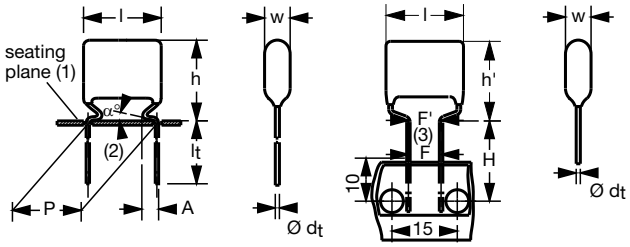
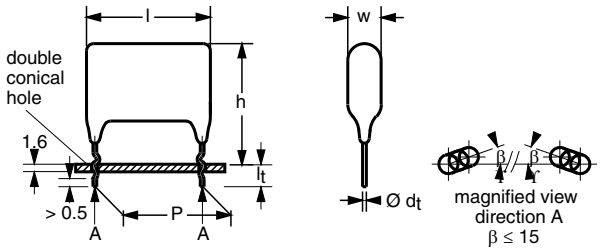
# AC and Pulse Metallized Polypropylene Film Capacitors
# KP/MKP Radial Lacquered Type




Dimensions in mm
(1) Hole Ø 1.3 for $d_t$ = 0.8 mm
(2) $0 \leq \alpha < 50°$
(3) $|F - F'| < 0.3$ mm
F = 7.5 + 0.6 / - 0.1 mm
(4) A = 2.0 + 1.0 / - 0.5 mm for 10 mm pitch
A = 2.5 + 1.5 / - 0.5 mm for 15 mm pitch
A = 2.5 + 1.4 / - 0.5 mm for pitch > 22.5 mm




Dimensions in mm

## APPLICATIONS
Where high currents and steep pulses occur. For deflection circuits in television sets.

## REFERENCE SPECIFICATIONS
IEC 60384-17

## MARKING
C-value; tolerance; rated voltage; manufacturer's type; manufacturer's location

## DIELECTRIC
Polypropylene film

## ELECTRODES
Metallized and aluminum

## CONSTRUCTION
Internal serial construction

## RATED (DC) VOLTAGE
630 V, 1000 V, 1600 V, 2000 V

## RATED (AC) VOLTAGE
300 V, 400 V, 500 V, 600 V

## RATED PEAK-TO-PEAK VOLTAGE
850 V, 1100 V, 1400 V, 1700 V

## FEATURES
- 10 mm to 27.5 mm pitch
- Supplied loose in box (including lock lead versions) and taped
- Bent back version for automatic insertion available
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e3

RoHS COMPLIANT

## ENCAPSULATION
Flame retardant epoxy material
(Class UL 94 V-0)

## CLIMATIC TESTING CLASS ACCORDING TO IEC 60068-1
55/105/56

## CAPACITANCE RANGE (E24 SERIES)
0.1 nF to 270 nF

## CAPACITANCE TOLERANCE
± 5 %; ± 3.5 %

## LEADS
Tinned wire

## RATED TEMPERATURE
85 °C

## MAXIMUM APPLICATION TEMPERATURE
105 °C

## PERFORMANCE GRADE
for C > 5.6 nF: grade 1 (long life)
for C ≤ 5.6 nF: grade 2

## STABILITY GRADE
Grade 2

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



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## COMPOSITION OF CATALOG NUMBER

| TYPE AND PITCHES | |
|---|---|
| 375 | 10.0 mm/7.5 mm |
| | 15.0 mm/7.5 mm |
| | 10.0 mm |
| | 15.0 mm |
| | 22.5 mm |
| | 27.5 mm |

**CAPACITANCE (numerically; but not for lock lead)**

| MULTIPLIER (nF) | |
|---|---|
| 0.01 | 1 |
| 0.1 | 2 |
| 1 | 3 |
| 10 | 4 |

Example:
104 = 10 x 10 = 100 nF

| | | | | |
|---|---|---|---|---|
| BFC2 | 375 | XX | YY | Y |
| 2222 (1) | 375 | XX | YY | Y |

(1) old ordering number

| TYPE | PACKAGING | LEAD CONFIGURATION | C-TOL. | 630 V | 1000 V | 1600 V | 2000 V |
|---|---|---|---|---|---|---|---|
| | | | | PREFERRED TYPES | | | |
| 375 | Loose in box | Lead length 5.0 mm ± 1.0 mm | ± 5 % | 14 | 24 | 34 | 44 |
| | | Lock lead 4.0 mm + 1.0/- 0.5 mm | ± 5 % | 90 | 90 | 90 | 90 |
| | Taped on reel (2) (bent back) | H = 16.0 mm; $P_0$ = 15.0 mm; Reel diameter 500 mm | ± 5 % | 16 | 26 | 36 | 46 |
| | | | | Dimensions of this code numbers stays between brackets | | | |
| | | | | ON REQUEST | | | |
| 375 | Loose in box | Lead length 5.0 ± 1.0 mm | ± 3.5 % | 15 | 25 | 35 | 45 |
| | | Lead length 3.5 ± 0.5 mm | ± 5 % | 10 | 20 | 30 | 40 |
| | | | ± 3.5 % | 11 | 21 | 31 | 41 |
| | Taped on reel (2) | H = 16.0 mm; $P_0$ = 12.7 mm; Reel diameter = 500 mm | ± 5 % | 12 | 22 | 32 | 42 |
| | | | ± 3.5 % | 13 | 23 | 33 | 43 |
| | Taped on reel (2) (bent back) | H = 16.0 mm; $P_0$ = 15.0 mm; Reel diameter = 500 mm | ± 3.5 % | 17 | 27 | 37 | 47 |
| | | | | Dimensions of this code numbers stays between brackets | | | |
| | | H = 16.0 mm; $P_0$ = 15.0 mm; Reel diameter = 356 mm | ± 5 % | 18 | 28 | 38 | 48 |

**Note**

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

## SPECIFIC REFERENCE DATA (630 $V_{DC}$)

| DESCRIPTION | VALUE | |
|---|---|---|
| Tangent of loss angle at (x $10^{-4}$) | 10 kHz | 100 kHz |
| Pitch = 10 mm, 15 mm, and 7.5 mm (bent back) | ≤ 6 | ≤ 10 |
| Pitch = 22.5 mm | ≤ 8 | ≤ 15 |
| Pitch = 27.5 mm | ≤ 8 | ≤ 20 |
| Rated voltage pulse slope $(dU/dt)_R$: | | |
| Pitch = 10 mm | 15 000 V/µs | |
| Pitch = 15 mm and 7.5 mm (bent back) | 8000 V/µs | |
| Pitch = 22.5 mm | 2800 V/µs | |
| Pitch = 27.5 mm | 1900 V/µs | |
| R between leads at 500 V, 1 min | > 100 000 MΩ | |
| R between interconnected leads and case, 500 V, 1 min | > 100 000 MΩ | |
| Ionization (AC) voltage (typical value) at 50 pC peak discharge<br>at 50 pC peak discharge<br>at 20 pC peak discharge | > 400 V | |
| Withstanding (DC) voltage (cut off current 10 mA), rise time 1000 V/s<br>for C ≤ 47 nF<br>for C > 47 nF | 1008 V, 1 min | |
| Withstanding (DC) voltage between leads and case | 2840 V, 1 min | |
| Maximum application temperature | 105 °C | |


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## $U_{RDC}$ = 630 V; $U_{RAC}$ = 300 V; $U_{PP}$ = 850 V (KINKED); C-TOL. = ± 5 %

| C | DIMENSIONS w x h (h') x l (mm) | MASS (g) (1) | CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING | | | | |
|---|---|---|---|---|---|---|---|
| | | | LOOSE IN BOX | REEL | | | C VALUE |
| | | | LEADS 5 mm ± 1.0 mm | ORIGINAL PITCH | PITCH = 7.5 mm (BENT BACK) | | ..YYY |
| | | | | Ø 500 mm | Ø 500 mm | Ø 356 mm | |
| | | | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | |
| C (pF) | PITCH = 10.0 mm ± 0.4 mm; $d_t$ = 0.60 mm ± 0.06 mm | | | PITCH = 10.0 mm | PITCH = 7.5 mm (BENT BACK) | | |
| 680 | 5.0 x 13.0 x 14.5 | 0.65 | **14...** (2000) | **12...** (1200) | | | **681** |
| 750 | | | | | | | **751** |
| 820 | 5.5 x 13.5 x 14.5 | 0.70 | **14...** (2000) | **12...** (1100) | | | **821** |
| 910 | | | | | | | **911** |
| 1000 | | | | | | | **102** |
| 1100 | | 0.75 | | | | | **112** |
| 1200 | | | | | | | **122** |
| 1300 | | | | | | | **132** |
| 1500 | | 0.80 | | | | | **152** |
| 1600 | | 0.85 | | | | | **162** |
| 1800 | 6.0 x 14.0 x 14.5 | 0.80 | **14...** (1750) | **12...** (1000) | | | **182** |
| 2000 | | 0.85 | | | | | **202** |
| 2200 | | 0.90 | | | | | **222** |
| 2400 | | 1.0 | | | | | **242** |
| 2700 | 6.5 x 14.5 x 14.5 | 1.1 | **14...** (1500) | **12...** (900) | | | **272** |

**Notes**

- SPQ = Standard Packing Quantity

(1) Net weight for short lead product only



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## $U_{RDC}$ = 630 V; $U_{RAC}$ = 300 V; $U_{PP}$ = 850 (KINKED); C-TOL. = ± 5 %

