

**TLV SERIES**
**105°C Long Life, Low Impedance, Lead Free Reflow Soldering.**
**◆FEATURES**

- Load Life 105°C 5000 hours.
- Reflow soldering is available.
- Large can-size SMD.
- RoHS compliance.


**◆SPECIFICATIONS**

| Items  | Characteristics   |                    |  |                    |  |                 |                                    |               |                  |      |      |      |      |      |  |                  |   |   |   |   |   |  |                  |   |   |   |   |   |  |
|--|---|--------------------|--|--------------------|--|-----------------|------------------------------------|---------------|------------------|------|------|------|------|------|--|------------------|---|---|---|---|---|--|------------------|---|---|---|---|---|--|
| Category Temperature Range                     | -55~+105°C  |                    |  |                    |  |                 |                                    |               |                  |      |      |      |      |      |  |                  |   |   |   |   |   |  |                  |   |   |   |   |   |  |
| Rated Voltage Range                            | 6.3~35V.DC  |                    |  |                    |  |                 |                                    |               |                  |      |      |      |      |      |  |                  |   |   |   |   |   |  |                  |   |   |   |   |   |  |
| Capacitance Tolerance                          | ±20% (20°C, 120Hz)  |                    |  |                    |  |                 |                                    |               |                  |      |      |      |      |      |  |                  |   |   |   |   |   |  |                  |   |   |   |   |   |  |
| Leakage Current(MAX)                           | I=0.01CV or 3μA whichever is greater. (After 2 minutes)<br>I=(μA) Leakage Current      C=(μF) Rated Capacitance      V=(V) Rated Voltage  |                    |  |                    |  |                 |                                    |               |                  |      |      |      |      |      |  |                  |   |   |   |   |   |  |                  |   |   |   |   |   |  |
| (tanδ) Dissipation Factor(MAX)                 | <table border="1"> <thead> <tr> <th>Rated Voltage</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>(20°C, 120Hz)</th> </tr> </thead> <tbody> <tr> <td>tanδ</td> <td>0.26</td> <td>0.19</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td></td> </tr> </tbody> </table> <p>When rated capacitance is over 1000μF, tanδ shall be added 0.02 to the listed value with increase of every 1000 μF.</p>   | Rated Voltage      | 6.3  | 10                 | 16   | 25              | 35                                 | (20°C, 120Hz) | tanδ             | 0.26 | 0.19 | 0.16 | 0.14 | 0.12 |  |                  |   |   |   |   |   |  |                  |   |   |   |   |   |  |
| Rated Voltage                                  | 6.3   | 10                 | 16   | 25                 | 35   | (20°C, 120Hz)   |                                    |               |                  |      |      |      |      |      |  |                  |   |   |   |   |   |  |                  |   |   |   |   |   |  |
| tanδ   | 0.26  | 0.19               | 0.16   | 0.14               | 0.12                                       |                 |                                    |               |                  |      |      |      |      |      |  |                  |   |   |   |   |   |  |                  |   |   |   |   |   |  |
| Endurance                                      | <p>After applying rated voltage with rated ripple current for 5000 hours at 105°C, the capacitors shall meet the following requirements.</p> <table border="1"> <tbody> <tr> <td>Capacitance Change</td> <td>Within ±30% of the initially measured value.</td> </tr> <tr> <td>Dissipation Factor</td> <td>Not more than 200% of the specified value.</td> </tr> <tr> <td>Leakage Current</td> <td>Not more than the specified value.</td> </tr> </tbody> </table>                               | Capacitance Change | Within ±30% of the initially measured value. | Dissipation Factor | Not more than 200% of the specified value. | Leakage Current | Not more than the specified value. |               |                  |      |      |      |      |      |  |                  |   |   |   |   |   |  |                  |   |   |   |   |   |  |
| Capacitance Change                             | Within ±30% of the initially measured value.  |                    |  |                    |  |                 |                                    |               |                  |      |      |      |      |      |  |                  |   |   |   |   |   |  |                  |   |   |   |   |   |  |
| Dissipation Factor                             | Not more than 200% of the specified value.  |                    |  |                    |  |                 |                                    |               |                  |      |      |      |      |      |  |                  |   |   |   |   |   |  |                  |   |   |   |   |   |  |
| Leakage Current                                | Not more than the specified value.  |                    |  |                    |  |                 |                                    |               |                  |      |      |      |      |      |  |                  |   |   |   |   |   |  |                  |   |   |   |   |   |  |
| Low Temperature Stability Impedance Ratio(MAX) | <table border="1"> <thead> <tr> <th>Rated Voltage</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>(120Hz)</th> </tr> </thead> <tbody> <tr> <td>Z(-25°C)/Z(20°C)</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td></td> </tr> <tr> <td>Z(-40°C)/Z(20°C)</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td></td> </tr> <tr> <td>Z(-55°C)/Z(20°C)</td> <td>4</td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> <td></td> </tr> </tbody> </table> | Rated Voltage      | 6.3  | 10                 | 16   | 25              | 35                                 | (120Hz)       | Z(-25°C)/Z(20°C) | 2    | 2    | 2    | 2    | 2    |  | Z(-40°C)/Z(20°C) | 3 | 3 | 3 | 3 | 3 |  | Z(-55°C)/Z(20°C) | 4 | 4 | 4 | 3 | 3 |  |
| Rated Voltage                                  | 6.3   | 10                 | 16   | 25                 | 35   | (120Hz)         |                                    |               |                  |      |      |      |      |      |  |                  |   |   |   |   |   |  |                  |   |   |   |   |   |  |
| Z(-25°C)/Z(20°C)                               | 2   | 2                  | 2  | 2                  | 2  |                 |                                    |               |                  |      |      |      |      |      |  |                  |   |   |   |   |   |  |                  |   |   |   |   |   |  |
| Z(-40°C)/Z(20°C)                               | 3   | 3                  | 3  | 3                  | 3  |                 |                                    |               |                  |      |      |      |      |      |  |                  |   |   |   |   |   |  |                  |   |   |   |   |   |  |
| Z(-55°C)/Z(20°C)                               | 4   | 4                  | 4  | 3                  | 3  |                 |                                    |               |                  |      |      |      |      |      |  |                  |   |   |   |   |   |  |                  |   |   |   |   |   |  |

