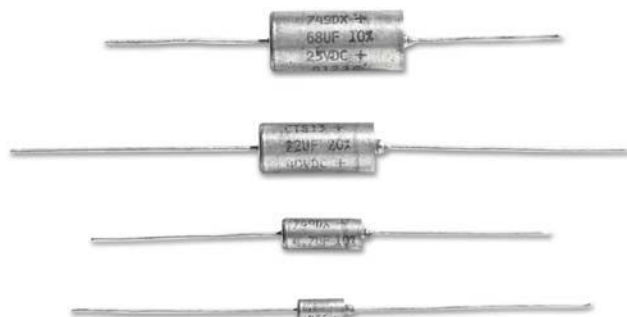


## Solid-Electrolyte TANTALEX® Capacitors, Hermetically Sealed, Axial-Lead, CECC Approved



### FEATURES

- Terminations: Tin/lead (SnPb), 100 % tin (RoHS compliant)
- Hermetically sealed metal case with plastic film insulation
- Extended capacitance range (type 749DX)
- High operational stability with both time and temperature
- Low leakage current
- Low dissipation factor
- Compliant to RoHS Directive 2011/65/EU


**RoHS\***  
COMPLIANT

### Note

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

### APPLICATIONS

Performance and reliability has been proven in a wide range of applications such as: filtering, by-pass, coupling, energy storage, timing circuits.

### PERFORMANCE CHARACTERISTICS

#### Operating Temperature:

- 55 °C to + 85 °C (types CTS13)

- 55 °C to + 125 °C (types CTS1, 749DX)

### SPECIFICATIONS

#### CECC

30201-001

30201-002 CTS1

30201-005 CTS13

30201-029 749DX

#### BS

749DX 9073-N001 749DX

### ORDERING INFORMATION

| CTS13<br>TYPE                                                                                                                                  | 105<br>CAPACITANCE                                                                                             | X0<br>CAPACITANCE<br>TOLERANCE                                | 040<br>DC VOLTAGE RATING<br>AT + 85 °C                                                                                | A<br>CASE<br>CODE                 | 2<br>STYLE<br>NUMBER                         | P<br>PACKAGING              | E3<br>RoHS<br>COMPLIANT                                                 |
|------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------------------------------------|-----------------------------|-------------------------------------------------------------------------|
| Identifies the basic capacitor design<br>CTS1 =<br>CECC 30201-002<br>CTS13 =<br>CECC 30201-005<br>749DX =<br>CECC 30201-001/<br>CECC 30201-029 | Expressed in picofarads.<br>First two digits are significant.<br>Third digit is the number of zeros following. | X0 = ± 20 %<br>X9 = ± 10 %<br>X5 = ± 5 % *<br>* Special order | Expressed in volts.<br>Where necessary, zeros precede the voltage rating to complete the 3 digit block<br>6R3 = 6.3 V | See Ratings and Case Codes table. | 0 = Bare Case<br>2 = Plastic-film insulation | See Tape and Reel Packaging | E3 = 100 % tin termination (RoHS compliant)<br>Blank = SnPb termination |

### DIMENSIONS in inches [millimeters]

| CASE CODE | $L_1 \pm 0.031$ [0.79] | J max.       | D max.      | LEAD DIAMETER<br>+ 10 %, - 0.05 |
|-----------|------------------------|--------------|-------------|---------------------------------|
| A         | 0.286 [7.26]           | 0.402 [10.2] | 0.141 [3.6] | 0.020 [0.5]                     |
| B         | 0.474 [12.04]          | 0.590 [15.0] | 0.192 [4.9] | 0.020 [0.5]                     |
| C         | 0.686 [17.42]          | 0.807 [20.5] | 0.295 [7.5] | 0.025 [0.6]                     |
| D         | 0.786 [19.96]          | 0.945 [24.0] | 0.364 [9.1] | 0.025 [0.6]                     |

**RATINGS AND CASE CODES - TYPE CTS1**

| C <sub>R</sub><br>(μF) | RATED VOLTAGE U <sub>R</sub> (+ 85 °C)     |          |          |          |          |          |          |
|------------------------|--------------------------------------------|----------|----------|----------|----------|----------|----------|
|                        | 6.3 V                                      | 10 V     | 16 V     | 25 V     | 40 V     | 50 V     | 63 V     |
|                        | CATEGORY VOLTAGE U <sub>C</sub> (+ 125 °C) |          |          |          |          |          |          |
|                        | 4 V                                        | 6.3 V    | 10 V     | 13 V     | 25 V     | 33 V     | 40 V     |
| <b>0.10</b>            |                                            |          |          |          |          |          | <b>A</b> |
| 0.12                   |                                            |          |          |          |          |          | A        |
| <b>0.15</b>            |                                            |          |          |          |          |          | <b>A</b> |
| 0.18                   |                                            |          |          |          |          |          | A        |
| <b>0.22</b>            |                                            |          |          |          |          |          | <b>A</b> |
| 0.27                   |                                            |          |          |          |          | A        | A        |
| <b>0.33</b>            |                                            |          |          |          |          | <b>A</b> | <b>A</b> |
| 0.39                   |                                            |          |          |          |          | A        | A        |
| <b>0.47</b>            |                                            |          |          |          | <b>A</b> | <b>A</b> | <b>A</b> |
| 0.56                   |                                            |          |          |          | A        | A        | A        |
| <b>0.68</b>            |                                            |          |          |          | <b>A</b> | <b>A</b> | <b>A</b> |
| 0.82                   |                                            |          |          |          | A        | A        | B        |
| <b>1.0</b>             |                                            |          |          |          | <b>A</b> | <b>A</b> | <b>B</b> |
| 1.2                    |                                            |          |          |          | A        | B        | B        |
| <b>1.5</b>             |                                            |          |          | <b>A</b> | <b>B</b> | <b>B</b> | <b>B</b> |
| 1.8                    |                                            |          | A        |          | B        | B        | B        |
| <b>2.2</b>             |                                            |          | <b>A</b> |          | <b>B</b> | <b>B</b> | <b>B</b> |
| 2.7                    |                                            |          | A        |          | B        | B        | B        |
| <b>3.3</b>             |                                            |          | <b>A</b> |          | <b>B</b> | <b>B</b> | <b>B</b> |
| 3.9                    |                                            | A        |          |          | B        | B        | B        |
| <b>4.7</b>             |                                            | <b>A</b> |          |          | <b>B</b> | <b>B</b> | <b>C</b> |
| 5.6                    | A                                          |          |          |          | B        | C        | C        |
| <b>6.8</b>             | <b>A</b>                                   |          |          |          | <b>B</b> | <b>C</b> | <b>C</b> |
| 8.2                    |                                            |          |          | B        | C        | C        | C        |
| <b>10</b>              |                                            |          |          | <b>B</b> | <b>C</b> | <b>C</b> | <b>C</b> |
| 12                     |                                            |          | B        |          | C        | C        | D        |
| <b>15</b>              |                                            |          | <b>B</b> |          | <b>C</b> | <b>C</b> | <b>D</b> |
| 18                     |                                            |          | B        |          | C        | C        | D        |
| <b>22</b>              |                                            |          | <b>B</b> |          | <b>C</b> | <b>D</b> |          |
| 27                     |                                            | B        |          | C        | D        |          |          |
| <b>33</b>              |                                            | <b>B</b> |          | <b>C</b> | <b>D</b> |          |          |
| 39                     | B                                          |          | C        |          | D        |          |          |
| <b>47</b>              | <b>B</b>                                   |          | <b>C</b> |          | <b>D</b> |          |          |
| 56                     | B                                          |          | C        | D        |          |          |          |
| <b>68</b>              |                                            |          | <b>C</b> | <b>D</b> |          |          |          |
| 82                     |                                            | C        | D        |          |          |          |          |
| <b>100</b>             |                                            | <b>C</b> | <b>D</b> |          |          |          |          |
| 120                    | C                                          |          | D        |          |          |          |          |
| <b>150</b>             | <b>C</b>                                   |          | <b>D</b> |          |          |          |          |
| 180                    |                                            | D        |          |          |          |          |          |
| <b>220</b>             |                                            | <b>D</b> |          |          |          |          |          |
| 270                    | D                                          |          |          |          |          |          |          |
| <b>330</b>             | <b>D</b>                                   |          |          |          |          |          |          |

**Note**

- Preferred ratings are in bold characters.  
Non-preferred ratings are available only with a capacitance tolerance of ± 10 % or ± 5 % (special order).

