RoHS Compliant
Directive 2011/65/EU

SPECIFICATION

Customer: ELTECH STARLINE

Item:	Crystal Unit
Type:	NX2520SA
Nominal frequency	16.000 MHz
Customer's Spec. No.:	
NDK Spec. No.:	EXS00A-CS07310

Receipt

Charge:

Sales	NDK-I P.Bandera	Tel. 39-02-96702920
Engineer	1st Eng. Dept. N.Wakisaka	Tel. 81-4-2900-6631

Approved	H.Kobayashi
Checked	N.Yamamoto
Drawn	N.Wakisaka

Revision Record

Rev.	Rev. Date	Items	Contents	Remarks
---	10.Oct.2013	Issue	---	---

1. Customer specifications number :

2. NDK specification number : EXS00A-CS07310

3. Type : NX2520SA

4. Electrical characteristics
   - 4.1 Nominal frequency (F_{nom}) : 16.000 MHz
   - 4.2 Overtone order : Fundamental (AT-cut)
   - 4.3 Frequency tolerance : $\pm 10 \times 10^{-6}$ max. (at +25°C)
   - 4.4 Frequency versus temperature characteristics : $\pm 15 \times 10^{-6}$ max. (at -40~+85°C) The reference temperature shall be +25°C.
   - 4.5 Equivalent resistance : 80Ω max.
   - 4.6 Maximum drive level : 200μW max.
   - 4.7 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(C_L) : 10pF
     - ・Level of drive : 10μW
   - 5.2 Equivalent resistance measurement
     - ・Measuring instrument : IEC π-Network
     - ・Load capacitance(C_L) : Series
     - ・Level of drive : 10μW

6. Other performances
   - 6.1 Operating temperature range : -40~+85°C
   - 6.2 Storage temperature range : -40~+85°C
   - 6.3 Air-tightness : Less than 1.1×10^{-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-00420
   - 8.2 Taping and reel figure : EXK17B-00161
   - 8.4 Holder marking : EXH11B-00317
   - 8.5 Reliability assurance Item : EXS30B-00249
   - 8.6 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.

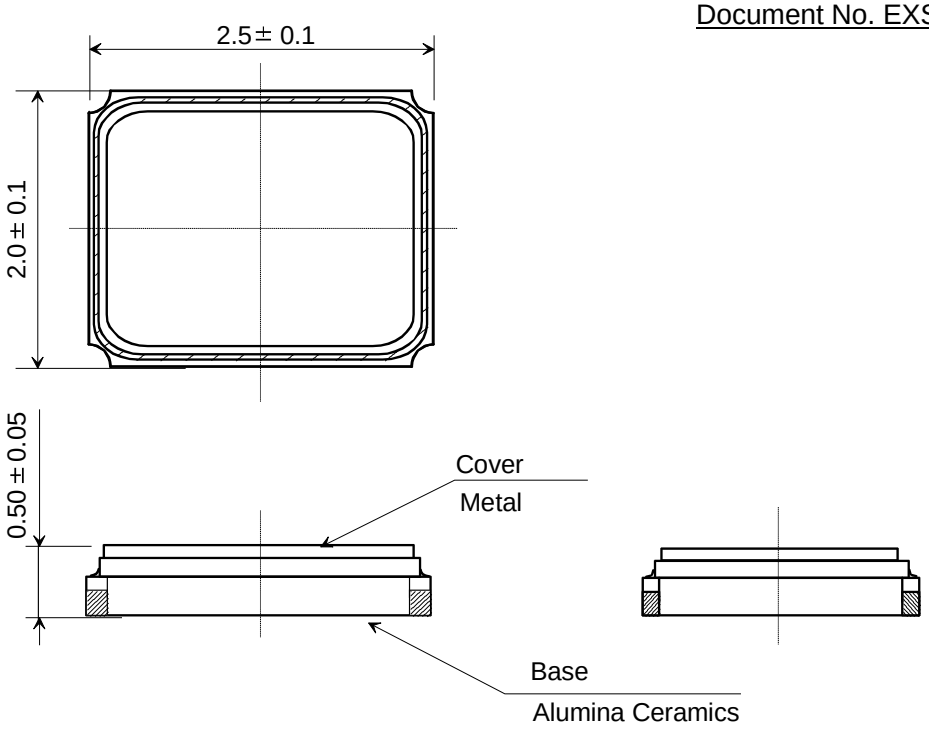
9.9 Crystal units will be damaged by ultrasonic welding process due to resonance of crystal wafer itself. NDK does not recommend using ultrasonic welding. If Ultra Sonic welding used, NDK strongly recommend verifying crystal unit damage by ultrasonic weld.

