      | —          | —           | —           | —           |

| Figure 2<br>Dimensions | 70 A – 100 A |             | 110 A – 200 A |             | 225 A – 400 A |             | 450 A – 600 A |             |
|------------------------|--------------|-------------|---------------|-------------|---------------|-------------|---------------|-------------|
|                        | Inches       | Millimeters | Inches        | Millimeters | Inches        | Millimeters | Inches        | Millimeters |
| A                      | 5.875        | 149.2       | 7.125         | 181         | 8.625         | 219.1       | 10.375        | 263.5       |
| B                      | 1            | 25.4        | 1.5           | 38.1        | 2             | 50.8        | 2.5           | 63.5        |
| C                      | 1.063        | 27          | 1.469         | 37.3        | 1.938         | 49.2        | 2.375         | 60.3        |
| D                      | 1.063        | 27          | 1.594         | 40.5        | 2.094         | 53.2        | 2.594         | 65.9        |
| E                      | 0.125        | 3.2         | 0.188         | 4.8         | 0.25          | 6.4         | 0.25          | 6.4         |
| F                      | 0.75         | 19.1        | 1.125         | 28.6        | 1.625         | 41.3        | 2             | 50.8        |
| G                      | 1.25         | 31.6        | 1.844         | 46.8        | 2.344         | 59.5        | 2.844         | 72.2        |
| H                      | 0.25         | 6.4         | 0.438         | 11.1        | 0.625         | 15.9        | 0.75          | 19.1        |
| J                      | 0.281        | 7.1         | 0.281         | 7.1         | 0.406         | 10.3        | 0.531         | 13.5        |
| K                      | 0.5          | 12.7        | 0.688         | 17.5        | 0.938         | 23.8        | 1.125         | 28.6        |

## TLS Series

The following illustration shows the dimensions of the TLS series telecommunications power fuse. (The TLS series replaces competitors' TPS and TGS series.)

*Note:* Contact Littelfuse for characteristic curves and additional mounting configurations.

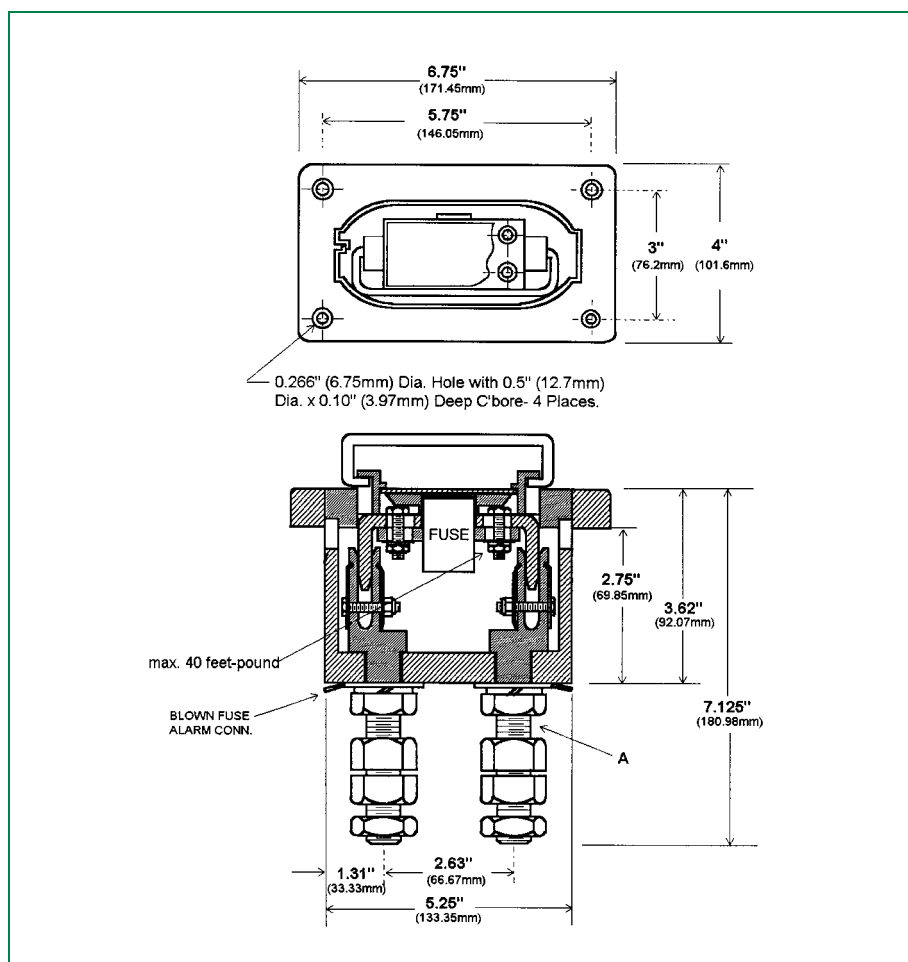


## LTFD Series

The following illustration shows the dimensions of the LTFD 6001 series (0 A – 800 A) telecommunications power fuse. Stud size is as follows:

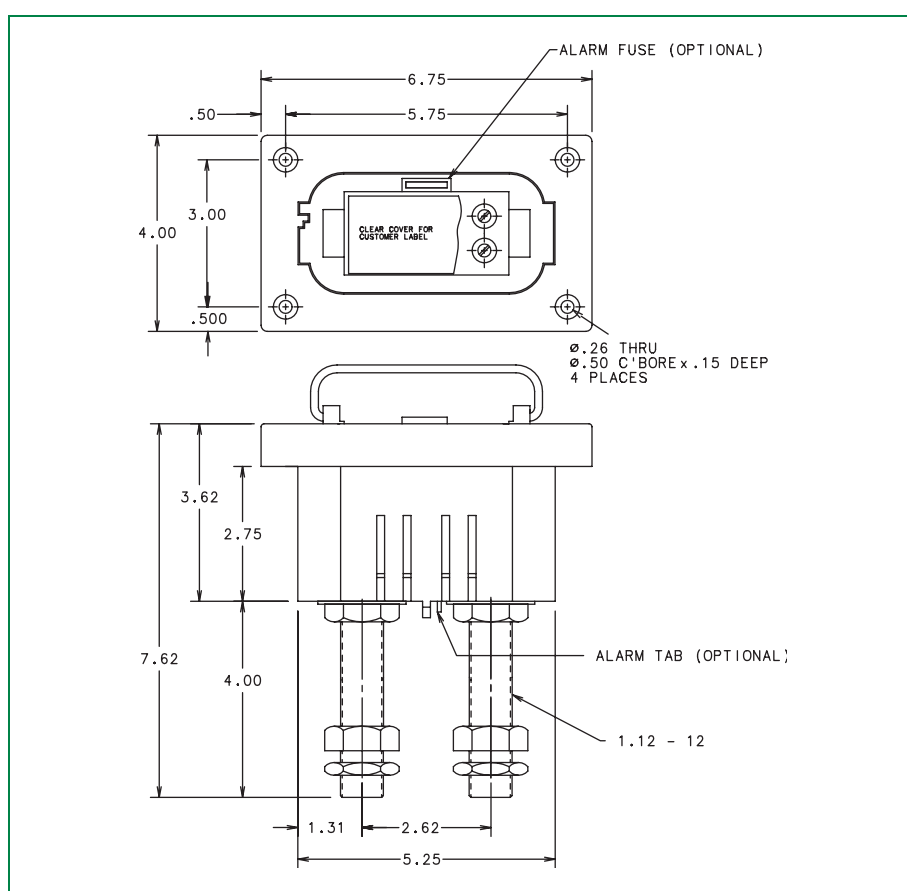
- 0.75 – 16x3.5 inches
- 0.875 – 14x3.5 inches

Dimensions are for reference only.



