

Q11-CS-V1.0

Antenna Test Report

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I. Test Environment

The antenna performance was measured using a vector network analyzer (VNA) and verified in a fully anechoic chamber. The setup includes calibrated reference antennas, an automated 3D turntable positioner, and dedicated test software for S-parameter, efficiency, gain, and OTA (TRP / TIS) characterization.

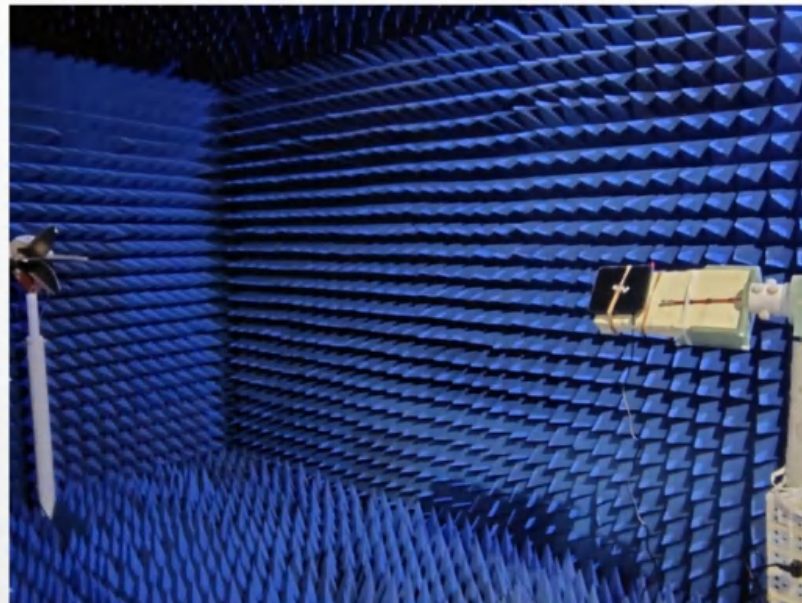


Figure 1. Test equipment and the fully anechoic chamber used for antenna characterization.



II. Antenna Assembly Diagram

The Q11-CS-V1.0 device integrates three internal antennas: one Bluetooth (BT) antenna and two Wi-Fi antennas (WIFI-1 and WIFI-2). The photo below shows the location of each antenna inside the chassis.

