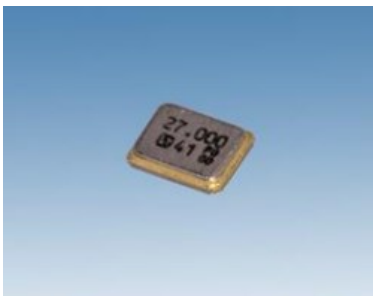
Crystal Unit

■NX1612SA Data Sheet
(for Short-range Wireless and OA / AV)

Application

Telecommunications equipment
Short-range Wireless equipment
Consumer equipment



Features

Ultra-compact and thin surface-mount crystal unit

- Applicable for Wearable device and Short-range Wireless module
- Ultra-compact and thin (Typ. : 1.6×1.2×0.30 mm)
- Reflow temperature profile (Available for lead free soldering)

RoHS Compliant
Directive 2011/65/EU
Directive (EU) 2015/863

Pb free

1. Item : Crystal Unit
2. Type : NX1612SA
3. Nominal Frequency : 32 MHz
4. NDK Spec. No. : EXS00A-CS10573
5. NDK Parts No. : CS10573-32M
6. Electrical Specifications

	Electrical Characteristics Items	Symbol	Electrical Characteristics Spec.				Notes
			MIN	TYP	MAX	Unit	
1	Nominal frequency	fnom		32.000		MHz	
2	Overtone order	-		Fundamental		-	
3	Frequency tolerance	-	-10	-	+10	ppm	at +25°C
4	Frequency versus temperature characteristics	-	-17	-	+17	$\times 10^{-6}$	at -30~+85°C The reference temperature shall be +30.5°C
5	Equivalent resistance	-	-	35	60	Ω	IEC π -network / Series
6	Load capacitance	C_L	-	10	-	pF	IEC π -network
7	Level of drive	-	-	10	200	μW	
8	Shunt Capacitance	C_0	-20%	0.59	+20%	pF	Not grounded
9	Motional Capacitance	C_1	-20%	1.18	+20%	fF	Not grounded
10	Motional Inductance	L_1	-20%	20.94	+20%	mH	Not grounded
11	Aging	-	-1	-	+1	ppm	1 year (at +25°C)
12	Frequency drift after reflow	-	-2	-	+2	$\times 10^{-6}$	after five times reflow passed.
13	Insulation resistance	-	500	-	-	MΩ	Terminal to terminal insulation resistance also terminal to cover insulation resistance must be 500MΩ (min) when DC100V ±15V is applied.
14	Operating temperature range	-	-30	-	+85	°C	
15	Storage temperature range	-	-40	-	+125	°C	
16	Air-tightness	-	-	-	1.1×10^{-9}	Pa m^3/s	Helium leak detector
18	Recommended oscillation margin	-	800	-	--	Ω	When the circuit does not have enough value as above, please contact us.
19	Temperature coefficient						
-1	To	-		30.5	-	°C	
-2	Third-order curve fitting coefficient	a1	9.325	-	11.175	x 10^{-5} ppm/°C^3	The curve can be modeled as a third-order polynomial. $f(t) = a_3 (t - t_0)^3 + a_2 (t - t_0)^2 + a_1 (t - t_0)$
-3	Second-order curve fitting coefficient	a2	-5.0	-	+5.0	x 10^{-4} ppm/°C^2	
-4	First-order curve fitting coefficient	a3	-0.549	-	-0.3	ppm/°C	

