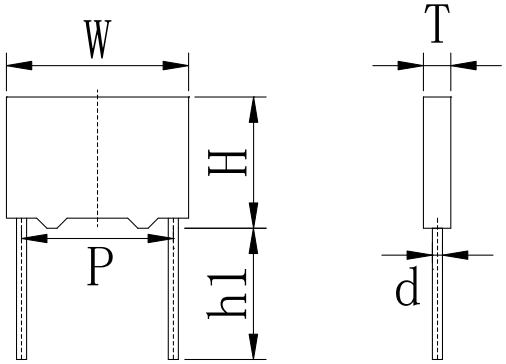
Metallized polypropylene film interference suppression capacitor（Class X2）

Series/Type:	**MKP61-X2**
Part No.:	**See table “Product Dimension”**
Specification No.:	**ZXDZ-202211257**

MKP61 type metallized polypropylene film interference suppression capacitor（Class X2）

Outline Drawing



Application and Feature：

High voltage、High insulation resistance、Good frequency response speed ，Plastic case（UL94 V-0），Epoxy resin sealing；suitable for the filtering and anti-radio-frequency interference at the both ends of the working frequency power supply（Only Indoor applications）.

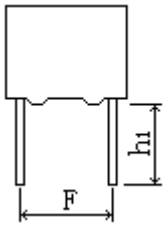
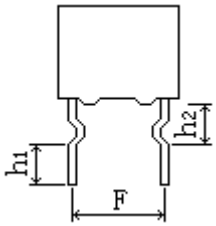
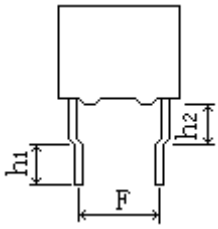
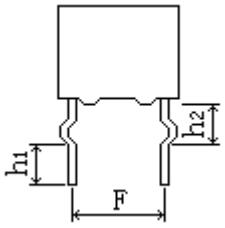
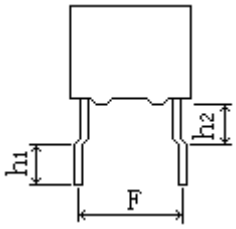
Specification：

Reference Standard	IEC 60384-14、GB/T6346.14		
Climatic Category	40/110/56/B		
Operation Temperature Range	-40℃~110℃		
Rated Voltage	275Vac/305Vac/310Vac (50/60Hz)		
Maximum continuous DC voltage	560Vdc		
Capacitance Range	0.001μF～45μF		
Capacitance Tolerance	±10%(K)、±20%(M)(20℃, 1kHz)		
Voltage proof	Between Terminals	4.3*U_R Vdc（2s）	
	Between Terminals to case	2200Vac（1min）	
Insulation Resistance	C_R≤0.33μF，IR≥15 000 MΩ C_R＞0.33μF，IR×C≥5 000s (20℃, 100V, 1min)		
Dissipation Factor	0.001μF≤C_R≤0.47μF	≤0.0010（1kHz，20℃）	≤0.0020（10kHz，20℃）
	0.47μF＜C_R≤1.0μF	≤0.0020（1kHz，20℃）	≤0.0040（10kHz，20℃）
	C_R＞1.0μF	≤0.0030（1kHz，20℃）	-
Special requirement			

Safety approvals

	CQC	GBT 6346.14, X2, 275Vac/305Vac, 0.001μF~45μF, 40/110/56/B IEC 60384-14, X2, 310Vac/630Vdc/560Vdc, 0.001μF~25μF, 40/110/56/B
	ENEC	IEC 60384-14, X2, 275Vac/305Vac, 0.001μF~45μF, 40/110/56/B IEC 60384-14, X2, 310Vac/630Vdc/560Vdc, 0.001μF~25μF, 40/110/56/B
	UL-CUL	UL60384-14, CSA E60384-1, CSA E60384-14 X2, 275Vac/305Vac/310Vac, 0.0010μF~45μF, 40/110/56/B
	KTL	K60384-1, K60384-14, X2, 305Vac, 0.0010μF~45μF, 40/110/56/B

