RoHS Compliant
Directive 2011/65/EU

SPECIFICATION

Customer: MTK

Item:	Crystal Unit
Type:	NX2016SA
Nominal Frequency:	27.12 MHz
Customer's Spec. No.:	---
NDK Spec. No.:	EXS00A-CS06744

Receipt

Charge:

Sales	NDK-TP Lilian Chiu	Tel. 886-2-2555-0232
Engineer	1st Eng. Dept. Y. Takaki	Tel. 81-4-2900-6631

Approved	M. Kubota
Checked	I. Miyahara
Drawn	Y. Takaki

Revision Record

Rev.	Rev. Date	Items	Contents	Remarks
---	25. Mar. 2013	Issue	---	---

1. Customer specifications number : ---

2. NDK specification number : EXS00A-CS06744

3. Type : NX2016SA

4. Electrical characteristics
   - 4.1 Nominal frequency (F_{nom}) : 27.12 MHz
   - 4.2 Overtone order : Fundamental
   - 4.3 Adjustment Tolerance : $\pm 10 \times 10^{-6}$ Max. (+ 25°C)
   - 4.4 Frequency stability over temperature : $\pm 30 \times 10^{-6}$ Max. (-40 to +85°C)
     The reference temp. shall be +25 °C
   - 4.5 Equivalent Resistance (R_R) : 60 Ω Max.
   - 4.6 Shunt Capacitance (C_0) : 2.0 pF Max.(Not Grounded)
   - 4.7 Insulation Resistance : Terminal to terminal insulation resistance also terminal to cover insulation resistance must be 500MΩ (Min.) when DC100V ±15V is applied.
   - 4.8 Maximum drive level : 100μW Max.

5. Measurement circuit
   - 5.1 Frequency measurement
     - ・Measuring instrument : IEC π -Network
     - ・Load capacitance(C_L) : 10pF
     - ・Level of drive : 10uW
   - 5.2 Equivalent resistance measurement
     - ・Measuring instrument : IEC π -Network
     - ・Load capacitance(C_L) : Series
     - ・Level of drive : 10uW

6. Other performances
   - 6.1 Operating Temperature range : - 40 to + 85 °C
   - 6.2 Storage Temperature range : - 40 to + 85 °C
   - 6.3 Air-tightness : Less than 1.1×10^{-9} Pa m^3/s (Helium leak detector)
   - 6.4 Aging : $\pm 5 \times 10^{-6}$ Max. / year

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

8. Application drawing
   - 8.1 External dimension : EXD14B-00467
   - 8.2 Taping and reel figure : EXK17B-00200
   - 8.3 Holder marking : EXH11B-00317
   - 8.4 Reliability assurance Item : EXS30B-00250

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.

9.10 The appearance color has a different case by purchasing it more than 2 suppliers of the component, but characteristic and reliability are guaranteed.

10. Prohibited items

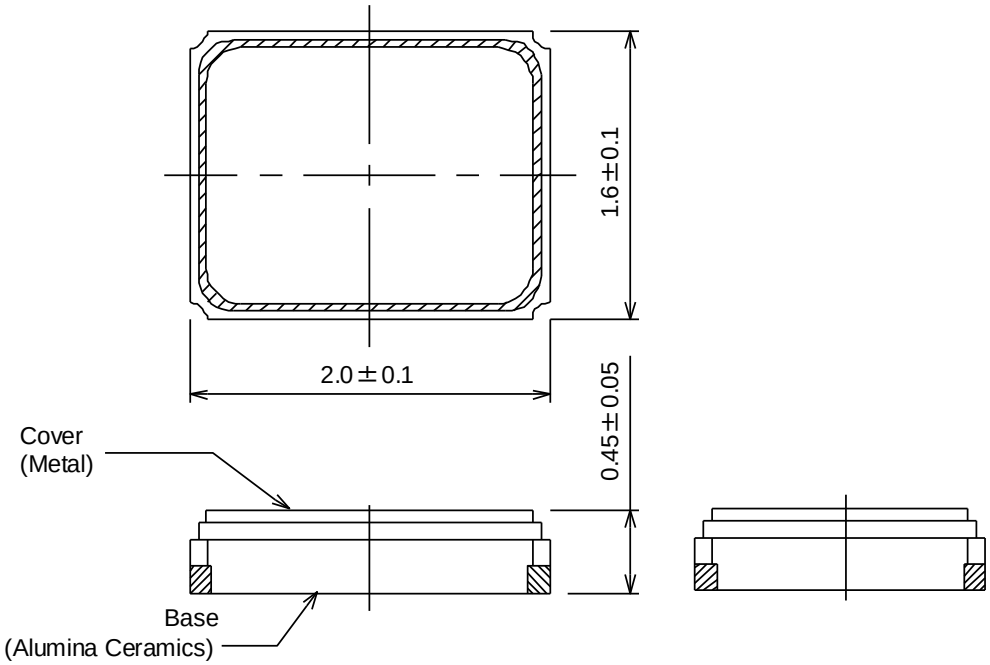
Be sure to use the product under the following conditions. Otherwise, the characteristics deterioration or destruction of the product may result.

