RoHS Compliant
Directive 2011/65/EU

# SPECIFICATION

Customer:

| | |
|---|---|
| Item: | CRYSTAL UNIT |
| Type: | NX3215SA |
| Nominal Frequency: | 32.768kHz |
| Customer's Spec. No.: | --- |
| NDK Spec. No.: | EXS00A-MU00202 |

Receipt

Charge:

| | | |
|---|---|---|
| Sales | NDK-TP：Lilian Chiu | Tel. 886-2-2555-0232 |
| Engineer | 1st Eng. Dept.: Hasuike | Tel. 81-(0)4-2900-6632 |

| | |
|---|---|
| Approved | H.Matsudo |
| Checked | --- |
| Drawn | Y.Hasuike |

**Revision Record**

| Rev. | Rev. Date | Items | Contents | Remarks |
|---|---|---|---|---|
| --- | 14.Nov.2011 | Issued | --- | --- |

1. Customer specifications number : ---

2. NDK specification number : EXS00A-MU00202

3. Type : NX3215SA

4. Electrical characteristics
   - 4.1. Nominal Frequency ($F_0$) : 32.768 kHz
   - 4.2. Overtone Order : Fundamental
   - 4.3. Adjustment tolerance(at +25°C) : $\pm 20 \times 10^{-6}$ Max.(No include aging )
   - 4.4. Turning Point : +25°C±5°C
   - 4.5. Temperature coefficient : $-0.04 \times 10^{-6}$ / °C$^2$ Max.
   - 4.6. Equivalent Resistance ($R_R$) : 70 kΩ Max.
   - 4.7. Shunt Capacitance ($C_0$) : 1.0 ± 0.5 pF
   - 4.8. Motional Capacitance ($C_1$) : 4.0 ± 2.0 fF
   - 4.9. Insulation Resistance :Terminal to terminal insulation resistance also terminal to cover insulation resistance must be 500MΩ (Min.) when DC100V ±15V is applied.

5. Measurement circuit
   - 5.1. Frequency measurement
     - ・Measuring instrument : Network Analyzer (CNA-LF made in Transat corp.)
     - ・Load capacitance ($C_L$) : 7.0pF
     - ・Level of drive : 0.1 μW
   - 5.2. Equivalent resistance measurement
     - ・Measuring instrument : Network Analyzer (CNA-LF made in Transat corp.)
     - ・Load capacitance ($C_L$) : Series
     - ・Level of drive : 0.1 μW

6. Other performances
   - 6.1. Operating Temperature range : - 40 to + 85°C
   - 6.2. Storage Temperature range : - 40 to + 125°C
   - 6.3. Maximum drive level : 0.5 μW Max.
   - 6.4 Aging (at +25 °C) : $\pm 3 \times 10^{-6}$ Max. / 1 year

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

8. Storage conditions
   - 8.1. It is not dropping a 2nd-packing box or not pushing and crushing in the case of storage.
   - 8.2. Direct rays are avoided and they are room temperature and humidity (dehumidification environment is desirable if it can do).
   - 8.3. A storage term should give half a year as a standard (even if it passes a storage term, there is no rapid degradation).

9. Application drawing

| | |
|---|---|
| 9.1. Dimension drawing | : EXD14B-00462 |
| 9.2. Taping and reel figure | : EXK17B-00302 |
| 9.3. Holder marking | : EXH11B-00422 |
| 9.4. Reel Packing | : EEK17B-00015 |
| 9.5. Structural Drawing | : EXD13B-00243 |
| 9.6. Reliability assurance Item | : EXS30B-00661 |
| 9.7. Quality Control Process Flow Chart | : EXQ11B-00387 |

10. Notice

10.1 Order items are manufactured according to specification. As to conditions, which are not indicated in t his specification and unpredictable such as applied condition and oscillation margin, please check them beforehand.

10.2 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.

10.3 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.

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

10.5 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.

10.6 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.

