WiFi 天线

WIFI antenna

产品设计与制造规格书

Product design and manufacturing specifications

- 客户名称/ Customer:
- 项目名称/Projec: WiFi 双频贴片天线
- 物料名称/Name: WiFi antenna
- 天线材质/Antenna materials: 陶瓷/Ceramics
- 物料编号/Part no: DBTDWBT3216P
- 设计/Designer:
- 审核/Check:
- 客户确认签章/Approved:

地址/Add: 深圳市南山区西丽镇平山一路云谷二期 8 栋 505
Rm505, 8th building, Yungu 2nd period, pingshan No.1 Road, Xili Town,Nanshan District, ShenZhen , China
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产品名称 Product name	WiFi 双频贴片天线/ Dual frequency patch antenna	产品编码/ Product code	DBTDWBT3216P

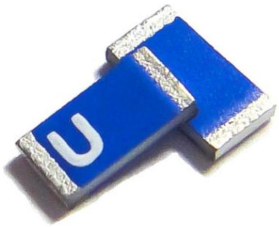
天线技术规格书

Technical specification for antenna

一、概述/Overview

该天线为 WiFi 双频终端贴片天线，工作频率为 2400-2500MHz/5150-5850MHz，广泛应用于 WiFi 产品、蓝牙耳机及音响、 PAD、手机多频天线设备、小型贴片机芯片设计。

This antenna is WiFi dual-band terminal patch antenna, the operating frequency is 2400-2500MHz/5150-5850MHz, widely used in WiFi products, Bluetooth headsets and audio, PAD, mobile phone multi-frequency antenna equipment, small size SMD chip design。



二、技术要求/Technical requirements

2.1 天线指标/Antenna Indicator

	技术要求	技术指标	
1	工作频率 Frequency	2400MHz-2500MHz	5150-5850MHz
2	回波损耗 Return Loss	-10dB（典型值）	-10dB（典型值）
3	天线效率 Efficiency	76%（典型值，在 80*40mm 底板上测试）	67%（典型值，在 80*40mm 底板上测试）
4	峰值增益 Peak Gain	1.5dBi（峰值）	2.9dBi（峰值）
5	输出驻波比 Output VSWR	≤2	≤2
6	极化 Polarization	线极化（Linear polarization）	线极化（Linear polarization）
7	阻抗 Impendance	50Ω	50Ω

2.2 环境适应性/Environmental Adaptability

1	工作温度/Operating temperature	-25°C ~ +70°C
2	存储温度/Storage temperature	-25°C~ +85°C
3	相对湿度/Relative humidity	10%~95%

2.3 机械特性/Mechanical properties

1	天线尺寸 Demention	3.2*1.6*0.5mm
2	天线材料 Material	陶瓷/Ceramics

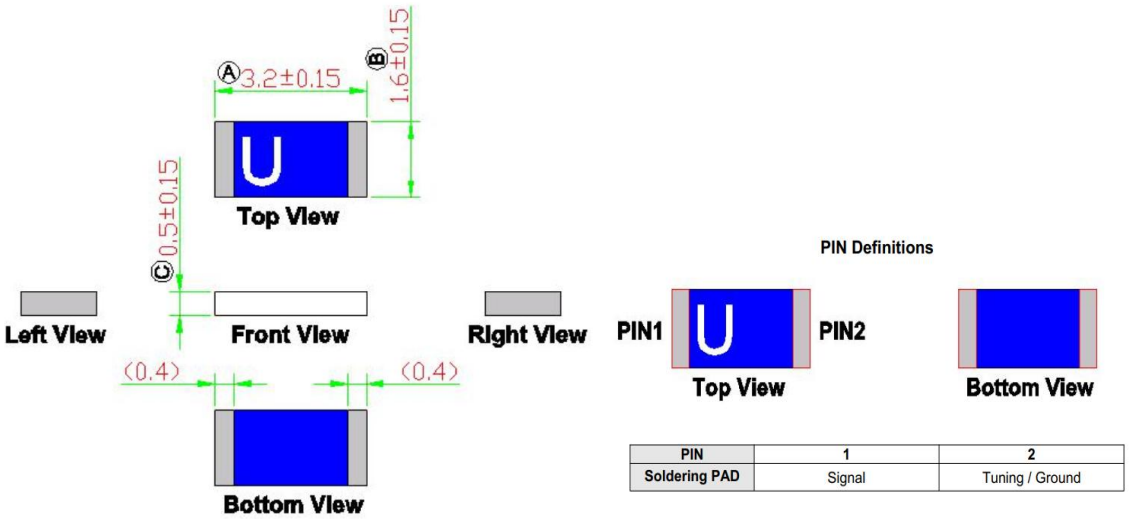


图 1 天线外形尺寸和管脚定义/Fig. 1 antenna outline size and pin definition

三、参考 PCB 设计/Reference PCB design

参考测试板见图 2，天线 PCB 设计建议参考图 3 进行。 /The reference test board is shown in Figure 2, and the antenna PCB design proposal is shown in Figure3 .

