



**HESTORE.HU**

elektronikai alkatrész áruház

**EN:** This Datasheet is presented by the manufacturer.

Please visit our website for pricing and availability at [www.hestore.hu](http://www.hestore.hu).

SC

Low Impedance and high frequency  
Series

- Features: 105°C 1000~3000 hours, Low impedance, high permissible ripple current at high frequency and high operation temperature (-40 ~ +105°C)
- Recommended Applications: Applicable for switching regulator of computer, especially for high frequency
- Corresponding product to RoHS

SY

↑ Long Life

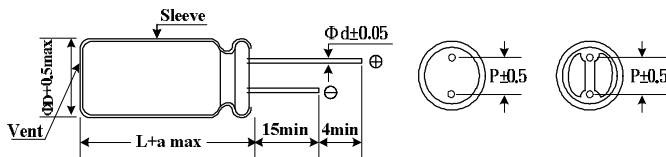
SC



### Specifications

| Item   | Characteristics  |                                       |      |      |      |      |                |      |      |  |
|--|--|---------------------------------------|------|------|------|------|----------------|------|------|--|
| Operating Temperature Range  | -40 ~ +105°C   |                                       |      |      |      |      |                |      |      |  |
| Rated Voltage Range  | 6.3 ~ 100VDC   |                                       |      |      |      |      |                |      |      |  |
| Rated Capacitance Range  | 4.7 ~ 15000 $\mu$ F  |                                       |      |      |      |      |                |      |      |  |
| Capacitance Tolerance  | $\pm 20\%$ at 120Hz, 20°C  |                                       |      |      |      |      |                |      |      |  |
| Leakage Current (MAX)(20°C)  | I=0.01CV or 3 $\mu$ A, whichever is greater. (After rated voltage applied for 2 minutes)   |                                       |      |      |      |      |                |      |      |  |
| Dissipation Factor (MAX)<br>( $\tan \delta$ ) (120Hz, 20°C)  | WV   | 6.3                                   | 10   | 16   | 25   | 35   | 50             | 63   | 100  |  |
|  | $\tan \delta$  | 0.22                                  | 0.19 | 0.16 | 0.14 | 0.12 | 0.10           | 0.09 | 0.08 |  |
| When nominal capacitance is over 1000 $\mu$ F,<br>$\tan \delta$ shall be added 0.02 to the listed value with increase of every 1000 $\mu$ F. |  |                                       |      |      |      |      |                |      |      |  |
| Low Temperature Stability  | WV   | 6.3                                   | 10   | 16   | 25   | 35   | 50             | 63   | 100  |  |
|  | Z(120Hz)   |                                       |      |      |      |      |                |      |      |  |
| Impedance Ratio (MAX)  | Z-25°C / Z+20°C  | 4                                     | 3    | 3    | 3    | 3    | 2              | 2    | 2    |  |
|  | Z-40°C / Z+20°C  | 8                                     | 6    | 4    | 4    | 4    | 4              | 4    | 4    |  |
| Endurance  | After applying rated voltage with ripple current for 3000 hours at 105°C,<br>the capacitors shall meet the following requirements.<br>If dimension is down size, Endurance will be less 1000 hours than standard |                                       |      |      |      |      |                |      |      |  |
|  | Capacitance Change   | Within $\pm 20\%$ of initial value    |      |      |      |      |                |      |      |  |
|  | Dissipation Factor   | Not more than 200% of specified value |      |      |      |      |                |      |      |  |
|  | Leakage Current  | Not more than the specified value     |      |      |      |      |                |      |      |  |
|  | Case Dia   | 5 x 11 ~ 10 x 12.5                    |      |      |      |      | 10 x 15 higher |      |      |  |
| Life   | 2000   |                                       |      |      |      | 3000 |                |      |      |  |
| * If dimension is down size, Endurance will be less 1000hrs than standard.   |  |                                       |      |      |      |      |                |      |      |  |
| Shelf Life   | After placed at 105°C without voltage applied for 1000 hours,<br>the capacitors shall meet the same requirement as Endurance.  |                                       |      |      |      |      |                |      |      |  |

### Diagram of Dimensions



| $\phi$ D | 5    | 6.3 | 8   | 10  | 13  | 16  | 18  | 22   |
|----------|------|-----|-----|-----|-----|-----|-----|------|
| P        | 2.0  | 2.5 | 3.5 | 5.0 | 5.0 | 7.5 | 7.5 | 10.0 |
| $\phi$ d | 0.50 | 0.5 | 0.6 | 0.6 | 0.6 | 0.8 | 0.8 | 0.8  |
| a        | 1.5  | 1.5 | 1.5 | 1.5 | 2.0 | 2.0 | 2.0 | 2.0  |

