Crystal Bridge to the Fut

RoHS Compliant
Directive 2011/65/EU

# SPECIFICATION

Customer: QZ TORCH

| | |
|---|---|
| Item: | Crystal Unit |
| Type: | NX2016SA |
| Nominal Frequency: | 25.000 MHz |
| Customer's Spec. No.: | |
| NDK Spec. No.: | STD-CZS-2 |

Receipt

**Revision Record**

| Rev. | Date | Items | Contents | Approved | Checked | Drawn |
|---|---|---|---|---|---|---|
| --- | 28.Mar.2018 | Issue | --- | M.Sato | --- | R.Omomo |
| | | | | | | |

1. Customer's Spec. No. :

2. NDK Spec. No. : STD-CZS-2

3. Type : NX2016SA

4. Electrical Specifications

| | Parameters | SYM. | Electrical Spec. | | | | Notes |
|---|---|---|---|---|---|---|---|
| | | | min | typ | max | Units | |
| 1 | Nominal frequency | $f_{nom}$ | | 25.000 | | MHz | |
| 2 | Overtone order | - | | Fundamental | | - | |
| 3 | Frequency tolerance | - | -15 | - | +15 | $\times 10^{-6}$ | at +25°C |
| 4 | Frequency versus temperature characteristics | - | -25 | - | +25 | $\times 10^{-6}$ | at -40~+85°C<br>The reference temperature shall be +25°C |
| 5 | Equivalent resistance | - | - | - | 80 | Ω | IEC PI-network/Series |
| 6 | Load capacitance | $C_L$ | - | 8 | - | pF | IEC PI-network |
| 7 | Level of drive | - | - | 10 | 200 | μW | |
| 8 | Operating temperature range | $T_{opr}$ | -40 | - | +85 | °C | |
| 9 | Storage temperature range | $T_{str}$ | -40 | - | +85 | °C | |
| 10 | Insulation resistance | - | 500 | - | - | MΩ | When terminal to terminal and terminal to cover were applied at DC100V ±15V. |
| 11 | Air-tightness | - | - | - | $1.1\times10^{-9}$ | Pa $m^3$/s | Helium leak detector |

5. Examination results document

Since a performance is guaranteed, an examination results document does not submit.

6. Application drawing

6.1 External dimension : EXD14B-00467
6.2 Taping and reel figure : EXK17B-00200
6.3 Reel Packing : EEK17B-00015
6.4 Holder marking : EXH11B-00317
6.5 Reliability assurance Item : EXS30B-00249

7. Notice

7.1 Crystal units will be damaged by ultrasonic welding process due to resonance of crystal wafer itself. NDK does not recommend using ultrasonic welding. If Ultra Sonic welding used, there are products that resonance phenomenon hardly occurs so please confirm with our sales.

7.2 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.

7.3 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.

7.4 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.

7.5 Where any change to the process condition is made due to the change(s) in the production line, inform personnel of the specifications.

7.6 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.

7.7 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.

7.8 In the company's production process whatever amount of ozone depleting substances (ODS) as specified in the Montreal protocol is not used.

7.9 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.

7.10 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.

