



SPECIFICATION

Customer: _____

Item: _____ CRYSTAL UNIT _____

Type: _____ NX2012SA _____

Nominal Frequency: _____ 32.768 KHz _____

Customer's Spec. No.: _____ --- _____

NDK Spec. No.: _____ _____

For your reference we submit this specification.

Please study and keep in your related document file.

Charge:

Sales	Oversea sale : Y. Tanabe	Tel. (81)-3-5192-3360
Engineer	Engineering Dept.1 : I. Miyahara	Tel. (81)-4-2900-6631

Approved _____ K. Ueki _____

Checked _____ --- _____

Drawn _____ I. Miyahara _____

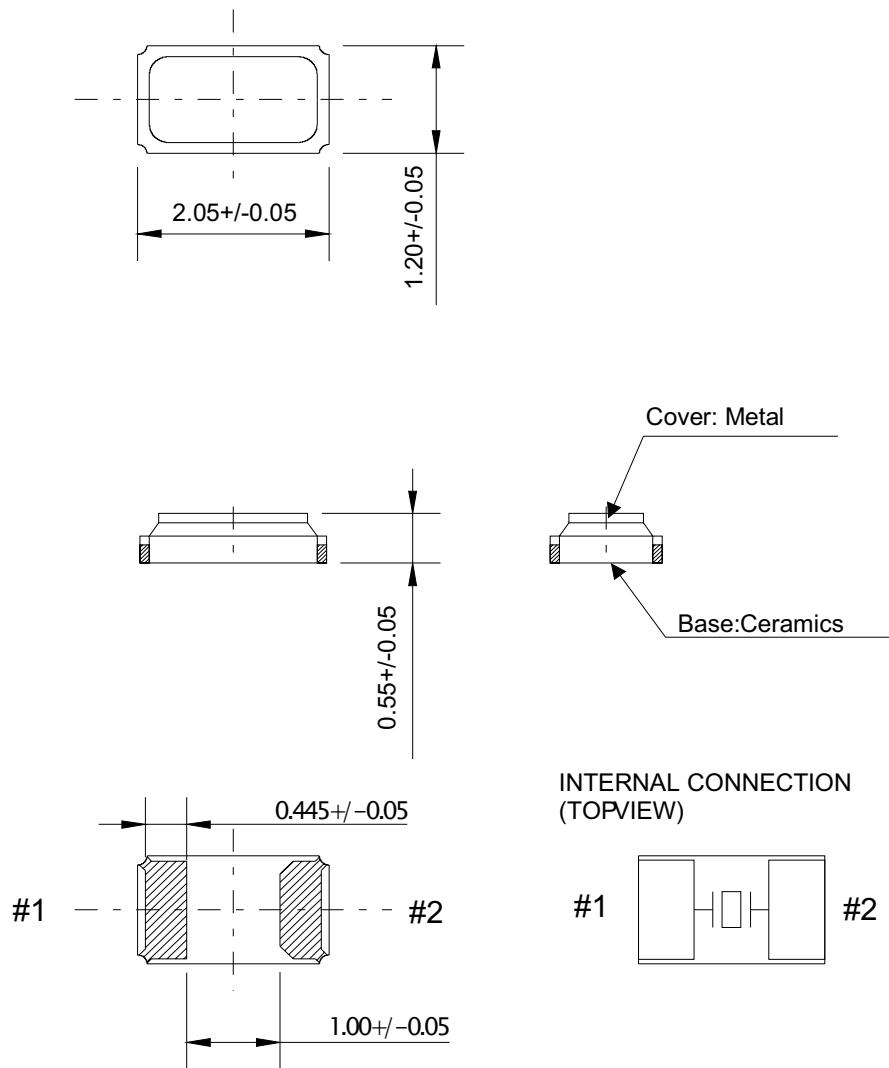
Revision Record

Rev.	Rev. Date	Items	Contents	Remarks
---		Marking rev		

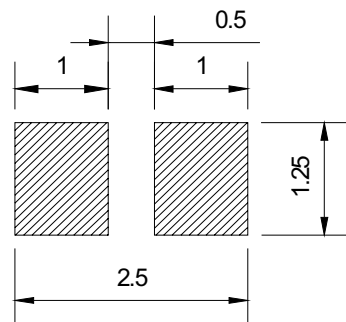
1. Customer specifications number : ---
2. NDK specification number : ---
3. Type : NX2012SA
4. Electrical characteristics
 - 4.1. Nominal Frequency (F_0) : 32.768 kHz
 - 4.2. Overtone Order : Fundamental
 - 4.3. Adjustment Tolerance : $\pm 20 \times 10^{-6}$ Max. (at +25°C)
 - 4.4. Turning Point : +25°C $\pm 5^\circ\text{C}$
 - 4.5. 2nd temperature Coefficient : $(-0.03 \pm 0.01) \times 10^{-6} / ^\circ\text{C}^2$ Max.
 - 4.6. Equivalent Resistance (R_R) : 90 k Ω Max. (60 k Ω typ.)
 - 4.7. Shunt Capacitance : 7 pF max.
