



Metallized Polypropylene Film Capacitor AC Filtering Radial Type



FEATURES

- High peak current capabilities
- Long lifetime
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

APPLICATIONS

- AC filtering
- UPS systems
- Renewable energy - grid interface
- Harmonic filter
- Welding equipment

| QUICK REFERENCE DATA | |
|---|--|
| Rated capacitance range | 1 µF to 70 µF |
| Capacitance tolerance | ± 5 % and 10 % |
| Maximum continuous AC voltage (50 Hz / 60 Hz) range, U _{NAC} | 230 V _{AC} , 250 V _{AC} , 275 V _{AC} , 310 V _{AC} , 350 V _{AC} , 440 V _{AC} |
| Climatic testing class | 40/85/56 |
| Maximum application temperature | 105 °C |
| Maximum permissible case temperature | 105 °C |
| Reference standards | IEC 61071, IEC 60068 |
| Dielectric | Polypropylene film |
| Electrodes | Metallized dielectric film |
| Construction | Mono and internal serial construction |
| Encapsulation | Plastic case sealed with resin; flame retardant |
| Terminals | Tinned wire |
| 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 Measuring voltage: 500 V |
| Life time expectancy ⁽²⁾ | Useful lifetime: > 60 000 h at intended mains voltage ⁽³⁾ FIT: < 10 x 10 ⁻⁹ /h (10 per 10 ⁹ component hours) at 0.5 x U _{NAC} , 40 °C |
| Marking | C-value; tolerance; rated voltage; code for dielectric material; code for manufacturing origin; manufacturer's type designation; manufacturer location, year and week; manufacturer's logo or name |

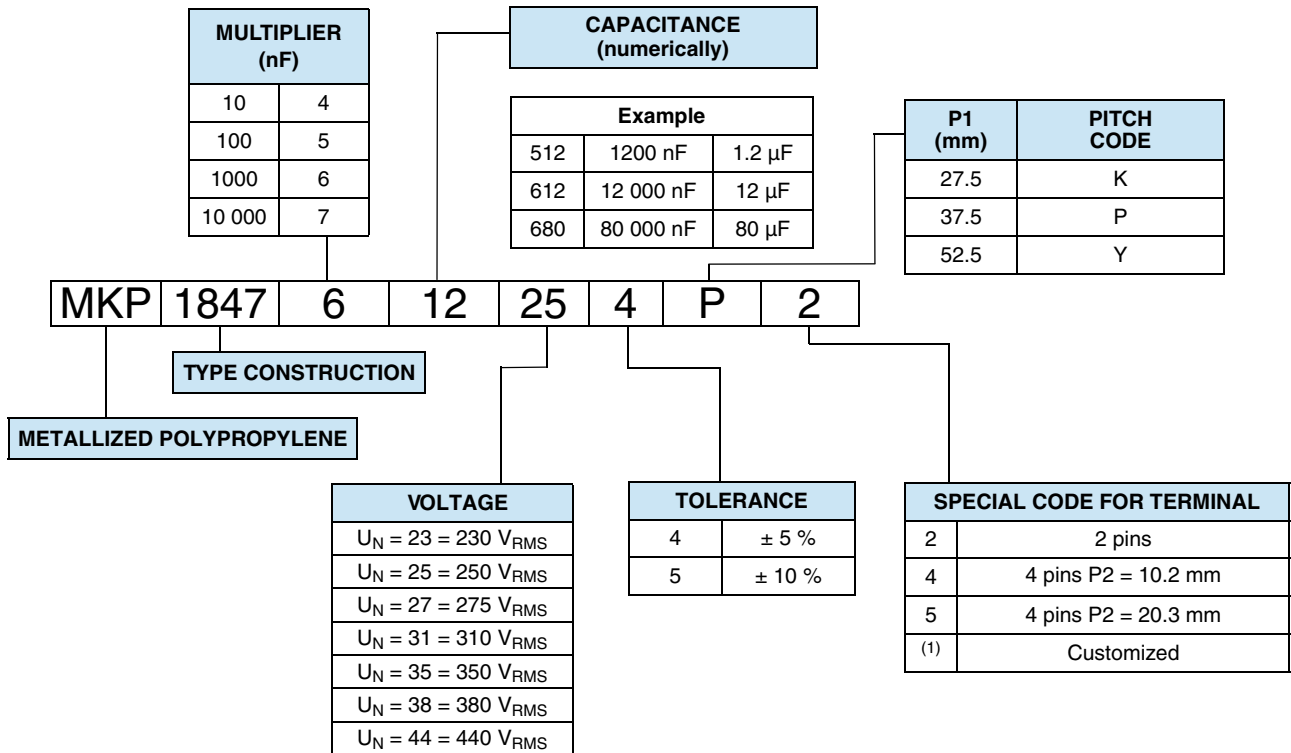
Notes

- 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 Capacitors" (www.vishay.com/doc?28169)
- ⁽²⁾ Statements about life time are based on calculations which are based on internal tests. They have to be understood exclusively as estimations. Also due to external factors, the life time in the field application may deviate from the calculated life time
- ⁽³⁾ Intended operational continuous mains voltage: see www.vishay.com/doc?28245

| MAXIMUM AC VOLTAGE RATINGS (V _{RMS}) | | | | | | |
|--|-------|-------|-------|-------|-------|-------|
| U _{NAC} | 230 V | 250 V | 275 V | 310 V | 350 V | 440 V |
| U _{OPAC} at 85 °C | 230 V | 250 V | 275 V | 310 V | 350 V | 440 V |
| U _{OPAC} at 105 °C | 160 V | 175 V | 190 V | 210 V | 240 V | 300 V |

