SPECIFICATIONS FOR APPROVAL

ITEM **CL21 Metallized Polyester Film Capacitor**

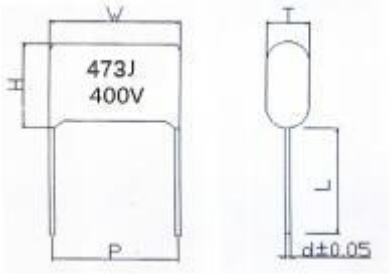
Akyga battery

Metallized polyester film DC fixed capacitors

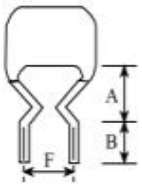
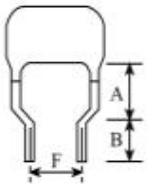
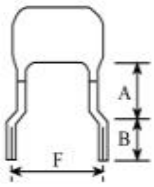
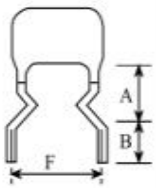
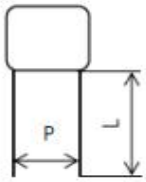
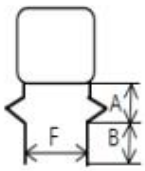
ME473J400DP7.5-004

(mm)

	CAP (uF)	R. V (VDC)	DF (1KHZ) ≦%	TOL ±%	W (max)	H (max)	T (max)	P (±0.8)	L (±0.7)	φd± 0.05	
ME473J400DP7.5-004	0.047	400V	0.8	5	9.5	9.0	5.0	7.5	22	0.6	V



473J
400V

(Code)	I	II	III	IV	V	X
(Forming shapes)						
(Applicable range)	P≥F		P≤F		P	P=F
	0mm≤P-F ≤3mm	3mm≤P-F ≤8mm	3mm≤F-P ≤5mm	0mm≤F-P ≤3mm		
(Dimcnsionstandard)	A≤5.0mm; B allow deviation±0.5mm; F allow deviation±1.0mm;					

1、Range

This regulation applies to CL21 metallized polyester film capacitors.

2、Features

2.1) Non-inductive winding structure for metallized polyester film.

2.2) Flame retardant epoxy powder encapsulation, good insulation performance.

2.3) Small size and light weight.

2.4) With self-healing function, wide capacity range and high reliability.

3、General technical data

3.1) Reference Standard: GB/T 7332 (IEC60384-2)

3.2) Climate Type: 55/110/56

3.3)Rated Voltage: 50/63/100V、250V、400V、630V（When the temperature exceeds 85°C but is lower than 110°C, the rated voltage decreases by 1.25%UR/°C)

3.4) Capacity range: 0.001μF---10μF

3.5) Capacitance Tolerance: J(±5%)、K（±10%）、M（±20%）

3.6) Proof Voltage: $1.6U_R$ (5S)

3.7) Insulation Resistance: U>100V C≦0.33uF ≥15000MΩ(20℃、100V、1min)

C>0.33uF ≥7500S(20℃、100V、1min)

U≦100V C≦0.33uF ≥3000MΩ(20℃、10V、1min)

C>0.33uF ≧1000S(20℃、10V、1min)

3.8) Loss Tangent: DF ≤0.8 %(20℃、$1KH_Z$)； ≤1.5%(20℃、$10KH_Z$)

4、Materials

4.1) Medium: polyethylene terephthalate film (polyester film)

4.2) Electrode: Aluminized

4.3) Lead wire: Tinned copper clad steel wire

4.4) Encapsulation: Powder epoxy encapsulation

5、Mark

5.1) The voltage and nominal capacitance and capacitance tolerance to be print on the capacitor.

5.2) Capacitance Representation Method:

PF	100	1000	10000	100000	1000000
NF	0.1	1.0	10.0	100.0	1000.0
μF	0.0001	0.001	0.01	0.1	1.0
代码	101	102	103	104	105

6、Purpose:

Widely used in communication equipment, tape recorders, TV sets, VCDs and DC or pulsating electrical appliances of various electronic equipment.

