

# GPD Series

- Guaranteed short time at 150°C
- Downsized and high-ripple current version of GPA series
- For automobile modules and other high temperature applications
- Endurance with ripple current : 2,000 to 3,000 hours at 125°C to 135°C
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

GPA  
P186

Downsized  
Higher ripple current → **GPD**

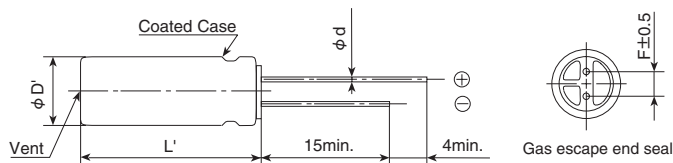


## SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                                                                              |      |      |      |      |      |      |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|------|------|------|
| Category                                               | -40 to +135°C                                                                                                                                                                                                                                                                                                                                |      |      |      |      |      |      |
| Temperature Range                                      |                                                                                                                                                                                                                                                                                                                                              |      |      |      |      |      |      |
| Rated Voltage Range                                    | 25 to 100V <sub>dc</sub>                                                                                                                                                                                                                                                                                                                     |      |      |      |      |      |      |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                    |      |      |      |      |      |      |
| Leakage Current                                        | I=0.03CV or 4μA, whichever is greater.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C, 1 minute)                                                                                                                                                                                      |      |      |      |      |      |      |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                                                                             | 25V  | 35V  | 50V  | 63V  | 80V  | 100V |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                                                                                  | 0.14 | 0.12 | 0.10 | 0.10 | 0.08 | 0.08 |
|                                                        | 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> )                                                                                                                                                                                                                                                                                                             | 25V  | 35V  | 50V  | 63V  | 80V  | 100V |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                                                                            | 2    | 2    | 2    | 2    | 2    | 2    |
|                                                        | Z(-40°C)/Z(+20°C)                                                                                                                                                                                                                                                                                                                            | 4    | 4    | 4    | 4    | 4    | 4    |
|                                                        | (at 120Hz)                                                                                                                                                                                                                                                                                                                                   |      |      |      |      |      |      |
| Endurance 1                                            | 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 the specified period of time at 125°C or 135°C.                                                                    |      |      |      |      |      |      |
| Time                                                   | 125°C 3,000hours<br>135°C 25 to 50V <sub>dc</sub> : 3,000hours<br>63 to 100V <sub>dc</sub> : 2,000hours                                                                                                                                                                                                                                      |      |      |      |      |      |      |
| Capacitance change                                     | ≤ ±30% of the initial value                                                                                                                                                                                                                                                                                                                  |      |      |      |      |      |      |
| D.F. (tanδ)                                            | ≤300% of the initial specified value                                                                                                                                                                                                                                                                                                         |      |      |      |      |      |      |
| Leakage current                                        | ≤The initial specified value                                                                                                                                                                                                                                                                                                                 |      |      |      |      |      |      |
| Endurance 2                                            | The following specifications shall be satisfied when the capacitors are restored to 20°C after the test condition that the rated voltage is applied for 100 hours at 150°C and DC voltage with the rated ripple current is applied (the peak voltage shall not exceed the rated voltage) for the specified period of time at 125°C or 135°C. |      |      |      |      |      |      |
| Time                                                   | 125°C 2,500hours<br>135°C 25 to 50V <sub>dc</sub> : 2,500hours<br>63 to 100V <sub>dc</sub> : 1,500hours                                                                                                                                                                                                                                      |      |      |      |      |      |      |
| Capacitance change                                     | ≤ ±30% of the initial value                                                                                                                                                                                                                                                                                                                  |      |      |      |      |      |      |
| D.F. (tanδ)                                            | ≤300% 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 125°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.                                                      |      |      |      |      |      |      |
| Capacitance change                                     | ≤ ±30% of the initial value                                                                                                                                                                                                                                                                                                                  |      |      |      |      |      |      |
| D.F. (tanδ)                                            | ≤300% of the initial specified value                                                                                                                                                                                                                                                                                                         |      |      |      |      |      |      |
| Leakage current                                        | ≤The initial specified value                                                                                                                                                                                                                                                                                                                 |      |      |      |      |      |      |

