

## Metallized Polypropylene Film Capacitor Radial Snubber Type



### FEATURES

- Reduce EMI by clamping voltage and current ringing
- High pulse strength (dV/dt up to 2500 V/μs)
- Low inductance construction (low ESL)
- Low ESR
- Material categorization:  
for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

### APPLICATIONS

- Photovoltaic and wind inverters
- Motor drives
- Frequency converters
- Direct mount on IGBT modules

### QUICK REFERENCE DATA

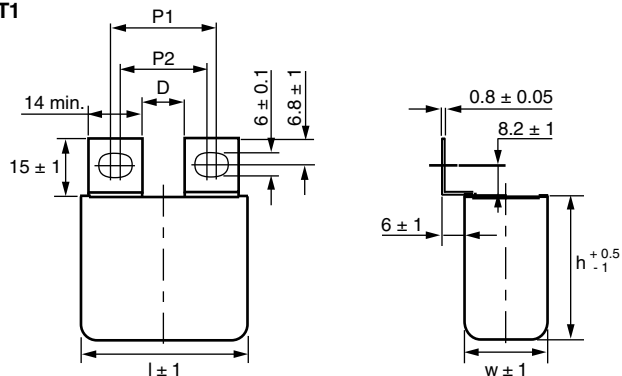
|                                                          |                                                                                                                                                                      |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rated capacitance range                                  | 0.047 μF to 10 μF                                                                                                                                                    |
| Capacitance tolerance                                    | ± 5 %/± 10 %                                                                                                                                                         |
| Rated (DC) voltage, U <sub>NDC</sub>                     | 700 V, 850 V, 1000 V, 1250 V, 1600 V, 2000 V, 2500 V                                                                                                                 |
| Climatic testing class                                   | 55/105/56                                                                                                                                                            |
| Rated temperature                                        | 85 °C                                                                                                                                                                |
| Maximum permissible case temperature                     | 105 °C                                                                                                                                                               |
| Rated (AC) voltage                                       | 420 V, 400 V to 450 V, 425 V to 500 V, 450 V to 550 V, 450 V to 600 V, 700 V, 800 V                                                                                  |
| Reference standards                                      | IEC 60384-17                                                                                                                                                         |
| Dielectric                                               | Polypropylene film                                                                                                                                                   |
| Electrodes                                               | Metallized film                                                                                                                                                      |
| Construction                                             | Series construction                                                                                                                                                  |
| Encapsulation                                            | Flame retardant plastic case and epoxy resin sealed                                                                                                                  |
| Terminals                                                | Tinned coated copper                                                                                                                                                 |
| Self inductance (L <sub>S</sub> )                        | < 0.7 nH per mm of lead spacing                                                                                                                                      |
| Withstanding DC voltage between terminals <sup>(1)</sup> | 1.6 U <sub>RDC</sub> for 60 s (maximum rise time 1000 V/s; cut off current 10 mA)                                                                                    |
| Test voltage between terminals and case                  | 1.4 U <sub>RAC</sub> + 2000 V <sub>DC</sub> for 60 s                                                                                                                 |
| Insulation resistance                                    | RC between leads, at 500 V after 1 min:<br>> 100 GΩ for C ≤ 0.33 μF<br>> 30 000 s for C > 0.33 μF                                                                    |
| Performance grade                                        | Grade 1 (long life)                                                                                                                                                  |
| Stability grade                                          | Grade 2                                                                                                                                                              |
| Life time expectancy                                     | Operation life > 300 000 h - failure rate < 5 FIT (40 °C and 0.5 x U <sub>R</sub> )                                                                                  |
| Marking                                                  | C-value, tolerance code, rated voltage, manufacturer's emblem, code for dielectric material, manufacturer's type designation, year and week, manufacturer's location |

### Notes

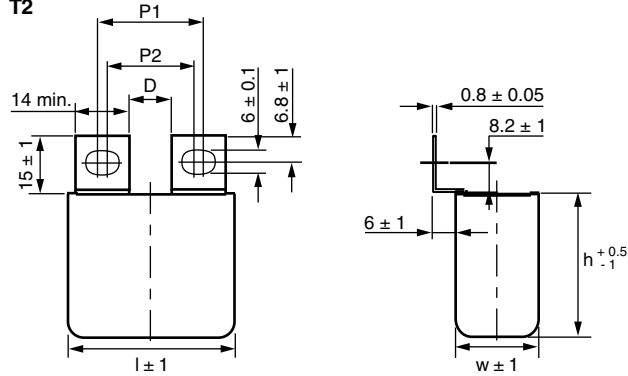
- For more detailed data and test requirements contact [dc-film@vishay.com](mailto:dc-film@vishay.com)
- For general information like characteristics and definitions used for film capacitors follow the link: [www.vishay.com/doc?28147](http://www.vishay.com/doc?28147)
- <sup>(1)</sup> See document "Voltage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

### DC VOLTAGE RATINGS

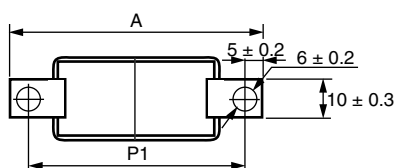
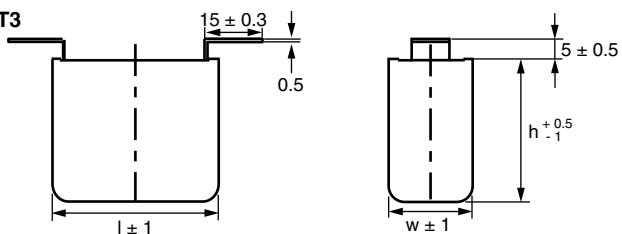
|                  |                     |                     |                      |                      |                      |                      |                      |
|------------------|---------------------|---------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| U <sub>RDC</sub> | 700 V <sub>DC</sub> | 850 V <sub>DC</sub> | 1000 V <sub>DC</sub> | 1250 V <sub>DC</sub> | 1600 V <sub>DC</sub> | 2000 V <sub>DC</sub> | 2500 V <sub>DC</sub> |
| U <sub>RAC</sub> | 420 V <sub>AC</sub> | 450 V <sub>AC</sub> | 500 V <sub>AC</sub>  | 550 V <sub>AC</sub>  | 600 V <sub>AC</sub>  | 700 V <sub>AC</sub>  | 800 V <sub>AC</sub>  |

**DIMENSIONS in millimeters AND AVAILABLE TERMINAL VERSIONS**
**T1**


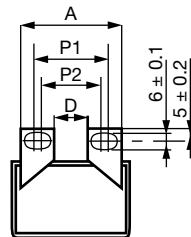
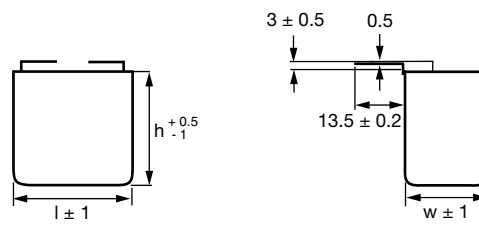
| L  | P1<br>$\pm 0.5$ | P2<br>$\pm 0.5$ | D<br>min. |
|----|-----------------|-----------------|-----------|
| 44 | 28              | 23              | 10.2      |
| 58 | 43              | 38              | 25.2      |

**T2**


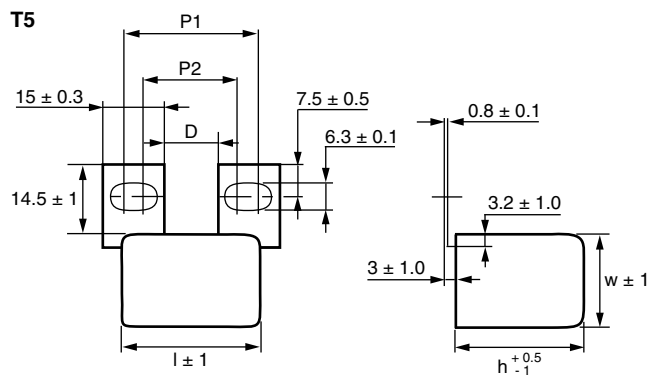
| L  | P1<br>$\pm 0.5$ | P2<br>$\pm 0.5$ | D<br>min. |
|----|-----------------|-----------------|-----------|
| 44 | 24.5            | 19.5            | 6.2       |
| 58 | 39.5            | 34.5            | 21.2      |

**T3**


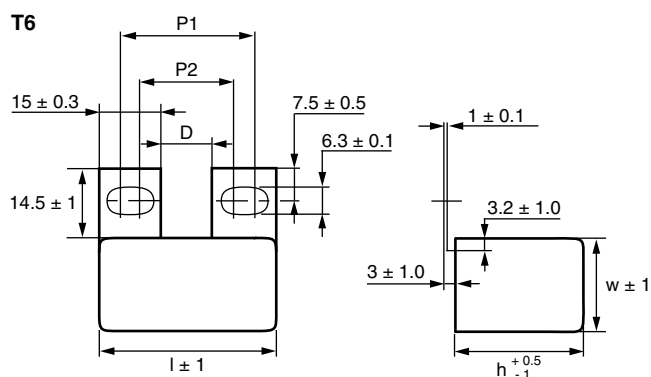
| L    | P1<br>$\pm 0.5$ | A<br>$\pm 1$ |
|------|-----------------|--------------|
| 33.5 | 47              | 57           |
| 44   | 57              | 67           |
| 58   | 72              | 82           |

**T4**


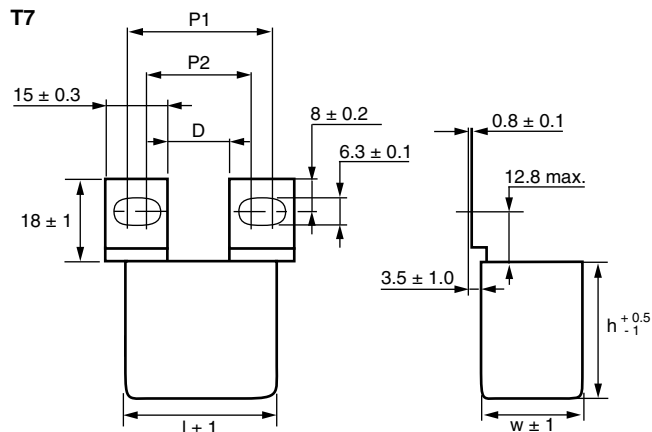
| L  | P1<br>$\pm 0.5$ | P2<br>$\pm 0.5$ | D<br>min. | A<br>$\pm 0.5$ |
|----|-----------------|-----------------|-----------|----------------|
| 44 | 28              | 22              | 11        | 38             |
| 58 | 43              | 37              | 26        | 53             |

**T5**


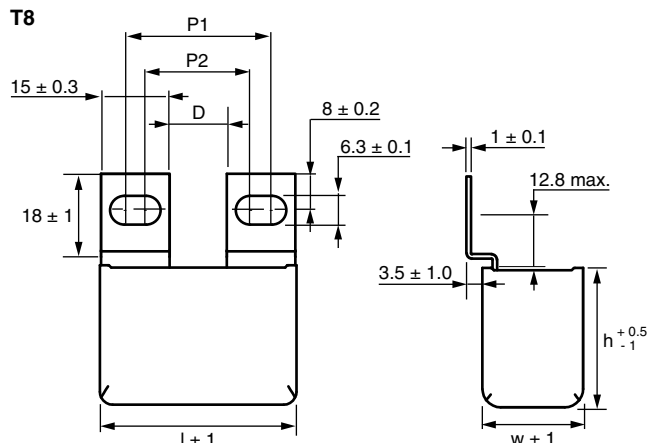
| L    | P1<br>$\pm 1$ | P2<br>$\pm 1$ | D<br>min. |
|------|---------------|---------------|-----------|
| 33.5 | 32.3          | 22.7          | 11        |
| 44   | 42.3          | 32.7          | 21        |
| 58   | 57.3          | 47.7          | 36        |

