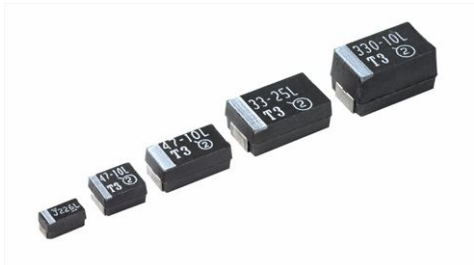


Solid Tantalum Surface Mount Capacitors

TANTAMOUNT® Molded Case, Standard Industrial Grade


FEATURES

- Terminations: 100 % matte tin, standard, tin/lead available
- Compliant terminations
- Molded case available in six case codes
- Compatible with "High Volume" automatic pick and place equipment
- Optical character recognition qualified
- Meets IEC specification QC300801/US0001 and EIA535BAAC mechanical and performance requirements
- Compliant to RoHS directive 2002/95/EC


RoHS*
 COMPLIANT

PERFORMANCE/ELECTRICAL CHARACTERISTICS
Operating Temperature: - 55 °C to + 85 °C
 (to + 125 °C with voltage derating)

Note: Refer to Doc. 40088

Capacitance Range: 0.10 µF to 1000 µF

Capacitance Tolerance: ± 5 %, ± 10 %, ± 20 %

100 % Surge Current Tested (D and E Case Codes)
Voltage Rating: 4 V_{DC} to 63 V_{DC}
ORDERING INFORMATION

| 293D | 107 | X9 | 010 | D | 2WE3 |
|------|--|--|--|----------------------------------|--|
| TYPE | CAPACITANCE | CAPACITANCE TOLERANCE | DC VOLTAGE RATING AT + 85 °C | CASE CODE | TERMINATION AND PACKAGING |
| | This is expressed in picofarads. The first two digits are the significant figures. The third is the number of zeros to follow. | X0 = ± 20 % X9 = ± 10 % X5 = ± 5 % | This is expressed in V. 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 | 2TE3: Matte tin, 7" (178 mm) reel 2WE3: Matte tin, 13" (330 mm) reel 8T: Tin/lead, 7" (178 mm) reel 8W: Tin/lead, 13" (330 mm) reel |

Note

We reserve the right to supply higher voltage ratings and tighter capacitance tolerance capacitors in the same case size. Voltage substitutions will be marked with the higher voltage rating.

DIMENSIONS in inches [millimeters]

| CASE CODE | EIA SIZE | L | W | H | P | Tw | Th MIN. |
|-----------|----------|-------------------------------|-------------------------------|-------------------------------|--------------------------------|-------------------------------|-----------------|
| A | 3216-18 | 0.126 ± 0.008 [3.2 ± 0.20] | 0.063 ± 0.008 [1.6 ± 0.20] | 0.063 ± 0.008 [1.6 ± 0.20] | 0.031 ± 0.012 [0.80 ± 0.30] | 0.047 ± 0.004 [1.2 ± 0.10] | 0.028 [0.70] |
| B | 3528-21 | 0.138 ± 0.008 [3.5 ± 0.20] | 0.110 ± 0.008 [2.8 ± 0.20] | 0.075 ± 0.008 [1.9 ± 0.20] | 0.031 ± 0.012 [0.80 ± 0.30] | 0.087 ± 0.004 [2.2 ± 0.10] | 0.028 [0.70] |
| C | 6032-28 | 0.236 ± 0.012 [6.0 ± 0.30] | 0.126 ± 0.012 [3.2 ± 0.30] | 0.098 ± 0.012 [2.5 ± 0.30] | 0.051 ± 0.012 [1.3 ± 0.30] | 0.087 ± 0.004 [2.2 ± 0.10] | 0.039 [1.0] |
| D | 7343-31 | 0.287 ± 0.012 [7.3 ± 0.30] | 0.170 ± 0.012 [4.3 ± 0.30] | 0.110 ± 0.012 [2.8 ± 0.30] | 0.051 ± 0.012 [1.3 ± 0.30] | 0.095 ± 0.004 [2.4 ± 0.10] | 0.039 [1.0] |
| E | 7343-43 | 0.287 ± 0.012 [7.3 ± 0.30] | 0.170 ± 0.012 [4.3 ± 0.30] | 0.158 ± 0.012 [4.0 ± 0.30] | 0.051 ± 0.012 [1.3 ± 0.30] | 0.095 ± 0.004 [2.4 ± 0.10] | 0.039 [1.0] |
| V | 7343-20 | 0.287 ± 0.012 [7.3 ± 0.30] | 0.170 ± 0.012 [4.3 ± 0.30] | 0.079 max. [2.0 max.] | 0.051 ± 0.012 [1.3 ± 0.30] | 0.095 ± 0.004 [2.4 ± 0.10] | 0.039 [1.0] |

* Pb containing terminations are not RoHS compliant, exemptions may apply

| RATINGS AND CASE CODES | | | | | | | | | |
|------------------------|---------|---------|-----------|---------|-------|---------|-------|-------|------|
| µF | 4 V | 6.3 V | 10 V | 16 V | 20 V | 25 V | 35 V | 50 V | 63 V |
| 0.1 | | | | | | | A | A | |
| 0.15 | | | | | | | A | A/B | |
| 0.22 | | | | | | | A | A/B | |
| 0.33 | | | | | | A | A | A/B | |
| 0.47 | | | A | | A | A | A/B | A/B/C | |
| 0.68 | | | | A | A | A | A/B | B/C | |
| 1 | | | A | A/B | A/B | A/B | A/B | B/C | |
| 1.5 | | A | A | A | A/B | A/B | B/C | B/C/D | |
| 2.2 | A | A | A/B | A/B | A/B | A/B/C | B/C | B/C/D | |
| 3.3 | A | A/B | A/B | A/B | A/B/C | A/B/C | B/C/D | C/D | |
| 4.7 | A / B | A/B | A/B/C | A/B/C | A/B/C | A/B/C/D | B/C/D | C/D/E | D |
| 6.8 | A / B | A/B | A/B/C | A/B/C | A/B/C | B/C/D | C/D | D/E | |
| 10 | A/B | A/B/C | A/B/C | A/B/C/D | B/C/D | B/C/D | C/D | D/E | E |
| 15 | A/B/C | A/B/C | A/B/C | B/C | B/C/D | B/C/D | D/E | E | |
| 22 | A/BC | A/B/C | A/B/C | B/C/D | B/C/D | C/D/E/V | D/E | | |
| 33 | A/B/C | A/B/C | B/C/D | B/C/D | C/D | D/E | | | |
| 47 | A/B/C | A/B/C/D | B/C/D | C/D/E | D/E | D/E | | | |
| 68 | B/C/D | B/C/D | B/C/D/E/V | D/E | D/E | | | | |
| 100 | A/B/C/D | B/C/D/E | B/C/D/E/V | D/E | D/E | | | | |
| 120 | D | D | E | | | | | | |
| 150 | B/C/D | C/D/E | C/D/E | D/E | | | | | |
| 220 | B/C/D/E | C/D/E | D/E/V | E | | | | | |
| 330 | D/E | D/E | D/E | | | | | | |
| 470 | D/E | D/E | E | | | | | | |
| 680 | E | E | | | | | | | |
| 1000 | E | E | | | | | | | |

