

SMD Antenna Specification Document

OverAir™ SMD Antenna Series
Compliant With RoHS Specifications

PN:CA-C01

2.4GHz Band Antenna

Characteristic

1. A small-sized SMD surface mount antenna with dimensions of only 3.20X1.60×0.40 mm³.
2. Low energy loss and high antenna efficiency.
3. It exhibits high stability under varying temperature and humidity conditions.

Apply

1. Antenna Applications in the 2.4GHz ISM Frequency Band.
2. Bluetooth, Wireless, and Smart Home Applications.

structure

1、 Antenna Feed Terminal

2、 Grounding Terminal on the Antenna Feed Side

3、 Antenna Ground Terminal

size

Three views	Symbol	Size (mm)
W=1.6 (mm) a=0.6 (mm) L=3.2 (mm) T=0.4 (mm)	L	3.20±0.10
	W	1.60±0.10
	T	0.40±0.05
	a	0.60±0.10

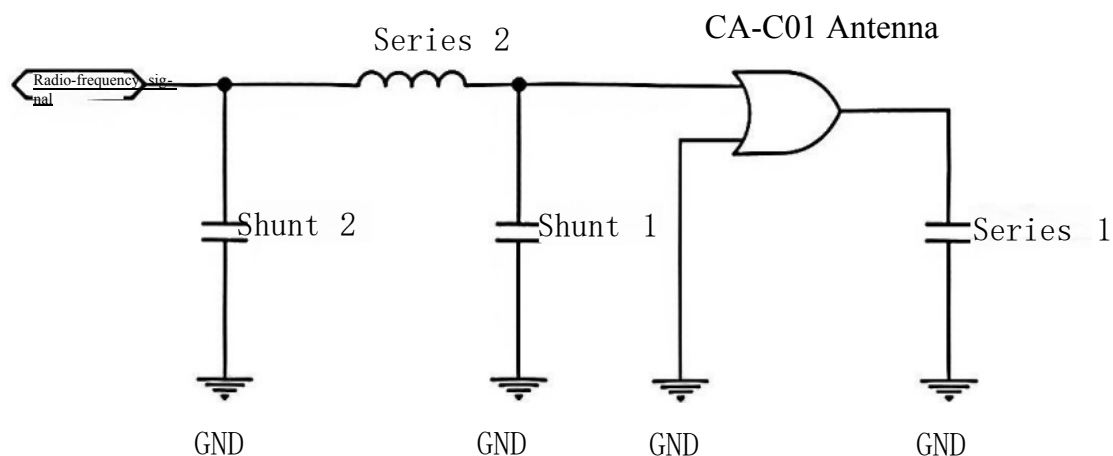
electrical character

CA-C01	Specification
Frequency Range	$2450 \pm 50\text{MHz}$
Bandwidth	$>100\text{MHz}$
Impedance	$50\ \Omega$
Gain (dBi)	2.96
Standing-wave ratio VSWR	<2
Operating Temperature	$-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
Acceptable Power Power Capacity	3W

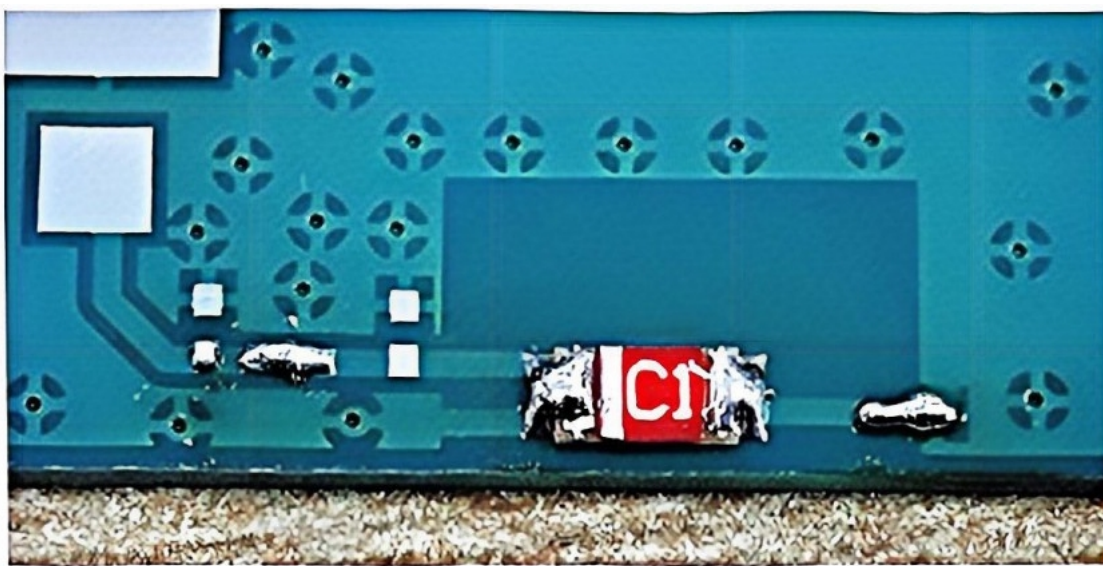
The operating frequency of 2.45 GHz needs to be achieved through impedance matching devices.

