COMBA TELECOM SYSTEMS (CHINA) LTD.

RECIPIENT

SPECIFICATIONS

MODEL : **TG-5501CA-15N 40MHz**

SPEC. No. : **A13-453-0B**

DATE: **Aug. 22. 2013**

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SPECIFICATIONS

1. Application

This document is applicable to the temperature compensated crystal oscillator (TCXO) that is delivered to **COMBA TELECOM SYSTEMS (CHINA) LTD.** from SEIKO EPSON Corp.

This product is compliant with RoHS Directive.

This Product supplied (and any technical information furnished, if any) by SEIKO EPSON Corporation shall not be used for the development and manufacture of weapon of mass destruction or for other military purposes. Making available such products and technology to any third party who may use such products or technologies for the said purposes are also prohibited.

This product listed here is designed as components or parts for electronics equipment in general consumer use. We do not expect that any of these products would be incorporated or otherwise used as a component or part for the equipment, which requires an extra high reliability, such as satellite, rocket and other space systems, and medical equipment, the functional purpose of which is to keep life.

2. Model

The model is **TG-5501CA-15N 40.000M**

3. Packing

It is subject to the packing standard of SEIKO EPSON Corp.

4. Amendment and abolishment

Amendment and/or abolishment of this specification are subject to the agreement of both parties.

5. Contents

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[1] Characteristics

- Lead Free Reflowable SMD (7.0 × 5.0 × 1.7 mm).
- Using the heat-resisting type AT cut quartz crystal allows almost the same temperature soldering as universal SMD IC.
- Operating supply voltage : 3.3 V.

[2] Absolute maximum ratings

Parameter	Symbol	Value	Unit	Note
Supply voltage	V_{CC}-GND	-0.6 to 6.0	V	
Storage temperature range	$T_{_STG}$	-40 to +90	°C	

[3] Operating range

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Power voltage	V_{CC}	3.135	3.300	3.465	V	Vcc=3.3 V± 5 %
	GND	0.0	-	0.0	V	
Operating temperature range	T_use	-40	+25	+85	°C	
Output load	Load_R	9	10	11	Ω	
	Load_C	9	10	11	pF	

[4] Frequency characteristics

1) Output frequency 40.000000 MHz

2) Frequency characteristics

(V_{CC} = 3.3 V, GND = 0.0 V, Load:10 kΩ //10 pF, T_use = +25 °C)

Parameter	Symbol	Value	Note
Frequency tolerance .	f_tol(OSC)	± 1.0×10^{-6} Max.	T_use =+25 °C ± 2 °C Before reflow cycle
Reflow shift	-	± 1.0×10^{-6} Max.	T_use = +25 *C ± 2 *C Reflow cycle : 2time *1
Frequency / temperature coefficient	fo-Tc	± 1.0×10^{-6} Max.	T_use =-40 °C to +85 °C Based on frequency at +25 °C
Frequency / Load coefficient	fo-Load	± 0.2×10^{-6} Max.	Load : 10 kΩ // 10 pF ± 10% each
Frequency / voltage coefficient	fo-Vcc	± 0.2×10^{-6} Max.	V_{CC}= 3.3 ± 5 %
Long term stability	f_age	± 1.0×10^{-6} Max.	First year T_use =+25 *C

*1 Measurement of frequency deviation is made 24 h after reflow soldering.

