**EASTONG**

ShenZhen Eastong Electronic technology Co., LTD

# APPROVAL SHEET
# FOR
# 火芯 HTD02
**（2.4G band internal antenna）**

| Issued by | | Checked by | |
|---|---|---|---|
| **Confirmed by** | | **Date** | **2023-08-11** |
| **Customer Confirm** | | | |

| Project: HTD02 | | Author: XU xiaorong | File Name: **HTD02-APP-RA** |
|---|---|---|---|
| Date: 2023-08-11 | | | |
| Rev: | Language: | Check: | |
| A | ENG | | |
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| Date | Revision | Description of Changes |
|---|---|---|
| 2023-08-11 | R:A | Antenna performance approved by customer |
|  |  |  |

# 1   SUMMARY

# 2   GENERAL DESCRIPTION

## 2.1    Definitions

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# 4   ELECTRICAL PERFORMANCE

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# 1      Summary

This report summarizes the electrical results of the proposed antenna to support the HTD02 program. We test the antenna with the latest version handset .

# 2      General Description

## 2.1      Definitions

VSWR: Voltage Standing Wave Rate

# 3      Mechanical Description

# 4      Electrical Performance

## 4.1      Set-up

### 4.1.1      VSWR and return loss

VSWR measurements ($S_{11}$) were performed using an Agilent E5070B Network Analyzer and the previously described test fixture. Coaxial chokes were used to mitigate surface currents on the outside of the cabling. The testing was performed in free space.

### 4.1.2      Efficiency, Gain and TRP/TIS

The gain of the antenna was measured in Dong Xin's 3D anechoic chamber in Shenzhen. The chamber is capable of doing tests from 380MHz to 6GHz. Coaxial chokes on the feed cable were used to mitigate surface currents. The measurement results are calibrated using dipole standards.  For TRP and TIS the chamber uses a Agilent 8960 to establish the connection with the mobile device. During TRP tests the 8960 reads the power received through the chamber probes whilst during TIS tests the 8960 transmits through the probe. All data is afterwards corrected by a calibration table.
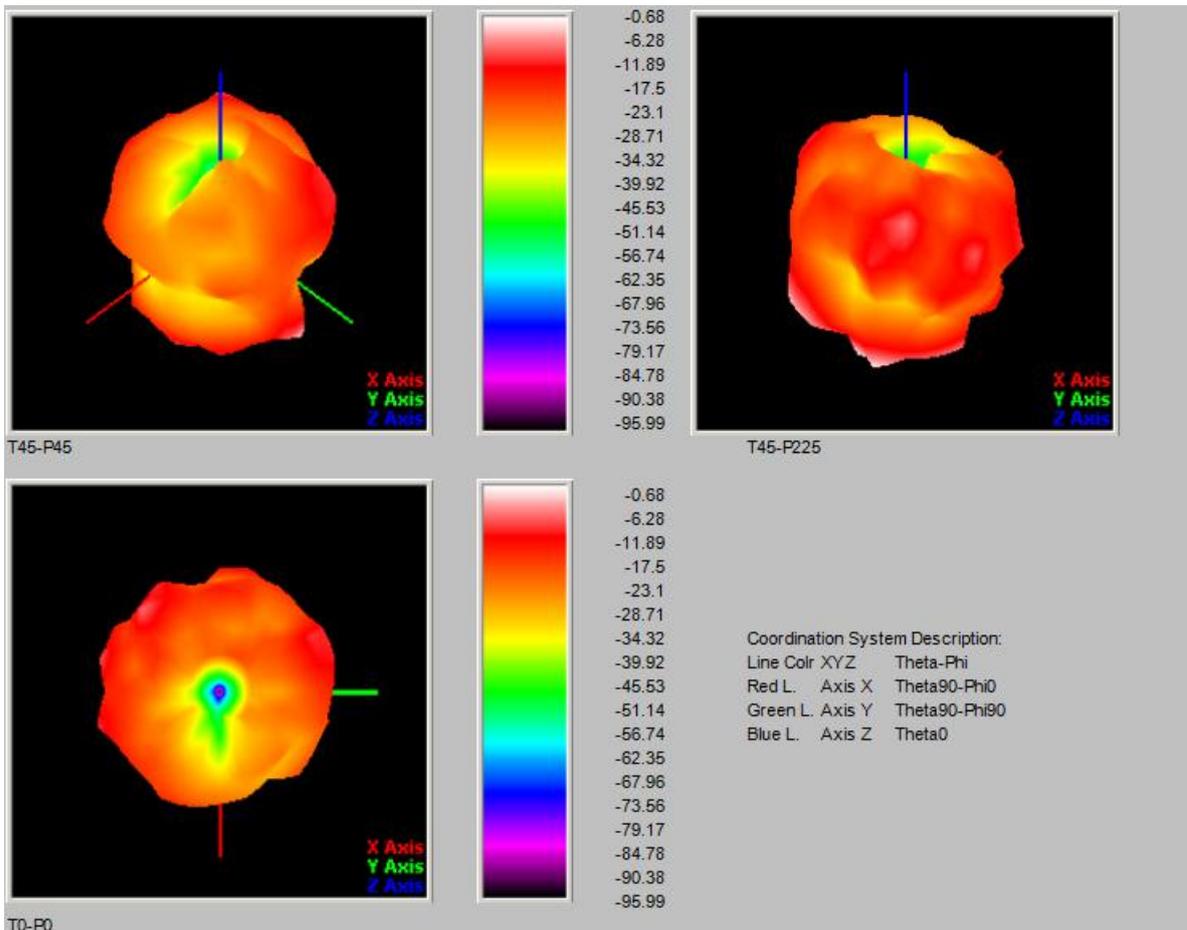
### 4.1.3      Matching Circuit Description

No matching.

