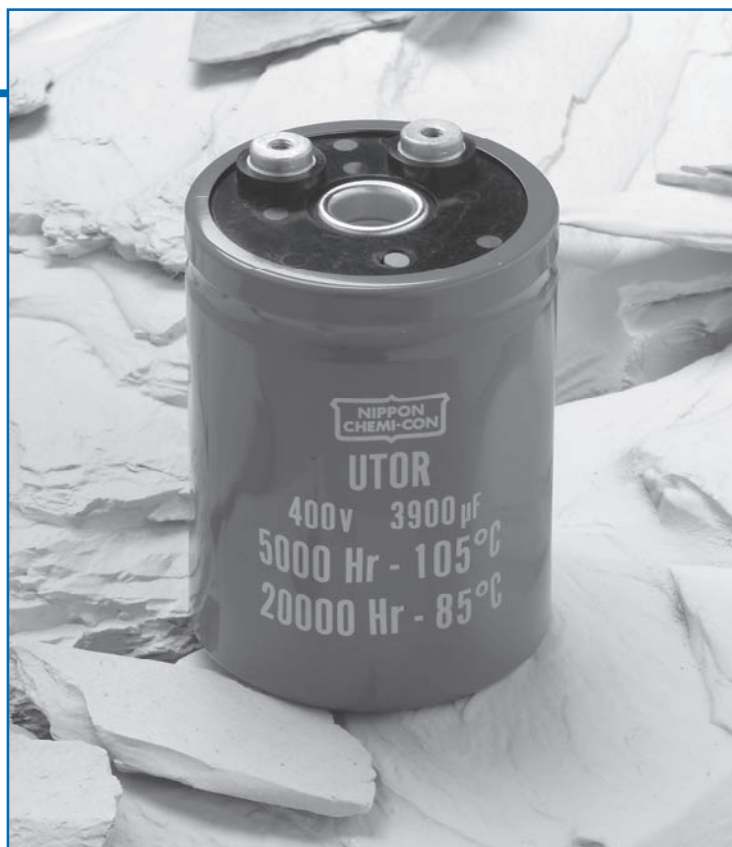


# UTOR Series



- Large Can Toroidal Design
- Lowest Thermal Resistance
- Optimum Cooling Capability
- New Lower Profile Sizes
- New Heat-Sink Mounting Kit
- RoHS Compliant



The UTOR series now offers higher capacitance and ripple current per case size. The upgrade allows the inverter designer to significantly reduce the size, weight, and cost of the capacitor bank. Toroidal geometry is ideal for cooling by either forced air or by heat-sink with the use of a new mounting kit option. The heat-sink kit option provides optimum thermal transfer while maintaining electrical isolation. These capacitors have an endurance rating of 5,000 hours at 105°C or 20,000 hours at 85°C with the rated ripple current applied. The UTOR series represents the optimum cost per amp of ripple current for a screw terminal mounted electrolytic capacitor.

## Summary of Specifications

- Screw terminals, high ripple Metric thread.
- Capacitance range: 680 to 10,000µF.
- Voltage range: 350 to 500VDC.
- Operating temperature range: -40°C to +105°C.
- Leakage current: 0.02CV(µA) or 5mA, whichever is smaller, after 5 minutes at +25°C.
- Standard capacitance tolerance: ±20%
- Nominal case size (D×L): D = 76mm (3.000"); L = 54mm (2.125") to 168mm (6.625").
- Rated lifetime: 5,000 hours at +105°C with rated ripple current applied.



