



# **SPECIFICATION**

(Reference sheet)

· Supplier : Samsung electro-mechanics · Samsung P/N: CL31B224KBFNNNE

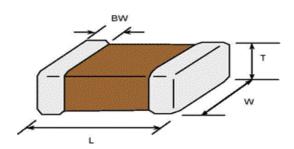
· Product : Multi-layer Ceramic Capacitor · Description : CAP, 220nF, 50V, ±10%, X7R, 1206

## A. Samsung Part Number

<u>CL</u> <u>31</u> <u>B</u> <u>224</u> <u>K</u> <u>B</u> <u>F</u> <u>N</u> <u>N</u> <u>N</u> <u>E</u> 1 2 3 4 5 6 7 8 9 0 10

1	Series	Samsung Multi-layer Ceramic Capacitor				
2	Size	1206 (inch code)	L: 3.20	± 0.15 mm	W:	1.60 ± 0.15 mm
3	Dielectric	X7R	8	Inner electrode		Ni
4	Capacitance	220 nF		Termination		Cu
(5)	Capacitance	±10 %		Plating		Sn 100% (Pb Free)
	tolerance		9	Product		Normal
6	Rated Voltage	50 V	10	Special		Reserved for future use
7	Thickness	1.25 ± 0.15 mm	11	Packaging		Embossed Type, 7" reel

#### **B. Structure & Dimension**



Samouna D/N	Dimension(mm)					
Samsung P/N	L	W	Т	BW		
CL31B224KBFNNNE	3.20 ± 0.15	1.60 ± 0.15	1.25 ± 0.15	0.50 ± 0.30		

### C. Samsung Reliablility Test and Judgement Condition

	Judgement	Test condition			
Capacitance	Within specified tolerance	1 <sup>kHz</sup> ±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 1 hour and maintained in ambient air for 24±2 hours.			
Insulation 10,000Mohm or 500Mohm× <i>µ</i> F		Rated Voltage 60~120 sec.			
<b>Resistance</b> 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	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℃, 3±0.3sec.			
	·	(preheating : 80~120°C for 10~30sec.)			
Resistance to	Capacitance change : within ±7.5%	Solder pot : 270±5°C, 10±1sec.			
Soldering Heat	Tan δ, IR : initial spec.				
Vibration Test	Capacitance change : within $\pm$ 5% Tan $\delta$ , IR : initial spec.	Amplitude: 1.5mm From 10Hz to 55Hz (return: 1min.) 2hours × 3 direction (x, y, z)			
Moisture Resistance	Capacitance change : within $\pm 12.5\%$ Tan $\delta$ : 0.05 max IR : 500Mohm or 25Mohm × $\mu$ F	With rated voltage 40±2°C, 90∼95%RH, 500+12/-0hrs			
	Whichever is smaller				
High Temperature Resistance	Capacitance change : within $\pm 12.5\%$ Tan $\bar{\delta}$ : 0.05 max IR : 1,000Mohm or 50Mohm × $\mu$ F Whichever is smaller	With 200% of the rated voltage Max. operating temperature 1000+48/-0hrs			
Temperature Cycling	Capacitance change : within ±7.5% Tan δ, IR : initial spec.	1 cycle condition  Min. operating temperature → 25°C  → Max. operating temperature → 25°C  5 cycle test			

X The reliability test condition can be replaced by the corresponding accelerated test condition.

## D. Recommended Soldering method:

Reflow ( Reflow Peak Temperature : 260+0/-5 $^{\circ}$ C, 10sec. Max )



A 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.