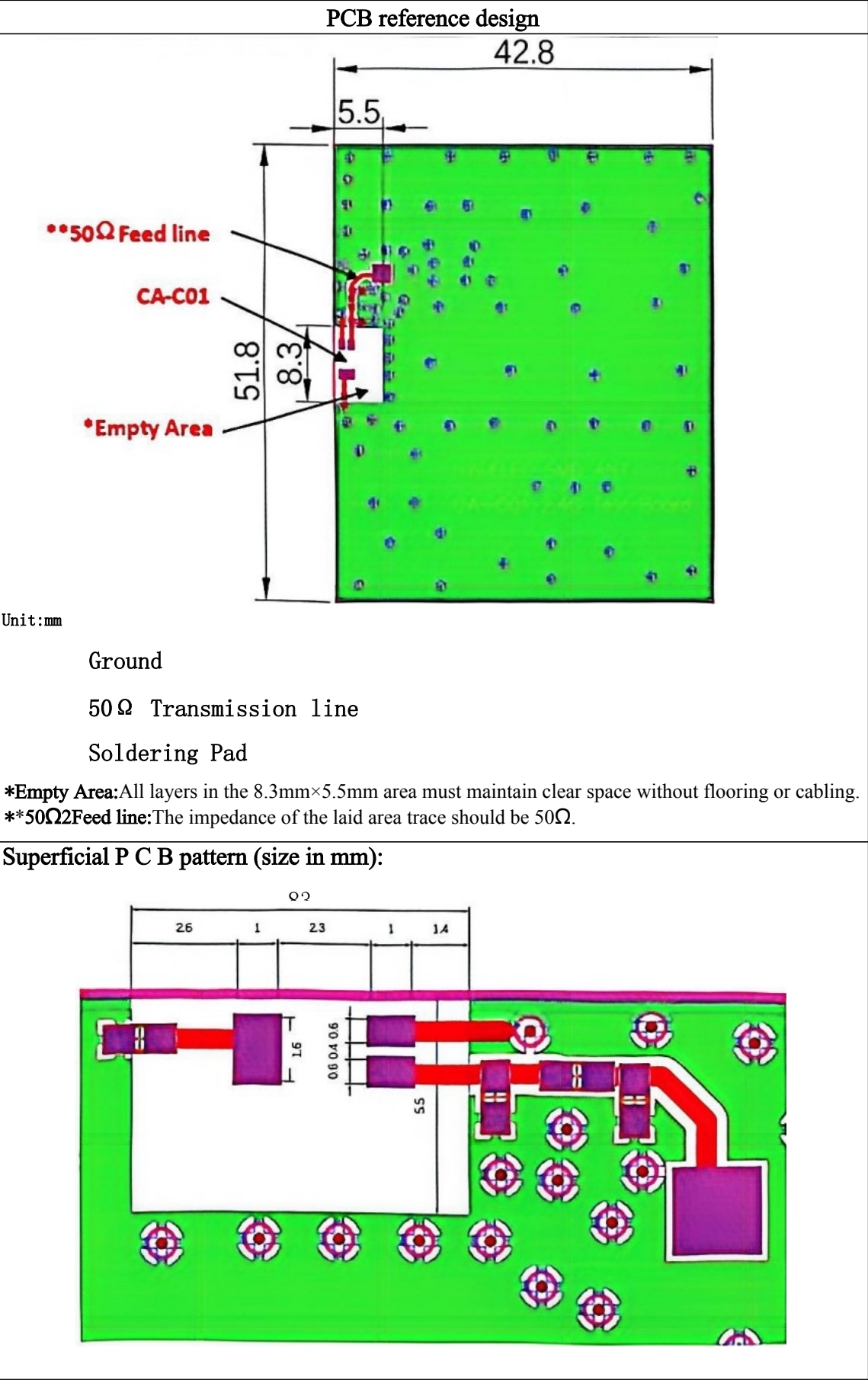
Antenna Pad and Tracing Design

Reference Design of PCB Schematic Diagram

