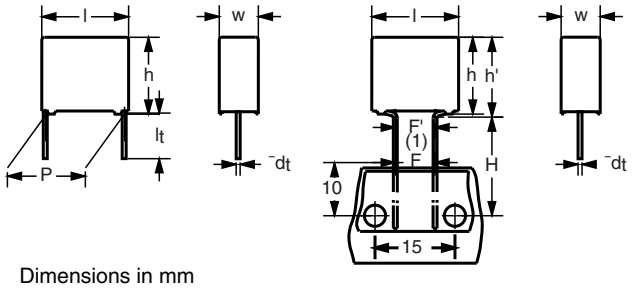
# AC and Pulse Double Metallized Polypropylene Film Capacitors MMKP Radial Potted Type




Dimensions in mm

(1) |F - F'| < 0.3 mm
F = 7.5 + 0.6/- 0.1 mm

## APPLICATIONS

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

## REFERENCE SPECIFICATIONS

IEC 60384-17

## MARKING

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

## DIELECTRIC

Polypropylene film

## ELECTRODES

Metallized

## ENCAPSULATION

Flame retardant plastic case and epoxy resin

## CONSTRUCTION

Internal serial construction

## RATED (DC) VOLTAGE

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

## RATED (AC) VOLTAGE

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

## RATED PEAK-TO-PEAK VOLTAGE

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

## FEATURES

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

Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e3

RoHS COMPLIANT

## ENCAPSULATION

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

## CLIMATIC CATEGORY

55/105/56

## CAPACITANCE RANGE (E24 SERIES)

0.001 µF to 2.7 µF

## CAPACITANCE TOLERANCE

± 5 %

## LEADS

Tinned wire

## RATED (DC) TEMPERATURE

85 °C

## RATED (AC) TEMPERATURE

105 °C

## MAXIMUM APPLICATION TEMPERATURE

105 °C

## DETAIL SPECIFICATION

For more detailed data and test requirements contact: dc-film@vishay.com



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# MMKP 383

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

## COMPOSITION OF CATALOG NUMBER

| TYPE AND PITCHES | |
|---|---|
| 383 | 15.0 mm/7.5 mm |
| | 15.0 mm |
| | 22.5 mm |
| | 27.5 mm |

CAPACITANCE (numerically)

| MULTIPLIER (nF) | |
|---|---|
| 0.1 | 2 |
| 1 | 3 |
| 10 | 4 |
| 100 | 5 |

Example:

104 = 10 x 10 = 100 nF

| | | | | |
|---|---|---|---|---|
| BFC2 | 383 | XX | YY | Y |
| 2222 (1) | 383 | XX | YY | Y |

(1) Old ordering code

| TYPE | PACKAGING | LEAD CONFIGURATION | PREFERRED TYPES | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | C-TOL. | 250 V | 400 V | 630 V | 1000 V | 1400 V | 1600 V | 2000 V | 2500 V |
| 383 | Loose in box | Lead length 3.5 mm ± 0.3 mm | ± 5 % | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| | Taped on reel (bent back to 7.5 mm) (1) | H = 16.0 mm; $P_0$ = 15.0 mm reel diameter = 500 mm | ± 5 % | 03 | 13 | 23 | 33 | 43 | 53 | 63 | - |
| | | | | Dimensions of this code numbers stay between brackets | | | | | | | |
| | | | ON REQUEST | | | | | | | | |
| 383 | Loose in box | Lead length 5.0 mm ± 1.0 mm | ± 5 % | 01 | 11 | 21 | 31 | 41 | 51 | 61 | 71 |
| | | Lead length 25.0 mm ± 2.0 mm | ± 5 % | 04 | 14 | 24 | 34 | 44 | 54 | 64 | 74 |
| | Taped on reel (1) | H = 18.5 mm; $P_0$ = 12.7 mm | ± 5 % | 02 | 12 | 22 | 32 | 42 | 52 | 62 | 72 |
| | Taped on reel (bent back to 7.5 mm) (1) | H = 16.0 mm; $P_0$ = 15.0 mm reel diameter = 356 mm | ± 5 % | 05 | 15 | 25 | 35 | 45 | 55 | 65 | - |
| | | | | Dimensions of this code numbers stay between brackets | | | | | | | |
| | Taped on reel (bent back to 10.0 mm) (1) | H = 16.0 mm; $P_0$ = 15.0 mm reel diameter = 500 mm | ± 5 % | 08 | 18 | 28 | 38 | 48 | 58 | 68 | - |

**Note**

(1) For detailed tape specifications refer to "Packaging Information" www. vishay.com/doc?28139 or end of catalog

## SPECIFIC REFERENCE DATA (250 Vdc)

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



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

| C (µF) | DIMENSIONS w x h (h') x l (mm) | MASS (g) [1] | CATALOG NUMBER BFC2 383 XXYYY AND PACKAGING | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | LOOSE IN BOX | | REEL | | | C-VALUE |
| | | | Leads 3.5 ± 0.3 mm | Leads 25.0 ± 2.0 mm | Original pitch | Pitch = 7.5 mm (bent back) | | ..YYY |
| | | | | | | Ø 500 mm | Ø 356 mm | |
| | | | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | |
| Pitch = 15 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm | | | | | Pitch = 15 mm | Pitch = 7.5 mm (bent back) | | |
| 0.082<br>0.091<br>0.1 | 5.0 x 11.0 (13.0) x 17.5 | 1.1 | **00…**<br>(1250) | **04…**<br>(1000) | **02…**<br>(1100) | **03…**<br>(950) | **05…**<br>(550) | **823**<br>**913**<br>**104** |
| 0.11<br>0.12<br>0.13<br>0.15 | 6.0 x 12.0 (14.0) x 17.5 | 1.4 | **00…**<br>(1000) | **04…**<br>(1000) | **02…**<br>(900) | **03…**<br>(800) | **05…**<br>(450) | **114**<br>**124**<br>**134**<br>**154** |
| 0.16<br>0.18<br>0.2 | 7.0 x 13.5 (15.5) x 17.5 | 1.8 | **00…**<br>(750) | **04…**<br>(500) | **02…**<br>(800) | **03…**<br>(700) | **05…**<br>(400) | **164**<br>**184**<br>**204** |
| 0.22<br>0.24<br>0.27<br>0.3 | 8.5 x 15.0 (17.0) x 17.5 | 2.6 | **00…**<br>(750) | **04…**<br>(500) | **02…**<br>(650) | **03…**<br>(550) | **05…**<br>(300) | **224**<br>**244**<br>**274**<br>**304** |
| 0.33<br>0.36<br>0.39 | 10.0 x 16.5 (18.5) x 17.5 | 3.3 | **00…**<br>(500) | **04…**<br>(450) | **02…**<br>(600) | **03…**<br>(500) | **05…**<br>(250) | **334**<br>**364**<br>**394** |

**Notes**

[1] Net weight for short lead products only

• SPQ = Standard Packaging Quantity

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

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

**Notes**

[1] Net weight for short lead products only

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## SPECIFIC REFERENCE DATA (400 Vdc)

| DESCRIPTION | VALUE | |
|---|---|---|
| Tangent of loss angle: | at 10 kHz | at 100 kHz |
| C ≤ 0.22 µF | ≤ 5 x $10^{-4}$ | ≤ 20 x $10^{-4}$ |
| 0.22 µF < C ≤ 0.33 µF | ≤ 10 x $10^{-4}$ | ≤ 35 x $10^{-4}$ |
| 0.33 µF < C ≤ 0.43 µF | ≤ 10 x $10^{-4}$ | ≤ 40 x $10^{-4}$ |
| 0.43 µF < C ≤ 0.68 µF | ≤ 10 x $10^{-4}$ | ≤ 50 x $10^{-4}$ |
| 0.68 µF < C ≤ 0.82 µF | ≤ 10 x $10^{-4}$ | ≤ 55 x $10^{-4}$ |
| 0.82 µF < C ≤ 1.2 µF | ≤ 10 x $10^{-4}$ | ≤ 60 x $10^{-4}$ |
| 1.2 µF < C ≤ 1.5 µF | ≤ 10 x $10^{-4}$ | ≤ 65 x $10^{-4}$ |
| Rated voltage pulse slope $(dU/dt)_R$: | | |
| C ≤ 0.082 µF | 600 V/µs | |
| 0.082 µF < C ≤ 0.22 µF | 1200 V/µs | |
| 0.22 µF < C ≤ 0.43 µF | 410 V/µs | |
| 0.42 µF < C ≤ 1.1 µF | 260 V/µs | |
| 1.1 µF < C ≤ 1.5 µF | 180 V/µs | |
| R between leads, for C ≤ 1 µF at 100 V, 1 min | > 100 000 MΩ | |
| RC between leads, for C >1 µF at 100 V, 1 min | > 100 000 s | |
| R between leads and case, 100 V, 1 min | > 30 000 MΩ | |
| Ionization (AC) voltage (typical value) at 50 pC peak discharge | > 220 V | |
| Withstanding (DC) voltage (cut off current 10 mA), rise time 100 V/s | 560 V, 1 min | |
| Withstanding (DC) voltage between leads and case | 2840 V, 1 min | |
| Maximum aplication temperature | 105 °C | |

