

# Specification

**Customer Name :Chengdu Heltec Automation Technology Co., Ltd.**

**Part No.:Tracker-LDS Antenna**

**Customer P/N :**

**Manufacturer Name :Chengdu VAE Communication Co., Ltd**

**Manufacturer Addr.: Room 201-03, 2F, Unit 1, Bldg IC Park, No. 2 Heshun Rd, High-Tech West Zone, Chengdu, Sichuan, China**

**Manufacturer P/N :648220601201**

| Made        | Check   | Approve |
|-------------|---------|---------|
| Songhao Lin | Guo Dai | Wei Liu |
| Sample Date | Version |         |
| 2025.09.03  | V1      |         |

## Revise Record

| Version                                                                                                                               | Record of change | Made        | Approve | Date       |
|---------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------|---------|------------|
| V1                                                                                                                                    | Initial Release  | Songhao Lin | Wei Liu | 2025.09.03 |
|                                                                                                                                       |                  |             |         |            |
|                                                                                                                                       |                  |             |         |            |
|                                                                                                                                       |                  |             |         |            |
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|                                                                                                                                       |                  |             |         |            |
|                                                                                                                                       |                  |             |         |            |
| <b>Note</b><br><br>1. The version number must be updated (e.g., from V1 to V2, V3, etc.) whenever product specifications are changed. |                  |             |         |            |

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## 2. Antenna Specification

### 2.1. Electrical Specification

| Electrical Specification  |                       |
|---------------------------|-----------------------|
| Operation Frequency (MHz) | 2400-2500             |
| Impedance (Ohms)          | 50                    |
| VSWR                      | 2400-2500≤ 2.0        |
| Efficiency (%)            | 2400-2500: 53.32      |
| Peak Gain (dBi)           | 2400-2500: 2.32       |
| Radiation Properties      | Omnidirectional       |
| Polarization              | Vertical Polarization |
| Max input Power (Watts)   | 50                    |

## 2.2 Mechanical Parameter

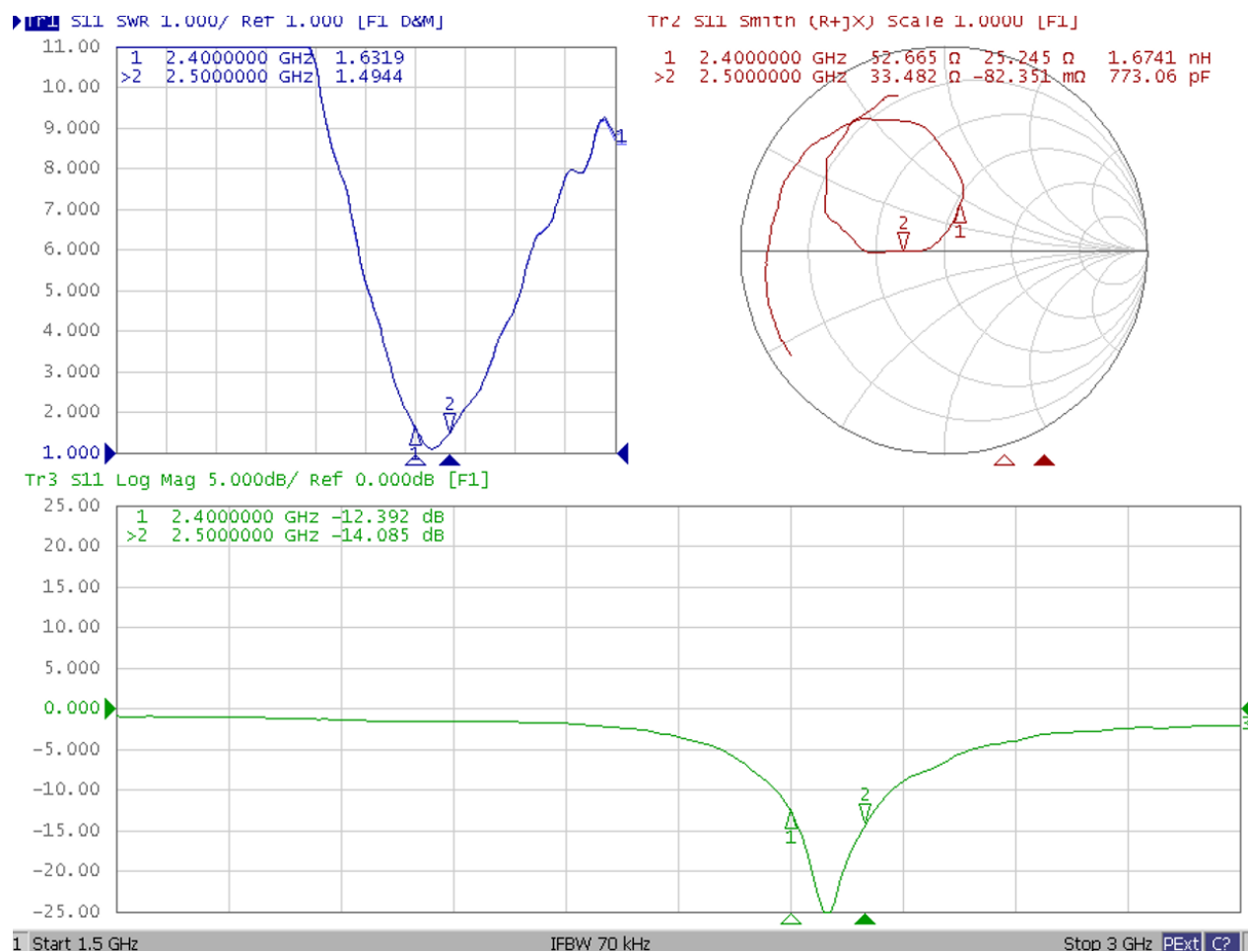
| Mechanical Parameter |              |
|----------------------|--------------|
| Structure Type       | LDS Antenna  |
| Dimension            | 53*25.4*6.65 |
| Material             | PC+Cu+Ni     |
| Salt Spray           | 48H          |

