

# Dongguan Gaochang Electronic Technology Co., Ltd

## Product specification

**CUSTOMER:** GuangDong macro-video smart technologies limited

**ADRESS:** Room C234, Research Institute of Tsinghua

University in Shenzhen No. 019, Gaoxin South 7th Road Yuehai

Subdistrict, Nanshan District Shenzhen, Guangdong Province China

**CUSTOMER P/N:** D8-1307000121

**OUR MODEL NO:** GC-502FPC-L70

**OUR MODEL NO:** 2.4G Internal antenna

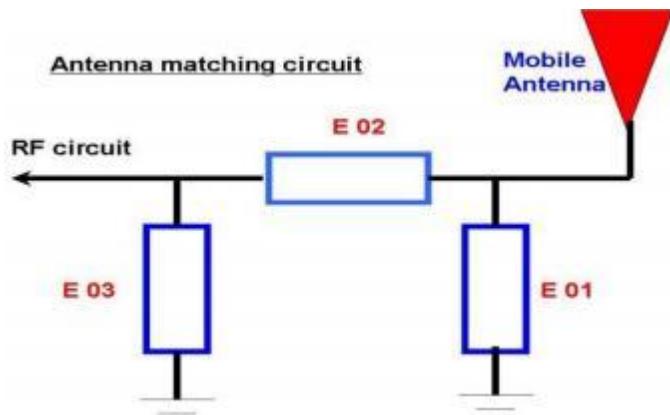
**Date:** 2025-4-17

Dongguan Gaochang Electronic Technology Co., Ltd			Client acknowledges
Engineering	Quality	Approved	Signature (Seal)
Mr.Xie	Mr.Huang	Mr.Gao	

## 1. Technical Specification

A. Electrical Characteristics	
Working Frequency Range	2400~2500MHz
S.W.R.	2400~2500MHz:<3.0
Antenna Gain(avg.)	2400~2500MHz: 3.26dBi
Impedance	50ohm
B. Material	
brass	
C. Environmental	
Operation Temperature	-45°C~+85°C
Storage Temperature	-45°C~+85°C

## 2. Matching Circuits



Element	Value	Vender
E1(0402)	OPEN	/
E2(0402)	SHORT	50 Ω
E3(0402)	OPEN	/

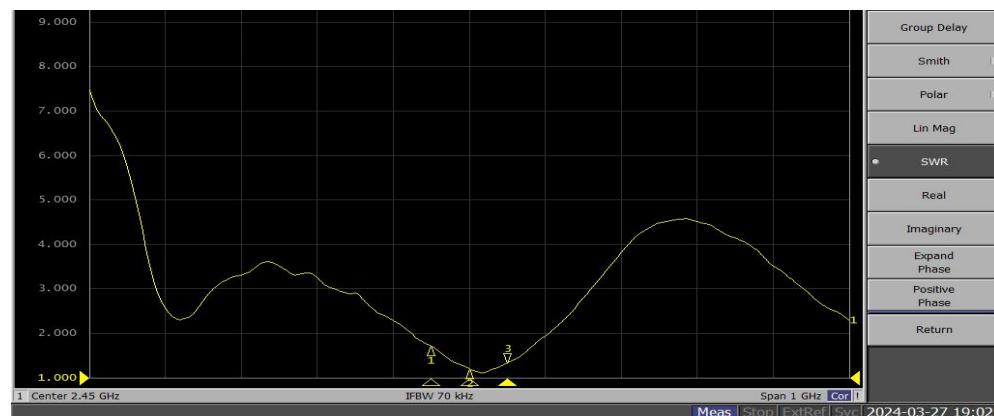
### 3. Curing antenna S11 Testing Result.

The S11 parameter was performed using a Agilent 8753D Network Analyzer and BEST'S test fixture that was using customer-providing device.

#### VSWR (Voltage standing wave ratio)

The Voltage Standing Wave Ratio (VSWR) is an indication of how good the impedance match is. VSWR is often abbreviated as SWR. If the transmission line and the antenna are not matched, the antenna will not accept all the power from the transmission line. The part it does not accept is reflected back and forth between the transmitter and the antenna. This sets up a fixed wave pattern along the line which we can measure and which is called the voltage standing wave ratio(VSWR).The VSWR (ratio of maximum voltage to the minimum voltage along the line)expresses the degree of match between the transmission line and the antenna. When the VSWR is 1 to 1(1:1) the match is perfect and all the energy is transferred to the antenna prior to be radiated. When the VSWR is 1.5:1, 96% of the power reaches the antenna. By definition VSWR can never be less than 1.VSWR and reflected power are different ways of measuring and expressing the same thing. A high VSWR is indication that the signal is reflected prior to being radiated by the antenna.

