

# Antenna specification

|                       |                  |                       |                    |
|-----------------------|------------------|-----------------------|--------------------|
| Customer Name         | ZKTECO CO., LTD. |                       |                    |
| Customer Project Name | D3               | Surbaner Project Name | D3                 |
| Customer P/N          | A86020051        | Surbaner P/N          | 3160-170-00475-V01 |
| Band                  | 2. 4-2. 5GHz     |                       |                    |
| Version               | A0               |                       |                    |
| Designer Information  |                  |                       |                    |
| RF Engineer           | Zeng Xinrong     | R&D Diretor           | Zhu Haokui         |
| ME Engineer           | Zou Rongkai      |                       |                    |

| Surbaner Approval |               |               |               | Customer Approval |             |
|-------------------|---------------|---------------|---------------|-------------------|-------------|
|                   | Prepared By   | Checked By    | Approval By   | Checked By        | Approval By |
| Signature         | Liu Shengrong | zhuhaokui     | ZengBinghao   |                   |             |
| Date              | Oct. 24. 2022 | Oct. 24. 2022 | Oct. 24. 2022 |                   |             |

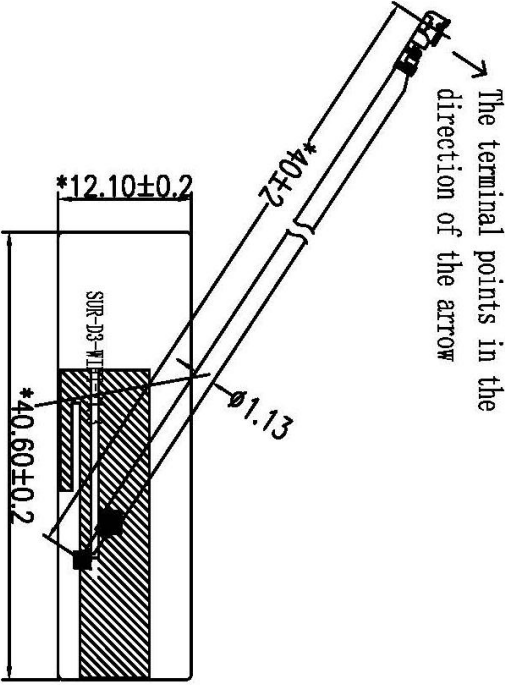
| Change Log |                    |                  |             |      |
|------------|--------------------|------------------|-------------|------|
| Version    | Change Description | Person in Charge | Approval By | Date |
|            |                    |                  |             |      |
|            |                    |                  |             |      |
|            |                    |                  |             |      |

|   |   |   |   |   |     |             |      |        |
|---|---|---|---|---|-----|-------------|------|--------|
| 1 | 2 | 3 | 4 | 5 | 6   | 7           | 8    |        |
|   |   |   |   |   | Rev | Description | Date | Remark |
|   |   |   |   |   | A   | New drawing |      |        |
|   |   |   |   |   | B   |             |      |        |

Screen printed characters

SUR-D3-WIFI-V1.3



The terminal points in the direction of the arrow

\*12.10±0.2

\*40.60±0.2

\*40±2

\*1.13

SUR-D3-WIFI-V1.3

## Sample Dimensions Test Report

|                  |                         |              |                 |              |                    |
|------------------|-------------------------|--------------|-----------------|--------------|--------------------|
| Customer Name    | Shang Ji                | Customer P/N | A86020051       | Surbaner P/N | 3160-170-00475-V01 |
| Test Date        | 2022/10/22              | Sample Qty.  | 3               | Inspector    | Zeng Xinrong       |
| Dimension No.    | Standard                | Sample 1     | Sample 2        | Sample 3     | Pass/NG            |
| ①FPC length      | 40.60±0.2mm             | 40.62        | 40.60           | 40.61        | Pass               |
| ②FPC Width       | 12.10±0.2mm             | 12.11        | 12.10           | 12.09        | Pass               |
| ③FPC Thickness   | 0.12±0.05mm             | 0.12         | 0.12            | 0.121        | Pass               |
| ④Long line       | 40±2mm                  | 40.1         | 40              | 40           | Pass               |
| ⑤                |                         |              |                 |              |                    |
| ⑥                |                         |              |                 |              |                    |
| ⑦                |                         |              |                 |              |                    |
|                  |                         |              |                 |              |                    |
| Conclusion       |                         |              |                 |              | PASS               |
| Inspector & Date | Zeng Xinrong 2022/10/22 |              | Approval & Date |              |                    |

## RF Performance Test Report

|               |            |              |           |              |                    |
|---------------|------------|--------------|-----------|--------------|--------------------|
| Customer Name | Shang Ji   | Project Name | D3        | Surbaner P/N | 3160-170-00475-V01 |
| Band          | 2.4-2.5GHz | Test Date    | 2022/6/14 | Inspector    | Zeng Xinrong       |

