



SPECIFICATION FOR APPROVAL

File No.: Q/FRK 0.GS.E.C31P-C03

Product Name	Metallized polypropylene film capacitor(dipped) for precision capacitor
Product Type	CBB21 series for precision capacitor
Product Code	C31 (P)
Customer	
Customer Code	
Issue Date	2017-8

Xiamen Faratronic Co. Ltd.			Approved by Customer
Drafted	Checked	Approved	



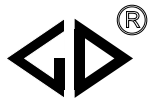
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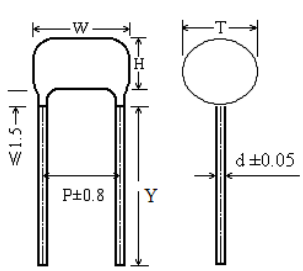
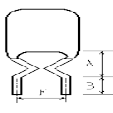
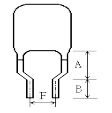
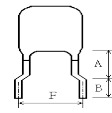
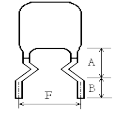


Version history

Current version	Date	Author	Change description

Metallized polypropylene film capacitor(dipped) for precision capacitor

Outline Drawing

	Forming Lead Shapes			
	I	II	III	IV
				
	$P \geq F$		$P < F$	
	$0\text{mm} \leq P-F \leq 3\text{mm}$	$3\text{mm} < P-F \leq 8\text{mm}$	$3\text{mm} < F-P \leq 5\text{mm}$	$0\text{mm} < F-P \leq 3\text{mm}$
	$F \pm 0.8\text{mm}; A \leq 5.0\text{mm}; B = 4.5 \pm 0.5\text{mm}$			

■ Features

- Metallized polypropylene structure
- Temperature coefficient of capacitance is small
- Good capacitance stability

Typical application

- Timing, LC-filter, oscillator circuits, applications with frequencies and high stability. etc.

■ Specifications

Reference Standard	GB 10190 (IEC 60384-16)
Climatic Category	55/85/56
Rated temperature	85°C
Rated Voltage	63V, 100V
Capacitance Range	1.0nF~100nF
Capacitance Tolerance	±1%(F); ±1.25%(A); ±1.5%(L); ; ±2%(G);; ±2.5%(B); ±3%(H);
Voltage Proof	1.6U _R (2s)
Insulation Resistance	≥100 000MΩ (20°C±3°C 10V, 1min)
Dissipation Factor	≤8×10 ⁻⁴ (1kHz, 20°C±3°C)



Part number system

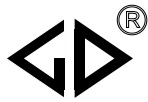
The 18 digits part number is formed as follow

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
C	3	1								P							

- Digit 1 to 3 Series code
C31 (P) = CBB21 series for precision capacitor
- Digit 4 to 5 D.C. rated voltage
1J=63V 2A=100V
- Digit 6 to 8 Rated capacitance value
For example: 103=10×10³pF=0.01μF
- Digit 9 Capacitance tolerance
F=±1%, A=±1.25%, L=±1.5%, G=±2% B=±2.5%, H=±3%,
- Digit 10 Pitch
2=5mm 3=7.5mm
- Digit 11 Internal use
- Digit 12 to 15 Lead form and packaging code
- Digit 16 to 18 Internal use

Table 1 lead form and packing code

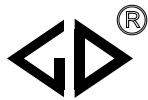
Digit 12		Digit 13		Digit 14		Digit 15	
code	explanation	code	explanation	code	explanation	code	explanation
A	ammo-pack	2 3	F=5.0mm F=7.5mm	1	kinked	A	each cap. between two consecutive holes P3=12.7mm,H=20.0mm (For pitch=7.5mm)
F	lead kinked	2 3 E	F=5.0mm F=7.5mm F=7.18mm	0 2 5	B=4.5mm The length of B B=3.2mm B=3.5mm	0	B Length tolerance ±0.5mm



□ Dimensions (mm)

