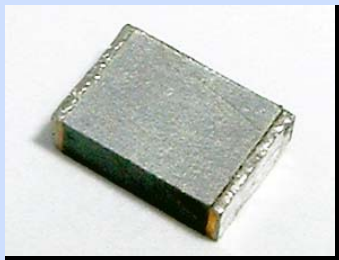


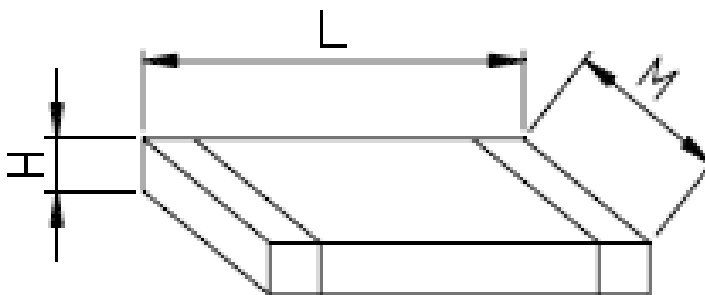
CPF Series

SMT Metallized Polyethylene Naphthalate Film D.C Capacitor (Stacked version)

TRIGON
COMPONENTS



DIMENSION: (mm)



FEATURES

- Uncoated, stacked construction, small size.
- Stability versus temperature, frequency, voltage, time and humidity.
- Reliable quality due to self-healing effect
- No piezoelectric effect, non-polar construction, non-linearity distortion.
- Low ESR, low noise level.
- High dv/dt ability.
- No cracking under thermal impact or mechanical bump.
- RoHS Compliant.

APPLICATIONS

- Telecom (XDSL, base station, multiplexer)
- Automotive (engine control system air-conditioning), HID Lamps.
- Lighting (electronic ballast, LED Drivers, LED Bulbs)
- DC/DC convertor
- Consumer (LCD, PDP)

ORDERING CODE

CPF 54 T 824 K 215
(1) (2) (3) (4) (5) (6)

- (1) Chip Film Capacitor
- (2) Size Code
- (3) Package
- (4) Capacitance Code
- (5) Tolerance Code
- (6) Rated Voltage Code

※Please refer to complete Ordering Code Document (CPF-Ord) for more ordering options.

SIZE	L	W
1812	4.8±0.3	3.2±0.4
2220	5.9±0.3	5.1±0.4
2824	7.3±0.4	6.1±0.5
4030	10.5±0.4	7.6±0.5
5040	13±0.4	10.2±0.5
6054	15.5±0.4	13.7±0.5

Capacitor

CPH Series

SMT Metallized Polyethylene Naphthalate Film D.C Capacitor (Stacked version)

TRIGON
COMPONENTS

SPECIFICATIONS

Reference Standard	IEC 60384-23	
Climatic Category	55/125/56	
Rated Temperature	100°C	
Operating Temperature Range	-55°C to +125°C (+100°C to +125°C: decreasing factor 1.25% per °C for UR)	
Rated Voltage	50/63V.100V.250V.400V.630V.1000V	
Capacitance Range	0.001uF ~ 12uF	
Capacitance Tolerance	±5%(J), ±10%(K), ±20%(M)	
Voltage Proof	1.4UR(5s)	
Dissipation Factor	≤0.008%(20°C, 1KHz)	
Insulation Resistance	CN ≤ 0.33uF, ≥ 1000MΩ CN > 0.33uF, ≥ 400s	UR < 100V, Charging voltage: 10V UR ≥ 100V, Charging voltage: 10V (20°C, 1min)
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 right value with UR/U	50/63V	50
	100V	70
	250V	100
	400V	150
	630V	200
	1000V	400
Welding process	Reflow soldering recommended	
MSL	3	

Capacitor

CPF Series

SMT Metallized Polyethylene Naphthalate Film D.C Capacitor (Stacked version)

