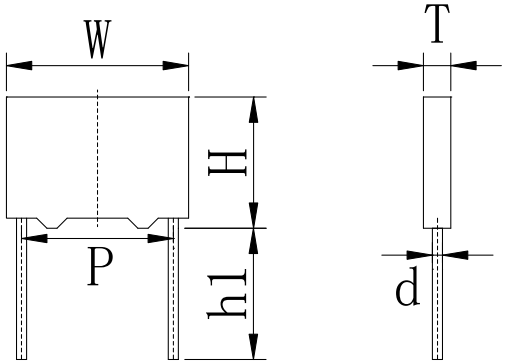
Metallized Polyester Film Capacitor (Box-type)

Series/Type:	**CL24**
Part No.:	**See table “Product Dimension”**
Specification No.:	**ZXDZ-202302197**

CL24 type metallized Polyester Film Capacitor(Box-type)

Outline Drawing



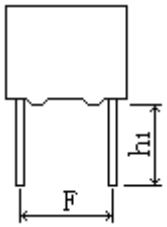
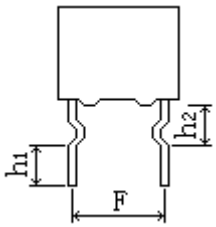
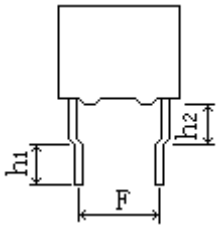
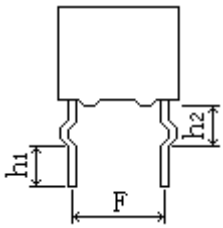
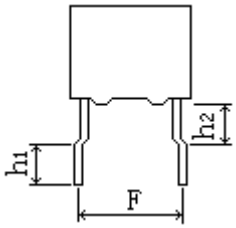
Application and Feature：

Metallized polyester film, non-inductive wound construction, plastic case, small size and excellent self-healing property, is suitable for DC, coupling, pulse, logic, oscillator circuits and interference suppression in low voltage application.

Specification：

Reference standard	IEC 60384-2、GB 7332		
Climatic category	55/125/56		① The frequency of the alternating current in the rated voltage is 50Hz(working frequency),the working voltage of the capacitor decreases as the frequency increases。 ② The working voltage of the capacitor decreases as the temperature rises. between 85~125℃,take 85℃ as the base, the temperature rises 1℃,the rated working voltage of the capacitor decreases 1.25%. ③ The working voltage of the capacitance decreases as the capacitance increases。 ④ Above mentioned instructions shall be fully considered when using the capacitor。
Rated temperature	85℃		
Operation Temperature Range	-55℃~125℃		
Rated voltage	63Vdc、100 Vdc、250Vdc、400Vdc、450Vdc、630Vdc		
Capacitance range	0.0047μF～45.0μF		
Capacitance tolerance	±5%(J)、±10%(K)、±20%(M) (20℃, 1kHz)		
Voltage proof between terminations	$U=1.6U_R$，5s(20℃)		
Insulation resistance	U_R≤100Vdc	C_R≤0.33μF，IR≥15 000MΩ C_R>0.33μF，IR×C≥5 000s (20℃, 10Vdc, 1min)	
	U_R>100Vdc	C_R≤0.33μF，IR≥30 000MΩ C_R>0.33μF，IR×C≥10 000s (20℃, 100Vdc, 1min)	
Dissipation factor	1kHz：tgδ≤0.0080		
Special requirement			

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)	

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

2、2.5mm≤ | P-F | ≤3mm /Choosing the specific crimping method according to the requirement of customer.

3、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
C	L	2	4													

Digit 1 to 4	Type code of film capacitor CL24=CL24
Digit 5 to 7	Rated capacitance value code For example: 103=10×10 ^{3}pF=0.01 μ F
Digit 8	Capacitance tolerance code J=±5% K=±10% M=±20%
Digit 9 to 10	DC rated voltage code 1J=63V 2A=100V 2E=250V 2G=400V 2S=450V 2J=630V
Digit 11	Pitch code 2=5 3=7.5 4=10.0 6=15.0 9=22.5 B=27.5
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	CK CY 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						
Q	insert foam	35	lead length 3.5mm				

Product Dimension:

Customer Part Number	Product code	Spec.	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	
	CL24223K2G30B000	CL24-400V-22nF-±10%	10.5	8.5	3.5	7.5			0.6	S-1
	CL24336K2AB1P350	CL24-100V-33.0μF-±10%	32.0	30.0	16.0	27.5	27.5	3.5	0.8	S-1

