



SPECIFICATION FOR APPROVAL

File No.: Q/FRK 0.GS.E.C49-C12

Product Name Metallized polypropylene film A.C. capacitor for capacitive divider
Product Type CBB62
Product Code C49G2104J80C000
Customer _____
Customer Code _____
Issue Date 2020-4

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



Xiamen Faratronic Co. Ltd.

Add: 99 Xinyuan Road, Haicang District, Xiamen, China

Marketing/Sales center

TEL: 0086-592-2335737 6208505 6208586

FAX: 0086-592-6208777

Mail: Vitawang@faratronic.com.cn

Donny@faratronic.com.cn

James@faratronic.com.cn

Http: www.faratronic.com.cn

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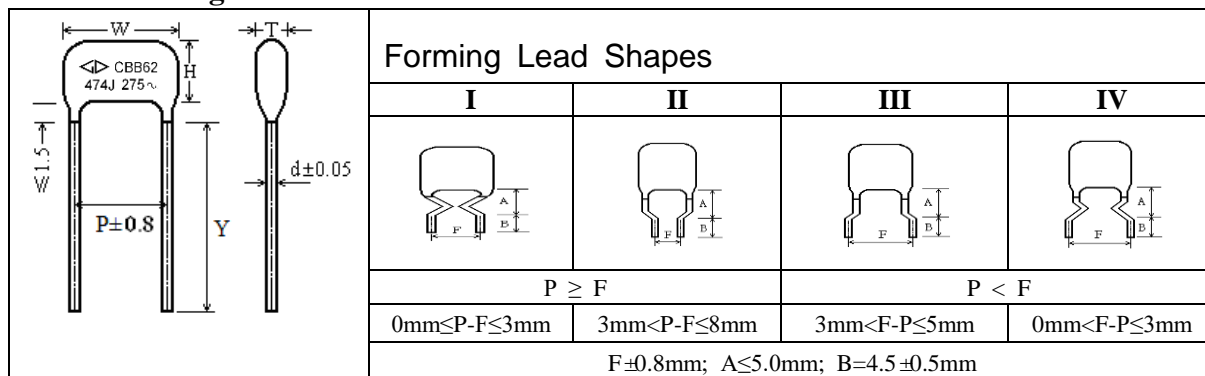


Version history

Current version	Date	Author	Change description

Metallized polypropylene film A.C. capacitor for capacitive divider

■ Outline Drawing



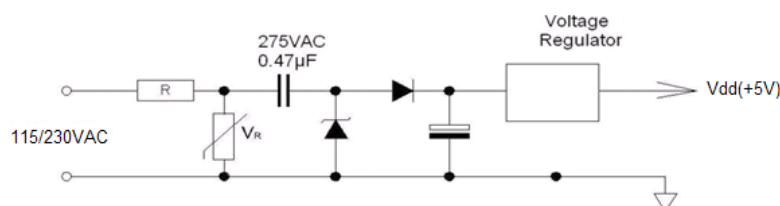
■ Features

- This is specifically designed for applications in serial with the 100Vac~240Vac main, i.e.: capacitive divider, for example, energy meter, LED driver etc.
- Metallized Polypropylene structure
- Good self-healing properties, withstanding surge voltage stressing
- Long stability of capacitance
- Flame resistant epoxy resin powder coating(UL94/V-0)

■ Specifications

Reference Standard	GB/T 14579 (IEC 60384-17)			
Climatic Category	40/085/21			
Rated temperature	85°C			
Operating Temperature Range	-40°C ~ +85°C			
Rated Voltage (U _R)	160Vac,50/60Hz	230Vac,50/60Hz	250Vac,50/60Hz	300Vac/275Vac,50/60Hz
Maximum continuous DC voltage	250Vdc	400Vdc	560Vdc	630Vdc
Capacitance Range	0.22μF~2.2μF	0.033μF ~4.7μF	0.010μF~4.0μF	0.10F~1.0μF
Voltage Proof (Between Terminals)	400Vdc(2s)	640Vdc (2s)	900Vdc (2s)	1500Vdc (2s)
Capacitance Tolerance	±5%(J), ±10%(K), ±20%(M)			
Insulation Resistance	R _N ≥ 15 000MΩ, C _N ≤ 0.33μF RC _N ≥ 5 000s, C _N > 0.33μF (20°C, 100V, 1min)			
Dissipation Factor	≤ 10 × 10 ⁻⁴ (1kHz, 20°C) Typical value 2 × 10 ⁻⁴ ≤ 20 × 10 ⁻⁴ (10kHz, 20°C) Typical value 5 × 10 ⁻⁴			
Note:	For long life time and continuous working, please choose 275Vac and upwards voltage.			

