

# KMG Series

- Endurance with ripple current : 1,000 to 2,000 hours at 105°C
- Solvent resistant type except 350 to 450V<sub>dc</sub>  
(see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

KMG P122  
↑  
Downsized

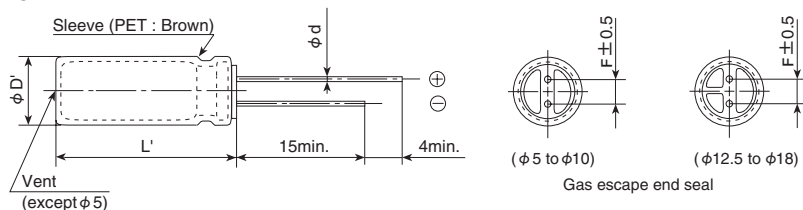


## SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                                                                                           |                                      |      |      |      |      |      |                           |                                      |                   |             |                  |  |  |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|------|---------------------------|--------------------------------------|-------------------|-------------|------------------|--|--|
| Category                                               | Standard                                                                                                                                                                                                                                                                                                                                                  |                                      |      |      |      |      |      |                           |                                      |                   |             |                  |  |  |
| Temperature Range                                      | -55 to +105℃(6.3 to 100V <sub>dc</sub> ) -40 to +105℃(160 to 400V <sub>dc</sub> ) -25 to +105℃(450V <sub>dc</sub> )                                                                                                                                                                                                                                       |                                      |      |      |      |      |      |                           |                                      |                   |             |                  |  |  |
| Rated Voltage Range                                    | 6.3 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                                                                                                 |                                      |      |      |      |      |      |                           |                                      |                   |             |                  |  |  |
| Capacitance Tolerance                                  | ±20% (M) (at 20℃, 120Hz)                                                                                                                                                                                                                                                                                                                                  |                                      |      |      |      |      |      |                           |                                      |                   |             |                  |  |  |
| Leakage Current                                        | 6.3 to 100V <sub>dc</sub>                                                                                                                                                                                                                                                                                                                                 |                                      |      |      |      |      |      | 160 to 450V <sub>dc</sub> |                                      |                   |             |                  |  |  |
|                                                        | I=0.03CV or 4μA, whichever is greater.                                                                                                                                                                                                                                                                                                                    |                                      |      |      |      |      |      | 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℃ after 1 minute)                                                                                                                                                                                                                                                                                                                                   |                                      |      |      |      |      |      | (at 20℃)                  |                                      |                   |             |                  |  |  |
|                                                        | Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)                                                                                                                                                                                                                                                                 |                                      |      |      |      |      |      |                           |                                      |                   |             |                  |  |  |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                                                                                          | 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℃, 120Hz)                                                                                                                                                                                                                                          |                                      |      |      |      |      |      |                           |                                      |                   |             |                  |  |  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                                                                                          | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V  | 63V                       | 100V                                 | 160 to 250V       | 350 to 400V | 450V             |  |  |
|                                                        | Z(-25℃)/Z(+20℃)                                                                                                                                                                                                                                                                                                                                           | 5                                    | 4    | 3    | 2    | 2    | 2    | 2                         | 2                                    | 3                 | 6           | 6                |  |  |
|                                                        | Z(-40℃)/Z(+20℃)                                                                                                                                                                                                                                                                                                                                           | 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℃ 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 <sub>dc</sub> and larger, 2) : φ12.5 and larger) at 105℃. |                                      |      |      |      |      |      |                           |                                      |                   |             |                  |  |  |
|                                                        | 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℃ 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 100V <sub>cd</sub>            |      |      |      |      |      |                           | 160 to 450V <sub>dc</sub>            |                   |             |                  |  |  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                                                                                        | ≤ ±20% of the initial value          |      |      |      |      |      |                           | ≤ ±20% of the initial value          |                   |             |                  |  |  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                                                                                               | ≤200% of the initial specified value |      |      |      |      |      |                           | ≤200% of the initial specified value |                   |             |                  |  |  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                                                                                           | ≤The initial specified value         |      |      |      |      |      |                           | ≤500% of the initial specified value |                   |             |                  |  |  |
|                                                        |                                                                                                                                                                                                                                                                                                                                                           |                                      |      |      |      |      |      |                           |                                      |                   |             |                  |  |  |