Mounted conditions

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

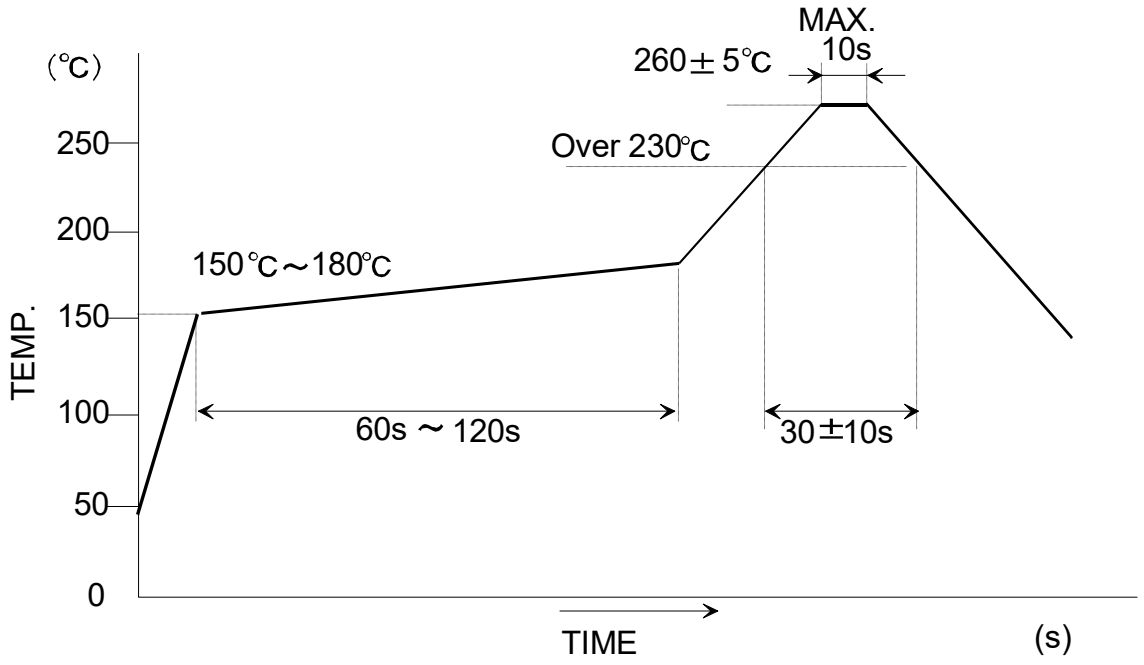
(1) Reflow soldering heat resistance

Peak Temp.	: 265° C, 10 sec.
Heating	: 230° C or higher, 40 sec.
Preheating	: 150~180° C, 120 sec.
Reflow passage times	: twice

(2) Manual soldering heat resistance

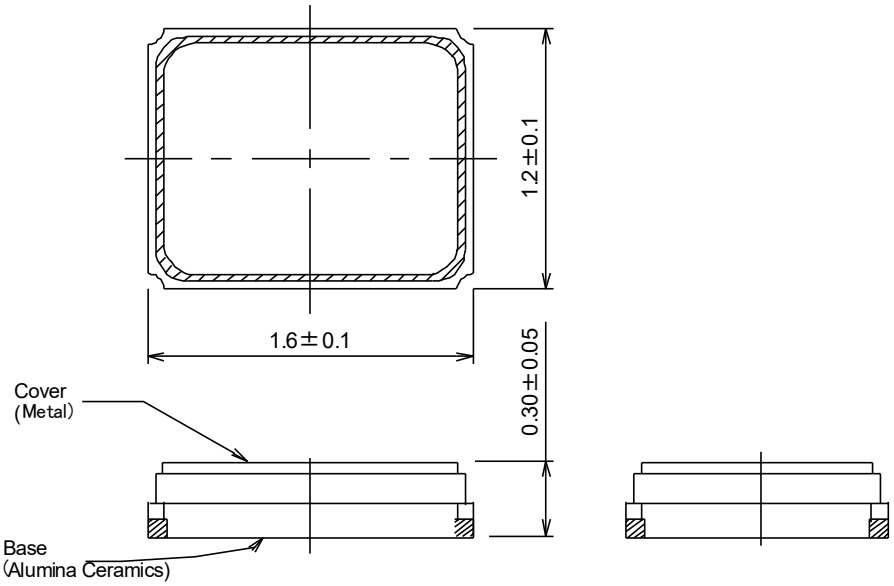
Pressing a soldering iron of 400°C on the terminal electrode for four seconds (twice).

