

## Interference Suppression Film Capacitors MKP Radial Potted Type



### FEATURES

- 7.5 mm to 27.5 mm lead pitch
- Supplied loose in box, taped on reel
- Material categorization:  
for definitions of compliance please see  
[www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS  
COMPLIANT**

### APPLICATIONS

For standard across the line X2 applications

See also application note: [www.vishay.com/doc?28153](http://www.vishay.com/doc?28153)

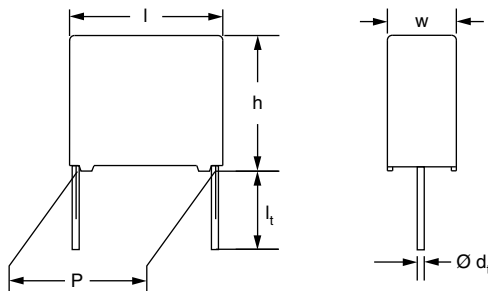
### QUICK REFERENCE DATA

|                                                 |                                                                                                                                                                                                |
|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Capacitance range (E12 series)                  | 0.001 $\mu$ F to 3.3 $\mu$ F (preferred values acc. to E6)                                                                                                                                     |
| Capacitance tolerance                           | $\pm 20\%$ ; $\pm 10\%$ , $\pm 5\%$                                                                                                                                                            |
| Climatic testing class according to IEC 60068-1 | 55/110/56/B                                                                                                                                                                                    |
| Rated AC voltage                                | 310 V <sub>AC</sub> ; 50 Hz to 60 Hz                                                                                                                                                           |
| Permissible DC voltage                          | 800 V <sub>DC</sub> at 85 °C, 630 V <sub>DC</sub> at 110 °C                                                                                                                                    |
| Maximum application temperature                 | C $\leq$ 470 nF: 110 °C (125 °C for less than 1000 h), C > 470 nF: 110 °C                                                                                                                      |
| Reference standards                             | IEC 60384-14 ed-4 (2013) and EN 60384-14<br>IEC 60065 requires pass. flamm. class B<br>UL 60384-14; CSA-E384-14, CQC                                                                           |
| Dielectric                                      | Polypropylene film                                                                                                                                                                             |
| Electrodes                                      | Metallized film                                                                                                                                                                                |
| Construction                                    | Mono construction                                                                                                                                                                              |
| Encapsulation                                   | Plastic case, epoxy resin sealed, flame retardant<br>UL-class 94 V-0                                                                                                                           |
| Leads                                           | Tinned wire                                                                                                                                                                                    |
| Marking                                         | C-value; tolerance; rated voltage; sub-class; manufacturer's type designation;<br>code for dielectric material, manufacturer location; manufacturer's logo;<br>year and week; safety approvals |

#### Note

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

### DIMENSIONS





## COMPOSITION OF CATALOG NUMBER

| TYPE AND PITCHES |         | CAPACITANCE<br>(numerically) |  | MULTIPLIER<br>(nF) |   |
|------------------|---------|------------------------------|--|--------------------|---|
| 338 2<br>X2      | 7.5 mm  |                              |  | 0.1                | 2 |
|                  | 10.0 mm |                              |  | 1                  | 3 |
|                  | 15.0 mm |                              |  | 10                 | 4 |
|                  | 22.5 mm |                              |  | 100                | 5 |
|                  | 27.5 mm |                              |  |                    |   |

|         |     |    |    |   |
|---------|-----|----|----|---|
| BFC2    | 338 | 2X | XX | X |
| 2222(*) | 338 | 2X | XX | X |

(\*) Old ordering code

Example:  
104 = 10 x 10 = 100 nF

| TYPE        | PACKAGING                 | STANDARD DIMENSIONS                                    | C-TOL.                    | PREFERRED TYPES        |
|-------------|---------------------------|--------------------------------------------------------|---------------------------|------------------------|
| MKP338 2 X2 | Loose in box              | Lead length 3.5 mm + 1 mm/- 0.5 mm; pitch ≤ 10.0 mm    | ± 20 %                    | BFC2 338 20            |
|             |                           | Lead length 3.5 mm ± 0.3 mm; pitch ≥ 15.0 mm           |                           | BFC2 338 20            |
|             |                           | Lead length 5.0 mm ± 1 mm                              |                           | BFC2 338 22            |
|             |                           | Lead length 25.0 mm ± 2 mm                             |                           | BFC2 338 24            |
|             | Taped ammo <sup>(1)</sup> | Pitch ≤ 15.0 mm; H = 18.5 mm; P <sub>0</sub> = 12.7 mm | ± 20 %                    | See tables for details |
|             | Taped reel <sup>(1)</sup> | Pitch 22.5 mm; H = 18.5 mm; P <sub>0</sub> = 12.7 mm   | ± 10 %<br>± 5 %           |                        |
| TYPE        | PACKAGING                 | ALTERNATIVE PITCH SIZES AND TOLERANCES                 | C-TOL.                    | PREFERRED TYPES        |
| MKP338 2 X2 | Loose in box              | Packaging like 20 % and alternative pitch sizes        | ± 5 %<br>± 10 %<br>± 20 % | See tables for details |

## Notes

- <sup>(1)</sup> Taped on reel and taped on ammo pitch = 27.5 mm is not available
- For detailed tape specifications refer to packaging information: [www.vishay.com/doc?28139](http://www.vishay.com/doc?28139)

| SPECIFIC REFERENCE DATA                                                                  |                                      |                         |
|------------------------------------------------------------------------------------------|--------------------------------------|-------------------------|
| DESCRIPTION                                                                              | VALUE                                |                         |
| Rated AC voltage (U <sub>RAC</sub> )                                                     | 310 V                                |                         |
| Permissible DC voltage (U <sub>RDC</sub> )                                               | 630 V                                |                         |
| Tangent of loss angle:                                                                   | at 1 kHz                             | at 10 kHz               |
| C ≤ 470 nF                                                                               | ≤ 10 x 10 <sup>-4</sup>              | ≤ 20 x 10 <sup>-4</sup> |
| 470 nF < C ≤ 1 μF                                                                        | ≤ 20 x 10 <sup>-4</sup>              | ≤ 70 x 10 <sup>-4</sup> |
| C > 1 μF                                                                                 | ≤ 30 x 10 <sup>-4</sup>              | -                       |
| Rated voltage pulse slope (dU/dt) <sub>R</sub> at 435 V <sub>DC</sub>                    |                                      |                         |
| Pitch = 7.5 mm                                                                           | 600 V/μs                             |                         |
| Pitch = 10 mm                                                                            | 600 V/μs                             |                         |
| Pitch = 15 mm and 7.5 mm (bent back)                                                     | 400 V/μs                             |                         |
| Pitch = 22.5 mm                                                                          | 150 V/μs                             |                         |
| Pitch = 27.5 mm                                                                          | 100 V/μs                             |                         |
| R between leads, for C ≤ 0.33 μF at 100 V; 1 min                                         | > 15 000 MΩ                          |                         |
| RC between leads, for C > 0.33 μF at 100 V; 1 min                                        | > 5000 s                             |                         |
| R between leads and case; 100 V; 1 min                                                   | > 30 000 MΩ                          |                         |
| Withstanding (DC) voltage (cut off current 10 mA) <sup>(1)</sup> ; rise time ≤ 1000 V/s: |                                      |                         |
| C ≤ 1 μF                                                                                 | 2200 V; 1 min                        |                         |
| C > 1 μF                                                                                 | 1800 V; 1 min                        |                         |
| Withstanding (AC) voltage between leads and case                                         | 2120 V; 1 min                        |                         |
| Max. application temperature for 0.001 μF ≤ C ≤ 0.47 μF                                  | 110 °C (125 °C for less than 1000 h) |                         |
| Max. application temperature for C > 0.47 μF                                             | 110 °C                               |                         |

## Note

- <sup>(1)</sup> See "Voltage Proof Test for Metalized Film Capacitors": [www.vishay.com/doc?28169](http://www.vishay.com/doc?28169)