#### VSWR

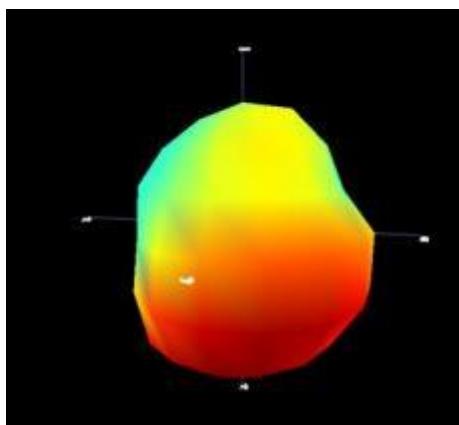


Marker	2400MHz	2450MHz	2500MHz
S.W.R	<2.0		

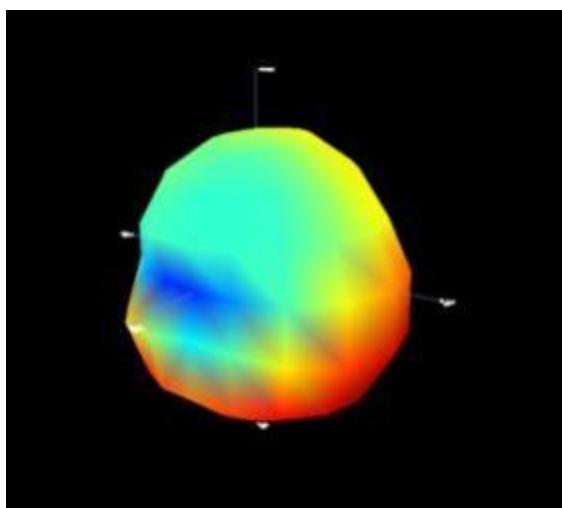
#### 4. 3D Radiation Pattern

Passive Test For 2.4G												
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHIS (%)	DHIS (%)	Max (dB)	Min (dB)	irectivity (dBi)	Beamwidth (3dB)	AttH (dB)	AttV (dB)
2400	57.21	-2.43	3.16	1.01	21.153	36.054	3.16	-11.97	5.58	0	45.51	45.06
2450	53.18	-2.74	3.12	0.97	19.152	34.029	3.12	-17.02	5.86	0	45.36	44.92
2500	56.54	-2.48	3.26	1.11	19.506	37.032	3.26	-14.39	5.74	30	45.93	45.51