**$U_{Rdc}$ = 400 V; $U_{Rac}$ = 200 V; $U_{pp}$ = 560 V; C-tol. = ± 5 %**

| C (µF) | DIMENSIONS w x h (h') x l (mm) | MASS (g) [1] | CATALOG NUMBER BFC2 383 XXYYY AND PACKAGING | | | | | C-VALUE |
|---|---|---|---|---|---|---|---|---|
| | | | LOOSE IN BOX | | REEL | | | |
| | | | Leads 3.5 ± 0.3 mm | Leads 25.0 ± 2.0 mm | Original pitch | Pitch = 7.5 mm (bent back) Ø 500 mm | Pitch = 7.5 mm (bent back) Ø 356 mm | ..YYY |
| | | | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | |
| Pitch = 15 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm | | | | | Pitch = 15 mm | Pitch = 7.5 mm (bent back) | | |
| 0.047 | 5.0 x 11.0 (13.0) x 17.5 | 1.1 | **10...** (1250) | **14...** (1000) | **12...** (1100) | **13...** (950) | **15...** (550) | **473** |
| 0.051 | | | | | | | | **513** |
| 0.056 | | | | | | | | **563** |
| 0.062 | 6.0 x 12.0 (14.0) x 17.5 | 1.4 | **10...** (1000) | **14...** (1000) | **12...** (900) | **13...** (800) | **15...** (450) | **623** |
| 0.068 | | | | | | | | **683** |
| 0.075 | | | | | | | | **753** |
| 0.082 | | | | | | | | **823** |
| 0.091 | 7.0 x 13.5 (15.5) x 17.5 | 1.8 | **10...** (750) | **14...** (500) | **12...** (800) | **13...** (700) | **15...** (400) | **913** |
| 0.1 | | | | | | | | **104** |
| 0.11 | | | | | | | | **114** |
| 0.12 | 8.5 x 15.0 (17.0) x 17.5 | 2.5 | **10...** (750) | **14...** (500) | **12...** (650) | **13...** (550) | **15...** (300) | **124** |
| 0.13 | | | | | | | | **134** |
| 0.15 | | | | | | | | **154** |
| 0.16 | | | | | | | | **164** |
| 0.18 | 10.0 x 16.5 (18.5) x 17.5 | 3.3 | **10...** (500) | **14...** (450) | **12...** (600) | **13...** (500) | **15...** (250) | **184** |
| 0.2 | | | | | | | | **204** |
| 0.22 | | | | | | | | **224** |

**Notes**

[1] Net weight for short lead products only

• SPQ = Standard Packaging Quantity



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

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

**Notes**

[1] Net weight for short lead products only

• SPQ = Standard Packaging Quantity

## SPECIFIC REFERENCE DATA (630 Vdc)

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



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# MMKP 383

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

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

| C (µF) | DIMENSIONS w x h (h') x l (mm) | MASS (g) [1] | CATALOG NUMBER BFC2 383 XXYYY AND PACKAGING | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | LOOSE IN BOX | | REEL | | | C-VALUE |
| | | | Leads 3.5 ± 0.3 mm | Leads 25.0 ± 2.0 mm | Original pitch | Pitch = 7.5 mm (bent back) | | ..YYY |
| | | | | | | Ø 500 mm | Ø 356 mm | |
| | | | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | |
| **Pitch = 15 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | | | **Pitch = 15 mm** | **Pitch = 7.5 mm (bent back)** | | |
| 0.03<br>0.033<br>0.036 | 5.0 x 11.0 (13.0) x 17.5 | 1.1 | **20…**<br>(1250) | **24…**<br>(1000) | **22…**<br>(2200) | **23…**<br>(950) | **25…**<br>(550) | **303**<br>**333**<br>**363** |
| 0.039<br>0.043<br>0.047<br>0.051<br>0.056 | 6.0 x 12.0 (14.0) x 17.5 | 1.4 | **20…**<br>(1000) | **24…**<br>(1000) | **22…**<br>(900) | **23…**<br>(800) | **25…**<br>(450) | **393**<br>**433**<br>**473**<br>**513**<br>**563** |
| 0.062<br>0.068<br>0.075 | 7.0 x 13.5 (15.5) x 17.5 | 1.8 | **20…**<br>(750) | **24…**<br>(500) | **22…**<br>(800) | **23…**<br>(700) | **25…**<br>(400) | **623**<br>**683**<br>**753** |
| 0.082<br>0.091<br>0.1<br>0.11 | 8.5 x 15.0 (17.0) x 17.5 | 2.5 | **20…**<br>(750) | **24…**<br>(500) | **22…**<br>(650) | **23…**<br>(550) | **25…**<br>(300) | **823**<br>**913**<br>**104**<br>**114** |
| 0.12<br>0.13<br>0.15 | 10.0 x 16.5 (18.5) x 17.5 | 3.3 | **20…**<br>(500) | **24…**<br>(450) | **22…**<br>(600) | **23…**<br>(500) | **25…**<br>(250) | **124**<br>**134**<br>**154** |
| **Pitch = 22.5 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | | | **Pitch = 22.5 mm** | | | |
| 0.16<br>0.18<br>0.2<br>0.22 | 8.5 x 18.0 x 26.0 | 4.2 | **20…**<br>(200) | **24…**<br>(250) | **22…**<br>(450) | - | - | **164**<br>**184**<br>**204**<br>**224** |
| 0.24<br>0.27<br>0.3 | 10.0 x 19.5 x 26.0 | 5.3 | **20…**<br>(200) | **24…**<br>(200) | **22…**<br>(350) | - | - | **174**<br>**304** |
| **Pitch = 27.5 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | | | **Pitch = 27.5 mm** | | | |
| 0.33<br>0.36<br>0.39<br>0.43 | 11.0 x 21.0 x 31.0 | 8.0 | **20…**<br>(750) | **24…**<br>(125) | - | | | **334**<br>**364**<br>**394**<br>**434** |
| 0.47<br>0.51<br>0.56 | 13.0 x 23.0 x 31.0 | 9.7 | **20…**<br>(500) | **24…**<br>(125) | | | | **474**<br>**514**<br>**564** |
| 0.62<br>0.68<br>0.75 | 15.0 x 25.0 x 31.0 | 12.6 | **20…**<br>(100) | **24…**<br>(125) | | | | **624**<br>**684**<br>**754** |
| 0.82<br>0.91<br>1.0 | 18.0 x 28.0 x 31.0 | 16.3 | **20…**<br>(100) | **24…**<br>(100) | | | | **824**<br>**914**<br>**105** |

**Notes**

[1] Net weight for short lead products only

• SPQ = Standard Packaging Quantity



For technical questions, contact: dc-film@vishay.com

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## SPECIFIC REFERENCE DATA (1000 Vdc)

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

**$U_{Rdc}$ = 1000 V; $U_{Rac}$ = 350 V; $U_{p-p}$ = 1000 V; C-tol. = ± 5 %**

| C (µF) | DIMENSIONS w x h (h') x l (mm) | MASS (g) [1] | CATALOG NUMBER BFC2 383 XXYYY AND PACKAGING | | | | | C-VALUE |
|---|---|---|---|---|---|---|---|---|
| | | | LOOSE IN BOX | | REEL | | | |
| | | | Leads 3.5 ± 0.3 mm | Leads 25.0 ± 2.0 mm | Original pitch | Pitch = 7.5 mm (bent back) | | ..YYY |
| | | | | | | Ø 500 mm | Ø 356 mm | |
| | | | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | |
| **Pitch = 15 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | | | **Pitch = 15 mm** | **Pitch = 7.5 mm (bent back)** | | |
| 0.0043 | 5.0 x 11.0 (13.0) x 17.5 | 1.1 | **30…** (1250) | **34…** (1000) | **32…** (1100) | **33…** (950) | **35…** (550) | **432** |
| 0.0047 | | | | | | | | **472** |
| 0.0051 | | | | | | | | **512** |
| 0.0056 | | | | | | | | **562** |
| 0.0062 | | | | | | | | **622** |
| 0.0068 | | | | | | | | **682** |
| 0.0075 | | | | | | | | **752** |
| 0.0082 | | | | | | | | **822** |
| 0.0091 | | | | | | | | **912** |
| 0.01 | | | | | | | | **103** |
| 0.011 | | | | | | | | **113** |
| 0.012 | | | | | | | | **123** |
| 0.013 | | | | | | | | **133** |
| 0.015 | | | | | | | | **153** |
| 0.016 | | | | | | | | **163** |
| 0.018 | 6.0 x 12.0 (14.0) x 17.5 | 1.4 | **30…** (1000) | **34…** (1000) | **32…** (900) | **33…** (800) | **35…** (450) | **183** |
| 0.02 | | | | | | | | **203** |
| 0.022 | | | | | | | | **223** |
| 0.024 | | | | | | | | **243** |
| 0.027 | 7.0 x 13.5 (15.5) x 17.5 | 1.8 | **30…** (750) | **34…** (500) | **32…** (800) | **33…** (700) | **35…** (400) | **273** |
| 0.030 | | | | | | | | **303** |
| 0.033 | | | | | | | | **333** |
| 0.036 | 8.5 x 15.0 (17.0) x 17.5 | 2.5 | **30…** (750) | **34…** (500) | **32…** (650) | **33…** (550) | **35…** (300) | **363** |
| 0.039 | | | | | | | | **393** |
| 0.043 | | | | | | | | **433** |
| 0.047 | | | | | | | | **473** |
| 0.051 | 10.0 x 16.5 (18.5) x 17.5 | 3.3 | **30…** (500) | **34…** (450) | **32…** (600) | **33…** (500) | **35…** (250) | **513** |
| 0.056 | | | | | | | | **563** |
| 0.062 | | | | | | | | **623** |