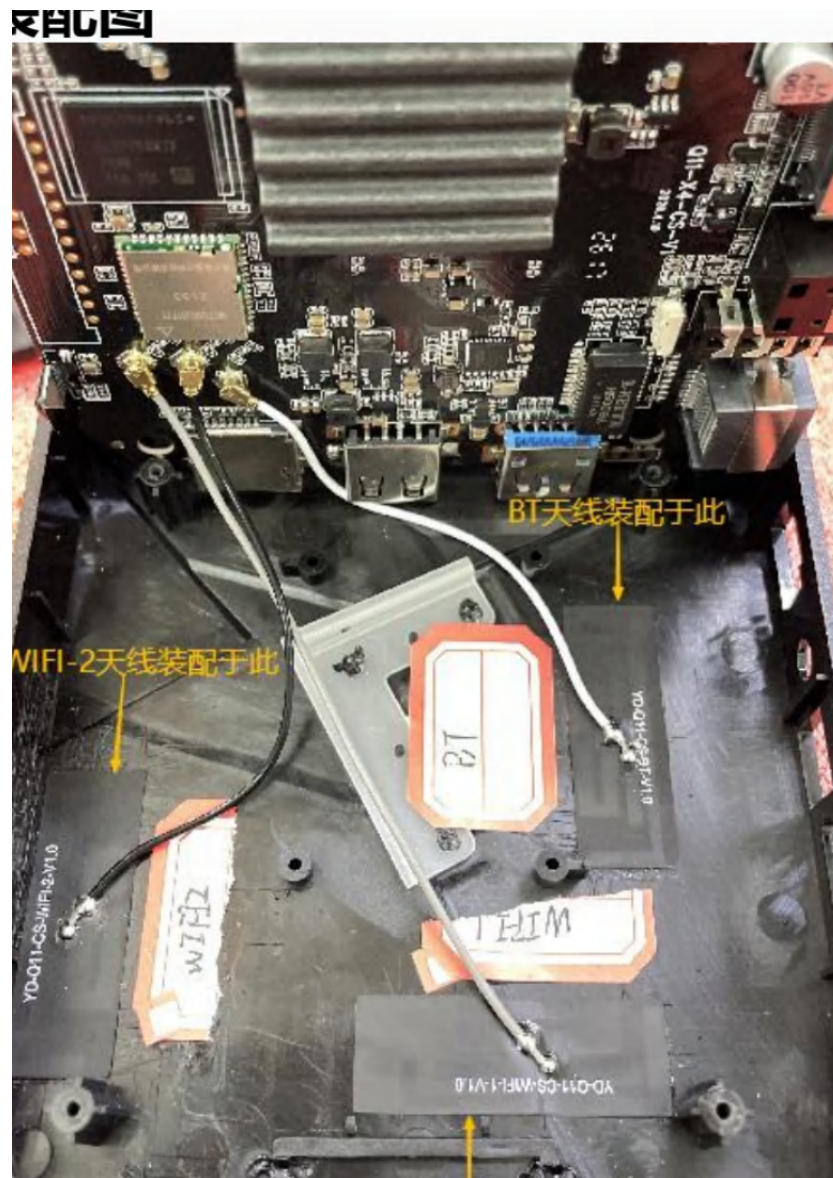
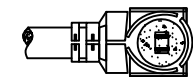
