

## Solid-Electrolyte TANTALEX® Capacitors, Hermetically-Sealed, Axial-Lead



### FEATURES

- Terminations: Tin/lead (SnPb), 100 % tin (RoHS compliant)
- These high performance, hermetically-sealed TANTALEX® capacitors have set the standard for solid-electrolyte tantalum capacitors for more than three decades
- High capacitance, low DCL, low dissipation factor and exceptional operating stability
- Performance and reliability have been proven in commercial, industrial and military applications
- Available in four case codes and capacitors and are supplied with plastic-film insulation
- Terminals are solid, tinned nickel wire leads
- The military equivalent to the 150D is the M39003/01 (style CSR13) which is qualified to MIL-PRF-39003
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



Available

**RoHS\***  
COMPLIANT

### Note

- \* Lead (Pb)-containing terminations are not RoHS-compliant. Exemptions may apply.

### PERFORMANCE CHARACTERISTICS

**Operating Temperature:** - 55 °C to + 125 °C  
(above 85 °C, voltage derating is required)

**Capacitance Tolerance:** At 120 Hz, + 25 °C  
± 20 %, ± 10 % standard. ± 5 % available as special

**Dissipation Factor:** At 120 Hz, + 25 °C

**DC Leakage Current (DCL Max.):**

**At + 25 °C:** Leakage current shall not exceed the values listed in the Standard Ratings table

**At + 85 °C:** Leakage current shall not exceed 10 times the values listed in the Standard Ratings table

**At + 125 °C:** Leakage shall not exceed 15 times the values listed in the Standard Ratings table

**Life Test:** Capacitors shall withstand rated DC voltage applied at + 85 °C for 2000 h or derated DC voltage applied at + 125 °C for 1000 h

Following the life test:

1. DCL shall not exceed 125 % of the initial requirement
2. Dissipation factor shall meet the initial requirement
3. Change in capacitance shall not exceed ± 5 %

### ORDERING INFORMATION

| 150D  | 224                                                                                                                            | X0                                                            | 006                                                                                              | A                                | 2                                     | T                             | E3                                                                      |
|-------|--------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------|----------------------------------|---------------------------------------|-------------------------------|-------------------------------------------------------------------------|
| MODEL | CAPACITANCE                                                                                                                    | CAPACITANCE TOLERANCE                                         | DC VOLTAGE RATING AT 85 °C                                                                       | CASE CODE                        | STYLE NUMBER                          | PACKAGING                     | RoHS COMPLIANT                                                          |
|       | This is expressed in picofarads. The first two digits are the significant figures. The third is the number of zeros to follow. | X0 = ± 20 %<br>X9 = ± 10 %<br>X5 = ± 5 % *<br>* Special order | This is expressed in volts. To complete the three-digit block, zeros precede the voltage rating. | See Ratings and Case Codes table | 0 = No Sleeve<br>2 = Insulated sleeve | B = Bulk<br>T = Tape and reel | E3 = 100 % tin termination (RoHS compliant)<br>Blank = SnPb termination |

**DIMENSIONS** in inches [millimeters]


| CASE CODE | D                                     | L <sub>1</sub>               | J<br>(MAXIMUM) | LEAD SIZE |                  |
|-----------|---------------------------------------|------------------------------|----------------|-----------|------------------|
|           | WITH INSULATING SLEEVE <sup>(1)</sup> |                              |                | AWG NO.   | NOMINAL DIAMETER |
| A         | 0.135 ± 0.016 [3.43 ± 0.41]           | 0.286 ± 0.031 [7.26 ± 0.79]  | 0.422 [10.720] | 24        | 0.020 [0.51]     |
| B         | 0.185 ± 0.016 [4.70 ± 0.41]           | 0.474 ± 0.031 [12.04 ± 0.79] | 0.610 [15.490] | 24        | 0.020 [0.51]     |
| R         | 0.289 ± 0.016 [7.34 ± 0.41]           | 0.686 ± 0.031 [17.42 ± 0.79] | 0.822 [20.880] | 22        | 0.025 [0.64]     |
| S         | 0.351 ± 0.016 [8.92 ± 0.41]           | 0.786 ± 0.031 [19.96 ± 0.79] | 0.922 [23.420] | 22        | 0.025 [0.64]     |

**Note**

<sup>(1)</sup> When a shrink-fitted insulation is used, it shall lap over the ends of the capacitor body

**STANDARD RATINGS**

| CAPACITANCE<br>(μF)                                                                   | CASE CODE | PART NUMBER     | MAX. DCL<br>AT + 25 °C<br>(μA) | MAX. DF<br>AT + 25 °C<br>120 Hz<br>(%) |
|---------------------------------------------------------------------------------------|-----------|-----------------|--------------------------------|----------------------------------------|
| 6 V <sub>DC</sub> AT + 85 °C, SURGE = 8 V; 4 V <sub>DC</sub> AT + 125 °C, SURGE = 5 V |           |                 |                                |                                        |
| 0.22                                                                                  | A         | 150D224(1)006A2 | 0.5                            | 2                                      |
| 0.27                                                                                  | A         | 150D274(1)006A2 | 0.5                            | 2                                      |
| 0.33                                                                                  | A         | 150D334(1)006A2 | 0.5                            | 2                                      |
| 0.39                                                                                  | A         | 150D394(1)006A2 | 0.5                            | 2                                      |
| 0.47                                                                                  | A         | 150D474(1)006A2 | 0.5                            | 2                                      |
| 0.56                                                                                  | A         | 150D564(1)006A2 | 0.5                            | 2                                      |
| 0.68                                                                                  | A         | 150D684(1)006A2 | 0.5                            | 2                                      |
| 0.82                                                                                  | A         | 150D824(1)006A2 | 0.5                            | 2                                      |
| 1.0                                                                                   | A         | 150D105(1)006A2 | 0.5                            | 2                                      |
| 1.2                                                                                   | A         | 150D125(1)006A2 | 0.5                            | 4                                      |
| 1.5                                                                                   | A         | 150D155(1)006A2 | 0.5                            | 4                                      |
| 1.8                                                                                   | A         | 150D185(1)006A2 | 0.5                            | 4                                      |
| 2.2                                                                                   | A         | 150D225(1)006A2 | 0.5                            | 4                                      |
| 2.7                                                                                   | A         | 150D275(1)006A2 | 0.5                            | 4                                      |
| 3.3                                                                                   | A         | 150D335(1)006A2 | 0.5                            | 4                                      |
| 3.9                                                                                   | A         | 150D395(1)006A2 | 0.5                            | 4                                      |
| 4.7                                                                                   | A         | 150D475(1)006A2 | 0.5                            | 4                                      |
| 5.6                                                                                   | A         | 150D565(1)006A2 | 0.5                            | 4                                      |
| 6.8                                                                                   | A         | 150D685(1)006A2 | 0.5                            | 6                                      |
| 8.2                                                                                   | B         | 150D825(1)006B2 | 0.5                            | 6                                      |
| 10                                                                                    | B         | 150D106(1)006B2 | 0.5                            | 6                                      |
| 12                                                                                    | B         | 150D126(1)006B2 | 0.5                            | 6                                      |
| 15                                                                                    | B         | 150D156(1)006B2 | 1.0                            | 6                                      |
| 18                                                                                    | B         | 150D186(1)006B2 | 1.0                            | 6                                      |

