

MAGIC-WAND Antenna Performance Report

Designer: caiqin
Date : 2022-08-25
Versions : 2.0



1. Antenna condition

please refer to the internal photo

- 1, The antenna is located at the bottom to avoid the influence of hand holding
- 2, The middle part is a battery, and the hand holding part has no antenna space
- 3, There are LED lights, buttons, motors and sensor on the top of PCB, without antenna space.



2. Pattern size & matching circuit

please refer to operation description.



3. Test sample photo

please refer to the external photo and setup photo



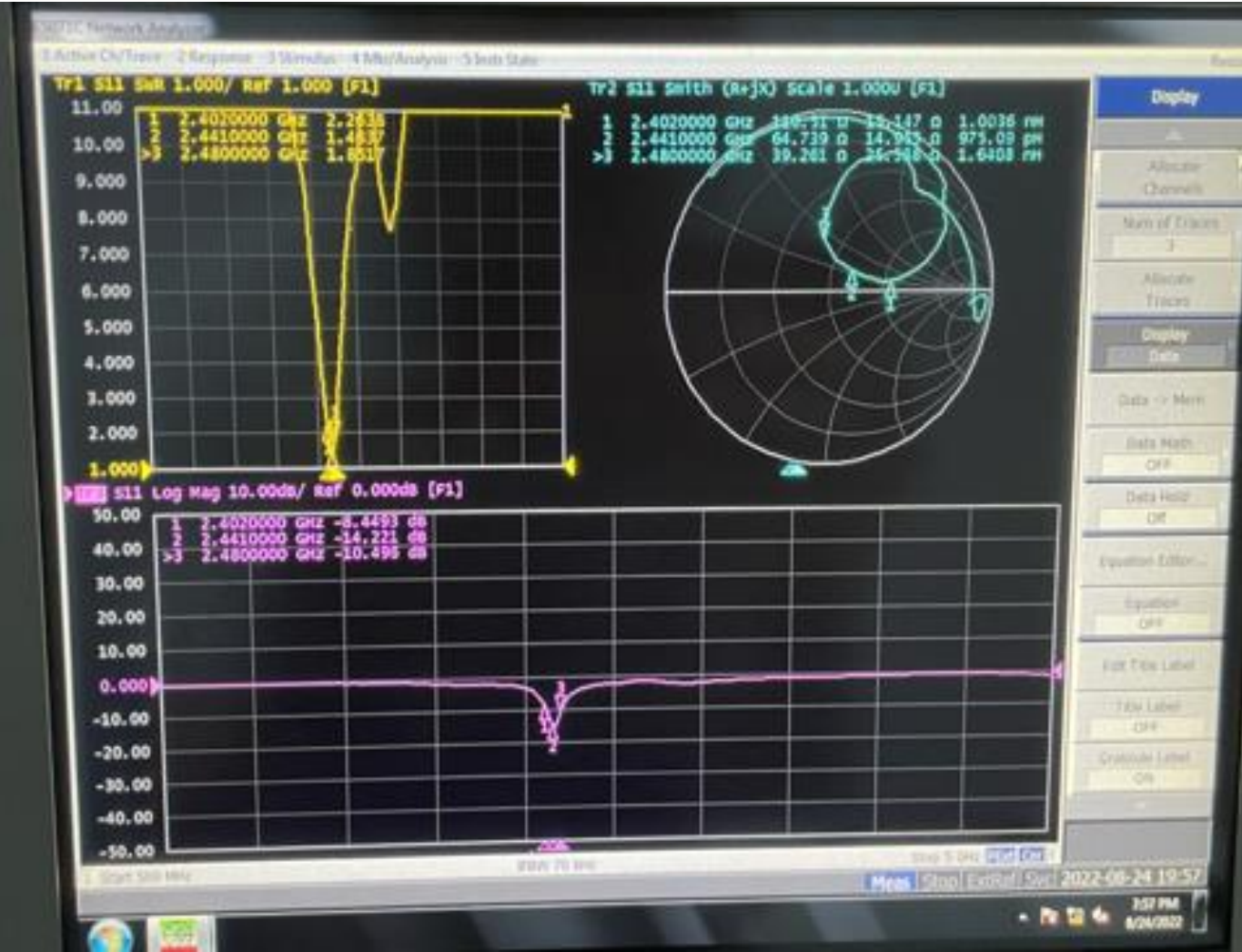
4. Test device and steps

Test device	Network analyzer
Manufacturers	Agilent
Model	E5071C
Serial NO	MY46630767
Last Cal	2022.4.28
test lab	Tonly OTA lab
Lab address	Huizhou City, Guangdong Province Tonly company

