

MK series

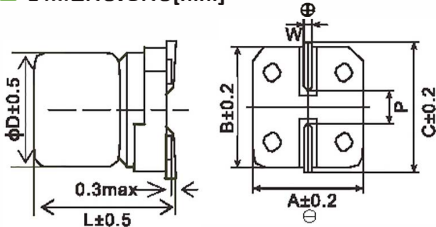
- Endurance: +105°C 2,000 ~ 3,000 hours
- Designed for surface mounting on high density PC board
- RoHS Compliant



SPECIFICATIONS

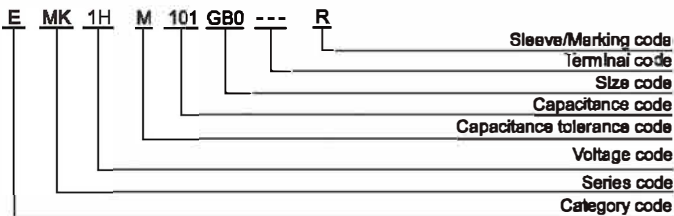
| Items | Characteristics | | | | | | | | | | | | |
|--|--|--|------|------|------|------|------------------------|------|------|------|---------|---------|------------------|
| Category Temperature Range | -40~+105°C(8.3~450V _{dc}) | | | | | | | | | | | | |
| Rated Voltage Range | 6.3~450V _{dc} | | | | | | | | | | | | |
| Capacitance Tolerance | ±20%(M) (at 20°C, 120Hz) | | | | | | | | | | | | |
| Leakage Current | 6.3~100V _{dc} | | | | | | 160~450V _{dc} | | | | | | (at 20°C) |
| | I ≤ 0.01CV or 3μA, whichever is greater. (2 minutes) I ≤ 0.04CV + 100μA (1 minute) | | | | | | | | | | | | |
| Where, I: Max. leakage current (μA), C: Nominal capacitance (μF), V: Rated voltage (V) | | | | | | | | | | | | | (at 20°C) |
| Dissipation Factor (tanδ) | Rated Voltage(V _{dc}) | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 80 | 100 | 160~250 | 400~450 | (at 20°C, 120Hz) |
| | tanδ (max.) | D80~E80 | 0.30 | 0.24 | 0.20 | 0.16 | 0.14 | 0.12 | 0.12 | 0.12 | 0.12 | - | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated Voltage(V _{dc}) | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 80 | 100 | 160~250 | 400~450 | (at 120Hz) |
| | Z(-25°C)/Z(+20°C) | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 6 | 6 | |
| | Z(-40°C)/Z(+20°C) | 10 | 8 | 6 | 4 | 3 | 3 | 3 | 3 | 3 | 10 | 18 | |
| Endurance | The specifications listed below shall be met when the capacitors are restored to 20°C after rated voltage is applied for a specified period of time at 105°C. | | | | | | | | | | | | |
| | Load Life | 2,000 hours(160~450V _{dc} : 3,000 hours) | | | | | | | | | | | |
| | Capacitance Change | ≤±20% of the initial value | | | | | | | | | | | |
| | Dissipation Factor (tanδ) | ≤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 leaving them under no load at 105°C for 1,000 hours (6.3~100V _{dc} : 500 hours). | | | | | | | | | | | | |
| | Capacitance Change | ≤±20% of the initial value | | | | | | | | | | | |
| | Dissipation Factor (tanδ) | ≤200% of the initial specified value | | | | | | | | | | | |
| | Leakage Current | ≤200% of the initial specified value | | | | | | | | | | | |

DIMENSIONS[mm]



