SAMSUNG ELECTRO-MECHANICS

RoHS+Halogen Compliant ecoparts

SPECIFICATION (Reference sheet)

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

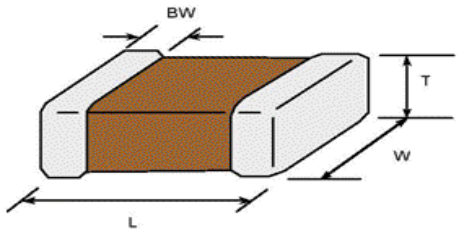
· **Samsung P/N :** **CL21B106KAYQFNE**
· **Description :** **CAP, 10㎌, 25V, ±10%, X7R, 0805**

A. Samsung Part Number

CL	21	B	106	K	A	Y	Q	F	N	E
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪

①	**Series**	Samsung Multi-layer Ceramic Capacitor			
②	**Size**	0805 (inch code)	L : 2.00 ± 0.20 ㎜	W : 1.25 ± 0.20 ㎜	
③	**Dielectric**	X7R	⑧	**Inner electrode**	Ni
④	**Capacitance**	10 ㎌		**Termination**	Cu
⑤	**Capacitance tolerance**	±10 %		**Plating**	Sn 100% (Pb Free)
⑥	**Rated Voltage**	25 V	⑨	**Product**	Normal
⑦	**Thickness**	1.25 ± 0.20 ㎜	⑩	**Special**	Product for POWER application
			⑪	**Packaging**	Embossed Type, 7" reel

B. Structure & Dimension



Samsung P/N	Dimension(㎜)			
	L	W	T	BW
CL21B106KAYQFNE	2.00 ± 0.20	1.25 ± 0.20	1.25 ± 0.20	0.50 +0.20/-0.30

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C. Samsung Reliablility Test and Judgement Condition

<table>
<tr><th></th><th>Judgement</th><th>Test condition</th></tr>
<tr><td>Capacitance</td><td>Within specified tolerance</td><td rowspan="2">1㎑ ±10% / 1.0±0.2Vrms
*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.</td></tr>
<tr><td>Tan δ (DF)</td><td>0.1 max.</td></tr>
<tr><td>Insulation Resistance</td><td>10,000Mohm or 100Mohm×㎌
Whichever is smaller</td><td>Rated Voltage 60~120 sec</td></tr>
<tr><td>Appearance</td><td>No abnormal exterior appearance</td><td>Microscope (×10)</td></tr>
<tr><td>Withstanding Voltage</td><td>No dielectric breakdown or
mechanical breakdown</td><td>250% of the rated voltage</td></tr>
<tr><td>Temperature Characteristics</td><td colspan="2">X7R(From -55℃ to 125℃, Capacitance change shoud be within ±15%) below 50% of the rated voltage
*Capacitance change rate = (C1-C2)/C3
C1 : Capacitance value shown in the table from step 3 to step 5
C2 : Capacitance value shown in the table at step 2
C3 : Capacitance value shown in the table at step 1
<table>
<tr><th>Step</th><th>Temperature (℃)</th><th>Applying voltage(V)</th></tr>
<tr><td>1</td><td>25±2</td><td>No bias</td></tr>
<tr><td>2</td><td>25±2</td><td rowspan="4">50% of the rated voltage</td></tr>
<tr><td>3</td><td>Min. temp.</td></tr>
<tr><td>4</td><td>25±2</td></tr>
<tr><td>5</td><td>Max. temp.</td></tr>
</table></td></tr>
<tr><td>Adhesive Strength of Termination</td><td>No peeling shall be occur on the
terminal electrode</td><td>500g·f, for 10±1 sec.</td></tr>
<tr><td>Bending Strength</td><td>Capacitance change : within ±12.5%
No mechanical damage</td><td>Bending to the limit (1mm)
with 1.0mm/sec.
Outgoing test (SPL) Class Ⅱ : 2mm</td></tr>
<tr><td>Solderability</td><td>More than 75% of terminal surface
is to be soldered newly</td><td>SnAg3.0Cu0.5 solder
245±5℃, 3±0.3sec.
(preheating : 80~120℃ for 10~30sec.)</td></tr>
<tr><td>Resistance to Soldering Heat</td><td>Capacitance change : within ±7.5%
Tan δ, IR : initial spec.</td><td>Solder pot : 270±5℃, 10±1sec.</td></tr>
<tr><td>Vibration Test</td><td>Capacitance change : within ± 5%
Tan δ, IR : initial spec.</td><td>Amplitude : 1.5mm
From 10㎐ to 55㎐ (return : 1min.)
2hours × 3 direction (x, y, z)</td></tr>
<tr><td>Moisture Resistance</td><td>Capacitance change : within ±12.5%
Tan δ : 0.125 max
IR : 500Mohm or 12.5Mohm×㎌
Whichever is smaller</td><td>With rated voltage
40±2℃, 90~95%RH, 500+12/-0hrs</td></tr>
<tr><td>High Temperature Resistance</td><td>Capacitance change : within ±12.5%
Tan δ : 0.125 max
IR : 1,000Mohm or 25Mohm×㎌
Whichever is smaller</td><td>With 100% of the rated voltage
Max. operating temperature
1,000+48/-0hrs</td></tr>
<tr><td>Temperature Cycling</td><td>Capacitance change : within ±7.5%
Tan δ, IR : initial spec.</td><td>1 cycle condition
Min. operating temperature → 25℃
→ Max. operating temperature → 25℃

