

# ANTENNA PASSIVE TEST REPORT

Application No.	ZEWM2311001828OA
Applicant	SKULLCANDY, INC.
Manufacturer	SKULLCANDY, INC.
Product Name	PUSH PLAY ACTIVE
Model No.	S2PPW
Standards	ANSI/IEEE Std 149-2008
Date Initial Sample(s) Received	2023.11.29
Testing Start Date	2023.11.29
Testing Finish Date	2023.11.29
Report Issue Date	2024.01.17

\* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Turner He

Prepared by

Max. Huang

Reviewed By

Ervin Li

Approved by



## Revision Version

Report No.	Version	Date	Memo
ZEWM2311001828OA01	01	2024.01.17	Initial creation of report



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## 1 General Information

### 1.1 Testing Laboratory

Test Lab	SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
Address	No.1 Workshop, M-10, Middle section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China 518057
Contact	Ervin Li
Tel.	+86 18823369694
Fax	+86-755-25328600
E-mail	Ervin.Li@sgs.com

### 1.2 Details of Applicant

Applicant's Name	SKULLCANDY, INC.
Applicant's Address	6301 N Landmark Dr Park City UT 84098, Utah United States of America
Contact	Andrew Carter
Tel.	(404) 561-0830
Fax	N/A
E-mail	andrew.carter@skullcandy.com

### 1.3 Details of Manufacturer

Manufacturer's Name	SKULLCANDY, INC.
Manufacturer's Address	6301 N Landmark Dr Park City UT 84098, Utah United States of America
Contact	Andrew Carter
Tel.	(404) 561-0830
Fax	N/A
E-mail	andrew.carter@skullcandy.com



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Shenzhen Branch, Wireless Laboratory

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中国·广东·深圳市南山区科技园中区M-10栋1号厂房 邮编: 518057 t (86-755) 26012053 sgs.china@sgs.com

## 1.4 General Description of EUT

Device Description:	PUSH PLAY ACTIVE
Device Manufacturer:	SKULLCANDY, INC.
Device Model:	S2PPW
Hardware Version:	N/A
Software Version:	N/A

## 1.5 Test Procedure

Testing is performed according to the **ANSI/IEEE Std 149-2008**.



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## 1.6 Test Specification

Identity	Document Title
ANSI/IEEE Std 149-2008	IEEE Standard Test Procedures for Antennas

## 1.7 Laboratory Environment

Temperature	Min. =19°C · Max. = 25°C	
Relative humidity	Min. =40% · Max. =72%	
Shield effect	0.7-6GHz	> 100dB
Ground resistance	<0.5Ω	



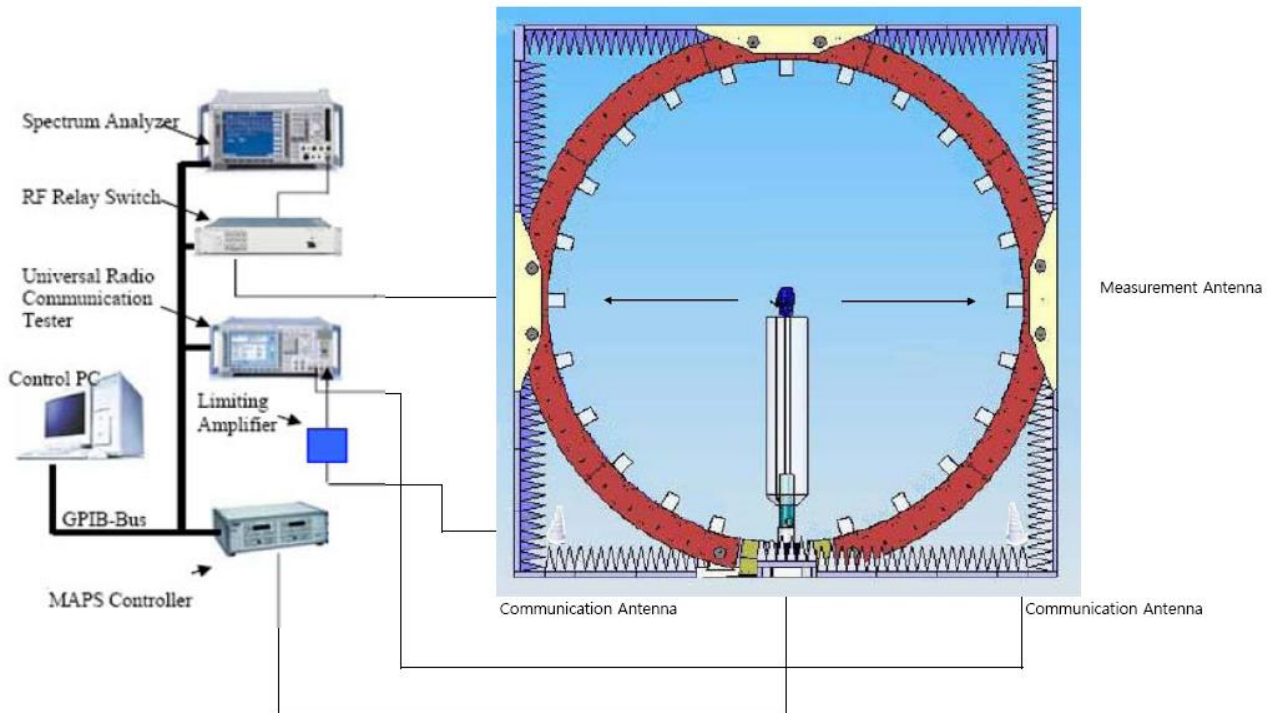
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## 2 OTA Measurements System Configuration