**Notes**

[1] Net weight for short lead products only

• SPQ = Standard Packaging Quantity



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| C (µF) | DIMENSIONS w x h (h') x l (mm) | MASS (g) (1) | CATALOG NUMBER BFC2 383 XXYYY AND PACKAGING | | | |
|---|---|---|---|---|---|---|
| | | | LOOSE IN BOX | | REEL | C-VALUE |
| | | | Leads | Leads | Original pitch | ..YYY |
| | | | XX (SPQ) | XX (SPQ) | XX (SPQ) | |
| **Pitch = 22.5 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | | | **Pitch 22.5 mm** | |
| 0.068 | 7.0 x 16.5 x 26.5 | 3.0 | **30 ...** (200) | **34...** (250) | **32...** (550) | **683** |
| 0.075<br>0.082<br>0.091 | 8.5 x 18.0 x 26.0 | 4.2 | **30...** (200) | **34...** (250) | **32...** (450) | **753**<br>**823**<br>**913** |
| 0.1<br>0.11<br>0.12<br>0.13 | 10.0 x 19.5 x 26.0 | 5.3 | **30...** (200) | **34...** (200) | **32...** (350) | **104**<br>**114**<br>**124**<br>**134** |
| **Pitch = 27.5 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | | | **Pitch = 27.5 mm** | |
| 0.15<br>0.16<br>0.18 | 11.0 x 21.0 x 31.0 | 8.0 | **30...** (100) | **34...** (125) | - | **154**<br>**164**<br>**184** |
| 0.2<br>0.22<br>0.24 | 13.0 x 23.0 x 31.0 | 9.7 | **30...** (100) | **34...** (125) | | **204**<br>**224**<br>**244** |
| 0.27<br>0.3<br>0.33 | 15.0 x 25.0 x 31.0 | 12.6 | **30...** (100) | **34...** (125) | | **274**<br>**304**<br>**334** |
| 0.36<br>0.39<br>0.43<br>0.47 | 18.0 x 28.0 x 31.0 | 16.3 | **30...** (100) | **34...** (100) | | **364**<br>**394**<br>**434**<br>**474** |

**Notes**

(1) Net weight for short lead products only

• SPQ = Standard Packaging Quantity

## SPECIFIC REFERENCE DATA (1400 Vdc)

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



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

| C (µF) | DIMENSIONS w x h (h') x l (mm) | MASS (g) [1] | CATALOG NUMBER BFC2 383 XXYYY AND PACKAGING | | | | | C-VALUE |
|---|---|---|---|---|---|---|---|---|
| | | | LOOSE IN BOX | | REEL | | | |
| | | | Leads 3.5 ± 0.3 mm | Leads 25.0 ± 2.0 mm | Original pitch | Pitch = 7.5 mm (bent back) | | ..YYY |
| | | | | | | Ø 500 mm | Ø 356 mm | |
| | | | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | |
| **Pitch = 15 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | | | **Pitch = 15 mm** | **Pitch = 7.5 mm (bent back)** | | |
| 0.0022 | 5.0 x 11.0 (13.0) x 17.5 | 1.1 | **40...** (1250) | **44...** (1000) | **42...** (1100) | **43...** (950) | **45...** (550) | **222** |
| 0.0024 | | | | | | | | **242** |
| 0.0027 | | | | | | | | **272** |
| 0.003 | | | | | | | | **302** |
| 0.0033 | | | | | | | | **332** |
| 0.0036 | | | | | | | | **362** |
| 0.0039 | | | | | | | | **392** |
| 0.0043 | 6.0 x 12.0 (14.0) x 17.5 | 1.4 | **40...** (1000) | **44...** (1000) | **42...** (900) | **43...** (800) | **45...** (450) | **432** |
| 0.0047 | | | | | | | | **472** |
| 0.0051 | | | | | | | | **512** |
| 0.0056 | | | | | | | | **562** |
| 0.0062 | 7.0 x 13.5 (15.5) x 17.5 | 1.8 | **40...** (750) | **44...** (500) | **42...** (800) | **43...** (700) | **45...** (400) | **622** |
| 0.0068 | | | | | | | | **682** |
| 0.0075 | | | | | | | | **752** |
| 0.0082 | | | | | | | | **822** |
| 0.0091 | 8.5 x 15.0 (17.0) x 17.5 | 2.5 | **40...** (750) | **44...** (500) | **42...** (650) | **43...** (550) | **45...** (300) | **912** |
| 0.01 | | | | | | | | **103** |
| 0.011 | | | | | | | | **113** |
| 0.012 | | | | | | | | **123** |
| 0.013 | 10.0 x 16.5 (18.5) x 17.5 | 3.3 | **40...** (500) | **44...** (450) | **42...** (600) | **43...** (500) | **45...** (250) | **133** |
| 0.015 | | | | | | | | **153** |
| 0.016 | | | | | | | | **163** |
| **Pitch = 22.5 ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | | | **Pitch = 22.5 mm** | | | |
| 0.018 | 7.0 x 16.5 x 26.0 | 3 | **40...** (200) | **44...** (250) | **42...** (550) | - | - | **183** |
| 0.02 | | | | | | | | **203** |
| 0.022 | 8.5 x 18.0 x 26.0 | 4.2 | **40...** (200) | **44...** (250) | **42...** (450) | - | - | **223** |
| 0.024 | | | | | | | | **243** |
| 0.027 | | | | | | | | **273** |
| 0.03 | 10.0 x 19.5 x 26.0 | 5.3 | **40...** (200) | **44...** (200) | **42...** (350) | - | - | **303** |
| 0.033 | | | | | | | | **333** |
| 0.036 | | | | | | | | **363** |
| 0.039 | | | | | | | | **393** |
| **Pitch = 27.5 ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | | | **Pitch = 27.5 mm** | | | |
| 0.043 | 11.0 x 21.0 x 31.0 | 8 | **40...** | **44...** | - | | | **433** |
| 0.047 | | | | | | | | **473** |
| 0.051 | | | | | | | | **513** |
| 0.056 | | | | | | | | **563** |
| 0.062 | 13.0 x 23.0 x 31.0 | 9.7 | **40...** (100) | **44...** (125) | | | | **623** |
| 0.068 | | | | | | | | **683** |
| 0.075 | | | | | | | | **753** |
| 0.082 | 15.0 x 25.0 x 31.0 | 12.6 | **40...** (100) | **44...** (125) | | | | **823** |
| 0.091 | | | | | | | | **913** |
| 0.1 | | | | | | | | **104** |
| 0.11 | 18.0 x 28.0 x 31.0 | 16.3 | **40...** (100) | **44...** (100) | | | | **114** |
| 0.12 | | | | | | | | **124** |
| 0.13 | | | | | | | | **134** |

**Notes**

[1] Net weight for short lead products only

• SPQ = Standard Packaging Quantity



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## SPECIFIC REFERENCE DATA (1600 Vdc)

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

**$U_{Rdc}$ = 1600 V; $U_{Rac}$ = 550 V; $U_{p-p}$ = 1600 V; C-tol. = ± 5 %**

| C (µF) | DIMENSIONS w x h (h') x l (mm) | MASS (g) [1] | CATALOG NUMBER BFC2 383 XXYYY AND PACKAGING | | | | | C-VALUE |
|---|---|---|---|---|---|---|---|---|
| | | | LOOSE IN BOX | | REEL | | | |
| | | | Leads 3.5 ± 0.3 | Leads 25.0 ± 2.0 | Original pitch | Pitch = 7.5 mm (bent back) | | ..YYY |
| | | | | | | Ø 500 mm | Ø 356 mm | |
| | | | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | |
| **Pitch = 15 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | | | **Pitch = 15 mm** | **Pitch = 7.5 mm (bent back)** | | |
| 0.0027 | 5.0 x 11.0 (13.0) x 17.5 | 1.1 | **50…** (1250) | **54…** (1000) | **52…** (1100) | **53…** (950) | **55…** (550) | **272** |
| 0.003 | | | | | | | | **302** |
| 0.0033 | | | | | | | | **332** |
| 0.0036 | | | | | | | | **362** |
| 0.0039 | | | | | | | | **392** |
| 0.0043 | 6.0 x 12.0 (14.0) x 17.5 | 1.4 | **50…** (1000) | **54…** (1000) | **52…** (900) | **53…** (800) | **55…** (450) | **432** |
| 0.0047 | | | | | | | | **472** |
| 0.0051 | | | | | | | | **512** |
| 0.0056 | | | | | | | | **562** |
| 0.0062 | 7.0 x 13.5 (15.5) x 17.5 | 1.8 | **50…** (750) | **54…** (500) | **52…** (800) | **53…** (700) | **55…** (400) | **622** |
| 0.0068 | | | | | | | | **682** |
| 0.0075 | | | | | | | | **752** |
| 0.0082 | 8.5 x 15.0 (17.0) x 17.5 | 2.5 | **50…** (750) | **54…** (500) | **52…** (650) | **53…** (550) | **55…** (300) | **822** |
| 0.0091 | | | | | | | | **912** |
| 0.01 | | | | | | | | **103** |
| 0.011 | | | | | | | | **113** |
| 0.012 | 10.0 x 16.5 (18.5) x 17.5 | 3.3 | **50…** (500) | **54…** (450) | **52…** (600) | **53…** (500) | **55…** (250) | **123** |
| 0.013 | | | | | | | | **133** |
| 0.015 | | | | | | | | **153** |
| **Pitch = 22.5 ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | | | **Pitch = 22.5 mm** | | | |
| 0.016 | 7.0 x 16.5 x 26.0 | 3.0 | **50…** (200) | **54…** (250) | **52…** (550) | - | - | **163** |
| 0.018 | | | | | | | | **183** |
| 0.02 | | | | | | | | **203** |
| 0.022 | 8.5 x 18.0 x 26.0 | 4.2 | **50…** (200) | **54…** (250) | **52…** (450) | - | - | **223** |
| 0.024 | | | | | | | | **243** |
| 0.027 | | | | | | | | **273** |
| 0.03 | | | | | | | | **303** |
| 0.033 | 10.0 x 19.5 x 26.0 | 5.3 | **50…** (200) | **54…** (200) | **52…** (350) | - | - | **333** |
| 0.036 | | | | | | | | **363** |
| 0.039 | | | | | | | | **393** |

