

## 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**

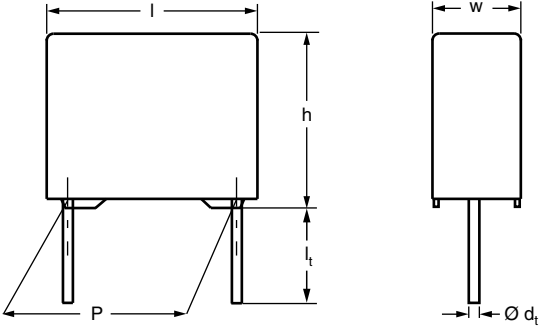
**APPLICATIONS**

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<br>       |
| 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 |

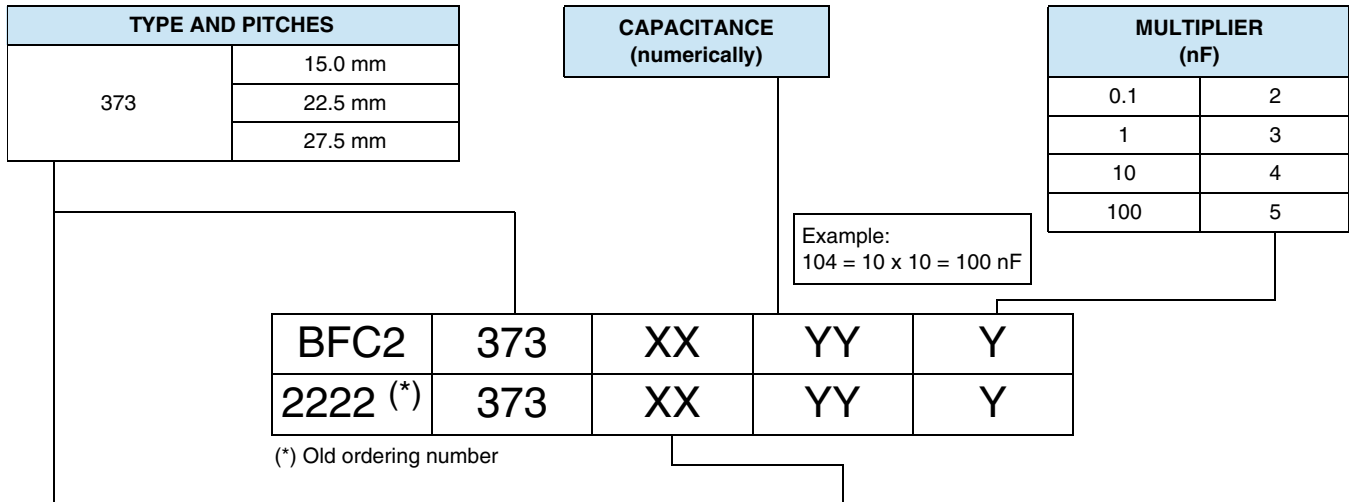
**Note**

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

| DIMENSIONS                                                                           |
|--------------------------------------------------------------------------------------|
|  |