### Antenna Test Equipment Introduction

Test of antenna input characteristics using Agilent E5071C and Agilent 5062A vector network analyzer; The radiation pattern of the antenna are tested using the Satimo starlab 3D near field Anechoic Chamber, and the instrument is used to agilent8960 E5515 and Agilent E4438C. The test coordinates of the darkroom are as follows:

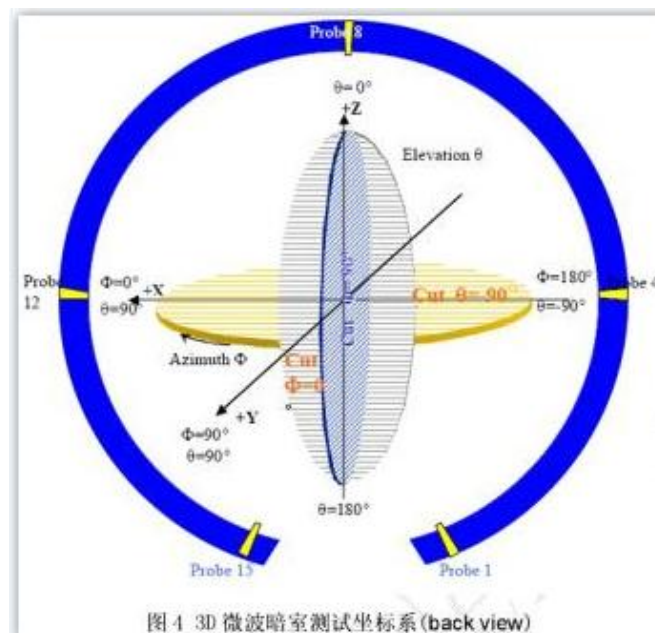
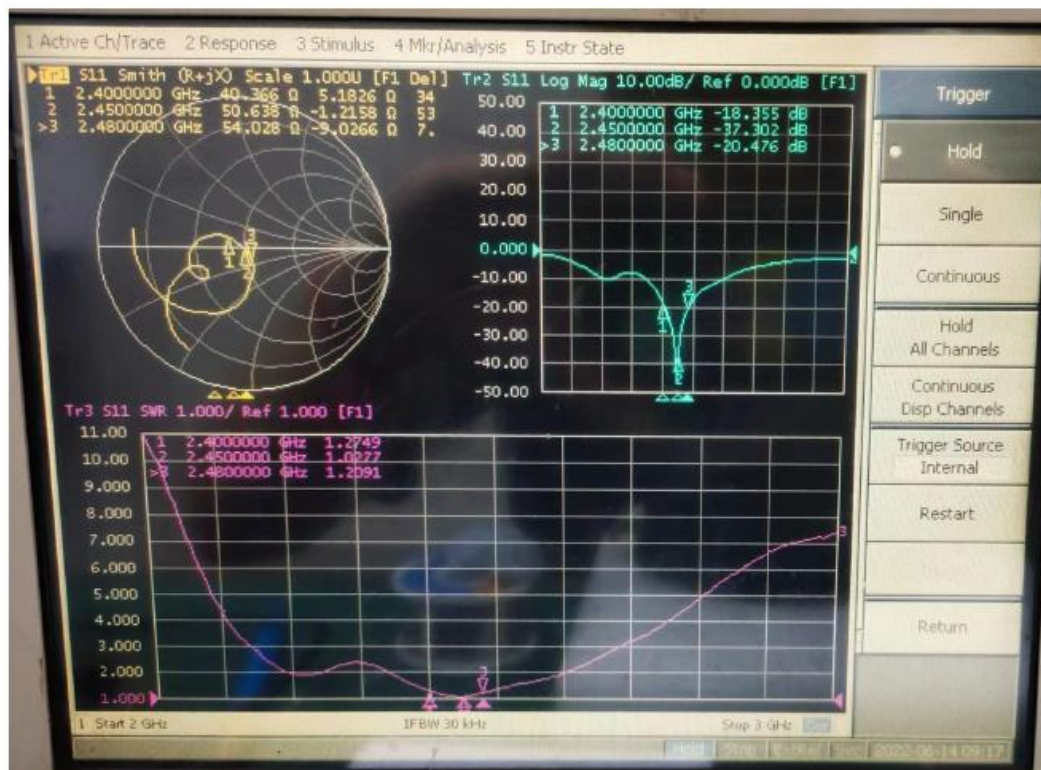


图4 3D微波暗室测试坐标系(back view)

### 1. S11 Parameter-VSWR

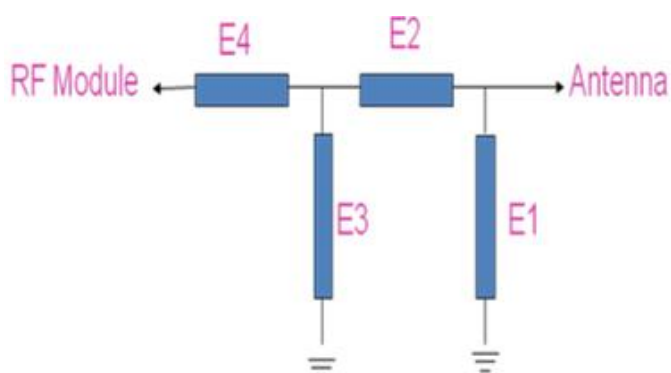
Measuring Method is a 50Ωcoaxial cable is connected to the antenna. Then this cable is connected to a network analyzer to measure the S11 parameter, Keeping this fixture away from metal at least 20cm.

