



SPECIFICATION

- · Supplier : Samsung electro-mechanics
- Product : Multi-layer Ceramic Capacitor
- · Samsung P/N:
- CL05B333KP5NNND

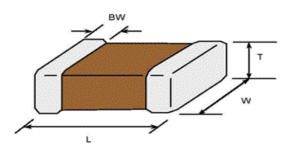
(Reference sheet)

- · Description :
- CAP, 33nF, 10V, ±10%, X7R, 0402

A. Samsung Part Number

		<u>CL</u> ①	<u>05</u> ②	<u>B</u> 3	<u>333</u> ④	<u>K</u> 5	<u>P</u> 6	<u>5</u> 7	<u>N</u> 8	<u>N</u> 9	<u>N</u> 10	<u>▶</u> ∭	
1	Series	Samsung Multi-layer Ceramic Capacitor											
2	Size	0402 (inch c	ode)		L:	1.00	± 0.05	mm			W:	0.50 ± 0.05 m	m
3	Dielectric	X7R				8	Inner	elect	rode			Ni	
4	Capacitance	33 nF					Term	inatio	on			Cu	
5	Capacitance	±10 %					Platir	ng				Sn 100%	(Pb Free)
	tolerance					9	Prod	uct				Normal	
6	Rated Voltage	10 V				10	Spec	ial				Reserved for	future use
1	Thickness	0.50 ± 0.05 mm	n		① Packaging				Cardboard Type, 13" reel				

B. Structure & Dimension



Samsung D/N	Dimension(mm)								
Samsung P/N	L	W	Т	BW					
CL05B333KP5NNND	1.00 ± 0.05	0.50 ± 0.05	0.50 ± 0.05	0.25 ± 0.10					

C. Samsung Reliablility Test and Judgement Condition

	Judgement	Test condition
Capacitance	Within specified tolerance	1 ^{kHz} ±10% / 1.0±0.2Vrms
Tan δ (DF)	0.05 max.	*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	10,000Mohm or 100Mohm× <i>µ</i> F	Rated Voltage 60~120 sec.
Resistance	Whichever is smaller	
Appearance	No abnormal exterior appearance	Microscope (×10)
Withstanding	No dielectric breakdown or	250% of the rated voltage
Voltage	mechanical breakdown	
Temperature	X7R	
Characteristics	(From-55℃ to 125℃, Capacitance chang	e should be within ±15%)
Adhesive Strength	No peeling shall be occur on the	500g f, for 10±1 sec.
of Termination	terminal electrode	
Bending Strength	Capacitance change : within ±12.5%	Bending to the limit (1mm)
		with 1.0mm/sec.
Solderability	More than 75% of terminal surface	SnAg3.0Cu0.5 solder
	is to be soldered newly	245±5℃, 3±0.3sec.
		(preheating : 80~120℃ for 10~30sec.)
Resistance to	Capacitance change : within ±7.5%	Solder pot : 270±5℃, 10±1sec.
Soldering Heat	Tan δ, IR : initial spec.	
Vibration Test	Capacitance change : within $\pm 5\%$ 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: 0.075 max	40±2℃, 90~95%RH, 500+12/-0hrs
	IR : 500Mohm or 25Mohm × μ F	
	Whichever is smaller	
High Temperature	Capacitance change : within ±12.5%	With 200% of the rated voltage
Resistance	Tan δ: 0.075 max	Max. operating temperature
	IR : 1,000Mohm or 50Mohm × μ F Whichever is smaller	1000+48/-0hrs
Temperature	Capacitance change : within ±7.5%	1 cycle condition
Cycling	Tan δ, IR : initial spec.	Min. operating temperature \rightarrow 25°C
		\rightarrow Max. operating temperature \rightarrow 25°C
		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.