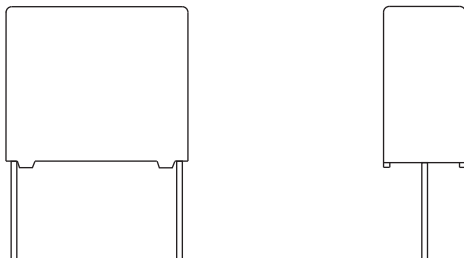




AC and Pulse Metallized Polypropylene Film Capacitors MKP/MKP Radial Potted Type



FEATURES

- 15 mm to 27.5 mm pitch
- Material categorization:
for definitions of compliance please see www.vishay.com/doc?99912

APPLICATIONS

- Where steep pulses occur e.g. SMPS (switch mode power supplies)
- Motor control circuits

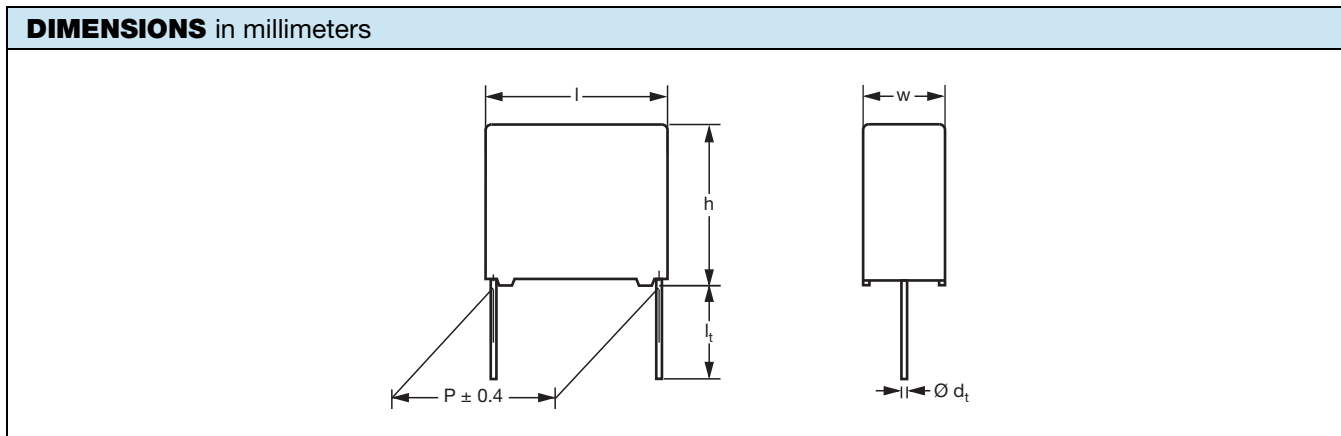


RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

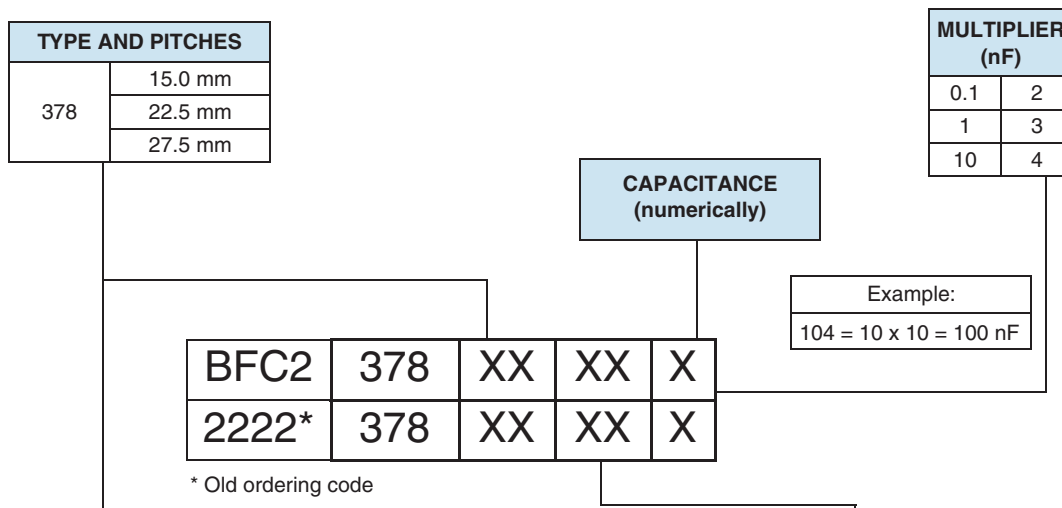
| QUICK REFERENCE DATA | |
|---|---|
| Capacitance range (E24 series) | 0.002 μ F to 0.68 μ F |
| Capacitance tolerance | \pm 5 % |
| Climatic testing class according to IEC 60068-1 | 55/085/56 |
| Rated DC temperature | 85 °C |
| Rated AC temperature | 70 °C |
| Maximum application temperature | 85 °C |
| Reference specifications | IEC 60384-17 |
| Dielectric | Polypropylene film |
| Electrodes | Metallized film |
| Construction | Internal serial construction |
| Encapsulation | Flame retardant plastic case and epoxy resin (UL-class 94 V-0) |
| Leads | Tinned wire |
| Marking | C-value; tolerance; rated voltage; manufacturer's type designation; code for dielectric material; manufacturer's emblem; code for factory of origin; year and week of manufacture |
| Rated DC voltage | 630 V _{DC} ; 1000 V _{DC} ; 1600 V _{DC} ; 2000 V _{DC} |
| Rated AC voltage | 300 V _{AC} ; 400 V _{AC} ; 500 V _{AC} ; 600 V _{AC} |
| Rated peak-to-peak voltage | 850 V; 1130 V; 1400 V; 1700 V |
| Performance grade | Grade 1 (long life) |
| Stability grade | Pitch 15 mm: grade 2 Pitch 22.5 mm and 27.5 mm: grade 1 |

