

GK<sub>HH</sub> series

105°C PC Board Mounting Type

Anti-Solvent  
Feature  
(Through 100V only)

- Higher C/V products.
- Plentiful line-up from  $\phi 35 \times 63$  to  $\phi 40 \times 100\text{mm}$ .
- Auxiliary terminals provided to assure anti-vibration performance.
- Adapted to the RoHS directive (2002/95/EC).

Products which are scheduled to be discontinued.  
Not recommended for new designs

GK<sub>HH</sub>

High C/V GU

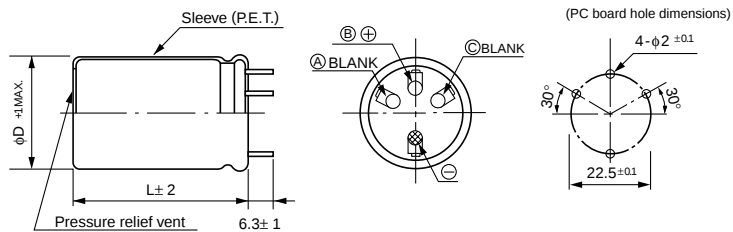
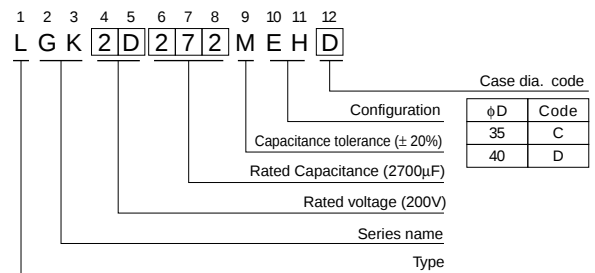


## ■ Specifications

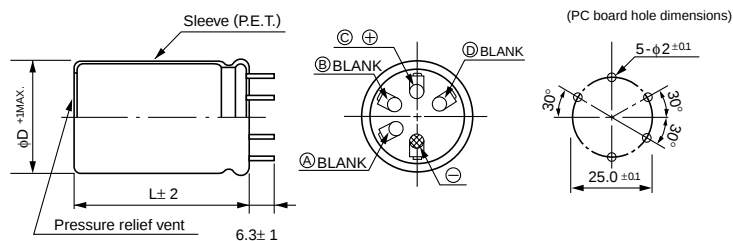
|                               |                                                                                                                                                                                                                             |               |      |           |      |      |                    |      |                                                   |      |      |      |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------|-----------|------|------|--------------------|------|---------------------------------------------------|------|------|------|
| Item                          | Performance Characteristics                                                                                                                                                                                                 |               |      |           |      |      |                    |      |                                                   |      |      |      |
| Category Temperature Range    | - 40 to +105°C (16 to 250V) , - 25 to +105°C (400V)                                                                                                                                                                         |               |      |           |      |      |                    |      |                                                   |      |      |      |
| Rated Voltage Range           | 16 to 400V                                                                                                                                                                                                                  |               |      |           |      |      |                    |      |                                                   |      |      |      |
| Rated Capacitance Range       | 560 to 68000μF                                                                                                                                                                                                              |               |      |           |      |      |                    |      |                                                   |      |      |      |
| Capacitance Tolerance         | ±20% at 120Hz, 20°C                                                                                                                                                                                                         |               |      |           |      |      |                    |      |                                                   |      |      |      |
| Leakage Current               | I ≤ 3√CV (μA) (After 5 minutes' application of rated voltage) [C : Rated Capacitance (μF) V : Voltage (V)]                                                                                                                  |               |      |           |      |      |                    |      |                                                   |      |      |      |
| Tangent of loss angle (tan δ) | Measurement frequency : 120Hz, Temperature : 20°C                                                                                                                                                                           |               |      |           |      |      |                    |      |                                                   |      |      |      |
|                               | Rated voltage(V)                                                                                                                                                                                                            | 16            | 25   | 35        | 50   | 63   | 80                 | 100  | 160                                               | 200  | 250  | 400  |
|                               | tan δ (MAX.)                                                                                                                                                                                                                | 0.60          | 0.50 | 0.40      | 0.35 | 0.30 | 0.30               | 0.25 | 0.20                                              | 0.15 | 0.15 | 0.30 |
| Stability at Low Temperature  | Measurement frequency : 120Hz                                                                                                                                                                                               |               |      |           |      |      |                    |      |                                                   |      |      |      |
|                               | Rated voltage(V)                                                                                                                                                                                                            |               |      | 16 to 250 |      |      | 400                |      |                                                   |      |      |      |
|                               | Impedance ratio                                                                                                                                                                                                             | Z-25°C/Z+20°C |      |           | 4    |      |                    | 8    |                                                   |      |      |      |
|                               | ZT/Z20 (MAX.)                                                                                                                                                                                                               | Z-40°C/Z+20°C |      |           | 15   |      |                    | —    |                                                   |      |      |      |
| Endurance                     | The specifications listed at right shall be met when the capacitors are restored to 20°C after D.C. bias plus rated ripple current is applied for 2000 hours at 105°C, the peak voltage shall not exceed the rated voltage. |               |      |           |      |      | Capacitance change |      | Within ±20% of initial value                      |      |      |      |
|                               |                                                                                                                                                                                                                             |               |      |           |      |      | tan δ              |      | 200% or less of initial specified value           |      |      |      |
|                               |                                                                                                                                                                                                                             |               |      |           |      |      | Leakage current    |      | Less than or equal to the initial specified value |      |      |      |
| Shelf Life                    | After storing the capacitors under no load at 105°C for 1000 hours, and after performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they will meet the requirements listed at right.                       |               |      |           |      |      | Capacitance change |      | Within ±15% of initial value                      |      |      |      |
|                               |                                                                                                                                                                                                                             |               |      |           |      |      | tan δ              |      | 150% or less of initial specified value           |      |      |      |
|                               |                                                                                                                                                                                                                             |               |      |           |      |      | Leakage current    |      | Less than or equal to the initial specified value |      |      |      |
| Marking                       | Printed with white color letter on black sleeve.                                                                                                                                                                            |               |      |           |      |      |                    |      |                                                   |      |      |      |

