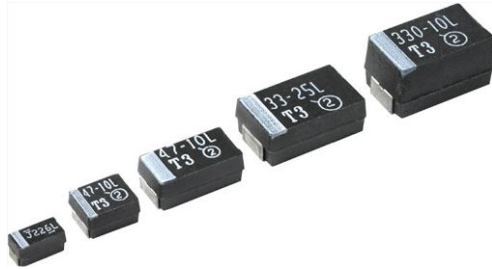


# Solid Tantalum Surface Mount Chip Capacitors

## TANTAMOUNT<sup>®</sup>, Molded Case, Standard Industrial Grade



### 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:** 0.10 µF to 1000 µF

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

**100 % Surge Current Tested (D and E Case Codes)**

**Voltage Rating:** 4 V<sub>DC</sub> to 63 V<sub>DC</sub>

### FEATURES

- Molded case available in six case codes
- Terminations: 100 % matte tin, standard, tin/lead available
- Compatible with “High Volume” automatic pick and place equipment
- Meets IEC specification QC300801/US0001 and EIA535BAAC mechanical and performance requirements
- Moisture sensitivity level 1
- Optical character recognition qualified
- Compliant terminations
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS\***  
COMPLIANT

### Note

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

### APPLICATIONS

- Industrial
- Telecom infrastructure
- General purpose

| 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 %<br>X9 = ± 10 %<br>X5 = ± 5 % (special order) | 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<br>2WE3: Matte tin, 13" (330 mm) reel<br>8T: Tin/lead, 7" (178 mm) reel<br>8W: Tin/lead, 13" (330 mm) reel |

### Notes

- 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.
- We reserve the right to supply better series with more extensive screening.
- Dry pack is available per request, contact regional marketing.

| DIMENSIONS in inches [millimeters] |          |                               |                               |                               |                                |                               |                       |
|------------------------------------|----------|-------------------------------|-------------------------------|-------------------------------|--------------------------------|-------------------------------|-----------------------|
|                                    |          |                               |                               |                               |                                |                               |                       |
| CASE CODE                          | EIA SIZE | L                             | W                             | H                             | P                              | T <sub>w</sub>                | T <sub>H</sub> (MIN.) |
| A                                  | 3216-18  | 0.126 ± 0.008<br>[3.2 ± 0.20] | 0.063 ± 0.008<br>[1.6 ± 0.20] | 0.063 ± 0.008<br>[1.6 ± 0.20] | 0.031 ± 0.012<br>[0.80 ± 0.30] | 0.047 ± 0.004<br>[1.2 ± 0.10] | 0.028<br>[0.70]       |
| B                                  | 3528-21  | 0.138 ± 0.008<br>[3.5 ± 0.20] | 0.110 ± 0.008<br>[2.8 ± 0.20] | 0.075 ± 0.008<br>[1.9 ± 0.20] | 0.031 ± 0.012<br>[0.80 ± 0.30] | 0.087 ± 0.004<br>[2.2 ± 0.10] | 0.028<br>[0.70]       |
| C                                  | 6032-28  | 0.236 ± 0.012<br>[6.0 ± 0.30] | 0.126 ± 0.012<br>[3.2 ± 0.30] | 0.098 ± 0.012<br>[2.5 ± 0.30] | 0.051 ± 0.012<br>[1.3 ± 0.30]  | 0.087 ± 0.004<br>[2.2 ± 0.10] | 0.039<br>[1.0]        |
| D                                  | 7343-31  | 0.287 ± 0.012<br>[7.3 ± 0.30] | 0.169 ± 0.012<br>[4.3 ± 0.30] | 0.110 ± 0.012<br>[2.8 ± 0.30] | 0.051 ± 0.012<br>[1.3 ± 0.30]  | 0.094 ± 0.004<br>[2.4 ± 0.10] | 0.039<br>[1.0]        |
| E                                  | 7343-43  | 0.287 ± 0.012<br>[7.3 ± 0.30] | 0.169 ± 0.012<br>[4.3 ± 0.30] | 0.157 ± 0.012<br>[4.0 ± 0.30] | 0.051 ± 0.012<br>[1.3 ± 0.30]  | 0.094 ± 0.004<br>[2.4 ± 0.10] | 0.039<br>[1.0]        |
| V                                  | 7343-20  | 0.287 ± 0.012<br>[7.3 ± 0.30] | 0.169 ± 0.012<br>[4.3 ± 0.30] | 0.079 max<br>[2.0 max]        | 0.051 ± 0.012<br>[1.3 ± 0.30]  | 0.094 ± 0.004<br>[2.4 ± 0.10] | 0.039<br>[1.0]        |

| RATINGS AND CASE CODES |         |         |           |         |       |         |       |       |      |
|------------------------|---------|---------|-----------|---------|-------|---------|-------|-------|------|
| μF                     | 4 V     | 6.3 V   | 10 V      | 16 V    | 20 V  | 25 V    | 35 V  | 50 V  | 63 V |
| 0.10                   |         |         |           |         |       | A       | 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   |      |
| 1.0                    |         |         | A         | A       | A/B   | A/B     | A/B   | B/C   |      |
| 1.5                    |         | A       | A         | A/B     | 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/B/C   | A/B/C   | A/B/C/D   | 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   | E       |       |       |      |
| 100                    | A/B/C/D | B/C/D/E | B/C/D/E/V | D/E/V   | 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                    | D/E     | E       |           |         |       |         |       |       |      |
| 1000                   | E       | E       |           |         |       |         |       |       |      |

| MARKING              |                              |             |                                   |
|----------------------|------------------------------|-------------|-----------------------------------|
| <p><b>A Case</b></p> | <b>“A” CASE VOLTAGE CODE</b> |             | <p><b>B, C, D, E, V Cases</b></p> |
|                      | <b>VOLTS</b>                 | <b>CODE</b> |                                   |
|                      | 4.0                          | G           |                                   |
|                      | 6.3                          | J           |                                   |
|                      | 10                           | A           |                                   |
|                      | 16                           | C           |                                   |
|                      | 20                           | D           |                                   |
|                      | 25                           | E           |                                   |
| 35                   | V                            |             |                                   |
| 50                   | T                            |             |                                   |

**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.

The Vishay Sprague® trademark is included if space permits. Capacitors rated at 6.3 V are marked 6 V.

A manufacturing date code is marked on all capacitors.

Capacitors may bear a different marking scheme if a part with more extensive screening is substituted. These would include “R” for low ESR series (TR3) or “P” for professional series (TP3).