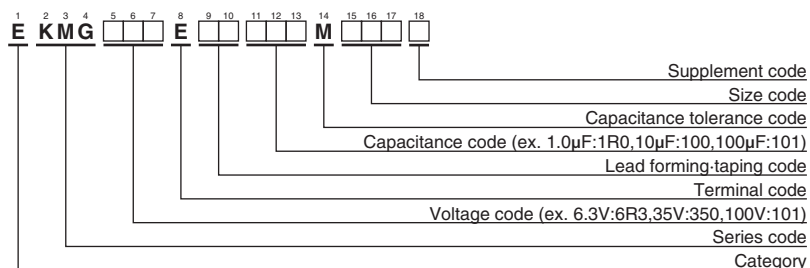
## DIMENSIONS [mm]

### 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)"

## ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(mAmps/<br>105°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(mAmps/<br>105°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|----------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|----------------------------------------------------|--------------------|
| 6.3         | 220         | 5×11                  | 0.34 | 140                                                | EKMG6R3E□□221ME11D | 63          | 10          | 5×11                  | 0.10 | 46                                                 | EKMG630E□□100ME11D |
|             | 330         | 6.3×11                | 0.34 | 190                                                | EKMG6R3E□□331MF11D |             | 22          | 5×11                  | 0.10 | 71                                                 | EKMG630E□□220ME11D |
|             | 470         | 6.3×11                | 0.34 | 230                                                | EKMG6R3E□□471MF11D |             | 33          | 6.3×11                | 0.10 | 100                                                | EKMG630E□□330MF11D |
|             | 1,000       | 8×11.5                | 0.34 | 380                                                | EKMG6R3E□□102MHB5D |             | 47          | 6.3×11                | 0.10 | 120                                                | EKMG630E□□470MF11D |
|             | 2,200       | 10×20                 | 0.36 | 710                                                | EKMG6R3E□□222MJ20S |             | 100         | 10×12.5               | 0.10 | 215                                                | EKMG630E□□101MJC5S |
|             | 3,300       | 10×20                 | 0.38 | 840                                                | EKMG6R3E□□332MJ20S |             | 220         | 10×16                 | 0.10 | 335                                                | EKMG630E□□221MJ16S |
|             | 4,700       | 12.5×20               | 0.40 | 1,090                                              | EKMG6R3E□□472MK20S |             | 330         | 10×20                 | 0.10 | 510                                                | EKMG630E□□331MJ20S |
|             | 6,800       | 12.5×25               | 0.44 | 1,350                                              | EKMG6R3E□□682MK25S |             | 470         | 12.5×20               | 0.10 | 640                                                | EKMG630E□□471MK20S |
|             | 10,000      | 16×25                 | 0.52 | 1,650                                              | EKMG6R3E□□103ML25S |             | 1,000       | 16×25                 | 0.10 | 930                                                | EKMG630E□□102ML25S |
|             | 15,000      | 16×35.5               | 0.62 | 2,010                                              | EKMG6R3E□□153MLP1S | 100         | 1.0         | 5×11                  | 0.08 | 15                                                 | EKMG101E□□1R0ME11D |
| 10          | 22,000      | 18×40                 | 0.76 | 2,350                                              | EKMG6R3E□□223MM40S |             | 2.2         | 5×11                  | 0.08 | 21                                                 | EKMG101E□□3R3MF11D |
|             | 220         | 6.3×11                | 0.24 | 170                                                | EKMG100E□□221MF11D |             | 3.3         | 5×11                  | 0.08 | 29                                                 | EKMG101E□□3R3ME11D |
|             | 330         | 6.3×11                | 0.24 | 200                                                | EKMG100E□□331MF11D |             | 4.7         | 5×11                  | 0.08 | 32                                                 | EKMG101E□□4R7ME11D |
|             | 470         | 8×11.5                | 0.24 | 250                                                | EKMG100E□□471MHB5D |             | 10          | 6.3×11                | 0.08 | 54                                                 | EKMG101E□□100MF11D |
|             | 1,000       | 10×12.5               | 0.24 | 460                                                | EKMG100E□□221MJC5S |             | 22          | 8×11.5                | 0.08 | 93                                                 | EKMG101E□□221MKB5D |
