

2.5GHz Multi-layer Band Pass Filter

Confidential

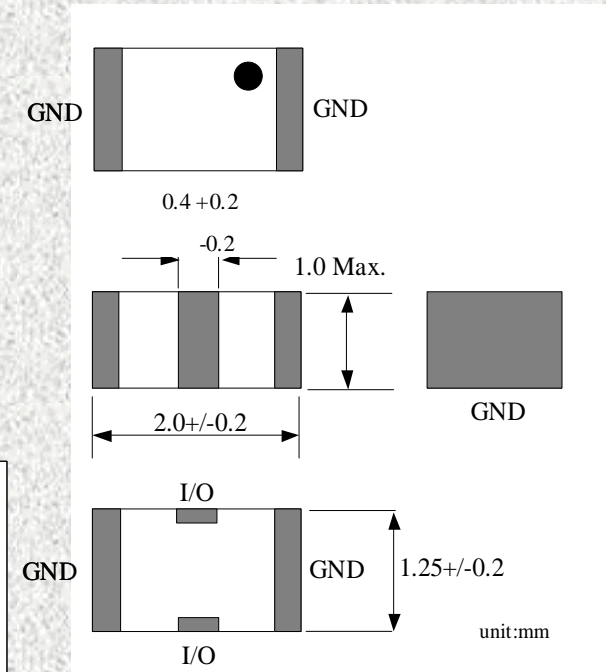
FI 212B245021

for Bluetooth[®], 802.11b/g/n

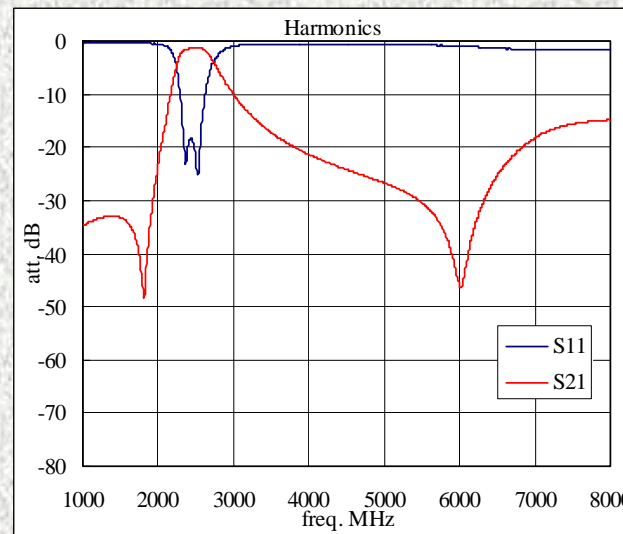
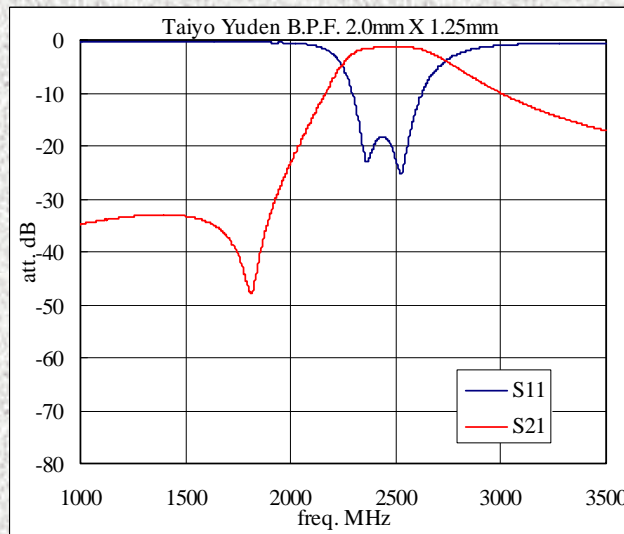
Electrical Characteristics

Passband frequency	2400-2500 MHz	Typ.
Insertion Loss at Passband	1.6 dB Max.(25 deg-C)	1.25 dB
	1.9 dB Max.(-30 - +85 deg-C)	
Ripple at Passband	1.0 dB Max.	0.33 dB
V.S.W.R. at Passband	2.0 Max.	1.29
Attenuation	25 dB Min.(1710 - 1910 MHz)	31.1 dB
	20 dB Min.(4800 - 5000 MHz)	
Impedance	50 ohm	

Shapes & Dimensions



Actual Data of Test sample



Note : All the specifications are subject to change without notice due to technical improvements

TAIYO YUDEN CO.,LTD.

