

APPROVAL SHEET

CUSTOMER NAME		
CUSTOMER P/N		
PART NAME	2.4G built-in antenna	
P/ N	XYD-B220	
APPROVAL REV.	A0	
DELIVERY DATE	2026. 5. 6	
PREPARED BY	Lee	
CHECKED BY	Jack	
APPROVED BY		
Customer Approved		
Approved By	Checked By	Prepared By

Address: Unit 603, Building 2, Huatian Garden, No. 214 Jian'an 1st Road, Xin'an Street,
Bao'an District, Shenzhen, China

Antenna technical parameters and environmental testing:

Electrical parameters of electrical apparatus			
Electrical Specifications		Mechanical Specifications	
Frequency Range	2400-2500MHz	Antenna material	copper
VSWR	<1.92	Working Temperature	-20℃~+70℃
Input Impedance	50 Ω	Working Humidity	20%~80%
Direction	All		
Gain	2.25 dBi		

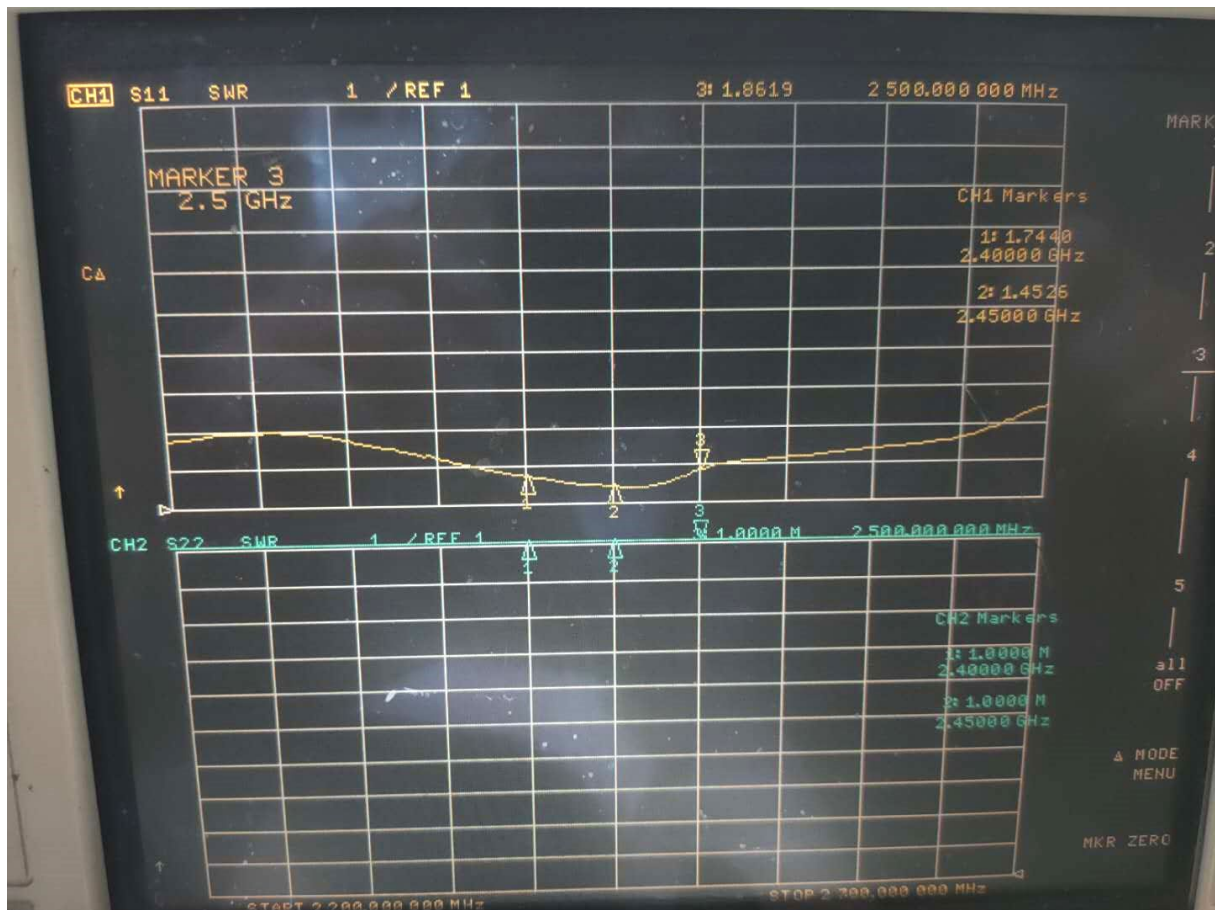
Environmental performance test:

project	test condition	standard
Storage Conditions	In the absence of specified test temperature, humidity, air pressure is as follows: 1. Temperature is - 20 ℃ ~ + 70 ℃ 2. Relative humidity of 45% to 45% 3. Air pressure is 86 kpa to 106 kpa	Electrical and mechanical properties is normal
high and low temperature test	Between 70 ℃ and -20 ℃ for 5 loops, then 1-2 h under normal conditions, check the appearance quality.	Size should meet the requirements and should satisfy the content with the electrical and mechanical properties
Constant damp and hot resistance test	95 + / - 3% relative humidity, temperature test: 40 ℃. Lasts 2 h after, try to take out the determination of electrical properties, within 5 min after try 1-2 h under article normal thing, check the appearance quality	Size should meet the requirements and should satisfy the content with the electrical and mechanical properties
vibration test	10-55 hz, vibration frequency range of displacement amplitude: 0.35 MM, acceleration amplitude: 50.0 M/S, sweep cycles: 30 times	Electrical and mechanical properties is normal
fall down test	1 m high altitude in accordance with the perpendicular axis free drop 3 times	Electrical and mechanical properties is normal

