

# Test report of Bells antenna field diagram

Prepared by : 李鎮江 Derek Lee

Date: 20220913

音质好声音

list:

Part 1. Dongle Antenna-----Page 3 ~ 7

Part 2. Headset Antenna-----Page 8~ 13

Part 3. Distance Test-----Page 14

## Part 1. Dongle Antenna :

### 1. PiFa onboard Antenna (Model: 9.03.36040.00125)

Antenna dimension drawing

a. Antenna type: PiFa onboard antenna

b. Antenna specification: Onboard snake antenna

c. Antenna dimension diagram: please check with the picture on the right

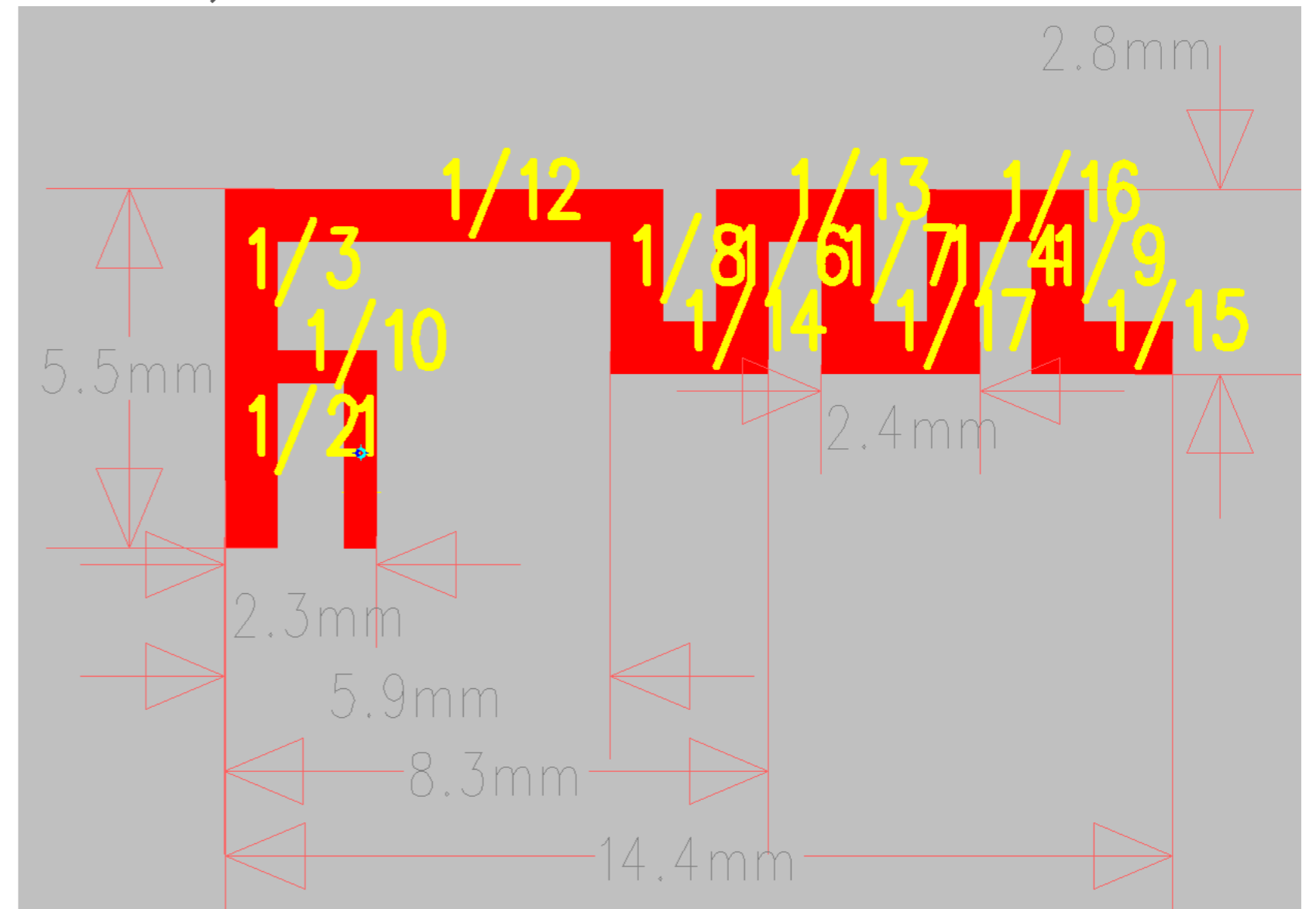
d. Antenna manufacturer company: 广东得胜电子有限公司

GUANGDONG TAKSTAR ELECTRONIC CO., LTD.

