

深圳市恒利永通电子有限公司

Shenzhen Hengli Yongtong Electronics Co.,LTD

产品承认书

客 户 深圳市悦尔实业有限公司
CUSTOMER: _____.

品 名 规 格 TS223N-L FPC 天线
DESCRIPTION: _____.

型 号 WA-F-LA-00-113
MODEL NO: _____.

客 户 料 号
CUS PART NO: _____.

日 期 2024.6.20
D A T E: _____.

呈样签章

工 程 ENGINEERING DEPARTMENT	品 保 Q C DEPARTMENT	业 务 SALES DEPARTMENT

客户承认签章

工 程 ENGINEERING DEPARTMENT	品 保 Q C DEPARTMENT	业 务 SALES DEPARTMENT

※ 客户确认样品附意栏:

WA-F-LA-00-113 Specification

1. Explanation of part number :

WA – F – LA – 00 – 113
(1) (2) (3) (4) (5)

(1) Product Type : Wireless Antenna

(2) Material: FPC

(3) Frequency : 2400MHz-2500MHz

(4) Coaxial Cable Type : 00

(5) Suffix : 113

2. Electrical Specification :

Those specifications were specially defined for 悦尔实业 TS223N-L model, and all characteristics were measured under the model's handset testing jig .

2-1. Frequency Band:

Frequency Band	MHz
BT	2400-2500

2-2. Impedance

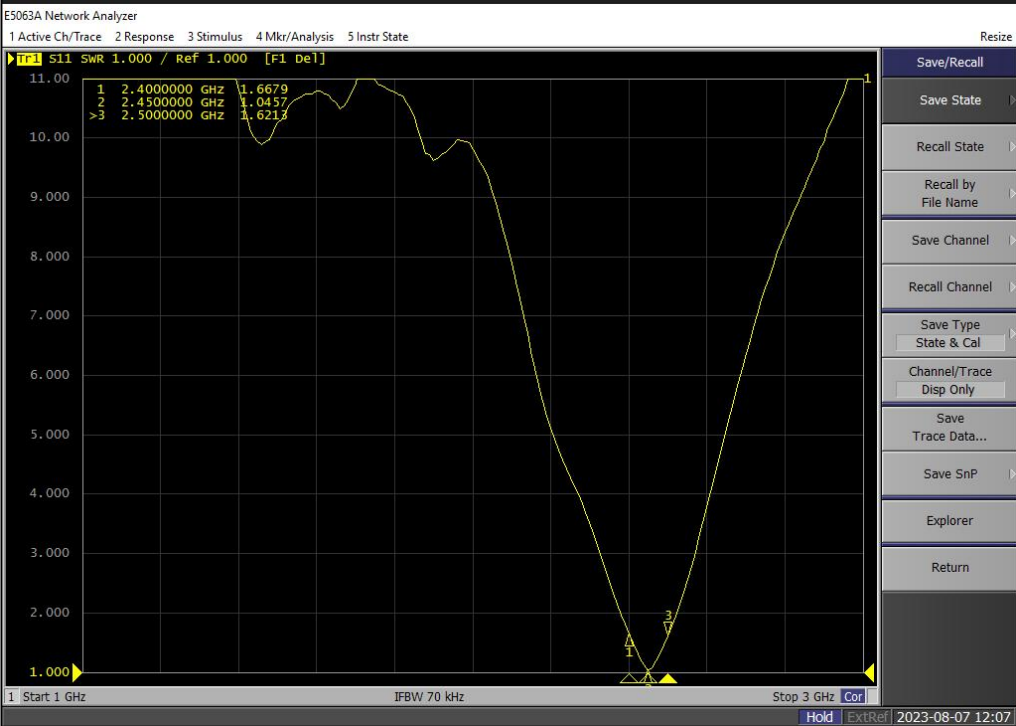
50 ohm nominal

2-3. VSWR

2-3-1.Measurement frequency points and VSWR value

Frequency (Unit MHz)	2400	2450	2500
VSWR	1.66	1.04	1.62

2-3-2. VSWR

Frequency Band(MHz)	2400	2450	2500
2-3-3. Typical Value:	≤2.0	≤2.0	≤2.0
2-3-4 Measuring Method	1. A 50 Ω coaxial cable is connected to the FPC. Then this cable is connected to a network analyzer to measure the VSWR. 2. Keeping this jig away from metal at least 20 cm		
2-3-5 Picture			

