Conforms to AEC-Q200

RoHS Compliant
Directive 2011/65/EU

SPECIFICATION

Customer: NDK EUROPE Ltd French Office

Receipt

Item: CRYSTAL UNIT

Type: NX3215SA

Nominal Frequency: 32.768kHz

Customer's Spec. No.: ---

NDK Spec. No.: EXS00A-MU00007

Charge:

Sales	NDK Europe Ltd. French Office : C. Combeau	Tel. 33-1-60-95-0000
Engineer	Engineering Dept. 1 : Y.Hasuike	Tel. 81-(0)4-2900-6632

Approved S.Sunaba

Checked ---

Drawn Y.Hasuike

Revision Record

Rev.	Rev. Date	Items	Contents	Remarks
---	30. Aug. 2007	Issue	---	---
A	21. Dec. 2009	External dimension	Changed to EXD14B-00462	8.1.
		Marking Drawing	Changed to EXH11B-00422	8.2.
		Taping and reel figure	Changed to EXK17B-00302	8.3.
		Packaging figure	Changed to EXK17B-00130	8.4.
		Packing Lavel	Changed to EXK17B-00213	8.5.
B	26. Mar. 2012	RoHS	Change to RoHS Compliant	---
		Equivalent resistance (R_1)	Changed to 70k ohms max.	4.6.
		Reliability assurance Item	Added to EXS30B-00661	8.6.
		Prohibited items	Added	10.

Revision Record				
Rev.	Rev. Date	Items	Contents	Remarks
C	8. May. 2012	Customer	Changed to NDK EUROPE Ltd French Office	Front cover
		Equivalent resistance (R_1)	Added to 80kΩ max. (-40 to +125°C)	4.6.
		Aging	Added to 10years	6.3.
		Reliability assurance Item	Changed to EXS30B-00722	8.6.
D	1.Jul.2013	Aging (at 25°C)	Added to Aging spec.	6.3
E	11.Mar.2014	Equivalent resistance (R_1)	Added to 60kΩ max. (-10 to +70°C)	4.6
			Added to 37kΩ typ. (at +25°C)	
F	1.Apr.2014	-	Added to “Conforms to AEC-Q200”	Front cover

1. Customer specifications number : ---

2. NDK specification number : EXS00A-MU00007

3. Type : NX3215SA

4. Electrical characteristics

4.1 Nominal frequency	: 32.768kHz
4.2 Overtone order	: Fundamental
4.3 Adjustment tolerance	: $\pm 20 \times 10^{-6}$max. (at +25 °C)
4.4 Turning Point	: +25°C±5°C
4.5 Temperature coefficient	: $-0.04 \times 10^{-6}/°C^2$ max. at -40 to +125°C
4.6 Equivalent resistance (R_1)	: 37 kΩ typ. (at +25 °C) 60kΩ max. (-10 to +70°C) 70kΩ max. (-40 to +85°C) 80kΩ max. (-40 to +125°C)
4.7 Shunt capacitance (C_0)	: 1.0±0.5pF
4.8 Motional capacitance(C1)	: 4.0±2.0fF
4.9 Maximum Drive Level	: 0.5μW max.
4.10 Insulation resistance	: Terminal to terminal insulation resistance also terminal to cover insulation resistance must be 500MΩ (min) when DC100V ±15V is applied.

5. Measurement circuit

5.1 Frequency measurement

・Measuring instrument	: Network Analyzer (CNA-LF made in Transat corp.)
・Load capacitance	: 12.5pF
・Level of drive	: 0.1μW

5.2 Equivalent resistance measurement

・Measuring instrument	: Network Analyzer (CNA-LF made in Transat corp.)
・ Load capacitance	: Series
・Level of drive	: 0.1μW

6. Other performances

6.1 Operating temperature range	: -40~+125°C
6.2 Storage temperature range	: -40~+125°C
6.3 Aging (at 25°C)	: +/-3ppm / year +/-5ppm / 5years +/-10ppm /10years +/-15ppm / 20years
6.4 Oscillation margin	: For stable oscillation, oscillation margin of min. 200kΩ is recommended

7. Examination results document

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

8. Application drawing

8.1. External dimension	: EXD14B-00462
8.2. Marking Drawing	: EXH11B-00422
8.3. Taping and reel figure	: EXK17B-00302
8.4. Packaging figure	: EXK17B-00130
8.5. Packing Lavel	: EXK17B-00213
8.6. Reliability assurance Item	: EXS30B-00722

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.