| C | DIMENSIONS w x h (h') x l (mm) | MASS (g) (1) | CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING | | | | |
|---|---|---|---|---|---|---|---|
| | | | LOOSE IN BOX | REEL | | | C VALUE |
| | | | LEADS 5 mm ± 1.0 mm | ORIGINAL PITCH | PITCH = 7.5 mm (BENT BACK) | | ..YYY |
| | | | | Ø 500 mm | Ø 500 mm | Ø 356 mm | |
| | | | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | |
| C (pF) | PITCH = 15.0 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm | | | | PITCH = 7.5 mm (BENT BACK) | | |
| 3000<br>3300 | 5.0 x 14.0 (16.0) x 18.5 | 1.0 | **14...**<br>(2000) | **12...**<br>(1200) | **16...**<br>(1000) | **18...**<br>(550) | **302**<br>**332** |
| 3600<br>3900<br>4300<br>4700<br>5100<br>5600 | 5.5 x 14.5 (16.0) x 18.5 | 1.1 | **14...**<br>(2000) | **12...**<br>(1100) | **16...**<br>(900) | **18...**<br>(500) | **362**<br>**392**<br>**432**<br>**472**<br>**512**<br>**562** |
| 6200<br>6800<br>7500<br>8200<br>9100<br>10 000<br>11 000<br>12 000<br>13 000<br>15 000<br>16 000 | 6.0 x 15.0 (16.0) x 18.5 | 1.2 | **14...**<br>(2000) | **12...**<br>(1000) | **16...**<br>(800) | **18...**<br>(450) | **622**<br>**682**<br>**752**<br>**822**<br>**912**<br>**103**<br>**113**<br>**123**<br>**133**<br>**153**<br>**163** |
| 18 000<br>20 000 | 6.5 x 15.5 (17.0) x 18.5 | 1.3 | **14...**<br>(1500) | **12...**<br>(900) | **16...**<br>(750) | **18...**<br>(400) | **183**<br>**203** |
| 22 000 | 7.0 x 16.0 (17.5) x 18.5 | 1.5 | **14...**<br>(1500) | **12...**<br>(800) | **16...**<br>(700) | **18...**<br>(400) | **223** |
| 24 000 | 7.5 x 16.5 (18.0) x 18.5 | 1.6 | **14...**<br>(1250) | **12...**<br>(800) | **16...**<br>(650) | **18...**<br>(350) | **243** |
| 27 000<br>30 000 | 8.0 x 17.0 (18.5) x 18.5 | 1.9 | **14...**<br>(1250) | **12...**<br>(750) | **16...**<br>(600) | **18...**<br>(350) | **273**<br>**303** |
| 33 000 | 8.5 x 17.5 (19.0) x 18.5 | 2 | **14...**<br>(1000) | **12...**<br>(700) | **16...**<br>(550) | **18...**<br>(300) | **333** |
| 36 000<br>39 000 | 9.0 x 18.5 (20.0) x 18.5 | 2.3 | **14...**<br>(900) | **12...**<br>(600) | **16...**<br>(500) | **18...**<br>(300) | **On request** |
| C (µF) | PITCH = 22.5 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm | | | PITCH = 22.5 mm | PITCH = 7.5 mm (BENT BACK) | | |
| 0.036<br>0.039<br>0.043<br>0.047<br>0.051<br>0.056<br>0.062 | 7.0 x 20.0 x 26.0 | 2.7 | **14...**<br>(650) | - | - | - | **363**<br>**393**<br>**433**<br>**473**<br>**513**<br>**563**<br>**623** |
| 0.068 | 7.5 x 20.5 x 26.0 | 3 | **14...**<br>(600) | - | - | - | **683** |
| 0.075<br>0.082 | 8.0 x 21.0 x 26.0 | 3.3 | **14...**<br>(550) | - | - | - | **753**<br>**823** |
| 0.091 | 8.5 x 21.5 x 26.0 | 3.8 | **14...**<br>(500) | - | - | - | **913** |
| 0.1 | 9.0 x 22.0 x 26.0 | 4 | **14...**<br>(450) | - | - | - | **104** |

**Notes**

- SPQ = Standard Packing Quantity

(1) Net weight for short lead product only



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## $U_{RDC}$ = 630 V; $U_{RAC}$ = 300 V; $U_{PP}$ = 850 (KINKED); C-TOL. = ± 5 %

| C | DIMENSIONS w x h (h') x l (mm) | MASS (g) (1) | CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING | | | | |
|---|---|---|---|---|---|---|---|
| | | | LOOSE IN BOX | REEL | | | C VALUE |
| | | | LEADS 5 mm ± 1.0 mm | ORIGINAL PITCH | PITCH = 7.5 mm (BENT BACK) | | ..YYY |
| | | | | Ø 500 mm | Ø 500 mm | Ø 356 mm | |
| | | | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | |
| C (µF) | PITCH = 22.5 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm | | | PITCH = 22.5 mm | PITCH = 7.5 mm (BENT BACK) | | |
| 0.11 | 9.5 x 22.5 x 26.0 | 4.3 | **14...** (400) | - | - | - | **114** |
| 0.12 | 10.0 x 23.0 x 26.0 | 4.7 | **14...** (400) | | | | **124** |
| C (µF) | PITCH = 27.5 mm ± 0.5 mm; $d_t$ = 0.80 mm ± 0.08 mm | | | PITCH = 27.5 mm | PITCH = 7.5 mm (BENT BACK) | | |
| 0.13 | 9.5 x 22.5 x 30.0 | 4.7 | **14...** (500) | - | - | - | **134** |
| 0.15 | 10.0 x 23.0 x 30.0 | 5.2 | **14...** (500) | | | | **154** |
| 0.16 | 10.5 x 23.5 x 30.0 | 5.5 | **14...** (450) | | | | **164** |
| 0.18 | 11.0 x 24.0 x 30.0 | 6 | **14...** (400) | | | | **184** |
| 0.2 | 11.5 x 24.5 x 30.0 | 6.6 | **14...** (400) | | | | **204** |
| 0.22 | 12.5 x 25.5 x 30.0 | 7.1 | **14...** (350) | | | | **224** |
| 0.24 | 13.0 x 26.0 x 30.0 | 7.7 | **14...** (300) | | | | **244** |
| 0.27 | 13.5 x 26.5 x 30.0 | 8.5 | **14...** (300) | | | | **274** |

**Notes**

- Loose in box, all lengths have same SPQ
- SPQ = Standard Packing Quantity

(1) Net weight for short lead product only

## $U_{RDC}$ = 630 V; $U_{RAC}$ = 300 V; $U_{PP}$ = 850 V (LOCK LEAD); C-TOL. = ± 5 %

| C | DIMENSIONS w x h (h') x l (mm) | MASS (g) (1) | CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING | |
|---|---|---|---|---|
| | | | LOOSE IN BOX | |
| | | | $l_t$ = 4.0 mm + 1.0 mm/- 0.5 mm | |
| | | | | (SPQ) |
| C (pF) | PITCH = 10.0 mm ± 1.0 mm; $d_t$ = 0.60 mm ± 0.06 mm | | | |
| 680 | 5.0 x 16.0 x 14.5 | 0.65 | **90308** | (2000) |
| 750 | | | **90309** | |
| 820 | 5.5 x 16.5 x 14.5 | 0.7 | **90311** | (2000) |
| 910 | | 0.7 | **90312** | |
| 1000 | | 0.7 | **90313** | |
| 1100 | | 0.75 | **90314** | |
| 1300 | | 0.75 | **90316** | |
| 1500 | | 0.80 | **90317** | |
| 1600 | | 0.85 | **90318** | |
| 1800 | 6.0 x 17.0 x 14.5 | 0.80 | **90319** | (1750) |
| 2000 | | 0.85 | **90321** | |
| 2200 | | 0.90 | **90322** | |
| 2400 | | 1.0 | **90323** | |
| 2700 | 6.5 x 17.5 x 14.5 | 1.1 | **90324** | (1500) |

**Notes**

- SPQ = Standard Packing Quantity

(1) Net weight for short lead product only


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## $U_{RDC}$ = 630 V; $U_{RAC}$ = 300 V; $U_{PP}$ = 850 V (LOCK LEAD); C-TOL. = ± 5 %

| C | DIMENSIONS w x h (h') x l (mm) | MASS (g) (1) | CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING | |
|---|---|---|---|---|
| | | | LOOSE IN BOX | |
| | | | $l_t$ = 4.0 mm + 1.0 mm/- 0.5 mm | |
| | | | | (SPQ) |
| **C (pF)** | **PITCH = 15.0 mm ± 1.0 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | |
| 3000 | 5.0 x 17.0 x 18.5 | 1 | **90325** | (2000) |
| 3300 | | | **90326** | |
| 3600 | 5.5 x 17.5 x 18.5 | 1.1 | **90327** | (2000) |
| 3900 | | | **90328** | |
| 4300 | | | **90329** | |
| 4700 | | | **90331** | |
| 5100 | | | **90332** | |
| 5600 | | | **90333** | |
| 6200 | 6.0 x 18.0 x 18.5 | 1.3 | **90334** | (2000) |
| 6800 | | | **90335** | |
| 7500 | | | **90336** | |
| 8200 | | | **90337** | |
| 9100 | | | **90338** | |
| 10 000 | | | **90339** | |
| 11 000 | | | **90236** | |
| 12 000 | | | **90341** | |
| 13 000 | | | **90342** | |
| 15 000 | | | **90343** | |
| 16 000 | | | **90344** | |
| 18 000 | 6.5 x 18.5 x 18.5 | 1.4 | **90218** | (1750) |
| 20 000 | | | **90345** | |
| 22 000 | 7.0 x 19.0 x 18.5 | 1.5 | **90219** | (1500) |
| 24 000 | 7.5 x 19.5 x 18.5 | 1.6 | **90221** | (1400) |
| 27 000 | 8.0 x 20.0 x 18.5 | 1.9 | **90223** | (1250) |
| 30 000 | | | **90346** | |
| 33 000 | 8.5 x 20.5 x 18.5 | 2 | **90347** | (1200) |
| 36 000 | 9.0 x 21.5 x 18.5 | 2.3 | **On request** | (1000) |
| 39 000 | | | | |
| **C (µF)** | **PITCH = 22.5 mm ± 1.0 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | |
| 0.036 | 7.0 x 23.0 x 26.0 | 2.7 | **90348** | (600) |
| 0.039 | | | **90349** | |
| 0.043 | | | **90351** | |
| 0.047 | | | **90352** | |
| 0.051 | | | **90353** | |
| 0.056 | | | **90354** | |
| 0.062 | | | **90355** | |
| 0.068 | 7.5 x 23.5 x 26.0 | 3 | **90356** | (550) |
| 0.075 | 8.0 x 24.0 x 26.0 | 3.3 | **90357** | (500) |
| 0.082 | | | **90358** | |
| 0.091 | 8.5 x 24.5 x 26.0 | 3.8 | **90359** | (450) |


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| C | DIMENSIONS w x h (h') x l (mm) | MASS (g) (1) | CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING | |
|---|---|---|---|---|
| | | | LOOSE IN BOX | |
| | | | $l_t$ = 4.0 mm + 1.0 mm/- 0.5 mm | |
| | | | | (SPQ) |
| **C (µF)** | **PITCH = 22.5 mm ± 1.0 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | |
| 0.1 | 9.0 x 25.0 x 26.0 | 4.0 | **90361** | (450) |
| 0.11 | 9.5 x 25.5 x 26.0 | 4.3 | **90362** | (400) |
| 0.12 | 10.0 x 26.0 x 26.0 | 4.7 | **90363** | (350) |
| **C (µF)** | **PITCH = 27.5 mm ± 1.0 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | |
| 0.13 | 9.5 x 25.5 x 30.0 | 4.7 | **90364** | (450) |
| 0.15 | 10.0 x 26.0 x 30.0 | 5.2 | **90365** | (400) |
| 0.16 | 10.5 x 26.5 x 30.0 | 5.5 | **90366** | (350) |
| 0.18 | 11.0 x 27.0 x 30.0 | 6.0 | **90367** | (350) |
| 0.2 | 11.5 x 27.5 x 30.0 | 6.6 | **90368** | (350) |
| 0.22 | 12.5 x 28.5 x 30.0 | 7.1 | **90369** | (300) |
| 0.24 | 13.0 x 29.0 x 30.0 | 7.7 | **90371** | (250) |
| 0.27 | 13.5 x 29.5 x 30.0 | 8.5 | **90372** | (250) |

