SPECIFICATION FOR APPROVAL

Product Name	Box-type Metallized Polypropylene Film Capacitor (X2 Class) (for capacitive divider)
Product Type	MKP62 Series Halogen Free
Type Code	A42（E）
Product Code	
Customer	
Customer Code	
Issue Date	2015-9

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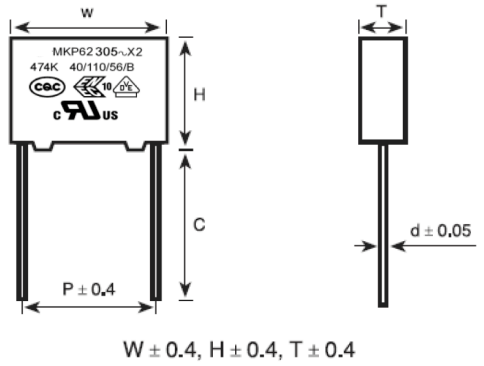
Metallized polypropylene film A.C. capacitor for capacitive divider (Class X2, 305Vac)

■ Outline Drawing



W ± 0.4, H ± 0.4, T ± 0.4

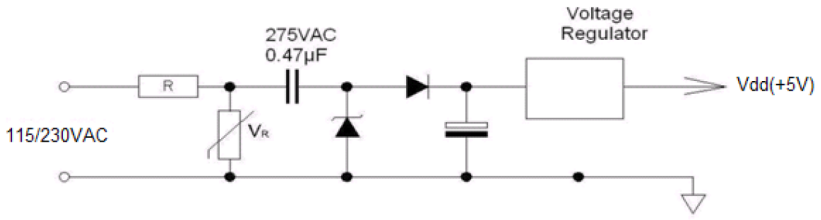
■ Features

- This is specifically designed for applications in serial with the 100～240Vac main, i.e.: capacitive divider, for example, energy meter, LED driver, etc.
- Metallized polypropylene structure
- Good self-healing properties, withstanding surge voltage stressing
- Long stability of capacitance
- Good properties in damp environment
- Excellent active and passive flame resistant abilities

■ Specifications

Reference Standard	GB/T 14472 (IEC60384-14)	
Safety Approvals	CQC03001002875, ENEC-VDE:40000358, UL-CUL: E186600, CCN: FOWX2/8	
Class	Class X2	
Climatic Category/Passive Flammability Category	40/110/56/B	
Operating temperature range	-40℃ ~ +110℃	
Rated Voltage	305Vac, 50/60Hz	
Capacitance Range	0.010μF ~2.2μF (available on request)	
Capacitance Tolerance	±10%(K), ±20%(M) (Other tolerance available on request)	
Voltage Proof	Between Terminals:	2 000Vdc(2s) C_N≤1.0μF 1 800Vdc(2s) C_N>1.0μF
	Between Terminals To Case:	2 120Vac(60s)
Endure impulse voltage	2500V	
Insulation Resistance	R≥15 000M , C_N≤0.33μF RC_N≥5 000s, C_N>0.33μF (20℃, 100V, 1min)	
Dissipation Factor	≤10×10^{-4}(1kHz,20℃) Typical value 3×10^{-4}	
	≤20×10^{-4}(10kHz,20℃) Typical value 8×10^{-4}	

■Typical circuit（0.47μF)



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■ Part number system

The 18 digits part number is formed as follow:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
A	4	2								**E**							

Digit 1 to 3 Series code

A42=MKP62 Halogen Free

Digit 4 to 5 A.C. rated voltage

Q2=305V P2=275V

Digit 6 to 8 Rated capacitance value

For example : 474=47×10^4 pF=0.47uF

Digit 9 Capacitance tolerance

K=±10% M=±20% N=0 ~ +10% 1=+4% ~ +14%

2= 0 ~ -10% 3=-5% ~ -14%

Digit 10 Pitch

4=10.0mm 6=15.0mm 9=22.5mm B=27.5mm

Digit 11 Internal use

Digit 12 to 15 Lead form and packaging code

Digit 16 to 18 Internal use

Table 1 Lead form and packaging code

Digit 12		Digit 13		Digit 14		Digit 15	
Code	explanation	Code	explanation	Code	explanation	Code	explanation
A	ammo-pack	6	F=15.0mm	0	straight	5	P3=25.4mm;H=18.5mm (For pitch=10/15mm)
C	straight lead "C" in the figure above	Code	explanation			0	Length tolerance ±0.5mm Or standard length
		00	standard lead length (18mm~26mm)				
		45	lead length 4.5mm				

