

Address: Room 1119, Building 1 Hongda Commercial and
Creative Park 96 Yuanxiang Road Yunpu Subdistrict
Huangpu District Guangzhou City

SMD Antenna Specifications

CrossAir™ SMD Antenna Series
Compliant with RoHS Specifications

PN: CA-C03

2.4 GHz ISM Band antenna

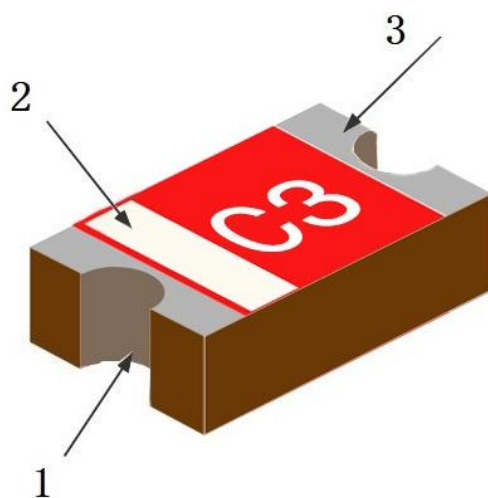
Characteristics

1. Compact SMD patch antenna measuring just $5.5 \times 2.0 \times 1.0 \text{ mm}^3$
2. Low energy dissipation with high antenna efficiency
3. High stability under varying temperature and humidity conditions

Application

1. 2.4GHz ISM Band Antenna Applications
2. Bluetooth, ZigBee, wireless applications, smart home applications, etc.
3. Wi-Fi (2.4GHz only)

Structure



1. Antenna feed end
2. Feed identification mark
3. Antenna soldered fixing end

Dimensions

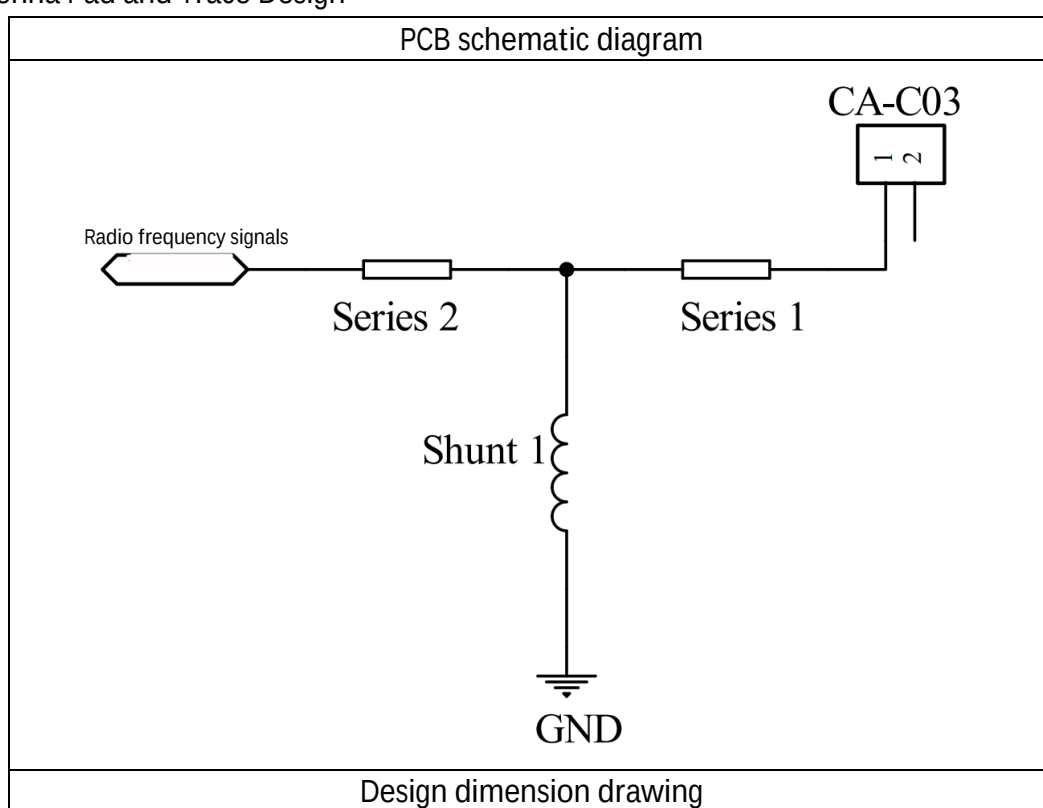
Three-view drawings	symbol	Dimensions(mm)
	L	5.5 ± 0.2
	w	2.0 ± 0.1
	T	1.0 ± 0.1
	a	0.5 ± 0.1