**T6**


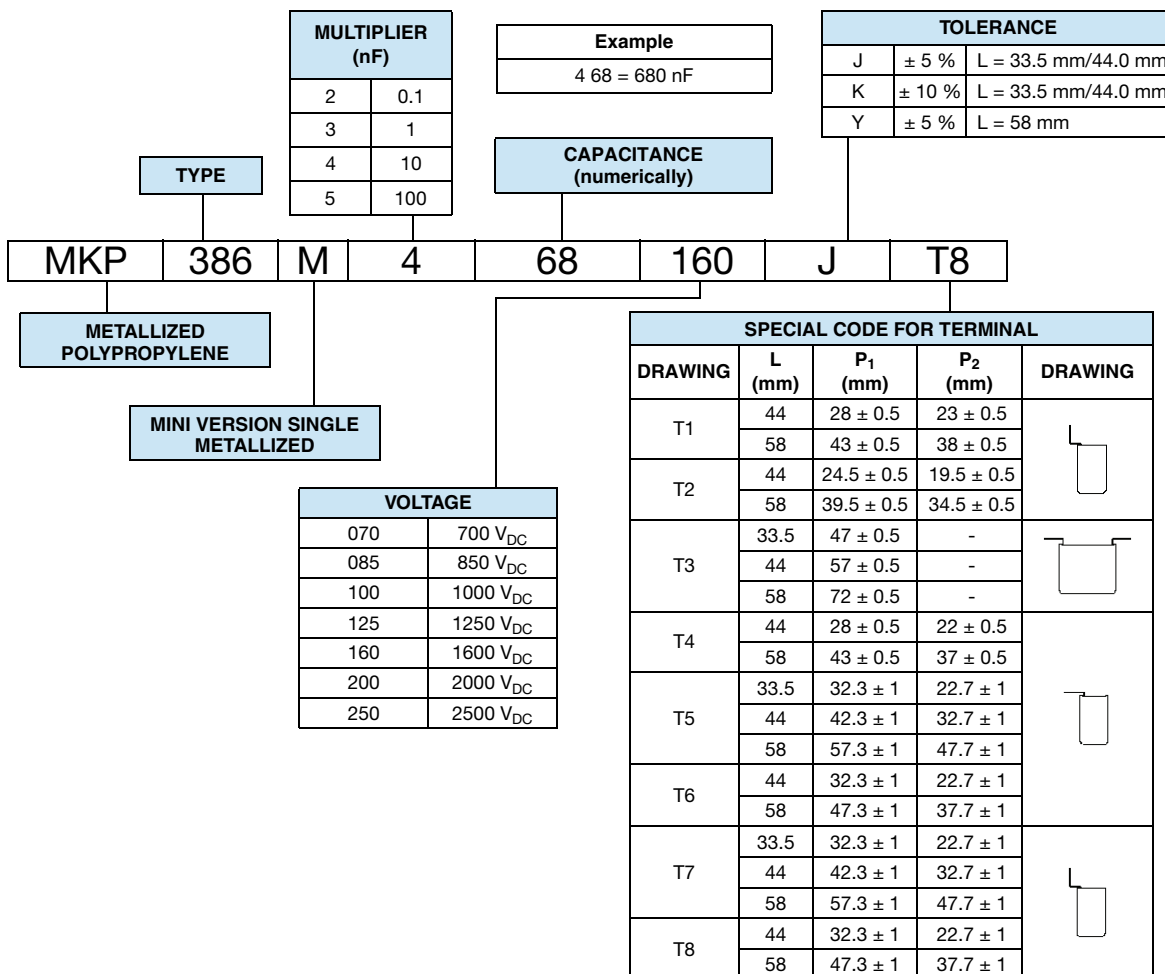
| L  | P1<br>$\pm 1$ | P2<br>$\pm 1$ | D<br>min. |
|----|---------------|---------------|-----------|
| 44 | 32.3          | 22.7          | 11        |
| 58 | 47.3          | 37.7          | 26        |

**DIMENSIONS in millimeters AND AVAILABLE TERMINAL VERSIONS**
**T7**


| L    | P1<br>± 1 | P2<br>± 1 | D<br>min. |
|------|-----------|-----------|-----------|
| 33.5 | 32.3      | 22.7      | 11        |
| 44   | 42.3      | 32.7      | 21        |
| 58   | 57.3      | 47.7      | 36        |

**T8**


| L  | P1<br>± 1 | P2<br>± 1 | D<br>min. |
|----|-----------|-----------|-----------|
| 44 | 32.3      | 22.7      | 11        |
| 58 | 47.3      | 37.7      | 26        |

**COMPOSITION OF CATALOG NUMBER**




## ELECTRICAL DATA AND ORDERING CODE

| U <sub>RDC</sub><br>(V) | CAP.<br>(μF)                                       | DIMENSION (mm) <sup>(4)</sup> |      |      | dU/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>1 kHz<br>< (10 <sup>-4</sup> ) | tan δ<br>10 kHz<br>< (10 <sup>-4</sup> ) | tan δ<br>100 kHz<br>< (10 <sup>-4</sup> ) | ORDERING CODE <sup>(1)</sup> |
|-------------------------|----------------------------------------------------|-------------------------------|------|------|-----------------|--------------------------|----------------------------------------|----------------------------|-----------------------------------------|------------------------------------------|-------------------------------------------|------------------------------|
|                         |                                                    | W                             | H    | L    |                 |                          |                                        |                            |                                         |                                          |                                           |                              |
| 700                     | U <sub>RAC</sub> = 420 V; U <sub>pp</sub> = 1130 V |                               |      |      |                 |                          |                                        |                            |                                         |                                          |                                           |                              |
|                         | 0.47                                               | 22.0                          | 30.5 | 33.5 | 800             | 376                      | 7.0                                    | 16.0                       | 4.0                                     | 8.0                                      | 50                                        | MKP386M447070J**             |
|                         | 0.68                                               | 22.0                          | 30.5 | 33.5 | 800             | 544                      | 8.0                                    | 11.0                       | 4.0                                     | 8.0                                      | 50                                        | MKP386M468070J**             |
|                         | 1.0                                                | 22.0                          | 30.5 | 33.5 | 800             | 800                      | 9.0                                    | 7.5                        | 4.0                                     | 8.0                                      | 50                                        | MKP386M510070J**             |
|                         | 1.5                                                | 22.0                          | 30.5 | 33.5 | 800             | 1200                     | 10.0                                   | 5.0                        | 4.0                                     | 8.0                                      | -                                         | MKP386M515070J**             |
|                         | 2.0                                                | 22.0                          | 38.0 | 44.0 | 370             | 740                      | 10.0                                   | 7.5                        | 5.0                                     | 15.0                                     | -                                         | MKP386M520070J**             |
|                         | 2.2                                                | 22.0                          | 38.0 | 44.0 | 370             | 814                      | 10.0                                   | 6.5                        | 5.0                                     | 15.0                                     | -                                         | MKP386M522070J**             |
|                         | 3.0                                                | 30.0                          | 46.0 | 44.0 | 370             | 1110                     | 14.0                                   | 5.5                        | 5.0                                     | 15.0                                     | -                                         | MKP386M530070J**             |
|                         | 3.3                                                | 30.0                          | 46.0 | 44.0 | 370             | 1221                     | 14.0                                   | 5.0                        | 5.0                                     | 15.0                                     | -                                         | MKP386M533070J**             |
|                         | 4.0                                                | 30.0                          | 46.0 | 44.0 | 370             | 1480                     | 15.0                                   | 4.5                        | 5.0                                     | 15.0                                     | -                                         | MKP386M540070J**             |
|                         | 4.7                                                | 30.0                          | 46.0 | 44.0 | 370             | 1739                     | 15.0                                   | 6.0                        | 5.0                                     | 15.0                                     | -                                         | MKP386M547070J**             |
| 5.0                     | 30.0                                               | 46.0                          | 44.0 | 370  | 1850            | 15.0                     | 6.0                                    | 5.0                        | 15.0                                    | -                                        | MKP386M550070J**                          |                              |
| 850                     | U <sub>RAC</sub> = 450 V; U <sub>pp</sub> = 1300 V |                               |      |      |                 |                          |                                        |                            |                                         |                                          |                                           |                              |
|                         | 0.47                                               | 22.0                          | 30.5 | 33.5 | 800             | 376                      | 7.5                                    | 13.0                       | 4.0                                     | 8.0                                      | 50                                        | MKP386M447085J**             |
|                         | 0.68                                               | 22.0                          | 30.5 | 33.5 | 800             | 544                      | 8.5                                    | 10.0                       | 4.0                                     | 8.0                                      | 50                                        | MKP386M468085J**             |
|                         | 0.82                                               | 22.0                          | 30.5 | 33.5 | 800             | 656                      | 9.0                                    | 8.5                        | 4.0                                     | 8.0                                      | 50                                        | MKP386M482085J**             |
|                         | 1.0                                                | 22.0                          | 30.5 | 33.5 | 800             | 800                      | 10.0                                   | 7.0                        | 4.0                                     | 8.0                                      | 50                                        | MKP386M510085J**             |
|                         | 1.5                                                | 22.0                          | 38.0 | 44.0 | 370             | 555                      | 10.0                                   | 9.0                        | 5.0                                     | 15.0                                     | -                                         | MKP386M515085J**             |
|                         | 2.0                                                | 22.0                          | 38.0 | 44.0 | 370             | 740                      | 12.0                                   | 7.0                        | 5.0                                     | 15.0                                     | -                                         | MKP386M520085J**             |
|                         | 2.2                                                | 22.0                          | 38.0 | 44.0 | 370             | 814                      | 13.0                                   | 6.0                        | 5.0                                     | 15.0                                     | -                                         | MKP386M522085J**             |
|                         | 3.0                                                | 30.0                          | 46.0 | 44.0 | 370             | 1110                     | 16.0                                   | 4.5                        | 5.0                                     | 15.0                                     | -                                         | MKP386M530085J**             |
|                         | 3.3                                                | 30.0                          | 46.0 | 44.0 | 370             | 1221                     | 16.0                                   | 4.0                        | 5.0                                     | 15.0                                     | -                                         | MKP386M533085J**             |
|                         | 4.0                                                | 30.0                          | 46.0 | 44.0 | 370             | 1480                     | 18.0                                   | 3.5                        | 5.0                                     | 15.0                                     | -                                         | MKP386M540085J**             |
|                         | U <sub>RAC</sub> = 400 V; U <sub>pp</sub> = 1200 V |                               |      |      |                 |                          |                                        |                            |                                         |                                          |                                           |                              |
|                         | 4.7                                                | 25.0                          | 45.0 | 58.0 | 170             | 798                      | 17.5                                   | 4.0                        | 6.0                                     | 25                                       | -                                         | MKP386M547085Y**             |
|                         | 5.0                                                | 25.0                          | 45.0 | 58.0 | 170             | 849                      | 18.0                                   | 3.5                        | 6.0                                     | 25                                       | -                                         | MKP386M550085Y**             |
|                         | 6.0                                                | 30.0                          | 45.0 | 58.0 | 170             | 1019                     | 20.5                                   | 3.0                        | 6.0                                     | 25                                       | -                                         | MKP386M560085Y**             |
|                         | 7.0                                                | 30.0                          | 45.0 | 58.0 | 170             | 1189                     | 22.5                                   | 2.5                        | 6.0                                     | 25                                       | -                                         | MKP386M570085Y**             |
|                         | 8.0                                                | 35.0                          | 50.0 | 58.0 | 170             | 1358                     | 26.0                                   | 2.0                        | 6.0                                     | 25                                       | -                                         | MKP386M580085Y**             |
| 10                      | 35.0                                               | 50.0                          | 58.0 | 170  | 1698            | 29.0                     | 1.5                                    | 6.0                        | 25                                      | -                                        | MKP386M610085Y**                          |                              |
| 1000                    | U <sub>RAC</sub> = 500 V; U <sub>pp</sub> = 1400 V |                               |      |      |                 |                          |                                        |                            |                                         |                                          |                                           |                              |
|                         | 0.47                                               | 22.0                          | 30.5 | 33.5 | 725             | 341                      | 7.5                                    | 13.0                       | 4.0                                     | 8.0                                      | 50                                        | MKP386M447100J**             |
|                         | 0.56                                               | 22.0                          | 30.5 | 33.5 | 725             | 406                      | 8.0                                    | 11.0                       | 4.0                                     | 8.0                                      | 50                                        | MKP386M456100J**             |
|                         | 0.68                                               | 22.0                          | 30.5 | 33.5 | 725             | 493                      | 9.0                                    | 9.0                        | 4.0                                     | 8.0                                      | 50                                        | MKP386M468100J**             |
|                         | 0.82                                               | 22.0                          | 30.5 | 33.5 | 725             | 595                      | 9.0                                    | 7.5                        | 4.0                                     | 8.0                                      | 50                                        | MKP386M482100J**             |
|                         | 1.0                                                | 22.0                          | 30.5 | 33.5 | 725             | 725                      | 10.0                                   | 6.0                        | 4.0                                     | 8.0                                      | 50                                        | MKP386M510100J**             |
|                         | 1.2                                                | 22.0                          | 38.0 | 44.0 | 340             | 408                      | 10.0                                   | 10.0                       | 5.0                                     | 15.0                                     | -                                         | MKP386M512100J**             |
|                         | 1.5                                                | 22.0                          | 38.0 | 44.0 | 340             | 510                      | 11.0                                   | 8.0                        | 5.0                                     | 15.0                                     | -                                         | MKP386M515100J**             |
|                         | 1.8                                                | 22.0                          | 38.0 | 44.0 | 340             | 612                      | 12.0                                   | 6.5                        | 5.0                                     | 15.0                                     | -                                         | MKP386M518100J**             |
|                         | 2.0                                                | 30.0                          | 46.0 | 44.0 | 340             | 680                      | 14.0                                   | 6.0                        | 5.0                                     | 15.0                                     | -                                         | MKP386M520100J**             |
|                         | 2.2                                                | 30.0                          | 46.0 | 44.0 | 340             | 748                      | 15.0                                   | 5.5                        | 5.0                                     | 15.0                                     | -                                         | MKP386M522100J**             |
|                         | 2.5                                                | 30.0                          | 46.0 | 44.0 | 340             | 850                      | 15.0                                   | 5.0                        | 5.0                                     | 15.0                                     | -                                         | MKP386M525100J**             |
|                         | 2.7                                                | 30.0                          | 46.0 | 44.0 | 340             | 918                      | 16.0                                   | 4.5                        | 5.0                                     | 15.0                                     | -                                         | MKP386M527100J**             |
|                         | 3.3                                                | 30.0                          | 46.0 | 44.0 | 340             | 1122                     | 18.0                                   | 3.5                        | 5.0                                     | 15.0                                     | -                                         | MKP386M533100J**             |
|                         | U <sub>RAC</sub> = 425 V; U <sub>pp</sub> = 1200 V |                               |      |      |                 |                          |                                        |                            |                                         |                                          |                                           |                              |
|                         | 3.3                                                | 25.0                          | 45.0 | 58.0 | 205             | 677                      | 16.0                                   | 4.5                        | 7.5                                     | 25                                       | -                                         | MKP386M533100Y**             |
|                         | 4.0                                                | 25.0                          | 45.0 | 58.0 | 205             | 820                      | 17.5                                   | 3.5                        | 7.5                                     | 25                                       | -                                         | MKP386M540100Y**             |
|                         | 4.7                                                | 30.0                          | 45.0 | 58.0 | 205             | 964                      | 20.0                                   | 3.0                        | 7.5                                     | 25                                       | -                                         | MKP386M547100Y**             |
|                         | 5.0                                                | 30.0                          | 45.0 | 58.0 | 205             | 1025                     | 21.0                                   | 3.0                        | 7.5                                     | 25                                       | -                                         | MKP386M550100Y**             |
|                         | 6.0                                                | 35.0                          | 50.0 | 58.0 | 205             | 1230                     | 24.5                                   | 2.5                        | 7.5                                     | 25                                       | -                                         | MKP386M560100Y**             |
|                         | 7.0                                                | 35.0                          | 50.0 | 58.0 | 205             | 1435                     | 26.5                                   | 2.0                        | 7.5                                     | 25                                       | -                                         | MKP386M570100Y**             |



