

# 规格書

## SPECIFICATION

Customer : \_\_\_\_\_

Part Name: \_\_\_\_\_ **E-CAP** \_\_\_\_\_

SPEC : \_\_\_\_\_ **LR Series** \_\_\_\_\_

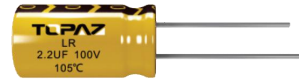
Part NO. : \_\_\_\_\_ **ALL** \_\_\_\_\_

Date : \_\_\_\_\_ **2017-11-22** \_\_\_\_\_

| CUSTOMER SIGN |  |  |
|---------------|--|--|
|               |  |  |

| TOPAZCON       |               |
|----------------|---------------|
| <b>DRAWING</b> | <b>RATIFY</b> |
| <b>黃峰</b>      | <b>陳慶</b>     |

# LR Series

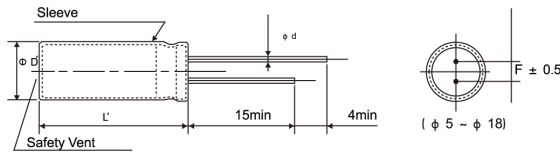


- 105 °C Miniaturized
- Low impedance high ripple current, long life
- Life time: +105 °C 8,000 to 10,000 hours
- RoHS Compliant

## ● SPECIFICATIONS

| Items   | Characteristics  |   |  |          |                  |           |            |         |      |  |       |
|---|--|---|--|----------|------------------|-----------|------------|---------|------|--|-------|
| Category  | -40 to +105 °C   |   |  |          |                  |           |            |         |      |  |       |
| Rated Voltage Range                                   | 10 to 100Vdc   |   |  |          |                  |           |            |         |      |  |       |
| Capacitance Tolerance                                 | ± 20%(M)   |   |  |          |                  |           |            |         |      |  |       |
| Leakage Current                                       | 1 ≤ 0.01CV or 3 μ A , whichever is greater<br>Where, I:Max.leakage current( μ A), C:Nominal capacitance ( μ F) V:Rated voltage(V)<br>(at 20 °C ,after 2minutes)  |   |  |          |                  |           |            |         |      |  |       |
| Dissipation Factor (tan δ)                            | Rated voltage(Vdc)   | 10 16 25 35 50 63 80 100                    |  |          |                  |           |            |         |      |  |       |
|   | tan δ (Max)  | 0.19 0.16 0.14 0.12 0.10 0.09 0.09 0.08     |  |          |                  |           |            |         |      |  |       |
|   | When nominal capacitance exceeds 1,000 μ F , add 0.02 to the value above for each 1,000 μ F increase<br>(at 20 °C 120Hz)   |   |  |          |                  |           |            |         |      |  |       |
| Low Temperature Characteristics (Max.Impedance Ratio) | Rate Voltage(Vdc)  | 10 16 25 35 50 63 80 100                    |  |          |                  |           |            |         |      |  |       |
|   | Z(-25 °C )/Z(+20 °C )  | 2   |  |          |                  |           |            |         |      |  |       |
|   | Z(-40 °C )/Z(+20 °C )  | 3   |  |          |                  |           |            |         |      |  |       |
| Endurance   | The following specification shall be satisfied when the capacitors are restored to 20 °C after subjected to DC voltage with the rated ripple current is applied for the specified period of time at 105 °C |   |  |          |                  |           |            |         |      |  |       |
|   | Capacitance Change   | ≤ ± 25% of the initial value(10V: ≤ ± 30% ) | <table border="1"> <tr> <td>Case Dia</td> <td>Life time(hours)</td> </tr> <tr> <td>Φ D ≤ 6.3</td> <td>10 to 100V</td> </tr> <tr> <td>Φ D ≥ 8</td> <td>8000</td> </tr> <tr> <td></td> <td>10000</td> </tr> </table> | Case Dia | Life time(hours) | Φ D ≤ 6.3 | 10 to 100V | Φ D ≥ 8 | 8000 |  | 10000 |
|   | Case Dia   | Life time(hours)                            |  |          |                  |           |            |         |      |  |       |
|   | Φ D ≤ 6.3  | 10 to 100V                                  |  |          |                  |           |            |         |      |  |       |
| Φ D ≥ 8   | 8000   |   |  |          |                  |           |            |         |      |  |       |
|   | 10000  |   |  |          |                  |           |            |         |      |  |       |
| D.F. (tan δ)  | ≤ 200% of the initial specified value  |   |  |          |                  |           |            |         |      |  |       |
| Leakage Current                                       | ≤ The initial specified value  |   |  |          |                  |           |            |         |      |  |       |
| Shelf Life  | The following specifications shall be satisfied when the capacitors are restored to 20 °C after exposing them for 1,000 hours at 105 °C without voltage applied  |   |  |          |                  |           |            |         |      |  |       |
|   | Capacitance Change   | ≤ ± 25% of the initial value(10v ≤ ± 30% )  |  |          |                  |           |            |         |      |  |       |
|   | D.F. (tan δ)   | ≤ 200% of the initial specified value       |  |          |                  |           |            |         |      |  |       |
|   | Leakage Current  | ≤ 200% The initial specified value          |  |          |                  |           |            |         |      |  |       |

## ● DIMENSIONS[mm]



| Φ D  | 5          | 6.3 | 8   | 10  | 12.5 | 16  | 18  |
|------|------------|-----|-----|-----|------|-----|-----|
| Φ d  | 0.5        | 0.5 | 0.5 | 0.6 | 0.6  | 0.8 | 0.8 |
| F    | 2.0        | 2.5 | 3.5 | 5.0 | 5.0  | 7.5 | 7.5 |
| Φ D' | Φ D+0.5max |     |     |     |      |     |     |
| L'   | L+2max     |     |     |     |      |     |     |

## ● RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

| Cap(μF)          | Freq(Hz) |      |      |      |
|------------------|----------|------|------|------|
|                  | 120      | 1k   | 10k  | 100k |
| Cap < 47         | 0.42     | 0.70 | 0.90 | 1.00 |
| 47 ≤ Cap < 330   | 0.50     | 0.73 | 0.92 | 1.00 |
| 330 ≤ Cap < 820  | 0.55     | 0.77 | 0.94 | 1.00 |
| 820 ≤ Cap < 2200 | 0.60     | 0.80 | 0.95 | 1.00 |
| Cap ≥ 2200       | 0.70     | 0.86 | 0.98 | 1.00 |

The endurance of capacitors is shorted with internal heating produced by ripple current at the rate of halving the lifetime with every 5 °C rise. When long life performance is required in actual use, the rms ripple current has to be reduced

# LR Series

● **STANDARD RATINGS**

(Impedance: at 20 °C 100kHz/ Ω max, Ripple current; mA<sub>RMS</sub>/105 °C 100kHz)

| WV (Vdc) | Cap (μ F) | Case Size φ D × L (mm) | tan δ | Impedance (Ω max) | Ripple current (mA <sub>RMS</sub> ) |
|----------|-----------|------------------------|-------|-------------------|-------------------------------------|
| 10(1A)   | 150       | 5 × 11<br>6.3 × 9      | 0.19  | 0.4<br>0.52       | 450<br>380                          |
|          | 330       | 6.3 × 11<br>8 × 9      | 0.19  | 0.17<br>0.22      | 700<br>590                          |
|          | 560       | 8 × 11.5<br>10 × 9     | 0.19  | 0.075<br>0.097    | 1200<br>1020                        |
|          | 680       | 8 × 16                 | 0.19  | 0.058             | 1600                                |
|          | 820       | 10 × 12.5              | 0.19  | 0.053             | 1700                                |
|          | 1000      | 8 × 20                 | 0.19  | 0.041             | 1950                                |
|          | 1200      | 10 × 16                | 0.19  | 0.038             | 2000                                |
|          | 1800      | 10 × 20                | 0.19  | 0.028             | 2500                                |
|          | 2200      | 10 × 25                | 0.21  | 0.024             | 2900                                |
|          | 2700      | 12.5 × 20              | 0.21  | 0.025             | 2600                                |
|          | 3300      | 12.5 × 25              | 0.23  | 0.019             | 3200                                |
|          | 4700      | 12.5 × 30              | 0.25  | 0.018             | 3660                                |
|          | 4700      | 16 × 20                | 0.25  | 0.021             | 3330                                |
|          | 5600      | 12.5 × 35              | 0.27  | 0.016             | 4120                                |
| 5600     | 16 × 25   | 0.27                   | 0.017 | 3810              |                                     |
| 16(1C)   | 120       | 5 × 11<br>6.3 × 9      | 0.16  | 0.4<br>0.52       | 450<br>380                          |
|          | 270       | 6.2 × 11<br>8 × 9      | 0.16  | 0.17<br>0.22      | 700<br>590                          |
|          | 470       | 8 × 11.5<br>10 × 9     | 0.16  | 0.075<br>0.097    | 1200<br>1020                        |
|          | 560       | 8 × 16                 | 0.16  | 0.059             | 1600                                |
|          | 680       | 10 × 12.5              | 0.16  | 0.053             | 1700                                |
|          | 820       | 8 × 20                 | 0.16  | 0.041             | 1950                                |
|          | 1000      | 10 × 16                | 0.16  | 0.038             | 2000                                |
|          | 1500      | 10 × 20                | 0.16  | 0.028             | 2500                                |
|          | 1800      | 10 × 25                | 0.18  | 0.024             | 2900                                |
|          | 2200      | 12.5 × 20              | 0.18  | 0.025             | 2600                                |
|          | 2700      | 12.5 × 25              | 0.18  | 0.019             | 3200                                |
|          | 3300      | 12.5 × 30              | 0.20  | 0.018             | 3660                                |
|          | 3300      | 16 × 20                | 0.20  | 0.021             | 3300                                |
|          | 3900      | 12.5 × 15              | 0.20  | 0.016             | 4120                                |
| 4700     | 16 × 25   | 0.22                   | 0.017 | 3810              |                                     |
| 25(1E)   | 68        | 5 × 11<br>6.3 × 9      | 0.14  | 0.4<br>0.52       | 450<br>380                          |
|          | 150       | 6.3 × 11<br>8 × 9      | 0.14  | 0.17<br>0.22      | 700<br>580                          |
|          | 330       | 8 × 11.5<br>10 × 9     | 0.14  | 0.075<br>0.097    | 1200<br>1020                        |
|          | 390       | 8x16                   | 0.14  | 0.059             | 1600                                |
|          | 470       | 10 × 12.5              | 0.14  | 0.053             | 1700                                |
|          | 560       | 8 × 20                 | 0.14  | 0.041             | 1960                                |
|          | 680       | 10 × 16                | 0.14  | 0.038             | 2000                                |
|          | 1000      | 10 × 20                | 0.14  | 0.028             | 2500                                |
|          | 1200      | 10 × 25                | 0.14  | 0.024             | 2900                                |
|          | 1500      | 12.5 × 20              | 0.14  | 0.025             | 2600                                |
|          | 1800      | 12.5 × 25              | 0.14  | 0.019             | 3200                                |
|          | 2200      | 12.5 × 30              | 0.16  | 0.018             | 3660                                |
|          | 2200      | 16 × 20                | 0.16  | 0.021             | 3330                                |
|          | 2700      | 12.5 × 35              | 0.16  | 0.016             | 4120                                |
| 3300     | 16 × 25   | 0.18                   | 0.017 | 3810              |                                     |