| ELECTRICAL DATA AND ORDERING CODE - PITCH 7.5 mm |                                                                              |                                 |                            |                                             |                                     |       |                                      |       |                                         |      |  |
|--------------------------------------------------|------------------------------------------------------------------------------|---------------------------------|----------------------------|---------------------------------------------|-------------------------------------|-------|--------------------------------------|-------|-----------------------------------------|------|--|
| U <sub>RAC</sub><br>(V)                          | CAP.<br>(μF)                                                                 | DIMENSIONS<br>w x h x l<br>(mm) | MASS<br>(g) <sup>(2)</sup> | CATALOG NUMBER BFC2 338 ..... AND PACKAGING |                                     |       |                                      |       |                                         |      |  |
|                                                  |                                                                              |                                 |                            | LOOSE IN BOX                                |                                     |       |                                      |       | AMMOPACK <sup>(1)</sup>                 |      |  |
|                                                  |                                                                              |                                 |                            | SHORT LEADS                                 |                                     |       | LONG LEADS                           |       | H = 18.5 mm<br>P <sub>0</sub> = 12.7 mm |      |  |
|                                                  |                                                                              |                                 |                            | l <sub>t</sub> = 3.5 mm<br>+ 1 mm/- 0.5 mm  | l <sub>t</sub> = 5.0 mm<br>± 1.0 mm | SPQ   | l <sub>t</sub> = 25.0 mm<br>± 2.0 mm | SPQ   |                                         | SPQ  |  |
| 310                                              | PITCH = 7.5 mm ± 0.4 mm; d <sub>t</sub> = 0.50 mm ± 0.05 mm; C-TOL. = ± 20 % |                                 |                            |                                             |                                     |       |                                      |       |                                         |      |  |
|                                                  | 0.0010                                                                       | 4.0 x 9.0 x 10.0                | 0.4                        | 20102                                       | 22102                               | 1500  | 24102                                | 1000  | 26102                                   | 1250 |  |
|                                                  | 0.0012                                                                       |                                 |                            | 20122                                       | 22122                               |       | 24122                                |       | 26122                                   |      |  |
|                                                  | 0.0015                                                                       |                                 |                            | 20152                                       | 22152                               |       | 24152                                |       | 26152                                   |      |  |
|                                                  | 0.0018                                                                       |                                 |                            | 20182                                       | 22182                               |       | 24182                                |       | 26182                                   |      |  |
|                                                  | 0.0022                                                                       |                                 |                            | 20222                                       | 22222                               |       | 24222                                |       | 26222                                   |      |  |
|                                                  | 0.0027                                                                       |                                 |                            | 20272                                       | 22272                               |       | 24272                                |       | 26272                                   |      |  |
|                                                  | 0.0033                                                                       |                                 |                            | 20332                                       | 22332                               |       | 24332                                |       | 26332                                   |      |  |
|                                                  | 0.0039                                                                       |                                 |                            | 20392                                       | 22392                               |       | 24392                                |       | 26392                                   |      |  |
|                                                  | 0.0047                                                                       |                                 |                            | 20472                                       | 22472                               |       | 24472                                |       | 26472                                   |      |  |
|                                                  | 0.0056                                                                       |                                 |                            | 20562                                       | 22562                               |       | 24562                                |       | 26562                                   |      |  |
|                                                  | 0.0068                                                                       |                                 |                            | 20682                                       | 22682                               |       | 24682                                |       | 26682                                   |      |  |
|                                                  | 0.0082                                                                       |                                 |                            | 20822                                       | 22822                               |       | 24822                                |       | 26822                                   |      |  |
|                                                  | 0.010                                                                        |                                 |                            | 20103                                       | 22103                               |       | 24103                                |       | 26103                                   |      |  |
|                                                  | 0.012                                                                        |                                 |                            | 20123                                       | 22123                               |       | 24123                                |       | 26123                                   |      |  |
|                                                  | 0.015                                                                        |                                 |                            | 20153                                       | 22153                               |       | 24153                                |       | 26153                                   |      |  |
|                                                  | 0.018                                                                        |                                 |                            | 20183                                       | 22183                               |       | 24183                                |       | 26183                                   |      |  |
|                                                  | 0.022                                                                        |                                 |                            | 20223                                       | 22223                               |       | 24223                                |       | 26223                                   |      |  |
|                                                  | 0.027                                                                        | 5.0 x 10.5 x 10.0               | 0.6                        | 20273                                       | 22273                               | 1000  | 24273                                | 1250  | 26273                                   | 1000 |  |
|                                                  | 0.033                                                                        |                                 |                            | 20333                                       | 22333                               |       | 24333                                |       | 26333                                   |      |  |
|                                                  | 0.039                                                                        | 5.0 x 10.5 x 10.0               | 0.6                        | 20393                                       | 22393                               | 750   | 24393                                | 1000  | 26393                                   | 750  |  |
|                                                  | 0.047                                                                        |                                 |                            | 20473                                       | 22473                               |       | 24473                                |       | 26473                                   |      |  |
|                                                  | PITCH = 7.5 mm ± 0.4 mm; d <sub>t</sub> = 0.50 mm ± 0.05 mm; C-TOL. = ± 10 % |                                 |                            |                                             |                                     |       |                                      |       |                                         |      |  |
|                                                  | 0.0010                                                                       | 4.0 x 9.0 x 10.0                | 0.4                        | 28101                                       | 28301                               | 1500  | 28501                                | 1000  | 28701                                   | 1250 |  |
|                                                  | 0.0012                                                                       |                                 |                            | 28102                                       | 28302                               |       | 28502                                |       | 28702                                   |      |  |
|                                                  | 0.0015                                                                       |                                 |                            | 28103                                       | 28303                               |       | 28503                                |       | 28703                                   |      |  |
|                                                  | 0.0018                                                                       |                                 |                            | 28104                                       | 28304                               |       | 28504                                |       | 28704                                   |      |  |
|                                                  | 0.0022                                                                       |                                 |                            | 28105                                       | 28305                               |       | 28505                                |       | 28705                                   |      |  |
|                                                  | 0.0027                                                                       |                                 |                            | 28106                                       | 28306                               |       | 28506                                |       | 28706                                   |      |  |
|                                                  | 0.0033                                                                       |                                 |                            | 28107                                       | 28307                               |       | 28507                                |       | 28707                                   |      |  |
|                                                  | 0.0039                                                                       |                                 |                            | 28108                                       | 28308                               |       | 28508                                |       | 28708                                   |      |  |
|                                                  | 0.0047                                                                       |                                 |                            | 28109                                       | 28309                               |       | 28509                                |       | 28709                                   |      |  |
|                                                  | 0.0056                                                                       |                                 |                            | 28111                                       | 28311                               |       | 28511                                |       | 28711                                   |      |  |
| 0.0068                                           | 28112                                                                        |                                 |                            | 28312                                       | 28512                               |       | 28712                                |       |                                         |      |  |
| 0.0082                                           | 28113                                                                        |                                 |                            | 28313                                       | 28513                               |       | 28713                                |       |                                         |      |  |
| 0.010                                            | 28114                                                                        |                                 |                            | 28314                                       | 28514                               |       | 28714                                |       |                                         |      |  |
| 0.012                                            | 28115                                                                        |                                 |                            | 28315                                       | 28515                               |       | 28715                                |       |                                         |      |  |
| 0.015                                            | 28116                                                                        |                                 |                            | 28316                                       | 28516                               |       | 28716                                |       |                                         |      |  |
| 0.018                                            | 28117                                                                        |                                 |                            | 28317                                       | 28517                               |       | 28717                                |       |                                         |      |  |
| 0.022                                            | 28118                                                                        |                                 |                            | 28318                                       | 28518                               |       | 28718                                |       |                                         |      |  |
| 0.027                                            | 5.0 x 10.5 x 10.0                                                            | 0.6                             | 28119                      | 28319                                       | 1000                                | 28519 | 1250                                 | 28719 | 1000                                    |      |  |
| 0.033                                            |                                                                              |                                 | 28121                      | 28321                                       |                                     | 28521 |                                      | 28721 |                                         |      |  |
| 0.039                                            | 5.0 x 10.5 x 10.0                                                            | 0.6                             | 28122                      | 28332                                       | 750                                 | 28522 | 1000                                 | 28722 | 750                                     |      |  |
| 0.047                                            | 6.0 x 11.5 x 10.0                                                            | 0.8                             | 28123                      | 28323                                       |                                     | 28523 |                                      | 28723 |                                         |      |  |



| ELECTRICAL DATA AND ORDERING CODE - PITCH 7.5 mm |                                                                             |                                 |                            |                                             |                                     |       |                                      |       |                                         |      |
|--------------------------------------------------|-----------------------------------------------------------------------------|---------------------------------|----------------------------|---------------------------------------------|-------------------------------------|-------|--------------------------------------|-------|-----------------------------------------|------|
| U <sub>RAC</sub><br>(V)                          | CAP.<br>(μF)                                                                | DIMENSIONS<br>w x h x l<br>(mm) | MASS<br>(g) <sup>(2)</sup> | CATALOG NUMBER BFC2 338 ..... AND PACKAGING |                                     |       |                                      |       |                                         |      |
|                                                  |                                                                             |                                 |                            | LOOSE IN BOX                                |                                     |       |                                      |       | AMMOPACK <sup>(1)</sup>                 |      |
|                                                  |                                                                             |                                 |                            | SHORT LEADS                                 |                                     |       | LONG LEADS                           |       | H = 18.5 mm<br>P <sub>0</sub> = 12.7 mm |      |
|                                                  |                                                                             |                                 |                            | l <sub>t</sub> = 3.5 mm<br>+ 1 mm/- 0.5 mm  | l <sub>t</sub> = 5.0 mm<br>± 1.0 mm | SPQ   | l <sub>t</sub> = 25.0 mm<br>± 2.0 mm | SPQ   |                                         | SPQ  |
| 310                                              | PITCH = 7.5 mm ± 0.4 mm; d <sub>t</sub> = 0.50 mm ± 0.05 mm; C-TOL. = ± 5 % |                                 |                            |                                             |                                     |       |                                      |       |                                         |      |
|                                                  | 0.0010                                                                      | 4.0 x 9.0 x 10.0                | 0.4                        | 28201                                       | 28401                               | 1500  | 28601                                | 1000  | 28801                                   | 1250 |
|                                                  | 0.0012                                                                      |                                 |                            | 28202                                       | 28402                               |       | 28602                                |       | 28802                                   |      |
|                                                  | 0.0015                                                                      |                                 |                            | 28203                                       | 28403                               |       | 28603                                |       | 28803                                   |      |
|                                                  | 0.0018                                                                      |                                 |                            | 28204                                       | 28404                               |       | 28604                                |       | 28804                                   |      |
|                                                  | 0.0022                                                                      |                                 |                            | 28205                                       | 28405                               |       | 28605                                |       | 28805                                   |      |
|                                                  | 0.0027                                                                      |                                 |                            | 28206                                       | 28406                               |       | 28606                                |       | 28806                                   |      |
|                                                  | 0.0033                                                                      |                                 |                            | 28207                                       | 28407                               |       | 28607                                |       | 28807                                   |      |
|                                                  | 0.0039                                                                      |                                 |                            | 28208                                       | 28408                               |       | 28608                                |       | 28808                                   |      |
|                                                  | 0.0047                                                                      |                                 |                            | 28209                                       | 28409                               |       | 28609                                |       | 28809                                   |      |
|                                                  | 0.0056                                                                      |                                 |                            | 28211                                       | 28411                               |       | 28611                                |       | 28811                                   |      |
|                                                  | 0.0068                                                                      |                                 |                            | 28212                                       | 28412                               |       | 28612                                |       | 28812                                   |      |
|                                                  | 0.0082                                                                      |                                 |                            | 28213                                       | 28413                               |       | 28613                                |       | 28813                                   |      |
|                                                  | 0.010                                                                       |                                 |                            | 28214                                       | 28414                               |       | 28614                                |       | 28814                                   |      |
|                                                  | 0.012                                                                       |                                 |                            | 28215                                       | 28415                               |       | 28615                                |       | 28815                                   |      |
|                                                  | 0.015                                                                       |                                 |                            | 28216                                       | 28416                               |       | 28616                                |       | 28816                                   |      |
|                                                  | 0.018                                                                       |                                 |                            | 28217                                       | 28417                               |       | 28617                                |       | 28817                                   |      |
|                                                  | 0.022                                                                       |                                 |                            | 28218                                       | 28418                               |       | 28618                                |       | 28818                                   |      |
|                                                  | 0.027                                                                       |                                 |                            | 28219                                       | 28419                               | 1000  | 28619                                | 1250  | 28819                                   | 1000 |
|                                                  | 0.033                                                                       | 5.0 x 10.5 x 10.0               | 0.6                        | 28221                                       | 28421                               | 1000  | 28621                                | 1250  | 28821                                   | 1000 |
|                                                  | 0.039                                                                       |                                 |                            | 28222                                       | 28422                               | 750   | 28622                                | 1000  | 28822                                   | 750  |
| 0.047                                            | 6.0 x 11.5 x 10.0                                                           | 0.8                             | 28223                      | 28423                                       | 750                                 | 28623 | 1000                                 | 28823 | 750                                     |      |

