Antenna Specification

NB-IoT B5 B8 / Lora / Sub-1g / UHF Band Antenna

Product Model: AB-S01

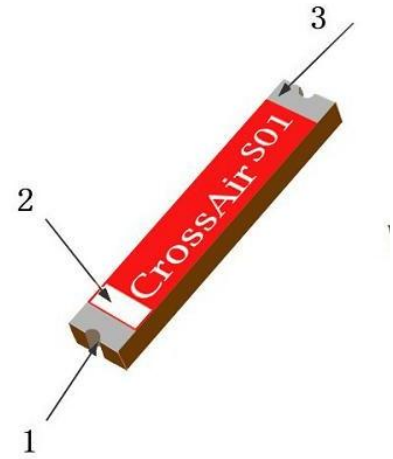
Features:

1. Size: 15.0 X 3.0 X 1.0 mm.
2. Low energy loss and high - gain antenna.
3. High stability under temperature and humidity changes.

Applications:

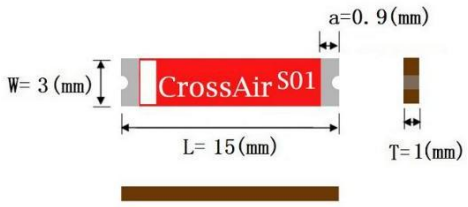
1. Antenna applications in NB-IoT B5 and B8 bands.
2. Antenna applications in Lora 915M, 868M, 490M, 433MHz bands.
3. Antenna applications in Sub-1g 915M, 868M, 490M, 433MHz bands.
4. Antenna applications in UHF band (400M - 800Mhz).

Structure



1. Antenna feed pin.
2. SMD direction mark.
3. Antenna fixing pin.

Dimensions

Three - view	Symbol	Dimension (mm)
	**L**	**15.0**±0.2
	w	**3.0**±0.1
	T	**1.0**±0.05
	a	**0.9**±0.1

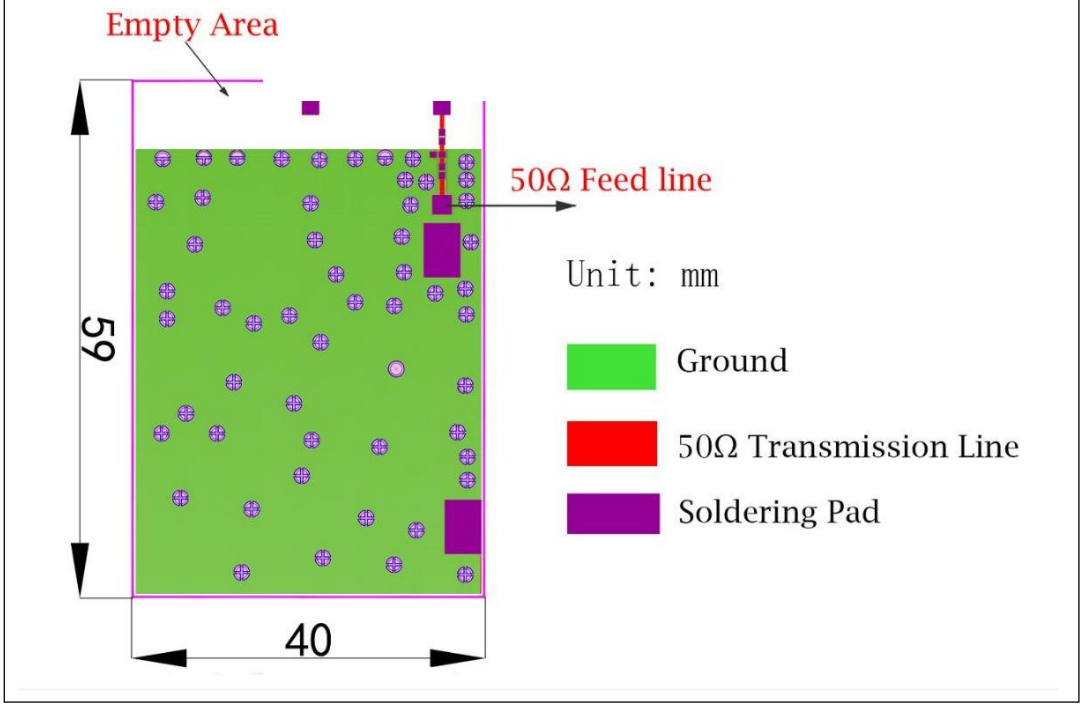
Electrical Characteristics:

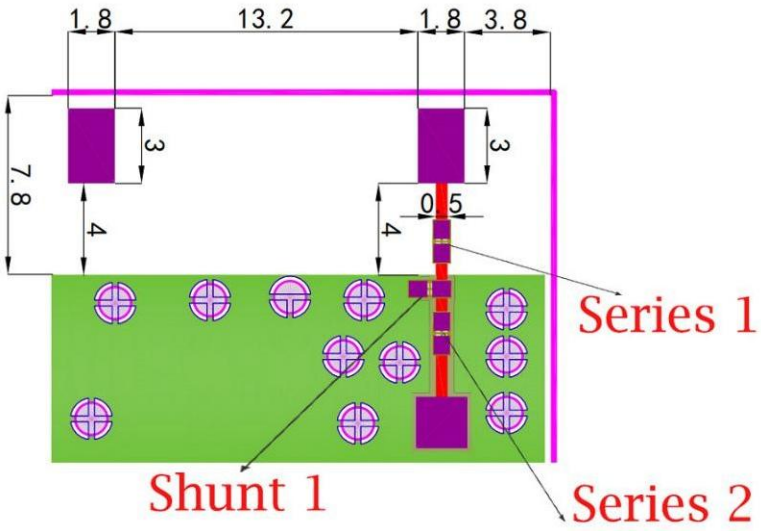
AB-S01	Specification
Working Frequency	850Mhz-930Mhz
Band Width	>80MHz
Impedance	50Ω
Gain(dBi)	3
Voltage Standing Wave Ratio (VSWR)	<2
Operating Temperature	-40℃~+85℃
Power Capacity	4W

The operating frequency of the antenna needs to be achieved through impedance - matching device debugging.