Call the factory for further explanation.



| STANDARD RATINGS   |           |                   |  |  |   |  |
|--|-----------|-------------------|--|--|---|--|
| CAPACITANCE<br>( $\mu$ F)  | CASE CODE | PART NUMBER       | MAX. DC<br>LEAKAGE<br>AT + 25 °C<br>( $\mu$ A) | MAX. DF<br>AT + 25 °C<br>120 Hz<br>(%) | MAX. ESR<br>AT + 25 °C<br>100 kHz<br>( $\Omega$ ) | MAX. RIPPLE<br>100 kHz<br>$I_{RMS}$<br>(A) |
| <b>4 V<sub>DC</sub> AT + 85 °C; 2.7 V<sub>DC</sub> AT + 125 °C</b> |           |                   |  |  |   |  |
| 2.2  | A         | 293D225(1)004A(2) | 0.5  | 6                                      | 7.60  | 0.10                                       |
| 3.3  | A         | 293D335(1)004A(2) | 0.5  | 6                                      | 7.60  | 0.10                                       |
| 4.7  | A         | 293D475(1)004A(2) | 0.5  | 6                                      | 6.30  | 0.11                                       |
| 4.7  | B         | 293D475(1)004B(2) | 0.5  | 6                                      | 7.00  | 0.11                                       |
| 6.8  | A         | 293D685(1)004A(2) | 0.5  | 6                                      | 5.50  | 0.12                                       |
| 6.8  | B         | 293D685(1)004B(2) | 0.5  | 6                                      | 3.40  | 0.16                                       |
| 10   | A         | 293D106(1)004A(2) | 0.5  | 6                                      | 5.10  | 0.12                                       |
| 10   | B         | 293D106(1)004B(2) | 0.5  | 6                                      | 3.50  | 0.16                                       |
| 15   | A         | 293D156(1)004A(2) | 0.6  | 6                                      | 3.40  | 0.15                                       |
| 15   | B         | 293D156(1)004B(2) | 0.6  | 6                                      | 2.90  | 0.17                                       |
| 15   | C         | 293D156(1)004C(2) | 0.6  | 6                                      | 2.80  | 0.20                                       |
| 22   | A         | 293D226(1)004A(2) | 0.9  | 6                                      | 2.90  | 0.16                                       |
| 22   | B         | 293D226(1)004B(2) | 0.9  | 6                                      | 2.50  | 0.18                                       |
| 22   | C         | 293D226(1)004C(2) | 0.9  | 6                                      | 1.80  | 0.25                                       |
| 33   | A         | 293D336(1)004A(2) | 1.3  | 6                                      | 2.90  | 0.16                                       |
| 33   | B         | 293D336(1)004B(2) | 1.3  | 6                                      | 2.00  | 0.21                                       |
| 33   | C         | 293D336(1)004C(2) | 1.3  | 6                                      | 1.80  | 0.25                                       |
| 47   | A         | 293D476(1)004A(2) | 1.9  | 14                                     | 2.50  | 0.17                                       |
| 47   | B         | 293D476(1)004B(2) | 1.9  | 6                                      | 1.90  | 0.21                                       |
| 47   | C         | 293D476(1)004C(2) | 1.9  | 6                                      | 1.80  | 0.25                                       |
| 68   | B         | 293D686(1)004B(2) | 2.7  | 6                                      | 1.90  | 0.21                                       |
| 68   | C         | 293D686(1)004C(2) | 2.7  | 6                                      | 1.40  | 0.28                                       |
| 68   | D         | 293D686(1)004D(2) | 2.7  | 6                                      | 0.80  | 0.43                                       |
| 100  | A         | 293D107X0004A(2)  | 10.0   | 30                                     | 2.50  | 0.22                                       |
| 100  | B         | 293D107(1)004B(2) | 4.0  | 8                                      | 1.80  | 0.22                                       |
| 100  | C         | 293D107(1)004C(2) | 4.0  | 6                                      | 0.80  | 0.37                                       |
| 100  | D         | 293D107(1)004D(2) | 4.0  | 6                                      | 0.70  | 0.46                                       |
| 120  | D         | 293D127(1)004D(2) | 4.8  | 6                                      | 0.60  | 0.51                                       |
| 150  | B         | 293D157(1)004B(2) | 6.0  | 14                                     | 1.60  | 0.23                                       |
| 150  | C         | 293D157(1)004C(2) | 6.0  | 12                                     | 0.70  | 0.40                                       |
| 150  | D         | 293D157(1)004D(2) | 6.0  | 8                                      | 0.60  | 0.50                                       |
| 220  | B         | 293D227X0004B(2)  | 8.8  | 18                                     | 1.50  | 0.24                                       |
| 220  | C         | 293D227(1)004C(2) | 8.8  | 8                                      | 0.70  | 0.40                                       |
| 220  | D         | 293D227(1)004D(2) | 8.8  | 8                                      | 0.60  | 0.50                                       |
| 220  | E         | 293D227(1)004E(2) | 8.8  | 8                                      | 0.50  | 0.57                                       |
| 330  | D         | 293D337(1)004D(2) | 13.2   | 8                                      | 0.60  | 0.50                                       |
| 330  | E         | 293D337(1)004E(2) | 13.2   | 8                                      | 0.50  | 0.57                                       |
| 470  | D         | 293D477(1)004D(2) | 18.8   | 10                                     | 0.60  | 0.50                                       |
| 470  | E         | 293D477(1)004E(2) | 18.8   | 10                                     | 0.50  | 0.57                                       |
| 680  | D         | 293D687X0004D(2)  | 27.2   | 25                                     | 0.20  | 0.87                                       |
| 680  | E         | 293D687(1)004E(2) | 27.2   | 12                                     | 0.50  | 0.57                                       |
| 1000   | E         | 293D108X0004E(2)  | 40.0   | 20                                     | 0.50  | 0.57                                       |

Note

- Part number definitions:
  - Tolerance: X0, X9
  - Terminations and packaging: 2TE3, 2WE3, 8T, 8W
  - Lead (Pb)-free terminations and packaging codes: 2TE3, 2WE3