10. Prohibited items

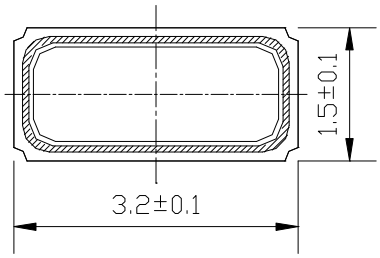
Be sure to use the product under the following conditions. Otherwise, the characteristics deterioration or destruction of the product may result.

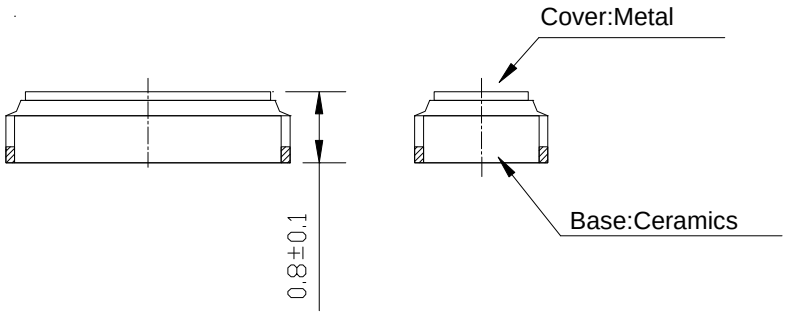
(1)Reflow soldering heat resistance

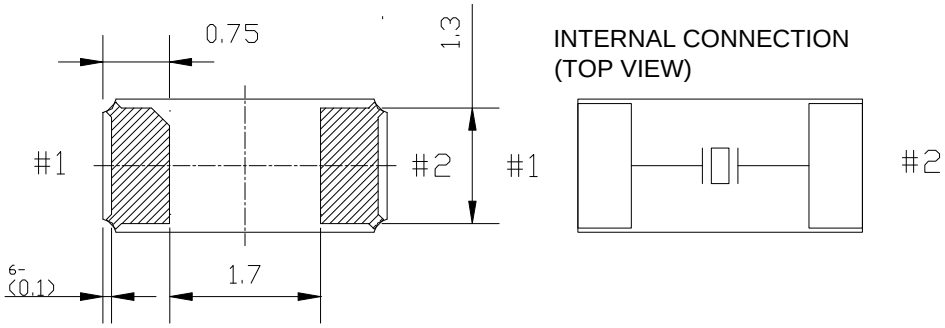
Peak temperature	: 265°C, 10 sec
Heating	: 230°C or higher, 30 sec
Preheating	: 150°C to 180°C, 120 sec
Reflow passage times	: Two times

(2)Manual soldering heat resistance

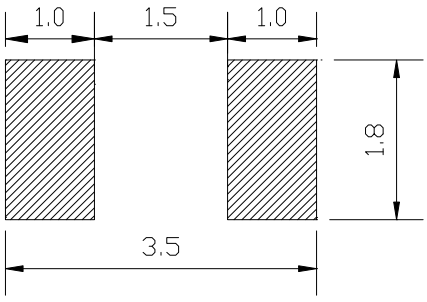
Pressing a soldering iron of 400°C on the terminal electrode for four seconds (twice).







Recommended soldering pattern



	Date of Revise	Charge	Approved	Reason
A	18.Dec.2009	Miyahara	K.Ueki	Add bilingual

	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	30.Aug.2009	Miyahara	Unit:mm	±0.2	10 / 1
Designed	30.Aug.2009	Miyahara	Title	Drawing No.	Rev.
Checked	---	---	**NX3215SA External Dimension**	**EXD14B-00462**	A
Approved	30.Aug.2009	K. Ueki			