### 2.1 Test Configuration

Great-Circle-Cut method is used to measure the antenna 3D GAIN of EUT in OTA qualified anechoic chamber. Equipment Under Test (EUT) geometry centre vertical projection at the centre of platform, the distance from EUT to measurement antenna is 5m



F-1. OTA Measurement System Configuration



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### 3 Test Equipment List

Type of Equipment	Model Number	Manufacture	Calibration Date	Valid Period
Network Analyzer	E5071C S/N MY46523591	Keysight	2023/2/16	2024/2/15
Quad-Ridge Horn Antenna 700 MHz-10 GHz	EMCO 3164-08 S/N 161915	ETS-Lindgren L.P.	N/A	N/A
MAPS Controller	EMCENTER S/N 160485	ETS-Lindgren L.P.	N/A	N/A
SAM V4.5BS Head Phantom	Head Phantom S/N 3609	SPEAG	NCR	NCR



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## 4 Measurement Uncertainty

Item	2400-2500 MHz (dB)
Gain	0.88
Efficiency	0.88
Measurement Uncertainty (95% CONFIDENCE INTERVAL) K=2	



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## 5 Test Results

Free Space Left #4			
Frequency (MHz)	Efficiency (dB)	Efficiency (%)	Gain (dBi)
2350	-4.56	34.98	0.49
2355	-4.64	34.35	0.44
2360	-4.25	37.60	0.80
2365	-4.27	37.40	0.81
2370	-4.30	37.16	0.64
2375	-4.24	37.70	0.70
2380	-4.28	37.31	0.64
2385	-4.04	39.48	0.85
2390	-4.08	39.11	0.87
2395	-3.86	41.08	1.02
2400	-3.99	39.90	0.96
2402	-4.08	39.05	0.83
2405	-4.05	39.35	0.86
2410	-3.91	40.65	1.09
2415	-3.96	40.14	0.99
2420	-3.76	42.06	1.23
2425	-3.82	41.46	1.25
2430	-4.00	39.83	0.98
2435	-4.09	38.98	0.98
2440	-4.19	38.08	0.69
2441	-4.17	38.33	0.74
2445	-3.94	40.32	1.09
2450	-3.86	41.09	1.25
2455	-3.74	42.27	1.22
2460	-3.90	40.76	1.25

Free Space Right #5			
Frequency (MHz)	Efficiency (dB)	Efficiency (%)	Gain (dBi)
2350	-5.10	30.88	0.05
2355	-5.08	31.04	-0.19
2360	-4.72	33.74	0.41
2365	-4.71	33.83	0.30
2370	-4.66	34.22	0.31
2375	-4.65	34.31	0.35
2380	-4.55	35.10	0.27
2385	-4.35	36.76	0.52
2390	-4.31	37.09	0.43
2395	-4.12	38.72	0.70
2400	-4.28	37.35	0.61
2402	-4.30	37.13	0.54
2405	-4.28	37.36	0.58
2410	-4.21	37.90	0.69
2415	-4.20	38.05	0.68
2420	-3.96	40.14	0.81
2425	-4.06	39.28	0.87
2430	-4.10	38.90	0.63
2435	-4.28	37.35	0.83
2440	-4.26	37.51	0.51
2441	-4.20	38.05	0.54
2445	-4.08	39.05	1.02
2450	-3.95	40.28	0.86
2455	-3.76	42.07	1.16
2460	-3.90	40.76	0.80



