



# **SPECIFICATION**

(Reference sheet)

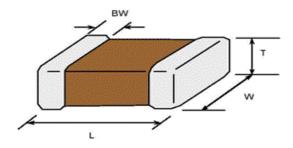
· Supplier : Samsung electro-mechanics · Samsung P/N: CL10B224KA8NNNC

· Product : Multi-layer Ceramic Capacitor · Description : CAP, 220nF, 25V, ±10%, X7R, 0603

### A. Samsung Part Number

1	Series	Samsung Multi-layer Ceramic Capacitor						
2	Size	0603 (inch code)	L: 1.60 ± 0.10 mm		W:	$0.80 \pm 0.10$ 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	25 V	10	Special		Reserved for future use		
7	Thickness	$0.80 \pm 0.10$ mm	11)	Packaging		Cardboard Type, 7" reel		

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



Samouna D/N	Dimension(mm)					
Samsung P/N	L	W	Т	BW		
CL10B224KA8NNNC	1.60 ± 0.10	0.80 ± 0.10	0.80 ± 0.10	0.30 ± 0.20		

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

Tan δ (DF)0.1 max.treated at 150 ℃ +0/-10 ℃ for 1 ho ambient air for 24±2 hours.Insulation10,000Mohm or 100Mohm×μFRated Voltage60~120 sec.ResistanceWhichever is smallerMicroscope (×10)				
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Resistance       Whichever is smaller         Appearance       No abnormal exterior appearance       Microscope (×10)	*A capacitor prior to measuring the capacitance is heat treated at $150^{\circ}C+0/-10^{\circ}C$ for 1 hour and maintained in ambient air for 24±2 hours.			
Appearance No abnormal exterior appearance Microscope (×10)				
With standing No dislocation broaded was a 250% of the rested vallence				
Withstanding   No dielectric breakdown or   250% of the rated voltage	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.	T .			
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 10~30	sec.)			
Resistance to Capacitance change: within ±7.5% Solder pot : 270±5°C, 10±1sec.				
Soldering Heat Tan δ, IR : initial spec.				
Vibration TestCapacitance change : within $\pm$ 5%Amplitude : 1.5mmTan δ, IR : initial spec.From 10Hz to 55Hz (return : 1min. 2hours $\times$ 3 direction (x, y, z)	)			
Moisture Capacitance change: within ±12.5% With rated voltage				
<b>Resistance</b> Tan δ : 0.125 max 40±2°C, 90~95%RH, 500+12/-0hr	rs			
IR: 500Mohm or 12.5Mohm × μF  Whichever is smaller				
High Temperature Capacitance change: within ±12.5% With 150% of the rated voltage	ge			
Resistance       Tan δ : 0.125 max       Max. operating temperature				
IR: 1,000Mohm or 25Mohm × $\mu$ F 1000+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	e → 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.

# 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