

CRYSTAL UNITS SPECIFICATION

Product Type : ST - 308

Model : 32.768KHz

Description : DIP/308/32.768KHz/12.5pF/20ppm

SKC P/N : CCHA32768K022

SPEC No. : 1 - 161021 - CCHA32768K022



DATE : 21-Oct-16

Designer : *Aaron Lee*

Checked By : *Tom*

Approved By : *Sam*

REVISION HISTORY

Rev	Revise Page	Revise Contents	Date	Ref. No.	Reviser
A	N/A	Initial Release	21-Oct-16	N/A	Aaron Lee

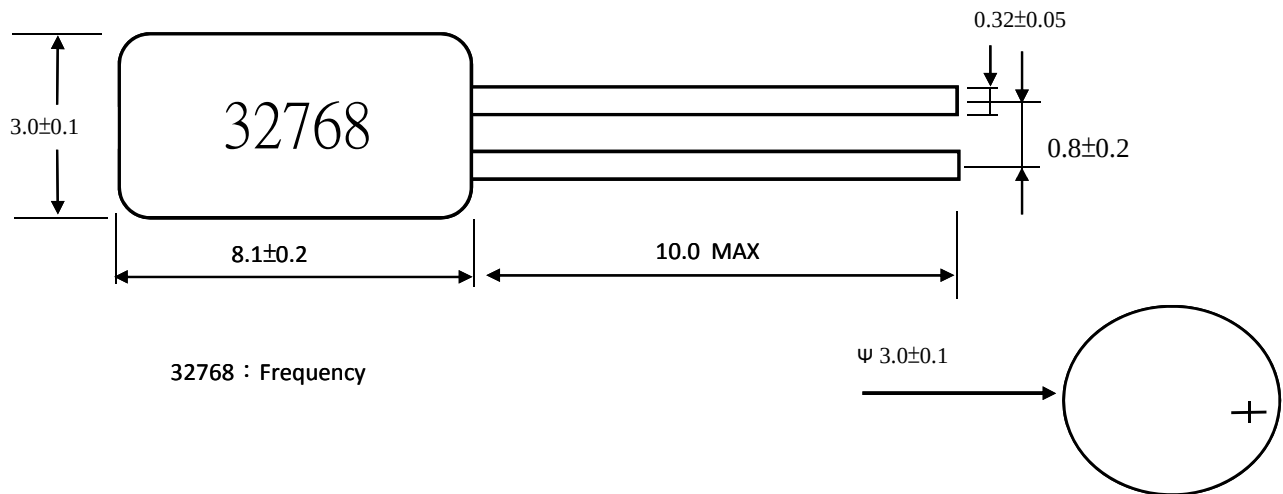
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■ ELECTRICAL CHARACTERISTICS

1	Holder type		ST - 308
2	Oscillation mode		☒ Fundamental ☐ 3rd Overtone ☐ 5th Overtone
3	Crystal cutting type		DT CUT
4	Nominal frequency	FL	32.768KHz
5	Frequency stability	Tol	± 20 ppm (ref at 25℃)
6	Operating temperature range	TOPR	-20℃ to +70℃
7	Storage temperature range		-40℃ to +85℃
8	Load capacitance	CL	12.5 PF ± 0.2PF
9	Equivalent series resistance	ESR	30 KOhms max.
10	Drive level	DL	1 uW MAX
11	Shunt capacitance	C0	1.75 pF TYP
12	Motional capacitance	C1	3.5 fF TYP
13	Insulation resistance		500M Ohms min. at DC 100V ± 10V
14	Aging rate per year		Less than ±5ppm / year

■ DIMENSIONS

(Unit:mm)



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■ RELIABILITY TEST

We evaluate environmental and mechanical characteristics by the following test condition.

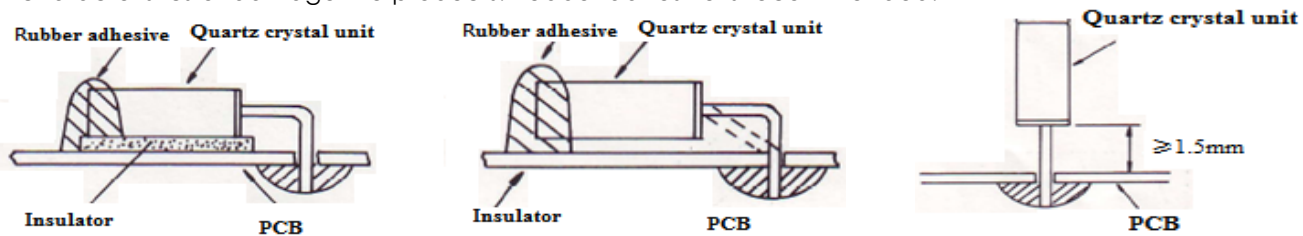
Measurement will be carried out after letting it alone in the room temperature for 1 to 2 hours.