## ■ Drawing

- For all of  $\phi 35\text{mm}$  products and for 63mmL or shorter with  $\phi 40\text{mm}$ .

Type numbering system (Example : 200V 2700 $\mu\text{F}$ )

- For 63mmL or longer with  $\phi 40\text{mm}$ .



## Notes:

As blank terminals are not insulated from capacitor element, they shall be mounted on independent lands.

## ● Frequency coefficient of rated ripple current

| Frequency (Hz) |             | 50   | 60   | 120  | 1 k  | 10k or more |
|----------------|-------------|------|------|------|------|-------------|
| Coeff.         | 16 to 100V  | 0.88 | 0.90 | 1.00 | 1.15 | 1.15        |
|                | 160 to 250V | 0.85 | 0.88 | 1.00 | 1.15 | 1.20        |
|                | 400V        | 0.88 | 0.90 | 1.00 | 1.10 | 1.15        |

Minimum order quantity : 50pcs.

- Dimension table in next page.

## ■Dimensions

| Cap.(μF)<br>Code |     | V(Code)<br>eD | 16V (1C) |       | 25V (1E) |       | 35V (1V) |       | 50V (1H) |       |
|------------------|-----|---------------|----------|-------|----------|-------|----------|-------|----------|-------|
|                  |     | 35            | 40       | 35    | 40       | 35    | 40       | 35    | 40       |       |
| 18000            | 183 |               |          |       |          |       |          |       | 35×68    | 40×63 |
|                  |     |               |          |       |          |       |          |       | 5.55     | 5.80  |
| 22000            | 223 |               |          |       |          |       | 35×63    | 40×50 | 35×80    | 40×63 |
|                  |     |               |          |       |          |       | 5.10     | 5.00  | 6.35     | 6.15  |
| 27000            | 273 |               |          |       |          |       | 35×68    | 40×63 |          |       |
|                  |     |               |          |       |          |       | 5.50     | 5.80  |          |       |
| 33000            | 333 |               |          |       | 35×63    | 40×50 | 35×80    | 40×63 |          |       |
|                  |     |               |          |       | 5.60     | 5.50  | 6.25     | 6.05  |          |       |
| 39000            | 393 |               |          |       | 35×68    | 40×63 |          |       |          |       |
|                  |     |               |          |       | 6.00     | 6.30  |          |       |          |       |
| 47000            | 473 |               | 35×63    | 40×50 | 35×80    | 40×63 |          |       |          |       |
|                  |     |               | 5.90     | 5.75  | 6.80     | 6.60  |          |       |          |       |
| 56000            | 563 |               | 35×68    | 40×63 |          |       |          |       |          |       |
|                  |     |               | 6.20     | 6.45  |          |       |          |       |          |       |
| 68000            | 683 |               | 35×80    | 40×63 |          |       |          |       |          |       |
|                  |     |               | 6.90     | 6.70  |          |       |          |       |          |       |