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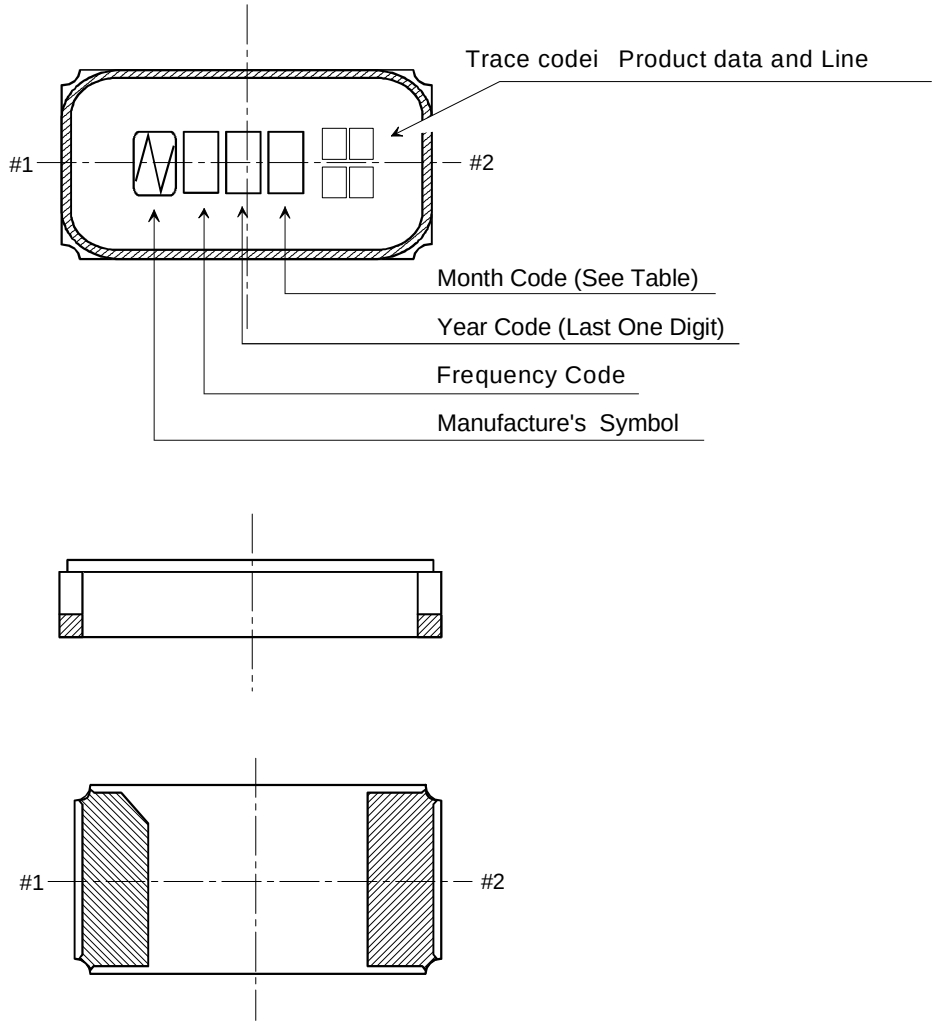

