

## LHK General Purpose, 105°C

### Features

- Used in communication equipments, switching power supply, etc.
- Safety vent construction design

### Specifications

| Item  | Performance Characteristics   |     |    |    |    |    |    |    |     |     |  |     |     |     |     |
|---|---|-----|----|----|----|----|----|----|-----|-----|--|-----|-----|-----|-----|
| Operating Temperature Range                   | -40 to +105°C   |     |    |    |    |    |    |    |     |     | -25 to +105°C  |     |     |     |     |
| Rated voltage Range                           | 6.3 to 100 VDC  |     |    |    |    |    |    |    |     |     | 160 to 450 VDC   |     |     |     |     |
| Capacitance Range                             | 0.1 to 15000 μF   |     |    |    |    |    |    |    |     |     | 0.47 to 470 μF   |     |     |     |     |
| Capacitance Tolerance                         | ±20% (120Hz, +20°C)   |     |    |    |    |    |    |    |     |     |  |     |     |     |     |
| Leakage Current<br>(+20°C, max.)              | I≤0.01 CV or 3(μA) After 1minute whichever is greater measured with rated working voltage applied.  |     |    |    |    |    |    |    |     |     | I≤0.03 CV or 3(μA) After 1minute with rated working voltage applied... |     |     |     |     |
| Dissipation Factor (tanδ)                     | Working Voltage (VDC)   | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | 160 | 200  | 250 | 350 | 400 | 450 |
|   | D.F.(%max)  | 23  | 20 | 16 | 14 | 12 | 10 | 10 | 10  | 15  | 15   | 16  | 20  | 20  | 20  |
|   | For Capacitance > 1000μF, add 2% per another 1000μF<br>(+20°C, at 120Hz)  |     |    |    |    |    |    |    |     |     |  |     |     |     |     |
| Low Temperature<br>Characteristics (at 120Hz) | Impedance ratio max.<br>Working Voltage (VDC)   | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | 160 | 200  | 250 | 350 | 400 | 450 |
|   | Z (-25°C)/Z(+20°C)  | 4   | 3  | 2  | 2  | 2  | 2  | 2  | 2   | 3   | 3  | 3   | 5   | 6   | 15  |
|   | Z (-40°C)/Z(+20°C)  | 8   | 6  | 4  | 4  | 3  | 3  | 3  | 3   | -   | -  | -   | -   | -   | -   |
|   | For Capacitance Value 1000μF, add 0.5 per another 1000μF for -25°C/+20°C<br>For Capacitance Value 1000μF, add 1 per another 1000μF for -40°C/+20°C  |     |    |    |    |    |    |    |     |     |  |     |     |     |     |
| Load Life                                     | Test conditions<br>Duration time : 2000Hrs<br>Ambient temperature: +105°C<br>Applied voltage: Rated DC working voltage<br>After test requirements:at+20°C<br>After test requirements:≤±20% of the initial measured value<br>Dissipation Factor: ≤200% of the initial specified value<br>Leakage current: ≤The initial specified value |     |    |    |    |    |    |    |     |     |  |     |     |     |     |
| Shelf Life                                    | Test conditions<br>Duration time : 1000Hrs<br>Ambient temperature: +105°C<br>Applied voltage: None<br>After test requirements at +20°C: Same limits as Load life.<br>Pre-treatment for measurements shall be conducted after application of DC working voltage for 30 minutes.  |     |    |    |    |    |    |    |     |     |  |     |     |     |     |

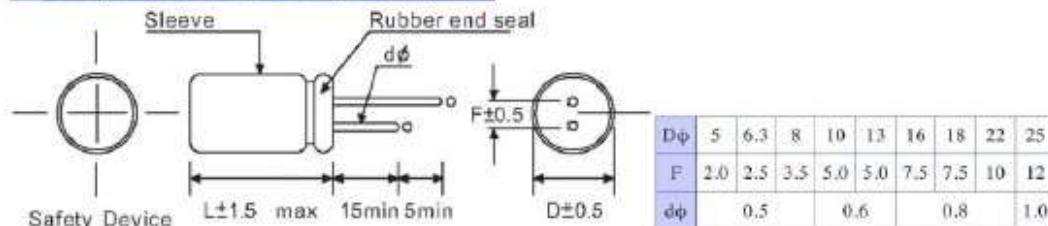
### Multiplier for Ripple Current VS. Frequency

| CAP(μF)/Hz | 50(60)       | 120 | 400 | 1K   | 10K  | 50-100K |
|------------|--------------|-----|-----|------|------|---------|
| Multiplier | CAP≤10       | 0.8 | 1.0 | 1.30 | 1.45 | 1.65    |
|            | 10<CAP≤100   | 0.8 | 1.0 | 1.23 | 1.36 | 1.48    |
|            | 100<CAP≤1000 | 0.8 | 1.0 | 1.16 | 1.25 | 1.35    |
|            | 1000<CAP     | 0.8 | 1.0 | 1.11 | 1.18 | 1.25    |