地址: 广东省惠州市博罗县龙溪镇富康一路2号

NO.2 Fu Kang Yi Rd., Longxi Boluo Huizhou,

Guangdong 516121 China



音质好声音

## Part 1. Dongle Antenna:

### 1. PiFa onboard Antenna

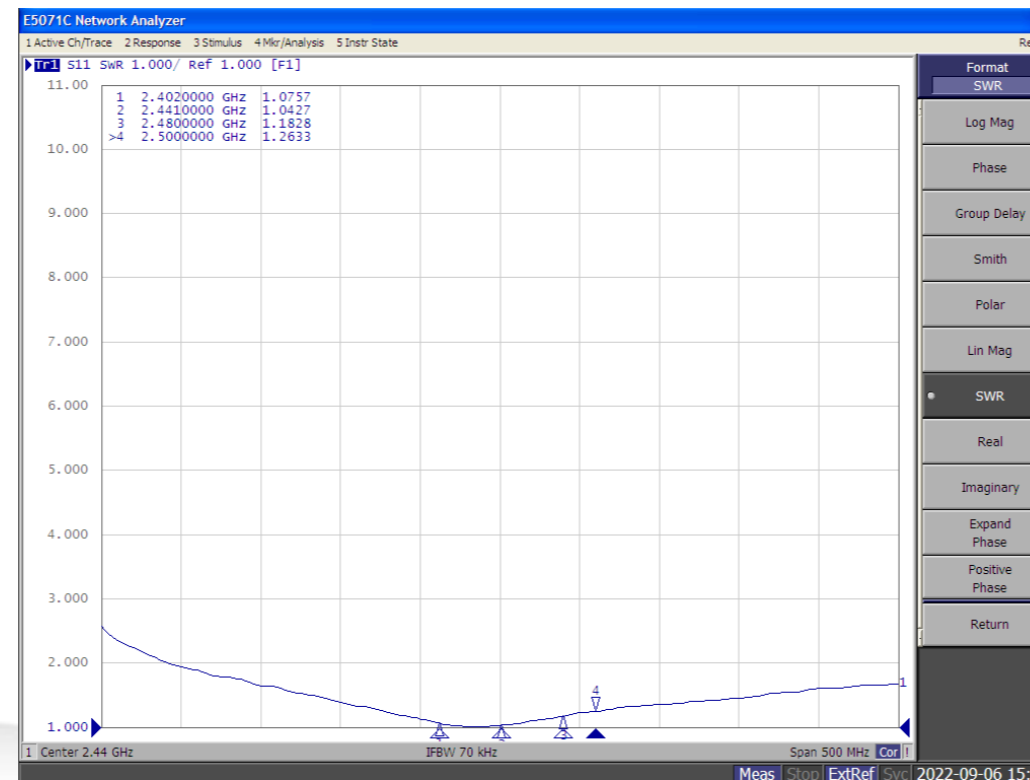
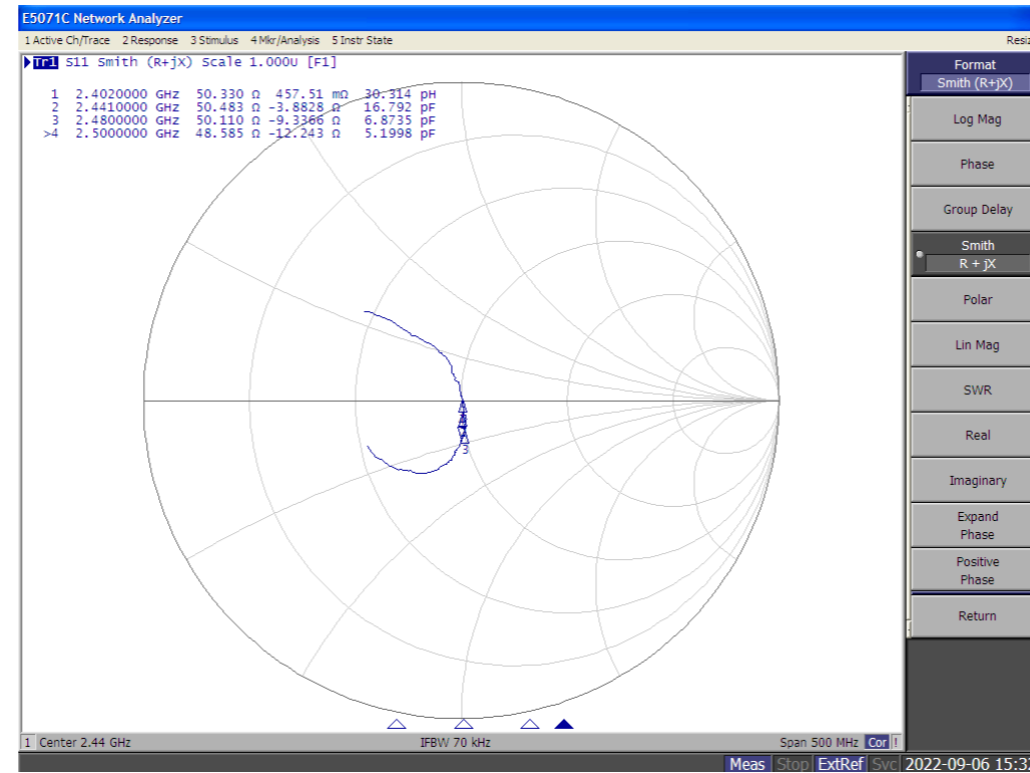
#### --Schematic & PCB

a.  $\pi$ -type network  $L1=0.75\text{pF}$ ,  
 $L2=0\text{R}$ , the capacitance to  
the ground is NC, which is  
not attached

b. On the basis of the  
original PiFa shape  
thickened, the shape of the  
figure on the right

