

# Metallized Polypropylene DC-Link Film Capacitor Automotive Grade



## FEATURES

- High performance DC filter
- Low ESR
- High peak current capabilities
- High RMS current capabilities
- AEC-Q200 qualified, revision D at  $T_{max.} = 85\text{ }^{\circ}\text{C}$
- Mounting: radial
- Material categorization:  
for definitions of compliance please see [www.vishay.com/doc?99912](http://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

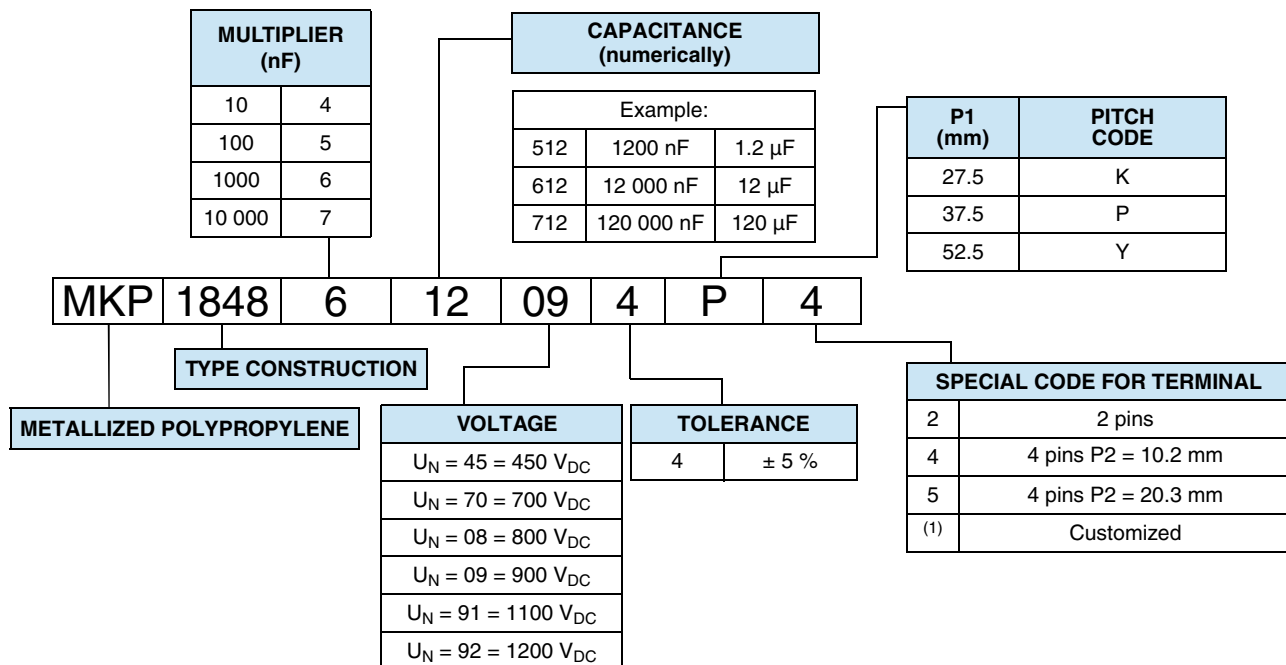
|                                                          |                                                                                                                                                                                          |
|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rated capacitance range                                  | 1 $\mu\text{F}$ to 400 $\mu\text{F}$                                                                                                                                                     |
| Capacitance tolerance                                    | 5 %                                                                                                                                                                                      |
| Rated voltage range, $U_{NDC}$                           | 450 V to 1200 V                                                                                                                                                                          |
| Climatic testing class                                   | 40 / 105 / 56                                                                                                                                                                            |
| Rated temperature                                        | 85 $^{\circ}\text{C}$                                                                                                                                                                    |
| Maximum permissible case temperature                     | 105 $^{\circ}\text{C}$ , 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 <sup>(1)</sup> | 1.5 $U_{NDC}$ for 10 s, cut off current 10 mA, rise time $\leq 1000\text{ V/s}$                                                                                                          |
| Insulation resistance                                    | RC between leads, after 1 min > 10 000 s<br>For $U_{NDC} \leq 500\text{ V}$ measuring voltage 100 V<br>For $U_{NDC} > 500\text{ V}$ measuring voltage 500 V                              |
| Life time expectancy                                     | Useful life time: > 100 000 h at $U_{NDC}$ and 70 $^{\circ}\text{C}$<br>FIT: < $10 \times 10^{-9}/\text{h}$ (10 per $10^9$ component h) at 0.5 x $U_{NDC}$ , 40 $^{\circ}\text{C}$       |
| Marking                                                  | C-value; tolerance; rated voltage; code for dielectric material;<br>code for manufacturing origin; manufacturer's type designation;<br>manufacturer's logo; year and week of manufacture |

