

# APPROVAL SHEET

**RFANT Series - 5220 - RoHS Compliance**

**MULTILAYER CERAMIC ANTENNA**

**Halogens Free Product**

**2.4 GHz ISM Band Application**

**P/N: RFANT5220110A0T**

**Address : No.566-1,Kao-shi Rd., Yangmei Dist.  
Tao-Yuan,32642,Taiwan,R.O.C.**

\*Contents in this sheet are subject to change without prior notice.

## FEATURES

1. Surface Mounted Devices with a small dimension of  $5.2 \times 2.0 \times 1.1 \text{ mm}^3$  meet future miniaturization trend.
2. Embedded and LTCC (Low Temperature Co-fired Ceramic) technology is able to future integrate with system design as well as beautifying the housing of final product.
3. High Stability in Temperature / Humidity Change

## APPLICATIONS

1. Bluetooth
2. Wireless LAN
3. HormRF
4. ISM band 2.4GHz wireless applications

## CONSTRUCTION

Top view



PIN	Connection
P1	Feeding
P2	Identification Mark
P3	Soldering terminal

## DIMENSIONS

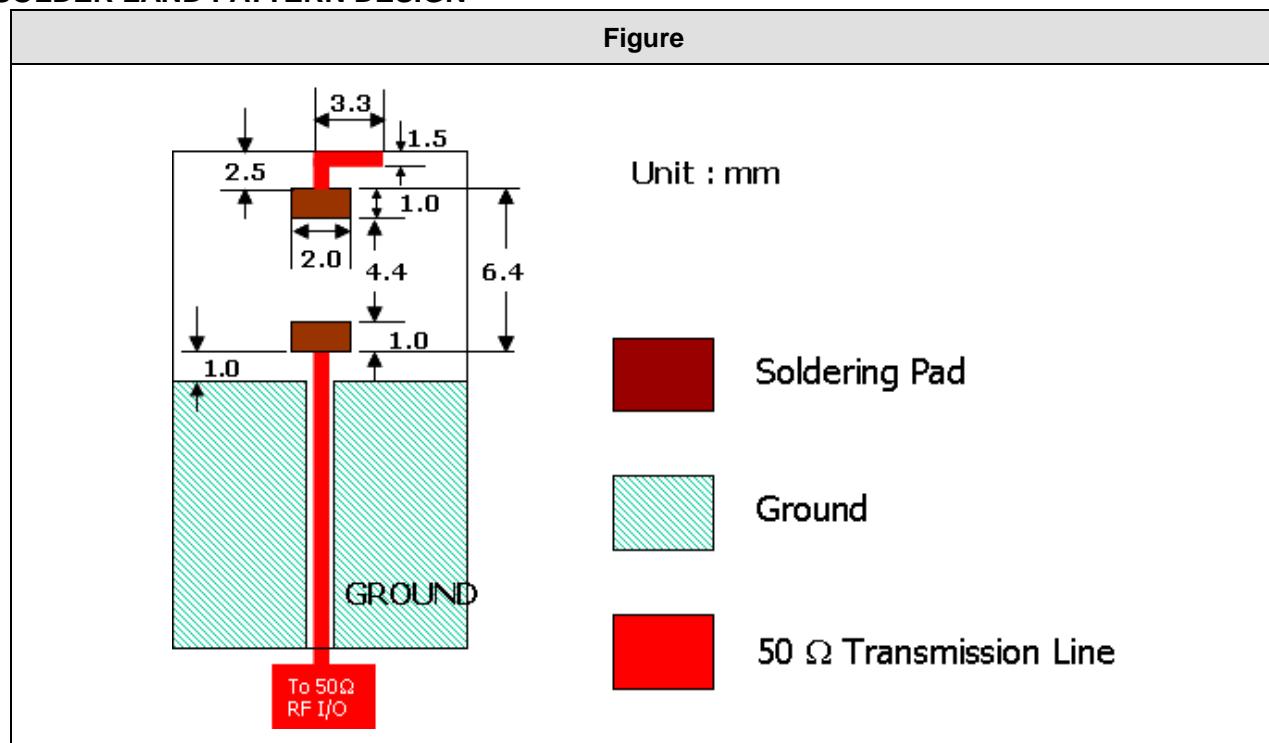
Figure	Symbol	Dimension (mm)
	L	$5.20 \pm 0.20$
	W	$2.00 \pm 0.20$
	T	$1.15 \pm 0.10$
	A	$0.40 \pm 0.25$