**Notes**

- SPQ = Standard Packing Quantity

<sup>(1)</sup> 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)

<sup>(2)</sup> Weight for short lead product only

| ELECTRICAL DATA AND ORDERING CODE - PITCH 10 mm |                                                                               |                                 |                            |                                             |                                     |       |                                      |      |                                         |     |
|-------------------------------------------------|-------------------------------------------------------------------------------|---------------------------------|----------------------------|---------------------------------------------|-------------------------------------|-------|--------------------------------------|------|-----------------------------------------|-----|
| U <sub>RAC</sub><br>(V)                         | CAP.<br>(μF)                                                                  | DIMENSIONS<br>w x h x l<br>(mm) | MASS<br>(g) <sup>(2)</sup> | CATALOG NUMBER BFC2 338 ..... AND PACKAGING |                                     |       |                                      |      |                                         |     |
|                                                 |                                                                               |                                 |                            | LOOSE IN BOX                                |                                     |       |                                      |      | AMMOPACK <sup>(1)</sup>                 |     |
|                                                 |                                                                               |                                 |                            | SHORT LEADS                                 |                                     |       | LONG LEADS                           |      | H = 18.5 mm<br>P <sub>0</sub> = 12.7 mm |     |
|                                                 |                                                                               |                                 |                            | l <sub>t</sub> = 3.5 mm<br>+ 1 mm/- 0.5 mm  | l <sub>t</sub> = 5.0 mm<br>± 1.0 mm | SPQ   | l <sub>t</sub> = 25.0 mm<br>± 2.0 mm | SPQ  |                                         | SPQ |
| 310                                             | PITCH = 10.0 mm ± 0.4 mm; d <sub>t</sub> = 0.60 mm ± 0.06 mm; C-TOL. = ± 20 % |                                 |                            |                                             |                                     |       |                                      |      |                                         |     |
|                                                 | 0.0010                                                                        | 4.0 x 10.0 x 12.5               | 0.6                        | 21102                                       | 23102                               | 1000  | 25102                                | 1250 | Not available                           |     |
|                                                 | 0.0012                                                                        |                                 |                            | 21122                                       | 23122                               |       | 25122                                |      |                                         |     |
|                                                 | 0.0015                                                                        |                                 |                            | 21152                                       | 23152                               |       | 25152                                |      |                                         |     |
|                                                 | 0.0018                                                                        |                                 |                            | 21182                                       | 23182                               |       | 25182                                |      |                                         |     |
|                                                 | 0.0022                                                                        |                                 |                            | 21222                                       | 23222                               |       | 25222                                |      |                                         |     |
|                                                 | 0.0027                                                                        |                                 |                            | 21272                                       | 23272                               | 25272 | 1000                                 |      |                                         |     |
|                                                 | 0.0033                                                                        |                                 |                            | 21332                                       | 23332                               | 25332 |                                      |      |                                         |     |
|                                                 | 0.0039                                                                        |                                 |                            | 21392                                       | 23392                               | 25392 |                                      |      |                                         |     |
|                                                 | 0.0047                                                                        |                                 |                            | 21472                                       | 23472                               | 25472 |                                      |      |                                         |     |
|                                                 | 0.0056                                                                        |                                 |                            | 21562                                       | 23562                               | 25562 |                                      |      |                                         |     |



| ELECTRICAL DATA AND ORDERING CODE - PITCH 10 mm                              |                                                                               |                                 |                            |                                             |                                     |       |                                      |       |                                         |     |  |  |
|------------------------------------------------------------------------------|-------------------------------------------------------------------------------|---------------------------------|----------------------------|---------------------------------------------|-------------------------------------|-------|--------------------------------------|-------|-----------------------------------------|-----|--|--|
| U <sub>RAC</sub><br>(V)                                                      | CAP.<br>(μF)                                                                  | DIMENSIONS<br>w x h x l<br>(mm) | MASS<br>(g) <sup>(2)</sup> | CATALOG NUMBER BFC2 338 ..... AND PACKAGING |                                     |       |                                      |       |                                         |     |  |  |
|                                                                              |                                                                               |                                 |                            | LOOSE IN BOX                                |                                     |       |                                      |       | AMMOPACK <sup>(1)</sup>                 |     |  |  |
|                                                                              |                                                                               |                                 |                            | SHORT LEADS                                 |                                     |       | LONG LEADS                           |       | H = 18.5 mm<br>P <sub>0</sub> = 12.7 mm |     |  |  |
|                                                                              |                                                                               |                                 |                            | l <sub>t</sub> = 3.5 mm<br>+ 1 mm/- 0.5 mm  | l <sub>t</sub> = 5.0 mm<br>± 1.0 mm | SPQ   | l <sub>t</sub> = 25.0 mm<br>± 2.0 mm | SPQ   |                                         | SPQ |  |  |
| 310                                                                          | PITCH = 10.0 mm ± 0.4 mm; d <sub>t</sub> = 0.60 mm ± 0.06 mm; C-TOL. = ± 20 % |                                 |                            |                                             |                                     |       |                                      |       |                                         |     |  |  |
|                                                                              | 0.0068                                                                        | 4.0 x 10.0 x 12.5               | 0.6                        | 21682                                       | 23682                               | 1000  | 25682                                | 1000  | Not available                           |     |  |  |
|                                                                              | 0.0082                                                                        |                                 |                            | 21822                                       | 23822                               |       | 25822                                |       |                                         |     |  |  |
|                                                                              | 0.010                                                                         |                                 |                            | 21103                                       | 23103                               |       | 25103                                |       |                                         |     |  |  |
|                                                                              | 0.012                                                                         |                                 |                            | 21123                                       | 23123                               |       | 25123                                |       |                                         |     |  |  |
|                                                                              | 0.015                                                                         |                                 |                            | 21153                                       | 23153                               |       | 25153                                |       |                                         |     |  |  |
|                                                                              | 0.018                                                                         |                                 |                            | 21183                                       | 23183                               |       | 25183                                |       |                                         |     |  |  |
|                                                                              | 0.022                                                                         |                                 |                            | 21223                                       | 23223                               |       | 25223                                |       |                                         |     |  |  |
|                                                                              | 0.027                                                                         |                                 |                            | 21273                                       | 23273                               |       | 25273                                |       |                                         |     |  |  |
|                                                                              | 0.033                                                                         |                                 |                            | 21333                                       | 23333                               |       | 25333                                |       |                                         |     |  |  |
|                                                                              | 0.039                                                                         |                                 |                            | 21393                                       | 23393                               |       | 25393                                |       |                                         |     |  |  |
|                                                                              | 0.047                                                                         |                                 |                            | 21473                                       | 23473                               |       | 25473                                |       |                                         |     |  |  |
|                                                                              | 0.056                                                                         | 5.0 x 11.0 x 12.5               | 0.82                       | 20563                                       | 22563                               | 750   | 24563                                | 750   | 27563                                   | 500 |  |  |
|                                                                              | 0.068                                                                         |                                 |                            | 20683                                       | 22683                               |       | 24683                                |       | 27683                                   |     |  |  |
|                                                                              | 0.082                                                                         | 6.0 x 12.0 x 12.5               | 1.1                        | 20823                                       | 22823                               | 750   | 24823                                | 750   | 27823                                   | 500 |  |  |
|                                                                              | 0.10                                                                          |                                 |                            | 20104                                       | 22104                               |       | 24104                                |       | 27104                                   |     |  |  |
|                                                                              | PITCH = 10.0 mm ± 0.4 mm; d <sub>t</sub> = 0.60 mm ± 0.06 mm; C-TOL. = ± 10 % |                                 |                            |                                             |                                     |       |                                      |       |                                         |     |  |  |
|                                                                              | 0.0010                                                                        | 4.0 x 10.0 x 12.5               | 0.6                        | 29194                                       | 29217                               | 1000  | 29241                                | 1250  | Not available                           |     |  |  |
|                                                                              | 0.0012                                                                        |                                 |                            | 29195                                       | 29218                               |       | 29242                                |       |                                         |     |  |  |
|                                                                              | 0.0015                                                                        |                                 |                            | 29196                                       | 29219                               |       | 29243                                |       |                                         |     |  |  |
|                                                                              | 0.0018                                                                        |                                 |                            | 29197                                       | 29221                               |       | 29244                                |       |                                         |     |  |  |
|                                                                              | 0.0022                                                                        |                                 |                            | 29198                                       | 29222                               |       | 29245                                |       |                                         |     |  |  |
|                                                                              | 0.0027                                                                        |                                 |                            | 29199                                       | 29223                               |       | 29246                                |       |                                         |     |  |  |
|                                                                              | 0.0033                                                                        |                                 |                            | 29201                                       | 29224                               |       | 29247                                | 1000  |                                         |     |  |  |
|                                                                              | 0.0039                                                                        |                                 |                            | 29202                                       | 29225                               |       | 29248                                |       |                                         |     |  |  |
|                                                                              | 0.0047                                                                        |                                 |                            | 29203                                       | 29226                               |       | 29249                                |       |                                         |     |  |  |
|                                                                              | 0.0056                                                                        |                                 |                            | 29204                                       | 29227                               |       | 29251                                |       |                                         |     |  |  |
|                                                                              | 0.0068                                                                        |                                 |                            | 29205                                       | 29228                               |       | 29252                                |       |                                         |     |  |  |
|                                                                              | 0.0082                                                                        |                                 |                            | 29206                                       | 29229                               |       | 29253                                |       |                                         |     |  |  |
|                                                                              | 0.010                                                                         |                                 |                            | 29207                                       | 29231                               |       | 29254                                |       |                                         |     |  |  |
|                                                                              | 0.012                                                                         |                                 |                            | 29208                                       | 29232                               |       | 29255                                |       |                                         |     |  |  |
| 0.015                                                                        | 29209                                                                         |                                 |                            | 29233                                       | 29256                               |       |                                      |       |                                         |     |  |  |
| 0.018                                                                        | 29211                                                                         |                                 |                            | 29234                                       | 29257                               |       |                                      |       |                                         |     |  |  |
| 0.022                                                                        | 29212                                                                         |                                 |                            | 29235                                       | 29258                               |       |                                      |       |                                         |     |  |  |
| 0.027                                                                        | 29213                                                                         |                                 |                            | 29236                                       | 29259                               |       |                                      |       |                                         |     |  |  |
| 0.033                                                                        | 29214                                                                         |                                 |                            | 29237                                       | 29261                               |       |                                      |       |                                         |     |  |  |
| 0.039                                                                        | 29215                                                                         |                                 |                            | 29238                                       | 29262                               |       |                                      |       |                                         |     |  |  |
| 0.047                                                                        | 29216                                                                         |                                 |                            | 29239                                       | 29263                               |       |                                      |       |                                         |     |  |  |
| 0.056                                                                        | 5.0 x 11.0 x 12.5                                                             | 0.82                            | 28124                      | 28324                                       | 750                                 | 28524 | 750                                  | 28924 | 500                                     |     |  |  |
| 0.068                                                                        |                                                                               |                                 | 28125                      | 28325                                       |                                     | 28525 |                                      | 28925 |                                         |     |  |  |
| 0.082                                                                        | 6.0 x 12.0 x 12.5                                                             | 1.1                             | 28126                      | 28326                                       | 750                                 | 28526 | 750                                  | 28926 |                                         |     |  |  |
| PITCH = 10.0 mm ± 0.4 mm; d <sub>t</sub> = 0.60 mm ± 0.06 mm; C-TOL. = ± 5 % |                                                                               |                                 |                            |                                             |                                     |       |                                      |       |                                         |     |  |  |
| 0.056                                                                        | 5.0 x 11.0 x 12.5                                                             | 0.82                            | 28224                      | 28424                                       | 750                                 | 28624 | 750                                  | 28944 | 500                                     |     |  |  |
| 0.068                                                                        | 6.0 x 12.0 x 12.5                                                             | 1.1                             | 28225                      | 28425                                       | 750                                 | 28625 | 750                                  | 28945 | 500                                     |     |  |  |
| 0.082                                                                        |                                                                               |                                 | 28226                      | 28426                                       |                                     | 28626 |                                      | 28946 |                                         |     |  |  |