NOTE

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

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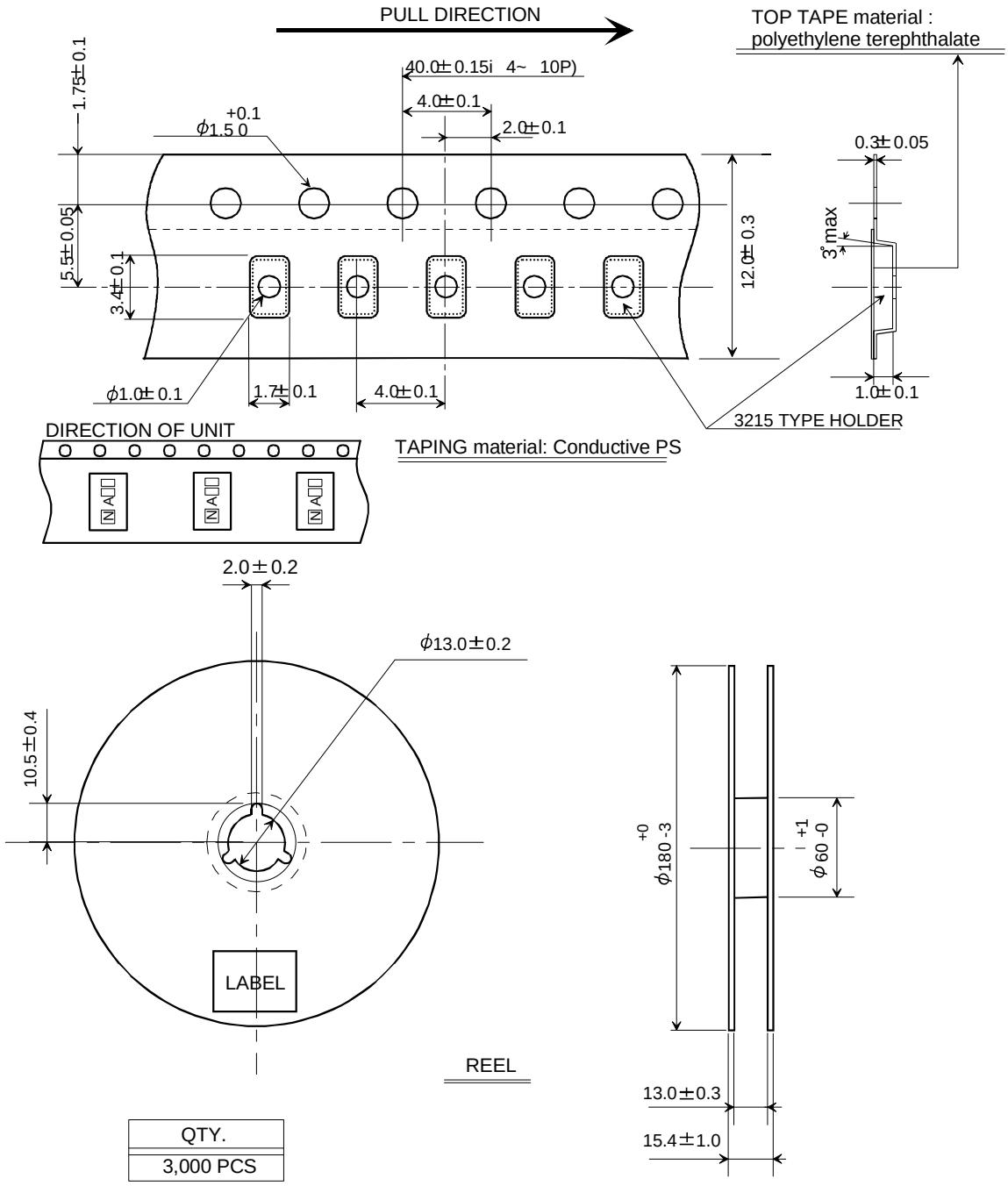
Form M-1



	Date of Revise	Charge	Approved	Reason

	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	23.Jun.2009	Miyahara	Dimension:mm		/
Designed	23.Jun.2009	Miyahara	Title	Drawing No.	Rev.
Checked	---	---	**Tape and Reel Spec.**	**EXK17B-00302**	
Approved	23.Jun.2009	K. Ueki			

