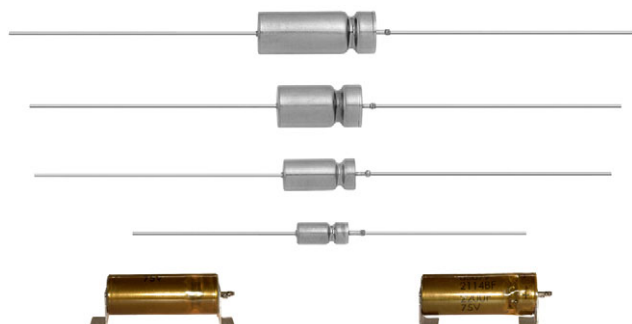




## Wet Tantalum Capacitors Tantalum-Case With Glass-to-Tantalum Hermetic Seal for -55 °C to +125 °C Operation, Low ESR



### LINKS TO ADDITIONAL RESOURCES



### FEATURES

- Models:
  - 136D - axial through-hole terminations
  - 136J - SMD, outward L-leaded terminations
  - 136L - SMD, inward L-leaded terminations
  - 136P - SMD, low profile outward L-leaded terminations
  - 136S - SMD, low profile inward L-leaded terminations
- Military specification MIL-PRF-39006/30 and 39006/31. model 136D capacitors are commercial equivalents of military style CLR90 and CLR91
- Capacitors to meet the MIL-specs must be ordered by M39006 part numbers shown in the relative specification
- Terminations: standard tin / lead (SnPb), 100 % tin (RoHS-compliant) available
- Standard and extended ratings
- Low ESR
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS\***  
Available

**HALOGEN**  
**FREE**

**GREEN**  
(5-2008)  
Available

### Note

\* This datasheet provides information about parts that are RoHS-compliant and / or parts that are non RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details

### PERFORMANCE CHARACTERISTICS

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

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

**DC Leakage Current (DCL Max.):** at +25 °C and above: 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 rated DC working voltage.

Following life test:

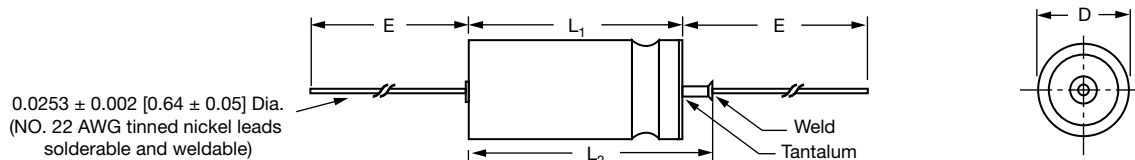
1. DCL, measured at +85 °C rated voltage, shall not be in excess of the original requirement.
2. The equivalent series resistance shall not exceed 150 % of the initial requirement.
3. Change in capacitance shall not exceed 10 % from the initial measurement.

### ORDERING INFORMATION

| 136D<br>MODEL                                                                                                                                                                                                                                           | 306<br>CAPACITANCE                                                                                                            | X0<br>CAPACITANCE<br>TOLERANCE                       | 006<br>DC VOLTAGE<br>RATING AT +85 °C                                                                                                                 | C<br>CASE<br>CODE                | 2<br>STYLE NUMBER                                                                                                                          | E3<br>RoHS-<br>COMPLIANT                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| 136D = axial through-hole leaded terminations<br>136J = SMD, outward L-leaded terminations<br>136L = SMD, inward L-leaded terminations<br>136P = low profile SMD, outward L-leaded terminations<br>136S = low profile SMD, inward L-leaded terminations | This is expressed in picofarads. The first two digits are the significant figures. The third is the number of zeros to follow | X0 = $\pm 20$ %<br>X9 = $\pm 10$ %<br>X5 = $\pm 5$ % | This is expressed in volts. To complete the three-digit block, zeros precede the voltage rating. A decimal point is indicated by an "R" (6R3 = 6.3 V) | See Ratings and Case Codes table | Standard temperature (max. +125 °C)<br>0 = no insulating sleeve<br>2 = polyester insulation sleeve<br>3 = high temperature film insulation | E3 = 100 % tin termination (RoHS-compliant design)<br>Blank = SnPb termination (standard design) |

### Notes

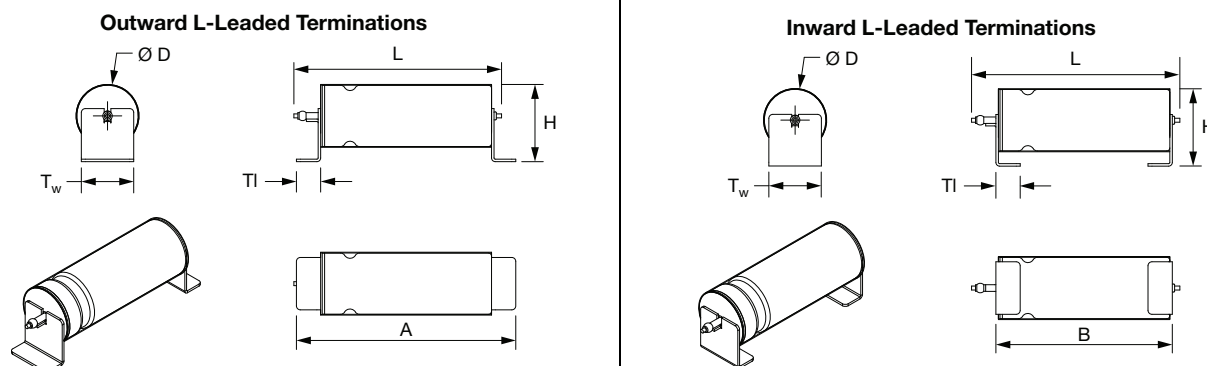
- Packaging: the use of formed plastic trays for packaging these axial lead components is standard. Tape and reel is not available due to the unit weight
- Contact marketing for SMD capacitors availability
- Capacitors with SMD terminations are available only with high temperature (Kapton) film insulation

**AXIAL PRODUCT DIMENSIONS** in inches [millimeters]


| TYPE 136D | CLR 90 / 91<br>EQUIV. | D<br>± 0.016 [0.41] | L <sub>1</sub><br>+ 0.031 [0.79]<br>- 0.016 [0.41] | L <sub>2</sub><br>(Max.) | E<br>± 0.250 [6.35] | WEIGHT<br>(g)<br>(Max.) |
|-----------|-----------------------|---------------------|----------------------------------------------------|--------------------------|---------------------|-------------------------|
| CASE CODE |                       |                     |                                                    |                          |                     |                         |
| C         | T1                    | 0.188 [4.78]        | 0.453 [11.51]                                      | 0.734 [18.64]            | 1.500 [38.10]       | 2.6                     |
| F         | T2                    | 0.281 [7.14]        | 0.641 [16.28]                                      | 0.922 [23.42]            | 2.250 [57.15]       | 6.2                     |
| T         | T3                    | 0.375 [9.53]        | 0.766 [19.46]                                      | 1.047 [26.59]            | 2.250 [57.15]       | 11.6                    |
| K         | T4                    | 0.375 [9.53]        | 1.062 [26.97]                                      | 1.343 [34.11]            | 2.250 [57.15]       | 17.7                    |

**Note**

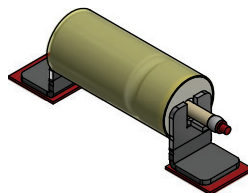
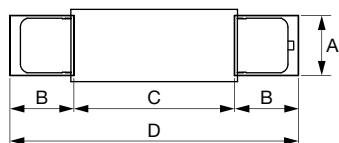
- For insulated parts, add 0.015" [0.38] to the diameter. The insulation shall lap over the ends of the capacitor body