# UTOR<sup>Series</sup>

## UTOR Specifications - Screw Terminals

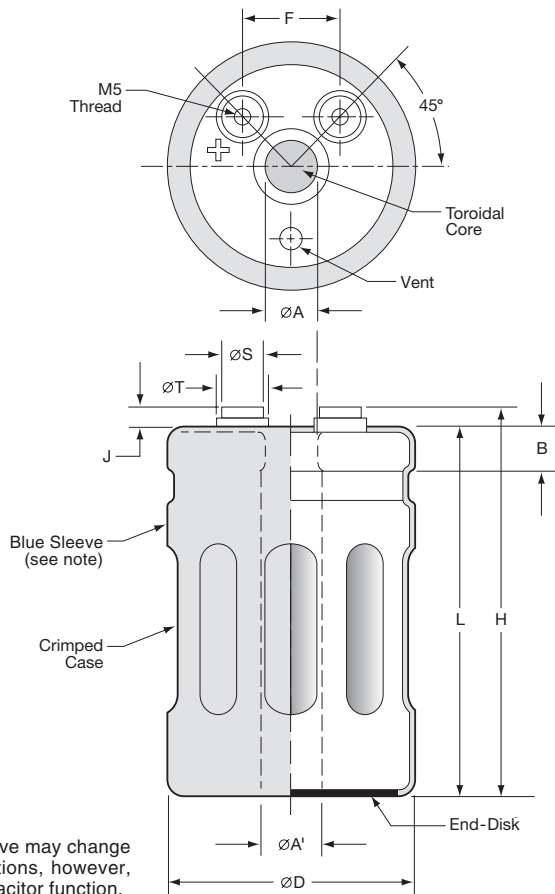
| Item                             | Characteristics  |               |             |                   |        |                   |      |       |      |               |              |    |        |        |        |        |             |      |      |      |                        |      |      |      |                          |      |      |      |
|----------------------------------|--|---------------|-------------|-------------------|--------|-------------------|------|-------|------|---------------|--------------|----|--------|--------|--------|--------|-------------|------|------|------|------------------------|------|------|------|--------------------------|------|------|------|
| Category Temperature Range       | - 40 to +105°C   |               |             |                   |        |                   |      |       |      |               |              |    |        |        |        |        |             |      |      |      |                        |      |      |      |                          |      |      |      |
| Rated Voltage Range              | 350 to 500VDC  |               |             |                   |        |                   |      |       |      |               |              |    |        |        |        |        |             |      |      |      |                        |      |      |      |                          |      |      |      |
| Capacitance Range                | 680 to 10,000µF at +25°C, 120Hz  |               |             |                   |        |                   |      |       |      |               |              |    |        |        |        |        |             |      |      |      |                        |      |      |      |                          |      |      |      |
| Capacitance Tolerance            | ±20% (M) at +25°C, 120Hz   |               |             |                   |        |                   |      |       |      |               |              |    |        |        |        |        |             |      |      |      |                        |      |      |      |                          |      |      |      |
| Leakage Current                  | I = 0.02CV (µA) or 5mA, whichever is smaller, after 5 minutes at +25°C.<br>Where I = Max. leakage current (µA), C = Nominal capacitance (µF) and V = Rated voltage (V)   |               |             |                   |        |                   |      |       |      |               |              |    |        |        |        |        |             |      |      |      |                        |      |      |      |                          |      |      |      |
| Rated Ripple Current Multipliers | <p>Ambient Temperature (°C)</p> <table border="1"> <tr> <td>+45°C</td> <td>+65°C</td> <td>+85°C</td> <td>+105°C</td> </tr> <tr> <td>2.45</td> <td>2.12</td> <td>1.73</td> <td>1.00</td> </tr> </table> <p>Cooling</p> <table border="1"> <thead> <tr> <th rowspan="2">Mounting Type</th> <th colspan="3">Air Velocity</th> </tr> <tr> <th>Static</th> <th>1.0m/s</th> <th>2.0m/s</th> </tr> </thead> <tbody> <tr> <td>Clamp Mount</td> <td>1.00</td> <td>1.20</td> <td>1.30</td> </tr> <tr> <td>Heat-Sink (air cooled)</td> <td>1.20</td> <td>1.45</td> <td>1.55</td> </tr> <tr> <td>Heat-Sink (fluid cooled)</td> <td>1.35</td> <td>1.65</td> <td>1.75</td> </tr> </tbody> </table> | +45°C         | +65°C       | +85°C             | +105°C | 2.45              | 2.12 | 1.73  | 1.00 | Mounting Type | Air Velocity |    |        | Static | 1.0m/s | 2.0m/s | Clamp Mount | 1.00 | 1.20 | 1.30 | Heat-Sink (air cooled) | 1.20 | 1.45 | 1.55 | Heat-Sink (fluid cooled) | 1.35 | 1.65 | 1.75 |
| +45°C                            | +65°C  | +85°C         | +105°C      |                   |        |                   |      |       |      |               |              |    |        |        |        |        |             |      |      |      |                        |      |      |      |                          |      |      |      |
| 2.45                             | 2.12   | 1.73          | 1.00        |                   |        |                   |      |       |      |               |              |    |        |        |        |        |             |      |      |      |                        |      |      |      |                          |      |      |      |
| Mounting Type                    | Air Velocity   |               |             |                   |        |                   |      |       |      |               |              |    |        |        |        |        |             |      |      |      |                        |      |      |      |                          |      |      |      |
|                                  | Static   | 1.0m/s        | 2.0m/s      |                   |        |                   |      |       |      |               |              |    |        |        |        |        |             |      |      |      |                        |      |      |      |                          |      |      |      |
| Clamp Mount                      | 1.00   | 1.20          | 1.30        |                   |        |                   |      |       |      |               |              |    |        |        |        |        |             |      |      |      |                        |      |      |      |                          |      |      |      |
