

**METALLIZED POLYPROPYLENE AND POLYESTER FILM CAPACITOR**

Typical applications: P.F.C. (Power Factor Correction)

PRODUCT CODE: R71

Pitch (mm)	Box thickness (B) (mm)	Maximum dimensions (mm)		
		B max	H max	L max
10.0	All	B +0.2	H +0.1	L +0.2
15.0	<7.5	B +0.2	H +0.1	L +0.3
15.0	≥7.5	B +0.2	H +0.1	L +0.5
22.5	All	B +0.2	H +0.1	L +0.3
27.5	All	B +0.2	H +0.1	L +0.3
37.5	All	B +0.3	H +0.1	L +0.3

**MKP Series**

**GENERAL TECHNICAL DATA**

- Dielectric:** polypropylene film.
- Plates:** metal layer deposited by evaporation under vacuum.
- Winding:** non-inductive type.
- Leads:** tinned wire.
- Protection:** plastic case, thermosetting resin filled. Box material is solvent resistant and flame retardant according to UL94 V0.
- Marking:** Manufacturer's logo, series, capacitance, tolerance, D.C. rated voltage.

**Operating temperature range:** -40 to +110°C  
 For temperatures between +105°C and 110°C a decreasing factor of 4% per degree C on the rated voltage  $V_R$  has to be applied.

**ELECTRICAL CHARACTERISTICS**

- Capacitance range:** 0.01µF to 22µF
- Capacitance tolerances (measured at 1 kHz):** ±10% (K); ±20% (M).
- Total self-inductance (L):** (lead length ~2mm)

Pitch (mm)	10	15	22.5	27.5	37.5
L(nH) ≈	9	10	18	18	20

**Dissipation factor (DF):**

$tg\delta \times 10^{-4}$  at +25°C ±5°C: ≤10 (6)\* at 1kHz  
 \* Typical value

**Insulation resistance:**

**Test conditions**

- Temperature: +25°C±5°C
- Voltage charge time: 1 min
- Voltage charge: 100 Vdc

**Performance**

- ≥1 x 10<sup>5</sup> MΩ for C ≤0.33µF (5 x 10<sup>5</sup> MΩ)\*
  - ≥30000 s for C >0.33µF (150000 s)\*
- \*Typical value

**Test voltage between terminations:**

1.6xV<sub>R</sub> applied for 2 s at +25°C±5°C

**MKT Series**

**GENERAL TECHNICAL DATA**

- Dielectric:** polyester film (polyethylene terephthalate).
- Plates:** metal layer deposited by evaporation under vacuum.
- Winding:** non-inductive type.
- Leads:** tinned wire.
- Protection:** plastic case, thermosetting resin filled. Box material is solvent resistant and flame retardant according to UL94 V0.
- Marking:** Manufacturer's logo, series, capacitance, tolerance, D.C. rated voltage.

**Operating temperature range:** -40 to +110°C  
 For temperatures between +85°C and 110°C a decreasing factor of 1.1% per degree C on the rated voltage  $V_R$  has to be applied.

**ELECTRICAL CHARACTERISTICS**

- Capacitance range:** 0.01µF to 22µF
- Capacitance tolerances (measured at 1 kHz):** ±10% (K); ±20% (M).
- Total self-inductance (L):** (lead length ~2mm)

Pitch (mm)	15	22.5	27.5	37.5
L(nH) ≈	10	18	18	22

**Dissipation factor (DF):**

$tg\delta \times 10^{-4}$  at +25°C ±5°C: ≤100 (50)\* at 1kHz  
 \* Typical value

**Insulation resistance:**

**Test conditions**

- Temperature: +25°C±5°C
- Voltage charge time: 1 min
- Voltage charge: 100 Vdc

**Performance**

- ≥30000 MΩ for C ≤0.33µF (50000 MΩ)\*
  - ≥10000 s for C >0.33µF (17000 s)\*
- \*Typical value

**Test voltage between terminations:**

1.6 x V<sub>R</sub> applied for 2 s at +25°C±5°C

METALLIZED POLYPROPYLENE AND POLYESTER FILM CAPACITOR

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R71 MKP Series

Table with columns: Rated Cap., 420Vdc/220Vac Std dimensions (B, H, L, p), Ø d, Max dv/dt (V/µs), Max Kp (V²/µs), Part Number. Rows include various capacitor values from 0.010µF to 22.0µF.