**SMD PRODUCT DIMENSIONS** in inches [millimeters]


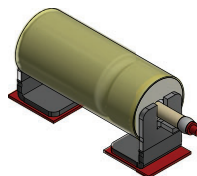
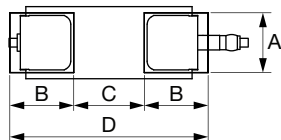
| TYPE      | 136J / 136L / 136P / 136S |              |              |               | 136J / 136P  | 136L / 136S  | 136J / 136L  | 136P / 136S    |
|-----------|---------------------------|--------------|--------------|---------------|--------------|--------------|--------------|----------------|
| CASE CODE | D<br>(max.)               | L<br>(max.)  | TI<br>(max.) | Tw<br>± 0.008 | A<br>(max.)  | B<br>(max.)  | H<br>(max.)  | LP H<br>(max.) |
| C         | 0.228 [5.8]               | 0.705 [17.9] | 0.157 [4.0]  | 0.158 [4.0]   | 0.773 [19.6] | 0.513 [13.0] | 0.296 [7.5]  |                |
| F         | 0.300 [7.6]               | 0.903 [22.9] | 0.157 [4.0]  | 0.217 [5.5]   | 1.001 [25.4] | 0.720 [18.3] | 0.374 [9.5]  |                |
| T         | 0.397 [10.1]              | 1.051 [26.7] | 0.157 [4.0]  | 0.331 [8.4]   | 1.143 [29.0] | 0.858 [21.8] | 0.492 [12.5] |                |
| K         | 0.397 [10.1]              | 1.343 [34.1] | 0.157 [4.0]  | 0.331 [8.4]   | 1.432 [36.4] | 1.140 [29.0] | 0.492 [12.5] | 0.421 [10.7]   |

**Note**

- Use appropriate adhesive between capacitor body and the board for improved mechanical strength

**PAD DIMENSIONS** in inches [millimeters]

**STYLE J, P**

| CASE CODE | A (min.)     | B (nom.)     | C (nom.)      | D (nom.)      |
|-----------|--------------|--------------|---------------|---------------|
| C         | 0.173 [4.40] | 0.185 [4.70] | 0.465 [11.80] | 0.835 [21.20] |
| F         | 0.232 [5.90] | 0.185 [4.70] | 0.650 [16.50] | 1.020 [25.90] |
| T         | 0.346 [8.80] | 0.185 [4.70] | 0.783 [19.90] | 1.154 [29.30] |
| K         | 0.346 [8.80] | 0.185 [4.70] | 1.059 [26.90] | 1.429 [36.30] |


**STYLE L, S**

| CASE CODE | A (min.)     | B (nom.)     | C (nom.)      | D (nom.)      |
|-----------|--------------|--------------|---------------|---------------|
| C         | 0.173 [4.40] | 0.185 [4.70] | 0.205 [5.20]  | 0.575 [14.60] |
| F         | 0.232 [5.90] | 0.185 [4.70] | 0.390 [9.90]  | 0.760 [19.30] |
| T         | 0.346 [8.80] | 0.185 [4.70] | 0.527 [13.39] | 0.897 [22.79] |
| K         | 0.346 [8.80] | 0.185 [4.70] | 0.800 [20.32] | 1.170 [29.72] |

**RATINGS AND CASE CODES** (Standard)

| μF  | 6 V | 8 V | 10 V | 15 V | 25 V | 30 V | 35 V | 50 V | 60 V | 75 V | 100 V | 125 V |
|-----|-----|-----|------|------|------|------|------|------|------|------|-------|-------|
| 1.7 |     |     |      |      |      |      |      |      |      |      |       | C     |
| 2.5 |     |     |      |      |      |      |      |      |      |      | C     |       |
| 3.5 |     |     |      |      |      |      |      |      |      | C    |       |       |
| 3.6 |     |     |      |      |      |      |      |      |      |      |       | C     |
| 4.0 |     |     |      |      |      |      |      |      | C    |      |       |       |
| 4.7 |     |     |      |      |      |      |      |      |      |      | C     |       |
| 5.0 |     |     |      |      |      |      |      | C    |      |      |       |       |
| 6.8 |     |     |      |      |      |      |      |      |      | C    |       |       |
| 8.0 |     |     |      |      |      | C    |      |      |      |      |       |       |
| 8.2 |     |     |      |      |      |      |      |      | C    |      |       |       |
| 9.0 |     |     |      |      |      |      |      |      |      |      |       | F     |
| 10  |     |     |      |      | C    |      |      | C    |      |      |       |       |
| 11  |     |     |      |      |      |      |      |      |      |      | F     |       |
| 14  |     |     |      |      |      |      |      |      |      |      |       | F     |
| 15  |     |     |      | C    |      | C    | C    |      |      | F    |       |       |
| 18  |     |     |      |      |      |      |      |      |      |      |       | T     |
| 20  |     |     | C    |      |      |      |      |      | F    |      |       |       |
| 22  |     |     |      |      | C    |      |      |      |      |      | F     |       |



| RATINGS AND CASE CODES (Standard) |     |     |      |      |      |      |      |      |      |      |       |       |
|-----------------------------------|-----|-----|------|------|------|------|------|------|------|------|-------|-------|
| $\mu\text{F}$                     | 6 V | 8 V | 10 V | 15 V | 25 V | 30 V | 35 V | 50 V | 60 V | 75 V | 100 V | 125 V |
| 25                                |     | C   |      |      |      |      |      | F    |      |      | T     | T     |
| 30                                | C   |     |      |      |      |      |      |      |      |      | T     |       |
| 33                                |     |     |      | C    |      |      |      |      |      | F    |       |       |
| 39                                |     |     |      |      |      |      |      |      | F    |      |       |       |
| 40                                |     |     |      |      |      | F    |      |      |      | T    |       |       |
| 43                                |     |     |      |      |      |      |      |      |      |      | T     |       |
| 47                                |     |     | C    |      |      |      |      | F    |      |      |       |       |
| 50                                |     |     |      |      | F    |      |      |      | T    |      |       |       |
| 56                                |     | C   |      |      |      |      |      |      |      | T    | K     | K     |
| 60                                |     |     |      |      |      |      |      | T    |      |      |       |       |
| 68                                | C   |     |      |      |      | F    | F    |      | T    |      |       |       |
| 70                                |     |     |      | F    |      |      |      |      |      |      |       |       |
| 82                                |     |     |      |      |      |      |      | T    |      |      |       |       |
| 86                                |     |     |      |      |      |      |      |      |      |      | K     |       |
| 100                               |     |     | F    |      | F    | T    |      |      |      |      |       |       |
| 110                               |     |     |      |      |      |      |      |      |      | K    |       |       |
| 120                               |     | F   |      | F    | T    |      |      |      |      |      |       |       |
| 140                               | F   |     |      |      |      |      |      |      | K    |      |       |       |
| 150                               |     |     |      |      |      | T    |      |      |      |      |       |       |
| 160                               |     |     |      |      |      |      |      | K    |      |      |       |       |
| 170                               |     |     |      | T    |      |      |      |      |      |      |       |       |
| 180                               |     |     | F    |      | T    |      |      |      |      |      |       |       |
| 220                               |     | F   |      |      |      |      |      |      |      |      |       |       |
| 250                               |     |     | T    |      |      |      |      |      |      |      |       |       |
| 270                               | F   |     |      | T    |      |      | K    |      |      |      |       |       |
| 290                               |     | T   |      |      |      |      |      |      |      |      |       |       |
| 300                               |     |     |      |      |      | K    |      |      |      |      |       |       |
| 330                               | T   |     |      |      |      |      |      |      |      |      |       |       |
| 350                               |     |     |      |      | K    |      |      |      |      |      |       |       |
| 390                               |     |     | T    |      |      |      |      |      |      |      |       |       |
| 430                               |     | T   |      |      |      |      |      |      |      |      |       |       |
| 540                               |     |     |      | K    |      |      |      |      |      |      |       |       |
| 560                               | T   |     |      |      |      |      |      |      |      |      |       |       |
| 750                               |     |     | K    |      |      |      |      |      |      |      |       |       |
| 850                               |     | K   |      |      |      |      |      |      |      |      |       |       |
| 1200                              | K   |     |      |      |      |      |      |      |      |      |       |       |



