

## 深圳市飞敏科技有限公司

ShenZhen FeiMin Technology CO., LTD.

## 产品规格书

Product specification

客户

CUSTOMER:

产品名称

D3 芯片天线

PRODUCTS:

D3 Chip antenna

客户料号

PART NO:

产品型号

Spec.:

E. 6. 041

日期

Data:

2023. 08. 16

| 供应商               |                  |                   |
|-------------------|------------------|-------------------|
| SUPPLIER          |                  |                   |
| 拟制<br>PREPARED BY | 审核<br>CHECKED BY | 批准<br>APPROVED BY |
| 马凡                | 夏兴喜              | 马冬冬               |

| 客户                |                  |                   |
|-------------------|------------------|-------------------|
| CUSTOMER          |                  |                   |
| 承认<br>ACCEPTED BY | 审核<br>CHECKED BY | 批准<br>APPROVED BY |
|                   |                  |                   |

备注：承认盖章后请回复一份承认书（或复印件）给我司，其余由贵公司存档

REMARK: Please send us one (or copy) of this approval with stamp after accepting, other copies filed by the customer.

地址：深圳市宝安区西乡街道固戍社区恒南一路C栋厂房303室

ADD: Room 303, Building C, Hengnan one Road, Gushu community, Xixiang Street, Bao' an District, Shenzhen City

电话 Tel: 0755-23035723

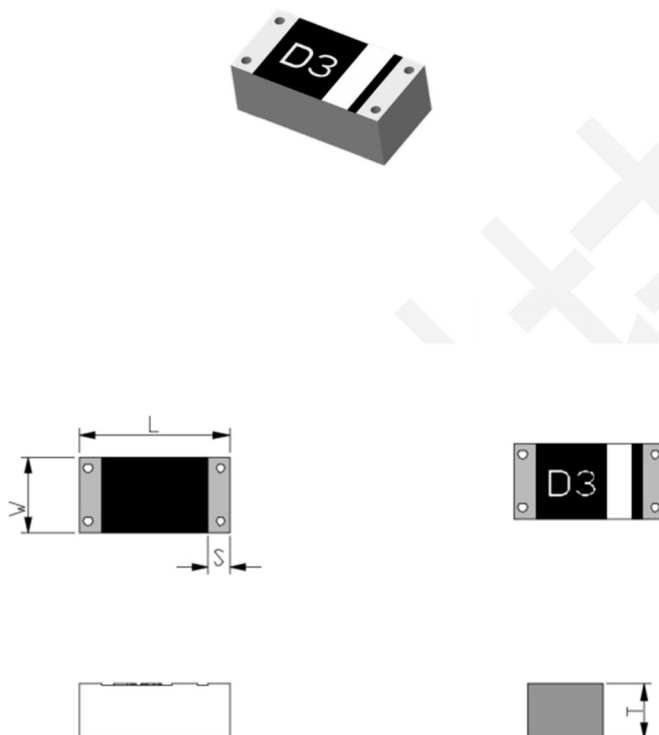
传真 Fax: 0755-23036702

邮箱 E-mail: ant001@fmant.cn

网址 HTTP: [www.fmant.cn](http://www.fmant.cn)

## 1. 项目信息 Project Information

### 1.1. 外观尺寸 Appearance and Dimensions



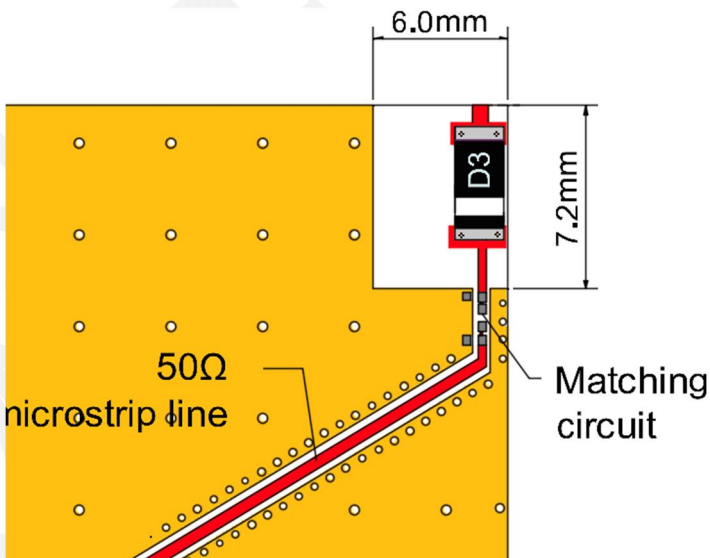
| Symbol   | Dimension (mm) |
|----------|----------------|
| L (长度)   | $3.4 \pm 0.20$ |
| W (宽度)   | $1.7 \pm 0.20$ |
| T (厚度)   | $1.2 \pm 0.20$ |
| S (电极宽度) | $0.4 \pm 0.20$ |