**Notes**

- SPQ = Standard Packing Quantity

(1) Net weight for short lead product only

## SPECIFIC REFERENCE DATA (1000 $V_{DC}$)

| DESCRIPTION | VALUE | |
|---|---|---|
| Tangent of loss angle at (x $10^{-4}$) | 10 kHz | 100 kHz |
| Pitch = 10 mm, 15 mm, and 7.5 mm (bent back) | ≤ 6 | ≤ 10 |
| Pitch = 22.5 mm | ≤ 8 | ≤ 15 |
| Pitch = 27.5 mm | ≤ 8 | ≤ 20 |
| Rated voltage pulse slope ($dU/d_t$): | | |
| Pitch = 10 mm | 27 000 V/µs | |
| Pitch = 15 mm and 7.5 mm (bent back) | 15 000 V/µs | |
| Pitch = 22.5 mm | 5000 V/µs | |
| Pitch = 27.5 mm | 3300 V/µs | |
| R between leads at 500 V, 1 min | > 100 000 MΩ | |
| R between interconnected leads and case, 500 V, 1 min | > 100 000 MΩ | |
| Ionization (AC) voltage (typical value)<br>at 50 pC peak discharge<br>at 20 pC peak discharge | > 500 V | |
| Withstanding (DC) voltage (cut off current 10 mA), rise time 1000 V/s<br>for C ≤ 47 nF<br>for C > 47 nF | 1600 V, 1 min<br>[1.6 - (0.0364 x (C- 47))] x 1000 V, 1 min | |
| Withstanding (DC) voltage between leads and case | 2840 V, 1 min | |
| Maximum application temperature | 105 °C | |


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## $U_{RDC}$ = 1000 V; $U_{RAC}$ = 400 V; $U_{PP}$ = 1100 V (KINKED); C-TOL. = ± 5 %

| C | DIMENSIONS w x h (h') x l (mm) | MASS (g) (1) | CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING | | | | |
|---|---|---|---|---|---|---|---|
| | | | LOOSE IN BOX | REEL | | | C VALUE |
| | | | LEADS 5 mm ± 1.0 mm | ORIGINAL PITCH | PITCH = 7.5 mm (BENT BACK) | | ..YYY |
| | | | | Ø 500 mm | Ø 500 mm | Ø 356 mm | |
| | | | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | |
| C (pF) | PITCH = 10.0 mm ± 0.4 mm; $d_t$ = 0.60 mm ± 0.06 mm | | | PITCH = 10.0 mm | PITCH = 7.5 mm (BENT BACK) | | |
| 100 | 5.0 x 13.0 x 14.5 | 0.5 | **24…** (2000) | **22…** (1200) | - | - | **101** |
| 110 | | | | | | | **111** |
| 120 | | | | | | | **121** |
| 130 | | | | | | | **131** |
| 150 | 5.5 x 13.5 x 14.5 | 0.55 | **24…** (2000) | **22…** (1100) | - | - | **151** |
| 160 | | 0.55 | | | | | **161** |
| 180 | | 0.55 | | | | | **181** |
| 200 | | 0.55 | | | | | **201** |
| 220 | | 0.60 | | | | | **221** |
| 240 | | 0.60 | | | | | **241** |
| 270 | | 0.60 | | | | | **271** |
| 300 | | 0.60 | | | | | **301** |
| 330 | | 0.60 | | | | | **331** |
| 360 | | 0.60 | | | | | **361** |
| 390 | | 0.65 | | | | | **391** |
| 430 | | 0.70 | | | | | **431** |
| 470 | | 0.75 | | | | | **471** |
| 510 | | 0.75 | | | | | **511** |
| 560 | | 0.80 | | | | | **561** |
| 620 | | 0.80 | | | | | **621** |
| 680 | | 0.80 | | | | | **681** |
| 750 | | 0.70 | | | | | **751** |
| 820 | | 0.70 | | | | | **821** |
| 910 | | 0.70 | | | | | **911** |
| 1000 | 6.0 x 14.0 x 14.5 | 0.75 | **24…** (1750) | **22…** (1000) | - | - | **102** |
| 1100 | | 0.85 | | | | | **112** |
| 1200 | | 0.90 | | | | | **122** |
| 1300 | | 0.85 | | | | | **132** |
| 1500 | | 0.90 | | | | | **152** |
| C (pF) | PITCH = 15.0 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm | | | PITCH = 15.0 mm | PITCH = 7.5 mm (BENT BACK) | | |
| 1600 | 5.5 x 14.5 (16.0) x 18.5 | 1.1 | **24…** (2000) | **22…** (1100) | **26…** (900) | **28…** (500) | **162** |
| 1800 | | | | | | | **182** |
| 2000 | | | | | | | **202** |
| 2200 | | | | | | | **222** |
| 2400 | | | | | | | **242** |
| 2700 | 6.0 x 15.0 (16.5) x 18.5 | 1.2 | **24…** (2000) | **22…** (1000) | **26…** (800) | **28…** (450) | **272** |
| 3000 | | | | | | | **302** |
| 3300 | | | | | | | **332** |
| 3600 | | | | | | | **362** |
| 3900 | | | | | | | **392** |
| 4300 | | | | | | | **432** |
| 4700 | | | | | | | **472** |
| 5100 | | | | | | | **512** |
| 5600 | | | | | | | **562** |

**Notes**

- Loose in box, all lengths have same SPQ
- SPQ = Standard Packing Quantity

(1) Net weight for short lead product only



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## $U_{RDC}$ = 1000 V; $U_{RAC}$ = 400 V; $U_{PP}$ = 1100 V (KINKED); C-TOL. = ± 5 %

| C | DIMENSIONS w x h (h') x l (mm) | MASS (g) (1) | CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING | | | | |
|---|---|---|---|---|---|---|---|
| | | | LOOSE IN BOX | REEL | | | C VALUE |
| | | | LEADS 5 mm ± 1.0 mm | ORIGINAL PITCH | PITCH = 7.5 mm (BENT BACK) | | ..YYY |
| | | | | Ø 500 mm | Ø 500 mm | Ø 356 mm | |
| | | | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | |
| **C (pF)** | **PITCH = 15.0 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | **PITCH = 15.0 mm** | **PITCH = 7.5 mm (BENT BACK)** | | |
| 6200<br>6800 | 6.0 x 15.0 (16.5) x 18.5 | 1.2 | **24…**<br>(2000) | **22…**<br>(1000) | **26…**<br>(800) | **28…**<br>(450) | **622**<br>**682** |
| 7500<br>8200<br>9100 | 7.0 x 16.0 (17.5) x 18.5 | 1.4 | **24…**<br>(1500) | **22…**<br>(800) | **26…**<br>(700) | **28…**<br>(400) | **752**<br>**822**<br>**912** |
| 10 000 | 7.5 x 16.5 (18.0) x 18.5 | 1.6 | **24…**<br>(1250) | **22…**<br>(800) | **26…**<br>(650) | **28…**<br>(350) | **103** |
| 11 000<br>12 000 | 8.0 x 17.0 (18.5) x 18.5 | 1.8 | **24…**<br>(1250) | **22…**<br>(750) | **26…**<br>(600) | **28…**<br>(350) | **113**<br>**123** |
| 13 000 | 8.5 x 17.5 (19.0) x 18.5 | 1.9 | **24…**<br>(1000) | **22…**<br>(700) | **26…**<br>(550) | **28…**<br>(300) | **133** |
| 15 000 | 9.0 x 18.5 (19.5) x 18.5 | 2.1 | **24…**<br>(1000) | **22…**<br>(650) | **26…**<br>(550) | **28…**<br>(300) | **153** |
| **C (µF)** | **PITCH = 22.5 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | **PITCH = 22.5 mm** | **PITCH = 7.5 mm (BENT BACK)** | | |
| 0.016<br>0.018 | 6.0 x 19.0 x 26.0 | 2.2 | **24…**<br>(800) | | | | **163**<br>**183** |
| 0.02<br>0.022 | 6.5 x 19.5 x 26.0 | 2.5 | **24…**<br>(750) | | | | **203**<br>**223** |
| 0.024 | 7.0 x 20.0 x 26.0 | 2.7 | **24…**<br>(650) | | | | **243** |
| 0.027<br>0.03 | 7.5 x 20.5 x 26.0 | 3.1 | **24…**<br>(600) | - | - | - | **273**<br>**303** |
| 0.033 | 8.0 x 21.0 x 26.0 | 3.4 | **24…**<br>(550) | | | | **333** |
| 0.036<br>0.039 | 8.5 x 21.5 x 26.0 | 3.7 | **24…**<br>(500) | | | | **363**<br>**393** |
| 0.043 | 9.0 x 22.0 x 26.0 | 4.1 | **24…**<br>(450) | | | | **433** |
| **C (µF)** | **PITCH = 27.5 mm ± 0.5 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | **PITCH = 27.5 mm** | **PITCH = 7.5 mm (BENT BACK)** | | |
| 0.047 | 7.0 x 20.0 x 30.0 | 3.1 | **24…**<br>(1000) | | | | **473** |
| 0.051<br>0.056 | 7.5 x 20.5 x 30.0 | 3.4 | **24…**<br>(750) | | | | **513**<br>**563** |
| 0.062 | 8.0 x 21.0 x 30.0 | 3.8 | **24…**<br>(650) | | | | **623** |
| 0.068 | 8.5 x 21.5 x 30.0 | 4.0 | **24…**<br>(550) | | | | **683** |
| 0.075 | 9.0 x 22.0 x 30.0 | 4.4 | **24…**<br>(550) | | | | **753** |
| 0.082 | 9.5 x 22.5 x 30.0 | 4.7 | **24…**<br>(500) | - | - | - | **823** |
| 0.091 | 10.0 x 23.0 x 30.0 | 5.1 | **24…**<br>(500) | | | | **913** |
| 0.10 | 10.5 x 23.5 x 30.0 | 5.5 | **24…**<br>(450) | | | | **104** |
| 0.11 | 11.0 x 24.0 x 30.0 | 5.9 | **24…**<br>(400) | | | | **114** |
| 0.12 | 11.5 x 24.5 x 30.0 | 6.3 | **24…**<br>(400) | | | | **124** |
| 0.13 | 12.0 x 25.0 x 30.0 | 6.8 | **24…**<br>(350) | | | | **134** |
| 0.15 | 12.5 x 25.5 x 30.0 | 7.6 | **24…**<br>(350) | | | | **154** |