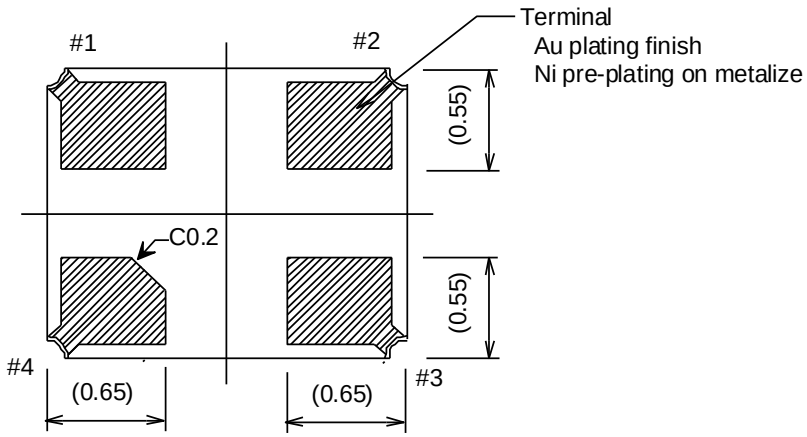
(1) Reflow soldering heat resistance

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

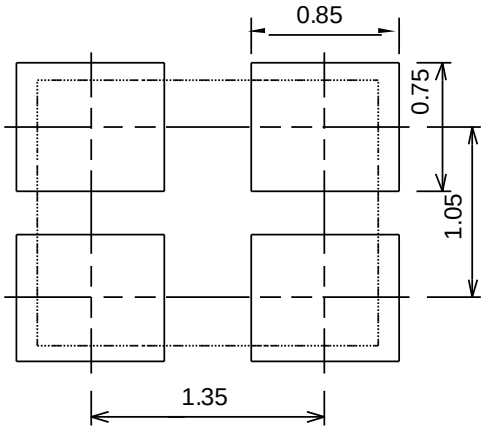
(2) Manual soldering heat resistance

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

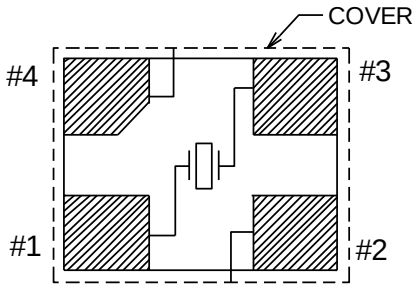




LAND PATTERN (TYPICAL)



PIN CONNECTION (TOP VIEW)



TERMINAL
#1,#3 : XTAL
#2,#4 : GND(CONNECTION WITH COVER)

	Date of Revise	Charge	Approved	Reason
A	15.Feb.2011	H.Ouchi	K.Ueki	Index position correction.

	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	19.Oct.2009	M.Harada	Dimension:mm	----	--/--
Designed	19.Oct.2009	M.Harada	Title: **NX2016SA** Dimension Drawing	Drawing No. **EXD14B-00467**	Rev. **A**
Checked	---	---			
Approved	20.Oct.2009	K.Ueki			