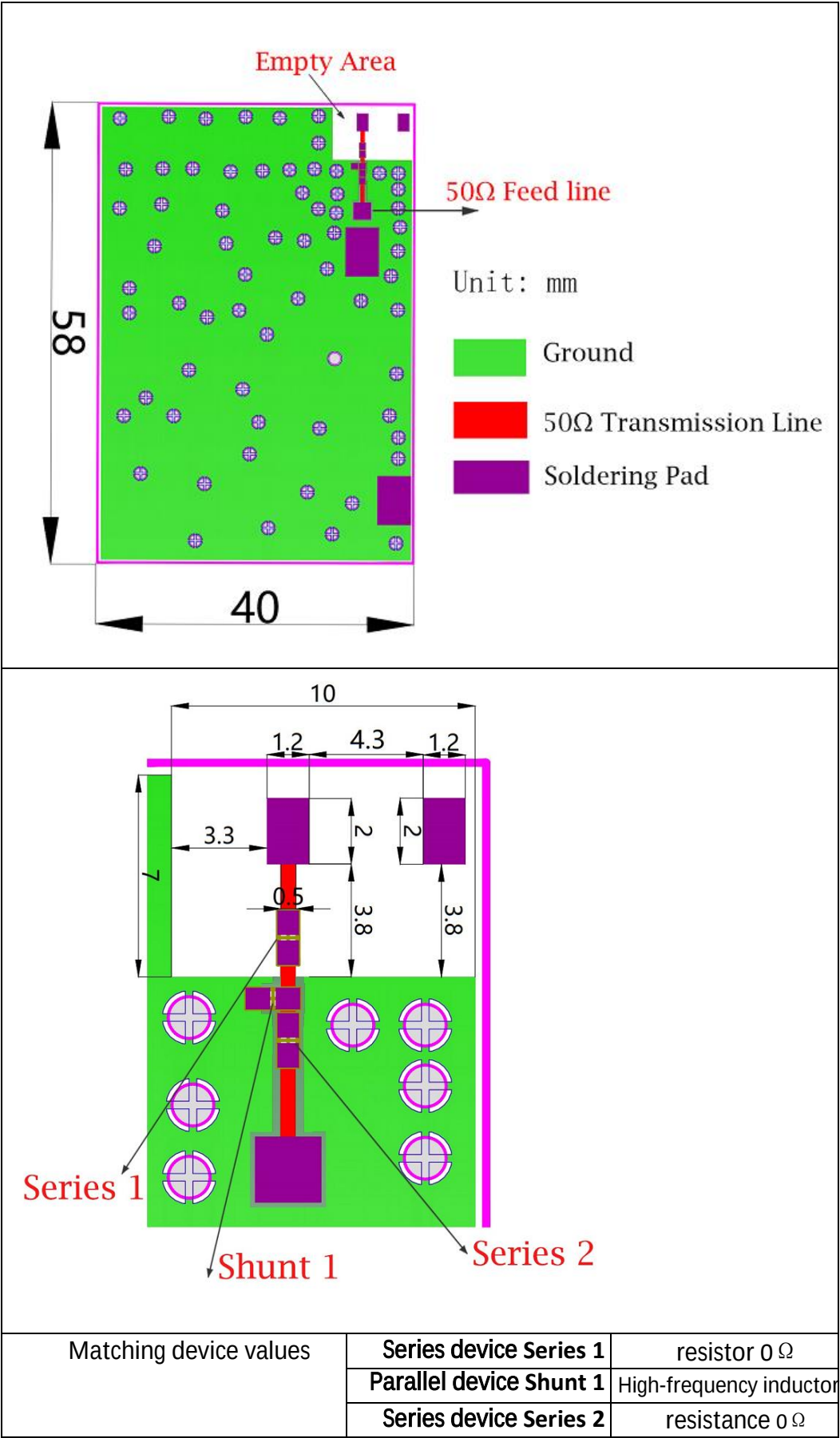
Electrical characteristics

CA-C03	Specification
Working Frequency	$2450 \pm 50\text{MHz}$
Band Width	$>100\text{MHz}$
Impedance	$50\ \Omega$
Gain(dBi)	4.3 (peak)
VSWR	<2
Operation Temperature	$-40^{\circ}\text{C} \sim +95^{\circ}\text{C}$
Power Capacity	3W

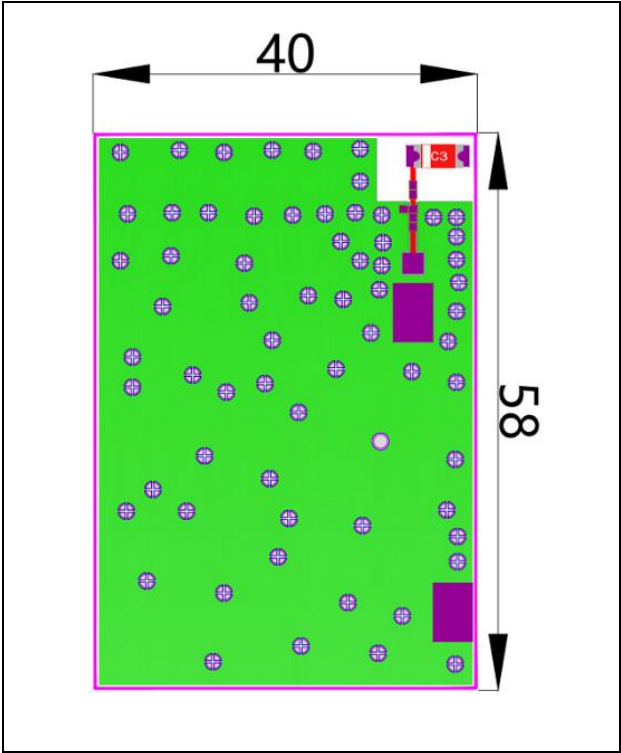
The antenna's 2.4 GHz operating frequency requires tuning via impedance matching components.