**Note**

- Part number definitions:  
(1) For 10 % tolerance specify X9; for 20 % specify "X0"; for 5 % "X5" (special order)

**STANDARD RATINGS**

| CAPACITANCE<br>( $\mu$ F)                                                                    | CASE CODE | PART NUMBER     | MAX. DCL<br>AT + 25 °C<br>( $\mu$ A) | MAX. DF<br>AT + 25 °C<br>120 Hz<br>(%) |
|----------------------------------------------------------------------------------------------|-----------|-----------------|--------------------------------------|----------------------------------------|
| <b>6 V<sub>DC</sub> AT + 85 °C, SURGE = 8 V; 4 V<sub>DC</sub> AT + 125 °C, SURGE = 5 V</b>   |           |                 |                                      |                                        |
| 22                                                                                           | B         | 150D226(1)006B2 | 1.0                                  | 6                                      |
| 27                                                                                           | B         | 150D276(1)006B2 | 1.0                                  | 6                                      |
| 33                                                                                           | B         | 150D336(1)006B2 | 1.0                                  | 6                                      |
| 39                                                                                           | B         | 150D396(1)006B2 | 1.0                                  | 6                                      |
| 47                                                                                           | B         | 150D476(1)006B2 | 2.0                                  | 6                                      |
| 56                                                                                           | B         | 150D566(1)006B2 | 2.0                                  | 6                                      |
| 68                                                                                           | R         | 150D686(1)006R2 | 3.0                                  | 6                                      |
| 82                                                                                           | R         | 150D826(1)006R2 | 3.0                                  | 6                                      |
| 100                                                                                          | R         | 150D107(1)006R2 | 3.0                                  | 6                                      |
| 120                                                                                          | R         | 150D127(1)006R2 | 3.0                                  | 6                                      |
| 150                                                                                          | R         | 150D157(1)006R2 | 6.0                                  | 6                                      |
| 180                                                                                          | R         | 150D187(1)006R2 | 6.0                                  | 6                                      |
| 220                                                                                          | S         | 150D227(1)006S2 | 6.0                                  | 8                                      |
| 270                                                                                          | S         | 150D277(1)006S2 | 6.0                                  | 8                                      |
| 330                                                                                          | S         | 150D337(1)006S2 | 10.0                                 | 8                                      |
| <b>10 V<sub>DC</sub> AT + 85 °C, SURGE = 13 V; 7 V<sub>DC</sub> AT + 125 °C, SURGE = 9 V</b> |           |                 |                                      |                                        |
| 0.22                                                                                         | A         | 150D224(1)010A2 | 0.5                                  | 2                                      |
| 0.27                                                                                         | A         | 150D274(1)010A2 | 0.5                                  | 2                                      |
| 0.33                                                                                         | A         | 150D334(1)010A2 | 0.5                                  | 2                                      |
| 0.39                                                                                         | A         | 150D394(1)010A2 | 0.5                                  | 2                                      |
| 0.47                                                                                         | A         | 150D474(1)010A2 | 0.5                                  | 2                                      |
| 0.56                                                                                         | A         | 150D564(1)010A2 | 0.5                                  | 2                                      |
| 0.68                                                                                         | A         | 150D684(1)010A2 | 0.5                                  | 2                                      |
| 0.82                                                                                         | A         | 150D824(1)010A2 | 0.5                                  | 2                                      |
| 1.0                                                                                          | A         | 150D105(1)010A2 | 0.5                                  | 2                                      |
| 1.2                                                                                          | A         | 150D125(1)010A2 | 0.5                                  | 4                                      |
| 1.5                                                                                          | A         | 150D155(1)010A2 | 0.5                                  | 4                                      |
| 1.8                                                                                          | A         | 150D185(1)010A2 | 0.5                                  | 4                                      |
| 2.2                                                                                          | A         | 150D225(1)010A2 | 0.5                                  | 4                                      |
| 2.7                                                                                          | A         | 150D275(1)010A2 | 0.5                                  | 4                                      |
| 3.3                                                                                          | A         | 150D335(1)010A2 | 0.5                                  | 4                                      |
| 3.9                                                                                          | A         | 150D395(1)010A2 | 0.5                                  | 4                                      |
| 4.7                                                                                          | A         | 150D475(1)010A2 | 0.5                                  | 4                                      |
| 5.6                                                                                          | B         | 150D565(1)010B2 | 0.5                                  | 4                                      |
| 6.8                                                                                          | B         | 150D685(1)010B2 | 1.0                                  | 6                                      |
| 8.2                                                                                          | B         | 150D825(1)010B2 | 1.0                                  | 6                                      |
| 10                                                                                           | B         | 150D106(1)010B2 | 1.0                                  | 6                                      |
| 12                                                                                           | B         | 150D126(1)010B2 | 1.0                                  | 6                                      |
| 15                                                                                           | B         | 150D156(1)010B2 | 1.0                                  | 6                                      |
| 18                                                                                           | B         | 150D186(1)010B2 | 1.0                                  | 6                                      |
| 22                                                                                           | B         | 150D226(1)010B2 | 2.0                                  | 6                                      |
| 27                                                                                           | B         | 150D276(1)010B2 | 2.0                                  | 6                                      |

**Note**

- Part number definitions:  
(1) For 10 % tolerance specify X9; for 20 % specify "X0"; for 5 % "X5" (special order)