Outline of shaping

Code of Shaping	CT Shaping Picture S-1	CK Shaping Picture S-2	CY Shaping Picture S-3
Outline Drawings of Shaping		 (0mm≤P-F≤3mm)	 (2.5mm≤P-F≤8mm)
Code of Shaping	CC Shaping Picture S-4	CX Shaping Picture S-5	
Outline Drawings of Shaping	 (0mm≤P-F≤3mm)	 2.5mm≤F-P≤8mm)	

/"F" indicates the pitch of Shaping products, Integer times of 2.5mm;

/Choosing the specific crimping method according to the requirement of customer.

h1:3.0~10.0mm ; h2: ≤5mm(CK Shaping-Picture S-2; CX Shaping-Picture S-5)
≤3mm (CY Shaping-Picture S-3);
≤6mm (CC Shaping-Picture S-4)。

Part number code system

The 16 digits part number is formed as follow:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
M	K	6	1													

Digit 1 to 4 Series code of film capacitor

MK61=MKP61

Digit 5 to 7 Rated capacitance value code

For example: 103=10×10 ^{3}pF=0.01 μ F

Digit 8 Capacitance tolerance code

K=±10% M=±20%

Digit 9 to 10 AC rated voltage code

N3=275Vac P2=305Vac P3=310Vac

Digit 11 Pitch code

3=7.5 4=10.0 6=15.0 9=22.5

B=27.5 E=37.5 G=52.5

Digit 12 Internal use

Digit 13~16 Lead form and packing code

Digit 17 Special code

Table1 Lead form and packing code

Digit13		Digit14		Digit15		Digit16	
Code	explanation	Code	explanation	Code	explanation	Code	explanation
A or R	ammo-pack or reel-pack	0	P=5.0mm	0	Straight	0	each capacitor between two consecutive holes, hole space is 12.7mm
		1	P=7.5mm	K	CK kinked	1	consecutive hole between two leads of the capacitor, hole space is 12.7mm
		2	P=10.0mm			2	each capacitor between two consecutive holes, hole space is 15.0mm
		3	P=15.0mm	Y	CY kinked	3	consecutive hole between two leads of the capacitor, hole space is 15.0mm
K or Y	lead kinked (in bulk)	0	F=5.0mm	0	h1=3.5mm	0	h1 length tolerance±0.5mm
		1	F=7.5mm				
		2	F=10.0mm				
		3	F=15.0mm				
B	bagged	00	standard lead length 15mm（min）			0	Length tolerance±0.5mm
P	box arrangement	35	lead length 3.5mm				
Q	insert foam						

MKP61(Mini)

Product Dimension:

Customer Part Number	Product code		Appearance Dimensions（mm）							Picture Number
			W	H	T	P	F	h1	d	
			±0.4	±0.4	±0.4	±0.4	±0.4	±0.5	±0.05	
	MK61334KP36MBA00	MKP61-310Vac-330nF-±10%	18.0	13.0	7.0	15.0	15.0	10.0	0.8	S-1
	MK61334KP26MBP00	MKP61-305Vac-330nF-±10%	18.0	13.0	7.0	15.0	15.0	25.0±2	0.8	S-1

Max dV/dt (V/μs)

（Vac）	Max dV/dt （V/μs）						
	P=7.5	P=10.0	P=15.0	P=22.5	P=27.5	P=37.5	P=52.5
275/305/310（Miniature）	450	400	300	140	100	70	40

Note:

Rated voltage pulse slope $(dV/dt)_R$ at rated voltage.

If the working voltage(U) is lower than the rated voltage(U_R),the capacitor can be worked at a higher dV/dt. In this case, the maximum allowed dV/dt is obtain by multiplying the up value with U_R/U.

