

KMG Series

- Endurance with ripple current : 1,000 to 2,000 hours at 105°C
- Solvent resistant type except 350 to 450V_{dc}
(see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

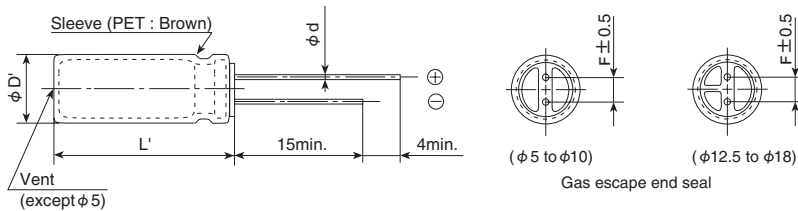


SPECIFICATIONS

| Items | Characteristics | | | | | | | | | | | | | | | | | | | | | | |
|---|---|--------------------------------------|------------------|------|---|---------------------------|------|------|------------------------------------|-------------|-------------|------|----|------|---------------|----------------|----------|--|-----------------|------------------|----------|--|-------------------|
| Category | Standard | | | | | | | | | | | | | | | | | | | | | | |
| Temperature Range | -55 to +105°C(6.3 to 100V _{dc}) | | | | -40 to +105°C(160 to 400V _{dc}) | | | | -25 to +105°C(450V _{dc}) | | | | | | | | | | | | | | |
| Rated Voltage Range | 6.3 to 450V _{dc} | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance Tolerance | ±20% (M) (at 20°C, 120Hz) | | | | | | | | | | | | | | | | | | | | | | |
| Leakage Current | 6.3 to 100V _{dc} | | | | | | | | | | | | | | | | | | | | | | |
| | I=0.03CV or 4μA, whichever is greater. | | | | | | | | | | | | | | | | | | | | | | |
| | 160 to 450V _{dc} | | | | | | | | | | | | | | | | | | | | | | |
| | <table border="1"> <tr> <th>CV</th> <th>Time</th> <th>After 1minute</th> <th>After 5minutes</th> </tr> <tr> <td>CV≤1,000</td> <td></td> <td>I=0.1CV+40 max.</td> <td>I=0.03CV+15 max.</td> </tr> <tr> <td>CV>1,000</td> <td></td> <td>I=0.04CV+100 max.</td> <td>I=0.02CV+25 max.</td> </tr> </table> | | | | | | | | | | | | CV | Time | After 1minute | After 5minutes | CV≤1,000 | | I=0.1CV+40 max. | I=0.03CV+15 max. | CV>1,000 | | I=0.04CV+100 max. |
| CV | Time | After 1minute | After 5minutes | | | | | | | | | | | | | | | | | | | | |
| CV≤1,000 | | I=0.1CV+40 max. | I=0.03CV+15 max. | | | | | | | | | | | | | | | | | | | | |
| CV>1,000 | | I=0.04CV+100 max. | I=0.02CV+25 max. | | | | | | | | | | | | | | | | | | | | |
| (at 20°C after 1 minute) (at 20°C) | | | | | | | | | | | | | | | | | | | | | | | |
| Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) | | | | | | | | | | | | | | | | | | | | | | | |
| Dissipation Factor (tanδ) | Rated voltage (V _{dc}) | 6.3V | 10V | 16V | 25V | 35V | 50V | 63V | 100V | 160 to 250V | 350 to 400V | 450V | | | | | | | | | | | |
| | tanδ (Max.) | 0.34 | 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°C, 120Hz) | | | | | | | | | | | | | | | | | | | | | | | |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V _{dc}) | 6.3V | 10V | 16V | 25V | 35V | 50V | 63V | 100V | 160 to 250V | 350 to 400V | 450V | | | | | | | | | | | |
| | Z(-25°C)/Z(+20°C) | 5 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 6 | 6 | | | | | | | | | | | |
| | Z(-40°C)/Z(+20°C) | 12 | 10 | 8 | 5 | 4 | 3 | 3 | 3 | 4 | 6 | — | | | | | | | | | | | |
| (at 120Hz) | | | | | | | | | | | | | | | | | | | | | | | |
| Endurance | The following specifications shall be satisfied when the capacitors are restored to 20°C 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 to meet the following two conditions 1): 160V _{dc} and larger, 2) : φ12.5 and larger) at 105°C. | | | | | | | | | | | | | | | | | | | | | | |
| | Capacitance change | ≤ ±20% of the initial value | | | | | | | | | | | | | | | | | | | | | |
| | D.F. (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 exposing them for 1,000 hours at 105°C 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 100V _{dc} | | | | 160 to 450V _{dc} | | | | | | | | | | | | | | | | | |
| | Capacitance change | ≤ ±20% of the initial value | | | | | | | | | | | | | | | | | | | | | |
| | D.F. (tanδ) | ≤200% of the initial specified value | | | | | | | | | | | | | | | | | | | | | |
| | Leakage current | ≤500% of the initial specified value | | | | | | | | | | | | | | | | | | | | | |

