

# NPCAP™-PSF Series

- Super low ESR, high ripple current capability
- ESR 5mΩmax. (2 to 4V<sub>dc</sub>)
- Longer life (20,000 hours at 105°C)
- Rated voltage range : 2 to 16V<sub>dc</sub>
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS2 Compliant
- Halogen Free



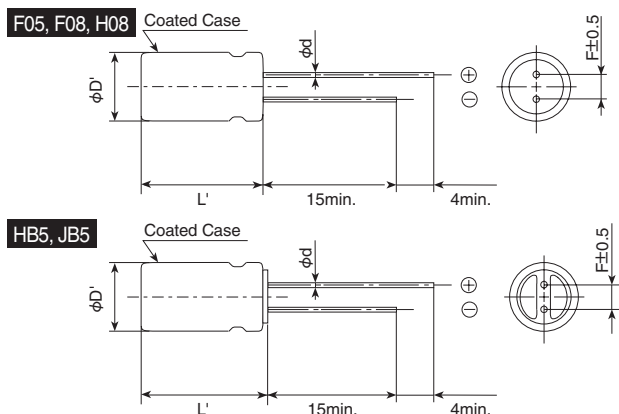
## SPECIFICATIONS

| Items                                                    | Characteristics                                                                                                                                                                                                  |  |                                                                                                                    |     |     |     |    |
|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------|-----|-----|-----|----|
| Category                                                 |                                                                                                                                                                                                                  |  |                                                                                                                    |     |     |     |    |
| Temperature Range                                        | -55 to +105℃                                                                                                                                                                                                     |  |                                                                                                                    |     |     |     |    |
| Rated Voltage Range                                      | 2 to 16V <sub>dc</sub>                                                                                                                                                                                           |  |                                                                                                                    |     |     |     |    |
| Capacitance Tolerance                                    | ± 20%(M) (at 20℃, 120Hz)                                                                                                                                                                                         |  |                                                                                                                    |     |     |     |    |
| Leakage Current<br>*Note                                 | Shall not exceed values shown in STANDARD RATINGS. (at 20℃ after 2 minutes)                                                                                                                                      |  |                                                                                                                    |     |     |     |    |
| Dissipation Factor<br>(tan δ )                           | 0.10 max. (at 20℃, 120Hz)                                                                                                                                                                                        |  |                                                                                                                    |     |     |     |    |
| Low Temperature Characteristics<br>(Max.Impedance Ratio) | Z(-25℃)/Z(+20℃)≤1.15<br>Z(-55℃)/Z(+20℃)≤1.25 (at 100kHz)                                                                                                                                                         |  |                                                                                                                    |     |     |     |    |
| Endurance                                                | The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage is applied for 20,000 hours at 105℃.                                                             |  |                                                                                                                    |     |     |     |    |
|                                                          | Appearance                                                                                                                                                                                                       |  | No significant damage                                                                                              |     |     |     |    |
|                                                          | Capacitance change                                                                                                                                                                                               |  | ≤ ±20% of the initial value                                                                                        |     |     |     |    |
|                                                          | D.F. (tan δ )                                                                                                                                                                                                    |  | ≤150% of the initial specified value                                                                               |     |     |     |    |
|                                                          | ESR                                                                                                                                                                                                              |  | ≤150% of the initial specified value                                                                               |     |     |     |    |
|                                                          | Leakage current                                                                                                                                                                                                  |  | ≤The initial specified value                                                                                       |     |     |     |    |
| Bias Humidity Test                                       | The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them to DC voltage at 60℃, 90 to 95% RH for 1,000 hours.                                                |  |                                                                                                                    |     |     |     |    |
|                                                          | Appearance                                                                                                                                                                                                       |  | No significant damage                                                                                              |     |     |     |    |
|                                                          | Capacitance change                                                                                                                                                                                               |  | ≤ ±20% of the initial value                                                                                        |     |     |     |    |
|                                                          | D.F. (tan δ )                                                                                                                                                                                                    |  | ≤The initial specified value                                                                                       |     |     |     |    |
|                                                          | ESR                                                                                                                                                                                                              |  | 2 to 6.3V <sub>dc</sub> : ≤The initial specified value<br>16V <sub>dc</sub> : ≤150% of the initial specified value |     |     |     |    |
|                                                          | Leakage current                                                                                                                                                                                                  |  | ≤The initial specified value                                                                                       |     |     |     |    |
| Surge Voltage Test                                       | The capacitors shall be subjected to 1,000 cycles each consisting of charge with the surge voltage specified at 105℃ for 30 seconds through a protective resistor(R=1kΩ) and discharge for 5 minutes 30 seconds. |  |                                                                                                                    |     |     |     |    |
|                                                          | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                 |  | 2.0                                                                                                                | 2.5 | 4.0 | 6.3 | 16 |
|                                                          | Surge voltage (V <sub>dc</sub> )                                                                                                                                                                                 |  | 2.3                                                                                                                | 2.9 | 4.6 | 7.2 | 18 |
|                                                          | Appearance                                                                                                                                                                                                       |  | No significant damage                                                                                              |     |     |     |    |
|                                                          | Capacitance change                                                                                                                                                                                               |  | ≤ ±20% of the initial value                                                                                        |     |     |     |    |
|                                                          | D.F. (tan δ )                                                                                                                                                                                                    |  | ≤The initial specified value                                                                                       |     |     |     |    |
|                                                          | ESR                                                                                                                                                                                                              |  | 2 to 6.3V <sub>dc</sub> : ≤The initial specified value<br>16V <sub>dc</sub> : ≤150% of the initial specified value |     |     |     |    |
|                                                          | Leakage current                                                                                                                                                                                                  |  | ≤The initial specified value                                                                                       |     |     |     |    |
|                                                          | Failure Rate                                                                                                                                                                                                     |  |                                                                                                                    |     |     |     |    |
|                                                          | 0.5% per 1,000 hours maximum (Confidence level 60% at 105℃)                                                                                                                                                      |  |                                                                                                                    |     |     |     |    |