1-1 Scope

This specification covers high frequency multilayer chip filter for use in electronic appliances and electric communications equipment.

1-2 Part Numbering System

Part number is indicated as follows.

(Example) $\frac{F1}{\text{Type}}$ $\frac{212}{\text{Size}}$ $\frac{B}{\text{Special code}}$ $\frac{2450}{\text{Frequency code}}$ $\frac{21}{\text{Individual Spec}}$ $\frac{-T}{\text{Packaging code}}$

Code	Size (mm)	Code	Special code	Code	Frequency code	Code	Packaging code
212	2.0x1.25	B	Band pass	2450	2450MHz	-T	-Taping

2 Environmental conditions

Standard test conditions shall be temperature of 5 to 35°C, relative humidity of 45 to 85% and air pressure of 86 to 106kPa. Test shall be conducted at temperature of 20±2°C, relative humidity of 65 to 70% and air pressure of 86 to 106kPa if test result is suspectable.

Unless otherwise specified, all tests shall be conducted under standard conditions.

3-1 Electrical specification

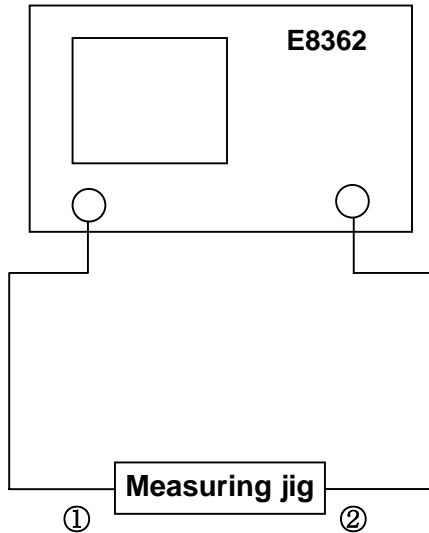
No.	Impedance (Zin · Zout)	50Ω Nominal
1	Nominal Frequency (fc)	2450MHz Nominal
2	Pass band frequency	2400 to 2500MHz
3	Insertion Loss at Pass band	1.6dB max. (+25°C) 1.9dB max. (-30 to +85°C)
4	Ripple at Pass band	1.0dB max. (4900 to 5950MHz)
5	V.S.W.R. at Pass band	2.0 max. (4900 to 5950MHz)
6	Attenuation	25dB min. (1710 - 1910 MHz)
		20dB min. (4800 - 5000 MHz)

3-2 Measuring equipment

- Electrical characteristics shall be measured on condition that test sample is set in specified measuring equipment.

Measuring equipment

NETWORK ANALYZER E8362 or equivalent

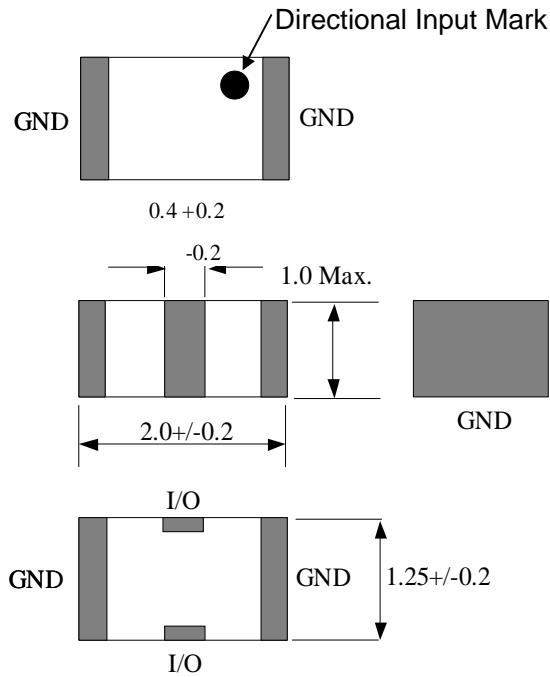


3-3 Attenuation

In above measuring equipment, when input① and output② are shorted, output shall be E1. And in case calibrated to reference level (0dB), when test sample is inserted in the equipment, output shall be E2. The loss shall be prescribed as attenuation.