TRIGON
COMPONENTS

CAPACITANCE RANGE

unit: LxWxE: in mm, **H** = (Thickness): mm

Size		1812				2220					
W.V.D.C		50/63	100	250	400	50/63	100	250	400	630	
Cap. 0.0010		1.8									
(uF) 0.0012		1.9									
0.0015		1.8									2.2
0.0018		2.1									2.2
0.0022		2.3									2.4
0.0027		2.7									2.8
0.0033		1.8									3.3
0.0039		1.9									3.8
0.0047		2.2									2.3
0.0056		2.5									2.6
0.0068		1.9									3.0
0.0082		2.2									2.2
0.010		2.0			2.5					2.6	
0.012		2.3			2.9					3.0	
0.015		2.8							1.8	3.6	
0.018		1.8							2.0	4.2	
0.022		2.0							2.4		
0.027		2.3							2.8		
0.033		2.7							3.3		
0.039		3.1							3.8		
0.047		2.3						2.0	4.5		
0.056		2.6						2.3			
0.068		3.0						2.6			
0.082		1.9						3.1			
0.10		2.2						3.6			
0.12		2.5						4.2			
0.15		3.0									
0.18		2.0					2.1				
0.22		2.3					2.2				
0.27		2.7					2.6				
0.33		3.2					3.0				
0.39						3.5	3.5				
0.47						2.3	4.2				
0.56						2.7					
0.68						3.1					
0.82						3.6					
1.0						4.3					

Size		2824					4030					
W.V.D.C		50/63	100	250	400	630	50/63	100	250	400	630	1000
Cap. 0.015												3.2
(uF) 0.018												3.6
0.022												4.2
0.027						4.7						5.0
0.033												6.0
0.047										4.8		
0.056					3.7							
0.068					4.3							
0.082										3.2		
0.10										3.8		
0.12										4.4		
0.15				3.6								
0.18				4.2								
0.22								2.9				
0.27								3.4				
0.33								4.0				
0.39								4.6				
0.56			3.5									
0.68			4.1									
0.82			4.8									
1.0								3.2				
1.2		3.6						3.7				
1.5		4.3						4.5				

Capacitor

CPF Series

SMT Metallized Polyethylene Naphthalate Film D.C Capacitor (Stacked version)

TRIGON
COMPONENTS

CAPACITANCE RANGE

unit: LxWxE: in mm, **H** = (Thickness): mm

Size	2824					4030						
	W.V.D.C	50/63	100	250	400	630	50/63	100	250	400	630	1000
Cap. 1.8							2.9					
(uF) 2.2							3.4					
2.7							4.0					
3.3							4.8					


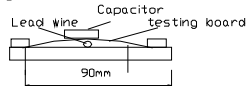
Size	5040						6054						
	W.V.D.C	50/63	100	250	400	630	1000	50/63	100	250	400	630	1000
Cap. 0.039							3.5						
(uF) 0.047							4.1						
0.056						2.8	4.7						
0.072							5.9						
0.082						3.8	6.6						
0.10						4.5							5.3
0.12													6.2
0.15					2.8								
0.18					3.2								
0.22					3.8							6.1	
0.27					4.8								
0.33											3.6		
0.39											4.1		
0.47				3.4							4.9		
0.56				4.0							5.7		
0.68				4.7									
0.82										3.6			
1.0										4.2			
1.2										4.9			
1.5										6.0			
1.8			3.4										
2.2			4.0										
2.7			4.7										
3.3										3.7			
3.9		3.5								4.2			
4.7		4.1								4.9			
5.6		4.8								5.8			
6.8									3.7				
8.2									4.3				
10									5.1				
12									6.0				

CPF Series

SMT Metallized Polyethylene Naphthalate Film D.C Capacitor (Stacked version)

TRIGON
COMPONENTS

TEST METHOD AND PERFORMANCE

No.	Item	Performance	Test method (IEC 60384-23)	
1	Solderability	Good quality of tinning	Solder temperature: 235°C±5°C Immersion time: 2.0±0.5s Immersion depth: 2mm	
2	Resistance to soldering heat	No visible damage Capacitance: $\Delta C/C$ =3%	Method: Reflow Soldering. The time for surface temperature of the capacitor remains at 215°C±3°C for 50±1s. The maximum surface temperature not exceed 240°C	
3	Mounting	No visible damage Capacitance: $\Delta C/C$ =±2% $\text{tg}\delta = 0.008(1\text{KHz})$	Ref. Item 4.1	
4	No visible damage	No visible damage	(According to CECC 32201) Force of 5 N applied for 10 secs 	
5	Board bending test	No visible damage for body and terminal Capacitance: $\Delta C/C$ =2%	Ref. Item 4.5 (According to CECC 32201)  Lead wire diameter 1.0mm	
6	climate sequence	Initial measurement	Capacitance (1kHz) $\text{tg}\delta$ (1kHz)	Ref. Item 4.3.2
		Rapid change of temperature	No visible damage	Ref. Item 4.8 $\theta_A = -55\pm 3^\circ\text{C}$, $\theta_B = +125\pm 2^\circ\text{C}$ 5 cycles, duration: $t = 30\text{min}$
		Dry heat		+125°C±2°C, 16 hours
		Damp heat, cyclic		Test Db, Severity: b, the first cycle
		Cold		-55°C±3°C, 2 hours
		Damp heat, cyclic other	Applying U_R for 1 minute within 15 minutes	Test Db, Severity b, the other cycles
		Final measurement	No visible damage $\Delta C/C = \pm 5\%$ (relative to the initial value) Increase of $\text{tg}\delta$ $C_N = 1\mu\text{F}: = 0.004(10\text{KHz})$ $C_N > 1\mu\text{F}: = 0.005(10\text{KHz})$ $\text{IR} = 50\%$ of the rated value	

