

### PH SERIES ■ HIGH VOLTAGE & HIGH RELIABILITY

#### KEY FEATURES



- **SOLID CONDUCTIVE POLYMER** ■ THT type
- Very high ripple current in smallest dimension
- Endurance: 105°C ■ 2 000 hours
- Low ESR at high frequency range
- No dry-out effect guarantees extremely long life

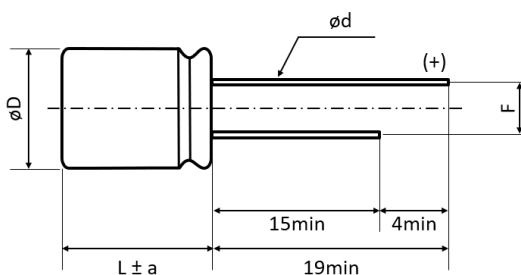


#### SPECIFICATIONS

| Items  |              | Performance Characteristics   |
|--|--------------|---|
| Operating Temperature Range                  |              | -55 ~ +105°C  |
| Rated Voltage Range                          | $V_R$        | 35 ~ 100V DC  |
| Surge Voltage                                | $V_S$        | $V_S = 1.10 \cdot V_R$  |
| Capacitance Range                            | $C_R$        | 6.8 ~ 330 $\mu$ F   |
| Cap. Tolerance                               | $\Delta C$   | $\pm 20\%$ (120Hz ■ 20°C)   |
| Leakage Current (20°C ■ $V_R$ applied)       | $I_{LEAK}$   | Not to exceed the values shown in standard ratings<br>After 2 minutes |
| Dissipation Factor % (20°C ■ 120Hz)          | $\tan\delta$ | Not to exceed the values shown in standard ratings                    |
| Equivalent Series Resistance (20°C ■ 100kHz) | ESR          | Not to exceed the values shown in standard ratings                    |

| Lifetime Test  |                |   |
|--|----------------|---|
| Endurance<br>105°C<br>( $V_R$ applied)                 | Test           | <b>2 000 hours</b>                        |
|  | $\Delta C/C_R$ | Within $\pm 20\%$ of the initial value    |
|  | $\tan\delta$   | Not to exceed 150% of the value specified |
|  | ESR            | Not to exceed 150% of the value specified |
|  | $I_{Leak}$     | Less than the specified value             |
| Moisture Resistance<br>stored at 60°C<br>(RH 90 ~ 95%) | Test           | <b>1 000 hours</b>                        |
|  | $\Delta C/C_R$ | Within $\pm 20\%$ of the initial value    |
|  | $\tan\delta$   | Not to exceed 150% of the value specified |
|  | ESR            | Not to exceed 150% of the value specified |
|  | $I_{Leak}$     | Less than the specified value             |

#### DIMENSIONS ■ All dimensions in mm



| $\phi D$ | L    | $\phi D+0.5max$ | a   | F $\pm 0.5$ | $\phi d \pm 0.05$ |
|----------|------|-----------------|-----|-------------|-------------------|
| 6.3      | 8    | 6.3             | 1   | 2.5         | 0.6               |
| 8        | 8    | 8               | 1   | 3.5         | 0.6               |
| 8        | 9    | 8               | 1.5 | 3.5         | 0.6               |
| 8        | 11.5 | 8               | 1.5 | 3.5         | 0.6               |
| 10       | 10   | 10              | 1.5 | 5           | 0.6               |
| 10       | 12.5 | 10              | 1.5 | 5           | 0.6               |