| V(Code)<br>Cap. (μF)<br>Code |     | φD | 63V (1J)        |                 | 80V (1K)        |                 | 100V (2A)       |                 |
|------------------------------|-----|----|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                              |     |    | 35              | 40              | 35              | 40              | 35              | 40              |
| 5600                         | 562 |    |                 |                 |                 |                 | 35 × 68<br>4.40 | 40 × 63<br>4.55 |
| 6800                         | 682 |    |                 |                 |                 |                 | 35 × 80<br>4.80 | 40 × 63<br>4.65 |
| 8200                         | 822 |    |                 |                 | 35 × 63<br>4.75 | 40 × 50<br>4.65 |                 |                 |
| 10000                        | 103 |    |                 |                 | 35 × 80<br>5.45 | 40 × 63<br>5.00 |                 |                 |
| 12000                        | 123 |    | 35 × 63<br>5.35 | 40 × 50<br>5.25 |                 |                 |                 |                 |
| 15000                        | 153 |    | 35 × 68<br>5.85 | 40 × 63<br>6.10 |                 |                 |                 |                 |

| V(Code)<br>Cap.(μF)<br>Code<br>φD |     | 160V (2C)      |                | 200V (2D)      |                | 250V (2E)      |                | 400V (2G)                           |                |
|-----------------------------------|-----|----------------|----------------|----------------|----------------|----------------|----------------|-------------------------------------|----------------|
|                                   |     | 35             | 40             | 35             | 40             | 35             | 40             | 35                                  | 40             |
| 560                               | 561 |                |                |                |                |                |                | 35×63<br>1.75                       | 40×50<br>1.70  |
| 680                               | 681 |                |                |                |                |                |                | 35×80<br>2.05                       | 40×63<br>2.00  |
| 820                               | 821 |                |                |                |                |                |                | 35×80<br>2.20                       |                |
| 1000                              | 102 |                |                |                |                |                |                | 35×100<br>2.65                      | 40×80<br>2.60  |
| 1200                              | 122 |                |                |                |                | 35×63<br>2.75  | 40×50<br>2.70  |                                     | 40×100<br>3.00 |
| 1500                              | 152 |                |                |                |                | 35×68<br>3.20  | 40×63<br>3.35  |                                     |                |
| 1800                              | 182 |                |                | 35×63<br>3.30  | 40×50<br>3.20  | 35×100<br>4.05 | 40×80<br>3.95  |                                     |                |
| 2200                              | 222 | 35×63<br>3.50  | 40×50<br>3.45  | 35×80<br>3.90  | 40×63<br>3.80  | 35×100<br>4.35 | 40×80<br>4.20  |                                     |                |
| 2700                              | 272 | 35×68<br>3.90  | 40×63<br>4.10  | 35×100<br>4.65 | 40×80<br>4.50  |                | 40×100<br>5.00 |                                     |                |
| 3300                              | 332 | 35×80<br>4.55  | 40×63<br>4.40  |                | 40×80<br>4.90  |                |                |                                     |                |
| 3900                              | 392 | 35×100<br>5.30 | 40×80<br>5.20  |                | 40×100<br>5.70 |                |                |                                     |                |
| 4700                              | 472 |                | 40×100<br>6.15 |                |                |                |                | Case size φD×L (mm)<br>Rated ripple |                |

Rated Ripple (Arms) at 105°C 120Hz