Testing Report

Customer Name: Pure Watercraft

Product Name: Pure Outboard Throttle

Sample Model: THG1

Reference Standard: *GB/T 9410-2008; ANSI/IEEE Std 149-2021*

Issue Date: 2022.11.30

Engineer: Jackson	Date: 2022.11.29
Auditor: Eason	Date: 2022.11.30
Approver: Aaron	Date: 2022.11.30

Shenzhen RFI-LAB Communication Technology Co., Ltd. RFI-LAB

Version

Version No.	Date	Description	Formulate	Approval
A0	2022.11.30	For the first time, formulate	Jackson	Eason

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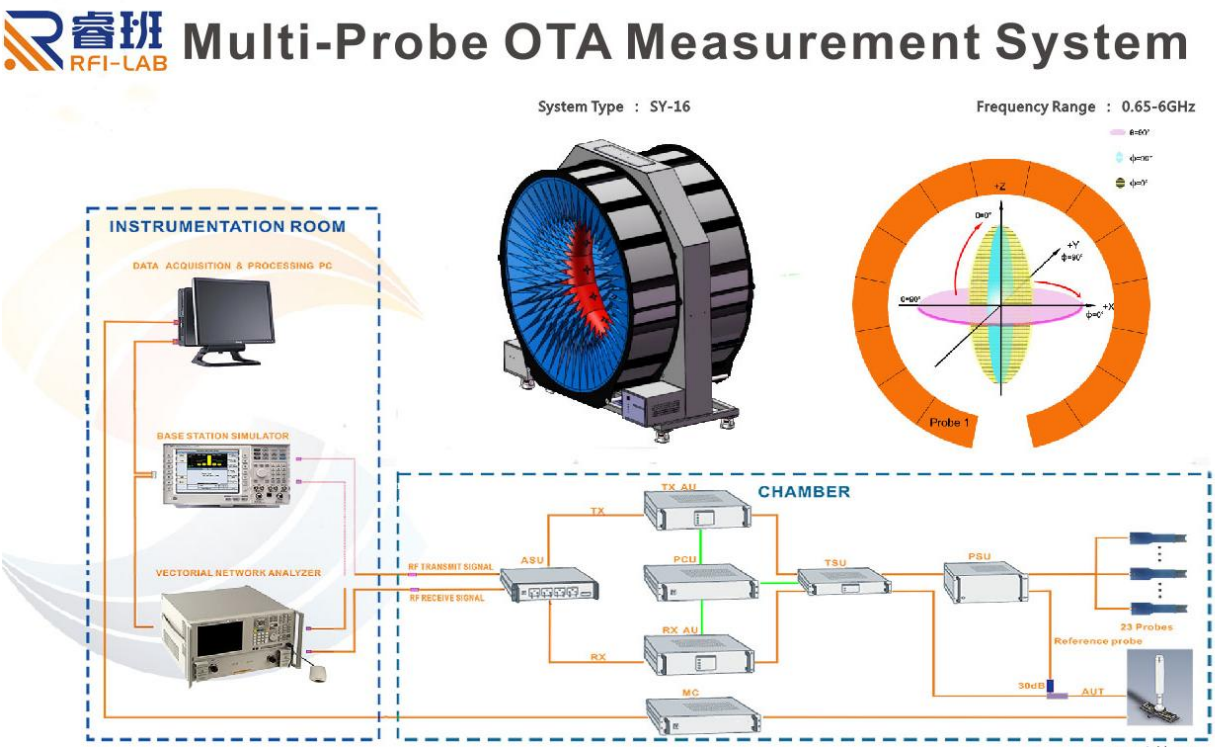
1.General Information

1.1 General information of testing institutions

Name	Shenzhen RFI-LAB Communication Technology Co., Ltd.
Address	/
Tel	/
E-mail	/
Equipment	All the equipment used in the report is fixed in 10/F A, Lingyun Bld, Liufang Rd, Baoan District, SZ

1.2 Testing principle



1.3 Test equipment

Equipment	Model No.	Serial No.	Manufacturer	Calibration date	Next calibration date
16 probe microwave chamber	3*3*2.5	RFI-LAB-RF-A00	SUNYIELD	2021.3.15	2023.3.14
Network Analyzer	E5071C	RFI-LAB-RF-A02	Agilent	2022.5.13	2023.5.12
Network Analyzer	E5071C	RFI-LAB-RF-C02	KEYSIGHT	2022.5.13	2023.5.12

