



RoHS Compliant
Directive 2011/65/EU

REFERENCE SPECIFICATION

Customer: _____

Item: _____ Crystal Clock Oscillators

Type: _____ NZ2520SH

Nominal Frequency: _____ 32.768 kHz

Customer's Spec. No.: _____

NDK Spec. No.: _____ ERG3169A

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
---	11.Feb.2015	Issue	---	Y.Akasaka	---	C.Sakurai

- 1. Customer's Spec. No. : -----
- 2. NDK Spec. No. : ERG3169A
- 3. Type : NZ2520SH

4. Maximum Ratings

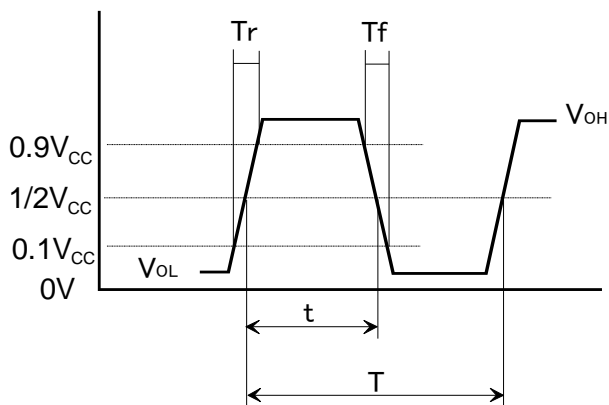
	Item	Ratings			Notes
		min	Max	Units	
1	Supply Voltage	-0.3	7.0	V	
2	Storage Temperature Range	-55	+125	°C	

5. Electrical Specifications

(Unless otherwise noted, TA=-40 to +85 °C, V_{CC}=1.8 V, Load=15 pF)

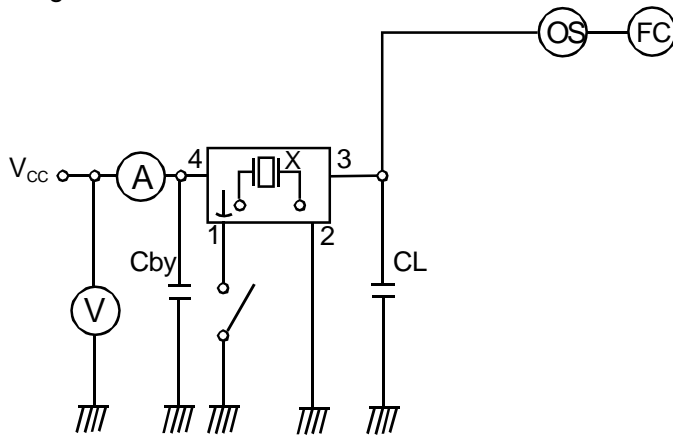
	Parameters	SYM	Electrical Spec.				Notes
			min	typ	max	Units	
1	Nominal Frequency	f _{nom}		32.768		kHz	
2	Supply Voltage	V _{CC}	1.62	1.8	1.98	V	
3	Current Consumption (Operating)	I _{CC}			0.22	mA	at 1.8 V, 25 °C
4	Current Consumption (Stand-by)	I _{ST}			10	μA	at 1.8 V, 25 °C
5	Output Level	-	C-MOS				
6	Load Capacitance	C _L			15	pF	
7	Operating Temperature Range	T _{opr}	-40		+85	°C	
8	Overall Frequency Tolerance	Δf/f _{nom}	-30		+30	ppm	*1
9	Long-term frequency stability	Δf _{lt}	-5		+5	ppm	at 25 °C, 1year
10	Output Voltage	V _{OL}			0.1	V _{CC}	
		V _{OH}	0.9			V _{CC}	
11	Rise Time(t _r), Fall Time(t _f)	t _r /t _f			200	ns	0.1 V _{CC} to 0.9 V _{CC}
12	Symmetry	SYM	45		55	%	at 1/2 V _{CC}
13	Start-up Time	t _{su}			5	ms	
14	Output Wave Form	-	Rectangular				
15	Stand-by Function						
	#1 PAD input			# 3 PAD output			
	H level (0.7 V _{CC} to V _{CC}) or open			Operating			
	L level (0.3 V _{CC} max)			High impedance			

*1 Inclusive of Freq. tolerance (at 25 °C), frequency/temperature characteristics, frequency/voltage coefficient



Symmetry = t/T × 100%

6. Measuring circuits



CL ; 15pF MAX including input capacity of oscilloscope

Cby ; Bypass capacitor (0.01uF)

7. Test data will not be submitted.

8. Application drawing

8.1 Dimension drawing

EKD14B-00027

8.2 Marking drawing

EKH11B-00113

8.3 Reliability assurance Item

EKS30B-00060

8.4 Taping & Reel drawing

EKK17B-00032

EEK17B-00015

9. Instruction Notice

9.1 Noise

When the NZ2520 series are used, the 0.01 μ F capacitor should be connected between V_{CC} and GND line. (Closer to the product terminal is desirable.)

