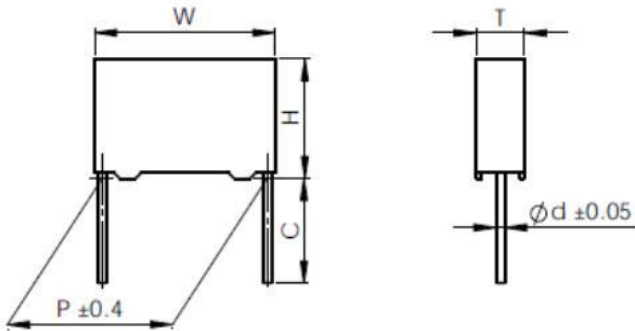


Version history

Current version	Date	Author	Change description

Metallized polypropylene film capacitor (Box-type)

■ Outline Drawing



$W \pm 0.4, H \pm 0.4, T \pm 0.4$

■ 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°C						
Operating temperature	-55°C~105°C (+85°C to +105°C: decreasing factor 1.25% per °C for U_R)						
Rated Voltage	630Vdc(350Vac)						
Capacitance Range	0.33 μ F						
Capacitance Tolerance	$\pm 5\%$ (J), $\pm 10\%$ (K)						
Voltage Proof	1.6 U_R (5s)						
Dissipation Factor	$\leq 10 \times 10^{-4}$ (20°C, 1kHz)						
Insulation Resistance	$\geq 100\ 000\ M\Omega, C_N \leq 0.33\ \mu F$			$\geq 30\ 000\ s, C_N > 0.33\ \mu F$			
		(20°C, 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	600	--
	1 600	--	--	--	4 500	1 800	--
2 000	--	--	--	9 500	4 500	--	

■ 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
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 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

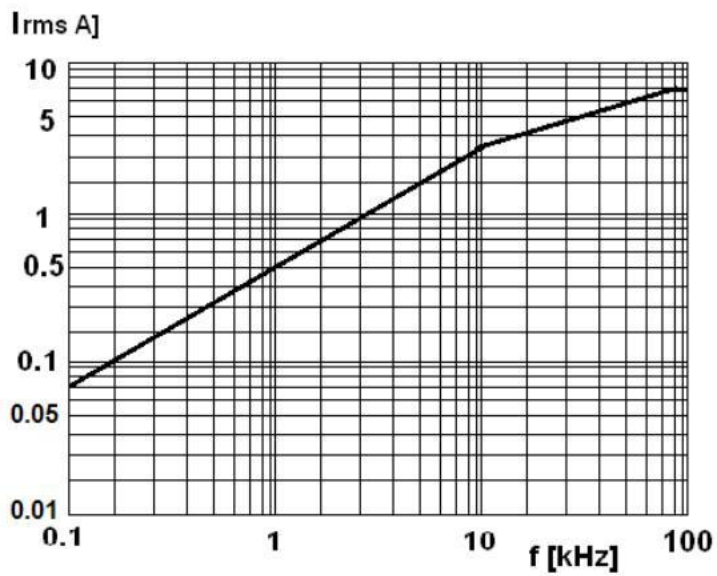
Digit 16 to 18 Internal use

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	2	F=5.0mm	0	straight	1	each cap. among two consecutive holes P3=12.7mm,H=18.5mm (For pitch=5.0/7.5mm)
		3	F=7.5mm			5	P3=25.4mm;H=18.5mm (For pitch=10/15mm)
		4	F=10.0mm				
		6	F=15.0mm				
C	straight lead "C" in the figure above	code	explanation			0	Length tolerance ±0.5mm Or standard length
		00	standard lead length (18mm~26mm)			2	Length tolerance ±0.3mm
		45	lead length 4.5mm				
		35	lead length 3.5mm				
		32	lead length 3.2mm				

■ Dimensions (mm)

630Vdc(350Vac)						
C_N (μF)	W ± 0.4	H ± 0.4	T ± 0.4	P ± 0.4	d	Part number
0.33	26.5	22.0	12.0	22.5	0.8	C322J334J92C350

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


Note: sinusoidal wave-form, environment temperature $\leq 85^\circ\text{C}$, internal temperature rise $\Delta T = 10^\circ\text{C}$, p (pitch) in mm.