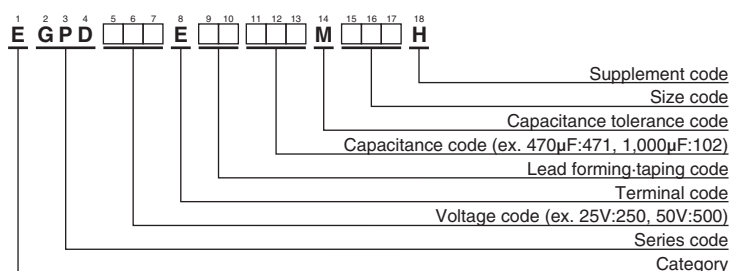
## DIMENSIONS [mm]

- Terminal Code : E



| φD  | 12.5       | 14.5 | 16  | 18  |
|-----|------------|------|-----|-----|
| φd  | 0.6        | 0.8  | 0.8 | 0.8 |
| F   | 5.0        | 7.5  | 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>φ D×L(mm) | ESR<br>(Ω max/100kHz) |       | Rated ripple current<br>(mArms/100kHz) |       | Part No.           |
|-------------|-------------|------------------------|-----------------------|-------|----------------------------------------|-------|--------------------|
|             |             |                        | 20°C                  | -40°C | 125°C                                  | 135°C |                    |
| 25          | 2,000       | 12.5×20                | 0.042                 | 0.48  | 2,760                                  | 1,690 | EGPD250E□□202MK20H |
|             | 2,700       | 14.5×20                | 0.038                 | 0.37  | 2,990                                  | 1,830 | EGPD250E□□272MU20H |
|             | 3,000       | 12.5×25                | 0.033                 | 0.30  | 3,480                                  | 2,010 | EGPD250E□□302MK25H |
|             | 3,300       | 16×20                  | 0.035                 | 0.27  | 3,040                                  | 1,860 | EGPD250E□□332ML20H |
|             | 3,600       | 12.5×30                | 0.028                 | 0.24  | 4,490                                  | 2,900 | EGPD250E□□362MK30H |
|             | 3,900       | 14.5×25                | 0.030                 | 0.28  | 4,120                                  | 2,780 | EGPD250E□□392MU25H |
|             | 4,300       | 18×20                  | 0.034                 | 0.22  | 3,250                                  | 1,870 | EGPD250E□□432MM20H |
|             | 4,700       | 12.5×35                | 0.025                 | 0.21  | 5,140                                  | 3,190 | EGPD250E□□472MK35H |
|             | 4,700       | 16×25                  | 0.028                 | 0.22  | 4,260                                  | 2,870 | EGPD250E□□472ML25H |
|             | 5,100       | 12.5×40                | 0.024                 | 0.19  | 5,810                                  | 3,470 | EGPD250E□□512MK40H |
|             | 5,100       | 14.5×30                | 0.025                 | 0.24  | 4,880                                  | 3,150 | EGPD250E□□512MU30H |
|             | 5,600       | 14.5×35                | 0.023                 | 0.20  | 5,420                                  | 3,360 | EGPD250E□□562MU35H |
|             | 5,600       | 16×30                  | 0.023                 | 0.18  | 5,480                                  | 3,400 | EGPD250E□□562ML30H |
|             | 6,200       | 18×25                  | 0.027                 | 0.19  | 4,500                                  | 2,900 | EGPD250E□□622MM25H |
|             | 6,800       | 14.5×40                | 0.022                 | 0.16  | 6,240                                  | 3,730 | EGPD250E□□682MU40H |
|             | 7,500       | 16×35                  | 0.020                 | 0.14  | 6,070                                  | 3,630 | EGPD250E□□752ML35H |
|             | 7,500       | 18×30                  | 0.022                 | 0.16  | 5,600                                  | 3,470 | EGPD250E□□752MM30H |
|             | 9,100       | 16×40                  | 0.019                 | 0.12  | 6,810                                  | 3,930 | EGPD250E□□912ML40H |
|             | 10,000      | 18×35                  | 0.019                 | 0.12  | 6,280                                  | 3,750 | EGPD250E□□103MM35H |
|             | 12,000      | 18×40                  | 0.018                 | 0.10  | 7,070                                  | 4,080 | EGPD250E□□123MM40H |