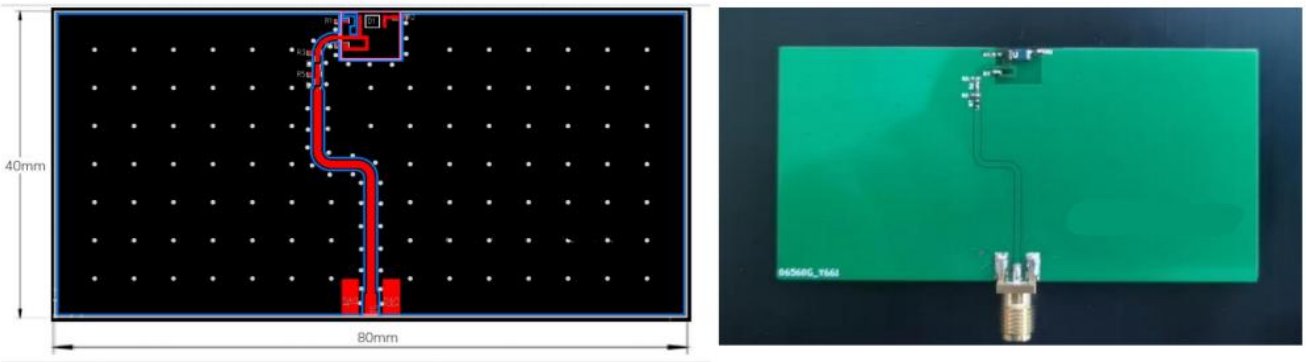
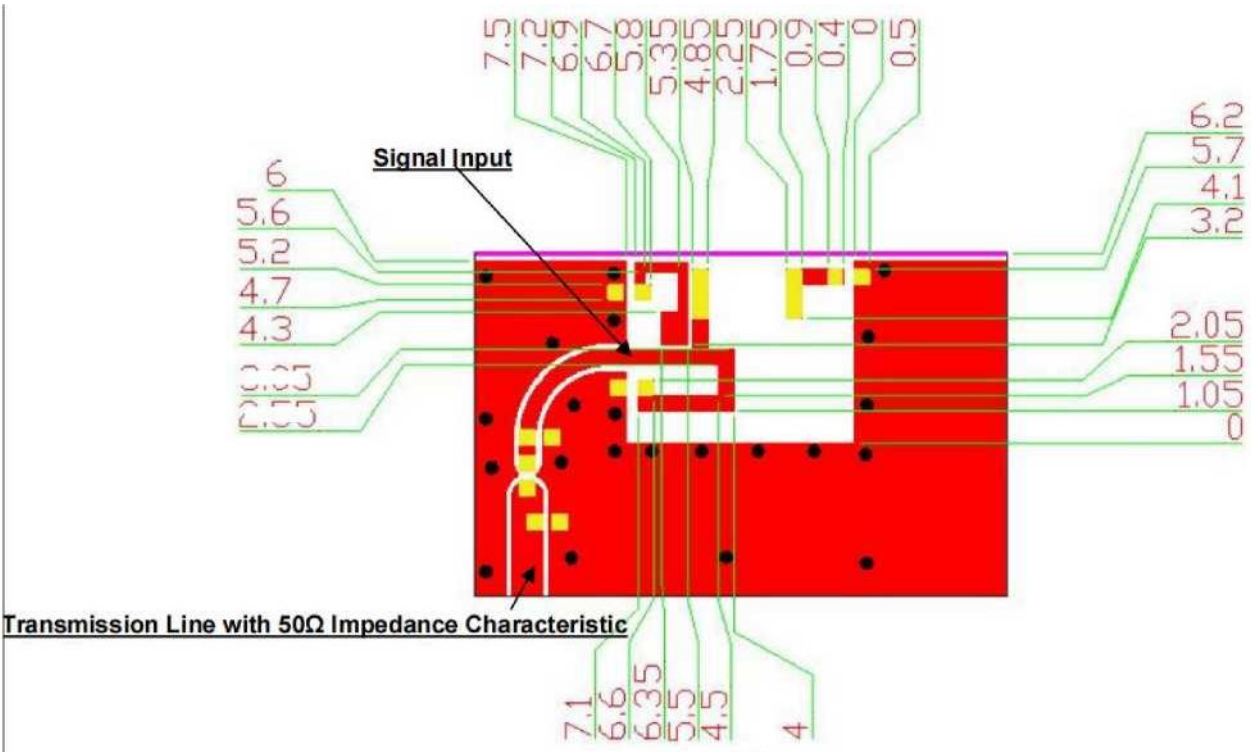
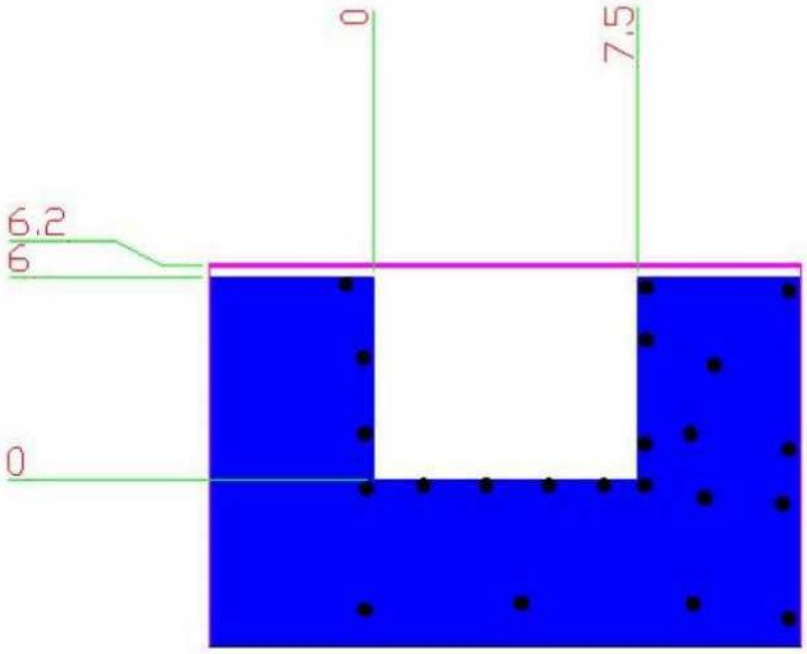


