TENTATIVE SPECIFICATIONS

HIGH FREQUENCY MULTILAYER CHIP ANTENNA

AH 086M555003-T

TAIYO YUDEN CO., LTD.

HIGH FREQUENCY MULTILAYER CHIP ANTENNA

Table of Contents

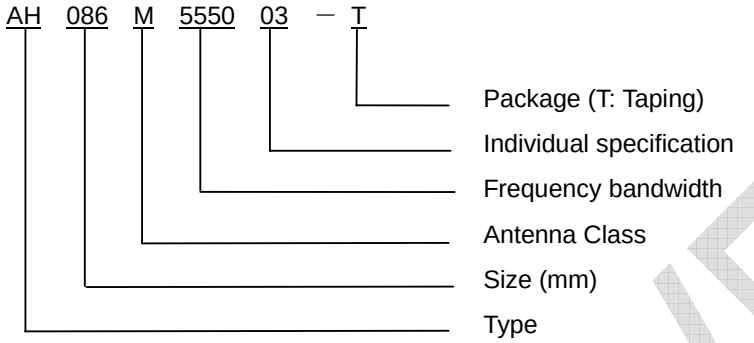
※RoHS compliance

- This product conform to ”RoHS compliance”.
- ”RoHS compliance” means that the product does not contain lead, cadmium, mercury, hexavalent chromium, PBB or PBDE referring to EU Directive 2002/95/EC, except other non-restricted substances or impurities which could not be technically removed at the refining process.

1.0 Scope

This specification covers the high frequency multilayer chip antenna in mounted condition on Taiyo Yuden evaluation board.

Part Numbering System



２．０ 2.0 Environment condition (Refer to the reliability test of table -1 for the reliability assurance.)

2.1 Operating temperature range : -20℃ to +80℃

2.2 Humidity : 15 to 95%RH (Without dew condensation)

2.3 Storage temperature range

（Antenna of single unit） : -40℃ to +85℃

2.4 Storage temperature and humidity range (packing condition)

: -10℃ to +40℃, 15 to 85% RH

3.0 Electrical characteristics

3.1 Input Impedance : 50Ω(Specified value)

3.2 Frequency bandwidth : 3100 to 4900MHz

3.3 Gain : 2.6 dBi max. (Peak)

: 0 dBi min.

(Average gain in omni-directional plane at vertical polarization)

3.4 VSWR in bandwidth*1 : 2.5 max. (Typical)

*1: VSWR in bandwidth in 3.4 of electrical specification shall be VSWR mounted on Taiyo Yuden on standard board.

4.0 Mechanical performance

4.1 Shape dimension, indication mark: Refer to figure -1. Sealed letter shall be T03.

4.2 Dimension of evaluation board and land-patterns: Refer to figure -2, 3.

5.0 Reliability test

Reliability test：To satisfy a reliability test per table -1.

6.0 packing specification

Packing form：Refer to pages 10 to 12.

7.0 Precautions

Refer to precautions in page 9.

Table 1

Reliability test

No.	Test Item	Test method	Judgment method ＊4
1	Humidity Test	Electrical characteristic is evaluated after products are left in 60℃ and 90% to 95%RH for 96 hours, and then in normal temperature and humidity for 1 hour.	To Satisfy less than 3.0 VSWR in bandwidth.
2	High Temperature Test	Electrical characteristics is evaluated after products is left in the atmosphere of 85℃ for 96 hours, and left in normal temperature for 1 hour.	To Satisfy less than 3.0 VSWR in bandwidth.
3	Low Temperature Test	Electrical characteristics is evaluated after products is left in the atmosphere of –40℃ for 96 hours, and left in normal temperature for 1 hour.	To Satisfy less than 3.0 VSWR in bandwidth.
4	Thermal Shock	Electrical characteristic is evaluated after products exposed alternately in -40℃ and 85℃ for every 30minutes for each temperature 10 times, and are left for 1 hour in normal temperature.	To Satisfy less than 3.0 VSWR in bandwidth.
5	Solderability	Products shall be submerged in solder （HS63S） of 230±5℃ fro 3±1 seconds after products are preheated in PO-Z-7 flux of 150℃. Then these products are picked up and appearance is checked by magnifier of 10 times.	At least 90% of terminal electrode is covered by new solder.
6	Soldering Heat Resistance (Reflow)	An electrical character is evaluated after products is subjected by 2 times reflow by temperature pattern as shown in next page.	To Satisfy less than 3.0 VSWR in bandwidth.