$$\text{Attenuation (ATT.)} = -20 \log (E2/E1) \text{ [dB]}$$

4-1 External dimensions (Unit: mm)



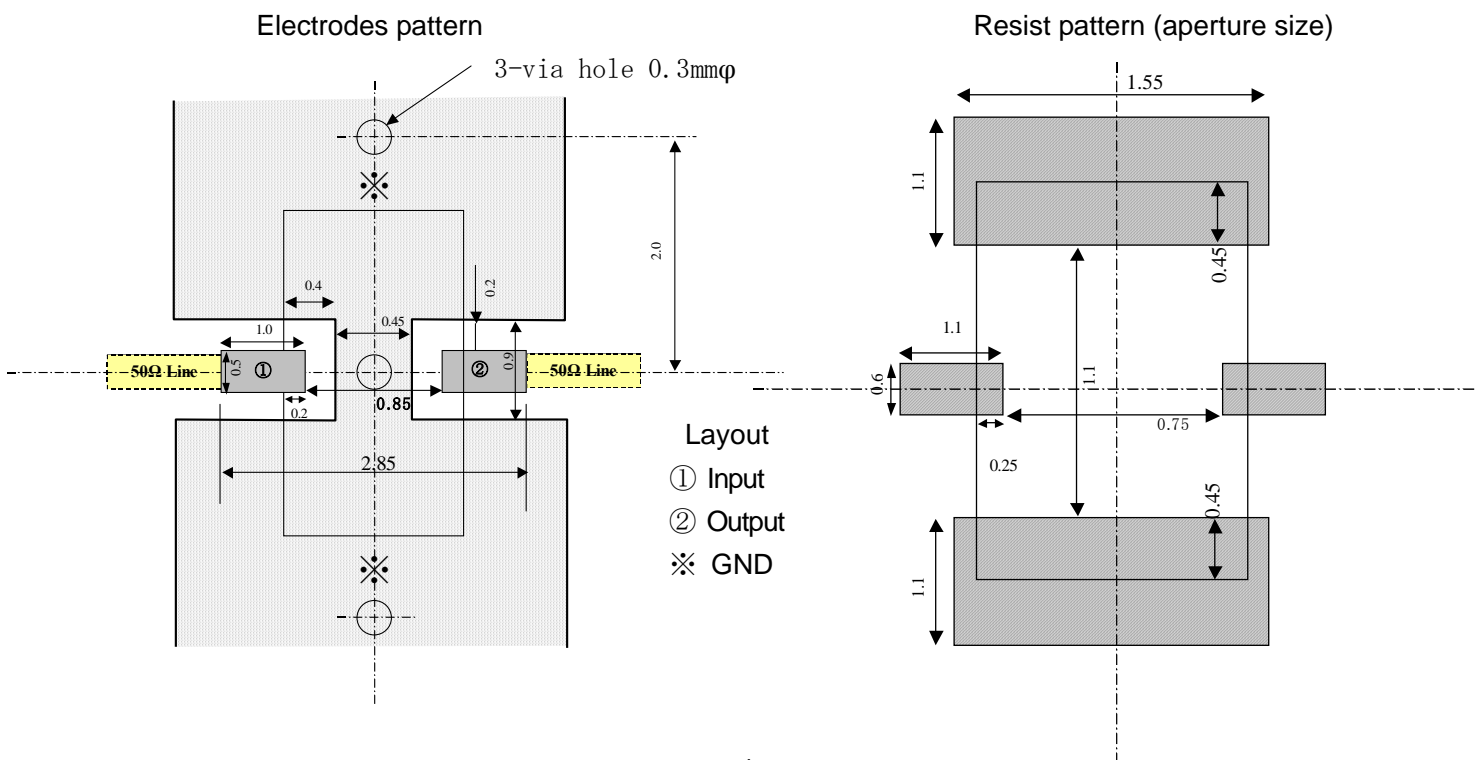
4-3 Material

- (1) Body: Dielectric ceramic compounds of barium titanate type
- (2) Internal conductors: Silver (Ag)
- (3) Terminal electrodes: Silver (Ag)
- (4) Surface: Ni- Sn plating