| STANDARD RATINGS   |           |                   |  |  |   |  |
|--|-----------|-------------------|--|--|---|--|
| CAPACITANCE<br>( $\mu$ F)  | CASE CODE | PART NUMBER       | MAX. DC<br>LEAKAGE<br>AT + 25 °C<br>( $\mu$ A) | MAX. DF<br>AT + 25 °C<br>120 Hz<br>(%) | MAX. ESR<br>AT + 25 °C<br>100 kHz<br>( $\Omega$ ) | MAX. RIPPLE<br>100 kHz<br>$I_{RMS}$<br>(A) |
| <b>6.3 V<sub>DC</sub> AT + 85 °C; 4 V<sub>DC</sub> AT 125 °C</b> |           |                   |  |  |   |  |
| 1.5  | A         | 293D155(1)6R3A(2) | 0.5  | 6                                      | 2.90  | 0.16                                       |
| 2.2  | A         | 293D225(1)6R3A(2) | 0.5  | 6                                      | 7.60  | 0.10                                       |
| 3.3  | A         | 293D335(1)6R3A(2) | 0.5  | 6                                      | 6.30  | 0.11                                       |
| 3.3  | B         | 293D335(1)6R3B(2) | 0.5  | 6                                      | 5.50  | 0.12                                       |
| 4.7  | A         | 293D475(1)6R3A(2) | 0.5  | 6                                      | 5.50  | 0.12                                       |
| 4.7  | B         | 293D475(1)6R3B(2) | 0.5  | 6                                      | 4.40  | 0.14                                       |
| 6.8  | A         | 293D685(1)6R3A(2) | 0.5  | 6                                      | 5.00  | 0.12                                       |
| 6.8  | B         | 293D685(1)6R3B(2) | 0.5  | 6                                      | 3.40  | 0.16                                       |
| 10   | A         | 293D106(1)6R3A(2) | 0.6  | 6                                      | 3.40  | 0.15                                       |
| 10   | B         | 293D106(1)6R3B(2) | 0.6  | 6                                      | 2.90  | 0.17                                       |
| 10   | C         | 293D106(1)6R3C(2) | 0.6  | 6                                      | 3.00  | 0.19                                       |
| 15   | A         | 293D156(1)6R3A(2) | 0.9  | 6                                      | 2.90  | 0.16                                       |
| 15   | B         | 293D156(1)6R3B(2) | 0.9  | 6                                      | 2.50  | 0.18                                       |
| 15   | C         | 293D156(1)6R3C(2) | 0.9  | 6                                      | 1.80  | 0.25                                       |
| 22   | A         | 293D226(1)6R3A(2) | 1.3  | 6                                      | 2.90  | 0.16                                       |
| 22   | B         | 293D226(1)6R3B(2) | 1.3  | 6                                      | 2.00  | 0.21                                       |
| 22   | C         | 293D226(1)6R3C(2) | 1.3  | 6                                      | 1.80  | 0.25                                       |
| 33   | A         | 293D336(1)6R3A(2) | 2.0  | 14                                     | 2.50  | 0.17                                       |
| 33   | B         | 293D336(1)6R3B(2) | 2.0  | 6                                      | 1.90  | 0.21                                       |
| 33   | C         | 293D336(1)6R3C(2) | 2.0  | 6                                      | 1.50  | 0.27                                       |
| 47   | A         | 293D476(1)6R3A(2) | 2.8  | 12                                     | 1.60  | 0.22                                       |
| 47   | B         | 293D476(1)6R3B(2) | 2.8  | 6                                      | 1.90  | 0.21                                       |
| 47   | C         | 293D476(1)6R3C(2) | 2.8  | 6                                      | 1.40  | 0.28                                       |
| 47   | D         | 293D476(1)6R3D(2) | 2.8  | 6                                      | 0.80  | 0.43                                       |
| 68   | B         | 293D686(1)6R3B(2) | 4.1  | 6                                      | 1.80  | 0.22                                       |
| 68   | C         | 293D686(1)6R3C(2) | 4.1  | 6                                      | 0.80  | 0.37                                       |
| 68   | D         | 293D686(1)6R3D(2) | 4.1  | 6                                      | 0.70  | 0.46                                       |
| 100  | B         | 293D107(1)6R3B(2) | 6.0  | 15                                     | 1.70  | 0.22                                       |
| 100  | C         | 293D107(1)6R3C(2) | 6.0  | 6                                      | 0.80  | 0.37                                       |
| 100  | D         | 293D107(1)6R3D(2) | 6.0  | 6                                      | 0.70  | 0.46                                       |
| 100  | E         | 293D107(1)6R3E(2) | 6.0  | 8                                      | 0.70  | 0.49                                       |
| 120  | D         | 293D127(1)6R3D(2) | 6.3  | 8                                      | 0.70  | 0.46                                       |
| 150  | C         | 293D157(1)6R3C(2) | 9.0  | 8                                      | 0.70  | 0.40                                       |
| 150  | D         | 293D157(1)6R3D(2) | 9.0  | 8                                      | 0.60  | 0.50                                       |
| 150  | E         | 293D157(1)6R3E(2) | 9.0  | 8                                      | 0.50  | 0.57                                       |
| 220  | C         | 293D227(1)6R3C(2) | 13.9   | 14                                     | 0.70  | 0.39                                       |
| 220  | D         | 293D227(1)6R3D(2) | 13.2   | 8                                      | 0.60  | 0.50                                       |
| 220  | E         | 293D227(1)6R3E(2) | 13.2   | 8                                      | 0.50  | 0.57                                       |
| 330  | D         | 293D337(1)6R3D(2) | 19.8   | 8                                      | 0.60  | 0.50                                       |
| 330  | E         | 293D337(1)6R3E(2) | 19.8   | 8                                      | 0.50  | 0.57                                       |
| 470  | D         | 293D477(1)6R3D(2) | 28.2   | 14                                     | 0.50  | 0.55                                       |
| 470  | E         | 293E477(1)6R3E(2) | 28.2   | 10                                     | 1.50  | 0.57                                       |
| 680  | E         | 293D687(1)6R3E(2) | 42.8   | 20                                     | 0.50  | 0.57                                       |
| 1000   | E         | 293D108X06R3E(2)  | 63.0   | 30                                     | 0.40  | 0.64                                       |

**Note**

- Part number definitions:
  - Tolerance: X0, X9
  - Terminations and packaging: 2TE3, 2WE3, 8T, 8W
  - Lead (Pb)-free terminations and packaging codes: 2TE3, 2WE3



