



SPECIFICATION

(Reference sheet)

· Supplier : Samsung electro-mechanics · Samsung P/N : CL31A106KPHNNNE

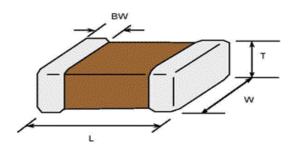
Product : Multi-layer Ceramic Capacitor Description : CAP, 10uF, 10V, ±10%, X5R, 1206

A. Samsung Part Number

<u>CL</u> <u>31</u> <u>A</u> <u>106</u> <u>K</u> <u>P</u> <u>H</u> <u>N</u> <u>N</u> <u>N</u> <u>E</u> ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

1	Series	Samsung Multi-layer Ceramic Capacitor					
2	Size	1206 (inch code)	L: 3.20	± 0.20 mm	W:	1.60 ± 0.20 mm	
3	Dielectric	X5R	8	Inner electrode		Ni	
4	Capacitance	10 uF		Termination		Cu	
(5)	Capacitance	±10 %		Plating		Sn 100% (Pb Free)	
	tolerance		9	Product		Normal	
6	Rated Voltage	10 V	10	Special		Reserved for future use	
7	Thickness	$1.60 \pm 0.20 \text{ mm}$	11)	Packaging		Embossed Type, 7" reel	

B. Structure & Dimension



Samsung P/N	Dimension(mm)					
Samsung F/N	L	W	Т	BW		
CL31A106KPHNNNE	3.20 ± 0.20	1.60 ± 0.20	1.60 ± 0.20	0.50 ± 0.30		

C. Samsung Reliablility Test and Judgement Condition

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		Judgement	Test condition		
Tan δ (DF) 0.05 max. treated at 150°C+0/-10°C for 1 hour and maintained in ambient air for 24±2 hours. Insulation 10,000Mohm or 100Mohm×μF Rated Voltage 60~120 sec. Resistance Whichever is smaller Agreamance Microscope (×10) Appearance No abnormal exterior appearance Microscope (×10) Withstanding No delectric breakdown or mechanical breakdown 250% of the rated voltage Temperature X5R (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 Solder ing Heat Tan δ, IR: initial spec. Solder pot: 270±5°C, 10±1sec. Vibration Test Capacitance change: within ±7.5% Solder pot: 270±5°C, 10±1sec. Soldering Heat Tan δ, 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: 0.125 max IR: 500Mohm or 12.5Mohm × μF Whic	Capacitance	Within specified tolerance	1灺 ±10% / 1.0±0.2Vrms		
Resistance Whichever is smaller Microscope (×10) Appearance No abnormal exterior appearance Microscope (×10) Withstanding No dielectric breakdown 250% of the rated voltage Voltage mechanical breakdown Temperature X5R Characteristics (From-55°C to 85°C, Capacitance change should be within ±15%) Adhesive Strength No peeling shall be occur on the of Termination 500g·f, for 10±1 sec. Gornal Termination 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 24±5±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) Wibration Test Capacitance change: within ±12.5% With rated voltage 40±2°C, 90~95%RH, 500+12/-0hrs Moisture Capacitance change: within ±12.5% With 150% of the rated voltage 40±2°C, 90~95%RH, 500+12/-0hrs Resistance Tan δ: 0.125 max Within ±12.5%	Tan δ (DF)	0.05 max.	treated at 150 °C+0/-10 °C for 1 hour and maintained in		
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Resistance to Capacitance change : within $\pm 7.5\%$ Solder pot : $270\pm 5^{\circ}$ C, 10 ± 1 sec. Vibration Test Capacitance change : within $\pm 5\%$ Tan δ , IR : initial spec. Vibration Test Capacitance change : within $\pm 5\%$ Tan δ , IR : initial spec. Moisture Capacitance change : within $\pm 12.5\%$ Resistance Tan δ : 0.125 max IR : 500 Mohm or 12.5 Mohm × \cancel{L}° Whichever is smaller High Temperature Resistance Tan δ : 0.125 max IR : $1,000$ Mohm or 25 Mohm × \cancel{L}° With 150% of the rated voltage Max. operating temperature 1,000+48/-0hrs Temperature Capacitance change : within $\pm 7.5\%$ Mix. operating temperature $\rightarrow 25^{\circ}$ C $\rightarrow Max$. operating temperature $\rightarrow 25^{\circ}$ C		is to be soldered newly	245±5°C, 3±0.3sec.		
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Whichever is smaller High Temperature Capacitance change : within ±12.5% With 150% of the rated voltage Resistance Tan δ : 0.125 max Max. operating temperature IR : 1,000Mohm or 25Mohm × μ F 1,000+48/-0hrs Whichever is smaller Capacitance change : within ±7.5% 1 cycle condition Cycling Tan δ, IR : initial spec. Min. operating temperature → 25°C → Max. operating temperature → 25°C	Resistance	Tan δ: 0.125 max	40±2°C, 90~95%RH, 500+12/-0hrs		
Resistance Tan δ : 0.125 max Max. operating temperature IR : 1,000Mohm or 25Mohm × μ F 1,000+48/-0hrs Whichever is smaller 1 cycle condition Cycling Tan δ, IR : initial spec. Min. operating temperature Min. operating temperature → 25°C → Max. operating temperature → 25°C					
IR: 1,000Mohm or 25Mohm × μ F Whichever is smaller Temperature Cycling Capacitance change: within ±7.5% Tan δ , IR: initial spec. Min. operating temperature Max. operating temperature \rightarrow 25°C \rightarrow Max. operating temperature \rightarrow 25°C	High Temperature	Capacitance change: within ±12.5%	With 150% of the rated voltage		
	Resistance	Tan δ: 0.125 max	Max. operating temperature		
Cycling Tan δ, IR : initial spec. Min. operating temperature → 25°C → Max. operating temperature → 25°C			1,000+48/-0hrs		
→ Max. operating temperature → 25°C	Temperature	Capacitance change: within ±7.5%	1 cycle condition		
	Cycling	Tan δ, IR : initial spec.	Min. operating temperature → 25°C		
5 cycle test			ightarrow Max. operating temperature $ ightarrow$ 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±5°C, 30sec.)



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.

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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
- 6 Power plant control equipment
- Atomic energy-related equipment
- Undersea equipment
- Traffic signal equipment
- Data-processing equipment
- ## Electric heating apparatus, burning equipment
- Safety equipment
- ® Any other applications with the same as or similar complexity or reliability to the applications