## Part 1. Dongle Antenna: 2. S11 feature parameters

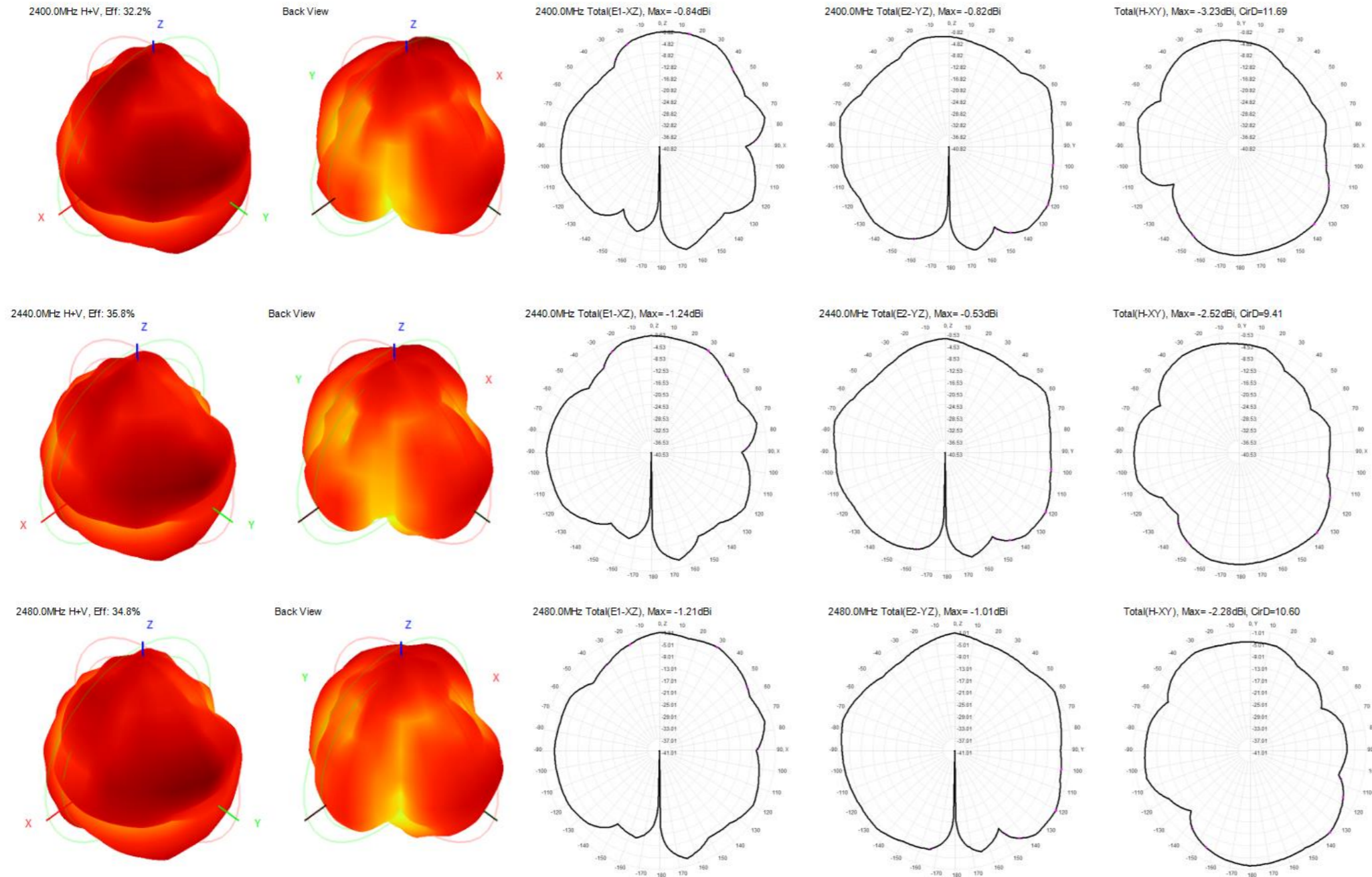
- a. Log Mag  $-23 \sim 32$  dB
- b. SWR  $1.0 \sim 1.1$
- d. Smith (R+jx)  $50 \Omega$



音质好声音

## Part 1. Dongle Antenna:

### 3. Metal PiFa Antenna, Free space Passive AppleField graph, Antenna efficiency and

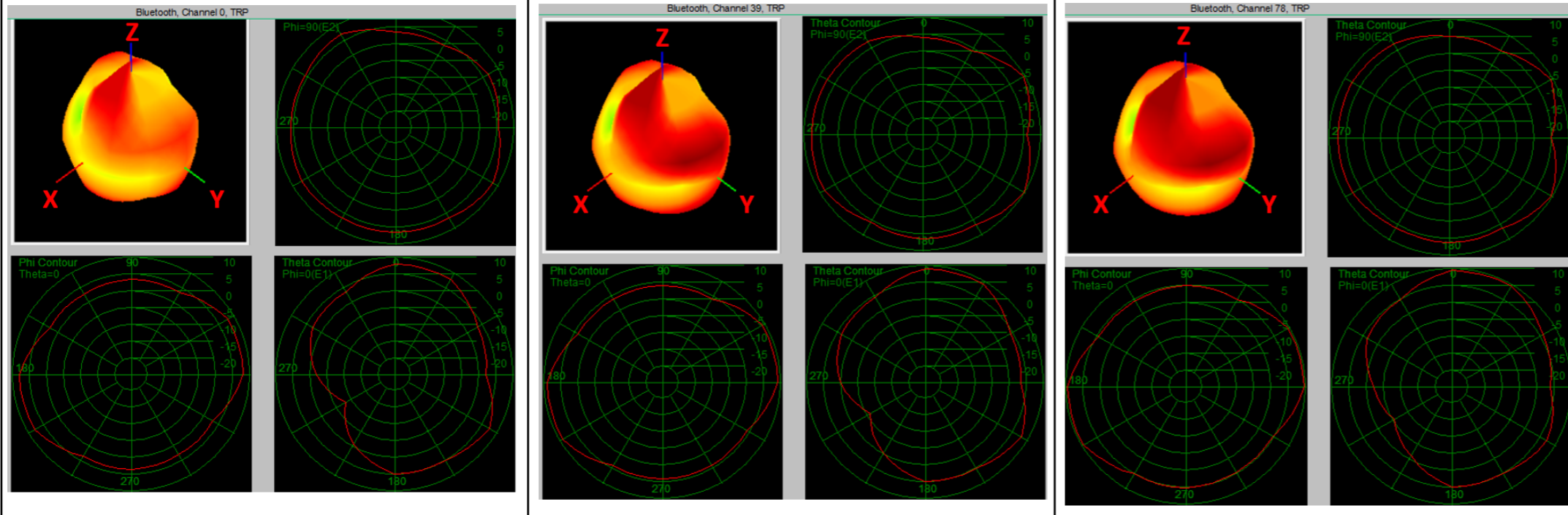


PCB Antenna passive Free state		
Frequency point(MHz)	Gain (dBi)	Efficiency (%)
Frequency (MHz)	Gain (dBi)	Efficiency (%)
2400	<b>0.14</b>	<b>32.23</b>
2410	<b>0.58</b>	<b>33.77</b>
2420	<b>0.86</b>	<b>34.53</b>
2430	<b>1.11</b>	<b>35.61</b>
2440	<b>1.22</b>	<b>35.78</b>
2450	<b>1.33</b>	<b>36.57</b>
2460	<b>1.30</b>	<b>36.30</b>
2470	<b>1.09</b>	<b>35.27</b>
2480	<b>0.93</b>	<b>34.77</b>
2490	<b>0.78</b>	<b>33.51</b>
2500	<b>0.76</b>	<b>32.64</b>

