

Interference Suppression Film Capacitor - Class X2 Radial MKP 310 V_{AC} - Standard Across the Line


FEATURES

- 7.5 mm to 52.5 mm lead pitch
- Capacitance range up to 40 μF
- Very small dimensions
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


**RoHS
COMPLIANT**
APPLICATIONS

For standard across the line X2 applications.
See also application note: www.vishay.com/doc?28153

| QUICK REFERENCE DATA | | |
|---|--|---|
| Capacitance range (E12 series) | 0.001 μF to 40 μF (preferred values according to E6) | |
| Capacitance tolerance | $\pm 20\%$, $\pm 10\%$, $\pm 5\%$ | |
| Rated AC voltage | 310 V _{AC} , 50 Hz to 60 Hz | |
| Permissible DC voltage | For C $\leq 10\ \mu\text{F}$ | For C > 10 μF |
| | 800 V _{DC} at 85 °C 630 V _{DC} at 110 °C | 575 V _{DC} at 85 °C 450 V _{DC} at 110 °C |
| Climatic testing class according to IEC 60068-1 | 55/110/56/B | |
| Maximum application temperature | 110 °C | |
| Leads | Tinned wire | |
| Reference standards | IEC 60384-14 ed-4 (2013) and EN 60384-14 IEC 60065 requires pass. flamm. class B CSA-E384-14, UL 60384-14 CQC | |
| Dielectric | Polypropylene film | |
| Electrodes | Metallized | |
| Construction | Mono construction | |
| Encapsulation | Plastic case, epoxy resin sealed, flame retardant UL-class 94 V-0 | |
| Marking | C-value, tolerance, rated voltage, sub-class, manufacturer's type, code for dielectric material, manufacturer location, year and week; manufacturer's logo or name; safety approvals | |

Note

- For more detailed data and test requirements, contact rfi@vishay.com

| DIMENSIONS in millimeters | |
|---------------------------|--------|
| 2 PINS | 4 PINS |
| | |

Note

- $\text{Ø } d \pm 10\%$ of standard diameter specified



COMPOSITION OF CATALOG NUMBER



Notes

- For detailed tape specifications refer to Packaging Information: www.vishay.com/doc?28139
- Terminal codes see detail tables for 37.5 mm and 52.5 mm pitch
- ⁽¹⁾ Packaging will be bulk for all capacitors with pitch ≤ 15 mm and such long leads (> 5 mm)
Capacitors with short leads up to 5 mm and pitch > 15 mm will be in tray and asking code will be "T"



| SPECIFIC REFERENCE DATA | | |
|---|--------------------------|--------------------------|
| DESCRIPTION | VALUE | |
| Rated AC voltage (U_{RAC}) | 310 V | |
| Permissible DC voltage (U_{RDC}) | 630 V | |
| Tangent of loss angle: | at 1 kHz | at 10 kHz |
| $C < 470$ nF | $\leq 10 \times 10^{-4}$ | $\leq 20 \times 10^{-4}$ |
| 470 nF $\leq C \leq 1$ μ F | $\leq 20 \times 10^{-4}$ | $\leq 70 \times 10^{-4}$ |
| 1 μ F $\leq C \leq 20$ μ F | $\leq 30 \times 10^{-4}$ | - |
| $C > 20$ μ F | $\leq 40 \times 10^{-4}$ | - |
| Rated voltage pulse slope (dU/dt) _R at 435 V _{DC} | | |
| Pitch = 7.5 mm | 600 V/ μ s | |
| Pitch = 10 mm | 600 V/ μ s | |
| Pitch = 15 mm | 400 V/ μ s | |
| Pitch = 22.5 mm | 150 V/ μ s | |
| Pitch ≥ 27.5 mm | 100 V/ μ s | |
| R between leads, for $C \leq 0.33$ μ F at 100 V; 1 min | $> 15\,000$ M Ω | |
| RC between leads, for $C > 0.33$ μ F at 100 V; 1 min | > 5000 s | |
| R between leads and case; 100 V; 1 min | $> 30\,000$ M Ω | |
| Withstanding (DC) voltage (cut off current 10 mA) ⁽¹⁾ ; rise time ≤ 1000 V/s: | | |
| $C \leq 1$ μ F | 2200 V; 1 min | |
| 1 μ F $< C \leq 10$ μ F | 1800 V; 1 min | |
| $C > 10$ μ F | 1500 V; 1 min | |
| Withstanding (AC) voltage between leads and case | 2120 V; 1 min | |
| Maximum application temperature | 110 °C | |

Note

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

| ELECTRICAL DATA AND ORDERING CODE - PITCH 7.5 mm | | | | | | | | | | |
|---|--------------------|---------------------------------|----------------------------|--|-----------------------------------|-------------|------------------------------------|-------------|---|------|
| U_{RAC} (V) | CAP. (μ F) | DIMENSIONS w x h x l (mm) | MASS (g) ⁽²⁾ | CATALOG NUMBER F339MX2 AND PACKAGING | | | | | | |
| | | | | LOOSE IN BOX | | | | | AMMOPACK ⁽¹⁾ | |
| | | | | SHORT LEADS | | | LONG LEADS | | H = 18.5 mm P ₀ = 12.7 mm | SPQ |
| | | | | $l_t =$ 3.5 mm + 1 mm / - 0.5 mm | $l_t =$ 5.0 mm ± 1.0 mm | SPQ | $l_t =$ 25.0 mm ± 2.0 mm | SPQ | | |
| PITCH = 7.5 mm ± 0.4 mm; $d_t = 0.50$ mm ± 0.05 mm; C-TOL. = ± 20 % | | | | | | | | | | |
| 310 | 0.0010 | 4.0 x 9.0 x 10.0 | 0.4 | 21031MCA2B0 | 21031MCM2B0 | 1500 | 21031MCI2B0 | 1000 | 21031MC02G0 | 1250 |
| | 0.0015 | | | 21531MCA2B0 | 21531MCM2B0 | | 21531MCI2B0 | | 21531MC02G0 | |
| | 0.0022 | | | 22231MCA2B0 | 22231MCM2B0 | | 22231MCI2B0 | | 22231MC02G0 | |
| | 0.0033 | | | 23331MCA2B0 | 23331MCM2B0 | | 23331MCI2B0 | | 23331MC02G0 | |
| | 0.0047 | | | 24731MCA2B0 | 24731MCM2B0 | | 24731MCI2B0 | | 24731MC02G0 | |
| | 0.0068 | | | 26831MCA2B0 | 26831MCM2B0 | | 26831MCI2B0 | | 26831MC02G0 | |
| | 0.010 | | | 31031MCA2B0 | 31031MCM2B0 | | 31031MCI2B0 | | 31031MC02G0 | |
| | 0.015 | | | 31531MCA2B0 | 31531MCM2B0 | | 31531MCI2B0 | | 31531MC02G0 | |
| | 0.022 | | | 32231MCA2B0 | 32231MCM2B0 | | 32231MCI2B0 | | 32231MC02G0 | |
| | 0.033 | | | 33331MCA2B0 | 33331MCM2B0 | | 33331MCI2B0 | | 33331MC02G0 | |
| | 0.047 | | | 5.0 x 10.5 x 10.0 | 0.4 | | 34731MCA2B0 | | 34731MCM2B0 | |
| 0.068 | 6.0 x 11.5 x 10.0 | 0.8 | 36831MCA2B0 | 36831MCM2B0 | 750 | 36831MCI2B0 | 1000 | 36831MC02G0 | 750 | |