**Notes**

[1] Net weight for short lead products only

• SPQ = Standard Packaging Quantity



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

| C (µF) | DIMENSIONS w x h (h') x l (mm) | MASS (g) [1] | CATALOG NUMBER BFC2 383 XXYYY AND PACKAGING | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | LOOSE IN BOX | | REEL | | | C-VALUE |
| | | | Leads 3.5 ± 0.3 | Leads 25.0 ± 2.0 | Original pitch | Pitch = 7.5 mm (bent back) | | ..YYY |
| | | | | | | Ø 500 mm | Ø 356 mm | |
| | | | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | |
| Pitch = 27.5 ± 0.4 mm; $d_t$= 0.80 mm ± 0.08 mm | | | | | Pitch = 27.5 mm | | | |
| 0.043 | 11.0 x 21.0 x 31.0 | 8 | **50…** (100) | **54…** (125) | - | | | **433** |
| 0.047 | | | | | | | | **473** |
| 0.051 | | | | | | | | **513** |
| 0.056 | | | | | | | | **563** |
| 0.062 | 13.0 x 23.0 x 31.0 | 9.7 | **50…** (100) | **54…** (125) | | | | **623** |
| 0.068 | | | | | | | | **683** |
| 0.075 | | | | | | | | **753** |
| 0.082 | 15.0 x 25.0 x 31.0 | 12.6 | **50…** (100) | **54…** (125) | | | | **823** |
| 0.091 | | | | | | | | **913** |
| 0.1 | | | | | | | | **104** |
| 0.11 | 18.0 x 28.0 x 31.0 | 16.3 | **50…** (100) | **54…** (100) | | | | **114** |
| 0.12 | | | | | | | | **124** |
| 0.13 | | | | | | | | **134** |
| 0.15 | | | | | | | | **154** |

**Notes**

[1] Net weight for short lead products only

• SPQ = Standard Packaging Quantity

## SPECIFIC REFERENCE DATA (2000 Vdc)

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



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

| C (µF) | DIMENSIONS w x h (h') x l (mm) | MASS (g) (1) | CATALOG NUMBER BFC2 383 XXYYY AND PACKAGING | | | | | C-VALUE |
|---|---|---|---|---|---|---|---|---|
| | | | LOOSE IN BOX | | REEL | | | |
| | | | Leads 3.5 ± 0.3 | Leads 25.0 ± 2.0 | Original pitch | Pitch = 7.5 mm (bent back) | | ..YYY |
| | | | | | | Ø 500 mm | Ø 356 mm | |
| | | | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | |
| **Pitch = 15 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | | | **Pitch = 15 mm** | **Pitch = 7.5 mm (bent back)** | | |
| 0.001 | 5.0 x 11.0 (13.0) x 17.5 | 1.1 | **60…** (1250) | **64…** (1000) | **62…** (1100) | **63…** (950) | **65…** (550) | **102** |
| 0.0011 | | | | | | | | **112** |
| 0.0012 | | | | | | | | **122** |
| 0.0013 | | | | | | | | **132** |
| 0.0015 | | | | | | | | **152** |
| 0.0016 | | | | | | | | **162** |
| 0.0018 | | | | | | | | **182** |
| 0.002 | | | | | | | | **202** |
| 0.0022 | | | | | | | | **222** |
| 0.0024 | | | | | | | | **242** |
| 0.0027 | 6.0 x 12.0 (14.0) x 17.5 | 1.4 | **60…** (1000) | **64…** (1000) | **62…** (900) | **63…** (800) | **65…** (450) | **272** |
| 0.003 | | | | | | | | **302** |
| 0.0033 | | | | | | | | **332** |
| 0.0036 | | | | | | | | **362** |
| 0.0039 | 7.0 x 13.5 (15.5) x 17.5 | 1.8 | **60…** (750) | **64…** (500) | **62…** (800) | **63…** (700) | **65…** (400) | **392** |
| 0.0043 | | | | | | | | **432** |
| 0.0047 | | | | | | | | **472** |
| 0.0051 | 8.5 x 15.0 (17.0) x 17.5 | 2.5 | **60…** (750) | **64…** (500) | **62…** (650) | **63…** (550) | **65…** (300) | **512** |
| 0.0056 | | | | | | | | **562** |
| 0.0062 | | | | | | | | **622** |
| 0.0068 | | | | | | | | **682** |
| 0.0075 | 10.0 x 16.5 (18.5) x 17.5 | 3.3 | **60…** (500) | **64…** (450) | **62…** (600) | **63…** (500) | **65…** (250) | **752** |
| 0.0082 | | | | | | | | **822** |
| 0.0091 | | | | | | | | **912** |
| 0.01 | | | | | | | | **103** |
| **Pitch = 22.5 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | | | **Pitch = 22.5 mm** | | | |
| 0.011 | 7.0 x 16.5 x 26.0 | 3.0 | **60…** (200) | **64…** (250) | **62…** (550) | - | - | **113** |
| 0.012 | | | | | | | | **123** |
| 0.013 | | | | | | | | **133** |
| 0.015 | 8.5 x 18.0 x 26.0 | 4.2 | **60…** (200) | **64…** (250) | **62…** (450) | - | - | **153** |
| 0.016 | | | | | | | | **163** |
| 0.018 | | | | | | | | **183** |
| 0.02 | 10.0 x 19.5 x 26.0 | 5.3 | **60…** (200) | **64…** (200) | **62…** (350) | - | - | **203** |
| 0.022 | | | | | | | | **223** |
| 0.024 | | | | | | | | **243** |
| **Pitch = 27.5 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | | | **Pitch = 27.5 mm** | | | |
| 0.027 | 11.0 x 21.0 x 31.0 | 8.0 | **60…** (100) | **64…** (125) | - | | | **273** |
| 0.03 | | | | | | | | **303** |
| 0.033 | | | | | | | | **333** |
| 0.036 | | | | | | | | **363** |
| 0.039 | | | | | | | | **393** |

**Notes**

(1) Net weight for short lead products only

• SPQ = Standard Packaging Quantity



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| C (µF) | DIMENSIONS w x h (h') x l (mm) | MASS (g) (1) | CATALOG NUMBER BFC2 383 XXYYY AND PACKAGING | | | | | C-VALUE |
|---|---|---|---|---|---|---|---|---|
| | | | LOOSE IN BOX | | REEL | | | |
| | | | Leads 3.5 ± 0.3 | Leads 25.0 ± 2.0 | Original pitch | Pitch = 7.5 mm (bent back) | | ..YYY |
| | | | | | | Ø 500 mm | Ø 356 mm | |
| | | | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | |
| **Pitch = 27.5 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | | | **Pitch = 27.5 mm** | | | |
| 0.043 | 13.0 x 23.0 x 31.0 | 9.7 | **60…** (100) | **64…** (125) | - | | | **433** |
| 0.047 | | | | | | | | **473** |
| 0.051 | | | | | | | | **513** |
| 0.056 | 15.0 x 25.0 x 31.0 | 12.6 | **60…** (100) | **64…** (125) | | | | **563** |
| 0.062 | | | | | | | | **623** |
| 0.068 | | | | | | | | **683** |
| 0.075 | 18.0 x 28.0 x 31.0 | 16.3 | **60…** (100) | **64…** (100) | | | | **753** |
| 0.082 | | | | | | | | **823** |
| 0.091 | | | | | | | | **913** |
| 0.10 | | | | | | | | **104** |

