

## Upgrade

# HK

## Miniaturized Series

- Smaller case sizes than HE series
- Load life of 3000 hours at 105°C
- Addition of 6.3 ~ 100V, 500V rated voltage
- Complied to the RoHS directive



Solvent Proof  
WV ≤ 100V



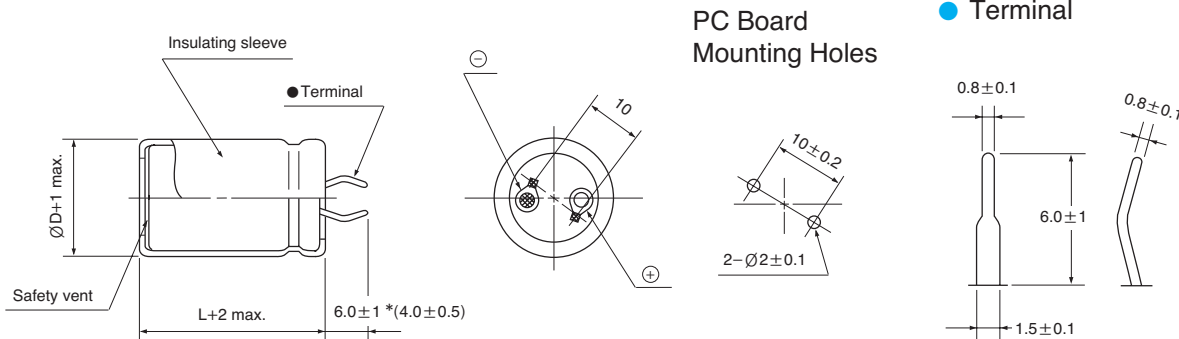
Miniaturized



| Item                                                                          | Characteristics                                                                                                                                                              |         |      |        |                                   |         |         |          |
|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------|--------|-----------------------------------|---------|---------|----------|
| Operating temperature range                                                   | WV<350 : -40 ~ +105°C, WV ≥ 350 : -25 ~ +105°C                                                                                                                               |         |      |        |                                   |         |         |          |
| Capacitance tolerance                                                         | ± 20% at 120Hz, 20°C                                                                                                                                                         |         |      |        |                                   |         |         |          |
| Leakage current max.                                                          | I=3√CV (μA) (after 5 minutes)                                                                                                                                                |         |      |        |                                   |         |         |          |
| Dissipation factor max.<br>(at 120Hz, 20°C)                                   | Capacitance > 1000μF : tanδ increases by 0.01 for each 1000μF from below value.                                                                                              |         |      |        |                                   |         |         |          |
|                                                                               | WV                                                                                                                                                                           | 6.3, 10 | 16   | 25, 35 | 50, 63                            | 80, 100 | 160~400 | 450, 500 |
|                                                                               | tanδ                                                                                                                                                                         | 0.50    | 0.40 | 0.35   | 0.25                              | 0.20    | 0.15    | 0.20     |
| Load life<br>(after application of the rated voltage for 3000 hours at 105°C) | Leakage current                                                                                                                                                              |         |      |        | Less than specified value         |         |         |          |
|                                                                               | Capacitance change                                                                                                                                                           |         |      |        | Within ± 20% of initial value     |         |         |          |
|                                                                               | tanδ                                                                                                                                                                         |         |      |        | Less than 200% of specified value |         |         |          |
| Shelf life (at 105°C)                                                         | After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value.<br>The measurement shall be performed at 20°C by the KS C 6035 clause 5.4. |         |      |        |                                   |         |         |          |

## DRAWING

Unit : mm



- \* Shorter terminal(4.0 ± 0.5) is also available upon request.  
Terminal length of height 20mm products is applied shorter terminal to standard terminal type.

## FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

| WV \ Frequency | 50Hz | 120Hz | 300Hz | 1kHz | 10kHz ≤ |
|----------------|------|-------|-------|------|---------|
| ~ 100          | 0.85 | 1.00  | 1.06  | 1.15 | 1.20    |
| 160 ~ 250      | 0.85 | 1.00  | 1.20  | 1.25 | 1.45    |
| 350 ~          | 0.85 | 1.00  | 1.15  | 1.20 | 1.40    |

# LARGE ALUMINUM ELECTROLYTIC CAPACITORS

**HK** series

## ● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

| WV<br>μF ØD | 6.3           |                 |               |               |               | 10            |                 |               |               |               | 16            |                 |               |               |               |
|-------------|---------------|-----------------|---------------|---------------|---------------|---------------|-----------------|---------------|---------------|---------------|---------------|-----------------|---------------|---------------|---------------|
|             | 22            | 25.4            | 30            | 35            | 40            | 22            | 25.4            | 30            | 35            | 40            | 22            | 25.4            | 30            | 35            | 40            |
| 8200        |               |                 |               |               |               |               |                 |               |               |               | 22×25<br>2.14 |                 |               |               |               |
| 10000       |               |                 |               |               |               | 22×25<br>2.17 |                 |               |               |               | 22×30<br>2.48 | 25.4×25<br>2.56 |               |               |               |
| 12000       | 22×25<br>2.19 |                 |               |               |               | 22×30<br>2.48 |                 |               |               |               | 22×35<br>2.80 | 25.4×30<br>2.90 | 30×25<br>2.97 |               |               |
| 15000       | 22×30<br>2.53 |                 |               |               |               | 22×35<br>2.83 | 25.4×25<br>2.75 |               |               |               | 22×40<br>3.17 | 25.4×35<br>3.29 | 30×30<br>3.38 |               |               |
| 18000       | 22×35<br>2.85 | 25.4×25<br>2.77 |               |               |               | 22×35<br>3.00 | 25.4×30<br>3.11 |               |               |               | 22×45<br>3.50 | 25.4×40<br>3.65 | 30×30<br>3.57 |               |               |
| 22000       | 22×35<br>3.04 | 25.4×30<br>3.15 |               |               |               | 22×40<br>3.35 | 25.4×35<br>3.48 | 30×25<br>3.38 |               |               |               | 25.4×45<br>4.03 | 30×35<br>3.98 |               |               |
| 27000       | 22×40<br>3.40 | 25.4×35<br>3.53 | 30×25<br>3.42 |               |               | 22×50<br>3.88 | 25.4×40<br>3.87 | 30×30<br>3.79 |               |               |               | 25.4×50<br>4.42 | 30×40<br>4.39 | 35×30<br>4.29 |               |
| 33000       | 22×50<br>3.92 | 25.4×40<br>3.91 | 30×30<br>3.83 |               |               |               | 25.4×45<br>4.26 | 30×35<br>4.20 |               |               |               |                 | 30×45<br>4.79 | 35×35<br>4.71 |               |
| 39000       |               | 25.4×45<br>4.26 | 30×35<br>4.20 |               |               |               | 25.4×50<br>4.60 | 30×40<br>4.57 | 35×30<br>4.46 |               |               |                 | 30×50<br>5.16 | 35×40<br>5.10 |               |
| 47000       |               | 25.4×50<br>4.63 | 30×40<br>4.60 | 35×30<br>4.50 |               |               |                 | 30×45<br>4.95 | 35×35<br>4.87 |               |               |                 |               | 35×45<br>5.50 | 40×40<br>5.60 |
| 56000       |               |                 | 30×50<br>5.17 | 35×40<br>5.12 |               |               |                 |               | 35×45<br>5.49 | 40×40<br>5.59 |               |                 |               |               | 40×50<br>6.22 |
| 68000       |               |                 |               | 35×45<br>5.52 | 40×40<br>5.62 |               |                 |               |               | 40×50<br>6.22 |               |                 |               |               | 40×60<br>6.83 |

