



Serial No. : 2018-0065

DATE : 2018/01/25

HONHEVER(HK)LIMITED

ITEM :

CRYSTAL RESONATOR

TYPE : DT-261

NOMINAL FREQUENCY : 77.503kHz

SPEC No. : 1TG100DHNS003R

If there is a change in this specifications, the specification number may be changed.

|          |                           |
|----------|---------------------------|
| RECEIPT  |                           |
| DATE     |                           |
| RECEIVED | (signature)<br><br>(name) |

General Manufacturer of Quartz Devices

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## 1. ELECTRICAL CHARACTERISTICS

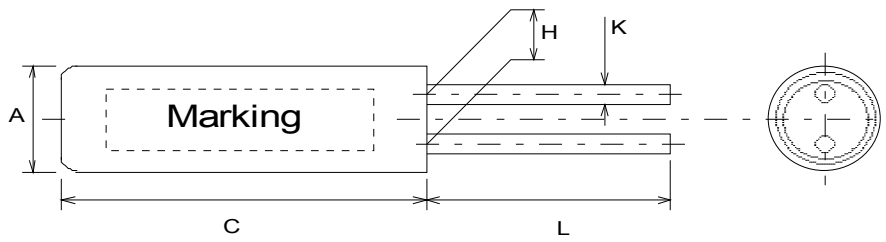
(This test shall be performed under the conditions of temp.at +25±2°C, relative humidity 60%max.)

|                                   |   |
|-----------------------------------|---|
| 1.1. NOMINAL FREQUENCY            | 77.503 kHz  |
| 1.2. OVERTONE ORDER               | Fundamental   |
| 1.3. LOADING CAPACITANCE(CL)      | 10.0 pF   |
| 1.4. FREQUENCY TOLERANCE          | ±20 ×10 <sup>-6</sup> max.                            |
| 1.5. DRIVE LEVEL                  | 1.0 ± 0.2 μW (2.0μW max.)                             |
| 1.6. SERIES RESISTANCE            | 40 kΩ max./Series                                     |
| 1.7. TURNOVER TEMPERATURE         | +25 ±5 °C   |
| 1.8. PARABOLIC COEFFICIENT        | -0.04 ×10 <sup>-6</sup> / °C <sup>2</sup> max.        |
| 1.9. SHUNT CAPACITANCE            | 0.75 pF Typ   |
| 1.10. OPERATING TEMPERATURE RANGE | -10 ~ +60 °C  |
| 1.11. STORAGE TEMPERATURE RANGE   | -20 ~ +70 °C  |
| 1.12. INSULATION RESISTANCE       | 500 MΩ min./DC100±15V<br>(Lead to lead, Lead to case) |

|   |                            |           |               |
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2. DIMENSIONS AND MARKING

2.1. DIMENSIONS



|           |          |           |              |          |
|-----------|----------|-----------|--------------|----------|
| A         | C        | H         | K            | L        |
| Φ2.1 max. | 6.0 max. | 0.7 ± 0.2 | Φ0.28 ± 0.05 | 5.0 min. |

unit : mm

Fig.-1

2.2. MARKING

Marking should be printed as follows:  
Logo(\*1),Frequency(\*2),Lot No.(\*3)

\*1 Manufacturer's trademark shall be marked 'D' as Logo.

\*2 In case of 77.503kHz,nominal frequency shall be marked '77'.

\*3 Lot No. shall be marked by two figures.

- (1)Year:The last digit of the year.
- (2)Month:As shown in the table

|        |      |      |      |      |     |      |      |      |      |      |      |      |
|--------|------|------|------|------|-----|------|------|------|------|------|------|------|
| 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    |

ex. Manufactured day: 2018.01.25 → 8 A  
Year Month

\*3 Marking direction is not specified.

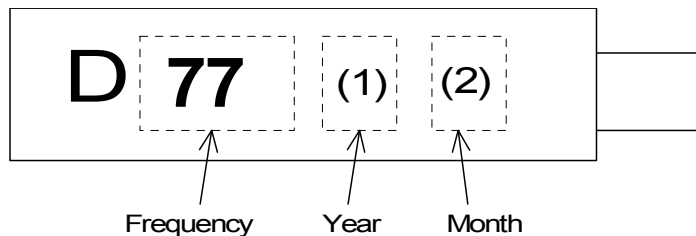


Fig.-2

|   |                            |           |               |
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3. PACKING

