



东莞市卓信电子科技有限公司

Dongguan Zhuoxin Electronic Technology Co., Ltd

公司地址：东莞市塘厦镇蛟乙塘银园街5号厂房2楼



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# 承 认 书

## SPECIFICATION FOR APPROVAL

客 户 名 称

CUSTOMER NAME: 百盛兴业

产 品 名 称

PRODUCT NAME: 2.4G 5dBi 大 SMA 公头母针黑色天线

客 户 料 号

CUSTOMER P/N:

卓信电子料号

ZX P/N: ZX02S62B2D469A REV:A

|              | MANUFACTURER<br>SIGNATURE | CUSTOMER<br>SIGNATURE |
|--------------|---------------------------|-----------------------|
| CHECKED BY:  | 王国行                       |                       |
| APPROVED BY: | 郭亮                        |                       |
| DATE:        | 2023-04-12                |                       |



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1. 规格表:

## 产品主要技术参数

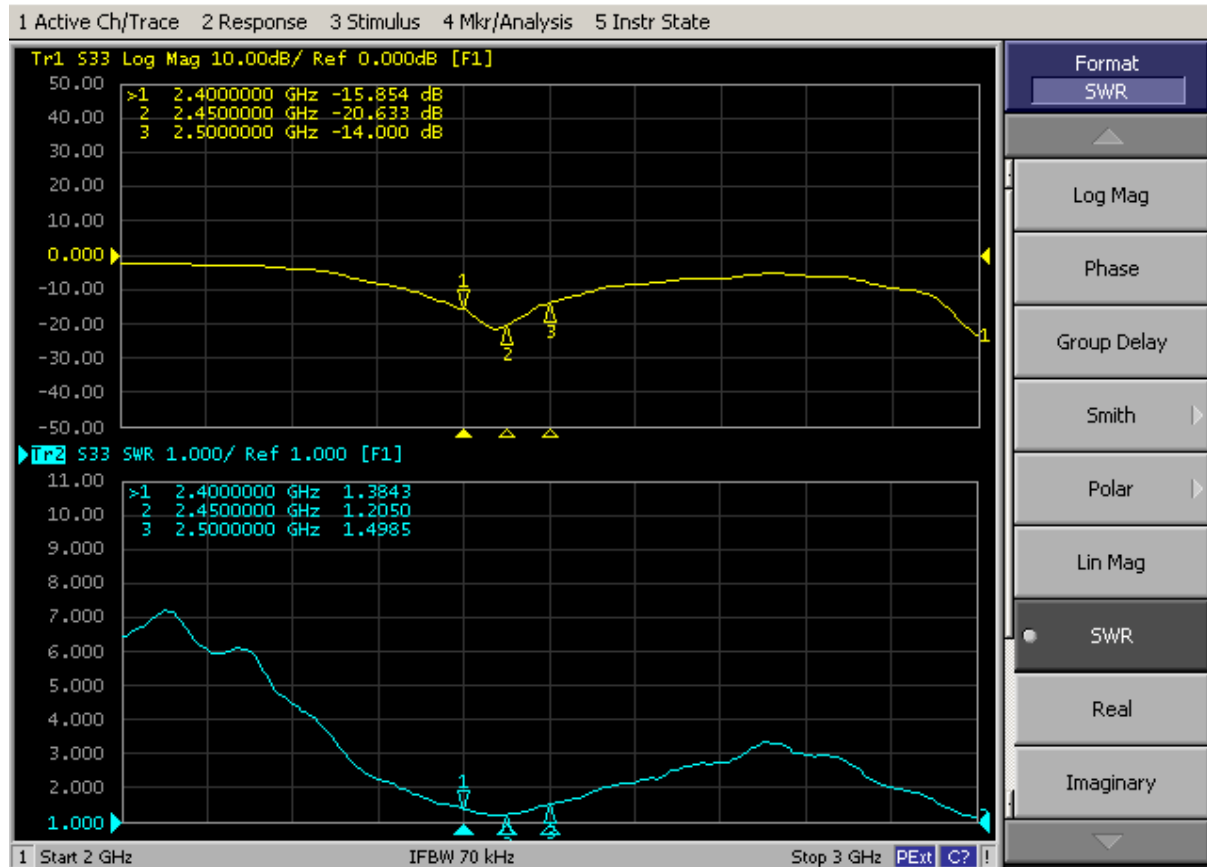
| 主要技术指标           |                                   | Main technical specifications |                                   |
|------------------|-----------------------------------|-------------------------------|-----------------------------------|
| 频率范围<br>(MHZ)    | 2400~2500                         | Frequency Range<br>(MHZ)      | 2400~2500                         |
| 特性阻抗( $\Omega$ ) | 50                                | Impedance( $\Omega$ )         | 50                                |
| 峰值增益(dBi)        | <5.5                              | Peak Gain(dBi)                | <5.5                              |
| 输出电压<br>驻波比      | $\leq 1.92$                       | VSWR                          | $\leq 1.92$                       |
| 极化方式             | 线极化                               | Polarization                  | Line                              |
| 连接方式             | SMA                               | Connector Type                | SMA                               |
| 物理性能             |                                   | Physical Properties           |                                   |
| 天线本体材料           | TPEE                              | Antenna Base                  | TPEE                              |
| 工作温度             | -20 $^{\circ}$ C~+50 $^{\circ}$ C | Operating Temp                | -20 $^{\circ}$ C~+50 $^{\circ}$ C |
| 保存温度             | -20 $^{\circ}$ C~+50 $^{\circ}$ C | Storage Temp                  | -20 $^{\circ}$ C~+50 $^{\circ}$ C |

