

Product Specification

Number: L-KLS10-HV16-2KV-Y5P-472K-P7.5-S

Name: Ceramic Capacitors

Customer: E17

Date: 2022-10-12

Customer Signature:



NINGBO KLS ELECTRONIC CO; LTD

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INDUSTRIAL ZONE BEILUN NINGBO ZHEJIANG.**

Compi	Check	Review	Approva
Jenny	Jack.C		

Spec. Name <div style="text-align: center; font-weight: bold;">Ceramic disc capacitor approve</div>				Record number	
Description <div style="text-align: center; font-weight: bold;">Guidelines for using ceramic disc capacitor</div>				Page: 1-7	

1. Applicable range:

The approval guidelines for using and safety item for the ceramic disc capacitor.

Take safety notice

If the capacitor using mistake in relevant rated and performance condition (using environment, circuit etc.) Will worsen it that will short or broken circuit, as smoke and fire as worst condition. Guide lines for using must strict confirm the safety condition as following.

2. Strict item as safety:

2.1 Using environment and circuit design.

2.1.1 Using environment and rated performance confirm

- Confirm storage and using environment ,It can not over the using environment .
It'll worsen short or broken circuit, as smoke and fire the capacitor over performance.
- Using in human machine (aviation, space, medical machine etc) must confirm with us before using

2.1.2 Operating temperature range

- It can't over operating temperature range
 - ① Don't over the highest temperature by the approve.
 - ② Don't over the highest temperature including environment and self-heating

2.1.3 Operating voltage

- Applied voltage between the capacitor terminals, In the DC circuit ,it using DC type capacitor.
Operating voltage don't over the 1/2 rated voltage of capacitor in the circuit. It must attention the max. electromotive force and pulse voltage that must less the 1/2 rated AC voltage.
- In communication or changes in ac/dc conversion circuit, ac voltage of capacitor should be used, and must consult manufacturers, confirmed rear can use. But in the general circuit, which USES voltage is less than (1). Please use our Y2, 500 vac capacitance, (2). 500 vac ~ 1 kvac. Please use our Y1 capacitance and should be considered under the condition of the surge in the outside world, using the maximum possible voltage, shall not exceed the rated ac voltage.
- In communication or changes in ac/dc conversion circuit, if use dc voltage of capacitor, in its general circuit, using voltage shall be the rated dc voltage for the 1/8, and should be considered under the condition of the surge in the outside world, using the maximum possible voltage shall not exceed the rated dc voltage 1/8. (1). Please use our Y2, 500 vac capacitance, (2). 500 vac ~ 1 kvac, please use our Y1 capacitance.
- Under fixed voltage, high frequency voltage, topped the pulse voltage loop when using continuous, consult please confirm.

2.1.4 The use of current

- Apply high frequency and pulse continuous that operating high current circuit must confirm with us before using.

2.1.5 heat-self confirm

- Operating AC or oscillation circuit in machine test, the temperature rise under 20℃

2.1.6 Location Limitation

- Please don't use in the following places
 - ① Water or salt solvent
 - ② Dew
 - ③ Corrosive place
 - ④ High vibration place as over approve

2.2 Operating environment and circuit design.

- If the capacitor using at plastic assembly ,Must research influence of the capacitor ,Some assembly will damage self-capacitor, As thermal expansion and cold shrink ,It have crevices in the epoxy that will worse there humidity

Rev.	Edit	Date	Content	Responsible
1	1			
	2			
	3			

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Spec. Name	Ceramic disc capacitor approve	Record number
Description	Guidelines for using ceramic disc capacitor	Page: 2-7

3. General item of safety

3.1 Real equipment, and welding conditions

3.1.1 design of P.C.B.

- Between the hold of PCB with lead of capacitor must have some apare .