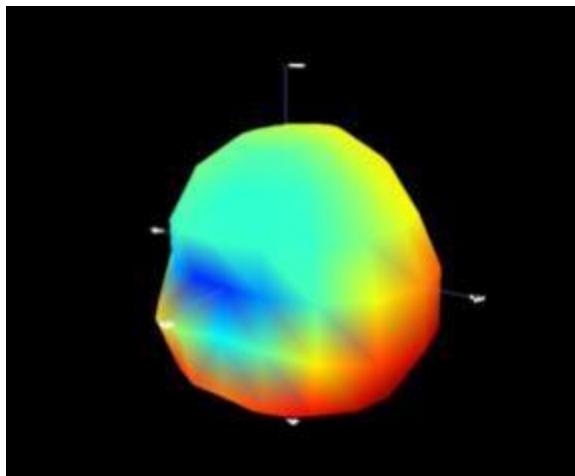
Frequency: 2400MHZ Gain: 3.16dbi



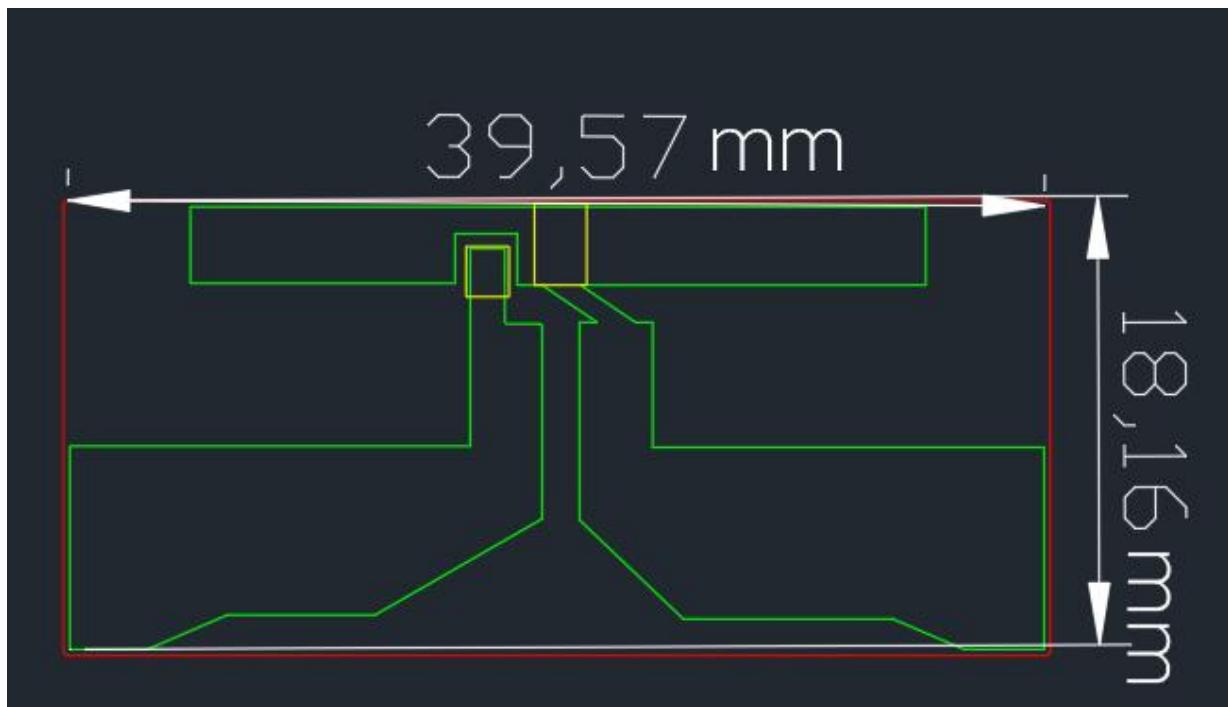
Frequency: 2450MHZ Gain: 3.12dbi



Frequency: 2500MHZ Gain: 3.26dbi



## 5. Product Appearance



2.4GHz Internal fpc 1.13 Black L=70MM-1+IPEXa

### 一、Salt Spray Test

Test objective: Test antenna resistance to salt spray corrosion

Test method:

Concentration of salt solution: 5% sodium chloride solution (95 ml distilled water + 5 g sodium chloride)

Place the antenna in the salt spray test chamber and suspend it with a rope to ensure uniform solution application and to avoid any uncoated areas on the antenna surface.

After spraying the solution, immediately place the antenna in the test chamber. Set the experimental duration for 48 hours, during which the sample must not be removed.

At the end of the experiment, take out the antenna and clean it with a cotton cloth and an ion blower to ensure all residues are removed. Allow the sample to dry at room temperature for 49 hours.

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Finally, inspect the antenna's appearance, mechanical properties, and electrical performance.

<b>Test Report</b>		Approval	Verified Mr.Dai	Test Operator Mr.Yang
Sample: 2.4GHz Internal Antenna				
Test objective: To evaluate the changes in the antenna's appearance, mechanical properties, and electrical performance under salt spray conditions.				
Sample Q'ty: 5pcs				
<b>Before Test</b>				
Sample No.		Appearance	<b>Mechanical properties &amp; Electrical performance</b>	
1#		OK	OK	
2#		OK	OK	
3#		OK	OK	
4#		OK	OK	
5#		OK	OK	
<b>After Test</b>				
Sample No.				
1#		OK	OK	
2#		OK	OK	
3#		OK	OK	
4#		OK	OK	
5#		OK	OK	
Conclusion: The salt spray test has been completed. The antenna's appearance is acceptable, and it maintains a good connection with the main board, as confirmed by continuity testing with a multimeter. No changes were observed in the mechanical properties. Signal testing showed that the standing wave ratio varies within $\pm 0.3$ , which meets the permissible requirements. Therefore, the 2.4GHz internal antenna complies with the salt spray test criteria.				