Antenna Pad and Trace Design:

Design dimension drawing

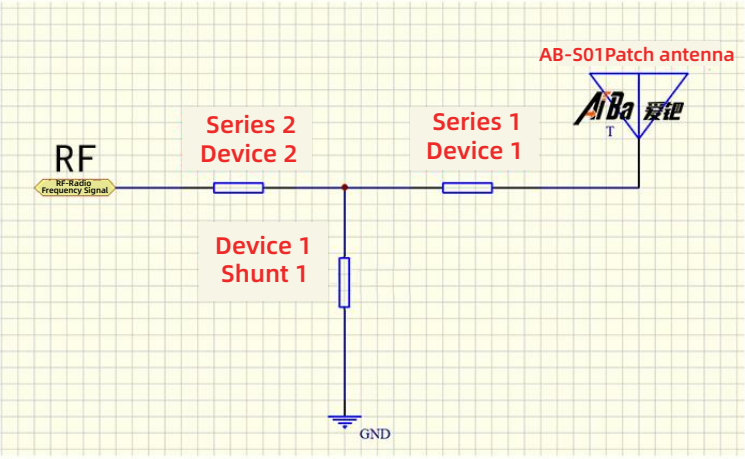




915MHz/B8 Matching Device Values	**Series Device 1**	5pf
	Shunt Device 1	6.2nh
	Series Device 2	0 Ω
868MHz/B5 Matching Device Values	**Series Device 1**	4.7nh
	Shunt Device 1	6.2nh
	Series Device 2	0 Ω
433Mhz Matching Device Values	**Series Device 1**	100nh
	Shunt Device 1	NC
	Series Device 2	0 Ω
490Mhz Matching Device Values	**Series Device 1**	82nh
	Shunt Device 1	NC
	Series Device 2	0 Ω

Note: The inductor must be a white high - frequency inductor!

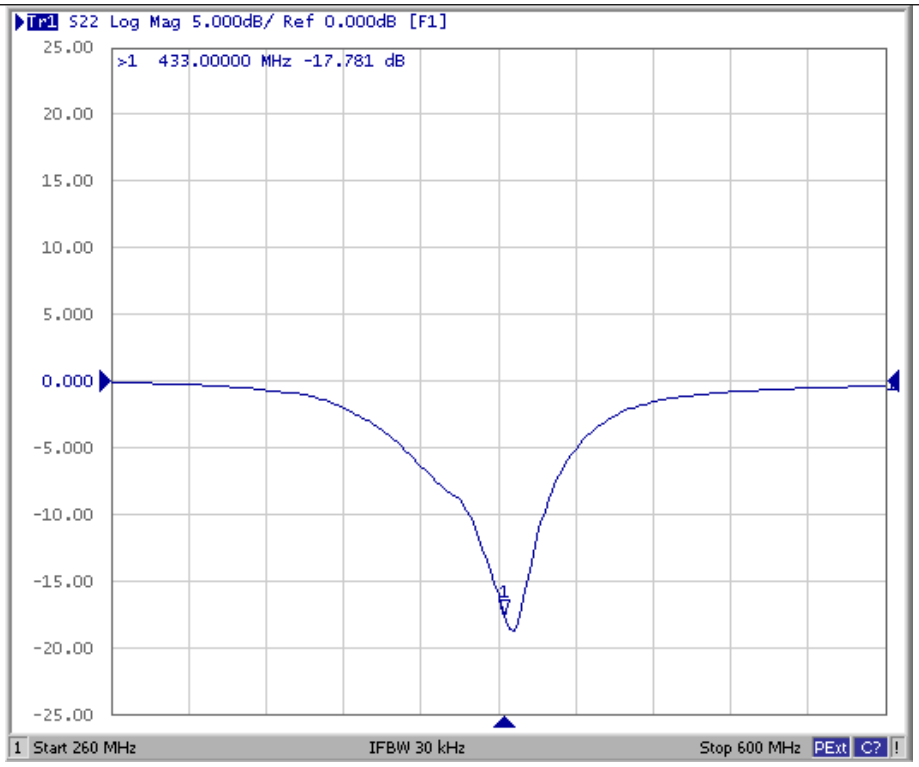
Antenna Impedance Matching Network Schematic Diagram



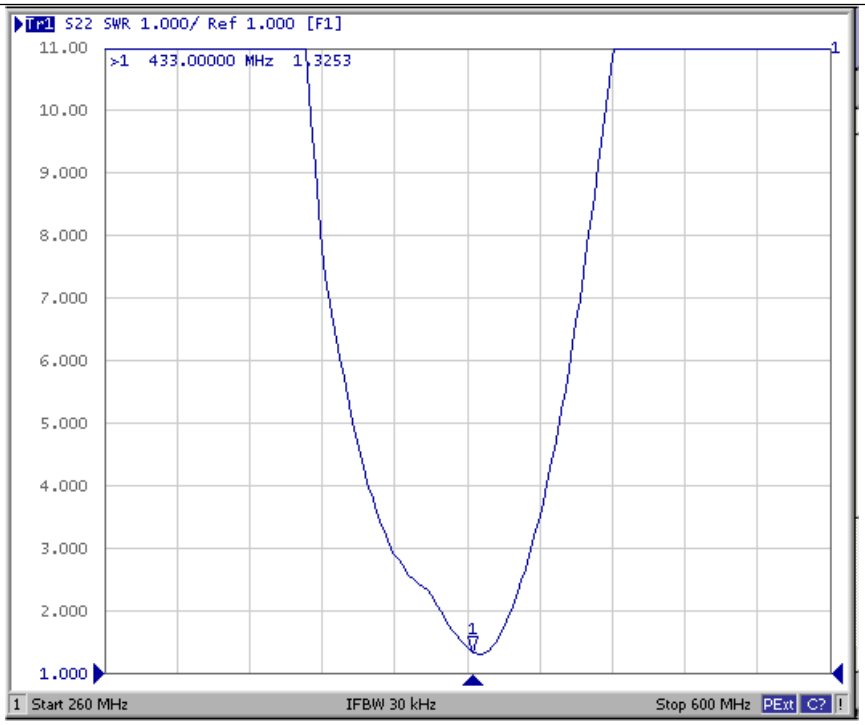
Note: For the values of peripheral devices required by the reference design of the RF chip, please follow the reference design of the chip manufacturer. The above antenna matching devices are independent of each other and cannot be replaced with each other.

