# Wet Tantalum Capacitors, Sintered Anode TANTALEX™, Tantalum Foil Replacement

Type 285D capacitors are commercial replacements for Military Style M39006/01, 02, 03, 04, 16, 17 and are designed to meet the performance requirements of Military Specification MIL-PRF-39006. Internal cells are M39006/22 and M39006/25.

## FEATURES

- High ripple current capability
- Extended temperature range
- Very low impedances over wide frequency ranges
- Long history of reliable operation
- Mounting: axial

## PERFORMANCE CHARACTERISTICS

**Operating Temperature:** -55 °C to +85 °C
(to +125 °C with voltage derating)

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

**DC Leakage Current (DCL Max.):**
at +25 °C, +85 °C, +125 °C: leakage current shall not exceed the values listed in the Standard Ratings Tables

**Life Test:** capacitors are capable of withstanding a 2000 h life test at a temperature of +85 °C or +125 °C at the applicable DC working voltage.

Following the life test:

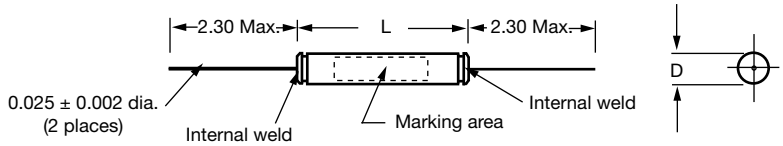
1. DCL shall not exceed the initial requirement.
2. Dissipation factor shall meet the initial requirement.
3. Change in capacitance shall not exceed 10 % from the initial measurement. For capacitors with voltage ratings of 15 $V_{DC}$ and below, change in capacitance shall not exceed + 10 %, - 25 % from the initial measurement.

## ORDERING INFORMATION

| 285D | 126 | X0 | 250 | B | 0 | |
|---|---|---|---|---|---|---|
| MODEL | CAPACITANCE | CAPACITANCE TOLERANCE | DC VOLTAGE RATING AT +85 °C | CASE CODE | STYLE NUMBER | POLARITY |
| | 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 % | This is expressed in volts. To complete the three-digit block, zeros precede the voltage rating. | See Ratings and Case Codes table | 0 = no outer tube<br>2 = outer polyester-film insulation | P = polar<br>N = non polar |

## DIMENSIONS in inches [millimeters]

Case material: Aluminum
Case neutral




| CASE CODE | BARE CASE | | WITH INSULATION SLEEVE | |
|---|---|---|---|---|
| | D ± 0.010 | L ± 0.062 | D (MAX.) | L |
| A | 0.385 [9.78] | 1.850 [46.99] | 0.406 [10.31] | (Sleeve will extend over both ends of the case) |
| B | 0.385 [9.78] | 2.250 [57.15] | 0.406 [10.31] | |
| C | 0.385 [9.78] | 2.700 [68.58] | 0.406 [10.31] | |
| D | 0.385 [9.78] | 3.000 [76.20] | 0.406 [10.31] | |
| E | 0.478 [12.14] | 1.950 [49.53] | 0.500 [12.70] | |
| F | 0.478 [12.14] | 2.380 [60.43] | 0.500 [12.70] | |
| G | 0.478 [12.14] | 3.060 [77.72] | 0.500 [12.70] | |
| H | 0.478 [12.14] | 3.500 [88.90] | 0.500 [12.70] | |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| RATINGS AND CASE CODES, POLAR CAPACITORS | | | | |
|---|---|---|---|---|
| µF | 150 V | 200 V | 250 V | 300 V |
| 1.0 | | | | C |
| 1.5 | | A | | |
| 1.8 | | | A | |
| 2.3 | | A | | |
| 3.4 | | | B | |
| 11 | | B | | |
| 13 | | | B | D |
| 14 | | | | H |
| 21 | | F | | |
| 23 | | | F | |
| 41 | | | G | |
| 43 | | G | | |
| 55 | B | | | |

| RATINGS AND CASE CODES, NON-POLAR CAPACITORS | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| µF | 6 V | 15 V | 25 V | 30 V | 50 V | 75 V | 100 V | 125 V | 150 V | 200 V | 250 V |
| 1.2 | | | | | | | | | | E | |
| 1.7 | | | | | | | | | | | E |
| 1.8 | | | | | | | | A | | | |
| 5.0 | | | | | | | A | | | | |
| 7.0 | | | | | | | | B | | | |
| 8.3 | | | | | | | | | E | | |
| 11 | | | | | | A | B | | | | |
| 15 | | | | | | | F | | | | |
| 23.5 | | | | | | | | F | | | |
| 28 | | | | | | | | G | | | |
| 34 | | | A | | A | | | | | | |
| 41 | | | | | | B | | | | | |
| 55 | | | | | | G | | | | | |
| 58 | | | | A | | | | | | | |
| 60 | | | | | B | | | | | | |
| 135 | | | B | | | | | | | | |
| 235 | | | | B | F | | | | | | |
| 340 | | | | | G | | | | | | |
| 410 | B | F | | | | | | | | | |