| RATINGS AND CASE CODES (Extended) |     |     |      |      |      |      |      |      |      |      |      |      |       |       |
|-----------------------------------|-----|-----|------|------|------|------|------|------|------|------|------|------|-------|-------|
| μF                                | 6 V | 8 V | 10 V | 15 V | 25 V | 30 V | 35 V | 40 V | 50 V | 60 V | 63 V | 75 V | 100 V | 125 V |
| 6.8                               |     |     |      |      |      |      |      |      |      |      |      |      |       | C     |
| 10                                |     |     |      |      |      |      |      |      |      |      |      |      | C     |       |
| 12                                |     |     |      |      |      |      |      |      |      |      |      | C    |       |       |
| 18                                |     |     |      |      |      |      |      |      |      | C    |      |      |       |       |
| 22                                |     |     |      |      |      |      |      |      |      |      |      | C    |       |       |
| 27                                |     |     |      |      |      |      |      |      |      | C    |      |      |       | F     |
| 33                                |     |     |      |      |      |      |      |      | C    |      |      |      |       |       |
| 39                                |     |     |      |      |      |      | C    | C    |      |      |      |      | F     |       |
| 47                                |     |     |      |      | C    | C    |      |      |      |      |      |      |       | T     |
| 56                                |     |     |      |      | C    | C    |      |      |      |      |      |      | T     | T     |
| 68                                |     |     |      |      | C    |      |      |      |      |      |      | F    | T     | K     |
| 82                                |     |     |      | C    |      |      |      |      |      | F    |      | F    |       | K     |
| 100                               |     |     |      | C    |      |      |      |      | F    | F    | F    |      |       |       |
| 120                               |     |     | C    |      |      |      | F    |      | F    |      |      |      | K     |       |
| 150                               |     |     | C    |      |      | F    |      |      |      |      |      |      |       |       |
| 180                               |     | C   |      |      | F    |      |      |      |      |      |      | T    |       |       |
| 220                               | C   |     |      |      |      | F    |      |      |      | T    |      | K    |       |       |
| 270                               |     |     |      | F    | F    |      |      |      | T    | K    |      |      |       |       |
| 300                               |     |     |      |      |      |      |      |      |      |      |      | K    |       |       |
| 330                               |     |     |      |      |      |      | T    |      | K    | K    |      |      |       |       |
| 370                               |     |     |      |      |      |      | K    |      |      |      |      |      |       |       |
| 390                               |     |     | F    | F    |      | T    |      |      |      |      |      |      |       |       |
| 470                               |     |     |      |      | T    | T    |      |      |      |      |      |      |       |       |
| 560                               | F   |     | F    |      | T    | K    |      |      |      |      |      |      |       |       |
| 680                               |     | F   |      | T    | K    |      |      |      |      |      |      |      |       |       |
| 820                               | F   |     |      | T    |      |      |      |      |      |      |      |      |       |       |
| 1000                              |     |     |      | K    |      |      |      |      |      |      |      |      |       |       |
| 1200                              | T   |     | T    |      |      |      |      |      |      |      |      |      |       |       |
| 1500                              | T   | T   | K    |      |      |      |      |      |      |      |      |      |       |       |
| 1800                              |     | K   |      |      |      |      |      |      |      |      |      |      |       |       |
| 2200                              | K   |     |      |      |      |      |      |      |      |      |      |      |       |       |



| STANDARD RATINGS                                            |              |                            |                            |                            |               |                   |                  |        |         |                          |
|-------------------------------------------------------------|--------------|----------------------------|----------------------------|----------------------------|---------------|-------------------|------------------|--------|---------|--------------------------|
| CAPACITANCE<br>(μF)                                         | CASE<br>CODE | PART NUMBER <sup>(1)</sup> | MAX. ESR                   | MAX. IMP.                  | MAX. DCL (μA) |                   | MAX. CAPACITANCE |        |         | MAX.                     |
|                                                             |              |                            | AT +25 °C<br>120 Hz<br>(Ω) | AT -55 °C<br>120 Hz<br>(Ω) | AT            |                   | CHANGE<br>(%) AT |        | 40 kHz  |                          |
|                                                             |              |                            |                            |                            | +25 °C        | +85 °C<br>+125 °C | -55 °C           | +85 °C | +125 °C | I <sub>RMS</sub><br>(mA) |
| 6 V <sub>DC</sub> AT +85 °C; 4 V <sub>DC</sub> AT +125 °C   |              |                            |                            |                            |               |                   |                  |        |         |                          |
| 30                                                          | C            | 136(1)306(2)0006C(3)(4)    | 1.99                       | 100                        | 1             | 2                 | -40              | +10.5  | +12     | 820                      |
| 68                                                          | C            | 136(1)686(2)0006C(3)(4)    | 1.58                       | 60                         | 1             | 2                 | -40              | +14    | +16     | 960                      |
| 140                                                         | F            | 136(1)147(2)0006F(3)(4)    | 0.99                       | 40                         | 1             | 3                 | -40              | +14    | +16     | 1200                     |
| 270                                                         | F            | 136(1)277(2)0006F(3)(4)    | 1.11                       | 25                         | 1             | 6.5               | -44              | +17.5  | +20     | 1375                     |
| 330                                                         | T            | 136(1)337(2)0006T(3)(4)    | 0.73                       | 20                         | 2             | 7.9               | -44              | +14    | +16     | 1800                     |
| 560                                                         | T            | 136(1)567(2)0006T(3)(4)    | 0.65                       | 25                         | 2             | 13                | -64              | +17.5  | +20     | 1900                     |
| 1200                                                        | K            | 136(1)128(2)0006K(3)(4)    | 0.50                       | 20                         | 3             | 14                | -80              | +25    | +25     | 2265                     |
| 8 V <sub>DC</sub> AT +85 °C; 5 V <sub>DC</sub> AT +125 °C   |              |                            |                            |                            |               |                   |                  |        |         |                          |
| 25                                                          | C            | 136(1)256(2)0008C(3)(4)    | 1.99                       | 100                        | 1             | 2                 | -40              | +10.5  | +12     | 820                      |
| 56                                                          | C            | 136(1)566(2)0008C(3)(4)    | 1.66                       | 59                         | 1             | 2                 | -40              | +14    | +16     | 900                      |
| 120                                                         | F            | 136(1)127(2)0008F(3)(4)    | 1.11                       | 50                         | 1             | 2                 | -44              | +17.5  | +20     | 1230                     |
| 220                                                         | F            | 136(1)227(2)0008F(3)(4)    | 1.12                       | 30                         | 1             | 7                 | -44              | +17.5  | +20     | 1370                     |
| 290                                                         | T            | 136(1)297(2)0008T(3)(4)    | 0.78                       | 25                         | 2             | 6                 | -64              | +17.5  | +20     | 1770                     |
| 430                                                         | T            | 136(1)437(2)0008T(3)(4)    | 0.71                       | 25                         | 2             | 14                | -64              | +17.5  | +20     | 1825                     |
| 850                                                         | K            | 136(1)857(2)0008K(3)(4)    | 0.47                       | 22                         | 4             | 16                | -80              | +25    | +25     | 2330                     |
| 10 V <sub>DC</sub> AT +85 °C; 7 V <sub>DC</sub> AT +125 °C  |              |                            |                            |                            |               |                   |                  |        |         |                          |
| 20                                                          | C            | 136(1)206(2)0010C(3)(4)    | 1.99                       | 175                        | 1             | 2                 | -32              | +10.5  | +12     | 820                      |
| 47                                                          | C            | 136(1)476(2)0010C(3)(4)    | 1.84                       | 100                        | 1             | 2                 | -36              | +14    | +16     | 855                      |
| 100                                                         | F            | 136(1)107(2)0010F(3)(4)    | 0.99                       | 60                         | 1             | 4                 | -36              | +14    | +16     | 1200                     |
| 180                                                         | F            | 136(1)187(2)0010F(3)(4)    | 1.11                       | 40                         | 1             | 7                 | -36              | +14    | +16     | 1365                     |
| 250                                                         | T            | 136(1)257(2)0010T(3)(4)    | 0.80                       | 30                         | 2             | 10                | -40              | +14    | +16     | 1720                     |
| 390                                                         | T            | 136(1)397(2)0010T(3)(4)    | 0.75                       | 25                         | 2             | 16                | -64              | +17.5  | +20     | 1800                     |
| 750                                                         | K            | 136(1)757(2)0010K(3)(4)    | 0.44                       | 23                         | 4             | 16                | -80              | +25    | +25     | 2360                     |
| 15 V <sub>DC</sub> AT +85 °C; 10 V <sub>DC</sub> AT +125 °C |              |                            |                            |                            |               |                   |                  |        |         |                          |
| 15                                                          | C            | 136(1)156(2)0015C(3)(4)    | 1.99                       | 155                        | 1             | 2                 | -24              | +10.5  | +12     | 780                      |
| 33                                                          | C            | 136(1)336(2)0015C(3)(4)    | 1.66                       | 90                         | 1             | 2                 | -28              | +14    | +16     | 820                      |
| 70                                                          | F            | 136(1)706(2)0015F(3)(4)    | 1.11                       | 75                         | 1             | 4                 | -28              | +14    | +16     | 1150                     |
| 120                                                         | F            | 136(1)127(2)0015F(3)(4)    | 1.12                       | 50                         | 1             | 7                 | -28              | +17.5  | +20     | 1450                     |
| 170                                                         | T            | 136(1)177(2)0015T(3)(4)    | 0.78                       | 35                         | 2             | 10                | -32              | +14    | +16     | 1480                     |
| 270                                                         | T            | 136(1)277(2)0015T(3)(4)    | 0.71                       | 30                         | 2             | 16                | -56              | +17.5  | +20     | 1740                     |
| 540                                                         | K            | 136(1)547(2)0015K(3)(4)    | 0.47                       | 23                         | 6             | 24                | -80              | +25    | +25     | 2330                     |
| 25 V <sub>DC</sub> AT +85 °C; 15 V <sub>DC</sub> AT +125 °C |              |                            |                            |                            |               |                   |                  |        |         |                          |
| 10                                                          | C            | 136(1)106(2)0025C(3)(4)    | 2.66                       | 220                        | 1             | 2                 | -16              | +8     | +9      | 715                      |
| 22                                                          | C            | 136(1)226(2)0025C(3)(4)    | 1.99                       | 140                        | 1             | 2                 | -20              | +10.5  | +12     | 800                      |
| 50                                                          | F            | 136(1)506(2)0025F(3)(4)    | 1.46                       | 70                         | 1             | 2                 | -28              | +13    | +15     | 1130                     |
| 100                                                         | F            | 136(1)107(2)0025F(3)(4)    | 0.99                       | 50                         | 1             | 10                | -28              | +13    | +15     | 1435                     |
| 120                                                         | T            | 136(1)127(2)0025T(3)(4)    | 1.16                       | 38                         | 2             | 6                 | -32              | +13    | +15     | 1450                     |
| 180                                                         | T            | 136(1)187(2)0025T(3)(4)    | 0.96                       | 32                         | 2             | 18                | -48              | +13    | +15     | 1525                     |
| 350                                                         | K            | 136(1)357(2)0025K(3)(4)    | 0.67                       | 24                         | 7             | 28                | -70              | +25    | +25     | 1970                     |

