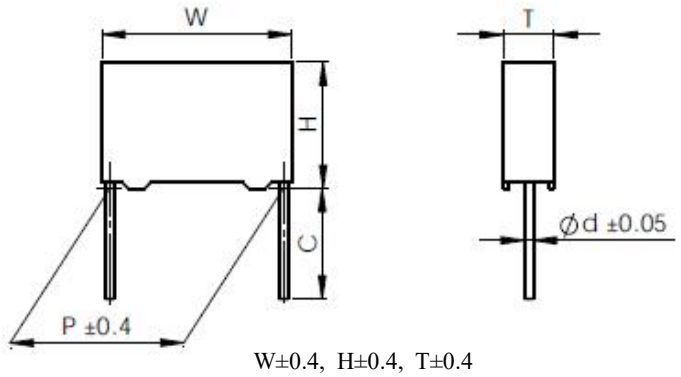
RoHS Compliant

Product Name	Metallized polypropylene film capacitor (Box-type)
Product Type	MKP21
Product Code	C323A104K61C450

Metallized polypropylene film capacitor (Box-type)

■ Outline Drawing



W±0.4, H±0.4, T±0.4

■ Features

- Metallized polypropylene structure
- Low loss at high frequency
- Small inherent temperature rise
- Plastic case（UL94 V-0），Epoxy resin sealing

■ Typical application

- Widely used in high frequency, DC,AC and pulse circuits
- S-correction circuits for TV sets and monitors

■ Specifications

Reference Standard	GB/T 10190 (IEC 60384-16)						
Climatic Category	55/105/56						
Rated temperature	85℃						
Operating temperature	-55℃~105℃ (+85℃ to +105℃: decreasing factor 1.25% per ℃ for U_R)						
Rated Voltage	160Vdc(90Vac); 250Vdc(160Vac); 400Vdc(220Vac); 630Vdc(250Vac); 1 000Vdc(400Vac); 1 600Vdc(600Vac); 2 000Vdc(700Vac)						
Capacitance Range	0.00056~15.0μF						
Capacitance Tolerance	±2% (G), ±3% (H), ±5%(J), ±10% (K), ±20% (M)						
Voltage Proof	1.6U_R (5s)						
Dissipation Factor	≤10×10^{-4}(20℃, 1kHz)						
Insulation Resistance	R≥100 000MΩ, C_N≤0.33μF RC_N≥30 000s, C_N>0.33μF (20℃, 100V, 1min)						
Maximum Pulse Rise Time(dV/dt) 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 right value with U_R/U.	U_R(V)	dV/dt(V/us)					
		P=5.0	P=7.5	P=10.0	P=15.0	P=22.5	P=27.5
	160	110	310	190	110	65	55
	250	270	660	560	310	130	110
	400	440	900	780	600	300	130
	630	550	1500	1200	900	400	200
	1 000	--	--	2200	2 000	800	--
	1 600	--	--	--	4 500	1 800	--
	2 000	--	--	--	9 500	4 500	--

■ Part number system

The 15 digits part number is formed as follow:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
C	3	2												

Digit 1 to 3 Series code

C32=MKP21

Digit 4 to 5 D.C. rated voltage

2C=160V 2E=250V 2G=400V

2J=630V 3A=1000V 3C=1600V

3D=2000V

Digit 6 to 8 Rated capacitance value

For example : 103=10×10^3 pF= 0.01μF

Digit 9 Capacitance tolerance

G=±2%, H=±3%, J=±5%

K=±10%, M=±20%

Digit 10 Pitch

2=5.0mm 3=7.5mm 4=10mm

6=15mm 9=22.5mm B=27.5mm

Digit 11 Internal use

Digit 12 to 15 Lead form and packaging code

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	2 3 4 6	F=5.0mm F=7.5mm F=10.0mm F=15.0mm	0	straight	1 5	each cap. among two consecutive holes P3=12.7mm,H=18.5mm (For pitch=5.0/7.5mm) 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)				
		32	lead length 3.2mm				
		35	lead length 3.5mm				
		45	lead length 4.5mm				
Note: Recommend short lead due to long lead could deform easily.							

