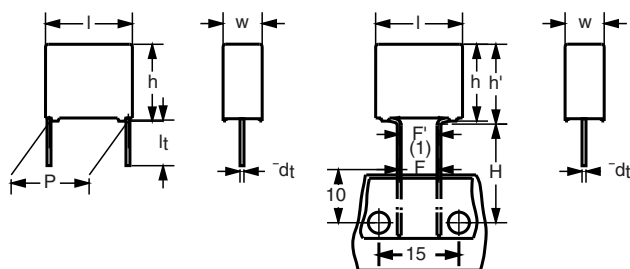




## AC and Pulse Double Metallized Polypropylene Film Capacitors MMKP Radial Potted Type



Dimensions in mm  
(1)  $|F - F'| < 0.3 \text{ mm}$   
 $F = 7.5 + 0.6/-0.1 \text{ mm}$

### FEATURES

7.5 mm bent back pitch. 15 mm to 27.5 mm lead pitch. Low contact resistance. Low loss dielectric. Small dimensions for high density packaging. Supplied loose in box and taped on reel

Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT

### ENCAPSULATION

Plastic case, epoxy resin sealed, flame retardant UL-class 94 V-0

### CLIMATIC CATEGORY

55/105/56

### CAPACITANCE RANGE (E24 SERIES)

0.001  $\mu\text{F}$  to 2.7  $\mu\text{F}$

### CAPACITANCE TOLERANCE

$\pm 5 \%$

### LEADS

Tinned wire

### RATED (DC) TEMPERATURE

85 °C

### RATED (AC) TEMPERATURE

105 °C

### MAXIMUM APPLICATION TEMPERATURE

105 °C

### DETAIL SPECIFICATION

For more detailed data and test requirements contact: [dc-film@vishay.com](mailto:dc-film@vishay.com)

### APPLICATIONS

Where steep pulses occur e.g. SMPS (switch mode power supplies). Electronic lighting e.g. Ballast. Motor control circuits. S-correction. For flyback applications please use 1400 V series.

### REFERENCE SPECIFICATIONS

IEC 60384-17

### MARKING

C-value; tolerance; rated voltage; sub-class; manufacturer's type; code for dielectric material; code for factory of origin; manufacturer; year and week of manufacture

### DIELECTRIC

Polypropylene film

### ELECTRODES

Metallized

### ENCAPSULATION

Flame retardant plastic case and epoxy resin

### CONSTRUCTION

Internal serial construction

### RATED (DC) VOLTAGE

250 V, 400 V, 630 V, 1000 V, 1400 V, 1600 V, 2000 V, 2500 V

### RATED (AC) VOLTAGE

125 V, 200 V, 220 V, 350 V, 500 V, 550 V, 700 V, 900 V

### RATED PEAK-TO-PEAK VOLTAGE

350 V, 560 V, 630 V, 1000 V, 1400 V, 1600 V, 2000 V, 2500 V



# AC and Pulse Double Metallized Polypropylene Film Capacitors MMKP Radial Potted Type

Vishay BCcomponents

**COMPOSITION OF CATALOG NUMBER**

| TYPE AND PITCHES |                | CAPACITANCE<br>(numerically) |  | MULTIPLIER<br>(nF) |   |
|------------------|----------------|------------------------------|--|--------------------|---|
| 383              | 15.0 mm/7.5 mm |                              |  | 0.1                | 2 |
|                  | 15.0 mm        |                              |  | 1                  | 3 |
|                  | 22.5 mm        |                              |  | 10                 | 4 |
|                  | 27.5 mm        |                              |  | 100                | 5 |

|                     |     |    |    |   |
|---------------------|-----|----|----|---|
| BFC2                | 383 | XX | YY | Y |
| 2222 <sup>(1)</sup> | 383 | XX | YY | Y |

(<sup>1</sup>) Old ordering code

Example:  
104 = 10 x 10 = 100 nF

| TYPE | PACKAGING                                              | LEAD CONFIGURATION                                              | PREFERRED TYPES |       |       |       |        |        |        |        |        |
|------|--------------------------------------------------------|-----------------------------------------------------------------|-----------------|-------|-------|-------|--------|--------|--------|--------|--------|
|      |                                                        |                                                                 | C-TOL.          | 250 V | 400 V | 630 V | 1000 V | 1400 V | 1600 V | 2000 V | 2500 V |
| 383  | Loose in box                                           | Lead length 3.5 mm ± 0.3 mm                                     | ± 5 %           | 00    | 10    | 20    | 30     | 40     | 50     | 60     | 70     |
|      | Taped on reel<br>(bent back to 7.5 mm) <sup>(1)</sup>  | H = 16.0 mm; P <sub>0</sub> = 15.0 mm<br>reel diameter = 500 mm | ± 5 %           | 03    | 13    | 23    | 33     | 43     | 53     | 63     | -      |
|      |                                                        |                                                                 | ON REQUEST      |       |       |       |        |        |        |        |        |
| 383  | Loose in box                                           | Lead length 5.0 mm ± 1.0 mm                                     | ± 5 %           | 01    | 11    | 21    | 31     | 41     | 51     | 61     | 71     |
|      |                                                        | Lead length 25.0 mm ± 2.0 mm                                    | ± 5 %           | 04    | 14    | 24    | 34     | 44     | 54     | 64     | 74     |
|      | Taped on reel<br><sup>(1)</sup>                        | H = 18.5 mm; P <sub>0</sub> = 12.7 mm                           | ± 5 %           | 02    | 12    | 22    | 32     | 42     | 52     | 62     | 72     |
|      | Taped on reel<br>(bent back to 7.5 mm) <sup>(1)</sup>  | H = 16.0 mm; P <sub>0</sub> = 15.0 mm<br>reel diameter = 356 mm | ± 5 %           | 05    | 15    | 25    | 35     | 45     | 55     | 65     | -      |
|      | Taped on reel<br>(bent back to 10.0 mm) <sup>(1)</sup> | H = 16.0 mm; P <sub>0</sub> = 15.0 mm<br>reel diameter = 500 mm | ± 5 %           | 08    | 18    | 28    | 38     | 48     | 58     | 68     | -      |

**Note**

(<sup>1</sup>) For detailed tape specifications refer to "Packaging Information" [www.vishay.com/doc?28139](http://www.vishay.com/doc?28139) or end of catalog

**SPECIFIC REFERENCE DATA (250 Vdc)**

| DESCRIPTION                                                          | VALUE                   |                         |
|----------------------------------------------------------------------|-------------------------|-------------------------|
|                                                                      | at 10 kHz               | at 100 kHz              |
| Tangent of loss angle:<br>C ≤ 0.15 μF                                | ≤ 5 x 10 <sup>-4</sup>  | ≤ 20 x 10 <sup>-4</sup> |
| 0.15 μF < C ≤ 0.39 μF                                                | ≤ 5 x 10 <sup>-4</sup>  | ≤ 25 x 10 <sup>-4</sup> |
| 0.39 μF < C ≤ 0.56 μF                                                | ≤ 10 x 10 <sup>-4</sup> | ≤ 25 x 10 <sup>-4</sup> |
| 0.56 μF < C ≤ 0.82 μF                                                | ≤ 10 x 10 <sup>-4</sup> | ≤ 40 x 10 <sup>-4</sup> |
| 0.82 μF < C ≤ 1.2 μF                                                 | ≤ 10 x 10 <sup>-4</sup> | ≤ 50 x 10 <sup>-4</sup> |
| 1.2 μF < C ≤ 1.8 μF                                                  | ≤ 10 x 10 <sup>-4</sup> | ≤ 65 x 10 <sup>-4</sup> |
| 1.8 μF < C ≤ 2.2 μF                                                  | ≤ 15 x 10 <sup>-4</sup> | ≤ 75 x 10 <sup>-4</sup> |
| 2.2 μF < C ≤ 2.7 μF                                                  | ≤ 15 x 10 <sup>-4</sup> | ≤ 85 x 10 <sup>-4</sup> |
| Rated voltage pulse slope (dU/d <sub>t</sub> )R:<br>C ≤ 0.15 μF      | 450 V/μs                |                         |
| 0.15 μF < C ≤ 0.39 μF                                                | 900 V/μs                |                         |
| 0.39 μF < C ≤ 0.82 μF                                                | 290 V/μs                |                         |
| 0.82 μF < C ≤ 2 μF                                                   | 190 V/μs                |                         |
| 2 μF < C ≤ 2.7 μF                                                    | 130 V/μs                |                         |
| R between leads, for C ≤ 1 μF at 100 V, 1 min                        | > 100 000 MΩ            |                         |
| RC between leads, for C > 1 μF at 100 V, 1 min                       | > 100 000 s             |                         |
| R between leads and case, 100 V, 1 min                               | > 30 000 MΩ             |                         |
| Ionization (AC) voltage (typical value) at 50 pC peak discharge      | > 220 V                 |                         |
| Withstanding (DC) voltage (cut off current 10 mA), rise time 100 V/s | 400 V, 1 min            |                         |
| Withstanding (DC) voltage between leads and case                     | 2840 V, 1 min           |                         |
| Maximum application temperature                                      | 105 °C                  |                         |



# AC and Pulse Double Metallized Polypropylene Film Capacitors MMKP Radial Potted Type

Vishay BCcomponents

 $U_{Rdc} = 250 \text{ V}$ ;  $U_{Rac} = 125 \text{ V}$ ;  $U_{pp} = 350 \text{ V}$ ;  $C\text{-tol.} = \pm 5 \%$ 

| C<br>(μF)                                                  | DIMENSIONS<br>w x h (h') x l<br>(mm) | MASS<br>(g) <sup>(1)</sup> | CATALOG NUMBER BFC2 383 XYYYY AND PACKAGING |                        |                 |                            |                |                          |
|------------------------------------------------------------|--------------------------------------|----------------------------|---------------------------------------------|------------------------|-----------------|----------------------------|----------------|--------------------------|
|                                                            |                                      |                            | LOOSE IN BOX                                |                        | REEL            |                            |                | C-VALUE                  |
|                                                            |                                      |                            | Leads<br>3.5 ± 0.3 mm                       | Leads<br>25.0 ± 2.0 mm | Original pitch  | Pitch = 7.5 mm (bent back) |                | ..YYY                    |
|                                                            |                                      |                            |                                             |                        |                 | Ø 500 mm                   | Ø 356 mm       |                          |
|                                                            |                                      |                            | XX<br>(SPQ)                                 | XX<br>(SPQ)            | XX<br>(SPQ)     | XX<br>(SPQ)                | XX<br>(SPQ)    |                          |
| Pitch = 15 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                      |                            |                                             |                        | Pitch = 15 mm   | Pitch = 7.5 mm (bent back) |                |                          |
| 0.082<br>0.091<br>0.1                                      | 5.0 x 11.0 (13.0) x 17.5             | 1.1                        | 00...<br>(1250)                             | 04...<br>(1000)        | 02...<br>(1100) | 03...<br>(950)             | 05...<br>(550) | 823<br>913<br>104        |
| 0.11<br>0.12<br>0.13<br>0.15                               | 6.0 x 12.0 (14.0) x 17.5             | 1.4                        | 00...<br>(1000)                             | 04...<br>(1000)        | 02...<br>(900)  | 03...<br>(800)             | 05...<br>(450) | 114<br>124<br>134<br>154 |
| 0.16<br>0.18<br>0.2                                        | 7.0 x 13.5 (15.5) x 17.5             | 1.8                        | 00...<br>(750)                              | 04...<br>(500)         | 02...<br>(800)  | 03...<br>(700)             | 05...<br>(400) | 164<br>184<br>204        |
| 0.22<br>0.24<br>0.27<br>0.3                                | 8.5 x 15.0 (17.0) x 17.5             | 2.6                        | 00...<br>(750)                              | 04...<br>(500)         | 02...<br>(650)  | 03...<br>(550)             | 05...<br>(300) | 224<br>244<br>274<br>304 |
| 0.33<br>0.36<br>0.39                                       | 10.0 x 16.5 (18.5) x 17.5            | 3.3                        | 00...<br>(500)                              | 04...<br>(450)         | 02...<br>(600)  | 03...<br>(500)             | 05...<br>(250) | 334<br>364<br>394        |

**Notes**<sup>(1)</sup> Net weight for short lead products only

• SPQ = Standard Packaging Quantity

 $U_{Rdc} = 250 \text{ V}$ ;  $U_{Rac} = 125 \text{ V}$ ;  $U_{pp} = 350 \text{ V}$ ;  $C\text{-tol.} = \pm 5 \%$ 

| CATALOG NUMBER BFC2 383 XYYYY AND PACKAGING                  |                                 |                            |                                                              |                        |                 |                          |
|--------------------------------------------------------------|---------------------------------|----------------------------|--------------------------------------------------------------|------------------------|-----------------|--------------------------|
| C<br>(μF)                                                    | DIMENSIONS<br>w x h x l<br>(mm) | MASS<br>(g) <sup>(1)</sup> | LOOSE IN BOX                                                 |                        | REEL            | C-VALUE                  |
|                                                              |                                 |                            | Leads<br>3.5 ± 0.3 mm                                        | Leads<br>25.0 ± 2.0 mm | Original pitch  | ..YYY                    |
|                                                              |                                 |                            | XX<br>(SPQ)                                                  | XX<br>(SPQ)            | XX<br>(SPQ)     |                          |
|                                                              |                                 |                            | Pitch = 22.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                        |                 | Pitch = 22.5 mm          |
| 0.43                                                         | 7.0 x 116.5 x 26.0              | 3.0                        | 00...<br>(200)                                               | 04...<br>(250)         | 02...<br>(550)  | 434                      |
| 0.47<br>0.51<br>0.56<br>0.62                                 | 8.5 x 18.0 x 26.0               | 4.2                        | 00...<br>(200)                                               | 04...<br>(250)         | 02...<br>(450)  | 474<br>514<br>564<br>624 |
| 0.68<br>0.75<br>0.82                                         | 10.0 x 19.5 x 26.0              | 5.3                        | 00...<br>(200)                                               | 04...<br>(200)         | 02...<br>(350)  | 684<br>754<br>824        |
| Pitch = 27.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                 |                            |                                                              |                        | Pitch = 27.5 mm |                          |
| 0.91<br>1.0<br>1.1<br>1.2                                    | 11.0 x 21.0 x 31.0              | 8.0                        | 00...<br>(750)                                               | 04...<br>(125)         | -               | 914<br>105<br>115<br>125 |
| 1.3<br>1.5<br>1.6                                            | 13.0 x 23.0 x 31.0              | 9.7                        | 00...<br>(500)                                               | 04...<br>(125)         |                 | 135<br>155<br>165        |
| 1.8<br>2.0                                                   | 15.0 x 25.0 x 31.0              | 12.6                       | 00...<br>(100)                                               | 04...<br>(125)         |                 | 185<br>205               |
| 2.2<br>2.4<br>2.7                                            | 18.0 x 28.0 x 31.0              | 16.3                       | 00...<br>(100)                                               | 04...<br>(100)         |                 | 225<br>245<br>275        |
|                                                              |                                 |                            |                                                              |                        |                 |                          |

**Notes**<sup>(1)</sup> Net weight for short lead products only

• SPQ = Standard Packaging Quantity



# AC and Pulse Double Metallized Polypropylene Film Capacitors MMKP Radial Potted Type

Vishay BCcomponents

**SPECIFIC REFERENCE DATA (400 Vdc)**

| DESCRIPTION                                                                                                                                                                              | VALUE                                                     |                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|-------------------------|
| Tangent of loss angle:<br>C ≤ 0.22 µF<br>0.22 µF < C ≤ 0.33 µF<br>0.33 µF < C ≤ 0.43 µF<br>0.43 µF < C ≤ 0.68 µF<br>0.68 µF < C ≤ 0.82 µF<br>0.82 µF < C ≤ 1.2 µF<br>1.2 µF < C ≤ 1.5 µF | at 10 kHz                                                 | at 100 kHz              |
|                                                                                                                                                                                          | ≤ 5 x 10 <sup>-4</sup>                                    | ≤ 20 x 10 <sup>-4</sup> |
|                                                                                                                                                                                          | ≤ 10 x 10 <sup>-4</sup>                                   | ≤ 35 x 10 <sup>-4</sup> |
|                                                                                                                                                                                          | ≤ 10 x 10 <sup>-4</sup>                                   | ≤ 40 x 10 <sup>-4</sup> |
|                                                                                                                                                                                          | ≤ 10 x 10 <sup>-4</sup>                                   | ≤ 50 x 10 <sup>-4</sup> |
|                                                                                                                                                                                          | ≤ 10 x 10 <sup>-4</sup>                                   | ≤ 55 x 10 <sup>-4</sup> |
|                                                                                                                                                                                          | ≤ 10 x 10 <sup>-4</sup>                                   | ≤ 60 x 10 <sup>-4</sup> |
| Rated voltage pulse slope (dU/dt) <sub>R</sub> :<br>C ≤ 0.082 µF<br>0.082 µF < C ≤ 0.22 µF<br>0.22 µF < C ≤ 0.43 µF<br>0.42 µF < C ≤ 1.1 µF<br>1.1 µF < C ≤ 1.5 µF                       | 600 V/µs<br>1200 V/µs<br>410 V/µs<br>260 V/µs<br>180 V/µs |                         |
|                                                                                                                                                                                          | > 100 000 MΩ                                              |                         |
|                                                                                                                                                                                          | > 100 000 s                                               |                         |
|                                                                                                                                                                                          | > 30 000 MΩ                                               |                         |
|                                                                                                                                                                                          | > 220 V                                                   |                         |
| Ionization (AC) voltage (typical value) at 50 pC peak discharge                                                                                                                          | > 220 V                                                   |                         |
| Withstanding (DC) voltage (cut off current 10 mA), rise time 100 V/s                                                                                                                     | 560 V, 1 min                                              |                         |
| Withstanding (DC) voltage between leads and case                                                                                                                                         | 2840 V, 1 min                                             |                         |
| Maximum application temperature                                                                                                                                                          | 105 °C                                                    |                         |

