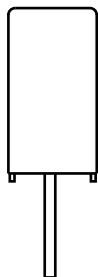
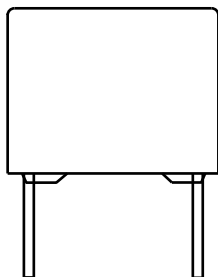


## DC Film Capacitors MKT Radial Potted Type



### FEATURES

- 15 mm to 27.5 mm lead pitch.  
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  
HALOGEN  
**FREE**

### APPLICATIONS

Blocking and coupling, bypass and energy reservoir

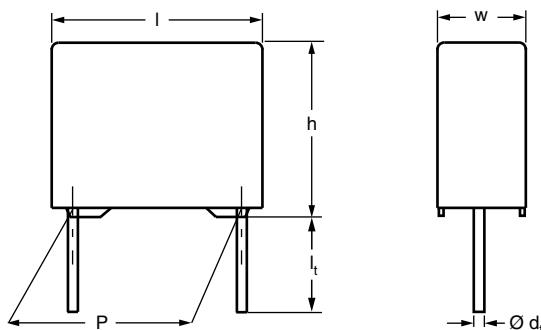
### QUICK REFERENCE DATA

|                                                   |                                                                                                                 |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Capacitance tolerance                             | $\pm 10\%$ , $\pm 5\%$                                                                                          |
| Capacitance range (E12 series)                    | 0.047 $\mu\text{F}$ to 15 $\mu\text{F}$                                                                         |
| Rated DC voltage                                  | 100 V, 250 V, 400 V, 630 V                                                                                      |
| Rated AC voltage                                  | 63 V, 160 V, 220 V, 250 V                                                                                       |
| Climatic testing class (according to IEC 60068-1) | 55/105/56                                                                                                       |
| Rated temperature                                 | 85 °C                                                                                                           |
| Maximum application temperature                   | 105 °C                                                                                                          |
| Performance grade                                 | Grade 1 (long life)                                                                                             |
| Leads                                             | Tinned wire                                                                                                     |
| Reference standards                               | IEC 60384-2                                                                                                     |
| Dielectric                                        | Polyester film                                                                                                  |
| Electrodes                                        | Metallized                                                                                                      |
| Construction                                      | Mono construction                                                                                               |
| Encapsulation                                     | Flame retardant plastic case and epoxy resin (UL-class 94 V-0)                                                  |
| Marking                                           | C-value; tolerance; rated voltage; manufacturer's symbol;<br>year and week of manufacturer; manufacturer's type |

#### Note

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

### DIMENSIONS





## COMPOSITION OF CATALOG NUMBER

| TYPE AND PITCHES |         | CAPACITANCE<br>(numerically) |   | MULTIPLIER<br>(nF) |   |
|------------------|---------|------------------------------|---|--------------------|---|
| 373              | 15.0 mm |                              |   | 0.1                | 2 |
|                  | 22.5 mm | 1                            | 3 |                    |   |
|                  | 27.5 mm | 10                           | 4 |                    |   |
|                  |         |                              |   | 100                | 5 |

Example:  
104 = 10 x 10 = 100 nF

|          |     |    |    |   |
|----------|-----|----|----|---|
| BFC2     | 373 | XX | YY | Y |
| 2222 (*) | 373 | XX | YY | Y |

(\*) Old ordering number

| TYPE            | PACKAGING         | LEAD CONFIGURATION                                                               | PREFERRED TYPES |       |       |       |       |
|-----------------|-------------------|----------------------------------------------------------------------------------|-----------------|-------|-------|-------|-------|
|                 |                   |                                                                                  | C-TOL.          | 100 V | 250 V | 400 V | 630 V |
| 373<br>compact  | Loose in box      | Lead length<br>5.0 mm ± 1.0 mm                                                   | ± 10 %          | 23    | 43    | 53    | 63    |
|                 | Taped on reel (1) | H <sup>(1)</sup> = 18.5 mm<br>P <sub>0</sub> = 12.7 mm<br>Reel diameter = 356 mm | ± 5 %           | 24    | 44    | 54    | 64    |
|                 |                   |                                                                                  | ± 10 %          | 27    | 47    | 57    | 67    |
| 373<br>standard | Loose in box      | Lead length<br>5.0 mm ± 1.0 mm                                                   | ± 10 %          | 21    | 41    | 51    | -     |
|                 |                   |                                                                                  | ± 5 %           | 22    | 42    | 52    |       |
|                 | Taped on reel (1) | H <sup>(1)</sup> = 18.5 mm<br>P <sub>0</sub> = 12.7 mm<br>Reel diameter = 356 mm | ± 10 %          | 25    | 45    | 55    |       |
|                 |                   |                                                                                  | ± 5 %           | 26    | 46    | 56    |       |

## Note

(1) For detailed tape specifications refer to packaging information: [www.vishay.com/doc?28139](http://www.vishay.com/doc?28139)

| SPECIFIC REFERENCE DATA                                                                                                 |                         |                          |                          |                     |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------|--------------------------|--------------------------|---------------------|
| DESCRIPTION                                                                                                             | VALUE                   |                          |                          |                     |
| Tangent of loss angle:<br>C ≤ 0.1 μF<br>0.1 μF < C ≤ 0.47 μF<br>0.47 μF < C ≤ 1.0 μF<br>1.0 μF < C ≤ 10 μF<br>C > 10 μF | at 1 kHz                | at 10 kHz                | at 100 kHz               |                     |
|                                                                                                                         | ≤ 75 x 10 <sup>-4</sup> | ≤ 130 x 10 <sup>-4</sup> | ≤ 250 x 10 <sup>-4</sup> |                     |
|                                                                                                                         | ≤ 75 x 10 <sup>-4</sup> | ≤ 130 x 10 <sup>-4</sup> | ≤ 300 x 10 <sup>-4</sup> |                     |
|                                                                                                                         | ≤ 75 x 10 <sup>-4</sup> | ≤ 130 x 10 <sup>-4</sup> | -                        |                     |
|                                                                                                                         | ≤ 75 x 10 <sup>-4</sup> | ≤ 150 x 10 <sup>-4</sup> | -                        |                     |
| Rated voltage pulse slope (dU/dt) <sub>R</sub> at<br>P = 15 mm<br>P = 22.5 mm<br>P = 27.5 mm                            | 100 V <sub>DC</sub>     | 250 V <sub>DC</sub>      | 400 V <sub>DC</sub>      | 630 V <sub>DC</sub> |
|                                                                                                                         | 14 V/μs                 | 16 V/μs                  | 34 V/μs                  | 90 V/μs             |
|                                                                                                                         | 5 V/μs                  | 7 V/μs                   | 14 V/μs                  | 35 V/μs             |
|                                                                                                                         | 4 V/μs                  | 6 V/μs                   | 12 V/μs                  | 30 V/μs             |
| R between leads, for C ≤ 0.33 μF<br>at 100 V; 1 min<br>at 500 V; 1 min                                                  | > 15 000 MΩ             | > 15 000 MΩ              | > 30 000 MΩ              | > 30 000 MΩ         |
| RC between leads, for C > 0.33 μF<br>at 100 V; 1 min<br>at 500 V; 1 min                                                 | > 5000 s                | > 10 000 s               | > 10 000 s               | > 10 000 s          |
| R between interconnecting leads and case<br>(foil method)                                                               | > 30 000 MΩ             |                          |                          |                     |
| Withstanding (DC) voltage (cut off current 10 mA) <sup>(1)</sup> ;<br>rise time ≤ 1000 V/s                              | 160 V; 1 min            | 400 V; 1 min             | 640 V; 1 min             | 1008 V; 1 min       |
| Withstanding (DC) voltage between leads and case                                                                        | 200 V; 1 min            | 500 V; 1 min             | 800 V; 1 min             | 1260 V; 1 min       |
| Maximum application temperature                                                                                         | 105 °C                  |                          |                          |                     |

## Note

(1) See "Voltage Proof Test for Metallized Film Capacitors": [www.vishay.com/doc?28169](http://www.vishay.com/doc?28169)



