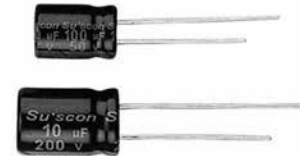


## HH series

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- Miniature HE series, long-life products.
- Load life:10000~12000 hours , 105°C
- Suitable for electronic ballast for lighting equipment,
- long-life power input with smooth function.
- RoHS Compliance
- HE系列的小型化長壽命品。
- 105°C 保證壽命10000~12000小時。
- 適用於照明設備電子整流器，長壽命電源輸入平滑用等。



## SPECIFICATIONS

| Items 項目                                                               | Characteristics 特性                                                                                                                                                                                                                                                                 |      |                                         |      |              |         |         |
|------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------------------------------------|------|--------------|---------|---------|
| Capacitance Tolerance<br>靜電容量誤差                                        | ± 20%(120Hz, 20℃)                                                                                                                                                                                                                                                                  |      |                                         |      |              |         |         |
| Operating Temperature Range<br>適用溫度範圍                                  | - 40 ~ +105℃                                                                                                                                                                                                                                                                       |      |                                         |      | - 25 ~ +105℃ |         |         |
| Rated Voltage Range<br>額定電壓範圍                                          | 160 ~ 450VDC                                                                                                                                                                                                                                                                       |      |                                         |      | 500VDC       |         |         |
| Leakage Current<br>洩漏電流                                                | I ≤ 0.04CV+100μA.( After 1minutes application of DC rated voltage, at 20 ℃)                                                                                                                                                                                                        |      |                                         |      |              |         |         |
| Dissipation Factor<br>散逸因素( tan δ)                                     | Measurement Frequency:120Hz. Temperature: 20℃                                                                                                                                                                                                                                      |      |                                         |      |              |         |         |
|                                                                        | Rated Voltage(V)                                                                                                                                                                                                                                                                   | 160  | 200~220                                 | 250  | 350          | 400~420 | 450~500 |
|                                                                        | tanδ(MAX)                                                                                                                                                                                                                                                                          | 0.20 | 0.20                                    | 0.20 | 0.24         | 0.24    | 0.24    |
|                                                                        | When nominal capacitance over 1000μF, tanδ shall be added 0.02 to the listed value with increase of every 1000μF                                                                                                                                                                   |      |                                         |      |              |         |         |
| Low Temperature Stability<br>低溫特性<br>Impedance Ratio(Max)<br>阻抗比率(最大值) | Measurement Frequency:120Hz                                                                                                                                                                                                                                                        |      |                                         |      |              |         |         |
|                                                                        | Rated Voltage(V)                                                                                                                                                                                                                                                                   | 160  | 200~220                                 | 250  | 350          | 400~420 | 450~500 |
|                                                                        | Z(-25℃) / Z(20℃)                                                                                                                                                                                                                                                                   | 3    | 3                                       | 3    | 5            | 5       | 6       |
|                                                                        | Z(-40℃) / Z(20℃)                                                                                                                                                                                                                                                                   | 8    | 8                                       | 8    | 10           | 10      | —       |
| Load Life 負荷壽命                                                         | The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 12,000 hours at 105℃.(L≤20mm,10,000 hours)                                                                      |      |                                         |      |              |         |         |
|                                                                        | Capacitance Change                                                                                                                                                                                                                                                                 |      | within ±20% of Initial Value            |      |              |         |         |
|                                                                        | tan δ                                                                                                                                                                                                                                                                              |      | 200% or less of Initial Specified Value |      |              |         |         |
|                                                                        | Leakage Current                                                                                                                                                                                                                                                                    |      | Initial Specified Value or less         |      |              |         |         |
| Shelf Life 放置壽命                                                        | The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000hours 105℃ without voltage applied. Before the measurement. The Capacitance shall be preconditioned by applying voltage according to them 4.1 of JIS C5101-4. |      |                                         |      |              |         |         |
|                                                                        | Capacitance Change                                                                                                                                                                                                                                                                 |      | within ±20% of Initial Value            |      |              |         |         |
|                                                                        | tan δ                                                                                                                                                                                                                                                                              |      | 200% or less of Initial Specified Value |      |              |         |         |
|                                                                        | Leakage Current                                                                                                                                                                                                                                                                    |      | 500% or less of Initial Specified Value |      |              |         |         |
| Standards 參照標準                                                         | IEC 60384-4 (JIS C 5101-4 )                                                                                                                                                                                                                                                        |      |                                         |      |              |         |         |