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

10.8 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. Prohibited items

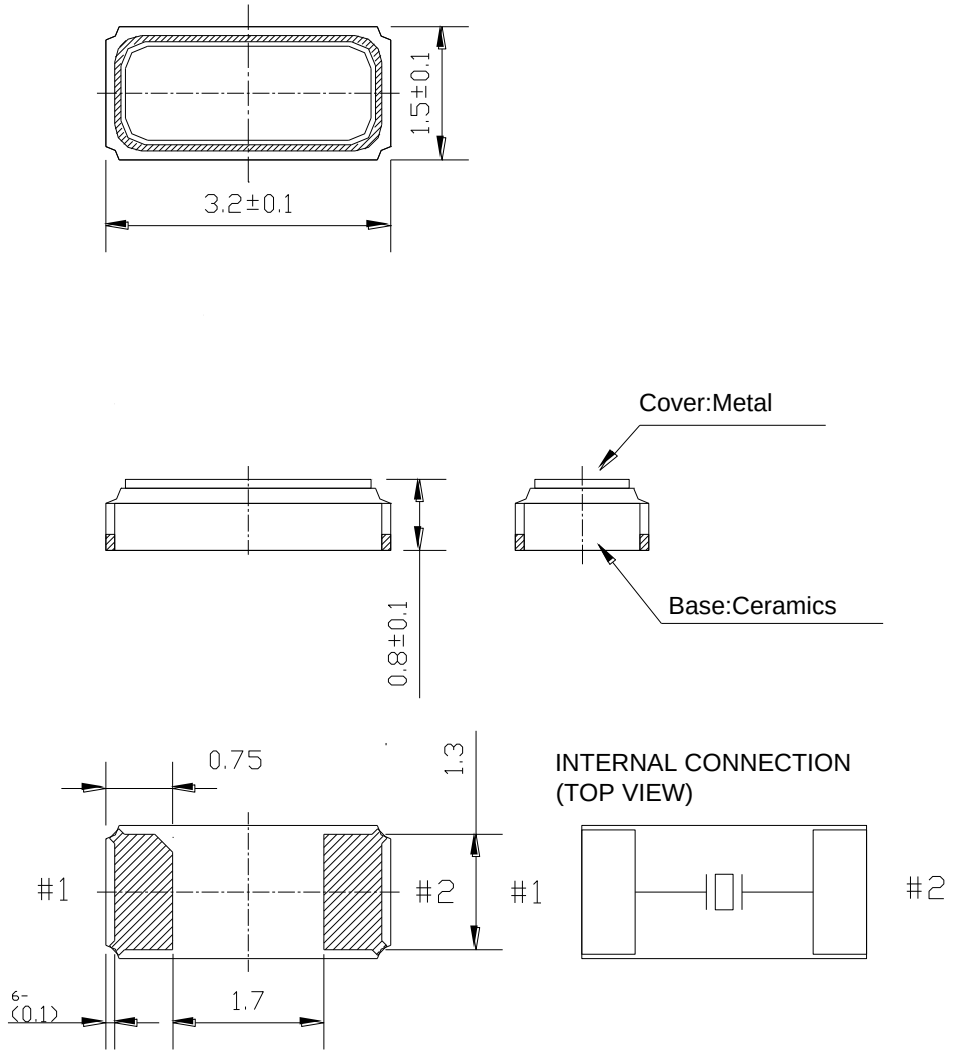
Be sure to use the product under the following conditions. Otherwise, the characteristics deterioration or destruction of the product may result.

(1)Reflow soldering heat resistance

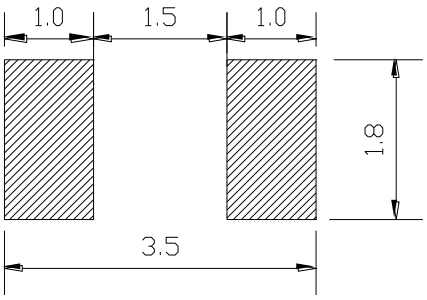
Peak temperature: 265°C, 10 sec
Heating: 230°C or higher, 30 sec
Preheating: 150°C to 180°C, 120 sec
Reflow passage times: Two times

