



# SPECIFICATION

- · Supplier : Samsung electro-mechanics
- · Product : Multi-layer Ceramic Capacitor
- Samsung P/N :
  Description :
- CL21F225ZAFNNNE
  - ion : CAP, 2.2uF, 25V, -20/+80%, Y5V, 0805

(Reference sheet)

A. Samsung Part Number

			<u>CL</u> ①	<mark>21</mark> ②	<u>Е</u> З	<u>225</u> ④	<b>Z</b> 5	<mark>4</mark> 6	<mark>Е</mark> ⑦	<u>N</u> 8	<u>N</u> 9	<u>N</u> 10	<u>Е</u> Ш		
1	Series	Samsung	Multi-	layer	Cerai	nic Ca	pacito	or							
2	Size	0805	(inch c	ode)		L:	2.00	± 0.10	mm			W:	1.25 ± 0.10	mm	
3	Dielectric	Y5V					8	Inner	elect	rode			Ni		
4	Capacitance	2.2	uF					Term	inatio	n			Cu		
5	Capacitance	-20/+80	%					Platir	ng				Sn 100%	(Pb Free)	
	tolerance						9	Prod	uct				Normal		
6	Rated Voltage	25 \	V				10	Spec	ial				Reserved fo	r future use	
1	Thickness	1.25 ± 0.1	10 mm				1	Pack	aging				Embossed 7	ype, 7" reel	

### B. Structure & Dimension



Samsung P/N	Dimension(mm)								
Samsung F/N	L	W	Т	BW					
CL21F225ZAFNNNE	2.00 ± 0.10	1.25 ± 0.10	1.25 ± 0.10	0.50 +0.20/-0.30					