**STANDARD RATINGS**

| CAPACITANCE<br>( $\mu$ F)                                                                      | CASE CODE | PART NUMBER     | MAX. DCL<br>AT + 25 °C<br>( $\mu$ A) | MAX. DF<br>AT + 25 °C<br>120 Hz<br>(%) |
|------------------------------------------------------------------------------------------------|-----------|-----------------|--------------------------------------|----------------------------------------|
| <b>10 V<sub>DC</sub> AT + 85 °C, SURGE = 13 V; 7 V<sub>DC</sub> AT + 125 °C, SURGE = 9 V</b>   |           |                 |                                      |                                        |
| 33                                                                                             | B         | 150D336(1)010B2 | 2.0                                  | 6                                      |
| 39                                                                                             | B         | 150D396(1)010B2 | 2.0                                  | 6                                      |
| 47                                                                                             | R         | 150D476(1)010R2 | 3.0                                  | 6                                      |
| 56                                                                                             | R         | 150D566(1)010R2 | 3.0                                  | 6                                      |
| 68                                                                                             | R         | 150D686(1)010R2 | 3.0                                  | 6                                      |
| 82                                                                                             | R         | 150D826(1)010R2 | 3.0                                  | 6                                      |
| 100                                                                                            | R         | 150D107(1)010R2 | 6.0                                  | 6                                      |
| 120                                                                                            | R         | 150D127(1)010R2 | 6.0                                  | 6                                      |
| 150                                                                                            | S         | 150D157(1)010S2 | 10.0                                 | 6                                      |
| 180                                                                                            | S         | 150D187(1)010S2 | 10.0                                 | 6                                      |
| 220                                                                                            | S         | 150D227(1)010S2 | 10.0                                 | 8                                      |
| <b>15 V<sub>DC</sub> AT + 85 °C, SURGE = 20 V; 10 V<sub>DC</sub> AT + 125 °C, SURGE = 12 V</b> |           |                 |                                      |                                        |
| 0.22                                                                                           | A         | 150D224(1)015A2 | 0.5                                  | 2                                      |
| 0.27                                                                                           | A         | 150D274(1)015A2 | 0.5                                  | 2                                      |
| 0.33                                                                                           | A         | 150D334(1)015A2 | 0.5                                  | 2                                      |
| 0.39                                                                                           | A         | 150D394(1)015A2 | 0.5                                  | 2                                      |
| 0.47                                                                                           | A         | 150D474(1)015A2 | 0.5                                  | 2                                      |
| 0.56                                                                                           | A         | 150D564(1)015A2 | 0.5                                  | 2                                      |
| 0.68                                                                                           | A         | 150D684(1)015A2 | 0.5                                  | 2                                      |
| 0.82                                                                                           | A         | 150D824(1)015A2 | 0.5                                  | 2                                      |
| 1.0                                                                                            | A         | 150D105(1)015A2 | 0.5                                  | 2                                      |
| 1.2                                                                                            | A         | 150D125(1)015A2 | 0.5                                  | 4                                      |
| 1.5                                                                                            | A         | 150D155(1)015A2 | 0.5                                  | 4                                      |
| 1.8                                                                                            | A         | 150D185(1)015A2 | 0.5                                  | 4                                      |
| 2.2                                                                                            | A         | 150D225(1)015A2 | 0.5                                  | 4                                      |
| 2.7                                                                                            | A         | 150D275(1)015A2 | 0.5                                  | 4                                      |
| 3.3                                                                                            | A         | 150D335(1)015A2 | 0.5                                  | 4                                      |
| 3.9                                                                                            | B         | 150D395(1)015B2 | 0.5                                  | 4                                      |
| 4.7                                                                                            | B         | 150D475(1)015B2 | 1.0                                  | 4                                      |
| 5.6                                                                                            | B         | 150D565(1)015B2 | 1.0                                  | 4                                      |
| 6.8                                                                                            | B         | 150D685(1)015B2 | 1.0                                  | 6                                      |
| 8.2                                                                                            | B         | 150D825(1)015B2 | 1.0                                  | 6                                      |
| 10                                                                                             | B         | 150D106(1)015B2 | 1.0                                  | 6                                      |
| 12                                                                                             | B         | 150D126(1)015B2 | 1.0                                  | 6                                      |
| 15                                                                                             | B         | 150D156(1)015B2 | 2.0                                  | 6                                      |
| 18                                                                                             | B         | 150D186(1)015B2 | 2.0                                  | 6                                      |
| 22                                                                                             | B         | 150D226(1)015B2 | 3.0                                  | 6                                      |
| 27                                                                                             | R         | 150D276(1)015R2 | 3.0                                  | 6                                      |
| 33                                                                                             | R         | 150D336(1)015R2 | 3.0                                  | 6                                      |
| 39                                                                                             | R         | 150D396(1)015R2 | 3.0                                  | 6                                      |
| 47                                                                                             | R         | 150D476(1)015R2 | 6.0                                  | 6                                      |
| 56                                                                                             | R         | 150D566(1)015R2 | 6.0                                  | 6                                      |

**Note**

- Part number definitions:  
(1) For 10 % tolerance specify "X9"; for 20 % specify "X0"; for 5 % "X5" (special order)

**STANDARD RATINGS**

| CAPACITANCE<br>( $\mu$ F)                                                                      | CASE CODE | PART NUMBER     | MAX. DCL<br>AT + 25 °C<br>( $\mu$ A) | MAX. DF<br>AT + 25 °C<br>120 Hz<br>(%) |
|------------------------------------------------------------------------------------------------|-----------|-----------------|--------------------------------------|----------------------------------------|
| <b>15 V<sub>DC</sub> AT + 85 °C, SURGE = 20 V; 10 V<sub>DC</sub> AT + 125 °C, SURGE = 12 V</b> |           |                 |                                      |                                        |
| 68                                                                                             | R         | 150D686(1)015R2 | 6.0                                  | 6                                      |
| 82                                                                                             | S         | 150D826(1)015S2 | 6.0                                  | 6                                      |
| 100                                                                                            | S         | 150D107(1)015S2 | 6.0                                  | 6                                      |
| 120                                                                                            | S         | 150D127(1)015S2 | 6.0                                  | 6                                      |
| 150                                                                                            | S         | 150D157(1)015S2 | 10.0                                 | 6                                      |
| <b>20 V<sub>DC</sub> AT + 85 °C, SURGE = 26 V; 13 V<sub>DC</sub> AT + 125 °C, SURGE = 16 V</b> |           |                 |                                      |                                        |
| 0.033                                                                                          | A         | 150D333(1)020A2 | 0.1                                  | 2                                      |
| 0.039                                                                                          | A         | 150D393(1)020A2 | 0.1                                  | 2                                      |
| 0.047                                                                                          | A         | 150D473(1)020A2 | 0.1                                  | 2                                      |
| 0.056                                                                                          | A         | 150D563(1)020A2 | 0.1                                  | 2                                      |
| 0.068                                                                                          | A         | 150D683(1)020A2 | 0.1                                  | 2                                      |
| 0.082                                                                                          | A         | 150D823(1)020A2 | 0.1                                  | 2                                      |
| 0.10                                                                                           | A         | 150D104(1)020A2 | 0.5                                  | 2                                      |
| 0.12                                                                                           | A         | 150D124(1)020A2 | 0.5                                  | 2                                      |
| 0.15                                                                                           | A         | 150D154(1)020A2 | 0.5                                  | 2                                      |
| 0.18                                                                                           | A         | 150D184(1)020A2 | 0.5                                  | 2                                      |
| 0.22                                                                                           | A         | 150D224(1)020A2 | 0.5                                  | 2                                      |
| 0.27                                                                                           | A         | 150D274(1)020A2 | 0.5                                  | 2                                      |
| 0.33                                                                                           | A         | 150D334(1)020A2 | 0.5                                  | 2                                      |
| 0.39                                                                                           | A         | 150D394(1)020A2 | 0.5                                  | 2                                      |
| 0.47                                                                                           | A         | 150D474(1)020A2 | 0.5                                  | 2                                      |
| 0.56                                                                                           | A         | 150D564(1)020A2 | 0.5                                  | 2                                      |
| 0.68                                                                                           | A         | 150D684(1)020A2 | 0.5                                  | 2                                      |
| 0.82                                                                                           | A         | 150D824(1)020A2 | 0.5                                  | 2                                      |
| 1.0                                                                                            | A         | 150D105(1)020A2 | 0.5                                  | 2                                      |
| 1.2                                                                                            | A         | 150D125(1)020A2 | 0.5                                  | 4                                      |
| 1.5                                                                                            | A         | 150D155(1)020A2 | 0.5                                  | 4                                      |
| 1.8                                                                                            | A         | 150D185(1)020A2 | 0.5                                  | 4                                      |
| 2.2                                                                                            | A         | 150D225(1)020A2 | 0.5                                  | 4                                      |
| 2.7                                                                                            | B         | 150D275(1)020B2 | 0.5                                  | 4                                      |
| 3.3                                                                                            | B         | 150D335(1)020B2 | 0.5                                  | 4                                      |
| 3.9                                                                                            | B         | 150D395(1)020B2 | 1.0                                  | 4                                      |
| 4.7                                                                                            | B         | 150D475(1)020B2 | 1.0                                  | 4                                      |
| 5.6                                                                                            | B         | 150D565(1)020B2 | 1.0                                  | 4                                      |
| 6.8                                                                                            | B         | 150D685(1)020B2 | 1.0                                  | 6                                      |
| 8.2                                                                                            | B         | 150D825(1)020B2 | 1.0                                  | 6                                      |
| 10                                                                                             | B         | 150D106(1)020B2 | 1.0                                  | 6                                      |
| 12                                                                                             | B         | 150D126(1)020B2 | 1.0                                  | 6                                      |
| 15                                                                                             | B         | 150D156(1)020B2 | 2.0                                  | 6                                      |
| 18                                                                                             | R         | 150D186(1)020R2 | 3.0                                  | 6                                      |
| 22                                                                                             | R         | 150D226(1)020R2 | 3.0                                  | 6                                      |
| 27                                                                                             | R         | 150D276(1)020R2 | 3.0                                  | 6                                      |