The following illustration shows the dimensions of the LTFD 1200 series (900 A – 1200 A) telecommunications power fuse. Stud size is 1.12 – 12x4 inches.

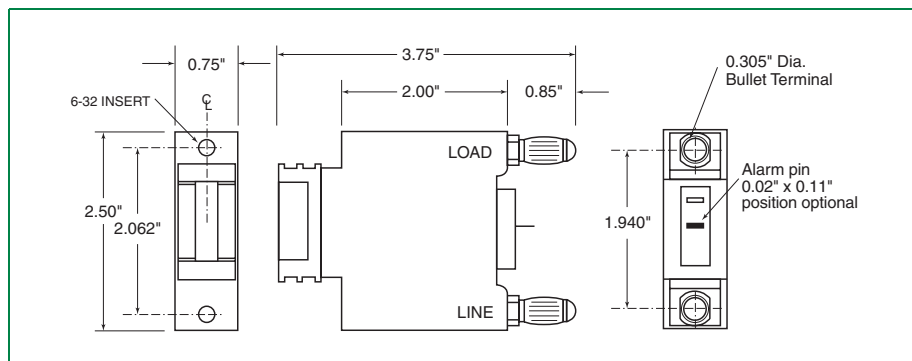
Dimensions are for reference only.



## LTFD 101 Series

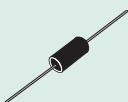
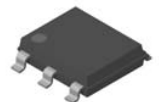
The following illustration shows the dimensions of the LTFD 101 series telecommunications power fuse. Contact Littelfuse for additional options and dimensions.

Dimensions are for reference only.



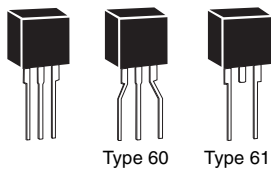
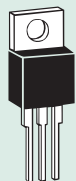
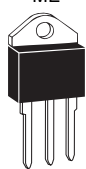
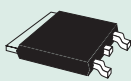
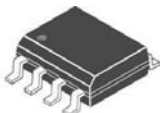
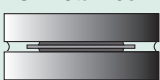
## Summary of Packing Options

| Package Type                                                                                            | Description                           | Packing Quantity | Added Suffix   | Industry Standard |
|---------------------------------------------------------------------------------------------------------|---------------------------------------|------------------|----------------|-------------------|
| SL1122A Series<br>     | Bulk Pack (10 x Trays of 100)         | 1000             | Standard       | EIA-RS-296        |
| SL0902A Series<br>    | Tape and Reel Pack                    | 1500             | SM             | EIA-481-2         |
|                                                                                                         | Bulk Pack                             | 1000             | C              | N/A               |
| SL1002A Series<br>   | Tape and Reel Pack (tape width 16 mm) | 1000             | SM             | EIA-481-2         |
|                                                                                                         | Bulk Pack                             | 1000             | C              | N/A               |
| SL1003A Series<br>   | Tape and Reel Pack                    | 700              | SM             | EIA-481-2         |
|                                                                                                         | 10 x Trays of 100                     | 1000             | R              | N/A               |
|                                                                                                         | Bulk Pack                             | 1000             | C              | N/A               |
| SL1011A/B Series<br> | Tape and Reel Pack                    | 1000             | A              | EIA-RS-296        |
|                                                                                                         | Bulk Pack                             | 1000             | C              | N/A               |
|                                                                                                         | Bulk Pack (10 x Trays of 100)         | 1000             | Formed Options | N/A               |
| SL1021A/B Series<br> | Bulk Pack (10 x Trays of 100)         | 1000             | R, RF, RS      | EIA-RS-296        |
| SL1024A/B Series<br> | Bulk Pack (10 x Trays of 100)         | 1000             | R, RF, RS      | N/A               |

| Package Type                                                                                                                                                                                 | Description                   | Packing Quantity                       | Added Suffix | Industry Standard |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----------------------------------------|--------------|-------------------|
| SL1411A Series<br>                                                                                          | Tape and Reel Pack            | 1000                                   | A            | EIA-296           |
|                                                                                                                                                                                              | Bulk Pack                     | 1000                                   | C            | N/A               |
| DO-214AA<br>SA, SB, SC, SD, including MC<br><br>3-lead                                                      | Embossed Carrier Reel Pack    | 2500                                   | RP           | EIA-481-1         |
| TO-92<br>EA, EB, EC, including MC<br><br>Note: Standard lead spacing for TO-92 reel pack is 0.200" (RP2). | Bulk Pack                     | 2000                                   | Standard     | N/A               |
|                                                                                                                                                                                              | Tape and Reel Pack            | 2000                                   | RP1, RP2     | EIA-468-B         |
|                                                                                                                                                                                              | Ammo Pack                     | 2000                                   | AP           | EIA-468-B         |
| T10A [DO-15]<br>                                                                                          | Tape and Reel Pack            | 5000                                   | RP           | EIA-468-B         |
|                                                                                                                                                                                              | Bulk Pack                     | 1000                                   | N/A          | N/A               |
| T10B [DO-201AD]<br>                                                                                       | Tape and Reel Pack            | 1000                                   | RP           | EIA-468-B         |
|                                                                                                                                                                                              | Bulk Pack                     | 500                                    | N/A          | N/A               |
| [T10C]<br>                                                                                                | Bulk Pack (10 x Trays of 100) | 1000                                   | N/A          | N/A               |
| Modified MS-013<br>                                                                                       | Tape and Reel Pack            | 1500                                   | RP           | EIA-481-1         |
|                                                                                                                                                                                              | Tube Pack                     | 50 per tube,<br>10 tubes per container | TP           | EIA-481-1         |



# Summary of Packing Options

| Package Type                                                                                                                            | Description                              | Packing Quantity                       | Added Suffix | Industry Standard |
|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|----------------------------------------|--------------|-------------------|
| TO-220<br>AA, AB, AC, AD<br><br><br>Type 60    Type 61 | Bulk Pack                                | 500                                    | Standard     | N/A               |
|                                                                                                                                         | Tape and Reel Pack                       | 700                                    | RP           | EIA-468-B         |
|                                                                                                                                         | Bulk Pack for Type 60 lead form          | 500                                    | BP           | N/A               |
|                                                                                                                                         | Tape and Reel Pack for Type 61 lead form | 700                                    | RP           | EIA-468-B         |
|                                                                                                                                         | Tube Pack                                | 50 per tube,<br>10 tubes per container | TP           | EIA-468-B         |
| TO-220AB<br><br>                                      | Bulk Pack                                | 500                                    | Standard     | N/A               |
| TO-218<br>ME<br><br>                                 | Bulk Pack                                | 250                                    | Standard     | N/A               |
| TO-263<br>D <sup>2</sup> PAK<br><br>                 | Tube Pack                                | 50 per tube,<br>10 tubes per container | TP           |                   |
|                                                                                                                                         | Tape and Reel Pack                       | 500                                    | RP           | EIA-481-2         |
| MS-012<br><br>                                       | Tape and Reel Pack                       | 5000                                   | Standard     | EIA-481-1         |
| SIDActor <sup>®</sup> Cell<br><br>                   | Bulk Pack (25 x Trays of 200)            | 5000                                   | —            | N/A               |

