

Product Specification

Number: L-KLS14-HC-49U-XXXX-XX-XX-X
Name: DIP Crystal Resonator
Customer: _____
Date: 2024-07-26

Customer Signature:



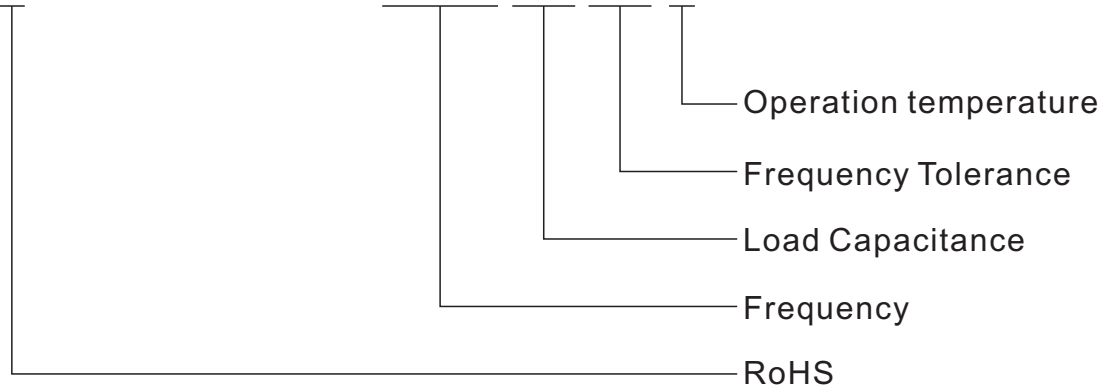
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Compi	Check	Review	Approva
Jenny	Jack.C		

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ORDER INFORMATION

L-KLS14-HC-49U-XXXX-XX-XX-X



Frequency:

2.000=2.000MHz 4.000=4.000MHz 5.000=5.000MHz
 6.000=6.000MHz 8.000=8.000MHz 10.000=10.000MHz
 12.000=12.000MHz 16.000=16.000MHz 20.000=20.000MHz

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Load Capacitance:

12=12pF 16=16pF 18=18pF
 20=20pF 30=30pF

Frequency Tolerance:

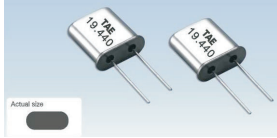
20=20ppm 30=30ppm

Operation temperature:

A:-10°C~+60°C B:-20°C~+70°C C:-40°C~+85°C

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RoHS Compliant Standard



HC-49U/5.000MHz



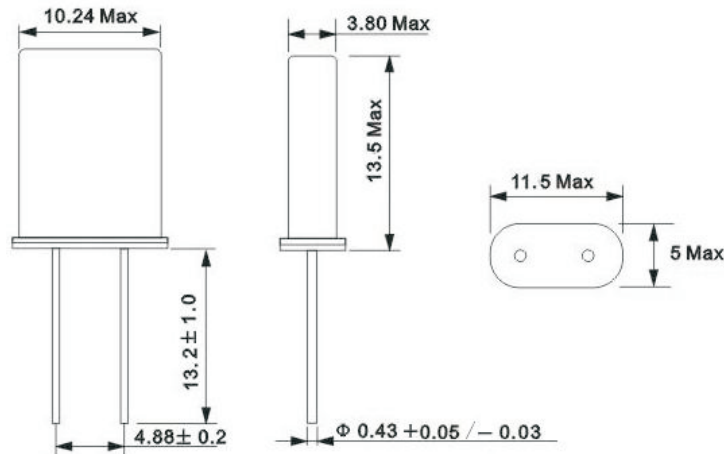
■ Features 特性

- Excellent clock signal generator for CPU's 适用于卓越的CPU时钟信号发生器
- Available in extended temperature range 适用于宽广的温度范围