**STANDARD RATINGS**

Part number shows tape version with straight leads

| $V_R$<br>(V) | $C_R$<br>( $\mu F$ ) | $\varnothing D$<br>(mm) | L<br>(mm) | $I_{LEAK}$<br>( $\mu A$ , 2min) | $\tan\delta$<br>+20°C •<br>120Hz<br>(%) | Max. ESR<br>+20°C •<br>100kHz<br>(m $\Omega$ ) | $I_R$ - Max.<br>Ripple Current<br>+105°C • 100kHz<br>(mA rms) | CapXon Part Number |
|--------------|----------------------|-------------------------|-----------|---------------------------------|---|--|---|--------------------|
| 35           | 10                   | 6.3                     | 8         | 175                             | 12                                      | 40   | 2100  | PH100M035E080PTC   |
|              | 10                   | 8                       | 8         | 175                             | 12                                      | 35   | 2300  | PH100M035F080PTD   |
|              | 22                   | 6.3                     | 8         | 154                             | 12                                      | 40   | 2100  | PH220M035E080PTC   |
|              | 22                   | 8                       | 11.5      | 154                             | 12                                      | 30   | 2890  | PH220M035F115PTD   |
|              | 33                   | 8                       | 8         | 231                             | 12                                      | 30   | 2500  | PH330M035F080PTD   |
|              | 33                   | 8                       | 11.5      | 231                             | 12                                      | 25   | 3100  | PH330M035F115PTD   |
|              | 39                   | 8                       | 11.5      | 273                             | 12                                      | 25   | 3100  | PH390M035F115PTD   |
|              | 47                   | 8                       | 8         | 329                             | 12                                      | 30   | 2700  | PH470M035F080PTD   |
|              | 47                   | 8                       | 11.5      | 329                             | 12                                      | 20   | 3600  | PH470M035F115PTD   |
|              | 47                   | 10                      | 12.5      | 329                             | 12                                      | 20   | 3800  | PH470M035G125PTA   |
|              | 56                   | 8                       | 8         | 392                             | 12                                      | 30   | 2700  | PH560M035F080PTD   |
|              | 56                   | 8                       | 11.5      | 392                             | 12                                      | 20   | 3600  | PH560M035F115PTD   |
|              | 68                   | 8                       | 8         | 476                             | 12                                      | 30   | 2700  | PH680M035F080PTD   |
|              | 68                   | 8                       | 11.5      | 476                             | 12                                      | 20   | 3600  | PH680M035F115PTD   |
|              | 68                   | 10                      | 12.5      | 476                             | 12                                      | 20   | 4000  | PH680M035G125PTA   |
|              | 82                   | 8                       | 11.5      | 574                             | 12                                      | 20   | 3600  | PH820M035F115PTD   |
|              | 100                  | 8                       | 8         | 700                             | 12                                      | 25   | 2800  | PH101M035F080PTD   |
|              | 100                  | 8                       | 11.5      | 700                             | 12                                      | 20   | 3600  | PH101M035F115PTD   |
|              | 100                  | 10                      | 10        | 700                             | 12                                      | 25   | 3000  | PH101M035G100PTA   |
|              | 100                  | 10                      | 12.5      | 700                             | 12                                      | 20   | 4000  | PH101M035G125PTA   |
| 120          | 10                   | 12.5                    | 840       | 12                              | 20                                      | 4400   | PH121M035G125PTA  |                    |