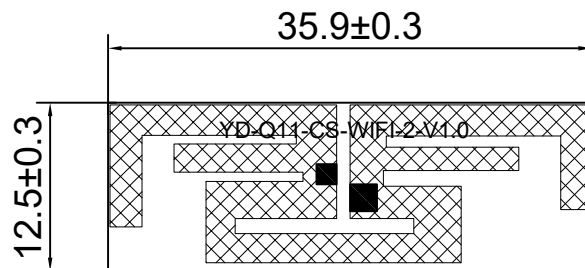
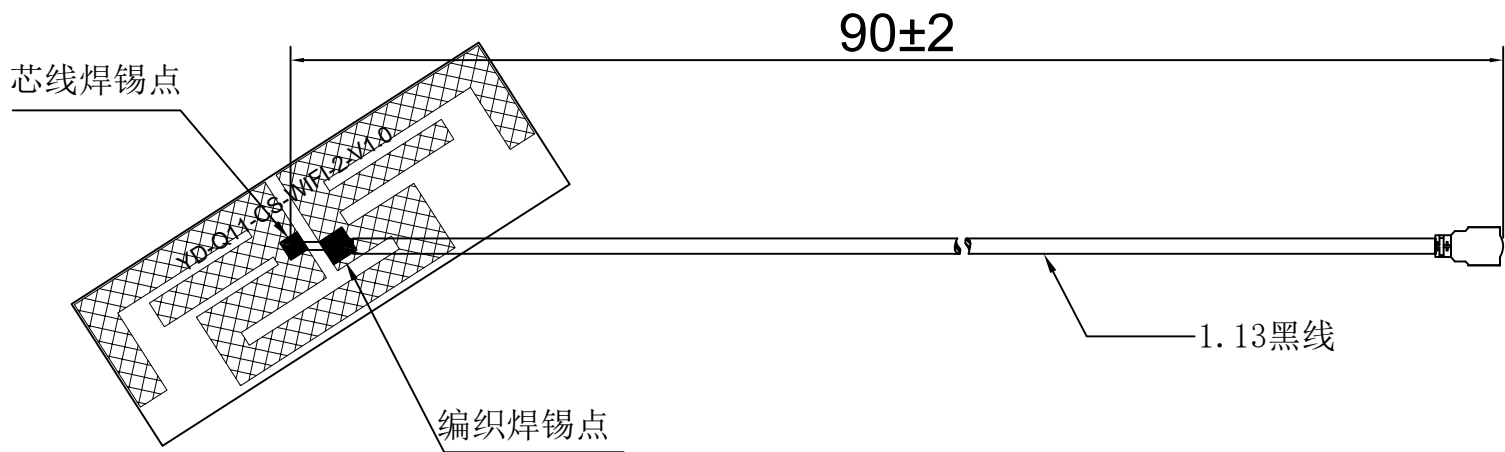