| WV (Vdc) | Cap (μ F) | Case Size φ D × L (mm) | tan δ | Impedance (Ω max) | Ripple current (mA <sub>RMS</sub> ) |
|----------|-----------|------------------------|-------|-------------------|-------------------------------------|
| 35(1V)   | 47        | 5 × 11<br>6.3 × 9      | 0.12  | 0.4<br>0.52       | 450<br>380                          |
|          | 100       | 6.3 × 11<br>8 × 9      | 0.12  | 0.17<br>0.22      | 700<br>590                          |
|          | 180       | 8 × 11.5<br>10 × 9     | 0.12  | 0.075<br>0.097    | 1200<br>1020                        |
|          | 220       | 8 × 16                 | 0.12  | 0.059             | 1600                                |
|          | 270       | 10 × 12.5              | 0.12  | 0.053             | 1700                                |
|          | 330       | 8 × 20                 | 0.12  | 0.041             | 1960                                |
|          | 390       | 10 × 16                | 0.12  | 0.038             | 2000                                |
|          | 560       | 10 × 20                | 0.12  | 0.028             | 2500                                |
|          | 680       | 10 × 25                | 0.12  | 0.024             | 2900                                |
|          | 820       | 12.5 × 20              | 0.12  | 0.025             | 2600                                |
|          | 1200      | 12.5 × 25              | 0.12  | 0.019             | 3200                                |
|          | 1500      | 12.5 × 30              | 0.12  | 0.018             | 3660                                |
|          | 1500      | 16 × 20                | 0.12  | 0.021             | 3330                                |
|          | 1800      | 12.5 × 35              | 0.12  | 0.016             | 4120                                |
| 1800     | 16 × 25   | 0.12                   | 0.017 | 3810              |                                     |
| 50(1H)   | 22        | 5 × 11<br>6.3 × 9      | 0.10  | 0.48<br>0.63      | 310<br>260                          |
|          | 56        | 6.3 × 11<br>8 × 9      | 0.10  | 0.22<br>0.29      | 500<br>425                          |
|          | 100       | 8 × 11.5<br>10 × 9     | 0.10  | 0.12<br>0.16      | 950<br>800                          |
|          | 120       | 8 × 16                 | 0.10  | 0.082             | 1230                                |
|          | 150       | 10 × 12.5              | 0.10  | 0.073             | 1280                                |
|          | 180       | 8 × 20                 | 0.10  | 0.058             | 1580                                |
|          | 220       | 10 × 16                | 0.10  | 0.053             | 1650                                |
|          | 330       | 10 × 20                | 0.10  | 0.038             | 2060                                |
|          | 390       | 10 × 25                | 0.10  | 0.032             | 2420                                |
|          | 470       | 12.5 × 20              | 0.10  | 0.032             | 2300                                |
|          | 680       | 12.5 × 25              | 0.10  | 0.025             | 2800                                |
|          | 820       | 12.5 × 30              | 0.10  | 0.023             | 3370                                |
|          | 820       | 16 × 20                | 0.10  | 0.026             | 3070                                |
|          | 1000      | 12.5 × 15              | 0.10  | 0.021             | 3810                                |
| 1000     | 16 × 25   | 0.10                   | 0.022 | 3510              |                                     |
| 63(1J)   | 18        | 5 × 11<br>6.3 × 9      | 0.09  | 0.71<br>0.92      | 240<br>200                          |
|          | 47        | 6.3 × 11<br>8 × 9      | 0.09  | 0.28<br>0.36      | 420<br>350                          |
|          | 82        | 8 × 11.5<br>10 × 9     | 0.09  | 0.18<br>0.24      | 720<br>610                          |
|          | 100       | 8 × 26                 | 0.09  | 0.13              | 990                                 |
|          | 120       | 10 × 12.5              | 0.09  | 0.11              | 990                                 |
|          | 150       | 8x20                   | 0.09  | 0.096             | 1200                                |
|          | 180       | 10x16                  | 0.09  | 0.076             | 1200                                |
|          | 270       | 10x20                  | 0.09  | 0.066             | 1570                                |
|          | 270       | 12.5x16                | 0.09  | 0.072             | 1570                                |
|          | 330       | 10x25                  | 0.09  | 0.046             | 1990                                |
|          | 390       | 12.5x20                | 0.09  | 0.041             | 1990                                |
|          | 470       | 12.5x25                | 0.09  | 0.031             | 2460                                |
|          | 560       | 12.5x30                | 0.09  | 0.028             | 2760                                |
|          | 560       | 16x20                  | 0.09  | 0.032             | 2380                                |
| 680      | 12.5x35   | 0.09                   | 0.024 | 3040              |                                     |
| 820      | 16x25     | 0.09                   | 0.025 | 2890              |                                     |

# LR Series

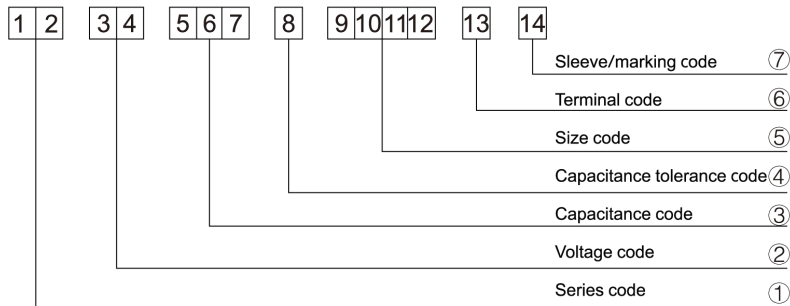
● STANDARD RATINGS

(Impedance: at 20 °C 100kHz/ Ω max, Ripple current: mA<sub>rms</sub>/105 °C 100kHz)