| 150          | 10                   | 12.5                    | 1050      | 12                              | 15                                      | 4400   | PH151M035G125PTA  |                    |
| 180          | 10                   | 12.5                    | 1260      | 12                              | 20                                      | 4000   | PH181M035G125PTA  |                    |
| 220          | 10                   | 12.5                    | 1540      | 12                              | 20                                      | 4000   | PH221M035G125PTA  |                    |
| 270          | 10                   | 12.5                    | 1890      | 12                              | 20                                      | 4000   | PH271M035G125PTA  |                    |
| 330          | 10                   | 12.5                    | 2310      | 12                              | 18                                      | 4400   | PH331M035G125PTA  |                    |
| 50           | 10                   | 8                       | 8         | 100                             | 12                                      | 45   | 2100  | PH100M050F080PTD   |
|              | 12                   | 6.3                     | 8         | 120                             | 12                                      | 50   | 1800  | PH120M050E080PTC   |
|              | 22                   | 8                       | 8         | 220                             | 12                                      | 45   | 2300  | PH220M050F080PTD   |
|              | 27                   | 8                       | 11.5      | 390                             | 12                                      | 32   | 2700  | PH270M050F115PTD   |
|              | 33                   | 8                       | 8         | 330                             | 12                                      | 45   | 2300  | PH330M050F080PTD   |
|              | 33                   | 8                       | 11.5      | 330                             | 12                                      | 32   | 2700  | PH330M050F115PTD   |
|              | 33                   | 10                      | 12.5      | 330                             | 12                                      | 30   | 3000  | PH330M050G125PTA   |
|              | 39                   | 8                       | 11.5      | 390                             | 12                                      | 32   | 2700  | PH390M050F115PTD   |
|              | 39                   | 10                      | 12.5      | 390                             | 12                                      | 30   | 3000  | PH390M050G125PTA   |
|              | 47                   | 8                       | 11.5      | 470                             | 12                                      | 30   | 2800  | PH470M050F115PTD   |
|              | 47                   | 10                      | 12.5      | 470                             | 12                                      | 25   | 3400  | PH470M050G125PTA   |
|              | 56                   | 8                       | 11.5      | 560                             | 12                                      | 30   | 2800  | PH560M050F115PTD   |
|              | 56                   | 10                      | 10        | 560                             | 12                                      | 30   | 2800  | PH560M050G100PTA   |
|              | 56                   | 10                      | 12.5      | 560                             | 12                                      | 25   | 3400  | PH560M050G125PTA   |
|              | 68                   | 8                       | 9         | 680                             | 12                                      | 40   | 2400  | PH680M050F090PTD   |
|              | 68                   | 8                       | 11.5      | 680                             | 12                                      | 30   | 2800  | PH680M050F115PTD   |
|              | 68                   | 10                      | 12.5      | 680                             | 12                                      | 25   | 3400  | PH680M050G125PTA   |
| 82           | 10                   | 12.5                    | 820       | 12                              | 25                                      | 3400   | PH820M050G125PTA  |                    |