＊4：We use our measuring board for judgement of electrical characteristics in reliability test.
While, evaluation board is used in 3.5 claus bandwidth VSWR.
Therefore, the judgement is different.

Reflow soldering condition

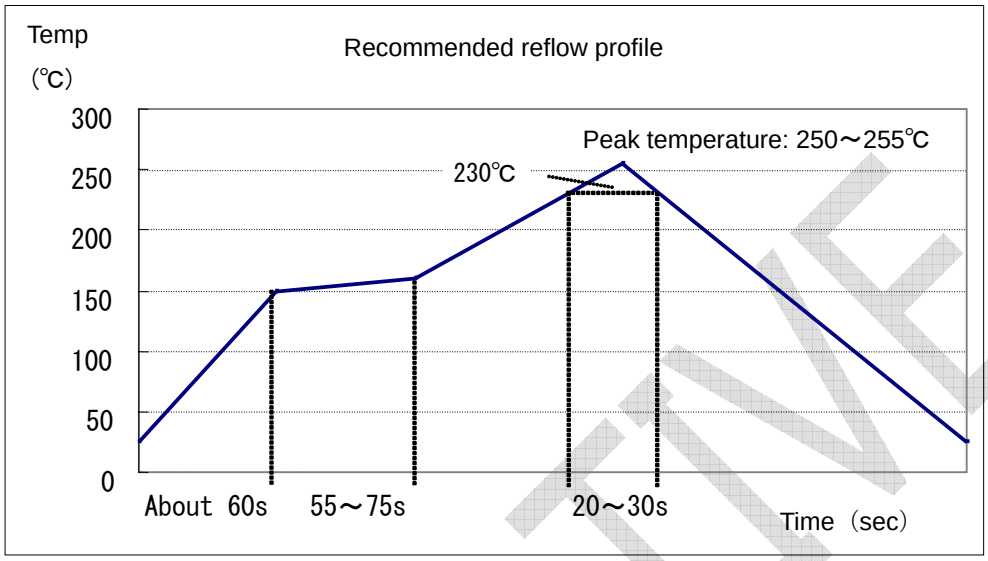
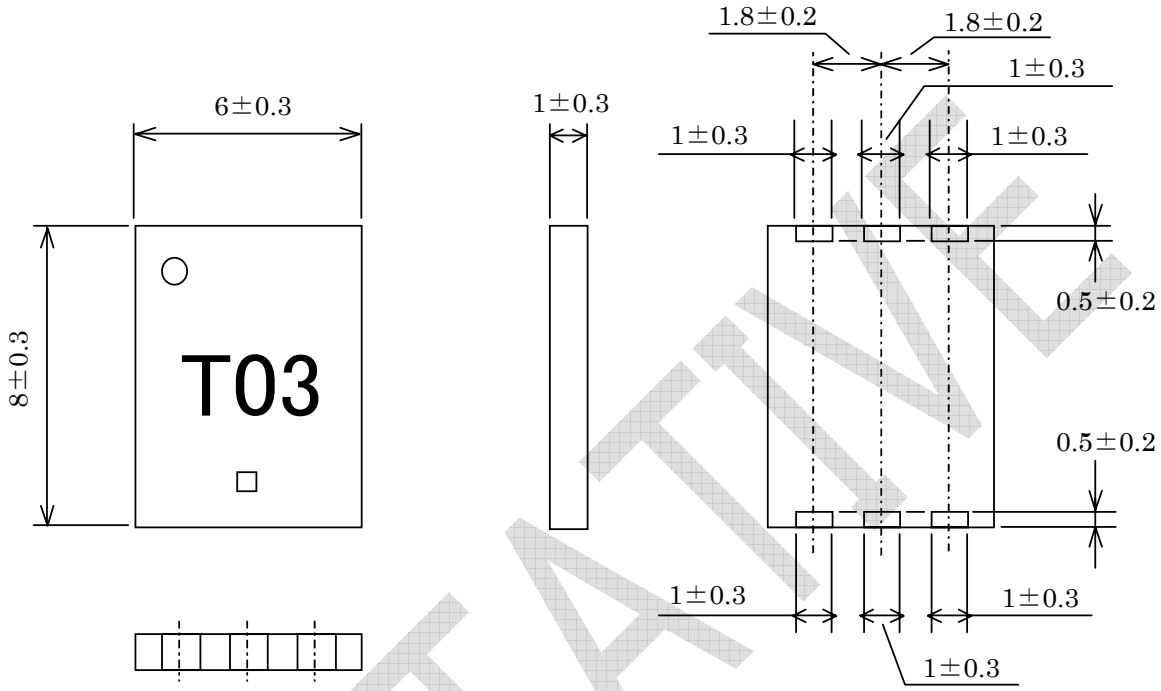


