

Product Specification Acceptance Certificate

Mobile communication terminal antenna

Product design and manufacturing

Product Name : Live Streaming Camera

Customer name : ShenZhen Hollyland Technology Co.,Ltd

Customer part number:

CAS number:

Manufacturer	Shenzhen Zhongke Wireless Co., Ltd.			
Manufacturer confirmation	Quality	R&D Department	Structure;	Approval
Date: Year month Day	Date: January 18, 2025			



Manufacturer: Shenzhen ZHONGKE Mireless Co., LTD

Shenzhen address: 1st Floor, Building A, Jinrui Zhonghe Science and Technology Park, Dalang,

Longhua New District,zhen City

Dongguan address: No.1, 4th Floor, Langshi Road, Tangjiao, Changping Town, DongguanPhone:

29588096

1. Purpose

To standardize the specifications and test methods of mobile communication terminal antenna products produced by Shenzhen Zhongke Wireless Co., Ltd., in order to avoid caused by different test conditions and methods.

2. Product Category and Product Model Overview

2.1 Overview of Product Model

This report mainly outlines the electrical results of the antenna designed for the **Live Streaming Camera** project. This antenna is for the frequency band: 2.4G/5.8 WIFI band.

3. Basic parameters and experimental equipment description

3.1 基本参数

Product electrical performance indicators	
working frequency range	2400-2480MHz 5100-5850MHz
Standing wave ratio	2400-2480 MHz: < 2 5100-5850MHz: <2
Antenna gain	2400-2480 MHz: 3dbi (±1) 5100-5850MHz: 3.7dBi (±1)
Radiation efficiency	2400-2480 MHz: > 50% 5100-5850MHz: >50%
Impedance	50 ohm
Product material description	
FPC	Coaxial line
Product environmental description	
working temperature	- 30℃ ~ + 85 ℃
storing temperature	- 30℃ ~ + 85 ℃

3.2 Description of experimental equipment

List	Testing project	Equipment
1. S Parameters	1.Return loss 2. VSWR at	Network analyzer: Agilent 8753ES
2. Coupling power test	1. Transmission power 2. Receiving sensitivity	Comprehensive tester: Agilent 8960 E5515C
3. Radiation pattern and gain	1. Radiation pattern 2. Antenna gain	1. Darkroom: 7x4x3 m (3D) 2. Network analyzer : Agilent 8753ES

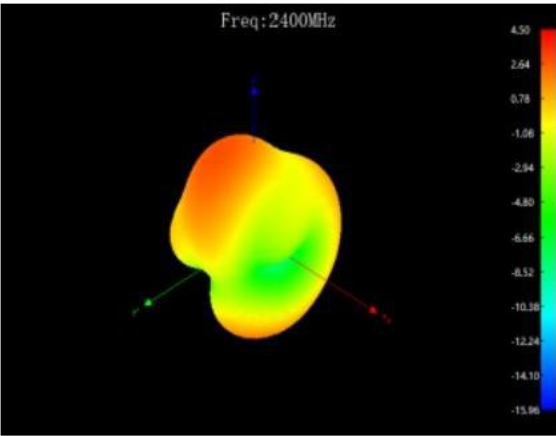
3. Antenna test data

4.1 Wifi:2.4G efficiency/gain;

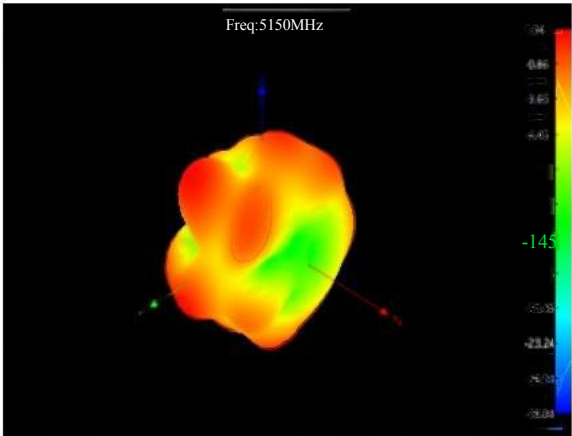
(WIFI 2#)			
Frequency/Mhz		Efficiency / %	MaxGain/dBi
2.4G	2400	52.59	3.73
	2410	57.42	3.16
	2420	60.69	3.81
	2430	63.63	3.84
	2440	64.39	3.84
	2450	64.63	3.64
	2460	59.27	3.11
	2470	53.56	3.48
	2480	51.71	2.99
	2490	50.18	2.79
	2500	49.84	2.56