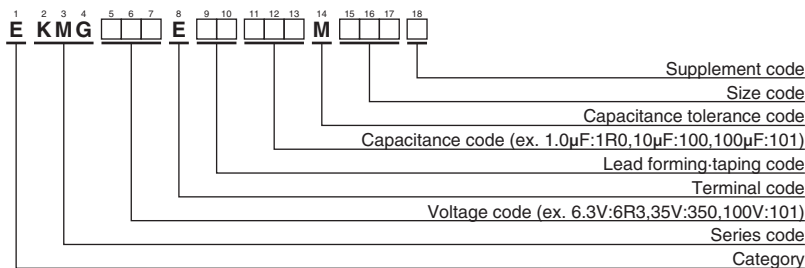
DIMENSIONS [mm]

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)"

◆ STANDARD RATINGS

| WV (Vdc) | Cap (μF) | Case size φD×L(mm) | tanδ | Rated ripple current (mAmps/105°C,120Hz) | Part No. | WV (Vdc) | Cap (μF) | Case size φD×L(mm) | tanδ | Rated ripple current (mAmps/105°C,120Hz) | Part No. |
|----------|----------|--------------------|-------|--|--------------------|----------|--------------------|--------------------|--------|--|--------------------|
| | | | | | | | | | | | |
| 6.3 | 220 | 5X11 | 0.34 | 140 | EKMG6R3E□□221ME11D | 63 | 10 | 5X11 | 0.10 | 46 | EKMG630E□□100ME11D |
| | 330 | 6.3X11 | 0.34 | 190 | EKMG6R3E□□331MF11D | | 22 | 5X11 | 0.10 | 71 | EKMG630E□□220ME11D |
| | 470 | 6.3X11 | 0.34 | 230 | EKMG6R3E□□471MF11D | | 33 | 6.3X11 | 0.10 | 100 | EKMG630E□□330MF11D |
| | 1,000 | 8X11.5 | 0.34 | 380 | EKMG6R3E□□102MHB5D | | 47 | 6.3X11 | 0.10 | 120 | EKMG630E□□470MF11D |
| | 2,200 | 10X20 | 0.36 | 710 | EKMG6R3E□□222MJ20S | | 100 | 10X12.5 | 0.10 | 215 | EKMG630E□□101MJC5S |
| | 3,300 | 10X20 | 0.38 | 840 | EKMG6R3E□□332MJ20S | | 220 | 10X16 | 0.10 | 335 | EKMG630E□□221MJ16S |
| | 4,700 | 12.5X20 | 0.40 | 1,090 | EKMG6R3E□□472MK20S | | 330 | 10X20 | 0.10 | 510 | EKMG630E□□331MJ20S |
| | 6,800 | 12.5X25 | 0.44 | 1,350 | EKMG6R3E□□682MK25S | | 470 | 12.5X20 | 0.10 | 640 | EKMG630E□□471MK20S |
| | 10,000 | 16X25 | 0.52 | 1,650 | EKMG6R3E□□103ML25S | | 1,000 | 16X25 | 0.10 | 930 | EKMG630E□□102ML25S |
| | 15,000 | 16X35.5 | 0.62 | 2,010 | EKMG6R3E□□153MLP1S | | | | | | |
| 22,000 | 18X40 | 0.76 | 2,350 | EKMG6R3E□□223MMM40S | | | | | | | |
| 10 | 220 | 6.3X11 | 0.24 | 170 | EKMG100E□□221MF11D | 100 | 1.0 | 5X11 | 0.08 | 15 | EKMG101E□□1R0ME11D |
| | 330 | 6.3X11 | 0.24 | 200 | EKMG100E□□331MF11D | | 2.2 | 5X11 | 0.08 | 21 | EKMG101E□□2R2ME11D |
| | 470 | 8X11.5 | 0.24 | 250 | EKMG100E□□471MHB5D | | 3.3 | 5X11 | 0.08 | 29 | EKMG101E□□3R3ME11D |
| | 1,000 | 10X12.5 | 0.24 | 460 | EKMG100E□□102MJC5S | | 4.7 | 5X11 | 0.08 | 32 | EKMG101E□□4R7ME11D |
| | 2,200 | 10X20 | 0.26 | 760 | EKMG100E□□222MJ20S | | 10 | 6.3X11 | 0.08 | 54 | EKMG101E□□100MF11D |
