

河南紫联物联网技术有限公司

Ultimate IOT (Henan) Technology Ltd.

Smart-Socket 天线规格书

Smart-Socket Antenna specification

日期 date 2022.11.22

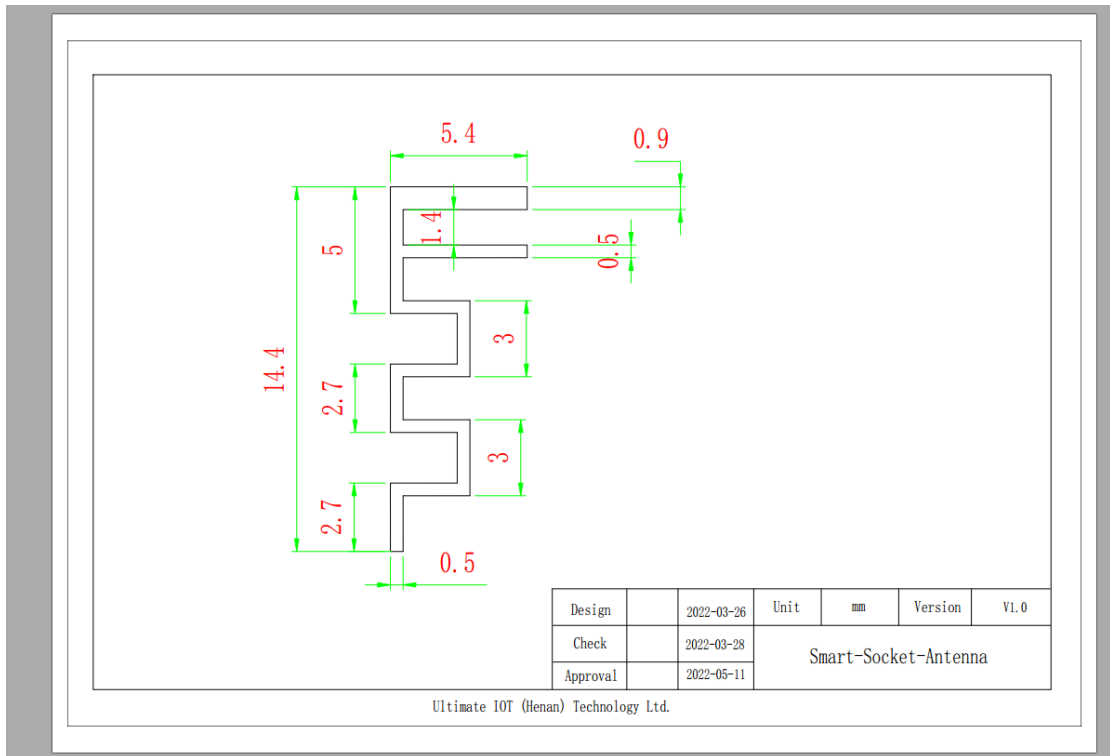
版本 edition V1.0

项目名称: project name SmartSocket

天线类型: Type of antenna PCB 天线 antennae

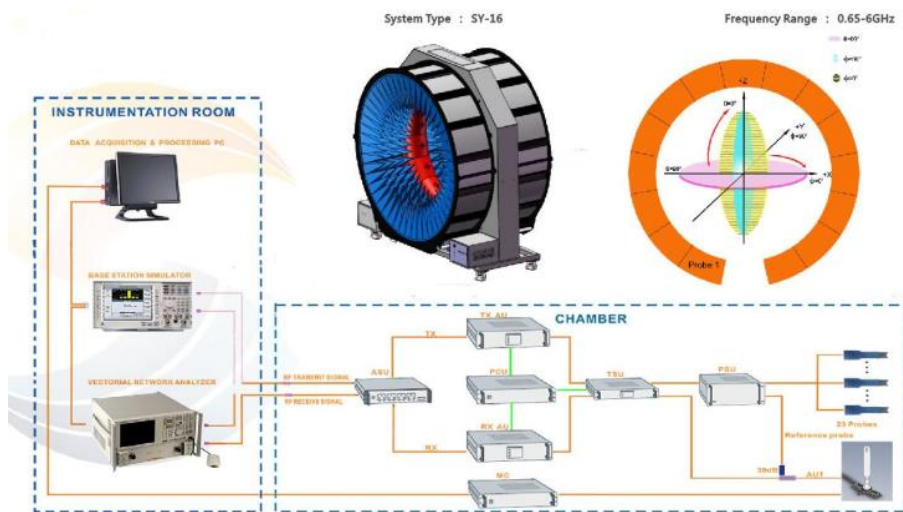
核准 producer	确认 affirm	审核 check
封盛 Feng Sheng	李银伟 LiyinWEI	李鑫 LiXin

