

# KMQ Series

- Downsized from current standard KMG series
- Solvent resistant type except 160 to 450V<sub>dc</sub>  
(see PRECAUTIONS AND GUIDELINES)
- RoHS2 Compliant

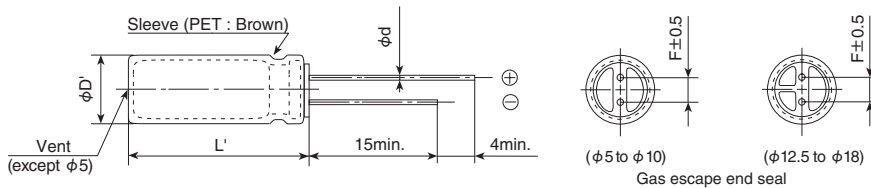


## SPECIFICATIONS

| Items  | Characteristics   |                                      |      |      |      |      |      |                                      |             |             |             |      |                            |   |
|--|---|--------------------------------------|------|------|------|------|------|--------------------------------------|-------------|-------------|-------------|------|----------------------------|---|
| Category   | -55 to +105°C(6.3 to 100V <sub>dc</sub> ) -40 to +105°C(160 to 400V <sub>dc</sub> ) -25 to +105°C(450V <sub>dc</sub> )  |                                      |      |      |      |      |      |                                      |             |             |             |      |                            |   |
| Temperature Range  |   |                                      |      |      |      |      |      |                                      |             |             |             |      |                            |   |
| Rated Voltage Range  | 6.3 to 450V <sub>dc</sub>   |                                      |      |      |      |      |      |                                      |             |             |             |      |                            |   |
| Capacitance Tolerance  | ±20% (M) (at 20°C, 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≤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°C after 1 minute) |   |                                      |      |      |      |      |      |                                      |             |             |             |      |                            |   |
| Dissipation Factor (tan δ)   | Rated voltage (V <sub>dc</sub> )  | 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°C, 120Hz)  |   |                                      |      |      |      |      |      |                                      |             |             |             |      |                            |   |
| Low Temperature Characteristics (Max. Impedance Ratio)   | Rated voltage (V <sub>dc</sub> )  | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V  | 63 to 100V                           | 160 to 200V | 250V        | 350V        | 400V | 450V                       |   |
|  | Z(-25°C)/Z(+20°C)   | ≤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°C)/Z(+20°C)   | ≤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°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 for φ 10 and more) at 105°C.         |                                      |      |      |      |      |      |                                      |             |             |             |      |                            |   |
|  | 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°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 <sub>dc</sub>            |      |      |      |      |      | 160 to 450V <sub>dc</sub>            |             |             |             |      |                            |   |
|  | 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)"

◆ STANDARD RATINGS

□ is not solvent resistant.