1.4 Test environment

Temperature	23.8℃
Humidity	60%RH
Pressure	100.25kPa

1.5 Statement

(1) The test results in the report are only applicable to the tested samples and the tested samples work under the environment described in the report.
(2) Only Shenzhen RFI-LAB Communication Technology Co., Ltd. have the right to modify the report, and the modification information shall be annotated in the revision form.
(3) Any objection to this report shall be raised within 30 days after formal confirmation of the report.
(4) This report is invalid if there is any evidence that the sample information provided is falsified.
(5) The report is invalid without the signature of the auditor and approver.

2.Sample Information

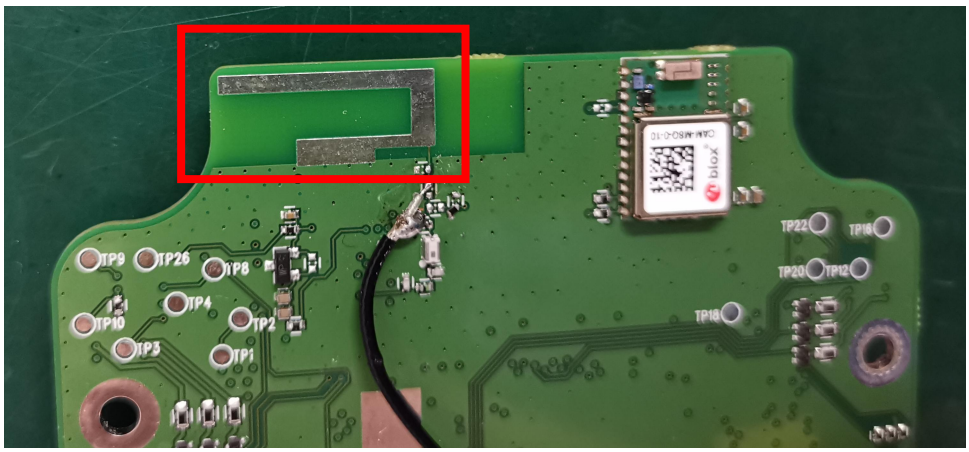
2.1 Client information

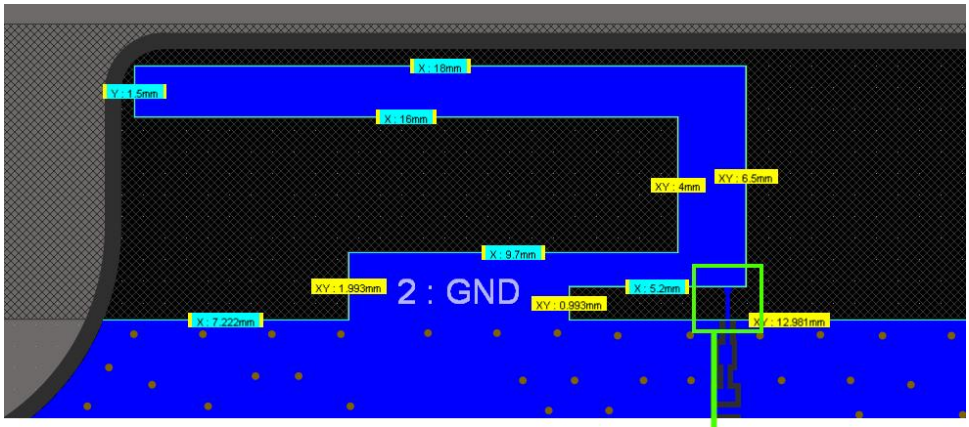
Name	Pure Watercraft.
Address	2151 N Northlake Way #210, Seattle, WA 98103
Contacts	/
Tel	/
E-mail	/