### Multiplier for Ripple Current

Frequency coefficient

| Frequency (Hz)     | 50   | 120  | 300  | 1K   | 10K  | 100K |
|--------------------|------|------|------|------|------|------|
| Below 4.7 $\mu$ F  | 0.30 | 0.40 | 0.50 | 0.70 | 0.80 | 1.00 |
| 5.6 ~ 33 $\mu$ F   | 0.40 | 0.50 | 0.60 | 0.80 | 0.90 | 1.00 |
| 34 ~ 330 $\mu$ F   | 0.60 | 0.70 | 0.80 | 0.90 | 0.95 | 1.00 |
| 331 ~ 1000 $\mu$ F | 0.65 | 0.90 | 0.90 | 0.98 | 1.00 | 1.00 |
| 1200 $\mu$ F Above | 0.85 | 0.90 | 0.95 | 0.98 | 1.00 | 1.00 |

**■ Dimensions, Rated Ripple Current, Max Impedance**

| Capacitance<br>( $\mu$ F) | Rated ( Surge) Voltage |        |       |            |        |       |            |        |       |            |        |       |
|---------------------------|------------------------|--------|-------|------------|--------|-------|------------|--------|-------|------------|--------|-------|
|                           | 6.3V ( 8 )             |        |       | 10V ( 13 ) |        |       | 16V ( 20 ) |        |       | 25V ( 32 ) |        |       |
|                           | SIZE                   | Ripple | Z     | SIZE       | Ripple | Z     | SIZE       | Ripple | Z     | SIZE       | Ripple | Z     |
| 4.7                       |                        |        |       |            |        |       |            |        |       |            |        |       |
| 6.8                       |                        |        |       |            |        |       |            |        |       |            |        |       |
| 10                        |                        |        |       |            |        |       |            |        |       | 5x11       | 50     | 0.550 |
| 22                        |                        |        |       |            |        |       |            |        |       |            |        |       |
| 33                        |                        |        |       |            |        |       |            |        |       |            |        |       |
| 47                        |                        |        |       |            |        |       |            |        |       | 5x11       | 150    | 0.450 |
| 56                        |                        |        |       |            |        |       | 5x11       | 100    | 0.630 | 5x11       | 150    | 0.420 |
| 68                        |                        |        |       |            |        |       | 5x11       | 150    | 0.420 | 6.3x11     | 200    | 0.370 |
| 100                       |                        |        |       | 5x11       | 150    | 0.420 | 5x11       | 200    | 0.370 | 6.3x11     | 250    | 0.220 |
| 120                       |                        |        |       | 5x11       | 200    | 0.370 | 6.3x11     | 250    | 0.320 | 8x11       | 300    | 0.200 |
| 150                       | 5x11                   | 200    | 0.420 | 6.3x11     | 250    | 0.320 | 6.3x11     | 300    | 0.220 | 8x11       | 550    | 0.140 |
| 220                       | 6.3x11                 | 250    | 0.320 | 6.3x11     | 300    | 0.220 | 8x11       | 550    | 0.140 | *8x11      | 620    | 0.120 |
| 270                       |                        |        |       |            |        |       |            |        |       | 8x15       | 750    | 0.100 |
| 330                       | *6.3x11                | 300    | 0.220 |            |        |       |            |        |       |            |        |       |
| 330                       | *6.3x11                | 320    | 0.230 | 8x11       | 550    | 0.140 | *8x11      | 620    | 0.120 | *8x15      | 660    | 0.100 |
| 330                       | 8x11                   | 400    | 0.180 |            |        |       | 8x15       | 750    | 0.100 | 8x20       | 800    | 0.069 |
| 330                       |                        |        |       |            |        |       | 10x12.5    | 688    | 0.080 | 10x16      | 900    | 0.086 |
| 470                       | *6.3x11                | 440    | 0.180 | *8x11      | 620    | 0.120 | *8x15      | 730    | 0.093 | *8x20      | 1000   | 0.067 |
| 470                       | 8x11                   | 550    | 0.140 | 8x15       | 750    | 0.100 | 10x12.5    | 800    | 0.085 | *10x12.5   | 900    | 0.086 |