7、Max dv/dt（V/μs）

	U_R(V)	dV/dt(V/us)				
		P=7.5	P=10	P=15	P=22.5	P=27.5
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.	50/63	7.5	6	3	2	--
	100	15	9	5	3	--
	250	30	20	12	8	5
	400	40	30	20	10	7
	630	60	40	25	12	10
	1000	70	60	30	15	12

8. Characteristic

<table>
<tr><th>No.</th><th>Item</th><th>Test Condition</th><th>Requirement</th><th></th></tr>
<tr><td>1</td><td>Capacitance Tolerance</td><td>Frequency: 1KHZ ±0.1KHZ Measuring voltage: ≤1Vrms</td><td>±5% (J) ±10% (K)</td><td></td></tr>
<tr><td>2</td><td>Loss Tangent</td><td>Frequency: 1KHZ ±0.1KHZ Measuring voltage: ≤1Vrms</td><td>≤0.8%</td><td></td></tr>
<tr><td>3</td><td>Insulation Resistance</td><td>Test Voltage:
U_R>100VDC was test with 100VDC,
U_R≦100VDC was test with 10VDC

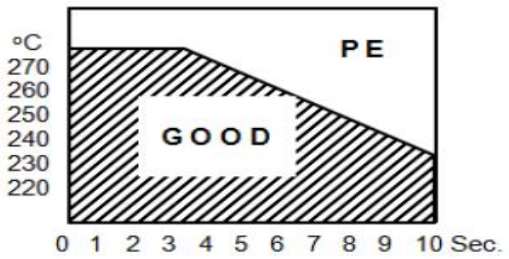
Temperature: 20℃±15℃ duration: 60 ±5sec</td><td>U>100V
C≦0.33uF ≥15000MΩ(20℃、100V、1min)
C>0.33uF ≥7500S(20℃、100V、1min)
U≦100V
C≦0.33uF ≥3000MΩ(20℃、10V、1min)
C>0.33uF ≧1000S(20℃、10V、1min)</td><td></td></tr>
<tr><td>4</td><td>Proof Voltage</td><td>Between Leads:
Test Voltage: 1.6U_R, duration: 5sec (P=5mm)
Wire Leads and Case:
Test Voltage: 2U_R, duration: 5sec
When the temperature exceeds 85°C but is lower than 110°C, the rated voltage decreases by 1.25%UR/°C</td><td>No breakdown or arcing</td><td></td></tr>
<tr><td>5</td><td>rapid change of temperature</td><td>Temperature: θA=-55℃, θB=+110℃
Exposure time at high and low temperature: 30min
Conversion time: 2~3min
cycle index: 5 次</td><td>No visible damage of appearance
Δc/c≤±5%
tgδ≤0.8%</td><td></td></tr>
<tr><td>6</td><td>Wire lead tensile strength</td><td>Tension :
<table><tr><th>Wire Lead diameter (mm)</th><th>Tension</th></tr><tr><td>0.3<d≤0.5</td><td>0.51kg</td></tr><tr><td>0.5<d≤0.8</td><td>1.0kg</td></tr></table></td><td>No mechanical damage, such as lead breakage and looseness</td><td></td></tr>
<tr><td>7</td><td>Wire lead bending strength</td><td>(half of the terminal) , Load:
<table><tr><th>Wire Lead diameter (mm)</th><th>Load</th></tr><tr><td>0.3<d≤0.5</td><td>0.51Kg</td></tr><tr><td>0.5<d≤0.8</td><td>1.0Kg</td></tr></table>In both positive and negative directions, it should be bent twice in each direction continuously, and the bending angle = 90°</td><td>No mechanical damage, such as lead breakage and looseness</td><td></td></tr>
</table>

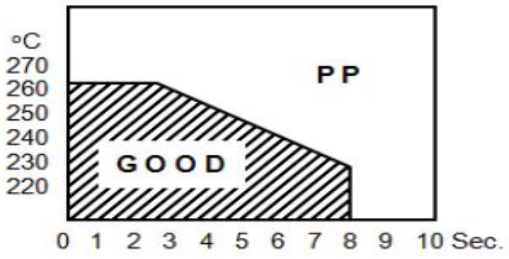
8	Weldability	Ta Method 1 Solder Temperature：260℃±5℃ Solder Time ： 2.0±0.5sec Solder ： Environmental protection material (lead-free)		More than 95% of the area has tin	
9	Durability				
NO.	Project		Performance	Test Condition	
9.1	temperature cycle	Appearance	no significant change	Test temperature cycle: 5 cycles in total. Each cycle includes: 1.+20 +/- 2℃，3 min 2. -55 +0/-3 ℃ ，30 min 3. +20 +/- 2℃，3 min 4. +110 +3/-0 ℃，30 min 5. +20 +/- 2℃，3 min	
		Proof Voltage	matching No. 4		
		Capacitance change rate (△C/C)	≦+/- 5%		
		Loss	△DF< 0.20% .(1KHz)		
		Appearance	no significant change		
9.2	high temperature loading	Appearance	No significant change,and the sign should be clearly identifiable	The test base on IEC 60384-2. Refer to JIS C 5102-1994. Test temperature : +110 +/-2 ℃. 110% voltage application: 1000 +24/-0 hour; After the test, allow to stand at standard temperature and humidity for 1.5 +/- 0.5 hours before measuring.	
		Proof Voltage	matching No. 4		
		Capacitance change rate (△C/C)	≦+/- 8%		
		Loss	△DF< 0.20% .(1KHz)		
		Insulation Resistance (I.R.)	≧50% of initial value		
9.3	Wet and heat loading	Appearance	No significant change,and the sign should be clearly identifiable	Refer to JIS C 0022. Test temperature :+40 +/- 2℃ Test humidity : 90% to 95% R.H. Test voltage : Rated voltage Test duration : 500 +24/-0 hours	
		Proof Voltage	matching No. 4		