5 cycle test</td></tr>
</table>

※ The reliability test condition can be replaced by the corresponding accelerated test condition.

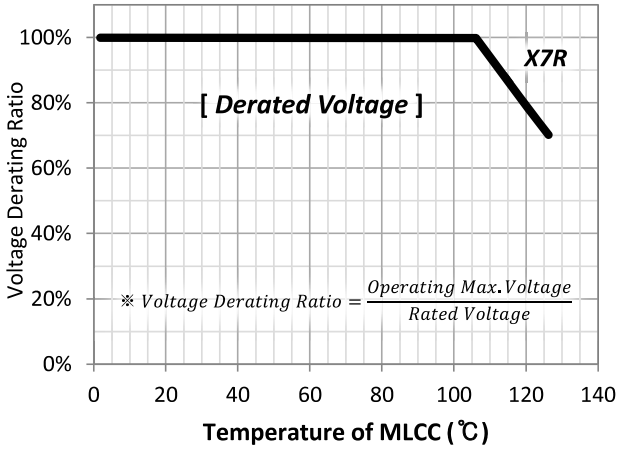
D. Recommended Soldering method :

Reflow (Reflow Peak Temperature : 260±5℃, 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.

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● 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.

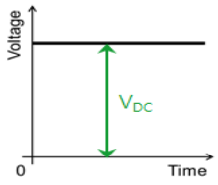
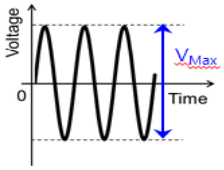
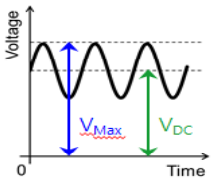
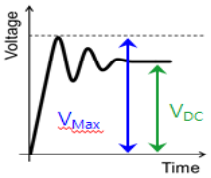
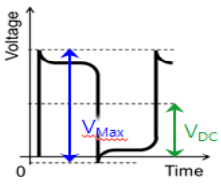
[Recommendations for long lifetime]

· V_{Max} ≤ (Derated Voltage on the left graph)

· V_{DC} ≤ 70% × (Derated Voltage on the left graph)

* Temperature of MLCC : Surface temperature of MLCC in the circuit.

[Types of voltage applied to the capacitor]

DC Voltage	AC Voltage	DC+AC Voltage 1	DC+AC Voltage 2	DC+Pulse Voltage
				

● 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
⑥ Power plant control equipment
⑦ Atomic energy-related equipment
⑧ Undersea equipment
⑨ Traffic signal equipment
⑩ Data-processing equipment
⑪ Electric heating apparatus, burning equipment
⑫ Safety equipment
⑬ Any other applications with the same as or similar complexity or reliability to the applications

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