**Notes**

- SPQ = Standard Packing Quantity

<sup>(1)</sup> 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)

<sup>(2)</sup> Weight for short lead product only



| ELECTRICAL DATA AND ORDERING CODE - PITCH 15 mm |                                                                               |                                 |                            |                                             |                                     |       |                                      |      |                                         |      |       |     |
|-------------------------------------------------|-------------------------------------------------------------------------------|---------------------------------|----------------------------|---------------------------------------------|-------------------------------------|-------|--------------------------------------|------|-----------------------------------------|------|-------|-----|
| U <sub>RAC</sub><br>(V)                         | CAP.<br>(μF)                                                                  | DIMENSIONS<br>w x h x l<br>(mm) | MASS<br>(g) <sup>(2)</sup> | CATALOG NUMBER BFC2 338 ..... AND PACKAGING |                                     |       |                                      |      |                                         |      |       |     |
|                                                 |                                                                               |                                 |                            | LOOSE IN BOX                                |                                     |       |                                      |      | AMMOPACK <sup>(1)</sup>                 |      |       |     |
|                                                 |                                                                               |                                 |                            | SHORT LEADS                                 |                                     |       | LONG LEADS                           |      | H = 18.5 mm<br>P <sub>0</sub> = 12.7 mm |      |       |     |
|                                                 |                                                                               |                                 |                            | l <sub>t</sub> = 3.5 mm<br>± 0.3 mm         | l <sub>t</sub> = 5.0 mm<br>± 1.0 mm | SPQ   | l <sub>t</sub> = 25.0 mm<br>± 2.0 mm | SPQ  |                                         | SPQ  |       |     |
| 310                                             | PITCH = 15.0 mm ± 0.4 mm; d <sub>t</sub> = 0.60 mm ± 0.06 mm; C-TOL. = ± 20 % |                                 |                            |                                             |                                     |       |                                      |      |                                         |      |       |     |
|                                                 | 0.010                                                                         | 5.0 x 11.0 x 17.5               | 1.0                        | 29076                                       | 29096                               | 1000  | 29116                                | 1000 | 29141                                   | 1100 |       |     |
|                                                 | 0.012                                                                         |                                 |                            | 29077                                       | 29097                               |       | 29117                                |      | 29143                                   |      |       |     |
|                                                 | 0.015                                                                         |                                 |                            | 29078                                       | 29098                               |       | 29118                                |      | 29145                                   |      |       |     |
|                                                 | 0.018                                                                         |                                 |                            | 29079                                       | 29099                               |       | 29119                                |      | 29147                                   |      |       |     |
|                                                 | 0.022                                                                         |                                 |                            | 29081                                       | 29101                               |       | 29121                                |      | 29149                                   |      |       |     |
|                                                 | 0.027                                                                         |                                 |                            | 29082                                       | 29102                               |       | 29122                                |      | 29152                                   |      |       |     |
|                                                 | 0.033                                                                         |                                 |                            | 29083                                       | 29103                               |       | 29123                                |      | 29154                                   |      |       |     |
|                                                 | 0.039                                                                         |                                 |                            | 29084                                       | 29104                               |       | 29124                                |      | 29156                                   |      |       |     |
|                                                 | 0.047                                                                         |                                 |                            | 29085                                       | 29105                               |       | 29125                                |      | 29158                                   |      |       |     |
|                                                 | 0.056                                                                         |                                 |                            | 21563                                       | 23563                               |       | 25563                                |      | 29161                                   |      |       |     |
|                                                 | 0.068                                                                         |                                 |                            | 21683                                       | 23683                               |       | 25683                                |      | 29163                                   |      |       |     |
|                                                 | 0.082                                                                         |                                 |                            | 21823                                       | 23823                               |       | 25823                                |      | 29165                                   |      |       |     |
|                                                 | 0.10                                                                          |                                 |                            | 21104                                       | 23104                               |       | 25104                                |      | 29166                                   |      |       |     |
|                                                 | 0.12                                                                          |                                 |                            | 20124                                       | 22124                               |       | 24124                                |      | 27124                                   | 900  |       |     |
|                                                 | 0.15                                                                          | 6.0 x 12.0 x 17.5               | 1.4                        | 20154                                       | 22154                               | 750   | 24154                                | 500  | 27154                                   | 800  |       |     |
|                                                 | 0.18                                                                          |                                 |                            | 20184                                       | 22184                               |       | 24184                                |      | 27184                                   |      |       |     |
|                                                 | PITCH = 15.0 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm; C-TOL. = ± 20 % |                                 |                            |                                             |                                     |       |                                      |      |                                         |      |       |     |
|                                                 | 0.22                                                                          | 7.0 x 13.5 x 17.5               | 1.8                        | 20224                                       | 22224                               | 750   | 24224                                | 500  | 27224                                   | 650  |       |     |
|                                                 | 0.27                                                                          | 8.5 x 15.0 x 17.5               | 2.4                        | 20274                                       | 22274                               | 750   | 24274                                | 500  | 27274                                   | 650  |       |     |
|                                                 | 0.33                                                                          |                                 |                            | 20334                                       | 22334                               | 500   | 24334                                | 450  | 27334                                   | 600  |       |     |
|                                                 | PITCH = 15.0 mm ± 0.4 mm; d <sub>t</sub> = 0.60 mm ± 0.06 mm; C-TOL. = ± 10 % |                                 |                            |                                             |                                     |       |                                      |      |                                         |      |       |     |
|                                                 | 0.010                                                                         | 5.0 x 11.0 x 17.5               | 1.0                        | 29066                                       | 29086                               | 1000  | 29106                                | 1000 | 29139                                   | 1100 |       |     |
|                                                 | 0.012                                                                         |                                 |                            | 29067                                       | 29087                               |       | 29107                                |      | 29142                                   |      |       |     |
|                                                 | 0.015                                                                         |                                 |                            | 29068                                       | 29088                               |       | 29108                                |      | 29144                                   |      |       |     |
|                                                 | 0.018                                                                         |                                 |                            | 29069                                       | 29089                               |       | 29109                                |      | 29146                                   |      |       |     |
|                                                 | 0.022                                                                         |                                 |                            | 29071                                       | 29091                               |       | 29111                                |      | 29148                                   |      |       |     |
|                                                 | 0.027                                                                         |                                 |                            | 29072                                       | 29092                               |       | 29112                                |      | 29151                                   |      |       |     |
|                                                 | 0.033                                                                         |                                 |                            | 29073                                       | 29093                               |       | 29113                                |      | 29153                                   |      |       |     |
|                                                 | 0.039                                                                         |                                 |                            | 29074                                       | 29094                               |       | 29114                                |      | 29155                                   |      |       |     |
|                                                 | 0.047                                                                         |                                 |                            | 29075                                       | 29095                               |       | 29115                                |      | 29157                                   |      |       |     |
|                                                 | 0.056                                                                         |                                 |                            | 29126                                       | 29131                               |       | 29135                                |      | 29159                                   |      |       |     |
|                                                 | 0.068                                                                         |                                 |                            | 29127                                       | 29132                               |       | 29136                                |      | 29162                                   |      |       |     |
|                                                 | 0.082                                                                         |                                 |                            | 29128                                       | 29133                               |       | 29137                                |      | 29164                                   |      |       |     |
|                                                 | 0.10                                                                          |                                 |                            | 28127                                       | 28327                               |       | 1000                                 |      | 28527                                   | 1000 | 28927 | 900 |
|                                                 | 0.12                                                                          |                                 |                            | 6.0 x 12.0 x 17.5                           | 1.4                                 |       | 28128                                |      | 28328                                   | 750  | 28528 | 500 |
|                                                 | 0.15                                                                          | 28129                           | 28329                      |                                             |                                     | 28529 | 28929                                |      |                                         |      |       |     |
|                                                 | PITCH = 15.0 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm; C-TOL. = ± 10 % |                                 |                            |                                             |                                     |       |                                      |      |                                         |      |       |     |
|                                                 | 0.18                                                                          | 7.0 x 13.5 x 17.5               | 1.8                        | 28131                                       | 28331                               | 750   | 28531                                | 500  | 28931                                   | 650  |       |     |
|                                                 | 0.22                                                                          | 8.5 x 15.0 x 17.5               | 2.4                        | 28132                                       | 28332                               | 500   | 28532                                | 450  | 28932                                   | 600  |       |     |
|                                                 | 0.27                                                                          |                                 |                            | 28133                                       | 28333                               |       | 28533                                |      | 28933                                   |      |       |     |
|                                                 | 0.33                                                                          |                                 |                            | 29129                                       | 29134                               |       | 29138                                |      | 29167                                   |      |       |     |
|                                                 | PITCH = 15.0 mm ± 0.4 mm; d <sub>t</sub> = 0.60 mm ± 0.06 mm; C-TOL. = ± 5 %  |                                 |                            |                                             |                                     |       |                                      |      |                                         |      |       |     |
|                                                 | 0.10                                                                          | 5.0 x 11.0 x 17.5               | 1.0                        | 28227                                       | 28427                               | 1000  | 28627                                | 1000 | 28947                                   | 900  |       |     |
|                                                 | 0.12                                                                          | 6.0 x 12.0 x 17.5               | 1.4                        | 28228                                       | 28428                               | 750   | 28628                                | 500  | 28948                                   | 800  |       |     |
|                                                 | 0.15                                                                          |                                 |                            | 28229                                       | 28429                               |       | 28629                                |      | 28949                                   |      |       |     |
|                                                 | PITCH = 15.0 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm; C-TOL. = ± 5 %  |                                 |                            |                                             |                                     |       |                                      |      |                                         |      |       |     |
|                                                 | 0.18                                                                          | 7.0 x 13.5 x 17.5               | 1.8                        | 28231                                       | 28431                               | 750   | 28631                                | 500  | 28951                                   | 650  |       |     |
|                                                 | 0.22                                                                          | 8.5 x 15.0 x 17.5               | 2.4                        | 28232                                       | 28432                               | 750   | 28632                                | 500  | 28952                                   | 650  |       |     |
|                                                 | 0.27                                                                          |                                 |                            | 28233                                       | 28433                               | 500   | 28633                                | 450  | 28953                                   | 600  |       |     |