| ELECTRICAL DATA AND ORDERING CODE - PITCH 7.5 mm | | | | | | | | | | |
|--|---|---------------------------------|----------------------------|--|-------------------------------|-------------|--------------------------------|---|-------------|-------------|
| U _{RAC} (V) | CAP. (µF) | DIMENSIONS w x h x l (mm) | MASS (g) ⁽²⁾ | CATALOG NUMBER F339MX2 AND PACKAGING | | | | | | |
| | | | | LOOSE IN BOX | | | | AMMOPACK ⁽¹⁾ | | |
| | | | | SHORT LEADS | | LONG LEADS | | H = 18.5 mm P ₀ = 12.7 mm | SPQ | |
| | | | | $l_t =$ 3.5 mm + 1 mm / - 0.5 mm | $l_t =$ 5.0 mm ± 1.0 mm | SPQ | $l_t =$ 25.0 mm ± 2.0 mm | | | SPQ |
| PITCH = 7.5 mm ± 0.4 mm; d_t = 0.50 mm ± 0.05 mm; C-TOL. = ± 10 % | | | | | | | | | | |
| 310 | 0.0010 | 4.0 x 9.0 x 10.0 | 0.45 | 21031KCA2B0 | 21031KCM2B0 | 1500 | 21031KCI2B0 | 1000 | 21031KC02G0 | 1250 |
| | 0.0012 | | | 21231KCA2B0 | 21231KCM2B0 | | 21231KCI2B0 | | 21231KC02G0 | |
| | 0.0015 | | | 21531KCA2B0 | 21531KCM2B0 | | 21531KCI2B0 | | 21531KC02G0 | |
| | 0.0018 | | | 21831KCA2B0 | 21831KCM2B0 | | 21831KCI2B0 | | 21831KC02G0 | |
| | 0.0022 | | | 22231KCA2B0 | 22231KCM2B0 | | 22231KCI2B0 | | 22231KC02G0 | |
| | 0.0027 | | | 22731KCA2B0 | 22731KCM2B0 | | 22731KCI2B0 | | 22731KC02G0 | |
| | 0.0033 | | | 23331KCA2B0 | 23331KCM2B0 | | 23331KCI2B0 | | 23331KC02G0 | |
| | 0.0039 | | | 23931KCA2B0 | 23931KCM2B0 | | 23931KCI2B0 | | 23931KC02G0 | |
| | 0.0047 | | | 24731KCA2B0 | 24731KCM2B0 | | 24731KCI2B0 | | 24731KC02G0 | |
| | 0.0056 | | | 25631KCA2B0 | 25631KCM2B0 | | 25631KCI2B0 | | 25631KC02G0 | |
| | 0.0068 | | | 26831KCA2B0 | 26831KCM2B0 | | 26831KCI2B0 | | 26831KC02G0 | |
| | 0.0082 | | | 28231KCA2B0 | 28231KCM2B0 | | 28231KCI2B0 | | 28231KC02G0 | |
| | 0.010 | | | 31031KCA2B0 | 31031KCM2B0 | | 31031KCI2B0 | | 31031KC02G0 | |
| | 0.012 | | | 31231KCA2B0 | 31231KCM2B0 | | 31231KCI2B0 | | 31231KC02G0 | |
| | 0.015 | | | 31531KCA2B0 | 31531KCM2B0 | | 31531KCI2B0 | | 31531KC02G0 | |
| | 0.018 | | | 31831KCA2B0 | 31831KCM2B0 | | 31831KCI2B0 | | 31831KC02G0 | |
| | 0.022 | | | 32231KCA2B0 | 32231KCM2B0 | | 32231KCI2B0 | | 32231KC02G0 | |
| | 0.027 | | | 32731KCA2B0 | 32731KCM2B0 | | 32731KCI2B0 | | 32731KC02G0 | |
| | 0.033 | 5.0 x 10.5 x 10.0 | 0.6 | 33331KCA2B0 | 33331KCM2B0 | 1000 | 33331KCI2B0 | 1250 | 33331KC02G0 | 1000 |
| | 0.039 | | | 33931KCA2B0 | 33931KCM2B0 | | 33931KCI2B0 | | 33931KC02G0 | |
| | 0.047 | 6.0 x 11.5 x 10.0 | 0.8 | 34731KCA2B0 | 34731KCM2B0 | 750 | 34731KCI2B0 | 1000 | 34731KC02G0 | 750 |
| | 0.056 | | | 35631KCA2B0 | 35631KCM2B0 | | 35631KCI2B0 | | 35631KC02G0 | |
| | PITCH = 7.5 mm ± 0.4 mm; d_t = 0.50 mm ± 0.05 mm; C-TOL. = ± 5 % | | | | | | | | | |
| | 310 | 0.0010 | 4.0 x 9.0 x 10.0 | 0.45 | 21031JCA2B0 | 21031JCM2B0 | 1500 | 21031JCI2B0 | 1000 | 21031JC02G0 |
| 0.0012 | | 21231JCA2B0 | | | 21231JCM2B0 | 21231JCI2B0 | | 21231JC02G0 | | |
| 0.0015 | | 21531JCA2B0 | | | 21531JCM2B0 | 21531JCI2B0 | | 21531JC02G0 | | |
| 0.0018 | | 21831JCA2B0 | | | 21831JCM2B0 | 21831JCI2B0 | | 21831JC02G0 | | |
| 0.0022 | | 22231JCA2B0 | | | 22231JCM2B0 | 22231JCI2B0 | | 22231JC02G0 | | |
| 0.0027 | | 22731JCA2B0 | | | 22731JCM2B0 | 22731JCI2B0 | | 22731JC02G0 | | |
| 0.0033 | | 23331JCA2B0 | | | 23331JCM2B0 | 23331JCI2B0 | | 23331JC02G0 | | |
| 0.0039 | | 23931JCA2B0 | | | 23931JCM2B0 | 23931JCI2B0 | | 23931JC02G0 | | |
| 0.0047 | | 24731JCA2B0 | | | 24731JCM2B0 | 24731JCI2B0 | | 24731JC02G0 | | |
| 0.0056 | | 25631JCA2B0 | | | 25631JCM2B0 | 25631JCI2B0 | | 25631JC02G0 | | |
| 0.0068 | | 26831JCA2B0 | | | 26831JCM2B0 | 26831JCI2B0 | | 26831JC02G0 | | |
| 0.0082 | | 28231JCA2B0 | | | 28231JCM2B0 | 28231JCI2B0 | | 28231JC02G0 | | |
| 0.010 | | 31031JCA2B0 | | | 31031JCM2B0 | 31031JCI2B0 | | 31031JC02G0 | | |
| 0.012 | | 31231JCA2B0 | | | 31231JCM2B0 | 31231JCI2B0 | | 31231JC02G0 | | |
| 0.015 | | 31531JCA2B0 | | | 31531JCM2B0 | 31531JCI2B0 | | 31531JC02G0 | | |
| 0.018 | | 31831JCA2B0 | | | 31831JCM2B0 | 31831JCI2B0 | | 31831JC02G0 | | |
| 0.022 | | 32231JCA2B0 | | | 32231JCM2B0 | 32231JCI2B0 | | 32231JC02G0 | | |
| 0.027 | | 32731JCA2B0 | | | 32731JCM2B0 | 32731JCI2B0 | | 32731JC02G0 | | |
| 0.033 | | 5.0 x 10.5 x 10.0 | 0.6 | 33331JCA2B0 | 33331JCM2B0 | 1000 | 33331JCI2B0 | 1250 | 33331JC02G0 | 1000 |
| 0.039 | | | | 33931JCA2B0 | 33931JCM2B0 | | 33931JCI2B0 | | 33931JC02G0 | |
| 0.047 | | 6.0 x 11.5 x 10.0 | 0.8 | 34731JCA2B0 | 34731JCM2B0 | 750 | 34731JCI2B0 | 1000 | 34731JC02G0 | 750 |
| 0.056 | | | | 35631JCA2B0 | 35631JCM2B0 | | 35631JCI2B0 | | 35631JC02G0 | |

Notes

- SPQ = Standard Packing Quantity

(1) H = in-tape height; P₀ = sprocket hole distance; for detailed specifications refer to "Packaging Information" www.vishay.com/doc?28139

(2) Weight for short lead product only



| ELECTRICAL DATA AND ORDERING CODE - PITCH 10 mm | | | | | | | | | | | | |
|---|-------------------|---------------------------------|----------------------------|--|--|-------------|---|-------------|---|-------------|---|-------------|
| U _{RAC} (V) | CAP. (μF) | DIMENSIONS w x h x l (mm) | MASS (g) ⁽³⁾ | CATALOG NUMBER F339MX2 AND PACKAGING | | | | | | | | |
| | | | | LOOSE IN BOX | | | | | AMMOPACK ⁽¹⁾ | | REEL ⁽¹⁾⁽²⁾ | |
| | | | | SHORT LEADS | | | LONG LEADS | | | | | |
| | | | | I _t = 3.5 mm + 1 mm / - 0.5 mm | I _t = 5.0 mm ± 1.0 mm | SPQ | I _t = 25.0 mm ± 2.0 mm | SPQ | H = 18.5 mm P ₀ = 12.7 mm | SPQ | Ø = 500 mm H = 18.5 mm P ₀ = 15.0 mm | SPQ |
| PITCH = 10.0 mm ± 0.4 mm; d_t = 0.60 mm ± 0.06 mm; C-TOL. = ± 20 % | | | | | | | | | | | | |
| | | 4.0 x 10.0 x 12.5 | 0.6 | 21031MDA2B0 | 21031MDM2B0 | 1000 | 21031MDI2B0 | 1250 | 21031MD02G0 | 950 | | |
| 0.0010 | | | | 21531MDA2B0 | 21531MDM2B0 | | 21531MDI2B0 | | 21531MD02G0 | | | |
| 0.0015 | | | | 22231MDA2B0 | 22231MDM2B0 | | 22231MDI2B0 | | 22231MD02G0 | | | |
| 0.0022 | | | | 23331MDA2B0 | 23331MDM2B0 | | 23331MDI2B0 | | 23331MD02G0 | | | |
| 0.0033 | | | | 24731MDA2B0 | 24731MDM2B0 | | 24731MDI2B0 | | 24731MD02G0 | | | |
| 0.0047 | | | | 26831MDA2B0 | 26831MDM2B0 | | 26831MDI2B0 | | 26831MD02G0 | | | |
| 0.0068 | | | | 31031MDA2B0 | 31031MDM2B0 | | 31031MDI2B0 | | 31031MD02G0 | | | |
| 0.010 | | | | 31531MDA2B0 | 31531MDM2B0 | | 31531MDI2B0 | | 31531MD02G0 | | | |
| 0.015 | | | | 32231MDA2B0 | 32231MDM2B0 | | 32231MDI2B0 | | 32231MD02G0 | | | |
| 0.022 | | | | 33331MDA2B0 | 33331MDM2B0 | | 33331MDI2B0 | | 33331MD02G0 | | | |
| 0.033 | | | | 34731MDA2B0 | 34731MDM2B0 | | 34731MDI2B0 | | 34731MD02G0 | | | |
| 0.047 | | | | 36831MDA2B0 | 36831MDM2B0 | | 36831MDI2B0 | | 36831MD02G0 | | | |
| 0.068 | | | | | | | | | | | | |
| 0.10 | 5.0 x 11.0 x 12.5 | | | 0.82 | 41031MDA2B0 | | 41031MDM2B0 | | 1000 | | | 41031MDI2B0 |
| 0.15 | 6.0 x 12.0 x 12.5 | 1.1 | 41531MDA2B0 | 41531MDM2B0 | 750 | 41531MDI2B0 | 750 | 41531MD02G0 | 600 | 41531MD02W0 | 1500 | |
| PITCH = 10.0 mm ± 0.4 mm; d_t = 0.60 mm ± 0.06 mm; C-TOL. = ± 10 % | | | | | | | | | | | | |
| | | 4.0 x 10.0 x 12.5 | 0.6 | 21031KDA2B0 | 21031KDM2B0 | 1000 | 21031KDI2B0 | 1250 | 21031KD02G0 | 950 | | |
| 0.0010 | | | | 21231KDA2B0 | 21231KDM2B0 | | 21231KDI2B0 | | 21231KD02G0 | | | |
| 0.0012 | | | | 21531KDA2B0 | 21531KDM2B0 | | 21531KDI2B0 | | 21531KD02G0 | | | |
| 0.0015 | | | | 21831KDA2B0 | 21831KDM2B0 | | 21831KDI2B0 | | 21831KD02G0 | | | |
| 0.0018 | | | | 22231KDA2B0 | 22231KDM2B0 | | 22231KDI2B0 | | 22231KD02G0 | | | |
| 0.0022 | | | | 22731KDA2B0 | 22731KDM2B0 | | 22731KDI2B0 | | 22731KD02G0 | | | |
| 0.0027 | | | | 23331KDA2B0 | 23331KDM2B0 | | 23331KDI2B0 | | 23331KD02G0 | | | |
| 0.0033 | | | | 23931KDA2B0 | 23931KDM2B0 | | 23931KDI2B0 | | 23931KD02G0 | | | |
| 0.0039 | | | | 24731KDA2B0 | 24731KDM2B0 | | 24731KDI2B0 | | 24731KD02G0 | | | |
| 0.0047 | | | | 25631KDA2B0 | 25631KDM2B0 | | 25631KDI2B0 | | 25631KD02G0 | | | |
| 0.0056 | | | | 26831KDA2B0 | 26831KDM2B0 | | 26831KDI2B0 | | 26831KD02G0 | | | |
| 0.0068 | | | | 28231KDA2B0 | 28231KDM2B0 | | 28231KDI2B0 | | 28231KD02G0 | | | |
| 0.0082 | | | | | | | | | | | | |
| 0.010 | | | | 31031KDA2B0 | 31031KDM2B0 | | 31031KDI2B0 | | 31031KD02G0 | | | |
| 0.012 | | 31231KDA2B0 | 31231KDM2B0 | 31231KDI2B0 | 31231KD02G0 | | | | | | | |
| 0.015 | | 31531KDA2B0 | 31531KDM2B0 | 31531KDI2B0 | 31531KD02G0 | | | | | | | |
| 0.018 | | 31831KDA2B0 | 31831KDM2B0 | 31831KDI2B0 | 31831KD02G0 | | | | | | | |
| 0.022 | | 32231KDA2B0 | 32231KDM2B0 | 32231KDI2B0 | 32231KD02G0 | | | | | | | |
| 0.027 | | 32731KDA2B0 | 32731KDM2B0 | 32731KDI2B0 | 32731KD02G0 | | | | | | | |
| 0.033 | | 33331KDA2B0 | 33331KDM2B0 | 33331KDI2B0 | 33331KD02G0 | | | | | | | |
| 0.039 | | 33931KDA2B0 | 33931KDM2B0 | 33931KDI2B0 | 33931KD02G0 | | | | | | | |
| 0.047 | | 34731KDA2B0 | 34731KDM2B0 | 34731KDI2B0 | 34731KD02G0 | | | | | | | |
| 0.056 | 5.0 x 11.0 x 12.5 | 0.82 | 35631KDA2B0 | 35631KDM2B0 | 1100 | 35631KDI2B0 | 1000 | 35631KD02G0 | 750 | | | |
| 0.068 | | 36831KDA2B0 | 36831KDM2B0 | | 36831KDI2B0 | | 36831KD02G0 | | 36831KD02W0 | 1900 | | |
| 0.082 | 6.0 x 12.0 x 12.5 | 1.1 | 38231KDA2B0 | 38231KDM2B0 | 750 | 38231KDI2B0 | 750 | 38231KD02G0 | 600 | 38231KD02W0 | 1500 | |
| 0.10 | | | 41031KDA2B0 | 41031KDM2B0 | | 41031KDI2B0 | | 41031KD02G0 | | | | |