| STANDARD RATINGS  |           |                   |  |  |   |  |
|---|-----------|-------------------|--|--|---|--|
| CAPACITANCE<br>( $\mu$ F)                                       | CASE CODE | PART NUMBER       | MAX. DC<br>LEAKAGE<br>AT + 25 °C<br>( $\mu$ A) | MAX. DF<br>AT + 25 °C<br>120 Hz<br>(%) | MAX. ESR<br>AT + 25 °C<br>100 kHz<br>( $\Omega$ ) | MAX. RIPPLE<br>100 kHz<br>$I_{RMS}$<br>(A) |
| <b>10 V<sub>DC</sub> AT + 85 °C; 7 V<sub>DC</sub> AT 125 °C</b> |           |                   |  |  |   |  |
| 0.47  | A         | 293D474(1)010A(2) | 0.5  | 4                                      | 14.00   | 0.07                                       |
| 1.0   | A         | 293D105(1)010A(2) | 0.5  | 4                                      | 9.60  | 0.09                                       |
| 1.5   | A         | 293D155(1)010A(2) | 0.5  | 6                                      | 8.00  | 0.10                                       |
| 2.2   | A         | 293D225(1)010A(2) | 0.5  | 6                                      | 6.30  | 0.11                                       |
| 2.2   | B         | 293D225(1)010B(2) | 0.5  | 6                                      | 4.60  | 0.14                                       |
| 3.3   | A         | 293D335(1)010A(2) | 0.5  | 6                                      | 5.50  | 0.12                                       |
| 3.3   | B         | 293D335(1)010B(2) | 0.5  | 6                                      | 5.50  | 0.12                                       |
| 4.7   | A         | 293D475(1)010A(2) | 0.5  | 6                                      | 5.00  | 0.12                                       |
| 4.7   | B         | 293D475(1)010B(2) | 0.5  | 6                                      | 3.40  | 0.16                                       |
| 4.7   | C         | 293D475(1)010C(2) | 0.5  | 6                                      | 2.30  | 0.22                                       |
| 6.8   | A         | 293D685(1)010A(2) | 0.7  | 6                                      | 4.20  | 0.13                                       |
| 6.8   | B         | 293D685(1)010B(2) | 0.7  | 6                                      | 2.90  | 0.17                                       |
| 6.8   | C         | 293D685(1)010C(2) | 0.7  | 6                                      | 1.90  | 0.24                                       |
| 10  | A         | 293D106(1)010A(2) | 1.0  | 6                                      | 3.40  | 0.15                                       |
| 10  | B         | 293D106(1)010B(2) | 1.0  | 6                                      | 2.50  | 0.18                                       |
| 10  | C         | 293D106(1)010C(2) | 1.0  | 6                                      | 1.80  | 0.25                                       |
| 15  | A         | 293D156(1)010A(2) | 1.5  | 6                                      | 2.90  | 0.16                                       |
| 15  | B         | 293D156(1)010B(2) | 1.5  | 6                                      | 2.00  | 0.21                                       |
| 15  | C         | 293D156(1)010C(2) | 1.5  | 6                                      | 1.80  | 0.25                                       |
| 22  | A         | 293D226(1)010A(2) | 2.2  | 8                                      | 2.50  | 0.17                                       |
| 22  | B         | 293D226(1)010B(2) | 2.2  | 6                                      | 1.90  | 0.21                                       |
| 22  | C         | 293D226(1)010C(2) | 2.2  | 6                                      | 1.50  | 0.27                                       |
| 22  | D         | 293D226(1)010D(2) | 2.2  | 6                                      | 1.50  | 0.32                                       |
| 33  | B         | 293D336(1)010B(2) | 3.3  | 6                                      | 1.90  | 0.21                                       |
| 33  | C         | 293D336(1)010C(2) | 3.3  | 6                                      | 1.40  | 0.28                                       |
| 33  | D         | 293D336(1)010D(2) | 3.3  | 6                                      | 0.80  | 0.43                                       |
| 47  | B         | 293D476(1)010B(2) | 4.7  | 6                                      | 1.80  | 0.22                                       |
| 47  | C         | 293D476(1)010C(2) | 4.7  | 6                                      | 1.10  | 0.32                                       |
| 47  | D         | 293D476(1)010D(2) | 4.7  | 6                                      | 0.70  | 0.46                                       |
| 68  | B         | 293D686(1)010B(2) | 6.8  | 14                                     | 1.80  | 0.22                                       |
| 68  | C         | 293D686(1)010C(2) | 6.8  | 6                                      | 1.00  | 0.33                                       |
| 68  | D         | 293D686(1)010D(2) | 6.8  | 6                                      | 0.70  | 0.46                                       |
| 68  | E         | 293D686(1)010E(2) | 6.8  | 6                                      | 0.80  | 0.45                                       |
| 68  | V         | 293D686(1)010V(3) | 6.8  | 6                                      | 0.70  | 0.42                                       |
| 100   | B         | 293D107X0010B(2)  | 10.0   | 25                                     | 2.50  | 0.18                                       |
| 100   | C         | 293D107(1)010C(2) | 10.0   | 8                                      | 0.90  | 0.35                                       |
| 100   | D         | 293D107(1)010D(2) | 10.0   | 8                                      | 0.60  | 0.50                                       |
| 100   | E         | 293D107(1)010E(2) | 10.0   | 8                                      | 0.70  | 0.49                                       |
| 100   | V         | 293D107(1)010V(3) | 10.0   | 8                                      | 0.70  | 0.42                                       |
| 120   | E         | 293D127(1)010E(2) | 12.0   | 6                                      | 1.00  | 0.41                                       |
| 150   | C         | 293D157X0010C(2)  | 15.0   | 20                                     | 0.90  | 0.35                                       |
| 150   | D         | 293D157(1)010D(2) | 15.0   | 8                                      | 0.60  | 0.50                                       |
| 150   | E         | 293D157(1)010E(2) | 15.0   | 8                                      | 0.50  | 0.57                                       |
| 220   | D         | 293D227(1)010D(2) | 22.0   | 8                                      | 0.60  | 0.50                                       |

Note

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



| STANDARD RATINGS   |           |                   |  |  |   |  |
|--|-----------|-------------------|--|--|---|--|
| CAPACITANCE<br>( $\mu$ F)  | CASE CODE | PART NUMBER       | MAX. DC<br>LEAKAGE<br>AT + 25 °C<br>( $\mu$ A) | MAX. DF<br>AT + 25 °C<br>120 Hz<br>(%) | MAX. ESR<br>AT + 25 °C<br>100 kHz<br>( $\Omega$ ) | MAX. RIPPLE<br>100 kHz<br>$I_{RMS}$<br>(A) |
| <b>10 V<sub>DC</sub> AT + 85 °C; 7 V<sub>DC</sub> AT 125 °C</b>    |           |                   |  |  |   |  |
| 220  | E         | 293D227(1)010E(2) | 22.0   | 8                                      | 0.50  | 0.57                                       |
| 220  | V         | 293D227(1)010V(3) | 30.0   | 12                                     | 0.50  | 0.50                                       |
| 330  | D         | 293D337(1)010D(2) | 33.0   | 15                                     | 0.50  | 0.57                                       |
| 330  | E         | 293D337(1)010E(2) | 33.0   | 10                                     | 0.50  | 0.57                                       |
| 470  | E         | 293D477(1)010E(2) | 47.0   | 15                                     | 0.50  | 0.57                                       |
| <b>16 V<sub>DC</sub> AT + 85 °C; 10 V<sub>DC</sub> AT + 125 °C</b> |           |                   |  |  |   |  |
| 0.68   | A         | 293D684(1)016A(2) | 0.5  | 4                                      | 10.40   | 0.08                                       |
| 1.0  | A         | 293D105(1)016A(2) | 0.5  | 4                                      | 9.30  | 0.09                                       |
| 1.5  | A         | 293D155(1)016A(2) | 0.5  | 6                                      | 6.70  | 0.11                                       |
| 1.5  | B         | 293D155(1)016B(2) | 0.5  | 6                                      | 6.40  | 0.12                                       |
| 2.2  | A         | 293D225(1)016A(2) | 0.5  | 6                                      | 5.90  | 0.11                                       |
| 2.2  | B         | 293D225(1)016B(2) | 0.5  | 6                                      | 4.60  | 0.14                                       |
| 3.3  | A         | 293D335(1)016A(2) | 0.5  | 6                                      | 5.00  | 0.12                                       |
| 3.3  | B         | 293D335(1)016B(2) | 0.5  | 6                                      | 3.50  | 0.16                                       |
| 4.7  | A         | 293D475(1)016A(2) | 0.8  | 6                                      | 5.00  | 0.12                                       |
| 4.7  | B         | 293D475(1)016B(2) | 0.8  | 6                                      | 2.90  | 0.17                                       |
| 4.7  | C         | 293D475(1)016C(2) | 0.8  | 6                                      | 2.90  | 0.19                                       |
| 6.8  | A         | 293D685(1)016A(2) | 1.1  | 6                                      | 4.20  | 0.13                                       |
| 6.8  | B         | 293D685(1)016B(2) | 1.1  | 6                                      | 2.50  | 0.18                                       |
| 6.8  | C         | 293D685(1)016C(2) | 1.1  | 6                                      | 1.90  | 0.24                                       |
| 10   | A         | 293D106(1)016A(2) | 1.6  | 6                                      | 3.00  | 0.16                                       |
| 10   | B         | 293D106(1)016B(2) | 1.6  | 6                                      | 2.00  | 0.21                                       |
| 10   | C         | 293D106(1)016C(2) | 1.6  | 6                                      | 1.80  | 0.25                                       |
| 10   | D         | 293D106(1)016D(2) | 2.5  | 6                                      | 1.20  | 0.35                                       |
| 15   | B         | 293D156(1)016B(2) | 2.4  | 6                                      | 2.00  | 0.21                                       |
| 15   | C         | 293D156(1)016C(2) | 2.4  | 6                                      | 1.50  | 0.27                                       |
| 22   | B         | 293D226(1)016B(2) | 3.5  | 6                                      | 1.90  | 0.21                                       |
| 22   | C         | 293D226(1)016C(2) | 3.5  | 6                                      | 1.40  | 0.28                                       |
| 22   | D         | 293D226(1)016D(2) | 3.5  | 6                                      | 0.80  | 0.43                                       |
| 33   | B         | 293D336(1)016B(2) | 5.3  | 6                                      | 1.80  | 0.22                                       |
| 33   | C         | 293D336(1)016C(2) | 5.3  | 6                                      | 1.10  | 0.32                                       |
| 33   | D         | 293D336(1)016D(2) | 5.3  | 6                                      | 0.70  | 0.46                                       |
| 47   | C         | 293D476(1)016C(2) | 7.5  | 6                                      | 1.00  | 0.33                                       |
| 47   | D         | 293D476(1)016D(2) | 7.5  | 6                                      | 0.70  | 0.46                                       |
| 47   | E         | 293D476(1)016E(2) | 7.5  | 6                                      | 0.80  | 0.45                                       |
| 68   | D         | 293D686(1)016D(2) | 10.9   | 6                                      | 0.60  | 0.50                                       |
| 68   | E         | 293D686(1)016E(2) | 10.9   | 6                                      | 0.80  | 0.45                                       |
| 100  | D         | 293D107(1)016D(2) | 16.0   | 8                                      | 0.60  | 0.50                                       |
| 100  | E         | 293D107(1)016E(2) | 16.0   | 8                                      | 0.60  | 0.52                                       |
| 100  | V         | 293D107(1)16V(3)  | 16.0   | 10                                     | 0.40  | 0.56                                       |
| 150  | D         | 293D157(1)016D(2) | 24.0   | 8                                      | 0.60  | 0.50                                       |
| 150  | E         | 293D157(1)016E(2) | 24.0   | 8                                      | 0.50  | 0.57                                       |
| 220  | E         | 293D227(1)016E(2) | 35.2   | 14                                     | 0.50  | 0.57                                       |