## 一、The Part of Dongle:

### 4. Metal PiFfa Antenna, Active Apple Field graph, Antenna efficiency and gain

OTA  
free  
field



PCB Antenna OTA free field	
Channel	TRP/TIS(dBm)
BlueTh-0000-TX	<b>4.38</b>
BlueTh-0039-TX	<b>5.24</b>
BlueTh-0078-TX	<b>5.28</b>
BlueTh-0000-RX	<b>-79.26</b>
BlueTh-0039-RX	<b>-78.91</b>
BlueTh-0078-RX	<b>-81.60</b>

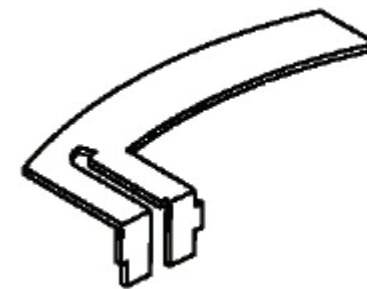
音质好声音

## Part 2. Headset Antenna:

### 1. PiFa onboard Antenna--Schematic & PCB

a.  $\pi$ -type network, L1 and L3 use 0R, L2=4.7nH, the capacitance to the ground is NC, which is not attached

b. The antenna uses external metal antenna, SUS304 nickel plated, thickness 0.4mm, the physical appearance, please check with the picture on the right



Antenna outline drawing



## Part 2. Headset Antenna:

### 1. Metal PiFa antenna (Model:178-BELLS-10A)

a. Antenna type: Metal PiFa antenna

b. Antenna specification: SUS304 1/2H Nickel preplating T=0.4mm / 23\*10.81\*3.9mm

c. Antenna dimension diagram: please check with the picture on the right

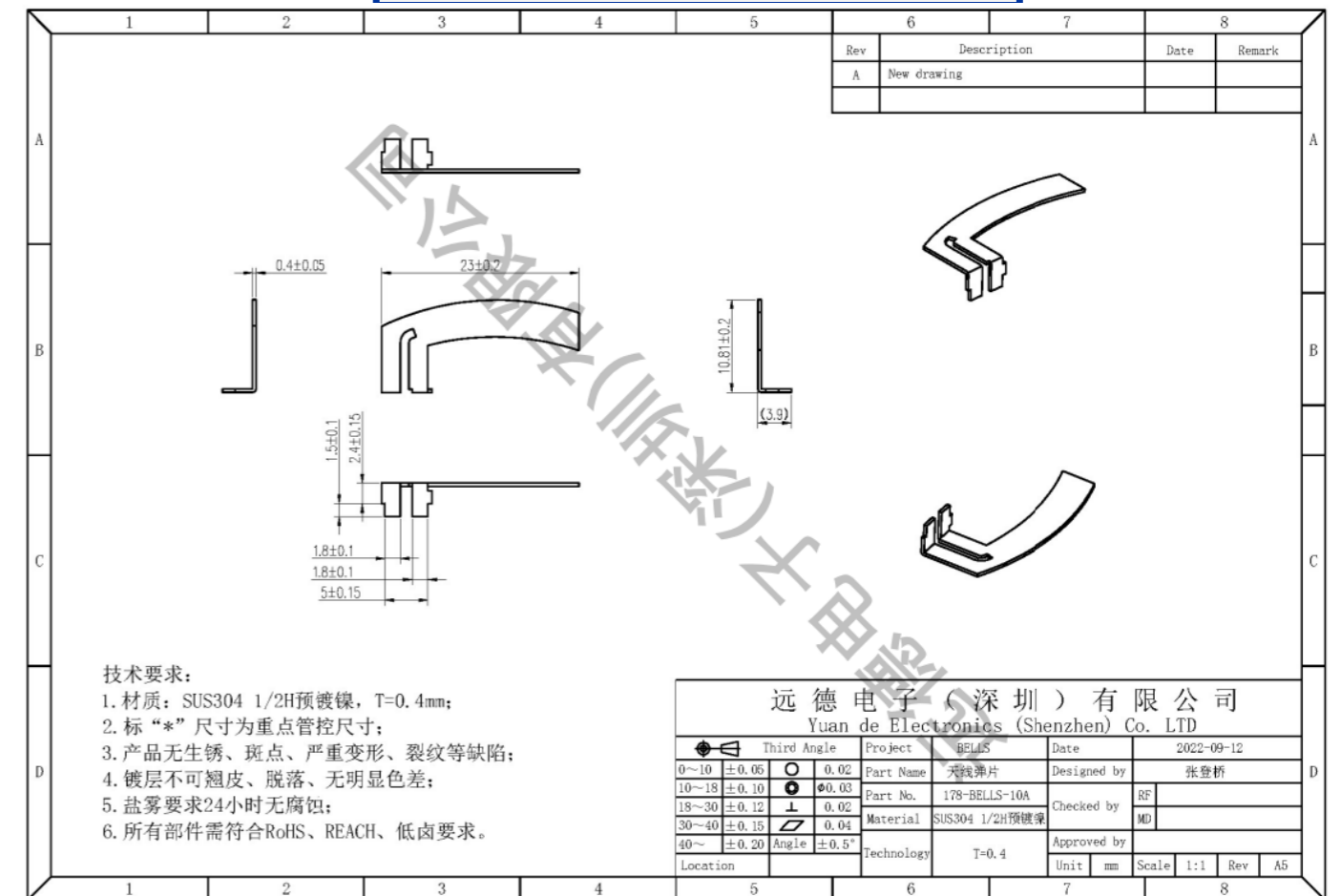
d. Antenna manufacturer company: 远德电子（深圳）有限公司

Yuan de Electronics(shenzhen) CO., LTD.