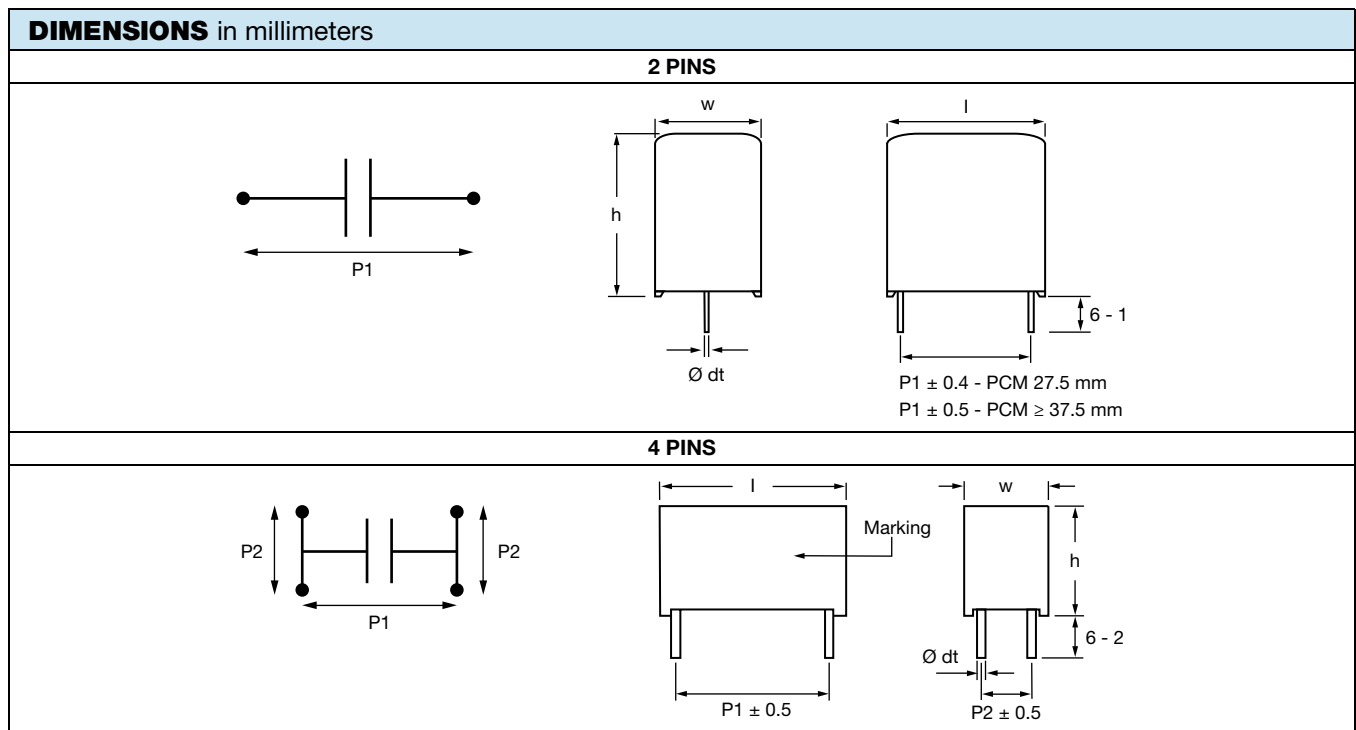


COMPOSITION OF CATALOG NUMBER



Note

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



Note

• $\varnothing dt \pm 10\%$ of standard diameter specified



| ELECTRICAL DATA AND ORDERING CODE | | | | | | | | | | | | | | | |
|---|------------------|-----------------------|------|------|------------|-------------|---------------------|--------------------------|-----------------------------|-----------|---------------------------------------|-----------|--|-----------------|-------------------|
| U _{NAC} (V) | CAP. (1) (μF) | DIMENSION (2) (mm) | | | P1 (mm) | P2 (mm) | dV/dt (3) (V/μs) | I _{PEAK} (A) | I _{RMS} (4) (A) | | tan δ 1 kHz ($< 10^{-4}$) (5) | | tan δ 10 kHz ($< 10^{-4}$) (5) | | ORDERING CODE (6) |
| | | w | h | l | | | | | 2 PINS | 4 PINS | 2 PINS | 4 PINS | 2 PINS | 4 PINS | |
| | | | | | | | | | | | | | | | |
| U_{NDC} = 450 V; U_{OPAC} AT 85 °C = 230 V_{RMS}; U_{OPAC} AT 105 °C = 160 V_{RMS} | | | | | | | | | | | | | | | |
| 230 | 1 | 9.0 | 19.0 | 32.0 | 27.5 | - | 45 | 45 | 2.5 | - | 5 | - | 30 | - | MKP1847510234K2 |
| | 2 | 11.0 | 21.0 | 32.0 | 27.5 | - | 45 | 90 | 3.5 | - | 5 | - | 30 | - | MKP1847520234K2 |
| | 3 | 13.0 | 23.0 | 32.0 | 27.5 | - | 45 | 135 | 5.0 | - | 5 | - | 30 | - | MKP1847530234K2 |
| | 4 | 15.0 | 25.0 | 32.0 | 27.5 | - | 45 | 180 | 6.0 | - | 5 | - | 30 | - | MKP1847540234K2 |
| | 5 | 18.0 | 28.0 | 32.0 | 27.5 | - | 45 | 225 | 7.5 | - | 5 | - | 30 | - | MKP1847550234K2 |
| | 6 | 18.0 | 28.0 | 32.0 | 27.5 | - | 45 | 270 | 8.0 | - | 5 | - | 30 | - | MKP1847560234K2 |
| | 7 | 18.0 | 28.0 | 32.0 | 27.5 | - | 45 | 315 | 8.5 | - | 5 | - | 30 | - | MKP1847570234K2 |
| | 8 | 21.0 | 31.0 | 32.0 | 27.5 | - | 45 | 360 | 10.0 | - | 5 | - | 30 | - | MKP1847580234K2 |
| | 9 | 21.0 | 31.0 | 32.0 | 27.5 | - | 45 | 405 | 10.5 | - | 5 | - | 30 | - | MKP1847590234K2 |
| | 10 | 20.0 | 35.0 | 32.0 | 27.5 | - | 45 | 450 | 11.5 | - | 5 | - | 30 | - | MKP1847610234K2 |
| | 10 | 18.5 | 35.5 | 43.0 | 37.5 | 10.2 | 20 | 200 | 8.0 | 9.0 | 10 | 8 | 75 | 70 | MKP1847610234P* |
| | 12 | 18.5 | 35.5 | 43.0 | 37.5 | 10.2 | 20 | 240 | 9.0 | 10.0 | 10 | 8 | 75 | 70 | MKP1847612234P* |
| | 15 | 21.5 | 38.5 | 42.0 | 37.5 | 10.2 | 20 | 300 | 11.0 | 12.0 | 10 | 8 | 75 | 70 | MKP1847615234P* |
| | 20 | 24.0 | 44.0 | 42.0 | 37.5 | 10.2 | 20 | 400 | 13.5 | 14.5 | 10 | 8 | 75 | 70 | MKP1847620234P* |
| | 22 | 24.0 | 44.0 | 42.0 | 37.5 | 10.2 | 20 | 440 | 14.0 | 15.5 | 10 | 8 | 75 | 70 | MKP1847622234P* |
| | 25 | 30.0 | 45.0 | 42.0 | 37.5 | 10.2 / 20.3 | 20 | 500 | 16.0 | 17.5 | 10 | 8 | 75 | 70 | MKP1847625234P* |
| | 30 | 30.0 | 45.0 | 42.0 | 37.5 | 10.2 / 20.3 | 20 | 600 | 17.5 | 19.0 | 10 | 8 | 75 | 70 | MKP1847630234P* |
| | 30 | 25.0 | 45.0 | 57.5 | 52.5 | 10.2 | 10 | 300 | 13.5 | 15.0 | 20 | 17 | 150 | 135 | MKP1847630234Y* |
| | 35 | 25.0 | 45.0 | 57.5 | 52.5 | 10.2 | 10 | 350 | 14.5 | 16.0 | 20 | 17 | 150 | 135 | MKP1847635234Y* |
| | 40 | 30.0 | 45.0 | 57.5 | 52.5 | 20.3 | 10 | 400 | 16.5 | 18.0 | 20 | 17 | 150 | 135 | MKP1847640234Y* |
| 45 | 30.0 | 45.0 | 57.5 | 52.5 | 20.3 | 10 | 450 | 17.5 | 19.0 | 20 | 17 | 150 | 135 | MKP1847645234Y* | |
| 50 | 35.0 | 50.0 | 57.5 | 52.5 | 20.3 | 10 | 500 | 20.0 | 21.5 | 20 | 17 | 150 | 135 | MKP1847650234Y* | |
| 55 | 35.0 | 50.0 | 57.5 | 52.5 | 20.3 | 10 | 550 | 21.0 | 22.5 | 20 | 17 | 150 | 135 | MKP1847655234Y* | |
| 60 | 35.0 | 50.0 | 57.5 | 52.5 | 20.3 | 10 | 600 | 21.5 | 23.5 | 20 | 17 | 150 | 135 | MKP1847660234Y* | |
| 65 | 45.0 | 45.0 | 57.5 | 52.5 | 20.3 | 10 | 650 | - | 25.5 | - | 17 | - | 135 | MKP1847665234Y5 | |
| 70 | 45.0 | 45.0 | 57.5 | 52.5 | 20.3 | 10 | 700 | - | 26.0 | - | 17 | - | 135 | MKP1847670235Y5 | |
| U_{NDC} = 500 V; U_{OPAC} AT 85 °C = 250 V_{RMS}; U_{OPAC} AT 105 °C = 175 V_{RMS} | | | | | | | | | | | | | | | |
| 250 | 1 | 9.0 | 19.0 | 32.0 | 27.5 | - | 50 | 50 | 2.5 | - | 5 | - | 25 | - | MKP1847510254K2 |
| | 2 | 11.0 | 21.0 | 32.0 | 27.5 | - | 50 | 100 | 4 | - | 5 | - | 25 | - | MKP1847520254K2 |
| | 3 | 13.0 | 23.0 | 32.0 | 27.5 | - | 50 | 150 | 5 | - | 5 | - | 25 | - | MKP1847530254K2 |
| | 4 | 15.0 | 25.0 | 32.0 | 27.5 | - | 50 | 200 | 6 | - | 5 | - | 25 | - | MKP1847540254K2 |
| | 5 | 18.0 | 28.0 | 32.0 | 27.5 | - | 50 | 250 | 7 | - | 5 | - | 25 | - | MKP1847550254K2 |
| | 6 | 18.0 | 28.0 | 32.0 | 27.5 | - | 50 | 300 | 6 | - | 5 | - | 25 | - | MKP1847560254K2 |
| | 7 | 21.0 | 31.0 | 32.0 | 27.5 | - | 50 | 350 | 8 | - | 5 | - | 25 | - | MKP1847570254K2 |
| | 8 | 21.0 | 31.0 | 32.0 | 27.5 | - | 50 | 400 | 9 | - | 5 | - | 25 | - | MKP1847580254K2 |
| | 9 | 20.0 | 35.0 | 32.0 | 27.5 | - | 50 | 450 | 11 | - | 5 | - | 25 | - | MKP1847590254K2 |
| | 5 | 18.5 | 35.5 | 43.0 | 37.5 | 10.2 | 25 | 125 | 7 | 8 | 10 | 8 | 70 | 65 | MKP1847550254P* |
| | 6 | 18.5 | 35.5 | 43.0 | 37.5 | 10.2 | 25 | 150 | 7 | 8 | 10 | 8 | 70 | 65 | MKP1847560254P* |
| | 7 | 18.5 | 35.5 | 43.0 | 37.5 | 10.2 | 25 | 175 | 7 | 8 | 10 | 8 | 70 | 65 | MKP1847570254P* |
| | 8 | 18.5 | 35.5 | 43.0 | 37.5 | 10.2 | 25 | 200 | 8 | 9 | 10 | 8 | 70 | 65 | MKP1847580254P* |
| | 9 | 18.5 | 35.5 | 43.0 | 37.5 | 10.2 | 25 | 225 | 8 | 9 | 10 | 8 | 70 | 65 | MKP1847590254P* |
| | 10 | 18.5 | 35.5 | 43.0 | 37.5 | 10.2 | 25 | 250 | 9 | 10 | 10 | 8 | 70 | 65 | MKP1847610254P* |
| 12 | 18.5 | 35.5 | 43.0 | 37.5 | 10.2 | 25 | 300 | 10 | 11 | 10 | 8 | 70 | 65 | MKP1847612254P* | |
| 15 | 21.5 | 38.5 | 42.0 | 37.5 | 10.2 | 25 | 375 | 11 | 12 | 10 | 8 | 70 | 65 | MKP1847615254P* | |



