# KMQ Series

- Downsized from current standard KMG series
- Solvent resistant type except 160 to 450Vdc (see PRECAUTIONS AND GUIDELINES)
- RoHS2 Compliant

## ◆SPECIFICATIONS

| Items | Characteristics |
|---|---|
| Category Temperature Range | -55 to +105℃(6.3 to 100Vdc) -40 to +105℃(160 to 400Vdc) -25 to +105℃(450Vdc) |
| Rated Voltage Range | 6.3 to 450Vdc |
| Capacitance Tolerance | ±20% (M) (at 20℃, 120Hz) |
| Leakage Current | 6.3 to 100Vdc: I=0.03CV or 4μA, whichever is greater. / 160 to 450Vdc: CV≦1,000 I=0.1CV+40 max.; CV>1,000 I=0.04CV+100 max. / Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 1 minute) |

**Dissipation Factor (tan δ)**

| Rated voltage (Vdc) | 6.3V | 10V | 16V | 25V | 35V | 50V | 63V | 100V | 160 to 250V | 350 to 400V | 450V |
|---|---|---|---|---|---|---|---|---|---|---|---|
| tan δ (Max.) | 0.28 | 0.24 | 0.20 | 0.16 | 0.14 | 0.12 | 0.10 | 0.08 | 0.20 | 0.24 | 0.24 |

When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20℃, 120Hz)

**Low Temperature Characteristics (Max. Impedance Ratio)**

| Rated voltage (Vdc) | | 6.3V | 10V | 16V | 25V | 35V | 50V | 63 to 100V | 160 to 200V | 250V | 350V | 400V | 450V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Z(-25℃)/Z(+20℃) | ≦φ8 | 5 | 4 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 4 | 4 | 6 |
| | ≧φ10 | 5 | 4 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 4 | 4 | 6 |
| Z(-40℃)/Z(+20℃) | ≦φ8 | 10 | 8 | 6 | 4 | 3 | 3 | 3 | 8 | 10 | 8 | 8 | — |
| | ≧φ10 | 10 | 8 | 6 | 4 | 3 | 3 | 3 | 4 | 4 | 6 | 6 | — |

(at 120Hz)

**Endurance**

The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied (the peak voltage shall not exceed the rated voltage) for 1,000 hours (2,000 hours for φ10 and more) at 105℃.

| | |
|---|---|
| Capacitance change | ≦±20% of the initial value |
| D.F. (tan δ) | ≦200% of the initial specified value |
| Leakage current | ≦The initial specified value |

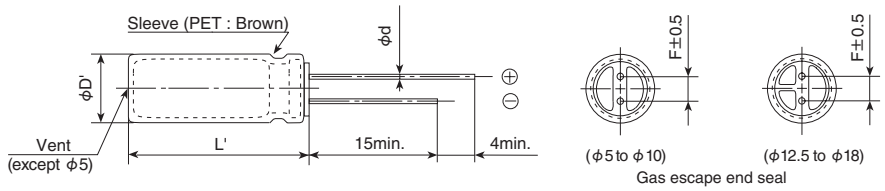
**Shelf Life**

The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.

| Rated voltage | 6.3 to 100Vdc | 160 to 450Vdc |
|---|---|---|
| Capacitance change | ≦±20% of the initial value | ≦±20% of the initial value |
| D.F. (tan δ) | ≦200% of the initial specified value | ≦200% of the initial specified value |
| Leakage current | ≦The initial specified value | ≦500% of the initial specified value |

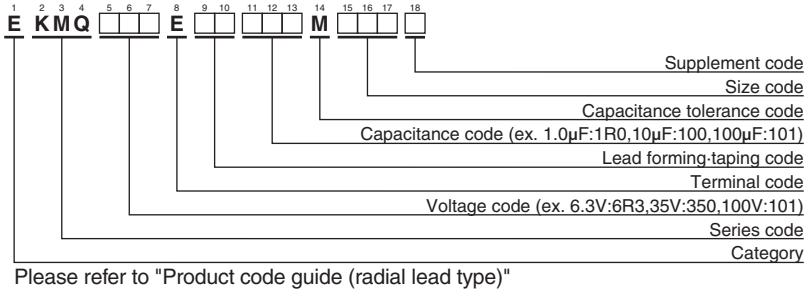
## ◆DIMENSIONS [mm]

● Terminal Code : E




| φD | 5 | 6.3 | 8 | 10 | 12.5 | 16 | 18 |
|---|---|---|---|---|---|---|---|
| φd | 0.5 | 0.5 | 0.6 | 0.6 | 0.6 | 0.8 | 0.8 |
| F | 2.0 | 2.5 | 3.5 | 5.0 | 5.0 | 7.5 | 7.5 |
| φD' | φD+0.5max. | | | | | | |
| L' | L+1.5max. | | | | | | |