| WV (V <sub>dc</sub> ) | Cap (μF)  | Case size φD×L(mm) | tan δ | Rated ripple current (mAmps/105°C, 120Hz) | Part No.           | WV (V <sub>dc</sub> ) | Cap (μF)  | Case size φD×L(mm) | tan δ    | Rated ripple current (mAmps/105°C, 120Hz) | Part No.           |
|-----------------------|-----------|--------------------|-------|---|--------------------|-----------------------|-----------|--------------------|----------|---|--------------------|
| 6.3                   | 1,000     | 8 × 11.5           | 0.28  | 390                                       | EKMQ6R3E□□102MHB5D | 63                    | 33        | 6.3 × 11           | 0.10     | 100                                       | EKMQ630E□□330MF11D |
|                       | 2,200     | 10 × 16            | 0.30  | 635                                       | EKMQ6R3E□□222MJ16S |                       | 47        | 6.3 × 11           | 0.10     | 120                                       | EKMQ630E□□470MF11D |
|                       | 3,300     | 10 × 20            | 0.32  | 840                                       | EKMQ6R3E□□332MJ20S |                       | 68        | 8 × 11.5           | 0.10     | 155                                       | EKMQ630E□□680MHB5D |
|                       | 4,700     | 12.5 × 20          | 0.34  | 1,090                                     | EKMQ6R3E□□472MK20S |                       | 100       | 8 × 11.5           | 0.10     | 200                                       | EKMQ630E□□101MHB5D |
|                       | 6,800     | 12.5 × 25          | 0.38  | 1,350                                     | EKMQ6R3E□□682MK25S |                       | 220       | 10 × 16            | 0.10     | 335                                       | EKMQ630E□□221MJ16S |
|                       | 10,000    | 16 × 25            | 0.46  | 1,650                                     | EKMQ6R3E□□103ML25S |                       | 330       | 10 × 20            | 0.10     | 510                                       | EKMQ630E□□331MJ20S |
|                       | 15,000    | 16 × 31.5          | 0.56  | 1,820                                     | EKMQ6R3E□□153MLN3S |                       | 470       | 12.5 × 20          | 0.10     | 640                                       | EKMQ630E□□471MK20S |
|                       | 22,000    | 18 × 35.5          | 0.70  | 2,280                                     | EKMQ6R3E□□223MMP1S |                       | 1,000     | 16 × 25            | 0.10     | 930                                       | EKMQ630E□□102ML25S |
| 10                    | 220       | 5 × 11             | 0.24  | 155                                       | EKMQ100E□□221ME11D | 100                   | 2,200     | 18 × 35.5          | 0.12     | 1,650                                     | EKMQ630E□□222MMP1S |
|                       | 330       | 6.3 × 11           | 0.24  | 210                                       | EKMQ100E□□331MF11D |                       | 1.0       | 5 × 11             | 0.08     | 15  | EKMQ101E□□1R0ME11D |
|                       | 470       | 6.3 × 11           | 0.24  | 250                                       | EKMQ100E□□471MF11D |                       | 2.2       | 5 × 11             | 0.08     | 21  | EKMQ101E□□2R2ME11D |
|                       | 1,000     | 10 × 12.5          | 0.24  | 460                                       | EKMQ100E□□102MJC5S |                       | 3.3       | 5 × 11             | 0.08     | 29  | EKMQ101E□□3R3ME11D |
|                       | 2,200     | 10 × 16            | 0.26  | 705                                       | EKMQ100E□□222MJ16S |                       | 4.7       | 5 × 11             | 0.08     | 32  | EKMQ101E□□4R7ME11D |
|                       | 3,300     | 12.5 × 20          | 0.28  | 1,000                                     | EKMQ100E□□332MK20S |                       | 10        | 5 × 11             | 0.08     | 50  | EKMQ101E□□100ME11D |
|                       | 4,700     | 12.5 × 25          | 0.30  | 1,260                                     | EKMQ100E□□472MK25S |                       | 22        | 6.3 × 11           | 0.08     | 93  | EKMQ101E□□220MF11D |
|                       | 6,800     | 16 × 25            | 0.34  | 1,570                                     | EKMQ100E□□682ML25S |                       | 33        | 8 × 11.5           | 0.08     | 130                                       | EKMQ101E□□330MHB5D |
|                       | 10,000    | 16 × 31.5          | 0.42  | 1,820                                     | EKMQ100E□□103MLN3S |                       | 47        | 8 × 11.5           | 0.08     | 140                                       | EKMQ101E□□470MHB5D |
|                       | 15,000    | 16 × 35.5          | 0.52  | 2,050                                     | EKMQ100E□□153MLP1S |                       | 68        | 10 × 12.5          | 0.08     | 190                                       | EKMQ101E□□680MJC5S |
| 16                    | 22,000    | 18 × 40            | 0.66  | 2,420                                     | EKMQ100E□□223MM40S | 100                   | 10 × 16   | 0.08               | 240      | EKMQ101E□□101MJ16S                        |                    |
|                       | 220       | 6.3 × 11           | 0.20  | 190                                       | EKMQ160E□□221MF11D | 220                   | 12.5 × 20 | 0.08               | 390      | EKMQ101E□□221MK20S                        |                    |
|                       | 330       | 6.3 × 11           | 0.20  | 225                                       | EKMQ160E□□331MF11D | 330                   | 12.5 × 25 | 0.08               | 540      | EKMQ101E□□331MK25S                        |                    |