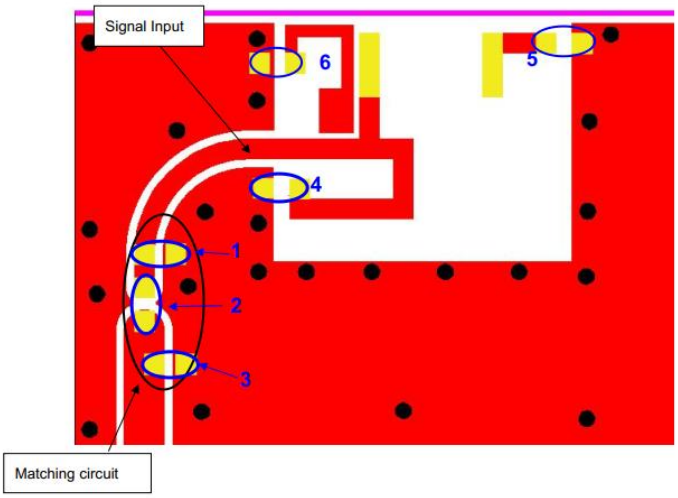
图 2 参考测试电路板/Fig. 2 reference test circuit board

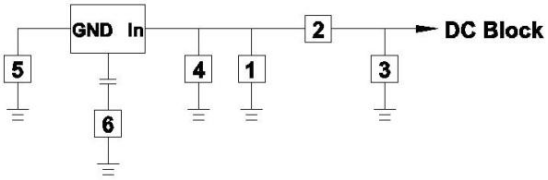


Top View



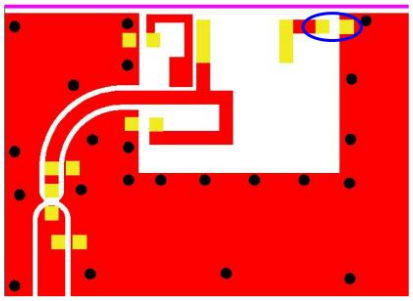
Bottom View

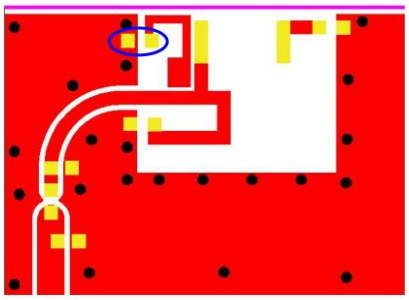


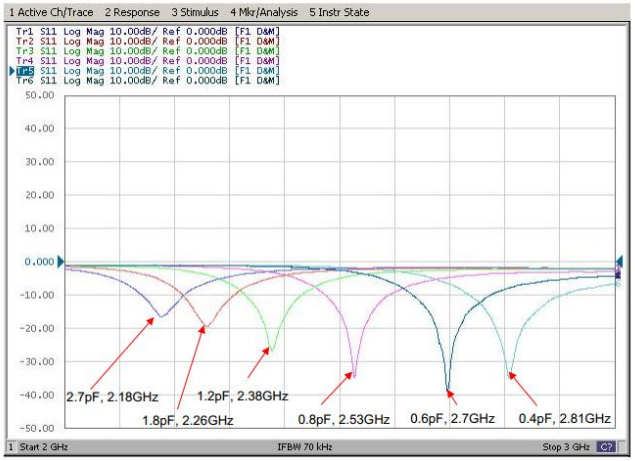


System Matching Circuit Component			
Location	Description	Vendor	Tolerance
1	N/A	-	-
2	1 nH, (0402)	DARFON	±0.3 nH
3	0.2 pF, (0402)	DARFON	±0.05 pF
4	22 pF, (0402)	DARFON	±5%
