



## Broadband Antenna for WIFI Sign Enhancement

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**WIFI vs Cellular network**

**Traditional WIFI booster**

- Transmitter: WIFI extender
- Receiver: WIFI Gun

**Previous research methods**

- Gain Enhancement
- Bandwidth Enhancement

**Ideal Model Characteristic**

- Small
- Portable
- Passive

**1. Constructed on a printed circuit board using lump antenna components rather than large antenna components**

**2. Sacrifice area directivity in order to enhance the signal in a specific direction, while simultaneously decreasing the signal intensity in the remaining angle of direction**

**Prerequisite Knowledges**

Maxwell Equations → Characteristic Impedance → Line Impedance → Impedance matching →

Wave Equation → VSWR → Reflection Coefficient → Smith chart →

Propagation Constant → Return loss → S-parameters →

**Software**

ANSYS Electronics Desktop, Advanced Design System

**Hardware**

LPKF

**TRL calibration**

Introduced test fixtures:

**HFSS Model**

	HFSS Model	Frequency Performance	Fabricated Product
Monopole Antenna			
Patch Antenna			
Ring Resonator			

**HFSS Simulation**

**HFSS Test Model**

Around 2.4GHz, the frequency performance indicated that the passive antenna resonator absorbed approximately 13.2dB.

**VNA test & analysis**

There was around 9.1dB enhancement by the effect of this passive antenna resonator. However, comparing to the HFSS simulation, the average S21 was quite small, which already reaching around -40dB.