2.2 Description of EUT(S)

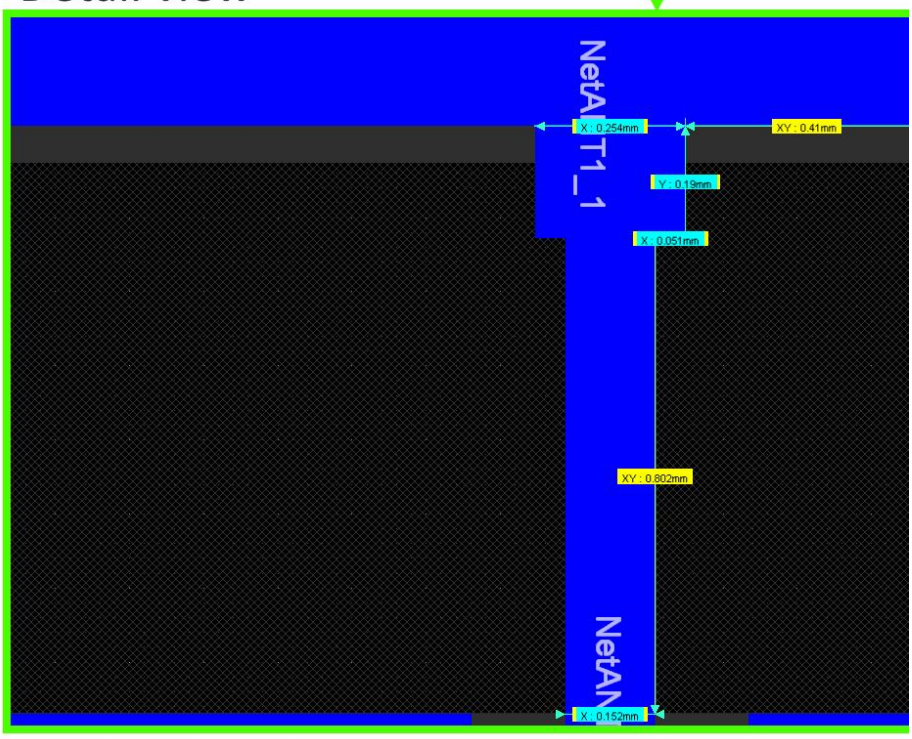
Product Name	Pure Outboard Throttle
Sample Model	THG1
Antenna Size	/
Antenna Type	PCB antenna
Serial No.	/
Test Item	VSWR; Antenna gain; Efficiency; Radiation pattern
Frequency Range	2400MHZ-2500MHZ
Received Date	2022.11.23
Test Date	2022.11.24
Remark	The length of the RF cable is 80mm