## ◆PART NUMBERING SYSTEM




Please refer to "Product code guide (radial lead type)"

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# KMQ Series

## ◆STANDARD RATINGS

| WV ($V_{dc}$) | Cap (μF) | Case size φD×L(mm) | tan δ | Rated ripple current (mArms/ 105℃, 120Hz) | Part No. |
|---|---|---|---|---|---|
| 6.3 | 1,000 | 8×11.5 | 0.28 | 390 | EKMQ6R3E□□102MHB5D |
| | 2,200 | 10×16 | 0.30 | 635 | EKMQ6R3E□□222MJ16S |
| | 3,300 | 10×20 | 0.32 | 840 | EKMQ6R3E□□332MJ20S |
| | 4,700 | 12.5×20 | 0.34 | 1,090 | EKMQ6R3E□□472MK20S |
| | 6,800 | 12.5×25 | 0.38 | 1,350 | EKMQ6R3E□□682MK25S |
| | 10,000 | 16×25 | 0.46 | 1,650 | EKMQ6R3E□□103ML25S |
| | 15,000 | 16×31.5 | 0.56 | 1,820 | EKMQ6R3E□□153MLN3S |
| | 22,000 | 18×35.5 | 0.70 | 2,280 | EKMQ6R3E□□223MMP1S |
| 10 | 220 | 5×11 | 0.24 | 155 | EKMQ100E□□221ME11D |
| | 330 | 6.3×11 | 0.24 | 210 | EKMQ100E□□331MF11D |
| | 470 | 6.3×11 | 0.24 | 250 | EKMQ100E□□471MF11D |
| | 1,000 | 10×12.5 | 0.24 | 460 | EKMQ100E□□102MJC5S |
| | 2,200 | 10×16 | 0.26 | 705 | EKMQ100E□□222MJ16S |
| | 3,300 | 12.5×20 | 0.28 | 1,000 | EKMQ100E□□332MK20S |
| | 4,700 | 12.5×25 | 0.30 | 1,260 | EKMQ100E□□472MK25S |
| | 6,800 | 16×25 | 0.34 | 1,570 | EKMQ100E□□682ML25S |
| | 10,000 | 16×31.5 | 0.42 | 1,820 | EKMQ100E□□103MLN3S |
| | 15,000 | 16×35.5 | 0.52 | 2,050 | EKMQ100E□□153MLP1S |
| | 22,000 | 18×40 | 0.66 | 2,420 | EKMQ100E□□223MM40S |
| 16 | 220 | 6.3×11 | 0.20 | 190 | EKMQ160E□□221MF11D |
| | 330 | 6.3×11 | 0.20 | 225 | EKMQ160E□□331MF11D |
| | 470 | 8×11.5 | 0.20 | 315 | EKMQ160E□□471MHB5D |
| | 1,000 | 10×12.5 | 0.20 | 500 | EKMQ160E□□102MJC5S |
| | 2,200 | 10×20 | 0.22 | 710 | EKMQ160E□□222MJ20S |
| | 3,300 | 12.5×25 | 0.24 | 1,170 | EKMQ160E□□332MK25S |
| | 4,700 | 16×25 | 0.26 | 1,500 | EKMQ160E□□472ML25S |
| | 6,800 | 16×25 | 0.30 | 1,600 | EKMQ160E□□682ML25S |
| | 10,000 | 16×35.5 | 0.38 | 1,930 | EKMQ160E□□103MLP1S |
| | 15,000 | 18×40 | 0.48 | 2,210 | EKMQ160E□□153MM40S |
| 25 | 100 | 5×11 | 0.16 | 125 | EKMQ250E□□101ME11D |
| | 220 | 6.3×11 | 0.16 | 200 | EKMQ250E□□221MF11D |
| | 330 | 8×11.5 | 0.16 | 310 | EKMQ250E□□331MHB5D |
| | 470 | 10×12.5 | 0.16 | 380 | EKMQ250E□□471MJC5S |
| | 1,000 | 10×16 | 0.16 | 610 | EKMQ250E□□102MJ16S |
| | 2,200 | 12.5×25 | 0.18 | 1,090 | EKMQ250E□□222MK25S |
| | 3,300 | 16×25 | 0.20 | 1,400 | EKMQ250E□□332ML25S |
| | 4,700 | 16×25 | 0.22 | 1,570 | EKMQ250E□□472ML25S |
| | 6,800 | 16×35.5 | 0.26 | 1,850 | EKMQ250E□□682MLP1S |
| | 10,000 | 18×40 | 0.34 | 2,000 | EKMQ250E□□103MM40S |
| 35 | 47 | 5×11 | 0.14 | 93 | EKMQ350E□□470ME11D |