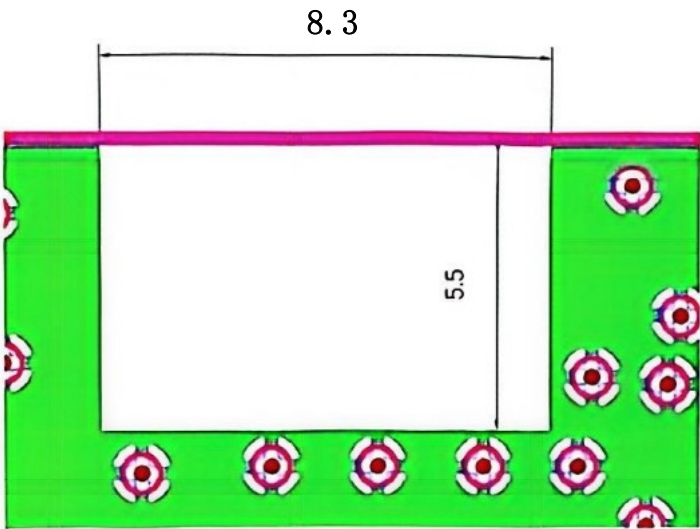


Antenna welding pattern



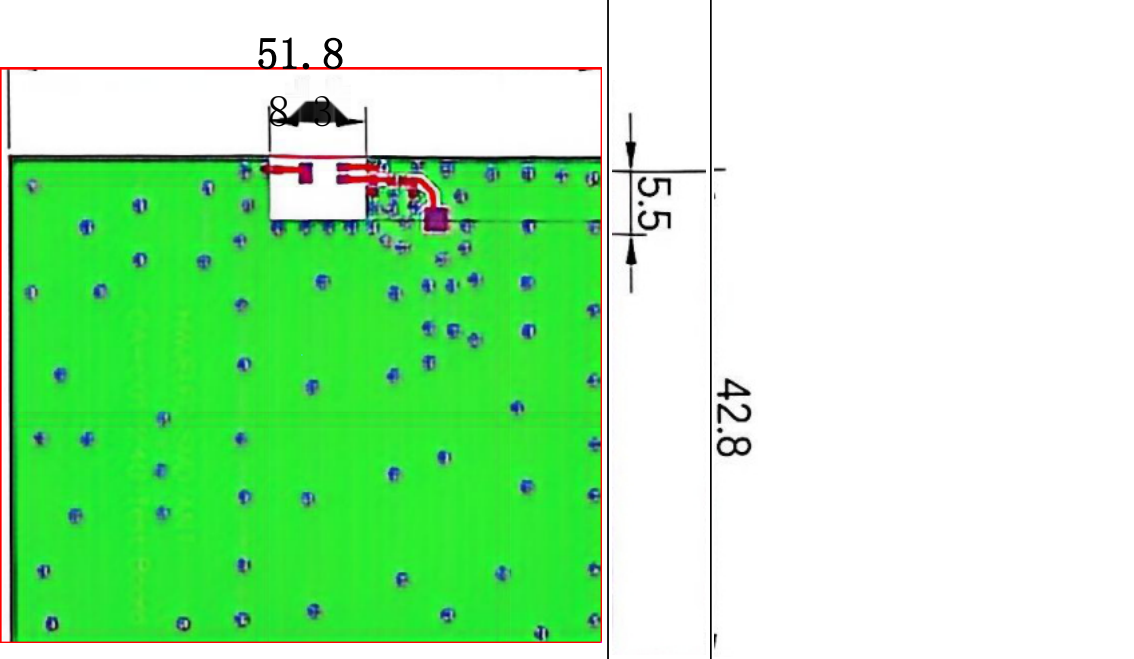


Lower PCB layout (dimensions in mm):

