DATE : 2009/02/10

ITEM : CRYSTAL RESONATORS

TYPE :	DT-38
NOMINAL FREQUENCY :	32.768kHz
SPEC No. :	1TC125AFNS027

Please acknowledge receipt of this specificaiton by signing and returning a copy to us.

RECEIPT	
DATE	
RECEIVED	(signature) (name)

General Manufacturer of Quartz Devices
DAISHINKU CORP.
1389 Shinzaike, Hiraoka-cho, Kakogawa, Hyogo
675-0194 Japan
Phone (81)79-425-3141 Fax (81)79-425-1134
http://www.kds.info/index_en.htm

C.ENG. T. Nakamura.

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1. Electrical characteristics (measured at +25±2°C)

(1) Nominal frequency	32.768 kHz
(2) Frequency tolerance	± 5 × 10^{-6} max.
(3) Loading capacitance	12.5 pF
(4) Equivalent resistance	30 kΩ max. / series
(5) Measurement drive level	1.0 ± 0.2 μW
(6) Turnover temperature	25 ± 5°C
(7) Parabolic curvature constant	- 4.0 × 10^{-8} / °C^2 max.
(8) Insulation resistance	Lead to lead 500 MΩ min. at D.C. 100V Lead to case
(9) Operating temperature range	- 10 ~ + 60 °C
(10) Storage temperature range	- 20 ~ + 70 °C
(11) Aging	± 5 × 10^{-6} max. / year

Manufacturing location	Spec No.
Tianjin	1TC125AFNS044

2. Construction

(1) Holder	DT-38
(2) Dimensions and marking	Refer to Fig-1 and Fig-2.

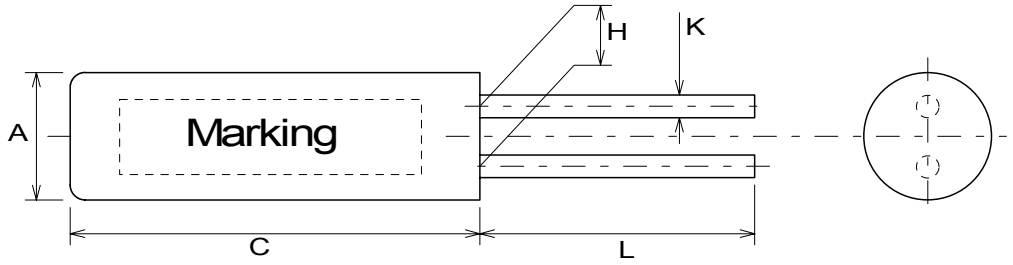
3. Other specifications

Use of Freon

This related product is not used with any ODC CLASS 1.

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4. Dimensions



A	C	H	K	L
dia.3.1 max.	8.3 max.	1.1 ± 0.2	dia.0.35±0.07	10.0±1.0

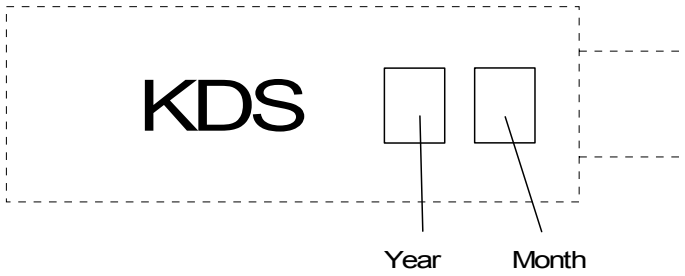
(Unit: mm)

Fig-1

5. Marking

The manufacturer's code and manufacturing date should be marked on the surface of the holder as the following diagram shows.

*Marking direction is not specified.



(*) Year : The last digit of the manufactured year
Ex) 2009 shall be marked as "9"
Month : As shown in the table
Ex) Feb. shall be marked as "B"

Month	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Symbol	A	B	C	D	E	F	G	H	J	K	L	M

Fig-2

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6. Mechanical endurance

Item	Standard	Condition
Vibration resistance	f_0: ±3×10^{-6} max.	(1) Vibration 30 ~ 120Hz (2) Cycle 2 min (3) G force 3G (4) Time 20 min X,Y,Z Each direction.
Shock resistance	f_0: ±3×10^{-6} max.	Free drops from 75cm high onto a wooden board (3 cm thickness) Repeat 3 times. Measure 5 min after the test.
Hermetical sealing	1×10^{-9} Pa-m^3/s max.	Testing by Helium leak detector.
Terminal strength	No visual damage	Bending terminals at +90°, at –90°, at +90°, and finally unbending at 0° 1mm from the bottom of case. One bend is counted as one time, it can be endured up to three times.
Soldering heat resistance	f_0: ±3×10^{-6} max.	Dipping terminals to 1mm from the bottom of product into the solder pot at +245±5°C for 3s. Measuring 1h after the test at +25°C.
Solder ability	90% min.	Terminals solder ability is at a bath temperature of +245±5°C for 3s. (with flux)