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2465	-4.04	39.41	0.95
2470	-4.27	37.38	0.70
2475	-4.41	36.21	0.64
2480	-4.54	35.18	0.35
2482	-4.53	35.24	0.59
2485	-4.54	35.12	0.58
2490	-4.45	35.90	0.46
2495	-4.21	37.94	1.06
2500	-4.15	38.43	0.85
2505	-4.06	39.31	1.19
2510	-4.20	38.04	0.73
2515	-4.50	35.48	0.61
2520	-4.90	32.33	0.04
2525	-5.22	30.08	-0.10
2530	-5.48	28.29	-0.40
2535	-5.63	27.37	-0.47
2540	-5.68	27.06	-0.43
2545	-5.57	27.76	-0.32
2550	-5.64	27.28	-0.29
2555	-5.76	26.55	-0.54
2560	-6.03	24.96	-0.74
2565	-6.23	23.84	-1.10
2570	-6.34	23.24	-1.02
2575	-6.42	22.83	-1.21
2580	-6.33	23.30	-0.97

2465	-3.96	40.21	0.73
2470	-4.22	37.86	0.40
2475	-4.29	37.22	0.36
2480	-4.46	35.84	0.27
2482	-4.47	35.77	0.15
2485	-4.45	35.87	0.20
2490	-4.44	35.95	0.37
2495	-4.22	37.87	0.36
2500	-4.22	37.84	0.51
2505	-4.10	38.87	0.34
2510	-4.23	37.78	0.23
2515	-4.50	35.48	-0.26
2520	-4.88	32.48	-0.66
2525	-5.23	29.96	-0.99
2530	-5.49	28.26	-1.22
2535	-5.61	27.46	-1.26
2540	-5.62	27.39	-1.36
2545	-5.49	28.22	-1.16
2550	-5.52	28.03	-1.35
2555	-5.66	27.16	-1.42
2560	-5.92	25.60	-1.75
2565	-6.15	24.28	-1.98
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2575	-6.35	23.19	-2.26
2580	-6.34	23.20	-2.12

