

Metallized Polypropylene Film Capacitors DC-Link Capacitor



FEATURES

- High performance DC filter
- Low ESR
- High peak current capabilities
- High RMS current capabilities
- AEC-Q200 qualified
- Mounting: radial
- Material categorization:
for definitions of compliance please see www.vishay.com/doc?99912


**RoHS
COMPLIANT**

APPLICATIONS

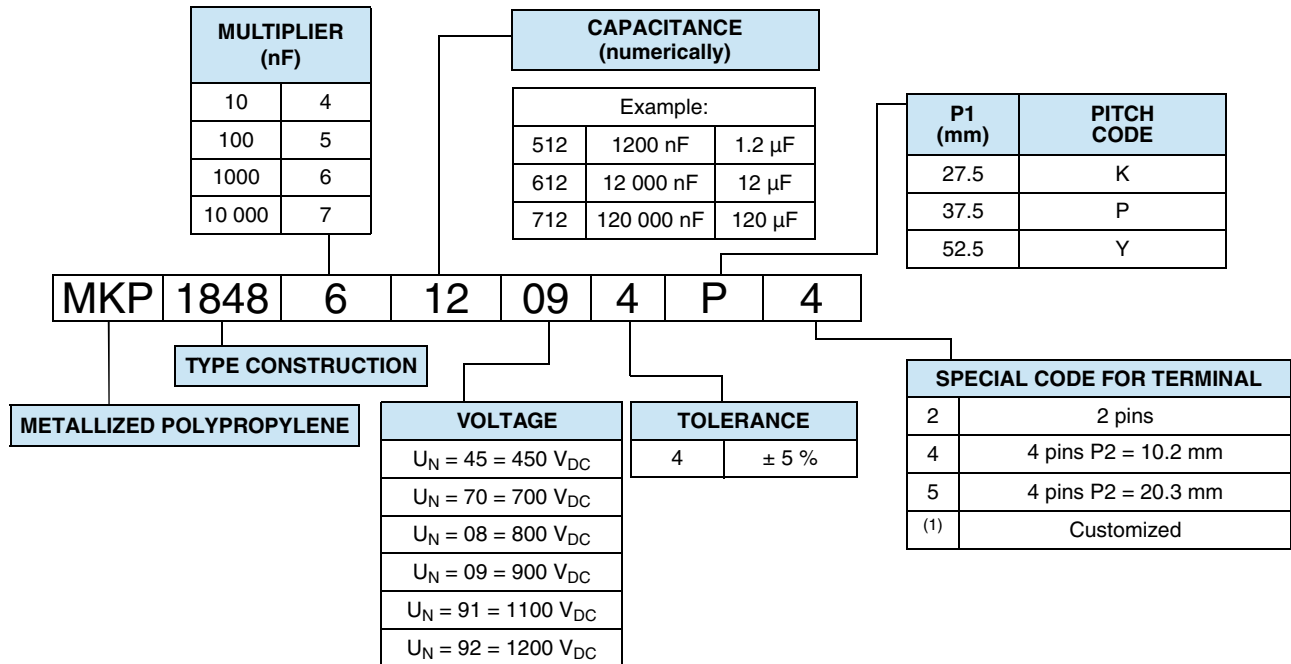
- High performance DC filtering
- HEV / EV: i.e. power train and OBC
- Renewable energies inverters
- Motor drives
- Power supplies

| QUICK REFERENCE DATA | |
|--|--|
| Rated capacitance range | 1 µF to 400 µF |
| Capacitance tolerance | 5 % |
| Rated voltage range, U _{NDC} | 450 V to 1200 V |
| Climatic testing class | 40 / 105 / 56 |
| Rated temperature | 85 °C |
| Maximum permissible case temperature | 105 °C, observing voltage derating |
| Maximum applicable peak to peak ripple voltage | 0.2 x U _{NDC} |
| Reference standards | IEC 61071, IEC 60068 |
| Dielectric | Polypropylene film |
| Electrodes | Metallized dielectric capacitor |
| Construction | Mono construction |
| Encapsulation | Plastic case, sealed with resin; flame retardant |
| Terminals | Tinned wires |
| Self inductance (L _S) | < 1 nH per mm of lead spacing |
| Withstanding DC voltage between terminals ⁽¹⁾ | 1.5 U _{NDC} for 10 s, cut off current 10 mA, rise time ≤ 1000 V/s |
| Insulation resistance | RC between leads, after 1 min > 10 000 s For U _{NDC} ≤ 500 V measuring voltage 100 V For U _{NDC} > 500 V measuring voltage 500 V |
| Life time expectancy | Useful life time: > 100 000 h at U _{NDC} and 70 °C FIT: < 10 x 10 ⁻⁹ /h (10 per 10 ⁹ component h) at 0.5 x U _{NDC} , 40 °C |
| Marking | C-value; tolerance; rated voltage; code for dielectric material; code for manufacturing origin; manufacturer's type designation; manufacturer's logo; year and week of manufacture |

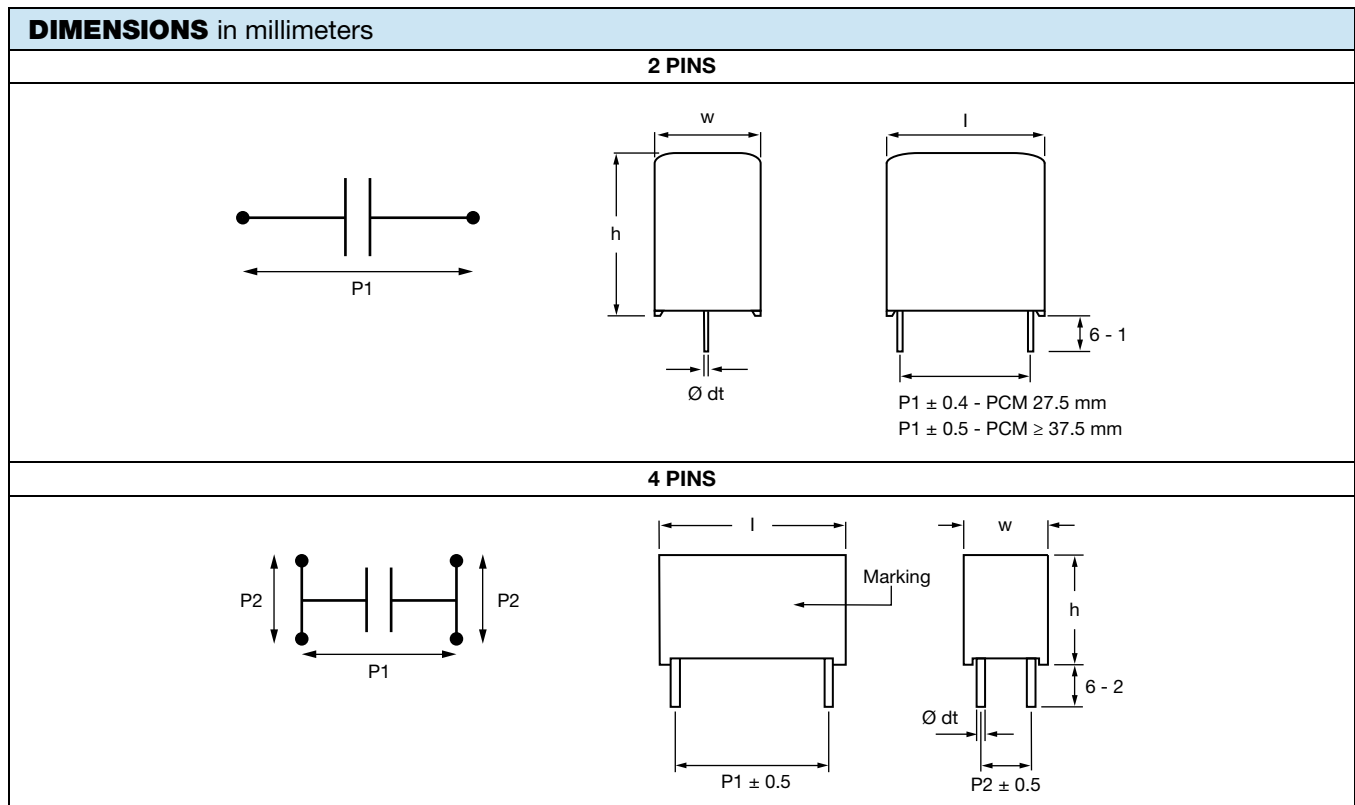
Notes

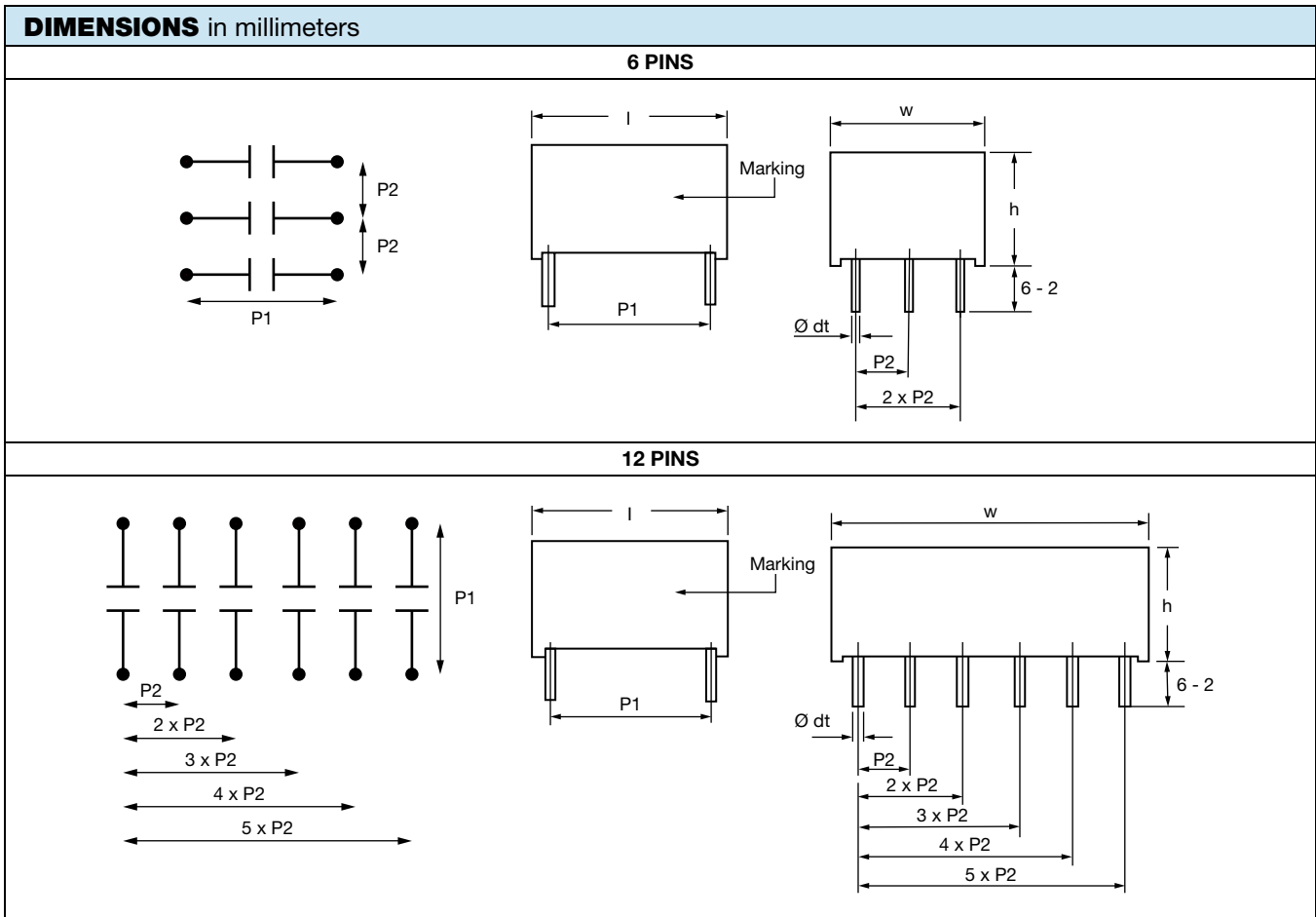
- For more detailed data and test requirements, contact dc-film@vishay.com
- For general information like characteristics and definitions used for film capacitors follow the link: www.vishay.com/doc?28147
- ⁽¹⁾ See document "Voltage Proof Test for Metallized Film Capacitors" (www.vishay.com/doc?28169)

| DC VOLTAGE RATINGS | | | | | | | |
|-----------------------------|-------|-------|-------|--------|--------|--------|--|
| U _{NDC} at 85 °C | 450 V | 700 V | 800 V | 900 V | 1100 V | 1200 V | |
| U _{OPDC} at 70 °C | 500 V | 800 V | 900 V | 1100 V | 1350 V | 1500 V | |
| U _{OPDC} at 105 °C | 300 V | 500 V | 570 V | 650 V | 800 V | 850 V | |