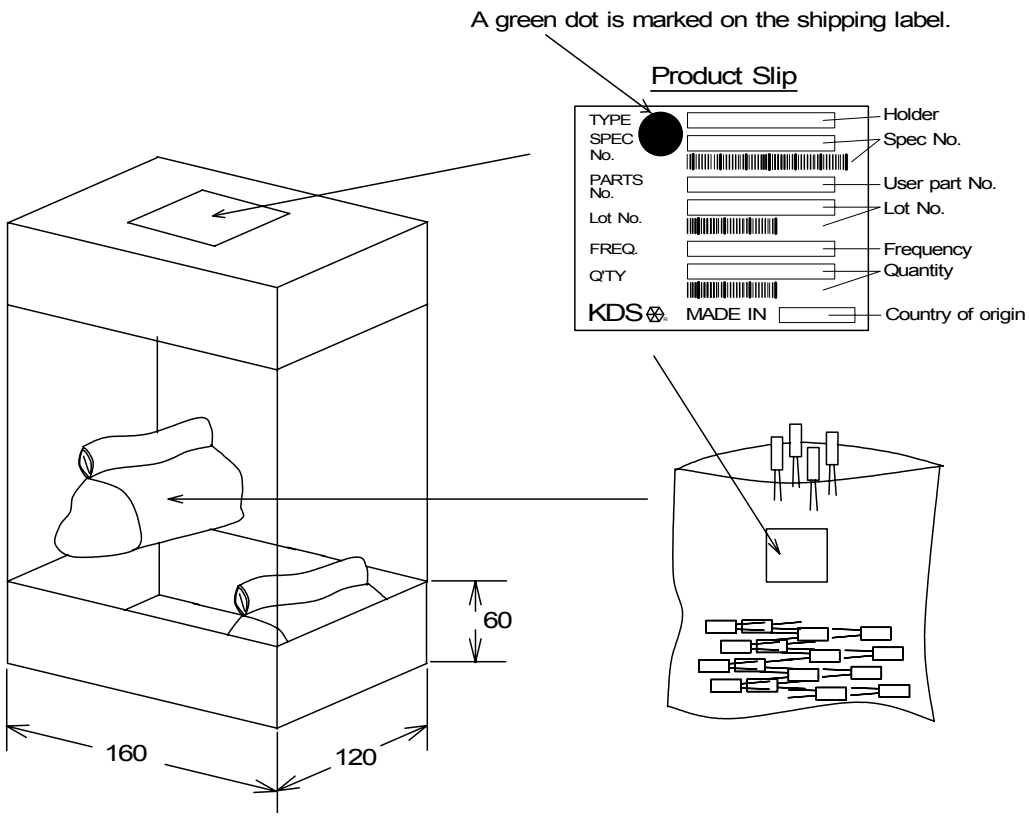
7. Environmental endurance

Item	Standard	Condition
High temperature storage	f_0: ±3×10^{-6} max.	+70°C × 24h Measuring 2h after the test at +25°C.
Low temperature storage	f_0: ±3×10^{-6} max.	-30°C × 24h Measuring 2h after the test at +25°C.
Moisture storage	f_0: ±3×10^{-6} max.	+40°C × 24h in 90 % relative humidity. Measuring 2h after the test at +25°C.

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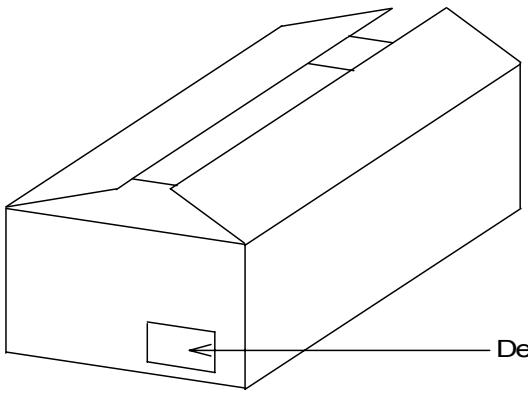
8. Packing

8.1. Inner box



1000 units per plastic bag. 5 plastic bags in an inner box. A product slip is attached on the inner box. (As for odd unit, shall be packed in a plastic bag.)