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## STANDARD RATINGS POLAR CAPACITORS

| CAPACITANCE (µF) | CASE CODE | PART NUMBER | MAX. DCL (µA) | | | Z MAX. IMPEDANCE AT -55 °C 120 Hz (Ω) | CAPACITANCE CHANGE (%) | | | DF (%) | RIPPLE CURRENT [1] (mA) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 25 °C | 85 °C | 125 °C | | -55 °C | 85 °C | 125 °C | | |
| **150 $V_{DC}$ AT 85 °C; 100 $V_{DC}$ AT +125 °C** | | | | | | | | | | | |
| 55 | B | 285D556(1)150B(2)P | 2 | 10 | 10 | 48 | -35 | 6 | 10 | 10 | 1650 |
| **200 $V_{DC}$ AT 85 °C; 135 $V_{DC}$ AT +125 °C** | | | | | | | | | | | |
| 1.5 | A | 285D155(1)200A(2)P | 1 | 2 | 2 | 1420 | -16 | 7 | 8 | 3 | 400 |
| 2.3 | A | 285D235(1)200A(2)P | 1 | 2 | 2 | 995 | -16 | 7 | 8 | 3 | 565 |
| 11 | B | 285D116(1)200B(2)P | 1 | 9 | 9 | 200 | -16 | 8 | 8 | 8 | 970 |
| 21 | F | 285D216(1)200F(2)P | 2 | 17 | 17 | 140 | -20 | 8 | 8 | 8.5 | 1335 |
| 43 | G | 285D436(1)200G(2)P | 9 | 36 | 36 | 60 | -25 | 15 | 15 | 10 | 1800 |
| **250 $V_{DC}$ AT 85 °C; 165 $V_{DC}$ AT +125 °C** | | | | | | | | | | | |
| 1.8 | A | 285D185(1)250A(2)P | 1 | 2 | 2 | 1200 | -16 | 7 | 8 | 3 | 520 |
| 3.4 | B | 285D345(1)250B(2)P | 3 | 12 | 12 | 600 | -14 | 10 | 12 | 6 | 700 |
| 13 | B | 285D136(1)250B(2)P | 5 | 24 | 24 | 180 | -18 | 12 | 15 | 7.2 | 1200 |
| 23 | F | 285D236(1)250F(2)P | 10 | 40 | 40 | 100 | -26 | 14 | 16 | 8 | 1500 |
| 41 | G | 285D416(1)250G(2)P | 12 | 48 | 48 | 64 | -30 | 15 | 17 | 17.4 | 1900 |
| **300 $V_{DC}$ AT 85 °C; 200 $V_{DC}$ AT +125 °C** | | | | | | | | | | | |
| 1.0 | C | 285D105(1)300C(2)P | 1 | 2 | 2 | 2130 | -16 | 7 | 8 | 2.8 | 400 |
| 13 | D | 285D136(1)300D(2)P | 5 | 24 | 24 | 240 | -20 | 12 | 15 | 10 | 1300 |
| 14 | H | 285D146(1)300H(2)P | 2 | 17 | 17 | 210 | -20 | 8 | 8 | 8.5 | 1335 |

**Notes**

- Part number definitions:

  (1) Capacitance tolerance:
  X0 = 20 %,
  X9 = 10 %

  (2) Style number or case insulation:
  0 = no insulation,
  2 = polyester film insulation

[1] Ripple current is at 40 kHz and is govern by the ripple current multipliers associated with MIL-PRF-39006/22 and MIL-PRF-39006/25. All capacitance, DF and Z measurements are based on 120 Hz frequency and equivalent series circuit measuring equipment settings. Other ratings are available. Contact factory with inquiry.