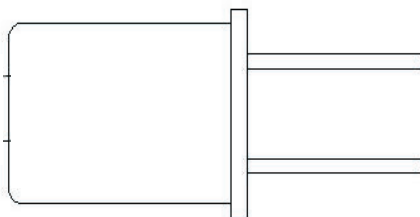
■ STANDARD SPECIFICATIONS 標準規格

Item	Model	HC-49U	Conditions
Frequency Range	頻率範圍	5.000MHz(Fund.)	
Frequency Tolerance	調整頻差	±30ppm	at 25°C ±3°C
Freq. Tol. Over Temp.	溫度頻差	±50ppm	-40~+85°C
Operating Temp. Range	工作溫度範圍	-40~+85°C	
Storage Temp. Range	保存溫度範圍	-40~+85°C	
Series Resistance	諧振電阻	100ohm Max.	at 25°C
Load Capacitance	負載電容	20pF	Need to specify
Shunt Capacitance	靜態電容	7 pF Max.	
Drive Level	激勵電平	100 μw Max.	
Aging[first year]	第一年老化率	±5ppm Max.	25 ± 3°C
Insulation Resistance	絕緣阻抗	500Mohm Min.	DC100V ± 15V

■ OUTLINE DRAWINGS(unit:mm)

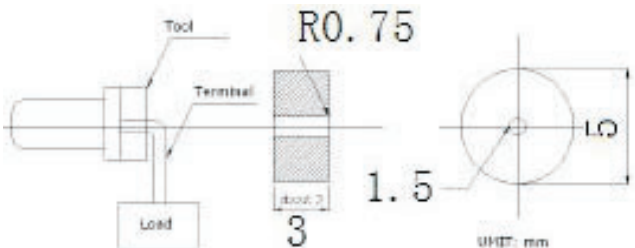


■ LASER MARKING



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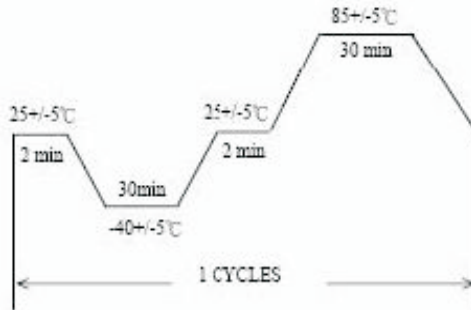
可靠性Reliability(Mechanical and Environmental Endurance)

No.	Test Items	Test Method and Condition	Requirements
1	振動 Vibration	(1)振動頻率Vibration Frequency 10 to 55Hz (2)振動幅度Vibration Amplitude 1.5mm (3)周期 Cycle Time 1-2min(10-55-10Hz) (4)振動方向Direction X.Y.Z (5)振動時間Duration 2h/each direction	頻率變化最大:±5ppm Frequency Change:±10ppm Max. 電阻變化最大:±15%或2ohm Resistance Change:±15% or 2ohm Max.
2	衝擊 Shock	從50cm高的地方自由跌落3次到30mm厚的硬木板上 3 Times free drop from 75cm height to hard wooden board of thickness more than 30mm	頻率變化最大:±5ppm Frequency Change:±10ppm Max. 電阻變化最大:±15%或2ohm Resistance Change:±15% or 2ohm Max.
3	氣密性 Leakage	晶體放入氦加壓罐內，充入氦氣壓力0.5-0.6Mpa保持1小時；然後使用氦質譜檢漏儀測試。 Put crystal units into a hermetic container and Helium for 0.5-0.6 Mpa,and keep it for 1h;Check the leakage by a Helium leak detector	漏氣率小於:1x10 ⁻⁸ Pa·m3/s Leakage:1x10 ⁻⁸ Pa·m3/s Max.
4	可焊性 Solderability	將引線浸入完全熔化的焊錫鍋內3±0.5s，焊錫溫度245℃±5℃ Put the leads of crystal units into solder melted tank for 3±0.5s Temperature of solder melted tank is 245℃±5℃	浸過引線面積的90%以上被新焊錫覆蓋 The dipped surface of the leads should be at least 90% covered with continuous new solder coating
5	耐焊接性能 Resistance to soldering heat	引腳浸入熔化的焊錫槽內，溫度350℃±10℃ 3-4秒或260℃±5℃ 10秒±1秒。 Terminals lead-wires of specimen shall be dipped into solder melted tank at 350℃±10℃ for 3~4sec. Or 260℃±5℃ for 10±1sec.	頻率變化最大:±5ppm Frequency Change:±10ppm Max. 電阻變化最大:±15%或2ohm Resistance Change:±15% or 2ohm Max.
6	引線強度 Lead Strength	(1)牽引pulling 样品基体固定，引腳轴向逐渐增加重量到8.82N，持续30秒。 Body of specimen shall be fixed,and 8.82N of tension weight shall be supplied gradually to axial direction of terminals/lead-wires for 30s. (2)样品基体固定，引腳逐渐弯曲90°施加225g牽引力，然后逐渐拉直同样的向反方向弯曲再拉直。（参照下图） Body of specimen shall be fixed,and 90 degree bending shall be given ,being supplied 225g tension weight.After that,terminal/lead-wires shall be straightened gradually.Then the same bending and straightening shall be supplied to the opposite direction in the same axial. (Refer to the below Fig.) 	晶體外觀無異常 There is no observation of any visual damages on the specimen