地址： 深圳市龙岗区龙岗街道龙岗社区龙盛路8号香玉儿化妆品龙岗厂区4号厂房101-1

101-1, Plant 4, Xiangyuer Cosmetics Longgang Factory, No. 8, Longsheng Road, Longgang Community, Longgang Street, Longgang District, Shenzhen

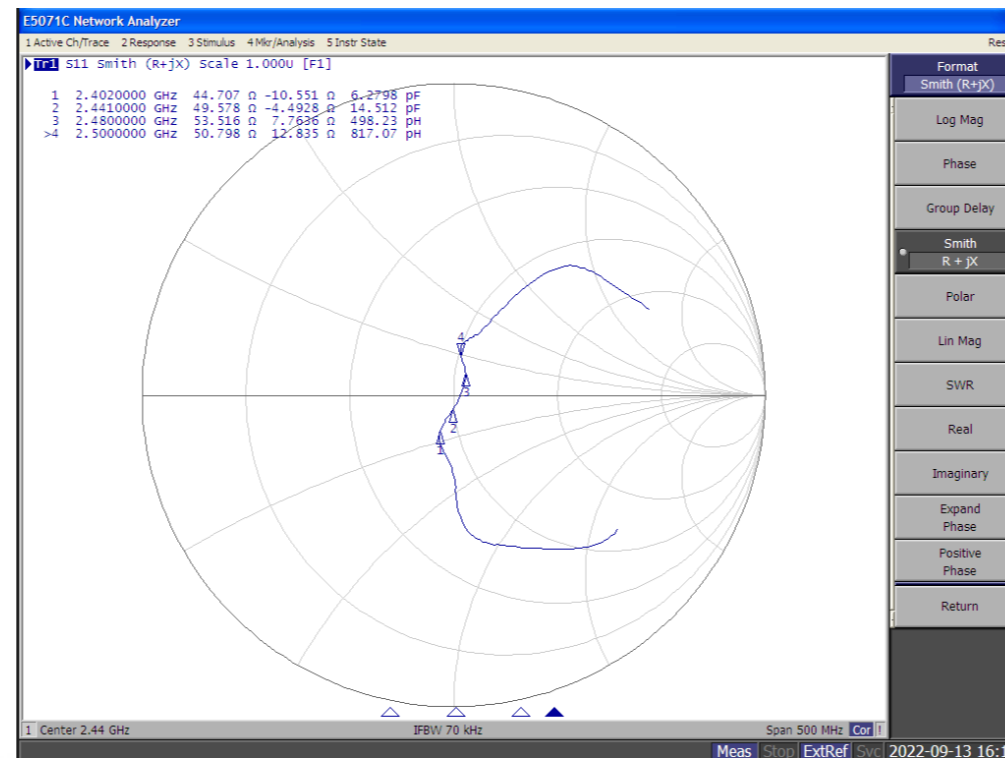
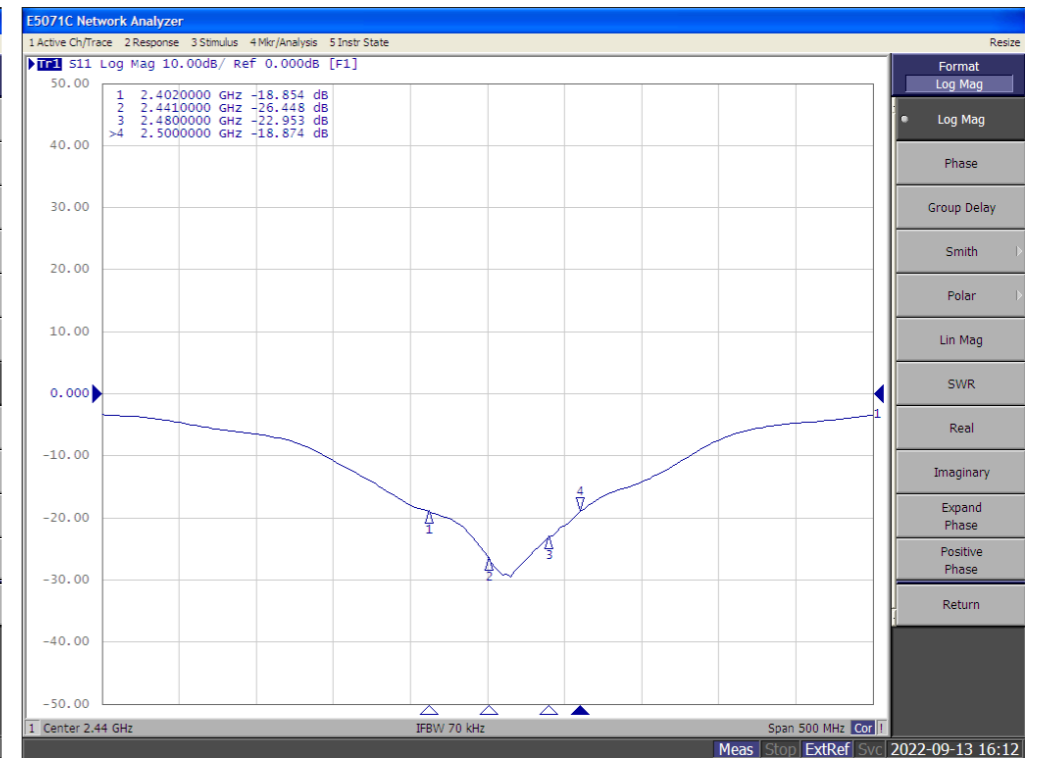
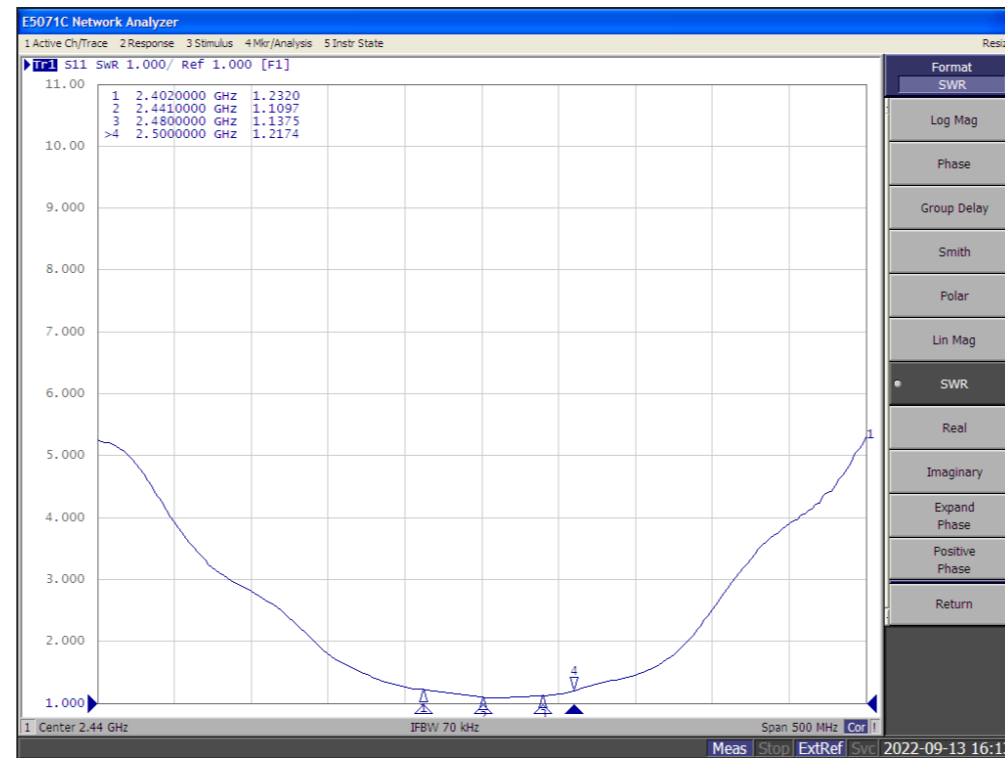
Antenna dimension drawing



