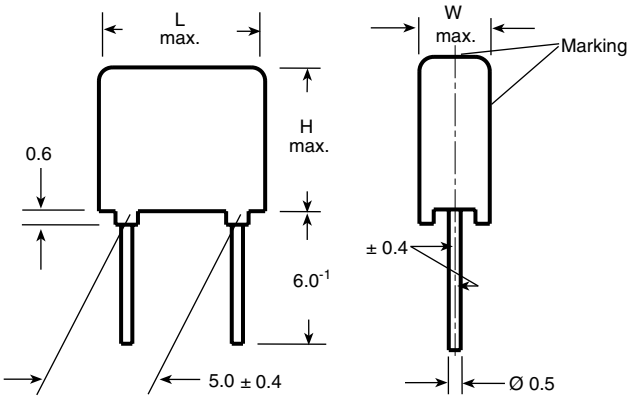
MKT 1817

Vishay Roederstein

Metallized Polyester Film Capacitors
MKT Radial Potted Types



APPLICATIONS

Blocking, bypassing, filtering and timing, high frequency coupling and decoupling for fast digital and analog ICs, interference suppression in low voltage applications.

REFERENCE SPECIFICATIONS

IEC 60384-2

MARKING

Manufacturer's logo/type/C-value/rated/tolerance/date of manufacture

DIELECTRIC

Polyester film

ELECTRODES

Metallized

CONSTRUCTION

Extended metallized film

TEST VOLTAGE (ELECTRODE/ELECTRODE)

1.6 x U_R for 2 s

RATED VOLTAGES (U_R)

63 Vdc, 100 Vdc, 250 Vdc, 400 Vdc

PERMISSIBLE AC VOLTAGES (RMS) UP TO 60 Hz

40 Vac, 63 Vac, 160 Vac, 200 Vac

FEATURES

- Compliant to RoHS directive 2002/95/EC

Pb-free

e3

RoHS COMPLIANT

ENCAPSULATION

Flame retardant plastic case (UL-class 94 V-0), epoxy resin sealed

CLIMATIC TESTING ACC. TO IEC 60068-1

55/100/56

CAPACITANCE RANGE (E12 SERIES)

1000 pF to 1.0 µF

CAPACITANCE TOLERANCES

± 20 % (M), ± 10 % (K), ± 5 % (J)

LEADS

Tinned wire

RATED TEMPERATURE

85 °C

OPERATING TEMPERATURE RANGE

- 55 °C to + 100 °C

PULL TEST ON LEADS

≥ 30 N in direction of leads according to IEC 60068-2-21

RELIABILITY

Operational life > 300 000 h

Failure rate < 2 FIT (40 °C/ 0.5 U_R)

DETAIL SPECIFICATION

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

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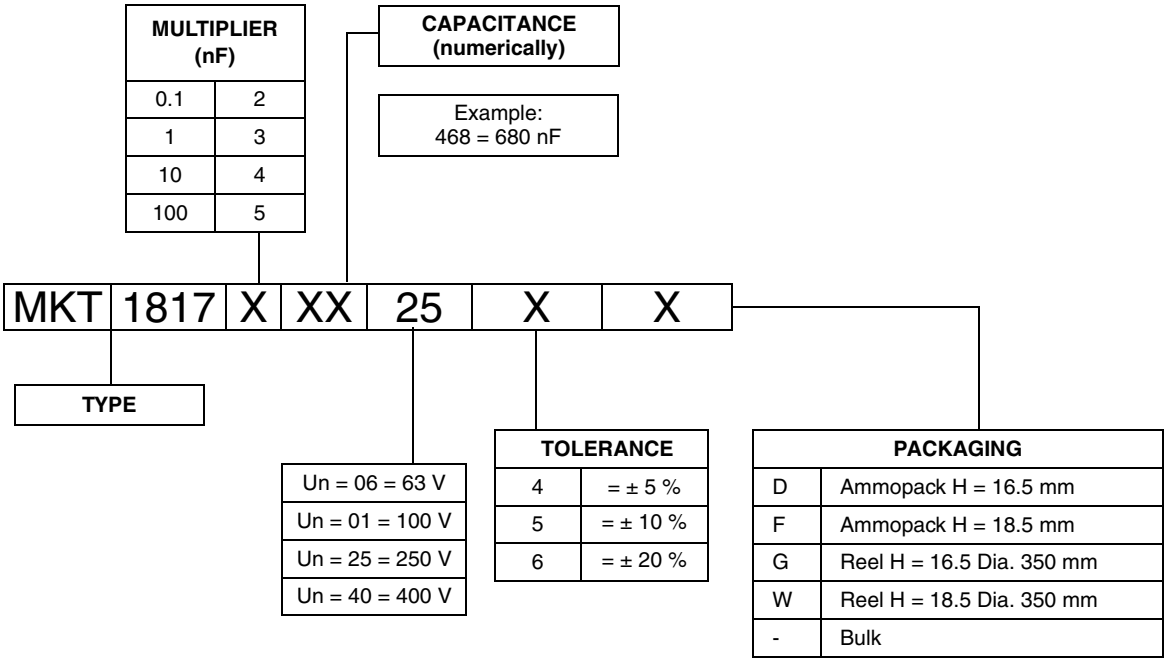
COMPOSITION OF CATALOG NUMBER



