



# SPECIFICATION

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

- Samsung P/N : **CL31B152K1FNFE**
- Description : **CAP, 1.5nF, 1000V, ±10%, X7R, 1206**

## A. Samsung Part Number

**CL 31 B 152 K I F N F N E**  
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

① <b>Series</b>	Samsung Multi-layer Ceramic Capacitor		
② <b>Size</b>	1206 (inch code)	L: 3.2 ± 0.15 mm	W: 1.6 ± 0.15 mm
③ <b>Dielectric</b>	X7R	⑧ <b>Inner electrode</b>	Ni
④ <b>Capacitance</b>	1.5 nF	<b>Termination</b>	Cu
⑤ <b>Capacitance tolerance</b>	±10 %	<b>Plating</b>	Sn 100% (Pb Free)
⑥ <b>Rated Voltage</b>	1000 V	⑨ <b>Product</b>	Product for POWER application
⑦ <b>Thickness</b>	1.25 ± 0.15 mm	⑩ <b>Special</b>	Reserved for future use
		⑪ <b>Packaging</b>	Embossed Type, 7"reel(2,000ea)

## B. Samsung Reliability Test and Judgement condition

	Performance	Test condition
<b>Capacitance</b>	Within specified tolerance	1kHz±10% 1.0±0.2Vrms
<b>Tan δ (DF)</b>	0.025 max.	
<b>Insulation Resistance</b>	More than 500Mohm·μF	Rated Voltage 60~120 sec.
<b>Appearance</b>	No abnormal exterior appearance	Visual inspection
<b>Withstanding Voltage</b>	No dielectric breakdown or mechanical breakdown	120% of the rated voltage
<b>Temperature Characteristics</b>	X7R (From -55℃ to 125℃, Capacitance change should be within ±15%)	
<b>Adhesive Strength of Termination</b>	No peeling shall be occur on the terminal electrode	500g·F, for 10±1 sec.
<b>Bending Strength</b>	Capacitance change : within ±12.5%	Bending to the limit (1mm) with 1.0mm/sec.
<b>Solderability</b>	More than 75% of terminal surface is to be soldered newly	SnAg3.0Cu0.5 solder 245±5℃, 3±0.3sec. (preheating : 80~120℃ for 10~30sec.)
<b>Resistance to Soldering heat</b>	Capacitance change : within ±7.5% Tan δ, IR : initial spec.	Solder pot : 270±5℃, 10±1sec.

	<b>Performance</b>	<b>Test condition</b>
<b>Vibration Test</b>	Capacitance change : within $\pm 5\%$ Tan $\delta$ , IR : initial spec.	Amplitude : 1.5mm From 10Hz to 55Hz (return : 1min.) 2hours $\times$ 3 direction (x, y, z)
<b>Moisture Resistance</b>	Capacitance change : within $\pm 12.5\%$ Tan $\delta$ : 0.05 max IR : More than $25M\Omega \cdot \mu F$	With rated voltage $40 \pm 2^\circ C$ , 90~95%RH, 500+12/-0 hours
<b>High Temperature Resistance</b>	Capacitance change : within $\pm 12.5\%$ Tan $\delta$ : 0.05 max IR : More than $50M\Omega \cdot \mu F$	With 100% of the rated voltage Max. operating temperature  1000+48/-0 hours
<b>Temperature Cycling</b>	Capacitance change : within $\pm 7.5\%$ Tan $\delta$ , IR : initial spec.	1 cycle condition Min. operating temperature $\rightarrow 25^\circ C$ $\rightarrow$ Max. operating temperature $\rightarrow 25^\circ C$  5 cycles test

**C. Recommended Soldering method :**

Reflow ( Reflow Peak Temperature :  $260 \pm 0/-5^\circ C$ , 10sec. Max )

\* For the more detail Specification, Please refer to the Samsung MLCC catalogue.