



# SPECIFICATION

- · Supplier : Samsung electro-mechanics
- Product : Multi-layer Ceramic Capacitor
- · Samsung P/N:
- CL05B103KA5NNNC

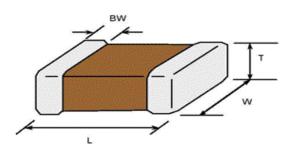
(Reference sheet)

- · Description :
- CAP, 10nF, 25V, ±10%, X7R, 0402

A. Samsung Part Number

			<u>5</u> <u>B</u> 2 3	<u>103</u> <u>K</u> ④ ⑤		<u>5</u> 7	<u>N</u> 8	<u>N</u> 9	<u>N</u> 10	<mark>C</mark> 1
1	Series	Samsung Multi-la	yer Ce	eramic Capa	citor					
2	Size	0402 (inch code	e)	L: 1.00	0 ± 0.05	5 mm			W:	$0.50\pm0.05~\text{mm}$
3	Dielectric	X7R		8	Inne	r elect	trode			Ni
4	Capacitance	10 nF			Term	ninatio	on			Cu
5	Capacitance	±10 %			Plati	ng				Sn 100% (Pb Free)
	tolerance			9	Prod	uct				Normal
6	Rated Voltage	25 V		10	Spec	cial				Reserved for future use
$\bigcirc$	Thickness	$0.50 \pm 0.05$ mm		Ű	Pack	aging	I			Cardboard Type, 7" reel

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



Samsung P/N	Dimension(mm)							
Sallisung F/N	L	W	Т	BW				
CL05B103KA5NNNC	1.00 ± 0.05	0.50 ± 0.05	0.50 ± 0.05	0.25 ± 0.10				