**Note**

- Part number definitions:  
(1) For 10 % tolerance specify "X9"; for 20 % specify "X0"; for 5 % "X5" (special order)

**STANDARD RATINGS**

| CAPACITANCE<br>( $\mu$ F)                                                                      | CASE CODE | PART NUMBER     | MAX. DCL<br>AT + 25 °C<br>( $\mu$ A) | MAX. DF<br>AT + 25 °C<br>120 Hz<br>(%) |
|------------------------------------------------------------------------------------------------|-----------|-----------------|--------------------------------------|----------------------------------------|
| <b>20 V<sub>DC</sub> AT + 85 °C, SURGE = 26 V; 13 V<sub>DC</sub> AT + 125 °C, SURGE = 16 V</b> |           |                 |                                      |                                        |
| 33                                                                                             | R         | 150D336(1)020R2 | 3.0                                  | 6                                      |
| 39                                                                                             | R         | 150D396(1)020R2 | 3.0                                  | 6                                      |
| 47                                                                                             | R         | 150D476(1)020R2 | 6.0                                  | 6                                      |
| 56                                                                                             | S         | 150D566(1)020S2 | 6.0                                  | 6                                      |
| 68                                                                                             | S         | 150D686(1)020S2 | 6.0                                  | 6                                      |
| 82                                                                                             | S         | 150D826(1)020S2 | 6.0                                  | 6                                      |
| 100                                                                                            | S         | 150D107(1)020S2 | 10.0                                 | 6                                      |
| <b>25 V<sub>DC</sub> AT + 85 °C, SURGE = 32 V; 17 V<sub>DC</sub> AT + 125 °C, SURGE = 21 V</b> |           |                 |                                      |                                        |
| 1.2                                                                                            | A         | 150D125(1)025A2 | 0.5                                  | 4                                      |
| 1.5                                                                                            | A         | 150D155(1)025A2 | 0.5                                  | 4                                      |
| 1.8                                                                                            | A         | 150D185(1)025A2 | 0.5                                  | 4                                      |
| 4.7                                                                                            | B         | 150D475(1)025B2 | 1.2                                  | 4                                      |
| 5.6                                                                                            | B         | 150D565(1)025B2 | 1.4                                  | 4                                      |
| 6.8                                                                                            | B         | 150D685(1)025B2 | 1.7                                  | 4                                      |
| 8.2                                                                                            | B         | 150D825(1)025B2 | 2.1                                  | 4                                      |
| 10                                                                                             | B         | 150D106(1)025B2 | 2.5                                  | 6                                      |
| 15                                                                                             | B         | 150D156(1)025B2 | 3.8                                  | 6                                      |
| 33                                                                                             | R         | 150D336(1)025R2 | 8.3                                  | 6                                      |
| 68                                                                                             | S         | 150D686(1)025S2 | 17                                   | 6                                      |
| 100                                                                                            | S         | 150D107(1)025S2 | 25                                   | 6                                      |
| <b>35 V<sub>DC</sub> AT + 85 °C, SURGE = 46 V; 23 V<sub>DC</sub> AT + 125 °C, SURGE = 28 V</b> |           |                 |                                      |                                        |
| 0.033                                                                                          | A         | 150D333(1)035A2 | 0.1                                  | 2                                      |
| 0.039                                                                                          | A         | 150D393(1)035A2 | 0.1                                  | 2                                      |
| 0.047                                                                                          | A         | 150D473(1)035A2 | 0.1                                  | 2                                      |
| 0.056                                                                                          | A         | 150D563(1)035A2 | 0.1                                  | 2                                      |
| 0.068                                                                                          | A         | 150D683(1)035A2 | 0.1                                  | 2                                      |
| 0.082                                                                                          | A         | 150D823(1)035A2 | 0.1                                  | 2                                      |
| 0.10                                                                                           | A         | 150D104(1)035A2 | 0.5                                  | 2                                      |
| 0.12                                                                                           | A         | 150D124(1)035A2 | 0.5                                  | 2                                      |
| 0.15                                                                                           | A         | 150D154(1)035A2 | 0.5                                  | 2                                      |
| 0.18                                                                                           | A         | 150D184(1)035A2 | 0.5                                  | 2                                      |
| 0.22                                                                                           | A         | 150D224(1)035A2 | 0.5                                  | 2                                      |
| 0.27                                                                                           | A         | 150D274(1)035A2 | 0.5                                  | 2                                      |
| 0.33                                                                                           | A         | 150D334(1)035A2 | 0.5                                  | 2                                      |
| 0.39                                                                                           | A         | 150D394(1)035A2 | 0.5                                  | 2                                      |
| 0.47                                                                                           | A         | 150D474(1)035A2 | 0.5                                  | 2                                      |
| 0.56                                                                                           | A         | 150D564(1)035A2 | 0.5                                  | 2                                      |
| 0.68                                                                                           | A         | 150D684(1)035A2 | 0.5                                  | 2                                      |
| 0.82                                                                                           | A         | 150D824(1)035A2 | 0.5                                  | 2                                      |
| 1.0                                                                                            | A         | 150D105(1)035A2 | 0.5                                  | 2                                      |
| 1.2                                                                                            | B         | 150D125(1)035B2 | 0.5                                  | 4                                      |
| 1.5                                                                                            | B         | 150D155(1)035B2 | 0.5                                  | 4                                      |