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可靠性Reliability(Mechanical and Environmental Endurance)

No.	Test Items	Test Method and Condition	Requirements
7	耐濕性 Humidity Endurance	晶體放置於 $60^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 、相對濕度90-95%環境中240小時後，常溫放置1-2小時 The crystal units shall be put in somewhere at $60^{\circ}\text{C} \pm 2^{\circ}\text{C}$ in relative humidity of 90-95% for 240 hours, then keep it for one or two hours under room temperature	頻率變化最大: $\pm 5\text{ppm}$ Frequency Change: $\pm 10\text{ppm Max.}$ 電阻變化最大: $\pm 15\%$ 或 2ohm Resistance Change: $\pm 15\%$ or 2ohm Max.
8	耐低溫能力 Low Temperature Endurance	晶體放置於 $-40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 環境中240小時後，常溫放置1-2小時 The crystal units shall be put in somewhere for 240 hours at temperature of $-40^{\circ}\text{C} \pm 2^{\circ}\text{C}$, then keep it for 1-2 hours under room temperature	
9	耐高溫能力 High Temperature Endurance	晶體放置於 $85^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 環境中 2小時後，常溫放置1-2小時 The crystal units shall be put in somewhere for 2 hours at temperature of $85^{\circ}\text{C} \pm 2^{\circ}\text{C}$, then keep it for 1 to 2 hours under room temperature	
10	高低溫迴圈 Temperature Cycle	參照下列溫度曲線圖，10個循環，溫度從底到高，再從高到低 溫度變化 $1^{\circ}\text{C}/\text{分鐘}$ 。 The following temperature cycle(10cycles).Refer to below Fig. Temperature shift from low to high, high to low shall be in 1deg./min	

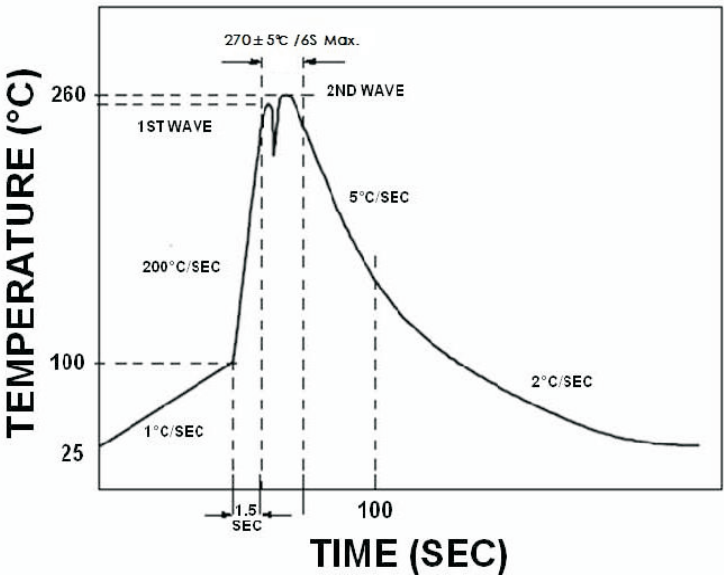



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使用說明 Processing Instructions