Antenna Testing (Test Board Thickness: 1.0mm)

Antenna S11 Characteristics
@433MHz

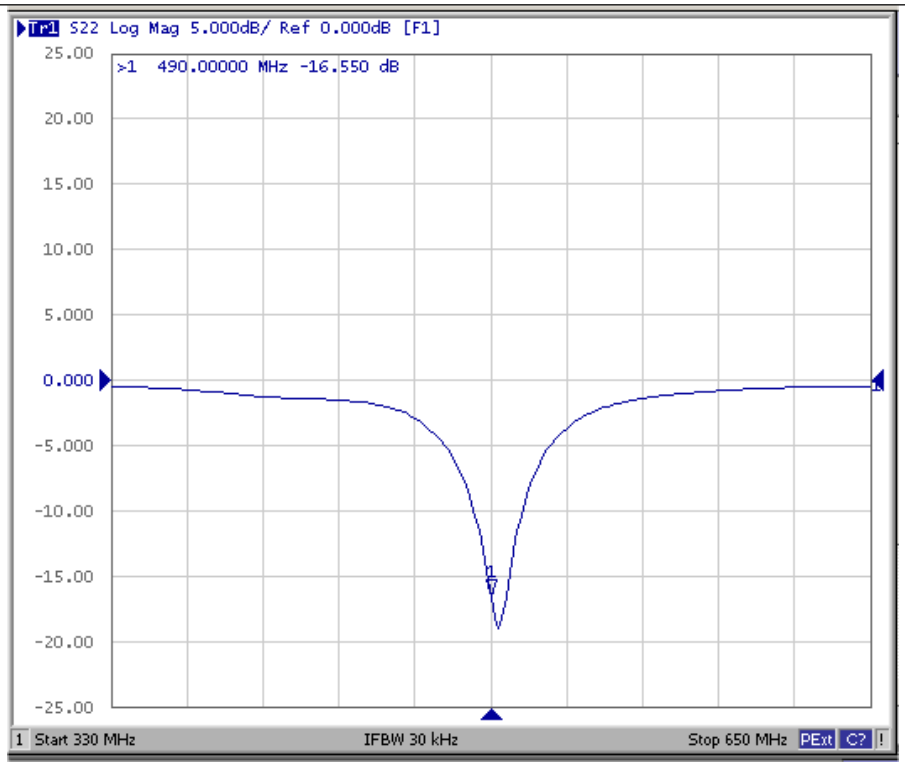


Antenna VSWR Characteristics
@433MHZ



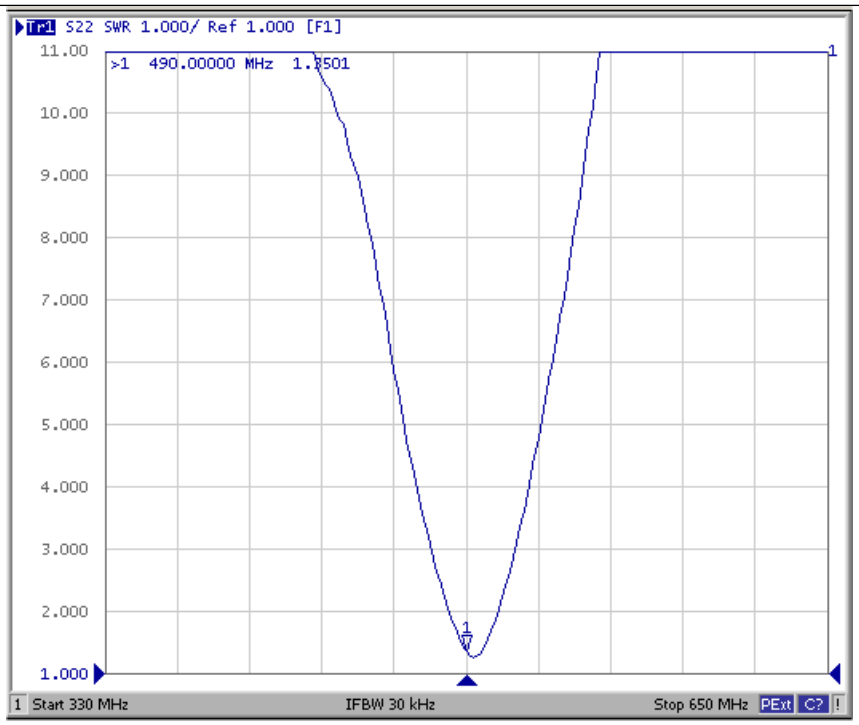
Antenna S11 Characteristics

@490MHz



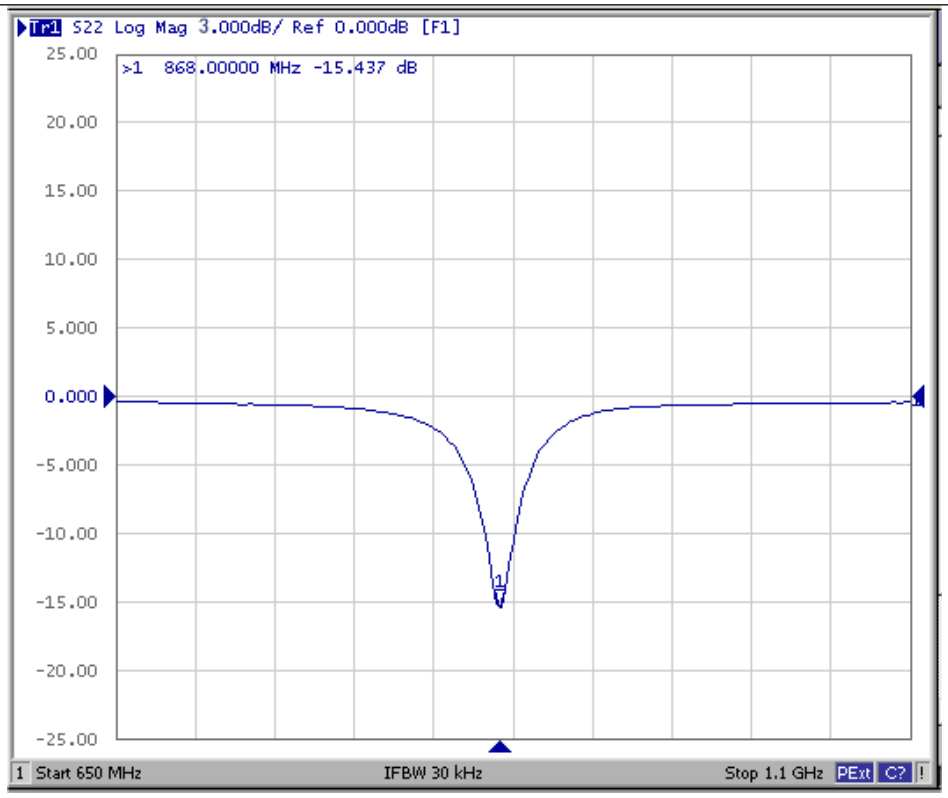
Antenna VSWR Characteristics

@490MHz



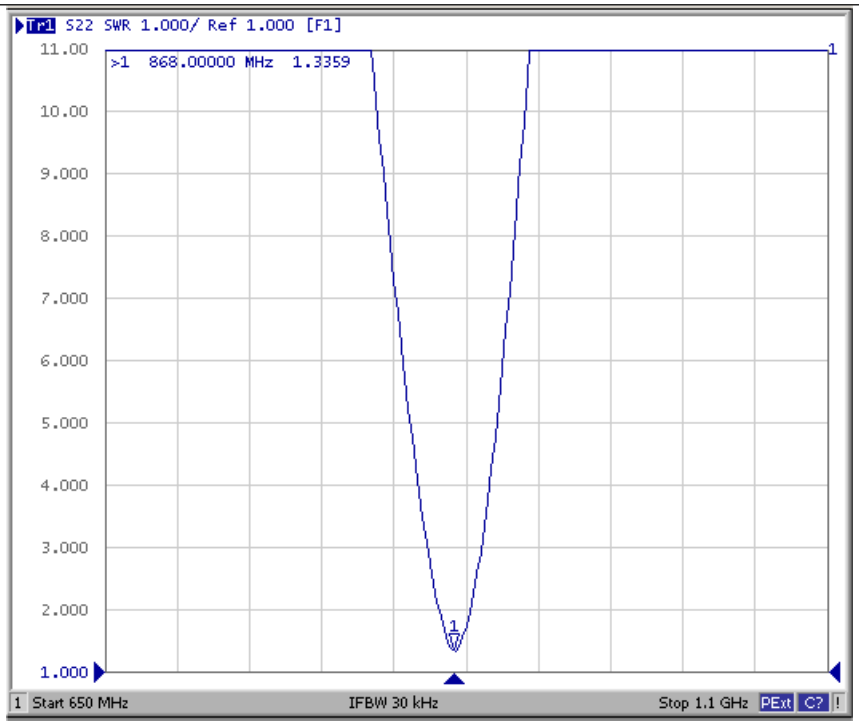