| 35          | 1,300       | 12.5×20                | 0.042                 | 0.48  | 2,760                                  | 1,690 | EGPD350E□□132MK20H |
|             | 1,600       | 14.5×20                | 0.038                 | 0.37  | 2,990                                  | 1,830 | EGPD350E□□162MU20H |
|             | 1,800       | 12.5×25                | 0.033                 | 0.30  | 3,480                                  | 2,010 | EGPD350E□□182MK25H |
|             | 2,000       | 16×20                  | 0.035                 | 0.27  | 3,040                                  | 1,860 | EGPD350E□□202ML20H |
|             | 2,200       | 12.5×30                | 0.028                 | 0.24  | 4,490                                  | 2,900 | EGPD350E□□222MK30H |
|             | 2,400       | 14.5×25                | 0.030                 | 0.28  | 4,120                                  | 2,780 | EGPD350E□□242MU25H |
|             | 2,400       | 18×20                  | 0.034                 | 0.22  | 3,250                                  | 1,870 | EGPD350E□□242MM20H |
|             | 2,700       | 12.5×35                | 0.025                 | 0.21  | 5,140                                  | 3,190 | EGPD350E□□272MK35H |
|             | 3,000       | 14.5×30                | 0.025                 | 0.24  | 4,880                                  | 3,150 | EGPD350E□□302MU30H |
|             | 3,000       | 16×25                  | 0.028                 | 0.22  | 4,260                                  | 2,870 | EGPD350E□□302ML25H |
|             | 3,300       | 12.5×40                | 0.024                 | 0.19  | 5,810                                  | 3,470 | EGPD350E□□332MK40H |
|             | 3,300       | 14.5×35                | 0.023                 | 0.20  | 5,420                                  | 3,360 | EGPD350E□□332MU35H |
|             | 3,600       | 16×30                  | 0.023                 | 0.18  | 5,480                                  | 3,400 | EGPD350E□□362ML30H |
|             | 3,900       | 18×25                  | 0.027                 | 0.19  | 4,500                                  | 2,900 | EGPD350E□□392MM25H |
|             | 4,300       | 14.5×40                | 0.022                 | 0.16  | 6,240                                  | 3,730 | EGPD350E□□432MU40H |
|             | 4,300       | 16×35                  | 0.020                 | 0.14  | 6,070                                  | 3,630 | EGPD350E□□432ML35H |
|             | 4,700       | 18×30                  | 0.022                 | 0.16  | 5,600                                  | 3,470 | EGPD350E□□472MM30H |
|             | 5,600       | 16×40                  | 0.019                 | 0.12  | 6,810                                  | 3,930 | EGPD350E□□562ML40H |
|             | 6,200       | 18×35                  | 0.019                 | 0.12  | 6,280                                  | 3,750 | EGPD350E□□622MM35H |
|             | 7,500       | 18×40                  | 0.018                 | 0.10  | 7,070                                  | 4,080 | EGPD350E□□752MM40H |
| 50          | 620         | 12.5×20                | 0.073                 | 0.88  | 2,400                                  | 1,470 | EGPD500E□□621MK20H |
|             | 750         | 14.5×20                | 0.063                 | 0.73  | 2,760                                  | 1,590 | EGPD500E□□751MU20H |
|             | 820         | 12.5×25                | 0.058                 | 0.67  | 3,350                                  | 2,260 | EGPD500E□□821MK25H |
|             | 1,000       | 16×20                  | 0.050                 | 0.55  | 2,960                                  | 1,870 | EGPD500E□□102ML20H |