| Size code | D | L | A | B | C | W | P |
|-----------|------|------|------|------|------|---------|-----|
| D80 | 5 | 7.7 | 5.3 | 5.3 | 5.9 | 0.5~0.8 | 1.4 |
| E80 | 8.3 | 7.7 | 8.6 | 8.8 | 7.2 | 0.5~0.8 | 1.9 |
| E80 | 8.3 | 10.5 | 8.8 | 8.6 | 7.2 | 0.5~0.8 | 1.9 |
| F80 | 8 | 10.5 | 8.3 | 8.3 | 9.0 | 0.7~1.1 | 3.1 |
| F80 | 8 | 12.5 | 8.3 | 8.3 | 9.0 | 0.7~1.1 | 3.1 |
| F80 | 8 | 13.5 | 8.3 | 8.3 | 9.0 | 0.7~1.1 | 3.1 |
| F80 | 8 | 15.5 | 8.3 | 8.3 | 9.0 | 0.7~1.1 | 3.1 |
| G80 | 10 | 10.5 | 10.3 | 10.3 | 11.0 | 0.7~1.1 | 4.5 |
| G80 | 10 | 12.5 | 10.3 | 10.3 | 11.0 | 0.7~1.1 | 4.5 |
| G80 | 10 | 13.5 | 10.3 | 10.3 | 11.0 | 0.7~1.1 | 4.5 |
| G80 | 10 | 16.5 | 10.3 | 10.3 | 11.0 | 0.7~1.1 | 4.5 |
| H80 | 12.5 | 13.5 | 13.0 | 13.0 | 13.7 | 1.0~1.3 | 4.5 |
| H80 | 12.5 | 16.0 | 13.0 | 13.0 | 13.7 | 1.0~1.3 | 4.5 |
| H80 | 12.5 | 21.0 | 13.0 | 13.0 | 13.7 | 1.0~1.3 | 4.5 |
| I80 | 16 | 16.5 | 17.0 | 17.0 | 18.0 | 1.0~1.3 | 6.5 |
| I80 | 16 | 21.5 | 17.0 | 17.0 | 18.0 | 1.0~1.3 | 6.5 |
| J80 | 18 | 18.5 | 19.0 | 19.0 | 20.0 | 1.0~1.3 | 8.5 |
| J80 | 18 | 21.5 | 19.0 | 19.0 | 20.0 | 1.0~1.3 | 8.5 |

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

| Rated voltage(V _{dc}) | 120 | 1k | 10k | 100k |
|---------------------------------|------|------|------|------|
| 6.3~450 | 0.50 | 0.80 | 0.90 | 1.00 |

Surface Mount Type

MK series

STANDARD RATINGS

| WV (V _{dc}) | Cap (μF) | Size code | tanδ | Rated ripple current (mArms/105°C,100kHz) |
|-----------------------|----------|-----------|------|---|
| 6.3(0J) | 100 | D80 | 0.30 | 105 |
| | 220 | E80 | 0.30 | 160 |
| | 330 | FB0 | 0.40 | 340 |
| | 1000 | GB0 | 0.40 | 860 |
| 10(1A) | 33 | D80 | 0.24 | 105 |
| | 100 | E80 | 0.24 | 175 |
| | 220 | E80 | 0.24 | 180 |
| | 330 | FB0 | 0.30 | 340 |
| | 470 | FB0 | 0.30 | 360 |
| 16(1C) | 820 | GB0 | 0.30 | 860 |
| | 47 | D80 | 0.20 | 105 |
| | 100 | E80 | 0.20 | 175 |
| | 150 | E80 | 0.20 | 190 |
| | 220 | FB0 | 0.26 | 500 |
| 25(1E) | 330 | FB0 | 0.26 | 545 |
| | 470 | GB0 | 0.26 | 800 |
| | 33 | D80 | 0.16 | 105 |
| | 47 | E80 | 0.16 | 180 |
| | 100 | E80 | 0.16 | 205 |
| 35(1V) | 220 | FB0 | 0.16 | 550 |
| | 330 | GB0 | 0.16 | 780 |
| | 470 | GD0 | 0.16 | 875 |
| | 10 | D80 | 0.14 | 105 |
| | 22 | D80 | 0.14 | 110 |
| 50(1H) | 47 | E80 | 0.14 | 210 |
| | 100 | FB0 | 0.14 | 575 |
| | 220 | GB0 | 0.14 | 835 |
| | 330 | GD0 | 0.14 | 900 |
| | 10 | D80 | 0.12 | 90 |
| 63(1J) | 22 | E80 | 0.12 | 175 |
| | 33 | E80 | 0.12 | 180 |
| | 47 | FB0 | 0.12 | 540 |
| | 100 | GB0 | 0.12 | 700 |
| | 220 | WE0 | 0.12 | 900 |
| 80(1B) | 330 | WG5 | 0.12 | 1180 |
| | 10 | D80 | 0.12 | 85 |
| | 22 | E80 | 0.12 | 150 |
| | 33 | FB0 | 0.12 | 375 |
| | 47 | FB0 | 0.12 | 450 |
| 100(1K) | 100 | GB0 | 0.12 | 575 |
| | 220 | WE0 | 0.12 | 890 |
| | 10 | E80 | 0.12 | 140 |
| | 22 | FB0 | 0.12 | 375 |
| | 33 | FB0 | 0.12 | 450 |
| 160(2C) | 47 | GB0 | 0.12 | 575 |
| | 100 | GD0 | 0.12 | 600 |
| | 150 | WE0 | 0.12 | 800 |
| | 220 | WG5 | 0.12 | 960 |
| | 4.7 | D80 | 0.12 | 70 |
| 200(2D) | 10 | E80 | 0.12 | 135 |
| | 22 | FB0 | 0.12 | 345 |
| | 33 | GB0 | 0.12 | 560 |
| | 47 | GB0 | 0.12 | 575 |
| | 100 | WE0 | 0.12 | 680 |

