

Antenna Report

FCC ID: A4R-G6ZUC

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Google LLC

1. Antenna Description

Internal Proprietary Antenna Solution consisting of 6 antennas.

- a. The antennas can all be classified as stamped sheet metal IFAs (inverted-F antennas)
- b. 2 x 2.4GHz/5GHz dual band antennas for BT, Thread, 5GHz WiFi
Primary
- c. 2 x 5GHz WiFi Diversity
- d. 2 x 2.4GHz/6GHz dual band antennas for WiFi
- e. Detailed antenna photos provided as part of internal photos submission; EUT Photo No.: ER/2022/30035~39, 95-P

2. Test Equipment

Site Description	Chamber Manufacturer	Type
AMS-8813 theta arm based antenna measurement test system	ETS-Lindgren	Fully Anechoic
Site Location	1600 Amphitheater Parkway Mountain View, CA 94043	

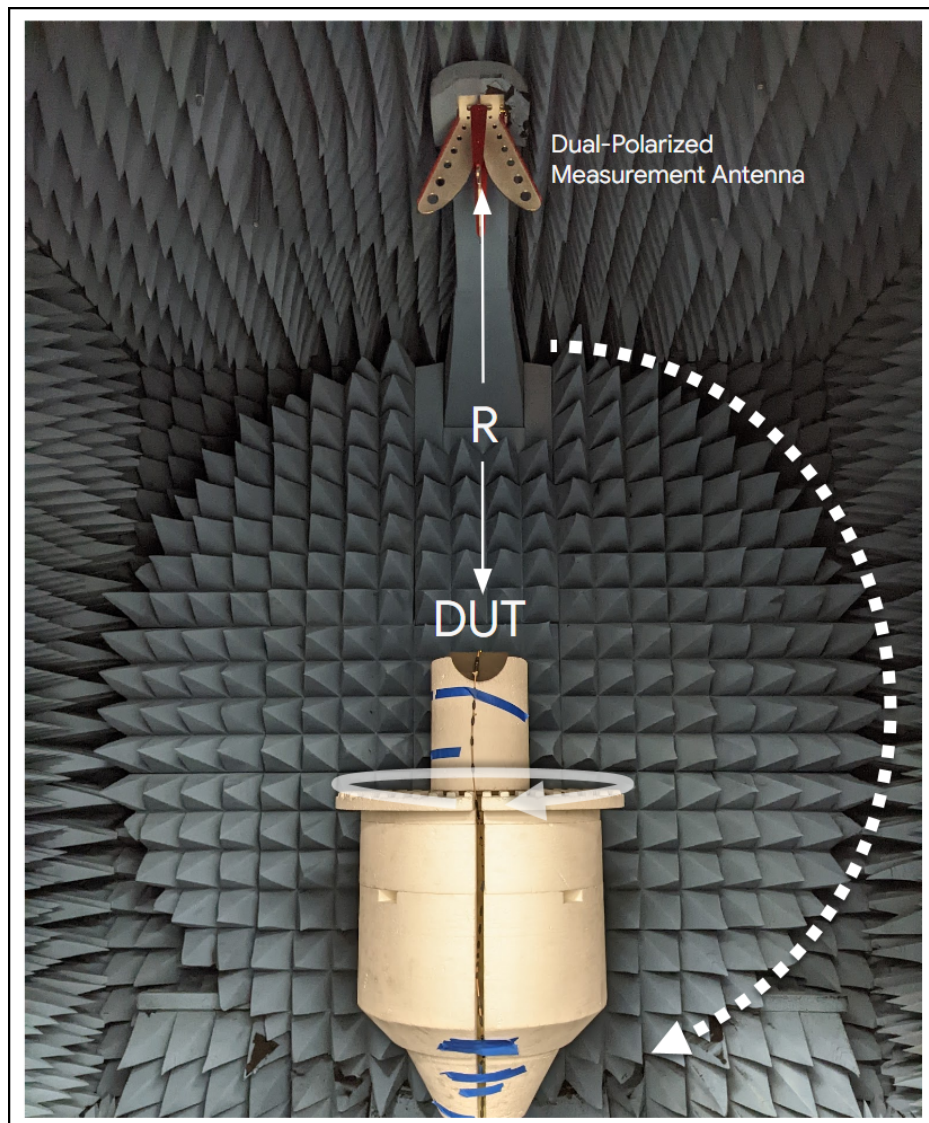
Description	Manufacturer	Model
Network Analyzer	Rhode & Schwarz	ZNB20

3. Measurement Methodology

The antenna gains are obtained through measurements in a fully anechoic OTA chamber with 3D dimensional scanning.

Measurements are taken in discrete steps in the theta and phi directions with data being recorded using the network analyzer for both theta and phi polarizations at each point resulting in a 3D gain pattern. Step size is ≤ 30 degrees along both axes.

Gain is derived from spatial averaging of VNA S21 measurements.



4. WLAN/BT/Thread Antenna Gains

PCB Antenna	Ant1 (5GHz Wi-Fi / 15.4 Thread)	Ant2 (5GHz Wi-Fi)	Ant3 (5GHz Wi-Fi / BLE)	Ant4 (5GHz Wi-Fi)	Ant5 (2.4GHz Wi-Fi / 6GHz Wi-Fi)	Ant6 (2.4GHz Wi-Fi / 6GHz Wi-Fi)
2.4 - 2.4835 GHz	3.3 dBi	N/A	3.2 dBi	N/A	2.4 dBi	2.3 dBi
5.15 - 5.25 GHz	4.8 dBi	3.7 dBi	4.5 dBi	3.7 dBi	N/A	N/A
5.725 - 5.895 GHz	5.0 dBi	3.3 dBi	3.3 dBi	3.3 dBi	N/A	N/A
5.925 - 6.425 GHz	N/A	N/A	N/A	N/A	6.0 dBi	5.3 dBi
6.425 - 6.875 GHz	N/A	N/A	N/A	N/A	5.5 dBi	5.2 dBi
6.875 - 7.125 GHz	N/A	N/A	N/A	N/A	3.4 dBi	3.3 dBi