WIFI			
Frequency/Mhz		Efficiency / %	MaxGain/dBi
5G	5150	56.26	3.22
	5200	55.58	3.16
	5250	52.09	3.32
	5300	59.89	3.59
	5350	62.37	3.59
	5400	67.02	3.65
	5450	61.05	3.68
	5500	64.26	3.13
	5550	68.53	3.61
	5600	65.59	3.39
	5650	58.08	3.51
	5700	58.08	3.55
	5750	52	3.82
	5800	54.26	3.82
	5850	53.95	3.68

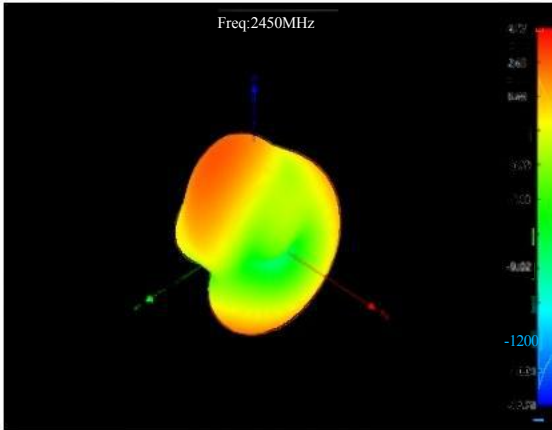
3D Directional Chart



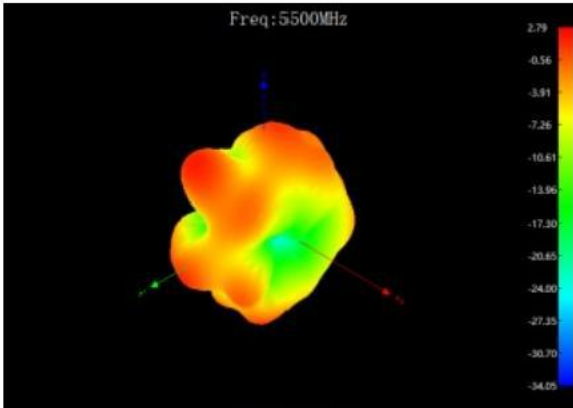