| MARKING | | | | | | | | | | | | | | | | | | | | | | |
|---|---|-----------------------|--|-------|------|-----|---|-----|---|----|---|----|---|----|---|----|---|----|---|----|---|--|
| <p style="text-align: center;">"A" Case Size</p> | <table border="1"> <thead> <tr> <th colspan="2">"A" CASE VOLTAGE CODE</th> </tr> <tr> <th>VOLTS</th> <th>CODE</th> </tr> </thead> <tbody> <tr><td>4.0</td><td>G</td></tr> <tr><td>6.3</td><td>J</td></tr> <tr><td>10</td><td>A</td></tr> <tr><td>16</td><td>C</td></tr> <tr><td>20</td><td>D</td></tr> <tr><td>25</td><td>E</td></tr> <tr><td>35</td><td>V</td></tr> <tr><td>50</td><td>T</td></tr> </tbody> </table> | "A" CASE VOLTAGE CODE | | VOLTS | CODE | 4.0 | G | 6.3 | J | 10 | A | 16 | C | 20 | D | 25 | E | 35 | V | 50 | T | <p style="text-align: center;">"B, C, D, E, V" Case Sizes</p> |
| "A" CASE VOLTAGE CODE | | | | | | | | | | | | | | | | | | | | | | |
| VOLTS | CODE | | | | | | | | | | | | | | | | | | | | | |
| 4.0 | G | | | | | | | | | | | | | | | | | | | | | |
| 6.3 | J | | | | | | | | | | | | | | | | | | | | | |
| 10 | A | | | | | | | | | | | | | | | | | | | | | |
| 16 | C | | | | | | | | | | | | | | | | | | | | | |
| 20 | D | | | | | | | | | | | | | | | | | | | | | |
| 25 | E | | | | | | | | | | | | | | | | | | | | | |
| 35 | V | | | | | | | | | | | | | | | | | | | | | |
| 50 | T | | | | | | | | | | | | | | | | | | | | | |
| <p>Marking Capacitor marking includes an anode (+) polarity band, capacitance in microfarads and the voltage rating. "A" Case capacitors use a letter code for the voltage and EIA capacitance code.</p> <p>The Vishay Sprague® trademark is included if space permits. Capacitors rated at 6.3 V are marked 6 V.</p> <p>A manufacturing date code is marked on all capacitors.</p> <p>Capacitors might bear a slightly different marking than the one shown above. For example, rating 22 µF 10 V could be marked either as 22-10L or 22R10.</p> <p>Call the factory for further explanation.</p> | | | | | | | | | | | | | | | | | | | | | | |



Solid Tantalum Surface Mount Capacitors
TANTAMOUNT® Molded Case, Standard Industrial Grade