**Notes**

(1) Net weight for short lead products only

• SPQ = Standard Packaging Quantity

## SPECIFIC REFERENCE DATA (2500 Vdc)

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



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# MMKP 383

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

$U_{Rdc}$ = 2500 V; $U_{Rac}$ = 900 V; $U_{p=p}$ = 2500 V; C-tol. = ± 5 %

| C (µF) | DIMENSIONS w x h x l (mm) | MASS (g) [1] | CATALOG NUMBER BFC2 383 XXYYY AND PACKAGING | | | |
|---|---|---|---|---|---|---|
| | | | LOOSE IN BOX | | REEL | C-VALUE |
| | | | Leads 3.5 ± 0.3 mm | Leads 25.0 ± 2.0 mm | H = 18.5 mm | ..YYY |
| | | | XX (SPQ) | XX (SPQ) | XX (SPQ) | |
| **Pitch = 22.5 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | | | | |
| 0.001 | 6.0 x 15.5 x 26.0 | 2.4 | **70…** (200) | **74…** (250) | **72…** (600) | **102** |
| 0.0011 | | | | | | **112** |
| 0.0012 | | | | | | **122** |
| 0.0013 | | | | | | **132** |
| 0.0015 | | | | | | **152** |
| 0.0016 | | | | | | **162** |
| 0.0018 | | | | | | **182** |
| 0.002 | | | | | | **202** |
| 0.0022 | | | | | | **222** |
| 0.0024 | | | | | | **242** |
| 0.0027 | | | | | | **272** |
| 0.003 | | | | | | **302** |
| 0.0033 | | | | | | **332** |
| 0.0036 | | | | | | **362** |
| 0.0039 | | | | | | **392** |
| 0.0043 | | | | | | **432** |
| 0.0047 | | | | | | **472** |
| 0.0051 | | | | | | **512** |
| 0.0056 | 7.0 x 16.5 x 26.0 | 3.0 | **70…** (200) | **74…** (250) | **72…** (550) | **562** |
| 0.0062 | | | | | | **622** |
| 0.0068 | | | | | | **682** |
| 0.0075 | | | | | | **752** |
| 0.0082 | 8.5 x 18.0 x 26.0 | 4.2 | **70…** (200) | **74…** (250) | **72…** (450) | **822** |
| 0.0091 | | | | | | **912** |
| 0.01 | | | | | | **103** |
| 0.011 | | | | | | **113** |
| 0.012 | 10.0 x 19.5 x 26.0 | 5.3 | **70…** (200) | **74…** (200) | **72…** (350) | **123** |
| 0.013 | | | | | | **133** |
| 0.015 | | | | | | **153** |
| **Pitch = 27.5 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | | | | |
| 0.016 | 9.0 x 19.0 x 31.0 | 5.9 | **70…** | **74…** | - | **163** |
| 0.018 | 11.0 x 21.0 x 31.0 | 8.0 | **70…** (100) | **74…** (125) | | **183** |
| 0.02 | | | | | | **203** |
| 0.022 | | | | | | **223** |
| 0.024 | | | | | | **243** |
| 0.027 | 13.0 x 23.0 x 31.0 | 9.7 | **70…** (100) | **74…** (125) | | **273** |
| 0.03 | | | | | | **303** |
| 0.033 | | | | | | **333** |
| 0.036 | 15.0 x 25.0 x 31.0 | 12.6 | **70…** (100) | **74…** (125) | | **363** |
| 0.039 | | | | | | **393** |
| 0.043 | | | | | | **433** |
| 0.047 | 18.0 x 28.0 x 31.0 | 16.3 | **70…** (100) | **74…** (100) | | **473** |
| 0.051 | | | | | | **513** |
| 0.056 | | | | | | **563** |

**Notes**

[1] Net weight for short lead products only

• SPQ = Standard Packaging Quantity



For technical questions, contact: dc-film@vishay.com



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## MOUNTING

### Normal Use

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

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

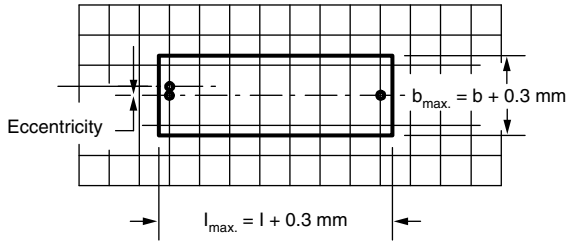
In order to withstand vibration and shock tests, it must be ensured that the stand-off pips are in good contact with the printed-circuit board:

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

### Space Requirements on Printed-Circuit Board

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

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




### Storage Temperature

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

### Ratings and Characteristics Reference Conditions

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

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



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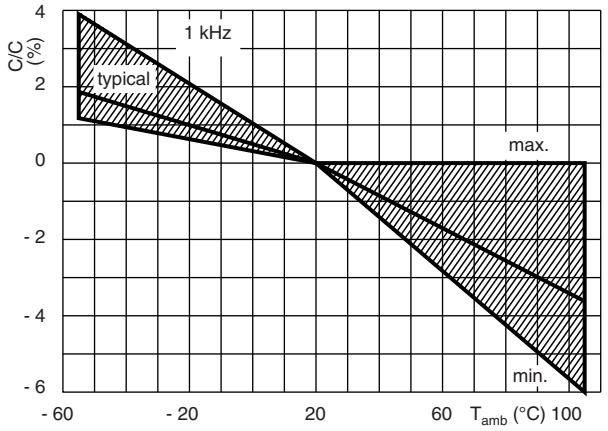
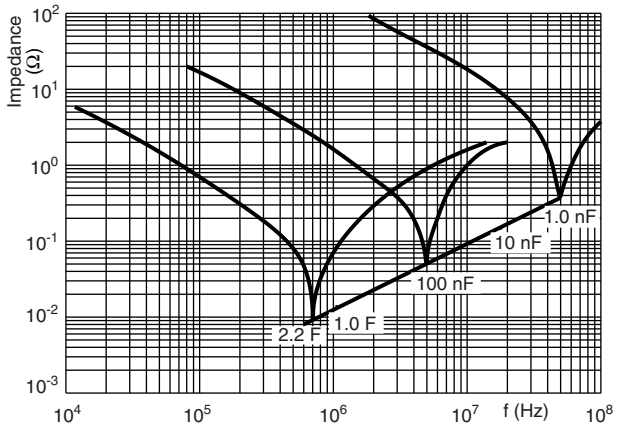
## CHARACTERISTICS

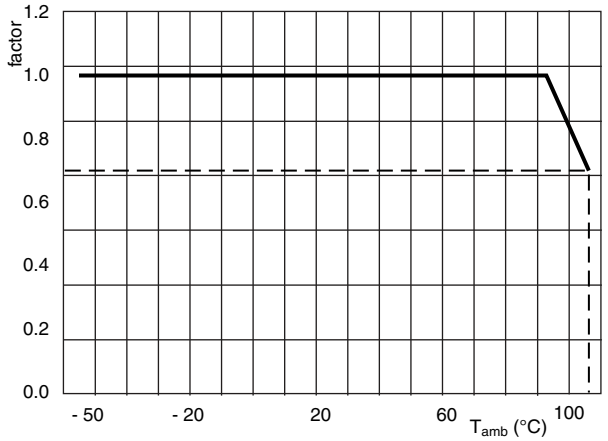
Capacitance as a function of ambient temperature (typical curve) (1 kHz)



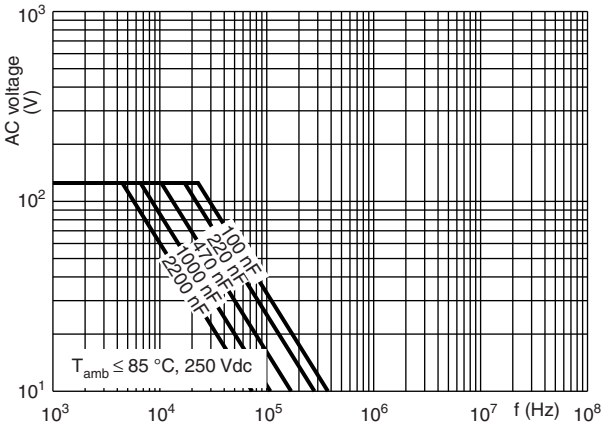

Impedance as a function of frequency (typical curve)



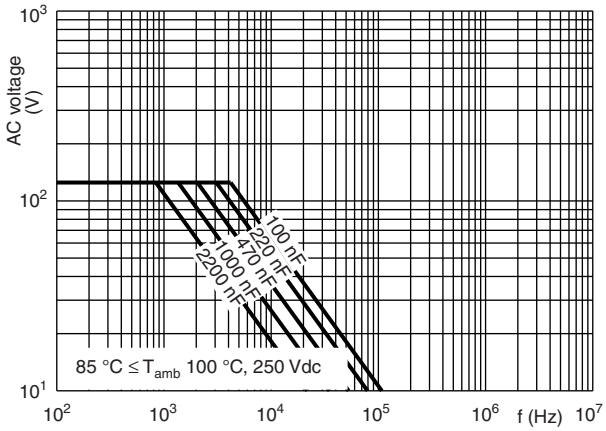

Max. DC and AC voltage as function of temperature




Max. RMS voltage as a function of frequency




Max. RMS voltage as a function of frequency



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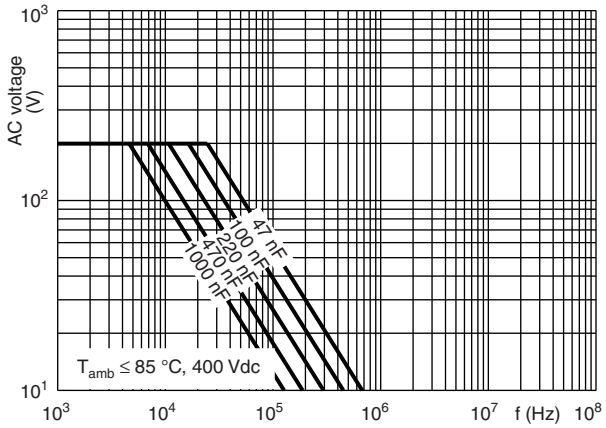
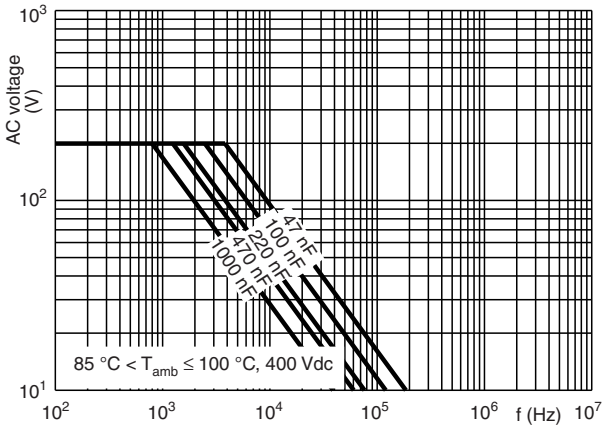
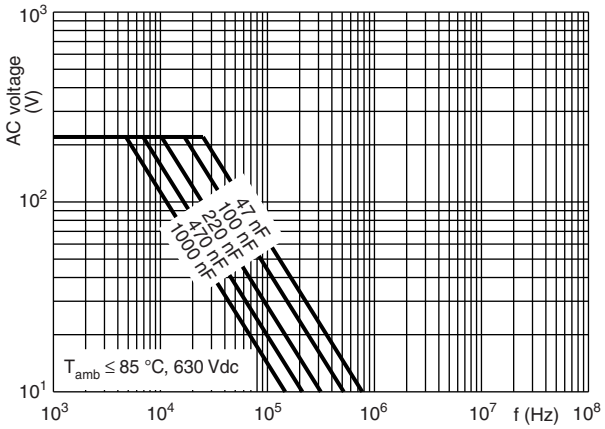
Max. RMS voltage as a function of frequency



