

ML series

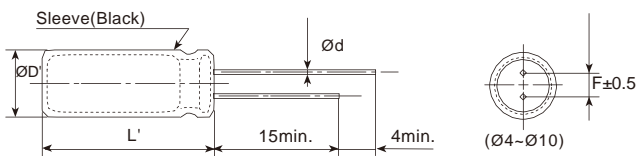
- Long life with 5mm to 9mm height.
- Endurance +105°C 3,000~5,000 hours
- RoHS Compliant



SPECIFICATIONS

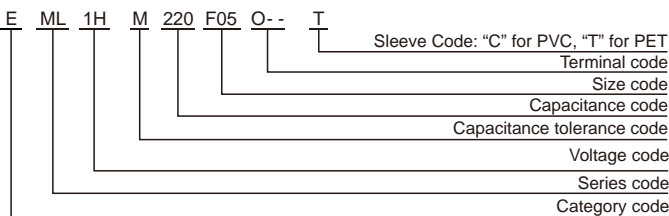
| Items | Characteristics |
|--|---|
| Category Temperature Range | -40~+105°C |
| Rated Voltage Range | 6.3~50 V _{dc} |
| Capacitance Tolerance | ±20%(M) (at 20°C,120Hz) |
| Leakage Current | I 0.01CV or 3μA, whichever is greater. Where, I:Max.leakage current (μA),C:Nominal capacitance (μF),V: Rated voltage (V) (at 20°C after 2 minutes) |
| Dissipation Factor (tan δ) | Rated Voltage(V _{dc}) 6.3 10 16 25 35 50 |
| | tan (max.) 0.40 0.35 0.30 0.25 0.20 0.20 |
| | When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20°C,120Hz) |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated Voltage(V _{dc}) 6.3 10 16 25 35 50 |
| | Z(-25°C)/Z(+20°C) 6 4 4 3 2 2 |
| | Z(-40°C)/Z(+20°C) 12 10 8 6 4 4 (at 120Hz) |
| Endurance | The following specifications shall be satisfied when the capacitors are restored to 20°C after DC voltage plus the rated ripple current is applied for a specified period of time at 105°C. |
| | Capacitance Change ±30% of the initial value |
| | D.F. (tan δ) 300% 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 ±30% of the initial value |
| | D.F. (tan δ) 300% of the initial specified value |
| | Leakage Current 200% of the initial specified value |

DIMENSIONS[mm]



| ØD | 4 | | 5 | | 6.3 | | 8 | | | 10x9 |
|-----|------------|-------|------|-----|------|-----|-----|-----|-----|------|
| | 6.3x5 | 6.3x7 | 8x5 | 8x7 | 8x9 | | | | | |
| Ød | 0.45 | 0.45 | 0.45 | 0.5 | 0.45 | 0.5 | 0.5 | 0.5 | 0.6 | |
| F | 1.5 | 2.0 | 2.5 | 2.5 | 3.5 | 3.5 | 3.5 | 5.0 | | |
| ØD' | ØD+0.5max. | | | | | | | | | |
| L' | L+2max. | | | | | | | | | |

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

| Freq.(Hz) | 60(50) | 120 | 500 | 1k | 10k |
|-------------|--------|------|------|------|------|
| Cap.<2.2 | 0.50 | 1.00 | 1.20 | 1.30 | 1.50 |
| 2.2 Cap.<10 | 0.65 | 1.00 | 1.20 | 1.30 | 1.50 |
| 10 Cap.<100 | 0.80 | 1.00 | 1.20 | 1.30 | 1.50 |
| Cap. 100 | 0.80 | 1.00 | 1.10 | 1.15 | 1.20 |

The endurance of capacitors is shortened 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.