**U<sub>Rdc</sub> = 400 V; U<sub>Rac</sub> = 200 V; U<sub>pp</sub> = 560 V; C-tol. = ± 5 %**

| C<br>(μF)                                                  | DIMENSIONS<br>w x h (h') x l<br>(mm) | MASS<br>(g) <sup>(1)</sup> | CATALOG NUMBER BFC2 383 XXYYY AND PACKAGING |                        |                          |                            |                           |                   | C-VALUE<br>..YYY |                          |                |                          |
|------------------------------------------------------------|--------------------------------------|----------------------------|---------------------------------------------|------------------------|--------------------------|----------------------------|---------------------------|-------------------|------------------|--------------------------|----------------|--------------------------|
|                                                            |                                      |                            | LOOSE IN BOX                                |                        | REEL                     |                            |                           |                   |                  |                          |                |                          |
|                                                            |                                      |                            | Leads<br>3.5 ± 0.3 mm                       | Leads<br>25.0 ± 2.0 mm | Original pitch           | Pitch = 7.5 mm (bent back) |                           |                   |                  |                          |                |                          |
|                                                            |                                      |                            |                                             |                        |                          | Ø 500 mm                   | Ø 356 mm                  |                   |                  |                          |                |                          |
| XX<br>(SPQ)                                                | XX<br>(SPQ)                          | XX<br>(SPQ)                | XX<br>(SPQ)                                 | XX<br>(SPQ)            |                          |                            |                           |                   |                  |                          |                |                          |
| Pitch = 15 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                      |                            |                                             |                        | Pitch = 15 mm            | Pitch = 7.5 mm (bent back) |                           |                   |                  |                          |                |                          |
| 0.047<br>0.051<br>0.056                                    | 5.0 x 11.0 (13.0) x 17.5             | 1.1                        | 10...<br>(1250)                             | 14...<br>(1000)        | 12...<br>(1100)          | 13...<br>(950)             | 15...<br>(550)            | 473<br>513<br>563 |                  |                          |                |                          |
| 0.062<br>0.068<br>0.075<br>0.082                           |                                      |                            | 6.0 x 12.0 (14.0) x 17.5                    | 1.4                    | 10...<br>(1000)          | 14...<br>(1000)            | 12...<br>(900)            | 13...<br>(800)    | 15...<br>(450)   | 623<br>683<br>753<br>823 |                |                          |
| 0.091<br>0.1<br>0.11                                       |                                      |                            |                                             |                        | 7.0 x 13.5 (15.5) x 17.5 | 1.8                        | 10...<br>(750)            | 14...<br>(500)    | 12...<br>(800)   | 13...<br>(700)           | 15...<br>(400) | 913<br>104<br>114        |
| 0.12<br>0.13<br>0.15<br>0.16                               | 8.5 x 15.0 (17.0) x 17.5             | 2.5                        |                                             |                        |                          |                            | 10...<br>(750)            | 14...<br>(500)    | 12...<br>(650)   | 13...<br>(550)           | 15...<br>(300) | 124<br>134<br>154<br>164 |
| 0.18<br>0.2<br>0.22                                        |                                      |                            |                                             |                        |                          |                            | 10.0 x 16.5 (18.5) x 17.5 | 3.3               | 10...<br>(500)   | 14...<br>(450)           | 12...<br>(600) | 13...<br>(500)           |

**Notes**

<sup>(1)</sup> Net weight for short lead products only

• SPQ = Standard Packaging Quantity



# AC and Pulse Double Metallized Polypropylene Film Capacitors MMKP Radial Potted Type

Vishay BCcomponents

 $U_{Rdc} = 400 \text{ V}$ ;  $U_{Rac} = 200$ ;  $U_{p-p} = 560 \text{ V}$ ; C-tol. =  $\pm 5 \%$ 

| C<br>( $\mu$ F)                                                      | DIMENSIONS<br>w x h x l<br>(mm) | MASS<br>(g) <sup>(1)</sup> | CATALOG NUMBER BFC2 383 XYYYY AND PACKAGING |                            |                 |         |
|----------------------------------------------------------------------|---------------------------------|----------------------------|---------------------------------------------|----------------------------|-----------------|---------|
|                                                                      |                                 |                            | LOOSE IN BOX                                |                            | REEL            | C-VALUE |
|                                                                      |                                 |                            | Leads<br>3.5 $\pm$ 0.3 mm                   | Leads<br>25.0 $\pm$ 2.0 mm | Original pitch  | ..YYY   |
|                                                                      |                                 |                            | XX<br>(SPQ)                                 | XX<br>(SPQ)                | XX<br>(SPQ)     |         |
| Pitch = 22.5 mm $\pm$ 0.4 mm; d <sub>t</sub> = 0.80 mm $\pm$ 0.08 mm |                                 |                            |                                             |                            | Pitch = 22.5 mm |         |
| 0.24                                                                 | 7.0 x 116.5 x 26.0              | 3.0                        | 10...<br>(200)                              | 14...<br>(250)             | 12...<br>(550)  | 244     |
| 0.27                                                                 | 8.5 x 18.0 x 26.0               | 4.2                        | 10...<br>(200)                              | 14...<br>(250)             | 12...<br>(450)  | 274     |
| 0.30                                                                 |                                 |                            |                                             |                            |                 | 304     |
| 0.33                                                                 |                                 |                            |                                             |                            |                 | 334     |
| 0.36                                                                 | 10.0 x 19.5 x 26.0              | 5.3                        | 10...<br>(200)                              | 14...<br>(200)             | 12...<br>(350)  | 364     |
| 0.39                                                                 |                                 |                            |                                             |                            |                 | 394     |
| 0.43                                                                 |                                 |                            |                                             |                            |                 | 434     |
| Pitch = 27.5 mm $\pm$ 0.4 mm; d <sub>t</sub> = 0.80 mm $\pm$ 0.08 mm |                                 |                            |                                             |                            |                 |         |
| 0.47                                                                 | 11.0 x 21.0 x 31.0              | 8.0                        | 10...<br>(100)                              | 14...<br>(125)             | -               | 474     |
| 0.51                                                                 |                                 |                            |                                             |                            |                 | 514     |
| 0.56                                                                 |                                 |                            |                                             |                            |                 | 564     |
| 0.62                                                                 |                                 |                            |                                             |                            |                 | 624     |
| 0.68                                                                 | 13.0 x 23.0 x 31.0              | 9.7                        | 10...<br>(100)                              | 14...<br>(125)             | -               | 684     |
| 0.75                                                                 |                                 |                            |                                             |                            |                 | 754     |
| 0.82                                                                 |                                 |                            |                                             |                            |                 | 824     |
| 0.91                                                                 | 15.0 x 25.0 x 31.0              | 12.6                       | 10...<br>(100)                              | 14...<br>(125)             | -               | 914     |
| 1.                                                                   |                                 |                            |                                             |                            |                 | 105     |
| 1.1                                                                  |                                 |                            |                                             |                            |                 | 115     |
| 1.2                                                                  | 18.0 x 28.0 x 31.0              | 16.3                       | 10...<br>(100)                              | 14...<br>(100)             | -               | 125     |
| 1.3                                                                  |                                 |                            |                                             |                            |                 | 135     |
| 1.5                                                                  |                                 |                            |                                             |                            |                 | 155     |

**Notes**<sup>(1)</sup> Net weight for short lead products only

• SPQ = Standard Packaging Quantity

**SPECIFIC REFERENCE DATA (630 Vdc)**

| DESCRIPTION                                                                                                                                                                                                                                                                                                            | VALUE                    |                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|
| Tangent of loss angle:<br>C $\leq$ 0.15 $\mu\text{F}$<br>0.15 $\mu\text{F}$ < C $\leq$ 0.22 $\mu\text{F}$<br>0.22 $\mu\text{F}$ < C $\leq$ 0.3 $\mu\text{F}$<br>0.3 $\mu\text{F}$ < C $\leq$ 0.47 $\mu\text{F}$<br>0.47 $\mu\text{F}$ < C $\leq$ 0.68 $\mu\text{F}$<br>0.68 $\mu\text{F}$ < C $\leq$ 1.0 $\mu\text{F}$ | at 10 kHz                | at 100 kHz               |
|                                                                                                                                                                                                                                                                                                                        | $\leq 5 \times 10^{-4}$  | $\leq 15 \times 10^{-4}$ |
|                                                                                                                                                                                                                                                                                                                        | $\leq 8 \times 10^{-4}$  | $\leq 25 \times 10^{-4}$ |
|                                                                                                                                                                                                                                                                                                                        | $\leq 8 \times 10^{-4}$  | $\leq 30 \times 10^{-4}$ |
|                                                                                                                                                                                                                                                                                                                        | $\leq 10 \times 10^{-4}$ | $\leq 40 \times 10^{-4}$ |
|                                                                                                                                                                                                                                                                                                                        | $\leq 10 \times 10^{-4}$ | $\leq 45 \times 10^{-4}$ |
|                                                                                                                                                                                                                                                                                                                        | $\leq 10 \times 10^{-4}$ | $\leq 50 \times 10^{-4}$ |
| Rated voltage pulse slope (dU/dt) <sub>R</sub> :<br>C $\leq$ 0.056 $\mu\text{F}$<br>0.056 $\mu\text{F}$ < C $\leq$ 0.15 $\mu\text{F}$<br>0.15 $\mu\text{F}$ < C $\leq$ 0.3 $\mu\text{F}$<br>0.3 $\mu\text{F}$ < C $\leq$ 0.75 $\mu\text{F}$<br>0.75 $\mu\text{F}$ < C $\leq$ 1.0 $\mu\text{F}$                         | 700 V/ $\mu\text{s}$     |                          |
|                                                                                                                                                                                                                                                                                                                        | 1400 V/ $\mu\text{s}$    |                          |
|                                                                                                                                                                                                                                                                                                                        | 470 V/ $\mu\text{s}$     |                          |
|                                                                                                                                                                                                                                                                                                                        | 300 V/ $\mu\text{s}$     |                          |
|                                                                                                                                                                                                                                                                                                                        | 210 V/ $\mu\text{s}$     |                          |
| R between leads, for C $\leq$ 1 $\mu\text{F}$ at 100 V, 1 min                                                                                                                                                                                                                                                          | > 100 000 M $\Omega$     |                          |
| R between leads and case, 100 V, 1 min                                                                                                                                                                                                                                                                                 | > 30 000 M $\Omega$      |                          |
| Ionization (AC) voltage (typical value) at 50 pC peak discharge                                                                                                                                                                                                                                                        | > 250 V                  |                          |
| Withstanding (DC) voltage (cut off current 10 mA), rise time 100 V/s                                                                                                                                                                                                                                                   | 1000 V, 1 min            |                          |
| Withstanding (DC) voltage between leads and case                                                                                                                                                                                                                                                                       | 2840 V, 1 min            |                          |
| Maximum application temperature                                                                                                                                                                                                                                                                                        | 105 °C                   |                          |



# AC and Pulse Double Metallized Polypropylene Film Capacitors MMKP Radial Potted Type

Vishay BCcomponents

 $U_{Rdc} = 630 \text{ V}$ ;  $U_{Rac} = 220 \text{ V}$ ;  $U_{p-p} = 630 \text{ V}$ ;  $C\text{-tol.} = \pm 5 \%$ 

