RoHS Compliant
Directive 2002/95/EC

SPECIFICATION

Customer:

Item:	Crystal Unit
Type:	NX3225GA
Nominal Frequency:	30.000MHz
Customer's Spec. No.:	
NDK Spec. No.:	S1-2070-1010-12

Receipt

Charge:

Sales	Tokyo Sales Office M.Tezuka	Tel. (81)-3-5453-6771
Engineer	1st Eng. Dept. K.Nakashima	Tel. (81)-4-2900-6631

Approved K.Ueki

Checked

Drawn K.Nakashima

Revision Record

Rev.	Rev. Date	Items	Contents	Remarks
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A				

1.Customer specifications number :

2.NDK specification number : S1-2070-1010-12
3.Type : NX3225GA

4.Electrical characteristics
- 4.1 Nominal frequency : 30.000MHz
- 4.2 Overtone order : Fundamental
- 4.3 Adjustment tolerance : $\pm 10 \times 10^{-6}$max. (+25 °C)
- 4.4 Tolerance over the temperature range : $\pm 10 \times 10^{-6}$max. (-20 ~ +70 °C)
  The reference temperature shall be 25°C
- 4.5 Equivalent resistance : 15Ωmax.
- 4.6 Shunt capacitance (C_0) : 1 ~ 2.5pF
- 4.7 Motional capacitance (C_1) : 5 ~ 9fF
- 4.7 Pulling Sensitivity (PS) : 7.4×10^{-6}/pF typ. (at CL=19pF)
  This value is calculated by following formula.
  $PS = (C_1 \times 1{,}000)/\{2(C_0+C_L)^2\}$ [$\times 10^{-6}$/pF]
  C_0=1.73pF typ., C_1=7.2fF typ., C_L=19pF
- 4.8 Maximum drive level : 300uWmax.
- 4.9 Frequency aging : $\pm 10 \times 10^{-6}$max. / years
- 4.10 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 : IECπ circuit
  - Load capacitance(C_L) : 12pF
  - Excitation level : 10μW
- 5.2 Equivalent resistance measurement
  - Measuring instrument : IECπ circuit
  - Load capacitance(C_L) : Series
  - Level of drive : 10μW

6. Other performances
- 6.1 Storage temperature range : -40 ~+85°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-00388
- 8.2 Taping and reel figure : EXK17B-00247
- 8.3 Holder marking : EXH11B-00027
- 8.4 Reliability assurance Item : EXS30B-00231
- 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.

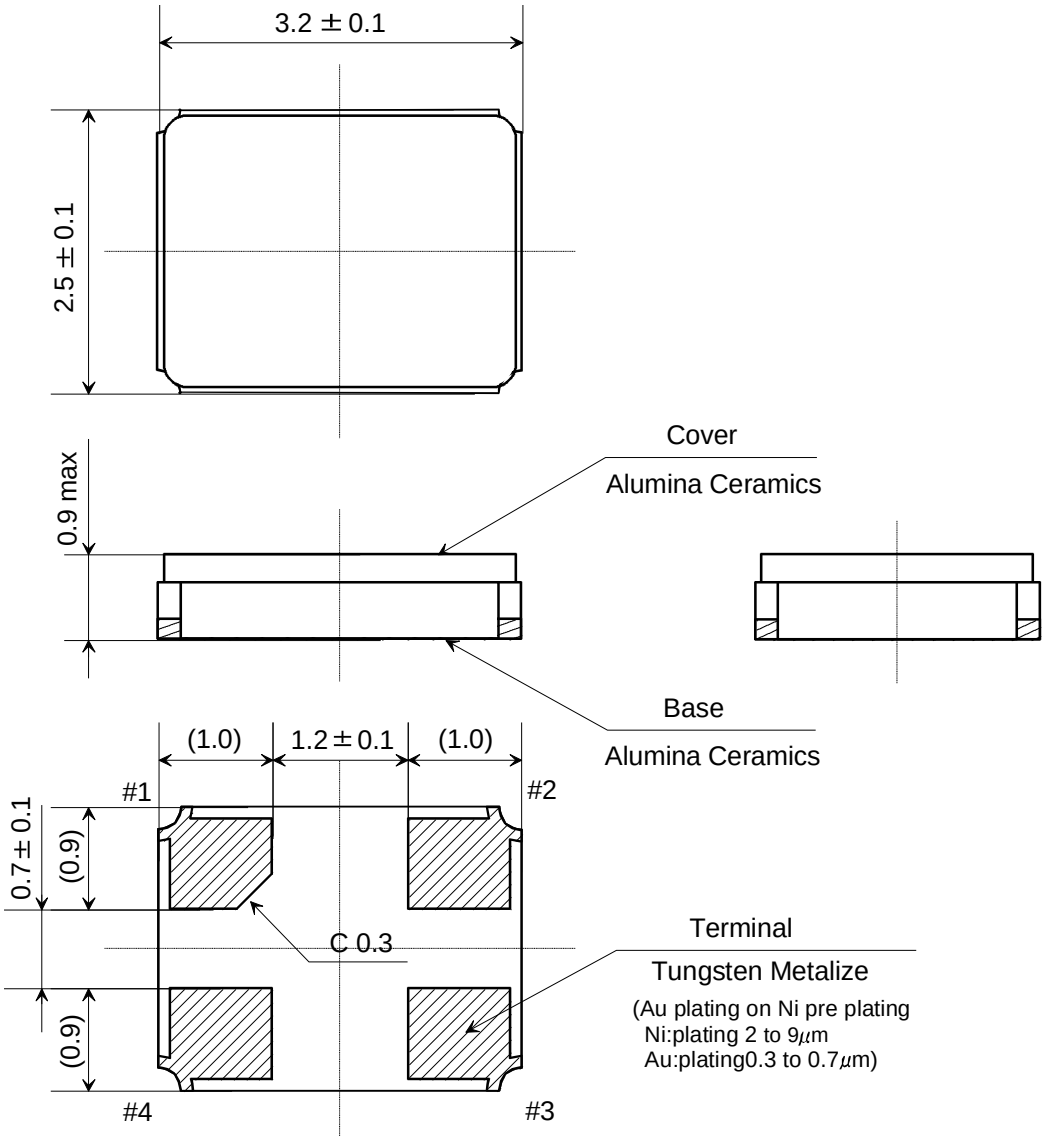
9.8. Information contained in this specification must not be quoted, reproduced or used for other purposes including processing either in part or in full without obtaining prior approval from the company.