**RATINGS AND CASE CODES - TYPE CTS13**

| $C_R$<br>( $\mu F$ ) | RATED VOLTAGE $U_R$ (+ 85 °C) |          |          |          |          |          |          |          |
|----------------------|-------------------------------|----------|----------|----------|----------|----------|----------|----------|
|                      | 6.3 V                         | 10 V     | 16 V     | 20 V     | 25 V     | 40 V     | 50 V     | 63 V     |
| <b>0.10</b>          |                               |          |          |          |          |          |          | <b>A</b> |
| 0.12                 |                               |          |          |          |          |          |          | A        |
| <b>0.15</b>          |                               |          |          |          |          |          |          | <b>A</b> |
| 0.18                 |                               |          |          |          |          |          |          | A        |
| <b>0.22</b>          |                               |          |          |          |          |          |          | <b>A</b> |
| 0.27                 |                               |          |          |          |          |          | A        | A        |
| <b>0.33</b>          |                               |          |          |          |          |          | <b>A</b> | <b>A</b> |
| 0.39                 |                               |          |          |          |          |          | A        | A        |
| <b>0.47</b>          |                               |          |          |          |          | <b>A</b> | <b>A</b> | <b>A</b> |
| 0.56                 |                               |          |          |          |          | A        | A        | A        |
| <b>0.68</b>          |                               |          |          |          |          | <b>A</b> | <b>A</b> | <b>A</b> |
| 0.82                 |                               |          |          |          |          | A        | A        | B        |
| <b>1.0</b>           |                               |          |          |          |          | <b>A</b> | <b>A</b> | <b>B</b> |
| 1.2                  |                               |          |          |          | A        | A        | B        | B        |
| <b>1.5</b>           |                               |          |          |          | <b>A</b> | <b>B</b> | <b>B</b> | <b>B</b> |
| 1.8                  |                               |          |          | A        |          | B        | B        | B        |
| <b>2.2</b>           |                               |          |          | <b>A</b> |          | <b>B</b> | <b>B</b> | <b>B</b> |
| 2.7                  |                               |          | A        |          |          | B        | B        | B        |
| <b>3.3</b>           |                               |          | <b>A</b> |          |          | <b>B</b> | <b>B</b> | <b>B</b> |
| 3.9                  |                               | A        |          |          |          | B        | B        | B        |
| <b>4.7</b>           |                               | <b>A</b> |          |          |          | <b>B</b> | <b>B</b> | <b>C</b> |
| 5.6                  | A                             |          |          |          |          | B        | C        | C        |
| <b>6.8</b>           | <b>A</b>                      |          |          |          |          | <b>B</b> | <b>C</b> | <b>C</b> |
| 8.2                  |                               |          |          |          | B        | C        | C        | C        |
| <b>10</b>            |                               |          |          |          | <b>B</b> | <b>C</b> | <b>C</b> | <b>C</b> |
| 12                   |                               |          |          | B        |          | C        | C        | D        |
| <b>15</b>            |                               |          |          | <b>B</b> |          | <b>C</b> | <b>C</b> | <b>D</b> |
| 18                   |                               |          | B        |          |          | C        | C        | D        |
| <b>22</b>            |                               |          | <b>B</b> |          |          | <b>C</b> | <b>D</b> |          |
| 27                   |                               | B        |          |          | C        | D        |          |          |
| <b>33</b>            |                               | <b>B</b> |          |          | <b>C</b> | <b>D</b> |          |          |
| 39                   | B                             |          |          | C        |          | D        |          |          |
| <b>47</b>            | <b>B</b>                      |          |          | <b>C</b> |          | <b>D</b> |          |          |
| 56                   | B                             |          | C        |          | D        |          |          |          |
| <b>68</b>            |                               |          | <b>C</b> |          | <b>D</b> |          |          |          |
| 82                   |                               | C        |          | D        |          |          |          |          |
| <b>100</b>           |                               | <b>C</b> |          | <b>D</b> |          |          |          |          |
| 120                  | C                             |          | D        |          |          |          |          |          |
| <b>150</b>           | <b>C</b>                      |          | <b>D</b> |          |          |          |          |          |
| 180                  |                               | D        |          |          |          |          |          |          |
| <b>220</b>           |                               | <b>D</b> |          |          |          |          |          |          |
| 270                  | D                             |          |          |          |          |          |          |          |
| <b>330</b>           | <b>D</b>                      |          |          |          |          |          |          |          |

**Note**

- Preferred ratings are in bold characters.  
Non-preferred ratings are available only with a capacitance tolerance of  $\pm 10\%$  or  $\pm 5\%$  (special order).



## RATINGS AND CASE CODES - TYPE 749DX

| C <sub>R</sub><br>( $\mu$ F) | RATED VOLTAGE U <sub>R</sub> (+ 85 °C)     |          |          |          |          |          |          |          |          |
|------------------------------|--------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
|                              | 6.3 V                                      | 10 V     | 16 V     | 20 V     | 25 V     | 35 V     | 40 V     | 50 V     | 63 V     |
|                              | CATEGORY VOLTAGE U <sub>C</sub> (+ 125 °C) |          |          |          |          |          |          |          |          |
|                              | 4 V                                        | 6.3 V    | 10 V     | 13 V     | 16 V     | 23 V     | 25 V     | 33 V     | 40 V     |
| 0.068                        |                                            |          |          |          |          |          |          |          |          |
| <b>0.10</b>                  |                                            |          |          |          |          | <b>A</b> | <b>A</b> |          | <b>A</b> |
| 0.12                         |                                            |          |          |          |          | A        | A        |          | A        |
| <b>0.15</b>                  |                                            |          |          |          |          | <b>A</b> | <b>A</b> |          | <b>A</b> |
| 0.18                         |                                            |          |          |          |          | A        | A        |          | A        |
| <b>0.22</b>                  |                                            |          |          |          |          | <b>A</b> | <b>A</b> |          | <b>A</b> |
| 0.27                         |                                            |          |          |          |          | A        | A        |          | A        |
| <b>0.33</b>                  |                                            |          |          |          |          | <b>A</b> | <b>A</b> |          | <b>A</b> |
| 0.39                         |                                            |          |          |          |          | A        | A        |          | A        |
| <b>0.47</b>                  |                                            |          |          |          |          | <b>A</b> | <b>A</b> |          | <b>A</b> |
| 0.56                         |                                            |          |          |          |          | A        | A        |          | A        |
| <b>0.68</b>                  |                                            |          |          |          |          | <b>A</b> | <b>A</b> |          | <b>A</b> |
| 0.82                         |                                            |          |          |          |          | A        | A        | A        | B        |
| <b>1.0</b>                   |                                            |          |          |          |          | <b>A</b> | <b>A</b> | <b>A</b> | <b>B</b> |
| 1.2                          |                                            |          |          |          | A        | B        | B        | B        | B        |
| <b>1.5</b>                   |                                            |          |          |          | <b>A</b> | <b>B</b> | <b>B</b> | <b>B</b> | <b>B</b> |
| 1.8                          |                                            |          |          | A        |          | B        | B        | B        | B        |
| <b>2.2</b>                   |                                            |          |          | <b>A</b> |          | <b>B</b> | <b>B</b> | <b>B</b> | <b>B</b> |
| 2.7                          |                                            |          | A        |          |          | B        | B        | B        | B        |
| <b>3.3</b>                   |                                            |          | <b>A</b> |          |          | <b>B</b> | <b>B</b> | <b>B</b> | <b>B</b> |
| 3.9                          |                                            | A        |          |          |          | B        | B        | B        | B        |
| <b>4.7</b>                   |                                            | <b>A</b> |          |          |          | <b>B</b> | <b>B</b> | <b>B</b> | <b>C</b> |
| 5.6                          | A                                          |          |          |          |          | B        | B        | C        | C        |
| <b>6.8</b>                   | <b>A</b>                                   |          |          |          |          | <b>B</b> | <b>B</b> | <b>C</b> | <b>C</b> |
| 8.2                          |                                            |          |          |          | B        | C        | C        | C        | C        |
| <b>10</b>                    |                                            |          |          |          | <b>B</b> | <b>C</b> | <b>C</b> | <b>C</b> | <b>C</b> |
| 12                           |                                            |          |          | B        |          | C        | C        | C        | D        |
| <b>15</b>                    |                                            |          |          | <b>B</b> |          | <b>C</b> | <b>C</b> | <b>C</b> | <b>D</b> |
| 18                           |                                            |          | B        |          |          | C        | C        | C        | D        |
| <b>22</b>                    |                                            |          | <b>B</b> |          |          | <b>C</b> | <b>C</b> | <b>D</b> |          |
| 27                           |                                            | B        |          |          | C        | D        | D        |          |          |
| <b>33</b>                    |                                            | <b>B</b> |          |          | <b>C</b> | <b>D</b> | <b>D</b> |          |          |
| 39                           |                                            | B        |          | C        |          | D        | D        |          |          |
| <b>47</b>                    | <b>B</b>                                   |          |          | <b>C</b> |          | <b>D</b> |          |          |          |
| 56                           | B                                          |          | C        |          | D        | D        |          |          |          |
| <b>68</b>                    |                                            |          | <b>C</b> |          | <b>D</b> |          |          |          |          |
| 82                           |                                            | C        |          | D        |          |          |          |          |          |
| <b>100</b>                   |                                            | <b>C</b> |          | <b>D</b> |          |          |          |          |          |
| 120                          |                                            | C        | D        |          |          |          |          |          |          |
| <b>150</b>                   | <b>C</b>                                   |          | <b>D</b> |          |          |          |          |          |          |
| 180                          | C                                          | D        |          |          |          |          |          |          |          |
| <b>220</b>                   |                                            | <b>D</b> |          |          |          |          |          |          |          |
| 270                          | D                                          |          |          |          |          |          |          |          |          |
| <b>330</b>                   | <b>D</b>                                   |          |          |          |          |          |          |          |          |

## Note

- Preferred ratings are in bold characters.  
Non-preferred ratings are available only with a capacitance tolerance of  $\pm 10\%$  or  $\pm 5\%$  (special order).