Note

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



COMPOSITION OF CATALOG NUMBER



| TYPE | PACKAGING | LEAD CONFIGURATION | PREFERRED TYPES | | | | |
|------|---------------|---------------------------------------|-----------------|-------|--------|--------|--------|
| | | | C-TOL. | 630 V | 1000 V | 1600 V | 2000 V |
| 380 | Loose in box | Lead length 3.5 mm ± 0.3 mm | ± 5 % | 64 | 74 | 84 | 94 |
| TYPE | PACKAGING | LEAD CONFIGURATION | ON REQUEST | | | | |
| 378 | Loose in box | Lead length 5.0 mm ± 1.0 mm | ± 5 % | 62 | 72 | 82 | 92 |
| | Taped on reel | H = 18.5 mm; P ₀ = 12.7 mm | | 65 | 75 | 85 | 95 |



| SPECIFIC REFERENCE DATA - 630 V _{DC} | | |
|---|--|-------------------------|
| DESCRIPTION | VALUE | |
| Tangent of loss angle: C ≤ 0.18 μF 0.2 μF ≤ C ≤ 0.3 μF 0.33 μF ≤ C ≤ 0.39 μF 0.43 μF ≤ C ≤ 0.51 μF C > 0.51 μF | at 10 kHz | at 100 kHz |
| | ≤ 10 x 10 ⁻⁴ | ≤ 35 x 10 ⁻⁴ |
| | ≤ 10 x 10 ⁻⁴ | ≤ 45 x 10 ⁻⁴ |
| | ≤ 10 x 10 ⁻⁴ | ≤ 55 x 10 ⁻⁴ |
| | ≤ 10 x 10 ⁻⁴ | ≤ 65 x 10 ⁻⁴ |
| Rated voltage pulse slope (dU/dt) _R : P = 15 mm P = 22.5 mm P = 27.5 mm P = 27.5 mm | 500 V/μs 370 V/μs 230 V/μs (b < 15 mm) 120 V/μs (b ≥ 15 mm) | |
| | R between leads, for C ≤ 1 μF; 500 V; 1 min | |
| | > 100 000 MΩ | |
| | R between leads and case; 500 V; 1 min | |
| > 100 000 MΩ | | |
| Ionization (AC) voltage (typical value) at 50 pC peak discharge | | > 400 V |
| Withstanding (DC) voltage (cut off current 10 mA) ⁽¹⁾ ; rise time ≤ 1000 V/s | | 1008 V; 1 min |
| Withstanding (DC) voltage between leads and case | | 2840 V; 1 min |