Physical picture of antenna:



Antenna performance test chart:

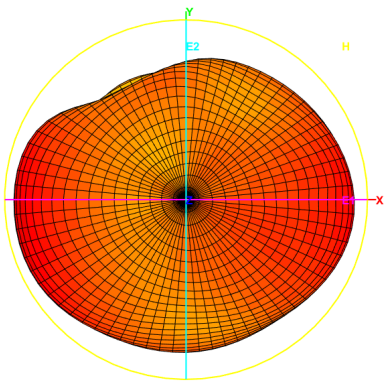


2D .3Dtest data:

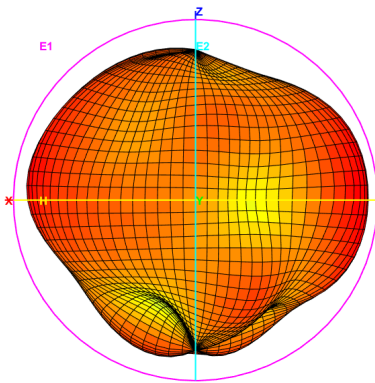
(2.4Gtest data)

Frequency	Efficiency (%)	Gain. (dBi)
2400MHz	51.17	1.84
2410MHz	51.52	1.69
2420MHz	54.20	1.96
2430MHz	51.29	2.02
2440MHz	47.64	2.00
2450MHz	47.86	2.25
2460MHz	46.56	1.89
2470MHz	47.53	1.92
2480MHz	48.98	1.78
2490MHz	50.23	1.83
2500MHz	45.81	1.51

