

## NFA Series

• 105°C 7,000~10,000Hrs assured.

- Non-solvent proof.
- High Ripple, Long Life.
- For ballasts stabilizer.
- RoHS compliant.
- Halogen-free capacitors are also available.



## SPECIFICATIONS

| Item   | Characteristics  |                         |                                 |         |                |                 |                  |      |                |                 |                  |   |                  |                 |
|--|--|-------------------------|---------------------------------|---------|----------------|-----------------|------------------|------|----------------|-----------------|------------------|---|------------------|-----------------|
| Rated Voltage Range                                | 160~400 V <sub>DC</sub>  | 420~500 V <sub>DC</sub> |                                 |         |                |                 |                  |      |                |                 |                  |   |                  |                 |
| Operating Temperature Range                        | -40~+105°C   | -25~+105°C              |                                 |         |                |                 |                  |      |                |                 |                  |   |                  |                 |
| Capacitance Tolerance                              | ±20%(M) (at 20°C, 120Hz)   |                         |                                 |         |                |                 |                  |      |                |                 |                  |   |                  |                 |
| Leakage Current                                    | <table border="1"> <thead> <tr> <th>C · V</th> <th>Time</th> <th>After 1 minute</th> <th>After 5 minutes</th> </tr> </thead> <tbody> <tr> <td>≤ 1000</td> <td></td> <td>I = 0.1CV + 40</td> <td>I = 0.03CV + 15</td> </tr> <tr> <td>&gt; 1000</td> <td></td> <td>I = 0.04CV + 100</td> <td>I = 0.02CV + 25</td> </tr> </tbody> </table> <p>Where, I:Max. Leakage current(μA) C:Nominal capacitance(μF) V:Rated voltage(V<sub>DC</sub>) (at 20°C)</p>   |                         | C · V                           | Time    | After 1 minute | After 5 minutes | ≤ 1000           |      | I = 0.1CV + 40 | I = 0.03CV + 15 | > 1000           |   | I = 0.04CV + 100 | I = 0.02CV + 25 |
| C · V  | Time   | After 1 minute          | After 5 minutes                 |         |                |                 |                  |      |                |                 |                  |   |                  |                 |
| ≤ 1000   |  | I = 0.1CV + 40          | I = 0.03CV + 15                 |         |                |                 |                  |      |                |                 |                  |   |                  |                 |
| > 1000   |  | I = 0.04CV + 100        | I = 0.02CV + 25                 |         |                |                 |                  |      |                |                 |                  |   |                  |                 |
| Dissipation Factor(Tanδ)                           | <table border="1"> <thead> <tr> <th>Rated Voltage(V<sub>DC</sub>)</th> <th>160~250</th> <th>350~500</th> </tr> </thead> <tbody> <tr> <td>Tanδ(Max.)</td> <td>0.20</td> <td>0.24</td> </tr> </tbody> </table> <p>(at 20°C, 120Hz)</p>   |                         | Rated Voltage(V <sub>DC</sub> ) | 160~250 | 350~500        | Tanδ(Max.)      | 0.20             | 0.24 |                |                 |                  |   |                  |                 |
| Rated Voltage(V <sub>DC</sub> )                    | 160~250  | 350~500                 |                                 |         |                |                 |                  |      |                |                 |                  |   |                  |                 |
| Tanδ(Max.)   | 0.20   | 0.24                    |                                 |         |                |                 |                  |      |                |                 |                  |   |                  |                 |
| Temperature Characteristics (Max. Impedance ratio) | <table border="1"> <thead> <tr> <th>Rated Voltage(V<sub>DC</sub>)</th> <th>160~250</th> <th>350~400</th> <th>420~500</th> </tr> </thead> <tbody> <tr> <td>Z(-25°C)/Z(20°C)</td> <td>3</td> <td>5</td> <td>6</td> </tr> <tr> <td>Z(-40°C)/Z(20°C)</td> <td>6</td> <td>6</td> <td>-</td> </tr> </tbody> </table> <p>(at 120Hz)</p>   |                         | Rated Voltage(V <sub>DC</sub> ) | 160~250 | 350~400        | 420~500         | Z(-25°C)/Z(20°C) | 3    | 5              | 6               | Z(-40°C)/Z(20°C) | 6 | 6                | -               |
| Rated Voltage(V <sub>DC</sub> )                    | 160~250  | 350~400                 | 420~500                         |         |                |                 |                  |      |                |                 |                  |   |                  |                 |
| Z(-25°C)/Z(20°C)                                   | 3  | 5                       | 6                               |         |                |                 |                  |      |                |                 |                  |   |                  |                 |
| Z(-40°C)/Z(20°C)                                   | 6  | 6                       | -                               |         |                |                 |                  |      |                |                 |                  |   |                  |                 |
| Load Life  | <p>The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage with the rated ripple current is applied (the peak voltage shall not exceed the rated voltage) for 10,000 hours at 105°C. (where, 7,000 hours for ø8, 8,000 hours for ø10)</p> <p>Capacitance change ≤ ±20% of the initial value<br/>                     Tanδ ≤ 200% of the initial specified value<br/>                     Leakage current ≤ The initial specified value</p>                                    |                         |                                 |         |                |                 |                  |      |                |                 |                  |   |                  |                 |
| Shelf Life   | <p>The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. The rated voltage shall be applied to the capacitors for a minimum of 30 minutes, at least 24 hours and not more than 48 hours before the measurements.</p> <p>Capacitance change ≤ ±20% of the initial value<br/>                     Tanδ ≤ 200% of the initial specified value<br/>                     Leakage current ≤ 500% of the initial specified value</p> |                         |                                 |         |                |                 |                  |      |                |                 |                  |   |                  |                 |
| Others   | Satisfied characteristics KS C IEC 60384-4   |                         |                                 |         |                |                 |                  |      |                |                 |                  |   |                  |                 |

