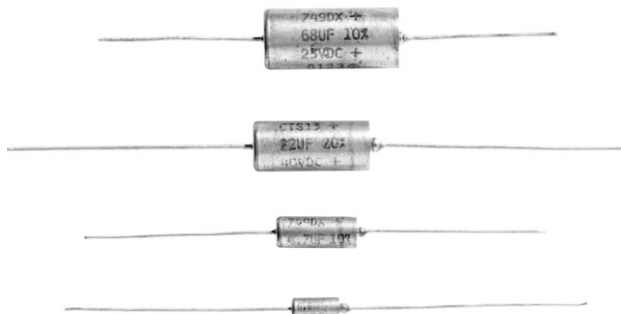


## Hermetically Sealed, Axial-Lead to CECC Specifications



### 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 2002/95/EC


**RoHS\***  
COMPLIANT

### 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 |

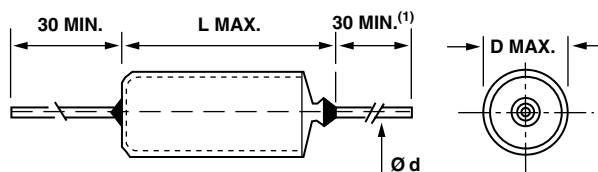
#### BS

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 = CECC 30201-002<br>CTS13 = CECC 30201-005<br>749DX = CECC 30201-001/029 | Expressed in picofarads. First two digits are significant. Third digit is the number of zeros following. | X0 = ± 20 %<br>X9 = ± 10 %<br>X5 = ± 5 %<br>(Special Order) | Expressed in volts. Where necessary, zeros precede the voltage rating to complete the 3 digit block<br>6R3 = 6.3 V | See Table Ratings and Case Codes. | 0 = Bare Case<br>2 = Plastic-Film Insulation | See Taping and Packaging | E3 = 100 % tin termination (RoHS compliant)<br>Blank = SnPb termination |

### DIMENSIONS in millimeters


<sup>(1)</sup> 23 mm MAX. FOR TAPED CAPACITORS

| CASE CODE | BS<br>D MAX. | NF<br>D MAX. | L MAX. | + 10 %<br>Ø d - 0.05 |
|-----------|--------------|--------------|--------|----------------------|
| A         | 3.6          | 3.8          | 10.2   | 0.5                  |
| B         | 4.9          | 5.1          | 15.0   | 0.5                  |
| C         | 7.5          | 7.7          | 20.5   | 0.6                  |
| D         | 9.1          | 9.3          | 24.0   | 0.6                  |

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

## 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).



| <b>RATINGS AND CASE CODES - TYPE CTS13</b> |                                               |             |             |             |            |             |             |             |
|--------------------------------------------|-----------------------------------------------|-------------|-------------|-------------|------------|-------------|-------------|-------------|
| <b>C<sub>R</sub><br/>μF</b>                | <b>RATED VOLTAGE U<sub>R</sub> (+ 85 °C )</b> |             |             |             |            |             |             |             |
|                                            | <b>6.3 V</b>                                  | <b>10 V</b> | <b>16 V</b> | <b>20 V</b> | <b>25V</b> | <b>40 V</b> | <b>50 V</b> | <b>63 V</b> |
| <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 ± 10 % or ± 5 % (special order).

| RATINGS AND CASE CODES - TYPE 749DX |                                              |          |          |          |          |          |          |          |          |
|-------------------------------------|----------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| C <sub>R</sub><br>μF                | 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>C</b> |
| 5.6                                 | A                                            |          |          |          |          | B        | B        | C        | C        |
| <b>6.8</b>                          | <b>A</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 ± 10 % or ± 5 % (special order).

**STANDARD/EXTENDED RATINGS - CTS1**

| CAPACITANCE<br>$C_R$<br>( $\mu$ F)           | CASE CODE | PART NUMBER          | MAX. DC 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 VDC AT + 85 °C, 4 VDC 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 VDC AT + 85 °C, 6.3 VDC 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 VDC AT + 85 °C, 10 VDC 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 VDC AT + 85 °C, 16 VDC 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                                                       |
| <b>40 VDC AT + 85 °C, 25 VDC AT + 125 °C</b> |           |                      |                                             |                                         |                                                         |
| 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                                                      |

