

GENERAL: This document is a summary of the Dual Band antenna. The document contains a short discussion on the antenna's general characteristics and later discusses the different test results.

INTRODUCTION: The Dual Band antenna (see figures 1a and 1b) is a hybrid of the 5 Ghz antenna (9G7286) and an Inverted F antenna for the 2.4 Ghz, combined through a diplexer into a single connector. Since the antenna is physically constrained, the antenna solution had to be quite innovative. The highlights of the design are:

- The antenna outline is small, and the original 9G7286 antenna had to be optimized for smaller size.
- The 2.4 Ghz antenna required an increase in the cavity depth right underneath it. That fact helped to improve the antenna's bandwidth. That required a unique fabrication technique.
- The diplexer had to be mounted on the bottom side of the antenna PCB. That required a unique transition of the antennas feed networks.

ANTENNA ELECTRICAL PERFORMANCE: The antenna was evaluated when mounted on a test fixture shown in figure 2. The antenna was tested for two sets of measurements

- Return Loss: Antenna's return loss was performed when the antenna was measured on the test fixture shown in figure 2. The test equipment used was the HP720D Vector Network Analyzer. The test data is shown in Appendix I.
- Radiation patterns: The antenna was tested at Allwave Corp. Near- Field facility. The test data is shown in Appendix II and Appendix III. The data in each frequency includes the following information:
 - Azimuth pattern (left) which was measured along the X- Z plane (Appendix II).
 - Elevation pattern (middle) which was measured Y-Z plane (Appendix II).
 - Elevation pattern (right) which was measured along the Y-X plane (Appendix II)

- Radiation pattern in 3D with the same coordinates shown in Appendix III.

The summary of the antenna's electrical performance is shown in Table I. The antenna has broad coverage in both the X and Y plane with gains that are similar to previous Carestream Health antennas.

ANTENNA MECHANICAL DESIGN: The antenna drawing with its physical details can be seen in Appendix IV.

Table I- Electrical performance summary

Frequency [Ghz]	2.4	2.44	2.48	5.15	5.25	5.35	5.5	5.725	5.825
Gain [dbi]	-7.2	-5.5	-8.4	-1.2	-0.8	-1.8	-2.3	-3.3	-3.5
Polarization	V	V	V	V	V	S45	S45	S45	S45
3db beamwidth Elev 1 [deg.]	140	150	150	120	120	110	110	110	110
3db beamwidth Elev 2 [deg.]	120	120	150	60	60	150	180	180	180
Impedance [ohms]	50								
VSWR	2.6:1 max								