Figure 2. Internal view of the device showing the BT antenna, WIFI-1 antenna and WIFI-2 antenna positions.

ROHS



1.13 RF-1代



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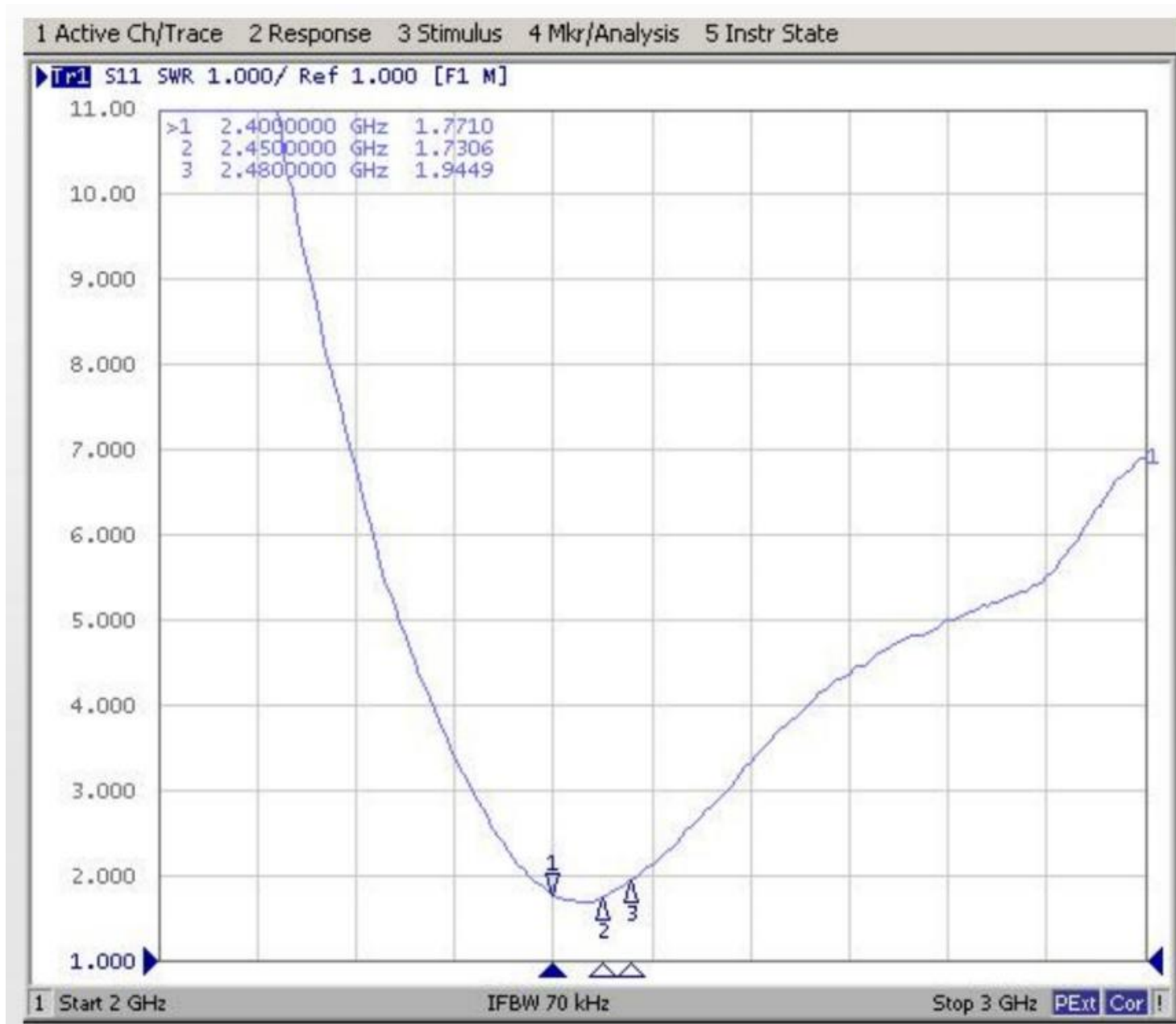
品名规格 (PRODUCT NAME)		FPC (YD-Q11-CS-WIFI-2-V1.0) -1.13黑线-L90MM-1代	
料 号 (P/N)			
客户料号(CUSTOMER PART NO)			
绘图 (DRAW)	Junchael Xie	版 本 (VER)	A1
审核 (CHECK)	Sean Zhang	日 期 (DATE)	2026-8-6
核准 (RATIFY)	Felicity Zhang	页 码 (PAGE)	1/1