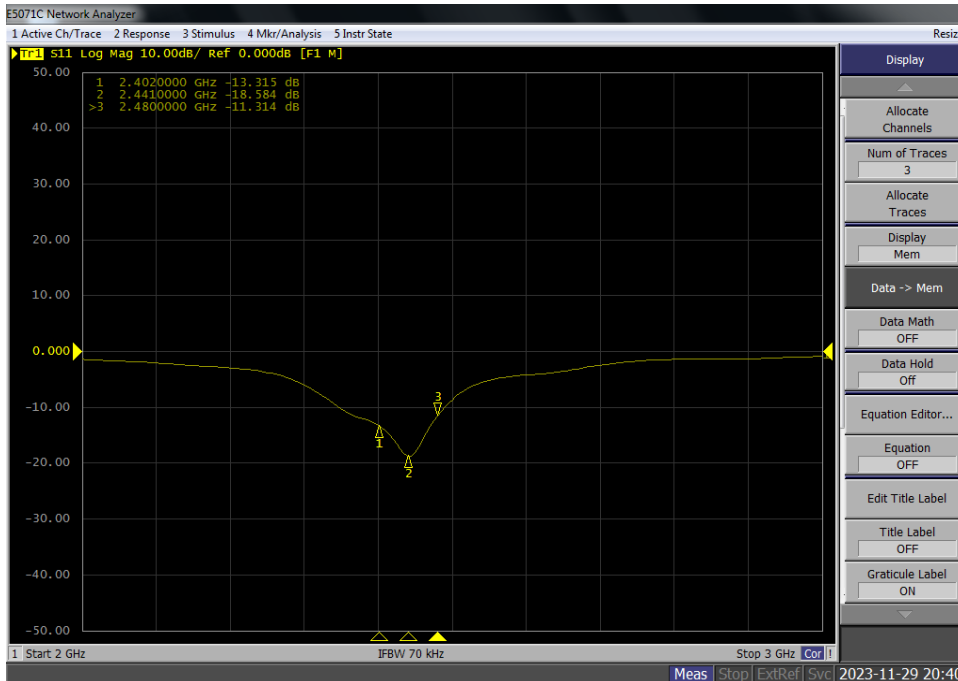


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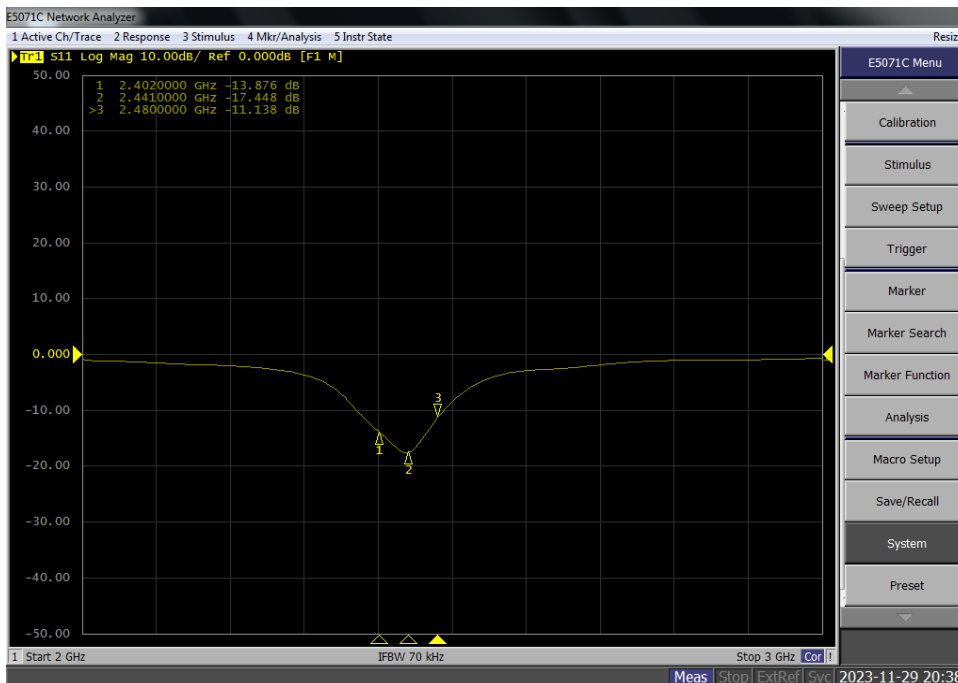
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## 6 Pattern Plots