**COMPOSITION OF CATALOG NUMBER**



| TYPE            | 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 (1) = 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 (1) = 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                   |                          |                          |                     |
|                                                                                | at 1 kHz                | at 10 kHz                | at 100 kHz               |                     |
| Tangent of loss angle:                                                         |                         |                          |                          |                     |
| C ≤ 0.1 µF                                                                     | ≤ 75 x 10 <sup>-4</sup> | ≤ 130 x 10 <sup>-4</sup> | ≤ 250 x 10 <sup>-4</sup> |                     |
| 0.1 µF < C ≤ 0.47 µF                                                           | ≤ 75 x 10 <sup>-4</sup> | ≤ 130 x 10 <sup>-4</sup> | ≤ 300 x 10 <sup>-4</sup> |                     |
| 0.47 µF < C ≤ 1.0 µF                                                           | ≤ 75 x 10 <sup>-4</sup> | ≤ 130 x 10 <sup>-4</sup> | -                        |                     |
| 1.0 µF < C ≤ 10 µF                                                             | ≤ 75 x 10 <sup>-4</sup> | ≤ 150 x 10 <sup>-4</sup> | -                        |                     |
| C > 10 µF                                                                      | ≤ 75 x 10 <sup>-4</sup> | -                        | -                        |                     |
| Rated voltage pulse slope (dU/dt) <sub>R</sub> at                              | 100 V <sub>DC</sub>     | 250 V <sub>DC</sub>      | 400 V <sub>DC</sub>      | 630 V <sub>DC</sub> |
| P = 15 mm                                                                      | 14 V/µs                 | 16 V/µs                  | 34 V/µs                  | 90 V/µs             |
| P = 22.5 mm                                                                    | 5 V/µs                  | 7 V/µs                   | 14 V/µs                  | 35 V/µs             |
| P = 27.5 mm                                                                    | 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) (1);<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 |                 |                                       |                 | C-VALUE<br><br>..YYY |  |
|                                                                                              |                                                                                              |                                 |                            | LOOSE IN BOX                                |                 | REEL <sup>(1)(2)</sup>                |                 |                      |  |
|                                                                                              |                                                                                              |                                 |                            | 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)     |                      |  |
| <b>U<sub>RAC</sub> = 63 V; PITCH = 15.0 mm ± 0.4 mm; d<sub>t</sub> = 0.60 mm ± 0.06 mm</b>   |                                                                                              |                                 |                            |                                             |                 |                                       |                 |                      |  |
| 100                                                                                          | 0.33                                                                                         | 5.0 x 11.0 x 17.5               | 1.1                        | 23...<br>(1000)                             | 24...<br>(1000) | 27...<br>(1100)                       | 28...<br>(1100) | 334                  |  |
|                                                                                              | 0.39                                                                                         |                                 |                            |                                             |                 |                                       |                 | 394                  |  |
|                                                                                              | 0.47                                                                                         |                                 |                            |                                             |                 |                                       |                 | 474                  |  |
|                                                                                              | 0.56                                                                                         |                                 |                            |                                             |                 |                                       |                 | 564                  |  |
|                                                                                              | 0.68                                                                                         |                                 |                            |                                             |                 |                                       |                 | 684                  |  |
|                                                                                              | 0.82                                                                                         |                                 |                            |                                             |                 |                                       |                 | 824                  |  |
|                                                                                              | 1.0                                                                                          |                                 |                            |                                             |                 |                                       |                 | 105                  |  |
|                                                                                              | 1.2                                                                                          |                                 |                            |                                             |                 |                                       |                 | 125                  |  |
|                                                                                              | 1.5                                                                                          |                                 |                            |                                             |                 |                                       |                 | 155                  |  |
|                                                                                              | 1.8                                                                                          | 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             |                      |  |
| <b>U<sub>RAC</sub> = 63 V; PITCH = 15.0 mm ± 0.4 mm; d<sub>t</sub> = 0.80 mm ± 0.08 mm</b>   |                                                                                              |                                 |                            |                                             |                 |                                       |                 |                      |  |
| 2.7                                                                                          | 7.0 x 13.5 x 17.5                                                                            | 2.0                             | 23...<br>(1000)            | 24...<br>(1000)                             | 27...<br>(800)  | 28...<br>(800)                        | 275             |                      |  |
| 3.3                                                                                          |                                                                                              |                                 |                            |                                             |                 |                                       |                 | 335                  |  |
| 3.9                                                                                          | 8.5 x 15.0 x 17.5                                                                            | 2.7                             | 23...<br>(1000)            | 24...<br>(1000)                             | 27...<br>(650)  | 28...<br>(650)                        | 395             |                      |  |
| 4.7                                                                                          |                                                                                              |                                 |                            |                                             |                 |                                       |                 | 475                  |  |
| <b>U<sub>RAC</sub> = 160 V; PITCH = 15.0 mm ± 0.40 mm; d<sub>t</sub> = 0.60 mm ± 0.06 mm</b> |                                                                                              |                                 |                            |                                             |                 |                                       |                 |                      |  |
| 250                                                                                          | 0.15                                                                                         | 5.0 x 11.0 x 17.5               | 1.1                        | 43...<br>(1000)                             | 44...<br>(1000) | 47...<br>(1100)                       | 48...<br>(1100) | 154                  |  |
|                                                                                              | 0.18                                                                                         |                                 |                            |                                             |                 |                                       |                 | 184                  |  |
|                                                                                              | 0.22                                                                                         |                                 |                            |                                             |                 |                                       |                 | 224                  |  |
|                                                                                              | 0.27                                                                                         |                                 |                            |                                             |                 |                                       |                 | 274                  |  |
|                                                                                              | 0.32                                                                                         |                                 |                            |                                             |                 |                                       |                 | 334                  |  |
|                                                                                              | 0.39                                                                                         | 6.0 x 12.0 x 17.5               | 1.5                        | 43...<br>(1000)                             | 44...<br>(1000) | 47...<br>(900)                        | 48...<br>(900)  | 394                  |  |
|                                                                                              | 0.47                                                                                         |                                 |                            |                                             |                 |                                       |                 | 474                  |  |
|                                                                                              | <b>U<sub>RAC</sub> = 160 V; PITCH = 15.0 mm ± 0.40 mm; d<sub>t</sub> = 0.80 mm ± 0.08 mm</b> |                                 |                            |                                             |                 |                                       |                 |                      |  |
|                                                                                              | 0.56                                                                                         | 7.0 x 13.5 x 17.5               | 2.0                        | 43...<br>(1000)                             | 44...<br>(1000) | 47...<br>(800)                        | 48...<br>(800)  | 564                  |  |
|                                                                                              | 0.68                                                                                         |                                 |                            |                                             |                 |                                       |                 | 684                  |  |
|                                                                                              | 0.82                                                                                         | 8.5 x 15.0 x 17.5               | 2.7                        | 43...<br>(1000)                             | 44...<br>(1000) | 47...<br>(650)                        | 48...<br>(650)  | 824                  |  |
|                                                                                              | 1.0                                                                                          |                                 |                            |                                             |                 |                                       |                 | 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                  |  |