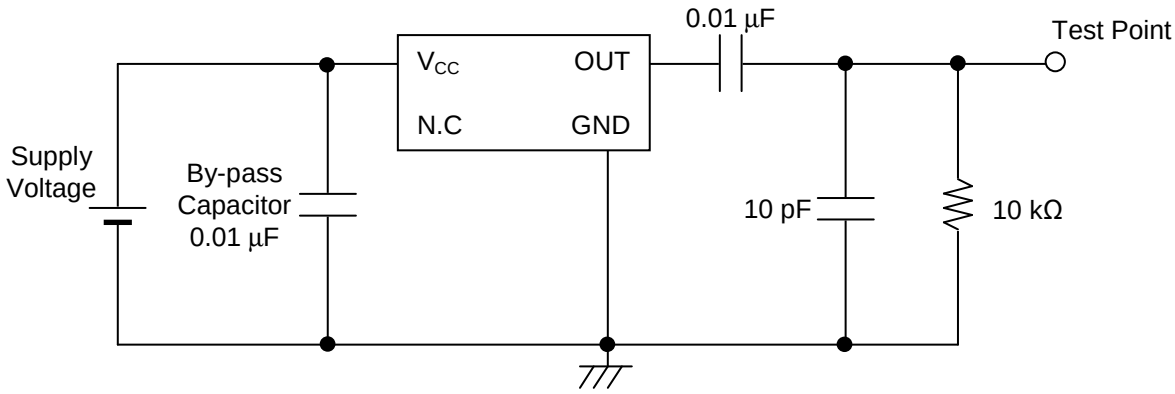
[5] Electrical characteristics

(V_{CC} = 3.3 V, GND = 0.0 V, Load:10 kΩ //10 pF, T_use = +25 °C)

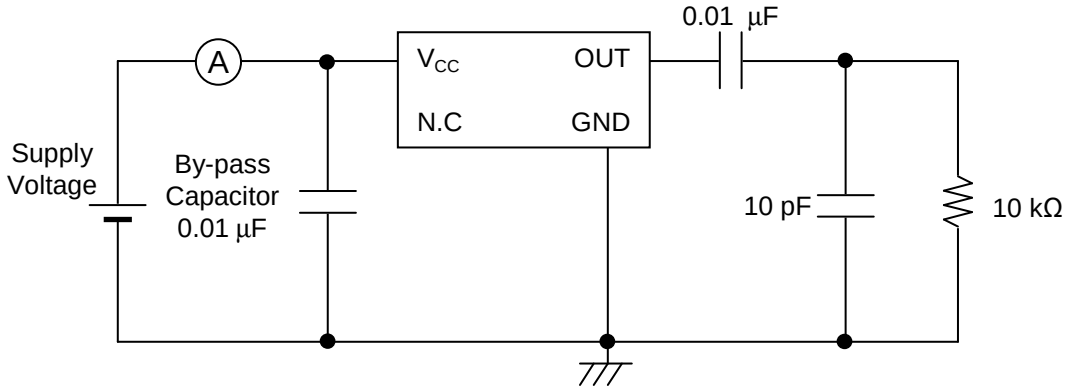
Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Current consumption	Icc	-	-	6.0	mA	
Output waveform	-	Clipped sine wave				
Output level	p-p	0.8	-	-	Vp-p	
SSB Phase noise	L(f)	-	-43	-	dBc/Hz	Offset:1 Hz
		-	-76	-		Offset:10 Hz
		-	-105	-		Offset:100 Hz
		-	-128	-		Offset:1 kHz
			-145			Offset:10 kHz
			-150			Offset:100 kHz
		-	-150	-		Offset:1 MHz

