

## Solid Tantalum Chip Capacitors TANTAMOUNT<sup>®</sup>, Conformal Coated



### FEATURES

- 8 mm, 12 mm tape packaging to EIA-481 reeling per IEC 60286-3.  
7" (178 mm) standard 13" (330 mm) available
- US and European case sizes available
- Mounting: Surface mount
- Terminations: 100 % tin (2) standard, tin/lead available
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



### Note

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

### PERFORMANCE/ELECTRICAL CHARACTERISTICS

[www.vishay.com/doc?40088](http://www.vishay.com/doc?40088)

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

**Capacitance Range:** 0.1 μF to 330 μF

**Capacitance Tolerance:** ± 10 %, ± 20 % standard

**Voltage Rating:** 2 V<sub>DC</sub> to 50 V<sub>DC</sub>

| ORDERING INFORMATION |  |  |  |                                  |  |   |
|----------------------|--|--|--|----------------------------------|--|---|
| 195D                 | 106  | X0   | 004  | S                                | 2  | T   |
| TYPE                 | CAPACITANCE  | CAPACITANCE TOLERANCE  | DC VOLTAGE RATING AT + 85 °C   | CASE CODE                        | TERMINATION  | PACKAGING   |
|                      | This is expressed in picofarads. The first two digits are the significant figures. The third is the number of zeros to follow. | <b>X0 = ± 20 %</b><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. A decimal point is indicated by an "R" (6R3 = 6.3 V). | See Ratings and Case Codes table | Style 2 is standard<br><b>2 = 100 % tin</b><br>4 = Gold plated<br>8 = Solder plated (60/40)<br>Special order | <b>T = Tape and reel</b><br><b>7" [178 mm] reel standard.</b><br><b>For H case size lengthwise</b><br><b>W = Tape and reel</b><br><b>13" [330 mm] reel available</b><br>See Standard Packaging Quantity table |

### Note

- Preferred tolerance and reel sizes are in bold.  
We reserve the right to supply higher voltage ratings and tighter capacitance tolerance capacitors in the same case size.

| DIMENSIONS in inches [millimeters] |                                |  |                                |                                |                                |                |                 |                 |
|------------------------------------|--------------------------------|--|--------------------------------|--------------------------------|--------------------------------|----------------|-----------------|-----------------|
|                                    |                                |  |                                |                                |                                |                |                 |                 |
| CASE CODE                          | L                              | W  | H                              | A                              | B                              | C (MIN.)       | D (REF.)        | J (MAX.)        |
| STANDARD CASE CODES                |                                |  |                                |                                |                                |                |                 |                 |
| C                                  | 0.087 max.<br>[2.21 max.]      | 0.045 ± 0.010<br>[1.14 ± 0.25]               | 0.045 ± 0.010<br>[1.14 ± 0.25] | 0.016 ± 0.008<br>[0.40 ± 0.20] | 0.042 ± 0.010<br>[1.07 ± 0.25] | -              | 0.063<br>[1.60] | 0.004<br>[0.10] |
| S                                  | 0.143 max.<br>[3.63 max.]      | 0.072 ± 0.008<br>[1.83 ± 0.20]               | 0.048 ± 0.008<br>[1.22 ± 0.20] | 0.023 ± 0.010<br>[0.58 ± 0.25] | 0.085 ± 0.015<br>[2.16 ± 0.37] | -              | 0.114<br>[2.90] | 0.004<br>[0.10] |
| V                                  | 0.143 max.<br>[3.63 max.]      | 0.104 ± 0.010<br>[2.65 ± 0.25]               | 0.051 ± 0.010<br>[1.30 ± 0.25] | 0.023 ± 0.010<br>[0.58 ± 0.25] | 0.085 ± 0.015<br>[2.16 ± 0.37] | -              | 0.114<br>[2.90] | 0.004<br>[0.10] |
| X                                  | 0.285 max.<br>[7.24 max.]      | 0.104 ± 0.010<br>[2.65 ± 0.25]               | 0.051 ± 0.010<br>[1.30 ± 0.25] | 0.039 ± 0.020<br>[1.00 ± 0.50] | 0.200 ± 0.027<br>[5.08 ± 0.69] | -              | 0.244<br>[6.20] | 0.004<br>[0.10] |
| Y                                  | 0.285 max.<br>[7.24 max.]      | 0.104 ± 0.010<br>[2.65 ± 0.25]               | 0.069 ± 0.010<br>[1.75 ± 0.25] | 0.039 ± 0.020<br>[1.00 ± 0.50] | 0.200 ± 0.027<br>[5.08 ± 0.69] | -              | 0.244<br>[6.20] | 0.004<br>[0.10] |
| Z                                  | 0.285 max.<br>[7.24 max.]      | 0.104 ± 0.010<br>[2.65 ± 0.25]               | 0.104 ± 0.010<br>[2.65 ± 0.25] | 0.039 ± 0.020<br>[1.00 ± 0.50] | 0.200 ± 0.027<br>[5.08 ± 0.69] | -              | 0.244<br>[6.20] | 0.004<br>[0.10] |
| R                                  | 0.283 max.<br>[7.20 max.]      | 0.236 + 0.012/- 0.024<br>[6.0 + 0.30/- 0.60] | 0.138 ± 0.012<br>[3.50 ± 0.30] | 0.051 ± 0.012<br>[1.30 ± 0.30] | 0.181 ± 0.025<br>[4.60 ± 0.60] | -              | 0.244<br>[6.20] | 0.004<br>[0.10] |
| EUROPEAN CASE CODES                |                                |  |                                |                                |                                |                |                 |                 |
| A                                  | 0.110 ± 0.008<br>[2.80 ± 0.20] | 0.0591 ± 0.012<br>[1.5 ± 0.30]               | 0.055 max.<br>[1.40 max.]      | 0.028 ± 0.012<br>[0.70 ± 0.30] | 0.063 ± 0.012<br>[1.60 ± 0.30] | 0.012<br>[0.3] | -               | -               |
| B                                  | 0.165 ± 0.008<br>[4.20 ± 0.20] | 0.055 ± 0.012<br>[1.4 ± 0.30]                | 0.063 max.<br>[1.6 max.]       | 0.031 ± 0.012<br>[0.80 ± 0.30] | 0.098 ± 0.012<br>[2.50 ± 0.30] | 0.012<br>[0.3] | -               | -               |
| D                                  | 0.165 ± 0.008<br>[4.20 ± 0.20] | 0.083 ± 0.012<br>[2.1 ± 0.30]                | 0.063 max.<br>[1.6 max.]       | 0.031 ± 0.012<br>[0.80 ± 0.30] | 0.098 ± 0.012<br>[2.50 ± 0.30] | 0.02<br>[0.5]  | -               | -               |
| E                                  | 0.217 ± 0.012<br>[5.50 ± 0.30] | 0.083 ± 0.012<br>[2.1 ± 0.30]                | 0.067 max.<br>[1.70 max.]      | 0.039 ± 0.012<br>[1.00 ± 0.30] | 0.126 ± 0.012<br>[3.20 ± 0.30] | 0.031<br>[0.8] | -               | -               |
| F                                  | 0.197 ± 0.012<br>[5.0 ± 0.30]  | 0.130 ± 0.012<br>[3.3 ± 0.30]                | 0.079 max.<br>[2.00 max.]      | 0.039 ± 0.012<br>[1.00 ± 0.30] | 0.142 ± 0.012<br>[3.60 ± 0.30] | 0.031<br>[0.8] | -               | -               |
| G                                  | 0.276 ± 0.012<br>[7.00 ± 0.30] | 0.102 ± 0.012<br>[2.6 ± 0.30]                | 0.110 max.<br>[2.80 max.]      | 0.039 ± 0.012<br>[1.00 ± 0.30] | 0.177 ± 0.012<br>[4.5 ± 0.30]  | 0.031<br>[0.8] | -               | -               |
| H                                  | 0.307 ± 0.012<br>[7.80 ± 0.30] | 0.146 ± 0.012<br>[3.7 ± 0.30]                | 0.118 max.<br>[3.0 max.]       | 0.039 ± 0.012<br>[1.00 ± 0.30] | 0.197 ± 0.012<br>[5.00 ± 0.30] | 0.031<br>[0.8] | -               | -               |