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| STANDARD RATINGS NON-POLAR CAPACITORS | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CAPACITANCE (µF) | CASE CODE | PART NUMBER | MAX. DCL (µA) | | | Z MAX. IMPEDANCE AT -55 °C 120 Hz (Ω) | CAPACITANCE CHANGE (%) | | | DF (%) | RIPPLE CURRENT [1] (mA) |
| | | | 25 °C | 85 °C | 125 °C | | -55 °C | 85 °C | 125 °C | | |
| **6 $V_{DC}$ AT 85 °C; 4 $V_{DC}$ AT +125 °C** | | | | | | | | | | | |
| 410 | B | 285D417(1)006B(2)N | 3 | 14 | 14 | 36 | -88 | 16 | 20 | 155 | 1500 |
| **15 $V_{DC}$ AT 85 °C; 10 $V_{DC}$ AT +125 °C** | | | | | | | | | | | |
| 410 | F | 285D417(1)015F(2)N | 6 | 24 | 24 | 44 | -77 | 20 | 25 | 3.6 | 1800 |
| **25 $V_{DC}$ AT 85 °C; 15 $V_{DC}$ AT +125 °C** | | | | | | | | | | | |
| 34 | A | 285D346(1)025A(2)N | 2 | 9 | 9 | 180 | -40 | 12 | 15 | 22 | 850 |
| 135 | B | 285D147(1)025B(2)N | 3 | 16 | 16 | 66 | -62 | 13 | 16 | 55 | 1400 |
| **30 $V_{DC}$ AT 85 °C; 20 $V_{DC}$ AT +125 °C** | | | | | | | | | | | |
| 58 | A | 285D586(1)030A(2)N | 1 | 5 | 5 | 60 | -38 | 8 | 12 | 12 | 1200 |
| 235 | B | 285D247(1)030B(2)N | 2 | 10 | 10 | 30 | -65 | 10 | 18 | 30 | 1800 |
| **50 $V_{DC}$ AT 85 °C; 30 $V_{DC}$ AT +125 °C** | | | | | | | | | | | |
| 34 | A | 285D346(1)050A(2)N | 1 | 5 | 5 | 66 | -25 | 8 | 15 | 7.6 | 1050 |
| 60 | B | 285D606(1)050B(2)N | 4 | 24 | 24 | 98 | -42 | 12 | 15 | 23 | 1200 |
| 235 | F | 285D247(1)050F(2)N | 3 | 25 | 25 | 20 | -45 | 8 | 15 | 31 | 2100 |
| 340 | G | 285D347(1)050G(2)N | 5 | 40 | 40 | 16 | -58 | 10 | 20 | 35 | 2750 |
| **75 $V_{DC}$ AT 85 °C; 50 $V_{DC}$ AT +125 °C** | | | | | | | | | | | |
| 11 | A | 285D116(1)075A(2)N | 3 | 12 | 12 | 314 | -19 | 10 | 12 | 8.5 | 600 |
| 41 | B | 285D416(1)075B(2)N | 4 | 24 | 24 | 126 | -30 | 12 | 15 | 15.2 | 1000 |
| 55 | G | 285D556(1)075G(2)N | 9 | 36 | 36 | 58 | -35 | 20 | 20 | 12 | 1850 |
| **100 $V_{DC}$ AT 85 °C; 65 $V_{DC}$ AT +125 °C** | | | | | | | | | | | |
| 5 | A | 285D505(1)100A(2)N | 3 | 12 | 12 | 400 | -35 | 16 | 20 | 4.5 | 800 |
| 11 | B | 285D116(1)100B(2)N | 1 | 9 | 9 | 200 | -16 | 8 | 8 | 7.5 | 965 |
| 15 | F | 285D156(1)100F(2)N | 2 | 12 | 12 | 160 | -16 | 8 | 8 | 7 | 1240 |
| **125 $V_{DC}$ AT 85 °C; 87 $V_{DC}$ AT +125 °C** | | | | | | | | | | | |
| 1.8 | A | 285D185(1)125A(2)N | 1 | 2 | 2 | 1200 | -16 | 7 | 8 | 2.7 | 520 |
| 7.0 | B | 285D705(1)125B(2)N | 1 | 7 | 7 | 334 | -16 | 7 | 8 | 6 | 860 |
| 23.5 | F | 285D246(1)125F(2)N | 10 | 40 | 40 | 100 | -26 | 14 | 16 | 7.9 | 1200 |
| 28 | G | 285D286(1)125G(2)N | 10 | 40 | 40 | 64 | -25 | 15 | 15 | 6.5 | 1800 |
| **150 $V_{DC}$ AT 85 °C; 100 $V_{DC}$ AT +125 °C** | | | | | | | | | | | |
| 8.3 | E | 285D835(1)150E(2)N | 1 | 5 | 5 | 264 | -25 | 5 | 9 | 10 | 1050 |
| **200 $V_{DC}$ AT 85 °C; 150 $V_{DC}$ AT +125 °C** | | | | | | | | | | | |
| 1.2 | E | 285D125(1)200E(2)N | 1 | 2 | 2 | 2260 | -16 | 7 | 8 | 3 | 600 |
| **250 $V_{DC}$ AT 85 °C; 165 $V_{DC}$ AT +125 °C** | | | | | | | | | | | |
| 1.7 | E | 285D175(1)250E(2)N | 3 | 12 | 12 | 1200 | -14 | 10 | 12 | 6 | 700 |

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