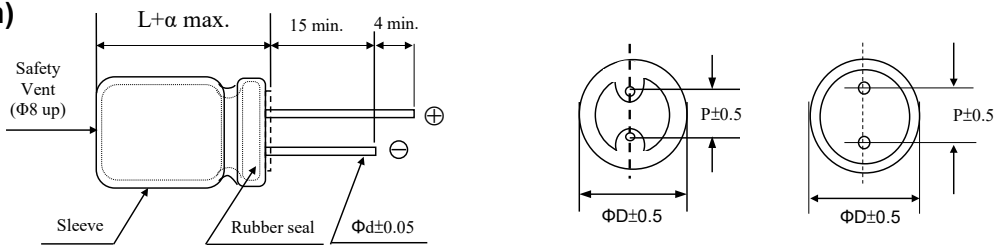
## Frequency Coefficient of Permissible Ripple Current

| Capacitance ( $\mu F$ ) | Frequency (Hz) |      |      |      |
|-------------------------|----------------|------|------|------|
|                         | 120            | 1K   | 10K  | 100K |
| 6.8~82                  | 1.00           | 1.75 | 2.25 | 2.50 |
| 100~680                 | 1.00           | 1.67 | 2.05 | 2.25 |

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DIMENSIONS(mm)



|    |     |      |      |     |     |
|----|-----|------|------|-----|-----|
| ΦD | 10  | 12.5 | 14.5 | 16  | 18  |
| P  | 5.0 | 5.0  | 7.5  | 7.5 | 7.5 |
| Φd | 0.6 | 0.6  | 0.8  | 0.8 | 0.8 |

|   |              |
|---|--------------|
| α | (L < 20) 1.5 |
|   | (L ≥ 20) 2.0 |

STANDARD RATINGS

DxL(mm), R.C.(mA rms) at 105℃ 120 Hz.