| STANDARD RATINGS/EXTENDED RATINGS - CTS1                           |           |                      |                                                |                                        |                                                         |
|--------------------------------------------------------------------|-----------|----------------------|------------------------------------------------|----------------------------------------|---------------------------------------------------------|
| CAPACITANCE<br>( $\mu$ F)                                          | CASE CODE | PART NUMBER          | MAX. DC<br>LEAKAGE<br>AT + 25 °C<br>( $\mu$ A) | MAX. DF<br>AT + 25 °C<br>120 Hz<br>(%) | MAX. IMPEDANCE<br>AT + 25 °C<br>100 kHz<br>( $\Omega$ ) |
| <b>6.3 V<sub>DC</sub> AT + 85 °C; 4 V<sub>DC</sub> AT 125 °C</b>   |           |                      |                                                |                                        |                                                         |
| 5.6                                                                | A         | CTS1565(1)6R3A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 6.8                                                                | A         | CTS1685(1)6R3A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 39                                                                 | B         | CTS1396(1)6R3B(2)(3) | 2.3                                            | 6                                      | 5                                                       |
| 47                                                                 | B         | CTS1476(1)6R3B(2)(3) | 2.8                                            | 6                                      | 5                                                       |
| 56                                                                 | B         | CTS1566(1)6R3B(2)(3) | 3.4                                            | 6                                      | 5                                                       |
| 120                                                                | C         | CTS1127(1)6R3C(2)(3) | 7.2                                            | 6                                      | 2                                                       |
| 150                                                                | C         | CTS1157(1)6R3C(2)(3) | 9.0                                            | 6                                      | 2                                                       |
| 270                                                                | D         | CTS1277(1)6R3D(2)(3) | 16.2                                           | 6                                      | 1                                                       |
| 330                                                                | D         | CTS1337(1)6R3D(2)(3) | 19.8                                           | 8                                      | 1                                                       |
| <b>10 V<sub>DC</sub> AT + 85 °C; 6.3 V<sub>DC</sub> AT 125 °C</b>  |           |                      |                                                |                                        |                                                         |
| 3.9                                                                | A         | CTS1395(1)010A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 4.7                                                                | A         | CTS1475(1)010A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 27                                                                 | B         | CTS1276(1)010B(2)(3) | 2.7                                            | 6                                      | 5                                                       |
| 33                                                                 | B         | CTS1336(1)010B(2)(3) | 3.3                                            | 6                                      | 5                                                       |
| 82                                                                 | C         | CTS1826(1)010C(2)(3) | 8.2                                            | 6                                      | 2                                                       |
| 100                                                                | C         | CTS1107(1)010C(2)(3) | 10.0                                           | 6                                      | 2                                                       |
| 180                                                                | D         | CTS1187(1)010D(2)(3) | 18.0                                           | 6                                      | 1                                                       |
| 220                                                                | D         | CTS1227(1)010D(2)(3) | 22.0                                           | 8                                      | 1                                                       |
| <b>16 V<sub>DC</sub> AT + 85 °C; 10 V<sub>DC</sub> AT + 125 °C</b> |           |                      |                                                |                                        |                                                         |
| 1.8                                                                | A         | CTS1185(1)016A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 2.2                                                                | A         | CTS1225(1)016A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 2.7                                                                | A         | CTS1275(1)016A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 3.3                                                                | A         | CTS1335(1)016A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 12                                                                 | B         | CTS1126(1)016B(2)(3) | 1.9                                            | 6                                      | 5                                                       |
| 15                                                                 | B         | CTS1156(1)016B(2)(3) | 2.4                                            | 6                                      | 5                                                       |
| 18                                                                 | B         | CTS1186(1)016B(2)(3) | 2.9                                            | 6                                      | 5                                                       |
| 22                                                                 | B         | CTS1226(1)016B(2)(3) | 3.5                                            | 6                                      | 5                                                       |
| 39                                                                 | C         | CTS1396(1)016C(2)(3) | 6.2                                            | 6                                      | 2                                                       |
| 47                                                                 | C         | CTS1476(1)016C(2)(3) | 7.5                                            | 6                                      | 2                                                       |
| 56                                                                 | C         | CTS1566(1)016C(2)(3) | 9.0                                            | 6                                      | 2                                                       |
| 68                                                                 | C         | CTS1686(1)016C(2)(3) | 10.9                                           | 6                                      | 2                                                       |
| 82                                                                 | D         | CTS1826(1)016D(2)(3) | 13.1                                           | 6                                      | 1                                                       |
| 100                                                                | D         | CTS1107(1)016D(2)(3) | 16.0                                           | 6                                      | 1                                                       |
| 120                                                                | D         | CTS1127(1)016D(2)(3) | 19.2                                           | 8                                      | 1                                                       |
| 150                                                                | D         | CTS1157(1)016D(2)(3) | 24.0                                           | 8                                      | 1                                                       |
| <b>25 V<sub>DC</sub> AT + 85 °C; 16 V<sub>DC</sub> AT + 125 °C</b> |           |                      |                                                |                                        |                                                         |
| 1.5                                                                | A         | CTS1155(1)025A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 8.2                                                                | B         | CTS1825(1)025B(2)(3) | 2.1                                            | 6                                      | 5                                                       |
| 10                                                                 | B         | CTS1106(1)025B(2)(3) | 2.5                                            | 6                                      | 5                                                       |
| 27                                                                 | C         | CTS1276(1)025C(2)(3) | 6.8                                            | 6                                      | 2                                                       |
| 33                                                                 | C         | CTS1336(1)025C(2)(3) | 8.3                                            | 6                                      | 2                                                       |
| 56                                                                 | D         | CTS1566(1)025D(2)(3) | 14.0                                           | 6                                      | 1                                                       |
| 68                                                                 | D         | CTS1686(1)025D(2)(3) | 17.0                                           | 6                                      | 1                                                       |

**Note**

- Part number definitions:
  - Capacitance tolerance code: X5, X9, X0
  - Style number: 0 or 2
  - Packaging code



| STANDARD RATINGS/EXTENDED RATINGS - CTS1                      |           |                      |                                                |                                        |                                                         |
|---------------------------------------------------------------|-----------|----------------------|------------------------------------------------|----------------------------------------|---------------------------------------------------------|
| CAPACITANCE<br>( $\mu$ F)                                     | CASE CODE | PART NUMBER          | MAX. DC<br>LEAKAGE<br>AT + 25 °C<br>( $\mu$ A) | MAX. DF<br>AT + 25 °C<br>120 Hz<br>(%) | MAX. IMPEDANCE<br>AT + 25 °C<br>100 kHz<br>( $\Omega$ ) |
| 40 V <sub>DC</sub> AT + 85 °C; 25 V <sub>DC</sub> AT + 125 °C |           |                      |                                                |                                        |                                                         |
| 0.47                                                          | A         | CTS1474(1)040A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.56                                                          | A         | CTS1564(1)040A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.68                                                          | A         | CTS1684(1)040A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.82                                                          | A         | CTS1824(1)040A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 1.0                                                           | A         | CTS1105(1)040A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 1.2                                                           | A         | CTS1125(1)040A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 1.5                                                           | B         | CTS1155(1)040B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 1.8                                                           | B         | CTS1185(1)040B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 2.2                                                           | B         | CTS1225(1)040B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 2.7                                                           | B         | CTS1275(1)040B(2)(3) | 1.1                                            | 6                                      | 5                                                       |
| 3.3                                                           | B         | CTS1335(1)040B(2)(3) | 1.3                                            | 6                                      | 5                                                       |
| 3.9                                                           | B         | CTS1395(1)040B(2)(3) | 1.6                                            | 6                                      | 5                                                       |
| 4.7                                                           | B         | CTS1475(1)040B(2)(3) | 1.9                                            | 6                                      | 5                                                       |
| 5.6                                                           | B         | CTS1565(1)040B(2)(3) | 2.2                                            | 6                                      | 5                                                       |
| 6.8                                                           | B         | CTS1685(1)040B(2)(3) | 2.7                                            | 6                                      | 5                                                       |
| 8.2                                                           | C         | CTS1825(1)040C(2)(3) | 3.3                                            | 6                                      | 2                                                       |
| 10                                                            | C         | CTS1106(1)040C(2)(3) | 4.0                                            | 6                                      | 2                                                       |
| 12                                                            | C         | CTS1126(1)040C(2)(3) | 4.8                                            | 6                                      | 2                                                       |
| 15                                                            | C         | CTS1156(1)040C(2)(3) | 6.0                                            | 6                                      | 2                                                       |
| 18                                                            | C         | CTS1186(1)040C(2)(3) | 7.2                                            | 6                                      | 2                                                       |
| 22                                                            | C         | CTS1226(1)040C(2)(3) | 8.8                                            | 6                                      | 2                                                       |
| 27                                                            | D         | CTS1276(1)040D(2)(3) | 10.8                                           | 6                                      | 1                                                       |
| 33                                                            | D         | CTS1336(1)040D(2)(3) | 13.2                                           | 6                                      | 1                                                       |
| 39                                                            | D         | CTS1396(1)040D(2)(3) | 15.6                                           | 6                                      | 1                                                       |
| 47                                                            | D         | CTS1476(1)040D(2)(3) | 18.8                                           | 6                                      | 1                                                       |
| 50 V <sub>DC</sub> AT + 85 °C; 33 V <sub>DC</sub> AT + 125 °C |           |                      |                                                |                                        |                                                         |
| 0.27                                                          | A         | CTS1274(1)050A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.33                                                          | A         | CTS1334(1)050A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.39                                                          | A         | CTS1394(1)050A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.47                                                          | A         | CTS1474(1)050A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.56                                                          | A         | CTS1564(1)050A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.68                                                          | A         | CTS1684(1)050A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.82                                                          | A         | CTS1824(1)050A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 1.0                                                           | A         | CTS1105(1)050A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 1.2                                                           | B         | CTS1125(1)050B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 1.5                                                           | B         | CTS1155(1)050B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 1.8                                                           | B         | CTS1185(1)050B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 2.2                                                           | B         | CTS1225(1)050B(2)(3) | 1.1                                            | 6                                      | 5                                                       |
| 2.7                                                           | B         | CTS1275(1)050B(2)(3) | 1.4                                            | 6                                      | 5                                                       |
| 3.3                                                           | B         | CTS1335(1)050B(2)(3) | 1.7                                            | 6                                      | 5                                                       |
| 3.9                                                           | B         | CTS1395(1)050B(2)(3) | 2.0                                            | 6                                      | 5                                                       |

**Note**

- Part number definitions:
  - Capacitance tolerance code: X5, X9, X0
  - Style number: 0 or 2
  - Packaging code

**STANDARD RATINGS/EXTENDED RATINGS - CTS1**

| CAPACITANCE<br>( $\mu$ F)                                          | CASE CODE | PART NUMBER          | MAX. DC<br>LEAKAGE<br>AT + 25 °C<br>( $\mu$ A) | MAX. DF<br>AT + 25 °C<br>120 Hz<br>(%) | MAX. IMPEDANCE<br>AT + 25 °C<br>100 kHz<br>( $\Omega$ ) |
|--------------------------------------------------------------------|-----------|----------------------|------------------------------------------------|----------------------------------------|---------------------------------------------------------|
| <b>50 V<sub>DC</sub> AT + 85 °C; 33 V<sub>DC</sub> AT + 125 °C</b> |           |                      |                                                |                                        |                                                         |
| 4.7                                                                | B         | CTS1475(1)050B(2)(3) | 2.4                                            | 6                                      | 5                                                       |
| 5.6                                                                | C         | CTS1565(1)050C(2)(3) | 2.8                                            | 6                                      | 2                                                       |
| 6.8                                                                | C         | CTS1685(1)050C(2)(3) | 3.4                                            | 6                                      | 2                                                       |
| 8.2                                                                | C         | CTS1825(1)050C(2)(3) | 4.1                                            | 6                                      | 2                                                       |
| 10                                                                 | C         | CTS1106(1)050C(2)(3) | 5.0                                            | 6                                      | 2                                                       |
| 12                                                                 | C         | CTS1126(1)050C(2)(3) | 6.0                                            | 6                                      | 2                                                       |
| 15                                                                 | C         | CTS1156(1)050C(2)(3) | 7.5                                            | 6                                      | 2                                                       |
| 18                                                                 | C         | CTS1186(1)050C(2)(3) | 9.0                                            | 6                                      | 2                                                       |
| 22                                                                 | D         | CTS1226(1)050D(2)(3) | 11.0                                           | 6                                      | 1                                                       |
| <b>63 V<sub>DC</sub> AT + 85 °C; 40 V<sub>DC</sub> AT + 125 °C</b> |           |                      |                                                |                                        |                                                         |
| 0.10                                                               | A         | CTS1104(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.12                                                               | A         | CTS1124(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.15                                                               | A         | CTS1154(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.18                                                               | A         | CTS1184(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.22                                                               | A         | CTS1224(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.27                                                               | A         | CTS1274(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.33                                                               | A         | CTS1334(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.39                                                               | A         | CTS1394(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.47                                                               | A         | CTS1474(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.56                                                               | A         | CTS1564(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.68                                                               | A         | CTS1684(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.82                                                               | B         | CTS1824(1)063B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 1.0                                                                | B         | CTS1105(1)063B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 1.2                                                                | B         | CTS1125(1)063B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 1.5                                                                | B         | CTS1155(1)063B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 1.8                                                                | B         | CTS1185(1)063B(2)(3) | 1.1                                            | 6                                      | 5                                                       |
| 2.2                                                                | B         | CTS1225(1)063B(2)(3) | 1.4                                            | 6                                      | 5                                                       |
| 2.7                                                                | B         | CTS1275(1)063B(2)(3) | 1.7                                            | 6                                      | 5                                                       |
| 3.3                                                                | B         | CTS1335(1)063B(2)(3) | 2.1                                            | 6                                      | 5                                                       |
| 3.9                                                                | B         | CTS1395(1)063B(2)(3) | 2.5                                            | 6                                      | 5                                                       |
| 4.7                                                                | C         | CTS1475(1)063C(2)(3) | 3.0                                            | 6                                      | 2                                                       |
| 5.6                                                                | C         | CTS1565(1)063C(2)(3) | 3.5                                            | 6                                      | 2                                                       |
| 6.8                                                                | C         | CTS1685(1)063C(2)(3) | 4.3                                            | 6                                      | 2                                                       |
| 8.2                                                                | C         | CTS1825(1)063C(2)(3) | 5.2                                            | 6                                      | 2                                                       |
| 10                                                                 | C         | CTS1106(1)063C(2)(3) | 6.3                                            | 6                                      | 2                                                       |
| 12                                                                 | D         | CTS1126(1)063D(2)(3) | 7.6                                            | 6                                      | 1                                                       |
| 15                                                                 | D         | CTS1156(1)063D(2)(3) | 9.5                                            | 6                                      | 1                                                       |
| 18                                                                 | D         | CTS1186(1)063D(2)(3) | 11.3                                           | 6                                      | 1                                                       |

