

# Testing Report

Customer Name: HangZhou Sky-Lighting Co., Ltd.

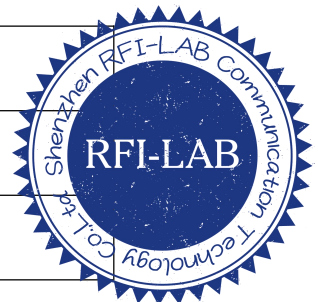
Product Name: Driver Antenna

Sample Model: G45-PA-Beacon BL RGBCW

Reference Standard: *GB/T 9410-2008; ANSI/IEEE Std 149-1979*

Issue Date: 2022.11.10

|                   |                  |
|-------------------|------------------|
| Engineer: Jackson | Date: 2022.11.9  |
| Auditor: Eason    | Date: 2022.11.10 |
| Approver: Janson  | Date: 2022.11.10 |



## Version

| Version No. | Date       | Description                   | Formulate | Approval |
|-------------|------------|-------------------------------|-----------|----------|
| A0          | 2022.11.10 | For the first time, formulate | Jackson   | Eason    |
|             |            |                               |           |          |
|             |            |                               |           |          |

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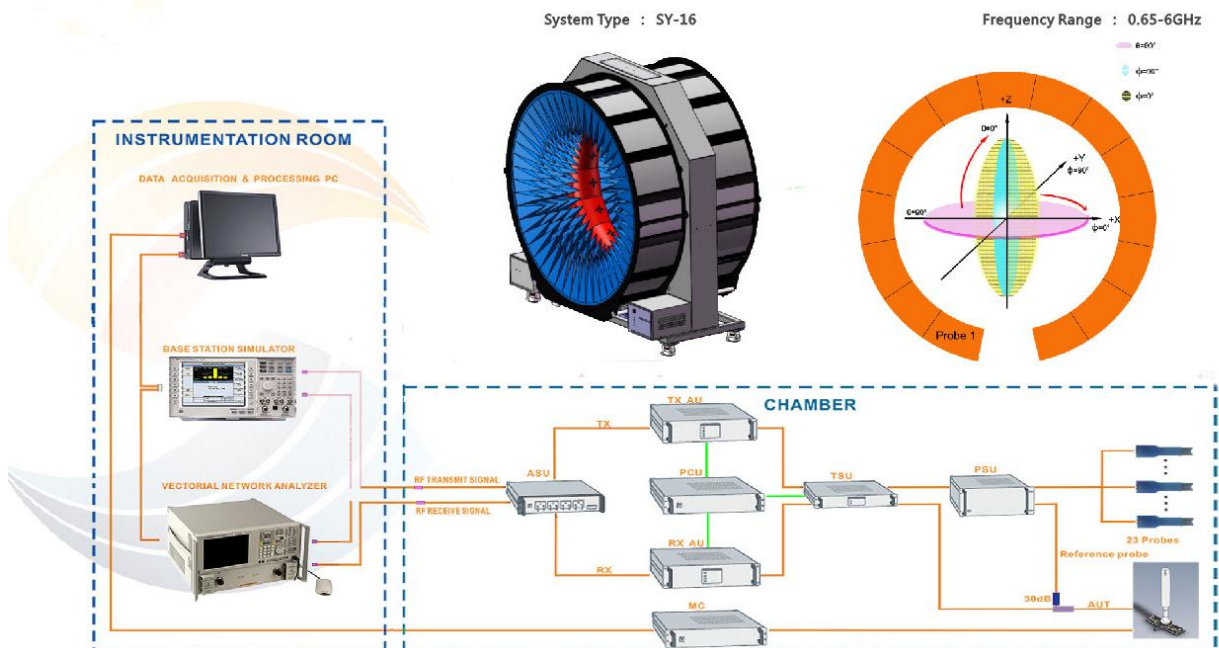
# 1.General Information

## 1.1 General information of testing institutions

|           |                                                                                                         |
|-----------|---------------------------------------------------------------------------------------------------------|
| Name      | Shenzhen RFI-LAB Communication Technology Co., Ltd.                                                     |
| Address   | 10/F A, Lingyun Bld, Liufang Rd, Baoan District, SZ                                                     |
| Tel       | 13682621346                                                                                             |
| E-mail    | rfi-lab@tech-now.com                                                                                    |
| Equipment | All the equipment used in the report is fixed in<br>10/F A, Lingyun Bld, Liufang Rd, Baoan District, SZ |