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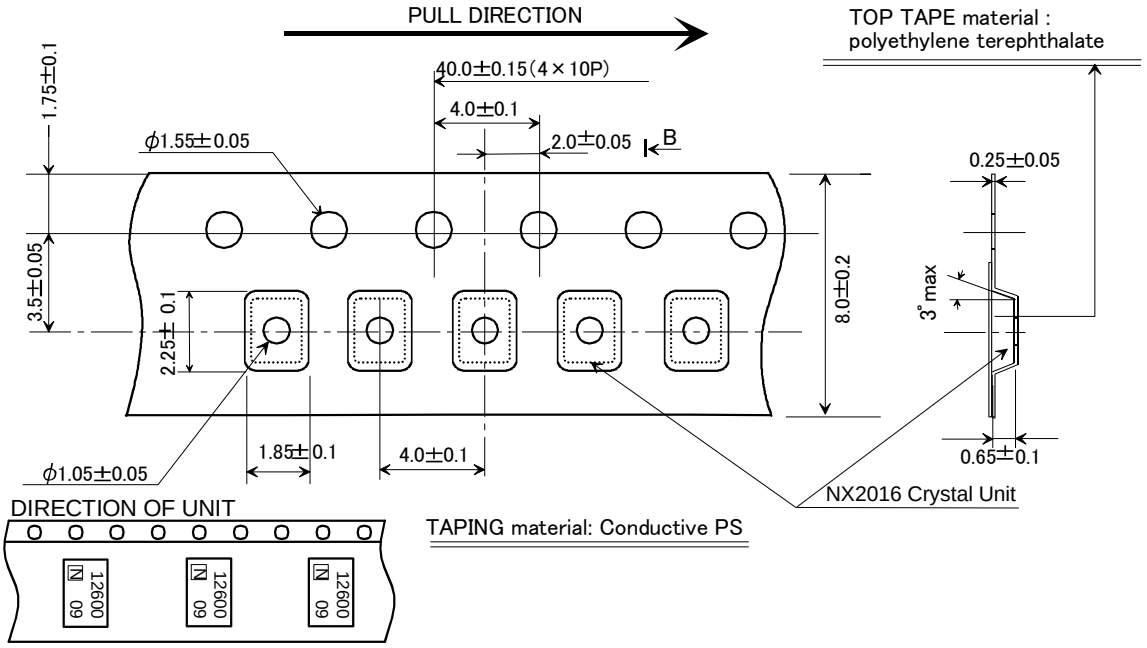