2.3 EUT appearance



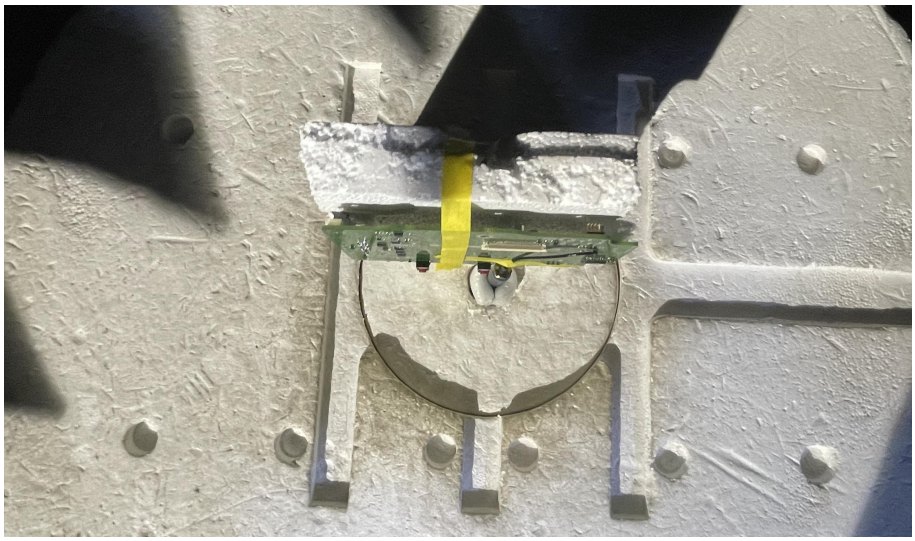


Detail view

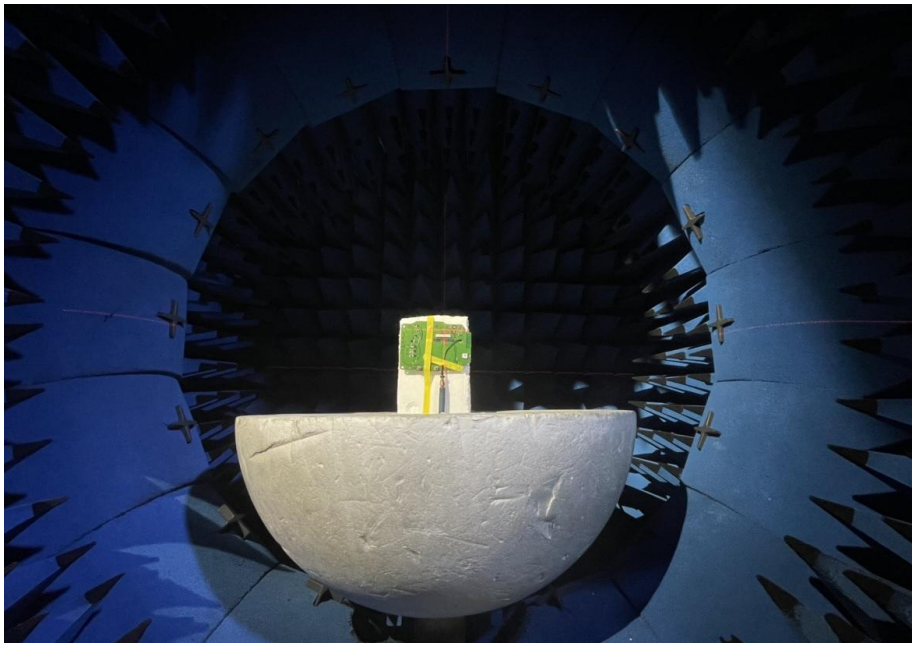


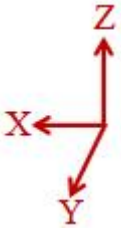
2.4 EUT setup photo of free space OTA testing

Planform



Front view





3.Test Results

3.1 Test standard

Name	Parameter	Method	Standard no.
Mobile communication antenna	Antenna gain	Generic specification for antennas used in the mobile communications	GB/T 9410-2008
	Radiation pattern		
	VSWR		
Antenna	Radiation efficiency	IEEE Standard Test Procedures for Antennas	ANSI/IEEE Std 149-2021
	Gain and directivity		