**Notes**

- Part number definitions:

(1) Model type:

136D - axial through-hole terminations

136J - SMD, outward L-leaded terminations

136L - SMD, inward L-leaded terminations

136P - SMD, low profile outward L-leaded terminations

136S - SMD, low profile inward L-leaded terminations

(2) Capacitance tolerance: X0 = 20 %, X9 = 10 %, X5 = 5 %

(3) Style number:

Standard temperature: 0 = no insulating sleeve, 2 = polyester insulation sleeve, 3 = high temperature film insulation;

High temperature: 6 = high temperature film insulation, 8 = no insulating sleeve

(4) Termination: blank = standard tin / lead, E3 = RoHS-compliant 100 % tin



| STANDARD RATINGS                                            |              |                            |                            |                            |               |                   |                  |        |         |                          |
|-------------------------------------------------------------|--------------|----------------------------|----------------------------|----------------------------|---------------|-------------------|------------------|--------|---------|--------------------------|
| CAPACITANCE<br>(μF)                                         | CASE<br>CODE | PART NUMBER <sup>(1)</sup> | MAX. ESR                   | MAX. IMP.                  | MAX. DCL (μA) |                   | MAX. CAPACITANCE |        |         | MAX.                     |
|                                                             |              |                            | AT +25 °C<br>120 Hz<br>(Ω) | AT -55 °C<br>120 Hz<br>(Ω) | AT            |                   | CHANGE<br>(%) AT |        | 40 kHz  |                          |
|                                                             |              |                            |                            |                            | +25 °C        | +85 °C<br>+125 °C | -55 °C           | +85 °C | +125 °C | I <sub>RMS</sub><br>(mA) |
| 30 V <sub>DC</sub> AT +85 °C; 20 V <sub>DC</sub> AT +125 °C |              |                            |                            |                            |               |                   |                  |        |         |                          |
| 8                                                           | C            | 136(1)805(2)0030C(3)(4)    | 3.32                       | 275                        | 1             | 2                 | -16              | +8     | +12     | 640                      |
| 15                                                          | C            | 136(1)156(2)0030C(3)(4)    | 2.21                       | 175                        | 1             | 2                 | -20              | +10.5  | +12     | 780                      |
| 40                                                          | F            | 136(1)406(2)0030F(3)(4)    | 1.66                       | 65                         | 1             | 5                 | -24              | +10.5  | +12     | 1120                     |
| 68                                                          | F            | 136(1)686(2)0030F(3)(4)    | 1.27                       | 60                         | 1             | 8                 | -24              | +13    | +15     | 1285                     |
| 100                                                         | T            | 136(1)107(2)0030T(3)(4)    | 1.13                       | 40                         | 2             | 12                | -28              | +10.5  | +12     | 1450                     |
| 150                                                         | T            | 136(1)157(2)0030T(3)(4)    | 1.02                       | 35                         | 2             | 18                | -48              | +13    | +15     | 1525                     |
| 300                                                         | K            | 136(1)307(2)0030K(3)(4)    | 0.69                       | 25                         | 8             | 32                | -60              | +25    | +25     | 1950                     |
| 35 V <sub>DC</sub> AT +85 °C; 22 V <sub>DC</sub> AT +125 °C |              |                            |                            |                            |               |                   |                  |        |         |                          |
| 15                                                          | C            | 136(1)156(2)0035C(3)(4)    | 3.10                       | 175                        | 0.75          | 1.5               | -20              | +10.5  | +12     | 660                      |
| 68                                                          | F            | 136(1)686(2)0035F(3)(4)    | 1.45                       | 60                         | 1             | 2                 | -24              | +13    | +15     | 1195                     |
| 270                                                         | K            | 136(1)277(2)0035K(3)(4)    | 0.70                       | 26                         | 3             | 12                | -58              | +25    | +25     | 1950                     |
| 50 V <sub>DC</sub> AT +85 °C; 30 V <sub>DC</sub> AT +125 °C |              |                            |                            |                            |               |                   |                  |        |         |                          |
| 5                                                           | C            | 136(1)505(2)0050C(3)(4)    | 3.98                       | 400                        | 1             | 2                 | -16              | +5     | +6      | 580                      |
| 10                                                          | C            | 136(1)106(2)0050C(3)(4)    | 2.66                       | 250                        | 1             | 2                 | -24              | +8     | +9      | 715                      |
| 25                                                          | F            | 136(1)256(2)0050F(3)(4)    | 2.13                       | 95                         | 1             | 5                 | -20              | +10.5  | +12     | 1005                     |
| 47                                                          | F            | 136(1)476(2)0050F(3)(4)    | 1.56                       | 70                         | 1             | 9                 | -28              | +13    | +15     | 1155                     |
| 60                                                          | T            | 136(1)606(2)0050T(3)(4)    | 1.33                       | 45                         | 2             | 12                | -16              | +10.5  | +12     | 1335                     |
| 82                                                          | T            | 136(1)826(2)0050T(3)(4)    | 1.22                       | 45                         | 2             | 16                | -32              | +13    | +15     | 1400                     |
| 160                                                         | K            | 136(1)167(2)0050K(3)(4)    | 0.71                       | 27                         | 8             | 32                | -50              | +25    | +25     | 1900                     |
| 60 V <sub>DC</sub> AT +85 °C; 40 V <sub>DC</sub> AT +125 °C |              |                            |                            |                            |               |                   |                  |        |         |                          |
| 4                                                           | C            | 136(1)405(2)0060C(3)(4)    | 4.65                       | 550                        | 1             | 2                 | -16              | +5     | +6      | 525                      |
| 8.2                                                         | C            | 136(1)825(2)0060C(3)(4)    | 3.24                       | 275                        | 1             | 2                 | -24              | +8     | +9      | 625                      |
| 20                                                          | F            | 136(1)206(2)0060F(3)(4)    | 2.32                       | 105                        | 1             | 5                 | -16              | +8     | +12     | 930                      |
| 39                                                          | F            | 136(1)396(2)0060F(3)(4)    | 1.70                       | 90                         | 1             | 9                 | -28              | +10.5  | +12     | 1110                     |
| 50                                                          | T            | 136(1)506(2)0060T(3)(4)    | 1.33                       | 50                         | 2             | 12                | -16              | +10.5  | +12     | 1330                     |
| 68                                                          | T            | 136(1)686(2)0060T(3)(4)    | 1.27                       | 50                         | 2             | 16                | -32              | +10.5  | +15     | 1365                     |
| 140                                                         | K            | 136(1)147(2)0060K(3)(4)    | 0.76                       | 28                         | 8             | 32                | -40              | +20    | +20     | 1850                     |