| Heat-Sink (air cooled)           | 1.20   | 1.45          | 1.55        |                   |        |                   |      |       |      |               |              |    |        |        |        |        |             |      |      |      |                        |      |      |      |                          |      |      |      |
| Heat-Sink (fluid cooled)         | 1.35   | 1.65          | 1.75        |                   |        |                   |      |       |      |               |              |    |        |        |        |        |             |      |      |      |                        |      |      |      |                          |      |      |      |
| Endurance (Load Life)            | <p>The following specifications shall be satisfied when the capacitors are restored to +25°C after subjecting them to DC voltage for 5,000 hours at +105°C with the rated ripple current applied. The sum of the DC voltage and peak AC voltage must not exceed the full rated voltage of the capacitors.</p> <p>Capacitance change: ≤ ±20% of initial measured value<br/> ESR change : ≤ 200% of initial specified value<br/> Leakage current : ≤ initial specified value</p>   |               |             |                   |        |                   |      |       |      |               |              |    |        |        |        |        |             |      |      |      |                        |      |      |      |                          |      |      |      |
| Shelf Test                       | <p>The following specifications shall be satisfied when the capacitors are restored to +25°C after exposing them for 1,000 hours at +105°C without voltage applied. The rated voltage shall be applied to the capacitors for a minimum of 30 minutes, at least 24 hours and not more than 48 hours before the measurements.</p> <p>Capacitance change: ≤ ±20% of initial measured value<br/> ESR change : ≤ 200% of initial specified value<br/> Leakage current : ≤ initial specified value</p>   |               |             |                   |        |                   |      |       |      |               |              |    |        |        |        |        |             |      |      |      |                        |      |      |      |                          |      |      |      |
| Vibration Rating                 | 10-55Hz, 10g sinusoidal in three axis, 2 hours per axis.   |               |             |                   |        |                   |      |       |      |               |              |    |        |        |        |        |             |      |      |      |                        |      |      |      |                          |      |      |      |
| Maximum Tightening Torque        | <table border="1"> <thead> <tr> <th rowspan="2">Terminal Code</th> <th rowspan="2">Thread Size</th> <th colspan="2">3 Threads Engaged</th> <th colspan="2">6 Threads Engaged</th> </tr> <tr> <th>in-lb</th> <th>N·m</th> <th>in-lb</th> <th>N·m</th> </tr> </thead> <tbody> <tr> <td>CT</td> <td>M5x0.8</td> <td>18.0</td> <td>2.0</td> <td>28.5</td> <td>3.2</td> </tr> </tbody> </table>   | Terminal Code | Thread Size | 3 Threads Engaged |        | 6 Threads Engaged |      | in-lb | N·m  | in-lb         | N·m          | CT | M5x0.8 | 18.0   | 2.0    | 28.5   | 3.2         |      |      |      |                        |      |      |      |                          |      |      |      |
| Terminal Code                    | Thread Size  |               |             | 3 Threads Engaged |        | 6 Threads Engaged |      |       |      |               |              |    |        |        |        |        |             |      |      |      |                        |      |      |      |                          |      |      |      |
|                                  |  | in-lb         | N·m         | in-lb             | N·m    |                   |      |       |      |               |              |    |        |        |        |        |             |      |      |      |                        |      |      |      |                          |      |      |      |
| CT                               | M5x0.8   | 18.0          | 2.0         | 28.5              | 3.2    |                   |      |       |      |               |              |    |        |        |        |        |             |      |      |      |                        |      |      |      |                          |      |      |      |
| Typical Inductance               | 25nH at 1MHz   |               |             |                   |        |                   |      |       |      |               |              |    |        |        |        |        |             |      |      |      |                        |      |      |      |                          |      |      |      |
| Custom Designs                   | Custom CV values per case size may be available upon request.<br>Contact appropriate representative with specific requirements.  |               |             |                   |        |                   |      |       |      |               |              |    |        |        |        |        |             |      |      |      |                        |      |      |      |                          |      |      |      |