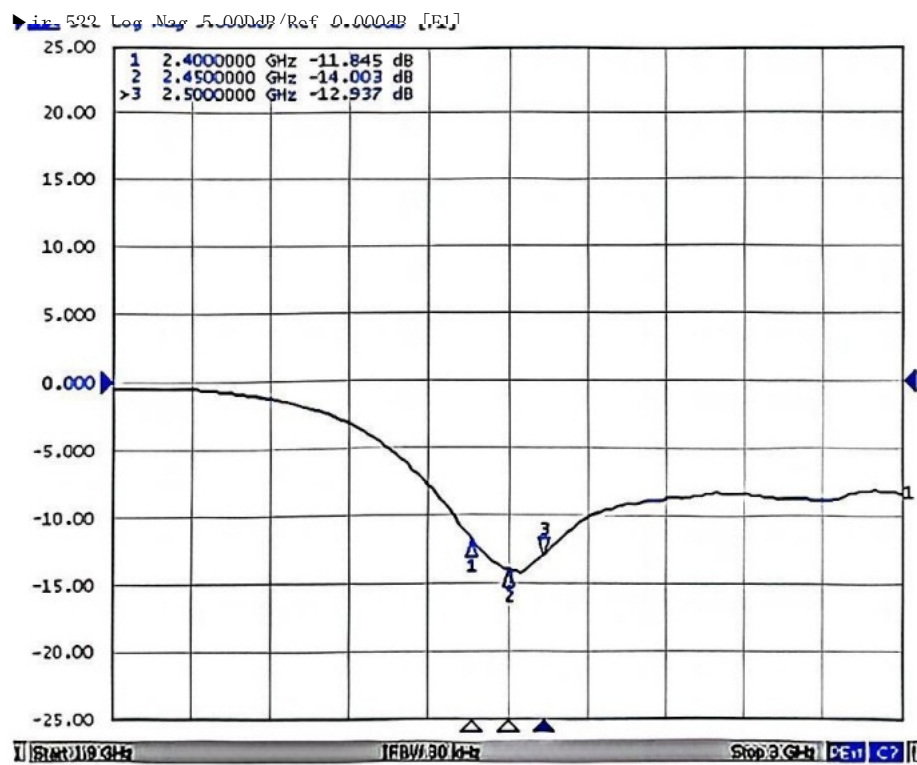


Matched device value	Series Device 1	0.75pF
	Shunt device Shunt1	1pF
	Series Device 2	1.8nH
	Shunt device shunt2	NC

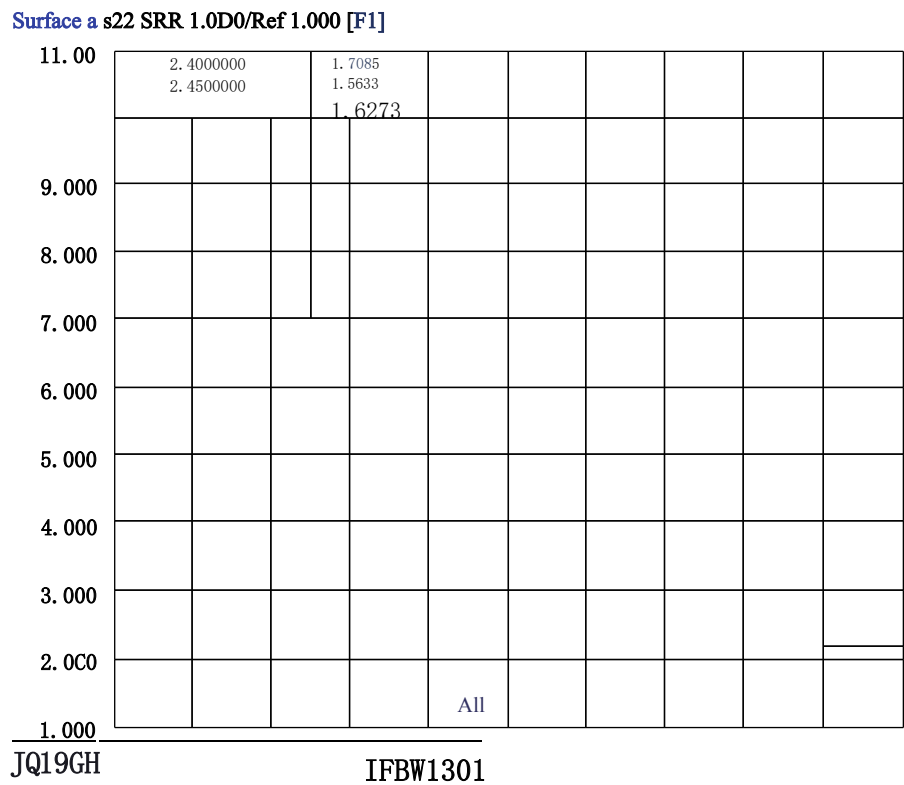
Antenna testing on test board (board thickness 1.0mm)