| ELECTRICAL DATA AND ORDERING CODE - PITCH 10 mm | | | | | | | | | | | | | | | | | | | |
|--|-------------------|---------------------------------|----------------------------|--|-------------------------------|-------------|--------------------------------|-------------------------|---|------------------------|---|-----|------|-------------|-------------|------|-----|---|---|
| U _{RAC} (V) | CAP. (μF) | DIMENSIONS w x h x l (mm) | MASS (g) ⁽³⁾ | CATALOG NUMBER F339MX2 AND PACKAGING | | | | | | | | | | | | | | | |
| | | | | LOOSE IN BOX | | | | AMMOPACK ⁽¹⁾ | | REEL ⁽¹⁾⁽²⁾ | | | | | | | | | |
| | | | | SHORT LEADS | | LONG LEADS | | | | | | | | | | | | | |
| | | | | $l_t =$ 3.5 mm + 1 mm / - 0.5 mm | $l_t =$ 5.0 mm ± 1.0 mm | SPQ | $l_t =$ 25.0 mm ± 2.0 mm | SPQ | H = 18.5 mm P ₀ = 12.7 mm | SPQ | Ø = 500 mm H = 18.5 mm P ₀ = 15.0 mm | SPQ | | | | | | | |
| PITCH = 10.0 mm ± 0.4 mm; d_t = 0.60 mm ± 0.06 mm; C-TOL. = ± 5 % | | | | | | | | | | | | | | | | | | | |
| 310 | 0.0010 | 4.0 x 10.0 x 12.5 | 0.6 | 21031JDA2B0 | 21031JDM2B0 | 1000 | 21031JDI2B0 | 21031JD02G0 | 1250 | 950 | - | - | | | | | | | |
| | 0.0012 | | | 21231JDA2B0 | 21231JDM2B0 | | 21231JDI2B0 | 21231JD02G0 | | | | | | | | | | | |
| | 0.0015 | | | 21531JDA2B0 | 21531JDM2B0 | | 21531JDI2B0 | 21531JD02G0 | | | | | | | | | | | |
| | 0.0018 | | | 21831JDA2B0 | 21831JDM2B0 | | 21831JDI2B0 | 21831JD02G0 | | | | | | | | | | | |
| | 0.0022 | | | 22231JDA2B0 | 22231JDM2B0 | | 22231JDI2B0 | 22231JD02G0 | | | | | | | | | | | |
| | 0.0027 | | | 22731JDA2B0 | 22731JDM2B0 | | 22731JDI2B0 | 22731JD02G0 | | | | | | | | | | | |
| | 0.0033 | | | 23331JDA2B0 | 23331JDM2B0 | | 23331JDI2B0 | 23331JD02G0 | | | | | | | | | | | |
| | 0.0039 | | | 23931JDA2B0 | 23931JDM2B0 | | 23931JDI2B0 | 23931JD02G0 | | | | | | | | | | | |
| | 0.0047 | | | 24731JDA2B0 | 24731JDM2B0 | | 24731JDI2B0 | 24731JD02G0 | | | | | | | | | | | |
| | 0.0056 | | | 25631JDA2B0 | 25631JDM2B0 | | 25631JDI2B0 | 25631JD02G0 | | | | | | | | | | | |
| | 0.0068 | | | 26831JDA2B0 | 26831JDM2B0 | | 26831JDI2B0 | 26831JD02G0 | | | | | | | | | | | |
| | 0.0082 | | | 28231JDA2B0 | 28231JDM2B0 | | 28231JDI2B0 | 28231JD02G0 | | | | | | | | | | | |
| | 0.010 | | | 4.0 x 10.0 x 12.5 | 0.6 | | 31031JDA2B0 | 31031JDM2B0 | | | | | 1000 | 31031JDI2B0 | 31031JD02G0 | 1250 | 950 | - | - |
| | 0.012 | | | | | | 31231JDA2B0 | 31231JDM2B0 | | | | | | 31231JDI2B0 | 31231JD02G0 | | | | |
| | 0.015 | | | | | | 31531JDA2B0 | 31531JDM2B0 | | | | | | 31531JDI2B0 | 31531JD02G0 | | | | |
| | 0.018 | | | | | | 31831JDA2B0 | 31831JDM2B0 | | | | | | 31831JDI2B0 | 31831JD02G0 | | | | |
| 0.022 | 32231JDA2B0 | 32231JDM2B0 | 32231JDI2B0 | | | 32231JD02G0 | | | | | | | | | | | | | |
| 0.027 | 32731JDA2B0 | 32731JDM2B0 | 32731JDI2B0 | | | 32731JD02G0 | | | | | | | | | | | | | |
| 0.033 | 33331JDA2B0 | 33331JDM2B0 | 33331JDI2B0 | | | 33331JD02G0 | | | | | | | | | | | | | |
| 0.039 | 33931JDA2B0 | 33931JDM2B0 | 33931JDI2B0 | | | 33931JD02G0 | | | | | | | | | | | | | |
| 0.047 | 34731JDA2B0 | 34731JDM2B0 | 34731JDI2B0 | | | 34731JD02G0 | | | | | | | | | | | | | |
| 0.056 | 5.0 x 11.0 x 12.5 | 0.82 | 35631JDA2B0 | | | 35631JDM2B0 | 1000 | 35631JDI2B0 | 35631JD02G0 | 1000 | 750 | - | | - | | | | | |
| 0.068 | | | 36831JDA2B0 | 36831JDM2B0 | 36831JDI2B0 | 36831JD02G0 | | | | | | | | | | | | | |
| 0.082 | 6.0 x 12.0 x 12.5 | 1.1 | 38231JDA2B0 | 38231JDM2B0 | 750 | 38231JDI2B0 | 38231JD02G0 | 750 | 600 | 38231JD02W0 | 1500 | | | | | | | | |
| 0.10 | | | 41031JDA2B0 | 41031JDM2B0 | | 41031JDI2B0 | 41031JD02G0 | | | | | | | | | | | | |

Notes

- SPQ = Standard Packing Quantity
- (1) Reel diameter = 356 mm is available on request
- (2) H = in tape height; P₀ = sprocket hole distance; for detailed specifications refer to "Packaging Information" www.vishay.com/doc?28139
- (3) Weight for short lead product only



| ELECTRICAL DATA AND ORDERING CODE - PITCH 15 mm | | | | | | | | | | |
|---|-------------------|---------------------------------|----------------------------|--|--|-------------|---|------------------------|---|------|
| U _{RAC} (V) | CAP. (µF) | DIMENSIONS w x h x l (mm) | MASS (g) ⁽³⁾ | CATALOG NUMBER F339MX2 AND PACKAGING | | | | | | |
| | | | | LOOSE IN BOX | | | | REEL ⁽¹⁾⁽²⁾ | | |
| | | | | SHORT LEADS | | LONG LEADS | | | | |
| | | | | l _t = 3.5 mm ± 0.3 mm | l _t = 5.0 mm ± 1.0 mm | SPQ | l _t = 25.0 mm ± 2.0 mm | SPQ | Ø = 500 mm H = 18.5 mm P ₀ = 12.7 mm | SPQ |
| PITCH = 15 mm ± 0.4 mm; d_t = 0.60 mm ± 0.06 mm; C-TOL. = ± 20 % | | | | | | | | | | |
| 310 | 0.010 | 5.0 x 11.0 x 17.5 | 1.0 | 31031MFP2B0 | 31031MFM2B0 | 1250 | 31031MFI2B0 | 1000 | 31031MF02W0 | 1100 |
| | 0.015 | | | 31531MFP2B0 | 31531MFM2B0 | | 31531MFI2B0 | | 31531MF02W0 | |
| | 0.022 | | | 32231MFP2B0 | 32231MFM2B0 | | 32231MFI2B0 | | 32231MF02W0 | |
| | 0.033 | | | 33331MFP2B0 | 33331MFM2B0 | | 33331MFI2B0 | | 33331MF02W0 | |
| | 0.047 | | | 34731MFP2B0 | 34731MFM2B0 | | 34731MFI2B0 | | 34731MF02W0 | |
| | 0.068 | | | 36831MFP2B0 | 36831MFM2B0 | | 36831MFI2B0 | | 36831MF02W0 | |
| | 0.10 | | | 41031MFP2B0 | 41031MFM2B0 | | 41031MFI2B0 | | 41031MF02W0 | |
| | 0.15 | | | 41531MFP2B0 | 41531MFM2B0 | | 41531MFI2B0 | | 41531MF02W0 | |
| 0.22 | 6.0 x 12.0 x 17.5 | 1.4 | 42231MFP2B0 | 42231MFM2B0 | 1000 | 42231MFI2B0 | 1000 | 42231MF02W0 | 900 | |
| PITCH = 15 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm; C-TOL. = ± 20 % | | | | | | | | | | |
| | 0.33 | 8.5 x 15.0 x 17.5 | 2.4 | 43331MFP2B0 | 43331MFM2B0 | 750 | 43331MFI2B0 | 500 | 43331MF02W0 | 650 |
| | 0.47 | 10.0 x 16.5 x 17.5 | 3.0 | 44731MFP2B0 | 44731MFM2B0 | 500 | 44731MFI2B0 | 450 | 44731MF02W0 | 600 |
| | 0.68 | 11.0 x 18.5 x 18.0 | 5.5 | 46831MFP2B0 | 46831MFM2B0 | 225 | 46831MFI2B0 | 350 | 46831MF02W0 | - |
| PITCH = 15 mm ± 0.4 mm; d_t = 0.60 mm ± 0.06 mm; C-TOL. = ± 10 % | | | | | | | | | | |
| 310 | 0.010 | 5.0 x 11.0 x 17.5 | 1.0 | 31031KFP2B0 | 31031KFM2B0 | 1250 | 31031KFI2B0 | 1000 | 31031KF02W0 | 1100 |
| | 0.012 | | | 31231KFP2B0 | 31231KFM2B0 | | 31231KFI2B0 | | 31231KF02W0 | |
| | 0.015 | | | 31531KFP2B0 | 31531KFM2B0 | | 31531KFI2B0 | | 31531KF02W0 | |
| | 0.018 | | | 31831KFP2B0 | 31831KFM2B0 | | 31831KFI2B0 | | 31831KF02W0 | |
| | 0.022 | | | 32231KFP2B0 | 32231KFM2B0 | | 32231KFI2B0 | | 32231KF02W0 | |
| | 0.027 | | | 32731KFP2B0 | 32731KFM2B0 | | 32731KFI2B0 | | 32731KF02W0 | |
| | 0.033 | | | 33331KFP2B0 | 33331KFM2B0 | | 33331KFI2B0 | | 33331KF02W0 | |
| | 0.039 | | | 33931KFP2B0 | 33931KFM2B0 | | 33931KFI2B0 | | 33931KF02W0 | |
| | 0.047 | | | 34731KFP2B0 | 34731KFM2B0 | | 34731KFI2B0 | | 34731KF02W0 | |
| | 0.056 | | | 35631KFP2B0 | 35631KFM2B0 | | 35631KFI2B0 | | 35631KF02W0 | |
| | 0.068 | | | 36831KFP2B0 | 36831KFM2B0 | | 36831KFI2B0 | | 36831KF02W0 | |
| | 0.082 | | | 38231KFP2B0 | 38231KFM2B0 | | 38231KFI2B0 | | 38231KF02W0 | |
| | 0.10 | | | 41031KFP2B0 | 41031KFM2B0 | | 41031KFI2B0 | | 41031KF02W0 | |
| | 0.12 | | | 41231KFP2B0 | 41231KFM2B0 | | 41231KFI2B0 | | 41231KF02W0 | |
| | 0.15 | 6.0 x 12.0 x 17.5 | 1.4 | 41531KFP2B0 | 41531KFM2B0 | 1000 | 41531KFI2B0 | 1000 | 41531KF02W0 | 900 |
| | 0.18 | | | 41831KFP2B0 | 41831KFM2B0 | | 41831KFI2B0 | | 41831KF02W0 | |
| PITCH = 15 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm; C-TOL. = ± 10 % | | | | | | | | | | |
| | 0.22 | 7.0 x 13.5 x 17.5 | 1.8 | 42231KFP2B0 | 42231KFM2B0 | 750 | 42231KFI2B0 | 500 | 42231KF02W0 | 800 |
| | 0.27 | 8.5 x 15.0 x 17.5 | 2.4 | 42731KFP2B0 | 42731KFM2B0 | 750 | 42731KFI2B0 | 500 | 42731KF02W0 | 650 |
| | 0.33 | | | 43331KFP2B0 | 43331KFM2B0 | | 43331KFI2B0 | | 43331KF02W0 | |
| | 0.39 | 10.0 x 16.5 x 17.5 | 3.0 | 43931KFP2B0 | 43931KFM2B0 | 500 | 43931KFI2B0 | 450 | 43931KF02W0 | 600 |
| | 0.47 | | | 44731KFP2B0 | 44731KFM2B0 | | 44731KFI2B0 | | 44731KF02W0 | |
| | 0.56 | 11.0 x 18.5 x 18.0 | 5.5 | 45631KFP2B0 | 45631KFM2B0 | 225 | 45631KFI2B0 | 350 | - | - |