|                       | 470       | 8 × 11.5           | 0.20  | 315                                       | EKMQ160E□□471MHB5D | 470                   | 16 × 25   | 0.08               | 715      | EKMQ101E□□471ML25S                        |                    |
|                       | 1,000     | 10 × 12.5          | 0.20  | 500                                       | EKMQ160E□□102MJC5S | 1,000                 | 18 × 35.5 | 0.08               | 960      | EKMQ101E□□102MMP1S                        |                    |
|                       | 2,200     | 10 × 20            | 0.22  | 710                                       | EKMQ160E□□222MJ20S | 160                   | 10        | 8 × 11.5           | 0.20     | 41  | EKMQ161E□□100MHB5D |
|                       | 3,300     | 12.5 × 25          | 0.24  | 1,170                                     | EKMQ160E□□332MK25S |                       | 22        | 10 × 12.5          | 0.20     | 92  | EKMQ161E□□220MJC5S |
|                       | 4,700     | 16 × 25            | 0.26  | 1,500                                     | EKMQ160E□□472ML25S |                       | 33        | 10 × 16            | 0.20     | 125                                       | EKMQ161E□□330MJ16S |
|                       | 6,800     | 16 × 25            | 0.30  | 1,600                                     | EKMQ160E□□682ML25S |                       | 47        | 10 × 20            | 0.20     | 150                                       | EKMQ161E□□470MJ20S |
|                       | 10,000    | 16 × 35.5          | 0.38  | 1,930                                     | EKMQ160E□□103MLP1S |                       | 68        | 12.5 × 20          | 0.20     | 250                                       | EKMQ161E□□680MK20S |
| 15,000                | 18 × 40   | 0.48               | 2,210 | EKMQ160E□□153MM40S                        | 100                |                       | 12.5 × 25 | 0.20               | 310      | EKMQ161E□□101MK25S                        |                    |
| 25                    | 100       | 5 × 11             | 0.16  | 125                                       | EKMQ250E□□101ME11D |                       | 220       | 16 × 31.5          | 0.20     | 540                                       | EKMQ161E□□221MLN3S |
|                       | 220       | 6.3 × 11           | 0.16  | 200                                       | EKMQ250E□□221MF11D |                       | 330       | 18 × 35.5          | 0.20     | 705                                       | EKMQ161E□□331MMP1S |
|                       | 330       | 8 × 11.5           | 0.16  | 310                                       | EKMQ250E□□331MHB5D |                       | 470       | 18 × 40            | 0.20     | 855                                       | EKMQ161E□□471MM40S |
|                       | 470       | 10 × 12.5          | 0.16  | 380                                       | EKMQ250E□□471MJC5S |                       | 200       | 1.0                | 6.3 × 11 | 0.20                                      | 16                 |
|                       | 1,000     | 10 × 16            | 0.16  | 610                                       | EKMQ250E□□102MJ16S | 2.2                   |           | 6.3 × 11           | 0.20     | 25  | EKMQ201E□□2R2MF11D |
|                       | 2,200     | 12.5 × 25          | 0.18  | 1,090                                     | EKMQ250E□□222MK25S | 3.3                   |           | 6.3 × 11           | 0.20     | 30  | EKMQ201E□□3R3MF11D |
|                       | 3,300     | 16 × 25            | 0.20  | 1,400                                     | EKMQ250E□□332ML25S | 4.7                   |           | 6.3 × 11           | 0.20     | 35  | EKMQ201E□□4R7MF11D |
|                       | 4,700     | 16 × 25            | 0.22  | 1,570                                     | EKMQ250E□□472ML25S | 10                    |           | 8 × 11.5           | 0.20     | 57  | EKMQ201E□□100MHB5D |
|                       | 6,800     | 16 × 35.5          | 0.26  | 1,850                                     | EKMQ250E□□682MLP1S | 22                    |           | 10 × 16            | 0.20     | 105                                       | EKMQ201E□□220MJ16S |
|                       | 10,000    | 18 × 40            | 0.34  | 2,000                                     | EKMQ250E□□103MM40S | 33                    |           | 10 × 20            | 0.20     | 140                                       | EKMQ201E□□330MJ20S |
| 35                    | 47        | 5 × 11             | 0.14  | 93  | EKMQ350E□□470ME11D | 47                    |           | 12.5 × 20          | 0.20     | 195                                       | EKMQ201E□□470MK20S |
|                       | 68        | 6.3 × 11           | 0.14  | 110                                       | EKMQ350E□□680MF11D | 68                    |           | 12.5 × 25          | 0.20     | 250                                       | EKMQ201E□□680MK25S |
|                       | 100       | 6.3 × 11           | 0.14  | 150                                       | EKMQ350E□□101MF11D | 100                   |           | 16 × 25            | 0.20     | 335                                       | EKMQ201E□□101ML25S |
|                       | 220       | 8 × 11.5           | 0.14  | 270                                       | EKMQ350E□□221MHB5D | 220                   | 16 × 35.5 | 0.20               | 500      | EKMQ201E□□221MLP1S                        |                    |