Vishay Sprague

| RATINGS AND PART NUMBER REFERENCE | | | | | | |
|--|-----------|-------------------|--|--|---|--|
| CAPACITANCE (μ F) | CASE CODE | PART NUMBER | MAX. DC LEAKAGE AT + 25 °C (μ A) | MAX. DF AT + 25 °C 120 Hz (%) | MAX. ESR AT + 25 °C 100 kHz (Ω) | MAX. RIPPLE 100 kHz I_{rms} (A) |
| 4 V_{DC} AT + 85 °C, 2.7 V_{DC} AT + 125 °C | | | | | | |
| 2.2 | A | 293D225(1)004A(2) | 0.5 | 6 | 7.6 | 0.10 |
| 3.3 | A | 293D335(1)004A(2) | 0.5 | 6 | 7.6 | 0.10 |
| 4.7 | A | 293D475(1)004A(2) | 0.5 | 6 | 6.3 | 0.11 |
| 4.7 | B | 293D475(1)004B(2) | 0.5 | 6 | 7.0 | 0.11 |
| 6.8 | A | 293D685(1)004A(2) | 0.5 | 6 | 5.5 | 0.12 |
| 6.8 | B | 293D685(1)004B(2) | 0.5 | 6 | 3.4 | 0.16 |
| 10 | A | 293D106(1)004A(2) | 0.5 | 6 | 5.1 | 0.12 |
| 10 | B | 293D106(1)004B(2) | 0.5 | 6 | 3.5 | 0.16 |
| 15 | A | 293D156(1)004A(2) | 0.6 | 6 | 3.4 | 0.15 |
| 15 | B | 293D156(1)004B(2) | 0.6 | 6 | 2.9 | 0.17 |
| 15 | C | 293D156(1)004C(2) | 0.6 | 6 | 2.8 | 0.20 |
| 22 | A | 293D226(1)004A(2) | 0.9 | 6 | 2.9 | 0.16 |
| 22 | B | 293D226(1)004B(2) | 0.9 | 6 | 2.5 | 0.18 |
| 22 | C | 293D226(1)004C(2) | 0.9 | 6 | 1.8 | 0.25 |
| 33 | A | 293D336(1)004A(2) | 1.3 | 6 | 2.9 | 0.16 |
| 33 | B | 293D336(1)004B(2) | 1.3 | 6 | 2.0 | 0.21 |
| 33 | C | 293D336(1)004C(2) | 1.3 | 6 | 1.8 | 0.25 |
| 47 | A | 293D476(1)004A(2) | 1.9 | 14 | 2.5 | 0.17 |
| 47 | B | 293D476(1)004B(2) | 1.9 | 6 | 1.9 | 0.21 |
| 47 | C | 293D476(1)004C(2) | 1.9 | 6 | 1.8 | 0.25 |
| 68 | B | 293D686(1)004B(2) | 2.7 | 6 | 1.9 | 0.21 |
| 68 | C | 293D686(1)004C(2) | 2.7 | 6 | 1.4 | 0.28 |
| 68 | D | 293D686(1)004D(2) | 2.7 | 6 | 0.8 | 0.43 |
| 100 | A | 293D107X0004A(2) | 10.0 | 30 | 2.5 | 0.22 |
| 100 | B | 293D107(1)004B(2) | 4.0 | 8 | 1.8 | 0.22 |
| 100 | C | 293D107(1)004C(2) | 4.0 | 6 | 0.8 | 0.37 |
| 100 | D | 293D107(1)004D(2) | 4.0 | 6 | 0.7 | 0.46 |
| 120 | D | 293D127(1)004D(2) | 4.8 | 6 | 0.6 | 0.51 |
| 150 | B | 293D157(1)004B(2) | 6.0 | 14 | 1.6 | 0.23 |
| 150 | C | 293D157(1)004C(2) | 6.0 | 12 | 0.7 | 0.40 |
| 150 | D | 293D157(1)004D(2) | 6.0 | 8 | 0.6 | 0.50 |
| 220 | B | 293D227X0004B(2) | 8.8 | 18 | 1.5 | 0.24 |
| 220 | C | 293D227(1)004C(2) | 8.8 | 8 | 0.7 | 0.40 |
| 220 | D | 293D227(1)004D(2) | 8.8 | 8 | 0.6 | 0.50 |
| 220 | E | 293D227(1)004E(2) | 8.8 | 8 | 0.5 | 0.57 |
| 330 | D | 293D337(1)004D(2) | 13.2 | 8 | 0.6 | 0.50 |
| 330 | E | 293D337(1)004E(2) | 13.2 | 8 | 0.5 | 0.57 |
| 470 | D | 293D477(1)004D(2) | 18.8 | 10 | 0.6 | 0.50 |
| 470 | E | 293D477(1)004E(2) | 18.8 | 10 | 0.5 | 0.57 |
| 680 | E | 293D687(1)004E(2) | 27.2 | 12 | 0.5 | 0.57 |
| 1000 | E | 293D108X0004E(2) | 40.0 | 20 | 0.5 | 0.57 |
| 6.3 V_{DC} AT + 85 °C, 4 V_{DC} AT 125 °C | | | | | | |
| 1.5 | A | 293D155(1)6R3A(2) | 0.5 | 6 | 2.9 | 0.16 |
| 2.2 | A | 293D225(1)6R3A(2) | 0.5 | 6 | 7.6 | 0.10 |
| 3.3 | A | 293D335(1)6R3A(2) | 0.5 | 6 | 6.3 | 0.11 |
| 3.3 | B | 293D335(1)6R3B(2) | 0.5 | 6 | 5.5 | 0.12 |
| 4.7 | A | 293D475(1)6R3A(2) | 0.5 | 6 | 5.5 | 0.12 |
| 4.7 | B | 293D475(1)6R3B(2) | 0.5 | 6 | 4.4 | 0.14 |
| 6.8 | A | 293D685(1)6R3A(2) | 0.5 | 6 | 5.0 | 0.12 |
| 6.8 | B | 293D685(1)6R3B(2) | 0.5 | 6 | 3.4 | 0.16 |
| 10 | A | 293D106(1)6R3A(2) | 0.6 | 6 | 3.4 | 0.15 |
| 10 | B | 293D106(1)6R3B(2) | 0.6 | 6 | 2.9 | 0.17 |
| 10 | C | 293D106(1)6R3C(2) | 0.6 | 6 | 3.0 | 0.19 |