See "PACKAGING INFORMATION" for pin treatment options.

**STANDARD RATINGS**

Part number shows tape version with straight leads

| $V_R$<br>(V) | $C_R$<br>( $\mu F$ ) | $\varnothing D$<br>(mm) | L<br>(mm) | $I_{LEAK}$<br>( $\mu A$ , 2min) | $\tan\delta$<br>+20°C •<br>120Hz<br>(%) | Max. ESR<br>+20°C •<br>100kHz<br>(m $\Omega$ ) | $I_R$ - Max.<br>Ripple Current<br>+105°C • 100kHz<br>(mA rms) | CapXon Part Number |
|--------------|----------------------|-------------------------|-----------|---------------------------------|---|--|---|--------------------|
| 50           | 100                  | 10                      | 12.5      | 1000                            | 12                                      | 25   | 3400  | PH101M050G125PTA   |
|              | 120                  | 10                      | 12.5      | 1200                            | 12                                      | 25   | 3400  | PH121M050G125PTA   |
| 63           | 10                   | 8                       | 8         | 126                             | 12                                      | 45   | 1900  | PH100M063F080PTD   |
|              | 10                   | 8                       | 11.5      | 126                             | 12                                      | 45   | 2100  | PH100M063F115PTD   |
|              | 22                   | 8                       | 8         | 277,2                           | 12                                      | 45   | 2100  | PH220M063F080PTD   |
|              | 27                   | 8                       | 11.5      | 340                             | 12                                      | 35   | 2300  | PH270M063F115PTD   |
|              | 33                   | 8                       | 11.5      | 415,8                           | 12                                      | 35   | 2500  | PH330M063F115PTD   |
|              | 33                   | 10                      | 10        | 416                             | 12                                      | 35   | 2700  | PH330M063G100PTA   |
|              | 39                   | 8                       | 11.5      | 491,4                           | 12                                      | 35   | 2500  | PH390M063F115PTD   |
|              | 39                   | 10                      | 12.5      | 491,4                           | 12                                      | 32   | 2900  | PH390M063G125PTA   |
|              | 47                   | 8                       | 11.5      | 592,2                           | 12                                      | 35   | 2500  | PH470M063F115PTD   |
|              | 47                   | 10                      | 12.5      | 592,2                           | 12                                      | 30   | 3000  | PH470M063G125PTA   |
|              | 56                   | 10                      | 12.5      | 705,6                           | 12                                      | 30   | 3000  | PH560M063G125PTA   |
|              | 68                   | 10                      | 12.5      | 856,8                           | 12                                      | 30   | 3000  | PH680M063G125PTA   |
|              | 82                   | 10                      | 12.5      | 1033,2                          | 12                                      | 30   | 3000  | PH820M063G125PTA   |
|              | 150                  | 10                      | 12.5      | 1890                            | 12                                      | 30   | 3000  | PH151M063G125PTA   |
| 80           | 10                   | 8                       | 8         | 160                             | 12                                      | 45   | 1900  | PH100M080F080PTD   |
|              | 12                   | 8                       | 11.5      | 192                             | 12                                      | 38   | 2100  | PH120M080F115PTD   |
|              | 22                   | 10                      | 12.5      | 352                             | 12                                      | 35   | 2800  | PH220M080G125PTA   |
|              | 27                   | 10                      | 12.5      | 432                             | 12                                      | 35   | 2800  | PH270M080G125PTA   |
|              | 33                   | 8                       | 11.5      | 528                             | 12                                      | 38   | 2100  | PH330M080F115PTD   |
|              | 33                   | 10                      | 12.5      | 528                             | 12                                      | 35   | 2800  | PH330M080G125PTA   |
| 100          | 6.8                  | 8                       | 8         | 136                             | 12                                      | 45   | 1800  | PH6R8M100F080PTD   |
|              | 8.2                  | 8                       | 11.5      | 164                             | 12                                      | 45   | 1800  | PH8R2M100F115PTD   |
|              | 10                   | 8                       | 11.5      | 200                             | 12                                      | 42   | 2100  | PH100M100F115PTD   |
|              | 12                   | 8                       | 11.5      | 240                             | 12                                      | 42   | 2100  | PH120M100F115PTD   |
|              | 12                   | 10                      | 12.5      | 240                             | 12                                      | 40   | 2300  | PH120M100G125PTA   |
|              | 15                   | 8                       | 11.5      | 300                             | 12                                      | 42   | 2100  | PH150M100F115PTD   |
|              | 18                   | 10                      | 12.5      | 360                             | 12                                      | 35   | 2500  | PH180M100G125PTA   |
|              | 22                   | 10                      | 12.5      | 440                             | 12                                      | 35   | 2800  | PH220M100G125PTA   |
|              | 27                   | 10                      | 12.5      | 540                             | 12                                      | 35   | 2800  | PH270M100G125PTA   |
|              | 33                   | 10                      | 12.5      | 660                             | 12                                      | 35   | 2800  | PH330M100G125PTA   |




See "PACKAGING INFORMATION" for pin treatment options.

**MULTIPLIER  $K_f$  for RIPPLE CURRENT vs. FREQUENCY**

| Frequency (Hz)    | $120 \leq \text{Freq.} < 1k$ | $1k \leq \text{Freq.} < 10k$ | $10k \leq \text{Freq.} < 100k$ | $100k \leq \text{Freq.} < 300k$ |
|-------------------|------------------------------|------------------------------|--------------------------------|---------------------------------|
| Coefficient $K_f$ | 0.05                         | 0.3                          | 0.7                            | 1                               |

**PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION**

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following links in the table.

|   |   |   |
|---|---|---|
|  |  |  |
| <p><a href="#">General Precautions &amp; Guidelines</a></p>                       | <p><a href="#">Packaging Information</a></p>                                      | <p><a href="#">3D Models</a></p>  |

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Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

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