



# 承 认 书

客户名称: 东莞市福茂智能技术有限公司

Customer Name:DONG GUAN HD ING SMART TECHNOLOGY CO.,LTD

客户料号: E1300000141

Customer Part Number:E1300000141

客户项目: Brave 7 LE

Client Pro ect:Brave 7 LE

众城料号: ZC-F0S1-WIFI0402

UNITY WIRELESS Part Number:ZC-F0S1-WIFI0402

产品描述: FPC 天线 频段: 2.4G 线长:37mm 线径:0.81MM 颜色:黑色

Product description: FPC antenna Frequency band:2.46 Wire length: 37mm Wire diameter: 0.81MM Color: black

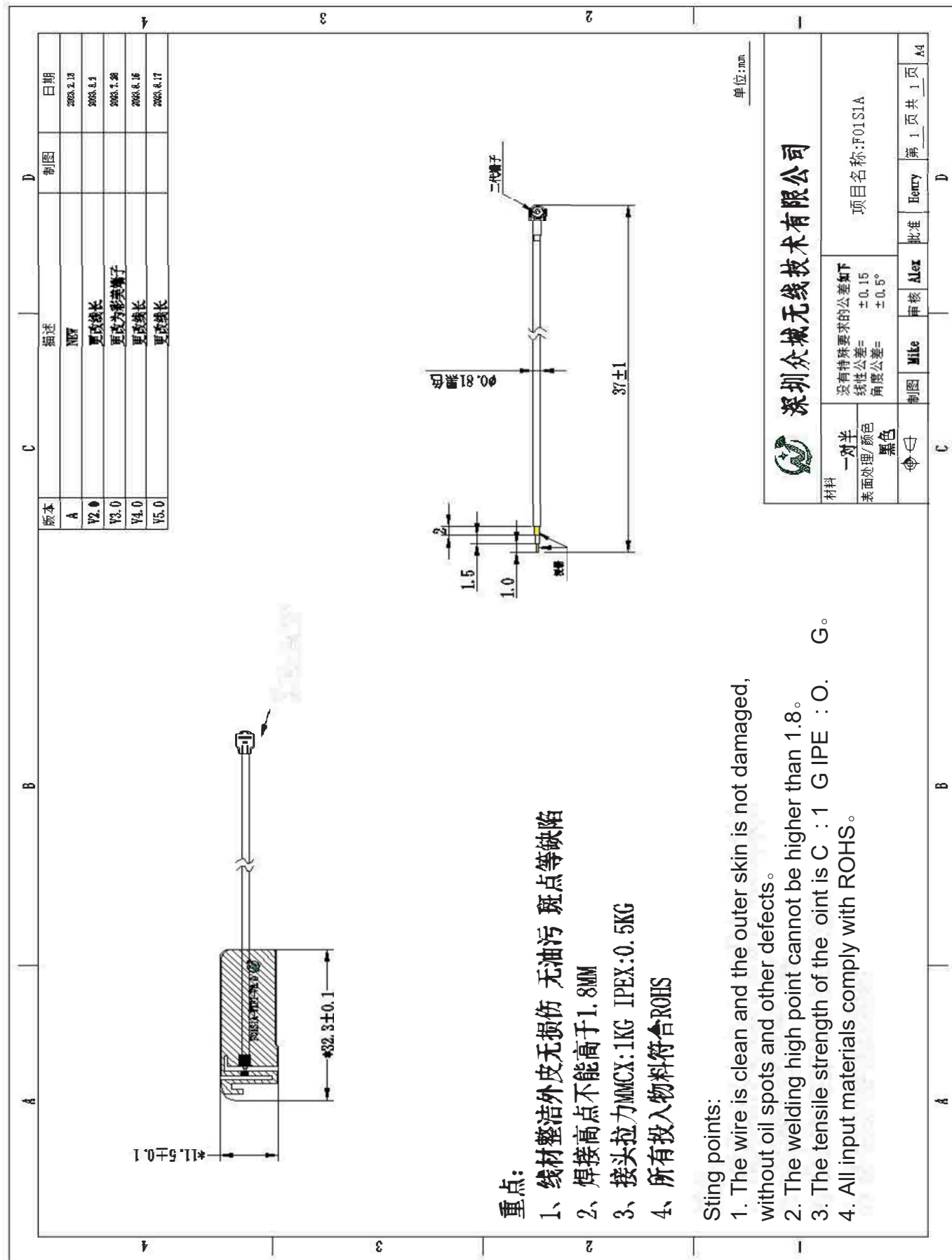
|  |  |  |
|--|--|--|
|  |  |  |
|  |  |  |
|  |  |  |