| 75 V <sub>DC</sub> AT +85 °C; 50 V <sub>DC</sub> AT +125 °C |              |                            |                            |                            |               |                   |                  |        |         |                          |
| 3.5                                                         | C            | 136(1)355(2)0075C(3)(4)    | 4.74                       | 650                        | 1             | 2                 | -16              | +5     | +6      | 525                      |
| 6.8                                                         | C            | 136(1)685(2)0075C(3)(4)    | 3.42                       | 300                        | 1             | 2                 | -20              | +8     | +9      | 610                      |
| 15                                                          | F            | 136(1)156(2)0075F(3)(4)    | 2.66                       | 150                        | 1             | 5                 | -16              | +10.5  | +9      | 890                      |
| 33                                                          | F            | 136(1)336(2)0075F(3)(4)    | 2.01                       | 90                         | 1             | 10                | -24              | +10.5  | +15     | 1000                     |
| 40                                                          | T            | 136(1)406(2)0075T(3)(4)    | 1.50                       | 60                         | 2             | 12                | -16              | +10.5  | +12     | 1250                     |
| 56                                                          | T            | 136(1)566(2)0075T(3)(4)    | 1.31                       | 60                         | 2             | 17                | -28              | +10.5  | +15     | 1335                     |
| 110                                                         | K            | 136(1)117(2)0075K(3)(4)    | 0.73                       | 29                         | 9             | 36                | -35              | +20    | +20     | 1850                     |

**Notes**

- Part number definitions:

(1) Model type:

136D - axial through-hole terminations

136J - SMD, outward L-leaded terminations

136L - SMD, inward L-leaded terminations

136P - SMD, low profile outward L-leaded terminations

136S - SMD, low profile inward L-leaded terminations

(2) Capacitance tolerance: X0 = 20 %, X9 = 10 %, X5 = 5 %

(3) Style number:

Standard temperature: 0 = no insulating sleeve, 2 = polyester insulation sleeve, 3 = high temperature film insulation;

High temperature: 6 = high temperature film insulation, 8 = no insulating sleeve

(4) Termination: blank = standard tin / lead, E3 = RoHS-compliant 100 % tin



| STANDARD RATINGS                                             |              |                         |                                     |                                     |                     |                   |                  |        |         |                             |
|--------------------------------------------------------------|--------------|-------------------------|-------------------------------------|-------------------------------------|---------------------|-------------------|------------------|--------|---------|-----------------------------|
| CAPACITANCE<br>( $\mu$ F)                                    | CASE<br>CODE | PART NUMBER (1)         | MAX. ESR                            | MAX. IMP.                           | MAX. DCL ( $\mu$ A) |                   | MAX. CAPACITANCE |        |         | MAX. RIPPLE                 |
|                                                              |              |                         | AT +25 °C<br>120 Hz<br>( $\Omega$ ) | AT -55 °C<br>120 Hz<br>( $\Omega$ ) | AT                  |                   | CHANGE<br>(%) AT |        |         | 40 kHz<br>$I_{RMS}$<br>(mA) |
|                                                              |              |                         |                                     |                                     | +25 °C              | +85 °C<br>+125 °C | -55 °C           | +85 °C | +125 °C |                             |
| 100 V <sub>DC</sub> AT +85 °C; 65 V <sub>DC</sub> AT +125 °C |              |                         |                                     |                                     |                     |                   |                  |        |         |                             |
| 2.5                                                          | C            | 136(1)255(2)0100C(3)(4) | 5.31                                | 950                                 | 1                   | 4                 | -16              | +8     | +8      | 505                         |
| 4.7                                                          | C            | 136(1)475(2)0100C(3)(4) | 4.24                                | 500                                 | 1                   | 2                 | -16              | +7     | +8      | 565                         |
| 11                                                           | F            | 136(1)116(2)0100F(3)(4) | 3.02                                | 200                                 | 1                   | 4                 | -16              | +7     | +8      | 835                         |
| 22                                                           | F            | 136(1)226(2)0100F(3)(4) | 2.26                                | 100                                 | 1                   | 9                 | -16              | +7     | +8      | 965                         |
| 25                                                           | T            | 136(1)256(2)0100T(3)(4) | 1.60                                | 93                                  | 2                   | 13                | -16              | +7     | +8      | 1200                        |
| 30                                                           | T            | 136(1)306(2)0100T(3)(4) | 1.55                                | 80                                  | 2                   | 12                | -16              | +8     | +8      | 1240                        |
| 43                                                           | T            | 136(1)436(2)0100T(3)(4) | 1.31                                | 70                                  | 2                   | 17                | -20              | +8     | +8      | 1335                        |
| 56                                                           | K            | 136(1)566(2)0100K(3)(4) | 0.80                                | 32                                  | 10                  | 40                | -25              | +15    | +15     | 1800                        |
| 86                                                           | K            | 136(1)866(2)0100K(3)(4) | 0.77                                | 30                                  | 9                   | 36                | -25              | +15    | +15     | 1800                        |
| 125 V <sub>DC</sub> AT +85 °C; 85 V <sub>DC</sub> AT +125 °C |              |                         |                                     |                                     |                     |                   |                  |        |         |                             |
| 1.7                                                          | C            | 136(1)175(2)0125C(3)(4) | 7.81                                | 1250                                | 1                   | 2                 | -16              | +7     | +8      | 415                         |
| 3.6                                                          | C            | 136(1)365(2)0125C(3)(4) | 4.98                                | 600                                 | 1                   | 2                 | -16              | +7     | +8      | 520                         |
| 9                                                            | F            | 136(1)905(2)0125F(3)(4) | 3.69                                | 240                                 | 1                   | 5                 | -16              | +7     | +8      | 755                         |
| 14                                                           | F            | 136(1)146(2)0125F(3)(4) | 2.85                                | 167                                 | 1                   | 7                 | -16              | +7     | +8      | 860                         |
| 18                                                           | T            | 136(1)186(2)0125T(3)(4) | 1.85                                | 129                                 | 2                   | 9                 | -16              | +7     | +8      | 1130                        |
| 25                                                           | T            | 136(1)256(2)0125T(3)(4) | 1.59                                | 93                                  | 2                   | 13                | -16              | +7     | +8      | 1200                        |
| 56                                                           | K            | 136(1)566(2)0125K(3)(4) | 0.77                                | 32                                  | 10                  | 40                | -25              | +15    | +15     | 1800                        |