III. BT - Antenna VSWR

The VSWR (Voltage Standing Wave Ratio) of the Bluetooth antenna was measured with a vector network analyzer from 2 GHz to 3 GHz. Marker readings at the key operating frequencies are summarized below.

Marker	Frequency (GHz)	VSWR
1	2.4000	1.7710
2	2.4500	1.7306
3	2.4800	1.9449

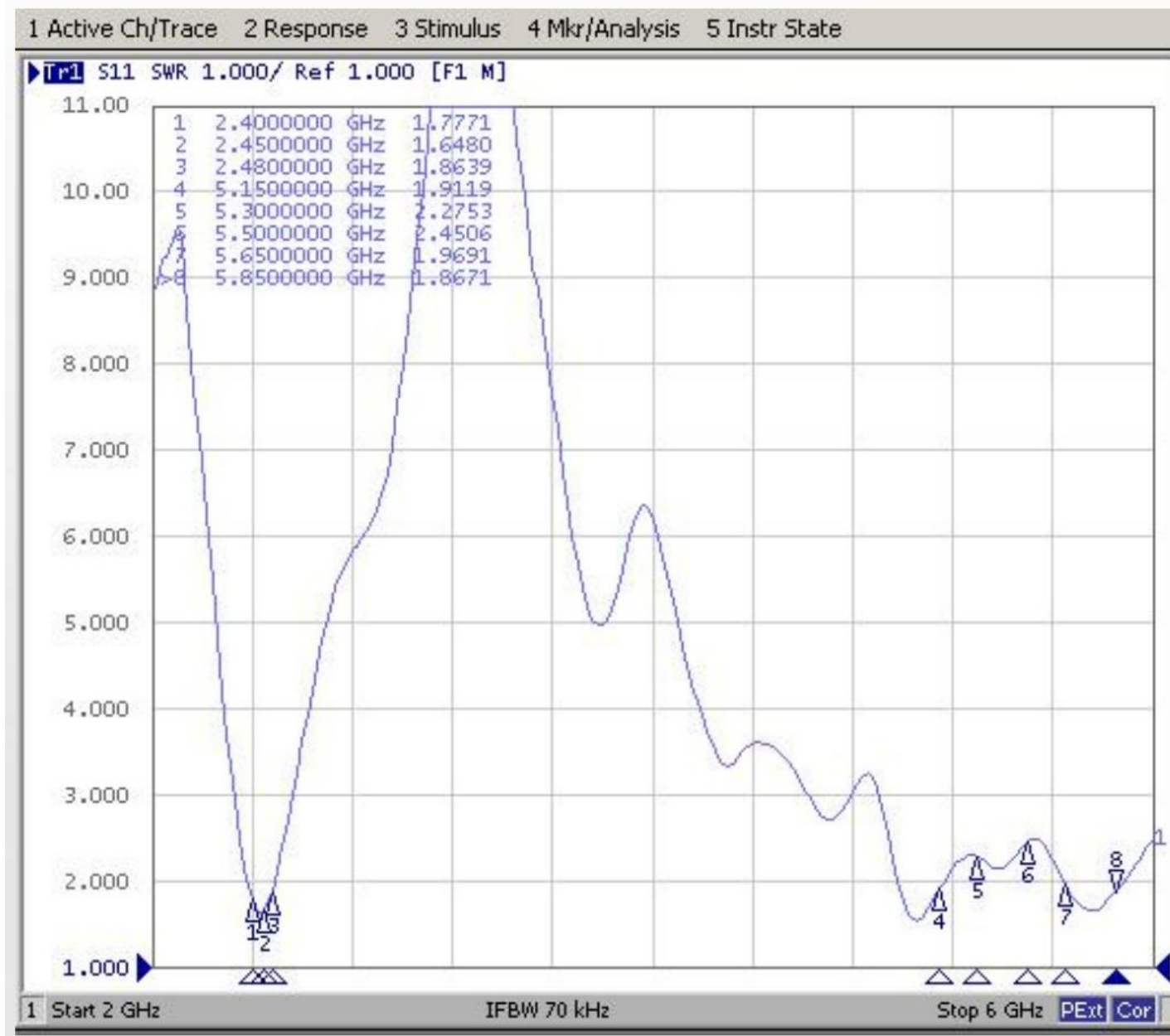




IV. WIFI-1 - Antenna VSWR

The VSWR of the WIFI-1 antenna was measured across the full operating range of 2 GHz to 6 GHz, covering both the 2.4 GHz and 5 GHz Wi-Fi bands.

Marker	Frequency (GHz)	VSWR
1	2.4000	1.7771
2	2.4500	1.6480
3	2.4800	1.8639
4	5.1500	1.9119
5	5.3000	2.2753
6	5.5000	2.4506
7	5.6500	1.9691
8	5.8500	1.8671