| ELECTRICAL DATA - COMPACT SIZE                                                         |                                                                                       |                                 |                            |                                             |                 |                                       |                 |                                                                                         |                   |                 |                 |                 |                 |                 |                                 |     |                 |                 |                |                |            |
|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|----------------------------|---------------------------------------------|-----------------|---------------------------------------|-----------------|-----------------------------------------------------------------------------------------|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|---------------------------------|-----|-----------------|-----------------|----------------|----------------|------------|
| U <sub>RDC</sub><br>(V)                                                                | CAP.<br>(μF)                                                                          | DIMENSIONS<br>w x h x l<br>(mm) | MASS<br>(g) <sup>(3)</sup> | CATALOG NUMBER BFC2 373 XYYYY AND PACKAGING |                 |                                       |                 |                                                                                         |                   |                 |                 |                 |                 |                 |                                 |     |                 |                 |                |                |            |
|                                                                                        |                                                                                       |                                 |                            | LOOSE IN BOX                                |                 | REEL <sup>(1)(2)</sup>                |                 | C-VALUE                                                                                 |                   |                 |                 |                 |                 |                 |                                 |     |                 |                 |                |                |            |
|                                                                                        |                                                                                       |                                 |                            | l <sub>t</sub> = 5.0 mm ± 1.0 mm            |                 | H = 18.5 mm; P <sub>0</sub> = 12.7 mm |                 |                                                                                         |                   |                 |                 |                 |                 |                 |                                 |     |                 |                 |                |                |            |
|                                                                                        |                                                                                       |                                 |                            | C-TOL. = ± 10 %                             | C-TOL. = ± 5 %  | C-TOL. = ± 10 %                       | C-TOL. = ± 5 %  |                                                                                         |                   |                 |                 |                 |                 |                 |                                 |     |                 |                 |                |                |            |
|                                                                                        |                                                                                       |                                 |                            | XX<br>(SPQ)                                 | XX<br>(SPQ)     | XX<br>(SPQ)                           | XX<br>(SPQ)     | ..YYY                                                                                   |                   |                 |                 |                 |                 |                 |                                 |     |                 |                 |                |                |            |
| 100                                                                                    | U <sub>RAC</sub> = 63 V; PITCH = 15.0 mm ± 0.4 mm; d <sub>t</sub> = 0.60 mm ± 0.06 mm |                                 |                            |                                             |                 |                                       |                 |                                                                                         |                   |                 |                 |                 |                 |                 |                                 |     |                 |                 |                |                |            |
|                                                                                        | 0.33<br>0.39<br>0.47<br>0.56<br>0.68<br>0.82<br>1.0<br>1.2<br>1.5<br>1.8              | 5.0 x 11.0 x 17.5               | 1.1                        | 23...<br>(1000)                             | 24...<br>(1000) | 27...<br>(1100)                       | 28...<br>(1100) | 334<br>394<br>474<br>564<br>684<br>824<br>105<br>125<br>155<br>185                      |                   |                 |                 |                 |                 |                 |                                 |     |                 |                 |                |                |            |
|                                                                                        | 2.2                                                                                   |                                 |                            |                                             |                 |                                       |                 | 6.0 x 12.0 x 17.5                                                                       | 1.5               | 23...<br>(1000) | 24...<br>(1000) | 27...<br>(900)  | 28...<br>(900)  | 225             |                                 |     |                 |                 |                |                |            |
|                                                                                        | U <sub>RAC</sub> = 63 V; PITCH = 15.0 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                 |                            |                                             |                 |                                       |                 |                                                                                         |                   |                 |                 |                 |                 |                 |                                 |     |                 |                 |                |                |            |
|                                                                                        | 2.7<br>3.3                                                                            |                                 |                            |                                             |                 |                                       |                 | 7.0 x 13.5 x 17.5                                                                       | 2.0               | 23...<br>(1000) | 24...<br>(1000) | 27...<br>(800)  | 28...<br>(800)  | 275<br>335      |                                 |     |                 |                 |                |                |            |
|                                                                                        | 3.9<br>4.7                                                                            |                                 |                            |                                             |                 |                                       |                 | 8.5 x 15.0 x 17.5                                                                       | 2.7               | 23...<br>(1000) | 24...<br>(1000) | 27...<br>(650)  | 28...<br>(650)  | 395<br>475      |                                 |     |                 |                 |                |                |            |
|                                                                                        | 250                                                                                   |                                 |                            |                                             |                 |                                       |                 | U <sub>RAC</sub> = 160 V; PITCH = 15.0 mm ± 0.40 mm; d <sub>t</sub> = 0.60 mm ± 0.06 mm |                   |                 |                 |                 |                 |                 |                                 |     |                 |                 |                |                |            |
|                                                                                        |                                                                                       |                                 |                            |                                             |                 |                                       |                 | 0.15<br>0.18<br>0.22<br>0.27<br>0.32                                                    | 5.0 x 11.0 x 17.5 | 1.1             | 43...<br>(1000) | 44...<br>(1000) | 47...<br>(1100) | 48...<br>(1100) | 154<br>184<br>224<br>274<br>334 |     |                 |                 |                |                |            |
|                                                                                        |                                                                                       |                                 |                            |                                             |                 |                                       |                 | 0.39<br>0.47                                                                            |                   |                 |                 |                 |                 |                 | 6.0 x 12.0 x 17.5               | 1.5 | 43...<br>(1000) | 44...<br>(1000) | 47...<br>(900) | 48...<br>(900) | 394<br>474 |
|                                                                                        |                                                                                       |                                 |                            |                                             |                 |                                       |                 | U <sub>RAC</sub> = 160 V; PITCH = 15.0 mm ± 0.40 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                   |                 |                 |                 |                 |                 |                                 |     |                 |                 |                |                |            |
|                                                                                        |                                                                                       |                                 |                            |                                             |                 |                                       |                 | 0.56<br>0.68                                                                            |                   |                 |                 |                 |                 |                 | 7.0 x 13.5 x 17.5               | 2.0 | 43...<br>(1000) | 44...<br>(1000) | 47...<br>(800) | 48...<br>(800) | 564<br>684 |
|                                                                                        |                                                                                       | 0.82<br>1.0                     | 8.5 x 15.0 x 17.5          | 2.7                                         | 43...<br>(1000) | 44...<br>(1000)                       | 47...<br>(650)  | 48...<br>(650)                                                                          |                   |                 |                 |                 |                 |                 | 824<br>105                      |     |                 |                 |                |                |            |
|                                                                                        |                                                                                       | 1.2                             | 10.0 x 16.5 x 17.5         | 3.5                                         | 43...<br>(500)  | 44...<br>(500)                        | 47...<br>(600)  | 48...<br>(600)                                                                          | 125               |                 |                 |                 |                 |                 |                                 |     |                 |                 |                |                |            |
| U <sub>RAC</sub> = 160 V; PITCH = 22.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                                                                       |                                 |                            |                                             |                 |                                       |                 |                                                                                         |                   |                 |                 |                 |                 |                 |                                 |     |                 |                 |                |                |            |
| 1.5<br>1.8                                                                             |                                                                                       | 8.5 x 18.0 x 26.0               | 4.5                        | 43...<br>(200)                              | 44...<br>(200)  | 47...<br>(450)                        | 48...<br>(450)  | 155<br>185                                                                              |                   |                 |                 |                 |                 |                 |                                 |     |                 |                 |                |                |            |
| 2.2<br>2.7                                                                             |                                                                                       | 10.0 x 19.5 x 26.0              | 5.7                        | 43...<br>(200)                              | 44...<br>(200)  | 47...<br>(350)                        | 48...<br>(350)  | 225<br>275                                                                              |                   |                 |                 |                 |                 |                 |                                 |     |                 |                 |                |                |            |
| U <sub>RAC</sub> = 160 V; PITCH = 27.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                                                                       |                                 |                            |                                             |                 |                                       |                 |                                                                                         |                   |                 |                 |                 |                 |                 |                                 |     |                 |                 |                |                |            |
| 3.3                                                                                    |                                                                                       | 11.0 x 21.0 x 31.0              | 8.2                        | 43...<br>(100)                              | 44...<br>(100)  | -                                     | -               | 335                                                                                     |                   |                 |                 |                 |                 |                 |                                 |     |                 |                 |                |                |            |
| 3.9<br>4.7                                                                             |                                                                                       | 13.0 x 23.0 x 31.0              | 10.2                       | 43...<br>(100)                              | 44...<br>(100)  | -                                     | -               | 395<br>475                                                                              |                   |                 |                 |                 |                 |                 |                                 |     |                 |                 |                |                |            |



| ELECTRICAL DATA - COMPACT SIZE                                                         |                                                                                        |                                                                                        |                            |                                             |                 |                                       |                 |                                               |                          |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|----------------------------|---------------------------------------------|-----------------|---------------------------------------|-----------------|-----------------------------------------------|--------------------------|
| U <sub>RDC</sub><br>(V)                                                                | CAP.<br>(μF)                                                                           | DIMENSIONS<br>w x h x l<br>(mm)                                                        | MASS<br>(g) <sup>(3)</sup> | CATALOG NUMBER BFC2 373 XXYYY AND PACKAGING |                 |                                       |                 |                                               |                          |
|                                                                                        |                                                                                        |                                                                                        |                            | LOOSE IN BOX                                |                 | REEL <sup>(1)(2)</sup>                |                 | C-VALUE                                       |                          |
|                                                                                        |                                                                                        |                                                                                        |                            | l <sub>t</sub> = 5.0 mm ± 1.0 mm            |                 | H = 18.5 mm; P <sub>0</sub> = 12.7 mm |                 |                                               |                          |
|                                                                                        |                                                                                        |                                                                                        |                            | C-TOL. = ± 10 %                             | C-TOL. = ± 5 %  | C-TOL. = ± 10 %                       | C-TOL. = ± 5 %  |                                               |                          |
|                                                                                        |                                                                                        |                                                                                        |                            | XX<br>(SPQ)                                 | XX<br>(SPQ)     | XX<br>(SPQ)                           | XX<br>(SPQ)     |                                               | ..YYY                    |
| 400                                                                                    | U <sub>RAC</sub> = 220 V; PITCH = 15.0 mm ± 0.4 mm; d <sub>t</sub> = 0.60 mm ± 0.06 mm |                                                                                        |                            |                                             |                 |                                       |                 |                                               |                          |
|                                                                                        | 0.047<br>0.056<br>0.068<br>0.082<br>0.10<br>0.12<br>0.15                               | 5.0 x 11.0 x 17.5                                                                      | 1.1                        | 53...<br>(1000)                             | 54...<br>(1000) | 57...<br>(1100)                       | 58...<br>(1100) | 473<br>563<br>683<br>823<br>104<br>124<br>154 |                          |
|                                                                                        | 0.18<br>0.22                                                                           | 6.0 x 12.0 x 17.5                                                                      | 1.5                        | 53...<br>(1000)                             | 54...<br>(1000) | 57...<br>(900)                        | 58...<br>(900)  | 184<br>224                                    |                          |
|                                                                                        | U <sub>RAC</sub> = 220 V; PITCH = 15.0 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                                                                        |                            |                                             |                 |                                       |                 |                                               |                          |
|                                                                                        | 0.27<br>0.33                                                                           | 7.0 x 13.5 x 17.5                                                                      | 2.0                        | 53...<br>(1000)                             | 54...<br>(1000) | 57...<br>(800)                        | 58...<br>(800)  | 274<br>334                                    |                          |
|                                                                                        | 0.39<br>0.47                                                                           | 8.5 x 15.0 x 17.5                                                                      | 2.7                        | 53...<br>(1000)                             | 54...<br>(1000) | 57...<br>(650)                        | 58...<br>(650)  | 394<br>474                                    |                          |
|                                                                                        | 0.56                                                                                   | 10.0 x 16.5 x 17.5                                                                     | 3.5                        | 53...<br>(500)                              | 54...<br>(500)  | 57...<br>(600)                        | 58...<br>(600)  | 564                                           |                          |
|                                                                                        | U <sub>RAC</sub> = 220 V; PITCH = 22.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                                                                        |                            |                                             |                 |                                       |                 |                                               |                          |
|                                                                                        | 0.68<br>0.82                                                                           | 8.5 x 18.0 x 26.0                                                                      | 4.5                        | 53...<br>(200)                              | 54...<br>(200)  | 57...<br>(450)                        | 58...<br>(450)  | 684<br>824                                    |                          |
|                                                                                        | 1.0<br>1.2                                                                             | 10.0 x 19.5 x 26.0                                                                     | 5.7                        | 53...<br>(200)                              | 54...<br>(200)  | 57...<br>(350)                        | 58...<br>(350)  | 105<br>125                                    |                          |
|                                                                                        | U <sub>RAC</sub> = 220 V; PITCH = 27.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                                                                        |                            |                                             |                 |                                       |                 |                                               |                          |
|                                                                                        | 1.5                                                                                    | 11.0 x 21.0 x 31.0                                                                     | 8.2                        | 53...<br>(100)                              | 54...<br>(100)  | -                                     | -               | 155                                           |                          |
|                                                                                        | 1.8<br>2.2                                                                             | 13.0 x 23.0 x 31.0                                                                     | 10.2                       | 53...<br>(100)                              | 54...<br>(100)  | -                                     | -               | 185<br>225                                    |                          |
|                                                                                        | 630                                                                                    | U <sub>RAC</sub> = 250 V; PITCH = 15.0 mm ± 0.4 mm; d <sub>t</sub> = 0.60 mm ± 0.06 mm |                            |                                             |                 |                                       |                 |                                               |                          |
|                                                                                        |                                                                                        | 0.047<br>0.056<br>0.068<br>0.082                                                       | 5.0 x 11.0 x 17.5          | 1.1                                         | 63...<br>(1000) | 64...<br>(1000)                       | 67...<br>(1100) | 68...<br>(1100)                               | 473<br>563<br>683<br>823 |
|                                                                                        |                                                                                        | 6.0 x 12.0 x 17.5                                                                      | 1.5                        | 63...<br>(1000)                             | 64...<br>(1000) | 67...<br>(900)                        | 68...<br>(900)  |                                               |                          |
| U <sub>RAC</sub> = 250 V; PITCH = 15.0 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                                                                        |                                                                                        |                            |                                             |                 |                                       |                 |                                               |                          |
| 0.10<br>0.12                                                                           |                                                                                        | 7.0 x 13.5 x 17.5                                                                      | 2.0                        | 63...<br>(1000)                             | 64...<br>(1000) | 67...<br>(800)                        | 68...<br>(800)  | 104<br>124                                    |                          |
| 0.15<br>0.18                                                                           |                                                                                        | 8.5 x 15.0 x 17.5                                                                      | 2.7                        | 63...<br>(1000)                             | 64...<br>(1000) | 67...<br>(650)                        | 68...<br>(650)  | 154<br>184                                    |                          |
| 0.22                                                                                   |                                                                                        | 10.0 x 16.5 x 17.5                                                                     | 3.5                        | 63...<br>(500)                              | 64...<br>(500)  | 67...<br>(600)                        | 68...<br>(600)  | 224                                           |                          |
| U <sub>RAC</sub> = 250 V; PITCH = 22.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                                                                        |                                                                                        |                            |                                             |                 |                                       |                 |                                               |                          |
| 0.27<br>0.33                                                                           |                                                                                        | 8.5 x 18.0 x 26.0                                                                      | 4.5                        | 63...<br>(200)                              | 64...<br>(200)  | 67...<br>(450)                        | 68...<br>(450)  | 274<br>334                                    |                          |
| 0.39<br>0.47                                                                           |                                                                                        | 10.0 x 19.5 x 26.0                                                                     | 5.7                        | 63...<br>(200)                              | 64...<br>(200)  | 67...<br>(350)                        | 68...<br>(350)  | 394<br>474                                    |                          |
| U <sub>RAC</sub> = 250 V; PITCH = 27.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                                                                        |                                                                                        |                            |                                             |                 |                                       |                 |                                               |                          |
| 0.56                                                                                   |                                                                                        | 11.0 x 21.0 x 31.0                                                                     | 8.2                        | 63...<br>(100)                              | 64...<br>(100)  | -                                     | -               | 564                                           |                          |
| 0.68<br>0.82                                                                           |                                                                                        | 13.0 x 23.0 x 31.0                                                                     | 10.2                       | 63...<br>(100)                              | 64...<br>(100)  | -                                     | -               | 684<br>824                                    |                          |
| 1.00                                                                                   |                                                                                        | 15.0 x 25.0 x 31.5                                                                     | 13.4                       | 63...<br>(100)                              | 64...<br>(100)  |                                       |                 | 105                                           |                          |