## 2. 成品图：

| ROHS |  |  |            |     |     |   |     |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
|------|--|--|------------|-----|-----|---|-----|------|--|---------|------------|-----|----|---------|----|-------|---|----------|---|------|----|-------|---|-----|----|------|---|------|---|---------|-----|------|---|-----|----|----|---|-----------|---|------|----|--------|---|------|---|------------|----|---------|---|----------|----|------|-----|------|---|
|      |  |  |            |     |     | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>版本</th> <th>日期</th> <th>变更内容</th> </tr> <tr> <td>A</td> <td>2021-12-19</td> <td>新发行</td> </tr> </table>   | 版本  | 日期   | 变更内容   | A       | 2021-12-19 | 新发行 |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
| 版本   | 日期   | 变更内容   |            |     |     |   |     |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
| A    | 2021-12-19   | 新发行  |            |     |     |   |     |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
| 1    |  |  |            |     |     |   | 1   |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
| 2    |  |  |            |     |     |   | 2   |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
| 3    |  |  |            |     |     |   | 3   |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
| 4    |  |  |            |     |     |   | 4   |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
| 5    | <p>Specification:</p> <p>Frequency Range: 2400~2500MHz</p> <p>Return loss: &lt;math&gt;-10\text{dB}&lt;/math&gt; or less</p>   |  |            |     |     |   | 5   |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
| 6    | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; text-align: center;"> </td> <td style="width: 15%; text-align: center;"> </td> <td style="width: 70%;"> <p>1. 外包装贴上1pcsROHS环保标签至外包装标签上;</p> <p>2. 外包装贴上1pcs外包装标签至外包装左上角。</p> <p>(注: 如果标签客户有要求则按客户要求贴; 否则按我司标签贴)。</p> </td> </tr> </table> |  |            |     |     |   |     |      | <p>1. 外包装贴上1pcsROHS环保标签至外包装标签上;</p> <p>2. 外包装贴上1pcs外包装标签至外包装左上角。</p> <p>(注: 如果标签客户有要求则按客户要求贴; 否则按我司标签贴)。</p> | 6       |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
|      |  | <p>1. 外包装贴上1pcsROHS环保标签至外包装标签上;</p> <p>2. 外包装贴上1pcs外包装标签至外包装左上角。</p> <p>(注: 如果标签客户有要求则按客户要求贴; 否则按我司标签贴)。</p> |            |     |     |   |     |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
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| 11   | 油漆   | 1  | EVA; 黑色    |     |     |   |     |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
| 10   | 铆钉   | 2  | POM; 黑色    |     |     |   |     |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
| 9    | 杆套   | 1  | TPPE; 黑色   |     |     |   |     |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
| 8    | 螺旋杆  | 1  | 黄铜         |     |     |   |     |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
| 7    | 空心柱  | 1  | 锌合金        |     |     |   |     |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
| 6    | 热缩套管   | 1  | PVC; 黑色    |     |     |   |     |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
| 5    | 接地管  | 1  | 锌合金        |     |     |   |     |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
| 4    | 线材   | 1  | RG178; 棕色  |     |     |   |     |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
| 3    | 上固定座   | 1  | PC; 黑色     |     |     |   |     |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
| 2    | 下固定座   | 1  | PC/PBT; 黑色 |     |     |   |     |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
| 1    | SMA公头母针  | 1  | 大SMA; 黑色   |     |     |   |     |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
| 序号   | 产品名称   | 数量   | 产品规格       |     |     |   |     |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
|      |  |  |            |     |     | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; text-align: center;">XXX</td> <td style="width: 15%; text-align: center;">≤2.0</td> <td style="width: 15%; text-align: center;">核准</td> <td colspan="3" style="text-align: center;">客户:</td> </tr> <tr> <td style="text-align: center;">XX</td> <td style="text-align: center;">≤1.0</td> <td style="text-align: center;">审核</td> <td colspan="3" style="text-align: center;">客户料号:</td> </tr> <tr> <td style="text-align: center;">X</td> <td style="text-align: center;">≤0.5</td> <td style="text-align: center;">制图</td> <td colspan="3" style="text-align: center;">产品名称:</td> </tr> <tr> <td style="text-align: center;">.X</td> <td style="text-align: center;">≤0.3</td> <td></td> <td colspan="3" style="text-align: center;">料号:</td> </tr> <tr> <td style="text-align: center;">.XX</td> <td style="text-align: center;">≤0.2</td> <td></td> <td style="text-align: center;">版本</td> <td style="text-align: center;">单位</td> <td style="text-align: center;">比例</td> </tr> <tr> <td style="text-align: center;">⊙</td> <td style="text-align: center;">⊙</td> <td></td> <td style="text-align: center;">A</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">1:1</td> </tr> <tr> <td></td> <td></td> <td></td> <td style="text-align: center;">大小</td> <td style="text-align: center;">页码</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td style="text-align: center;">A4</td> <td style="text-align: center;">1/1</td> <td></td> </tr> </table>   | XXX | ≤2.0 | 核准   | 客户:     |            |     | XX | ≤1.0    | 审核 | 客户料号: |   |          | X | ≤0.5 | 制图 | 产品名称: |   |     | .X | ≤0.3 |   | 料号:  |   |         | .XX | ≤0.2 |   | 版本  | 单位 | 比例 | ⊙ | ⊙         |   | A    | mm | 1:1    |   |      |   | 大小         | 页码 |         |   |          |    | A4   | 1/1 |      | 6 |
| XXX  | ≤2.0   | 核准   | 客户:        |     |     |   |     |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
| XX   | ≤1.0   | 审核   | 客户料号:      |     |     |   |     |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
| X    | ≤0.5   | 制图   | 产品名称:      |     |     |   |     |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
| .X   | ≤0.3   |  | 料号:        |     |     |   |     |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
| .XX  | ≤0.2   |  | 版本         | 单位  | 比例  |   |     |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
| ⊙    | ⊙  |  | A          | mm  | 1:1 |   |     |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
|      |  |  | 大小         | 页码  |     |   |     |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
|      |  |  | A4         | 1/1 |     |   |     |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |
| A    | B  | C  | D          | E   | F   | G   |     |      |  |         |            |     |    |         |    |       |   |          |   |      |    |       |   |     |    |      |   |      |   |         |     |      |   |     |    |    |   |           |   |      |    |        |   |      |   |            |    |         |   |          |    |      |     |      |   |