R71 MKP Series

Table with columns: Rated Cap., 630Vdc/275Vac Std dimensions (B, H, L, p), Ø d, Max dv/dt (V/µs), Max Kp (V²/µs), Part Number. Rows include various capacitor values from 0.010µF to 10.0µF.

Table with columns: Rated Cap., 520Vdc/250Vac Std dimensions (B, H, L, p), Ø d, Max dv/dt (V/µs), Max Kp (V²/µs), Part Number. Rows include various capacitor values from 0.010µF to 15.0µF.

Mechanical version and packaging Internal use Tolerance: K (±10%); M (±20%)

All dimensions are in mm.

Note: If the working voltage (V) is lower than the rated voltage (Vr), the capacitors 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 Vr/V. The pulse characteristics Kp depends on the voltage waveform and in any case it cannot overcome the value given in the above table.

\* Not suitable for across-the-line applications. Please refer to Interference Suppression Capacitors at page XX

Mechanical version and packaging Internal use Tolerance: K (±10%); M (±20%)

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**R71 MKT Series**

Rated Cap.	450Vdc/220Vac Std dimensions				Ø d (mm)	Max dv/dt (V/µs)	Max K <sub>0</sub> (V <sup>2</sup> /µs)	Part Number
	B	H	L	p				
0.10 µF	5.0	11.0	18.0	15.0	0.8	120	108 E3	R71XI 3100-0--
0.15 µF	5.0	11.0	18.0	15.0	0.8	120	108 E3	R71XI 3150-0--
0.22 µF	5.0	11.0	18.0	15.0	0.8	120	108 E3	R71XI 3220-0--
0.33 µF	6.0	12.0	18.0	15.0	0.8	120	108 E3	R71XI 3330-0--
0.47 µF	7.5	13.5	18.0	15.0	0.8	120	108 E3	R71XI 3470-0--
0.47 µF	6.0	17.5	18.0	15.0	0.8	120	108 E3	R71XI 3470-1--
0.47 µF	9.0	12.5	18.0	15.0	0.8	120	108 E3	R71XI 3470-2--
0.68 µF	10.0	16.0	18.0	15.0	0.8	120	108 E3	R71XI 3680-0--
0.68 µF	7.5	18.5	18.0	15.0	0.8	120	108 E3	R71XI 3680-1--
0.68 µF	13.0	12.0	18.0	15.0	0.8	120	108 E3	R71XI 3680-2--
1.0 µF	7.5	18.5	18.0	15.0	0.8	120	108 E3	R71XI 4100-1--
1.2 µF	11.0	19.0	18.0	15.0	0.8	120	108 E3	R71XI 4120-0--
0.22 µF	6.0	15.0	26.5	22.5	0.8	80	72 E3	R71XN 3220-0--
0.33 µF	6.0	15.0	26.5	22.5	0.8	80	72 E3	R71XN 3330-0--
0.47 µF	6.0	15.0	26.5	22.5	0.8	80	72 E3	R71XN 3470-0--
0.68 µF	6.0	15.0	26.5	22.5	0.8	80	72 E3	R71XN 3680-0--
1.0 µF	8.5	17.0	26.5	22.5	0.8	80	72 E3	R71XN 4100-0--
1.5 µF	10.0	18.5	26.5	22.5	0.8	80	72 E3	R71XN 4150-0--
2.2 µF	11.0	20.0	26.5	22.5	0.8	80	72 E3	R71XN 4220-0--
2.7 µF	13.0	22.0	26.5	22.5	0.8	80	72 E3	R71XN 4270-0--
1.5 µF	9.0	17.0	32.0	27.5	0.8	60	54 E3	R71XR 4150-0--
2.2 µF	10.0	20.0	32.0	27.5	0.8	60	54 E3	R71XR 4220-0--
3.3 µF	13.0	22.0	32.0	27.5	0.8	60	54 E3	R71XR 4330-0--
4.7 µF	14.0	28.0	32.0	27.5	0.8	60	54 E3	R71XR 4470-0--
6.8 µF	18.0	33.0	32.0	27.5	0.8	60	54 E3	R71XR 4680-0--
10.0 µF	22.0	37.0	32.0	27.5	0.8	60	54 E3	R71XR 5100-0--
3.3 µF	11.0	22.0	41.5	37.5	1.0	40	36 E3	R71XW4330-0--
4.7 µF	13.0	24.0	41.5	37.5	1.0	40	36 E3	R71XW4470-0--
5.6 µF	13.0	24.0	41.5	37.5	1.0	40	36 E3	R71XW4560-0--
6.8 µF	16.0	28.5	41.5	37.5	1.0	40	36 E3	R71XW4680-0--
10.0 µF	19.0	32.0	41.5	37.5	1.0	40	36 E3	R71XW5100-0--
22.0 µF	24.0	44.0	41.5	37.5	1.0	40	36 E3	R71XW5220-0--

Mechanical version and packaging (Table1) \_\_\_\_\_  
 Internal use \_\_\_\_\_  
 Tolerance: J (±5%); K (±10%); M (±20%) \_\_\_\_\_

All dimensions are in mm.