Figure -1

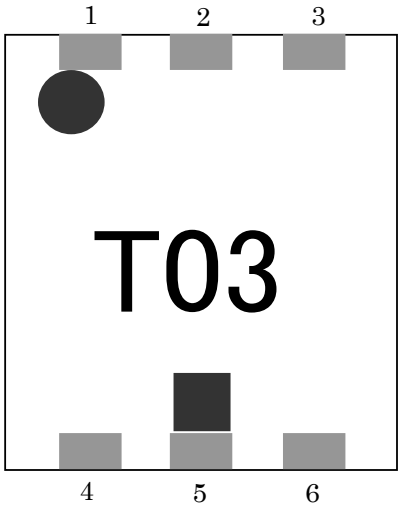
Part number: PG_AH_086M555003-T

Shape dimension



Unit: mm

Pin arrangement



※Top side view

1	NC	4	NC
2	NC	5	FEED
3	NC	6	NC

Indication and marker

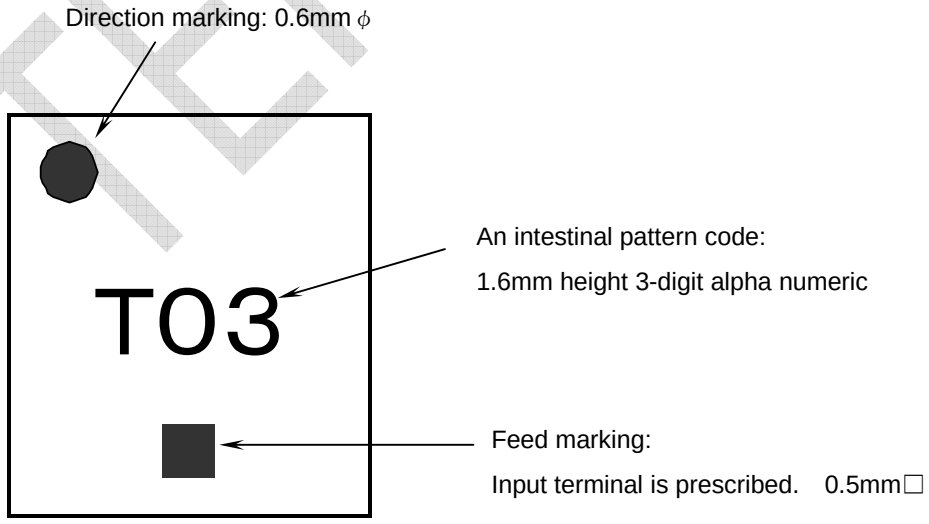
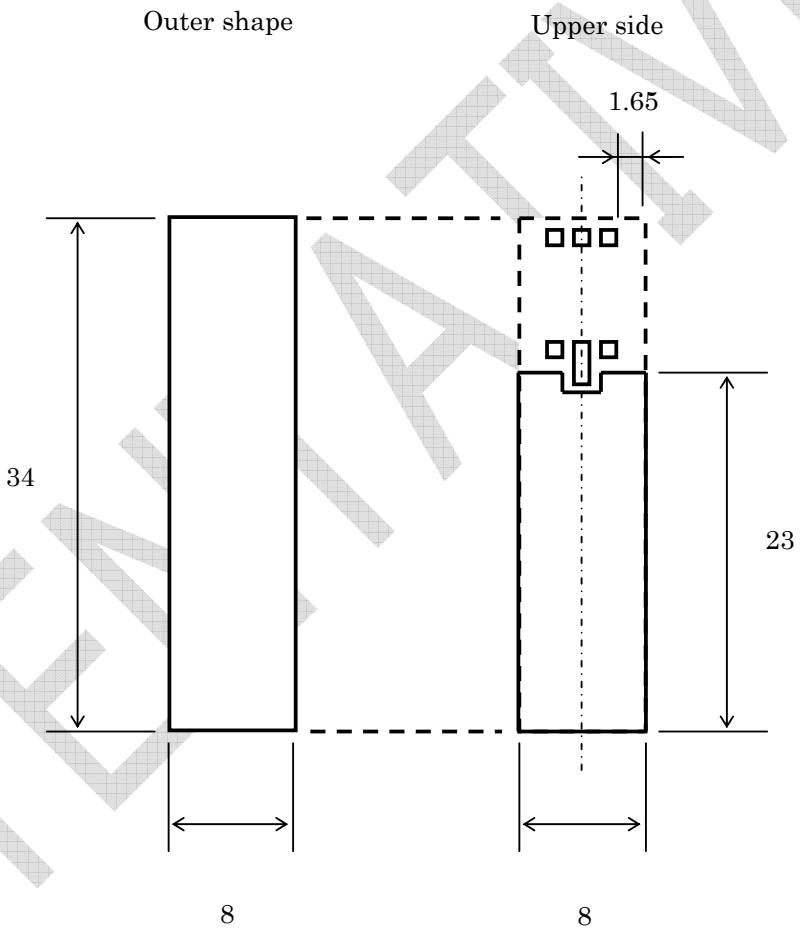