### 1.2. 天线净空区面积 antenna Clearance area

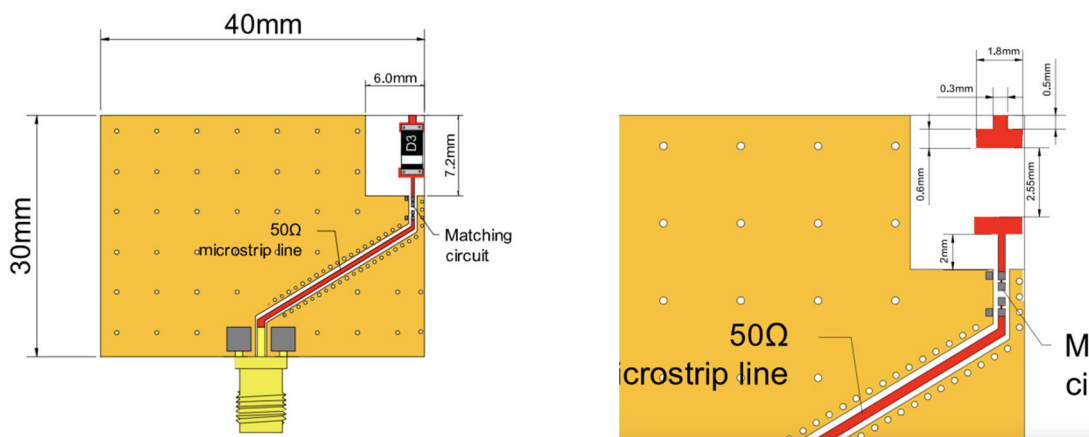
在设计天线时，应远离金属部件和不相关的部件，如电池、振荡器、防护罩、摄像头等，为天线留出

干净的空间。这个间隔简称为净空区。以下是我们建议预留的净空区面积大小。

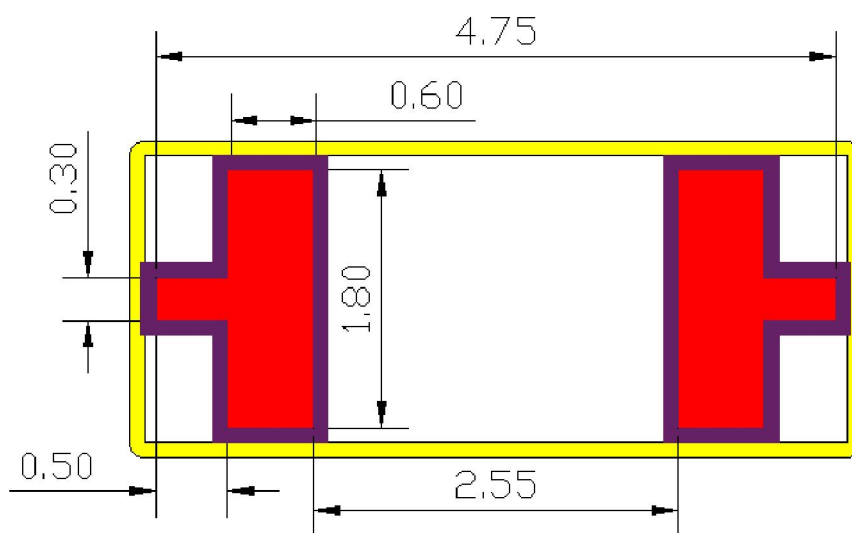
When designing the antenna, it should be far away from metal components and irrelevant components such as batteries, oscillators, shields, cameras, etc. to leave a clean space for the antenna. This interval is called clearance area. The following is the size of clearance area we recommend to reserve.