**Notes**

- SPQ = Standard Packing Quantity

(1) Reel diameter = 356 mm is available on request

(2) H = in-tape height; P<sub>0</sub> = sprocket hole distance; for detailed specifications refer to packaging information: [www.vishay.com/doc?28139](http://www.vishay.com/doc?28139)

(3) Weight for short lead product only



| ELECTRICAL DATA - STANDARD SIZE |                                                                                       |                                                                                        |                            |                                             |                 |                                       |                 |                                                                                        |                    |                 |                 |                 |                |                   |                          |                 |                 |                 |                |                   |
|---------------------------------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|----------------------------|---------------------------------------------|-----------------|---------------------------------------|-----------------|----------------------------------------------------------------------------------------|--------------------|-----------------|-----------------|-----------------|----------------|-------------------|--------------------------|-----------------|-----------------|-----------------|----------------|-------------------|
| U <sub>RDC</sub><br>(V)         | C<br>(μF)                                                                             | DIMENSIONS<br>w x h x l<br>(mm)                                                        | MASS<br>(g) <sup>(3)</sup> | CATALOG NUMBER BFC2 373 XYYYY AND PACKAGING |                 |                                       |                 |                                                                                        |                    |                 |                 |                 |                |                   |                          |                 |                 |                 |                |                   |
|                                 |                                                                                       |                                                                                        |                            | LOOSE IN BOX                                |                 | REEL <sup>(1)(2)</sup>                |                 | C-VALUE                                                                                |                    |                 |                 |                 |                |                   |                          |                 |                 |                 |                |                   |
|                                 |                                                                                       |                                                                                        |                            | l <sub>t</sub> = 5.0 mm ± 1.0 mm            |                 | H = 18.5 mm; P <sub>0</sub> = 12.7 mm |                 |                                                                                        |                    |                 |                 |                 |                |                   |                          |                 |                 |                 |                |                   |
|                                 |                                                                                       |                                                                                        |                            | C-TOL. = ± 10 %                             | C-TOL. = ± 5 %  | C-TOL. = ± 10 %                       | C-TOL. = ± 5 %  |                                                                                        |                    |                 |                 |                 |                |                   |                          |                 |                 |                 |                |                   |
|                                 |                                                                                       |                                                                                        |                            | XX<br>(SPQ)                                 | XX<br>(SPQ)     | XX<br>(SPQ)                           | XX<br>(SPQ)     | ..YYY                                                                                  |                    |                 |                 |                 |                |                   |                          |                 |                 |                 |                |                   |
| 100                             | U <sub>RAC</sub> = 63 V; PITCH = 15.0 mm ± 0.4 mm; d <sub>t</sub> = 0.60 mm ± 0.06 mm |                                                                                        |                            |                                             |                 |                                       |                 |                                                                                        |                    |                 |                 |                 |                |                   |                          |                 |                 |                 |                |                   |
|                                 | 0.33<br>0.39<br>0.47<br>0.56<br>0.68                                                  | 5.0 x 11.0 x 17.5                                                                      | 1.1                        | 21...<br>(1000)                             | 22...<br>(1000) | 25...<br>(1100)                       | 26...<br>(1100) | 334<br>394<br>474<br>564<br>684                                                        |                    |                 |                 |                 |                |                   |                          |                 |                 |                 |                |                   |
|                                 | 0.82<br>1.00                                                                          |                                                                                        |                            |                                             |                 |                                       |                 | 6.0 x 12.0 x 17.5                                                                      | 1.5                | 21...<br>(1000) | 22...<br>(1000) | 25...<br>(900)  | 26...<br>(900) | 824<br>105        |                          |                 |                 |                 |                |                   |
|                                 | U <sub>RAC</sub> = 63 V; PITCH = 15.0 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                                                                        |                            |                                             |                 |                                       |                 |                                                                                        |                    |                 |                 |                 |                |                   |                          |                 |                 |                 |                |                   |
|                                 | 1.2<br>1.5                                                                            |                                                                                        |                            |                                             |                 |                                       |                 |                                                                                        |                    |                 |                 |                 |                | 7.0 x 13.5 x 17.5 | 2.0                      | 21...<br>(1000) | 22...<br>(1000) | 25...<br>(800)  | 26...<br>(800) | 125<br>155        |
|                                 | 1.8<br>2.2                                                                            |                                                                                        |                            |                                             |                 |                                       |                 |                                                                                        |                    |                 |                 |                 |                |                   |                          |                 |                 |                 |                | 8.5 x 15.0 x 17.5 |
|                                 | U <sub>RAC</sub> = 63 V; PITCH = 22.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                                                                        |                            |                                             |                 |                                       |                 |                                                                                        |                    |                 |                 |                 |                |                   |                          |                 |                 |                 |                |                   |
|                                 | 2.7<br>3.3                                                                            | 8.5 x 18.0 x 26.0                                                                      | 4.5                        | 21...<br>(200)                              | 22...<br>(200)  | 25...<br>(450)                        | 26...<br>(450)  | 275<br>335                                                                             |                    |                 |                 |                 |                |                   |                          |                 |                 |                 |                |                   |
|                                 | 3.9<br>4.7                                                                            |                                                                                        |                            |                                             |                 |                                       |                 | 10.0 x 19.5 x 26.0                                                                     | 5.7                | 21...<br>(200)  | 22...<br>(200)  | 25...<br>(350)  | 26...<br>(350) | 395<br>475        |                          |                 |                 |                 |                |                   |
|                                 | U <sub>RAC</sub> = 63 V; PITCH = 27.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                                                                        |                            |                                             |                 |                                       |                 |                                                                                        |                    |                 |                 |                 |                |                   |                          |                 |                 |                 |                |                   |
|                                 | 5.6<br>6.8                                                                            | 11.0 x 21.0 x 31.0                                                                     | 8.2                        | 21...<br>(100)                              | 22...<br>(100)  | -                                     | -               | 565<br>685                                                                             |                    |                 |                 |                 |                |                   |                          |                 |                 |                 |                |                   |
|                                 | 8.2<br>10                                                                             |                                                                                        |                            |                                             |                 |                                       |                 | 13.0 x 23.0 x 31.0                                                                     | 10.2               | 21...<br>(100)  | 22...<br>(100)  | -               | -              | 825<br>106        |                          |                 |                 |                 |                |                   |
|                                 | 12<br>15                                                                              | 18.0 x 28.0 x 31.5                                                                     | 18.4                       | 21...<br>(100)                              | 22...<br>(100)  | -                                     | -               |                                                                                        |                    |                 |                 |                 |                | 126<br>156        |                          |                 |                 |                 |                |                   |
|                                 | 250                                                                                   |                                                                                        |                            |                                             |                 |                                       |                 | U <sub>RAC</sub> = 160 V; PITCH = 15.0 mm ± 0.4 mm; d <sub>t</sub> = 0.60 mm ± 0.06 mm |                    |                 |                 |                 |                |                   |                          |                 |                 |                 |                |                   |
|                                 |                                                                                       | 0.15<br>0.18<br>0.22                                                                   | 5.0 x 11.0 x 17.5          | 1.1                                         | 41...<br>(1000) | 42...<br>(1000)                       | 45...<br>(1100) | 46...<br>(1100)                                                                        | 154<br>184<br>224  |                 |                 |                 |                |                   |                          |                 |                 |                 |                |                   |
|                                 |                                                                                       | 0.27<br>0.33<br>0.39<br>0.47                                                           |                            |                                             |                 |                                       |                 |                                                                                        | 6.0 x 12.0 x 17.5  | 1.5             | 41...<br>(1000) | 42...<br>(1000) | 45...<br>(900) | 46...<br>(900)    | 274<br>334<br>394<br>474 |                 |                 |                 |                |                   |
|                                 |                                                                                       | U <sub>RAC</sub> = 160 V; PITCH = 15.0 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                            |                                             |                 |                                       |                 |                                                                                        |                    |                 |                 |                 |                |                   |                          |                 |                 |                 |                |                   |
|                                 |                                                                                       | 0.56<br>0.68                                                                           | 7.0 x 13.5 x 17.5          | 2.0                                         | 41...<br>(1000) | 42...<br>(1000)                       | 45...<br>(800)  | 46...<br>(800)                                                                         |                    |                 |                 |                 |                |                   | 564<br>684               |                 |                 |                 |                |                   |
|                                 |                                                                                       | 0.82<br>1.0                                                                            |                            |                                             |                 |                                       |                 |                                                                                        |                    |                 |                 |                 |                |                   | 8.5 x 15.0 x 17.5        | 2.7             | 41...<br>(1000) | 42...<br>(1000) | 45...<br>(650) | 46...<br>(650)    |
|                                 |                                                                                       | U <sub>RAC</sub> = 160 V; PITCH = 22.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                            |                                             |                 |                                       |                 |                                                                                        |                    |                 |                 |                 |                |                   |                          |                 |                 |                 |                |                   |
|                                 |                                                                                       | 1.2<br>1.5                                                                             | 8.5 x 18.0 x 26.0          | 4.5                                         | 41...<br>(200)  | 42...<br>(200)                        | 45...<br>(450)  | 46...<br>(450)                                                                         | 125<br>155         |                 |                 |                 |                |                   |                          |                 |                 |                 |                |                   |
|                                 |                                                                                       | 1.8<br>2.2                                                                             |                            |                                             |                 |                                       |                 |                                                                                        | 10.0 x 19.5 x 26.0 | 5.7             | 41...<br>(200)  | 42...<br>(200)  | 45...<br>(350) | 46...<br>(350)    | 185<br>225               |                 |                 |                 |                |                   |
|                                 |                                                                                       | U <sub>RAC</sub> = 160 V; PITCH = 27.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                            |                                             |                 |                                       |                 |                                                                                        |                    |                 |                 |                 |                |                   |                          |                 |                 |                 |                |                   |
|                                 |                                                                                       | 2.7<br>3.3                                                                             | 13.0 x 23.0 x 31.0         | 10.2                                        | 41...<br>(100)  | 42...<br>(100)                        | -               | -                                                                                      | 275<br>335         |                 |                 |                 |                |                   |                          |                 |                 |                 |                |                   |
|                                 |                                                                                       | 3.9<br>4.7                                                                             |                            |                                             |                 |                                       |                 |                                                                                        | 15.0 x 28.0 x 31.5 | 13.4            | 41...<br>(100)  | 42...<br>(100)  | -              | -                 | 395<br>475               |                 |                 |                 |                |                   |