**Notes**

- Loose in box, all lengths have same SPQ
- SPQ = Standard Packing Quantity

(1) Net weight for short lead product only



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## $U_{RDC}$ = 1000 V; $U_{RAC}$ = 400 V; $U_{PP}$ = 1100 V (LOCK LEAD); C-TOL. = ± 5 %

| C | DIMENSIONS w x h (h') x l (mm) | MASS (g) (1) | CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING | |
|---|---|---|---|---|
| | | | LOOSE IN BOX | |
| | | | $l_t$ = 4.0 mm + 1.0 mm/- 0.5 mm | |
| | | | | (SPQ) |
| **C (pF)** | **PITCH = 10.0 mm ± 1.0 mm; $d_t$ = 0.60 mm ± 0.06 mm** | | | |
| 100 | 5.0 x 16.0 x 14.5 | 0.5 | **90373** | (2000) |
| 110 | | | **90374** | |
| 120 | | | **90375** | |
| 130 | | | **90376** | |
| 150 | 5.5 x 16.5 x 14.5 | 0.55 | **90377** | (2000) |
| 160 | | 0.55 | **90378** | |
| 180 | | 0.55 | **90379** | |
| 200 | | 0.55 | **90281** | |
| 220 | | 0.60 | **90382** | |
| 240 | | 0.60 | **90383** | |
| 270 | | 0.60 | **90384** | |
| 300 | | 0.60 | **90385** | |
| 330 | | 0.60 | **90386** | |
| 360 | | 0.60 | **90387** | |
| 390 | | 0.65 | **90388** | |
| 430 | | 0.70 | **90389** | |
| 470 | | 0.75 | **90391** | |
| 510 | | 0.75 | **90392** | |
| 560 | | 0.80 | **90393** | |
| 620 | | 0.80 | **90394** | |
| 680 | | 0.80 | **90395** | |
| 750 | | 0.70 | **90396** | |
| 820 | | 0.70 | **90397** | |
| 910 | | 0.70 | **90398** | |
| 1000 | 6.0 x 17.0 x 14.5 | 0.75 | **90399** | (1750) |
| 1100 | | 0.85 | **90401** | |
| 1200 | | 0.90 | **90402** | |
| 1300 | | 0.85 | **90403** | |
| 1500 | | 0.90 | **90404** | |
| **C (pF)** | **PITCH = 15.0 mm ± 1.0 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | |
| 1600 | 5.5 x 17.5 x 18.5 | 1.1 | **90405** | (2000) |
| 1800 | | | **90406** | |
| 2000 | | | **90407** | |
| 2200 | | | **90408** | |
| 2400 | | | **90409** | |
| 2700 | 6.0 x 18.0 x 18.5 | 1.2 | **90411** | (2000) |
| 3000 | | | **90412** | |
| 3300 | | | **90413** | |
| 3600 | | | **90414** | |
| 3900 | | | **90415** | |
| 4300 | | | **90416** | |
| 4700 | | | **90417** | |
| 5100 | | | **90418** | |
| 5600 | | | **90419** | |
| 6200 | | | **90421** | |
| 6800 | | | **90422** | |


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| C | DIMENSIONS w x h (h') x l (mm) | MASS (g) (1) | CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING | |
|---|---|---|---|---|
| | | | LOOSE IN BOX | |
| | | | $l_t$ = 4.0 mm + 1.0 mm/- 0.5 mm | |
| | | | | (SPQ) |
| **C (pF)** | **PITCH = 15.0 mm ± 1.0 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | |
| 7500<br>8200<br>9100 | 7.0 x 19.0 x 18.5 | 1.5 | **90232**<br>**90423**<br>**90424** | (1500) |
| 10 000 | 7.5 x 19.5 x 18.5 | 1.6 | **90425** | (1400) |
| 11 000<br>12 000 | 8.0 x 20.0 x 18.5 | 1.8 | **90426**<br>**90427** | (1250) |
| 13 000 | 8.5 x 20.5 x 18.5 | 1.9 | **90428** | (1200) |
| 15 000 | 9.0 x 21.0 x 18.5 | 2.1 | **90429** | (1100) |
| **C (µF)** | **PITCH = 22.5 mm ± 1.0 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | |
| 0.016<br>0.018 | 6.0 x 22.0 x 26.0 | 2.2 | **90431**<br>**90432** | (750) |
| 0.02<br>0.022 | 6.5 x 22.5 x 26.0 | 2.5 | **90433**<br>**90434** | (700) |
| 0.024 | 7.0 x 23.0 x 26.0 | 2.7 | **90435** | (600) |
| 0.027<br>0.03 | 7.5 x 23.5 x 26.0 | 3.1 | **90436**<br>**90437** | (550) |
| 0.033 | 8.0 x 24.0 x 26.0 | 3.4 | **90438** | (500) |
| 0.036<br>0.039 | 8.5 x 24.5 x 26.0 | 3.8 | **90439**<br>**90224** | (450) |
| 0.043 | 9.0 x 25.0 x 26.0 | 4.1 | **90441** | (450) |
| **C (µF)** | **PITCH = 27.5 mm ± 1.0 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | |
| 0.047 | 7.0 x 23.0 x 30.0 | 3.1 | **90442** | (800) |
| 0.051<br>0.056 | 7.5 x 23.5 x 30.0 | 3.4 | **90443**<br>**90444** | (600) |
| 0.062 | 8.0 x 24.0 x 30.0 | 3.8 | **90445** | (550) |
| 0.068 | 8.5 x 24.5 x 30.0 | 4.0 | **90446** | (550) |
| 0.075 | 9.0 x 25.0 x 30.0 | 4.4 | **90447** | (450) |
| 0.082 | 9.5 x 25.5 x 30.0 | 4.7 | **90448** | (450) |
| 0.091 | 10.0 x 26.0 x 30.0 | 5.1 | **90449** | (400) |
| 0.1 | 10.5 x 26.5 x 30.0 | 5.5 | **90451** | (350) |
| 0.11 | 11.0 x 27.0 x 30.0 | 5.9 | **90452** | (350) |
| 0.12 | 11.5 x 27.5 x 30.0 | 6.3 | **90453** | (350) |
| 0.13 | 12.0 x 28.0 x 30.0 | 6.8 | **90454** | (350) |
| 0.15 | 12.0 x 28.5 x 30.0 | 7.6 | **90455** | (300) |

**Notes**

- SPQ = Standard Packing Quantity

(1) Net weight for short lead product only


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## SPECIFIC REFERENCE DATA (1600 $V_{DC}$)

| DESCRIPTION | VALUE | |
|---|---|---|
| Tangent of loss angle at (x $10^{-4}$): | 10 kHz | 100 kHz |
| Pitch = 10 mm, 15 mm and 7.5 mm (bent back) | ≤ 6 | ≤ 10 |
| Pitch = 22.5 mm | ≤ 6 | ≤ 15 |
| Pitch = 27.5 mm | ≤ 6 | ≤ 20 |
| Rated voltage pulse slope ($dU/d_t$): | | |
| Pitch = 10 mm | | |
| Pitch = 15 mm and 7.5 mm (bent back) | 21 000 V/µs | |
| Pitch = 22.5 mm | 7000 V/µs | |
| Pitch = 27.5 mm | 4700 V/µs | |
| R between leads at 500 V, 1 min | > 100 000 MΩ | |
| R between interconnected leads and case, 500 V, 1 min | > 100 000 MΩ | |
| Ionization (AC) voltage (typical value) | | |
| at 50 pC peak discharge | > 550 V | |
| at 10 pC peak discharge | | |
| Withstanding (DC) voltage (cut off current 10 mA), rise time 1000 V/s | | |
| for C ≤ 47 nF | 2560 V, 1 min | |
| for C > 47 nF | | |
| Withstanding (DC) voltage between leads and case | 2840 V, 1 min | |
| Maximum application temperature | 105 °C | |

## $U_{RDC}$ = 1600 V; $U_{RAC}$ = 500 V; $U_{PP}$ = 1400 V (KINKED); C-TOL. = ± 5 %

| C | DIMENSIONS w x h (h') x l (mm) | MASS (g) (1) | CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING | | | | |
|---|---|---|---|---|---|---|---|
| | | | LOOSE IN BOX | REEL | | | C VALUE |
| | | | LEADS 5 mm ± 1.0 mm | ORIGINAL PITCH | PITCH = 7.5 mm (BENT BACK) | | ..YYY |
| | | | | Ø 500 mm | Ø 500 mm | Ø 356 mm | |
| | | | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | |
| C (pF) | PITCH = 15.0 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm | | | PITCH = 15.0 mm | PITCH = 7.5 mm (BENT BACK) | | |
| 680 | 5.5 x 14.5 (15.0) x 18.5 | 0.75 | **34…** (2000) | **32…** (1100) | **36…** (900) | **38…** (500) | **681** |
| 750 | | | | | | | **751** |
| 820 | | | | | | | **821** |
| 910 | 6.0 x 15.0 (15.5) x 18.5 | 0.8 | **34…** (2000) | **32…** (1000) | **36…** (800) | **38…** (450) | **911** |
| 1000 | | 0.85 | | | | | **102** |
| 1100 | | 0.85 | | | | | **112** |
| 1200 | | 0.90 | | | | | **122** |
| 1300 | | 0.95 | | | | | **132** |
| 1500 | 5.5 x 14.5 (16.0) x 18.5 | 1.1 | **34…** (2000) | **32…** (1100) | **36…** (900) | **38…** (500) | **152** |
| 1600 | | | | | | | **162** |
| 1800 | 6.0 x 15.0 (16.5) x 18.5 | 1.2 | **34…** (2000) | **32…** (1000) | **36…** (800) | **38…** (450) | **182** |
| 2000 | 6.5 x 15.5 (17.0) x 18.5 | 1.3 | **34…** (1500) | **32…** (900) | **36…** (750) | **38…** (400) | **202** |
| 2200 | | | | | | | **222** |
| 2400 | 7.0 x 16.0 (17.5) x 18.5 | 1.4 | **34…** (1500) | **32…** (800) | **36…** (700) | **38…** (400) | **242** |
| 2700 | 7.5 x 16.5 (18.0) x 18.5 | 1.6 | **34…** (1250) | **32…** (800) | **36…** (650) | **38…** (350) | **272** |
| 3000 | | | | | | | **302** |
| 3300 | 8.0 x 17.0 (18.5) x 18.5 | 1.7 | **34…** (1250) | **32…** (750) | **36…** (600) | **38…** (350) | **332** |
| 3600 | 8.5 x 17.5 (19.0) x 18.5 | 1.8 | **34…** (1000) | **32…** (700) | **36…** (550) | **38…** (300) | **362** |
| 3900 | 9.0 x 18.5 (19.5) x 18.5 | 2.0 | **34…** (1000) | **32…** (650) | **36…** (550) | **38…** (300) | **392** |
| 4300 | | | | | | | **432** |