| ELECTRICAL DATA AND ORDERING CODE | | | | | | | | | | | | | | | |
|-----------------------------------|---|---|------|------|------------|-------------|---------------------|--------------------------|-----------------------------|-----------|---|-----------|--|-----------------|-------------------|
| U _{NAC} (V) | CAP. (1) (μF) | DIMENSION (2) (mm) | | | P1 (mm) | P2 (mm) | dV/dt (3) (V/μs) | I _{PEAK} (A) | I _{RMS} (4) (A) | | tan δ 1 kHz (< 10 ⁻⁴) (5) | | tan δ 10 kHz (< 10 ⁻⁴) (5) | | ORDERING CODE (6) |
| | | w | h | l | | | | | 2 PINS | 4 PINS | 2 PINS | 4 PINS | 2 PINS | 4 PINS | |
| | | U _{ND} C = 500 V; U _{OPAC} AT 85 °C = 250 V _{RMS} ; U _{OPAC} AT 105 °C = 175 V _{RMS} | | | | | | | | | | | | | |
| 250 | 20 | 30.0 | 45.0 | 42.0 | 37.5 | 10.2 / 20.3 | 25 | 500 | 10 | 11 | 10 | 8 | 70 | 65 | MKP1847620254P* |
| | 22 | 30.0 | 45.0 | 42.0 | 37.5 | 10.2 / 20.3 | 25 | 550 | 15 | 16 | 10 | 8 | 70 | 65 | MKP1847622254P* |
| | 25 | 30.0 | 45.0 | 42.0 | 37.5 | 10.2 / 20.3 | 25 | 625 | 16 | 17 | 10 | 8 | 70 | 65 | MKP1847625254P* |
| | 15 | 25.0 | 45.0 | 57.5 | 52.5 | 10.2 | 12 | 180 | 12 | 13 | 16 | 14 | 135 | 125 | MKP1847615254Y* |
| | 20 | 25.0 | 45.0 | 57.5 | 52.5 | 10.2 | 12 | 240 | 12 | 13 | 16 | 14 | 135 | 125 | MKP1847620254Y* |
| | 22 | 25.0 | 45.0 | 57.5 | 52.5 | 10.2 | 12 | 264 | 12 | 13 | 16 | 14 | 135 | 125 | MKP1847622254Y* |
| | 25 | 25.0 | 45.0 | 57.5 | 52.5 | 10.2 | 12 | 300 | 13 | 14 | 16 | 14 | 135 | 125 | MKP1847625254Y* |
| | 30 | 30.0 | 45.0 | 57.5 | 52.5 | 20.3 | 12 | 360 | 15 | 16 | 16 | 14 | 135 | 125 | MKP1847630254Y* |
| | 35 | 30.0 | 45.0 | 57.5 | 52.5 | 20.3 | 12 | 420 | 16 | 17 | 16 | 14 | 135 | 125 | MKP1847635254Y* |
| | 40 | 35.0 | 50.0 | 57.5 | 52.5 | 20.3 | 12 | 480 | 19 | 20 | 16 | 14 | 135 | 125 | MKP1847640254Y* |
| | 45 | 35.0 | 50.0 | 57.5 | 52.5 | 20.3 | 12 | 540 | 20 | 21 | 16 | 14 | 135 | 125 | MKP1847645254Y* |
| | 50 | 35.0 | 50.0 | 57.5 | 52.5 | 20.3 | 12 | 600 | 21 | 22 | 16 | 14 | 135 | 125 | MKP1847650254Y* |
| 55 | 45.0 | 45.0 | 57.5 | 52.5 | 20.3 | 12 | 660 | - | 24 | - | 14 | - | 125 | MKP1847655254Y5 | |
| 60 | 45.0 | 45.0 | 57.5 | 52.5 | 20.3 | 12 | 720 | - | 25 | - | 14 | - | 125 | MKP1847660255Y5 | |
| 275 | U _{ND} C = 600 V; U _{OPAC} AT 85 °C = 275 V _{RMS} ; U _{OPAC} AT 105 °C = 190 V _{RMS} | | | | | | | | | | | | | | |
| | 1 | 9.0 | 19.0 | 32.0 | 27.5 | - | 55 | 55 | 2.5 | - | 5 | - | 25 | - | MKP1847510274K2 |
| | 2 | 13.0 | 23.0 | 32.0 | 27.5 | - | 55 | 110 | 4.5 | - | 5 | - | 25 | - | MKP1847520274K2 |
| | 3 | 15.0 | 25.0 | 32.0 | 27.5 | - | 55 | 165 | 5.5 | - | 5 | - | 25 | - | MKP1847530274K2 |
| | 4 | 18.0 | 28.0 | 32.0 | 27.5 | - | 55 | 220 | 7 | - | 5 | - | 25 | - | MKP1847540274K2 |
| | 5 | 21.0 | 31.0 | 32.0 | 27.5 | - | 55 | 275 | 8 | - | 5 | - | 25 | - | MKP1847550274K2 |
| | 6 | 21.0 | 31.0 | 32.0 | 27.5 | - | 55 | 330 | 7 | - | 5 | - | 25 | - | MKP1847560274K2 |
| | 7 | 20.0 | 35.0 | 32.0 | 27.5 | - | 55 | 385 | 10 | - | 5 | - | 25 | - | MKP1847570274K2 |
| | 5 | 18.5 | 35.5 | 43.0 | 37.5 | 10.2 | 30 | 150 | 7 | 8 | 8 | 7 | 65 | 55 | MKP1847550274P* |
| | 6 | 18.5 | 35.5 | 43.0 | 37.5 | 10.2 | 30 | 180 | 7 | 8 | 8 | 7 | 65 | 55 | MKP1847560274P* |
| | 7 | 18.5 | 35.5 | 43.0 | 37.5 | 10.2 | 30 | 210 | 8 | 9 | 8 | 7 | 65 | 55 | MKP1847570274P* |
| | 8 | 18.5 | 35.5 | 43.0 | 37.5 | 10.2 | 30 | 240 | 8 | 9 | 8 | 7 | 65 | 55 | MKP1847580274P* |
| | 9 | 18.5 | 35.5 | 43.0 | 37.5 | 10.2 | 30 | 270 | 9 | 10 | 8 | 7 | 65 | 55 | MKP1847590274P* |
| | 10 | 21.5 | 38.5 | 42.0 | 37.5 | 10.2 | 30 | 300 | 10 | 11 | 8 | 7 | 65 | 55 | MKP1847610274P* |
| | 12 | 21.5 | 38.5 | 42.0 | 37.5 | 10.2 | 30 | 360 | 11 | 12 | 8 | 7 | 65 | 55 | MKP1847612274P* |
| | 15 | 24.0 | 44.0 | 42.0 | 37.5 | 10.2 | 30 | 450 | 13 | 14 | 8 | 7 | 65 | 55 | MKP1847615274P* |
| | 20 | 30.0 | 45.0 | 42.0 | 37.5 | 10.2 / 20.3 | 30 | 600 | 16 | 17 | 8 | 7 | 65 | 55 | MKP1847620274P* |
| | 15 | 25.0 | 45.0 | 57.5 | 52.5 | 10.2 | 13 | 195 | 11 | 12 | 15 | 12 | 125 | 105 | MKP1847615274Y* |
| | 20 | 25.0 | 45.0 | 57.5 | 52.5 | 10.2 | 13 | 260 | 12 | 13 | 15 | 12 | 125 | 105 | MKP1847620274Y* |
| | 22 | 25.0 | 45.0 | 57.5 | 52.5 | 10.2 | 13 | 286 | 13 | 14 | 15 | 12 | 125 | 105 | MKP1847622274Y* |
| | 25 | 30.0 | 45.0 | 57.5 | 52.5 | 20.3 | 13 | 325 | 15 | 16 | 15 | 12 | 125 | 105 | MKP1847625274Y* |
| | 30 | 30.0 | 45.0 | 57.5 | 52.5 | 20.3 | 13 | 390 | 16 | 17 | 15 | 12 | 125 | 105 | MKP1847630274Y* |
| 35 | 35.0 | 50.0 | 57.5 | 52.5 | 20.3 | 13 | 455 | 19 | 20 | 15 | 12 | 125 | 105 | MKP1847635274Y* | |
| 40 | 35.0 | 50.0 | 57.5 | 52.5 | 20.3 | 13 | 520 | 20 | 21 | 15 | 12 | 125 | 105 | MKP1847640274Y* | |
| 45 | 45.0 | 45.0 | 57.5 | 52.5 | 20.3 | 13 | 585 | - | 23 | - | 12 | - | 105 | MKP1847645274Y5 | |
| 50 | 45.0 | 45.0 | 57.5 | 52.5 | 20.3 | 13 | 650 | - | 24 | - | 12 | - | 105 | MKP1847650275Y5 | |