| Cap<br>(μF) | V | 160     |      | 200       |      | 220       |      | 250       |      | 350       |      |
|-------------|---|---------|------|-----------|------|-----------|------|-----------|------|-----------|------|
|             |   | D x L   | R.C. | D x L     | R.C. | D x L     | R.C. | D x L     | R.C. | D x L     | R.C. |
| 12          |   |         |      |           |      |           |      |           |      | 10x16     | 135  |
| 22          |   |         |      |           |      |           |      | 10x16     | 185  | 10x20     | 200  |
| 27          |   |         |      | 10x16     | 200  | 10x16     | 200  |           |      | 10x25     | 240  |
| 33          |   |         |      |           |      |           |      | 10x20     | 240  | 10x30     | 255  |
| 39          |   | 10x16   | 245  |           |      | 10x20     | 265  |           |      | 12.5x20   | 330  |
| 47          |   | 10x20   | 275  | 10x20     | 290  |           |      | 10x25     | 315  | 10x35     | 325  |
|             |   |         |      |           |      |           |      | 10x30     | 340  | 10x40     | 375  |
|             |   |         |      |           |      |           |      |           |      | 12.5x25   | 425  |
|             |   |         |      |           |      |           |      |           |      | 14.5x20   | 420  |
| 56          |   | 10x20   | 315  | 10x25     | 345  | 10x25     | 345  | 12.5x20   | 430  | 10x45     | 425  |
|             |   |         |      |           |      | 10x30     | 370  |           |      | 12.5x30   | 495  |
|             |   |         |      |           |      |           |      |           |      | 16x20     | 475  |
| 68          |   | 10x25   | 380  | 10x30     | 405  | 12.5x20   | 475  | 10x35     | 430  | 10x50     | 485  |
|             |   |         |      |           |      |           |      | 14.5x20   | 505  | 12.5x35   | 580  |
|             |   |         |      |           |      |           |      |           |      | 14.5x25   | 545  |
|             |   |         |      |           |      |           |      |           |      | 18x20     | 550  |
| 82          |   | 10x25   | 415  |           |      | 10x35     | 470  | 10x40     | 495  | 12.5x40   | 655  |
|             |   | 10x30   | 445  | 12.5x20   | 520  | 14.5x20   | 555  | 10x45     | 515  | 14.5x31.5 | 645  |
|             |   |         |      |           |      |           |      | 12.5x25   | 565  | 16x25     | 625  |
| 100         |   | 12.5x20 | 575  | 10x35     | 520  | 10x40     | 545  | 10x50     | 585  | 12.5x45   | 750  |
|             |   |         |      | 12.5x25   | 625  | 10x45     | 565  | 12.5x30   | 660  | 12.5x50   | 770  |
|             |   |         |      | 14.5x20   | 615  | 12.5x25   | 625  | 14.5x25   | 665  | 14.5x35.5 | 740  |
|             |   |         |      |           |      |           |      | 16x20     | 635  | 16x31.5   | 740  |
| 120         |   | 10x35   | 570  | 10x40     | 595  | 10x50     | 645  | 12.5x35   | 770  | 16x20     | 635  |
|             |   |         |      | 10x45     | 620  | 12.5x30   | 725  | 16x25     | 755  | 18x25     | 710  |
|             |   | 14.5x20 | 675  | 12.5x30   | 725  | 14.5x25   | 725  |           |      | 14.5x40   | 835  |
|             |   |         |      | 16x20     | 695  | 16x20     | 695  | 18x20     | 730  | 14.5x45   | 860  |
| 150         |   | 10x40   | 665  | 10x50     | 720  | 12.5x35   | 860  | 12.5x40   | 890  | 16x35.5   | 830  |
|             |   | 10x45   | 695  | 12.5x35   | 860  | 16x25     | 845  | 12.5x45   | 920  | 16x40     | 960  |
|             |   | 12.5x25 | 765  | 14.5x25   | 810  | 18x20     | 815  | 14.5x31.5 | 870  | 16x45     | 975  |
|             |   |         |      |           |      |           |      |           |      | 18x31.5   | 940  |
| 180         |   | 10x50   | 785  | 14.5x31.5 | 955  | 12.5x40   | 975  | 12.5x50   | 1035 | 18x40     | 1080 |
|             |   | 12.5x30 | 885  | 16x25     | 925  | 12.5x45   | 1005 | 14.5x35.5 | 990  | 16x50     | 1090 |
|             |   | 14.5x25 | 890  |           |      |           |      | 14.5x40   | 1020 | 18x35.5   | 1065 |
|             |   | 16x20   | 855  | 18x20     | 895  | 14.5x31.5 | 955  | 16x31.5   | 995  |           |      |
|             |   |         |      |           |      |           |      | 18x25     | 950  |           |      |

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## STANDARD RATINGS

DxL(mm), R.C.(mA rms) at 105℃ 120 Hz.