 - 4.8. Insulation Resistance : Terminal to terminal insulation resistance also terminal to cover insulation resistance must be 500M Ω (Min.) when DC100V $\pm 15\text{V}$ is applied.
 - 4.8 Aging : $\pm 3\text{ppm max./1year(at +25 } ^\circ\text{C)}$
5. Measurement circuit
 - 5.1. Frequency measurement
 - Measuring Instrument : Network Analyzer (CNA-LF made in Transat corp.)
 - Load Capacitance (C_L) : 12.5 pF
 - Level of Drive : 0.1 μW
 - 5.2. Equivalent resistance measurement
 - Measuring Instrument : Network Analyzer (CNA-LF made in Transat corp.)
 - Load Capacitance (C_L) : Series
 - Level of Drive : 0.1 μW
6. Other performances
 - 6.1. Operating Temperature range : - 40 to + 85 °C
 - 6.2. Storage Temperature range : - 40 to + 85 °C
 - 6.3. Maximum drive level : 0.5 μW Max.
 - 6.4. Spurious nearby 3fo : There is not spurious at the 3fo
(Three times nominal frequency)
7. Examination results document
Since a performance is guaranteed, an examination results document does not submit.
8. Application drawing
 - 8.1. Dimension Drawing : EXD14B-00387
 - 8.2. Taping and Reel figure : EXK17B-00273
 - 8.3. Holder Marking : EXH11B-00366

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.

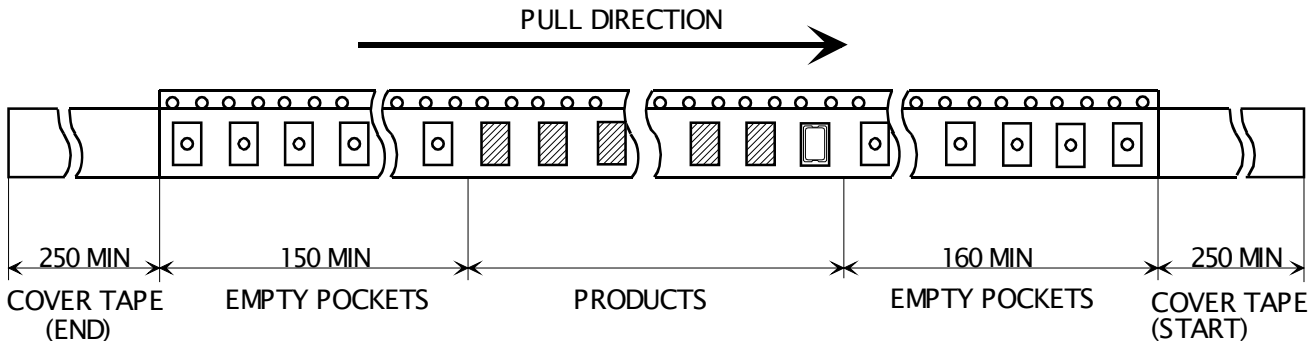
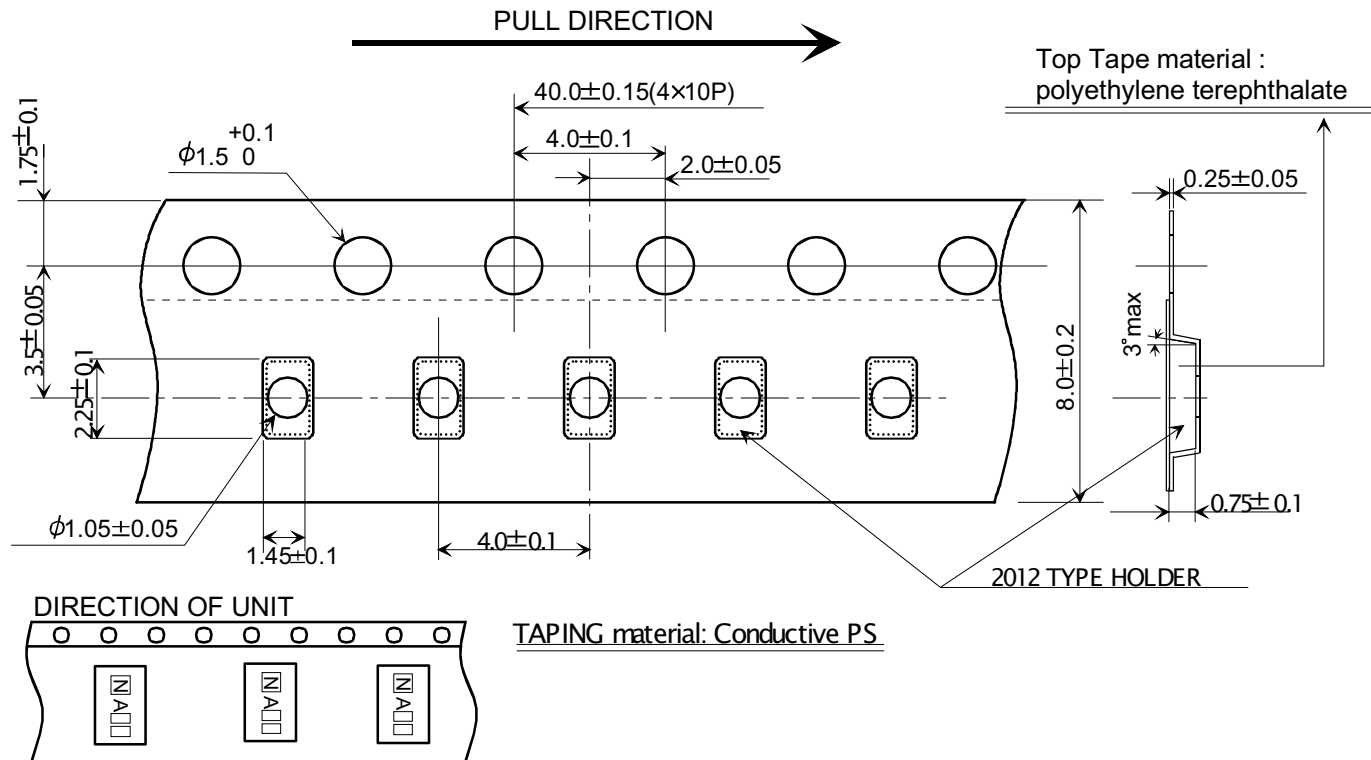