Note

⁽¹⁾ See "Voltage Proof Test for Metalized Film Capacitors" www.vishay.com/doc?28169

| ELECTRICAL DATA AND ORDERING CODE | | | | | | |
|-----------------------------------|---|---------------------------------|----------------------------|---|-----------|--|
| U _{RDC} (V) | CAP. (μF) | DIMENSIONS w x h x l (mm) | MASS ⁽²⁾ (g) | CATALOG NUMBER BFC2 378 AND PACKAGING | | |
| | | | | LOOSE IN BOX | | REEL ⁽¹⁾ |
| | | | | l _t = 3.5 mm ± 0.3 mm | ALL LEADS | H = 18.5 mm; P ₀ = 12.7 mm |
| | | | | C-TOL. = ± 5 % | | |
| LAST 5 DIGITS OF CATALOG NUMBER | | SPQ | SPQ | | | |
| 630 | PITCH = 15.0 mm ± 0.4 mm; d _t = 0.60 ± 0.06 mm; U _{RAC} = 300 V; U _{p-p} = 850 V | | | | | |
| | 0.015 | 5.0 x 11.0 x 17.5 | 1.0 | 64153 | 1000 | 1100 |
| | 0.016 | | | 64163 | | |
| | 0.018 | | | 64183 | | |
| | 0.020 | | | 64203 | | |
| | 0.022 | | | 64223 | | |
| | 0.024 | 5.0 x 11.0 x 17.5 | 1.4 | 64243 | 1000 | 900 |
| | 0.027 | | | 64273 | | |
| | 0.030 | | | 64303 | | |
| | 0.033 | | | 64333 | | |
| | 0.036 | | | 6.0 x 12.0 x 17.5 | | |
| | 0.039 | 64393 | | | | |
| | 0.043 | 64433 | | | | |
| | 0.047 | 7.0 x 13.0 x 17.5 | 2.4 | 64473 | 1000 | 650 |
| | 0.051 | | | 64513 | | |
| | PITCH = 22.5 mm ± 0.4 mm; d _t = 0.80 ± 0.08 mm; U _{RAC} = 300 V; U _{p-p} = 850 V | | | | | |
| | 0.056 | 6.0 x 15.5 x 26.0 | 2.4 | 64563 | 300 | 600 |
| | 0.062 | | | 64623 | | |
| 0.068 | 64683 | | | | | |
| 0.075 | 64753 | | | | | |
| 0.082 | 64823 | | | | | |
| 0.091 | 6.0 x 15.5 x 26.0 | 2.9 | 64823 | 200 | 550 | |
| 0.10 | | | 64913 | | | |
| 0.11 | | | 64104 | | | |
| 0.12 | 7.0 x 16.5 x 26.0 | 3.8 | 64114 | 200 | 450 | |
| 0.13 | | | 64124 | | | |
| 0.15 | | | 64134 | | | |
| 0.16 | 8.5 x 18.0 x 26.0 | 6.8 | 64154 | 200 | 350 | |
| 0.18 | | | 64164 | | | |
| | | | 64184 | | | |



| ELECTRICAL DATA AND ORDERING CODE | | | | | | |
|---|----------------------------|--|--|--|------------------|---|
| U_{RDC} (V) | CAP. (μF) | DIMENSIONS w x h x l (mm) | MASS ⁽²⁾ (g) | CATALOG NUMBER BFC2 378 AND PACKAGING | | |
| | | | | LOOSE IN BOX | | REEL ⁽¹⁾ |
| | | | | l_t = 3.5 mm ± 0.3 mm | ALL LEADS | H = 18.5 mm; P₀ = 12.7 mm |
| | | | | C-TOL. = ± 5 % | | |
| LAST 5 DIGITS OF CATALOG NUMBER | SPQ | SPQ | | | | |
| PITCH = 27.5 mm ± 0.4 mm; d_t = 0.80 ± 0.08 mm; U_{RAC} = 300 V; U_{p-p} = 850 V | | | | | | |
| 630 | 0.20 | 9.0 x 19.0 x 31.5 | 7.4 | 64204 | 100 | |
| | 0.22 | | | 64224 | | |
| | 0.24 | | | 64244 | | |
| | 0.27 | | | 64274 | | |
| | 0.30 | 11.0 x 21.0 x 31.0 | 9.2 | 64304 | 100 | |
| | 0.33 | | | 64334 | | |
| | 0.36 | | | 64364 | | |
| | 0.39 | | | 64394 | | |
| | 0.43 | 13.0 x 23.0 x 31.0 | 12.3 | 64434 | 100 | |
| | 0.47 | | | 64474 | | |
| | 0.51 | | | 64514 | | |
| | 0.56 | 15.0 x 25.0 x 31.5 | 16.1 | 64564 | 100 | |
| | 0.62 | | | 64624 | | |
| | 0.68 | | | 64684 | | |