| C<br>(μF)                                                    | DIMENSIONS<br>w x h (h') x l<br>(mm) | MASS<br>(g) <sup>(1)</sup> | CATALOG NUMBER BFC2 383 XYYYY AND PACKAGING |                        |                 |                            |          |        | C-VALUE<br><br>..YYY |       |       |       |     |       |       |     |       |       |     |
|--------------------------------------------------------------|--------------------------------------|----------------------------|---------------------------------------------|------------------------|-----------------|----------------------------|----------|--------|----------------------|-------|-------|-------|-----|-------|-------|-----|-------|-------|-----|
|                                                              |                                      |                            | LOOSE IN BOX                                |                        | REEL            |                            |          |        |                      |       |       |       |     |       |       |     |       |       |     |
|                                                              |                                      |                            | Leads<br>3.5 ± 0.3 mm                       | Leads<br>25.0 ± 2.0 mm | Original pitch  | Pitch = 7.5 mm (bent back) |          |        |                      |       |       |       |     |       |       |     |       |       |     |
|                                                              |                                      |                            |                                             |                        |                 | Ø 500 mm                   | Ø 356 mm |        |                      |       |       |       |     |       |       |     |       |       |     |
| XX<br>(SPQ)                                                  | XX<br>(SPQ)                          | XX<br>(SPQ)                | XX<br>(SPQ)                                 | XX<br>(SPQ)            |                 |                            |          |        |                      |       |       |       |     |       |       |     |       |       |     |
| Pitch = 15 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm   |                                      |                            |                                             |                        | Pitch = 15 mm   | Pitch = 7.5 mm (bent back) |          |        |                      |       |       |       |     |       |       |     |       |       |     |
| 0.03                                                         | 5.0 x 11.0 (13.0) x 17.5             | 1.1                        | 20...                                       | 24...                  | 22...           | 23...                      | 25...    | 303    |                      |       |       |       |     |       |       |     |       |       |     |
| 0.033                                                        |                                      |                            | (1250)                                      | (1000)                 | (2200)          | (950)                      | (550)    | 333    |                      |       |       |       |     |       |       |     |       |       |     |
| 0.036                                                        |                                      |                            |                                             |                        |                 |                            |          | 363    |                      |       |       |       |     |       |       |     |       |       |     |
| 0.039                                                        | 6.0 x 12.0 (14.0) x 17.5             | 1.4                        | 20...                                       | 24...                  | 22...           | 23...                      | 25...    | 393    |                      |       |       |       |     |       |       |     |       |       |     |
| 0.043                                                        |                                      |                            |                                             |                        |                 |                            |          | (1000) | (1000)               | (900) | (800) | (450) | 433 |       |       |     |       |       |     |
| 0.047                                                        |                                      |                            |                                             |                        |                 |                            |          |        |                      |       |       |       | 473 |       |       |     |       |       |     |
| 0.051                                                        |                                      |                            |                                             |                        |                 |                            |          |        |                      |       |       |       | 513 |       |       |     |       |       |     |
| 0.056                                                        |                                      |                            |                                             |                        |                 |                            |          |        |                      |       |       |       | 563 |       |       |     |       |       |     |
| 0.062                                                        | 7.0 x 13.5 (15.5) x 17.5             | 1.8                        | 20...                                       | 24...                  | 22...           | 23...                      | 25...    | 623    |                      |       |       |       |     |       |       |     |       |       |     |
| 0.068                                                        |                                      |                            | (750)                                       | (500)                  | (800)           | (700)                      | (400)    | 683    |                      |       |       |       |     |       |       |     |       |       |     |
| 0.075                                                        |                                      |                            |                                             |                        |                 |                            |          | 753    |                      |       |       |       |     |       |       |     |       |       |     |
| 0.082                                                        | 8.5 x 15.0 (17.0) x 17.5             | 2.5                        | 20...                                       | 24...                  | 22...           | 23...                      | 25...    | 823    |                      |       |       |       |     |       |       |     |       |       |     |
| 0.091                                                        |                                      |                            |                                             |                        |                 |                            |          | (750)  | (500)                | (650) | (550) | (300) | 913 |       |       |     |       |       |     |
| 0.1                                                          |                                      |                            |                                             |                        |                 |                            |          |        |                      |       |       |       | 104 |       |       |     |       |       |     |
| 0.11                                                         |                                      |                            |                                             |                        |                 |                            |          |        |                      |       |       |       | 114 |       |       |     |       |       |     |
| 0.12                                                         | 10.0 x 16.5 (18.5) x 17.5            | 3.3                        | 20...                                       | 24...                  | 22...           | 23...                      | 25...    | 124    |                      |       |       |       |     |       |       |     |       |       |     |
| 0.13                                                         |                                      |                            | (500)                                       | (450)                  | (600)           | (500)                      | (250)    | 134    |                      |       |       |       |     |       |       |     |       |       |     |
| 0.15                                                         |                                      |                            |                                             |                        |                 |                            |          | 154    |                      |       |       |       |     |       |       |     |       |       |     |
| Pitch = 22.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                      |                            |                                             |                        | Pitch = 22.5 mm |                            |          |        |                      |       |       |       |     |       |       |     |       |       |     |
| 0.16                                                         | 8.5 x 18.0 x 26.0                    | 4.2                        | 20...                                       | 24...                  | 22...           | -                          | -        | 164    |                      |       |       |       |     |       |       |     |       |       |     |
| 0.18                                                         |                                      |                            |                                             |                        |                 |                            |          | (200)  | (250)                | (450) |       |       | 184 |       |       |     |       |       |     |
| 0.2                                                          |                                      |                            |                                             |                        |                 |                            |          |        |                      |       |       |       | 204 |       |       |     |       |       |     |
| 0.22                                                         |                                      |                            |                                             |                        |                 |                            |          |        |                      |       |       |       | 224 |       |       |     |       |       |     |
| 0.24                                                         | 10.0 x 19.5 x 26.0                   | 5.3                        | 20...                                       | 24...                  | 22...           | -                          | -        | 174    |                      |       |       |       |     |       |       |     |       |       |     |
| 0.27                                                         |                                      |                            |                                             |                        |                 |                            |          | (200)  | (200)                | (350) |       |       | 304 |       |       |     |       |       |     |
| 0.3                                                          |                                      |                            |                                             |                        |                 |                            |          |        |                      |       |       |       |     |       |       |     |       |       |     |
| Pitch = 27.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                      |                            |                                             |                        | Pitch = 27.5 mm |                            |          |        |                      |       |       |       |     |       |       |     |       |       |     |
| 0.33                                                         | 11.0 x 21.0 x 31.0                   | 8.0                        | 20...                                       | 24...                  | -               |                            |          | 334    |                      |       |       |       |     |       |       |     |       |       |     |
| 0.36                                                         |                                      |                            |                                             |                        |                 |                            |          | (750)  | (125)                | 364   |       |       |     |       |       |     |       |       |     |
| 0.39                                                         |                                      |                            |                                             |                        |                 |                            |          |        |                      | 394   |       |       |     |       |       |     |       |       |     |
| 0.43                                                         |                                      |                            |                                             |                        |                 |                            |          |        |                      | 434   |       |       |     |       |       |     |       |       |     |
| 0.47                                                         | 13.0 x 23.0 x 31.0                   | 9.7                        | 20...                                       | 24...                  |                 |                            |          | -      |                      |       | 474   |       |     |       |       |     |       |       |     |
| 0.51                                                         |                                      |                            |                                             |                        |                 |                            |          |        |                      |       | (500) | (125) | 514 |       |       |     |       |       |     |
| 0.56                                                         |                                      |                            |                                             |                        |                 |                            |          |        |                      |       |       |       | 564 |       |       |     |       |       |     |
| 0.62                                                         | 15.0 x 25.0 x 31.0                   | 12.6                       | 20...                                       | 24...                  |                 |                            |          |        |                      |       | -     |       |     | 624   |       |     |       |       |     |
| 0.68                                                         |                                      |                            |                                             |                        |                 |                            |          |        |                      |       |       |       |     | (100) | (125) | 684 |       |       |     |
| 0.75                                                         |                                      |                            |                                             |                        |                 |                            |          |        |                      |       |       |       |     |       |       | 754 |       |       |     |
| 0.82                                                         | 18.0 x 28.0 x 31.0                   | 16.3                       | 20...                                       | 24...                  |                 |                            |          |        |                      |       |       |       |     | -     |       |     | 824   |       |     |
| 0.91                                                         |                                      |                            |                                             |                        |                 |                            |          |        |                      |       |       |       |     |       |       |     | (100) | (100) | 914 |
| 1.0                                                          |                                      |                            |                                             |                        |                 |                            |          |        |                      |       |       |       |     |       |       |     |       |       | 105 |

**Notes**<sup>(1)</sup> Net weight for short lead products only

• SPQ = Standard Packaging Quantity



# AC and Pulse Double Metallized Polypropylene Film Capacitors MMKP Radial Potted Type

Vishay BCcomponents

**SPECIFIC REFERENCE DATA (1000 Vdc)**

| DESCRIPTION                                                                                                                                                                                                                                                                       | VALUE                                                       |                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|--------------------------|
| Tangent of loss angle:<br>$C \leq 0.062 \mu\text{F}$<br>$0.062 \mu\text{F} < C \leq 0.13 \mu\text{F}$<br>$0.13 \mu\text{F} < C \leq 0.22 \mu\text{F}$<br>$0.22 \mu\text{F} < C \leq 0.33 \mu\text{F}$<br>$0.33 \mu\text{F} < C \leq 0.47 \mu\text{F}$                             | at 10 kHz                                                   | at 100 kHz               |
|                                                                                                                                                                                                                                                                                   | $\leq 5 \times 10^{-4}$                                     | $\leq 15 \times 10^{-4}$ |
|                                                                                                                                                                                                                                                                                   | $\leq 6 \times 10^{-4}$                                     | $\leq 20 \times 10^{-4}$ |
|                                                                                                                                                                                                                                                                                   | $\leq 8 \times 10^{-4}$                                     | $\leq 25 \times 10^{-4}$ |
|                                                                                                                                                                                                                                                                                   | $\leq 8 \times 10^{-4}$                                     | $\leq 30 \times 10^{-4}$ |
|                                                                                                                                                                                                                                                                                   | $\leq 8 \times 10^{-4}$                                     | $\leq 35 \times 10^{-4}$ |
| Rated voltage pulse slope (dU/dt) <sub>R</sub> :<br>$C \leq 0.024 \mu\text{F}$<br>$0.024 \mu\text{F} < C \leq 0.062 \mu\text{F}$<br>$0.062 \mu\text{F} < C \leq 0.13 \mu\text{F}$<br>$0.13 \mu\text{F} < C \leq 0.33 \mu\text{F}$<br>$0.33 \mu\text{F} < C \leq 0.47 \mu\text{F}$ | 1700 V/μs<br>3300 V/μs<br>1200 V/μs<br>700 V/μs<br>470 V/μs |                          |
| R between leads, for $C \leq 1 \mu\text{F}$ at 500 V, 1 min                                                                                                                                                                                                                       | > 100 000 MΩ                                                |                          |
| R between leads and case, 500 V, 1 min                                                                                                                                                                                                                                            | > 30 000 MΩ                                                 |                          |
| Ionization (AC) voltage (typical value) at 50 pC peak discharge                                                                                                                                                                                                                   | > 440 V                                                     |                          |
| Withstanding (DC) voltage (cut off current 10 mA), rise time 100 V/s                                                                                                                                                                                                              | 1600 V, 1 min                                               |                          |
| Withstanding (DC) voltage between leads and case                                                                                                                                                                                                                                  | 2840 V, 1 min                                               |                          |
| Maximum application temperature                                                                                                                                                                                                                                                   | 105 °C                                                      |                          |

 $U_{Rdc} = 1000 \text{ V}$ ;  $U_{Rac} = 350 \text{ V}$ ;  $U_{p-p} = 1000 \text{ V}$ ;  $C\text{-tol.} = \pm 5 \%$ 

| C<br>(μF)                                                                                                                                   | DIMENSIONS<br>w x h (h') x l<br>(mm) | MASS<br>(g) <sup>(1)</sup> | CATALOG NUMBER BFC2 383 XYYYY AND PACKAGING |                        |                 |                            |                         |                                                                                                       |                         |                 |                 |                |                |                |                          |     |                |                |                |                |                |                          |     |                |                |                |                |                |                           |
|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------------------------|---------------------------------------------|------------------------|-----------------|----------------------------|-------------------------|-------------------------------------------------------------------------------------------------------|-------------------------|-----------------|-----------------|----------------|----------------|----------------|--------------------------|-----|----------------|----------------|----------------|----------------|----------------|--------------------------|-----|----------------|----------------|----------------|----------------|----------------|---------------------------|
|                                                                                                                                             |                                      |                            | LOOSE IN BOX                                |                        | REEL            |                            |                         | C-VALUE<br>..YYY                                                                                      |                         |                 |                 |                |                |                |                          |     |                |                |                |                |                |                          |     |                |                |                |                |                |                           |
|                                                                                                                                             |                                      |                            | Leads<br>3.5 ± 0.3 mm                       | Leads<br>25.0 ± 2.0 mm | Original pitch  | Pitch = 7.5 mm (bent back) |                         |                                                                                                       |                         |                 |                 |                |                |                |                          |     |                |                |                |                |                |                          |     |                |                |                |                |                |                           |
|                                                                                                                                             |                                      |                            | XX<br>(SPQ)                                 | XX<br>(SPQ)            |                 | XX<br>(SPQ)                | Ø 500 mm<br>XX<br>(SPQ) |                                                                                                       | Ø 356 mm<br>XX<br>(SPQ) |                 |                 |                |                |                |                          |     |                |                |                |                |                |                          |     |                |                |                |                |                |                           |
| Pitch = 15 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm                                                                                  |                                      |                            |                                             |                        | Pitch = 15 mm   | Pitch = 7.5 mm (bent back) |                         |                                                                                                       |                         |                 |                 |                |                |                |                          |     |                |                |                |                |                |                          |     |                |                |                |                |                |                           |
| 0.0043<br>0.0047<br>0.0051<br>0.0056<br>0.0062<br>0.0068<br>0.0075<br>0.0082<br>0.0091<br>0.01<br>0.011<br>0.012<br>0.013<br>0.015<br>0.016 | 5.0 x 11.0 (13.0) x 17.5             | 1.1                        | 30...<br>(1250)                             | 34...<br>(1000)        | 32...<br>(1100) | 33...<br>(950)             | 35...<br>(550)          | 432<br>472<br>512<br>562<br>622<br>682<br>752<br>822<br>912<br>103<br>113<br>123<br>133<br>153<br>163 |                         |                 |                 |                |                |                |                          |     |                |                |                |                |                |                          |     |                |                |                |                |                |                           |
| 0.018<br>0.02<br>0.022<br>0.024                                                                                                             |                                      |                            |                                             |                        |                 |                            |                         | 6.0 x 12.0 (14.0) x 17.5                                                                              | 1.4                     | 30...<br>(1000) | 34...<br>(1000) | 32...<br>(900) | 33...<br>(800) | 35...<br>(450) | 183<br>203<br>223<br>243 |     |                |                |                |                |                |                          |     |                |                |                |                |                |                           |
| 0.027<br>0.030<br>0.033                                                                                                                     |                                      |                            |                                             |                        |                 |                            |                         |                                                                                                       |                         |                 |                 |                |                |                | 7.0 x 13.5 (15.5) x 17.5 | 1.8 | 30...<br>(750) | 34...<br>(500) | 32...<br>(800) | 33...<br>(700) | 35...<br>(400) | 273<br>303<br>333        |     |                |                |                |                |                |                           |
| 0.036<br>0.039<br>0.043<br>0.047                                                                                                            |                                      |                            |                                             |                        |                 |                            |                         |                                                                                                       |                         |                 |                 |                |                |                |                          |     |                |                |                |                |                | 8.5 x 15.0 (17.0) x 17.5 | 2.5 | 30...<br>(750) | 34...<br>(500) | 32...<br>(650) | 33...<br>(550) | 35...<br>(300) | 363<br>393<br>433<br>473  |
| 0.051<br>0.056<br>0.062                                                                                                                     |                                      |                            |                                             |                        |                 |                            |                         |                                                                                                       |                         |                 |                 |                |                |                |                          |     |                |                |                |                |                |                          |     |                |                |                |                |                | 10.0 x 16.5 (18.5) x 17.5 |

**Notes**

- <sup>(1)</sup> Net weight for short lead products only  
• SPQ = Standard Packaging Quantity



AC and Pulse Double Metallized Polypropylene  
Film Capacitors MMKP Radial Potted Type

Vishay BCcomponents

| C<br>(μF)                                                    | DIMENSIONS<br>w x h (h') x l<br>(mm) | MASS<br>(g) <sup>(1)</sup> | CATALOG NUMBER BFC2 383 XYYYY AND PACKAGING |                |                |                          |
|--------------------------------------------------------------|--------------------------------------|----------------------------|---------------------------------------------|----------------|----------------|--------------------------|
|                                                              |                                      |                            | LOOSE IN BOX                                |                | REEL           | C-VALUE                  |
|                                                              |                                      |                            | Leads                                       | Leads          | Original pitch | ..YYY                    |
|                                                              |                                      |                            | XX<br>(SPQ)                                 | XX<br>(SPQ)    | XX<br>(SPQ)    |                          |
| Pitch = 22.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                      |                            | Pitch 22.5 mm                               |                |                |                          |
| 0.068                                                        | 7.0 x 16.5 x 26.5                    | 3.0                        | 30 ...<br>(200)                             | 34...<br>(250) | 32...<br>(550) | 683                      |
| 0.075<br>0.082<br>0.091                                      | 8.5 x 18.0 x 26.0                    | 4.2                        | 30...<br>(200)                              | 34...<br>(250) | 32...<br>(450) | 753<br>823<br>913        |
| 0.1<br>0.11<br>0.12<br>0.13                                  | 10.0 x 19.5 x 26.0                   | 5.3                        | 30...<br>(200)                              | 34...<br>(200) | 32...<br>(350) | 104<br>114<br>124<br>134 |
| Pitch = 27.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                      |                            | Pitch = 27.5 mm                             |                |                |                          |
| 0.15<br>0.16<br>0.18                                         | 11.0 x 21.0 x 31.0                   | 8.0                        | 30...<br>(100)                              | 34...<br>(125) |                | 154<br>164<br>184        |
| 0.2<br>0.22<br>0.24                                          | 13.0 x 23.0 x 31.0                   | 9.7                        | 30...<br>(100)                              | 34...<br>(125) |                | 204<br>224<br>244        |
| 0.27<br>0.3<br>0.33                                          | 15.0 x 25.0 x 31.0                   | 12.6                       | 30...<br>(100)                              | 34...<br>(125) |                | 274<br>304<br>334        |
| 0.36<br>0.39<br>0.43<br>0.47                                 | 18.0 x 28.0 x 31.0                   | 16.3                       | 30...<br>(100)                              | 34...<br>(100) |                | 364<br>394<br>434<br>474 |

**Notes**

<sup>(1)</sup> Net weight for short lead products only

• SPQ = Standard Packaging Quantity

**SPECIFIC REFERENCE DATA (1400 Vdc)**

| DESCRIPTION                                                                                                                                                                                                                                     | VALUE                                                                                         |                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|--------------------------|
| Tangent of loss angle:<br>C $\leq$ 0.016 $\mu$ F<br>0.016 $\mu$ F < C $\leq$ 0.039 $\mu$ F<br>0.039 $\mu$ F < C $\leq$ 0.13 $\mu$ F                                                                                                             | at 10 kHz                                                                                     | at 100 kHz               |
|                                                                                                                                                                                                                                                 | $\leq 5 \times 10^{-4}$                                                                       | $\leq 10 \times 10^{-4}$ |
|                                                                                                                                                                                                                                                 | $\leq 5 \times 10^{-4}$                                                                       | $\leq 15 \times 10^{-4}$ |
|                                                                                                                                                                                                                                                 | $\leq 5 \times 10^{-4}$                                                                       | $\leq 20 \times 10^{-4}$ |
| Rated voltage pulse slope (dU/dt) <sub>R</sub> :<br>C $\leq$ 0.0056 $\mu$ F<br>0.0056 $\mu$ F < C $\leq$ 0.016 $\mu$ F<br>0.016 $\mu$ F < C $\leq$ 0.039 $\mu$ F<br>0.039 $\mu$ F < C $\leq$ 0.1 $\mu$ F<br>0.1 $\mu$ F < C $\leq$ 0.13 $\mu$ F | 8000 V/ $\mu$ s<br>15 000 V/ $\mu$ s<br>4000 V/ $\mu$ s<br>2100 V/ $\mu$ s<br>1500 V/ $\mu$ s |                          |
| R between leads, for C $\leq$ 1 $\mu$ F at 500 V, 1 min                                                                                                                                                                                         | > 100 000 M $\Omega$                                                                          |                          |
| R between leads and case, 500 V, 1 min                                                                                                                                                                                                          | > 30 000 M $\Omega$                                                                           |                          |
| Ionization (AC) voltage (typical value) at 20 pC peak discharge                                                                                                                                                                                 | > 500 V                                                                                       |                          |
| Withstanding (DC) voltage (cut off current 10 mA), rise time 100 V/s                                                                                                                                                                            | 2250 V, 1 min                                                                                 |                          |
| Withstanding (DC) voltage between leads and case                                                                                                                                                                                                | 2840 V, 1 min                                                                                 |                          |
| Maximum application temperature                                                                                                                                                                                                                 | 105 °C                                                                                        |                          |