**Notes**

- SPQ = Standard Packing Quantity

<sup>(1)</sup> 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)

<sup>(2)</sup> Weight for short lead product only



| ELECTRICAL DATA AND ORDERING CODE - PITCH 22.5 mm |                                                                               |                                 |                            |                                             |                                     |     |                                      |       |                                         |     |
|---------------------------------------------------|-------------------------------------------------------------------------------|---------------------------------|----------------------------|---------------------------------------------|-------------------------------------|-----|--------------------------------------|-------|-----------------------------------------|-----|
| U <sub>RAC</sub><br>(V)                           | CAP.<br>(μF)                                                                  | DIMENSIONS<br>w x h x l<br>(mm) | MASS<br>(g) <sup>(2)</sup> | CATALOG NUMBER BFC2 338 ..... AND PACKAGING |                                     |     |                                      |       |                                         |     |
|                                                   |                                                                               |                                 |                            | LOOSE IN BOX                                |                                     |     |                                      |       | REEL (500 mm) <sup>(1)</sup>            |     |
|                                                   |                                                                               |                                 |                            | SHORT LEADS                                 |                                     |     | LONG LEADS                           |       | H = 18.5 mm<br>P <sub>0</sub> = 12.7 mm |     |
|                                                   |                                                                               |                                 |                            | l <sub>t</sub> = 3.5 mm<br>± 0.3 mm         | l <sub>t</sub> = 5.0 mm<br>± 1.0 mm | SPQ | l <sub>t</sub> = 25.0 mm<br>± 2.0 mm | SPQ   |                                         | SPQ |
| 310                                               | PITCH = 22.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm; C-TOL. = ± 20 % |                                 |                            |                                             |                                     |     |                                      |       |                                         |     |
|                                                   | 0.12                                                                          | 6.0 x 15.5 x 26.0               | 2.4                        | 21124                                       | 23124                               | 300 | 25124                                | 250   | 29264                                   | 600 |
|                                                   | 0.15                                                                          |                                 |                            | 21154                                       | 23154                               |     | 25154                                |       | 29265                                   |     |
|                                                   | 0.18                                                                          |                                 |                            | 21184                                       | 23184                               | 200 | 25184                                | 250   | 29266                                   | 500 |
|                                                   | 0.22                                                                          |                                 |                            | 21224                                       | 23224                               |     | 25224                                |       | 29267                                   |     |
|                                                   | 0.27                                                                          |                                 |                            | 21274                                       | 23274                               |     | 25274                                |       | 29268                                   |     |
|                                                   | 0.33                                                                          |                                 |                            | 21334                                       | 23334                               |     | 25334                                |       | 29269                                   |     |
|                                                   | 0.39                                                                          | 7.0 x 16.5 x 26.0               | 2.9                        | 20394                                       | 22394                               | 200 | 24394                                | 250   | 27394                                   | 450 |
|                                                   | 0.47                                                                          |                                 |                            | 20474                                       | 22474                               |     | 24474                                |       | 27474                                   |     |
|                                                   | 0.56                                                                          | 8.5 x 18.0 x 26.0               | 3.8                        | 20564                                       | 22564                               | 200 | 24564                                | 200   | 27564                                   | 350 |
|                                                   | 0.68                                                                          |                                 |                            | 20684                                       | 22684                               |     | 24684                                |       | 27684                                   |     |
|                                                   | 0.82                                                                          | 10.0 x 19.5 x 26.0              | 6.8                        | 20824                                       | 22824                               | 150 | 24824                                | 200   | 27824                                   | 300 |
|                                                   | 1.0                                                                           |                                 |                            | 20105                                       | 22105                               |     | 24105                                |       | 27105                                   |     |
|                                                   | PITCH = 22.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm; C-TOL. = ± 10 % |                                 |                            |                                             |                                     |     |                                      |       |                                         |     |
|                                                   | 0.12                                                                          | 6.0 x 15.5 x 26.0               | 2.4                        | 29169                                       | 29175                               | 300 | 29181                                | 250   | 29271                                   | 600 |
|                                                   | 0.15                                                                          |                                 |                            | 29171                                       | 29176                               |     | 29182                                |       | 29272                                   |     |
|                                                   | 0.18                                                                          |                                 |                            | 29172                                       | 29177                               | 200 | 29183                                | 250   | 29273                                   | 500 |
|                                                   | 0.22                                                                          |                                 |                            | 29173                                       | 29178                               |     | 29184                                |       | 29274                                   |     |
|                                                   | 0.27                                                                          |                                 |                            | 29174                                       | 29179                               |     | 29185                                |       | 29275                                   |     |
|                                                   | 0.33                                                                          |                                 |                            | 28134                                       | 28334                               |     | 28534                                |       | 28934                                   | 450 |
|                                                   | 0.39                                                                          | 7.0 x 16.5 x 26.0               | 2.9                        | 28135                                       | 28335                               | 200 | 28535                                | 250   | 28935                                   | 450 |
|                                                   | 0.47                                                                          |                                 |                            | 28136                                       | 28336                               |     | 28536                                |       | 200                                     |     |
|                                                   | 0.56                                                                          | 8.5 x 18.0 x 26.0               | 3.8                        | 28137                                       | 28337                               |     | 28537                                | 28937 |                                         |     |
|                                                   | 0.68                                                                          | 10.0 x 19.5 x 26.0              | 6.8                        | 28138                                       | 28338                               | 150 | 28538                                | 28938 |                                         |     |
|                                                   | 0.82                                                                          |                                 |                            | 28139                                       | 28339                               |     | 28539                                | 28939 |                                         |     |
|                                                   | PITCH = 22.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm; C-TOL. = ± 5 %  |                                 |                            |                                             |                                     |     |                                      |       |                                         |     |
|                                                   | 0.33                                                                          | 7.0 x 16.5 x 26.0               | 2.9                        | 28234                                       | 28434                               | 200 | 28634                                | 250   | 28954                                   | 450 |
|                                                   | 0.39                                                                          |                                 |                            | 28235                                       | 28435                               |     | 28635                                |       | 28955                                   |     |
|                                                   | 0.47                                                                          | 8.5 x 18.0 x 26.0               | 3.8                        | 28236                                       | 28436                               | 200 | 28636                                | 200   | 28956                                   | 350 |
|                                                   | 0.56                                                                          |                                 |                            | 28237                                       | 28437                               |     | 28637                                |       | 28957                                   |     |
|                                                   | 0.68                                                                          | 10.0 x 19.5 x 26.0              | 6.8                        | 28238                                       | 28438                               | 150 | 28638                                | 200   | 28958                                   | 300 |
|                                                   | 0.82                                                                          | 12.0 x 22.0 x 26.0              | 7.8                        | 28239                                       | 28439                               | 150 | 28639                                | 200   | 28959                                   | 300 |