Antenna Pad and Trace Design

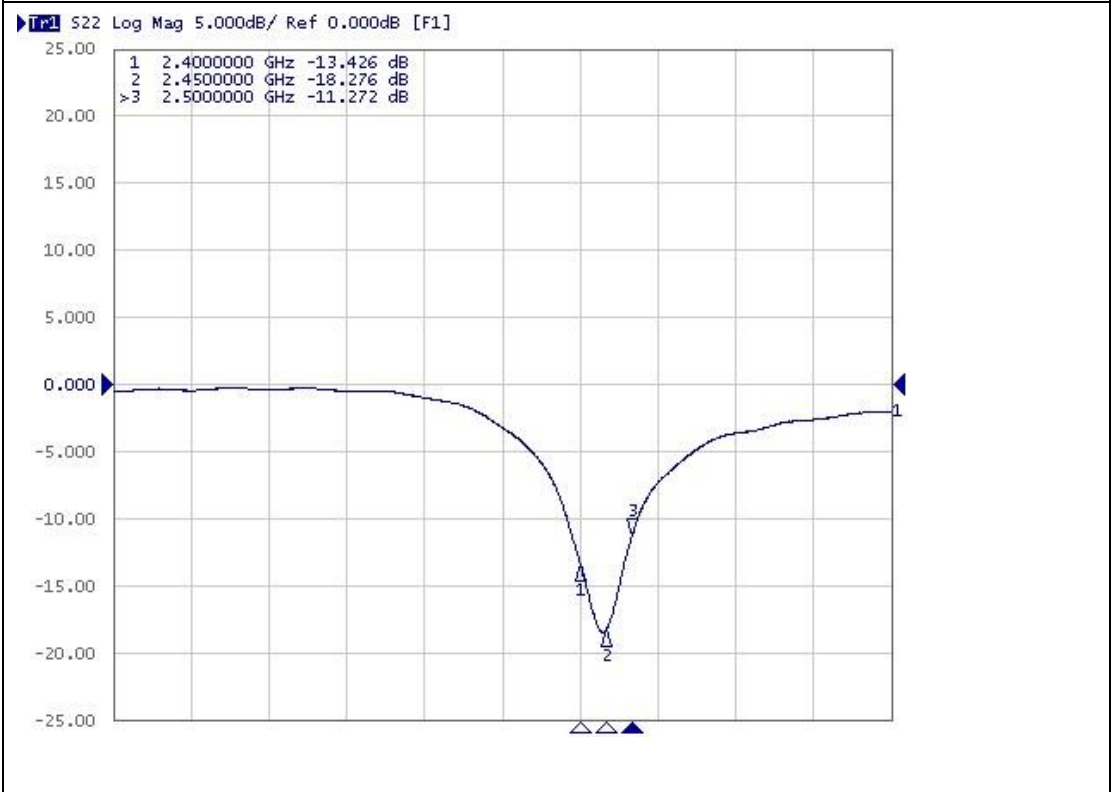




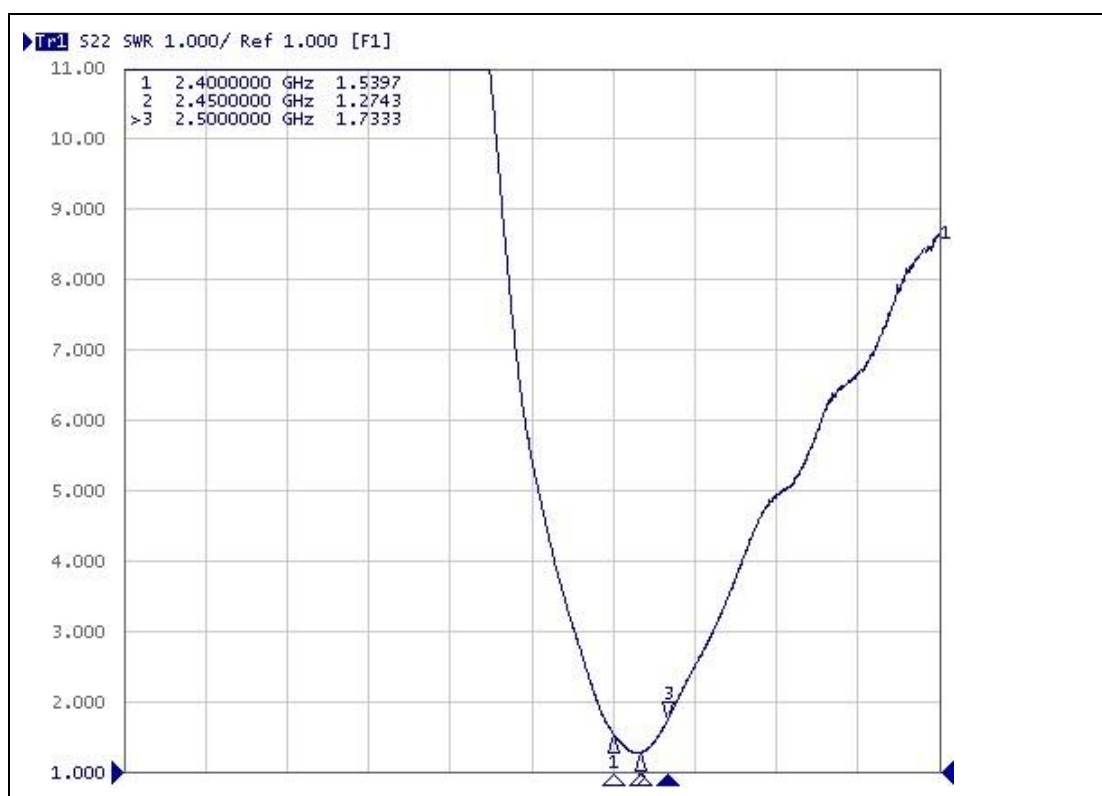
Antenna testing on test board (board thickness 1.0mm)



Antenna S11 Specifications

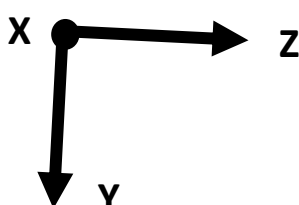
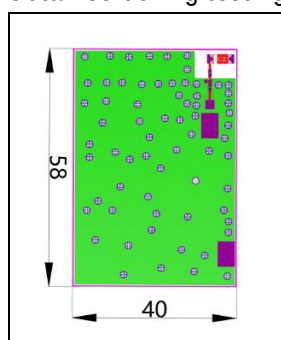