Figure -2
Dimension of evaluation board for this antenna

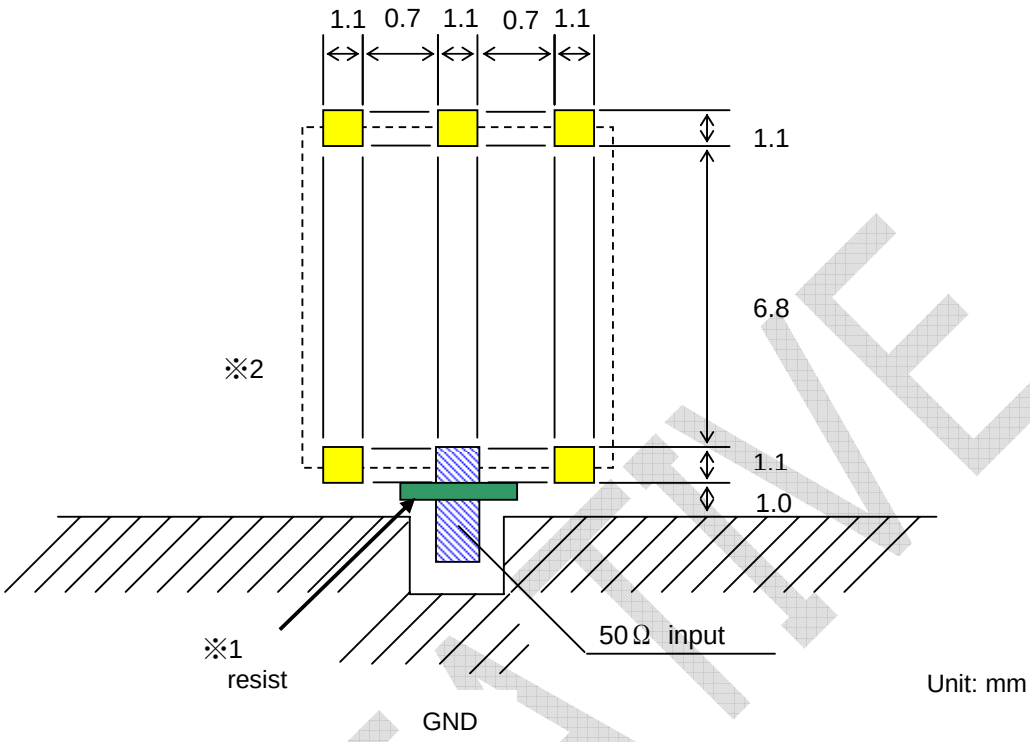
- Board material: FR-4
- Thickness of base material: 0.8mm
- Electrode pattern: Surface (through hole processing)
- Thickness of electrode: 35 μ m
- Land part: Refer to figure3



Unit: mm

Figure -3

Antenna land-patterns



※1：A solder area is set at solder resist.

※2：Don't arrange the pattern on near, surface and inside layer to the antenna mounting area.
(Refer to our company evaluation circuit board.)

Precautions

1. Be careful of using these products because characteristics may be deteriorated when it is used in the following environment.
   - ・Special gas atmosphere (Such as CI2, NH3, SOx and Nox, etc.)
   - ・Gas atmosphere with volatility and flammability
   - ・Place where dust is abundant

・Place where water splashes directly, dew condensation is ease to occur because of high humidity, direct sunlight is subjected and freeze.

2. Don't apply excessive pressure and shock because these products are made from ceramics element.
3. Don't apply excessive pressure and shock to these products during transporting and handling of print circuit board that these products are soldered.
4. Be careful of handling (Don't fall and hit) because characteristics changes when electrode is damaged and chipped out. And, don't touch these products with bare hands because it causes a solderability decline.
5. Please storage under the following condition

   Temperature : Below +40 ℃

   Humidity : Below 85% RH

   Use these products after the delivery within six months. And, after more than six months have passed, confirm solderability before the use them.