**Note**

- The anode termination (D less B) will be a minimum of 0.010" (0.25 mm), C case = 0.005" (0.131 mm) minimum



| RATINGS AND CASE CODES |     |     |       |      |      |       |      |      |      |      |       |
|------------------------|-----|-----|-------|------|------|-------|------|------|------|------|-------|
| μF                     | 2 V | 4 V | 6.3 V | 10 V | 15 V | 16 V  | 20 V | 25 V | 35 V | 40 V | 50 V  |
| 0.10                   |     |     |       |      |      |       |      |      | A    | A    | A/C   |
| 0.15                   |     |     |       |      |      |       |      |      | A    | A    | A/C   |
| 0.22                   |     |     |       | S    |      |       |      |      | A    | A    | B/C/S |
| 0.33                   |     |     |       |      |      |       |      | A    | B/C  | B    | B/S   |
| 0.47                   |     |     |       |      | A    | A     | A    | C    | B/S  | B    | D/V   |
| 0.68                   |     |     |       |      | A    | A     | C    | B/S  | D/S  | D    | D/V   |
| 1.0                    |     |     |       | A/S  | B    | B/C   | B/S  | S    | D/S  | D    | E/X   |
| 1.5                    |     |     | A     | C    | B    | B/S   | S    | D/S  | E/V  | E    | F/X   |
| 2.2                    |     | A   | C     | B/S  |      | S     | D/S  | E/V  | F/X  | F    | F/Y   |
| 3.3                    | A   | C   | B/S   | S    | D    | D/S   | E/V  | X    | F/Y  | F    | G/Z   |
| 4.7                    | A   | B/S | S     | D/S  | E    | E/V   | X    | F/X  | G/Z  | G    | H/Z   |
| 6.8                    | A   | S   | D/S   | E/V  |      | X     | F/X  | G/Y  | H/Z  | H    | R     |
| 10                     | A   | D/S | E/V   | X    | F    | F/X   | Y    | G/Y  | Z    |      | R     |
| 15                     |     | E/V | X     | F/X  |      | Y     | G/Z  | H/Z  | R    |      |       |
| 22                     |     | X   | F/X   | Y    | G    | G/Y/Z | H/Z  | R    | R    |      |       |
| 33                     |     | F/X | Y     | G/Z  | H    | H/Z   | R    | R    |      |      |       |
| 47                     |     | Y   | G/Y   | H/Z  |      | R     | R    |      |      |      |       |
| 68                     |     | G/Y | H/Z   | R    |      | R     |      |      |      |      |       |
| 100                    |     | H/Z | Z     | H/R  |      |       |      |      |      |      |       |
| 120                    |     | R   | R     | R    |      |       |      |      |      |      |       |
| 150                    |     | R   | R     | R    |      |       |      |      |      |      |       |
| 180                    |     | R   | R     |      |      |       |      |      |      |      |       |
| 220                    |     | R   | R     |      |      |       |      |      |      |      |       |
| 330                    |     | R   |       |      |      |       |      |      |      |      |       |