|                                                                                              | <b>U<sub>RAC</sub> = 160 V; PITCH = 22.5 mm ± 0.4 mm; d<sub>t</sub> = 0.80 mm ± 0.08 mm</b>  |                                 |                            |                                             |                 |                                       |                 |                      |  |
|                                                                                              | 1.5                                                                                          | 8.5 x 18.0 x 26.0               | 4.5                        | 43...<br>(200)                              | 44...<br>(200)  | 47...<br>(450)                        | 48...<br>(450)  | 155                  |  |
|                                                                                              | 1.8                                                                                          |                                 |                            |                                             |                 |                                       |                 | 185                  |  |
| 2.2                                                                                          | 10.0 x 19.5 x 26.0                                                                           | 5.7                             | 43...<br>(200)             | 44...<br>(200)                              | 47...<br>(350)  | 48...<br>(350)                        | 225             |                      |  |
| 2.7                                                                                          |                                                                                              |                                 |                            |                                             |                 |                                       | 275             |                      |  |
| <b>U<sub>RAC</sub> = 160 V; PITCH = 27.5 mm ± 0.4 mm; d<sub>t</sub> = 0.80 mm ± 0.08 mm</b>  |                                                                                              |                                 |                            |                                             |                 |                                       |                 |                      |  |
| 3.3                                                                                          | 11.0 x 21.0 x 31.0                                                                           | 8.2                             | 43...<br>(100)             | 44...<br>(100)                              | -               | -                                     | 335             |                      |  |
| 3.9                                                                                          | 13.0 x 23.0 x 31.0                                                                           | 10.2                            | 43...<br>(100)             | 44...<br>(100)                              | -               | -                                     | 395             |                      |  |
| 4.7                                                                                          |                                                                                              |                                 |                            |                                             |                 |                                       | 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 XXYY AND PACKAGING |                 |                                       |                 | C-VALUE<br><br>..YYY                          |            |                 |                 |                |                |                   |     |
|                                                                                             |                                                                                             |                                 |                            | LOOSE IN BOX                               |                 | REEL <sup>(1)(2)</sup>                |                 |                                               |            |                 |                 |                |                |                   |     |
|                                                                                             |                                                                                             |                                 |                            | 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)     |                                               |            |                 |                 |                |                |                   |     |
| <b>U<sub>RAC</sub> = 220 V; PITCH = 15.0 mm ± 0.4 mm; d<sub>t</sub> = 0.60 mm ± 0.06 mm</b> |                                                                                             |                                 |                            |                                            |                 |                                       |                 |                                               |            |                 |                 |                |                |                   |     |
| 400                                                                                         | 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        |     |
|                                                                                             | <b>U<sub>RAC</sub> = 220 V; PITCH = 15.0 mm ± 0.4 mm; d<sub>t</sub> = 0.80 mm ± 0.08 mm</b> |                                 |                            |                                            |                 |                                       |                 |                                               |            |                 |                 |                |                |                   |     |
|                                                                                             | 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 |
|                                                                                             | 0.56                                                                                        |                                 |                            |                                            |                 |                                       |                 | 10.0 x 16.5 x 17.5                            | 3.5        | 53...<br>(500)  | 54...<br>(500)  | 57...<br>(600) | 58...<br>(600) |                   |     |
|                                                                                             | <b>U<sub>RAC</sub> = 220 V; PITCH = 22.5 mm ± 0.4 mm; d<sub>t</sub> = 0.80 mm ± 0.08 mm</b> |                                 |                            |                                            |                 |                                       |                 |                                               |            |                 |                 |                |                |                   |     |
|                                                                                             | 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        |     |
|                                                                                             | <b>U<sub>RAC</sub> = 220 V; PITCH = 27.5 mm ± 0.4 mm; d<sub>t</sub> = 0.80 mm ± 0.08 mm</b> |                                 |                            |                                            |                 |                                       |                 |                                               |            |                 |                 |                |                |                   |     |
|                                                                                             | 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                                    |            |                 |                 |                |                |                   |     |
|                                                                                             | <b>U<sub>RAC</sub> = 250 V; PITCH = 15.0 mm ± 0.4 mm; d<sub>t</sub> = 0.60 mm ± 0.06 mm</b> |                                 |                            |                                            |                 |                                       |                 |                                               |            |                 |                 |                |                |                   |     |
|                                                                                             | 630                                                                                         | 0.047<br>0.056                  | 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 |                 |                 |                |                |                   |     |
| 0.068<br>0.082                                                                              |                                                                                             | 6.0 x 12.0 x 17.5               |                            |                                            |                 |                                       |                 |                                               | 1.5        | 63...<br>(1000) | 64...<br>(1000) | 67...<br>(900) | 68...<br>(900) | 683<br>823        |     |
| <b>U<sub>RAC</sub> = 250 V; PITCH = 15.0 mm ± 0.4 mm; d<sub>t</sub> = 0.80 mm ± 0.08 mm</b> |                                                                                             |                                 |                            |                                            |                 |                                       |                 |                                               |            |                 |                 |                |                |                   |     |
| 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               |     |
| <b>U<sub>RAC</sub> = 250 V; PITCH = 22.5 mm ± 0.4 mm; d<sub>t</sub> = 0.80 mm ± 0.08 mm</b> |                                                                                             |                                 |                            |                                            |                 |                                       |                 |                                               |            |                 |                 |                |                |                   |     |
| 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        |     |
| <b>U<sub>RAC</sub> = 250 V; PITCH = 27.5 mm ± 0.4 mm; d<sub>t</sub> = 0.80 mm ± 0.08 mm</b> |                                                                                             |                                 |                            |                                            |                 |                                       |                 |                                               |            |                 |                 |                |                |                   |     |
| 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 |                 |                                       |                 | C-VALUE<br><br>..YYY            |                 |                          |                |
|                                                                                             |                                                                                             |                                 |                            | LOOSE IN BOX                                |                 | REEL <sup>(1)(2)</sup>                |                 |                                 |                 |                          |                |
|                                                                                             |                                                                                             |                                 |                            | 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)     |                                 |                 |                          |                |
| <b>U<sub>RAC</sub> = 63 V; PITCH = 15.0 mm ± 0.4 mm; d<sub>t</sub> = 0.60 mm ± 0.06 mm</b>  |                                                                                             |                                 |                            |                                             |                 |                                       |                 |                                 |                 |                          |                |
| 100                                                                                         | 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               |                |
|                                                                                             | <b>U<sub>RAC</sub> = 63 V; PITCH = 15.0 mm ± 0.4 mm; d<sub>t</sub> = 0.80 mm ± 0.08 mm</b>  |                                 |                            |                                             |                 |                                       |                 |                                 |                 |                          |                |
|                                                                                             | 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                     | 2.7             | 21...<br>(1000)                 | 22...<br>(1000) | 25...<br>(650)           | 26...<br>(650) |
|                                                                                             | <b>U<sub>RAC</sub> = 63 V; PITCH = 22.5 mm ± 0.4 mm; d<sub>t</sub> = 0.80 mm ± 0.08 mm</b>  |                                 |                            |                                             |                 |                                       |                 |                                 |                 |                          |                |
|                                                                                             | 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               |                |
|                                                                                             | <b>U<sub>RAC</sub> = 63 V; PITCH = 27.5 mm ± 0.4 mm; d<sub>t</sub> = 0.80 mm ± 0.08 mm</b>  |                                 |                            |                                             |                 |                                       |                 |                                 |                 |                          |                |
