

# NPCAP™-PXH Series

- Super low ESR, impedance and high heat resistance have been obtained by using conductive polymer as electrolyte.
- Suitable for DC-DC converters, voltage regulators and decoupling applications.
- Endurance : 125°C 1,000 hours
- Rated voltage range : 2.5 to 20V<sub>dc</sub>, Capacitance range : 22 to 1,000μF
- Case size range : φ 6.3×5.7L to φ 10×7.7L
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS2 Compliant
- Halogen Free

PXH

Higher temperature  
PXA



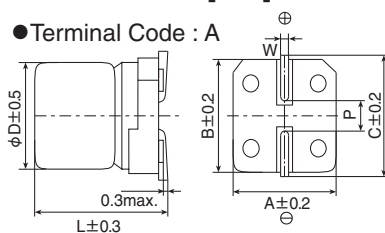
## SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                  |  |                                                  |     |     |    |    |    |
|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------|-----|-----|----|----|----|
| Category                                               | -55 to +125℃                                                                                                                                                                                                     |  |                                                  |     |     |    |    |    |
| Temperature Range                                      |                                                                                                                                                                                                                  |  |                                                  |     |     |    |    |    |
| Rated Voltage Range                                    | 2.5 to 20V <sub>dc</sub>                                                                                                                                                                                         |  |                                                  |     |     |    |    |    |
| Capacitance Tolerance                                  | ±20% (M) (at 20℃, 120Hz)                                                                                                                                                                                         |  |                                                  |     |     |    |    |    |
| Leakage Current                                        | Shall not exceed values shown in STANDARD RATINGS. (at 20℃ after 2 minutes)                                                                                                                                      |  |                                                  |     |     |    |    |    |
| *Note                                                  |                                                                                                                                                                                                                  |  |                                                  |     |     |    |    |    |
| Dissipation Factor (tan δ )                            | 0.12 max. (at 20℃, 120Hz)                                                                                                                                                                                        |  |                                                  |     |     |    |    |    |
| Low Temperature Characteristics (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 1,000 hours at 125℃.                                                              |  |                                                  |     |     |    |    |    |
|                                                        | Appearance                                                                                                                                                                                                       |  | No significant damage                            |     |     |    |    |    |
|                                                        | Capacitance change                                                                                                                                                                                               |  | ≤ ±20% of the initial value                      |     |     |    |    |    |
|                                                        | D.F. (tan δ )                                                                                                                                                                                                    |  | ≤200% of the initial specified value             |     |     |    |    |    |
|                                                        | ESR                                                                                                                                                                                                              |  | ≤200% of the initial specified value             |     |     |    |    |    |
|                                                        | Leakage current                                                                                                                                                                                                  |  | ≤The initial specified value                     |     |     |    |    |    |
|                                                        |                                                                                                                                                                                                                  |  |                                                  |     |     |    |    |    |
| Bias Humidity                                          | The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them to the DC rated 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 )                                                                                                                                                                                                    |  | ≤150% of the initial specified value             |     |     |    |    |    |
|                                                        | ESR                                                                                                                                                                                                              |  | ≤150% of the initial specified value             |     |     |    |    |    |
|                                                        | Leakage current                                                                                                                                                                                                  |  | ≤The initial specified value                     |     |     |    |    |    |
|                                                        |                                                                                                                                                                                                                  |  |                                                  |     |     |    |    |    |
| Surge Voltage                                          | The capacitors shall be subjected to 1,000 cycles each consisting of charge with the surge voltage specified at 125℃ for 30 seconds through a protective resistor(R=1kΩ) and discharge for 5 minutes 30 seconds. |  |                                                  |     |     |    |    |    |
|                                                        | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                 |  | 2.5                                              | 4.0 | 6.3 | 10 | 16 | 20 |
|                                                        | Surge voltage (V <sub>ac</sub> )                                                                                                                                                                                 |  | 2.9                                              | 4.6 | 7.2 | 12 | 18 | 23 |
|                                                        |                                                                                                                                                                                                                  |  |                                                  |     |     |    |    |    |
|                                                        | 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                     |     |     |    |    |    |
|                                                        |                                                                                                                                                                                                                  |  |                                                  |     |     |    |    |    |
| Soldering Heat                                         | The following specifications shall be satisfied when the solder temperature is reduced back to 20℃ to measure dip resistance after soldering has been performed under the recommended soldering conditions.      |  |                                                  |     |     |    |    |    |
|                                                        | 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) |     |     |    |    |    |
|                                                        |                                                                                                                                                                                                                  |  |                                                  |     |     |    |    |    |
| Failure Rate                                           | 0.5% per 1,000 hours maximum (Confidence level 60% at 125℃)                                                                                                                                                      |  |                                                  |     |     |    |    |    |

\*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 125°C.