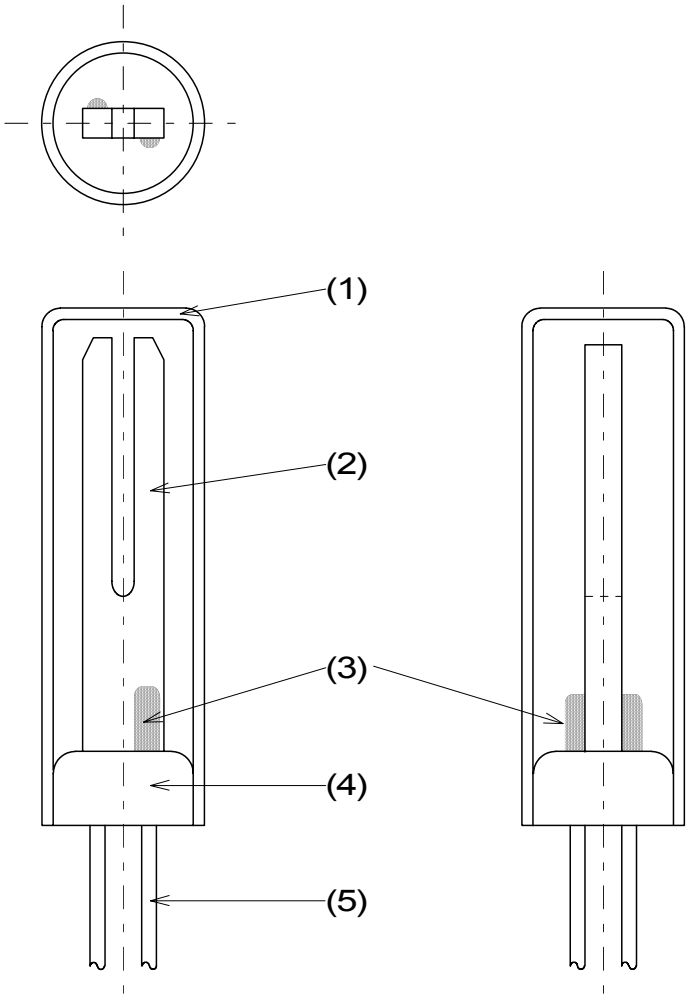
8.2. Outer box



Crystal units shall be packed in inner box by production lot. Outer carton size would be changed depending on lot size.
The description label shall be put on outer carton.

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9. Inside structure



No	Components	Materials	Finish/Specifications
(1)	Can	Nickel silver	Ni plating
(2)	Crystal blank	SiO_2	-
(3)	Solder	Sn-Ag-Cu	-
(4)	Shell	42 alloy	Sn plating
(5)	Lead terminal	Kovar	Sn plating

This is a sketch of inside construction.
So the size of this drawing may not match with actual size.

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10. User manual for tuning fork type crystal units (cylinder type)

10.1. Shock

Do not add excessive shocks to units, otherwise deterioration or non-oscillation may be caused.
Please be careful not to drop the units and operate them in a shock free condition.
Please also confirm conditions before applying automatic mounting or changing the condition of use.

10.2. Temperature and humidity

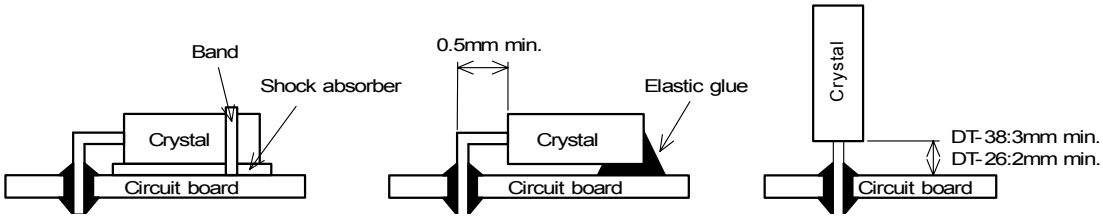
Operation or storage in high-temperature, low-temperature or high-humidity may cause deterioration of the units.
Please operate or store them under condition of normal temperature and normal humidity.

10.3. Solder heat

Solder which shall be melted at +217°C is used inside of these units, and therefore deterioration or non-oscillation may be caused if the units' body temperature reaches +150°C or over.
Please use SMD or heat-resistant type units when applying the above temperature.
Please be aware of temperature conditions or consult with us when applying flow-soldering.
May we also remind you to solder at +280°C max. with 5s max., or at +260°C max. with 10s max. at the leads.
Please do not apply solder to the body of units directly, as it may cause deterioration.

10.4. Mounting

If a horizontal laying position on the circuit board is required, fix the units firmly.
Especially under the vibrating conditions, insert shock absorber between the unit and circuit board or fix the unit with elastic glue (silicon applied) onto the board.
Please do not put the glue on glass part of units.
If a vertical standing position on a circuit board is required it is suggested to keep the unit at least 3mm away from circuit board for DT-38 type and 2mm for DT-26 type.



10.5. Lead cutting and Lead forming

Please keep your lead cutters in good condition, when applying the lead cutting.
If forming or reforming the leads, do not add excessive power to the roots of leads or press the sealing areas otherwise the glass may crack and leakages may be caused.
Please do not cut or bend the leads within 0.5 mm from the base of the cylinder body.

10.6. Ultrasonic washing and ultrasonic welding

Since mounting by Ultrasonic welding and processing have a possibility of an excessive vibration spreading inside a crystal resonator and becoming the cause of characteristic deterioration and not oscillating, it does not recommend.
Please consult with us if ultrasonic washing is required.

10.7. Drive level

Oscillation in excessive drive level may cause deterioration or non-oscillation.
For this product, drive level less than 1.0μW is recommended.
And original characteristics cannot be guaranteed when more than 2.0μW is supplied.

Thank you very much.

Please do contact us to below if you have any question.

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REVISION RECORD

Rev. No.	Date	Reason	Contents	Approved	Checked	Drawn
-	2009/02/09		The first edition.	T.N		H.N

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