Crystal Bridge to the Future

RoHS Compliant
Directive 2011/65/EU

REFERENCE SPECIFICATION

Customer:

Item:	CRYSTAL UNIT
Type:	NX3215SA
Nominal Frequency:	32.768kHz
Customer's Spec. No.:	---
NDK Spec. No.:	EXS00A-MU00746

For your reference we submit this specification.
Please study and keep in your related document file.

Charge:

Sales		
Engineer		

Revision Record

Rev.	Date	Items	Contents	Approved	Checked	Drawn
---	17.Jun.2015	Issue	---	S.Sunaba	S.Kawanishi	Y.Hasuike

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

2. NDK Spec. No. : EXS00A-MU00746

3. Type : NX3215SA

4. Electrical Specifications

	Parameters	SYM.	Electrical Spec.				Notes
			MIN	TYP	MAX	UNITS	
4.1	Nominal Frequency	F_{nom}	32.768			kHz	-
4.2	Oscillation Mode	-	Fundamental			-	-
4.3	Load Capacitance	CL	7.0			pF	Network Analyzer (CNA-LF made in Transat corp.)
4.4	Frequency Tolerance	-	+/-20			ppm	at +25 +/-3°C ,Not include aging
4.5	Turning Point	-	+25 +/-5			°C	-
4.6	Temperature coefficient	-	-	-	-0.04	ppm/ $°C^2$	-
4.7	Operating Temperature range	-	-40	~	+85	°C	-
4.8	Aging	-	+/-3			ppm	1^{st} year (at +25°C)
4.9	Drive level	DL	-	0.1	1.0	uW	-
4.10	Equivalent Resistance	R_r	-	-	70	kΩ	Network Analyzer (CNA-LF made in Transat corp.)
4.11	Shunt Capacitance	C_0	0.5	1.0	1.5	pF	-
4.12	Insulation Resistance	-	500	-	-	MΩ	Terminal to terminal insulation resistance must be 500MΩ (Min.) when DC100V ±15V is applied.
4.13	Storage Temperature range	-	-40	~	+85	°C	-
4.14	Motional Capacitance	C_1	2.0	4.0	6.0	fF	Network Analyzer (CNA-LF made in Transat corp.)

5. Examination results document

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

6. Application drawing

6.1 Dimension drawing : EXD14B-00462
6.2 Taping and reel figure : EXK17B-00303
6.3 Holder marking : EXH11B-00422
6.4 Reel Packing : EEK17B-00015
6.5 Reliability assurance Item : EXS30B-00952

7. Notice

7.1 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.

7.2 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.

7.3 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.

7.4 Where any change to the process condition is made due to the change(s) in the production line, inform personnel of the specifications.

7.5 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.

7.6 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.

7.7 In the company's production process whatever amount of ozone depleting substances (ODS) as specified in the Montreal protocol is not used.

7.8 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.

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

7.10 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.

