Crystal Bridge to the Future

RoHS Compliant
Directive 2011/65/EU
Directive (EU) 2015/863

SPECIFICATION

Customer: SANKYOKU ELECTRONICS (HK) LTD.

Item:	Quartz Crystal Controlled Oscillators
Type:	NT7050BC
Nominal Frequency:	40.000 MHz
Customer's Spec. No.:	---
NDK Spec. No.:	NCS5176B

Receipt

Revision Record

Rev.	Date	Items	Contents	Approved	Checked	Drawn
---	4.Sep.2019	Issue	---	T.Matsumoto	Y.Sato	A.Iketani

This is specification of temperature compensated crystal oscillator.

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

2. NDK Spec. No. : NCS5176B

3. Type : NT7050BC

4. External Dimension : ETD14B-01521

5. Rating

5.1 Nominal Frequency (f_{nom})

40.000 MHz

5.2 Supply Voltage (V_{CC})

DC+3.3 V±5 %

5.3 Output Load Condition (C_L)

15 pF±10 %

5.4 Operating Temperature Range (T_{opr})

-40 °C to +105 °C

5.5 Storage Temperature Range (T_{str})

-55 °C to +125 °C

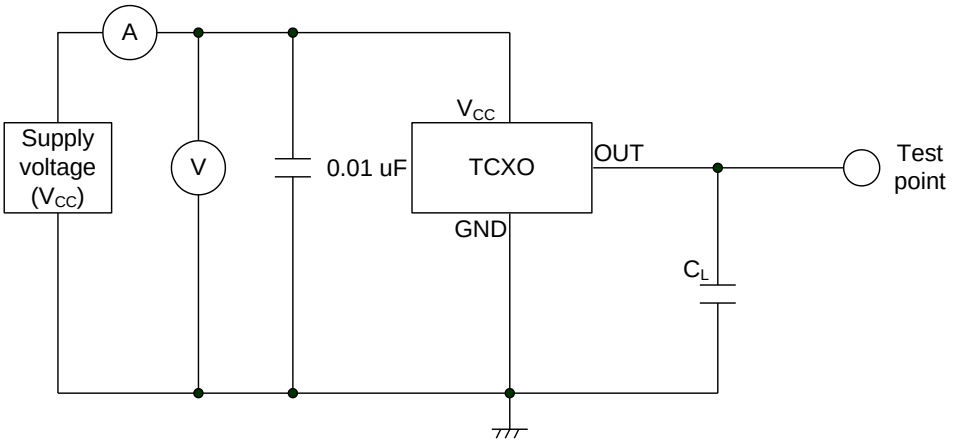
6. Electrical Specification

Unless otherwise specified, measuring condition T = +25±2 °C, V_{CC} =+3.3 V, C_L = 15 pF.

	Item	Symbol	Condition	Spec. Value		Unit
				Min.	Max.	
6.1	Current Consumption	I_{CC}	-	-	10	mA
6.2	Overall Frequency Tolerance		Total of 6.2.1 to 6.2.5	-4.6	+4.6	ppm
	6.2.1 Frequency Tolerance	$\Delta f/f_{nom}$	(*1)	-	-	ppm
	6.2.2 Frequency/Temperature Characteristics	$\Delta f/f$	-40 °C to +105 °C (*2)	-0.1	+0.1	ppm
	6.2.3 Frequency/Voltage Coefficient	$\Delta f/f$	DC+3.3 V±5 % (*3)	-	-	ppm
	6.2.4 Frequency/Load Coefficient	$\Delta f/f$	15 pF±10 % (*3)	-	-	ppm
	6.2.5 Long-Term Frequency Stability	$\Delta f/f$	15 years (*4)	-	-	ppm
6.3	Output		CMOS			
	6.3.1 Output Voltage (Square)	V_{OH}	-	90 % V_{CC}	-	V
		V_{OL}	-	-	10 % V_{CC}	V
	6.3.2 Symmetry	SYM	50 % V_{CC}	40	60	%
	6.3.3 Rise Time	t_r	10 % to 90 % V_{CC}	-	8	ns
	6.3.4 Fall Time	t_f	90 % to 10 % V_{CC}	-	8	ns
6.4	Enable/Disable Function	Open or Min. 70 % V_{CC}		Enable		
		Max. 30 % V_{CC}		Disable		

(*1) $\Delta f/f_{nom}$: Frequency shift at T = +25±2 °C, V_{CC} =+3.3 V, C_L = 15 pF from nominal frequency (f_{nom}).
(*2) $\Delta f/f$: Frequency shift from the reference frequency at (Fmax + Fmin)/2.
(*3) $\Delta f/f$: Frequency shift from the reference frequency at T = +25±2 °C, V_{CC} =+3.3 V, C_L = 15 pF.
(*4) $\Delta f/f$: Frequency shift from the reference frequency at T = +25±2 °C, V_{CC} =+3.3 V, C_L = 15 pF, after 24 h operation.