AC and Pulse Double Metallized Polypropylene  
Film Capacitors MMKP Radial Potted Type

Vishay BCcomponents

$U_{Rdc} = 1400 \text{ V}$ ;  $U_{Rac} = 500 \text{ V}$ ;  $U_{p-p} = 1400 \text{ V}$ ;  $C\text{-tol.} = \pm 5 \%$

| C<br>( $\mu\text{F}$ )                                             | DIMENSIONS<br>w x h (h') x l<br>(mm) | MASS<br>(g) <sup>(1)</sup> | CATALOG NUMBER BFC2 383 XYYYY AND PACKAGING |                            |                 |                            |                      |     | C-VALUE<br>..YYY |  |     |  |  |     |  |  |     |
|--------------------------------------------------------------------|--------------------------------------|----------------------------|---------------------------------------------|----------------------------|-----------------|----------------------------|----------------------|-----|------------------|--|-----|--|--|-----|--|--|-----|
|                                                                    |                                      |                            | LOOSE IN BOX                                |                            | REEL            |                            |                      |     |                  |  |     |  |  |     |  |  |     |
|                                                                    |                                      |                            | Leads<br>3.5 $\pm$ 0.3 mm                   | Leads<br>25.0 $\pm$ 2.0 mm | Original pitch  | Pitch = 7.5 mm (bent back) |                      |     |                  |  |     |  |  |     |  |  |     |
|                                                                    |                                      |                            |                                             |                            |                 | $\varnothing$ 500 mm       | $\varnothing$ 356 mm |     |                  |  |     |  |  |     |  |  |     |
| XX<br>(SPQ)                                                        | XX<br>(SPQ)                          | XX<br>(SPQ)                | XX<br>(SPQ)                                 | XX<br>(SPQ)                |                 |                            |                      |     |                  |  |     |  |  |     |  |  |     |
| Pitch = 15 mm $\pm$ 0.4 mm; d <sub>t</sub> = 0.80 mm $\pm$ 0.08 mm |                                      |                            |                                             |                            | Pitch = 15 mm   | Pitch = 7.5 mm (bent back) |                      |     |                  |  |     |  |  |     |  |  |     |
| 0.0022                                                             | 5.0 x 11.0 (13.0) x 17.5             | 1.1                        | 40...<br>(1250)                             | 44...<br>(1000)            | 42...<br>(1100) | 43...<br>(950)             | 45...<br>(550)       | 222 |                  |  |     |  |  |     |  |  |     |
| 0.0024                                                             |                                      |                            |                                             |                            |                 |                            |                      | 242 |                  |  |     |  |  |     |  |  |     |
| 0.0027                                                             |                                      |                            |                                             |                            |                 |                            |                      | 272 |                  |  |     |  |  |     |  |  |     |
| 0.003                                                              |                                      |                            |                                             |                            |                 |                            |                      | 302 |                  |  |     |  |  |     |  |  |     |
| 0.0033                                                             |                                      |                            |                                             |                            |                 |                            |                      | 332 |                  |  |     |  |  |     |  |  |     |
| 0.0036                                                             |                                      |                            |                                             |                            |                 |                            |                      | 362 |                  |  |     |  |  |     |  |  |     |
| 0.0039                                                             |                                      |                            |                                             |                            |                 |                            |                      | 392 |                  |  |     |  |  |     |  |  |     |
| 0.0043                                                             | 6.0 x 12.0 (14.0) x 17.5             | 1.4                        | 40...<br>(1000)                             | 44...<br>(1000)            | 42...<br>(900)  | 43...<br>(800)             | 45...<br>(450)       | 432 |                  |  |     |  |  |     |  |  |     |
| 0.0047                                                             |                                      |                            |                                             |                            |                 |                            |                      | 472 |                  |  |     |  |  |     |  |  |     |
| 0.0051                                                             |                                      |                            |                                             |                            |                 |                            |                      | 512 |                  |  |     |  |  |     |  |  |     |
| 0.0056                                                             |                                      |                            |                                             |                            |                 |                            |                      | 562 |                  |  |     |  |  |     |  |  |     |
| 0.0062                                                             | 7.0 x 13.5 (15.5) x 17.5             | 1.8                        | 40...<br>(750)                              | 44...<br>(500)             | 42...<br>(800)  | 43...<br>(700)             | 45...<br>(400)       | 622 |                  |  |     |  |  |     |  |  |     |
| 0.0068                                                             |                                      |                            |                                             |                            |                 |                            |                      | 682 |                  |  |     |  |  |     |  |  |     |
| 0.0075                                                             |                                      |                            |                                             |                            |                 |                            |                      | 752 |                  |  |     |  |  |     |  |  |     |
| 0.0082                                                             |                                      |                            |                                             |                            |                 |                            |                      | 822 |                  |  |     |  |  |     |  |  |     |
| 0.0091                                                             | 8.5 x 15.0 (17.0) x 17.5             | 2.5                        | 40...<br>(750)                              | 44...<br>(500)             | 42...<br>(650)  | 43...<br>(550)             | 45...<br>(300)       | 912 |                  |  |     |  |  |     |  |  |     |
| 0.01                                                               |                                      |                            |                                             |                            |                 |                            |                      | 103 |                  |  |     |  |  |     |  |  |     |
| 0.011                                                              |                                      |                            |                                             |                            |                 |                            |                      | 113 |                  |  |     |  |  |     |  |  |     |
| 0.012                                                              |                                      |                            |                                             |                            |                 |                            |                      | 123 |                  |  |     |  |  |     |  |  |     |
| 0.013                                                              | 10.0 x 16.5 (18.5) x 17.5            | 3.3                        | 40...<br>(500)                              | 44...<br>(450)             | 42...<br>(600)  | 43...<br>(500)             | 45...<br>(250)       | 133 |                  |  |     |  |  |     |  |  |     |
| 0.015                                                              |                                      |                            |                                             |                            |                 |                            |                      | 153 |                  |  |     |  |  |     |  |  |     |
| 0.016                                                              |                                      |                            |                                             |                            |                 |                            |                      | 163 |                  |  |     |  |  |     |  |  |     |
| Pitch = 22.5 $\pm$ 0.4 mm; d <sub>t</sub> = 0.80 mm $\pm$ 0.08 mm  |                                      |                            |                                             |                            | Pitch = 22.5 mm |                            |                      |     |                  |  |     |  |  |     |  |  |     |
| 0.018                                                              | 7.0 x 16.5 x 26.0                    | 3                          | 40...<br>(200)                              | 44...<br>(250)             | 42...<br>(550)  | -                          | -                    | 183 |                  |  |     |  |  |     |  |  |     |
| 0.02                                                               |                                      |                            |                                             |                            |                 |                            |                      | 203 |                  |  |     |  |  |     |  |  |     |
| 0.022                                                              | 8.5 x 18.0 x 26.0                    | 4.2                        | 40...<br>(200)                              | 44...<br>(250)             | 42...<br>(450)  | -                          | -                    | 223 |                  |  |     |  |  |     |  |  |     |
| 0.024                                                              |                                      |                            |                                             |                            |                 |                            |                      | 243 |                  |  |     |  |  |     |  |  |     |
| 0.027                                                              |                                      |                            |                                             |                            |                 |                            |                      | 273 |                  |  |     |  |  |     |  |  |     |
| 0.03                                                               | 10.0 x 19.5 x 26.0                   | 5.3                        | 40...<br>(200)                              | 44...<br>(200)             | 42...<br>(350)  | -                          | -                    | 303 |                  |  |     |  |  |     |  |  |     |
| 0.033                                                              |                                      |                            |                                             |                            |                 |                            |                      | 333 |                  |  |     |  |  |     |  |  |     |
| 0.036                                                              |                                      |                            |                                             |                            |                 |                            |                      | 363 |                  |  |     |  |  |     |  |  |     |
| 0.039                                                              |                                      |                            |                                             |                            |                 |                            |                      | 393 |                  |  |     |  |  |     |  |  |     |
| Pitch = 27.5 $\pm$ 0.4 mm; d <sub>t</sub> = 0.80 mm $\pm$ 0.08 mm  |                                      |                            |                                             |                            | Pitch = 27.5 mm |                            |                      |     |                  |  |     |  |  |     |  |  |     |
| 0.043                                                              | 11.0 x 21.0 x 31.0                   | 8                          | 40...                                       | 44...                      | -               |                            |                      | 433 |                  |  |     |  |  |     |  |  |     |
| 0.047                                                              |                                      |                            |                                             |                            |                 |                            |                      | 473 |                  |  |     |  |  |     |  |  |     |
| 0.051                                                              |                                      |                            |                                             |                            |                 |                            |                      | 513 |                  |  |     |  |  |     |  |  |     |
| 0.056                                                              |                                      |                            |                                             |                            |                 |                            |                      | 563 |                  |  |     |  |  |     |  |  |     |
| 0.062                                                              | 13.0 x 23.0 x 31.0                   | 9.7                        | 40...<br>(100)                              | 44...<br>(125)             |                 |                            |                      |     |                  |  | 623 |  |  |     |  |  |     |
| 0.068                                                              |                                      |                            |                                             |                            |                 |                            |                      |     |                  |  | 683 |  |  |     |  |  |     |
| 0.075                                                              |                                      |                            |                                             |                            |                 |                            |                      |     |                  |  | 753 |  |  |     |  |  |     |
| 0.082                                                              | 15.0 x 25.0 x 31.0                   | 12.6                       | 40...<br>(100)                              | 44...<br>(125)             |                 |                            |                      |     |                  |  |     |  |  | 823 |  |  |     |
| 0.091                                                              |                                      |                            |                                             |                            |                 |                            |                      |     |                  |  |     |  |  | 913 |  |  |     |
| 0.1                                                                |                                      |                            |                                             |                            |                 |                            |                      |     |                  |  |     |  |  | 104 |  |  |     |
| 0.11                                                               | 18.0 x 28.0 x 31.0                   | 16.3                       | 40...<br>(100)                              | 44...<br>(100)             |                 |                            |                      |     |                  |  |     |  |  |     |  |  | 114 |
| 0.12                                                               |                                      |                            |                                             |                            |                 |                            |                      |     |                  |  |     |  |  |     |  |  | 124 |
| 0.13                                                               |                                      |                            |                                             |                            | 134             |                            |                      |     |                  |  |     |  |  |     |  |  |     |

**Notes**

<sup>(1)</sup> Net weight for short lead products only

• SPQ = Standard Packaging Quantity



# AC and Pulse Double Metallized Polypropylene Film Capacitors MMKP Radial Potted Type

Vishay BCcomponents

**SPECIFIC REFERENCE DATA (1600 Vdc)**

| DESCRIPTION                                                                                                                                                                                                                                                                           | VALUE                                                                                                                       |                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Tangent of loss angle:<br>$C \leq 0.015 \mu\text{F}$<br>$0.015 \mu\text{F} < C \leq 0.15 \mu\text{F}$                                                                                                                                                                                 | at 10 kHz                                                                                                                   | at 100 kHz               |
|                                                                                                                                                                                                                                                                                       | $\leq 5 \times 10^{-4}$                                                                                                     | $\leq 15 \times 10^{-4}$ |
|                                                                                                                                                                                                                                                                                       | $\leq 5 \times 10^{-4}$                                                                                                     | $\leq 20 \times 10^{-4}$ |
| Rated voltage pulse slope (dU/dt) <sub>R</sub> :<br>$C \leq 0.0056 \mu\text{F}$<br>$0.0056 \mu\text{F} < C \leq 0.0075 \mu\text{F}$<br>$0.0075 \mu\text{F} < C \leq 0.039 \mu\text{F}$<br>$0.039 \mu\text{F} < C \leq 0.1 \mu\text{F}$<br>$0.1 \mu\text{F} < C \leq 0.15 \mu\text{F}$ | 8000 V/ $\mu\text{s}$<br>15 000 V/ $\mu\text{s}$<br>3100 V/ $\mu\text{s}$<br>1800 V/ $\mu\text{s}$<br>1200 V/ $\mu\text{s}$ |                          |
| R between leads, for $C \leq 1 \mu\text{F}$ at 500 V, 1 min                                                                                                                                                                                                                           | > 100 000 M $\Omega$                                                                                                        |                          |
| R between leads and case, 500 V, 1 min                                                                                                                                                                                                                                                | > 30 000 M $\Omega$                                                                                                         |                          |
| Ionization (AC) voltage (typical value) at 20 pC peak discharge                                                                                                                                                                                                                       | > 660 V                                                                                                                     |                          |
| Withstanding (DC) voltage (cut off current 10 mA), rise time 100 V/s                                                                                                                                                                                                                  | 2560 V, 1 min                                                                                                               |                          |
| Withstanding (DC) voltage between leads and case                                                                                                                                                                                                                                      | 2840 V, 1 min                                                                                                               |                          |
| Maximum application temperature                                                                                                                                                                                                                                                       | 105 °C                                                                                                                      |                          |

**U<sub>Rdc</sub> = 1600 V; U<sub>Rac</sub> = 550 V; U<sub>p-p</sub> = 1600 V; C-tol. =  $\pm 5\%$** 

| C<br>( $\mu$ F)                                                    | DIMENSIONS<br>w x h (h') x l<br>(mm) | MASS<br>(g) <sup>(1)</sup> | CATALOG NUMBER BFC2 383 XYYYY AND PACKAGING |                         |                 |                            |                      |                                 | C-VALUE<br>..YYY |
|--------------------------------------------------------------------|--------------------------------------|----------------------------|---------------------------------------------|-------------------------|-----------------|----------------------------|----------------------|---------------------------------|------------------|
|                                                                    |                                      |                            | LOOSE IN BOX                                |                         | REEL            |                            |                      |                                 |                  |
|                                                                    |                                      |                            | Leads<br>3.5 $\pm$ 0.3                      | Leads<br>25.0 $\pm$ 2.0 | Original pitch  | Pitch = 7.5 mm (bent back) |                      |                                 |                  |
|                                                                    |                                      |                            |                                             |                         |                 | $\varnothing$ 500 mm       | $\varnothing$ 356 mm |                                 |                  |
|                                                                    |                                      |                            | XX<br>(SPQ)                                 | XX<br>(SPQ)             | XX<br>(SPQ)     | XX<br>(SPQ)                | XX<br>(SPQ)          |                                 |                  |
| Pitch = 15 mm $\pm$ 0.4 mm; d <sub>t</sub> = 0.80 mm $\pm$ 0.08 mm |                                      |                            |                                             |                         | Pitch = 15 mm   | Pitch = 7.5 mm (bent back) |                      |                                 |                  |
| 0.0027<br>0.003<br>0.0033<br>0.0036<br>0.0039                      | 5.0 x 11.0 (13.0) x 17.5             | 1.1                        | 50...<br>(1250)                             | 54...<br>(1000)         | 52...<br>(1100) | 53...<br>(950)             | 55...<br>(550)       | 272<br>302<br>332<br>362<br>392 |                  |
| 0.0043<br>0.0047<br>0.0051<br>0.0056                               | 6.0 x 12.0 (14.0) x 17.5             | 1.4                        | 50...<br>(1000)                             | 54...<br>(1000)         | 52...<br>(900)  | 53...<br>(800)             | 55...<br>(450)       | 432<br>472<br>512<br>562        |                  |
| 0.0062<br>0.0068<br>0.0075                                         | 7.0 x 13.5 (15.5) x 17.5             | 1.8                        | 50...<br>(750)                              | 54...<br>(500)          | 52...<br>(800)  | 53...<br>(700)             | 55...<br>(400)       | 622<br>682<br>752               |                  |
| 0.0082<br>0.0091<br>0.01<br>0.011                                  | 8.5 x 15.0 (17.0) x 17.5             | 2.5                        | 50...<br>(750)                              | 54...<br>(500)          | 52...<br>(650)  | 53...<br>(550)             | 55...<br>(300)       | 822<br>912<br>103<br>113        |                  |
| 0.012<br>0.013<br>0.015                                            | 10.0 x 16.5 (18.5) x 17.5            | 3.3                        | 50...<br>(500)                              | 54...<br>(450)          | 52...<br>(600)  | 53...<br>(500)             | 55...<br>(250)       | 123<br>133<br>153               |                  |
| Pitch = 22.5 $\pm$ 0.4 mm; d <sub>t</sub> = 0.80 mm $\pm$ 0.08 mm  |                                      |                            |                                             |                         | Pitch = 22.5 mm |                            |                      |                                 |                  |
| 0.016<br>0.018<br>0.02                                             | 7.0 x 16.5 x 26.0                    | 3.0                        | 50...<br>(200)                              | 54...<br>(250)          | 52...<br>(550)  | -                          | -                    | 163<br>183<br>203               |                  |
| 0.022<br>0.024<br>0.027<br>0.03                                    | 8.5 x 18.0 x 26.0                    | 4.2                        | 50...<br>(200)                              | 54...<br>(250)          | 52...<br>(450)  | -                          | -                    | 223<br>243<br>273<br>303        |                  |
| 0.033<br>0.036<br>0.039                                            | 10.0 x 19.5 x 26.0                   | 5.3                        | 50...<br>(200)                              | 54...<br>(200)          | 52...<br>(350)  | -                          | -                    | 333<br>363<br>393               |                  |