| WV (V <sub>dc</sub> ) | Cap (μ F) | Case Size φ D × L(mm) | tan δ | Impedance (Ω max) | Ripple current (mA <sub>rms</sub> ) |
|-----------------------|-----------|-----------------------|-------|-------------------|-------------------------------------|
| 80(1K)                | 12        | 5 × 11<br>6.3 × 9     | 0.09  | 1.2<br>1.6        | 220<br>180                          |
|                       | 27        | 6.3 × 11<br>8 × 9     | 0.09  | 0.46<br>0.60      | 370<br>310                          |
|                       | 47        | 8 × 11.5<br>10 × 9    | 0.09  | 0.29<br>0.38      | 620<br>520                          |
|                       | 56        | 8 × 16                | 0.09  | 0.20              | 780                                 |
|                       | 68        | 10 × 12.5             | 0.09  | 0.17              | 780                                 |
|                       | 82        | 8 × 20                | 0.09  | 0.16              | 1040                                |
|                       | 100       | 10 × 16               | 0.09  | 0.11              | 1040                                |
|                       | 150       | 10 × 20               | 0.09  | 0.084             | 1430                                |
|                       | 150       | 12.5 × 16             | 0.09  | 0.11              | 1430                                |
|                       | 180       | 10 × 25               | 0.09  | 0.069             | 1620                                |
|                       | 220       | 12.5 × 20             | 0.09  | 0.062             | 1750                                |
|                       | 270       | 12.5 × 25             | 0.09  | 0.047             | 2210                                |
|                       | 330       | 12.5 × 30             | 0.09  | 0.042             | 2400                                |
|                       | 330       | 16 × 20               | 0.09  | 0.048             | 1950                                |
|                       | 390       | 12.5 × 35             | 0.09  | 0.038             | 2600                                |
|                       | 470       | 12.5 × 40             | 0.09  | 0.032             | 2860                                |
|                       | 470       | 16 × 25               | 0.09  | 0.038             | 2430                                |
|                       | 470       | 18 × 20               | 0.09  | 0.045             | 2270                                |
|                       | 560       | 16 × 31.5             | 0.09  | 0.032             | 2640                                |
|                       | 680       | 16 × 35.5             | 0.09  | 0.029             | 2860                                |
| 680                   | 18 × 25   | 0.09                  | 0.036 | 2500              |                                     |
| 820                   | 16 × 40   | 0.09                  | 0.027 | 3510              |                                     |
| 820                   | 18 × 31.5 | 0.09                  | 0.030 | 2860              |                                     |
| 1000                  | 18 × 35.5 | 0.09                  | 0.027 | 3510              |                                     |
| 1200                  | 18 × 40   | 0.09                  | 0.026 | 3860              |                                     |

| WV (V <sub>dc</sub> ) | Cap (μ F) | Case Size φ D × L(mm) | tan δ | Impedance (Ω max) | Ripple current (mA <sub>rms</sub> ) |
|-----------------------|-----------|-----------------------|-------|-------------------|-------------------------------------|
| 100(2A)               | 8.2       | 5 × 11<br>6.3 × 9     | 0.08  | 1.2<br>1.6        | 220<br>180                          |
|                       | 18        | 6.3 × 11<br>8 × 9     | 0.08  | 0.46<br>0.60      | 370<br>310                          |
|                       | 33        | 8 × 11.5<br>10 × 9    | 0.08  | 0.29<br>0.38      | 620<br>520                          |
|                       | 47        | 8 × 16                | 0.08  | 0.20              | 780                                 |
|                       | 56        | 10 × 12.5             | 0.08  | 0.17              | 780                                 |
|                       | 68        | 8 × 20                | 0.08  | 0.16              | 1040                                |
|                       | 82        | 10 × 16               | 0.08  | 0.11              | 1040                                |
|                       | 100       | 10 × 20               | 0.08  | 0.084             | 1430                                |
|                       | 100       | 12.5 × 16             | 0.08  | 0.11              | 1430                                |
|                       | 120       | 10 × 25               | 0.08  | 0.069             | 1620                                |
|                       | 150       | 12.5 × 20             | 0.08  | 0.062             | 1750                                |
|                       | 220       | 12.5 × 25             | 0.08  | 0.047             | 2210                                |
|                       | 270       | 12.5 × 30             | 0.08  | 0.042             | 2400                                |
|                       | 270       | 16 × 20               | 0.08  | 0.048             | 1950                                |
|                       | 330       | 12.5 × 35             | 0.08  | 0.036             | 2600                                |
|                       | 390       | 12.5 × 40             | 0.08  | 0.032             | 2860                                |
|                       | 390       | 16 × 25               | 0.08  | 0.038             | 2430                                |
|                       | 390       | 18 × 20               | 0.08  | 0.045             | 2270                                |
|                       | 470       | 16 × 31.5             | 0.08  | 0.032             | 2640                                |
|                       | 470       | 18 × 25               | 0.08  | 0.036             | 2500                                |
| 560                   | 16 × 35.5 | 0.08                  | 0.029 | 2860              |                                     |
| 560                   | 18 × 31.5 | 0.08                  | 0.030 | 2860              |                                     |
| 680                   | 16x40     | 0.08                  | 0.027 | 3510              |                                     |
| 680                   | 18 × 35.5 | 0.08                  | 0.027 | 3510              |                                     |
| 820                   | 18 × 40   | 0.08                  | 0.026 | 3860              |                                     |

## Part Number System



### ① Series code

| Series name | Code |   |
|-------------|------|---|
|             | 1    | 2 |
| SM          | S    | M |
| SS          | S    | S |
| SH          | S    | H |
| SP          | S    | P |
| NP          | N    | P |
| LL          | L    | L |
| RD          | R    | D |
| RE          | R    | E |
| RT          | R    | T |
| RF          | R    | F |
| RG          | R    | G |
| RJ          | R    | J |
| RR          | R    | R |
| LF          | L    | F |
| LJ          | L    | J |
| LR          | L    | R |
| LG          | L    | G |