■ Typical circuit (0.47μF)



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	4	9								E				

- Digit 1 to 3 Series code
C49=CBB62
- Digit 4 to 5 A.C. rated voltage
C2=160V P5=230V E2=250V P2=275V Q1=300V
- Digit 6 to 8 Rated capacitance value
For example : 474=47×10⁴ pF= 0.47μF
- Digit 9 Capacitance tolerance
J=±5%, K=±10%, M=±20%
- Digit 10 Pitch
3=7.5mm 4=10.0mm 6=15.0mm 8=20.0mm
9=22.5mm A=25.0mm B=27.5mm
- Digit 11 Internal use
- Digit 12 to 15 Lead form and packaging code

Table1 Lead form and packaging code

Digit 12		Digit 13		Digit 14		Digit 15	
code	explanation	code	explanation	code	explanation	code	explanation
A	ammo-pack	3	F=7.5mm	1	kinked	A	each cap. between two consecutive holes P3=12.7mm,H=20.0mm (For pitch=7.5mm)
		4	F=10.0mm			E	P3=25.4mm;H=20.0mm (For pitch=10.0/15.0mm)
F	lead kinked	6	F=15.0mm	0	B=4.5mm The length of B	0	B Length tolerance ±0.5mm
		9	F=22.5mm				
		code	explanation				
Y	straight lead “Y” in the figure above	45	lead length 4.5mm	0		0	Length tolerance ±0.5mm
		35	lead length 3.5mm				

Digit12-15 code “C000”means standard lead length (18mm ~ 30mm)
Note: Recommend short lead due to long lead could deform easily.

Dimensions(mm)

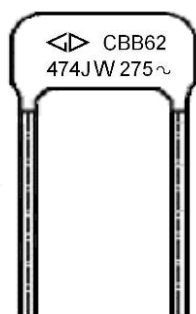
400Vac						
C _N (μF)	W max	H max	T max	P	d	Part number
0.1	24.0	16.5	9.0	20.0	0.8	C49G2104J80C000

Test Method And Performance

No.	Item	Performance	Test method(IEC 60384-17)
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	ΔC/C ≤±3%(relative to the initial value) Increase of tgδ: ≤0.003 (10kHz,C≤1.0μF) ≤0.002 (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.	θ _A =-40°C, θ _B =+85°C 5 cycles, Duration: t=30min
3	Vibration(straight lead)	There shall be no evidence of deterioration.	Amplitude 0.75mm or acceleration 100m/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: 400m/s ² ,Pulse duration, 6ms
	Final measurement	ΔC/C ≤±3%(relative to the initial value) Increase of tgδ: ≤0.003 (10kHz, C≤1.0μF) ≤0.002 (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	+85°C, 16h
		Damp heat, Cyclic	Test Db, Severity: b, the first cycle
		Cold	-40°C, 2h
		Low air pressure	There shall be no permanent breakdown, flashover or other harmful deformation
			15°C~35°C, 8.5kPa, 1h, Applying U _R during the last 5 min.