**Notes**

- SPQ = Standard Packing Quantity

<sup>(1)</sup> 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)

<sup>(2)</sup> Weight for short lead product only



| ELECTRICAL DATA AND ORDERING CODE - PITCH 27.5 mm |                                                                               |                                 |                            |                                             |                                     |       |                                      |                    |                |                |
|---------------------------------------------------|-------------------------------------------------------------------------------|---------------------------------|----------------------------|---------------------------------------------|-------------------------------------|-------|--------------------------------------|--------------------|----------------|----------------|
| U <sub>RAC</sub><br>(V)                           | CAP.<br>(μF)                                                                  | DIMENSIONS<br>w x h x l<br>(mm) | MASS<br>(g) <sup>(1)</sup> | CATALOG NUMBER BFC2 338 ..... AND PACKAGING |                                     |       |                                      |                    |                |                |
|                                                   |                                                                               |                                 |                            | LOOSE IN BOX                                |                                     |       |                                      |                    |                |                |
|                                                   |                                                                               |                                 |                            | SHORT LEADS                                 |                                     |       | LONG LEADS                           |                    |                |                |
|                                                   |                                                                               |                                 |                            | l <sub>t</sub> = 3.5 mm<br>± 0.3 mm         | l <sub>t</sub> = 5.0 mm<br>± 1.0 mm | SPQ   | l <sub>t</sub> = 25.0 mm<br>± 2.0 mm | SPQ                |                |                |
| 310                                               | PITCH = 27.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm; C-TOL. = ± 20 % |                                 |                            |                                             |                                     |       |                                      |                    |                |                |
|                                                   | 0.39<br>0.47<br>0.56<br>0.68<br>0.82                                          | 9.0 x 19.0 x 31.5               | 5.5                        | 21394<br>21474                              | 23394<br>23474                      | 100   | 25394<br>25474                       | 150                |                |                |
|                                                   | 21564<br>21684<br>21824                                                       |                                 |                            | 23564<br>23684<br>23824                     | 25564<br>25684<br>25824             |       | 125                                  |                    |                |                |
|                                                   | 1.0<br>1.2                                                                    |                                 |                            | 11.0 x 21.0 x 31.0                          | 7.4                                 |       |                                      | 21105<br>20125     | 23105<br>22125 | 25105<br>24125 |
|                                                   | 1.5<br>1.8                                                                    |                                 |                            |                                             |                                     |       |                                      | 13.0 x 23.0 x 31.0 | 9.2            | 20155<br>20185 |
|                                                   | 2.2                                                                           |                                 |                            | 15.0 x 25.0 x 31.5                          | 12.3                                |       |                                      |                    |                | 20225<br>22225 |
|                                                   | 2.7<br>3.3                                                                    | 18.0 x 28.0 x 31.5              | 16.1                       | 20275<br>20335                              | 22275<br>22335                      |       | 50                                   | 24275<br>24335     | 75             |                |
|                                                   | PITCH = 27.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm; C-TOL. = ± 10 % |                                 |                            |                                             |                                     |       |                                      |                    |                |                |
|                                                   | 1.0<br>1.2                                                                    | 11.0 x 21.0 x 31.0              | 7.4                        | 28141<br>28142                              | 28341<br>28342                      |       | 100                                  | 28541<br>28542     | 125            |                |
|                                                   | 1.5                                                                           |                                 |                            | 13.0 x 23.0 x 31.0                          | 9.2                                 |       |                                      | 28143<br>28144     |                | 28343<br>28344 |
|                                                   | 1.8                                                                           | 15.0 x 25.0 x 31.5              | 12.3                       | 28145                                       | 28345                               |       |                                      | 50                 |                | 28545          |
|                                                   | 2.2                                                                           |                                 |                            | 28146                                       | 28346                               | 28546 |                                      |                    |                |                |
|                                                   | 2.7                                                                           | 18.0 x 28.0 x 31.5              | 16.1                       |                                             |                                     |       |                                      |                    |                |                |
|                                                   | PITCH = 27.5 mm ± 0.4 mm; d <sub>t</sub> = 0.80 mm ± 0.08 mm; C-TOL. = ± 5 %  |                                 |                            |                                             |                                     |       |                                      |                    |                |                |
|                                                   | 1.0                                                                           | 11.0 x 21.0 x 31.0              | 7.4                        | 28241                                       | 28441                               | 100   | 28641                                | 125                |                |                |
|                                                   | 1.2                                                                           | 13.0 x 23.0 x 31.0              | 9.2                        | 28242                                       | 28442                               | 100   | 28642                                | 125                |                |                |
|                                                   | 1.5                                                                           |                                 |                            | 28243                                       | 28443                               |       | 28643                                |                    |                |                |
|                                                   | 1.8                                                                           | 15.0 x 25.0 x 31.5              | 12.3                       | 28244                                       | 28444                               | 100   | 28644                                | 100                |                |                |
|                                                   | 2.2                                                                           | 18.0 x 28.0 x 31.5              | 16.1                       | 28245                                       | 28445                               | 50    | 28645                                | 75                 |                |                |
|                                                   | 2.7                                                                           |                                 |                            | 28246                                       | 28446                               |       | 28646                                |                    |                |                |

**Notes**

- SPQ = Standard Packing Quantity
- <sup>(1)</sup> Weight for short lead product only

| APPROVALS                                                                                                                                                                                                                                                                                                                                                            |                     |                |                    |                                                                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------------|--------------------|------------------------------------------------------------------------|
| SAFETY APPROVALS X2                                                                                                                                                                                                                                                                                                                                                  | VOLTAGE             | VALUE          | FILE NUMBERS       | LINKS                                                                  |
| EN 60384-14 (ENEC)<br>(= IEC 60384-14 ed-4 (2013))                                                                                                                                                                                                                                                                                                                   | 310 V <sub>AC</sub> | 1 nF to 3.3 µF | ENEC16/FI/19/10001 | <a href="http://www.vishay.com/doc?28179">www.vishay.com/doc?28179</a> |
| UL 60384-14                                                                                                                                                                                                                                                                                                                                                          | 310 V <sub>AC</sub> | 1 nF to 3.3 µF | E354331            | <a href="http://www.vishay.com/doc?28184">www.vishay.com/doc?28184</a> |
| CSA-E384-14                                                                                                                                                                                                                                                                                                                                                          | 310 V <sub>AC</sub> | 1 nF to 3.3 µF | E354331            |                                                                        |
| CQC                                                                                                                                                                                                                                                                                                                                                                  | 310 V <sub>AC</sub> | 1 nF to 3.3 µF | CQC07001018685 (F) | <a href="http://www.vishay.com/doc?28227">www.vishay.com/doc?28227</a> |
|                                                                                                                                                                                                                                                                                                                                                                      |                     |                | CQC07001021279 (L) | <a href="http://www.vishay.com/doc?28228">www.vishay.com/doc?28228</a> |
| CB-test certificate                                                                                                                                                                                                                                                                                                                                                  | 310 V <sub>AC</sub> | 1 nF to 3.3 µF | FI-39827           | <a href="http://www.vishay.com/doc?28175">www.vishay.com/doc?28175</a> |
| The ENEC-approval together with the CB-certificate replace all national marks of the following countries (they have already signed the ENEC-agreement): Austria; Belgium; Czech. Republic; Denmark; Finland; France; Germany; Greece; Hungary; Ireland; Italy; Luxembourg; Netherlands; Norway; Portugal; Slovenian; Spain; Sweden; Switzerland; and United Kingdom. |                     |                |                    |                                                                        |
|                                                                                                                 |                     |                |                    |                                                                        |

## MOUNTING

### Normal Use

The capacitors are designed for mounting on printed-circuit boards. The capacitors packed in bandoleers 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 the stand-off pips are in good contact with the printed-circuit board:

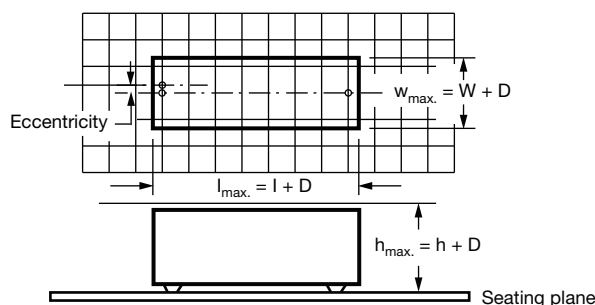
- For pitches  $\leq 15$  mm capacitors shall be mechanically fixed by the leads
- For longer pitches the capacitors shall be mounted in the same way and the body clamped

