

ANTENNA PASSIVE TEST REPORT

Application No. ZEWM2206000672OA
Applicant Razer Inc
Manufacturer Razer (Asia-Pacific) Pte Ltd
Product Name Gaming Speaker
Model No. RZ05-0476/RZ05-0476XXXX-XXXX (X can be 0-9 or A-Z)
Standards ANSI/IEEE Std 149-2008
Date Initial Sample(s) Received 2022.06.08
Testing Start Date 2022.06.22
Testing Finish Date 2022.06.22
Report Issue Date 2022.08.01

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

YUANYU LUO

Prepared by

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Reviewed By

Yubin Li

Approved by



Revision Version

Report No.	Version	Date	Memo
ZEWM2206000672OA01	00	2022.08.01	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	Panta Sun
Tel.	+86 (0) 755 2601 2053
Fax	+86 (0) 755 2671 0594
E-mail	Panta.Sun@sgs.com

1.2 Details of Applicant

Applicant's Name	Razer Inc
Applicant's Address	9 Pasteur, Suite 100, Irvine, CA92618, USA
Contact	Christopher Chan
Tel.	+65-6508-2260
Fax	N/A
E-mail	christopher.chan@razer.com

1.3 Details of Manufacturer

Manufacturer's Name	Razer Inc
Manufacturer's Address	9 Pasteur, Suite 100, Irvine, CA92618, USA
Contact	Johnsen Tia
Tel.	+65 6571 6828
Fax	N/A
E-mail	johnsen.tia@razer.com



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1.4 General Description of EUT

Device Description:	Gaming Speaker
Device Manufacturer:	Razer (Asia-Pacific) Pte Ltd
Device Model:	RZ05-0476/RZ05-0476XXXX-XXXX (X can be 0-9 or A-Z)
Hardware Version:	20220505V3
Software Version:	N/A
S/N:	N/A

1.5 Test Procedure

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



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Shenzhen Branch Testing & Calibration Laboratory

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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

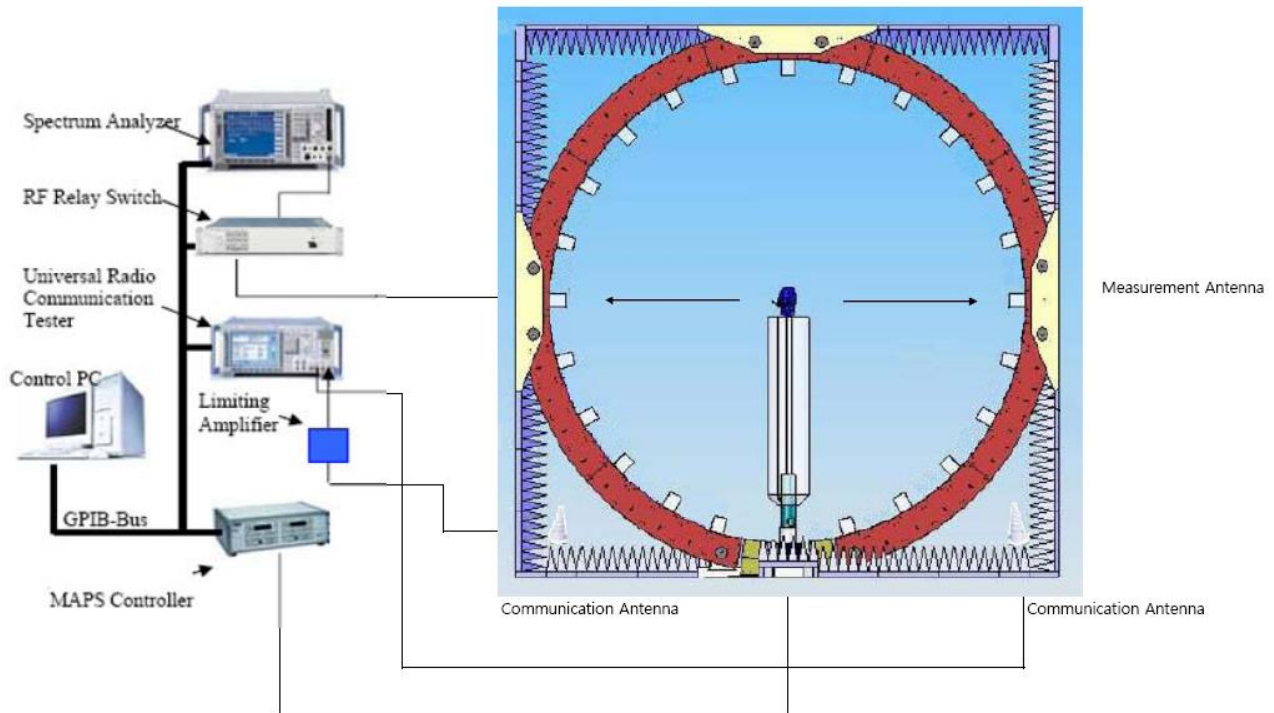
Temperature	Min. =19°C, Max. = 25°C	
Relative humidity	Min. =40%, Max. =72%	
Shield effect	0.7-6GHz	> 100dB
Ground resistance	<0.5Ω	