| 470                       |                        |        |       |            |        |       |            |        |       | 10x16      | 1050   | 0.064 |
| 680                       | *8x11                  | 580    | 0.120 | *8x11      | 640    | 0.110 | 10x16      | 1050   | 0.064 | 10x20      | 1100   | 0.039 |
| 680                       | 8x15                   | 700    | 0.100 | 10x12.5    | 800    | 0.085 |            |        |       |            |        |       |
| 820                       | 8x20                   | 750    | 0.085 | 10x16      | 1050   | 0.064 | 10x20      | 1100   | 0.044 | 10x20      | 1250   | 0.039 |
| 1000                      | *8x11                  | 580    | 0.150 | 8x20       | 1080   | 0.065 | *10x16     | 1140   | 0.043 | *10x20     | 1160   | 0.047 |
| 1000                      | *8x15                  | 670    | 0.085 | *10x12.5   | 930    | 0.075 | 10x20      | 1250   | 0.039 | *10x25     | 1310   | 0.042 |
| 1000                      | 8x20                   | 800    | 0.069 | 10x16      | 990    | 0.085 |            |        |       | 13x20      | 1450   | 0.038 |
| 1000                      | 10x12.5                | 690    | 0.080 | 10x20      | 1100   | 0.050 |            |        |       |            |        |       |
| 1200                      | 10x16                  | 1000   | 0.064 | 10x20      | 1250   | 0.044 | *10x25     | 1310   | 0.042 | 13x25      | 1600   | 0.290 |
| 1200                      |                        |        |       |            |        |       | 13x20      | 1450   | 0.038 |            |        |       |
| 1500                      | *8x15                  | 980    | 0.085 | 10x20      | 1450   | 0.039 | *10x20     | 1200   | 0.045 | *13x30     | 1750   | 0.032 |
| 1500                      | *8x20                  | 1070   | 0.051 |            |        |       | 13x20      | 1600   | 0.034 | 16x25      | 2000   | 0.028 |
| 1500                      | *10x16                 | 1070   | 0.055 |            |        |       |            |        |       |            |        |       |
| 1500                      | 10x20                  | 1250   | 0.044 |            |        |       |            |        |       |            |        |       |
| 2200                      | *10x20                 | 1220   | 0.051 | *10x20     | 1330   | 0.047 | *10x30     | 1780   | 0.032 | *13x30     | 1810   | 0.029 |
| 2200                      | *10x25                 | 1310   | 0.048 | *10x25     | 1450   | 0.039 | *13x20     | 1720   | 0.033 | *16x25     | 1660   | 0.032 |
| 2200                      | 13x20                  | 1450   | 0.043 | 13x20      | 1600   | 0.038 | 13x25      | 2000   | 0.028 | 16x32      | 2200   | 0.024 |
| 3300                      | *10x25                 | 1400   | 0.043 | *10x30     | 1740   | 0.032 | *13x40     | 2200   | 0.026 | *16x36     | 2540   | 0.019 |
| 3300                      | 13x25                  | 1700   | 0.035 | 13x25      | 2000   | 0.028 | 16x25      | 2200   | 0.024 | 18x36      | 2550   | 0.019 |
| 3900                      | 13x25                  | 1750   | 0.032 |            |        |       |            |        |       |            |        |       |
| 4700                      | *13x30                 | 1570   | 0.033 | *13x25     | 1860   | 0.028 | 16x36      | 2550   | 0.019 | 18x36      | 2800   | 0.019 |
| 4700                      | *13x25                 | 1520   | 0.032 | 16x25      | 2200   | 0.024 |            |        |       |            |        |       |
| 4700                      | 16x25                  | 1800   | 0.028 |            |        |       |            |        |       |            |        |       |
| 6800                      | 16x32                  | 2000   | 0.024 | 16x36      | 2550   | 0.019 | 18x36      | 2800   | 0.019 | 18x36      | 2800   | 0.019 |
| 8200                      | 16x32                  | 2350   | 0.019 | 18x36      | 2800   | 0.019 |            |        |       |            |        |       |
| 10000                     | 16x36                  | 2550   | 0.019 |            |        |       |            |        |       |            |        |       |
| 15000                     | 18x36                  | 3000   | 0.019 |            |        |       |            |        |       |            |        |       |