## 2.3 Environment Specification

| Environment Specification |               |
|---------------------------|---------------|
| Operating temperature     | -40°C ~ +80°C |
| Storage temperature       | -40°C ~ +80°C |

## 3. Passive Test Data

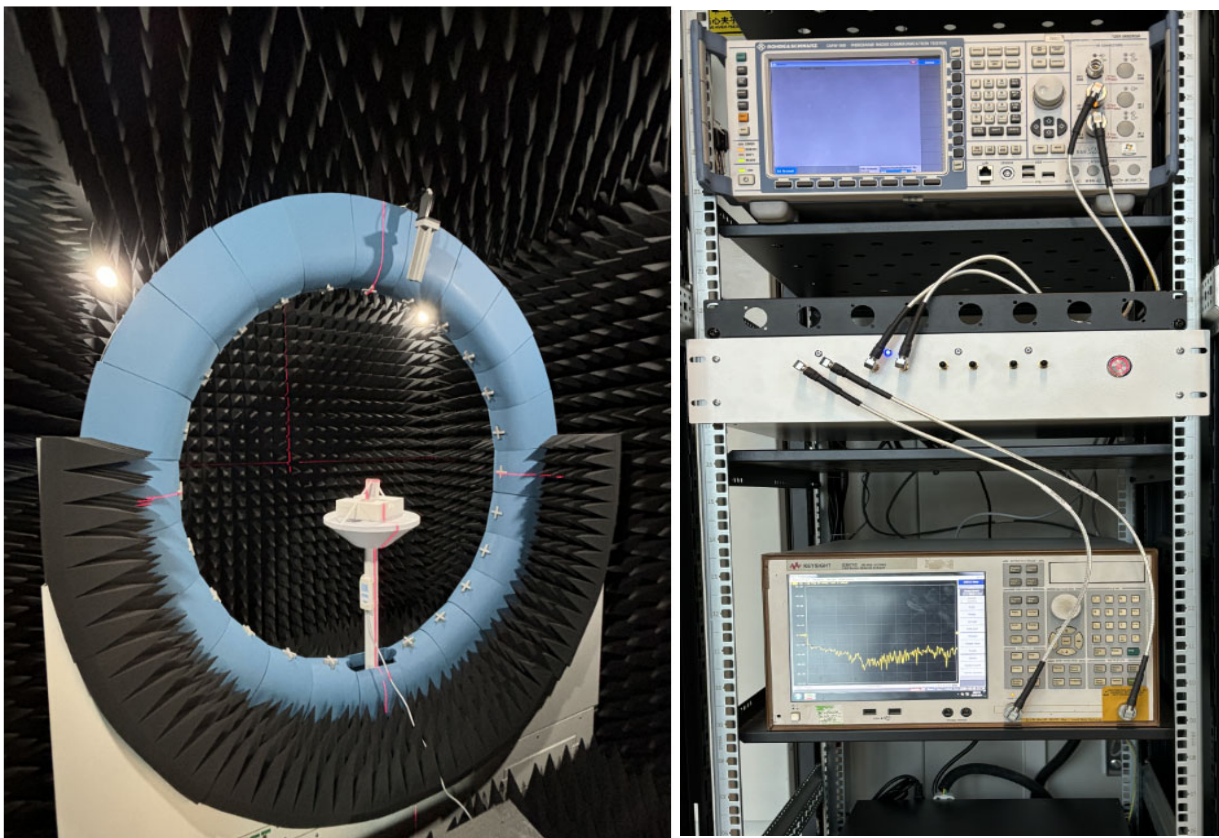
### 3.1. VSWR / Smith chart / Return loss



