

# GXE Series

- For automobile modules and other high temperature applications
- Downsized, long life, low impedance and better low temperature characteristics
- Endurance with ripple current : 2,000 to 5,000 hours at 125°C
- Solvent resistant type except 63 to 450V (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

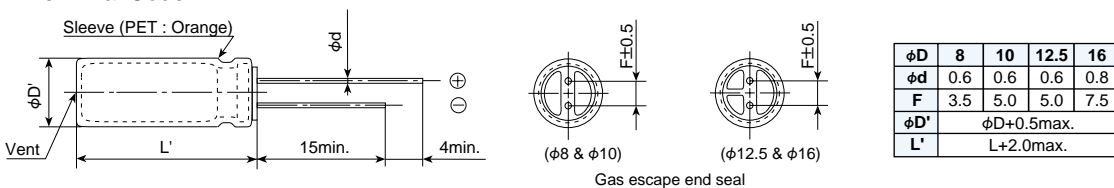


## ◆ SPECIFICATIONS

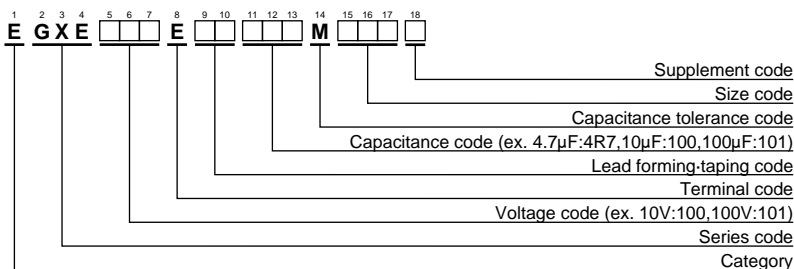
| Items   | Characteristics  |   |      |      |      |                              |                                      |      |      |             |             |
|---|--|---|------|------|------|------------------------------|--------------------------------------|------|------|-------------|-------------|
| Category  | -40 to +125°C (10 to 250V <sub>dc</sub> ) -25 to +125°C (350 to 450V <sub>dc</sub> )   |   |      |      |      |                              |                                      |      |      |             |             |
| Temperature Range   |  |   |      |      |      |                              |                                      |      |      |             |             |
| Rated Voltage Range   | 10 to 450V <sub>dc</sub>   |   |      |      |      |                              |                                      |      |      |             |             |
| Capacitance Tolerance   | ±20% (M) (at 20°C, 120Hz)  |   |      |      |      |                              |                                      |      |      |             |             |
| Leakage Current   | 10 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          |                                      |      |      |             |             |
|   |  |   |      |      |      | CV>1,000 I=0.04CV+100        |                                      |      |      |             |             |
| 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> )   | 10V   | 16V  | 25V  | 35V  | 50V                          | 63V                                  | 80V  | 100V | 160 to 250V | 350 to 450V |
|   | tanδ (Max.)  | 0.20  | 0.16 | 0.14 | 0.12 | 0.10                         | 0.10                                 | 0.08 | 0.08 | 0.20        | 0.24        |
| 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> )   | 10V   | 16V  | 25V  | 35V  | 50V                          | 63V                                  | 80V  | 100V | 160 to 250V | 350 to 450V |
|   | Z(-25°C)/Z(+20°C)  | 3   | 2    | 2    | 2    | 2                            | 2                                    | 2    | 2    | 3           | 6           |
|   | Z(-40°C)/Z(+20°C)  | 6   | 4    | 4    | 4    | 4                            | 4                                    | 4    | 4    | 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 for the specified time at 125°C.   |   |      |      |      |                              |                                      |      |      |             |             |
|   |  | 10 to 100V <sub>dc</sub>                                  |      |      |      |                              | 160 to 450V <sub>dc</sub>            |      |      |             |             |
|   | Time   | φ8 : 2,000hours φ10 : 3,000hours φ12.5 & φ16 : 5,000hours |      |      |      |                              | 2,000hours                           |      |      |             |             |
|   | Capacitance change   | ≤±30% of the initial value                                |      |      |      |                              | ≤±20% of the initial value           |      |      |             |             |
|   | D.F. (tanδ)  | ≤300% of the initial specified value                      |      |      |      |                              | ≤200% of the initial specified value |      |      |             |             |
| Leakage current   | ≤The initial specified value   |   |      |      |      | ≤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 (500 hours for 350 to 450V <sub>dc</sub> ) 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. |   |      |      |      |                              |                                      |      |      |             |             |
|   |  | 10 to 100V <sub>dc</sub>                                  |      |      |      |                              | 160 to 450V <sub>dc</sub>            |      |      |             |             |
|   | Capacitance change   | ≤±30% of the initial value                                |      |      |      |                              | ≤±20% of the initial value           |      |      |             |             |
|   | D.F. (tanδ)  | ≤300% 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



## ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"

◆STANDARD RATINGS

□ is not solvent resistant.

| WV (Vdc) | Cap (μF) | Case size φD×L(mm) | Impedance (Ωmax/20°C, 100kHz) | Rated ripple current (mA <sub>rms</sub> /125°C, Note1) | Part No.           | WV (Vdc)           | Cap (μF)           | Case size φD×L(mm) | Impedance (Ωmax/20°C, 100kHz) | Rated ripple current (mA <sub>rms</sub> /125°C, Note1) | Part No.           |                    |
|----------|----------|--------------------|-------------------------------|--|--------------------|--------------------|--------------------|--------------------|-------------------------------|--|--------------------|--------------------|
| 10       | 220      | 8×12               | 0.32                          | 340  | EGXE100E□□221MH12D | 80                 | 47                 | 10×12.5            | 0.80                          | 480  | EGXE800E□□470MJC5S |                    |
|          | 330      | 10×12.5            | 0.15                          | 620  | EGXE100E□□331MJC5S |                    | 100                | 10×20              | 0.39                          | 790  | EGXE800E□□101MJ20S |                    |
|          | 470      | 10×12.5            | 0.15                          | 620  | EGXE100E□□471MJC5S |                    | 220                | 12.5×25            | 0.18                          | 1,240  | EGXE800E□□221MK25S |                    |
|          | 1,000    | 10×20              | 0.075                         | 950  | EGXE100E□□102MJ20S |                    | 330                | 12.5×30            | 0.16                          | 1,390  | EGXE800E□□331MK30S |                    |
|          | 2,200    | 12.5×25            | 0.040                         | 1,350  | EGXE100E□□222MK25S |                    | 470                | 16×25              | 0.11                          | 1,500  | EGXE800E□□471ML25S |                    |
|          | 3,300    | 16×25              | 0.031                         | 1,620  | EGXE100E□□332ML25S |                    | 100                | 4.7                | 8×12                          | 2.0  | 130                | EGXE101E□□4R7MH12D |
|          | 4,700    | 16×31.5            | 0.025                         | 1,860  | EGXE100E□□472MLN3S |                    |                    | 10                 | 8×12                          | 1.5  | 150                | EGXE101E□□100MH12D |
| 16       | 100      | 8×12               | 0.32                          | 340  | EGXE160E□□101MH12D | 22                 |                    | 10×12.5            | 0.80                          | 480  | EGXE101E□□220MJC5S |                    |
|          | 220      | 10×12.5            | 0.15                          | 620  | EGXE160E□□221MJC5S | 33                 |                    | 10×12.5            | 0.80                          | 480  | EGXE101E□□330MJC5S |                    |
|          | 330      | 10×12.5            | 0.15                          | 620  | EGXE160E□□331MJC5S | 47                 |                    | 10×16              | 0.55                          | 630  | EGXE101E□□470MJ16S |                    |
|          | 470      | 10×16              | 0.094                         | 790  | EGXE160E□□471MJ16S | 100                |                    | 12.5×20            | 0.25                          | 990  | EGXE101E□□101MK20S |                    |
|          | 1,000    | 12.5×20            | 0.058                         | 1,080  | EGXE160E□□102MK20S | 220                |                    | 16×25              | 0.11                          | 1,500  | EGXE101E□□221ML25S |                    |
|          | 2,200    | 16×25              | 0.031                         | 1,620  | EGXE160E□□222ML25S | 330                | 16×31.5            | 0.079              | 1,790                         | EGXE101E□□331MLN3S                                     |                    |                    |
|          | 3,300    | 16×31.5            | 0.025                         | 1,860  | EGXE160E□□332MLN3S | 160                | 22                 | 10×20              | —                             | 115  | EGXE161E□□220MJ20S |                    |
| 25       | 100      | 8×12               | 0.32                          | 340  | EGXE250E□□101MH12D |                    | 33                 | 10×25              | —                             | 154  | EGXE161E□□330MJ25S |                    |
|          | 220      | 10×12.5            | 0.15                          | 620  | EGXE250E□□221MJC5S |                    | 47                 | 12.5×20            | —                             | 187  | EGXE161E□□470MK20S |                    |
|          | 330      | 10×16              | 0.094                         | 790  | EGXE250E□□331MJ16S |                    | 68                 | 12.5×25            | —                             | 245  | EGXE161E□□680MK25S |                    |
|          | 470      | 10×20              | 0.075                         | 950  | EGXE250E□□471MJ20S |                    | 100                | 16×25              | —                             | 329  | EGXE161E□□101ML25S |                    |
|          | 1,000    | 12.5×25            | 0.040                         | 1,350  | EGXE250E□□102MK25S |                    | 150                | 16×31.5            | —                             | 434  | EGXE161E□□151MLN3S |                    |
|          | 2,200    | 16×31.5            | 0.025                         | 1,860  | EGXE250E□□222MLN3S |                    | 200                | 10                 | 10×20                         | —  | 78                 | EGXE201E□□100MJ20S |
|          | 35       | 100                | 8×12                          | 0.32   | 340                | EGXE350E□□101MH12D |                    | 22                 | 10×25                         | —  | 126                | EGXE201E□□220MJ25S |