### ② Voltage code

| WV (V <sub>dc</sub> ) | Code |   |
|-----------------------|------|---|
|                       | 3    | 4 |
| 4                     | 0    | G |
| 6.3                   | 0    | J |
| 10                    | 1    | A |
| 16                    | 1    | C |
| 25                    | 1    | E |
| 35                    | 1    | V |
| 50                    | 1    | H |
| 63                    | 1    | J |
| 80                    | 1    | K |
| 100                   | 2    | A |
| 160                   | 2    | C |
| 200                   | 2    | D |
| 250                   | 2    | E |
| 350                   | 2    | V |
| 400                   | 2    | G |
| 450                   | 2    | W |
| 500                   | 2    | H |

### ③ Capacitance code

| Cap (uF) | Code |   |   |
|----------|------|---|---|
|          | 5    | 6 | 7 |
| 0.1      | R    | 1 | 0 |
| 0.22     | R    | 2 | 2 |
| 0.33     | R    | 3 | 3 |
| 0.47     | R    | 4 | 7 |
| 1        | 1    | R | 0 |
| 2.2      | 2    | R | 2 |
| 3.3      | 3    | R | 3 |
| 4.7      | 4    | R | 7 |
| 6.8      | 6    | R | 8 |
| 10       | 1    | 0 | 0 |
| 22       | 2    | 2 | 0 |
| 33       | 3    | 3 | 0 |
| 47       | 4    | 7 | 0 |
| 100      | 1    | 0 | 1 |
| 220      | 2    | 2 | 1 |
| 330      | 3    | 3 | 1 |
| 470      | 4    | 7 | 1 |
| 560      | 5    | 6 | 1 |
| 1000     | 1    | 0 | 2 |
| 1500     | 1    | 5 | 2 |
| 2200     | 2    | 2 | 2 |
| 3300     | 3    | 3 | 2 |
| 4700     | 4    | 7 | 2 |
| 6800     | 6    | 8 | 2 |
| 10000    | 1    | 0 | 3 |
| 15000    | 1    | 5 | 3 |

### ④ Capacitance tolerance code

| Tol. (%)  | Code |
|-----------|------|
|           | 8    |
| -5 ~ +5   | J    |
| -10 ~ +10 | K    |
| -20 ~ +20 | M    |

### ⑤ Size code

| ΦD × L (mm) | Code |    |    |    |
|-------------|------|----|----|----|
|             | 9    | 10 | 11 | 12 |
| 3 × 5       | 0    | 3  | 0  | 5  |
| 4 × 5       | 0    | 4  | 0  | 5  |
| 5 × 5       | 0    | 5  | 0  | 5  |
| 6.3 × 5     | 0    | 6  | 0  | 5  |
| 4 × 7       | 0    | 4  | 0  | 7  |
| 5 × 7       | 0    | 5  | 0  | 7  |
| 6.3 × 7     | 0    | 6  | 0  | 7  |
| 8 × 7       | 0    | 8  | 0  | 7  |
| 5 × 11      | 0    | 5  | 1  | 1  |
| 6.3 × 11    | 0    | 6  | 1  | 1  |
| 8 × 12      | 0    | 8  | 1  | 2  |
| 8 × 16      | 0    | 8  | 1  | 6  |
| 10 × 12     | 1    | 0  | 1  | 2  |
| 10 × 16     | 1    | 0  | 1  | 6  |
| 8 × 20      | 0    | 8  | 2  | 0  |
| 10 × 20     | 1    | 0  | 2  | 0  |
| 13 × 20     | 1    | 3  | 2  | 0  |
| 13 × 25     | 1    | 3  | 2  | 5  |
| 16 × 25     | 1    | 6  | 2  | 5  |
| 16 × 32     | 1    | 6  | 3  | 2  |
| 16 × 36     | 1    | 6  | 3  | 6  |
| 18 × 32     | 1    | 8  | 3  | 2  |
| 18 × 36     | 1    | 8  | 3  | 6  |
| 18 × 40     | 1    | 8  | 4  | 0  |

### ⑦ Sleeve/Marking code

| Sleeve/Marking | Code 14 |
|----------------|---------|
| PET            | T       |
| Black          | B       |
| Yellow         | Y       |
| Ink Green      | I       |
| Pea Green      | P       |
| Orange         | O       |

### ⑥ Terminal code

| Specification | Code 13  |   |
|---------------|----------|---|
| Bulk packing  | 0        |   |
| Φ4-8Taping    | T1       |   |
|               | T2       |   |
|               | T2       |   |
| Φ10-18Taping  | T3       |   |
|               | Lesd Cut | F |
|               |          | C |
| R             |          |   |
| L             |          |   |
| M             |          |   |
| S             |          |   |
| B             |          |   |
| K             |          |   |