## STANDARD/EXTENDED RATINGS - CTS1

| CAPACITANCE<br>$C_R$<br>( $\mu$ F)    | CASE CODE | PART NUMBER          | MAX. DC 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 VDC AT + 85 °C, 25 VDC AT + 125 °C |           |                      |                                             |                                         |                                                         |
| 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 VDC AT + 85 °C, 33 VDC 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                                                       |
| 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                                                       |



| STANDARD/EXTENDED RATINGS - CTS1      |           |                      |                                             |                                         |                                                         |
|---------------------------------------|-----------|----------------------|---------------------------------------------|-----------------------------------------|---------------------------------------------------------|
| CAPACITANCE<br>$C_R$<br>( $\mu$ F)    | CASE CODE | PART NUMBER          | MAX. DC 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>( $\Omega$ ) |
| 63 VDC AT + 85 °C, 40 VDC AT + 125 °C |           |                      |                                             |                                         |                                                         |
| 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                                                       |

**Notes**

(1) Capacitance Tolerance Code: X5, X9, X0

(2) Style number - 0 or 2

(3) Packaging Code

| STANDARD/EXTENDED RATINGS - CTS13  |           |                       |                                             |                                         |                                                         |
|------------------------------------|-----------|-----------------------|---------------------------------------------|-----------------------------------------|---------------------------------------------------------|
| CAPACITANCE<br>$C_R$<br>( $\mu$ F) | CASE CODE | PART NUMBER           | MAX. DC 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>( $\Omega$ ) |
| 6.3 VDC AT + 85 °C                 |           |                       |                                             |                                         |                                                         |
| 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                                                       |
| 10 VDC AT + 85 °C                  |           |                       |                                             |                                         |                                                         |
| 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                                                       |
| 16 VDC AT + 85 °C                  |           |                       |                                             |                                         |                                                         |
| 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                                                       |
| 20 VDC AT + 85 °C                  |           |                       |                                             |                                         |                                                         |
| 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                                                       |
| 25 VDC AT + 85 °C                  |           |                       |                                             |                                         |                                                         |
| 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                                                       |





| STANDARD/EXTENDED RATINGS - CTS13     |           |                       |                                       |                                         |                                                |
|---------------------------------------|-----------|-----------------------|---------------------------------------|-----------------------------------------|------------------------------------------------|
| CAPACITANCE<br>C <sub>R</sub><br>(μF) | CASE CODE | PART NUMBER           | MAX. DC LEAKAGE<br>AT + 25 °C<br>(μA) | MAX. DF<br>AT + 25 °C<br>120 Hz,<br>(%) | MAX. IMPEDANCE<br>AT + 25 °C<br>100 kHz<br>(Ω) |
| 40 VDC 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 VDC 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                                              |
| 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                                              |

| STANDARD/EXTENDED RATINGS - CTS13  |           |                       |                                             |                                         |                                                         |
|------------------------------------|-----------|-----------------------|---------------------------------------------|-----------------------------------------|---------------------------------------------------------|
| CAPACITANCE<br>$C_R$<br>( $\mu$ F) | CASE CODE | PART NUMBER           | MAX. DC 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>( $\Omega$ ) |
| 63 VDC AT + 85 °C                  |           |                       |                                             |                                         |                                                         |
| 0.1                                | 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                                                       |

## Notes

- (1) Capacitance Tolerance Code: X5, X9, X0
- (2) Style number - 0 or 2
- (3) Packaging Code



| STANDARD/EXTENDED RATINGS - 749DX     |           |                       |                                       |                                         |                                                |
|---------------------------------------|-----------|-----------------------|---------------------------------------|-----------------------------------------|------------------------------------------------|
| CAPACITANCE<br>C <sub>R</sub> (μF)    | CASE CODE | PART NUMBER           | MAX. DC LEAKAGE<br>AT + 25 °C<br>(μA) | MAX. DF<br>AT + 25 °C<br>120 Hz,<br>(%) | MAX. IMPEDANCE<br>AT + 25 °C<br>100 kHz<br>(Ω) |
| 6.3 VDC AT + 85 °C, 4 VDC AT 125 °C   |           |                       |                                       |                                         |                                                |
| 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                                              |
| 10 VDC AT + 85 °C, 6.3 VDC AT 125 °C  |           |                       |                                       |                                         |                                                |
| 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                                              |
| 16 VDC AT + 85 °C, 10 VDC AT + 125 °C |           |                       |                                       |                                         |                                                |
| 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                                              |
| 20 VDC AT + 85 °C, 13 VDC AT + 125 °C |           |                       |                                       |                                         |                                                |
| 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                                              |
| 25 VDC AT + 85 °C, 16 VDC AT + 125 °C |           |                       |                                       |                                         |                                                |
| 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                                              |
| 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                                              |

