1. Customer specifications number :

2. NDK specification number :
3. Type : NX3225GD

4. Electrical characteristics
   4.1 Nominal frequency (F_{nom}) : 8.000 MHz
   4.2 Overtone order : Fundamental
   4.3 Frequency tolerance : $\pm 50 \times 10^{-6}$ max. (at +25°C)
   4.4 Frequency versus temperature characteristics : $\pm 150 \times 10^{-6}$ max. (at -40~+150°C)
   The reference temperature shall be +25°C
   4.5 Equivalent resistance : 500Ω max
   4.6 Frequency aging : $\pm 10 \times 10^{-6}$ max./ year (at +25°C)
   4.7 Maximum drive Level : 200μW max.
   4.8 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 : IEC π-Network
      Load capacitance (CL) : 8pF
      Excitation level : 10μW
   5.2 Equivalent resistance measurement
      Measuring instrument : IEC π-Network
      Load capacitance (CL) : Series
      Level of drive : 10μW

6. Other performances
   6.1 Operating temperature range : -40~+150°C
   6.2 Storage temperature range : -40~+150°C
   6.2 Air-tightness : Less than 3×10^{-9} Pa m^3/s (Helium leak detector)

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

8. Application drawing
   8.1 External dimension : EXD14B-00474
   8.2 Taping and reel figure : EXK17B-00247
   8.3 Holder marking : EXH11B-00392
   8.4 Reliability assurance Item : EXS30B-00396
   8.5 Recommendation reflow profile : EXS30B-00344

9. Notice

9.1 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.

9.2 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.

9.3 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.

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

9.5 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.

9.6 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.

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

9.8 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.

9.9 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.

10. 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).
When using a soldering iron, press its tip on the part below the sealed part, avoiding the glass-sealed part (otherwise, the glass will melt and air-tightness may be lost).

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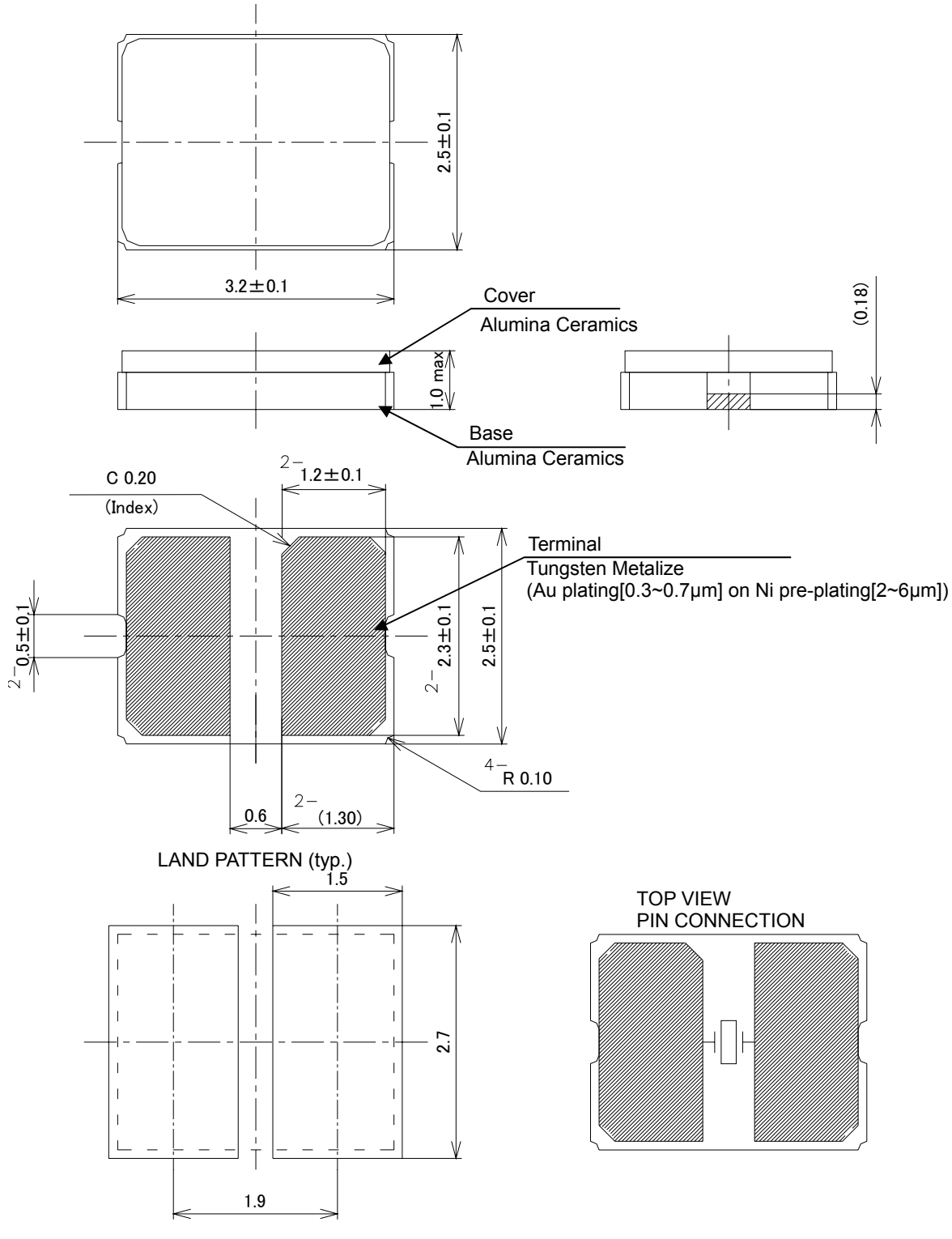