Antenna VSWR Characteristics

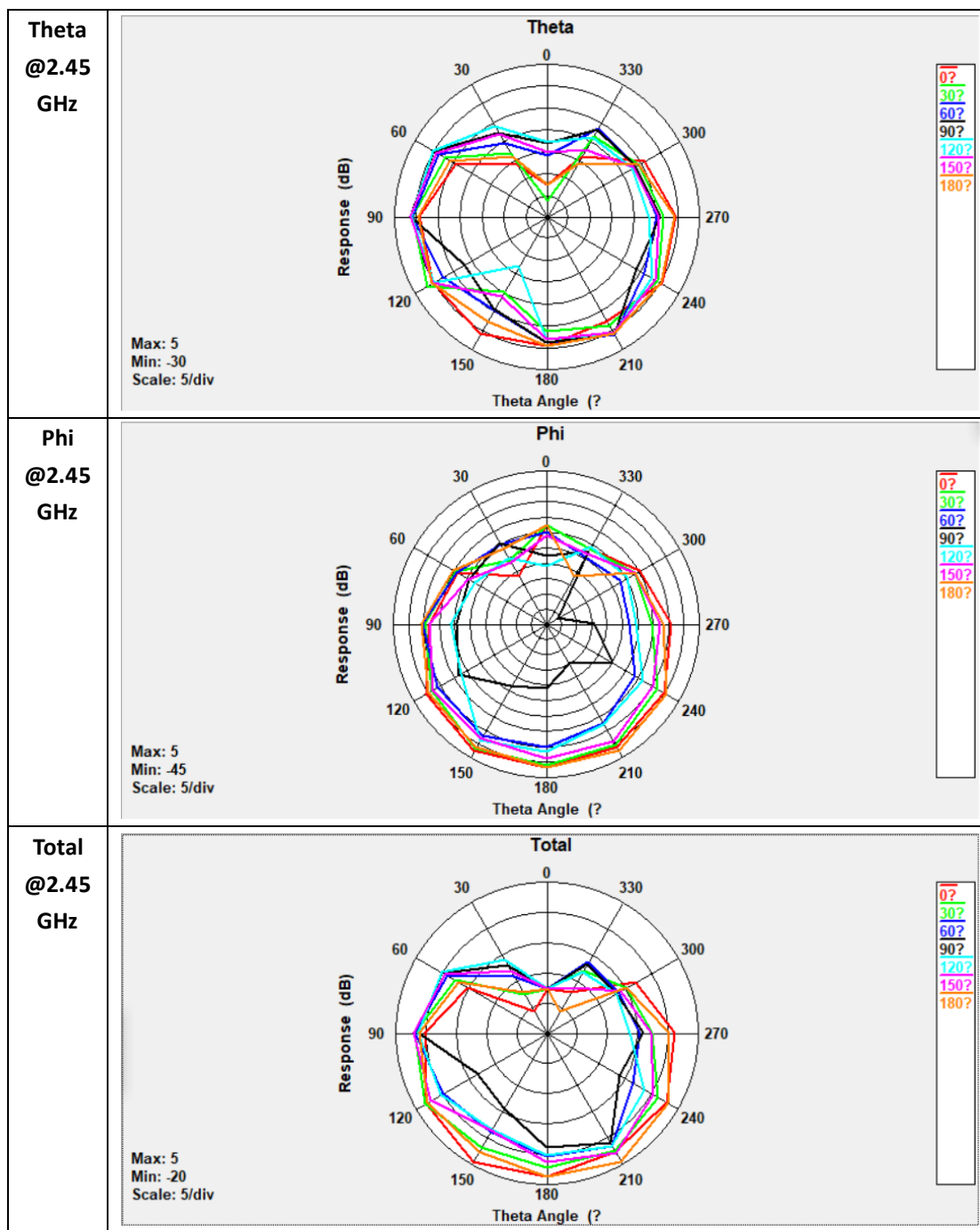


Efficiency and Radiation Pattern

Performance characteristics such as efficiency, radiation pattern, and gain are derived from the test board design. The specification test data for the CA-C03 antenna is based on the dimensions of the test PCB board and the test direction shown in the diagram below. The following data was obtained during testing in an ETS 3D microwave anechoic chamber.