# UTOR Series

## Diagram of Dimensions - Screw Terminals

### Toroidal Large Can/Screw Terminals

Unit: mm and inches



Note:  
In some cases, the color of the sleeve may change slightly due to the operating conditions, however, the discoloration will not impair capacitor function.

### Terminal Specifications in Millimeters

| Terminal Code | Thread Size | Minimum Thread Depth | J<br>± 0.50 | ØS<br>± 0.25 | ØT<br>± 0.25 |
|---------------|-------------|----------------------|-------------|--------------|--------------|
| CT            | M5x0.8      | 10.5                 | 7.0         | 13.0         | 18.5         |

### Terminal Specifications in Inches

| Terminal Code | Thread Size | Minimum Thread Depth | J<br>± 0.020 | ØS<br>± 0.010 | ØT<br>± 0.010 |
|---------------|-------------|----------------------|--------------|---------------|---------------|
| CT            | M5x0.8      | 0.413                | 0.276        | 0.512         | 0.728         |

### Case Dimensions in Millimeters

| ØA<br>± 0.20 | ØA'<br>± 0.30 | B<br>± 0.5 | F<br>± 0.25 |
|--------------|---------------|------------|-------------|
| 16.3         | 18.9          | 9.5        | 31.8        |

### Case Dimensions in Inches

| ØA<br>± 0.008 | ØA'<br>± 0.012 | B<br>± 0.020 | F<br>± 0.010 |
|---------------|----------------|--------------|--------------|
| 0.642         | 0.744          | 0.374        | 1.250        |

| Case Size Code | ØD<br>+2.0 | L<br>+2.0 | H<br>±1.0 |
|----------------|------------|-----------|-----------|
| E54            | 76         | 54        | 61        |
| E67            | 76         | 67        | 74        |
| E79            | 76         | 79        | 86        |
| E92            | 76         | 92        | 99        |
| EA5            | 76         | 105       | 112       |
| EB7            | 76         | 117       | 124       |
| ED0            | 76         | 130       | 137       |
| EE3            | 76         | 143       | 150       |
| EF5            | 76         | 155       | 162       |
| EG8            | 76         | 168       | 175       |

| Case Size Code | ØD<br>+0.080 | L<br>+0.080 | H<br>± 0.040 |
|----------------|--------------|-------------|--------------|
| E54            | 3.000        | 2.125       | 2.402        |
| E67            | 3.000        | 2.625       | 2.913        |
| E79            | 3.000        | 3.125       | 3.386        |
| E92            | 3.000        | 3.625       | 3.898        |
| EA5            | 3.000        | 4.125       | 4.409        |
| EB7            | 3.000        | 4.625       | 4.882        |
| ED0            | 3.000        | 5.125       | 5.394        |
| EE3            | 3.000        | 5.625       | 5.906        |
| EF5            | 3.000        | 6.125       | 6.378        |
| EG8            | 3.000        | 6.625       | 6.890        |

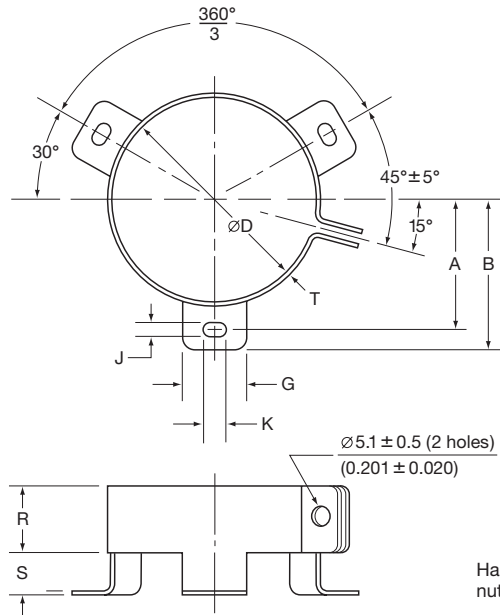


# UTOR<sub>Series</sub>

## Mounting Hardware - Screw Terminals

### Type C: Three-Footed Clamp

Unit: mm (inches)



Hardware: Screw, washer and hexagon nut included with each clamp.