|                       | 330       | 10 × 12.5          | 0.14  | 350                                       | EKMQ350E□□331MJC5S | 330                   | 18 × 40   | 0.20               | 675      | EKMQ201E□□331MM40S                        |                    |
|                       | 470       | 10 × 16            | 0.14  | 460                                       | EKMQ350E□□471MJ16S | 250                   | 3.3       | 6.3 × 11           | 0.20     | 28  | EKMQ251E□□3R3MF11D |
|                       | 1,000     | 12.5 × 20          | 0.14  | 810                                       | EKMQ350E□□102MK20S |                       | 4.7       | 6.3 × 11           | 0.20     | 35  | EKMQ251E□□4R7MF11D |
|                       | 2,200     | 16 × 25            | 0.16  | 1,260                                     | EKMQ350E□□222ML25S |                       | 10        | 10 × 12.5          | 0.20     | 71  | EKMQ251E□□100MJC5S |
|                       | 3,300     | 16 × 31.5          | 0.18  | 1,500                                     | EKMQ350E□□332MLN3S |                       | 22        | 10 × 20            | 0.20     | 105                                       | EKMQ251E□□220MJ20S |
|                       | 4,700     | 16 × 35.5          | 0.20  | 1,780                                     | EKMQ350E□□472MLP1S |                       | 33        | 10 × 20            | 0.20     | 140                                       | EKMQ251E□□330MJ20S |
| 6,800                 | 18 × 40   | 0.24               | 2,000 | EKMQ350E□□682MM40S                        | 47                 |                       | 12.5 × 20 | 0.20               | 190      | EKMQ251E□□470MK20S                        |                    |
| 50                    | 1.0       | 5 × 11             | 0.12  | 13  | EKMQ500E□□1R0ME11D |                       | 68        | 16 × 25            | 0.20     | 270                                       | EKMQ251E□□680ML25S |
|                       | 2.2       | 5 × 11             | 0.12  | 20  | EKMQ500E□□2R2ME11D |                       | 100       | 16 × 25            | 0.20     | 310                                       | EKMQ251E□□101ML25S |
|                       | 3.3       | 5 × 11             | 0.12  | 25  | EKMQ500E□□3R3ME11D |                       | 220       | 18 × 35.5          | 0.20     | 485                                       | EKMQ251E□□221MMP1S |
|                       | 4.7       | 5 × 11             | 0.12  | 30  | EKMQ500E□□4R7ME11D |                       | 350       | 2.2                | 6.3 × 11 | 0.24                                      | 21                 |
|                       | 10        | 5 × 11             | 0.12  | 46  | EKMQ500E□□100ME11D | 3.3                   |           | 8 × 11.5           | 0.24     | 30  | EKMQ351E□□3R3MHB5D |
|                       | 22        | 5 × 11             | 0.12  | 68  | EKMQ500E□□220ME11D | 4.7                   |           | 8 × 11.5           | 0.24     | 39  | EKMQ351E□□4R7MHB5D |
|                       | 33        | 5 × 11             | 0.12  | 90  | EKMQ500E□□330ME11D | 10                    |           | 10 × 12.5          | 0.24     | 64  | EKMQ351E□□100MJC5S |
|                       | 47        | 6.3 × 11           | 0.12  | 115                                       | EKMQ500E□□470MF11D | 22                    |           | 12.5 × 20          | 0.24     | 130                                       | EKMQ351E□□220MK20S |
|                       | 68        | 6.3 × 11           | 0.12  | 150                                       | EKMQ500E□□680MF11D | 33                    |           | 12.5 × 25          | 0.24     | 170                                       | EKMQ351E□□330MK25S |
|                       | 100       | 8 × 11.5           | 0.12  | 190                                       | EKMQ500E□□101MHB5D | 47                    |           | 16 × 25            | 0.24     | 230                                       | EKMQ351E□□470ML25S |
| 220                   | 10 × 12.5 | 0.12               | 300   | EKMQ500E□□221MJC5S                        | 68                 | 16 × 25               |           | 0.24               | 285      | EKMQ351E□□680ML25S                        |                    |
| 330                   | 10 × 16   | 0.12               | 410   | EKMQ500E□□331MJ16S                        | 100                | 18 × 31.5             |           | 0.24               | 375      | EKMQ351E□□101MMN3S                        |                    |
| 470                   | 10 × 20   | 0.12               | 540   | EKMQ500E□□471MJ20S                        | 400                | 1.0                   |           | 6.3 × 11           | 0.24     | 15  | EKMQ401E□□1R0MF11D |
| 1,000                 | 12.5 × 25 | 0.12               | 950   | EKMQ500E□□102MK25S                        |                    | 2.2                   | 8 × 11.5  | 0.24               | 27       | EKMQ401E□□2R2MHB5D                        |                    |
| 2,200                 | 16 × 31.5 | 0.14               | 1,410 | EKMQ500E□□222MLN3S                        |                    | 3.3                   | 8 × 11.5  | 0.24               | 34       | EKMQ401E□□3R3MHB5D                        |                    |
| 3,300                 | 18 × 35.5 | 0.16               | 1,770 | EKMQ500E□□332MMP1S                        |                    | 4.7                   | 10 × 12.5 | 0.24               | 42       | EKMQ401E□□4R7MJC5S                        |                    |
| 63                    | 22        | 5 × 11             | 0.10  | 71  | EKMQ630E□□220ME11D | 10                    | 10 × 16   | 0.24               | 64       | EKMQ401E□□100MJ16S                        |                    |