CPF Series

SMT Metallized Polyethylene Naphthalate Film D.C Capacitor (Stacked version)

TRIGON
COMPONENTS

TEST METHOD AND PERFORMANCE

No.	Item	Performance	Test method (IEC 60384-23)
7	Damp heat steady state	No visible damage and the marking shall be legible. Capacitance: $ \Delta C/C = 7\%$ Increase of $\tan\delta(1\text{KHz}) = 0.005$ IR: =50% of the rated value	Ref. Item 4.10 Temperature: $40^\circ\text{C} \pm 2^\circ\text{C}$ Humidity: $93 \pm 0.2\% / -0.3\% \text{RH}$ Duration: 56 days
8	Endurance	No visible damage Capacitance: $ \Delta C/C = 5\%$ Increase of $\tan\delta$ $C_N = 1\mu\text{F}: = 0.005(10\text{KHz})$ $C_N > 1\mu\text{F}: = 0.003(1\text{KHz})$ IR: =50% of the rated value	Ref. Item 4.11 1000 hours + 100°C : $1.25 \times U_R$ + 125°C : $1.25 \times U_C (U_C = 0.8 U_R)$
9	Charging and discharging	Capacitance: $ \Delta C/C = 5\%$ Increase of $\tan\delta$ $C_N = 1\mu\text{F}: = 0.005(10\text{KHz})$ $C_N > 1\mu\text{F}: = 0.003(1\text{KHz})$ IR: =50% of the rated value	Ref. Item 4.2 Times: 10000, $dV/dt = 100\text{V}/\mu\text{s}$ Duration of charging: 0.5s Duration of discharging: 0.5s Charging voltage: rated voltage Charging resistance: $220/C_N(\Omega)$ or current intensity =1A (whichever is the less current intensity) Discharging resistance: $R = U_R / (C_N \times dV/dt)$ C_N : rated capacitance (μF)

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%

CPF Series

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COMPONENTS

TAPING AND PACKAGING (mm)

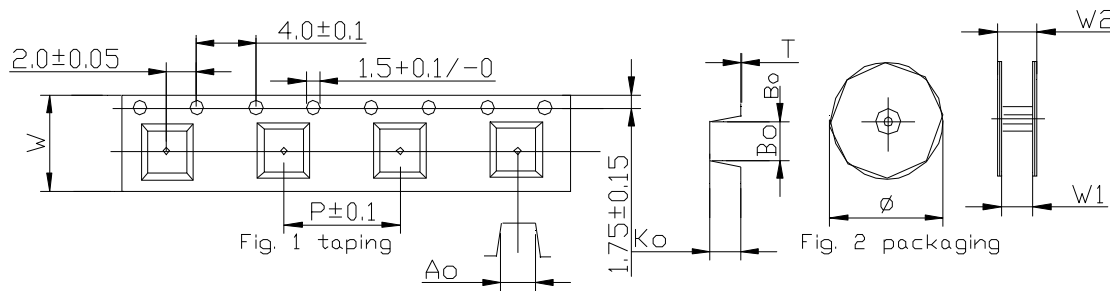


Table 1 taping dimensions

Size code	Cap. Dimensions			Tape dimensions						Reel dimensions			Packaging quantities	
	L mm	W mm	Tape code	Ao±0.1 mm	B±0.1 mm	Ko±0.1 mm	W±0.3 mm	P±0.1 mm	T±0.05 mm	Ø mm	W1+2.0/-0 mm	W2±1.5 mm	Reel pcs	Loose pcs
1812	4.8	3.2	a b	3.8	5.1	2.0 2.6	12	8	0.3	330	12	16	4000 3000	1500
2220	5.9	5.1	a b c	5.7	6.4	2.9 3.8 4.9	12 12 16	8 8 8	0.3 0.35 0.4	330	12 16 16	16 16 20	3000 2250 1750	1500
2824	7.3	6.1	a b c	6.6	7.9	3.8 4.6 5.5	16	12	0.35 0.4 0.4	330	16	20	1500 1250 1000	1000
4030	10.5	7.6	a b c	8.4	11.0	3.8 4.8 5.8	16	12	0.35 0.4 0.4	330	16	20	1500 1250 1000	1000
5040	13.0	10.2	a b c	10.9	13.5	3.8 4.7 5.9	24	16	0.35 0.4 0.4	330	24	28	1100 900 750	500
6054	15.5	13.7	a b c	14.4	16.0	4.3 5.1 5.8	24	20	0.4 0.4 0.5	330	24	28	800 600 600	500

According with IEC 60286 and EIA 481.

