Crystal Bridge to the Future

RoHS Compliant
Directive 2011/65/EU

# SPECIFICATION

Customer: ELTECH

Item: Quartz Crystal Controlled Oscillators

Type: NT7050BB

Nominal Frequency: 10.000 MHz

Customer's Spec. No.: ---

NDK Spec. No.: END4833A

Receipt

Charge:

| | | |
|---|---|---|
| Sales | NDK-I<br>Paola Bandera | Tel. +39 02 96702920<br>e-Mail: bandera@it.ndk.com |
| Engineer | Engineering Dept.2<br>H.Nagaushi | Tel. +81 4 2900 6619<br>e-Mail: nagaushi@ndk.com |

**Revision Record**

| Rev. | Date | Items | Contents | Approved | Checked | Drawn |
|---|---|---|---|---|---|---|
| --- | 24.Dec.2014 | Issue | --- | T.Matsumoto | N.Sekine | H.Nagaushi |
| | | | | | | |

This is specification of temperature compensated crystal oscillator.

1. Customer's Spec. No. : ---

2. NDK Spec. No. : END4833A

3. Type : NT7050BB

4. External Dimension : ETD14B-01479

5. Rating

5.1 Nominal Frequency ($f_{nom}$)

10.000 MHz

5.2 Supply Voltage ($V_{CC}$)

DC+3.3 V±5 %

5.3 Output Load Condition ($C_L$)

15 pF±10 %

5.4 Operating Temperature Range ($T_{opr}$)

-20 °C to +105 °C

5.5 Storage Temperature Range ($T_{str}$)

-55 °C to +125 °C

6. Electrical Specification

Unless otherwise specified, measuring condition T = +25±2 °C, $V_{CC}$ =+3.3 V, $C_L$ = 15 pF.

| | Item | Symbol | Condition | Spec. Value | | Unit |
|---|---|---|---|---|---|---|
| | | | | Min. | Max. | |
| 6.1 | Current Consumption | $I_{CC}$ | - | - | 6 | mA |
| 6.2 | Overall Frequency Tolerance | $\Delta f/f_{nom}$ | (*1) | -4.6 | +4.6 | ppm |
| | 6.2.1 Frequency Tolerance | $\Delta f/f_{nom}$ | (*2) | -0.9 | +0.9 | ppm |
| | 6.2.2 Frequency/Temperature Characteristics | $\Delta f/f$ | -20 °C to +105 °C (*3) | -0.5 | +0.5 | ppm |
| | 6.2.3 Frequency/Voltage Coefficient | $\Delta f/f$ | DC+3.3 V±5 % (*3) | -0.1 | +0.1 | ppm |
| | 6.2.4 Frequency/Load Coefficient | $\Delta f/f$ | 15 pF±10 % (*3) | -0.1 | +0.1 | ppm |
| | 6.2.5 Long-Term Frequency Stability | $\Delta f/f$ | 1 year (*4) | -1.0 | +1.0 | ppm |
| | | | 15 years (*4) | -3.0 | +3.0 | ppm |
| 6.3 | Output | | CMOS | | | |
| | 6.3.1 Output Voltage (Square) | $V_{OH}$ | - | 90 % $V_{CC}$ | - | V |
| | | $V_{OL}$ | - | - | 10 % $V_{CC}$ | V |
| | 6.3.2 Symmetry | SYM | 50 % $V_{CC}$ | 45 | 55 | % |
| | 6.3.3 Rise Time | $t_r$ | 10 % to 90 % $V_{CC}$ | - | 9 | ns |
| | 6.3.4 Fall Time | $t_f$ | 90 % to 10 % $V_{CC}$ | - | 9 | ns |
| | 6.3.5 Start-up Time | $t_{su}$ | - | - | 2 | ms |

(*1) $\Delta f/f_{nom}$: Including calibration Frequency Tolerance, Frequency/Voltage Coefficient ±5 %, Reflow, Long-Term Frequency Stability 15 years and Frequency/Temperature Characteristics -20 °C to +105 °C.
(*2) $\Delta f/f_{nom}$: Frequency shift at T = +25±2 °C, $V_{CC}$ =+3.3 V, $C_L$ = 15 pF in reference to Nominal frequency ($f_{nom}$) after a reflow.
(*3) $\Delta f/f$ : Frequency shift at T = +25±2 °C, $V_{CC}$ =+3.3 V, $C_L$ = 15 pF.
(*4) $\Delta f/f$ : Frequency shift of 24 hours at T = +25±2 °C, $V_{CC}$ =+3.3 V, $C_L$ = 15 pF.