## DIMENSIONS OF NFA Series

Unit(mm)

Marking : DARK BROWN SLEEVE, SILVER INK

| øD  | 8             | 10           | 12.5 | 16  | 18  | 20  | 22   |
|-----|---------------|--------------|------|-----|-----|-----|------|
| ød  | 0.6           | 0.6          | 0.6  | 0.8 | 0.8 | 0.8 | 0.8  |
| F   | 3.5           | 5.0          | 5.0  | 7.5 | 7.5 | 7.5 | 10.0 |
| øD' | øD + 0.5 max. |              |      |     |     |     |      |
| L'  | L + 1.5 max.  | L + 2.0 max. |      |     |     |     |      |

## RATINGS OF NFA Series

| V <sub>DC</sub> | 160          |  | 200          |  |
|-----------------|--------------|--|--------------|--|
| Items<br>μF     | ∅ D × L (mm) | Rated Ripple Current<br>(mArms/105°C, 120Hz) | ∅ D × L (mm) | Rated Ripple Current<br>(mArms/105°C, 120Hz) |
| 22              | 10 × 20      | 192  | 10 × 20      | 192  |
| 33              | 10 × 20      | 236  | 10 × 20      | 236  |
| 47              | 12.5 × 20    | 312  | 12.5 × 20    | 262  |
| 68              | 12.5 × 25    | 409  | 12.5 × 20    | 312  |
|                 |              |  | 10 × 33      | 409  |
|                 |              |  | 12.5 × 25    | 409  |
| 100             | 16 × 25      | 548  | 16 × 25      | 548  |
| 150             | 16 × 31.5    | 724  | 16 × 31.5    | 701  |
| 220             | 16 × 31.5    | 876  | 18 × 31.5    | 906  |
| 330             | 16 × 35.5    | 1,110  |              |  |

| V <sub>DC</sub> | 250          |  | 350          |  |
|-----------------|--------------|--|--------------|--|
| Items<br>μF     | ∅ D × L (mm) | Rated Ripple Current<br>(mArms/105°C, 120Hz) | ∅ D × L (mm) | Rated Ripple Current<br>(mArms/105°C, 120Hz) |
| 10              | 10 × 20      | 130  | 10 × 20      | 126  |
| 22              | 12.5 × 20    | 214  | 12.5 × 20    | 207  |
| 33              | 12.5 × 25    | 285  | 16 × 20      | 284  |
| 47              | 12.5 × 25    | 340  | 16 × 25      | 364  |
| 56              | 10 × 33      | 350  |              |  |
| 68              | 16 × 25      | 452  | 16 × 31.5    | 472  |
| 100             | 16 × 31.5    | 591  | 18 × 31.5    | 591  |
| 150             | 18 × 25      | 700  | 18 × 40      | 760  |
| 220             | 18 × 31.5    | 850  | 22 × 45      | 970  |
| 330             | 20 × 40      | 1,196  |              |  |