COMPOSITION OF CATALOG NUMBER

Note

(1) Tabs terminals or customized terminals are available on request




Notes

- $\varnothing dt \pm 10\%$ of standard diameter specified
- For pitch 27.5 mm marking will be either on top or front side.
For pitch ≥ 37.5 mm marking will be on front side only

| ELECTRICAL DATA AND ORDERING CODE | | | | | | | | | | | | | | | |
|--|-----------------------------------|----------------------------------|------|------|------------|------------|-----------------------|-------------------|---------------------------------|-----------|-------------------------------------|-----------|---|-----------------|------------------------------|
| U_{NDC} AT 85 °C (V) | CAP. ⁽⁸⁾ (μ F) | DIMENSION ⁽⁵⁾ (mm) | | | P1 (mm) | P2 (mm) | dV/dt (V/ μ s) | I_{PEAK} (A) | I_{RMS} ⁽²⁾ (A) | | ESR ⁽³⁾ (m Ω) | | $\tan \delta$ 10 kHz ($< 10^{-4}$) ⁽⁴⁾ | | ORDERING CODE ⁽¹⁾ |
| | | w | h | l | | | | | 2 PINS | 4 PINS | 2 PINS | 4 PINS | 2 PINS | 4 PINS | |
| | | | | | | | | | | | | | | | |
| 450 | 1 | 9.0 | 19.0 | 32.0 | 27.5 | - | 75 | 75 | 2.5 | - | 54 | - | 85 | - | MKP1848510454K2 |
| | 2 | 9.0 | 19.0 | 32.0 | 27.5 | - | 75 | 150 | 3 | - | 34.5 | - | 85 | - | MKP1848520454K2 |
| | 3 | 11.0 | 21.0 | 32.0 | 27.5 | - | 75 | 225 | 4 | - | 23.0 | - | 85 | - | MKP1848530454K2 |
| | 4 | 11.0 | 21.0 | 32.0 | 27.5 | - | 75 | 300 | 4 | - | 20.5 | - | 85 | - | MKP1848540454K2 |
| | 5 | 13.0 | 23.0 | 32.0 | 27.5 | - | 75 | 375 | 5 | - | 16.5 | - | 85 | - | MKP1848550454K2 |
| | 6 | 15.0 | 25.0 | 32.0 | 27.5 | - | 75 | 450 | 6 | - | 13.5 | - | 85 | - | MKP1848560454K2 |
| | 7 | 15.0 | 25.0 | 32.0 | 27.5 | - | 75 | 525 | 6.5 | - | 11.5 | - | 85 | - | MKP1848570454K2 |
| | 8 | 18.0 | 28.0 | 32.0 | 27.5 | - | 75 | 600 | 8.5 | - | 8.5 | - | 85 | - | MKP1848580454K2 |
| | 9 | 18.0 | 28.0 | 32.0 | 27.5 | - | 75 | 675 | 8.5 | - | 9.0 | - | 85 | - | MKP1848590454K2 |
| | 10 | 18.0 | 28.0 | 32.0 | 27.5 | - | 75 | 750 | 9 | - | 8.0 | - | 85 | - | MKP1848610454K2 |
| | 12 | 21.0 | 31.0 | 32.0 | 27.5 | - | 75 | 900 | 10 | - | 7.0 | - | 85 | - | MKP1848612454K2 |
| | 15 | 20.0 | 35.0 | 32.0 | 27.5 | - | 75 | 1125 | 11.5 | - | 6.0 | - | 85 | - | MKP1848615454K2 |
| 10 | 18.5 | 35.5 | 43.0 | 37.5 | 10.2 | 40 | 400 | 7.5 | 8 | 13.5 | 12.0 | 160 | 140 | MKP1848610454P* | |



| ELECTRICAL DATA AND ORDERING CODE | | | | | | | | | | | | | | | |
|--|---|---|------|------|-------------|-------------|-----------------|--------------------------|--|-----------|----------------------------|-----------|---|--------------------------------|------------------------------|
| U _{NDC} AT 85 °C (V) | CAP. ⁽⁶⁾ (µF) | DIMENSION ⁽⁵⁾ (mm) | | | P1 (mm) | P2 (mm) | dV/dt (V/µs) | I _{PEAK} (A) | I _{RMS} ⁽²⁾ (A) | | ESR ⁽³⁾ (mΩ) | | tan δ 10 kHz ($< 10^{-4}$) ⁽⁴⁾ | | ORDERING CODE ⁽¹⁾ |
| | | w | h | l | | | | | 2 PINS | 4 PINS | 2 PINS | 4 PINS | 2 PINS | 4 PINS | |
| | | U _{OPDC} AT 70 °C = 500 V, U _{OPDC} AT 105 °C = 300 V | | | | | | | | | | | | | |
| 450 | 12 | 18.5 | 35.5 | 43.0 | 37.5 | 10.2 | 40 | 480 | 8 | 8.5 | 11.5 | 10.0 | 160 | 140 | MKP1848612454P* |
| | 15 | 18.5 | 35.5 | 43.0 | 37.5 | 10.2 | 40 | 600 | 9 | 10 | 9.0 | 8.0 | 160 | 140 | MKP1848615454P* |
| | 20 | 21.5 | 38.5 | 43.0 | 37.5 | 10.2 | 40 | 800 | 11 | 12 | 7.0 | 6.0 | 160 | 140 | MKP1848620454P* |
| | 22 | 21.5 | 38.5 | 43.0 | 37.5 | 10.2 | 40 | 880 | 11 | 11.5 | 7.5 | 6.5 | 160 | 140 | MKP1848622454P* |
| | 25 | 21.5 | 38.5 | 43.0 | 37.5 | 10.2 | 40 | 1000 | 11.5 | 12.5 | 6.5 | 5.5 | 160 | 140 | MKP1848625454P* |
| | 30 | 24.0 | 44.0 | 42.0 | 37.5 | 10.2 | 40 | 1200 | 13.5 | 15 | 5.5 | 4.5 | 160 | 140 | MKP1848630454P* |
| | 35 | 30.0 | 45.0 | 42.0 | 37.5 | 10.2 / 20.3 | 40 | 1400 | 17 | 18.5 | 4.0 | 3.5 | 160 | 140 | MKP1848635454P* |
| | 40 | 30.0 | 45.0 | 42.0 | 37.5 | 10.2 / 20.3 | 40 | 1600 | 17 | 18.5 | 4.0 | 3.5 | 160 | 140 | MKP1848640454P* |
| | 40 | 25.0 | 45.0 | 57.5 | 52.5 | 10.2 | 20 | 800 | 13 | 13.5 | 6.5 | 6.0 | 310 | 280 | MKP1848640454Y* |
| | 45 | 25.0 | 45.0 | 57.5 | 52.5 | 10.2 | 20 | 900 | 12.5 | 13.5 | 7.0 | 6.0 | 310 | 280 | MKP1848645454Y* |
| | 50 | 30.0 | 45.0 | 57.5 | 52.5 | 20.3 | 20 | 1000 | 15 | 15.5 | 5.5 | 5.0 | 310 | 280 | MKP1848650454Y* |
| | 55 | 30.0 | 45.0 | 57.5 | 52.5 | 20.3 | 20 | 1100 | 15 | 15.5 | 5.5 | 5.0 | 310 | 280 | MKP1848655454Y* |
| | 60 | 30.0 | 45.0 | 57.5 | 52.5 | 20.3 | 20 | 1200 | 15.5 | 16.5 | 5.0 | 4.5 | 310 | 280 | MKP1848660454Y* |
| | 65 | 35.0 | 50.0 | 57.5 | 52.5 | 20.3 | 20 | 1300 | 19 | 20.5 | 4.0 | 3.5 | 310 | 280 | MKP1848665454Y* |
| | 70 | 35.0 | 50.0 | 57.5 | 52.5 | 20.3 | 20 | 1400 | 18 | 19 | 4.5 | 4.0 | 310 | 280 | MKP1848670454Y* |
| | 75 | 35.0 | 50.0 | 57.5 | 52.5 | 20.3 | 20 | 1500 | 19 | 20.5 | 4.0 | 3.5 | 310 | 280 | MKP1848675454Y* |
| | 80 | 35.0 | 50.0 | 57.5 | 52.5 | 20.3 | 20 | 1600 | 19 | 20.5 | 4.0 | 3.5 | 310 | 280 | MKP1848680454Y* |
| | 90 | 45.0 | 45.0 | 57.5 | 52.5 | 20.3 | 20 | 1800 | - | 21.5 | - | 3.0 | - | 280 | MKP1848690454Y5 |
| 95 | 45.0 | 45.0 | 57.5 | 52.5 | 20.3 | 20 | 1900 | - | 21.5 | - | 3.0 | - | 280 | MKP1848695454Y5 | |
| 100 | 45.0 | 45.0 | 57.5 | 52.5 | 20.3 | 20 | 2000 | - | 23.5 | - | 2.5 | - | 280 | MKP1848710454Y5 | |
| 200 | 70.0 | 65.0 | 57.5 | 52.5 | 20.3 | 20 | 2000 | - | 30.5 | - | 2.0 | - | 310 | MKP1848720454Y5 ⁽⁶⁾ | |
| 400 | 130 | 65.0 | 57.5 | 52.5 | 20.3 | 10 | 4000 | - | 50.5 | - | 1.5 | - | 380 | MKP1848740454Y5 ⁽⁷⁾ | |
| 700 | U _{OPDC} AT 70 °C = 800 V, U _{OPDC} AT 105 °C = 500 V | | | | | | | | | | | | | | |
| | 1 | 9 | 19 | 32 | 27.5 | - | 75 | 75 | 2.5 | - | 54 | - | 68 | - | MKP1848510704K2 |
| | 2 | 9 | 19 | 32 | 27.5 | - | 75 | 150 | 3 | - | 34.5 | - | 68 | - | MKP1848520704K2 |
| | 3 | 11 | 21 | 32 | 27.5 | - | 75 | 225 | 4 | - | 23 | - | 68 | - | MKP1848530704K2 |
| | 4 | 13 | 23 | 32 | 27.5 | - | 75 | 300 | 5 | - | 17 | - | 68 | - | MKP1848540704K2 |
| | 5 | 15 | 25 | 32 | 27.5 | - | 75 | 375 | 6 | - | 14 | - | 68 | - | MKP1848550704K2 |
| | 6 | 18 | 28 | 32 | 27.5 | - | 75 | 450 | 7.5 | - | 11.5 | - | 68 | - | MKP1848560704K2 |
| | 7 | 18 | 28 | 32 | 27.5 | - | 75 | 525 | 8 | - | 10 | - | 68 | - | MKP1848570704K2 |
| | 8 | 18 | 28 | 32 | 27.5 | - | 75 | 600 | 8.5 | - | 8.5 | - | 68 | - | MKP1848580704K2 |
| | 9 | 21 | 31 | 32 | 27.5 | - | 75 | 675 | 10 | - | 7.5 | - | 68 | - | MKP1848590704K2 |
| | 10 | 21 | 31 | 32 | 27.5 | - | 75 | 750 | 10 | - | 7 | - | 68 | - | MKP1848610704K2 |
| | 12 | 20 | 35 | 32 | 27.5 | - | 75 | 900 | 11.5 | - | 6 | - | 68 | - | MKP1848612704K2 |
| | 10 | 18.5 | 35.5 | 43 | 37.5 | 10.2 | 40 | 400 | 7.5 | 8 | 13.5 | 12 | 135 | 120 | MKP1848610704P* |
| | 12 | 18.5 | 35.5 | 43 | 37.5 | 10.2 | 40 | 480 | 8 | 8.5 | 11.5 | 10 | 135 | 120 | MKP1848612704P* |
| | 15 | 18.5 | 35.5 | 43 | 37.5 | 10.2 | 40 | 600 | 9 | 10 | 9 | 8 | 135 | 120 | MKP1848615704P* |
| | 20 | 21.5 | 38.5 | 43 | 37.5 | 10.2 | 40 | 800 | 11 | 12 | 7 | 6 | 135 | 120 | MKP1848620704P* |
| | 22 | 24 | 44 | 42 | 37.5 | 10.2 | 40 | 880 | 13 | 13.5 | 6 | 5.5 | 135 | 120 | MKP1848622704P* |
| | 25 | 24 | 44 | 42 | 37.5 | 10.2 | 40 | 1000 | 13.5 | 14.5 | 5.5 | 5 | 135 | 120 | MKP1848625704P* |
| 30 | 30 | 45 | 42 | 37.5 | 10.2 / 20.3 | 40 | 1200 | 16 | 17 | 4.5 | 4 | 135 | 120 | MKP1848630704P* | |