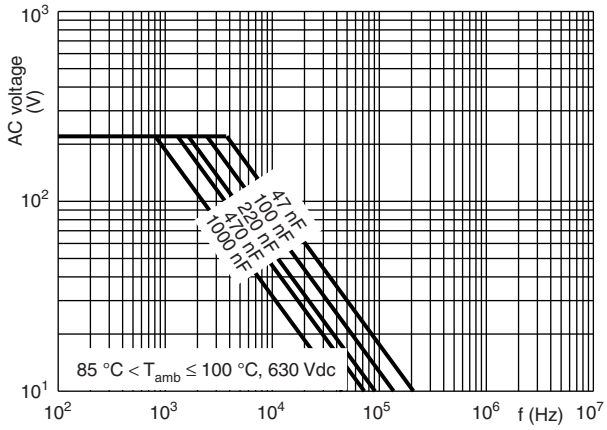

Max. RMS voltage as a function of frequency



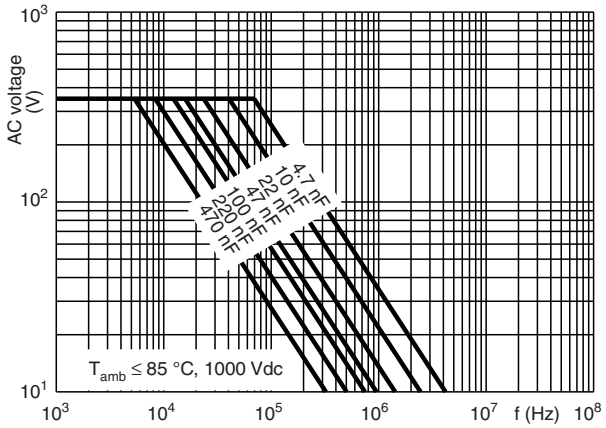

Max. RMS voltage as a function of frequency



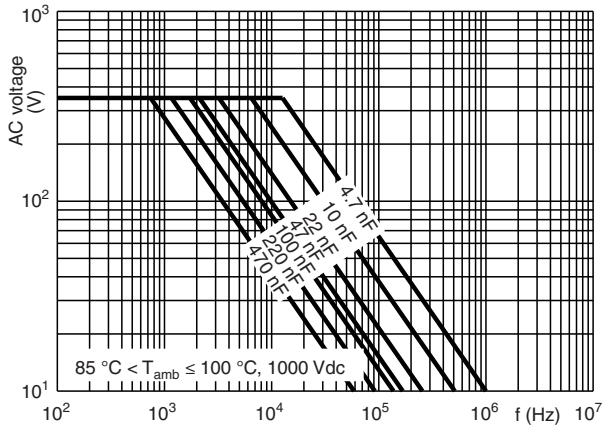

Max. RMS voltage as a function of frequency




Max. RMS voltage as a function of frequency




Max. RMS voltage as a function of frequency



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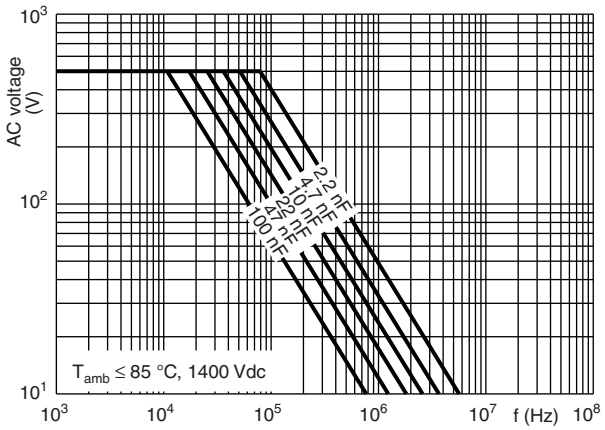
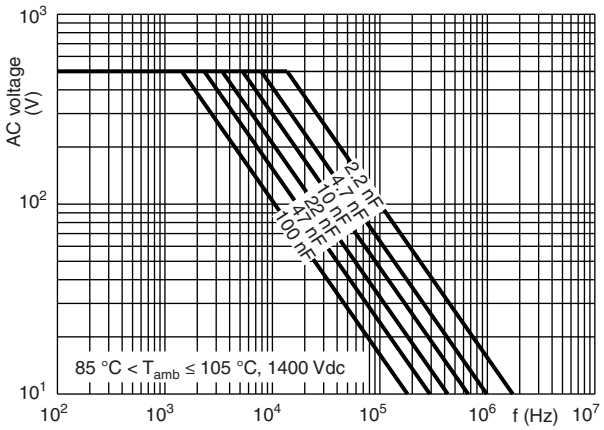
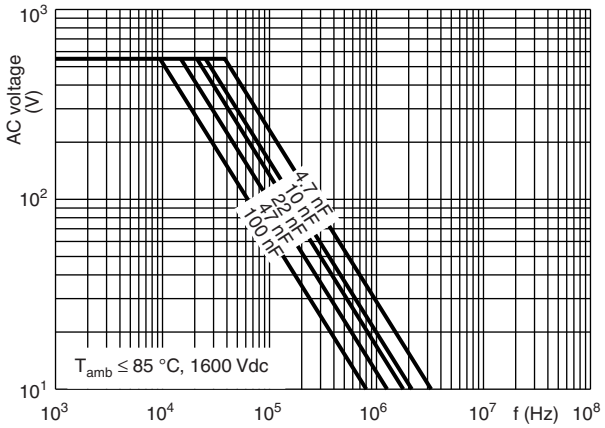
Max. RMS voltage as a function of frequency



