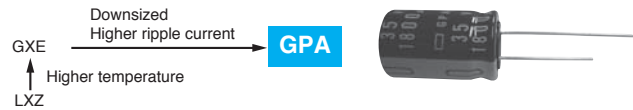


Upgrade!

# GPA Series

- Downsized, low impedance and high-ripple current version of GXE series
- Specified ESR after endurance test
- For high ripple current automotive applications.  
(Direct fuel injection and electric power steering etc.)
- Endurance with ripple current : 3,000 to 5,000 hours at 125°C
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

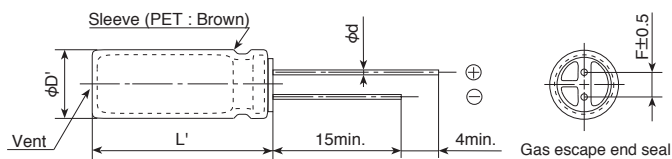


## SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                         |                                      |      |      |      |      |                  |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|------------------|
| Category                                               | –40 to +125°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 above value 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                                              | 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 5,000 hours (3,000 hours for 25L and less) at 125 °C.         |                                      |      |      |      |      |                  |
|                                                        | 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         |      |      |      |      |                  |

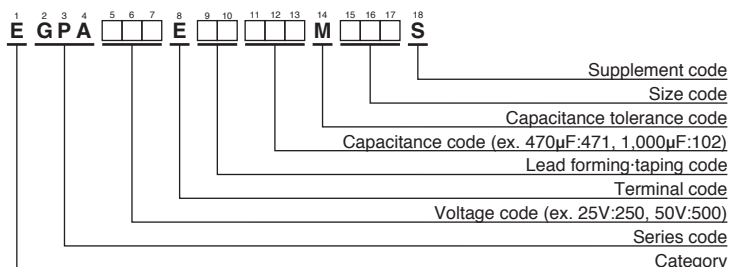
## DIMENSIONS [mm]