### Type C: Clamp Specifications

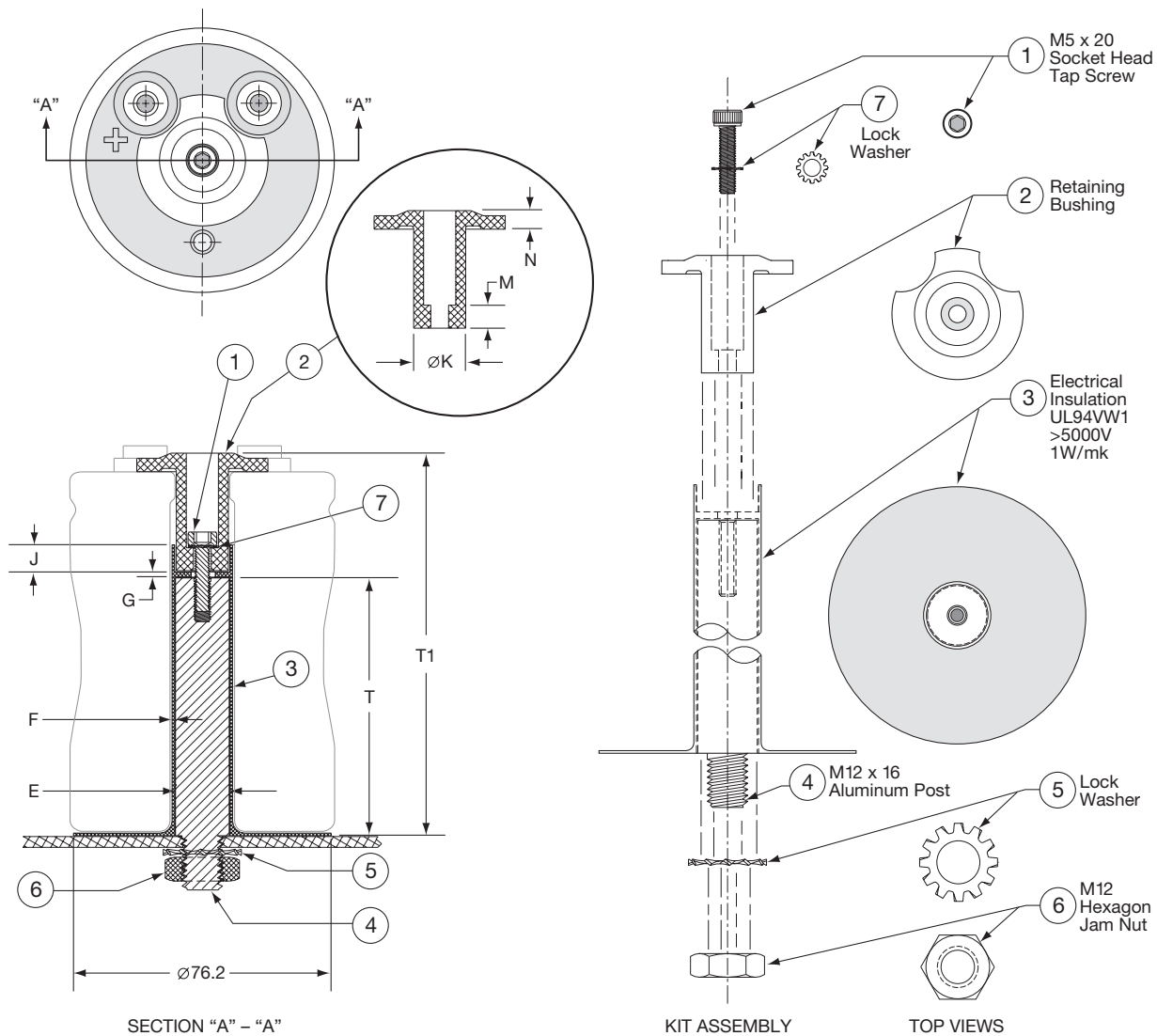
| Mounting Code | Case $\varnothing D$ | A<br>$\pm 1.0$ (0.040) | B<br>$\pm 1.0$ (0.040) | G<br>$\pm 1.0$ (0.040) | J<br>$\pm 0.5$ (0.020) | K<br>$\pm 0.5$ (0.020) | R<br>$\pm 1.0$ (0.040) | S<br>$\pm 1.0$ (0.040) | T<br>$\pm 0.5$ (0.020) |
|---------------|----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| C             | 76.2 (3.000)         | 44.5 (1.750)           | 49.2 (1.937)           | 13.3 (0.524)           | 4.5 (0.177)            | 7.1 (0.280)            | 19.1 (0.751)           | 9.5 (0.374)            | 1.0 (0.040)            |

# UTOR Series

## Mounting Hardware - Screw Terminals

### Type H: Heat Sink Mounting Kit

Unit: mm (inches)