7. Test circuit



C_L=15 pF including impedance of probe and jig.

Fig.1 Test Circuit

8. Environmental Conditions

	Item	Condition	Specification
8.1	Vibration Test	IEC60068-2-6,test Fc 10 to 500 Hz, 98.1 m/s^2, 2 hours, 3 directions.	After following test, Complies with all items of electrical characteristic specification.
8.2	Shock Test	IEC60068-2-27,test Ea 981 m/s^2,6 ms, Half Sine, 3 bumps, 6 directions.	

9. Marking Drawing
ETH11B-00685

10. Moisture Sensitivity Level
Level 3 (Compliant with J-STD-020)

11. Packing
ETK17B-00436

12. Notes on use
12.1 Even if the appearance color etc. of the product differs by purchasing the component parts by more than two companies, there is no influence on the characteristics and reliability.
12.2 IN THE CASE OF THE FOLLOWING ITEMS, WE ARE NOT RESPONSIBLE FOR WARRANTY / COMPENSATION.

(1) WHEN PRODUCTS OF THIS SPECIFICATION ARE USED FOR EQUIPMENT RELATED TO HUMAN LIFE OR PROPERTY, IT IS THE RESPONSIBILITY OF THE CUSTOMER TO CONFIRM THE INFLUENCE ON THIS PRODUCT AND EQUIPMENT TO BE USED BEFOREHAND, CONDUCT NECESSARY SAFETY DESIGN (INCLUDING REDUNDANT DESIGN, MALFUNCTION PREVENTION DESIGN, etc.), AND PLEASE USE IT AFTER SECURING SUFFICIENT SAFETY OF EQUIPMENT.

1. SAFETY-RELATED EQUIPMENT SUCH AS AUTOMOBILES, TRAINS, SHIPS, etc., OR EQUIPMENT DIRECTLY INVOLVED IN OPERATION
2. AIRCRAFT EQUIPMENT
3. SPACE EQUIPMENT
4. MEDICAL EQUIPMENT
5. MILITARY EQUIPMENT
6. DISASTER PREVENTION / CRIME PREVENTION EQUIPMENT
7. TRAFFIC LIGHT
8. OTHER EQUIPMENT REQUIRING THE SAME PERFORMANCE AS THE BOVE-MENTIONED EQUIPMENT

(2) IN CASES WHERE IT IS NOT INDICATED IN THE REQUESTED STANDARD AND IS USED UNDER CONDITIONS OF USE (INCLUDING CIRCUIT MARGIN etc.) THAT CAN NOT BE PREDICTED AT THE PRODUCTION STAGE.

(3) WHEN USING ULTRASONIC WELDING MACHINE. (THERE IS A POSSIBILITY THAT THE CHARACTERISTIC DEGRADATION IS CAUSED BY THE RESONANCE PHENOMENON OF THE PIEZOELECTORIC MATERIAL.
(EXAMPLE; CRYSTAL PIECE))
WE WILL NOT TAKE ANY RESPONSIBILITY FOR THE INFLUENCE OF THE CUSTOMERS' PROCESS.
SO, PLEASE SUFFICIENTLY EVALUATE AT A SAMPLE STEP WHEN YOU USE ULTRASONIC WELDING MACHINE.