|             | 1,100       | 12.5×30                | 0.048                 | 0.52  | 4,220                                  | 2,520 | EGPD500E□□112MK30H |
|             | 1,100       | 14.5×25                | 0.048                 | 0.52  | 3,750                                  | 2,420 | EGPD500E□□112MU25H |
|             | 1,300       | 12.5×35                | 0.042                 | 0.44  | 4,810                                  | 2,780 | EGPD500E□□132MK35H |
|             | 1,300       | 16×25                  | 0.042                 | 0.44  | 4,040                                  | 2,500 | EGPD500E□□132ML25H |
|             | 1,300       | 18×20                  | 0.042                 | 0.44  | 3,130                                  | 2,110 | EGPD500E□□132MM20H |
|             | 1,500       | 14.5×30                | 0.038                 | 0.39  | 4,590                                  | 2,740 | EGPD500E□□152MU30H |
|             | 1,600       | 12.5×40                | 0.037                 | 0.36  | 5,240                                  | 3,020 | EGPD500E□□162MK40H |
|             | 1,600       | 14.5×35                | 0.035                 | 0.36  | 5,060                                  | 2,920 | EGPD500E□□162MU35H |
|             | 1,600       | 16×30                  | 0.035                 | 0.36  | 5,130                                  | 2,960 | EGPD500E□□162ML30H |
|             | 1,800       | 18×25                  | 0.033                 | 0.32  | 4,230                                  | 2,530 | EGPD500E□□182MM25H |
|             | 2,200       | 14.5×40                | 0.029                 | 0.27  | 5,630                                  | 3,250 | EGPD500E□□222MU40H |
|             | 2,200       | 16×35                  | 0.029                 | 0.27  | 5,480                                  | 3,160 | EGPD500E□□222ML35H |
|             | 2,400       | 18×30                  | 0.028                 | 0.25  | 5,240                                  | 3,020 | EGPD500E□□242MM30H |
|             | 2,700       | 16×40                  | 0.025                 | 0.22  | 5,930                                  | 3,420 | EGPD500E□□272ML40H |
|             | 3,000       | 18×35                  | 0.024                 | 0.20  | 5,870                                  | 3,390 | EGPD500E□□302MM35H |
|             | 3,600       | 18×40                  | 0.023                 | 0.16  | 6,420                                  | 3,700 | EGPD500E□□362MM40H |
| 63          | 390         | 12.5×20                | 0.072                 | 0.56  | 1,640                                  | 1,420 | EGPD630E□□391MK20H |
|             | 560         | 12.5×25                | 0.052                 | 0.39  | 2,520                                  | 2,050 | EGPD630E□□561MK25H |
|             | 560         | 14.5×20                | 0.061                 | 0.40  | 1,790                                  | 1,550 | EGPD630E□□561MU20H |
|             | 680         | 16×20                  | 0.053                 | 0.34  | 2,140                                  | 1,910 | EGPD630E□□681ML20H |
|             | 750         | 12.5×30                | 0.042                 | 0.30  | 3,110                                  | 2,630 | EGPD630E□□751MK30H |
|             | 750         | 14.5×25                | 0.047                 | 0.30  | 2,650                                  | 2,160 | EGPD630E□□751MU25H |
|             | 910         | 12.5×35                | 0.035                 | 0.25  | 3,760                                  | 2,970 | EGPD630E□□911MK35H |
|             | 910         | 18×20                  | 0.044                 | 0.26  | 2,350                                  | 2,100 | EGPD630E□□911MM20H |