PCB 天线图纸 PCB Drawing of antenna



一、基本信息 essential information

1.1 测试原理 Test Principles



1.2 测试设备 Testing Equipment

名称 name	型号 model	设备编号 equipment number	厂商 manufacturer	校准日期 Date of calibration	下次校准日期 Next calibration date
16 探头微波 暗室 16 probe microwave darkroom	3*3*2.5	RFI-LAB-RF-A00	SUNYIELD	2021.3.15	2023.3.14
网络分析仪 network analyzer	E5071C	RFI-LAB-RF-A02	Agilent	2021.3.13	2023.3.12
网络分析仪 network analyzer	E5071C	RFI-LAB-RF-C02	KEYSIGHT	2021.3.13	2023.3.12

1.3 测试环境 Test Environment

环境温度 environment temperature	23.7°C
相对湿度 relative humidity	59%RH
大气压强 atmospheric pressure	100.11kPa

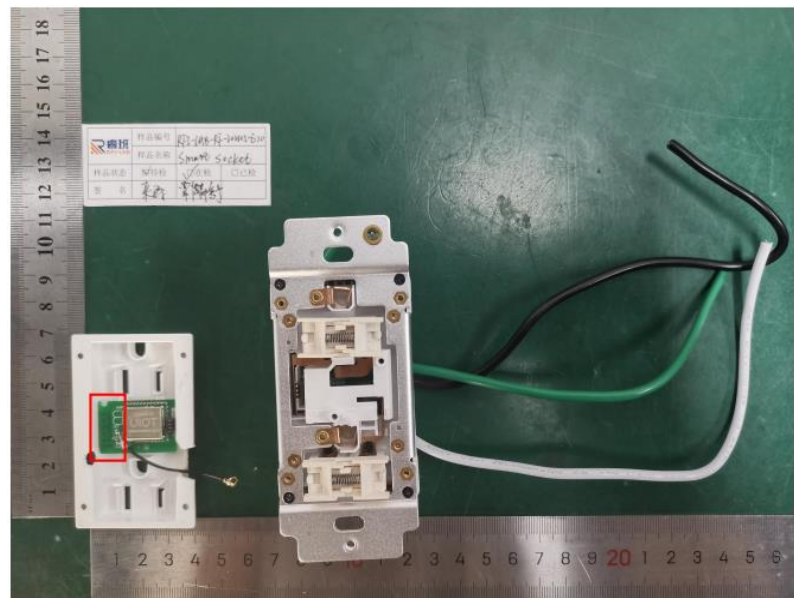
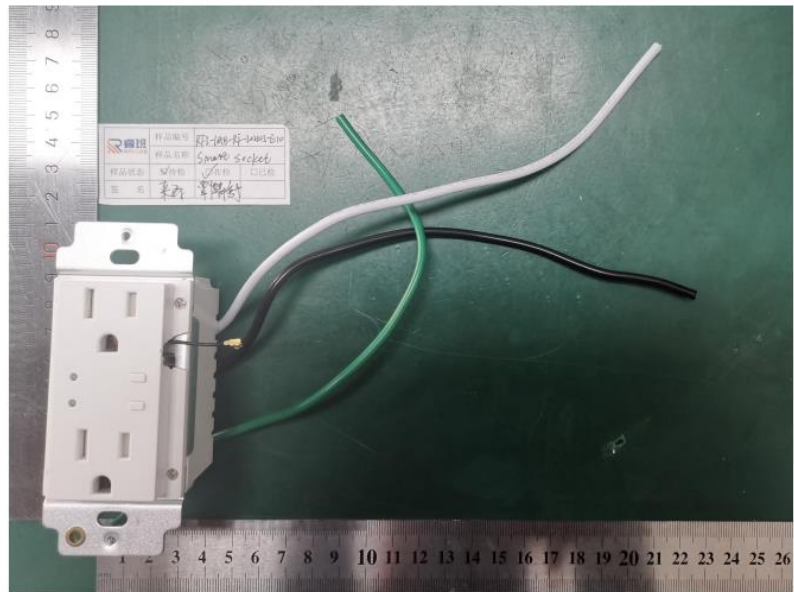
二、 样品信息 Sample information