| ELECTRICAL DATA AND ORDERING CODE | | | | | | | | | | | | | | | |
|-----------------------------------|---|---|------|------|---------|-------------|--------------|-----------------------|-------------------------------------|--------|-------------------------|--------|---|--------------------------------|--------------------------------|
| U _{NDC} AT 85 °C (V) | CAP. ⁽⁶⁾ (µF) | DIMENSION ⁽⁵⁾ (mm) | | | P1 (mm) | P2 (mm) | dV/dt (V/µs) | I _{PEAK} (A) | I _{RMS} ⁽²⁾ (A) | | ESR ⁽³⁾ (mΩ) | | tan δ 10 kHz (< 10 ⁻⁴) ⁽⁴⁾ | | ORDERING CODE ⁽¹⁾ |
| | | w | h | l | | | | | 2 PINS | 4 PINS | 2 PINS | 4 PINS | 2 PINS | 4 PINS | |
| | | U _{OPDC} AT 70 °C = 800 V, U _{OPDC} AT 105 °C = 500 V | | | | | | | | | | | | | |
| 700 | 35 | 30 | 45 | 42 | 37.5 | 10.2 / 20.3 | 40 | 1400 | 17 | 18.5 | 4 | 3.5 | 135 | 120 | MKP1848635704P* |
| | 30 | 25 | 45 | 57.5 | 52.5 | 10.2 | 20 | 600 | 11 | 12 | 9 | 8 | 270 | 240 | MKP1848630704Y* |
| | 35 | 25 | 45 | 57.5 | 52.5 | 10.2 | 20 | 700 | 12 | 12.5 | 7.5 | 7 | 270 | 240 | MKP1848635704Y* |
| | 40 | 25 | 45 | 57.5 | 52.5 | 10.2 | 20 | 800 | 13 | 13.5 | 6.5 | 6 | 270 | 240 | MKP1848640704Y* |
| | 45 | 30 | 45 | 57.5 | 52.5 | 20.3 | 20 | 900 | 14.5 | 15 | 6 | 5.5 | 270 | 240 | MKP1848645704Y* |
| | 50 | 30 | 45 | 57.5 | 52.5 | 20.3 | 20 | 1000 | 15 | 15.5 | 5.5 | 5 | 270 | 240 | MKP1848650704Y* |
| | 55 | 35 | 50 | 57.5 | 52.5 | 20.3 | 20 | 1100 | 17 | 18 | 5 | 4.5 | 270 | 240 | MKP1848655704Y* |
| | 60 | 35 | 50 | 57.5 | 52.5 | 20.3 | 20 | 1200 | 18 | 19 | 4.5 | 4 | 270 | 240 | MKP1848660704Y* |
| | 65 | 35 | 50 | 57.5 | 52.5 | 20.3 | 20 | 1300 | 19 | 20.5 | 4 | 3.5 | 270 | 240 | MKP1848665704Y* |
| | 70 | 45 | 45 | 57.5 | 52.5 | 20.3 | 20 | 1400 | - | 20 | - | 3.5 | - | 240 | MKP1848670704Y5 |
| | 75 | 45 | 45 | 57.5 | 52.5 | 20.3 | 20 | 1500 | - | 21.5 | - | 3 | - | 240 | MKP1848675704Y5 |
| | 80 | 45 | 45 | 57.5 | 52.5 | 20.3 | 20 | 1600 | - | 21.5 | - | 3 | - | 240 | MKP1848680704Y5 |
| | 160 | 70 | 65 | 57.5 | 52.5 | 20.3 | 20 | 3200 | - | 30.5 | - | 2.5 | - | 280 | MKP1848716704Y5 ⁽⁶⁾ |
| 320 | 130 | 65 | 57.5 | 52.5 | 20.3 | 20 | 6400 | - | 54 | - | 1.3 | - | 280 | MKP1848732704Y5 ⁽⁷⁾ | |
| 800 | U _{OPDC} AT 70 °C = 900 V, U _{OPDC} AT 105 °C = 570 V | | | | | | | | | | | | | | |
| | 1 | 9 | 19 | 32 | 27.5 | - | 75 | 75 | 2 | - | 62.5 | - | 60 | - | MKP1848510084K2 |
| | 2 | 11 | 21 | 32 | 27.5 | - | 75 | 150 | 3.5 | - | 31 | - | 60 | - | MKP1848520084K2 |
| | 3 | 13 | 23 | 32 | 27.5 | - | 75 | 225 | 4.5 | - | 21 | - | 60 | - | MKP1848530084K2 |
| | 4 | 15 | 25 | 32 | 27.5 | - | 75 | 300 | 5.5 | - | 15.5 | - | 60 | - | MKP1848540084K2 |
| | 5 | 18 | 28 | 32 | 27.5 | - | 75 | 375 | 7 | - | 12.5 | - | 60 | - | MKP1848550084K2 |
| | 6 | 18 | 28 | 32 | 27.5 | - | 75 | 450 | 7.5 | - | 10.5 | - | 60 | - | MKP1848560084K2 |
| | 7 | 21 | 31 | 32 | 27.5 | - | 75 | 525 | 9 | - | 9 | - | 60 | - | MKP1848570084K2 |
| | 8 | 21 | 31 | 32 | 27.5 | - | 75 | 600 | 9.5 | - | 8 | - | 60 | - | MKP1848580084K2 |
| | 9 | 20 | 35 | 32 | 27.5 | - | 75 | 675 | 10 | - | 8 | - | 60 | - | MKP1848590084K2 |
| | 10 | 18.5 | 35.5 | 43 | 37.5 | 10.2 | 40 | 400 | 8 | 8.5 | 12.5 | 11 | 122 | 110 | MKP1848610084P* |
| | 12 | 18.5 | 35.5 | 43 | 37.5 | 10.2 | 40 | 480 | 8.5 | 9 | 10.5 | 9 | 122 | 110 | MKP1848612084P* |
| | 15 | 21.5 | 38.5 | 43 | 37.5 | 10.2 | 40 | 600 | 10 | 11 | 8.5 | 7.5 | 122 | 110 | MKP1848615084P* |
| | 20 | 24 | 44 | 42 | 37.5 | 10.2 | 40 | 800 | 13 | 13.5 | 6 | 5.5 | 122 | 110 | MKP1848620084P* |
| | 22 | 30 | 45 | 42 | 37.5 | 10.2 / 20.3 | 40 | 880 | 14.5 | 15.5 | 5.5 | 5 | 122 | 110 | MKP1848622084P* |
| | 25 | 30 | 45 | 42 | 37.5 | 10.2 / 20.3 | 40 | 1000 | 15.5 | 16 | 5 | 4.5 | 122 | 110 | MKP1848625084P* |
| | 30 | 25 | 45 | 57.5 | 52.5 | 10.2 | 10 | 300 | 12 | 12 | 8 | 7.5 | 240 | 215 | MKP1848630084Y* |
| | 35 | 30 | 45 | 57.5 | 52.5 | 20.3 | 10 | 350 | 13 | 14.5 | 7 | 6 | 240 | 215 | MKP1848635084Y* |
| | 40 | 30 | 45 | 57.5 | 52.5 | 20.3 | 10 | 400 | 14.5 | 15 | 6 | 5.5 | 240 | 215 | MKP1848640084Y* |
| | 45 | 35 | 50 | 57.5 | 52.5 | 20.3 | 10 | 450 | 16 | 17 | 5.5 | 5 | 240 | 215 | MKP1848645084Y* |
| | 50 | 35 | 50 | 57.5 | 52.5 | 20.3 | 10 | 500 | 17 | 18 | 5 | 4.5 | 240 | 215 | MKP1848650084Y* |
| 55 | 45 | 45 | 57.5 | 52.5 | 20.3 | 10 | 550 | - | 18.5 | - | 4 | - | 215 | MKP1848655084Y5 | |
| 60 | 45 | 45 | 57.5 | 52.5 | 20.3 | 10 | 600 | - | 20 | - | 3.5 | - | 215 | MKP1848660084Y5 | |
| 120 | 70 | 65 | 57.5 | 52.5 | 20.3 | 10 | 1600 | - | 27 | - | 3.2 | - | 215 | MKP1848712084Y5 ⁽⁶⁾ | |
| 240 | 130 | 65 | 57.5 | 52.5 | 20.3 | 10 | 3200 | - | 48.5 | - | 1.6 | - | 215 | MKP1848724084Y5 ⁽⁷⁾ | |