■ Test Method And Performance

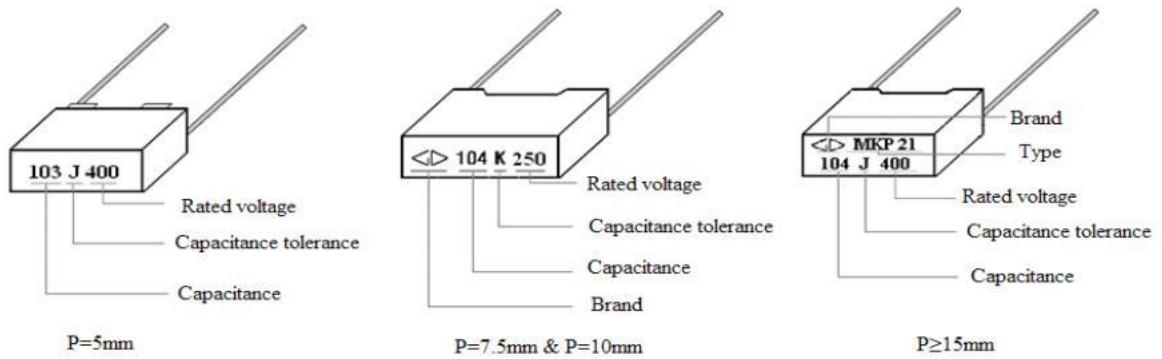
No.	Item	Performance	Test method(IEC 60384-16)
1	Solderability	Good quality of tinning	Solder temperature:245°C±5°C Immersion time: 2.0s±0.5s
2	Initial measurement	Capacitance Tgδ:1kHz, C>1.0μF 10kHz, C≤1.0μF	
	Terminal strength	There shall be no visible damage	Tension: 0.6≤φd≤0.8mm, 10N φd=1.0mm, 20N 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	ΔC/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 temperature	There shall be no evidence of deterioration.	θA=-55°C, θB=+105°C 5 cycles, Duration: t=30min
3	Vibration	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	There shall be no evidence of deterioration.	4 000 times, Acceleration: 390m/s ² ,Pulse duration, 6ms
	Final measurement	ΔC/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°C, 16h
		Damp heat,	Test Db, Severity: b, the first cycle
		Cyclic Cold	-55°C, 2h
		Low air pressure	There shall be no permanent breakdown, flashover or other harmful deformation when applying UR at the last 1 minute. 15°C~35°C, 8.5kPa, 1h,

No.	Item		Performance	Test method(IEC 60384-16)
4	climate sequence (continue)	Damp heat, cyclic other	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 $\text{tg}\delta$: ≤ 0.005 (10kHz, $C \leq 1.0\mu\text{F}$) ≤ 0.005 (1kHz, $C > 1.0\mu\text{F}$) IR: $\geq 50\%$ of the rated value	Test Db, Severity b, the other cycles, Applying U_R for 1 minute after the test finished.
		Final measurement		
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 $\text{tg}\delta \leq 0.002$ (1kHz) IR: $\geq 50\%$ of the rated value	Temperature: $40^\circ\text{C} \pm 2^\circ\text{C}$ Humidity: $93 \pm 23\% \text{RH}$ Duration: 56 days
6	Endurance		$\Delta C/C \leq \pm 5\%$ (relative to the initial value) Increase of $\text{tg}\delta$: ≤ 0.004 (10kHz, $C \leq 1.0\mu\text{F}$) ≤ 0.004 (1kHz, $C > 1.0\mu\text{F}$) IR: $\geq 50\%$ of the rated value	Temperature: $+85^\circ\text{C}$ Voltage: $1.25 \times U_R$ (50Hz) 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 $+85^\circ\text{C}$: $-3.25\% \leq (C_f - C_d) / C_d \leq 0$	Static method: The capacitors should be kept at the following temperature in turn: a. $(+20 \pm 2)^\circ\text{C}$, b. $(-40 \pm 2)^\circ\text{C}$, d. $(20 \pm 2)^\circ\text{C}$, f. $(+85 \pm 2)^\circ\text{C}$, g. $(+20 \pm 2)^\circ\text{C}$
8	Charging and discharging		$\Delta C/C \leq \pm 5\%$ (relative to the initial value) Increase of $\text{tg}\delta$: ≤ 0.005 (10kHz, $C \leq 1.0\mu\text{F}$) ≤ 0.005 (1kHz, $C > 1.0\mu\text{F}$) IR: $\geq 50\%$ 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: $220/C$ (Ω) Discharging resistance: $U_R \div C_N \div dv/dt$ (Ω) C_N : rated capacitance (μF) dv/dt value: see P2

■ Quality ensuring test (before shipment):