### 6.1 Return Loss



Free Space Left #4



Free Space Right #5

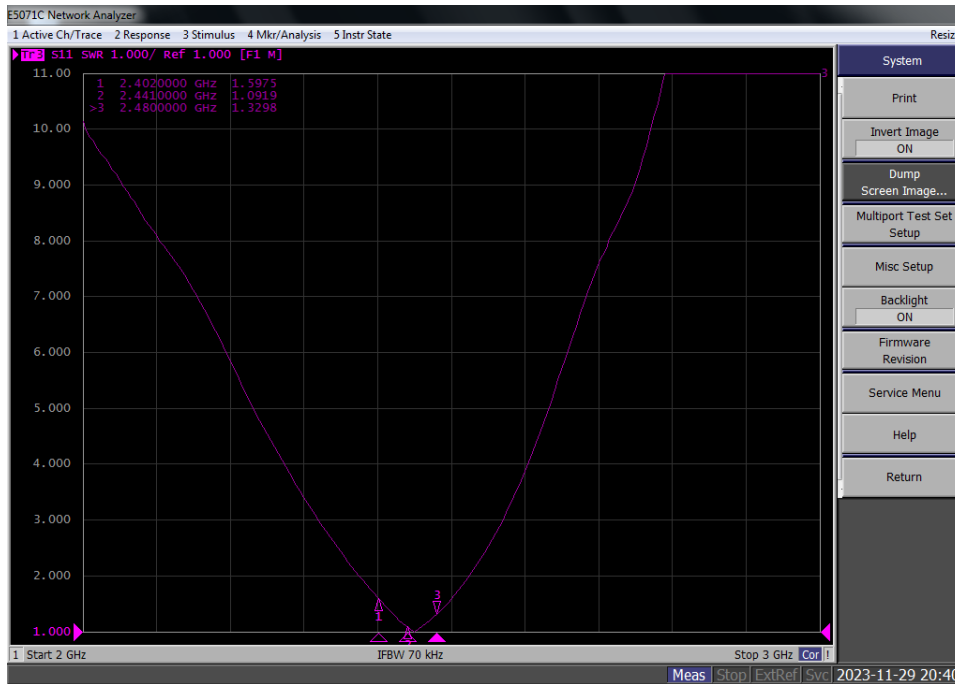


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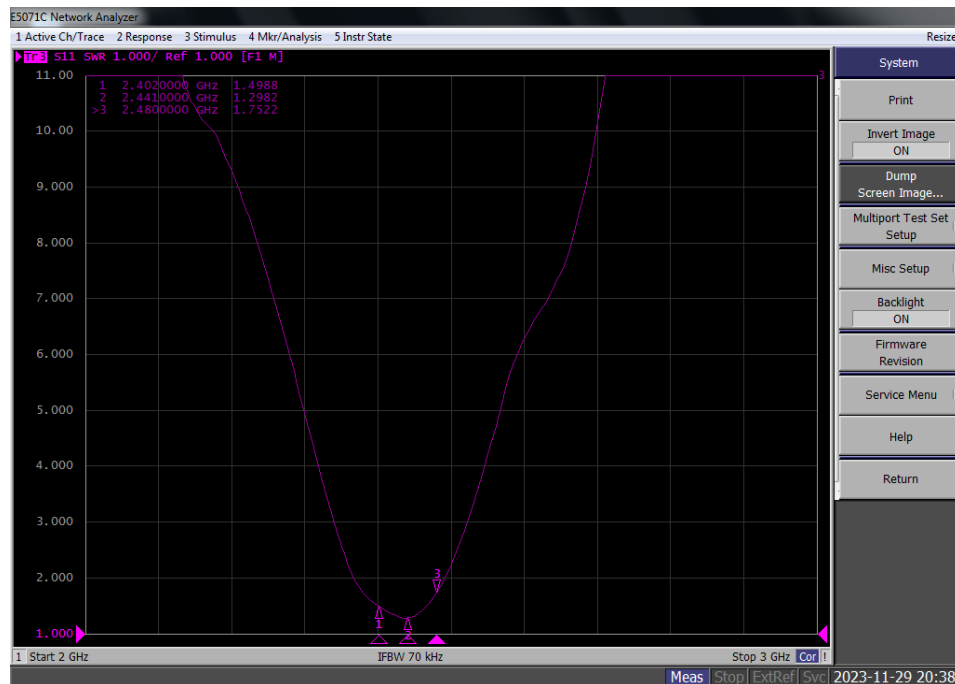