- 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 (Initial)<br>(Ω max/100kHz) |       | ESR (End of Life)<br>(Ω max/100kHz) |       | Rated ripple current<br>(mA rms/125°C, 100kHz) | Part No.           |
|-------------|-------------|------------------------|---------------------------------|-------|-------------------------------------|-------|------------------------------------------------|--------------------|
|             |             |                        | 20°C                            | -40°C | 20°C                                | -40°C |                                                |                    |
| 25          | 1,200       | 12.5×20                | 0.044                           | 0.22  | 0.18                                | 2.2   | 1,820                                          | EGPA250E□□122MK20S |
|             | 1,500       | 14.5×20                | 0.037                           | 0.19  | 0.11                                | 1.3   | 2,100                                          | EGPA250E□□152MU20S |
|             | 1,800       | 12.5×25                | 0.033                           | 0.17  | 0.13                                | 1.6   | 2,280                                          | EGPA250E□□182MK25S |
|             | 1,800       | 16×20                  | 0.034                           | 0.17  | 0.10                                | 1.3   | 2,280                                          | EGPA250E□□182ML20S |
|             | 2,200       | 12.5×30                | 0.029                           | 0.13  | 0.11                                | 1.3   | 2,560                                          | EGPA250E□□222MK30S |
|             | 2,200       | 14.5×25                | 0.028                           | 0.14  | 0.080                               | 0.90  | 2,620                                          | EGPA250E□□222MU25S |
|             | 2,700       | 12.5×35                | 0.024                           | 0.11  | 0.090                               | 0.80  | 2,970                                          | EGPA250E□□272MK35S |
|             | 2,700       | 14.5×30                | 0.023                           | 0.10  | 0.070                               | 0.70  | 3,060                                          | EGPA250E□□272MU30S |
|             | 2,700       | 16×25                  | 0.026                           | 0.13  | 0.080                               | 1.1   | 2,860                                          | EGPA250E□□272ML25S |
|             | 2,700       | 18×20                  | 0.032                           | 0.16  | 0.090                               | 0.60  | 2,490                                          | EGPA250E□□272MM20S |
|             | 3,300       | 12.5×40                | 0.021                           | 0.095 | 0.080                               | 0.50  | 3,340                                          | EGPA250E□□332MK40S |
|             | 3,300       | 14.5×35                | 0.021                           | 0.095 | 0.060                               | 0.70  | 3,380                                          | EGPA250E□□332MU35S |
|             | 3,300       | 16×30                  | 0.023                           | 0.10  | 0.070                               | 0.90  | 3,160                                          | EGPA250E□□332ML30S |
|             | 3,900       | 16×35                  | 0.020                           | 0.090 | 0.060                               | 0.70  | 3,590                                          | EGPA250E□□392ML35S |
|             | 3,900       | 18×25                  | 0.024                           | 0.12  | 0.070                               | 0.50  | 3,010                                          | EGPA250E□□392MM25S |
|             | 4,700       | 14.5×40                | 0.018                           | 0.081 | 0.050                               | 0.50  | 3,730                                          | EGPA250E□□472MU40S |
|             | 4,700       | 18×30                  | 0.022                           | 0.099 | 0.080                               | 0.60  | 3,390                                          | EGPA250E□□472MM30S |
|             | 5,600       | 16×40                  | 0.017                           | 0.077 | 0.040                               | 0.60  | 3,970                                          | EGPA250E□□562ML40S |
|             | 5,600       | 18×35                  | 0.019                           | 0.086 | 0.070                               | 0.50  | 3,840                                          | EGPA250E□□562MM35S |
|             | 6,800       | 18×40                  | 0.016                           | 0.072 | 0.030                               | 0.40  | 4,230                                          | EGPA250E□□682MM40S |
| 35          | 680         | 12.5×20                | 0.044                           | 0.22  | 0.18                                | 2.2   | 1,820                                          | EGPA350E□□681MK20S |
|             | 1,000       | 12.5×25                | 0.033                           | 0.17  | 0.13                                | 1.6   | 2,280                                          | EGPA350E□□102MK25S |
|             | 1,000       | 14.5×20                | 0.037                           | 0.19  | 0.11                                | 1.3   | 2,100                                          | EGPA350E□□102MU20S |
|             | 1,200       | 12.5×30                | 0.029                           | 0.13  | 0.11                                | 1.3   | 2,560                                          | EGPA350E□□122MK30S |
|             | 1,200       | 16×20                  | 0.034                           | 0.17  | 0.10                                | 1.3   | 2,280                                          | EGPA350E□□122ML20S |
|             | 1,200       | 14.5×25                | 0.028                           | 0.14  | 0.080                               | 0.90  | 2,620                                          | EGPA350E□□122MU25S |
|             | 1,500       | 12.5×35                | 0.024                           | 0.11  | 0.090                               | 0.80  | 2,970                                          | EGPA350E□□152MK35S |
|             | 1,500       | 14.5×30                | 0.023                           | 0.10  | 0.070                               | 0.70  | 3,060                                          | EGPA350E□□152MU30S |
|             | 1,500       | 18×20                  | 0.032                           | 0.16  | 0.090                               | 0.60  | 2,490                                          | EGPA350E□□152MM20S |