Recommended soldering pattern



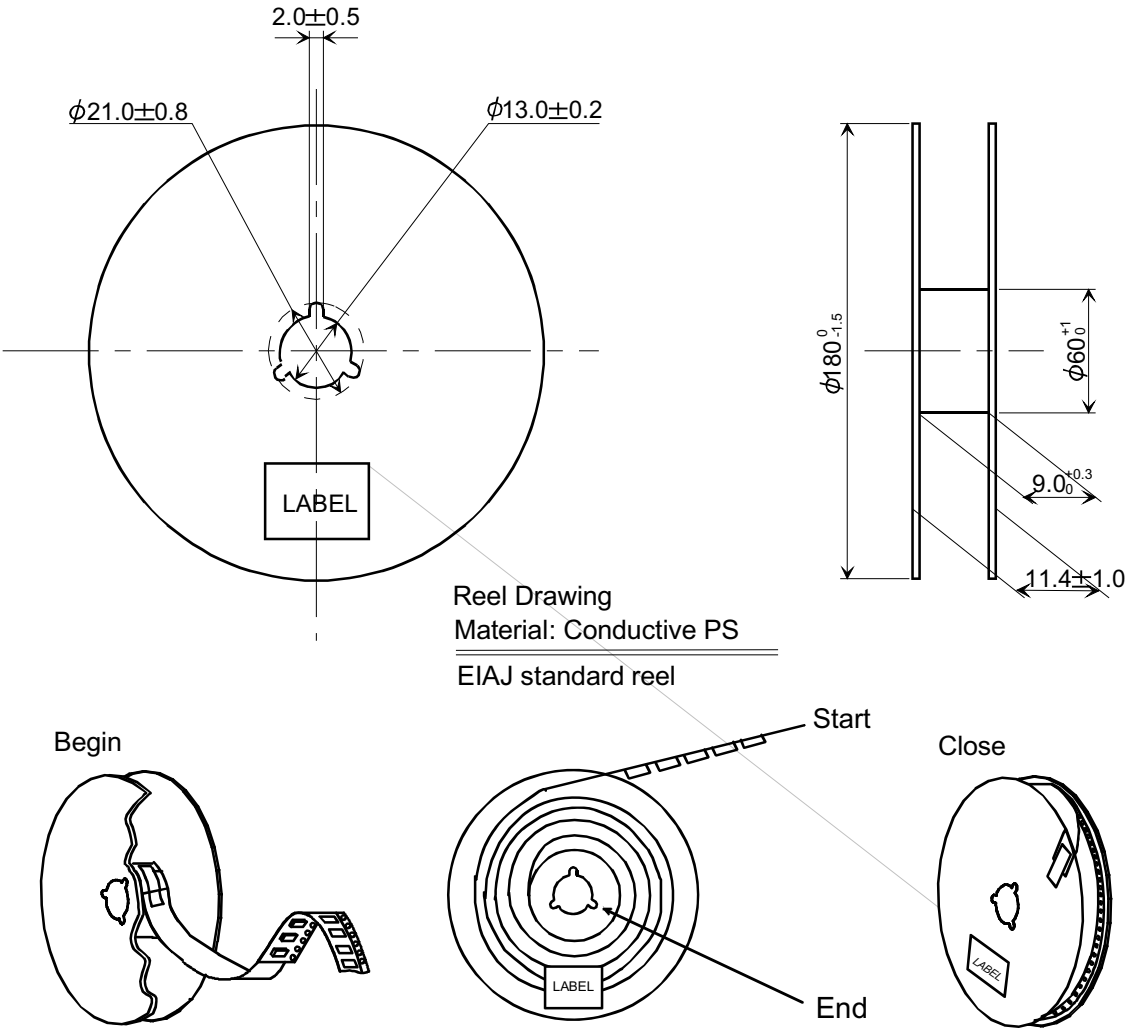
	Date of Revise		Charge	Approved	Reason		
B	7.Jan2011		S. Kawanishi	M. Umeki	All was revised		
	Date	Name	Third Angle Projection		Tolerance	Scale	
Drawn	17.July.2007	S.Kawanishi	Unit mm		±0.2	10 / 1	
Designed	17.July.2007	S.Kawanishi	Title Dimension drawing		Drawing No. EXD14B-00387		Rev.
Checked	17.July.2007	M.Yoshimatsu					B
Approved	17.July.2007	K.Ono					

