



# SPECIFICATION

(Reference sheet)

- Supplier : Samsung electro-mechanics
- Product : Multi-layer Ceramic Capacitor

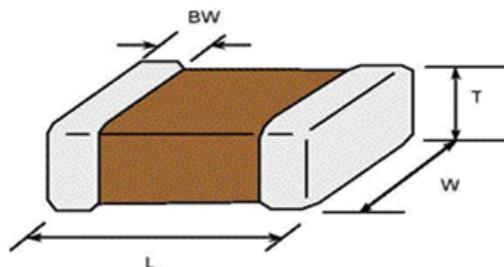
- Samsung P/N : CL10C220GB8NNNC
- Description : CAP, 22pF, 50V, ± 2%, C0G, 0603

## A. Samsung Part Number

CL 10 C 220 G B 8 N N N C  
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

① Series	Samsung Multi-layer Ceramic Capacitor		
② Size	0603 (inch code)	L: $1.60 \pm 0.10$ mm	W: $0.80 \pm 0.10$ mm
③ Dielectric	C0G	⑧ Inner electrode	Ni
④ Capacitance	22 pF	Termination	Cu
⑤ Capacitance tolerance	± 2%	Plating	Sn 100% (Pb Free)
⑥ Rated Voltage	50 V	⑨ Product	Normal
⑦ Thickness	$0.80 \pm 0.10$ mm	⑩ Special	Reserved for future use
		⑪ Packaging	Cardboard Type, 7" reel

## B. Structure and dimension



Samsung P/N (Lead Free)	Dimension(mm)			
	L	W	T	BW
CL10C220GB8NNNC	$1.60 \pm 0.10$	$0.80 \pm 0.10$	$0.80 \pm 0.10$	$0.30 \pm 0.20$

### C. Samsung Reliability Test and Judgement condition

	Performance	Test condition
<b>Capacitance</b>	Within specified tolerance	$1\text{MHz}\pm10\%$ / 0.5~5Vrms
<b>Q</b>	840 min	
<b>Insulation Resistance</b>	10,000Mohm or $500\text{Mohm}\times\mu\text{F}$ Whichever is smaller	Rated Voltage 60~120 sec.
<b>Appearance</b>	No abnormal exterior appearance	Microscop (X10)
<b>Withstanding Voltage</b>	No dielectric breakdown or mechanical breakdown	300% of the rated voltage
<b>Temperature Characteristics</b>	C0G (From -55°C to 125°C, Capacitance change should be within $\pm30\text{PPM}/\text{°C}$ )	
<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 $\pm5\%$ or $\pm0.5\text{pF}$ whichever is larger	Bending to the limit (1mm) with 1.0mm/sec.
<b>Solderability</b>	More than 75% of terminal surface is to be soldered newly	SnAg3.0Cu0.5 solder 245±5°C, 3±0.3sec. (preheating : 80~120°C for 10~30sec.)
<b>Resistance to Soldering heat</b>	Capacitance change : within $\pm2.5\%$ or $\pm0.25\text{pF}$ whichever is larger Tan δ, IR : initial spec.	Solder pot : 270±5°C, 10±1sec.
<b>Vibration Test</b>	Capacitance change : within $\pm2.5\%$ or $\pm0.25\text{pF}$ whichever is larger Tan δ, IR : initial spec.	Amplitude : 1.5mm From 10Hz to 55Hz (return : 1min.) 2hours ' 3 direction (x, y, z)
<b>Moisture Resistance</b>	Capacitance change : within $\pm7.5\%$ or $\pm0.75\text{pF}$ whichever is larger Q : 173.33 min IR : 500Mohm or $25\text{Mohm}\times\mu\text{F}$ Whichever is smaller	With rated voltage 40±2°C, 90~95%RH, 500+12/-0hrs
<b>High Temperature Resistance</b>	Capacitance change : within $\pm3\%$ or $\pm0.3\text{pF}$ whichever is larger Q : 330 min IR : 1,000Mohm or $50\text{Mohm}\times\mu\text{F}$ Whichever is smaller	With 200% of the rated voltage Max. operating temperature 1000+48/-0hrs
<b>Temperature Cycling</b>	Capacitance change : within $\pm2.5\%$ or $\pm0.25\text{pF}$ whichever is larger Tan δ, IR : initial spec.	1 cycle condition Min. operating temperature → 25°C → Max. operating temperature → 25°C  5 cycle test

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

### D. Recommended Soldering method :

Reflow ( Reflow Peak Temperature : 260+0/-5°C, 10sec. Max )

 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.

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- ② Automotive or Transportation equipment (vehicles, trains, ships, etc)*
- ③ Medical equipment*
- ④ Military equipment*
- ⑤ Disaster prevention/crime prevention equipment*
- ⑥ Any other applications with the same as or similar complexity or reliability to the applications set forth above.*