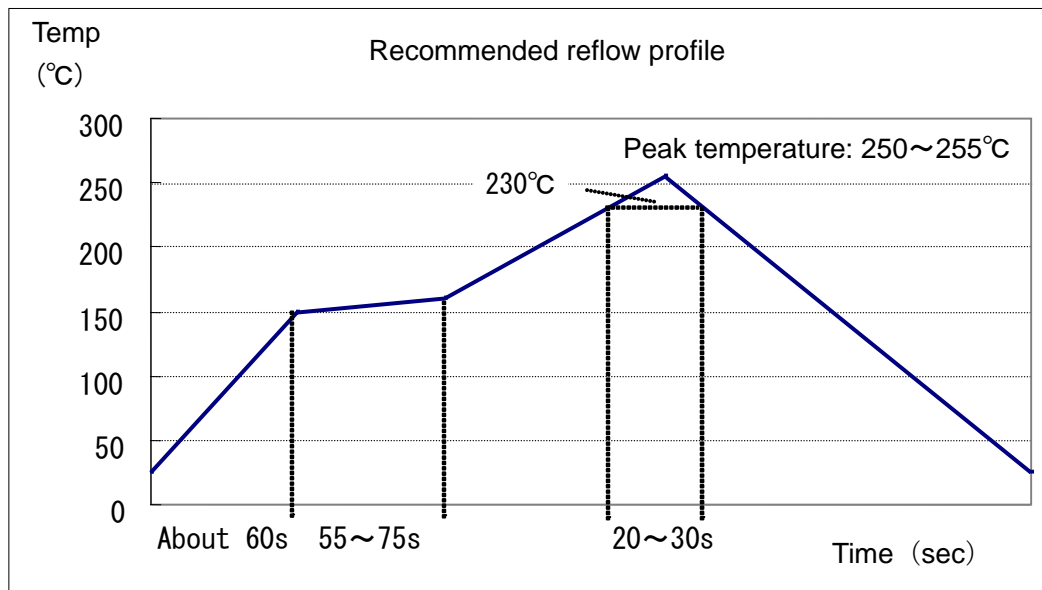
4-4 Marking

Abbreviation is marked following dot which means input side.

4-5 Dimension examples of recommended land pattern (Thickness: 0.4mm, BT range, Both side via hole board)



5 Reflow soldering condition



6-1 Packaging

Taping shall be conducted as follows.

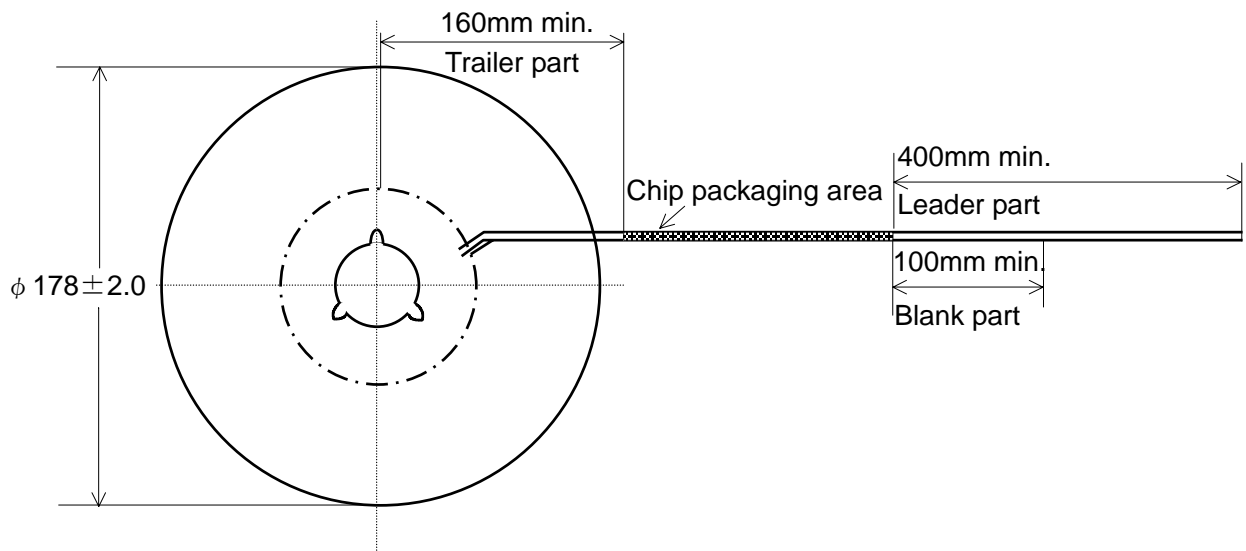
Unless otherwise specified, conform to JIS C 0806.

