

## NPCAP™-PXF Series

- Super low ESR, impedance and high heat resistance have been obtained by using conductive polymer as electrolyte.
- Rated voltage range : 2 to 10V<sub>dc</sub>, Capacitance range : 120 to 680μF
- Case size range : φ 5x3.9L to φ 8x6.7L
- Suitable for DC-DC converters, voltage regulators and decoupling applications used on computer motherboards etc.
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS2 Compliant
- Halogen Free

PXF

↑ Lower ESR  
PXE



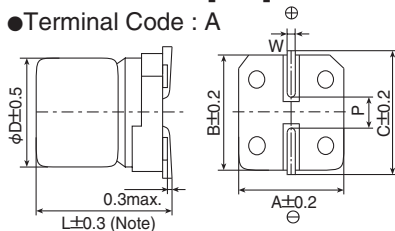
### ◆ SPECIFICATIONS

| Items   | Characteristics  |                                  |                       |                    |                                      |              |                                       |                                  |                                       |                 |   |     |    |
|---|--|----------------------------------|-----------------------|--------------------|--------------------------------------|--------------|---------------------------------------|----------------------------------|---------------------------------------|-----------------|---|-----|----|
| <b>Category</b>   |  |                                  |                       |                    |                                      |              |                                       |                                  |                                       |                 |   |     |    |
| <b>Temperature Range</b>                                      | -55 to +105°C  |                                  |                       |                    |                                      |              |                                       |                                  |                                       |                 |   |     |    |
| <b>Rated Voltage Range</b>                                    | 2 to 10V <sub>dc</sub>   |                                  |                       |                    |                                      |              |                                       |                                  |                                       |                 |   |     |    |
| <b>Capacitance Tolerance</b>                                  | ±20% (M) (at 20°C, 120Hz)  |                                  |                       |                    |                                      |              |                                       |                                  |                                       |                 |   |     |    |
| <b>Leakage Current</b><br><small>*Note</small>                | Shall not exceed values shown in STANDARD RATINGS. (at 20°C after 2 minutes)   |                                  |                       |                    |                                      |              |                                       |                                  |                                       |                 |   |     |    |
| <b>Dissipation Factor (tan δ)</b>                             | 0.12 max. (at 20°C, 120Hz)   |                                  |                       |                    |                                      |              |                                       |                                  |                                       |                 |   |     |    |
| <b>Low Temperature Characteristics (Max. Impedance Ratio)</b> | Z(-25°C)/Z(+20°C) ≤ 1.15<br>Z(-55°C)/Z(+20°C) ≤ 1.25 (at 100kHz)   |                                  |                       |                    |                                      |              |                                       |                                  |                                       |                 |   |     |    |
| <b>Endurance</b>  | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 15,000 hours (E40, F46 : 3,000 hours) at 105°C.  |                                  |                       |                    |                                      |              |                                       |                                  |                                       |                 |   |     |    |
|   | <table border="1"> <tr><td>Appearance</td><td>No significant damage</td></tr> <tr><td>Capacitance change</td><td>≤ ±20% of the initial value</td></tr> <tr><td>D.F. (tan δ)</td><td>≤ 150% of the initial specified value</td></tr> <tr><td>ESR</td><td>≤ 150% of the initial specified value</td></tr> <tr><td>Leakage current</td><td>≤ The initial specified value</td></tr> </table>             | 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                     |     |    |
| 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  |                                  |                       |                    |                                      |              |                                       |                                  |                                       |                 |   |     |    |
| <b>Bias Humidity</b>  | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjecting them to the DC rated voltage at 60°C, 90 to 95% RH for 1,000 hours (E40, F46 : 500 hours).   |                                  |                       |                    |                                      |              |                                       |                                  |                                       |                 |   |     |    |
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| 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  |                                  |                       |                    |                                      |              |                                       |                                  |                                       |                 |   |     |    |