Antenna S11 Characteristics

@868MHz



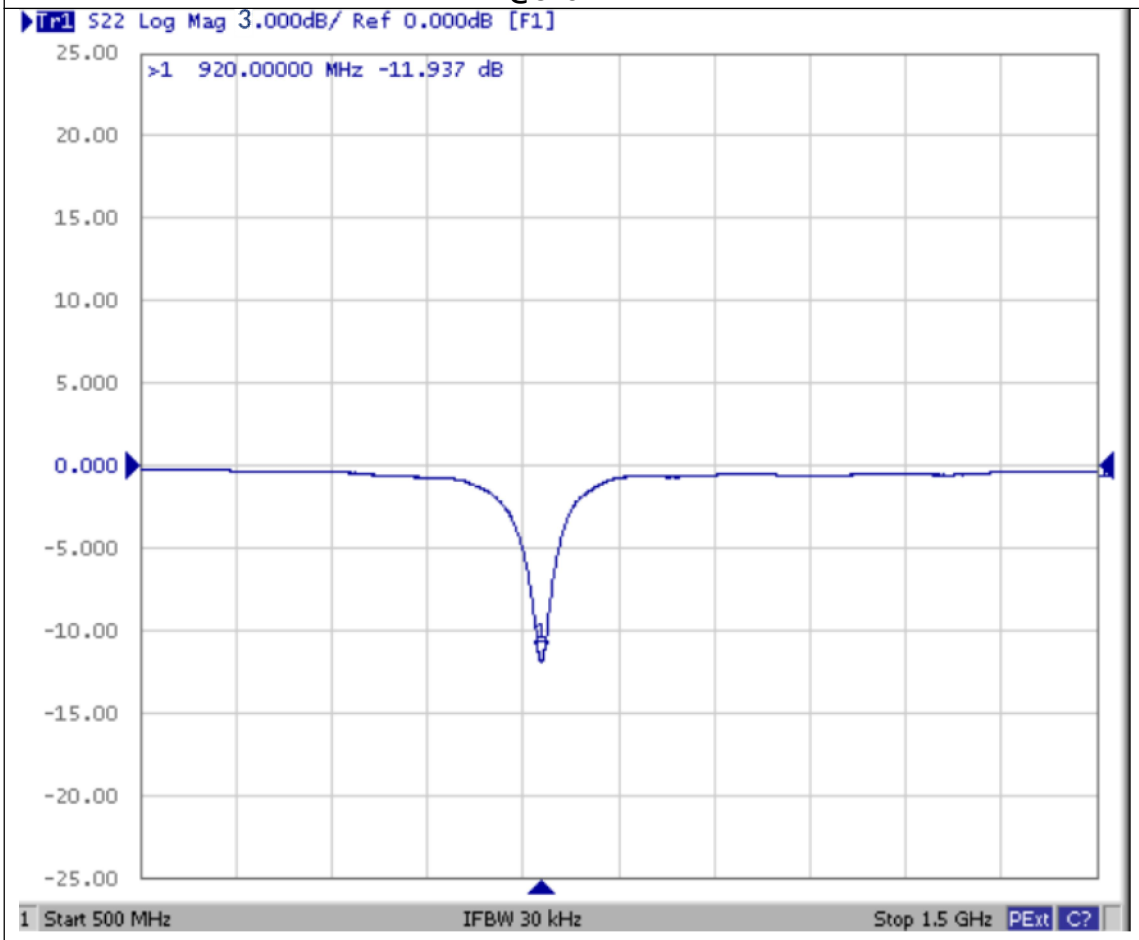
Antenna VSWR Characteristics

@868MHz



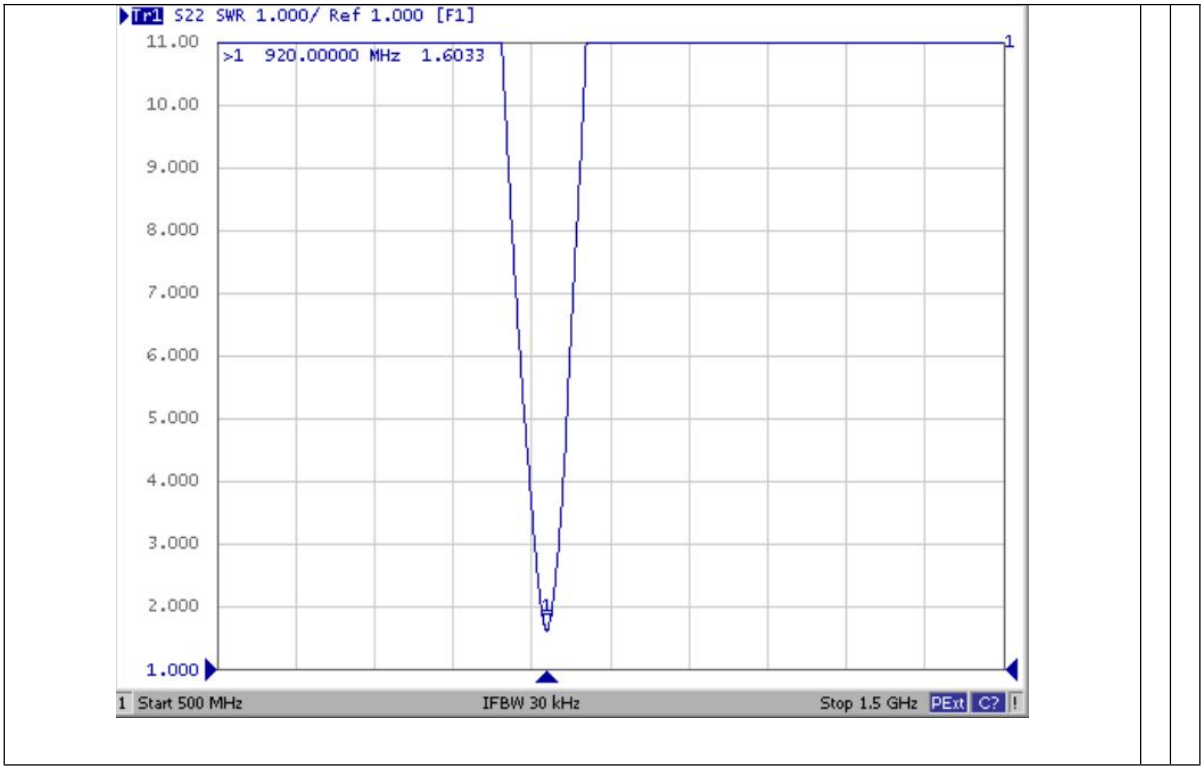
Antenna S11 Characteristics

@920MHz



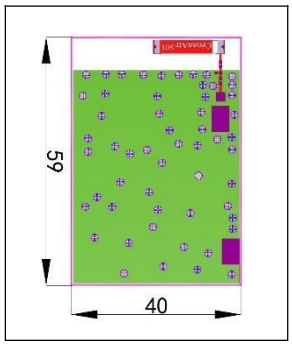
Antenna VSWR Characteristics

@920MHz



Efficiency and Radiation Pattern

Parameters such as efficiency, radiation pattern,
and gain are based on the test results of the test board.
The specification characteristic test data of the AB-S01 antenna are the parameters obtained based on the test PCB board and the test direction shown in the following figure.
The following data are the test results in the ETS 3D microwave anechoic chamber.