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

3 Test Equipment List

Type of Equipment	Model Number	Manufacture	Calibration Date	Valid Period
Network Analyzer	E5071C S/N MY46523591	Keysight	2022/4/11	2023/4/10
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



4 Measurement Uncertainty

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



5 Test Results

Free Space			
Frequency (MHz)	Efficiency (dB)	Efficiency (%)	Gain (dBi)
2350	-3.14	48.51	2.06
2355	-2.80	52.53	2.46
2360	-2.40	57.52	3.00
2365	-2.37	57.99	2.96
2370	-2.52	55.95	3.02
2375	-2.72	53.40	2.70
2380	-2.66	54.18	3.07
2385	-2.55	55.59	2.84
2390	-2.24	59.64	3.42
2395	-2.07	62.14	3.31
2400	-2.10	61.70	3.52
2402	-2.09	61.74	3.58
2405	-2.11	61.56	3.31
2410	-2.08	61.92	3.49
2415	-1.99	63.29	3.43
2420	-1.93	64.18	3.53
2425	-1.90	64.59	3.51
2430	-1.97	63.56	3.30
2435	-1.98	63.43	3.41
2440	-1.87	65.06	3.34
2441	-1.84	65.47	3.38
2445	-1.78	66.43	3.60
2450	-1.75	66.81	3.50
2455	-1.81	65.88	3.55
2460	-1.98	63.43	3.28
2465	-2.02	62.77	3.30
2470	-2.17	60.62	2.99
2475	-2.01	62.91	3.20
2480	-2.09	61.79	3.10
2482	-2.07	62.12	3.20
2485	-2.05	62.43	3.22
2490	-2.20	60.26	3.12
2495	-2.09	61.75	3.21
2500	-2.12	61.41	3.22
2505	-2.02	62.82	3.24