| <b>Surge Voltage</b>  | The capacitors shall be subjected to 1,000 cycles each consisting of charge with the surge voltage specified at 105°C for 30 seconds through a protective resistor(R=1kΩ) and discharge for 5 minutes 30 seconds.  |                                  |                       |                    |                                      |              |                                       |                                  |                                       |                 |   |     |    |
|   | <table border="1"> <tr> <td>Rated voltage (V<sub>dc</sub>)</td> <td>2.0</td> <td>2.5</td> <td>4.0</td> <td>6.3</td> <td>10</td> </tr> <tr> <td>Surge voltage (V<sub>dc</sub>)</td> <td>2.3</td> <td>2.9</td> <td>4.6</td> <td>7.2</td> <td>12</td> </tr> </table>  | Rated voltage (V <sub>dc</sub> ) | 2.0                   | 2.5                | 4.0                                  | 6.3          | 10                                    | Surge voltage (V <sub>dc</sub> ) | 2.3                                   | 2.9             | 4.6   | 7.2 | 12 |
| Rated voltage (V <sub>dc</sub> )                              | 2.0  | 2.5                              | 4.0                   | 6.3                | 10                                   |              |                                       |                                  |                                       |                 |   |     |    |
| Surge voltage (V <sub>dc</sub> )                              | 2.3  | 2.9                              | 4.6                   | 7.2                | 12                                   |              |                                       |                                  |                                       |                 |   |     |    |
|   | <table border="1"> <tr><td>Appearance</td><td>No significant damage</td></tr> <tr><td>Capacitance change</td><td>≤ ±20% of the initial value</td></tr> <tr><td>D.F. (tan δ)</td><td>≤ 150% of the initial specified value</td></tr> <tr><td>ESR</td><td>≤ 150% of the initial specified value</td></tr> <tr><td>Leakage current</td><td>≤ The initial specified value</td></tr> </table>             | 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                     |     |    |
| 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  |                                  |                       |                    |                                      |              |                                       |                                  |                                       |                 |   |     |    |
| <b>Soldering Heat</b>   | The following specifications shall be satisfied when the solder temperature is reduced back to 20°C after soldering has been performed under the recommended soldering conditions.   |                                  |                       |                    |                                      |              |                                       |                                  |                                       |                 |   |     |    |
|   | <table border="1"> <tr><td>Appearance</td><td>No significant damage</td></tr> <tr><td>Capacitance value</td><td>Within the specified tolerance range</td></tr> <tr><td>D.F. (tan δ)</td><td>≤ The initial specified value</td></tr> <tr><td>ESR</td><td>≤ The initial specified value</td></tr> <tr><td>Leakage current</td><td>≤ The initial specified value (Voltage treatment)</td></tr> </table> | Appearance                       | No significant damage | Capacitance value  | Within the specified tolerance range | D.F. (tan δ) | ≤ The initial specified value         | ESR                              | ≤ The initial specified value         | Leakage current | ≤ The initial specified value (Voltage treatment) |     |    |
| Appearance  | No significant damage  |                                  |                       |                    |                                      |              |                                       |                                  |                                       |                 |   |     |    |
| Capacitance value   | Within the specified tolerance range   |                                  |                       |                    |                                      |              |                                       |                                  |                                       |                 |   |     |    |
| D.F. (tan δ)  | ≤ The initial specified value  |                                  |                       |                    |                                      |              |                                       |                                  |                                       |                 |   |     |    |
| ESR   | ≤ The initial specified value  |                                  |                       |                    |                                      |              |                                       |                                  |                                       |                 |   |     |    |
| Leakage current   | ≤ The initial specified value (Voltage treatment)  |                                  |                       |                    |                                      |              |                                       |                                  |                                       |                 |   |     |    |