(4) USING RESIN MOLD MAY AFFECT THE PRODUCT CHARACTERISTIC.
PLEASE MAKE SURE TO TELL OUR SALES CONTACT WHEN YOU USE RESIN MOLD. WE WILL PERFORM INDIVIDUAL CORRESPONDENCE ABOUT A DELIVERY SPECIFICATION AND AN EVALUATION METHOD.
IN ADDITION, IF YOU USE RESIN MOLD WITHOUT CONTACTING US, AND CAUSES DAMAGES AGAINST A CUSTOMER OR A THIRD PARTY, WE WILL NOT BE LIABLE FOR THE DAMAGES AND OTHER RESPONSIBILITIES BECAUSE WE CONSIDER IT IS UNDER SELF-RESPONSIBILITY USING RESIN MOLD.
WE WILL NOT TAKE ANY RESPONSIBILITY FOR THE INFLUENCE OF THE CUSTOMERS' PROCESS. PLEASE SUFFICIENTLY EVALUATE AT A SAMPLE STEP WHEN YOU USE RESIN MOLD.

(5) WHEN PERFORMING IMPROPER HANDLING THAT EXCEEDS THE GUARANTEED RANGE.

12.3 This product cannot be used for automotive applications.
We have other products available for automotive applications so please contact us.

13. Notes on storage

13.1 When storing the product in high temperature and high humidity condition for a long time, product characteristics (solderability etc.) and packaging condition may be deteriorated. Please store product at temperature + 5 °C ~ + 35 °C, humidity 85 % RH or less. The product is an electronic component, so please do not storage and use, under a dewing state.

13.2 The product storage deadline is 12 months after delivery in unopened state. Please use within storage deadline. If you exceed storage deadline, please check the product characteristics etc, please use.

14. Other Requests

14.1 Please use this specification only for confirmation of the specification of this product.

14.2 If there is a change request, please contact within three weeks from issue date. If there is no communication, we will deliver the product under the contents of this specification. In addition, if the product delivery date is within 3 weeks and there is a change request, we will consult the processing separately.

14.3 NOTES THAT ARE DESCRIBED IN THIS DOCUMENT, IF YOU DID NOT COMPLY WITH THE PROHIBITIONS, AND OTHER PLEASE, INCLUDING THE FAILURE CORRESPONDENCE OR COMPENSATION OR DAMAGES, WE CAN NOT ASSUME THE RESPONSIBILITY, PLEASE UNDERSTAND.