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| C | DIMENSIONS w x h (h') x l (mm) | MASS (g) [1] | CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING | | | | |
|---|---|---|---|---|---|---|---|
| | | | LOOSE IN BOX | REEL | | | C VALUE |
| | | | LEADS 5 mm ± 1.0 mm | ORIGINAL PITCH | PITCH = 7.5 mm (BENT BACK) | | ..YYY |
| | | | | Ø 500 mm | Ø 500 mm | Ø 356 mm | |
| | | | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | |
| **C (µF)** | **PITCH = 22.5 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | **PITCH = 22.5 mm** | **PITCH = 7.5 mm (BENT BACK)** | | |
| 0.0047 | 6.0 x 19.0 x 26.0 | 2.0 | **34…** (800) | - | - | - | **472** |
| 0.0051 | | | | | | | **512** |
| 0.0056 | | | | | | | **562** |
| 0.0062 | 6.5 x 19.5 x 26.0 | 2.1 | **34…** (750) | | | | **622** |
| 0.0068 | | | | | | | **682** |
| 0.0075 | 7.0 x 20.0 x 26.0 | 2.3 | **34…** (650) | | | | **752** |
| 0.0082 | | | | | | | **822** |
| 0.0091 | 7.5 x 20.5 x 26.0 | 2.5 | **34…** (600) | | | | **912** |
| 0.01 | 8.0 x 21.0 x 26.0 | 2.6 | **34…** (550) | | | | **103** |
| 0.011 | 8.5 x 21.5 x 26.0 | 2.9 | **34…** (500) | | | | **113** |
| 0.012 | | | | | | | **123** |
| 0.013 | 9.0 x 22.0 x 26.0 | 3.1 | **34…** (450) | | | | **133** |
| 0.015 | 9.5 x 22.5 x 26.0 | 3.5 | **34…** (400) | | | | **153** |
| 0.016 | 10.0 x 23.0 x 26.0 | 3.6 | **34…** (400) | | | | **163** |
| 0.018 | 10.5 x 23.5 x 26.0 | 4.0 | **34…** (350) | | | | **183** |
| **C (µF)** | **PITCH = 27.5 mm ± 0.5 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | **PITCH = 27.5 mm** | **PITCH = 7.5 mm (BENT BACK)** | | |
| 0.02 | 9.0 x 22.0 x 30.0 | 4.2 | **34…** (550) | - | - | - | **203** |
| 0.022 | 9.5 x 22.5 x 30.0 | 4.4 | **34…** (500) | | | | **223** |
| 0.024 | 10.0 x 23.0 x 30.0 | 4.7 | **34…** (500) | | | | **243** |
| 0.027 | 10.5 x 23.5 x 30.0 | 5.2 | **34…** (450) | | | | **273** |
| 0.03 | 11.0 x 24.0 x 30.0 | 5.6 | **34…** (400) | | | | **303** |
| 0.033 | 11.5 x 24.5 x 30.0 | 6.0 | **34…** (400) | | | | **333** |
| 0.036 | 12.0 x 25.0 x 30.0 | 6.5 | **34…** (350) | | | | **363** |
| 0.039 | 12.5 x 25.5 x 30.0 | 6.9 | **34…** (350) | | | | **393** |

**Notes**

- Loose in box, all lengths have same SPQ
- SPQ = Standard Packing Quantity

[1] Net weight for short lead product only


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## $U_{RDC}$ = 1600 V; $U_{RAC}$ = 500 V; $U_{PP}$ = 1400 V (LOCK LEAD); C-TOL. = ± 5 %

| C | DIMENSIONS w x h (h') x l (mm) | MASS (g) (1) | CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING | |
|---|---|---|---|---|
| | | | LOOSE IN BOX | |
| | | | $l_t$ = 4.0 mm + 1.0 mm/- 0.5 mm | |
| | | | | (SPQ) |
| **C (pF)** | **PITCH = 15.0 mm ± 1.0 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | |
| 680 | 5.5 x 17.5 x 18.5 | 0.75 | **90456** | (2000) |
| 750 | | | **90457** | |
| 820 | | | **90458** | |
| 910 | 6.0 x 18.0 x 18.5 | 0.80 | **90459** | (2000) |
| 1000 | | 0.85 | **90461** | |
| 1100 | | 0.85 | **90462** | |
| 1200 | | 0.90 | **90463** | |
| 1300 | | 0.95 | **90464** | |
| 1500 | 5.5 x 17.5 x 18.5 | 1.1 | **90465** | (2000) |
| 1600 | | | **90466** | |
| 1800 | 6.0 x 18.0 x 18.5 | 1.2 | **90467** | (2000) |
| 2000 | 6.5 x 18.5 x 18.5 | 1.3 | **90468** | (1750) |
| 2200 | | | **90469** | |
| 2400 | 7.0 x 19.0 x 18.5 | 1.4 | **90471** | (1500) |
| 2700 | 7.5 x 19.5 x 18.5 | 1.6 | **90472** | (1400) |
| 3000 | | | **90473** | |
| 3300 | 8.0 x 20.0 x 18.5 | 1.9 | **90141** | (1250) |
| 3600 | 8.5 x 20.5 x 18.5 | 2.3 | **90142** | (1200) |
| 3900 | 9.0 x 21.5 x 18.5 | 2.5 | **90143** | (1100) |
| 4300 | | | **90144** | |
| **C (µF)** | **PITCH = 22.5 mm ± 1.0 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | |
| 0.0047 | 6.0 x 22.0 x 26.0 | 2.4 | **90145** | (750) |
| 0.0051 | | | **90146** | |
| 0.0056 | | | **90147** | |
| 0.0062 | 6.5 x 22.5 x 26.0 | 2.6 | **90148** | (700) |
| 0.0068 | | | **90149** | |
| 0.0075 | 7.0 x 23.0 x 26.0 | 2.8 | **90151** | (600) |
| 0.0082 | | | **90152** | |
| 0.0083 | | | **90202** | |
| 0.0091 | 7.5 x 23.5 x 26.0 | 2.9 | **90153** | (550) |
| 0.01 | 8.0 x 24.0 x 26.0 | 3.2 | **90154** | (500) |
| 0.011 | 8.5 x 24.5 x 26.0 | 3.4 | **90155** | (450) |
| 0.012 | | | **90156** | |
| 0.013 | 9.0 x 25.0 x 26.0 | 3.6 | **90157** | (450) |
| 0.015 | 9.5 x 25.5 x 26.0 | 4.0 | **90158** | (400) |
| 0.016 | 10.0 x 26.0 x 26.0 | 4.3 | **90159** | (350) |
| 0.018 | 10.5 x 26.5 x 26.0 | 4.7 | **90161** | (350) |
| **C (µF)** | **PITCH = 27.5 mm ± 1.0 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | |
| 0.02 | 9.0 x 25.0 x 30.0 | 4.2 | **90474** | (450) |
| 0.022 | 9.5 x 25.5 x 30.0 | 4.4 | **90475** | (450) |
| 0.024 | 10.0 x 26.0 x 30.0 | 4.7 | **90476** | (400) |
| 0.027 | 10.5 x 26.5 x 30.0 | 5.2 | **90477** | (350) |
| 0.03 | 11.0 x 27.0 x 30.0 | 5.6 | **90478** | (350) |
| 0.033 | 11.5 x 27.5 x 30.0 | 6.0 | **90479** | (350) |
| 0.036 | 12.0 x 28.0 x 30.0 | 6.5 | **90481** | (300) |
| 0.039 | 12.5 x 28.5 x 30.0 | 6.9 | **90482** | (300) |

**Notes**

- SPQ = Standard Packing Quantity

(1) Net weight for short lead product only



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## SPECIFIC REFERENCE DATA (2000 $V_{DC}$)

| DESCRIPTION | VALUE | |
|---|---|---|
| Tangent of loss angle at (x $10^{-4}$): | 10 kHz | 100 kHz |
| Pitch = 10 mm, 15 mm, and 7.5 mm (bent back) | ≤ 6 | ≤ 10 |
| Pitch = 22.5 mm | ≤ 6 | ≤ 10 |
| Pitch = 27.5 mm | ≤ 6 | ≤ 15 |
| Rated voltage pulse slope ($dU/d_t$): | | |
| Pitch = 10 mm | | |
| Pitch = 15 mm and 7.5 mm (bent back) | 30 000 V/µs | |
| Pitch = 22.5 mm | 10 000 V/µs | |
| Pitch = 27.5 mm | 6700 V/µs | |
| R between leads at 500 V, 1 min | > 100 000 MΩ | |
| R between interconnected leads and case, 500 V, 1 min | > 100 000 MΩ | |
| Ionization (AC) voltage (typical value) | | |
| at 50 pC peak discharge | > 600 V | |
| at 20 pC peak discharge | | |
| Withstanding (DC) voltage (cut off current 10 mA), rise time 1000 V/s | | |
| for C ≤ 47 nF | 3200 V, 1 min | |
| for C > 47 nF | | |
| Withstanding (DC) voltage between leads and case | 2840 V, 1 min | |
| Maximum application temperature | 105 °C | |

## $U_{RDC}$ = 2000 V; $U_{RAC}$ = 600 V; $U_{PP}$ = 1700 (KINKED); C-TOL. = ± 5 %

| C | DIMENSIONS w x h (h') x l (mm) | MASS (g) (1) | CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING | | | | |
|---|---|---|---|---|---|---|---|
| | | | LOOSE IN BOX | REEL | | | C VALUE |
| | | | LEADS 5 mm ± 1.0 mm | ORIGINAL PITCH | PITCH = 7.5 mm (BENT BACK) | | ..YYY |
| | | | | Ø 500 mm | Ø 500 mm | Ø 356 mm | |
| | | | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | |
| C (pF) | PITCH = 15.0 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm | | | PITCH = 15.0 mm | PITCH = 7.5 mm (BENT BACK) | | |
| 100 | 5.5 x 14.5 (15.0) x 18.5 | 0.75 | **44…** (2000) | **42…** (1100) | **46…** (900) | **48…** (500) | **101** |
| 110 | | 0.75 | | | | | **111** |
| 120 | | 0.75 | | | | | **121** |
| 130 | | 0.75 | | | | | **131** |
| 150 | | 0.75 | | | | | **151** |
| 160 | | 0.75 | | | | | **161** |
| 180 | | 0.75 | | | | | **181** |
| 200 | | 0.75 | | | | | **201** |
| 220 | | 0.75 | | | | | **221** |
| 240 | | 0.75 | | | | | **241** |
| 270 | | 0.75 | | | | | **271** |
| 300 | | 0.75 | | | | | **301** |
| 330 | | 0.75 | | | | | **331** |
| 360 | | 0.75 | | | | | **361** |
| 390 | | 0.75 | | | | | **391** |
| 430 | | 0.75 | | | | | **431** |
| 470 | | 0.80 | | | | | **471** |
| 510 | | 0.80 | | | | | **511** |
| 560 | | 0.80 | | | | | **561** |