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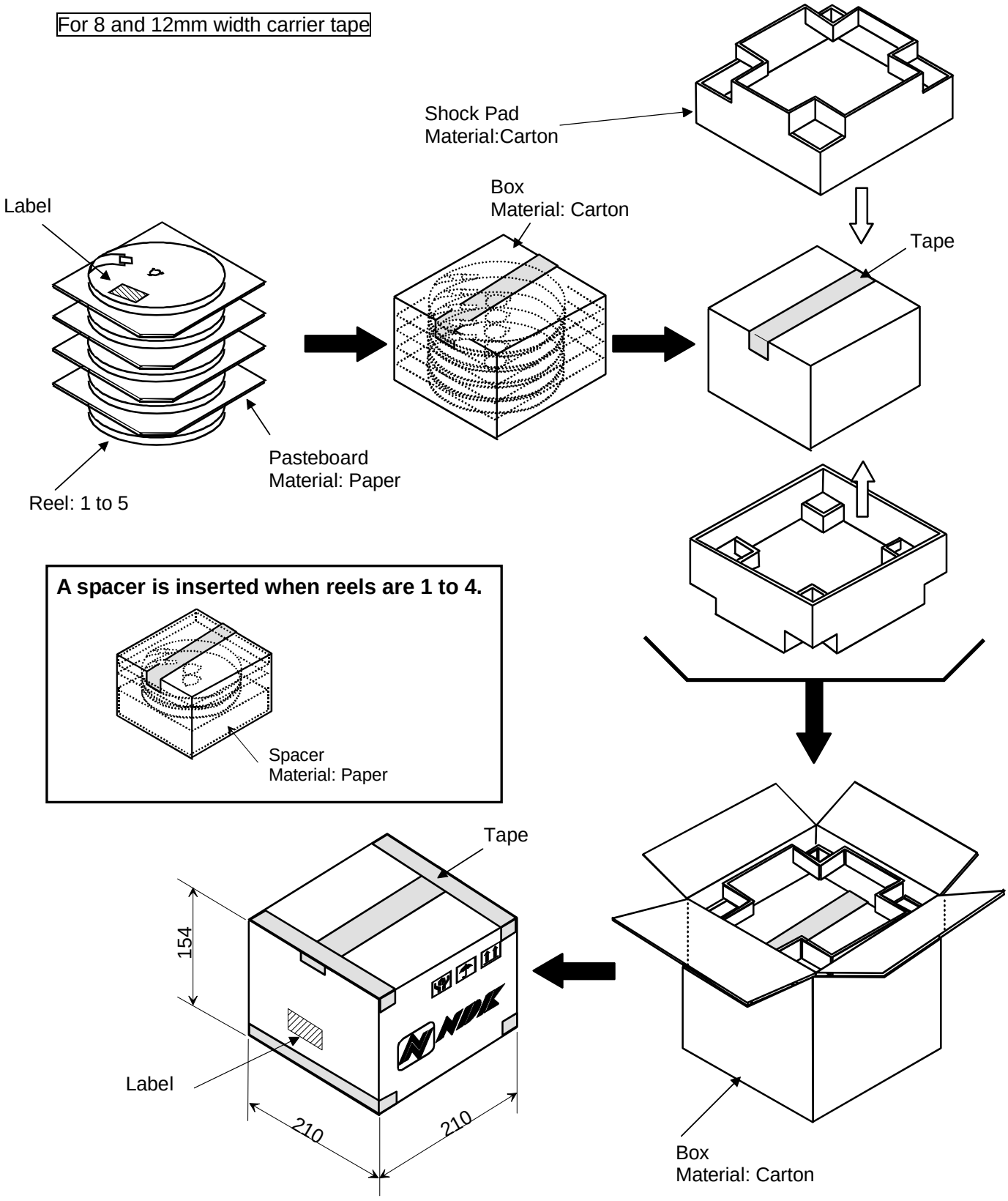
For 8 and 12mm width carrier tape



	Date of Revise	Charge	Approved	Reason
B	30 Jun. 2008	K. Oguri	K. Miyashita	The pasting method of shipping tape was corrected.

	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	9.Aug.2002	K.Oguri	Dimension:mm		----------
Designed	9.Aug.2002	K.Oguri	Title	Drawing No.	Rev.
Checked	---------	--------	**180mm reel Packing**	**EXK17B-00130**	B
Approved	9.Aug.2002	K.Miyashita			

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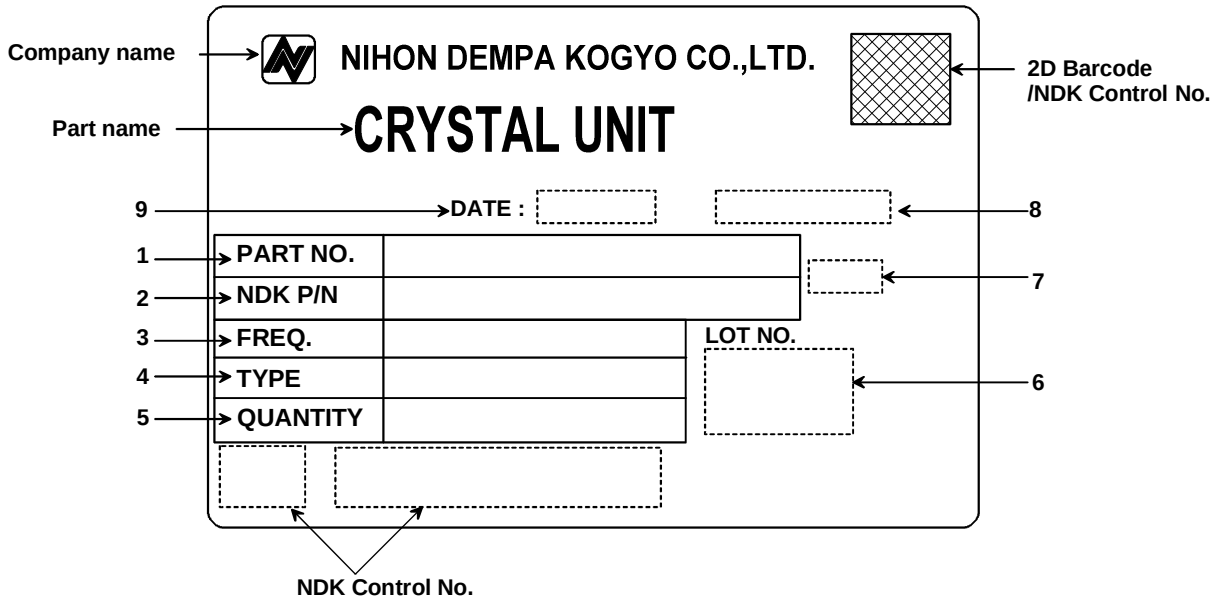
Form M-1