**Note**

- Part number definitions:
  - Capacitance tolerance code: X5, X9, X0
  - Style number: 0 or 2
  - Packaging code



| STANDARD RATINGS/EXTENDED RATINGS - CTS13 |           |                       |                                                |                                        |                                                         |
|-------------------------------------------|-----------|-----------------------|------------------------------------------------|----------------------------------------|---------------------------------------------------------|
| CAPACITANCE<br>( $\mu$ F)                 | CASE CODE | PART NUMBER           | MAX. DC<br>LEAKAGE<br>AT + 25 °C<br>( $\mu$ A) | MAX. DF<br>AT + 25 °C<br>120 Hz<br>(%) | MAX. IMPEDANCE<br>AT + 25 °C<br>100 kHz<br>( $\Omega$ ) |
| <b>6.3 V<sub>DC</sub> AT + 85 °C</b>      |           |                       |                                                |                                        |                                                         |
| 5.6                                       | A         | CTS13565(1)6R3A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 6.8                                       | A         | CTS13685(1)6R3A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 39                                        | B         | CTS13396(1)6R3B(2)(3) | 2.3                                            | 6                                      | 5                                                       |
| 47                                        | B         | CTS13476(1)6R3B(2)(3) | 2.8                                            | 6                                      | 5                                                       |
| 56                                        | B         | CTS13566(1)6R3B(2)(3) | 3.4                                            | 6                                      | 5                                                       |
| 120                                       | C         | CTS13127(1)6R3C(2)(3) | 7.2                                            | 6                                      | 2                                                       |
| 150                                       | C         | CTS13157(1)6R3C(2)(3) | 9.0                                            | 6                                      | 2                                                       |
| 270                                       | D         | CTS13277(1)6R3D(2)(3) | 16.2                                           | 6                                      | 1                                                       |
| 330                                       | D         | CTS13337(1)6R3D(2)(3) | 19.8                                           | 8                                      | 1                                                       |
| <b>10 V<sub>DC</sub> AT + 85 °C</b>       |           |                       |                                                |                                        |                                                         |
| 3.9                                       | A         | CTS13395(1)010A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 4.7                                       | A         | CTS13475(1)010A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 27                                        | B         | CTS13276(1)010B(2)(3) | 2.7                                            | 6                                      | 5                                                       |
| 33                                        | B         | CTS13336(1)010B(2)(3) | 3.3                                            | 6                                      | 5                                                       |
| 82                                        | C         | CTS13826(1)010C(2)(3) | 8.2                                            | 6                                      | 2                                                       |
| 100                                       | C         | CTS13107(1)010C(2)(3) | 10.0                                           | 6                                      | 2                                                       |
| 180                                       | D         | CTS13187(1)010D(2)(3) | 18.0                                           | 6                                      | 1                                                       |
| 220                                       | D         | CTS13227(1)010D(2)(3) | 22.0                                           | 8                                      | 1                                                       |
| <b>16 V<sub>DC</sub> AT + 85 °C</b>       |           |                       |                                                |                                        |                                                         |
| 2.7                                       | A         | CTS13275(1)016A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 3.3                                       | A         | CTS13335(1)016A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 18                                        | B         | CTS13186(1)016B(2)(3) | 2.9                                            | 6                                      | 5                                                       |
| 22                                        | B         | CTS13226(1)016B(2)(3) | 3.5                                            | 6                                      | 5                                                       |
| 56                                        | C         | CTS13566(1)016C(2)(3) | 9.0                                            | 6                                      | 2                                                       |
| 68                                        | C         | CTS13686(1)016C(2)(3) | 10.9                                           | 6                                      | 2                                                       |
| 120                                       | D         | CTS13127(1)016D(2)(3) | 19.2                                           | 8                                      | 1                                                       |
| 150                                       | D         | CTS13157(1)016D(2)(3) | 24.0                                           | 8                                      | 1                                                       |
| <b>20 V<sub>DC</sub> AT + 85 °C</b>       |           |                       |                                                |                                        |                                                         |
| 1.8                                       | A         | CTS13185(1)020A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 2.2                                       | A         | CTS13225(1)020A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 12                                        | B         | CTS13126(1)020B(2)(3) | 2.4                                            | 6                                      | 5                                                       |
| 15                                        | B         | CTS13156(1)020B(2)(3) | 3.0                                            | 6                                      | 5                                                       |
| 39                                        | C         | CTS13396(1)020C(2)(3) | 7.8                                            | 6                                      | 2                                                       |
| 47                                        | C         | CTS13476(1)020C(2)(3) | 9.4                                            | 6                                      | 2                                                       |
| 82                                        | D         | CTS13826(1)020D(2)(3) | 16.4                                           | 6                                      | 1                                                       |
| 100                                       | D         | CTS13107(1)020D(2)(3) | 20.0                                           | 8                                      | 1                                                       |
| <b>25 V<sub>DC</sub> AT + 85 °C</b>       |           |                       |                                                |                                        |                                                         |
| 1.2                                       | A         | CTS13125(1)025A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 1.5                                       | A         | CTS13155(1)025A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 8.2                                       | B         | CTS13825(1)025B(2)(3) | 2.1                                            | 6                                      | 5                                                       |
| 10                                        | B         | CTS13106(1)025B(2)(3) | 2.5                                            | 6                                      | 5                                                       |
| 27                                        | C         | CTS13276(1)025C(2)(3) | 6.8                                            | 6                                      | 2                                                       |
| 33                                        | C         | CTS13336(1)025C(2)(3) | 8.3                                            | 6                                      | 2                                                       |
| 56                                        | D         | CTS13566(1)025D(2)(3) | 14.0                                           | 6                                      | 1                                                       |
| 68                                        | D         | CTS13686(1)025D(2)(3) | 17.0                                           | 6                                      | 1                                                       |

**Note**

- Part number definitions:
  - Capacitance tolerance code: X5, X9, X0
  - Style number: 0 or 2
  - Packaging code





| STANDARD RATINGS/EXTENDED RATINGS - CTS13 |           |                       |                                                |                                        |                                                         |
|-------------------------------------------|-----------|-----------------------|------------------------------------------------|----------------------------------------|---------------------------------------------------------|
| CAPACITANCE<br>( $\mu$ F)                 | CASE CODE | PART NUMBER           | MAX. DC<br>LEAKAGE<br>AT + 25 °C<br>( $\mu$ A) | MAX. DF<br>AT + 25 °C<br>120 Hz<br>(%) | MAX. IMPEDANCE<br>AT + 25 °C<br>100 kHz<br>( $\Omega$ ) |
| 40 V <sub>DC</sub> AT + 85 °C             |           |                       |                                                |                                        |                                                         |
| 0.47                                      | A         | CTS13474(1)040A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.56                                      | A         | CTS13564(1)040A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.68                                      | A         | CTS13684(1)040A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.82                                      | A         | CTS13824(1)040A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 1.0                                       | A         | CTS13105(1)040A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 1.2                                       | A         | CTS13125(1)040A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 1.5                                       | B         | CTS13155(1)040B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 1.8                                       | B         | CTS13185(1)040B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 2.2                                       | B         | CTS13225(1)040B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 2.7                                       | B         | CTS13275(1)040B(2)(3) | 1.1                                            | 6                                      | 5                                                       |
| 3.3                                       | B         | CTS13335(1)040B(2)(3) | 1.3                                            | 6                                      | 5                                                       |
| 3.9                                       | B         | CTS13395(1)040B(2)(3) | 1.6                                            | 6                                      | 5                                                       |
| 4.7                                       | B         | CTS13475(1)040B(2)(3) | 1.9                                            | 6                                      | 5                                                       |
| 5.6                                       | B         | CTS13565(1)040B(2)(3) | 2.2                                            | 6                                      | 5                                                       |
| 6.8                                       | B         | CTS13685(1)040B(2)(3) | 2.7                                            | 6                                      | 5                                                       |
| 8.2                                       | C         | CTS13825(1)040C(2)(3) | 3.3                                            | 6                                      | 2                                                       |
| 10                                        | C         | CTS13106(1)040C(2)(3) | 4.0                                            | 6                                      | 2                                                       |
| 12                                        | C         | CTS13126(1)040C(2)(3) | 4.8                                            | 6                                      | 2                                                       |
| 15                                        | C         | CTS13156(1)040C(2)(3) | 6.0                                            | 6                                      | 2                                                       |
| 18                                        | C         | CTS13186(1)040C(2)(3) | 7.2                                            | 6                                      | 2                                                       |
| 22                                        | C         | CTS13226(1)040C(2)(3) | 8.8                                            | 6                                      | 2                                                       |
| 27                                        | D         | CTS13276(1)040D(2)(3) | 10.8                                           | 6                                      | 1                                                       |
| 33                                        | D         | CTS13336(1)040D(2)(3) | 13.2                                           | 6                                      | 1                                                       |
| 39                                        | D         | CTS13396(1)040D(2)(3) | 15.6                                           | 6                                      | 1                                                       |
| 47                                        | D         | CTS13476(1)040D(2)(3) | 18.8                                           | 6                                      | 1                                                       |
| 50 V <sub>DC</sub> AT + 85 °C             |           |                       |                                                |                                        |                                                         |
| 0.27                                      | A         | CTS13274(1)050A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.33                                      | A         | CTS13334(1)050A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.39                                      | A         | CTS13394(1)050A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.47                                      | A         | CTS13474(1)050A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.56                                      | A         | CTS13564(1)050A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.68                                      | A         | CTS13684(1)050A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.82                                      | A         | CTS13824(1)050A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 1.0                                       | A         | CTS13105(1)050A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 1.2                                       | B         | CTS13125(1)050B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 1.5                                       | B         | CTS13155(1)050B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 1.8                                       | B         | CTS13185(1)050B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 2.2                                       | B         | CTS13225(1)050B(2)(3) | 1.1                                            | 6                                      | 5                                                       |
| 2.7                                       | B         | CTS13275(1)050B(2)(3) | 1.4                                            | 6                                      | 5                                                       |
| 3.3                                       | B         | CTS13335(1)050B(2)(3) | 1.7                                            | 6                                      | 5                                                       |
| 3.9                                       | B         | CTS13395(1)050B(2)(3) | 2.0                                            | 6                                      | 5                                                       |