| WV<br>μF ØD | 25            |                 |               |               |               | 35            |                 |               |               |               | 50            |                 |               |               |               |
|-------------|---------------|-----------------|---------------|---------------|---------------|---------------|-----------------|---------------|---------------|---------------|---------------|-----------------|---------------|---------------|---------------|
|             | 22            | 25.4            | 30            | 35            | 40            | 22            | 25.4            | 30            | 35            | 40            | 22            | 25.4            | 30            | 35            | 40            |
| 2700        |               |                 |               |               |               |               |                 |               |               |               | 22×30<br>1.94 |                 |               |               |               |
| 3300        |               |                 |               |               |               | 22×25<br>1.62 |                 |               |               |               | 22×35<br>2.20 |                 |               |               |               |
| 3900        |               |                 |               |               |               | 22×30<br>1.88 |                 |               |               |               | 22×40<br>2.52 | 25.4×35<br>2.62 | 30×25<br>2.54 |               |               |
| 4700        | 22×25<br>1.73 |                 |               |               |               | 22×35<br>2.14 | 25.4×25<br>2.09 |               |               |               | 22×45<br>2.81 | 25.4×40<br>2.93 | 30×30<br>2.87 |               |               |
| 5600        | 22×30<br>1.98 |                 |               |               |               | 22×35<br>2.29 | 25.4×30<br>2.37 | 30×25<br>2.43 |               |               | 22×50<br>3.11 | 25.4×40<br>3.11 | 30×35<br>3.21 |               |               |
| 6800        | 22×30<br>2.14 |                 |               |               |               | 22×40<br>2.61 | 25.4×35<br>2.71 | 30×30<br>2.79 |               |               |               | 25.4×50<br>3.64 | 30×40<br>3.61 | 35×30<br>3.53 |               |
| 8200        | 22×35<br>2.42 | 25.4×30<br>2.50 |               |               |               | 22×50<br>3.02 | 25.4×40<br>3.02 | 30×30<br>2.95 |               |               |               |                 | 30×45<br>3.94 | 35×35<br>3.87 |               |
| 10000       | 22×40<br>2.77 | 25.4×35<br>2.88 |               |               |               |               | 25.4×45<br>3.43 | 30×35<br>3.38 |               |               |               |                 | 30×50<br>4.42 | 35×40<br>4.37 |               |
| 12000       | 22×45<br>3.09 | 25.4×40<br>3.22 | 30×30<br>3.15 |               |               |               | 25.4×50<br>3.78 | 30×40<br>3.75 | 35×30<br>3.67 |               |               |                 |               | 35×45<br>4.78 |               |
| 15000       |               | 25.4×45<br>3.62 | 30×35<br>3.57 | 35×30<br>3.65 |               |               |                 | 30×45<br>4.19 | 35×35<br>4.12 |               |               |                 |               | 35×50<br>5.24 | 40×40<br>5.13 |
| 18000       |               | 25.4×50<br>3.98 | 30×40<br>3.95 | 35×35<br>4.06 |               |               |                 |               | 35×40<br>4.52 |               |               |                 |               |               | 40×50<br>5.76 |
| 22000       |               |                 | 30×45<br>4.36 | 35×35<br>4.28 |               |               |                 |               | 35×45<br>4.95 | 40×40<br>5.04 |               |                 |               |               | 40×50<br>5.98 |
| 27000       |               |                 |               | 35×45<br>4.92 | 40×40<br>5.01 |               |                 |               |               | 40×50<br>5.92 |               |                 |               |               | 40×60<br>6.61 |