[6] Test circuit

1) Output level



2) Current consumption



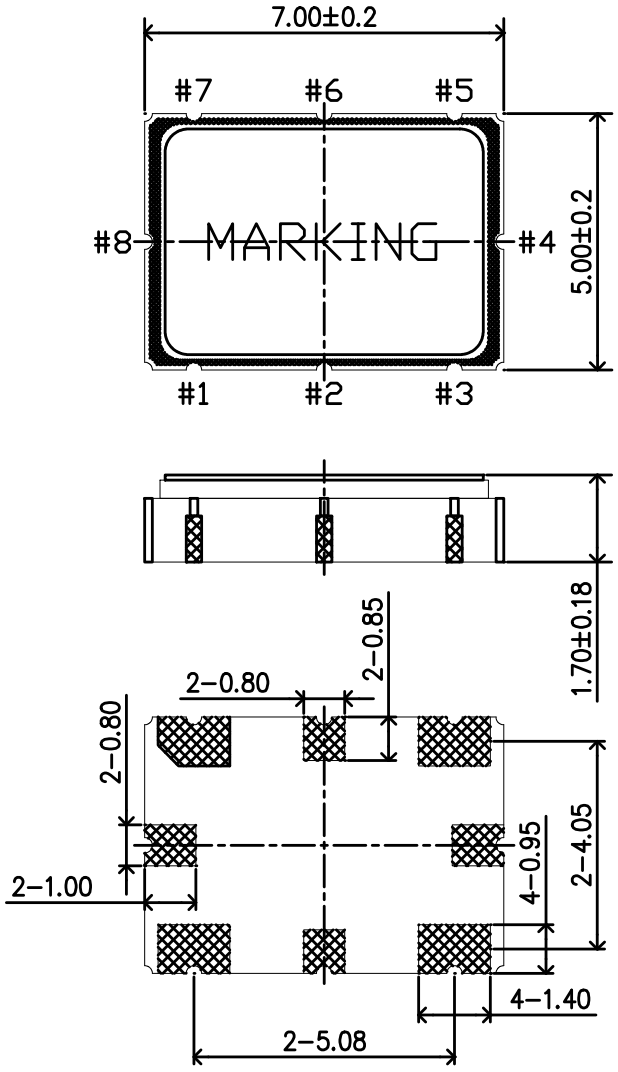
3) Conditions

1. Oscilloscope : Impedance Min. 1 MΩ
   Input capacitance Max. 10 pF
   Band width Min. 300 MHz

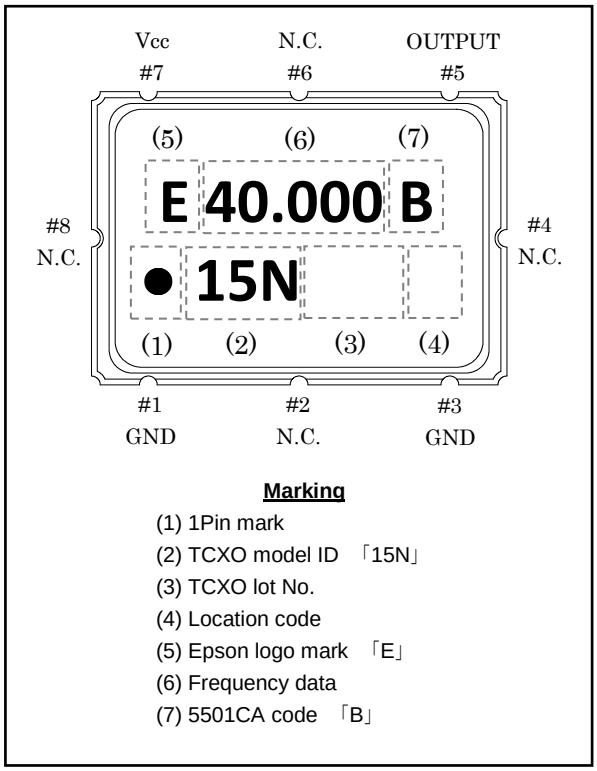
   Impossible to measure both frequency and wave form at the same time.(In case of using oscilloscope's amplifier output, possible to measure both at the same time.)
2. CL includes probe capacitance.
3. A capacitor (By-pass:0.01µF) is placed between V_{CC} and GND, and closely to TCXO.
4. Use the current meter whose internal impedance value is small.
5. Power Supply

   Impedance of power supply should be as lowest as possible.
6. GND should apply one point earth.

[7] Dimensions And Marking Layout



(unit : mm)



Marking

(1) 1Pin mark
(2) TCXO model ID 「15N」
(3) TCXO lot No.
(4) Location code
(5) Epson logo mark 「E」
(6) Frequency data
(7) 5501CA code 「B」

Pin Connections	
#1	N.C.
#2	N.C.
#3	GND
#4	N.C.
#5	OUTPUT
#6	N.C
#7	Vcc
#8	N.C

Material

Ceramics(base)
Au coated nickel(terminal)
Fe-Ni-Co(lid)