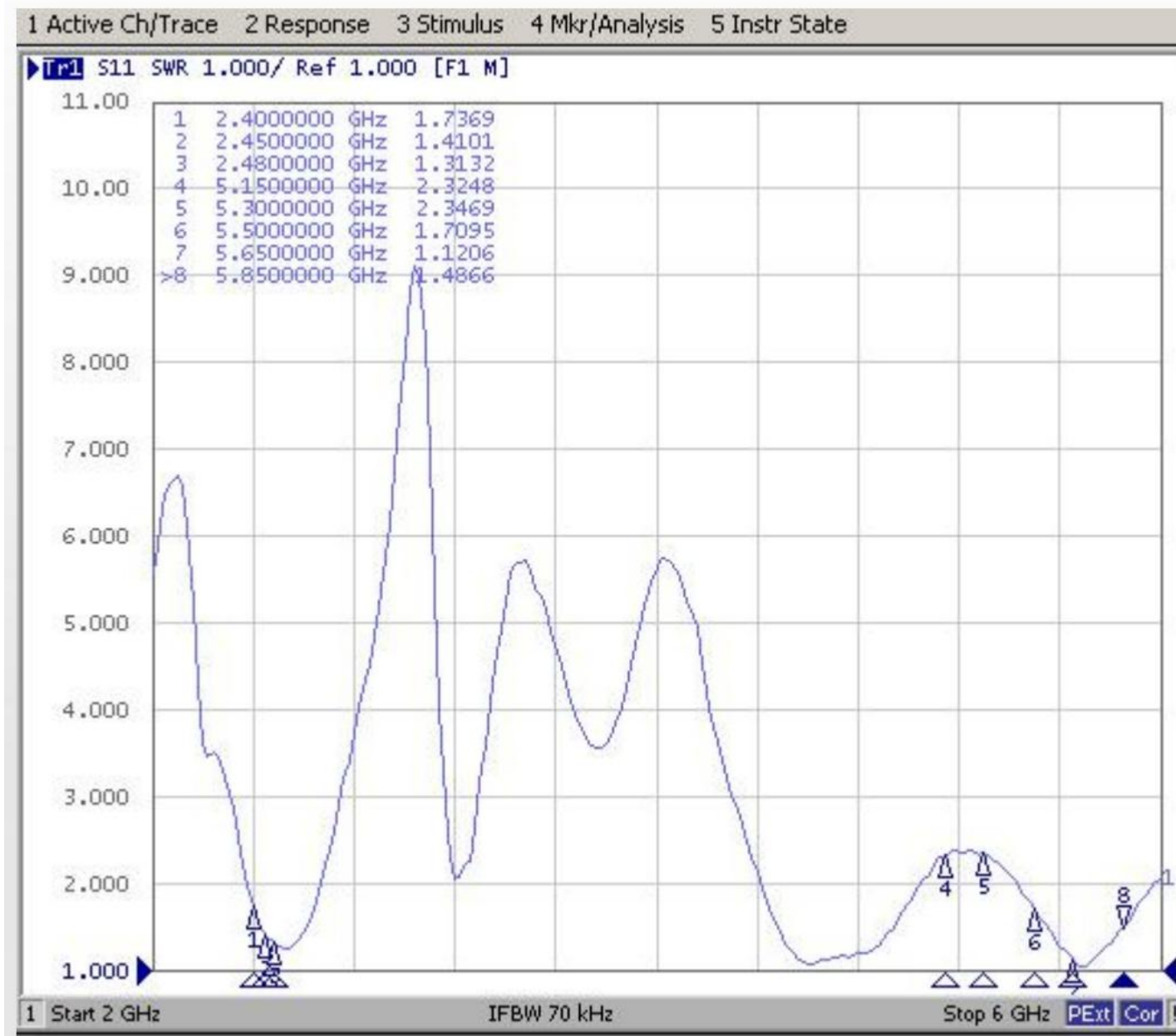




V. WIFI-2 - Antenna VSWR

The VSWR of the WIFI-2 antenna was measured across 2 GHz to 6 GHz. The results show good impedance matching in both the 2.4 GHz and 5 GHz bands.

Marker	Frequency (GHz)	VSWR
1	2.4000	1.7369
2	2.4500	1.4101
3	2.4800	1.3132
4	5.1500	2.3248
5	5.3000	2.3469
6	5.5000	1.7095
7	5.6500	1.1208
8	5.8500	1.4866





VI. BT - Anechoic Chamber Test Data: Efficiency & Gain

The Bluetooth antenna was measured in the anechoic chamber across the ISM band (2400 – 2500 MHz). Total efficiency and peak gain values at each frequency are tabulated below, along with the 3D and 2D radiation patterns at 2400 MHz.

Freq (MHz)	Efficiency (%)	Gain (dBi)
2400	46.71	2.94
2410	46.55	2.93
2420	42.47	2.56
2430	43.33	2.61
2440	44.19	2.67
2450	47.28	3.01
2460	45.02	2.92
2470	46.75	3.19
2480	47.34	3.43
2490	50.71	3.92
2500	47.71	3.78

