

REFERENCE SPECIFICATION

Customer: _____

| | |
|-----------------------|----------------|
| Item: | Crystal Unit |
| Type: | NX3225SA |
| Nominal Frequency: | 40.000 MHz |
| Customer's Spec. No.: | --- |
| NDK Spec. No.: | EXS00A-CS09512 |
| Conforms to AEC-Q200 | |

For your reference we submit this specification.
Please study and keep in your related document file.

| Revision Record | | | | | | |
|-----------------|---------------|---|-----------------|-------------|---------|-----------|
| Rev. | Rev. Date | Items | Contents | Approved | Checked | Drawn |
| ----- | 15. Dec. 2015 | Issue | --- | I. Miyahara | -- | K.Tsukumo |
| A | 22. Aug. 2017 | 4.4 Frequency versus Temperature Characteristic | Add: -40~+85°C | I. Miyahara | -- | K.Tsukumo |
| B | 23. Aug. 2017 | 4.4 Frequency versus Temperature Characteristic | Add: -40~+125°C | M.Sato | --- | R.Omomo |
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| | | | | | | |

1. Customer Specifications Number : ---
2. NDK Specification Number : EXS00A-CS09512
3. Type : NX3225SA

4. Electrical Characteristics

| | Electrical Characteristics Items | Symbol | Electrical Characteristics Spec. | | | | Notes |
|----|---|------------------|----------------------------------|-----|-----------------------|----------------------|--|
| | | | MIN | TYP | MAX | Unit | |
| 1 | Nominal frequency | f _{nom} | 40.000 | | | MHz | |
| 2 | Overtone order | - | Fundamental | | | - | |
| 3 | Frequency tolerance | - | -10 | - | +10 | ppm | at +25°C |
| 4 | Frequency versus Temperature Characteristic | - | -10 | - | +10 | ppm | at -20 to +75°C The reference temperature shall be +25°C |
| | | - | -20 | - | +20 | ppm | at -40 to +85°C The reference temperature shall be +25°C |
| | | - | -50 | - | +50 | ppm | at -40 to +125°C The reference temperature shall be +25°C |
| 5 | Equivalent resistance | - | - | - | 50 | Ω | IEC π-network / Series |
| 6 | Load capacitance | CL | - | 9 | - | pF | IEC π-network |
| 7 | Level of drive | - | - | 10 | 200 | μW | |
| 8 | Insulation resistance | - | 500 | - | - | MΩ | Terminal to terminal insulation resistance also terminal to cover insulation resistance must be 500MΩ (min) when DC100V ±15V is applied. |
| 9 | Operating Temperature range | - | -40 | - | +125 | °C | |
| 10 | Storage temperature range | - | -40 | - | +125 | °C | |
| 11 | Air-tightness | - | - | - | 1.1 x10 ⁻⁹ | Pa m ³ /s | Helium leak detector |

5. Examination results document

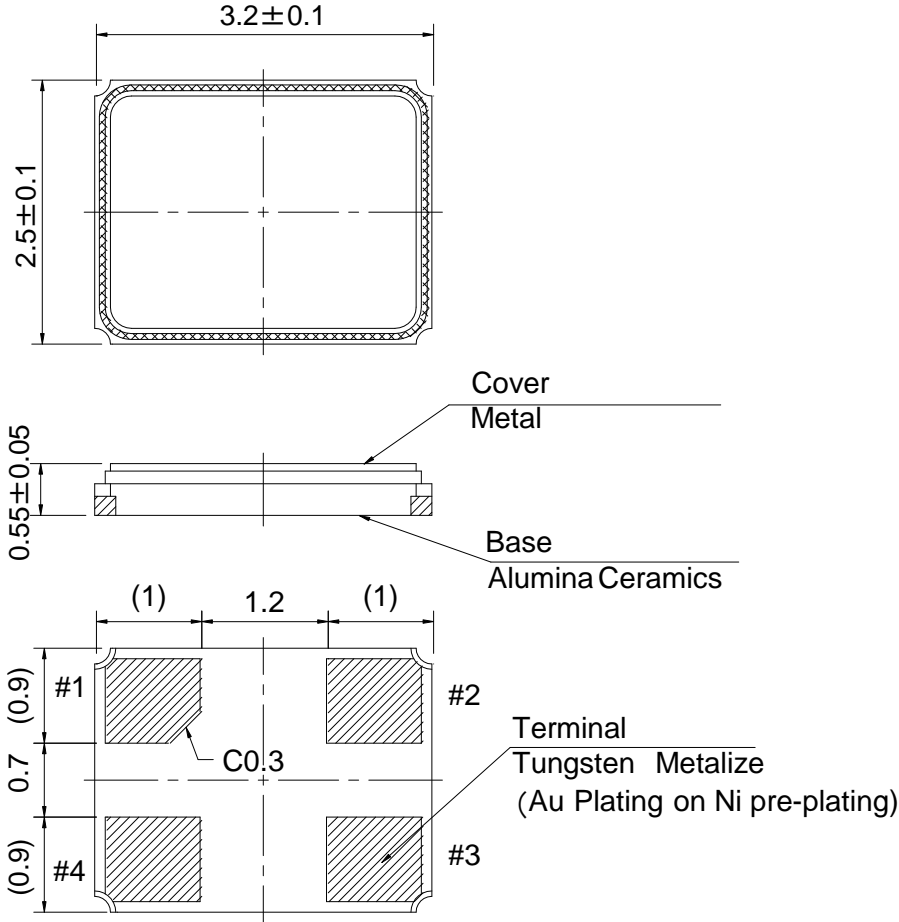
Since a performance is guaranteed, an examination results document does not submit.