## Notes

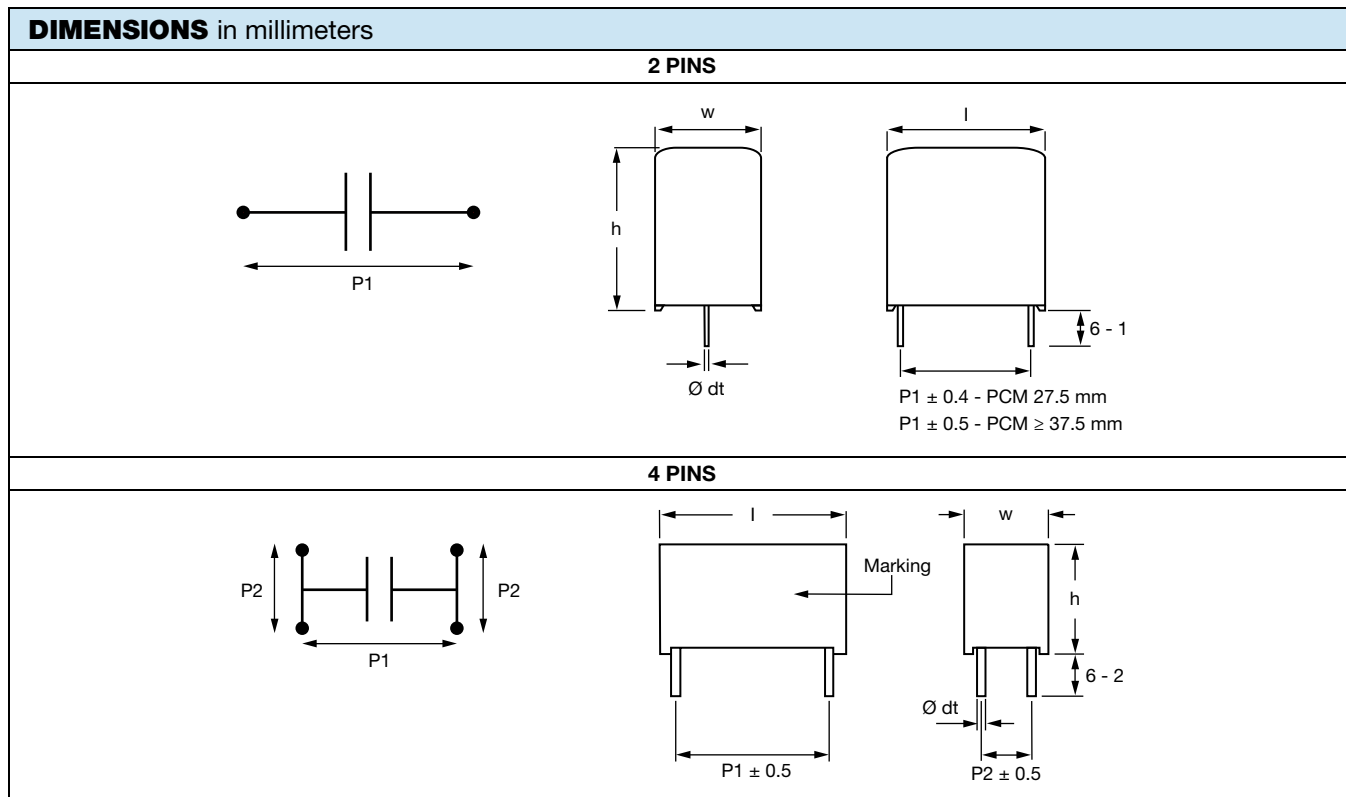
- For more detailed data and test requirements, contact [dc-film@vishay.com](mailto:dc-film@vishay.com)
  - For general information like characteristics and definitions used for film capacitors follow the link: [www.vishay.com/doc?28147](http://www.vishay.com/doc?28147)
- <sup>(1)</sup> See document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

## DC VOLTAGE RATINGS

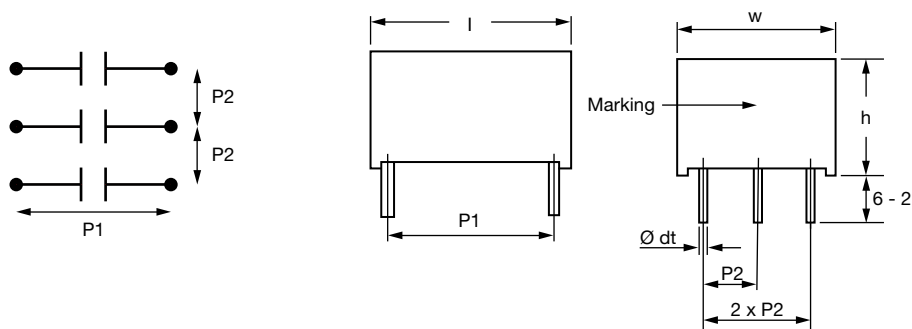
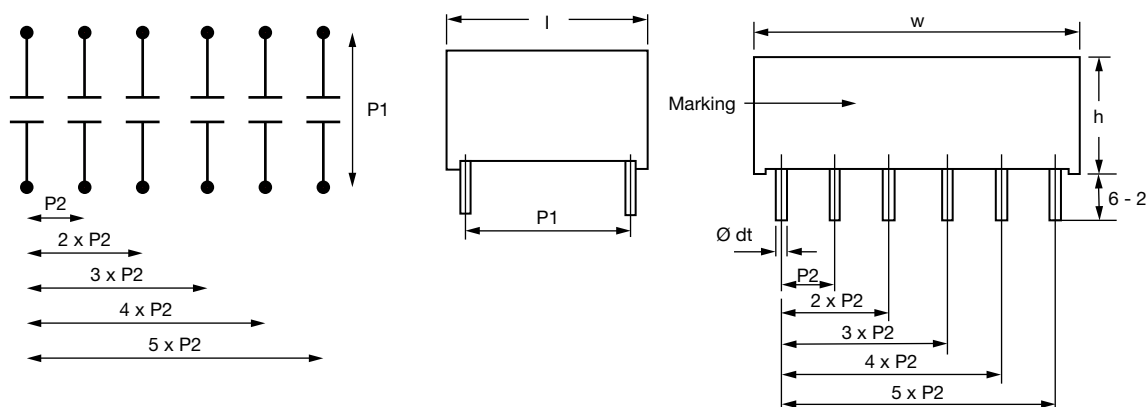
|                                      |       |       |       |        |        |        |
|--------------------------------------|-------|-------|-------|--------|--------|--------|
| $U_{NDC}$ at 85 $^{\circ}\text{C}$   | 450 V | 700 V | 800 V | 900 V  | 1100 V | 1200 V |
| $U_{OPDC}$ at 70 $^{\circ}\text{C}$  | 500 V | 800 V | 900 V | 1100 V | 1350 V | 1500 V |
| $U_{OPDC}$ at 105 $^{\circ}\text{C}$ | 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