### Multiplier for Ripple Current VS. Temperature

| Temperature (°C) | 45   | 60   | 70   | 85   | 105  |
|------------------|------|------|------|------|------|
| Multiplier       | 2.10 | 1.90 | 1.65 | 1.40 | 1.00 |

### Diagram of Dimensions: (Unit: mm)





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**Case Size**

| pF    | W.V.<br>(S.V.) | 6.3<br>(8)   |  | 10<br>(13)                      |  | 16<br>(20)                      |   | 25<br>(32)                      |   | 35<br>(44)                      |        | φD x L (mm) |
|-------|----------------|--------------|--|---------------------------------|--|---------------------------------|---|---------------------------------|---|---------------------------------|--------|-------------|
|       |                | Size         | Ripple                                 | Size                            | Ripple                                   | Size                            | Ripple                                    | Size                            | Ripple                                    | Size                            | Ripple |             |
| 1     |                |              |  |                                 |  | 5x11                            | 9   | 5x11                            | 9   | 5x11                            | 11     |             |
| 4.7   |                |              |  |                                 |  |                                 |   | 5x11                            | 27  | 5x11                            | 29     |             |
| 6.8   |                |              |  |                                 |  |                                 |   | 5x11                            | 35  | 5x11                            | 38     |             |
| 10    |                |              |  |                                 |  | 5x11                            | 38  | 5x11                            | 40  | 5x11                            | 42     |             |
| 22    |                |              |  | 5x11                            | 50                                       | 5x11                            | 56  | 5x11                            | 60  | 5x11                            | 62     |             |
| 33    | 5x11           | 56           | 5x11                                   | 60                              | 5x11                                     | 65                              | 5x11                                      | 70                              | 5x11                                      | 78                              |        |             |
| 47    | 5x11           | 68           | 5x11                                   | 72                              | 5x11                                     | 100                             | 5x11                                      | 105                             | 5x11                                      | 110                             | 6.3x11 | 115         |
| 68    | 5x11           | 77           | 5x11                                   | 82                              | 5x11                                     | 105                             | 6.3x11                                    | 120                             | 6.3x11                                    | 140                             |        |             |
| 100   | 5x11           | 98           | 5x11                                   | 110                             | 5x11                                     | 115                             | 6.3x11                                    | 135                             | 6.3x11                                    | 165                             |        |             |
|       |                |              |  |                                 | 6.3x11                                   | 125                             | 6.3x11                                    | 150                             | 8x11                                      | 180                             |        |             |
|       |                |              |  |                                 | 8x11                                     | 165                             | 8x11                                      | 175                             | 8x14                                      | 190                             |        |             |
| 220   | 5x11<br>6.3x11 | 160<br>180   | 5x11<br>6.3x11                         | 170<br>180                      | 6.3x11<br>8x11                           | 220<br>230                      | 6x11<br>8x11<br>10x12                     | 230<br>240<br>285               | 8x11<br>8x14<br>10x12                     | 300<br>325<br>330<br>350<br>330 |        |             |
| 330   | 6.3x11         | 200          | 6.3x11<br>8x11                         | 260<br>280                      | 8x11                                     | 300                             | 8x11<br>8x14<br>10x12                     | 350<br>352<br>355               | 10x12<br>10x15                            | 410<br>420                      |        |             |
| 470   | 6.3x11<br>8x11 | 280<br>310   | 6.3x11<br>8x11                         | 300<br>315                      | 8x11<br>8x14<br>10x12                    | 380<br>390<br>400               | 8x14<br>10x12<br>10x15<br>10x20           | 415<br>445<br>450<br>465        | 8x20<br>10x12<br>10x15<br>10x17<br>10x20  | 500<br>460<br>470<br>480<br>520 |        |             |