Antenna S11 Characteristics



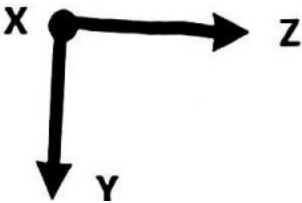
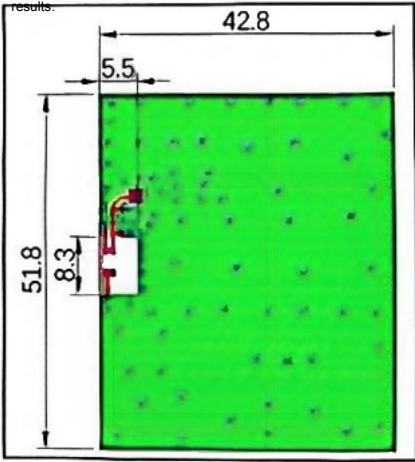
Antenna VSWR Characteristics



Efficiency and Radiation Diagram

Performance metrics including efficiency, radiation pattern, and gain are based on the test PCB board design. The test data for antenna specifications and characteristics of CA-C01 are derived from the test.

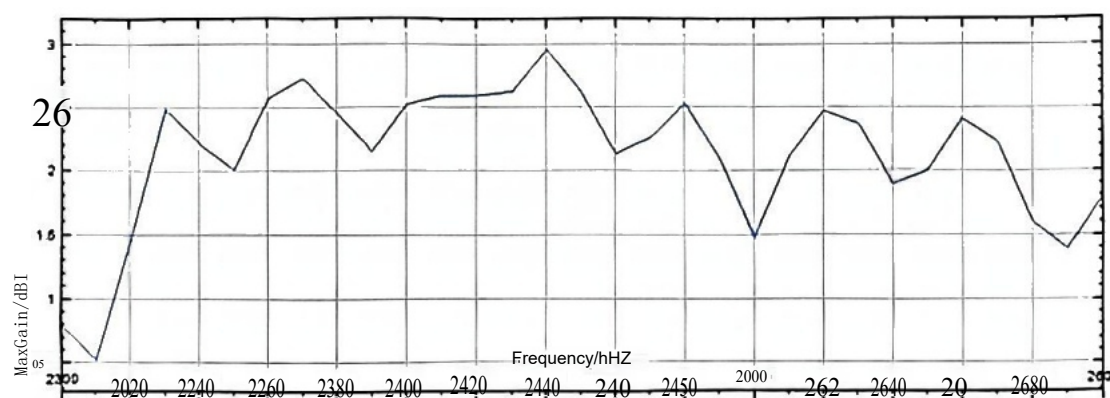
The PCB board dimensions and test orientation as shown in the figure below. The following data are based on ETS3D microwave anechoic chamber test results.



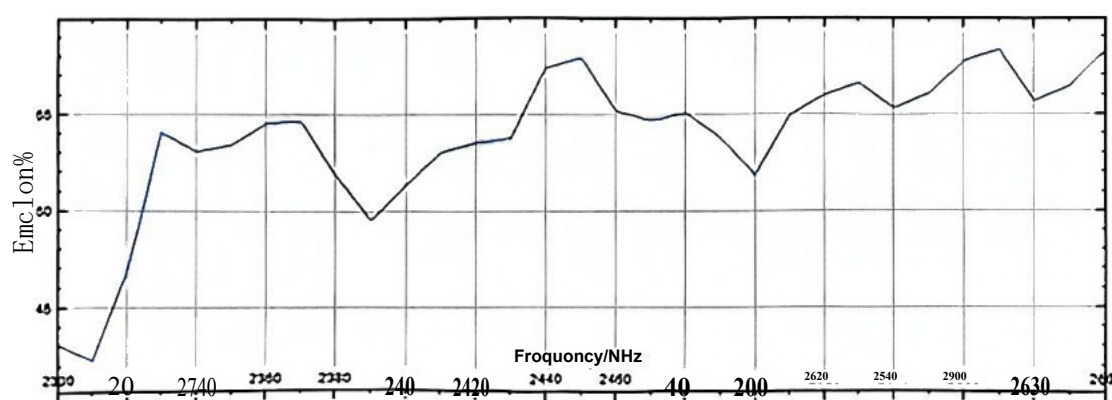
Antenna Gain Efficiency Test Table

Frequency/MHz	MaxGain/dBi	Effiaiciency /%
2400	2.52	51.4
2410	2.59	53.09
2420	2.59	53.58
2430	2.62	53.83
2440	2.96	57.41
2450	2.62	57.94
2460	2.13	55.21
2470	2.26	54.7
2480	2.53	55.08
2490	2.1	53.83
2500	1.48	51.88