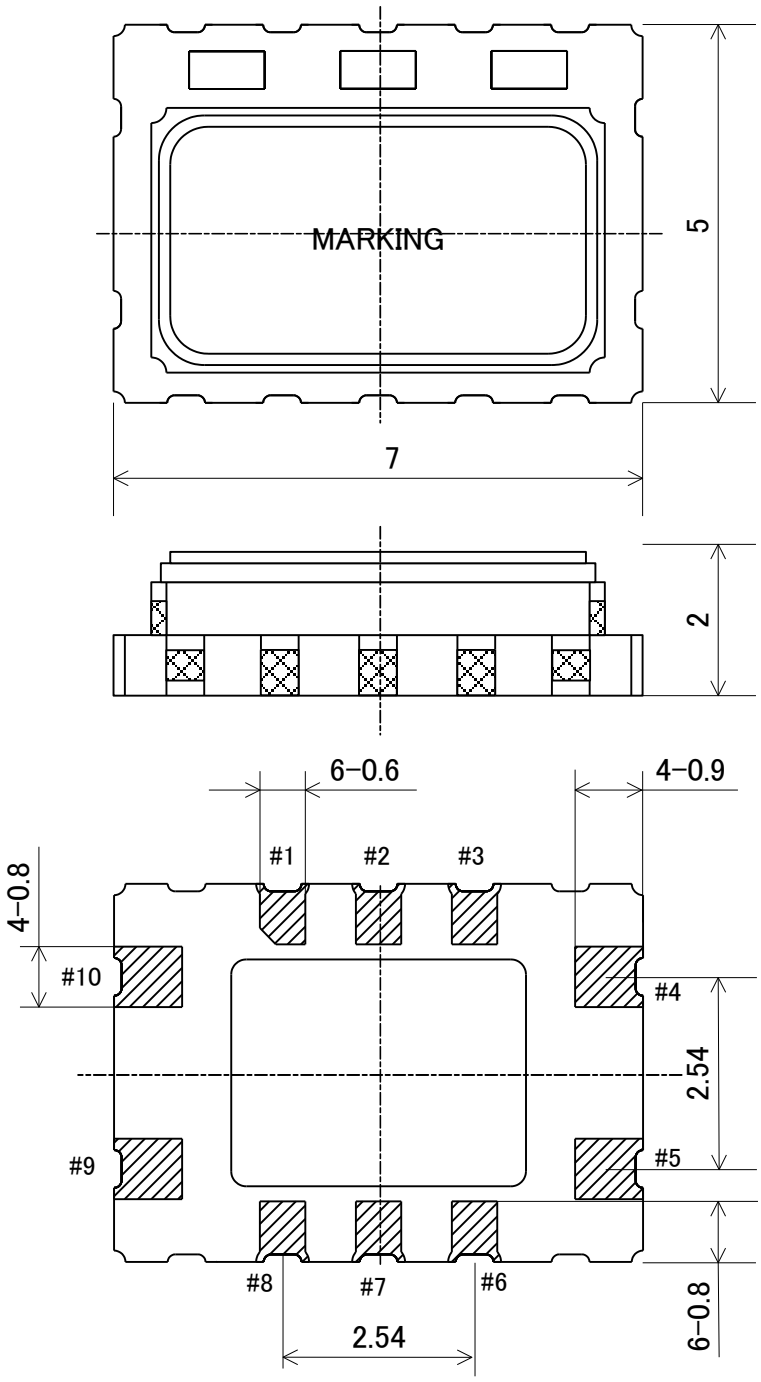
15. Prohibited items

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: 260 °C /10 s
Heating: 225 °C or higher/30 s
Preheating: 150 °C to 180 °C /120 s
Reflow passage times: twice
Please do not reflow the board upside down after mounting them.
(The products themselves or their covers may fall off.)

(2) Manual soldering heat resistance
Press a soldering iron of 350 °C on the terminal electrode for five seconds (twice).

(3) Washing
This product does not correspond to rinsing.



Pin Connection

#1	Do not connect	*1
#2	NC	
#3	NC	
#4	GND	
#5	OUTPUT	
#6	Do not connect	*1
#7	NC	
#8	Enable/Disable	
#9	VCC	*2
#10	Do not connect	*1

*1 Please do not connect with terminal.
*2 Please connect a 0.01 uF bypass capacitor near the VCC terminal.

	Date of Revise	Charge	Approved	Reason

	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	14.Jul.2011	T.Terashima	Dimension: mm	±0.2	10/1
Designed	14.Jul.2011	T.Terashima	Title	Drawing No.	Rev.
Checked	-----	-----	**External Dimension**	**ETD14B-01521**	
Approved	14.Jul.2011	Y.Yokozeki			

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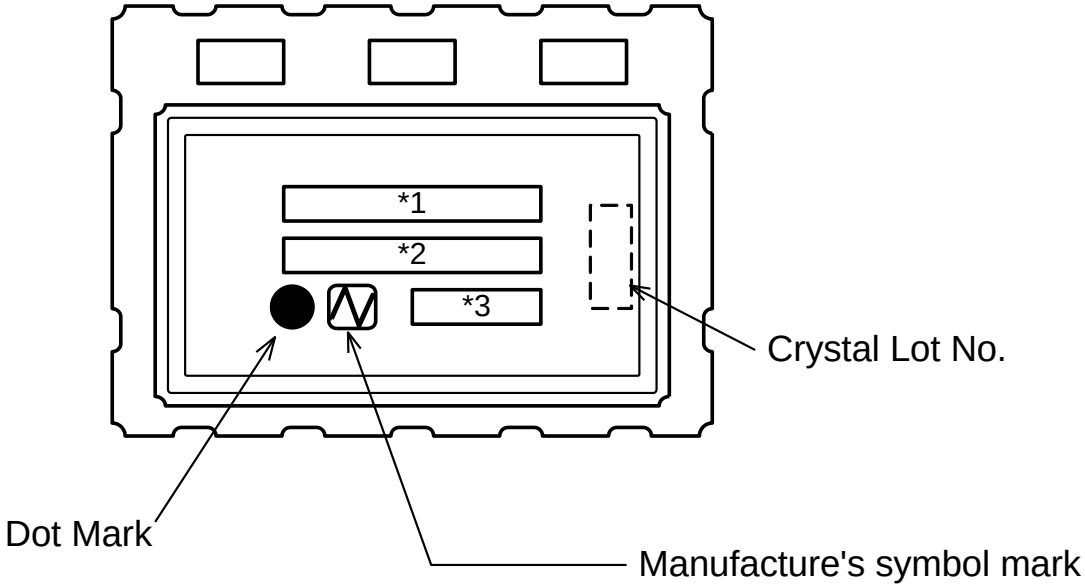
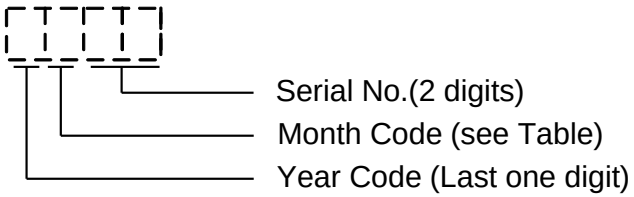