| 560   | 8x11           | 320          | 8x11                                   | 330                             | 10x12                                    | 410                             | 10x15                                     | 460                             | 10x17<br>13x14                            | 540<br>500                      |        |             |
| 680   | 8x11           | 360          | 8x11<br>8x14<br>10x12                  | 400<br>410<br>420               | 8x14<br>10x12                            | 470<br>480                      | 10x12<br>10x15<br>10x17                   | 450<br>520<br>600               | 10x20<br>13x21                            | 650<br>750                      |        |             |
| 820   | 8x11           | 390          | 10x12                                  | 480                             | 10x15                                    | 550                             | 10x15                                     | 640                             | 10x20                                     | 760                             |        |             |
| 1000  | 8x11<br>10x12  | 420<br>460   | 8x11<br>8x14<br>8x16<br>10x12<br>10x15 | 490<br>500<br>530<br>530<br>580 | 8x20<br>10x12<br>10x13<br>10x15<br>10x20 | 570<br>580<br>590<br>600<br>630 | 10x15<br>10x17<br>10x20<br>13x16<br>13x21 | 740<br>800<br>850<br>850<br>900 | 10x20<br>10x25<br>13x14<br>13x16<br>13x21 | 810<br>870<br>850<br>860<br>910 |        |             |
| 1500  | 10x15          | 620          | 10x17                                  | 770                             | 10x20                                    | 820                             | 13x21                                     | 910                             | 13x26                                     | 970                             |        |             |
| 2200  | 10x17<br>10x20 | 780<br>800   | 10x17<br>10x20                         | 870<br>900                      | 10x20<br>13x16<br>13x21<br>13x26         | 980<br>980<br>1020<br>1060      | 10x25<br>13x21<br>13x26<br>16x16          | 1180<br>1210<br>1250<br>1270    | 13x26<br>16x21<br>16x26<br>16x31          | 1260<br>1290<br>1300<br>1400    |        |             |
| 2700  | 10x20          | 850          | 13x21                                  | 920                             | 13x21                                    | 1100                            | 16x26                                     | 1330                            | 16x31                                     | 1500                            |        |             |
| 3300  | 10x20<br>13x21 | 970<br>1010  | 10x25<br>13x21                         | 1110<br>1160                    | 13x21<br>13x26<br>16x16                  | 1220<br>1240<br>1220            | 16x26<br>16x31<br>18x17                   | 1480<br>1540<br>1450            | 16x31<br>16x36<br>18x36                   | 1620<br>1680<br>1720            |        |             |
| 4700  | 10x25<br>13x21 | 1160<br>1200 | 13x21<br>13x26                         | 1360<br>1380                    | 13x26<br>16x26<br>18x17                  | 1450<br>1620<br>1560            | 16x31                                     | 1800                            | 18x36                                     | 1900                            |        |             |
| 5600  | 13x26          | 1320         | 16x26                                  | 1510                            | 16x31<br>18x19                           | 1720<br>1660                    | 16x36                                     | 1890                            | 18x36                                     | 2000                            |        |             |
| 6800  | 16x26          | 1470         | 16x26<br>16x31                         | 1680<br>1800                    | 16x31                                    | 1880                            | 18x36                                     | 2040                            | 18x41                                     | 2090                            |        |             |
| 8200  | 16x26          | 1520         | 16x31                                  | 1840                            | 16x36                                    | 1950                            | 18x36                                     | 2090                            | 22x42                                     | 2180                            |        |             |
| 10000 | 16x26<br>16x31 | 1690<br>1740 | 16x36<br>18x36                         | 1900<br>1980                    | 18x36<br>18x41                           | 2060<br>2080                    | 18x41<br>22x42                            | 2160<br>2200                    | 18x41<br>25x44                            | 2200<br>2300                    |        |             |
| 15000 | 16x36<br>18x36 | 2080<br>2190 | 18x36                                  | 2230                            | 22x42                                    | 2300                            | 22x42                                     | 2500                            | -   | -                               |        |             |