9.2 Resistance to dropping

The NZ2520 series is designed to be impactproof so that no damage occurs when dropped a height(75 cm) three times. However, if dropped from a desk etc., it is advisable to check their performance or contact us to check it.

9.3 Electrostatic protection

The NZ2520 series employ C-MOS ICs for the active element. Please use them in static-free environments.

9.4 High temperature

Normal operation cannot be guaranteed for the NZ2520 series at +125 $^{\circ}$ C (for 24 hours). Be sure that the units are kept within the specified temperature range.

9.5 Cleaning

Basically, the NZ2520 series are applicable for ultrasonic wave cleaning. However, in some case, during ultrasonic wave cleanings, internal design may get damage. Please check condition carefully beforehand.

9.6 Other

The NZ2520 series are C-MOS applied products. And careful handling(same as with C-MOS IC) are needed to avoid electrostatic problems.

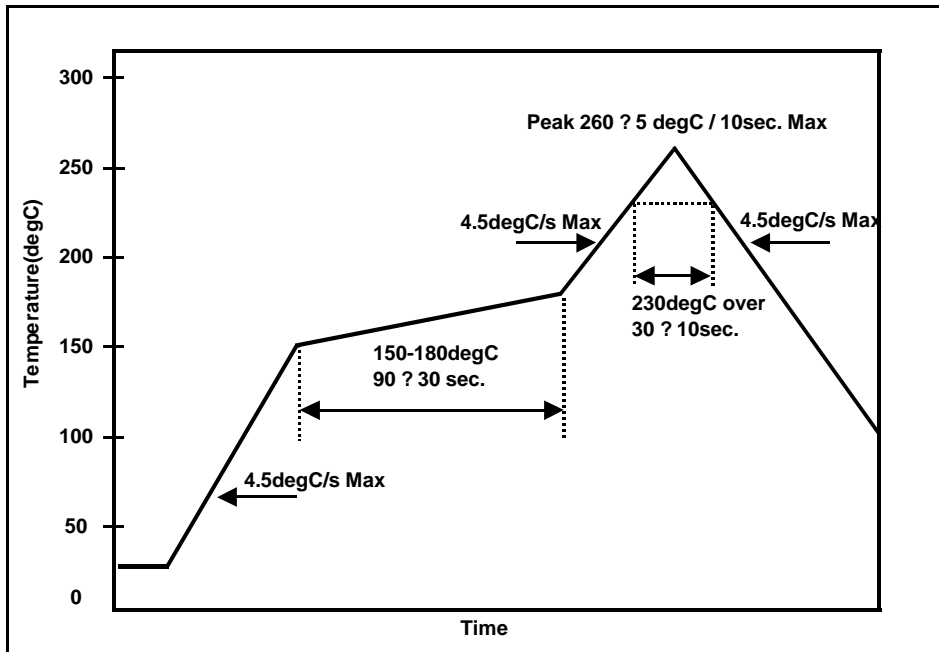
Incorrect PAD connection is cause of trouble. Please make sure to connect correctly as below.