*1 Type

*2 Nominal frequency (5 digits, a unit (MHz) is not written)

*3 Oscillator Lot No.



Month	1	2	3	4	5	6	7	8	9	10	11	12
Month Code	1	2	3	4	5	6	7	8	9	O	N	D

	Date of Revise	Charge	Approved	Reason
A				

	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	16.Jul.2019	N.Sekine	Dimension:mm	-	-
Designed	16.Jul.2019	N.Sekine	Title	Drawing No.	Rev.
Checked	16.Jul.2019	Y.Sato	**Marking Drawing**	**ETH11B-00685**	
Approved	16.Jul.2019	T.Matsumoto			

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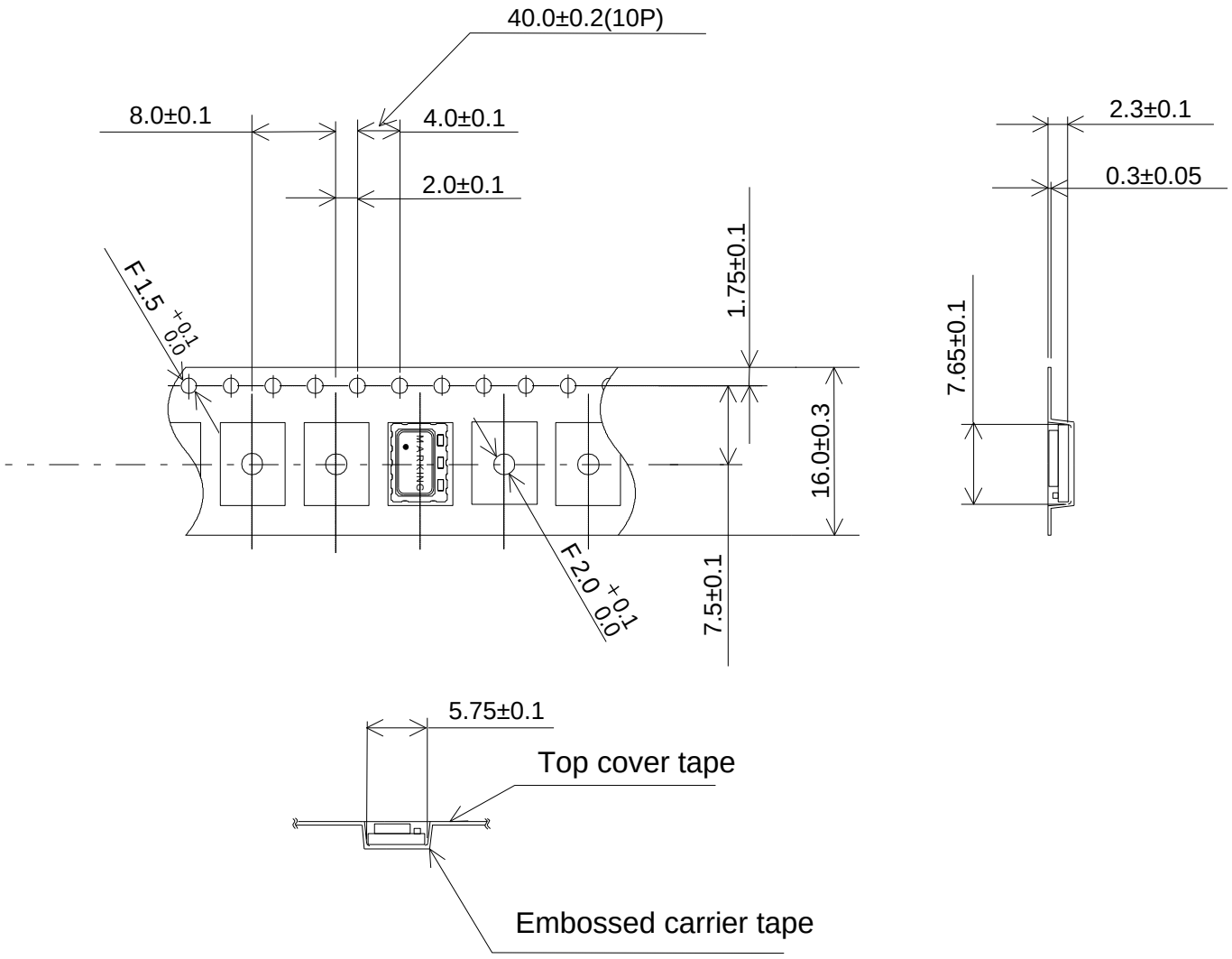