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| C | DIMENSIONS w x h (h') x l (mm) | MASS (g) (1) | CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING | | | | |
|---|---|---|---|---|---|---|---|
| | | | LOOSE IN BOX | REEL | | | C VALUE |
| | | | LEADS 5 mm ± 1.0 mm | ORIGINAL PITCH | PITCH = 7.5 mm (BENT BACK) | | ..YYY |
| | | | | Ø 500 mm | Ø 500 mm | Ø 356 mm | |
| | | | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | |
| **C (pF)** | **PITCH = 15.0 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | **PITCH = 15.0 mm** | **PITCH = 7.5 mm (BENT BACK)** | | |
| 620 | 6.0 x 15.0 (15.5) x 18.5 | 0.85 | **44…** (2000) | **42…** (1000) | **46…** (800) | **48…** (450) | **621** |
| 680 | | 0.85 | | | | | **681** |
| 750 | | 0.90 | | | | | **751** |
| 820 | 6.5 x 15.5 (16.0) x 18.5 | 0.95 | **44…** (1500) | **42…** (900) | **46…** (750) | **48…** (400) | **821** |
| 910 | 5.5 x 14.5 (16.0) x 18.5 | 1.1 | **44…** (2000) | **42…** (420) | **46…** (900) | **48…** (500) | **911** |
| 1000 | 6.0 x 15.0 (16.5) x 18.5 | 1.2 | **44…** (2000) | **42…** (1000) | **46…** (800) | **48…** (450) | **102** |
| 1100 | | | | | | | **112** |
| 1200 | | | | | | | **122** |
| 1300 | 6.5 x 15.5 (17.0) x 18.5 | 1.3 | **44…** (1500) | **42…** (900) | **46…** (750) | **48…** (400) | **132** |
| 1500 | 7.0 x 16.0 (17.5) x 18.5 | 1.4 | **44…** (1500) | **42…** (800) | **46…** (700) | **48…** (400) | **152** |
| 1600 | 7.5 x 16.5 (18.0) x 18.5 | 1.5 | **44…** (1250) | **42…** (800) | **46…** (650) | **48…** (350) | **162** |
| 1800 | | | | | | | **182** |
| 2000 | 8.0 x 17.0 (18.5) x 18.5 | 1.6 | **44…** (1250) | **42…** (750) | **46…** (600) | **48…** (350) | **202** |
| 2200 | 8.5 x 17.5 (19.0) x 18.5 | 1.7 | **44…** (1000) | **42…** (700) | **46…** (550) | **48…** (300) | **222** |
| 2400 | 9.0 x 18.0 (19.5) x 18.5 | 1.8 | **44…** (1000) | **42…** (650) | **46…** (550) | **48…** (300) | **242** |
| 2700 | 9.5 x 18.5 (20.0) x 18.5 | 2.0 | **44…** (900) | **42…** (600) | **46…** (500) | **48…** (300) | **272** |
| **C (µF)** | **PITCH = 22.5 mm ± 0.4 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | **PITCH = 22.5 mm** | **PITCH = 7.5 mm (BENT BACK)** | | |
| 0.003 | 6.0 x 19.0 x 26.0 | 2.1 | **44…** (800) | - | - | - | **302** |
| 0.0033 | | | | | | | **332** |
| 0.0036 | | | | | | | **362** |
| 0.0039 | | | | | | | **392** |
| 0.0043 | 6.5 x 19.5 x 26.0 | 2.3 | **44…** (750) | | | | **432** |
| 0.0047 | | | | | | | **472** |
| 0.0051 | 7.0 x 20.0 x 26.0 | 2.6 | **44…** (650) | | | | **512** |
| 0.0056 | | | | | | | **562** |
| 0.0062 | 7.5 x 20.5 x 26.0 | 2.8 | **44…** (600) | | | | **622** |
| 0.0068 | 8.0 x 21.0 x 26.0 | 3.0 | **44…** (550) | | | | **682** |
| 0.0075 | | | | | | | **752** |
| 0.0082 | 8.5 x 21.5 x 26.0 | 3.3 | **44…** (500) | | | | **822** |
| 0.0091 | 9.0 x 22.0 x 26.0 | 3.6 | **44…** (450) | | | | **912** |
| 0.01 | 9.5 x 22.5 x 26.0 | 3.8 | **44…** (400) | | | | **103** |


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| C | DIMENSIONS w x h (h') x l (mm) | MASS (g) (1) | CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING | | | | |
|---|---|---|---|---|---|---|---|
| | | | LOOSE IN BOX | REEL | | | C VALUE |
| | | | LEADS 5 mm ± 1.0 mm | ORIGINAL PITCH | PITCH = 7.5 mm (BENT BACK) | | ..YYY |
| | | | | Ø 500 mm | Ø 500 mm | Ø 356 mm | |
| | | | XX (SPQ) | XX (SPQ) | XX (SPQ) | XX (SPQ) | |
| C (µF) | PITCH = 27.5 mm ± 0.5 mm; $d_t$ = 0.80 mm ± 0.08 mm | | | PITCH = 27.5 mm | PITCH = 7.5 mm (BENT BACK) | | |
| 0.011 | 9.0 x 22.0 x 30.0 | 3.8 | **44...** (550) | - | - | - | **113** |
| 0.012 | 9.5 x 22.5 x 30.0 | 4.1 | **44...** (500) | | | | **123** |
| 0.013 | 10.0 x 23.0 x 30.0 | 4.4 | **44...** (500) | | | | **133** |
| 0.015 | 10.5 x 23.5 x 30.0 | 4.9 | **44...** (450) | | | | **153** |
| 0.016 | 11.0 x 24.0 x 30.0 | 5.1 | **44...** (400) | | | | **163** |
| 0.018 | 11.5 x 24.5 x 30.0 | 5.6 | **44...** (400) | | | | **183** |
| 0.02 | 12.5 x 25.5 x 30.0 | 6.1 | **44...** (350) | | | | **203** |
| 0.022 | 13.0 x 26.0 x 30.0 | 6.5 | **44...** (300) | | | | **223** |

**Notes**

- Loose in box, all lengths have same SPQ
- SPQ = Standard Packing Quantity

(1) Net weight for short lead product only

## $U_{RDC}$ = 2000 V; $U_{RAC}$ = 600 V; $U_{PP}$ = 1700 V (LOCK LEAD)

| C | DIMENSIONS w x h (h') x l (mm) | MASS (g) (1) | CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING | |
|---|---|---|---|---|
| | | | LOOSE IN BOX | |
| | | | $l_t$ = 4.0 mm + 1.0 mm/- 0.5 mm | |
| | | | | (SPQ) |
| C (pF) | PITCH = 15.0 mm ± 1.0 mm; $d_t$ = 0.80 mm ± 0.08 mm | | | |
| 100 | 5.5 x 17.5 x 18.5 | 0.75 | **90483** | (2000) |
| 110 | | 0.75 | **90484** | |
| 120 | | 0.75 | **90485** | |
| 130 | | 0.75 | **90486** | |
| 150 | | 0.75 | **90487** | |
| 160 | | 0.75 | **90488** | |
| 180 | | 0.75 | **90489** | |
| 200 | | 0.75 | **90491** | |
| 220 | | 0.75 | **90276** | |
| 240 | | 0.75 | **90492** | |
| 270 | | 0.75 | **90493** | |
| 300 | | 0.75 | **90494** | |
| 330 | | 0.75 | **90495** | |
| 360 | | 0.75 | **90496** | |
| 390 | | 0.75 | **90188** | |
| 430 | | 0.75 | **90497** | |
| 470 | | 0.80 | **90498** | |
| 510 | | 0.80 | **90499** | |
| 560 | | 0.80 | **90501** | |


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| C | DIMENSIONS w x h (h') x l (mm) | MASS (g) (1) | CATALOG NUMBER BFC2 375 XXYYY AND PACKAGING | |
|---|---|---|---|---|
| | | | LOOSE IN BOX | |
| | | | $l_t$ = 4.0 mm + 1.0 mm/- 0.5 mm | |
| | | | | (SPQ) |
| **C (pF)** | **PITCH = 15.0 mm ± 1.0 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | |
| 620 | 6.0 x 18.0 x 18.5 | 0.85 | **90502** | (2000) |
| 680 | | 0.85 | **90229** | |
| 750 | | 0.90 | **90503** | |
| 820 | 6.5 x 18.5 x 18.5 | 0.95 | **90504** | (1750) |
| 910 | 5.5 x 17.5 x 18.5 | 1.1 | **90505** | (2000) |
| 1000 | 6.0 x 18.0 x 18.5 | 1.3 | **90225** | (2000) |
| 1100 | | | **90506** | |
| 1200 | | | **90226** | |
| 1300 | 6.5 x 18.5 x 18.5 | 1.3 | **90507** | (1750) |
| 1500 | 7.0 x 19.0 x 18.5 | 1.5 | **90266** | (1500) |
| 1600 | 7.5 x 19.5 x 18.5 | 1.7 | **90508** | (1400) |
| 1800 | | | **90237** | |
| 2000 | 8.0 x 20.0 x 18.5 | 1.7 | **90509** | (1250) |
| 2200 | 8.5 x 20.5 x 18.5 | 2.3 | **90227** | (1200) |
| 2400 | 9.0 x 21.0 x 18.5 | 1.8 | **90511** | (1100) |
| 2700 | 9.5 x 21.5 x 18.5 | 2.7 | **90228** | (1000) |
| **C (µF)** | **PITCH = 22.5 mm ± 1.0 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | |
| 0.003 | 6.0 x 22.0 x 26.0 | 2.2 | **90512** | (750) |
| 0.0033 | | | **90162** | |
| 0.0036 | | | **90163** | |
| 0.0039 | | | **90164** | |
| 0.0043 | 6.5 x 22.5 x 26.0 | 2.4 | **90165** | (700) |
| 0.0047 | | | **90166** | |
| 0.0051 | 7.0 x 23.0 x 26.0 | 2.6 | **90167** | (600) |
| 0.0056 | | | **90168** | |
| 0.0062 | 7.5 x 23.5 x 26.0 | 2.8 | **90169** | (550) |
| 0.0068 | 8.0 x 24.0 x 26.0 | 3.0 | **90171** | (500) |
| 0.0075 | | | **90172** | |
| 0.0082 | 8.5 x 24.5 x 26.0 | 3.2 | **90173** | (450) |
| 0.0091 | 9.0 x 25.0 x 26.0 | 3.5 | **90174** | (450) |
| 0.01 | 9.5 x 25.5 x 26.0 | 3.8 | **90175** | (400) |
| **C (µF)** | **PITCH = 27.5 mm ± 1.0 mm; $d_t$ = 0.80 mm ± 0.08 mm** | | | |
| 0.011 | 9.0 x 25.0 x 30.0 | 4.4 | **90176** | (450) |
| 0.012 | 9.5 x 25.5 x 30.0 | 4.6 | **90177** | (450) |
| 0.013 | 10.0 x 26.0 x 30.0 | 5.0 | **90178** | (400) |
| 0.015 | 10.5 x 26.5 x 30.0 | 5.4 | **90179** | (350) |
| 0.016 | 11.0 x 27.0 x 30.0 | 5.8 | **90181** | (350) |
| 0.018 | 11.5 x 27.5 x 30.0 | 6.2 | **90182** | (350) |
| 0.02 | 12.5 x 28.5 x 30.0 | 6.1 | **90513** | (300) |
| 0.022 | 13.0 x 29.0 x 30.0 | 6.5 | **90514** | (250) |

**Notes**

- SPQ = Standard Packing Quantity

(1) Net weight for short lead product only



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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 in printed-circuit boards by means of automatic insertion machines.

For detailed tape specifications refer to “Packaging information” www.vishay.com/doc?28139 or end of catalog.

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

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

### Storage Temperature

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

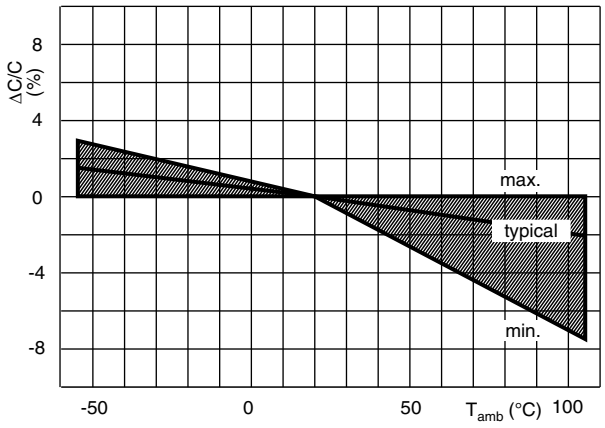
### Ratings and Characteristics Reference Conditions

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

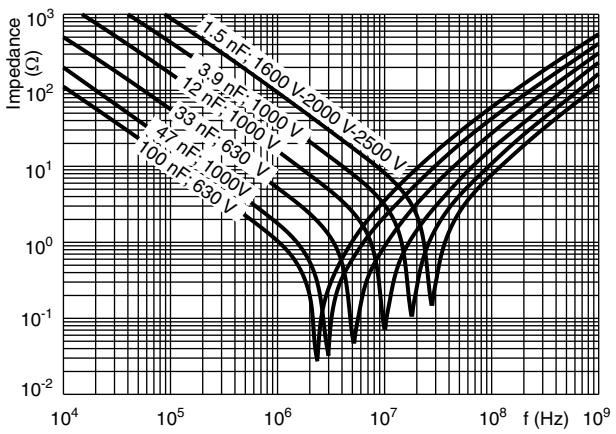
For reference testing, a conditioning period shall be applied over 96 h ± 4 h by heating the products in a circulating air oven at the rated temperature and a relative humidity not exceeding 20 %.