|             | 2,200       | 10×20                 | 0.26 | 760                                                | EKMG100E□□222MJ20S |             | 33          | 8×11.5                | 0.08 | 130                                                | EKMG101E□□330MHB5D |
|             | 3,300       | 12.5×20               | 0.28 | 1,000                                              | EKMG100E□□332MK20S |             | 47          | 10×12.5               | 0.08 | 165                                                | EKMG101E□□470MJC5S |
|             | 4,700       | 12.5×25               | 0.30 | 1,260                                              | EKMG100E□□472MK25S |             | 100         | 10×20                 | 0.08 | 265                                                | EKMG101E□□101MJ20S |
|             | 6,800       | 16×25                 | 0.34 | 1,570                                              | EKMG100E□□682ML25S |             | 220         | 12.5×25               | 0.08 | 440                                                | EKMG101E□□220MK25S |
|             | 10,000      | 16×35.5               | 0.42 | 1,890                                              | EKMG100E□□103MLP1S |             | 330         | 16×25                 | 0.08 | 540                                                | EKMG101E□□331ML25S |
| 16          | 15,000      | 18×35.5               | 0.52 | 2,180                                              | EKMG100E□□153MMP1S |             | 470         | 16×31.5               | 0.08 | 715                                                | EKMG101E□□471MLN3S |
|             | 100         | 5×11                  | 0.20 | 110                                                | EKMG160E□□101ME11D | 160         | 1,000       | 18×40                 | 0.08 | 985                                                | EKMG101E□□102MM40S |
|             | 220         | 6.3×11                | 0.20 | 180                                                | EKMG160E□□221MF11D |             | 3.3         | 6.3×11                | 0.20 | 28                                                 | EKMG161E□□3R3MF11D |
|             | 330         | 8×11.5                | 0.20 | 260                                                | EKMG160E□□331MHB5D |             | 4.7         | 6.3×11                | 0.20 | 34                                                 | EKMG161E□□4R7MF11D |
|             | 470         | 8×11.5                | 0.20 | 310                                                | EKMG160E□□471MHB5D |             | 10          | 10×12.5               | 0.20 | 67                                                 | EKMG161E□□100MJC5S |
|             | 1,000       | 10×16                 | 0.20 | 560                                                | EKMG160E□□102MJ16S |             | 22          | 10×20                 | 0.20 | 120                                                | EKMG161E□□220MJ20S |
|             | 2,200       | 12.5×20               | 0.22 | 920                                                | EKMG160E□□222MK20S |             | 33          | 10×20                 | 0.20 | 145                                                | EKMG161E□□330MJ20S |
|             | 3,300       | 12.5×25               | 0.24 | 1,170                                              | EKMG160E□□332MK25S |             | 47          | 12.5×20               | 0.20 | 195                                                | EKMG161E□□470MK20S |
|             | 4,700       | 16×25                 | 0.26 | 1,480                                              | EKMG160E□□472ML25S |             | 100         | 16×25                 | 0.20 | 335                                                | EKMG161E□□101ML25S |
|             | 6,800       | 16×31.5               | 0.30 | 1,780                                              | EKMG160E□□682MLN3S |             | 220         | 16×31.5               | 0.20 | 540                                                | EKMG161E□□221MLN3S |
|             | 10,000      | 18×35.5               | 0.38 | 2,060                                              | EKMG160E□□103MMP1S |             | 330         | 18×35.5               | 0.20 | 705                                                | EKMG161E□□331MMP1S |
| 25          | 47          | 5×11                  | 0.16 | 80                                                 | EKMG250E□□470ME11D | 200         | 3.3         | 6.3×11                | 0.20 | 28                                                 | EKMG201E□□3R3MF11D |
|             | 100         | 6.3×11                | 0.16 | 130                                                | EKMG250E□□101MF11D |             | 4.7         | 8×11.5                | 0.20 | 39                                                 | EKMG201E□□4R7MHB5D |