| | 3,300 | 12.5X20 | 0.28 | 1,000 | EKMG100E□□332MK20S | | 22 | 8X11.5 | 0.08 | 93 | EKMG101E□□221MHB5D |
| | 4,700 | 12.5X25 | 0.30 | 1,260 | EKMG100E□□472MK25S | | 33 | 8X11.5 | 0.08 | 130 | EKMG101E□□330MHB5D |
| | 6,800 | 16X25 | 0.34 | 1,570 | EKMG100E□□682ML25S | | 47 | 10X12.5 | 0.08 | 165 | EKMG101E□□470MJC5S |
| | 10,000 | 16X35.5 | 0.42 | 1,890 | EKMG100E□□103MLP1S | | 100 | 10X20 | 0.08 | 265 | EKMG101E□□101MJ20S |
| | 15,000 | 18X35.5 | 0.52 | 2,180 | EKMG100E□□153MMP1S | | 220 | 12.5X25 | 0.08 | 440 | EKMG101E□□220MHB5D |
| 16 | 100 | 5X11 | 0.20 | 110 | EKMG160E□□101ME11D | 160 | 330 | 16X25 | 0.08 | 540 | EKMG101E□□331ML25S |
| | 220 | 6.3X11 | 0.20 | 180 | EKMG160E□□221MF11D | | 470 | 16X31.5 | 0.08 | 715 | EKMG101E□□471MLN3S |
| | 330 | 8X11.5 | 0.20 | 260 | EKMG160E□□331MHB5D | | 1,000 | 18X40 | 0.08 | 985 | EKMG101E□□102MM40S |
| | 470 | 8X11.5 | 0.20 | 310 | EKMG160E□□471MHB5D | | 3.3 | 6.3X11 | 0.20 | 28 | EKMG161E□□3R3MF11D |
| | 1,000 | 10X16 | 0.20 | 560 | EKMG160E□□102MJ16S | | 4.7 | 6.3X11 | 0.20 | 34 | EKMG161E□□4R7MF11D |
| | 2,200 | 12.5X20 | 0.22 | 920 | EKMG160E□□222MK20S | | 10 | 10X12.5 | 0.20 | 67 | EKMG161E□□100MJC5S |
| | 3,300 | 12.5X25 | 0.24 | 1,170 | EKMG160E□□332MK25S | | 22 | 10X20 | 0.20 | 120 | EKMG161E□□220MJ20S |
| | 4,700 | 16X25 | 0.26 | 1,480 | EKMG160E□□472ML25S | | 33 | 10X20 | 0.20 | 145 | EKMG161E□□330MJ20S |
| | 6,800 | 16X31.5 | 0.30 | 1,780 | EKMG160E□□682MLN3S | | 47 | 12.5X20 | 0.20 | 195 | EKMG161E□□470MK20S |
| | 10,000 | 18X35.5 | 0.38 | 2,060 | EKMG160E□□103MMP1S | | 100 | 16X25 | 0.20 | 335 | EKMG161E□□101ML25S |
| 25 | 47 | 5X11 | 0.16 | 80 | EKMG250E□□470ME11D | 200 | 220 | 16X31.5 | 0.20 | 540 | EKMG161E□□221MLN3S |
| | 100 | 6.3X11 | 0.16 | 130 | EKMG250E□□101MF11D | | 330 | 18X35.5 | 0.20 | 705 | EKMG161E□□331MMP1S |
| | 220 | 8X11.5 | 0.16 | 230 | EKMG250E□□221MHB5D | | 3.3 | 6.3X11 | 0.20 | 28 | EKMG201E□□3R3MF11D |
| | 330 | 8X11.5 | 0.16 | 310 | EKMG250E□□331MHB5D | | 4.7 | 8X11.5 | 0.20 | 39 | EKMG201E□□4R7MHB5D |