| ELECTRICAL DATA AND ORDERING CODE | | | | | | | | | | | | | | | |
|-----------------------------------|--|--|------|------|------------|-------------|---------------------|--------------------------|-----------------------------|-----------|---|-----------|--|-----------------|-------------------|
| U _{NAC} (V) | CAP. (1) (μF) | DIMENSION (2) (mm) | | | P1 (mm) | P2 (mm) | dV/dt (3) (V/μs) | I _{PEAK} (A) | I _{RMS} (4) (A) | | tan δ 1 kHz (< 10 ⁻⁴) (5) | | tan δ 10 kHz (< 10 ⁻⁴) (5) | | ORDERING CODE (6) |
| | | w | h | l | | | | | 2 PINS | 4 PINS | 2 PINS | 4 PINS | 2 PINS | 4 PINS | |
| | | U _{NDC} = 630 V; U _{OPAC} AT 85 °C = 310 V _{RMS} ; U _{OPAC} AT 105 °C = 210 V _{RMS} | | | | | | | | | | | | | |
| 310 | 1 | 11.0 | 21.0 | 32.0 | 27.5 | - | 68 | 68 | 3 | - | 5 | - | 20 | - | MKP1847510314K2 |
| | 2 | 15.0 | 25.0 | 32.0 | 27.5 | - | 68 | 136 | 5 | - | 5 | - | 20 | - | MKP1847520314K2 |
| | 3 | 18.0 | 28.0 | 32.0 | 27.5 | - | 68 | 204 | 7 | - | 5 | - | 20 | - | MKP1847530314K2 |
| | 4 | 21.0 | 31.0 | 32.0 | 27.5 | - | 68 | 272 | 8 | - | 5 | - | 20 | - | MKP1847540314K2 |
| | 5 | 21.0 | 31.0 | 32.0 | 27.5 | - | 68 | 340 | 9 | - | 5 | - | 20 | - | MKP1847550314K2 |
| | 5 | 18.5 | 35.5 | 43.0 | 37.5 | 10.2 | 35 | 175 | 7 | 8 | 7 | 6 | 55 | 50 | MKP1847550314P* |
| | 6 | 18.5 | 35.5 | 43.0 | 37.5 | 10.2 | 35 | 210 | 8 | 9 | 7 | 6 | 55 | 50 | MKP1847560314P* |
| | 7 | 18.5 | 35.5 | 43.0 | 37.5 | 10.2 | 35 | 245 | 9 | 10 | 7 | 6 | 55 | 50 | MKP1847570314P* |
| | 8 | 21.5 | 38.5 | 42.0 | 37.5 | 10.2 | 35 | 280 | 10 | 11 | 7 | 6 | 55 | 50 | MKP1847580314P* |
| | 9 | 21.5 | 38.5 | 42.0 | 37.5 | 10.2 | 35 | 315 | 10 | 11 | 7 | 6 | 55 | 50 | MKP1847590314P* |
| | 10 | 21.5 | 38.5 | 42.0 | 37.5 | 10.2 | 35 | 350 | 11 | 12 | 7 | 6 | 55 | 50 | MKP1847610315P* |
| | 12 | 24.0 | 44.0 | 42.0 | 37.5 | 10.2 | 35 | 420 | 12 | 13 | 7 | 6 | 55 | 50 | MKP1847612314P* |
| | 15 | 30.0 | 45.0 | 42.0 | 37.5 | 10.2 / 20.3 | 35 | 525 | 15 | 16 | 7 | 6 | 55 | 50 | MKP1847615314P* |
| | 10 | 25.0 | 45.0 | 57.5 | 52.5 | 10.2 | 15 | 150 | 10 | 11 | 12 | 10 | 105 | 90 | MKP1847610314Y* |
| | 12 | 25.0 | 45.0 | 57.5 | 52.5 | 10.2 | 15 | 180 | 10 | 11 | 12 | 10 | 105 | 90 | MKP1847612314Y* |
| | 15 | 25.0 | 45.0 | 57.5 | 52.5 | 10.2 | 15 | 225 | 12 | 13 | 12 | 10 | 105 | 90 | MKP1847615314Y* |
| | 20 | 30.0 | 45.0 | 57.5 | 52.5 | 20.3 | 15 | 300 | 14 | 15 | 12 | 10 | 105 | 90 | MKP1847620314Y* |
| | 22 | 35.0 | 50.0 | 57.5 | 52.5 | 20.3 | 15 | 330 | 16 | 17 | 12 | 10 | 105 | 90 | MKP1847622314Y* |
| 25 | 35.0 | 50.0 | 57.5 | 52.5 | 20.3 | 15 | 375 | 17 | 18 | 12 | 10 | 105 | 90 | MKP1847625314Y* | |
| 30 | 45.0 | 45.0 | 57.5 | 52.5 | 20.3 | 15 | 450 | - | 21 | - | 10 | - | 90 | MKP1847630314Y5 | |
| 35 | 45.0 | 45.0 | 57.5 | 52.5 | 20.3 | 15 | 525 | - | 22 | - | 10 | - | 90 | MKP1847635314Y5 | |
| 350 | U _{NDC} = 700 V; U _{OPAC} AT 85 °C = 350 V _{RMS} ; U _{OPAC} AT 105 °C = 240 V _{RMS} | | | | | | | | | | | | | | |
| | 1 | 11.0 | 21.0 | 32.0 | 27.5 | - | 100 | 100 | 3 | - | 5 | - | 20 | - | MKP1847510354K2 |
| | 2 | 15.0 | 25.0 | 32.0 | 27.5 | - | 100 | 200 | 5 | - | 5 | - | 20 | - | MKP1847520354K2 |
| | 3 | 18.0 | 28.0 | 32.0 | 27.5 | - | 100 | 300 | 7 | - | 5 | - | 20 | - | MKP1847530354K2 |
| | 4 | 21.0 | 31.0 | 32.0 | 27.5 | - | 100 | 400 | 9 | - | 5 | - | 20 | - | MKP1847540354K2 |
| | 5 | 18.5 | 35.5 | 43.0 | 37.5 | 10.2 | 50 | 250 | 7 | 8 | 7 | 6 | 50 | 45 | MKP1847550354P* |
| | 6 | 18.5 | 35.5 | 43.0 | 37.5 | 10.2 | 50 | 300 | 8 | 9 | 7 | 6 | 50 | 45 | MKP1847560354P* |
| | 7 | 21.5 | 38.5 | 42.0 | 37.5 | 10.2 | 50 | 350 | 9 | 10 | 7 | 6 | 50 | 45 | MKP1847570354P* |
| | 8 | 21.5 | 38.5 | 42.0 | 37.5 | 10.2 | 50 | 400 | 10 | 11 | 7 | 6 | 50 | 45 | MKP1847580354P* |
| | 9 | 24.0 | 44.0 | 42.0 | 37.5 | 10.2 | 50 | 450 | 11 | 12 | 7 | 6 | 50 | 45 | MKP1847590354P* |
| | 10 | 24.0 | 44.0 | 42.0 | 37.5 | 10.2 | 50 | 500 | 12 | 13 | 7 | 6 | 50 | 45 | MKP1847610354P* |
| | 12 | 30.0 | 45.0 | 42.0 | 37.5 | 10.2 / 20.3 | 50 | 600 | 14 | 15 | 7 | 6 | 50 | 45 | MKP1847612354P* |
| | 10 | 25.0 | 45.0 | 57.5 | 52.5 | 10.2 | 25 | 250 | 10 | 11 | 12 | 10 | 100 | 85 | MKP1847610354Y* |
| | 12 | 25.0 | 45.0 | 57.5 | 52.5 | 10.2 | 25 | 300 | 11 | 12 | 12 | 10 | 100 | 85 | MKP1847612354Y* |
| | 15 | 25.0 | 45.0 | 57.5 | 52.5 | 10.2 | 25 | 375 | 12 | 13 | 12 | 10 | 100 | 85 | MKP1847615354Y* |
| | 20 | 30.0 | 45.0 | 57.5 | 52.5 | 20.3 | 25 | 500 | 15 | 16 | 12 | 10 | 100 | 85 | MKP1847620354Y* |
| | 22 | 35.0 | 50.0 | 57.5 | 52.5 | 20.3 | 25 | 550 | 17 | 18 | 12 | 10 | 100 | 85 | MKP1847622354Y* |
| | 25 | 35.0 | 50.0 | 57.5 | 52.5 | 20.3 | 25 | 625 | 18 | 19 | 12 | 10 | 100 | 85 | MKP1847625354Y* |
| 30 | 45.0 | 45.0 | 57.5 | 52.5 | 20.3 | 25 | 750 | - | 22 | - | 10 | - | 85 | MKP1847630354Y5 | |



| ELECTRICAL DATA AND ORDERING CODE | | | | | | | | | | | | | | | |
|-----------------------------------|------------------|---|------|------|------------|-------------|---------------------|--------------------------|-----------------------------|-----------|---|-----------|--|-----------------|-------------------|
| U _{NAC} (V) | CAP. (1) (μF) | DIMENSION (2) (mm) | | | P1 (mm) | P2 (mm) | dV/dt (3) (V/μs) | I _{PEAK} (A) | I _{RMS} (4) (A) | | tan δ 1 kHz (< 10 ⁻⁴) (5) | | tan δ 10 kHz (< 10 ⁻⁴) (5) | | ORDERING CODE (6) |
| | | w | h | l | | | | | 2 PINS | 4 PINS | 2 PINS | 4 PINS | 2 PINS | 4 PINS | |
| | | U _{NDC} = 1000 V; U _{OPAC} AT 85 °C = 440 V _{RMS} ; U _{OPAC} AT 105 °C = 300 V _{RMS} | | | | | | | | | | | | | |
| 440 | 1.0 | 15.7 | 28.5 | 41.5 | 37.5 | 10.2 | 80 | 80 | 5 | - | 7 | - | 25 | - | MKP1847510444P* |
| | 1.5 | 18.5 | 35.5 | 43.0 | 37.5 | 10.2 | 80 | 120 | 7 | - | 7 | - | 25 | - | MKP1847515444P* |
| | 2.0 | 21.5 | 38.5 | 43.0 | 37.5 | 10.2 | 80 | 160 | 9 | 10 | 7 | 6 | 25 | 20 | MKP1847520444P* |
| | 2.2 | 21.5 | 38.5 | 43.0 | 37.5 | 10.2 | 80 | 176 | 9 | 10 | 7 | 6 | 25 | 20 | MKP1847522444P* |
| | 3 | 24.0 | 44.0 | 42.0 | 37.5 | 10.2 / 20.3 | 80 | 240 | 12 | 13 | 7 | 6 | 25 | 20 | MKP1847530444P* |
| | 3.3 | 24.0 | 44.0 | 42.0 | 37.5 | 10.2 / 20.3 | 80 | 264 | 12 | 13 | 7 | 6 | 25 | 20 | MKP1847533444P* |
| | 4 | 30.0 | 45.0 | 42.0 | 37.5 | 10.2 / 20.3 | 80 | 320 | 14 | 15 | 7 | 6 | 25 | 20 | MKP1847540444P* |
| | 5 | 30.0 | 57.0 | 42.0 | 37.5 | 20.3 | 80 | 400 | 17 | 18 | 7 | 6 | 25 | 20 | MKP1847550444P* |
| | 5 | 25.0 | 45.0 | 57.5 | 52.5 | 10.2 | 35 | 175 | 13 | 14 | 12 | 10 | 50 | 40 | MKP1847550444Y* |
| | 6 | 30.0 | 45.0 | 57.5 | 52.5 | 20.3 | 35 | 210 | 14 | 15 | 12 | 10 | 50 | 40 | MKP1847560444Y* |
| | 7 | 35.0 | 50.0 | 57.5 | 52.5 | 20.3 | 35 | 245 | 17 | 18 | 12 | 10 | 50 | 40 | MKP1847570444Y* |
| | 8 | 35.0 | 50.0 | 57.5 | 52.5 | 20.3 | 35 | 280 | 18 | 19 | 12 | 10 | 50 | 40 | MKP1847580444Y* |
| 9 | 35.0 | 50.0 | 57.5 | 52.5 | 20.3 | 35 | 315 | 19 | 20 | 12 | 10 | 50 | 40 | MKP1847590444Y* | |
| 10 | 35.0 | 50.0 | 57.5 | 52.5 | 20.3 | 35 | 350 | 20 | 21 | 12 | 10 | 50 | 40 | MKP1847610444Y* | |
| 12 | 45.0 | 45.0 | 57.5 | 52.5 | 20.3 | 35 | 420 | - | 24 | - | 10 | - | 40 | MKP1847612444Y5 | |