10. Prohibited items

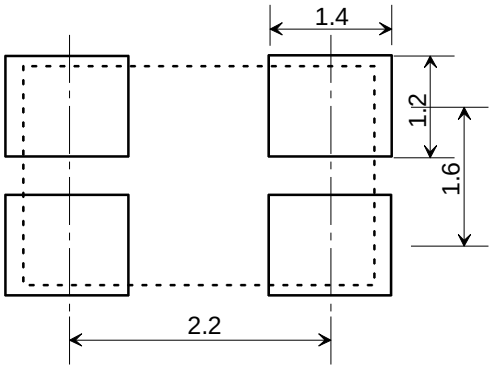
Be sure to use the product under the following conditions. Otherwise, the characteristics deterioration or destruction of the product may result.

(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

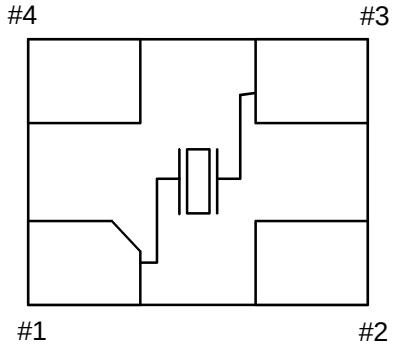
(2) Manual soldering heat resistance
Pressing a soldering iron of 400°C on the terminal electrode for four seconds (twice).



LAND PATTERN (TYPICAL)



TOP VIEW
PIN CONNECTION



TERMINAL
#1,#3:X'tal
#2,#4:No Connection

	Date of Revise	Charge	Approved	Reason
A				

	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	**NX3225GA Dimension Drawing**	**EXD14B-00388**	
Approved	30.Jun.2006	T.Ishii			