**Note**

- Part number definitions:
  - Capacitance tolerance code: X5, X9, X0
  - Style number: 0 or 2
  - Packaging code

**STANDARD RATINGS/EXTENDED RATINGS - CTS13**

| CAPACITANCE<br>( $\mu$ F)           | CASE CODE | PART NUMBER           | MAX. DC<br>LEAKAGE<br>AT + 25 °C<br>( $\mu$ A) | MAX. DF<br>AT + 25 °C<br>120 Hz<br>(%) | MAX. IMPEDANCE<br>AT + 25 °C<br>100 kHz<br>( $\Omega$ ) |
|-------------------------------------|-----------|-----------------------|------------------------------------------------|----------------------------------------|---------------------------------------------------------|
| <b>50 V<sub>DC</sub> AT + 85 °C</b> |           |                       |                                                |                                        |                                                         |
| 4.7                                 | B         | CTS13475(1)050B(2)(3) | 2.4                                            | 6                                      | 5                                                       |
| 5.6                                 | C         | CTS13565(1)050C(2)(3) | 2.8                                            | 6                                      | 2                                                       |
| 6.8                                 | C         | CTS13685(1)050C(2)(3) | 3.4                                            | 6                                      | 2                                                       |
| 8.2                                 | C         | CTS13825(1)050C(2)(3) | 4.1                                            | 6                                      | 2                                                       |
| 10                                  | C         | CTS13106(1)050C(2)(3) | 5.0                                            | 6                                      | 2                                                       |
| 12                                  | C         | CTS13126(1)050C(2)(3) | 6.0                                            | 6                                      | 2                                                       |
| 15                                  | C         | CTS13156(1)050C(2)(3) | 7.5                                            | 6                                      | 2                                                       |
| 18                                  | C         | CTS13186(1)050C(2)(3) | 9.0                                            | 6                                      | 2                                                       |
| 22                                  | D         | CTS13226(1)050D(2)(3) | 11.0                                           | 6                                      | 1                                                       |
| <b>63 V<sub>DC</sub> AT + 85 °C</b> |           |                       |                                                |                                        |                                                         |
| 0.10                                | A         | CTS13104(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.12                                | A         | CTS13124(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.15                                | A         | CTS13154(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.18                                | A         | CTS13184(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.22                                | A         | CTS13224(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.27                                | A         | CTS13274(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.33                                | A         | CTS13334(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.39                                | A         | CTS13394(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.47                                | A         | CTS13474(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.56                                | A         | CTS13564(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.68                                | A         | CTS13684(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.82                                | B         | CTS13824(1)063B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 1.0                                 | B         | CTS13105(1)063B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 1.2                                 | B         | CTS13125(1)063B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 1.5                                 | B         | CTS13155(1)063B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 1.8                                 | B         | CTS13185(1)063B(2)(3) | 1.1                                            | 6                                      | 5                                                       |
| 2.2                                 | B         | CTS13225(1)063B(2)(3) | 1.4                                            | 6                                      | 5                                                       |
| 2.7                                 | B         | CTS13275(1)063B(2)(3) | 1.7                                            | 6                                      | 5                                                       |
| 3.3                                 | B         | CTS13335(1)063B(2)(3) | 2.1                                            | 6                                      | 5                                                       |
| 3.9                                 | B         | CTS13395(1)063B(2)(3) | 2.5                                            | 6                                      | 5                                                       |
| 4.7                                 | C         | CTS13475(1)063C(2)(3) | 3.0                                            | 6                                      | 2                                                       |
| 5.6                                 | C         | CTS13565(1)063C(2)(3) | 3.5                                            | 6                                      | 2                                                       |
| 6.8                                 | C         | CTS13685(1)063C(2)(3) | 4.3                                            | 6                                      | 2                                                       |
| 8.2                                 | C         | CTS13825(1)063C(2)(3) | 5.2                                            | 6                                      | 2                                                       |
| 10                                  | C         | CTS13106(1)063C(2)(3) | 6.3                                            | 6                                      | 2                                                       |
| 12                                  | D         | CTS13126(1)063D(2)(3) | 7.6                                            | 6                                      | 1                                                       |
| 15                                  | D         | CTS13156(1)063D(2)(3) | 9.5                                            | 6                                      | 1                                                       |
| 18                                  | D         | CTS13186(1)063D(2)(3) | 11.3                                           | 6                                      | 1                                                       |

**Note**

- Part number definitions:
  - Capacitance tolerance code: X5, X9, X0
  - Style number: 0 or 2
  - Packaging code



| STANDARD RATINGS/EXTENDED RATINGS - 749DX                          |           |                       |                                                |                                        |                                                         |
|--------------------------------------------------------------------|-----------|-----------------------|------------------------------------------------|----------------------------------------|---------------------------------------------------------|
| CAPACITANCE<br>( $\mu$ F)                                          | CASE CODE | PART NUMBER           | MAX. DC<br>LEAKAGE<br>AT + 25 °C<br>( $\mu$ A) | MAX. DF<br>AT + 25 °C<br>120 Hz<br>(%) | MAX. IMPEDANCE<br>AT + 25 °C<br>100 kHz<br>( $\Omega$ ) |
| <b>6.3 V<sub>DC</sub> AT + 85 °C; 4 V<sub>DC</sub> AT 125 °C</b>   |           |                       |                                                |                                        |                                                         |
| 5.6                                                                | A         | 749DX565(1)6R3A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 6.8                                                                | A         | 749DX685(1)6R3A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 47                                                                 | B         | 749DX476(1)6R3B(2)(3) | 2.8                                            | 6                                      | 5                                                       |
| 56                                                                 | B         | 749DX566(1)6R3B(2)(3) | 3.4                                            | 6                                      | 5                                                       |
| 150                                                                | C         | 749DX157(1)6R3C(2)(3) | 9.0                                            | 8                                      | 2                                                       |
| 180                                                                | C         | 749DX187(1)6R3C(2)(3) | 10.8                                           | 8                                      | 2                                                       |
| 270                                                                | D         | 749DX277(1)6R3D(2)(3) | 16.2                                           | 8                                      | 1                                                       |
| 330                                                                | D         | 749DX337(1)6R3D(2)(3) | 19.8                                           | 8                                      | 1                                                       |
| <b>10 V<sub>DC</sub> AT + 85 °C; 6.3 V<sub>DC</sub> AT 125 °C</b>  |           |                       |                                                |                                        |                                                         |
| 3.9                                                                | A         | 749DX395(1)010A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 4.7                                                                | A         | 749DX475(1)010A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 27                                                                 | B         | 749DX276(1)010B(2)(3) | 2.7                                            | 6                                      | 5                                                       |
| 33                                                                 | B         | 749DX336(1)010B(2)(3) | 3.3                                            | 6                                      | 5                                                       |
| 39                                                                 | B         | 749DX396(1)010B(2)(3) | 3.9                                            | 6                                      | 5                                                       |
| 82                                                                 | C         | 749DX826(1)010C(2)(3) | 8.2                                            | 6                                      | 2                                                       |
| 100                                                                | C         | 749DX107(1)010C(2)(3) | 10.0                                           | 6                                      | 2                                                       |
| 120                                                                | C         | 749DX127(1)010C(2)(3) | 12.0                                           | 8                                      | 2                                                       |
| 180                                                                | D         | 749DX187(1)010D(2)(3) | 18.0                                           | 8                                      | 1                                                       |
| 220                                                                | D         | 749DX227(1)010D(2)(3) | 22.0                                           | 8                                      | 1                                                       |
| <b>16 V<sub>DC</sub> AT + 85 °C; 10 V<sub>DC</sub> AT + 125 °C</b> |           |                       |                                                |                                        |                                                         |
| 2.7                                                                | A         | 749DX275(1)016A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 3.3                                                                | A         | 749DX335(1)016A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 18                                                                 | B         | 749DX186(1)016B(2)(3) | 2.9                                            | 6                                      | 5                                                       |
| 22                                                                 | B         | 749DX226(1)016B(2)(3) | 3.5                                            | 6                                      | 5                                                       |
| 56                                                                 | C         | 749DX566(1)016C(2)(3) | 9.0                                            | 6                                      | 2                                                       |
| 68                                                                 | C         | 749DX686(1)016C(2)(3) | 10.9                                           | 6                                      | 2                                                       |
| 120                                                                | D         | 749DX127(1)016D(2)(3) | 19.2                                           | 8                                      | 1                                                       |
| 150                                                                | D         | 749DX157(1)016D(2)(3) | 24.0                                           | 8                                      | 1                                                       |
| <b>20 V<sub>DC</sub> AT + 85 °C; 13 V<sub>DC</sub> AT + 125 °C</b> |           |                       |                                                |                                        |                                                         |
| 1.8                                                                | A         | 749DX185(1)020A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 2.2                                                                | A         | 749DX225(1)020A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 12                                                                 | B         | 749DX126(1)020B(2)(3) | 2.4                                            | 6                                      | 5                                                       |
| 15                                                                 | B         | 749DX156(1)020B(2)(3) | 3.0                                            | 6                                      | 5                                                       |
| 39                                                                 | C         | 749DX396(1)020C(2)(3) | 7.8                                            | 6                                      | 2                                                       |
| 47                                                                 | C         | 749DX476(1)020C(2)(3) | 9.4                                            | 6                                      | 2                                                       |
| 82                                                                 | D         | 749DX826(1)020D(2)(3) | 16.4                                           | 6                                      | 1                                                       |
| 100                                                                | D         | 749DX107(1)020D(2)(3) | 20.0                                           | 6                                      | 1                                                       |
| <b>25 V<sub>DC</sub> AT + 85 °C; 16 V<sub>DC</sub> AT + 125 °C</b> |           |                       |                                                |                                        |                                                         |
| 1.2                                                                | A         | 749DX125(1)025A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 1.5                                                                | A         | 749DX155(1)025A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 8.2                                                                | B         | 749DX825(1)025B(2)(3) | 2.1                                            | 6                                      | 5                                                       |