2.1 测试项目 test item

驻波比； 增益； 效率； 辐射方向图； 方向图圆度

Standing wave ratio; Gain; Efficiency; Radiation direction diagram; Roundness of a directional graph

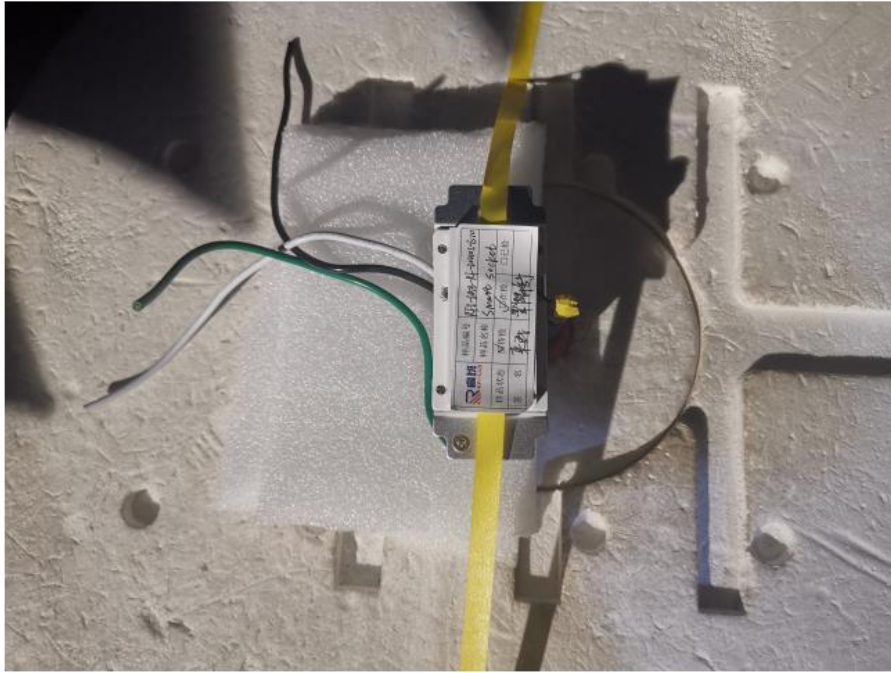
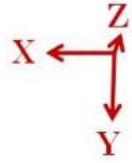
2.2 样品图片 sample picture



- 2.3 样品摆放图 Sample layout diagram

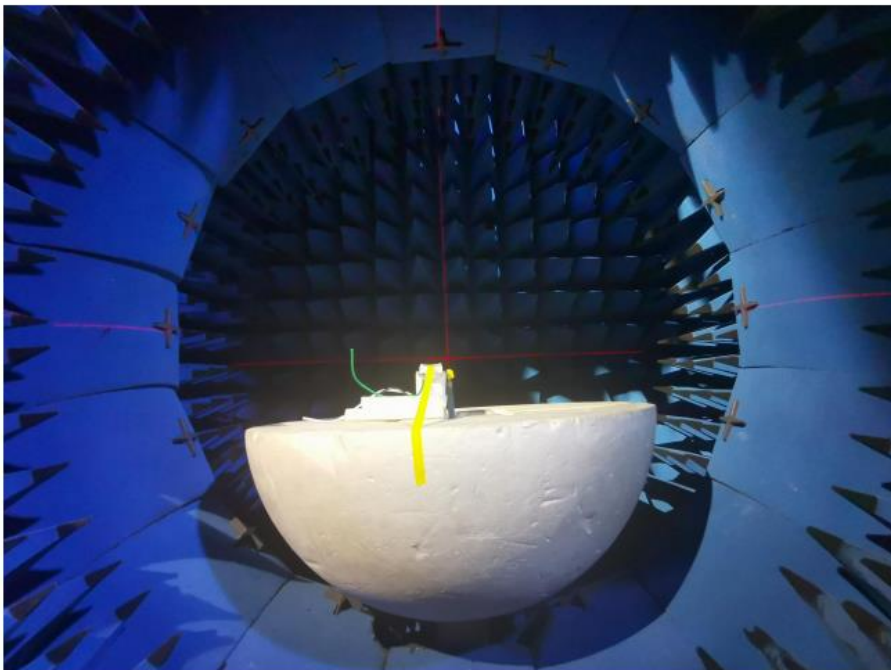
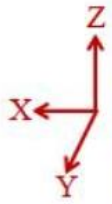
vertical view