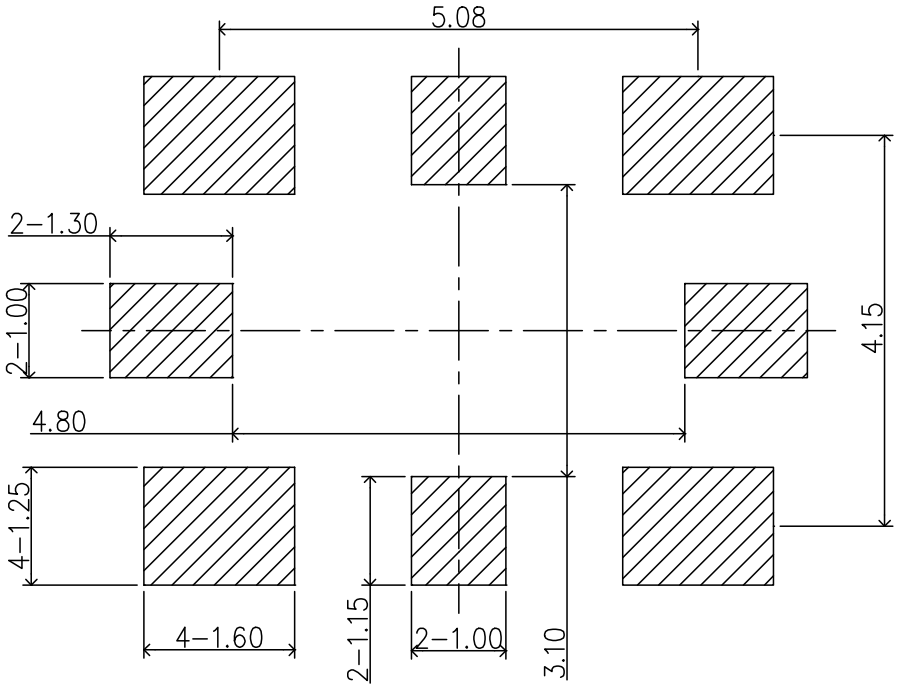
[8] Recommendable patterning

For actual design work, please consider optimum condition together with mounting density, reliability of soldering and mount ability etc.

Do not design any patterns .

Soldering position

Unit: mm



[9] Handling precautions

Prior to using this product, please carefully read the section entitled “Precautions” on our Web site (http://www5.epsondevice.com/en/quartz/tech/precaution/) for instructions on how to handle and use the product properly to ensure optimal performance of the product in your equipment. Before using the product under any conditions other than those specified therein, please consult with us to verify and confirm that the performance of the product will not be negatively affected by use under such conditions.

In addition to the foregoing precautions, in order to avoid the deteriorating performance of the product, we strongly recommend that you DO NOT use the product under ANY of the following conditions:

(1) Mounting the product on a board using water-soluble solder flux and using the product without removing the residue of the flux completely from the board. The residue of such flux that is soluble in water or water-soluble cleaning agent, especially the residues which contains active halogens, will negatively affect the performance and reliability of the product.
(2) Using the product in any manner that will result in any shock or impact to the product.
(3) Using the product in places where the product is exposed to water, chemicals, organic solvent, sunlight, dust, corrosive gasses, or other materials.
(4) Using the product in places where the product is exposed to static electricity or electromagnetic waves.
(5) Applying ultrasonic cleaning without advance verification and confirmation that the product will not be affected by such a cleaning process, because it may damage the crystal, IC and/or metal line of the product.
(6) Touching the IC surface with tweezers or other hard materials directly.
(7) Using the product under any other conditions that may negatively affect the performance and/or reliability of the product.
(8) Using the product with power line ripple exceeding 200 mV(p-p) level.

Should any customer use the product in any manner contrary to the precautions and/or advice herein, such use shall be done at the customer’s own risk.

TAPING SPECIFICATION

Ⅰ. Application

This standard will apply to 7×5 Ceramic package.

Spec：CA package (Height:2mm max)

Ⅱ. Contents

Item No.	Item	Page
〔1〕	Taping specification	1 to 2
〔2〕	Inner carton	3
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〔4〕	Marking	4
〔5〕	Quantity	
〔6〕	Storage environment	
〔7〕	Handling	