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## 6.2 VSWR



Free Space Left #4



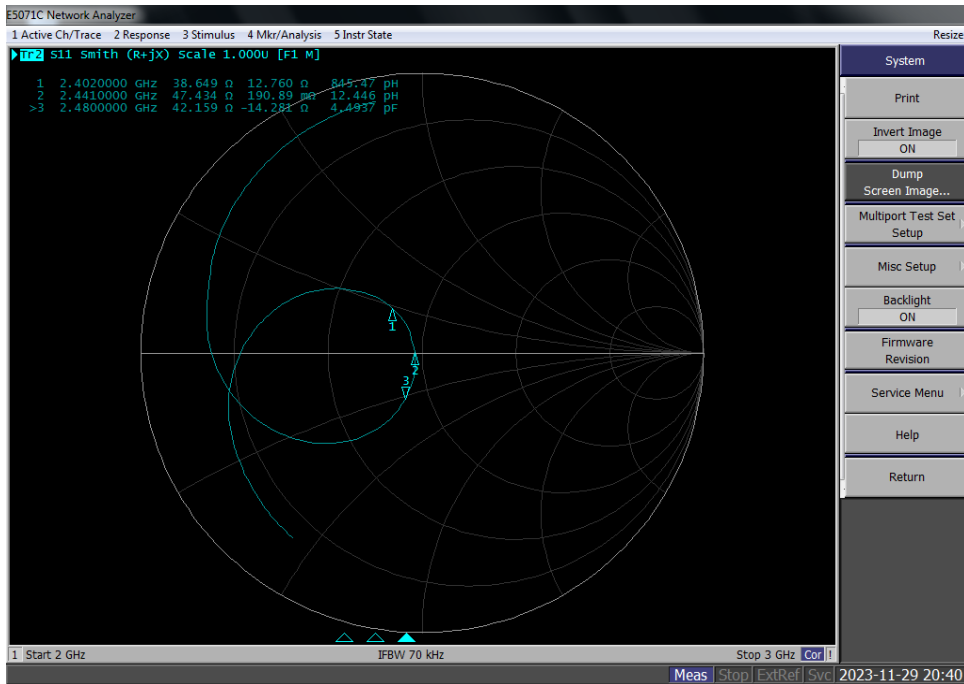
Free Space Right #5



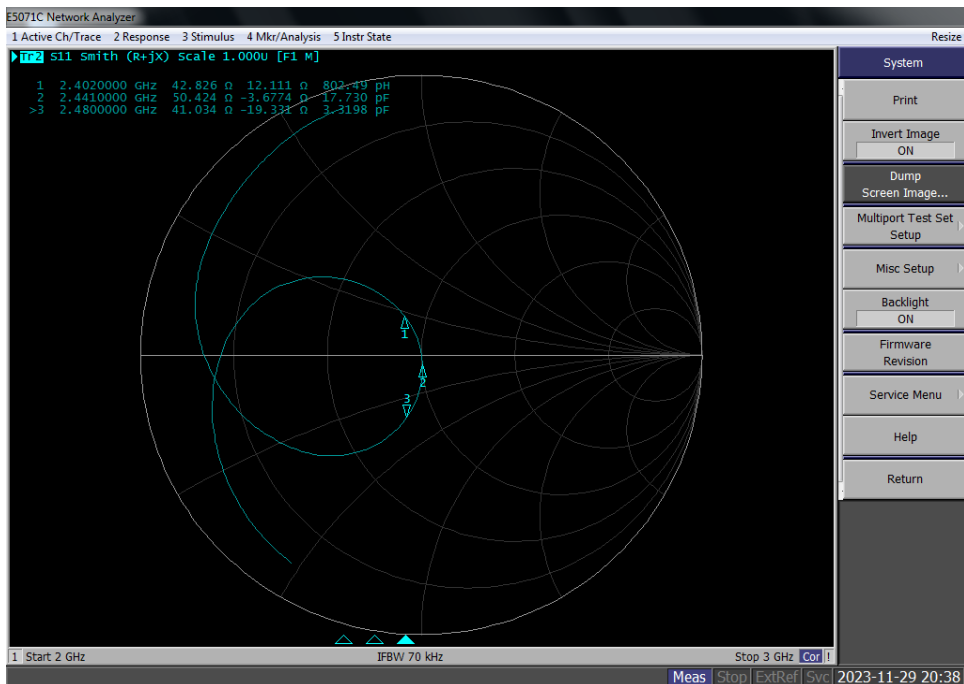
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### 6.3 Stimulus