6. Arrange these products of position of mounting where stress isn't applied against sled and deflection of circuit board.

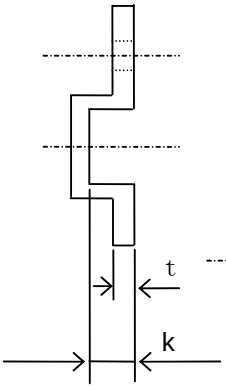
   Be careful not to apply stress and deflection of board during process after soldering these products (circuit board cut, break board checker, mounting of other components, installation to chassis and wave soldering to backside of the circuit board after Reflow soldering) because electrode peeling and chip break occur by stress and deflection. When separating print circuit board after mounting, please 7. Be careful not to apply excessive stress and shock to prevent break and chip out during mounting these products on print circuit board.
8. Please use flux containing less than 0.1% wt (cl conversion) of halogen material in soldering to prevent corrosion of electrodes and decline of insulation resistance.
9. Preheat in soldering so as to be less than 100℃ between solder temperature and products temperate to prevent break of these products.
10. When supersonic washing is applied, please confirm cleaning condition in advance because crack may occur in these products and the soldering part by vibration and strength of the terminal electrode may be declined.
11. Confirm in advance washing liquid to use by washing after soldering and so on because an indication seal may get blurred and disappear.
12. When repairing by hand solder iron, temperature of soldering iron should be less than less than 320℃ for less than 3 seconds to prevent a terminal electrode decline.