Notes

- (1) H = in-tape height; P₀ = sprocket hole distance; for detailed specifications refer to packaging information
- (2) Weight for short lead product only
- SPQ = Standard Packing Quantity

| SPECIFIC REFERENCE DATA - 1000 V_{DC} | | |
|---|-------------------------|-------------------------|
| DESCRIPTION | VALUE | |
| Tangent of loss angle: | at 10 kHz | at 100 kHz |
| C ≤ 0.051 μF | ≤ 10 x 10 ⁻⁴ | ≤ 20 x 10 ⁻⁴ |
| 0.056 μF ≤ C ≤ 0.22 μF | ≤ 10 x 10 ⁻⁴ | ≤ 25 x 10 ⁻⁴ |
| Rated voltage pulse slope (dU/dt) _R : | | |
| P = 15 mm | 1300 V/μs | |
| P = 22.5 mm | 1200 V/μs | |
| P = 27.5 mm | 600 V/μs (b < 15 mm) | |
| P = 27.5 mm | 300 V/μs (b ≥ 15 mm) | |
| R between leads, for C ≤ 1 μF; 500 V; 1 min | > 100 000 MΩ | |
| R between leads and case; 500 V; 1 min | > 100 000 MΩ | |
| Ionization (AC) voltage (typical value) at 50 pC peak discharge | > 500 V | |
| Withstanding (DC) voltage (cut off current 10 mA) ⁽¹⁾ ; rise time ≤ 1000 V/s | 1600 V; 1 min | |
| Withstanding (DC) voltage between leads and case | 2840 V; 1 min | |

Note

- (1) See "Voltage Proof Test for Metalized Film Capacitors" www.vishay.com/doc?28169