| STANDARD RATINGS   |           |                      |                          |                               |  |
|--|-----------|----------------------|--------------------------|-------------------------------|--|
| CAPACITANCE (μF)   | CASE CODE | PART NUMBER          | MAX. DCL AT + 25 °C (μA) | MAX. DF AT + 25 °C 120 Hz (%) |  |
| <b>2 V<sub>DC</sub> AT + 85 °C, 1.2 V<sub>DC</sub> AT + 125 °C</b> |           |                      |                          |                               |  |
| 3.3  | A         | 195D335(1)002A(2)(3) | 0.5                      | 8                             |  |
| 4.7  | A         | 195D475(1)002A(2)(3) | 0.5                      | 8                             |  |
| 6.8  | A         | 195D685(1)002A(2)(3) | 0.5                      | 8                             |  |
| 10   | A         | 195D106(1)002A(2)(3) | 0.6                      | 8                             |  |
| <b>4 V<sub>DC</sub> AT + 85 °C, 2.7 V<sub>DC</sub> AT + 125 °C</b> |           |                      |                          |                               |  |
| 2.2  | A         | 195D225(1)004A(2)(3) | 0.5                      | 8                             |  |
| 3.3  | C         | 195D335(1)004C(2)(3) | 0.5                      | 6                             |  |
| 4.7  | B         | 195D475(1)004B(2)(3) | 0.5                      | 8                             |  |
| 4.7  | S         | 195D475(1)004S(2)(3) | 0.5                      | 6                             |  |
| 6.8  | S         | 195D685(1)004S(2)(3) | 0.5                      | 6                             |  |
| 10   | D         | 195D106(1)004D(2)(3) | 0.5                      | 8                             |  |
| 10   | S         | 195D106(1)004S(2)(3) | 0.5                      | 6                             |  |
| 15   | E         | 195D156(1)004E(2)(3) | 0.6                      | 8                             |  |
| 15   | V         | 195D156(1)004V(2)(3) | 0.6                      | 6                             |  |
| 22   | X         | 195D226(1)004X(2)(3) | 0.9                      | 6                             |  |

**Note**

- Part number definitions:
  - (1) Tolerance: For 10 % tolerance, specify "X9", for 20 % tolerance, change to "X0"
  - (2) Termination: For 100 % tin specify "2", for gold plated specify "4", for solder plated 60/40 specify "8"
  - (3) Packaging code: For 7" reels specify "T", for 13" reels specify "W"



| 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 (%) |
| <b>4 V<sub>DC</sub> AT + 85 °C, 2.7 V<sub>DC</sub> AT + 125 °C</b> |           |                      |                                      |                                     |
| 33   | F         | 195D336(1)004F(2)(3) | 1.3                                  | 8                                   |
| 33   | X         | 195D336(1)004X(2)(3) | 1.3                                  | 6                                   |
| 47   | Y         | 195D476(1)004Y(2)(3) | 1.9                                  | 6                                   |
| 68   | G         | 195D686(1)004G(2)(3) | 2.7                                  | 8                                   |
| 68   | Y         | 195D686(1)004Y(2)(3) | 2.7                                  | 6                                   |
| 100  | H         | 195D107(1)004H(2)(3) | 4.0                                  | 8                                   |
| 100  | Z         | 195D107(1)004Z(2)(3) | 4.0                                  | 8                                   |
| 120  | R         | 195D127(1)004R(2)(3) | 4.8                                  | 8                                   |
| 150  | R         | 195D157(1)004R(2)(3) | 6.0                                  | 8                                   |
| 180  | R         | 195D187(1)004R(2)(3) | 7.2                                  | 8                                   |
| 220  | R         | 195D227(1)004R(2)(3) | 8.8                                  | 8                                   |
| 330  | R         | 195D337(1)004R(2)(3) | 13.2                                 | 8                                   |
| <b>6.3 V<sub>DC</sub> AT + 85 °C, 4 V<sub>DC</sub> AT + 125 °C</b> |           |                      |                                      |                                     |
| 1.5  | A         | 195D155(1)6R3A(2)(3) | 0.5                                  | 8                                   |
| 2.2  | C         | 195D225(1)6R3C(2)(3) | 0.5                                  | 6                                   |
| 3.3  | B         | 195D335(1)6R3B(2)(3) | 0.5                                  | 8                                   |
| 3.3  | S         | 195D335(1)6R3S(2)(3) | 0.5                                  | 6                                   |
| 4.7  | S         | 195D475(1)6R3S(2)(3) | 0.5                                  | 6                                   |
| 6.8  | D         | 195D685(1)6R3D(2)(3) | 0.5                                  | 8                                   |
| 6.8  | S         | 195D685(1)6R3S(2)(3) | 0.5                                  | 6                                   |
| 10   | E         | 195D106(1)6R3E(2)(3) | 0.6                                  | 8                                   |
| 10   | V         | 195D106(1)6R3V(2)(3) | 0.6                                  | 6                                   |
| 15   | X         | 195D156(1)6R3X(2)(3) | 0.9                                  | 6                                   |
| 22   | F         | 195D226(1)6R3F(2)(3) | 1.3                                  | 8                                   |
| 22   | X         | 195D226(1)6R3X(2)(3) | 1.3                                  | 6                                   |
| 33   | Y         | 195D336(1)6R3Y(2)(3) | 2.0                                  | 6                                   |
| 47   | G         | 195D476(1)6R3G(2)(3) | 2.8                                  | 8                                   |
| 47   | Y         | 195D476(1)6R3Y(2)(3) | 2.8                                  | 6                                   |
| 68   | H         | 195D686(1)6R3H(2)(3) | 4.1                                  | 8                                   |
| 68   | Z         | 195D686(1)6R3Z(2)(3) | 4.1                                  | 6                                   |
| 100  | Z         | 195D107(1)6R3Z(2)(3) | 6.0                                  | 8                                   |
| 120  | R         | 195D127(1)6R3R(2)(3) | 7.2                                  | 8                                   |
| 150  | R         | 195D157(1)6R3R(2)(3) | 9.0                                  | 8                                   |
| 180  | R         | 195D187(1)6R3R(2)(3) | 10.8                                 | 8                                   |
| 220  | R         | 195D227(1)6R3R(2)(3) | 13.2                                 | 8                                   |
| <b>10 V<sub>DC</sub> AT + 85 °C, 7 V<sub>DC</sub> AT + 125 °C</b>  |           |                      |                                      |                                     |
| 0.22   | S         | 195D224(1)010S(2)(3) | 0.5                                  | 4                                   |
| 1.0  | A         | 195D105(1)010A(2)(3) | 0.5                                  | 6                                   |
| 1.0  | S         | 195D105(1)010S(2)(3) | 0.5                                  | 6                                   |
| 1.5  | C         | 195D155(1)010C(2)(3) | 0.5                                  | 6                                   |
| 2.2  | B         | 195D225(1)010B(2)(3) | 0.5                                  | 6                                   |
| 2.2  | S         | 195D225(1)010S(2)(3) | 0.5                                  | 6                                   |
| 3.3  | S         | 195D335(1)010S(2)(3) | 0.5                                  | 6                                   |
| 4.7  | D         | 195D475(1)010D(2)(3) | 0.5                                  | 6                                   |
| 4.7  | S         | 195D475(1)010S(2)(3) | 0.5                                  | 6                                   |
| 6.8  | E         | 195D685(1)010E(2)(3) | 0.7                                  | 6                                   |
| 6.8  | V         | 195D685(1)010V(2)(3) | 0.7                                  | 6                                   |