## S11 Parameter-VSWR



| Frequency | 2400 | 2450 | 2500 |
|-----------|------|------|------|
| VSWR      | 1.27 | 1.02 | 1.20 |

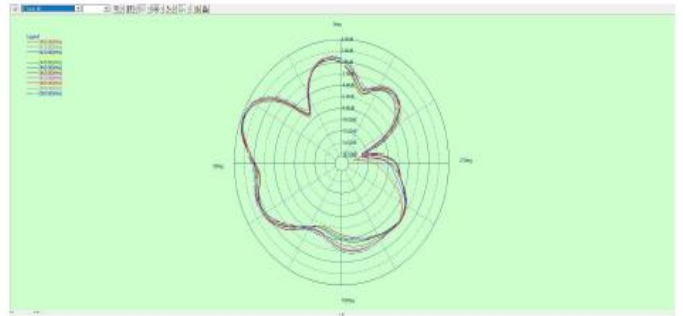
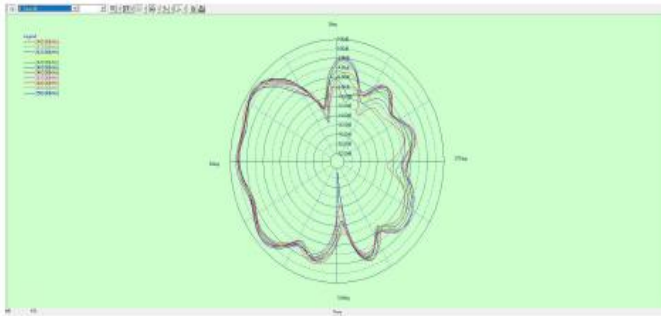
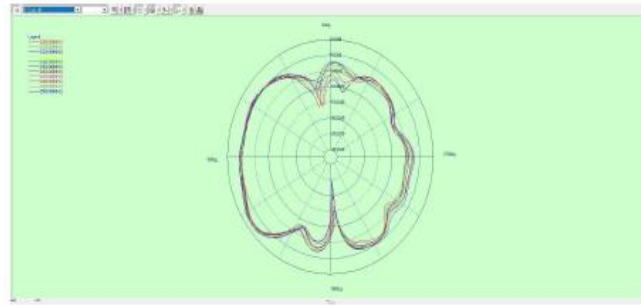
## 2. Antenna Matching Network



| Element | Capacitor | Inductor |
|---------|-----------|----------|
| E1      | N/A       | N/A      |
| E2      | N/A       | N/A      |
| E3      | N/A       | N/A      |
| E4      | N/A       | N/A      |

PCB board end matching circuit has not been changed

## 2D Pattern



## 3. Gain & Efficiency

| Frequency (MHz) | Efficiency (%) | Peak GAIN (dBi) |
|-----------------|----------------|-----------------|
| 2400            | 52.19          | 2.51            |
| 2410            | 53.15          | 2.46            |
| 2420            | 56.42          | 2.75            |
| 2430            | 55.98          | 2.78            |
| 2440            | 53.77          | 2.61            |
| 2450            | 55.68          | 2.56            |
| 2460            | 60.24          | 2.90            |
| 2470            | 59.04          | 2.74            |
| 2480            | 55.87          | 2.39            |
| 2490            | 57.46          | 2.66            |
| 2500            | 61.29          | 2.93            |

#### 4.OTA

|                 |                   |         |          |          |
|-----------------|-------------------|---------|----------|----------|
| Test Equipment: | R&S CMW270        |         |          |          |
| Test Condition: | 3D chamber        |         |          |          |
| Band            | Wireless Protocol | Channel | TRP(dBm) | TIS(dBm) |
| WIFI            | 802.11 b/11Mbps   | 1       | 16.83    | -80.21   |
|                 |                   | 6       | 16.74    | -81.38   |
|                 |                   | 11      | 15.70    | -79.64   |
|                 | 802.11 g/54Mbps   | 1       | 11.93    | -68.13   |
|                 |                   | 6       | 11.89    | -67.03   |
|                 |                   | 11      | 11.23    | -65.64   |
|                 | 802.11 n/65Mbps   | 1       | 11.69    | -62.23   |
|                 |                   | 6       | 11.66    | -62.29   |
|                 |                   | 11      | 10.91    | -60.44   |

#### 5.Antenna position map