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Type Code A42

■ Dimensions(mm)

305Vac								
C_N	tolerance	marking	W	H	T	P	d	Part number
0.010	±5%	K	13.0	9.0	4.0	10.0	0.6	A42Q2103K4E****+++
0.022	±5%	K	13.0	11.0	5.0	10.0	0.6	A42Q2223K4E****+++
0.033	±5%	K	13.0	12.0	6.0	10.0	0.6	A42Q2333K4E****+++
0.047	±5%	K	13.0	12.0	6.0	10.0	0.6	A42Q2473K4E****+++
0.010	±5%	K	17.5	11.0	5.0	15.0	0.6	A42Q2103K6E****+++
0.015	±5%	K	17.5	11.0	5.0	15.0	0.6	A42Q2153K6E****+++
0.022	±5%	K	17.5	11.0	5.0	15.0	0.6	A42Q2223K6E****+++
0.033	±5%	K	17.5	11.0	5.0	15.0	0.6	A42Q2333K6E****+++
0.047	±5%	K	17.5	11.0	5.0	15.0	0.6	A42Q2473K6E****+++
0.068	±5%	K	17.5	12.0	6.0	15.0	0.6	A42Q2683K6E****+++
0.10	±5%	K	17.5	13.5	7.5	15.0	0.6	A42Q2104K6E****+++
0.15	±5%	K	17.5	14.5	8.5	15.0	0.6	A42Q2154K6E****+++
0.22	±5%	K	17.5	16.0	10.0	15.0	0.8	A42Q2224K6E****+++
0.33	±5%	K	17.5	19.0	11.0	15.0	0.8	A42Q2334K6E****+++
0.15	±5%	K	26.5	15.0	6.0	22.5	0.8	A42Q2154K9E****+++
0.18	±5%	K	26.5	16.0	7.0	22.5	0.8	A42Q2184K9E****+++
0.22	±5%	K	26.5	16.0	7.0	22.5	0.8	A42Q2224K9E****+++
0.27	±5%	K	26.5	17.0	8.5	22.5	0.8	A42Q2274K9E****+++
0.33	±5%	K	26.5	17.0	8.5	22.5	0.8	A42Q2334K9E****+++
0.39	±5%	K	26.5	18.5	10.0	22.5	0.8	A42Q2394K9E****+++
0.39	0~+10%	K	26.5	18.5	10.0	22.5	0.8	A42Q2394N9E****+++
0.39	+4%~+14%	M	26.5	18.5	10.0	22.5	0.8	A42Q239419E****+++
0.47	-14%~-5%	M	26.5	18.5	10.0	22.5	0.8	A42Q247439E****+++
0.47	-10~0%	K	26.5	20.0	11.0	22.5	0.8	A42Q247429E****+++
0.47	±5%	K	26.5	20.0	11.0	22.5	0.8	A42Q2474K9E****+++
0.47	0~+10%	K	26.5	20.0	11.0	22.5	0.8	A42Q2474N9E****+++
0.56	±5%	K	26.5	18.5	10.0	22.5	0.8	A42Q2564K9E****+++
0.56	0~+10%	K	26.5	18.5	10.0	22.5	0.8	A42Q2564N9E****+++
0.60	±5%	K	26.5	20.0	11.0	22.5	0.8	A42Q2604K9E****+++
0.68	±5%	K	26.5	20.0	11.0	22.5	0.8	A42Q2684K9E****+++
0.68	0~+10%	K	26.5	20.0	11.0	22.5	0.8	A42Q2684N9E****+++
0.75	±5%	K	26.5	20.0	11.0	22.5	0.8	A42Q2754K9E****+++
0.82	±5%	K	26.5	22.0	12.0	22.5	0.8	A42Q2824K9E****+++
0.87	±5%	K	26.5	22.0	12.0	22.5	0.8	A42Q2874K9E****+++
0.91	±5%	K	26.5	22.0	12.0	22.5	0.8	A42Q2914K9E****+++
1.0	±5%	K	26.5	22.0	12.0	22.5	0.8	A42Q2105K9E****+++
0.39	±5%	K	32.0	18.0	9.0	27.5	0.8	A42Q2394KBE****+++
0.47	±5%	K	32.0	18.0	9.0	27.5	0.8	A42Q2474KBE****+++
0.56	±5%	K	32.0	20.0	11.0	27.5	0.8	A42Q2564KBE****+++
0.56	0~+10%	K	32.0	20.0	11.0	27.5	0.8	A42Q2564NBE****+++
0.60	±5%	K	32.0	20.0	11.0	27.5	0.8	A42Q2604KBE****+++
0.68	±5%	K	32.0	20.0	11.0	27.5	0.8	A42Q2684KBE****+++
0.68	0~+10%	K	32.0	20.0	11.0	27.5	0.8	A42Q2684NBE****+++
0.82	±5%	K	32.0	22.0	13.0	27.5	0.8	A42Q2824KBE****+++
1.0	±5%	K	32.0	22.0	13.0	27.5	0.8	A42Q2105KBE****+++
1.2	±5%	K	32.0	28.0	14.0	27.5	0.8	A42Q2125KBE****+++
1.5	±5%	K	32.0	28.0	14.0	27.5	0.8	A42Q2155KBE****+++
1.8	±5%	K	32.0	30.0	16.0	27.5	0.8	A42Q2185KBE****+++
2.2	±5%	K	32.0	33.0	18.0	27.5	0.8	A42Q2225KBE****+++