Note

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

SPECIFIC REFERENCE DATA

DESCRIPTION		VALUE		
Tangent of loss angle:		at 1 kHz	at 10 kHz	at 100 kHz
C ≤ 0.1 µF		≤ 80 x 10^{-4}	≤ 150 x 10^{-4}	≤ 250 x 10^{-4}
0.1 µF < C x 1.0 µF		≤ 80 x 10^{-4}	≤ 150 x 10^{-4}	-
Pitch (mm)	Rated voltage pulse slope $(dU/dt)_R$ at			
	63 Vdc	100 Vdc	250 Vdc	400 Vdc
5	15	24	44	100
If the maximum pulse voltage is less than the rated voltage higher dU/dt values can be permitted.				
R between leads, for C ≤ 0.33 µF and U_R ≤ 100 V			> 15 000 MΩ	
R between leads, for C ≤ 0.33 µF and U_R > 100 V			> 30 000 MΩ	
RC between leads, for C > 0.33 µF and U_R ≤ 100 V			> 5000 s	
RC between leads, for C > 0.33 µF and U_R > 100 V			> 10 000 s	
R between interconnecting leads and casing 100 V (foil method)			> 30 000 MΩ	
Withstanding (DC) voltage (cut off current 10 mA); rise time 100 V/s			1.6 x U_{Rdc}, 1 min	
Withstanding (DC) voltage between leads and case			2.0 x U_{Rdc}, with minimum of 200 Vdc; 1 min	
Maximum application temperature			100 °C	

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CAPACITANCE	CAPACITANCE CODE	VOLTAGE CODE 06 63 Vdc/40 Vac			VOLTAGE CODE 01 100 Vdc/63 Vac			VOLTAGE CODE 25 250 Vdc/160 Vac			VOLTAGE CODE 40 400 Vdc/200 Vac		
		w (mm)	h (mm)	l (mm)	w (mm)	h (mm)	l (mm)	w (mm)	h (mm)	l (mm)	w (mm)	h (mm)	l (mm)
1000 pF	-210	-	-	-	-	-	-	-	-	-	2.5	6.0	7.5
1500 pF	-215	-	-	-	-	-	-	-	-	-	2.5	6.0	7.5
2200 pF	-222	-	-	-	-	-	-	-	-	-	2.5	6.0	7.5
3300 pF	-233	-	-	-	-	-	-	2.5	6.0	7.5	3.0	6.5	7.5
4700 pF	-247	-	-	-	-	-	-	2.5	6.0	7.5	3.5	8.5	7.5
6800 pF	-268	-	-	-	-	-	-	2.5	6.0	7.5	3.5	8.5	7.5
0.01 µF	-310	-	-	-	-	-	-	2.5	6.0	7.5	4.5	9.5	7.5
0.015 µF	-315	-	-	-	-	-	-	2.5	6.0	7.5	4.5	9.5	7.5
0.022 µF	-322	-	-	-	2.5	6.0	7.5	3.0	6.5	7.5	5.5	11.5	7.5
0.033 µF	-333	-	-	-	2.5	6.0	7.5	3.5	8.5	7.5	-	-	-
0.047 µF	-347	-	-	-	2.5	6.0	7.5	4.5	9.5	7.5	-	-	-
0.068 µF	-368	-	-	-	2.5	6.0	7.5	4.5	9.5	7.5	-	-	-
0.10 µF	-410	2.5	6.0	7.5	3.5	8.5	7.5	5.5	11.5	7.5	-	-	-
0.15 µF	-415	3.5	8.5	7.5	4.5	9.5	7.5	-	-	-	-	-	-
0.22 µF	-422	3.5	8.5	7.5	5.0	10.0	7.5	-	-	-	-	-	-
0.33 µF	-433	4.5	9.5	7.5	5.5	11.5	7.5	-	-	-	-	-	-
0.47 µF	-447	5.0	10.0	7.5	-	-	-	-	-	-	-	-	-
0.68 µF	-468	5.0	10.5	7.5	-	-	-	-	-	-	-	-	-
1.0 µF	-510	5.5	11.5	7.5	-	-	-	-	-	-	-	-	-