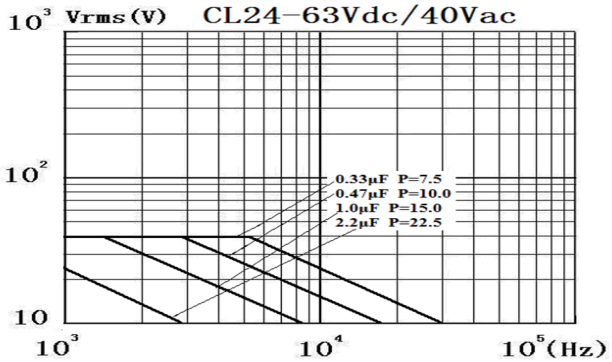
Max dV/dt (V/μs)

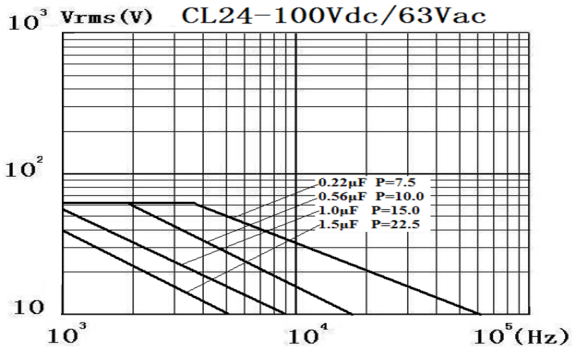
（V）	dV/dt(V/μs)				
	P=5.0mm	P=7.5mm	P=10.0mm	P=15.0mm	P=22.5mm
63	10	6	4	2	1
100	18	11	7	5	3
250	30	20	12	8	5
400	50	38	20	15	9
450	55	40	23	18	13
630	70	50	32	24	15

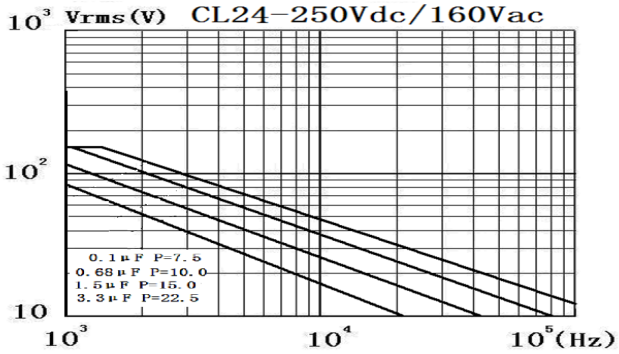
/Rated voltage pulse slope (dV/dt) R at rated voltage.

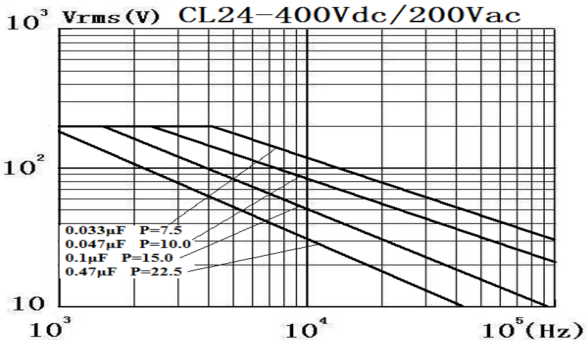
/If the working voltage(U) is lower than the rated voltage(UR),the capacitor can be worked at a higher dV/dt. In this case, the maximum allowed dV/dt is obtain by multiplying the up value with UR/U.