2-4. Efficiency and Gain

- **量测仪器:** 微波暗室, 网络分析仪, 标准天线.
- **微波暗室说明:**
这是本公司设置在深圳的微波暗室, 本微波暗室是属于一套远场量测系统,暗室的大小为 7.0 米 x4.0 米 x3.0 米 , 静区尺寸(Quiet zone)大小为 15 厘米 x15 厘米 x15 厘米。

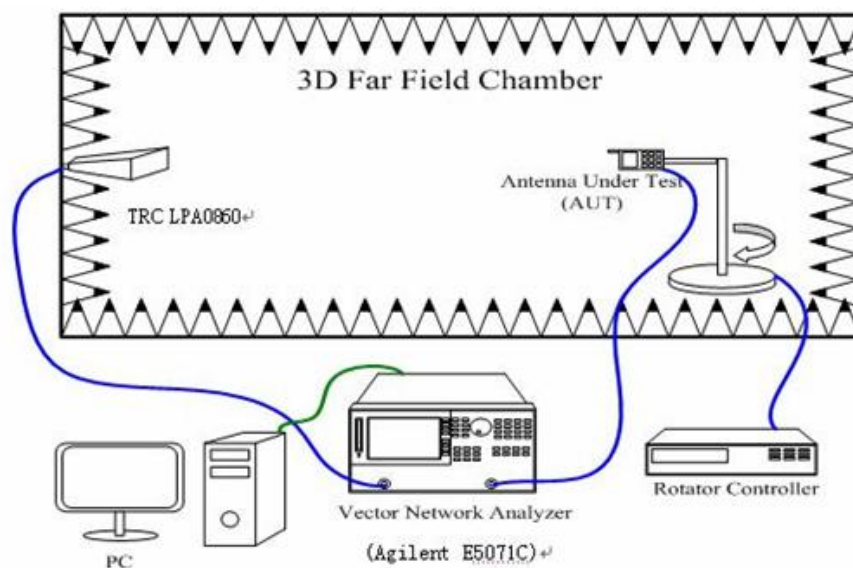


图. 1. 微波暗室内仪器设置

图. 1 为微波暗室内的仪器设置及网络分析仪的联接图，发射天线(本暗室所使用发射天线的型号为 TRC LPA0860 800MHZ-6GHZ)到待测天线(AUT)的距离为 1.35 米，待测天线放置在旋转平台上,藉由控制转台旋转的角度可对待测天线做概略性及较为准确的量测。

将待测天线放置于旋转台上,并测得其各个平面(ZY 平面及 ZX 平面)的 360 度场强数据。再将待测天线换置成标准偶极天线(本暗室所使用的标准偶极天线型号为 TRC AD series dipole antenna 800MHz~2500MHz)将其 360 度的场强数据测出，以作换算增益标准值，经由式 1 的换算即可获得待测天线的增益值及方向图。

$$G_{AUT} = G_{stand} + P_{AUT} - P_{stand}$$

G_{AUT} : Gain of AUT

G_{stand} : Gain of Standard Gain Antenna

P_{AUT} : Measured Power of AUT

P_{stand} : Measured Power of Standard Gain Antenna

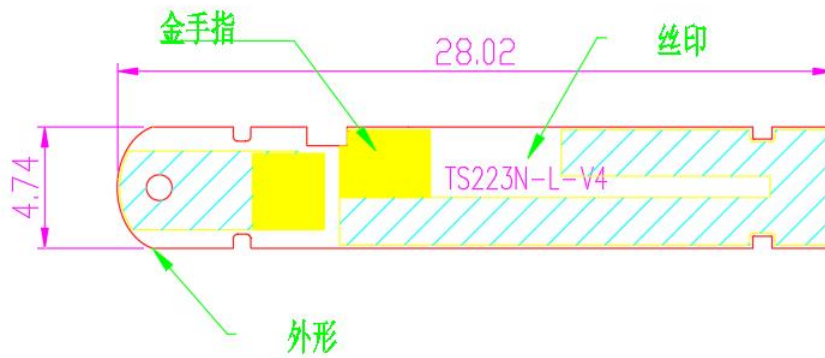
2-4-1 Efficiency and Gain

Frequency(MHz)	Efficiency (%)	Average GAIN(dB)	Peak GAIN (dBi)
2400	36.33	-4.39	2.02
2450	40.71	-3.9	2.05
2500	37.65	-4.24	1.97

3.Mechanical Specification:

3-1. Mechanical Configuration (Unit: mm)