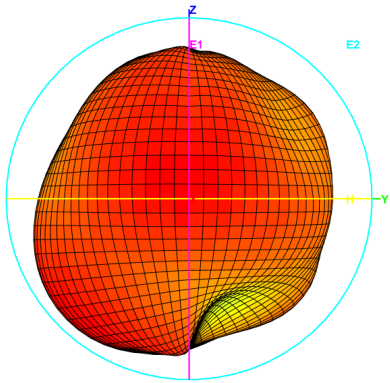
Total_3D_H_2.4GHz



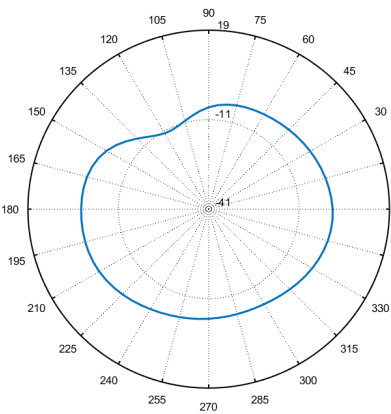
Total_3D_E1_2.4GHz



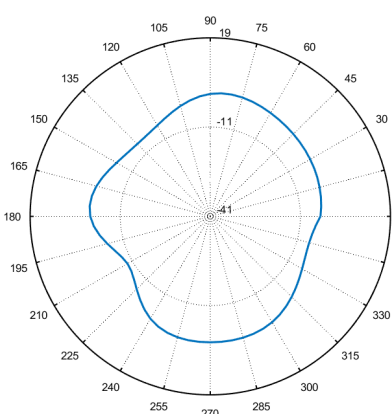
Total_3D_E2_2.4GHz



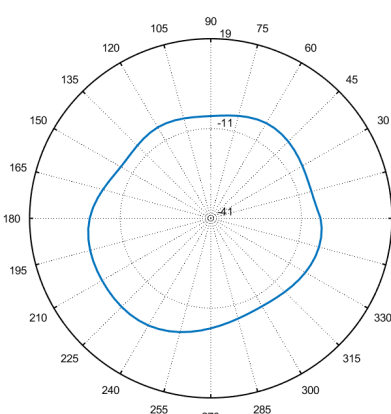
Total_Polar_H_2.4GHz



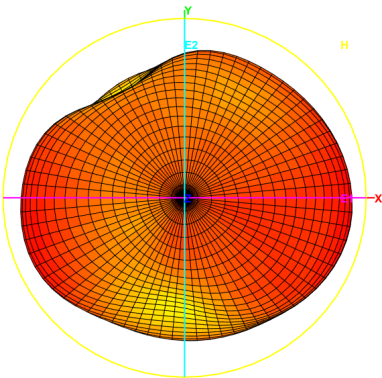
Total_Polar_E1_2.4GHz



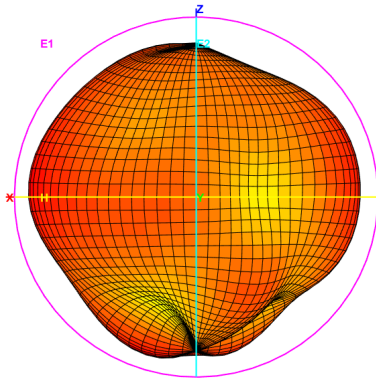
Total_Polar_E2_2.4GHz



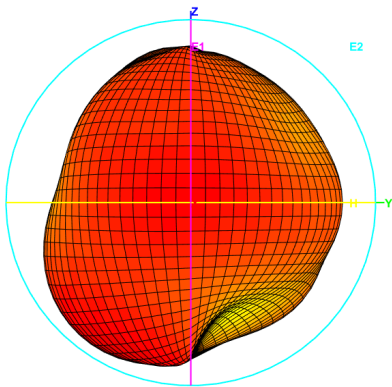
Total_3D_H_2.45GHz



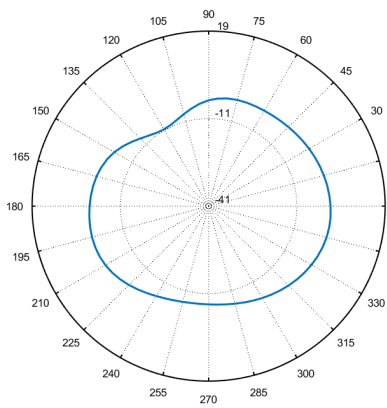
Total_3D_E1_2.45GHz



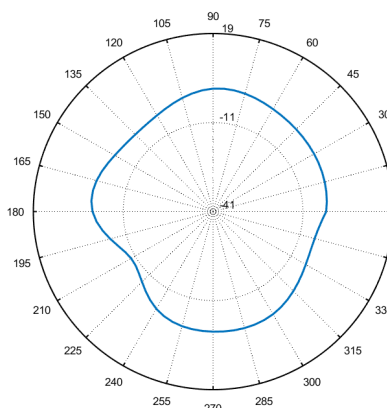
Total_3D_E2_2.45GHz



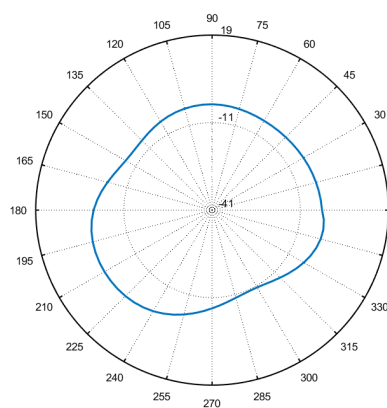
Total_Polar_H_2.45GHz



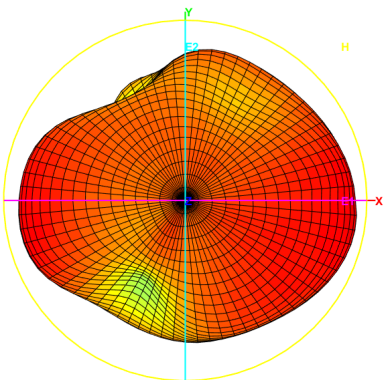
Total_Polar_E1_2.45GHz



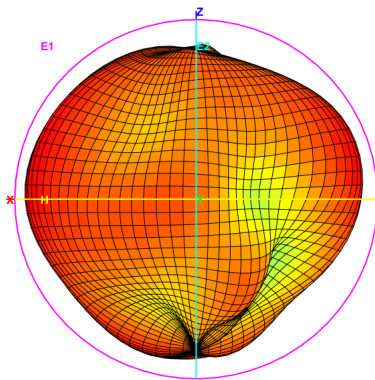
Total_Polar_E2_2.45GHz



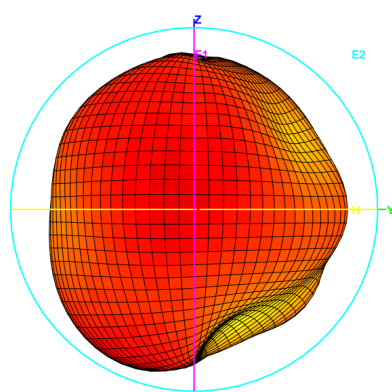
Total_3D_H_2.5GHz



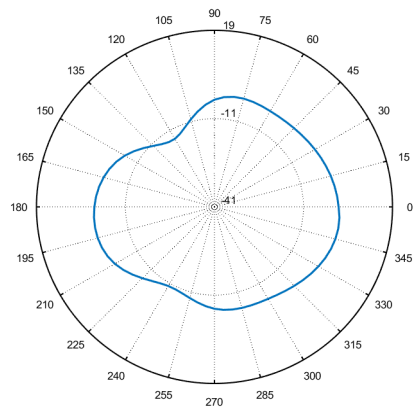
Total_3D_E1_2.5GHz



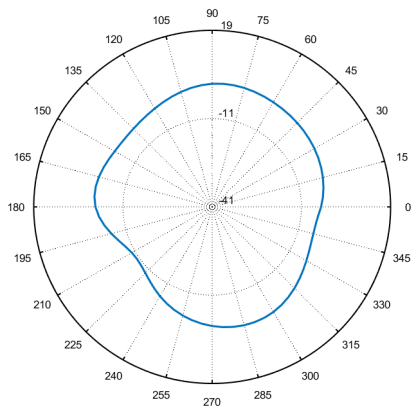
Total_3D_E2_2.5GHz



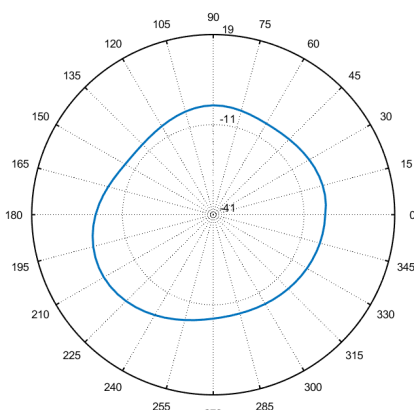
Total_Polar_H_2.5GHz



Total_Polar_E1_2.5GHz



Total_Polar_E2_2.5GHz



Material RoHS conformity declaration form												
We hereby certify that the raw materials used and the additives in the production engineering of the products to your company are conformed to the RoHS environmental requiremetns. (RoHS directive 2011/65 / EU)												
About the report of composition of raw materials, packaging materials and additives used in the production process for components and auxiliary materials is as bellow:												