**Notes**

- <sup>(1)</sup> Net weight for short lead products only  
 • SPQ = Standard Packaging Quantity



AC and Pulse Double Metallized Polypropylene  
Film Capacitors MMKP Radial Potted Type

Vishay BCcomponents

$U_{Rdc} = 1600 \text{ V}$ ;  $U_{Rac} = 550 \text{ V}$ ;  $U_{p-p} = 1600 \text{ V}$ ;  $C\text{-tol.} = \pm 5 \%$

| C<br>(μF)                                                 | DIMENSIONS<br>w x h (h') x l<br>(mm) | MASS<br>(g) <sup>(1)</sup> | CATALOG NUMBER BFC2 383 XYYYY AND PACKAGING |                     |                |                            |          |         |
|-----------------------------------------------------------|--------------------------------------|----------------------------|---------------------------------------------|---------------------|----------------|----------------------------|----------|---------|
|                                                           |                                      |                            | LOOSE IN BOX                                |                     | REEL           |                            |          | C-VALUE |
|                                                           |                                      |                            | Leads<br>3.5 ± 0.3                          | Leads<br>25.0 ± 2.0 | Original pitch | Pitch = 7.5 mm (bent back) |          | ..YYY   |
|                                                           |                                      |                            |                                             |                     |                | Ø 500 mm                   | Ø 356 mm |         |
| XX<br>(SPQ)                                               | XX<br>(SPQ)                          | XX<br>(SPQ)                | XX<br>(SPQ)                                 | XX<br>(SPQ)         | XX<br>(SPQ)    |                            |          |         |
| Pitch = 27.5 ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                      |                            | Pitch = 27.5 mm                             |                     |                |                            |          |         |
| 0.043                                                     | 11.0 x 21.0 x 31.0                   | 8                          | 50...<br>(100)                              | 54...<br>(125)      |                | 433                        |          |         |
| 0.047                                                     |                                      |                            |                                             |                     |                | 473                        |          |         |
| 0.051                                                     |                                      |                            |                                             |                     |                | 513                        |          |         |
| 0.056                                                     |                                      |                            |                                             |                     |                | 563                        |          |         |
| 0.062                                                     | 13.0 x 23.0 x 31.0                   | 9.7                        | 50...<br>(100)                              | 54...<br>(125)      |                | 623                        |          |         |
| 0.068                                                     |                                      |                            |                                             |                     |                | 683                        |          |         |
| 0.075                                                     |                                      |                            |                                             |                     |                | 753                        |          |         |
| 0.082                                                     | 15.0 x 25.0 x 31.0                   | 12.6                       | 50...<br>(100)                              | 54...<br>(125)      |                | 823                        |          |         |
| 0.091                                                     |                                      |                            |                                             |                     |                | 913                        |          |         |
| 0.1                                                       |                                      |                            |                                             |                     |                | 104                        |          |         |
| 0.11                                                      | 18.0 x 28.0 x 31.0                   | 16.3                       | 50...<br>(100)                              | 54...<br>(100)      |                | 114                        |          |         |
| 0.12                                                      |                                      |                            |                                             |                     |                | 124                        |          |         |
| 0.13                                                      |                                      |                            |                                             |                     |                | 134                        |          |         |
| 0.15                                                      |                                      |                            |                                             |                     |                | 154                        |          |         |

**Notes**

<sup>(1)</sup> Net weight for short lead products only

• SPQ = Standard Packaging Quantity

**SPECIFIC REFERENCE DATA (2000 Vdc)**

| DESCRIPTION                                                                                                                                                                                                                                                                          | VALUE                    |                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|
| Tangent of loss angle:<br>$C \leq 0.01 \mu\text{F}$<br>$0.01 \mu\text{F} < C \leq 0.1 \mu\text{F}$                                                                                                                                                                                   | at 10 kHz                | at 100 kHz               |
|                                                                                                                                                                                                                                                                                      | $\leq 5 \times 10^{-4}$  | $\leq 15 \times 10^{-4}$ |
|                                                                                                                                                                                                                                                                                      | $\leq 10 \times 10^{-4}$ | $\leq 18 \times 10^{-4}$ |
| Rated voltage pulse slope (dU/dt) <sub>R</sub> :<br>$C \leq 0.0036 \mu\text{F}$<br>$0.0036 \mu\text{F} < C \leq 0.01 \mu\text{F}$<br>$0.01 \mu\text{F} < C \leq 0.024 \mu\text{F}$<br>$0.024 \mu\text{F} < C \leq 0.068 \mu\text{F}$<br>$0.068 \mu\text{F} < C \leq 0.1 \mu\text{F}$ | 11 000 V/ $\mu\text{s}$  |                          |
|                                                                                                                                                                                                                                                                                      | 20 000 V/ $\mu\text{s}$  |                          |
|                                                                                                                                                                                                                                                                                      | 4400 V/ $\mu\text{s}$    |                          |
|                                                                                                                                                                                                                                                                                      | 2500 V/ $\mu\text{s}$    |                          |
|                                                                                                                                                                                                                                                                                      | 1800 V/ $\mu\text{s}$    |                          |
| R between leads, for $C \leq 1 \mu\text{F}$ at 500 V, 1 min                                                                                                                                                                                                                          | > 100 000 M $\Omega$     |                          |
| R between leads and case, 500 V, 1 min                                                                                                                                                                                                                                               | > 30 000 M $\Omega$      |                          |
| Ionization (AC) voltage (typical value) at 20 pC peak discharge                                                                                                                                                                                                                      | > 750 V                  |                          |
| Withstanding (DC) voltage (cut off current 10 mA), rise time 100 V/s                                                                                                                                                                                                                 | 3200 V, 1 min            |                          |
| Withstanding (DC) voltage between leads and case                                                                                                                                                                                                                                     | 2840 V, 1 min            |                          |
| Maximum application temperature                                                                                                                                                                                                                                                      | 105 °C                   |                          |



AC and Pulse Double Metallized Polypropylene  
Film Capacitors MMKP Radial Potted Type

Vishay BCcomponents

$U_{Rdc} = 2000 \text{ V}$ ;  $U_{Rac} = 700 \text{ V}$ ;  $U_{p-p} = 2000 \text{ V}$ ; C-tol. =  $\pm 5 \%$

| C<br>( $\mu\text{F}$ )                                               | DIMENSIONS<br>w x h (h') x l<br>(mm) | MASS<br>(g) <sup>(1)</sup> | CATALOG NUMBER BFC2 383 XXXYYY AND PACKAGING |                         |                 |                            |                      |     | C-VALUE<br>..YYY |
|----------------------------------------------------------------------|--------------------------------------|----------------------------|----------------------------------------------|-------------------------|-----------------|----------------------------|----------------------|-----|------------------|
|                                                                      |                                      |                            | LOOSE IN BOX                                 |                         | REEL            |                            |                      |     |                  |
|                                                                      |                                      |                            | Leads<br>3.5 $\pm$ 0.3                       | Leads<br>25.0 $\pm$ 2.0 | Original pitch  | Pitch = 7.5 mm (bent back) |                      |     |                  |
|                                                                      |                                      |                            |                                              |                         |                 | $\varnothing$ 500 mm       | $\varnothing$ 356 mm |     |                  |
|                                                                      |                                      |                            | XX<br>(SPQ)                                  | XX<br>(SPQ)             | XX<br>(SPQ)     | XX<br>(SPQ)                | XX<br>(SPQ)          |     |                  |
| Pitch = 15 mm $\pm$ 0.4 mm; d <sub>t</sub> = 0.80 mm $\pm$ 0.08 mm   |                                      |                            |                                              |                         | Pitch = 15 mm   | Pitch = 7.5 mm (bent back) |                      |     |                  |
| 0.001                                                                | 5.0 x 11.0 (13.0) x 17.5             | 1.1                        | 60...<br>(1250)                              | 64...<br>(1000)         | 62...<br>(1100) | 63...<br>(950)             | 65...<br>(550)       | 102 |                  |
| 0.0011                                                               |                                      |                            |                                              |                         |                 |                            |                      | 112 |                  |
| 0.0012                                                               |                                      |                            |                                              |                         |                 |                            |                      | 122 |                  |
| 0.0013                                                               |                                      |                            |                                              |                         |                 |                            |                      | 132 |                  |
| 0.0015                                                               |                                      |                            |                                              |                         |                 |                            |                      | 152 |                  |
| 0.0016                                                               |                                      |                            |                                              |                         |                 |                            |                      | 162 |                  |
| 0.0018                                                               |                                      |                            |                                              |                         |                 |                            |                      | 182 |                  |
| 0.002                                                                |                                      |                            |                                              |                         |                 |                            |                      | 202 |                  |
| 0.0022                                                               |                                      |                            |                                              |                         |                 |                            |                      | 222 |                  |
| 0.0024                                                               |                                      |                            |                                              |                         |                 |                            |                      | 242 |                  |
| 0.0027                                                               | 6.0 x 12.0 (14.0) x 17.5             | 1.4                        | 60...<br>(1000)                              | 64...<br>(1000)         | 62...<br>(900)  | 63...<br>(800)             | 65...<br>(450)       | 272 |                  |
| 0.003                                                                |                                      |                            |                                              |                         |                 |                            |                      | 302 |                  |
| 0.0033                                                               |                                      |                            |                                              |                         |                 |                            |                      | 332 |                  |
| 0.0036                                                               |                                      |                            |                                              |                         |                 |                            |                      | 362 |                  |
| 0.0039                                                               | 7.0 x 13.5 (15.5) x 17.5             | 1.8                        | 60...<br>(750)                               | 64...<br>(500)          | 62...<br>(800)  | 63...<br>(700)             | 65...<br>(400)       | 392 |                  |
| 0.0043                                                               |                                      |                            |                                              |                         |                 |                            |                      | 432 |                  |
| 0.0047                                                               |                                      |                            |                                              |                         |                 |                            |                      | 472 |                  |
| 0.0051                                                               | 8.5 x 15.0 (17.0) x 17.5             | 2.5                        | 60...<br>(750)                               | 64...<br>(500)          | 62...<br>(650)  | 63...<br>(550)             | 65...<br>(300)       | 512 |                  |
| 0.0056                                                               |                                      |                            |                                              |                         |                 |                            |                      | 562 |                  |
| 0.0062                                                               |                                      |                            |                                              |                         |                 |                            |                      | 622 |                  |
| 0.0068                                                               |                                      |                            |                                              |                         |                 |                            |                      | 682 |                  |
| 0.0075                                                               | 10.0 x 16.5 (18.5) x 17.5            | 3.3                        | 60...<br>(500)                               | 64...<br>(450)          | 62...<br>(600)  | 63...<br>(500)             | 65...<br>(250)       | 752 |                  |
| 0.0082                                                               |                                      |                            |                                              |                         |                 |                            |                      | 822 |                  |
| 0.0091                                                               |                                      |                            |                                              |                         |                 |                            |                      | 912 |                  |
| 0.01                                                                 |                                      |                            |                                              |                         |                 |                            |                      | 103 |                  |
| Pitch = 22.5 mm $\pm$ 0.4 mm; d <sub>t</sub> = 0.80 mm $\pm$ 0.08 mm |                                      |                            |                                              |                         | Pitch = 22.5 mm |                            |                      |     |                  |
| 0.011                                                                | 7.0 x 16.5 x 26.0                    | 3.0                        | 60...<br>(200)                               | 64...<br>(250)          | 62...<br>(550)  | -                          | -                    | 113 |                  |
| 0.012                                                                |                                      |                            |                                              |                         |                 |                            |                      | 123 |                  |
| 0.013                                                                |                                      |                            |                                              |                         |                 |                            |                      | 133 |                  |
| 0.015                                                                | 8.5 x 18.0 x 26.0                    | 4.2                        | 60...<br>(200)                               | 64...<br>(250)          | 62...<br>(450)  | -                          | -                    | 153 |                  |
| 0.016                                                                |                                      |                            |                                              |                         |                 |                            |                      | 163 |                  |
| 0.018                                                                |                                      |                            |                                              |                         |                 |                            |                      | 183 |                  |
| 0.02                                                                 | 10.0 x 19.5 x 26.0                   | 5.3                        | 60...<br>(200)                               | 64...<br>(200)          | 62...<br>(350)  | -                          | -                    | 203 |                  |
| 0.022                                                                |                                      |                            |                                              |                         |                 |                            |                      | 223 |                  |
| 0.024                                                                |                                      |                            |                                              |                         |                 |                            |                      | 243 |                  |
| Pitch = 27.5 mm $\pm$ 0.4 mm; d <sub>t</sub> = 0.80 mm $\pm$ 0.08 mm |                                      |                            |                                              |                         | Pitch = 27.5 mm |                            |                      |     |                  |
| 0.027                                                                | 11.0 x 21.0 x 31.0                   | 8.0                        | 60...<br>(100)                               | 64...<br>(125)          | -               |                            |                      | 273 |                  |
| 0.03                                                                 |                                      |                            |                                              |                         |                 |                            |                      | 303 |                  |
| 0.033                                                                |                                      |                            |                                              |                         |                 |                            |                      | 333 |                  |
| 0.036                                                                |                                      |                            |                                              |                         |                 |                            |                      | 363 |                  |
| 0.039                                                                |                                      |                            |                                              |                         |                 |                            |                      | 393 |                  |

**Notes**

- (1) Net weight for short lead products only  
• SPQ = Standard Packaging Quantity



AC and Pulse Double Metallized Polypropylene  
Film Capacitors MMKP Radial Potted Type

Vishay BCcomponents

| C<br>(μF)                                                    | DIMENSIONS<br>w x h (h') x l<br>(mm) | MASS<br>(g) <sup>(1)</sup> | CATALOG NUMBER BFC2 383 XYYYY AND PACKAGING |                     |                 |                            |             | C-VALUE<br><br>..YYY |
|--------------------------------------------------------------|--------------------------------------|----------------------------|---------------------------------------------|---------------------|-----------------|----------------------------|-------------|----------------------|
|                                                              |                                      |                            | LOOSE IN BOX                                |                     | REEL            |                            |             |                      |
|                                                              |                                      |                            | Leads<br>3.5 ± 0.3                          | Leads<br>25.0 ± 2.0 | Original pitch  | Pitch = 7.5 mm (bent back) |             |                      |
|                                                              |                                      |                            |                                             |                     |                 | Ø 500 mm                   | Ø 356 mm    |                      |
|                                                              |                                      |                            | XX<br>(SPQ)                                 | XX<br>(SPQ)         | XX<br>(SPQ)     | XX<br>(SPQ)                | XX<br>(SPQ) |                      |
| Pitch = 27.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                      |                            |                                             |                     | Pitch = 27.5 mm |                            |             |                      |
| 0.043                                                        | 13.0 x 23.0 x 31.0                   | 9.7                        | 60...<br>(100)                              | 64...<br>(125)      | -               |                            |             | 433                  |
| 0.047                                                        |                                      |                            |                                             |                     |                 |                            |             | 473                  |
| 0.051                                                        |                                      |                            |                                             |                     |                 |                            |             | 513                  |
| 0.056                                                        | 15.0 x 25.0 x 31.0                   | 12.6                       | 60...<br>(100)                              | 64...<br>(125)      |                 |                            |             | 563                  |
| 0.062                                                        |                                      |                            |                                             |                     |                 |                            |             | 623                  |
| 0.068                                                        |                                      |                            |                                             |                     |                 |                            |             | 683                  |
| 0.075                                                        | 18.0 x 28.0 x 31.0                   | 16.3                       | 60...<br>(100)                              | 64...<br>(100)      | 753             |                            |             |                      |
| 0.082                                                        |                                      |                            |                                             |                     | 823             |                            |             |                      |
| 0.091                                                        |                                      |                            |                                             |                     | 913             |                            |             |                      |
| 0.10                                                         |                                      |                            |                                             |                     | 104             |                            |             |                      |