| ELECTRICAL DATA - STANDARD SIZE |                                                                                        |                                 |                            |                                             |                 |                                       |                 |                                 |      |                 |                 |                |                |                   |     |                 |                 |                |                |            |
|---------------------------------|----------------------------------------------------------------------------------------|---------------------------------|----------------------------|---------------------------------------------|-----------------|---------------------------------------|-----------------|---------------------------------|------|-----------------|-----------------|----------------|----------------|-------------------|-----|-----------------|-----------------|----------------|----------------|------------|
| U <sub>RDC</sub><br>(V)         | C<br>(μF)                                                                              | DIMENSIONS<br>w x h x l<br>(mm) | MASS<br>(g) <sup>(3)</sup> | CATALOG NUMBER BFC2 373 XXYYY AND PACKAGING |                 |                                       |                 |                                 |      |                 |                 |                |                |                   |     |                 |                 |                |                |            |
|                                 |                                                                                        |                                 |                            | LOOSE IN BOX                                |                 | REEL <sup>(1)(2)</sup>                |                 | C-VALUE<br><br>..YYY            |      |                 |                 |                |                |                   |     |                 |                 |                |                |            |
|                                 |                                                                                        |                                 |                            | l <sub>t</sub> = 5.0 mm ± 1.0 mm            |                 | H = 18.5 mm; P <sub>0</sub> = 12.7 mm |                 |                                 |      |                 |                 |                |                |                   |     |                 |                 |                |                |            |
|                                 |                                                                                        |                                 |                            | C-TOL. = ± 10 %                             | C-TOL. = ± 5 %  | C-TOL. = ± 10 %                       | C-TOL. = ± 5 %  |                                 |      |                 |                 |                |                |                   |     |                 |                 |                |                |            |
|                                 |                                                                                        |                                 |                            | XX<br>(SPQ)                                 | XX<br>(SPQ)     | XX<br>(SPQ)                           | XX<br>(SPQ)     |                                 |      |                 |                 |                |                |                   |     |                 |                 |                |                |            |
| 400                             | U <sub>RAC</sub> = 220 V; PITCH = 15.0 mm ± 0.4 mm; d <sub>t</sub> = 0.60 mm ± 0.06 mm |                                 |                            |                                             |                 |                                       |                 |                                 |      |                 |                 |                |                |                   |     |                 |                 |                |                |            |
|                                 | 0.047<br>0.056<br>0.068<br>0.082<br>0.10                                               | 5.0 x 11.0 x 17.5               | 1.1                        | 51...<br>(1000)                             | 52...<br>(1000) | 55...<br>(1100)                       | 56...<br>(1100) | 473<br>563<br>683<br>823<br>104 |      |                 |                 |                |                |                   |     |                 |                 |                |                |            |
|                                 | 0.12<br>0.15                                                                           |                                 |                            |                                             |                 |                                       |                 | 6.0 x 12.0 x 17.5               | 1.5  | 51...<br>(1000) | 52...<br>(1000) | 55...<br>(900) | 56...<br>(900) | 124<br>154        |     |                 |                 |                |                |            |
|                                 | U <sub>RAC</sub> = 220 V; PITCH = 15.0 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                 |                            |                                             |                 |                                       |                 |                                 |      |                 |                 |                |                |                   |     |                 |                 |                |                |            |
|                                 | 0.18<br>0.22                                                                           |                                 |                            |                                             |                 |                                       |                 |                                 |      |                 |                 |                |                | 7.0 x 13.5 x 17.5 | 2.0 | 51...<br>(1000) | 52...<br>(1000) | 55...<br>(800) | 56...<br>(800) | 184<br>224 |
|                                 | 0.27<br>0.33                                                                           |                                 |                            |                                             |                 |                                       |                 | 8.5 x 15.0 x 17.5               | 2.7  | 51...<br>(1000) | 52...<br>(1000) | 55...<br>(650) | 56...<br>(650) |                   |     |                 |                 |                |                | 274<br>334 |
|                                 | U <sub>RAC</sub> = 220 V; PITCH = 22.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                 |                            |                                             |                 |                                       |                 |                                 |      |                 |                 |                |                |                   |     |                 |                 |                |                |            |
|                                 | 0.39<br>0.47                                                                           | 8.5 x 18.0 x 26.0               | 4.5                        | 51...<br>(200)                              | 52...<br>(200)  | 55...<br>(450)                        | 56...<br>(450)  |                                 |      |                 |                 |                |                | 394<br>474        |     |                 |                 |                |                |            |
|                                 | 0.56<br>0.68                                                                           |                                 |                            |                                             |                 |                                       |                 | 10.0 x 19.5 x 26.0              | 5.7  | 51...<br>(200)  | 52...<br>(200)  | 55...<br>(350) | 56...<br>(350) | 564<br>684        |     |                 |                 |                |                |            |
|                                 | U <sub>RAC</sub> = 220 V; PITCH = 27.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                 |                            |                                             |                 |                                       |                 |                                 |      |                 |                 |                |                |                   |     |                 |                 |                |                |            |
|                                 | 0.82<br>1.0                                                                            | 13.0 x 23.0 x 31.0              | 10.2                       | 51...<br>(100)                              | 52...<br>(100)  | -                                     | -               |                                 |      |                 |                 |                |                | 824<br>105        |     |                 |                 |                |                |            |
|                                 | 1.2<br>1.5                                                                             |                                 |                            |                                             |                 |                                       |                 | 15.0 x 25.0 x 31.5              | 13.4 | 51...<br>(100)  | 52...<br>(100)  | -              | -              | 125<br>125        |     |                 |                 |                |                |            |

**Notes**

- SPQ = Standard Packing Quantity

(1) Reel diameter = 356 mm is available on request

(2) H = in-tape height; P<sub>0</sub> = sprocket hole distance; for detailed specifications refer to packaging information: [www.vishay.com/doc?28139](http://www.vishay.com/doc?28139)