## ELECTRICAL DATA AND ORDERING CODE

| U <sub>RDC</sub><br>(V) | CAP.<br>(μF)                                       | DIMENSION (mm) <sup>(4)</sup> |      |      | dU/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>1 kHz<br>< (10 <sup>-4</sup> ) | tan δ<br>10 kHz<br>< (10 <sup>-4</sup> ) | tan δ<br>100 kHz<br>< (10 <sup>-4</sup> ) | ORDERING CODE <sup>(1)</sup> |
|-------------------------|----------------------------------------------------|-------------------------------|------|------|-----------------|--------------------------|----------------------------------------|----------------------------|-----------------------------------------|------------------------------------------|-------------------------------------------|------------------------------|
|                         |                                                    | W                             | H    | L    |                 |                          |                                        |                            |                                         |                                          |                                           |                              |
| 1250                    | U <sub>RAC</sub> = 550 V; U <sub>pp</sub> = 1550 V |                               |      |      |                 |                          |                                        |                            |                                         |                                          |                                           |                              |
|                         | 0.33                                               | 22.0                          | 30.5 | 33.5 | 800             | 264                      | 7.0                                    | 16.0                       | 4.0                                     | 8.0                                      | 40                                        | MKP386M433125J**             |
|                         | 0.39                                               | 22.0                          | 30.5 | 33.5 | 800             | 312                      | 7.0                                    | 14.0                       | 4.0                                     | 8.0                                      | 40                                        | MKP386M439125J**             |
|                         | 0.47                                               | 22.0                          | 30.5 | 33.5 | 800             | 376                      | 8.0                                    | 11.0                       | 4.0                                     | 8.0                                      | 40                                        | MKP386M447125J**             |
|                         | 0.56                                               | 22.0                          | 30.5 | 33.5 | 800             | 448                      | 8.5                                    | 10.0                       | 4.0                                     | 8.0                                      | 40                                        | MKP386M456125J**             |
|                         | 0.68                                               | 22.0                          | 30.5 | 33.5 | 800             | 544                      | 9.5                                    | 8.0                        | 4.0                                     | 8.0                                      | 40                                        | MKP386M468125J**             |
|                         | 0.82                                               | 22.0                          | 38.0 | 44.0 | 375             | 308                      | 9.0                                    | 13.0                       | 5.0                                     | 15.0                                     | 60                                        | MKP386M482125J**             |
|                         | 1.0                                                | 22.0                          | 38.0 | 44.0 | 375             | 375                      | 10.0                                   | 10.0                       | 5.0                                     | 15.0                                     | 60                                        | MKP386M510125J**             |
|                         | 1.2                                                | 22.0                          | 38.0 | 44.0 | 375             | 450                      | 11.0                                   | 9.0                        | 5.0                                     | 15.0                                     | -                                         | MKP386M512125J**             |
|                         | 1.5                                                | 30.0                          | 46.0 | 44.0 | 375             | 563                      | 14.0                                   | 7.0                        | 5.0                                     | 15.0                                     | -                                         | MKP386M515125J**             |
|                         | 1.8                                                | 30.0                          | 46.0 | 44.0 | 375             | 675                      | 15.0                                   | 6.0                        | 5.0                                     | 15.0                                     | -                                         | MKP386M518125J**             |
|                         | 2.0                                                | 30.0                          | 46.0 | 44.0 | 375             | 750                      | 16.0                                   | 5.5                        | 5.0                                     | 15.0                                     | -                                         | MKP386M520125J**             |
|                         | 2.2                                                | 30.0                          | 46.0 | 44.0 | 375             | 825                      | 18.0                                   | 4.5                        | 5.0                                     | 15.0                                     | -                                         | MKP386M522125J**             |
|                         | U <sub>RAC</sub> = 450 V; U <sub>pp</sub> = 1300 V |                               |      |      |                 |                          |                                        |                            |                                         |                                          |                                           |                              |
|                         | 2.2                                                | 25.0                          | 45.0 | 58.0 | 225             | 495                      | 14.0                                   | 6.0                        | 7.5                                     | 20                                       | -                                         | MKP386M522125Y**             |
|                         | 2.5                                                | 25.0                          | 45.0 | 58.0 | 225             | 563                      | 15.0                                   | 5.0                        | 7.5                                     | 20                                       | -                                         | MKP386M525125Y**             |
|                         | 3.0                                                | 25.0                          | 45.0 | 58.0 | 225             | 675                      | 16.5                                   | 4.0                        | 7.5                                     | 20                                       | -                                         | MKP386M530125Y**             |
|                         | 3.3                                                | 30.0                          | 45.0 | 58.0 | 225             | 743                      | 18.0                                   | 4.0                        | 7.5                                     | 20                                       | -                                         | MKP386M533125Y**             |
| 4.0                     | 35.0                                               | 50.0                          | 58.0 | 225  | 900             | 21.5                     | 3.0                                    | 7.5                        | 20                                      | -                                        | MKP386M540125Y**                          |                              |
| 4.7                     | 35.0                                               | 50.0                          | 58.0 | 225  | 1058            | 23.5                     | 2.5                                    | 7.5                        | 20                                      | -                                        | MKP386M547125Y**                          |                              |
| 5.0                     | 35.0                                               | 50.0                          | 58.0 | 225  | 1125            | 24.5                     | 2.5                                    | 7.5                        | 20                                      | -                                        | MKP386M550125Y**                          |                              |
| 1600                    | U <sub>RAC</sub> = 600 V; U <sub>pp</sub> = 1690 V |                               |      |      |                 |                          |                                        |                            |                                         |                                          |                                           |                              |
|                         | 0.22                                               | 22.0                          | 30.5 | 33.5 | 800             | 176                      | 7.0                                    | 16.0                       | 3.0                                     | 5.0                                      | 40                                        | MKP386M422160J**             |
|                         | 0.27                                               | 22.0                          | 30.5 | 33.5 | 800             | 216                      | 7.0                                    | 15.0                       | 3.0                                     | 5.0                                      | 40                                        | MKP386M427160J**             |
|                         | 0.33                                               | 22.0                          | 30.5 | 33.5 | 800             | 264                      | 8.0                                    | 12.0                       | 3.0                                     | 5.0                                      | 40                                        | MKP386M433160J**             |
|                         | 0.39                                               | 22.0                          | 30.5 | 33.5 | 800             | 312                      | 8.5                                    | 10.0                       | 3.0                                     | 5.0                                      | 40                                        | MKP386M439160J**             |
|                         | 0.47                                               | 22.0                          | 30.5 | 33.5 | 800             | 376                      | 9.0                                    | 8.5                        | 3.0                                     | 5.0                                      | 40                                        | MKP386M447160J**             |
|                         | 0.56                                               | 22.0                          | 38.0 | 44.0 | 375             | 210                      | 9.0                                    | 14.0                       | 4.0                                     | 10.0                                     | 60                                        | MKP386M456160J**             |
|                         | 0.68                                               | 22.0                          | 38.0 | 44.0 | 375             | 255                      | 9.0                                    | 12.0                       | 4.0                                     | 10.0                                     | 60                                        | MKP386M468160J**             |
|                         | 0.82                                               | 22.0                          | 38.0 | 44.0 | 375             | 308                      | 10.0                                   | 10.0                       | 4.0                                     | 10.0                                     | 60                                        | MKP386M482160J**             |
|                         | 1.0                                                | 22.0                          | 38.0 | 44.0 | 375             | 375                      | 12.0                                   | 8.0                        | 4.0                                     | 10.0                                     | 60                                        | MKP386M510160J**             |
|                         | 1.3                                                | 30.0                          | 46.0 | 44.0 | 375             | 488                      | 16.0                                   | 6.0                        | 4.0                                     | 10.0                                     | -                                         | MKP386M513160J**             |
|                         | 1.5                                                | 30.0                          | 46.0 | 44.0 | 375             | 563                      | 16.0                                   | 5.5                        | 4.0                                     | 10.0                                     | -                                         | MKP386M515160J**             |
|                         | 1.8                                                | 30.0                          | 46.0 | 44.0 | 375             | 675                      | 18.0                                   | 4.5                        | 4.0                                     | 10.0                                     | -                                         | MKP386M518160J**             |
|                         | 2.0                                                | 30.0                          | 46.0 | 44.0 | 375             | 750                      | 19.0                                   | 4.0                        | 4.0                                     | 10.0                                     | -                                         | MKP386M520160K**             |
|                         | U <sub>RAC</sub> = 450 V; U <sub>pp</sub> = 1300 V |                               |      |      |                 |                          |                                        |                            |                                         |                                          |                                           |                              |
|                         | 1.5                                                | 25.0                          | 45.0 | 58.0 | 360             | 540                      | 18.0                                   | 3.5                        | 5.0                                     | 15                                       | -                                         | MKP386M515160Y**             |
|                         | 2.0                                                | 30.0                          | 45.0 | 58.0 | 360             | 720                      | 22.0                                   | 2.5                        | 5.0                                     | 15                                       | -                                         | MKP386M520160Y**             |
|                         | 2.2                                                | 35.0                          | 50.0 | 58.0 | 360             | 792                      | 25.0                                   | 2.5                        | 5.0                                     | 15                                       | -                                         | MKP386M522160Y**             |
| 2.5                     | 35.0                                               | 50.0                          | 58.0 | 360  | 900             | 26.5                     | 2.0                                    | 5.0                        | 15                                      | -                                        | MKP386M525160Y**                          |                              |
| 2000                    | U <sub>RAC</sub> = 700 V; U <sub>pp</sub> = 1980 V |                               |      |      |                 |                          |                                        |                            |                                         |                                          |                                           |                              |
|                         | 0.047                                              | 22.0                          | 30.5 | 33.5 | 2000            | 94                       | 6.0                                    | 20.0                       | 3.0                                     | 5.0                                      | 30                                        | MKP386M347200J**             |
|                         | 0.068                                              | 22.0                          | 30.5 | 33.5 | 2000            | 136                      | 6.5                                    | 17.0                       | 3.0                                     | 5.0                                      | 30                                        | MKP386M368200J**             |
|                         | 0.10                                               | 22.0                          | 30.5 | 33.5 | 2000            | 200                      | 8.0                                    | 11.0                       | 3.0                                     | 5.0                                      | 30                                        | MKP386M410200J**             |
|                         | 0.12                                               | 22.0                          | 30.5 | 33.5 | 2000            | 240                      | 9.0                                    | 9.0                        | 3.0                                     | 5.0                                      | 30                                        | MKP386M412200J**             |
|                         | 0.15                                               | 22.0                          | 30.5 | 33.5 | 2000            | 300                      | 9.5                                    | 8.0                        | 3.0                                     | 5.0                                      | 30                                        | MKP386M415200J**             |
|                         | 0.22                                               | 22.0                          | 38.0 | 44.0 | 850             | 187                      | 10.0                                   | 10.0                       | 4.0                                     | 10.0                                     | 50                                        | MKP386M422200J**             |
|                         | 0.27                                               | 22.0                          | 38.0 | 44.0 | 850             | 230                      | 11.0                                   | 8.5                        | 4.0                                     | 10.0                                     | 50                                        | MKP386M427200J**             |
|                         | 0.33                                               | 22.0                          | 38.0 | 44.0 | 850             | 281                      | 12.0                                   | 7.0                        | 4.0                                     | 10.0                                     | 50                                        | MKP386M433200J**             |
|                         | 0.39                                               | 22.0                          | 38.0 | 44.0 | 850             | 332                      | 12.0                                   | 6.0                        | 4.0                                     | 10.0                                     | 50                                        | MKP386M439200J**             |
|                         | 0.47                                               | 30.0                          | 46.0 | 44.0 | 850             | 400                      | 16.0                                   | 5.0                        | 4.0                                     | 10.0                                     | 50                                        | MKP386M447200J**             |
|                         | 0.56                                               | 30.0                          | 46.0 | 44.0 | 850             | 476                      | 18.0                                   | 4.0                        | 4.0                                     | 10.0                                     | 50                                        | MKP386M456200J**             |
|                         | 0.68                                               | 30.0                          | 46.0 | 44.0 | 850             | 578                      | 20.0                                   | 3.5                        | 4.0                                     | 10.0                                     | 50                                        | MKP386M468200J**             |
|                         | 0.68                                               | 25.0                          | 45.0 | 58.0 | 525             | 357                      | 14.0                                   | 6.0                        | 5.0                                     | 15.0                                     | 75                                        | MKP386M468200Y**             |
|                         | 0.82                                               | 25.0                          | 45.0 | 58.0 | 525             | 431                      | 15.5                                   | 5.0                        | 5.0                                     | 15.0                                     | 75                                        | MKP386M482200Y**             |
|                         | 1.0                                                | 30.0                          | 45.0 | 58.0 | 525             | 525                      | 18.0                                   | 4.0                        | 5.0                                     | 15.0                                     | -                                         | MKP386M510200Y**             |
|                         | 1.5                                                | 35.0                          | 50.0 | 58.0 | 525             | 788                      | 24.0                                   | 2.5                        | 5.0                                     | 15.0                                     | -                                         | MKP386M515200Y**             |