7. Environmental Conditions

| | Item | Condition | Specification |
|---|---|---|---|
| 7.1 | Vibration Test | IEC60068-2-6,test Fc<br>10 Hz to 500 Hz, 98.1 m/s$^2$, 2 h, 3 direction. | After following test, Complies with all items of electrical characteristic specification. |
| 7.2 | Shock Test | IEC60068-2-27,test Ea<br>981 m/s$^2$, 6 ms, Half Sine, 3 bumps, 6 directions. | |

8. Marking

Type
Nominal Frequency (MHz is not written)
NDK Symbol Mark
Lot No.
Dot Mark

9. Moisture Sensitivity Level

Level 3 (Compliant with J-STD-020)

10. Packing

ETK17B-00338

11. Notice

11.1 Order items are manufactured according to specification. As to conditions, which are not indicated in this specification and unpredictable such as applied condition and oscillation margin, please check them beforehand.
11.2 Unless we receive request for modification within 3 weeks from the issue date of this NDK specification sheet, we will supply products according to this specification. Also, if you'd like to modify specification of order, which has been placed with delivery request within 3 weeks from the issue data of this specification sheet, we would like to discuss with you separately.
11.3 In no event shall the company be liable for any product failure resulting from an inappropriate handling or operation of the product beyond the scope of its guarantee.
11.4 Where any change to the process condition is made due to the change(s) in the production line, inform personnel of the specifications.
11.5 Should this specification data give rise to any disputes relating to any intellectual property rights or any other rights of a third person, the company shall not indemnify anyone for any damage. Their disclosure must not be construed as the grant of a license to use any of the intellectual property rights owned by the company.
11.6 If you intend to use products listed on this specification for applications that may result in loss of life or assets (controls relating to safety, medical equipment, aeronautical equipment, space equipment, etc.), please do not fail to advise us of your intention beforehand.
11.7 In the company's production process whatever amount of ozone depleting substances (ODS) as specified in the Montreal protocol is not used.
11.8 Information contained in this specification must not be quoted, reproduced or used for other purposes including processing either in part or in full without obtaining prior approval from the company.
11.9 The appearance color and so on have a different case by purchasing it more than 2 suppliers of the component, but characteristic and reliability are guaranteed.

11.10 In case of the product long time keep at high temperature and humidity, may affect product characteristic (solder ability) and a packing condition.
Please keep at storage condition of temperature +5 °C to +35 °C, humidity ~ 85 %RH.

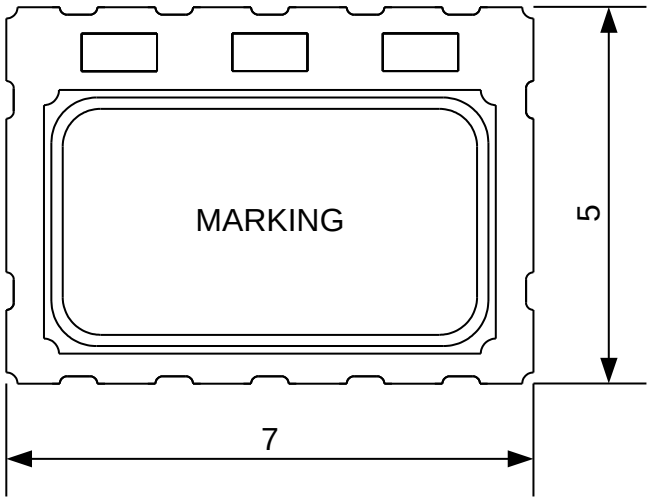
12. Prohibited items

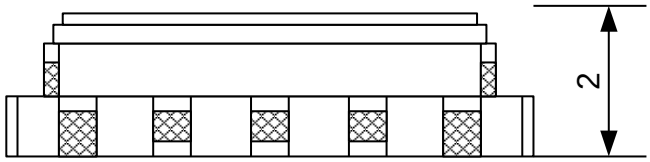
Be sure to use the product under the following conditions. Otherwise, the characteristics deterioration or destruction of the product may result.