■ Reflow soldering process-parameters and suggestions

Suggested guidelines about the main reflow parameters are as follows:

- Max time over 215°C = 50 sec
- Max temp. ramp rate = 3°C / sec (heating) and 6°C / sec (cooling)
- Max peak temperature on the component body = 240°C
- Second reflow = be sure that, before the second reflow, the temperature on the capacitor surface is below 50°C

CPF Series

SMT Metallized Polyethylene Naphthalate Film D.C Capacitor (Stacked version)

TRIGON
COMPONENTS

REFLOW TEMPERATURE PROFILE

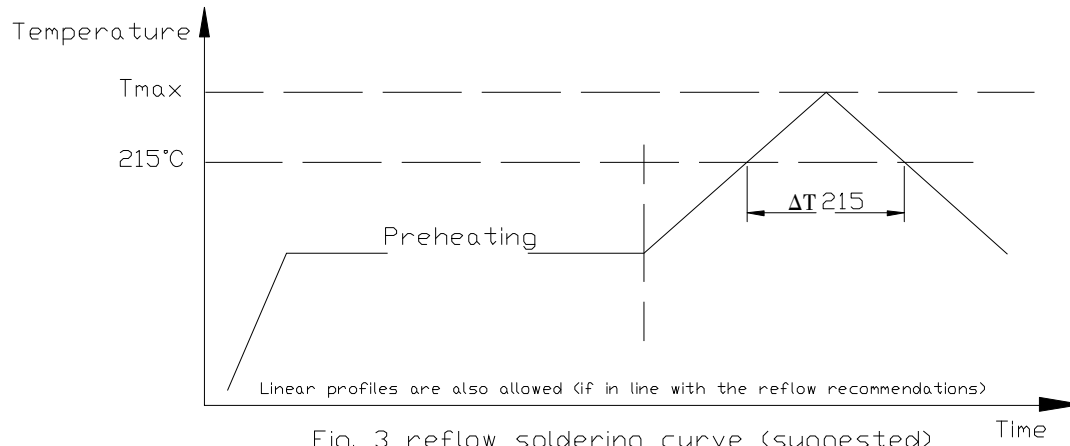


Fig. 3 reflow soldering curve (suggested)

- Suggested Solder paste:
We suggest to use a Sn / Ag / Cu solder paste (suggested thickness 0.10 - 0.15 mm) with a melting point of around 217°C.)
- Suggested manual soldering parameters (for Touch only the landing areas on PCB with the soldering iron)
We only suggest to use the component with reflow soldering. If you have to solder with iron, please refer to the parameters of hand-soldering detailedly.
Time = ≤ 5 sec
Temperature = ≤ 260°C

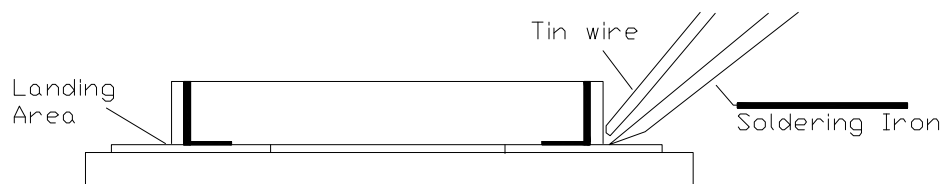


Fig. 4 hand-soldering method (suggested)

■ Moisture suggestions:

We supply our product in a MBB (Moisture Barrier Bag) Class 1, in order to guarantee the possibility to store them in all conditions. We can guarantee a minimum shelf-life of 12 months.

After the opening of the MBB, We think that the permanence at a temperature lower than 30°C and relative humidity lower than 60% is assured for 168 hours.

For longer periods and/or higher temperature and relative humidity values, it is absolutely indispensable to protect the components against humidity.

If the reel is partially used, we recommends the recycle of the same MBB or a storage in areas with controlled temperature and humidity.