**Note**

- Part number definitions:
  - Tolerance: For 10 % tolerance, specify "X9", for 20 % tolerance, change to "X0"
  - Termination: For 100 % tin specify "2", for gold plated specify "4", for solder plated 60/40 specify "8"
  - Packaging code: For 7" reels specify "T", for 13" reels specify "W"



| 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 (%) |
| <b>10 V<sub>DC</sub> AT + 85 °C, 7 V<sub>DC</sub> AT + 125 °C</b>  |           |                      |                                      |                                     |
| 10   | X         | 195D106(1)010X(2)(3) | 1.0                                  | 6                                   |
| 15   | F         | 195D156(1)010F(2)(3) | 1.5                                  | 6                                   |
| 15   | X         | 195D156(1)010X(2)(3) | 1.5                                  | 6                                   |
| 22   | Y         | 195D226(1)010Y(2)(3) | 2.2                                  | 6                                   |
| 33   | G         | 195D336(1)010G(2)(3) | 3.3                                  | 6                                   |
| 33   | Z         | 195D336(1)010Z(2)(3) | 3.0                                  | 6                                   |
| 47   | H         | 195D476(1)010H(2)(3) | 4.7                                  | 6                                   |
| 47   | Z         | 195D476(1)010Z(2)(3) | 4.7                                  | 6                                   |
| 68   | R         | 195D686(1)010R(2)(3) | 6.8                                  | 6                                   |
| 100  | H         | 195D107(1)010H(2)(3) | 8.0                                  | 7                                   |
| 100  | R         | 195D107(1)010R(2)(3) | 10.0                                 | 8                                   |
| 120  | R         | 195D127(1)010R(2)(3) | 12.0                                 | 8                                   |
| 150  | R         | 195D157(1)010R(2)(3) | 15.0                                 | 8                                   |
| <b>15 V<sub>DC</sub> AT + 85 °C, 10 V<sub>DC</sub> AT + 125 °C</b> |           |                      |                                      |                                     |
| 0.47   | A         | 195D474(1)015A(2)(3) | 0.5                                  | 6                                   |
| 0.68   | A         | 195D684(1)015A(2)(3) | 0.5                                  | 6                                   |
| 1.0  | B         | 195D105(1)015B(2)(3) | 0.5                                  | 6                                   |
| 1.5  | B         | 195D155(1)015B(2)(3) | 0.5                                  | 6                                   |
| 3.3  | D         | 195D335(1)015D(2)(3) | 0.5                                  | 6                                   |
| 4.7  | E         | 195D475(1)015E(2)(3) | 0.7                                  | 6                                   |
| 10   | F         | 195D106(1)015F(2)(3) | 1.5                                  | 6                                   |
| 22   | G         | 195D226(1)015G(2)(3) | 3.3                                  | 6                                   |
| 33   | H         | 195D336(1)015H(2)(3) | 5.0                                  | 6                                   |
| <b>16 V<sub>DC</sub> AT + 85 °C, 10 V<sub>DC</sub> AT + 125 °C</b> |           |                      |                                      |                                     |
| 0.47   | A         | 195D474(1)016A(2)(3) | 0.5                                  | 6                                   |
| 0.68   | A         | 195D684(1)016A(2)(3) | 0.5                                  | 6                                   |
| 1.0  | B         | 195D105(1)016B(2)(3) | 0.5                                  | 6                                   |
| 1.0  | C         | 195D105(1)016C(2)(3) | 0.5                                  | 4                                   |
| 1.5  | B         | 195D155(1)016B(2)(3) | 0.5                                  | 6                                   |
| 1.5  | S         | 195D155(1)016S(2)(3) | 0.5                                  | 6                                   |
| 2.2  | S         | 195D225(1)016S(2)(3) | 0.5                                  | 6                                   |
| 3.3  | D         | 195D335(1)016D(2)(3) | 0.5                                  | 6                                   |
| 3.3  | S         | 195D335(1)016S(2)(3) | 0.5                                  | 6                                   |
| 4.7  | E         | 195D475(1)016E(2)(3) | 0.7                                  | 6                                   |
| 4.7  | V         | 195D475(1)016V(2)(3) | 0.7                                  | 6                                   |
| 6.8  | X         | 195D685(1)016X(2)(3) | 1.0                                  | 6                                   |
| 10   | F         | 195D106(1)016F(2)(3) | 1.5                                  | 6                                   |
| 10   | X         | 195D106(1)016X(2)(3) | 1.5                                  | 6                                   |
| 15   | Y         | 195D156(1)016Y(2)(3) | 2.3                                  | 6                                   |
| 22   | G         | 195D226(1)016G(2)(3) | 3.3                                  | 6                                   |
| 22   | Y         | 195D226(1)016Y(2)(3) | 3.2                                  | 6                                   |
| 22   | Z         | 195D226(1)016Z(2)(3) | 3.3                                  | 6                                   |
| 33   | H         | 195D336(1)016H(2)(3) | 5.0                                  | 6                                   |
| 33   | Z         | 195D336(1)016Z(2)(3) | 5.0                                  | 6                                   |
| 47   | R         | 195D476(1)016R(2)(3) | 7.1                                  | 6                                   |
| 68   | R         | 195D686(1)016R(2)(3) | 10.2                                 | 6                                   |