Lead Forming

Taping Specifications

Fig.1 Code:T1

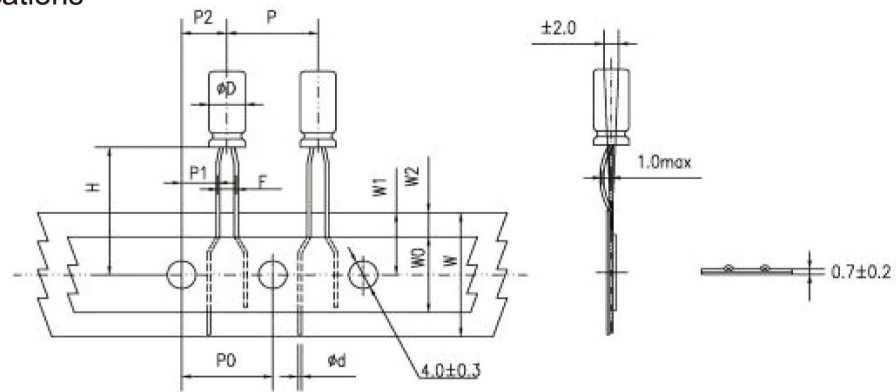


Fig.2 Code:T2

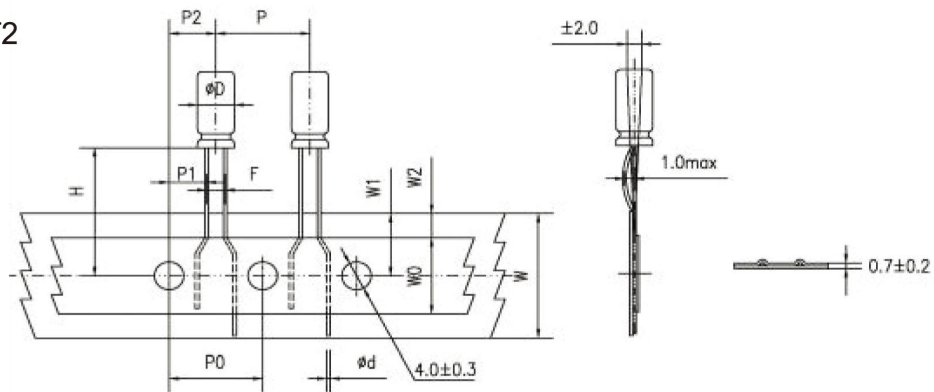


Fig.3 Code:T2

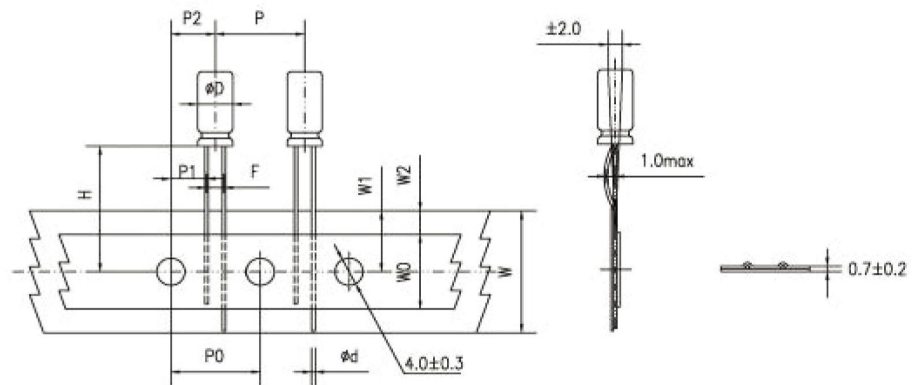
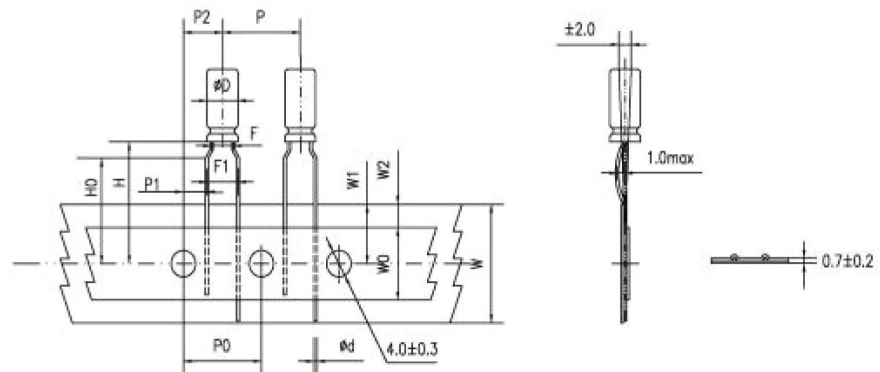


