

# SPECIFICATION

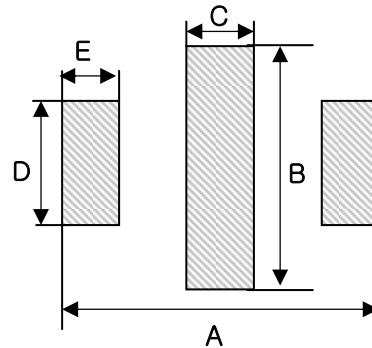
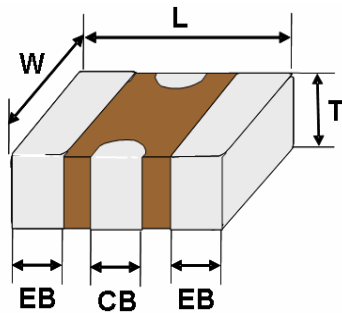
- **Supplier :** Samsung electro-mechanics
- **Product :** Multi-layer Ceramic Capacitor
- **Part Number :** **CL21B223MB8NXNC**
- **Discription :** Cap, 22nF, 50V, ±20%, X7R, 0805

## A. Samsung Part Number

CL  
 21  
 B  
 223  
 M  
 B  
 8  
 N  
 X  
 N  
 C  
 ①      ②      ③      ④      ⑤      ⑥      ⑦      ⑧      ⑨      ⑩      ⑪

① <b>Series</b>	Samsung Multi-layer Ceramic Capacitor		
② <b>Size</b>	0805 (inch code)	L: 2.0 ±0.15mm	W: 1.25 ±0.15 mm
③ <b>Dielectric</b>	X7R	⑧ <b>Inner electrode</b>	Ni
④ <b>Capacitance</b>	22 nF	<b>Termination</b>	Cu
⑤ <b>Capacitance tolerance</b>	±20 %	<b>Plating</b>	Sn 100% (Pb Free)
⑥ <b>Rated Voltage</b>	50 V	⑨ <b>Product</b>	X2Y
⑦ <b>Thickness</b>	0.8 ±0.1 mm	⑩ <b>Special</b>	Reserved for future use
		⑪ <b>Packaging</b>	Cardboard Type, 7" reel

## B. Structure and Dimensions:



<Recommended Land pattern design>

	Dimmension(mm)
<b>L</b>	2.0 ± 0.15
<b>W</b>	1.25 ± 0.15
<b>T</b>	0.8 ± 0.1
<b>CB</b>	0.6 ± 0.2
<b>EB</b>	0.3 ± 0.2

	Dimmension(mm)
<b>A</b>	3.05
<b>B</b>	2.03
<b>C</b>	0.56
<b>D</b>	1.27
<b>E</b>	0.89

### C. Samsung Reliability Test and Judgement condition

	Judgement	Test condition
<b>Capacitance</b>	Within specified tolerance	1kHz±10%      1.0±0.2Vrms
<b>Tan δ (DF)</b>	0.025 max.	
<b>Insulation Resistance</b>	10,000MΩ min.	Rated Voltage      60~120 sec.
<b>Appearance</b>	No abnormal exterior appearance	Microscope (×10)
<b>Withstanding Voltage</b>	No dielectric breakdown or mechanical breakdown	250% of the rated voltage
<b>Temperature Characterisitcs</b>	X5R (From -55℃ to 85℃, Capacitance change should be within ±15%)	
<b>Adhesive Strength of Termination</b>	No peeling shall be occur on the terminal electrode	500g·F, for 10±1 sec.
<b>Bending Strength</b>	Capacitance change :      within ±12.5%	Bending to the limit (1mm) for 5 sec. with 1.0mm/sec.
<b>Solderability</b>	More than 75% of terminal surface is to be soldered newly	1) Sn63Pb37 solder 235±5℃, 5±0.5sec. 2) SnAg3.0Cu0.5 solder 245±5℃, 3±0.3sec. (preheating : 80~120℃ for 10~30sec.)
<b>Resistance to Soldering heat</b>	Capacitance change :      within ±7.5% Tan δ, IR : initial spec.	Solder pot : 270±5℃, 10±1sec.
<b>Vibration Test</b>	Capacitance change :      within ±5% Tan δ, IR : initial spec.	Amplitude : 1.5mm From 10Hz to 55Hz (return : 1min.) 2hours × 3 direction (x, y, z)
<b>Humidity</b>	Capacitance change :      within ±12.5% Tan δ :    0.05 max IR : 1,000MΩ min.	40±2℃, 90~95%RH, 500+12/-0hrs
<b>Moisture Resistance</b>	Capacitance change :      within ±12.5% Tan δ :    0.05 max IR : 500MΩ min.	With rated voltage 40±2℃, 90~95%RH, 500+12/-0hrs Note : Since the residue of flux may affect resistivity, it is recommended to use proper solder paste and cleaning fluid to remove flux residue thoroughly.
<b>High Temperature Resistance</b>	Capacitance change :      within ±12.5% Tan δ :    0.05 max IR : 1,000MΩ min.	With 200% of the rated voltage Max. operating temperature 1000+48/-0hrs
<b>Temperature Cycling</b>	Capacitance change :      within ±7.5% Tan δ, IR : initial spec.	1 cycle condition Min. operating temperature → 25℃ → Max. operating temperature → 25℃ 5 cycle test