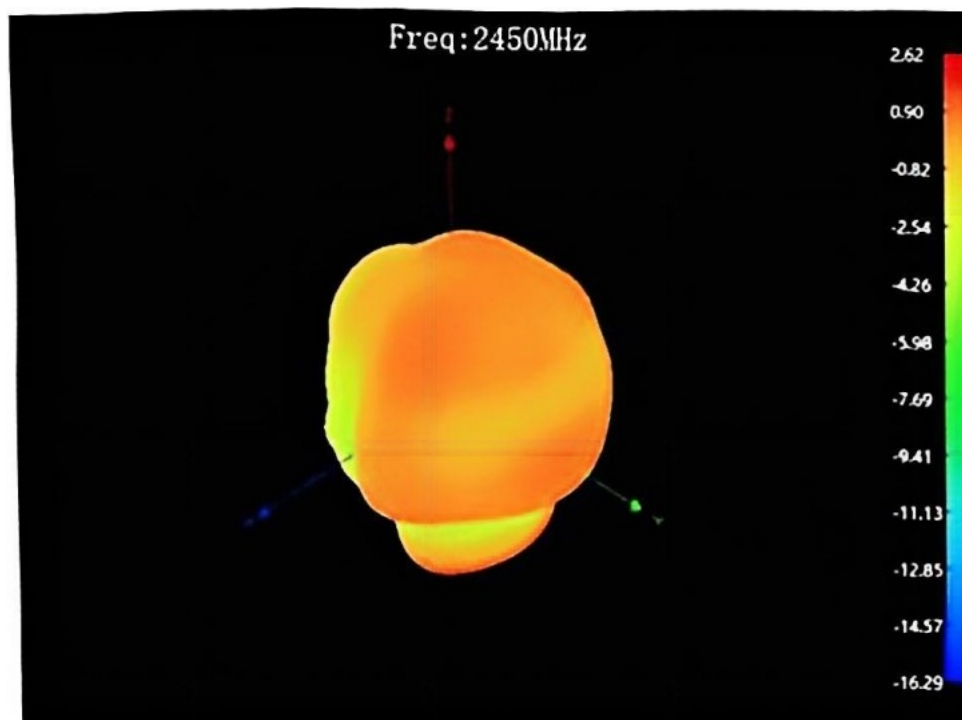
Antenna Gain Curve Diagram

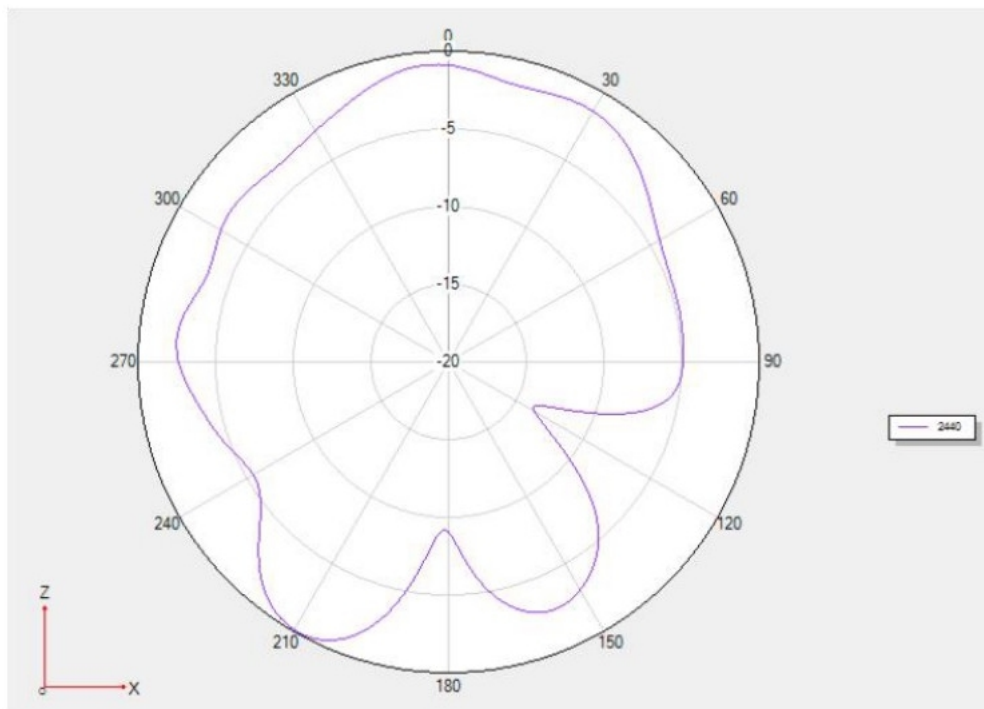


Skyline Efficiency Curve Plot

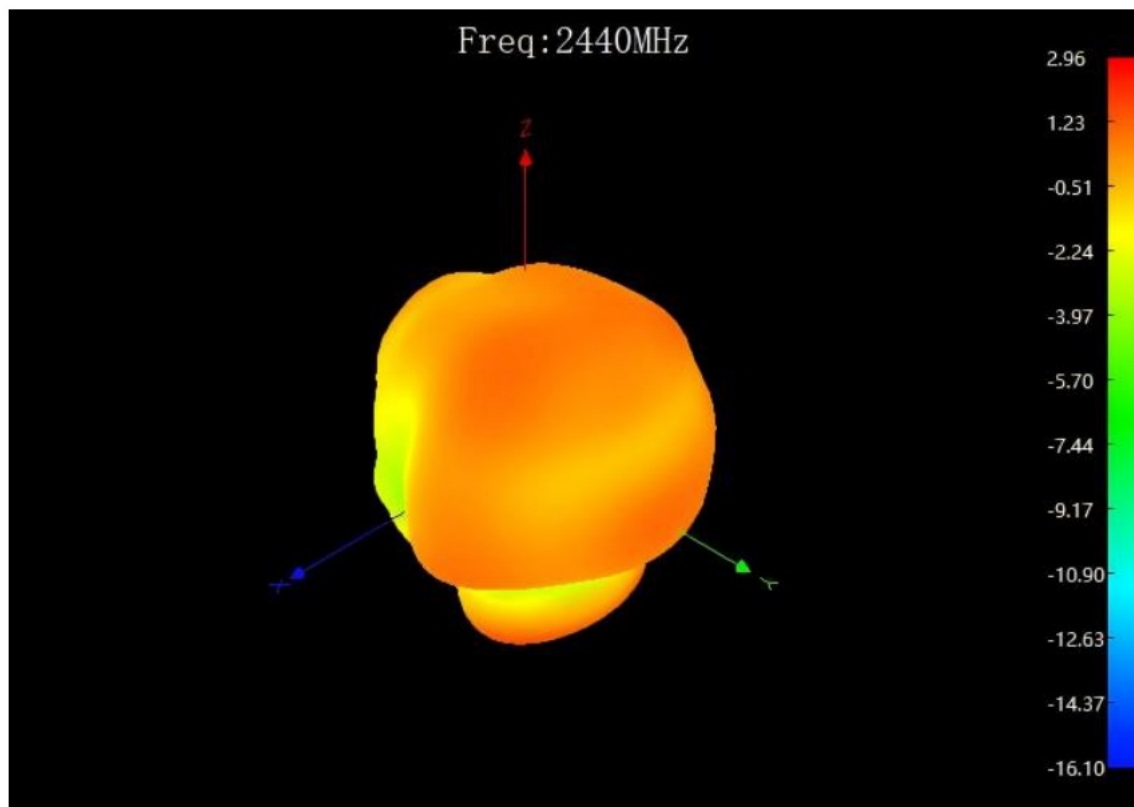


3D Directional Chart Unit:dBi



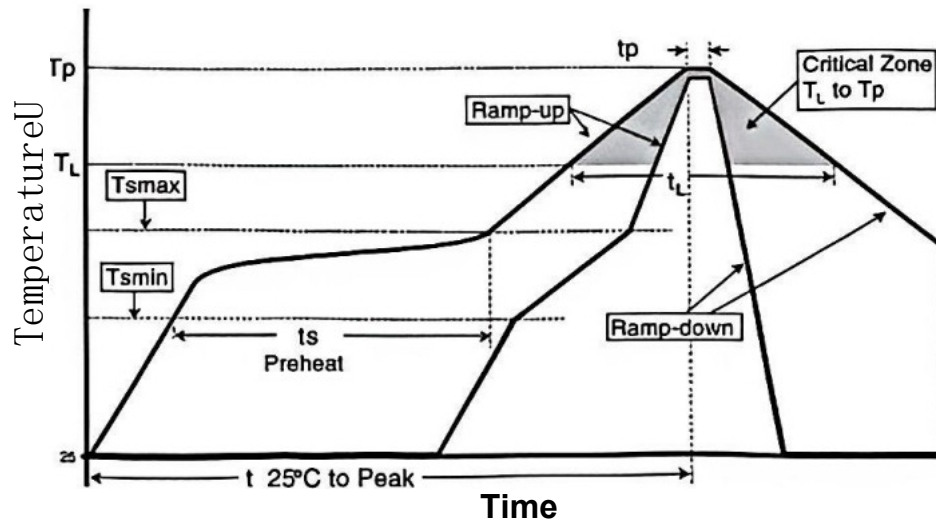


Maximum Antenna Gain 3D Direction Pattern Unit:dBi



Welding Condition

The following figure illustrates a reliable and non-destructive welding specification:



Phaso	Profilo features	PbFree assembly (SnAgCu)
RAMP-UP	Avg. Ramp-up Rate (Tsmax to Tp)	3°C/second (max)
PREHEAT	-Temperature Min (Tmin) Temperature Max (Tsmax) -Time (tsmin to tsmax)	150°C 200°C 60-180 seconds