| ELECTRICAL DATA AND ORDERING CODE | | | | | | |
|--|--|--|--|--|------------------|---|
| U_{RDC} (V) | CAP. (μF) | DIMENSIONS w x h x l (mm) | MASS ⁽²⁾ (g) | CATALOG NUMBER BFC2 378 AND PACKAGING | | |
| | | | | LOOSE IN BOX | | REEL ⁽¹⁾ |
| | | | | l_t = 3.5 mm ± 0.3 mm | ALL LEADS | H = 18.5 mm; P₀ = 12.7 mm |
| | | | | C-TOL. = ± 5 % | | |
| LAST 5 DIGITS OF CATALOG NUMBER | SPQ | SPQ | | | | |
| 1000 | PITCH = 15.0 mm ± 0.4 mm; d_t = 0.60 ± 0.06 mm; U_{RAC} = 300 V; U_{p-p} = 1130 V | | | | | |
| | 0.0030 | 5.0 x 11.0 x 17.5 | 1.0 | 74302 | 1000 | 1100 |
| | 0.0033 | | | 74332 | | |
| | 0.0036 | | | 74362 | | |
| | 0.0039 | | | 74392 | | |
| | 0.0043 | | | 74432 | | |
| | 0.0047 | | | 74472 | | |
| | 0.0051 | | | 74512 | | |
| | 0.0056 | | | 74562 | | |
| | 0.0062 | | | 74622 | | |
| | 0.0068 | | | 74682 | | |
| | 0.0075 | | | 74752 | | |
| | 0.0082 | 6.0 x 12.0 x 17.5 | 1.4 | 74822 | 1000 | 900 |
| | 0.0091 | | | 74912 | | |
| | 0.010 | | | 74103 | | |
| | 0.011 | 74113 | | | | |
| | PITCH = 22.5 mm ± 0.4 mm; d_t = 0.80 ± 0.08 mm; U_{RAC} = 300 V; U_{p-p} = 1130 V | | | | | |
| | 0.012 | 6.0 x 15.5 x 26.0 | 2.4 | 74123 | 300 | 600 |
| | 0.013 | | | 74133 | | |
| | 0.015 | | | 74153 | | |
| | 0.016 | | | 74163 | | |
| | 0.018 | | | 74183 | | |
| | 0.020 | | | 74203 | | |
| | 0.022 | 7.0 x 16.5 x 26.0 | 2.9 | 74223 | 200 | 550 |
| | 0.024 | | | 74243 | | |
| | 0.027 | | | 74273 | | |
| | 0.030 | 8.5 x 18.0 x 26.0 | 3.8 | 74303 | 200 | 450 |
| | 0.033 | | | 74333 | | |
| | 0.036 | | | 74363 | | |
| | 0.039 | | | 74393 | | |
| | 0.043 | 9.0 x 19.0 x 31.5 | 6.8 | 74433 | 200 | 350 |
| | 0.047 | | | 74473 | | |
| | 0.051 | | | 74513 | | |
| | PITCH = 27.5 mm ± 0.4 mm; d_t = 0.80 ± 0.08 mm; U_{RAC} = 300 V; U_{p-p} = 1130 V | | | | | |
| | 0.056 | 11.0 x 21.0 x 31.5 | 7.4 | 74563 | 100 | |
| | 0.062 | | | 74623 | | |
| 0.068 | 74683 | | | | | |
| 0.075 | 74753 | | | | | |
| 0.082 | 13.0 x 23.0 x 31.0 | 9.2 | 74823 | 100 | | |
| 0.091 | | | 74913 | | | |
| 0.10 | | | 74104 | | | |
| 0.11 | | | 74114 | | | |
| 0.12 | 15.0 x 25.0 x 31.5 | 12.3 | 74124 | 100 | | |
| 0.13 | | | 74134 | | | |
| 0.15 | | | 74154 | | | |
| 0.16 | | | 74164 | | | |
| 0.18 | 18.0 x 28.0 x 31.5 | 16.1 | 74184 | 100 | | |
| 0.20 | | | 74204 | | | |
| 0.22 | | | 74224 | | | |

Notes

- (1) H = in-tape height; P₀ = sprocket hole distance; for detailed specifications refer to packaging information
- (2) Weight for short lead product only
- SPQ = Standard Packing Quantity



| SPECIFIC REFERENCE DATA - 1600 V _{DC} | | |
|---|-------------------------|-------------------------|
| DESCRIPTION | VALUE | |
| Tangent of loss angle: | at 10 kHz | at 100 kHz |
| C ≤ 0.022 μF | ≤ 10 x 10 ⁻⁴ | ≤ 15 x 10 ⁻⁴ |
| 0.024 μF ≤ C ≤ 0.1 μF | ≤ 10 x 10 ⁻⁴ | ≤ 20 x 10 ⁻⁴ |
| Rated voltage pulse slope (dU/dt) _R : | 1600 V/μs | |
| P = 22.5 mm | 900 V/μs (b < 15 mm) | |
| P = 27.5 mm | 450 V/μs (b ≥ 15 mm) | |
| P = 27.5 mm | | |
| R between leads, for C ≤ 1 μF; 500 V; 1 min | > 100 000 MΩ | |
| R between leads and case; 500 V; 1 min | > 100 000 MΩ | |
| Ionization (AC) voltage (typical value) at 20 pC peak discharge | > 600 V | |
| Withstanding (DC) voltage (cut off current 10 mA) ⁽¹⁾ ; rise time ≤ 1000 V/s | 2560 V; 1 min | |
| Withstanding (DC) voltage between leads and case | 2840 V; 1 min | |