3.1.2 Adjustment of assembly machine

- If it have excessive pound phenomenon when auto assembly, please adjust the assembly machine.
- Capacitor location and the surrounding space adjustment

Voltage	Distance and space between the PCB safety
<250VDC	$\geq 0.5\text{mm}$
500VDC~2KVDC 250VAC~1KVAC	$\geq 1.0\text{mm}$
3KVDC~6.3KVDC 2KVAC~4KVAC	$\geq 2.0\text{mm}$
$\geq 8\text{KVDC}$	$\geq 2.5\text{mm}$

Voltage	At least to maintain the space in other parts of the capacitance between a safe distance to avoid
<250VDC	$\geq 0.5\text{mm}$
500VDC~2KVDC 250VAC~	$\geq 1.5\text{mm}$
3KVDC~6.3KVDC 2KVAC~4KVAC	$\geq 3.0\text{mm}$
$\geq 8\text{KVDC}$	$\geq 4.5\text{mm}$
>20KVDC	$\geq 6.5\text{mm}$

3.1.3 Soldering

- Soldering fluidness: In this flow of the halogen need : $\leq 0.1\text{WT}\%$ (0.1WT% are rated of transform C1)
- Solder: It can't immerge capacitor body in the solder process at approve.
- Washing: It must use lotion wash. If the capacitor wash with P.C.B. must comfirm the solvent can't influence the capacitor body.

3.2 Storage

- The capacitor must storage in door , That can't storage in high humidity and high temperature environment. The temperature must at 5~40°C and the humidity under 75%. They are wallamted for a period of one year . From the date of mannfacture, But the storage perior must confirm lead will not oxidize.
- It must avoid direct by sun shine and soaked by dew

Rev.	Edit	Date	Content				Responsible	
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Standard title : Ceramic disc capacitor approve	Record NO.
Name: Guidelines for using ceramic disc capacitor	Page : 3-7

1 . Applicable range :

The specification applicable at ceramic disc capacitor (500VDC-15KVDC)

2 . Recommend standard :

GB9597-88

3 . The principle of part number :

L- KLS10 - HV16 - 2KV - Y5P - 472 K - P7.5 - S
 (1) (2) (3) (4) (5) (6) (7) (8) (9)

(1) RoHS Compliance

(2) Ceramic capacitors

(3) HV16 is high dielectric constant type ceramic capacitor

(4) Rated voltage

Voltage	500V	1KV	2KV
Symbol	500V	1KV	2KV

(5) Material

NPO	N75	SLO	2SL	X7R	Y5E	Y5P	Y5R	Y5U	Y5V	Z5V
NPO	N750	SL	2SL	X7R	Y5E	Y5P	Y5R	Y5U	Y5V	Z5V
CH										

(6) Capacitance

222 ~ 2200PF ~ 22nF ~ 0.0022μF	103~10000PF~10nF~0.01μF
331 ~ 330PF ~ 0.33nF ~ 0.00033μF	104~100000PF~100nF~0.1μF
102 ~ 1000PF ~ 1.0nF ~ 0.001uF	
472 ~ 4700PF ~ 4.7nF ~ 0.0047uF	

(7) Tolerance

Tolerance	±5%	±10%	±20%	+80%-20%
Symbol	J	K	M	Z

(8) Pitch

Pitch	2.5mm	5mm	7.5mm
Symbol	P3	P5	P7.5

(9) Lead Type:

S=Straight lead

Rve	Edit	Date	Content				Responsible		
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Name: <div style="text-align: center; margin-top: 10px;">Guidelines for using ceramic disc capacitor</div>				Page : 4-7	

4 . Operating temperature range :
-25℃ ~ 125℃ Include capacitor-self heat maximum 20℃, it can't application temperature characteristic.

5 . Performance : Performance and test method refer to table1.

6 . Experiment condition :
The standard experiment condition as (temperature15~35℃,humidity45`75%,atmospheric pressure 86~106kpa).If it can't limited any condition But doubt place or special place,Must using standard condition, as (temperature20±5℃, humidity 60 ~ 70%, atmospheric pressure 86 ~ 106kPa)