|  |  |  |
|--|--|--|
|  |  |  |
|  |  |  |
|  |  |  |

# 目录

|                                     |       |
|-------------------------------------|-------|
| 一、封面 (Cover)                        | 1~2   |
| 二、目录(Index)                         | 3     |
| 三、文件制定 (Document formulation)       | 4     |
| 四、工程图纸(Product Drawing)             | 5     |
| 五、产品参数(ProductParameter)            | 6~8   |
| 六、测试设备(Test Equipment & Conditions) | 9     |
| 七、环境与可靠性测试(reliabilitytesting)      | 10~11 |
| 八、包装规范(Package specification)       | 12    |

工程图纸：

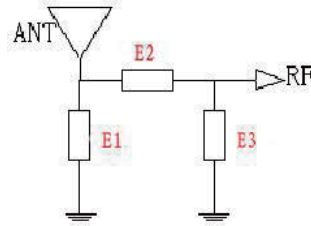


## 产品参数：Product parameters

| 品名                                      | FPC 天线         | Model                         | FPC 天线              |
|-----------------------------------------|----------------|-------------------------------|---------------------|
| Frequency range<br>频率范围<br>(MHz)        | 2.4G-2.5G      | Frequency                     | 2.4G-2.5G           |
| 带宽 (MHz)<br>Bandwidth                   | 100            | Bandwidth (MHz)               | 100                 |
| 极化方式<br>Polarization                    | 线极化            | Polarization Type             | Linear polarization |
| 天线增益<br>Antenna gain<br>(dBi)           | -0.85          | Gain (dBi)                    | -0.85               |
| 电压驻波比<br>Voltage standing<br>wave ratio | <2             | VSWR                          | <2                  |
| 输入阻抗<br>Input Impedance<br>(Ω)          | 50             | Input Impedance (Ω)           | 50                  |
| 同轴线长度<br>Coaxial cable length<br>(mm)   | 37mm           | Cable length (mm)             | 37mm                |
| 电缆线颜色<br>Cable color                    | 黑色<br>Black    | Cable Colour                  | 黑色                  |
| 接口形式<br>Interface type                  | 扣合<br>Snap fit | Connector Type                | 扣合                  |
| 工作温度<br>Operating temperature<br>(°C)   | -40~+85        | Operation<br>temperature (°C) | -40~+85             |
| 存储温度<br>Storage temperature<br>(°C)     | -40~+85        | Store temperat<br>(°C)        | -40~+85             |

## 1. 天线匹配(原天线匹配) Antenna Matching

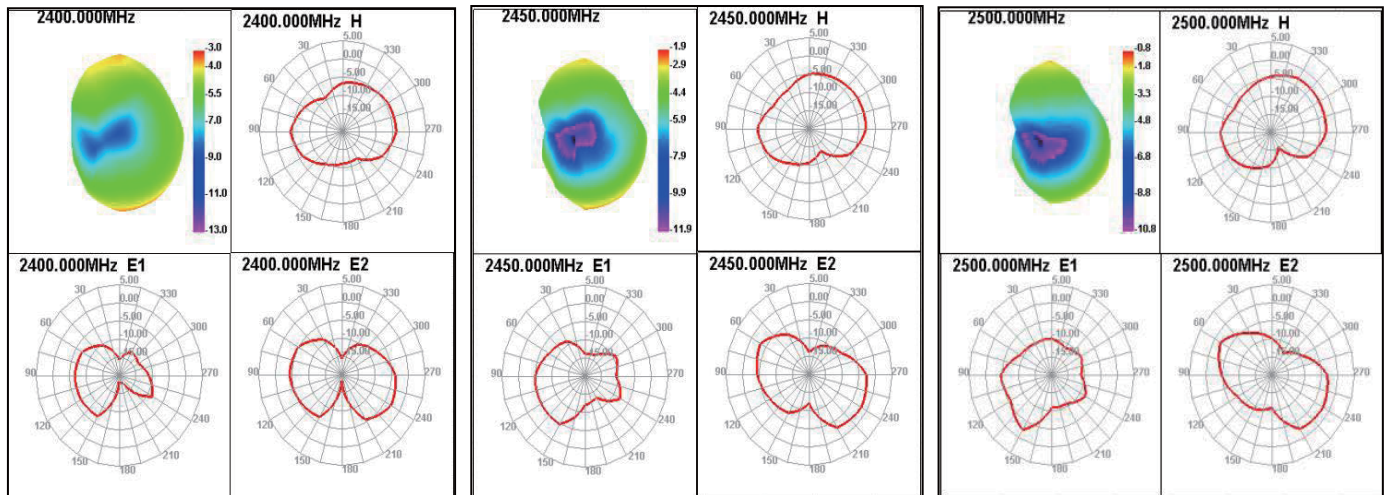
|  | E1  | E2         | E3  |
|--|-----|------------|-----|
|  | N/A | 0 $\Omega$ | N/A |