- Taping shall be right-sided wound (when the end is pulled out, sprocket hole will be at the right-hand side).
- Seal tape shall not be crossed over sprocket holes. And seal tape shall not be out of carrier tape.
- For packaging chips by taping, blank spaces are provided on taping as shown below.

Leader part: 400mm min.

Leader part (Blank part): 100mm min.

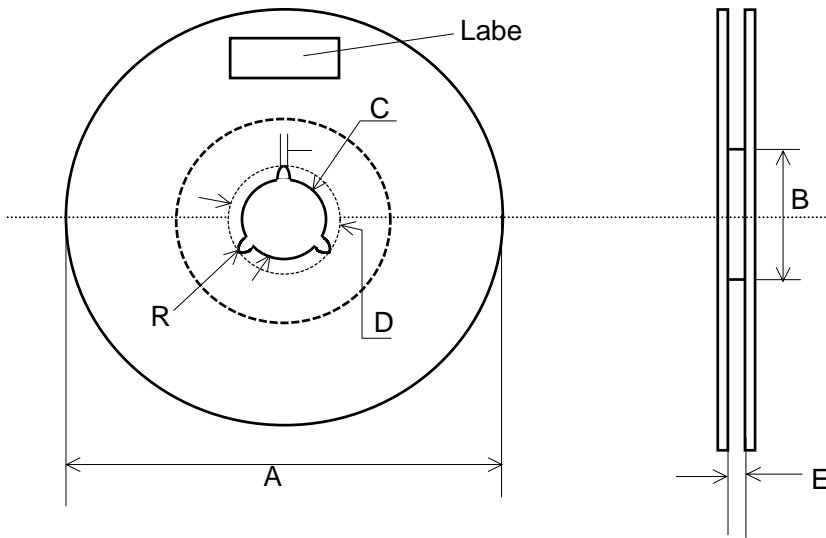
Trailer part (Blank part): 160mm min.



Unit [mm]

- Leader part of seal tape shall be sealed with adhesive tape.
- 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 $0^\circ \sim 20^\circ$
- Label indicating Parts No., Quantity, Lot No. and Customer Parts No. shall be attached to reel.