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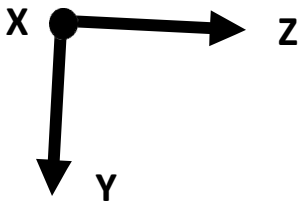
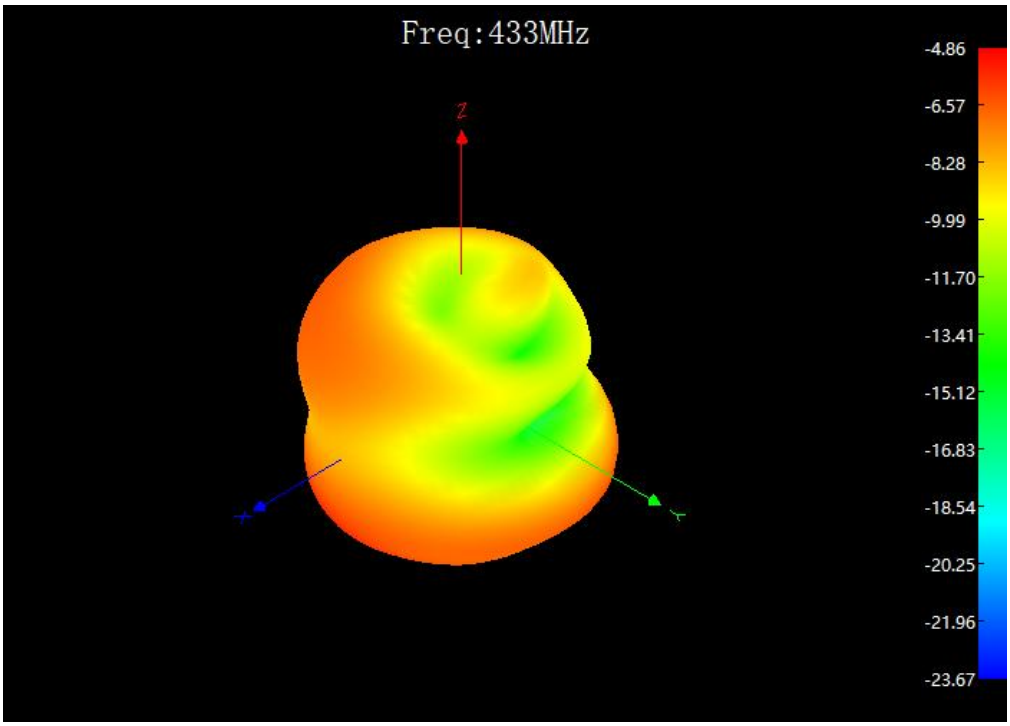