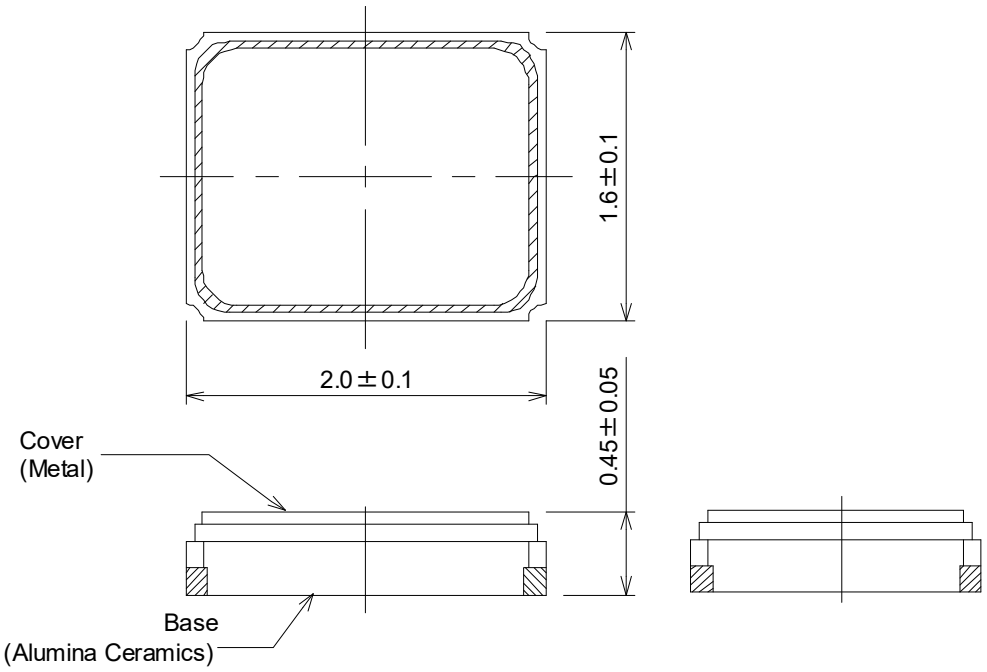
7.11 In case of the product long time keep at high temperature and humidity, may affect product characteristic (solder ability) and a packing condition.
Please keep at storage condition of temperature +5°C ~+35°C, humidity ~85%RH.

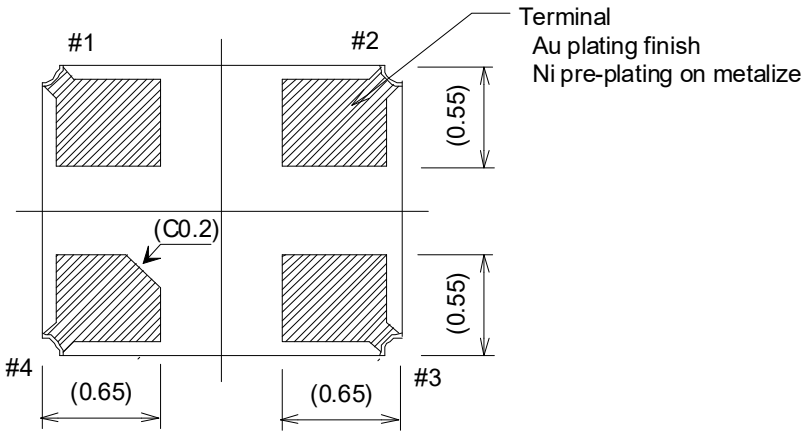
8. Prohibited items

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

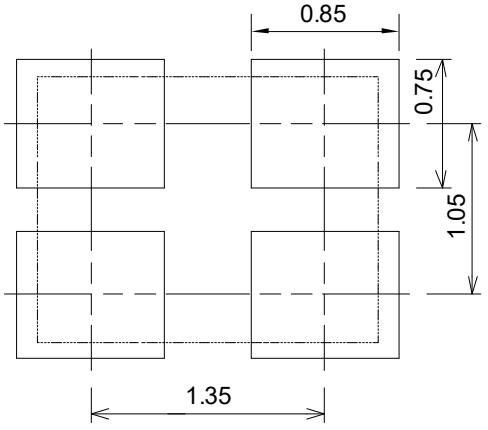
(1) Reflow soldering heat resistance
Peak temperature: 265°C, 10 sec
Heating: 230°C or higher, 40 sec
Preheating: 150°C to 180°C, 120 sec
Reflow passage times: twice

(2) Manual soldering heat resistance
Pressing a soldering iron of 400°C on the terminal electrode for four seconds (twice).