**Notes**

- (1) Net weight for short lead products only  
• SPQ = Standard Packaging Quantity

**SPECIFIC REFERENCE DATA (2500 Vdc)**

| DESCRIPTION                                                                                                                                                    | VALUE                                                   |                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|--------------------------|
| Tangent of loss angle:<br>C $\leq$ 0.015 $\mu$ F<br>0.015 $\mu$ F < C $\leq$ 0.056 $\mu$ F                                                                     | at 10 kHz                                               | at 100 kHz               |
|                                                                                                                                                                | $\leq 5 \times 10^{-4}$                                 | $\leq 10 \times 10^{-4}$ |
|                                                                                                                                                                | $\leq 5 \times 10^{-4}$                                 | $\leq 15 \times 10^{-4}$ |
| Rated voltage pulse slope (dU/dt) <sub>R</sub> :<br>C $\leq$ 0.015 $\mu$ F<br>0.015 $\mu$ F < C $\leq$ 0.043 $\mu$ F<br>0.043 $\mu$ F < C $\leq$ 0.056 $\mu$ F | 13 000 V/ $\mu$ s<br>6000 V/ $\mu$ s<br>4200 V/ $\mu$ s |                          |
| R between leads, for C $\leq$ 1 $\mu$ F at 500 V, 1 min                                                                                                        | > 100 000 M $\Omega$                                    |                          |
| R between leads and case, 500 V, 1 min                                                                                                                         | > 30 000 M $\Omega$                                     |                          |
| Ionization (AC) voltage (typical value) at 20 pC peak discharge                                                                                                | > 1000 V                                                |                          |
| Withstanding (DC) voltage (cut off current 10 mA), rise time 100 V/s                                                                                           | 3500 V, 1 min                                           |                          |
| Withstanding (DC) voltage between leads and case                                                                                                               | 2840 V, 1 min                                           |                          |
| Maximum application temperature                                                                                                                                | 105 °C                                                  |                          |



AC and Pulse Double Metallized Polypropylene  
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$U_{Rdc} = 2500 \text{ V}$ ;  $U_{Rac} = 900 \text{ V}$ ;  $U_{p-p} = 2500 \text{ V}$ ;  $C\text{-tol.} = \pm 5 \%$

| C<br>(μF)                                                                                                                                                                     | DIMENSIONS<br>w x h x l<br>(mm) | MASS<br>(g) <sup>(1)</sup> | CATALOG NUMBER BFC2 383 XYYYY AND PACKAGING |                        |                |                                                                                                                            |     |                |                |                |                          |     |                |                |                    |                          |                |                |                    |                |                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------------------|---------------------------------------------|------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------|-----|----------------|----------------|----------------|--------------------------|-----|----------------|----------------|--------------------|--------------------------|----------------|----------------|--------------------|----------------|---------------------------------|
|                                                                                                                                                                               |                                 |                            | LOOSE IN BOX                                |                        | REEL           | C-VALUE                                                                                                                    |     |                |                |                |                          |     |                |                |                    |                          |                |                |                    |                |                                 |
|                                                                                                                                                                               |                                 |                            | Leads<br>3.5 ± 0.3 mm                       | Leads<br>25.0 ± 2.0 mm | H = 18.5 mm    | ..YYY                                                                                                                      |     |                |                |                |                          |     |                |                |                    |                          |                |                |                    |                |                                 |
|                                                                                                                                                                               |                                 |                            | XX<br>(SPQ)                                 | XX<br>(SPQ)            | XX<br>(SPQ)    |                                                                                                                            |     |                |                |                |                          |     |                |                |                    |                          |                |                |                    |                |                                 |
| Pitch = 22.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm                                                                                                                  |                                 |                            |                                             |                        |                |                                                                                                                            |     |                |                |                |                          |     |                |                |                    |                          |                |                |                    |                |                                 |
| 0.001<br>0.0011<br>0.0012<br>0.0013<br>0.0015<br>0.0016<br>0.0018<br>0.002<br>0.0022<br>0.0024<br>0.0027<br>0.003<br>0.0033<br>0.0036<br>0.0039<br>0.0043<br>0.0047<br>0.0051 | 6.0 x 15.5 x 26.0               | 2.4                        | 70...<br>(200)                              | 74...<br>(250)         | 72...<br>(600) | 102<br>112<br>122<br>132<br>152<br>162<br>182<br>202<br>222<br>242<br>272<br>302<br>332<br>362<br>392<br>432<br>472<br>512 |     |                |                |                |                          |     |                |                |                    |                          |                |                |                    |                |                                 |
| 0.0056<br>0.0062<br>0.0068<br>0.0075                                                                                                                                          |                                 |                            |                                             |                        |                | 7.0 x 16.5 x 26.0                                                                                                          | 3.0 | 70...<br>(200) | 74...<br>(250) | 72...<br>(550) | 562<br>622<br>682<br>752 |     |                |                |                    |                          |                |                |                    |                |                                 |
| 0.0082<br>0.0091<br>0.01<br>0.011                                                                                                                                             |                                 |                            |                                             |                        |                |                                                                                                                            |     |                |                |                | 8.5 x 18.0 x 26.0        | 4.2 | 70...<br>(200) | 74...<br>(250) | 72...<br>(450)     | 822<br>912<br>103<br>113 |                |                |                    |                |                                 |
| 0.012<br>0.013<br>0.015                                                                                                                                                       |                                 |                            |                                             |                        |                |                                                                                                                            |     |                |                |                |                          |     |                |                |                    | 10.0 x 19.5 x 26.0       | 5.3            | 70...<br>(200) | 74...<br>(200)     | 72...<br>(350) | 123<br>133<br>153               |
| Pitch = 27.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm                                                                                                                  |                                 |                            |                                             |                        |                |                                                                                                                            |     |                |                |                |                          |     |                |                |                    |                          |                |                |                    |                |                                 |
| 0.016<br>0.018<br>0.02<br>0.022<br>0.024                                                                                                                                      |                                 |                            |                                             |                        |                | 9.0 x 19.0 x 31.0                                                                                                          | 5.9 | 70...          | 74...          | -              |                          |     |                |                |                    |                          |                |                |                    |                | 163<br>183<br>203<br>223<br>243 |
| 0.027<br>0.03<br>0.033                                                                                                                                                        |                                 |                            |                                             |                        |                |                                                                                                                            |     |                |                |                | 11.0 x 21.0 x 31.0       | 8.0 | 70...<br>(100) | 74...<br>(125) | 273<br>303<br>333  |                          |                |                |                    |                |                                 |
| 0.036<br>0.039<br>0.043                                                                                                                                                       |                                 |                            |                                             |                        |                |                                                                                                                            |     |                |                |                |                          |     |                |                | 13.0 x 23.0 x 31.0 | 9.7                      | 70...<br>(100) | 74...<br>(125) | 363<br>393<br>433  |                |                                 |
| 0.047<br>0.051<br>0.056                                                                                                                                                       |                                 |                            |                                             |                        |                |                                                                                                                            |     |                |                |                |                          |     |                |                |                    |                          |                |                | 15.0 x 25.0 x 31.0 | 12.6           | 70...<br>(100)                  |

**Notes**

<sup>(1)</sup> Net weight for short lead products only

• SPQ = Standard Packaging Quantity



## MOUNTING

### Normal Use

The capacitors are designed for mounting on printed-circuit boards. The capacitors packed in bandoliers are designed for mounting on printed-circuit boards by means of automatic insertion machines. For detailed tape specifications refer to "Packaging Information" [www.vishay.com/docs?28139](http://www.vishay.com/docs?28139)

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

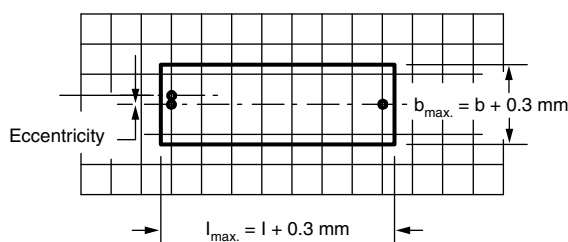
In order to withstand vibration and shock tests, it must be ensured that the stand-off pips are in good contact with the printed-circuit board:

- For original pitch = 15 mm the capacitors shall be mechanically fixed by the leads
- For larger pitches the capacitors shall be mounted in the same way and the body clamped

### Space Requirements on Printed-Circuit Board

The maximum length and width of film capacitors is shown in the drawing:

- Eccentricity as in drawing. The maximum eccentricity is smaller than or equal to the lead diameter of the product concerned
- Product height with seating plane as given by "IEC 60717" as reference:  $h_{\max.} \leq h + 0.3 \text{ mm}$



### Storage Temperature

- Storage temperature:  $T_{\text{stg}} = -25^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$  with RH maximum 80 % without condensation

### Ratings and Characteristics Reference Conditions

Unless otherwise specified, all electrical values apply to an ambient free temperature of  $23^{\circ}\text{C} \pm 1^{\circ}\text{C}$ , 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 %.

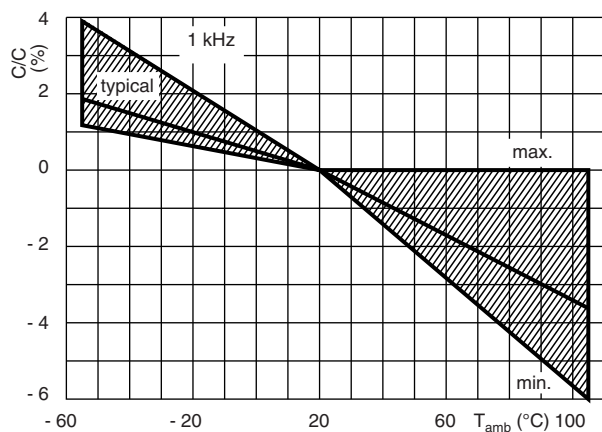


AC and Pulse Double Metallized Polypropylene  
Film Capacitors MMKP Radial Potted Type

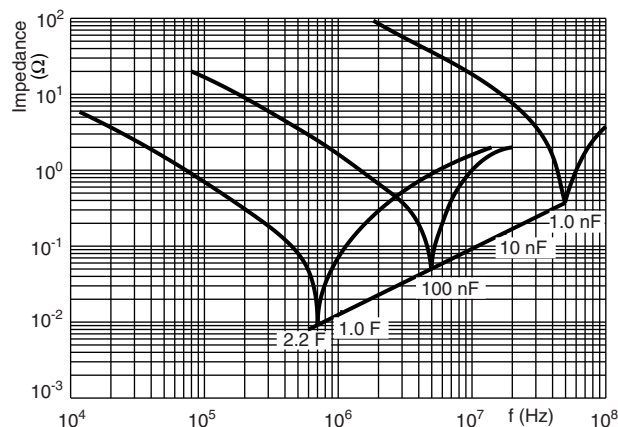
Vishay BCcomponents

**CHARACTERISTICS**

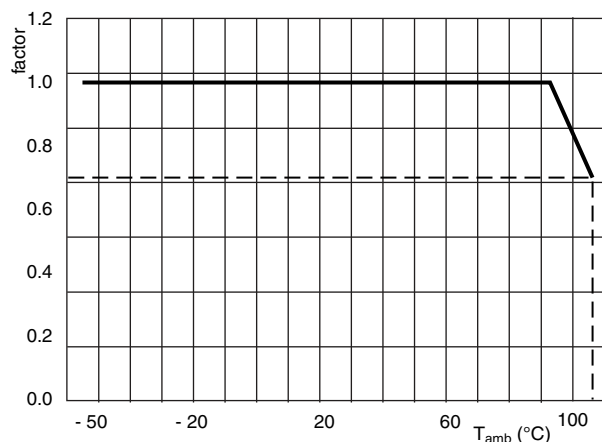
Capacitance as a function of ambient temperature (typical curve)  
(1 kHz)



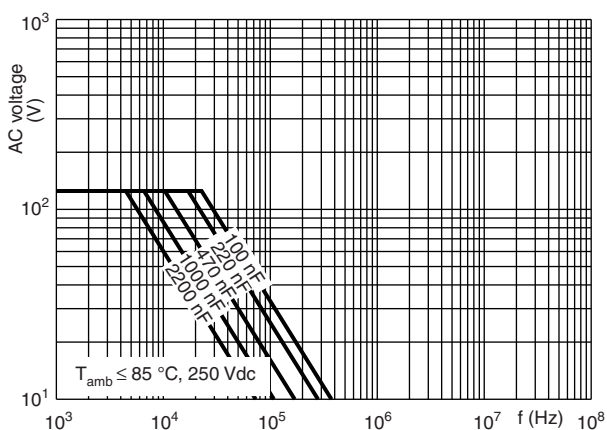
Impedance as a function of frequency (typical curve)



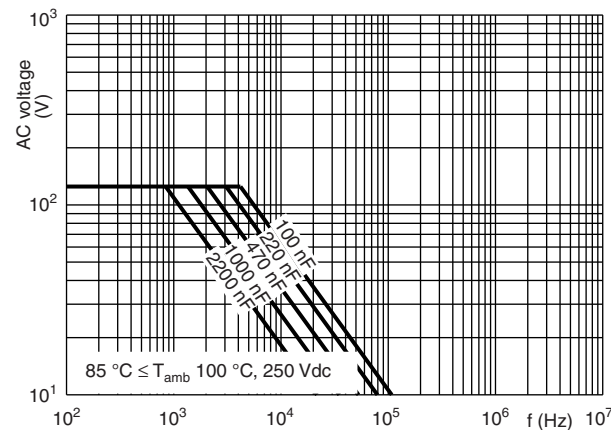
Max. DC and AC voltage as function of temperature



Max. RMS voltage as a function of frequency



Max. RMS voltage as a function of frequency

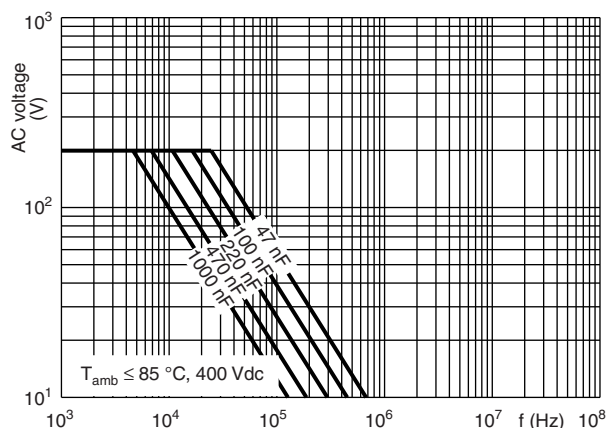




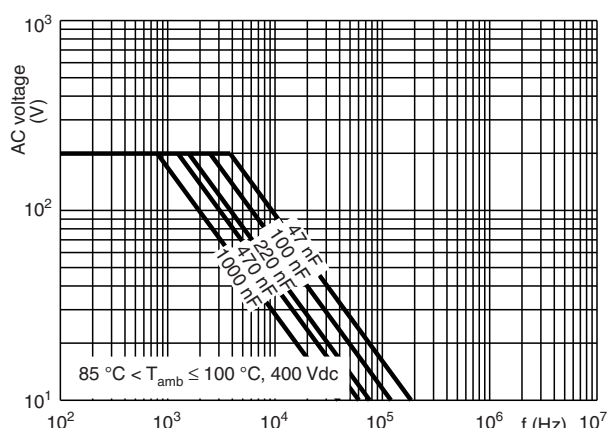
AC and Pulse Double Metallized Polypropylene  
Film Capacitors MMKP Radial Potted Type