### Type H: Heat Sink Mounting Kit Dimensions

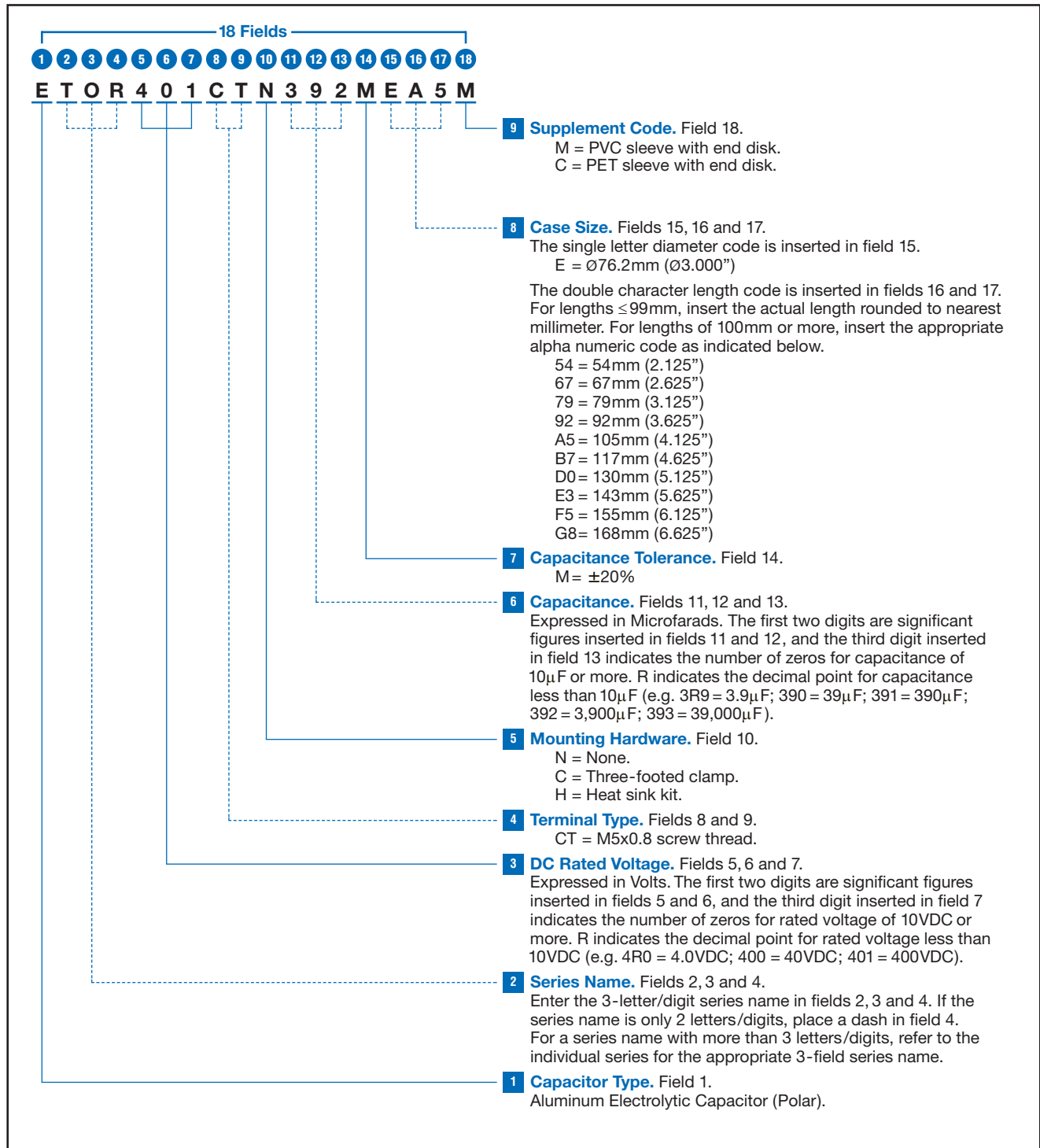
| Mounting Code | Case Size Code | T<br>± 0.2 (0.008) | T1<br>± 0.5 (0.020) |
|---------------|----------------|--------------------|---------------------|
| H             | E54            | 35 (1.378)         | 58 (2.280)          |
| H             | E67            | 35 (1.378)         | 71 (2.780)          |
| H             | E79            | 60 (2.362)         | 83 (3.280)          |
| H             | E92            | 60 (2.362)         | 96 (3.780)          |
| H             | EA5            | 60 (2.362)         | 109 (4.280)         |
| H             | EB7            | 60 (2.362)         | 121 (4.780)         |
| H             | ED0            | 111 (4.370)        | 134 (5.280)         |
| H             | EE3            | 111 (4.370)        | 147 (5.780)         |
| H             | EF5            | 111 (4.370)        | 160 (6.280)         |
| H             | EG8            | 111 (4.370)        | 172 (6.780)         |

| Dimension | Millimeters  | Inches        |
|-----------|--------------|---------------|
| E         | 18.6 Max.    | 0.732 Max.    |
| F         | 0.56 ± 0.05  | 0.022 ± 0.002 |
| G         | 2.00 ± 0.13  | 0.080 ± 0.005 |
| J         | 8.00 ± 0.13  | 0.315 ± 0.005 |
| øK        | 15.24 ± 0.20 | 0.600 ± 0.008 |
| M         | 6.76 ± 0.13  | 0.266 ± 0.005 |
| N         | 5.49 ± 0.13  | 0.216 ± 0.005 |



