

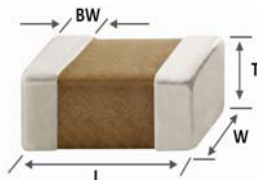
Specification of Automotive MLCC (Reference sheet)

- Supplier : Samsung electro-mechanics
- Product : Multi-layer Ceramic Capacitor

- Samsung P/N : **CL05C3R9CC51PNC**
- Description : **CAP, 3.9pF, 100V, $\pm 0.25\text{pF}$, C0G, 0402**
- AEC-Q200 Qualified

A. Dimension

● Dimension



Size	0402 inch
L	1.00±0.05 mm
W	0.50±0.05 mm
T	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>3R9</u>	<u>C</u>	<u>C</u>	<u>5</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 Capacitor									
② Size	0402 (inch code)	L: 1.00±0.05 mm		W: 0.50±0.05 mm						
③ Dielectric	C0G	⑧ Inner electrode		Ni						
④ Capacitance	3.9 pF	Termination		Cu						
⑤ Capacitance tolerance	$\pm 0.25\text{pF}$	Plating		Sn 100% (Pb Free)						
⑥ Rated Voltage	100 V	⑨ Product		Automotive						
⑦ Thickness	0.50±0.05 mm	⑩ Special code		Normal						
		⑪ Packaging		Cardboard Type, 7" Reel						

C. Reliability Test and Judgement condition

	Performance	Test condition
High Temperature Exposure	Appearance : No abnormal exterior appearance Capacitance Change : Within $\pm 2.5\%$ or $\pm 0.25\text{pF}$ whichever is larger Q : 478 min. IR : More than 10,000 M Ω or 500 M $\Omega \times \mu\text{F}$ Whichever is smaller	Unpowered, 1,000hrs @ Max. temperature Measurement at 24±2hrs after test conclusion
Temperature Cycling	Appearance : No abnormal exterior appearance Capacitance Change : Within $\pm 2.5\%$ or $\pm 0.25\text{pF}$ whichever is larger Q : 478 min. IR : More than 10,000 M Ω or 500 M $\Omega \times \mu\text{F}$ Whichever is smaller	1,000Cycles Measurement at 24±2hrs after test conclusion 1 cycle condition : -55+0/-3℃(30±3min) → Room Temp. (1min) → 125+3/-0℃(30±3min) → Room Temp. (1min)
Destructive Physical Analysis	No Defects or abnormalities	Per EIA 469
Humidity Bias	Appearance : No abnormal exterior appearance Capacitance Change : Within $\pm 2.5\%$ or $\pm 0.25\text{pF}$ whichever is larger Q : 112.987 min. IR : More than 500 M Ω or 25 M $\Omega \times \mu\text{F}$ Whichever is smaller	1,000hrs 85℃/85%RH, Rated Voltage and 1.3~1.5V, Add 100kohm resistor The charge/discharge current is less than 50mA.
High Temperature Operating Life	Appearance : No abnormal exterior appearance Capacitance Change : Within $\pm 3\%$ or $\pm 0.3\text{pF}$ whichever is larger Q : 239 min. IR : More than 1,000 M Ω or 50 M $\Omega \times \mu\text{F}$ Whichever is smaller	1,000hrs @ 125℃, 200% Rated Voltage, Measurement at 24±2hrs after test conclusion The charge/discharge current is less than 50mA.

	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 				

D. Recommended Soldering method :

Reflow (Reflow Peak Temperature : 260 +0/-5℃, 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.

● 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
- ⑦ Undersea equipment
- ⑧ Traffic signal equipment
- ⑨ Data-processing equipment
- ⑩ Electric heating apparatus, burning equipment
- ⑪ Safety equipment
- ⑫ Any other applications with the same as or similar complexity or reliability to the applications