**Note**

- Part number definitions:
  - Tolerance: X0, X9
  - Terminations and packaging: 2TE3, 2WE3, 8T, 8W
  - Lead (Pb)-free terminations and packaging codes: 2TE3, 2WE3



| STANDARD RATINGS   |           |                   |  |  |   |  |
|--|-----------|-------------------|--|--|---|--|
| CAPACITANCE<br>( $\mu$ F)  | CASE CODE | PART NUMBER       | MAX. DC<br>LEAKAGE<br>AT + 25 °C<br>( $\mu$ A) | MAX. DF<br>AT + 25 °C<br>120 Hz<br>(%) | MAX. ESR<br>AT + 25 °C<br>100 kHz<br>( $\Omega$ ) | MAX. RIPPLE<br>100 kHz<br>$I_{RMS}$<br>(A) |
| <b>20 V<sub>DC</sub> AT + 85 °C; 13 V<sub>DC</sub> AT + 125 °C</b> |           |                   |  |  |   |  |
| 0.47   | A         | 293D474(1)020A(2) | 0.5  | 4                                      | 14.00   | 0.07                                       |
| 0.68   | A         | 293D684(1)020A(2) | 0.5  | 4                                      | 10.00   | 0.09                                       |
| 1.0  | A         | 293D105(1)020A(2) | 0.5  | 4                                      | 8.40  | 0.09                                       |
| 1.0  | B         | 293D105(1)020B(2) | 0.5  | 4                                      | 9.00  | 0.10                                       |
| 1.5  | A         | 293D155(1)020A(2) | 0.5  | 6                                      | 6.30  | 0.11                                       |
| 1.5  | B         | 293D155(1)020B(2) | 0.5  | 4.8                                    | 5.60  | 0.12                                       |
| 2.2  | A         | 293D225(1)020A(2) | 0.5  | 6                                      | 5.90  | 0.11                                       |
| 2.2  | B         | 293D225(1)020B(2) | 0.5  | 6                                      | 3.50  | 0.16                                       |
| 3.3  | A         | 293D335(1)020A(2) | 0.7  | 6                                      | 5.90  | 0.11                                       |
| 3.3  | B         | 293D335(1)020B(2) | 0.7  | 6                                      | 3.00  | 0.17                                       |
| 3.3  | C         | 293D335(1)020C(2) | 0.8  | 6                                      | 2.30  | 0.22                                       |
| 4.7  | A         | 293D475(1)020A(2) | 0.9  | 6                                      | 5.00  | 0.12                                       |
| 4.7  | B         | 293D475(1)020B(2) | 0.9  | 6                                      | 2.90  | 0.17                                       |
| 4.7  | C         | 293D475(1)020C(2) | 0.9  | 6                                      | 2.30  | 0.22                                       |
| 6.8  | A         | 293D685(1)020A(2) | 1.4  | 6                                      | 4.50  | 0.13                                       |
| 6.8  | B         | 293D685(1)020B(2) | 1.4  | 6                                      | 2.50  | 0.18                                       |
| 6.8  | C         | 293D685(1)020C(2) | 1.4  | 6                                      | 1.90  | 0.24                                       |
| 10   | B         | 293D106(1)020B(2) | 2.0  | 6                                      | 2.10  | 0.20                                       |
| 10   | C         | 293D106(1)020C(2) | 2.0  | 6                                      | 1.70  | 0.25                                       |
| 10   | D         | 293D106(1)020D(2) | 2.0  | 6                                      | 1.00  | 0.38                                       |
| 15   | B         | 293D156(1)020B(2) | 3.0  | 6                                      | 2.30  | 0.19                                       |
| 15   | C         | 293D156(1)020C(2) | 3.0  | 6                                      | 1.50  | 0.27                                       |
| 15   | D         | 293D156(1)020D(2) | 3.0  | 6                                      | 0.90  | 0.41                                       |
| 22   | B         | 293D226(1)020B(2) | 4.4  | 6                                      | 2.10  | 0.20                                       |
| 22   | C         | 293D226(1)020C(2) | 4.4  | 6                                      | 1.10  | 0.32                                       |
| 22   | D         | 293D226(1)020D(2) | 4.4  | 6                                      | 0.70  | 0.46                                       |
| 33   | C         | 293D336(1)020C(2) | 6.6  | 6                                      | 1.00  | 0.33                                       |
| 33   | D         | 293D336(1)020D(2) | 6.6  | 6                                      | 0.70  | 0.46                                       |
| 47   | D         | 293D476(1)020D(2) | 9.4  | 6                                      | 0.70  | 0.46                                       |
| 47   | E         | 293D476(1)020E(2) | 9.4  | 6                                      | 0.60  | 0.52                                       |
| 68   | D         | 293D686(1)020D(2) | 13.6   | 6                                      | 0.70  | 0.46                                       |
| 68   | E         | 293D686(1)020E(2) | 13.6   | 6                                      | 0.60  | 0.52                                       |
| 100  | D         | 293D107(1)020D(2) | 20.0   | 8                                      | 0.60  | 0.50                                       |
| 100  | E         | 293D107(1)020E(2) | 20.0   | 8                                      | 0.50  | 0.57                                       |
| <b>25 V<sub>DC</sub> AT + 85 °C; 17 V<sub>DC</sub> AT + 125 °C</b> |           |                   |  |  |   |  |
| 0.10   | A         | 293D104(1)025A(2) | 0.5  | 4                                      | 20.00   | 0.06                                       |
| 0.33   | A         | 293D334(1)025A(2) | 0.5  | 4                                      | 13.00   | 0.08                                       |
| 0.47   | A         | 293D474(1)025A(2) | 0.5  | 4                                      | 12.00   | 0.08                                       |
| 0.68   | A         | 293D684(1)025A(2) | 0.5  | 4                                      | 8.40  | 0.09                                       |
| 1.0  | A         | 293D105(1)025A(2) | 0.5  | 4                                      | 7.60  | 0.10                                       |
| 1.0  | B         | 293D105(1)025B(2) | 0.5  | 4                                      | 5.00  | 0.13                                       |
| 1.5  | A         | 293D155(1)025A(2) | 0.5  | 6                                      | 6.70  | 0.11                                       |
| 1.5  | B         | 293D155(1)025B(2) | 0.5  | 6                                      | 4.60  | 0.14                                       |
| 2.2  | A         | 293D225(1)025A(2) | 0.6  | 6                                      | 6.30  | 0.11                                       |