俯视图



主视图

front view



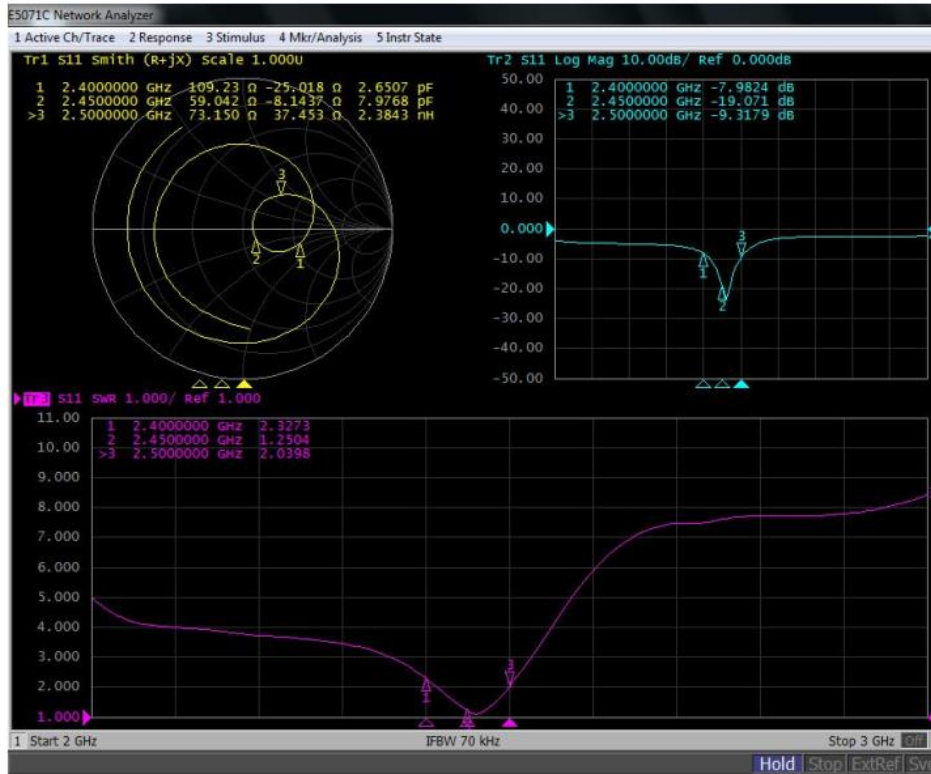
三、测试结果 test result

3.1 检测依据 detection principle

对象名称 Object name	参数名称 name of parameter	方法名称 Method Name	依据标准号 According to standard number
移动通信天线 Mobile communication antenna	辐射方向图 radiated pattern	移动通信天线通用技 术规范 General technical specification for mobile communication antennas	GB/T9410-2008
	天线增益 aerial gain		
	电压驻波比 Voltage Standing Wave Ratio		
	方向图圆度 Roundness of a directional graph		
天线 antenna	增益与方向性 Gain and directivity	IEEE 天线测试标准流 程 IEEE Standard Procedure for antenna testing	ANSI/IEEE Std 149-1979
	辐射效率 radiant efficiency		

3.2 测试数据 testing dataset

- 3.31 网络分析仪测试 Network analyzer test



3.31 驻波比 standing-wave ratio (SWR)

频率/MHz frequency	2400	2450	2500
电压驻波比 Voltage main wave ratio	2.3273	1.2504	2.0398

- 3.31 增益和效率 **Gain and efficiency**

频率/MHz frequency	2400	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500
最大增益/dBi maximum gain	-3.11	-2.94	-2.66	-2.67	-2.6	-2.6	-2.76	-2.84	-3.08	-3.51	-3.85
平均增益/dBi Average Gain	-9.63	-9.51	-9.36	-9.28	-9.22	-9.12	-9.16	-9.19	-9.32	-9.56	-9.87
效率/% Efficient	10.88	11.18	11.58	11.81	11.98	12.24	12.14	12.04	11.70	11.06	10.31

3.34 方向图圆度 Roundness of a directional graph

频率/MHz frequency	2400	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500
H Theta=90/dB	11.09	11.73	12.55	12.91	13.21	13.47	13.79	14.37	14.64	14.66	14.94
V Phi=90/dB	12.68	12.69	13.54	13.44	13.3	17.31	20.35	18.13	15.57	15.17	15.03
V Phi=0/dB	11.45	10.91	11.09	11.57	12.96	16.06	18.77	15.09	16.14	21.82	16.9

3.35 方向图 directional diagram