| ELECTRICAL DATA AND ORDERING CODE - PITCH 15 mm | | | | | | | | | | |
|--|-------------------|---------------------------------|----------------------------|--|--|-------------|---|-------------|---|------|
| U _{RAC} (V) | CAP. (µF) | DIMENSIONS w x h x l (mm) | MASS (g) ⁽³⁾ | CATALOG NUMBER F339MX2 AND PACKAGING | | | | | | |
| | | | | LOOSE IN BOX | | | | | REEL ⁽¹⁾⁽²⁾ | |
| | | | | SHORT LEADS | | | LONG LEADS | | | |
| | | | | l _t = 3.5 mm ± 0.3 mm | l _t = 5.0 mm ± 1.0 mm | SPQ | l _t = 25.0 mm ± 2.0 mm | SPQ | Ø = 500 mm H = 18.5 mm P ₀ = 12.7 mm | SPQ |
| PITCH = 15 mm ± 0.4 mm; d_t = 0.60 mm ± 0.06 mm; C-TOL. = ± 5 % | | | | | | | | | | |
| 310 | 0.010 | 5.0 x 11.0 x 17.5 | 1.0 | 31031JFP2B0 | 31031JFM2B0 | 1250 | 31031JFI2B0 | 1000 | 31031JF02W0 | 1100 |
| | 0.012 | | | 31231JFP2B0 | 31231JFM2B0 | | 31231JFI2B0 | | 31231JF02W0 | |
| | 0.015 | | | 31531JFP2B0 | 31531JFM2B0 | | 31531JFI2B0 | | 31531JF02W0 | |
| | 0.018 | | | 31831JFP2B0 | 31831JFM2B0 | | 31831JFI2B0 | | 31831JF02W0 | |
| | 0.022 | | | 32231JFP2B0 | 32231JFM2B0 | | 32231JFI2B0 | | 32231JF02W0 | |
| | 0.027 | | | 32731JFP2B0 | 32731JFM2B0 | | 32731JFI2B0 | | 32731JF02W0 | |
| | 0.033 | 5.0 x 11.0 x 17.5 | 1.0 | 33331JFP2B0 | 33331JFM2B0 | 1250 | 33331JFI2B0 | 1000 | 33331JF02W0 | 1100 |
| | 0.039 | | | 33931JFP2B0 | 33931JFM2B0 | | 33931JFI2B0 | | 33931JF02W0 | |
| | 0.047 | | | 34731JFP2B0 | 34731JFM2B0 | | 34731JFI2B0 | | 34731JF02W0 | |
| | 0.056 | | | 35631JFP2B0 | 35631JFM2B0 | | 35631JFI2B0 | | 35631JF02W0 | |
| | 0.068 | | | 36831JFP2B0 | 36831JFM2B0 | | 36831JFI2B0 | | 36831JF02W0 | |
| | 0.082 | | | 38231JFP2B0 | 38231JFM2B0 | | 38231JFI2B0 | | 38231JF02W0 | |
| | 0.10 | | | 41031JFP2B0 | 41031JFM2B0 | | 41031JFI2B0 | | 41031JF02W0 | |
| | 0.12 | | | 41231JFP2B0 | 41231JFM2B0 | | 41231JFI2B0 | | 41231JF02W0 | |
| 0.15 | 6.0 x 12.0 x 17.5 | 1.4 | 41531JFP2B0 | 41531JFM2B0 | 1000 | 41531JFI2B0 | 1000 | 41531JF02W0 | 900 | |
| 0.18 | | | 41831JFP2B0 | 41831JFM2B0 | | 41831JFI2B0 | | 41831JF02W0 | | |
| PITCH = 15 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm; C-TOL. = ± 5 % | | | | | | | | | | |
| | 0.22 | 7.0 x 13.5 x 17.5 | 1.8 | 42231JFP2B0 | 42231JFM2B0 | 750 | 42231JFI2B0 | 500 | 42231JF02W0 | 800 |
| | 0.27 | 8.5 x 15.0 x 17.5 | 2.4 | 42731JFP2B0 | 42731JFM2B0 | 750 | 42731JFI2B0 | 500 | 42731JF02W0 | 650 |
| | 0.33 | | | 43331JFP2B0 | 43331JFM2B0 | | 43331JFI2B0 | | 43331JF02W0 | |
| | 0.39 | 10.0 x 16.5 x 17.5 | 3.0 | 43931JFP2B0 | 43931JFM2B0 | 500 | 43931JFI2B0 | 450 | 43931JF02W0 | 600 |
| | 0.47 | | | 44731JFP2B0 | 44731JFM2B0 | | 44731JFI2B0 | | 44731JF02W0 | |
| | 0.56 | 11.0 x 18.5 x 18.0 | 5.5 | 45631JFP2B0 | 45631JFM2B0 | 225 | 45631JFI2B0 | 350 | - | - |

Notes

- SPQ = Standard Packing Quantity
- (1) Reel diameter = 356 mm is available on request
- (2) H = in tape height; P₀ = sprocket hole distance; for detailed specifications refer to "Packaging Information" www.vishay.com/doc?28139
- (3) Weight for short lead product only



