



## SPECIFICATION

- · Supplier : Samsung electro-mechanics
- Product : Multi-layer Ceramic Capacitor
- · Samsung P/N:
- CL03B222KP3NNND

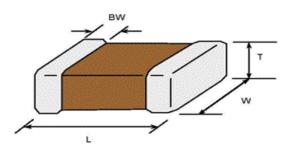
(Reference sheet)

- · Description :
- CAP, 2.2nF, 10V, ±10%, X7R, 0201

A. Samsung Part Number

		<u>CL</u> ①	<u>03</u> ②	<u>B</u> 3	<u>222</u> ④	<u>K</u> 5	<u>P</u> 6	<u>3</u> 7	<u>N</u> 8	<u>N</u> 9	<u>N</u> 10	<b>D</b> (1)	
1	Series	Samsung Multi-layer Ceramic Capacitor											
2	Size	0201 (inch c	ode)		L: $0.60 \pm 0.03$ mm			W:	$0.30 \pm 0.03 \text{ mm}$				
3	Dielectric	X7R			Inner electrode				Ni				
4	Capacitance	2.2 nF					Term	inatio	on			Cu	
5	Capacitance	±10 %					Platir	ng				Sn 100%	(Pb Free)
	tolerance					9	Prod	uct				Normal	
6	Rated Voltage	10 V				10	Spec	ial				Reserved fo	r future use
$\bigcirc$	Thickness	$0.30 \pm 0.03$ mr	n		① Packaging				Cardboard Type, 13" reel				

## **B. Structure & Dimension**



Samsung D/N	Dimension(mm)							
Samsung P/N	L	W	Т	BW				
CL03B222KP3NNND	0.60 ± 0.03	0.30 ± 0.03	0.30 ± 0.03	0.15 ± 0.05				

## C. Samsung Reliablility Test and Judgement Condition

	Judgement	Test condition				
Capacitance	Within specified tolerance	1 <sup>kHz</sup> ±10% / 1.0±0.2Vrms				
Tan δ (DF)	0.05 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× <i>μ</i> F	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				
Voltage	mechanical breakdown					
Temperature	X7R					
Characteristics	(From-55℃ to 125℃, Capacitance chang	e should be within ±15%)				
Adhesive Strength	No peeling shall be occur on the	200g·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°C, 3±0.3sec.				
		(preheating : 80~120℃ for 10~30sec.)				
Resistance to	Capacitance change : within ±7.5%	Solder pot : 270±5℃, 10±1sec.				
Soldering Heat	Tan δ, IR : initial spec.					
Vibration Test	Capacitance change : within $\pm 5\%$ Tan $\delta$ , 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: 0.075 max	40±2℃, 90~95%RH, 500+12/-0hrs				
	IR : 500Mohm or 25Mohm × <sup>µF</sup>					
	Whichever is smaller					
High Temperature	Capacitance change : within ±12.5%	With 200% of the rated voltage				
Resistance	Tan δ: 0.075 max	Max. operating temperature				
	IR : 1,000Mohm or 50Mohm × <i>μ</i> 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 $\rightarrow 25^{\circ}C$				
-		→ Max. operating temperature → $25^{\circ}$ 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°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.