下面的說明和資訊供用戶正確理解和使用我們公司的石英晶體系列產品，預防不當的加工方式對石英晶體的損壞，確保用戶設備的可靠性

The following instructions and information are provided for the purpose of having the user understand the proper way to process our crystal products to prevent problems prior to use and enhance the reliability of the equipment to which they are applied.

No.	PROCESSING INSTRUCTIONS
1	<p>石英晶體意外跌落 When dropped by mistake</p> <p>設計和製造的石英晶體本身具有耐衝擊能力,但是當石英晶體元件經受劇烈的機械衝擊，如跌落到地板上或安裝期間劇烈震動時，在使用之前需要進行電性能確認</p> <p>The crystal units are designed and manufactured to resist physical shocks.However,when the crystal units are subjected to excessive impact such as being dropped onto the floor or giving shocks during processing,need to make sure its satisfactory performance before using it.</p>
2	<p>焊接 Soldering</p> <p>a.使用電烙鐵焊接時，引線應該在3秒內焊接完畢，電烙鐵溫度不能高於380°C</p> <p>Lead wires should be soldered within 3 seconds with the soldering iron heated to a temperature no higher than 380°C</p> <p>b.使用浸錫方式焊接時，引線應該在10秒內焊接完畢，焊錫溫度不能高於270°C，並且注意不能將整個晶體浸錫。推薦使用垂直安裝方式，避免熱力直接傳導到晶體上</p> <p>In solder-dip processing,the leads should be soldered within 10 seconds with a temperature no higher than 270°C .Mounting in upright is recommendable to prevent the heat conduction directly to the body of the crystal unit.</p> <p>c.波峰焊接 Wave soldering</p> <p>推薦使用下面的波峰焊曲線 The WAVE SOLDERING PROFILE as below is recommended:</p>  <p>The graph shows a temperature profile for wave soldering. The y-axis is Temperature (°C) from 25 to 260. The x-axis is Time (SEC) from 0 to 100. The profile starts at 25°C, rises at 1°C/SEC to 100°C, then rises at 200°C/SEC to a first peak of 270 ± 5°C within 1.5 SEC. It then drops at 5°C/SEC to a second peak (2ND WAVE) and finally cools at 2°C/SEC. The total time for the second wave is 100 SEC.</p>