|             | 220         | 8×11.5                | 0.16 | 230                                                | EKMG250E□□221MHB5D |             | 10          | 10×16                 | 0.20 | 74                                                 | EKMG201E□□100MJ16S |
|             | 330         | 8×11.5                | 0.16 | 310                                                | EKMG250E□□331MHB5D |             | 22          | 10×20                 | 0.20 | 120                                                | EKMG201E□□220MJ20S |
|             | 470         | 10×12.5               | 0.16 | 380                                                | EKMG250E□□471MJC5S |             | 33          | 12.5×20               | 0.20 | 160                                                | EKMG201E□□330MK20S |
|             | 1,000       | 10×20                 | 0.16 | 680                                                | EKMG250E□□102MJ20S |             | 47          | 12.5×20               | 0.20 | 195                                                | EKMG201E□□470MK20S |
|             | 2,200       | 12.5×25               | 0.18 | 1,090                                              | EKMG250E□□222MK25S |             | 100         | 16×25                 | 0.20 | 335                                                | EKMG201E□□101ML25S |
|             | 3,300       | 16×25                 | 0.20 | 1,400                                              | EKMG250E□□332ML25S |             | 220         | 18×35.5               | 0.20 | 575                                                | EKMG201E□□221MMP1S |
|             | 4,700       | 16×31.5               | 0.22 | 1,710                                              | EKMG250E□□472MLN3S | 250         | 2.2         | 6.3×11                | 0.20 | 23                                                 | EKMG251E□□2R2MF11D |
|             | 6,800       | 18×35.5               | 0.26 | 2,040                                              | EKMG250E□□682MMP1S |             | 3.3         | 8×11.5                | 0.20 | 32                                                 | EKMG251E□□3R3MHB5D |
| 35          | 47          | 5×11                  | 0.14 | 90                                                 | EKMG350E□□470ME11D |             | 4.7         | 8×11.5                | 0.20 | 39                                                 | EKMG251E□□4R7MHB5D |
|             | 100         | 6.3×11                | 0.14 | 150                                                | EKMG350E□□101MF11D |             | 10          | 10×16                 | 0.20 | 74                                                 | EKMG251E□□100MJ16S |
|             | 220         | 8×11.5                | 0.14 | 270                                                | EKMG350E□□221MHB5D |             | 22          | 12.5×20               | 0.20 | 130                                                | EKMG251E□□220MK20S |
|             | 330         | 10×12.5               | 0.14 | 350                                                | EKMG350E□□331MJC5S |             | 33          | 12.5×20               | 0.20 | 160                                                | EKMG251E□□330MK20S |
|             | 470         | 10×16                 | 0.14 | 460                                                | EKMG350E□□471MJ16S |             | 47          | 12.5×25               | 0.20 | 210                                                | EKMG251E□□470MK25S |
|             | 1,000       | 12.5×20               | 0.14 | 810                                                | EKMG350E□□102MK20S |             | 100         | 16×31.5               | 0.20 | 365                                                | EKMG251E□□101MLN3S |
|             | 2,200       | 16×25                 | 0.16 | 1,260                                              | EKMG350E□□222ML25S |             | 220         | 18×40                 | 0.20 | 585                                                | EKMG251E□□221MM40S |
|             | 3,300       | 16×35.5               | 0.18 | 1,610                                              | EKMG350E□□332MLP1S | 350         | 1.0         | 6.3×11                | 0.24 | 15                                                 | EKMG351E□□1R0MF11D |
|             | 4,700       | 18×35.5               | 0.20 | 1,910                                              | EKMG350E□□472MMP1S |             | 2.2         | 8×11.5                | 0.24 | 26                                                 | EKMG351E□□2R2MHB5D |