**Notes**

- Part number definitions:

(1) Model type:

136D - axial through-hole terminations

136J - SMD, outward L-leaded terminations

136L - SMD, inward L-leaded terminations

136P - SMD, low profile outward L-leaded terminations

136S - SMD, low profile inward L-leaded terminations

(2) Capacitance tolerance: X0 = 20 %, X9 = 10 %, X5 = 5 %

(3) Style number:

Standard temperature: 0 = no insulating sleeve, 2 = polyester insulation sleeve, 3 = high temperature film insulation;

High temperature: 6 = high temperature film insulation, 8 = no insulating sleeve

(4) Termination: blank = standard tin / lead, E3 = RoHS-compliant 100 % tin



| EXTENDED RATINGS                                            |              |                            |                                        |                                         |                     |                   |                                   |        |         |                                                      |
|-------------------------------------------------------------|--------------|----------------------------|----------------------------------------|-----------------------------------------|---------------------|-------------------|-----------------------------------|--------|---------|------------------------------------------------------|
| CAPACITANCE<br>(μF)                                         | CASE<br>CODE | PART NUMBER <sup>(1)</sup> | MAX. ESR<br>AT +25 °C<br>120 Hz<br>(Ω) | MAX. IMP.<br>AT -55 °C<br>120 Hz<br>(Ω) | MAX. DCL (μA)<br>AT |                   | MAX. CAPACITANCE<br>CHANGE (%) AT |        |         | MAX.<br>RIPPLE<br>40 kHz<br>I <sub>RMS</sub><br>(mA) |
|                                                             |              |                            |                                        |                                         | +25 °C              | +85 °C<br>+125 °C | -55 °C                            | +85 °C | +125 °C |                                                      |
| 6 V <sub>DC</sub> AT +85 °C; 4 V <sub>DC</sub> AT +125 °C   |              |                            |                                        |                                         |                     |                   |                                   |        |         |                                                      |
| 220                                                         | C            | 136(1)227(2)0006C(3)(4)    | 1.50                                   | 36                                      | 2                   | 9                 | -64                               | +13    | +16     | 1000                                                 |
| 560                                                         | F            | 136(1)567(2)0006F(3)(4)    | 1.25                                   | 21                                      | 3                   | 9                 | -77                               | +16    | +20     | 1500                                                 |
| 820                                                         | F            | 136(1)827(2)0006F(3)(4)    | 1.25                                   | 18                                      | 3                   | 14                | -88                               | +16    | +20     | 1500                                                 |
| 1200                                                        | T            | 136(1)128(2)0006T(3)(4)    | 0.75                                   | 18                                      | 5                   | 18                | -88                               | +20    | +25     | 1900                                                 |
| 1500                                                        | T            | 136(1)158(2)0006T(3)(4)    | 0.75                                   | 18                                      | 5                   | 20                | -90                               | +20    | +25     | 1900                                                 |
| 2200                                                        | K            | 136(1)228(2)0006K(3)(4)    | 0.50                                   | 13                                      | 6                   | 24                | -90                               | +25    | +30     | 2300                                                 |
| 8 V <sub>DC</sub> AT +85 °C; 5 V <sub>DC</sub> AT +125 °C   |              |                            |                                        |                                         |                     |                   |                                   |        |         |                                                      |
| 180                                                         | C            | 136(1)187(2)0008C(3)(4)    | 1.50                                   | 45                                      | 2                   | 9                 | -60                               | +13    | +16     | 1000                                                 |
| 680                                                         | F            | 136(1)687(2)0008F(3)(4)    | 1.25                                   | 22                                      | 3                   | 14                | -83                               | +16    | +20     | 1500                                                 |
| 1500                                                        | T            | 136(1)158(2)0008T(3)(4)    | 0.75                                   | 18                                      | 5                   | 20                | -90                               | +20    | +25     | 1900                                                 |
| 1800                                                        | K            | 136(1)188(2)0008K(3)(4)    | 0.50                                   | 14                                      | 7                   | 25                | -90                               | +25    | +30     | 2300                                                 |
| 10 V <sub>DC</sub> AT +85 °C; 7 V <sub>DC</sub> AT +125 °C  |              |                            |                                        |                                         |                     |                   |                                   |        |         |                                                      |
| 120                                                         | C            | 136(1)127(2)0010C(3)(4)    | 1.60                                   | 54                                      | 2                   | 6                 | -40                               | +14    | +16     | 900                                                  |
| 150                                                         | C            | 136(1)157(2)0010C(3)(4)    | 1.50                                   | 54                                      | 2                   | 9                 | -55                               | +13    | +16     | 900                                                  |
| 390                                                         | F            | 136(1)397(2)0010F(3)(4)    | 1.25                                   | 27                                      | 3                   | 9                 | -66                               | +16    | +20     | 1450                                                 |
| 560                                                         | F            | 136(1)567(2)0010F(3)(4)    | 1.25                                   | 27                                      | 3                   | 16                | -77                               | +16    | +20     | 1450                                                 |
| 1200                                                        | T            | 136(1)128(2)0010T(3)(4)    | 0.75                                   | 18                                      | 5                   | 20                | -88                               | +20    | +25     | 1850                                                 |
| 1500                                                        | K            | 136(1)158(2)0010K(3)(4)    | 0.50                                   | 15                                      | 7                   | 25                | -88                               | +25    | +30     | 2300                                                 |
| 15 V <sub>DC</sub> AT +85 °C; 10 V <sub>DC</sub> AT +125 °C |              |                            |                                        |                                         |                     |                   |                                   |        |         |                                                      |
| 82                                                          | C            | 136(1)826(2)0015C(3)(4)    | 0.95                                   | 72                                      | 2                   | 6                 | -35                               | +12    | +16     | 900                                                  |
| 100                                                         | C            | 136(1)107(2)0015C(3)(4)    | 0.95                                   | 72                                      | 2                   | 9                 | -44                               | +13    | +16     | 900                                                  |
| 270                                                         | F            | 136(1)277(2)0015F(3)(4)    | 1.25                                   | 31                                      | 3                   | 9                 | -62                               | +16    | +15     | 1450                                                 |
| 390                                                         | F            | 136(1)397(2)0015F(3)(4)    | 1.25                                   | 31                                      | 3                   | 16                | -66                               | +16    | +20     | 1450                                                 |
| 680                                                         | T            | 136(1)687(2)0015T(3)(4)    | 0.90                                   | 22                                      | 6                   | 18                | -74                               | +20    | +25     | 1800                                                 |
| 820                                                         | T            | 136(1)827(2)0015T(3)(4)    | 0.90                                   | 22                                      | 6                   | 24                | -77                               | +20    | +25     | 1800                                                 |
| 1000                                                        | K            | 136(1)108(2)0015K(3)(4)    | 0.60                                   | 17                                      | 8                   | 32                | -77                               | +25    | +30     | 2330                                                 |
| 25 V <sub>DC</sub> AT +85 °C; 15 V <sub>DC</sub> AT +125 °C |              |                            |                                        |                                         |                     |                   |                                   |        |         |                                                      |
| 47                                                          | C            | 136(1)476(2)0025C(3)(4)    | 2.60                                   | 100                                     | 2                   | 6                 | -23                               | +12    | +15     | 800                                                  |
| 56                                                          | C            | 136(1)566(2)0025C(3)(4)    | 2.15                                   | 90                                      | 2                   | 6                 | -25                               | +12    | +15     | 850                                                  |
| 68                                                          | C            | 136(1)686(2)0025C(3)(4)    | 2.15                                   | 90                                      | 2                   | 9                 | -40                               | +12    | +15     | 850                                                  |
| 180                                                         | F            | 136(1)187(2)0025F(3)(4)    | 1.35                                   | 33                                      | 3                   | 9                 | -54                               | +13    | +15     | 1400                                                 |
| 270                                                         | F            | 136(1)277(2)0025F(3)(4)    | 1.35                                   | 33                                      | 3                   | 16                | -62                               | +13    | +16     | 1400                                                 |
| 470                                                         | T            | 136(1)477(2)0025T(3)(4)    | 0.90                                   | 24                                      | 6                   | 18                | -65                               | +18    | +25     | 1750                                                 |
| 560                                                         | T            | 136(1)567(2)0025T(3)(4)    | 0.90                                   | 24                                      | 7                   | 28                | -72                               | +20    | +25     | 1750                                                 |
| 680                                                         | K            | 136(1)687(2)0025K(3)(4)    | 0.60                                   | 19                                      | 8                   | 32                | -72                               | +25    | +30     | 2100                                                 |