| 天线型号 (Model)        | 天线尺寸 (size)        | 净空区面积<br>Clearance area<br>L*W(mm) |                                                                                     |
|---------------------|--------------------|------------------------------------|-------------------------------------------------------------------------------------|
| A1 (2.4G 单极)        | 5.5*1.2*1.2        | 9.1*5.6                            |                                                                                     |
| X5 (2.4G 单极)        | 5.2*2.2*1.0        | 8.7*6.5                            |                                                                                     |
| X6 (2.4G pifa)      | 3.2*1.6*1.0        | 7.0*6.0                            |                                                                                     |
| D1 (2.4G 单极)        | 5.2*2.2*1.0        | 8.7*6.5                            |                                                                                     |
| D2 (2.4G 单极)        | 5.2*2.2*1.0        | 8.7*6.5                            |                                                                                     |
| <b>D3 (2.4G 单极)</b> | <b>3.4*1.7*1.2</b> | <b>7.2*6.0</b>                     |  |
| F01 (2.4G pifa)     | 3.2*1.6*0.4        | 7.0*6.0                            |                                                                                     |
| S2 (2.4/5.8G 双频)    | 7.0*3.0*2.0        | 9.0*7.0                            |                                                                                     |
| U1 (UHF 单极)         | 15.0*3.0*1.0       | 19.0*8.0                           |                                                                                     |
| G2 (GPS 单极)         | 9.5*3.0*1.0        | 13.5*7.5                           |                                                                                     |

### 1.3. 天线 Demo 测试板 Demo Test Board with Antenna(Unit:mm)



#### 1.4.建议 PCB 板尺寸布局 Suggested PCB board size layout



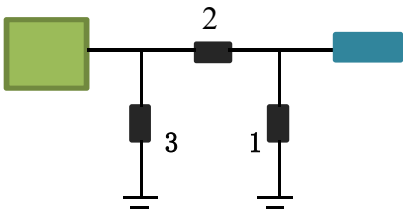
单位: mm

#### 1.5. 匹配电路 Matching Circuit

使用以下推荐的匹配和调谐元件值,在我们的标准 30\*40 mm 评估板上,中心频率约为 2440mhz。然而,这些是典型的参考值,当电路板或零件供应商不同时,可能需要更改。

With the following recommended values of matching and tuning components,the center frequencies will be about 2440 MHz at our standard 30\*40 mm evaluation board.However,these are

typical reference values which may need to be changed when circuit boards or part vendors are different.



| 系统匹配电路元件(村田)                               |              |           |
|--------------------------------------------|--------------|-----------|
| System Matching Circuit Component (Murata) |              |           |
| Location                                   | Description  | Tolerance |
| 1                                          | NC           | /         |
| 2                                          | 4.7nH(0402)  | ±0.2nH    |
| 3                                          | 2.0pF (0402) | ±0.1pF    |

## 2. 电特性 Electrical

### Characteristics(30\*40mm ground plane)

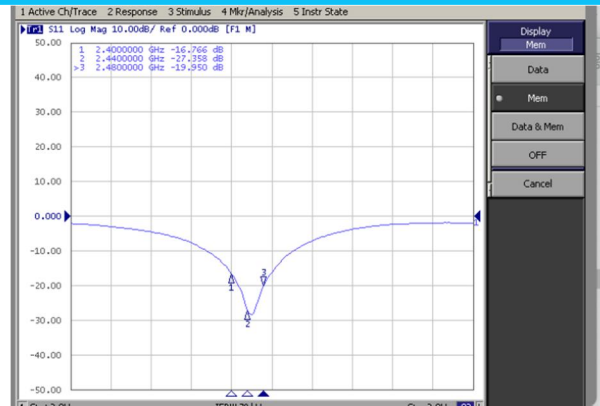
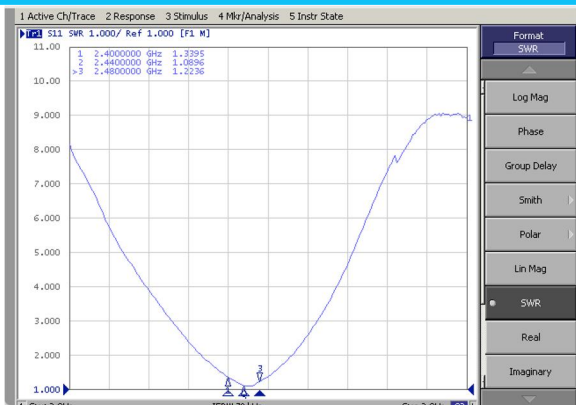
2.1.电子表格 Electrical Table

| 特征 Characteristics      |               | 规范 Specifications | 单位 Unit |
|-------------------------|---------------|-------------------|---------|
| 轮廓尺寸 Outline Dimensions |               | 3.4*1.7*1.2       | mm      |
| 工作频率 Working Frequency  |               | 2400-2500         | MHz     |
| 电压驻波比 VSWR              |               | <2                | /       |
| 阻抗 Impedance            |               | 50                | Ω       |
| 极化 Polarization         |               | 线极化               | /       |
| 增益 Gain                 | 峰值 Peak       | 3.54              | dB      |
|                         | 效率 Efficiency | 52.81             | %       |

