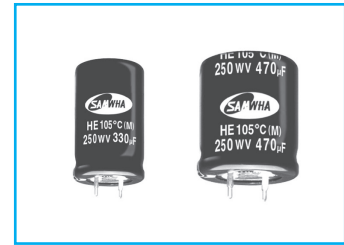


LARGE ALUMINUM ELECTROLYTIC CAPACITORS

HE Wide Temperature Range, Standard Series

- Wide temperature range of -40(-25) ~ +105°C
- Standard snap-in terminal type
- Complied to the RoHS directive

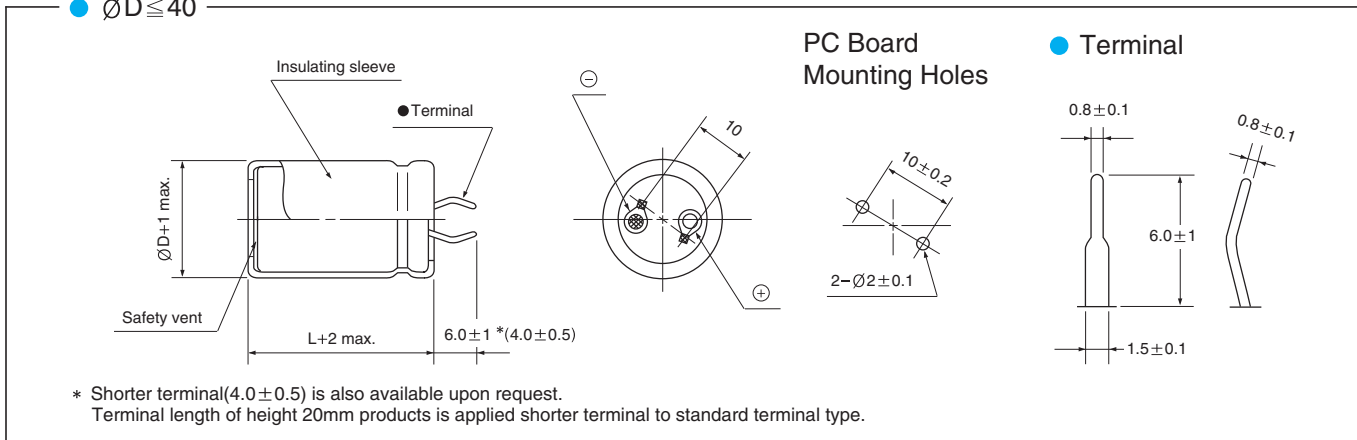


| Item | Characteristics | | | | | | | | | | | | | | | |
|--|---|-----------------------------------|---------|--------|---------|-----------|-----------|-----------|-----------|------|------|------|------|------|------|------|
| Operating temperature range | WV < 350 : -40 ~ +105°C, WV ≥ 350 : -25 ~ +105°C | | | | | | | | | | | | | | | |
| Capacitance tolerance | ±20% at 120Hz, 20°C | | | | | | | | | | | | | | | |
| Leakage current max. | $I = 3\sqrt{CV}$ (µA) (after 5 minutes) | | | | | | | | | | | | | | | |
| Dissipation factor max. (at 120Hz, 20°C) | Capacitance > 1000µF : tanδ increases by 0.01 for each 1000µF from below value. | | | | | | | | | | | | | | | |
| | <table border="1"> <tr> <td>WV</td> <td>6.3, 10</td> <td>16</td> <td>25, 35</td> <td>50, 63</td> <td>80, 100</td> <td>160 ~ 400</td> <td>450 ~ 550</td> </tr> <tr> <td>tanδ</td> <td>0.50</td> <td>0.40</td> <td>0.35</td> <td>0.25</td> <td>0.20</td> <td>0.15</td> <td>0.20</td> </tr> </table> | WV | 6.3, 10 | 16 | 25, 35 | 50, 63 | 80, 100 | 160 ~ 400 | 450 ~ 550 | tanδ | 0.50 | 0.40 | 0.35 | 0.25 | 0.20 | 0.15 |
| WV | 6.3, 10 | 16 | 25, 35 | 50, 63 | 80, 100 | 160 ~ 400 | 450 ~ 550 | | | | | | | | | |
| tanδ | 0.50 | 0.40 | 0.35 | 0.25 | 0.20 | 0.15 | 0.20 | | | | | | | | | |
| Load life (after application of the rated voltage for 2000 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. The measurement shall be performed at 20°C by the KS C IEC 60384 - 4 | | | | | | | | | | | | | | | |