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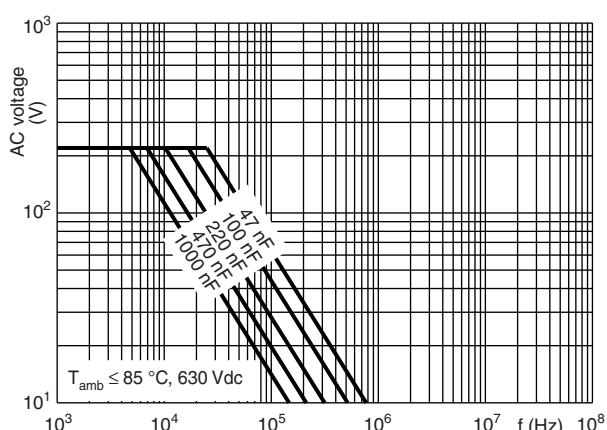
Max. RMS voltage as a function of frequency



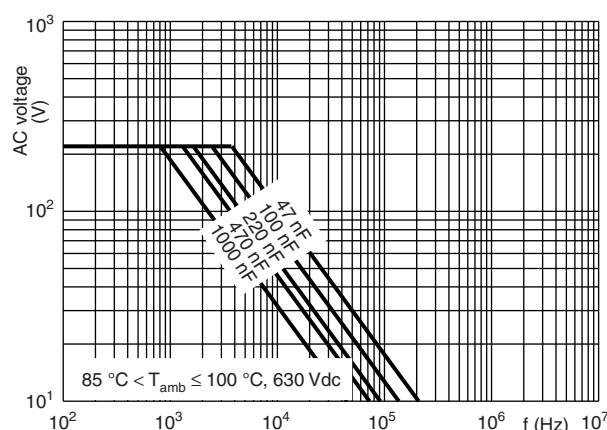
Max. RMS voltage as a function of frequency



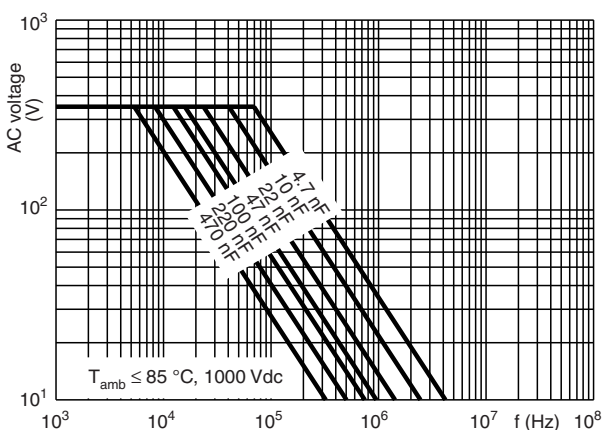
Max. RMS voltage as a function of frequency



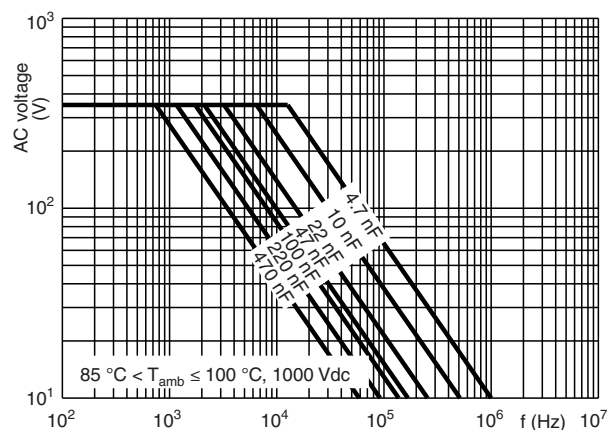
Max. RMS voltage as a function of frequency



Max. RMS voltage as a function of frequency



Max. RMS voltage as a function of frequency

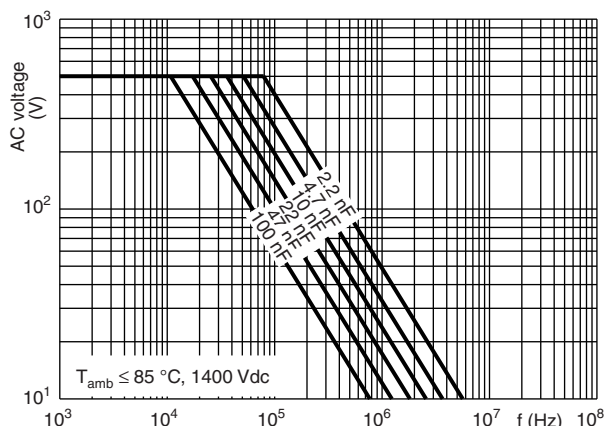




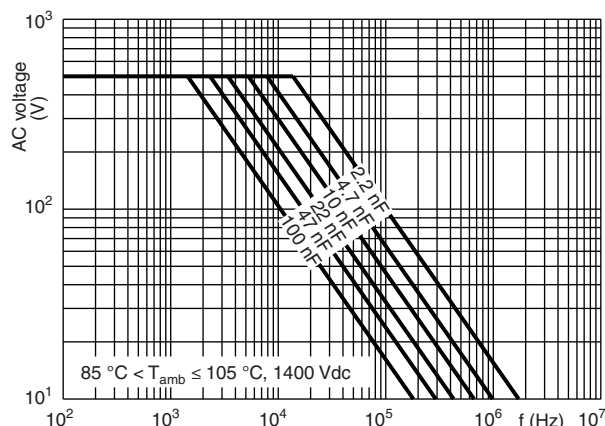
AC and Pulse Double Metallized Polypropylene  
Film Capacitors MMKP Radial Potted Type

Vishay BCcomponents

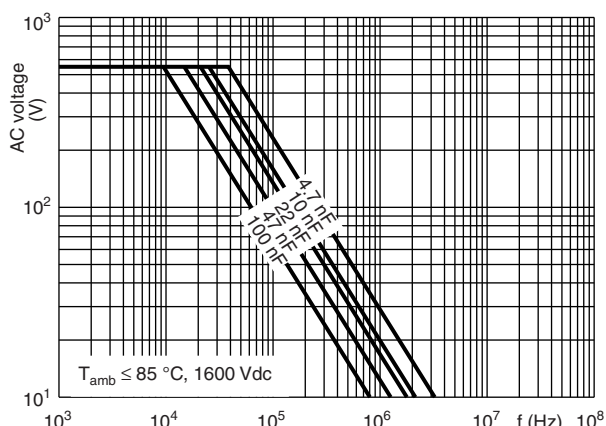
Max. RMS voltage as a function of frequency



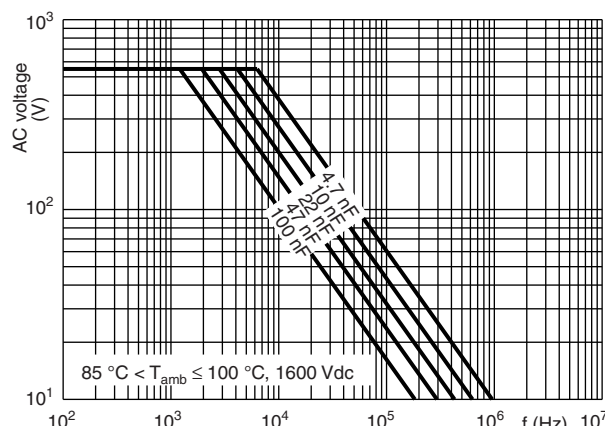
Max. RMS voltage as a function of frequency



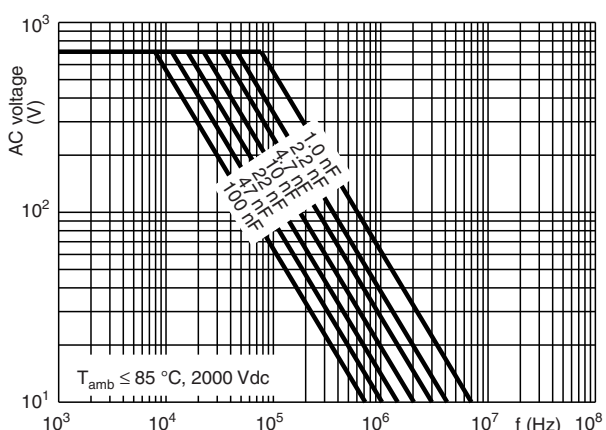
Max. RMS voltage as a function of frequency



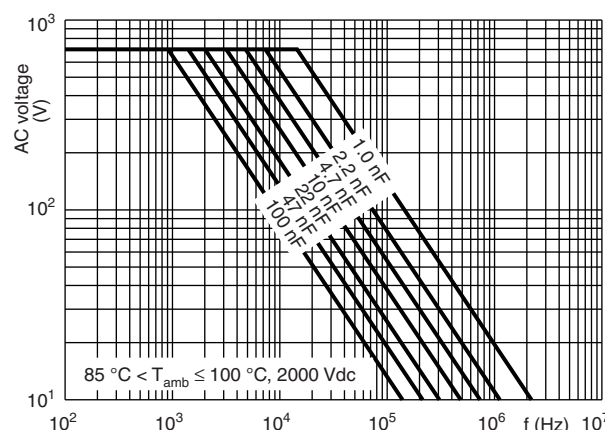
Max. RMS voltage as a function of frequency



Max. RMS voltage as a function of frequency



Max. RMS voltage as a function of frequency

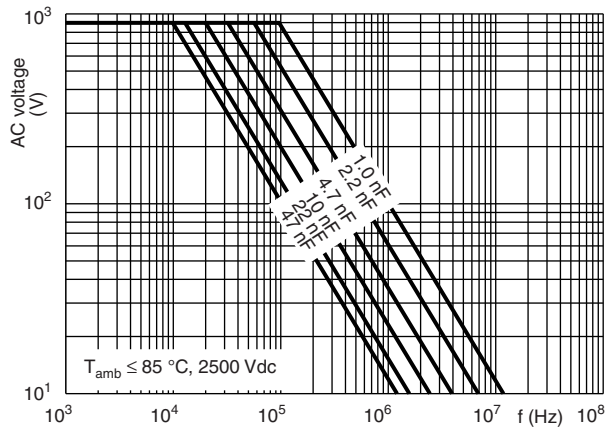




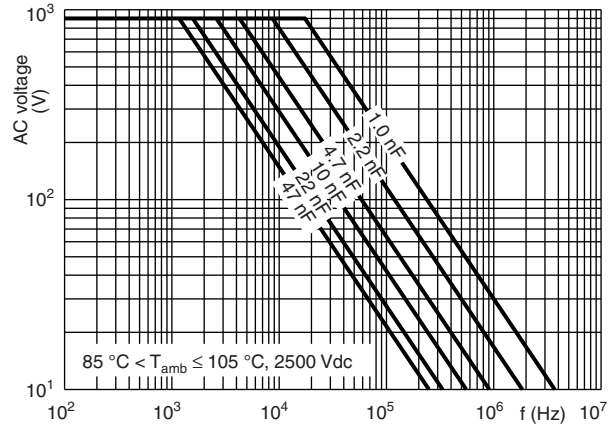
AC and Pulse Double Metallized Polypropylene  
Film Capacitors MMKP Radial Potted Type

Vishay BCcomponents

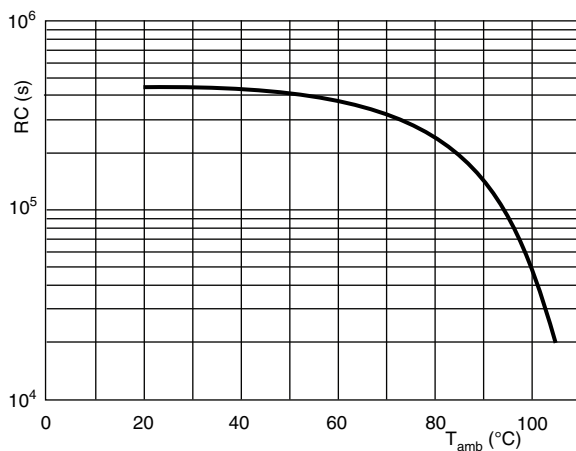
Max. RMS voltage as a function of frequency



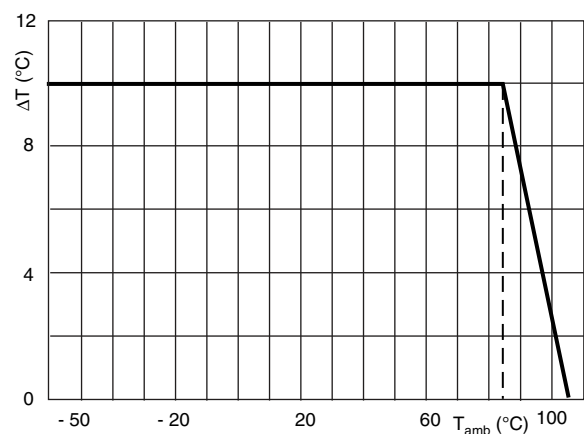
Max. RMS voltage as a function of frequency



Insulation resistance as a function of ambient temperature



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

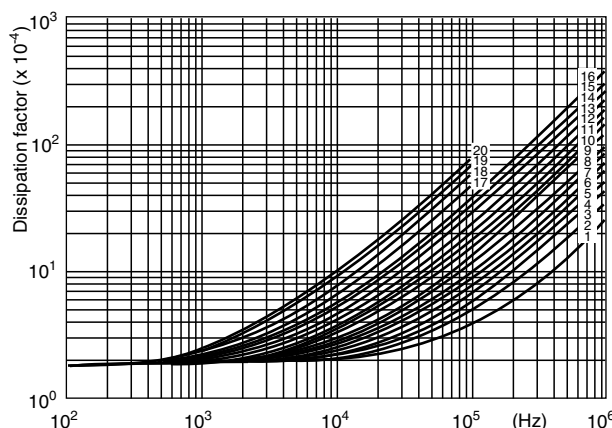




# AC and Pulse Double Metallized Polypropylene Film Capacitors MMKP Radial Potted Type

Vishay BCcomponents

Tangent of loss angle as a function of frequency (typical curve)



| 250 V                                                                                                                                                                                                                                                                                                                                                                                                            | 400 V                                                                                                                                                                                                                                                                                                                                                           | 630 V                                                                                                                                                                                                                                                                                                                     | 1000 V                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $C \leq 0.091 \mu\text{F}$ , curve 8<br>$C \leq 0.015 \mu\text{F}$ , curve 9<br>$C \leq 0.022 \mu\text{F}$ , curve 10<br>$C \leq 0.027 \mu\text{F}$ , curve 11<br>$C \leq 0.033 \mu\text{F}$ , curve 12<br>$C \leq 0.056 \mu\text{F}$ , curve 15<br>$C \leq 0.082 \mu\text{F}$ , curve 16<br>$C \leq 1.2 \mu\text{F}$ , curve 18<br>$C \leq 1.61 \mu\text{F}$ , curve 19<br>$C \leq 2.21 \mu\text{F}$ , curve 20 | $C \leq 0.047 \mu\text{F}$ , curve 5<br>$C \leq 0.068 \mu\text{F}$ , curve 6<br>$C \leq 0.1 \mu\text{F}$ , curve 7<br>$C \leq 0.2 \mu\text{F}$ , curve 8<br>$C \leq 0.24 \mu\text{F}$ , curve 12<br>$C \leq 0.36 \mu\text{F}$ , curve 13<br>$C \leq 0.43 \mu\text{F}$ , curve 14<br>$C \leq 0.56 \mu\text{F}$ , curve 16<br>$C \leq 1.1 \mu\text{F}$ , curve 17 | $C \leq 0.033 \mu\text{F}$ , curve 4<br>$C \leq 0.068 \mu\text{F}$ , curve 5<br>$C \leq 0.1 \mu\text{F}$ , curve 6<br>$C \leq 0.15 \mu\text{F}$ , curve 7<br>$C \leq 0.22 \mu\text{F}$ , curve 11<br>$C \leq 0.27 \mu\text{F}$ , curve 12<br>$C \leq 0.47 \mu\text{F}$ , curve 15<br>$C \leq 0.68 \mu\text{F}$ , curve 16 | $C \leq 0.01 \mu\text{F}$ , curve 2<br>$C \leq 0.027 \mu\text{F}$ , curve 3<br>$C \leq 0.047 \mu\text{F}$ , curve 4<br>$C \leq 0.062 \mu\text{F}$ , curve 5<br>$C \leq 0.075 \mu\text{F}$ , curve 6<br>$C \leq 0.1 \mu\text{F}$ , curve 7<br>$C \leq 0.15 \mu\text{F}$ , curve 8<br>$C \leq 0.22 \mu\text{F}$ , curve 9<br>$C \leq 0.3 \mu\text{F}$ , curve 10<br>$C \leq 0.39 \mu\text{F}$ , curve 11<br>$C \leq 0.47 \mu\text{F}$ , curve 12 |
| 140 V                                                                                                                                                                                                                                                                                                                                                                                                            | 1600 V                                                                                                                                                                                                                                                                                                                                                          | 2000 V                                                                                                                                                                                                                                                                                                                    | 2500 V                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| $C \leq 0.0047 \mu\text{F}$ , curve 1<br>$C \leq 0.016 \mu\text{F}$ , curve 2<br>$C \leq 0.033 \mu\text{F}$ , curve 3<br>$C \leq 0.051 \mu\text{F}$ , curve 4<br>$C \leq 0.068 \mu\text{F}$ , curve 5<br>$C \leq 0.082 \mu\text{F}$ , curve 6<br>$C \leq 0.1 \mu\text{F}$ , curve 7                                                                                                                              | $C \leq 0.0047 \mu\text{F}$ , curve 3<br>$C \leq 0.0091 \mu\text{F}$ , curve 4<br>$C \leq 0.068 \mu\text{F}$ , curve 5<br>$C \leq 0.01 \mu\text{F}$ , curve 6<br>$C \leq 0.15 \mu\text{F}$ , curve 7                                                                                                                                                            | $C \leq 0.0047 \mu\text{F}$ , curve 2<br>$C \leq 0.033 \mu\text{F}$ , curve 3<br>$C \leq 0.1 \mu\text{F}$ , curve 4                                                                                                                                                                                                       | $C \leq 0.0047 \mu\text{F}$ , curve 1<br>$C \leq 0.015 \mu\text{F}$ , curve 2<br>$C \leq 0.056 \mu\text{F}$ , curve 3                                                                                                                                                                                                                                                                                                                          |