## STANDARD/EXTENDED RATINGS - 749DX

| CAPACITANCE<br>$C_R$ (μF)             | CASE CODE | PART NUMBER           | MAX. DC LEAKAGE<br>AT + 25 °C<br>(μA) | MAX. DF<br>AT + 25 °C<br>120 Hz,<br>(%) | MAX. IMPEDANCE<br>AT + 25 °C<br>100 kHz<br>(Ω) |
|---------------------------------------|-----------|-----------------------|---------------------------------------|-----------------------------------------|------------------------------------------------|
| 35 VDC AT + 85 °C, 23 VDC AT + 125 °C |           |                       |                                       |                                         |                                                |
| 0.1                                   | 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                                     | 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                                              |
| 40 VDC AT + 85 °C, 25 VDC AT + 125 °C |           |                       |                                       |                                         |                                                |
| 0.1                                   | 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                                              |

**STANDARD/EXTENDED RATINGS - 749DX**

| CAPACITANCE<br>$C_R$ ( $\mu$ F)              | CASE CODE | PART NUMBER           | MAX. DC 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>40 VDC AT + 85 °C, 25 VDC AT + 125 °C</b> |           |                       |                                             |                                         |                                                         |
| 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                                                       |
| <b>50 VDC AT + 85 °C, 33 VDC AT + 125 °C</b> |           |                       |                                             |                                         |                                                         |
| 0.82                                         | A         | 749DX824(1)050A(2)(3) | 1.0                                         | 6                                       | 10                                                      |
| 1                                            | 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                                                       |
| 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                                                       |
| <b>63 VDC AT + 85 °C, 40 VDC AT + 125 °C</b> |           |                       |                                             |                                         |                                                         |
| 0.1                                          | 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                                                      |

| STANDARD/EXTENDED RATINGS - 749DX     |           |                       |                                             |                                         |                                                         |
|---------------------------------------|-----------|-----------------------|---------------------------------------------|-----------------------------------------|---------------------------------------------------------|
| CAPACITANCE<br>$C_R$ ( $\mu$ F)       | CASE CODE | PART NUMBER           | MAX. DC 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>( $\Omega$ ) |
| 63 VDC AT + 85 °C, 40 VDC AT + 125 °C |           |                       |                                             |                                         |                                                         |
| 0.82                                  | B         | 749DX824(1)063B(2)(3) | 1.0                                         | 6                                       | 5                                                       |
| 1                                     | 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                                                       |

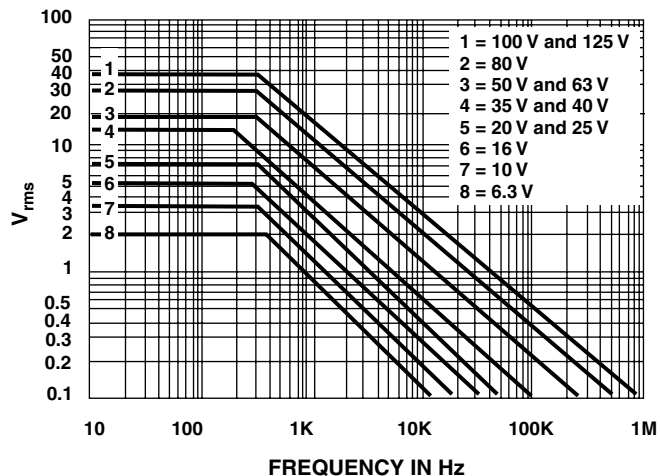
## Notes

- (1) Capacitance Tolerance Code: X5, X9, X0
- (2) Style number - 0 or 2
- (3) Packaging Code