**Note**

- Part number definitions:  
(1) For 10 % tolerance specify "X9"; for 20 % specify "X0"; for 5 % "X5" (special order)

**STANDARD RATINGS**

| CAPACITANCE<br>( $\mu$ F)                                                                      | CASE CODE | PART NUMBER     | MAX. DCL<br>AT + 25 °C<br>( $\mu$ A) | MAX. DF<br>AT + 25 °C<br>120 Hz<br>(%) |
|------------------------------------------------------------------------------------------------|-----------|-----------------|--------------------------------------|----------------------------------------|
| <b>35 V<sub>DC</sub> AT + 85 °C, SURGE = 46 V; 23 V<sub>DC</sub> AT + 125 °C, SURGE = 28 V</b> |           |                 |                                      |                                        |
| 1.8                                                                                            | B         | 150D185(1)035B2 | 0.5                                  | 4                                      |
| 2.2                                                                                            | B         | 150D225(1)035B2 | 1.0                                  | 4                                      |
| 2.7                                                                                            | B         | 150D275(1)035B2 | 1.0                                  | 4                                      |
| 3.3                                                                                            | B         | 150D335(1)035B2 | 1.0                                  | 4                                      |
| 3.9                                                                                            | B         | 150D395(1)035B2 | 1.0                                  | 4                                      |
| 4.7                                                                                            | B         | 150D475(1)035B2 | 1.0                                  | 4                                      |
| 5.6                                                                                            | B         | 150D565(1)035B2 | 1.0                                  | 4                                      |
| 6.8                                                                                            | B         | 150D685(1)035B2 | 2.0                                  | 4                                      |
| 8.2                                                                                            | R         | 150D825(1)035R2 | 3.0                                  | 4                                      |
| 10                                                                                             | R         | 150D106(1)035R2 | 3.0                                  | 4                                      |
| 12                                                                                             | R         | 150D126(1)035R2 | 3.0                                  | 4                                      |
| 15                                                                                             | R         | 150D156(1)035R2 | 3.0                                  | 4                                      |
| 18                                                                                             | R         | 150D186(1)035R2 | 3.0                                  | 4                                      |
| 22                                                                                             | R         | 150D226(1)035R2 | 6.0                                  | 4                                      |
| 27                                                                                             | S         | 150D276(1)035S2 | 6.0                                  | 4                                      |
| 33                                                                                             | S         | 150D336(1)035S2 | 6.0                                  | 4                                      |
| 39                                                                                             | S         | 150D396(1)035S2 | 6.0                                  | 4                                      |
| 47                                                                                             | S         | 150D476(1)035S2 | 10.0                                 | 4                                      |
| <b>50 V<sub>DC</sub> AT + 85 °C, SURGE = 65 V; 33 V<sub>DC</sub> AT + 125 °C, SURGE = 40 V</b> |           |                 |                                      |                                        |
| 0.056                                                                                          | A         | 150D563(1)050A2 | 0.1                                  | 2                                      |
| 0.068                                                                                          | A         | 150D683(1)050A2 | 0.1                                  | 2                                      |
| 0.082                                                                                          | A         | 150D823(1)050A2 | 0.1                                  | 2                                      |
| 0.10                                                                                           | A         | 150D104(1)050A2 | 0.5                                  | 2                                      |
| 0.12                                                                                           | A         | 150D124(1)050A2 | 0.5                                  | 2                                      |
| 0.15                                                                                           | A         | 150D154(1)050A2 | 0.5                                  | 2                                      |
| 0.18                                                                                           | A         | 150D184(1)050A2 | 0.5                                  | 2                                      |
| 0.22                                                                                           | A         | 150D224(1)050A2 | 0.5                                  | 2                                      |
| 0.27                                                                                           | A         | 150D274(1)050A2 | 0.5                                  | 2                                      |
| 0.33                                                                                           | A         | 150D334(1)050A2 | 0.5                                  | 2                                      |
| 0.39                                                                                           | A         | 150D394(1)050A2 | 0.5                                  | 2                                      |
| 0.47                                                                                           | A         | 150D474(1)050A2 | 0.5                                  | 2                                      |
| 0.56                                                                                           | A         | 150D564(1)050A2 | 0.5                                  | 2                                      |
| 0.68                                                                                           | A         | 150D684(1)050A2 | 0.5                                  | 2                                      |
| 0.82                                                                                           | A         | 150D824(1)050A2 | 0.5                                  | 2                                      |
| 1.0                                                                                            | A         | 150D105(1)050A2 | 0.5                                  | 2                                      |
| 1.2                                                                                            | B         | 150D125(1)050B2 | 0.5                                  | 4                                      |
| 1.5                                                                                            | B         | 150D155(1)050B2 | 0.5                                  | 4                                      |
| 1.8                                                                                            | B         | 150D185(1)050B2 | 0.5                                  | 4                                      |
| 2.2                                                                                            | B         | 150D225(1)050B2 | 1.0                                  | 4                                      |
| 2.7                                                                                            | B         | 150D275(1)050B2 | 1.0                                  | 4                                      |
| 3.3                                                                                            | B         | 150D335(1)050B2 | 2.0                                  | 4                                      |
| 3.9                                                                                            | B         | 150D395(1)050B2 | 2.0                                  | 4                                      |