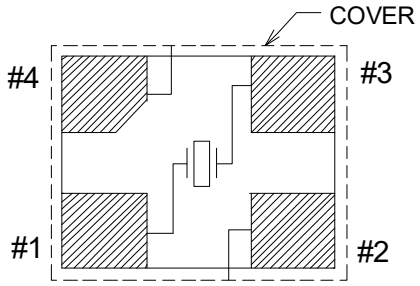



LAND PATTERN (TYPICAL)




PIN CONNECTION (TOP VIEW)




TERMINAL
#1,#3 : XTAL
#2,#4 : GND(CONNECTION WITH COVER)

| | Date of Revise | Charge | Approved | Reason |
|---|---|---|---|---|
| B | 22.Apr.2016 | N.Wakisaka | H.Kobayashi | Revise index to reference value. |

| | Date | Name | Third Angle Projection | Tolerance | Scale |
|---|---|---|---|---|---|
| Drawn | 19.Oct.2009 | M.Harada | Dimension:mm | ---- | --/-- |
| Designed | 19.Oct.2009 | M.Harada | Title | Drawing No. | Rev. |
| Checked | --- | --- | **NX2016SA** Dimension Drawing | **EXD14B-00467** | **B** |
| Approved | 20.Oct.2009 | K.Ueki | | | |

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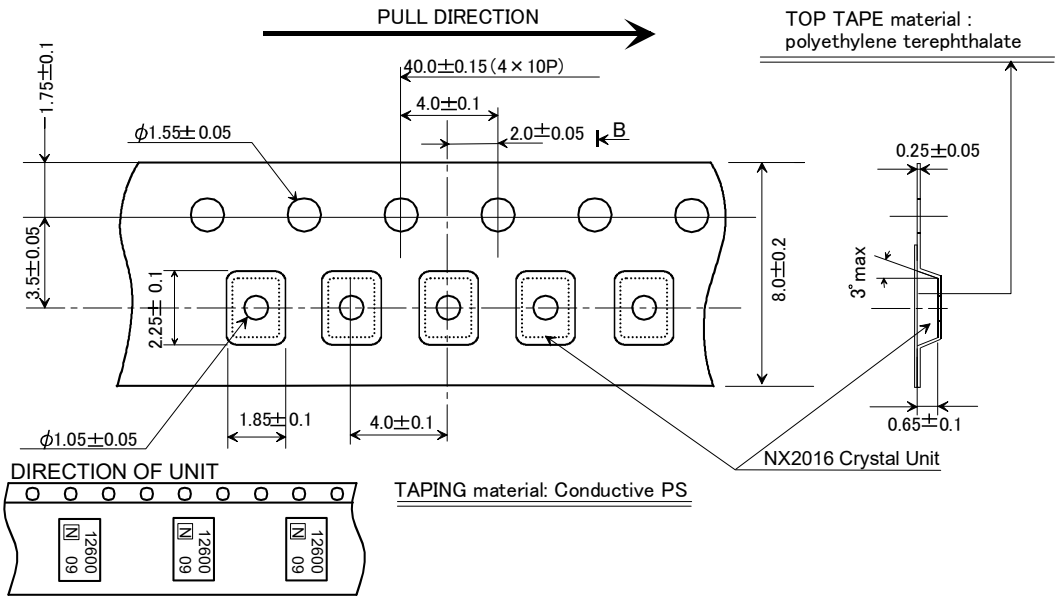