6. Application drawing

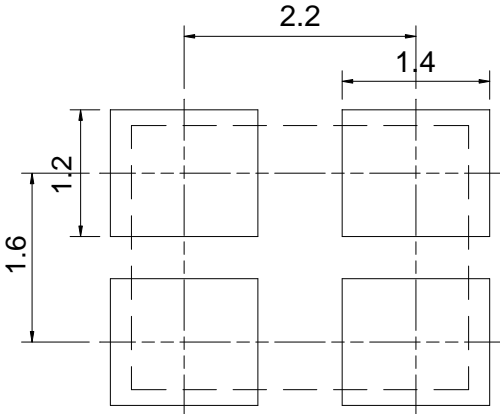
- 6.1 External dimension : EXD14B-00370
- 6.2 Taping and reel figure : EXK17B-00098
- 6.3 Holder marking : EXH11B-00317
- 6.4 Reliability assurance Item : EXS30B-00499

7. Notice

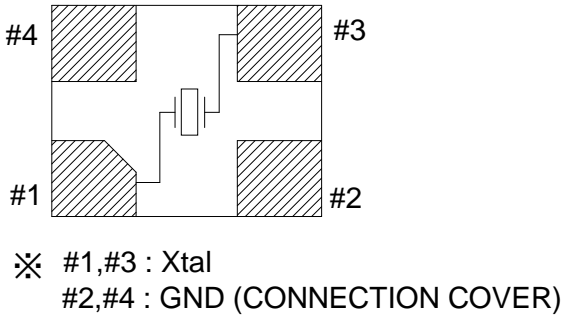
- 7.1 Order items are manufactured according to specification. As to conditions, which are not indicated in the specification and unpredictable such as applied condition and oscillation margin, please check them beforehand.
- 7.2 Crystal units will be damaged by ultrasonic welding process due to resonance of crystal wafer itself. NDK does not recommend using ultrasonic welding. If Ultra Sonic welding used, NDK strongly recommend verifying crystal unit damage by ultrasonic weld.
- 7.3 The appearance color has a different case by purchasing it more than 2 suppliers of the component, but characteristic and reliability are guaranteed.