## 1.2 Testing principle

### Multi-Probe OTA Measurement System



### 1.3 Test equipment

| Equipment                  | Model No. | Serial No.     | Manufacturer | Calibration date | Next calibration date |
|----------------------------|-----------|----------------|--------------|------------------|-----------------------|
| 16 probe microwave chamber | 3*3*2.5   | RFI-LAB-RF-A00 | SUNYIELD     | 2021.3.15        | 2023.3.14             |
| Network Analyzer           | E5071C    | RFI-LAB-RF-A02 | Agilent      | 2022.5.13        | 2023.5.12             |

### 1.4 Test environment

|             |           |
|-------------|-----------|
| Temperature | 23.7℃     |
| Humidity    | 59%RH     |
| Pressure    | 100.12kPa |

### 1.5 Statement

- (1) The test results in the report are only applicable to the tested samples and the tested samples work under the environment described in the report.
- (2) Only Shenzhen RFI-LAB Communication Technology Co., Ltd. have the right to modify the report, and the modification information shall be annotated in the revision form.
- (3) Any objection to this report shall be raised within 30 days after formal confirmation of the report.
- (4) This report is invalid if there is any evidence that the sample information provided is falsified.
- (5) The report is invalid without the signature of the auditor and approver.

## 2.Sample Information

### 2.1 Client information

|                     |                                 |
|---------------------|---------------------------------|
| <b>Name</b>         | HangZhou Sky-Lighting Co., Ltd. |
| <b>Address</b>      | /                               |
| <b>Contacts</b>     | Junhong Dong                    |
| <b>Tel</b>          | 0571-86263850                   |
| <b>E-mail</b>       | Dong@sky-lighting.cn            |
| <b>Manufacturer</b> | HangZhou Sky-Lighting Co., Ltd. |

### 2.2 Description of EUT(S)

|                        |                                             |
|------------------------|---------------------------------------------|
| <b>Product Name</b>    | Driver Antenna                              |
| <b>Sample Model</b>    | G45-PA-Beacon BL RGBCW                      |
| <b>Size</b>            | /                                           |
| <b>Serial No.</b>      | /                                           |
| <b>Test Item</b>       | Antenna gain; Efficiency; Radiation pattern |
| <b>Frequency Range</b> | 2400-2500MHz                                |
| <b>Received Date</b>   | 2022.11.9                                   |
| <b>Test Date</b>       | 2022.11.9                                   |
| <b>Remark</b>          | The length of the RF cable is 20mm          |

## 2.3 EUT appearance

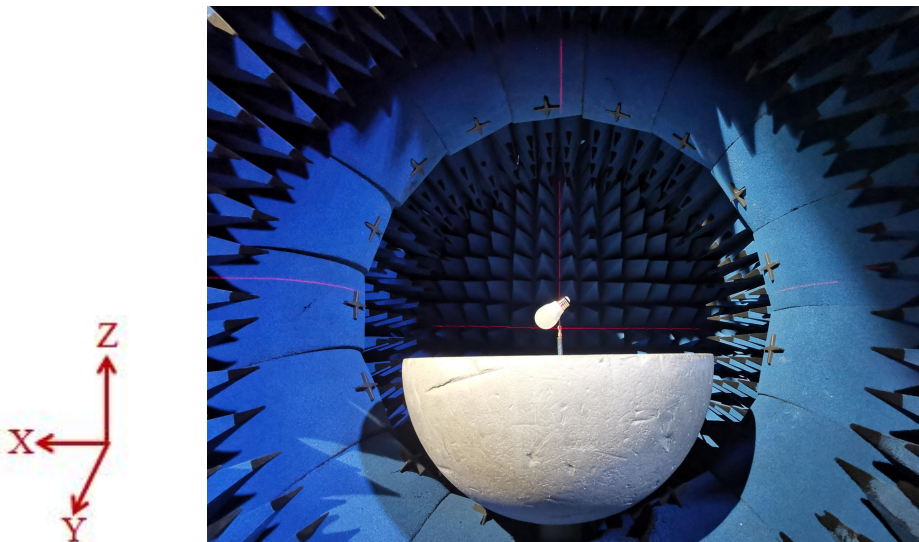
### Annex 1: Antenna information

## 2.4 DUT setup photo of free space OTA testing

Planform



Front view



## 3. Test Results

### 3.1 Test standard

| Name                         | Parameter            | Method                                                               | Standard no.           |
|------------------------------|----------------------|----------------------------------------------------------------------|------------------------|
| Mobile communication antenna | Antenna gain         | Generic specification for antennas used in the mobile communications | GB/T 9410-2008         |
|                              | Radiation pattern    |                                                                      |                        |
| Antenna                      | Radiation efficiency | IEEE Standard Test Procedures for Antennas                           | ANSI/IEEE Std 149-1979 |
|                              | Gain and directivity |                                                                      |                        |