Note: If the working voltage (V) is lower than the rated voltage (V<sub>R</sub>), 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<sub>R</sub>/V. The pulse characteristic K<sub>0</sub> depends on the voltage wave-form and in any case it cannot overcome the value given in the above table.

Table 1

Standard packaging style	Lead length (mm)	Taping style			Ordering code (Digit 10 to 11)
		P <sub>2</sub> (mm)	Fig. (No.)	Pitch (mm)	
AMMO-PACK		12.70	2	10.0/15.0	DQ
AMMO-PACK		19.05	3	22.5	DQ
REEL Ø 355mm		12.70	2	10.0/15.0	GY
REEL Ø 500mm		12.70	2	10.0/15.0	CK
REEL Ø 500mm		19.05	3	22.5/27.5	CK
Loose, short leads	4 <sup>+2</sup>				AA
Loose, long leads (p≥15mm)	30 <sup>+5</sup> 25 <sup>-2/-1</sup>				40 50

Note: Ammo-pack is the preferred packaging for taped version

**TEST METHOD AND PERFORMANCE**

**Damp heat, steady state:**

**Test conditions 1st**

Temperature: +40°C±2°C  
 Relative humidity (RH): 93% ±2%  
 Test duration: 56 days

**Test conditions 2nd**

Temperature: +60°C±2°C  
 Relative humidity (RH): 95% ±2%  
 Test duration: 500 hours

**Performance**

Capacitance change |ΔC/C|: ≤5%  
 Insulation resistance: ≥50% of initial limit.

**Endurance:**

**Test conditions R71 MKP Series**

Temperature: +105°C±2°C  
 Test duration: 2000 h  
 Voltage applied: 1.25xV<sub>R</sub>

**Test conditions R71 MKT Series**

Temperature: +85°C±2°C  
 Test duration: 2000 h  
 Voltage applied: 1.25xV<sub>R</sub>

**Performance**

Capacitance change |ΔC/C|: ≤5%  
 Insulation resistance: ≥50% of initial limit.

**Resistance to soldering heat:**

**Test conditions**

Solder bath temperature: +260°C±5°C  
 Dipping time (with heat screen): 10 s±1 s

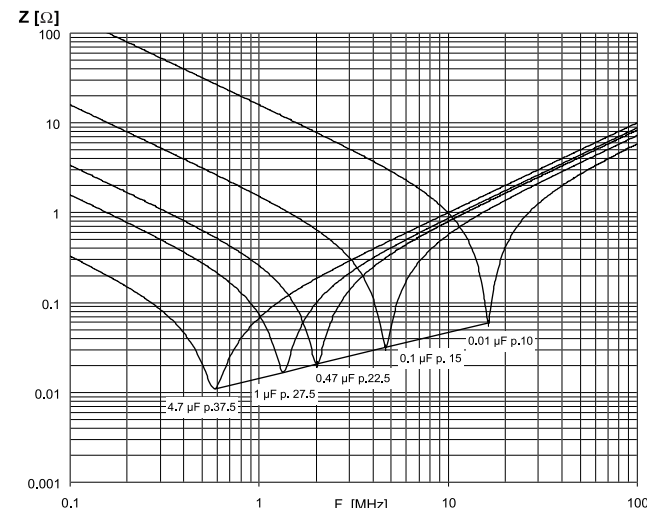
**Performance**

Capacitance change |ΔC/C|: ≤2%

**TYPICAL GRAPHS**

Impedance Vs. Frequency (lead length 2 mm)

Typical values.