Test method And Performance

No.	Item	Performance	Test method(GB2693-2001)
1	Solderability	After solderability, good quality of tinning, there shall no continuous part of uncoated pin	Solder temperature: 235˚C±5˚C Immersion time: 2.0s±0.5s
2	Terminal strength	There shall be no visible damage	Tense: 0.50≤d≤0.80, 10N 0.80＜d≤1.25, 20N The terminals shall be bent 2 times in each direction
3	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	Initial measurement	Capacitance tgδ	
	Rapid change of temperature	There shall be no evidence of deterioration.	θ_A=-40˚C, θ_B =+110˚C 5 cycles Duration: t=30min
	Vibration	There shall be no evidence of deterioration.	Amplitude 0.75mm or acceleration 100m/s^2 (whichever is the smaller severity), f:10Hz to 500Hz.Three directions, 2h for each direction, total 6h.
	Bump	There shall be no evidence of deterioration.	4000 times,Acceleration:400m/s2, Pulse duration,6ms
	Final measurement	There shall be no visible damage ΔC/C：≤5% (relative to the initial value)	

No.	Item	Performance		Test method(GB2693-2001)
5	climate sequence	Initial measurement	C_R＞0.33μF，τ≥1×10 s Capacitance（1KHz）、tgδ： C_R≤1μF,Test frequency 10KHz C_R>1μF,Test frequency 1KHz Voltage proof：4.3U_R Insulation resistance： C_R≤0.33μF，≥3×10^4 MΩ C_R＞0.33μF，τ≥1×10^4s	
		Dry heat		+110℃, 16h
		Damp heat, Cyclic		Test Db, the first cycle，times of cycle：one（24h）
		Cold		-40℃, 2h
		Damp heat, cyclic other		Test Db, 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_R≤1μF　Δtgδ≤0.008　(10kHz) C_R>1μF　Δtgδ≤0.005　(1kHz) Voltage proof：Applying 4.3U_R no breakdown and flashover I.R.: ≥50%of the rated value	

No.	Item	Performance	Test method(GB2693-2001)
6	Damp heat steady state	There shall be no visible damage, legible marking ΔC/C ≤5% (relative to the initial value) Increase of tgδ: C_R≤1μF Δtgδ≤0.008 (10kHz) C_R>1μF Δtgδ≤0.005 (1kHz) Voltage proof: Applying 4.3U_R no breakdown and flashover IR: ≥50% of the rated value	Temperature:40˚C±2˚C Humidity: $93\pm^{2}_{3}$ %RH Duration: 56days
7	Pulse	More than and including 3 times , no self-healing breakdown and flashover	Pulse times: 24 Pulse interval: ≥10s Peak voltage: C_R≤1μF, 2.5kV C_R>1μF, $2.5/\sqrt{C_R}$ KV
8	Endurance	There shall be no visible damage, legible marking ΔC/C ≤10% (relative to the initial value) Increase of tgδ: C_R≤1μF Δtgδ≤0.008 (10kHz) C_R>1μF Δtgδ≤0.005 (1kHz) Voltage proof: Applying 4.3U_R no breakdown and flashover IR.: ≥50% of the rated value	T=110℃, 1000h, Applied Voltage: 1.25×UR at 50Hz
9	Charging and discharging	ΔC/C ≤10% (relative to the initial value) Increase of tgδ: C_R≤1μF Δtgδ≤0.008 (10kHz) C_R>1μF Δtgδ≤0.005 (1kHz)	Times: 10000 Duration of charging: 0.5s Duration of discharging: 0.5s Charging voltage: $\sqrt{2}$ U_R Vdc

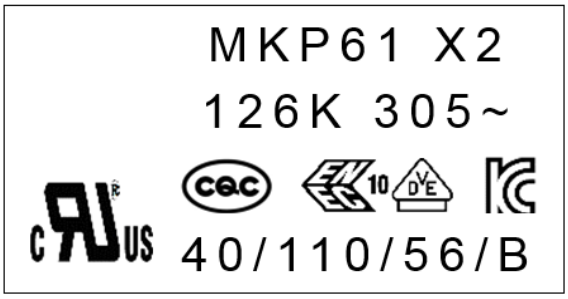
No.	Item	Performance	Test method(GB2693-2001)
10	Passive flammability	The flaming time of each capacitor shall not go beyond 10s after it is taken apart from the flame. Drop of each capacitor caused by flame shall not fire the tissue below.	Needle flame test The category of flammability: B Expose time: 1 time Capacitor Volume Exposing time $250 < V(mm^3) \leqslant 500$ 20s $500 < V(mm^3) \leqslant 1750$ 30s $V(mm^3) > 1750$ 60s
11	Active flammability	The cheesecloth 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. Each sample shall be subjected to 20 discharged, the interval between successive discharges shall be 5s. $Ui=2.5kV^{+7}_{0}\%$

