

# GPA Series Upgrade!

- Guaranteed short time at 150°C
- 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

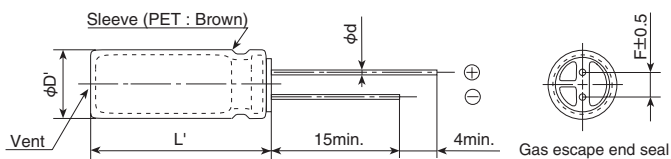


## SPECIFICATIONS

| Items   | Characteristics   |                                      |      |      |      |      |      |
|---|---|--------------------------------------|------|------|------|------|------|
| Category  | -40 to +125°C   |                                      |      |      |      |      |      |
| Temperature Range   | -40 to +125°C   |                                      |      |      |      |      |      |
| 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 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         |      |      |      |      |      |
| 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 4,500 hours (2,500 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         |      |      |      |      |      |

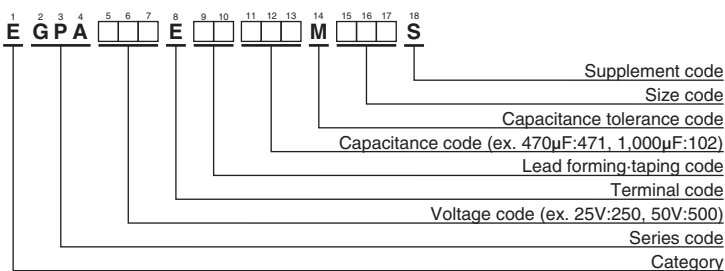
## DIMENSIONS [mm]

- 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>(V <sub>dc</sub> ) | 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>(mArms/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>(V <sub>dc</sub> ) | 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>(mArms/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 |
| 100                      | 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.

Please contact us for lifetime estimation.