| V <sub>DC</sub> | 400          |  | 420          |  |
|-----------------|--------------|--|--------------|--|
| Items<br>μF     | ∅ D × L (mm) | Rated Ripple Current<br>(mArms/105°C, 120Hz) | ∅ D × L (mm) | Rated Ripple Current<br>(mArms/105°C, 120Hz) |
| 2.2             | 8 × 11.5     | 27   | 8 × 11.5     | 25   |
| 3.3             | 8 × 11.5     | 33   | 8 × 11.5     | 31   |
| 4.7             | 8 × 11.5     | 39   | 8 × 11.5     | 37   |
| 6.8             | 8 × 15       | 63   | 8 × 20       | 76   |
| 8.2             | 8 × 20       | 75   | 10 × 16      | 87   |
| 10              | 10 × 20      | 126  | 10 × 20      | 116  |
| 15              | 10 × 20      | 154  | 10 × 25      | 155  |
| 22              | 12.5 × 25    | 225  | 12.5 × 20    | 191  |
| 33              | 16 × 20      | 284  | 16 × 20      | 262  |
| 47              | 16 × 25      | 364  | 16 × 25      | 335  |
| 68              | 16 × 31.5    | 472  | 18 × 25      | 435  |
| 82              | 18 × 31.5    | 536  | 16 × 31.5    | 507  |
| 100             | 18 × 35.5    | 611  | 18 × 31.5    | 580  |
| 120             | 18 × 40      | 680  | 18 × 40      | 659  |
| 150             | 18 × 40      | 760  | 18 × 45      | 757  |
| 180             | 20 × 40      | 855  |              |  |
| 220             | 22 × 45      | 996  |              |  |

| V <sub>DC</sub> | 450          |   | 500          |   |
|-----------------|--------------|---|--------------|---|
| Items<br>μF     | ∅ D × L (mm) | Rated Ripple Current<br>(mA rms/105°C, 120Hz) | ∅ D × L (mm) | Rated Ripple Current<br>(mA rms/105°C, 120Hz) |
| 2.2             | 8 × 15       | 44  |              |   |
| 3.3             | 10 × 16      | 63  | 10 × 12.5    | 52  |
| 4.7             | 10 × 16      | 74  | 10 × 12.5    | 62  |
| 6.8             | 10 × 20      | 96  | 10 × 16      | 83  |
| 8.2             | 10 × 20      | 106   | 10 × 20      | 98  |
| 10              | 10 × 20      | 108   | 12.5 × 20    | 120   |
|                 | 12.5 × 20    | 114   |              |   |
| 22              | 16 × 25      | 241   | 16 × 25      | 228   |
| 33              | 12.5 × 30    | 315   | 18 × 25      | 260   |
|                 | 16 × 31.5    | 319   |              |   |
| 47              | 18 × 25      | 368   | 18 × 31.5    | 393   |
| 56              | 16 × 31.5    | 410   |              |   |
| 68              | 18 × 25      | 435   | 16 × 45      | 625   |
|                 | 18 × 31.5    | 473   | 18 × 35.5    | 550   |
| 82              | 18 × 35.5    | 537   |              |   |
| 100             | 18 × 40      | 602   |              |   |
| 120             | 18 × 40      | 659   |              |   |
| 150             | 20 × 40      | 757   |              |   |
| 180             | 22 × 45      | 892   |              |   |
| 220             |              |   |              |   |

## RATED RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

| Freq.(Hz) | 120  | 1k   | 10k  | 50k  | 100k |
|-----------|------|------|------|------|------|
| Factor    | 1.00 | 1.25 | 1.50 | 1.60 | 1.75 |

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