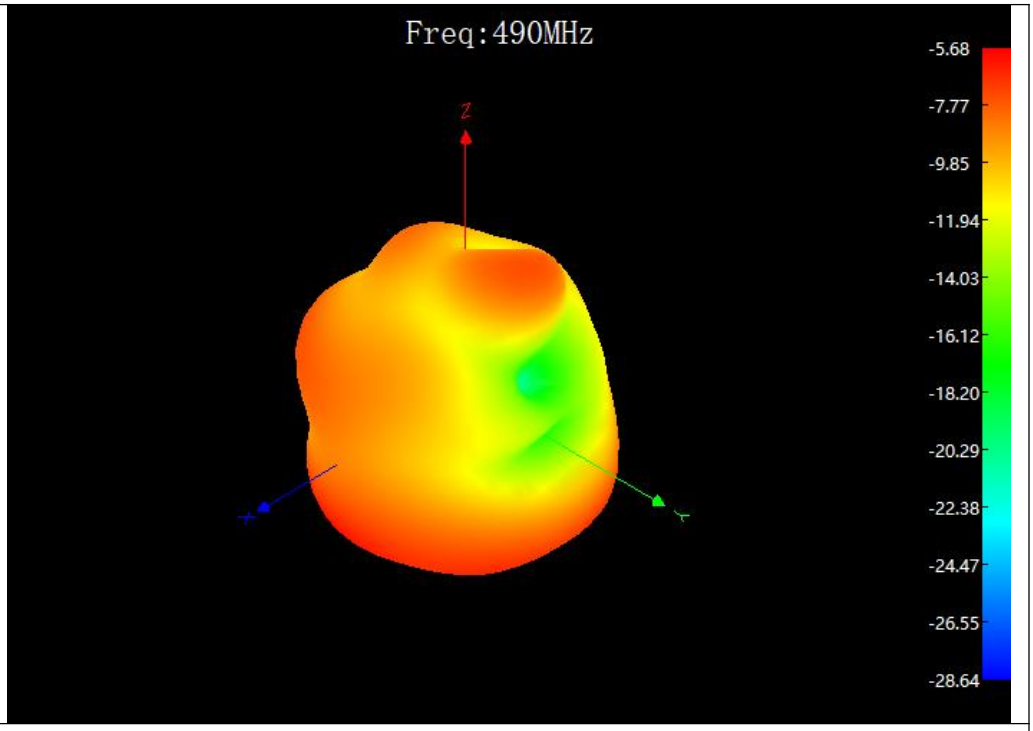
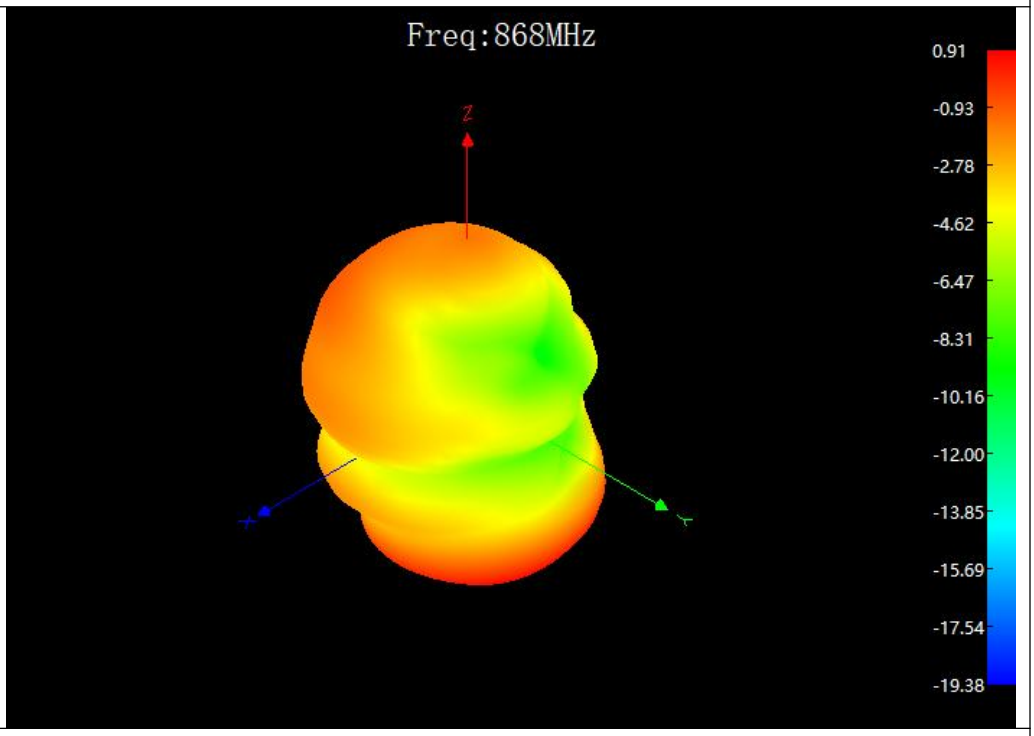
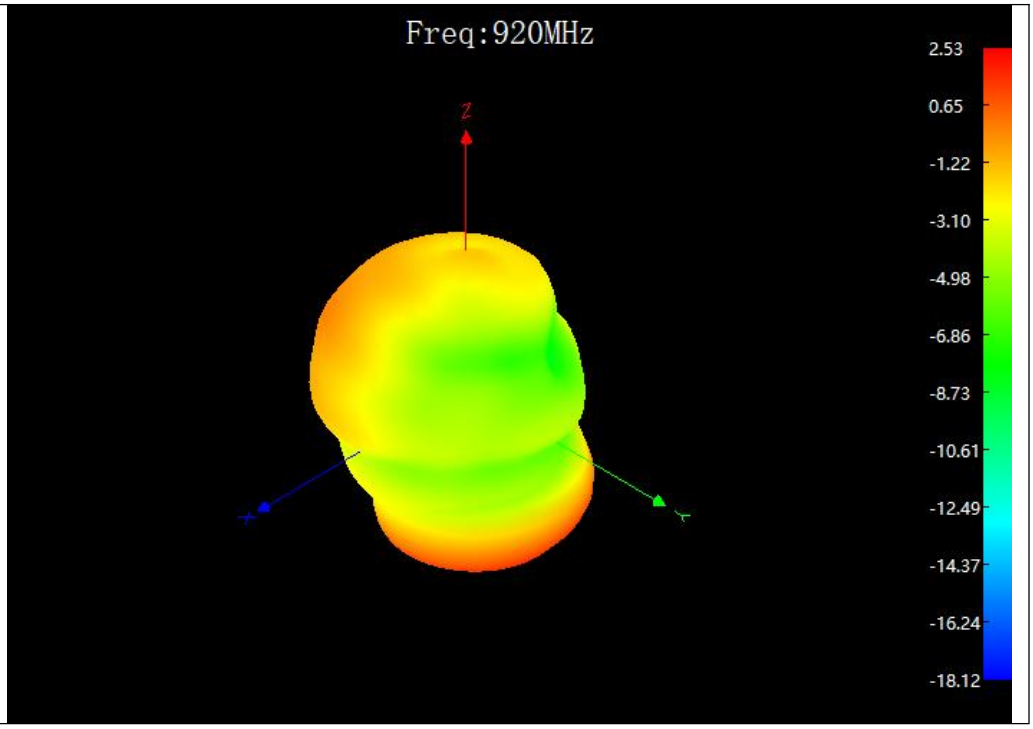