Fig.4 Code:T3



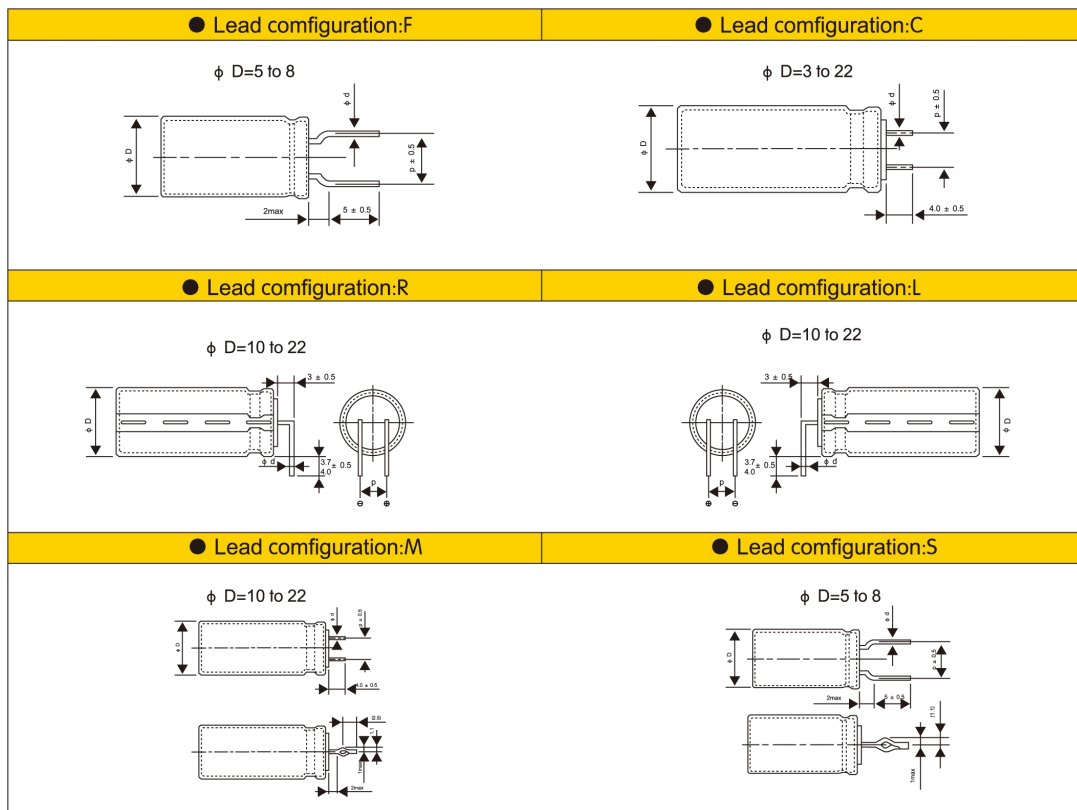
**Specification Fig.1 & Fig.2 & Fig.3**

| Items                                    | Symbol | CASE SIZE      |                |                |                |                |      |                |                |                  |                                   | Tolerance      |                |  |               |
|--|--------|----------------|----------------|----------------|----------------|----------------|------|----------------|----------------|------------------|-----------------------------------|----------------|----------------|--|---------------|
|  |        | 4 × 5<br>4 × 7 |                | 5 × 5<br>5 × 7 |                | 5x11           |      | 6.3x5          | 6.3x7<br>6.3x9 | 6.3x11<br>6.3x12 | 8x5/7<br>8x9/11<br>8x11.5<br>8x12 |                | 8x16<br>8x20   | 10x9/12<br>10x12.5<br>10x13/16<br>10x20/25 |               |
| Pin Code                                 |        | T <sub>1</sub> | T <sub>2</sub> | T <sub>1</sub> | T <sub>2</sub> | T <sub>1</sub> |      | T <sub>2</sub> | T <sub>2</sub> | T <sub>2</sub>   | T <sub>2</sub>                    | T <sub>2</sub> | T <sub>2</sub> |  |               |
| Lead wire diameter                       | φd     | 0.45           |                | 0.45           |                | 0.5            |      | 0.45           | 0.5            | 0.5              | 0.5                               | 0.45/0.5       | 0.6            | 0.6  | ± 0.05        |
| Pitch of body                            | P      | 12.7           |                | 12.7           |                | 12.7           |      | 12.7           | 12.7           | 12.7             | 12.7                              | 12.7           | 12.7           | 12.7                                       | ± 1.0         |
| Feed hole pitch                          | PO     | 12.7           |                | 12.7           |                | 12.7           |      | 12.7           | 12.7           | 12.7             | 12.7                              | 12.7           | 12.7           | 12.7                                       | ± 0.2         |
| Hole center to lead distance             | P1     | 5.1            | 5.6            | 5.1            | 5.35           | 5.1            | 5.35 | 5.1            | 5.1            | 5.1              | 5.1                               | 4.6            | 4.6            | 3.85                                       | ± 0.7         |
| Feed hole center to body center distance | P2     | 6.35           |                | 6.35           |                | 6.35           |      | 6.35           | 6.35           | 6.35             | 6.35                              | 6.35           | 6.35           | 6.35                                       | ± 1.0         |
| Lead to lead distance                    | F      | 2.5            | 1.5            | 2.5            | 2.0            | 2.5            | 2.0  | 2.5            | 2.5            | 2.5              | 2.5                               | 3.5            | 3.5            | 5.0  | ± 0.5         |
| Height of body from tape center          | H      | 18.5           |                | 18.5           |                | 18.5           |      | 18.5           | 18.5           | 18.5             | 18.5                              | 18.5           | 18.5           | 18.5                                       | ± 0.75        |
| Base tape width                          | W      | 18.0           |                | 18.0           |                | 18.0           |      | 18.0           | 18.0           | 18.0             | 18.0                              | 18.0           | 18.0           | 18.0                                       | ± 0.5         |
| Adhesive tape width                      | WO     | 11.0           |                | 11.0           |                | 11.0           |      | 11.0           | 11.0           | 11.0             | 11.0                              | 11.0           | 11.0           | 11.0                                       | min           |
| Hole positron                            | W1     | 9.0            |                | 9.0            |                | 9.0            |      | 9.0            | 9.0            | 9.0              | 9.0                               | 9.0            | 9.0            | 9.0  | +0.75<br>-0.5 |
| Hole down tape position                  | W2     | 3.0            |                | 3.0            |                | 3.0            |      | 3.0            | 3.0            | 3.0              | 3.0                               | 3.0            | 3.0            | 3.0  | max           |