| Package Type                                                                                                                        | Description                | Packing Quantity | Added Suffix | Industry Standard |
|-------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------|--------------|-------------------|
| <b>TeleLink® Surface Mount Fuse 461 Series</b><br> | Embossed Carrier Reel Pack | 2500             | RP           | EIA-481-B         |
|                                                                                                                                     | Bulk Pack                  | 5000             | BP           | N/A               |
|                                                                                                                                     | Tape and Reel Pack (16 mm) | 2500             | ERT16        |                   |
| <b>229P / 230P Series</b><br>                     | Bulk Pack                  | 1000             | M            | EIA-296           |
|                                                                                                                                     | Tape and Reel Pack         | 1500             | DRT1         | EIA-296           |
|                                                                                                                                     | Tape and Reel Pack         | 2500             | ERT1         | EIA-296           |
| <b>451 / 453 Series</b><br>                      | Tape and Reel Pack (12 mm) | 1000             | MR           | EIA-RS481-1       |
|                                                                                                                                     | Tape and Reel Pack (12 mm) | 5000             | NR           | EIA-RS481-1       |
| <b>452 / 454 Series</b><br>                      | Tape and Reel Pack (12 mm) | 1000             | MR           | EIA-RS481-1       |
|                                                                                                                                     | Tape and Reel Pack (12 mm) | 5000             | NR           | EIA-RS481-1       |
| <b>154 Series</b><br>                            | Tape and Reel Pack (16 mm) | 1500             | DR           | EIA-481           |
| <b>464 Series</b><br>                            | Tape and Reel Pack (24 mm) | 1500             | DR           | EIA-RS481-1       |
| <b>465 Series</b><br>                            | Tape and Reel Pack (24 mm) | 1500             | DR           | EIA-RS481-1       |
| <b>481 Series</b><br>                            | Bulk Pack                  | Five-pack        | V            |                   |
|                                                                                                                                     | Bulk Pack                  | 100-piece box    | H            |                   |

# Summary of Packing Options

| Package Type                                                                                           | Description                                              | Packing Quantity | Added Suffix | Industry Standard |
|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------|------------------|--------------|-------------------|
| 482 Series<br>        | Contact Littelfuse for packing and ordering information. |                  |              |                   |
| L17T Series<br>      | Contact Littelfuse for packing and ordering information. |                  |              |                   |
| TLN Series<br>      | Contact Littelfuse for packing and ordering information. |                  |              |                   |
| TLS Series<br>      | Contact Littelfuse for packing and ordering information. |                  |              |                   |
| LTFD Series<br>     | Contact Littelfuse for packing and ordering information. |                  |              |                   |
| LTFD 101 Series<br> | Contact Littelfuse for packing and ordering information. |                  |              |                   |

## Packing Options



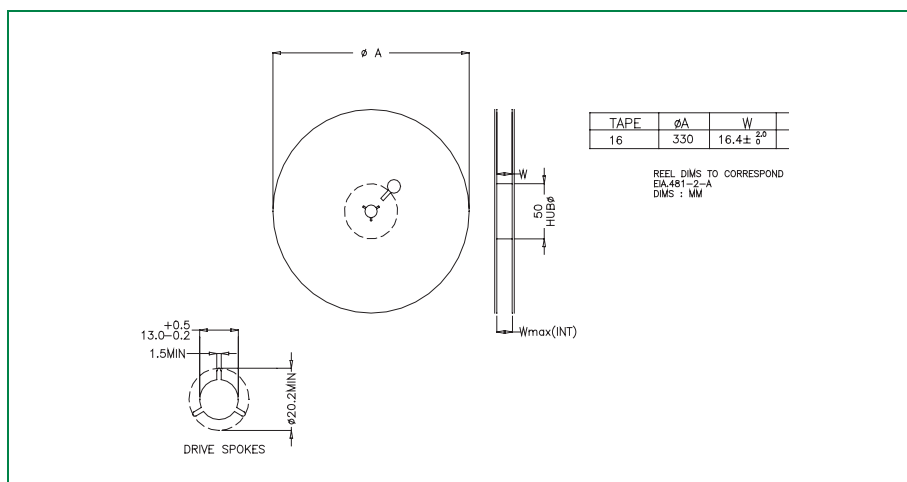
### SL1122A Series

Tape and reel packing options meet all specifications as set forth in EIA-481-1. Bulk pack quantity is 1000 (10 trays of 100). Depth of tray with lid is 22 mm; width of tray is 222 mm x 222 mm.



### SL0902A Series

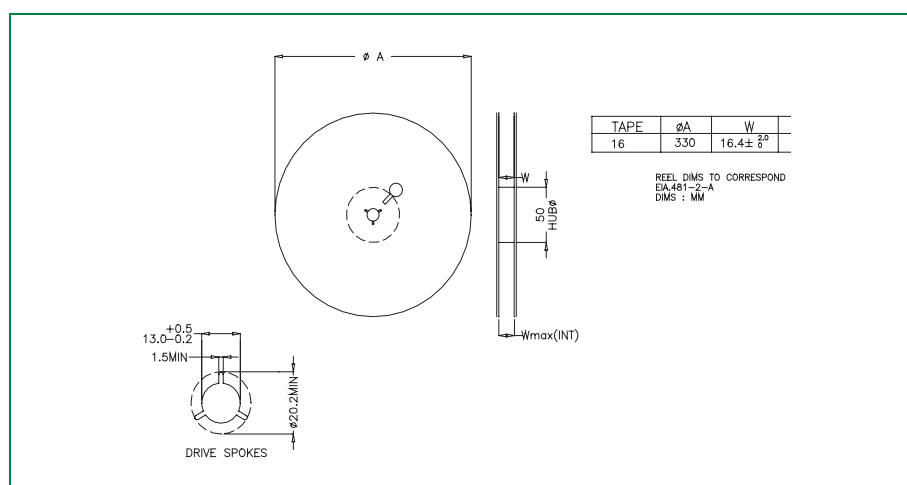
Tape and reel packing options meet all specifications as set forth in EIA-481-2. Standard reel pack quantity is 1500. Bulk pack quantity is 1000.





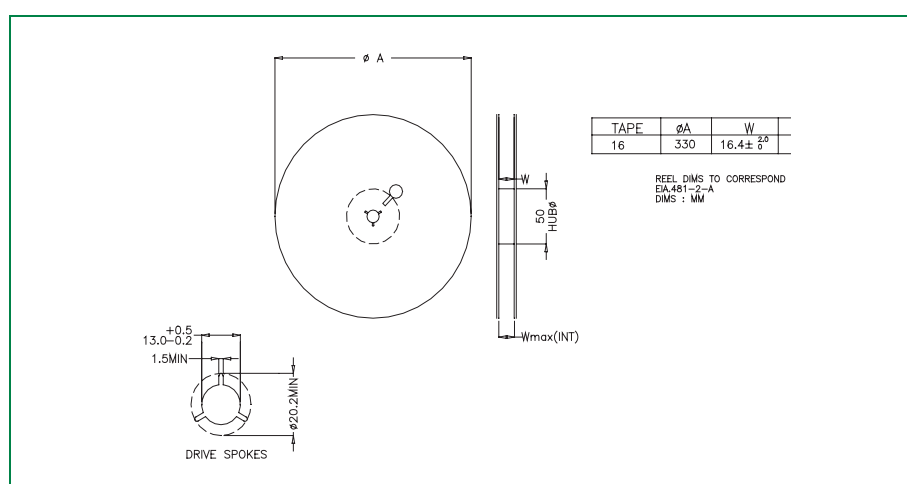
## SL1002A Series

Tape and reel packing options meet all specifications as set forth in EIA-481-2. Standard reel pack quantity is 1000. Bulk pack quantity is 1000.



## SL1003A Series

Tape and reel packing options meet all specifications as set forth in EIA-481-2. Standard reel pack quantity is 700. Bulk pack quantity is 1000.





### **SL1011A/B Series**

Tape and reel packing options meet all specifications as set forth in EIA-296. Standard reel pack quantity is 1000. Bulk pack quantity is 1000.