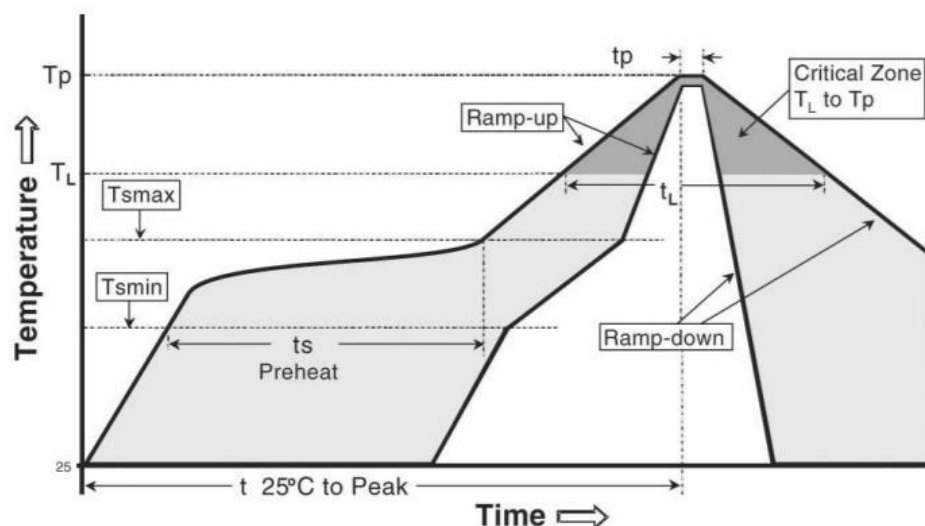


Gain and efficiency	bandwidth 2.4G-2.5GHz
Peak Gain	4.3dBi
Average Gain across the band	4.1dBi
Gain Range across the band	3.9dBi~4.3dBi
Peak Efficiency	81.7%
Average Efficiency across the band	80.2%
Efficiency Range across the band	78.6%~81.7%



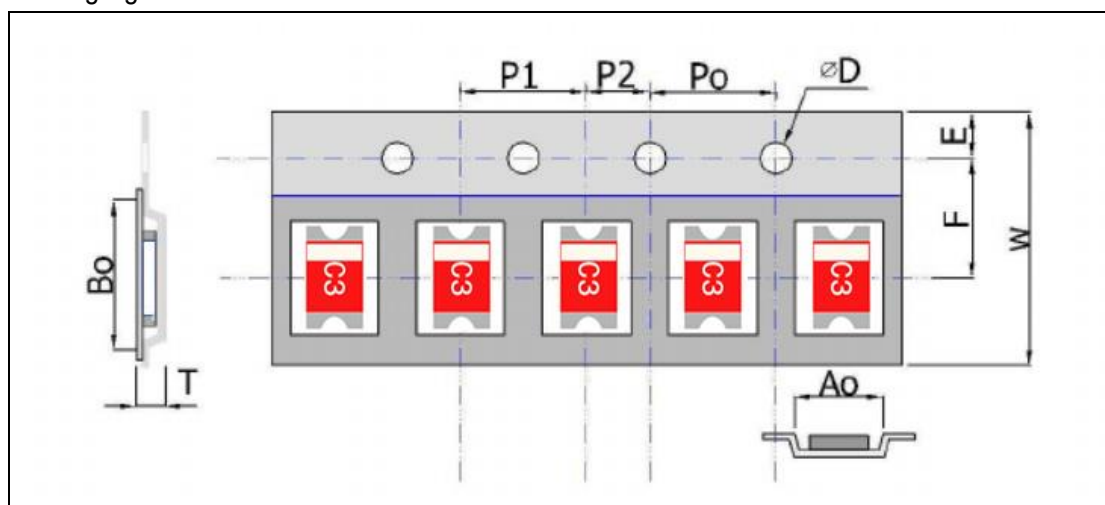
Welding conditions

A typical reliable and non-destructive welding specification is illustrated below:



Phase	Profile features	Pb-Free assembly (SnAgCu)
RAMP-UP	Avg. Ramp-up Rate (Tsmax to Tp)	3 °C / second (max.)
PREHEAT	- Temperature Min (Tsmin) - Temperature Max (Tsmax) - Time (tsmin to tsmax)	150 °C 200 °C 60-180 seconds
REFLOW	- Temperature (TL) - Total Time above TL (tL)	217 °C 60-150 seconds
PEAK	- Temperature (Tp) - Time (tp)	260 °C 20-40 seconds
RAMP-DOWN	Rate	6 °C/second max
Time from 25 °C to Peak Temperature		8 minutes max

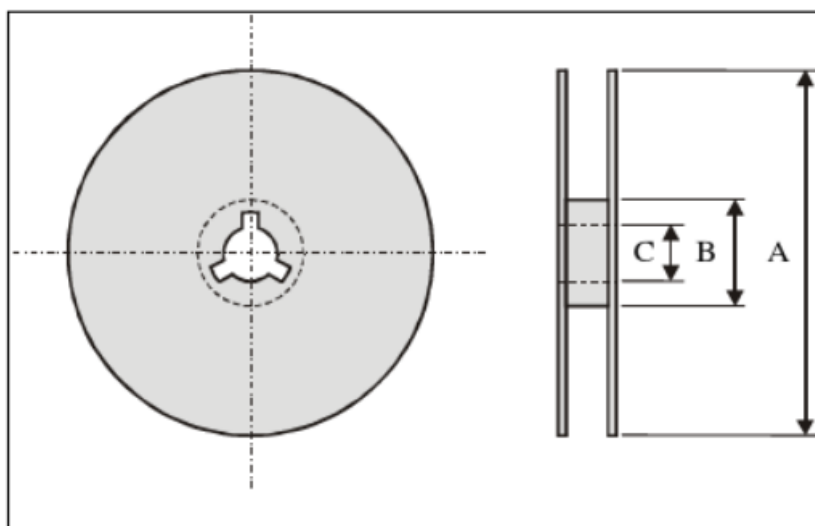
Packaging



Plastic carrier tape specifications (unit: mm)

Index	Ao	Bo	ΦD	T	W
Dimension (mm)	3.0 ± 0.1	6.0 ± 0.1	1.55 ± 0.05	1.6 ± 0.1	16 ± 0.2
Index	E	F	Po	P1	P2
Dimension (mm)	1.75 ± 0.1	7.0 ± 0.1	4.0 ± 0.1	4.0 ± 0.1	2.0 ± 0.1

Reel dimensions



Index	A	B	C
Dimension(mm)	330	100	13.5

Standard quantity: 3000 pieces per tray.

Storage environment

Products shall be stored under the following conditions:

Temperature : $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$

Humidity : 30% to 70% relative humidity

The product must not be placed in locations where it may come into contact with corrosive gases such as sulphur. Chlorine gas or acids may cause oxidation of the product's electrodes, resulting in impaired solderability.

The product should be stored in a toolbox and protected from moisture and dust.

The product should be stored in a warehouse, shielded from heat, vibration, and direct sunlight.

The product must be stored in sealed conditions.