### 2.2.电压驻波比与回波损耗 VSWR & return loss

VSWR

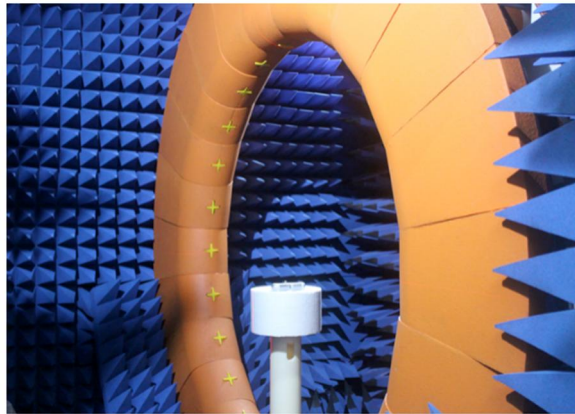
return loss



### 2.3.天线增益与效率 Gain and Efficiency

测试系统 Test system

#### 主要测试指标



24 探头微波暗室 24 probe microwave darkroom

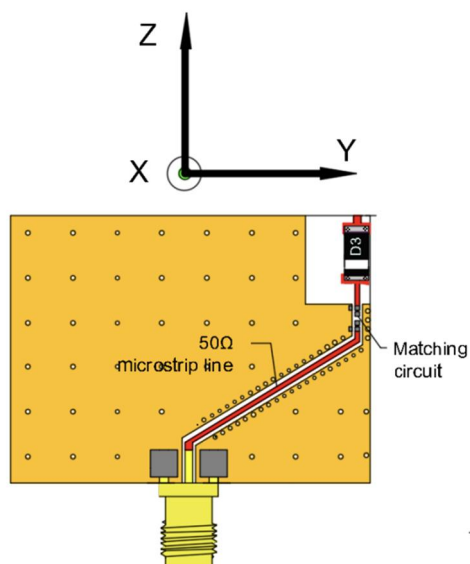
频率: 0.4GHz至6GHz

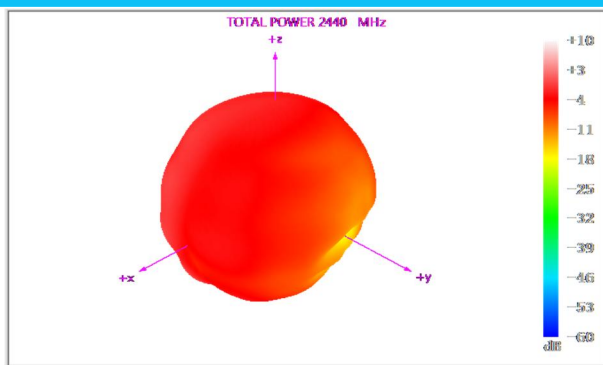
- ◆ 无源指标 Passive pointer
- ◆ 增益 Gain
- ◆ 效率 efficiency
- ◆ 3D方向图 3D direction map
- 有源指标 Active index
- TRP总辐射功率 TRP total radiated power
- TIS总接收灵敏度 TIS Total receiving sensitivity

| Frequency (MHz) | Gain (dBi) | Efficiency (%) |
|-----------------|------------|----------------|
| 2400 MHz        | 2.53       | 48.07          |
| 2410 MHz        | 2.42       | 46.87          |