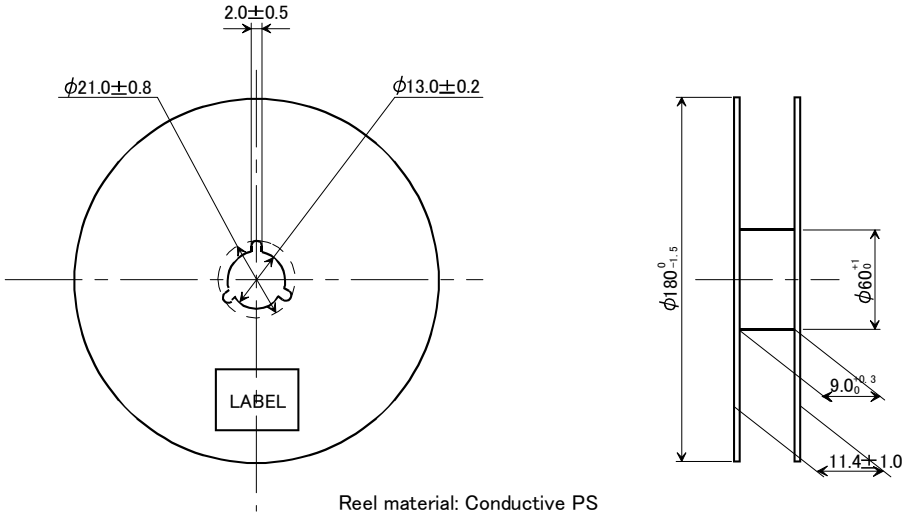


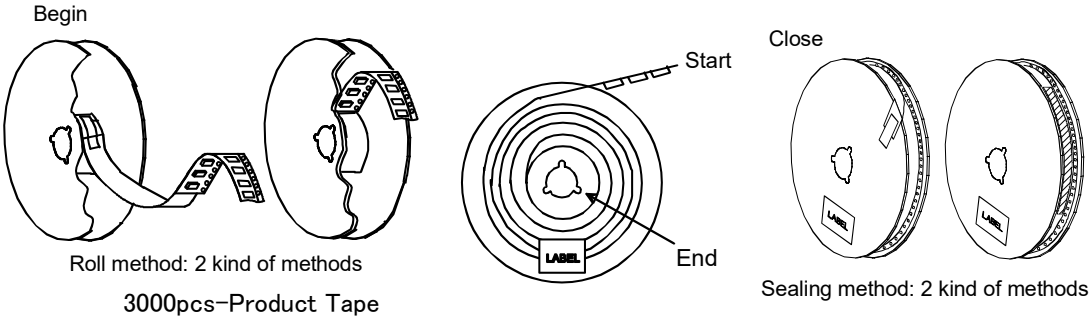


| | Date of Revise | Charge | Approved | Reason |
|---|---|---|---|---|
| B | 3 Oct. 2016 | H. Ohkubo | H. Murakoshi | Addition of roll method and sealing method. |

| | Date | Name | Third Angle Projection | Tolerance | Scale |
|---|---|---|---|---|---|
| Drawn | 12.Apr.2005 | K.Oguri | Dimension:mm | | / |
| Designed | 12.Apr.2005 | K.Oguri | Title | Drawing No. | Rev. |
| Checked | ---------- | --------- | **NX2016 Series Taping and Reel Spec.** | **EXK17B-00200** | B |
| Approved | 12.Apr.2005 | K. Miyashita | | | |

