433 MHz Antenna Gain Test Report

(1) Test Equipment and Conditions

Test Equipment:

- ◆ Network Analyzer
- ◆ Standard Gain Antenna (Reference Antenna)
- ◆ Spectrum Analyzer
- ◆ Turntable for Radiation Pattern Measurement

Test Frequency: 433 MHz

Ambient Temperature: 25 °C

Supply Voltage: 3 V (Battery-powered, BAT-3V)

Crystal Frequency: 26.2982 MHz

RF Transmitter IC: CMT2150L

(2) Antenna Design Overview

Antenna Type: Loop Antenna, PCB ANT

Antenna Specifications:

Length: 152.352 mm, Width: 1 mm

Layers: Top and bottom (2 layers), PCB Thickness: 0.8 mm

Design Characteristics:

The loop antenna is located along the edge of the PCB.

The loop perimeter is 152.352 mm, which is approximately 1/5 of the wavelength at 433 MHz.

This qualifies it as a small loop antenna (electrical length much less than one wavelength).

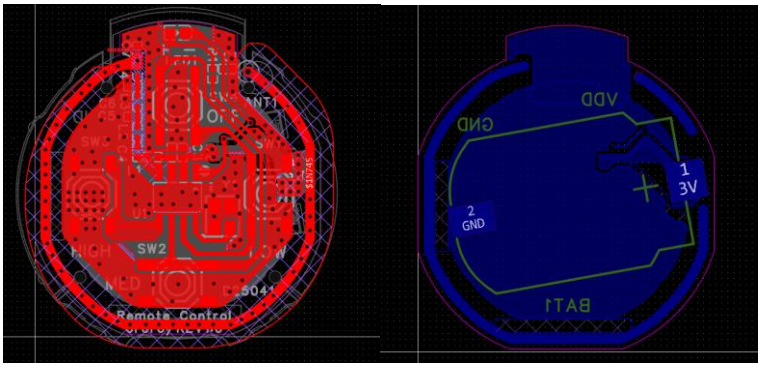
PCB Layout: The antenna is placed around the edge of the PCB, with no large ground planes nearby, to help maintain radiation efficiency.

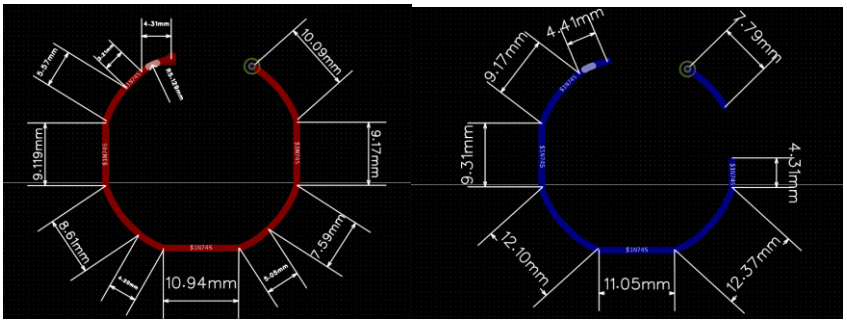
(3) Antenna Geometry and Manufacturer

PCB Manufacturer: Shenzhen JLG Technology Group Co., Ltd.

Antenna Manufacturer: Shenzhen JLG Technology Group Co., Ltd.

Antenna Trace Dimensions: Width: 1 mm, Length: 152.352 mm





(4) Test Results

Antenna Gain：Peak Gain: -1.5 dBi

Radiation Pattern

Directionality: Approximately omnidirectional in the H-plane

In the horizontal plane (H-plane), the radiation pattern is nearly circular, with a maximum variation under 4 dB.

In the vertical plane (E-plane), the main lobe is perpendicular to the loop plane, with a peak gain of -1.5 dBi.

Return Loss: -12 dB @ 433 MHz

Radiation Efficiency: 35 %