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深圳市恒利永通电子有限公司

产品承认书

客 户 深圳市悦尔实业有限公司
CUSTOMER: _____.

品 名 规 格 TS335N-R
DESCRIPTION: _____.

型 号 WA-F-LA-00-125
MODEL NO: _____.

客 户 料 号 S.CN.TS335N.R001
CUS PART NO: _____.

日 期 2025.12.28
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-00-125 Specification

1. Explanation of part number :

WA – F – LA – 00 – 125
(1) (2) (3) (4) (5)

(1) Product Type : Wireless Antenna

(2) Material: FPC

(3) Frequency : 2400MHz-2500MHz

(4) Coaxial Cable Type : 00

(5) Suffix : 125

2. Electrical Specification :

Those specifications were specially defined for 悦尔 TS335N-R 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

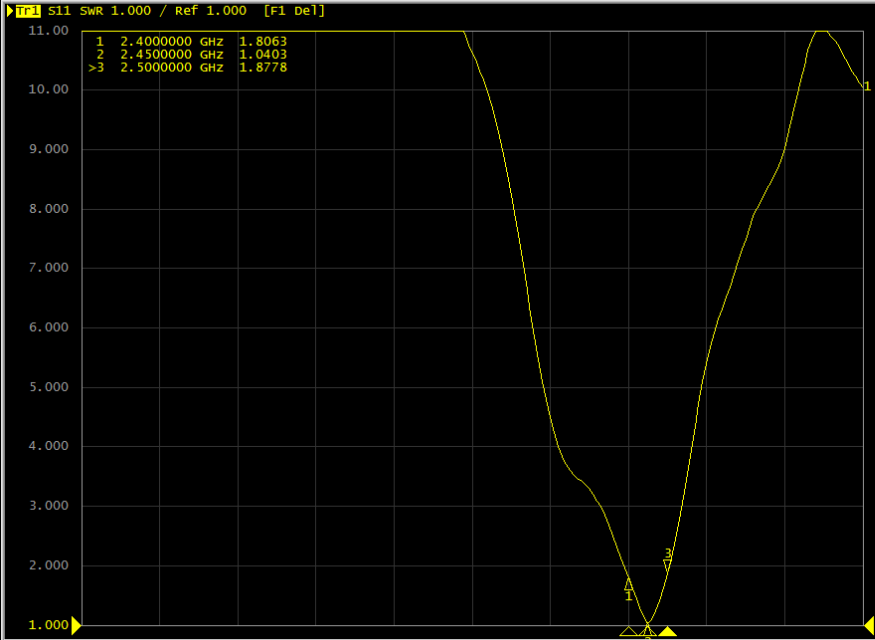
50 ohm nominal

2-3. VSWR

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

Frequency (Unit MHz)	2400	2450	2500
VSWR	1.80	1.04	1.87

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 50Ω 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	E5063A Network Analyzer 1 Active Ch/Trace 2 Response 3 Stimulus 4 Mkr/Analysis 5 Instr State ▶ Tr S11 SWR 1.000 / Ref 1.000 [F1 Del] <table><tr><td>1</td><td>2.4000000 GHz</td><td>1.8063</td></tr><tr><td>2</td><td>2.4500000 GHz</td><td>1.0403</td></tr><tr><td>>3</td><td>2.5000000 GHz</td><td>1.8778</td></tr></table>  1 Start 1 GHz IFBW 70 kHz Stop 3 GHz Cor Hold Ext Ref 2023-11-09 10:11			1	2.4000000 GHz	1.8063	2	2.4500000 GHz	1.0403	>3	2.5000000 GHz	1.8778
1	2.4000000 GHz	1.8063										
2	2.4500000 GHz	1.0403										
>3	2.5000000 GHz	1.8778										

2-4. Efficiency and Gain

- Measuring instruments: microwave darkroom, network analyzer, standard antenna.微波
- Dark room description:
- This is the microwave darkroom set up by our company in Shenzhen, which belongs to a far-field measurement system. The size of the darkroom is 7.0 m x4.0 m x3.0 m, and the size of the Quiet zone is 15 cm x15 cm x15cm