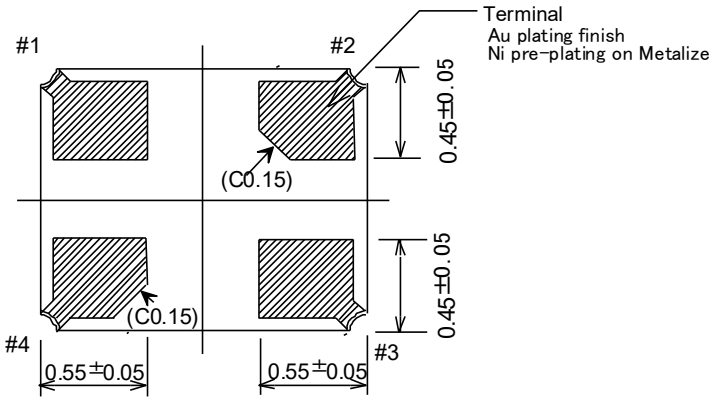
Recommendation reflow condition



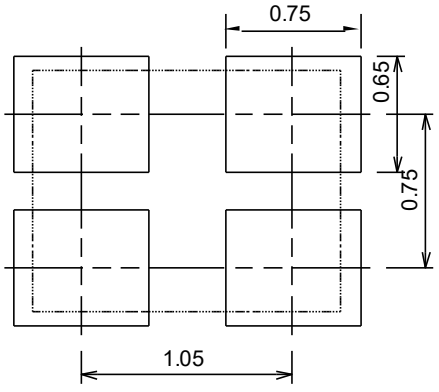
Dimension drawing

Unit : mm
Tolerance : +/-0.1mm

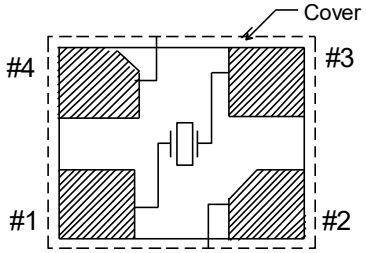




LAND PATTERN (Recommended)