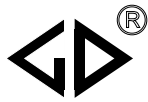
63Vdc/100Vdc #						
C _N (μF)	W _{max}	H _{max}	T _{max}	P	d	Part number
		Crimped lead				
0.0010	7.5	11.0	6.5	5.0	0.5	C311J102-2P****+++
0.0015	7.5	11.0	6.5	5.0	0.5	C311J152-2P****+++
0.0022	7.5	11.0	6.5	5.0	0.5	C311J222-2P****+++
0.0027	7.5	11.0	6.5	5.0	0.5	C311J272-2P****+++
0.0033	7.5	11.0	6.5	5.0	0.5	C311J332-2P****+++
0.0039	7.5	11.0	6.5	5.0	0.5	C311J392-2P****+++
0.0047	7.50	11.5	7.0	5.0	0.5	C311J472-2P****+++
0.0068	7.50	10.8	6.3	5.0	0.5	C311J682-2P****+++
0.0082	7.50	11.0	6.5	5.0	0.5	C311J822-2P****+++
0.010	7.50	11.1	6.6	5.0	0.5	C311J103-2P****+++
0.022	7.50	10.9	6.4	5.0	0.5	C311J223-2P****+++
0.0068	10.0	11.2	6.7	7.5	0.5	C311J682-3P****+++
0.0082	10.0	11.5	7.0	7.5	0.5	C311J822-3P****+++
0.010	10.0	11.9	7.4	7.5	0.5	C311J103-3P****+++
0.012	10.0	11.7	7.2	7.5	0.5	C311J123-3P****+++
0.015	10.0	11.5	7.0	7.5	0.5	C311J153-3P****+++
0.022	10.0	11.1	6.6	7.5	0.5	C311J223-3P****+++
0.033	10.0	11.0	6.5	7.5	0.5	C311J333-3P****+++
0.047	10.0	11.6	7.1	7.5	0.5	C311J473-3P****+++
0.056	10.0	11.6	7.1	7.5	0.5	C311J563-3P****+++
0.068	10.0	11.9	7.4	7.5	0.5	C311J683-3P****+++
0.082	10.0	11.3	6.8	7.5	0.5	C311J823-3P****+++
0.10	10.0	11.7	7.2	7.5	0.6	C311J104-3P****+++

- Note: 1. “-”=capacitance tolerance code, F=±1%, A=±1.25%, L=±1.5%, G=±2% B=±2.5%, H=±3%,
 2. “****”=lead form and packing code (refer to table 1).
 3. “#”when the rated voltage is 100Vdc, the digit 4-5 is 2A.



■ Test Method And Performance

No.	Item	Performance	Test method (IEC60384-16)
1	Solderability	Good quality of tinning	Solder temperature: 245°C ±5°C Immersion time: 2.0s±0.5s
2	Initial measurement	Capacitance, Tgδ: 10kHz	
	Terminal strength	There shall be no visible damage	Tension: φd=0.5mm, 5N 0.5<φd≤0.8mm, 10N Bend: φd=0.5mm, 2.5N 0.5<φd≤0.8mm, 5N 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	There shall be no visible damage and the marking shall be legible. ΔC/C ≤±0.2%(relative to the initial value) tgδ: ≤0.0010 (10kHz)	
3	Solvent resistance of Component	The dimensions of capacitor shall accord with table 1 The change of capacitors' weight shall not go beyond 1%.	Solvent: Industrial isopropanol. Solvent temperature: 23°C ±5°C Method 2: (without rubbing) time: 5min ±0.5min Recovery time: 48h
4	Initial measurement	Capacitance, Tgδ: 1kHz	
	Rapid change of temperature	There shall be no visible damage and the marking shall be legible. ΔC/C ≤±0.2%(relative to the initial value) tgδ: ≤0.0010 (10kHz)	θ _A =-55°C, θ _B =+85°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 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 ≤±0.5%(relative to the initial value) tgδ (10kHz): ≤0.0010 I.R. ≥50GΩ (C _N ≤120nF) I.R. ≥6000s (C _N >120nF)	
5	climate sequence	Initial measurement	Capacitance, Tgδ: 10kHz
		Dry heat	+85°C, 16h
		Damp heat, Cyclic	Test Db, Severity: b, the first cycle
		Cold	-55°C, 2h