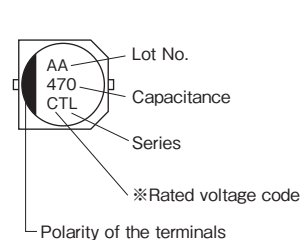
**◆MULTIPLIER FOR RIPPLE CURRENT**

Frequency Coefficient

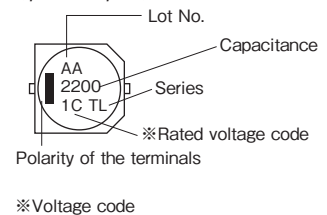
| (Hz) Frequency |             | 120  | 1K   | 10K  | 100K≦ |
|----------------|-------------|------|------|------|-------|
| Coefficient    | 100~150μF   | 0.50 | 0.80 | 0.95 | 1.00  |
|                | 220~10000μF | 0.60 | 0.85 | 0.95 | 1.00  |

**◆MARKING**

(φ8, φ10)



(φ12.5~φ18)

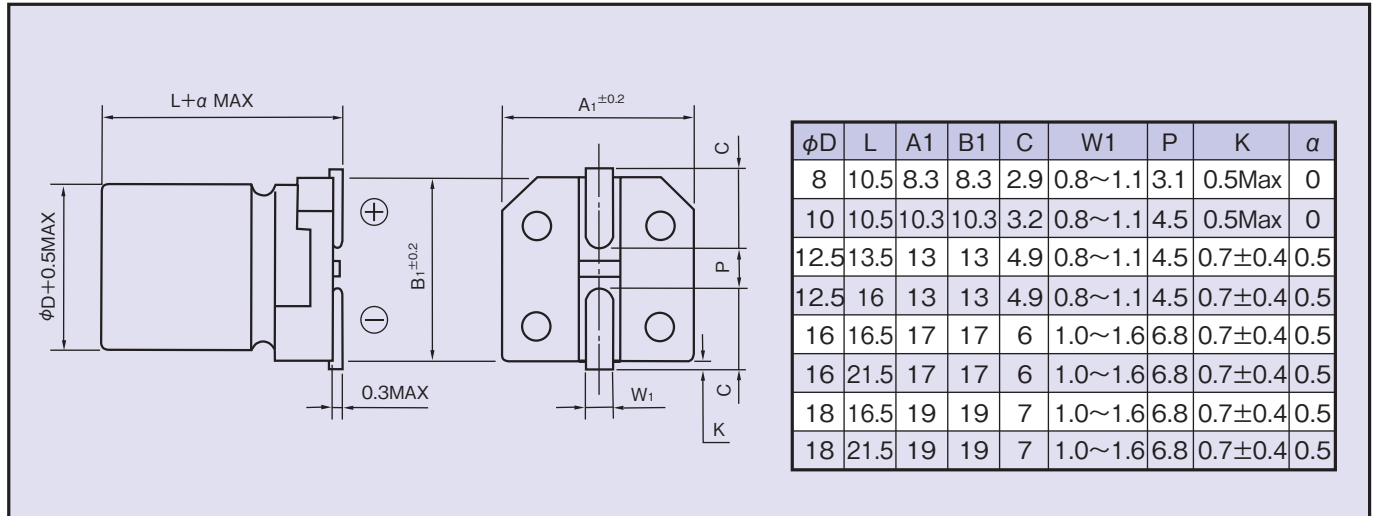

**◆PART NUMBER**

|               |        |                   |                       |        |           |
|---------------|--------|-------------------|-----------------------|--------|-----------|
| □□□           | TLV    | □□□□□             | M                     | □□□    | D×L       |
| Rated Voltage | Series | Rated Capacitance | Capacitance Tolerance | Option | Case Size |

| Rated Voltage | 6.3     | 10 | 16 | 25 | 35 |    |
|---------------|---------|----|----|----|----|----|
| Voltage code  | φD≤10   | j  | A  | C  | E  | V  |
|               | φD≥12.5 | 0J | 1A | 1C | 1E | 1V |

◆ **DIMENSIONS**

(mm)



◆ **STANDARD SIZE**

Size φDXL(mm), Ripple current(mA r.m.s./105°C,100kHz), Impedance(Ω Max/20°C, 100kHz)

| WV (V.DC) | Cap (μF) | Size (φDXL) | Ripple | Impedance | WV (V.DC) | Cap (μF) | Size (φDXL) | Ripple  | Impedance |      |
|-----------|----------|-------------|--------|-----------|-----------|----------|-------------|---------|-----------|------|
| 6.3 (0J)  | 2200     | 12.5×13.5   | 1100   | 0.065     | 25 (1E)   | 220      | 8×10.5      | 600     | 0.16      |      |
|           | 3300     | 12.5×16     | 1400   | 0.055     |           | 330      | 8×10.5      | 600     | 0.16      |      |
|           | 4700     | 16×16.5     | 1800   | 0.045     |           | 470      | 10×10.5     | 850     | 0.08      |      |
