



SPECIFICATION

- · Supplier : Samsung electro-mechanics
- · Product : Multi-layer Ceramic Capacitor
- · Samsung P/N:
- CL10B471KB8NNWC

(Reference sheet)

- · Description :
- CAP, 470pF, 50V, ±10%, X7R, 0603

A. Samsung Part Number

		CL ①	<u>10</u> ②	<u>B</u> 3	<u>471</u> ④	<u>K</u> 5	<u>B</u> 6	<u>8</u> 7	<u>N</u> 8	<u>N</u> 9	<u>W</u> 10	<u>С</u> Ш	
1	Series	Samsung M	ulti-laye	r Cer	amic C	apac	itor						
2	Size	0603 (inch	code)		L:	1.60	± 0.10	mm			W:	0.80 ± 0.10	mm
3	Dielectric	X7R				8	Inner	elect	trode			Ni	
4	Capacitance	470 pF					Term	inatio	on			Cu	
5	Capacitance	±10 %					Plati	ng				Sn 100%	(Pb Free)
	tolerance					9	Prod	uct				Normal	
6	Rated Voltage	50 V				10	Spec	ial				Industrial (N	Network,etc)
\bigcirc	Thickness	0.80 ± 0.10	nm			1	Pack	aging	I			Cardboard	Type, 7" reel

B. Structure & Dimension



Samsung D/N	Dimension(mm)								
Samsung P/N	L	W	Т	BW					
CL10B471KB8NNWC	1.60 ± 0.10	0.80 ± 0.10	0.80 ± 0.10	0.30 ± 0.20					