**Note**

- Part number definitions:
  - Capacitance tolerance code: X5, X9, X0
  - Style number: 0 or 2
  - Packaging code



| STANDARD RATINGS/EXTENDED RATINGS - 749DX                     |           |                       |                                                |                                        |                                                         |
|---------------------------------------------------------------|-----------|-----------------------|------------------------------------------------|----------------------------------------|---------------------------------------------------------|
| CAPACITANCE<br>( $\mu$ F)                                     | CASE CODE | PART NUMBER           | MAX. DC<br>LEAKAGE<br>AT + 25 °C<br>( $\mu$ A) | MAX. DF<br>AT + 25 °C<br>120 Hz<br>(%) | MAX. IMPEDANCE<br>AT + 25 °C<br>100 kHz<br>( $\Omega$ ) |
| 25 V <sub>DC</sub> AT + 85 °C; 16 V <sub>DC</sub> AT + 125 °C |           |                       |                                                |                                        |                                                         |
| 10                                                            | B         | 749DX106(1)025B(2)(3) | 2.5                                            | 6                                      | 5                                                       |
| 27                                                            | C         | 749DX276(1)025C(2)(3) | 6.8                                            | 6                                      | 2                                                       |
| 33                                                            | C         | 749DX336(1)025C(2)(3) | 8.3                                            | 6                                      | 2                                                       |
| 56                                                            | D         | 749DX566(1)025D(2)(3) | 14.0                                           | 6                                      | 1                                                       |
| 68                                                            | D         | 749DX686(1)025D(2)(3) | 17.0                                           | 6                                      | 1                                                       |
| 35 V <sub>DC</sub> AT + 85 °C; 23 V <sub>DC</sub> AT + 125 °C |           |                       |                                                |                                        |                                                         |
| 0.10                                                          | A         | 749DX104(1)035A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.12                                                          | A         | 749DX124(1)035A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.15                                                          | A         | 749DX154(1)035A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.18                                                          | A         | 749DX184(1)035A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.22                                                          | A         | 749DX224(1)035A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.27                                                          | A         | 749DX274(1)035A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.33                                                          | A         | 749DX334(1)035A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.39                                                          | A         | 749DX394(1)035A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.47                                                          | A         | 749DX474(1)035A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.56                                                          | A         | 749DX564(1)035A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.68                                                          | A         | 749DX684(1)035A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.82                                                          | A         | 749DX824(1)035A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 1.0                                                           | A         | 749DX105(1)035A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 1.2                                                           | B         | 749DX125(1)035B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 1.5                                                           | B         | 749DX155(1)035B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 1.8                                                           | B         | 749DX185(1)035B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 2.2                                                           | B         | 749DX225(1)035B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 2.7                                                           | B         | 749DX275(1)035B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 3.3                                                           | B         | 749DX335(1)035B(2)(3) | 1.2                                            | 6                                      | 5                                                       |
| 3.9                                                           | B         | 749DX395(1)035B(2)(3) | 1.4                                            | 6                                      | 5                                                       |
| 4.7                                                           | B         | 749DX475(1)035B(2)(3) | 1.6                                            | 6                                      | 5                                                       |
| 5.6                                                           | B         | 749DX565(1)035B(2)(3) | 2.0                                            | 6                                      | 5                                                       |
| 6.8                                                           | B         | 749DX685(1)035B(2)(3) | 2.4                                            | 6                                      | 5                                                       |
| 8.2                                                           | C         | 749DX825(1)035C(2)(3) | 2.9                                            | 6                                      | 2                                                       |
| 10                                                            | C         | 749DX106(1)035C(2)(3) | 3.5                                            | 6                                      | 2                                                       |
| 12                                                            | C         | 749DX126(1)035C(2)(3) | 4.2                                            | 6                                      | 2                                                       |
| 15                                                            | C         | 749DX156(1)035C(2)(3) | 5.3                                            | 6                                      | 2                                                       |
| 18                                                            | C         | 749DX186(1)035C(2)(3) | 6.3                                            | 6                                      | 2                                                       |
| 22                                                            | C         | 749DX226(1)035C(2)(3) | 7.7                                            | 6                                      | 2                                                       |
| 27                                                            | D         | 749DX276(1)035D(2)(3) | 9.5                                            | 6                                      | 1                                                       |
| 33                                                            | D         | 749DX336(1)035D(2)(3) | 11.6                                           | 6                                      | 1                                                       |
| 39                                                            | D         | 749DX396(1)035D(2)(3) | 13.7                                           | 6                                      | 1                                                       |
| 47                                                            | D         | 749DX476(1)035D(2)(3) | 16.5                                           | 6                                      | 1                                                       |
| 56                                                            | D         | 749DX566(1)035D(2)(3) | 19.6                                           | 6                                      | 1                                                       |

**Note**

- Part number definitions:
  - Capacitance tolerance code: X5, X9, X0
  - Style number: 0 or 2
  - Packaging code



| STANDARD RATINGS/EXTENDED RATINGS - 749DX                     |           |                       |                                                |                                        |                                                         |
|---------------------------------------------------------------|-----------|-----------------------|------------------------------------------------|----------------------------------------|---------------------------------------------------------|
| CAPACITANCE<br>( $\mu$ F)                                     | CASE CODE | PART NUMBER           | MAX. DC<br>LEAKAGE<br>AT + 25 °C<br>( $\mu$ A) | MAX. DF<br>AT + 25 °C<br>120 Hz<br>(%) | MAX. IMPEDANCE<br>AT + 25 °C<br>100 kHz<br>( $\Omega$ ) |
| 40 V <sub>DC</sub> AT + 85 °C; 25 V <sub>DC</sub> AT + 125 °C |           |                       |                                                |                                        |                                                         |
| 0.10                                                          | A         | 749DX104(1)040A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.12                                                          | A         | 749DX124(1)040A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.15                                                          | A         | 749DX154(1)040A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.18                                                          | A         | 749DX184(1)040A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.22                                                          | A         | 749DX224(1)040A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.27                                                          | A         | 749DX274(1)040A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.33                                                          | A         | 749DX334(1)040A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.39                                                          | A         | 749DX394(1)040A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.47                                                          | A         | 749DX474(1)040A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.56                                                          | A         | 749DX564(1)040A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.68                                                          | A         | 749DX684(1)040A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.82                                                          | A         | 749DX824(1)040A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 1.0                                                           | A         | 749DX105(1)040A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 1.2                                                           | B         | 749DX125(1)040B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 1.5                                                           | B         | 749DX155(1)040B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 1.8                                                           | B         | 749DX185(1)040B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 2.2                                                           | B         | 749DX225(1)040B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 2.7                                                           | B         | 749DX275(1)040B(2)(3) | 1.1                                            | 6                                      | 5                                                       |
| 3.3                                                           | B         | 749DX335(1)040B(2)(3) | 1.3                                            | 6                                      | 5                                                       |
| 3.9                                                           | B         | 749DX395(1)040B(2)(3) | 1.6                                            | 6                                      | 5                                                       |
| 4.7                                                           | B         | 749DX475(1)040B(2)(3) | 1.9                                            | 6                                      | 5                                                       |
| 5.6                                                           | B         | 749DX565(1)040B(2)(3) | 2.2                                            | 6                                      | 5                                                       |
| 6.8                                                           | B         | 749DX685(1)040B(2)(3) | 2.7                                            | 6                                      | 5                                                       |
| 8.2                                                           | C         | 749DX825(1)040C(2)(3) | 3.3                                            | 6                                      | 2                                                       |
| 10                                                            | C         | 749DX106(1)040C(2)(3) | 4.0                                            | 6                                      | 2                                                       |
| 12                                                            | C         | 749DX126(1)040C(2)(3) | 4.8                                            | 6                                      | 2                                                       |
| 15                                                            | C         | 749DX156(1)040C(2)(3) | 6.0                                            | 6                                      | 2                                                       |
| 18                                                            | C         | 749DX186(1)040C(2)(3) | 7.2                                            | 6                                      | 2                                                       |
| 22                                                            | C         | 749DX226(1)040C(2)(3) | 8.8                                            | 6                                      | 2                                                       |
| 27                                                            | D         | 749DX276(1)040D(2)(3) | 10.8                                           | 6                                      | 1                                                       |
| 33                                                            | D         | 749DX336(1)040D(2)(3) | 13.2                                           | 6                                      | 1                                                       |
| 39                                                            | D         | 749DX396(1)040D(2)(3) | 15.6                                           | 6                                      | 1                                                       |
| 50 V <sub>DC</sub> AT + 85 °C; 33 V <sub>DC</sub> AT + 125 °C |           |                       |                                                |                                        |                                                         |
| 0.82                                                          | A         | 749DX824(1)050A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 1.0                                                           | A         | 749DX105(1)050A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 1.2                                                           | B         | 749DX125(1)050B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 1.5                                                           | B         | 749DX155(1)050B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 1.8                                                           | B         | 749DX185(1)050B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 2.2                                                           | B         | 749DX225(1)050B(2)(3) | 1.1                                            | 6                                      | 5                                                       |
| 2.7                                                           | B         | 749DX275(1)050B(2)(3) | 1.4                                            | 6                                      | 5                                                       |
| 3.3                                                           | B         | 749DX335(1)050B(2)(3) | 1.7                                            | 6                                      | 5                                                       |

**Note**

- Part number definitions:
  - (1) Capacitance tolerance code: X5, X9, X0
  - (2) Style number: 0 or 2
  - (3) Packaging code