| RATINGS AND PART NUMBER REFERENCE | | | | | | |
|--|-----------|-------------------|--|--|---|--|
| CAPACITANCE (μ F) | CASE CODE | PART NUMBER | MAX. DC LEAKAGE AT + 25 °C (μ A) | MAX. DF AT + 25 °C 120 Hz (%) | MAX. ESR AT + 25 °C 100 kHz (Ω) | MAX. RIPPLE 100 kHz I_{rms} (A) |
| 6.3 V_{DC} AT + 85 °C, 4 V_{DC} AT 125 °C | | | | | | |
| 15 | A | 293D156(1)6R3A(2) | 0.9 | 6 | 2.9 | 0.16 |
| 15 | B | 293D156(1)6R3B(2) | 0.9 | 6 | 2.5 | 0.18 |
| 15 | C | 293D156(1)6R3C(2) | 0.9 | 6 | 1.8 | 0.25 |
| 22 | A | 293D226(1)6R3A(2) | 1.3 | 6 | 2.9 | 0.16 |
| 22 | B | 293D226(1)6R3B(2) | 1.3 | 6 | 2.0 | 0.21 |
| 22 | C | 293D226(1)6R3C(2) | 1.3 | 6 | 1.8 | 0.25 |
| 33 | A | 293D336(1)6R3A(2) | 2.0 | 14 | 2.5 | 0.17 |
| 33 | B | 293D336(1)6R3B(2) | 2.0 | 6 | 1.9 | 0.21 |
| 33 | C | 293D336(1)6R3C(2) | 2.0 | 6 | 1.5 | 0.27 |
| 47 | A | 293D476(1)6R3A(2) | 2.8 | 12 | 1.6 | 0.22 |
| 47 | B | 293D476(1)6R3B(2) | 2.8 | 6 | 1.9 | 0.21 |
| 47 | C | 293D476(1)6R3C(2) | 2.8 | 6 | 1.4 | 0.28 |
| 47 | D | 293D476(1)6R3D(2) | 2.8 | 6 | 0.8 | 0.43 |
| 68 | B | 293D686(1)6R3B(2) | 4.1 | 6 | 1.8 | 0.22 |
| 68 | C | 293D686(1)6R3C(2) | 4.1 | 6 | 0.8 | 0.37 |
| 68 | D | 293D686(1)6R3D(2) | 4.1 | 6 | 0.7 | 0.46 |
| 100 | B | 293D107(1)6R3B(2) | 6.0 | 15 | 1.7 | 0.22 |
| 100 | C | 293D107(1)6R3C(2) | 6.0 | 6 | 0.8 | 0.37 |
| 100 | D | 293D107(1)6R3D(2) | 6.0 | 6 | 0.7 | 0.46 |
| 100 | E | 293D107(1)6R3E(2) | 6.0 | 8 | 0.7 | 0.49 |
| 120 | D | 293D127(1)6R3D(2) | 6.3 | 8 | 0.7 | 0.46 |
| 150 | C | 293D157(1)6R3C(2) | 9.0 | 8 | 0.7 | 0.40 |
| 150 | D | 293D157(1)6R3D(2) | 9.0 | 8 | 0.6 | 0.50 |
| 150 | E | 293D157(1)6R3E(2) | 9.0 | 8 | 0.5 | 0.57 |
| 220 | C | 293D227(1)6R3C(2) | 13.9 | 14 | 0.7 | 0.39 |
| 220 | D | 293D227(1)6R3D(2) | 13.2 | 8 | 0.6 | 0.50 |
| 220 | E | 293D227(1)6R3E(2) | 13.2 | 8 | 0.5 | 0.57 |
| 330 | D | 293D337(1)6R3D(2) | 19.8 | 8 | 0.6 | 0.50 |
| 330 | E | 293D337(1)6R3E(2) | 19.8 | 8 | 0.5 | 0.57 |
| 470 | D | 293D477(1)6R3D(2) | 28.2 | 14 | 0.5 | 0.55 |
| 470 | E | 293E477(1)6R3E(2) | 28.2 | 10 | 1.5 | 0.57 |
| 680 | E | 293D687(1)6R3E(2) | 42.8 | 20 | 0.5 | 0.57 |
| 1000 | E | 293D108X06R3E(2) | 63.0 | 20 | 0.4 | 0.64 |
| 10 V_{DC} AT + 85 °C, 7 V_{DC} AT 125 °C | | | | | | |
| 0.47 | A | 293D474(1)010A(2) | 0.5 | 4 | 14.0 | 0.07 |
| 1.0 | A | 293D105(1)010A(2) | 0.5 | 4 | 9.6 | 0.09 |
| 1.5 | A | 293D155(1)010A(2) | 0.5 | 6 | 8.0 | 0.10 |
| 2.2 | A | 293D225(1)010A(2) | 0.5 | 6 | 6.3 | 0.11 |
| 2.2 | B | 293D225(1)010B(2) | 0.5 | 6 | 4.6 | 0.14 |
| 3.3 | A | 293D335(1)010A(2) | 0.5 | 6 | 5.5 | 0.12 |
| 3.3 | B | 293D335(1)010B(2) | 0.5 | 6 | 5.5 | 0.12 |
| 4.7 | A | 293D475(1)010A(2) | 0.5 | 6 | 5.0 | 0.12 |
| 4.7 | B | 293D475(1)010B(2) | 0.5 | 6 | 3.4 | 0.16 |
| 4.7 | C | 293D475(1)010C(2) | 0.5 | 6 | 2.3 | 0.22 |
| 6.8 | A | 293D685(1)010A(2) | 0.7 | 6 | 4.2 | 0.13 |
| 6.8 | B | 293D685(1)010B(2) | 0.7 | 6 | 2.9 | 0.17 |
| 6.8 | C | 293D685(1)010C(2) | 0.7 | 6 | 1.9 | 0.24 |
| 10 | A | 293D106(1)010A(2) | 1.0 | 6 | 3.4 | 0.15 |
| 10 | B | 293D106(1)010B(2) | 1.0 | 6 | 2.5 | 0.18 |
| 10 | C | 293D106(1)010C(2) | 1.0 | 6 | 1.8 | 0.25 |
| 15 | A | 293D156(1)010A(2) | 1.5 | 6 | 2.9 | 0.16 |
| 15 | B | 293D156(1)010B(2) | 1.5 | 6 | 2.0 | 0.21 |
| 15 | C | 293D156(1)010C(2) | 1.5 | 6 | 1.8 | 0.25 |



Solid Tantalum Surface Mount Capacitors
TANTAMOUNT® Molded Case, Standard Industrial Grade