## ELECTRICAL DATA AND ORDERING CODE

| U <sub>RDC</sub><br>(V) | CAP.<br>(μF)                                       | DIMENSION (mm) <sup>(4)</sup> |      |      | dU/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>1 kHz<br>< (10 <sup>-4</sup> ) | tan δ<br>10 kHz<br>< (10 <sup>-4</sup> ) | tan δ<br>100 kHz<br>< (10 <sup>-4</sup> ) | ORDERING CODE <sup>(1)</sup> |
|-------------------------|----------------------------------------------------|-------------------------------|------|------|-----------------|--------------------------|----------------------------------------|----------------------------|-----------------------------------------|------------------------------------------|-------------------------------------------|------------------------------|
|                         |                                                    | W                             | H    | L    |                 |                          |                                        |                            |                                         |                                          |                                           |                              |
| 2500                    | U <sub>RAC</sub> = 800 V; U <sub>pp</sub> = 2260 V |                               |      |      |                 |                          |                                        |                            |                                         |                                          |                                           |                              |
|                         | 0.047                                              | 22.0                          | 30.5 | 33.5 | 2500            | 118                      | 6.0                                    | 20.0                       | 3.0                                     | 5.0                                      | 30                                        | MKP386M347250J**             |
|                         | 0.068                                              | 22.0                          | 30.5 | 33.5 | 2500            | 170                      | 7.0                                    | 14.0                       | 3.0                                     | 5.0                                      | 30                                        | MKP386M368250J**             |
|                         | 0.10                                               | 22.0                          | 30.5 | 33.5 | 2500            | 250                      | 8.5                                    | 10.0                       | 3.0                                     | 5.0                                      | 30                                        | MKP386M410250J**             |
|                         | 0.12                                               | 22.0                          | 30.5 | 33.5 | 2500            | 300                      | 9.5                                    | 8.0                        | 3.0                                     | 5.0                                      | 30                                        | MKP386M412250J**             |
|                         | 0.15                                               | 22.0                          | 38.0 | 44.0 | 1000            | 150                      | 9.5                                    | 12.5                       | 4.0                                     | 10.0                                     | 50                                        | MKP386M415250J**             |
|                         | 0.18                                               | 22.0                          | 38.0 | 44.0 | 1000            | 180                      | 10.0                                   | 11.0                       | 4.0                                     | 10.0                                     | 50                                        | MKP386M418250J**             |
|                         | 0.22                                               | 22.0                          | 38.0 | 44.0 | 1000            | 220                      | 11.0                                   | 8.5                        | 4.0                                     | 10.0                                     | 50                                        | MKP386M422250J**             |
|                         | 0.33                                               | 30.0                          | 46.0 | 44.0 | 1000            | 330                      | 15.0                                   | 6.0                        | 4.0                                     | 10.0                                     | 50                                        | MKP386M433250J**             |
|                         | 0.39                                               | 30.0                          | 46.0 | 44.0 | 1000            | 390                      | 16.0                                   | 5.0                        | 4.0                                     | 10.0                                     | 50                                        | MKP386M439250J**             |
|                         | 0.47                                               | 30.0                          | 46.0 | 44.0 | 1000            | 470                      | 18.0                                   | 4.0                        | 4.0                                     | 10.0                                     | 50                                        | MKP386M447250J**             |
|                         | 0.47                                               | 25.0                          | 45.0 | 58.0 | 795             | 374                      | 15.0                                   | 5.5                        | 5.0                                     | 15.0                                     | 75                                        | MKP386M447250Y**             |
|                         | 0.56                                               | 30.0                          | 45.0 | 58.0 | 795             | 445                      | 17.0                                   | 4.5                        | 5.0                                     | 15.0                                     | 75                                        | MKP386M456250Y**             |
|                         | 0.68                                               | 35.0                          | 50.0 | 58.0 | 795             | 541                      | 20.5                                   | 4.0                        | 5.0                                     | 15.0                                     | 75                                        | MKP386M468250Y**             |
| 0.82                    | 35.0                                               | 50.0                          | 58.0 | 795  | 652             | 22.5                     | 3.0                                    | 5.0                        | 15.0                                    | 75                                       | MKP386M482250Y**                          |                              |

## Notes

- (1) Change the symbol \*\* according special code for the terminals (see Packaging Information table)  
 (2) Maximum RMS current at 100 kHz, + 85 °C  
 (3) The ESR (Equivalent Series Resistance) typical values at 100 kHz  
 (4) Standard dimension

## PACKAGING INFORMATION

| U <sub>RDC</sub><br>(V) | CAP.<br>(μF) | ORDERING CODE <sup>(1)</sup> | MASS<br>(g) | TERMINAL AVAILABLE - SPQ (pcs) |    |    |    |    |    |    |    |
|-------------------------|--------------|------------------------------|-------------|--------------------------------|----|----|----|----|----|----|----|
|                         |              |                              |             | T1                             | T2 | T3 | T4 | T5 | T6 | T7 | T8 |
| 700                     | 0.47         | MKP386M447070J**             | 41          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 0.68         | MKP386M468070J**             | 39          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 1.0          | MKP386M510070J**             | 38          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 1.5          | MKP386M515070J**             | 35          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 2.0          | MKP386M520070J**             | 59          | 42                             | 42 | 36 | 42 | 36 | 42 | 36 | 42 |
|                         | 2.2          | MKP386M522070J**             | 57          | 42                             | 42 | 36 | 42 | 36 | 42 | 36 | 42 |
|                         | 3.0          | MKP386M530070J**             | 91          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
|                         | 3.3          | MKP386M533070J**             | 89          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
|                         | 4.0          | MKP386M540070J**             | 86          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
|                         | 4.7          | MKP386M547070J**             | 82          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
| 850                     | 5.0          | MKP386M550070J**             | 80          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
|                         | 0.47         | MKP386M447085J**             | 40          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 0.68         | MKP386M468085J**             | 39          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 0.82         | MKP386M482085J**             | 38          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 1.0          | MKP386M510085J**             | 36          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 1.5          | MKP386M515085J**             | 60          | 42                             | 42 | 36 | 42 | 36 | 42 | 36 | 42 |
|                         | 2.0          | MKP386M520085J**             | 56          | 42                             | 42 | 36 | 42 | 36 | 42 | 36 | 42 |
|                         | 2.2          | MKP386M522085J**             | 55          | 42                             | 42 | 36 | 42 | 36 | 42 | 36 | 42 |
|                         | 3.0          | MKP386M530085J**             | 88          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
|                         | 3.3          | MKP386M533085J**             | 86          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
|                         | 4.0          | MKP386M540085J**             | 86          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
|                         | 4.7          | MKP386M547085Y**             | 79          | 50                             | 50 | 48 | 55 | 55 | 55 | 50 | 50 |
|                         | 5.0          | MKP386M550085Y**             | 78          | 50                             | 50 | 48 | 55 | 55 | 55 | 50 | 50 |
|                         | 6.0          | MKP386M560085Y**             | 93          | 45                             | 45 | 40 | 45 | 45 | 45 | 45 | 45 |
|                         | 7.0          | MKP386M570085Y**             | 90          | 45                             | 45 | 40 | 45 | 45 | 45 | 45 | 45 |
|                         | 8.0          | MKP386M580085Y**             | 121         | 35                             | 35 | 36 | 40 | 40 | 40 | 35 | 35 |
|                         | 10           | MKP386M610085Y**             | 114         | 35                             | 35 | 36 | 40 | 40 | 40 | 35 | 35 |