**DIMENSIONS** in millimeters

**6 PINS <sup>(1)</sup>**

**12 PINS <sup>(1)</sup>**

**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  $\geq 37.5$  mm marking will be on front side only / 6 pins and 12 pins lateral side
- <sup>(1)</sup> 6 pins and 12 pins capacitors nominal capacitance is achieved by connecting the represented individual cells in parallel

**ELECTRICAL DATA AND ORDERING CODE**

| U <sub>NDC</sub><br>AT<br>85 °C<br>(V) | CAP. <sup>(8)</sup><br>(μF)                                             | DIMENSION <sup>(5)</sup><br>(mm) |      |      | P1<br>(mm) | P2<br>(mm) | dV/dt<br>(V/μs) | I <sub>PEAK</sub><br>(A) | I <sub>RMS</sub> <sup>(2)</sup><br>(A) |           | ESR <sup>(3)</sup><br>(mΩ) |           | tan δ<br>10 kHz<br>( $< 10^{-4}$ ) <sup>(4)</sup> |                 | ORDERING CODE <sup>(1)</sup> |
|----------------------------------------|-------------------------------------------------------------------------|----------------------------------|------|------|------------|------------|-----------------|--------------------------|----------------------------------------|-----------|----------------------------|-----------|---------------------------------------------------|-----------------|------------------------------|
|                                        |                                                                         | w                                | h    | l    |            |            |                 |                          | 2<br>PINS                              | 4<br>PINS | 2<br>PINS                  | 4<br>PINS | 2<br>PINS                                         | 4<br>PINS       |                              |
|                                        |                                                                         |                                  |      |      |            |            |                 |                          |                                        |           |                            |           |                                                   |                 |                              |
| 450                                    | U <sub>OPDC</sub> AT 70 °C = 500 V, U <sub>OPDC</sub> AT 105 °C = 300 V |                                  |      |      |            |            |                 |                          |                                        |           |                            |           |                                                   |                 |                              |
|                                        | 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 <sub>NDC</sub><br>AT<br>85 °C<br>(V) | CAP. <sup>(8)</sup><br>(μF)                                             | DIMENSION <sup>(5)</sup><br>(mm) |      |      | P1<br>(mm) | P2<br>(mm)  | dV/dt<br>(V/μs) | I <sub>PEAK</sub><br>(A) | I <sub>RMS</sub> <sup>(2)</sup><br>(A) |           | ESR <sup>(3)</sup><br>(mΩ) |           | tan δ<br>10 kHz<br>( $< 10^{-4}$ ) <sup>(4)</sup> |           | ORDERING CODE <sup>(1)</sup>   |
|----------------------------------------|-------------------------------------------------------------------------|----------------------------------|------|------|------------|-------------|-----------------|--------------------------|----------------------------------------|-----------|----------------------------|-----------|---------------------------------------------------|-----------|--------------------------------|
|                                        |                                                                         | w                                | h    | l    |            |             |                 |                          | 2<br>PINS                              | 4<br>PINS | 2<br>PINS                  | 4<br>PINS | 2<br>PINS                                         | 4<br>PINS |                                |
|                                        |                                                                         |                                  |      |      |            |             |                 |                          |                                        |           |                            |           |                                                   |           |                                |
| 450                                    | U <sub>OPDC</sub> AT 70 °C = 500 V, U <sub>OPDC</sub> AT 105 °C = 300 V |                                  |      |      |            |             |                 |                          |                                        |           |                            |           |                                                   |           |                                |
|                                        | 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 | 42.0 | 37.5       | 10.2        | 40              | 800                      | 11                                     | 12        | 7.0                        | 6.0       | 160                                               | 140       | MKP1848620454P*                |
|                                        | 22                                                                      | 21.5                             | 38.5 | 42.0 | 37.5       | 10.2        | 40              | 880                      | 11                                     | 11.5      | 7.5                        | 6.5       | 160                                               | 140       | MKP1848622454P*                |
|                                        | 25                                                                      | 21.5                             | 38.5 | 42.0 | 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                                                                     | 65.5                             | 65.0 | 57.5 | 52.5       | 20.3        | 20              | 2000                     | -                                      | 30.5      | -                          | 2.0       | -                                                 | 310       | MKP1848720454Y5 <sup>(6)</sup> |
|                                        | 400                                                                     | 130                              | 65.0 | 57.5 | 52.5       | 20.3        | 10              | 4000                     | -                                      | 50.5      | -                          | 1.5       | -                                                 | 380       | MKP1848740454Y5 <sup>(7)</sup> |
| 700                                    | U <sub>OPDC</sub> AT 70 °C = 800 V, U <sub>OPDC</sub> 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 | 42   | 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 <sub>NDC</sub><br>AT<br>85 °C<br>(V) | CAP. <sup>(8)</sup><br>(μF)                                             | DIMENSION <sup>(5)</sup><br>(mm) |      |      | P1<br>(mm) | P2<br>(mm)  | dV/dt<br>(V/μs) | I <sub>PEAK</sub><br>(A) | I <sub>RMS</sub> <sup>(2)</sup><br>(A) |           | ESR <sup>(3)</sup><br>(mΩ) |           | tan δ<br>10 kHz<br>( $< 10^{-4}$ ) <sup>(4)</sup> |           | ORDERING CODE <sup>(1)</sup>   |
|----------------------------------------|-------------------------------------------------------------------------|----------------------------------|------|------|------------|-------------|-----------------|--------------------------|----------------------------------------|-----------|----------------------------|-----------|---------------------------------------------------|-----------|--------------------------------|
|                                        |                                                                         | w                                | h    | l    |            |             |                 |                          | 2<br>PINS                              | 4<br>PINS | 2<br>PINS                  | 4<br>PINS | 2<br>PINS                                         | 4<br>PINS |                                |
|                                        |                                                                         |                                  |      |      |            |             |                 |                          |                                        |           |                            |           |                                                   |           |                                |
| 700                                    | U <sub>OPDC</sub> AT 70 °C = 800 V, U <sub>OPDC</sub> AT 105 °C = 500 V |                                  |      |      |            |             |                 |                          |                                        |           |                            |           |                                                   |           |                                |
|                                        | 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                                                                     | 65.5                             | 65   | 57.5 | 52.5       | 20.3        | 20              | 3200                     | -                                      | 30.5      | -                          | 2.5       | -                                                 | 280       | MKP1848716704Y5 <sup>(6)</sup> |
|                                        | 320                                                                     | 130                              | 65   | 57.5 | 52.5       | 20.3        | 20              | 6400                     | -                                      | 54        | -                          | 1.3       | -                                                 | 280       | MKP1848732704Y5 <sup>(7)</sup> |
| 800                                    | U <sub>OPDC</sub> AT 70 °C = 900 V, U <sub>OPDC</sub> 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 | 42   | 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                                                                     | 65.5                             | 65   | 57.5 | 52.5       | 20.3        | 10              | 1600                     | -                                      | 27        | -                          | 3.2       | -                                                 | 215       | MKP1848712084Y5 <sup>(6)</sup> |
|                                        | 240                                                                     | 130                              | 65   | 57.5 | 52.5       | 20.3        | 10              | 3200                     | -                                      | 48.5      | -                          | 1.6       | -                                                 | 215       | MKP1848724084Y5 <sup>(7)</sup> |