Free Space Left #4



Free Space Right #5

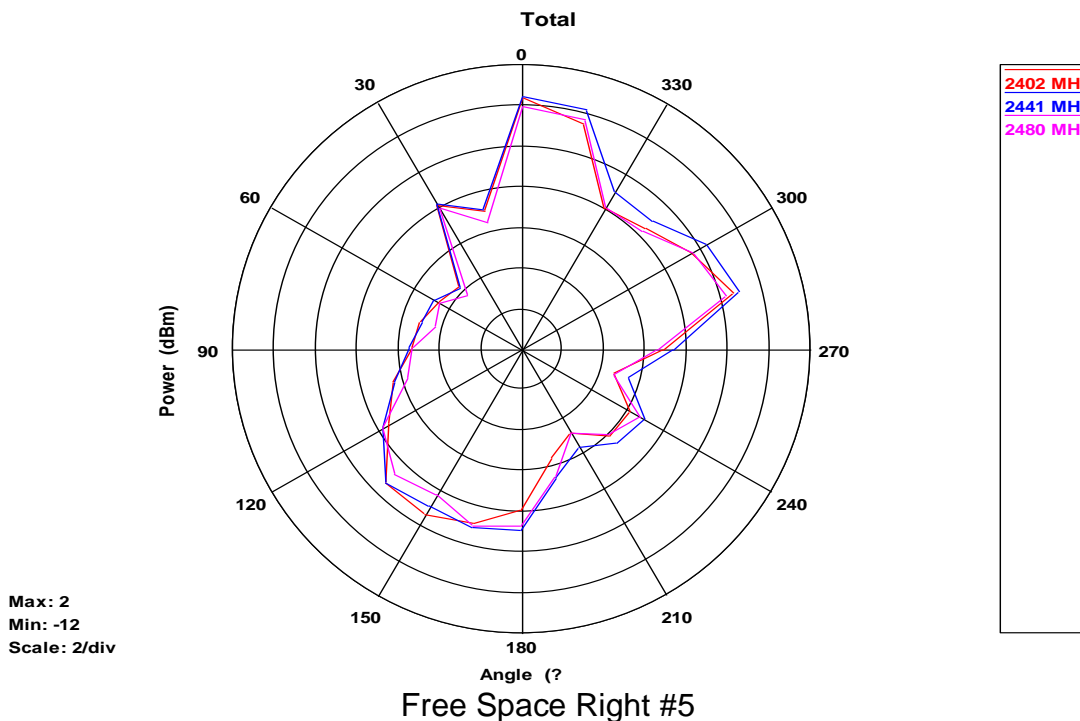
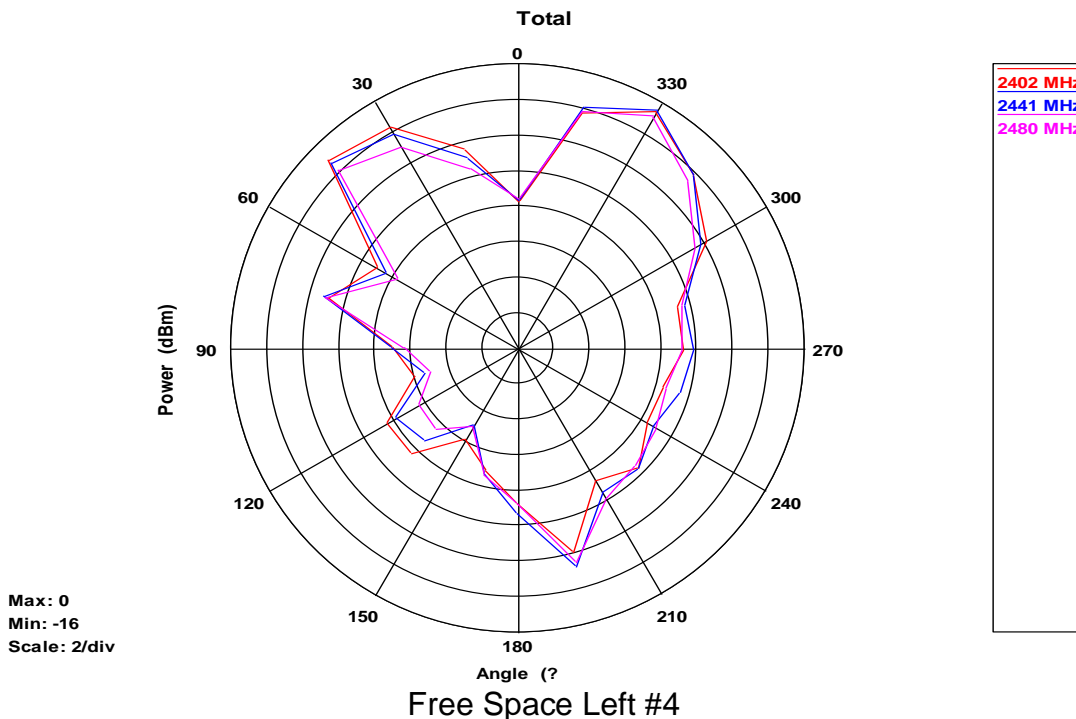