Vishay Sprague

| RATINGS AND PART NUMBER REFERENCE | | | | | | |
|--|-----------|-------------------|--|--|---|--|
| CAPACITANCE (μ F) | CASE CODE | PART NUMBER | MAX. DC LEAKAGE AT + 25 °C (μ A) | MAX. DF AT + 25 °C 120 Hz (%) | MAX. ESR AT + 25 °C 100 kHz (Ω) | MAX. RIPPLE 100 kHz I_{rms} (A) |
| 10 V_{DC} AT + 85 °C, 7 V_{DC} AT 125 °C | | | | | | |
| 22 | A | 293D226(1)010A(2) | 2.2 | 8 | 2.5 | 0.17 |
| 22 | B | 293D226(1)010B(2) | 2.2 | 6 | 1.9 | 0.21 |
| 22 | C | 293D226(1)010C(2) | 2.2 | 6 | 1.5 | 0.27 |
| 33 | B | 293D336(1)010B(2) | 3.3 | 6 | 1.9 | 0.21 |
| 33 | C | 293D336(1)010C(2) | 3.3 | 6 | 1.4 | 0.28 |
| 33 | D | 293D336(1)010D(2) | 3.3 | 6 | 0.8 | 0.43 |
| 47 | B | 293D476(1)010B(2) | 4.7 | 6 | 1.8 | 0.22 |
| 47 | C | 293D476(1)010C(2) | 4.7 | 6 | 1.1 | 0.32 |
| 47 | D | 293D476(1)010D(2) | 4.7 | 6 | 0.7 | 0.46 |
| 68 | B | 293D686(1)010B(2) | 6.8 | 14 | 1.8 | 0.22 |
| 68 | C | 293D686(1)010C(2) | 6.8 | 6 | 1.0 | 0.33 |
| 68 | D | 293D686(1)010D(2) | 6.8 | 6 | 0.7 | 0.46 |
| 68 | E | 293D686(1)010E(2) | 6.8 | 6 | 0.8 | 0.45 |
| 68 | V | 293D686(1)010V(3) | 6.8 | 6 | 0.7 | 0.42 |
| 100 | B | 293D107X0010B(2) | 10.0 | 25 | 2.5 | 0.18 |
| 100 | C | 293D107(1)010C(2) | 10.0 | 8 | 0.9 | 0.35 |
| 100 | D | 293D107(1)010D(2) | 10.0 | 8 | 0.6 | 0.50 |
| 100 | E | 293D107(1)010E(2) | 10.0 | 8 | 0.7 | 0.49 |
| 100 | V | 293D107(1)010V(3) | 10.0 | 8 | 0.7 | 0.42 |
| 120 | E | 293D127(1)010E(2) | 12.0 | 6 | 1.0 | 0.41 |
| 150 | C | 293D157X0010C(2) | 15.0 | 20 | 0.9 | 0.35 |
| 150 | D | 293D157(1)010D(2) | 15.0 | 8 | 0.6 | 0.50 |
| 150 | E | 293D157(1)010E(2) | 15.0 | 8 | 0.5 | 0.57 |
| 220 | D | 293D227(1)010D(2) | 22.0 | 8 | 0.6 | 0.50 |
| 220 | E | 293D227(1)010E(2) | 22.0 | 8 | 0.5 | 0.57 |
| 220 | V | 293D227(1)010V(3) | 30.0 | 12 | 0.5 | 0.50 |
| 330 | D | 293D337(1)010D(2) | 33.0 | 15 | 0.5 | 0.57 |
| 330 | E | 293D337(1)010E(2) | 33.0 | 10 | 0.5 | 0.57 |
| 470 | E | 293D477(1)010E(2) | 47.0 | 15 | 0.5 | 0.57 |
| 16 V_{DC} AT + 85 °C, 10 V_{DC} AT + 125 °C | | | | | | |
| 0.68 | A | 293D684(1)016A(2) | 0.5 | 4 | 10.4 | 0.08 |
| 1 | A | 293D105(1)016A(2) | 0.5 | 4 | 9.3 | 0.09 |
| 1.5 | A | 293D155(1)016A(2) | 0.5 | 6 | 6.7 | 0.11 |
| 1.5 | B | 293D155(1)016B(2) | 0.5 | 6 | 6.4 | 0.12 |
| 2.2 | A | 293D225(1)016A(2) | 0.5 | 6 | 5.9 | 0.11 |
| 2.2 | B | 293D225(1)016B(2) | 0.5 | 6 | 4.6 | 0.14 |
| 3.3 | A | 293D335(1)016A(2) | 0.5 | 6 | 5.0 | 0.12 |
| 3.3 | B | 293D335(1)016B(2) | 0.5 | 6 | 3.5 | 0.16 |
| 4.7 | A | 293D475(1)016A(2) | 0.8 | 6 | 5.0 | 0.12 |
| 4.7 | B | 293D475(1)016B(2) | 0.8 | 6 | 2.9 | 0.17 |
| 4.7 | C | 293D475(1)016C(2) | 0.8 | 6 | 2.9 | 0.19 |
| 6.8 | A | 293D685(1)016A(2) | 1.1 | 6 | 4.2 | 0.13 |
| 6.8 | B | 293D685(1)016B(2) | 1.1 | 6 | 2.5 | 0.18 |
| 6.8 | C | 293D685(1)016C(2) | 1.1 | 6 | 1.9 | 0.24 |
| 10 | A | 293D106(1)016A(2) | 1.6 | 6 | 3.0 | 0.16 |
| 10 | B | 293D106(1)016B(2) | 1.6 | 6 | 2.0 | 0.21 |
| 10 | C | 293D106(1)016C(2) | 1.6 | 6 | 1.8 | 0.25 |
| 10 | D | 293D106(1)016D(2) | 2.5 | 6 | 1.2 | 0.35 |
| 15 | B | 293D156(1)016B(2) | 2.4 | 6 | 2.0 | 0.21 |
| 15 | C | 293D156(1)016C(2) | 2.4 | 6 | 1.5 | 0.27 |
| 22 | B | 293D226(1)016B(2) | 3.5 | 6 | 1.9 | 0.21 |
| 22 | C | 293D226(1)016C(2) | 3.5 | 6 | 1.4 | 0.28 |
| 22 | D | 293D226(1)016D(2) | 3.5 | 6 | 0.8 | 0.43 |