### D. Recommended Soldering method :

Reflow ( Reflow Peak Temperature : 260+0/-5℃, 10sec. max. )

# Multi Layer Ceramic Capacitor (MLCC)

## I. Electrical Characteristics Data

1. Model : CL21B223MB8NXNC

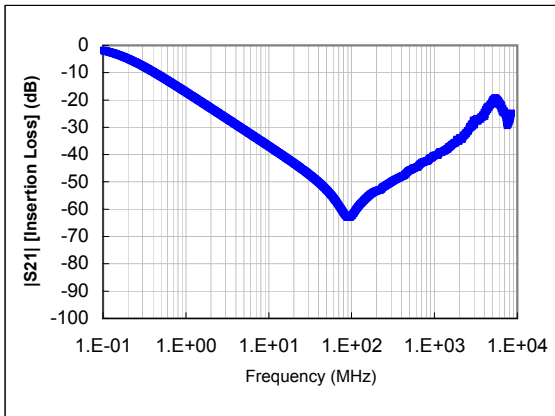
2. Description

Part no.	Size (inch(mm))	Thickness (mm)	Temperature characteristics	Capacitance value(nF)	Capacitance tolerance(%)	Voltage (V)
CL21B223MB8NXNC	0805/2012	0.8mm	X7R	22nF	± 20 %	50

3. Characteristics Data

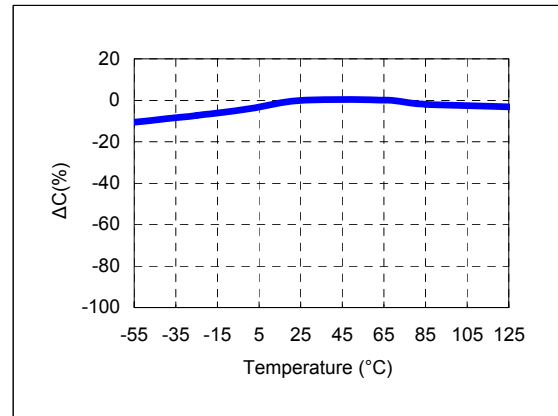
1) Frequency Characteristics

Agilent 5071A , 0.3MHz to 8.5GHz



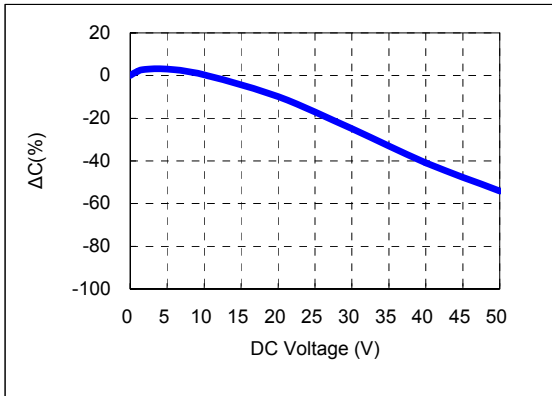
2) Temperature Characteristics (TCC)

Agilent 4284A, 1kHz, 1.0Vrms



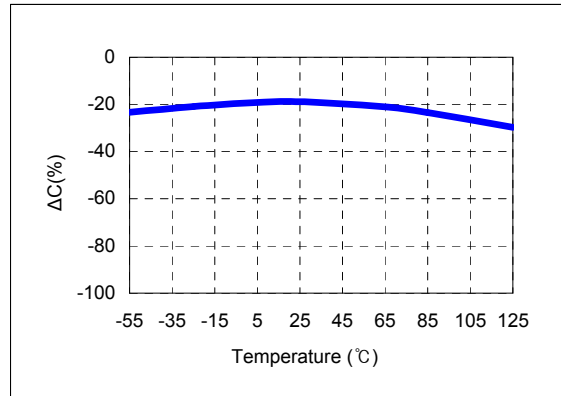
3) DC Bias Characteristics

Quadtech 7600, 1kHz, 1Vrms



4) Bias TCC characteristics

Agilent 4284A, 1kHz, 1.0Vrms, 25Vdc



5) AC Voltage Characteristics

Agilent 4284A, 1kHz