ML series

■ STANDARD RATINGS

| WV (Vdc) | Cap (μF) | Size DxL(mm) | tan | Rated ripple current (mA _{rms} /105°C, 120Hz) | Part Number |
|----------|----------|--------------|------|--|----------------|
| 6.3(0J) | 27 | 4x5 | 0.40 | 25 | EML0JM270C05OT |
| | 47 | 4x7 | 0.40 | 47 | EML0JM470C07OT |
| | 56 | 5x5 | 0.40 | 50 | EML0JM560D05OT |
| | 82 | 5x7 | 0.40 | 75 | EML0JM820D07OT |
| | 120 | 6.3x5 | 0.40 | 80 | EML0JM121E05OT |
| | 180 | 6.3x7 | 0.40 | 110 | EML0JM181E07OT |
| | 220 | 8x5 | 0.40 | 125 | EML0JM221F05OT |
| | 270 | 8x7 | 0.40 | 165 | EML0JM271F07OT |
| | 470 | 8x7 | 0.40 | 190 | EML0JM471F07OT |
| | 560 | 8x9 | 0.40 | 230 | EML0JM561F09OT |
| 1000 | 10x9 | 0.40 | 480 | EML0JM102G09OT | |
| 10(1A) | 22 | 4x5 | 0.35 | 22 | EML1AM220C05OT |
| | 33 | 4x7 | 0.35 | 43 | EML1AM330C07OT |
| | 47 | 5x5 | 0.35 | 48 | EML1AM470D05OT |
| | 56 | 5x7 | 0.35 | 68 | EML1AM560D07OT |
| | 100 | 6.3x5 | 0.35 | 75 | EML1AM101E05OT |
| | 120 | 6.3x7 | 0.35 | 100 | EML1AM121E07OT |
| | 180 | 8x5 | 0.35 | 120 | EML1AM181F05OT |
| | 220 | 8x7 | 0.35 | 160 | EML1AM221F07OT |
| | 330 | 8x7 | 0.35 | 180 | EML1AM331F07OT |
| | 470 | 8x9 | 0.35 | 210 | EML1AM471F09OT |
| 680 | 10x9 | 0.35 | 470 | EML1AM681G09OT | |
| 16(1C) | 18 | 4x5 | 0.30 | 20 | EML1CM180C05OT |
| | 22 | 4x7 | 0.30 | 40 | EML1CM220C07OT |
| | 33 | 5x5 | 0.30 | 45 | EML1CM330D05OT |
| | 39 | 5x7 | 0.30 | 65 | EML1CM390D07OT |
| | 68 | 6.3x5 | 0.30 | 70 | EML1CM680E05OT |
| | 100 | 6.3x7 | 0.30 | 95 | EML1CM101E07OT |
| | 120 | 8x5 | 0.30 | 110 | EML1CM121F05OT |
| | 150 | 8x7 | 0.30 | 125 | EML1CM151F07OT |
| | 220 | 8x7 | 0.30 | 170 | EML1CM221F07OT |
| | 330 | 8x9 | 0.30 | 195 | EML1CM331F09OT |
| 470 | 10x9 | 0.30 | 460 | EML1CM471G09OT | |
| 25(1E) | 10 | 4x5 | 0.25 | 18 | EML1EM100C05OT |
| | 15 | 4x7 | 0.25 | 35 | EML1EM150C07OT |
| | 22 | 5x5 | 0.25 | 42 | EML1EM220D05OT |
| | 27 | 5x7 | 0.25 | 57 | EML1EM270D07OT |
| | 47 | 6.3x5 | 0.25 | 65 | EML1EM470E05OT |
| | 56 | 6.3x7 | 0.25 | 85 | EML1EM560E07OT |
| | 82 | 8x5 | 0.25 | 100 | EML1EM820F05OT |
| | 100 | 8x7 | 0.25 | 112 | EML1EM101F07OT |
| | 150 | 8x7 | 0.25 | 140 | EML1EM151F07OT |
| | 220 | 8x9 | 0.25 | 190 | EML1EM221F09OT |
| 330 | 10x9 | 0.25 | 450 | EML1EM331G09OT | |

| WV (Vdc) | Cap (μF) | Size DxL(mm) | tan | Rated ripple current (mA _{rms} /105°C, 120Hz) | Part Number |
|----------|----------|--------------|------|--|----------------|
| 35(1V) | 6.8 | 4x5 | 0.20 | 17 | EML1VM6R8C05OT |
| | 10 | 4x7 | 0.20 | 28 | EML1VM100C07OT |
| | 12 | 5x5 | 0.20 | 34 | EML1VM120D05OT |
| | 18 | 5x7 | 0.20 | 48 | EML1VM180D07OT |
| | 27 | 6.3x5 | 0.20 | 58 | EML1VM270E05OT |
| | 39 | 6.3x7 | 0.20 | 76 | EML1VM390E07OT |
| | 47 | 8x5 | 0.20 | 80 | EML1VM470F05OT |
| | 56 | 8x7 | 0.20 | 105 | EML1VM560F07OT |
| | 100 | 8x7 | 0.20 | 125 | EML1VM101F07OT |
| | 150 | 8x9 | 0.20 | 180 | EML1VM151F09OT |
| | 220 | 10x9 | 0.20 | 360 | EML1VM221G09OT |
| | 50(1H) | 1 | 4x5 | 0.20 | 8 |
| 2.2 | | 4x5 | 0.20 | 11 | EML1HM2R2C05OT |
| 3.3 | | 4x5 | 0.20 | 14 | EML1HM3R3C05OT |
| 4.7 | | 4x7 | 0.20 | 23 | EML1HM4R7C07OT |
| 6.8 | | 5x5 | 0.20 | 25 | EML1HM6R8D05OT |
| 10 | | 5x7 | 0.20 | 30 | EML1HM100D07OT |
| 12 | | 6.3x5 | 0.20 | 37 | EML1HM120E05OT |
| 18 | | 6.3x7 | 0.20 | 50 | EML1HM180E07OT |
| 22 | | 8x5 | 0.20 | 62 | EML1HM220F05OT |
| 33 | | 8x7 | 0.20 | 75 | EML1HM330F07OT |
| 56 | | 8x7 | 0.20 | 115 | EML1HM560F07OT |
| 82 | | 8x9 | 0.20 | 160 | EML1HM820F09OT |
| 120 | | 10x9 | 0.20 | 315 | EML1HM121G09OT |

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