| RATINGS AND PART NUMBER REFERENCE | | | | | | |
|--|-----------|-------------------|--|--|---|--|
| CAPACITANCE (μ F) | CASE CODE | PART NUMBER | MAX. DC LEAKAGE AT + 25 °C (μ A) | MAX. DF AT + 25 °C 120 Hz (%) | MAX. ESR AT + 25 °C 100 kHz (Ω) | MAX. RIPPLE 100 kHz I_{rms} (A) |
| 16 V_{DC} AT + 85 °C, 10 V_{DC} AT + 125 °C | | | | | | |
| 33 | B | 293D336(1)016B(2) | 5.3 | 6 | 1.8 | 0.22 |
| 33 | C | 293D336(1)016C(2) | 5.3 | 6 | 1.1 | 0.32 |
| 33 | D | 293D336(1)016D(2) | 5.3 | 6 | 0.7 | 0.46 |
| 47 | C | 293D476(1)016C(2) | 7.5 | 6 | 1.0 | 0.33 |
| 47 | D | 293D476(1)016D(2) | 7.5 | 6 | 0.7 | 0.46 |
| 47 | E | 293D476(1)016E(2) | 7.5 | 6 | 0.8 | 0.45 |
| 68 | D | 293D686(1)016D(2) | 10.9 | 6 | 0.6 | 0.50 |
| 68 | E | 293D686(1)016E(2) | 10.9 | 6 | 0.8 | 0.45 |
| 100 | D | 293D107(1)016D(2) | 16.0 | 8 | 0.6 | 0.50 |
| 100 | E | 293D107(1)016E(2) | 16.0 | 8 | 0.6 | 0.52 |
| 150 | D | 293D157(1)016D(2) | 24.0 | 8 | 0.6 | 0.50 |
| 150 | E | 293D157(1)016E(2) | 24.0 | 8 | 0.5 | 0.57 |
| 220 | E | 293D227(1)016E(2) | 35.2 | 14 | 0.5 | 0.57 |
| 20 V_{DC} AT + 85 °C, 13 V_{DC} AT + 125 °C | | | | | | |
| 0.47 | A | 293D474(1)020A(2) | 0.5 | 4 | 14.0 | 0.07 |
| 0.68 | A | 293D684(1)020A(2) | 0.5 | 4 | 10.0 | 0.09 |
| 1 | A | 293D105(1)020A(2) | 0.5 | 4 | 8.4 | 0.09 |
| 1 | B | 293D105(1)020B(2) | 0.5 | 4 | 9.0 | 0.10 |
| 1.5 | A | 293D155(1)020A(2) | 0.5 | 6 | 6.3 | 0.11 |
| 1.5 | B | 293D155(1)020B(2) | 0.5 | 4.8 | 5.6 | 0.12 |
| 2.2 | A | 293D225(1)020A(2) | 0.5 | 6 | 5.9 | 0.11 |
| 2.2 | B | 293D225(1)020B(2) | 0.5 | 6 | 3.5 | 0.16 |
| 3.3 | A | 293D335(1)020A(2) | 0.7 | 6 | 5.9 | 0.11 |
| 3.3 | B | 293D335(1)020B(2) | 0.7 | 6 | 3.0 | 0.17 |
| 3.3 | C | 293D335(1)020C(2) | 0.8 | 6 | 2.3 | 0.22 |
| 4.7 | A | 293D475(1)020A(2) | 0.9 | 6 | 5.0 | 0.12 |
| 4.7 | B | 293D475(1)020B(2) | 0.9 | 6 | 2.9 | 0.17 |
| 4.7 | C | 293D475(1)020C(2) | 0.9 | 6 | 2.3 | 0.22 |
| 6.8 | A | 293D685(1)020A(2) | 1.4 | 6 | 4.5 | 0.13 |
| 6.8 | B | 293D685(1)020B(2) | 1.4 | 6 | 2.5 | 0.18 |
| 6.8 | C | 293D685(1)020C(2) | 1.4 | 6 | 1.9 | 0.24 |
| 10 | B | 293D106(1)020B(2) | 2.0 | 6 | 2.1 | 0.20 |
| 10 | C | 293D106(1)020C(2) | 2.0 | 6 | 1.7 | 0.25 |
| 10 | D | 293D106(1)020D(2) | 2.0 | 6 | 1.0 | 0.38 |
| 15 | B | 293D156(1)020B(2) | 3.0 | 6 | 2.3 | 0.19 |
| 15 | C | 293D156(1)020C(2) | 3.0 | 6 | 1.5 | 0.27 |
| 15 | D | 293D156(1)020D(2) | 3.0 | 6 | 0.9 | 0.41 |
| 22 | B | 293D226(1)020B(2) | 4.4 | 6 | 2.1 | 0.20 |
| 22 | C | 293D226(1)020C(2) | 4.4 | 6 | 1.1 | 0.32 |
| 22 | D | 293D226(1)020D(2) | 4.4 | 6 | 0.7 | 0.46 |
| 33 | C | 293D336(1)020C(2) | 6.6 | 6 | 1.0 | 0.33 |
| 33 | D | 293D336(1)020D(2) | 6.6 | 6 | 0.7 | 0.46 |
| 47 | D | 293D476(1)020D(2) | 9.4 | 6 | 0.7 | 0.46 |
| 47 | E | 293D476(1)020E(2) | 9.4 | 6 | 0.6 | 0.52 |
| 68 | D | 293D686(1)020D(2) | 13.6 | 6 | 0.7 | 0.46 |
| 68 | E | 293D686(1)020E(2) | 13.6 | 6 | 0.6 | 0.52 |
| 100 | D | 293D107(1)020D(2) | 20.0 | 8 | 0.6 | 0.50 |
| 100 | E | 293D107(1)020E(2) | 20.0 | 8 | 0.5 | 0.57 |



Solid Tantalum Surface Mount Capacitors
TANTAMOUNT® Molded Case, Standard Industrial Grade