Note

⁽¹⁾ See "Voltage Proof Test for Metalized Film Capacitors" www.vishay.com/doc?28169

| ELECTRICAL DATA AND ORDERING CODE | | | | | | |
|-----------------------------------|--|---------------------------------|----------------------------|---|-----------|--|
| U _{RDC} (V) | CAP. (μF) | DIMENSIONS w x h x l (mm) | MASS ⁽²⁾ (g) | CATALOG NUMBER BFC2 378 AND PACKAGING | | |
| | | | | LOOSE IN BOX | | REEL ⁽¹⁾ |
| | | | | l _t = 3.5 mm ± 0.3 mm | ALL LEADS | H = 18.5 mm; P ₀ = 12.7 mm |
| | | | | C-TOL. = ± 5 % | | |
| LAST 5 DIGITS OF CATALOG NUMBER | | SPQ | SPQ | | | |
| 1600 | PITCH = 22.5 mm ± 0.4 mm; d_t = 0.80 ± 0.08 mm; U_{RAC} = 500 V; U_{p-p} = 1400 V | | | | | |
| | 0.0056 | 6.0 x 15.5 x 26.0 | 2.4 | 84562 | 300 | 600 |
| | 0.0062 | | | 84622 | | |
| | 0.0068 | | | 84682 | | |
| | 0.0075 | | 2.9 | 84752 | 200 | 550 |
| | 0.0082 | | | 84822 | | |
| | 0.0091 | | | 84912 | | |
| | 0.010 | 3.8 | 84103 | 200 | 450 | |
| | 0.011 | | 84113 | | | |
| | 0.012 | | 84123 | | | |
| | 0.013 | 6.8 | 84133 | 200 | 350 | |
| | 0.015 | | 84153 | | | |
| | 0.016 | | 84163 | | | |
| | 0.018 | 9.0 x 19.0 x 31.5 | 7.4 | 84183 | 100 | |
| | 0.020 | | | 84203 | | |
| | 0.022 | | 84223 | | | |
| | PITCH = 27.5 mm ± 0.4 mm; d_t = 0.80 ± 0.08 mm; U_{RAC} = 500 V; U_{p-p} = 1400 V | | | | | |
| | 0.024 | 11.0 x 21.0 x 31.0 | 9.2 | 84243 | 100 | |
| | 0.027 | | | 84273 | | |
| | 0.030 | | | 84303 | | |
| 0.033 | 13.0 x 23.0 x 31.0 | 12.3 | 84333 | 100 | | |
| 0.036 | | | 84363 | | | |
| 0.039 | | | 84393 | | | |
| 0.043 | 15.0 x 25.0 x 31.5 | 16.1 | 84433 | 100 | | |
| 0.047 | | | 84473 | | | |
| 0.051 | | | 84513 | | | |
| 0.056 | | | 84563 | 100 | | |
| 0.062 | | | 84623 | | | |
| 0.068 | | | 84683 | | | |
| 0.075 | | | 84753 | 100 | | |
| 0.082 | | | 84823 | | | |
| 0.091 | | | 84913 | | | |
| 0.10 | | | 84104 | | | |

Notes

- ⁽¹⁾ H = in-tape height; P₀ = sprocket hole distance; for detailed specifications refer to packaging information
- ⁽²⁾ Weight for short lead product only
- SPQ = Standard Packing Quantity



| SPECIFIC REFERENCE DATA - 2000 V _{DC} | | |
|---|--|---------------------------------------|
| DESCRIPTION | VALUE | |
| Tangent of loss angle: C ≤ 0.051 μF | at 10 kHz ≤ 10 x 10 ⁻⁴ | at 100 kHz ≤ 15 x 10 ⁻⁴ |
| Rated voltage pulse slope (dU/dt) _R : P = 22.5 mm P = 27.5 mm P = 27.5 mm | 2000 V/μs 1200 V/μs (b < 15 mm) 600 V/μs (b ≥ 15 mm) | |
| R between leads, for C ≤ 1 μF; 500 V; 1 min | > 100 000 MΩ | |
| R between leads and case; 500 V; 1 min | > 100 000 MΩ | |
| Ionization (AC) voltage (typical value) at 20 pC peak discharge | > 600 V | |
| Withstanding (DC) voltage (cut off current 10 mA) ⁽¹⁾ ; rise time ≤ 1000 V/s | 3200 V; 1 min | |
| Withstanding (DC) voltage between leads and case | 2840 V; 1 min | |

Note

⁽¹⁾ See "Voltage Proof Test for Metalized Film Capacitors" www.vishay.com/doc?28169