| ELECTRICAL DATA AND ORDERING CODE - PITCH 22.5 mm | | | | | | | | | | |
|---|--------------------|---------------------------------|----------------------------|--|-------------------------------------|-------------|--------------------------------------|-------------|---|-----|
| U _{RAC} (V) | CAP. (μF) | DIMENSIONS w x h x l (mm) | MASS (g) ⁽²⁾ | CATALOG NUMBER F339MX2 AND PACKAGING | | | | | | |
| | | | | LOOSE IN BOX | | | | | REEL ⁽¹⁾⁽²⁾ | |
| | | | | SHORT LEADS | | | LONG LEADS | | | |
| | | | | l _t = 3.5 mm ± 0.3 mm | l _t = 5.0 mm ± 1.0 mm | SPQ | l _t = 25.0 mm ± 2.0 mm | SPQ | Ø = 500 mm H = 18.5 mm P ₀ = 12.7 mm | SPQ |
| PITCH = 22.5 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm; C-TOL. = ± 20 % | | | | | | | | | | |
| 0.15 | 6.0 x 15.5 x 26.0 | 2.4 | 41531MIP2T0 | 41531MIM2T0 | 300 | 41531MII2B0 | 250 | 41531MIO2W0 | 600 | |
| 0.22 | | | 42231MIP2T0 | 42231MIM2T0 | | 42231MII2B0 | | 42231MIO2W0 | | |
| 0.33 | | | 43331MIP2T0 | 43331MIM2T0 | | 43331MII2B0 | | 43331MIO2W0 | | |
| 0.47 | 7.0 x 16.5 x 26.0 | 2.9 | 44731MIP2T0 | 44731MIM2T0 | 200 | 44731MII2B0 | 250 | 44731MIO2W0 | 500 | |
| 0.68 | 8.5 x 18.0 x 26.0 | 3.8 | 46831MIP2T0 | 46831MIM2T0 | 200 | 46831MII2B0 | 250 | 46831MIO2W0 | 450 | |
| 1.0 | 10.0 x 19.5 x 26.0 | 6.8 | 51031MIP2T0 | 51031MIM2T0 | 200 | 51031MII2B0 | 200 | 51031MIO2W0 | 350 | |
| 1.5 | 12.0 x 22.0 x 26.0 | 10 | 51531MIP2T0 | 51531MIM2T0 | 150 | 51531MII2B0 | 200 | 51531MIO2W0 | 300 | |
| 2.2 | 12.5 x 22.5 x 26.5 | 11 | 52231MIP2T0 | 52231MIM2T0 | 110 | 52231MII2B0 | 275 | 52231MIO2W0 | 250 | |
| PITCH = 22.5 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm; C-TOL. = ± 10 % | | | | | | | | | | |
| 0.12 | 6.0 x 15.5 x 26.0 | 2.4 | 41231KIP2T0 | 41231KIM2T0 | 300 | 41231KII2B0 | 250 | 41231KIO2W0 | 600 | |
| 0.15 | | | 41531KIP2T0 | 41531KIM2T0 | | 41531KII2B0 | | 41531KIO2W0 | | |
| 0.18 | | | 41831KIP2T0 | 41831KIM2T0 | | 41831KII2B0 | | 41831KIO2W0 | | |
| 0.22 | | | 42231KIP2T0 | 42231KIM2T0 | | 42231KII2B0 | | 42231KIO2W0 | | |
| 0.27 | | | 42731KIP2T0 | 42731KIM2T0 | | 42731KII2B0 | | 42731KIO2W0 | | |
| 0.33 | | | 43331KIP2T0 | 43331KIM2T0 | | 43331KII2B0 | | 43331KIO2W0 | | |
| 0.39 | 7.0 x 16.5 x 26.0 | 2.9 | 43931KIP2T0 | 43931KIM2T0 | 200 | 43931KII2B0 | 250 | 43931KIO2W0 | 500 | |
| 0.47 | | | 44731KIP2T0 | 44731KIM2T0 | | 44731KII2B0 | | 44731KIO2W0 | | |
| 0.56 | 8.5 x 18.0 x 26.0 | 3.8 | 45631KIP2T0 | 45631KIM2T0 | 200 | 45631KII2B0 | 250 | 45631KIO2W0 | 450 | |
| 0.68 | | | 46831KIP2T0 | 46831KIM2T0 | | 46831KII2B0 | | 46831KIO2W0 | | |
| 0.82 | 10.0 x 19.5 x 26.0 | 6.8 | 48231KIP2T0 | 48231KIM2T0 | 200 | 48231KII2B0 | 200 | 48231KIO2W0 | 350 | |
| 1.0 | 12.0 x 22.0 x 26.0 | 7.8 | 51031KIP2T0 | 51031KIM2T0 | 150 | 51031KII2B0 | 200 | 51031KIO2W0 | 300 | |
| 1.2 | | | 51231KIP2T0 | 51231KIM2T0 | | 51231KII2B0 | | 51231KIO2W0 | | |
| 1.5 | | | 51531KIP2T0 | 51531KIM2T0 | | 51531KII2B0 | | 51531KIO2W0 | | |
| 1.8 | | | 51831KIP2T0 | 51831KIM2T0 | | 51831KII2B0 | | 51831KIO2W0 | | |
| 2.2 | 15.5 x 26.5 x 26.5 | 14 | 52231KIP2T0 | 52231KIM2T0 | 110 | 52231KII2B0 | 275 | 52231KIO2W0 | 250 | |
| PITCH = 22.5 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm; C-TOL. = ± 5 % | | | | | | | | | | |
| 0.12 | 6.0 x 15.5 x 26.0 | 2.4 | 41231JIP2T0 | 41231JIM2T0 | 300 | 41231JII2B0 | 250 | 41231JIO2W0 | 600 | |
| 0.15 | | | 41531JIP2T0 | 41531JIM2T0 | | 41531JII2B0 | | 41531JIO2W0 | | |
| 0.18 | | | 41831JIP2T0 | 41831JIM2T0 | | 41831JII2B0 | | 41831JIO2W0 | | |
| 0.22 | | | 42231JIP2T0 | 42231JIM2T0 | | 42231JII2B0 | | 42231JIO2W0 | | |
| 0.27 | | | 42731JIP2T0 | 42731JIM2T0 | | 42731JII2B0 | | 42731JIO2W0 | | |
| 0.33 | | | 43331JIP2T0 | 43331JIM2T0 | | 43331JII2B0 | | 43331JIO2W0 | | |
| 0.39 | 7.0 x 16.5 x 26.0 | 2.9 | 43931JIP2T0 | 43931JIM2T0 | 200 | 43931JII2B0 | 250 | 43931JIO2W0 | 500 | |
| 0.47 | | | 44731JIP2T0 | 44731JIM2T0 | | 44731JII2B0 | | 44731JIO2W0 | | |
| 0.56 | 8.5 x 18.0 x 26.0 | 3.8 | 45631JIP2T0 | 45631JIM2T0 | 200 | 45631JII2B0 | 250 | 45631JIO2W0 | 450 | |
| 0.68 | | | 46831JIP2T0 | 46831JIM2T0 | | 46831JII2B0 | | 46831JIO2W0 | | |
| 0.82 | 10.0 x 19.5 x 26.0 | 6.8 | 48231JIP2T0 | 48231JIM2T0 | 200 | 48231JII2B0 | 200 | 48231JIO2W0 | 350 | |
| 1.0 | 12.0 x 22.0 x 26.0 | 7.8 | 51031JIP2T0 | 51031JIM2T0 | 150 | 51031JII2B0 | 200 | 51031JIO2W0 | 300 | |
| 1.2 | | | 51231JIP2T0 | 51231JIM2T0 | | 51231JII2B0 | | 51231JIO2W0 | | |
| 1.5 | | | 51531JIP2T0 | 51531JIM2T0 | | 51531JII2B0 | | 51531JIO2W0 | | |
| 1.8 | | | 51831JIP2T0 | 51831JIM2T0 | | 51831JII2B0 | | 51831JIO2W0 | | |
| 2.2 | 15.5 x 26.5 x 26.5 | 14 | 52231JIP2T0 | 52231JIM2T0 | 110 | 52231JII2B0 | 275 | 52231JIO2W0 | 250 | |

Notes

• SPQ = Standard Packing Quantity

(1) Reel diameter = 356 mm is available on request

(2) H = in tape height; P₀ = sprocket hole distance; for detailed specifications refer to "Packaging Information" www.vishay.com/doc?28139

(3) Weight for short lead product only



| ELECTRICAL DATA AND ORDERING CODE - PITCH 27.5 mm | | | | | | | | |
|---|--------------------|---------------------------------|----------------------------|--|----------------------------------|-------------|-----------------------------------|-----|
| U _{RAC} (V) | CAP. (μF) | DIMENSIONS w x h x l (mm) | MASS (g) ⁽¹⁾ | CATALOG NUMBER F339MX2 AND PACKAGING | | | | |
| | | | | LOOSE IN BOX | | | | |
| | | | | SHORT LEADS | | | LONG LEADS | |
| | | | | l _t = 3.5 mm ± 0.3 mm | l _t = 5.0 mm ± 1.0 mm | SPQ | l _t = 25.0 mm ± 2.0 mm | SPQ |
| PITCH = 27.5 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm; C-TOL. = ± 20 % | | | | | | | | |
| 0.47 | 9.0 x 19.0 x 31.5 | 5.5 | 44731MKP2T0 | 44731MKM2T0 | 100 | 44731MKI2B0 | 150 | |
| 0.68 | | | 46831MKP2T0 | 46831MKM2T0 | | 46831MKI2B0 | | |
| 1.0 | | | 51031MKP2T0 | 51031MKM2T0 | | 51031MKI2B0 | | |
| 1.5 | 11.0 x 21.0 x 31.0 | 7.4 | 51531MKP2T0 | 51531MKM2T0 | 100 | 51531MKI2B0 | 125 | |
| 2.2 | 13.0 x 23.0 x 31.0 | 9.2 | 52231MKP2T0 | 52231MKM2T0 | 100 | 52231MKI2B0 | 125 | |
| 3.3 | 18.0 x 28.0 x 31.5 | 12.3 | 53331MKP2T0 | 53331MKM2T0 | 100 | 53331MKI2B0 | 100 | |
| 4.7 | 21.0 x 31.0 x 31.0 | 16.1 | 54731MKP2T0 | 54731MKM2T0 | 50 | 54731MKI2B0 | 75 | |
| 6.8 | 20.0 x 35.0 x 31.5 | 17.5 | 56831MKP2T0 | 56831MKM2T0 | 70 | 56831MKI2B0 | 150 | |
| PITCH = 27.5 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm; C-TOL. = ± 10 % | | | | | | | | |
| 0.39 | 9.0 x 19.0 x 31.5 | 5.5 | 43931KKP2T0 | 43931KKM2T0 | 100 | 43931KKI2B0 | 150 | |
| 0.47 | | | 44731KKP2T0 | 44731KKM2T0 | | 44731KKI2B0 | | |
| 0.56 | | | 45631KKP2T0 | 45631KKM2T0 | | 45631KKI2B0 | | |
| 0.68 | | | 46831KKP2T0 | 46831KKM2T0 | | 46831KKI2B0 | | |
| 0.82 | | | 48231KKP2T0 | 48231KKM2T0 | | 48231KKI2B0 | | |
| 1.0 | 11.0 x 21.0 x 31.0 | 7.4 | 51031KKP2T0 | 51031KKM2T0 | 100 | 51031KKI2B0 | 125 | |
| 1.2 | | | 51231KKP2T0 | 51231KKM2T0 | | 51231KKI2B0 | | |
| 1.5 | | | 51531KKP2T0 | 51531KKM2T0 | | 51531KKI2B0 | | |
| 1.8 | 13.0 x 23.0 x 31.0 | 9.2 | 51831KKP2T0 | 51831KKM2T0 | 100 | 51831KKI2B0 | 125 | |
| 2.2 | | | 52231KKP2T0 | 52231KKM2T0 | | 52231KKI2B0 | | |
| 2.7 | 15.0 x 25.0 x 31.5 | 12.3 | 52731KKP2T0 | 52731KKM2T0 | 100 | 52731KKI2B0 | 125 | |
| 3.3 | 18.0 x 28.0 x 31.5 | 16.1 | 53331KKP2T0 | 53331KKM2T0 | 100 | 53331KKI2B0 | 100 | |
| 3.9 | 21.0 x 31.0 x 31.0 | 20.3 | 53931KKP2T0 | 53931KKM2T0 | 50 | 53931KKI2B0 | 75 | |
| 4.7 | | | 54731KKP2T0 | 54731KKM2T0 | | 54731KKI2B0 | | |
| 5.6 | | | 55631KKP2T0 | 55631KKM2T0 | | 55631KKI2B0 | | |
| PITCH = 27.5 mm ± 0.4 mm; d_t = 0.80 mm ± 0.08 mm; C-TOL. = ± 5 % | | | | | | | | |
| 0.39 | 9.0 x 19.0 x 31.5 | 5.5 | 43931JKP2T0 | 43931JKM2T0 | 100 | 43931JKI2B0 | 150 | |
| 0.47 | | | 44731JKP2T0 | 44731JKM2T0 | | 44731JKI2B0 | | |
| 0.56 | | | 45631JKP2T0 | 45631JKM2T0 | | 45631JKI2B0 | | |
| 0.68 | | | 46831JKP2T0 | 46831JKM2T0 | | 46831JKI2B0 | | |
| 0.82 | | | 48231JKP2T0 | 48231JKM2T0 | | 48231JKI2B0 | | |
| 1.0 | 11.0 x 21.0 x 31.0 | 7.4 | 51031JKP2T0 | 51031JKM2T0 | 100 | 51031JKI2B0 | 125 | |
| 1.2 | | | 51231JKP2T0 | 51231JKM2T0 | | 51231JKI2B0 | | |
| 1.5 | | | 51531JKP2T0 | 51531JKM2T0 | | 51531JKI2B0 | | |
| 1.8 | 13.0 x 23.0 x 31.0 | 9.2 | 51831JKP2T0 | 51831JKM2T0 | 100 | 51831JKI2B0 | 125 | |
| 2.2 | | | 52231JKP2T0 | 52231JKM2T0 | | 52231JKI2B0 | | |
| 2.7 | 15.0 x 25.0 x 31.5 | 12.3 | 52731JKP2T0 | 52731JKM2T0 | 100 | 52731JKI2B0 | 125 | |
| 3.3 | 18.0 x 28.0 x 31.5 | 16.1 | 53331JKP2T0 | 53331JKM2T0 | 100 | 53331JKI2B0 | 100 | |
| 3.9 | 21.0 x 31.0 x 31.0 | 18.3 | 53931JKP2T0 | 53931JKM2T0 | 50 | 53931JKI2B0 | 75 | |
| 4.7 | | | 54731JKP2T0 | 54731JKM2T0 | | 54731JKI2B0 | | |
| 5.6 | | | 55631JKP2T0 | 55631JKM2T0 | | 55631JKI2B0 | | |