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	Date of Revise	Charge	Approved	Reason
B	25 Nov.2010	H. Ohkubo	K. Oguri	Change of DIRECTION OF UNIT.
	Date	Name	Third Angle Projection	Tolerance
Drawn	31.Jul.2007	K.Oguri	Dimension:mm	Scale
Designed	31.Jul.2007	S. Kawanishi	Title	Drawing No.
Checked	-----	-----		
Approved	31.Jul.2007	K. Ono		
2012 TYPE Taping and Reel Spec.			EXK17B-00273 1/2	Rev.
				B

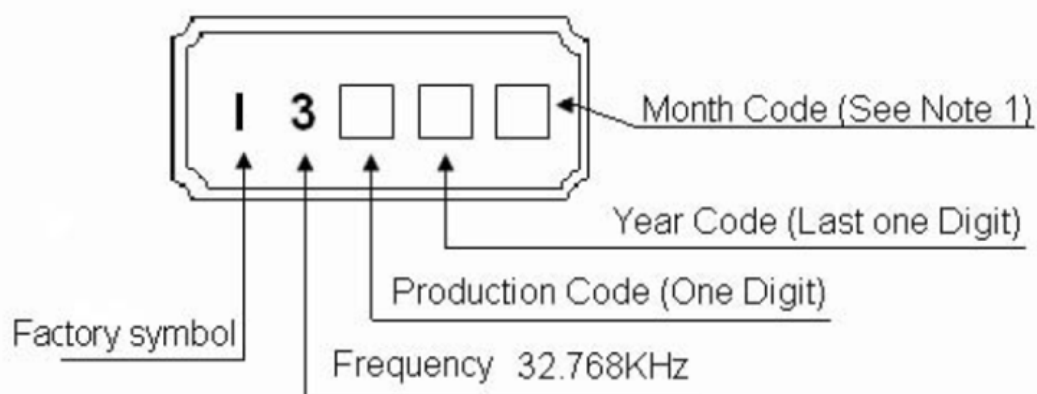
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Designed	31.Jul.2007	S. Kawanishi	Title	Drawing No.	Rev.
Checked	-----	-----			
Approved	31.Jul.2007	K. Ono			B

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Marking



NOTE

1. Month Code

Month	1 Jan.	2 Feb.	3 Mar.	4 Apr.	5 May	6 June	7 July	8 Aug.	9 Sep.	10 Oct.	11 Nov.	12 Dec.
Month Code	1	2	3	4	5	6	7	8	9	X	Y	Z

	Date of Revise		Charge		Approved		Reason			
B	9.June.2010		S.Kawanishi		M.Umeki		To change the direction of crystal unit			
		Date	Name		Third Angle Projection		Tolerance		Scale	
Drawn		20.July.2007	S.Kawanishi		Dimension:mm				/	
Designed		20.July.2007	S.Kawanishi		Title NX2012SA Marking Drawing			Drawing No. EXH11B-00366		Rev.
Checked		20.July.2007	M.Yoshimatsu							C
Approved		20.July.2007	K.Ono							

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