NO	Item	Characteristics	Test Method
1	Appearance,size and mark	Normal	Size measured by vernier. Appearance and
2	Mark and resistance to solvent	The mark reference appendix specification, resistance to solvent test, mark must clear	Appearance part number test by visual. Resistance to solvent test: Put the capacitor in the 20-25℃ cleanser immerge 5+/-0.5mins
3	Voltage proof	Between terminals Normal	Test Voltage: W.V.=500V-2KV T.V=200%×W.V. W.V.=3KV-6KV T.V=150%×W.V. W.V.=8KV-15KV T.V=150%×W.V. Time of Voltage: 1 ~ 5seconds Charge and discharge current 50mA max
	Between terminal and case	Normal	Test Voltage: 1300V.DC Time of Voltage: between1 ~ 5seconds Charge and discharge current 50mA max Voltage is applied: small metal ball method
4	Insulation resistance	T.C. 10000MΩ MIN HIK 5000MΩ MIN semiconductor(S.C.)100MΩ MIN	Test voltage: Rated voltage≤1KVDC: 100VDC , >1KVDC:500VDC; semiconductor(S.C.): 16VDC。 Test time: 1min±5s
5	Capacitance	Within the standard tolerance	Measure voltage T.C. HIK : 1.0Vrms semiconductor(S.C.) : 0.1Vrms Measure frequency: T.C. : ≤1000PF 1MHz >1000PF 1KHz HIK、 semiconductor (S.C.) : 1KHz Measure temperature : 25℃±2℃
6	Q and Dissipation factor (tan δ)	T.C. : 1.C<30PF : Q≥400+20×C 2.C≥30PF : Q≥1000 HIK : 1.Y5E、 Y5P、 Z5U、 Y5U、 X7R : DF≤2.5% 2. Z5V、 Y5V : DF≤5% 3. BN、 Y5T : DF≤0.5% 4.Y5R : DF≤0.2% semiconductor(S.C.): 1.Y5P、 Y5U : DF≤5% 2.Y5V : DF≤7%	same condition as the capacitance

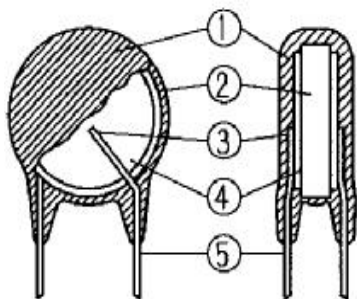
Rve	Edit	Date	Content	Responsible
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	2			
	3			

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7 . Construction . Shape . Dimension

Does not specifically limit conditions, according to state (temperature 15 ~ 35 °C, relative humidity of 45 ~ 75%, atmospheric pressure 86 ~ 106kPa).

Doubt occasions or special requirements of the occasion, according to state (temperature 20 ± 5 ° C, relative temperature 60 ~ 70%, atmospheric pressure 86 ~ 06kPa).

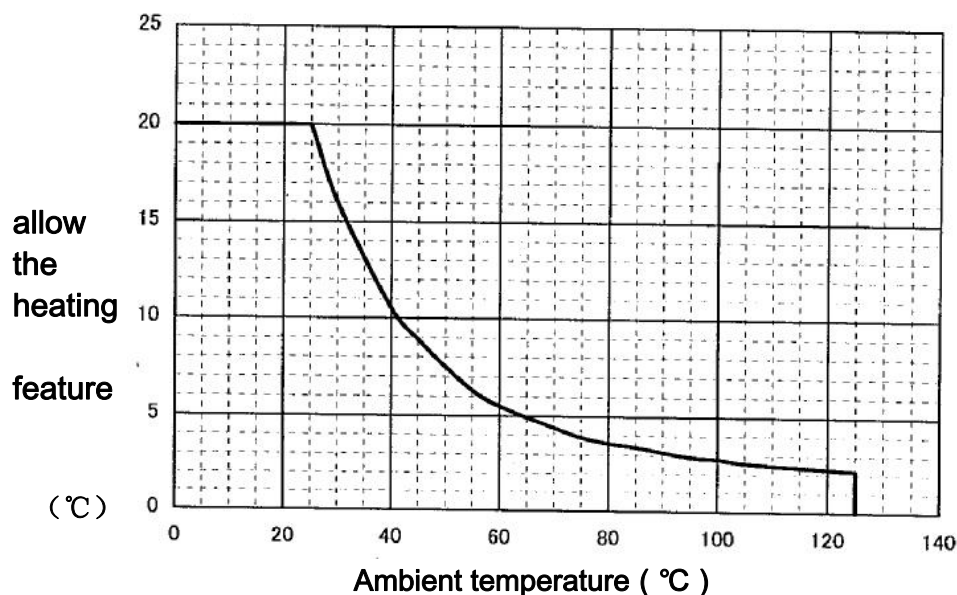


Material

NO.	Name	Material
1	Coating	Blue epoxy UL94.V-0
2	disc	Ceramic
3	Sloder	Tin of ROHS
4	Electrode	Silver
5	Loading	CP Lead

Shape and outline dimension refer to attachmen

8.Ambient temperature - allow the heating features



【Explain】 :

The capacitor operating at AC voltage self-heat temperature in room temperature(25°C)max are 20°C. Self-heat tempetature (to different capacitor surface and environment temperature). It have varied according variety of surface temprature. Environment temperature over 25°C, It'll referent up figure.

