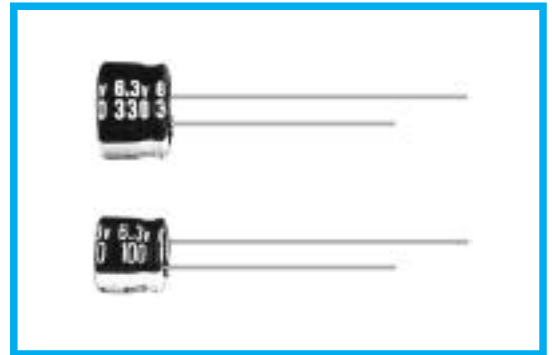


**MS5 SERIES**
**85°C 5mm Height.**
**◆FEATURES**

- RoHS compliance.

**MS5**

105°C Version

**MH5**

**◆規格表 SPECIFICATIONS**

| Items  | Characteristics  |                    |                                   |                    |  |                 |                                    |    |    |                  |      |      |      |      |      |      |      |                  |    |    |    |   |   |   |   |
|--|--|--------------------|-----------------------------------|--------------------|--|-----------------|------------------------------------|----|----|------------------|------|------|------|------|------|------|------|------------------|----|----|----|---|---|---|---|
| Category Temperature Range                       | -40~+85°C  |                    |                                   |                    |  |                 |                                    |    |    |                  |      |      |      |      |      |      |      |                  |    |    |    |   |   |   |   |
| Rated Voltage Range                              | 4~50V.DC   |                    |                                   |                    |  |                 |                                    |    |    |                  |      |      |      |      |      |      |      |                  |    |    |    |   |   |   |   |
| Capacitance Tolerance                            | ±20% (20°C, 120Hz)   |                    |                                   |                    |  |                 |                                    |    |    |                  |      |      |      |      |      |      |      |                  |    |    |    |   |   |   |   |
| Leakage Current(MAX)<br>(tan δ)                  | I=0.01CV or 3 μA whichever is greater. (After 2 minutes application of rated voltage)<br>I=Leakage Current( μ A)      C=Rated Capacitance( μ F)      V=Rated Voltage(V)  |                    |                                   |                    |  |                 |                                    |    |    |                  |      |      |      |      |      |      |      |                  |    |    |    |   |   |   |   |
| Dissipation Factor(MAX)                          | <table border="1"> <thead> <tr> <th>Rated Voltage (V)</th> <th>4</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> </tr> </thead> <tbody> <tr> <td>tan δ</td> <td>0.35</td> <td>0.26</td> <td>0.22</td> <td>0.18</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> </tr> </tbody> </table> (20°C, 120Hz)  | Rated Voltage (V)  | 4                                 | 6.3                | 10   | 16              | 25                                 | 35 | 50 | tan δ            | 0.35 | 0.26 | 0.22 | 0.18 | 0.16 | 0.14 | 0.12 |                  |    |    |    |   |   |   |   |
| Rated Voltage (V)                                | 4  | 6.3                | 10                                | 16                 | 25   | 35              | 50                                 |    |    |                  |      |      |      |      |      |      |      |                  |    |    |    |   |   |   |   |
| tan δ  | 0.35   | 0.26               | 0.22                              | 0.18               | 0.16                                       | 0.14            | 0.12                               |    |    |                  |      |      |      |      |      |      |      |                  |    |    |    |   |   |   |   |
| Endurance  | After applying rated voltage with rated ripple current for 1000 hrs at 85°C, the capacitors shall meet the following requirements. <table border="1"> <tbody> <tr> <td>Capacitance Change</td> <td>Within ±25% of the initial 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 ±25% of the initial value. | Dissipation Factor | Not more than 200% of the specified value. | Leakage Current | Not more than the specified value. |    |    |                  |      |      |      |      |      |      |      |                  |    |    |    |   |   |   |   |
| Capacitance Change                               | Within ±25% of the initial value.  |                    |                                   |                    |  |                 |                                    |    |    |                  |      |      |      |      |      |      |      |                  |    |    |    |   |   |   |   |
| Dissipation Factor                               | Not more than 200% of the specified value.   |                    |                                   |                    |  |                 |                                    |    |    |                  |      |      |      |      |      |      |      |                  |    |    |    |   |   |   |   |
| Leakage Current                                  | Not more than the specified value.   |                    |                                   |                    |  |                 |                                    |    |    |                  |      |      |      |      |      |      |      |                  |    |    |    |   |   |   |   |
| Low Temperature Stability<br>mpedance Ratio(MAX) | <table border="1"> <thead> <tr> <th>Rated Voltage (V)</th> <th>4</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> </tr> </thead> <tbody> <tr> <td>Z(-25°C)/Z(20°C)</td> <td>7</td> <td>6</td> <td>4</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z(-40°C)/Z(20°C)</td> <td>15</td> <td>12</td> <td>10</td> <td>8</td> <td>6</td> <td>4</td> <td>4</td> </tr> </tbody> </table> (120Hz)       | Rated Voltage (V)  | 4                                 | 6.3                | 10   | 16              | 25                                 | 35 | 50 | Z(-25°C)/Z(20°C) | 7    | 6    | 4    | 4    | 3    | 2    | 2    | Z(-40°C)/Z(20°C) | 15 | 12 | 10 | 8 | 6 | 4 | 4 |
| Rated Voltage (V)                                | 4  | 6.3                | 10                                | 16                 | 25   | 35              | 50                                 |    |    |                  |      |      |      |      |      |      |      |                  |    |    |    |   |   |   |   |
| Z(-25°C)/Z(20°C)                                 | 7  | 6                  | 4                                 | 4                  | 3  | 2               | 2                                  |    |    |                  |      |      |      |      |      |      |      |                  |    |    |    |   |   |   |   |
| Z(-40°C)/Z(20°C)                                 | 15   | 12                 | 10                                | 8                  | 6  | 4               | 4                                  |    |    |                  |      |      |      |      |      |      |      |                  |    |    |    |   |   |   |   |