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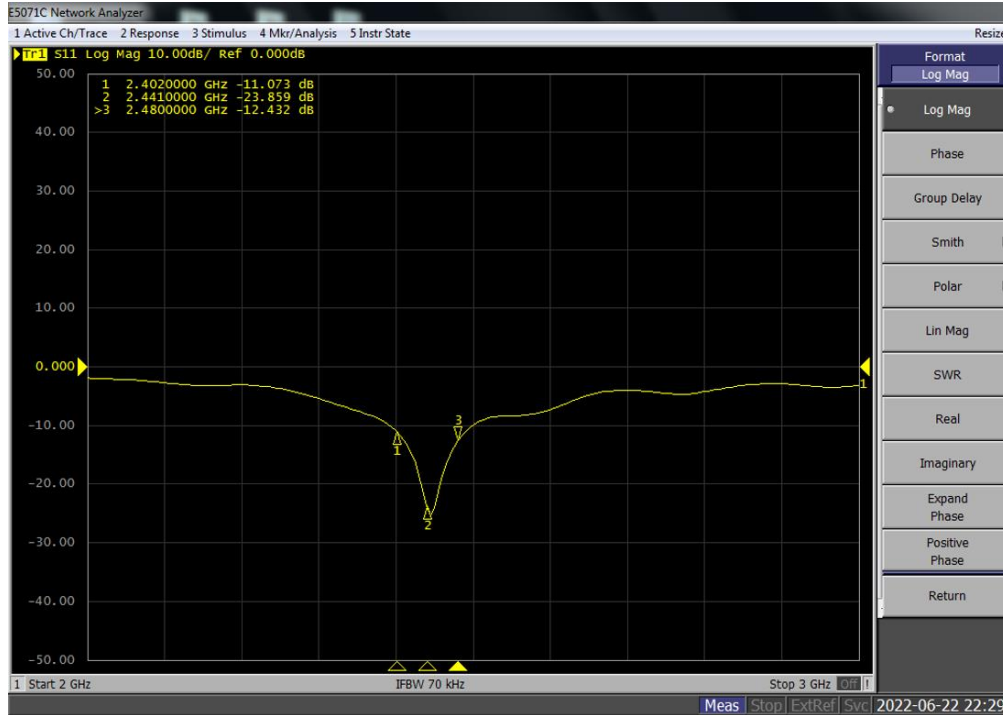
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2510	-2.02	62.76	3.27
2515	-2.20	60.24	3.03
2520	-2.42	57.30	2.75
2525	-2.70	53.69	2.49
2530	-2.78	52.69	2.34
2535	-2.80	52.54	2.27
2540	-2.71	53.63	2.40
2545	-2.62	54.74	2.34
2550	-2.75	53.04	2.43
2555	-2.91	51.13	2.13
2560	-3.10	49.02	2.22
2565	-3.04	49.61	2.17
2570	-2.97	50.46	2.43
2575	-2.92	51.07	2.37
2580	-3.00	50.10	2.27



6 Pattern Plots

6.1 Return Loss



Free Space



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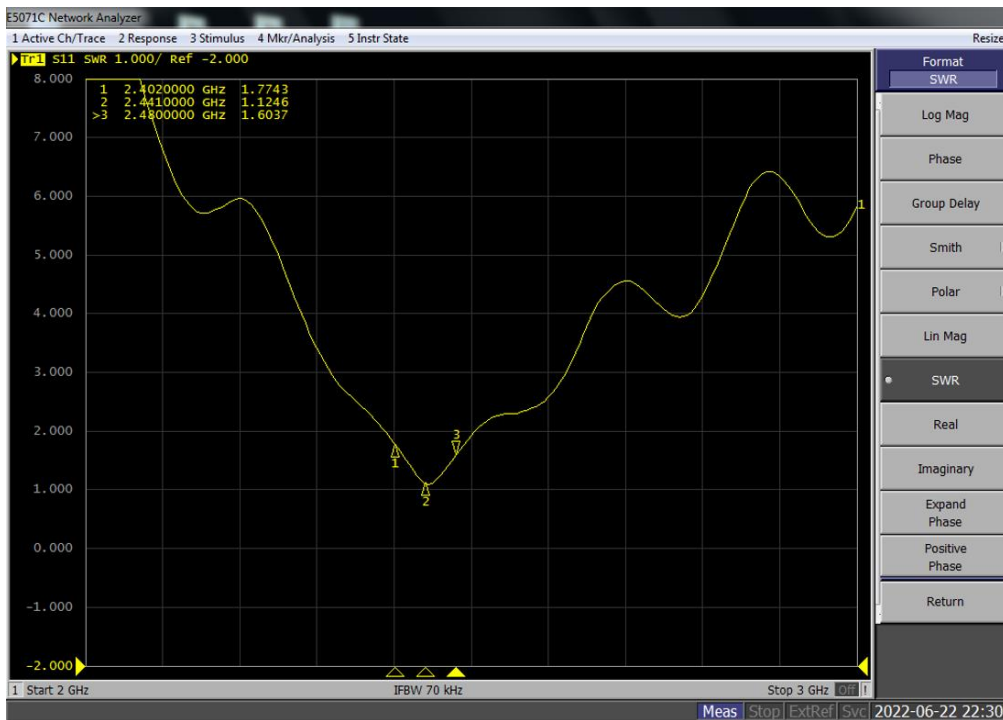
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6.2 VSWR