(2)Manual soldering heat resistance

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



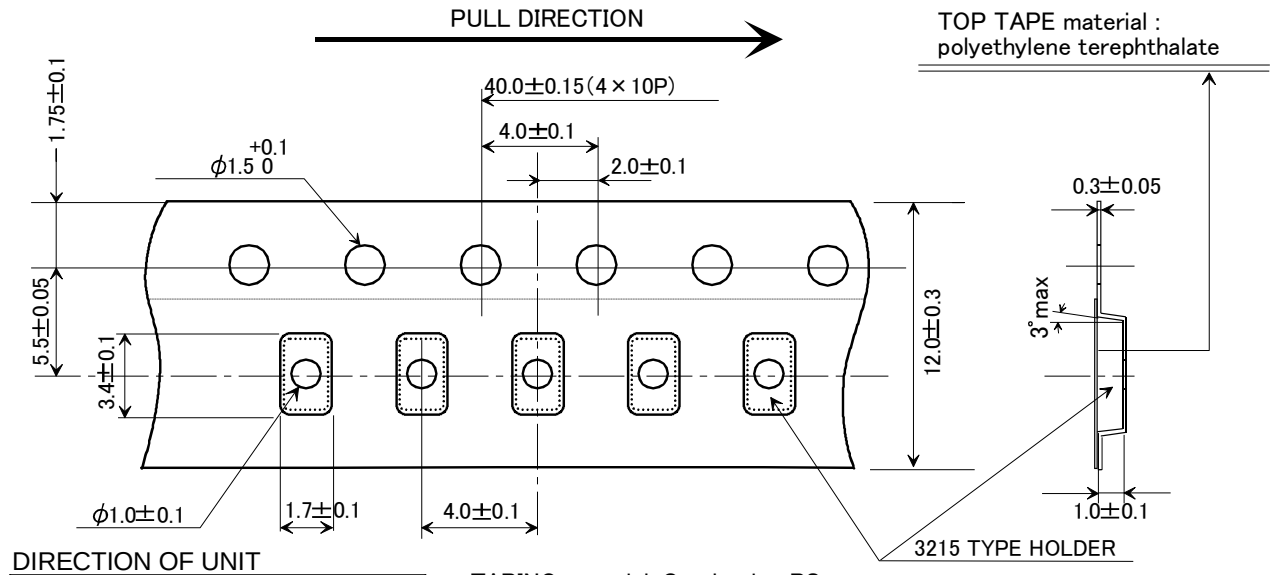

## Recommended soldering pattern

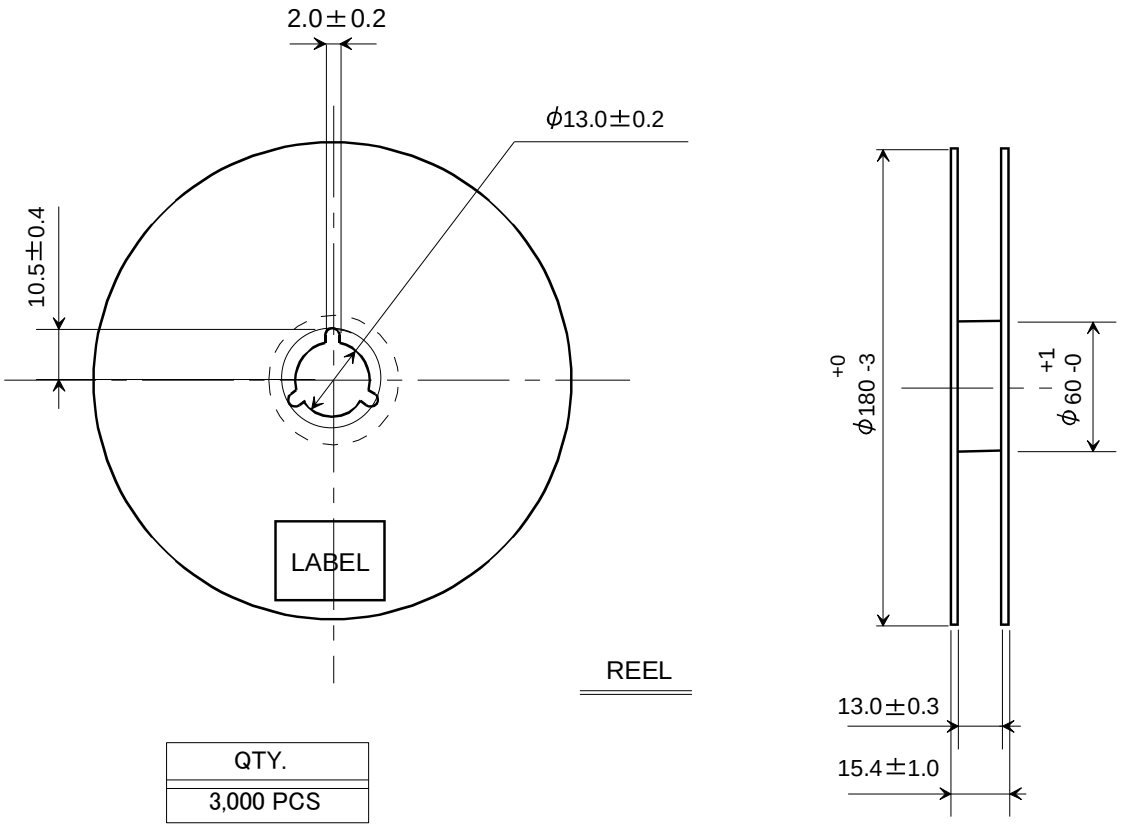



| | Date of Revise | Charge | Approved | Reason |
|---|---|---|---|---|
| A | 18.Dec.2009 | Miyahara | K.Ueki | Add bilingual |

| | Date | Name | Third Angle Projection | Tolerance | Scale |
|---|---|---|---|---|---|
| Drawn | 30.Aug.2009 | Miyahara | 単位:mm | ±0.2 | 10 / 1 |
| Designed | 30.Aug.2009 | Miyahara | Title | Drawing No. | Rev. |
| Checked | --- | --- | **NX3215SA External Dimension** | **EXD14B-00462** | A |
| Approved | 30.Aug.2009 | K. Ueki | | | |