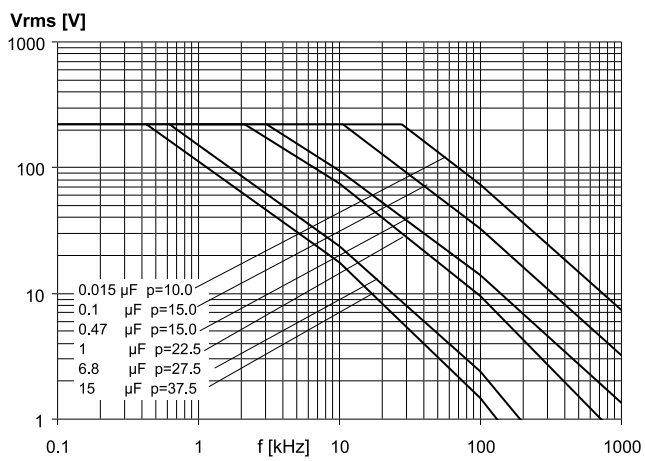


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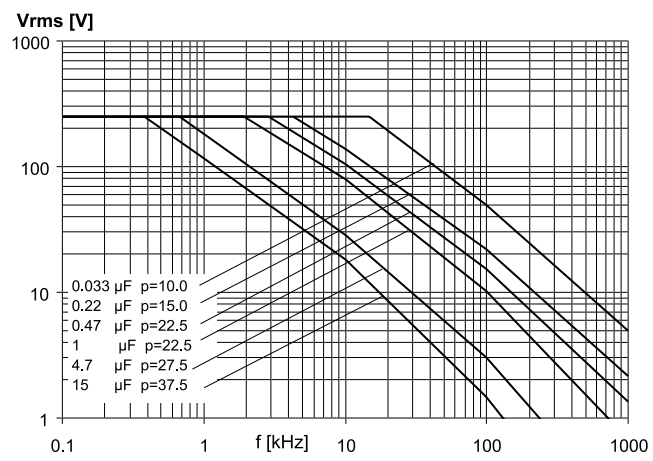
PRODUCT CODE: R71