## ELECTRICAL DATA AND ORDERING CODE

| U <sub>NDC</sub><br>AT<br>85 °C<br>(V) | CAP. <sup>(8)</sup><br>(μF)                                              | DIMENSION <sup>(5)</sup><br>(mm) |      |      | P1<br>(mm) | P2<br>(mm)  | dV/dt<br>(V/μs) | I <sub>PEAK</sub><br>(A) | I <sub>RMS</sub> <sup>(2)</sup><br>(A) |           | ESR <sup>(3)</sup><br>(mΩ) |           | tan δ<br>10 kHz<br>( $< 10^{-4}$ ) <sup>(4)</sup> |                                | ORDERING CODE <sup>(1)</sup>   |
|----------------------------------------|--------------------------------------------------------------------------|----------------------------------|------|------|------------|-------------|-----------------|--------------------------|----------------------------------------|-----------|----------------------------|-----------|---------------------------------------------------|--------------------------------|--------------------------------|
|                                        |                                                                          | w                                | h    | l    |            |             |                 |                          | 2<br>PINS                              | 4<br>PINS | 2<br>PINS                  | 4<br>PINS | 2<br>PINS                                         | 4<br>PINS                      |                                |
|                                        |                                                                          |                                  |      |      |            |             |                 |                          |                                        |           |                            |           |                                                   |                                |                                |
| 900                                    | U <sub>OPDC</sub> AT 70 °C = 1100 V, U <sub>OPDC</sub> AT 105 °C = 650 V |                                  |      |      |            |             |                 |                          |                                        |           |                            |           |                                                   |                                |                                |
|                                        | 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 | 42   | 37.5       | 10.2        | 40              | 400                      | 8.5                                    | 9         | 12                         | 11        | 100                                               | 90                             | MKP1848610094P*                |
|                                        | 12                                                                       | 21.5                             | 38.5 | 42   | 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                                                                      | 65.5                             | 65   | 57.5 | 52.5       | 20.3        | 20              | 2000                     | -                                      | 26.5      | -                          | 3.3       | -                                                 | 205                            | MKP1848710094Y5 <sup>(6)</sup> |
| 200                                    | 130                                                                      | 65                               | 57.5 | 52.5 | 20.3       | 20          | 4000            | -                        | 48.5                                   | -         | 1.6                        | -         | 205                                               | MKP1848720094Y5 <sup>(7)</sup> |                                |
| 1100                                   | U <sub>OPDC</sub> AT 70 °C = 1350 V, U <sub>OPDC</sub> 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 | 42   | 37.5       | 10.2        | 45              | 315                      | 8                                      | 8.5       | 13                         | 11.5      | 90                                                | 80                             | MKP1848570914P*                |
|                                        | 8                                                                        | 21.5                             | 38.5 | 42   | 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 <sub>NDC</sub><br>AT<br>85 °C<br>(V) | CAP. <sup>(8)</sup><br>(μF)                                              | DIMENSION <sup>(5)</sup><br>(mm) |      |      | P1<br>(mm) | P2<br>(mm)  | dV/dt<br>(V/μs) | I <sub>PEAK</sub><br>(A) | I <sub>RMS</sub> <sup>(2)</sup><br>(A) |           | ESR <sup>(3)</sup><br>(mΩ) |           | tan δ<br>10 kHz<br>( $< 10^{-4}$ ) <sup>(4)</sup> |                                | ORDERING CODE <sup>(1)</sup>   |
|----------------------------------------|--------------------------------------------------------------------------|----------------------------------|------|------|------------|-------------|-----------------|--------------------------|----------------------------------------|-----------|----------------------------|-----------|---------------------------------------------------|--------------------------------|--------------------------------|
|                                        |                                                                          | w                                | h    | l    |            |             |                 |                          | 2<br>PINS                              | 4<br>PINS | 2<br>PINS                  | 4<br>PINS | 2<br>PINS                                         | 4<br>PINS                      |                                |
|                                        |                                                                          |                                  |      |      |            |             |                 |                          |                                        |           |                            |           |                                                   |                                |                                |
| 1100                                   | U <sub>OPDC</sub> AT 70 °C = 1350 V, U <sub>OPDC</sub> AT 105 °C = 800 V |                                  |      |      |            |             |                 |                          |                                        |           |                            |           |                                                   |                                |                                |
|                                        | 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                                                                       | 65.5                             | 65   | 57.5 | 52.5       | 20.3        | 23              | 1380                     | -                                      | 40        | -                          | 2.5       | -                                                 | 180                            | MKP1848660914Y5 <sup>(6)</sup> |
|                                        | 70                                                                       | 65.5                             | 65   | 57.5 | 52.5       | 20.3        | 23              | 1610                     | -                                      | 34.5      | -                          | 2         | -                                                 | 180                            | MKP1848670914Y5 <sup>(6)</sup> |
|                                        | 120                                                                      | 130                              | 65   | 57.5 | 52.5       | 20.3        | 23              | 2760                     | -                                      | 39.5      | -                          | 2.4       | -                                                 | 180                            | MKP1848712914Y5 <sup>(7)</sup> |
| 140                                    | 130                                                                      | 65                               | 57.5 | 52.5 | 20.3       | 23          | 3220            | -                        | 43.5                                   | -         | 2                          | -         | 180                                               | MKP1848714914Y5 <sup>(7)</sup> |                                |
| 1200                                   | U <sub>OPDC</sub> AT 70 °C = 1500 V, U <sub>OPDC</sub> 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 | 42   | 37.5       | 10.2        | 48              | 336                      | 8.5                                    | 9         | 12                         | 11        | 80                                                | 70                             | MKP1848570924P*                |
|                                        | 8                                                                        | 21.5                             | 38.5 | 42   | 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                                                                       | 65.5                             | 65   | 57.5 | 52.5       | 20.3        | 24              | 1440                     | -                                      | 23        | -                          | 4.5       | -                                                 | 170                            | MKP1848660924Y5 <sup>(6)</sup> |
| 120                                    | 130                                                                      | 65                               | 57.5 | 52.5 | 20.3       | 24          | 2280            | -                        | 40.5                                   | -         | 2.3                        | -         | 170                                               | MKP1848712924Y5 <sup>(7)</sup> |                                |