### 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 drawings.

- For products with pitch  $\leq 15$  mm,  $\Delta w = \Delta l = 0.3$  mm;  $\Delta h = 0.1$  mm
- For products with  $15$  mm  $<$  pitch  $\leq 27.5$  mm,  $\Delta w = \Delta l = 0.5$  mm;  $\Delta h = 0.1$  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<sub>stg</sub> = -25 °C to +35 °C with RH maximum 75 % without condensation

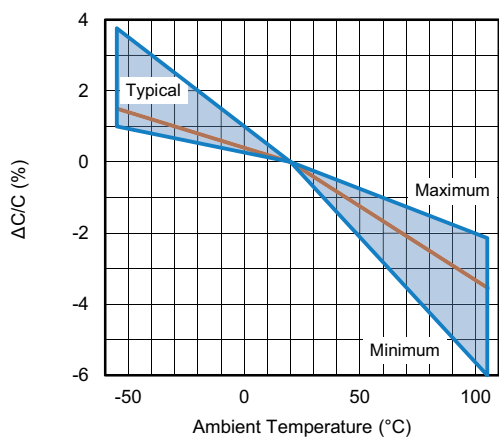
### Ratings and Characteristics Reference Conditions

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

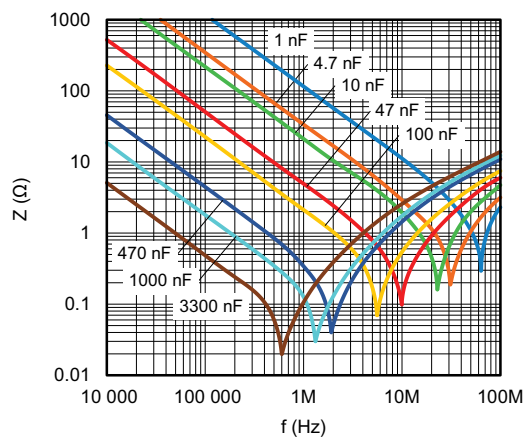
For reference testing, a conditioning period shall be applied over 96 h  $\pm$  4 h by heating the products in a circulating air oven at the rated temperature and a relative humidity not exceeding 20 %.



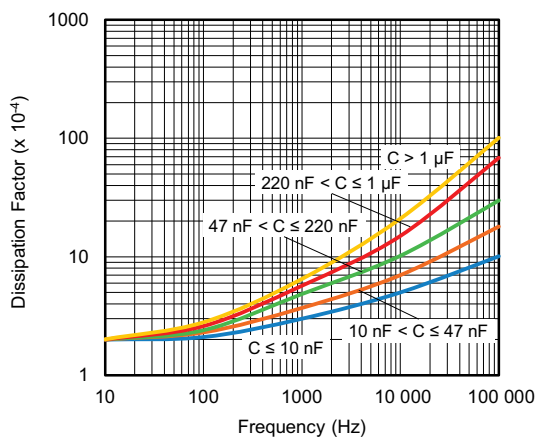
## CHARACTERISTICS



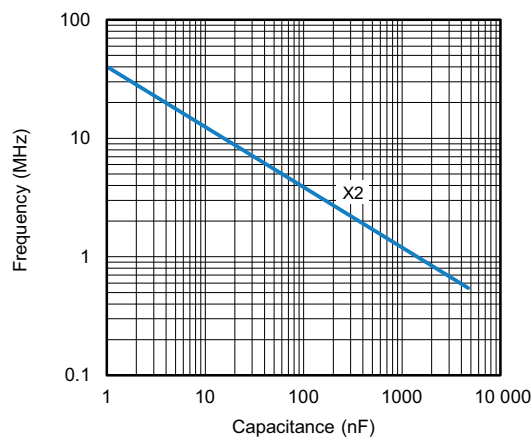
Capacitance as a function of ambient temperature (typical curve)



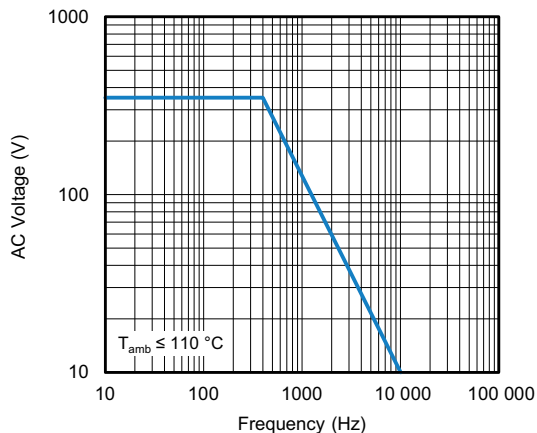
Impedance as a function of frequency (typical curve)



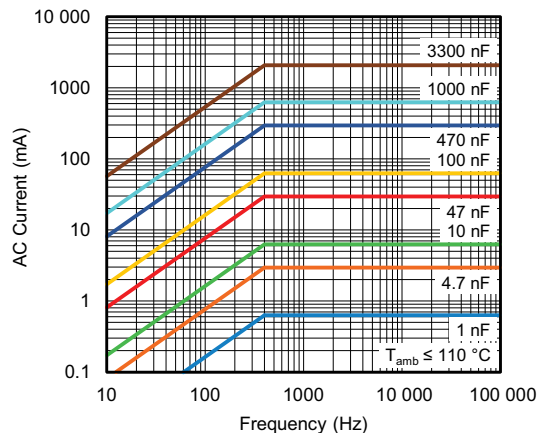
Tangent of loss angle as a function of frequency (typical curve)



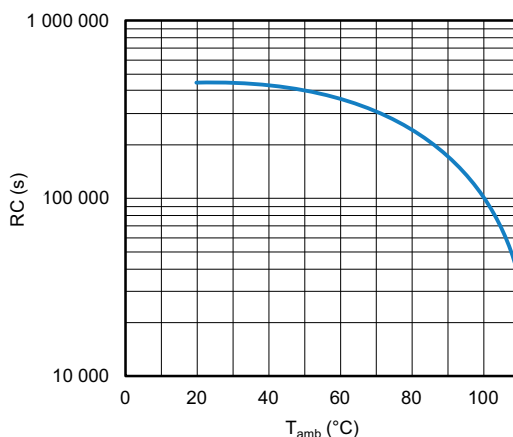
Resonant frequency as a function of capacitance (typical curve)



Max. RMS voltage as a function of frequency (typical curve)



Max. RMS current as a function of frequency (typical curve)



Insulation resistance as a function of ambient temperature

### APPLICATION NOTES

- For X2 electromagnetic interference suppression in **standard across the line applications** (50 Hz / 60 Hz) with a maximum mains voltage of 310 V<sub>AC</sub>
- For series impedance applications we refer to application note [www.vishay.com/doc?28153](http://www.vishay.com/doc?28153)
- 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: [rfi@vishay.com](mailto:rfi@vishay.com)
- These capacitors are not intended for continuous pulse applications. For these situations, capacitors of the AC and pulse programs must be used
- The maximum ambient temperature must not exceed 105 °C (125 °C for less than 1000 h) for C ≤ 470 nF and 110 °C for C > 470 nF
- Rated voltage pulse slope:  
if the pulse voltage is lower than the rated voltage, the values of the specific reference data can be multiplied by 435 V<sub>DC</sub> and divided by the applied voltage

### INSPECTION REQUIREMENTS

#### General Notes

Sub-clause numbers of tests and performance requirements refer to the “Sectional Specification, IEC Publication IEC 60384-14 ed-4 (2013) and Specific Reference Data.”

| GROUP C INSPECTION REQUIREMENTS                     |                                                                                          |                                                               |
|-----------------------------------------------------|------------------------------------------------------------------------------------------|---------------------------------------------------------------|
| SUB-CLAUSE NUMBER AND TEST                          | CONDITIONS                                                                               | PERFORMANCE REQUIREMENTS                                      |
| <b>SUB-GROUP C1A PART OF SAMPLE OF SUB-GROUP C1</b> |                                                                                          |                                                               |
| 4.1 Dimensions (detail)                             |                                                                                          | As specified in chapters “General Data” of this specification |
| Initial measurements                                | Capacitance<br>Tangent of loss angle:<br>For C ≤ 1 µF at 10 kHz<br>For C > 1 µF at 1 kHz |                                                               |
| 4.3 Robustness of terminations                      | Tensile: Load 10 N; 10 s<br>Bending: Load 5 N; 4 x 90°                                   | No visible damage                                             |
| 4.4 Resistance to soldering heat                    | No pre-drying<br>Method: 1A<br>Solder bath: 280 °C ± 5 °C<br>Duration: 10 s              |                                                               |