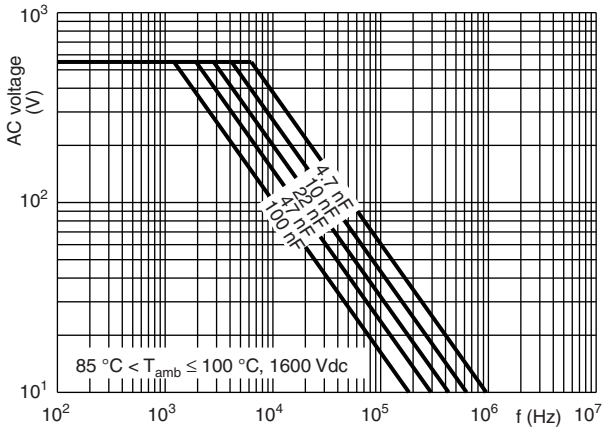

Max. RMS voltage as a function of frequency



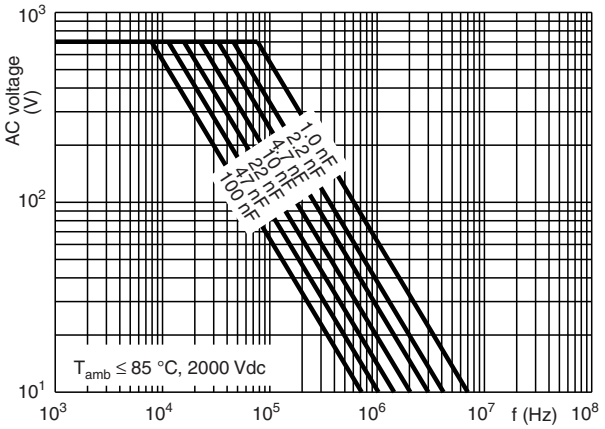

Max. RMS voltage as a function of frequency



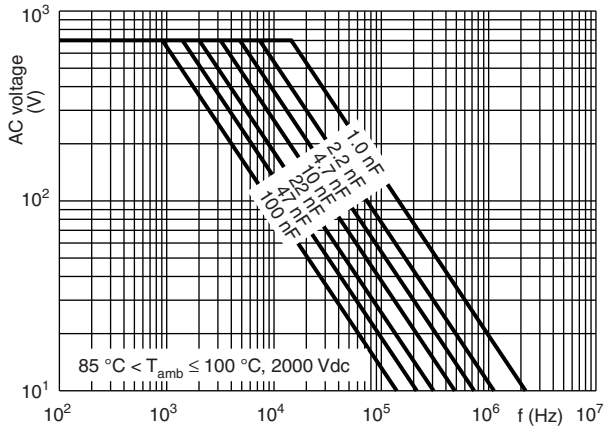

Max. RMS voltage as a function of frequency




Max. RMS voltage as a function of frequency




Max. RMS voltage as a function of frequency



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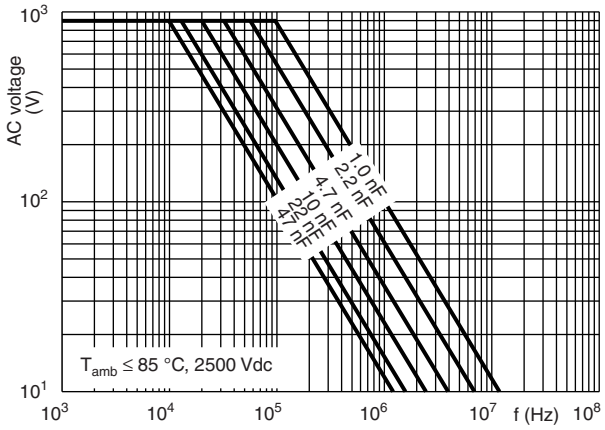
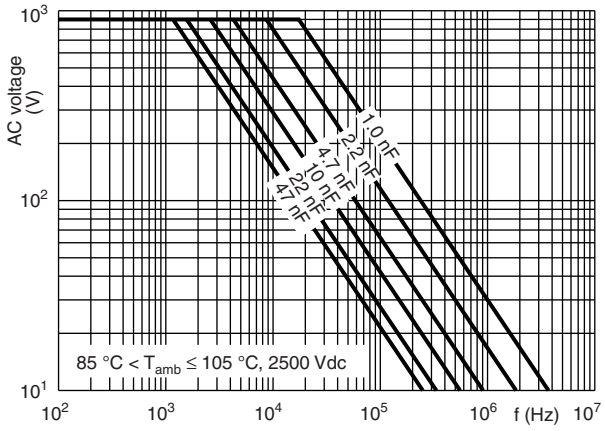
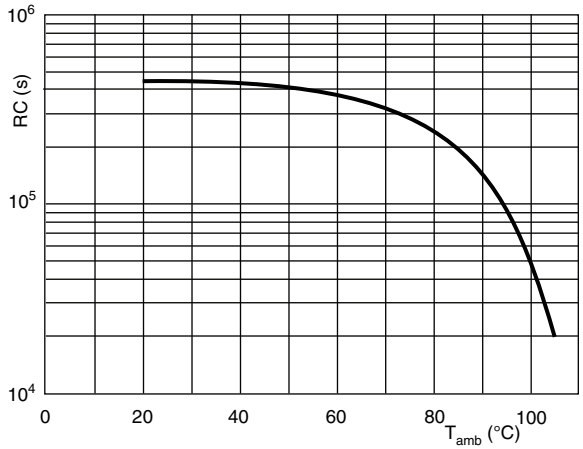
Max. RMS voltage as a function of frequency



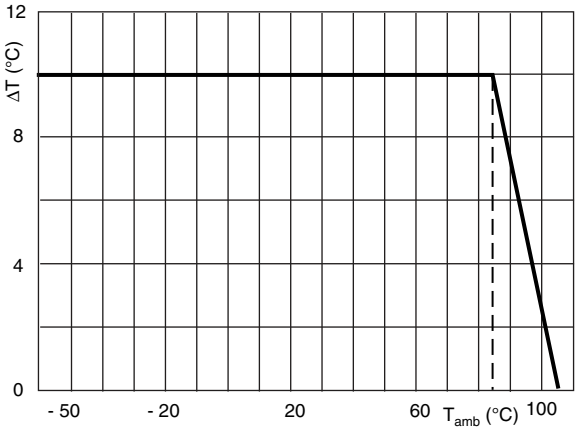

Max. RMS voltage as a function of frequency




Insulation resistance as a function of ambient temperature




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



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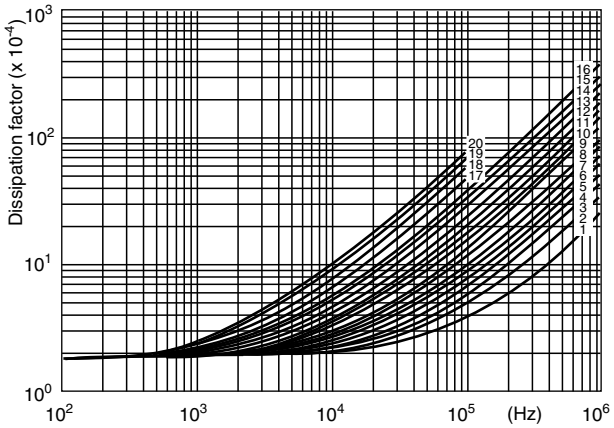
Tangent of loss angle as a function of frequency (typical curve)




| 250 V | 400 V | 630 V | 1000 V |
|---|---|---|---|
| C ≤ 0.091 µF, curve 8 | C ≤ 0.047 µF, curve 5 | C ≤ 0.033 µF, curve 4 | C ≤ 0.01 µF, curve 2 |
| C ≤ 0.015 µF, curve 9 | C ≤ 0.068 µF, curve 6 | C ≤ 0.068 µF, curve 5 | C ≤ 0.027 µF, curve 3 |
| C ≤ 0.022 µF, curve 10 | C ≤ 0.1 µF, curve 7 | C ≤ 0.1 µF, curve 6 | C ≤ 0.047 µF, curve 4 |
| C ≤ 0.027 µF, curve 11 | C ≤ 0.2 µF, curve8 | C ≤ 0.15 µF, curve 7 | C ≤ 0.062 µF, curve 5 |
| C ≤ 0.033 µF, curve 12 | C ≤ 0.24 µF, curve 12 | C ≤ 0.22 µF, curve 11 | C ≤ 0.075 µF, curve 6 |
| C ≤ 0.056 µF, curve 15 | C ≤ 0.36 µF, curve 13 | C ≤ 0.27 µF, curve 12 | C ≤ 0.1 µF, curve 7 |
| C ≤ 0.082 µF, curve 16 | C ≤ 0.43 µF, curve 14 | C ≤ 0.47 µF, curve 15 | C ≤ 0.15 µF, curve 8 |
| C ≤ 1.2 µF, curve 18 | C ≤ 0.56 µF, curve 16 | C ≤ 0.68 µF, curve 16 | C ≤ 0.22 µF, curve 9 |
| C ≤ 1.61 µF, curve 19 | C ≤ 1.1 µF, curve 17 | | C ≤ 0.3 µF, curve 10 |
| C ≤ 2.21 µF, curve 20 | | | C ≤ 0.39 µF, curve 11 |
| | | | C ≤ 0.47 µF, curve 12 |
| **140 V** | **1600 V** | **2000 V** | **2500 V** |
| C ≤ 0.0047 µF, curve 1 | C ≤ 0.0047 µF, curve 3 | C ≤ 0.0047 µF, curve 2 | C ≤ 0.0047 µF, curve 1 |
| C ≤ 0.016 µF, curve 2 | C ≤ 0.0091 µF, curve 4 | C ≤ 0.033 µF, curve 3 | C ≤ 0.015 µF, curve 2 |
| C ≤ 0.033 µF, curve 3 | C ≤ 0.068 µF, curve 5 | C ≤ 0.1 µF, curve 4 | C ≤ 0.056 µF, curve 3 |
| C ≤ 0.051 µF, curve 4 | C ≤ 0.01 µF, curve 6 | | |
| C ≤ 0.068 µF, curve 5 | C ≤ 0.15 µF, curve 7 | | |
| C ≤ 0.082 µF, curve 6 | | | |
| C ≤ 0.1 µF, curve 7 | | | |

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

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



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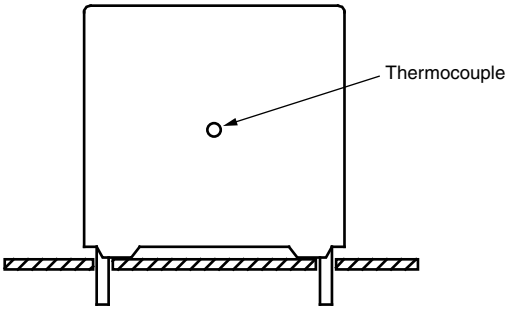
## POWER DISSIPATION AND MAXIMUM COMPONENT TEMPERATURE RISE

The power dissipation must be limited in order not to exceed the maximum allowed component temperature rise as a function of the free air ambient temperature.
The power dissipation can be calculated according type detail specification “HQN-384-01/101: Technical Information Film Capacitors”.
The component temperature rise ($\Delta T$) can be measured (see section “Measuring the component temperature” for more details) or calculated by $\Delta T = P/G$:

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

## MEASURING THE COMPONENT TEMPERATURE

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




The temperature is measured in unloaded ($T_{amb}$) and maximum loaded condition ($T_C$).
The temperature rise is given by $\Delta T = T_C - T_{amb}$.
To avoid radiation or convection, the capacitor should be tested in a wind-free box.

## APPLICATION NOTE AND LIMITING CONDITIONS

These capacitors are not suitable for mains applications as across-the-line capacitors without additional protection, as described hereunder. These mains applications are strictly regulated in safety standards and therefore electromagnetic interference suppression capacitors conforming the standards must be used.

To select the capacitor for a certain application, the following conditions must be checked:

1. The peak voltage ($U_P$) shall not be greater than the rated DC voltage ($U_{Rdc}$)
2. The peak-to-peak voltage ($U_{P-P}$) shall not be greater than $2\sqrt{2} \times U_{Rac}$ to avoid the ionisation inception level
3. The voltage pulse slope (dU/dt) shall not exceed the rated voltage pulse slope in an RC-circuit at rated voltage and without ringing. If the pulse voltage is lower than the rated DC voltage, the rated voltage pulse slope may be multiplied by $U_{Rdc}$ and divided by the applied voltage.
   For all other pulses following equation must be fulfilled:

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

   T is the pulse duration.

4. The maximum component surface temperature rise must be lower than the limits (see graph max. allowed component temperature rise).
5. Since in circuits used at voltages over 280 V peak-to-peak the risk for an intrinsically active flammability after a capacitor breakdown (short circuit) increases, it is recommended that the power to the component is limited to 100 times the values mentioned in the table: “Heat Conductivity”



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6. When using these capacitors as across-the-line capacitor in the input filter for mains applications or as series connected with an impedance to the mains the applicant must guarantee that the following conditions are fulfilled in any case (spikes and surge voltages from the mains included).