|             | 1,800       | 12.5×40                | 0.021                           | 0.095 | 0.080                               | 0.50  | 3,340                                          | EGPA350E□□182MK40S |
|             | 1,800       | 16×25                  | 0.026                           | 0.13  | 0.080                               | 1.1   | 2,860                                          | EGPA350E□□182ML25S |
|             | 2,200       | 14.5×35                | 0.021                           | 0.095 | 0.060                               | 0.70  | 3,380                                          | EGPA350E□□222MU35S |
|             | 2,200       | 16×30                  | 0.023                           | 0.10  | 0.070                               | 0.90  | 3,160                                          | EGPA350E□□222ML30S |
|             | 2,200       | 18×25                  | 0.024                           | 0.12  | 0.070                               | 0.50  | 3,010                                          | EGPA350E□□222MM25S |
|             | 2,700       | 14.5×40                | 0.018                           | 0.081 | 0.050                               | 0.50  | 3,730                                          | EGPA350E□□272MU40S |
|             | 2,700       | 16×35                  | 0.020                           | 0.090 | 0.060                               | 0.70  | 3,590                                          | EGPA350E□□272ML35S |
|             | 2,700       | 18×30                  | 0.022                           | 0.099 | 0.080                               | 0.60  | 3,390                                          | EGPA350E□□272MM30S |
|             | 3,300       | 16×40                  | 0.017                           | 0.077 | 0.040                               | 0.60  | 3,970                                          | EGPA350E□□332ML40S |
|             | 3,300       | 18×35                  | 0.019                           | 0.086 | 0.070                               | 0.50  | 3,840                                          | EGPA350E□□332MM35S |
|             | 4,700       | 18×40                  | 0.016                           | 0.072 | 0.030                               | 0.40  | 4,230                                          | EGPA350E□□472MM40S |
| 50          | 470         | 12.5×20                | 0.065                           | 0.33  | 0.18                                | 2.2   | 1,500                                          | EGPA500E□□471MK20S |
|             | 560         | 14.5×20                | 0.055                           | 0.28  | 0.11                                | 1.3   | 1,740                                          | EGPA500E□□561MU20S |
|             | 680         | 12.5×25                | 0.048                           | 0.24  | 0.13                                | 1.6   | 1,900                                          | EGPA500E□□681MK25S |
|             | 680         | 16×20                  | 0.043                           | 0.22  | 0.10                                | 1.3   | 2,040                                          | EGPA500E□□681ML20S |
|             | 820         | 12.5×30                | 0.041                           | 0.18  | 0.11                                | 1.3   | 2,150                                          | EGPA500E□□821MK30S |
|             | 820         | 14.5×25                | 0.040                           | 0.20  | 0.080                               | 0.90  | 2,190                                          | EGPA500E□□821MU25S |
|             | 1,000       | 12.5×35                | 0.034                           | 0.15  | 0.090                               | 0.80  | 2,510                                          | EGPA500E□□102MK35S |
|             | 1,000       | 14.5×30                | 0.036                           | 0.16  | 0.070                               | 0.70  | 2,470                                          | EGPA500E□□102MU30S |
|             | 1,000       | 16×25                  | 0.031                           | 0.16  | 0.080                               | 1.1   | 2,620                                          | EGPA500E□□102ML25S |
|             | 1,000       | 18×20                  | 0.039                           | 0.20  | 0.090                               | 0.60  | 2,240                                          | EGPA500E□□102MM20S |
|             | 1,200       | 12.5×40                | 0.028                           | 0.13  | 0.080                               | 0.50  | 2,870                                          | EGPA500E□□122MK40S |
|             | 1,200       | 14.5×35                | 0.029                           | 0.13  | 0.060                               | 0.70  | 2,840                                          | EGPA500E□□122MU35S |
|             | 1,200       | 16×30                  | 0.027                           | 0.13  | 0.070                               | 0.90  | 2,940                                          | EGPA500E□□122ML30S |
|             | 1,200       | 18×25                  | 0.029                           | 0.15  | 0.070                               | 0.50  | 2,750                                          | EGPA500E□□122MM25S |
|             | 1,500       | 16×35                  | 0.023                           | 0.10  | 0.060                               | 0.70  | 3,300                                          | EGPA500E□□152ML35S |
|             | 1,800       | 14.5×40                | 0.024                           | 0.11  | 0.050                               | 0.50  | 3,230                                          | EGPA500E□□182MU40S |
|             | 1,800       | 18×30                  | 0.026                           | 0.12  | 0.080                               | 0.60  | 3,140                                          | EGPA500E□□182MM30S |
|             | 2,200       | 16×40                  | 0.020                           | 0.090 | 0.040                               | 0.60  | 3,720                                          | EGPA500E□□222ML40S |
|             | 2,200       | 18×35                  | 0.022                           | 0.10  | 0.070                               | 0.50  | 3,510                                          | EGPA500E□□222MM35S |
|             | 2,700       | 18×40                  | 0.018                           | 0.080 | 0.030                               | 0.40  | 3,940                                          | EGPA500E□□272MM40S |