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

Tan δ (DF)0.025 m.Insulation10,000 McResistanceWhichevAppearanceNo abnorWithstandingNo dielecVoltagemechanicTemperatureX7RCharacteristics(From-55Adhesive StrengthNo peelinof Terminationterminal eBending StrengthCapacitarSolderabilityMore tharResistance toCapacitarSoldering HeatTan δ, IRVibration TestCapacitarResistanceIan δ, IRMoistureCapacitarResistanceIan δ, IRMoistureCapacitarResistanceIan δ, IR	ohm or 500Mohm×µF er is smaller mal exterior appearance tric breakdown or al breakdown <u>°C to 125°C, Capacitance chang</u> g shall be occur on the electrode nce change : within ±12.5%	1kHz ±10% / 1.0±0.2Vrms         *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.         Rated Voltage       60~120 sec.         Microscope (×10)       250% of the rated voltage         e should be within ±15%)       500g·f, for 10±1 sec.         Bending to the limit (1mm) with 1.0mm/sec.
Insulation10,000MoResistanceWhichevAppearanceNo abnorWithstandingNo dielectVoltagemechanicTemperatureX7RCharacteristics(From-55Adhesive StrengthNo peelinof Terminationterminal eBending StrengthCapacitarSolderabilityMore thatSoldering HeatTan δ, IRVibration TestCapacitarTan δ, IRCapacitarTan δ, IRIRSolderung HeatTan δ, IRSolderung HeatTan δ, IRSolderung HeatTan δ, IR	ohm or 500Mohm×µF er is smaller mal exterior appearance tric breakdown or al breakdown <u>°C to 125°C, Capacitance chang</u> g shall be occur on the electrode nce change : within ±12.5%	treated at 150°C+0/-10°C for 1 hour and maintained in ambient air for 24±2 hours.         Rated Voltage       60~120 sec.         Microscope (×10)       250% of the rated voltage         e should be within ±15%)       500g·f, for 10±1 sec.         Bending to the limit (1mm)
Resistance       Whichev         Appearance       No abnor         Withstanding       No dielector         Voltage       mechanic         Temperature       X7R         Characteristics       (From-55)         Adhesive Strength       No peelin         of Termination       terminal e         Bending Strength       Capacitar         Solderability       More than         is to be so       Soldering Heat         Vibration Test       Capacitar         Resistance       Capacitar         Tan ō, IR       Moisture         Resistance       Tan ō :         IR :       50	er is smaller mal exterior appearance tric breakdown or al breakdown <u>°C to 125°C, Capacitance chang</u> g shall be occur on the electrode nce change : within ±12.5%	Microscope (×10)         250% of the rated voltage         e should be within ±15%)         500g·f, for 10±1 sec.         Bending to the limit (1mm)
AppearanceNo abnorWithstandingNo dielectVoltagemechanicTemperatureX7RCharacteristics(From-55Adhesive StrengthNo peelinof Terminationterminal etBending StrengthCapacitanSolderabilityMore thanResistance toCapacitanSoldering HeatTan δ, IRVibration TestCapacitanMoistureCapacitanResistanceIR :Soldering HeatSoldering Heat	mal exterior appearance tric breakdown or al breakdown <u>°C to 125°C, Capacitance chang</u> g shall be occur on the electrode nce change : within ±12.5%	250% of the rated voltage e should be within ±15%) 500g·f, for 10±1 sec. Bending to the limit (1mm)
Withstanding       No dielection         Voltage       mechanic         Temperature       X7R         Characteristics       (From-55         Adhesive Strength       No peelin         of Termination       terminal eterminal etermin	tric breakdown or al breakdown <u>°C to 125°C, Capacitance chang</u> g shall be occur on the electrode nce change : within ±12.5%	250% of the rated voltage e should be within ±15%) 500g·f, for 10±1 sec. Bending to the limit (1mm)
Voltage       mechanic         Temperature       X7R         Characteristics       (From-55         Adhesive Strength       No peelin         of Termination       terminal e         Bending Strength       Capacitar         Solderability       More than         Solderability       More than         Soldering Heat       Tan δ, IR         Vibration Test       Capacitar         Resistance       Tan δ, IR         Moisture       Capacitar         Resistance       Tan δ, IR         Moisture       Capacitar         Resistance       Tan δ, IR	al breakdown <sup>°</sup> C to 125 <sup>°</sup> C, Capacitance chang g shall be occur on the electrode nce change : within ±12.5% n 75% of terminal surface	e should be within ±15%) 500g·f, for 10±1 sec. Bending to the limit (1mm)
Temperature       X7R         Characteristics       (From-55         Adhesive Strength       No peelin         of Termination       terminal e         Bending Strength       Capacitar         Solderability       More thar         Resistance to       Capacitar         Soldering Heat       Tan δ, IR         Vibration Test       Capacitar         Resistance       Ian ō, IR         Moisture       Capacitar         Resistance       Ian ō, IR         Moisture       Capacitar         IR :       50	℃ to 125℃, Capacitance chang g shall be occur on the electrode nce change : within ±12.5%	500g·f, for 10±1 sec. Bending to the limit (1mm)