Vishay Sprague

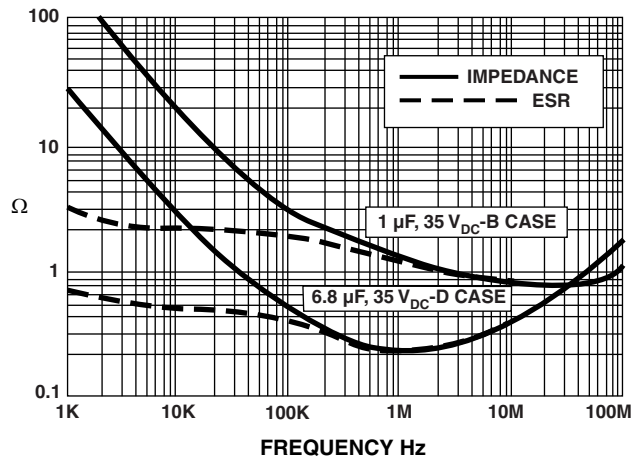
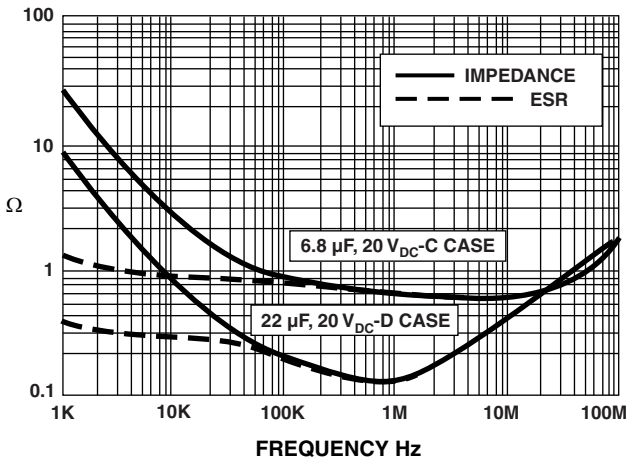
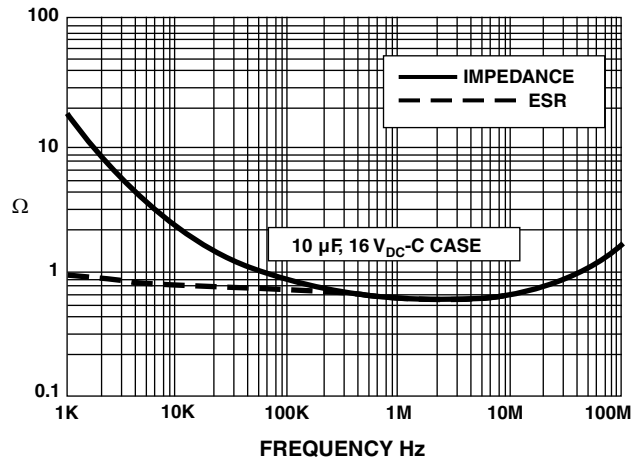
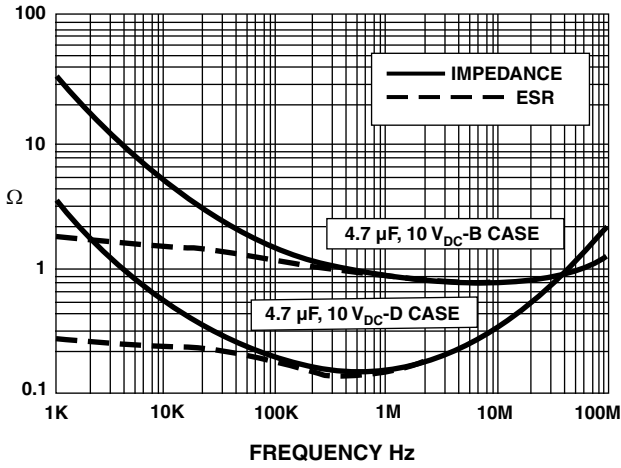
| RATINGS AND PART NUMBER REFERENCE | | | | | | |
|--|-----------|-------------------|--|--|---|--|
| CAPACITANCE (μ F) | CASE CODE | PART NUMBER | MAX. DC LEAKAGE AT + 25 °C (μ A) | MAX. DF AT + 25 °C 120 Hz (%) | MAX. ESR AT + 25 °C 100 kHz (Ω) | MAX. RIPPLE 100 kHz I_{rms} (A) |
| 25 V_{DC} AT + 85 °C, 17 V_{DC} AT + 125 °C | | | | | | |
| 0.33 | A | 293D334(1)025A(2) | 0.5 | 4 | 13.0 | 0.08 |
| 0.47 | A | 293D474(1)025A(2) | 0.5 | 4 | 12.0 | 0.08 |
| 0.68 | A | 293D684(1)025A(2) | 0.5 | 4 | 8.4 | 0.09 |
| 1 | A | 293D105(1)025A(2) | 0.5 | 4 | 7.6 | 0.10 |
| 1 | B | 293D105(1)025B(2) | 0.5 | 4 | 5.0 | 0.13 |
| 1.5 | A | 293D155(1)025A(2) | 0.5 | 6 | 6.7 | 0.11 |
| 1.5 | B | 293D155(1)025B(2) | 0.5 | 6 | 4.6 | 0.14 |
| 2.2 | A | 293D225(1)025A(2) | 0.6 | 6 | 6.3 | 0.11 |
| 2.2 | B | 293D225(1)025B(2) | 0.6 | 6 | 3.8 | 0.15 |
| 2.2 | C | 293D225(1)025C(2) | 0.6 | 6 | 3.2 | 0.19 |
| 3.3 | A | 293D335(1)025A(2) | 0.8 | 6 | 4.0 | 0.14 |
| 3.3 | B | 293D335(1)025B(2) | 0.8 | 6 | 3.1 | 0.17 |
| 3.3 | C | 293D335(1)025C(2) | 0.8 | 6 | 2.3 | 0.22 |
| 4.7 | A | 293D475(1)025A(2) | 1.2 | 6 | 5.5 | 0.12 |
| 4.7 | B | 293D475(1)025B(2) | 1.2 | 6 | 2.8 | 0.17 |
| 4.7 | C | 293D475(1)025C(2) | 1.2 | 6 | 2.0 | 0.24 |
| 4.7 | D | 293D475(1)025D(2) | 1.2 | 6 | 1.3 | 0.34 |
| 6.8 | B | 293D685(1)025B(2) | 1.7 | 6 | 2.4 | 0.19 |
| 6.8 | C | 293D685(1)025C(2) | 1.7 | 6 | 1.7 | 0.25 |
| 6.8 | D | 293D685(1)025D(2) | 1.7 | 6 | 1.1 | 0.37 |
| 10 | B | 293D106(1)025B(2) | 2.5 | 6 | 2.3 | 0.19 |
| 10 | C | 293D106(1)025C(2) | 2.5 | 6 | 1.5 | 0.27 |
| 10 | D | 293D106(1)025D(2) | 2.5 | 6 | 1.0 | 0.39 |
| 15 | B | 293D156(1)025B(2) | 3.8 | 6 | 2.2 | 0.20 |
| 15 | C | 293D156(1)025C(2) | 3.8 | 6 | 1.2 | 0.30 |
| 15 | D | 293D156(1)025D(2) | 3.8 | 6 | 0.8 | 0.43 |
| 22 | C | 293D226(1)025C(2) | 5.5 | 6 | 1.2 | 0.30 |
| 22 | D | 293D226(1)025D(2) | 5.5 | 6 | 0.7 | 0.46 |
| 22 | E | 293D226(1)025E(2) | 5.5 | 6 | 0.8 | 0.45 |
| 22 | V | 293D226(1)025V(3) | 5.5 | 6 | 0.7 | 0.42 |
| 33 | D | 293D336(1)025D(2) | 8.3 | 6 | 0.7 | 0.46 |
| 33 | E | 293D336(1)025E(2) | 8.3 | 6 | 0.6 | 0.52 |
| 47 | D | 293D476(1)025D(2) | 11.8 | 8 | 0.7 | 0.46 |
| 47 | E | 293D476(1)025E(2) | 11.8 | 6 | 0.6 | 0.52 |
| 35 V_{DC} AT + 85 °C, 23 V_{DC} AT + 125 °C | | | | | | |
| 0.1 | A | 293D104(1)035A(2) | 0.5 | 4 | 20.0 | 0.06 |
| 0.15 | A | 293D154(1)035A(2) | 0.5 | 4 | 18.0 | 0.07 |
| 0.22 | A | 293D224(1)035A(2) | 0.5 | 4 | 15.0 | 0.07 |
| 0.33 | A | 293D334(1)035A(2) | 0.5 | 4 | 13.0 | 0.08 |
| 0.47 | A | 293D474(1)035A(2) | 0.5 | 4 | 10.0 | 0.09 |
| 0.47 | B | 293D474(1)035B(2) | 0.5 | 4 | 8.0 | 0.10 |
| 0.68 | A | 293D684(1)035A(2) | 0.5 | 4 | 7.6 | 0.10 |
| 0.68 | B | 293D684(1)035B(2) | 0.5 | 4 | 6.5 | 0.11 |
| 1 | A | 293D105(1)035A(2) | 0.5 | 4 | 7.5 | 0.10 |
| 1 | B | 293D105(1)035B(2) | 0.5 | 4 | 5.0 | 0.13 |
| 1.5 | B | 293D155(1)035B(2) | 0.5 | 6 | 4.2 | 0.14 |
| 1.5 | C | 293D155(1)035C(2) | 0.5 | 6 | 3.8 | 0.17 |
| 2.2 | B | 293D225(1)035B(2) | 0.8 | 6 | 3.8 | 0.15 |
| 2.2 | C | 293D225(1)035C(2) | 0.8 | 6 | 2.9 | 0.20 |
| 3.3 | B | 293D335(1)035B(2) | 1.2 | 6 | 3.5 | 0.16 |
| 3.3 | C | 293D335(1)035C(2) | 1.2 | 6 | 2.1 | 0.23 |
| 3.3 | D | 293D335(1)035D(2) | 1.2 | 6 | 1.7 | 0.30 |
| 4.7 | B | 293D475(1)035B(2) | 1.7 | 6 | 3.1 | 0.17 |
| 4.7 | C | 293D475(1)035C(2) | 1.6 | 6 | 1.9 | 0.24 |
| 4.7 | D | 293D475(1)035D(2) | 1.6 | 6 | 1.3 | 0.34 |