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

| $W_{\text{max}}$<br>(mm) | HEAT CONDUCTIVITY (mW/°C) |               |               |
|--------------------------|---------------------------|---------------|---------------|
|                          | PITCH 15 mm               | PITCH 22.5 mm | PITCH 27.5 mm |
| 4.0                      | -                         | -             | -             |
| 5.0                      | 10                        | -             | -             |
| 6.0                      | 11                        | 19            | -             |
| 7.0                      | 12                        | 21            | -             |
| 8.5                      | 16                        | 25            | -             |
| 10.0                     | 18                        | 28            | -             |
| 11.0                     | -                         | -             | 36            |
| 13.0                     | -                         | -             | 42            |
| 15.0                     | -                         | -             | 48            |
| 18.0                     | -                         | -             | 57            |

**POWER DISSIPATION AND MAXIMUM COMPONENT TEMPERATURE RISE**

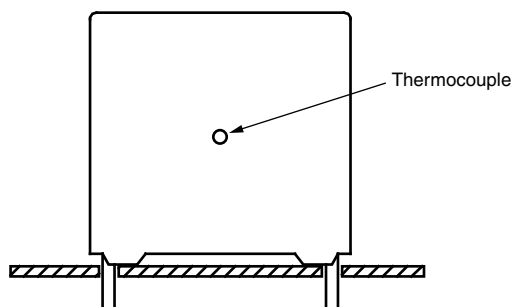
The power dissipation must be limited in order not to exceed the maximum allowed component temperature rise as a function of the free air ambient temperature. The power dissipation can be calculated according type detail specification "HQN-384-01/101: Technical Information Film Capacitors".

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 ( $^{\circ}\text{C}$ )
- $P$  = Power dissipation of the component (mW)
- $G$  = Heat conductivity of the component ( $\text{mW}/^{\circ}\text{C}$ )

**MEASURING THE COMPONENT TEMPERATURE**

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



The temperature is measured in unloaded ( $T_{\text{amb}}$ ) and maximum loaded condition ( $T_C$ ). The temperature rise is given by  $\Delta T = T_C - T_{\text{amb}}$ . 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 ( $U_{\text{Rdc}}$ )
2. The peak-to-peak voltage ( $U_{\text{P-P}}$ ) shall not be greater than  $2\sqrt{2} \times U_{\text{Rac}}$  to avoid the ionisation inception level
3. The voltage pulse 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  $U_{\text{Rdc}}$  and divided by the applied voltage.

For all other pulses following equation must be fulfilled:

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

$T$  is the pulse duration.

4. The maximum component surface temperature rise must be lower than the limits (see graph 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"



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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                             | $T_{amb} \leq 85^{\circ}\text{C}$ | $85^{\circ}\text{C} < T_{amb} \leq 105^{\circ}\text{C}$ |
|----------------------------------------------|-----------------------------------|---------------------------------------------------------|
| Maximum continuous RMS voltage               | $U_{Rac}$                         | $U_{Rac}$                                               |
| Maximum temperature RMS-overvoltage (< 24 h) | $1.25 \times U_{Rac}$             | $1.25 \times U_{Rac}$                                   |
| Maximum peak voltage ( $V_{O-P}$ ) (< 2 s)   | $1.6 \times U_{Rdc}$              | $1.1 \times U_{Rdc}$                                    |

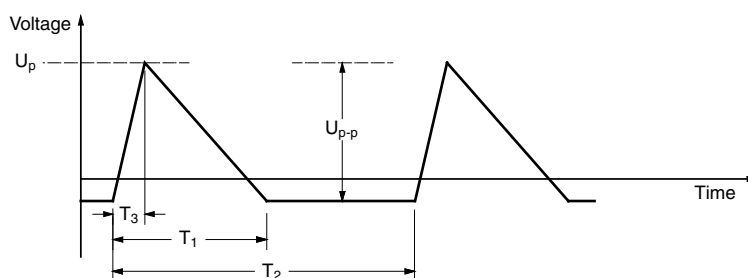
**EXAMPLE**

C = 4 nF - 1600 V used for the voltage signal shown in next drawing.  
 $U_{P-P} = 1000$  V;  $U_P = 900$  V;  $T_1 = 12$   $\mu\text{s}$ ;  $T_2 = 64$   $\mu\text{s}$ ;  $T_3 = 4$   $\mu\text{s}$   
 The ambient temperature is  $80^{\circ}\text{C}$ . In case of failure, the oscillation is blocked.

Checking conditions:

1. The peak voltage  $U_P = 900$  V is lower than 1600 Vdc
2. The peak-to-peak voltage 1000 V is lower than  $2\sqrt{2} \times 550$  Vac = 1600  $U_{P-P}$
3. The voltage pulse slope  $(dU/dt) = 1000$  V/4  $\mu\text{s} = 250$  V/ $\mu\text{s}$   
 This is lower than 8000 V/ $\mu\text{s}$  (see specific reference data for each version)
4. The dissipated power is 35 mW as calculated with fourier terms and typical  $\text{tg}\delta$ .  
 The temperature rise for  $W_{max.} = 6.0$  mm and pitch = 15 mm will be  $35$  mW/11 mW/ $^{\circ}\text{C} = 3.2^{\circ}\text{C}$   
 This is lower than  $10^{\circ}\text{C}$  temperature rise at  $80^{\circ}\text{C}$ , according graph.
5. Oscillation is blocked
6. Not applicable

**Voltage Signal**





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**INSPECTION REQUIREMENTS****General Notes:**

Sub-clause numbers of tests and performance requirements refer to the "Sectional Specification, Publication IEC 60384-17 and Specific Reference Data".

**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 (detail)                                   |                                                                                                                                                                                                                                                 | As specified in chapters "General Data" of this specification                                                                                                                                                                                                                                                                             |
| 4.3.1 Initial measurements                                | Capacitance<br>Tangent of loss angle:<br>For $C \leq 1 \mu\text{F}$ at 100 kHz or<br>for $C > 1 \mu\text{F}$ at 10 kHz                                                                                                                          |                                                                                                                                                                                                                                                                                                                                           |
| 4.3 Robustness of terminations                            | Tensile: Load 10 N; 10 s<br>Bending: Load 5 N; 4 x 90°                                                                                                                                                                                          | No visible damage                                                                                                                                                                                                                                                                                                                         |
| 4.4 Resistance to soldering heat                          | Method: 1A<br>Solder bath: 280 °C $\pm$ 5 °C<br>Duration: 10 s                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                           |
| 4.14 Component solvent resistance                         | Isopropylalcohol at room temperature<br>Method: 2<br>Immersion time: 5 min $\pm$ 0.5 min<br>Recovery time: Min. 1 h, max. 2 h                                                                                                                   |                                                                                                                                                                                                                                                                                                                                           |
| 4.4.2 Final measurements                                  | Visual examination<br><br>Capacitance<br><br>Tangent of loss angle                                                                                                                                                                              | No visible damage<br>Legible marking<br><br>$ \Delta C/C  \leq 1\%$ of the value measured initially<br><br>Increase of $\tan \delta$<br>$\leq 0.0005$ for: $C \leq 100 \text{ nF}$ or<br>$\leq 0.001$ for: $100 \text{ nF} < C \leq 470 \text{ nF}$ or<br>$\leq 0.0015$ for: $C > 470 \text{ nF}$<br>Compared to values measured in 4.3.1 |
| <b>SUB-GROUP C1B OTHER PART OF SAMPLE OF SUB-GROUP C1</b> |                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                           |
| 4.6.1 Initial measurements                                | Capacitance<br>Tangent of loss angle:<br>For $C \leq 1 \mu\text{F}$ at 100 kHz or<br>for $C > 1 \mu\text{F}$ at 10 kHz                                                                                                                          |                                                                                                                                                                                                                                                                                                                                           |
| 4.15 Solvent resistance of the marking                    | Isopropylalcohol at room temperature<br>Method: 1<br>Rubbing material: cotton wool                                                                                                                                                              | No visible damage<br>Legible marking                                                                                                                                                                                                                                                                                                      |
| 4.6 Rapid change of temperature                           | Immersion time: 5.0 min $\pm$ 0.5 min<br>$\theta A = -55\text{ °C}$<br>$\theta B = +105\text{ °C}$<br>5 cycles<br>Duration $t = 30 \text{ min}$                                                                                                 |                                                                                                                                                                                                                                                                                                                                           |
| 4.7 Vibration                                             | Visual examination<br>Mounting: see section "Mounting" for more information<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 | No visible damage                                                                                                                                                                                                                                                                                                                         |



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| SUB-CLAUSE NUMBER AND TEST                                                                                                                                                                                 | CONDITIONS                                                                                                                                                                                                                                                                         | PERFORMANCE REQUIREMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SUB-GROUP C1B OTHER PART OF SAMPLE OF SUB-GROUP C1</b>                                                                                                                                                  |                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 4.7.2 Final inspection<br>4.9 Shock<br><br>4.9.3 Final measurements                                                                                                                                        | Visual examination<br>Mounting:<br>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><br>Visual examination<br>Capacitance<br>Tangent of loss angle<br><br>Insulation resistance          | No visible damage<br><br><br>No visible damage<br>$ \Delta C/C  \leq 1\%$ of the value measured in 4.6.1<br>Increase of $\tan \delta$<br>$\leq 0.0005$ for: $C \leq 100$ nF or<br>$\leq 0.001$ for: $100$ nF $< C \leq 470$ nF or<br>$\leq 0.0015$ for: $C > 470$ nF<br>Compared to values measured in 4.6.1<br>As specified in section "Insulation Resistance" of this specification                                                                                                           |
| <b>SUB-GROUP C1 COMBINED SAMPLE OF SPECIMENS OF SUB-GROUPS C1A AND C1B</b>                                                                                                                                 |                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 4.10 Climatic sequence<br>4.10.2 Dry heat<br><br>4.10.3 Damp heat cyclic<br>Test Db, first cycle<br>4.10.4 Cold<br><br>4.10.6 Damp heat cyclic<br>Test Db, remaining cycles<br>4.10.6.2 Final measurements | Temperature: + 105 °C<br>Duration: 16 h<br><br>Temperature: - 55 °C<br>Duration: 2 h<br><br>Voltage proof = $U_{Rdc}$ for 1 min within 15 min after removal from testchamber<br>Visual examination<br><br>Capacitance<br><br>Tangent of loss angle<br><br>Insulation resistance    | No breakdown of flash-over<br><br>No visible damage<br>Legible marking<br>For original pitch = 22.5 mm and 27.5 mm:<br>$ \Delta C/C  \leq 3\%$ of the value measured in 4.4.2 or 4.9.3<br>Increase of $\tan \delta$<br>$\leq 0.0005$ for: $C \leq 100$ nF or<br>$\leq 0.001$ for: $100$ nF $< C \leq 470$ nF or<br>$\leq 0.0015$ for: $C > 470$ nF<br>Compared to values measured in 4.3.1 or 4.6.1<br>$\geq 50\%$ of values specified in section "Insulation Resistance" of this specification |
| <b>SUB-GROUP C2</b>                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 4.11 Damp heat steady state<br>4.11.1 Initial measurements<br>4.11.3 Final measurements                                                                                                                    | 56 days, 40 °C, 90 % to 95 % RH<br>no load<br>Capacitance<br>Tangent of loss angle at 1 kHz<br>Voltage proof = $U_{Rdc}$ for 1 min within 15 min after removal from testchamber<br>Visual examination<br><br>Capacitance<br><br>Tangent of loss angle<br><br>Insulation resistance | No breakdown of flash-over<br><br>No visible damage<br>Legible marking<br>$ \Delta C/C  \leq 1\%$ of the value measured in 4.11.1.<br>Increase of $\tan \delta$<br>$\leq 0.0005$ for: $C \leq 100$ nF or<br>$\leq 0.001$ for: $100$ nF $< C \leq 470$ nF or<br>$\leq 0.0015$ for: $C \leq 470$ nF<br>Compared to values measured in 4.11.1<br>$\geq 50\%$ of values specified in section "Insulation Resistance" of this specification                                                          |



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| SUB-CLAUSE NUMBER AND TEST                                                                                       | CONDITIONS                                                                                                                              | PERFORMANCE REQUIREMENTS                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SUB-GROUP C3A</b>                                                                                             |                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                   |
| 4.12.1 Endurance test at 50 Hz alternating voltage                                                               | Duration: 2000 h<br>1.25 x U <sub>Rdc</sub> at 105 °C                                                                                   |                                                                                                                                                                                                                                                                                                                                                                   |
| 4.12.1.1 Initial measurements                                                                                    | Capacitance<br>Tangent of loss angle:<br>For C ≤ 1 µF at 100 kHz or<br>for C > 1 µF 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> ΔC/C  ≤ 5 % compared to values measured in 4.12.1.1<br><br>Increase of tan δ<br>≤ 0.0005 for: C ≤ 100 nF or<br>≤ 0.001 for: 100 nF < C ≤ 470 nF or<br>≤ 0.0015 for: C > 470 nF<br>Compared to values measured in 4.12.1.1<br><br>≥ 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<br><br>Final measurements | Capacitance<br>Capacitance at - 55 °C<br>Capacitance at 20 °C<br>Capacitance at + 105 °C<br>Capacitance<br><br>Insulation resistance    | For - 55 °C to + 20 °C:<br>+ 1 % ≤  ΔC/C  ≤ 3.75 % or<br>for 20 °C to 105 °C:<br>- 6 % ≤  ΔC/C  ≤ 0 %<br>As specified in section "Capacitance" of this specification.<br>As specified in section "Insulation Resistance" of this specification                                                                                                                    |
| 4.13 Charge and discharge                                                                                        | 10 000 cycles<br>Charged to U <sub>Rdc</sub><br>Discharge resistance:<br><br>$R = \frac{U_{Rdc}}{5 \times C \times (2.5 \times dU/dt)}$ |                                                                                                                                                                                                                                                                                                                                                                   |
| 4.13.1 Initial measurements                                                                                      | Capacitance<br>Tangent of loss angle:<br>For C ≤ 1 µF at 100 kHz or<br>for C > 1 µF at 10 kHz                                           |                                                                                                                                                                                                                                                                                                                                                                   |
| 4.13.3 Final measurements                                                                                        | Capacitance<br><br>Tangent of loss angle<br><br>Insulation resistance                                                                   | ΔC/C  ≤ 1 % compared to values measured in 4.13.1<br><br>Increase of tan δ<br>≤ 0.0005 for: C ≤ 100 nF or<br>≤ 0.001 for: 100 nF < C ≤ 470 nF or<br>≤ 0.0015 for: C > 470 nF<br>Compared to values measured in 4.13.1<br><br>≥ 50 % of values specified in section "Insulation Resistance" of this specification                                                  |



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