### **SL1021A/B Series**

Bulk pack quantity is 1000 (10 trays of 100). Depth of tray with lid is 22 mm; width of tray is 222 mm x 222 mm.



### **SL1024A/B Series**

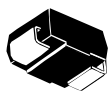
Bulk pack quantity is 1000 (10 trays of 100). Depth of tray with lid is 22 mm; width of tray is 222 mm x 222 mm.



### **SL1411A Series**

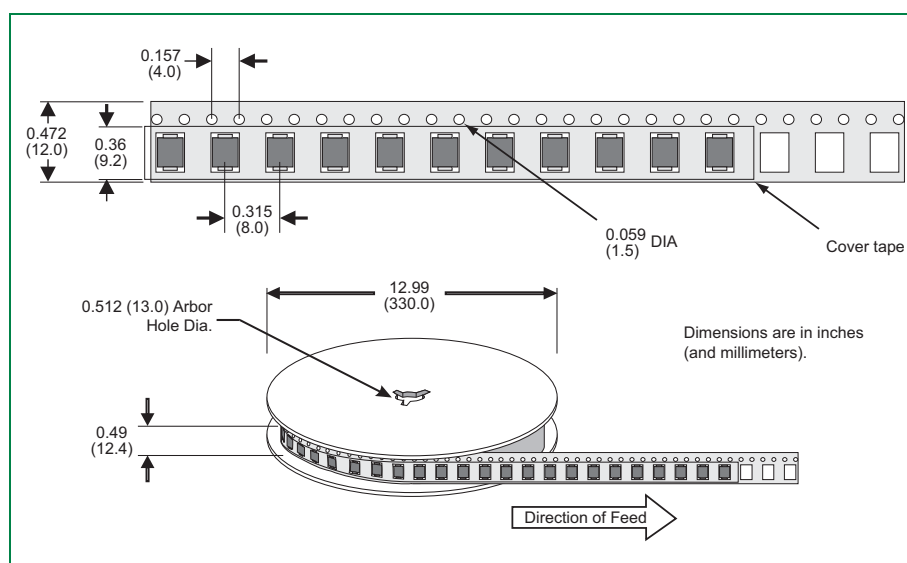
Tape and reel packing options meet all specifications as set forth in EIA-296. Standard reel pack quantity and bulk pack quantity for axial-leaded devices is 1000 pieces.

Contact Littelfuse for surface mount packaging information.

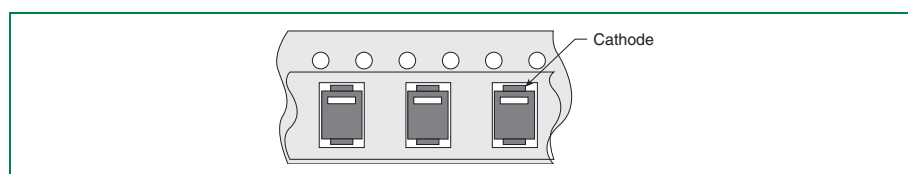


## DO-214AA

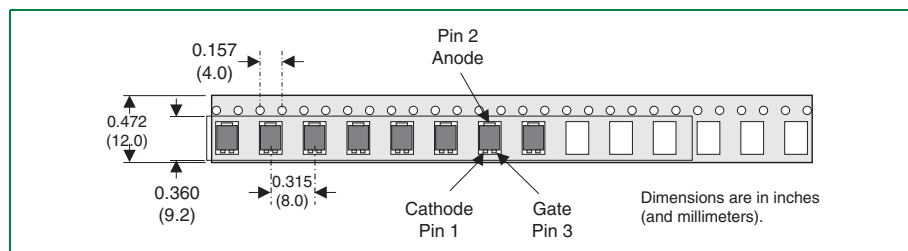
Tape and reel packing options meet all specifications as set forth in EIA-481-1. Standard reel pack quantity is 2500. Bulk pack quantity is 1000.



The following illustration shows the DO-214AA component orientation for P0641S, P0721S, P0901S, P1101S, P1301S, P1701S:



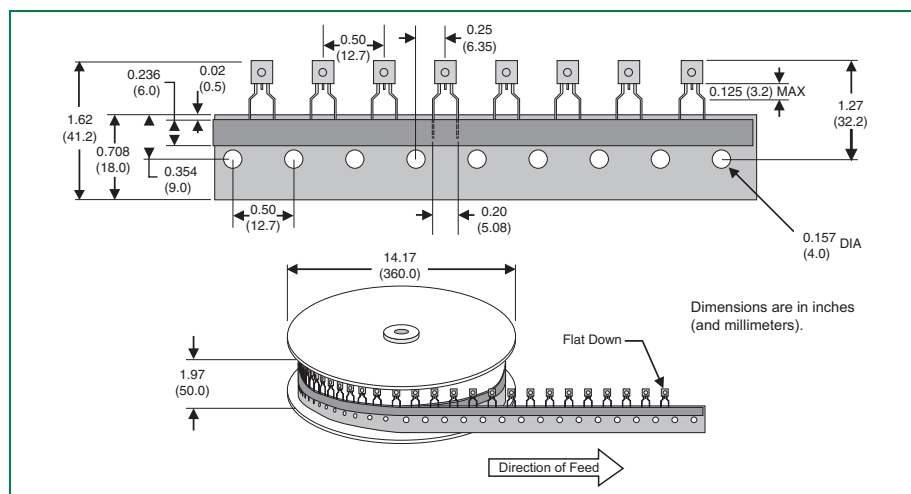
The following illustration shows the modified DO-214 tape and reel:





## TO-92

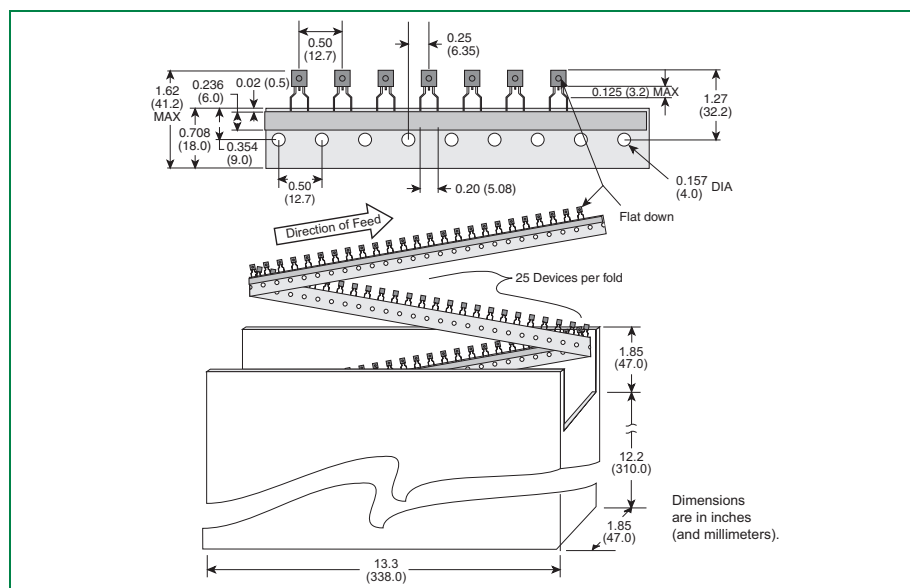
Tape and reel packing options meet all specifications as set forth in EIA-468-B. Standard reel pack quantity is 2000.



### Notes:

- Part number suffix RP2 denotes 0.200" (5 mm) lead spacing and is Littelfuse's default value.
- Part number suffix RP1 denotes 0.100" (2.54 mm) lead spacing and is available upon request.