Component /Part Name	Material Composition	ICP report #	Test Org.	Test Date	Content of harmful substances (ppm)						PASS?	
					Cd	Pb	Hg	Cr ⁶⁺	PBB	PBDE	PASS	
Cupronicke 1	Cupronickel	CANEC1922053501	SGS	19/11/13	ND	28	ND	ND	ND	ND	PASS	

APPROVAL SHEET

MULTILAYER CERAMIC ANTENNA

RFANT Series – RoHS Compliance

2.4 GHz ISM Band Working Frequency

P/N: RFANT5220110A0T

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

**FEATURES**

- ☐ Surface Mounted Devices with a small dimension of $5.2 \times 2.0 \times 1.1 \text{ mm}^3$ meet future miniaturization trend.
- ☐ 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.
- ☐ High Stability in Temperature / Humidity Change

APPLICATIONS

- ☐ Bluetooth
- ☐ Wireless LAN
- ☐ HormRF
- ☐ ISM band 2.4GHz wireless applications

DESCRIPTION

Walsin Technology Corporation develops a new ceramic embedded antenna specified for 2.4 GHz ISM Band application, as shown in below "CONSTRUCTION". Both of Wireless LAN IEEE 802.11b and Bluetooth™ typically located on this unlicensed frequency band which range covers from 2.4GHz to 2.4835GHz. To fulfil the friendly usage for antenna, this antenna has been designed to a typical 150MHz bandwidth through Walsin's advanced LTCC (Low Temperature Co-fired Ceramic) technology and superior product design via 3D EM Simulation Skill.

This antenna has a rectangular ceramic body with a tiny dimension of $5.2 \times 2.0 \times 1.1 \text{ mm}^3$ meet the future SMT automation and miniaturization requirements on modern portable devices.