Free Space



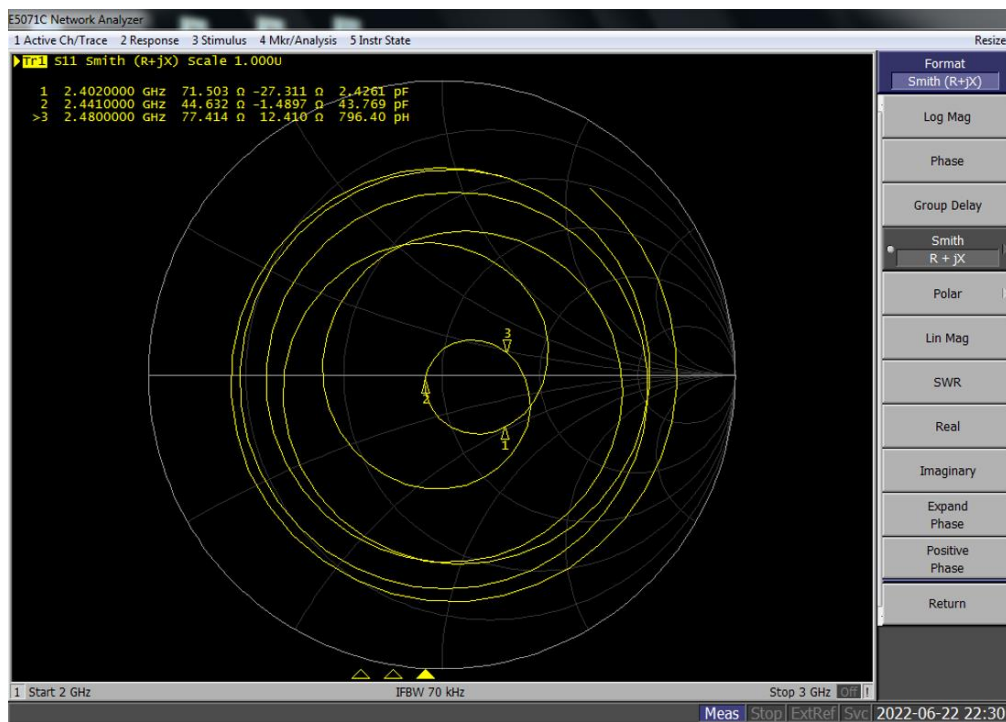
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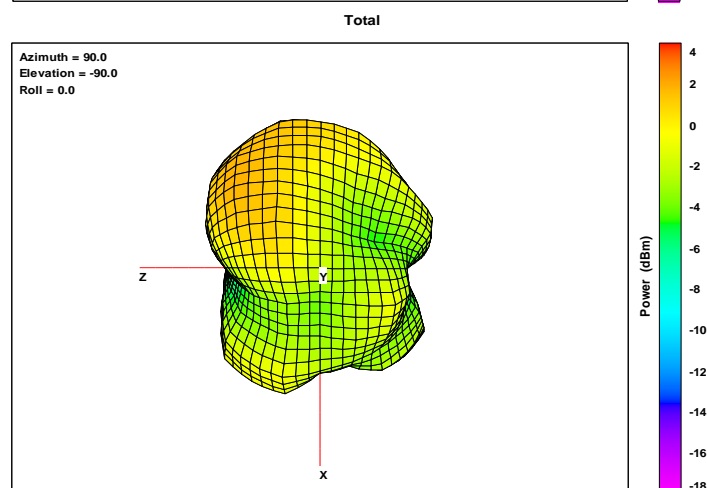
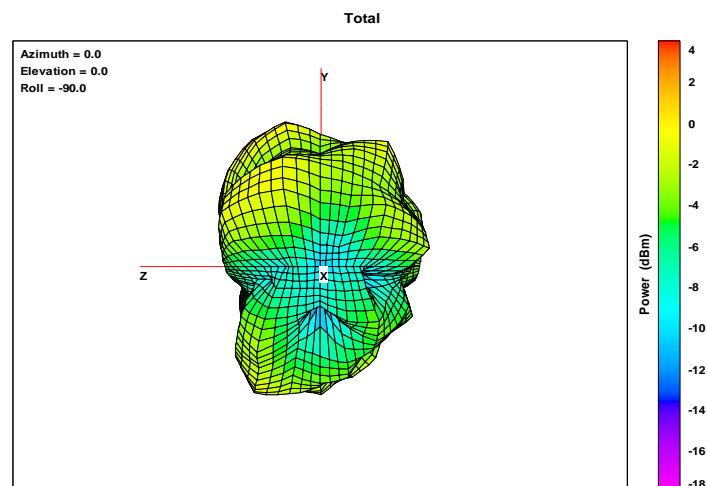
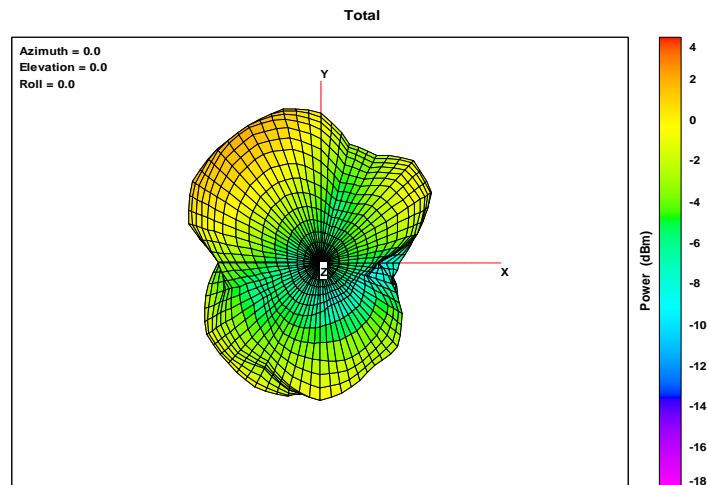
6.3 Stimulus