|                                                                                             | 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               |                |
| <b>U<sub>RAC</sub> = 160 V; PITCH = 15.0 mm ± 0.4 mm; d<sub>t</sub> = 0.60 mm ± 0.06 mm</b> |                                                                                             |                                 |                            |                                             |                 |                                       |                 |                                 |                 |                          |                |
| 250                                                                                         | 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 |                |
|                                                                                             | <b>U<sub>RAC</sub> = 160 V; PITCH = 15.0 mm ± 0.4 mm; d<sub>t</sub> = 0.80 mm ± 0.08 mm</b> |                                 |                            |                                             |                 |                                       |                 |                                 |                 |                          |                |
|                                                                                             | 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)  | 824<br>105               |                |
|                                                                                             | <b>U<sub>RAC</sub> = 160 V; PITCH = 22.5 mm ± 0.4 mm; d<sub>t</sub> = 0.80 mm ± 0.08 mm</b> |                                 |                            |                                             |                 |                                       |                 |                                 |                 |                          |                |
|                                                                                             | 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               |                |
|                                                                                             | <b>U<sub>RAC</sub> = 160 V; PITCH = 27.5 mm ± 0.4 mm; d<sub>t</sub> = 0.80 mm ± 0.08 mm</b> |                                 |                            |                                             |                 |                                       |                 |                                 |                 |                          |                |
|                                                                                             | 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 XXYY AND PACKAGING |                 |                                       |                    | C-VALUE<br>..YYY |                |
|                                                                                        |                                                                                        |                                 |                            | LOOSE IN BOX                               |                 | REEL <sup>(1)(2)</sup>                |                    |                  |                |
|                                                                                        |                                                                                        |                                 |                            | 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)        |                  |                |
| U <sub>RAC</sub> = 220 V; PITCH = 15.0 mm ± 0.4 mm; d <sub>t</sub> = 0.60 mm ± 0.06 mm |                                                                                        |                                 |                            |                                            |                 |                                       |                    |                  |                |
| 400                                                                                    | 0.047                                                                                  | 5.0 x 11.0 x 17.5               | 1.1                        | 51...<br>(1000)                            | 52...<br>(1000) | 55...<br>(1100)                       | 56...<br>(1100)    | 473              |                |
|                                                                                        | 0.056                                                                                  |                                 |                            |                                            |                 |                                       |                    | 563              |                |
|                                                                                        | 0.068                                                                                  |                                 |                            |                                            |                 |                                       |                    | 683              |                |
|                                                                                        | 0.082                                                                                  |                                 |                            |                                            |                 |                                       |                    | 823              |                |
|                                                                                        | 0.10                                                                                   |                                 |                            |                                            |                 |                                       |                    | 104              |                |
|                                                                                        | 0.12                                                                                   | 6.0 x 12.0 x 17.5               | 1.5                        | 51...<br>(1000)                            | 52...<br>(1000) | 55...<br>(900)                        | 56...<br>(900)     | 124              |                |
|                                                                                        | 0.15                                                                                   |                                 |                            |                                            |                 |                                       |                    | 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                                                                                   | 7.0 x 13.5 x 17.5               | 2.0                        | 51...<br>(1000)                            | 52...<br>(1000) | 55...<br>(800)                        | 56...<br>(800)     | 184              |                |
|                                                                                        | 0.22                                                                                   |                                 |                            |                                            |                 |                                       |                    | 224              |                |
|                                                                                        | 0.27                                                                                   | 8.5 x 15.0 x 17.5               | 2.7                        | 51...<br>(1000)                            | 52...<br>(1000) | 55...<br>(650)                        | 56...<br>(650)     | 274              |                |
|                                                                                        | 0.33                                                                                   |                                 |                            |                                            |                 |                                       |                    | 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                                                                                   | 8.5 x 18.0 x 26.0               | 4.5                        | 51...<br>(200)                             | 52...<br>(200)  | 55...<br>(450)                        | 56...<br>(450)     | 394              |                |
| 0.47                                                                                   | 474                                                                                    |                                 |                            |                                            |                 |                                       |                    |                  |                |
| 0.56                                                                                   | 10.0 x 19.5 x 26.0                                                                     | 5.7                             | 51...<br>(200)             | 52...<br>(200)                             | 55...<br>(350)  | 56...<br>(350)                        | 564                |                  |                |
| 0.68                                                                                   |                                                                                        |                                 |                            |                                            |                 |                                       | 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                                                                                   | 13.0 x 23.0 x 31.0                                                                     | 10.2                            | 51...<br>(100)             | 52...<br>(100)                             | -               | -                                     | 824                |                  |                |
| 1.0                                                                                    |                                                                                        |                                 |                            |                                            |                 |                                       | 105                |                  |                |
| 1.2                                                                                    |                                                                                        |                                 |                            |                                            |                 |                                       | 15.0 x 25.0 x 31.5 | 13.4             | 51...<br>(100) |
| 1.5                                                                                    | 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 XXYYY 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 |  |
| <b>U<sub>RAC</sub> = 63 V; PITCH = 22.5 mm ± 0.4 mm; d<sub>t</sub> = 0.80 mm ± 0.08 mm</b>  |                                                                                             |                                 |                            |                                             |                |     |                        |                |     |  |
| 100                                                                                         | 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          |     |  |
|                                                                                             | <b>U<sub>RAC</sub> = 63 V; PITCH = 27.5 mm ± 0.4 mm; d<sub>t</sub> = 0.80 mm ± 0.08 mm</b>  |                                 |                            |                                             |                |     |                        |                |     |  |
| 4.7                                                                                         | 9.0 x 19.0 x 31.0                                                                           | 6.1                             | 90032                      | 90033                                       | 100            | -   |                        |                |     |  |
| <b>U<sub>RAC</sub> = 160 V; PITCH = 22.5 mm ± 0.4 mm; d<sub>t</sub> = 0.80 mm ± 0.08 mm</b> |                                                                                             |                                 |                            |                                             |                |     |                        |                |     |  |
| 250                                                                                         | 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          |     |  |
|                                                                                             | <b>U<sub>RAC</sub> = 160 V; PITCH = 27.5 mm ± 0.4 mm; d<sub>t</sub> = 0.80 mm ± 0.08 mm</b> |                                 |                            |                                             |                |     |                        |                |     |  |
|                                                                                             | 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                                       |                |     |                        |                |     |  |
| <b>U<sub>RAC</sub> = 220 V; PITCH = 22.5 mm ± 0.4 mm; d<sub>t</sub> = 0.80 mm ± 0.08 mm</b> |                                                                                             |                                 |                            |                                             |                |     |                        |                |     |  |
| 400                                                                                         | 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          |     |  |
|                                                                                             | <b>U<sub>RAC</sub> = 220 V; PITCH = 27.5 mm ± 0.4 mm; d<sub>t</sub> = 0.80 mm ± 0.08 mm</b> |                                 |                            |                                             |                |     |                        |                |     |  |
| 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:

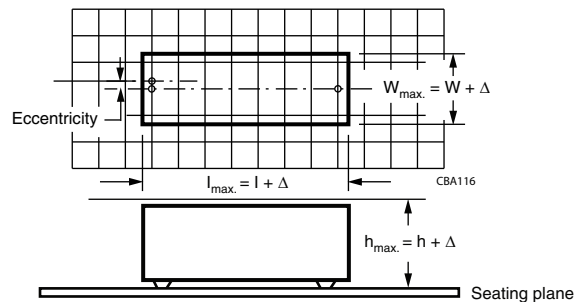
- For pitches  $\leq 15$  mm capacitors shall be mechanically fixed by the leads
- For larger pitches the capacitors shall be mounted in the same way and the body clamped

### 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

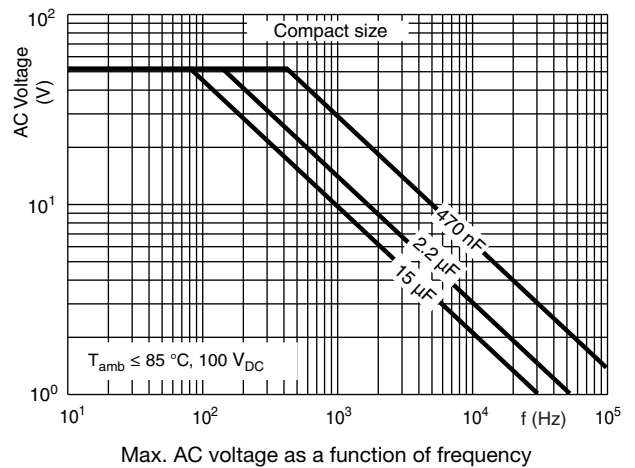
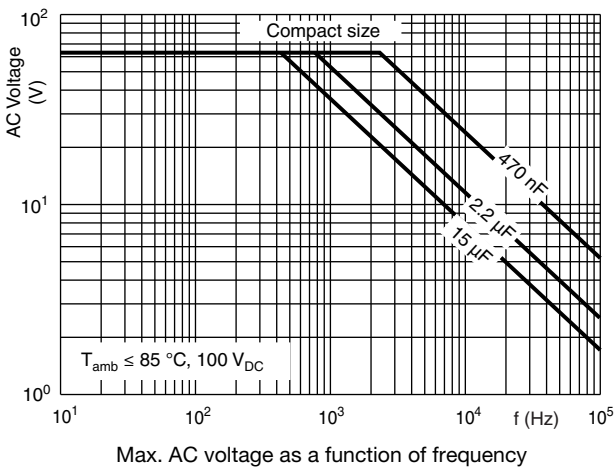
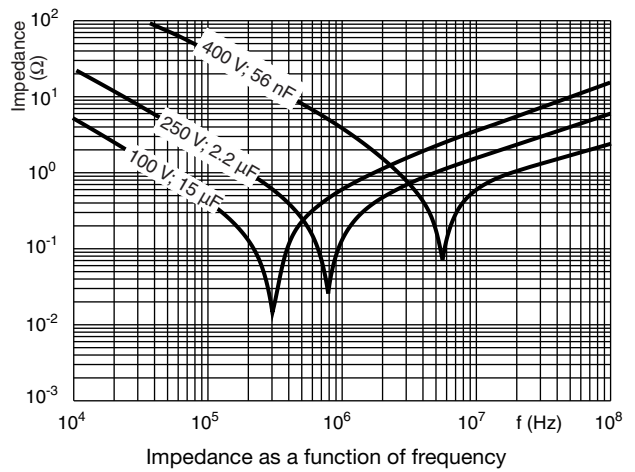
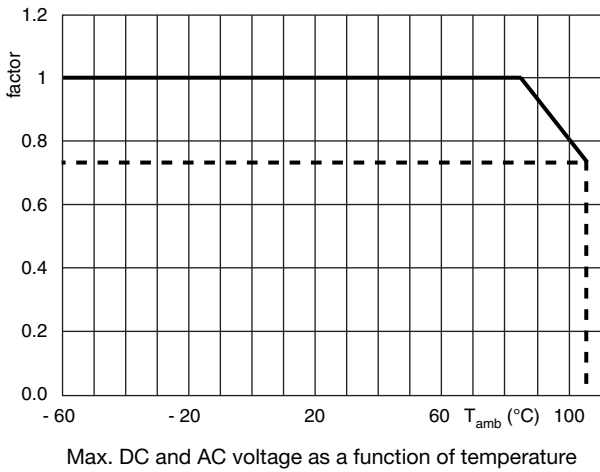
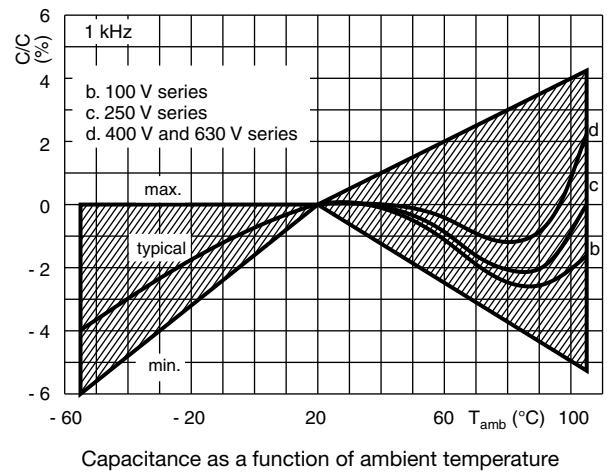
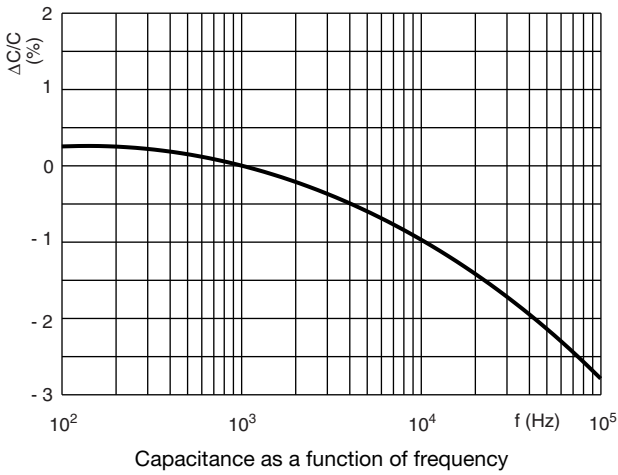
Unless otherwise specified, all electrical values apply to an ambient free air temperature of  $23$  °C  $\pm 1$  °C, an atmospheric pressure of 86 kPa to 106 kPa and a relative humidity of  $50$  %  $\pm 2$  %.