**Note**

- Part number definitions:
  - Tolerance: X0, X9
  - Terminations and packaging: 2TE3, 2WE3, 8T, 8W
  - Lead (Pb)-free terminations and packaging codes: 2TE3, 2WE3



| STANDARD RATINGS   |           |                   |  |  |   |  |
|--|-----------|-------------------|--|--|---|--|
| CAPACITANCE<br>( $\mu$ F)  | CASE CODE | PART NUMBER       | MAX. DC<br>LEAKAGE<br>AT + 25 °C<br>( $\mu$ A) | MAX. DF<br>AT + 25 °C<br>120 Hz<br>(%) | MAX. ESR<br>AT + 25 °C<br>100 kHz<br>( $\Omega$ ) | MAX. RIPPLE<br>100 kHz<br>$I_{RMS}$<br>(A) |
| <b>25 V<sub>DC</sub> AT + 85 °C; 17 V<sub>DC</sub> AT + 125 °C</b> |           |                   |  |  |   |  |
| 2.2  | B         | 293D225(1)025B(2) | 0.6  | 6                                      | 3.80  | 0.15                                       |
| 2.2  | C         | 293D225(1)025C(2) | 0.6  | 6                                      | 3.20  | 0.19                                       |
| 3.3  | A         | 293D335(1)025A(2) | 0.8  | 6                                      | 6.00  | 0.14                                       |
| 3.3  | B         | 293D335(1)025B(2) | 0.8  | 6                                      | 3.10  | 0.17                                       |
| 3.3  | C         | 293D335(1)025C(2) | 0.8  | 6                                      | 2.30  | 0.22                                       |
| 4.7  | A         | 293D475(1)025A(2) | 1.2  | 6                                      | 5.50  | 0.12                                       |
| 4.7  | B         | 293D475(1)025B(2) | 1.2  | 6                                      | 2.80  | 0.17                                       |
| 4.7  | C         | 293D475(1)025C(2) | 1.2  | 6                                      | 2.00  | 0.24                                       |
| 4.7  | D         | 293D475(1)025D(2) | 1.2  | 6                                      | 1.30  | 0.34                                       |
| 6.8  | B         | 293D685(1)025B(2) | 1.7  | 6                                      | 2.40  | 0.19                                       |
| 6.8  | C         | 293D685(1)025C(2) | 1.7  | 6                                      | 1.70  | 0.25                                       |
| 6.8  | D         | 293D685(1)025D(2) | 1.7  | 6                                      | 1.10  | 0.37                                       |
| 10   | B         | 293D106(1)025B(2) | 2.5  | 6                                      | 2.30  | 0.19                                       |
| 10   | C         | 293D106(1)025C(2) | 2.5  | 6                                      | 1.50  | 0.27                                       |
| 10   | D         | 293D106(1)025D(2) | 2.5  | 6                                      | 1.00  | 0.39                                       |
| 15   | B         | 293D156(1)025B(2) | 3.8  | 6                                      | 2.20  | 0.20                                       |
| 15   | C         | 293D156(1)025C(2) | 3.8  | 6                                      | 1.20  | 0.30                                       |
| 15   | D         | 293D156(1)025D(2) | 3.8  | 6                                      | 0.80  | 0.43                                       |
| 22   | C         | 293D226(1)025C(2) | 5.5  | 6                                      | 1.20  | 0.30                                       |
| 22   | D         | 293D226(1)025D(2) | 5.5  | 6                                      | 0.70  | 0.46                                       |
| 22   | E         | 293D226(1)025E(2) | 5.5  | 6                                      | 0.80  | 0.45                                       |
| 22   | V         | 293D226(1)025V(3) | 5.5  | 6                                      | 0.70  | 0.42                                       |
| 33   | D         | 293D336(1)025D(2) | 8.3  | 6                                      | 0.70  | 0.46                                       |
| 33   | E         | 293D336(1)025E(2) | 8.3  | 6                                      | 0.60  | 0.52                                       |
| 47   | D         | 293D476(1)025D(2) | 11.8   | 8                                      | 0.70  | 0.46                                       |
| 47   | E         | 293D476(1)025E(2) | 11.8   | 6                                      | 0.60  | 0.52                                       |
| 68   | E         | 293D686(1)025E(2) | 17.0   | 8                                      | 0.60  | 0.52                                       |
| <b>35 V<sub>DC</sub> AT + 85 °C; 23 V<sub>DC</sub> AT + 125 °C</b> |           |                   |  |  |   |  |
| 0.10   | A         | 293D104(1)035A(2) | 0.5  | 4                                      | 20.00   | 0.06                                       |
| 0.15   | A         | 293D154(1)035A(2) | 0.5  | 4                                      | 18.00   | 0.07                                       |
| 0.22   | A         | 293D224(1)035A(2) | 0.5  | 4                                      | 15.00   | 0.07                                       |
| 0.33   | A         | 293D334(1)035A(2) | 0.5  | 4                                      | 13.00   | 0.08                                       |
| 0.47   | A         | 293D474(1)035A(2) | 0.5  | 4                                      | 10.00   | 0.09                                       |
| 0.47   | B         | 293D474(1)035B(2) | 0.5  | 4                                      | 8.00  | 0.10                                       |
| 0.68   | A         | 293D684(1)035A(2) | 0.5  | 4                                      | 7.60  | 0.10                                       |
| 0.68   | B         | 293D684(1)035B(2) | 0.5  | 4                                      | 6.50  | 0.11                                       |
| 1.0  | A         | 293D105(1)035A(2) | 0.5  | 4                                      | 7.50  | 0.10                                       |
| 1.0  | B         | 293D105(1)035B(2) | 0.5  | 4                                      | 5.00  | 0.13                                       |
| 1.5  | B         | 293D155(1)035B(2) | 0.5  | 6                                      | 4.20  | 0.14                                       |
| 1.5  | C         | 293D155(1)035C(2) | 0.5  | 6                                      | 3.80  | 0.17                                       |
| 2.2  | B         | 293D225(1)035B(2) | 0.8  | 6                                      | 3.80  | 0.15                                       |
| 2.2  | C         | 293D225(1)035C(2) | 0.8  | 6                                      | 2.90  | 0.20                                       |
| 3.3  | B         | 293D335(1)035B(2) | 1.2  | 6                                      | 3.50  | 0.16                                       |
| 3.3  | C         | 293D335(1)035C(2) | 1.2  | 6                                      | 2.10  | 0.23                                       |
| 3.3  | D         | 293D335(1)035D(2) | 1.2  | 6                                      | 1.70  | 0.30                                       |