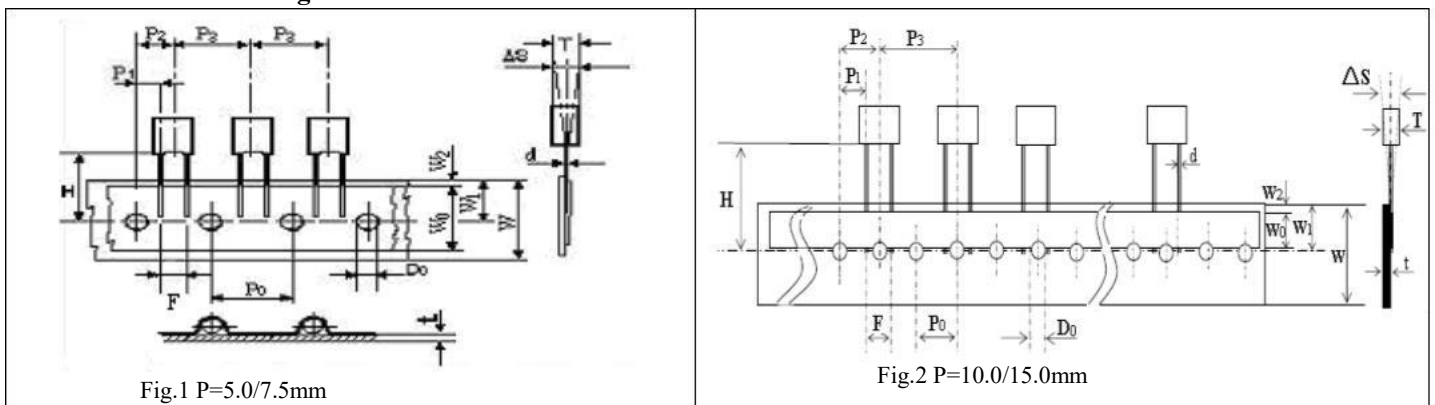
Inspection item (each batch)	Inspection level (GB 2828)	
	IL	AQL
Appearance inspection	II	1.5%
Dimensions		
Capacitance	II	0.65%
Tangent of the loss angle		
Dielectric strength		
Insulation resistance		
Solderability	S-3	2.5%

■ Marking



■ Taping specification for box-type capacitors

▲ Outline Drawing



▲ 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	ΔS	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 position	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

▲ Packing Quantity

Pitch (mm)	Box thickness T(mm)	Ammo-pack (pcs/box)	
		Domestic	Export
5.0	2.5	2500	2 000
	3.5	1 700	1 500
	4.5	1 400	1 300
	5.0	1 200	1 000
7.5	6.0	1 000	800
	3.5	1 700	1 500
	4.0	1 500	1 350
	5.0	1 200	1 050
10.0/ 15.0	6.0	1 000	850
	4.0	750	650
	5.0	600	500
15.0	6.0	500	450
	7.5	400	350
	8.5	350	300
	10.0	300	250
	11.0	250	220

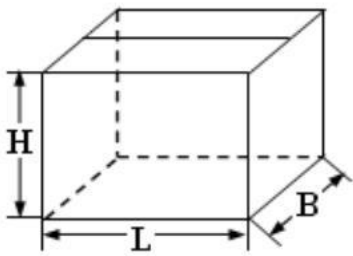
Note: * P₀=15mm is also available;

**F can be other lead spacing;

***H=16.5mm is available;

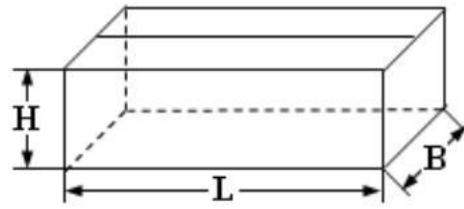
■ Packing box sizes(mm)

1. Out packing box for bulk



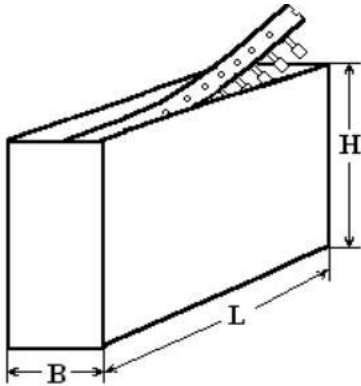
L:375±5
B:375±5
H:265±5

2. Inner packing box for bulk



L:355±3
B:175±3
H:118±3

3. Box sizes for Ammo-pack



L:330±3
B:48±3
H:260±3

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