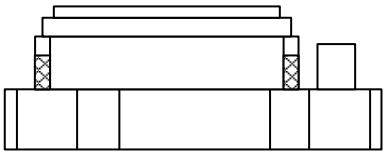
(1) Reflow soldering heat resistance
Peak temperature: 260 °C /10 s
Heating: 225 °C or higher/30 s
Preheating: 150 °C to 180 °C /120 s
Reflow passage times: twice
In reflowing, the turning over of mounted boards shall be forbidden.

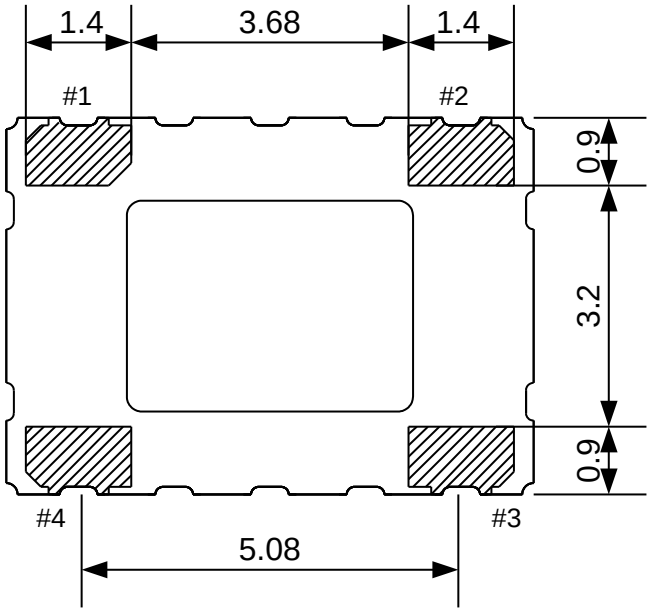
(2) Manual soldering heat resistance
Press a soldering iron of 350 °C on the terminal electrode for five seconds (twice).

(3) Washing
This product does not correspond to rinsing.






Terminal land connections

| | |
|---|---|
| #1 | Do not connect |
| #2 | GND |
| #3 | OUTPUT |
| #4 | $V_{CC}$ |

*1 Please connect a 0.01 uF capacitor near the $V_{CC}$ terminal

| | Date of Revise | Charge | Approved | Reason |
|---|---|---|---|---|
| A | 5.Mar.2014 | N.Sekine | T.Matsumoto | #4 and *1:[Change] VCC→$V_{CC}$ |

| | Date | Name | Third Angle Projection | Tolerance | Scale |
|---|---|---|---|---|---|
| Drawn | 31.Mar.2011 | N.Sekine | Dimension:mm | ±0.2 | 10/1 |
| Designed | 31.Mar.2011 | N.Sekine | Title | Drawing No. | Rev. |
| Checked | | ----- | **External Dimension** | **ETD14B-01479** | A |
| Approved | 31.Mar.2011 | Y.Yokozeki | | | |