(3) Weight for short lead product only



| ELECTRICAL DATA - AVAILABLE ON REQUEST |                                                                                        |                                 |                            |                                            |                |     |                        |                |     |
|----------------------------------------|----------------------------------------------------------------------------------------|---------------------------------|----------------------------|--------------------------------------------|----------------|-----|------------------------|----------------|-----|
| U <sub>RDC</sub><br>(V)                | C<br>(μF)                                                                              | DIMENSIONS<br>w x h x l<br>(mm) | MASS<br>(g) <sup>(3)</sup> | CATALOG NUMBER BFC2 373 XXYY AND PACKAGING |                |     |                        |                |     |
|                                        |                                                                                        |                                 |                            | LOOSE IN BOX                               |                |     | REEL <sup>(1)(2)</sup> |                |     |
|                                        |                                                                                        |                                 |                            | l <sub>t</sub> = 5.0 mm ± 1.0 mm           |                |     | H = 18.5 mm            |                |     |
|                                        |                                                                                        |                                 |                            | C-TOL. = ± 10 %                            | C-TOL. = ± 5 % | SPQ | C-TOL. = ± 10 %        | C-TOL. = ± 5 % | SPQ |
| 100                                    | U <sub>RAC</sub> = 63 V; PITCH = 22.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm  |                                 |                            |                                            |                |     |                        |                |     |
|                                        | 1.5                                                                                    | 6.0 x 15.5 x 26.0               | 2.7                        | 90012                                      | 90013          | 300 | 90018                  | 90019          | 600 |
|                                        | 1.8                                                                                    | 7.0 x 16.5 x 26.0               | 3.3                        | 90022                                      | 90023          | 200 | 90028                  | 90029          | 550 |
|                                        | 2.2                                                                                    |                                 |                            | 90002                                      | 90003          |     | 90008                  | 90009          |     |
|                                        | U <sub>RAC</sub> = 63 V; PITCH = 27.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm  |                                 |                            |                                            |                |     |                        |                |     |
| 4.7                                    | 9.0 x 19.0 x 31.0                                                                      | 6.1                             | 90032                      | 90033                                      | 100            | -   |                        |                |     |
| 250                                    | U <sub>RAC</sub> = 160 V; PITCH = 22.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                 |                            |                                            |                |     |                        |                |     |
|                                        | 0.47                                                                                   | 6.0 x 15.5 x 26.0               | 2.7                        | 90042                                      | 90046          | 300 | 90048                  | 90049          | 600 |
|                                        | 0.56                                                                                   |                                 |                            | 90052                                      | 90053          |     | 90058                  | 90059          |     |
|                                        | 0.68                                                                                   |                                 |                            | 90062                                      | 90063          |     | 90068                  | 90069          |     |
|                                        | 0.82                                                                                   | 7.0 x 16.5 x 26.0               | 3.3                        | 90072                                      | 90073          | 200 | 90078                  | 90079          | 550 |
|                                        | 1.0                                                                                    |                                 |                            | 90082                                      | 90083          |     | 90088                  | 90089          |     |
|                                        | U <sub>RAC</sub> = 160 V; PITCH = 27.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                 |                            |                                            |                |     |                        |                |     |
|                                        | 1.2                                                                                    | 9.0 x 19.0 x 31.5               | 6.1                        | 90172                                      | 90173          | 100 | -                      |                |     |
|                                        | 1.5                                                                                    |                                 |                            | 90092                                      | 90093          |     |                        |                |     |
|                                        | 1.8                                                                                    | 9.0 x 21.0 x 31.0               | 8.2                        | 90102                                      | 90103          | 100 | -                      |                |     |
| 2.2                                    | 90112                                                                                  |                                 |                            | 90113                                      |                |     |                        |                |     |
| 400                                    | U <sub>RAC</sub> = 220 V; PITCH = 22.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                 |                            |                                            |                |     |                        |                |     |
|                                        | 0.22                                                                                   | 6.0 x 15.5 x 26.0               | 2.7                        | 90122                                      | 90123          | 300 | 90128                  | 90129          | 600 |
|                                        | 0.27                                                                                   | 7.0 x 16.5 x 26.0               | 3.3                        | 90132                                      | 90133          | 200 | 90138                  | 90139          | 550 |
|                                        | 0.33                                                                                   |                                 |                            | 90142                                      | 90143          |     | 90148                  | 90149          |     |
|                                        | U <sub>RAC</sub> = 220 V; PITCH = 27.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm |                                 |                            |                                            |                |     |                        |                |     |
|                                        | 0.68                                                                                   | 9.0 x 19.0 x 31.5               | 6.1                        | 90152                                      | 90153          | 100 | -                      |                |     |

**Notes**

- SPQ = Standard Packing Quantity

(1) Reel diameter = 356 mm is available on request

(2) H = in-tape height; P<sub>0</sub> = sprocket hole distance; for detailed specifications refer to packaging information: [www.vishay.com/doc?28139](http://www.vishay.com/doc?28139)

(3) Weight for short lead product only

## MOUNTING

### Normal Use

The capacitors are designed for mounting on printed-circuit boards. The capacitors packed in bandoliers are designed for mounting in printed-circuit boards by means of automatic insertion machines.

For detailed tape specifications refer to packaging information: [www.vishay.com/doc?28139](http://www.vishay.com/doc?28139)

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

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

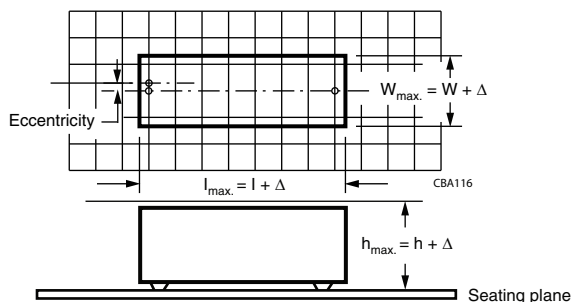
- For pitches  $\leq 15$  mm capacitors shall be mechanically fixed by the leads
- For larger pitches the capacitors shall be mounted in the same way and the body clamped

### Space Requirements On Printed-Circuit Board

The maximum space for length ( $l_{max.}$ ), width ( $w_{max.}$ ) and height ( $h_{max.}$ ) of film capacitors to take in account on the printed-circuit board is shown in the drawing:

- For products with pitch  $\leq 15$  mm,  $\Delta w = \Delta l = 0.3$  mm and  $\Delta h = 0.1$  mm
- For products with  $15$  mm  $<$  pitch  $\leq 27.5$  mm,  $\Delta w = \Delta l = 0.5$  mm and  $\Delta h = 0.1$  mm

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



## SOLDERING

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

“Soldering Guidelines for Film Capacitors”: [www.vishay.com/doc?28171](http://www.vishay.com/doc?28171)

### Storage Temperature

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

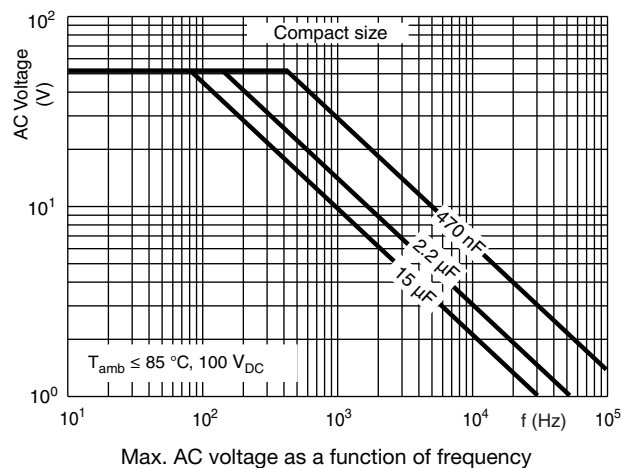
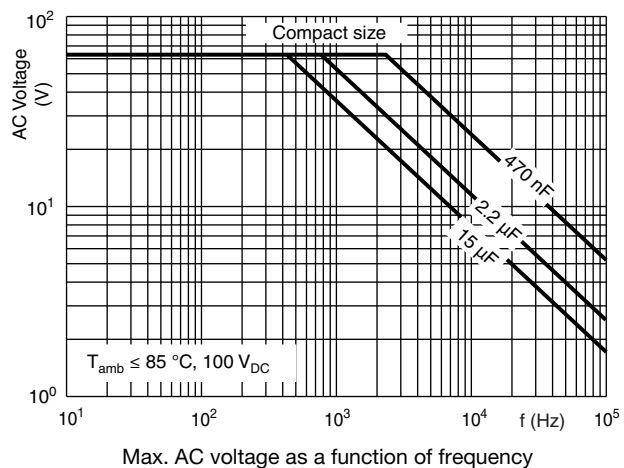
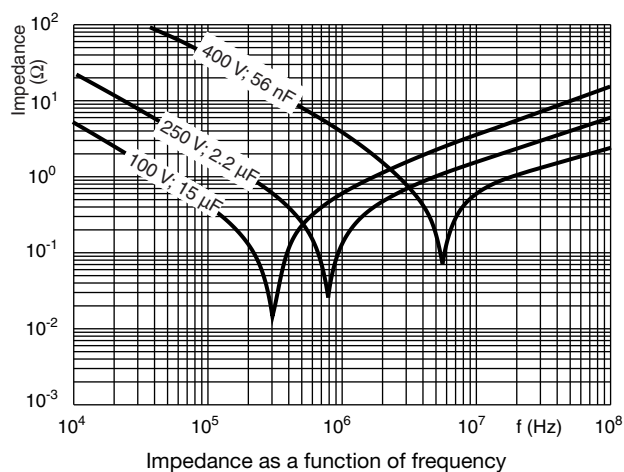
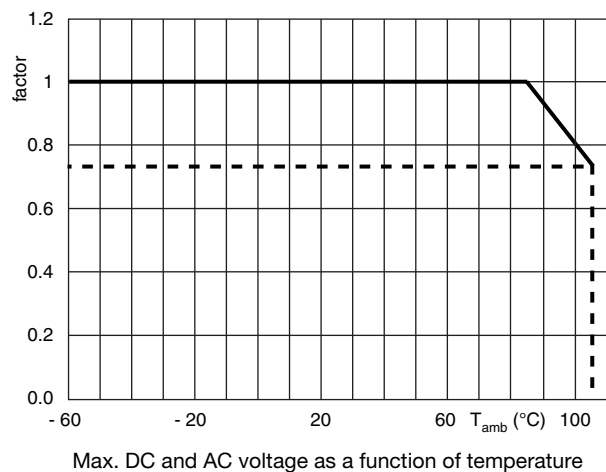
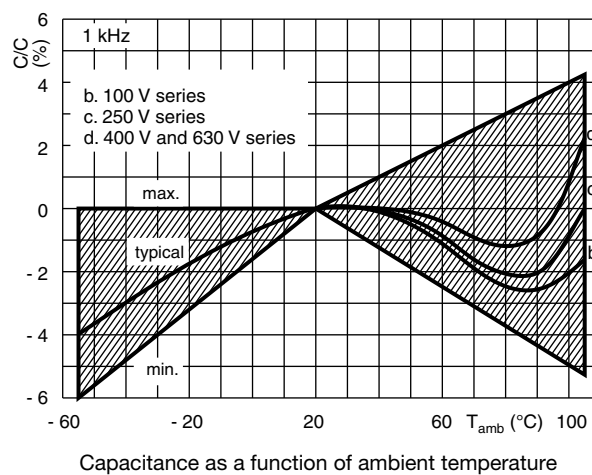
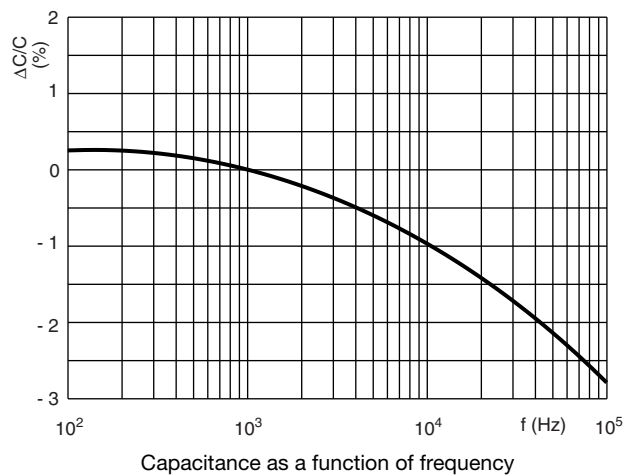
### Ratings and Characteristics Reference Conditions