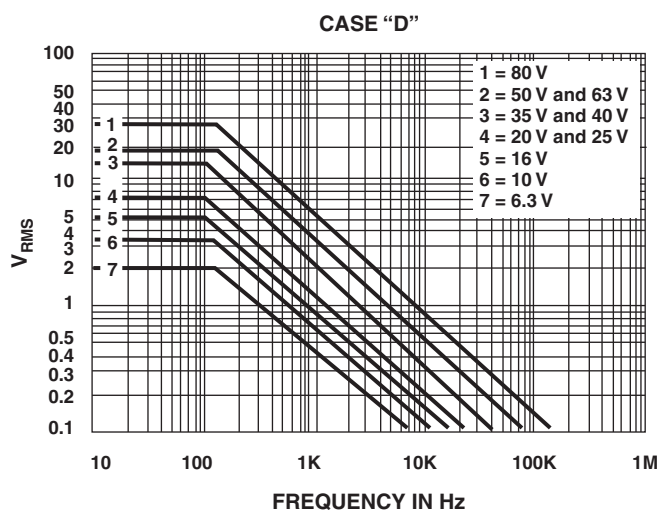
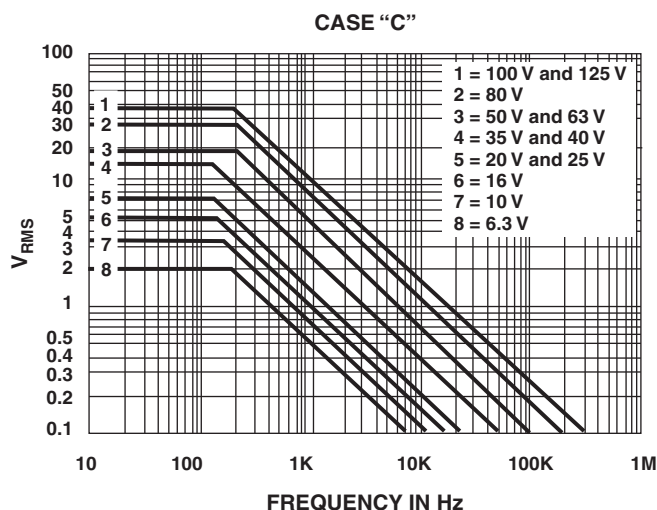
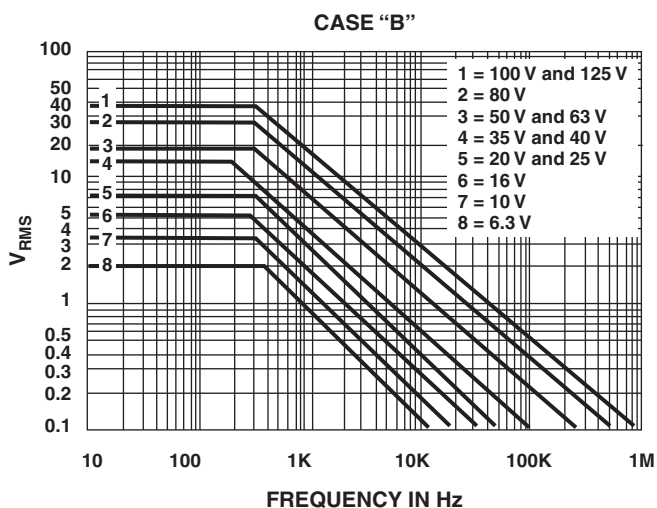
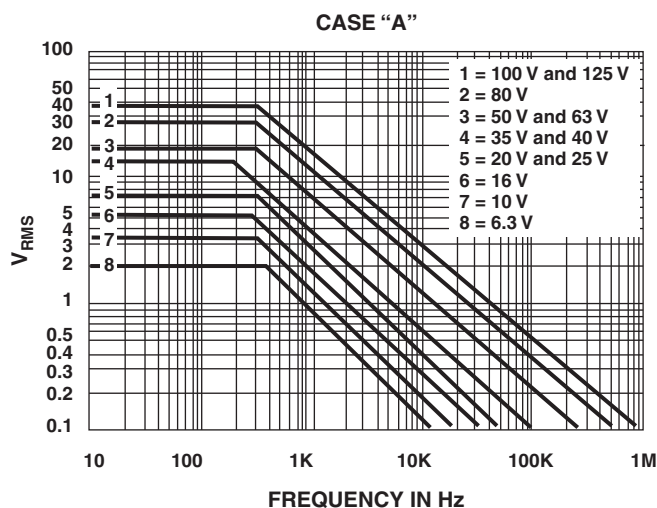
| STANDARD RATINGS/EXTENDED RATINGS - 749DX                     |           |                       |                                                |                                        |                                                         |
|---------------------------------------------------------------|-----------|-----------------------|------------------------------------------------|----------------------------------------|---------------------------------------------------------|
| CAPACITANCE<br>( $\mu$ F)                                     | CASE CODE | PART NUMBER           | MAX. DC<br>LEAKAGE<br>AT + 25 °C<br>( $\mu$ A) | MAX. DF<br>AT + 25 °C<br>120 Hz<br>(%) | MAX. IMPEDANCE<br>AT + 25 °C<br>100 kHz<br>( $\Omega$ ) |
| 50 V <sub>DC</sub> AT + 85 °C; 33 V <sub>DC</sub> AT + 125 °C |           |                       |                                                |                                        |                                                         |
| 3.9                                                           | B         | 749DX395(1)050B(2)(3) | 2.0                                            | 6                                      | 5                                                       |
| 4.7                                                           | B         | 749DX475(1)050B(2)(3) | 2.4                                            | 6                                      | 5                                                       |
| 5.6                                                           | C         | 749DX565(1)050C(2)(3) | 2.8                                            | 6                                      | 2                                                       |
| 6.8                                                           | C         | 749DX685(1)050C(2)(3) | 3.4                                            | 6                                      | 2                                                       |
| 8.2                                                           | C         | 749DX825(1)050C(2)(3) | 4.1                                            | 6                                      | 2                                                       |
| 10                                                            | C         | 749DX106(1)050C(2)(3) | 5.0                                            | 6                                      | 2                                                       |
| 12                                                            | C         | 749DX126(1)050C(2)(3) | 6.0                                            | 6                                      | 2                                                       |
| 15                                                            | C         | 749DX156(1)050C(2)(3) | 7.5                                            | 6                                      | 2                                                       |
| 18                                                            | C         | 749DX186(1)050C(2)(3) | 9.0                                            | 6                                      | 2                                                       |
| 22                                                            | D         | 749DX226(1)050D(2)(3) | 11.0                                           | 6                                      | 1                                                       |
| 63 V <sub>DC</sub> AT + 85 °C; 40 V <sub>DC</sub> AT + 125 °C |           |                       |                                                |                                        |                                                         |
| 0.10                                                          | A         | 749DX104(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.12                                                          | A         | 749DX124(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.15                                                          | A         | 749DX154(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.18                                                          | A         | 749DX184(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.22                                                          | A         | 749DX224(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.27                                                          | A         | 749DX274(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.33                                                          | A         | 749DX334(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.39                                                          | A         | 749DX394(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.47                                                          | A         | 749DX474(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.56                                                          | A         | 749DX564(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.68                                                          | A         | 749DX684(1)063A(2)(3) | 1.0                                            | 6                                      | 10                                                      |
| 0.82                                                          | B         | 749DX824(1)063B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 1.0                                                           | B         | 749DX105(1)063B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 1.2                                                           | B         | 749DX125(1)063B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 1.5                                                           | B         | 749DX155(1)063B(2)(3) | 1.0                                            | 6                                      | 5                                                       |
| 1.8                                                           | B         | 749DX185(1)063B(2)(3) | 1.1                                            | 6                                      | 5                                                       |
| 2.2                                                           | B         | 749DX225(1)063B(2)(3) | 1.4                                            | 6                                      | 5                                                       |
| 2.7                                                           | B         | 749DX275(1)063B(2)(3) | 1.7                                            | 6                                      | 5                                                       |
| 3.3                                                           | B         | 749DX335(1)063B(2)(3) | 2.1                                            | 6                                      | 5                                                       |
| 3.9                                                           | B         | 749DX395(1)063B(2)(3) | 2.5                                            | 6                                      | 5                                                       |
| 4.7                                                           | C         | 749DX475(1)063C(2)(3) | 3.0                                            | 6                                      | 2                                                       |
| 5.6                                                           | C         | 749DX565(1)063C(2)(3) | 3.5                                            | 6                                      | 2                                                       |
| 6.8                                                           | C         | 749DX685(1)063C(2)(3) | 4.3                                            | 6                                      | 2                                                       |
| 8.2                                                           | C         | 749DX825(1)063C(2)(3) | 5.2                                            | 6                                      | 2                                                       |
| 10                                                            | C         | 749DX106(1)063C(2)(3) | 6.3                                            | 6                                      | 2                                                       |
| 12                                                            | D         | 749DX126(1)063D(2)(3) | 7.6                                            | 6                                      | 1                                                       |
| 15                                                            | D         | 749DX156(1)063D(2)(3) | 9.5                                            | 6                                      | 1                                                       |
| 18                                                            | D         | 749DX186(1)063D(2)(3) | 11.3                                           | 6                                      | 1                                                       |

**Note**

- Part number definitions:
  - Capacitance tolerance code: X5, X9, X0
  - Style number: 0 or 2
  - Packaging code



TYPICAL CURVES RIPPLE VOLTAGE AT + 25 °C



**PERFORMANCE CHARACTERISTICS****1. Operating temperature:**

- 55 °C to + 85 °C with rated DC voltage  $U_R$  applied,  
+ 85 °C to + 125 °C with linear voltage derating  
to category voltage  $U_C$  (only for types CTS1, 749DX).

**2. Capacitance and tolerance:**

Capacitance measured at 100 Hz and + 25 °C shall be within the specified tolerance limits of the nominal rating. Capacitance measurement shall be made by means of a polarized capacitance bridge. The polarizing voltage shall be of 2.2 V. The maximum voltage applied during measurements shall be 1.0  $V_{RMS}$  at 100 Hz and + 25 °C.

**3. Reverse voltage:**

These capacitors are capable of withstanding peak voltage in the reverse direction equal to: 15 % of the rated DC voltage at + 25 °C, 5 % of the rated DC voltage at + 85 °C.

**4. Surge voltage:****Table 1**

| PRODUCT TYPE | SURGE VOLTAGE AT + 85 °C | SURGE VOLTAGE AT + 125 °C |
|--------------|--------------------------|---------------------------|
| CTS13        | 1.30 $U_R$               | -                         |
| 749DX/CTS1   | 1.30 $U_R$               | 1.30 $U_C$                |

Capacitors shall withstand the surge voltage applied in series with a 1000 W resistor, at the rate of 1.5 min on, 5.5 min off, for 1000 successive test cycles at + 85 °C or at + 125 °C. After test, dissipation factor and leakage current shall meet the initial requirements at + 25 °C (see below), capacitance change shall not exceed  $\pm 10$  % of initial value at + 25 °C.