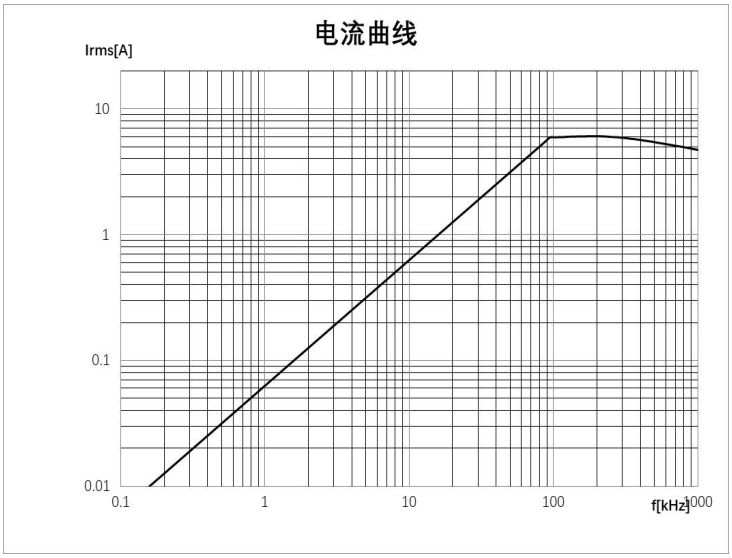
■ Dimensions (mm)

1000Vdc						
C_N (μF)	W	H	T	P	d	Part number
0.1	17.5	19.0	11.0	15.0	0.8	C323A104K61C450

Note: 1. "-"=capacitance tolerance code, M=±20%,K=±10%,J=±5%, H=±3%,G=±2%

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

■ MAX. CURRENT(Ir.m.s) VERSUS FREQUENCY



Note: sinusoidal wave-form, environment temperature≤85℃,internal temperature rise △T=10℃, p (pitch) in mm.

■ Test Method And Performance

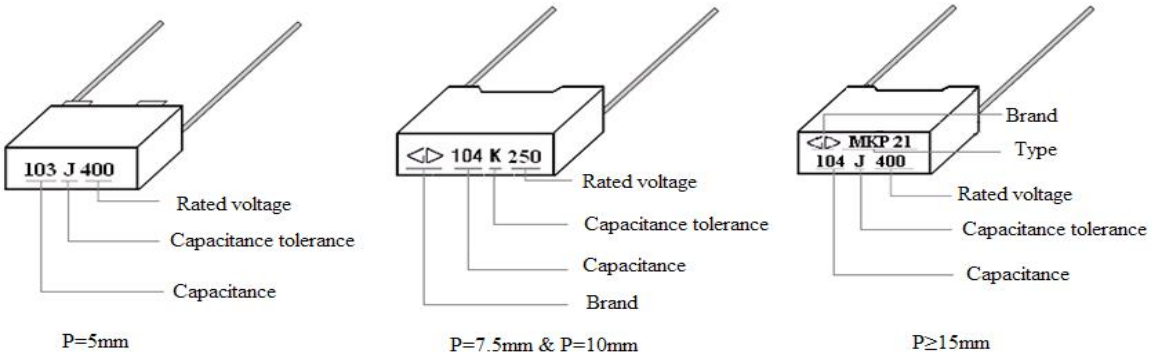
No.	Item	Performance	Test method(IEC 60384-16)
1	Solderability	Good quality of tinning	Solder temperature:245˚C±5˚C Immersion time: 2.0s±0.5s
2	Initial measurement	Capacitance Tgδ:1kHz，C>1.0μF 10kHz，C≤1.0μF	
	Terminal Strength (straight lead)	There shall be no visible damage	Tension: 0.6≤ϕd≤0.8mm，10N ϕd=1.0mm，20N Bend: 0.6≤ϕd≤0.8mm，5N ϕd=1.0mm，10N The terminals shall be bent 2 times in each direction.
	Resistance to solder heat	There shall be no visible damage	Solder temperature:260˚C±5˚C Immersion time: 10s±1s