**◆MULTIPLIER FOR RIPPLE CURRENT**

Frequency coefficient

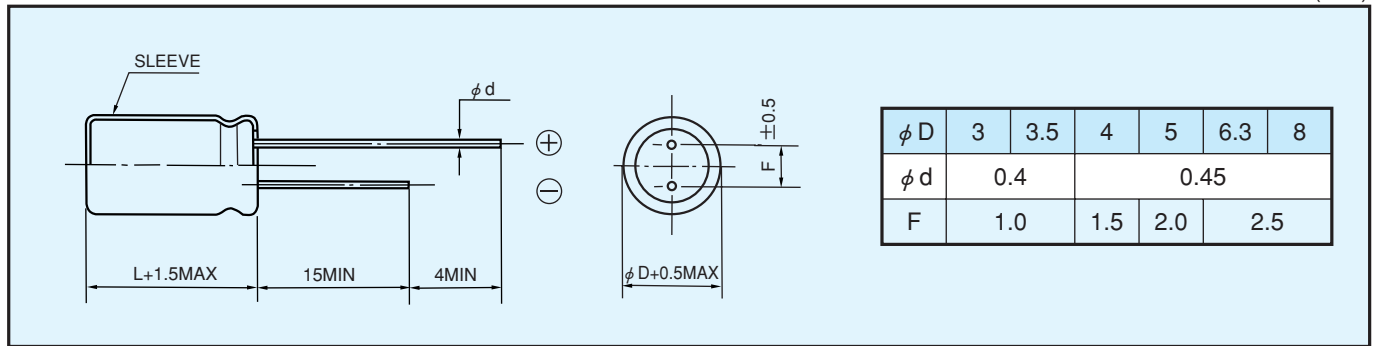
| Frequency (Hz) | 60(50) | 120 | 500  | 1k   | 10k≤ |
|----------------|--------|-----|------|------|------|
| 0.1~1 μF       | 0.50   | 1.0 | 1.20 | 1.30 | 1.50 |
| 1.5~6.8 μF     | 0.65   | 1.0 | 1.20 | 1.30 | 1.50 |
| 10~68 μF       | 0.8    | 1.0 | 1.20 | 1.30 | 1.50 |
| 100~470 μF     | 0.8    | 1.0 | 1.10 | 1.15 | 1.20 |

