



# **SPECIFICATION**

(Reference sheet)

· Supplier : Samsung electro-mechanics · Samsung P/N : CL31B225KBHNNNE

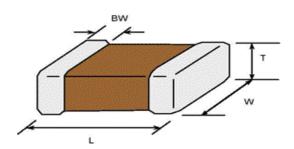
· Product : Multi-layer Ceramic Capacitor · Description : CAP, 2.2uF, 50V, ±10%, X7R, 1206

## A. Samsung Part Number

<u>CL</u> <u>31</u> <u>B</u> <u>225</u> <u>K</u> <u>B</u> <u>H</u> <u>N</u> <u>N</u> <u>N</u> <u>E</u> 1 2 3 4 5 6 7 8 9 10 11

1	Series	Samsung Multi-layer Ceramic Capacitor				
2	Size	1206 (inch code)	L: 3.20	± 0.20 mm	W:	1.60 ± 0.20 mm
3	Dielectric	X7R	8	Inner electrode		Ni
4	Capacitance	2.2 uF		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	$1.60 \pm 0.20 \; \text{mm}$	11	Packaging		Embossed Type, 7" reel

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



Samsung P/N	Dimension(mm)						
Samsung F/N	L	W	Т	BW			
CL31B225KBHNNNE	3.20 ± 0.20	1.60 ± 0.20	1.60 ± 0.20	0.50 ± 0.30			

#### C. Samsung Reliablility Test and Judgement Condition

	Judgement	Test condition			
Capacitance	Within specified tolerance	1kHz ±10% / 1.0±0.2Vrms			
Tan δ (DF)	0.1 max.	*A capacitor prior to measuring the capacitance is heat treated at 150°C+0/-10°C for 1 hour and maintained in ambient air for 24±2 hours.			
Insulation 10,000Mohm or 100Mohm×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			
/oltage 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 ± 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: 0.125 max	40±2°C, 90~95%RH, 500+12/-0hrs			
	IR: 500Mohm or 12.5Mohm × $\mu$ F				
	Whichever is smaller				
High Temperature	Capacitance change: within ±12.5%	With 150% of the rated voltage			
Resistance	Tan δ: 0.125 max	Max. operating temperature			
	IR : 1,000Mohm or 25Mohm × <i>μ</i> F	1,000+48/-0hrs			
	Whichever is smaller				
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			
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X The reliability test condition can be replaced by the corresponding accelerated test condition.

### D. Recommended Soldering method:

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



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.