2400MHZ



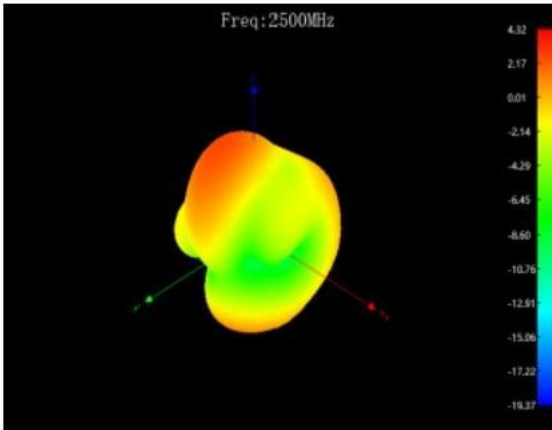
5150MHZ



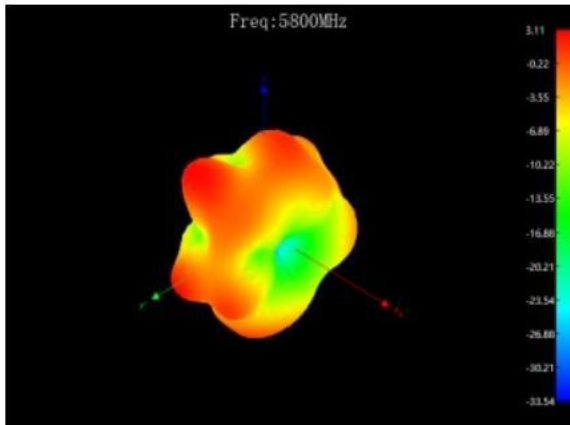
2450MHZ



5500MHZ

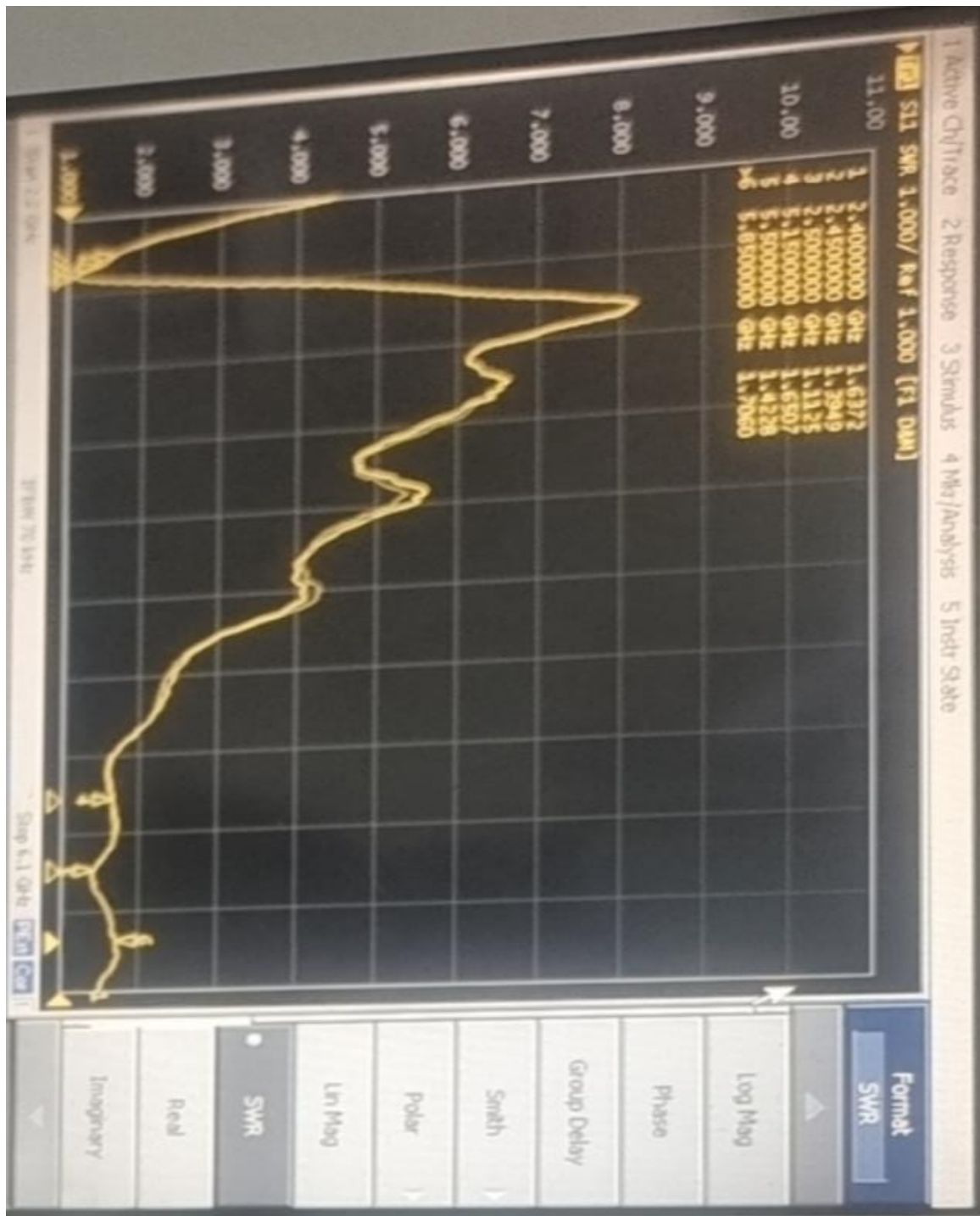


2500MHZ

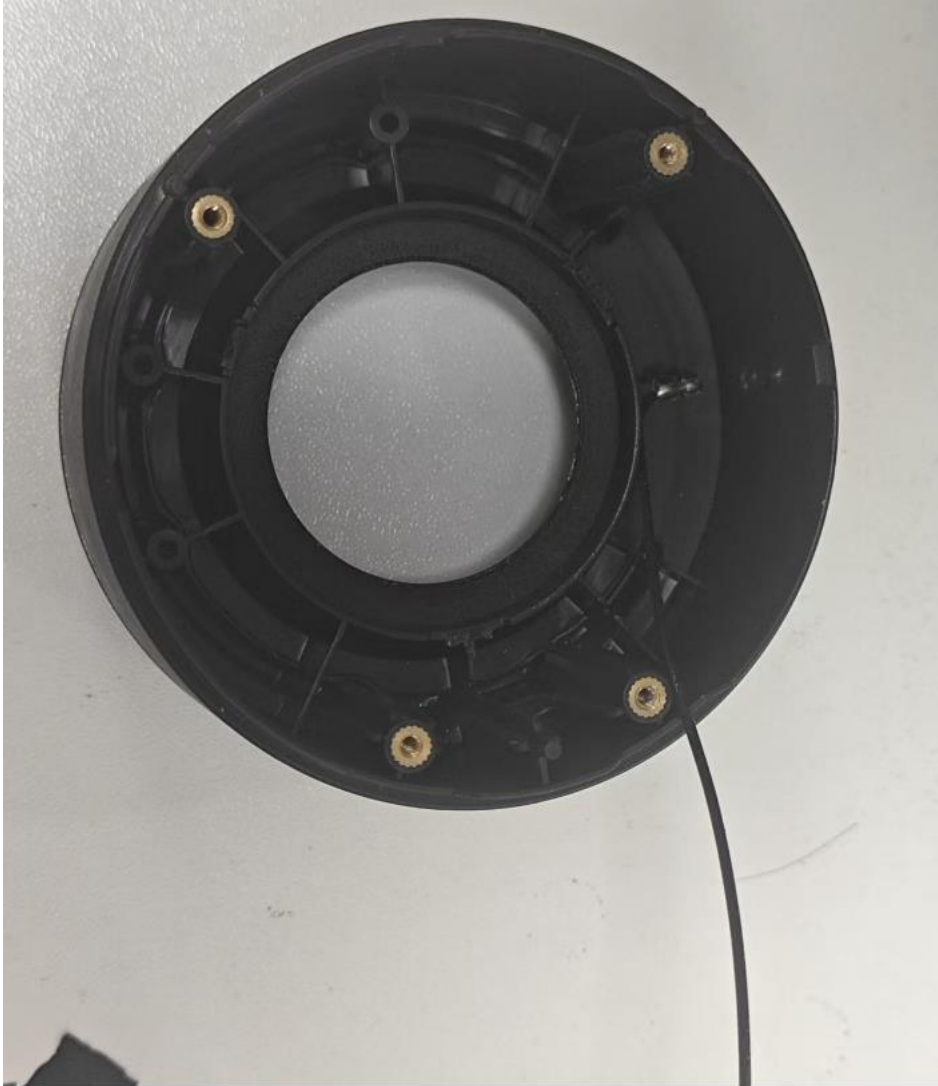


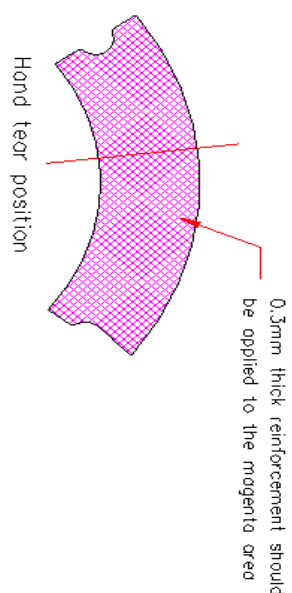
5850MHZ

4.4WIFI SWR



5.1 Antenna assembly diagram





Serial Number	material	DESCRIPTION	number
①	FPC	PI	1
②	Coolant line	BLACK IPEX-14, RFE1.13	1
③			

 Shenzhen Zhongke Wireless Technology Co., Ltd									
	Third	Project	C4602		DATA		2005.06.18		
0~10	±0.10	○ 0.02	Product Name		C4602-WF-R-V1.0		DESIGN		MD
10~20	±0.12	◎ 0.03	Item number		--		To Examine		
20~40	±0.15	⊥ 0.02	material quality		PI		RF		
40~	±0.20	▽ 0.04	appearance				Confirm		
Page	Total 1 Page		Page 1		Unit		mm/Proportion		1:1
								Version	A.D