Quality ensuring test (before shipment):

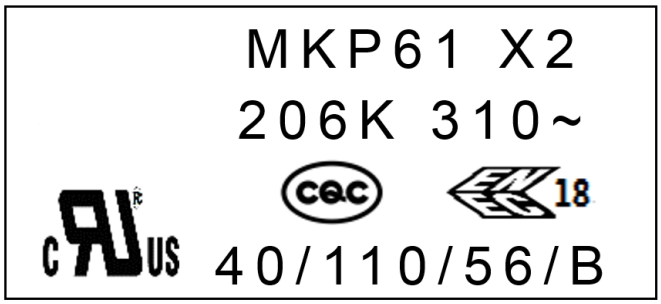
Inspection item（each batch）	Inspection level （GB 2828）	
	IL	AQL
Appearance inspection	S-4	1.5
Dimensions		
Capacitance	II	0.04
Tangent of the loss angle		
Dielectric strength		
Insulation resistance		
Solderability	S-3	2.5

Marking

For example



For 275Vac or 305Vac



For 310Vac

			UL & CUL
MKP61			CQC
X2			ENEC
126K 206K			ENEC
305～ 350～			KTL
		40/110/56/B	

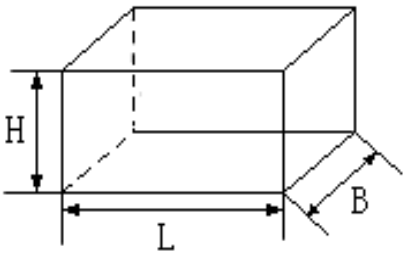
Packaging

Packaging bags

A certain quantity of capacitors and the qualified bill shall be packed with a plastic bag . Then put several plastic bags into one small packing box, sealed with adhesive paper. One big packing box contains 6 small packing box. Packing with small or big box depends on the customer's purchase quantity.

The dimensions of packing boxes refer to the drawing .

For the packing box with capacitors, all kinds of shipments are permitted, but the sprinkle of rain or snow and mechanical damage must be avoided.



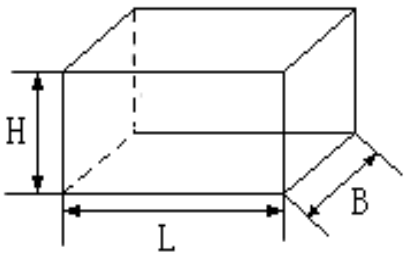
L±5mm	220	470
B±5mm	200	340
H±5mm	105	235

Board packaging

The capacitor will insert the lead into the plastic foam, and put it into the packing box. Every 6 boxes are packed in the outer box.

Packing diagram, inner packing box and outer packing box dimensions are shown in the figure below

For the packing box with capacitors, all kinds of shipments are permitted, but the sprinkle of rain or snow and mechanical damage must be avoided.



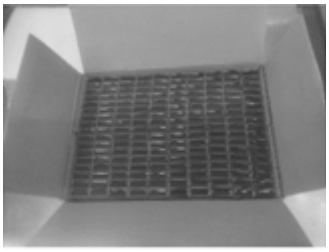
L±5mm	220	470
B±5mm	200	340
H±5mm	105	235

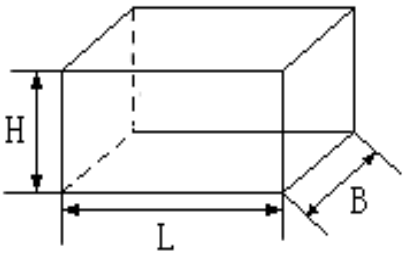
Row box packaging

The capacitor will be arranged by a plater, and put it into the packing box. Every4 boxes are packed in the outer box.