RECOMMENDED PACKAGING

PACKAGING CODE	TYPE OF PACKAGING	HEIGHT (H) (mm)	REEL DIAMETER (mm)	ORDERING CODE EXAMPLES	PITCH 5
D	Ammo	16.5	S [1]	MKT 1817-233-255-D	x
G	Ammo	18.5	S [1]	MKT 1817-233-255-G	x
F	Reel	16.5	350	MKT 1817-233-255-F	x
W	Reel	18.5	350	MKT 1817-233-255-W	x
-	Bulk	-	-	MKT 1817-233-255	x

Note
[1] S = box size 55 mm x 210 mm x 340 mm (w x h x l)

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MOUNTING

Normal use

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

Specific Method of Mounting to Withstand Vibration and Shock

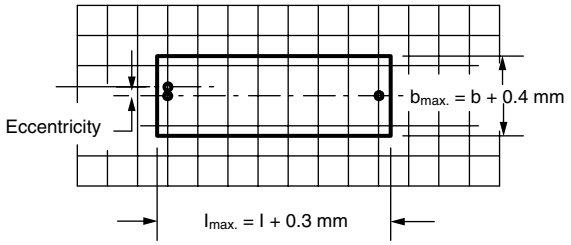
In order to withstand vibration and shock tests, it must be ensured that the stand-off pips are in good contact with the printed-circuit board:

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

Space Requirements on Printed-Circuit Board

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

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



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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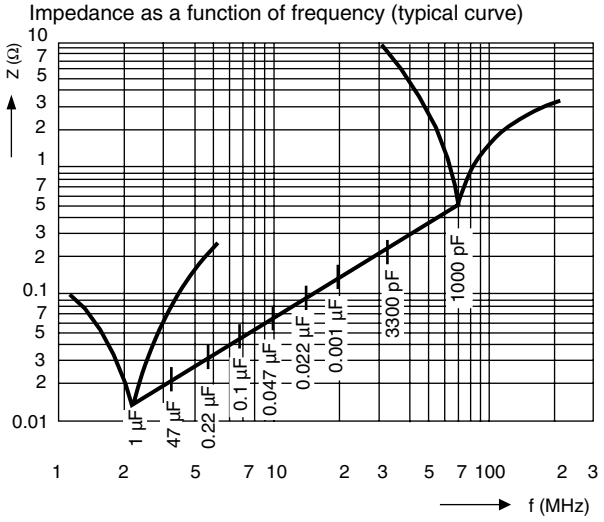
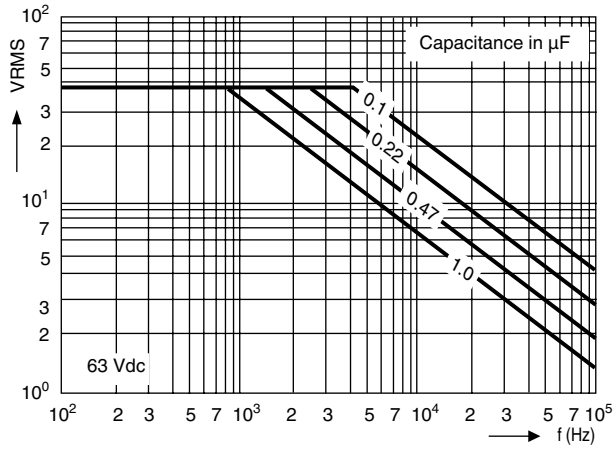
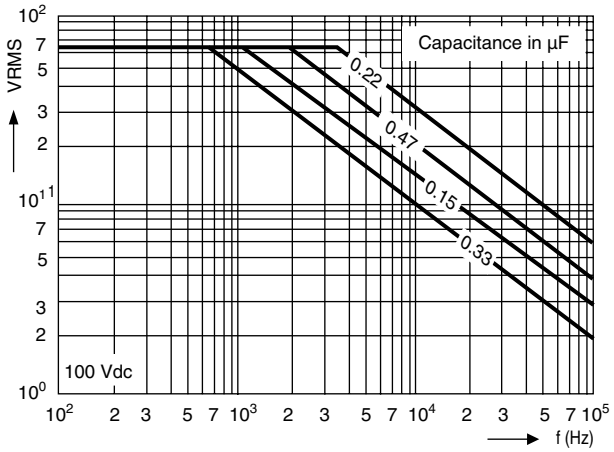
Impedance as a function of frequency (typical curve)