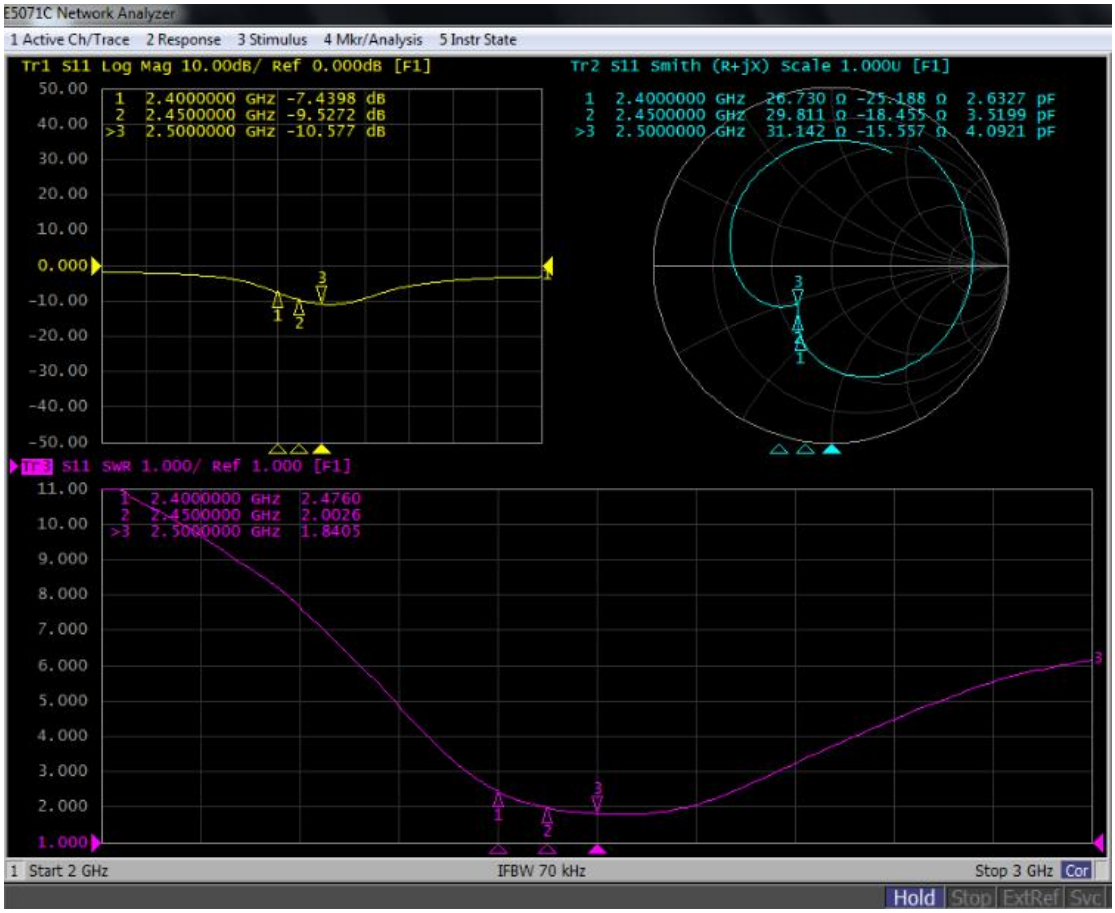
3.2 Test uncertainty

The uncertainty was calculated on the basis of the GUM published by ISO, using the inclusion factor of K=2 and the 95% confidence level to express the extended uncertainty.

Item	Uncertainty
VSWR	±0.3
Antenna gain	±1dB
Radiation efficiency	±10%

3.3 Test data

3.3.1 S11 parameters



3.3.2 VSWR data

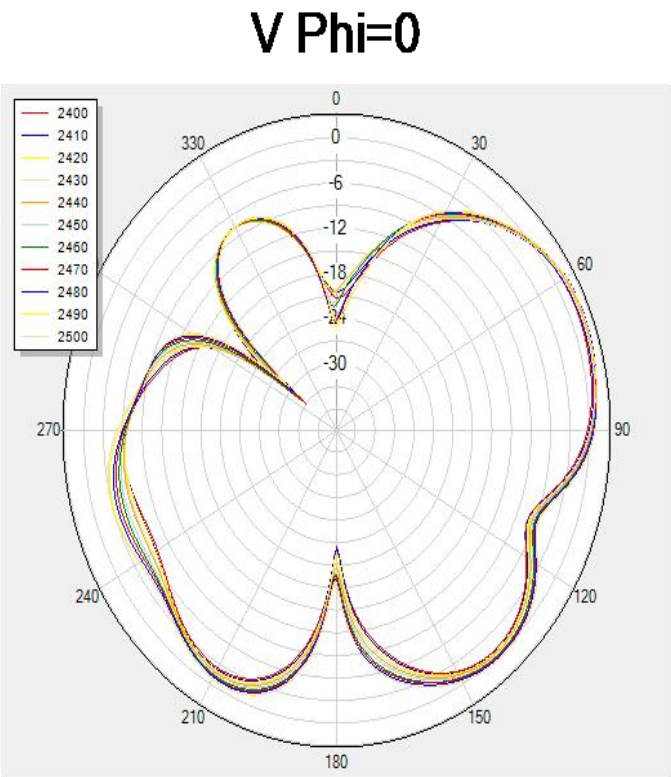
Frequency/MHz	2400	2450	2500
VSWR	2.4760	2.0026	1.8405

3.3.3 Typical free space efficiency and gain

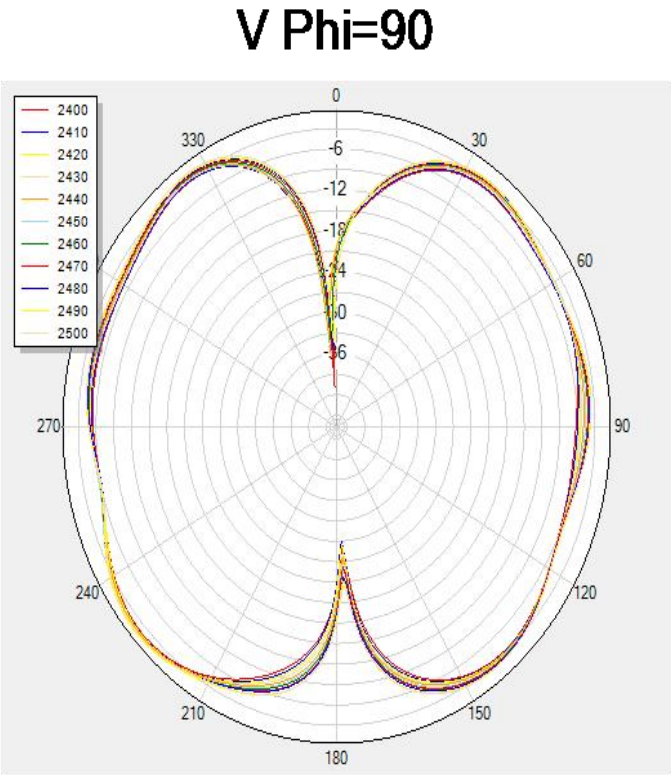
Frequency/MHz	2400	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500
Peak Gain/dBi	1.94	2.20	2.41	2.63	2.75	3.03	3.10	3.28	3.30	3.57	3.48
Efficiency/%	51.71	53.45	55.26	57.03	58.38	62.01	62.94	64.27	65.66	68.11	68.18