| | 470 | 10X12.5 | 0.16 | 380 | EKMG250E□□471MJC5S | | 10 | 10X16 | 0.20 | 74 | EKMG201E□□100MJ16S |
| | 1,000 | 10X20 | 0.16 | 680 | EKMG250E□□102MJ20S | | 22 | 10X20 | 0.20 | 120 | EKMG201E□□220MJ20S |
| | 2,200 | 12.5X25 | 0.18 | 1,090 | EKMG250E□□222MK25S | | 33 | 12.5X20 | 0.20 | 160 | EKMG201E□□330MK20S |
| | 3,300 | 16X25 | 0.20 | 1,400 | EKMG250E□□332ML25S | | 47 | 12.5X20 | 0.20 | 195 | EKMG201E□□470MK20S |
| | 4,700 | 16X31.5 | 0.22 | 1,710 | EKMG250E□□472MLN3S | | 100 | 16X25 | 0.20 | 335 | EKMG201E□□101ML25S |
| | 6,800 | 18X35.5 | 0.26 | 2,040 | EKMG250E□□682MMP1S | | 220 | 18X35.5 | 0.20 | 575 | EKMG201E□□221MMP1S |
| 35 | 47 | 5X11 | 0.14 | 90 | EKMG350E□□470ME11D | 250 | 2.2 | 6.3X11 | 0.20 | 23 | EKMG251E□□2R2MF11D |
| | 100 | 6.3X11 | 0.14 | 150 | EKMG350E□□101MF11D | | 3.3 | 8X11.5 | 0.20 | 32 | EKMG251E□□3R3MHB5D |
| | 220 | 8X11.5 | 0.14 | 270 | EKMG350E□□221MHB5D | | 4.7 | 8X11.5 | 0.20 | 39 | EKMG251E□□4R7MHB5D |
| | 330 | 10X12.5 | 0.14 | 350 | EKMG350E□□331MJC5S | | 10 | 10X16 | 0.20 | 74 | EKMG251E□□100MJ16S |
| | 470 | 10X16 | 0.14 | 460 | EKMG350E□□471MJ16S | | 22 | 12.5X20 | 0.20 | 130 | EKMG251E□□220MK20S |
| | 1,000 | 12.5X20 | 0.14 | 810 | EKMG350E□□102MK20S | | 33 | 12.5X20 | 0.20 | 160 | EKMG251E□□330MK20S |
| | 2,200 | 16X25 | 0.16 | 1,260 | EKMG350E□□222ML25S | | 47 | 12.5X25 | 0.20 | 210 | EKMG251E□□470MK25S |
| | 3,300 | 16X35.5 | 0.18 | 1,610 | EKMG350E□□332MLP1S | | 100 | 16X31.5 | 0.20 | 365 | EKMG251E□□101MLN3S |
| | 4,700 | 18X35.5 | 0.20 | 1,910 | EKMG350E□□472MMP1S | | 220 | 18X40 | 0.20 | 585 | EKMG251E□□221MM40S |
| | 50 | 1.0 | 5X11 | 0.12 | 13 | | EKMG500E□□1R0ME11D | 350 | 1.0 | 6.3X11 | 0.24 |
| 2.2 | | 5X11 | 0.12 | 20 | EKMG500E□□2R2ME11D | 2.2 | 8X11.5 | | 0.24 | 26 | EKMG351E□□2R2MHB5D |
| 3.3 | | 5X11 | 0.12 | 25 | EKMG500E□□3R3ME11D | 3.3 | 10X12.5 | | 0.24 | 38 | EKMG351E□□3R3MJC5S |
| 4.7 | | 5X11 | 0.12 | 30 | EKMG500E□□4R7ME11D | 4.7 | 10X16 | | 0.24 | 50 | EKMG351E□□4R7MJ16S |
| 10 | | 5X11 | 0.12 | 40 | EKMG500E□□100ME11D | 10 | 10X20 | | 0.24 | 80 | EKMG351E□□100MJ20S |
| 22 | | 5X11 | 0.12 | 65 | EKMG500E□□220ME11D | 22 | 12.5X20 | | 0.24 | 130 | EKMG351E□□220MK20S |