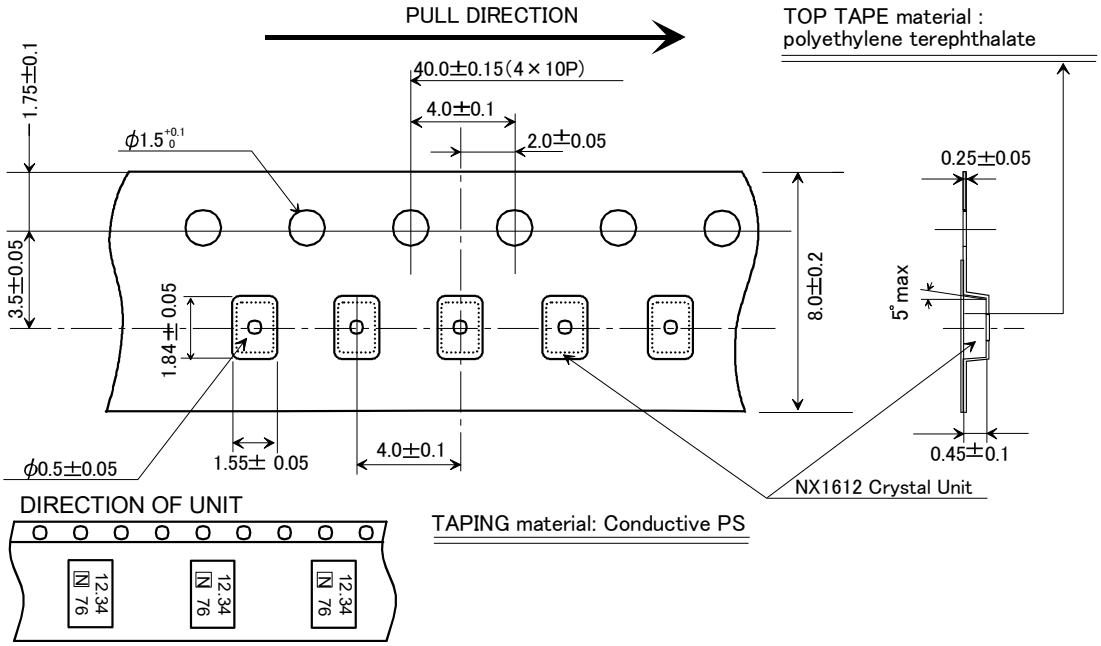


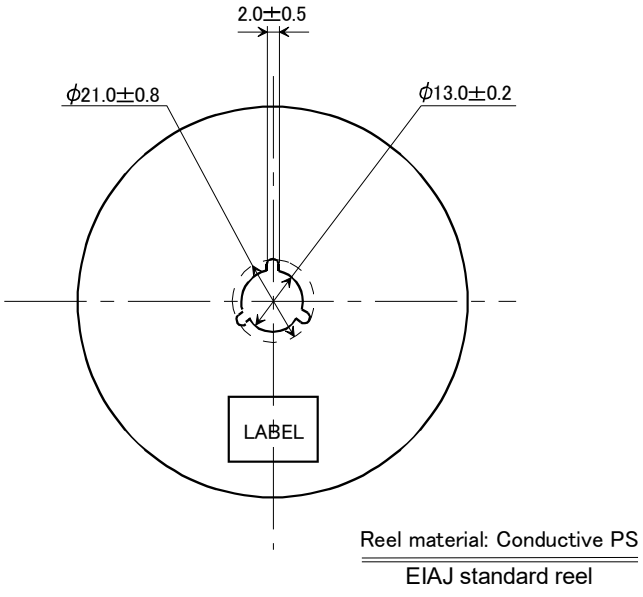
TOP VIEW
Terminal land connections

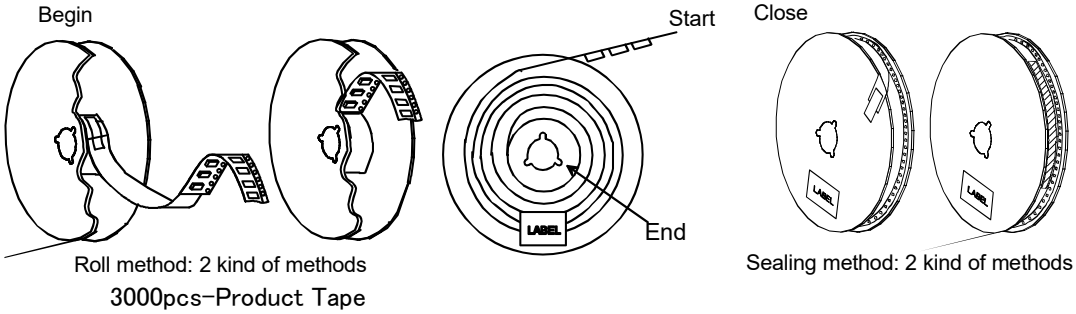


TERMINAL
#1,#3 : XTAL
#2,#4 : GND(CONNECTION WITH COVER)

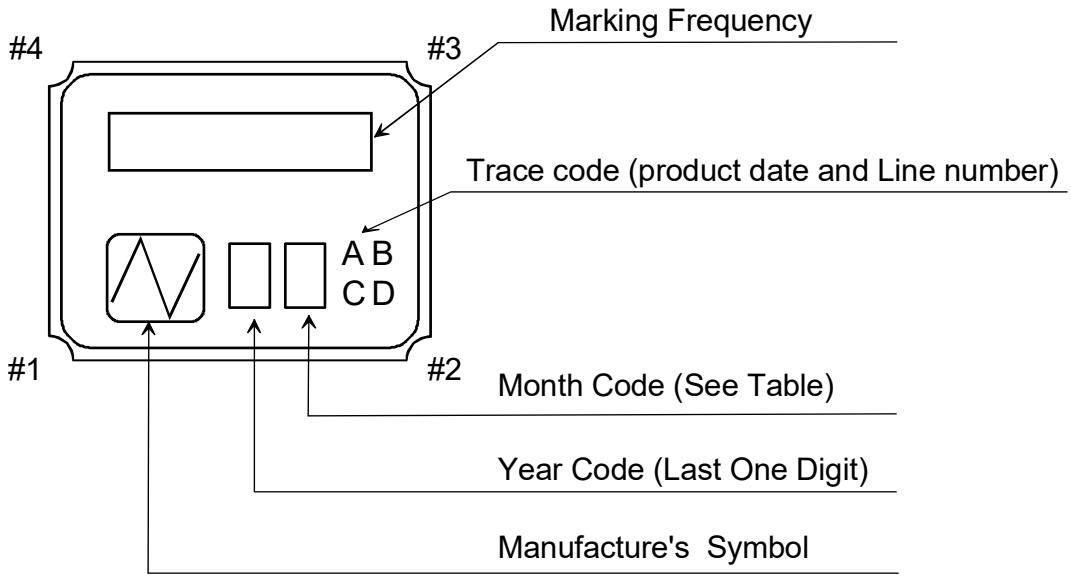
Taping and reel spec.







Marking spec.



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.