## PACKAGING INFORMATION

| U <sub>RDC</sub><br>(V) | CAP.<br>(μF) | ORDERING CODE <sup>(1)</sup> | MASS<br>(g) | TERMINAL AVAILABLE - SPQ (pcs) |    |    |    |    |    |    |    |
|-------------------------|--------------|------------------------------|-------------|--------------------------------|----|----|----|----|----|----|----|
|                         |              |                              |             | T1                             | T2 | T3 | T4 | T5 | T6 | T7 | T8 |
| 1000                    | 0.47         | MKP386M447100J**             | 39          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 0.56         | MKP386M456100J**             | 39          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 0.68         | MKP386M468100J**             | 38          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 0.82         | MKP386M482100J**             | 37          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 1.0          | MKP386M510100J**             | 35          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 1.2          | MKP386M512100J**             | 60          | 42                             | 42 | 36 | 42 | 36 | 42 | 36 | 42 |
|                         | 1.5          | MKP386M515100J**             | 58          | 42                             | 42 | 36 | 42 | 36 | 42 | 36 | 42 |
|                         | 1.8          | MKP386M518100J**             | 56          | 42                             | 42 | 36 | 42 | 36 | 42 | 36 | 42 |
|                         | 2.0          | MKP386M520100J**             | 92          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
|                         | 2.2          | MKP386M522100J**             | 90          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
|                         | 2.5          | MKP386M525100J**             | 88          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
|                         | 2.7          | MKP386M527100J**             | 86          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
|                         | 3.3          | MKP386M533100J**             | 81          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
|                         | 3.3          | MKP386M533100Y**             | 78          | 50                             | 50 | 48 | 55 | 55 | 55 | 50 | 50 |
|                         | 4.0          | MKP386M540100Y**             | 75          | 50                             | 50 | 48 | 55 | 55 | 55 | 50 | 50 |
|                         | 4.7          | MKP386M547100Y**             | 90          | 45                             | 45 | 40 | 45 | 45 | 45 | 45 | 45 |
|                         | 5.0          | MKP386M550100Y**             | 89          | 45                             | 45 | 40 | 45 | 45 | 45 | 45 | 45 |
|                         | 6.0          | MKP386M560100Y**             | 119         | 35                             | 35 | 36 | 40 | 40 | 40 | 35 | 35 |
|                         | 7.0          | MKP386M570100Y**             | 114         | 35                             | 35 | 36 | 40 | 40 | 40 | 35 | 35 |
| 1250                    | 0.33         | MKP386M433125J**             | 40          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 0.39         | MKP386M439125J**             | 39          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 0.47         | MKP386M447125J**             | 38          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 0.56         | MKP386M456125J**             | 37          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 0.68         | MKP386M468125J**             | 36          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 0.82         | MKP386M482125J**             | 60          | 42                             | 42 | 36 | 42 | 36 | 42 | 36 | 42 |
|                         | 1.0          | MKP386M510125J**             | 59          | 42                             | 42 | 36 | 42 | 36 | 42 | 36 | 42 |
|                         | 1.2          | MKP386M512125J**             | 56          | 42                             | 42 | 36 | 42 | 36 | 42 | 36 | 42 |
|                         | 1.5          | MKP386M515125J**             | 91          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
|                         | 1.8          | MKP386M518125J**             | 88          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
|                         | 2.0          | MKP386M520125J**             | 86          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
|                         | 2.2          | MKP386M522125J**             | 84          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
|                         | 2.2          | MKP386M522125Y**             | 81          | 50                             | 50 | 48 | 55 | 55 | 55 | 50 | 50 |
|                         | 2.5          | MKP386M525125Y**             | 79          | 50                             | 50 | 48 | 55 | 55 | 55 | 50 | 50 |
|                         | 3.0          | MKP386M530125Y**             | 76          | 50                             | 50 | 48 | 55 | 55 | 55 | 50 | 50 |
|                         | 3.3          | MKP386M533125Y**             | 93          | 45                             | 45 | 40 | 45 | 45 | 45 | 45 | 45 |
|                         | 4.0          | MKP386M540125Y**             | 123         | 35                             | 35 | 36 | 40 | 40 | 40 | 35 | 35 |
|                         | 4.7          | MKP386M547125Y**             | 119         | 35                             | 35 | 36 | 40 | 40 | 40 | 35 | 35 |
|                         | 5.0          | MKP386M550125Y**             | 116         | 35                             | 35 | 36 | 40 | 40 | 40 | 35 | 35 |
| 1600                    | 0.22         | MKP386M422160J**             | 40          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 0.27         | MKP386M427160J**             | 39          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 0.33         | MKP386M433160J**             | 38          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 0.39         | MKP386M439160J**             | 37          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 0.47         | MKP386M447160J**             | 35          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 0.56         | MKP386M456160J**             | 61          | 42                             | 42 | 36 | 42 | 36 | 42 | 36 | 42 |
|                         | 0.68         | MKP386M468160J**             | 59          | 42                             | 42 | 36 | 42 | 36 | 42 | 36 | 42 |
|                         | 0.82         | MKP386M482160J**             | 57          | 42                             | 42 | 36 | 42 | 36 | 42 | 36 | 42 |
|                         | 1.0          | MKP386M510160J**             | 54          | 42                             | 42 | 36 | 42 | 36 | 42 | 36 | 42 |
|                         | 1.3          | MKP386M513160J**             | 87          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
|                         | 1.5          | MKP386M515160J**             | 84          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
|                         | 1.8          | MKP386M518160J**             | 79          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
|                         | 2.0          | MKP386M520160K**             | 76          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
|                         | 1.5          | MKP386M515160Y**             | 75          | 50                             | 50 | 48 | 55 | 55 | 55 | 50 | 50 |
|                         | 2.0          | MKP386M520160Y**             | 87          | 45                             | 45 | 40 | 45 | 45 | 45 | 45 | 45 |
|                         | 2.2          | MKP386M522160Y**             | 119         | 35                             | 35 | 36 | 40 | 40 | 40 | 35 | 35 |
|                         | 2.5          | MKP386M525160Y**             | 115         | 35                             | 35 | 36 | 40 | 40 | 40 | 35 | 35 |

**PACKAGING INFORMATION**

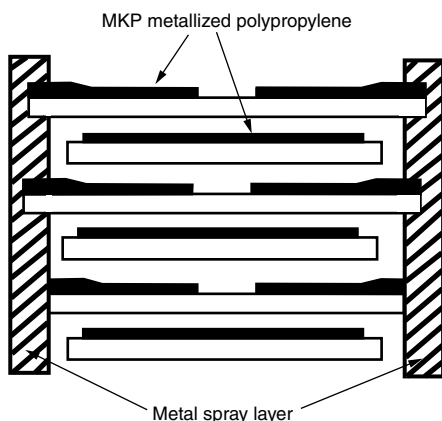
| U <sub>RDC</sub><br>(V) | CAP.<br>(μF) | ORDERING CODE <sup>(1)</sup> | MASS<br>(g) | TERMINAL AVAILABLE - SPQ (pcs) |    |    |    |    |    |    |    |
|-------------------------|--------------|------------------------------|-------------|--------------------------------|----|----|----|----|----|----|----|
|                         |              |                              |             | T1                             | T2 | T3 | T4 | T5 | T6 | T7 | T8 |
| 2000                    | 0.047        | MKP386M347200J**             | 41          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 0.068        | MKP386M368200J**             | 40          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 0.10         | MKP386M410200J**             | 39          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 0.12         | MKP386M412200J**             | 38          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 0.15         | MKP386M415200J**             | 37          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 0.22         | MKP386M422200J**             | 61          | 42                             | 42 | 36 | 42 | 36 | 42 | 36 | 42 |
|                         | 0.27         | MKP386M427200J**             | 59          | 42                             | 42 | 36 | 42 | 36 | 42 | 36 | 42 |
|                         | 0.33         | MKP386M433200J**             | 57          | 42                             | 42 | 36 | 42 | 36 | 42 | 36 | 42 |
|                         | 0.39         | MKP386M439200J**             | 55          | 42                             | 42 | 36 | 42 | 36 | 42 | 36 | 42 |
|                         | 0.47         | MKP386M447200J**             | 90          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
|                         | 0.56         | MKP386M456200J**             | 87          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
|                         | 0.68         | MKP386M468200J**             | 82          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
|                         | 0.68         | MKP386M468200Y**             | 78          | 50                             | 50 | 48 | 55 | 55 | 55 | 50 | 50 |
|                         | 0.82         | MKP386M482200Y**             | 75          | 50                             | 50 | 48 | 55 | 55 | 55 | 50 | 50 |
|                         | 1.0          | MKP386M510200Y**             | 89          | 45                             | 45 | 40 | 45 | 45 | 45 | 45 | 45 |
|                         | 1.5          | MKP386M515200Y**             | 112         | 35                             | 35 | 36 | 40 | 40 | 40 | 35 | 35 |
| 2500                    | 0.047        | MKP386M347250J**             | 40          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 0.068        | MKP386M368250J**             | 39          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 0.10         | MKP386M410250J**             | 37          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 0.12         | MKP386M412250J**             | 36          |                                |    | 48 |    | 48 |    | 55 |    |
|                         | 0.15         | MKP386M415250J**             | 61          | 42                             | 42 | 36 | 42 | 36 | 42 | 36 | 42 |
|                         | 0.18         | MKP386M418250J**             | 59          | 42                             | 42 | 36 | 42 | 36 | 42 | 36 | 42 |
|                         | 0.22         | MKP386M422250J**             | 57          | 42                             | 42 | 36 | 42 | 36 | 42 | 36 | 42 |
|                         | 0.33         | MKP386M433250J**             | 88          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
|                         | 0.39         | MKP386M439250J**             | 85          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
|                         | 0.47         | MKP386M447250J**             | 80          | 63                             | 63 | 54 | 63 | 60 | 63 | 60 | 63 |
|                         | 0.47         | MKP386M447250Y**             | 74          | 50                             | 50 | 48 | 55 | 55 | 55 | 50 | 50 |
|                         | 0.56         | MKP386M456250Y**             | 89          | 45                             | 45 | 40 | 45 | 45 | 45 | 45 | 45 |
|                         | 0.68         | MKP386M468250Y**             | 119         | 35                             | 35 | 36 | 40 | 40 | 40 | 35 | 35 |
|                         | 0.82         | MKP386M482250Y**             | 113         | 35                             | 35 | 36 | 40 | 40 | 40 | 35 | 35 |

**Note**

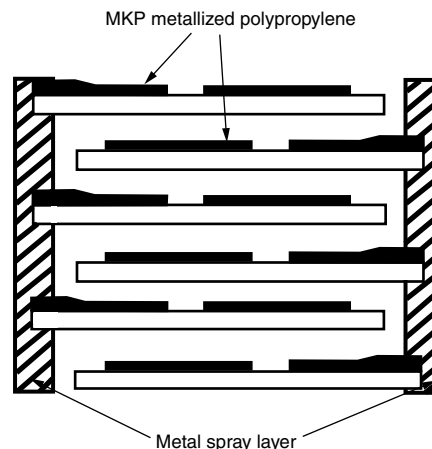
(1) Change the \*\* symbol according special code for the terminals

**CONSTRUCTION**

Low inductive wound cells elements of metallized polypropylene film, potted with resin in flame retardant case. Series construction for 420 V<sub>AC</sub> to 600 V<sub>AC</sub> versions build in case width ≤ 44 mm and 450 V<sub>AC</sub> to 550 V<sub>AC</sub> versions build in case width > 44 mm.