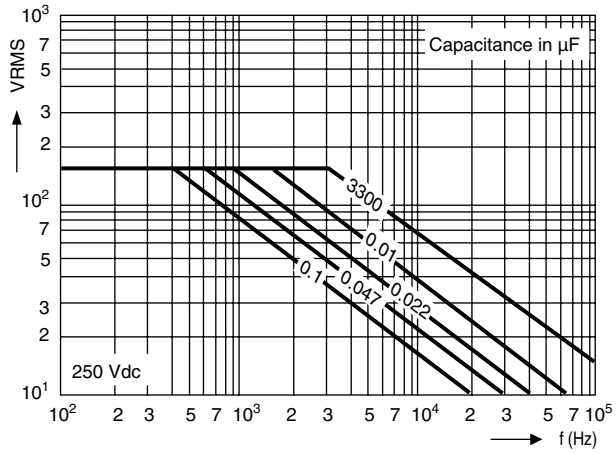
Max. RMS voltage as a function of frequency at $T_{amb} \leq 85$ °C



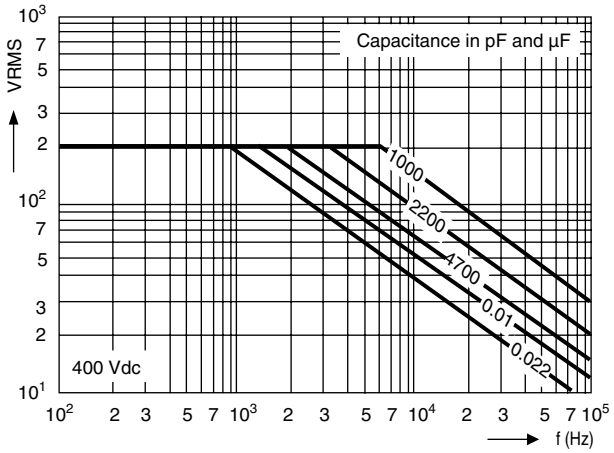
Max. RMS voltage as a function of frequency at $T_{amb} \leq 85$ °C



Max. RMS voltage as a function of frequency at $T_{amb} \leq 85$ °C



Max. RMS voltage as a function of frequency at $T_{amb} \leq 85$ °C



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INSPECTION REQUIREMENTS

Sub-clause numbers of tests and performance requirements refer to the “Sectional Specification, Publication IEC 60384-2 and Specific Reference Data”.

Group C Inspection

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 Tangent of loss angle: For C ≤ 1 µF at 10 kHz for C > 1 µF at 1 kHz	
4.3 Robustness of terminations	Method: 1A Solder bath: 280 °C ± 5 °C	No visible damage
4.4 Resistance to soldering heat (see note 3)	Duration: 10 s Isopropylalcohol at room temperature Method: 2	
4.14 Component solvent resistance	Immersion time: 5 min ± 0.5 min Recovery time: Min. 1 h, max. 2 h	
4.4.2 Final measurements	Visual examination	No visible damage Legible marking
	Capacitance	$\|\Delta C/C\| \leq 2$ % of the value measured initially
	Tangent of loss angle	Increase of tan δ: ≤ 0.003 for: C ≤ 1 µF or ≤ 0.002 for: C > 1 µF Compared to values measured in 4.3.1
SUB-GROUP C1B OTHER PART OF SAMPLE OF SUB-GROUP C1		
4.6.1 Initial measurements	Capacitance Tangent of loss angle: For C ≤ 1 µF at 10 kHz for C > 1 µF at 1 kHz	
4.6 Rapid change of temperature	θA = - 55 °C θB = + 100 °C 5 cycles Duration t = 30 min	
	Visual examination	No visible damage
4.7 Vibration (see note 3)	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	