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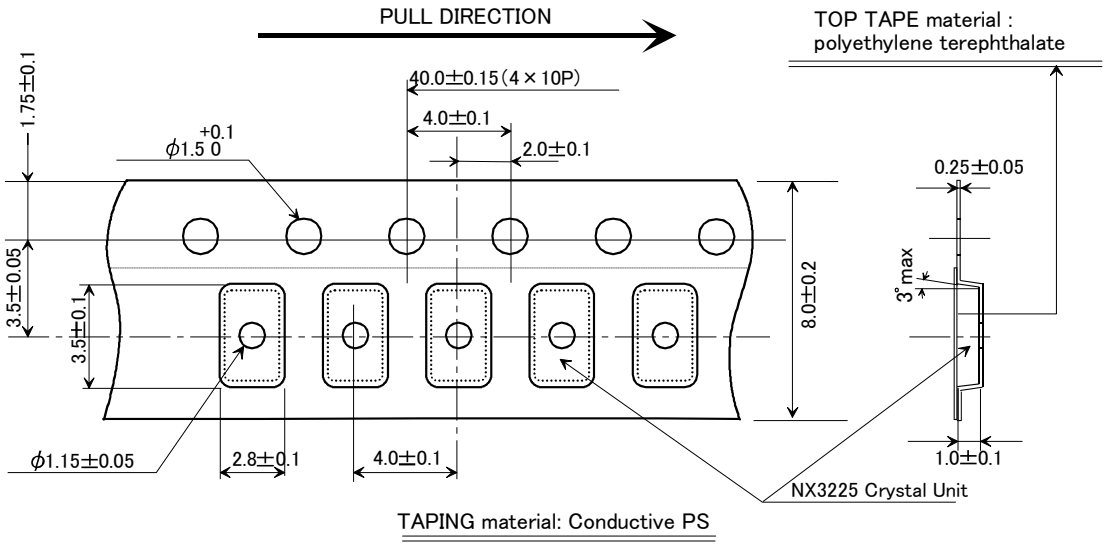
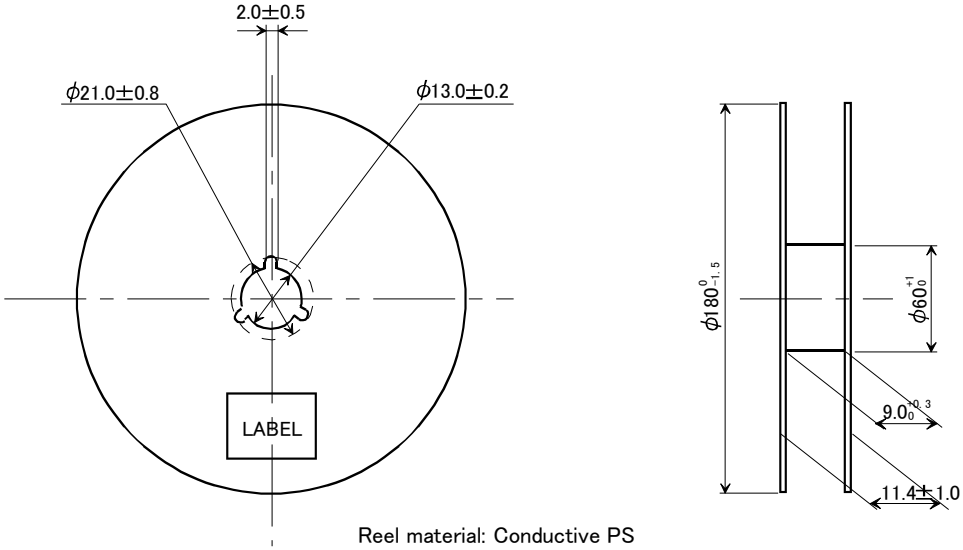
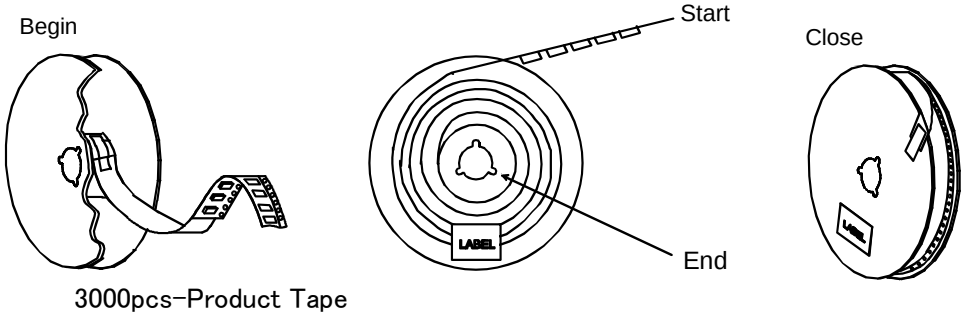


TAPING material: Conductive PS



Reel material: Conductive PS

EIAJ standard reel



3000pcs-Product Tape

	Date of Revise	Charge	Approved	Reason
A				

	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**	
Approved	30.Jun.2006	T.Ishii			