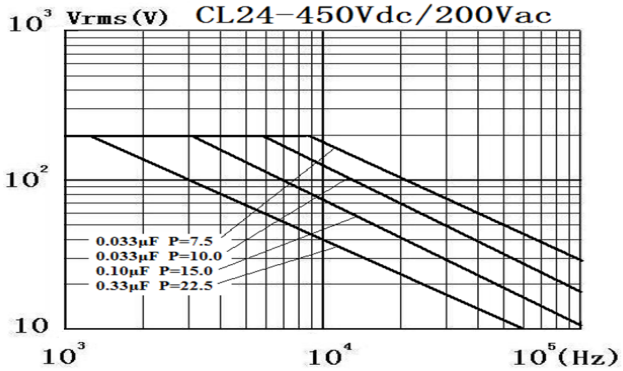
Max.Voltage(Vr.m.s) versus Frequency

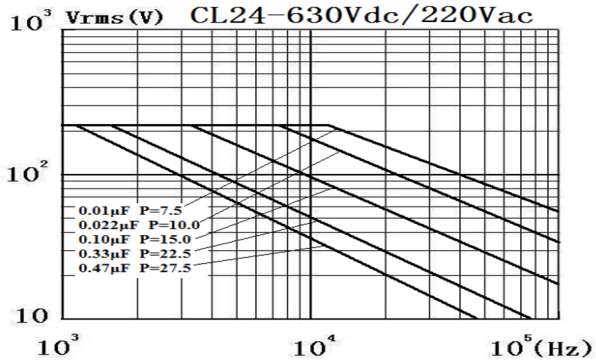












Environment temperature≤85℃,internal temperature rise △T=15℃ P (pitch) in mm

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：≤2% (relative to the initial value) Increase of tgδ：C_R≤1μF ≤0.003 (10kHz) C_R>1μF ≤0.002 (1kHz)	Solder temperature:260˚C±5˚C Immersion time: 10s±0.5s
4	Initial easurement	Capacitance tgδ：C_R≤1μF：Test frequency ，10kHz C_R>1μF： Test frequency ， 1kHz	
	Rapid change of temperature	There shall be no evidence of deterioration.	θ_A=-55˚C, θ_B =+105˚C 5 cycles Duration: t=30min
	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 perpendicular directions, 2h foreach direction,total 6h.
	Bump	There shall be no evidence of deterioration.	4000 times,Acceleration:390m/s2, Pulse duration,6ms
	Final measurement	There shall be no visible damage ΔC/C：≤5% (relative to the initial value) Increase of tgδ：C_R≤1μF ≤0.003 (10kHz) C_R>1μF ≤0.002 (1kHz) IR: ≥50% of the rated value	

No.	Item	Performance		Test method(GB2693-2001)
5	climate sequence	Initial measurement		
		Dry heat		+125℃, 16h
		Damp heat,Cyclic		Test Db, he first cycle
		Cold		-55℃, 2h
		Low air pressure	There shall be no permanent breakdown,flashover or other harmful deformation.	8.5kPa（85mbar）, 1h
		Damp heat, cyclic other		Test Db, the other cycles
		Final measurement	There shall be no visible damage, legible marking$\Delta C/C \leq 5\%$ (relative to the initial value) Increase of tgδ: $C_R \leq 1\mu F$ ≤ 0.005 (10kHz) $C_R > 1\mu F$ ≤ 0.003 (1kHz) IR: ≥50%of the rated value	
6	Damp heat steady state	There shall be no visible damage, legible marking$\Delta C/C \leq 5\%$ (relative to the initial value) Increase of tgδ: $C_R \leq 1\mu F$ ≤ 0.005 (10kHz) $C_R > 1\mu F$ ≤ 0.005 (1kHz) IR: ≥50% of the rated value		Temperature:40˚C±2˚C Humidity: $93\pm^{2}_{3}$ %RH Duration: 56days

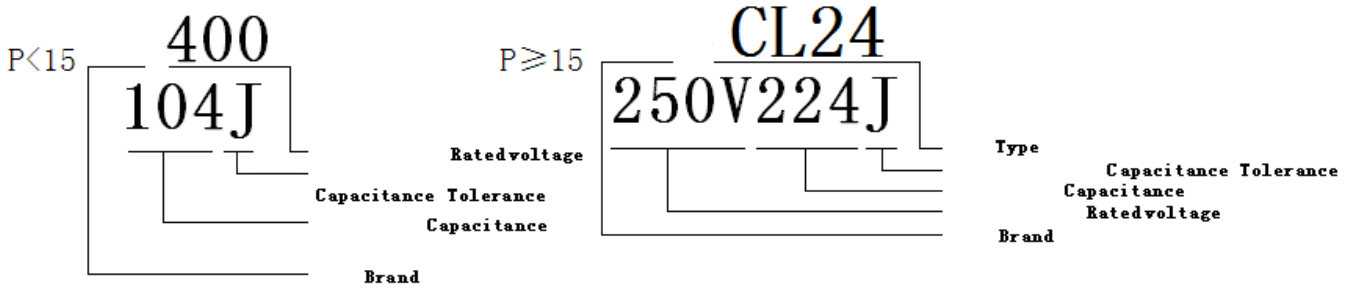
No.	Item	Performance	Test method(GB2693-2001)
7	Endurance	There shall be no visible damage, legible marking$\Delta C/C \leq 5\%$(relative to the initial value) Increase of tgδ: $C_R \leq 1\mu F$ ≤ 0.003 (10kHz) $C_R > 1\mu F$ ≤ 0.002 (1kHz) I.R: ≥50% of the rated value	T=85℃, 1000h, Applied Voltage: $1.25 \times U_R$
8	Charging and discharging	$\Delta C/C \leq 3\%$(relative to the initial value) Increase of tgδ: $C_R \leq 1\mu F \leq 0.003$ (10kHz) $C_R > 1\mu F \leq 0.002$ (1kHz) I.R.: ≥50% of the rated value	Times: 10000 Duration of charging: 0.5s Duration of discharging: 0.5s Charging voltage: U_R