## ELECTRICAL CHARACTERISTICS

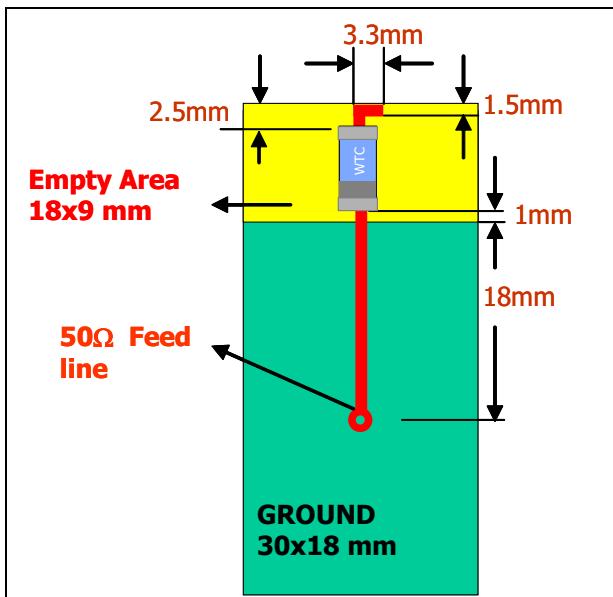
RFANT5220110A0T	Specification
Working Frequency Range	2.4 GHz ~ 2.5GHz
Gain	2 dB (Typical)
VSWR	2 max.
Polarization	Linear
Azimuth Beamwidth	Omni-directional
Impedance	50Ω
Rated Power (max.)	3 Watts
Maximum Input Power	5 Watts for 5 minutes
Moisture sensitivity levels	MSL is LEVEL 1 (Refer to : IPC/JEDEC J-STD-020)
HBM ESD	Pass 1KV on all pins (Base on AEC-Q200-002)
MM ESD	Pass 200V (Base on EIA/JESD22-A115)
<b>Operating &amp; Storage Condition (Component)</b>	
Operation Temperature Range: -40°C ~ +85°C	
Storage Temperature Range: -40°C ~ +85°C	
<b>Storage Condition before Soldering (Included packaging material)</b>	
Storage Temperature Range: +5 ~ +40 °C	
Humidity: 30 to 70% relative humidity	