| Cap<br>(μF) | V       | 160       |           | 200       |         | 220       |         | 250     |         | 350   |      |  |  |
|-------------|---------|-----------|-----------|-----------|---------|-----------|---------|---------|---------|-------|------|--|--|
|             | Item    | D x L     | R.C.      | D x L     | R.C.    | D x L     | R.C.    | D x L   | R.C.    | D x L | R.C. |  |  |
| 220         |         | 12.5x35   | 1040      | 12.5x40   | 1075    | 12.5x50   | 1145    | 14.5x45 | 1160    | 18x45 | 1210 |  |  |
|             |         | 16x25     | 1020      | 12.5x45   | 1110    | 14.5x35.5 | 1095    | 14.5x50 | 1185    |       |      |  |  |
|             | 220     | 18x20     | 990       | 14.5x35.5 | 1095    | 16x31.5   | 1100    | 16x35.5 | 1125    | 18x50 | 1220 |  |  |
|             |         |           |           | 18x25     | 1050    | 18x25     | 1050    | 18x31.5 | 1135    |       |      |  |  |
|             |         |           |           |           |         |           |         |         |         |       |      |  |  |
| 270         |         | 12.5x40   | 1190      | 12.5x50   | 1265    | 14.5x45   | 1285    | 16x40   | 1285    |       |      |  |  |
|             | 270     | 12.5x45   | 1230      | 14.5x40   | 1250    | 14.5x50   | 1315    | 16x45   | 1310    |       |      |  |  |
|             |         | 14.5x31.5 | 1170      | 14.5x45   | 1290    | 16x35.5   | 1245    |         |         |       |      |  |  |
|             |         | 270       | 14.5x35.5 | 1210      | 16x31.5 | 1220      | 18x31.5 | 1260    | 18x35.5 | 1300  |      |  |  |
|             | 16x35.5 |           |           |           | 1250    |           |         |         |         |       |      |  |  |
| 330         |         | 12.5x50   | 1400      | 14.5x50   | 1450    | 16x40     | 1425    | 16x50   | 1475    |       |      |  |  |
|             | 330     | 14.5x40   | 1385      | 16x40     | 1425    | 16x45     | 1450    | 18x40   | 1460    |       |      |  |  |
|             |         | 16x31.5   | 1350      | 18x31.5   | 1395    | 18x35.5   | 1440    | 18x45   | 1485    |       |      |  |  |
|             |         | 18x25     | 1290      |           |         |           |         |         |         |       |      |  |  |
| 390         |         | 14.5x45   | 1545      | 16x45     | 1575    | 16x50     | 1600    | 18x50   | 1625    |       |      |  |  |
|             | 390     | 16x35.5   | 1500      | 18x35.5   | 1565    | 18x40     | 1590    |         |         |       |      |  |  |
|             |         |           |           |           |         | 18x45     | 1620    |         |         |       |      |  |  |
| 470         |         | 14.5x50   | 1735      | 16x50     | 1755    | 18x50     | 1785    |         |         |       |      |  |  |
|             | 470     | 16x40     | 1700      | 18x40     | 1745    |           |         |         |         |       |      |  |  |
|             |         | 16x45     | 1730      |           |         |           |         |         |         |       |      |  |  |
|             |         | 18x31.5   | 1660      | 18x45     | 1770    |           |         |         |         |       |      |  |  |
|             |         | 18x35.5   | 1715      |           |         |           |         |         |         |       |      |  |  |
| 560         |         | 16x50     | 1920      | 18x50     | 1945    |           |         |         |         |       |      |  |  |
|             | 18x40   | 1905      |           |           |         |           |         |         |         |       |      |  |  |
| 680         |         | 18x45     | 2130      |           |         |           |         |         |         |       |      |  |  |
|             | 680     | 18x50     | 2145      |           |         |           |         |         |         |       |      |  |  |

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## STANDARD RATINGS

DxL(mm), R.C.(mA rms) at 105℃ 120 Hz.