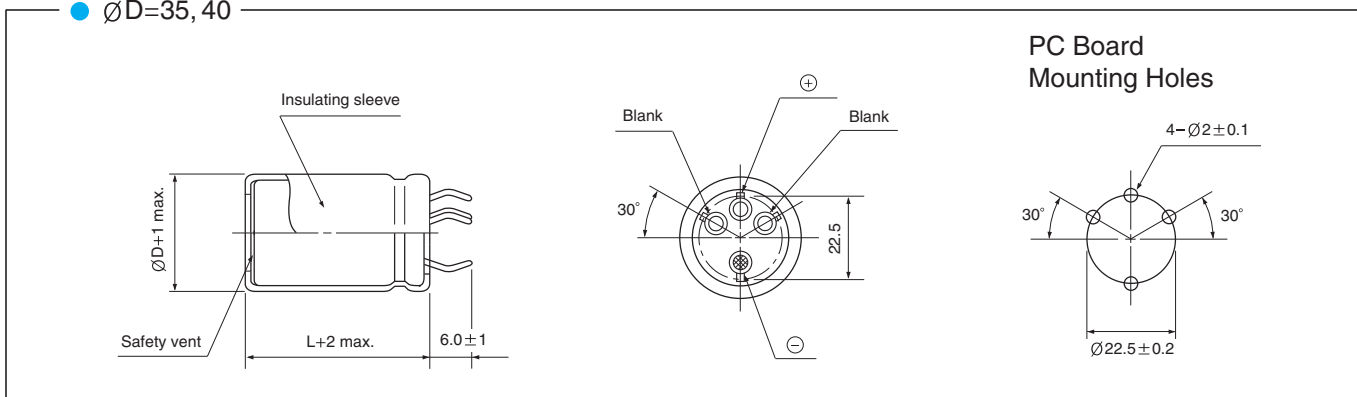
● DRAWING

Unit : mm

● ØD ≤ 40



● ØD=35, 40



● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

| WV | Frequency(Hz) | 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 |
| 315 ~ | | 0.85 | 1.00 | 1.15 | 1.20 | 1.40 |

HE series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

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

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

| WV 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 1.37 | | | | | 22×30 1.46 | 25.4×25 1.51 | | | |
| 1000 | | | | | | 22×30 1.62 | 25.4×25 1.67 | | | | 22×35 1.71 | 25.4×30 1.77 | | | |
| 1200 | 22×25 1.37 | | | | | 22×30 1.67 | 25.4×25 1.72 | | | | 22×40 1.86 | 25.4×35 1.94 | 30×25 1.88 | | |
| 1500 | 22×30 1.50 | 25.4×25 1.54 | | | | 22×35 1.98 | 25.4×30 2.05 | | | | 22×45 2.18 | 25.4×40 2.28 | 30×30 2.23 | | |
| 1800 | 22×30 1.64 | 25.4×25 1.69 | | | | 22×40 2.28 | 25.4×35 2.37 | 30×25 2.30 | | | | 25.4×45 2.61 | 30×35 2.57 | | |
| 2200 | 22×35 1.86 | 25.4×30 1.92 | | | | 22×45 2.51 | 25.4×35 2.49 | 30×30 2.56 | | | | 25.4×50 2.85 | 30×40 2.83 | 35×30 2.76 | |
| 2700 | 22×40 2.17 | 25.4×30 2.13 | 30×25 2.18 | | | | 25.4×45 3.03 | 30×35 2.99 | | | | | 30×45 3.27 | 35×35 3.22 | |
| 3300 | 22×50 2.53 | 25.4×40 2.53 | 30×30 2.48 | | | | 25.4×50 3.33 | 30×40 3.30 | 35×30 3.23 | | | | 30×50 3.59 | 35×40 3.55 | |
| 3900 | | 25.4×45 2.88 | 30×35 2.84 | | | | | 30×45 3.75 | 35×35 3.69 | | | | | 35×45 4.03 | |
| 4700 | | 25.4×50 3.20 | 30×40 3.17 | 35×30 3.10 | | | | 30×50 4.10 | 35×40 4.06 | | | | | 35×50 4.40 | 40×40 4.31 |
| 5600 | | | 30×45 3.51 | 35×35 3.46 | | | | | 35×45 4.44 | | | | | | 40×50 4.88 |
| 6800 | | | 30×50 3.92 | 35×40 3.88 | | | | | 35×50 4.90 | 40×40 4.80 | | | | | 40×50 5.18 |
| 8200 | | | | 35×45 4.22 | | | | | | 40×50 5.32 | | | | | |
| 10000 | | | | 35×50 4.74 | 40×40 4.64 | | | | | | | | | | |