**Remark: The specification is defined based on the test board dimension as in below**

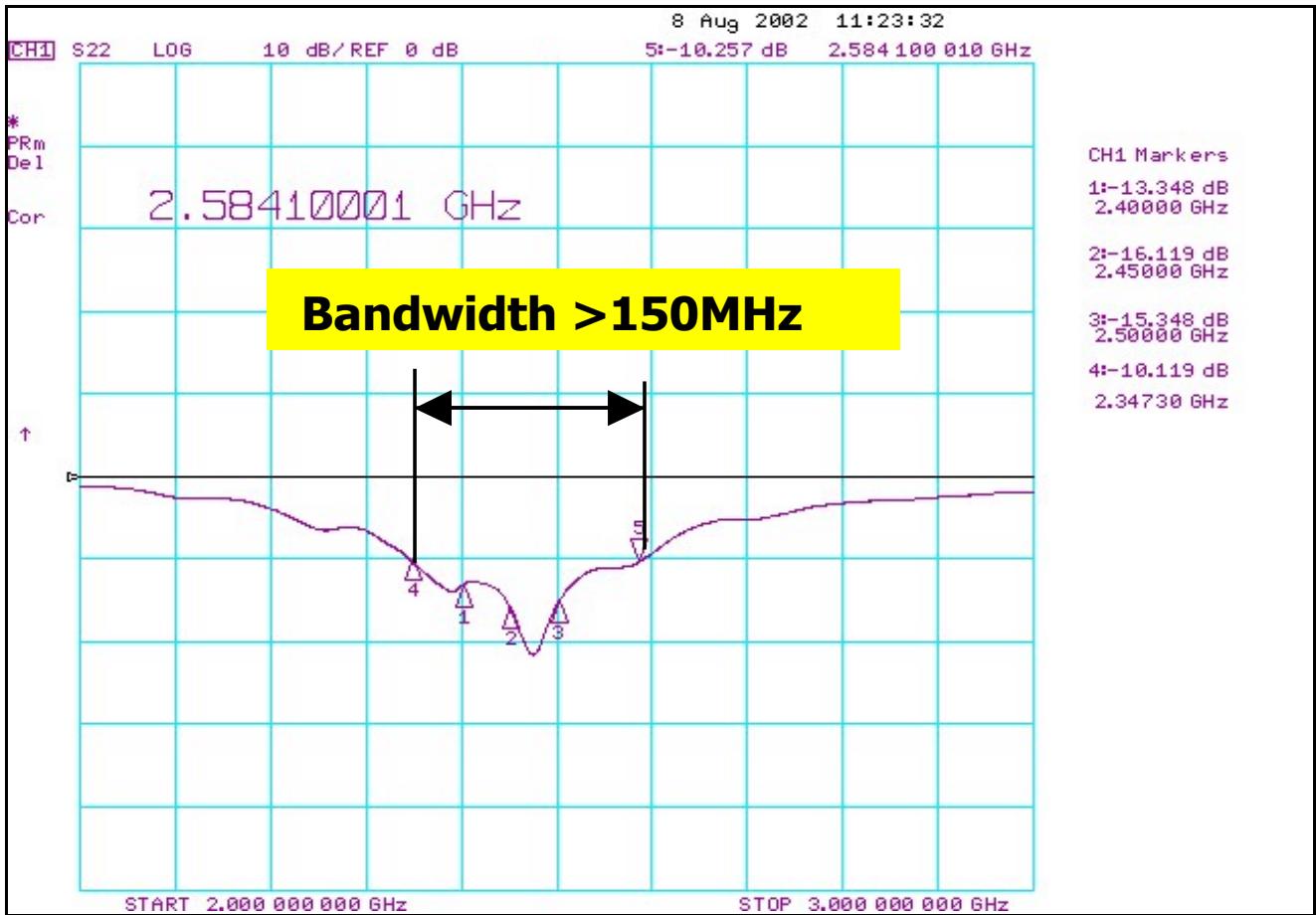
## SOLDER LAND PATTERN DESIGN



Antenna on Test Board ( FR4 Thickness 0.8mm)

