

# GXE Series

- For automobile modules and other high temperature applications
- Downsize, 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)
- RoHS2 Compliant
- AEC-Q200 compliant : Please contact Chemi-Con for more details, test data, information.



## ◆ SPECIFICATIONS

| Items   | Characteristics  |   |      |      |      |                              |                                      |      |      |                     |                  |
|---|--|---|------|------|------|------------------------------|--------------------------------------|------|------|---------------------|------------------|
| <b>Category</b>   | -40 to +125°C (10 to 250V <sub>dc</sub> ) -25 to +125°C (350 to 450V <sub>dc</sub> )   |   |      |      |      |                              |                                      |      |      |                     |                  |
| <b>Temperature Range</b>  |  |   |      |      |      |                              |                                      |      |      |                     |                  |
| <b>Rated Voltage Range</b>  | 10 to 450V <sub>dc</sub>   |   |      |      |      |                              |                                      |      |      |                     |                  |
| <b>Capacitance Tolerance</b>  | ±20% (M) (at 20°C, 120Hz)  |   |      |      |      |                              |                                      |      |      |                     |                  |
| <b>Leakage Current</b>  | 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) |                  |
| <b>Dissipation Factor (tan δ)</b>   | Rated voltage (V <sub>dc</sub> )   | 10V   | 16V  | 25V  | 35V  | 50V                          | 63V                                  | 80V  | 100V | 160 to 250V         | 350 to 450V      |
|   | tan δ (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 value above for each 1,000μF increase.   |   |      |      |      |                              |                                      |      |      |                     | (at 20°C, 120Hz) |
| <b>Low Temperature Characteristics (Max. Impedance Ratio)</b>                             | 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)          |                  |
| <b>Endurance</b>  | 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 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. (tan δ)   | ≤300% of the initial specified value                      |      |      |      |                              | ≤200% of the initial specified value |      |      |                     |                  |
| Leakage current   | ≤The initial specified value   |   |      |      |      | ≤The initial specified value |                                      |      |      |                     |                  |
| <b>Shelf Life</b>   | 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. (tan δ)   | ≤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 (V <sub>dc</sub> ) | Cap (μF) | Case size φD×L(mm) | Impedance (Ω max./20°C, 100kHz) | Rated ripple current (mA rms/125°C, Note1) | Part No.           | WV (V <sub>dc</sub> ) | Cap (μF) | Case size φD×L(mm) | Impedance (Ω max./20°C, 100kHz) | Rated ripple current (mA rms/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                |
| 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□□100MK20S |
|                       | 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                         |                    |
| 25                    | 3,300    | 16×31.5            | 0.025                           | 1,860                                      | EGXE160E□□332MLN3S | 160                   | 22       | 10×20              | —                               | 115  | EGXE161E□□220MJ20S |
|                       | 100      | 8×12               | 0.32                            | 340  | EGXE250E□□101MH12D |                       | 33       | 10×25              | —                               | 154  | EGXE161E□□330MH12D |
|                       | 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 |
| 35                    | 2,200    | 16×31.5            | 0.025                           | 1,860                                      | EGXE250E□□222MLN3S | 200                   | 10       | 10×20              | —                               | 78   | EGXE201E□□100MJ20S |
|                       | 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 |
| 50                    | 1,000    | 16×25              | 0.031                           | 1,620                                      | EGXE350E□□102ML25S | 250                   | 10       | 10×20              | —                               | 78   | EGXE251E□□100MJ20S |
|                       | 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                 |
| 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                 |
|                       | 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                 |
| 1,000                 | 16×31.5  | 0.059              | 1,850                           | EGXE630E□□102MLN3S                         | 10                 | 12.5×20               |          | —                  | 86                              | EGXE451E□□100MK20S                         |                    |
| 22                    | 8×12     | 1.5                | 150                             | EGXE800E□□220MH12D                         | 22                 | 16×25                 |          | —                  | 154                             | EGXE451E□□220ML25S                         |                    |
| 80                    | 33       | 10×12.5            | 0.80                            | 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

● Frequency Multipliers

(10 to 100V<sub>dc</sub>)

| 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 450V<sub>dc</sub>)

| 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.