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

## ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φ D×L(mm) | ESR<br>(Ω max/100kHz) |       | Rated ripple current<br>(mA rms/100kHz) |       | Part No.           |
|-------------|-------------|------------------------|-----------------------|-------|-----------------------------------------|-------|--------------------|
|             |             |                        | 20°C                  | -40°C | 125°C                                   | 135°C |                    |
| 63          | 1,000       | 14.5×30                | 0.037                 | 0.23  | 3,360                                   | 2,840 | EGPD630E□□102MU30H |
|             | 1,000       | 16×25                  | 0.038                 | 0.23  | 2,940                                   | 2,680 | EGPD630E□□102ML25H |
|             | 1,100       | 12.5×40                | 0.031                 | 0.22  | 4,610                                   | 3,260 | EGPD630E□□112MK40H |
|             | 1,200       | 14.5×35                | 0.033                 | 0.20  | 3,860                                   | 3,050 | EGPD630E□□122MU35H |
|             | 1,200       | 16×30                  | 0.034                 | 0.20  | 3,860                                   | 3,050 | EGPD630E□□122ML30H |
|             | 1,300       | 18×25                  | 0.033                 | 0.19  | 3,080                                   | 2,810 | EGPD630E□□132MM25H |
|             | 1,500       | 14.5×40                | 0.028                 | 0.16  | 4,930                                   | 3,490 | EGPD630E□□152MU40H |
|             | 1,600       | 16×35                  | 0.027                 | 0.15  | 4,590                                   | 3,420 | EGPD630E□□162ML35H |
|             | 1,600       | 18×30                  | 0.028                 | 0.15  | 4,080                                   | 3,220 | EGPD630E□□162MM30H |
|             | 1,800       | 16×40                  | 0.025                 | 0.14  | 5,190                                   | 3,670 | EGPD630E□□182ML40H |
| 80          | 2,200       | 18×35                  | 0.022                 | 0.12  | 5,220                                   | 3,690 | EGPD630E□□222MM35H |
|             | 2,400       | 18×40                  | 0.021                 | 0.11  | 5,660                                   | 3,820 | EGPD630E□□242MM40H |
|             | 270         | 12.5×20                | 0.072                 | 0.56  | 1,640                                   | 1,420 | EGPD800E□□271MK20H |
|             | 360         | 14.5×20                | 0.061                 | 0.40  | 1,790                                   | 1,550 | EGPD800E□□361MU20H |
|             | 390         | 12.5×25                | 0.052                 | 0.39  | 2,520                                   | 2,050 | EGPD800E□□391MK25H |
|             | 470         | 16×20                  | 0.053                 | 0.34  | 2,140                                   | 1,910 | EGPD800E□□471ML20H |
|             | 510         | 12.5×30                | 0.042                 | 0.30  | 3,110                                   | 2,630 | EGPD800E□□511MK30H |
|             | 510         | 14.5×25                | 0.047                 | 0.30  | 2,650                                   | 2,160 | EGPD800E□□511MU25H |
|             | 620         | 12.5×35                | 0.035                 | 0.25  | 3,760                                   | 2,970 | EGPD800E□□621MK35H |
|             | 620         | 18×20                  | 0.044                 | 0.26  | 2,350                                   | 2,100 | EGPD800E□□621MM20H |
|             | 680         | 14.5×30                | 0.037                 | 0.23  | 3,360                                   | 2,840 | EGPD800E□□681MU30H |
|             | 680         | 16×25                  | 0.038                 | 0.23  | 2,940                                   | 2,680 | EGPD800E□□681ML25H |
|             | 750         | 12.5×40                | 0.031                 | 0.22  | 4,610                                   | 3,260 | EGPD800E□□751MK40H |
|             | 750         | 14.5×35                | 0.033                 | 0.20  | 3,860                                   | 3,050 | EGPD800E□□751MU35H |
|             | 750         | 16×30                  | 0.034                 | 0.20  | 3,860                                   | 3,050 | EGPD800E□□751ML30H |
|             | 820         | 18×25                  | 0.033                 | 0.19  | 3,080                                   | 2,810 | EGPD800E□□821MM25H |