**Note**

- Part number definitions:

(1) Model type:

136D - axial through-hole terminations

136J - SMD, outward L-leaded terminations

136L - SMD, inward L-leaded terminations

136P - SMD, low profile outward L-leaded terminations

136S - SMD, low profile inward L-leaded terminations

(2) Capacitance tolerance: X0 = 20 %, X9 = 10 %, X5 = 5 %

(3) Style number:

Standard temperature: 0 = no insulating sleeve, 2 = polyester insulation sleeve, 3 = high temperature film insulation;

High temperature: 6 = high temperature film insulation, 8 = no insulating sleeve

(4) Termination: blank = standard tin / lead, E3 = RoHS-compliant 100 % tin



| EXTENDED RATINGS                                            |              |                            |                                        |                                         |                     |                   |                                   |        |         |                                                      |
|-------------------------------------------------------------|--------------|----------------------------|----------------------------------------|-----------------------------------------|---------------------|-------------------|-----------------------------------|--------|---------|------------------------------------------------------|
| CAPACITANCE<br>(μF)                                         | CASE<br>CODE | PART NUMBER <sup>(1)</sup> | MAX. ESR<br>AT +25 °C<br>120 Hz<br>(Ω) | MAX. IMP.<br>AT -55 °C<br>120 Hz<br>(Ω) | MAX. DCL (μA)<br>AT |                   | MAX. CAPACITANCE<br>CHANGE (%) AT |        |         | MAX.<br>RIPPLE<br>40 kHz<br>I <sub>RMS</sub><br>(mA) |
|                                                             |              |                            |                                        |                                         | +25 °C              | +85 °C<br>+125 °C | -55 °C                            | +85 °C | +125 °C |                                                      |
| 30 V <sub>DC</sub> AT +85 °C; 20 V <sub>DC</sub> AT +125 °C |              |                            |                                        |                                         |                     |                   |                                   |        |         |                                                      |
| 47                                                          | C            | 136(1)476(2)0030C(3)(4)    | 2.60                                   | 100                                     | 2                   | 6                 | -23                               | +12    | +15     | 800                                                  |
| 56                                                          | C            | 136(1)566(2)0030C(3)(4)    | 2.60                                   | 100                                     | 2                   | 9                 | -38                               | +12    | +15     | 800                                                  |
| 150                                                         | F            | 136(1)157(2)0030F(3)(4)    | 1.25                                   | 36                                      | 3                   | 9                 | -42                               | +13    | +15     | 1200                                                 |
| 220                                                         | F            | 136(1)227(2)0030F(3)(4)    | 1.25                                   | 36                                      | 3                   | 16                | -60                               | +13    | +16     | 1200                                                 |
| 390                                                         | T            | 136(1)397(2)0030T(3)(4)    | 0.90                                   | 25                                      | 6                   | 18                | -55                               | +18    | +25     | 1500                                                 |
| 470                                                         | T            | 136(1)477(2)0030T(3)(4)    | 0.90                                   | 25                                      | 8                   | 32                | -65                               | +20    | +25     | 1500                                                 |
| 560                                                         | K            | 136(1)567(2)0030K(3)(4)    | 0.65                                   | 20                                      | 9                   | 36                | -65                               | +25    | +30     | 2000                                                 |
| 35 V <sub>DC</sub> AT +85 °C; 22 V <sub>DC</sub> AT +125 °C |              |                            |                                        |                                         |                     |                   |                                   |        |         |                                                      |
| 39                                                          | C            | 136(1)396(2)0035C(3)(4)    | 2.05                                   | 61                                      | 2                   | 6                 | -22                               | +12    | +14     | 820                                                  |
| 120                                                         | F            | 136(1)127(2)0035F(3)(4)    | 1.25                                   | 31                                      | 3                   | 10                | -40                               | +13    | +15     | 1315                                                 |
| 330                                                         | T            | 136(1)337(2)0035T(3)(4)    | 0.90                                   | 20                                      | 6                   | 18                | -50                               | +16    | +25     | 1640                                                 |
| 370                                                         | K            | 136(1)377(2)0035K(3)(4)    | 0.65                                   | 15                                      | 9                   | 36                | -60                               | +25    | +30     | 2040                                                 |
| 40 V <sub>DC</sub> AT +85 °C; 25 V <sub>DC</sub> AT +125 °C |              |                            |                                        |                                         |                     |                   |                                   |        |         |                                                      |
| 39                                                          | C            | 136(1)396(2)0040C(3)(4)    | 2.05                                   | 61                                      | 2                   | 6                 | -22                               | +12    | +14     | 820                                                  |
| 50 V <sub>DC</sub> AT +85 °C; 30 V <sub>DC</sub> AT +125 °C |              |                            |                                        |                                         |                     |                   |                                   |        |         |                                                      |
| 33                                                          | C            | 136(1)336(2)0050C(3)(4)    | 2.50                                   | 135                                     | 2                   | 9                 | -29                               | +10    | +12     | 700                                                  |
| 100                                                         | F            | 136(1)107(2)0050F(3)(4)    | 1.40                                   | 49                                      | 4                   | 12                | -36                               | +13    | +15     | 1200                                                 |
| 120                                                         | F            | 136(1)127(2)0050F(3)(4)    | 1.25                                   | 49                                      | 4                   | 24                | -42                               | +12    | +15     | 1200                                                 |
| 270                                                         | T            | 136(1)277(2)0050T(3)(4)    | 1.00                                   | 30                                      | 8                   | 32                | -46                               | +20    | +25     | 1450                                                 |
| 330                                                         | K            | 136(1)337(2)0050K(3)(4)    | 0.75                                   | 30                                      | 9                   | 36                | -46                               | +25    | +30     | 1900                                                 |
| 60 V <sub>DC</sub> AT +85 °C; 40 V <sub>DC</sub> AT +125 °C |              |                            |                                        |                                         |                     |                   |                                   |        |         |                                                      |
| 18                                                          | C            | 136(1)186(2)0060C(3)(4)    | 3.50                                   | 160                                     | 2                   | 12                | -20                               | +7     | +8      | 700                                                  |
| 27                                                          | C            | 136(1)276(2)0060C(3)(4)    | 2.51                                   | 144                                     | 3                   | 12                | -24                               | +10    | +12     | 700                                                  |
| 82                                                          | F            | 136(1)826(2)0060F(3)(4)    | 1.45                                   | 54                                      | 4                   | 16                | -30                               | +15    | +15     | 1100                                                 |
| 100                                                         | F            | 136(1)107(2)0060F(3)(4)    | 1.25                                   | 54                                      | 4                   | 20                | -36                               | +12    | +15     | 1100                                                 |
| 220                                                         | T            | 136(1)227(2)0060T(3)(4)    | 0.90                                   | 29                                      | 8                   | 32                | -40                               | +16    | +20     | 1400                                                 |
| 270                                                         | K            | 136(1)277(2)0060K(3)(4)    | 0.70                                   | 23                                      | 9                   | 36                | -45                               | +20    | +25     | 1850                                                 |
| 330                                                         | K            | 136(1)337(2)0060K(3)(4)    | 0.65                                   | 31                                      | 10                  | 40                | -72                               | +25    | +25     | 1850                                                 |
| 63 V <sub>DC</sub> AT +85 °C; 40 V <sub>DC</sub> AT +125 °C |              |                            |                                        |                                         |                     |                   |                                   |        |         |                                                      |
| 100                                                         | F            | 136(1)107(2)0063F(3)(4)    | 1.25                                   | 54                                      | 2                   | 12                | -36                               | +12    | +15     | 1100                                                 |
| 75 V <sub>DC</sub> AT +85 °C; 50 V <sub>DC</sub> AT +125 °C |              |                            |                                        |                                         |                     |                   |                                   |        |         |                                                      |
| 12                                                          | C            | 136(1)126(2)0075C(3)(4)    | 2.55                                   | 157                                     | 3                   | 12                | -19                               | +10    | +12     | 600                                                  |
| 22                                                          | C            | 136(1)226(2)0075C(3)(4)    | 2.57                                   | 157                                     | 3                   | 12                | -19                               | +10    | +12     | 600                                                  |
| 68                                                          | F            | 136(1)686(2)0075F(3)(4)    | 1.50                                   | 63                                      | 4                   | 16                | -25                               | +12    | +15     | 1000                                                 |
| 82                                                          | F            | 136(1)826(2)0075F(3)(4)    | 1.23                                   | 63                                      | 4                   | 24                | -30                               | +12    | +15     | 1000                                                 |
| 180                                                         | T            | 136(1)187(2)0075T(3)(4)    | 0.90                                   | 30                                      | 9                   | 36                | -35                               | +16    | +20     | 1300                                                 |
| 220                                                         | K            | 136(1)227(2)0075K(3)(4)    | 1.12                                   | 24                                      | 10                  | 40                | -40                               | +20    | +25     | 1800                                                 |
| 300                                                         | K            | 136(1)307(2)0075K(3)(4)    | 0.90                                   | 32                                      | 12                  | 48                | -60                               | +22    | +22     | 2000                                                 |