**Note**

- Part number definitions:
  - Tolerance: For 10 % tolerance, specify "X9", for 20 % tolerance, change to "X0"
  - Termination: For 100 % tin specify "2", for gold plated specify "4", for solder plated 60/40 specify "8"
  - Packaging code: For 7" reels specify "T", for 13" reels specify "W"



| 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 (%) |
| <b>20 V<sub>DC</sub> AT + 85 °C, 13 V<sub>DC</sub> AT + 125 °C</b> |           |                      |                                      |                                     |
| 0.47   | A         | 195D474(1)020A(2)(3) | 0.5                                  | 6                                   |
| 0.68   | C         | 195D684(1)020C(2)(3) | 0.5                                  | 4                                   |
| 1.0  | B         | 195D105(1)020B(2)(3) | 0.5                                  | 6                                   |
| 1.0  | S         | 195D105(1)020S(2)(3) | 0.5                                  | 4                                   |
| 1.5  | S         | 195D155(1)020S(2)(3) | 0.5                                  | 6                                   |
| 2.2  | D         | 195D225(1)020D(2)(3) | 0.5                                  | 6                                   |
| 2.2  | S         | 195D225(1)020S(2)(3) | 0.5                                  | 6                                   |
| 3.3  | E         | 195D335(1)020E(2)(3) | 0.7                                  | 6                                   |
| 3.3  | V         | 195D335(1)020V(2)(3) | 0.7                                  | 6                                   |
| 4.7  | X         | 195D475(1)020X(2)(3) | 0.9                                  | 6                                   |
| 6.8  | F         | 195D685(1)020F(2)(3) | 1.4                                  | 6                                   |
| 6.8  | X         | 195D685(1)020X(2)(3) | 1.4                                  | 6                                   |
| 10   | Y         | 195D106(1)020Y(2)(3) | 2.0                                  | 6                                   |
| 15   | G         | 195D156(1)020G(2)(3) | 3.0                                  | 6                                   |
| 15   | Z         | 195D156(1)020Z(2)(3) | 3.0                                  | 6                                   |
| 22   | H         | 195D226(1)020H(2)(3) | 4.4                                  | 6                                   |
| 22   | Z         | 195D226(1)020Z(2)(3) | 4.4                                  | 6                                   |
| 33   | R         | 195D336(1)020R(2)(3) | 6.6                                  | 6                                   |
| 47   | R         | 195D476(1)020R(2)(3) | 9.4                                  | 6                                   |
| <b>25 V<sub>DC</sub> AT + 85 °C, 17 V<sub>DC</sub> AT + 125 °C</b> |           |                      |                                      |                                     |
| 0.33   | A         | 195D334(1)025A(2)(3) | 0.5                                  | 6                                   |
| 0.47   | C         | 195D474(1)025C(2)(3) | 0.5                                  | 4                                   |
| 0.68   | B         | 195D684(1)025B(2)(3) | 0.5                                  | 6                                   |
| 0.68   | S         | 195D684(1)025S(2)(3) | 0.5                                  | 4                                   |
| 1.0  | S         | 195D105(1)025S(2)(3) | 0.5                                  | 4                                   |
| 1.5  | D         | 195D155(1)025D(2)(3) | 0.5                                  | 6                                   |
| 1.5  | S         | 195D155(1)025S(2)(3) | 0.5                                  | 6                                   |
| 2.2  | E         | 195D225(1)025E(2)(3) | 0.6                                  | 6                                   |
| 2.2  | V         | 195D225(1)025V(2)(3) | 0.6                                  | 6                                   |
| 3.3  | X         | 195D335(1)025X(2)(3) | 0.8                                  | 6                                   |
| 4.7  | F         | 195D475(1)025F(2)(3) | 1.2                                  | 6                                   |
| 4.7  | X         | 195D475(1)025X(2)(3) | 1.2                                  | 6                                   |
| 6.8  | G         | 195D685(1)025G(2)(3) | 1.7                                  | 6                                   |
| 6.8  | Y         | 195D685(1)025Y(2)(3) | 1.7                                  | 6                                   |
| 10   | G         | 195D106(1)025G(2)(3) | 2.5                                  | 6                                   |
| 10   | Y         | 195D106(1)025Y(2)(3) | 2.5                                  | 6                                   |
| 15   | H         | 195D156(1)025H(2)(3) | 3.8                                  | 6                                   |
| 15   | Z         | 195D156(1)025Z(2)(3) | 3.8                                  | 6                                   |
| 22   | R         | 195D226(1)025R(2)(3) | 5.5                                  | 6                                   |
| 33   | R         | 195D336(1)025R(2)(3) | 8.3                                  | 6                                   |