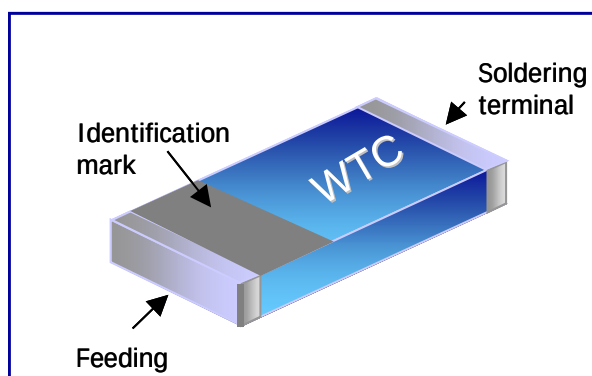
CONSTRUCTION

Fig 1. Outline of 2.4GHz Antenna – RFANT5220110A0T

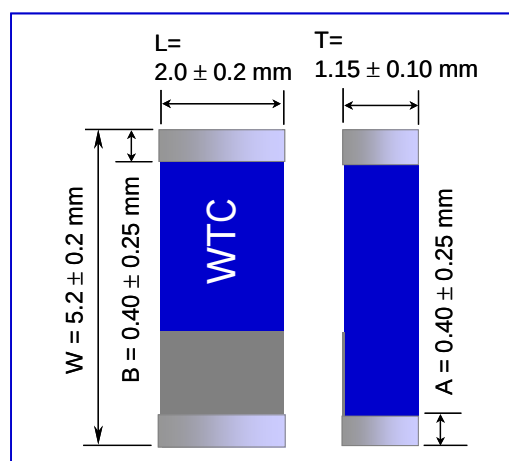
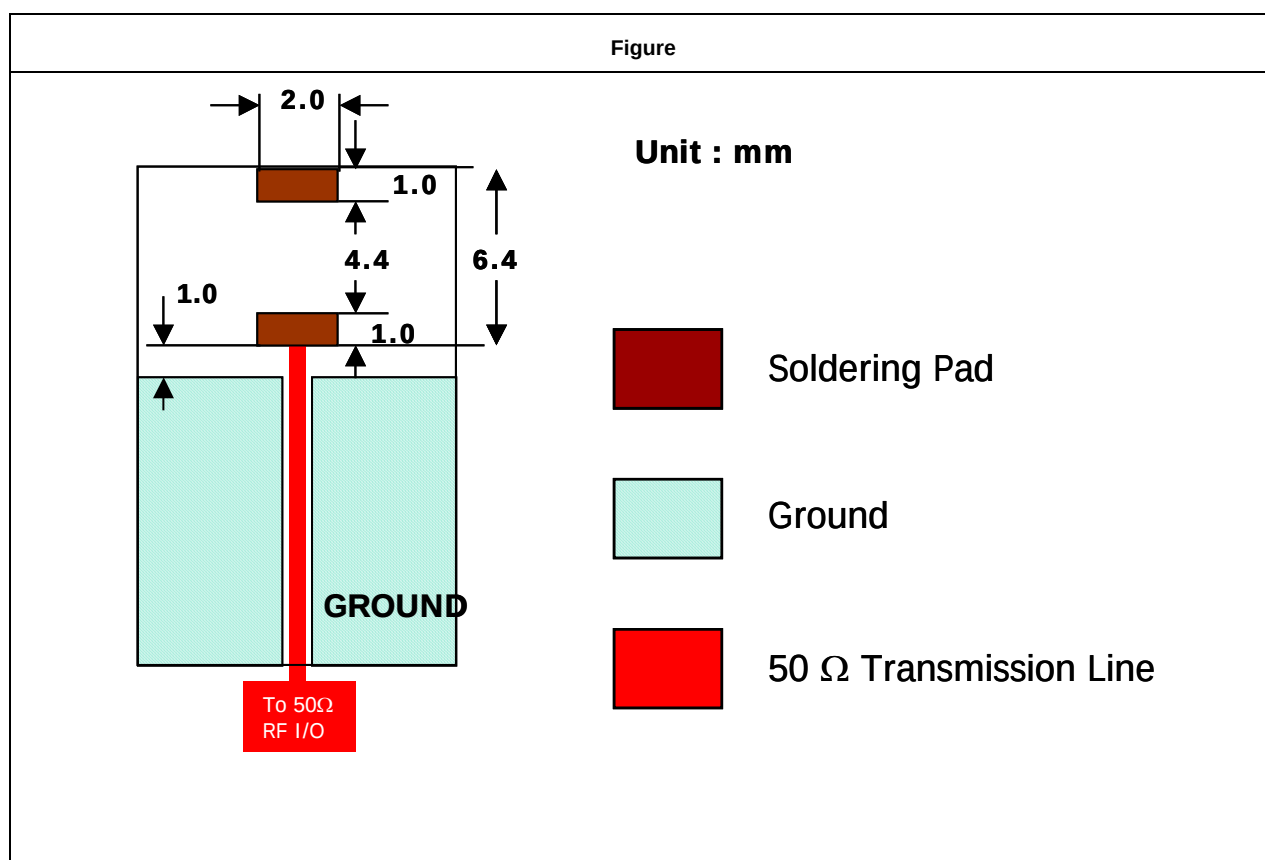