8. Prohibited items

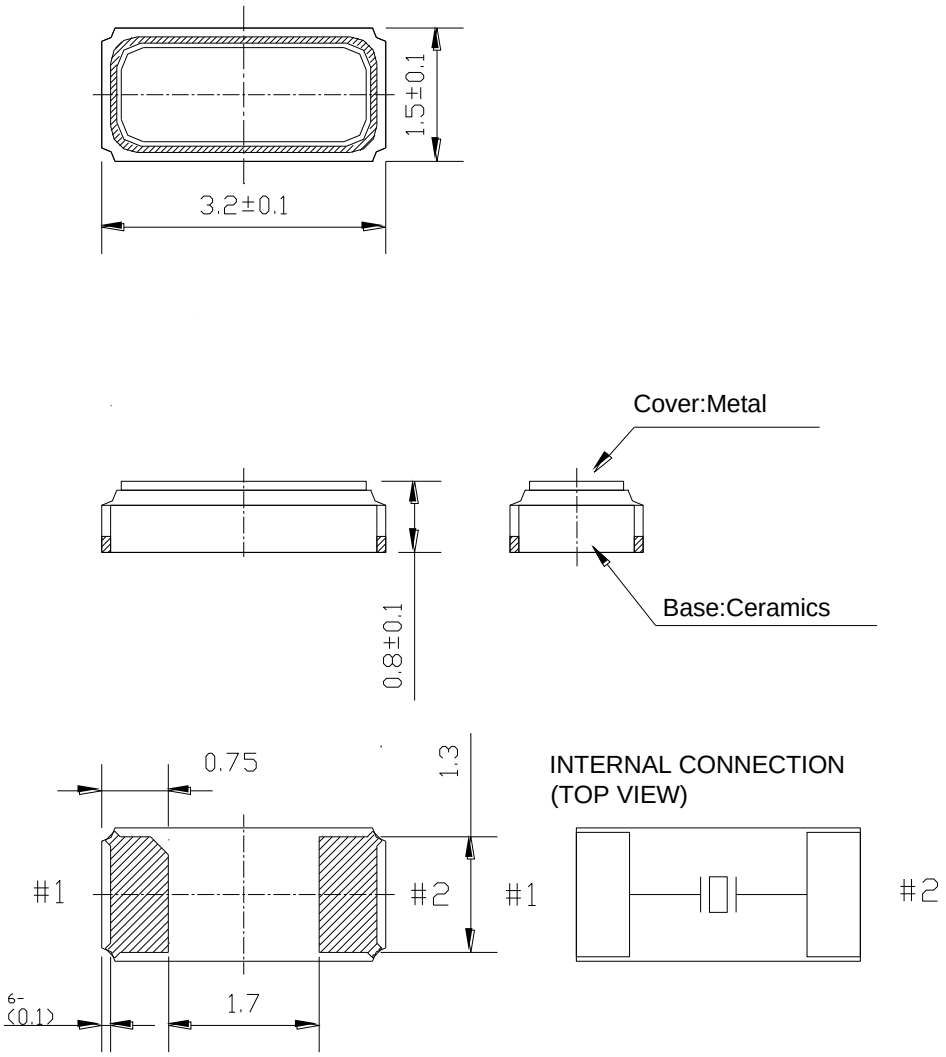
Be sure to use the product under the following conditions. Otherwise, the characteristics deterioration or destruction of the product may result.

(1)Reflow soldering heat resistance

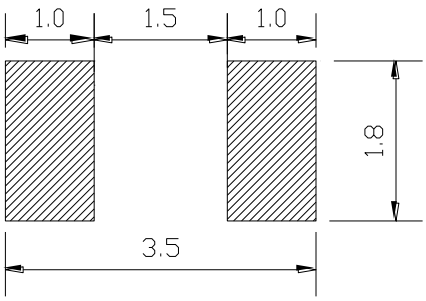
Peak temperature	: 265°C, 10 sec
Heating	: 230°C or higher, 30 sec
Preheating	: 150°C to 180°C, 120 sec
Reflow passage times	: twice

(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	Scale
Drawn	30.Aug.2009	Miyahara	Dimension:mm	±0.2	10 / 1
Designed	30.Aug.2009	Miyahara	Title	Drawing No.	Rev.
Checked	---	---	**NX3215SA External Dimension**	**EXD14B-00462**	B
Approved	30.Aug.2009	K. Ueki			