※ Taiyo Yuden shall not be responsible for any deficiencies if these products are used other than specified the above condition in this specification.

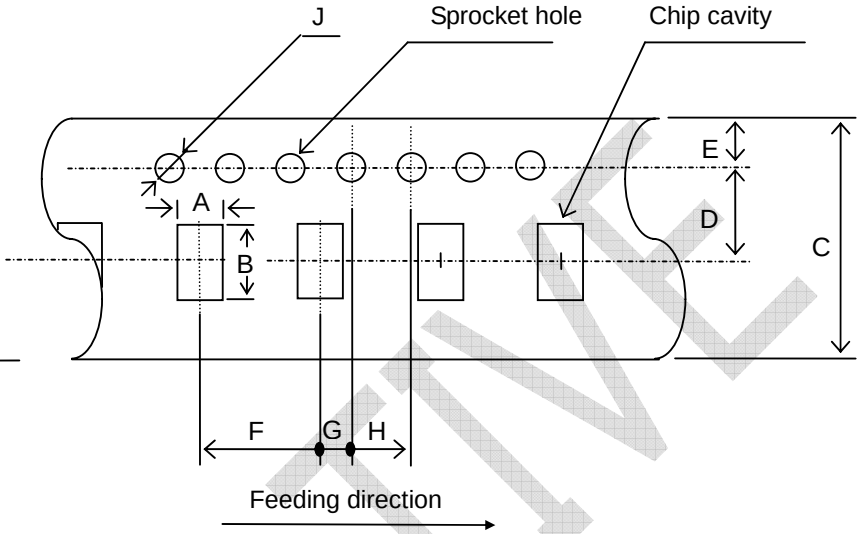
Tape Packaging (T)

◎In case of taping packing, plastic tapes shall be used

Plastic tape



Tape Size



Dimensions

Type	A	B
0861	6.25±0.1	8.26±0.1

[Unit : mm]

Dimensions

C	D	E	F	G	H	J	K	t
16.0 $^{+0.3}_{-0.1}$	7.5±0.1	1.75±0.1	12.0±0.1	2.0±0.1	4.0±0.1	ϕ 1.5 $^{+0.1}_{-0}$	1.3max.	0.3max.

[Unit : mm]

Dimension of Reel

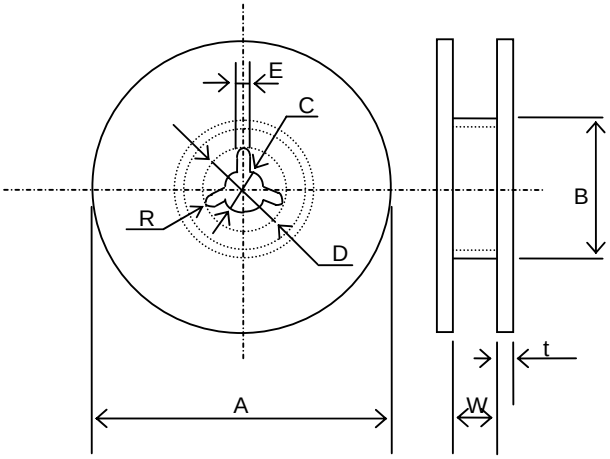
Code	A	B	C
Size	ϕ 330±2.0	ϕ 100±1	ϕ 13.0±0.2

