



Specification of Automotive MLCC (Reference sheet)

● Supplier : Samsung electro-mechanics

● Product : Multi-layer Ceramic Capacitor

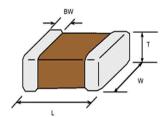
● Samsung P/N: CL10C102JB81PNC

Description : CAP, 1 nF, 50V, ± 5%, C0G, 0603

● AEC-Q200 Qualified

A. Dimension

Dimension



Size	0603 inch				
L	1.6±0.1 mm				
W	0.8±0.1 mm				
T	0.8±0.1 mm				
BW	0.3±0.2 mm				

B. Samsung Part Number

<u>CL</u>	<u>10</u>	<u>C</u>	<u>102</u>	<u>J</u>	<u>B</u>	<u>8</u>	<u>1</u>	<u>P</u>	<u>N</u>	<u>C</u>
①	2	3	4	(5)	6	⑦	8	9	10	11

① Series	Samsung Multi-layer Ceramic C	apacitor	
② Size	0603 (inch code)	L: 1.6±0.1 mm	W: 0.8±0.1 mm
3 Dielectric	COG	8 Inner electrode	Ni
Capacitance	1 nF	Termination	Cu
⑤ Capacitance	± 5%	Plating	Sn 100% (Pb Free)
tolerance		Product	Automotive
6 Rated Voltage	50 V	Special code	Normal
7 Thickness	0.8±0.1 mm	1 Packaging	Cardboard Type, 7" Reel

C. Reliability Test and Judgement condition

·	Performance	Test condition				
High Temperature	Appearance : No abnormal exterior appearance	Unpowered, 1,000hrs @ Max. temperature				
Exposure	Capacitance Change: Within ±2.5% or 0.25pF	Measurement at 24±2hrs after test conclusion				
	whichever is larger					
	Q: 1,000 min.					
	IR : More than 10,000 № or 500 №×μF					
	Whichever is smaller					
Temperature Cycling	Appearance : No abnormal exterior appearance	1,000Cycles				
	Capacitance Change: Within ±2.5% or 0.25pF	Measurement at 24±2hrs after test conclusion				
	whichever is larger					
	Q: 1,000 min.	1 cycle condition : -55+0/-3 °C (30±3min) → Room Temp. (1min)				
	IR : More than 10,000 № or 500 №×μF	→ 125+3/-0°C(30±3min) → Room Temp. (1min)				
	Whichever is smaller					
Destructive Physical	No Defects or abnormalities	Per EIA 469				
Analysis						
Humidity Bias	Appearance : No abnormal exterior appearance	1,000hrs 85℃/85%RH, Rated Voltage and 1.3~1.5V,				
	Capacitance Change: Within ±2.5% or 0.25pF	Add 100kohm resistor				
	whichever is larger					
	Q: 200 min.	The charge/discharge current is less than 50mA.				
	IR : More than 500 № or 25 №× μF					
	Whichever is smaller					
High Temperature	Appearance : No abnormal exterior appearance	1,000hrs @ 125 °C, 200% Rated Voltage,				
Operating Life	Capacitance Change: Within ±3% or 0.3pF	Measurement at 24±2hrs after test conclusion				
	whichever is larger	The charge/discharge current is less than 50mA.				
	Q: 350 min.					
	IR : More than 1,000 № or 50 №×μF					
	Whichever is smaller					

	Performance			Test condition							
External Visual	No abnormal exterior appearance		Micro	scope ('10)							
Physical Dimensions	Within the specified dimensions			The calipers	;						
Mechanical Shock	Appearance : No abnormal exterior	appearance	Three	e shocks in ea	ach direction	should be a	applied along				
	Capacitance Change: Within ±2.	3 mut	tually perpend	dicular axes	of the test s	pecimen (18 sl	nocks)				
	whichever		Peak value	Duration	Wave	Velocity					
				1,500G	0.5ms	Half sine	4.7m/sec				
	Q, IR: Initial spec.										
Vibration	Appearance : No abnormal exterior	appearance	5a's f	or 20min., 12	cycles each	of 3 orienta	tions				
Vibration		.5% or 0.25pF	_		-		its on one long	side			
	whichever					•	sides. Parts m				
			2" from any								
	Q, IR: Initial spec.					_,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					
	,										
Resistance to	Appearance : No abnormal exterior	appearance	prehe	eating : 150°C	for 60~120	sec.					
Solder Heat	Capacitance Change: Within ±2.	.5% or 0.25pF		er pot : 260±5							
	whichever	r is larger									
	Q, IR: Initial spec.										
ESD	Appearance : No abnormal exterior	appearance	AEC-	Q200-002 or	ISO/DIS106	05					
	Capacitance Change: Within ±2.										
	whichever										
	Q, IR: Initial spec.										
Solderability	95% of the terminations is to be so		a) Preheat at 155 °C for 4 hours, Immerse in solder for 5s at 245±5 °C								
	evenly and continuously			b) Steam aging for 8 hours, Immerse in solder for 5s at 245±5 ℃							
				c) Steam aging for 8 hours, Immerse in solder for 120s at 260±5 °C							
			solder : a solution ethanol and rosin								
Electrical	Capacitance : Within specified tole	rance	The Capacitance / D.F. should be measured at 25 ℃,								
Characterization	Q: 1,000 min.	4 000 NOF	1 kHz ± 10%, 0.5~5 Vrms								
	IR(25 °C): More than 100,000 № or 1,000 №×µF			I.R. should be measured with a DC voltage not exceeding Rated Voltage @25°C, @125°C for 60~120 sec.							
	Whichever is smaller IR(125°C): More than 10,000 ™Ω or 100 ™Ω×μF			Trated voilage (200, (200 lot 00~120 sec.							
	Whichever is smaller										
	vviiidilevel le cinaliei										
	Dielectric Strength	Dielectric Strength			Dielectric Strength: 300% of the rated voltage for 1~5 seconds						
Board Flex	Appearance : No abnormal exterior	appearance		ing to the limi		60 seconds					
	Capacitance Change: Within ±5	% or 0.5pF									
	whichever	r is larger									
Terminal	Appearance : No abnormal exterior	appearance	10 N,	for 60 sec.							
Strength(SMD)	Capacitance Change: Within ±2.	.5% or 0.25pF									
	whichever	r is larger									
Beam Load	Destruction value should be exceed	d 20 N	Beam	n speed :	0.5±0.05 mm	/sec					
Temperature	COG										
Characteristics	From -55 ℃ to 125 ℃, Capacitance	e change should b	e with	nin 0±30ppm/	$^{\circ}$						

D. Recommended Soldering method :

Reflow (Reflow Peak Temperature : 260 +0/-5 $^{\circ}$ C, 30sec.), Meet IPC/JEDEC J-STD-020 D Standard



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.