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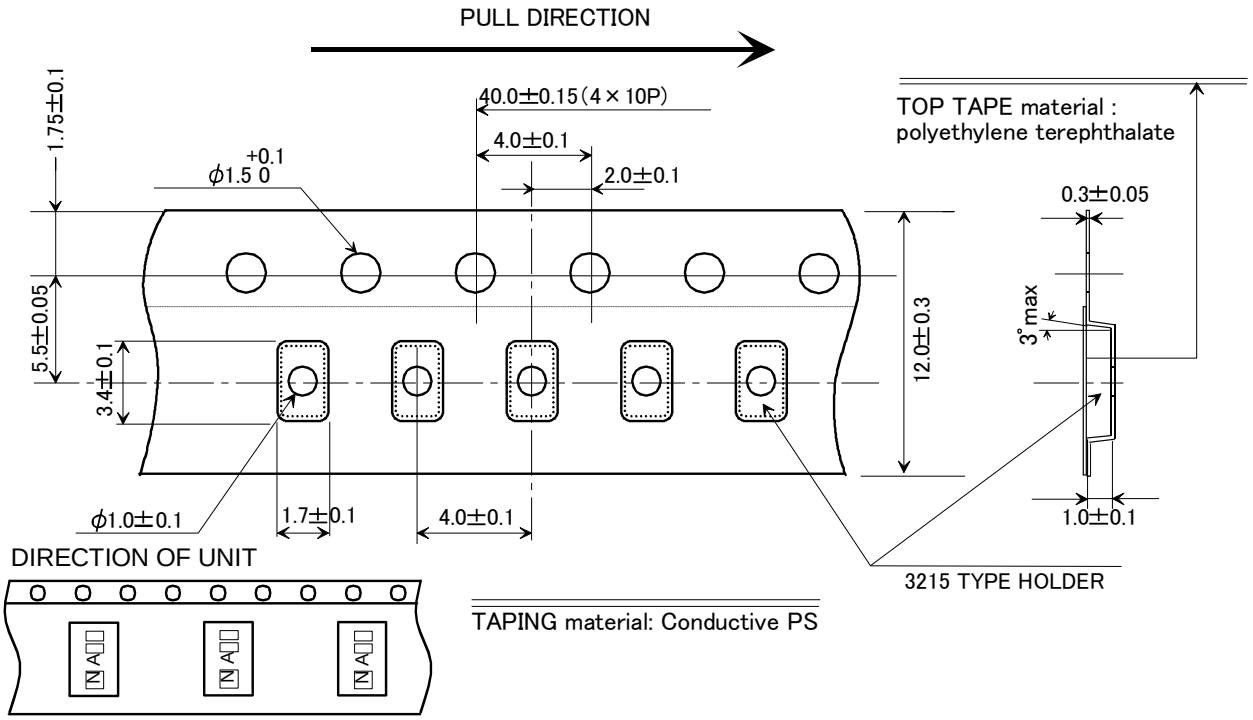

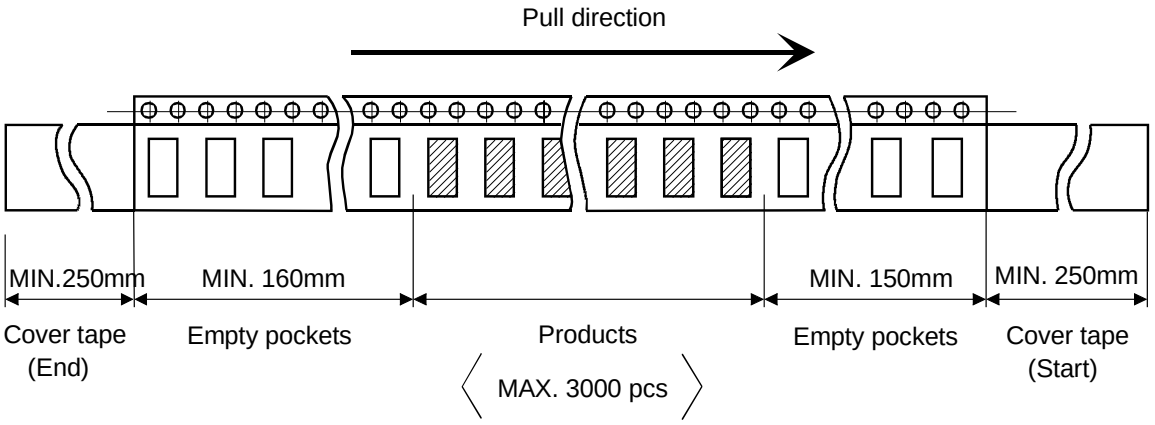

	Date of Revise	Charge	Approved	Reason
B	24.Apr.2013	Sato	Matsudo	Added English

	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 1/2**	B
Approved	9.Jul.2009	K.Ueki			