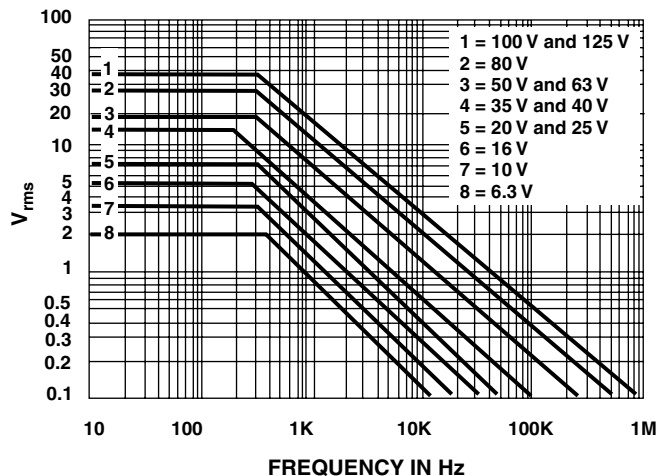


## TYPICAL CURVES RIPPLE VOLTAGE AT + 25 °C

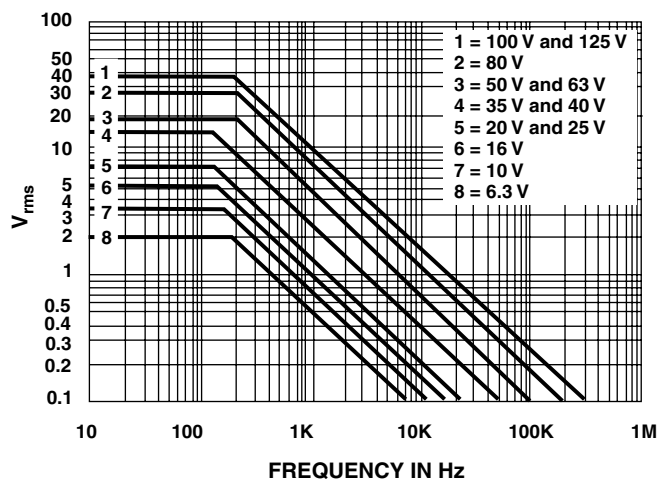
### CASE "A" CAPACITORS



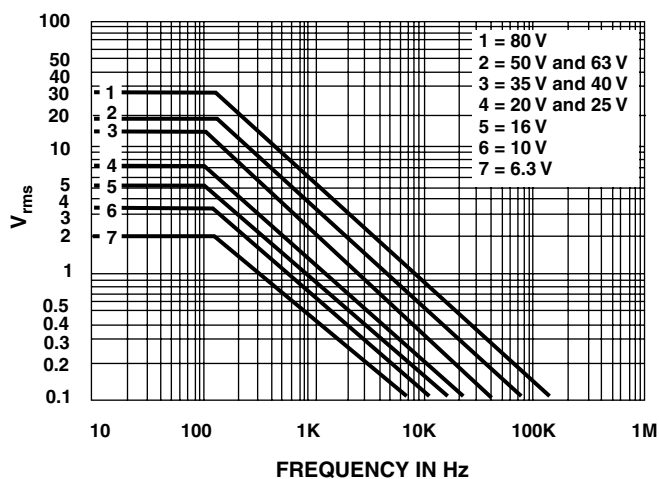
### CASE "B" CAPACITORS



### CASE "C" CAPACITORS



### CASE "D" CAPACITORS



## 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  $\Omega$  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>(2)</sup> | + 15 %           |

Note <sup>(2)</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 ( $\Omega$ ) <sup>(3)</sup> |
|-----------|-------------------------------|
| A         | 10                            |
| B         | 5                             |
| C         | 2                             |
| D         | 1                             |

Note <sup>(3)</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 $\pm 10$ % of initial value at + 25 °C | Within initial requirement at + 25 °C | Within 125 % of initial requirements 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                                     |

#### 12. 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.

#### 13. 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 cosecutive rotations of 180°

### GUIDE TO APPLICATION

#### 1. A-C 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. A-C 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 page 59 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<br/>AT + 25 °C (W)</b> |
|------------------|---------------------------------------------|
| A                | 0.115                                       |
| B                | 0.145                                       |
| C                | 0.185                                       |
| D                | 0.225                                       |

## TAPE AND REEL PACKING

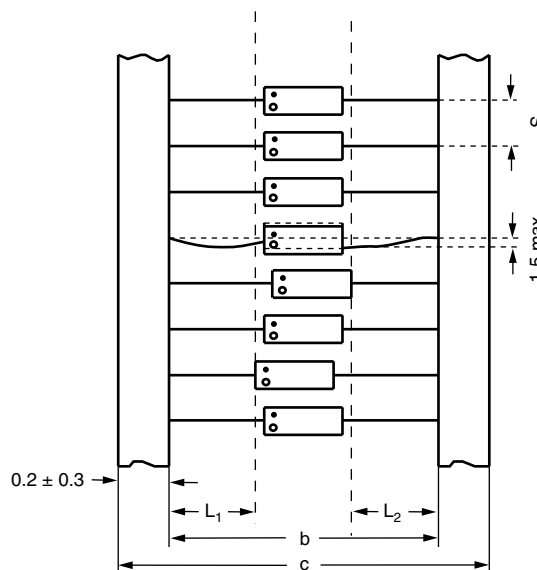
MEETS IEC 286-1

$L_1 - L_2 = 1.5 \text{ mm max.}$

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 ± 0.3       | 63 ± 2    | 78     | 53 ± 2   | 68     | 1000         | 53 ± 2    | 68     | 500         | 100          |
| B              | 5.0 ± 0.3       | 63 ± 2    | 78     | 53 ± 2   | 68     | 1000         | 53 ± 2    | 68     | 500         | 75           |
| C              | 10.0 ± 0.3      | 63 ± 2    | 78     | 63 ± 2   | 78     | 500          | 53 ± 2    | 68     | 250         | 50           |
| D              | 10.0 ± 0.3      | 63 ± 2    | 78     | 63 ± 2   | 78     | 500          | 53 ± 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 ± 20 %, K = ± 10 % ; J = ± 5 %) ; rated DC voltage at + 85 °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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