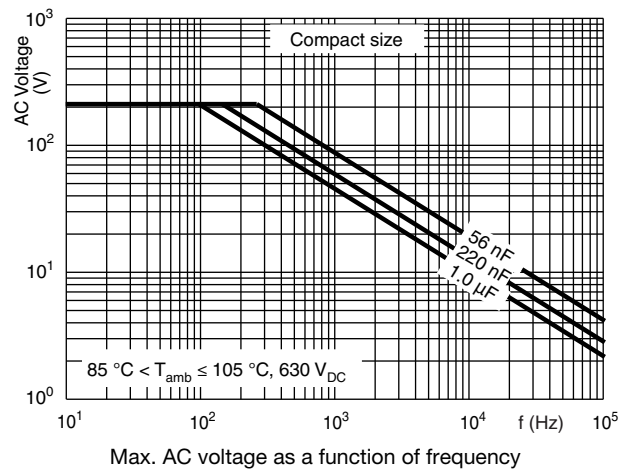
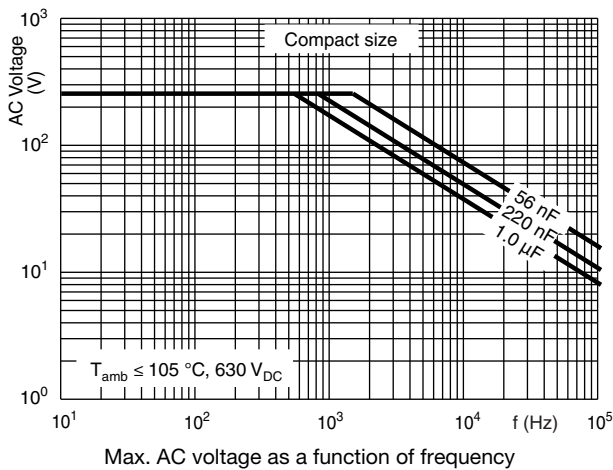
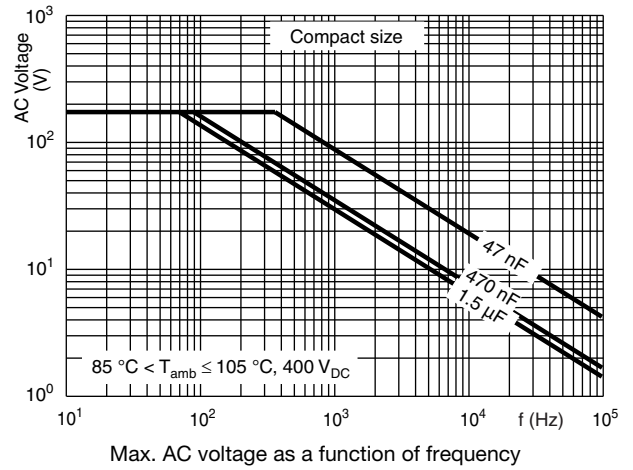
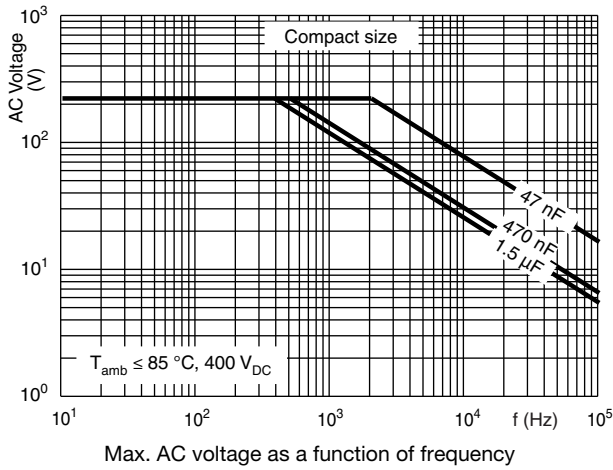
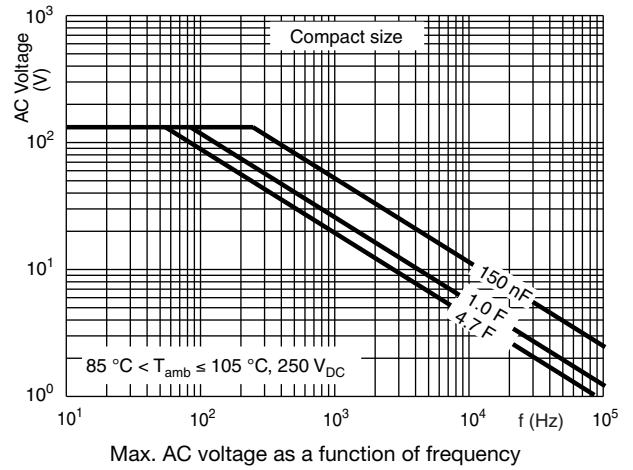
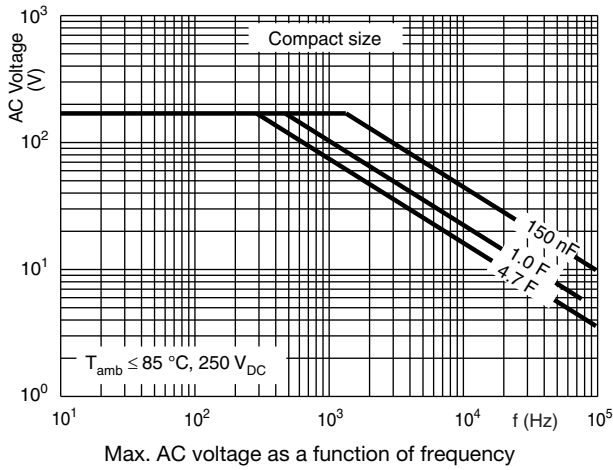
For reference testing, a conditioning period shall be applied over  $96$  h  $\pm 4$  h by heating the products in a circulating air oven at the rated temperature and a relative humidity not exceeding 20 %.

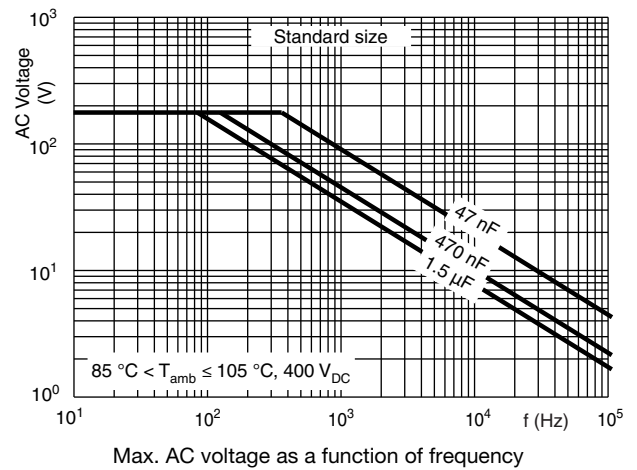
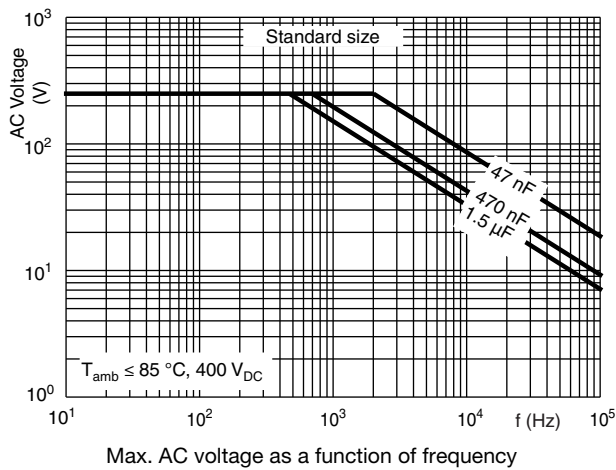
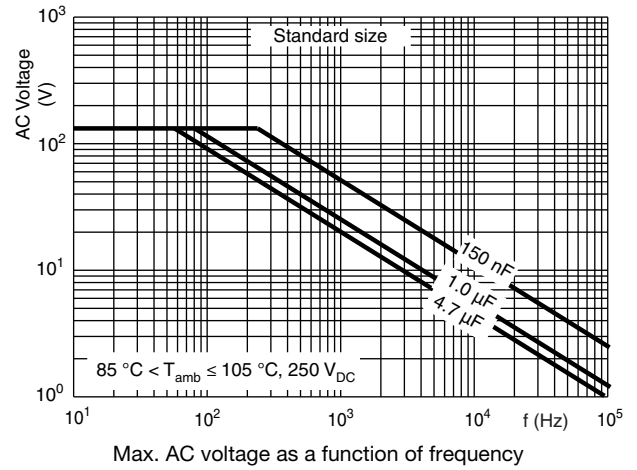
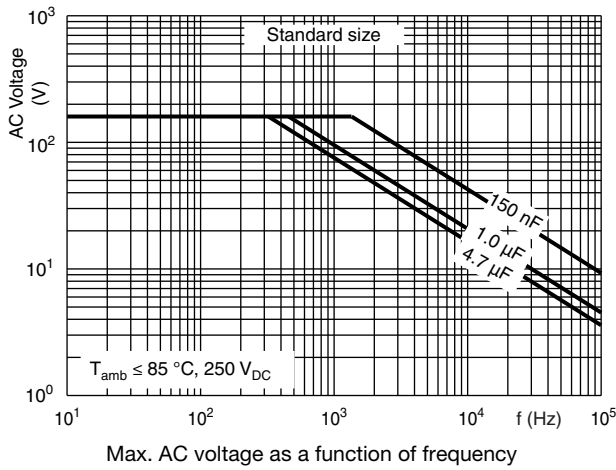
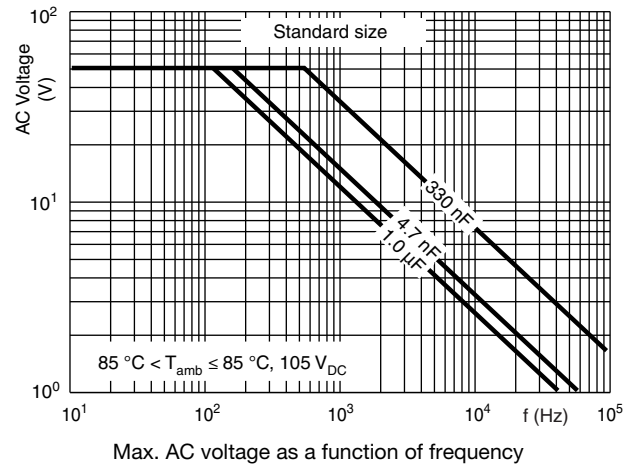
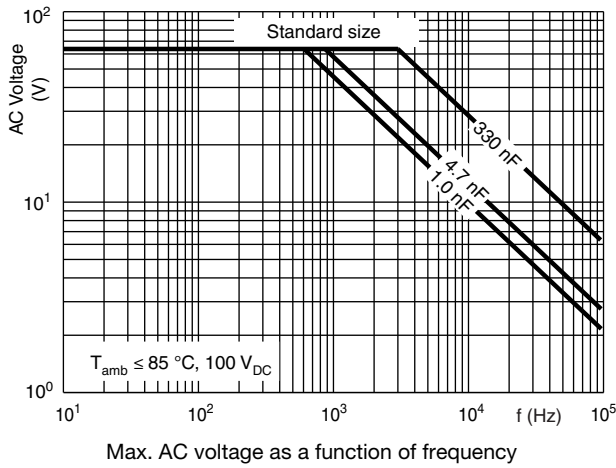