☆ Size: D  $\phi$  x L (mm) ☆ Ripple Current: (mA/rms), 105°C, 100KHz ☆ Impedance ( $\Omega$ ), 20°C, 100KHz

" \* " is down size , Ripple Life is less 1000 hrs than standard

**■ Dimensions, Rated Ripple Current, Max Impedance**

| Capacitance<br>( $\mu$ F) | RATED ( SURAGE ) VOLTAGE |        |       |            |        |       |            |        |       |              |        |       |
|---------------------------|--------------------------|--------|-------|------------|--------|-------|------------|--------|-------|--------------|--------|-------|
|                           | 35V ( 44 )               |        |       | 50V ( 63 ) |        |       | 63V ( 79 ) |        |       | 100V ( 125 ) |        |       |
|                           | SIZE                     | Ripple | Z     | SIZE       | Ripple | Z     | SIZE       | Ripple | Z     | SIZE         | Ripple | Z     |
| 4.7                       | 5x11                     | 115    | 1.200 | 5x11       | 115    | 2.000 | 5x11       | 115    | 2.200 | 5x11         | 120    | 2.000 |
| 6.8                       | 5x11                     | 120    | 1.000 | 5x11       | 120    | 1.850 | 5x11       | 120    | 2.000 | 5x11         | 140    | 1.850 |
| 10                        | 5x11                     | 140    | 0.900 | 5x11       | 140    | 1.700 | 5x11       | 140    | 1.850 | 6.3x11       | 200    | 1.500 |
| 15                        | 5x11                     | 170    | 0.690 | 5x11       | 180    | 1.200 | 5x11       | 200    | 1.700 | 6.3x11       | 250    | 1.200 |
| 22                        | 5x11                     | 190    | 0.420 | 5x11       | 200    | 0.700 | 6.3x11     | 250    | 1.200 | 8x11         | 300    | 0.790 |
| 33                        | 5x11                     | 200    | 0.420 | 6.3x11     | 250    | 0.600 | 6.3x11     | 300    | 0.900 | 8x15         | 450    | 0.590 |
| 47                        | 6.3x11                   | 250    | 0.370 | 6.3x11     | 300    | 0.520 | 8x11       | 450    | 0.700 | 10x16        | 550    | 0.350 |
| 68                        | 6.3x11                   | 300    | 0.220 | 8x11       | 450    | 0.350 | 8x11       | 550    | 0.520 | 10x20        | 650    | 0.240 |
| 100                       | *6.3x11                  | 360    | 0.180 | *8x11      | 480    | 0.290 | 8x20       | 650    | 0.350 | 13x20        | 800    | 0.180 |
|                           | 8x11                     | 450    | 0.140 | 8x15       | 550    | 0.250 |            |        |       |              |        |       |
| 120                       | 8x11                     | 550    | 0.130 | 8x20       | 650    | 0.210 | 10x16      | 800    | 0.300 | 13x25        | 1050   | 0.150 |
| 150                       | 8x15                     | 650    | 0.100 | 10x12.5    | 800    | 0.160 | 10x16      | 1050   | 0.200 | 13x25        | 1300   | 0.110 |
| 220                       | *8x15                    | 730    | 0.100 | *10x16     | 1050   | 0.100 | 10x20      | 1300   | 0.150 | 16x25        | 1400   | 0.071 |
|                           | 10x12.5                  | 800    | 0.069 | 10x25      | 1050   | 0.068 |            |        |       |              |        |       |
| 330                       | *10x16                   | 900    | 0.052 | 10x20      | 1300   | 0.072 | 13x20      | 1400   | 0.100 | 16x32        | 1550   | 0.049 |
|                           | 10x20                    | 1050   | 0.044 |            |        |       |            |        |       |              |        |       |
| 470                       | 10x20                    | 1300   | 0.039 | *10x20     | 1390   | 0.075 | 13x25      | 1550   | 0.064 | 18x36        | 1770   | 0.038 |
|                           |                          |        |       | 13x20      | 1400   | 0.060 |            |        |       |              |        |       |
| 680                       | 13x20                    | 1400   | 0.038 | 13x25      | 1550   | 0.050 | 16x25      | 1700   | 0.052 |              |        |       |
| 820                       | 13x20                    | 1550   | 0.034 | 16x25      | 1700   | 0.040 | 16x32      | 1900   | 0.048 |              |        |       |
| 1000                      | 13x25                    | 1700   | 0.029 | 16x25      | 1900   | 0.039 | 16x32      | 2100   | 0.042 |              |        |       |
| 1200                      | 16x25                    | 1900   | 0.028 | 16x32      | 2100   | 0.025 | 16x36      | 2550   | 0.036 |              |        |       |
| 1500                      | 16x25                    | 2100   | 0.024 | 16x36      | 2550   | 0.025 | 18x36      | 2800   | 0.033 |              |        |       |
| 2200                      | *16x32                   | 2300   | 0.021 | 18x40      | 2800   | 0.025 |            |        |       |              |        |       |
|                           | 16x36                    | 2550   | 0.019 |            |        |       |            |        |       |              |        |       |
| 3300                      | 18x36                    | 2880   | 0.019 |            |        |       |            |        |       |              |        |       |
| 3900                      |                          |        |       |            |        |       |            |        |       |              |        |       |
| 4700                      |                          |        |       |            |        |       |            |        |       |              |        |       |
| 6800                      |                          |        |       |            |        |       |            |        |       |              |        |       |
| 8200                      |                          |        |       |            |        |       |            |        |       |              |        |       |
| 10000                     |                          |        |       |            |        |       |            |        |       |              |        |       |
| 15000                     |                          |        |       |            |        |       |            |        |       |              |        |       |

☆ Size:  $D \phi \times L$  (mm)    ☆ Ripple Current: (mA/rms), 105°C, 100KHz    ☆ Impedance ( $\Omega$ ), 20°C, 100KHz

" \* " is down size , Ripple Life is less 1000 hrs than standard