**MAX. VOLTAGE (Vr.m.s.) VERSUS FREQUENCY (sinusoidal wave-form / Th ≤ 40°C)**

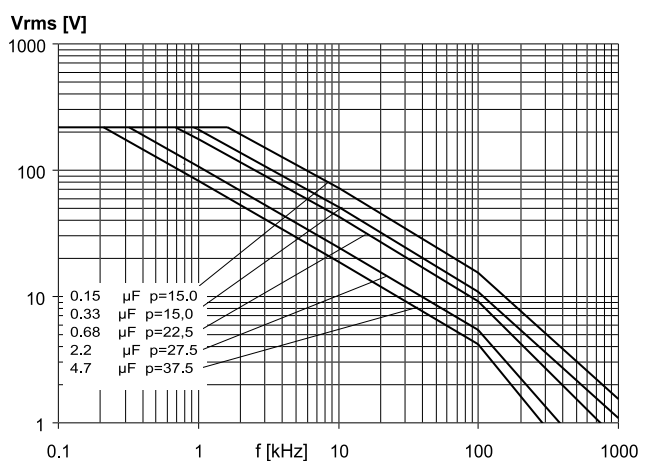
**420Vdc / 220Vac**



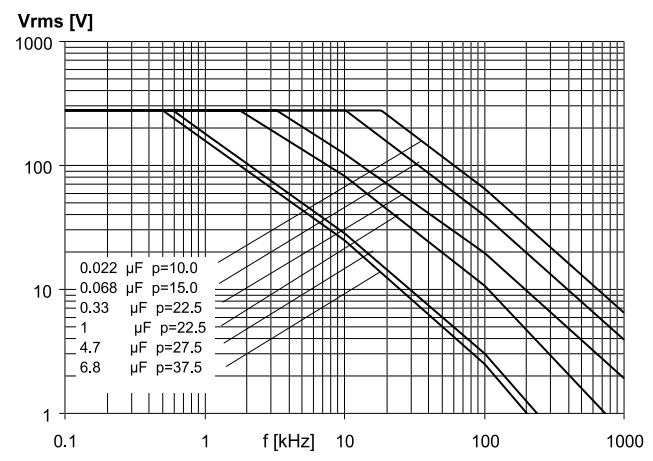
**520Vdc / 250Vac**



**450Vdc / 220Vac**



**630Vdc / 275Vac**

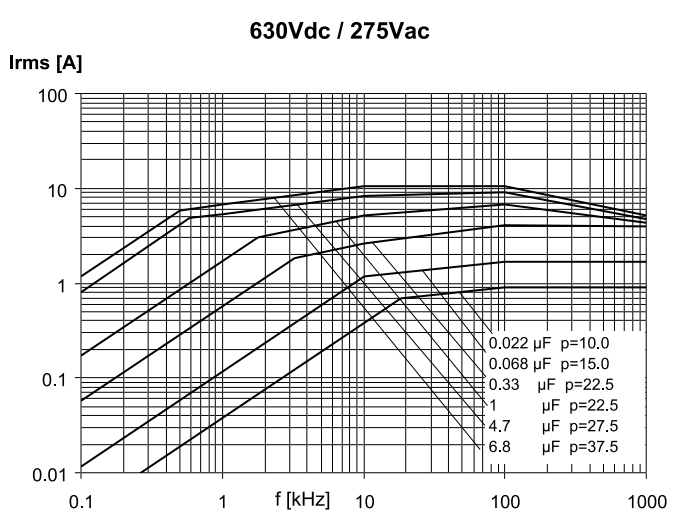
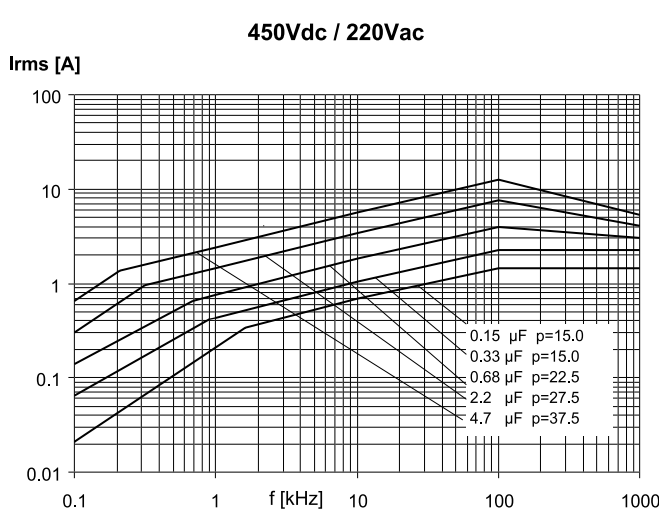
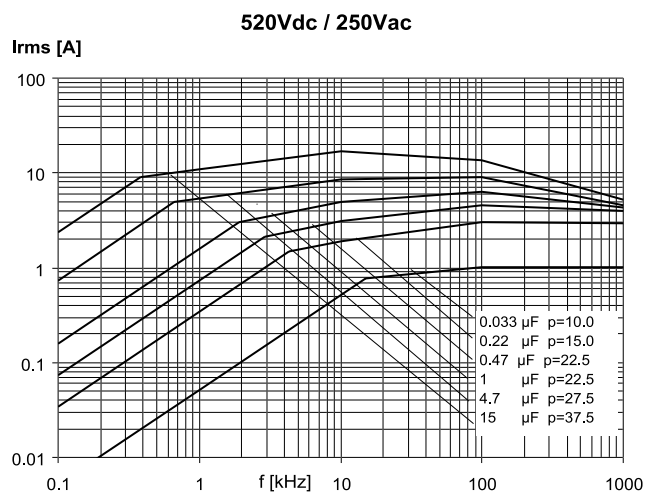
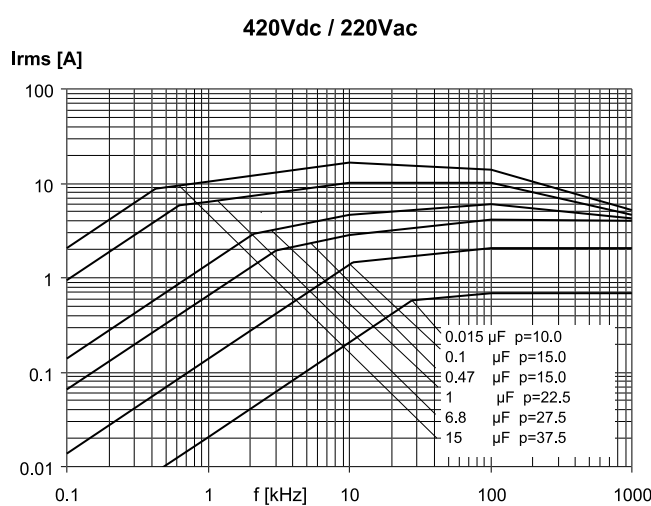


Note: p (pitch) in mm.

**METALLIZED POLYPROPYLENE AND POLYESTER FILM CAPACITOR**

PRODUCT CODE: R71

MAX. CURRENT (I<sub>r.m.s.</sub>) VERSUS FREQUENCY (sinusoidal wave-form / Th ≤ 40°C)



Note: p (pitch) in mm.