3.3.4 Typical free space radiation pattern

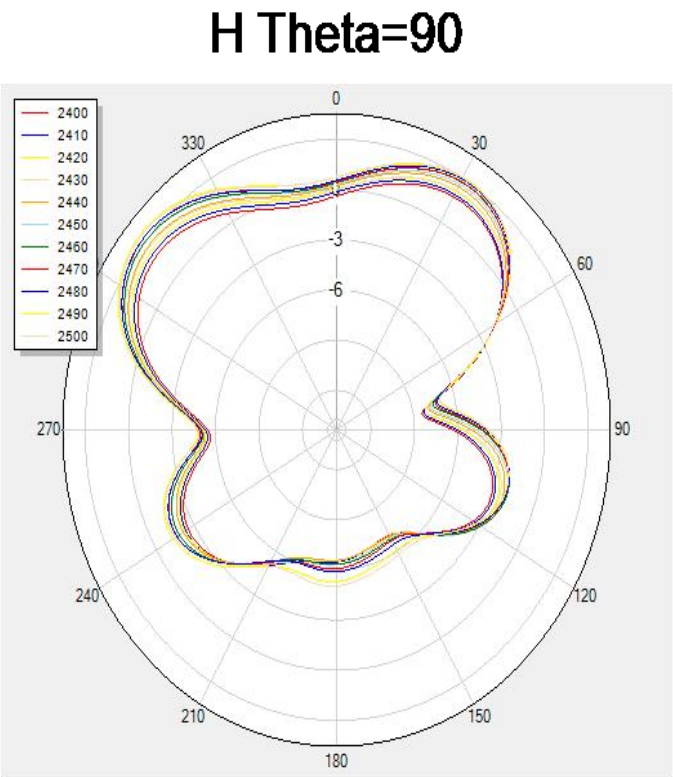
(1) X-Z Plane:



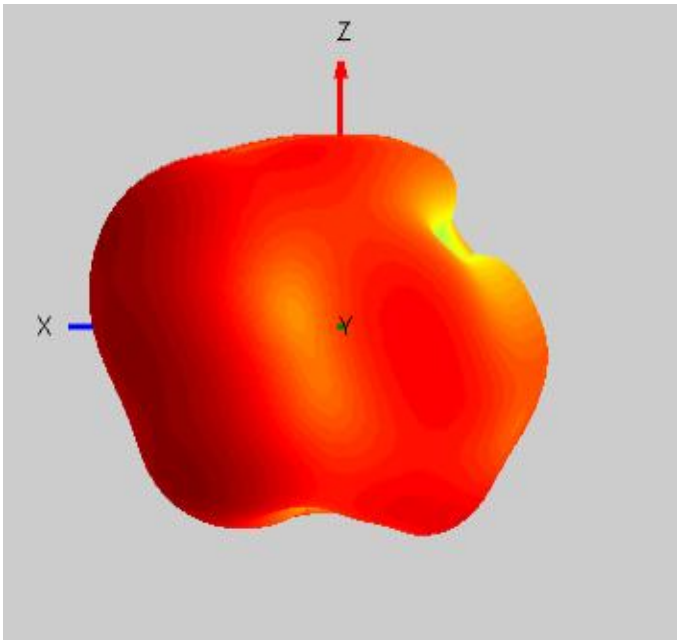
(2) Y-Z Plane:



(3) X-Y Plane:



(4) Typical Free Space 3D Radiation Pattern at 2.45GHz:



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