		Capacitance change rate (△C/C)	≦+/- 10%	After the test, allow to stand at standard temperature and humidity for 1.5 +/- 0.5 hours before measuring.	
		Loss	△DF<0.20% .(1KHz)		
		Insulation Resistance (I.R.)	≧50% of initial value		
9.4	Soldering temperature bearing capacity	Appearance	No significant change,and the sign should be clearly identifiable	The test base on IEC 68-2-20 Tb. Welding temperature : 260 +/- 5℃. Dip duration : 5 +/- 0.5 sec. .(P=5mm) 10 +/- 0.5 sec. .(P=7.5mm) Dip thickness: 4 +/- 0.8 mm from the root After the test, allow to stand at standard temperature and humidity for 1.5 +/- 0.5 hours before measuring.	
		Proof voltage between terminals	matching No. 4		
		Capacitance change rate (△C/C)	≦+/- 3%		
		Connector	It should be stable		
9.5	Dry heat resistance	Appearance	No significant change,and the sign should be clearly identifiable	Test temperature : +110 +/- 2℃ Test duration : 16 +1/-0 hours	
		Proof voltage	matching No. 4		
		Capacitance change rate (△C/C)	≦+/- 5%		
9.6	Cold resistance	Appearance	No significant change,and the sign should be clearly identifiable	Test temperature : -55 +/-2 ℃ Test duration : 2 +/-1 hours	
		Proof voltage	matching No. 4		
		Capacitance change rate (△C/C)	≦+/- 5%		
9.7	Vibration resistance	Connection strength	Neither cause an open circuit, nor cause a short circuit. The connection should be stable.	The test base on IEC 68-2-6 Fc. Frequency change : 10--500 Hz. The vibration distance : 0.75 mm. The test direction : X, Y, Z. The test duration : 2 hours +1/-0 each direction	
		Appearance	No mechanical damage		

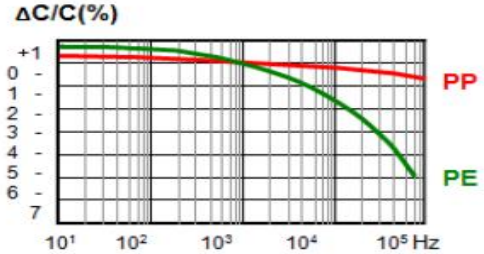
9.8	severe temperature changes	Appearance	No significant change	The test base on IEC 68-2-14 Na. Test temperature . High temperature : +110 +/-5 ℃ Low temperature : -55 +/-5℃ Each temperature 30 minutes +/- 10%	
		Proof voltage	matching No. 4		
		Appearance	No mechanical damage		
9.9	Short circuit charge and discharge	Capacitance change rate (△C/C)	≦+/- 3% (1KHZ)	The voltage of Short circuit charge and discharge : U_R	
		Loss change rate (△DF)	< 3% (10KHz)	The times of short circuit charging and discharging : 3 times	
		Insulation Resistance (I.R.)	matching No. 3	Sampling quantity: 10 pcs /batch	
9.10	Normal temperature storage	Capacitance change rate (△C/C)	≦+/- 2% (1KHZ)	Temperature: ≦35℃ Humidity : ≦80% Storage time : 30-35 days	
		Loss change rate (△DF)	matching No.2		
		Insulation Resistance (I.R.)	matching No. 3		

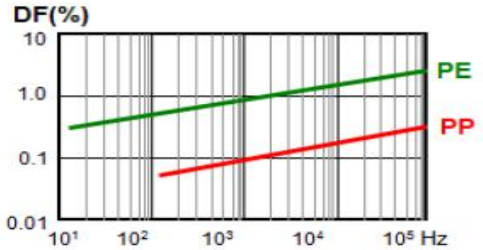
Soldering Temperature VS Time





Frequency Characteristics





Temperature Characteristics