### 3. 天线测试报告

#### 3.1: 网络分析仪测试报告

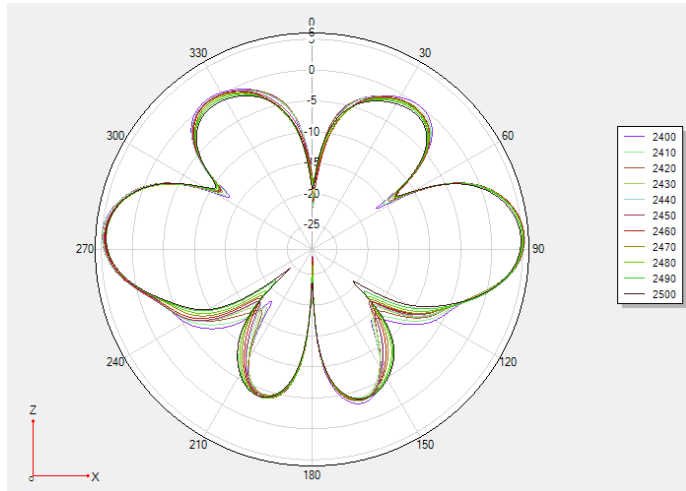


#### 3.2: 暗室 2D、3DRaditation Pattern

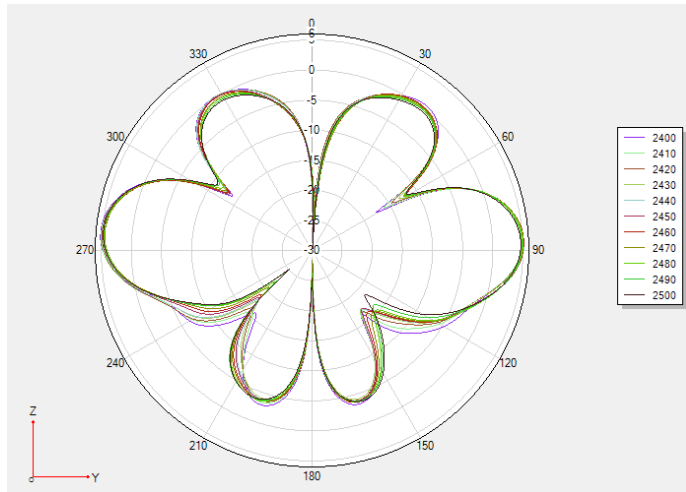
##### 3.2-1 效率及增益

| Frequency (MHz) | Efficiency (%) | Peak Gain / dB |
|-----------------|----------------|----------------|
| 2400            | 76.21          | 4.81           |
| 2450            | 76.91          | 4.83           |
| 2500            | 74.64          | 4.72           |