| 100      |          | 10×12.5            | 0.15                          | 620  | EGXE350E□□101MJC5S | 33                 |                    | 12.5×20            | —                             | 157  | EGXE201E□□330MK20S |                    |
| 220      |          | 10×16              | 0.094                         | 790  | EGXE350E□□221MJ16S | 47                 |                    | 12.5×25            | —                             | 204  | EGXE201E□□470MK25S |                    |
| 330      |          | 10×20              | 0.075                         | 950  | EGXE350E□□331MJ20S | 68                 |                    | 16×20              | —                             | 250  | EGXE201E□□680ML20S |                    |
| 470      |          | 12.5×20            | 0.058                         | 1,080  | EGXE350E□□471MK20S | 100                |                    | 16×25              | —                             | 329  | EGXE201E□□101ML25S |                    |
| 1,000    |          | 16×25              | 0.031                         | 1,620  | EGXE350E□□102ML25S | 250                |                    | 10                 | 10×20                         | —  | 78                 | EGXE251E□□100MJ20S |
| 50       |          | 10                 | 8×12                          | 0.75   | 180                |                    | EGXE500E□□100MH12D | 22                 | 12.5×20                       | —  | 128                | EGXE251E□□220MK20S |
|          | 22       | 8×12               | 0.50                          | 250  | EGXE500E□□220MH12D |                    | 33                 | 12.5×25            | —                             | 171  | EGXE251E□□330MK25S |                    |
|          | 33       | 8×12               | 0.50                          | 280  | EGXE500E□□330MH12D |                    | 47                 | 16×25              | —                             | 225  | EGXE251E□□470ML25S |                    |
|          | 47       | 8×12               | 0.50                          | 280  | EGXE500E□□470MH12D |                    | 68                 | 16×31.5            | —                             | 292  | EGXE251E□□680MLN3S |                    |
|          | 100      | 10×12.5            | 0.20                          | 520  | EGXE500E□□101MJC5S |                    | 350                | 4.7                | 10×20                         | —  | 53                 | EGXE351E□□4R7MJ20S |
|          | 220      | 10×20              | 0.098                         | 880  | EGXE500E□□221MJ20S |                    |                    | 10                 | 10×25                         | —  | 85                 | EGXE351E□□100MJ25S |
|          | 330      | 12.5×20            | 0.081                         | 990  | EGXE500E□□331MK20S | 22                 |                    | 12.5×25            | —                             | 139  | EGXE351E□□220MK25S |                    |
| 470      | 12.5×25  | 0.059              | 1,150                         | EGXE500E□□471MK25S                                     | 33                 | 16×25              |                    | —                  | 189                           | EGXE351E□□330ML25S                                     |                    |                    |
| 1,000    | 16×31.5  | 0.032              | 1,590                         | EGXE500E□□102MLN3S                                     | 47                 | 16×31.5            |                    | —                  | 243                           | EGXE351E□□470MLN3S                                     |                    |                    |
| 63       | 33       | 8×12               | 1.5                           | 150  | EGXE630E□□330MH12D | 400                |                    | 4.7                | 10×20                         | —  | 53                 | EGXE401E□□4R7MJ20S |
|          | 47       | 10×12.5            | 0.59                          | 530  | EGXE630E□□470MJC5S |                    |                    | 10                 | 10×25                         | —  | 86                 | EGXE401E□□100MJ25S |
|          | 100      | 10×16              | 0.41                          | 690  | EGXE630E□□101MJ16S |                    | 22                 | 12.5×30            | —                             | 142  | EGXE401E□□220MK30S |                    |
|          | 220      | 12.5×20            | 0.16                          | 1,050  | EGXE630E□□221MK20S |                    | 33                 | 16×25              | —                             | 189  | EGXE401E□□330ML25S |                    |
|          | 330      | 12.5×25            | 0.12                          | 1,290  | EGXE630E□□331MK25S |                    | 47                 | 16×31.5            | —                             | 243  | EGXE401E□□470MLN3S |                    |
|          | 470      | 12.5×30            | 0.097                         | 1,460  | EGXE630E□□471MK30S |                    | 450                | 4.7                | 10×25                         | —  | 58                 | EGXE451E□□4R7MJ25S |
|          | 1,000    | 16×31.5            | 0.059                         | 1,850  | EGXE630E□□102MLN3S |                    |                    | 10                 | 12.5×20                       | —  | 86                 | EGXE451E□□100MK20S |
| 80       | 22       | 8×12               | 1.5                           | 150  | EGXE800E□□220MH12D | 22                 |                    | 16×25              | —                             | 154  | EGXE451E□□220ML25S |                    |
|          | 33       | 10×12.5            | 0.8                           | 480  | EGXE800E□□330MJC5S | 33                 |                    | 16×31.5            | —                             | 203  | EGXE451E□□330MLN3S |                    |