音质好声音

## Part 2. Headset Antenna: 2. S11feature parameters

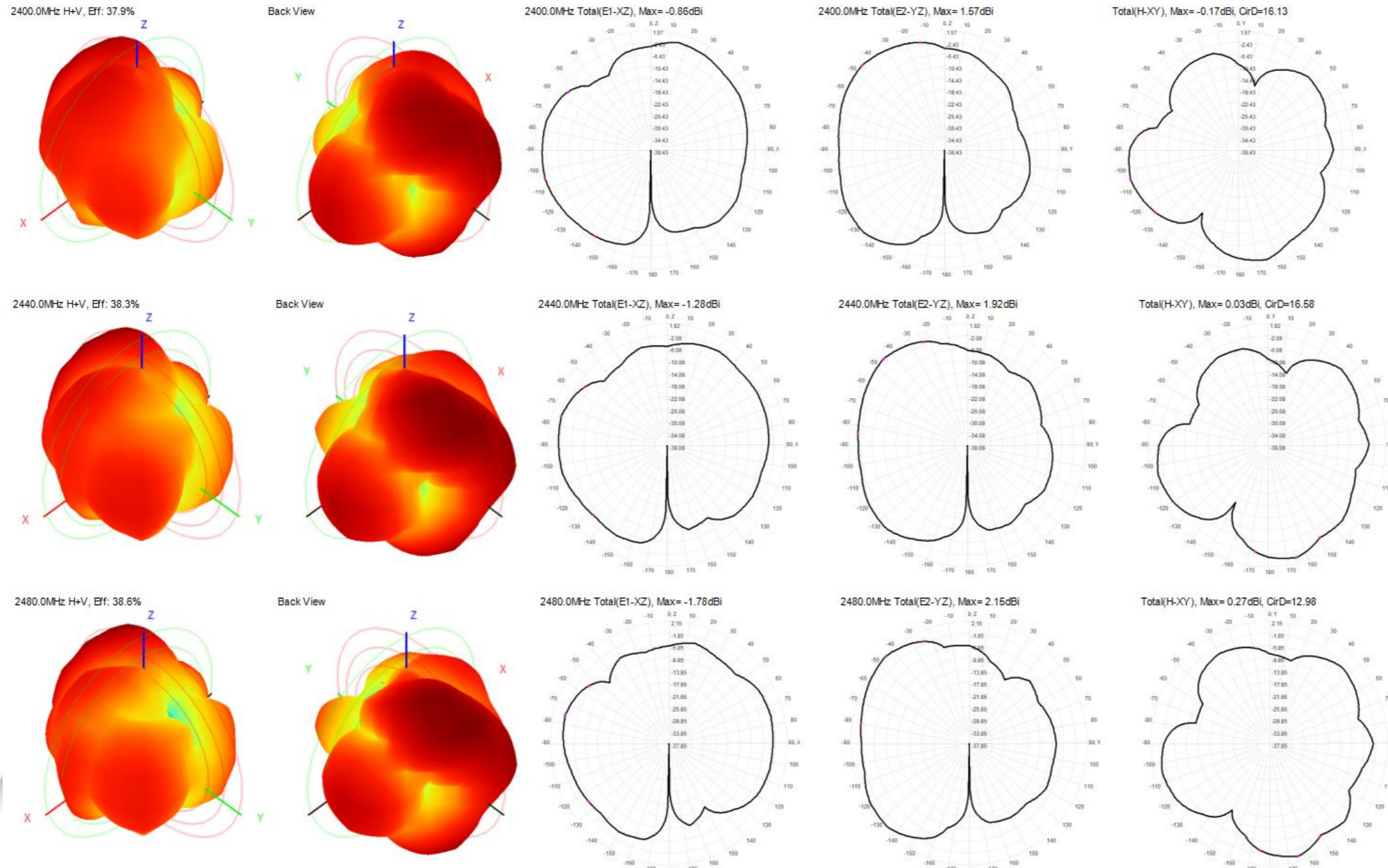
- a. SWR 1.1~1.2
- b. Log Mag -18.8~-26.4dB
- c. Smith (R+jx) 44.7~53.5  $\Omega$