## 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

| $U_{NDC}$<br>AT 85 °C<br>(V) | HEIGHT<br>(mm)                                            | CAP. <sup>(5)</sup><br>( $\mu$ F) | $\varnothing$ dt | ORDERING CODE <sup>(1)</sup>   | MASS<br>(g) | SPQ <sup>(2)</sup><br>(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 <sup>(3)</sup> | 266         | 20                          |
|                              | 65                                                        | 400                               | 1.2              | MKP1848740454Y5 <sup>(4)</sup> | 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

| $U_{NDC}$<br>AT 85 °C<br>(V) | HEIGHT<br>(mm)                                            | CAP. <sup>(5)</sup><br>(μF) | Ø dt | ORDERING CODE <sup>(1)</sup>   | MASS<br>(g) | SPQ <sup>(2)</sup><br>(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 <sup>(3)</sup> | 264         | 20                          |
|                              | 65                                                        | 320                         | 1.2  | MKP1848732704Y5 <sup>(4)</sup> | 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 <sup>(3)</sup> | 276         | 20                          |
|                              | 65                                                        | 240                         | 1.2  | MKP1848724084Y5 <sup>(4)</sup> | 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

| $U_{NDC}$<br>AT 85 °C<br>(V) | HEIGHT<br>(mm)                                             | CAP. <sup>(5)</sup><br>( $\mu$ F) | $\varnothing$ dt | ORDERING CODE <sup>(1)</sup>   | MASS<br>(g) | SPQ <sup>(2)</sup><br>(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 <sup>(3)</sup> | 259         | 20                          |
|                              | 65                                                         | 200                               | 1.2              | MKP1848720094Y5 <sup>(4)</sup> | 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 <sup>(3)</sup> | 256         | 20                          |
|                              | 65                                                         | 70                                | 1.2              | MKP1848670914Y5 <sup>(3)</sup> | 257         | 20                          |
|                              | 65                                                         | 120                               | 1.2              | MKP1848712914Y5 <sup>(4)</sup> | 606         | 10                          |
|                              | 65                                                         | 140                               | 1.2              | MKP1848714914Y5 <sup>(4)</sup> | 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        |                                                            |                             |      |                                |             |                             |
|------------------------------|------------------------------------------------------------|-----------------------------|------|--------------------------------|-------------|-----------------------------|
| $U_{NDC}$<br>AT 85 °C<br>(V) | HEIGHT<br>(mm)                                             | CAP. <sup>(5)</sup><br>(μF) | Ø dt | ORDERING CODE <sup>(1)</sup>   | MASS<br>(g) | SPQ <sup>(2)</sup><br>(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 <sup>(3)</sup> | 264         | 20                          |
|                              | 65                                                         | 120                         | 1.2  | MKP1848712924Y5 <sup>(4)</sup> | 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.

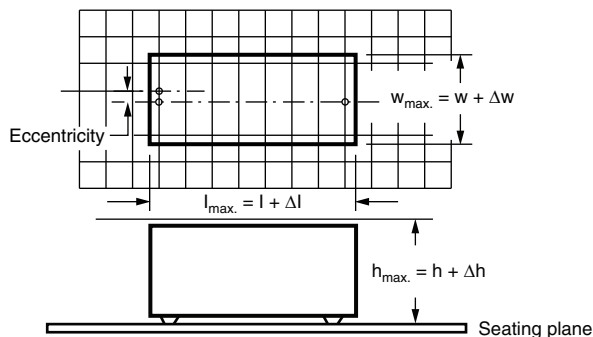
The capacitors shall be mechanically fixed by the leads and the body clamped.

**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  $15 \text{ mm} < \text{pitch} \leq 27.5 \text{ mm}$ ,  $\Delta w = \Delta l = \Delta h = 0.5 \text{ mm}$
- 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.

