

SPECIFICATION

Customer: _____

Item:	CRYSTAL UNIT
Type:	NX3215SA
Nominal Frequency:	32.768kHz
Customer's Spec. No.:	---
NDK Spec. No.:	NX3215SA-10ppm-45KOhm

Receipt

Charge:

Sales	NDK-I : Paola Bandera	Tel. 39-02-96702920
Engineer	5 th Eng. Dept.: Hasuike	Tel. 81-4-2900-6632

Approved	H.Matsudo
Checked	---
Drawn	Y.Hasuike

Revision Record				
Rev.	Rev. Date	Items	Contents	Remarks
---	18.Oct.2012	Issue	---	---

1. Customer specifications number	: ---
2. NDK specification number	:
3. Type	: NX3215SA
4. Electrical characteristics	
4.1. Nominal Frequency (F_0)	: 32.768 kHz
4.2. Overtone Order	: Fundamental
4.3. Adjustment tolerance	: $\pm 10 \times 10^{-6}$ Max. (at +25°C ,Not include aging)
4.4. Turning Point	: +25°C \pm 5°C
4.5. Temperature coefficient	: $-0.035 \times 10^{-6} / ^\circ\text{C}^2$ Max.
4.6. Equivalent Resistance (R_R)	: 45 k Ω Max.
4.7. Shunt Capacitance (C_0)	: 1.0 ± 0.5 pF
4.8. Motional Capacitance (C_1)	: 4.0 ± 2.0 fF
4.9. Insulation Resistance	: Terminal to terminal insulation resistance also terminal to cover insulation resistance must be 500M Ω (Min.) when DC100V \pm 15V is applied.
5. Measurement circuit	
5.1. Frequency measurement	
· Measuring instrument	: Network Analyzer (CNA-LF made in Transat corp.)
· Load capacitance (C_L)	: 6pF or 7pF or 9pF or 12pF or 12.5pF
· Level of drive	: 0.1 μ W
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 μ W
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 μ W Max.
6.4. Aging (at +25 °C)	: $\pm 3 \times 10^{-6}$ Max. / 1 year
7. Examination results document	
Since a performance is guaranteed, an examination results document does not submit.	
8. Application drawing	
8.1. Dimension drawing	: EXD14B-00462
8.2. Taping and reel figure	: EXK17B-00303
8.3. Holder marking	: EXH11B-00422
8.4. Reel Packing	: EEK17B-00015
8.5. Reliability assurance Item	: EXS30B-00661

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 date 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

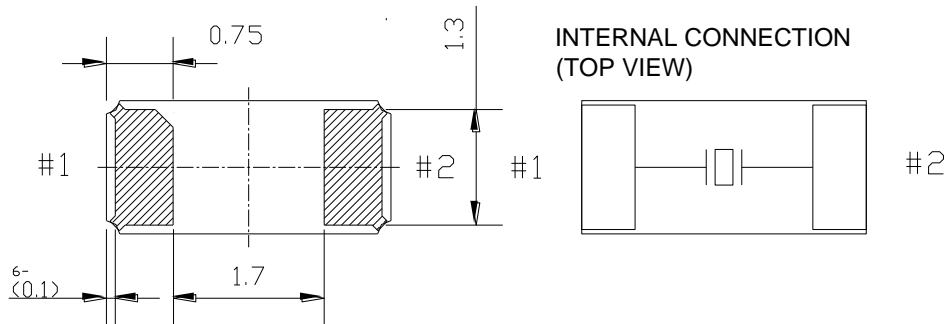
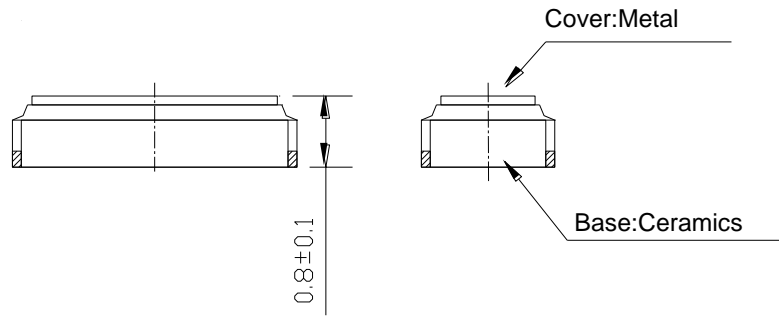
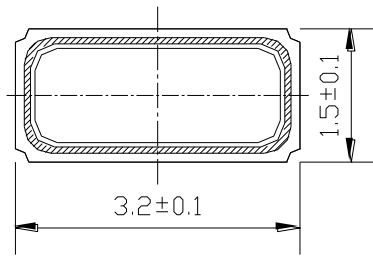
Be sure to use the product under the following conditions. Otherwise, the characteristics deterioration or destruction of the product may result.