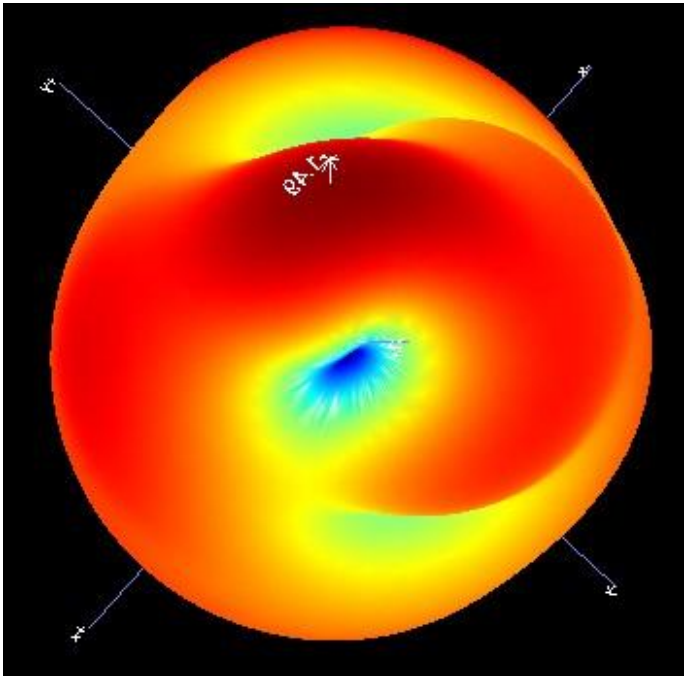
The appearance of the antenna is according to drawing Figure 3-1-1