| 33 | | 5X11 | 0.12 | 90 | EKMG500E□□330ME11D | 33 | 16X25 | | 0.24 | 195 | EKMG351E□□330ML25S |
| 47 | | 6.3X11 | 0.12 | 110 | EKMG500E□□470MF11D | 47 | 16X25 | | 0.24 | 230 | EKMG351E□□470ML25S |
| 100 | | 8X11.5 | 0.12 | 180 | EKMG500E□□101MHB5D | 100 | 18X31.5 | | 0.24 | 375 | EKMG351E□□101MMN3S |
| 220 | | 10X12.5 | 0.12 | 300 | EKMG500E□□221MJC5S | 400 | 1.0 | | 6.3X11 | 0.24 | 15 |
| 330 | 10X16 | 0.12 | 410 | EKMG500E□□331MJ16S | 2.2 | | 8X11.5 | 0.24 | 26 | EKMG401E□□2R2MHB5D | |
| 470 | 10X20 | 0.12 | 530 | EKMG500E□□471MJ20S | 3.3 | | 10X12.5 | 0.24 | 38 | EKMG401E□□3R3MJC5S | |
| 1,000 | 12.5X25 | 0.12 | 950 | EKMG500E□□102MK25S | 4.7 | | 10X16 | 0.24 | 50 | EKMG401E□□4R7MJ16S | |
| 2,200 | 16X35.5 | 0.14 | 1,470 | EKMG500E□□222MLP1S | 10 | | 10X20 | 0.24 | 80 | EKMG401E□□100MJ20S | |
| 3,300 | 18X35.5 | 0.16 | 1,770 | EKMG500E□□332MMP1S | 22 | | 12.5X25 | 0.24 | 145 | EKMG401E□□220MK25S | |
| | | | | | 33 | | 16X25 | 0.24 | 195 | EKMG401E□□330ML25S | |
| | | | | | 47 | | 16X31.5 | 0.24 | 250 | EKMG401E□□470MLN3S | |
| | | | | | 100 | | 16X40 | 0.24 | 350 | EKMG401E□□101ML40S | |

□ □ : Enter the appropriate lead forming or taping code.

KMGSeries

◆ **STANDARD RATINGS**

is not solvent resistant.

| WV (Vdc) | Cap (μF) | Case size φD×L(mm) | tanδ | Rated ripple current (mA _{rms} /105°C,120Hz) | Part No. |
|----------|----------|--------------------|------|---|--------------------|
| 450 | 2.2 | 10×12.5 | 0.24 | 23 | EKMG451E□□2R2MJC5S |
| | 3.3 | 10×16 | 0.24 | 31 | EKMG451E□□3R3MJ16S |
| | 4.7 | 10×20 | 0.24 | 40 | EKMG451E□□4R7MJ20S |
| | 10 | 12.5×20 | 0.24 | 65 | EKMG451E□□100MK20S |
| | 22 | 16×25 | 0.24 | 115 | EKMG451E□□220ML25S |
| | 33 | 16×31.5 | 0.24 | 155 | EKMG451E□□330MLN3S |
| | 47 | 16×35.5 | 0.24 | 185 | EKMG451E□□470MLP1S |

□□ : Enter the appropriate lead forming or taping code.

◆ **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 47 | 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 endurance of capacitors is reduced 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.