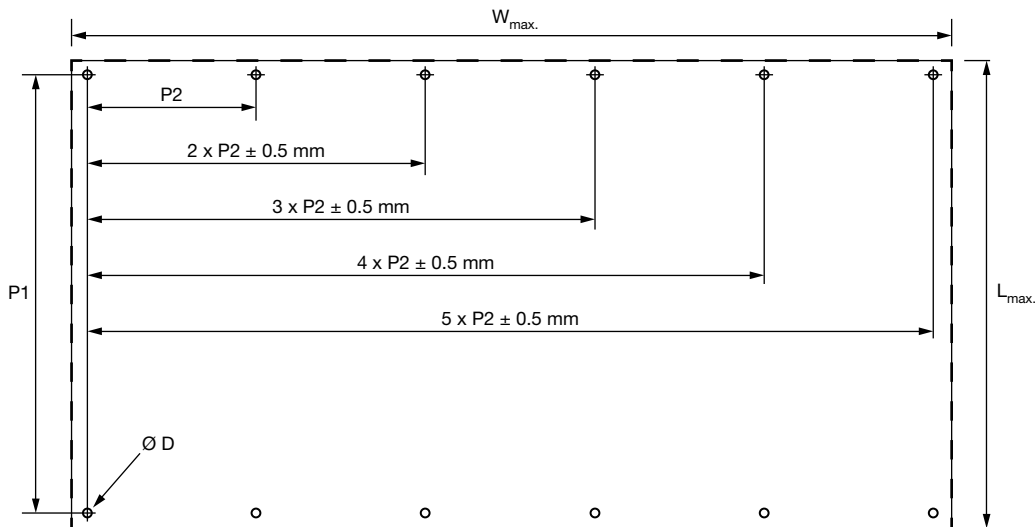
The maximum length and width of film capacitors is shown in the figure.

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  $\Delta w = \Delta h = 1.0 \text{ mm}$
- 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 <sub>max.</sub> (mm) | W <sub>max.</sub> (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](http://www.vishay.com/doc?28171)

## Storage Temperature

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

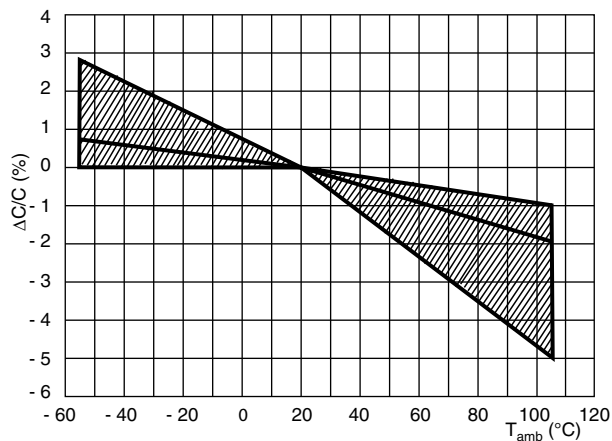
## Ratings and Characteristics Reference Conditions

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  $50 \% \pm 2 \%$ .

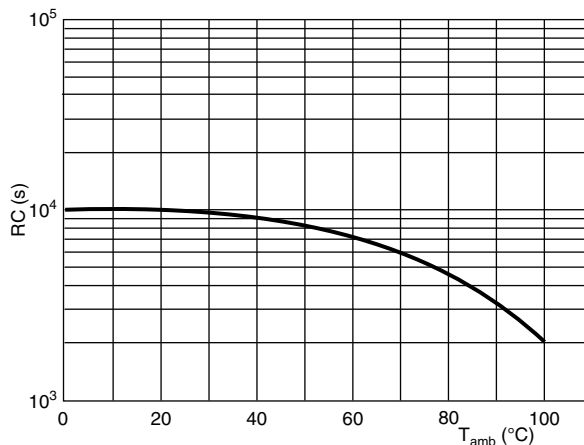
For reference testing, a conditioning period shall be applied over  $96 \text{ h} \pm 4 \text{ h}$  by heating the products in a circulating air oven at the rated temperature and a relative humidity not exceeding 20 %.



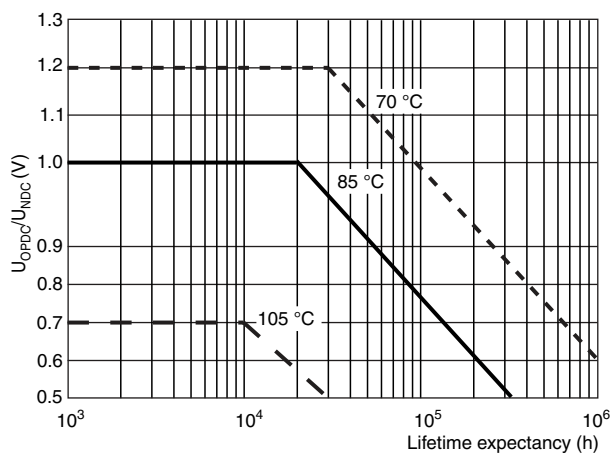
## CHARACTERISTICS



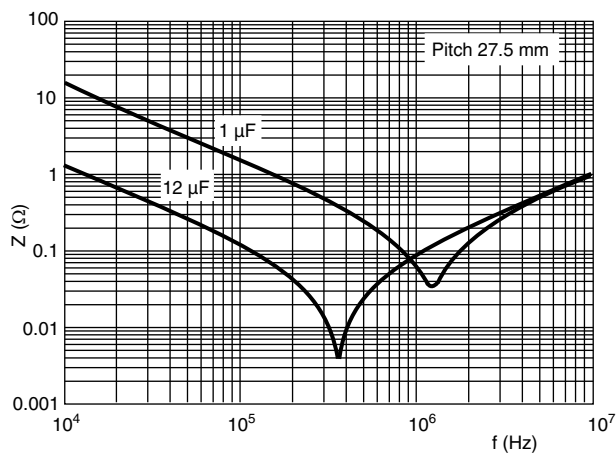
Capacitance  
(typical curve)