7.1 Environmental Characteristic

Test Item	Test description
1. Low Temperature	Temp.: -20 °C Time: 24 hours
2. High Temperature	Temp.: 80°C Time: 24 hours
3. Salt Fog	5±0.1% Nad salt fog PH Value: 6.5-7.2 Temp: 35±1°C Time:24 hours

8.1 Characteristics and Reliability Test; Reliability test report

Test Items 測試項目	Test Condition and Procedure 測試方法	Requirements 要求	Result 結果
C1 V.S.W.R. 電壓駐波比	Set DUT on Network Analyzer; make individual calibration to test 設置網路分析儀參數進行測試	Directive DUT specification 符合待測物 規範	PASS
C3 Antenna Gain天線增益	Set DUT on Antenna Chamber; make individual calibration to test 設置天線暗室參數進行測試	Directive DUT specification 符合待測物 規範	PASS
M1 Vibration 震動	GB / T2423.48-2008 Amplitude: 0.03 inch (1.5mm); Freq: 20 to 80 to 20 Hz 3 directions; 2 hours for each direction 振幅 1.5mm; 頻率 20~80~20Hz; 3 個方向各 2H	1. No Visual Damage 2. Frequency Tol. ≤5%無明顯外觀不良 ;頻率偏移≤ 5%	PASS
M4 Pull Test 拉力	Holding with individual specification; force applied to axis of Connector .單獨定義產品端子拉 力	1. Directive DUT specification 2. Frequency Tol. ≤5%符合 待測物規範 ;頻率偏移≤ 5%	PASS
M5 Magnetic force 磁力	The separate definition of retention product magnetic surface magnets and adsorption on the iron 單獨定義產品磁鐵表面磁力及吸附鐵板上 保持力	1. Directive DUT specification 2. Frequency Tol. ≤ 5%符 合待測物規範 ;頻率偏移 ≤5%	PASS
M6 Sway test 搖擺測試	Holding with individual specification; the swing joint and wire,wire and plastic body test.單獨定 義接頭與線材、線材與塑膠本體的搖擺測試 .	1. Directive DUT specification 2. Frequency Tol. ≤ 5%符 合待測物規範 ;頻率偏移 ≤5%	PASS
M7 Dimension 尺寸	Inspection of dimension, color, material, package, surface process.检查尺寸 ,颜色,材料,包 装,表面處理	Directive DUT specification 符合待測物 規範	PASS
E2 Salt Spray 鹽霧	GB / T 2423.17-2008 Temp: 35°C; RH: ≥ 95%; NaCl solution: ≥ 5%;Time: 24H 溫度 35°C; 濕 度≥95%;鹽水濃度≥5% ; 測試 24H	1. No Visual Damage 2. Frequency Tol. ≤5%無明顯外觀不良 ;頻率偏移≤ 5%	PASS
E3 Temperature and Humidity Chamber 恒溫恒濕	GB / T 2423.3-2006 Temp: 80°C / 12 H; -40°C / 12H RH: ≥ 90%; Time: 24H 溫度 80°C測試 12H 轉-40°C測試 12H; 濕度 ≥ 90% ; 時間 24H	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol. ≤5%恢復 2H 后, 無明顯外觀不良 ; 頻率偏移≤5%	PASS
E4 Thermal Shock 冷熱衝擊	GB / T 2423.22 - 2008 - 40 °C (30 minutes) to + 80 °C (30 minutes); Cycles: 24	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol. ≤5%	PASS

Code for product packaging

Actual packaging is based on customer requirements.

Product name/specification				
1. Label requirements				
Customer name	****			
Supplier name	***	Purchase Order Number	***	
Material number	***	Material Name	***	
Material Specifications	***	Quantity	***	
production date	***	Inspector	***	

Material label			
Supplier	***		
Project name:	***		
Material code:	***		
Material Specifications	***		
Delivery date:	***	Delivery quantity:	***

2. Packing requirements

Operation instructions:

1. Inner packaging:

Product 100 PCS per small bag

2. Outer packaging: Quantity/box based on actual quantity

Precautions:

1. Whether to add partition boards, pearl cotton;

2. The pasting of labels, such as ROHS, etc.