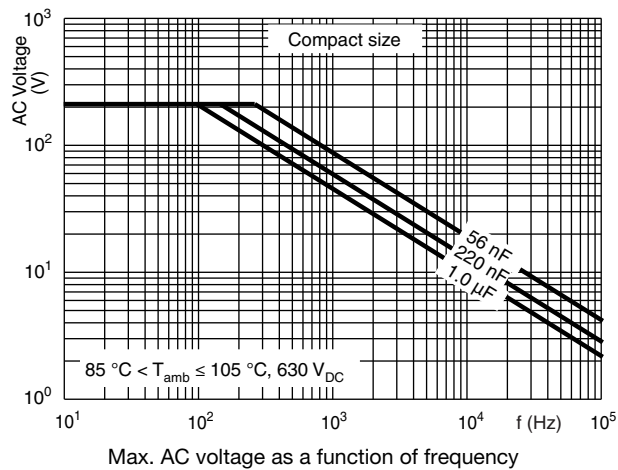
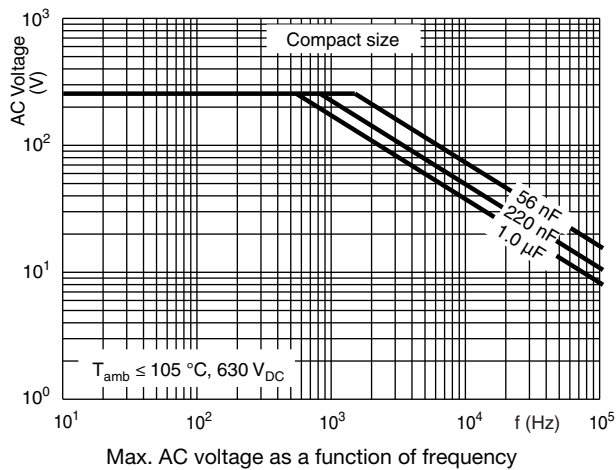
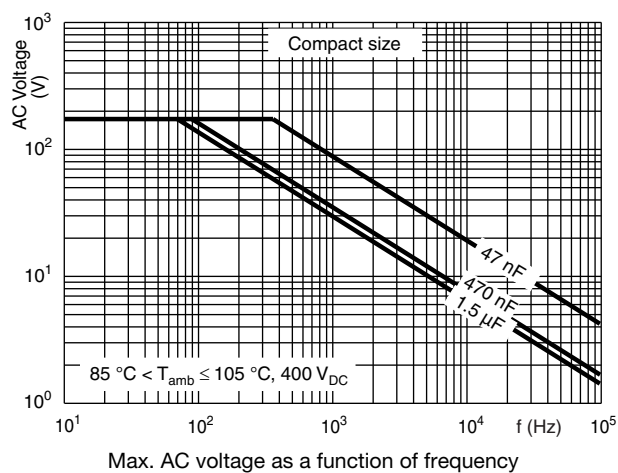
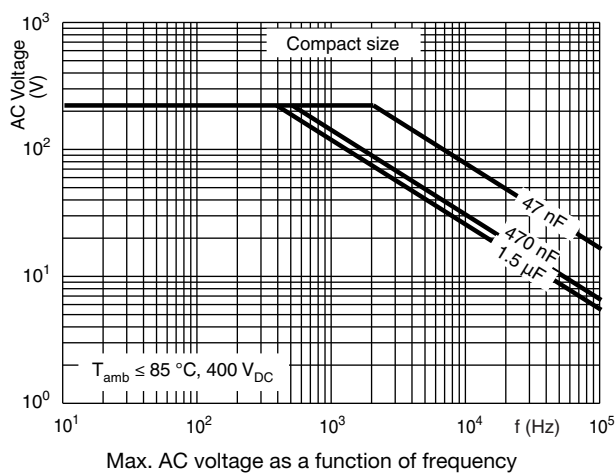
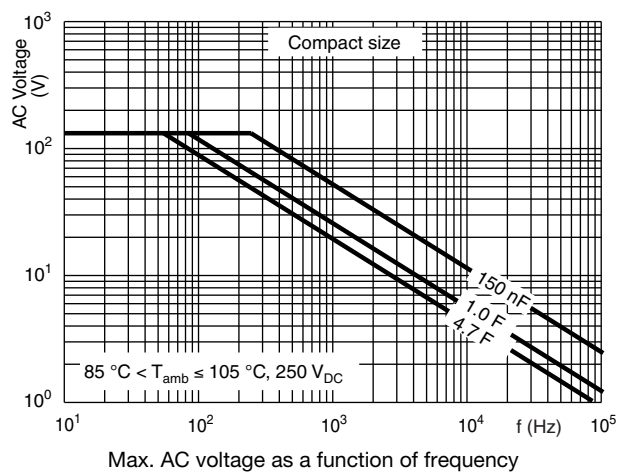
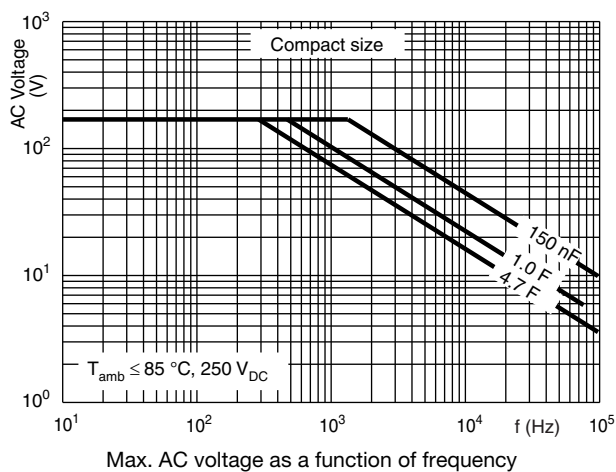
Unless otherwise specified, all electrical values apply to an ambient free air temperature of  $23$  °C  $\pm 1$  °C, an atmospheric pressure of 86 kPa to 106 kPa and a relative humidity of  $50$  %  $\pm 2$  %.

