



AIR-AP1131AG Antenna System Design Specification

1. Introduction

The AIR-AP1131AG access point is a dual band, simultaneous AP supporting 802.11b and 802.11g in the 2.4 GHz band and 802.11a in all the available 5 GHz bands. As such, the product contains a total of 4 antennas. There are two antennas for the 2.4 GHz band and two antennas for the 5 GHz band. The design and operation of these antennas is covered in this document.

3. Antenna Design

An inverted-F antenna will be used for both bands. This antenna type is shown in the Figure 1 below. It is formed by bending a monopole antenna down over a ground plane and then driving the resultant antenna away from the grounded end to achieve a 50Ω driving point impedance. Typically, these antennas are built using a flat plate, rather than a wire, for VSWR bandwidth considerations.

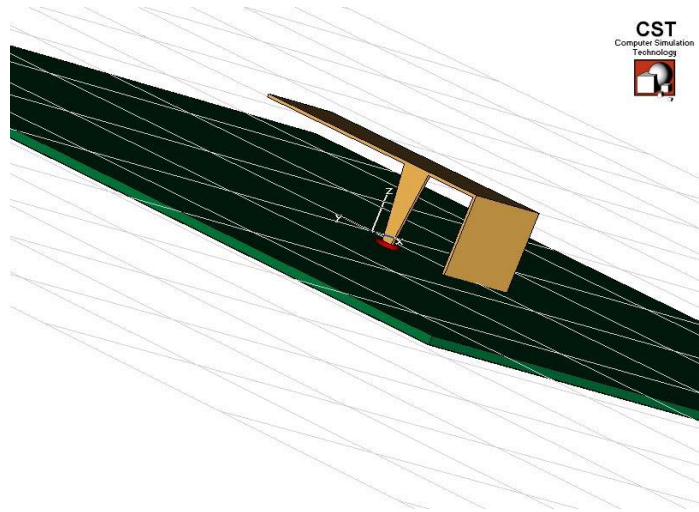


Figure 1.
Basic Inverted-F antenna Geometry

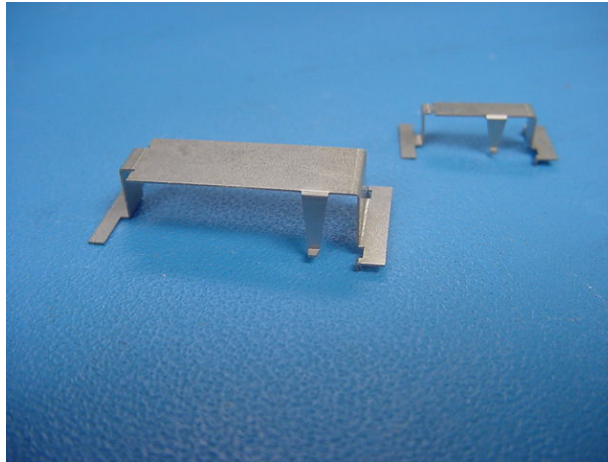


Figure 4
Photograph of the AIR-AP1131AG Antennas with “Break-away” Support Legs.

4. Antenna Specifications from Measurement Results.

5 GHz Inverted-F Antenna Specifications				
	Minimum	Typical	Maximum	Comments
Length		13.7 mm (540 mils)		
Width		4 mm (157 mils)		
Height		5 mm (197 mils)		
Material		C770 Nickel-Silver Alloy		12 mil thick
Mounting Method		Surface Mount		Antennas have break- away support leg.
2:1 VSWR Bandwidth		5150 MHz - 5825 MHz		Covers UNII-1, 2, & 3
Peak Gain	4 dBi		4.5 dBi	Peak gain close to +/- 60 degrees from boresight.
Front-to-Back Ratio		10 dB		This spec is included to help describe the radiation pattern as mostly "away" from the front of the product.
2.4 GHz-to-5 GHz Isolation	30 dB		40 dB	28 dB is the requirement for radio operation

Table 1.
Summary of 5 GHz Inverted-F Antenna Specs

2.4 GHz Inverted-F Antenna Specifications				
	Minimum	Typical	Maximum	Comments
Length		25.4 mm (1 inch)		
Width		9 mm (350 mils)		
Height		7 mm (0.28 mils)		
Material		C770 Nickel-Silver Alloy		12 mil thick
Mounting Method		Surface Mount		Antennas have break- away support leg.
2:1 VSWR Bandwidth		2400 MHz - 2500 MHz		Useable for 802.11 b/g
Peak Gain			3 dBi	Peak Gain close to +/-45 degrees from boresight.
Front-to-Back Ratio		10 dB		
5 GHz-to-2.4 GHz Isolation	30 dB		40 dB	30 dB is the requirement for radio operation

Table 2.
Summary of 2.4 GHz Inverted-F Antenna Specifications