# UTOR Series

**Part Numbering System for UTOR Series** When ordering, always specify complete 18-field global part number.





# UTOR Series

## Standard Voltage Ratings - Screw Terminals

| Rated Voltage (WVDC)                | Capacitance (µF) | Global Part Number† | Nominal Case Size* D x L (mm) | Case Size Code | Maximum ESR (mΩ) at +25°C, 120Hz | Rated Ripple Current (A rms) at +105°C |       |       |
|-------------------------------------|------------------|---------------------|-------------------------------|----------------|----------------------------------|--|-------|-------|
|                                     |                  |                     |                               |                |                                  | 120Hz                                  | 300Hz | >3kHz |
| <b>350 Volts</b><br>400 Volts Surge | 1,800            | ETOR351CTN182ME54M  | 76 x 54                       | E54            | 44                               | 11.8                                   | 14.1  | 16.5  |
|                                     | 2,700            | ETOR351CTN272ME67M  | 76 x 67                       | E67            | 30                               | 15.4                                   | 18.5  | 21.6  |
|                                     | 3,300            | ETOR351CTN332ME79M  | 76 x 79                       | E79            | 24                               | 17.1                                   | 20.5  | 23.9  |
|                                     | 4,700            | ETOR351CTN472ME92M  | 76 x 92                       | E92            | 17                               | 21.6                                   | 26.0  | 30.3  |
|                                     | 5,600            | ETOR351CTN562MEA5M  | 76 x 105                      | EA5            | 14                               | 24.9                                   | 29.9  | 34.9  |
|                                     | 6,800            | ETOR351CTN682MED0M  | 76 x 130                      | ED0            | 12                               | 30.2                                   | 36.2  | 42.2  |
|                                     | 8,200            | ETOR351CTN822MEE3M  | 76 x 143                      | EE3            | 10                               | 34.5                                   | 41.4  | 48.3  |
|                                     | 10,000           | ETOR351CTN103MEG8M  | 76 x 168                      | EG8            | 8                                | 41.0                                   | 49.2  | 57.4  |
| <b>400 Volts</b><br>450 Volts Surge | 1,500            | ETOR401CTN152ME54M  | 76 x 54                       | E54            | 53                               | 10.7                                   | 12.9  | 15.0  |
|                                     | 2,200            | ETOR401CTN222ME67M  | 76 x 67                       | E67            | 36                               | 13.9                                   | 16.7  | 19.5  |
|                                     | 2,700            | ETOR401CTN272ME79M  | 76 x 79                       | E79            | 30                               | 15.4                                   | 18.5  | 21.6  |
|                                     | 3,300            | ETOR401CTN332ME92M  | 76 x 92                       | E92            | 24                               | 18.1                                   | 21.8  | 25.4  |
|                                     | 3,900            | ETOR401CTN392MEA5M  | 76 x 105                      | EA5            | 21                               | 20.8                                   | 25.0  | 29.1  |
|                                     | 4,700            | ETOR401CTN472MEB7M  | 76 x 117                      | EB7            | 17                               | 24.0                                   | 28.8  | 33.6  |
|                                     | 5,600            | ETOR401CTN562MED0M  | 76 x 130                      | ED0            | 14                               | 27.4                                   | 32.9  | 38.3  |
|                                     | 6,800            | ETOR401CTN682MEE3M  | 76 x 143                      | EE3            | 12                               | 31.4                                   | 37.7  | 44.0  |
|                                     | 8,200            | ETOR401CTN822MEG8M  | 76 x 168                      | EG8            | 10                               | 37.1                                   | 44.5  | 52.0  |
| <b>420 Volts</b><br>470 Volts Surge | 1,200            | ETOR421CTN122ME54M  | 76 x 54                       | E54            | 89                               | 9.3                                    | 11.1  | 13.0  |
|                                     | 1,800            | ETOR421CTN182ME67M  | 76 x 67                       | E67            | 59                               | 12.2                                   | 14.6  | 17.1  |
|                                     | 2,200            | ETOR421CTN222ME79M  | 76 x 79                       | E79            | 40                               | 14.9                                   | 17.9  | 20.9  |
|                                     | 3,300            | ETOR421CTN332ME92M  | 76 x 92                       | E92            | 32                               | 17.5                                   | 21.0  | 24.5  |
|                                     | 3,900            | ETOR421CTN392MEA5M  | 76 x 105                      | EA5            | 27                               | 20.1                                   | 24.1  | 28.2  |
|                                     | 4,700            | ETOR421CTN472MED0M  | 76 x 130                      | ED0            | 23                               | 24.2                                   | 29.1  | 33.9  |
|                                     | 5,600            | ETOR421CTN562MEE3M  | 76 x 143                      | EE3            | 19                               | 27.6                                   | 33.1  | 38.6  |
|                                     | 6,800            | ETOR421CTN682MEG8M  | 76 x 168                      | EG8            | 16                               | 32.7                                   | 39.2  | 45.7  |
| <b>450 Volts</b><br>500 Volts Surge | 1,000            | ETOR451CTN102ME54M  | 76 x 54                       | E54            | 89                               | 9.3                                    | 11.1  | 13.0  |
|                                     | 1,500            | ETOR451CTN152ME67M  | 76 x 67                       | E67            | 59                               | 12.2                                   | 14.6  | 17.1  |
|                                     | 2,200            | ETOR451CTN222ME79M  | 76 x 79                       | E79            | 48                               | 13.5                                   | 16.2  | 18.9  |
|                                     | 2,700            | ETOR451CTN272ME92M  | 76 x 92                       | E92            | 40                               | 15.9                                   | 19.0  | 22.2  |
|                                     | 3,300            | ETOR451CTN332MEA5M  | 76 x 105                      | EA5            | 32                               | 18.5                                   | 22.2  | 25.9  |
|                                     | 3,900            | ETOR451CTN392MEB7M  | 76 x 117                      | EB7            | 27                               | 21.1                                   | 25.3  | 29.6  |
|                                     | 4,700            | ETOR451CTN472MED0M  | 76 x 130                      | ED0            | 23                               | 24.2                                   | 29.1  | 33.9  |
|                                     | 5,600            | ETOR451CTN562MEF5M  | 76 x 155                      | EF5            | 19                               | 28.6                                   | 34.3  | 40.1  |
| <b>500 Volts</b><br>550 Volts Surge | 680              | ETOR501CTN681ME54M  | 76 x 54                       | E54            | 206                              | 6.5                                    | 7.8   | 9.1   |
|                                     | 1,000            | ETOR501CTN102ME67M  | 76 x 67                       | E67            | 140                              | 8.4                                    | 10.1  | 11.8  |
|                                     | 1,500            | ETOR501CTN152ME79M  | 76 x 79                       | E79            | 93                               | 10.3                                   | 12.4  | 14.4  |
|                                     | 1,800            | ETOR501CTN182ME92M  | 76 x 92                       | E92            | 78                               | 12.0                                   | 14.4  | 16.8  |
|                                     | 2,200            | ETOR501CTN222MEA5M  | 76 x 105                      | EA5            | 64                               | 14.0                                   | 16.8  | 19.6  |
|                                     | 2,700            | ETOR501CTN272MEB7M  | 76 x 117                      | EB7            | 52                               | 16.3                                   | 19.5  | 22.8  |
|                                     | 3,300            | ETOR501CTN332MEE3M  | 76 x 143                      | EE3            | 42                               | 19.6                                   | 23.5  | 27.4  |
|                                     | 3,900            | ETOR501CTN392MEG8M  | 76 x 168                      | EG8            | 36                               | 22.1                                   | 26.5  | 31.0  |