## DIMENSIONS [mm]

- Terminal Code : A



| Size code | φD  | L   | A    | B    | C    | W          | P   |
|-----------|-----|-----|------|------|------|------------|-----|
| F60       | 6.3 | 5.7 | 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 |
| J80       | 10  | 7.7 | 10.3 | 10.3 | 11.0 | 0.7 to 1.1 | 4.5 |

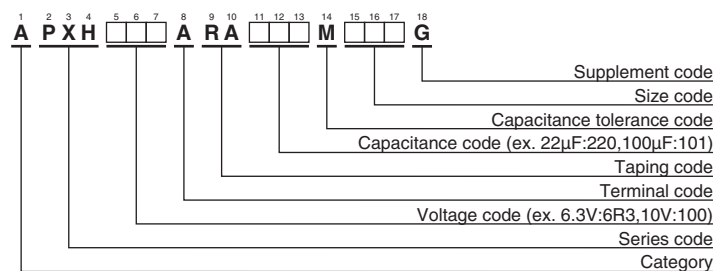
## MARKING

EX) 20V22μF



NPCAP™-PXH Series

◆PART NUMBERING SYSTEM



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

◆STANDARD RATINGS

| WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Size code | Leakage current<br>(μA max./after 2min.) | ESR<br>(mΩ max./20°C, 100k to 300kHz) | Rated ripple current<br>(mArms/100kHz)        |                                                | Part No.           |
|--------------------------|-------------|-----------|------------------------------------------|---------------------------------------|-----------------------------------------------|------------------------------------------------|--------------------|
|                          |             |           |                                          |                                       | -55°C ≤ T <sub>x</sub> ≤ +105°C <sup>*1</sup> | +105°C < T <sub>x</sub> ≤ +125°C <sup>*1</sup> |                    |
| 2.5                      | 220         | F60       | 110                                      | 35                                    | 2,500                                         | 770                                            | APXH2R5ARA221MF60G |
|                          | 560         | H70       | 280                                      | 30                                    | 3,100                                         | 960                                            | APXH2R5ARA561MH70G |
|                          | 1,000       | J80       | 500                                      | 25                                    | 3,700                                         | 1,100                                          | APXH2R5ARA102MJ80G |
| 4                        | 150         | F60       | 120                                      | 35                                    | 2,450                                         | 770                                            | APXH4R0ARA151MF60G |
|                          | 220         | H70       | 176                                      | 30                                    | 3,020                                         | 960                                            | APXH4R0ARA221MH70G |
|                          | 680         | J80       | 544                                      | 25                                    | 3,700                                         | 1,100                                          | APXH4R0ARA681MJ80G |
| 6.3                      | 82          | F60       | 103                                      | 40                                    | 2,400                                         | 720                                            | APXH6R3ARA820MF60G |
|                          | 100         | F60       | 126                                      | 40                                    | 2,400                                         | 720                                            | APXH6R3ARA101MF60G |
|                          | 150         | H70       | 189                                      | 30                                    | 3,020                                         | 960                                            | APXH6R3ARA151MH70G |
|                          | 220         | H70       | 277                                      | 30                                    | 3,020                                         | 960                                            | APXH6R3ARA221MH70G |
| 10                       | 470         | J80       | 592                                      | 25                                    | 3,700                                         | 1,100                                          | APXH6R3ARA471MJ80G |
|                          | 56          | F60       | 112                                      | 45                                    | 2,250                                         | 680                                            | APXH100ARA560MF60G |
|                          | 120         | H70       | 240                                      | 35                                    | 2,800                                         | 880                                            | APXH100ARA121MH70G |
|                          | 150         | H70       | 300                                      | 35                                    | 2,800                                         | 880                                            | APXH100ARA151MH70G |
| 16                       | 330         | J80       | 660                                      | 30                                    | 3,700                                         | 1,010                                          | APXH100ARA331MJ80G |
|                          | 39          | F60       | 125                                      | 50                                    | 2,050                                         | 650                                            | APXH160ARA390MF60G |
|                          | 82          | H70       | 262                                      | 40                                    | 2,700                                         | 830                                            | APXH160ARA820MH70G |
|                          | 150         | J80       | 480                                      | 35                                    | 3,020                                         | 930                                            | APXH160ARA151MJ80G |
| 20                       | 180         | J80       | 576                                      | 35                                    | 3,020                                         | 930                                            | APXH160ARA181MJ80G |
|                          | 22          | F60       | 88.0                                     | 60                                    | 1,650                                         | 590                                            | APXH200ARA220MF60G |
|                          | 47          | H70       | 188                                      | 45                                    | 2,000                                         | 780                                            | APXH200ARA470MH70G |
|                          | 82          | J80       | 328                                      | 45                                    | 2,400                                         | 820                                            | APXH200ARA820MJ80G |

\*1 T<sub>x</sub> : Ambient temperature (°C)

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

| Frequency (Hz)            | 120  | 1k   | 10k  | 50k  | 100k to 500k |
|---------------------------|------|------|------|------|--------------|
| 2.5 to 6.3V <sub>dc</sub> | 0.05 | 0.30 | 0.55 | 0.70 | 1.00         |
| 10 to 20V <sub>dc</sub>   | 0.05 | 0.25 | 0.55 | 0.55 | 1.00         |

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[APXH6R3ARA471MJ80G](#) [APXH160ARA820MH70G](#) [APXH160ARA151MJ80G](#) [APXH4R0ARA681MJ80G](#)  
[APXH160ARA181MJ80G](#) [APXH200ARA220MF60G](#) [APXH6R3ARA101MF60G](#) [APXH100ARA121MH70G](#)  
[APXH100ARA151MH70G](#) [APXH6R3ARA151MH70G](#) [APXH2R5ARA102MJ80G](#) [APXH2R5ARA221MF60G](#)  
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[APXH6R3ARA221MH70G](#) [APXH4R0ARA221MH70G](#) [APXH4R0ARA151MF60G](#) [APXH160ARA390MF60G](#)  
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