2400MHz-2500MHz

### 3.2 Test System

Multi-probe spherical near-field anechoic chamber test system that meets the relevant international regulations such as CTIA and 3GPP, a multi-functional wireless test system with excellent performance in radio frequency, absorption, and mechanical structure. The system has high integration and reliability. It supports pendulum sampling frequency-doubling technology and can be adapt to the testing needs of small multi-lobed antennas. It is suitable for the wireless testing of small high-integration electronic devices such as IoT devices, drone modules, car machine modules, smart home devices, and mobile communication equipment. It can also meet the testing needs of ceiling antennas, miniature base stations, and embedded routers, etc., which have high dependence on the passive performance of antennas.

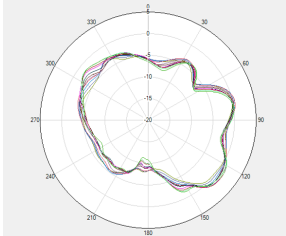
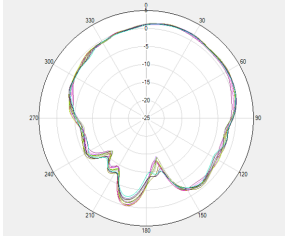
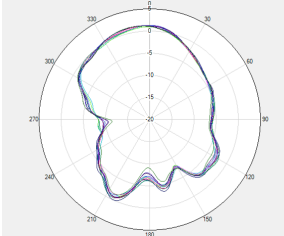


|                       |                                                                                                                   |
|-----------------------|-------------------------------------------------------------------------------------------------------------------|
| <b>Supported Bnad</b> | <b>600MHz-9GHz (Expand. 12GHz)</b>                                                                                |
| <b>Test Item</b>      | <b>Passive: Gain/Efficiency/2D/3D radiation/non-circularity/axial ratio...<br/>Active: TRP/TIS/EIRP/EIS</b>       |
| <b>Test Standard</b>  | <b>2G/3G/4G/5G/Wi-Fi b/g/n/a/ac/ax/BT /NB-IOT /Cat-M (eMTC)/GPS/BEIDOU/GLONASS/ZigBee/LoRa(Non-signaling )...</b> |

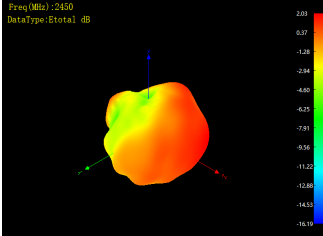
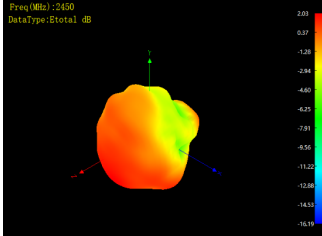
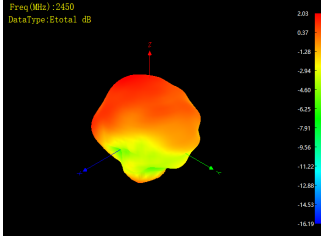
### 3.3. Efficiency & Gain

| Frequency (MHz) | Efficiency (%) | Gain(dBi) |
|-----------------|----------------|-----------|
| 2400            | 51.40          | 1.66      |
| 2410            | 52.72          | 1.71      |
| 2420            | 54.95          | 1.82      |
| 2430            | 55.46          | 1.88      |
| 2440            | 52.60          | 1.83      |
| 2450            | 53.33          | 2.04      |
| 2460            | 52.97          | 2.14      |
| 2470            | 55.21          | 2.25      |
| 2480            | 53.95          | 2.32      |
| 2490            | 52.97          | 2.28      |
| 2500            | 50.93          | 2.30      |
| AVG             | 53.32          | 2.02      |

### 3.4. 2D Ridiation Model 2D

| Frequency(MHz) | XOY-plane                                                                         | XOZ-plane                                                                          | YOZ-plane                                                                           |
|----------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 2400-2500      |  |  |  |

### 3.5. 3D Ridiation Model 3D

| Frequency(MHz) | XOY-plane                                                                           | XOZ-plane                                                                            | YOZ-plane                                                                             |
|----------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 2450           |  |  |  |