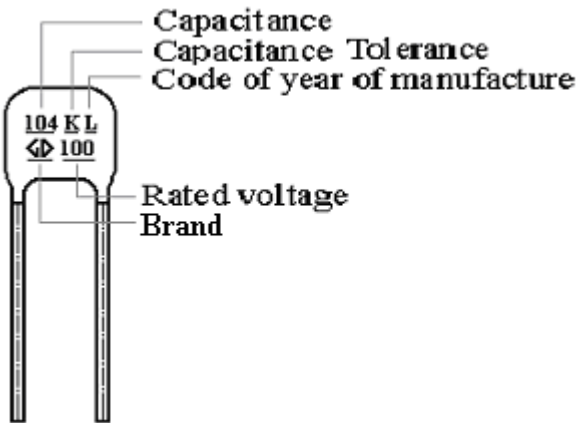
No.	Item		Performance	Test method (IEC60384-16)
5	climate sequence (continue)	Low air pressure	There shall be no permanent breakdown, flashover or other harmful deformation when applying U_R at the last 1 minute.	15°C~35°C, 8.5kPa, 1h,
		Damp heat, cyclic other		Test Db, Severity b, the other cycles, Applying U_R for 1 minute after the test finished.
		Final Measurement (continue)	There shall be no visible damage and the marking shall be legible. $\Delta C/C \leq \pm 0.5\%$ (relative to the initial value) $tg\delta: \leq 0.0015$ (10kHz) or 1.4 time initial value (whichever is greater) I.R. $\geq 50G\Omega$ ($C_N \leq 120nF$) I.R. $\geq 6000s$ ($C_N > 120nF$)	
6	Damp heat steady state	There shall be no visible damage and the marking shall be legible. $\Delta C/C \leq \pm 0.4\%$ (relative to the initial value) $tg\delta: \leq 0.0010$ (10kHz) I.R. $\geq 50G\Omega$ ($C_N \leq 120nF$) I.R. $\geq 6000s$ ($C_N > 120nF$)	Temperature: 40°C $\pm 2^\circ C$ Humidity: 93 ± 3 %RH Duration: 56days	
7	Endurance	There shall be no visible damage and the marking shall be legible. $\Delta C/C \leq \pm 0.5\%$ (relative to the initial value) $tg\delta: \leq 0.0010$ (10kHz) I.R. $\geq 50G\Omega$ ($C_N \leq 120nF$) I.R. $\geq 6000s$ ($C_N > 120nF$)	2 000h $+85^\circ C, 1.5 \times U_R$	
8	Temperature characteristic	Measuring capacitance and temperature at test point b, d, f .: 1. Temperature coefficient of the capacitance(α): At lower category temperature : $\alpha_b = \frac{C_b - C_d}{C_d(\theta_b - \theta_d)}$ At upper category temperature : $\alpha_r = \frac{C_r - C_d}{C_d(\theta_r - \theta_d)}$ The range α_b and α_r (-200 \pm 100)ppm/°C 2 I.R. at test point f : I.R. $\geq 4G\Omega$ ($C_N \leq 120nF$) I.R. $\geq 6000s$ ($C_N > 120nF$)	Static method: The Capacitors should be kept at the following temperature in turn: a(+20 \pm 2) °C, b(-55 \pm 2) °C, d(20 \pm 2) °C f(+85 \pm 2) °C, g(+20 \pm 2) °C	

Quality ensuring test (before shipment):

Inspection item (each batch)	Inspection level (GB 2828)	
	IL	AQL
Appearance inspection	S-4	1.5%
Dimensions		
Capacitance	II	0.65%
Tangent of the loss angle		
Dielectric strength		
Insulation resistance		
Solderability	S-3	2.5%

Marking

$P \leq 10.0\text{mm}$



Taping for dipped-type capacitor

▲ Outline Drawing

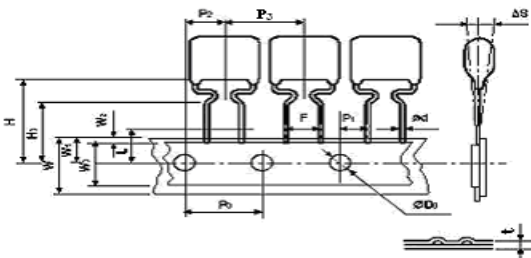


Fig.1

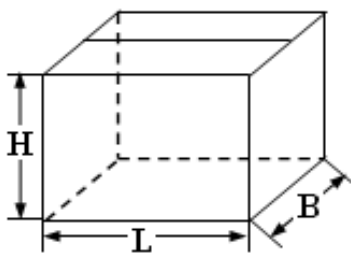
▲ Taping Dimensions(mm)

Technology index title	Code	Dimensions (mm)		
		P=5.0	P=7.5	Tolerance
Taping type	—	Fig 1	Fig 1	—
Part number Digit12-15	Ammo-pack	A21A	A31A	
Taping pitch	P ₃	12.7	12.7	±1.0
Feed hole pitch	P ₀	12.7	12.7	±0.3
Center of wire	P ₁	3.85	2.60	±0.7
Center of body	P ₂	6.35	6.35	±1.3
Pitch of taping wire	F**	5.0	7.5	+0.8 -0.2
Component alignment	△S	0	0	±2.0
Height of crangle from tape center	H	20.0	20.0	±1.0
Height of component from tape center	H ₀	16.0	16.0	±0.5
Carrier tape width	W	18.0	18.0	+1.0 -0.5
Hold down tape width	W ₀	10min	10min	—
Hole position	W ₁	9.0	9.0	+0.75 -0.5
Hold down tape sition	W ₂	3max	3max	—
Feed hole dia.	D ₀	4.0	4.0	±0.3
Tape thickness	t	0.7	0.7	±0.2

Note: * P₀=15mm is also available;
** F can be other lead spacing;

□ Packing box sizes(mm)

1. Out packing box for bulk



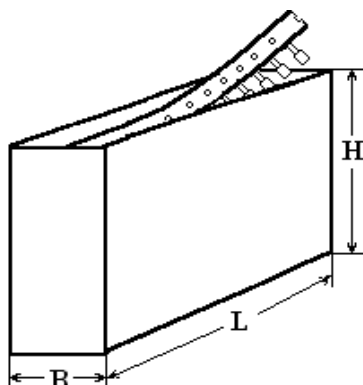
L:375±5
B:375±5
H:265±5

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