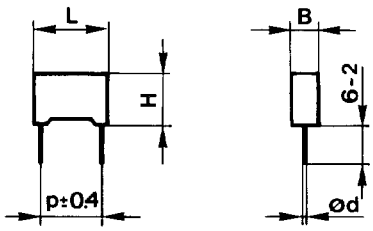
R.71
MKP Series

METALLIZED POLYPROPYLENE FILM CAPACITOR

ORDERING CODE: **R.71**



Typical applications: temperature compensation circuits, timing, oscillator circuits, power factor correction and coupling capacitor in SMPS applications.

All dimensions are in mm.

p = 7.5mm

B	= 4	> 4
Ød	0.6	0.8

p ≥ 10mm Ød = 0.8

GENERAL TECHNICAL DATA

Dielectric:
polypropylene film
Plates:
aluminum layer deposited by evaporation under vacuum.
Winding:
non-inductive type.
Leads:
tinned wire (minimum lead content 5%).
Protection:
plastic case, epoxy resin filled. Box made of solvent resistant material and flame retardant according to UL94 V0.
Marking: (red colour):
capacitance, tolerance and DC nominal voltage.
Climatic category:
FMD DIN 40040
55/100/56 IEC 68-1
Operating temperature range:
–55 to +105°C
Technical terms and tests:
IEC 384-16 CECC 31200 DIN 45910 T23

ELECTRICAL CHARACTERISTICS

Nominal Voltage (Vn):
160Vdc - 250Vdc - 400Vdc - 630Vdc.

Category Voltage (Vc): up to 85°C Vc = Vn

For temperature between +85°C and +105°C a decreasing factor of 1.25% per degree °C on the nominal voltage Vn has to be applied.

Capacitance range: 1000pF to 10μF

Capacitance values:
values in compliance with IEC Norm, E6 series.

Capacitance tolerances: (measured at 1 KHz) ±5%(J) ±10%(K) ±20%(M).

Total self-inductance (L):

Pitch (mm)	7.5	10	15	22.5	27.5
L (nH) ≈	8	9	10	18	18

(Lead length 2 mm)

Dissipation Factor (DF):
$tg\delta \times 10^{-4}$ at +25°C ± 5°C

KHz	C < 0.1μF	0.1μF to 1μF	> 1μF
1	⩽ 6	⩽ 6	⩽ 6
10	⩽ 10	⩽ 20	
100	⩽ 30		

Insulation Resistance:
Test conditions
Temperature: +25°C ± 5°C
Voltage charge time: 1 minute
Voltage charge: 100Vdc
For C ⩽ 0.33μF: ⩾ 1×10^5 MΩ (Typ. value: 5×10^5 MΩ)
For C > 0.33μF: ⩾ 30.000 sec. (Typ. value: 150.000 sec).
Test voltage between terminations:
1.6 × Vn applied for 2 sec. at +25°C ± 5°C

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Max pulse rise time (dv/dt) and pulse characteristics (K_0):

V_R	Lead spacing (mm) 7.5	10	15	22.5	27.5	
160	5.5	4	2	1.5	1	dv/dt (V/μs)
	1800	1300	640	480	320	K_0 (V^2/μs)
250	15	11	7	4	3	dv/dt (V/μs)
	7500	5500	3500	2000	1500	K_0 (V^2/μs)
400	35	20	10	5.5	5	dv/dt (V/μs)
	28000	16000	8000	4400	4000	K_0 (V^2/μs)
630	55	30	15	8	7	dv/dt (V/μs)
	69000	38000	19000	10000	8800	K_0 (V^2/μs)

If the working voltage (V) is lower than the rated voltage (V_R), the capacitor may work at higher dv/dt. In this case the maximum value allowed is obtained multiplying the above value (see table dv/dt) with the ratio V_R/V. The pulse characteristic K_0 depends on the voltage wave-form and in any case it cannot exceed the value given in the above table.
The dv/dt test is carried out at 10 times the above values.

TEST METHOD AND PERFORMANCE

Damp heat test:
Test conditions
Temperature: +40°C
Relative humidity: 93%±2%
Test duration: 56 days
Performance
Capacitance change: ΔC/C: ≤±2%
DF change Δtgδ: $\leq 10\times10^{-4}$ at 1KHz
Insulation resistance: ≥50% of limit value

Life test:
Test conditions
Temperature: +85°C
Test duration: 2000h
Voltage applied: 1.25×Vn
Performance
Capacitance change ΔC/C: ≤±3%
DF change Δtgδ: $\leq 10\times10^{-4}$ for C>1μF at 1KHz
$\leq 10\times10^{-4}$ for C≤1μF at 10KHz
Insulation resistance: ≥50% of limit value

Soldering:
Test conditions
Soldering temperature: +260°C±5°C
Soldering duration: 10 sec.±1 sec.
Performance
Capacitance change ΔC/C: ≤±1%
DF change Δtgδ: $\leq 10\times10^{-4}$ for C>1μF at 1KHz
$\leq 10\times10^{-4}$ for C≤1μF at 10KHz
Insulation resistance: ≥limit value

Long term stability (after two years):
Storage - Standard environmental conditions.
Performance
Capacitance change ΔC/C: ≤±0.5%.