**◆PART NUMBER**

|               |        |                   |                       |        |              |           |
|---------------|--------|-------------------|-----------------------|--------|--------------|-----------|
| □□□           | MS5    | □□□□□             | □                     | □□□    | □□           | D×L       |
| Rated Voltage | Series | Rated Capacitance | Capacitance Tolerance | Option | Lead Forming | Case Size |

**◆ DIMENSIONS**

(mm)



**◆ STANDARD SIZE, RATED RIPPLE CURRENT**

Size  $\phi D \times L$ (mm), Ripple Current (mA r.m.s./85°C, 120Hz)

| WV (V.DC)<br>Cap ( $\mu F$ ) | 4<br>(0G) |        | 6.3<br>(0J) |        | 10<br>(1A) |        | 16<br>(1C) |        |
|------------------------------|-----------|--------|-------------|--------|------------|--------|------------|--------|
|                              | Size      | Ripple | Size        | Ripple | Size       | Ripple | Size       | Ripple |
| 4.7                          |           |        |             |        |            |        | ● 4×5      | 11     |
| 6.8                          |           |        |             |        | ● 4×5      | 10     | * 4×5      | 13     |
| 10                           |           |        | ● 4×5       | 14     | ● 4×5      | 16     | * 4×5      | 18     |
| 15                           |           |        | * 4×5       | 18     | 4×5        | 22     | 5×5        | 26     |
| 22                           | ● 4×5     | 20     | 4×5         | 22     | 5×5        | 30     | 5×5        | 35     |
| 33                           | * 4×5     | 27     | 5×5         | 34     | 5×5        | 45     | 6.3×5      | 51     |
| 47                           | 4×5       | 37     | 5×5         | 37     | 6.3×5      | 50     | 6.3×5      | 65     |
| 68                           | 5×5       | 45     | 6.3×5       | 55     | 6.3×5      | 59     | 6.3×5      | 70     |
| 100                          | 5×5       | 62     | 6.3×5       | 62     | 6.3×5      | 80     | 8×5        | 92     |
| 220                          | 6.3×5     | 74     | 8×5         | 120    | 8×5        | 145    |            |        |
| 330                          | 8×5       | 145    | 8×5         | 145    |            |        |            |        |
| 470                          | 8×5       | 181    |             |        |            |        |            |        |

| WV (V.DC)<br>Cap ( $\mu F$ ) | 25<br>(1E) |        | 35<br>(1V) |        | 50<br>(1H) |        |
|------------------------------|------------|--------|------------|--------|------------|--------|
|                              | Size       | Ripple | Size       | Ripple | Size       | Ripple |
| 0.1                          |            |        |            |        | ● 4×5      | 1      |
| 0.15                         |            |        |            |        | ● 4×5      | 1.5    |
| 0.22                         |            |        |            |        | ● 4×5      | 2.5    |
| 0.33                         |            |        |            |        | ● 4×5      | 4      |
| 0.47                         |            |        |            |        | ● 4×5      | 6      |
| 0.68                         |            |        |            |        | ● 4×5      | 7      |
| 1                            |            |        |            |        | ● 4×5      | 8.6    |
| 1.5                          |            |        |            |        | ● 4×5      | 8.7    |
| 2.2                          |            |        | ● 4×5      | 9      | * 4×5      | 9.1    |
| 3.3                          | ● 4×5      | 11     | * 4×5      | 12     | 4×5        | 13     |
| 4.7                          | * 4×5      | 13     | 4×5        | 14     | 5×5        | 20     |
| 6.8                          | 4×5        | 19     | 5×5        | 20     | 6.3×5      | 26     |
| 10                           | 5×5        | 27     | 5×5        | 27     | 6.3×5      | 31     |
| 15                           | 5×5        | 33     | 6.3×5      | 35     | 6.3×5      | 39     |
| 22                           | 6.3×5      | 46     | 6.3×5      | 46     | 8×5        | 60     |
| 33                           | 6.3×5      | 54     | 8×5        | 65     | 8×5        | 80     |
| 47                           | 6.3×5      | 65     | 8×5        | 85     |            |        |
| 68                           | 8×5        | 90     |            |        |            |        |
| 100                          | 8×5        | 120    |            |        |            |        |

3mm DIA. is available for marked ●, and 3.5mm DIA. is available for marked \* when specified.