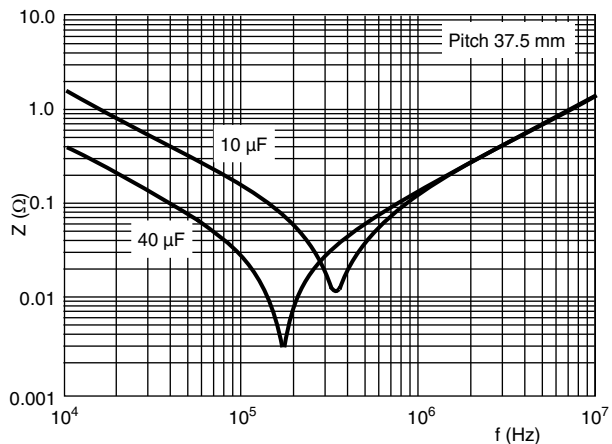
Insulation resistance  
(typical curve)



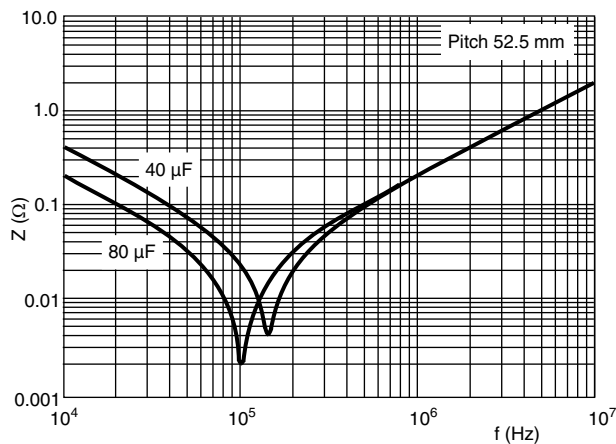
Lifetime expectancy  
(typical curve)



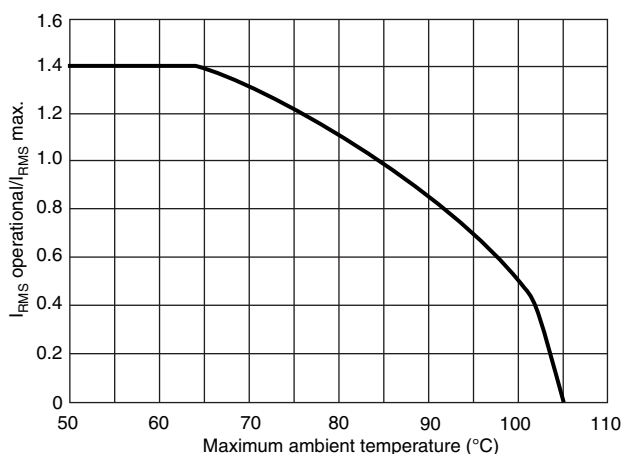
Impedance vs. frequency  
(typical curve)



Impedance vs. frequency  
(typical curve)



Impedance vs. frequency  
(typical curve)


Maximum I<sub>RMS</sub> 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 | 42.0 | 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                        |
| 65.5              | 65.0 | 57.5 | 152                       |
| 130.0             | 65.0 | 57.5 | 243                       |

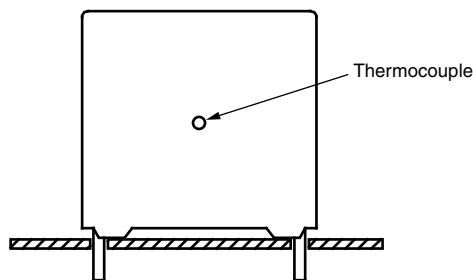
## POWER DISSIPATION AND MAXIMUM COMPONENT TEMPERATURE RISE

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 ( $\Delta T$ ) 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



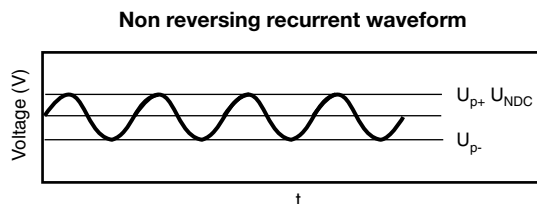
The case temperature is measured in unloaded ( $T_{amb}$ ) and maximum loaded condition ( $T_C$ ). To avoid thermal radiation or convection, the capacitor must be tested in a closed area from air circulation.

## 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](mailto: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                                                                                    |
|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| <b>ROUTINE TEST-FINAL INSPECTION</b>                    |                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                             |
| 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 $\tan \delta$                                     | 1 kHz at room temperature<br>10 kHz at room temperature                                                                                                                                                                                                                                                                                                                                                     | See specific reference data                                                                                 |
| 5.5.1.2 Voltage test between terminal                   | $1.5 \times U_{NDC}$ at $T_{amb}$<br>Duration 10 s                                                                                                                                                                                                                                                                                                                                                          | No visible damage or puncture<br>No flashover                                                               |
| 5.7 Insulation resistance                               | $U_{NDC} \leq 500$ V measuring voltage 100 V at room temperature<br><br>$U_{NDC} > 500$ V measuring voltage 500 V at room temperature<br>Duration 1 min                                                                                                                                                                                                                                                     | See specific reference data                                                                                 |
| <b>TYPE TESTS</b>                                       |                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                             |
| 5.14.2 External inspection                              | Check for finish, marking and overall dimensions                                                                                                                                                                                                                                                                                                                                                            | Legible marking and finish as specified<br>Dimensions: see specific drawing                                 |
| 5.14.0 Initial measurements                             | Capacitance at 1 kHz<br>$\tan \delta$ at 10 kHz                                                                                                                                                                                                                                                                                                                                                             |                                                                                                             |
| 5.14.1.1.4 Robustness of terminations<br>IEC 60068-2-21 | Tensile $U_{a1}$<br>Wire diameter      section      load<br>$\leq 0.8$ mm $\leq 0.5$ mm <sup>2</sup> 10 N<br>$\leq 1.25$ mm $\leq 1.2$ mm <sup>2</sup> 20 N<br>Duration 10 s $\pm$ 1 s<br><br>Bending $U_b$ method 1<br>Wire diameter      section      load<br>$\leq 0.8$ mm $\leq 0.05$ mm <sup>3</sup> 10 N<br>$\leq 1.25$ mm $\leq 0.019$ mm <sup>3</sup> 20 N<br>4 x 90 °,<br>Duration 2 s to 3 s/bend |                                                                                                             |
| 5.14.1.6 Resistance to soldering heat<br>IEC 60068-2-20 | No predrying, method 1A<br>Solder bath: 260 °C<br>Duration 10 s $\pm$ 1 s                                                                                                                                                                                                                                                                                                                                   |                                                                                                             |
| 5.14.4 Final measurements                               | Capacitance<br>$\tan \delta$                                                                                                                                                                                                                                                                                                                                                                                | $ \Delta C/C  \leq 0.5$ %<br>Increase of $\tan \delta \leq 0.0050$<br>Compared to values measured in 5.14.0 |
| 5.14.0 Initial measurements                             | Capacitance at 1 kHz<br>$\tan \delta$ at 10 kHz                                                                                                                                                                                                                                                                                                                                                             |                                                                                                             |