Gain and Efficiency	423M-443MHz	470M-510MHz	828M-908MHz	880M-960MHz
Peak Gain	0.55dbi	1.81dbi	3.16dbi	3.2dBi
Average Gain across the band	0.11dbi	0.99dbi	2.57dbi	2.6dBi
Gain Range across the band	-0.32dbi~0.55dbi	0.01dbi~1.81dbi	2.01dbi~3.16dbi	2.2dBi~3.2dBi
Peak Efficiency	18.14%	21.03%	51.5%	45.39%
Average Efficiency across the band	16.82%	18.31%	37.52%	32.37%
Efficiency Range across the band	14.61%~18.14%	14.24%~21.03%	20.09%~51.5%	16.33%~45.39%

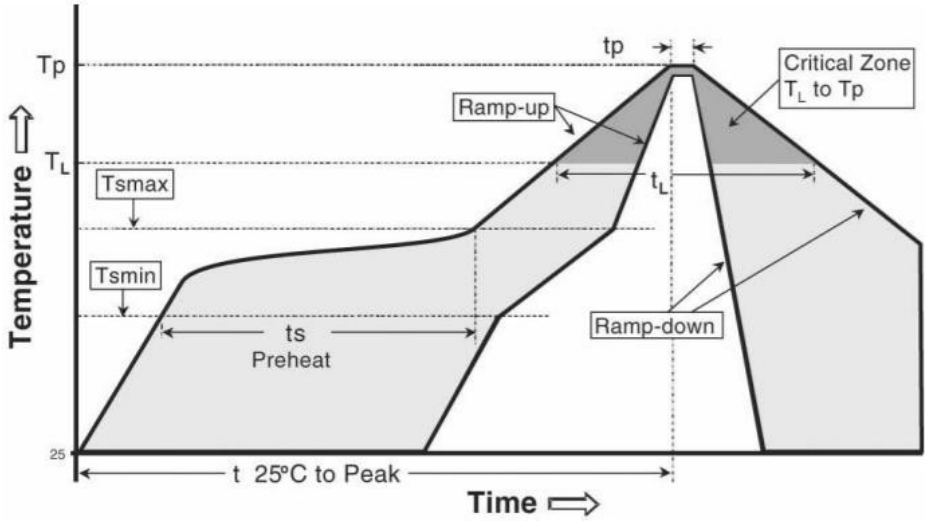
@433MHz	

@490MHz	
@868MHz	

@920MHz	

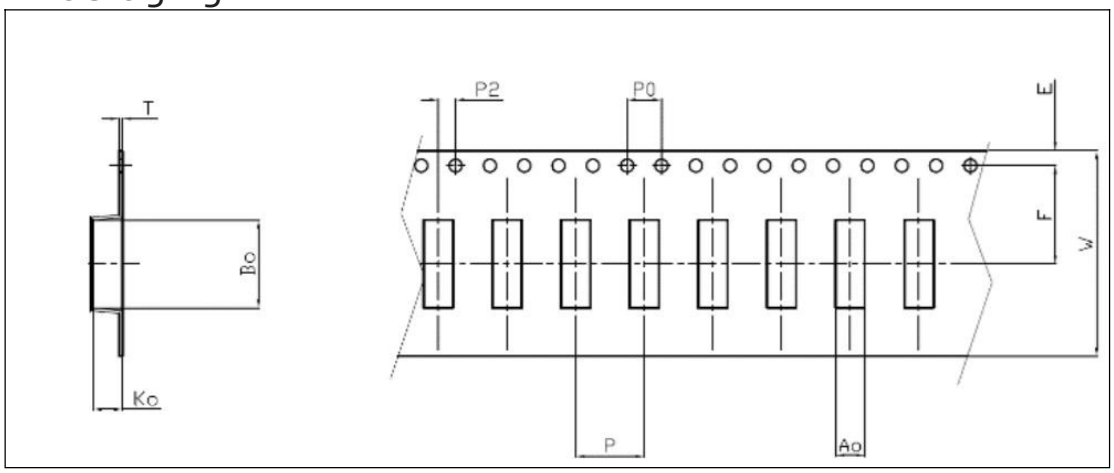
Soldering Conditions:

Typical welding specifications for reliable and non-destructive welding are shown 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

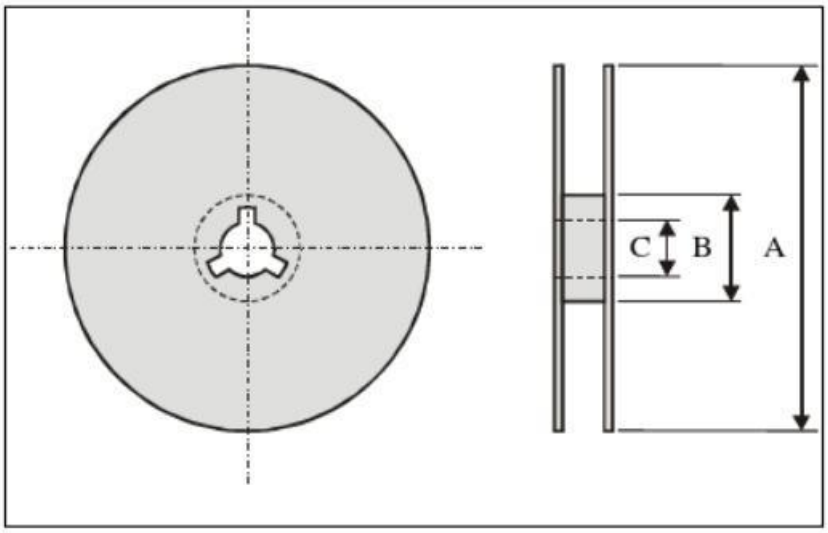
Packaging



Plastic Carrier Tape Specifications (Unit: mm)

Index	Ao	Bo	Ko	T	W
Dimension (mm)	3.3±0.1	15.5±0.1	1.3±0.1	0.3±0.05	24.0±0.3
Index	E	F	P	P0	P2
Dimension (mm)	1.75±0.1	11.0±0.1	8.0±0.1	4.0±0.1	2.0±0.1

Reel Dimensions:



Index	A	B	C
Dimension(mm)	**330**	**100**	**13.5**

Standard Quantity: 2000 PCS/reel.

Storage Environment:

The product should meet the following conditions during storage:

Reel storage temperature: -10℃~+40℃ (not the antenna operating temperature).

Reel storage humidity: 30% to 70% relative humidity (not the antenna operating humidity).

The product should not be placed in contact with corrosive gases, such as sulfur, chlorine, or acids.

The product should be placed in a toolbox to avoid the influence of moisture and dust.

The product should be stored in a warehouse to avoid heat, vibration, and direct sunlight.

The product should be stored in a sealed condition.