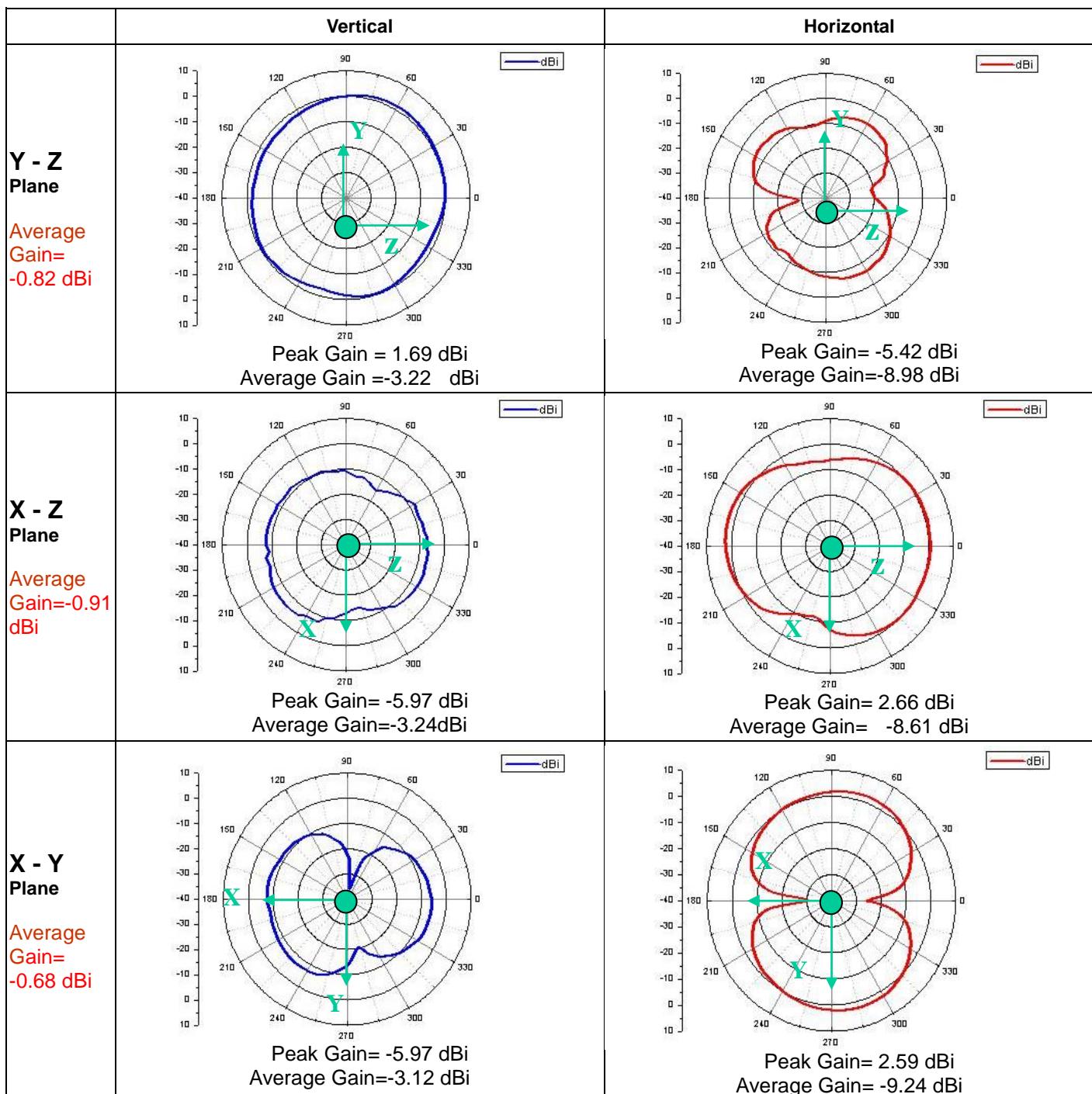
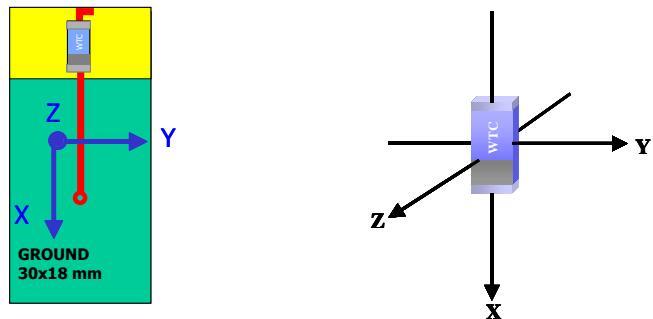


Antenna S11 on Test Board



## RADIATION PATTERN

Radiation Pattern and Gain were dependent on measurement board design. The specification of RFANT5220110A0T antenna was measured based on the PCB size and installation position as shown in the below figure Test Board



**RELIABILITY TEST**

Test item	Test condition / Test method	Specification
Solderability JIS C 0050-4.6 JESD22-B102D	*Solder bath temperature : $235 \pm 5^\circ\text{C}$ *Immersion time : $2 \pm 0.5$ sec Solder : Sn3Ag0.5Cu for lead-free	At least 95% of a surface of each terminal electrode must be covered by fresh solder.
Resistance to soldering heat JIS C 0050-5.4	*Preheating temperature : $120\text{--}150^\circ\text{C}$ , 1 minute. *Solder temperature : $270 \pm 5^\circ\text{C}$ *Immersion time : $10 \pm 1$ sec Solder : Sn3Ag0.5Cu for lead-free Measurement to be made after keeping at room temperature for $24 \pm 2$ hrs	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within $-40 \text{--} 85^\circ\text{C}$ . Loss of metallization on the edges of each electrode shall not exceed 25%.
Drop Test JIS C 0044 Customer's specification.	*Height : 75 cm *Test Surface : Rigid surface of concrete or steel. *Times : 6 surfaces for each units ; 2 times for each side.	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within $-40 \text{--} 85^\circ\text{C}$ .
Vibration JIS C 0040	*Frequency : $10\text{Hz}\text{--}55\text{Hz}\text{--}10\text{Hz}(1\text{min})$ *Total amplitude : 1.5mm *Test times : 6hrs.(Two hrs each in three mutually perpendicular directions)	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within $-40 \text{--} 85^\circ\text{C}$ .
Adhesive Strength of Termination JIS C 0051- 7.4.3	*Pressurizing force : 5N (LGA terminal series) for 10 sec ; 5N ( $\leq 1608$ ) for 10 sec ; 10N ( $> 1608$ ) for 10 sec.	No remarkable damage or removal of the termination.
Bending test JIS C 0051- 7.4.1	The middle part of substrate shall be pressurized by means of the pressurizing rod at a rate of about 1 mm/s per second until the deflection becomes 1mm and then pressure shall be maintained for $5 \pm 1$ sec. Measurement to be made after keeping at room temperature for $24 \pm 2$ hours	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within $-40 \text{--} 85^\circ\text{C}$ .