### 3.2 Test uncertainty

The uncertainty was calculated on the basis of the GUM published by ISO, using the inclusion factor of  $K=2$  and the 95% confidence level to express the extended uncertainty.

| Item                 | Uncertainty      |
|----------------------|------------------|
| Antenna gain         | $\pm 1\text{dB}$ |
| Radiation efficiency | $\pm 10\%$       |

### 3.3 Test data

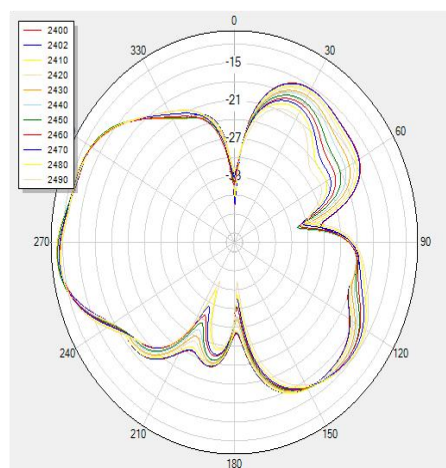
#### 3.3.2 Typical free space efficiency and gain

| Frequency/MHz | 2400   | 2402   | 2410  | 2420  | 2430  | 2440   | 2450  | 2460   | 2470   | 2480  | 2490   | 2500  |
|---------------|--------|--------|-------|-------|-------|--------|-------|--------|--------|-------|--------|-------|
| Peak Gain/dBi | -10.07 | -10.02 | -9.93 | -9.96 | -9.86 | -10.01 | -9.93 | -10.29 | -10.13 | -10.3 | -10.38 | -10.8 |
| Efficiency/%  | 2.65   | 2.65   | 2.61  | 2.54  | 2.49  | 2.42   | 2.36  | 2.23   | 2.25   | 2.23  | 2.16   | 2.04  |

#### 3.3.3 Typical free space radiation pattern

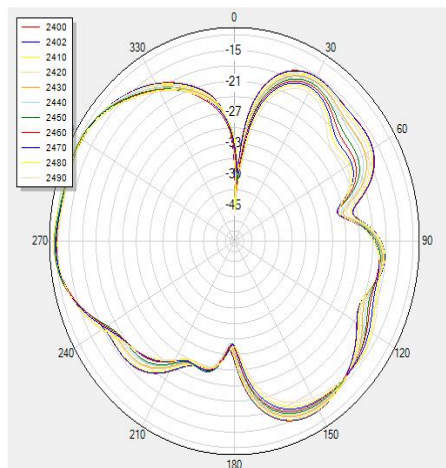
(1) X-Z Plane:

V Phi=0



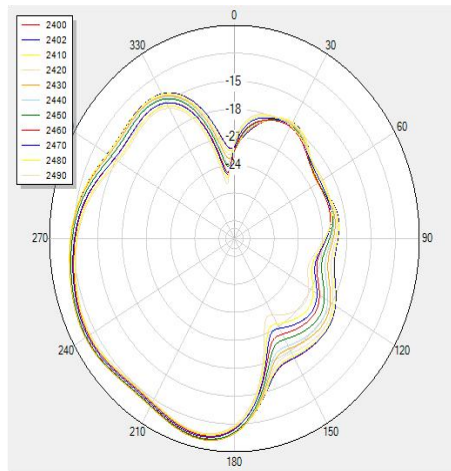
(2) Y-Z Plane:

V Phi=90

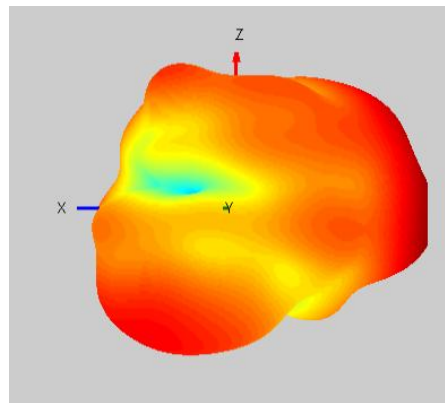


(3) X-Y Plane:

**H Theta=90**



(4) Typical Free Space 3D Radiation Pattern at 2.45GHz:



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