	Embossed carrier tape	Top cover tape
Materials	PS	PET+PE+Adhesive layer
Disposition	Antistatic	Antistatic

	Date of Revise	Charge	Approved	Reason
A				

	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	11.May.2016	N.Sekine	Dimension:mm	---	---
Designed	11.May.2016	N.Sekine	Title	Drawing No.	Rev.
Checked	11.May.2016	A.Nakamura	**Packing**	**ETK17B-00436 (1/4)**	
Approved	11.May.2016	T.Matsumoto			

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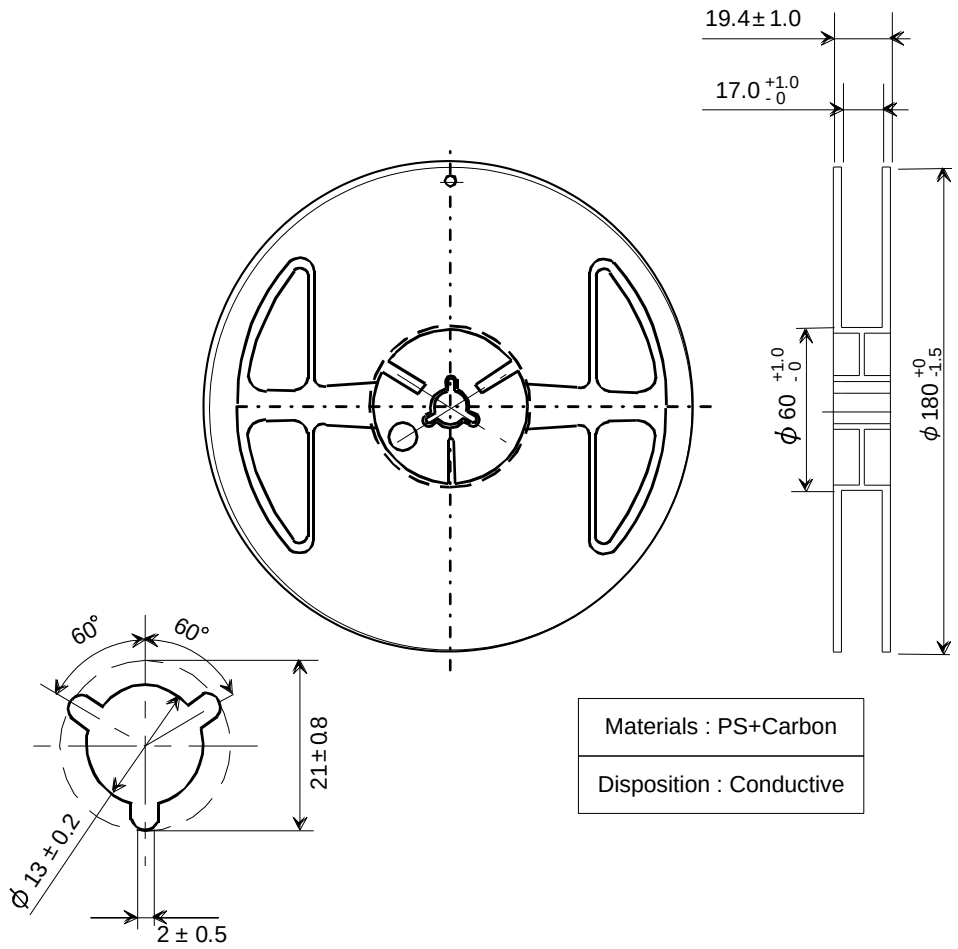
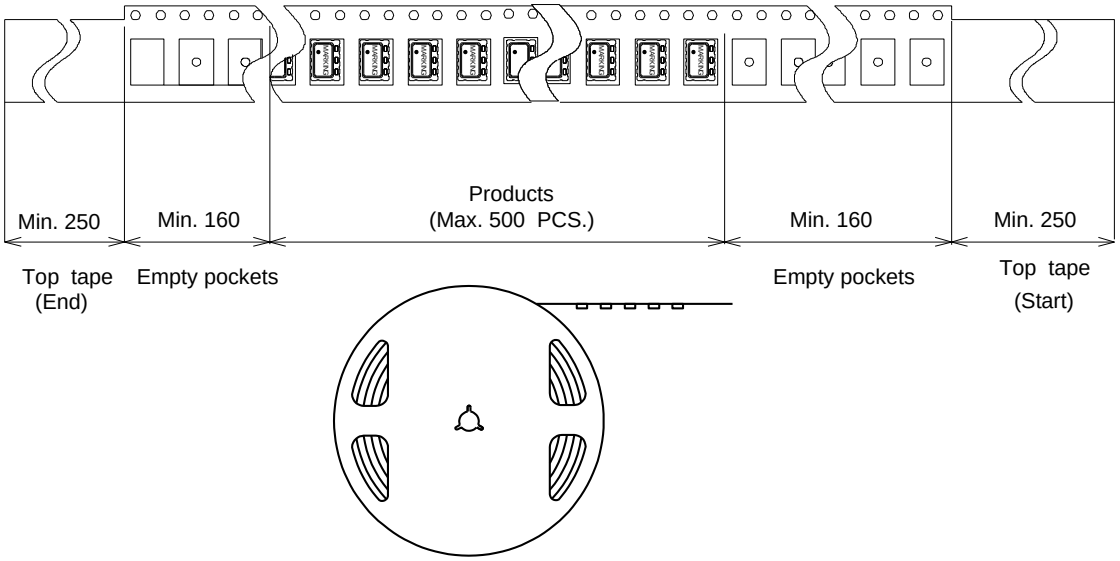