Fig 2. Dimension

SOLDER LAND PATTERN DESIGN

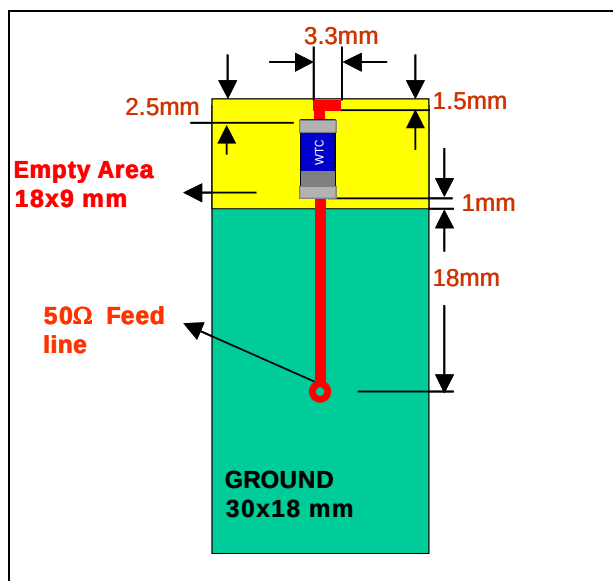


ELECTRICAL CHARACTERISTICS

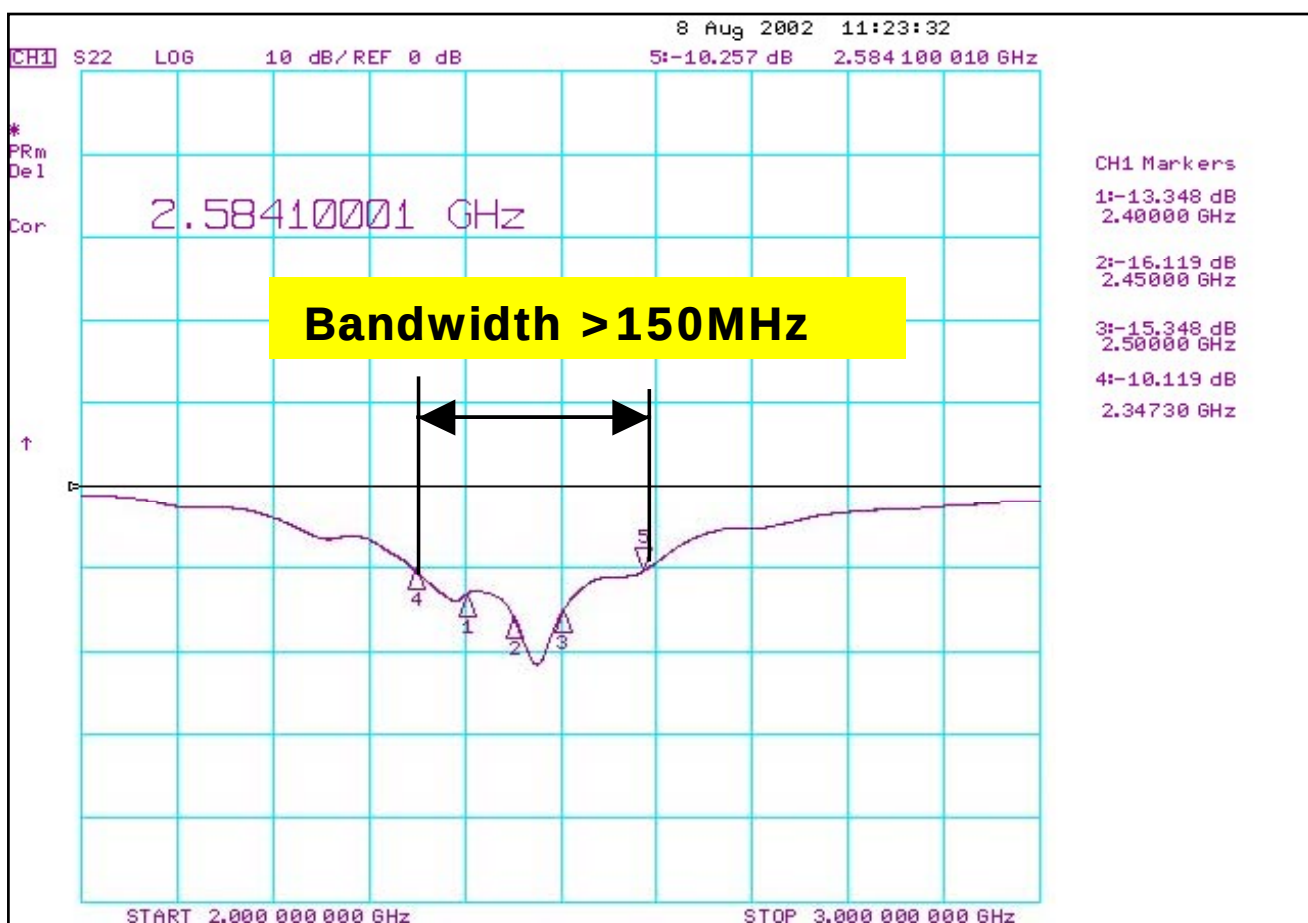
Item	Specification
Working Frequency Range	2.4 GHz ~ 2.5GHz
Gain	2 dBi (Typical)
VSWR	2 max.
Polarization	Linear
Azimuth Beamwidth	Omni-directional
Impedance	50Ω
Rated Power (max.)	3 Watts
Maximum Input Power	5 Watts for 5 minutes
Operation Temperature	-40°C ~ +85°C

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

Antenna on Test Board (FR4 Thickness 0.8mm)