Triple construction for 700 V<sub>AC</sub> and 800 V<sub>AC</sub> versions build in case width ≤ 44 mm and 550 V<sub>AC</sub> to 700 V<sub>AC</sub> versions build in case width > 44 mm.



Series construction with 4 sections for 800 V<sub>AC</sub> versions build in case width > 44 mm.



## MOUNTING

### Normal Use

The capacitors are designed for mounting on printed-circuit boards or IGBT or GTO modules.

### Specific Method of Mounting to Withstand Vibration and Shock

In order to withstand vibration and shock tests, the capacitors shall be mechanically fixed by tabs it must be ensured that the tabs are screwed tightly on the test board.

When the weight of the capacitor is bigger than 50 g it needs a clamp in the body of the capacitor.

## SOLDERING CONDITIONS

### Storage Temperature

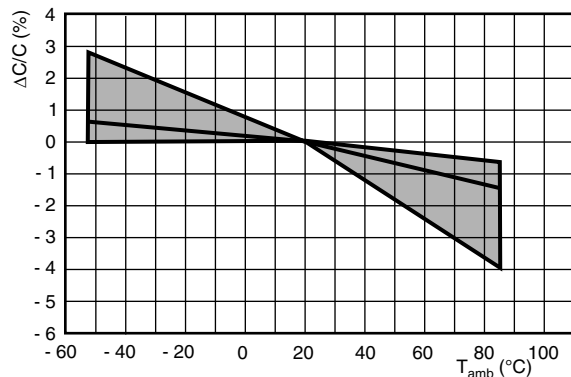
$T_{stg} = -25\text{ °C to } +35\text{ °C}$  with RH maximum 75 % without condensation.

### Ratings and Characteristics Reference Conditions

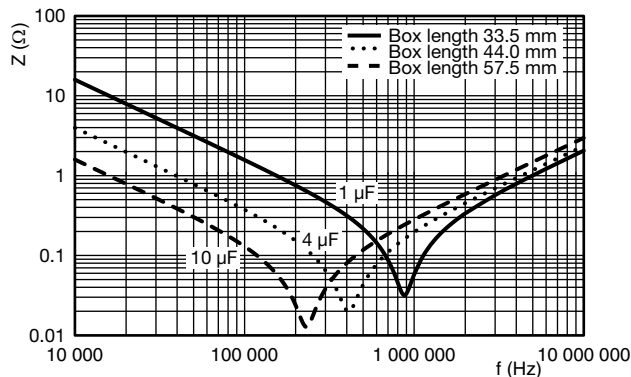
Unless otherwise specified, all electrical values apply to an ambient temperature of  $23\text{ °C} \pm 1\text{ °C}$ , an atmospheric pressure of 86 kPa to 106 kPa and a relative humidity of  $50\% \pm 2\%$ .

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 %.

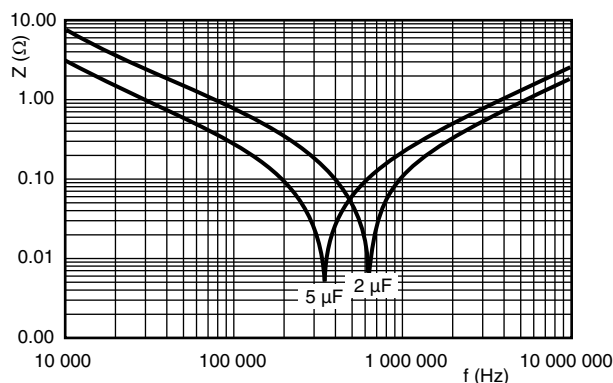
## CHARACTERISTICS



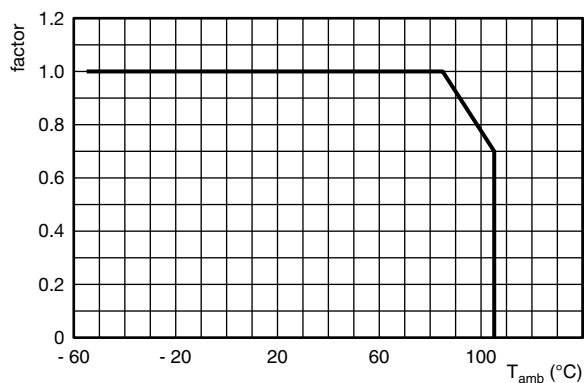
Capacitance as a function of ambient temperature (typical curve)



Impedance as a function of frequency (typical curve)



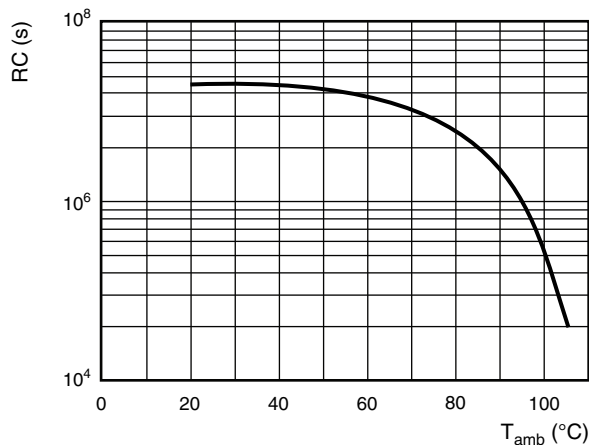
Impedance as function of frequency for box length 44.0 mm (typical curve)



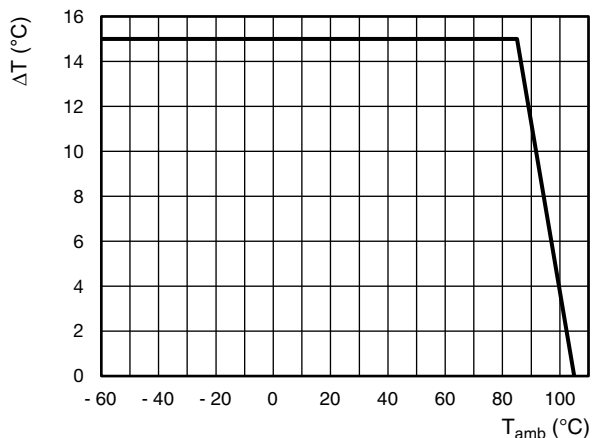
Max. DC and AC voltage as a function of temperature



## CHARACTERISTICS

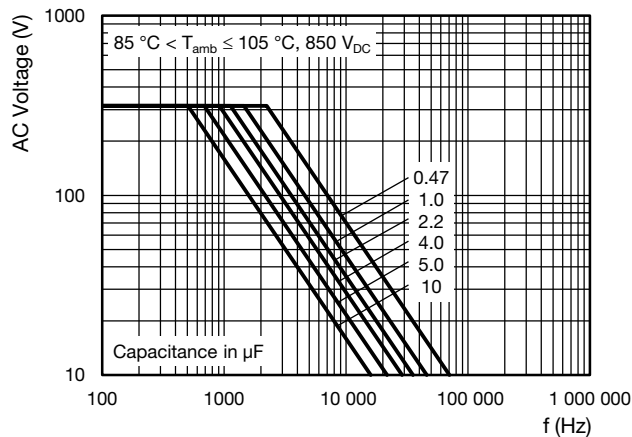
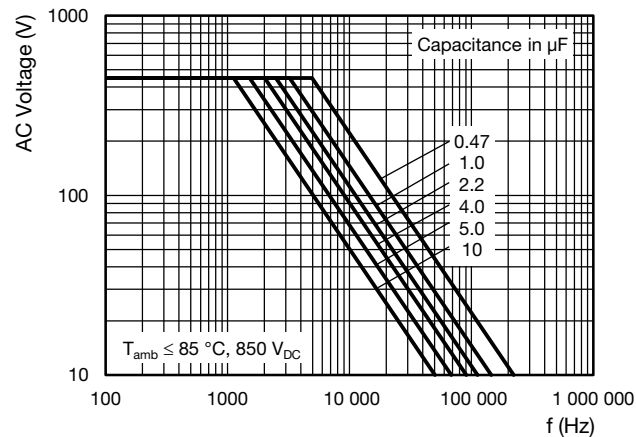
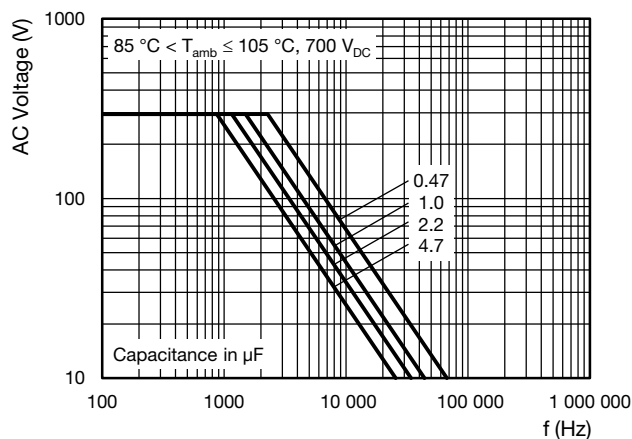
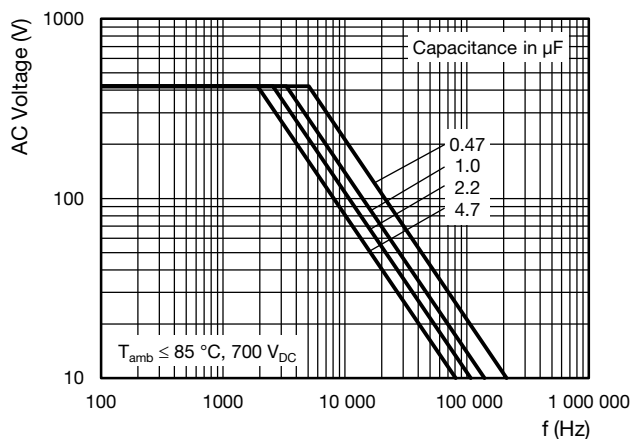


Insulation resistance as a function of ambient temperature (typical curve)