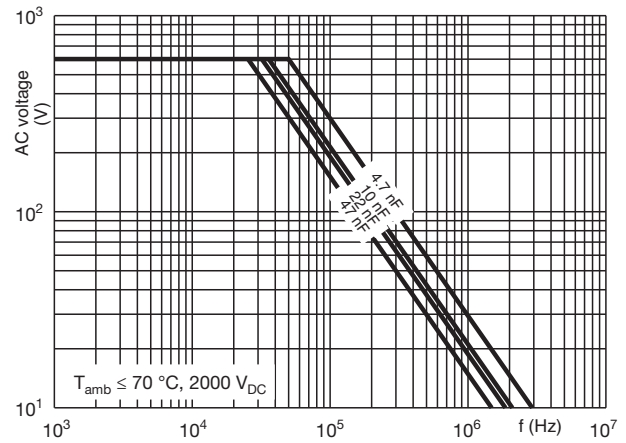
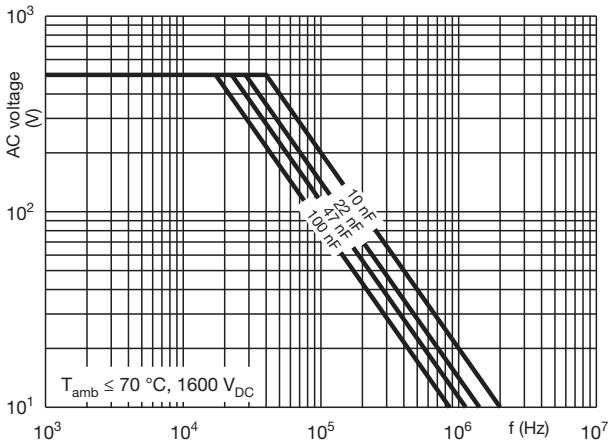
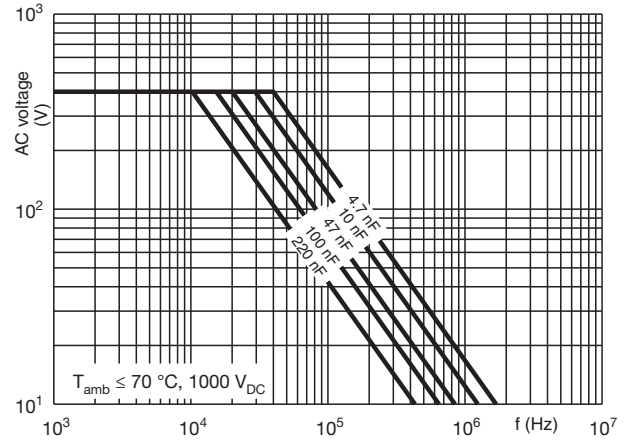
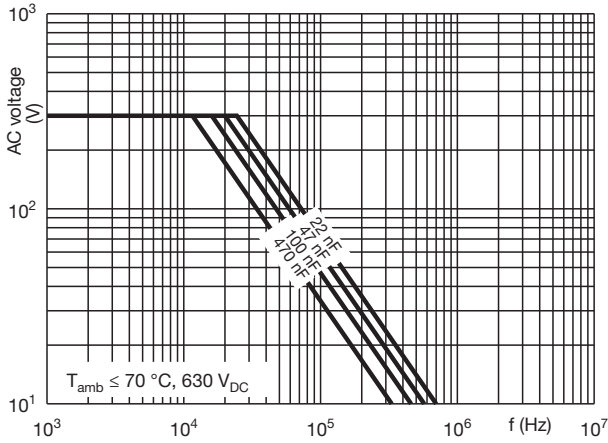
| ELECTRICAL DATA AND ORDERING CODE | | | | | | | | | | |
|------------------------------------|--|---------------------------------|----------------------------|---|-----------|--|--------------------|-------------------------|-------------------------|----------------|
| U _{RDC} (V) | CAP. (μF) | DIMENSIONS w x h x l (mm) | MASS ⁽²⁾ (g) | CATALOG NUMBER BFC2 378 AND PACKAGING | | | | | | |
| | | | | LOOSE IN BOX | | REEL ⁽¹⁾ | | | | |
| | | | | I _t = 3.5 mm ± 0.3 mm | ALL LEADS | H = 18.5 mm; P ₀ = 12.7 mm | | | | |
| | | | | C-TOL. = ± 5 % | | | | | | |
| LAST 5 DIGITS OF CATALOG NUMBER | SPQ | SPQ | | | | | | | | |
| 2000 | PITCH = 22.5 mm ± 0.4 mm; d _t = 0.80 ± 0.08 mm; U _{RAC} = 600 V; U _{p-p} = 1700 V | | | | | | | | | |
| | 0.0033 0.0036 | 6.0 x 12.0 x 26.0 | 2.4 | 94332 94362 | 300 | 600 | | | | |
| | 0.0039 0.0043 0.0047 0.0051 | | 2.9 | 94392 94432 94472 94512 | 200 | 550 | | | | |
| | 0.0056 | | | | | | 94562 | | | |
| | 0.0062 0.0068 0.0075 | | | | | | 3.8 | 94622 94682 94752 | 200 | 450 |
| | 0.0082 | | | | | | | | | |
| | 0.0091 0.010 0.011 | 6.8 | 94912 94103 94113 | 200 | 350 | | | | | |
| | 0.012 | | | | | 94123 | | | | |
| | PITCH = 27.5 mm ± 0.4 mm; d _t = 0.80 ± 0.08 mm; U _{RAC} = 600 V; U _{p-p} = 1700 V | | | | | | | | | |
| | 0.013 0.015 0.016 | 9.0 x 19.0 x 31.5 | 7.4 | 94133 94153 94163 | 100 | | | | | |
| | 0.018 0.020 | | | | | | 11.0 x 21.0 x 31.0 | 94183 94203 | | |
| | 0.022 0.024 | | | | | | | | 9.2 | 94223 94243 |
| | 0.027 | 94273 | | | | | | | | |
| | 0.030 0.033 0.036 | 13.0 x 23.0 x 31.0 | 12.3 | 94303 94333 94363 | 100 | | | | | |
| | 0.039 0.043 0.047 | | | | | | 15.0 x 25.0 x 31.5 | 16.1 | 94393 94433 94473 | 100 |
| | 0.051 | | | | | | | | | |