**NIHON DEMPA KOGYO CO., LTD.**



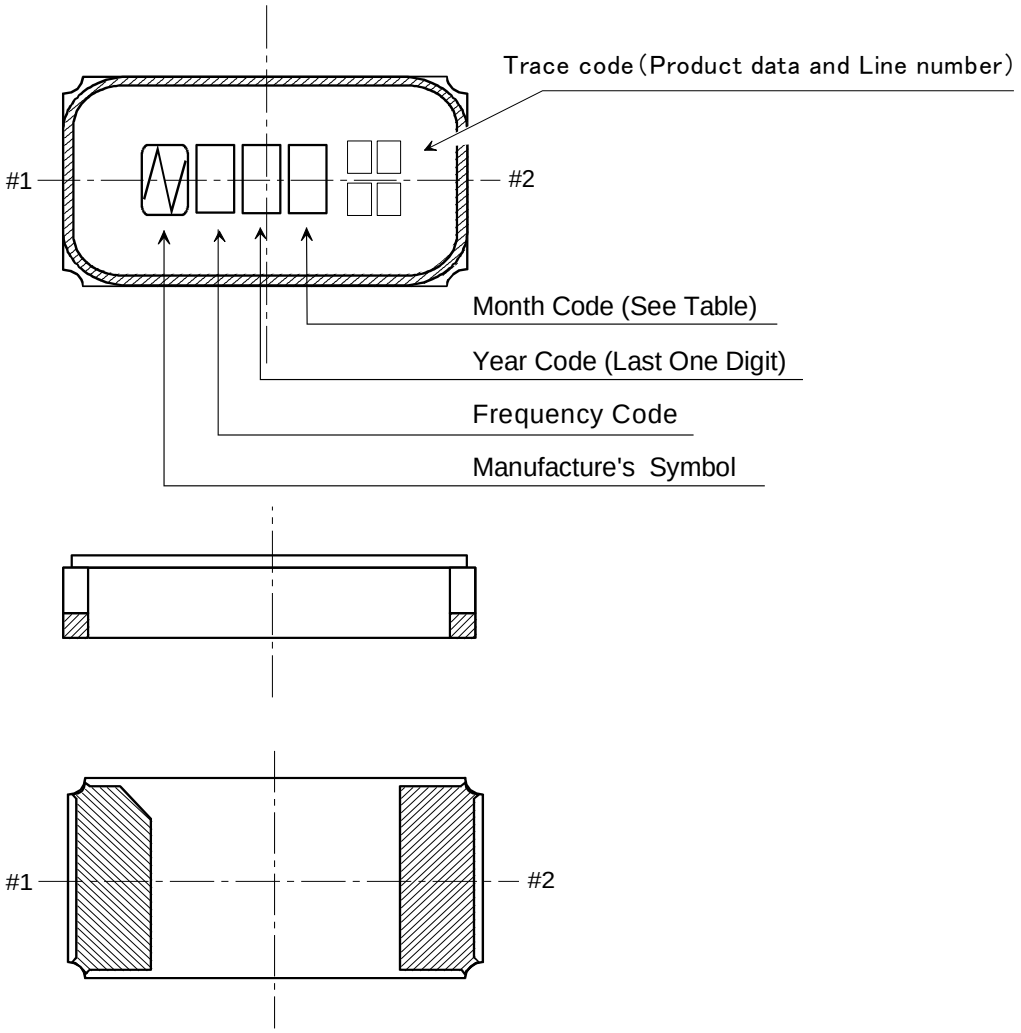




| QTY. |
|---|
| 3,000 PCS |

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

| | Date | Name | Third Angle Projection | Tolerance | Scale |
|---|---|---|---|---|---|
| Drawn | 23.Jun.2009 | Miyahara | Dimension:mm | | / |
| Designed | 23.Jun.2009 | Miyahara | Title | Drawing No. | Rev. |
| Checked | --- | --- | **Tape and Reel Spec.** | **EXK17B-00302** | |
| Approved | 23.Jun.2009 | K. Ueki | | | |