CHARACTERISTICS

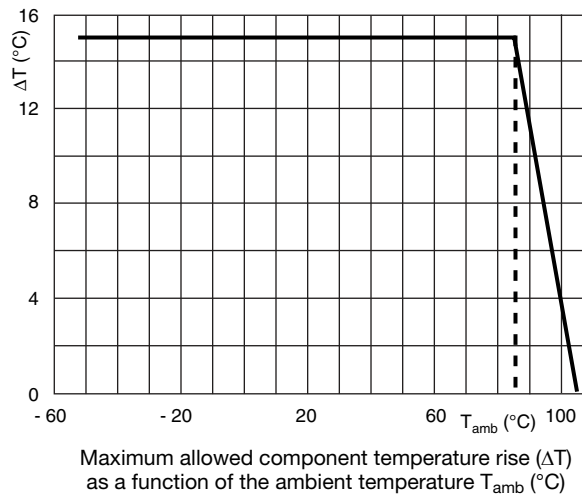
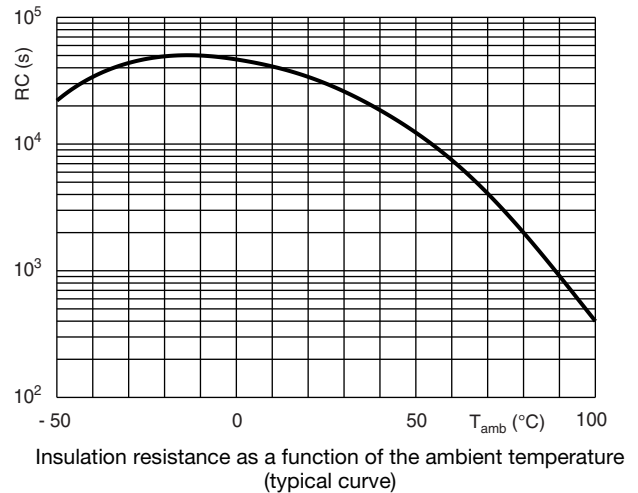
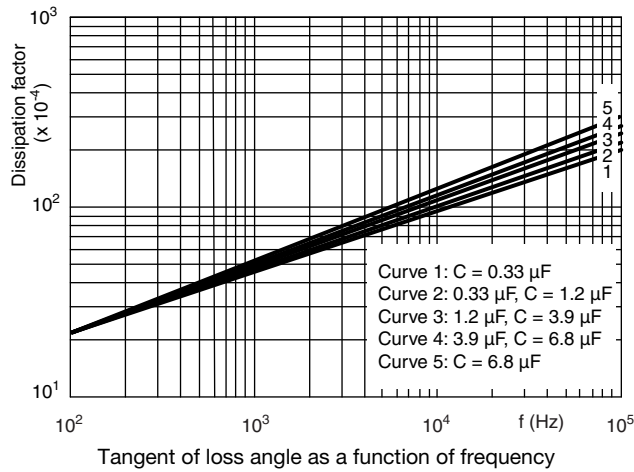






**Maximum RMS current (sinewave) as a function of frequency**

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



| <b>HEAT CONDUCTIVITY (G) AS A FUNCTION OF (ORIGINAL) PITCH AND CAPACITOR BODY THICKNESS IN <math>\text{mW}/^{\circ}\text{C}</math></b> |                                                                    |                      |                      |
|----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|----------------------|----------------------|
| <b><math>W_{MAX.}</math><br/>(mm)</b>                                                                                                  | <b>HEAT CONDUCTIVITY (<math>\text{mW}/^{\circ}\text{C}</math>)</b> |                      |                      |
|                                                                                                                                        | <b>PITCH 15.0 mm</b>                                               | <b>PITCH 22.5 mm</b> | <b>PITCH 27.5 mm</b> |
| 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.