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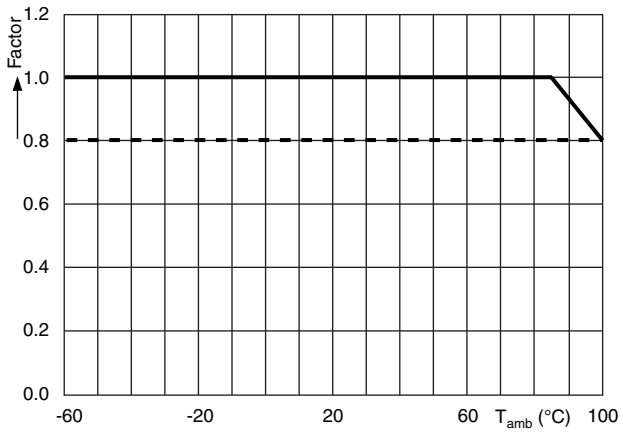
## CHARACTERISTICS



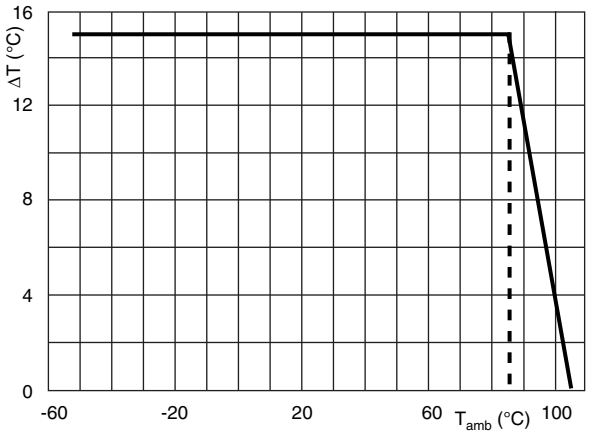

Capacitance as a function of ambient temperature (typical curve)




Impedance as a function of frequency (typical curve)

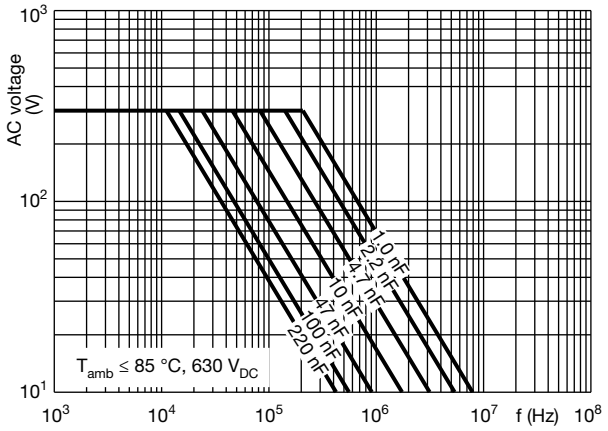



Maximum DC voltage as a function of temperature

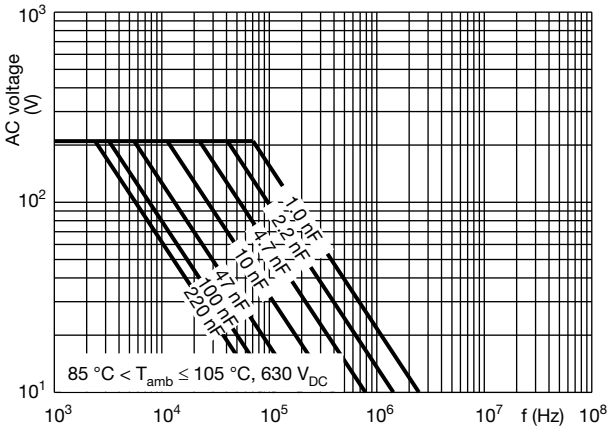



Maximum allowed component temperature rise as a function of ambient temperature

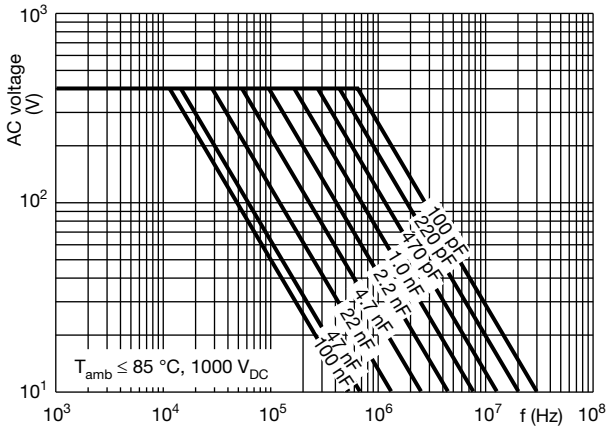

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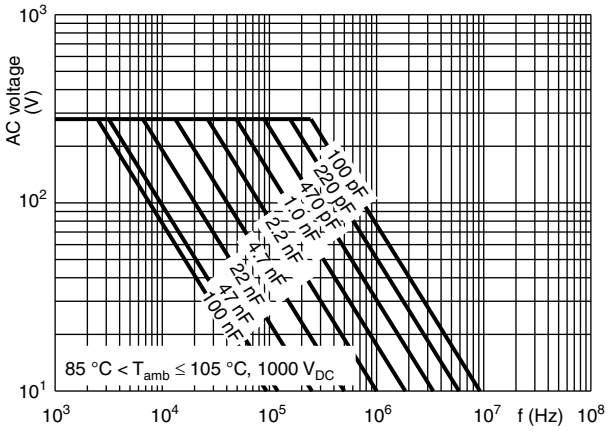

Max. RMS voltage (sinewave) as a function of frequency



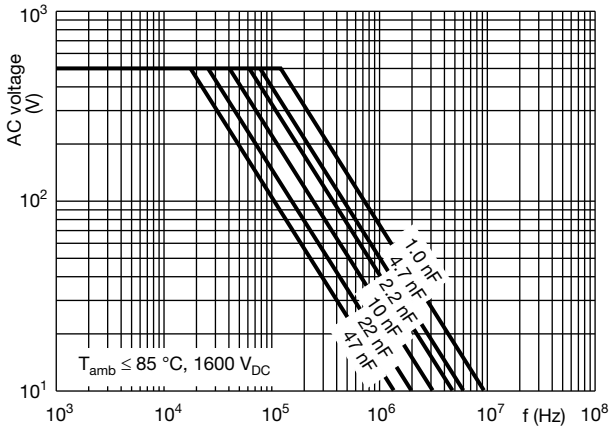

Max. RMS voltage (sinewave) as a function of frequency



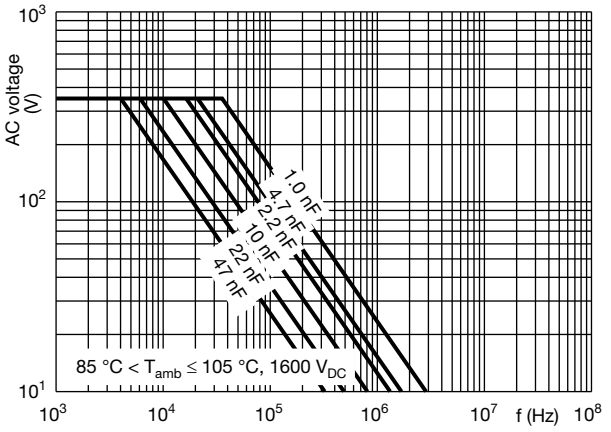

Max. RMS voltage (sinewave) as a function of frequency




Max. RMS voltage (sinewave) as a function of frequency




Max. RMS voltage (sinewave) as a function of frequency

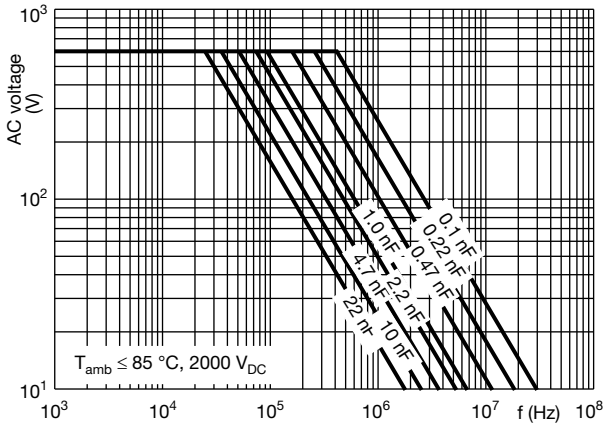



Max. RMS voltage (sinewave) as a function of frequency

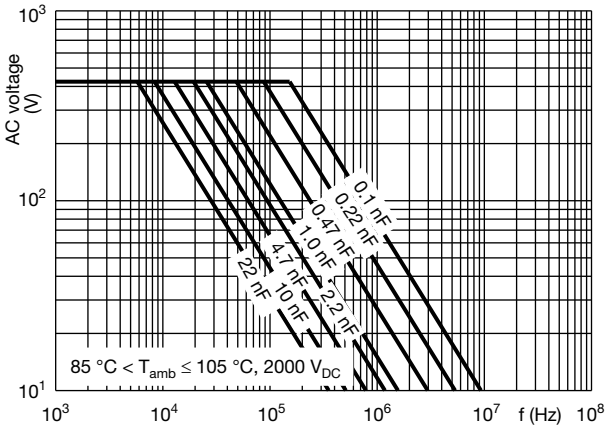


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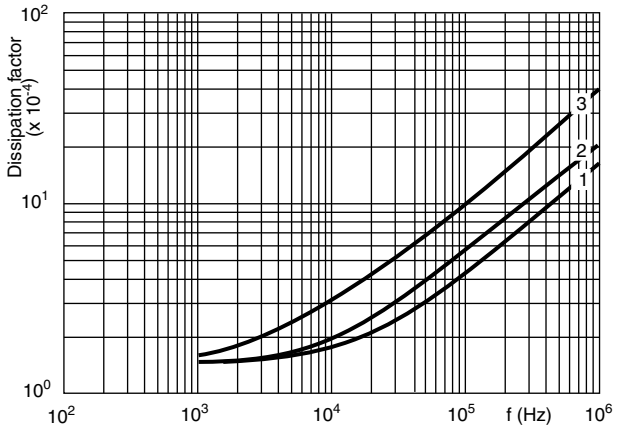
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Max. RMS voltage (sinewave) as a function of frequency