#2 terminal \rightarrow GND

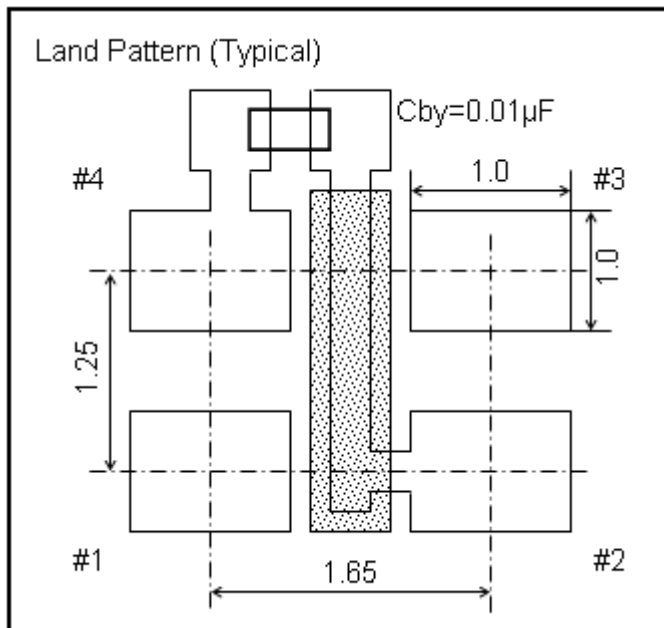
#4 terminal \rightarrow V_{CC}

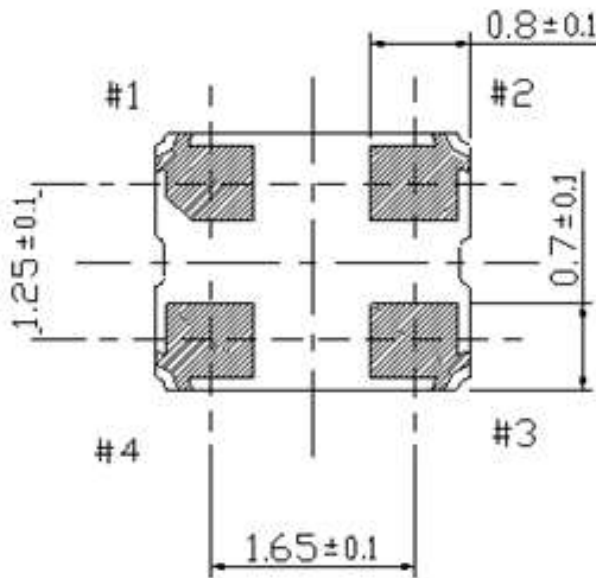
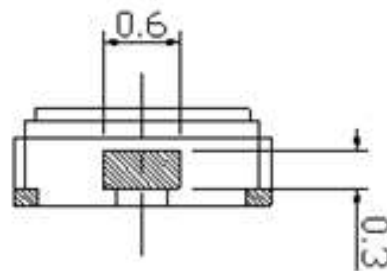
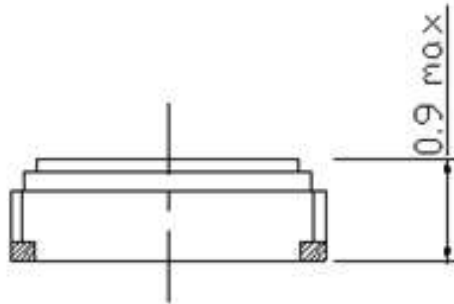
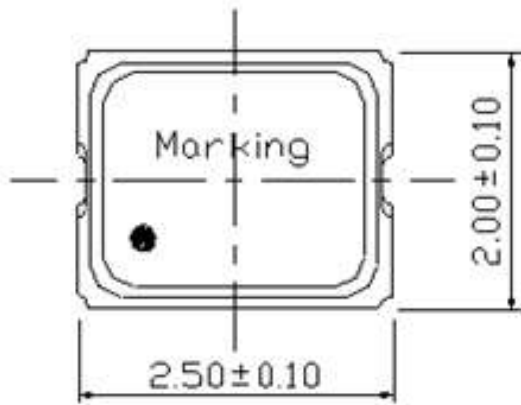
10. Order items are manufactured according to specification. As to conditions, which are not indicated in this specification and unpredictable such as applied condition and oscillation margin, please check them beforehand.

*Example For Soldering Conditions (The below graph corresponds to Pb free solder)



* Recommended footprint [mm]