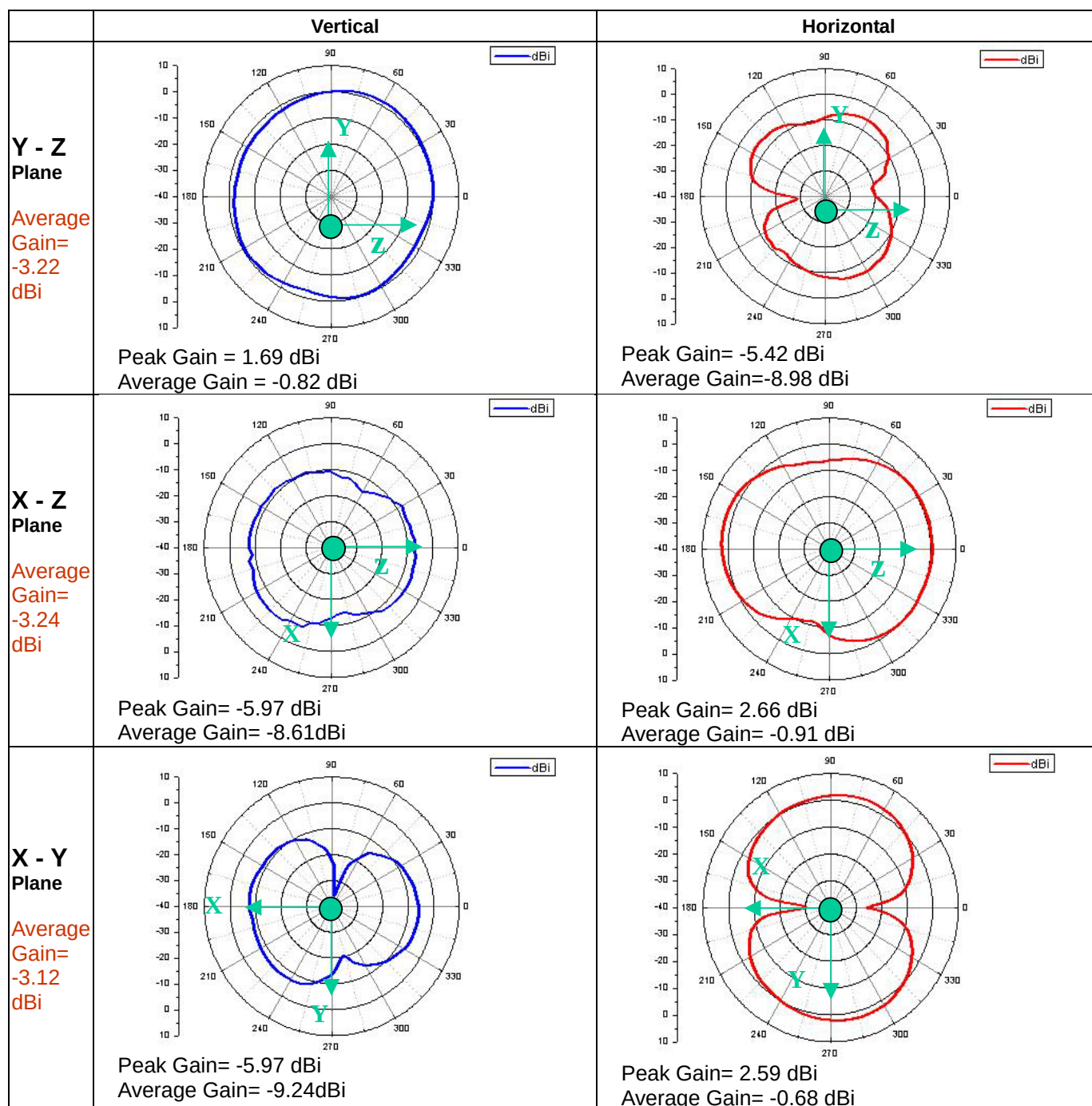
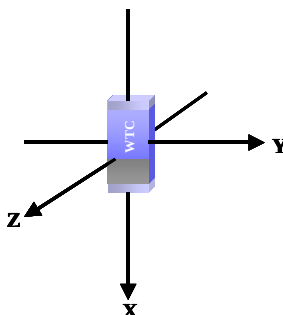
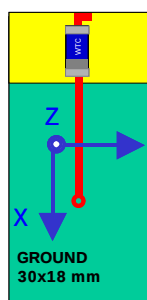


Antenna S11 on Test Board



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****■ Mechanical performance**

Test item	Test condition / Test method	Specification
Solderability	Solder temp. : $235 \pm 5^{\circ}\text{C}$ Immersion time: 2 ± 1 sec Solder: SN63	95% min. coverage of all metabolised area
Resistance to soldering heat	Solder: Sn63 Preheating temperature: $150 \pm 10^{\circ}\text{C}$ Solder Temperature: $260 \pm 5^{\circ}\text{C}$ Immersion time: 10 ± 1 sec Measurement to be made after keeping at room temp. for 24 ± 2 hrs.	No mechanical damage. Ceramic surface shall not be exposed in the middle of the termination or on the terminated product edge by leaching.
Drop test	Height : 75 cm Direction : 3 directions Times : 3 times.	No mechanical damage. Samples shall satisfy electrical specification after test..

