



SPECIFICATION (Reference sheet)

· Supplier : Samsung electro-mechanics · Samsung P/N : CL03X105MR3CSNH

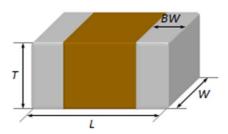
· Product : Multi-layer Ceramic Capacitor · Description : CAP, 14, 4V, ±20%, X6S, 0201

A. Samsung Part Number

<u>CL</u> <u>03</u> <u>X</u> <u>105</u> <u>M</u> <u>R</u> <u>3</u> <u>C</u> <u>S</u> <u>N</u> <u>H</u> ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

① Series Samsung Multi-layer Ceramic Capacitor ② Size 0201 (inch code) L: $0.60 \pm 0.05 \text{ mm}$ W: $0.30 \pm 0.05 \text{ mm}$ 3 Dielectric X6S 8 Inner electrode Ni 4 Capacitance 1 μF Control code **Termination** ⑤ Capacitance ±20 % **Plating** Sn 100% (Pb Free) tolerance 9 Product Size control code **6** Rated Voltage 4 V 10 Special Reserved for future use 7 Thickness Cardboard Type, 7" reel $0.30 \pm 0.05 \; \text{mm}$ 11 Packaging

B. Structure & Dimension



Samsung P/N	Dimension(mm)			
	L	W	Т	BW
CL03X105MR3CSNH	0.60 ± 0.05	0.30 ± 0.05	0.30 ± 0.05	0.15 ± 0.05

C. Samsung Reliablility Test and Judgement Condition

	Judgement	Test condition	
Capacitance	Within specified tolerance	1kHz ±10% / 0.5±0.1Vrms	
Tan δ (DF)	0.1 max.	*A capacitor prior to measuring the capacitance is heat treated at 150 ℃+0/-10 ℃ for 1hour 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	X6S		
Characteristics	(From -55 ℃ to 105 ℃, Capacitance change should be within ±22%)		
Adhesive Strength	No peeling shall be occur on the	200g·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 is to be soldered newly	SnAg3.0Cu0.5 solder 245±5°C, 3±0.3sec. (preheating : 80~120°C for 10~30sec.)	
Resistance to	Capacitance change : within ±7.5%	Solder pot : 270±5°C, 10±1sec.	
Soldering Heat	Tan δ, IR : initial spec.		
Vibration Test	Capacitance change : within ± 10% 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: 0.125 max IR: 500Mohm or 12.5Mohm×μF Whichever is smaller	40±2°C, 90~95%RH, 500+12/-0hrs	
High Temperature Resistance	Capacitance change: within ±12.5% Tan δ: 0.125 max IR: 1,000Mohm or 25Mohm×μF Whichever is smaller	With 100 % of the rated voltage Max. operating temperature 1,000+48/-0hrs	
Temperature Cycling	Capacitance change : within ±15% Tan δ, IR : initial spec.	1 cycle condition Min. operating temperature → 25°C → Max. operating temperature → 25°C 5 cycle test	

D. Recommended Soldering method:

Reflow (Reflow Peak Temperature : 260±5 °C, 30sec.)



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.

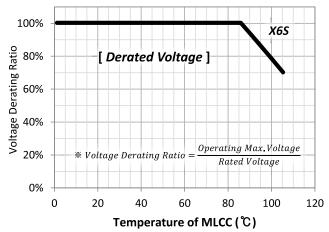
We may change, modify or discontinue the product specifications without notice at any time.

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.

Derating



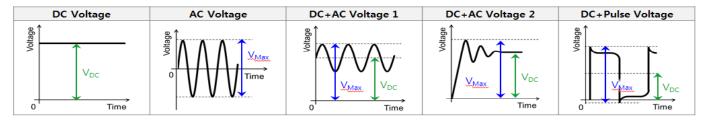
This product ,which guarantees High Temperature Reliability Test with 100% of rated voltage at the maximum temperature, is recommended to be used in the circuit with derated voltage compared to the rated voltage of the capacitor for long lifetime.

Max. $voltage(V_{Max})$ and DC $voltage(V_{DC})$ applied to this product shown in the table below are recommended to be used under the following conditions for long lifetime, respectively.

[Recommendations for long lifetime]

- $\cdot V_{Max} \le (Derated Voltage on the left graph)$
- \cdot V_{DC} \leq 70% × (Derated Voltage on the left graph)

[Types of voltage applied to the capacitor]



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 Automotive or Transportation equipment (vehicles, trains, ships, etc)
- 3 Medical equipment
- 4 Military equipment
- ⑤ Disaster prevention/crime prevention equipment
- Power plant control equipment
- Atomic energy-related equipment
- Undersea equipment
- 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

^{*} Temperature of MLCC : Surface temperature of MLCC in the circuit.