| | 68 | 6.3×11 | 0.14 | 110 | EKMQ350E□□680MF11D |
| | 100 | 6.3×11 | 0.14 | 150 | EKMQ350E□□101MF11D |
| | 220 | 8×11.5 | 0.14 | 270 | EKMQ350E□□221MHB5D |
| | 330 | 10×12.5 | 0.14 | 350 | EKMQ350E□□331MJC5S |
| | 470 | 10×16 | 0.14 | 460 | EKMQ350E□□471MJ16S |
| | 1,000 | 12.5×20 | 0.14 | 810 | EKMQ350E□□102MK20S |
| | 2,200 | 16×25 | 0.16 | 1,260 | EKMQ350E□□222ML25S |
| | 3,300 | 16×31.5 | 0.18 | 1,500 | EKMQ350E□□332MLN3S |
| | 4,700 | 16×35.5 | 0.20 | 1,780 | EKMQ350E□□472MLP1S |
| | 6,800 | 18×40 | 0.24 | 2,000 | EKMQ350E□□682MM40S |
| 50 | 1.0 | 5×11 | 0.12 | 13 | EKMQ500E□□1R0ME11D |
| | 2.2 | 5×11 | 0.12 | 20 | EKMQ500E□□2R2ME11D |
| | 3.3 | 5×11 | 0.12 | 25 | EKMQ500E□□3R3ME11D |
| | 4.7 | 5×11 | 0.12 | 30 | EKMQ500E□□4R7ME11D |
| | 10 | 5×11 | 0.12 | 46 | EKMQ500E□□100ME11D |
| | 22 | 5×11 | 0.12 | 68 | EKMQ500E□□220ME11D |
| | 33 | 5×11 | 0.12 | 90 | EKMQ500E□□330ME11D |
| | 47 | 6.3×11 | 0.12 | 115 | EKMQ500E□□470MF11D |
| | 68 | 6.3×11 | 0.12 | 150 | EKMQ500E□□680MF11D |
| | 100 | 8×11.5 | 0.12 | 190 | EKMQ500E□□101MHB5D |
| 50 | 220 | 10×12.5 | 0.12 | 300 | EKMQ500E□□221MJC5S |
| | 330 | 10×16 | 0.12 | 410 | EKMQ500E□□331MJ16S |
| | 470 | 10×20 | 0.12 | 540 | EKMQ500E□□471MJ20S |
| | 1,000 | 12.5×25 | 0.12 | 950 | EKMQ500E□□102MK25S |
| | 2,200 | 16×31.5 | 0.14 | 1,410 | EKMQ500E□□222MLN3S |
| | 3,300 | 18×35.5 | 0.16 | 1,770 | EKMQ500E□□332MMP1S |
| 63 | 22 | 5×11 | 0.10 | 71 | EKMQ630E□□220ME11D |
| | 33 | 6.3×11 | 0.10 | 100 | EKMQ630E□□330MF11D |
| | 47 | 6.3×11 | 0.10 | 120 | EKMQ630E□□470MF11D |
| | 68 | 8×11.5 | 0.10 | 155 | EKMQ630E□□680MHB5D |
| | 100 | 8×11.5 | 0.10 | 200 | EKMQ630E□□101MHB5D |
| | 220 | 10×16 | 0.10 | 335 | EKMQ630E□□221MJ16S |
| | 330 | 10×20 | 0.10 | 510 | EKMQ630E□□331MJ20S |
| | 470 | 12.5×20 | 0.10 | 640 | EKMQ630E□□471MK20S |
| | 1,000 | 16×25 | 0.10 | 930 | EKMQ630E□□102ML25S |
| | 2,200 | 18×35.5 | 0.12 | 1,650 | EKMQ630E□□222MMP1S |
| 100 | 1.0 | 5×11 | 0.08 | 15 | EKMQ101E□□1R0ME11D |
| | 2.2 | 5×11 | 0.08 | 21 | EKMQ101E□□2R2ME11D |
| | 3.3 | 5×11 | 0.08 | 29 | EKMQ101E□□3R3ME11D |
| | 4.7 | 5×11 | 0.08 | 32 | EKMQ101E□□4R7ME11D |
| | 10 | 5×11 | 0.08 | 50 | EKMQ101E□□100ME11D |
| | 22 | 6.3×11 | 0.08 | 93 | EKMQ101E□□220MF11D |
| | 33 | 8×11.5 | 0.08 | 130 | EKMQ101E□□330MHB5D |
| | 47 | 8×11.5 | 0.08 | 140 | EKMQ101E□□470MHB5D |
| | 68 | 10×12.5 | 0.08 | 190 | EKMQ101E□□680MJC5S |
| | 100 | 10×16 | 0.08 | 240 | EKMQ101E□□101MJ16S |
| | 220 | 12.5×20 | 0.08 | 390 | EKMQ101E□□221MK20S |
| | 330 | 12.5×25 | 0.08 | 540 | EKMQ101E□□331MK25S |
| | 470 | 16×25 | 0.08 | 715 | EKMQ101E□□471ML25S |