The following figure shows the TO-92 Ammo Pack option:

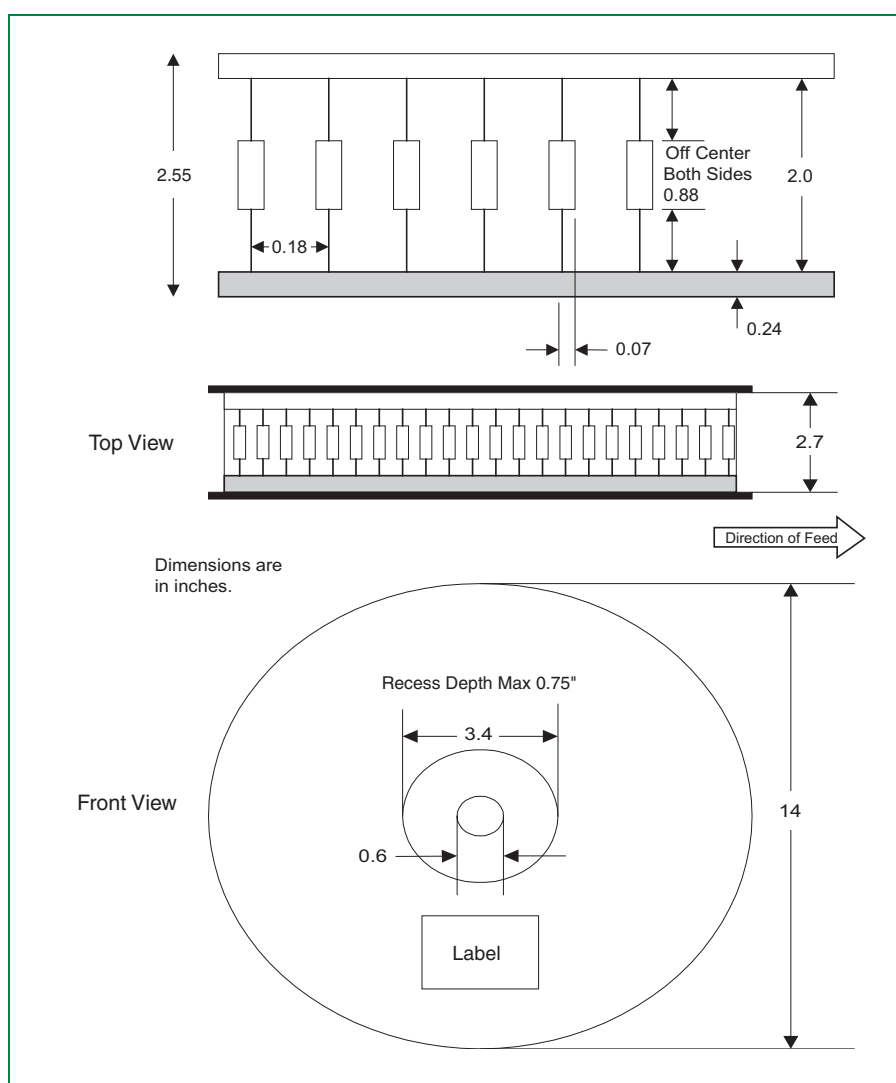






## T10A

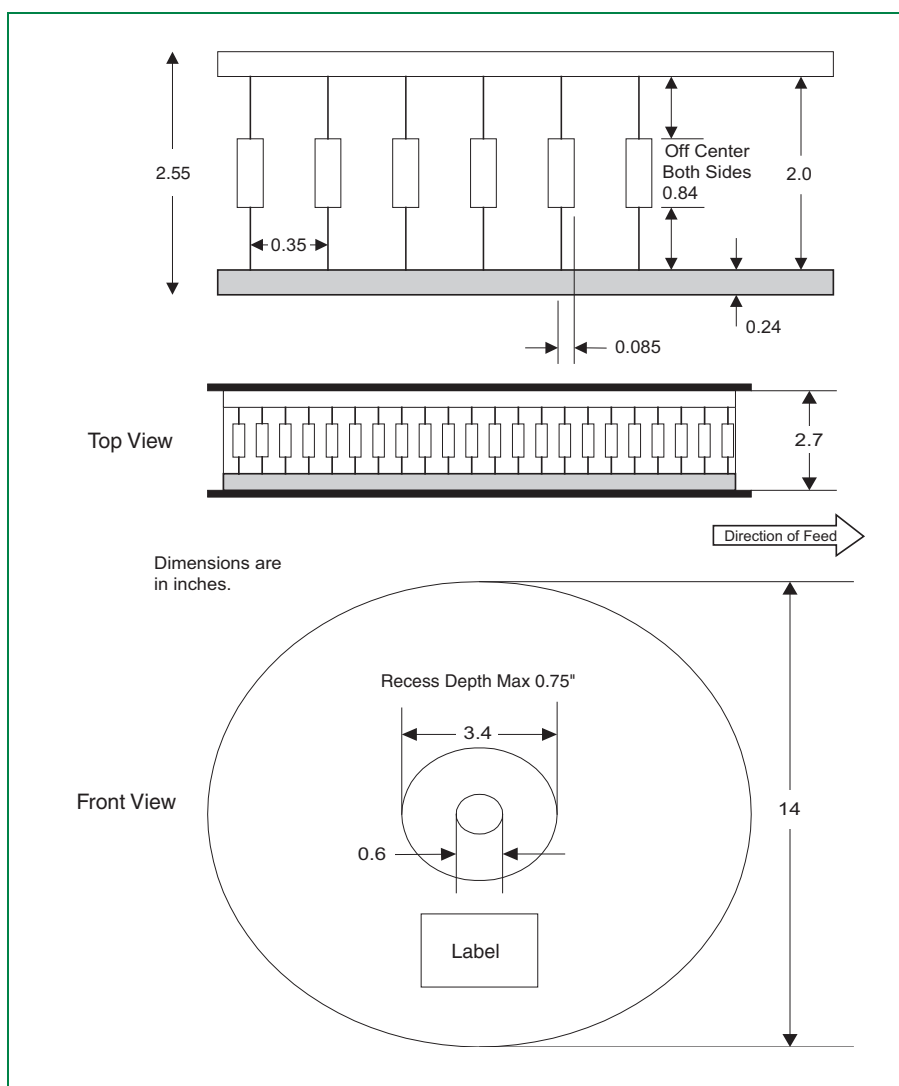
Tape and reel packing options for the T10A meet all specifications as set forth in EIA-468-B. Standard reel pack quantity is 5000. Bulk pack quantity is 1000.