| ELECTRICAL DATA AND ORDERING CODE | | | | | | | | | | | | | | | |
|--|--|--|------|------|------------|-------------|-----------------|--------------------------|--|-----------|----------------------------|-----------|---|--------------------------------|------------------------------|
| U _{NDC} AT 85 °C (V) | CAP. ⁽⁶⁾ (µF) | DIMENSION ⁽⁵⁾ (mm) | | | P1 (mm) | P2 (mm) | dV/dt (V/µs) | I _{PEAK} (A) | I _{RMS} ⁽²⁾ (A) | | ESR ⁽³⁾ (mΩ) | | tan δ 10 kHz ($< 10^{-4}$) ⁽⁴⁾ | | ORDERING CODE ⁽¹⁾ |
| | | w | h | l | | | | | 2 PINS | 4 PINS | 2 PINS | 4 PINS | 2 PINS | 4 PINS | |
| | | U _{OPDC} AT 70 °C = 1100 V, U _{OPDC} AT 105 °C = 650 V | | | | | | | | | | | | | |
| 900 | 1 | 9 | 19 | 32 | 27.5 | - | 40 | 40 | 2 | - | 63 | - | 50 | - | MKP1848510094K2 |
| | 2 | 13 | 23 | 32 | 27.5 | - | 80 | 160 | 3.5 | - | 32 | - | 50 | - | MKP1848520094K2 |
| | 3 | 15 | 25 | 32 | 27.5 | - | 80 | 240 | 5 | - | 21 | - | 50 | - | MKP1848530094K2 |
| | 4 | 18 | 28 | 32 | 27.5 | - | 80 | 320 | 6 | - | 16 | - | 50 | - | MKP1848540094K2 |
| | 5 | 21 | 31 | 32 | 27.5 | - | 80 | 400 | 7.5 | - | 13 | - | 50 | - | MKP1848550094K2 |
| | 6 | 21 | 31 | 32 | 27.5 | - | 80 | 480 | 8.5 | - | 10 | - | 50 | - | MKP1848560094K2 |
| | 7 | 20 | 35 | 32 | 27.5 | - | 80 | 560 | 9 | - | 9 | - | 50 | - | MKP1848570094K2 |
| | 5 | 18.5 | 35.5 | 43 | 37.5 | 10.2 | 20 | 100 | 6 | 6.5 | 21 | 19 | 100 | 90 | MKP1848550094P* |
| | 6 | 18.5 | 35.5 | 43 | 37.5 | 10.2 | 40 | 240 | 6.5 | 7 | 18 | 16 | 100 | 90 | MKP1848560094P* |
| | 7 | 18.5 | 35.5 | 43 | 37.5 | 10.2 | 40 | 280 | 6.5 | 7 | 18 | 16 | 100 | 90 | MKP1848570094P* |
| | 8 | 18.5 | 35.5 | 43 | 37.5 | 10.2 | 40 | 320 | 7 | 7.5 | 16 | 14 | 100 | 90 | MKP1848580094P* |
| | 9 | 18.5 | 35.5 | 43 | 37.5 | 10.2 | 40 | 360 | 7.5 | 8 | 14 | 12 | 100 | 90 | MKP1848590094P* |
| | 10 | 21.5 | 38.5 | 43 | 37.5 | 10.2 | 40 | 400 | 8.5 | 9 | 12 | 11 | 100 | 90 | MKP1848610094P* |
| | 12 | 21.5 | 38.5 | 43 | 37.5 | 10.2 | 40 | 480 | 9.5 | 10 | 10 | 9 | 100 | 90 | MKP1848612094P* |
| | 15 | 24 | 44 | 42 | 37.5 | 10.2 | 40 | 600 | 11 | 12 | 8 | 7 | 100 | 90 | MKP1848615094P* |
| | 16 | 24 | 44 | 42 | 37.5 | 10.2 | 40 | 640 | 11 | 12 | 8 | 7 | 100 | 90 | MKP1848616094P* |
| | 20 | 30 | 45 | 42 | 37.5 | 10.2 / 20.3 | 40 | 800 | 14 | 15.5 | 6 | 5 | 100 | 90 | MKP1848620094P* |
| | 15 | 25 | 45 | 57.5 | 52.5 | 10.2 | 20 | 300 | 9 | 9.5 | 14 | 12 | 200 | 185 | MKP1848615094Y* |
| | 20 | 25 | 45 | 57.5 | 52.5 | 10.2 | 20 | 400 | 9.5 | 10 | 12 | 11 | 200 | 185 | MKP1848620094Y* |
| | 22 | 25 | 45 | 57.5 | 52.5 | 10.2 | 20 | 440 | 10 | 10.5 | 11 | 10 | 200 | 185 | MKP1848622094Y* |
| | 25 | 30 | 45 | 57.5 | 52.5 | 20.3 | 20 | 500 | 11 | 11.5 | 10 | 9 | 200 | 185 | MKP1848625094Y* |
| | 30 | 30 | 45 | 57.5 | 52.5 | 20.3 | 20 | 600 | 12.5 | 13 | 8 | 7 | 200 | 185 | MKP1848630094Y* |
| | 35 | 35 | 50 | 57.5 | 52.5 | 20.3 | 20 | 700 | 14.5 | 15.5 | 7 | 6 | 200 | 185 | MKP1848635094Y* |
| 40 | 35 | 50 | 57.5 | 52.5 | 20.3 | 20 | 800 | 15.5 | 17 | 6 | 5 | 200 | 185 | MKP1848640094Y* | |
| 45 | 45 | 45 | 57.5 | 52.5 | 20.3 | 20 | 900 | - | 16.5 | - | 5 | - | 185 | MKP1848645094Y5 | |
| 50 | 45 | 45 | 57.5 | 52.5 | 20.3 | 20 | 1000 | - | 18.5 | - | 4 | - | 185 | MKP1848650094Y5 | |
| 100 | 70 | 65 | 57.5 | 52.5 | 20.3 | 20 | 2000 | - | 26.5 | - | 3.3 | - | 205 | MKP1848710094Y5 ⁽⁶⁾ | |
| 200 | 130 | 65 | 57.5 | 52.5 | 20.3 | 20 | 4000 | - | 48.5 | - | 1.6 | - | 205 | MKP1848720094Y5 ⁽⁷⁾ | |
| 1100 | U _{OPDC} AT 70 °C = 1350 V, U _{OPDC} AT 105 °C = 800 V | | | | | | | | | | | | | | |
| | 1 | 11 | 21 | 32 | 27.5 | - | 95 | 95 | 3 | - | 45.5 | - | 45 | - | MKP1848510914K2 |
| | 2 | 15 | 25 | 32 | 27.5 | - | 95 | 190 | 4.5 | - | 23 | - | 45 | - | MKP1848520914K2 |
| | 3 | 18 | 28 | 32 | 27.5 | - | 95 | 285 | 6 | - | 15.5 | - | 45 | - | MKP1848530914K2 |
| | 4 | 21 | 31 | 32 | 27.5 | - | 95 | 380 | 8 | - | 11.5 | - | 45 | - | MKP1848540914K2 |
| | 5 | 20 | 35 | 32 | 27.5 | - | 95 | 475 | 9 | - | 9.5 | - | 45 | - | MKP1848550914K2 |
| | 5 | 18.5 | 35.5 | 43 | 37.5 | 10.2 | 45 | 225 | 6.5 | 7 | 18 | 16 | 90 | 80 | MKP1848550914P* |
| | 6 | 18.5 | 35.5 | 43 | 37.5 | 10.2 | 45 | 270 | 7 | 7.5 | 15 | 13.5 | 90 | 80 | MKP1848560914P* |
| | 7 | 21.5 | 38.5 | 43 | 37.5 | 10.2 | 45 | 315 | 8 | 8.5 | 13 | 11.5 | 90 | 80 | MKP1848570914P* |
| | 8 | 21.5 | 38.5 | 43 | 37.5 | 10.2 | 45 | 360 | 9 | 9.5 | 11 | 10 | 90 | 80 | MKP1848580914P* |
| | 9 | 24 | 44 | 42 | 37.5 | 10.2 | 45 | 405 | 10 | 10.5 | 10 | 9 | 90 | 80 | MKP1848590914P* |
| | 10 | 24 | 44 | 42 | 37.5 | 10.2 | 45 | 450 | 10.5 | 11 | 9 | 8 | 90 | 80 | MKP1848610914P* |
| | 12 | 30 | 45 | 42 | 37.5 | 10.2 / 20.3 | 45 | 540 | 12.5 | 13.5 | 7.5 | 6.5 | 90 | 80 | MKP1848612914P* |



| ELECTRICAL DATA AND ORDERING CODE | | | | | | | | | | | | | | | |
|--|--|--|------|------|------------|------------|-----------------|--------------------------|--|-----------|----------------------------|-----------|---|--------------------------------|--------------------------------|
| U _{NDC} AT 85 °C (V) | CAP. ⁽⁶⁾ (μF) | DIMENSION ⁽⁵⁾ (mm) | | | P1 (mm) | P2 (mm) | dV/dt (V/μs) | I _{PEAK} (A) | I _{RMS} ⁽²⁾ (A) | | ESR ⁽³⁾ (mΩ) | | tan δ 10 kHz ($< 10^{-4}$) ⁽⁴⁾ | | ORDERING CODE ⁽¹⁾ |
| | | w | h | l | | | | | 2 PINS | 4 PINS | 2 PINS | 4 PINS | 2 PINS | 4 PINS | |
| | | U _{OPDC} AT 70 °C = 1350 V, U _{OPDC} AT 105 °C = 800 V | | | | | | | | | | | | | |
| 1100 | 10 | 25 | 45 | 57.5 | 52.5 | 10.2 | 23 | 230 | 8 | 8.5 | 18 | 16 | 175 | 155 | MKP1848610914Y* |
| | 12 | 25 | 45 | 57.5 | 52.5 | 10.2 | 23 | 276 | 8.5 | 9 | 15 | 13 | 175 | 155 | MKP1848612914Y* |
| | 15 | 25 | 45 | 57.5 | 52.5 | 10.2 | 23 | 345 | 9.5 | 10.5 | 12 | 10.5 | 175 | 155 | MKP1848615914Y* |
| | 20 | 30 | 45 | 57.5 | 52.5 | 20.3 | 23 | 460 | 11.5 | 12.5 | 9 | 8 | 175 | 155 | MKP1848620914Y* |
| | 22 | 35 | 50 | 57.5 | 52.5 | 20.3 | 23 | 506 | 13.5 | 14.5 | 8 | 7 | 175 | 155 | MKP1848622914Y* |
| | 25 | 35 | 50 | 57.5 | 52.5 | 20.3 | 23 | 575 | 14.5 | 15 | 7 | 6.5 | 175 | 155 | MKP1848625914Y* |
| | 30 | 45 | 45 | 57.5 | 52.5 | 20.3 | 23 | 690 | - | 16.5 | - | 5 | - | 155 | MKP1848630914Y5 |
| | 60 | 70 | 65 | 57.5 | 52.5 | 20.3 | 23 | 1380 | - | 40 | - | 2.5 | - | 180 | MKP1848660914Y5 ⁽⁶⁾ |
| | 70 | 70 | 65 | 57.5 | 52.5 | 20.3 | 23 | 1610 | - | 34.5 | - | 2 | - | 180 | MKP1848670914Y5 ⁽⁶⁾ |
| | 120 | 130 | 65 | 57.5 | 52.5 | 20.3 | 23 | 2760 | - | 39.5 | - | 2.4 | - | 180 | MKP1848712914Y5 ⁽⁷⁾ |
| 140 | 130 | 65 | 57.5 | 52.5 | 20.3 | 23 | 3220 | - | 43.5 | - | 2 | - | 180 | MKP1848714914Y5 ⁽⁷⁾ | |
| 1200 | U _{OPDC} AT 70 °C = 1500 V, U _{OPDC} AT 105 °C = 850 V | | | | | | | | | | | | | | |
| | 1 | 11 | 21 | 32 | 27.5 | - | 100 | 100 | 3 | - | 43 | - | 40 | - | MKP1848510924K2 |
| | 2 | 15 | 25 | 32 | 27.5 | - | 100 | 200 | 5 | - | 21.5 | - | 40 | - | MKP1848520924K2 |
| | 3 | 18 | 28 | 32 | 27.5 | - | 100 | 300 | 6.5 | - | 14.5 | - | 40 | - | MKP1848530924K2 |
| | 4 | 21 | 31 | 32 | 27.5 | - | 100 | 400 | 8 | - | 11 | - | 40 | - | MKP1848540924K2 |
| | 5 | 18.5 | 35.5 | 43 | 37.5 | 10.2 | 48 | 240 | 6.5 | 7 | 17 | 15 | 80 | 70 | MKP1848550924P* |
| | 6 | 18.5 | 35.5 | 43 | 37.5 | 10.2 | 48 | 288 | 7.5 | 8 | 14 | 12.5 | 80 | 70 | MKP1848560924P* |
| | 7 | 21.5 | 38.5 | 43 | 37.5 | 10.2 | 48 | 336 | 8.5 | 9 | 12 | 11 | 80 | 70 | MKP1848570924P* |
| | 8 | 21.5 | 38.5 | 43 | 37.5 | 10.2 | 48 | 384 | 9 | 9.5 | 10.5 | 9.5 | 80 | 70 | MKP1848580924P* |
| | 9 | 24 | 44 | 42 | 37.5 | 10.2 | 48 | 432 | 10.5 | 11 | 9.5 | 8.5 | 80 | 70 | MKP1848590924P* |
| | 10 | 24 | 44 | 42 | 37.5 | 10.2 | 48 | 480 | 11 | 11.5 | 8.5 | 7.5 | 80 | 70 | MKP1848610924P* |
| | 12 | 30 | 45 | 42 | 37.5 | 10.2/20.3 | 48 | 576 | 13 | 13.5 | 7 | 6.5 | 80 | 70 | MKP1848612924P* |
| | 10 | 25 | 45 | 57.5 | 52.5 | 10.2 | 24 | 240 | 8 | 8.5 | 17 | 15 | 165 | 150 | MKP1848610924Y* |
| | 12 | 25 | 45 | 57.5 | 52.5 | 10.2 | 24 | 288 | 9 | 9.5 | 14 | 12.5 | 165 | 150 | MKP1848612924Y* |
| | 15 | 25 | 45 | 57.5 | 52.5 | 10.2 | 24 | 360 | 10 | 10.5 | 11 | 10 | 165 | 150 | MKP1848615924Y* |
| | 20 | 35 | 50 | 57.5 | 52.5 | 20.3 | 24 | 480 | 13 | 14 | 8.5 | 7.5 | 165 | 150 | MKP1848620924Y* |
| | 22 | 35 | 50 | 57.5 | 52.5 | 20.3 | 24 | 528 | 14 | 14.5 | 7.5 | 7 | 165 | 150 | MKP1848622924Y* |
| | 25 | 35 | 50 | 57.5 | 52.5 | 20.3 | 24 | 600 | 15 | 15.5 | 6.5 | 6 | 165 | 150 | MKP1848625924Y* |
| | 30 | 45 | 45 | 57.5 | 52.5 | 20.3 | 24 | 720 | - | 16.5 | - | 5 | - | 150 | MKP1848630924Y5 |
| | 60 | 70 | 65 | 57.5 | 52.5 | 20.3 | 24 | 1440 | - | 23 | - | 4.5 | - | 170 | MKP1848660924Y5 ⁽⁶⁾ |
| 120 | 130 | 65 | 57.5 | 52.5 | 20.3 | 24 | 2280 | - | 40.5 | - | 2.3 | - | 170 | MKP1848712924Y5 ⁽⁷⁾ | |