\*Note : If any doubt arises, measure the leakage current after the following voltage treatment.  
Voltage treatment : DC rated voltage is applied to the capacitors for 120 minutes at 105°C.

## DIMENSIONS [mm]

### Terminal Code : E



| Size code                     | F05               | F08 | H08 | HB5       | JB5  |
|-------------------------------|-------------------|-----|-----|-----------|------|
| φD                            | 6.3               |     | 8.0 |           | 10.0 |
| φd                            | 0.45              |     | 0.6 |           |      |
| F                             | 2.5               |     | 3.5 |           | 5.0  |
| Note: L+1.2 max for 3.5V820μF |                   |     |     |           |      |
| L'                            | L+1.0max. (Note1) |     |     | L+1.5max. |      |

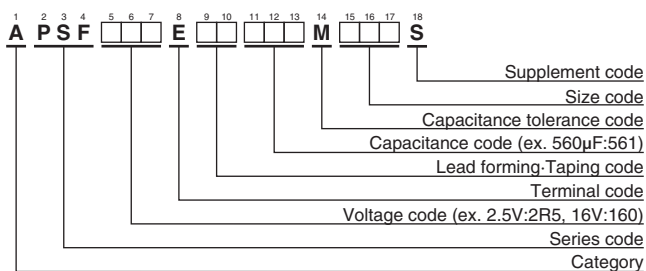
## MARKING

EX) 2.5V560μF



NPCAP™-PSF Series

◆PART NUMBERING SYSTEM



Please refer to "Product code guide (conductive polymer type)"

◆STANDARD RATINGS

| WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Case size<br>φ D × L (mm) | Leakage current<br>(μA max./after 2min.) | ESR<br>(mΩ max./20°C,<br>100k to 300kHz) | Rated ripple current<br>(mA <sub>rms</sub> /105°C, 100kHz) | Part No.           |
|--------------------------|-------------|---------------------------|------------------------------------------|------------------------------------------|------------------------------------------------------------|--------------------|
| 2                        | 1,000       | 6.3 × 8                   | 500                                      | 5                                        | 5,900                                                      | APSF2R0E□□102MF08S |
| 2.5                      | 330         | 6.3 × 8                   | 500                                      | 5                                        | 5,900                                                      | APSF2R5E□□331MF08S |
|                          | 470         | 6.3 × 8                   | 500                                      | 5                                        | 5,900                                                      | APSF2R5E□□471MF08S |
|                          | 560         | 6.3 × 8                   | 500                                      | 5                                        | 5,900                                                      | APSF2R5E□□561MF08S |
|                          | 820         | 6.3 × 8                   | 500                                      | 5                                        | 5,900                                                      | APSF2R5E□□821MF08S |
|                          | 1,200       | 6.3 × 8                   | 1,200                                    | 5                                        | 5,900                                                      | APSF2R5E□□122MF08S |
|                          | 1,600       | 8 × 8                     | 800                                      | 5                                        | 6,100                                                      | APSF2R5E□□162MH08S |
| 4                        | 470         | 6.3 × 8                   | 500                                      | 5                                        | 5,900                                                      | APSF4R0E□□471MF08S |
|                          | 560         | 6.3 × 8                   | 500                                      | 5                                        | 5,900                                                      | APSF4R0E□□561MF08S |
| 6.3                      | 820         | 6.3 × 8                   | 1,030                                    | 8                                        | 4,700                                                      | APSF6R3E□□821MF08S |
| 16                       | 100         | 6.3 × 5                   | 500                                      | 24                                       | 2,490                                                      | APSF160E□□101MF05S |
|                          | 270         | 8 × 8                     | 864                                      | 10                                       | 5,000                                                      | APSF160E□□271MH08S |
|                          | 270         | 8 × 11.5                  | 864                                      | 11                                       | 5,080                                                      | APSF160E□□271MHB5S |
|                          | 330         | 8 × 8                     | 1,050                                    | 13                                       | 4,700                                                      | APSF160E□□331MH08S |
|                          | 470         | 8 × 11.5                  | 1,500                                    | 11                                       | 5,400                                                      | APSF160E□□471MHB5S |
|                          | 470         | 10 × 11.5                 | 1,500                                    | 10                                       | 6,100                                                      | APSF160E□□471MJB5S |

□□ : Enter the appropriate lead forming or taping code.

◆RATED RIPPLE CURRENT MULTIPLIERS

● Frequency Multipliers

| Frequency (Hz)   | 120  | 1k   | 10k  | 50k  | 100k to 500k |
|------------------|------|------|------|------|--------------|
| Radial lead type | 0.10 | 0.35 | 0.60 | 0.80 | 1.00         |