| WV (V _{dc}) | Cap (μF) | Size code | tanδ | Rated ripple current (mArms/105°C,100kHz) |
|-----------------------|----------|-----------|------|---|
| 160(2C) | 10 | GB0 | 0.15 | 90 |
| | 15 | GB0 | 0.15 | 136 |
| | 22 | GE0 | 0.15 | 180 |
| | 33 | WE0 | 0.15 | 200 |
| | | GH0 | 0.15 | 240 |
| | 47 | WE0 | 0.15 | 310 |
| | | WG5 | 0.15 | 420 |
| | 68 | LH0 | 0.15 | 520 |
| | | LN0 | 0.15 | 660 |
| | | MH0 | 0.15 | 660 |
| 100 | LN0 | 0.15 | 780 | |
| | MN0 | 0.15 | 780 | |
| 200(2D) | 10 | GB0 | 0.15 | 120 |
| | 15 | GB0 | 0.15 | 164 |
| | 22 | GE0 | 0.15 | 200 |
| | | WG5 | 0.15 | 236 |
| | 33 | GH0 | 0.15 | 260 |
| | | WG5 | 0.15 | 300 |
| | 47 | WM5 | 0.15 | 440 |
| | | LN0 | 0.15 | 556 |
| 250(2E) | 68 | LN0 | 0.15 | 680 |
| | 2.2 | EB0 | 0.15 | 56 |
| | 3.3 | EB0 | 0.15 | 68 |
| | 4.7 | FB0 | 0.15 | 96 |
| | | GB0 | 0.15 | 104 |
| | 10 | WE0 | 0.15 | 184 |
| | | LH0 | 0.15 | 364 |
| | 33 | LN0 | 0.15 | 470 |
| MH0 | | 0.15 | 470 | |
| 400(2G) | 47 | MN0 | 0.15 | 580 |
| | 1 | E80 | 0.20 | 28 |
| | 1.5 | EB0 | 0.20 | 36 |
| | 2.2 | EB0 | 0.20 | 44 |
| | | FB0 | 0.20 | 52 |
| | 3.3 | FB0 | 0.20 | 64 |
| | | GB0 | 0.20 | 72 |
| | 3.9 | FE0 | 0.20 | 72 |
| | | GB0 | 0.20 | 76 |
| | | FB0 | 0.20 | 78 |
| 450(2W) | 4.7 | FD0 | 0.20 | 80 |
| | 5.6 | GB0 | 0.20 | 84 |
| | | FD0 | 0.20 | 96 |
| | 6.8 | FE0 | 0.20 | 108 |
| | 8.2 | FG0 | 0.20 | 130 |
| | 10 | GH0 | 0.20 | 156 |
| | | LH0 | 0.20 | 176 |
| | | WG5 | 0.20 | 184 |
| | 15 | LH0 | 0.20 | 210 |
| | | LN0 | 0.20 | 260 |
| MN0 | | 0.20 | 280 | |
| 450(2W) | 2.2 | GB0 | 0.20 | 50 |
| | 3.3 | WE0 | 0.20 | 80 |
| | 4.7 | WE0 | 0.20 | 96 |
| | 10 | LH0 | 0.20 | 170 |
| | 15 | LN0 | 0.20 | 200 |
| 22 | LN0 | 0.20 | 240 | |

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