	Date of Revise	Charge	Approved	Reason
B	8.Jan.2013	N.Yamamoto	M.Kubota	Add plating thickness

	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	13.May.2010	R.Shariman	Dimension:mm	---	1 / 15
Designed	13.May.2010	R.Shariman	Title	Drawing No.	Rev.
Checked	13.May.2010	K.Komada	**NX3225GD Dimension Drawing**	**EXD14B-00474**	**B**
Approved	13.May.2010	K.Ueki			

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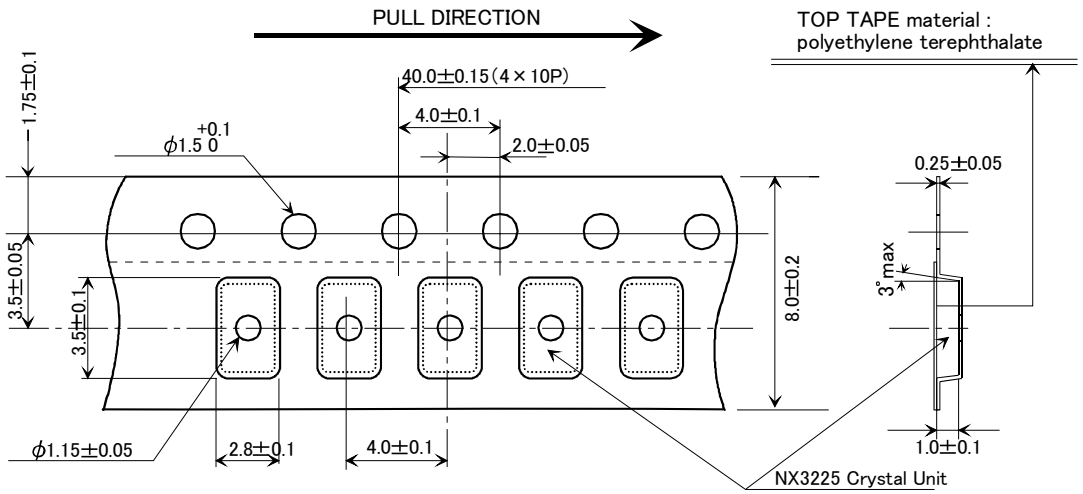
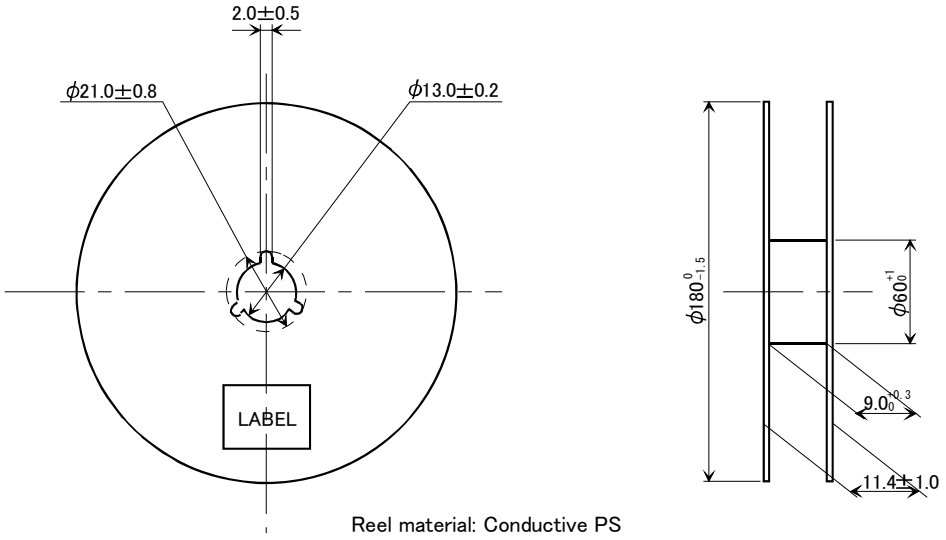
Form M-1