| WV<br>μF ØD | 63            |                 |               |               |               | 80            |                 |               |               |               | 100                                                              |                 |               |               |               |
|-------------|---------------|-----------------|---------------|---------------|---------------|---------------|-----------------|---------------|---------------|---------------|------------------------------------------------------------------|-----------------|---------------|---------------|---------------|
|             | 22            | 25.4            | 30            | 35            | 40            | 22            | 25.4            | 30            | 35            | 40            | 22                                                               | 25.4            | 30            | 35            | 40            |
| 820         |               |                 |               |               |               | 22×25<br>1.37 |                 |               |               |               | 22×30<br>1.46                                                    | 25.4×25<br>1.51 |               |               |               |
| 1000        |               |                 |               |               |               | 22×30<br>1.62 | 25.4×25<br>1.67 |               |               |               | 22×35<br>1.71                                                    | 25.4×30<br>1.77 |               |               |               |
| 1200        | 22×25<br>1.37 |                 |               |               |               | 22×30<br>1.67 | 25.4×25<br>1.72 |               |               |               | 22×40<br>1.86                                                    | 25.4×35<br>1.94 | 30×25<br>1.88 |               |               |
| 1500        | 22×30<br>1.50 | 25.4×25<br>1.54 |               |               |               | 22×35<br>1.98 | 25.4×30<br>2.05 |               |               |               | 22×45<br>2.18                                                    | 25.4×40<br>2.28 | 30×30<br>2.23 |               |               |
| 1800        | 22×30<br>1.64 | 25.4×25<br>1.69 |               |               |               | 22×40<br>2.28 | 25.4×35<br>2.37 | 30×25<br>2.30 |               |               |                                                                  | 25.4×45<br>2.61 | 30×35<br>2.57 |               |               |
| 2200        | 22×35<br>1.86 | 25.4×30<br>1.92 |               |               |               | 22×45<br>2.51 | 25.4×35<br>2.49 | 30×30<br>2.56 |               |               |                                                                  | 25.4×50<br>2.85 | 30×40<br>2.83 | 35×30<br>2.76 |               |
| 2700        | 22×40<br>2.17 | 25.4×30<br>2.13 | 30×25<br>2.18 |               |               |               | 25.4×45<br>3.03 | 30×35<br>2.99 |               |               |                                                                  |                 | 30×45<br>3.27 | 35×35<br>3.22 |               |
| 3300        | 22×50<br>2.53 | 25.4×40<br>2.53 | 30×30<br>2.48 |               |               |               | 25.4×50<br>3.33 | 30×40<br>3.30 | 35×30<br>3.23 |               |                                                                  |                 | 30×50<br>3.59 | 35×40<br>3.55 |               |
| 3900        |               | 25.4×45<br>2.88 | 30×35<br>2.84 |               |               |               |                 | 30×45<br>3.75 | 35×35<br>3.69 |               |                                                                  |                 |               | 35×45<br>4.03 |               |
| 4700        |               | 25.4×50<br>3.20 | 30×40<br>3.10 | 35×30<br>3.10 |               |               |                 | 30×50<br>4.10 | 35×40<br>4.06 |               |                                                                  |                 |               | 35×50<br>4.40 | 40×40<br>4.31 |
| 5600        |               |                 | 30×45<br>3.51 | 35×35<br>3.46 |               |               |                 |               | 35×45<br>4.44 |               |                                                                  |                 |               |               | 40×50<br>4.88 |
| 6800        |               |                 | 30×50<br>3.92 | 35×40<br>3.88 |               |               |                 |               | 35×50<br>4.90 | 40×40<br>4.80 |                                                                  |                 |               |               | 40×50<br>5.18 |
| 8200        |               |                 |               | 35×45<br>4.22 |               |               |                 |               |               | 40×50<br>5.32 | ← Case size ØD×L (mm)<br>← Ripple current (Arms) at 105°C, 120Hz |                 |               |               |               |
| 10000       |               |                 |               | 35×50<br>4.74 | 40×40<br>4.64 |               |                 |               |               |               |                                                                  |                 |               |               |               |