Code	D	E	W
Size	ϕ 21.0±0.8	2.0±0.5	25.5±1.0

Code	t	R
Size	2.5max.	1.0

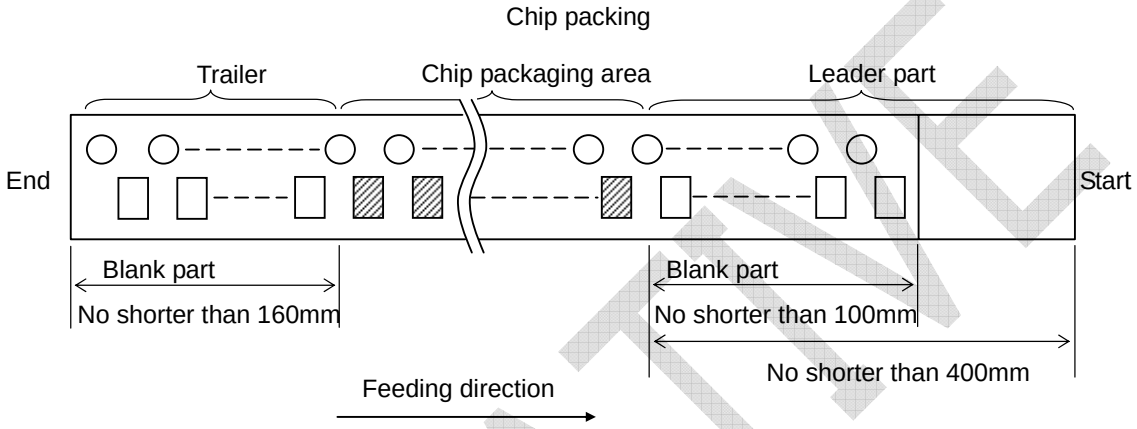
[Unit : mm]

Dimensions of Reel

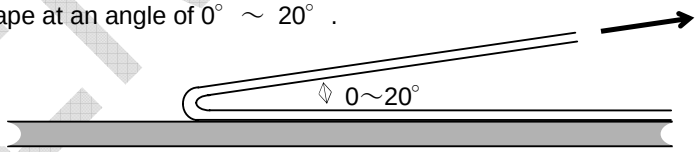


Tape Packaging (T)

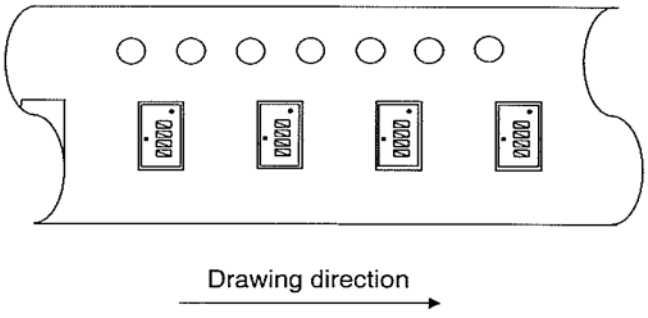
1. Taping shall be right-sided wound. When the end is pulled out, sprocket hole will be at the right-hand side.
2. For packaging chips by taping, blank spaces are provided on taping as shown in the figure.
   - Leader part 400mm min.
   - Leader part (Blank part) 100mm min.
   - Trailer (Blank part) 160mm min.



3. Seal tape of plastic taping shall not be crossed over sprocket holes.
4. Plastic tape shall not be seamed.
5. Tensile strength of tape is 5N (0.51kgf) or over.
6. Number of chips missed from tape reel shall be 1 piece maximum per reel.
7. Standard number of chips contained in a reel shall be 1,000 pieces.
8. Label indicating part No., quantity and lot No. shall be attached to the outside of reel.
9. Peeling strength of seal tape (or top tape) shall be 0.1～0.7N (10.2～71.4gf) when seal tape (or top tape) is peeled from carrier tape at an angle of 0° ～ 20° .