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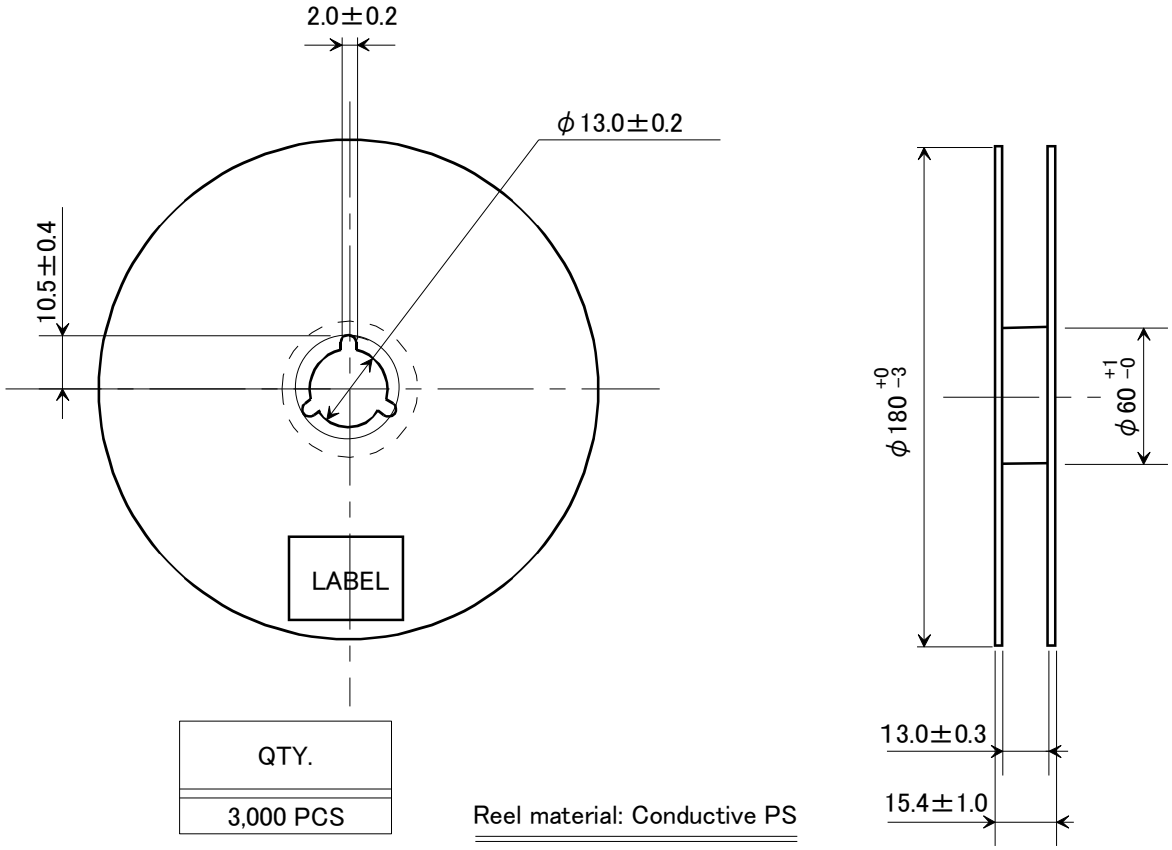
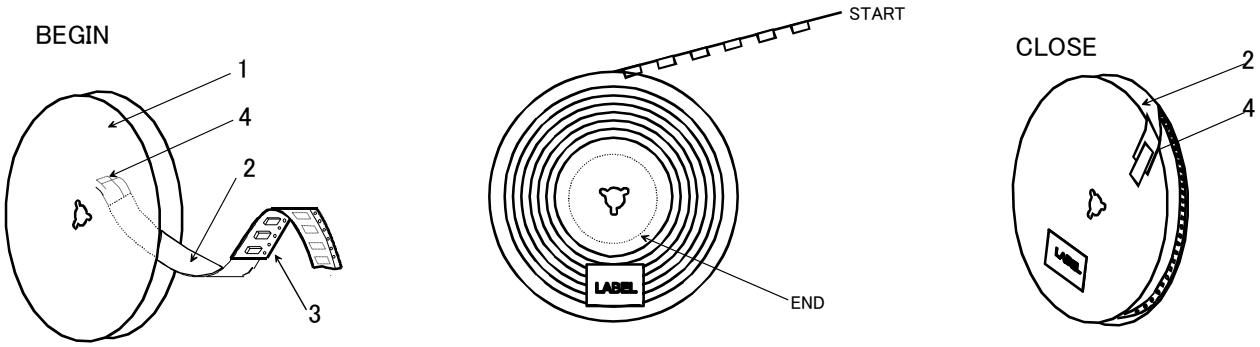