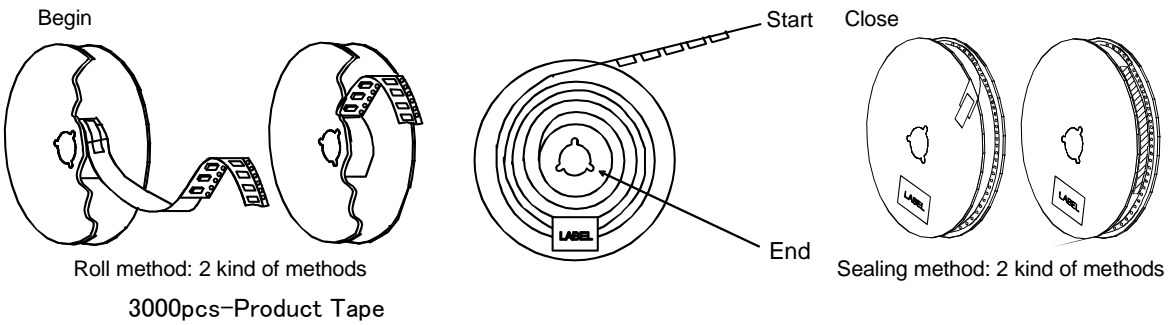
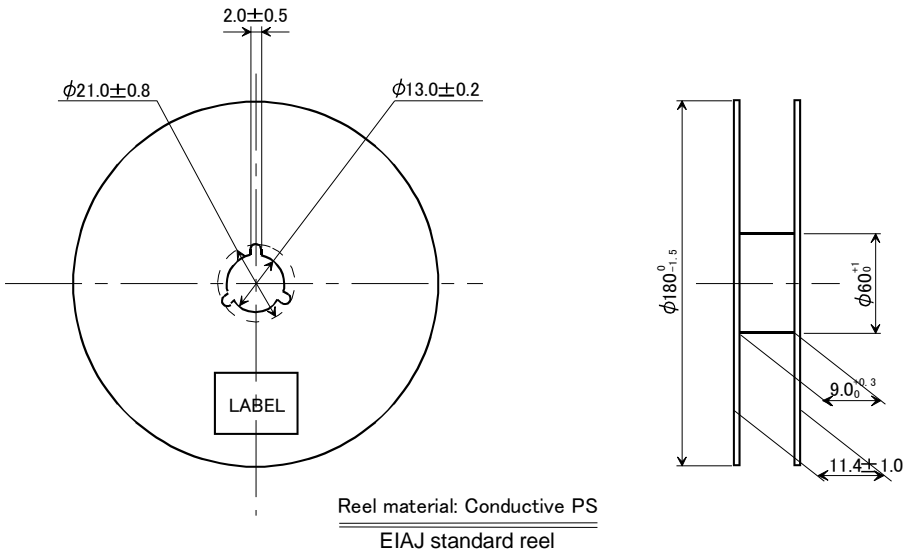
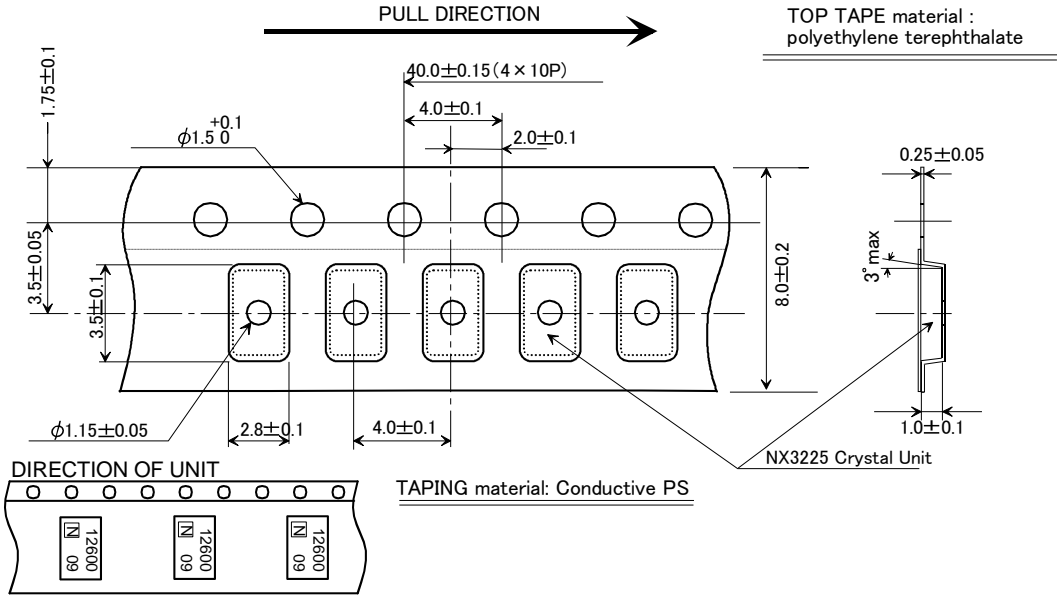
LAND PATTERN (TYPICAL)