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

LARGE ALUMINUM ELECTROLYTIC CAPACITORS

HE series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

| WV μF / ØD | 160 | | | | | 200 | | | | | 250 | | | | |
|---------------|---------------|-----------------|---------------|---------------|---------------|---------------|-----------------|---------------|---------------|---------------|---------------|-----------------|---------------|---------------|---------------|
| | 22 | 25.4 | 30 | 35 | 40 | 22 | 25.4 | 30 | 35 | 40 | 22 | 25.4 | 30 | 35 | 40 |
| 150 | | | | | | 22×20 0.63 | | | | | 22×20 0.68 | 25.4×20 0.69 | | | |
| 180 | 22×20 0.69 | | | | | 22×20 0.69 | | | | | 22×25 0.74 | 25.4×20 0.76 | 30×20 0.83 | | |
| 220 | 22×20 0.76 | | | | | 22×25 0.82 | 25.4×20 0.84 | | | | 22×25 0.88 | 25.4×25 0.90 | 30×20 0.92 | | |
| 270 | 22×25 0.91 | 25.4×20 0.93 | | | | 22×25 0.91 | 25.4×25 1.00 | 30×20 | | | 22×30 1.03 | 25.4×25 1.06 | 30×25 1.09 | | |
| 330 | 22×25 1.01 | 25.4×25 1.10 | 30×20 1.13 | | | 22×30 1.07 | 25.4×25 1.11 | 30×20 1.13 | | | 22×35 1.20 | 25.4×30 1.18 | 30×25 1.21 | | |
| 390 | 22×30 1.17 | 25.4×25 1.20 | 30×20 1.23 | | | 22×30 1.24 | 25.4×30 1.28 | 30×25 1.31 | | | 22×40 1.36 | 25.4×35 1.42 | 30×25 1.42 | 35×25 | |
| 470 | 22×30 1.36 | 25.4×25 1.32 | 30×25 1.44 | | | 22×35 1.43 | 25.4×30 1.48 | 30×25 1.44 | 35×25 1.56 | | 22×45 1.56 | 25.4×35 1.56 | 30×30 1.53 | 35×25 1.56 | |
| 560 | 22×35 1.56 | 25.4×30 1.53 | 30×25 1.57 | 35×25 1.70 | | 22×45 1.63 | 25.4×35 1.62 | 30×30 1.67 | 35×25 1.70 | | | 25.4×40 1.86 | 30×30 1.76 | 35×30 1.80 | |
| 680 | 22×40 1.80 | 25.4×35 1.79 | 30×25 1.73 | 35×25 1.88 | | 22×50 1.88 | 25.4×40 1.96 | 30×30 1.84 | 35×25 1.88 | | | | 30×35 2.12 | 35×35 2.09 | |
| 820 | | 25.4×40 2.06 | 30×30 2.02 | 35×25 2.06 | | | 25.4×45 2.25 | 30×35 2.13 | 35×30 2.18 | | | | 30×40 2.23 | 35×35 2.40 | |
| 1000 | | 25.4×40 2.38 | 30×35 2.35 | 35×30 2.41 | | | | 30×40 2.57 | 35×35 2.53 | | | | | 35×40 2.76 | 40×40 2.81 |
| 1200 | | 25.4×50 2.52 | 30×40 2.50 | 35×30 2.44 | | | | 30×50 2.72 | 35×35 2.57 | 40×40 2.85 | | | | 35×45 2.91 | 40×50 3.08 |
| 1500 | | | | 35×40 3.00 | 40×40 3.19 | | | | 35×45 3.13 | 40×50 3.44 | | | | | 40×60 3.68 |