Notes

- SPQ = Standard Packing Quantity
- (1) Weight for short lead product only



| ELECTRICAL DATA AND ORDERING CODE - PITCH 37.5 mm / PITCH 52.5 mm (two pin version) | | | | | | | |
|--|--|---------------------------------|----------------------------|--|-----|-----------------------------------|-----|
| U _{RAC} (V) | CAP. (μF) | DIMENSIONS w x h x l (mm) | MASS (g) ⁽¹⁾ | CATALOG NUMBER F339MX2 AND PACKAGING | | | |
| | | | | LOOSE IN BOX | | | |
| | | | | SHORT LEADS | | LONG LEADS | |
| | | | | l _t = 5.0 mm ± 1.0 mm | SPQ | l _t = 25.0 mm ± 2.0 mm | SPQ |
| 310 | PITCH = 37.5 mm ± 0.5 mm; d_t = 1.0 mm ± 0.1 mm; C-TOL. = ± 20 % | | | | | | |
| | 3.3 | 12.5 x 22.5 x 41.5 | 11.5 | 53331MPM2T0 | 90 | 53331MPI2T0 | 200 |
| | 4.7 | 14.5 x 24.5 x 41.5 | 14.5 | 54731MPM2T0 | 80 | 54731MPI2T0 | 175 |
| | 6.8 | 18.0 x 32.5 x 41.5 | 19.5 | 56831MPM2T0 | 60 | 56831MPI2T0 | 125 |
| | 10 | 18.5 x 35.5 x 43.0 | 30.0 | 61031MPM2T0 | 105 | 61031MPI2T0 | 105 |
| | 15 | 24.0 x 44.0 x 42.0 | 48.0 | 61531MPM2T0 | 77 | 61531MPI2T0 | 77 |
| | 20 | 30.0 x 45.0 x 42.0 | 64.0 | 62031MPM2T0 | 63 | 62031MPI2T0 | 63 |
| | PITCH = 37.5 mm ± 0.5 mm; d_t = 1.0 mm ± 0.1 mm; C-TOL. = ± 10 % | | | | | | |
| | 3.3 | 14.5 x 24.5 x 41.5 | 15.5 | 53331KPM2T0 | 80 | 53331KPI2T0 | 175 |
| | 3.9 | 16.0 x 28.5 x 41.5 | 19.0 | 53931KPM2T0 | 70 | 53931KPI2T0 | 150 |
| | 4.7 | | | 54731KPM2T0 | | 54731KPI2T0 | |
| | 5.6 | 18.0 x 32.5 x 41.5 | 25.5 | 55631KPM2T0 | 60 | 55631KPI2T0 | 125 |
| | 6.8 | | | 56831KPM2T0 | | 56831KPI2T0 | |
| | 8.2 | 18.5 x 35.5 x 43.0 | 30.0 | 58231KPM2T0 | 105 | 58231KPI2T0 | 105 |
| | 10 | 21.5 x 38.5 x 42.0 | 37.5 | 61031KPM2T0 | 91 | 61031KPI2T0 | 91 |
| | 15 | 30.0 x 45.0 x 42.0 | 67.0 | 61531KPM2T0 | 63 | 61531KPI2T0 | 63 |
| | PITCH = 37.5 mm ± 0.5 mm; d_t = 1.0 mm ± 0.1 mm; C-TOL. = ± 5 % | | | | | | |
| | 3.3 | 14.5 x 24.5 x 41.5 | 15.5 | 53331JPM2T0 | 80 | 53331JPI2T0 | 175 |
| | 3.9 | 16.0 x 28.5 x 41.5 | 19.0 | 53931JPM2T0 | 70 | 53931JPI2T0 | 150 |
| | 4.7 | | | 54731JPM2T0 | | 54731JPI2T0 | |
| | 5.6 | 18.0 x 32.5 x 41.5 | 25.5 | 55631JPM2T0 | 60 | 55631JPI2T0 | 125 |
| | 6.8 | | | 56831JPM2T0 | | 56831JPI2T0 | |
| | 8.2 | 18.5 x 35.5 x 43.0 | 30.0 | 58231JPM2T0 | 105 | 58231JPI2T0 | 105 |
| | 10 | 21.5 x 38.5 x 42.0 | 37.5 | 61031JPM2T0 | 91 | 61031JPI2T0 | 91 |
| | 15 | 30.0 x 45.0 x 42.0 | 67.0 | 61531JPM2T0 | 63 | 61531JPI2T0 | 63 |
| | PITCH = 52.5 mm ± 0.5 mm; d_t = 1.2 mm ± 0.12 mm; C-TOL. = ± 20 % | | | | | | |
| | 20 | 25.0 x 45.0 x 57.5 | 69.0 | 62031MYM2T0 | 55 | 62031MYI2T0 | 55 |
| | 25 | | 63.5 | 62531MYM2T0 | | 62531MYI2T0 | |
| | 30 | 30.0 x 45.0 x 57.5 | 85.0 | 63031MYM2T0 | 45 | 63031MYI2T0 | 45 |
| | 35 | 35.0 x 50.0 x 57.5 | 105.0 | 63531MYM2T0 | 40 | 63531MYI2T0 | 40 |
| | 40 | | | 64031MYM2T0 | | 64031MYI2T0 | |
| | PITCH = 52.5 mm ± 0.5 mm; d_t = 1.2 mm ± 0.12 mm; C-TOL. = ± 10 % | | | | | | |
| | 20 | 25.0 x 45.0 x 57.5 | 65.5 | 62031KYM2T0 | 55 | 62031KYI2T0 | 55 |
| | 25 | 30.0 x 45.0 x 57.5 | 86.5 | 62531KYM2T0 | 45 | 62531KYI2T0 | 45 |
| | 30 | 35.0 x 50.0 x 57.5 | 105.0 | 63031KYM2T0 | 40 | 63031KYI2T0 | 40 |
| | 35 | | | 63531KYM2T0 | | 63531KYI2T0 | |
| | PITCH = 52.5 mm ± 0.5 mm; d_t = 1.2 mm ± 0.12 mm; C-TOL. = ± 5 % | | | | | | |
| | 20 | 25.0 x 45.0 x 57.5 | 65.5 | 62031JYM2T0 | 55 | 62031JYI2T0 | 55 |
| | 25 | 30.0 x 45.0 x 57.5 | 86.5 | 62531JYM2T0 | 45 | 62531JYI2T0 | 45 |
| | 30 | 30.0 x 50.0 x 57.5 | 105.0 | 63031JYM2T0 | 40 | 63031JYI2T0 | 40 |

Notes




- SPQ = Standard Packing Quantity
- ⁽¹⁾ Weight for short lead product only



| ELECTRICAL DATA AND ORDERING CODE - PITCH 37.5 mm / PITCH 52.5 mm (four pin version) | | | | | | | |
|--|--------------------|---------------------------------|----------------------------|--|-------------|-----------------------------------|-----|
| U _{RAC} (V) | CAP. (μF) | DIMENSIONS w x h x l (mm) | MASS (g) ⁽¹⁾ | CATALOG NUMBER F339MX2 AND PACKAGING | | | |
| | | | | LOOSE IN BOX | | | |
| | | | | SHORT LEADS | | LONG LEADS | |
| | | | | l _t = 5.0 mm ± 1.0 mm | SPQ | l _t = 25.0 mm ± 2.0 mm | SPQ |
| PITCH P₁ = 37.5 mm ± 0.5 mm; P₂ = 10.2 mm ± 0.5 mm; d_t = 1.0 mm ± 0.1 mm; C-TOL. = ± 20 % | | | | | | | |
| 10 | 18.5 x 35.5 x 43.0 | 30.0 | 61031MPM4T0 | 105 | - | - | - |
| 15 | 24.0 x 44.0 x 42.0 | 48.0 | 61531MPM4T0 | 77 | - | - | - |
| 20 | 30.0 x 45.0 x 42.0 | 64.0 | 62031MPM4T0 | 63 | - | - | - |
| PITCH P₁ = 37.5 mm ± 0.5 mm; P₂ = 20.3 mm ± 0.5 mm; d_t = 1.0 mm ± 0.1 mm; C-TOL. = ± 20 % | | | | | | | |
| 20 | 30.0 x 45.0 x 42.0 | 64.0 | 62031MPM5T0 | 63 | - | - | - |
| PITCH P₁ = 37.5 mm ± 0.5 mm; P₂ = 10.2 mm ± 0.5 mm; d_t = 1.0 mm ± 0.1 mm; C-TOL. = ± 10 % | | | | | | | |
| 10 | 21.5 x 38.5 x 42.0 | 37.5 | 61031KPM4T0 | 91 | - | - | - |
| 15 | 30.0 x 45.0 x 42.0 | 67.0 | 61531KPM4T0 | 63 | - | - | - |
| PITCH P₁ = 37.5 mm ± 0.5 mm; P₂ = 20.3 mm ± 0.5 mm; d_t = 1.0 mm ± 0.1 mm; C-TOL. = ± 10 % | | | | | | | |
| 15 | 30.0 x 45.0 x 42.0 | 67.0 | 61531KPM5T0 | 63 | - | - | - |
| PITCH P₁ = 37.5 mm ± 0.5 mm; P₂ = 10.2 mm ± 0.5 mm; d_t = 1.0 mm ± 0.1 mm; C-TOL. = ± 5 % | | | | | | | |
| 10 | 21.5 x 38.5 x 42.0 | 37.5 | 61031JPM4T0 | 91 | - | - | - |
| 15 | 30.0 x 45.0 x 42.0 | 67.0 | 61531JPM4T0 | 63 | - | - | - |
| PITCH P₁ = 37.5 mm ± 0.5 mm; P₂ = 20.3 mm ± 0.5 mm; d_t = 1.0 mm ± 0.1 mm; C-TOL. = ± 5 % | | | | | | | |
| 15 | 30.0 x 45.0 x 42.0 | 67.0 | 61531JPM5T0 | 63 | - | - | - |
| PITCH P₁ = 52.5 mm ± 0.5 mm; P₂ = 10.2 mm ± 0.5 mm; d_t = 1.2 mm ± 0.12 mm; C-TOL. = ± 20 % | | | | | | | |
| 310 | 25 | 25.0 x 45.0 x 57.5 | 69.0 | 62031MYM4T0 | 55 | 62031MYI4T0 | 55 |
| | | | 63.5 | 62531MYM4T0 | | 62531MYI4T0 | |
| | 30 | 30.0 x 45.0 x 57.5 | 85.0 | 63031MYM4T0 | 45 | 63031MYI4T0 | 45 |
| PITCH P₁ = 52.5 mm ± 0.5 mm; P₂ = 20.3 mm ± 0.5 mm; d_t = 1.2 mm ± 0.12 mm; C-TOL. = ± 20 % | | | | | | | |
| 30 | 30.0 x 45.0 x 57.5 | 85.0 | 63031MYM5T0 | 45 | 63031MYI5T0 | 45 | 45 |
| 35 | 35.0 x 50.0 x 57.5 | 105.0 | 63531MYM5T0 | 40 | 63531MYI5T0 | 40 | 40 |
| 40 | 35.0 x 50.0 x 57.5 | 105.0 | 64031MYM5T0 | 40 | 64031MYI5T0 | 40 | 40 |
| PITCH P₁ = 52.5 mm ± 0.5 mm; P₂ = 10.2 mm ± 0.5 mm; d_t = 1.2 mm ± 0.12 mm; C-TOL. = ± 10 % | | | | | | | |
| 20 | 25.0 x 45.0 x 57.5 | 65.5 | 62031KYM4T0 | 55 | 62031KYI4T0 | 55 | 55 |
| 25 | 30.0 x 45.0 x 57.5 | 86.5 | 62531KYM4T0 | 45 | 62531KYI4T0 | 45 | 45 |
| PITCH P₁ = 52.5 mm ± 0.5 mm; P₂ = 20.3 mm ± 0.5 mm; d_t = 1.2 mm ± 0.12 mm; C-TOL. = ± 10 % | | | | | | | |
| 25 | 30.0 x 45.0 x 57.5 | 86.5 | 62531KYM5T0 | 45 | 62531KYI5T0 | 45 | 45 |
| 30 | 35.0 x 50.0 x 57.5 | 105.0 | 63031KYM5T0 | 40 | 63031KYI5T0 | 40 | 40 |
| | | | 63531KYM5T0 | | 63531KYI5T0 | | |
| PITCH P₁ = 52.5 mm ± 0.5 mm; P₂ = 10.2 mm ± 0.5 mm; d_t = 1.2 mm ± 0.12 mm; C-TOL. = ± 5 % | | | | | | | |
| 20 | 25.0 x 45.0 x 57.5 | 65.5 | 62031JYM4T0 | 55 | 62031JYI4T0 | 55 | 55 |
| 25 | 30.0 x 45.0 x 57.5 | 86.5 | 62531JYM4T0 | 45 | 62531JYI4T0 | 45 | 45 |
| PITCH P₁ = 52.5 mm ± 0.5 mm; P₂ = 20.3 mm ± 0.5 mm; d_t = 1.2 mm ± 0.12 mm; C-TOL. = ± 5 % | | | | | | | |
| 25 | 30.0 x 45.0 x 57.5 | 86.5 | 62531JYM5T0 | 45 | 62531JYI5T0 | 45 | 45 |
| 30 | 35.0 x 50.0 x 57.5 | 105.0 | 63031JYM5T0 | 40 | 63031JYI5T0 | 40 | 40 |