	Final measurement		Δ C/C ≤ ± 3 % (relative to the initial value) Increase of tgδ: ≤0.004 (10kHz,C≤1.0μF) ≤0.004 (1kHz,C>1.0μF)	
3	Initial measurement		Capacitance Tgδ:1kHz，C>1.0μF 10kHz，C≤1.0μF	
	Rapid change of tempe rature		There shall be no evidence of deterioration.	θ_A=-55˚C, θ_B =+105˚C 5 cycles, Duration: t=30min
3	Vibration(straight lead)		There shall be no evidence of deterioration.	Amplitude 0.75mm or acceleration 98m/s^2 (whichever is the smaller severity), f: 10Hz to 500Hz.Three directions, 2h for each direction, total 6h.
	Bump(straight lead)		There shall be no evidence of deterioration.	4 000 times, Acceleration: 390m/s^2,Pulse duration, 6ms
	Final measurement		Δ C/C ≤ ± 3 % (relative to the initial value) Increase of tgδ: ≤0.004 (10kHz, C≤1.0μF) ≤0.004 (1kHz, C>1.0μF) IR: ≥ 50% of the rated value	
4	climate sequence	Initial measurement	Capacitance Tgδ:1kHz，C>1.0μF 10kHz，C≤1.0μF	
		Dry heat		+105℃，16h
		Damp heat, Cyclic		Test Db, Severity: b, the first cycle
		Cold		-55℃，2h
		Low air pressure	There shall be no permanent breakd own, flashover or other harmful def ormation when applying U_R at the l ast 1 minute.	15℃～35℃，8.5kPa，1h,

No.	Item		Performance	Test method(IEC 60384-16)
4	climate sequence (continue)	Damp heat, cyclic other		Test Db, Severity b, the other cycles, Applying U_R for 1 minute after the test finished.
		Final mea surement	There shall be no evidence of deterioration and the marking shall be legible. Δ C/C ≤ ± 5 % (relative to the initial value) Increase of tgδ: ≤0.005 (10kHz, C≤1.0μF) ≤0.005 (1kHz, C>1.0μF) IR: ≥ 50% of the rated value	

5	Damp heat steady state	There shall be no evidence of deterioration and the marking shall be legible. $\Delta C/C \leq \pm 5\%$ (relative to the initial value) Increase of tgδ ≤0.002(1kHz) IR: ≥50% of the rated value	Temperature:40˚C ±2˚C Humidity: 93^{+2}_{-3} %RH Duration: 56days
6	Endurance	$\Delta C/C \leq \pm 5\%$ (relative to the initial value) Increase of tgδ: ≤0.004 (10kHz, C≤1.0μF) ≤0.004 (1kHz, C>1.0μF) IR: ≥ 50% of the rated value	Temperature: +85℃ Voltage: $1.25\times U_R$ Duration: 1 000h
7	Temperature characteristic	Measuring capacitance at test point b, d, f: Characteristic at lower category temperature -40˚C: $0\leq(C_b-C_d)/C_d\leq+3\%$ Characteristic at upper category temperature +85˚C: $-3.25\%\leq(C_f-C_d)/C_d\leq0$	Static method: The capacitors should be kept at the following temperature in turn: a.(+20±2) ˚C， b.(–40±2) ˚C，d.(20±2) ˚C，f.(+85±2) ˚C，g.(+20±2) ˚C
8	Charging and discharging	$\Delta C/C \leq \pm 5\%$ (relative to the initial value) Increase of tgδ: ≤0.005 (10kHz, C≤1.0μF) ≤0.005 (1kHz, C>1.0μF) IR: ≥ 50% of the rated value	Times: 10 000 Duration of charging: 0.5s Duration of discharging: 0.5s Charging voltage: rated voltage U_R Charging resistance: $220/C_N(\Omega)$ Discharging resistance: $U_R\div C_N\div dv/dt(\Omega)$ C_N: rated capacitance (μF) dv/dt value: see P2