Environmental characteristics

Test item	Test condition / Test method	Specification
Humidity Resistance	Humidity: 90% to 95% R.H. Temperature: $40 \pm 2^{\circ}\text{C}$ Time: 500 ± 24 hours. Measurement: After placing for 24 hours Minimum.	No mechanical damage. Samples shall satisfy electrical specification after test.
Temperature cycle	1. 30 ± 3 minutes at $-40^{\circ}\text{C} \pm 3^{\circ}\text{C}$, 2. 10~15 minutes at room temperature, 3. 30 ± 3 minutes at $+85^{\circ}\text{C} \pm 3^{\circ}\text{C}$, 4. 10~15 minutes at room temperature, Total 100 continuous cycles Measurement after placing for 48 ± 2 hrs min.	No mechanical damage. Samples shall satisfy electrical specification after test.
High temperature	Temperature: $85^{\circ}\text{C} \pm 2^{\circ}\text{C}$ Test duration: 24 hours Measurement must be taken after subjection to the above conditions, followed by exposure in room environment for 1 to 2 hours.	No mechanical damage. Samples shall satisfy electrical specification after test.
Low temperature	Temperature: $-40^{\circ}\text{C} \pm 3^{\circ}\text{C}$ Test duration: 24 hours Measurement must be taken after subjection to the above conditions, followed by exposure in room environment for 1 to 2 hours.	No mechanical damage. Samples shall satisfy electrical specification after test.

SOLDERING CONDITION

Typical examples of soldering processes that provide reliable joints without any damage are given in Fig 2

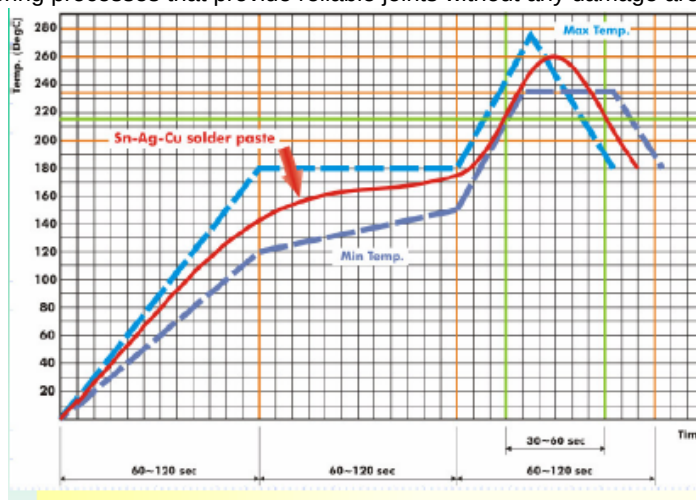


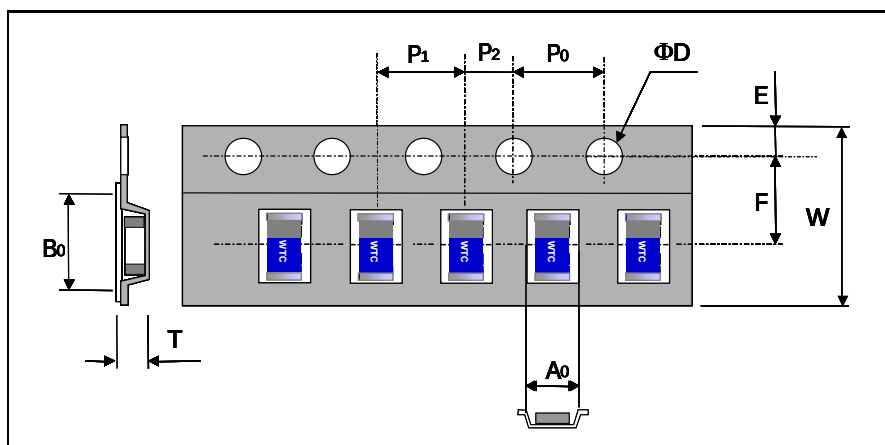
Fig 2. Infrared soldering profile

ORDERING CODE

RF	ANT	522011	0	A	0	T
Walsin RF device	Product code ANT : Antenna	Dimension code Per 2 digits of Length, Width, Thickness : e.g. : 522011 = Length 52, Width 20, Thickness 11	Unit of dimension 0 : 0.1 mm 1 : 1.0 mm	Application A : 2.4GHZ ISM Band	Specification Design Code	Packing T : 7" Reeled G : 10" Reeled B : Bulk X : SFC product

PACKAGING

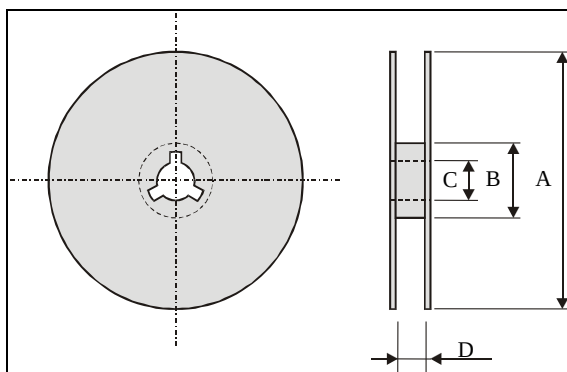
Plastic Tape specifications (unit :mm)



Index	A0	B0	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	P0	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	D
Dimension (mm)	Φ178	Φ60.0	Φ13.5	12.4±0.1

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, which can be confirmed.
- (2) Storage environment condition.

- Products should be storage in the warehouse on the following conditions.
- Temperature : -10 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 son 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.