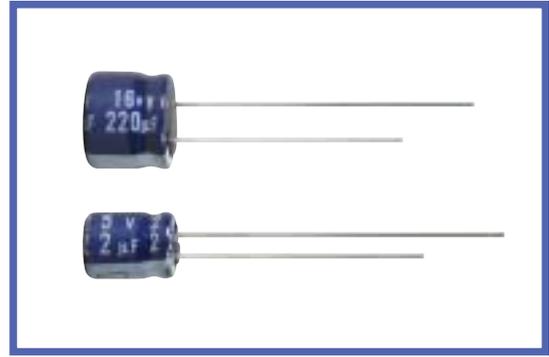


**MS7 SERIES**
**85°C 7mm Height.**
**◆ FEATURES**

- RoHS compliance.


**◆ SPECIFICATIONS**

| Items   | Characteristics   |                    |                                    |                    |  |                 |                                    |      |    |    |               |      |      |      |      |      |      |      |      |                  |   |   |   |   |   |   |   |   |                  |    |    |   |   |   |   |   |   |
|---|---|--------------------|------------------------------------|--------------------|--|-----------------|------------------------------------|------|----|----|---------------|------|------|------|------|------|------|------|------|------------------|---|---|---|---|---|---|---|---|------------------|----|----|---|---|---|---|---|---|
| Category Temperature Range                        | -40 ~ +85°C   |                    |                                    |                    |  |                 |                                    |      |    |    |               |      |      |      |      |      |      |      |      |                  |   |   |   |   |   |   |   |   |                  |    |    |   |   |   |   |   |   |
| Rated Voltage Range                               | 4 ~ 63V.DC  |                    |                                    |                    |  |                 |                                    |      |    |    |               |      |      |      |      |      |      |      |      |                  |   |   |   |   |   |   |   |   |                  |    |    |   |   |   |   |   |   |
| Capacitance Tolerance                             | ± 20%(20°C, 120Hz)  |                    |                                    |                    |  |                 |                                    |      |    |    |               |      |      |      |      |      |      |      |      |                  |   |   |   |   |   |   |   |   |                  |    |    |   |   |   |   |   |   |
| Leakage Current(MAX)                              | I=0.01CV or 3µA whichever is greater. (After 2 minutes application of rated voltage)<br>I=Leakage Current(µA)      C=Rated Capacitance(µF)      V=Rated Voltage(V)  |                    |                                    |                    |  |                 |                                    |      |    |    |               |      |      |      |      |      |      |      |      |                  |   |   |   |   |   |   |   |   |                  |    |    |   |   |   |   |   |   |
| Dissipation Factor(MAX)<br>(tanδ)                 | <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> <th>63</th> </tr> </thead> <tbody> <tr> <td>(20°C, 120Hz)</td> <td>0.35</td> <td>0.24</td> <td>0.20</td> <td>0.17</td> <td>0.15</td> <td>0.13</td> <td>0.10</td> <td>0.10</td> </tr> </tbody> </table>   | Rated Voltage (V)  | 4                                  | 6.3                | 10   | 16              | 25                                 | 35   | 50 | 63 | (20°C, 120Hz) | 0.35 | 0.24 | 0.20 | 0.17 | 0.15 | 0.13 | 0.10 | 0.10 |                  |   |   |   |   |   |   |   |   |                  |    |    |   |   |   |   |   |   |
| Rated Voltage (V)                                 | 4   | 6.3                | 10                                 | 16                 | 25   | 35              | 50                                 | 63   |    |    |               |      |      |      |      |      |      |      |      |                  |   |   |   |   |   |   |   |   |                  |    |    |   |   |   |   |   |   |
| (20°C, 120Hz)                                     | 0.35  | 0.24               | 0.20                               | 0.17               | 0.15                                       | 0.13            | 0.10                               | 0.10 |    |    |               |      |      |      |      |      |      |      |      |                  |   |   |   |   |   |   |   |   |                  |    |    |   |   |   |   |   |   |
| Endurance   | <p>After applying rated voltage with rated ripple current for 1000 hrs at 85°C, the capacitors shall meet the following requirements.</p> <table border="1"> <tbody> <tr> <td>Capacitance Change</td> <td>Within ± 20% 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 ± 20% 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 ± 20% 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>Impedance 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> <th>63</th> </tr> </thead> <tbody> <tr> <td>(120Hz)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Z(-25°C)/Z(20°C)</td> <td>7</td> <td>4</td> <td>3</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z(-40°C)/Z(20°C)</td> <td>15</td> <td>10</td> <td>8</td> <td>6</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> </tr> </tbody> </table> | Rated Voltage (V)  | 4                                  | 6.3                | 10   | 16              | 25                                 | 35   | 50 | 63 | (120Hz)       |      |      |      |      |      |      |      |      | Z(-25°C)/Z(20°C) | 7 | 4 | 3 | 3 | 2 | 2 | 2 | 2 | Z(-40°C)/Z(20°C) | 15 | 10 | 8 | 6 | 4 | 4 | 4 | 4 |
| Rated Voltage (V)                                 | 4   | 6.3                | 10                                 | 16                 | 25   | 35              | 50                                 | 63   |    |    |               |      |      |      |      |      |      |      |      |                  |   |   |   |   |   |   |   |   |                  |    |    |   |   |   |   |   |   |
| (120Hz)   |   |                    |                                    |                    |  |                 |                                    |      |    |    |               |      |      |      |      |      |      |      |      |                  |   |   |   |   |   |   |   |   |                  |    |    |   |   |   |   |   |   |
| Z(-25°C)/Z(20°C)                                  | 7   | 4                  | 3                                  | 3                  | 2  | 2               | 2                                  | 2    |    |    |               |      |      |      |      |      |      |      |      |                  |   |   |   |   |   |   |   |   |                  |    |    |   |   |   |   |   |   |
| Z(-40°C)/Z(20°C)                                  | 15  | 10                 | 8                                  | 6                  | 4  | 4               | 4                                  | 4    |    |    |               |      |      |      |      |      |      |      |      |                  |   |   |   |   |   |   |   |   |                  |    |    |   |   |   |   |   |   |

