



SPECIFICATION

- · Supplier : Samsung electro-mechanics
- Product : Multi-layer Ceramic Capacitor
- · Samsung P/N :
- CL21A105KPFNNNE

(Reference sheet)

- · Description :
- CAP, 1uF, 10V, ±10%, X5R, 0805

A. Samsung Part Number

			<u>CL</u> 1	<mark>21</mark> ②	<u>▲</u> ③	<u>105</u> ④	<u>K</u> 5	<u>P</u> 6	<mark>Е</mark> ⑦	<u>N</u> 8	<u>N</u> 9	<u>N</u> 10	<u>Е</u> Ш		
1	Series	Samsung Multi-layer Ceramic Capacitor													
2	Size	0805 ((inch c	ode)		L:	2.00	± 0.10	mm			W:	1.25 ± 0.10	mm	
3	Dielectric	X5R					8	Inner	elect	rode			Ni		
4	Capacitance	1 u	μF					Term	inatio	n			Cu		
5	Capacitance	±10 9	%					Platir	ng				Sn 100%	(Pb Free)	
	tolerance						9	Prod	uct				Normal		
6	Rated Voltage	10 \	V				10	Spec	ial				Reserved fo	r future use	
1	Thickness	1.25 ± 0.1	10 mm				1	Pack	aging				Embossed 7	Type, 7" reel	

B. Structure & Dimension



Samsung P/N	Dimension(mm)							
Samsung F/N	L	W	Т	BW				
CL21A105KPFNNNE	2.00 ± 0.10	1.25 ± 0.10	1.25 ± 0.10	0.50 +0.20/-0.30				

C. Samsung Reliablility Test and Judgement Condition

Tan δ (DF) 0.05 max. treated at 150°C+0/-10°C for 1 hour and maintained ambient air for 24±2 hours. Insulation 10,000Mohm or 100Mohm×μ [±] Rated Voltage 60~120 sec. Appearance No abnormal exterior appearance Microscope (×10) Withstanding No dielectric breakdown or 250% of the rated voltage Voltage mechanical breakdown 250% Temperature XSR Characteristics (From-55°C to 85°C, Capacitance change should be within ±15%) Adhesive Strength Adhesive Strength No peeling shall be occur on the terminal electrode 500g·f, for 10±1 sec. Bending Strength Capacitance change : within ±12.5% Bending to the limit (1mm) with 1.0mm/sec. Solderability More than 75% of terminal surface is to be solder d newly SAg3.0Cu0.5 solder Soldering Heat Tan δ, IR : initial spec. Yibration Test Capacitance change : within ±7.5% Soldering Heat Tan δ, IR : initial spec. Amplitude : 1.5mm Vibration Test Capacitance change : within ±12.5% Amplitude : 1.5mm Resistance Tan δ, IR : initial spec. Yibrin trad voltage Vibration Test Capacitance change : within ±12.5% Amplitude : 1.5mm		Judgement	Test condition
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Resistance Whichever is smaller Appearance No abnormal exterior appearance Microscope (×10) Withstanding No dielectric breakdown or mechanical breakdown 250% of the rated voltage Temperature X5R 250% of the rated voltage Characteristics (From-55°C to 85°C, Capacitance change should be within ±15%) Adhesive Strength No peeling shall be occur on the terminal electrode 500g-f, for 10±1 sec. Bending Strength Capacitance change : within ±12.5% Bending to the limit (1mm) with 1.0mm/sec. Solderability 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.) Resistance to Capacitance change : within ±7.5% Solder pot : 270±5°C, 10±1sec. Soldering Heat Tan 5, IR : initial spec. Amplitude : 1.5mm From 10Hz to 55Hz (return : 1min.) 2hours × 3 direction (x, y, z) Moisture Capacitance change : within ±12.5% Tan 5 : 0.075 max With rated voltage 40±2°C, 90-95%RH, 500+12/-0hrs High Temperature Capacitance change : within ±12.5% Whichever is smaller With 200% of the rated voltage Max. operating temperature 1000+48/-0hrs	Tan δ (DF)	0.05 max.	*A capacitor prior to measuring the capacitance is heat treated at $150^{\circ}C+0/-10^{\circ}C$ for 1 hour and maintained in ambient air for 24±2 hours.
AppearanceNo abnormal exterior appearanceMicroscope (×10)WithstandingNo dielectric breakdown or mechanical breakdown250% of the rated voltageYoltagemechanical breakdown250% of the rated voltageTemperatureX5R Characteristics(From-55°C to 85°C, Capacitance change should be within ±15%)Adhesive StrengthNo peeling shall be occur on the terminal electrode500g·f, for 10±1 sec.Bending StrengthCapacitance change : utim ±12.5%Bending to the limit (1mm) with 1.0mm/sec.SolderabilityMore than 75% of terminal surface is to be soldered newlySnAg3.0Cu0.5 solder 245±5°C, 3±0.3sec. (preheating : 80~120°C for 10~30sec.)Resistance to Vibration TestCapacitance change : Capacitance change : mital spec.Solder pot : 270±5°C, 10±1sec.Vibration Test ResistanceCapacitance change : mital spec.within ±12.5% Mombum or 25Mohm × μ^{F} Whichever is smallerAmplitude : 1.5mm From 10Hz to 55Hz (return : 1min.) 2hours × 3 direction (x, y, z)Moisture ResistanceCapacitance change : mital spec.With rated voltage 40±2°C, 90~95%RH, 500+12/-0hrsHigh Temperature ResistanceCapacitance change : mital spelWith ±12.5% Max. operating temperature 1000+48/-0hrsHigh Temperature ResistanceCapacitance change : mital spelWith ±12.5% Max. operating temperature 1000+48/-0hrs	Insulation	10,000Mohm or 100Mohm× <i>μ</i> F	Rated Voltage 60~120 sec.
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Whichever is smaller High Temperature Resistance IR : 1,000Mohm or 50Mohm × μF Whichever is smaller	Resistance	Tan δ : 0.075 max	40±2℃, 90~95%RH, 500+12/-0hrs
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Whichever is smaller		Tan δ : 0.075 max	-
		IR : 1,000Mohm or 50Mohm × μF	1000+48/-0hrs
Temperature Capacitance change : within ±7.5% 1 cycle condition		Whichever is smaller	
	Temperature	Capacitance change : within ±7.5%	1 cycle condition
CyclingTan δ , IR : initial spec.Min. operating temperature \rightarrow 25°C	-	Tan δ, IR : initial spec.	-
\rightarrow Max. operating temperature \rightarrow 25°C	-		\rightarrow Max. operating temperature \rightarrow 25°C
5 cycle test			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.

- Disclaimer & Limitation of Use and Application -

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.

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