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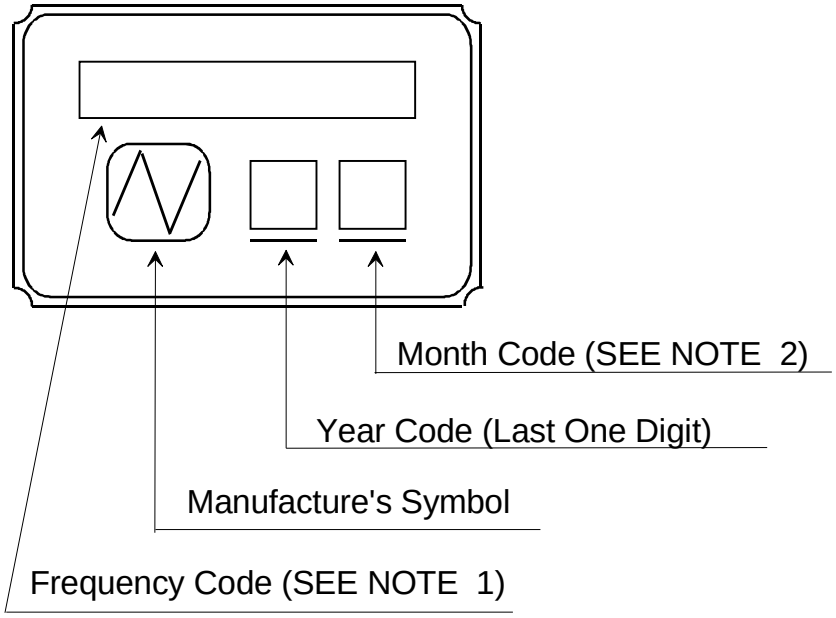
Form M-1



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

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

	Date of Revise	Charge	Approved	Reason
B	9.Nov.2000	H.Yagishita	T.Ishii	Change Form

	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	3.Aug.1999	Y.Morizumi	Dimension:mm		/
Designed	3.Aug.1999	Y.Morizumi	Title	Drawing No.	Rev.
Checked	----------	----------	**Crystal Holder Marking**	**EXH11B-00027**	B
Approved	3.Aug.1999	T.Ishii			

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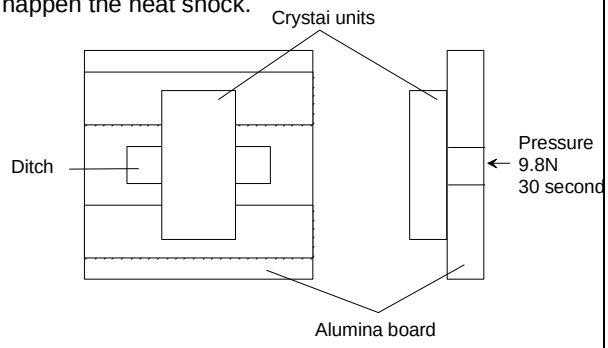
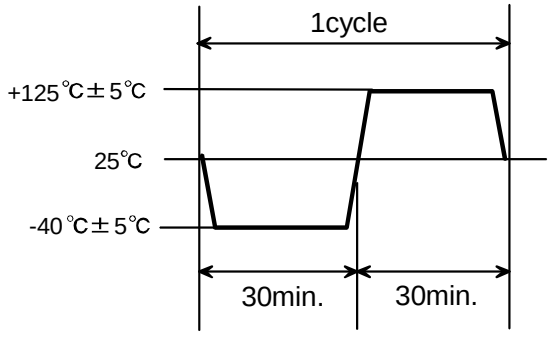
Form M-1

Reliability assurance item

No.	Test item	Test methods	Spec. code
1	Drop	Devices are dropped from the height 75cm onto concrete. Execution 3 times random drops.	A
2	Shock	Acceleration: 50000m/s^2 (5000G) Duration:0.15 msec 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 200 m/s^2 (20G) Sweep time: 20 minutes Test time: 4 hours × 3	A
4	Electrode adherent strength	Reflow soldering shall be used for soldering on test fixture (Glass fiber epoxy laminate : Thickness 1.6mm+/-0.2mm) shown below. (220~240°C) Be careful to happen the heat shock. 	B
5	Solderability	Pre-heat temperature : 150°C Pre-heat Time : 60~120sec. Peek temperature : 240±5°C Solderind temperature : Over 215°C Test time : 10~30 sec.	C
6	Resistance to soldering heat	Pre-heat temperature : 150°C Pre-heat Time : 60~120sec. Test temperature : 260±5°C Test time : 10 sec. Max.	A,B
7	Resistance to cold	Leave at –40 °C ± 2 °C for 1000 hours.	A
8	Resistance to heat	Leave at +125 °C ± 2 °C for 1000 hours.	A
9	Humidity	Device are left in temperature at +85 °C with relative humidity of 80~85% for 1000 hours.	A,D
10	Thermal shock	Device are left into the following temperature cycle as shown in (Figure1) for 500 consecutive cycle.  (Figure1)	A,B

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.

Recommendation reflow condition

1.IR reflow condition