| | 1,000 | 18×35.5 | 0.08 | 960 | EKMQ101E□□102MMP1S |
| *1 160 | 68 | 12.5×20 | 0.20 | 250 | EKMQ161E□□680MK20S |
| | 100 | 12.5×25 | 0.20 | 310 | EKMQ161E□□101MK25S |
| | 220 | 16×31.5 | 0.20 | 540 | EKMQ161E□□221MLN3S |
| | 330 | 18×35.5 | 0.20 | 705 | EKMQ161E□□331MMP1S |
| | 470 | 18×40 | 0.20 | 855 | EKMQ161E□□471MM40S |
| *1 200 | 47 | 12.5×20 | 0.20 | 195 | EKMQ201E□□470MK20S |
| | 68 | 12.5×25 | 0.20 | 250 | EKMQ201E□□680MK25S |
| | 100 | 16×25 | 0.20 | 335 | EKMQ201E□□101ML25S |
| | 220 | 16×35.5 | 0.20 | 500 | EKMQ201E□□221MLP1S |
| | 330 | 18×40 | 0.20 | 675 | EKMQ201E□□331MM40S |
| *1 250 | 47 | 12.5×20 | 0.20 | 190 | EKMQ251E□□470MK20S |
| | 68 | 16×25 | 0.20 | 270 | EKMQ251E□□680ML25S |
| | 100 | 16×25 | 0.20 | 310 | EKMQ251E□□101ML25S |
| | 220 | 18×35.5 | 0.20 | 485 | EKMQ251E□□221MMP1S |
| *1 350 | 22 | 12.5×20 | 0.24 | 130 | EKMQ351E□□220MK20S |
| | 33 | 12.5×25 | 0.24 | 170 | EKMQ351E□□330MK25S |
| | 47 | 16×25 | 0.24 | 230 | EKMQ351E□□470ML25S |
| | 68 | 16×25 | 0.24 | 285 | EKMQ351E□□680ML25S |
| | 100 | 18×31.5 | 0.24 | 375 | EKMQ351E□□101MMN3S |
| *1 400 | 22 | 12.5×25 | 0.24 | 145 | EKMQ401E□□220MK25S |
| | 33 | 16×25 | 0.24 | 195 | EKMQ401E□□330ML25S |
| | 47 | 16×25 | 0.24 | 200 | EKMQ401E□□470ML25S |
| | 68 | 16×31.5 | 0.24 | 240 | EKMQ401E□□680MLN3S |
| | 100 | 18×35.5 | 0.24 | 310 | EKMQ401E□□101MMP1S |
| *1 450 | 22 | 12.5×25 | 0.24 | 100 | EKMQ451E□□220MK25S |
| | 33 | 16×25 | 0.24 | 125 | EKMQ451E□□330ML25S |
| | 47 | 16×31.5 | 0.24 | 155 | EKMQ451E□□470MLN3S |
| | 68 | 18×35.5 | 0.24 | 185 | EKMQ451E□□680MMP1S |
| | 100 | 18×40 | 0.24 | 200 | EKMQ451E□□101MM40S |

□□ : Enter the appropriate lead forming or taping code.
The products shown in [ ] are not recommended for new designs (NRND).
*1: Assembly boards with the designated products attached cannot be cleaned.

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# KMQ Series

## ◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

| Capacitance(μF) \ Frequency(Hz) | 50 | 120 | 300 | 1k | 10k | 100k |
|---|---|---|---|---|---|---|
| **1.0 to 4.7** | 0.65 | 1.00 | 1.35 | 1.75 | 2.30 | 2.50 |
| **10 to 68** | 0.75 | 1.00 | 1.25 | 1.50 | 1.75 | 1.80 |
| **100 to 1,000** | 0.80 | 1.00 | 1.15 | 1.30 | 1.40 | 1.50 |
| **2,200 to** | 0.85 | 1.00 | 1.03 | 1.05 | 1.08 | 1.08 |

The deterioration of aluminum electrolytic capacitors accelerates their life due to the internal heating produced by ripple current. For details, refer to Section "5-3 Ripple Current Effect on Lifetime" in the catalog, Technical Note.

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