Notes

- (1) Change the * symbol with special code for the terminals
- (2) Maximum RMS current at 10 kHz, +85 °C, Δt = +15 °C, capacitance tolerance ≤ ± 5 %
- (3) Equivalent series resistance typical values at f = 10 kHz to 100 kHz for P = 27.5 mm, at f = 10 kHz to 70 kHz for P = 37.5 mm, at f = 10 kHz to 50 kHz for P = 52.5 mm
- (4) Maximum tan δ values
- (5) Standard dimension
- (6) 6 pins
- (7) 12 pins
- (8) Intermediate capacitance values available on request



| PACKAGING INFORMATION | | | | | | |
|-------------------------------------|--|-----------------------------|--------------------------------|------------------------------|-------------|-----------------------------|
| U _{NDC} AT 85 °C (V) | HEIGHT (mm) | CAP. ⁽⁵⁾ (µF) | Ø dt | ORDERING CODE ⁽¹⁾ | MASS (g) | SPQ ⁽²⁾ (pcs) |
| 450 | U_{OPDC} AT 70 °C = 500 V, U_{OPDC} AT 105 °C = 300 V | | | | | |
| | 19 | 1 | 0.8 | MKP1848510454K2 | 6 | 160 |
| | 19 | 2 | 0.8 | MKP1848520454K2 | 5.5 | 160 |
| | 21 | 3 | 0.8 | MKP1848530454K2 | 8.5 | 130 |
| | 21 | 4 | 0.8 | MKP1848540454K2 | 8.5 | 130 |
| | 23 | 5 | 0.8 | MKP1848550454K2 | 10.5 | 115 |
| | 25 | 6 | 0.8 | MKP1848560454K2 | 12.5 | 100 |
| | 25 | 7 | 0.8 | MKP1848570454K2 | 11.5 | 100 |
| | 28 | 8 | 0.8 | MKP1848580454K2 | 15 | 80 |
| | 28 | 9 | 0.8 | MKP1848590454K2 | 16 | 80 |
| | 28 | 10 | 0.8 | MKP1848610454K2 | 15 | 80 |
| | 31 | 12 | 0.8 | MKP1848612454K2 | 21.5 | 65 |
| | 35 | 15 | 0.8 | MKP1848615454K2 | 20 | 70 |
| | 35.5 | 10 | 1.0 | MKP1848610454P* | 34 | 105 |
| | 35.5 | 12 | 1.0 | MKP1848612454P* | 32 | 105 |
| | 35.5 | 15 | 1.0 | MKP1848615454P* | 30 | 105 |
| | 38.5 | 20 | 1.0 | MKP1848620454P* | 36 | 91 |
| | 38.5 | 22 | 1.0 | MKP1848622454P* | 38 | 91 |
| | 38.5 | 25 | 1.0 | MKP1848625454P* | 36 | 91 |
| | 44 | 30 | 1.0 | MKP1848630454P* | 48 | 77 |
| | 45 | 35 | 1.0 | MKP1848635454P* | 57 | 63 |
| | 45 | 40 | 1.0 | MKP1848640454P* | 60 | 63 |
| | 45 | 40 | 1.2 | MKP1848640454Y* | 66 | 55 |
| | 45 | 45 | 1.2 | MKP1848645454Y* | 70 | 55 |
| | 45 | 50 | 1.2 | MKP1848650454Y* | 88 | 45 |
| | 45 | 55 | 1.2 | MKP1848655454Y* | 96 | 45 |
| | 45 | 60 | 1.2 | MKP1848660454Y* | 91 | 45 |
| | 50 | 65 | 1.2 | MKP1848665454Y* | 100 | 40 |
| | 50 | 70 | 1.2 | MKP1848670454Y* | 112 | 40 |
| | 50 | 75 | 1.2 | MKP1848675454Y* | 108 | 40 |
| | 50 | 80 | 1.2 | MKP1848680454Y* | 102 | 40 |
| | 45 | 90 | 1.2 | MKP1848690454Y5 | 127 | 30 |
| 45 | 95 | 1.2 | MKP1848695454Y5 | 124 | 30 | |
| 45 | 100 | 1.2 | MKP1848710454Y5 | 120 | 30 | |
| 65 | 200 | 1.2 | MKP1848720454Y5 ⁽³⁾ | 266 | 20 | |
| 65 | 400 | 1.2 | MKP1848740454Y5 ⁽⁴⁾ | 490 | 10 | |
| 700 | U_{OPDC} AT 70 °C = 800 V, U_{OPDC} AT 105 °C = 500 V | | | | | |
| | 19 | 1 | 0.8 | MKP1848510704K2 | 6 | 160 |
| | 19 | 2 | 0.8 | MKP1848520704K2 | 5.5 | 160 |
| | 21 | 3 | 0.8 | MKP1848530704K2 | 8.5 | 130 |
| | 23 | 4 | 0.8 | MKP1848540704K2 | 10.5 | 115 |
| | 25 | 5 | 0.8 | MKP1848550704K2 | 12 | 100 |
| | 28 | 6 | 0.8 | MKP1848560704K2 | 17 | 80 |
| | 28 | 7 | 0.8 | MKP1848570704K2 | 16 | 80 |
| | 28 | 8 | 0.8 | MKP1848580704K2 | 15 | 80 |
| | 31 | 9 | 0.8 | MKP1848590704K2 | 22 | 65 |
| | 31 | 10 | 0.8 | MKP1848610704K2 | 21 | 65 |
| | 35 | 12 | 0.8 | MKP1848612704K2 | 20 | 70 |
| | 35.5 | 10 | 1.0 | MKP1848610704P* | 34 | 105 |
| | 35.5 | 12 | 1.0 | MKP1848612704P* | 32 | 105 |
| | 35.5 | 15 | 1.0 | MKP1848615704P* | 30 | 105 |
| | 38.5 | 20 | 1.0 | MKP1848620704P* | 36 | 91 |



| PACKAGING INFORMATION | | | | | | |
|-------------------------------------|--|-----------------------------|--------------------------------|--------------------------------|-------------|-----------------------------|
| U _{NDC} AT 85 °C (V) | HEIGHT (mm) | CAP. ⁽⁵⁾ (µF) | Ø dt | ORDERING CODE ⁽¹⁾ | MASS (g) | SPQ ⁽²⁾ (pcs) |
| 700 | U_{OPDC} AT 70 °C = 800 V, U_{OPDC} AT 105 °C = 500 V | | | | | |
| | 44 | 22 | 1.0 | MKP1848622704P* | 49 | 77 |
| | 44 | 25 | 1.0 | MKP1848625704P* | 47 | 77 |
| | 45 | 30 | 1.0 | MKP1848630704P* | 62 | 63 |
| | 45 | 35 | 1.0 | MKP1848635704P* | 55 | 63 |
| | 45 | 30 | 1.2 | MKP1848630704Y* | 76 | 55 |
| | 45 | 35 | 1.2 | MKP1848635704Y* | 71 | 55 |
| | 45 | 40 | 1.2 | MKP1848640704Y* | 66 | 55 |
| | 45 | 45 | 1.2 | MKP1848645704Y* | 95 | 45 |
| | 45 | 50 | 1.2 | MKP1848650704Y* | 88 | 45 |
| | 50 | 55 | 1.2 | MKP1848655704Y* | 112 | 40 |
| | 50 | 60 | 1.2 | MKP1848660704Y* | 107 | 40 |
| | 50 | 65 | 1.2 | MKP1848665704Y* | 100 | 40 |
| | 45 | 70 | 1.2 | MKP1848670704Y5 | 128 | 30 |
| | 45 | 75 | 1.2 | MKP1848675704Y5 | 123 | 30 |
| | 45 | 80 | 1.2 | MKP1848680704Y5 | 119 | 30 |
| 65 | 160 | 1.2 | MKP1848716704Y5 ⁽³⁾ | 264 | 20 | |
| 65 | 320 | 1.2 | MKP1848732704Y5 ⁽⁴⁾ | 359 | 10 | |
| 800 | U_{OPDC} AT 70 °C = 900 V, U_{OPDC} AT 105 °C = 570 V | | | | | |
| | 19 | 1 | 0.8 | MKP1848510084K2 | 6.5 | 160 |
| | 21 | 2 | 0.8 | MKP1848520084K2 | 9 | 130 |
| | 23 | 3 | 0.8 | MKP1848530084K2 | 11 | 115 |
| | 25 | 4 | 0.8 | MKP1848540084K2 | 12 | 100 |
| | 28 | 5 | 0.8 | MKP1848550084K2 | 17 | 80 |
| | 28 | 6 | 0.8 | MKP1848560084K2 | 16 | 80 |
| | 31 | 7 | 0.8 | MKP1848570084K2 | 23 | 65 |
| | 31 | 8 | 0.8 | MKP1848580084K2 | 21 | 65 |
| | 35 | 9 | 0.8 | MKP1848590084K2 | 21 | 70 |
| | 35.5 | 10 | 1.0 | MKP1848610084P* | 32 | 105 |
| | 35.5 | 12 | 1.0 | MKP1848612084P* | 30 | 105 |
| | 38.5 | 15 | 1.0 | MKP1848615084P* | 37 | 91 |
| | 44 | 20 | 1.0 | MKP1848620084P* | 47 | 77 |
| | 45 | 22 | 1.0 | MKP1848622084P* | 65 | 63 |
| | 45 | 25 | 1.0 | MKP1848625084P* | 61 | 63 |
| | 45 | 30 | 1.2 | MKP1848630084Y* | 69 | 55 |
| | 45 | 35 | 1.2 | MKP1848635084Y* | 97 | 45 |
| | 45 | 40 | 1.2 | MKP1848640084Y* | 91 | 45 |
| | 50 | 45 | 1.2 | MKP1848645084Y* | 112 | 40 |
| | 50 | 50 | 1.2 | MKP1848650084Y* | 104 | 40 |
| | 45 | 55 | 1.2 | MKP1848655084Y5 | 131 | 30 |
| | 45 | 60 | 1.2 | MKP1848660084Y5 | 125 | 30 |
| | 65 | 120 | 1.2 | MKP1848712084Y5 ⁽³⁾ | 276 | 20 |
| | 65 | 240 | 1.2 | MKP1848724084Y5 ⁽⁴⁾ | 393 | 10 |
| | 19 | 1 | 0.8 | MKP1848510094K2 | 6 | 160 |
| | 23 | 2 | 0.8 | MKP1848520094K2 | 11 | 115 |
| | 25 | 3 | 0.8 | MKP1848530094K2 | 12 | 100 |
| | 28 | 4 | 0.8 | MKP1848540094K2 | 16.5 | 80 |
| | 31 | 5 | 0.8 | MKP1848550094K2 | 22.5 | 65 |
| | 31 | 6 | 0.8 | MKP1848560094K2 | 21 | 65 |
| | 35 | 7 | 0.8 | MKP1848570094K2 | 21 | 70 |
| 35.5 | 5 | 1.0 | MKP1848550094P* | 32 | 105 | |
| 35.5 | 6 | 1.0 | MKP1848560094P* | 30 | 105 | |