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

◆STANDARD RATINGS

is not solvent resistant.

| WV (V <sub>dc</sub> ) | Cap (μF) | Case size φD×L(mm) | tan δ | Rated ripple current (mA <sub>rms</sub> /105°C, 120Hz) | Part No.           | WV (V <sub>dc</sub> ) | Cap (μF)  | Case size φD×L(mm) | tan δ | Rated ripple current (mA <sub>rms</sub> /105°C, 120Hz) | Part No.           |
|-----------------------|----------|--------------------|-------|--|--------------------|-----------------------|-----------|--------------------|-------|--|--------------------|
| 400                   | 22       | 12.5 × 25          | 0.24  | 145  | EKMQ401E□□220MK25S | 450                   | 4.7       | 10 × 12.5          | 0.24  | 32   | EKMQ451E□□4R7MJC5S |
|                       | 33       | 16 × 25            | 0.24  | 195  | EKMQ401E□□330ML25S |                       | 10        | 10 × 20            | 0.24  | 56   | EKMQ451E□□100MJ20S |
|                       | 47       | 16 × 25            | 0.24  | 200  | EKMQ401E□□470ML25S |                       | 22        | 12.5 × 25          | 0.24  | 100  | EKMQ451E□□220MK25S |
|                       | 68       | 16 × 31.5          | 0.24  | 240  | EKMQ401E□□680MLN3S |                       | 33        | 16 × 25            | 0.24  | 125  | EKMQ451E□□330ML25S |
|                       | 100      | 18 × 35.5          | 0.24  | 310  | EKMQ401E□□101MMP1S |                       | 47        | 16 × 31.5          | 0.24  | 155  | EKMQ451E□□470MLN3S |
| 450                   | 2.2      | 8 × 11.5           | 0.24  | 20   | EKMQ451E□□2R2MHB5D | 68                    | 18 × 35.5 | 0.24               | 185   | EKMQ451E□□680MMP1S                                     |                    |
|                       | 3.3      | 10 × 12.5          | 0.24  | 28   | EKMQ451E□□3R3MJC5S | 100                   | 18 × 40   | 0.24               | 200   | EKMQ451E□□101MM40S                                     |                    |

□□ : 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 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 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.