



# **SPECIFICATION**

(Reference sheet)

- Supplier : Samsung electro-mechanics - Samsung P/N : CL10C090DB8NNNC

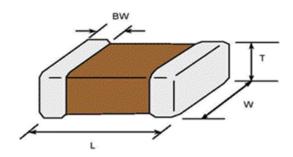
• Product : Multi-layer Ceramic Capacitor • Description : CAP, 9pF, 50V, ± 0.5pF, C0G, 0603

# A. Samsung Part Number

<u>CL</u> <u>10</u> <u>C</u> <u>090</u> <u>D</u> <u>B</u> <u>8</u> <u>N</u> <u>N</u> <u>N</u> <u>C</u> ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

① S	Series	Samsung Multi-layer Ceramic Capacitor				
② S	Size	0603 (inch code)	L: 1.60 ± 0.10 mm	W: 0.80 ± 0.10 mm		
3 D	Dielectric	C0G	Inner electrode	Ni		
4 C	Capacitance	<b>9</b> pF	Termination	Cu		
⑤ C	Capacitance	<b>±</b> 0.5 pF	Plating	Sn 100% (Pb Free)		
to	olerance		9 Product	Normal		
6 R	Rated Voltage	50 V	<b>⑩</b> Special	Reserved for future use		
<b>⑦</b> T	Thickness	0.80 ± 0.10 mm	① Packaging	Cardboard Type, 7" reel		

### B. Structure and dimension



Samsung P/N	Dimension(mm)				
(Lead Free)	L	W	Т	BW	
CL10C090DB8NNNC	1.60 ± 0.10	0.80 ± 0.10	0.80 ± 0.10	0.30 ± 0.20	