HK series

## ● DIMENSIONS &amp; MAXIMUM PERMISSIBLE RIPPLE CURRENT

| WV<br>μF<br>ØD | 160           |                 |               |               | 200           |                 |               |               | 250           |                 |               |               |
|----------------|---------------|-----------------|---------------|---------------|---------------|-----------------|---------------|---------------|---------------|-----------------|---------------|---------------|
|                | 22            | 25.4            | 30            | 35            | 22            | 25.4            | 30            | 35            | 22            | 25.4            | 30            | 35            |
| 120            |               |                 |               |               |               |                 |               |               | 22×20<br>0.56 |                 |               |               |
| 150            |               |                 |               |               | 22×20<br>0.63 |                 |               |               | 22×25<br>0.68 | 25.4×20<br>0.69 |               |               |
| 180            |               |                 |               |               | 22×20<br>0.69 | 25.4×20<br>0.76 |               |               | 22×25<br>0.74 | 25.4×20<br>0.76 |               |               |
| 220            | 22×20<br>0.76 |                 |               |               | 22×25<br>0.82 | 25.4×20<br>0.84 |               |               | 22×25<br>0.82 | 25.4×25<br>0.90 | 30×20<br>0.92 |               |
| 270            | 22×25<br>0.91 | 25.4×20<br>0.93 |               |               | 22×25<br>0.91 | 25.4×25<br>1.00 | 30×20<br>1.02 |               | 22×30<br>0.97 | 25.4×25<br>1.00 | 30×20<br>1.02 |               |
| 330            | 22×25<br>1.01 | 25.4×20<br>1.03 |               |               | 22×30<br>1.07 | 25.4×25<br>1.11 | 30×20<br>1.13 |               | 22×35<br>1.14 | 25.4×30<br>1.18 | 30×25<br>1.21 | 35×20<br>1.23 |
| 390            | 22×25<br>1.09 | 25.4×25<br>1.20 | 30×20<br>1.23 |               | 22×30<br>1.17 | 25.4×25<br>1.20 | 30×25<br>1.31 | 35×20<br>1.34 | 22×40<br>1.30 | 25.4×35<br>1.35 | 30×25<br>1.31 | 35×25<br>1.42 |
| 470            | 22×30<br>1.28 | 25.4×25<br>1.32 | 30×20<br>1.35 |               | 22×35<br>1.36 | 25.4×30<br>1.40 | 30×25<br>1.44 | 35×20<br>1.47 | 22×45<br>1.50 | 25.4×35<br>1.48 | 30×30<br>1.53 | 35×25<br>1.56 |
| 560            | 22×35<br>1.48 | 25.4×30<br>1.53 | 30×25<br>1.57 | 35×20<br>1.60 | 22×40<br>1.56 | 25.4×30<br>1.53 | 30×25<br>1.57 | 35×25<br>1.70 | 22×50<br>1.71 | 25.4×40<br>1.70 | 30×30<br>1.67 | 35×25<br>1.70 |
| 680            | 22×40<br>1.72 | 25.4×30<br>1.69 | 30×25<br>1.73 | 35×20<br>1.76 | 22×45<br>1.80 | 25.4×35<br>1.79 | 30×30<br>1.84 | 35×25<br>1.88 |               | 25.4×50<br>2.05 | 30×35<br>1.94 | 35×30<br>1.98 |
| 820            | 22×45<br>1.98 | 25.4×35<br>1.96 | 30×30<br>2.02 | 35×25<br>2.06 |               | 25.4×45<br>2.16 | 30×30<br>2.02 | 35×25<br>2.06 |               |                 | 30×40<br>2.23 | 35×35<br>2.29 |
| 1000           | 22×50<br>2.28 | 25.4×40<br>2.28 | 30×30<br>2.23 | 35×25<br>2.28 |               | 25.4×50<br>2.48 | 30×35<br>2.35 | 35×30<br>2.41 |               |                 | 30×50<br>2.68 | 35×40<br>2.65 |
| 1200           |               | 25.4×45<br>2.41 | 30×35<br>2.44 | 35×30<br>2.44 |               |                 | 30×40<br>2.50 | 35×35<br>2.57 |               |                 | 30×60<br>2.92 | 35×45<br>2.80 |
| 1500           |               | 25.4×50<br>2.81 | 30×40<br>2.79 | 35×30<br>2.73 |               |                 | 30×50<br>3.04 | 35×40<br>3.00 |               |                 |               | 35×50<br>3.25 |
| 1800           |               |                 | 30×45<br>3.19 | 35×35<br>3.14 |               |                 |               | 35×45<br>3.43 |               |                 |               |               |
| 2200           |               |                 | 30×50<br>3.44 | 35×45<br>3.55 |               |                 |               | 35×50<br>3.68 |               |                 |               |               |
| 2700           |               |                 |               | 35×50<br>4.08 |               |                 |               |               |               |                 |               |               |