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



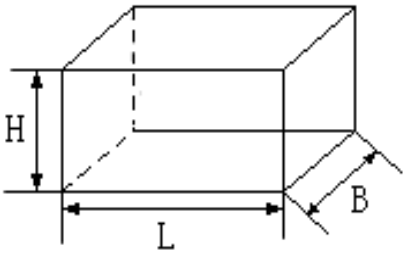
Packaging

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.



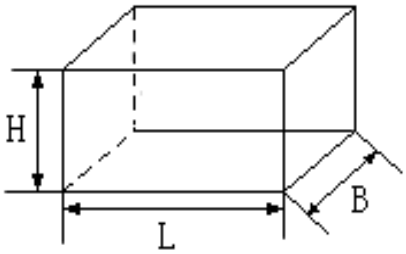
L±5mm	220	470
B±5mm	200	340
H±5mm	105	235

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.



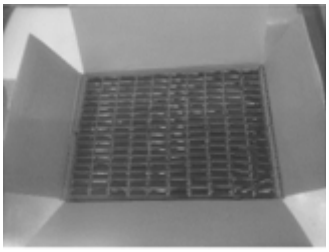
L±5mm	220	470
B±5mm	200	340
H±5mm	105	235

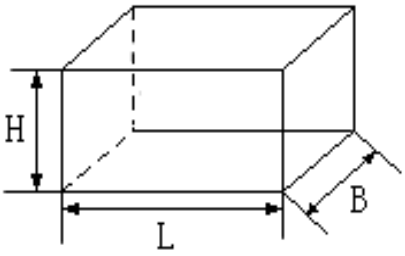
Row box packaging

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

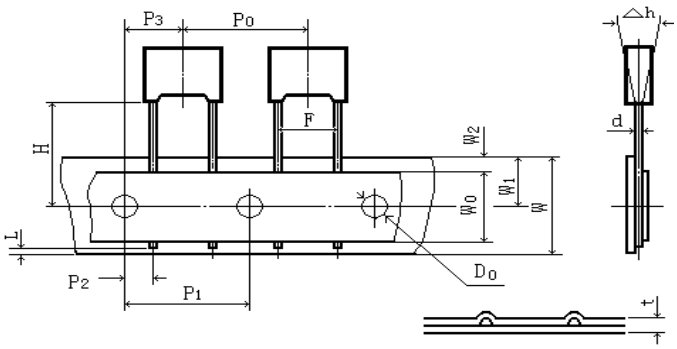
For the packing box with capacitors, all kinds of shipments are permitted, but the sprinkle of rain or snow and mechanical damage must be avoided.



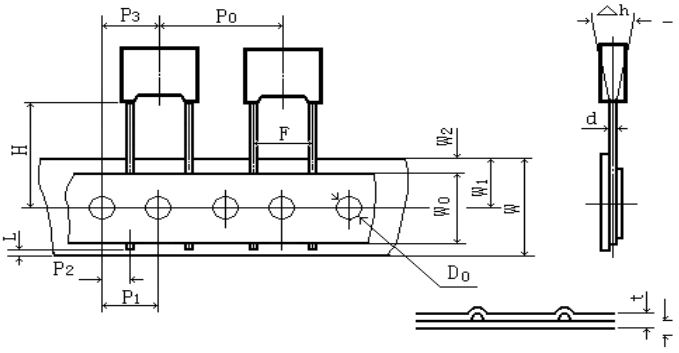


L±5mm	330	470
B±5mm	230	340
H±5mm	100	235

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

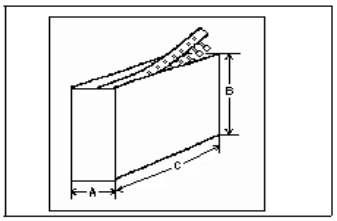
F can be other lead space

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 forceto the lead wire root area.
- Be careful to lead cusp.

Recommend storage conditions：

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