(1) Reflow soldering heat resistance

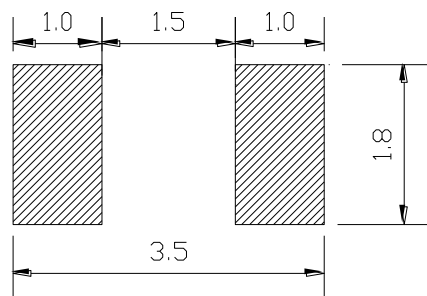
- Peak temperature : 265°C, 10 sec
- Heating : 230°C or higher, 30 sec
- Preheating : 150°C to 180°C, 120 sec
- Reflow passage times : Two times

(2) Manual soldering heat resistance

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

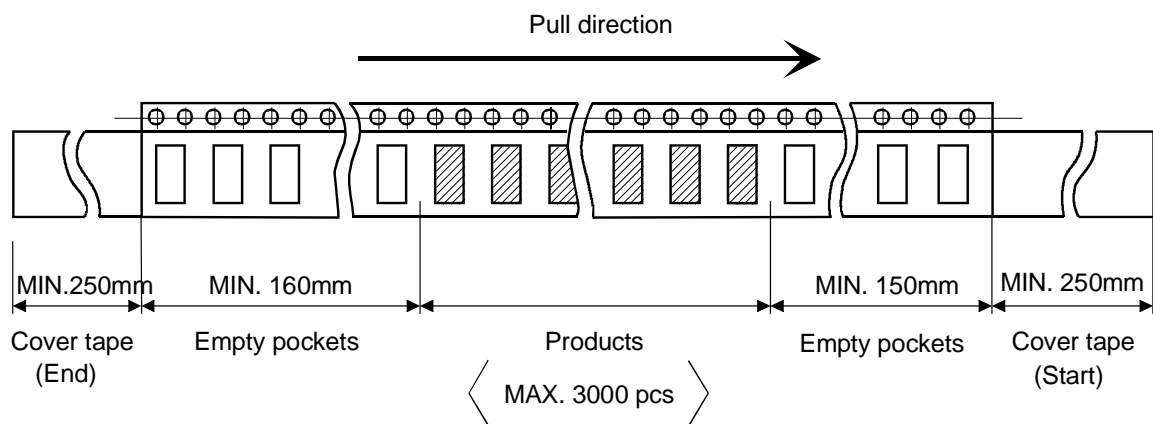
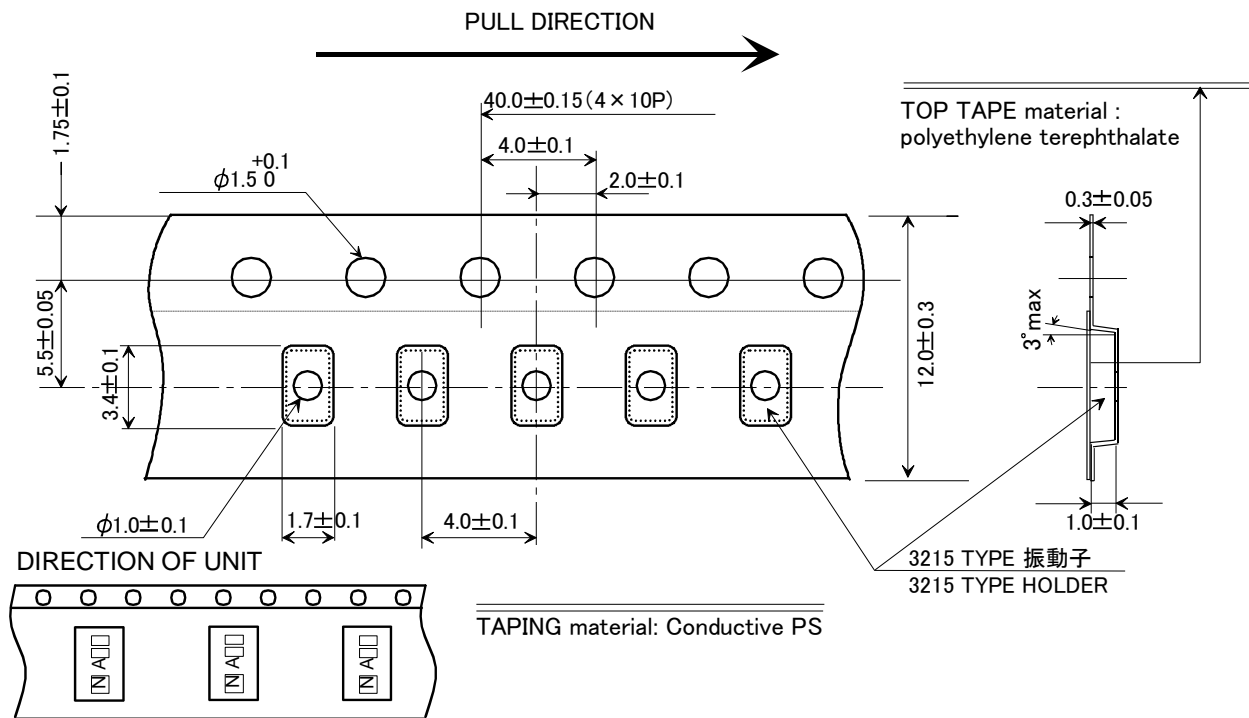