Materials : PS+Carbon
Disposition : Conductive



	Date of Revise	Charge	Approved	Reason
A				

	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	11.May.2016	N.Sekine	Dimension:mm	---	---
Designed	11.May.2016	N.Sekine	Title	Drawing No.	Rev.
Checked	11.May.2016	A.Nakamura	**Packing**	**ETK17B-00436 (2/4)**	
Approved	11.May.2016	T.Matsumoto			

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Tape break force, peel strength and angle

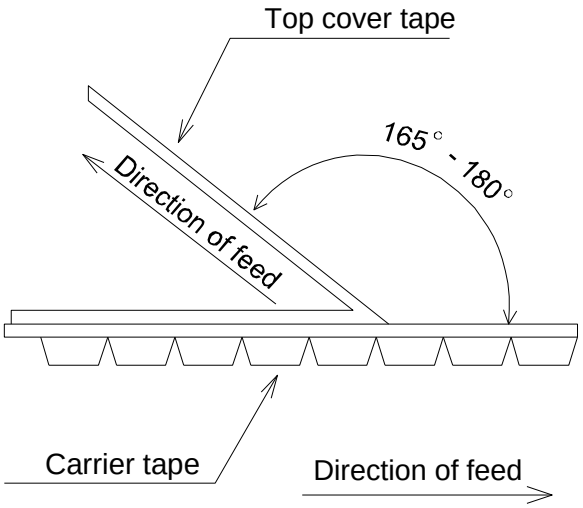
Required setting:

Tape break force: Min 10 N

Top cover tape strength: Min 10 N

Top cover tape peel force : 0.1-1.3 N(0.1-1.0 for 8 mm carrier tapes), at a peel speed of 300 +/-10 mm/min.

Angle between the top cover tape and the direction of feed during peel off.
165-180°



The cover tapes not extend over the edge of the carrier tape or cover any part of the sprocket holes.