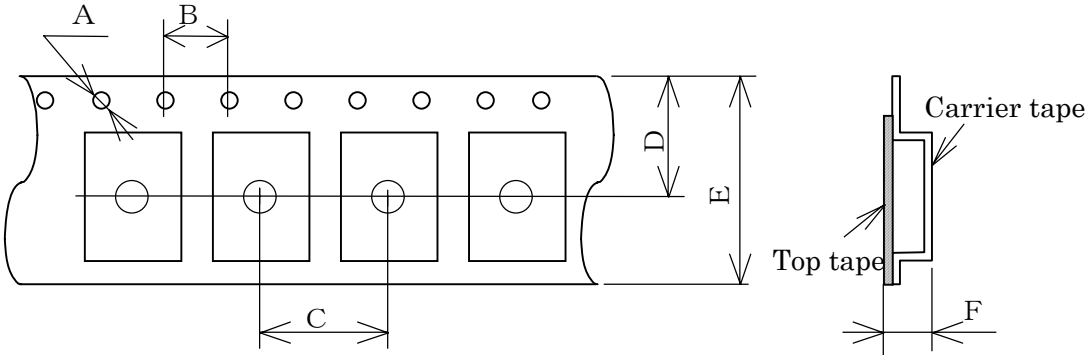
〔1〕 Taping specification

Subject to「EIA-481」and「IEC-60286」

(1) Tape dimensions TE-1612L

Material of the carrier tape : PS

Material of the top tape : PET

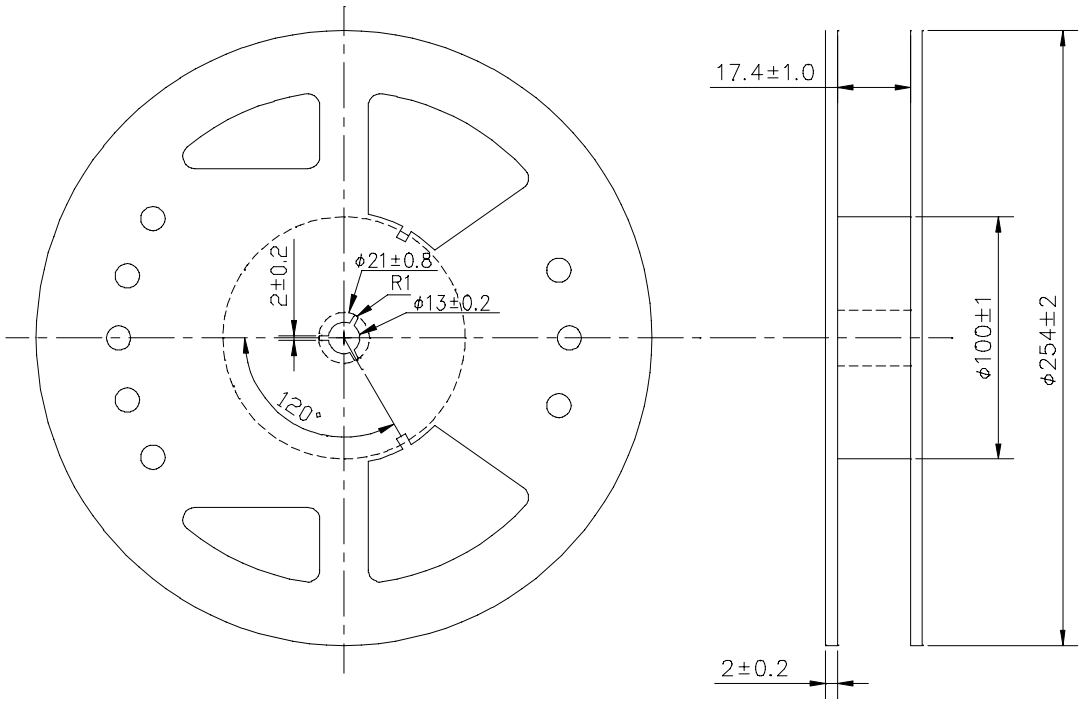


Symbol	A	B	C	D	E	F
Value	ϕ 1.5	4.0	8.0	9.25	16.0	2.6

Unit : mm

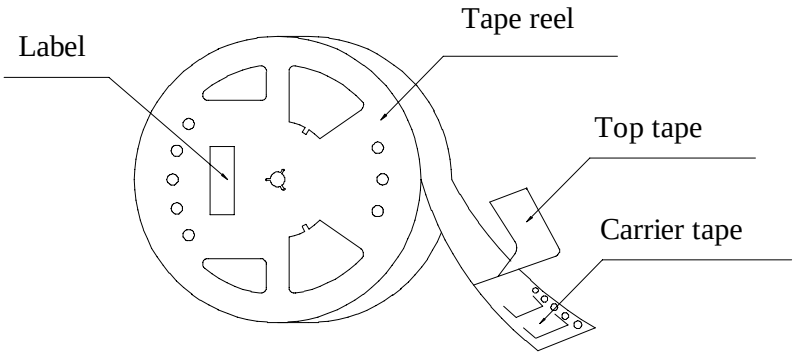
(2) Reel dimensions

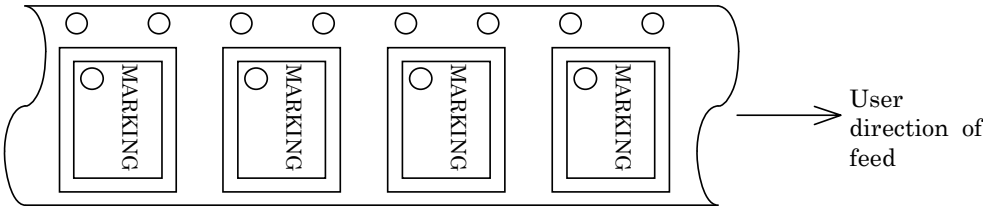