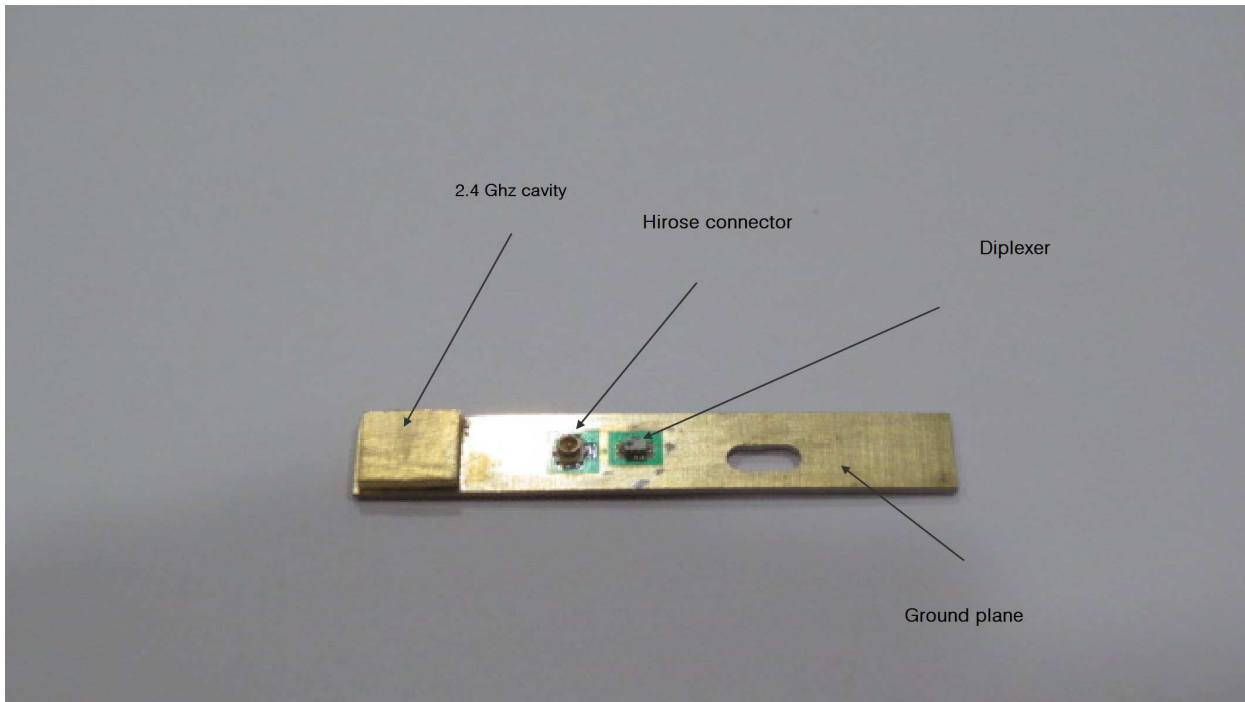
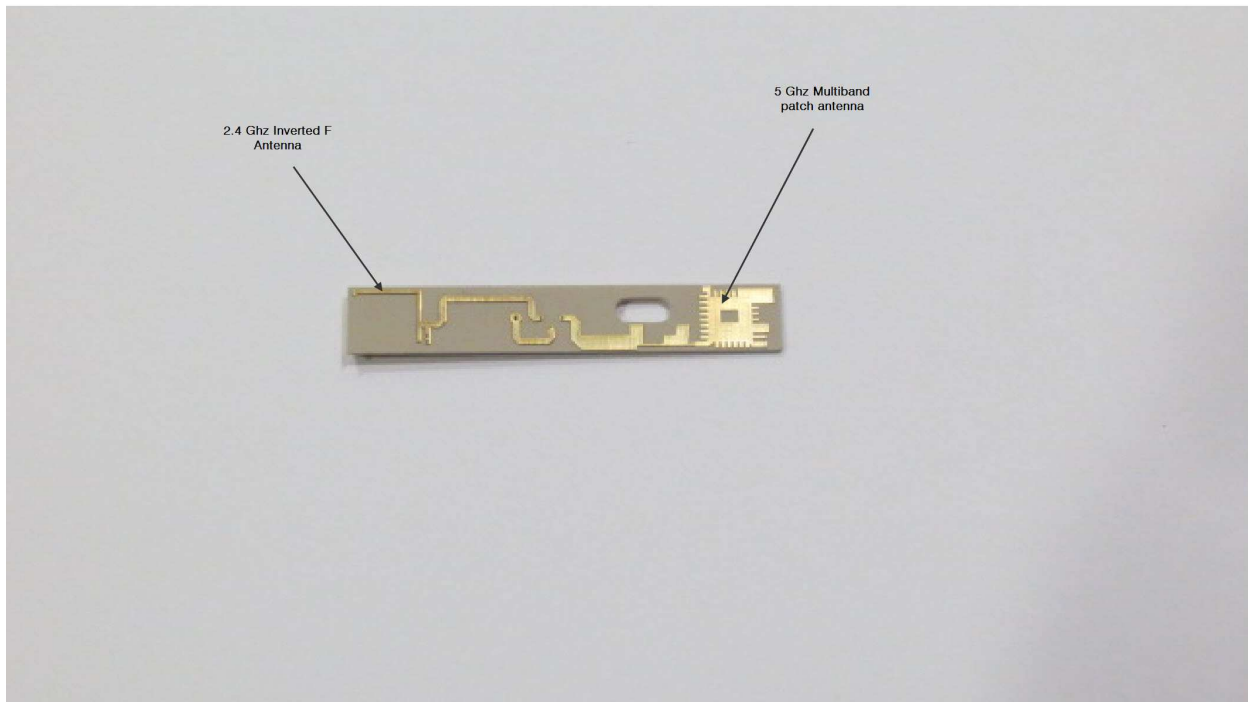


Figure 1- Antenna configuration