**Note**

- Part number definitions:
  - Tolerance: X0, X9
  - Terminations and packaging: 2TE3, 2WE3, 8T, 8W
  - Lead (Pb)-free terminations and packaging codes: 2TE3, 2WE3





| STANDARD RATINGS   |           |                   |   |  |   |   |
|--|-----------|-------------------|---|--|---|---|
| CAPACITANCE<br>( $\mu\text{F}$ )                                   | CASE CODE | PART NUMBER       | MAX. DC<br>LEAKAGE<br>AT + 25 °C<br>( $\mu\text{A}$ ) | MAX. DF<br>AT + 25 °C<br>120 Hz<br>(%) | MAX. ESR<br>AT + 25 °C<br>100 kHz<br>( $\Omega$ ) | MAX. RIPPLE<br>100 kHz<br>$I_{\text{RMS}}$<br>(A) |
| <b>35 V<sub>DC</sub> AT + 85 °C; 23 V<sub>DC</sub> AT + 125 °C</b> |           |                   |   |  |   |   |
| 4.7  | B         | 293D475(1)035B(2) | 1.7   | 6                                      | 3.10  | 0.17  |
| 4.7  | C         | 293D475(1)035C(2) | 1.6   | 6                                      | 1.90  | 0.24  |
| 4.7  | D         | 293D475(1)035D(2) | 1.6   | 6                                      | 1.30  | 0.34  |
| 6.8  | C         | 293D685(1)035C(2) | 2.4   | 6                                      | 1.80  | 0.25  |
| 6.8  | D         | 293D685(1)035D(2) | 2.4   | 6                                      | 1.10  | 0.37  |
| 10   | C         | 293D106(1)035C(2) | 3.5   | 6                                      | 1.60  | 0.26  |
| 10   | D         | 293D106(1)035D(2) | 3.5   | 6                                      | 0.80  | 0.43  |
| 15   | D         | 293D156(1)035D(2) | 5.3   | 6                                      | 0.70  | 0.46  |
| 15   | E         | 293D156(1)035E(2) | 5.3   | 6                                      | 0.70  | 0.49  |
| 22   | D         | 293D226(1)035D(2) | 7.7   | 6                                      | 0.60  | 0.50  |
| 22   | E         | 293D226(1)035E(2) | 7.7   | 6                                      | 0.60  | 0.57  |
| <b>50 V<sub>DC</sub> AT + 85 °C; 33 V<sub>DC</sub> AT + 125 °C</b> |           |                   |   |  |   |   |
| 0.10   | A         | 293D104(1)050A(2) | 0.5   | 4                                      | 19.00   | 0.06  |
| 0.15   | A         | 293D154(1)050A(2) | 0.5   | 4                                      | 17.00   | 0.07  |
| 0.15   | B         | 293D154(1)050B(2) | 0.5   | 4                                      | 14.00   | 0.08  |
| 0.22   | A         | 293D224(1)050A(2) | 0.5   | 4                                      | 15.00   | 0.07  |
| 0.22   | B         | 293D224(1)050B(2) | 0.5   | 4                                      | 12.00   | 0.08  |
| 0.33   | A         | 293D334(1)050A(2) | 0.5   | 4                                      | 14.00   | 0.07  |
| 0.33   | B         | 293D334(1)050B(2) | 0.5   | 4                                      | 10.00   | 0.09  |
| 0.47   | A         | 293D474(1)050A(2) | 0.5   | 4                                      | 12.00   | 0.08  |
| 0.47   | B         | 293D474(1)050B(2) | 0.5   | 4                                      | 8.40  | 0.10  |
| 0.47   | C         | 293D474(1)050C(2) | 0.5   | 4                                      | 6.70  | 0.13  |
| 0.68   | B         | 293D684(1)050B(2) | 0.5   | 4                                      | 7.60  | 0.11  |
| 0.68   | C         | 293D684(1)050C(2) | 0.5   | 4                                      | 5.90  | 0.14  |
| 1.0  | B         | 293D105(1)050B(2) | 0.5   | 4                                      | 6.70  | 0.11  |
| 1.0  | C         | 293D105(1)050C(2) | 0.5   | 4                                      | 4.60  | 0.16  |
| 1.5  | B         | 293D155(1)050B(2) | 0.8   | 6                                      | 6.00  | 0.12  |
| 1.5  | C         | 293D155(1)050C(2) | 0.8   | 6                                      | 3.40  | 0.18  |
| 1.5  | D         | 293D155(1)050D(2) | 0.8   | 6                                      | 2.90  | 0.23  |
| 2.2  | B         | 293D225(1)050B(2) | 1.1   | 6                                      | 3.50  | 0.16  |
| 2.2  | C         | 293D225(1)050C(2) | 1.1   | 6                                      | 2.90  | 0.20  |
| 2.2  | D         | 293D225(1)050D(2) | 1.1   | 6                                      | 2.10  | 0.27  |
| 3.3  | C         | 293D335(1)050C(2) | 1.7   | 6                                      | 2.50  | 0.21  |
| 3.3  | D         | 293D335(1)050D(2) | 1.7   | 6                                      | 1.70  | 0.30  |
| 4.7  | C         | 293D475(1)050C(2) | 2.4   | 6                                      | 1.50  | 0.27  |
| 4.7  | D         | 293D475(1)050D(2) | 2.4   | 6                                      | 1.20  | 0.37  |
| 4.7  | E         | 293D475(1)050E(2) | 2.4   | 6                                      | 1.10  | 0.34  |
| 6.8  | D         | 293D685(1)050D(2) | 3.4   | 6                                      | 0.90  | 0.41  |
| 6.8  | E         | 293D685(1)050E(2) | 3.4   | 6                                      | 0.90  | 0.43  |
| 10   | D         | 293D106(1)050D(2) | 5.0   | 6                                      | 0.80  | 0.43  |
| 10   | E         | 293D106(1)050E(2) | 5.0   | 6                                      | 0.80  | 0.45  |
| 15   | E         | 293D156(1)050E(2) | 7.5   | 6                                      | 0.80  | 0.45  |
| <b>63 V<sub>DC</sub> AT + 85 °C; 40 V<sub>DC</sub> AT + 125 °C</b> |           |                   |   |  |   |   |
| 4.7  | D         | 293D475(1)063D(2) | 3.0   | 6                                      | 1.10  | 0.37  |
| 10   | E         | 293D106(1)063E(2) | 6.3   | 6                                      | 1.00  | 0.41  |