Recommended soldering pattern



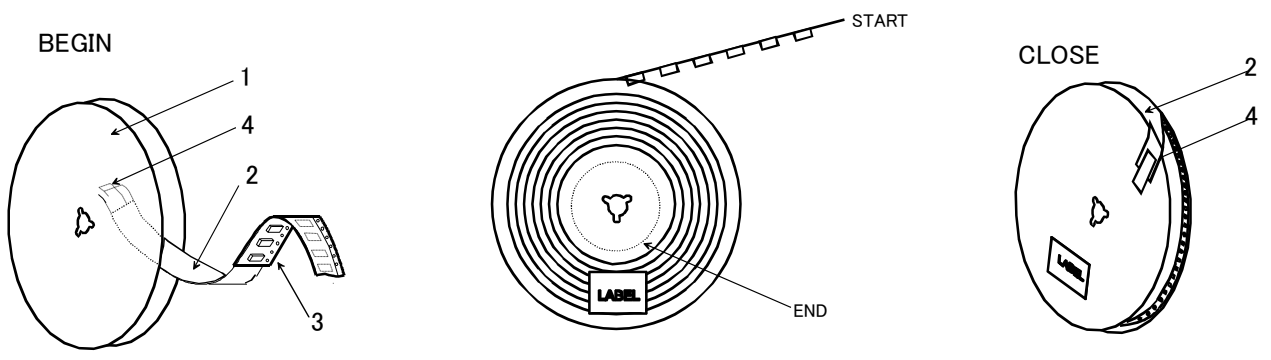
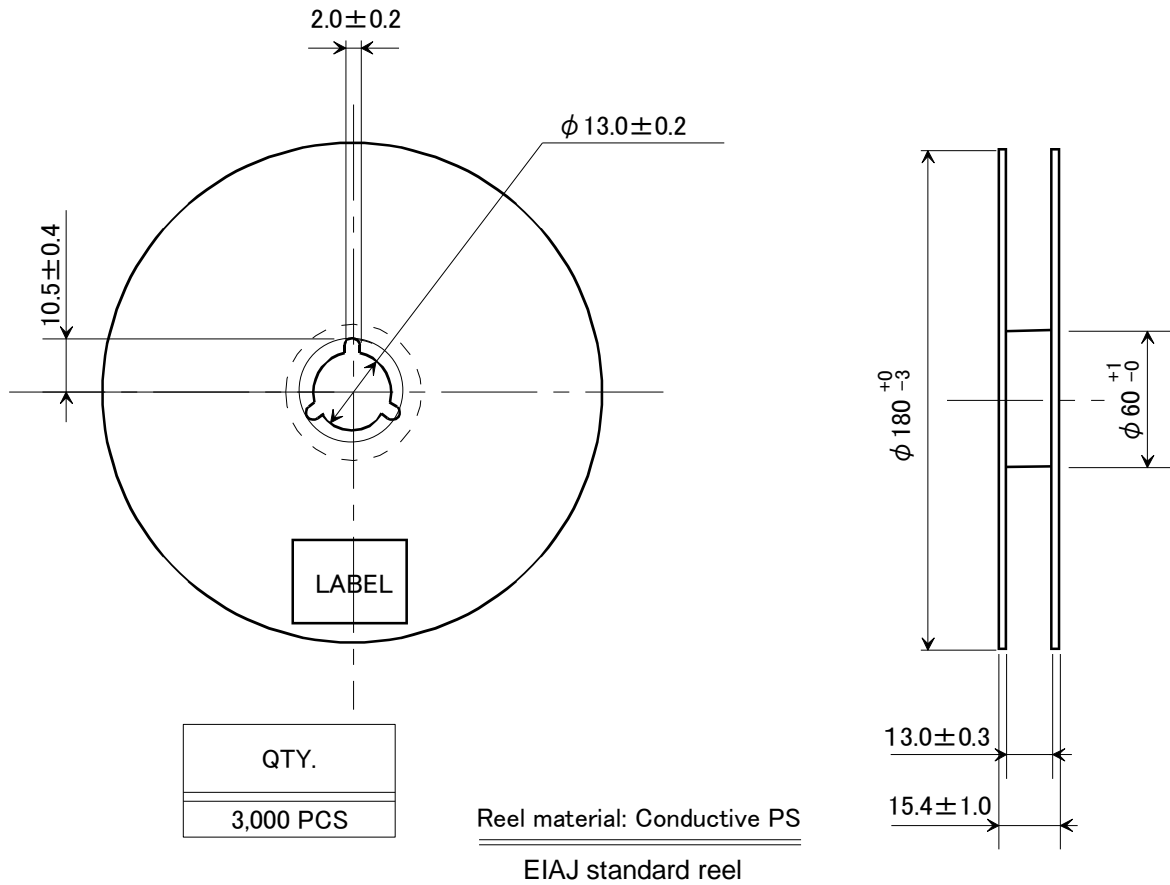
	Date of Revise	Charge	Approved	Reason
B	10.May.2012	Hasuike	Matsudo	Add bilingual
	Date	Name	Third Angle Projection	Tolerance
Drawn	30.Aug.2009	Miyahara	Dimension:mm	± 0.2
Designed	30.Aug.2009	Miyahara	Title	Drawing No.
Checked	---	---		
Approved	30.Aug.2009	K. Ueki	NX3215SA External Dimension	EXD14B-00462
				Rev. B