Notes

- SPQ = Standard Packing Quantity
- ⁽¹⁾ Weight for short lead product only

| APPROVALS | | | | |
|--|---------------------|---------------|-----------------|--|
| SAFETY APPROVALS X2 | VOLTAGE | VALUE | FILE NUMBERS | LINK |
| EN 60384-14 (ENEC) (= IEC 60384-14 ed-4 (2013)) | 310 V _{AC} | 1 nF to 40 μF | 40028493 | www.vishay.com/doc?28215 |
| UL 60384-14 | 310 V _{AC} | 1 nF to 40 μF | E354331 | www.vishay.com/doc?28216 |
| CSA-E384-14 | 310 V _{AC} | 1 nF to 40 μF | E354331 | |
| CQC | 310 V _{AC} | 1 nF to 40 μF | 10001041904 (L) | www.vishay.com/doc?28217 |
| | | | 10001041903 (F) | www.vishay.com/doc?28237 |
| CB - Test certificate | 310 V _{AC} | 1 nF to 40 μF | DE-41725 | www.vishay.com/doc?28214 |
| The ENEC-approval together with the CB-Certificate replace all national marks of the following countries (they have already signed the ENEC-Agreement): Austria; Belgium; Czech.Republic; Denmark; Finland; France; Germany; Greece; Hungary; Ireland; Italy; Luxembourg; Netherlands; Norway; Portugal; Slovenian; Spain; Sweden; Switzerland and United Kingdom. | | | | |
|    | | | | |

MOUNTING

Normal Use

The capacitors are designed for mounting on printed-circuit boards. The capacitors packed in 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

Specific Method of Mounting to Withstand Vibration and Shock

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

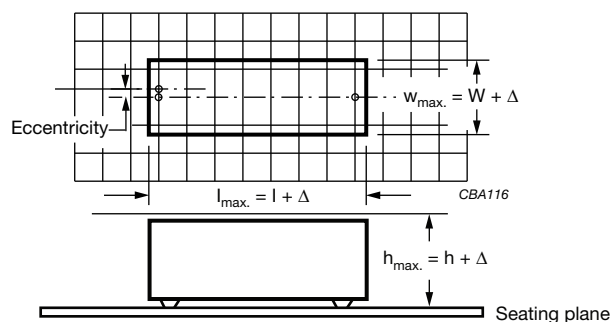
- For pitches ≤ 15 mm capacitors shall be mechanically fixed by the leads
- For larger pitches the capacitors shall be mounted in the same way and the body clamped in addition

Space Requirements on Printed Circuit-Board

The maximum space for length ($l_{max.}$), width ($w_{max.}$), and height ($h_{max.}$) of film capacitors to take in account on the printed circuit board is shown in the drawings:

- For products with pitch ≤ 15 mm, $\Delta w = \Delta l = 0.3$ mm and $\Delta h = 0.1$ mm
- For products with 15 mm $<$ pitch ≤ 27.5 mm, $\Delta w = \Delta l = 0.5$ mm and $\Delta h = 0.1$ mm
- For products with pitch = 37.5 mm, $\Delta w = \Delta l = 0.7$ mm; $\Delta h = 0.5$ mm
- For products with pitch = 52.5 mm, $\Delta w = \Delta l = 1.0$ mm and $\Delta h = 0.5$ mm

Eccentricity defined as in drawing. The maximum eccentricity is smaller than or equal to the lead diameter of the product concerned.



SOLDERING CONDITIONS

For general soldering conditions and wave soldering profile, we refer to the application note: "Soldering Guidelines for Film Capacitors": www.vishay.com/doc?28171

Storage Temperature

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

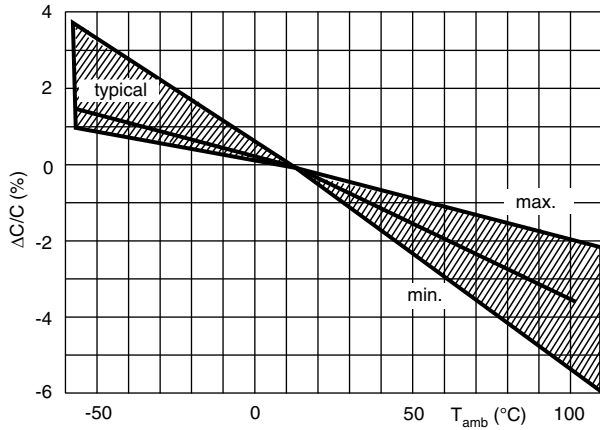
Ratings and Characteristics Reference Conditions

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

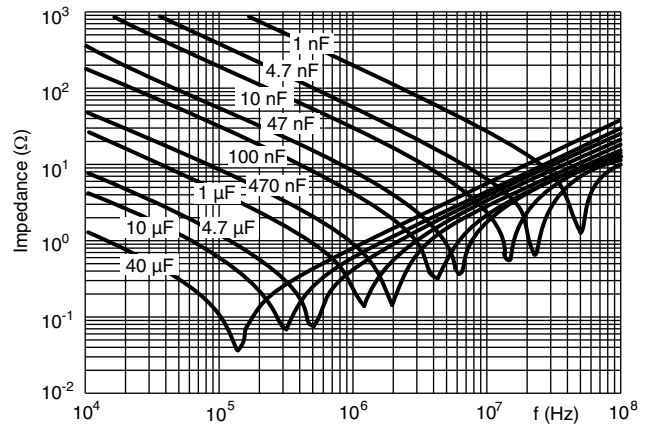
For reference testing, a conditioning period shall be applied over 96 h ± 4 h by heating the products in a circulating air oven at the rated temperature and a relative humidity not exceeding 20 %.



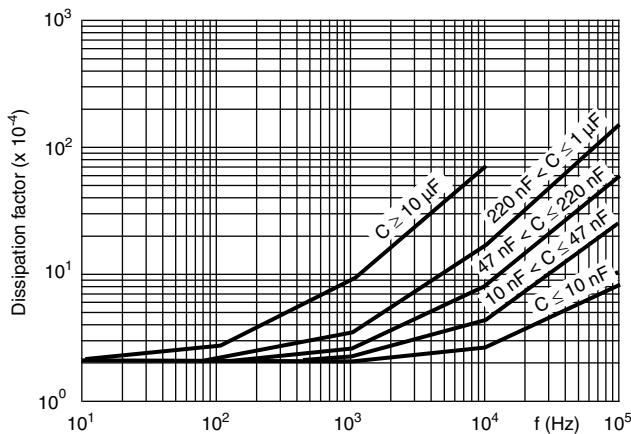
CHARACTERISTICS



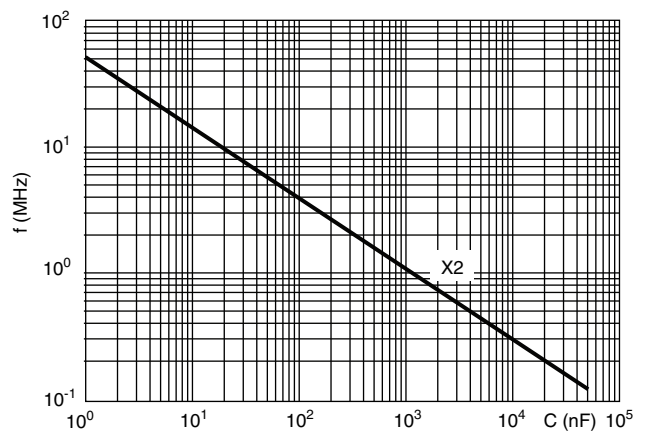
Capacitance as a function of ambient temperature (typical curve)



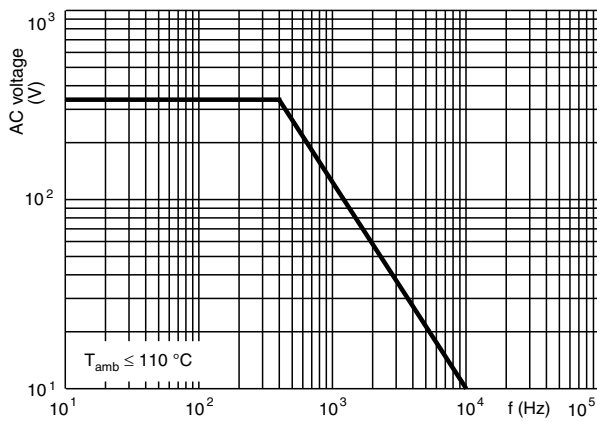
Impedance as a function of frequency (typical curve)



