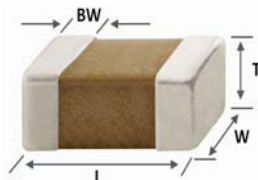


# Specification of Automotive MLCC (Reference sheet)

- Supplier : Samsung electro-mechanics
- Product : Multi-layer Ceramic Capacitor
- Samsung P/N : **CL05C3R9CC51PNC**
- Description : **CAP, 3.9pF, 100V, ± 0.25pF, 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

|           |           |          |            |          |          |          |          |          |          |          |
|-----------|-----------|----------|------------|----------|----------|----------|----------|----------|----------|----------|
| <b>CL</b> | <b>05</b> | <b>C</b> | <b>3R9</b> | <b>C</b> | <b>C</b> | <b>5</b> | <b>1</b> | <b>P</b> | <b>N</b> | <b>C</b> |
| 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 | ± 0.25pF                              | 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<br>Capacitance Change : Within ±2.5% or ±0.25pF whichever is larger<br>Q : 478 min.<br>IR : More than 10,000 MΩ or 500 MΩ×μF<br>Whichever is smaller | Unpowered, 1,000hrs @ Max. temperature<br>Measurement at 24±2hrs after test conclusion                                                                                    |
| Temperature Cycling             | Appearance : No abnormal exterior appearance<br>Capacitance Change : Within ±2.5% or ±0.25pF whichever is larger<br>Q : 478 min.<br>IR : More than 10,000 MΩ or 500 MΩ×μF<br>Whichever is smaller | 1,000Cycles<br>Measurement at 24±2hrs after test conclusion<br><br>1 cycle condition : -55+0/-3℃(30±3min) → Room Temp. (1min)<br>→ 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<br>Capacitance Change : Within ±2.5% or ±0.25pF whichever is larger<br>Q : 112.987 min.<br>IR : More than 500 MΩ or 25 MΩ×μF<br>Whichever is smaller | 1,000hrs 85℃/85%RH, Rated Voltage and 1.3~1.5V,<br>Add 100kohm resistor<br><br>The charge/discharge current is less than 50mA.                                            |
| High Temperature Operating Life | Appearance : No abnormal exterior appearance<br>Capacitance Change : Within ±3% or ±0.3pF whichever is larger<br>Q : 239 min.<br>IR : More than 1,000 MΩ or 50 MΩ×μF<br>Whichever is smaller      | 1,000hrs @ 125℃, 200% Rated Voltage,<br>Measurement at 24±2hrs after test conclusion<br>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<br>Capacitance Change :   Within ±2.5% or ±0.25pF<br> |                    |

#### D. Recommended Soldering method :

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

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*The products listed in this Specification sheet are **NOT** designed and manufactured for any use and applications set forth below.*

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*If you have any questions regarding this 'Limitation of Use and Application', you should first contact our sales personnel or application engineers.*

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- 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