

# Flip F Bluetooth antenna specification

Version number: V1.0

Release date: 2025-01-01

## 1. Product overview

Antenna type: inverted F antenna (IFA)

Application scenarios: Bluetooth (2.4GHz ISM band, such as BLE 5.0/5.1/5.2)

Features: miniaturization, low cost, PCB integrated design, omnidirectional radiation, etc

## 2. electrical character

Parameter	Speci fication values	Test condi tion
Service frequency	2400~2480 MHz	Bluetooth frequency band
Impedance	50Ω (±10%)	Reference plane: PCB gr- ound plane
Standing wave ratio (VS- WR)	≤2.0	Center frequency 2450MHz
Return loss (S11)	≤-10 dB	In the range of 2400-2480 MHz
Gain	0 dBi (typical value)	Free space
Productiveness	≥70%	Wi th PCB, ground plane
Polarization mode	Linear polarization	

## 3. Mecha-

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S:

Total length (L): 21 mm ( /4 wavel -  
ength design) Short circuit pin he-  
ight (H): 6.3 mm Feed point positi -  
on:

3.3 mm short of the lead

material :

Radiation source: PCB copper layer  
(thickness 1 oz)

Substrate: FR4 (dielectric constant =  
4.4, thickness 1.2 mm)

#### 4. Design

parameter

structure

diagram:



**PCB layout requirements:**

The antenna area needs to be clear (no wiring or metal)

The ground plane extends below the antenna by at least 15~ 30 mm

Short circuit pin and feed point spacing: 2~ 5 mm

#### 5. environmental suitability

Working temperature: -40 ~ +85

Humidity: 95% RH (non-condensing)

#### 6. Test certification

**Standard compliance:**

FCC CFR 47 Part 15 (if applicable)

ETSI EN 300 328 (if applicable)

**Measured data:**

Use a vector network analyzer (VNA) to test S11.

The radiation efficiency and gain were tested in a dark room.

#### 7. matters need attention

Antenna performance is affected by surrounding metal objects, and clearance requirements must be strictly followed. Impedance matching fine tuning (such as type matching network) should be done during mass production.