| WV<br>μF<br>ØD | 350           |                 |               |               | 400           |                 |               |               | 450           |                 |               |               |
|----------------|---------------|-----------------|---------------|---------------|---------------|-----------------|---------------|---------------|---------------|-----------------|---------------|---------------|
|                | 22            | 25.4            | 30            | 35            | 22            | 25.4            | 30            | 35            | 22            | 25.4            | 30            | 35            |
| 47             |               |                 |               |               | 22×20<br>0.34 |                 |               |               |               |                 |               |               |
| 56             | 22×20<br>0.37 |                 |               |               | 22×20<br>0.37 | 25.4×20<br>0.41 |               |               | 22×25<br>0.40 |                 |               |               |
| 68             | 22×20<br>0.41 | 25.4×20<br>0.45 |               |               | 22×25<br>0.44 | 25.4×20<br>0.45 |               |               | 22×30<br>0.47 | 25.4×25<br>0.48 |               |               |
| 82             | 22×25<br>0.48 | 25.4×20<br>0.49 |               |               | 22×25<br>0.48 | 25.4×25<br>0.53 | 30×20<br>0.54 |               | 22×30<br>0.51 | 25.4×25<br>0.53 |               |               |
| 100            | 22×25<br>0.53 | 25.4×25<br>0.58 | 30×20<br>0.60 |               | 22×30<br>0.57 | 25.4×25<br>0.58 | 30×20<br>0.60 |               | 22×35<br>0.60 | 25.4×30<br>0.62 | 30×25<br>0.64 |               |
| 120            | 22×30<br>0.62 | 25.4×25<br>0.64 | 30×20<br>0.65 |               | 22×35<br>0.66 | 25.4×25<br>0.64 | 30×25<br>0.70 | 35×20<br>0.71 | 22×40<br>0.69 | 25.4×30<br>0.68 | 30×25<br>0.70 | 35×25<br>0.76 |
| 150            | 22×35<br>0.74 | 25.4×30<br>0.76 | 30×25<br>0.78 | 35×20<br>0.80 | 22×40<br>0.78 | 25.4×30<br>0.76 | 30×25<br>0.78 | 35×20<br>0.80 | 22×45<br>0.81 | 25.4×40<br>0.85 | 30×30<br>0.83 | 35×25<br>0.85 |
| 180            | 22×40<br>0.85 | 25.4×30<br>0.83 | 30×25<br>0.86 | 35×20<br>0.87 | 22×45<br>0.89 | 25.4×35<br>0.88 | 30×30<br>0.91 | 35×25<br>0.93 | 22×50<br>0.93 | 25.4×40<br>0.93 | 30×30<br>0.91 | 35×25<br>0.93 |
| 220            | 22×45<br>0.98 | 25.4×35<br>0.98 | 30×30<br>1.00 | 35×25<br>1.03 | 22×50<br>1.03 | 25.4×40<br>1.03 | 30×30<br>1.00 | 35×25<br>1.03 |               | 25.4×45<br>1.07 | 30×35<br>1.06 | 35×25<br>1.03 |
| 270            | 22×50<br>1.14 | 25.4×40<br>1.14 | 30×30<br>1.11 | 35×25<br>1.14 |               | 25.4×45<br>1.19 | 30×35<br>1.17 | 35×30<br>1.20 |               |                 | 30×40<br>1.23 | 35×30<br>1.20 |
| 330            |               | 25.4×45<br>1.31 | 30×35<br>1.30 | 35×30<br>1.33 |               | 25.4×50<br>1.37 | 30×40<br>1.36 | 35×30<br>1.33 |               |                 | 30×45<br>1.42 | 35×35<br>1.40 |
| 390            |               | 25.4×50<br>1.49 | 30×40<br>1.48 | 35×35<br>1.52 |               |                 | 30×45<br>1.54 | 35×35<br>1.52 |               |                 | 30×50<br>1.61 | 35×40<br>1.59 |
| 470            |               |                 | 30×45<br>1.69 | 35×35<br>1.67 |               |                 | 30×50<br>1.76 | 35×40<br>1.74 |               |                 |               | 35×45<br>1.82 |
| 560            |               |                 | 30×50<br>1.92 | 35×40<br>1.90 |               |                 |               | 35×45<br>1.98 |               |                 |               | 35×50<br>2.06 |
| 680            |               |                 |               | 35×50<br>2.27 |               |                 |               | 35×50<br>2.27 |               |                 |               |               |

| WV<br>μF<br>ØD | 500           |                 |               |               |               |
|----------------|---------------|-----------------|---------------|---------------|---------------|
|                | 22            | 25.4            | 30            | 35            | 40            |
| 82             | 22×40<br>0.42 | 25.4×35<br>0.43 | 30×20<br>0.40 |               |               |
| 100            | 22×45<br>0.49 | 25.4×35<br>0.48 | 30×30<br>0.50 |               |               |
| 120            | 22×50<br>0.51 | 25.4×40<br>0.50 | 30×30<br>0.50 | 35×25<br>0.51 |               |
| 150            |               | 25.4×45<br>0.53 | 30×35<br>0.53 | 35×30<br>0.54 |               |
| 180            |               | 25.4×50<br>0.55 | 30×40<br>0.55 | 35×35<br>0.57 |               |
| 220            |               |                 | 30×50<br>0.89 | 35×35<br>0.84 |               |
| 270            |               |                 | 30×55<br>1.02 | 35×40<br>0.97 |               |
| 330            |               |                 | 30×60<br>1.17 | 35×50<br>1.17 |               |
| 390            |               |                 |               | 35×60<br>1.36 |               |
| 470            |               |                 |               |               | 40×60<br>1.57 |
| 560            |               |                 |               |               | 40×70<br>1.82 |

← Case size ØD×L (mm)  
 ← Ripple current (Arms) at 105°C, 120Hz