**Note**

- Part number definitions:
  - Tolerance: X0, X9
  - Terminations and packaging: 2TE3, 2WE3, 8T, 8W
  - Lead (Pb)-free terminations and packaging codes: 2TE3, 2WE3



**RECOMMENDED VOLTAGE DERATING GUIDELINES** (for temperatures below + 85 °C)

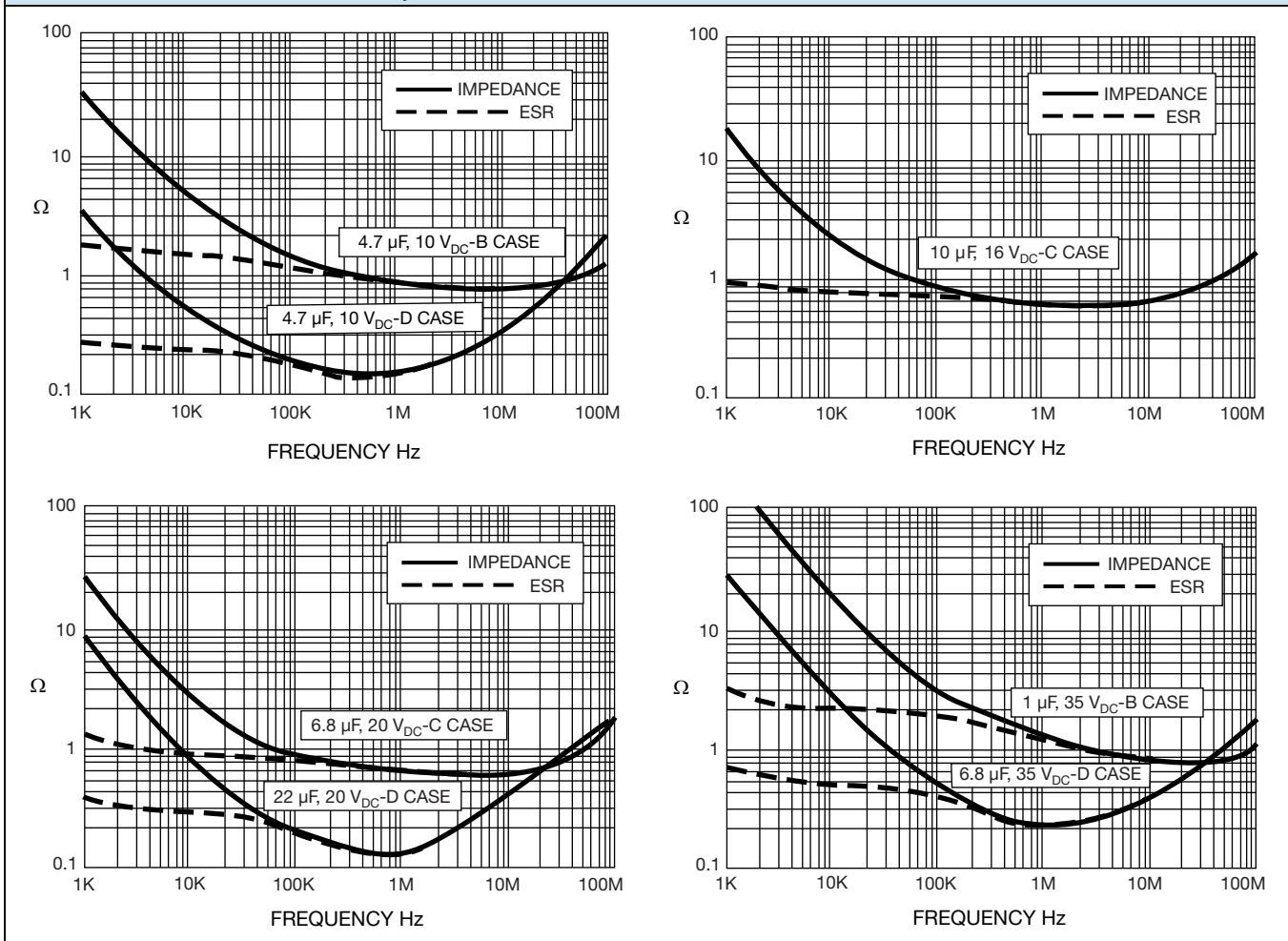
**STANDARD CONDITIONS. FOR EXAMPLE: OUTPUT FILTERS**

| Capacitor Voltage Rating | Operating Voltage |
|--------------------------|-------------------|
| 4.0                      | 2.5               |
| 6.3                      | 3.6               |
| 10                       | 6.0               |
| 16                       | 10                |
| 20                       | 12                |
| 25                       | 15                |
| 35                       | 24                |
| 50                       | 28                |
| 63                       | 36                |

**SEVERE CONDITIONS. FOR EXAMPLE: INPUT FILTERS**

| Capacitor Voltage Rating | Operating Voltage |
|--------------------------|-------------------|
| 4.0                      | 2.5               |
| 6.3                      | 3.3               |
| 10                       | 5.0               |
| 16                       | 8.0               |
| 20                       | 10                |
| 25                       | 12                |
| 35                       | 15                |
| 50                       | 24                |
| 63                       | 31                |

**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                 | 0.075  |
| B                 | 0.085  |
| C                 | 0.110  |
| D                 | 0.150  |
| E                 | 0.165  |
| V                 | 0.125  |

| STANDARD PACKAGING QUANTITY |                |          |
|-----------------------------|----------------|----------|
| CASE CODE                   | UNITS PER REEL |          |
|                             | 7" REEL        | 13" REEL |
| A                           | 2000           | 9000     |
| B                           | 2000           | 8000     |
| C                           | 500            | 3000     |
| D                           | 500            | 2500     |
| E                           | 400            | 1500     |
| V                           | 1000           | 5000     |

| PRODUCT INFORMATION                  |  |
|--------------------------------------|--|
| Guide for Molded Tantalum Capacitors | <a href="http://www.vishay.com/doc?40074">www.vishay.com/doc?40074</a> |
| Pad Dimensions                       |  |
| Packaging Dimensions                 |  |
| 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> |



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**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.**

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