Rve	Edit	Date	Content			Responsible	
1	1						
	2						
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Issue		NINGBO KLS ELECTRONIC CO; LTD			Approve	Manager	Prepare
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Standard title :	Ceramic disc capacitor approve	Record NO.
Name:	Guidelines for using ceramic disc capacitor	Page : 6-7

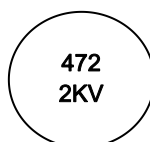
9 . REPRESATATION :

1.Capacitance : under100pF, marking 2 number,over 100pF , marking 3 number

2.Voltage : 1kV/2kV/3kV real marking

For example :

2KV 4.7nF



10 . Packing Method :

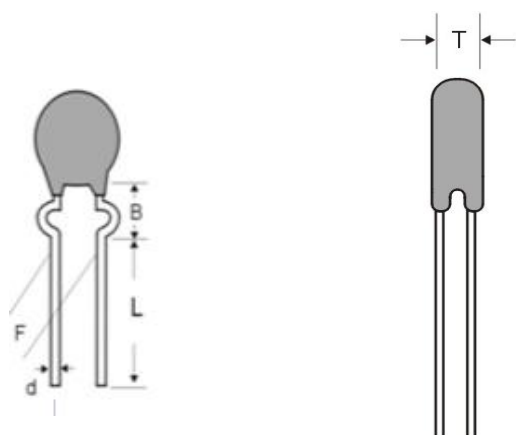
(1) Bulk ☒ 500PCS per bag

(2) Taped ☐ 1000PCS per bag

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2022-10-12					Kandy	Roland	Jenny
Implement							
2022-10-12							

Standard title : Ceramic disc capacitor approve	Record NO.
Name: Guidelines for using ceramic disc capacitor	Page : 7-7

12.Shape and Dimension



Outline dimension

Symbo	dimension(mm)	Remark
D	-	Refer to be below list
T	-	Refer to be below list
L	-	Refer to be below list
F	7.5±1.0	
B	6.0max	
d	0.5±0.1	

Code

Customer NO.	Type NO.	Capacitance		voltage (KV)	Dimension (mm)			
		Cap.(nF)	tolerance		D max	T max	F	L
L-KLS10-HV16-2KV-Y5P-472K-P7.5-S		4.7	±10%	2KV	13.0	5	7.5±1.0	27±5.0

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(單層)陶瓷系列承認書
(Disc) Ceramic Capacitors series

2022年10月12日

Customer		Customer NO 顧客料號						Q'TY 數量	
		Part No 零件代號		L-KLS10-HV16-2KV-Y5P-472K-P7.5-S					
顧 客		Operating Temperature (使用溫度範圍)			-25℃ ~ +125℃		Cap change (容量變化率) 溫度範圍		-25℃ ~ +85℃ '±22%
Name Code	C/C	CAP.	4.7nF (472)	TOL	+10%	Material	Y5P	W.V. 電壓 (DC)	2KV
規 格		容量		誤差	-10%	材質			

1. Test condition 測試條件

Instrument (儀器)	Freq.頻率	Temp.溫度	R.H.濕度	環保
HP4278A	1KHz 1.0V	25℃ +/-2℃	65%	ROHS

Appearance 外觀	Capacitance 靜電容量 (nF)	Insulation Resistance 絕緣電阻 (MΩ)	Body size 外徑 (mm) D	Coating on Lead 塗料長度 (mm) B	Lead Spacing 導線間格 (mm) F
472 2KV	4.23~5.17	≥5000	≤13	≤6	7.5±1.0
DF值	Lead Length 導線長度 (mm) L	Thickness 厚度 (mm) T	Wire diameter 線徑 (mm) d	Dielectric Strength 誘電體強度V.DC	
≤2.5%	27±5.0	≤5	0.5±0.1	4KV.DC1-5S 充放電電流為50mA以下	

2.Actual record 實測記錄

NO	1	2	3	4	5	6	7	8	9	10
Capacitance 靜電容量(NF)										
DF值(%)										
Judgment 判定	AC <input checked="" type="checkbox"/> RE <input type="checkbox"/>									

3.Reference drawing 圖形參考