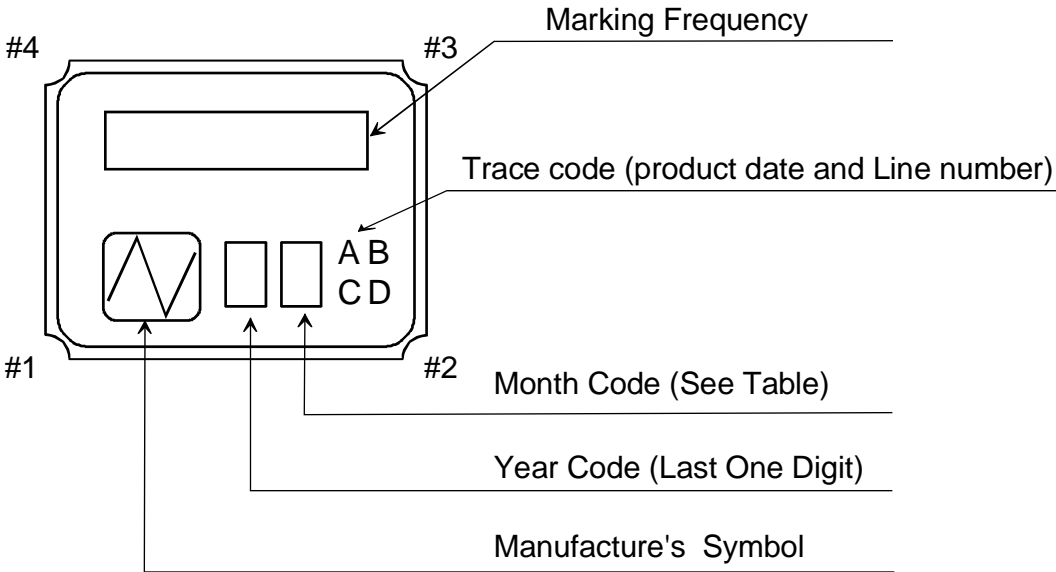
PIN CONNECTION (TOP VIEW)



| | | | | | |
|----------|----------------|------------|---------------------------------------|---------------------|----------|
| | Date of Revise | Charge | Approved | Reason | |
| A | 4.Sep.2007 | R.Shariman | K.Kubota | Add Tolerance. | |
| | Date | Name | Third Angle Projection | Tolerance | Scale |
| Drawn | 25.Oct.2005 | S.Mizusawa | Dimension:mm | ±0.1 | - / - |
| Designed | 25.Oct.2005 | S.Mizusawa | Title | Drawing No. | Rev. |
| Checked | | | | | |
| Approved | 25.Oct.2005 | S.Mizusawa | | | |
| | | | NX3225SA Dimension Drawing | EXD14B-00370 | A |



| | | | | |
|----------|----------------|-------------|-------------------------------------|---|
| | Date of Revise | Charge | Approved | Reason |
| I | 22 Aug. 2012 | T. Shimizu | K. Oguri | Top cover tape leader line was deleted. |
| | Date | Name | Third Angle Projection | Tolerance |
| Drawn | 3.Sep.2001 | K.Oguri | Dimension:mm | Scale |
| Designed | 3.Sep.2001 | K.Oguri | Title | |
| Checked | | | Drawing No. | |
| Approved | 3.Sep.2001 | K.Miyashita | Rev. | |
| | | | NX3225 Series Taping and Reel Spec. | |
| | | | EXK17B-0098 | |
| | | | I | |



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 | | | | |

Reliability assurance item

(page: 1/1)

| No. | Test Item | Test Methods | Specification Code |
|-----|--------------------------|--|--------------------|
| 1 | High Temperature Storage | +125±3°C 1000h | A,D |
| 2 | Low Temperature Storage | -40±3°C 1000h | A,D |
| 3 | Temperature Humidity | +85±3°C 80~85%RH 1000h | A,D |
| 4 | Temperature Cycling | -55±5°C / +125±5°C It is 1000 cycles using 30 minutes each as 1 cycle. | A,D |
| 5 | Vibration | Frequency Range : 10~2000Hz Amplitude or Acceleration : 1.52mm or 196m/s ² 1 cycle : 20 minutes Test time : Three mutually perpendicular axes each 4 hours. | B,D |
| 6 | Shock | Devices are shocked to half sine wave (49000m/s ² , 0.15msec) six mutually perpendicular axis each 1 times. | B,D |
| 7 | Drop | Devices are dropped from the height 75cm onto iron plate. Execution 3 times random drops. | B,D |
| 8 | Solderability | Pre-heat temperature : +150±10°C Pre-heat time : 60~120s When the temperature of the specimen is reached at +215±3°C, it shall be left for 30±1sec. Material: H63A (Silver 2~3%) Flux : Rosin resin methyl alcohol solvent (1 : 4) | C |
| 9 | Reflow resistance | Pre-heat temperature : +150~180°C Pre-heat time : 90±30s Heat temperature : more than +230°C Pre-heat time : less than 30s Peak temperature : +260±5°C Peak time : less than 10s | B,D |

| Specification code | Specification |
|--------------------|--|
| A | $\Delta f/f \leq \pm 20$ ppm $\Delta CI/CI \leq \pm 15$ % or 5 Ω make use larger value |
| B | $\Delta f/f \leq \pm 10$ ppm $\Delta CI/CI \leq \pm 15$ % or 5 Ω make use larger value |
| C | The electrodes should be covered by a new solder at least 90% of immersed area. |
| D | After testing unless cracking of materials view of eyes and unless break of seal. |