LABEL SIZE: 76×50mm



No.	Marking Item	Marking Contents
1	PART NO.	Customer's Part Number
2	NDK P/N	NDK Part Number
3	FREQ.	Frequency
4	TYPE	NDK Type name
5	QUANTITY	Total quantity
6	LOT NO.	* Lot No.: A lot marking indicated on the product (EIA code, Lot No., etc.) * Marking Method : Lot No.-QTY. Example of mixed 2 lots.; 54-1000pcs , 55-1000pcs
7	OTHERS	The marking corresponded to ROHS * The "ROHS" is indicated for products corresponded to ROHS.
8	COUNTRY OF ORIGIN	Country of Origin
9	DATE	Production date DD/MM/YYYY

	Date of Revise	Charge	Approved	Reason
C	15 May 2008	T. Shimizu	K. Miyashita	No. 8 and 9 were added.

	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	13.May.2005	K.Oguri	~~Dimension:mm~~	---	---
Designed	13.May.2005	K.Oguri	Title	Drawing No.	Rev.
Checked	---	---	**Packing Label**	**EXK17B-00213**	C
Approved	13.May.2005	K. Miyashita			

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Reliability assurance item

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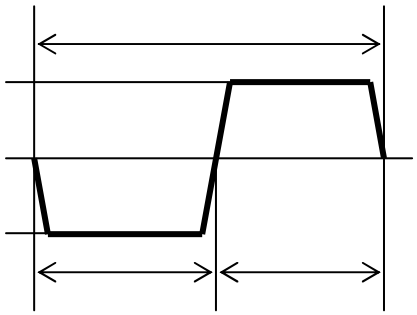
No.	Test Item	Test Methods	Specification Code
1	Drop	Devices are dropped from the height 1.2m onto iron plate. Execution 3 times random drops.	A
2	Shock	Acceleration: 49000 m/s^2 Duration: 0.15 ms Half-Sine pulse 1 Shocks in 6 mutually perpendicular planes, Total 6 shocks	A
3	Vibration	Frequency range: 10 to 2000 Hz Amplitude or Acceleration: 1.52 mm or 196 m/s^2 Sweep time: 20 min Test time: 4 h×3	A
4	Resistance to heat	Leave at +125±2 °C for 1000 h	A
5	Resistance to cold	Leave at -40±2 °C for 1000 h	A
6	Thermal shock	Device are left into the following temperature cycle as shown in (Figure1) for 1000 consecutive cycle.  (Figure1)	A
7	Humidity	Device are left in temperature at +85±2 °C with relative humidity of 80~85 % for 1000 h	A
8	Shear Stress	10N press the side of product for 10±1s. Ref: 60068-2-21 (Mechanical strength test for SMD)	B
9	Resistance to soldering heat	Pre-heat temperature : 150 °C Pre-heat time : 60 ~ 120 s Test temperature : 260 ± 5 °C Test time : 10 ± 1 s	A
10	Solderability	Pre-heat temperature : 150 °C Pre-heat Time : 60 ~ 120 s Peak temperature : 240 ± 5 °C 215 °C Over time : 10 ~ 30 s	C

Specification code	Specification
A	df/f<=±20ppm, CI<=100kΩ
B	No peeling-off soldered part.
C	The leads shall acquire a new solder coat cover at 90 % of immersed area.