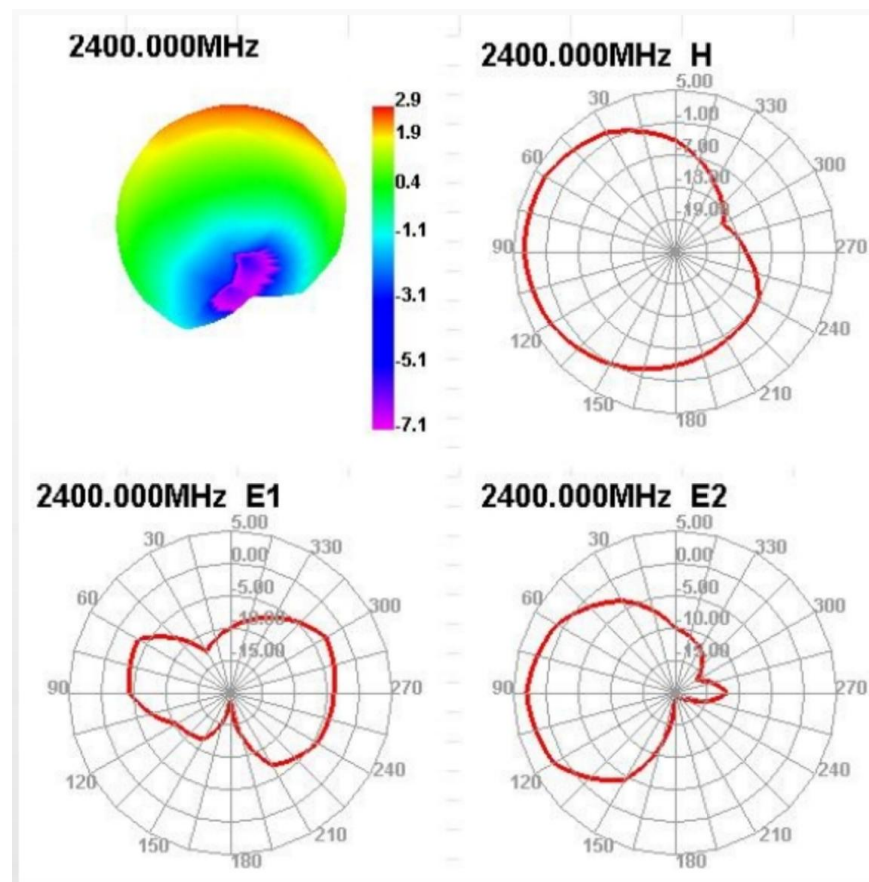


Figure 6. BT antenna efficiency / gain table (left) and 3D & 2D radiation patterns at 2400 MHz (H, E1, E2 planes).



VII. Anechoic Chamber Test Data: OTA (Wi-Fi 2.4 GHz)

Over-the-Air (OTA) performance of the Wi-Fi 2.4 GHz radio was measured in the anechoic chamber. Total Radiated Power (TRP) and Total Isotropic Sensitivity (TIS) were captured for channels 1, 6, and 11 using an 802.11b signal at 11 Mbps.

Application Information	
04Version	5.258.361
TotalTime	20m 44s 3ms
AdditionalInfor	802.11b : 11Mbps

Wifi 2G TRP		
1	6	11
2412	2437	2462
13.51	14.03	16.05

Wifi 2G TIS		
1	6	11
2412	2437	2462
-78.82	-78.13	-78.56

Table 1. Application information, Wi-Fi 2G TRP and TIS results.



VIII. Anechoic Chamber Test Data: OTA (Wi-Fi 5 GHz)

Over-the-Air (OTA) performance of the Wi-Fi 5 GHz radio was measured in the anechoic chamber. TRP and TIS results for channels 36, 64, and 161 are summarized below using an 802.11a signal at 54 Mbps.

Application Information	
04Version	5.258.361
TotalTime	19m 0s 157ms
AdditionalInfor	802.11a : 54Mbps

Wifi 5G TRP		
36	64	161
5180	5320	5805
15.91	13.71	16.39

Wifi 5G TIS		
36	64	161
5180	5320	5805
-71.34	-73.99	-69.82

Table 2. Application information, Wi-Fi 5G TRP and TIS results.

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