| PACKAGING INFORMATION | | | | | | |
|-------------------------------------|---|-----------------------------|--------------------------------|--------------------------------|-------------|-----------------------------|
| U _{NDC} AT 85 °C (V) | HEIGHT (mm) | CAP. ⁽⁵⁾ (µF) | Ø dt | ORDERING CODE ⁽¹⁾ | MASS (g) | SPQ ⁽²⁾ (pcs) |
| 900 | U_{OPDC} AT 70 °C = 1100 V, U_{OPDC} AT 105 °C = 650 V | | | | | |
| | 35.5 | 7 | 1.0 | MKP1848570094P* | 33 | 105 |
| | 35.5 | 8 | 1.0 | MKP1848580094P* | 31 | 105 |
| | 35.5 | 9 | 1.0 | MKP1848590094P* | 30 | 105 |
| | 38.5 | 10 | 1.0 | MKP1848610094P* | 39 | 91 |
| | 38.5 | 12 | 1.0 | MKP1848612094P* | 36 | 91 |
| | 44 | 15 | 1.0 | MKP1848615094P* | 47 | 77 |
| | 44 | 16 | 1.0 | MKP1848616094P* | 45 | 77 |
| | 45 | 20 | 1.0 | MKP1848620094P* | 57 | 63 |
| | 45 | 15 | 1.2 | MKP1848615094Y* | 70 | 55 |
| | 45 | 20 | 1.2 | MKP1848620094Y* | 73 | 55 |
| | 45 | 22 | 1.2 | MKP1848622094Y* | 70 | 55 |
| | 45 | 25 | 1.2 | MKP1848625094Y* | 98 | 45 |
| | 45 | 30 | 1.2 | MKP1848630094Y* | 89 | 45 |
| | 50 | 35 | 1.2 | MKP1848635094Y* | 109 | 40 |
| | 50 | 40 | 1.2 | MKP1848640094Y* | 99 | 40 |
| | 45 | 45 | 1.2 | MKP1848645094Y5 | 124 | 30 |
| | 45 | 50 | 1.2 | MKP1848650094Y5 | 117 | 30 |
| 65 | 100 | 1.2 | MKP1848710094Y5 ⁽³⁾ | 259 | 20 | |
| 65 | 200 | 1.2 | MKP1848720094Y5 ⁽⁴⁾ | 608 | 10 | |
| 1100 | U_{OPDC} AT 70 °C = 1350 V, U_{OPDC} AT 105 °C = 800 V | | | | | |
| | 21 | 1 | 0.8 | MKP1848510914K2 | 9 | 130 |
| | 25 | 2 | 0.8 | MKP1848520914K2 | 12 | 100 |
| | 28 | 3 | 0.8 | MKP1848530914K2 | 16 | 80 |
| | 31 | 4 | 0.8 | MKP1848540914K2 | 21.5 | 65 |
| | 35 | 5 | 0.8 | MKP1848550914K2 | 21.5 | 70 |
| | 35.5 | 5 | 1.0 | MKP1848550914P* | 33 | 105 |
| | 35.5 | 6 | 1.0 | MKP1848560914P* | 30 | 105 |
| | 38.5 | 7 | 1.0 | MKP1848570914P* | 39 | 91 |
| | 38.5 | 8 | 1.0 | MKP1848580914P* | 37 | 91 |
| | 44 | 9 | 1.0 | MKP1848590914P* | 50 | 77 |
| | 44 | 10 | 1.0 | MKP1848610914P* | 48 | 77 |
| | 45 | 12 | 1.0 | MKP1848612914P* | 63 | 63 |
| | 45 | 10 | 1.2 | MKP1848610914Y* | 81 | 55 |
| | 45 | 12 | 1.2 | MKP1848612914Y* | 77 | 55 |
| | 45 | 15 | 1.2 | MKP1848615914Y* | 70 | 55 |
| | 45 | 20 | 1.2 | MKP1848620914Y* | 91 | 45 |
| | 50 | 22 | 1.2 | MKP1848622914Y* | 115 | 40 |
| | 50 | 25 | 1.2 | MKP1848625914Y* | 108 | 40 |
| | 45 | 30 | 1.2 | MKP1848630914Y5 | 126 | 30 |
| | 65 | 60 | 1.2 | MKP1848660914Y5 ⁽³⁾ | 256 | 20 |
| | 65 | 70 | 1.2 | MKP1848670914Y5 ⁽³⁾ | 257 | 20 |
| 65 | 120 | 1.2 | MKP1848712914Y5 ⁽⁴⁾ | 606 | 10 | |
| 65 | 140 | 1.2 | MKP1848714914Y5 ⁽⁴⁾ | 608 | 10 | |
| 1200 | U_{OPDC} AT 70 °C = 1500 V, U_{OPDC} AT 105 °C = 850 V | | | | | |
| | 21 | 1 | 0.8 | MKP1848510924K2 | 9 | 130 |
| | 25 | 2 | 0.8 | MKP1848520924K2 | 11.5 | 100 |
| | 28 | 3 | 0.8 | MKP1848530924K2 | 15 | 80 |
| | 31 | 4 | 0.8 | MKP1848540924K2 | 20 | 65 |
| | 35.5 | 5 | 1.0 | MKP1848550924P* | 31 | 105 |
| | 35.5 | 6 | 1.0 | MKP1848560924P* | 29 | 105 |
| | 38.5 | 7 | 1.0 | MKP1848570924P* | 37 | 91 |

| PACKAGING INFORMATION | | | | | | |
|------------------------------|--|-----------------------------------|--------------------------------|--------------------------------|-------------|-----------------------------|
| U_{NDC} AT 85 °C (V) | HEIGHT (mm) | CAP. ⁽⁵⁾ (μ F) | \varnothing dt | ORDERING CODE ⁽¹⁾ | MASS (g) | SPQ ⁽²⁾ (pcs) |
| 1200 | U_{OPDC} AT 70 °C = 1500 V, U_{OPDC} AT 105 °C = 850 V | | | | | |
| | 38.5 | 8 | 1.0 | MKP1848580924P* | 35 | 91 |
| | 44 | 9 | 1.0 | MKP1848590924P* | 48 | 77 |
| | 44 | 10 | 1.0 | MKP1848610924P* | 45 | 77 |
| | 45 | 12 | 1.0 | MKP1848612924P* | 60 | 63 |
| | 45 | 10 | 1.2 | MKP1848610924Y* | 79 | 55 |
| | 45 | 12 | 1.2 | MKP1848612924Y* | 74 | 55 |
| | 45 | 15 | 1.2 | MKP1848615924Y* | 67 | 55 |
| | 50 | 20 | 1.2 | MKP1848620924Y* | 115 | 40 |
| | 50 | 22 | 1.2 | MKP1848622924Y* | 109 | 40 |
| | 50 | 25 | 1.2 | MKP1848625924Y* | 100 | 40 |
| | 45 | 30 | 1.2 | MKP1848630924Y5 | 119 | 30 |
| | 65 | 60 | 1.2 | MKP1848660924Y5 ⁽³⁾ | 264 | 20 |
| 65 | 120 | 1.2 | MKP1848712924Y5 ⁽⁴⁾ | 612 | 10 | |

Notes

- (1) Change the * symbol with special code for the terminals
- (2) SPQ = Standard Packing Quantity
- (3) 6 pins
- (4) 12 pins
- (5) Intermediate capacitance values available on request

CONSTRUCTION DESCRIPTION

Low inductive wound cell elements of metallized polypropylene film, potted with resin in a flame retardant case.

SPECIFIC METHOD OF MOUNTING TO WITHSTAND VIBRATION AND SHOCK

The capacitor unit is designed for mounting on a printed circuit board.

In order to withstand vibration and shock tests, it must be insured that the stand-off pips are in good contact with the printed circuit board.

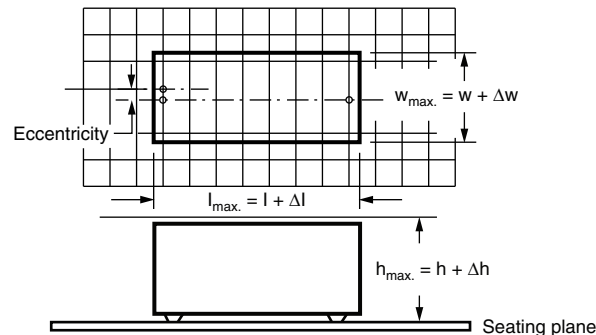
The capacitors shall be mechanically fixed by the leads and the body clamped.

SPACE REQUIREMENTS ON PRINTED-CIRCUIT BOARD

The maximum length and width of film capacitors is shown in the figure.

For product height with seating plane as given by "IEC 60717" as reference.

For 2 pins:



For the maximum product dimensions and maximum space requirements for length (l_{max}), width (w_{max}), and height (h_{max}) following tolerances must be taken in account in the envelopment of the components as shown in the drawings below:

- For products with $15 \text{ mm} < \text{pitch} \leq 27.5 \text{ mm}$, $\Delta w = \Delta l = 0.5 \text{ mm}$, and $\Delta h = 0.1 \text{ mm}$
- For products with $\text{pitch} = 37.5 \text{ mm}$, $\Delta w = \Delta l = 0.7 \text{ mm}$, and $\Delta h = 0.5 \text{ mm}$
- For products with $\text{pitch} = 52.5 \text{ mm}$, $\Delta w = \Delta l = 1.0 \text{ mm}$, and $\Delta h = 0.5 \text{ mm}$

Eccentricity defined as in drawing. The maximum eccentricity is smaller than or equal to the lead diameter of the product concerned.

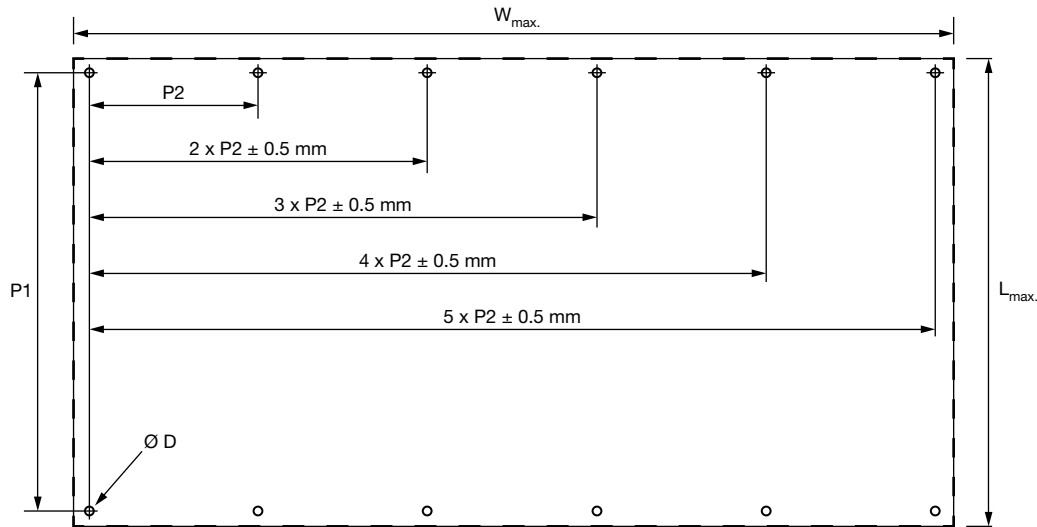
The maximum length and width of film capacitors is shown in the figure.