\*Ripple Current (mA, rms) at 105°C 120Hz



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| μF    | W.V.<br>(S.V.)                  | Case Size                |                         |                   |                |              |                |              |                |              |        | φD x L (mm) |  |
|-------|---------------------------------|--------------------------|-------------------------|-------------------|----------------|--------------|----------------|--------------|----------------|--------------|--------|-------------|--|
|       |                                 | 50<br>{63}               |                         | 63<br>{79}        |                | 100<br>{125} |                | 160<br>{200} |                | 200<br>{250} |        |             |  |
| Size  | Ripple                          | Size                     | Ripple                  | Size              | Ripple         | Size         | Ripple         | Size         | Ripple         | Size         | Ripple |             |  |
| 0.1   | 5x11                            | 1.3                      | 5x11                    | 1.3               | 5x11           | 1.3          | -              | -            | -              | -            | -      |             |  |
| 0.22  | 5x11                            | 2.9                      | 5x11                    | 2.9               | 5x11           | 2.9          | -              | -            | -              | -            | -      |             |  |
| 0.33  | 5x11                            | 4.2                      | 5x11                    | 4.2               | 5x11           | 4.2          | -              | -            | -              | -            | -      |             |  |
| 0.47  | 5x11                            | 8                        | 5x11                    | 8                 | 5x11           | 8            | 5x11           | 12           | 5x11           | 12           | -      |             |  |
| 1     | 5x11                            | 14                       | 5x11                    | 14                | 5x11           | 15           | 5x11           | 17           | 6.3x11         | 17           | -      |             |  |
| 2.2   | 5x11                            | 20                       | 5x11                    | 21                | 5x11<br>6x11   | 22<br>24     | 6.3x11         | 26           | 6.3x11         | 33           | -      |             |  |
| 3.3   | 5x11                            | 26                       | 5x11                    | 28                | 5x11           | 30           | 6.3x11         | 32           | 6.3x11         | 43           | -      |             |  |
| 4.7   | 5x11                            | 32                       | 5x11                    | 34                | 5x11           | 36           | 6.3x11<br>8x11 | 36<br>42     | 8x11           | 51           | -      |             |  |
| 6.8   | 5x11                            | 40                       | 5x11                    | 42                | 6.3x11         | 47           | 8x11           | 56           | 10x12          | 63           | -      |             |  |
| 10    | 5x11<br>6x11                    | 50<br>55                 | 5x11                    | 51                | 6.3x11         | 60           | 8x11<br>10x12  | 75<br>78     | 10x12<br>10x15 | 83<br>90     | -      |             |  |
| 22    | 5x11                            | 75                       | 5x11<br>6.3x11          | 75<br>85          | 6.3x11<br>8x11 | 98<br>105    | 10x15          | 105          | 10x20          | 135          | -      |             |  |
| 33    | 5x11<br>6.3x11                  | 90<br>95                 | 6.3x11<br>8x11          | 105<br>115        | 8x11<br>10x12  | 145<br>155   | 10x20          | 170          | 13x21          | 180          | -      |             |  |
| 47    | 6.3x11                          | 120                      | 6.3x11<br>8x11          | 145<br>155        | 10x12<br>10x15 | 170<br>180   | 13x21          | 210          | 13x21<br>13x26 | 220<br>230   | -      |             |  |
| 68    | 8x11                            | 155                      | 8x11                    | 185               | 10x15<br>10x17 | 240<br>250   | 13x26          | 280          | 16x26          | 300          | -      |             |  |
| 100   | 8x11                            | 200                      | 8x11<br>10x12           | 220<br>240        | 10x15<br>10x20 | 250<br>270   | 13x26<br>16x26 | 320<br>330   | 16x26          | 360          | -      |             |  |
| 220   | 8x16<br>10x12<br>10x15<br>10x17 | 355<br>350<br>360<br>365 | 10x17<br>10x20          | 400<br>430        | 13x26<br>16x26 | 530<br>560   | 16x36          | 580          | 18x36          | 590          | -      |             |  |
| 330   | 10x15<br>10x17<br>10x20         | 435<br>450<br>470        | 10x20<br>13x21          | 500<br>570        | 16x26          | 680          | 18x32          | 710          | 18x32<br>18x36 | 590<br>740   | -      |             |  |
| 470   | 10x20<br>13x21                  | 590<br>610               | 13x21<br>13x26<br>16x26 | 640<br>700<br>720 | 16x26<br>16x31 | 840<br>860   | 18x36<br>18x41 | 870<br>880   | 22x42          | 890          | -      |             |  |
| 560   | 13x21                           | 660                      | 13x26                   | 770               | 16x36          | 880          | -              | -            | -              | -            | -      |             |  |
| 680   | 13x21<br>13x26                  | 730<br>770               | 16x26                   | 880               | 16x36          | 920          | -              | -            | -              | -            | -      |             |  |
| 820   | 13x26                           | 850                      | 16x26                   | 920               | 18x32          | 970          | -              | -            | -              | -            | -      |             |  |
| 1000  | 13x26<br>16x21<br>16x26         | 900<br>950<br>1010       | 16x26<br>16x36          | 1150<br>1220      | 18x41          | 1250         | -              | -            | -              | -            | -      |             |  |
| 1500  | 16x31                           | 1300                     | 18x32                   | 1350              | 22x42          | 1500         | -              | -            | -              | -            | -      |             |  |
| 2200  | 16x26<br>16x31<br>18x36         | 1400<br>1450<br>1550     | 18x36<br>22x42          | 1590<br>2100      | 25x44          | 1880         | -              | -            | -              | -            | -      |             |  |
| 2700  | 18x36                           | 1610                     | 22x42                   | 1720              | -              | -            | -              | -            | -              | -            | -      |             |  |
| 3300  | 18x36                           | 1780                     | 22x42                   | 1900              | -              | -            | -              | -            | -              | -            | -      |             |  |
| 4700  | 22x42                           | 2050                     | 25x44                   | 2200              | -              | -            | -              | -            | -              | -            | -      |             |  |
| 5600  | 25x44                           | 2160                     | -                       | -                 | -              | -            | -              | -            | -              | -            | -      |             |  |
| 6800  | 25x44                           | 2280                     | -                       | -                 | -              | -            | -              | -            | -              | -            | -      |             |  |
| 10000 | 25x44                           | 2800                     | -                       | -                 | -              | -            | -              | -            | -              | -            | -      |             |  |