Reel material: Conductive PS

EIAJ standard reel



	Date of Revise	Charge	Approved	Reason
B	24.Apr.2013	Sato	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**	B
Approved	9.Jul.2009	K.Ueki			

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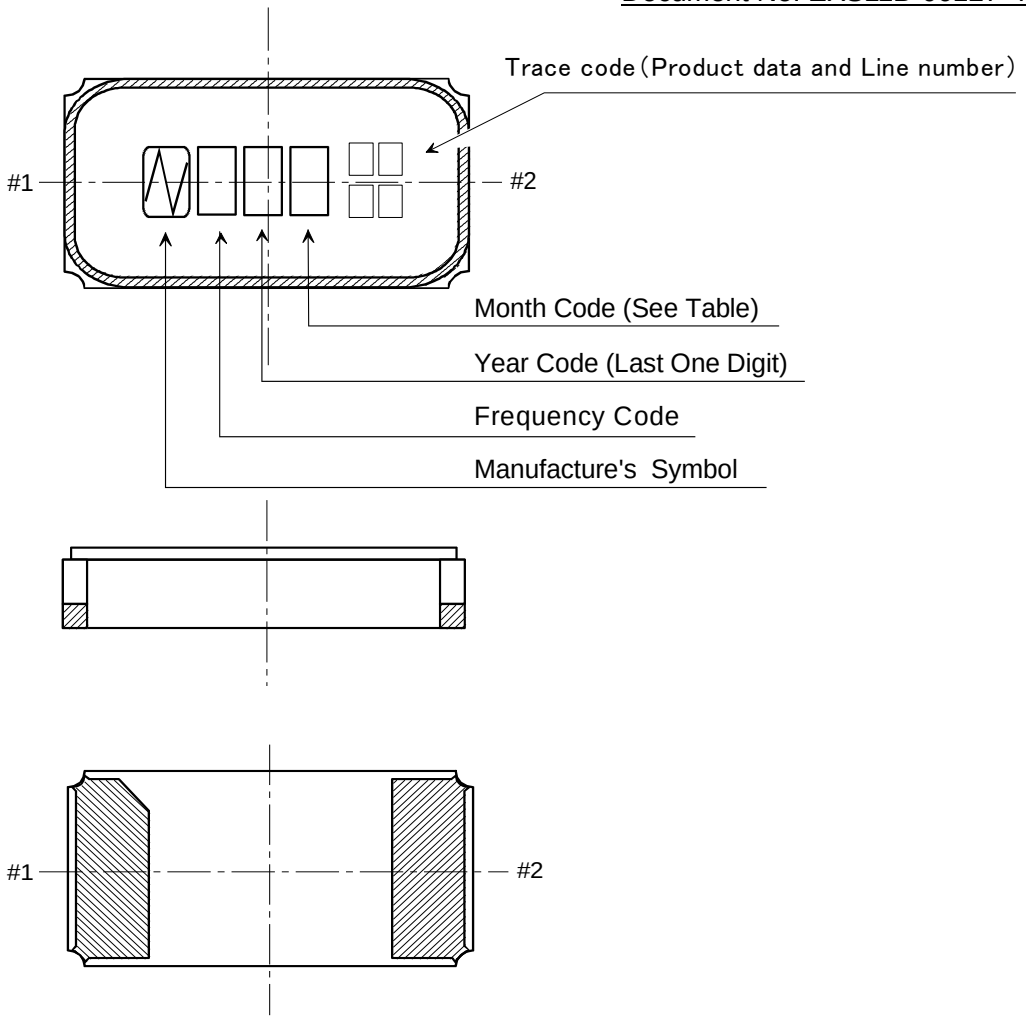
Form M-1



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 Triming.