For the minimum product dimensions for length ($l_{min.}$), width ($w_{min.}$), and height ($h_{min.}$) following tolerances of the components are valid:

$l_{min.} = l - \Delta l$, $w_{min.} = w - \Delta w$, and $h_{min.} = h - \Delta h$ following

- For products with $15 \text{ mm} < \text{pitch} \leq 22.5 \text{ mm}$, $\Delta l = 1.0 \text{ mm}$, and $\Delta w = \Delta h = 0.5 \text{ mm}$
- For products with $\text{pitch} = 27.5 \text{ mm}$, $\Delta l = 1.5 \text{ mm}$, and $\Delta w = \Delta h = 0.5 \text{ mm}$
- For products with $\text{pitch} = 37.5 \text{ mm}$, $\Delta l = 1.5 \text{ mm}$, and $\Delta w = \Delta h = 1.0 \text{ mm}$
- For products with $\text{pitch} = 52.5 \text{ mm}$, $\Delta l = 1.5 \text{ mm}$, and $\Delta w = \Delta h = 1.0 \text{ mm}$

For 4 pins, 6 pins, and 12 pins:



| P1 (mm) | L _{max.} (mm) | W _{max.} (mm) | Ø D (mm) | H (mm) |
|---------|------------------------|------------------------|----------|-----------|
| 27.5 | $l + 1.6$ | $w + 2.0$ | 1.2 | $h + 0.2$ |
| 37.5 | $l + 2.0$ | $w + 3.0$ | 1.5 | $h + 0.5$ |
| 52.5 | $l + 2.4$ | $w + 4.0$ | 1.7 | $h + 0.5$ |

SOLDERING CONDITIONS

For general soldering conditions and wave soldering profile, we refer to the application note:

“Soldering Guidelines for Film Capacitors”: www.vishay.com/doc?28171

Storage Temperature

$T_{stg} = -25 \text{ °C}$ to $+35 \text{ °C}$ with RH maximum 75 % without condensation.

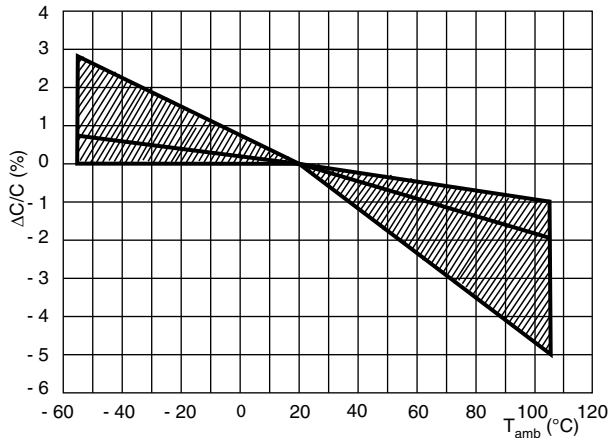
Ratings and Characteristics Reference Conditions

Unless otherwise specified, all electrical values apply to an ambient temperature of $23 \text{ °C} \pm 1 \text{ °C}$, an atmospheric pressure of 86 kPa to 106 kPa and a relative humidity of $50 \% \pm 2 \%$.

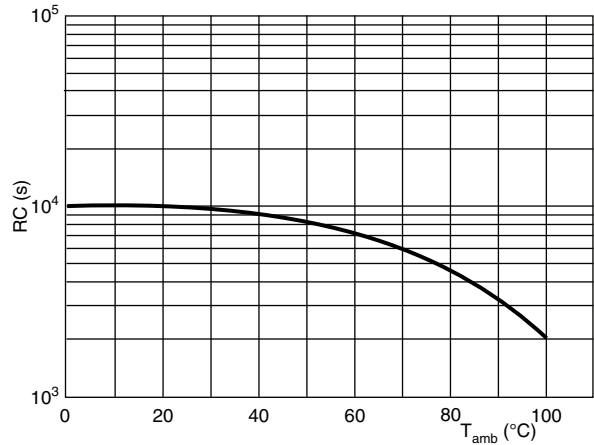
For reference testing, a conditioning period shall be applied over $96 \text{ h} \pm 4 \text{ h}$ by heating the products in a circulating air oven at the rated temperature and a relative humidity not exceeding 20 %.



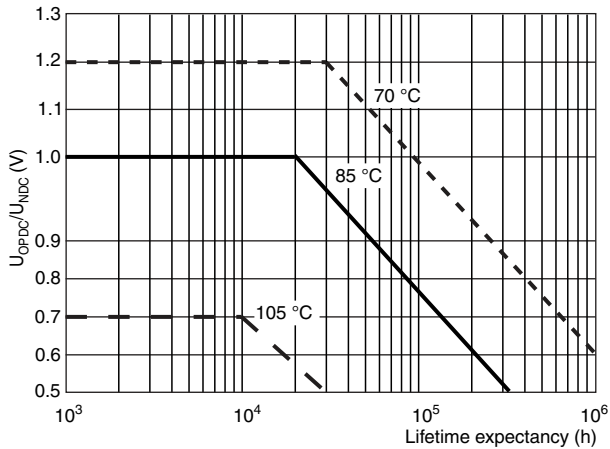
CHARACTERISTICS



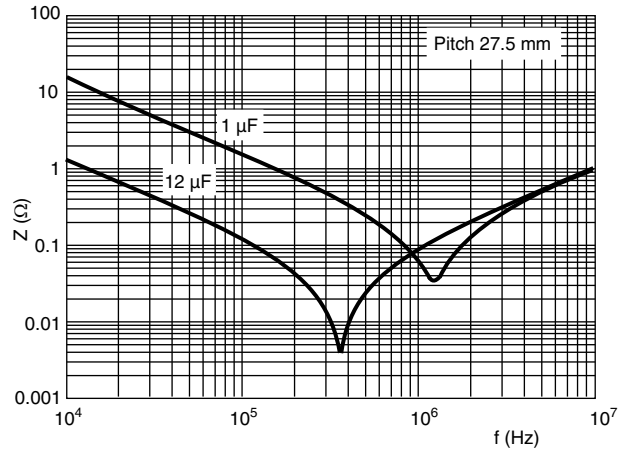
Capacitance (typical curve)



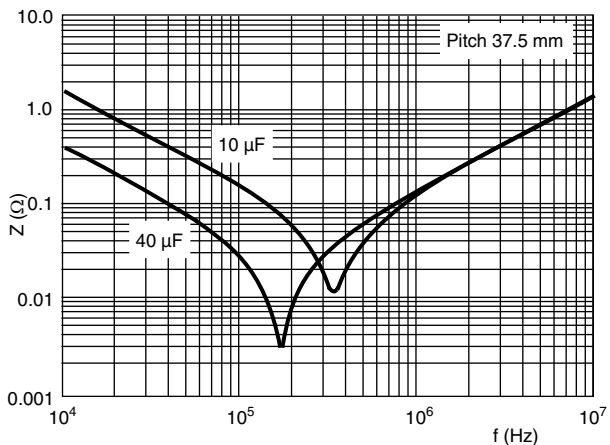
Insulation resistance (typical curve)



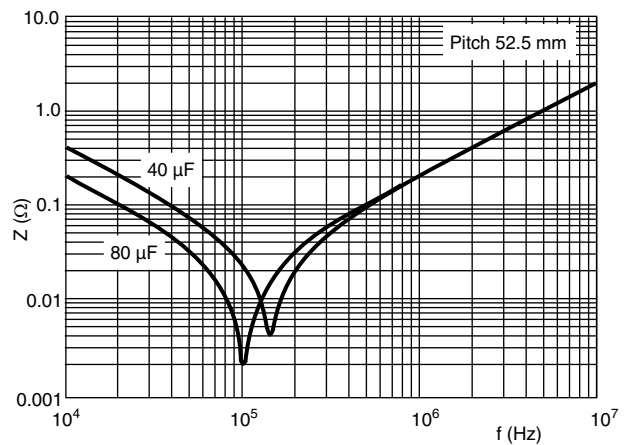
Lifetime expectancy (typical curve)



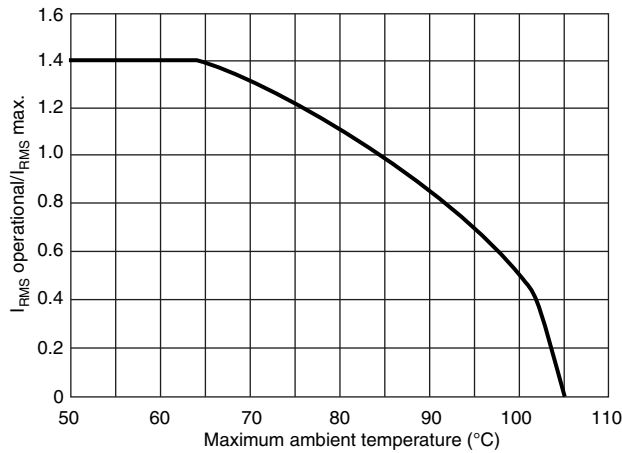
Impedance vs. frequency (typical curve)



Impedance vs. frequency (typical curve)



Impedance vs. frequency (typical curve)



Maximum I_{RMS} current in function of the ambient temperature

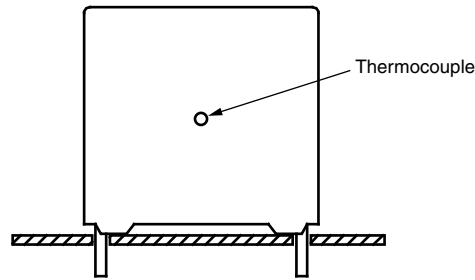
| HEAT CONDUCTIVITY | | | |
|-------------------|------|------|---------------------------|
| DIMENSIONS (mm) | | | HEAT CONDUCTIVITY (mW/°C) |
| w | h | l | |
| 9.0 | 19.0 | 32.0 | 24 |
| 11.0 | 21.0 | 32.0 | 28 |
| 13.0 | 23.0 | 32.0 | 32 |
| 15.0 | 25.0 | 32.0 | 36 |
| 18.0 | 28.0 | 32.0 | 44 |
| 21.0 | 31.0 | 32.0 | 51 |
| 21.0 | 35.0 | 32.0 | 56 |
| 18.5 | 35.5 | 43.0 | 54 |
| 21.5 | 38.5 | 43.0 | 61 |
| 24.0 | 44.0 | 42.0 | 70 |
| 30.0 | 45.0 | 42.0 | 81 |
| 25.0 | 45.0 | 57.5 | 77 |
| 30.0 | 45.0 | 57.5 | 85 |
| 35.0 | 50.0 | 57.5 | 100 |
| 45.0 | 45.0 | 57.5 | 94 |
| 70.0 | 65.0 | 57.5 | 152 |
| 130.0 | 65.0 | 57.5 | 243 |

POWER DISSIPATION AND MAXIMUM COMPONENT TEMPERATURE RISE

The power dissipation must be limited in order not to exceed the maximum allowed component temperature rise as a function of the free air ambient temperature.