Note: 1. "-"=capacitance tolerance code, K=±10%, M=±20%

2. "****"=lead form and packing code (refer to table 1)

3. If used in the 380Vac, Pls refer to MKP65. Pls contact our technical engineer for more details.

■ Test Method And Performance

No.	Item		Performance	Test Method (GB/T14472, IEC 60384-14)
1	4.5 Solderability		Good quality of tinning	Solder temperature: 245°C ±5°C Immersion time: 2.0s±0.5s
2	4.3 Terminal strength		There shall be no visible damage	Tense: 0.50<d≤0.80, 10N 0.80<d≤1.25, 20N Bend: 0.50<d≤0.80, 5N 0.80<d≤1.25, 10N The terminals shall be bent 2 times in each direction
3	4.4 Resistance to solder heat		There shall be no visible damage ΔC/C ≤±5%(relative to the initial value)	Solder temperature:260°C±5°C Immersion time: 10s±1s
4	4.20 Solvent resistance of the marking		The marking shall be legible	Solvent: Industrial isopropanol. Solvent temperature:23°C±5°C Dipping time: 5min±0.5min Condition: scrub Scrub material: absorbent cotton Reverting time: No
5	4.2 Initial measurement		Capacitance、Tgδ	
	4.6 Rapid change of temperature		There shall be no evidence of deterioration.	T_A=-40°C, T_B =+110°C 5 cycles Duration: t=30min
	4.7 Vibration		There shall be no evidence of deterioration.	Amplitude 0.75mm or acceleration 100m/s² (whichever is the smaller severity), f: 10Hz to 500Hz.Three directions, 2h for each direction, total 6h.
	4.8 Bump		There shall be no evidence of deterioration.	4 000 times, Acceleration: 400m/s², Pulse duration, 6ms
	Final measurement		There shall be no visible damage ΔC/C≤±5%(relative to the initial value)	
6	4.11 Climate sequence	Initial measurement		
		Dry heat		+110℃, 16h
		Damp heat, Cyclic		Test Db, Severity: b, the first cycle
		Cold		-40℃, 2h
		Damp heat, cyclic other		Test Db, Severity b, the other cycles
		Final measurement	There shall be no visible damage, legible marking ΔC/C≤±5%(relative to the initial value) Increase of tgδ: C_N≤1μF: ≤0.008 (10kHz) C_N>1μF: ≤0.005 (1kHz) Dielectric strength : there shall be no permanent breakdown or flashover I.R.: ≥ 50% of the rated value	