| RATINGS AND PART NUMBER REFERENCE | | | | | | |
|--|-----------|-------------------|--|--|---|--|
| CAPACITANCE (μ F) | CASE CODE | PART NUMBER | MAX. DC LEAKAGE AT + 25 °C (μ A) | MAX. DF AT + 25 °C 120 Hz (%) | MAX. ESR AT + 25 °C 100 kHz (Ω) | MAX. RIPPLE 100 kHz I_{rms} (A) |
| 35 V_{DC} AT + 85 °C, 23 V_{DC} AT + 125 °C | | | | | | |
| 6.8 | C | 293D685(1)035C(2) | 2.4 | 6 | 1.8 | 0.25 |
| 6.8 | D | 293D685(1)035D(2) | 2.4 | 6 | 1.1 | 0.37 |
| 10 | C | 293D106(1)035C(2) | 3.5 | 6 | 1.6 | 0.26 |
| 10 | D | 293D106(1)035D(2) | 3.5 | 6 | 0.8 | 0.43 |
| 15 | D | 293D156(1)035D(2) | 5.3 | 6 | 0.7 | 0.46 |
| 15 | E | 293D156(1)035E(2) | 5.3 | 6 | 0.7 | 0.49 |
| 22 | D | 293D226(1)035D(2) | 7.7 | 6 | 0.6 | 0.52 |
| 22 | E | 293D226(1)035E(2) | 7.7 | 6 | 0.6 | 0.52 |
| 50 V_{DC} AT + 85 °C, 33 V_{DC} AT + 125 °C | | | | | | |
| 0.1 | A | 293D104(1)050A(2) | 0.5 | 4 | 19.0 | 0.06 |
| 0.15 | A | 293D154(1)050A(2) | 0.5 | 4 | 17.0 | 0.07 |
| 0.15 | B | 293D154(1)050B(2) | 0.5 | 4 | 14.0 | 0.08 |
| 0.22 | A | 293D224(1)050A(2) | 0.5 | 4 | 15.0 | 0.07 |
| 0.22 | B | 293D224(1)050B(2) | 0.5 | 4 | 12.0 | 0.08 |
| 0.33 | A | 293D334(1)050A(2) | 0.5 | 4 | 14.0 | 0.07 |
| 0.33 | B | 293D334(1)050B(2) | 0.5 | 4 | 10.0 | 0.09 |
| 0.47 | A | 293D474(1)050A(2) | 0.5 | 4 | 12.0 | 0.08 |
| 0.47 | B | 293D474(1)050B(2) | 0.5 | 4 | 8.4 | 0.10 |
| 0.47 | C | 293D474(1)050C(2) | 0.5 | 4 | 6.7 | 0.13 |
| 0.68 | B | 293D684(1)050B(2) | 0.5 | 4 | 7.6 | 0.11 |
| 0.68 | C | 293D684(1)050C(2) | 0.5 | 4 | 5.9 | 0.14 |
| 1 | B | 293D105(1)050B(2) | 0.5 | 4 | 6.7 | 0.11 |
| 1 | C | 293D105(1)050C(2) | 0.5 | 4 | 4.6 | 0.16 |
| 1.5 | B | 293D155(1)050B(2) | 0.8 | 6 | 6.0 | 0.12 |
| 1.5 | C | 293D155(1)050C(2) | 0.8 | 6 | 3.4 | 0.18 |
| 1.5 | D | 293D155(1)050D(2) | 0.8 | 6 | 2.9 | 0.23 |
| 2.2 | B | 293D225(1)050B(2) | 1.1 | 6 | 3.5 | 0.16 |
| 2.2 | C | 293D225(1)050C(2) | 1.1 | 6 | 2.9 | 0.20 |
| 2.2 | D | 293D225(1)050D(2) | 1.1 | 6 | 2.1 | 0.27 |
| 3.3 | C | 293D335(1)050C(2) | 1.7 | 6 | 2.5 | 0.21 |
| 3.3 | D | 293D335(1)050D(2) | 1.7 | 6 | 1.7 | 0.30 |
| 4.7 | C | 293D475(1)050C(2) | 2.4 | 6 | 1.5 | 0.27 |
| 4.7 | D | 293D475(1)050D(2) | 2.4 | 6 | 1.2 | 0.37 |
| 4.7 | E | 293D475(1)050E(2) | 2.4 | 6 | 1.4 | 0.34 |
| 6.8 | D | 293D685(1)050D(2) | 3.4 | 6 | 0.9 | 0.41 |
| 6.8 | E | 293D685(1)050E(2) | 3.4 | 6 | 0.9 | 0.43 |
| 10 | D | 293D106(1)050D(2) | 5.0 | 6 | 0.8 | 0.43 |
| 10 | E | 293D106(1)050E(2) | 5.0 | 6 | 0.8 | 0.45 |
| 15 | E | 293D156(1)050E(2) | 7.5 | 6 | 0.8 | 0.45 |
| 63 V_{DC} AT + 85 °C, 40 V_{DC} AT + 125 °C | | | | | | |
| 4.7 | D | 293D475(1)063D(2) | 3.0 | 6 | 1.1 | 0.37 |
| 10 | E | 293D106(1)063E(2) | 6.3 | 6 | 1.0 | 0.41 |

Notes

- (1) Tolerance: X0, X9, X5
- (2) Terminations and packaging: 2TE3, 2WE3, 8T, 8W
- (3) Lead (Pb)-free terminations and packaging codes: 2TE3, 2WE3

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





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