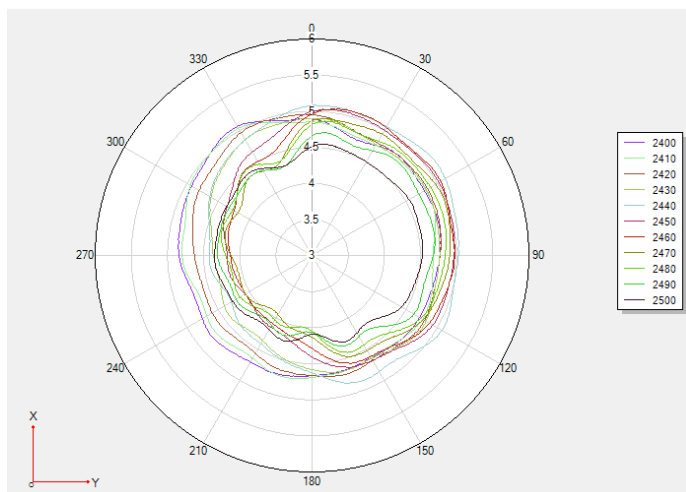
### 3.2.2 2D/3D 场型图



Phi 0 2D 图

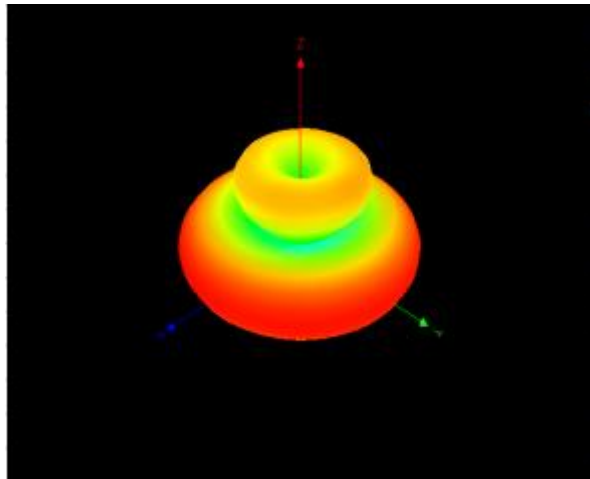


Phi 90 2D 图

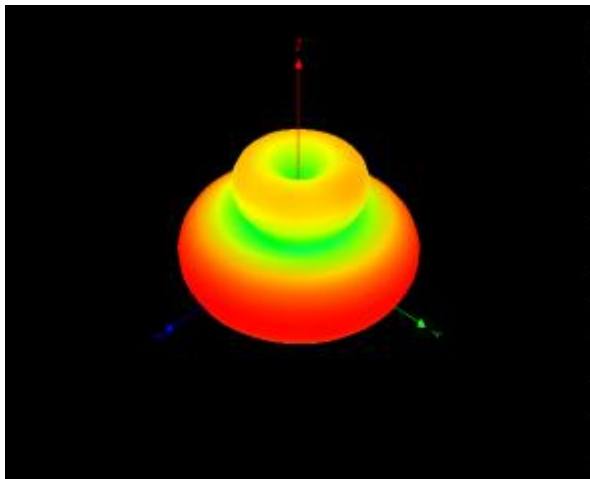


Theta 90 2D 图

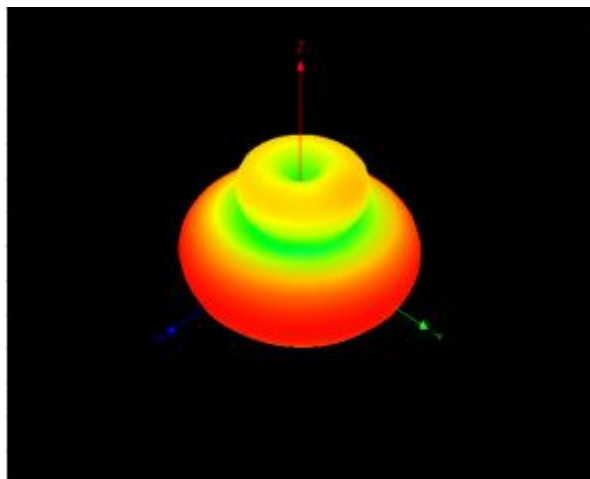
ANT 3D Radiation with Max Gain



2400MHz



2450MHz



2500MHz