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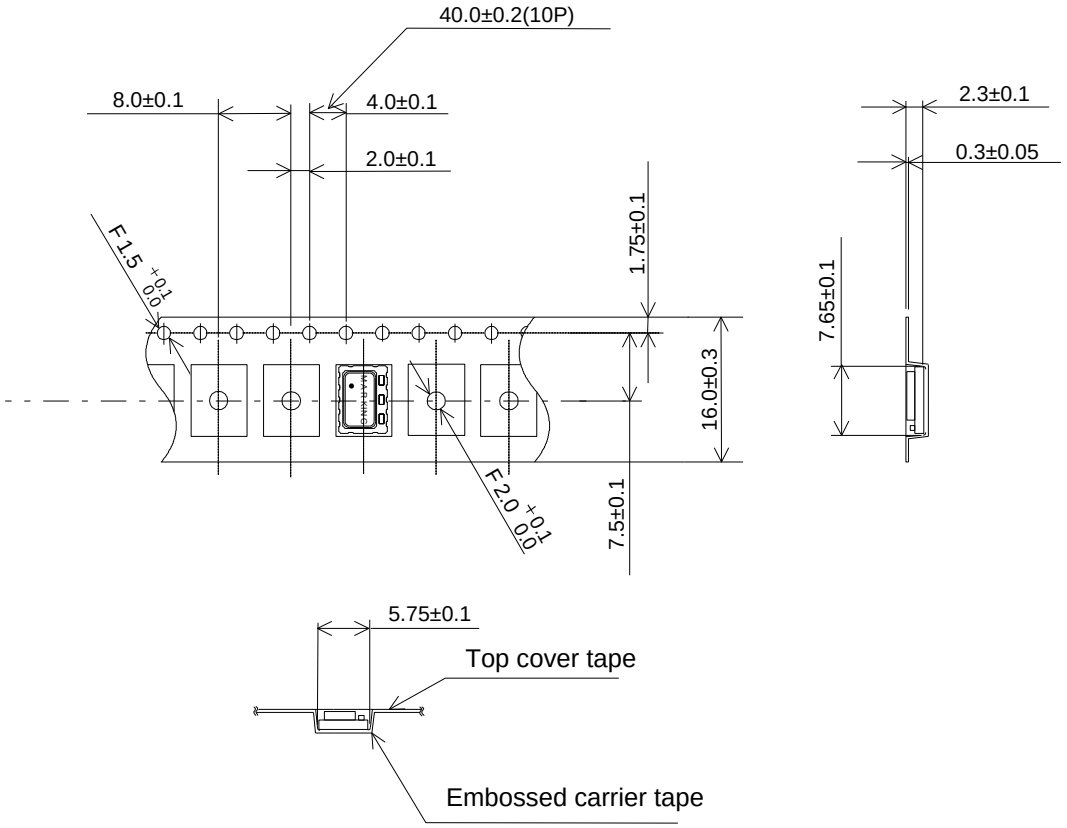


| | Embossed carrier tape | Top cover tape |
|---|---|---|
| Materials | PS | PET+PE+Adhesive layer |
| Disposition | Antistatic | Antistatic |

| | Date of Revise | Charge | Approved | Reason |
|---|---|---|---|---|
| | | | | |

| | Date | Name | Third Angle Projection | Tolerance | Scale |
|---|---|---|---|---|---|
| Drawn | 07.Jan.2011 | T.Terashima | Dimension : mm | --- | --- |
| Designed | 07.Jan.2011 | T.Terashima | Title | Drawing No. | Rev. |
| Checked | ----- | ----- | **Packing(1/4)** | **ETK17B-00338** | |
| Approved | 07.Jan.2011 | Y.Yokozeki | | | |