Notes

- (1) Intermediate capacitance values available on request
- (2) Standard dimension. For tolerances see chapter "Space Requirements for Printed-Circuit Board Applications and Dimension Tolerances"
- (3) Rated voltage pulse slope (dU/dt) R at voltage U_{NDC}
- (4) Maximum RMS current at 10 kHz, +85 °C, capacitance tolerance specified
- (5) The ESR (Equivalent Series Resistance) can be calculated as tan δ (f)/(2 x π x f x C)
- (6) Change the * symbol with special code for the terminals

| PACKAGING INFORMATION | | | | | |
|-------------------------|------------------|-----------------|-------------------|-------------|------------------|
| U _{NAC} (V) | CAP. (1) (μF) | Ø dt | ORDERING CODE (2) | MASS (g) | SPQ (3) (pcs) |
| 230 | 1 | 0.8 | MKP1847510234K2 | 6 | 160 |
| | 2 | 0.8 | MKP1847520234K2 | 9 | 130 |
| | 3 | 0.8 | MKP1847530234K2 | 11 | 115 |
| | 4 | 0.8 | MKP1847540234K2 | 12 | 100 |
| | 5 | 0.8 | MKP1847550234K2 | 17 | 80 |
| | 6 | 0.8 | MKP1847560234K2 | 16 | 80 |
| | 7 | 0.8 | MKP1847570234K2 | 15 | 80 |
| | 8 | 0.8 | MKP1847580234K2 | 22 | 65 |
| | 9 | 0.8 | MKP1847590234K2 | 21 | 65 |
| | 10 | 0.8 | MKP1847610234K2 | 21 | 70 |
| | 10 | 1.0 | MKP1847610234P* | 32 | 105 |
| | 12 | 1.0 | MKP1847612234P* | 30 | 105 |
| | 15 | 1.0 | MKP1847615234P* | 37 | 91 |
| | 20 | 1.0 | MKP1847620234P* | 48 | 77 |
| | 22 | 1.0 | MKP1847622234P* | 45 | 77 |
| | 25 | 1.0 | MKP1847625234P* | 62 | 63 |
| | 30 | 1.0 | MKP1847630234P* | 56 | 63 |
| | 30 | 1.2 | MKP1847630234Y* | 69 | 55 |
| | 35 | 1.2 | MKP1847635234Y* | 65 | 55 |
| | 40 | 1.2 | MKP1847640234Y* | 91 | 45 |
| 45 | 1.2 | MKP1847645234Y* | 86 | 45 | |
| 50 | 1.2 | MKP1847650234Y* | 107 | 40 | |
| 55 | 1.2 | MKP1847655234Y* | 101 | 40 | |
| 60 | 1.2 | MKP1847660234Y* | 96 | 40 | |
| 65 | 1.2 | MKP1847665234Y5 | 121 | 30 | |
| 70 | 1.2 | MKP1847670235Y5 | 120 | 30 | |



| PACKAGING INFORMATION | | | | | |
|-------------------------|-----------------------------|-----------------|------------------------------|-------------|-----------------------------|
| U _{NAC} (V) | CAP. ⁽¹⁾ (µF) | Ø dt | ORDERING CODE ⁽²⁾ | MASS (g) | SPQ ⁽³⁾ (pcs) |
| 250 | 1 | 0.8 | MKP1847510254K2 | 6 | 160 |
| | 2 | 0.8 | MKP1847520254K2 | 9 | 130 |
| | 3 | 0.8 | MKP1847530254K2 | 10 | 115 |
| | 4 | 0.8 | MKP1847540254K2 | 12 | 100 |
| | 5 | 0.8 | MKP1847550254K2 | 16 | 80 |
| | 6 | 0.8 | MKP1847560254K2 | 15 | 80 |
| | 7 | 0.8 | MKP1847570254K2 | 22 | 65 |
| | 8 | 0.8 | MKP1847580254K2 | 21 | 65 |
| | 9 | 0.8 | MKP1847590254K2 | 20 | 70 |
| | 5 | 1.0 | MKP1847550254P* | 36 | 105 |
| | 6 | 1.0 | MKP1847560254P* | 35 | 105 |
| | 7 | 1.0 | MKP1847570254P* | 34 | 105 |
| | 8 | 1.0 | MKP1847580254P* | 32 | 105 |
| | 9 | 1.0 | MKP1847590254P* | 31 | 105 |
| | 10 | 1.0 | MKP1847610254P* | 30 | 105 |
| | 12 | 1.0 | MKP1847612254P* | 27 | 105 |
| | 15 | 1.0 | MKP1847615254P* | 34 | 91 |
| | 20 | 1.0 | MKP1847620254P* | 63 | 63 |
| | 22 | 1.0 | MKP1847622254P* | 61 | 63 |
| | 25 | 1.0 | MKP1847625254P* | 57 | 63 |
| | 15 | 1.2 | MKP1847615254Y* | 83 | 55 |
| | 20 | 1.2 | MKP1847620254Y* | 77 | 55 |
| | 22 | 1.2 | MKP1847622254Y* | 75 | 55 |
| | 25 | 1.2 | MKP1847625254Y* | 71 | 55 |
| | 30 | 1.2 | MKP1847630254Y* | 97 | 45 |
| | 35 | 1.2 | MKP1847635254Y* | 91 | 45 |
| | 40 | 1.2 | MKP1847640254Y* | 111 | 40 |
| | 45 | 1.2 | MKP1847645254Y* | 105 | 40 |
| 50 | 1.2 | MKP1847650254Y* | 98 | 40 | |
| 55 | 1.2 | MKP1847655254Y5 | 123 | 30 | |
| 60 | 1.2 | MKP1847660255Y5 | 120 | 30 | |
| 275 | 1 | 0.8 | MKP1847510274K2 | 6 | 160 |
| | 2 | 0.8 | MKP1847520274K2 | 11 | 115 |
| | 3 | 0.8 | MKP1847530274K2 | 12 | 100 |
| | 4 | 0.8 | MKP1847540274K2 | 16 | 80 |
| | 5 | 0.8 | MKP1847550274K2 | 22 | 65 |
| | 6 | 0.8 | MKP1847560274K2 | 21 | 65 |
| | 7 | 0.8 | MKP1847570274K2 | 20 | 70 |
| | 5 | 1.0 | MKP1847550274P* | 34 | 105 |
| | 6 | 1.0 | MKP1847560274P* | 33 | 105 |
| | 7 | 1.0 | MKP1847570274P* | 31 | 105 |
| | 8 | 1.0 | MKP1847580274P* | 30 | 105 |
| | 9 | 1.0 | MKP1847590274P* | 28 | 105 |
| | 10 | 1.0 | MKP1847610274P* | 37 | 91 |
| | 12 | 1.0 | MKP1847612274P* | 34 | 91 |
| | 15 | 1.0 | MKP1847615274P* | 45 | 77 |
| | 20 | 1.0 | MKP1847620274P* | 56 | 63 |
| | 15 | 1.2 | MKP1847615274Y* | 78 | 55 |
| | 20 | 1.2 | MKP1847620274Y* | 70 | 55 |
| | 22 | 1.2 | MKP1847622274Y* | 67 | 55 |
| | 25 | 1.2 | MKP1847625274Y* | 95 | 45 |
| | 30 | 1.2 | MKP1847630274Y* | 86 | 45 |
| | 35 | 1.2 | MKP1847635274Y* | 106 | 40 |
| | 40 | 1.2 | MKP1847640274Y* | 96 | 40 |
| 45 | 1.2 | MKP1847645274Y5 | 186 | 30 | |
| 50 | 1.2 | MKP1847650275Y5 | 186 | 30 | |