## 2. 4G 无源测试数据: 2.4G passive test data

| Freq (MHz) | Effi (%) | Gain (dBi) |
|------------|----------|------------|
| 2400       | 19.33    | -2.99      |
| 2410       | 18.83    | -3.09      |
| 2420       | 20.33    | -2.78      |
| 2430       | 21.39    | -2.52      |
| 2440       | 22.76    | -2.19      |
| 2450       | 24.09    | -1.87      |
| 2460       | 23.99    | -1.86      |
| 2470       | 22.99    | -2.05      |
| 2480       | 24.29    | -1.43      |
| 2490       | 24.26    | -1.14      |
| 2500       | 24.5     | -0.85      |

## 天线苹果图: Antenna diagram



天线摆放位置:

Antenna placement



## 测试设备 Test equipment

- 量测仪器：微波暗室，网络分析仪，标准天线。

Measuring instruments: microwave darkroom, network analyzer, standard antenna

- 微波暗室说明：Microwave darkroom description:

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。

This is the microwave darkroom set up by our company in Shenzhen. This microwave darkroom belongs to a far-field measurement system. The size of the darkroom is 7.0m x 4.0m x 3.0m, and the size of the quiet zone is 15cm x 15cm x 15cm.

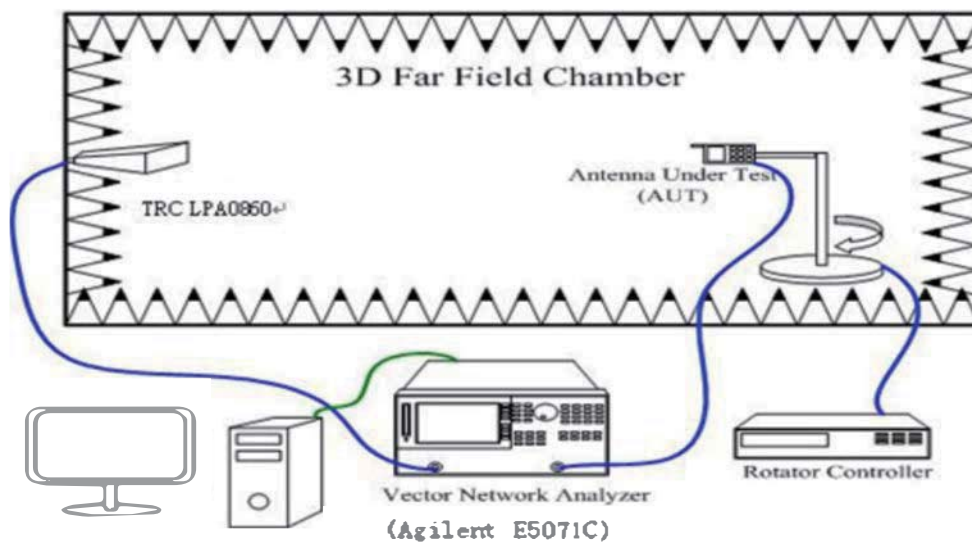


图. 1 为微波暗室内的仪器设置及网络分析仪的联接图，发射天线(本暗室所使用发射天线的型号为 TRC LPA0860 800MHZ-6GHZ)到待测天线(AUT)的距离为 1.35 米，待测天线放置在旋转平台上,藉由控制转台旋转的角度可对待测天线做概略性及较为准确的量测。

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。

Figure 1 shows the instrument settings and network analyzer connection diagram in the microwave darkroom. The distance from the transmitting antenna the transmitting antenna model used in this darkroom is TRC L A0 0 0 0 HZ- GHZ to the antenna under test AUT is 1.35 meters. The antenna under test is placed on a rotating platform. y controlling the rotation angle of the turntable, the antenna under test can be roughly and more accurately measured. The antenna under test is placed on the rotating platform, and the 3 0-degree field strength data of each plane ZY plane and Z plane is measured. Then the antenna under test is replaced with a standard dipole antenna the standard dipole antenna model used in this darkroom is TRC AD series dipole antenna 00 Hz 2s00 Hz and its 3 0-degree field strength data is measured to convert the gain standard value. The gain value and radiation pattern of the antenna under test 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