C. Samsung Reliablility Test and Judgement Condition

Tan δ (DF)0.025 mInsulation10,000 MaResistanceWhichevAppearanceNo abnorWithstandingNo dielectVoltagemechanicTemperatureX7RCharacteristics(From-55Adhesive StrengthNo peelirof Terminationterminal deBending StrengthCapacitatSolderabilityMore thatResistance toCapacitatSoldering HeatTan δ, IRVibration TestCapacitatResistanceTan δ, IRMoistureCapacitatResistanceTan δ; IRMoistureCapacitatResistanceTan δ; IR	ohm or 500Mohm×⊭F er is smaller mal exterior appearance etric breakdown or cal breakdown ℃ to 125℃, Capacitance chang ng shall be occur on the	500g·f, for 10±1 sec. Bending to the limit (1mm) with 1.0mm/sec.
Insulation10,000MResistanceWhichevAppearanceNo abnorWithstandingNo dieledVoltagemechanidTemperatureX7RCharacteristics(From-55Adhesive StrengthNo peelirof Terminationterminal deBending StrengthCapacitalSolderabilityMore thatSoldering HeatTan δ, IRVibration TestCapacitalTan δ, IRTan δ, IRMoistureCapacitalResistanceTan δ, IRIR :50	ohm or 500Mohm×µF er is smaller mal exterior appearance tric breakdown or cal breakdown ℃ to 125℃, Capacitance chang ig 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) with 1.0mm/sec.
Resistance Whichev Appearance No abnor Withstanding No dieled Voltage mechanid Temperature X7R Characteristics (From-55) Adhesive Strength No peelin of Termination terminal e Bending Strength Capacital Solderability More that Soldering Heat Tan δ, IR Vibration Test Capacital Resistance Tan δ, IR Moisture Capacital Resistance Tan δ, IR Moisture Capacital Resistance Tan δ	rer is smaller mal exterior appearance stric breakdown or cal breakdown <u>C to 125°C, Capacitance chang</u> ng shall be occur on the electrode nce change : within ±12.5%	Microscope (×10) 250% of the rated voltage je should be within ±15%) 500g·f, for 10±1 sec. Bending to the limit (1mm) with 1.0mm/sec.
Appearance No abnor Withstanding No dieled Withstanding No dieled Voltage mechanid Temperature X7R Characteristics (From-55 Adhesive Strength No peelir of Termination terminal e Bending Strength Capacital Solderability More that Solderability More that Soldering Heat Tan δ, IR Vibration Test Capacital Moisture Capacital Resistance Tan δ : IR : 50	mal exterior appearance tric breakdown or cal breakdown <u>C to 125°C, Capacitance chang</u> ig shall be occur on the <u>electrode</u> nce change : within ±12.5% n 75% of terminal surface	250% of the rated voltage le should be within ±15%) 500g·f, for 10±1 sec. Bending to the limit (1mm) with 1.0mm/sec.
Withstanding No dielection Voltage mechanic Temperature X7R Characteristics (From-55 Adhesive Strength No peelin of Termination terminal e Bending Strength Capacital Solderability More that Resistance to Capacital Soldering Heat Tan δ, IR Vibration Test Capacital Moisture Capacital Resistance Tan δ, IR Moisture Capacital IR : 50	tric breakdown or cal breakdown <u>°C to 125°C, Capacitance chang</u> og shall be occur on the electrode nce change : within ±12.5%	250% of the rated voltage le should be within ±15%) 500g·f, for 10±1 sec. Bending to the limit (1mm) with 1.0mm/sec.
Voltage mechanic Temperature X7R Characteristics (From-55) Adhesive Strength No peelin of Termination terminal e Bending Strength Capacital Solderability More that is to be s Resistance to Capacital Soldering Heat Tan δ, IR Vibration Test Capacital Resistance Tan δ, IR In of the second state Tan δ, IR	cal breakdown ^C to 125 [°] C, Capacitance chang ig shall be occur on the electrode ince change : within ±12.5% in 75% of terminal surface	<pre>b also raise rouge ge should be within ±15%) 500g·f, for 10±1 sec. Bending to the limit (1mm) with 1.0mm/sec.</pre>
Temperature X7R Characteristics (From-55 Adhesive Strength No peelin of Termination terminal e Bending Strength Capacital Solderability More that Resistance to Capacital Soldering Heat Tan δ, IR Vibration Test Capacital Resistance Tan δ, IR In Solderability Capacital Soldering Heat Tan δ, IR Vibration Test Capacital Tan ō, IR Tan ō, IR Moisture Capacital Resistance Tan ō IR	℃ 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) with 1.0mm/sec.
Characteristics (From-55 Adhesive Strength No peelin of Termination terminal e Bending Strength Capacital Solderability More that is to be s Resistance to Capacital Soldering Heat Tan δ, IR Vibration Test Capacital Moisture Capacital Resistance IR : Moisture Capacital Resistance IR : 50	ng shall be occur on the electrode nce change : within ±12.5% n 75% of terminal surface	500g·f, for 10±1 sec. Bending to the limit (1mm) with 1.0mm/sec.
Adhesive Strength of Termination No peelin terminal of Bending Strength Solderability More that is to be si Resistance to Capacitat Soldering Heat Vibration Test Capacitat Capacitat Tan δ, IR Moisture Capacitat Capacitat Tan δ : IR : 50	ng shall be occur on the electrode nce change : within ±12.5% n 75% of terminal surface	500g·f, for 10±1 sec. Bending to the limit (1mm) with 1.0mm/sec.
of Termination terminal e Bending Strength Capacital Solderability More that is to be some state of the second state of t	electrode nce change : within ±12.5% n 75% of terminal surface	Bending to the limit (1mm) with 1.0mm/sec.
Bending Strength Capacital Solderability More that is to be side side side side side side side sid	nce change : within ±12.5%	with 1.0mm/sec.
Solderability More that is to be sold i	n 75% of terminal surface	with 1.0mm/sec.
Resistance to Capacital Soldering Heat Tan δ, IR Vibration Test Capacital Tan δ, IR Tan δ, IR Moisture Capacital Resistance Tan δ : IR : 50		
Resistance to Capacital Soldering Heat Tan δ, IR Vibration Test Capacital Tan δ, IR Tan δ, IR Moisture Capacital Resistance Tan δ : IR : 50		SpAg2 0Cu0 5 colder
Resistance to Capacital Soldering Heat Tan δ, IR Vibration Test Capacital Tan δ, IR Tan δ, IR Moisture Capacital Resistance Tan δ : IR : 50	oldered newly	SnAg3.0Cu0.5 solder
Resistance to Capacital Soldering Heat Tan δ, IR Vibration Test Capacital Tan δ, IR Tan δ, IR Moisture Capacital Resistance Tan δ : IR : 50		245±5℃, 3±0.3sec.
Soldering Heat Tan δ, IR Vibration Test Capacital Tan δ, IR Moisture Capacital Tan δ, IR Resistance Tan δ : IR : 50		(preheating : 80~120°C for 10~30sec.)
Vibration Test Capacital Tan ō, IR Moisture Capacital Resistance Tan ō : IR : 50	nce change : within ±7.5%	Solder pot : 270±5℃, 10±1sec.
Moisture Capacital Resistance Tan δ : IR : 50	: initial spec.	
Resistance Tan ō : 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
14)0Mohm or 25Mohm × μ F	
VV	hichever is smaller	
High Temperature Capacitat	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 Capacitat		1 cycle condition
	nce change : within ±7.5%	
	ince change : within ±7.5%	Min. operating temperature \rightarrow 25°C
	•	Min. operating temperature \rightarrow 25°C \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