| PACKAGING INFORMATION | | | | | |
|-------------------------|-----------------------------|-----------------|------------------------------|-----------------|-----------------------------|
| U _{NAC} (V) | CAP. ⁽¹⁾ (µF) | Ø dt | ORDERING CODE ⁽²⁾ | MASS (g) | SPQ ⁽³⁾ (pcs) |
| 310 | 1.0 | 0.8 | MKP1847510314K2 | 9 | 130 |
| | 2.0 | 0.8 | MKP1847520314K2 | 12 | 100 |
| | 3.0 | 0.8 | MKP1847530314K2 | 16 | 80 |
| | 4.0 | 0.8 | MKP1847540314K2 | 22 | 65 |
| | 5.0 | 0.8 | MKP1847550314K2 | 20 | 65 |
| | 5.0 | 1.0 | MKP1847550314P* | 32 | 105 |
| | 6.0 | 1.0 | MKP1847560314P* | 30 | 105 |
| | 7.0 | 1.0 | MKP1847570314P* | 28 | 105 |
| | 8.0 | 1.0 | MKP1847580314P* | 37 | 91 |
| | 9.0 | 1.0 | MKP1847590314P* | 35 | 91 |
| | 10 | 1.0 | MKP1847610315P* | 34 | 91 |
| | 12 | 1.0 | MKP1847612314P* | 44 | 77 |
| | 15 | 1.0 | MKP1847615314P* | 58 | 63 |
| | 10 | 1.2 | MKP1847610314Y* | 81 | 55 |
| | 12 | 1.2 | MKP1847612314Y* | 77 | 55 |
| | 15 | 1.2 | MKP1847615314Y* | 71 | 55 |
| | 20 | 1.2 | MKP1847620314Y* | 93 | 45 |
| | 22 | 1.2 | MKP1847622314Y* | 117 | 40 |
| | 25 | 1.2 | MKP1847625314Y* | 111 | 40 |
| 30 | 1.2 | MKP1847630314Y5 | 187 | 30 | |
| 35 | 1.2 | MKP1847635314Y5 | 187 | 30 | |
| 350 | 1.0 | 0.8 | MKP1847510354K2 | 9 | 130 |
| | 2.0 | 0.8 | MKP1847520354K2 | 12 | 100 |
| | 3.0 | 0.8 | MKP1847530354K2 | 15 | 80 |
| | 4.0 | 0.8 | MKP1847540354K2 | 21 | 65 |
| | 5.0 | 1.0 | MKP1847550354P* | 30 | 105 |
| | 6.0 | 1.0 | MKP1847560354P* | 28 | 105 |
| | 7.0 | 1.0 | MKP1847570354P* | 37 | 91 |
| | 8.0 | 1.0 | MKP1847580354P* | 34 | 91 |
| | 9.0 | 1.0 | MKP1847590354P* | 48 | 77 |
| | 10 | 1.0 | MKP1847610354P* | 45 | 77 |
| | 12 | 1.0 | MKP1847612354P* | 60 | 63 |
| | 10 | 1.2 | MKP1847610354Y* | 78 | 55 |
| | 12 | 1.2 | MKP1847612354Y* | 74 | 55 |
| | 15 | 1.2 | MKP1847615354Y* | 67 | 55 |
| | 20 | 1.2 | MKP1847620354Y* | 87 | 45 |
| | 22 | 1.2 | MKP1847622354Y* | 111 | 40 |
| | 25 | 1.2 | MKP1847625354Y* | 102 | 40 |
| | 30 | 1.2 | MKP1847630354Y5 | 187 | 30 |
| | 440 | 1.0 | 1.0 | MKP1847510444P* | 27 |
| 1.5 | | 1.0 | MKP1847515444P* | 42 | 105 |
| 2.0 | | 1.0 | MKP1847520444P* | 52 | 91 |
| 2.2 | | 1.0 | MKP1847522444P* | 52 | 91 |
| 3.0 | | 1.0 | MKP1847530444P* | 61 | 77 |
| 3.3 | | 1.0 | MKP1847533444P* | 58 | 77 |
| 4.0 | | 1.0 | MKP1847540444P* | 74 | 63 |
| 5.0 | | 1.0 | MKP1847550444P* | 83 | 63 |
| 5.0 | | 1.2 | MKP1847550444Y* | 100 | 55 |
| 6.0 | | 1.2 | MKP1847560444Y* | 135 | 45 |
| 7.0 | | 1.2 | MKP1847570444Y* | 155 | 40 |
| 8.0 | | 1.2 | MKP1847580444Y* | 152 | 40 |
| 9.0 | | 1.2 | MKP1847590444Y* | 145 | 40 |
| 10 | | 1.2 | MKP1847610445Y* | 140 | 40 |
| 12 | 1.2 | MKP1847612445Y5 | 180 | 30 | |

Notes

- (1) Intermediate capacitance values available on request
- (2) Change the * symbols with special code for terminals
- (3) SPQ = Standard Packing Quantity



CONSTRUCTION

Low inductive wound cell elements of metallized polypropylene film. Pattern film for pitch ≥ 37.5 mm and standard foil for pitch 27.5 mm, potted with resin in a flame retardant case.

Specific Method of Mounting to Withstand Vibration and Shock

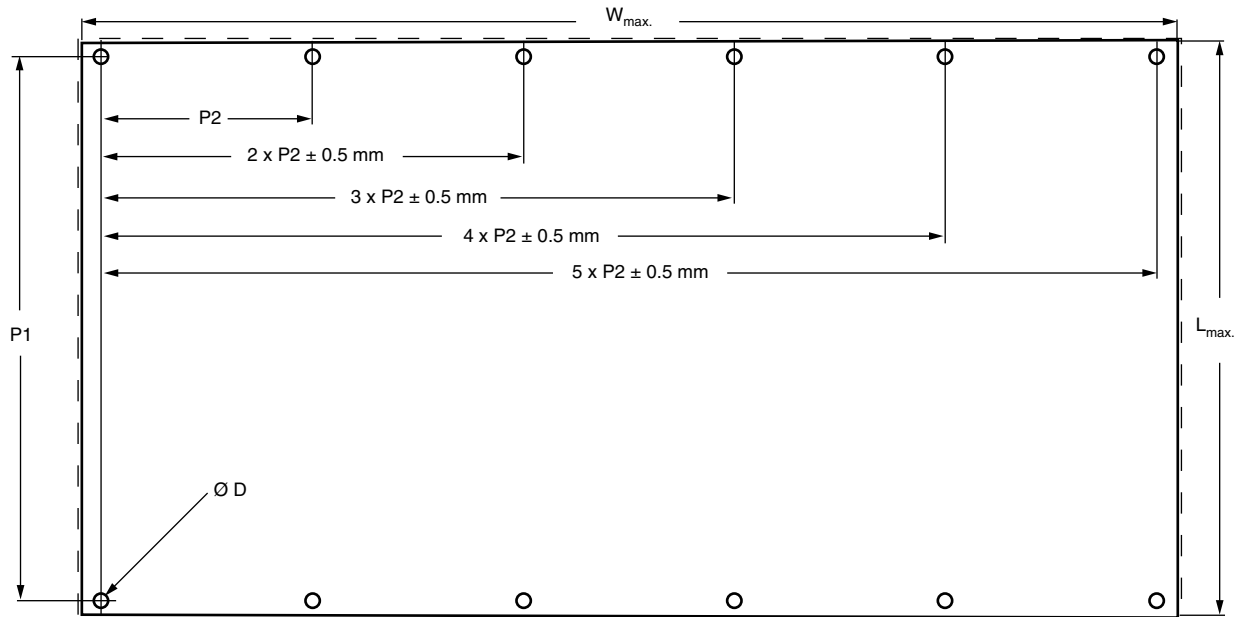
The capacitor unit is designed for mounting on a printed circuit board. In order to withstand vibration and shock tests, it must be insured that the stand-off pips are in good contact with the printed circuit board. The capacitors shall be mechanically fixed by the leads and the body clamped.

Space Requirements on Printed-Circuit Board and Dimension Tolerances

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

$L_{max.} = l + \Delta l$

$W_{max.} = w + \Delta w$



| P1 (mm) | ΔL (mm) | ΔW (mm) | $\varnothing D$ (mm) | Δh (mm) |
|---------|-----------------|-----------------|----------------------|-----------------|
| 27.5 | 2 | 1.6 | 1.2 | 0.2 |
| 37.5 | 3 | 2.0 | 1.5 | 0.5 |
| 52.5 | 4 | 2.4 | 1.7 | 0.5 |

For the maximum height $h_{max.}$, a Δh of 0.5 mm must be taken in account on the height dimension h .

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 $h_{min.} = h - \Delta h$

For products with pitch = 27.5 mm, $\Delta l = 1.0$ mm and $\Delta w = \Delta h = 0.5$ mm

For products with pitch = 37.5 mm, $\Delta l = 1.0$ mm and $\Delta w = \Delta h = 1.0$ mm

For products with pitch = 52.5 mm, $\Delta l = 1.5$ mm and $\Delta w = \Delta h = 1.0$ mm

SOLDERING CONDITIONS

For general soldering conditions and wave soldering profile, we refer to the document: "Characteristics and Definitions used for Film Capacitors": www.vishay.com/doc?26033

Storage Temperature

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

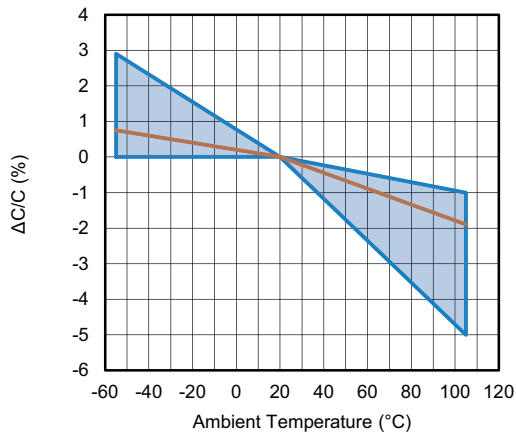
Ratings and Characteristics Reference Conditions

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

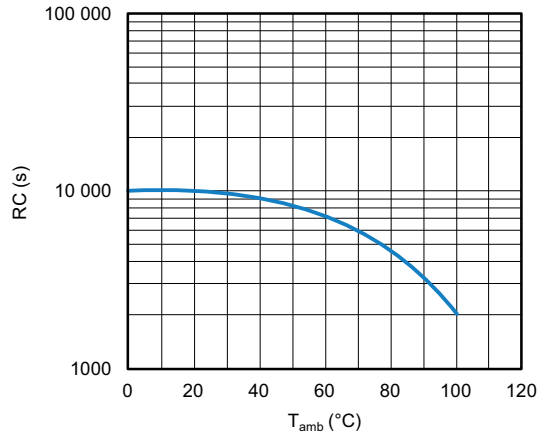
For reference testing, a conditioning period shall be applied over 96 h ± 4 h by heating the products in a circulating air oven at the rated temperature and a relative humidity not exceeding 20 %.