5 Fine tuning element	1 pF, (0402)	DARFON	±0.05 pF
6 Fine tuning element	0.2 pF, (0402)	DARFON	±0.05 pF

图 3 天线 PCB 设计参考板/Fig. 3 Antenna PCB design reference board







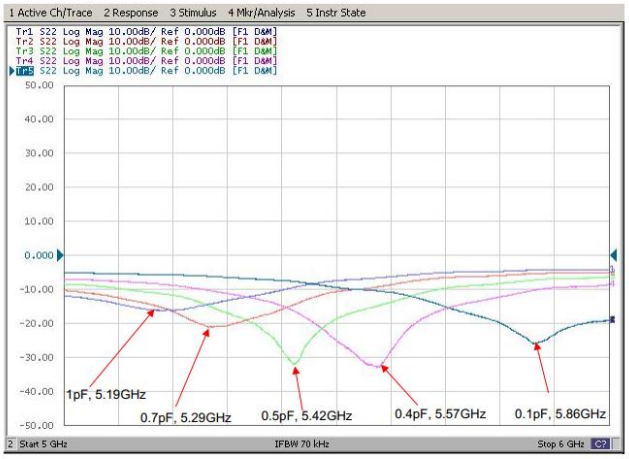
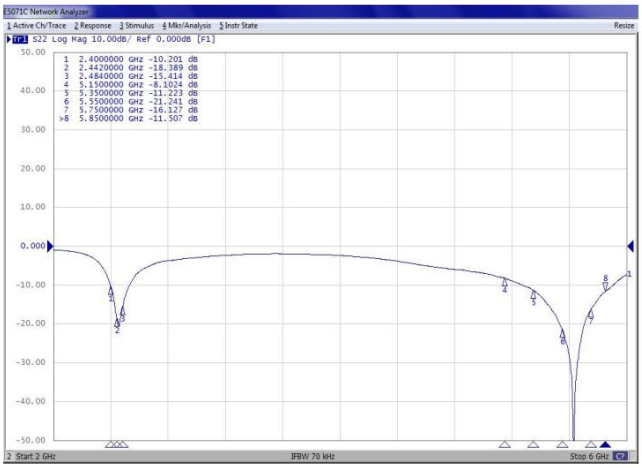


图 4 天线调谐电路和频率调整/Fig. 4 antenna tuning circuit and frequency adjustment

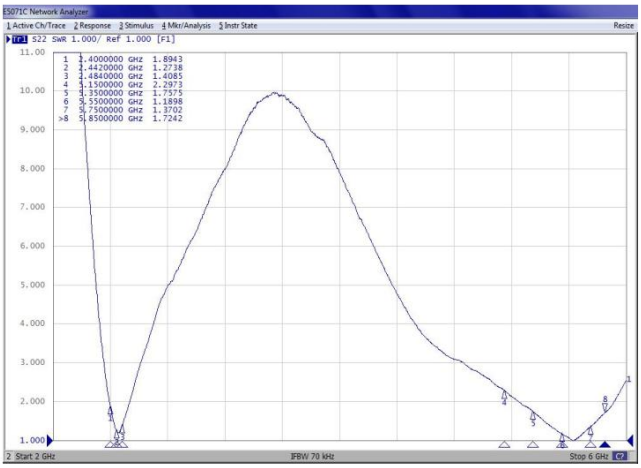
四、天线测试数据/Antenna test data

1、阻抗原图和回波损耗（dB）：/Impedance diagram and echo loss（dB）

Return Loss (S_{11})