	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	Drawing No.	Rev.
Checked	--	--	**NX3215SA Marking Drawing**	**EXH11B-00422**	
Approved	28.OCt.2009	Ueki			

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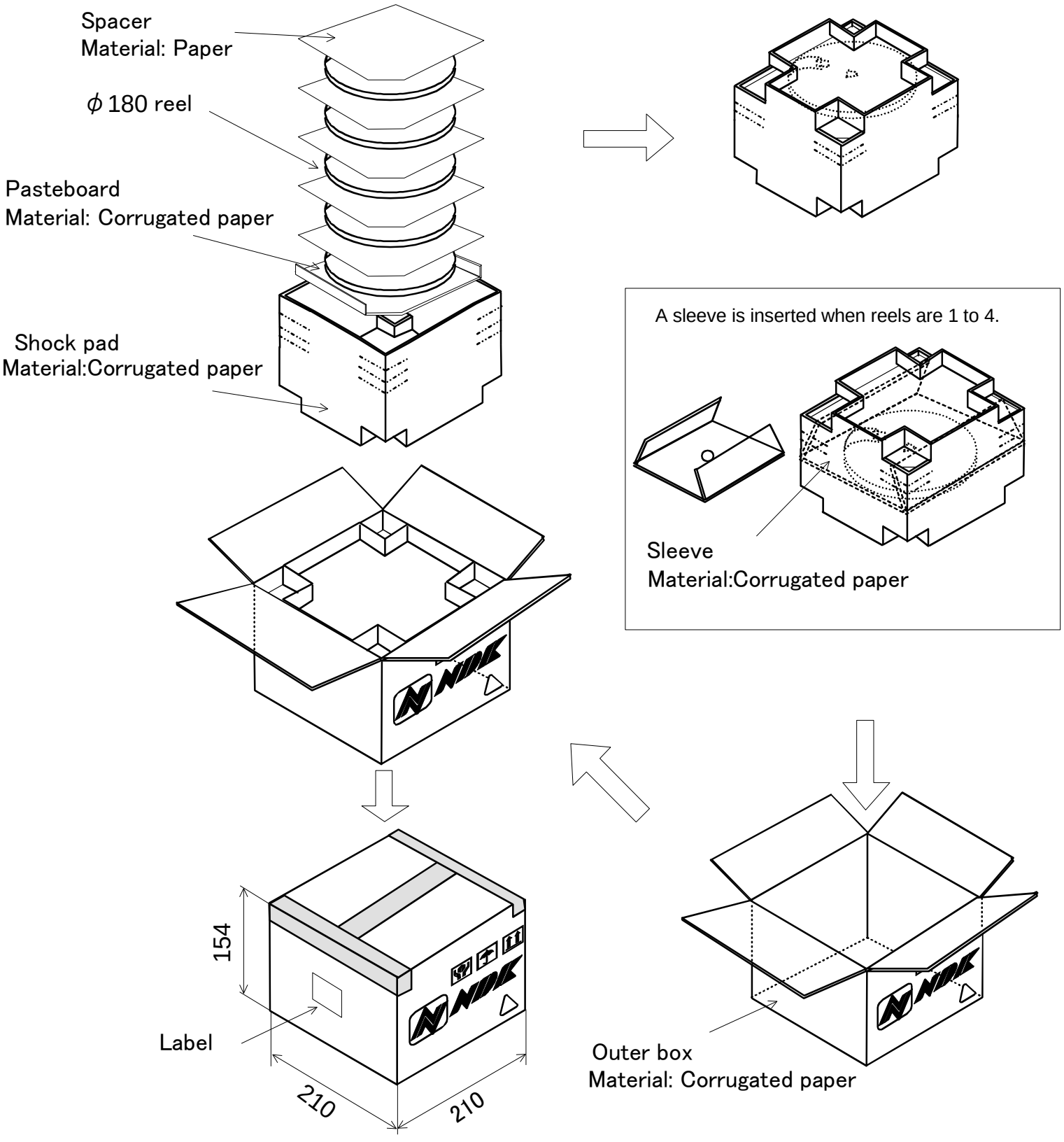
Form M-1