Notes on use

1. Even if the appearance color etc. of the product differs by purchasing the component parts by more than two companies, there is no influence on the characteristics and reliability.
2. Since the crystal unit is a passive component, it is important to have appropriate circuit conditions. Please be sure to check the circuit conditions before using the crystal units, and ensure the necessary circuit margin, and confirm that the desired frequency is output. Moreover, please check the circuit conditions when using an existing crystal unit for another model or board. If the circuit conditions are not appropriate, there is a risk of oscillation stop or frequency deviation.
3. IN THE CASE OF THE FOLLOWING ITEMS, WE ARE NOT RESPONSIBLE FOR WARRANTY / COMPENSATION.
   (1) WHEN PRODUCTS OF THIS SPECIFICATION ARE USED FOR EQUIPMENT RELATED TO HUMAN LIFE OR PROPERTY, IT IS THE RESPONSIBILITY OF THE CUSTOMER TO CONFIRM THE INFLUENCE ON THIS PRODUCT AND EQUIPMENT TO BE USED BEFOREHAND, CONDUCT NECESSARY SAFETY DESIGN (INCLUDING REDUNDANT DESIGN, MALFUNCTION PREVENTION DESIGN, etc.), AND PLEASE USE IT AFTER SECURING SUFFICIENT SAFETY OF EQUIPMENT.
      1. SAFETY-RELATED EQUIPMENT SUCH AS AUTOMOBILES, TRAINS, SHIPS, etc., OR EQUIPMENT DIRECTLY INVOLVED IN OPERATION
      2. AIRCRAFT EQUIPMENT
      3. SPACE EQUIPMENT
      4. MEDICAL EQUIPMENT
      5. MILITARY EQUIPMENT
      6. DISASTER PREVENTION / CRIME PREVENTION EQUIPMENT
      7. TRAFFIC LIGHT
      8. OTHER EQUIPMENT REQUIRING THE SAME PERFORMANCE AS THE ABOVE-MENTIONED EQUIPMENT

   (2) IN CASES WHERE IT IS NOT INDICATED IN THE REQUESTED STANDARD AND IS USED UNDER CONDITIONS OF USE (INCLUDING CIRCUIT MARGIN etc.) THAT CAN NOT BE PREDICTED AT THE PRODUCTION STAGE.

   (3) WHEN USING ULTRASONIC WELDING MACHINE. (THERE IS A POSSIBILITY THAT THE CHARACTERISTIC DEGRADATION IS CAUSED BY THE RESONANCE PHENOMENON OF THE PIEZOELECTORIC MATERIAL.(EXAMPLE; CRYSTAL PIECE))
   WE WILL NOT TAKE ANY RESPONSIBILITY FOR THE INFLUENCE OF THE CUSTOMERS' PROCESS.SO, PLEASE SUFFICIENTLY EVALUATE AT A SAMPLE STEP WHEN YOU USE ULTRASONIC WELDING MACHINE.

   (4) USING RESIN MOLD MAY AFFECT THE PRODUCT CHARACTERISTIC.
   PLEASE MAKE SURE TO TELL OUR SALES CONTACT WHEN YOU USE RESIN MOLD. WE WILL PERFORM INDIVIDUAL CORRESPONDENCE ABOUT A DELIVERY SPECIFICATION AND AN EVALUATION METHOD. IN ADDITION, IF YOU USE RESIN MOLD WITHOUT CONTACTING US, AND CAUSES DAMAGES AGAINST A CUSTOMER OR A THIRD PARTY, WE WILL NOT BE LIABLE FOR THE DAMAGES AND OTHER RESPONSIBILITIES BECAUSE WE CONSIDER IT IS UNDER SELF-RESPONSIBILITY USING RESIN MOLD. WE WILL NOT TAKE ANY RESPONSIBILITY FOR THE INFLUENCE OF THE CUSTOMERS' PROCESS. PLEASE SUFFICIENTLY EVALUATE AT A SAMPLE STEP WHEN YOU USE RESIN MOLD.

   (5) WHEN PERFORMING IMPROPER HANDLING THAT EXCEEDS THE GUARANTEED RANGE.

4. This product cannot be used for equipment related to the safety of automobiles or equipment directly involved in operation.(example: air bag, TPMS, engine control, steering control, brake control etc.)

Notes on storage

1. When storing the product in high temperature and high humidity condition for a long time, product characteristics (solderability etc.) and packaging condition may be deteriorated. Please store product at temperature + 5°C ~ + 35°C, humidity 85% RH or less. The product is an electronic component, so please do not storage and use, under a dewing state.
2. The product storage deadline is 12 months after delivery in unopened state. Please use within storage deadline. If you exceed storage deadline, please check the product characteristics etc, please use.

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