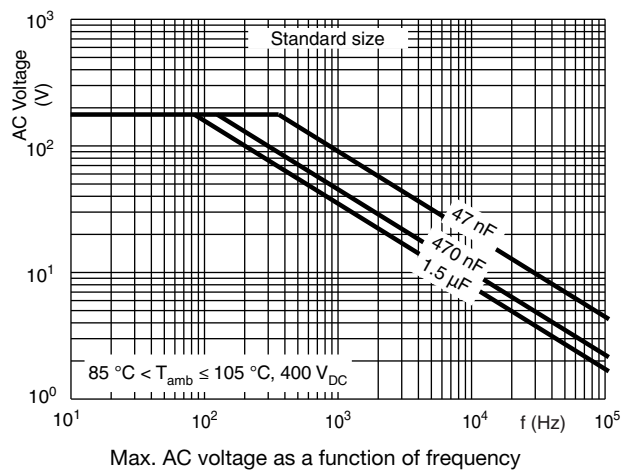
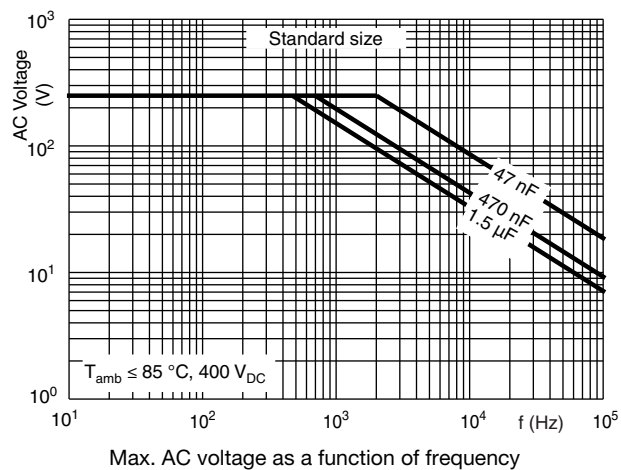
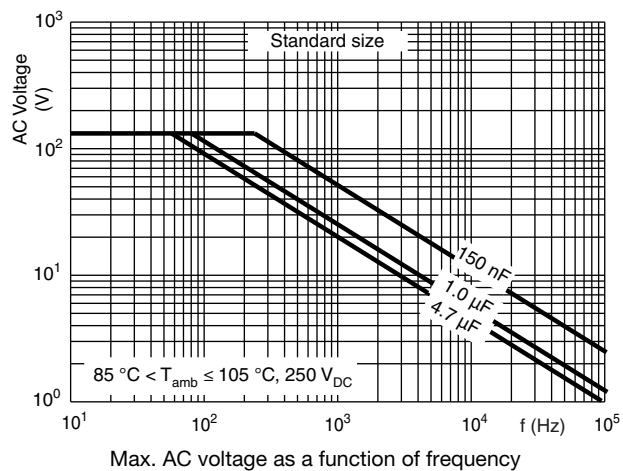
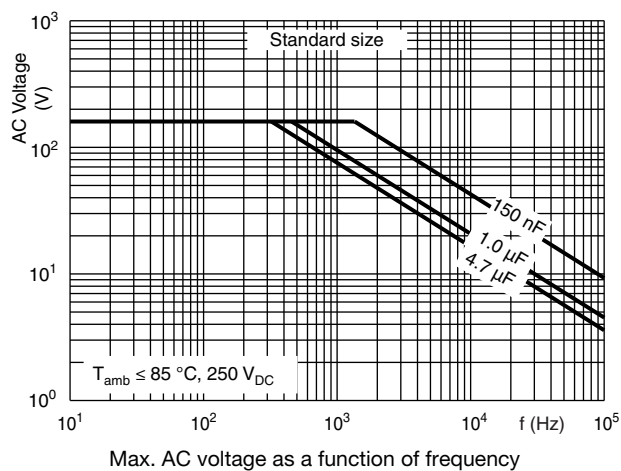
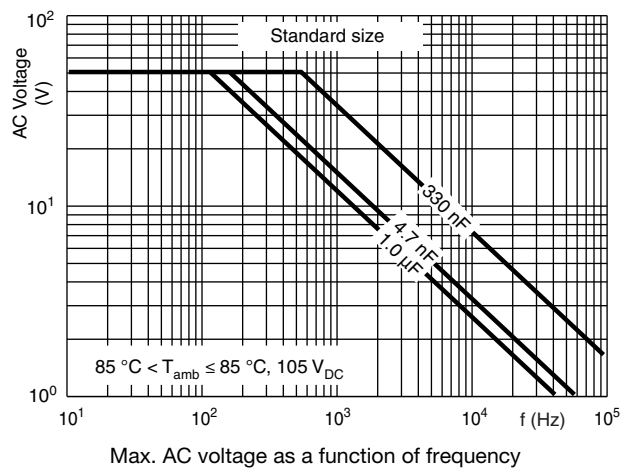
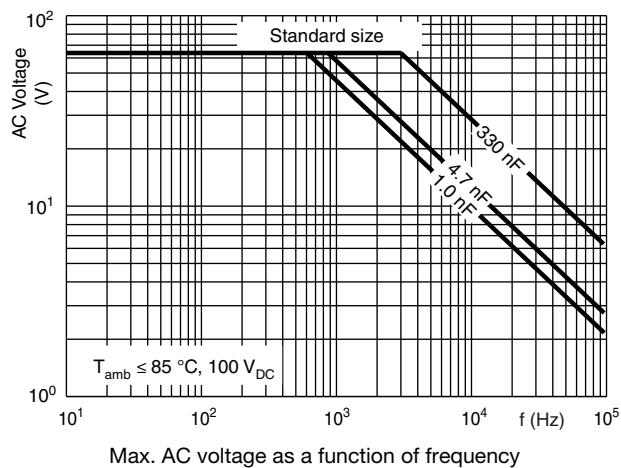
For reference testing, a conditioning period shall be applied over  $96$  h  $\pm 4$  h by heating the products in a circulating air oven at the rated temperature and a relative humidity not exceeding 20 %.



## CHARACTERISTICS

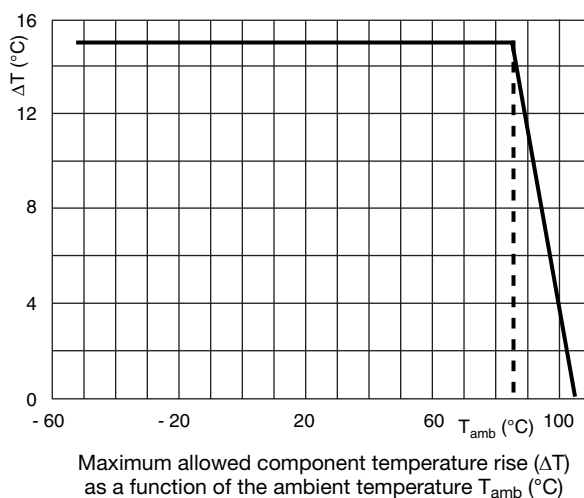
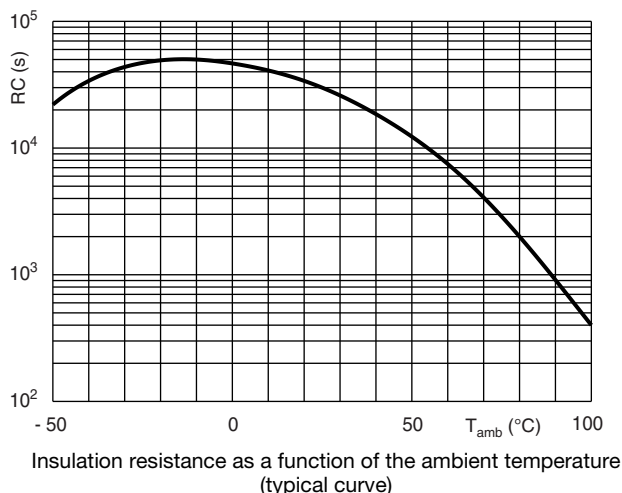
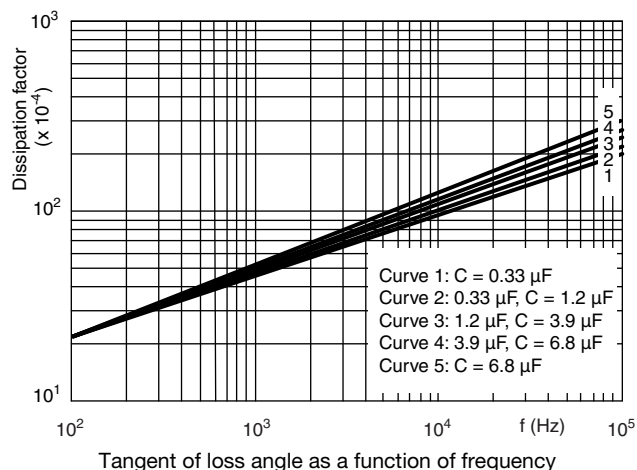






### Maximum RMS current (sinewave) as a function of frequency

$U_{AC}$  is the maximum AC voltage depending on the ambient temperature in the curves “Max. RMS voltage and AC current as a function of frequency”.



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

| $W_{MAX.}$<br>(mm) | HEAT CONDUCTIVITY (mW/°C) |               |               |
|--------------------|---------------------------|---------------|---------------|
|                    | PITCH 15.0 mm             | PITCH 22.5 mm | PITCH 27.5 mm |
| 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 ambient temperature.

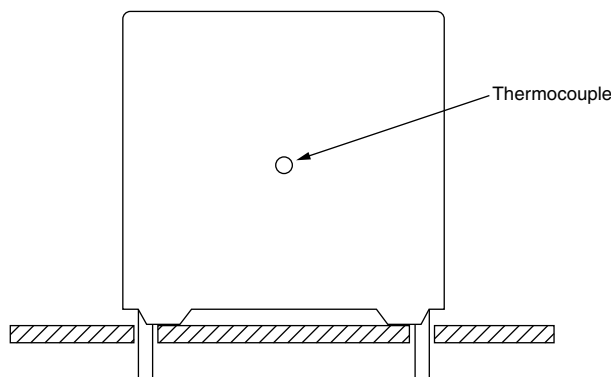
The power dissipation can be calculated according type detail specification "HQN-384-01/101: Technical Information Film Capacitors", [www.vishay.com/doc?28147](http://www.vishay.com/doc?28147).

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.

For capacitors connected in parallel, normally the proof voltage and possibly the rated voltage must be reduced. For information depending of the capacitance value and the number of parallel connections contact: [dc-film@vishay.com](mailto:dc-film@vishay.com)

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

For all other pulses following equation must be fulfilled:

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

$T$  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"
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               | $U_{RAC}$                         | See "Max. AC voltage as function of temperature" per characteristics |
| Maximum temperature RMS-overvoltage (< 24 h) | $1.25 \times U_{RAC}$             | $U_{RAC}$                                                            |
| Maximum peak voltage ( $V_{O-P}$ ) (< 2 s)   | $1.6 \times U_{RDC}$              | $1.3 \times U_{RDC}$                                                 |

#### Example

$C = 330 \text{ nF}$  - 63 V used for the voltage signal shown in next drawing.

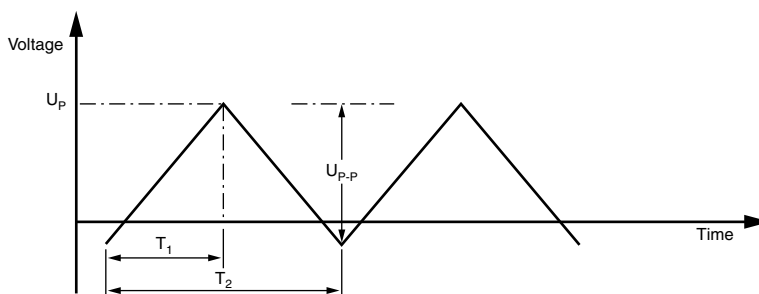
$U_{P-P} = 40 \text{ V}$ ;  $U_P = 35 \text{ V}$ ;  $T_1 = 100 \mu\text{s}$ ;  $T_2 = 200 \mu\text{s}$

The ambient temperature is  $35^{\circ}\text{C}$

Checking conditions:

1. The peak voltage  $U_P = 35 \text{ V}$  is lower than  $63 V_{DC}$
2. The peak-to-peak voltage  $40 \text{ V}$  is lower than  $2\sqrt{2} \times 40 V_{AC} = 113 U_{P-P}$
3. The voltage pulse slope  $(dU/dt) = 40 \text{ V}/100 \mu\text{s} = 0.4 \text{ V}/\mu\text{s}$   
This is lower than  $60 \text{ V}/\mu\text{s}$  (see specific reference data for each version)
4. The dissipated power is  $16.2 \text{ mW}$  as calculated with fourier terms  
The temperature rise for  $W_{max.} = 3.5 \text{ mm}$  and pitch =  $5 \text{ mm}$  will be  $16.2 \text{ mW}/3.0 \text{ mW}/^{\circ}\text{C} = 5.4^{\circ}\text{C}$   
This is lower than  $15^{\circ}\text{C}$  temperature rise at  $35^{\circ}\text{C}$ , according figure "Max. allowed component temperature rise"
5. Not applicable
6. Not applicable