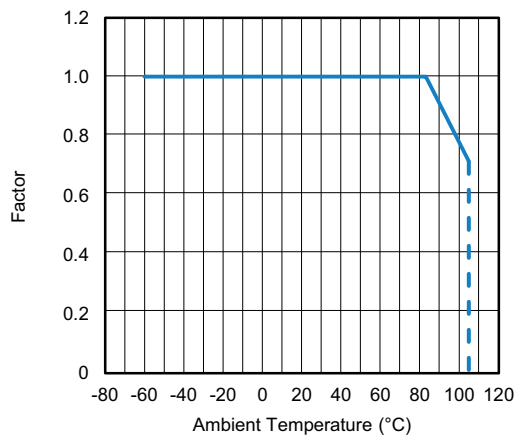
CHARACTERISTICS



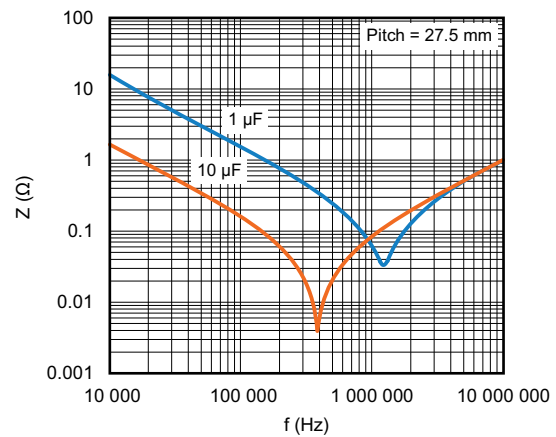
Capacitance as a function of ambient temperature (typical curve)



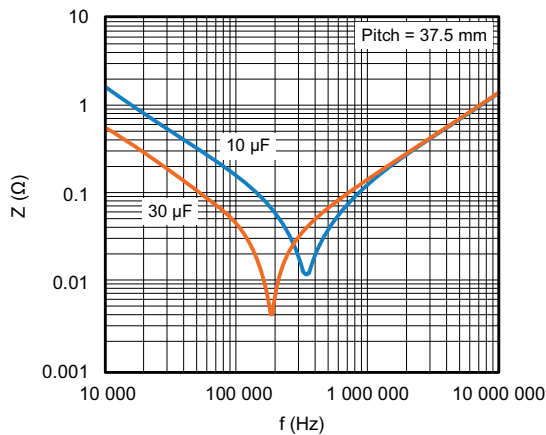
Insulation resistance as a function of ambient temperature (typical curve)



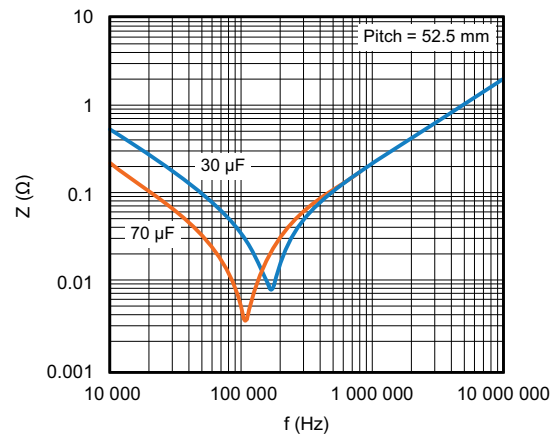
RMS voltage in function of temperature



Impedance vs. frequency (typical curve)



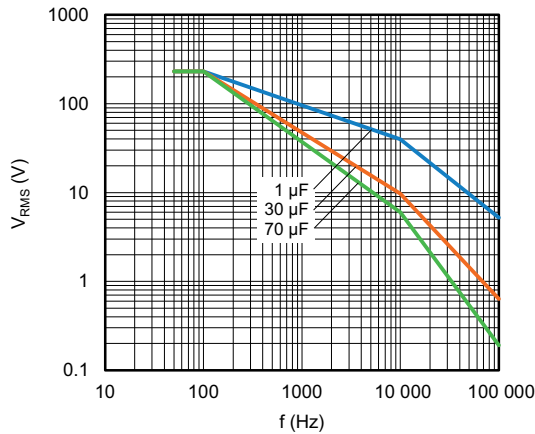
Impedance vs. frequency (typical curve)



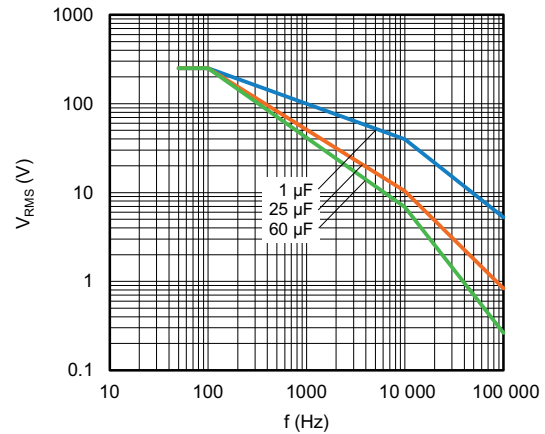
Impedance vs. frequency (typical curve)



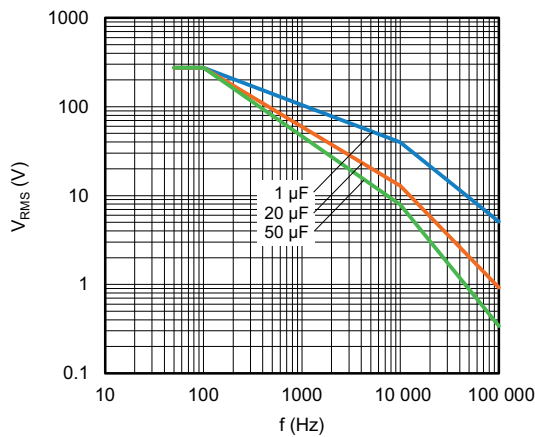
CHARACTERISTICS



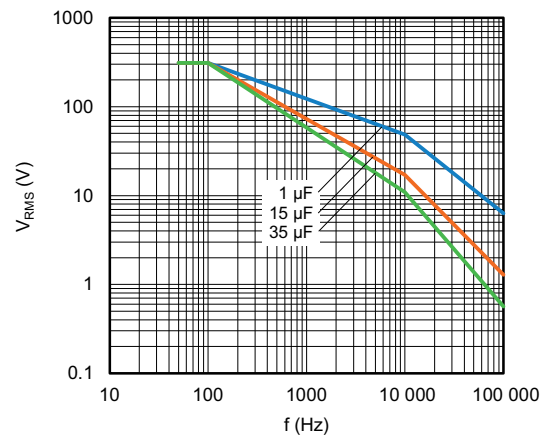
Maximum RMS voltage as function of frequency
 $T_{amb} \leq 85\text{ }^{\circ}\text{C}$; $U_n = 230\text{ V}_{AC}$



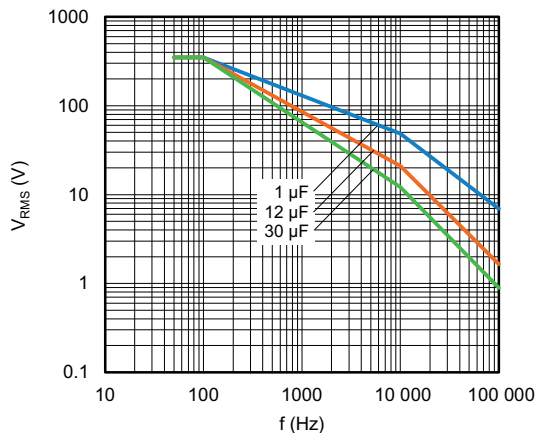
Maximum RMS voltage as function of frequency
 $T_{amb} \leq 85\text{ }^{\circ}\text{C}$; $U_n = 250\text{ V}_{AC}$



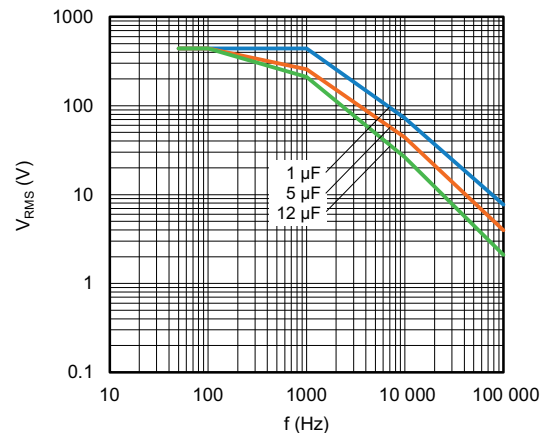
Maximum RMS voltage as function of frequency
 $T_{amb} \leq 85\text{ }^{\circ}\text{C}$; $U_n = 275\text{ V}_{AC}$



Maximum RMS voltage as function of frequency
 $T_{amb} \leq 85\text{ }^{\circ}\text{C}$; $U_n = 310\text{ V}_{AC}$



Maximum RMS voltage as function of frequency
 $T_{amb} \leq 85\text{ }^{\circ}\text{C}$; $U_n = 350\text{ V}_{AC}$



Maximum RMS voltage as function of frequency
 $T_{amb} \leq 85\text{ }^{\circ}\text{C}$; $U_n = 440\text{ V}_{AC}$



| HEAT CONDUCTIVITY | | | | | |
|-------------------|------|------|---------------------------|---------------|---------------|
| DIMENSIONS (mm) | | | HEAT CONDUCTIVITY (mW/°C) | | |
| w | h | l | PITCH 27.5 mm | PITCH 37.5 mm | PITCH 52.5 mm |
| 9.0 | 19.0 | 32.0 | 16 | - | - |
| 11.0 | 21.0 | 32.0 | 19 | - | - |
| 13.0 | 23.0 | 32.0 | 22 | - | - |
| 15.0 | 25.0 | 32.0 | 25 | - | - |
| 18.0 | 28.0 | 32.0 | 30 | - | - |
| 21.0 | 31.0 | 32.0 | 35 | - | - |
| 18.5 | 35.5 | 43.0 | - | 45 | - |
| 21.5 | 38.5 | 42.0 | - | 51 | - |
| 24.0 | 44.0 | 42.0 | - | 59 | - |
| 30.0 | 45.0 | 42.0 | - | 68 | - |
| 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 | - | - | 108 |

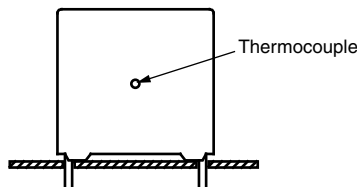
Power Dissipation and Maximum Component Temperature Rise

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 $\Delta T = P/G$:

- ΔT = component temperature rise (°C) with a maximum of 15 °C
- P = 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).