Material of the reel : Conductive polystyrene



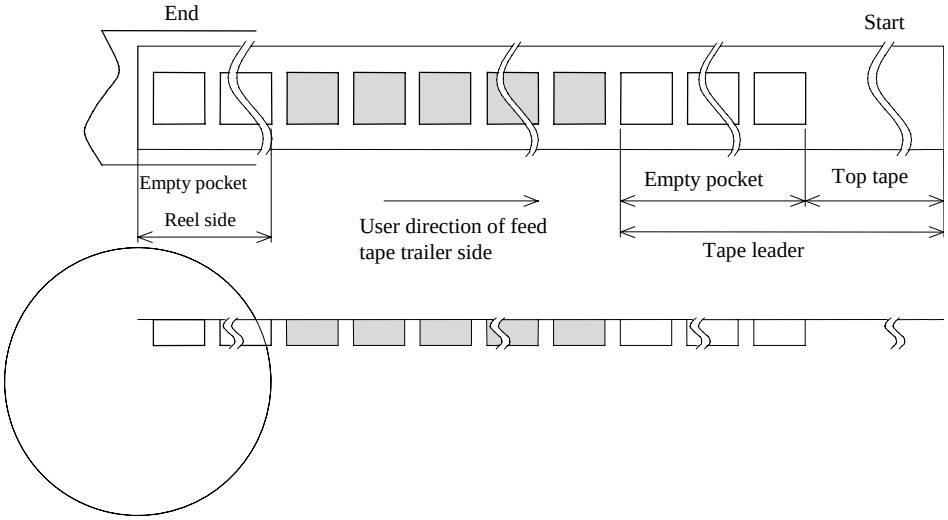
(3) Packing

①Tape & reel





②Start & end point



Item		Empty space
Tape leader	Top tape	Min. 1 000 mm
	Carrier tape	Min. 160 mm
Tape trailer	Top tape	Min. 0 mm
	Carrier tape	Min. 160 mm

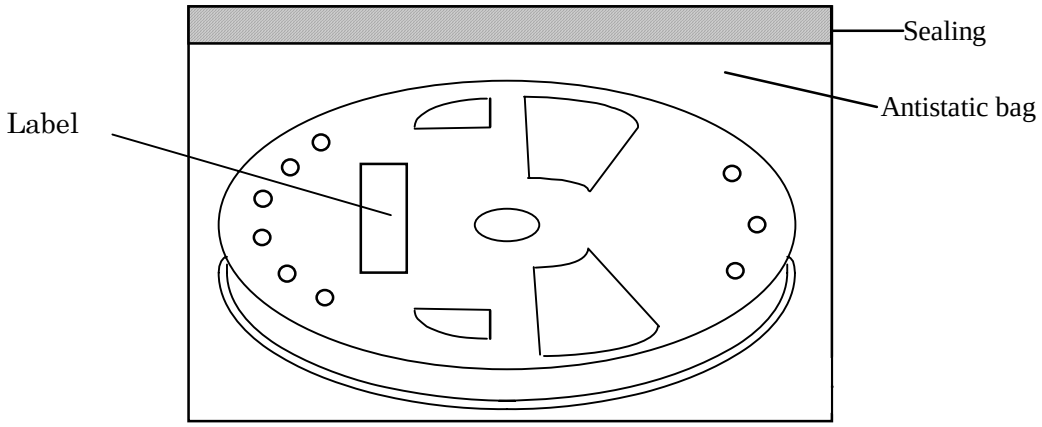
(4) Peel force of the cover tape

① angle : cover tape during peel off and the direction of unreeling shall be 165° to 180°.