|             | 1,000       | 14.5×40                | 0.028                 | 0.16  | 4,930                                   | 3,490 | EGPD800E□□102MU40H |
|             | 1,000       | 16×35                  | 0.027                 | 0.15  | 4,590                                   | 3,420 | EGPD800E□□102ML35H |
|             | 1,100       | 18×30                  | 0.028                 | 0.15  | 4,080                                   | 3,220 | EGPD800E□□112MM30H |
|             | 1,300       | 16×40                  | 0.025                 | 0.14  | 5,190                                   | 3,670 | EGPD800E□□132ML40H |
|             | 1,300       | 18×35                  | 0.022                 | 0.12  | 5,220                                   | 3,690 | EGPD800E□□132MM35H |
| 100         | 1,600       | 18×40                  | 0.021                 | 0.11  | 5,660                                   | 3,820 | EGPD800E□□162MM40H |
|             | 160         | 12.5×20                | 0.090                 | 0.75  | 1,580                                   | 1,410 | EGPD101E□□161MK20H |
|             | 200         | 14.5×20                | 0.083                 | 0.61  | 1,660                                   | 1,480 | EGPD101E□□201MU20H |
|             | 220         | 12.5×25                | 0.068                 | 0.55  | 2,140                                   | 1,960 | EGPD101E□□221MK25H |
|             | 270         | 16×20                  | 0.067                 | 0.47  | 2,050                                   | 1,670 | EGPD101E□□271ML20H |
|             | 300         | 12.5×30                | 0.052                 | 0.41  | 2,950                                   | 2,330 | EGPD101E□□301MK30H |
|             | 300         | 14.5×25                | 0.058                 | 0.42  | 2,300                                   | 2,100 | EGPD101E□□301MU25H |
|             | 360         | 12.5×35                | 0.045                 | 0.35  | 3,530                                   | 2,630 | EGPD101E□□361MK35H |
|             | 360         | 18×20                  | 0.061                 | 0.35  | 2,270                                   | 1,860 | EGPD101E□□361MM20H |
|             | 390         | 14.5×30                | 0.047                 | 0.33  | 3,120                                   | 2,460 | EGPD101E□□391MU30H |
|             | 390         | 16×25                  | 0.048                 | 0.33  | 2,790                                   | 2,360 | EGPD101E□□391ML25H |
|             | 430         | 12.5×40                | 0.038                 | 0.29  | 4,140                                   | 2,920 | EGPD101E□□431MK40H |
|             | 430         | 14.5×35                | 0.043                 | 0.30  | 3,510                                   | 2,620 | EGPD101E□□431MU35H |
|             | 470         | 16×30                  | 0.041                 | 0.27  | 3,440                                   | 2,720 | EGPD101E□□471ML30H |
|             | 510         | 18×25                  | 0.045                 | 0.25  | 2,920                                   | 2,470 | EGPD101E□□511MM25H |
|             | 560         | 14.5×40                | 0.034                 | 0.23  | 4,330                                   | 3,060 | EGPD101E□□561MU40H |
|             | 560         | 16×35                  | 0.036                 | 0.23  | 4,190                                   | 2,960 | EGPD101E□□561ML35H |
|             | 620         | 18×30                  | 0.037                 | 0.20  | 3,920                                   | 2,920 | EGPD101E□□621MM30H |
|             | 750         | 16×40                  | 0.028                 | 0.18  | 5,020                                   | 3,380 | EGPD101E□□751ML40H |
|             | 820         | 18×35                  | 0.030                 | 0.16  | 4,710                                   | 3,330 | EGPD101E□□821MM35H |
|             | 910         | 18×40                  | 0.026                 | 0.14  | 5,280                                   | 3,560 | EGPD101E□□911MM40H |

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

## ◆RATED RIPPLE CURRENT MULTIPLIERS

### ●Frequency Multipliers

| Capacitance(μF) | Frequency(Hz) | 120  | 1k   | 10k  | 100k |
|-----------------|---------------|------|------|------|------|
| 160 to 200      |               | 0.40 | 0.75 | 0.90 | 1.00 |
| 220 to 620      |               | 0.50 | 0.85 | 0.94 | 1.00 |
| 680 to 2,000    |               | 0.60 | 0.87 | 0.95 | 1.00 |
| 2,200 to 4,300  |               | 0.75 | 0.90 | 0.95 | 1.00 |
| 4,700 to 12,000 |               | 0.85 | 0.95 | 0.98 | 1.00 |

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.

Please contact us for lifetime estimation.