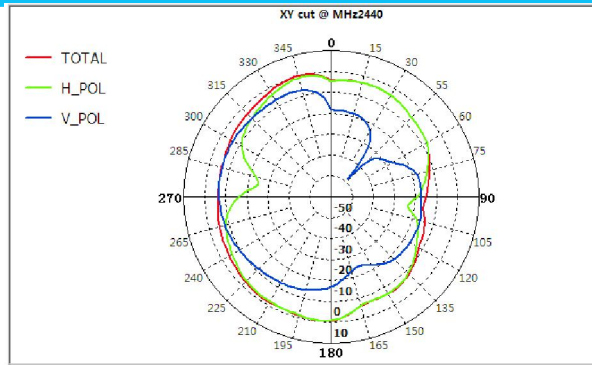
|          |      |       |
|----------|------|-------|
| 2420 MHz | 2.62 | 45.74 |
| 2430 MHz | 2.60 | 47.41 |
| 2440 MHz | 2.83 | 49.21 |
| 2450 MHz | 3.04 | 49.87 |
| 2460 MHz | 3.37 | 50.91 |
| 2470 MHz | 3.51 | 51.95 |
| 2480 MHz | 3.54 | 52.81 |
| 2490 MHz | 3.39 | 51.34 |
| 2500 MHz | 3.31 | 49.99 |