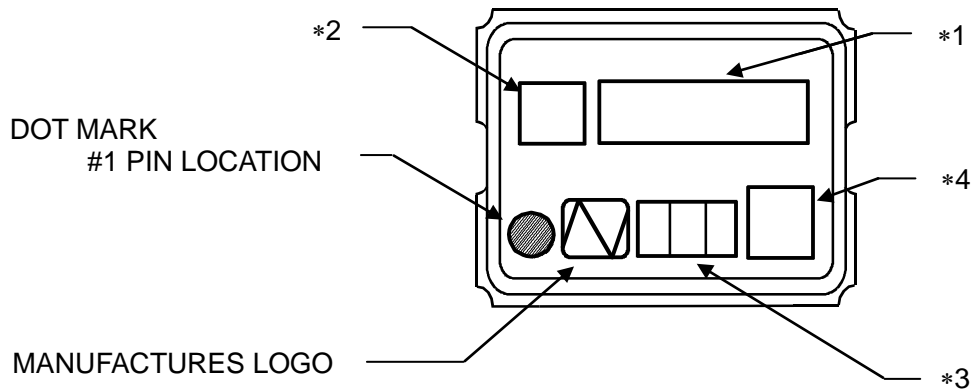


Terminal land connections

#1	STAND-BY
#2	GND
#3	OUTPUT
#4	V _{CC}

	Date of Revise	Charge	Approved	Reason	
C	2.Aug.2012	Y.Oishi	C.Ishimaru	Change V _{DD} →V _{CC} , PAD CONNECTIONS→Terminal land connections	
	Date	Name	Third Angle Projection	Tolerance	
Drawn	23.Oct.2003	M.Yamaguchi	Dimension : mm	-----	
Designed	27.Jun.2003	M.Yamaguchi	Title NZ2520S Dimension of External	Drawing No. EKD14B-00027	
Checked	-----	-----			Rev. C
Approved	23.Oct.2003	H.Omata			

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***1 [FREQUENCY]**

Digits are two and 3rd digit will be omitted.
 kHz unit sign is marked.
 ex,) 32.768kHz → 32K

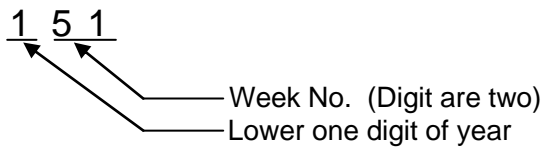
***2 [MODEL MARK]**

A last digit of model is marked. →

[MODEL MARK]	
NZ2520SA	→ Space
NZ2520SB	→ B
NZ2520SC	→ C
NZ2520SD	→ D
NZ2520SEA	→ E
NZ2520SF	→ F
NZ2520SG	→ G

***3 [WEEK CODE (Digit are three)]**

ex,) In case of 51st week of 2011.



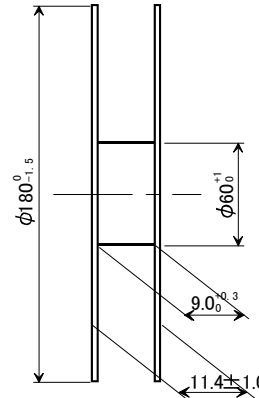
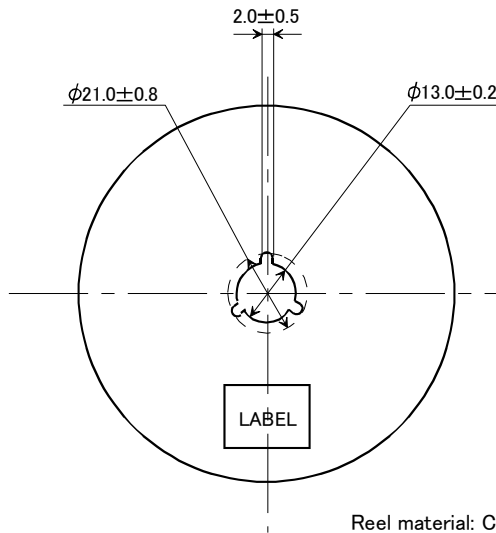
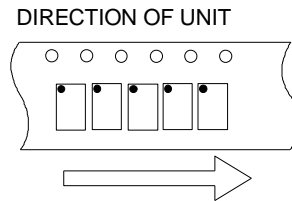
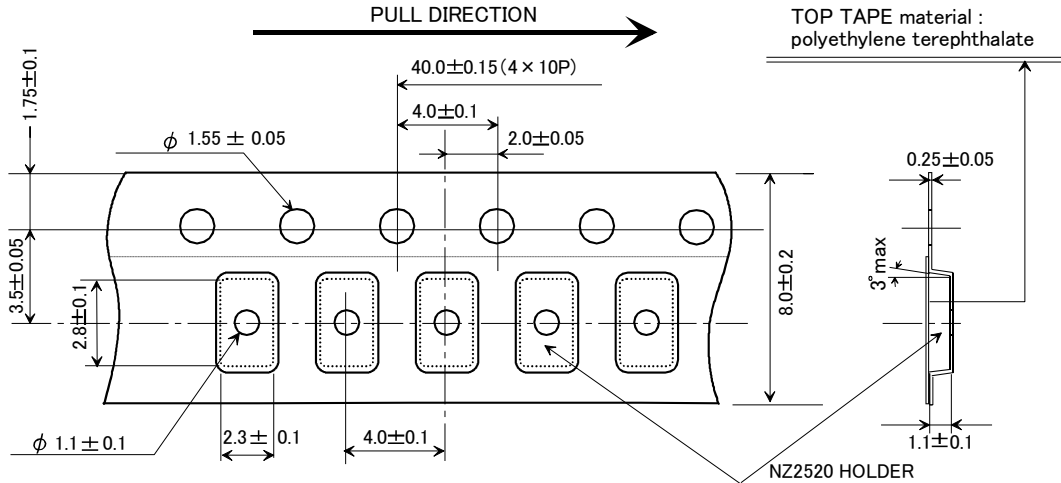
***4 [Trace code]**