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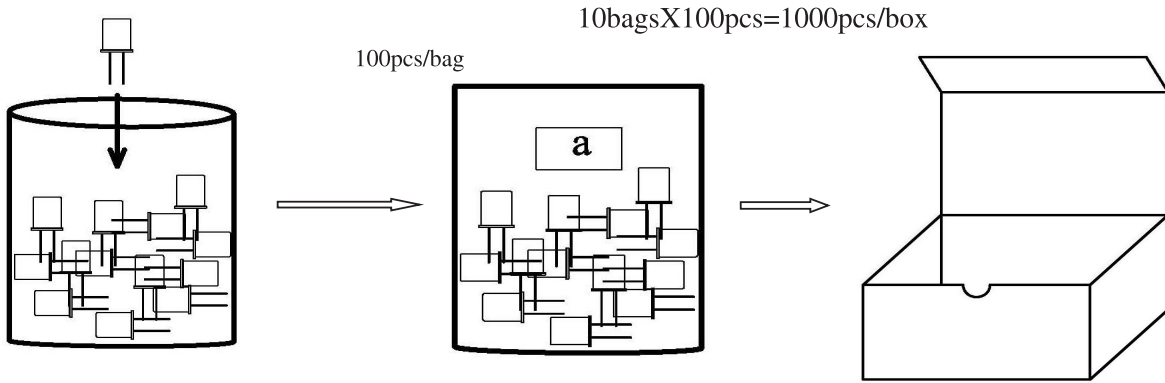
No.	PROCESSING INSTRUCTIONS
3	<p>石英晶體彎腳 TO BEND THE LEAD of cylinder type products</p> <p>(1)晶體元件需要彎腳時，為了防止彎腳時造成密封玻璃體的破裂，從彎腳處到晶體基座底部距離應大於1.5mm。推薦距離3.0mm,並使用工裝夾具進行彎腳。</p> <p>When the lead of crystal units need to be bent,leave more than 1.5mm (3.0mm is recommendable) of lead from the case in order to prevent from any cracks of the hermetic sealing glass at the root of the lead,and use a jig to bend if possible.</p> <p>(2)晶體元件進行彎腳時，不要剝離引線的鍍層</p> <p>When bending the lead of cylinder type crystal units,do not scrape off the soldering plating from the lead surface.</p>
4	<p>元件的安裝 MOUNTING</p> <p>4.1晶體元件的安裝 MOUNTING of products</p> <p>(1)為了避免影響元件電性能或損壞元件，嚴禁將晶體元件外殼焊接在印製板上進行固定。</p> <p>Soldering the body of the crystal units with PCB must be avoided due to deteriorate the characteristics or damage</p>
5	<p>石英晶體元件的清洗 CLEANING</p> <p>(1)惡劣的超聲波清洗或超聲波焊接可能會影響和損壞石英晶體元件。如果您對晶體元件進行了超聲波清洗，請一定在使用前確認晶體元件是否受到了影響和損壞</p> <p>Crystal units may be sffected and destroyed at worst by supersonic cleaning or supersonic welding.Please be sure to check if your cleaning and welding process sffects any damage to crystal units before using.</p> <p>(2)有些清洗液也可能造成晶體元件的損壞，請在使用清洗液前確認該清洗液是否適用</p> <p>Some kinds of cleaning fluid may cause any damage to crystal units.Please be sure to check suitabilityof the cleaning fluid in advance.</p>
6	<p>貯存 STORAGE</p> <p>石英晶體元件長時間貯存在高溫或高濕環境中，可能會影響頻率的穩定性或可焊性。請將晶體元件貯存在正常的溫度和濕度環境中，避免陽光直射和露水凝結，避免貯存6個月以上再使用，拆封後儘快裝配使用。</p> <p>Storage of crystal units under higher temperature or high humidity for a long term may affects frequency stability or solderability.</p> <p>Please store the crystal units under the normal temperature and humidity without exposing to direct sunlight and dew condensation ,and avoid the storage of crystal units for more than 6 months,and mount them as soon as possible after unpacking.</p>

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包装 PACKING

Packing For Pb Free Parts:

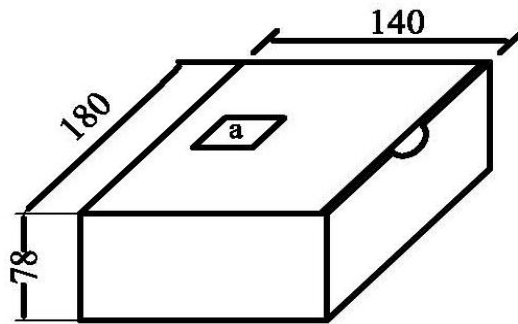
1. INNER BOX:(Unit:mm)



2.LOGO STICKER(CARTON and INNER BOX):(Unit:mm)

Label a

	合格证	
	TYPE	
	FREQUENCY	
	Δf/f0	
	CL	
	RES	
	P/N	
	QTY	
	OQC	
	DELIVERY DATE	
	LEAD FREE	



PUT IN

10 INNER BOX x1000pcs=10000pcs