**Note**

- Part number definitions:
  - Tolerance: For 10 % tolerance, specify "X9", for 20 % tolerance, change to "X0"
  - Termination: For 100 % tin specify "2", for gold plated specify "4", for solder plated 60/40 specify "8"
  - Packaging code: For 7" reels specify "T", for 13" reels specify "W"



| <b>STANDARD RATINGS</b>   |                  |                      |  |  |
|---|------------------|----------------------|--|--|
| <b>CAPACITANCE<br/>(<math>\mu</math>F)</b>  | <b>CASE CODE</b> | <b>PART NUMBER</b>   | <b>MAX. DCL<br/>AT + 25 °C<br/>(<math>\mu</math>A)</b> | <b>MAX. DF<br/>AT + 25 °C<br/>120 Hz (%)</b> |
| <b>35 V<sub>DC</sub> AT + 85 °C, 23 V<sub>DC</sub> AT + 125 °C</b>                      |                  |                      |  |  |
| 0.10  | A                | 195D104(1)035A(2)(3) | 0.5  | 6  |
| 0.15  | A                | 195D154(1)035A(2)(3) | 0.5  | 6  |
| 0.22  | A                | 195D224(1)035A(2)(3) | 0.5  | 6  |
| 0.33  | B                | 195D334(1)035B(2)(3) | 0.5  | 6  |
| 0.33  | C                | 195D334(1)035C(2)(3) | 0.5  | 4  |
| 0.47  | B                | 195D474(1)035B(2)(3) | 0.5  | 6  |
| 0.47  | S                | 195D474(1)035S(2)(3) | 0.5  | 4  |
| 0.68  | D                | 195D684(1)035D(2)(3) | 0.5  | 6  |
| 0.68  | S                | 195D684(1)035S(2)(3) | 0.5  | 4  |
| 1.0   | D                | 195D105(1)035D(2)(3) | 0.5  | 6  |
| 1.0   | S                | 195D105(1)035S(2)(3) | 0.5  | 4  |
| 1.5   | E                | 195D155(1)035E(2)(3) | 0.5  | 6  |
| 1.5   | V                | 195D155(1)035V(2)(3) | 0.5  | 6  |
| 2.2   | F                | 195D225(1)035F(2)(3) | 0.8  | 6  |
| 2.2   | X                | 195D225(1)035X(2)(3) | 0.8  | 6  |
| 3.3   | F                | 195D335(1)035F(2)(3) | 1.2  | 6  |
| 3.3   | Y                | 195D335(1)035Y(2)(3) | 1.2  | 6  |
| 4.7   | G                | 195D475(1)035G(2)(3) | 1.6  | 6  |
| 4.7   | Z                | 195D475(1)035Z(2)(3) | 1.6  | 6  |
| 6.8   | H                | 195D685(1)035H(2)(3) | 2.4  | 6  |
| 6.8   | Z                | 195D685(1)035Z(2)(3) | 2.4  | 6  |
| 10  | Z                | 195D106(1)035Z(2)(3) | 3.5  | 6  |
| 15  | R                | 195D156(1)035R(2)(3) | 5.3  | 6  |
| 22  | R                | 195D226(1)035R(2)(3) | 7.7  | 6  |
| <b>40 V<sub>DC</sub> AT + 85 °C, 23 V<sub>DC</sub> TO 25 V<sub>DC</sub> AT + 125 °C</b> |                  |                      |  |  |
| 0.10  | A                | 195D104(1)040A(2)(3) | 0.5  | 6  |
| 0.15  | A                | 195D154(1)040A(2)(3) | 0.5  | 6  |
| 0.22  | A                | 195D224(1)040A(2)(3) | 0.5  | 6  |
| 0.33  | B                | 195D334(1)040B(2)(3) | 0.5  | 6  |
| 0.47  | B                | 195D474(1)040B(2)(3) | 0.5  | 6  |
| 0.68  | D                | 195D684(1)040D(2)(3) | 0.5  | 6  |
| 1.0   | D                | 195D105(1)040D(2)(3) | 0.5  | 6  |
| 1.5   | E                | 195D155(1)040E(2)(3) | 0.5  | 6  |
| 2.2   | F                | 195D225(1)040F(2)(3) | 0.8  | 6  |
| 3.3   | F                | 195D335(1)040F(2)(3) | 1.2  | 6  |
| 4.7   | G                | 195D475(1)040G(2)(3) | 1.6  | 6  |
| 6.8   | H                | 195D685(1)040H(2)(3) | 2.4  | 6  |
| <b>50 V<sub>DC</sub> AT + 85 °C, 33 V<sub>DC</sub> AT + 125 °C</b>                      |                  |                      |  |  |
| 0.10  | A                | 195D104(1)050A(2)(3) | 0.5  | 6  |
| 0.10  | C                | 195D104(1)050C(2)(3) | 0.5  | 4  |
| 0.15  | A                | 195D154(1)050A(2)(3) | 0.5  | 6  |
| 0.15  | C                | 195D154(1)050C(2)(3) | 0.5  | 4  |
| 0.22  | B                | 195D224(1)050B(2)(3) | 0.5  | 6  |
| 0.22  | C                | 195D224(1)050C(2)(3) | 0.5  | 4  |
| 0.22  | S                | 195D224(1)050S(2)(3) | 0.5  | 4  |
| 0.33  | B                | 195D334(1)050B(2)(3) | 0.5  | 6  |
| 0.33  | S                | 195D334(1)050S(2)(3) | 0.5  | 4  |