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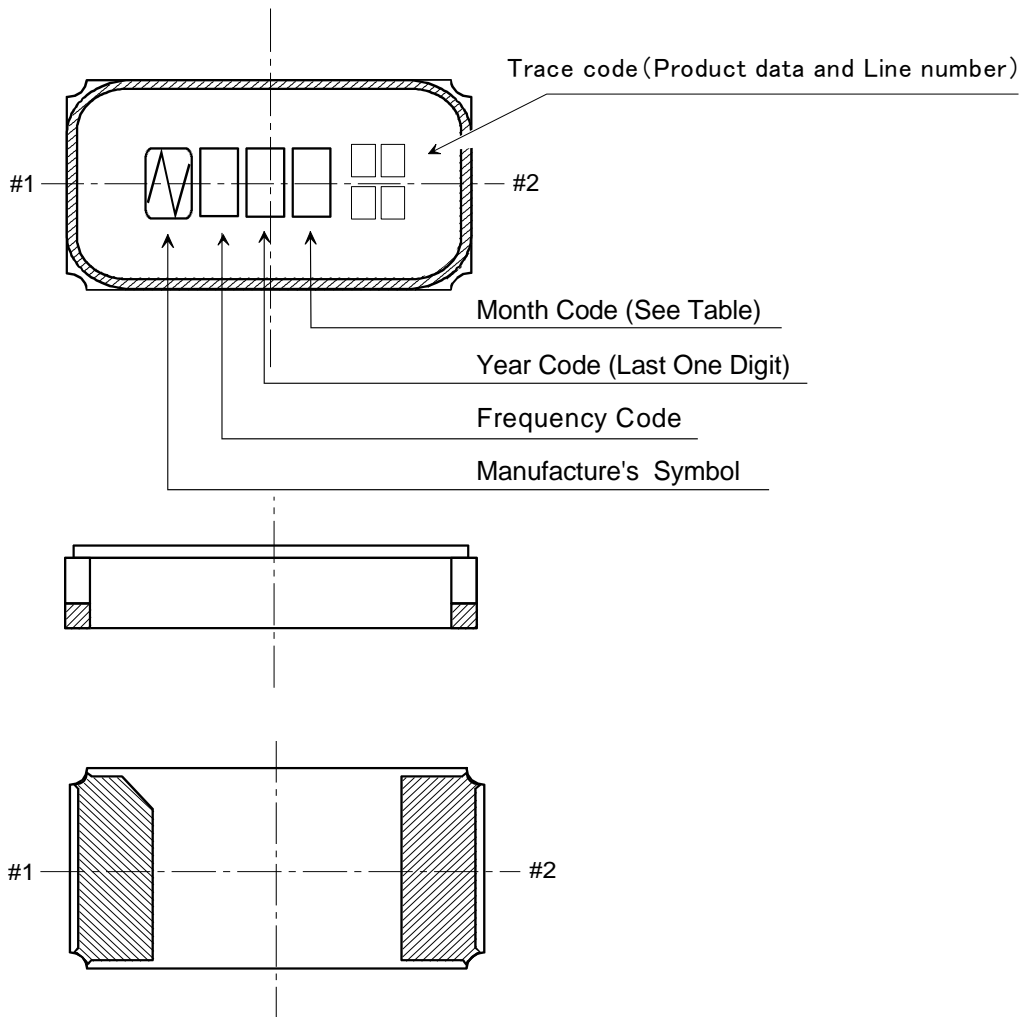
	Date of Revise	Charge	Approved	Reason
A	3.Aug.2012	Hasuike	Matsudo	Added English
	Date	Name	Third Angle Projection	Tolerance
Drawn	9.Jul.2009	N.Yamamoto	mm	Scale
Designed	9.Jul.2009	N.Yamamoto	Title	Drawing No.
Checked	---	---	3215 TYPE Taping and Reel Spec.	EXK17B-00303 1/2
Approved	9.Jul.2009	K.Ueki		
				A

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	Date of Revise	Charge	Approved	Reason	
A	3.Aug.2012	Hasuike	Matsudo	Added English	
	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	9.Jul.2009	N.Yamamoto	mm		/
Designed	9.Jul.2009	N.Yamamoto	Title	Drawing No.	Rev.
Checked	---	---	3215 TYPE Taping and Reel Spec.	EXK17B-00303 2/2	A
Approved	9.Jul.2009	K.Ueki			

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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