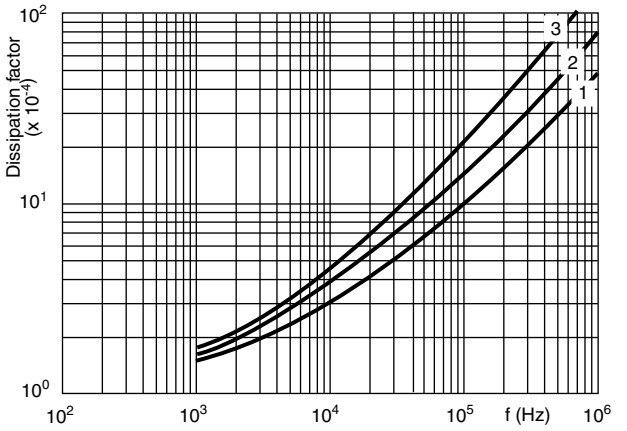



Max. RMS voltage (sinewave) as a function of frequency



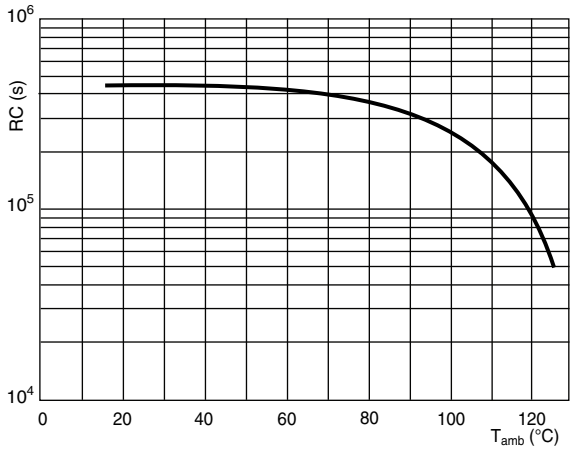

1. KP/MPK 10.0 mm and 15 mm pitch all versions
   22.5 mm pitch, 1000 V, 1600 V, 2000 V and 2500 V versions
2. KP/MPK 22.5 mm pitch, 630 V versions
   27.5 mm pitch, 1000 V, 1600 V and 2000 V versions
3. KP/MPK 27.5 mm pitch, 630 V versions

Tangent of loss angle
(typical curve)




1. KP/MPK 10.0 mm and 15 mm pitch all versions
   22.5 mm pitch, 1000 V, 1600 V, 2000 V and 2500 V versions
2. KP/MPK 22.5 mm pitch, 630 V versions
   27.5 mm pitch, 1000 V, 1600 V and 2000 V versions
3. KP/MPK 27.5 mm pitch, 630 V versions

Maximum curves




Insulation resistance as a function of ambient temperature



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

| $W_{max.}$ (mm) | HEAT CONDUCTIVITY (mW/°C) | | | |
|---|---|---|---|---|
| | PITCH 10 mm | PITCH 15 mm | PITCH 22.5 mm | PITCH 27.5 mm |
| 4.0 | 4.0 | 5.0 | - | - |
| 4.5 | 4.5 | 6.0 | - | - |
| 5.0 | 5.0 | 6.0 | 12.0 | 13.0 |
| 5.5 | 6.0 | 6.5 | 13.0 | 15.0 |
| 6.0 | 6.0 | 6.5 | 13.0 | 15.0 |
| 6.5 | 6.5 | 8.0 | 15.0 | 17.0 |
| 7.0 | - | 8.0 | 15.0 | 17.0 |
| 7.5 | - | 9.0 | 17.0 | 18.0 |
| 8.0 | - | 9.0 | 17.0 | 20.0 |
| 8.5 | - | 11.0 | 18.0 | 20.0 |
| 9.0 | - | 11.0 | 18.0 | 22.0 |
| 9.5 | - | 12.0 | 20.0 | 22.0 |
| 10.0 | - | 12.0 | 20.0 | 23.0 |
| 10.5 | - | - | 22.0 | 25.0 |
| 11.0 | - | - | 22.0 | 25.0 |
| 11.5 | - | - | 23.0 | 27.0 |
| 12.0 | - | - | - | 27.0 |
| 12.5 | - | - | - | 30.0 |
| 13.0 | - | - | - | 30.0 |
| 13.5 | - | - | - | 30.0 |
| 14.0 | - | - | - | 30.0 |
| 14.5 | - | - | - | 33.0 |
| 15.0 | - | - | - | 33.0 |
| 15.5 | - | - | - | 37.0 |
| 16.0 | - | - | - | 37.0 |

## POWER DISSIPATION AND MAXIMUM COMPONENT TEMPERATURE RISE

The power dissipation must be limited in order not to exceed the maximum allowed component temperature rise as a function of the free ambient temperature.

The power dissipation can be calculated according type detail specification “HQN-384-01/101: Technical Information Film Capacitors”

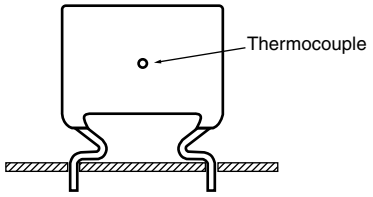
The component temperature rise ($\Delta T$) can be measured (see section “Measuring the component temperature” for more details) or calculated by $\Delta T = P/G$:

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


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## 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

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 ($U_{PP}$) shall not be greater than the maximum ($U_{p-p}$) to avoid the ionization 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:

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

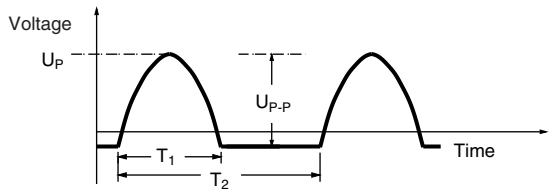
   T is the pulse duration.
4. The maximum component surface temperature rise must be lower than the limits.

**Example**

C = 10 nF 1600 V, KP/MPK
This is a signal as in the drawing below
$U_{P-P}$ = 1200 V; $U_P$ = 1100 V; $T_1$ = 12 µs; $T_2$ = 64 µs
The ambient temperature is 50 °C

Checking conditions:

1. The peak voltage $U_P$ = 1100 V is lower than 1600 $V_{DC}$
2. The peak-to-peak voltage 1200 V is lower than $2\sqrt{02} \times 550$ $V_{AC}$ = 1414 $U_{P-P}$
3. The voltage pulse slope (dU/dt) = 320 V is much lower than 7000 V/µs
4. The dissipated power is 170 mW as calculated with fourier terms
   This gives a temperature rise of 170 mW/(17 mW/°C) = 10 °C which is allowed according Fig. “Max. allowed temperature rise as a function of ambient temperature” for an ambient temperature of 50 °C





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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 at 100 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 | $\lvert\Delta C/C\rvert \leq 1\ \% + 5$ pF of the value measured initially |
| | | Tangent of loss angle | Increase of tan $\delta$: $\leq 0.0005$<br>Compared to values measured in 4.3.1 |
| **SUB-GROUP C1B PART OF SAMPLE OF SUB-GROUP C1** | | | |
| 4.6.1 | Initial measurements | Capacitance<br>Tangent of loss angle at 100 kHz | |
| 4.15 | 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 °C<br>$\theta B$ = +105 °C<br>5 cycles<br>Duration t = 30 min | |
| 4.7 | Vibration | Visual examination<br>Mounting:<br>See section “Mounting” of this specification<br>Procedure B4<br>Frequency range: 10 Hz to 55 Hz<br>Amplitude: 0.75 mm or<br>Acceleration 98 m/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 |
|---|---|---|
| 4.7.2 Final inspection | Visual examination | No visible damage |
| 4.9 Shock | Mounting:<br>see section “Mounting” of this specification<br>Pulse shape: half sine<br>Acceleration: 490 m/s²<br>Duration of pulse: 11 ms | |
| 4.9.3 Final measurements | Visual examination | No visible damage |
| | Capacitance | For C > 0.027µF: $\|\Delta C/C\| \leq 2$ % or<br>for C ≤ 0.027µF: $\|\Delta C/C\| \leq 3$ % + 5 pF<br>of the value measured in 4.6.1. |
| | Tangent of loss angle | Increase of tan δ: ≤ 0.0005<br>Compared to values measured in 4.6.1 |
| | Insulation resistance | As specified in chapter “General data” 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 | $\|\Delta C/C\| \leq 3$ % of the value measured in 4.4.2 or 4.9.3 |
| | Tangent of loss angle | Increase of tan δ: ≤ 0.001<br>Compared to values measured in 4.3.1 or 4.6.1 |
| | Insulation resistance | ≥ 50 % of values specified in chapters “General data” of this specification |


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| SUB-CLAUSE NUMBER AND TEST | CONDITIONS | PERFORMANCE REQUIREMENTS |
|---|---|---|
| **SUB-GROUP C2** | | |
| 4.11 Damp heat steady state | 56 days, 40 °C, 90 % to 95 % RH | |
| 4.11.1 Initial measurements | Capacitance<br>Tangent of loss angle at 1 kHz | |
| 4.11.3 Final measurements | Voltage proof = $U_{RDC}$ for 1 min within 15 min after removal from testchamber | No breakdown of flash-over |
| | Visual examination | No visible damage<br>Legible marking |
| | Capacitance | $\lvert\Delta C/C\rvert \leq 1\ \% + 5$ pF of the value measured in 4.11.1. |
| | Tangent of loss angle | Increase of tan $\delta \leq 0.0005$<br>Compared to values measured in 4.11.1 |
| | Insulation resistance | ≥ 50 % of values specified in section “Insulation Resistance” of this specification |
| **SUB GROUP C3** | | |
| 4.12.1 Endurance | Duration: 2000 h<br>Temperature: 85 °C<br>Voltage: 1.25 x max. $U_{RDC}$ $V_{RMS}$, 50 Hz<br>Duration: 2000 h<br>Temperature: 105 °C | |
| 4.12.1.1 Initial measurements | Voltage: 0.875 x max. $U_{RDC}$ $V_{RMS}$, 50 Hz<br>Capacitance<br>Tangent of loss angle at 100 kHz | |
| 4.12.1.3 Final measurements | Visual examination | No visible damage<br>Legible marking<br>Temperature: 85 °C |
| | Capacitance | For C > 0.056 µF: $\lvert\Delta C/C\rvert \leq 2\ \% + 5$ pF or<br>for C > 0.056 µF: $\lvert\Delta C/C\rvert \leq 3\ \% + 5$ pF<br>of the value measured in 4.12.1.1<br>Temperature: 105 °C<br>$\lvert\Delta C/C\rvert \leq 5\ \% + 5$ pF |
| | Tangent of loss angle | Increase of tan $\delta$: ≤ 0.001<br>Compared to values measured in 4.12.1 |
| | Insulation resistance | ≥ 50 % of values specified in chapters “General data” of this specification |
| **SUB-GROUP C4** | | |
| 4.2.6 Temperature characteristics | Capacitance | As specified in section “Capacitance” of this specification |
| | Insulation resistance | As specified in chapters “General data” of this specification |


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