No.	Item	Performance	Test Method (GB/T14472, IEC 60384-14)
7	4.12 Damp heat steady state	There shall be no visible damage, legible marking ΔC/C ≤±5%(relative to the initial value) Increase of tgδ: C_N≤1μF: ≤0.008 (10kHz) C_N>1μF: ≤0.005 (1kHz) Dielectric strength : There shall be no permanent breakdown or flashover I.R.: ≥ 50% of the rated value	Temperature: 40˚C ±2˚C Humidity: 93±3 %RH Duration: 56 days
8	4.13 Impulse voltage	There are three or more waveforms which indicate that no self-heating breakdown have occurred when it is monitored by the monitor	Each individual capacitor shall be subjected to 24 impulses of the same polarity (when any three successive impulses are shown by the monitor to have a wave form indicating that no self-healing breakdown have taken place the impulses can be stopped), the time between impulses shall not be less than 10s, and the peak value of the voltage impulse: 2.5kV(suitable for C_N≤1μF; When C_N>1μF, the capacitor can endure pulse voltage value is $2.5/\sqrt{C_N}$ kV)
9	4.14 Endurance	There shall be no visible damage, legible marking ΔC/C≤±10%(relative to the initial value) Increase of tgδ: C_N≤1μF: ≤0.008 (10kHz) C_N>1μF: ≤0.005 (1kHz) Dielectric strength : There shall be no breakdown or flashover I.R. : ≥ 50% of the rated value	+110˚C, 1.25U_RVa.c., 1 000h The voltage shall be subjected to 1000Vrms for 0.1s every one hour during test.
10	4.15 Charging and discharging	ΔC/C ≤±10%(relative to the initial value) Increase of tgδ: C_N≤1μF: ≤0.008 (10kHz) C_N>1μF: ≤0.005 (1kHz) I.R.: ≥ 50% of the rated value	Times: 10 000 Duration of charging: 0.5s Duration of discharging: 0.5s Charging voltage: $\sqrt{2}$ U_R Vd.c. Charging resistance: 220/C_N(Ω) or the current ≤1.0A (whichever is the minor) Discharging resistance: $R=\frac{\sqrt{2}U_R}{C_N\times\frac{dU}{dt}}(\Omega)$ C_N: Capacitance (μF) dU/dt(V/us) : 100V/μs
11	4.17 Passive flammability	The flaming time of each capacitor shall not go beyond 10s after it is taken apart from the flame. Drop of each capacitor caused by flame shall not fire the tissue below.	Needle flame test The category of flammability: B Expose time: 1 time Capacitor Volume Exposing time 250<V(mm³)≤500 20s 500<V(mm³)≤1750 30s V(mm³)>1750 60s

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No.	Item	Performance	Test Method (GB/T14472, IEC 60384-14)
12	4.18 Active flammability	The cheese cloth around the capacitor shall not burn with a flame.	The specimens shall be individually wrapped in at least 1, but not more than 2,complete layers of cheesecloth, the cheesecloth shall be untreated pure cotton cloth. Each sample shall be subjected to 20 discharged, the interval between successive discharges shall be 5s. U_i=2.5kV $^{+7}_{0}$ % U_R be applied and be maintained for 120 $^{+10}_{0}$ s after the last discharge.

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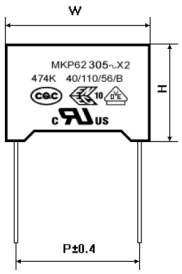
■ Quality ensuring test (before shipment):

Inspection item (each batch)	Inspection level (GB/T 2828.1, ISO2859-1)	
	IL	AQL
Appearance inspection	II	1.5%
Dimensions		
Capacitance	II	0.25%
Tangent of the loss angle		
Dielectric strength		
Insulation resistance		
Solderability	S-3	2.5%

■ Marking

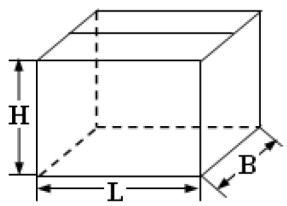


Marking Introduction:

Sign	explain	Sign	explain
	Brand		ENEC-VDE Approval
MKP62	Type		CQC Approval
305~	Rated voltage		UL,CUL Approval
X2	Class	40/110/56/B	Climate category / Passive Flammability Class
474K	Rated capacitance and tolerance		

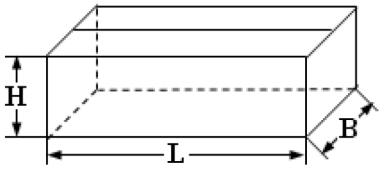
■ Packing box sizes(mm)

1. Out packing box for bulk



L:375±5
B:375±5
H:265±5

2. Inner packing box for bulk



L:355±3
B:175±3
H:118±3