REFLOW	Temperature (TL) -Total Time above TL (L)	217°C 60-150 seconds
PEAK	-Temperature (TP) • Time (p)	260°C 20-40 seconds
RAMP-DOWN	Rate	6°C/second max
Time from 25°C to Peak Temperature		8minutes max

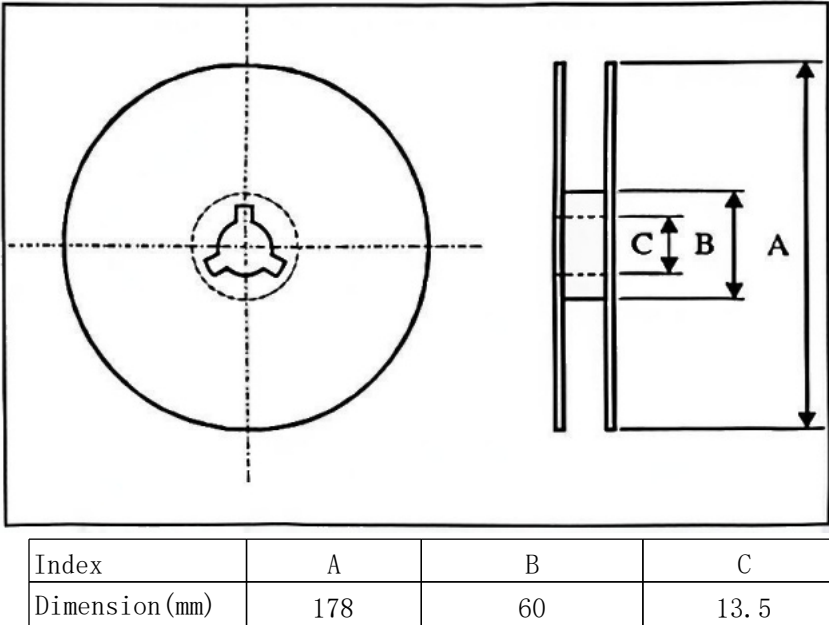
Packing Specifications

	P1	P2	
			Mountain]
			L
article		2 Two	
	T	Ao	

Plastic carrier specifications (unit: mm)

Index	Ao	B0	φD	T	W
Dimension (mm)	2.0±0.1	3.6±0.1	1.55±0.05	0.9±0.1	8.2±0.1
Index	E	F	P0	P1	P2
Dimension (mm)	1.75±0.1	3.2±0.1	4.0±0.1	4.0±0.1	2.0±0.1

Spool Size



Standard quantity: 3000 PCS per tray.

Storage Environment

Products must meet the following conditions during storage:

temperature : -10°C~+40°C

Humidity: 3 0 % to 7 0 % relative humidity

The product should be placed in locations away from corrosive gases such as sulfur. Chlorine or acids may cause electrode oxidation, leading to reduced weldability.

The product should be stored in a tool box and protected from moisture and dust exposure.

The product shall be stored in a warehouse and protected from heat, vibration, and direct sunlight.

The product should be stored under closed conditions.

Business Cooperation and Technical Support

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