#### C. Samsung Reliablility Test and Judgement Condition

		Judgement	Test condition
Tan δ (DF)    0.09 max.    treated at 150°C+0/-10°C for 1 hour and maintained ambient air for 24±2 hours.      Insulation    10,000Mohm or 100Mohm×μ <sup>E</sup> Rated Voltage    60~120 sec.      Resistance    Whichever is smaller    Microscope (×10)      Withstanding    No dielectric breakdown or    250% of the rated voltage      Voltage    mechanical breakdown    500g f, for 10±1 sec.      Characteristics    (From-30°C to 85°C, Capacitance change should be within -82-+22%)      Adhesive Strength    No peeling shall be occur on the terminal electrode    500g f, for 10±1 sec.      Bending Strength    Capacitance change : within ±30%    Bending to the limit (1mm) with 1.0mm/sec.      Solderability    More than 75% of terminal surface is to be soldered newly    Solder pot : 270±5°C, 10±1sec.      Soldering Heat    Tan δ, IR : initial spec.    Amplitude : 1.5mm From 10Hz to 55Hz (return : 1min.) 2hours × 3 direction (x, y, z)      Moisture    Capacitance change : within ±30% Tan δ : 0.125 max    With rated voltage      Resistance    Capacitance change : within ±30% Tan δ : 0.125 max    With 200% of the rated voltage      Resistance    Tan δ : 0.125 max    Max. operating temperature      High Temperature    Capacitance change : within ±30% Tan δ : 0.125 max    Max. operating temperature <td>Capacitance</td> <td>Within specified tolerance</td> <td>1<sup>kHz</sup> ±10% / 1.0±0.2Vrms</td>	Capacitance	Within specified tolerance	1 <sup>kHz</sup> ±10% / 1.0±0.2Vrms
Resistance      Whichever is smaller        Appearance      No abnormal exterior appearance      Microscope (×10)        Withstanding      No dielectric breakdown or      250% of the rated voltage        Voltage      mechanical breakdown      250% of the rated voltage        Temperature      Y5V        Characteristics      (From-30 ℃ to 85 ℃, Capacitance change should be within -82~+22%)        Adhesive Strength      No peeling shall be occur on the terminal electrode      500g·f, for 10±1 sec.        Garacteristics      (From-30 ℃ to 85 ℃, Capacitance change should be within -82~+22%)        Adhesive Strength      No peeling shall be occur on the terminal electrode      500g·f, for 10±1 sec.        Solderability      More than 75% of terminal surface is to be solder      Solder      2454.5 <sup>+</sup> ℃, 3±0.3sec.        Soldering Heat      Tan δ, IR : initial spec.      Solder pot : 270±5 <sup>+</sup> ℃, 10±1sec.      Solder        Soldering Heat      Tan δ, IR : initial spec.      Amplitude : 1.5mm      From 10Hz to 55Hz (return : 1min.)        Vibration Test      Capacitance change : within ±20%      X direction (x, y, z)      With rated voltage        Moisture      Capacitance change : within ±30%      With rated voltage      Ma±2°, 0.95%/RH, 500+12/-0hrs	Tan δ (DF)	0.09 max.	*A capacitor prior to measuring the capacitance is heat treated at $150^{\circ}C+0/-10^{\circ}C$ for 1 hour and maintained in ambient air for 24±2 hours.
AppearanceNo abnormal exterior appearanceMicroscope (×10)WithstandingNo dielectric breakdown or mechanical breakdown250% of the rated voltageYoutagemechanical breakdown250% of the rated voltageTemperatureYSVCharacteristics(From-30°C to 85°C, Capacitance change should be within -82~+22%)Adhesive StrengthNo peeling shall be occur on the terminal electrodeBending StrengthCapacitance change : is to be soldered newlyBending to the limit (1mm) with 1.0mm/sec.SolderabilityMore than 75% of terminal surface is to be soldered newlySolder pot : 270±5°C, 10±1sec.Soldering HeatTan ō, IR : initial spec.Solder pot : 270±5°C, 10±1sec.Vibration TestCapacitance change : Capacitance change : within ±20%Amplitude : 1.5mm From 10Hz to 55Hz (return : 1min.) 2hours × 3 direction (x, y, z)MoistureCapacitance change : within ±30%With rated voltage 40±2°C, 90~95%RH, 500+12/-0hrs IR : Tan ō : 0.125 max IR : 1,000Mohm or 25Mohm × µF Whichever is smallerWith 200% of the rated voltage Max. operating temperature 1000+48/-0hrsHigh Temperature Capacitance change : ResistanceCapacitance change : max IR : 1,000Mohm or 25Mohm × µF Whichever is smallerWith 200% of the rated voltage Max. operating temperature 1000+48/-0hrsHigh Temperature Capacitance change : Whichever is smaller1 cycle condition Min. operating temperature 1000+48/-0hrs	Insulation	10,000Mohm or 100Mohm× <i>µ</i> F	Rated Voltage 60~120 sec.
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Resistance to Soldering HeatCapacitance change : Tan $\delta$ , IR : initial spec.within $\pm 20\%$ Solder pot : $270\pm5^{\circ}$ C, $10\pm1$ sec.Vibration TestCapacitance change : Capacitance change : Tan $\delta$ , IR : initial spec.within $\pm 20\%$ From 10Hz to 55Hz (return : 1min.) 2hours × 3 direction (x, y, z)Moisture ResistanceCapacitance change : Tan $\delta$ : 0.125 maxwithin $\pm 30\%$ With rated voltage 40 $\pm 2^{\circ}$ C, $90^{\circ}95\%$ RH, $500\pm12$ /ohrsHigh Temperature ResistanceCapacitance change : within $\pm 30\%$ IR : 0.125 maxWith $200\%$ of the rated voltage Max. operating temperature 1000+48/-0hrsHigh Temperature Capacitance change : Whichever is smallerWith $\pm 20\%$ IR : 0.125 maxWith $\pm 20\%$ IR : 0.125 maxOutput IR : 0.125 maxHigh Temperature ResistanceCapacitance change : Whichever is smallerWith $\pm 20\%$ IR : 0.125 maxVith $200\%$ of the rated voltage Max. operating temperature 1000+48/-0hrsMax. operating temperature 1000+48/-0hrsIcycle condition Min. operating temperature I cycle conditionIcycle condition Min. operating temperatureIcycle condition Min. operating temperatureIcycle condition Min. operating temperature	Solderability	More than 75% of terminal surface	SnAg3.0Cu0.5 solder
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Whichever is smallerWhichever is smallerTemperature CyclingCapacitance change : within $\pm 20\%$ Tan $\delta$ , IR : initial spec.1 cycle condition Min. operating temperature $\rightarrow 25^{\circ}C$	Resistance	-	
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CyclingTan $\delta$ , IR : initial spec.Min. operating temperature $\rightarrow$ 25°C		Whichever is smaller	
CyclingTan $\delta$ , IR : initial spec.Min. operating temperature $\rightarrow$ 25°C	Temperature	Capacitance change : within ±20%	1 cycle condition
$\rightarrow$ Max. operating temperature $\rightarrow$ 25°C	-	Tan δ, IR : initial spec.	Min. operating temperature $\rightarrow$ 25°C
			$\rightarrow$ Max. operating temperature $\rightarrow$ 25°C
5 cycle test			5 cycle test

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

## D. Recommended Soldering method :

Reflow ( Reflow Peak Temperature : 260+0/-5°C, 10sec. Max )

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.

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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.

- Aerospace/Aviation equipment
- ② Automotive or Transportation equipment (vehicles, trains, ships, etc)
- 3 Medical equipment
- *④ Military equipment*
- *5* Disaster prevention/crime prevention equipment
- *ⓐ* Any other applications with the same as or similar complexity or reliability to the applications set forth above.