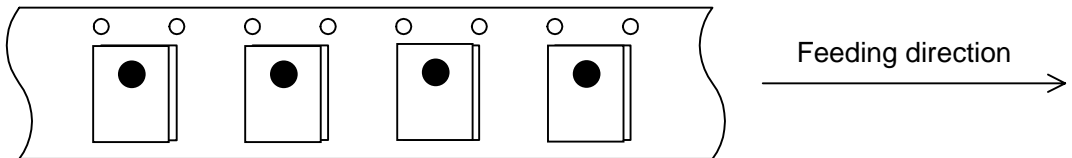
6-2 Dimensions of Reel



Code	ϕA	ϕB	ϕC	ϕD
Size	178 ± 2.0	50 min.	13 ± 0.5	21.0 ± 0.8

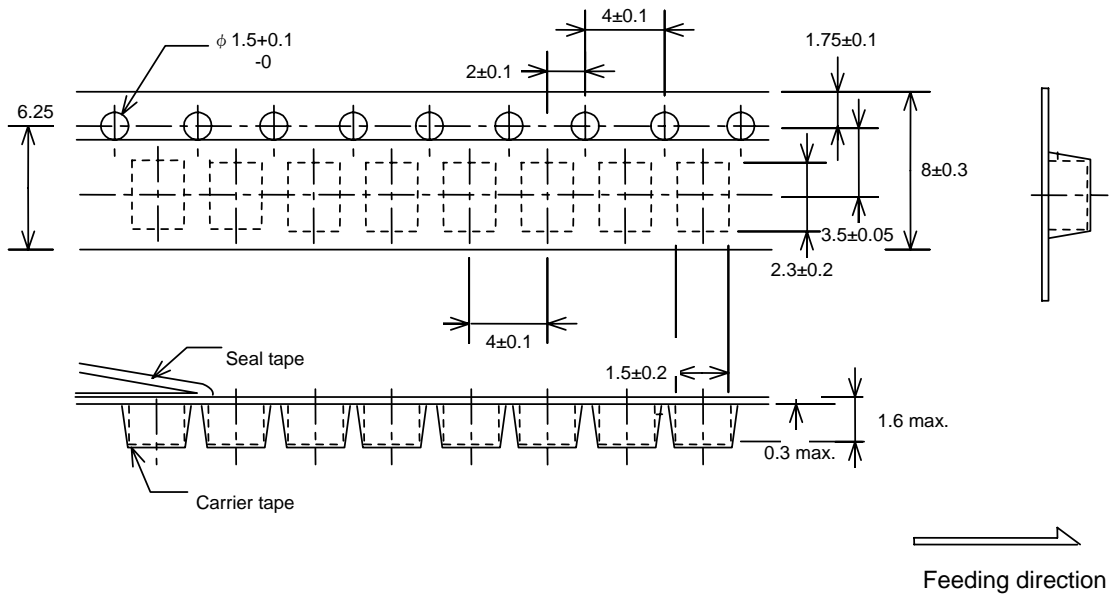
Code	E	Unit [mm]
Size	10 ± 1.5	

- Chips shall be packaged in the uniform direction; ① termination is faced up to sprocket holes. Chips shall not be out of mounting part of carrier tape.

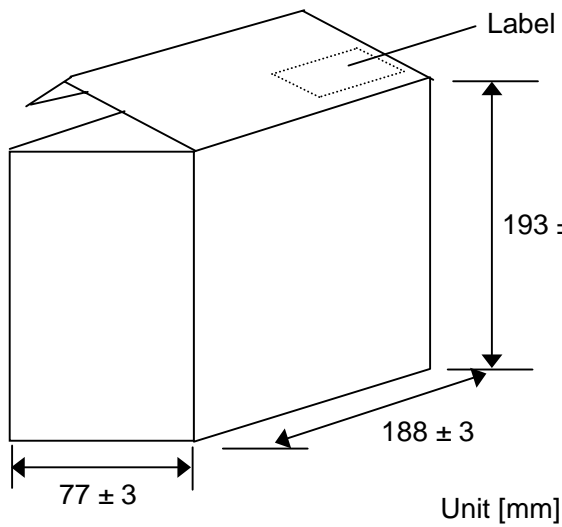


- Taping reel shall be packaged in plastic bag per reel.
- Standard number of chips contained in a taping reel shall be 3,000 pieces.

6-3 External dimensions of carrier tape (Unit: mm)



6-4 Package type



One Reel
3,000 pcs/ Reel

Box with 34mm thickness is used for packaging of one reel or two reels.
And box with 77mm thickness is used for packaging of three to five reels.

Unit [mm]

7 Precautions

1. Be careful of using these products because characteristics may be deteriorated if it is used in the following environment.
 - Special gas atmosphere (Such as Cl₂, NH₃, SO_x and No_x, 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. Be careful not to apply excessive pressure and shock because these products are made from ceramics element.
3. Be careful not to 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 drop and hit) because characteristics changes when electrode is damaged and chipped out. And be careful not to touch these products with bare hands because it causes a solderability decline.
5. Please storage under the following condition.
 - Temperature: -10°C to +40°C
 - Humidity: 15% to 85% RH
 - Please use these products after the delivery within six months. And after more than six months have passed, please confirm solderability before the use of them.
6. Please arrange these products of position of mounting where stress isn't applied against bend 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 may occur when circuit board bends during handling. When separating print circuit board after mounting, please avoid hand breaking and use special tools.
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. Please preheat in soldering so as to be less than 100°C between solder temperature and products temperate to prevent break of these products.
10. When ultrasonic 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 decline.
11. Please confirm washing liquid to use when washing after soldering and so on in advance, because an indication seal may get blurred and disappear.
12. When repairing by soldering iron, temperature of soldering iron should be less than 320°C for less than 3 seconds to prevent a terminal electrode decline.

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 aforesaid operating conditions.

This product is developed, designed and intended for use in general electronics equipments. (for AV, household, office supply, information service, telecommunications, etc.). Before incorporating the components into any equipments in the field such as aerospace, aviation, nuclear control, submarine, transportation, (automotive driving and control, passenger protection, train control, ship control), transportation signal, disaster prevention, medical, public information network etc.

where higher safety and reliability are especially required, please contact Taiyo Yuden Co., Ltd. for more detail in advance.

And before incorporating the components or devices into the equipments not mentioned in the above, if there is possibility of direct damage or injury to human body, please contact Taiyo Yuden Co., Ltd. for more detail in advance.