No.	Item	Performance	Test method(IEC 60384-17)
4	Damp heat, cyclic other		Test Db, Severity b, the other cycles, Applying U_R for 1 min within 15 min after the test finished.
	climate sequence (continue) Final measurement	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 $\text{tg}\delta$: ≤ 0.003 (10kHz, $C \leq 1.0\mu\text{F}$) ≤ 0.002 (1kHz, $C > 1.0\mu\text{F}$) IR: $\geq 50\%$ 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 $\text{tg}\delta \leq 0.002$ IR: $\geq 50\%$ of the rated value	Temperature: $40^\circ\text{C} \pm 2^\circ\text{C}$ Humidity: $93 \pm 3\%$ RH Duration: 21 days Applying U_R for 1 min Within 15 min after the test finished.
6	Endurance	$\Delta C/C \leq \pm 5\%$ (relative to the initial value) Increase of $\text{tg}\delta$: ≤ 0.003 (10kHz, $C \leq 1.0\mu\text{F}$) ≤ 0.002 (1kHz, $C > 1.0\mu\text{F}$) IR: $\geq 50\%$ of the rated value	Rate 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. $(-40 \pm 3)^\circ\text{C}$, 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 $\text{tg}\delta$: ≤ 0.003 (10kHz, $C \leq 1.0\mu\text{F}$) ≤ 0.002 (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 Charging resistance: $220/C_N(\Omega)$ Discharging resistance: $R = 10/C_N(\Omega)$ or 20Ω (whichever is the greater) C_N : rated capacitance (μF)

■ Marking (example)



Marking Introduction:

Code	Explanation	Code	Explanation
	Brand	275~	Rated voltage
CBB62	Type	474K	Rated capacitance and tolerance
		W	Code of year of manufacture

■ Taping for dipped-type capacitor

▲ Outline Drawing

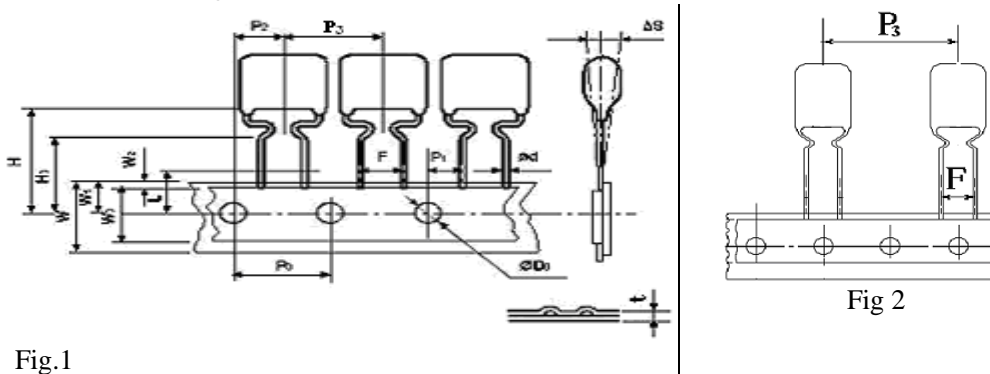


Fig.1

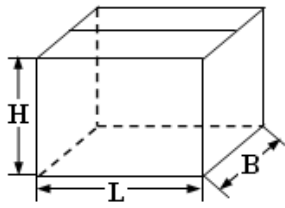
▲ Taping Dimensions(mm)

Technology index title	Code	Dimensions (mm)				Tolerance
		P=5.0	P=7.5	P=10.0	P=15.0	
Taping type	—	Fig 1	Fig 1	Fig 2	Fig 2	—
Part number Digit12-15	Ammo-pack	A21A	A31A	A41E	A61E	
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	2.60	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	+0.8 -0.2
Component alignment	△S	0	0	0	0	±2.0
Height of crangle from tape center	H	20.0	20.0	20.0	20.0	±1.0
Height of component from tape center	H ₀	16.0	16.0	16.0	16.0	±0.5
Carrier tape width	W	18.0	18.0	18.0	18.0	+1.0 -0.5
Hold down tape width	W ₀	10min	10min	10min	10min	—
Hole position	W ₁	9.0	9.0	9.0	9.0	+0.75 -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	±0.3
Tape thickness	t	0.7	0.7	0.7	0.7	±0.2

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

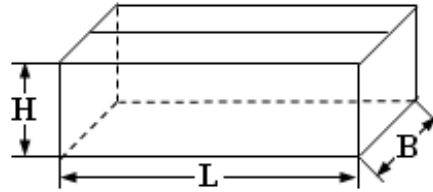
■ Packing box sizes(mm)(example)

1. Out packing box for bulk



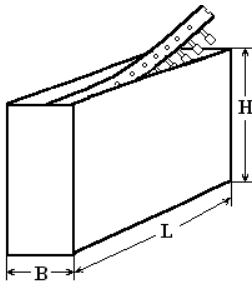
L:375±5
B:375±5
H:265±5

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