	Date of Revise	Charge	Approved	Reason
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	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	11.May.2016	N.Sekine	Dimension:mm	---	---
Designed	11.May.2016	N.Sekine	Title	Drawing No.	Rev.
Checked	11.May.2016	A.Nakamura	**Packing**	**ETK17B-00436 (3/4)**	
Approved	11.May.2016	T.Matsumoto			

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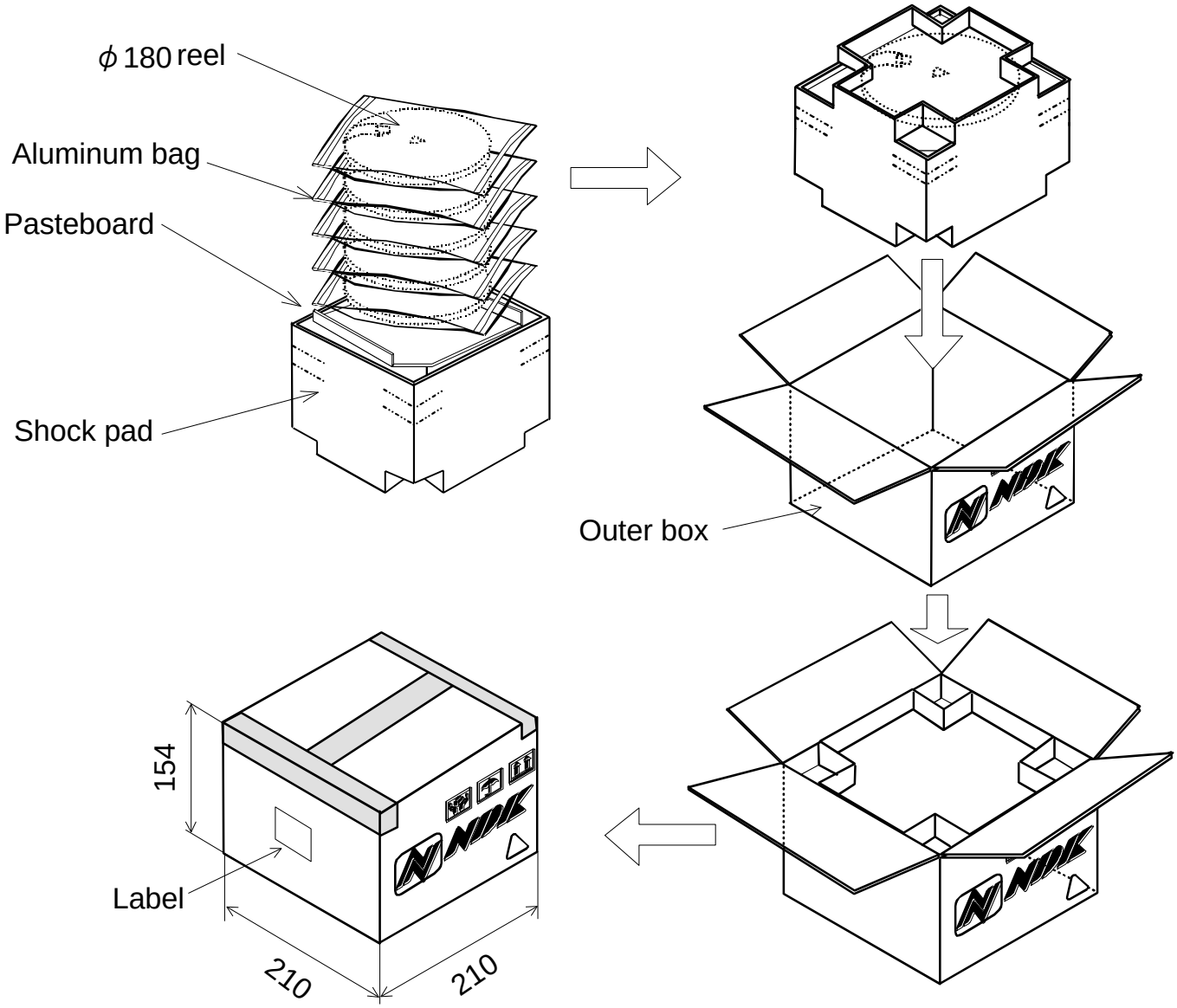

	Date of Revise	Charge	Approved	Reason
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	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	11.May.2016	N.Sekine	Dimension:mm	---	---
Designed	11.May.2016	N.Sekine	Title	Drawing No.	Rev.
Checked	11.May.2016	A.Nakamura	**Packing**	**ETK17B-00436 (4/4)**	
Approved	11.May.2016	T.Matsumoto			

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