**NIHON DEMPA KOGYO CO., LTD.**




NOTE

1. Month Code

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

2. Frequency Code

A : 32.768kHz

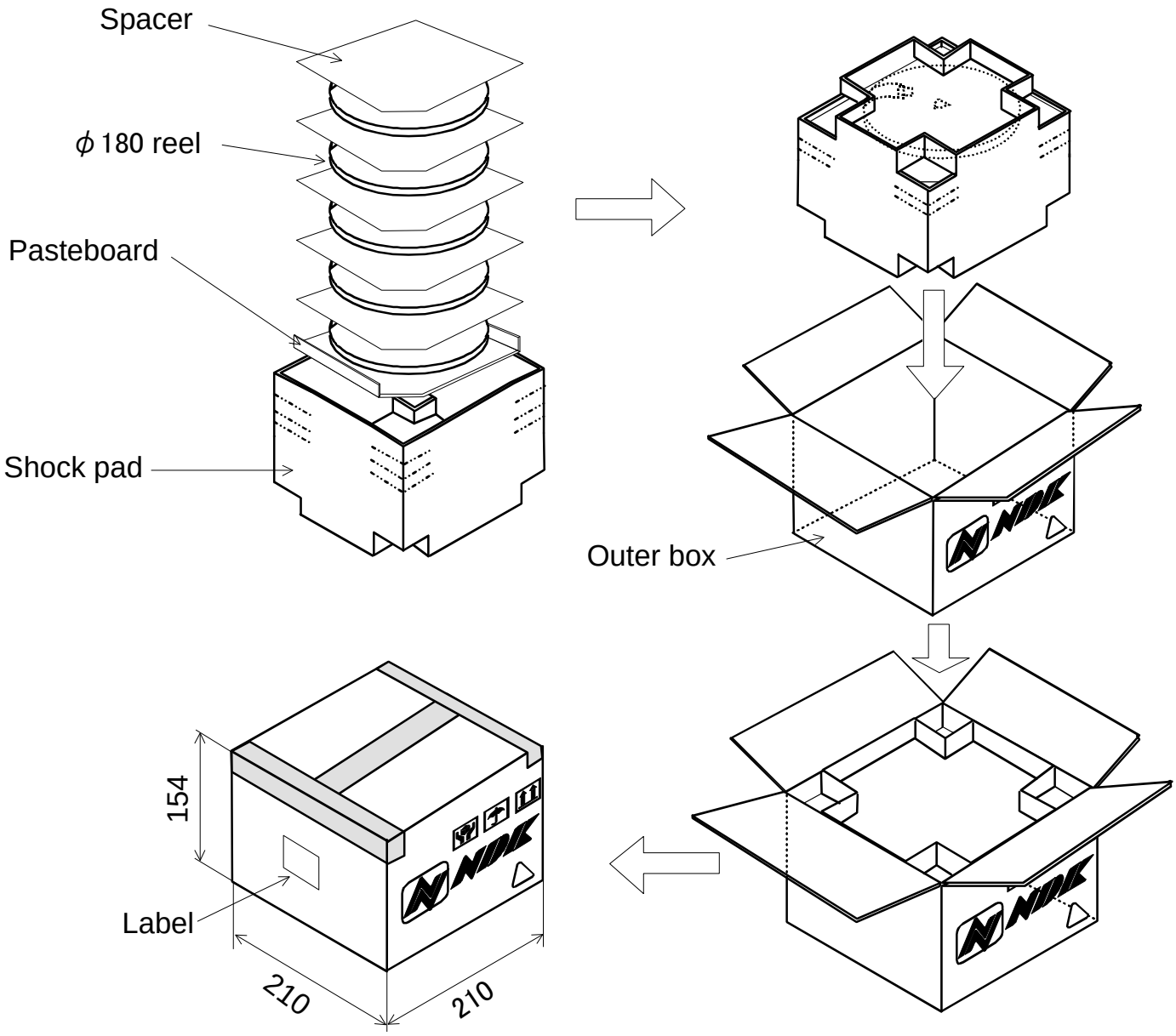
3. Marking Method

Marking Method is Laser Triming.

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

| | Date | Name | Third Angle Projection | Tolerance | Scale |
|---|---|---|---|---|---|
| Drawn | 28.OCt.2009 | Miyahara | Dimension:mm | | / |
| Designed | 28.OCt.2009 | Miyahara | Title: **NX3215SA Marking Drawing** | Drawing No.: **EXH11B-00422** | Rev. |
| Checked | -- | -- | | | |
| Approved | 28.OCt.2009 | Ueki | | | |