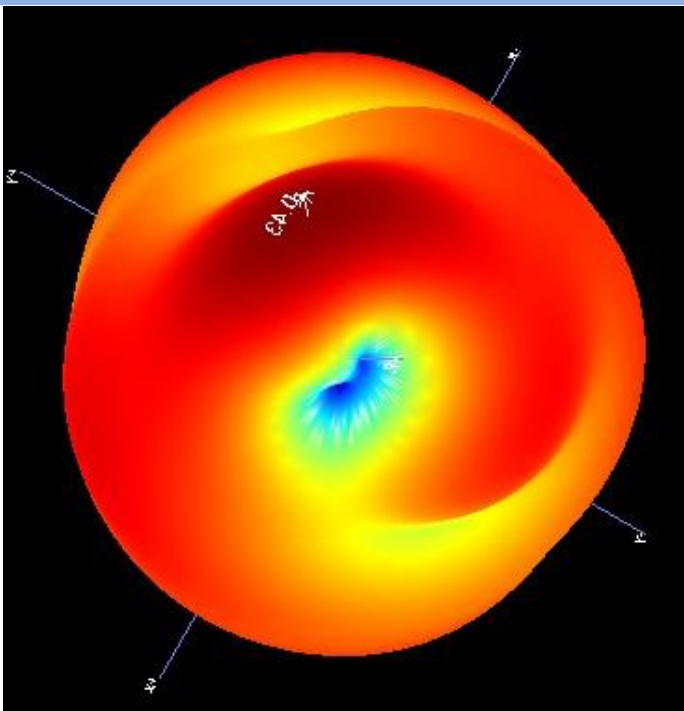
ANNEX B RADIATION PATTERN

B.1 3D Pattern

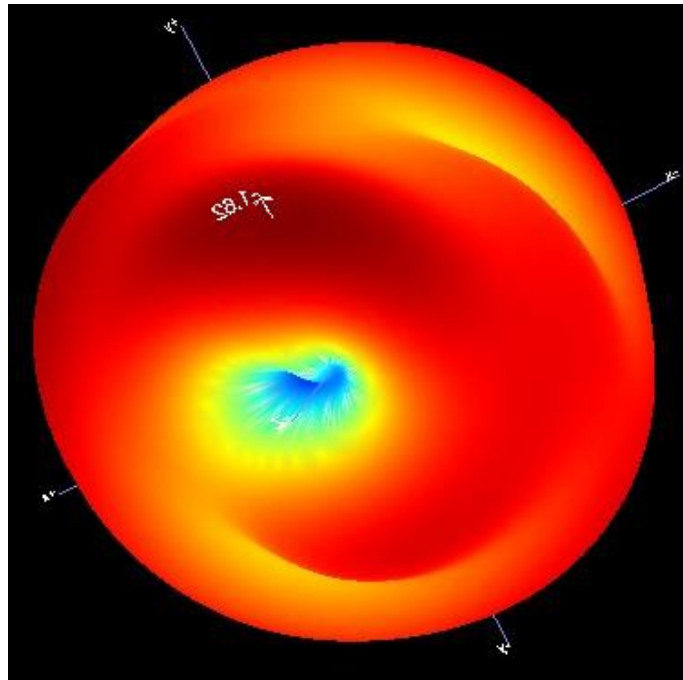
B1.1 3D Pattern for 2402MHz



B1.2 3D Pattern for 2441MHz

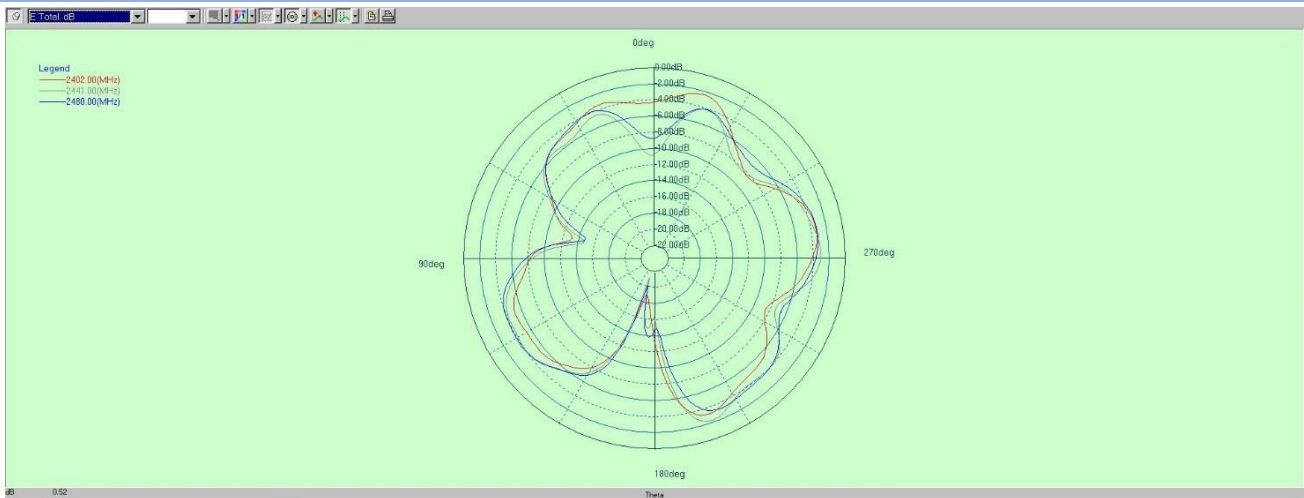


B1.3 3D Pattern for 2480MHz

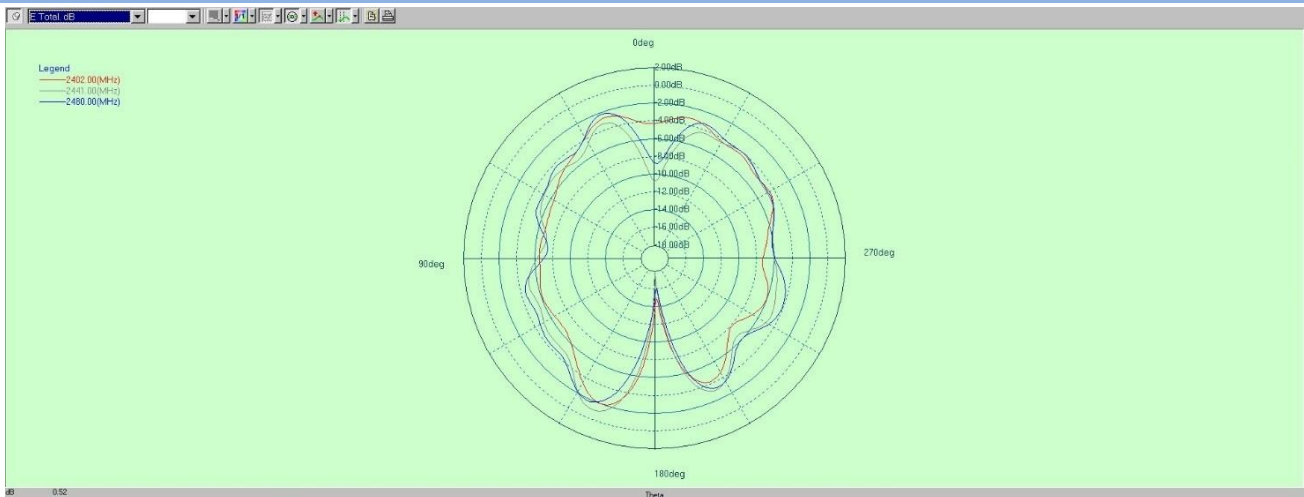


B.2 1D Radiation Pattern

B2.1 PHI=0



B2.2 PHI=90



B2.3 THETA=90