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

### ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φ D×L(mm) | ESR (Initial)<br>(Ω max/100kHz) |       | ESR (End of Life)<br>(Ω max/100kHz) |       | Rated ripple current<br>(mA rms/125°C, 100kHz) | Part No.           |
|-------------|-------------|------------------------|---------------------------------|-------|-------------------------------------|-------|------------------------------------------------|--------------------|
|             |             |                        | 20°C                            | -40°C | 20°C                                | -40°C |                                                |                    |
| 63          | 470         | 16×20                  | 0.085                           | 0.58  | 0.19                                | 3.0   | 1,790                                          | EGPA630E□□471ML20S |
|             | 680         | 16×25                  | 0.061                           | 0.48  | 0.14                                | 2.0   | 2,030                                          | EGPA630E□□681ML25S |
|             | 680         | 18×20                  | 0.070                           | 0.49  | 0.19                                | 3.0   | 1,910                                          | EGPA630E□□681MM20S |
|             | 820         | 16×30                  | 0.053                           | 0.41  | 0.090                               | 1.3   | 2,330                                          | EGPA630E□□821ML30S |
|             | 1,000       | 16×35                  | 0.044                           | 0.33  | 0.070                               | 0.90  | 2,580                                          | EGPA630E□□102ML35S |
|             | 1,000       | 18×25                  | 0.049                           | 0.34  | 0.14                                | 2.0   | 2,280                                          | EGPA630E□□102MM25S |
|             | 1,200       | 16×40                  | 0.036                           | 0.26  | 0.060                               | 0.80  | 2,900                                          | EGPA630E□□122ML40S |
|             | 1,200       | 18×30                  | 0.041                           | 0.26  | 0.090                               | 1.3   | 2,580                                          | EGPA630E□□122MM30S |
|             | 1,500       | 18×35                  | 0.035                           | 0.21  | 0.070                               | 0.90  | 2,890                                          | EGPA630E□□152MM35S |
| 80          | 1,800       | 18×40                  | 0.030                           | 0.18  | 0.060                               | 0.80  | 3,210                                          | EGPA630E□□182MM40S |
|             | 330         | 16×20                  | 0.085                           | 0.58  | 0.19                                | 3.0   | 1,790                                          | EGPA800E□□331ML20S |
|             | 470         | 16×25                  | 0.061                           | 0.48  | 0.14                                | 2.0   | 2,030                                          | EGPA800E□□471ML25S |
|             | 470         | 18×20                  | 0.070                           | 0.49  | 0.19                                | 3.0   | 1,910                                          | EGPA800E□□471MM20S |
|             | 560         | 16×30                  | 0.053                           | 0.41  | 0.090                               | 1.3   | 2,330                                          | EGPA800E□□561ML30S |
|             | 560         | 18×25                  | 0.049                           | 0.34  | 0.14                                | 2.0   | 2,280                                          | EGPA800E□□561MM25S |
|             | 680         | 16×35                  | 0.044                           | 0.33  | 0.070                               | 0.90  | 2,580                                          | EGPA800E□□681ML35S |
|             | 680         | 18×30                  | 0.041                           | 0.26  | 0.090                               | 1.3   | 2,580                                          | EGPA800E□□681MM30S |
|             | 820         | 16×40                  | 0.036                           | 0.26  | 0.060                               | 0.80  | 2,900                                          | EGPA800E□□821ML40S |
| 100         | 820         | 18×35                  | 0.035                           | 0.21  | 0.070                               | 0.90  | 2,890                                          | EGPA800E□□821MM35S |
|             | 1,200       | 18×40                  | 0.030                           | 0.18  | 0.060                               | 0.80  | 3,210                                          | EGPA800E□□122MM40S |
|             | 200         | 16×20                  | 0.11                            | 0.88  | 0.25                                | 3.9   | 1,580                                          | EGPA101E□□201ML20S |
|             | 270         | 18×20                  | 0.091                           | 0.73  | 0.22                                | 3.9   | 1,690                                          | EGPA101E□□271MM20S |
|             | 300         | 16×25                  | 0.079                           | 0.72  | 0.18                                | 2.7   | 1,990                                          | EGPA101E□□301ML25S |
|             | 360         | 16×30                  | 0.068                           | 0.62  | 0.13                                | 1.9   | 2,250                                          | EGPA101E□□361ML30S |
|             | 390         | 18×25                  | 0.064                           | 0.50  | 0.15                                | 2.7   | 2,110                                          | EGPA101E□□391MM25S |
|             | 470         | 16×35                  | 0.056                           | 0.50  | 0.090                               | 1.3   | 2,500                                          | EGPA101E□□471ML35S |
|             | 510         | 18×30                  | 0.054                           | 0.39  | 0.13                                | 1.9   | 2,410                                          | EGPA101E□□511MM30S |
|             | 560         | 16×40                  | 0.046                           | 0.39  | 0.080                               | 1.1   | 2,700                                          | EGPA101E□□561ML40S |
|             | 620         | 18×35                  | 0.044                           | 0.32  | 0.090                               | 1.3   | 2,690                                          | EGPA101E□□621MM35S |
|             | 750         | 18×40                  | 0.039                           | 0.27  | 0.080                               | 1.1   | 2,880                                          | EGPA101E□□751MM40S |

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

### ◆RATED RIPPLE CURRENT MULTIPLIERS

#### ●Frequency Multipliers

| Capacitance(μF) | Frequency(Hz) |      |      |      |
|-----------------|---------------|------|------|------|
|                 | 120           | 1k   | 10k  | 100k |
| 200             | 0.40          | 0.82 | 0.93 | 1.00 |
| 270 to 560      | 0.50          | 0.85 | 0.94 | 1.00 |
| 620 to 1,800    | 0.60          | 0.87 | 0.95 | 1.00 |
| 2,200 to 3,900  | 0.75          | 0.90 | 0.95 | 1.00 |
| 4,700 to 6,800  | 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.