## T10B

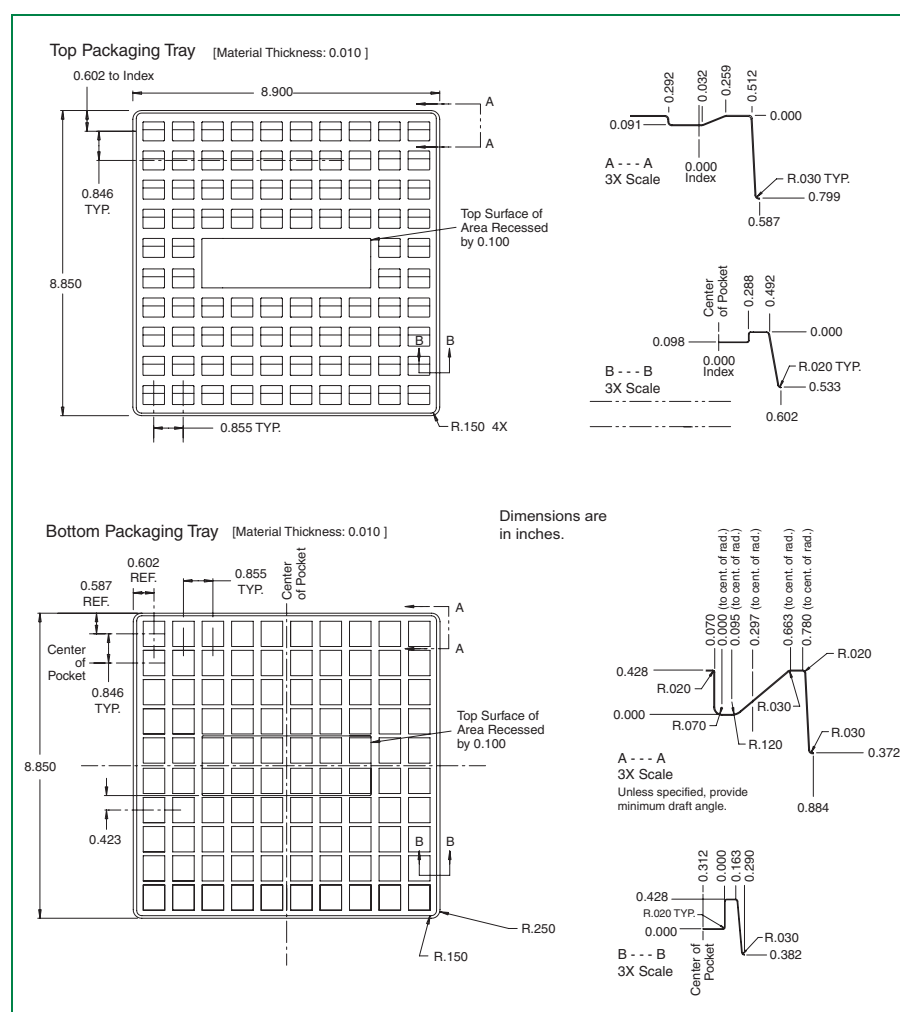
Tape and reel packing options for the T10B meet all specifications as set forth in EIA-468-B. Standard reel pack quantity is 1000. Bulk pack quantity is 500.

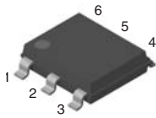




## T10C

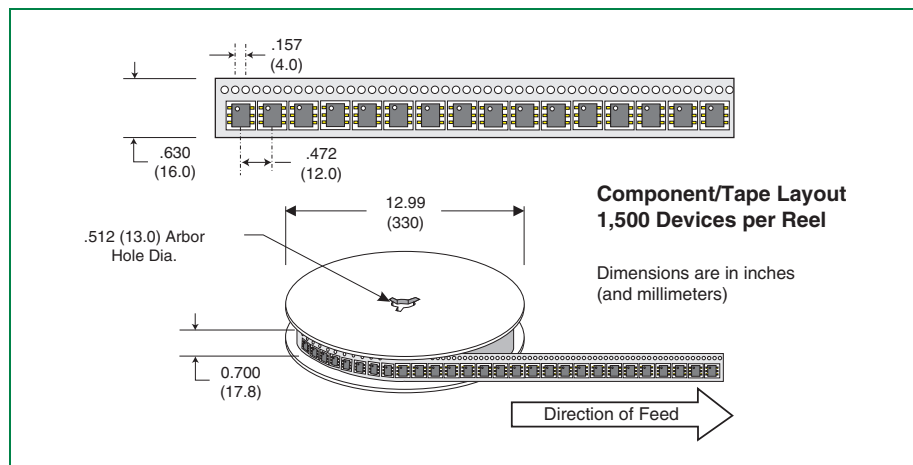
The following illustration shows the tray for the T10C. Standard tray quantity is 1000 per box (10 trays of 100 each).



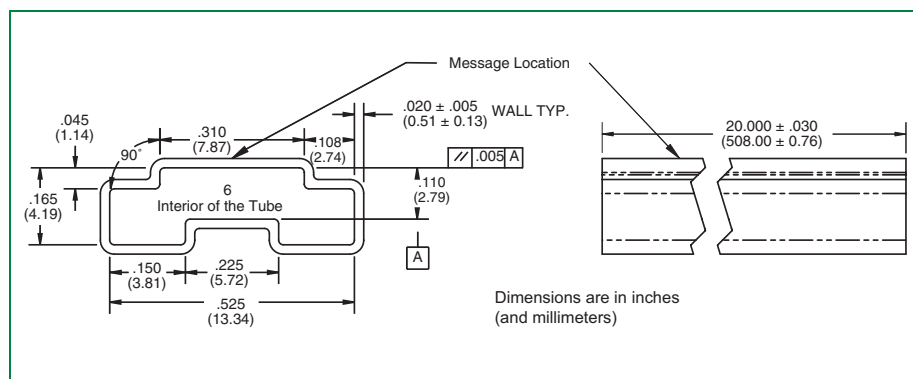


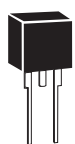
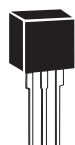
## Modified MS-013 Six-pin

Tape and reel packing options meet all specifications as set forth in EIA-468-B. Standard reel pack quantity is 1500.



The following illustration shows the tube pack:

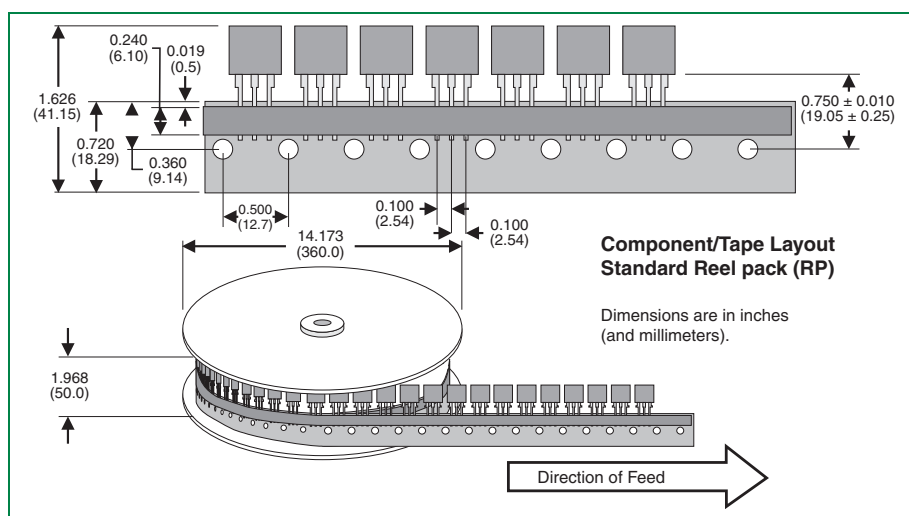




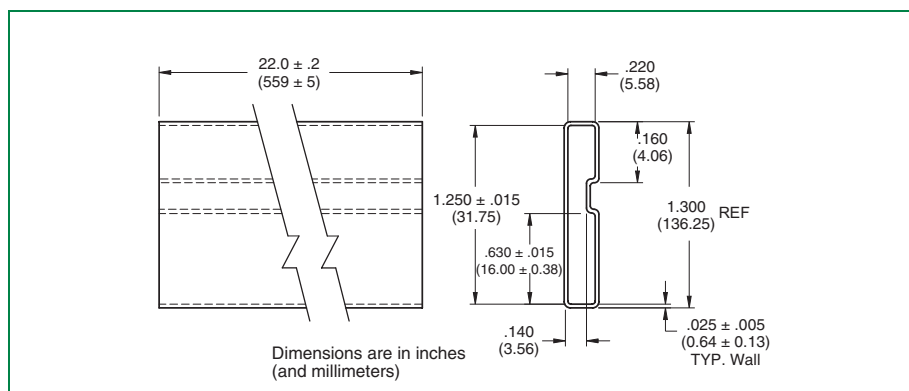
Type 61

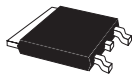
## Modified TO-220

Tape and reel packing options meet all specifications as set forth in EIA-468-B. Standard reel pack quantity is 700.