| Cap<br>(μF) | V    | 400       |      | 420       |      | 450       |      | 500     |      |  |  |
|-------------|------|-----------|------|-----------|------|-----------|------|---------|------|--|--|
|             | Item | D x L     | R.C. | D x L     | R.C. | D x L     | R.C. | D x L   | R.C. |  |  |
| 6.8         |      |           |      | 10x16     | 105  | 10x16     | 105  | 10x20   | 90   |  |  |
| 8.2         |      |           |      |           |      |           |      | 10x25   | 110  |  |  |
| 10          |      | 10x16     | 125  |           |      |           |      | 10x30   | 130  |  |  |
| 12          |      |           |      | 10x20     | 150  | 10x20     | 150  | 12.5x20 | 135  |  |  |
| 15          |      |           |      | 10x25     | 185  | 10x25     | 185  | 10x35   | 170  |  |  |
|             |      |           |      |           |      |           |      | 10x40   | 175  |  |  |
|             |      |           |      |           |      |           |      | 12.5x25 | 165  |  |  |
| 18          |      | 10x20     | 180  | 10x30     | 215  | 10x30     | 215  | 10x45   | 190  |  |  |
|             |      |           |      |           |      | 12.5x20   | 255  | 12.5x30 | 190  |  |  |
| 22          |      | 10x25     | 215  | 12.5x20   | 285  | 10x35     | 250  | 10x50   | 230  |  |  |
|             |      |           |      |           |      |           |      | 12.5x35 | 220  |  |  |
| 27          |      | 10x30     | 255  | 10x35     | 275  | 10x40     | 290  | 12.5x40 | 260  |  |  |
|             |      |           |      | 10x40     | 290  | 10x45     | 305  |         |      |  |  |
|             |      | 12.5x20   | 300  | 12.5x25   | 340  | 12.5x25   | 340  |         |      |  |  |
|             |      |           |      | 14.5x20   | 335  | 14.5x20   | 335  |         |      |  |  |
| 33          |      | 10x35     | 300  | 10x45     | 335  | 12.5x30   | 400  | 12.5x45 | 285  |  |  |
|             |      |           |      | 12.5x30   | 400  | 14.5x25   | 400  |         |      |  |  |
|             |      |           |      | 16x20     | 385  | 16x20     | 385  |         |      |  |  |
| 39          |      | 10x40     | 340  | 10x50     | 375  | 10x50     | 375  | 12.5x50 | 330  |  |  |
|             |      | 10x45     | 355  |           |      | 12.5x35   | 460  |         |      |  |  |
|             |      | 12.5x25   | 390  | 14.5x25   | 435  | 18x20     | 440  |         |      |  |  |
|             |      | 14.5x20   | 385  |           |      |           |      |         |      |  |  |
| 47          |      | 12.5x30   | 455  | 12.5x35   | 505  | 12.5x40   | 525  |         |      |  |  |
|             |      | 16x20     | 435  | 16x25     | 500  | 14.5x31.5 | 515  |         |      |  |  |
|             |      |           |      | 18x20     | 480  | 16x25     | 500  |         |      |  |  |
| 56          |      | 10x50     | 440  | 12.5x40   | 570  | 12.5x45   | 590  |         |      |  |  |
|             |      | 12.5x35   | 525  | 12.5x45   | 590  | 14.5x35.5 | 580  |         |      |  |  |
|             |      | 14.5x25   | 495  | 14.5x31.5 | 560  | 16x31.5   | 585  |         |      |  |  |
|             |      | 18x20     | 500  |           |      | 18x25     | 560  |         |      |  |  |
| 68          |      | 12.5x40   | 600  | 12.5x50   | 670  | 12.5x50   | 670  |         |      |  |  |
|             |      | 14.5x31.5 | 585  | 14.5x35.5 | 640  | 14.5x40   | 660  |         |      |  |  |
|             |      |           |      | 14.5x40   | 660  | 14.5x45   | 680  |         |      |  |  |
|             |      | 16x25     | 570  | 16x31.5   | 645  | 16x35.5   | 660  |         |      |  |  |
|             |      |           |      | 18x25     | 615  |           |      |         |      |  |  |
| 82          |      | 12.5x45   | 680  | 14.5x45   | 750  | 14.5x50   | 765  |         |      |  |  |
|             |      | 12.5x50   | 700  | 16x35.5   | 725  | 16x40     | 750  |         |      |  |  |
|             |      | 14.5x35.5 | 670  |           |      | 16x45     | 760  |         |      |  |  |
|             |      | 16x31.5   | 670  | 18x31.5   | 730  | 18x31.5   | 730  |         |      |  |  |
|             |      | 18x25     | 640  |           |      |           |      |         |      |  |  |
| 100         |      | 14.5x40   | 760  | 14.5x50   | 845  | 16x50     | 855  |         |      |  |  |
|             |      | 14.5x45   | 785  | 16x40     | 825  |           |      |         |      |  |  |
|             |      | 16x35.5   | 760  | 16x45     | 840  | 18x35.5   | 835  |         |      |  |  |
|             |      |           |      | 18x35.5   | 835  |           |      |         |      |  |  |
| 120         |      | 14.5x50   | 875  | 16x50     | 935  | 18x40     | 930  |         |      |  |  |
|             |      | 16x40     | 860  | 18x40     | 930  |           |      |         |      |  |  |
|             |      | 16x45     | 875  |           |      |           |      |         |      |  |  |
|             |      | 18x31.5   | 840  | 18x45     | 945  | 18x45     | 945  |         |      |  |  |
|             |      | 18x35.5   | 870  |           |      |           |      |         |      |  |  |
| 150         |      | 16x50     | 995  | 18x50     | 1060 | 18x50     | 1060 |         |      |  |  |
|             |      | 18x40     | 985  |           |      |           |      |         |      |  |  |
| 180         |      | 18x45     | 1095 |           |      |           |      |         |      |  |  |
| 220         |      | 18x50     | 1220 |           |      |           |      |         |      |  |  |