



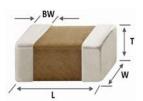
Specification of Automotive MLCC

● Supplier : Samsung electro-mechanics ● Samsung P/N : CL05C200JB51PNC

● AEC-Q200 Qualified

A. Dimension

Dimension



Size	0402 inch	
L	1.00±0.05 mm	
W	0.50±0.05 mm	
Т	0.50±0.05 mm	
BW	0.25±0.10 mm	

B. Samsung Part Number

<u>CL</u>	<u>05</u>	<u>C</u>	<u>200</u>	<u>J</u>	<u>B</u>	<u>5</u>	<u>1</u>	<u>P</u>	<u>N</u>	<u>C</u>
①	2	3	4	(5)	⑥	①	8	9	10	11

① Series	Samsung Multi-layer Ceramic Capacitor		
② Size	0402 (inch code)	L: 1.00±0.05 mm	W: 0.50±0.05 mm
3 Dielectric	C0G	® Inner electrode	Ni
Capacitance	20 pF	Termination	Cu
⑤ Capacitance	± 5%	Plating	Sn 100% (Pb Free)
tolerance		9 Product	Automotive
Rated Voltage	50 V	Special code	Normal
① Thickness	0.50±0.05 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: 800 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: 800 min.	1 cycle condition : -55+0/-3°C(30±3min) → Room Temp. (1min)		
	IR : More than 10,000 № or 500 №× μF	\rightarrow 125+3/-0 $^{\circ}$ C(30±3min) \rightarrow 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: 166.6 min.	The charge/discharge current is less than 50mA.		
	IR : More than 500 MΩ or 25 MΩ×μF			
	Whichever is smaller			
High Temperature	Appearance : No abnormal exterior appearance	1,000hrs @ 125 ℃, 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: 325 min.			
	IR : More than 1,000 № or 50 № × μF			
	Whichever is smaller			

	Performance	Test condition			
External Visual	No abnormal exterior appearance	Microscope (*10)			
Physical Dimensions	Within the specified dimensions	Using The calipers			
Mechanical Shock	Appearance: No abnormal exterior appearance Capacitance Change: Within ±2.5% or ±0.25pF whichever is larger Q, IR: Initial spec.	Three shocks in each direction should be applied along 3 mutually perpendicular axes of the test specimen (18 shocks) Peak value Duration Wave Velocity 1,500G 0.5ms Half sine 4.7m/sec			
Vibration	Appearance : No abnormal exterior appearance Capacitance Change : Within ±2.5% or ±0.25pF whichever is larger Q, IR : Initial spec.	5g's for 20min., 12cycles each of 3 orientations, Use 8"×5" PCB 0.031" Thick 7 secure points on one long side and 2 secure points at corners of opposite sides. Parts mounted within 2" from any secure point. Test from 10~2,000Hz.			
Resistance to Solder Heat	Appearance : No abnormal exterior appearance Capacitance Change : Within ±2.5% or ±0.25pF whichever is larger Q, IR : Initial spec.	Preheating : 150°C for 60~120 sec. Solder pot : 260±5°C, 10±1sec.			
ESD	Appearance : No abnormal exterior appearance Capacitance Change : Within ±2.5% or ±0.25pF whichever is larger Q, IR : Initial spec.	AEC-Q200-002 or ISO/DIS10605			
Solderability	95% of the terminations is to be soldered evenly and continuously	a) Preheat at 155°C for 4 hours, Immerse in solder for 5s at 245±5°C b) Steam aging for 8 hours, Immerse in solder for 5s at 245±5°C c) Steam aging for 8 hours, Immerse in solder for 120s at 260±5°C solder: a solution ethanol and rosin			
Electrical Characterization	Capacitance: Within specified tolerance Q: 800 min. IR(25℃): More than 100,000 № or 1,000 №×μF Whichever is smaller. IR(125℃): More than 10,000 № or 100 №×μF Whichever is smaller.	The Capacitance / D.F. should be measured at 25 °C, 1 № ± 10%, 0.5~5 Vrms I.R. should be measured with a DC voltage not exceeding Rated Voltage @25 °C, @125 °C for 60~120 sec.			
Board Flex	Dielectric Strength Appearance : No abnormal exterior appearance Capacitance Change : Within ±5% or ±0.5pF whichever is larger	Dielectric Strength : 300% of the rated voltage for 1~5 seconds Bending to the limit, 3 mm for 60 seconds			
Terminal Strength(SMD)	Appearance : No abnormal exterior appearance Capacitance Change : Within ±2.5% or ±0.25pF whichever is larger	2 N, for 60 sec.			
Beam Load Temperature Characteristics	Destruction value should be exceed 8 N COG From -55 °C to 125 °C, Capacitance change should	Beam speed : 0.5±0.05 mm/sec be within 0±30ppm/℃			

D. Recommended Soldering method :

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



A 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.

- ① Aerospace/Aviation equipment
- ② Medical equipment
- 3 Military equipment
- 4 Disaster prevention/crime prevention equipment
- ⑤ Power plant control equipment
- 6 Atomic energy-related equipment
- ① Undersea equipment
- 8 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