TEST ITEM		TEST METHODS	CRITERIA
1	Shock	3 Times free drop from 75cm height to hard wooden board of thickness more than 30mm.	$\Delta F/F \leq \pm 10 \text{ ppm}$ $\Delta CI \leq 5K \Omega$
2	Vibration	Vibration Frequency : 10 to 55Hz Vibration Amplitude : 1.5mm Cycle Time : 1-2min(10-55-10Hz) Direction : X.Y.Z Duration : 2h/each direction	$\Delta F/F \leq \pm 10 \text{ ppm}$ $\Delta CI \leq 5K \Omega$
3	Resistance to soldering heat	Put the leads of crystal units into solder melted tank for 5 sec. Temperature : $350^{\circ}\text{C} \pm 10^{\circ}\text{C}$	$\Delta F/F \leq \pm 10 \text{ ppm}$ $\Delta CI \leq 10K \Omega$
4	High Temperature Exposure	Temperature : $85 \pm 5^{\circ}\text{C}$ Length of Test : $96 \pm 4 \text{ Hrs}$	$\Delta F/F \leq \pm 10 \text{ ppm}$ $\Delta CI \leq 5K \Omega$
5	Low Temperature Exposure	Temperature : $-20 \pm 5^{\circ}\text{C}$ Length of Test : $96 \pm 4 \text{ Hrs}$	$\Delta F/F \leq \pm 10 \text{ ppm}$ $\Delta CI \leq 5K \Omega$
6	Humidity	Temperature : $40 \pm 2^{\circ}\text{C}$ Relative Humidity : 90% - 95% Length of Test : $96 \pm 4 \text{ Hrs}$	$\Delta F/F \leq \pm 10 \text{ ppm}$ $\Delta CI \leq 5K \Omega$
7	Temperature Cycle	Cycle : 5 cycles Temp. : 100°C for 30 mins, -40°C for 30 mins.	$\Delta F/F \leq \pm 10 \text{ ppm}$ $\Delta CI \leq 5K \Omega$
8	Sealing	Less than 0.5 - 0.6 Mpa, and keep it for 1 hour.	$1 \times 10^{-8} \text{ mbar} \cdot 1 / \text{s Max}$
9	Pulling Test	The crystal lead with the 0.9kg power keep it for $30 \pm 5 \text{ s}$.	No peeling - off at a solder part
10	Bending Test	bend the crystal lead 90° with 0.45kg power 2 times (bend should be more than 1.5mm from the case)	No peeling - off at a solder part

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■ Notice

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.

1	When dropped by mistake	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.
2	Soldering	A. Lead wires should be soldered within 3 seconds with the soldering iron heated to a temperature no higher than 350℃. B. In solder-dip processing, the leads should be soldered within 6 seconds with a temperature no higher than 270℃. Mounting in upright is recommendable to prevent the heat conduction directly to the body of the crystal unit.
3	To bend the lead	A. When the lead of cylinder type 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. B. When bending the lead of cylinder type crystal units, do not scrape off the soldering plating from the lead surface.
4	Mounting	A. Soldering the body of the cylinder type crystal units with PCB must be avoided due to deteriorate the characteristics or damage the products. Rubber adhesive is recommended.  The diagrams illustrate the correct mounting of a quartz crystal unit. The first diagram shows the unit mounted on a PCB with rubber adhesive. The second diagram shows the unit mounted on a PCB with rubber adhesive. The third diagram shows the unit mounted on a PCB with rubber adhesive, with a dimension line indicating a distance of $\geq 1.5\text{mm}$ from the body case to the bend. B. When the lead needs to be bent by hand, please follow the instruction as below: Hold the body of the cylinder type crystal unit in fingers; pick at the part with tweezers, which you want to bend. There should be more than 1.5mm(3.0mm is recommended) from the body case; Bend the lead 90° by tweezers without pulling the lead strongly. If pulling the lead strongly may cause any cracks of hermetic sealing glass at the root of the lead and may cause the leakage and the characteristics to deteriorate.

CRYSTAL UNITS SPECIFICATION

5	Cleaning	A. Crystal units may be affected and destroyed at worst by supersonic cleaning or supersonic welding. Please be sure to check if your cleaning and welding process affects any damage to crystal units before using. B. Some kinds of cleaning fluid may cause any damage to crystal units. Please be sure to check suitability of the cleaning fluid in advance.
6	Storage	Storage of crystal units under higher temperature or high humidity for a long term may affects frequency stability or solder ability. 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.