Lead spacing: 7.5 mm

Rated Capacitance	160V-/90V ~				250V-/200V ~				400V-/220V ~				*630V-/250V ~			
	B	H	L	p	B	H	L	p	B	H	L	p	B	H	L	p
1000pF													4	9	10.5	7.5
1500pF													4	9	10.5	7.5
2200pF													4	9	10.5	7.5
3300pF													4	9	10.5	7.5
4700pF													4	9	10.5	7.5
6800pF									4	9	10.5	7.5				
0.010μF									4	9	10.5	7.5				
0.015μF					4	9	10.5	7.5								
0.022μF					4	9	10.5	7.5								
0.033μF	4	9	10.5	7.5												
0.047μF	4	9	10.5	7.5												
0.068μF	4	9	10.5	7.5												
0.10μF	5	11	10.5	7.5												
0.15μF	6	12	10.5	7.5												

Lead spacing: 10÷27.5 mm

1000pF													4	9	13	10
1500pF													4	9	13	10
2200pF													4	9	13	10
3300pF													4	9	13	10
4700pF													4	9	13	10
6800pF													4	9	13	10
0.010μF									4	9	13	10	5	11	13	10
0.015μF									4	9	13	10	6	12	13	10
0.022μF					4	9	13	10	5	11	13	10	5	11	18	15
0.033μF					4	9	13	10	6	12	13	10	6	12	18	15
0.047μF	4	9	13	10	5	11	13	10	6	12	13	10	7.5	13.5	18	15
0.068μF	4	9	13	10	6	12	13	10	6	12	18	15	8.5	14.5	18	15
0.10μF	5	11	13	10	5	11	18	15	7.5	13.5	18	15	7	16	26.5	22.5
0.15μF	5	11	13	10	6	12	18	15	8.5	14.5	18	15	8.5	17	26.5	22.5
0.22μF	5	11	18	15	7.5	13.5	18	15	7	16	26.5	22.5	9	17	32	27.5
0.33μF	6	12	18	15	6	15	26.5	22.5	8.5	17	26.5	22.5	13	22	32	27.5
0.47μF	7.5	13.5	18	15	7	16	26.5	22.5	9	17	32	27.5	15	30	32	27.5
0.68μF	6	15	26.5	22.5	10	18.5	26.5	22.5	11	20	32	27.5	15	30	32	27.5
1.0μF	8.5	17	26.5	22.5	11	20	32	27.5	15	30	32	27.5	18	33	32	27.5
1.5μF	10	18.5	26.5	22.5	13	22	32	27.5	15	30	32	27.5				
2.2μF	11	20	32	27.5	15	30	32	27.5	18	33	32	27.5				
3.3μF	13	22	32	27.5	18	33	32	27.5								
4.7μF	15	30	32	27.5	22	37	32	27.5								
6.8μF	15	30	32	27.5												
10μF	22	47	32	27.5												

Nominal voltage change as a function of frequency see page 36.
All dimensions are in mm.
* **Note:** Not available for across the line application.
Please refer to R40 Series on page 56.

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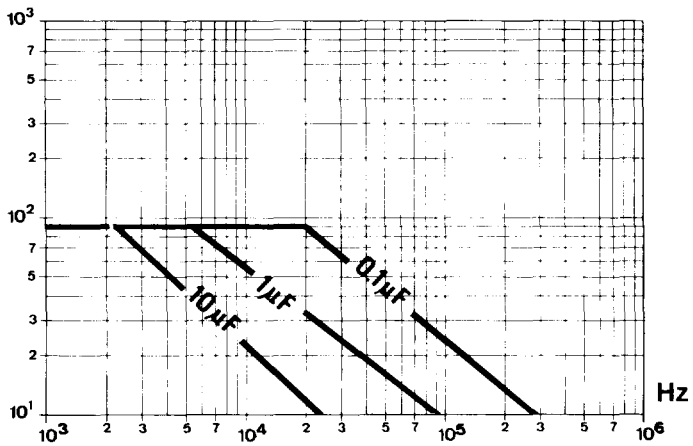
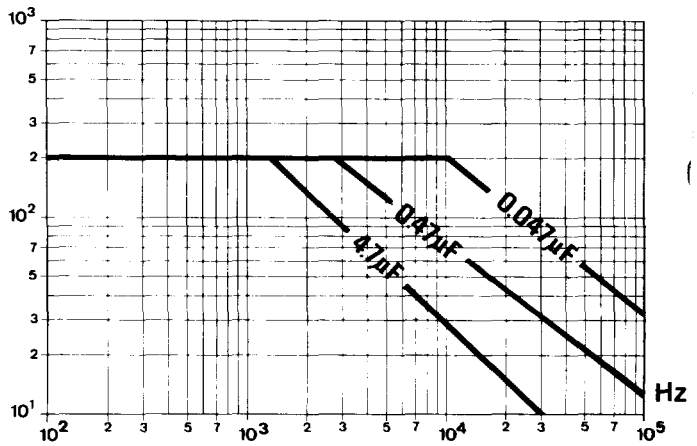
Nominal voltage variation versus frequency

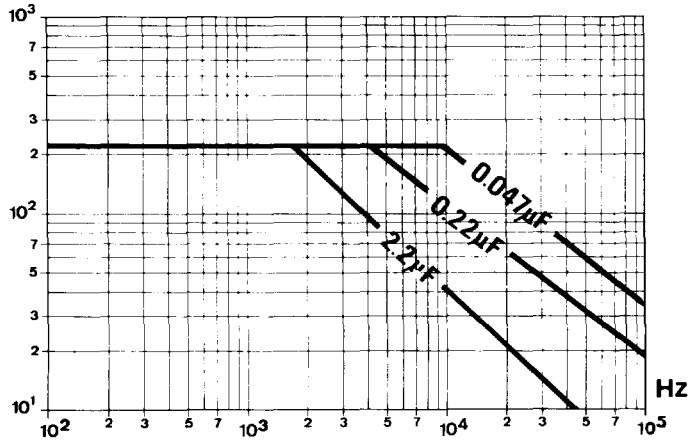
V.eff 160V-/ 90V~



V.eff 250V-/200V~



V.eff 400V-/220V~



V.eff 630V-/250V~