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Model: 2.4GHz PCB ANT

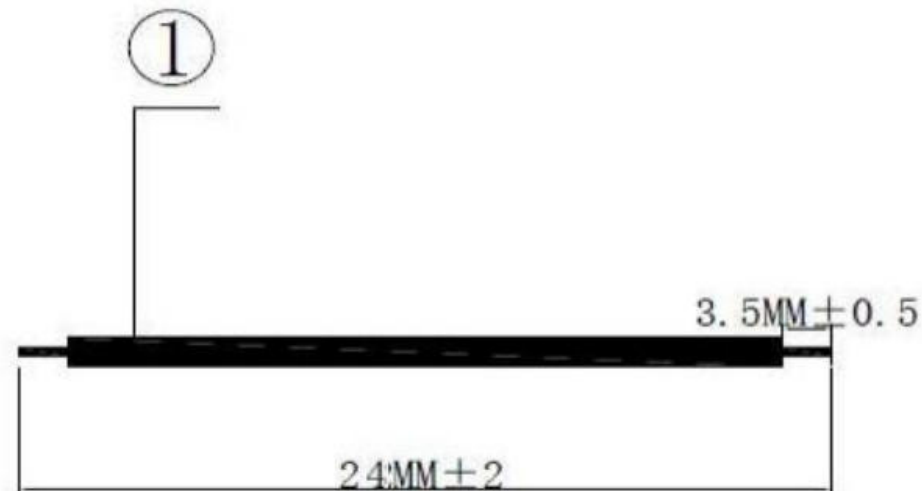
Notes for antenna installation



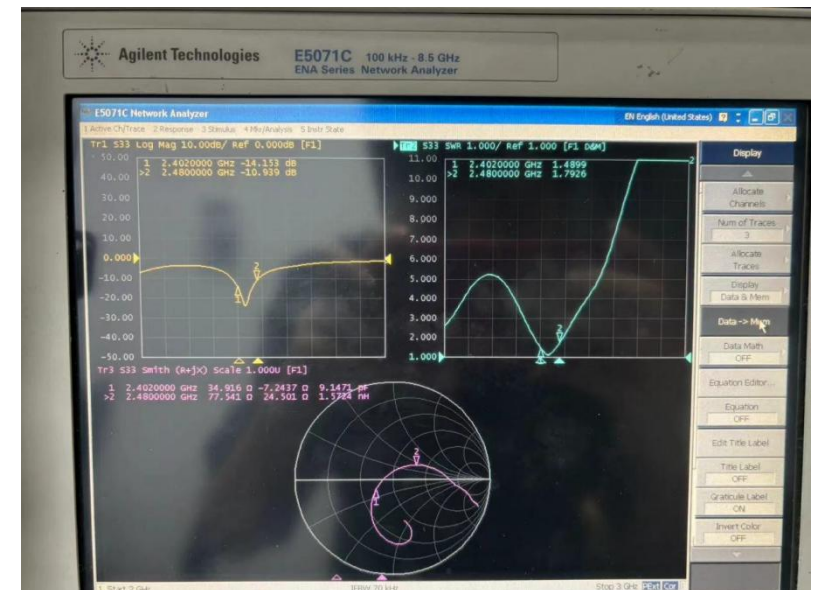
Notes for antenna installation

Electronic wire installation recommendations :

- 1: The electronic wire length is in the 24.60mm.
- 2: The electronic wire is installed on the side of the horn.
- 3: The end of the electronic wire is fixed with adhesive paper to make the consistency of the batch production good.