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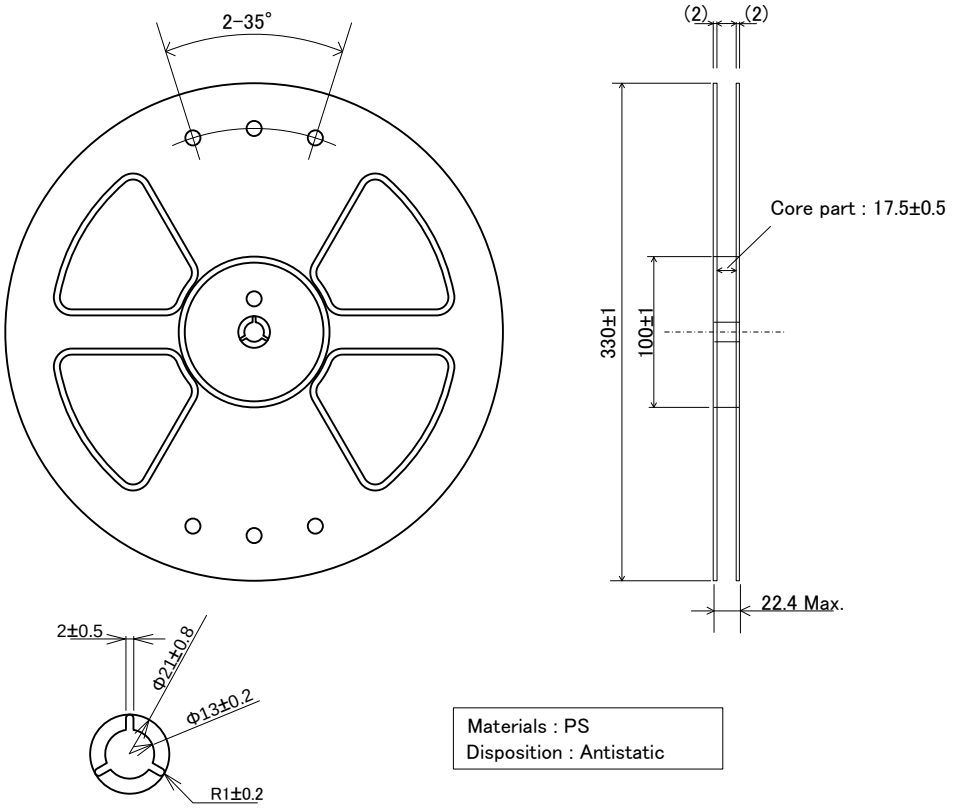
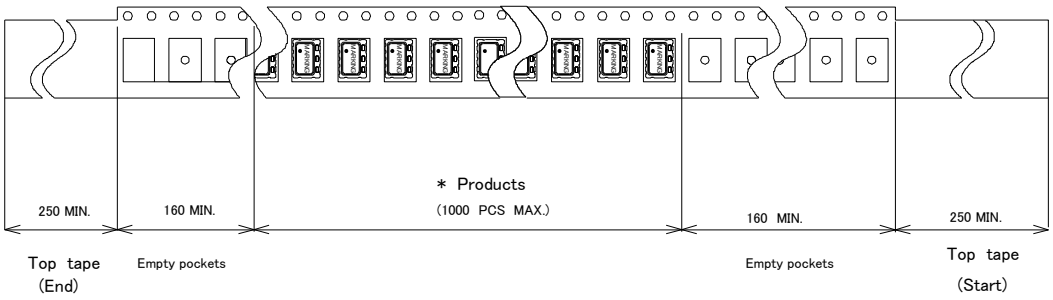
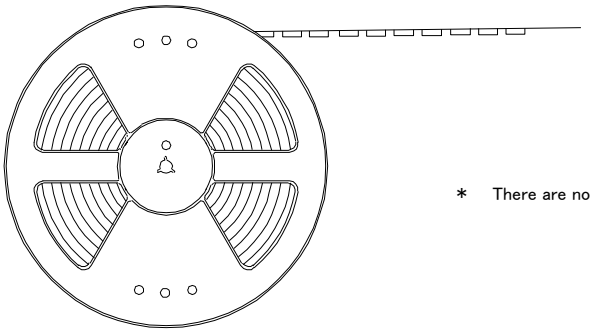
Form M-1




Materials : PS
Disposition : Antistatic



＊ There are no vacant pockets for this area.

| | Date of Revise | Charge | Approved | Reason |
|---|---|---|---|---|
| | | | | |

| | Date | Name | Third Angle Projection | Tolerance | Scale |
|---|---|---|---|---|---|
| Drawn | 07.Jan.2011 | T.Terashima | Dimension : mm | --- | --- |
| Designed | 07.Jan.2011 | T.Terashima | Title | Drawing No. | Rev. |
| Checked | ----- | ----- | **Packing(2/4)** | **ETK17B-00338** | |
| Approved | 07.Jan.2011 | Y.Yokozeki | | | |

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Form M-1

# Tape break force, peel strength and angle

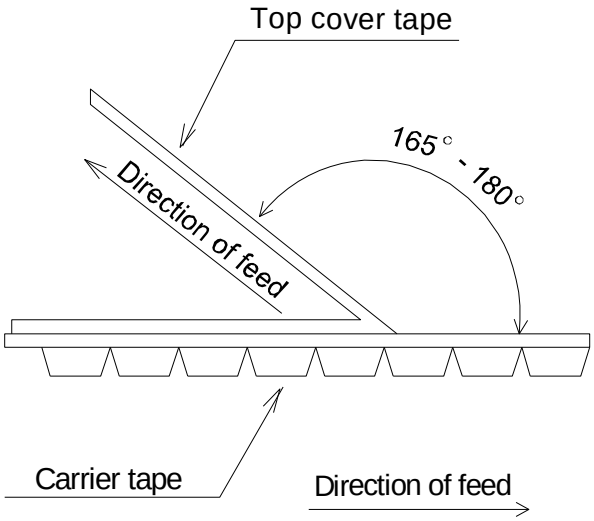
Required setting:

Tape break force: min 10N

Top cover tape strength: min 10N

Top cover tape peel force : 0.1-1.3N(0.1-1.0 for 8mm carrier tapes),at a peel speed of 300 +/-10mm/min.

Angle between the top cover tape and the direction of feed during peel off.
165-180°




The cover tapes not extend over the edge of the carrier tape or cover any part of the sprocket holes.

| | Date of Revise | Charge | Approved | Reason |
|---|---|---|---|---|
| | | | | |

| | Date | Name | Third Angle Projection | Tolerance | Scale |
|---|---|---|---|---|---|
| Drawn | 07.Jan.2011 | T.Terashima | Dimension : mm | --- | --- |
| Designed | 07.Jan.2011 | T.Terashima | Title | Drawing No. | Rev. |
| Checked | ----- | ----- | **Packing(3/4)** | **ETK17B-00338** | |
| Approved | 07.Jan.2011 | Y.Yokozeki | | | |

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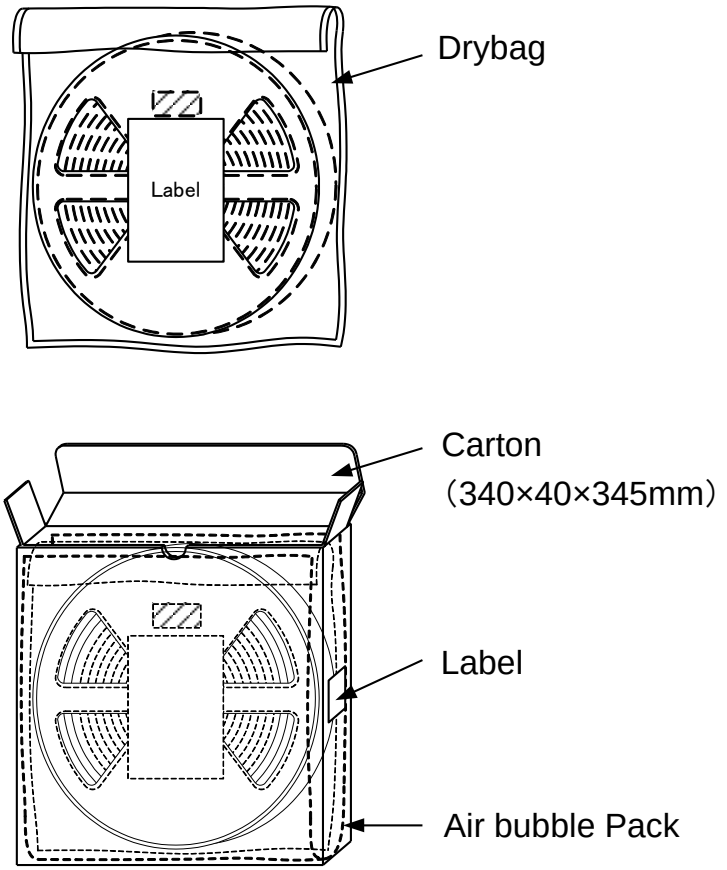
Form M-1

〈Inner packing〉

Max. 1000pcs./ Reel




| | Date of Revise | Charge | Approved | Reason |
|---|---|---|---|---|
| | | | | |

| | Date | Name | Third Angle Projection | Tolerance | Scale |
|---|---|---|---|---|---|
| Drawn | 07.Jan.2011 | T.Terashima | Dimension : mm | --- | --- |
| Designed | 07.Jan.2011 | T.Terashima | Title | Drawing No. | Rev. |
| Checked | ----- | ----- | **Packing(4/4)** | **ETK17B-00338** | |
| Approved | 07.Jan.2011 | Y.Yokozeki | | | |

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Form M-1