#### C. Samsung Reliability Test and Judgement condition

Capacitance       Within specified tolerance       1Mt±10%       0.5~5Vrms         Q       580 min       Rated Voltage       60~120 sec.         Insulation       10,000Mohm or 500Mohm×μF       Rated Voltage       60~120 sec.         Resistance       Whichever is smaller       Microscope (*10)         Appearance       No abnormal exterior appearance       Microscope (*10)         Withstanding       No dielectric breakdown or       300% of the rated voltage         Voltage       mechanical breakdown       COG         Characteristics       (From -55 °C to 125 °C, Capacitance change should be within ±30PPM/°C)         Adhesive Strength of Termination       No peeling shall be occur on the terminal electrode       500g×F, for 10±1 sec.         Bending Strength       Capacitance change : with 1.0mm/sec.       Bending to the limit (1mm) with 1.0mm/sec.		Performance	Test condition			
Insulation10,000Mohm or 500Mohm×µFRated Voltage60~120 sec.ResistanceWhichever is smallerMicroscope (′10)AppearanceNo abnormal exterior appearanceMicroscope (′10)WithstandingNo dielectric breakdown or wechanical breakdown300% of the rated voltageTemperatureC0GCharacteristics(From -55 °C to 125 °C, Capacitance change should be within ±30PPM/°C)Adhesive Strength of TerminationNo peeling shall be occur on the terminal electrode500g×F, for 10±1 sec.Bending StrengthCapacitance change : with 1.0mm/sec.Bending to the limit (1mm) within ±5% or ±0.5pF whichever is larger	Capacitance	Within specified tolerance	1Mb±10% 0.5~5Vrms			
Resistance       Whichever is smaller         Appearance       No abnormal exterior appearance       Microscope (*10)         Withstanding       No dielectric breakdown or mechanical breakdown       300% of the rated voltage         Temperature       C0G         Characteristics       (From -55℃ to 125℃, Capacitance change should be within ±30PPM/℃)         Adhesive Strength of Termination       No peeling shall be occur on the terminal electrode       500g×F, for 10±1 sec.         Bending Strength       Capacitance change : minute change : with 1.0mm/sec.       Bending to the limit (1mm) within ±5% or ±0.5pF whichever is larger						
Appearance       No abnormal exterior appearance       Microscope (′10)         Withstanding       No dielectric breakdown or mechanical breakdown       300% of the rated voltage         Temperature       C0G         Characteristics       (From -55 ℃ to 125 ℃, Capacitance change should be within ±30PPM/ ℃)         Adhesive Strength of Termination       No peeling shall be occur on the terminal electrode       500g×F, for 10±1 sec.         Bending Strength within ±5% or ±0.5 pF whichever is larger       Bending to the limit (1mm) with 1.0mm/sec.	Insulation	10,000Mohm or 500Mohm×µF	Rated Voltage 60~120 sec.			
Withstanding       No dielectric breakdown or mechanical breakdown       300% of the rated voltage         Temperature       C0G         Characteristics       (From -55℃ to 125℃, Capacitance change should be within ±30PPM/℃)         Adhesive Strength of Termination       No peeling shall be occur on the terminal electrode         Bending Strength       Capacitance change : with 1.0mm/sec.         Within ±5% or ±0.5pF whichever is larger       with 1.0mm/sec.	Resistance	Whichever is smaller				
Voltage       mechanical breakdown         Temperature       C0G         Characteristics       (From -55 °C to 125 °C, Capacitance change should be within ±30PPM/ °C)         Adhesive Strength of Termination       No peeling shall be occur on the terminal electrode       500g×F, for 10±1 sec.         Bending Strength       Capacitance change : with 1.0mm/sec.       Bending to the limit (1mm) within ±5% or ±0.5 pF whichever is larger	Appearance	No abnormal exterior appearance	Microscope ('10)			
Temperature       C0G         Characteristics       (From -55 ℃ to 125 ℃, Capacitance change should be within ±30PPM/ ℃)         Adhesive Strength of Termination       No peeling shall be occur on the terminal electrode         Bending Strength       Capacitance change : with 1.0mm/sec.         Within ±5% or ±0.5 pF whichever is larger       with 1.0mm/sec.	Withstanding	No dielectric breakdown or	300% of the rated voltage			
Characteristics       (From -55 °C to 125 °C, Capacitance change should be within ±30PPM/ °C)         Adhesive Strength of Termination       No peeling shall be occur on the terminal electrode       500g×F, for 10±1 sec.         Bending Strength within ±5% or ±0.5 pF whichever is larger       Bending to the limit (1mm) with 1.0mm/sec.	Voltage	mechanical breakdown				
Adhesive Strength of Termination  Bending Strength  Capacitance change:  within ±5% or ±0.5pF whichever is larger  No peeling shall be occur on the 500g×F, for 10±1 sec.  Bending Strength  Soug×F, for 10±1 sec.  Bending to the limit (1mm)  with 1.0mm/sec.	Temperature C0G					
of Termination       terminal electrode         Bending Strength       Capacitance change : within ±5% or ±0.5 pF whichever is larger       Bending to the limit (1mm) with 1.0mm/sec.	Characteristics	(From -55℃ to 125℃, Capacitance change should be within ±30PPM/℃)				
Bending Strength Capacitance change : Bending to the limit (1mm) within ±5% or ±0.5 pF whichever is larger with 1.0mm/sec.	Adhesive Strength	No peeling shall be occur on the	500g×F, for 10±1 sec.			
within ±5% or ±0.5pF whichever is larger with 1.0mm/sec.	of Termination	terminal electrode				
1 1111 111 111 111	Bending Strength	Capacitance change :	Bending to the limit (1mm)			
		within ±5% or ±0.5pF whichever is larger	with 1.0mm/sec.			
Solderability   More than 75% of terminal surface   SnAg3.0Cu0.5 solder	Solderability	More than 75% of terminal surface	SnAg3.0Cu0.5 solder			
is to be soldered newly 245±5°C, 3±0.3sec.		is to be soldered newly	245±5℃, 3±0.3sec.			
(preheating : 80~120 ℃ for 10~30sec.)			(preheating : 80~120 ℃ for 10~30sec.)			
Resistance to Capacitance change : Solder pot : 270±5°C, 10±1sec.	Resistance to	Capacitance change :	Solder pot : 270±5℃, 10±1sec.			
Soldering heat within ±2.5% or ±0.25pF whichever is larger	Soldering heat	within ±2.5% or ±0.25pF whichever is larger				
Tan δ, IR : initial spec.		Tan δ, IR : initial spec.				
Vibration Test Capacitance change : Amplitude : 1.5mm	Vibration Test	Capacitance change :	Amplitude : 1.5mm			
within ±2.5% or ±0.25pF whichever is larger From 10Hz to 55Hz (return : 1min.)		within ±2.5% or ±0.25pF whichever is larger	From 10Hz to 55Hz (return : 1min.)			
Tan δ, IR: initial spec. 2hours ´3 direction (x, y, z)		Tan δ, IR : initial spec.	2hours ´ 3 direction (x, y, z)			
Moisture Capacitance change : With rated voltage	Moisture	Capacitance change :				
Resistance within ±7.5% or ±0.75pF whichever is larger 40±2°C, 90~95%RH, 500+12/-0hrs	Resistance	within ±7.5% or ±0.75pF whichever is larger	40±2℃, 90~95%RH, 500+12/-0hrs			
Q: 130 min		Q: 130 min				
IR : 500Mohm or 25Mohm × μΓ		IR: 500Mohm or 25Mohm × μF				
Whichever is smaller		Whichever is smaller				
High Temperature Capacitance change : With 200% of the rated voltage	High Temperature	Capacitance change :	With 200% of the rated voltage			
Resistance within ±3% or ±0.3 pF whichever is larger Max. operating temperature	Resistance	within ±3% or ±0.3pF whichever is larger	Max. operating temperature			
Q: 290 min 1000+48/-0hrs		Q: 290 min				
IR: 1,000Mohm or 50Mohm × $\mu$ F		IR : 1,000Mohm or 50Mohm × μF				
Whichever is smaller		Whichever is smaller				
Temperature Capacitance change : 1 cycle condition	Temperature	Capacitance change :	1 cycle condition			
Cycling within $\pm 2.5\%$ or $\pm 0.25 pF$ whichever is larger Min. operating temperature $\rightarrow$ 25 °C	-	within ±2.5% or ±0.25pF whichever is larger	Min. operating temperature → 25°C			
Tan δ, IR : initial spec. $\rightarrow$ Max. operating temperature $\rightarrow$ 25 °C		_				
5 cycle test			5 cycle test			

<sup>\*</sup> The reliability test condition can be replaced by the corresponding accelerated test condition.

# D. Recommended Soldering method:

Reflow ( Reflow Peak Temperature : 260+0/-5℃, 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.