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



3. S11 result



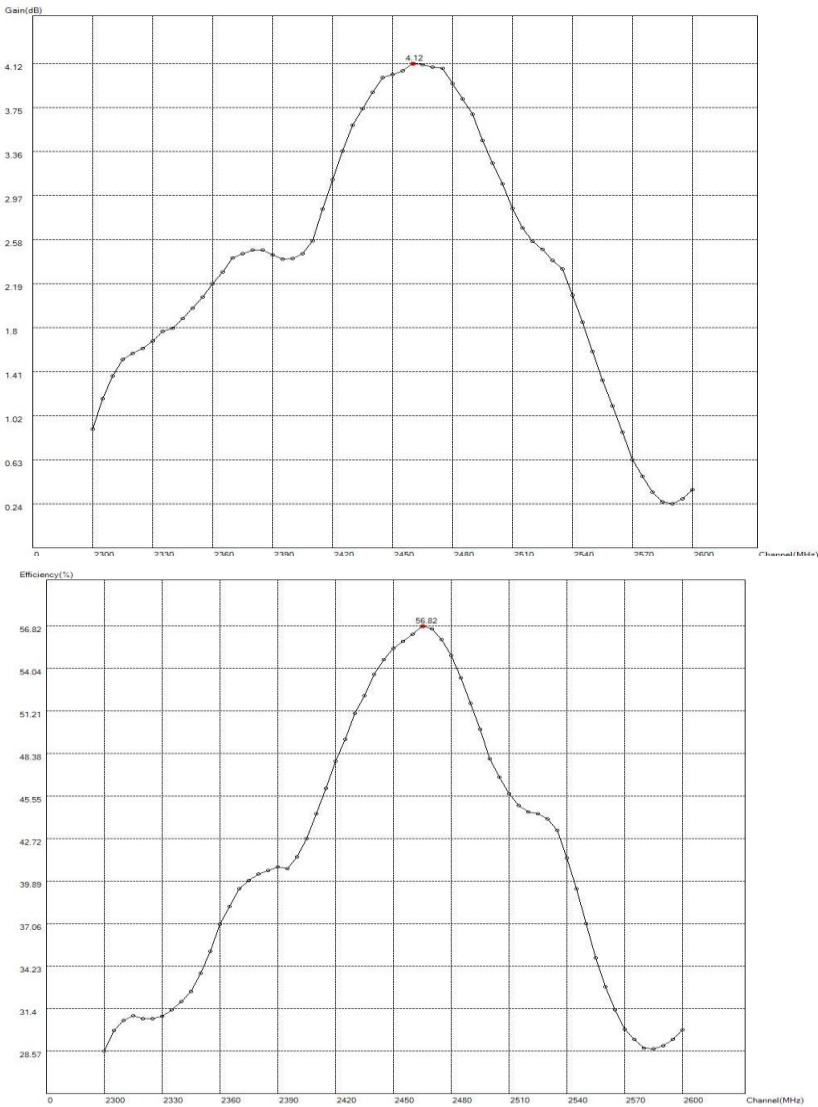
fre	2402MHz	2441MHz	2480MHz
VSWR	2.26	1.48	1.85

S11 is ok!



4. Efficiency & Gain

Freq(MHz)	Gain(dBi)	Efficiency(dB)	Efficiency(%)
2400	2.402072217	-3.822502386	41.47150168
2405	2.447779326	-3.695168472	42.70543528
2410	2.561158575	-3.53291649	44.33108401
2415	2.83799592	-3.368534177	46.04119448
2420	3.101579647	-3.201366886	47.84794733
2425	3.353080159	-3.072102177	49.29351438
2430	3.578628444	-2.923326933	51.0114075
2435	3.725172991	-2.822835874	52.20551839
2440	3.872177842	-2.707681661	53.60827514
2445	4.000687352	-2.630418179	54.5705313
2450	4.029568433	-2.569439949	55.34214719
2455	4.058369528	-2.532835053	55.81057471
2460	4.124392516	-2.495800389	56.28853702
2465	4.110957632	-2.454736395	56.82328807
2470	4.091467853	-2.468679828	56.64114411
2475	4.07898003	-2.523388721	55.93210032
2480	3.947235799	-2.608242042	54.84989441