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Temperature cycle JIS C 0025	<ol style="list-style-type: none"> <li>30±3 minutes at <math>-40^{\circ}\text{C} \pm 3^{\circ}\text{C}</math>,</li> <li>10~15 minutes at room temperature,</li> <li>30±3 minutes at <math>+85^{\circ}\text{C} \pm 3^{\circ}\text{C}</math>,</li> <li>10~15 minutes at room temperature,</li> </ol> <p>Total 100 continuous cycles Measurement to be made after keeping at room temperature for <math>24 \pm 2</math> hrs</p>	<p>No mechanical damage.</p> <p>Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within <math>-40 \sim 85^{\circ}\text{C}</math>.</p>
High temperature JIS C 0021	<p>*Temperature : <math>85^{\circ}\text{C} \pm 2^{\circ}\text{C}</math></p> <p>*Test duration : 1000+24/-0 hours</p> <p>Measurement to be made after keeping at room temperature for <math>24 \pm 2</math> hrs</p>	<p>No mechanical damage.</p> <p>Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within <math>-40 \sim 85^{\circ}\text{C}</math>.</p>
Humidity (steady conditions) JIS C 0022	<p>*Humidity : 90% to 95% R.H.</p> <p>*Temperature : <math>40 \pm 2^{\circ}\text{C}</math></p> <p>*Time : 1000+24/-0 hrs.</p> <p>Measurement to be made after keeping at room temperature for <math>24 \pm 2</math> hrs</p> <p>※ 500hrs measuring the first data then 1000hrs data</p>	<p>No mechanical damage.</p> <p>Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within <math>-40 \sim 85^{\circ}\text{C}</math>.</p>
Low temperature JIS C 0020	<p>*Temperature : <math>-40^{\circ}\text{C} \pm 2^{\circ}\text{C}</math></p> <p>*Test duration : 1000+24/-0 hours</p> <p>Measurement to be made after keeping at room temperature for <math>24 \pm 2</math> hrs</p>	<p>No mechanical damage.</p> <p>Electrical specification shall satisfy the descriptions in electrical characteristics under the operational temperature range within <math>-40 \sim 85^{\circ}\text{C}</math>.</p>

## SOLDERING CONDITION

Typical examples of soldering processes that provide reliable joints without any damage are given in Fig 2. This product could sustain by reflow process three times, and the temperature below 260°C.

