



SPECIFICATION

(Reference sheet)

· Supplier : Samsung electro-mechanics · Samsung P/N : CL05B471KB5NCNC

Product : Multi-layer Ceramic Capacitor

Description : CAP, 470pF, 50V, ±10%, X7R, 0402

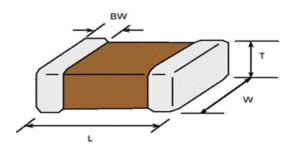
A. Samsung Part Number

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1	Series	Samsung Multi-layer Ceramic Capacitor				
2	Size	0402 (inch code)	$L: 1.00 \pm 0.05 \text{ mm}$	$W:~0.50\pm0.05~\text{mm}$		
3	Dielectric	X7R	8 Inner electrode	e Ni		
4	Capacitance	470 pF	Termination	Cu		
(5)	Capacitance	±10 %	Plating	Sn 100% (Pb Free)		
	tolerance		9 Product	High -Q		
6	Rated Voltage	50 V	10 Special	Reserved for future use		
7	Thickness	0.50 ± 0.05 mm	① Packaging	Cardboard Type, 7" reel		

B. Structure & Dimension



Samsung P/N	Dimension(mm)				
Samsung F/N	L	W	Т	BW	
CL05B471KB5NCNC	1.00 ± 0.05	0.50 ± 0.05	0.50 ± 0.05	0.25 ± 0.10	

C. Samsung Reliablility Test and Judgement Condition

	Judgement	Test condition		
Capacitance	Within specified tolerance	1kHz ±10% / 1.0±0.2Vrms		
Tan δ (DF)	0.025 max.	*A capacitor prior to measuring the capacitance is heat treated at $150^{\circ}\text{C}+0/-10^{\circ}\text{C}$ for 1hour and maintained in ambient air for 24±2 hours.		
Insulation	10,000Mohm or 500Mohm×μF	Rated Voltage 60~120 sec.		
Resistance	Whichever is smaller			
Appearance	No abnormal exterior appearance	Microscope (×10)		
Withstanding	No dielectric breakdown or	250% of the rated voltage		
Voltage	mechanical breakdown			
Temperature	X7R			
Characteristics	(From-55℃ to 125℃, Capacitance change s	should be within ±15%)		
Adhesive Strength	No peeling shall be occur on the	500g·f, for 10±1 sec.		
of Termination	terminal electrode			
Bending Strength	Capacitance change: within ±12.5%	Bending to the limit (1mm)		
		with 1.0mm/sec.		
Solderability	More than 75% of terminal surface	SnAg3.0Cu0.5 solder		
	is to be soldered newly	245±5°C, 3±0.3sec.		
		(preheating : 80~120°C for 10~30sec.)		
Resistance to	Capacitance change : within ±7.5%	Solder pot : 270±5℃, 10±1sec.		
Soldering Heat	Tan δ, IR : initial spec.			
Vibration Test	Capacitance change : within \pm 5% Tan δ , IR : initial spec.	Amplitude: 1.5mm From 10Hz to 55Hz (return: 1min.) 2hours × 3 direction (x, y, z)		
Moisture	Capacitance change: within ±12.5%	With rated voltage		
Resistance	Tan δ : 0.05 max	40±2°C, 90~95%RH, 500+12/-0hrs		
	IR: 500Mohm or 25Mohm × μ F			
	Whichever is smaller			
High Temperature	Capacitance change : within ±12.5%	With 200% of the rated voltage		
Resistance	Tan δ: 0.05 max	Max. operating temperature		
	IR: 1,000Mohm or 50Mohm × <i>μ</i> F Whichever is smaller	1,000+48/-0hrs		
Temperature	Capacitance change: within ±7.5%	1 cycle condition		
Cycling	Tan δ, IR : initial spec.	Min. operating temperature → 25°C		
		→ Max. operating temperature → 25°C		
		5 cycle test		
		o cycle lest		

D. Recommended Soldering method:

Reflow (Reflow Peak Temperature : 260±5°C, 30sec.)



Product specifications included in the specifications are effective as of March 1, 2013.

Please be advised that they are standard product specifications for reference only.

We may change, modify or discontinue the product specifications without notice at any time.

So, you need to approve the product specifications before placing an order.

Should you have any question regarding the product specifications,

please contact our sales personnel or application engineers.

Disclaimer & Limitation of Use and Application

The products listed in this Specification sheet are **NOT** designed and manufactured for any use and applications set forth below.

Please note that any misuse of the products deviating from products specifications or information provided in this Spec sheet may cause serious property damages or personal injury.

We will **NOT** be liable for any damages resulting from any misuse of the products, specifically including using the products for high reliability applications as listed below.

If you have any questions regarding this 'Limitation of Use and Application', you should first contact our sales personnel or application engineers.

- ① Aerospace/Aviation equipment
- 2 Automotive or Transportation equipment (vehicles, trains, ships, etc)
- 3 Medical equipment
- 4 Military equipment
- ⑤ Disaster prevention/crime prevention equipment
- 6 Power plant control equipment
- Atomic energy-related equipment
- Undersea equipment
- Traffic signal equipment
- Data-processing equipment
- ## Electric heating apparatus, burning equipment
- Safety equipment
- ® Any other applications with the same as or similar complexity or reliability to the applications