**Note**

- Part number definitions:

(1) Model type:

136D - axial through-hole terminations

136J - SMD, outward L-leaded terminations

136L - SMD, inward L-leaded terminations

136P - SMD, low profile outward L-leaded terminations

136S - SMD, low profile inward L-leaded terminations

(2) Capacitance tolerance: X0 = 20 %, X9 = 10 %, X5 = 5 %

(3) Style number:

Standard temperature: 0 = no insulating sleeve, 2 = polyester insulation sleeve, 3 = high temperature film insulation;

High temperature: 6 = high temperature film insulation, 8 = no insulating sleeve

(4) Termination: blank = standard tin / lead, E3 = RoHS-compliant 100 % tin



| EXTENDED RATINGS                                             |              |                            |                                        |                                         |                     |                   |                                   |        |         |                                                      |
|--------------------------------------------------------------|--------------|----------------------------|----------------------------------------|-----------------------------------------|---------------------|-------------------|-----------------------------------|--------|---------|------------------------------------------------------|
| CAPACITANCE<br>(μF)                                          | CASE<br>CODE | PART NUMBER <sup>(1)</sup> | MAX. ESR<br>AT +25 °C<br>120 Hz<br>(Ω) | MAX. IMP.<br>AT -55 °C<br>120 Hz<br>(Ω) | MAX. DCL (μA)<br>AT |                   | MAX. CAPACITANCE<br>CHANGE (%) AT |        |         | MAX.<br>RIPPLE<br>40 kHz<br>I <sub>RMS</sub><br>(mA) |
|                                                              |              |                            |                                        |                                         | +25 °C              | +85 °C<br>+125 °C | -55 °C                            | +85 °C | +125 °C |                                                      |
| 100 V <sub>DC</sub> AT +85 °C; 65 V <sub>DC</sub> AT +125 °C |              |                            |                                        |                                         |                     |                   |                                   |        |         |                                                      |
| 10                                                           | C            | 136(1)106(2)0100C(3)(4)    | 2.99                                   | 200                                     | 3                   | 12                | -17                               | +10    | +12     | 800                                                  |
| 39                                                           | F            | 136(1)396(2)0100F(3)(4)    | 1.77                                   | 80                                      | 5                   | 24                | -20                               | +12    | +15     | 1300                                                 |
| 56                                                           | T            | 136(1)566(2)0100T(3)(4)    | 1.22                                   | 50                                      | 5                   | 20                | -25                               | +12    | +12     | 1400                                                 |
| 68                                                           | T            | 136(1)686(2)0100T(3)(4)    | 1.11                                   | 40                                      | 10                  | 40                | -30                               | +14    | +16     | 1600                                                 |
| 120                                                          | K            | 136(1)127(2)0100K(3)(4)    | 1.38                                   | 30                                      | 12                  | 48                | -35                               | +15    | +17     | 2000                                                 |
| 125 V <sub>DC</sub> AT +85 °C; 85 V <sub>DC</sub> AT +125 °C |              |                            |                                        |                                         |                     |                   |                                   |        |         |                                                      |
| 6.8                                                          | C            | 136(1)685(2)0125C(3)(4)    | 5.86                                   | 300                                     | 3                   | 12                | -14                               | +10    | +12     | 700                                                  |
| 27                                                           | F            | 136(1)276(2)0125F(3)(4)    | 1.77                                   | 90                                      | 5                   | 24                | -18                               | +12    | +15     | 1200                                                 |
| 47                                                           | T            | 136(1)476(2)0125T(3)(4)    | 1.12                                   | 50                                      | 10                  | 40                | -26                               | +14    | +16     | 1500                                                 |
| 56                                                           | T            | 136(1)566(2)0125T(3)(4)    | 1.11                                   | 50                                      | 10                  | 40                | -26                               | +14    | +16     | 1500                                                 |
| 68                                                           | K            | 136(1)686(2)0125K(3)(4)    | 1.10                                   | 32                                      | 11                  | 44                | -28                               | +15    | +16     | 1850                                                 |
| 82                                                           | K            | 136(1)826(2)0125K(3)(4)    | 1.41                                   | 32                                      | 12                  | 48                | -30                               | +15    | +17     | 1900                                                 |

**Note**

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(2) Capacitance tolerance: X0 = 20 %, X9 = 10 %, X5 = 5 %

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