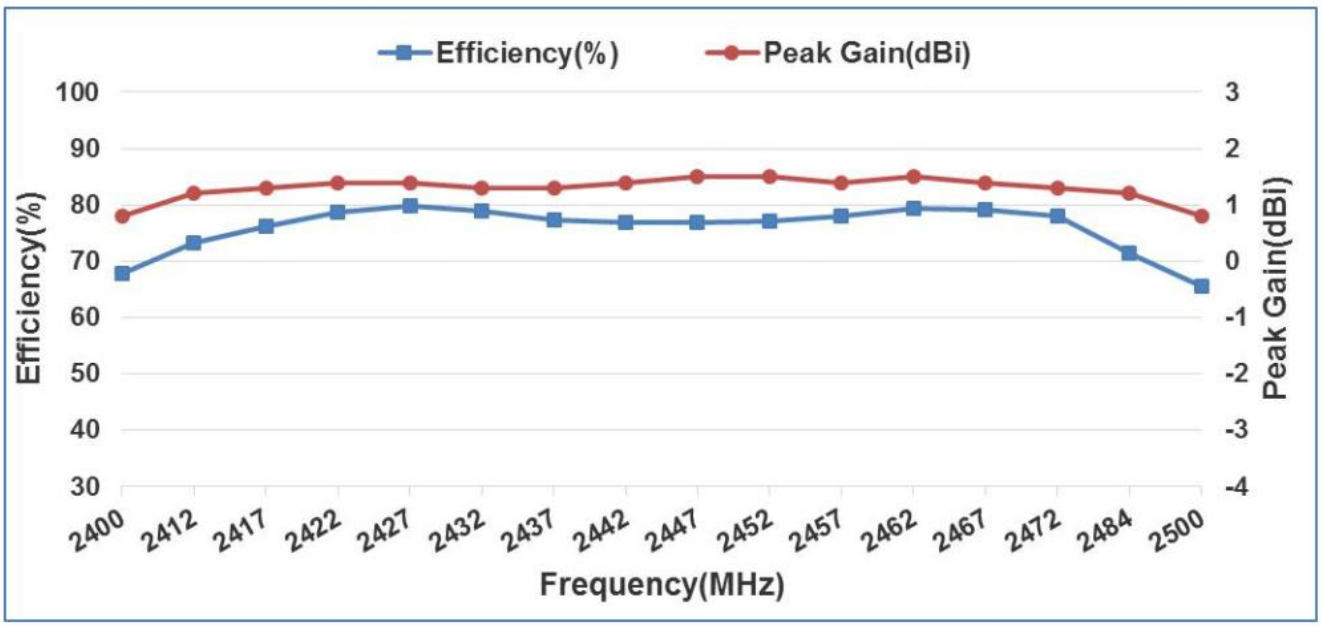


VSWR (S_{11})

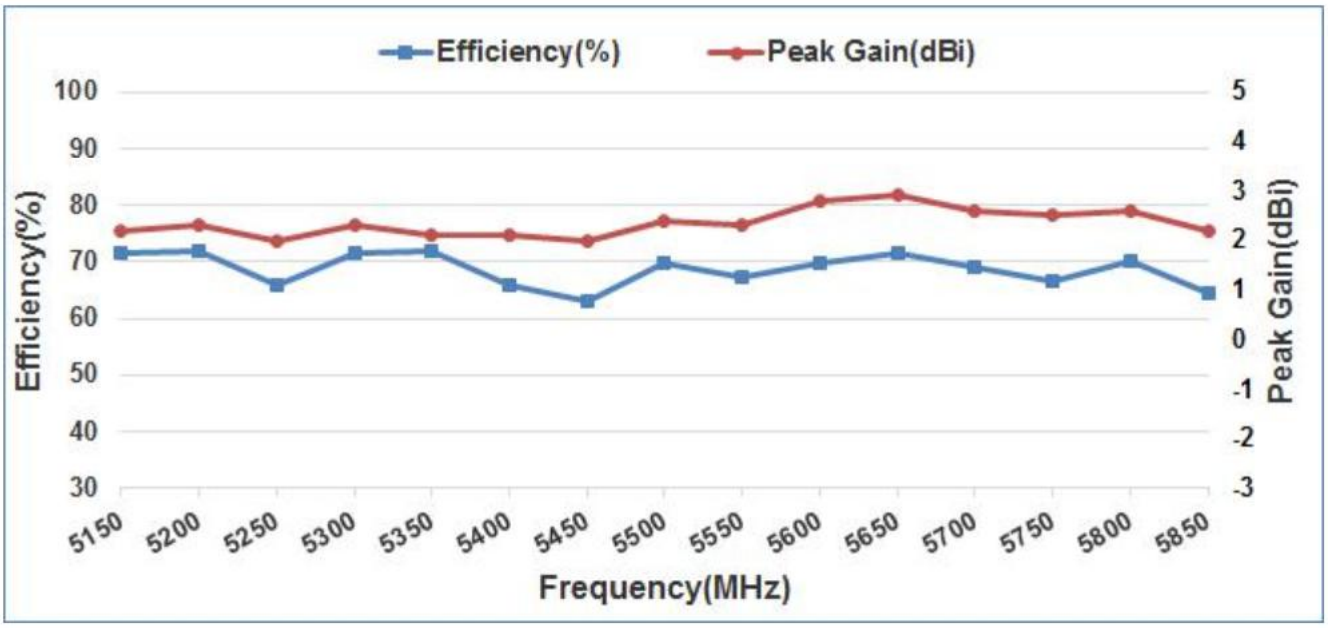


2、天线效率和增益/Antenna efficiency and gain:

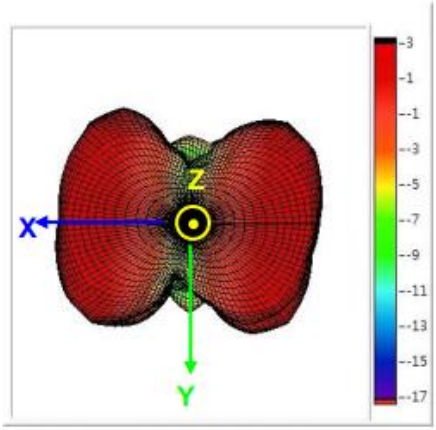
Frequency(MHz)	2400	2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484	2500
Efficiency(dB)	-1.7	-1.4	-1.2	-1.0	-1.0	-1.0	-1.1	-1.1	-1.2	-1.1	-1.1	-1.0	-1.0	-1.1	-1.5	-1.8
Efficiency(%)	67.9	73.2	76.1	78.7	79.9	78.8	77.4	76.8	76.8	77.2	78.1	79.3	79.2	78.1	71.5	65.5
Peak Gain(dBi)	0.8	1.2	1.3	1.4	1.4	1.3	1.3	1.4	1.5	1.5	1.4	1.5	1.4	1.3	1.2	0.8

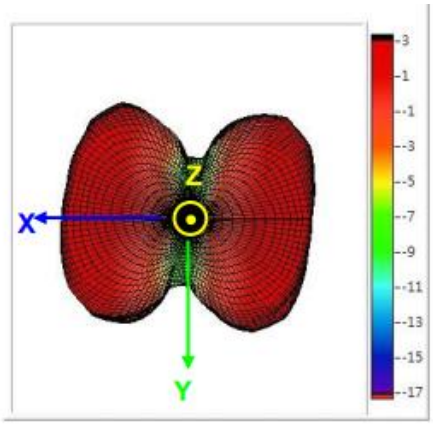


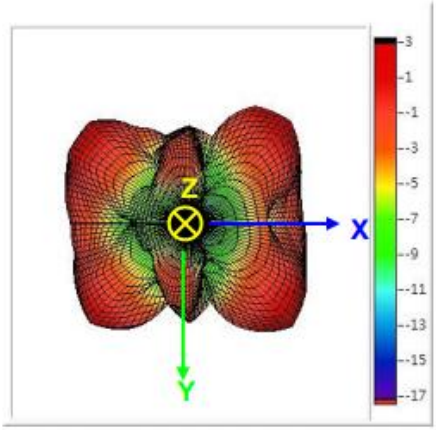
Frequency(MHz)	5150	5200	5250	5300	5350	5400	5450	5500	5550	5600	5650	5700	5750	5800	5850
Efficiency(dB)	-1.5	-1.4	-1.8	-1.5	-1.4	-1.8	-2.0	-1.6	-1.7	-1.6	-1.4	-1.6	-1.8	-1.5	-1.9
Efficiency(%)	71.5	71.9	65.7	71.6	71.9	65.8	63.2	69.9	67.3	69.6	71.7	68.9	66.6	70.1	64.6
Peak Gain(dBi)	2.2	2.3	2.0	2.3	2.1	2.1	2.0	2.4	2.3	2.8	2.9	2.6	2.5	2.6	2.2

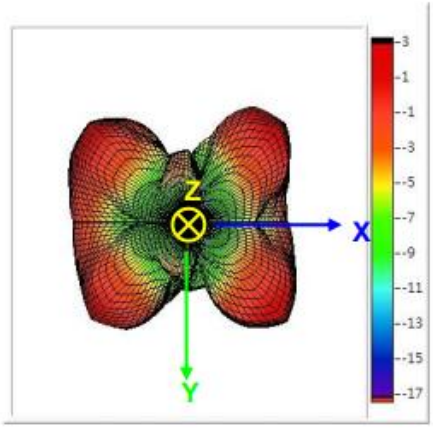


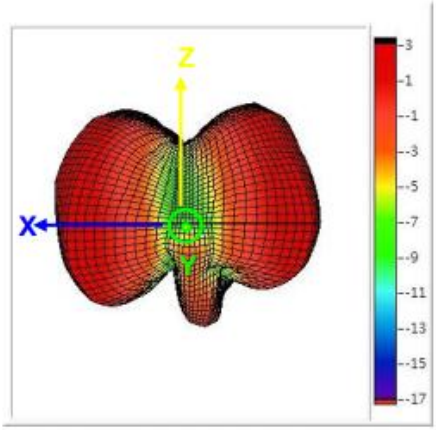
3、天线辐射方向图/Antenna radiation pattern:

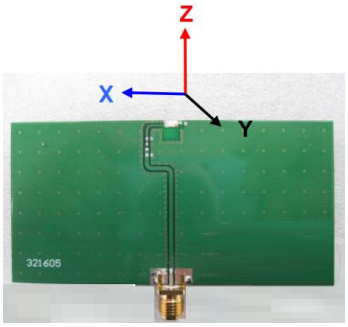


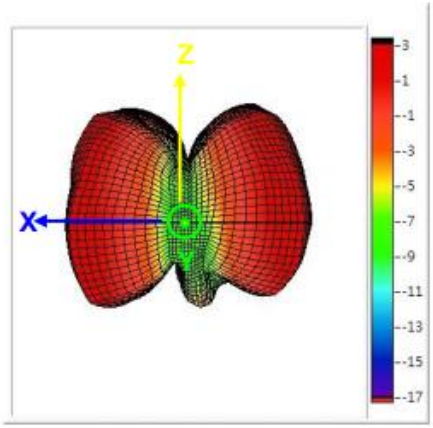












2.4GHz 天线方向图/Antenna Directions
2.4GHz Antenna Directions

天线测试参考板 /
Antenna test reference panel

5GHz 天线方向图/
5GHz Antenna Directions

五、天线焊接条件 /Welding condition of antenna

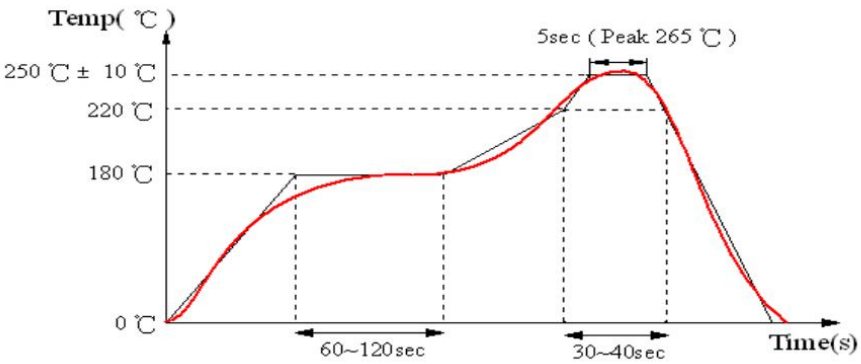
1、焊剂 /Flux

① 使用松香助焊剂，禁止使用卤化物含量起过 0.2wt%的强酸性助焊剂。 /Use Rosin flux, do not use strong acid flux with halide content up to 0.2 wt% .

② 使用纯锡焊料 /Use pure tin solder

2、回流焊条件 /Reflow soldering conditions

●预热时，产品表温与焊料温度的温差最大不允许超出 150℃，焊接完后冷却时，产品表温与溶剂温度之间的温差最大不允许超出 100℃。预热不足有可能引发产品表面裂纹，导致产品品质下降。/The maximum temperature difference between surface temperature and solder temperature is not allowed to exceed 150 ° C during preheating, and the maximum temperature difference between surface temperature and solvent temperature is not allowed to exceed 100 ° C during cooling after welding. Lack of preheating may lead to surface cracks, resulting in product quality decline.



●标准回流焊曲线 /Standard reflow soldering curve

3、手工返工 /Manual rework

当使用电烙铁进行手工焊接时，以下条件必须严格遵守 /When soldering by hand, the following conditions must be strictly observed

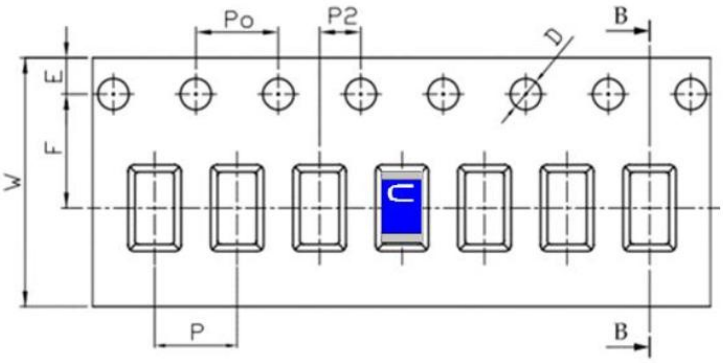
预热 Pre-heating	150℃, 1 minute
尖端温度 Tip temperature	350℃ max
输出功率 Soldering iron output	80w max
电烙铁头尖端尺寸 End of soldering iron	φ3mm max
焊接时间 Soldering time	3 seconds max