Packing diagram, inner packing box and outer packing box dimensions are shown in the figure below

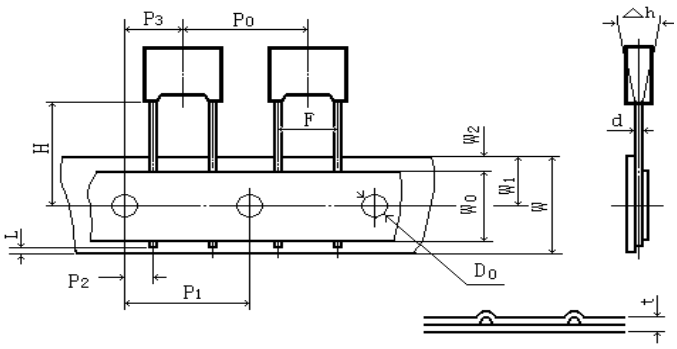
For the packing box with capacitors, all kinds of shipments are permitted, but the sprinkle of rain or snow and mechanical damage must be avoided.



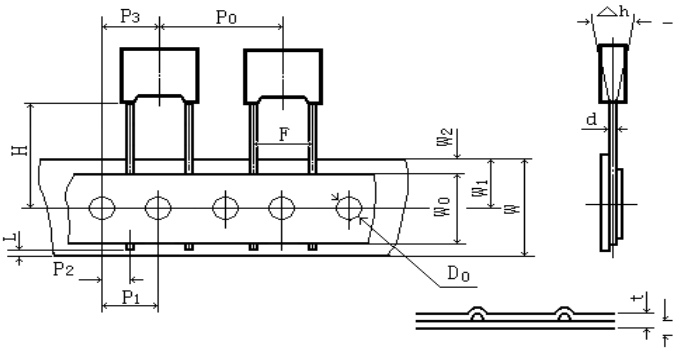


L±5mm	330	470
B±5mm	230	340
H±5mm	100	235

Specification of radial taping capacitors



Picture T-1



Picture T-2

Dimensions of taping (mm)

sign			P_0	P_1	P_2	P_3	F	△h	W	W_0	W_1	W_2	H	D_0	t	L
deviation		fig.	±1.0	±0.2	±0.5	±1.3	+0.4 -0.2	±2.0	±0.5	/	±0.5	/	±0.5	±0.2	±0.2	/
Dimensions	P=5.0	T-1	12.7	12.7	3.85	6.35	5.0	0	18.0	11.0min	9.0	0.5-3.0	18.5	4.0	0.7	0min
	P=7.5	T-1	12.7	12.7	2.6	6.35	7.5	0	18.0	11.0min	9.0	0.5-3.0	18.5	4.0	0.7	0min
	P=10.0	T-2	25.4	12.7	7.7	12.7	10.0	0	18.0	11.0min	9.0	0.5-3.0	18.5	4.0	0.7	0min
	P=15.0	T-2	25.4	12.7	5.2	12.7	15.0	0	18.0	11.0min	9.0	0.5-3.0	18.5	4.0	0.7	0min

Note：

P is lead space before kink

P1=15.0mm is also available

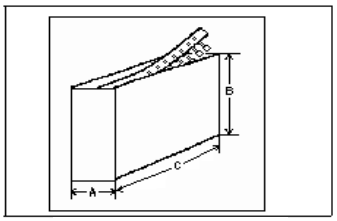
F can be other lead space

If you need other taping, please contact us

Dimensions of taping packing

Ammo-pack

Code	Size(mm)
A	53±5
B	267±5
C	325±5



picture 6

Cautions of using：

Permissible conditions:

- Do not exceed upper category temperature.
- Avoid overload of capacitors.
- Pulse current should be within the figures calculated by dv/dt.

Handling cautions

- Do not apply excessive force to the lead wire root area.
- Be careful to lead cusp.

Recommend storage conditions

- Temperature：≤ 30℃.
- Humidity ≤70%RH, no dew allowed on the capacitor.

Other cautions

- The capacitor is a miniaturized design. Please meet the requirements of the specification for use and storage, so as to avoid early failure of capacitance loss.