	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	Scale
Drawn	26 Feb. 2010	H. Ohkubo	Dimension:mm	---	---
Designed	26 Feb. 2010	K.Oguri	Title	Drawing No.	Rev.
Checked	26 Feb. 2010	K.Oguri	**180 dia. Reel package**	**EEK17B-00015**	C
Approved	26 Feb. 2010	J. Nakamura			

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Reliability assurance item

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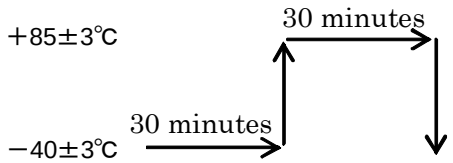
No.	Test Item	Test Methods	Specification Code
1	AGING	1 year at 25 °C +/- 3°C	A
2	HEAT RESISTANCE	at 85 °C for 500 hours.	B
3	COLD RESISTANCE	at –40 °C for 500 hours.	B
4	HUMIDITY	at +85 °C with 80 to 85 % RH for 500 hours.	B
5	THERMAL SHOCK	Temperature cycle as shown in (Fig.1) for 100 cycle.  ONE CYCLE (Fig.1)	B
6	VIBRATION	Frequency Range : 10 to 2000Hz Amplitude or Acceleration : 1.52 mm or 20 G 1 cycle : 20 minutes Test time : Three mutually perpendicular axes each 12 times.	B
7	SHOCK 1	Shock : 3000 Gs 0.3 msec. Test time : Six mutually perpendicular axes each 1 times.	B
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.	C
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)	D
10	REFLOW RESISTANCE	Temperature cycle as shown in (Fig2.) for 3 cycle.	B

Specification code	Specification
A	dF/F ≤ +/- 3ppm
B	dF/F ≤ +/- 5ppm dCI ≤ +/- 5 kohm
C	dF/F ≤ +/- 15ppm dCI ≤ +/- 5 kohm
D	The electrodes shall acquire a new solder coat over at least 90 % of immersed area.

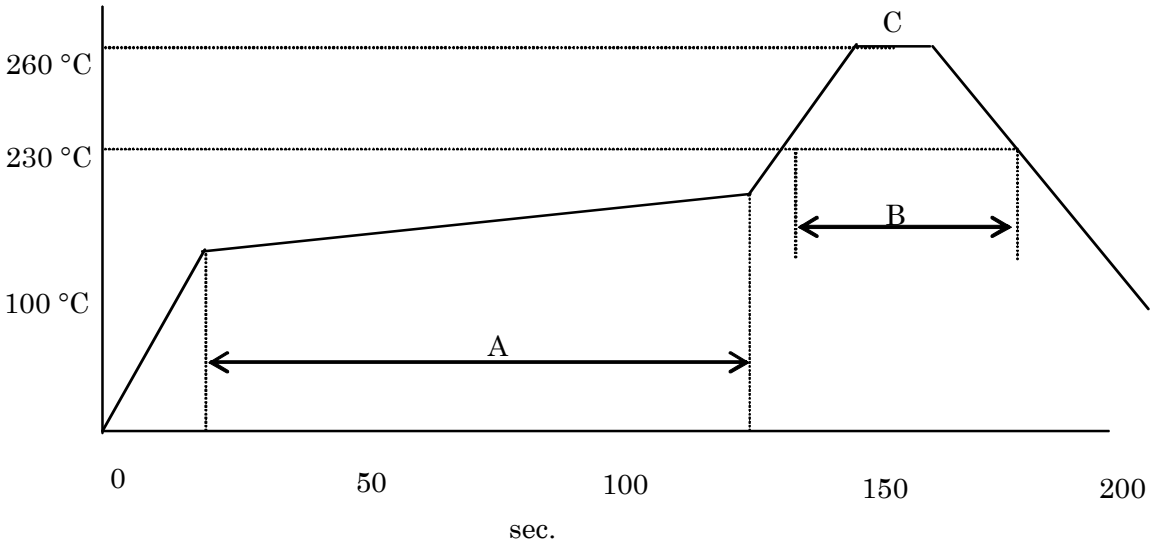


Fig.2 REFLOW

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.)