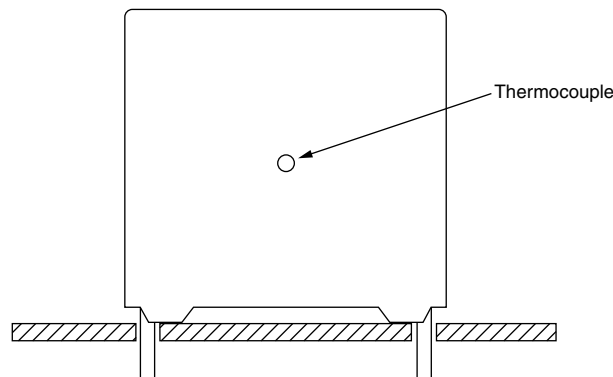
The power dissipation can be calculated according type detail specification “HQN-384-01/101: Technical Information Film Capacitors”, [www.vishay.com/doc?28147](http://www.vishay.com/doc?28147).

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 ( $T_{\text{C}}$ ).

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

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 ( $U_{\text{P}}$ ) 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).

| <b>VOLTAGE CONDITIONS FOR 6 ABOVE</b>            |                                |                                                                      |
|--------------------------------------------------|--------------------------------|----------------------------------------------------------------------|
| <b>ALLOWED VOLTAGES</b>                          | <b>T<sub>amb</sub> ≤ 85 °C</b> | <b>85 °C &lt; T<sub>amb</sub> ≤ 105 °C</b>                           |
| Maximum continuous RMS voltage                   | U <sub>RAC</sub>               | See "Max. AC voltage as function of temperature" per characteristics |
| Maximum temperature RMS-overvoltage (< 24 h)     | 1.25 x U <sub>RAC</sub>        | U <sub>RAC</sub>                                                     |
| Maximum peak voltage (V <sub>O-P</sub> ) (< 2 s) | 1.6 x U <sub>RDC</sub>         | 1.3 x U <sub>RDC</sub>                                               |

**Example**

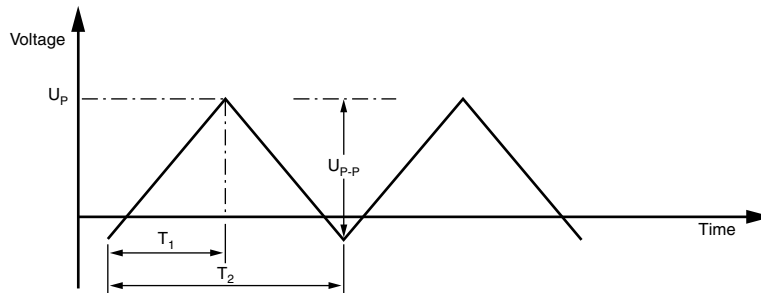
C = 330 nF - 63 V used for the voltage signal shown in next drawing.

U<sub>P-P</sub> = 40 V; U<sub>P</sub> = 35 V; T<sub>1</sub> = 100 μs; T<sub>2</sub> = 200 μs

The ambient temperature is 35 °C

Checking conditions:

1. The peak voltage U<sub>P</sub> = 35 V is lower than 63 V<sub>DC</sub>
2. The peak-to-peak voltage 40 V is lower than  $2\sqrt{2} \times 40 \text{ V}_{AC} = 113 \text{ U}_{P-P}$
3. The voltage pulse slope (dU/dt) = 40 V/100 μs = 0.4 V/μs  
This is lower than 60 V/μs (see specific reference data for each version)
4. The dissipated power is 16.2 mW as calculated with fourier terms  
The temperature rise for W<sub>max.</sub> = 3.5 mm and pitch = 5 mm will be 16.2 mW/3.0 mW/°C = 5.4 °C  
This is lower than 15 °C temperature rise at 35 °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".

| <b>GROUP C INSPECTION REQUIREMENTS</b>               |                                                                                                                                  |                                                               |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
| <b>SUB-CLAUSE NUMBER AND TEST</b>                    | <b>CONDITIONS</b>                                                                                                                | <b>PERFORMANCE REQUIREMENTS</b>                               |
| <b>SUB-GROUP C-1A 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 ≤ 470 nF at 100 kHz<br>for 470 nF < C ≤ 10 μF at 10 kHz<br>for C > 10 μF at 1 kHz |                                                               |
| 4.3 Robustness of terminations                       | Tensile and bending                                                                                                              | No visible damage                                             |
| 4.4 Resistance to soldering heat                     | Method: 1A<br>Solder bath: 280 °C ± 5 °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<br><br>Visual examination<br><br>Capacitance<br><br>Tangent of loss angle<br><br>Insulation resistance | No breakdown of flash-over<br><br>No visible damage<br>Legible marking<br><br>$ \Delta C/C  \leq 3\%$ of the value measured in 4.4.2 or 4.9.3<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>$\leq 0.005$ for: $C > 470$ nF<br>Compared to values measured in 4.3.1 or 4.6.1<br><br>$\geq 50\%$ 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<br><br>Visual examination<br><br>Capacitance<br><br>Tangent of loss angle<br><br>Insulation resistance | No breakdown of flash-over<br><br>No visible damage<br>Legible marking<br><br>$ \Delta C/C  \leq 5\%$ of the value measured in 4.11.1.<br><br>Increase of $\tan \delta \leq 0.005$<br>Compared to values measured in 4.11.1<br><br>$\geq 50\%$ 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 <sub>RDC</sub> at 85 °C<br>0.8 x 1.25 U <sub>RDC</sub> at 105 °C                                    |                                                                                                                                                                                                                                                                                                                                                                                                     |
| 4.12.1 Initial measurements     | Capacitance<br>Tangent of loss angle:<br>for C ≤ 470 nF at 100 kHz<br>for 470 nF < C ≤ 10 μF at 10 kHz<br>for C > 10 μF 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> ΔC/C  ≤ 5 % compared to values measured in 4.12.1<br><br>Increase of tan δ<br>≤ 0.005 for: C ≤ 100 nF or<br>≤ 0.010 for: 100 nF < C ≤ 220 nF or<br>≤ 0.015 for: 220 nF < C ≤ 470 nF and<br>≤ 0.003 for: C > 470 nF<br>Compared to values measured in 4.12.1<br><br>≥ 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 <sub>RDC</sub><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 ≤ 470 nF at 100 kHz<br>for 470 nF < C ≤ 10 μF at 10 kHz<br>for C > 10 μF at 1 kHz |                                                                                                                                                                                                                                                                                                                                                                                                     |
| 4.13.3 Final measurements       | Capacitance<br><br>Tangent of loss angle<br><br>Insulation resistance                                                            | ΔC/C  ≤ 3 % compared to values measured in 4.13.1<br><br>Increase of tan δ<br>≤ 0.005 for: C ≤ 100 nF or<br>≤ 0.010 for: 100 nF < C ≤ 220 nF or<br>≤ 0.015 for: 220 nF < C ≤ 470 nF and<br>≤ 0.003 for: C > 470 nF<br>Compared to values measured in 4.13.1<br><br>≥ 50 % of values specified in section "Insulation Resistance" of this specification                                              |



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