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



| SUB-CLAUSE NUMBER AND TEST                                 | CONDITIONS                                                                                                                                                                                                                                                                                                                                                                                                   | PERFORMANCE REQUIREMENTS                                                                                                                                                                    |
|------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>TYPE TESTS</b>                                          |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                             |
| 5.13.0 Initial measurements                                | Capacitance at 1 kHz<br>tan $\delta$ at 10 kHz                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                             |
| 5.13.1 Change of temperature<br>acc. to IEC 60068-2-14     | Test Nb<br>$T_{max.} = 85\text{ }^{\circ}\text{C}$<br>$T_{min.} = -40\text{ }^{\circ}\text{C}$<br>Transition time: 1 h, equivalent to $1\text{ }^{\circ}\text{C/min}$                                                                                                                                                                                                                                        |                                                                                                                                                                                             |
| 5.13.2 Damp heat steady state<br>acc. to IEC 60068-2-78    | Test Ca<br>$T_{max.} = 40\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$<br>RH = 93 % $\pm$ 3 %<br>Duration 56 days                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                             |
| 5.5.3.2 Voltage test between terminal                      | $1.5 \times U_{NDC}$ at ambient temperature<br>Duration 60 s                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                             |
| 5.13.3 Final measurements                                  | Visual examination<br><br>Capacitance<br>tan $\delta$ at $1 U_{RMS}$ 10 kHz                                                                                                                                                                                                                                                                                                                                  | No puncturing or flashover<br>Self healing punctures are permitted<br><br>$ \Delta C/C  \leq 2.0\text{ }%$<br>Increase of tan $\delta \leq 0.0150$<br>Compared to values measured in 5.13.0 |
| 5.10.0 Initial measurements                                | Capacitance at 1 kHz<br>tan $\delta$ at 10 kHz                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                             |
| 5.10.1 Thermal stability test under<br>overload conditions | Natural cooling $T_{amb} \pm 5\text{ }^{\circ}\text{C}$<br>$1.21 \times P_{max.} = (U_2/2) \times W_2 \times C \times \tan \delta =$<br>$1.21 \times (I_{max.}^2 / W_2 \times c) \times \tan \delta_2$ with<br>$W_2 = 2 \times p \times f_2$ for $I_{max.}$<br>(see specific reference data)<br>$f_2 = 10\text{ kHz}$<br>Duration 48 h                                                                       |                                                                                                                                                                                             |
| 5.10.2 Final measurements                                  | Measure the temperature every 1.5 h during<br>the last 6 h<br>Capacitance<br>tan $\delta$ at 10 kHz                                                                                                                                                                                                                                                                                                          | Temperature rise $< 1\text{ }^{\circ}\text{C}$<br>$ \Delta C/C  \leq 2\text{ }%$<br>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<br>curve "Resonant frequency" of this<br>specification                                                                                      |
| 5.10.0 Initial measurements                                | Capacitance at 1 kHz<br>tan $\delta$ at 10 kHz                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                             |
| 5.15.1 Endurance test between terminals                    | Sequence<br>$1.4 \times U_{NDC}$ at $T_{max.} = 85\text{ }^{\circ}\text{C}$<br>$1.4 \times U_{OPDC}$ at $105\text{ }^{\circ}\text{C}$<br>Duration 250 h<br>1000 x discharge at $1.4 \times I$ (maximum<br>repetitive peak current in continuous<br>operation)<br>$1.4 \times U_{NDC}$ at $T_{max.} = 85\text{ }^{\circ}\text{C}$<br>$1.4 \times U_{OPDC}$ at $105\text{ }^{\circ}\text{C}$<br>Duration 250 h |                                                                                                                                                                                             |
| 5.15.2 Final measurements                                  | Capacitance<br>tan $\delta$                                                                                                                                                                                                                                                                                                                                                                                  | $ \Delta C/C  \leq 3\text{ }%$<br>Increase of tan $\delta \leq 0.0150$<br>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<br>at $T_{max.} = 85\text{ °C}$                                                                                    |                                                                    |
| 5.16.3.1 Destruction test sequence<br>High DC voltage test | Product enveloped with cheese cloth<br>3 x $U_{NDC}$ or DC voltage<br>Until repetitive product healings occur<br>Duration = 15 min      | Audible healings or check healings with<br>oscilloscope            |
| High AC voltage test                                       | $AC_{RMS}$ voltage = $U_{NDC}/2 \sqrt{2}$<br>with minimum of 250 V <sub>AC</sub><br>Duration = 5 min<br>Repeat destruction sequence 3 x |                                                                    |
| 5.16.3.2 Final measurements                                | Visual examination                                                                                                                      | No puncturing or flashover<br>Self healing punctures are permitted |



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