**Note**

- Part number definitions:  
(1) For 10 % tolerance specify X9; for 20 % specify "X0"; for 5 % "X5" (special order)



| STANDARD RATINGS                                                                          |           |                 |                                      |                                        |
|-------------------------------------------------------------------------------------------|-----------|-----------------|--------------------------------------|----------------------------------------|
| CAPACITANCE<br>( $\mu$ F)                                                                 | CASE CODE | PART NUMBER     | MAX. DCL<br>AT + 25 °C<br>( $\mu$ A) | MAX. DF<br>AT + 25 °C<br>120 Hz<br>(%) |
| 50 V <sub>DC</sub> AT + 85 °C, SURGE = 65 V; 33 V <sub>DC</sub> AT + 125 °C, SURGE = 40 V |           |                 |                                      |                                        |
| 4.7                                                                                       | B         | 150D475(1)050B2 | 3.0                                  | 4                                      |
| 5.6                                                                                       | R         | 150D565(1)050R2 | 3.0                                  | 4                                      |
| 6.8                                                                                       | R         | 150D685(1)050R2 | 3.0                                  | 4                                      |
| 8.2                                                                                       | R         | 150D825(1)050R2 | 3.0                                  | 4                                      |
| 10                                                                                        | R         | 150D106(1)050R2 | 3.0                                  | 4                                      |
| 12                                                                                        | R         | 150D126(1)050R2 | 3.0                                  | 4                                      |
| 15                                                                                        | R         | 150D156(1)050R2 | 6.0                                  | 4                                      |
| 18                                                                                        | R         | 150D186(1)050R2 | 6.0                                  | 4                                      |
| 22                                                                                        | S         | 150D226(1)050S2 | 6.0                                  | 4                                      |
| 60 V <sub>DC</sub> AT + 85 °C, SURGE = 78 V; 40 V <sub>DC</sub> AT + 125 °C, SURGE = 49 V |           |                 |                                      |                                        |
| 0.10                                                                                      | A         | 150D104(1)060A2 | 0.5                                  | 4.0                                    |
| 0.12                                                                                      | A         | 150D124(1)060A2 | 0.5                                  | 4.0                                    |
| 0.15                                                                                      | A         | 150D154(1)060A2 | 0.5                                  | 4.0                                    |
| 0.18                                                                                      | A         | 150D184(1)060A2 | 0.5                                  | 4.0                                    |
| 0.22                                                                                      | A         | 150D224(1)060A2 | 0.5                                  | 4.0                                    |
| 0.27                                                                                      | A         | 150D274(1)060A2 | 0.5                                  | 4.0                                    |
| 0.33                                                                                      | A         | 150D334(1)060A2 | 0.5                                  | 4.0                                    |
| 0.39                                                                                      | A         | 150D394(1)060A2 | 0.5                                  | 4.0                                    |
| 0.47                                                                                      | A         | 150D474(1)060A2 | 0.5                                  | 4.0                                    |
| 0.56                                                                                      | A         | 150D564(1)060A2 | 0.5                                  | 4.0                                    |
| 0.68                                                                                      | A         | 150D684(1)060A2 | 0.5                                  | 4.0                                    |
| 1.0                                                                                       | B         | 150D105(1)060B2 | 0.5                                  | 4.0                                    |
| 2.2                                                                                       | B         | 150D225(1)060B2 | 1.0                                  | 4.0                                    |
| 4.7                                                                                       | R         | 150D475(1)060R2 | 3.0                                  | 6.0                                    |
| 5.6                                                                                       | R         | 150D565(1)060R2 | 3.0                                  | 6.0                                    |
| 6.8                                                                                       | R         | 150D685(1)060R2 | 4.0                                  | 6.0                                    |
| 8.2                                                                                       | R         | 150D825(1)060R2 | 5.0                                  | 6.0                                    |
| 10                                                                                        | R         | 150D106(1)060R2 | 6.0                                  | 6.0                                    |
| 12                                                                                        | S         | 150D126(1)060S2 | 6.0                                  | 6.0                                    |
| 15                                                                                        | S         | 150D156(1)060S2 | 9.0                                  | 6.0                                    |
| 18                                                                                        | S         | 150D186(1)060S2 | 10.0                                 | 6.0                                    |
| 22                                                                                        | S         | 150D226(1)060S2 | 12.0                                 | 6.0                                    |
| 75 V <sub>DC</sub> AT + 85 °C, SURGE = 98 V; 50 V <sub>DC</sub> AT + 125 °C, SURGE = 64 V |           |                 |                                      |                                        |
| 0.033                                                                                     | A         | 150D333(1)075A2 | 0.5                                  | 2                                      |
| 0.039                                                                                     | A         | 150D393(1)075A2 | 0.5                                  | 2                                      |
| 0.047                                                                                     | A         | 150D473(1)075A2 | 0.5                                  | 2                                      |
| 0.056                                                                                     | A         | 150D563(1)075A2 | 0.5                                  | 2                                      |
| 0.068                                                                                     | A         | 150D683(1)075A2 | 0.5                                  | 2                                      |
| 0.082                                                                                     | A         | 150D823(1)075A2 | 0.5                                  | 2                                      |
| 0.10                                                                                      | A         | 150D104(1)075A2 | 0.5                                  | 2                                      |
| 0.12                                                                                      | A         | 150D124(1)075A2 | 0.5                                  | 2                                      |
| 0.15                                                                                      | A         | 150D154(1)075A2 | 0.5                                  | 2                                      |

**Note**

- Part number definitions:  
(1) For 10 % tolerance specify "X9"; for 20 % specify "X0"; for 5 % "X5" (special order)