**5. Leakage current:**

Rated voltage  $U_R$  shall be applied to capacitors during five minutes with a resistor of 1000 W in series with each capacitor, before making DC leakage current measurements. The leakage current shall not exceed the following limits:

**Table 2**

| TEMPERATURE | CTS1/CTS13/749DX                                               |
|-------------|----------------------------------------------------------------|
| + 25 °C     | 0.01 $C_R \times U_R$ or<br>1 $\mu A$ whichever is greater     |
| + 85 °C     | 0.1 $C_R \times U_R$ or<br>10 $\mu A$ whichever is greater     |
| + 125 °C    | 0.125 $C_R \times U_R$ or<br>12.5 $\mu A$ whichever is greater |

**6. Dissipation factor:**

The dissipation factor, when measured at 100 Hz, shall not exceed the values below:

**Table 3**

| TEMP.                   | CTS1/CTS13          |                  | 749DX          |             |
|-------------------------|---------------------|------------------|----------------|-------------|
|                         | $C_R U_R \leq 1900$ | $C_R U_R > 1900$ | $C_R \leq 100$ | $C_R > 100$ |
| - 55 °C                 | 9 %                 | 11 %             | 8 %            | 10 %        |
| + 25 °C                 | 6 %                 | 8 %              | 6 %            | 8 %         |
| + 85 °C                 | 9 %                 | 11 %             | -              | -           |
| + 125 °C <sup>(1)</sup> | 12 %                | 14 %             | 10 %           | 11 %        |

**Note**

<sup>(1)</sup> Not applicable for CTS13

**7. Stability at low and high temperature:**

Capacitance change with temperature shall not exceed the limits of the following table, leakage current and dissipation factor shall be within the limits specified in Tables 2 and 3.

**Table 4**

| TEMPERATURE             | CTS1/CTS13/749DX |
|-------------------------|------------------|
| - 55 °C                 | - 10 %           |
| + 85 °C                 | + 12 %           |
| + 125 °C <sup>(1)</sup> | + 15 %           |

**Note**

<sup>(1)</sup> Not applicable for CTS13

**8. Impedance:**

The impedance measured at 100 kHz and 25 °C shall not exceed the following values:

**Table 5**

| CASE CODE | Z (W) <sup>(1)</sup> |
|-----------|----------------------|
| A         | 10                   |
| B         | 5                    |
| C         | 2                    |
| D         | 1                    |

**Note**

<sup>(1)</sup> Not applicable for  $C_R \leq 0.68 \mu F$

**9. Life test:**

After 2000 h at + 85 °C with rated DC voltage applied, or after 2000 h at + 125 °C with category DC voltage applied (for types CTS1, 749DX only) capacitors shall meet the requirements in Table 6.

**Table 6**

| PRODUCT TYPE           | CAPACITANCE CHANGE                                     | DISSIPATION FACTOR                             | DC LEAKAGE CURRENT                                       |
|------------------------|--------------------------------------------------------|------------------------------------------------|----------------------------------------------------------|
| CTS1<br>CTS13<br>749DX | Within<br>$\pm 10$ % of<br>initial value<br>at + 25 °C | Within<br>initial<br>requirement<br>at + 25 °C | Within 125 %<br>of initial<br>requirements<br>at + 25 °C |



**PERFORMANCE CHARACTERISTICS (Continued)****10. Humidity test:**

After 56 days (1350 h) at + 40 °C, 90 % to 95 % of relative humidity (per IEC 68-2-3) with no voltage applied, capacitors shall meet the requirements in Table 7 below.

**Table 7**

|                           |                                                 |
|---------------------------|-------------------------------------------------|
| <b>CAPACITANCE CHANGE</b> | Within ± 3 % of initial value                   |
| <b>DC LEAKAGE CURRENT</b> | Within initial requirement at + 25 °C - Table 2 |
| <b>DISSIPATION FACTOR</b> | Within initial requirement at + 25 °C - Table 3 |

**Table 8**

|                           |                                                 |
|---------------------------|-------------------------------------------------|
| <b>CAPACITANCE CHANGE</b> | Within ± 5 % of initial value at + 25 °C        |
| <b>DC LEAKAGE CURRENT</b> | Within initial requirement at + 25 °C - Table 2 |
| <b>DISSIPATION FACTOR</b> | Within initial requirement at + 25 °C - Table 3 |

Typical values of charge-discharge current (per above test conditions).

| <b>RATED VOLTAGE<br/>U<sub>R</sub> (V)</b> | <b>CHARGE-DISCHARGE CURRENT<br/>(A)</b> |
|--------------------------------------------|-----------------------------------------|
| 6.3                                        | 13                                      |
| 10                                         | 20                                      |
| 16                                         | 32                                      |
| 25                                         | 50                                      |
| 40                                         | 80                                      |
| 50                                         | 100                                     |
| 63                                         | 126                                     |

**11. Insulation test:**

For capacitors with insulating sleeves, a DC voltage of 100 V shall be applied for one minute between the case of the capacitor and a metal "V" block in intimate contact with the insulating sleeve. The insulating resistance measured in these conditions shall be at least 100 MΩ.

**12. Lead pull test:**

Leads shall withstand the following test (IEC 68-2-2): Tensile stress of 5N (cases A and B) or 10N (cases C and D) for 10 s in any direction

One bend in each direction

Two consecutive rotations of 180°

**GUIDE TO APPLICATION****1. AC ripple current:**

The maximum allowable ripple current shall be determined from the formula:

$$I_{RMS} = \sqrt{\frac{P}{R_{ESR}}}$$

where,

P = Power dissipation in W at + 25 °C as given below

R<sub>ESR</sub> = The capacitor Equivalent Series Resistance at the specified frequency.

**2. AC ripple voltage:**

The maximum allowable ripple voltage shall be determined from the formula:

$$V_{RMS} = \sqrt{\frac{P}{R_{ESR}}} \times Z$$

where,

Z = The capacitor impedance at the specified frequency.

The calculations are summarized on the graphs in table "Typical Curves Ripple Voltage at + 25 °C" giving the maximum available ripple voltage as a function of frequency.

However, the sum of the peak AC voltage plus the DC voltage shall not exceed the rated DC voltage at + 85 °C of the capacitor. The sum of the negative peak AC voltage plus the DC voltage shall not allow a voltage reversal exceeding 15 % of the rated DC voltage.

**3. AC ripple current or voltage derating factor:**

If these capacitors are to be operated at temperatures above + 25 °C, the permissible RMS ripple current or voltage shall be calculated using the derating factors in the table below:

| <b>TEMPERATURE</b> | <b>DERATING FACTOR</b> |
|--------------------|------------------------|
| + 25 °C            | 1.0                    |
| + 55 °C            | 0.8                    |
| + 85 °C            | 0.6                    |
| + 125 °C           | 0.4                    |

**4. Power dissipation:**

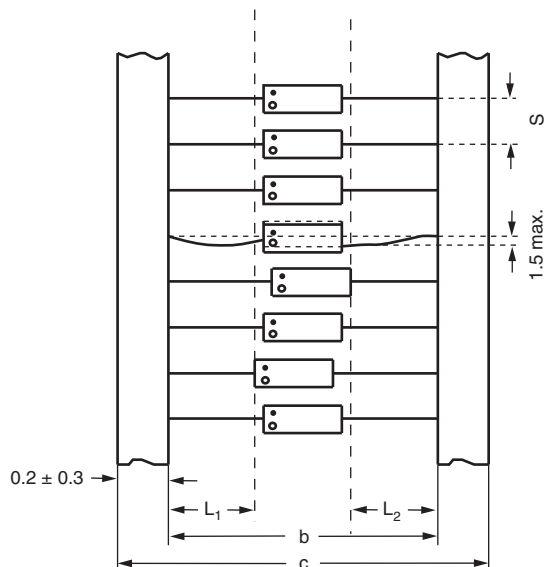
Power dissipation will be affected by the heat sinking capability of the mounting surface. Non-sinusoidal ripple current may produce heating effects which differ from those shown in the following table. It is important that the equivalent I<sub>RMS</sub> value be established when calculating permissible operating levels.

| <b>CASE CODE</b> | <b>POWER DISSIPATION AT + 25 °C (W)</b> |
|------------------|-----------------------------------------|
| A                | 0.115                                   |
| B                | 0.145                                   |
| C                | 0.185                                   |
| D                | 0.225                                   |

**TAPE AND REEL PACKAGING**

MEETS IEC 286-1

$L_1 - L_2 = 1.5 \text{ mm max.}$   
 $S$  = Component spacing (cumulative tolerance on 20 units = 4 mm)  
 $b$  = Tape spacing  
 $c$  = Overall length


**DIMENSIONS** in millimeters

| CASE SIZE      | REEL AND AMMO S | REEL PACK  |        |            |        |              | AMMO PACK  |        |             | BULK         |
|----------------|-----------------|------------|--------|------------|--------|--------------|------------|--------|-------------|--------------|
|                |                 | OPTION P   |        | OPTION R   |        | QTY PER REEL | OPTION G   |        | QTY PER BOX | QTY PER PACK |
|                |                 | B          | C MAX. | B          | C MAX. |              | B          | C MAX. |             |              |
| A              | $5.0 \pm 0.3$   | $63 \pm 2$ | 78     | $53 \pm 2$ | 68     | 1000         | $53 \pm 2$ | 68     | 500         | 100          |
| B              | $5.0 \pm 0.3$   | $63 \pm 2$ | 78     | $53 \pm 2$ | 68     | 1000         | $53 \pm 2$ | 68     | 500         | 75           |
| C              | $10.0 \pm 0.3$  | $63 \pm 2$ | 78     | $63 \pm 2$ | 78     | 500          | $53 \pm 2$ | 68     | 250         | 50           |
| D              | $10.0 \pm 0.3$  | $63 \pm 2$ | 78     | $63 \pm 2$ | 78     | 500          | $53 \pm 2$ | 68     | 250         | 25           |
| PACKAGING CODE |                 | P          |        | R          |        |              | G          |        |             | B            |

**MARKING**

Capacitors shall be marked with Sprague and/or the registered trademark 2 at vendor's option; the type number; rated capacitance and tolerance (with a letter code, if different from  $\pm 20\%$ ,  $K = \pm 10\%$ ;  $J = \pm 5\%$ ); rated DC voltage at  $+85^\circ\text{C}$  and the date code of manufacture.

Capacitors shall be marked on one end with a "plus" sign (+) to identify the positive terminal.



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