■ Marking（example）



P=5mm　　P=7.5mm & P=10mm　　P≥15mm

■ Taping specification for box-type capacitors

▲ Outline Drawing

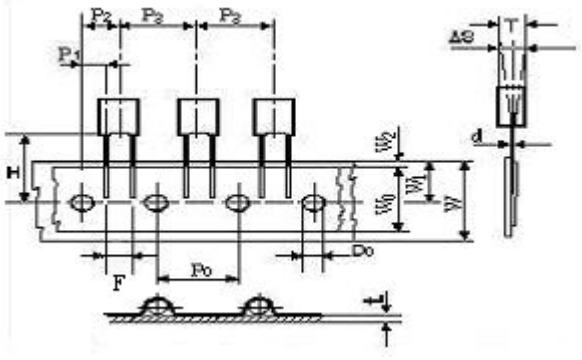


Fig.1 P=5.0/7.5mm

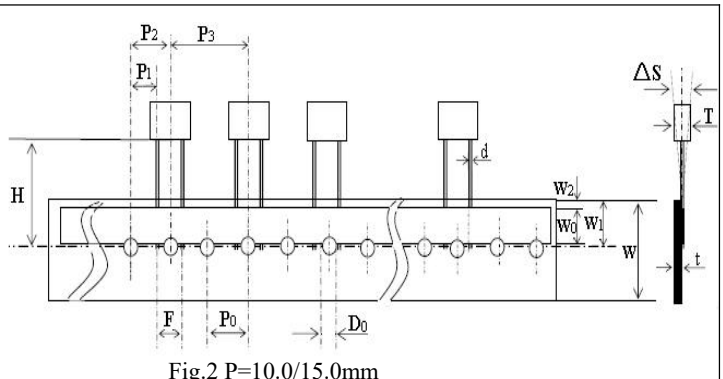


Fig.2 P=10.0/15.0mm

▲ **Taping Dimensions(mm)**

Technology index title	Code	Dimensions				
		P=5.0	P=7.5	P=10.0	P=15.0	Tolerance
Taping type	—	Fig 1	Fig 1	Fig2	Fig 2	——
Part number Digit12-15	Ammo-pack	A201	A301	A405	A605	
Taping pitch	P_3	12.7	12.7	25.4	25.4	±1.0
Feed hole pitch	P_0	12.7	12.7	12.7	12.7	±0.3
Center of wire	P_1	3.85	2.6	7.7	5.2	±0.7
Center of body	P_2	6.35	6.35	12.7	12.7	±1.3
Pitch of taping wire	F**	5.0	7.5	10.0	15.0	+0.6 -0.1
Component alignment	△S	0	0	0	0	±2.0
Height of component from tape center	H***	18.5	18.5	18.5	18.5	±0.5
Carrier tape width	W	18.0	18.0	18.0	18.0	+1.0 -0.5
Hold down tape width	W_0	6min	10min	10min	10min	——
Hole position	W_1	9.0	9.0	9.0	9.0	±0.5
Hold down tape sition	W_2	3max	3max	3max	3max	——
Feed hole dia.	D_0	4.0	4.0	4.0	4.0	±0.2
Tape thickness	t	0.7	0.7	0.7	0.7	±0.2

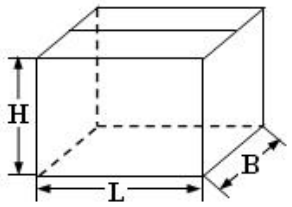
Note: * P_0=15mm is also available;

**F can be other lead spacing;

***H=16.5mm is available;

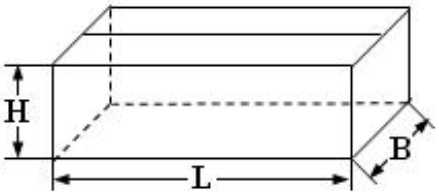
■ Packing box sizes(mm)(example)

1. Out packing box for bulk



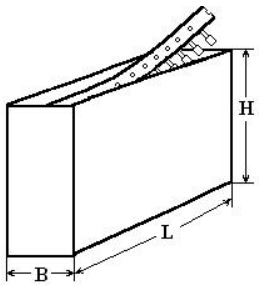
L:375±5
B:375±5
H:265±5

2. Inner packing box for bulk



L:355±3
B:175±3
H:118±3

3. Box sizes for Ammo-pack



L:350±3
B:50±3
H:260±3