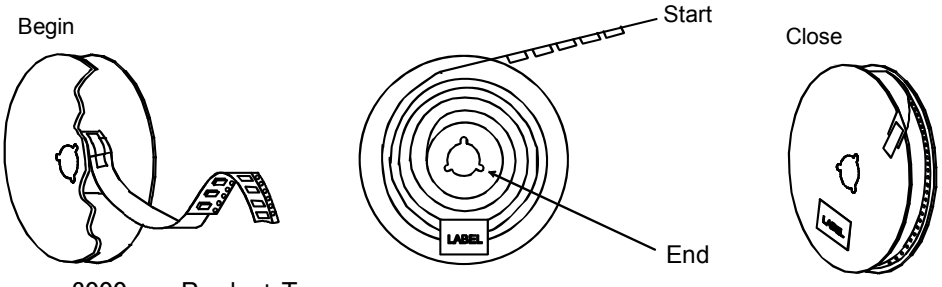


TAPING material: Conductive PS



Reel material: Conductive PS

EIAJ standard reel



3000pcs-Product Tape

	Date of Revise	Charge	Approved	Reason
A	26 Mar. 2013	T. Shimizu	K. Oguri	The appearance of a drawing was corrected.

	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	30.Jun.2006	H.Yagishita	Dimension:mm	---	- / -
Designed	30.Jun.2006	H.Yagishita	Title	Drawing No.	Rev.
Checked	30.Jun.2006	K.Kubota	**NX3225 Series Taping and Reel Spec.**	**EXK17B-00247**	B
Approved	30.Jun.2006	T.Ishii			

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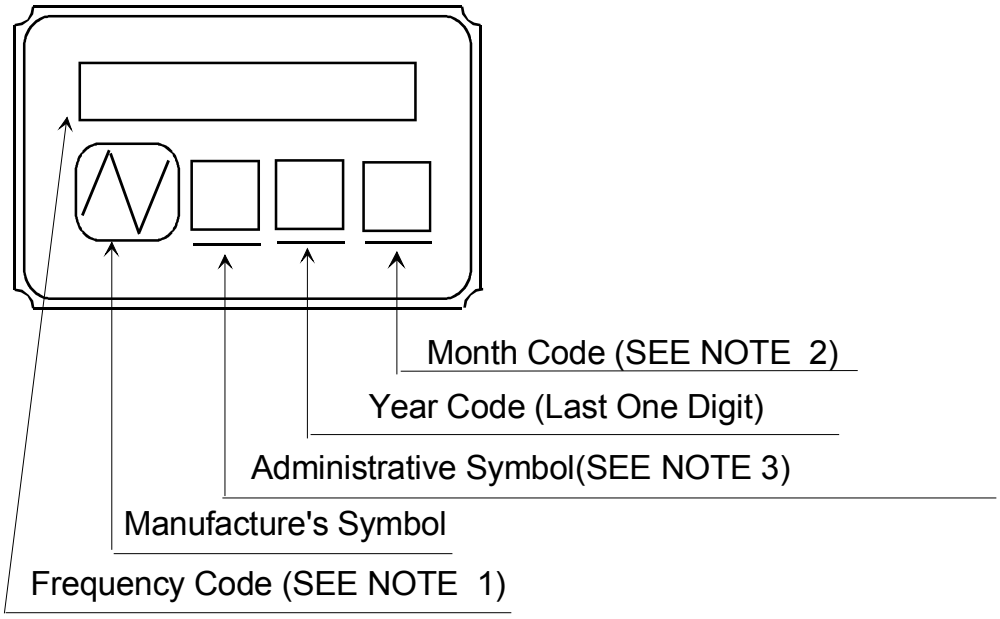
Form M-1