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

(Note1) Ripple current frequency

10 to 100V = 100kHz

160 to 450V = 120Hz

◆RATED RIPPLE CURRENT MULTIPLIERS

●(10 to 100Vdc) Frequency Multipliers

| Capacitance (μF) | Frequency (Hz) |      |      |      |
|------------------|----------------|------|------|------|
|                  | 120            | 1k   | 10k  | 100k |
| 4.7 to 100       | 0.40           | 0.75 | 0.90 | 1.00 |
| 220 to 470       | 0.50           | 0.85 | 0.94 | 1.00 |
| 1,000            | 0.60           | 0.87 | 0.95 | 1.00 |
| 2,200 to 3,300   | 0.75           | 0.90 | 0.95 | 1.00 |
| 4,700            | 0.85           | 0.95 | 0.98 | 1.00 |

●(160 to 450Vdc) Frequency Multipliers

| Capacitance (μF) | Frequency (Hz) |      |      |      |      |      |  |
|------------------|----------------|------|------|------|------|------|--|
|                  | 50             | 120  | 300  | 1k   | 10k  | 100k |  |
| 4.7 to 33        | 0.75           | 1.00 | 1.25 | 1.50 | 1.75 | 1.80 |  |
| 47 to 150        | 0.80           | 1.00 | 1.15 | 1.30 | 1.40 | 1.50 |  |

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.