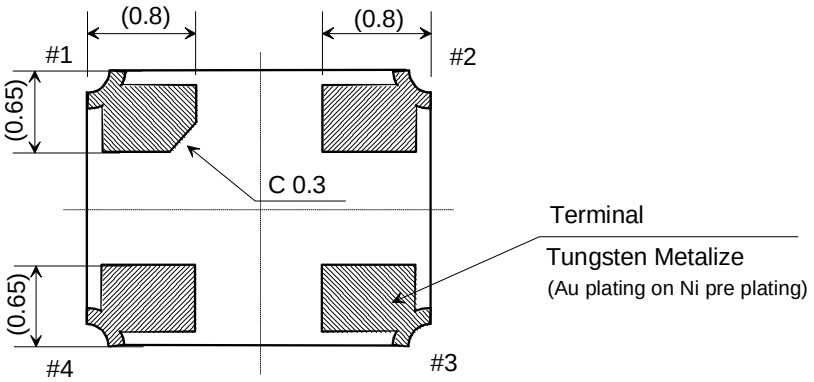
10. Prohibited items

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

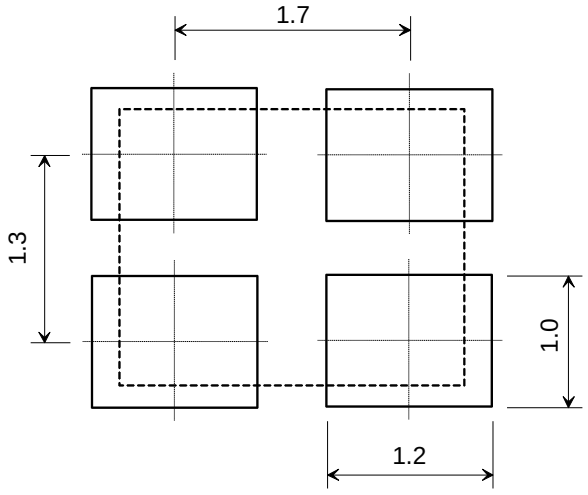
(1) Reflow soldering heat resistance
Peak temperature: 265°C, 10 sec
Heating: 230°C or higher, 40 sec
Preheating: 150°C to 180°C, 120 sec
Reflow passage times: twice

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

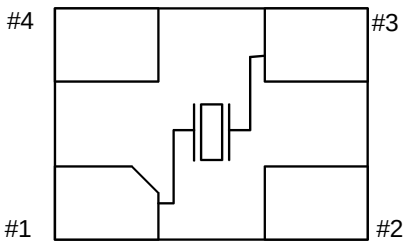




LAND PATTERN (TYPICAL)