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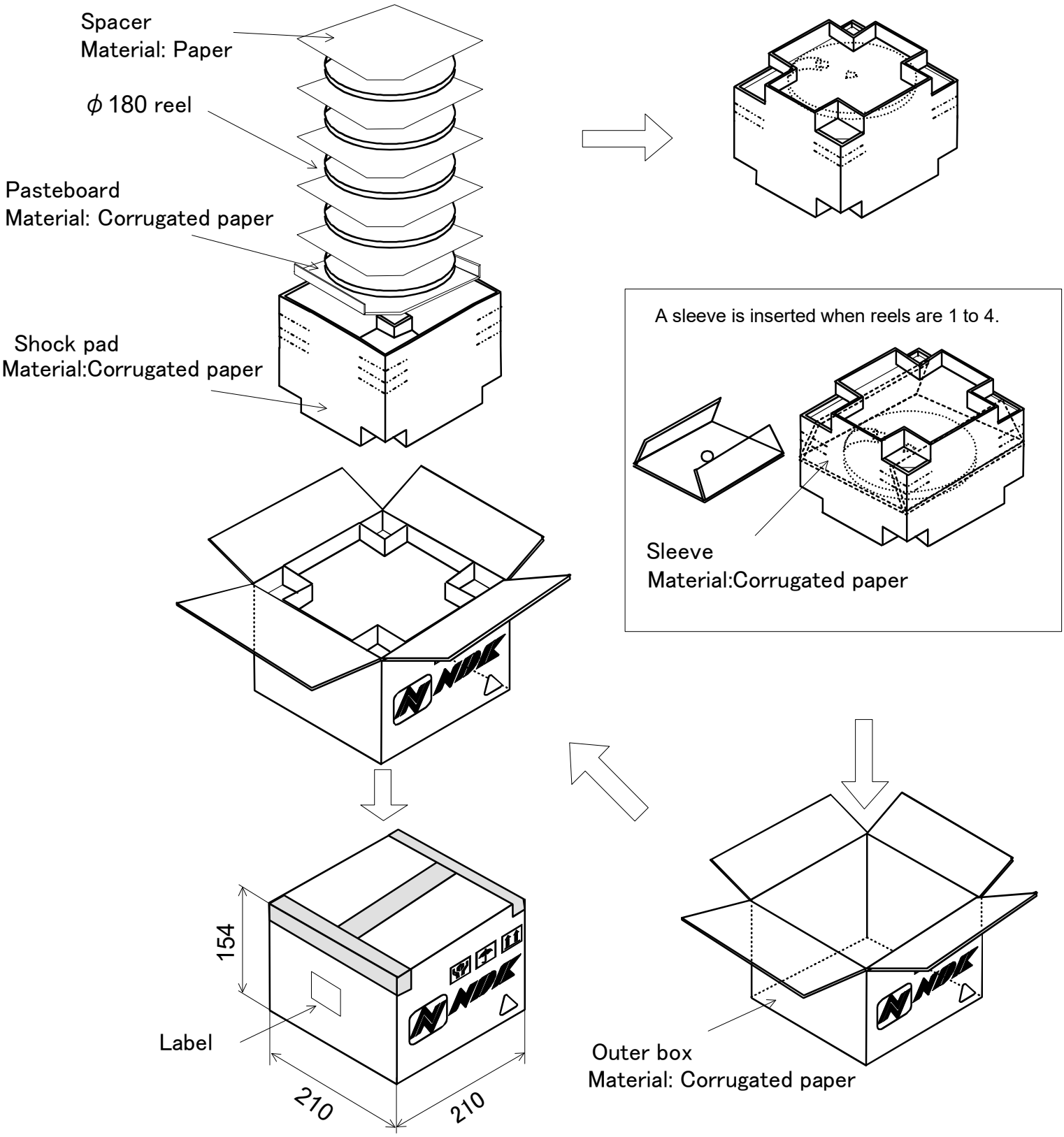
Form M-1




| | Date of Revise | Charge | Approved | Reason |
|---|---|---|---|---|
| C | 4 Jul. 2012 | H.Ohkubo | K.Oguri | Addition of condition when reels are 1 to 4. |

| | Date | Name | Third Angle Projection | Tolerance | Scale |
|---|---|---|---|---|---|
| Drawn | 26 Feb. 2010 | H. Ohkubo | Dimension:mm | --- | --- |
| Designed | 26 Feb. 2010 | K.Oguri | Title | Drawing No. | Rev. |
| Checked | 26 Feb. 2010 | K.Oguri | **180 dia. Reel package** | **EEK17B-00015** | C |
| Approved | 26 Feb. 2010 | J. Nakamura | | | |

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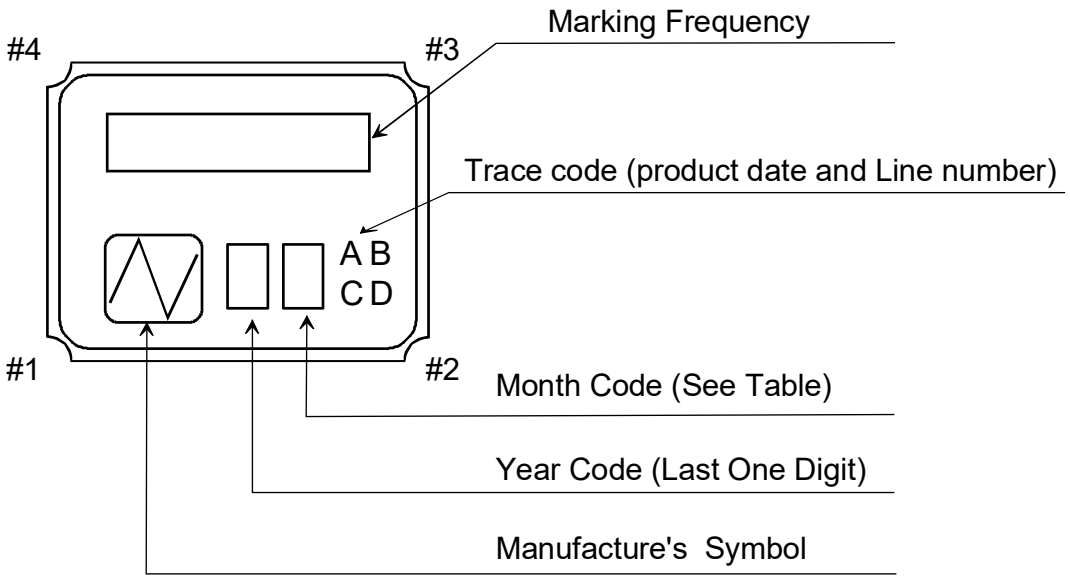