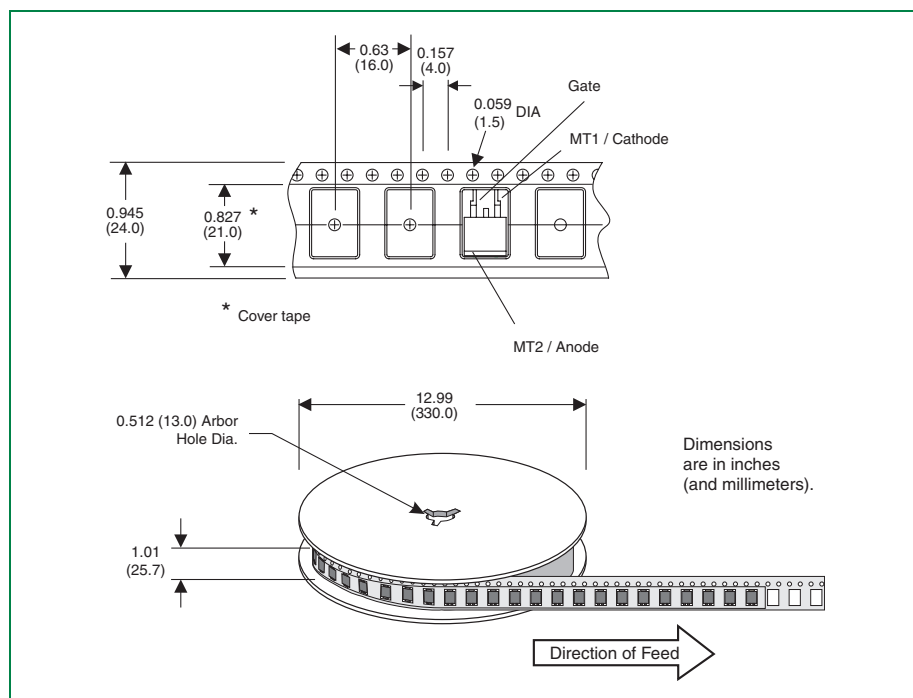
The following illustration shows the tube pack:





## TO-263

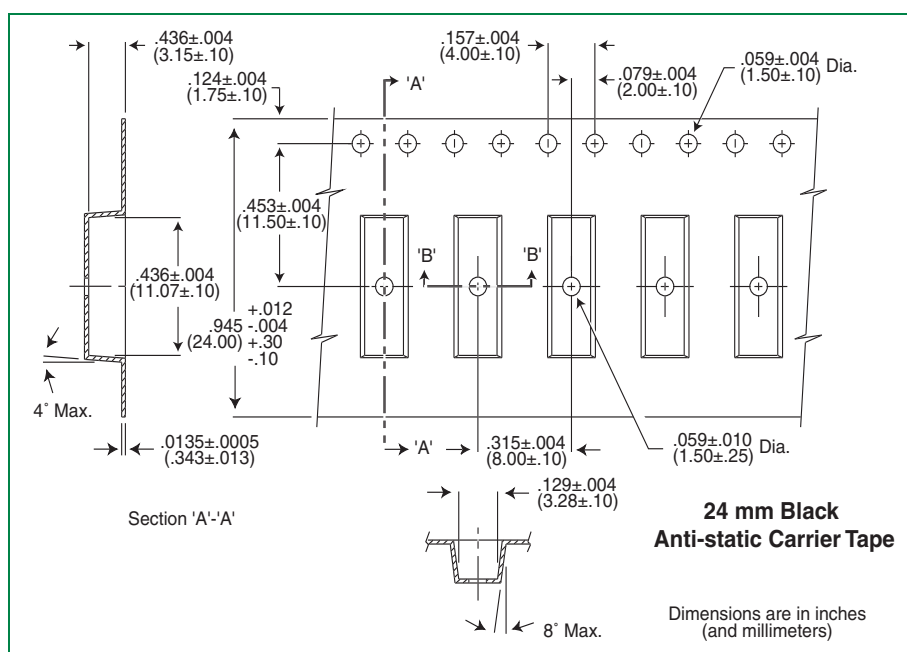
Tape and reel packing options meet all specifications as set forth in EIA-481-2. Standard reel pack quantity is 500.



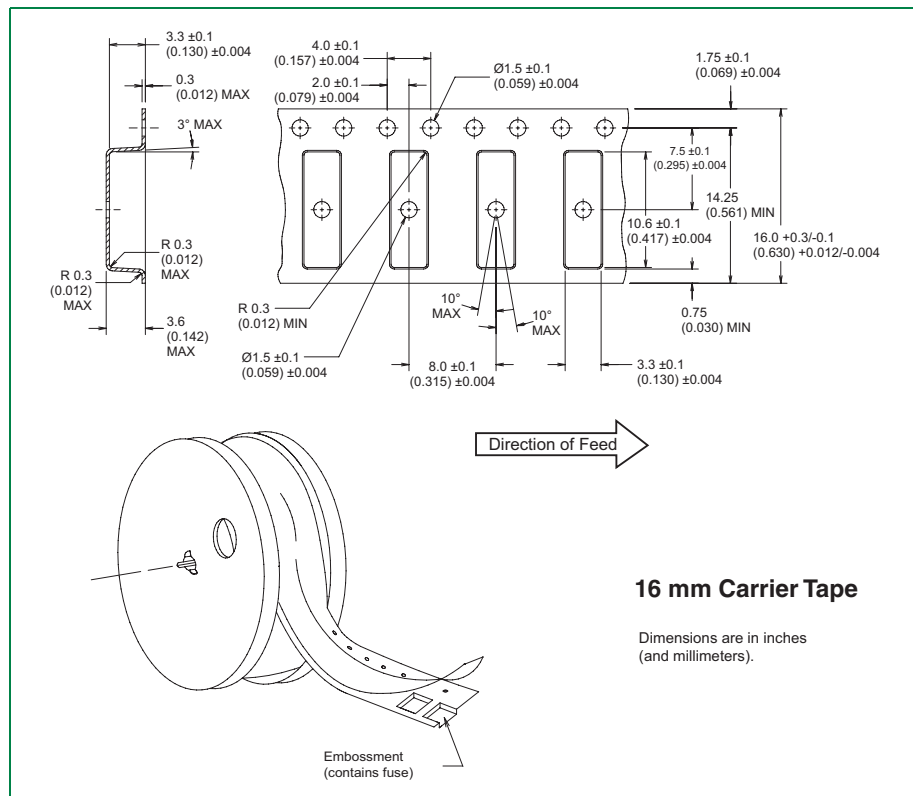


## TeleLink® Surface Mount Fuse

The following illustration shows the dimensions of the 24mm TeleLink embossed carrier tape.