**STANDARD RATINGS**

| CAPACITANCE<br>( $\mu$ F)                                                                        | CASE CODE | PART NUMBER     | MAX. DCL<br>AT + 25 °C<br>( $\mu$ A) | MAX. DF<br>AT + 25 °C<br>120 Hz<br>(%) |
|--------------------------------------------------------------------------------------------------|-----------|-----------------|--------------------------------------|----------------------------------------|
| <b>75 V<sub>DC</sub> AT + 85 °C, SURGE = 98 V; 50 V<sub>DC</sub> AT + 125 °C, SURGE = 64 V</b>   |           |                 |                                      |                                        |
| 0.18                                                                                             | A         | 150D184(1)075A2 | 0.5                                  | 2                                      |
| 0.22                                                                                             | A         | 150D224(1)075A2 | 0.5                                  | 2                                      |
| 0.27                                                                                             | A         | 150D274(1)075A2 | 0.5                                  | 2                                      |
| 0.33                                                                                             | A         | 150D334(1)075A2 | 0.5                                  | 2                                      |
| 0.39                                                                                             | A         | 150D394(1)075A2 | 0.5                                  | 2                                      |
| 0.47                                                                                             | A         | 150D474(1)075A2 | 0.5                                  | 2                                      |
| 0.56                                                                                             | A         | 150D564(1)075A2 | 0.5                                  | 2                                      |
| 0.68                                                                                             | A         | 150D684(1)075A2 | 0.5                                  | 2                                      |
| 0.82                                                                                             | B         | 150D824(1)075B2 | 0.5                                  | 2                                      |
| 1.0                                                                                              | B         | 150D105(1)075B2 | 0.5                                  | 2                                      |
| 1.2                                                                                              | B         | 150D125(1)075B2 | 0.5                                  | 4                                      |
| 1.5                                                                                              | B         | 150D155(1)075B2 | 1.0                                  | 4                                      |
| 1.8                                                                                              | B         | 150D185(1)075B2 | 1.0                                  | 4                                      |
| 2.2                                                                                              | B         | 150D225(1)075B2 | 1.0                                  | 4                                      |
| 2.7                                                                                              | B         | 150D275(1)075B2 | 1.0                                  | 4                                      |
| 3.3                                                                                              | B         | 150D335(1)075B2 | 2.0                                  | 4                                      |
| 3.9                                                                                              | B         | 150D395(1)075B2 | 2.0                                  | 4                                      |
| 4.7                                                                                              | R         | 150D475(1)075R2 | 4.0                                  | 4                                      |
| 5.6                                                                                              | R         | 150D565(1)075R2 | 4.0                                  | 4                                      |
| 6.8                                                                                              | R         | 150D685(1)075R2 | 6.0                                  | 4                                      |
| 8.2                                                                                              | R         | 150D825(1)075R2 | 6.0                                  | 4                                      |
| 10                                                                                               | R         | 150D106(1)075R2 | 8.0                                  | 4                                      |
| 12                                                                                               | S         | 150D126(1)075S2 | 10.0                                 | 4                                      |
| 15                                                                                               | S         | 150D156(1)075S2 | 12.0                                 | 4                                      |
| <b>100 V<sub>DC</sub> AT + 85 °C, SURGE = 130 V; 67 V<sub>DC</sub> AT + 125 °C, SURGE = 86 V</b> |           |                 |                                      |                                        |
| 0.033                                                                                            | A         | 150D333(1)100A2 | 0.5                                  | 2                                      |
| 0.039                                                                                            | A         | 150D393(1)100A2 | 0.5                                  | 2                                      |
| 0.047                                                                                            | A         | 150D473(1)100A2 | 0.5                                  | 2                                      |
| 0.056                                                                                            | A         | 150D563(1)100A2 | 0.5                                  | 2                                      |
| 0.068                                                                                            | A         | 150D683(1)100A2 | 0.5                                  | 2                                      |
| 0.082                                                                                            | A         | 150D823(1)100A2 | 0.5                                  | 2                                      |
| 0.10                                                                                             | A         | 150D104(1)100A2 | 0.5                                  | 2                                      |
| 0.12                                                                                             | A         | 150D124(1)100A2 | 0.5                                  | 2                                      |
| 0.15                                                                                             | A         | 150D154(1)100A2 | 0.5                                  | 2                                      |
| 0.18                                                                                             | A         | 150D184(1)100A2 | 0.5                                  | 2                                      |
| 0.22                                                                                             | A         | 150D224(1)100A2 | 0.5                                  | 2                                      |
| 0.27                                                                                             | A         | 150D274(1)100A2 | 0.5                                  | 2                                      |
| 0.33                                                                                             | A         | 150D334(1)100A2 | 0.5                                  | 2                                      |
| 0.39                                                                                             | A         | 150D394(1)100A2 | 0.5                                  | 2                                      |
| 0.47                                                                                             | A         | 150D474(1)100A2 | 0.5                                  | 2                                      |
| 0.56                                                                                             | A         | 150D564(1)100A2 | 0.5                                  | 2                                      |
| 0.68                                                                                             | B         | 150D684(1)100B2 | 0.5                                  | 2                                      |

**Note**

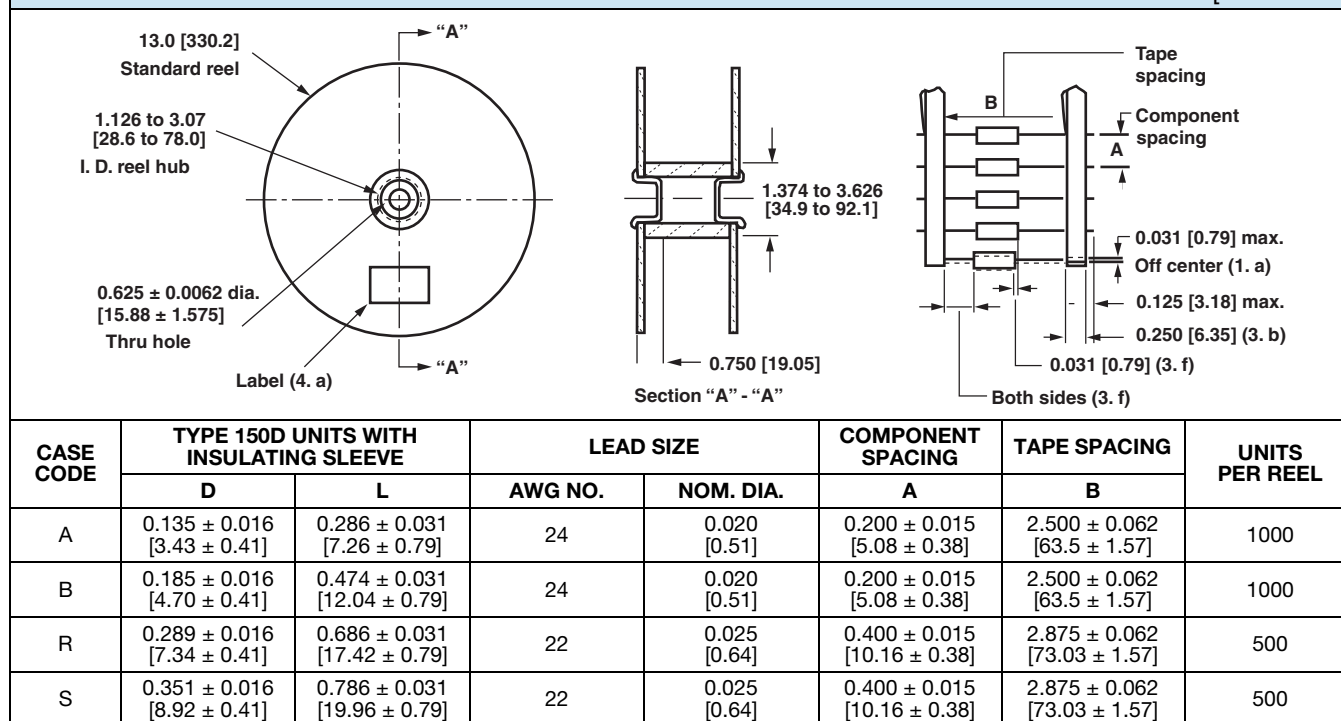
- Part number definitions:  
(1) For 10 % tolerance specify X9; for 20 % specify "X0"; for 5 % "X5" (special order)