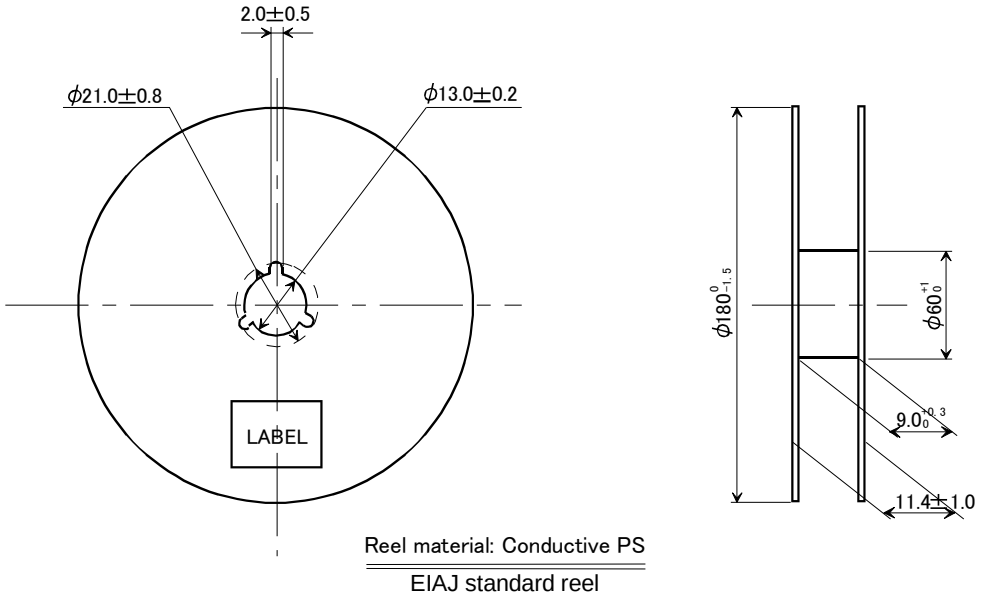

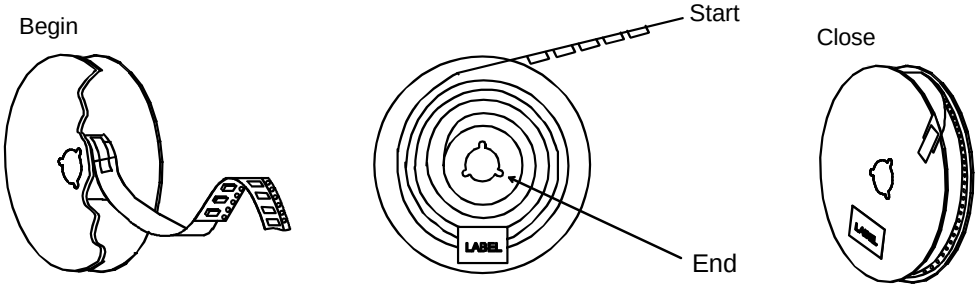

3000pcs-Product Tape

	Date of Revise	Charge	Approved	Reason
A	26.Nov.2009	H.Ouchi	K.Ueki	Title change

	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	12.Apr.2005	K.Oguri	Dimension:mm		/
Designed	12.Apr.2005	K.Oguri	Title	Drawing No.	Rev.
Checked	----------	---------	**NX2016 Series Taping and Reel Spec.**	**EXK17B-00200**	A
Approved	12.Apr.2005	K. Miyashita			

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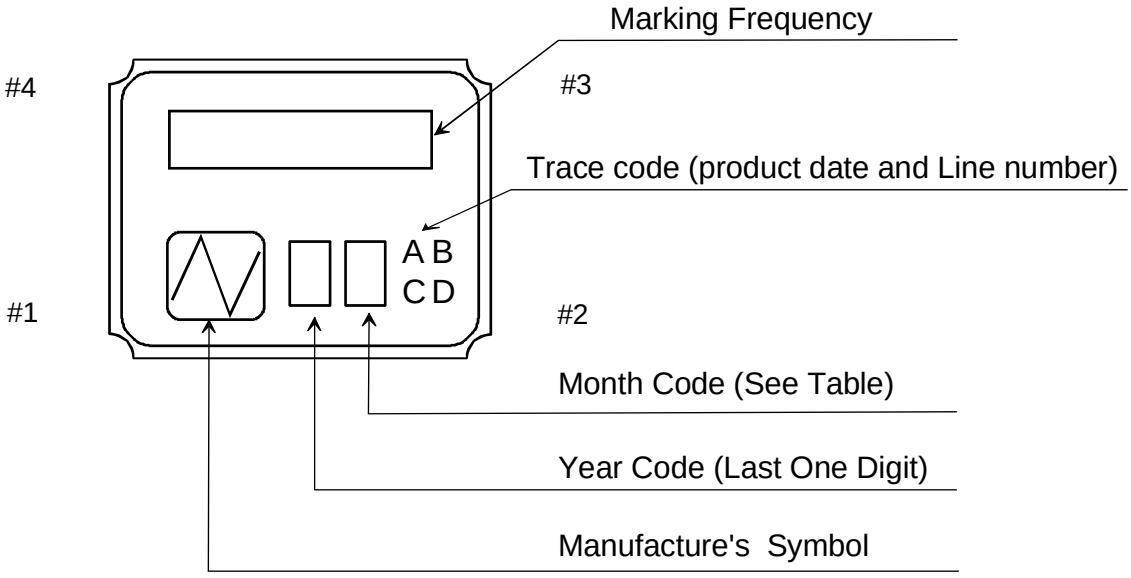
Form M-1



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	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			

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Reliability assurance item

No.	Test Item	Test Methods	Spec. Code
1	High Temperature Storage	+85±3°C 720h	A
2	Low Temperature Storage	-40±3°C 500h	A
3	Temperature Humidity	+85±3°C 80~85%RH 500h	A
4	Temperature Cycling	-40±3°C / +85±3°C It is 1000 cycles using 30 minutes each as 1 cycle.	A
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.	A
6	Shock	Devices are shocked to half sine wave (29418m/s^2, 0.3msec) six mutually perpendicular axis each 1 times.	A
7	Drop	Preparation : Test pieces should be fixed on the dummy load with 200g weight. Condition : Height 1.5m onto concrete Drop times : 10 times in 6 mutually perpendicular axes	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

Specification code	Specification
A	$\Delta f/f \leq \pm$ 3 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.

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