**Voltage Conditions for 6 Above**

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

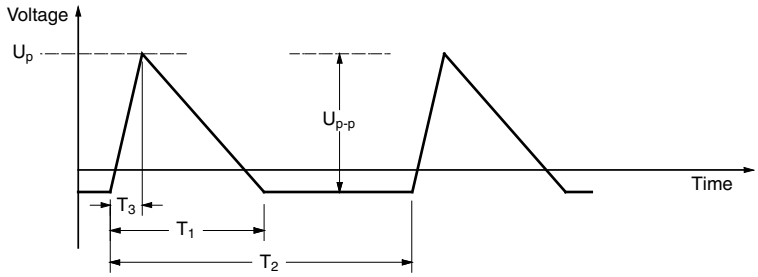
## EXAMPLE

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

Checking conditions:

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

**Voltage Signal**



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## INSPECTION REQUIREMENTS

**General Notes:**

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

**Group C Inspection Requirements**

| SUB-CLAUSE NUMBER AND TEST | CONDITIONS | PERFORMANCE REQUIREMENTS |
|---|---|---|
| **SUB-GROUP C1A PART OF SAMPLE OF SUB-GROUP C1** | | |
| 4.1 Dimensions (detail) | | As specified in chapters “General Data” of this specification |
| 4.3.1 Initial measurements | Capacitance<br>Tangent of loss angle:<br>For C ≤ 1 µF at 100 kHz or<br>for C > 1 µF at 10 kHz | |
| 4.3 Robustness of terminations | Tensile: Load 10 N; 10 s<br>Bending: Load 5 N; 4 x 90° | No visible damage |
| 4.4 Resistance to soldering heat | Method: 1A<br>Solder bath: 280 °C ± 5 °C<br>Duration: 10 s | |
| 4.14 Component solvent resistance | Isopropylalcohol at room temperature<br>Method: 2<br>Immersion time: 5 min ± 0.5 min<br>Recovery time: Min. 1 h, max. 2 h | |
| 4.4.2 Final measurements | Visual examination | No visible damage<br>Legible marking |
| | Capacitance | $\lvert\Delta C/C\rvert \leq 1$ % of the value measured initially |
| | Tangent of loss angle | Increase of tan $\delta$<br>≤ 0.0005 for: C ≤ 100 nF or<br>≤ 0.001 for: 100 nF < C ≤ 470 nF or<br>≤ 0.0015 for: C > 470 nF<br>Compared to values measured in 4.3.1 |
| **SUB-GROUP C1B OTHER PART OF SAMPLE OF SUB-GROUP C1** | | |
| 4.6.1 Initial measurements | Capacitance<br>Tangent of loss angle:<br>For C ≤ 1 µF at 100 kHz or<br>for C > 1 µF at 10 kHz | |
| 4.15 Solvent resistance of the marking | Isopropylalcohol at room temperature<br>Method: 1<br>Rubbing material: cotton wool | No visible damage<br>Legible marking |
| 4.6 Rapid change of temperature | Immersion time: 5.0 min ± 0.5 min<br>θA = - 55 °C<br>θB = + 105 °C<br>5 cycles<br>Duration t = 30 min | |
| 4.7 Vibration | Visual examination<br>Mounting: see section “Mounting” for more information<br>Procedure B4<br>Frequency range: 10 Hz to 55 Hz<br>Amplitude: 0.75 mm or<br>Acceleration 98 m/s²<br>(whichever is less severe)<br>Total duration 6 h | No visible damage |



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| SUB-CLAUSE NUMBER AND TEST | CONDITIONS | PERFORMANCE REQUIREMENTS |
|---|---|---|
| **SUB-GROUP C1B OTHER PART OF SAMPLE OF SUB-GROUP C1** | | |
| 4.7.2 Final inspection | Visual examination | No visible damage |
| 4.9 Shock | Mounting:<br>See section “Mounting” for more information<br>Pulse shape: Half sine<br>Acceleration: 490 m/s²<br>Duration of pulse: 11 ms | |
| 4.9.3 Final measurements | Visual examination | No visible damage |
| | Capacitance | $\lvert\Delta C/C\rvert \leq 1$ % of the value measured in 4.6.1 |
| | Tangent of loss angle | Increase of tan $\delta$<br>$\leq 0.0005$ for: $C \leq 100$ nF or<br>$\leq 0.001$ for: 100 nF $< C \leq 470$ nF or<br>$\leq 0.0015$ for: $C > 470$ nF<br>Compared to values measured in 4.6.1 |
| | Insulation resistance | As specified in section “Insulation Resistance” of this specification |
| **SUB-GROUP C1 COMBINED SAMPLE OF SPECIMENS OF SUB-GROUPS C1A AND C1B** | | |
| 4.10 Climatic sequence | | |
| 4.10.2 Dry heat | Temperature: + 105 °C<br>Duration: 16 h | |
| 4.10.3 Damp heat cyclic<br>Test Db, first cycle | | |
| 4.10.4 Cold | Temperature: - 55 °C<br>Duration: 2 h | |
| 4.10.6 Damp heat cyclic<br>Test Db, remaining cycles | | |
| 4.10.6.2 Final measurements | Voltage proof = $U_{Rdc}$ for 1 min within 15 min after removal from testchamber | No breakdown of flash-over |
| | Visual examination | No visible damage<br>Legible marking |
| | Capacitance | For original pitch = 22.5 mm and 27.5 mm:<br>$\lvert\Delta C/C\rvert \leq 3$ % of the value measured in 4.4.2 or 4.9.3 |
| | Tangent of loss angle | Increase of tan $\delta$<br>$\leq 0.0005$ for: $C \leq 100$ nF or<br>$\leq 0.001$ for: 100 nF $< C \leq 470$ nF or<br>$\leq 0.0015$ for: $C > 470$ nF<br>Compared to values measured in 4.3.1 or 4.6.1 |
| | Insulation resistance | $\geq 50$ % of values specified in section “Insulation Resistance” of this specification |
| **SUB-GROUP C2** | | |
| 4.11 Damp heat steady state | 56 days, 40 °C, 90 % to 95 % RH<br>no load | |
| 4.11.1 Initial measurements | Capacitance<br>Tangent of loss angle at 1 kHz | |
| 4.11.3 Final measurements | Voltage proof = $U_{Rdc}$ for 1 min within 15 min after removal from testchamber | No breakdown of flash-over |
| | Visual examination | No visible damage<br>Legible marking |
| | Capacitance | $\lvert\Delta C/C\rvert \leq 1$ % of the value measured in 4.11.1. |
| | Tangent of loss angle | Increase of tan $\delta$<br>$\leq 0.0005$ for: $C \leq 100$ nF or<br>$\leq 0.001$ for: 100 nF $< C \leq 470$ nF or<br>$\leq 0.0015$ for: $C \leq 470$ nF<br>Compared to values measured in 4.11.1 |
| | Insulation resistance | $\geq 50$ % of values specified in section “Insulation Resistance” of this specification |



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| SUB-CLAUSE NUMBER AND TEST | CONDITIONS | PERFORMANCE REQUIREMENTS |
|---|---|---|
| **SUB-GROUP C3A** | | |
| 4.12.1 Endurance test at 50 Hz alternating voltage | Duration: 2000 h<br>1.25 x $U_{Rdc}$ at 105 °C | |
| 4.12.1.1 Initial measurements | Capacitance<br>Tangent of loss angle:<br>For C ≤ 1 µF at 100 kHz or<br>for C > 1 µF at 10 kHz | |
| 4.12.1.3 Final measurements | Visual examination | No visible damage<br>Legible marking |
| | Capacitance | \|ΔC/C\| ≤ 5 % compared to values measured in 4.12.1.1 |
| | Tangent of loss angle | Increase of tan δ<br>≤ 0.0005 for: C ≤ 100 nF or<br>≤ 0.001 for: 100 nF < C ≤ 470 nF or<br>≤ 0.0015 for: C > 470 nF<br>Compared to values measured in 4.12.1.1 |
| | Insulation resistance | ≥ 50 % of values specified in section "Insulation Resistance" of this specification |
| **SUB-GROUP C4** | | |
| 4.2.6 Temperature charcteristics<br>Initial measurements<br>Intermediate measurements<br><br>Final measurements | Capacitance<br>Capacitance at - 55 °C<br>Capacitance at 20 °C<br>Capacitance at + 105 °C<br>Capacitance<br><br>Insulation resistance | For - 55 °C to + 20 °C:<br>+ 1 % ≤ \|ΔC/C\| ≤ 3.75 % or<br>for 20 °C to 105 °C:<br>- 6 % ≤ \|ΔC/C\| ≤ 0 %<br>As specified in section "Capacitance" of this specification.<br>As specified in section "Insulation Resistance" of this specification |
| 4.13 Charge and discharge | 10 000 cycles<br>Charged to $U_{Rdc}$<br>Discharge resistance:<br>$R = \frac{U_{Rdc}}{5 \times C \times (2.5 \times dU/dt)}$ | |
| 4.13.1 Initial measurements | Capacitance<br>Tangent of loss angle:<br>For C ≤ 1 µF at 100 kHz or<br>for C > 1 µF at 10 kHz | |
| 4.13.3 Final measurements | Capacitance | \|ΔC/C\| ≤ 1 % compared to values measured in 4.13.1 |
| | Tangent of loss angle | Increase of tan δ<br>≤ 0.0005 for: C ≤ 100 nF or<br>≤ 0.001 for: 100 nF < C ≤ 470 nF or<br>≤ 0.0015 for: C > 470 nF<br>Compared to values measured in 4.13.1 |
| | Insulation resistance | ≥ 50 % of values specified in section "Insulation Resistance" of this specification |



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- Техническая поддержка проекта;
- Защита от снятия компонента с производства.

**Как с нами связаться**

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