| 50          | 1.0         | 5×11                  | 0.12 | 13                                                 | EKMG500E□□1R0ME11D |             | 3.3         | 10×12.5               | 0.24 | 38                                                 | EKMG351E□□3R3MJC5S |
|             | 2.2         | 5×11                  | 0.12 | 20                                                 | EKMG500E□□2R2ME11D |             | 4.7         | 10×16                 | 0.24 | 50                                                 | EKMG351E□□4R7MJ16S |
|             | 3.3         | 5×11                  | 0.12 | 25                                                 | EKMG500E□□3R3ME11D |             | 10          | 10×20                 | 0.24 | 80                                                 | EKMG351E□□100MJ20S |
|             | 4.7         | 5×11                  | 0.12 | 30                                                 | EKMG500E□□4R7ME11D |             | 22          | 12.5×20               | 0.24 | 130                                                | EKMG351E□□220MK20S |
|             | 10          | 5×11                  | 0.12 | 40                                                 | EKMG500E□□100ME11D |             | 33          | 16×25                 | 0.24 | 195                                                | EKMG351E□□330ML25S |
|             | 22          | 5×11                  | 0.12 | 65                                                 | EKMG500E□□220ME11D |             | 47          | 16×25                 | 0.24 | 230                                                | EKMG351E□□470ML25S |
|             | 33          | 5×11                  | 0.12 | 90                                                 | EKMG500E□□330ME11D |             | 100         | 18×31.5               | 0.24 | 375                                                | EKMG351E□□101MMN3S |
|             | 47          | 6.3×11                | 0.12 | 110                                                | EKMG500E□□470MF11D | 400         | 1.0         | 6.3×11                | 0.24 | 15                                                 | EKMG401E□□1R0MF11D |
|             | 100         | 8×11.5                | 0.12 | 180                                                | EKMG500E□□101MHB5D |             | 2.2         | 8×11.5                | 0.24 | 26                                                 | EKMG401E□□2R2MHB5D |
|             | 220         | 10×12.5               | 0.12 | 300                                                | EKMG500E□□221MJC5S |             | 3.3         | 10×12.5               | 0.24 | 38                                                 | EKMG401E□□3R3MJC5S |
|             | 330         | 10×16                 | 0.12 | 410                                                | EKMG500E□□331MJ16S |             | 4.7         | 10×16                 | 0.24 | 50                                                 | EKMG401E□□4R7MJ16S |
|             | 470         | 10×20                 | 0.12 | 530                                                | EKMG500E□□471MJ20S |             | 10          | 10×20                 | 0.24 | 80                                                 | EKMG401E□□100MJ20S |
|             | 1,000       | 12.5×25               | 0.12 | 950                                                | EKMG500E□□102MK25S |             | 22          | 12.5×25               | 0.24 | 145                                                | EKMG401E□□220MK25S |
|             | 2,200       | 16×35.5               | 0.14 | 1,470                                              | EKMG500E□□222MLP1S |             | 33          | 16×25                 | 0.24 | 195                                                | EKMG401E□□330ML25S |
|             | 3,300       | 18×35.5               | 0.16 | 1,770                                              | EKMG500E□□332MMP1S |             | 47          | 16×31.5               | 0.24 | 250                                                | EKMG401E□□470MLN3S |
|             |             |                       |      |                                                    |                    |             | 100         | 16×40                 | 0.24 | 350                                                | EKMG401E□□101ML40S |

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

## KMG Series

### ◆STANDARD RATINGS

□ is not solvent resistant.

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(mA <sub>rms</sub> /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.