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

3. Marking contents

Example

Administrative symbol	S

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

	Date of Revise	Charge	Approved	Reason

	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	19.May.2008	R.Shariman	Dimension:mm		/
Designed	19.May.2008	R.Shariman	Title	Drawing No.	Rev.
Checked	19.May.2008	M.Harada	**Crystal Holder Marking**	**EXH11B-00392**	
Approved	19.May.2008	K.Kubota			

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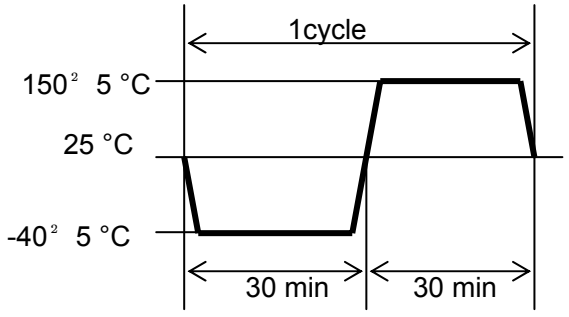
Form M-1

Reliability assurance item

No.	Test item	Test methods	Spec. code
1	Drop	Devices are dropped from the height 75 cm onto iron plate. Execution 3 times random drops.	A
2	Shock	Acceleration: 49000 m/s^2 Duration: 0.15 ms Half-Sine pulse 1 Shocks in 6 mutually perpendicular planes, Total 6 shocks	A
3	Vibration	Frequency range: 10 to 2000 Hz Amplitude or Acceleration: 1.52 mm or 196 m/s^2 Sweep time: 20 min Test time: 4 hØ 3	A
4	Electrode adherent strength	See remark (1)	B
5	Solderability	Pre-heat temperature : 150 °C Pre-heat Time : 60 ~ 120 s Peak temperature : 240 ² 5 °C 215 °C Over time : 10 ~ 30 s	C
6	Resistance to soldering heat	Pre-heat temperature : 150 °C Pre-heat time : 60 ~ 120 s Test temperature : 260 ± 5 °C Test time : 10 ± 1 s	A,B
7	Resistance to cold	Leave at -40 ² 2 °C for 1000 h	A
8	Resistance to heat	Leave at +150 ² 2 °C for 1000 h	A
9	Humidity	Device are left in temperature at +85 ² 2 °C with relative humidity of 80~85 % for 1000 h	A,D
10	Thermal shock	Device are left into the following temperature cycle as shown in (Figure1) for 1000 consecutive cycle.  (Figure1)	A,B

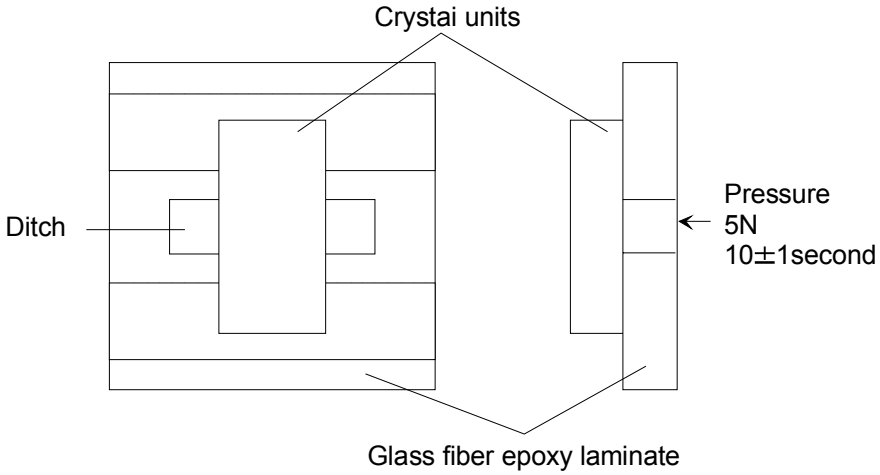
Reliability assurance item

Spec. code	Specification
A	Frequency tolerance and series resistance should be cleared.
B	After testing unless cracking of materials view of eyes and unless break of seal.
C	The leads shall acquire a new solder coat cover at 90 % of immersed area.
D	Insulation resistance shall be greater than 500 MΩ

Remark (1) Electrode adherent strength.

1) Test method condition

Using the solder, soldering Iron or reflow soldering bath shall be used for soldering on test fixture (Glass fiber epoxy laminate : Thickness 1.6mm+/-0.2mm) shown below.



2) Specified value

No peel of electrode, no crack, no other abnormality

Recommendation reflow condition

1.IR reflow condition