**◆ MULTIPLIER FOR RIPPLE CURRENT**

Frequency coefficient

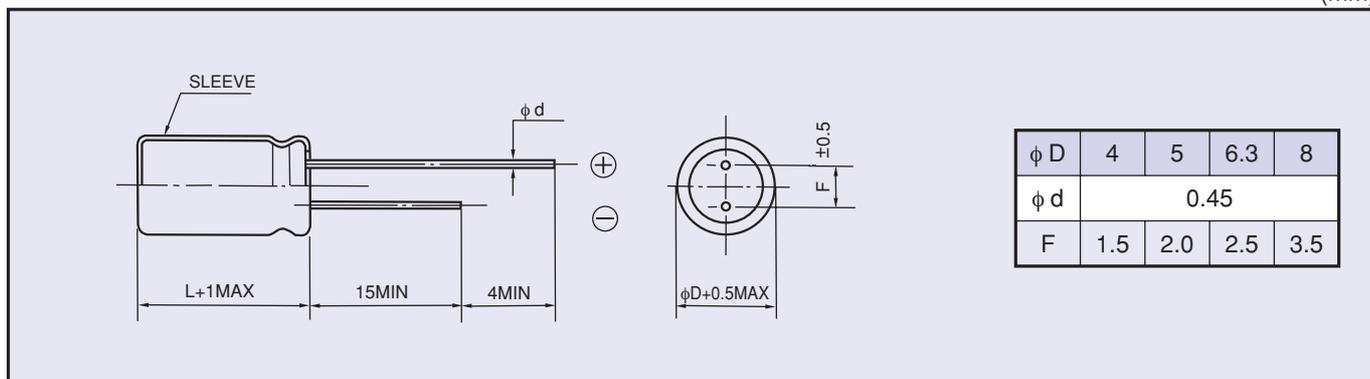
| Frequency (Hz) | 60(50) | 120 | 500  | 1k   | 10k≤ |
|----------------|--------|-----|------|------|------|
| 0.1~1µF        | 0.50   | 1.0 | 1.20 | 1.30 | 1.50 |
| 2.2~4.7µF      | 0.65   | 1.0 | 1.20 | 1.30 | 1.50 |
| 10~47µF        | 0.8    | 1.0 | 1.20 | 1.30 | 1.50 |
| 100~470µF      | 0.8    | 1.0 | 1.10 | 1.15 | 1.20 |

**◆ PART NUMBER**

|               |        |                   |                       |        |              |           |
|---------------|--------|-------------------|-----------------------|--------|--------------|-----------|
| □□□           | MS7    | □□□□□             | □                     | □□□    | □□           | 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 |
| 10                        |           |        |             |        |            |        | 4x7        | 28     |
| 22                        |           |        | 4x7         | 34     | 4x7        | 38     | 4x7        | 42     |
| 33                        | 4x7       | 33     | 4x7         | 42     | 4x7        | 46     | 5x7        | 62     |
| 47                        | 4x7       | 39     | 4x7         | 50     | 5x7        | 66     | 5x7        | 73     |
| 100                       | 5x7       | 65     | 5x7         | 87     | 6.3x7      | 99     | 6.3x7      | 110    |
| 220                       | 6.3x7     | 110    | 6.3x7       | 133    | 8x7        | 165    | 8x7        | 145    |
| 330                       | 8x7       | 165    | 8x7         | 180    | 8x7        | 210    |            |        |
| 470                       | 8x7       | 190    |             |        |            |        |            |        |

| WV(V.DC)<br>Cap( $\mu$ F) | 25<br>(1E) |        | 35<br>(1V) |        | 50<br>(1H) |        | 63<br>(1J) |        |
|---------------------------|------------|--------|------------|--------|------------|--------|------------|--------|
|                           | Size       | Ripple | Size       | Ripple | Size       | Ripple | Size       | Ripple |
| 0.1                       |            |        |            |        | 4x7        | 1.3    | 4x7        | 1.3    |
| 0.22                      |            |        |            |        | 4x7        | 3.0    | 4x7        | 3.0    |
| 0.33                      |            |        |            |        | 4x7        | 4.4    | 4x7        | 4.4    |
| 0.47                      |            |        |            |        | 4x7        | 6.3    | 4x7        | 6.3    |
| 1                         |            |        |            |        | 4x7        | 12     | 4x7        | 12     |
| 2.2                       |            |        |            |        | 4x7        | 16     | 4x7        | 16     |
| 3.3                       |            |        | 4x7        | 18     | 4x7        | 19     | 5x7        | 24     |
| 4.7                       | 4x7        | 21     | 4x7        | 22     | 4x7        | 24     | 6.3x7      | 33     |
| 10                        | 4x7        | 31     | 5x7        | 32     | 5x7        | 42     | 6.3x7      | 45     |
| 22                        | 5x7        | 55     | 6.3x7      | 60     | 6.3x7      | 64     |            |        |
| 33                        | 6.3x7      | 66     | 6.3x7      | 73     | 8x7        | 75     |            |        |
| 47                        | 6.3x7      | 80     | 8x7        | 95     | 8x7        | 85     |            |        |
| 100                       | 8x7        | 115    | 8x7        | 115    |            |        |            |        |