2. Frequency Code

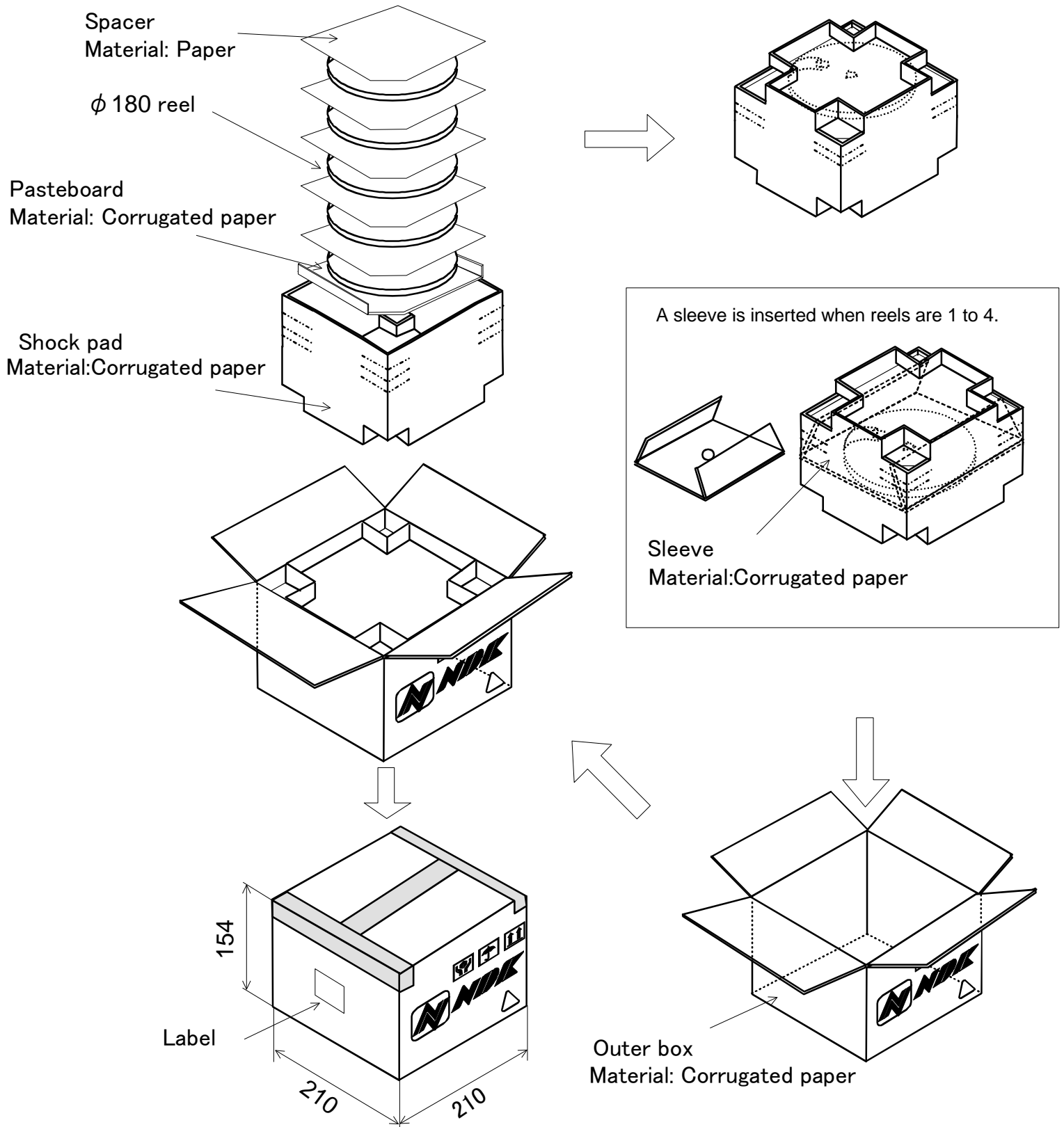
A : 32.768kHz

3. Marking Method

Marking Method is Laser Trimming.

	Date of Revise	Charge	Approved	Reason			
	Date	Name	Third Angle Projection	Tolerance		Scale	
Drawn	28.Oct.2009	Miyahara	Dimension:mm			/	
Designed	28.Oct.2009	Miyahara	Title NX3215SA Marking Drawing		Drawing No. EXH11B-00422		Rev.
Checked	--	--					
Approved	28.Oct.2009	Ueki					

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	Date of Revise	Charge	Approved	Reason
C	4 Jul. 2012	H. Ohkubo	K. Oguri	Addition of condition when reels are 1 to 4.
	Date	Name	Third Angle Projection	Tolerance
Drawn	26 Feb. 2010	H. Ohkubo	Dimension:mm	-----
Designed	26 Feb. 2010	K. Oguri	Title	Drawing No.
Checked	26 Feb. 2010	K. Oguri	180 dia. Reel package	EEK17B-00015
Approved	26 Feb. 2010	J. Nakamura		
				C