Antenna parameters



Freq	2.4GHz	2.5GHz	spce
VSWR	1.48	1.79	<2
Log Mag	-14.15	-10.93	<-10

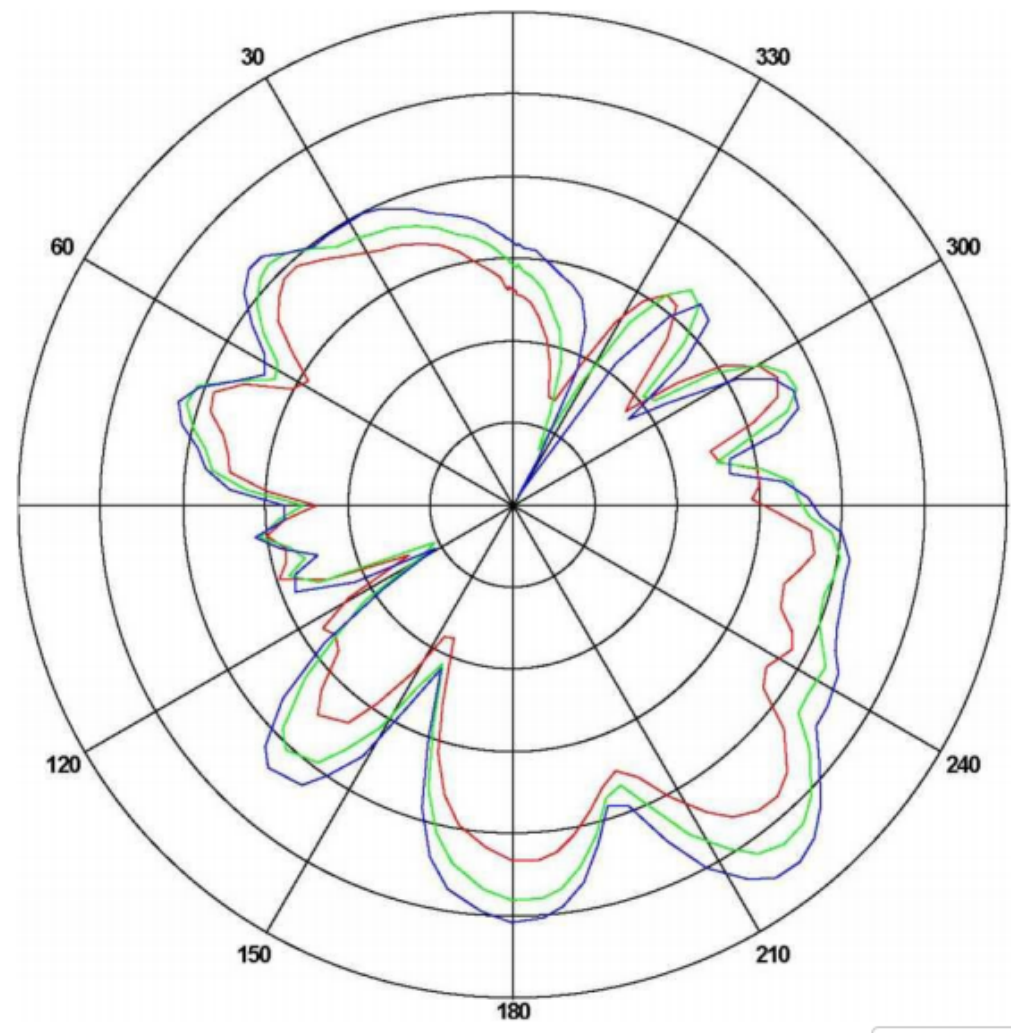
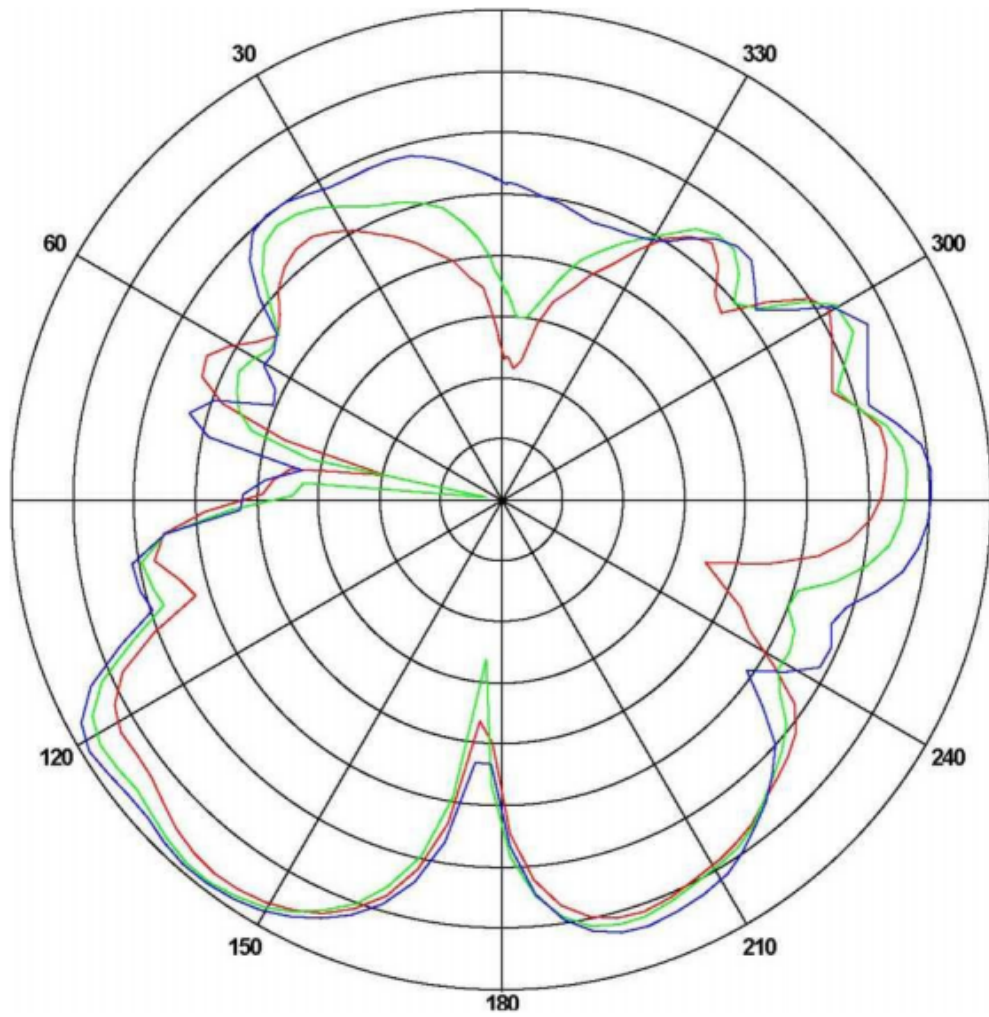
Antenna parameters

Frequency/Mhz	Efficiency / %	Gain/dBi
2400	4.2	-7.13
2410	4.21	-7.3
2420	4.33	-7.43
2430	4.38	-7.69
2440	4.4	-7.9
2450	4.66	-7.84
2460	4.8	-7.75
2470	5.01	-7.56
2480	4.7	-7.7
2490	4.65	-7.62
2500	4.29	-7.99

The measured distance on the roof of the building

Project	T11-N	Test date	2024.5.9	
Software release		Test location	The measured distance on the roof of the building	
Model	Measuring distance	Metal watchband	Non-metallic watchband	
IOS	Positive effective distance (≥15m)	18	17	
	Back effective distance (≥10m)	10	6	
Android	Positive effective distance (≥15m)	18	18	
	Back effective distance (≥10m)	9	9	

Antenna Radiation Pattern





Thank You!

The Concepts National Income And National Product Have Roughly The Same Value And Can Be Used Interchangeably If Our Interest Is In Their