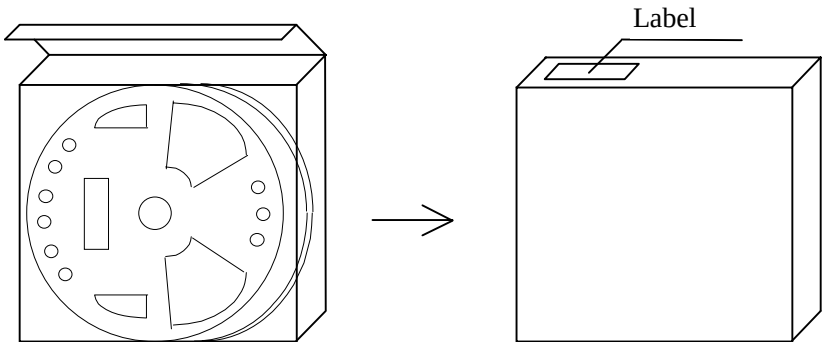
② peel speed : 300 mm / min.

〔2〕 Inner carton

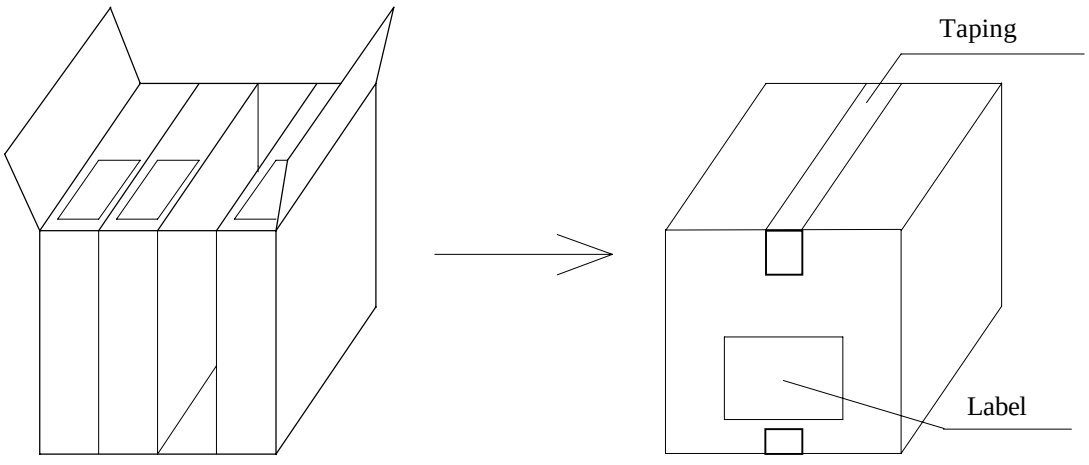
a) Packing to antistatic bag



b) Packing to inner carton



〔3〕 Shipping carton



〔4〕 Marking

(1) Reel marking

・Reel marking shall consist of :

1) Parts name
2) Quantity
3) Manufacturing date or symbol
4) Manufacturer’s date or symbol
5) Others (if necessary)

(2) Inner carton marking

・Same as reel marking.

(3) Shipping carton marking

・Shipping carton marking shall consist of :

1) Parts name
2) Quantity

〔5〕 Quantity

・1 000 pcs./reel

〔6〕 Storage environment

(1) To storage the reel at 15 °C to 35 °C, 25 %RH to 85 %RH of humidity.
(2) To open the packing just before using.
(3) Not to expose the sun.
(4) Not to storage with some erosive chemicals.
(5) Nothing is allowed to put on the reel or carton to prevent mechanical damage.

〔7〕 Handling

・To handle with care to prevent the damage of tape, reel and products.