3.1. INNER BOX

3.1.1. THE WAY OF PACKING

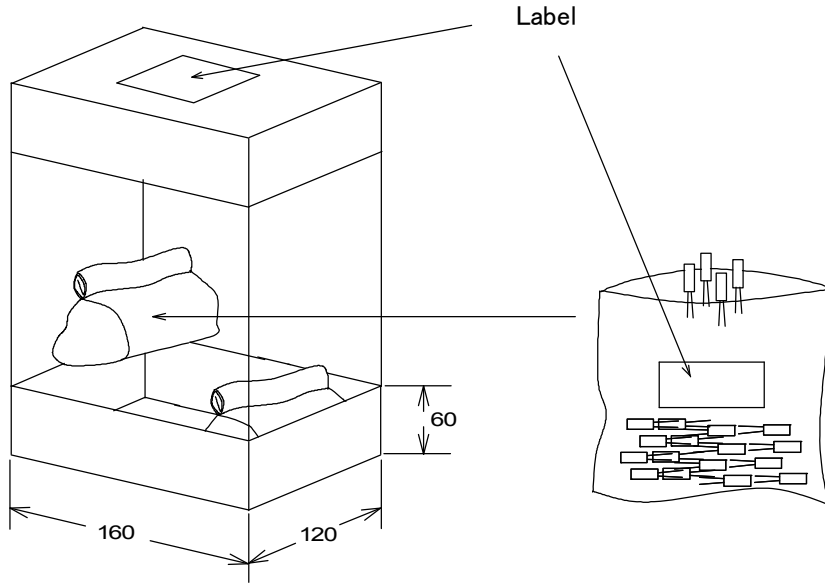
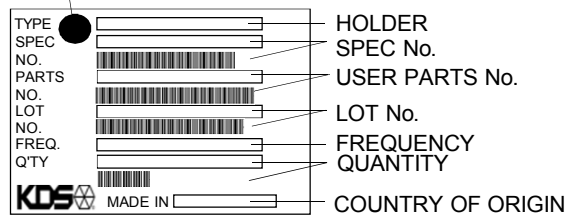


Fig.-3

2,000 pieces per plastic bag. 5 plastic bags as 10,000 pieces max. in an inner box.  
 A label is attached on an inner box.  
 (Even small quantity lot less than 2,000 pieces will be put into a plastic bag. Pieces will be packed with cushion material.)

3.1.2. LABEL CONTENTS

A green dot is marked onto the shipping label.



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3.2. OUTER BOX

3.2.1. PACKING AND LABEL

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

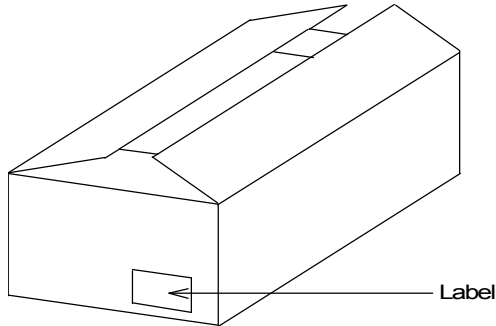


Fig.-4

3.2.2. SIZE OF A PACKING CARTON

There may be different size of packing carton used depending on the lot size  
 Also,the product packed inside shall be protected by air cushion.

3.2.3. LABEL CONTENTS

- The type of product
- Lot No.
- Specification
- Quantity
- Shipment Day
- Remark

|   |                            |           |               |
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#### 4. MECHANICAL ENDURANCE

##### 4.1. SHOCK

After the following test, parts shall conform specification Table-1-A.  
3times free drop from 750mm heights to a hard wood board of minimum thickness 30mm.

##### 4.2. VIBRATION

After the following test, parts shall conform specification Table-1-A.  
and no abnormal appearance shall be observed.

- (1)Frequency of Vibration : 30~120Hz
- (2)Cycle : 1~2min
- (3)Amplitude : 3G constant
- (4)Vibration period : 20min for X,Y,Z axis

##### 4.3. AIRTIGHTNESS

$1.0 \times 10^{-9}$  Pa-m<sup>3</sup>/s max.  
Testing by a Helium leak detector.

##### 4.4. TERMINAL STRENGTH

After the following test, parts shall show no visual damage.  
Bending terminals at +90°, then at -90°, then at +90°, and then finally unbending at 0°  
1.0mm from the bottom of case.  
One bend is counted as one time, it can be endured up to three times.

##### 4.5. SOLDERING HEAT RESISTANCE

After the following test, parts shall conform specification Table-1-A.  
Dipping terminals to 1mm from the bottom of product into the solder pot at +260±5°C for 3s.  
Measuring 1h after the test at +25°C.

##### 4.6. SOLDERABILITY

After the following test, more than 90% of leads shall be covered by new solder.  
Dipping leads to 1mm from the bottom of product into the solder pot at +245±5°C for 3s.  
(Use rosin type flux for solder.)