#### 2.4. 天线辐射方向图 Antenna radiation pattern

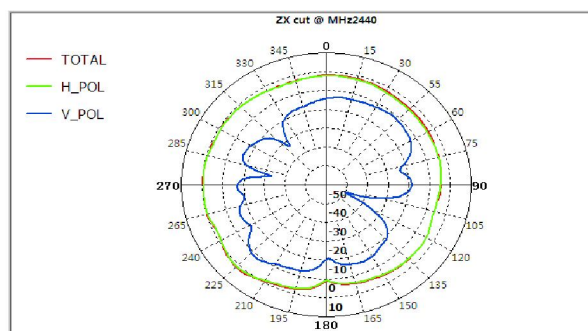




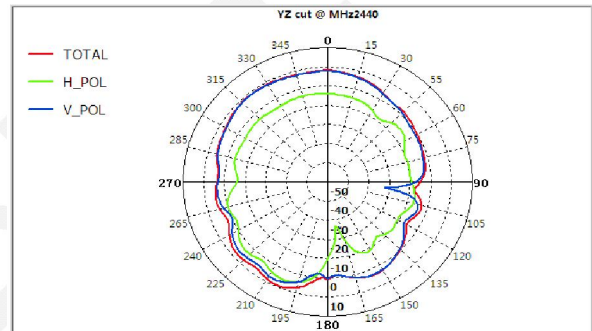
3D-plane@2.44GHz



2D-plane XOY @2.44GHz

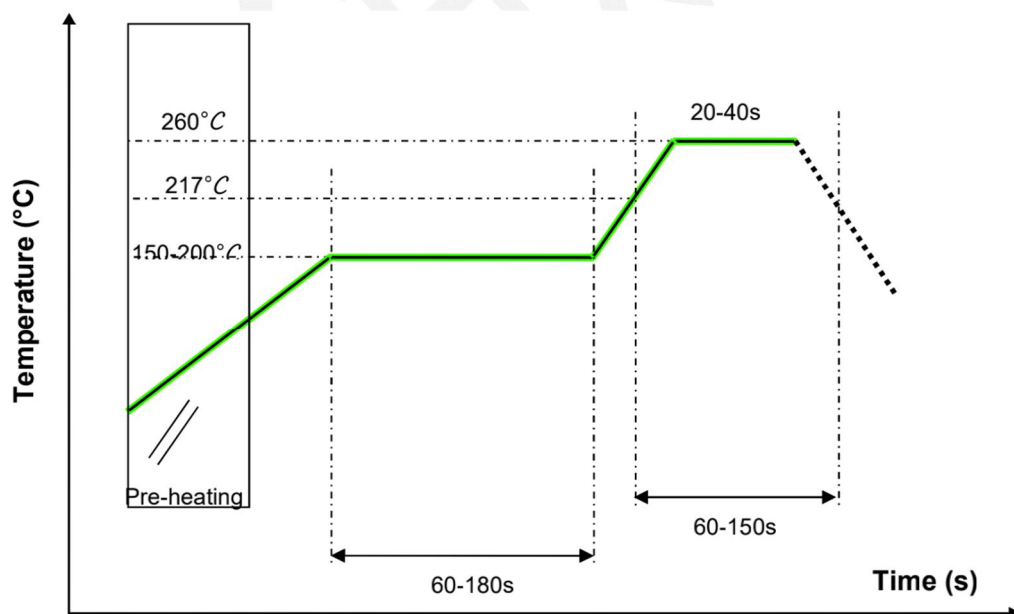


2D-plane XOZ@2.44GHz



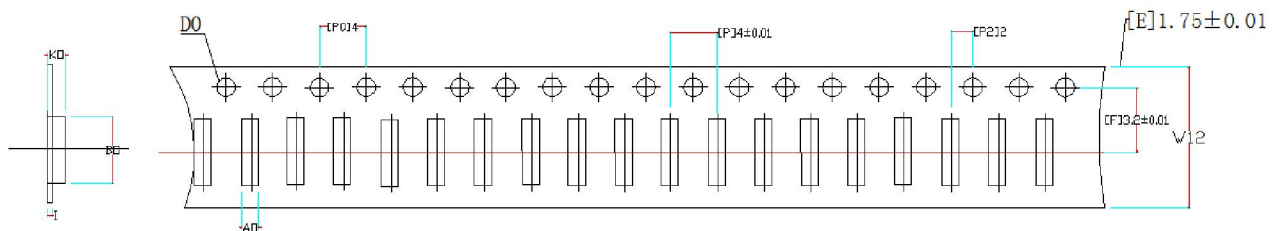
2D-plane YOZ @2.44GHz

### 3.焊接和安装 Soldering and Mounting



## 4.包装信息 Packaging Information

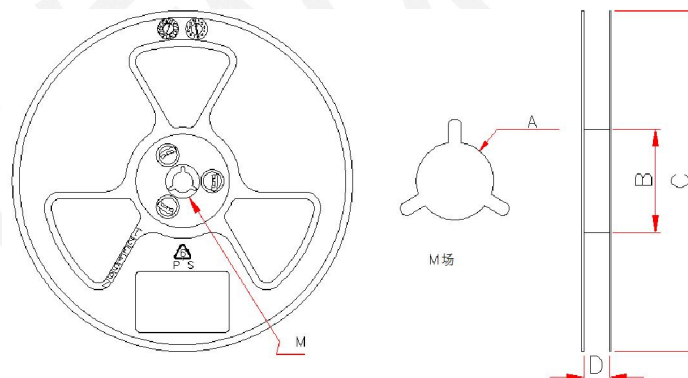
### 4.1. 胶带规范 Tape specification



| Index          | A0        | B0        | K0        | P0        | P         | P2        | φ D0     | W          | E          | F         | T          |
|----------------|-----------|-----------|-----------|-----------|-----------|-----------|----------|------------|------------|-----------|------------|
| Dimension (mm) | 2.0 ± 0.1 | 3.7 ± 0.1 | 1.5 ± 0.1 | 4.0 ± 0.1 | 4.0 ± 0.1 | 2.0 ± 0.1 | 1.5 +0.1 | 12.0 ± 0.3 | 1.75 ± 0.1 | 3.7 ± 0.1 | 0.3 ± 0.05 |

- 10 链轮孔距累积公差±0.20。10 sprocket hole pitch cumulative tolerance ±0.20.
- 在 250 毫米中，载体的拱度在 1 毫米以内。Carrier camber is within 1 mm in 250 mm.
- 所有尺寸符合 EIA-481-C 要求。All dimensions meet EIA-481-C requirements.
- 材料:透明 PS。Material :Transparent PS.
- 包装长度每 7"卷:12.5 米。Packing length per 7" reel :12.5Meters.
- 组件加载/ 7"卷:3000 个。Component load per 7" reel : 3000 pcs.(前后共预留 120pcs)

### 4.2. 卷规范 Reel specification



| Index          | A          | B         | C         | D          |
|----------------|------------|-----------|-----------|------------|
| Dimension (mm) | 13.3 ± 0.3 | 100 ± 0.3 | 330 ± 0.3 | 24.5 ± 0.3 |

## 5.注意事项 Notes

- 1) 产品应小心处理，以避免汗水和皮肤油脂损坏或污染。

Products should be handled with care to avoid damage or contamination from perspiration and skin oils.

- 2) 对于单个部件，强烈建议使用镊子或真空拾取。

The use of tweezers or vacuum pick up is strongly recommended for individual components.

## 6. 储存条件 Storage Conditions

- 1) 推荐产品从交货之日起 6 个月内使用。

Recommended products should be used within 6 months form the time of delivery.

- 2) 存储环境条件

Storage environment condition

- 温湿度条件:-10~40℃，30~70%RH。

Temperature and humidity conditions:-10~40℃ and 30~70%RH.

- 包装材料应保存在空气中不含氯或硫的地方。

The packaging material should be kept where no chlorine or sulfur exists in the air.

- 产品应储存在仓库内，无热震、振动、阳光直射等。

Products should be storage in the warehouse without heat shock,vibration,direct sunlight and so on.