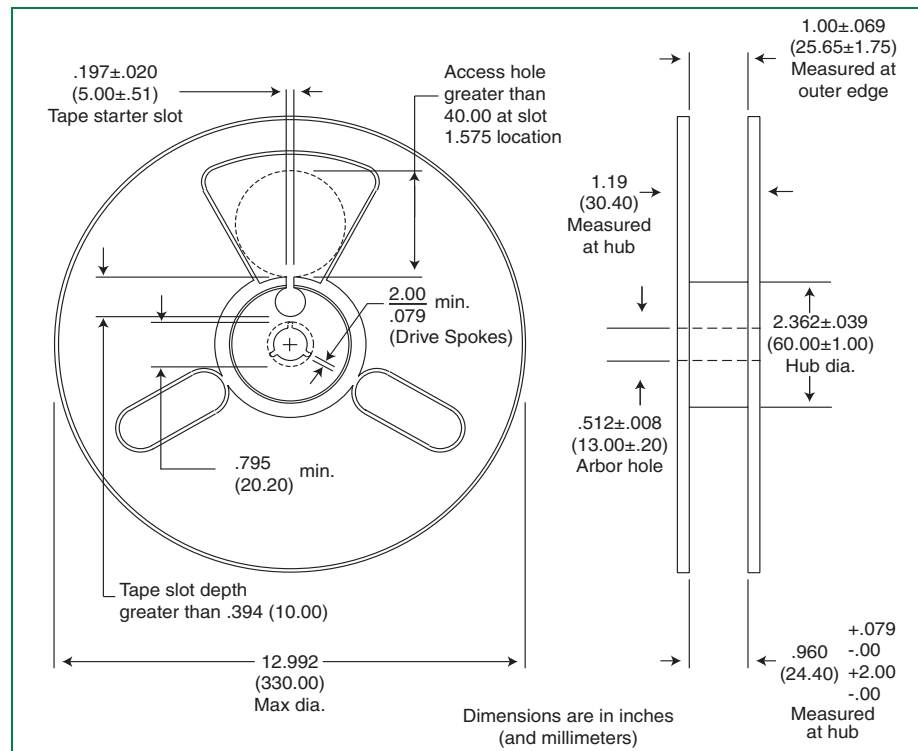


The following illustration shows the dimensions of the *TeleLink* 16 mm carrier tape.





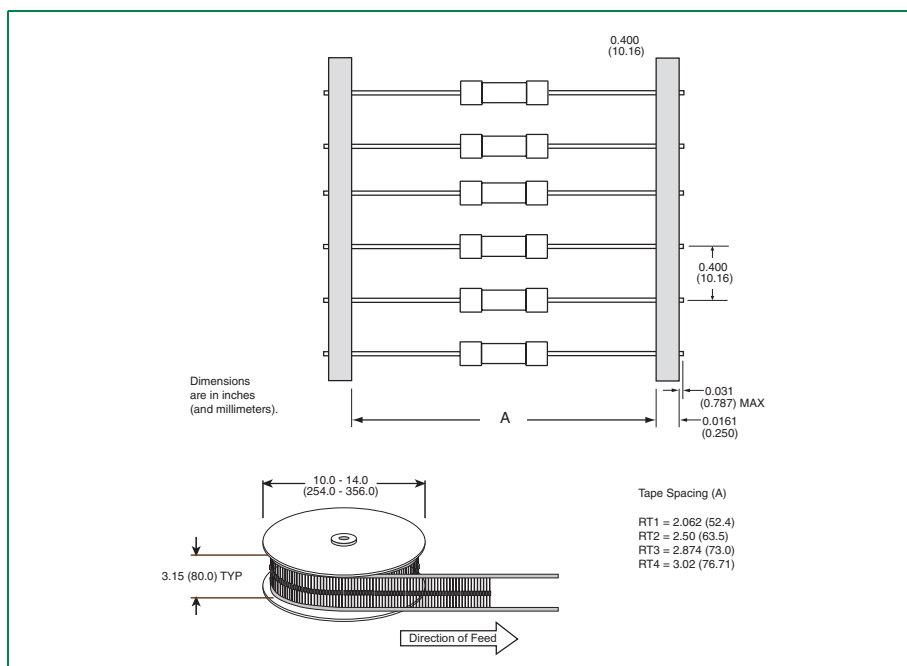
The following illustration shows the *TeleLink* 13-inch (330 mm), injection-molded, high-impact, anti-static, white, plastic reel. Material conforms to EIA-481-1. Surface resistivity is 1011  $\Omega$ /square. Materials comply with ASTM D-257.





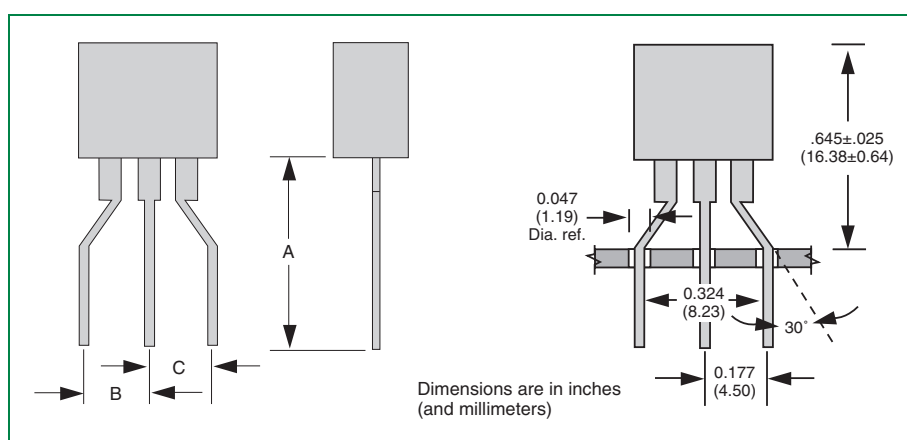
## 229P / 230P Series

Tape and reel packing options meet all specifications as set forth in EIA-296. Standard reel pack quantity is 1500 and 2500. Bulk pack quantity is 1000.



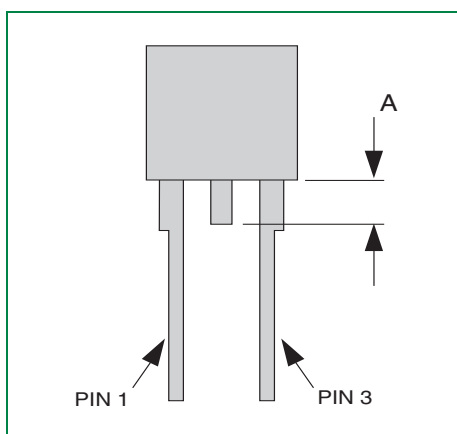
## Lead Form Options

### Modified TO-220 Type 60



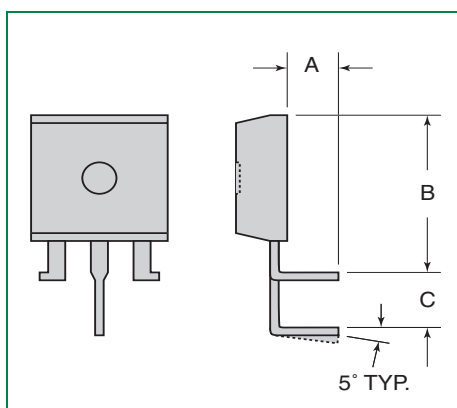
| Dimension | Inches |       | Millimeters |      |
|-----------|--------|-------|-------------|------|
|           | Min    | Max   | Min         | Max  |
| A         | 0.485  |       | 12.32       |      |
| B         | 0.162  | 0.192 | 4.11        | 4.88 |
| C         | 0.162  | 0.192 | 4.11        | 4.88 |

## Modified TO-220 Type 61



| Dimension | Inches |       | Millimeters |      |
|-----------|--------|-------|-------------|------|
|           | Min    | Max   | Min         | Max  |
| A         | 0.030  | 0.060 | 0.762       | 1.52 |

## Modified TO-220 Type 62



| Dimension | Inches |       | Millimeters |       |
|-----------|--------|-------|-------------|-------|
|           | Min    | Max   | Min         | Max   |
| A         | 0.172  | 0.202 | 4.37        | 5.13  |
| B         | 0.440  | 0.460 | 11.18       | 11.68 |
| C         | 0.120  | 0.130 | 3.05        | 3.30  |