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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 (see note 3)	Mounting: See section “Mounting” of this specification Pulse shape: Half sine Acceleration: 490 m/s² Duration of pulse: 11 ms	
4.9.2 Final measurements	Visual examination Capacitance Tangent of loss angle Insulation resistance	No visible damage $\|\Delta C/C\| \leq 5$ % of the value measured in 4.6.1 Increase of tan δ: ≤ 0.003 for: $C \leq 1$ µF or ≤ 0.002 for: $C > 1$ µF Compared to values measured in 4.6.1 ≥ 50 % of values specified in section “Insulation resistance” of this specification
SUB-GROUP C1 COMBINED SAMPLE OF SPECIMENS OF SUB-GROUPS C1A AND C1B		
4.10 Climatic sequence 4.10.2 Dry heat 4.10.3 Damp heat cyclic Test Db First cycle 4.10.4 Cold 4.10.6 Damp heat cyclic Test Db remaining cycles 4.10.6.2 Final measurements	Temperature: + 100 °C Duration: 16 h Temperature: - 55 °C Duration: 2 h Voltage proof = U_{Rdc} for 1 min within 15 min after removal from testchamber Visual examination Capacitance Tangent of loss angle Insulation resistance	 No breakdown or flash-over No visible damage Legible marking $\|\Delta C/C\| \leq 5$ % of the value measured in 4.4.2 or 4.9.3. Increase of tan δ: ≤ 0.005 for: $C \leq 1$ µF or ≤ 0.003 for: $C > 1$ µF Compared to values measured in 4.3.1. or 4.6.1 ≥ 50 % of values specified in section “Insulation resistance” of this specification
SUB-GROUP C2		
4.11 Damp heat steady state 4.11.1 Initial measurements	56 days; 40 °C; 90 % to 95 % RH Capacitance Tangent of loss angle at 1 kHz	

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SUB-CLAUSE NUMBER AND TEST	CONDITIONS	PERFORMANCE REQUIREMENTS
4.11.3 Final measurements	Voltage proof = U_{Rdc} for 1 min within 15 min after removal from testchamber Visual examination Capacitance Tangent of loss angle Insulation resistance	No breakdown or flash-over No visible damage Legible marking $\|\Delta C/C\| \leq 5$ % of the value measured in 4.11.1. Increase of tan δ: ≤ 0.005 for: $C \leq 1$ µF or Compared to values measured in 4.11.1. ≥ 50 % of values specified in section "Insulation resistance" of this specification
SUB-GROUP C3		
4.12 Endurance	Duration: 2000 h 1.25 x U_{Rdc} at 85 °C 1.0 x U_{Rdc} at 100 °C	
4.12.1 Initial measurements	Capacitance Tangent of loss angle: For $C \leq 1$ µF at 10 kHz for $C > 1$ µF at 1 kHz	
4.12.5 Final measurements	Visual examination Capacitance Tangent of loss angle Insulation resistance	No visible damage Legible marking $\|\Delta C/C\| \leq 5$ % compared to values measured in 4.12.1. Increase of tan δ: ≤ 0.003 for: $C \leq 1$ µF or ≤ 0.002 for: $C > 1$ µF Compared to values measured in 4.12.1. ≥ 50 % of values specified in section "Insulation resistance" of this specification
SUB-GROUP C4		
4.13 Charge and discharge	10 000 cycles Charged to U_{Rdc} Discharge resistance: $R = \frac{UR}{C \times 5 \times (dU/dt)R}$	
4.13.1 Initial measurements	Capacitance Tangent of loss angle: For $C \leq 1$ µF at 10 kHz for $C > 1$ µF at 1 kHz	
4.13.3 Final measurements	Capacitance Tangent of loss angle Insulation resistance	$\|\Delta C/C\| \leq 3$ % compared to values measured in 4.13.1. Increase of tan δ: ≤ 0.003 for: $C \leq 1$ µF ≤ 0.002 for: $C > 1$ µF Compared to values measured in 4.13.1. ≥ 50 % of values specified in section "Insulation resistance" of this specification

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