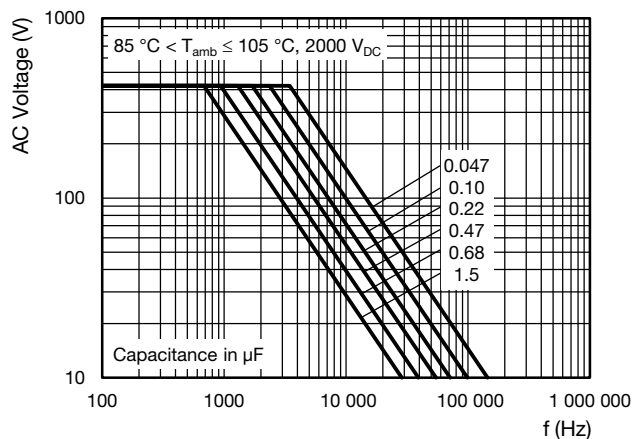
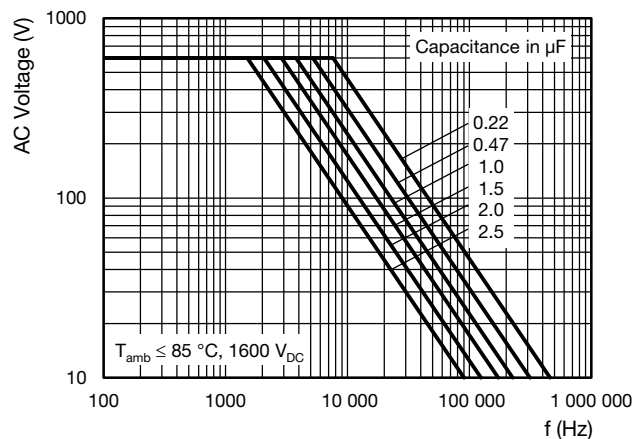
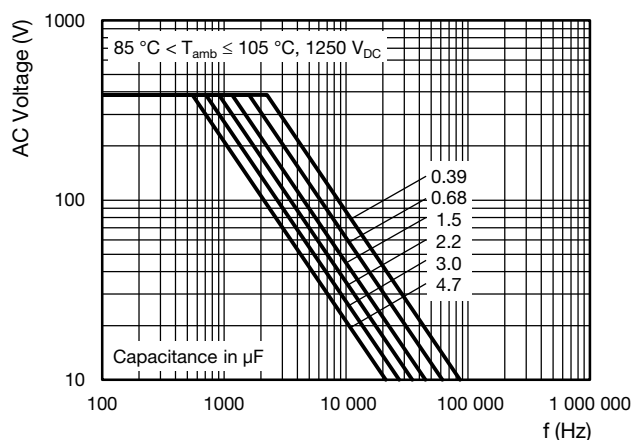
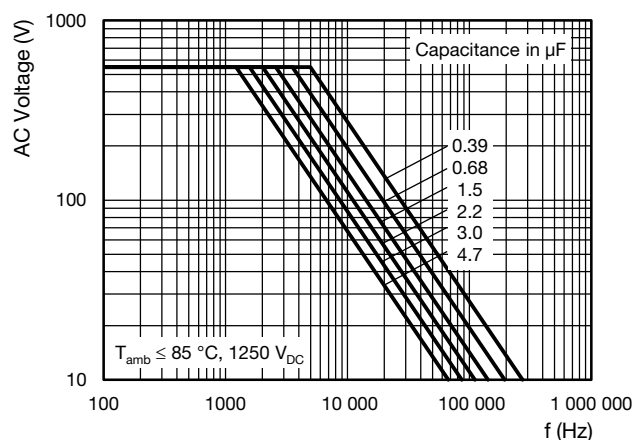
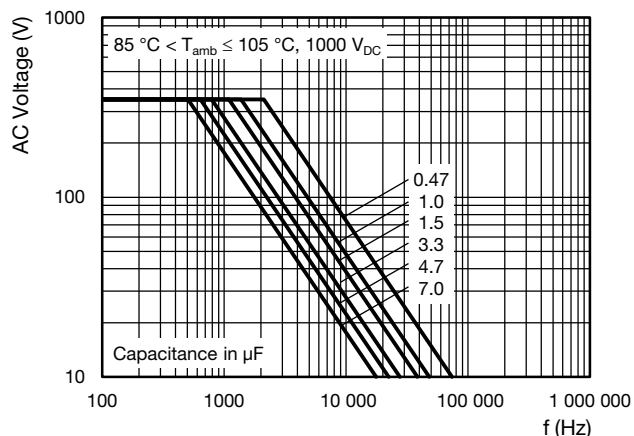
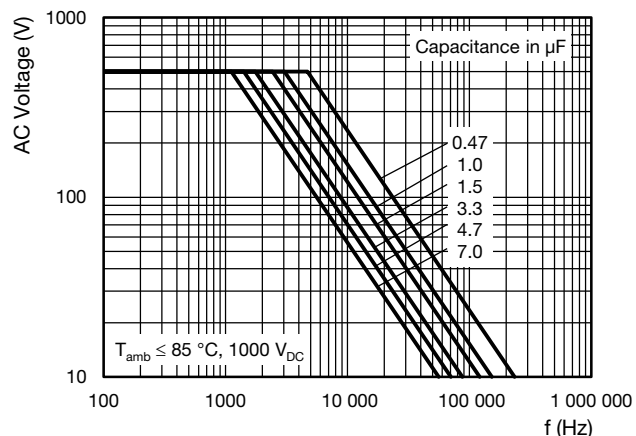
Maximum allowed component temperature rise ( $\Delta T$ ) as function of the ambient temperature ( $T_{amb}$ )

## MAXIMUM RMS VOLTAGE (SINEWAVE) AS A FUNCTION OF FREQUENCY



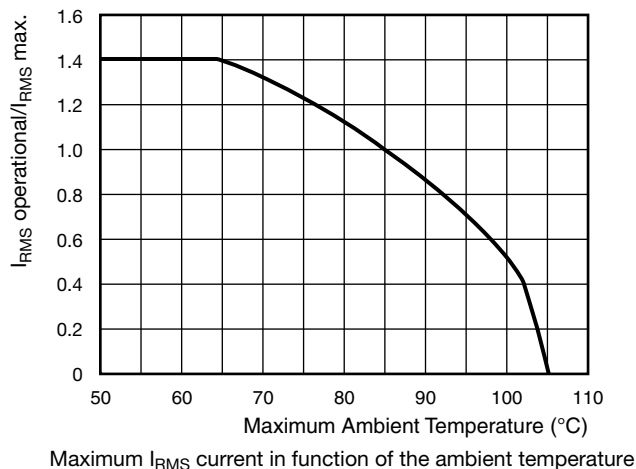
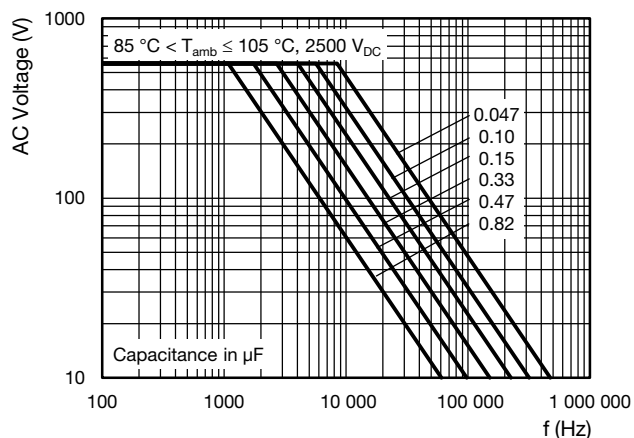
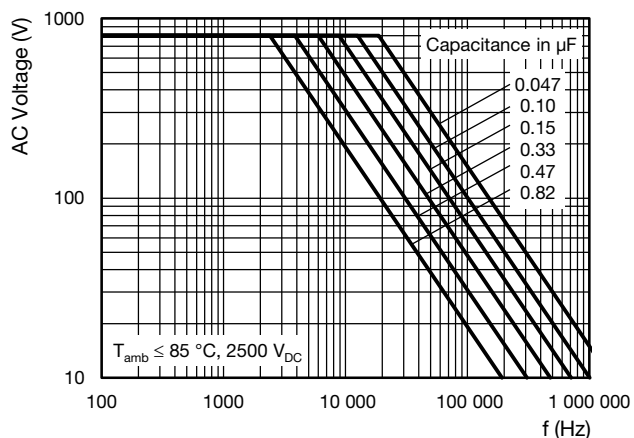
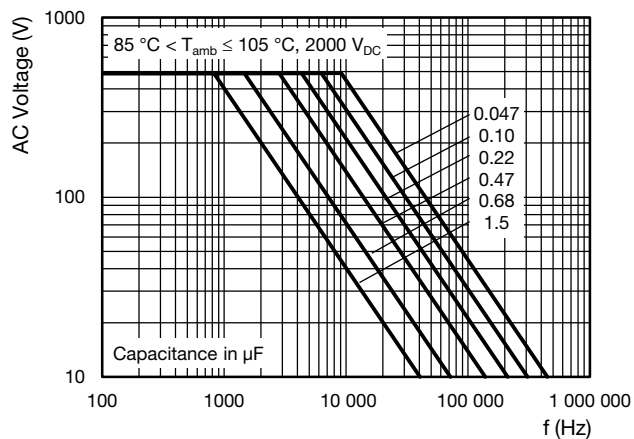
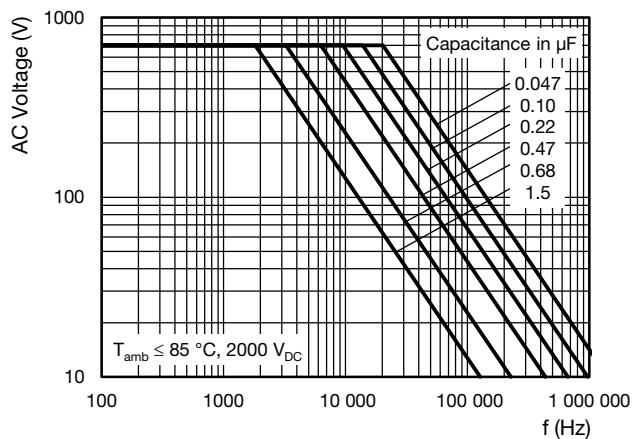


## MAXIMUM RMS VOLTAGE (SINEWAVE) AS A FUNCTION OF FREQUENCY





## MAXIMUM RMS VOLTAGE (SINEWAVE) AS A FUNCTION OF FREQUENCY



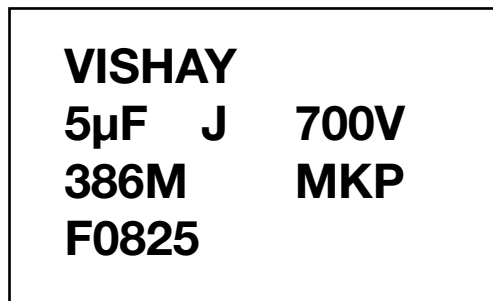
## MARKING

### Product Marking and Identification

The capacitor is marked by laser print or stamp, with following information:

1. Manufacturer's logo
2. Code for dielectric material (MKP)
3. Manufacturer's type designation (386)
4. Single metallized (M)
5. Rated capacitance value (5  $\mu$ F)
6. Tolerance on rated capacitance (J =  $\pm$  5 %)
7. Rated DC voltage (700 V)
8. Code for factory of origin (F)
9. Year and week of manufacture (e.g. 0825)

### Printing Example:



### Packing Bar Code Label

1. Manufacturer's logo
2. Country of origin
3. Sub family
4. Type description
5. Capacitance value, tolerance, voltage and climatic category according to IEC 60068-1
6. Production center
7. Preference origin code: A  
Country of origin in code
8. Product type description
9. Batch number
10. Quantity and production date, year week code
11. Product code

### Label Example:



## HEAT CONDUCTIVITY (G) AS A FUNCTION OF ORIGINAL PITCH AND CAPACITOR BODY THICKNESS IN mW/°C

| W <sub>max</sub> . (mm) | HEAT CONDUCTIVITY (mW/°C) |                    |                    |
|-------------------------|---------------------------|--------------------|--------------------|
|                         | BOX LENGTH 33.5 mm        | BOX LENGTH 44.0 mm | BOX LENGTH 58.0 mm |
| 22                      | 75                        | 100                | -                  |
| 25                      | -                         | -                  | 155                |
| 30                      | -                         | 140                | 170                |
| 35                      | -                         | -                  | 200                |

## 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.

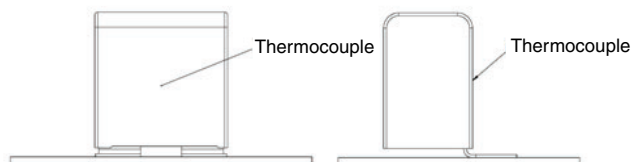
The power dissipation can be calculated according type detail specification "HQN-384-01/101: Technical Information Film Capacitors" with the typical tgδ of the curves.

The component temperature rise ( $\Delta T$ ) can be measured (see section "Measuring the Component Temperature" for more details) or calculated by  $\Delta T = P/G$ :

- $\Delta T$  = Component temperature rise (°C) with maximum of 10 °C rise (°C)
- P = Power dissipation of the component (mW)
- G = Heat conductivity of the component (mW/°C)

## MEASURING THE COMPONENT TEMPERATURE

A thermocouple must be attached to the capacitor body as in:



The temperature is measured in unloaded ( $T_{amb}$ ) and maximum loaded condition ( $T_C$ ).

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

To avoid radiation or convection, the capacitor should be tested in a wind-free box.