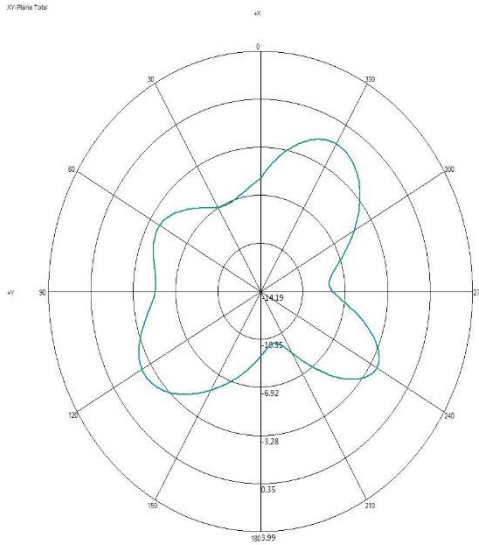


The efficiency is more than 40%

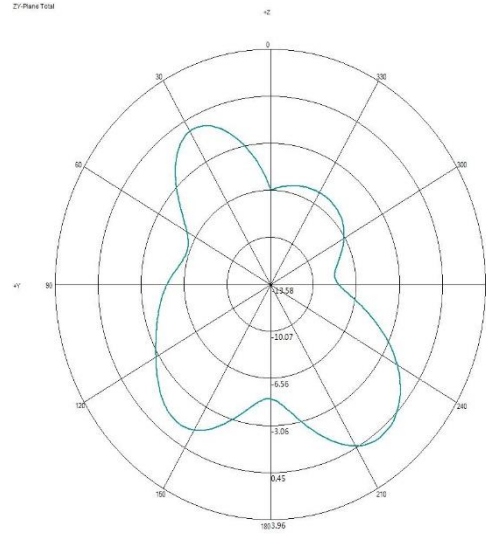


5. Radiation Pattern

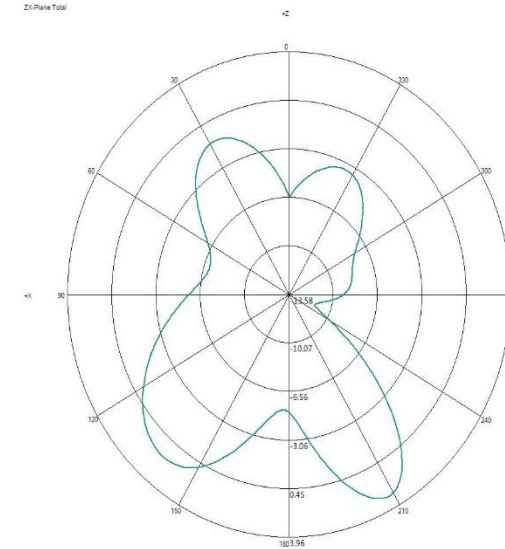
Channel(MHz) 2440
XY-Plane Total



Channel(MHz) 2440
ZY-Plane Total



Channel(MHz) 2440
ZX-Plane Total



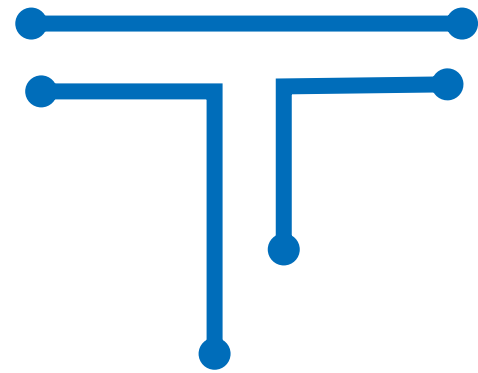
The direction map is relatively uniform without obvious notch, and there is no dead angle during use.



6.Conclusion

- The passive of Antenna is ok





THANKS