\*Ripple Current (mA, rms) at 105°C 120Hz



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| Case Size            |                | φD x L (mm)  |                |              |                                  |                          |                |              |      |
|----------------------|----------------|--------------|----------------|--------------|----------------------------------|--------------------------|----------------|--------------|------|
| W.V.<br>{S.V.}<br>μF | Size           | 250<br>{300} |                | 350<br>{400} |                                  | 400<br>{450}             |                | 450<br>{500} |      |
|                      |                | Ripple       | Size           | Ripple       | Size                             | Ripple                   | Size           | Ripple       | Size |
| 0.47                 | 5x11           | 12           | 6.3x11         | 15           | 6.3x11                           | 15                       | 6.3x11         | 15           |      |
| 1                    | 6.3x11         | 17           | 6.3x11         | 20           | 6x11<br>8x11                     | 20<br>22                 | 8x11           | 22           |      |
| 2.2                  | 6x11<br>8x11   | 35<br>36     | 10x12          | 39           | 8x11<br>10x12                    | 35<br>39                 | 10x12<br>10x17 | 39<br>50     |      |
| 3.3                  | 8x11           | 43           | 10x12          | 53           | 10x12<br>10x15                   | 53<br>55                 | 10x15<br>10x20 | 53<br>55     |      |
| 4.7                  | 8x11<br>10x12  | 48<br>51     | 10x12<br>10x15 | 63<br>66     | 8x11<br>8x14                     | 60<br>63                 | 10x20          | 64           |      |
|                      |                |              |                |              | 10x12<br>10x15<br>10x17<br>10x20 | 63<br>69<br>70<br>72     |                |              |      |
| 6.8                  | 10x12          | 70           | 10x15          | 79           | 10x15                            | 85                       | 10x20          | 75           |      |
| 10                   | 10x15          | 90           | 10x20          | 110          | 10x12<br>10x15                   | 98<br>100                | 13x21<br>13x26 | 92<br>98     |      |
|                      |                |              |                |              | 10x17<br>10x20<br>13x21          | 110<br>112<br>115        |                |              |      |
| 22                   | 10x12<br>10x20 | 115<br>160   | 13x26          | 180          | 13x21<br>16x26                   | 170<br>190               | 16x26<br>16x31 | 175<br>180   |      |
| 33                   | 13x21<br>13x26 | 175<br>180   | 16x26          | 190          | 13x26<br>16x16<br>16x21<br>16x26 | 200<br>200<br>210<br>220 | 16x36          | 210          |      |
|                      |                |              |                |              |                                  |                          |                |              |      |
| 47                   | 13x26<br>16x26 | 240<br>260   | 16x31          | 250          | 16x26<br>16x31<br>16x36<br>18x21 | 280<br>300<br>350<br>270 | 16x26<br>16x36 | 250<br>280   |      |
|                      |                |              |                |              |                                  |                          |                |              |      |
| 68                   | 16x26          | 320          | 16x31          | 330          | 16x31<br>16x36<br>18x26          | 340<br>355<br>350        | 18x31<br>18x36 | 320<br>330   |      |
| 100                  | 16x31          | 400          | 18x36          | 420          | 18x31<br>18x36                   | 435<br>450               | 18x36<br>22x32 | 430<br>500   |      |

\*Ripple Current (mA, rms) at 105°C 120Hz