#### Voltage Signal



## INSPECTION REQUIREMENTS

### General Notes

Sub-clause numbers of tests and performance requirements refer to the "Sectional Specification, Publication IEC 60384-2 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 $C \leq 470 \text{ nF}$ at $100 \text{ kHz}$<br>for $470 \text{ nF} < C \leq 10 \mu\text{F}$ at $10 \text{ kHz}$<br>for $C > 10 \mu\text{F}$ at $1 \text{ kHz}$ |                                                               |
| 4.3 Robustness of terminations                      | Tensile and bending                                                                                                                                                                                          | No visible damage                                             |
| 4.4 Resistance to soldering heat                    | Method: 1A<br>Solder bath: $280^{\circ}\text{C} \pm 5^{\circ}\text{C}$<br>Duration: 10 s                                                                                                                     |                                                               |



| GROUP C INSPECTION REQUIREMENTS                     |                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SUB-CLAUSE NUMBER AND TEST                          | CONDITIONS                                                                                                                                                                                                                                          | PERFORMANCE REQUIREMENTS                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>SUB-GROUP C1A PART OF SAMPLE OF SUB-GROUP C1</b> |                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 4.14 Component solvent resistance                   | Isopropylalcohol at room temperature<br>Method: 2<br>Immersion time: 5 min ± 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 2\%$ of the value measured initially<br><br>Increase of $\tan \delta$<br>$\leq 0.005$ for: $C \leq 100$ nF or<br>$\leq 0.010$ for: $100$ nF < $C \leq 220$ nF or<br>$\leq 0.015$ for: $220$ nF < $C \leq 470$ nF and<br>$\leq 0.003$ for: $C > 470$ nF<br>Compared to values measured in 4.3.1                                                          |
| <b>SUB-GROUP C1B PART OF SAMPLE OF SUB-GROUP C1</b> |                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 4.6.1 Initial measurements                          | Capacitance<br>Tangent of loss angle:<br>for $C \leq 470$ nF at 100 kHz<br>for $470$ nF < $C \leq 10$ $\mu$ F at 10 kHz<br>for $C > 10$ $\mu$ F at 1 kHz                                                                                            | No visible damage                                                                                                                                                                                                                                                                                                                                                                                                      |
| 4.6 Rapid change of temperature                     | $\theta A = -55$ °C<br>$\theta B = +105$ °C<br>5 cycles<br>Duration $t = 30$ min                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 4.7 Vibration                                       | Visual examination<br>Mounting:<br>see section "Mounting" of this specification<br>Procedure B4<br>Frequency range: 10 Hz to 55 Hz<br>Amplitude: 0.75 mm or<br>Acceleration 98 m/s <sup>2</sup><br>(whichever is less severe)<br>Total duration 6 h | No visible damage                                                                                                                                                                                                                                                                                                                                                                                                      |
| 4.7.2 Final inspection                              | Visual examination                                                                                                                                                                                                                                  | No visible damage                                                                                                                                                                                                                                                                                                                                                                                                      |
| 4.9 Shock                                           | Mounting:<br>see section "Mounting" of this specification<br>Pulse shape: half sine<br>Acceleration: 490 m/s <sup>2</sup><br>Duration of pulse: 11 ms                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 4.9.3 Final measurements                            | Visual examination<br><br>Capacitance<br><br>Tangent of loss angle<br><br><br><br>Insulation resistance                                                                                                                                             | No visible damage<br><br>$ \Delta C/C  \leq 3\%$ of the value measured in 4.6.1<br><br>Increase of $\tan \delta$<br>$\leq 0.005$ for: $C \leq 100$ nF or<br>$\leq 0.010$ for: $100$ nF < $C \leq 220$ nF or<br>$\leq 0.015$ for: $220$ nF < $C \leq 470$ nF and<br>$\leq 0.003$ for: $C > 470$ nF<br>Compared to values measured in 4.6.1<br><br>As specified in section "Insulation Resistance" of this specification |



| GROUP C INSPECTION REQUIREMENTS                                            |                                                                                  |                                                                                                                                                                                                                                                             |
|----------------------------------------------------------------------------|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SUB-CLAUSE NUMBER AND TEST                                                 | CONDITIONS                                                                       | PERFORMANCE REQUIREMENTS                                                                                                                                                                                                                                    |
| <b>SUB-GROUP C1 COMBINED SAMPLE OF SPECIMENS OF SUB-GROUPS C1A AND C1B</b> |                                                                                  |                                                                                                                                                                                                                                                             |
| 4.10 Climatic sequence                                                     |                                                                                  |                                                                                                                                                                                                                                                             |
| 4.10.2 Dry heat                                                            | Temperature: +105 °C<br>Duration: 16 h                                           |                                                                                                                                                                                                                                                             |
| 4.10.3 Damp heat cyclic<br>Test Db, first cycle                            |                                                                                  |                                                                                                                                                                                                                                                             |
| 4.10.4 Cold                                                                | Temperature: -55 °C<br>Duration: 2 h                                             |                                                                                                                                                                                                                                                             |
| 4.10.6 Damp heat cyclic<br>Test Db, remaining cycles                       |                                                                                  |                                                                                                                                                                                                                                                             |
| 4.10.6.2 Final measurements                                                | Voltage proof = $U_{RDC}$ for 1 min within 15 min after removal from testchamber | No breakdown of flash-over                                                                                                                                                                                                                                  |
|                                                                            | Visual examination                                                               | No visible damage<br>Legible marking                                                                                                                                                                                                                        |
|                                                                            | Capacitance                                                                      | $ \Delta C/C  \leq 3\%$ of the value measured in 4.4.2 or 4.9.3                                                                                                                                                                                             |
|                                                                            | Tangent of loss angle                                                            | Increase of $\tan \delta$<br>$\leq 0.005$ for: $C \leq 100$ nF or<br>$\leq 0.010$ for: $100$ nF < $C \leq 220$ nF or<br>$\leq 0.015$ for: $220$ nF < $C \leq 470$ nF and<br>$\leq 0.005$ for: $C > 470$ nF<br>Compared to values measured in 4.3.1 or 4.6.1 |
|                                                                            | Insulation resistance                                                            | $\geq 50\%$ of values specified in section "Insulation Resistance" of this specification                                                                                                                                                                    |
| <b>SUB-GROUP C2</b>                                                        |                                                                                  |                                                                                                                                                                                                                                                             |
| 4.11 Damp heat steady state                                                | 56 days, 40 °C, 90 % to 95 % RH                                                  |                                                                                                                                                                                                                                                             |
| 4.11.1 Initial measurements                                                | Capacitance<br>Tangent of loss angle at 1 kHz                                    |                                                                                                                                                                                                                                                             |
| 4.11.3 Final measurements                                                  | Voltage proof = $U_{RDC}$ for 1 min within 15 min after removal from testchamber | No breakdown of flash-over                                                                                                                                                                                                                                  |
|                                                                            | Visual examination                                                               | No visible damage<br>Legible marking                                                                                                                                                                                                                        |
|                                                                            | Capacitance                                                                      | $ \Delta C/C  \leq 5\%$ of the value measured in 4.11.1.                                                                                                                                                                                                    |
|                                                                            | Tangent of loss angle                                                            | Increase of $\tan \delta \leq 0.005$<br>Compared to values measured in 4.11.1                                                                                                                                                                               |
|                                                                            | Insulation resistance                                                            | $\geq 50\%$ of values specified in section "Insulation Resistance" of this specification                                                                                                                                                                    |





| GROUP C INSPECTION REQUIREMENTS |                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SUB-CLAUSE NUMBER AND TEST      | CONDITIONS                                                                                                                                               | PERFORMANCE REQUIREMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>SUB GROUP C3</b>             |                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 4.12 Endurance                  | Duration: 2000 h<br>1.25 x $U_{RDC}$ at 85 °C<br>0.8 x 1.25 $U_{RDC}$ at 105 °C                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 4.12.1 Initial measurements     | Capacitance<br>Tangent of loss angle:<br>for $C \leq 470$ nF at 100 kHz<br>for $470$ nF < $C \leq 10$ $\mu$ F at 10 kHz<br>for $C > 10$ $\mu$ F at 1 kHz |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 4.12.5 Final measurements       | Visual examination<br><br>Capacitance<br><br>Tangent of loss angle<br><br>Insulation resistance                                                          | No visible damage<br>Legible marking<br><br>$ \Delta C/C  \leq 5$ % compared to values measured in 4.12.1<br><br>Increase of $\tan \delta$<br>$\leq 0.005$ for: $C \leq 100$ nF or<br>$\leq 0.010$ for: $100$ nF < $C \leq 220$ nF or<br>$\leq 0.015$ for: $220$ nF < $C \leq 470$ nF and<br>$\leq 0.003$ for: $C > 470$ nF<br>Compared to values measured in 4.12.1<br><br>$\geq 50$ % of values specified in section "Insulation Resistance" of this specification |
| <b>SUB-GROUP C4</b>             |                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 4.13 Charge and discharge       | 10 000 cycles<br>Charged to $U_{RDC}$<br>Discharge resistance:<br>$R = \frac{U_R}{C \times 2.5 \times (dU/dt)_R}$                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 4.13.1 Initial measurements     | Capacitance<br>Tangent of loss angle:<br>for $C \leq 470$ nF at 100 kHz<br>for $470$ nF < $C \leq 10$ $\mu$ F at 10 kHz<br>for $C > 10$ $\mu$ F at 1 kHz |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 4.13.3 Final measurements       | Capacitance<br><br>Tangent of loss angle<br><br>Insulation resistance                                                                                    | $ \Delta C/C  \leq 3$ % compared to values measured in 4.13.1<br><br>Increase of $\tan \delta$<br>$\leq 0.005$ for: $C \leq 100$ nF or<br>$\leq 0.010$ for: $100$ nF < $C \leq 220$ nF or<br>$\leq 0.015$ for: $220$ nF < $C \leq 470$ nF and<br>$\leq 0.003$ for: $C > 470$ nF<br>Compared to values measured in 4.13.1<br><br>$\geq 50$ % of values specified in section "Insulation Resistance" of this specification                                             |



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