音质好声音

## Part 2. Headset Antenna:

### 3. Metal PiFa Antenna, Free space Passive AppleField graph, Antenna efficiency and

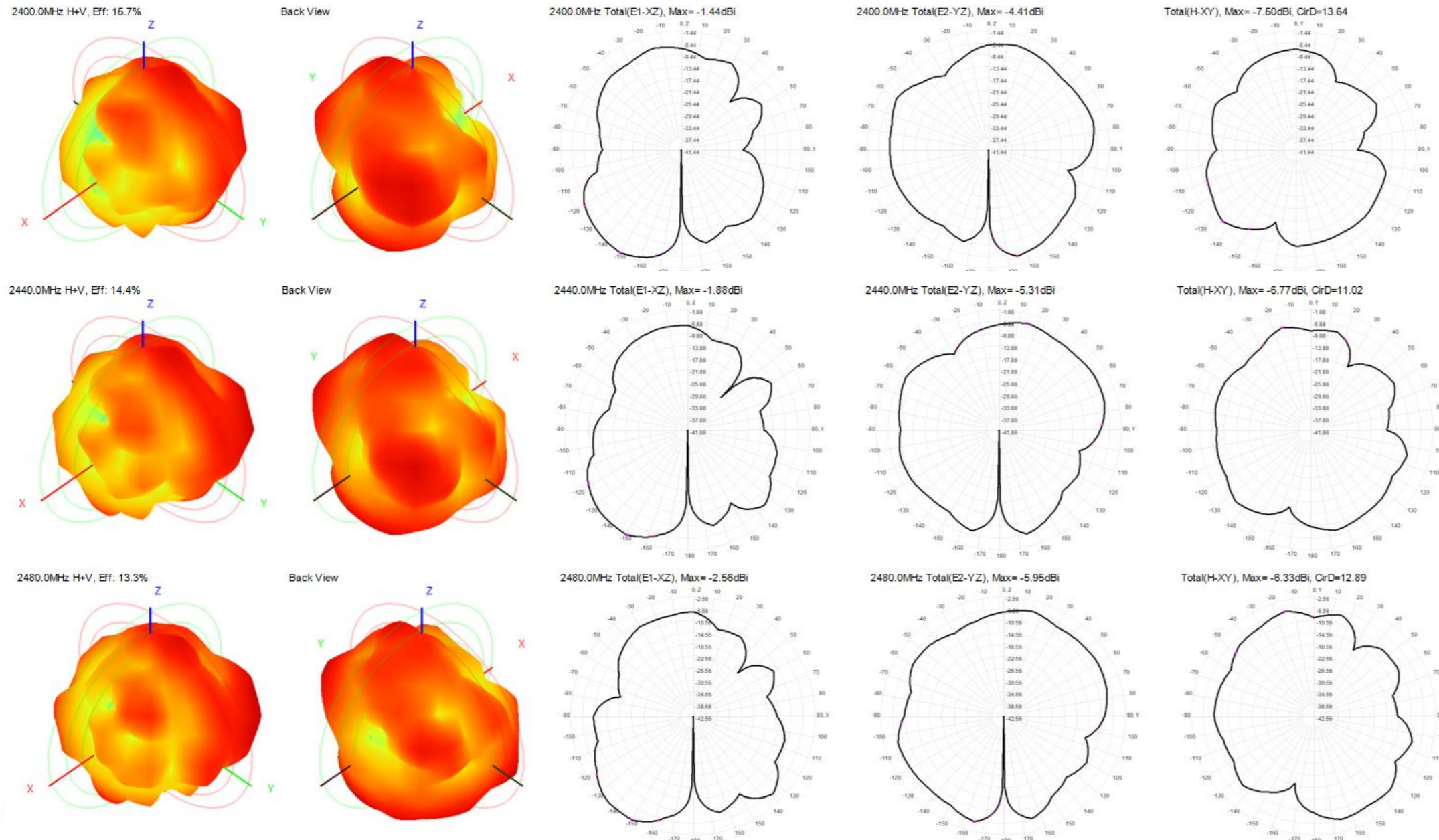


PCB Antenna passive Free state		
Frequency(MHz)	Gain(dBi)	Effi (%)
2400	2.24	37.91
2410	2.17	38.42
2420	2.01	37.96
2430	2.07	38.42
2440	2.16	38.31
2450	2.41	39.04
2460	2.49	38.74
2470	2.48	38.20
2480	2.56	38.63
2490	2.65	38.97
2500	2.75	40.19