†For mounting and construction options, refer to the part numbering system for descriptions and codes.

\*Refer to diagram of dimensions for detailed case size specifications.



- Always read "Notes on Use" before using the product in order to enable you to use the product correctly and prevent any faults and accidents from occurring.
- Request the Product Specification on the product of NIPPON CHEMI-CON CORPORATION to refer to it as well as this brochure prior to the order of the products. Some specific notes on use of the ordered product may be described in the specifications.
- The products listed in this catalog are designed and manufactured for general electronics equipment use and are not intended for use in applications that can adversely affect human life; where the malfunction of equipment may cause damage to life or property. In addition, our products are not intended to be used in specific applications that may cause a major social impact. Please consult with us in advance of usage of our products in the following listed applications. ① Aerospace equipment ② Power generation equipment such as thermal power, nuclear power etc. ③ Medical equipment ④ Transport equipment (automobiles, trains, ships, etc.) ⑤ Transportation control equipment ⑥ Disaster prevention / crime prevention equipment ⑦ Highly publicized information processing equipment ⑧ Submarine equipment ⑨ Other applications that are not considered general-purpose applications.
- The circuits described as examples in this catalog and the "delivery specifications" are featured in order to show the operations and usage of our products, however, this fact does not guarantee that the circuits are available to function in your equipment systems. We are not in any case responsible for any failures or damage caused by the use of information contained herein. You should examine our products, of which the characteristics are described in the "delivery specifications" and other documents, and determine whether or not our products suit your requirements according to the specifications of your equipment systems. Therefore, you bear final responsibility regarding the use of our products.  
Please make sure that you take appropriate safety measures such as use of redundant design and malfunction prevention measures in order to prevent fatal accidents and/or fires in the event any of our products malfunction.
- We strongly recommend our customers to purchase Nippon Chemi-Con products only through our official sales channels. We assume no responsibility for any defects or damages caused by using products purchased from outside our official sales channel or of counterfeit goods. In addition, we will ask the customer to pay the investigation cost for products purchased outside our official sales channel.
- We reserve the right to discontinue production and delivery of products. We do not guarantee that all the products included in this catalog will be available in the future.  
The aforementioned does not apply in the case of individual agreements deviating from the foregoing for customer-specific products
- We continually strive to improve the quality and reliability of our products, but in any case that our product does not meet our published specifications, please stop using it promptly and contact us immediately. As for compensation for non-conforming goods delivered by Chemi-Con, we will limit it only to goods found in non-compliance of our published specifications. This may be accomplished by a no cost replacement of non-conforming individual products, a credit of the piece price paid per each individual non-conforming product, or in other ways deemed necessary.  
In addition, we have an established system with enhanced traceability, therefore we will limit the applicable lot items for any potential compensation.

[Part Numbering System](#)

[Part Numbering System \(Appendix\)](#)

[Standardization](#)

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