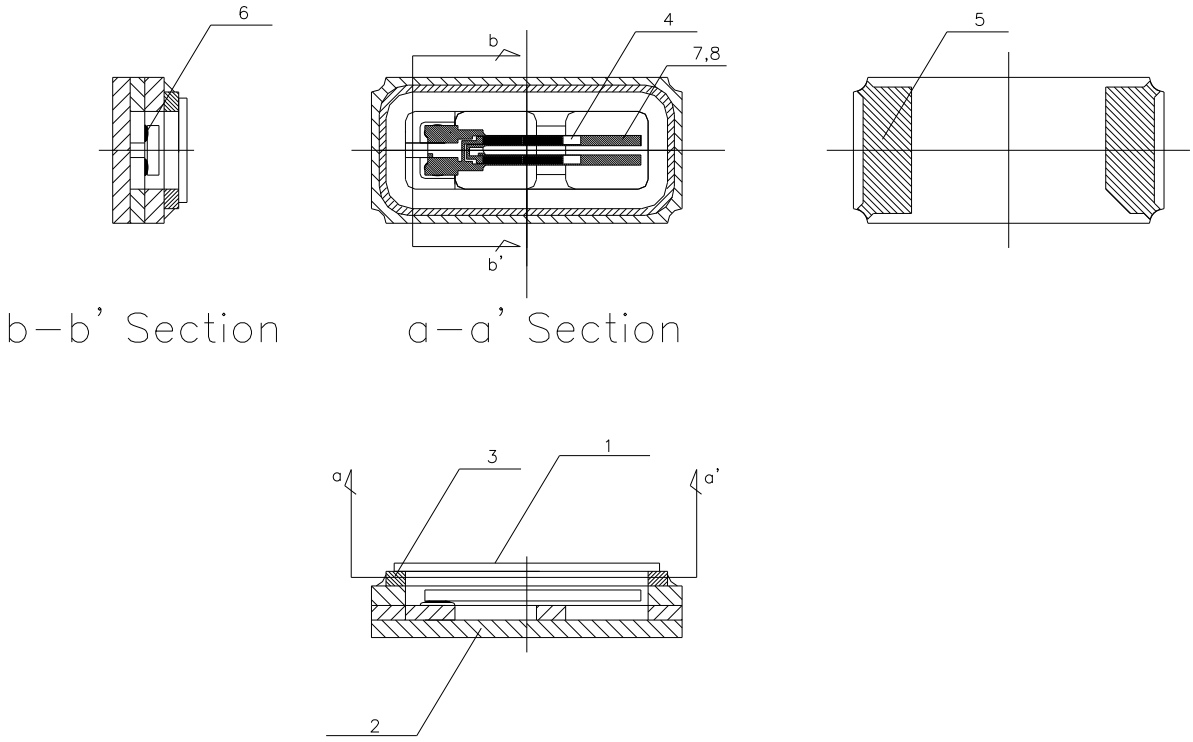
**NIHON DEMPA KOGYO CO., LTD.**




| | Date of Revise | Charge | Approved | Reason |
|---|---|---|---|---|
| B | 19 May 2011 | H.Ohkubo | K.Oguri | Correction of a clerical error. |

| | 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** | B |
| Approved | 26 Feb. 2010 | J. Nakamura | | | |

**NIHON DEMPA KOGYO CO., LTD.**




| Seal | | | Seam weld | Mass(Reference: Typ.) | | 0.0129g |
|---|---|---|---|---|---|---|
| No. | Part | | Material | No. | Part | Material |
| 1 | Lid | | Kover<br>Ni plating | 5 | Terminal | Tungsten<br>Au plating<br>(0.3 to 1.0μm)<br>Ni pre-plating(1.27 to 8.89μm) |
| 2 | Base | | Ceramic / $Al_2O_3$ | | | |
| 3 | Base | Kover ring | kover<br>Au plating<br>Ni pre-plating | 6 | Conductive adhesive | Silicon + Ag filer |
| | | | | 7 | Electrode | Au |
| 4 | Blank | | Crystal （$Si0_2$） | 8 | | Cr |

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

| | Date | Name | Third Angle Projection | Tolerance | Scale |
|---|---|---|---|---|---|
| Drawn | 14. Jul. 2011 | Y.Hasuike | mm | ---- | - / - |
| Designed | 14. Jul. 2011 | Y.Hasuike | 名称/Title | Drawing No. | Rev. |
| Checked | --- | --- | NX3215SA Structural Drawing | **EXD13B-00243** | --- |
| Approved | 14. Jul. 2011 | H.Matsudo | | | |

**NIHON DEMPA KOGYO CO., LTD.**

# Reliability assurance item



| No. | Test Item | Test Methods | Specification Code |
|---|---|---|---|
| 1 | AGING | 1 year at 25 °C +/- 3°C | a |
| 2 | HEAT RESISTANCE | at +85 °C for 500 hours. | a |
| 3 | COLD RESISTANCE | at –40 °C for 500 hours. | a |
| 4 | HUMIDITY | at +85 °C with 80 to 85 % RH for 500 hours. | a |
| 5 | THERMAL SHOCK | Temperature cycle as shown in (Fig.1) for 100 cycle.<br>30 minutes<br>+85 °C +/- 3 °C<br>30 minutes<br>-40 °C +/- 3 °C<br>ONE CYCLE (Fig.1) | a |
| 6 | VIBRATION | Frequency Range : 10 to 2000Hz<br>Amplitude or Acceleration : 1.52 mm or 196m/s$^2$<br>1 cycle : 20 minutes<br>Test time : Three mutually perpendicular axes each 12 times. | a |
| 7 | SHOCK 1 | Shock : 3000 Gs 0.3 msec.<br>Test time : Six mutually perpendicular axes each 1 times. | a |
| 8 | SHOCK 2 | Shock : Device are put on the weight of 200 g and dropped on concrete board.<br>Height : 1.5 m<br>Drop times : Six mutually perpendicular axes each 10 times. | b |
| 9 | SOLDERABILITY | Residual heat temperature 150 °C<br>Residual heat time 60 to 120 sec<br>Peak temperature 240°C<br>(more than 215 °C 10 to 30 sec) | c |
| 10 | REFLOW RESISTANCE | Temperature cycle as shown in (Fig2.) for 3 cycle. | a |

| Specification code | Specification |
|---|---|
| a | dF/F ≤ +/- 5ppm<br>dCI ≤ +/- 5 kohm |
| b | dF/F ≤ +/- 15ppm<br>dCI ≤ +/- 5 kohm |
| c | The electrodes shall acquire a new solder coat over at least 90 % of immersed area. |