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## 7 2-D Antenna Pattern(Theta=90°)

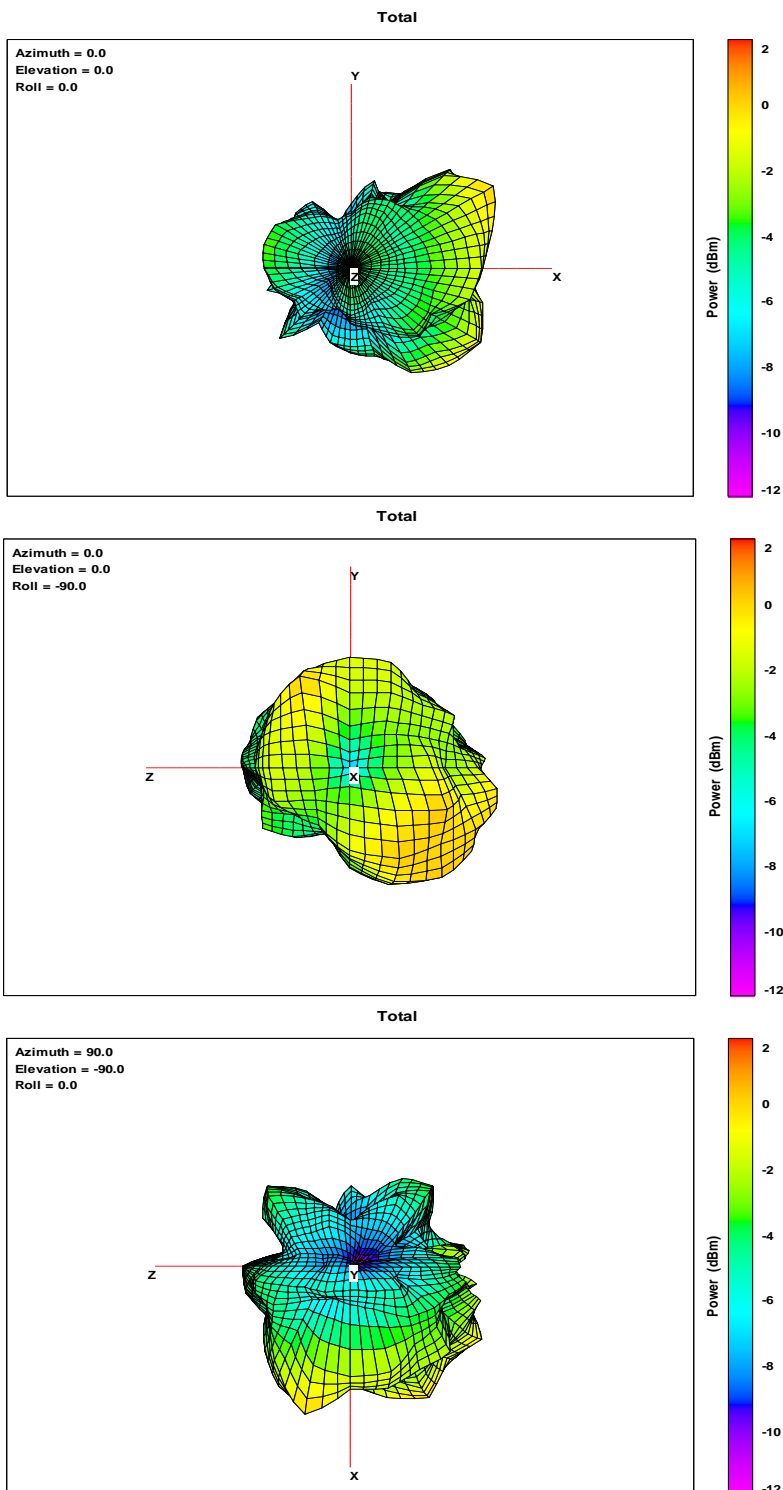


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## 8 3-D Antenna Pattern



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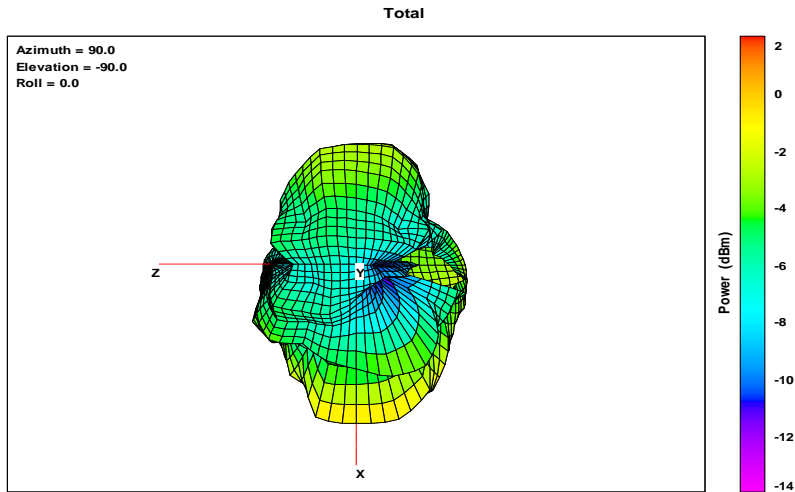
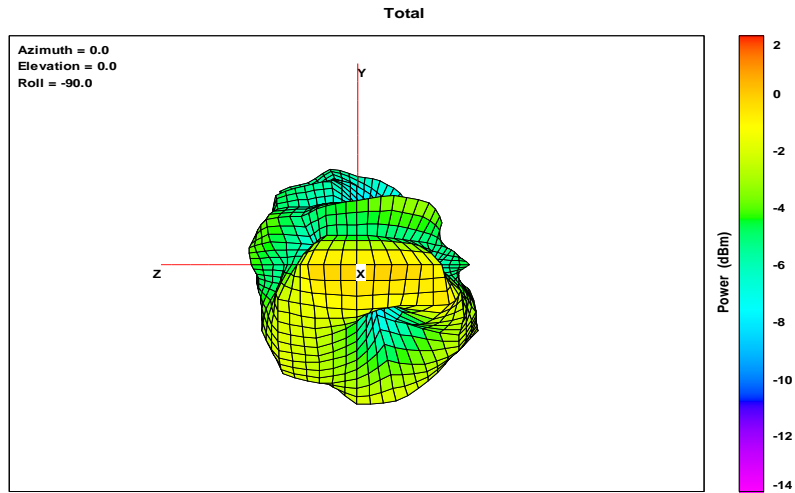
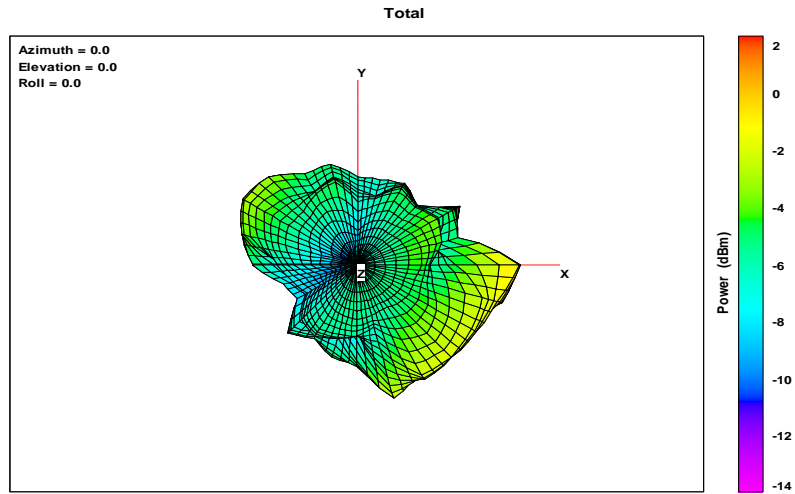
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