Notes

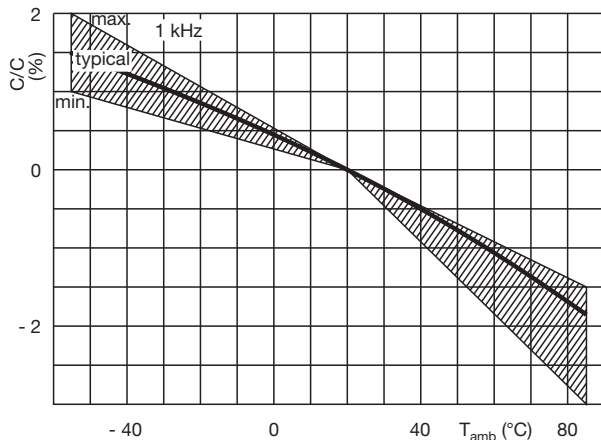
- ⁽¹⁾ H = in-tape height; P₀ = sprocket hole distance; for detailed specifications refer to packaging information
- ⁽²⁾ Weight for short lead product only
- SPQ = Standard Packing Quantity



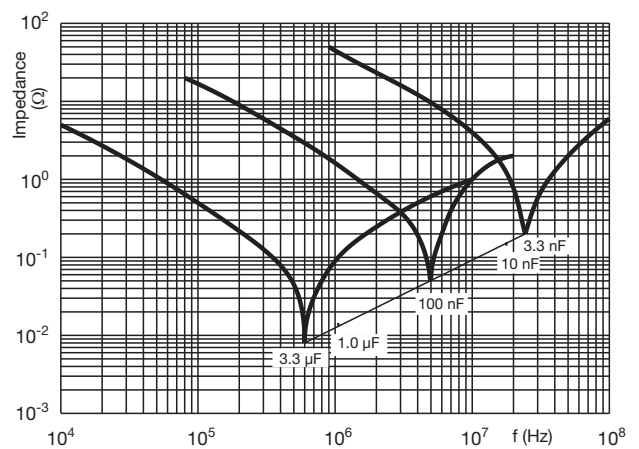
MAXIMUM RMS VOLTAGE (SINEWAVE) AS A FUNCTION OF FREQUENCY



CAPACITANCE



IMPEDANCE





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