[TOP VIEW]
PIN CONNECTION

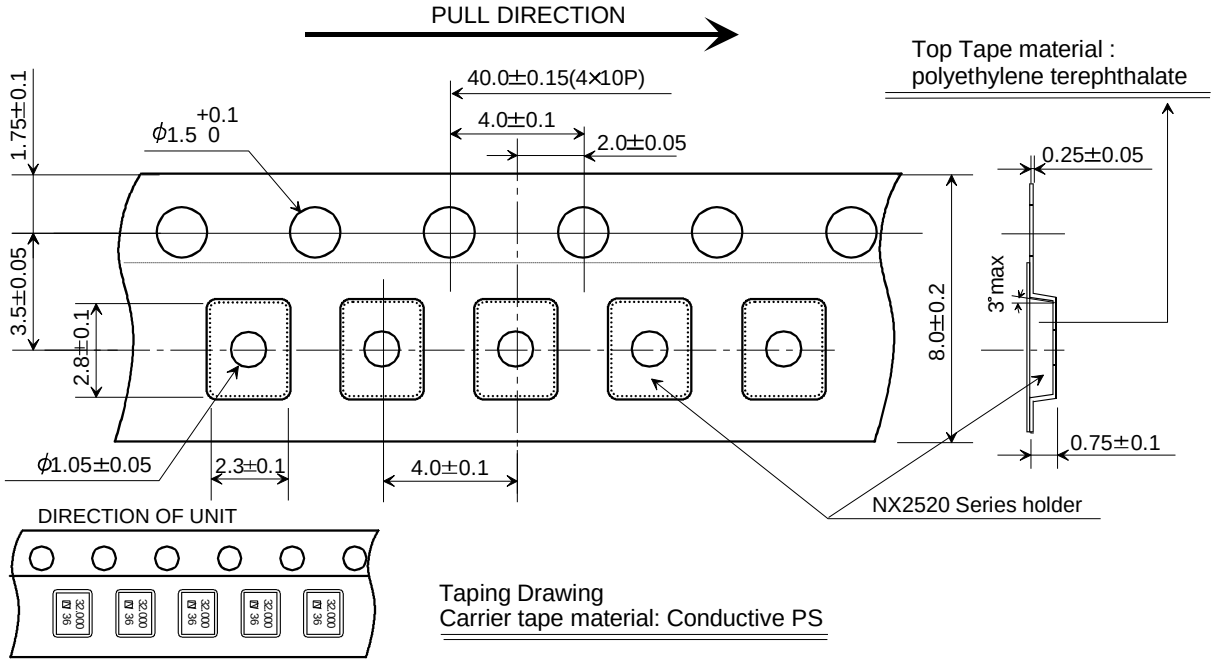


TERMINAL
#1,#3:X'tal
#2,#4:GND(CONNECTION COVER)

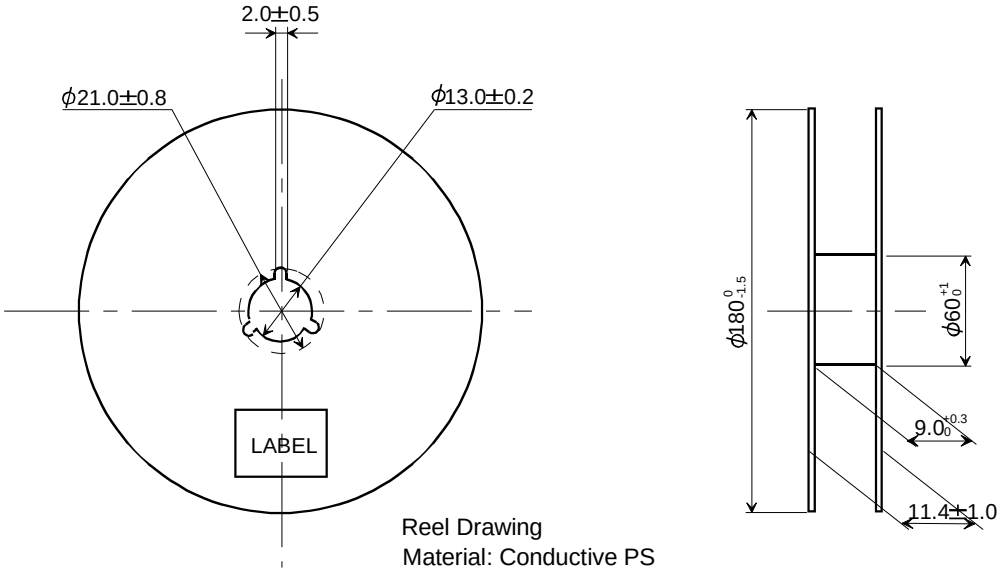
	Date of Revise	Charge	Approved	Reason

	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	30.Oct.2007	K.Sato	Dimension:mm	---	- / -
Designed	30.Oct.2007	K.Sato	Title	Drawing No.	Rev.
Checked	---	---	**NX2520SA Dimension Drawing**	**EXD14B-00420**	
Approved	30.Oct.2007	K.Kubota			

NIHON DEMPA KOGYO CO., LTD.