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## 5. ENVIRONMENTAL ENDURANCE

## 5.1. HIGH TEMPERATURE

2h past at room temperature after following test,  
parts shall conform specification Table-1-A.  
24h +70±2°C

## 5.2. LOW TEMPERATURE

2h past at room temperature after following test,  
parts shall conform specification Table-1-A.  
24h -30±3°C

## 5.3. HUMIDITY

2h past at room temperature after following test,  
parts shall conform specification Table-1-A.  
24h +40±2°C,relative humidity 85±5%.

## 6. SPECIFICATION

Table-1

|   | Frequency Variation    | Series Resistance Variation   |
|---|------------------------|---|
| A | $\pm 3 \times 10^{-6}$ | $\pm 15\%$ or $\pm 5\text{k}\Omega$ max. (Use larger specification) |

|   |                            |           |               |
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## 7. HANDLING GUIDE TO DT-261 TYPE

### 7.1. HANDLING

Do not add excessive shocks to units, otherwise characteristic deterioration or no-oscillation may be caused.

Please be careful not to drop, and operate them on the shock free condition.

Please also confirm the condition before applying automatic mounting or changing the condition of use.

In the process where the board is warped, such as board separation process, be careful that the warping does not influence the characteristics and soldering of crystal products.

### 7.2. DRIVE LEVEL

Oscillation in excessive drive level may cause characteristic deterioration or no-oscillation.

For this product, drive level as less than  $1.0\mu\text{W}$  is recommended.

And original characteristics cannot be guaranteed when more than  $2.0\mu\text{W}$  is supplied.

### 7.3. SOLDERING

Solder which shall be melt at  $+217^{\circ}\text{C}$  is used inside of a unit.,

Therefore characteristic deterioration or no-oscillation may be caused if the temperature of the package comes  $+150^{\circ}\text{C}$  or over.

Please use SMD or heat-resistant type units when applying the above temperature.

And please deeply concern about temperature condition or consult with us when applying wave soldering.

Also please remind to solder with dipping at  $+280^{\circ}\text{C}$  max. for 5s max., or at  $+260^{\circ}\text{C}$  max. for 10s max. at the leads.

With regard to hand soldering, we recommend to solder at  $+350^{\circ}\text{C}$  max. for 3s max.

And please take care so that a soldering iron should not touch the sealing area.

Please do not apply solder to the package directly, as it may cause characteristic deterioration.

### 7.4. MOUNTING

Fix the units firmly if laid condition on circuit board is required.

Especially under the vibrating condition, insert shock absorber between the unit and circuit board, or fix the unit with elastic glue (silicone applied) onto the board.

If soldering the unit at standing condition is required, it is suggested to keep it away from a circuit board more than 2mm.

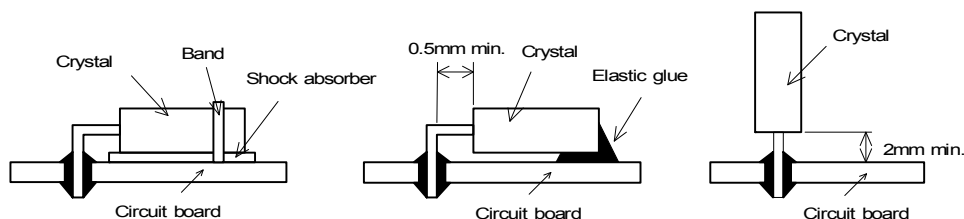


Fig.-5

|   |                            |           |               |
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#### 7.5. LEAD CUTTING AND LEAD FORMING

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

#### 7.6. CLEANING

Though use of aqueous solvent, alcohols solvent or alternative fluorocarbon type solvent is available, please consult with us if you use other solvent.  
 Tuning fork crystals resonate at frequency bands that are close to the washing frequency of ultrasonic cleaning machines and this may cause resonance deterioration of the crystal.  
 Therefore the use of ultrasonic cleaning machines to clean tuning fork crystals should be avoided.  
 After applying ultrasonic cleaning, the functionality of crystals should be verified by testing the performance of the end product.

#### 7.7. ULTRASONIC WELDING

Original characteristics cannot be guaranteed when ultrasonic welding is applied, due to the damage of inside crystal blank by sympathetic vibration, and this may cause no-oscillation of units.

#### 7.8. STORAGE

Please keep the crystal units in the temperature range of +40°C max. and the humidity range of 80% max. for storing, because the solderability of the crystal units may deteriorate if it is stored under high temperature or high humidity environment.  
 The crystal units must not be subjected to direct sunlight, and please store in a non-condensing place.  
 Solderability of the crystal units may deteriorate in long-term storage, so it is recommended crystal units be used within 6 months after shipped from KDS.

|   |                            |           |               |
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