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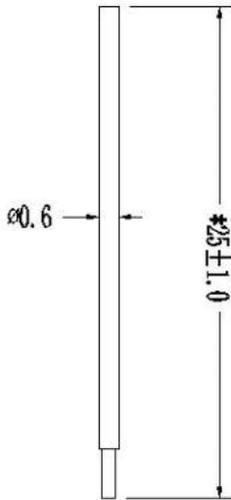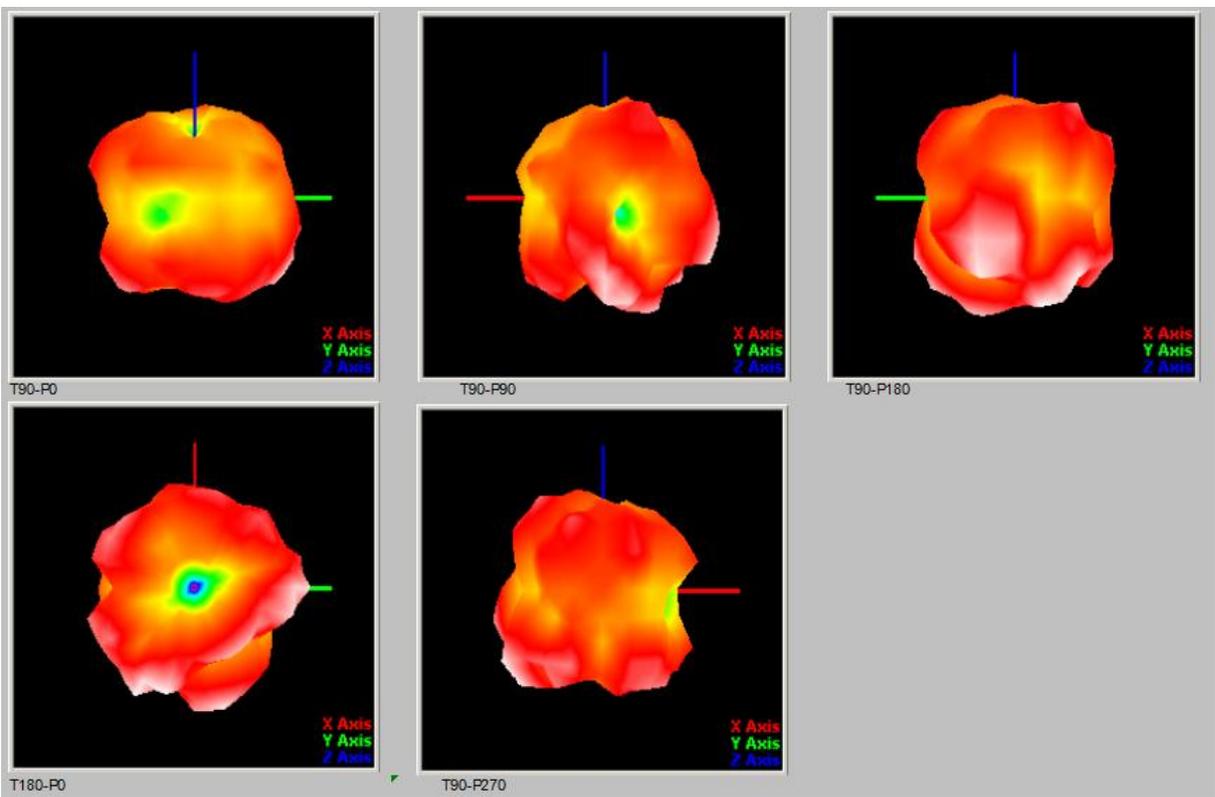
</div>

## 4.2　　Measurement Data

| Test Point ID | Freq. (MHz) | TRP (dBm) | Gain (dBi) | Directivity (dBi) | Efficiency (%) |
|---|---|---|---|---|---|
| 1 | 2400.0 | 2400.00 | -0.57 | 4.61 | 30.3% |
| 2 | 2410.0 | 2410.00 | -0.68 | 4.32 | 31.7% |
| 3 | 2420.0 | 2420.00 | 1.48 | 6.15 | 34.1% |
| 4 | 2430.0 | 2430.00 | 0.41 | 5.09 | 34.0% |
| 5 | 2440.0 | 2440.00 | 0.02 | 5.10 | 31.1% |
| 6 | 2450.0 | 2450.00 | -0.09 | 4.35 | 36.0% |
| 7 | 2460.0 | 2460.00 | -0.63 | 4.00 | 34.4% |
| 8 | 2470.0 | 2470.00 | 0.24 | 4.98 | 33.6% |
| 9 | 2480.0 | 2480.00 | -0.97 | 3.10 | 39.2% |
| 10 | 2490.0 | 2490.00 | 0.92 | 4.42 | 44.7% |
| 11 | 2500.0 | 2500.00 | 2.41 | 5.19 | 52.7% |



T45-P45

T45-P225

T0-P0

```
-0.68
-6.28
-11.89
-17.5
-23.1
-28.71
-34.32
-39.92
-45.53
-51.14
-56.74
-62.35
-67.96
-73.56
-79.17
-84.78
-90.38
-95.99
```

Coordination System Description:
Line Colr XYZ      Theta-Phi
Red L.    Axis X   Theta90-Phi0
Green L.  Axis Y   Theta90-Phi90
Blue L.   Axis Z   Theta0

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T90-P0



T90-P90



T90-P180



T180-P0



T90-P270



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