



# **SPECIFICATION**

- · Supplier : Samsung electro-mechanics
- Product : Multi-layer Ceramic Capacitor
- · Samsung P/N:
- CL10B392KB8NFNC

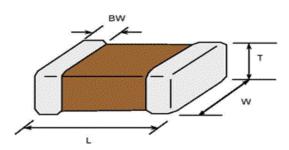
(Reference sheet)

- · Description :
- CAP, 3.9nF, 50V, ±10%, X7R, 0603

A. Samsung Part Number

		<u>CL</u> <u>10</u> ① ②	B 392 K 3 4 5	<u>₿</u> 8 <u>№</u> 678	<u>F</u> <u>N</u> 9 10	<u>C</u> ₪
1	Series	Samsung Multi-laye	r Ceramic Capao	citor		
2	Size	0603 (inch code)	L: 1.60	± 0.10 mm	W:	$0.80 \pm 0.10$ mm
3	Dielectric	X7R	8	Inner electrode		Ni
4	Capacitance	3.9 nF		Termination		Cu
5	Capacitance	±10 %		Plating		Sn 100% (Pb Free)
	tolerance		9	Product		Product for POWER application
6	Rated Voltage	50 V	10	Special		Reserved for future use
1	Thickness	0.80 ± 0.10 mm	1	Packaging		Cardboard Type, 7" reel

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



Samsung D/N	Dimension(mm)					
Samsung P/N	L	W	Т	BW		
CL10B392KB8NFNC	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 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, IRIRSoldering HeatTan δ, IRSoldering TestCapacitarTan δ, IRSoldering TestSoldering TestCapacitarSoldering TestCapacitarTan δ, IRSoldering TestSoldering TestCapacitarSoldering TestSapacitarSoldering TestSa	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     Tan δ, IR   Tan δ, IR     Moisture   Capacitar     Resistance   Tan δ     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   IR : 50	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
-	$100$ only $0.0$ with $111 \pm 1.0/0$	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,

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- 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.