## APPLICATION NOTE AND LIMITING CONDITIONS

These capacitors are not suitable for mains applications as across-the-line capacitors without additional protection, as described hereunder. 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:

1. The peak voltage ( $U_P$ ) shall not be greater than the rated DC voltage ( $U_{RDC}$ )
2. The peak-to-peak voltage ( $U_{pp}$ ) shall not be greater than the maximum ( $U_{pp}$ ) to avoid the ionization inception level
3. The voltage peak slope ( $dU/dt$ ) shall not exceed the rated voltage pulse slope in an RC-circuit at rated voltage and without ringing. If the pulse voltage is lower than the rated DC voltage, the rated voltage pulse slope may be multiplied by  $U_{RDC}$  and divided by the applied voltage.

For all other pulses following equation must be fulfilled:

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

$T$  is the pulse duration.

4. The maximum component surface temperature rise must be lower than the limits (see figure Max. Allowed Component Temperature Rise)
5. Since in circuits used at voltages over 280 V peak-to-peak the risk for an intrinsically active flammability after a capacitor breakdown (short circuit) increases, it is recommended that the power to the component is limited to 100 times the values mentioned in the table "Heat conductivity"
6. When using these capacitors as across-the-line capacitor in the input filter for mains applications or as series connected with an impedance to the mains the applicant must guarantee that the following conditions are fulfilled in any case (spikes and surge voltages from the mains included)

| VOLTAGE CONDITIONS FOR 6 ABOVE             |                                 |                                                        |
|--------------------------------------------|---------------------------------|--------------------------------------------------------|
| ALLOWED VOLTAGES                           | $T_{amb} \leq 85^\circ\text{C}$ | $85^\circ\text{C} \leq T_{amb} \leq 105^\circ\text{C}$ |
| Maximum continuous RMS voltage             | $U_{RAC}$                       | $0.7 \times U_{RAC}$                                   |
| Maximum temporary RMS overvoltage (< 24 h) | $1.25 \times U_{RAC}$           | $0.875 \times U_{RAC}$                                 |
| Maximum peak voltage ( $V_{o-p}$ ) (< 2 s) | $1.6 \times U_{RDC}$            | $1.1 \times U_{RDC}$                                   |



## INSPECTION REQUIREMENTS

### General Notes

Sub-clause numbers of tests and performance requirements refer to the “Sectional Specification, Publication IEC 60384-17”.

| GROUP C INSPECTION REQUIREMENTS                     |                                                                                                                                                                                                                             |                                                                                        |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| SUB-CLAUSE NUMBER AND TEST                          | CONDITIONS                                                                                                                                                                                                                  | PERFORMANCE REQUIREMENTS                                                               |
| <b>SUB-GROUP C1A PART OF SAMPLE OF SUB-GROUP C1</b> |                                                                                                                                                                                                                             |                                                                                        |
| 4.1 Dimensions (details)                            |                                                                                                                                                                                                                             | As specified in chapters “General Data” of this specification                          |
| 4.3.1 Initial measurements                          | Capacitance<br>Tangent of loss angle:<br>For $C > 1 \mu\text{F}$ at 1 kHz<br>For $C \leq 1 \mu\text{F}$ at 10 kHz                                                                                                           |                                                                                        |
| 4.3 Robustness of terminations                      | Tensile: Load 30 N; 10 s                                                                                                                                                                                                    | No visible damage                                                                      |
| 4.4 Resistance to soldering heat                    | No pre-drying<br>Method: 1A<br>Solder bath: 265 °C<br>Duration: 10 s                                                                                                                                                        |                                                                                        |
| 4.4.2 Final measurements                            | Visual examination                                                                                                                                                                                                          | No visible damage<br>Legible marking                                                   |
|                                                     | Capacitance                                                                                                                                                                                                                 | $ \Delta C/C  \leq 2 \%$ of the value measured initially                               |
|                                                     | Tangent of loss angle                                                                                                                                                                                                       | Increase of $\tan \delta: \leq 0.002$<br>Compared to values measured initially         |
|                                                     | Insulation resistance                                                                                                                                                                                                       | $\leq 50 \%$ values specified in section “Insulation Resistance” of this specification |
| <b>SUB-GROUP C1B PART OF SAMPLE OF SUB-GROUP C1</b> |                                                                                                                                                                                                                             |                                                                                        |
| 4.6.1 Initial measurements                          | Capacitance<br>Tangent of loss angle:<br>For $C > 1 \mu\text{F}$ at 1 kHz<br>For $C \leq 1 \mu\text{F}$ at 10 kHz                                                                                                           |                                                                                        |
| 4.6 Rapid change of temperature                     | $\theta A = -55 \text{ }^{\circ}\text{C}$<br>$\theta B = +105 \text{ }^{\circ}\text{C}$<br>5 cycles<br>Duration $t = 30 \text{ min}$<br>Visual examination                                                                  | No visible damage                                                                      |
| 4.7 Vibration                                       | Mounting: See section “Mounting” of this specification<br>Procedure B4:<br>Frequency range: 10 Hz to 55 Hz<br>Amplitude: 0.75 mm or<br>Acceleration 98 m/s <sup>2</sup><br>(whichever is less severe)<br>Total duration 6 h |                                                                                        |
| 4.7.2 Final inspection                              | Visual examination                                                                                                                                                                                                          | No visible damage                                                                      |
| 4.9 Shock                                           | Mounting: See section “Mounting” for more information<br>Pulse shape: Half sine<br>Acceleration: 490 m/s <sup>2</sup><br>Duration of pulse: 11 ms<br>Visual examination                                                     | No visible damage                                                                      |



| <b>GROUP C INSPECTION REQUIREMENTS</b>                                     |                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SUB-CLAUSE NUMBER AND TEST</b>                                          | <b>CONDITIONS</b>                                                                                                                                                                           | <b>PERFORMANCE REQUIREMENTS</b>                                                                                                                                                                                                                                                                                                                         |
| <b>SUB-GROUP C1B PART OF SAMPLE OF SUB-GROUP C1</b>                        |                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                         |
| 4.9.3 Final measurements                                                   | Capacitance<br><br>Tangent of loss angle<br><br>Insulation resistance                                                                                                                       | $ \Delta C/C  \leq 2\%$ of the value measured initially<br><br>Increase of $\tan \delta \leq 0.002$<br>Compared to values measured initially<br><br>$\geq 50\%$ values specified in section "Insulation Resistance" of this specification                                                                                                               |
| 4.15 Solvent resistance of the marking                                     | Isopropyl alcohol at room temperature<br>Method: 1<br>Rubbing material: Cotton wool<br>Immersion time: 5 min $\pm$ 0.5 min                                                                  | No visible damage<br>Legible marking                                                                                                                                                                                                                                                                                                                    |
| <b>SUB-GROUP C1 COMBINED SAMPLE OF SPECIMENS OF SUB-GROUPS C1A AND C1B</b> |                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                         |
| 4.10 Climatic sequence                                                     |                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                         |
| 4.10.2 Dry heat                                                            | Temperature: + 105 °C<br>Duration: 16 h                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                         |
| 4.10.3 Damp heat cyclic<br>Test Db, first cycle                            |                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                         |
| 4.10.4 Cold                                                                | Temperature: - 55 °C<br>Duration: 2 h                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                         |
| 4.10.6 Damp heat cyclic<br>Test Db<br>remaining cycles                     |                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                         |
| 4.10.6.2 Final measurements                                                | Voltage proof = $U_{RDC}$ for 1 min within<br>15 min after removal from test chamber<br><br>Visual examination<br><br>Capacitance<br><br>Tangent of loss angle<br><br>Insulation resistance | No breakdown or flash-over<br><br>No visible damage<br>Legible marking<br><br>$ \Delta C/C  \leq 3\%$ of the value measured initially<br><br>Increase of $\tan \delta: \leq 0.002$<br>Compared to values measured in 4.3.1 or<br>4.6.1 as applicable<br><br>$\geq 50\%$ of values specified in section<br>"Insulation Resistance" of this specification |
| <b>SUB-GROUP C2</b>                                                        |                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                         |
| 4.11 Damp heat steady state                                                |                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                         |
| 4.11.1 Initial measurements                                                | Capacitance<br>Tangent of loss angle at 1 kHz                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                         |
| 4.11.3 Final measurements                                                  | Visual examination<br>Voltage proof = $U_{RDC}$ for 1 min within<br>15 min after removal from test chamber<br><br>Capacitance<br><br>Tangent of loss angle<br><br>Insulation resistance     | No visible damage<br>Legible marking<br>No breakdown or flash-over<br><br>$ \Delta C/C  \leq 3\%$ of the value measured in 4.11.1.<br><br>Increase of $\tan \delta \leq 0.002$<br>Compared to values measured in 4.11.1<br><br>$\geq 50\%$ of values specified in section<br>"Insulation Resistance" of this specification                              |



| <b>GROUP C INSPECTION REQUIREMENTS</b>                                                 |                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SUB-CLAUSE NUMBER AND TEST</b>                                                      | <b>CONDITIONS</b>                                                                                                                                                                                                           | <b>PERFORMANCE REQUIREMENTS</b>                                                                                                                                                                                                                                                                                                                                      |
| <b>SUB-GROUP C3A</b>                                                                   |                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                      |
| 4.12.1 Endurance test<br>at 50 Hz alternative voltage                                  | Duration: 2000 h<br>1.25 x $U_{RAC}$ at 85 °C<br>0.875 x $U_{RAC}$ at 105 °C                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                      |
| 4.12.1.1 Initial measurements                                                          | Capacitance<br>Tangent of loss angle at:<br>For $C > 1 \mu F$ at 1 kHz<br>For $C \leq 1 \mu F$ at 10 kHz                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                      |
| 4.12.1.3 Final measurements                                                            | Visual examination<br><br>Capacitance<br><br>Tangent of loss angle<br><br>Insulation resistance                                                                                                                             | No visible damage<br>Legible marking<br><br>$ \Delta C/C  \leq 5 \%$ compared to values measured in 4.12.1.1<br><br>Increase of $\tan \delta$ :<br>$\leq 0.0015$ for $C \leq 1 \mu F$<br>$\leq 0.0015$ for $C > 1 \mu F$<br>Compared to values measured in 4.12.1.1<br><br>$\geq 50 \%$ of values specified in section "Insulation Resistance" of this specification |
| <b>SUB-GROUP C4</b>                                                                    |                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                      |
| 4.2.6 Temperature characteristics<br>Initial measurements<br>Intermediate measurements | Capacitance<br>Capacitance at - 55 °C<br>Capacitance at 20 °C<br>Capacitance at + 105 °C                                                                                                                                    | For - 55 °C to 20 °C<br>$0 \% \leq  \Delta C/C  \leq 2.75 \%$ or<br>For 20 °C to 105 °C<br>$- 5.5 \% \leq  \Delta C/C  \leq 0 \%$<br>As specified in section "Capacitance" of this specification                                                                                                                                                                     |
| 4.13 Charge and discharge                                                              | 10 000 cycles<br>(1...50 c/s) $2.5 \times (dU/dt)_R$ charge to $U_{RDC}$<br>with maximum pulse slope $\leq 0.01 (dU/dt)_R$<br>Duration: 5 ms<br><br>Discharge resistance:<br>$R = \frac{U_n(V_{DC})}{2.5 \times C (dU/dt)}$ |                                                                                                                                                                                                                                                                                                                                                                      |
| 4.13.1 Initial measurements                                                            | Capacitance<br>Tangent of loss angle at:<br>For $C > 1 \mu F$ at 1 kHz<br>For $C \leq 1 \mu F$ at 10 kHz                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                      |
| 4.13.3 Final measurements                                                              | Capacitance<br><br>Tangent of loss angle<br><br>Insulation resistance                                                                                                                                                       | $ \Delta C/C  \leq 5 \%$ compared to values measured in 4.13.1.<br><br>Increase of $\tan \delta$ :<br>$\leq 0.0015$ for $C \leq 1 \mu F$<br>$\leq 0.0015$ for $C > 1 \mu F$<br>Compared to values measured in 4.13.1<br><br>$\geq 50 \%$ of values specified in section "Insulation Resistance" of this specification                                                |



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