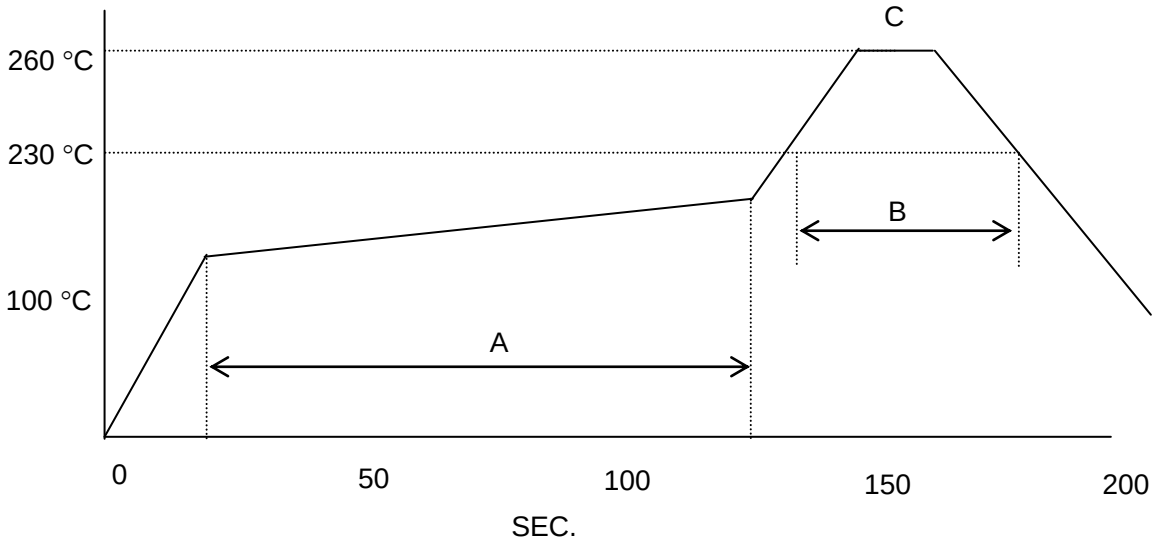
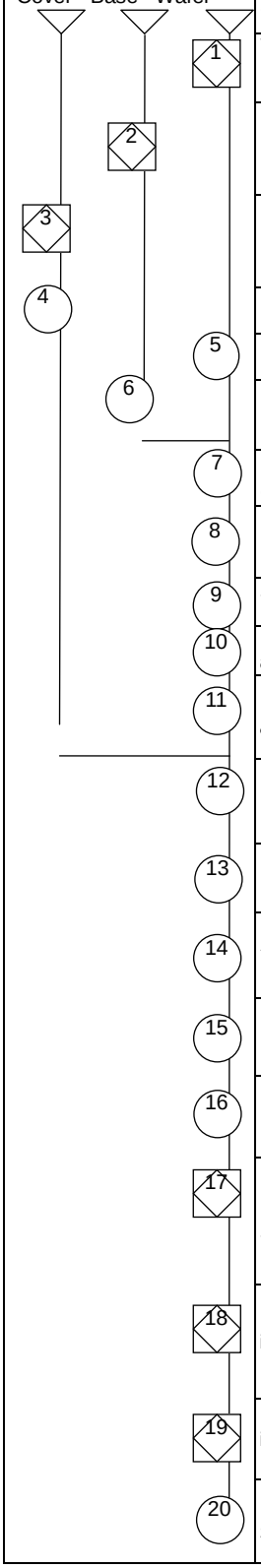



Fig.2 REFLOW

A: 150 to 180 °C ( 60 to 120 sec. )
B: 230 °C min. ( 30 sec. max. )
C: PEAK-TEMP. 260 °C +/- 5 °C ( 10sec. max. )

| EXQ11B-00387<br>Product Group: Crystal Unit<br>Type:NX3215SA<br>Factory: NDK | Date | | 3.Dec.2008 | | |
|---|---|---|---|---|---|
| | QA Dept | | 1st. Engineering Dept. | | |
| | Approved | Checked | Approved | Checked | Drawn |
| | M.Morimoto | N.Ohira | K.Kubota | | M.Sato |