|           | 6800     | 16×21.5     | 2330   | 0.029     |           | 1000     | 12.5×13.5   | 1100    | 0.065     |      |
|           | 10000    | 18×21.5     | 2640   | 0.028     |           | 1500     | 16×16.5     | 1800    | 0.045     |      |
| 10 (1A)   | 1000     | 10×10.5     | 850    | 0.08      |           | 2200     | 18×16.5     | 2060    | 0.044     |      |
|           | 2200     | 12.5×16     | 1400   | 0.055     |           | 3300     | 18×21.5     | 2640    | 0.028     |      |
|           | 3300     | 16×16.5     | 1800   | 0.045     |           | 35 (1V)  | 100         | 8×10.5  | 600       | 0.16 |
|           | 4700     | 18×16.5     | 2060   | 0.044     |           |          | 100         | 10×10.5 | 850       | 0.08 |
|           | 6800     | 18×21.5     | 2640   | 0.028     |           |          | 150         | 8×10.5  | 600       | 0.16 |
| 16 (1C)   | 470      | 8×10.5      | 600    | 0.16      | 220       |          | 8×10.5      | 600     | 0.16      |      |
|           | 680      | 10×10.5     | 850    | 0.08      | 330       |          | 10×10.5     | 850     | 0.08      |      |
|           | 1500     | 12.5×13.5   | 1100   | 0.065     | 470       |          | 12.5×13.5   | 1100    | 0.065     |      |
|           | 2200     | 16×16.5     | 1800   | 0.045     | 680       |          | 12.5×13.5   | 1100    | 0.065     |      |
|           | 3300     | 18×16.5     | 2060   | 0.044     | 1000      |          | 16×16.5     | 1800    | 0.045     |      |
|           | 4700     | 16×21.5     | 2330   | 0.029     | 1500      |          | 18×16.5     | 2060    | 0.044     |      |
|           |          |             |        |           | 2200      |          | 16×21.5     | 2330    | 0.029     |      |