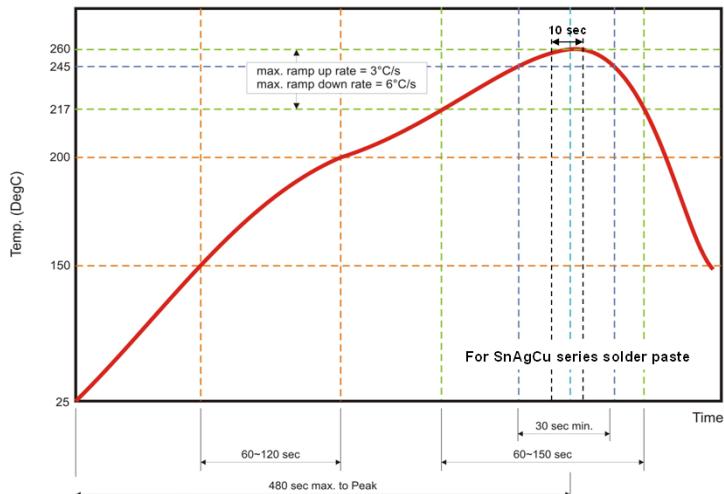


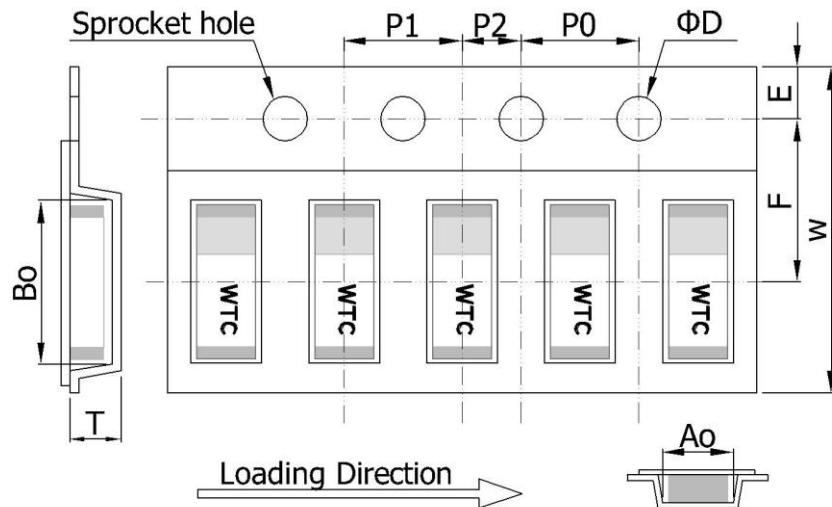
Fig 2. Infrared soldering profile

## ORDERING CODE

RF	ANT	522011	0	A	0	T
Walsin RF device	Product code ANT : Antenna	<b>Dimension code</b> Per 2 digits of Length, Width, Thickness : e.g. : 522011 = Length 52, Width 20, Thickness 11	<b>Unit of dimension</b> 0 : 0.1 mm 1 : 1.0 mm	<b>Application</b> A : 2.4GHz	<b>Specification</b> Design Code	<b>Packing</b> T : Reeled

Minimum Ordering Quantity: 2000 pcs per reel.

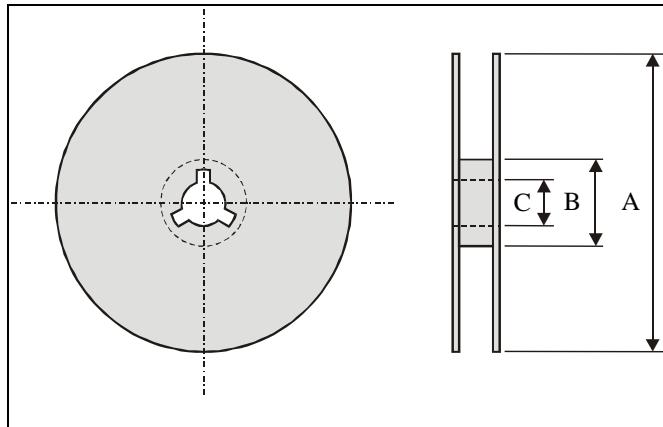
## PACKAGING



### Plastic Tape specifications (unit :mm)

Index	Ao	Bo	ΦD	T	W
Dimension (mm)	2.40 ± 0.10	5.50 ± 0.10	1.55 ± 0.05	1.20 ± 0.10	12.0 ± 0.10
Index	E	F	Po	P1	P2
Dimension (mm)	1.75 ± 0.10	5.50 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.10

**Reel dimensions**



Index	A	B	C
Dimension (mm)	Φ178	Φ60.0	Φ13.5

Typing Quantity: 2000 pieces per 7" reel

**CAUTION OF HANDLING**

**Limitation of Applications**

Please contact us before using our products for the applications listed below which require especially high reliability for the prevention of defects, which might directly cause damage to the third party's life, body or property.

- (1) Aircraft equipment
- (2) Aerospace equipment
- (3) Undersea equipment
- (4) Medical equipment
- (5) Disaster prevention / crime prevention equipment
- (6) Traffic signal equipment
- (7) Transportation equipment (vehicles, trains, ships, etc.)
- (8) Applications of similar complexity and /or reliability requirements to the applications listed in the above.

**Storage condition**

- (1) Products should be used in 6 months from the day of WALSIN outgoing inspection.
- (2) Storage environment condition.
  - Products should be storage in the warehouse on the following conditions.
  - Temperature : +5 to +40°C
  - Humidity : 30 to 70% relative humidity
  - Don't keep products in corrosive gases such as sulfur. Chlorine gas or acid or it may cause oxidization of electrode, resulting in poor solderability.
  - Products should be storage on the palette for the prevention of the influence from humidity, dust and so on.
  - Products should be storage in the warehouse without heat shock, vibration, direct sunlight and so on.
  - Products should be storage under the airtight packaged condition.