**STANDARD RATINGS**

| CAPACITANCE<br>( $\mu$ F)                                                                        | CASE CODE | PART NUMBER     | MAX. DCL<br>AT + 25 °C<br>( $\mu$ A) | MAX. DF<br>AT + 25 °C<br>120 Hz<br>(%) |
|--------------------------------------------------------------------------------------------------|-----------|-----------------|--------------------------------------|----------------------------------------|
| <b>100 V<sub>DC</sub> AT + 85 °C, SURGE = 130 V; 67 V<sub>DC</sub> AT + 125 °C, SURGE = 86 V</b> |           |                 |                                      |                                        |
| 0.82                                                                                             | B         | 150D824(1)100B2 | 0.5                                  | 2                                      |
| 1.0                                                                                              | B         | 150D105(1)100B2 | 0.5                                  | 2                                      |
| 1.2                                                                                              | B         | 150D125(1)100B2 | 0.5                                  | 3                                      |
| 1.5                                                                                              | B         | 150D155(1)100B2 | 0.6                                  | 3                                      |
| 1.8                                                                                              | B         | 150D185(1)100B2 | 0.6                                  | 3                                      |
| 2.2                                                                                              | B         | 150D225(1)100B2 | 0.6                                  | 3                                      |
| 2.7                                                                                              | B         | 150D275(1)100B2 | 0.6                                  | 3                                      |
| 3.3                                                                                              | R         | 150D335(1)100R2 | 2.5                                  | 3                                      |
| 3.9                                                                                              | R         | 150D395(1)100R2 | 3.0                                  | 3                                      |
| 4.7                                                                                              | R         | 150D475(1)100R2 | 4.0                                  | 3                                      |
| 5.6                                                                                              | R         | 150D565(1)100R2 | 4.0                                  | 3                                      |
| 6.8                                                                                              | R         | 150D685(1)100R2 | 6.0                                  | 3                                      |
| 8.2                                                                                              | S         | 150D825(1)100S2 | 6.0                                  | 3                                      |
| 10                                                                                               | S         | 150D106(1)100S2 | 6.0                                  | 3                                      |
| <b>125 V<sub>DC</sub> AT + 85 °C, SURGE = 140 V; 82 V<sub>DC</sub> AT + 125 °C, SURGE = 94 V</b> |           |                 |                                      |                                        |
| 0.027                                                                                            | A         | 150D273(1)125A2 | 1.0                                  | 2                                      |
| 0.033                                                                                            | A         | 150D333(1)125A2 | 1.0                                  | 2                                      |
| 0.039                                                                                            | A         | 150D393(1)125A2 | 1.0                                  | 2                                      |
| 0.047                                                                                            | A         | 150D473(1)125A2 | 1.0                                  | 2                                      |
| 0.056                                                                                            | A         | 150D563(1)125A2 | 1.0                                  | 2                                      |
| 0.068                                                                                            | A         | 150D683(1)125A2 | 1.0                                  | 2                                      |
| 0.082                                                                                            | A         | 150D823(1)125A2 | 1.0                                  | 2                                      |
| 0.10                                                                                             | A         | 150D104(1)125A2 | 1.0                                  | 2                                      |
| 0.12                                                                                             | A         | 150D124(1)125A2 | 1.0                                  | 2                                      |
| 0.15                                                                                             | A         | 150D154(1)125A2 | 1.0                                  | 2                                      |
| 0.18                                                                                             | A         | 150D184(1)125A2 | 1.0                                  | 2                                      |
| 0.22                                                                                             | A         | 150D224(1)125A2 | 1.0                                  | 2                                      |
| 0.27                                                                                             | A         | 150D274(1)125A2 | 1.0                                  | 2                                      |
| 0.33                                                                                             | A         | 150D334(1)125A2 | 1.0                                  | 2                                      |
| 0.39                                                                                             | A         | 150D394(1)125A2 | 1.5                                  | 2                                      |
| 0.47                                                                                             | A         | 150D474(1)125A2 | 1.5                                  | 2                                      |
| 0.56                                                                                             | B         | 150D564(1)125B2 | 1.6                                  | 2                                      |
| 0.68                                                                                             | B         | 150D684(1)125B2 | 1.8                                  | 2                                      |
| 0.82                                                                                             | B         | 150D824(1)125B2 | 2.0                                  | 2                                      |
| 1.0                                                                                              | B         | 150D105(1)125B2 | 2.0                                  | 2                                      |
| 1.2                                                                                              | B         | 150D125(1)125B2 | 2.0                                  | 3                                      |
| 1.5                                                                                              | B         | 150D155(1)125B2 | 2.0                                  | 3                                      |
| 1.8                                                                                              | B         | 150D185(1)125B2 | 2.0                                  | 3                                      |
| 2.2                                                                                              | B         | 150D225(1)125B2 | 2.0                                  | 3                                      |

**Note**

- Part number definitions:  
(1) For 10 % tolerance specify X9; for 20 % specify "X0"; for 5 % "X5" (special order)

**STANDARD REEL PACKAGING SPECIFICATIONS - MEETS EIA STANDARD RS-296 in inches [millimeters]**

**STANDARD REEL PACKAGING INFORMATION**
**1. Component Leads**

- Component leads shall not be bent beyond 0.047" [1.19 mm] maximum from their nominal position when measured from the leading edge of the component lead at the inside tape edge and at the lead egress from the component.
- The "C" dimension shall be governed by the overall length of the reel packaged component. The distance between flanges shall be 0.125" to 0.250" [3.18 mm to 6.35 mm] greater than the overall component length.

**2. Orientation**

All polarized components must be oriented to one direction. The cathode lead tape shall be a color and the anode lead tape shall be white.

**3. Reeling**

- Components on any reel shall not represent more than two date codes when date code identification is required.
- Component leads shall be positioned between pairs of 0.250" [6.35 mm] tape.
- The disposable reels have hubs and corrugated fibreboard flanges and core or equivalent.
- A minimum of 12.0" [304.8 mm] leader of tape shall be provided before the first and after the last component on the reel.
- 50 lb or 60 lb. Kraft paper must be wound between layer of components as far as necessary for component protection. Width of paper to be 0.062" to 0.250" [1.57 mm to 6.35 mm] less than the "C" dimension of the reel. Solid-electrolyte Tantalex® capacitors hermetically-sealed, axial-lead.

- A row of components must be centered between tapes  $\pm 0.047$ " [1.19 mm]. In addition, individual components may deviate from center of component row  $\pm 0.031$ " [0.79 mm].
- Staples shall not be used for splicing. Not more than 4 layers of tape shall be used in any splice area and no tape shall be offset from another by more than 0.031" [0.79 mm] non-cumulative. Tape splices shall overlap at least 6.0" [152.4 mm] for butt joints and at least 3.0" [76.2 mm] for lap joints and shall not be weaker than unspliced tape. Universal splicing clips may also be used.
- Quantity per reel shall be controlled so that tape components and cover shall not extend beyond the smallest dimension of the flange (either across flats or diameter). Once the quantity per reel for each part number has been established, future orders for that part number shall be packaged in that quantity. When order or release quantity is less than the established quantity, a standard commercial pack is to be used.
- A maximum of 0.25 % of the components per reel quantity may be missing without consecutive missing components.
- Adequate protection must be provided to prevent physical damage to both reel and components during shipment and storage.

**4. Marking**

Minimum reel and carton marking shall consist of the following: Customer part number, purchase order no., quantity, package date, manufacturer's name, electrical value, date code, Vishay Sprague part number and country of origin.



## Disclaimer

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