Trace code consists of four digits number or letter.
 This code indicates production date and production line number.

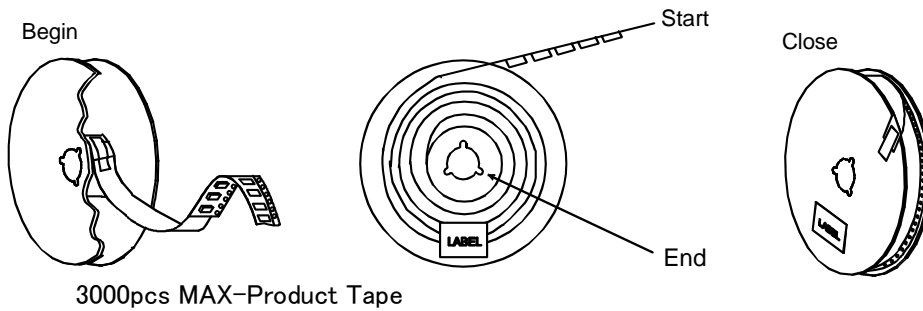
Date of Revise	Charge	Approved	Reason
A	2011.Mar.30	Y.Oishi	C.Ishimaru
*1: Digit are five→Digit are two. kHz unit sign is addition.			
Date	Name	Third Angle Projection	Tolerance
Drawn	2011.Dec.20	Y.Oishi	mm
Designed	2011.Dec.20	Y.Oishi	Title
Checked	2011.Dec.20	K.Gen	Drawing No.
Approved	2011.Dec.20	C.Ishimaru	NZ2520S(kHz) Marking
		EKH11B-00113	
		Rev.	
		A	

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Environmental Test Conditions	Specification
1. Thermal Shock Test 1 cycle: -40°C (30 minutes) ~ +85°C(30 minutes) Number of cycle: 100 cycle.	*1
2. High Temperature High Humidity Test Temperature : +85°C, Humidity : 80 ~ 85%, Time : 250 hours.	*1
3. +85°C Aging (Non Operating) Temperature : +85°C, Time : 500 Hours.	*1
4. Vibration Test MIL-STD-202F test method:204D Test condition : D 10 ~ 2000Hz, 1.52mmp-p, or 196m/s ² 20 minutes/cycle, XYZ 3 directions 4 times.	*1
5. Shock Test MIL-STD-202F test method : 213B Test condition : Half sinusoidal wave 29400m/s ² , 0.3ms, 3 directions, 3 times each.	*1
6. Drop Test (JIG attachment) Dummy load : 200g, Height : 1.5m, Fall conditions : On concrete The number of times of fall : Six directions and 1 time each are made into 1 cycle, and it is 10 cycle.	*1
7. Soldering Test (Reflow) Pre heat : 150±10°C, 60~120sec. Main heat : 30±1 seconds after amounting to 215 °C. Peak temperature : 240°C	More than 90% of should be covered by solder.
8. Soldering Resistance (Reflow) Pre heat : 180±10°C, 120 sec min, Main heat : 225°C min, 70sec max. Peak temperature : 260°C . Reflow time : 3 times.	*1
<p>*1 After the test mentioned above, the electrical specifications are satisfied. Also frequency deviation before and after test should be</p> $\Delta F/F \leq \pm 10 \times 10^{-6}$ <p>The electrical specifications are I_{CC}, T_r/T_f, V_{OL}/V_{OH}, duty cycle, stand-by function, stand-by current consumption.</p>	