音质好声音

## Part 2. Headset Antenna:

### 4. Metal PiFa Antenna, Headform Passive AppleField graph, Antenna efficiency and

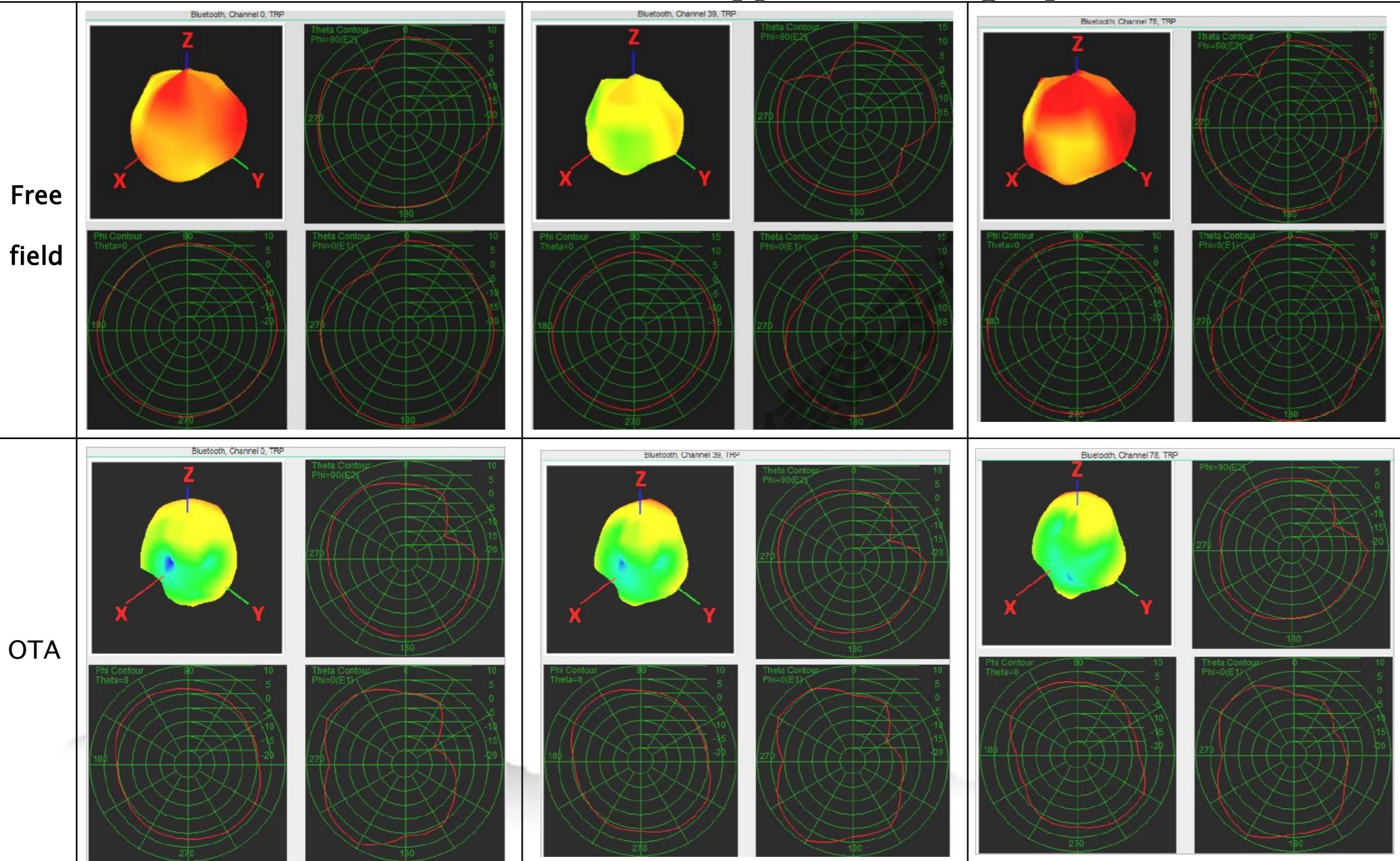


PCB Antenna passive Free state		
Frequency(MHz)	Gain(dBi)	Effi (%)
2400	<b>-0.26</b>	<b>15.74</b>
2410	<b>-0.41</b>	<b>15.68</b>
2420	<b>-0.70</b>	<b>15.11</b>
2430	<b>-0.88</b>	<b>14.82</b>
2440	<b>-1.11</b>	<b>14.37</b>
2450	<b>-1.28</b>	<b>14.26</b>
2460	<b>-1.40</b>	<b>13.94</b>
2470	<b>-1.63</b>	<b>13.45</b>
2480	<b>-1.77</b>	<b>13.29</b>
2490	<b>-2.06</b>	<b>13.12</b>
2500	<b>-2.19</b>	<b>13.24</b>

音质好声音

## Part 2. Headset Antenna:

### 4. Metal PiFa Antenna, Active Apple Field graph, Antenna efficiency and gain



PCB Antenna OTA 头模		
state	Free field	Headform
Channel	TRP/TIS(dBm)	TRP/TIS(dBm)
BlueTh-0000-TX	5.15	2.8
BlueTh-0039-TX	5.93	2.65
BlueTh-0078-TX	5.44	2.0
BlueTh-0000-RX	-92.41	-90.91
BlueTh-0039-RX	-90.14	-88.66
BlueTh-0078-RX	-90.43	-87.49

音质好声音

## Part 3. Distance Test:

Product Model : Bells	Project Stage :	Test Result	Pass
Software Version : V4010	Hardware Version :		Fail
Test Quantity : 1PCS	APP: KuGou		NA
Tester : Siyuan Tan	Test Date : 2022/9/13		Pass Rate
Test Place : GUANGDONG TAKSTAR ELECTRONIC CO., LTD	Weather : Sunny 、 breeze		

### Bluetooth Long-distance test

Direction	Environment (Temp./RH)	Redmi K30 Ultra				Test condition & method
0 deg	33°C/45%	80m				<p>1. Test condition : In the case of TAKSTAR's front gate field simulation normal use, to confirm the furthest transmission distance that Bluetooth can reach.</p> <p>2. Test method : After the phone is connected to the Bluetooth headset, it is placed 80cm above the ground. There should be no metal in the measuring stand of the phone. The phone is placed vertically on the measuring stand with the screen facing the tester.</p>
90 deg	33°C/45%	80m				
180 deg	33°C/45%	80m				
270 deg	33°C/45%	80m				

### 2.4G Long-distance test

Direction	Environment (Temp./RH)	Computer 90°	Computer 180°	Computer 270°	Computer 0°
People (90°)	33°C/45%	30m	30m	30m	30m
People (180°)	33°C/45%	35m	35m	35m	35m
People (270°)	33°C/45%	40m	40m	40m	40m
People (0°)	33°C/45%	35m	35m	35m	35m

1. Test condition : In the case of TAKSTAR's front gate field simulation normal use, to confirm the furthest transmission distance that Bluetooth can reach.

2. Test method : After the phone is connected to the Bluetooth headset, it is placed 80cm above the ground. There should be no metal in the measuring stand of the phone. The phone is placed vertically on the measuring stand with the screen facing the tester.

直线有效距离测试示意图

直线距离 0m, 5m, 10m, 15m

距离地面高度70cm

慢慢远离测试手机

360° 转动身体

Frontal direction

0 deg

Human Head

270 deg

180 deg

DUT\_L

-90 deg

DUT\_R

1. Test condition : In the case of TAKSTAR's front gate field simulation normal use, to confirm the furthest transmission distance that 2.4G can reach.

2. Test method : After the computer is connected to the headset, it is placed 80 centimeters above the ground. The computer is placed horizontally on the bench. The Dongle is plugged into the r

LOS (Line-of-Sight) RF range (m)

Frontal direction

0 deg

Human Head

270 deg

180 deg

DUT\_L

-90 deg

DUT\_R

音质好声音

謝謝您的審閱

Thanks for your listening

音源好声音