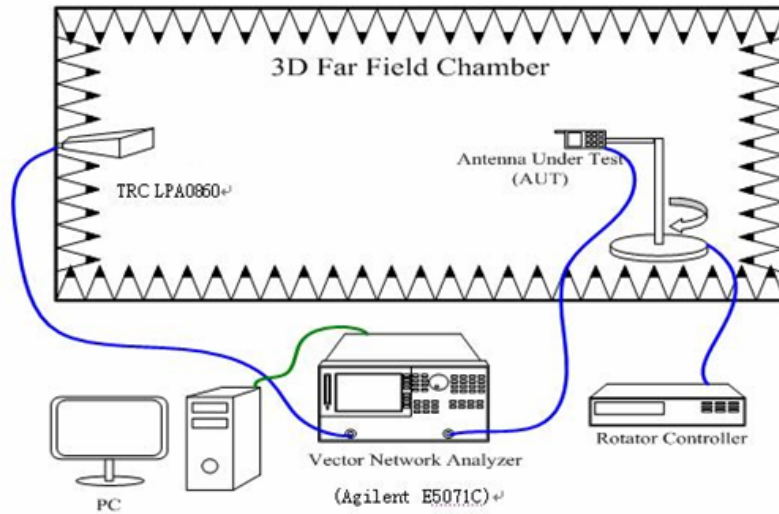


图 1. 微波暗室内仪器设置

FIG. 1 shows the instrument setup in the microwave darkroom and the connection diagram of the network analyzer. The distance between the transmitting antenna (the model of transmitting antenna used in the darkroom is TRC LPA0860 800MHZ-6GHZ) and the antenna to be tested (AUT) is 1.35m. The antenna to be measured is placed on a rotating platform and can be measured roughly and accurately by controlling the rotating Angle of the rotating table.

The antenna to be measured is placed on the rotating table, and the 360-degree field intensity data of each plane (ZY plane and ZX plane) are measured. Another day to be measured

The wire is changed into a standard dipole antenna (the model of the standard dipole antenna used in this darkroom is TRC AD series dipole antenna 800MHz~2500MHz), and the field intensity data of 360 degrees is measured, and the standard gain value is used as the converted gain value. The gain value and direction diagram of the antenna to be measured can be obtained through the conversion of formula 1.