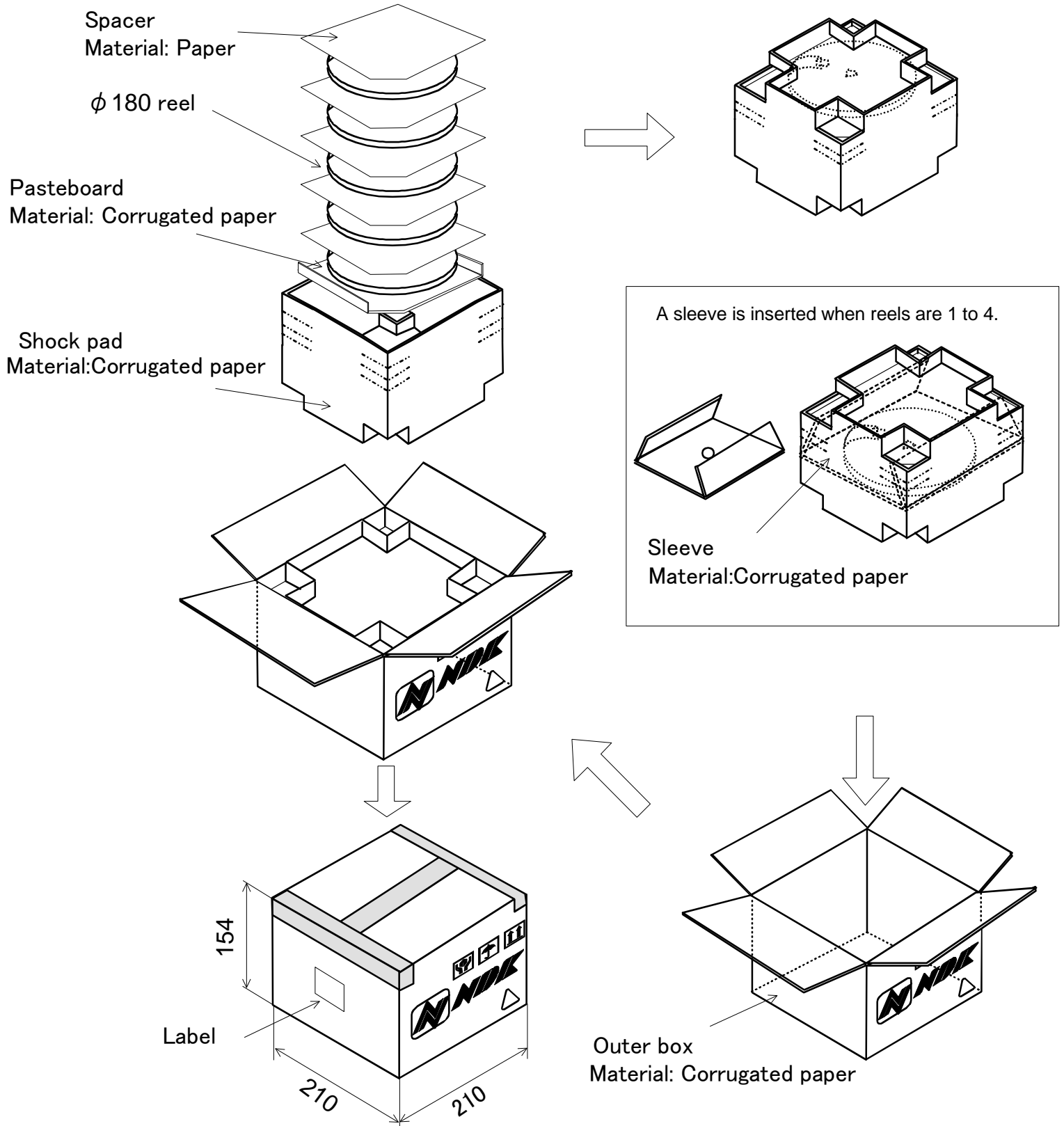
Reel material: Conductive PS
EIAJ standard reel



3000pcs MAX-Product Tape

	Date of Revise	Charge	Approved	Reason
C	5.Sep.2012	Y.Oishi	C.Ishimaru	3000pcs-Product Tape→3000pcs MAX-Product Tape.
	Date	Name	Third Angle Projection	Tolerance
Drawn	7.Oct.2003	Y.Okajima	Dimension:mm	Scale
Designed	7.Oct.2003	Y.Okajima	Title	Drawing No.
Checked			NZ2520 Taping and Reel Spec.	EKK17B-00032
Approved	7.Oct.2003	H.Omata		
				C

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

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