**Note**

- Part number definitions:
  - Tolerance: For 10 % tolerance, specify "X9", for 20 % tolerance, change to "X0"
  - Termination: For 100 % tin specify "2", for gold plated specify "4", for solder plated 60/40 specify "8"
  - Packaging code: For 7" reels specify "T", for 13" reels specify "W"



| <b>STANDARD RATINGS</b>  |           |                      |                                      |                                     |
|--|-----------|----------------------|--------------------------------------|-------------------------------------|
| 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 (%) |
| <b>50 V<sub>DC</sub> AT + 85 °C, 33 V<sub>DC</sub> AT + 125 °C</b> |           |                      |                                      |                                     |
| 0.47   | D         | 195D474(1)050D(2)(3) | 0.5                                  | 6                                   |
| 0.47   | V         | 195D474(1)050V(2)(3) | 0.5                                  | 4                                   |
| 0.68   | D         | 195D684(1)050D(2)(3) | 0.5                                  | 6                                   |
| 0.68   | V         | 195D684(1)050V(2)(3) | 0.5                                  | 4                                   |
| 1.0  | E         | 195D105(1)050E(2)(3) | 0.5                                  | 6                                   |
| 1.0  | X         | 195D105(1)050X(2)(3) | 0.5                                  | 4                                   |
| 1.5  | F         | 195D155(1)050F(2)(3) | 0.8                                  | 6                                   |
| 1.5  | X         | 195D155(1)050X(2)(3) | 0.8                                  | 6                                   |
| 2.2  | F         | 195D225(1)050F(2)(3) | 1.1                                  | 6                                   |
| 2.2  | Y         | 195D225(1)050Y(2)(3) | 1.1                                  | 6                                   |
| 3.3  | G         | 195D335(1)050G(2)(3) | 1.7                                  | 6                                   |
| 3.3  | Z         | 195D335(1)050Z(2)(3) | 1.7                                  | 6                                   |
| 4.7  | H         | 195D475(1)050H(2)(3) | 2.4                                  | 6                                   |
| 4.7  | Z         | 195D475(1)050Z(2)(3) | 2.4                                  | 6                                   |
| 6.8  | R         | 195D685(1)050R(2)(3) | 3.4                                  | 6                                   |
| 10   | R         | 195D106(1)050R(2)(3) | 5.0                                  | 6                                   |

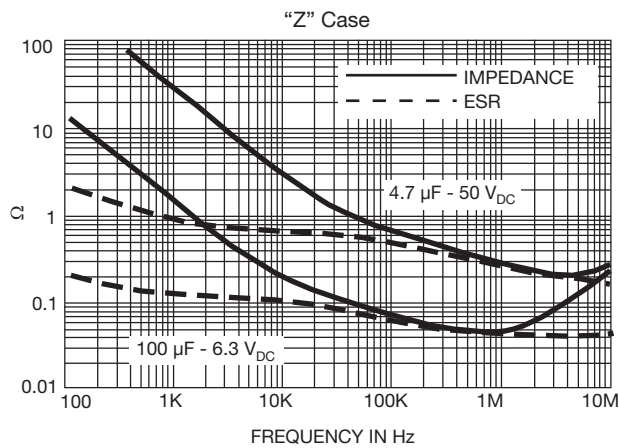
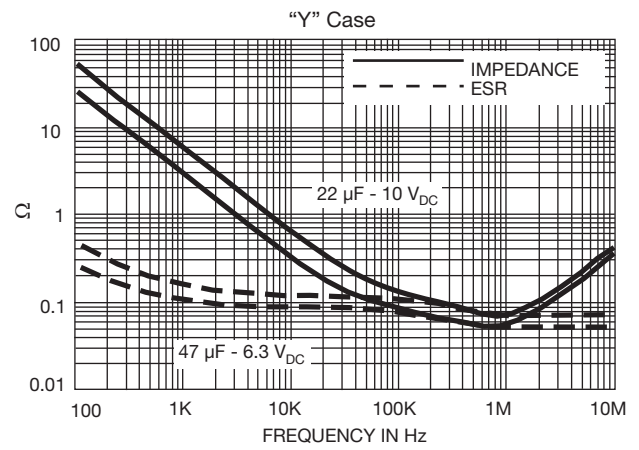
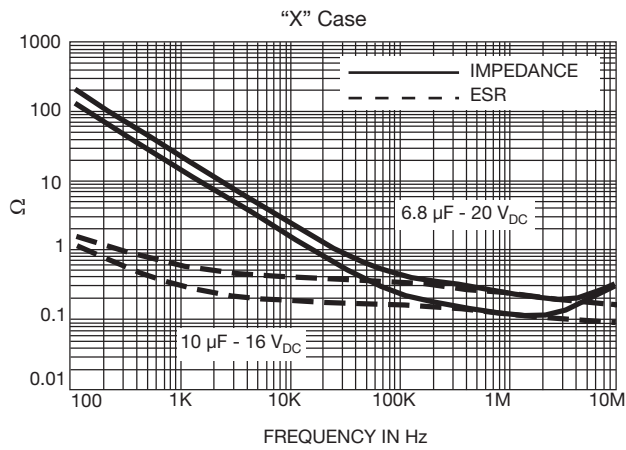
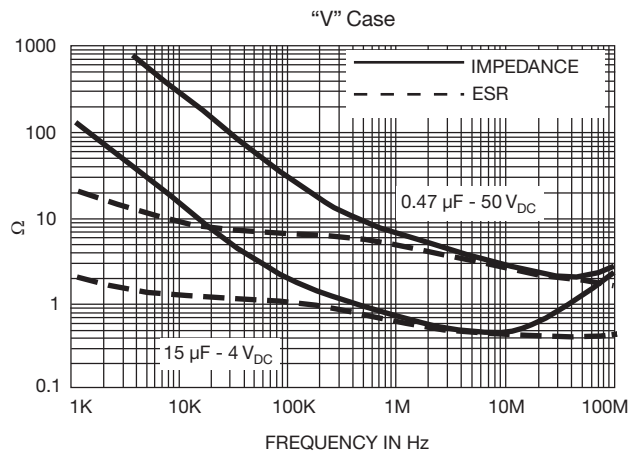
**Note**