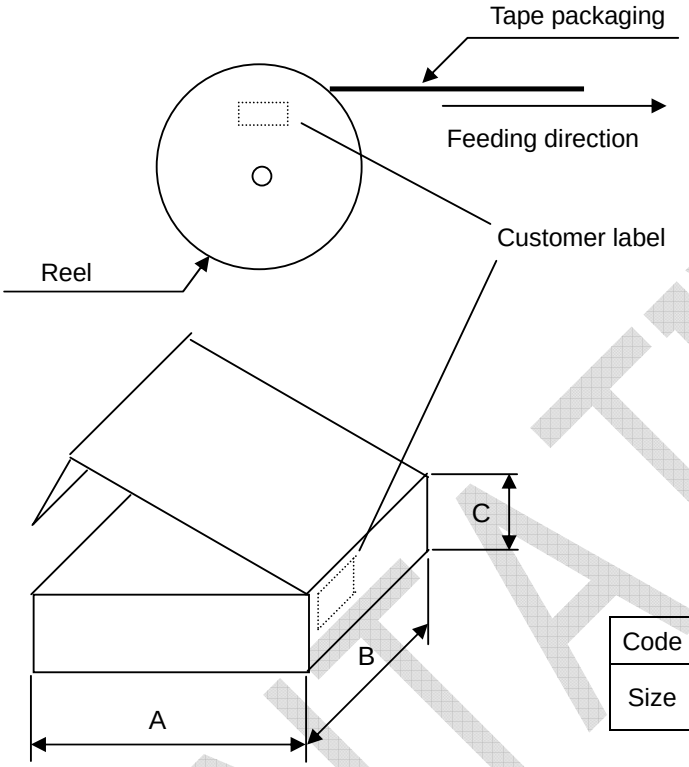


10. Regarding direction of components, direction marking shall be placed on feeding hole side of taping.



Tape　Packaging (T)

［Packaging　Mode］



Customer label description
1.Manufacturer Name
2.Customer Parts No.
3.Our Parts No.
4.Quantity
5. Control No.
（Shipping Lot No.）

Code	A	B	C	Reel
Size	350	340	75	2 Reel　max

［Unit：mm］

Material: Paper

Packaging unit: Maximum 2reels in a box.

・To attach labels means that all products are passed.

・Manufacturing site

Manufacturing site is indicated on the labels.

MADE IN ○○○

「Part materials, Sub materials/ Unit parts materials and their treatment」

1. Part materials and sub materials

We never use the following prohibited substances in materials of delivery parts, sub materials and unit parts and in additive in manufacturing process.

「Substance prohibited to be used」

(1) Cadmium and its compounds
(2) PBB: Polybromobiphenyl
PBDE: Polybromodiphenyl ether
(3) Poly chlorination paraffine
(4) Polychlorinated biphenyls (PCB)
(5) Polychlorinated naphthalene
(6) Organotin compounds (Tributyl tin/ triphenyl tin)
(7) Asbestos
(8) AZO compounds
(The human body contact portion with the product made on the assumption that a human body was touched continuously)
(9) Mercury and its compounds
(10) Hexavalent chromium compounds
(11) Mirex
(12) TBBP-A-bis
(13) Formaldehyde
(14) Lead and its compounds (packaging material, paint, pigment and ink used on printed circuit board)

2. Non-use certification shall be submitted at the time of parts-approval to guarantee that all parts satisfy section 1.

3. To simplify sorting of plastic parts and sub materials waste, the type of material shall be marked on plastic parts. For details on marking symbols, refer to ISO-1043 ”Plastics Symbols.” Except for below case

［Exceptions］

・There is no space to indicate the marking of material type.
・There is fear of damage of performance and function by indicating the marking of material type.
・Indication of the marking of material type is difficult due to manufacturing method.

Operating conditions for guarantee of this product are as shown in the specification.
Please note that Taiyo Yuden Co., Ltd. shall not be responsible for a failure and/or abnormality which are caused by use under the conditions other than the aforesaid operating conditions.