The component temperature rise (ΔT) can be measured or calculated by $\Delta T = P/G$:

- $\Delta T = T_C - T_{amb}$ = case temperature rise (°C) with a maximum of 15 °C at rated temperature.
- $P = I_{RMS}^2 \times ESR$ = power dissipation of the component (mW)
- G = heat conductivity of the component (mW/°C)

MEASURING THE COMPONENT TEMPERATURE


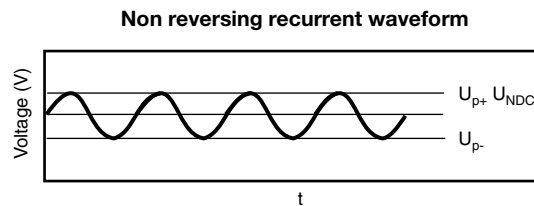
The case temperature is measured in unloaded (T_{amb}) and maximum loaded condition (T_C). To avoid thermal radiation or convection, the capacitor must be tested in a closed area from air circulation.

APPLICATION NOTE AND LIMITING CONDITIONS

These capacitors are not suitable for mains applications as across-the-line capacitors without additional protection. These mains applications are strictly regulated in safety standards and therefore electromagnetic interference suppression capacitors conforming the standards must be used.

To select the capacitor for a certain application, the following conditions must be checked:

- The continuous peak voltage (U_{p+}) shall not exceed the rated DC voltage rating (U_{NDC})
- The peak-to-peak ripple voltage (U_{pp}) shall not be greater than $0.2 \times (U_{NDC})$



- For capacitors connected in parallel, normally the proof voltage and possibly the rated voltage must be reduced. For information depending of the capacitance value and the number of parallel connections contact: dc-film@vishay.com
- The voltage peak slope (dU/dt) shall not exceed the pulse slope at the DC voltage rating. If the pulse voltage is lower than the rated DC voltage, the rated voltage pulse slope may be multiplied by U_{NDC} and divided by the applied voltage.

For all other pulses following equation must be fulfilled:

$$2 \times \int_0^T \left(\frac{dU}{dt} \right)^2 \times dt < U_{NDC} \times \left(\frac{dU}{dt} \right)_{rated}$$

T is the pulse duration

Maximum Repetitive Peak Voltages

The capacitor unit may be subjected to the following surge without any significant reduction of lifetime expectancy

| REPETITIVE SURGE VOLTAGE | MAXIMUM DURATION PER DAY |
|--------------------------|--------------------------|
| $1.1 \times U_{NDC}$ | 30 % on load duration |
| $1.15 \times U_{NDC}$ | 30 min |
| $1.2 \times U_{NDC}$ | 5 min |
| $1.3 \times U_{NDC}$ | 1 min |
| $1.5 \times U_{NDC}$ | 110 ms |



INSPECTION REQUIREMENTS

General Notes

Sub-clause numbers of tests and performance requirements refer to the “Sectional Specification, Publication IEC 61071”.

| SUB-CLAUSE NUMBER AND TEST | CONDITIONS | PERFORMANCE REQUIREMENTS |
|--|---|--|
| ROUTINE TEST-FINAL INSPECTION | | |
| 5.14.2.1 External inspection, visual examination | | Legible marking as specified |
| 5.14.2.2 Dimensions | | See specification drawing |
| 5.3.1 Capacitance | 1 kHz at room temperature | See specific reference data |
| 5.3.2 tan δ | 1 kHz at room temperature 10 kHz at room temperature | See specific reference data |
| 5.5.1.2 Voltage test between terminal | 1.5 x U _{NDC} at T _{amb} Duration 10 s | No visible damage or puncture No flashover |
| 5.7 Insulation resistance | U _{NDC} ≤ 500 V measuring voltage 100 V at room temperature U _{NDC} > 500 V measuring voltage 500 V at room temperature Duration 1 min | See specific reference data |
| TYPE TESTS | | |
| 5.14.2 External inspection | Check for finish, marking and overall dimensions | Legible marking and finish as specified Dimensions: see specific drawing |
| 5.14.0 Initial measurements | Capacitance at 1 kHz tan δ at 10 kHz | |
| 5.14.1.1.4 Robustness of terminations IEC 60068-2-21 | Tensile U _{a1} Wire diameter section load ≤ 0.8 mm ≤ 0.5 mm ² 10 N ≤ 1.25 mm ≤ 1.2 mm ² 20 N Duration 10 s ± 1 s Bending U _b method 1 Wire diameter section load ≤ 0.8 mm ≤ 0.05 mm ³ 10 N ≤ 1.25 mm ≤ 0.019 mm ³ 20 N 4 x 90 °, Duration 2 s to 3 s/bend | |
| 5.14.1.6 Resistance to soldering heat IEC 60068-2-20 | No predrying, method 1A Solder bath: 260 °C Duration 10 s ± 1 s | |
| 5.14.4 Final measurements | Capacitance tan δ | ΔC/C ≤ 0.5 % Increase of tan δ ≤ 0.0050 Compared to values measured in 5.14.0 |
| 5.14.0 Initial measurements | Capacitance at 1 kHz tan δ at 10 kHz | |



| SUB-CLAUSE NUMBER AND TEST | CONDITIONS | PERFORMANCE REQUIREMENTS |
|---|---|--|
| TYPE TESTS | | |
| 5.14.3.1 Vibration IEC 60068-2-6 | 10 Hz to 55 Hz: amplitude ± 0.35 mm or acceleration 98 m/s^2 Test duration: 10 frequency cycles, 3 axes offset from each other by 90° 1 octave/min Visual examination | No visible damages |
| 5.14.3.2 Shock or impact IEC 60068-2-6 | Pulse shape: half sine Acceleration: 490 m/s^2 Duration t of pulse: 11 ms Visual examination | No visible damage |
| 5.14.4 Final measurements | Capacitance $\tan \delta$ | $ \Delta C/C \leq 0.5 \%$ Increase of $\tan \delta \leq 0.0050$ Compared to values measured in 5.14.0 |
| 5.5.3.1 Initial measurements | Capacitance at 1 kHz $\tan \delta$ at 10 kHz R insulation | |
| 5.5.3.2 Voltage test between terminal | $1.5 \times U_{\text{NDC}}$ at T_{amb} Duration 60 s | |
| 5.5.3.3 Final measurements | Capacitance $\tan \delta$ R insulation | $ \Delta C/C \leq 0.5 \%$ Increase of $\tan \delta \leq 1.2$ initial $\tan \delta + 0.0001$ R insulation $\geq 50 \%$ of specified values |
| 5.9.1 Initial measurements | Capacitance at 1 kHz $\tan \delta$ at 10 kHz | |
| 5.9.2 Surge discharge test | $1.1 \times U_{\text{NDC}}$ Number of discharges: 5 Time lapse: every 2 min (10 min total) | |
| 5.9.3 Voltage test between terminal | Within 5 min after the surge discharge test Duration 60 s $1.5 \times U_{\text{NDC}}$ at T_{amb} | |
| 5.9.3 Final measurements | Capacitance $\tan \delta$ at 10 kHz | $ \Delta C/C \leq 1.0 \%$ $\tan \delta \leq 1.2$ initial $\tan \delta + 0.0001$ Compared to values measured in 5.9.1 |
| 5.11.1 Initial measurements | Capacitance at 1 kHz $\tan \delta$ at 10 kHz | |
| 5.11.2 Self healing test | $1.5 \times U_{\text{NDC}}$ Duration 10 s Number of clearings ≤ 5 Clearing = voltage drop of 5 % increase the voltage at 100 V/s till 5 clearings occur with a max. of $2.5 \times U_{\text{NDC}}$ for a duration of 10 s | |
| 5.11.3 Final measurements | Capacitance $\tan \delta$ | $ \Delta C/C \leq 0.5 \%$ $\tan \delta \leq 1.2 \times$ initial $\tan \delta + 0.0001$ Compared to values measured in 5.11.1 |



| SUB-CLAUSE NUMBER AND TEST | CONDITIONS | PERFORMANCE REQUIREMENTS |
|--|--|--|
| TYPE TESTS | | |
| 5.13.0 Initial measurements | Capacitance at 1 kHz tan δ at 10 kHz | |
| 5.13.1 Change of temperature acc. to IEC 60068-2-14 | Test Nb $T_{max.} = 85\text{ }^{\circ}\text{C}$ $T_{min.} = -40\text{ }^{\circ}\text{C}$ Transition time: 1 h, equivalent to $1\text{ }^{\circ}\text{C}/\text{min}$ | |
| 5.13.2 Damp heat steady state acc. to IEC 60068-2-78 | Test Ca $T_{max.} = 40\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ RH = 93 % \pm 3 % Duration 56 days | |
| 5.5.3.2 Voltage test between terminal | $1.5 \times U_{NDC}$ at ambient temperature Duration 60 s | |
| 5.13.3 Final measurements | Visual examination Capacitance tan δ at $1 U_{RMS}$ 10 kHz | No puncturing or flashover Self healing punctures are permitted $ \Delta C/C \leq 2.0\%$ Increase of tan $\delta \leq 0.0150$ Compared to values measured in 5.13.0 |
| 5.10.0 Initial measurements | Capacitance at 1 kHz tan δ at 10 kHz | |
| 5.10.1 Thermal stability test under overload conditions | Natural cooling $T_{amb} \pm 5\text{ }^{\circ}\text{C}$ $1.21 \times P_{max.} = (U_2/2) \times W_2 \times C \times \tan \delta =$ $121 \times (I_{max.}^2/W_2 \times c) \times \tan \delta_2$ with $W_2 = 2 \times p \times f_2$ for $I_{max.}$ (see specific reference data) $f_2 = 10\text{ kHz}$ Duration 48 h | |
| 5.10.2 Final measurements | Measure the temperature every 1.5 h during the last 6 h Capacitance tan δ at 10 kHz | Temperature rise $< 1\text{ }^{\circ}\text{C}$ $ \Delta C/C \leq 2\%$ Increase of tan $\delta \leq 1.2 \times \text{initial } \delta + 0.0150$ |
| 5.12 Resonance frequency measurement | Impedance analyzer at T_{amb} | > 0.9 times the value as specified in typical curve "Resonant frequency" of this specification |
| 5.10.0 Initial measurements | Capacitance at 1 kHz tan δ at 10 kHz | |
| 5.15.1 Endurance test between terminals | Sequence $1.4 \times U_{NDC}$ at $T_{max.} = 85\text{ }^{\circ}\text{C}$ $1.4 \times U_{OPDC}$ at $105\text{ }^{\circ}\text{C}$ Duration 250 h 1000 x discharge at $1.4 \times I$ (maximum repetitive peak current in continuous operation) $1.4 \times U_{NDC}$ at $T_{max.} = 85\text{ }^{\circ}\text{C}$ $1.4 \times U_{OPDC}$ at $105\text{ }^{\circ}\text{C}$ Duration 250 h | |
| 5.15.2 Final measurements | Capacitance tan δ | $ \Delta C/C \leq 3\%$ Increase of tan $\delta \leq 0.0150$ Compared to values measured in 5.15.0 |



| SUB-CLAUSE NUMBER AND TEST | CONDITIONS | PERFORMANCE REQUIREMENTS |
|--|--|--|
| TYPE TESTS | | |
| 5.16.3.0 Initial measurements | Capacitance at 1 kHz at $T_{max.} = 85\text{ }^{\circ}\text{C}$ | |
| 5.16.3.1 Destruction test sequence High DC voltage test | Product enveloped with cheese cloth 3 x U_{NDC} or DC voltage Until repetitive product healings occur Duration = 15 min | Audible healings or check healings with oscilloscope |
| High AC voltage test | AC_{RMS} voltage = $U_{NDC}/2 \sqrt{2}$ with minimum of 250 V_{AC} Duration = 5 min Repeat destruction sequence 3 x | |
| 5.16.3.2 Final measurements | Visual examination | No puncturing or flashover Self healing punctures are permitted |



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