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Reliability assurance item

(page: 1/2)

No.	Test Item	Test Methods	Specification Code
1	AGING	1 year at 25 °C +/- 3°C	a
2	HEAT RESISTANCE	at +85 °C for 500 hours.	a
3	COLD RESISTANCE	at -40 °C for 500 hours.	a
4	HUMIDITY	at +85 °C with 80 to 85 % RH for 500 hours.	a
5	THERMAL SHOCK	Temperature cycle as shown in (Fig.1) for 100 cycle. <div style="text-align: center;"> <p style="text-align: center;">ONE CYCLE (Fig.1)</p> </div>	a
6	VIBRATION	Frequency Range : 10 to 2000Hz Amplitude or Acceleration : 1.52 mm or 196m/s ² 1 cycle : 20 minutes Test time : Three mutually perpendicular axes each 12 times.	a
7	SHOCK 1	Shock : 3000 Gs 0.3 msec. Test time : Six mutually perpendicular axes each 1 times.	a
8	SHOCK 2	Shock : Device are put on the weight of 200 g and dropped on concrete board. Height : 1.5 m Drop times : Six mutually perpendicular axes each 10 times.	b
9	SOLDERABILITY	Residual heat temperature 150 °C Residual heat time 60 to 120 sec Peak temperature 240°C (more than 215 °C 10 to 30 sec)	c
10	REFLOW RESISTANCE	Temperature cycle as shown in (Fig2.) for 3 cycle.	a

Specification code	Specification
a	dF/F ≤ +/- 5ppm dCl ≤ +/- 5 kohm
b	dF/F ≤ +/- 15ppm dCl ≤ +/- 5 kohm
c	The electrodes shall acquire a new solder coat over at least 90 % of immersed area.

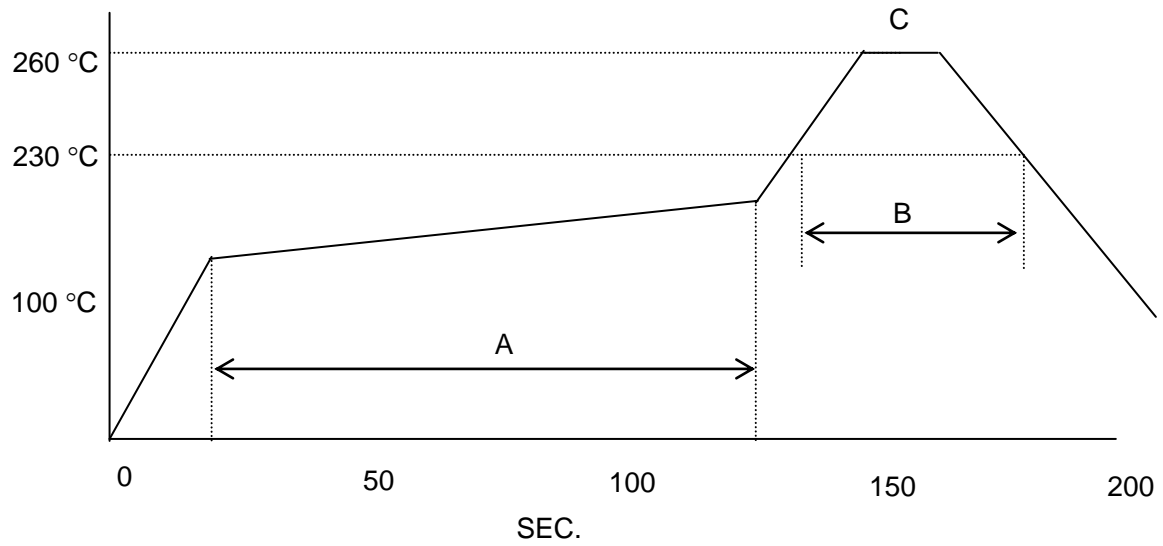


Fig.2 REFLOW

- A: 150 to 180 °C (60 to 120 sec.)
- B: 230 °C min. (30 sec. max.)
- C: PEAK-TEMP. 260 °C +/- 5 °C (10sec. max.)