Free Space



7 3-D Antenna Pattern



Free Space

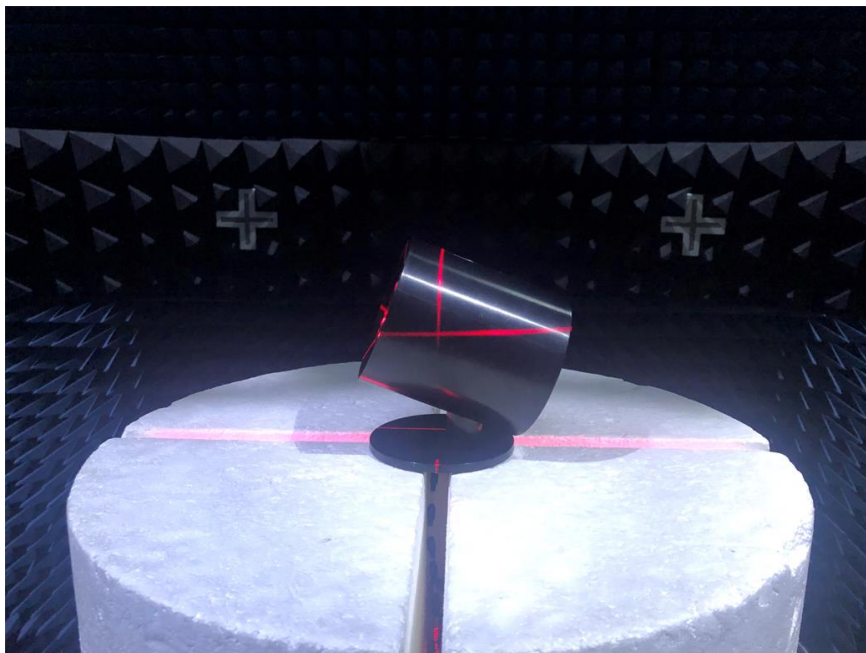


8 The EUT and Test Configuration



Photo of EUT





Free Space View

End of Report