The temperature rise is given by $\Delta T = T_C - T_{amb}$.

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 peak voltage (U_{P+}) shall not be greater than $\sqrt{2} \times U_{RMS}$
- The peak-to-peak ripple voltage (U_{PP}) shall not be greater than $2 \times \sqrt{2} \times U_{RMS}$ (for U_{RMS} consult above graph: Maximum RMS Voltage as Function of Frequency)
- The voltage pulse slope (dU/dt) shall not exceed the rated 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

- The maximum component surface temperature must be lower than 105 °C and maximum temperature rise between case and free air ambient shall be lower than 15 °C.
- For continuous operation, 24 hours per day for several years, please refer to application note: www.vishay.com/doc?28245



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 DC voltage test between terminals | 1.5 x U _{NDC} at T _{amb} Duration 10 s | No visible damage or puncture No flashover | | |
| 5.6.1 Voltage test between terminals and case | 2200 V _{AC} (50 Hz), 60 s | No visible damage or puncture No flashover | | |
| 5.7 Insulation resistance | 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} : duration 10 s ± 1 s | | | |
| | Wire diameter | | Section | Load |
| | d ≤ 0.80 mm | | S ≤ 0.5 mm ² | 10 N (± 10 %) |
| | d ≤ 1.25 mm | | S ≤ 1.2 mm ² | 20 N (± 10 %) |
| 5.14.1.6 Resistance to soldering heat IEC 60068-2-20 | Bending U _b method 1: 4 x 90 °, duration 2 s to 3 s/bend | | | |
| | Wire diameter | | Section modules | Load |
| | d ≤ 0.80 mm | | Z _x ≤ 0.050 mm ³ | 5 N (± 10 %) |
| | d ≤ 1.25 mm | | Z _x ≤ 0.019 mm ³ | 10 N (± 10 %) |
| 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 | | | |
| 5.14.3.1 Vibration IEC 60068-2-6 | f = 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 damage | | |



| SUB-CLAUSE NUMBER AND TEST | CONDITIONS | PERFORMANCE REQUIREMENTS |
|---|---|---|
| TYPE TESTS | | |
| 5.14.3.2 Shock or impact IEC 60068-2-6 | Pulse shape: half sine Acceleration: 490 m/s ² Duration of pulse: 11 ms Visual examination | No visible damage |
| 5.14.4 Final measurements | Capacitance tan δ | $ \Delta C/C \leq 0.5 \%$ Increase of tan δ ≤ 0.0050 Compared to values measured in 5.14.0 |
| 5.5.3.1 Initial measurements | Capacitance at 1 kHz tan δ at 10 kHz R insulation | |
| 5.5.3.2 DC voltage test between terminals | 1.5 x U _{NDC} at T _{amb} Duration 10 s | |
| 5.5.3.3 Final measurements | Capacitance tan δ R insulation | $ \Delta C/C \leq 0.5 \%$ Increase of tan δ ≤ 0.0050 R insulation ≥ 50 % of specified values |
| 5.9.1 Initial measurements | Capacitance at 1 kHz tan δ at 10 kHz | |
| 5.9.2 Surge discharge test | 1.1 x U _{NDC} Number of discharges: 5 Time lapse: every 2 min (10 min total) | |
| 5.9.3 DC voltage test between terminals | Within 5 min after the surge discharge test 1.5 x U _{NDC} at T _{amb} , duration 10 s | |
| 5.9.4 Final measurements | Capacitance tan δ at 10 kHz | $ \Delta C/C \leq 1.0 \%$ tan δ ≤ 1.2 x initial tan δ + 0.0001 Compared to values measured in 5.9.1 |
| 5.11.1 Initial measurements | Capacitance at 1 kHz tan δ at 10 kHz | |
| 5.11.2 Self healing test | 1.5 x U _{NDC} , duration 10 s Increase the voltage at 100 V/s till 5 clearings occur or until voltage reach max. of 2.5 x U _{NDC} , for a duration of 10 s | |
| 5.11.3 Final measurements | Capacitance tan δ | $ \Delta C/C \leq 0.5 \%$ tan δ ≤ 1.2 x initial tan δ + 0.0001 Compared to values measured in 5.11.1 |
| 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 °C T _{min.} = -40 °C Transition time: 1 h, equivalent to 1 °C/min 5 cycles | |
| 5.13.2 Damp heat steady state acc. to IEC 60068-2-78 | Test Ca T = 40 °C ± 2 °C RH = 93 % ± 3 % Duration 56 days | |
| 5.5.3.2 DC voltage test between terminals | 1.5 x U _{NDC} at ambient temperature Duration 10 s | |
| 5.13.3 Final measurements | Visual examination Capacitance tan δ at 10 kHz | No puncturing or flashover Self healing punctures are permitted $ \Delta C/C \leq 2.0 \%$ Increase of tan δ ≤ 0.0150 Compared to values measured in 5.13.0 |



| SUB-CLAUSE NUMBER AND TEST | | CONDITIONS | PERFORMANCE REQUIREMENTS |
|----------------------------|---|--|---|
| TYPE TESTS | | | |
| 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 $T_{amb} \pm 5 \text{ }^\circ\text{C}$ $1.21 \times P_{max.} = (U^2/2) \times w_2 \times C \times \tan \delta_2 =$ $1.21 \times (I_{RMS}^2/w_2 \times C) \times \tan \delta_2$ with $w_2 = 2 \times \pi \times f_2$ for $I = I_{RMS}$. (see specific reference data) $f_2 = 10 \text{ kHz}$ Duration 48 h Measure the temperature every 1.5 h during the last 6 hours | Temperature rise < 1 °C |
| 5.10.2 | Final measurements | Capacitance tan δ at 10 kHz | $ \Delta C/C \leq 2.0 \%$ Increase of tan δ ≤ 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 |
| 5.15.0 | Initial measurements | Capacitance at 1 kHz tan δ at 10 kHz | |
| 5.15.1 | Endurance test between terminals | Sequence $1.25 \times U_{NAC}$ at $T_{max.} = 85 \text{ }^\circ\text{C}$ $1.25 \times U_{OPAC}$ at $105 \text{ }^\circ\text{C}$ at $T_{max.} = 105 \text{ }^\circ\text{C}$ Duration 500 h 1000 x discharge at $1.4 \times \hat{i}$ (maximum repetitive peak current in continuous operation) $1.25 \times U_{NAC}$ at $T_{max.} = 85 \text{ }^\circ\text{C}$ $1.25 \times U_{OPAC}$ at $105 \text{ }^\circ\text{C}$ at $T_{max.} = 105 \text{ }^\circ\text{C}$ Duration 500 h | |
| 5.15.2 | Final measurements | Capacitance tan δ | $ \Delta C/C \leq 3.0 \%$ Increase of tan δ ≤ 0.0150 Compared to values measured in 5.15.0 |
| 5.16.3.0A | Initial measurements | Capacitance at 1 kHz | |
| 5.16.3.1.A | Destruction test sequence for <u>non-segment film</u> | The capacitors must be put in an oven at $T_{max.} = 85 \text{ }^\circ\text{C}$ product enveloped with cheese cloth | |
| | High DC voltage test | $3 \times U_{NDC}$ 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 = $1 \times U_{NAC}$, with minimum of 250 V_{AC} Duration 5 min Repeat destruction sequence 3 x | |
| 5.16.3.2.A | Final measurements | Visual examination | No puncturing, flashover or burning of the cheese cloth. Self-healing punctures are permitted |



| SUB-CLAUSE NUMBER AND TEST | CONDITIONS | PERFORMANCE REQUIREMENTS |
|---|--|---|
| TYPE TESTS | | |
| <p>5.16.3.0.B Initial measurements</p> <p>5.16.3.1.B Destruction test sequence for <u>segment film</u></p> <p>High DC voltage test (limited to 200 mA)</p> <p>High AC voltage test</p> <p>5.16.3.2.B Final measurements</p> | <p>Capacitance at 1 kHz</p> <p>The capacitors must be put in an oven at $T_{max.} = 105\text{ °C}$/2 h and cooled down Product enveloped with cheese cloth</p> <p>3 x U_{NDC} with minimum 2000 V_{DC} Duration 1 min</p> <p>Discharge the capacitor Duration 1 min</p> <p>AC_{RMS} voltage = 1 x U_{NAC} Duration 15 s</p> <p>The above sequence shall be repeated until the test sample capacitance loss 5 % of its initial measurement in 5.16.3.0.B</p> <p>Visual examination</p> | <p>DC power supply capable of obtaining the desired breakdown voltage</p> <p>No burning of the cheese cloth. The dielectric must withstand the test sequence conducted.</p> |



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