**Specification Fig.4**

| Items                                    | Symbol | CASE SIZE      |                |                |                |                |                    |                      |                                    |                  | Tolerance     |
|--|--------|----------------|----------------|----------------|----------------|----------------|--------------------|----------------------|------------------------------------|------------------|---------------|
|  |        | 4 × 5<br>4 × 7 | 5 × 5          | 5 × 7          | 5 × 11         | 6.3 × 5        | 6.3 × 7<br>6.3 × 9 | 6.3 × 11<br>6.3 × 12 | 8 × 5/7<br>8 × 9/11<br>8 × 11.5/12 | 8 × 16<br>8 × 20 |               |
| Pin Code                                 |        | T <sub>3</sub> | T <sub>3</sub> | T <sub>3</sub> | T <sub>3</sub> | T <sub>3</sub> | T <sub>3</sub>     | T <sub>3</sub>       | T <sub>3</sub>                     | T <sub>3</sub>   |               |
| Lead wire diameter                       | φd     | 0.45           | 0.45           | 0.45           | 0.5            | 0.45           | 0.5                | 0.5                  | 0.45/0.5                           | 0.6              | ± 0.05        |
| Pitch of body                            | P      | 12.7           | 12.7           | 12.7           | 12.7           | 12.7           | 12.7               | 12.7                 | 12.7                               | 12.7             | ± 1.0         |
| Feed hole pitch                          | PO     | 12.7           | 12.7           | 12.7           | 12.7           | 12.7           | 12.7               | 12.7                 | 12.7                               | 12.7             | ± 0.2         |
| Hole center to lead distance             | P1     | 3.85           | 3.85           | 3.85           | 3.85           | 3.85           | 3.85               | 3.85                 | 3.85                               | 3.85             | ± 0.7         |
| Feed hole center to body center distance | P2     | 6.35           | 6.35           | 6.35           | 6.35           | 6.35           | 6.35               | 6.35                 | 6.35                               | 6.35             | ± 1.0         |
| Lead to lead distance                    | F      | 1.5            | 2.0            | 2.0            | 2.0            | 2.5            | 2.5                | 2.5                  | 3.5                                | 3.5              | ± 0.5         |
| Lead to lead distance                    | F1     | 5.0            | 5.0            | 5.0            | 5.0            | 5.0            | 5.0                | 5.0                  | 5.0                                | 5.0              | +0.8<br>-0.2  |
| Height of body from tape center          | H      | 18.5           | 18.5           | 18.5           | 18.5           | 18.5           | 18.5               | 18.5                 | 18.5                               | 18.5             | ± 0.75        |
| Lead wire clinch height                  | HO     | 16.0           | 16.0           | 16.0           | 16.0           | 16.0           | 16.0               | 16.0                 | 16.0                               | 16.0             | ± 0.5         |
| Base tape width                          | W      | 18.0           | 18.0           | 18.0           | 18.0           | 18.0           | 18.0               | 18.0                 | 18.0                               | 18.0             | ± 0.5         |
| Adhesive tape width                      | WO     | 11.0           | 11.0           | 11.0           | 11.0           | 11.0           | 11.0               | 11.0                 | 11.0                               | 11.0             | min           |
| Hole position                            | W1     | 9.0            | 9.0            | 9.0            | 9.0            | 9.0            | 9.0                | 9.0                  | 9.0                                | 9.0              | +0.75<br>-0.5 |
| Hole down tape position                  | W2     | 3.0            | 3.0            | 3.0            | 3.0            | 3.0            | 3.0                | 3.0                  | 3.0                                | 3.0              | max           |

● Lead Forming & Cut:



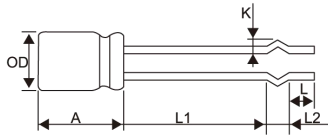
● LEAD SPACING&RECOMMENDED PCB DIMENSIONS

(mm)

| Dimension | φD | φd      | p    | PC Board      |           | Lead Configuration |
|-----------|----|---------|------|---------------|-----------|--------------------|
|           |    |         |      | Hole diameter | Thickness |                    |
| 5         |    | 0.5     | 5.0  | 0.8           | 1.6       | F<br>C<br>S        |
| 6.3       |    | 0.5     | 5.0  | 0.8           |           |                    |
| 8         |    | 0.5/0.6 | 5.0  | 1.0           |           |                    |
| 10        |    | 0.6     | 5.0  | 1.0           | 1.6       | C<br>M<br>R<br>L   |
| 12.5      |    | 0.6     | 5.0  | 1.0           |           |                    |
| 16        |    | 0.8     | 7.5  | 1.2           |           |                    |
| 18        |    | 0.8     | 7.5  | 1.2           |           |                    |
| 20        |    | 0.8     | 7.5  | 1.2           |           |                    |
| 22        |    | 0.8     | 10.0 | 1.2           |           |                    |

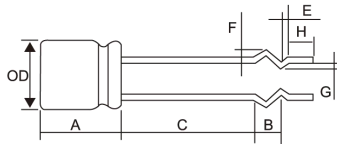


● Lead configuration: B



| $\phi D$ | L1        | L2        | K   | A         | L       |           |
|----------|-----------|-----------|-----|-----------|---------|-----------|
| 5        | 17.5-19.5 | 2.6       | 1.9 | 10.0-15.0 | 3.0-5.0 |           |
| 6.3      | 17.5-19.5 | 2.6       | 1.9 | 10.0-16.0 |         |           |
| 8        | 12.0-14.0 | 2.5       | 1.3 | 10.0-20.0 |         |           |
| 8        | 13.5-15.5 | 2.5       | 1.5 |           |         |           |
| 8        | 13.0-15.0 | 3.0       | 1.5 |           |         |           |
| 8        | 19.5-21.5 | 3.0       | 1.5 |           |         |           |
| 8        | 21.0-23.0 | 3.0       | 1.5 |           |         |           |
| 10       | 7.5-9.5   | 2.5       | 1.7 | 10.0-25.0 |         |           |
| 10       | 17.0-19.0 | 2.5       | 1.7 |           |         |           |
| 10       | 10.5-12.5 | 2.5       | 1.5 |           |         |           |
| 10       | 10.0-12.0 | 3.0       | 1.5 |           |         |           |
| 10       | 13.0-15.0 | 3.0       | 1.5 |           |         |           |
| 10       | 18.0-20.0 | 3.0       | 1.5 |           |         |           |
| 10       | 21.0-23.0 | 3.0       | 1.5 |           |         |           |
|          | $\pm 1.0$ | $\pm 0.5$ | 0.3 | $\pm 1.0$ |         | $\pm 1.0$ |

● Lead configuration: K



| $\phi D$ | C         | B         | E         | F         | G         | A         | H         |
|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 8        | 13.5-15.5 | 3         | 1.2       | 1.8       | 0.8       | 10-20     | 3.0-5.0   |
| 10       | 18.5-20.5 | 3         | 1.2       | 1.8       | 1         | 10-25     |           |
| 10       | 19.0-21.0 | 3         | 1.5       | 1.4       | 0.5       |           |           |
|          | $\pm 1.0$ | $\pm 0.5$ | $\pm 0.3$ | $\pm 0.3$ | $\pm 0.3$ | $\pm 1.0$ | $\pm 1.0$ |