Characteristics       (From-55         Adhesive Strength       No peelin         of Termination       terminal e         Bending Strength       Capacitar         Solderability       More than         Solderability       More than         Resistance to       Capacitar         Soldering Heat       Tan δ, IR         Vibration Test       Capacitar         Moisture       Capacitar         Resistance       IR :       50	g shall be occur on the electrode nce change : within ±12.5%	500g·f, for 10±1 sec. Bending to the limit (1mm)
Adhesive Strength of Termination       No peelin terminal e         Bending Strength       Capacitar         Solderability       More than is to be so         Resistance to       Capacitar         Soldering Heat       Tan δ, IR         Vibration Test       Capacitar         Resistance       Tan δ, IR         Image: Strength       Capacitar         Soldering Heat       Tan δ, IR         Vibration Test       Capacitar         Tan δ, IR       Tan δ, IR         Moisture       Capacitar         Resistance       Tan δ :         IR :       50	g shall be occur on the electrode nce change : within ±12.5%	500g·f, for 10±1 sec. Bending to the limit (1mm)
of Termination       terminal e         Bending Strength       Capacitar         Solderability       More than is to be so         Resistance to       Capacitar         Soldering Heat       Tan δ, IR         Vibration Test       Capacitar         Resistance       Tan δ, IR         Moisture       Capacitar         Resistance       Tan δ, IR         Moisture       Capacitar         IR :       50	nce change : within ±12.5%	Bending to the limit (1mm)
Bending Strength       Capacitan         Solderability       More than         Solderability       More than         Resistance to       Capacitan         Soldering Heat       Tan δ, IR         Vibration Test       Capacitan         Resistance       Capacitan         Tan δ, IR       Tan δ, IR         Moisture       Capacitan         Resistance       Tan δ :         IR :       50	nce change : within ±12.5%	
Solderability       More that is to be soldering         Resistance to       Capacitar         Soldering Heat       Tan δ, IR         Vibration Test       Capacitar         Tan δ, IR       Tan δ, IR         Moisture       Capacitar         Resistance       Tan δ, IR         IR :       50	n 75% of terminal surface	
Resistance to       Capacitar         Soldering Heat       Tan δ, IR         Vibration Test       Capacitar         Tan δ, IR       Tan δ, IR         Moisture       Capacitar         Resistance       Tan δ :         IR :       50		with 1.0mm/sec.
Resistance to       Capacitar         Soldering Heat       Tan δ, IR         Vibration Test       Capacitar         Tan δ, IR       Tan δ, IR         Moisture       Capacitar         Resistance       Tan δ :         IR :       50		
Resistance to       Capacitar         Soldering Heat       Tan δ, IR         Vibration Test       Capacitar         Tan δ, IR       Tan δ, IR         Moisture       Capacitar         Resistance       Tan δ :         IR :       50		SnAg3.0Cu0.5 solder
Soldering Heat       Tan δ, IR         Vibration Test       Capacitar         Tan δ, IR         Moisture       Capacitar         Resistance       Tan δ :         IR :       50	oldered newly	245±5°C, 3±0.3sec.
Soldering Heat       Tan δ, IR         Vibration Test       Capacitar         Moisture       Capacitar         Resistance       Tan δ :         IR :       50		(preheating : 80~120℃ for 10~30sec.)
Vibration Test       Capacitar         Tan δ, IR         Moisture       Capacitar         Resistance       Tan δ :         IR :       50	nce change : within ±7.5%	Solder pot : 270±5℃, 10±1sec.
Moisture         Capacitar           Resistance         Tan δ :           IR :         50	: initial spec.	
Resistance         Tan δ :           IR :         50	nce change : within ± 5% : initial spec.	Amplitude : 1.5mm From 10Hz to 55Hz (return : 1min.) 2hours × 3 direction (x, y, z)
IR : 50	nce change : within ±12.5%	With rated voltage
	0.05 max	40±2°C, 90~95%RH, 500+12/-0hrs
W	00Mohm or 25Mohm × $\mu$ F	
	hichever is smaller	
High Temperature Capacitar	nce change : within ±12.5%	With 200% of the rated voltage
	0.05 max	Max. operating temperature
	000Mohm or 50Mohm × <i>μ</i> F hichever is smaller	1000+48/-0hrs
Temperature Capacitar	nce change : within ±7.5%	1 cycle condition
-	ioconange. within ±1.0/0	Min. operating temperature $\rightarrow 25^{\circ}$ C
	: initial spec.	
	•	$\rightarrow$ Max. operating temperature $\rightarrow$ 25°C
	•	

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.

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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
- Ø Power plant control equipment
- ⑦ Atomic energy-related equipment
- Indersea equipment
- Itraffic signal equipment
- Data-processing equipment
- ① Electric heating apparatus, burning equipment
- ② Safety equipment
- 13 Any other applications with the same as or similar complexity or reliability to the applications