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

G_{AUT} : Gain of AUT

G_{stand} : Gain of Standard Gain Antenna

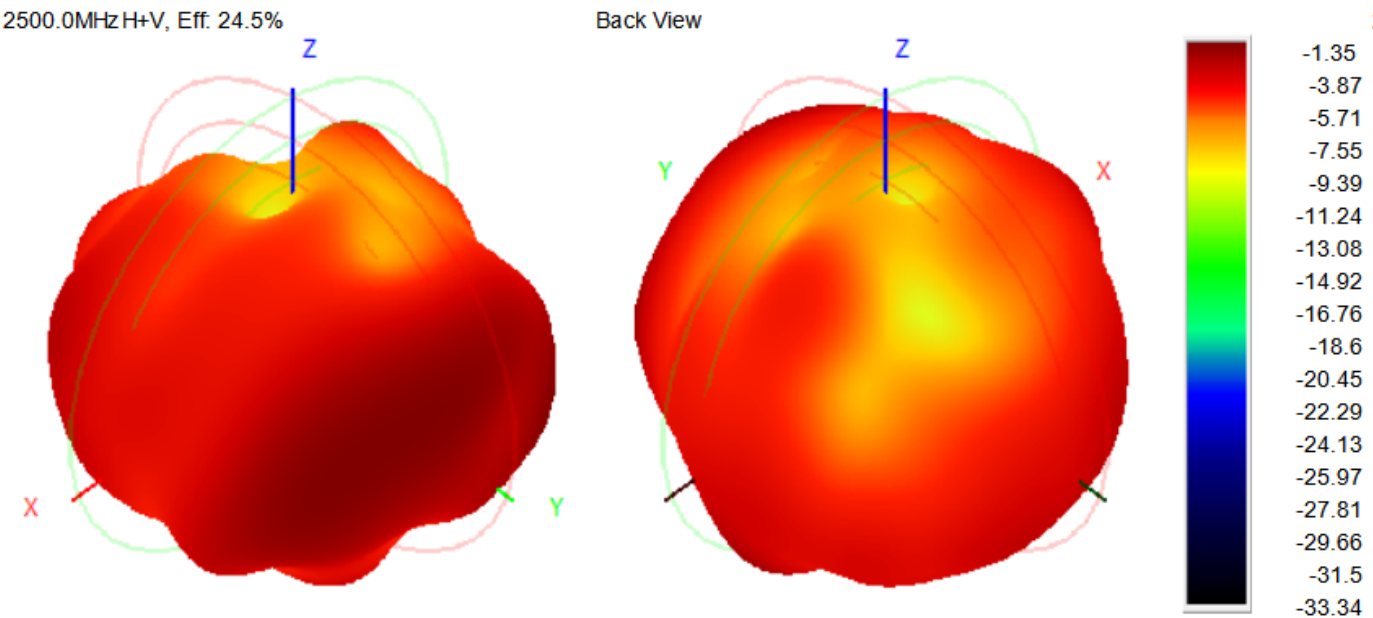
P_{AUT} : Measured Power of AUT

P_{stand} : Measured Power of Standard Gain Antenna

2-4-1 Efficiency and Gain

Frequency(MHz)	Efficiency (%)	Average GAIN(dB)	Peak GAIN (dBi)
2400	21.02	-6.77	-1.88
2450	22.13	-6.55	-1.71
2500	21.32	-6.71	-1.35

2-4-2 2D/3D Gain Pattern(dBi)

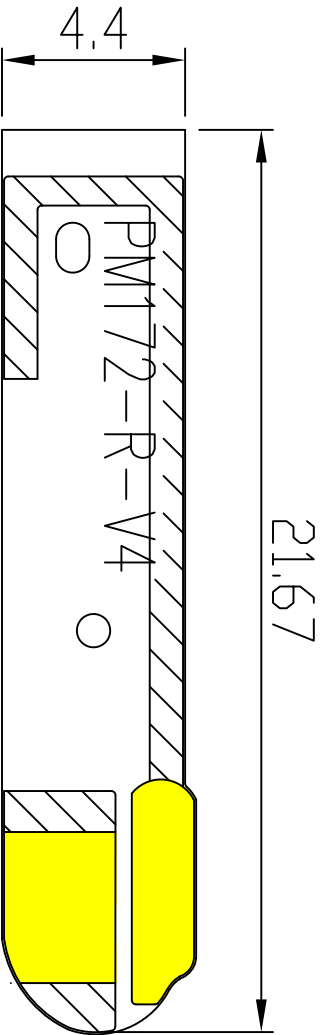


3.Mechanical Specification:

3-1. Mechanical Configuration (Unit: mm)

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

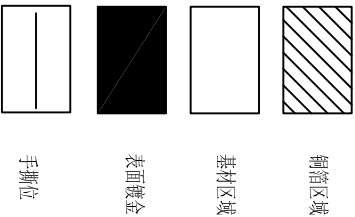
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- NOTE:
1. Red represents the outline, pay attention to the edge dimensions
 2. The blue-filled area is copper plating for electrical wiring.
 3. The yellow-filled area requires gold plating on the surface.
 4. The illustration shows the front view. There is 3M adhesive on the bottom and a tear-off area reserved on the back.
 5. The surface of this FPC is black ink, and white screen printing needs to be added.
 6. The antenna material uses electrolytic copper with a pair and half structure.

NOTE

1. 红色为外形轮廓, 注意边缘尺寸
2. 青色填充部位为电气走线覆铜
3. 黄色填充部分需要表面镀金
4. 图示为正面, 底部带3M胶, 背面预留手撕位
5. 此FPC表面为黑色油墨, 且需添加白色丝印
6. 天线材料采用电解铜一对半



深圳市恒利永通电子有限公司

一般公差:		料号:	名称:	日期:	设计:	Jack
X.	± 0.5	TS335N(PM172)-R-V4	TS335N(PM172)-R-V4	2025/11/27	R F:	Jack
.X	± 0.25	PET/T=0.10mm			确认:	Jack
.XX	± 0.05	表面处理: 清洁				
.XXX	± 0.05	颜色: 黑色	比例: 1:1		版本: V4	
ANGULAR	$\angle \pm 0.5^{\circ}$					