| WV μF / ØD | 315 | | | | | 350 | | | | | 400 | | | | |
|---------------|---------------|-----------------|---------------|---------------|---------------|---------------|-----------------|---------------|---------------|---------------|---------------|-----------------|---------------|---------------|---------------|
| | 22 | 25.4 | 30 | 35 | 40 | 22 | 25.4 | 30 | 35 | 40 | 22 | 25.4 | 30 | 35 | 40 |
| 56 | | | | | | | | | | | 22×20 0.37 | | | | |
| 68 | | | | | | 22×20 0.41 | | | | | 22×20 0.44 | 25.4×20 0.45 | | | |
| 82 | 22×20 0.45 | | | | | 22×25 0.48 | 25.4×20 0.49 | | | | 22×25 0.48 | 25.4×25 0.53 | 30×20 0.54 | | |
| 100 | 22×25 0.53 | 25.4×20 0.55 | | | | 22×25 0.53 | 25.4×25 0.59 | 30×20 0.60 | | | 22×25 0.56 | 25.4×25 0.58 | 30×20 0.60 | | |
| 120 | 22×30 0.62 | 25.4×25 0.64 | 30×20 0.65 | | | 22×30 0.62 | 25.4×25 0.64 | 30×20 0.65 | | | 22×30 0.66 | 25.4×30 0.68 | 30×25 0.70 | | |
| 150 | 22×30 0.74 | 25.4×25 0.76 | 30×20 0.73 | | | 22×35 0.78 | 25.4×30 0.76 | 30×25 0.78 | | | 22×35 0.77 | 25.4×30 0.75 | 30×25 0.78 | | |
| 180 | 22×35 0.85 | 25.4×30 0.88 | 30×25 0.86 | | | 22×40 0.89 | 25.4×35 0.88 | 30×30 0.91 | | | 22×40 0.89 | 25.4×40 0.93 | 30×30 0.91 | 35×25 0.93 | |
| 220 | 22×40 0.98 | 25.4×35 0.98 | 30×25 0.98 | | | 22×50 1.03 | 25.4×40 1.03 | 30×30 1.00 | 35×25 1.03 | | 22×45 1.02 | 25.4×40 1.01 | 30×30 1.00 | 35×30 1.08 | |
| 270 | | 25.4×40 1.19 | 30×30 1.12 | 35×25 1.14 | | | 25.4×45 1.19 | 30×35 1.17 | 35×30 1.20 | | | 25.4×45 1.17 | 30×35 1.17 | 35×30 1.20 | |
| 330 | | 25.4×40 1.24 | 30×35 1.36 | 35×30 1.33 | | | 25.4×50 1.35 | 30×40 1.36 | 35×30 1.36 | | | 25.4×50 1.35 | 30×40 1.36 | 35×35 1.40 | |
| 390 | | | 30×35 1.47 | 35×30 1.52 | | | 25.4×50 1.47 | 30×40 1.54 | 35×35 1.54 | | | 25.4×60 1.54 | 30×50 1.61 | 35×40 1.59 | |
| 470 | | | 30×40 1.70 | 35×35 1.74 | | | | | 35×40 1.74 | | | | 30×50 1.76 | 35×40 1.82 | 40×40 1.85 |
| 560 | | | 30×45 1.90 | 35×40 1.90 | | | | | 35×45 2.06 | 40×40 2.02 | | | | 35×45 2.06 | 40×50 2.18 |
| 680 | | | 30×50 2.12 | 35×45 2.18 | 40×40 2.23 | | | | | 40×50 2.40 | | | | 35×50 2.27 | 40×60 2.57 |