| Process Name | Department | Machine, Device Jig, Tools | Check Item Test Item Control Item | Control Method | Standards/ Specification | Remarks |
|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | --- | A Working procedure |
| Wafer incoming Inspection (Check sampling) | Furukawa NDK | Visual, Confirmation of the data | Frequency, Dimension | Once / lot | Blank Incoming Inspection Standards | B Process control tag |
| Base incoming Inspection (Check sampling) | Ditto | Visual, Confirmation of the data | Dimension, Appearance Insulation | Once / lot | Components Incoming Inspection Standards | C Design sheet |
| Cover incoming Inspection (Check sampling) | Ditto | Visual, Confirmation of the data | Dimension, Appearance | Once / lot | Components Incoming Inspection Standards | D Individual specificati on sheet |
| Cover degassing | Ditto | Annealing Oven | Temperature, Time | Every time | A,B | |
| Chip break | Ditto | Chip break jig | Pressure | Once / day | A,B | |
| Base cleaning | Ditto | Blow & Vacuum M/C | Pressure | Once / day | A,B | |
| Support & Bonding | Ditto | Support bonding M/C | Bonding position<br>Bonding volume | 100% | A,B | |
| Curing and baking | Ditto | Tunnel type oven | Belt speed<br>Temperature<br>$O_2$ Density | Once / day | A,B | |
| Turn-over | Ditto | Turn-over M/C | Pressure | Once / day | A,B | |
| Frequency adjustment | Ditto | Frequency adjustment M/C | Vacuum rate<br>Pressure | Once / day | A,B,D | |
| Frequency check & Turn-over | Ditto | Freq. check M/C<br>Turn-over M/C | Frequency | 100% | A,B,D | |
| | | | Pressure | Once / day | A,B | |
| 1st Sealing | Ditto | Sealing M/C | Current | 100% | A,B | |
| | | | O2 Density, Dew point | Once / day | A,B | |
| Unit loading | Ditto | Loading M/C | Pressure | Once / day | A,B | |
| Annealing & 2nd Sealing | Ditto | Annealing & Sealing M/C | Current | 100% | A,B | |
| | | | Vacuum rate<br>Temperature | Once / day | A,B | |
| Reflow (100%) | Ditto | Reflow oven | Belt speed<br>Temperature | Once / day | A,B | |
| He pressure (100%) | Ditto | He pressure tub | Pressure<br>Time | Once / day | A,B | |
| Product inspection & Taping | Ditto | Auto inspection M/C | Frequency,<br>ESR, Insulation, C0 | 100% | A,B,D | |
| | | Laser marking M/C | Content of marking | 100% | A,B,D | |
| | | Taping M/C | Temperature<br>Taping strength | Once / day | A,B | |
| Confirmation inspection (Sampling) | Ditto | Network analyzer<br>TC measurement system<br>Quality confirmation sheet | Frequency,<br>ESR, C0,<br>Temp. characteristics | Once / QN | A,B,D | |
| Quality Guarantee inspection (Checking) | Ditto | Visual<br>Quality confirmation sheet | Dimension, Appearance,<br>Frequency, ESR, C0,<br>Temp. characteristics | Once / QN | A,B,D | |
| Packing & Shipping | Ditto | Visual | Packing appearance<br>Quantity<br>Contents of label | 100% | A,B,D | |

# X-ON Electronics

Largest Supplier of Electrical and Electronic Components

***Click to view similar products for*** Crystals ***category:***

***Click to view products by*** Nihon Dempa Kogyo ***manufacturer:***

Other Similar products are found below :

CS325S24000000ABJT 718-13.2-1 MC405 32.0000K-R3:PURE SN FC-135R 32.7680KF-A3 7A-40.000MAAE-T 7B-27.000MBBK-T FL2000085 9B-15.360MBBK-B 9C-7.680MBBK-T ASH7K-32.768KHZ AT-41.600MAGQ-T BTD1062E05A-513 LFXTAL066198Cutt 9C-14.31818MBBK-T FA-238 50.0000MB30X-K3 FC-12M 32.7680KA-AC3 SSPT7F-9PF20-R FX325BS-38.88EEM1201 LFXTAL065253Cutt LFXTAL066431Cutt XT9S20ANA14M7456 XT9SNLANA16M 646G-24-2 7A-24.576MBBK-T 7B-30.000MBBK-T WX26-32.768K-6PF 9B-14.31818MBBK-B CD1AM 7B-25.000MAAE-T 7A-14.31818MBBK-T 6504-202-1501 6526-202-1501 FA-118T 27.1200MB50P-K0 FC-135R 32.7680KA-A3 ABM12-104-37.400MHZT ABLS-10.000MHZ-D3W-T BTJ112E01E-513 BTJ722K01C-7067 BTL-20-513 TSX-3225 24.0000MF15X-AC TSX-3225 16.0000MF18X-AC BTJ120E02C BTL-12-513 7A-10.000MBBK-T 7A-11.0592MBBK-T ABM12-103-24.000MHZT CS325S25000000ABJT ABM3B-25.000MHZ-B2-X-T FC-135 32.7680KA-A5 FX0800015