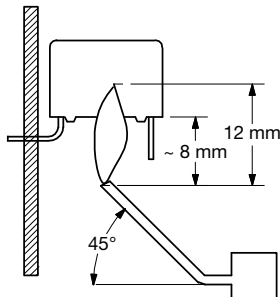
| GROUP C INSPECTION REQUIREMENTS                     |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SUB-CLAUSE NUMBER AND TEST                          | CONDITIONS                                                                                                                                                                                                                 | PERFORMANCE REQUIREMENTS                                                                                                                                                                                                                                                                                                                               |
| <b>SUB-GROUP C1A PART OF SAMPLE OF SUB-GROUP C1</b> |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                        |
| 4.19 Component solvent resistance                   | Isopropylalcohol at room temperature<br>Method: 2<br>Immersion time: 5 min ± 0.5 min<br>Recovery time:<br>Min. 1 h, max. 2 h                                                                                               |                                                                                                                                                                                                                                                                                                                                                        |
| 4.4.2 Final measurements                            | Visual examination<br><br>Capacitance<br><br>Tangent of loss angle<br><br>Insulation resistance                                                                                                                            | No visible damage<br>Legible marking<br><br>$ \Delta C/C  \leq 5\%$ of the value measured initially<br><br>Increase of $\tan \delta$ :<br>$\leq 0.008$ for: $C \leq 1\ \mu\text{F}$ or<br>$\leq 0.005$ for: $C > 1\ \mu\text{F}$<br>Compared to values measured initially<br><br>As specified in section "Insulation resistance" of this specification |
| <b>SUB-GROUP C1B PART OF SAMPLE OF SUB-GROUP C1</b> |                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                        |
| Initial measurements                                | Capacitance<br>Tangent of loss angle:<br>For $C \leq 1\ \mu\text{F}$ at 10 kHz<br>For $C > 1\ \mu\text{F}$ at 1 kHz                                                                                                        |                                                                                                                                                                                                                                                                                                                                                        |
| 4.20 Solvent resistance of the marking              | Isopropylalcohol at room temperature<br>Method: 1<br>Rubbing material: Cotton wool<br>Immersion time: 5 min ± 0.5 min                                                                                                      | No visible damage<br>Legible marking                                                                                                                                                                                                                                                                                                                   |
| 4.6 Rapid change of temperature                     | $\theta A = -55\ ^\circ\text{C}$<br>$\theta B = +110\ ^\circ\text{C}$<br>5 cycles<br>Duration $t = 30\ \text{min}$                                                                                                         |                                                                                                                                                                                                                                                                                                                                                        |
| 4.6.1 Inspection                                    | Visual examination                                                                                                                                                                                                         | No visible damage                                                                                                                                                                                                                                                                                                                                      |
| 4.7 Vibration (see note 3.1)                        | Mounting: See section "Mounting" of this specification<br>Procedure B4<br>Frequency range: 10 Hz to 55 Hz.<br>Amplitude: 0.75 mm or<br>Acceleration $98\ \text{m/s}^2$<br>(whichever is less severe)<br>Total duration 6 h |                                                                                                                                                                                                                                                                                                                                                        |
| 4.7.2 Final inspection                              | Visual examination                                                                                                                                                                                                         | No visible damage                                                                                                                                                                                                                                                                                                                                      |
| 4.9 Shock (see note 3)                              | Mounting: See section "Mounting" for more information<br>Pulse shape: Half sine<br>Acceleration: $490\ \text{m/s}^2$<br>Duration of pulse: 11 ms                                                                           |                                                                                                                                                                                                                                                                                                                                                        |
| 4.9.2 Final measurements                            | Visual examination<br><br>Capacitance<br><br>Tangent of loss angle<br><br>Insulation resistance                                                                                                                            | No visible damage<br><br>$ \Delta C/C  \leq 5\%$ of the value measured initially<br><br>Increase of $\tan \delta$ :<br>$\leq 0.008$ for: $C \leq 1\ \mu\text{F}$ or<br>$\leq 0.005$ for: $C > 1\ \mu\text{F}$<br>Compared to values measured initially<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<br/>COMBINED SAMPLE OF<br/>SPECIMENS OF SUB-GROUPS<br/>C1A AND C1B</b> |                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 4.11 Climatic sequence                                                                 |                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 4.11.1 Initial measurements                                                            | Capacitance<br>Measured in 4.4.2 and 4.9.2<br>Tangent of loss angle:<br>Measured initially in C1A and C1B                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 4.11.2 Dry heat                                                                        | Temperature: 110 °C                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 4.11.3 Damp heat cyclic<br>Test Db<br>First cycle                                      | Duration: 16 h                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 4.11.4 Cold                                                                            | Temperature: - 55 °C                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 4.11.5 Damp heat cyclic<br>Test Db<br>Remaining cycles                                 | Duration: 2 h                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 4.11.6 Final measurements                                                              | Visual examination<br><br>Capacitance<br><br>Tangent of loss angle<br><br>Voltage proof<br>1350 V <sub>DC</sub> ; 1 min between terminations<br><br>Insulation resistance | 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 $\tan \delta$ :<br>$\leq 0.008$ for: $C \leq 1\ \mu\text{F}$ or<br>$\leq 0.005$ for: $C > 1\ \mu\text{F}$<br>Compared to values measured in 4.11.1.<br><br>No permanent breakdown or flash-over<br><br>$\geq 50\%$ of values specified in section "Insulation resistance" of this specification |
| <b>SUB GROUP C2</b>                                                                    |                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 4.12 Damp heat steady state                                                            | 56 days; 40 °C; 90 % to 95 % RH<br>no load                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 4.12.1 Initial measurements                                                            | Capacitance<br>Tangent of loss angle: at 1 kHz                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 4.12.3 Final measurements                                                              | Visual examination<br><br>Capacitance<br><br>Tangent of loss angle<br><br>Voltage proof<br>1350 V <sub>DC</sub> ; 1 min between term.<br><br>Insulation resistance        | No visible damage<br>Legible marking<br><br>$ \Delta C/C  \leq 5\%$ of the value measured in 4.12.1.<br><br>Increase of $\tan \delta$ :<br>$\leq 0.008$ for: $C \leq 1\ \mu\text{F}$ or<br>$\leq 0.005$ for: $C > 1\ \mu\text{F}$<br>Compared to values measured in 4.12.1.<br><br>No permanent breakdown or flash-over<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>             |                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4.13.1 Initial measurements     | Capacitance<br>Tangent of loss angle:<br>For $C \leq 1 \mu\text{F}$ at 10 kHz<br>For $C > 1 \mu\text{F}$ at 1 kHz                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4.13 Impulse voltage            | 3 successive impulses, full wave, peak voltage:<br>X2: 2.5 kV for $C \leq 1 \mu\text{F}$<br>X2: 2.5 kV/ $\sqrt{C}$ for $C > 1 \mu\text{F}$<br>Max. 24 pulses                                                                             | No selfhealing breakdowns or flashover                                                                                                                                                                                                                                                                                                                                                                                         |
| 4.14 Endurance                  | Duration: 1000 h<br>$1.25 \times U_{\text{RAC}}$ at 110 °C<br>Once in every hour the voltage is increased to 1000 V <sub>RMS</sub> for 0.1 s via resistor of $47 \Omega \pm 5 \%$                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4.14.7 Final measurements       | Visual examination<br><br>Capacitance<br><br>Tangent of loss angle<br><br>Voltage proof<br>1350 V <sub>DC</sub> ; 1 min between terminations.<br>2120 V <sub>AC</sub> ; 1 min between terminations and case<br><br>Insulation resistance | No visible damage<br>Legible marking<br><br>$ \Delta C/C  \leq 10 \%$ compared to values measured in 4.13.1.<br><br>Increase of $\tan \delta$ :<br>$\leq 0.008$ for: $C \leq 1 \mu\text{F}$ or<br>$\leq 0.005$ for: $C > 1 \mu\text{F}$<br>Compared to values measured in 4.13.1.<br><br>No permanent breakdown or flash-over<br><br>$\geq 50 \%$ of values specified in section "Insulation resistance" of this specification |
| <b>SUB-GROUP C4</b>             |                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4.15 Charge and discharge       | 10 000 cycles<br>Charge to 435 V <sub>DC</sub><br>Discharge resistance:<br>$R = \frac{435 V_{\text{DC}}}{1.25 \times C (dU/dt)}$                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4.15.1 Initial measurements     | Capacitance<br>Tangent of loss angle:<br>For $C \leq 1 \mu\text{F}$ at 10 kHz<br>For $C > 1 \mu\text{F}$ at 1 kHz                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4.15.3 Final measurements       | Capacitance<br><br>Tangent of loss angle<br><br>Insulation resistance                                                                                                                                                                    | $ \Delta C/C  \leq 10 \%$ compared to values measured in 4.15.1.<br><br>Increase of $\tan \delta$ :<br>$\leq 0.008$ for: $C \leq 1 \mu\text{F}$ or<br>$\leq 0.005$ for: $C > 1 \mu\text{F}$<br>Compared to values measured in 4.15.1.<br><br>$\geq 50 \%$ of values specified in section "Insulation Resistance" of this specification                                                                                         |

| <b>GROUP C INSPECTION REQUIREMENTS</b> |                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                      |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SUB-CLAUSE NUMBER AND TEST</b>      | <b>CONDITIONS</b>                                                                                                                                                                                                                                                                                                                                                                                                | <b>PERFORMANCE REQUIREMENTS</b>                                                                                                                      |
| <b>SUB-GROUP C5</b>                    |                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                      |
| 4.16 Radio frequency characteristic    | Resonance frequency                                                                                                                                                                                                                                                                                                                                                                                              | $\geq 0.9$ times the value as specified in section "Resonant frequency" of this specification                                                        |
| <b>SUB-GROUP C6</b>                    |                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                      |
| 4.17 Passive flammability<br>Class B   | <p>Bore of gas jet: <math>\varnothing 0.5</math> mm<br/> Fuel: Butane<br/> Test duration for actual volume V in mm<sup>3</sup>:<br/> <math>V \leq 250</math>: 10 s<br/> <math>250 &lt; V \leq 500</math>: 20 s<br/> <math>500 &lt; V \leq 1750</math>: 30 s<br/> <math>V &gt; 1750</math>: 60 s<br/> One flame application</p>  | After removing test flame from capacitor, the capacitor must not continue to burn for more than 10 s. No burning particle must drop from the sample. |
| <b>SUB-GROUP C7</b>                    |                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                      |
| 4.18 Active flammability               | 20 cycles of 2.5 kV discharges on the test capacitor connected to $U_{RAC}$                                                                                                                                                                                                                                                                                                                                      | The cheese cloth around the capacitors shall not burn with a flame.<br>No electrical measurements are required.                                      |



## Disclaimer

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