NOTE

1. Frequency Code

Marking Frequency is consist of five digits, first five digits of Nominal Frequency

Example

| | |
|---|---|
| Nominal Frequency | 28.636363 MHz |
| Frequency Code | 28.636 |

2. Month Code Table

| Month | 1 Jan. | 2 Feb. | 3 Mar. | 4 Apr. | 5 May. | 6 Jun. | 7 Jul. | 8 Aug. | 9 Sep. | 10 Oct. | 11 Nov. | 12 Dec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Month Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | X | Y | Z |

*Marking digits are not include a decimal point and dot mark.

| | Date of Revise | Charge | Approved | Reason |
|---|---|---|---|---|
| D | 10. Dec 2014 | Y.Sakurai | H.Kobayashi | Added terminal number information. |

| | Date | Name | Third Angle Projection | Tolerance | Scale |
|---|---|---|---|---|---|
| Drawn | 16.Jan.2006 | I.Miyahara | Dimension:mm | | / |
| Designed | 16.Jan.2006 | I.Miyahara | Title | Drawing No. | Rev. |
| Checked | 16.Jan.2006 | --- | **Crystal Holder Marking** | **EXH11B-00317** | **D** |
| Approved | 16.Jan.2006 | K.Okamoto | | | |

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# Reliability assurance item

(page: 1/1)

| No. | Test Item | Test Methods | Specification Code |
|---|---|---|---|
| 1 | High Temperature Storage *1 | +85±3°C 720h | A |
| 2 | Low Temperature Storage | -40±3°C 500h | A |
| 3 | Temperature Humidity | +60±3°C 90~95%RH 500h | A |
| 4 | Temperature Cycling *1 | -40±3°C / +85±3°C<br>It is 500 cycles using 30 minutes each as 1 cycle. | A |
| 5 | Vibration | Frequency Range : 10~55Hz<br>Amplitude : 1.52mm<br>1 cycle : 1 minutes<br>Test time : Three mutually perpendicular axes each 2 hours. | A |
| 6 | Shock | Devices are shocked to half sine wave (981m/s$^2$) three mutually perpendicular axis each 3 times. | A |
| 7 | Drop | Devices are dropped from the height 75cm onto wooden block. ( more than 30mm thickness.)<br>Execution 3 times random drops | A |
| 8 | Solderability | Pre-heat temperature : +150±10°C<br>Pre-heat time : 60~120s<br>When the temperature of the specimen is reached at +215±3°C, it shall be left for 30±1sec.<br>Peak temperature 240±5°C<br>Material: Pb-free (Sn-3.0Ag-0.5Cu)<br>Flux : Rosin resin methyl alcohol solvent ( 1 : 4 ) | B |
| 9 | Reflow resistance | Pre-heat temperature : +150~180°C<br>Pre-heat time : 90±30s<br>Heat temperature : more than +230°C<br>Heat time : 30s±10s<br>Peak temperature : +260±5°C<br>Peak time : less than 10s | A |

*1. High Temperature Storage and Temperature Cycling
In case of customer spec on High temperature exceed +85°C, Low temperature exceed -40°C, above test according to customer spec high or low temperature will be perform and guarantee.

| Specification code | Specification |
|---|---|
| A | $\Delta f/f \leq \pm$ 5 ppm<br>$\Delta CI/CI \leq \pm$ 15 % or 5 Ω make use larger value |
| B | The electrodes should be covered by a new solder at least 90% of immersed area. |

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