| WV μF / ØD | 450 | | | | | 500 | | | | | 550 | | | | |
|---------------|---------------|-----------------|---------------|---------------|---------------|---------------|-----------------|---------------|---------------|---------------|---------------|-----------------|---------------|---------------|---------------|
| | 22 | 25.4 | 30 | 35 | 40 | 22 | 25.4 | 30 | 35 | 40 | 22 | 25.4 | 30 | 35 | 40 |
| 47 | 22×20 0.34 | | | | | 22×25 0.32 | 25.4×20 0.32 | | | | 22×25 0.35 | | | | |
| 56 | 22×25 0.40 | 25.4×20 0.41 | | | | 22×30 0.37 | 25.4×25 0.38 | 30×20 0.40 | | | 22×30 0.41 | 25.4×25 0.42 | | | |
| 68 | 22×25 0.44 | 25.4×25 0.48 | 30×20 0.49 | | | 22×30 0.50 | 25.4×25 0.42 | 30×25 0.47 | | | 22×35 0.48 | 25.4×30 0.49 | 30×25 0.51 | | |
| 82 | 22×30 0.51 | 25.4×25 0.52 | 30×20 0.54 | | | 22×35 0.53 | 25.4×30 0.61 | 30×25 0.52 | | | 22×40 0.55 | 25.4×35 0.57 | 30×25 0.56 | | |
| 100 | 22×30 0.56 | 25.4×25 0.58 | 30×25 0.64 | | | 22×35 0.55 | 25.4×35 0.70 | 30×25 0.56 | 35×25 0.61 | | 22×45 0.64 | 25.4×40 0.66 | 30×30 0.66 | 35×25 0.67 | |
| 120 | 22×35 0.66 | 25.4×30 0.67 | 30×25 0.70 | 35×20 0.76 | | 22×40 0.66 | 25.4×35 0.71 | 30×30 0.80 | 35×30 0.71 | | 22×50 0.73 | 25.4×40 0.72 | 30×35 0.75 | 35×30 0.75 | |
| 150 | 22×45 0.80 | 25.4×30 0.77 | 30×25 0.83 | 35×25 0.85 | | | 25.4×40 0.81 | 30×30 0.82 | 35×30 0.79 | | | 25.4×50 0.88 | 30×40 0.88 | 35×30 0.88 | |
| 180 | | 25.4×35 0.93 | 30×30 0.90 | 35×25 0.98 | | | 25.4×45 0.86 | 30×40 1.02 | 35×30 1.05 | | | | 30×45 1.00 | 35×35 1.01 | |
| 220 | | 25.4×40 1.08 | 30×30 1.06 | 35×30 1.08 | | | | 30×40 1.12 | 35×35 1.08 | | | | 30×50 1.15 | 35×40 1.15 | |
| 270 | | | 30×35 1.23 | 35×30 1.26 | | | | 30×50 1.18 | 35×40 1.24 | 40×40 1.24 | | | | 35×45 1.32 | 40×40 1.34 |
| 330 | | | 30×40 1.42 | 35×35 1.46 | | | | | 35×45 1.42 | 40×50 1.48 | | | | 35×50 1.58 | 40×50 1.62 |
| 390 | | | 30×50 1.60 | 35×40 1.66 | | | | | 35×50 1.62 | 40×50 1.77 | | | | 35×60 1.78 | 40×60 1.87 |
| 470 | | | | 35×40 1.81 | 40×40 1.85 | | | | 35×55 1.71 | 40×60 1.88 | | | | | |
| 560 | | | | 35×45 2.06 | 40×50 2.18 | | | | | | | | | | |

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