六、包装/Packaging

①编带和带轮尺寸/Braid and pulley dimensions : Unit：mm

②包装数量/Quantity of packing: 5000 PCS / Plate

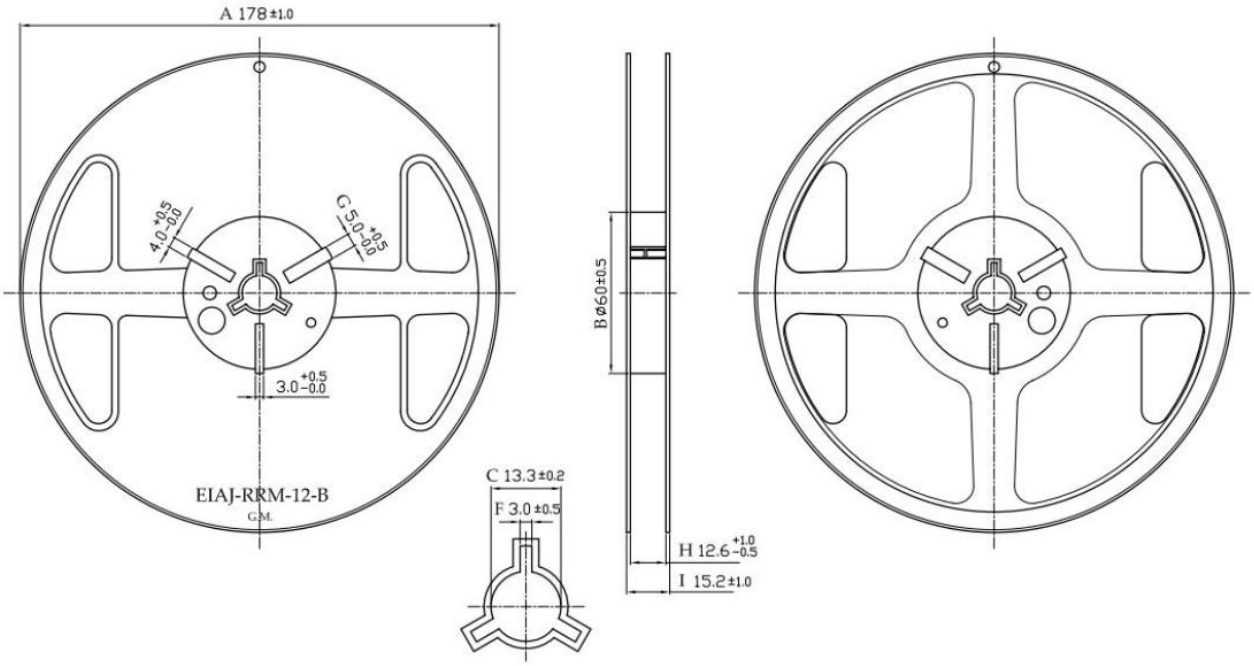
a. Tape Drawing



b. Tape Dimensions (unit: mm)

Feature	Specifications	Tolerances
W	12.00	±0.30
P	4.00	±0.10
E	1.75	±0.10
F	5.50	±0.10
P2	2.00	±0.10
D	1.50	+0.10 -0.00
Po	4.00	±0.10
10Po	40.00	±0.20

c. Reel Drawing



七、保管 /Storage

①. 保管期限 /Storage period

距出厂检验时间六个月内，产品可以使用；检验时间可以通过包装外侧标记的检验号确认；

若时间超出六个月，应检查焊接性能后方可使用。/The product can be used within six months from the time of inspection. The inspection time can be confirmed by the inspection number marked on the outside of the package.

②．保存条件/Save condition

●存放货物的库房应满足以下条件/The warehouse where the goods are stored shall meet the following conditions

温度/Temperature : 10 ~40℃　湿度/Humidity : 30 to 70% relative humidity

不允许温、湿度有极剧变化。/Extreme changes in temperature and humidity are not allowed.

●禁止将产品保管在腐蚀性物质中，例如硫磺、氯气或者酸，否则将引起端头氧化，导致降低焊接性。/Do not store products in corrosive substances, such as sulfur, chlorine or acid, as this will cause oxidation of the end, resulting in reduced solderability.

●为了避免受潮气、灰尘等物质的影响，产品应保管于货架上。/In order to avoid moisture, dust and other substances, the product should be kept on the shelf.

●产品保管在库房中时，应避免热冲击，振动以及直接光照等等。/Products in storage, should avoid thermal shock, vibration and direct lighting and so on.

●产品应密封包装。/The product should be sealed and packaged.