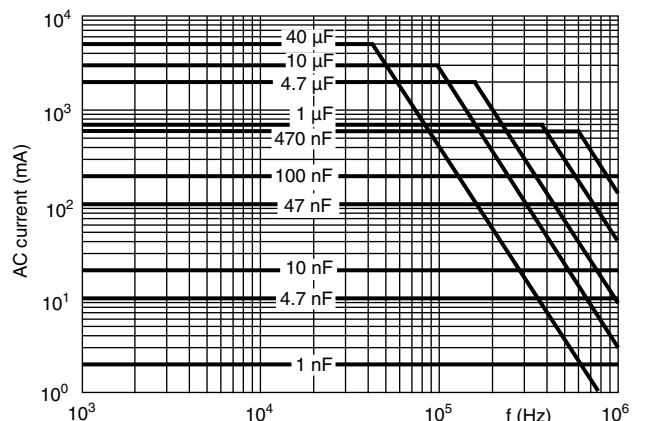
Tangent of loss angle as a function of frequency (typical curve)



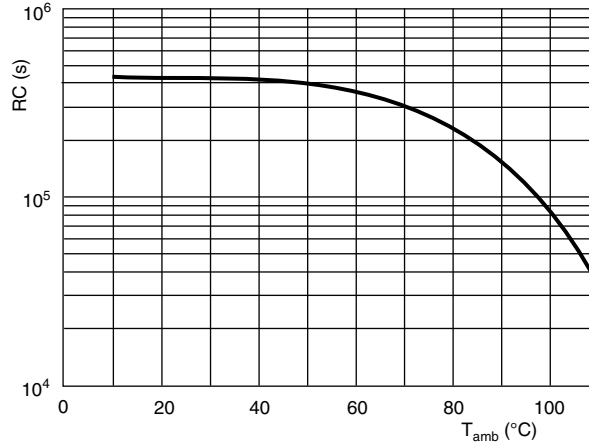
Resonant frequency as a function of capacitance (typical curve)



Max. RMS voltage as a function of frequency



Max. RMS current as a function of frequency

CHARACTERISTICS

 Insulation resistance as a function of ambient temperature
(typical curve)

APPLICATION NOTES

- For X2 electromagnetic interference suppression in **standard across the line applications** (50 Hz / 60 Hz) with a maximum mains voltage of 310 V_{AC}.
- For series impedance applications we refer to application note www.vishay.com/doc?28153
- For capacitors connected in parallel, normally the proof voltage and possibly the rated voltage must be reduced. For information depending of the capacitance value and the number of parallel connections contact: rfi@vishay.com
- These capacitors are not intended for continuous pulse application. For these situations capacitors of the AC and pulse programs must be used.
- The maximum ambient temperature must not exceed 110 °C.
- Rated voltage pulse slope:
if the pulse voltage is lower than the rated voltage, the values of the specific reference data can be multiplied by 435 V_{DC} and divided by the applied voltage

INSPECTION REQUIREMENTS
General Notes

Sub-clause numbers of tests and performance requirements refer to the “Sectional Specification, IEC 60384-14 ed-4 (2013) 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) Initial measurements | Capacitance Tangent of loss angle: for C ≤ 1 μF at 10 kHz or for C > 1 μF at 1 kHz | As specified in chapters “General data” of this specification |
| 4.3 Robustness of terminations | Tensile: load 10 N; 10 s Bending: load 5 N; 4 x 90° | No visible damage |
| 4.4 Resistance to soldering heat | No pre-drying Method: 1A Solder bath: 280 °C ± 5 °C Duration: 10 s | |
| 4.19 Component solvent resistance | Isopropylalcohol at room temperature Method: 2 Immersion time: 5 min ± 0.5 min Recovery time: Min. 1 h, max. 2 h | |



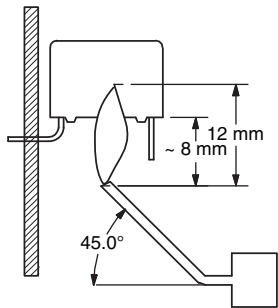
| GROUP C INSPECTION REQUIREMENTS | | |
|---|--|--|
| SUB-CLAUSE NUMBER AND TEST | CONDITIONS | PERFORMANCE REQUIREMENTS |
| SUB-GROUP C1A PART OF SAMPLE OF SUB-GROUP C1 | | |
| 4.4.2 Final measurements | <p>Visual examination</p> <p>Capacitance</p> <p>Tangent of loss angle</p> <p>Insulation resistance</p> | <p>No visible damage Legible marking</p> <p>$\Delta C/C \leq 5\%$ of the value measured initially</p> <p>Increase of $\tan \delta$: ≤ 0.008 for: $C \leq 1 \mu\text{F}$ or ≤ 0.005 for: $C > 1 \mu\text{F}$ Compared to values measured initially</p> <p>As specified in section "Insulation Resistance" of this specification</p> |
| SUB-GROUP C1B PART OF SAMPLE OF SUB-GROUP C1 | | |
| Initial measurements | <p>Capacitance</p> <p>Tangent of loss angle: for $C \leq 1 \mu\text{F}$ at 10 kHz or for $C > 1 \mu\text{F}$ at 1 kHz</p> | |
| 4.20 Solvent resistance of the marking | <p>Isopropylalcohol at room temperature Method: 1 Rubbing material: cotton wool Immersion time: 5 min \pm 0.5 min</p> | <p>No visible damage Legible marking</p> |
| 4.6 Rapid change of temperature | <p>$\theta A = -55\text{ }^\circ\text{C}$ $\theta B = +125\text{ }^\circ\text{C}$</p> | |
| 4.6.1 Inspection | <p>5 cycles Duration $t = 30$ min</p> | <p>No visible damage</p> |
| 4.7 Vibration | <p>Visual examination Mounting: see section "Mounting" of this specification Procedure B4 Frequency range: 10 Hz to 55 Hz Amplitude: 0.75 mm or Acceleration 98 m/s² (whichever is less severe) Total duration 6 h</p> | |
| 4.7.2 Final inspection | <p>Visual examination</p> | <p>No visible damage</p> |
| 4.9 Shock | <p>Mounting: see section "Mounting" for more information Pulse shape: half sine Acceleration: 490 m/s² Duration of pulse: 11 ms</p> | |
| 4.9.2 Final measurements | <p>Visual examination</p> <p>Capacitance</p> <p>Tangent of loss angle</p> <p>Insulation resistance</p> | <p>No visible damage</p> <p>$\Delta C/C \leq 5\%$ of the value measured initially.</p> <p>Increase of $\tan \delta$: ≤ 0.008 for: $C \leq 1 \mu\text{F}$ or ≤ 0.005 for: $C > 1 \mu\text{F}$ Compared to values measured initially</p> <p>As specified in section "Insulation Resistance" of this specification</p> |



| GROUP C INSPECTION REQUIREMENTS | | |
|--|---|--|
| SUB-CLAUSE NUMBER AND TEST | CONDITIONS | PERFORMANCE REQUIREMENTS |
| SUB-GROUP C1 COMBINED SAMPLE OF SPECIMENS OF SUB-GROUPS C1A AND C1B | | |
| 4.11 Climatic sequence | | |
| 4.11.1 Initial measurements | Capacitance Measured in 4.4.2 and 4.9.2 Tangent of loss angle: measured initially in C1A and C1B | |
| 4.11.2 Dry heat | Temperature: 110 °C Duration: 16 h | |
| 4.11.3 Damp heat cyclic Test Db First cycle | | |
| 4.11.4 Cold | Temperature: -55 °C Duration: 2 h | |
| 4.11.5 Damp heat cyclic Test Db Remaining cycles | | |
| 4.11.6 Final measurements | Visual examination Capacitance Tangent of loss angle Voltage proof 1350 V _{DC} ; 1 min between terminations Insulation resistance | No visible damage Legible marking ΔC/C ≤ 5 % of the value measured in 4.11.1. Increase of tan δ: ≤ 0.008 for: C ≤ 1 μF or ≤ 0.005 for: C > 1 μF Compared to values measured in 4.11.1. No permanent breakdown or flash-over ≥ 50 % of values specified in section “Insulation Resistance” of this specification |
| SUB-GROUP C2 | | |
| 4.12 Damp heat steady state | 56 days; 40 °C; 90 % to 95 % RH no load | |
| 4.12.1 Initial measurements | Capacitance Tangent of loss angle: at 1 kHz | |
| 4.12.3 Final measurements | Visual examination Capacitance Tangent of loss angle Voltage proof 1350 V _{DC} ; 1 min between terminations Insulation resistance | No visible damage Legible marking ΔC/C ≤ 5 % of the value measured in 4.12.1. Increase of tan δ: ≤ 0.008 for: C ≤ 1 μF or ≤ 0.005 for: C > 1 μF Compared to values measured in 4.12.1. No permanent breakdown or flash-over ≥ 50 % of values specified in section “Insulation Resistance” of this specification |



| GROUP C INSPECTION REQUIREMENTS | | |
|---------------------------------|---|--|
| SUB-CLAUSE NUMBER AND TEST | CONDITIONS | PERFORMANCE REQUIREMENTS |
| SUB-GROUP C3 | | |
| 4.13.1 Initial measurements | Capacitance Tangent of loss angle: for C ≤ 1 μF at 10 kHz or for C > 1 μF at 1 kHz | |
| 4.13 Impulse voltage | 3 successive impulses, full wave, peak voltage: X2: 2.5 kV for C ≤ 1 μF X2: 2.5 kV/√C for C > 1 μF Max. 24 pulses | No self healing breakdowns or flash-over |
| 4.14 Endurance | Duration: 1000 h 1.25 x U _{RAC} at 110 °C Once in every hour the voltage is increased to 1000 V _{RMS} for 0.1 s via resistor of 47 Ω ± 5 % | |
| 4.14.7 Final measurements | Visual examination Capacitance Tangent of loss angle Voltage proof 1350 V _{DC} ; 1 min between terminations 2120 V _{AC} ; 1 min between terminations and case Insulation resistance | No visible damage Legible marking ΔC/C ≤ 10 % compared to values measured in 4.13.1. Increase of tan δ: ≤ 0.008 for: C ≤ 1 μF or ≤ 0.005 for: C > 1 μF Compared to values measured in 4.13.1. No permanent breakdown or flash-over ≥ 50 % of values specified in section "Insulation Resistance" of this specification |
| SUB-GROUP C4 | | |
| 4.15 Charge and discharge | 10 000 cycles Charged to 435 V _{DC} Discharge resistance: $R = \frac{435 V_{DC}}{1.25 \times C (dU/dt)}$ R = 2.2 Ω for pitch 37.5 mm and 52.5 mm | |
| 4.15.1 Initial measurements | Capacitance Tangent of loss angle: for C ≤ 1 μF at 10 kHz or for C > 1 μF at 1 kHz | |
| 4.15.3 Final measurements | Capacitance Tangent of loss angle Insulation resistance | ΔC/C ≤ 10 % compared to values measured in 4.15.1. Increase of tan δ: ≤ 0.008 for: C ≤ 1 μF or ≤ 0.005 for: C > 1 μF Compared to values measured in 4.15.1. ≥ 50 % of values specified in section "Insulation Resistance" of this specification |

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



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