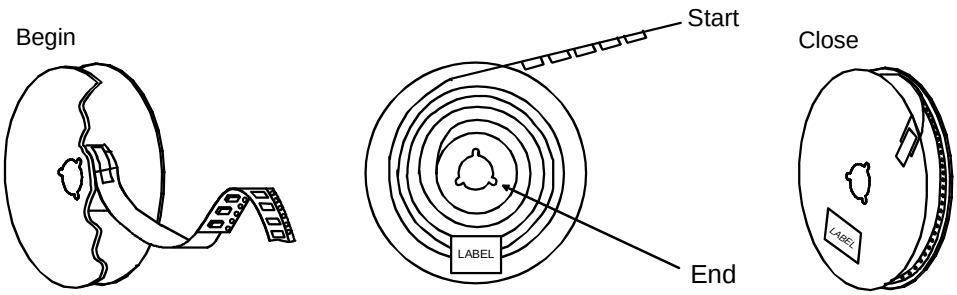


Taping Drawing
Carrier tape material: Conductive PS



Reel Drawing
Material: Conductive PS

EIAJ standard reel

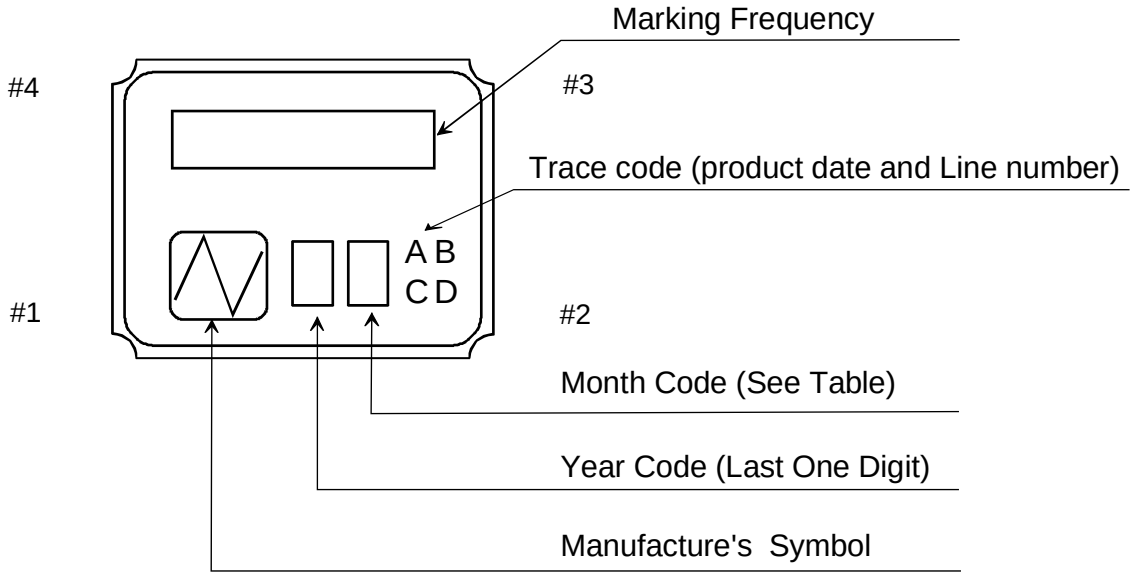


3000pcs-Product Tape

	Date of Revise	Charge	Approved	Reason
B	14. Mar. 2008	Wada	Kubota	Changed drawing title

	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	19.Jun.2003	H.Yagishita	Dimension: mm	----	- / -
Designed	19.Jun.2003	H.Yagishita	Title: **NX2520 Series Taping and Reel Spec.**	Drawing No.: **EXK17B-00161**	Rev.: **B**
Checked	19.Jun.2003	K.Kubota			
Approved	19.Jun.2003	T.Ishii			

NIHON DEMPA KOGYO CO., LTD.



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	10.July.2008	Miyahara	K.Kubota	Delete application period.

	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**	B
Approved	16.Jan.2006	K.Okamoto			

NIHON DEMPA KOGYO CO., LTD.

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 It is 500 cycles using 30 minutes each as 1 cycle.	A
5	Vibration	Frequency Range : 10~55Hz Amplitude : 1.52mm 1 cycle : 1 minutes 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.) Execution 3 times random drops	A
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. Peak temperature 240±5°C Material: Pb-free (Sn-3.0Ag-0.5Cu) Flux : Rosin resin methyl alcohol solvent (1 : 4)	B
9	Reflow resistance	Pre-heat temperature : +150~180°C Pre-heat time : 90±30s Heat temperature : more than +230°C Heat time : 30s±10s Peak temperature : +260±5°C 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 $\Delta CI/CI \leq \pm 15$ % or 5 Ω make use larger value
B	The electrodes should be covered by a new solder at least 90% of immersed area.

Recommendation reflow condition

1.IR reflow condition