\*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 : A



Note : L<sup>+0.1</sup><sub>-0.2</sub> for E40 and F46

| Size Code | φD  | L   | A   | B   | C   | W          | P   |
|-----------|-----|-----|-----|-----|-----|------------|-----|
| E40       | 5   | 3.9 | 5.3 | 5.3 | 5.9 | 0.5 to 0.8 | 1.4 |
| E61       | 5   | 5.8 | 5.3 | 5.3 | 5.9 | 0.5 to 0.8 | 1.4 |
| F46       | 6.3 | 4.5 | 6.6 | 6.6 | 7.2 | 0.5 to 0.8 | 1.9 |
| F61       | 6.3 | 5.8 | 6.6 | 6.6 | 7.2 | 0.5 to 0.8 | 1.9 |
| F80       | 6.3 | 7.7 | 6.6 | 6.6 | 7.2 | 0.5 to 0.8 | 1.9 |
| H70       | 8   | 6.7 | 8.3 | 8.3 | 9.0 | 0.7 to 1.1 | 3.1 |

### ◆ MARKING

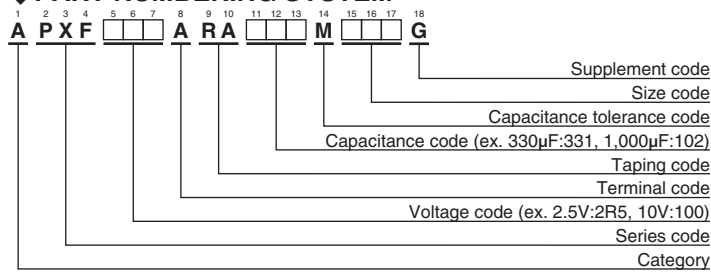
EX) 2.5V390μF





## NPCAP™-PXF Series

### ◆PART NUMBERING SYSTEM



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

### ◆STANDARD RATINGS

| WV (V <sub>dc</sub> ) | Cap ( $\mu$ F) | Size code | Leakage current ( $\mu$ A max./after 2min.) | ESR (m $\Omega$ max./20°C, 100k to 300kHz) | Rated ripple current (mArms/105°C, 100kHz) | Part No.           |
|-----------------------|----------------|-----------|---|--|--|--------------------|
| 2                     | 680            | F61       | 700   | 12   | 3,500                                      | APXF2R0ARA681MF61G |
| 2.5                   | 220            | E40       | 700   | 12   | 3,300                                      | APXF2R5ARA221ME40G |
|                       | 330            | E61       | 700   | 10   | 3,900                                      | APXF2R5ARA331ME61G |
|                       | 330            | F46       | 700   | 12   | 3,500                                      | APXF2R5ARA331MF46G |
|                       | 390            | E61       | 700   | 10   | 3,900                                      | APXF2R5ARA391ME61G |
|                       | 390            | F61       | 292   | 10   | 3,900                                      | APXF2R5ARA391MF61G |
|                       | 470            | F80       | 352   | 9  | 4,200                                      | APXF2R5ARA471MF80G |
|                       | 560            | F61       | 700   | 10   | 3,900                                      | APXF2R5ARA561MF61G |
|                       | 560            | F80       | 420   | 9  | 4,200                                      | APXF2R5ARA561MF80G |
|                       | 560            | H70       | 420   | 10   | 4,500                                      | APXF2R5ARA561MH70G |
| 4                     | 680            | H70       | 510   | 10   | 4,500                                      | APXF2R5ARA681MH70G |
|                       | 330            | F61       | 396   | 10   | 3,900                                      | APXF4R0ARA331MF61G |
|                       | 390            | F80       | 468   | 9  | 4,200                                      | APXF4R0ARA391MF80G |
|                       | 470            | H70       | 564   | 10   | 4,500                                      | APXF4R0ARA471MH70G |
| 6.3                   | 560            | H70       | 672   | 10   | 4,500                                      | APXF4R0ARA561MH70G |
|                       | 150            | E40       | 700   | 20   | 2,700                                      | APXF6R3ARA151ME40G |
|                       | 150            | E61       | 700   | 12   | 3,500                                      | APXF6R3ARA151ME61G |
|                       | 220            | E61       | 700   | 12   | 3,500                                      | APXF6R3ARA221ME61G |
|                       | 220            | F61       | 415   | 10   | 3,900                                      | APXF6R3ARA221MF61G |
|                       | 270            | F80       | 510   | 9  | 4,200                                      | APXF6R3ARA271MF80G |
|                       | 330            | F61       | 700   | 10   | 3,900                                      | APXF6R3ARA331MF61G |
|                       | 330            | F80       | 623   | 9  | 4,200                                      | APXF6R3ARA331MF80G |
|                       | 330            | H70       | 623   | 10   | 4,500                                      | APXF6R3ARA331MH70G |
| 10                    | 390            | H70       | 737   | 10   | 4,500                                      | APXF6R3ARA391MH70G |
|                       | 120            | E61       | 240   | 22   | 2,600                                      | APXF100ARA121ME61G |
|                       | 270            | F61       | 540   | 20   | 2,800                                      | APXF100ARA271MF61G |

### ◆RATED RIPPLE CURRENT MULTIPLIERS

● Frequency Multipliers

| Frequency (Hz) | 120  | 1k   | 10k  | 50k  | 100k to 500k |
|----------------|------|------|------|------|--------------|
| SMD type       | 0.05 | 0.30 | 0.55 | 0.70 | 1.00         |



- Always read "Notes on Use" before using the product in order to enable you to use the product correctly and prevent any faults and accidents from occurring.
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[Part Numbering System](#)

[Part Numbering System \(Appendix\)](#)

[Standardization](#)

[Available Items by Manufacturing Locations](#)

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[Recommended Soldering Conditions](#)

[Taping, Lead-preforming, Terminal and Packaging Options](#)

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