- Part number definitions:
  - Tolerance: For 10 % tolerance, specify "X9", for 20 % tolerance, change to "X0"
  - Termination: For 100 % tin specify "2", for gold plated specify "4", for solder plated 60/40 specify "8"
  - Packaging code: For 7" reels specify "T", for 13" reels specify "W"

| <b>RECOMMENDED VOLTAGE DERATING GUIDELINES</b> (for temperature below + 85 °C) |                   |
|--|-------------------|
| <b>STANDARD CONDITIONS. FOR EXAMPLE: OUTPUT FILTERS</b>                        |                   |
| Capacitor Voltage Rating   | Operating Voltage |
| 2.0  | 1.2               |
| 4.0  | 2.5               |
| 6.3  | 3.6               |
| 10   | 6                 |
| 15/16  | 9                 |
| 20   | 12                |
| 25   | 15                |
| 35   | 24                |
| 40   | 26                |
| 50   | 28                |
| <b>SEVERE CONDITIONS. FOR EXAMPLE: INPUT FILTERS</b>                           |                   |
| Capacitor Voltage Rating   | Operating Voltage |
| 2.0  | 1.0               |
| 4.0  | 2.5               |
| 6.3  | 3.3               |
| 10   | 5.0               |
| 15/16  | 7.5               |
| 20   | 10                |
| 25   | 12                |
| 35   | 15                |
| 40   | 20                |
| 50   | 24                |



**TYPICAL CURVES AT + 25 °C, IMPEDANCE AND ESR VS. FREQUENCY**





| POWER DISSIPATION |  |
|-------------------|--|
| CASE CODE         | MAXIMUM PERMISSIBLE POWER DISSIPATION AT + 25 °C (W) IN FREE AIR |
| A                 | 0.040  |
| B                 | 0.050  |
| C                 | 0.030  |
| D                 | 0.080  |
| E                 | 0.090  |
| F                 | 0.110  |
| G                 | 0.120  |
| H                 | 0.140  |
| R                 | 0.250  |
| S                 | 0.080  |
| V                 | 0.095  |
| X                 | 0.110  |
| Y                 | 0.120  |
| Z                 | 0.135  |

| STANDARD PACKAGING QUANTITY |                |          |
|-----------------------------|----------------|----------|
| CASE CODE                   | UNITS PER REEL |          |
|                             | 7" REEL        | 13" REEL |
| A                           | 2500           | n/a      |
| B                           | 2000           | n/a      |
| C                           | 2500           | 10 000   |
| D                           | 2000           | n/a      |
| E                           | 2000           | n/a      |
| F                           | 700            | n/a      |
| G                           | 1400           | n/a      |
| H                           | 400            | n/a      |
| R                           | 600            | n/a      |
| S                           | 2500           | 10 000   |
| V                           | 2500           | 10 000   |
| X                           | 200            | 10 000   |
| Y                           | 1500           | 7500     |
| Z                           | 1500           | 5000     |

| PRODUCT INFORMATION            |  |
|--------------------------------|--|
| Conformal Coated Guide         | <a href="http://www.vishay.com/doc?40150">www.vishay.com/doc?40150</a> |
| Moisture Sensitivity           | <a href="http://www.vishay.com/doc?40135">www.vishay.com/doc?40135</a> |
| SELECTOR GUIDES                |  |
| Solid Tantalum Selector Guide  | <a href="http://www.vishay.com/doc?49053">www.vishay.com/doc?49053</a> |
| Solid Tantalum Chip Capacitors | <a href="http://www.vishay.com/doc?40091">www.vishay.com/doc?40091</a> |
| FAQ                            |  |
| Frequently Asked Questions     | <a href="http://www.vishay.com/doc?40110">www.vishay.com/doc?40110</a> |



## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

## Material Category Policy

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.**

**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.**



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.