**Product specification acknowledgment.**

**Shenzhen Maya antenna lab**

**R&D center in ShenZhen**

**The mobile communication terminal antenna**

**PRODUCT NAME** **UF0901**

**CUSTOMER** Shenzhen Ulefone Technology Co., Ltd.
7A01, Building A, Block 1, Anhongji Tianyao Plaza, Longhua District,Shenzhen City, Guangdong Province China

| account party | Development party | | |
|---|---|---|---|
| Customer acknowledges | Quality Department | R&D Department | approved by |
| | | ME:<br>RF: | |
| Date： | Date： | | |

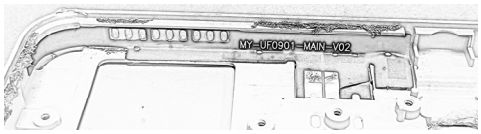
**Shenzhen Maya communication equipment Co., LTD**
Site：Room 205, Building B, Qishenghuo Digital Valley, Longhua District, Shenzhen City
Tel: 86-755-82916162 Fax: 86-755-82916227

# Aim

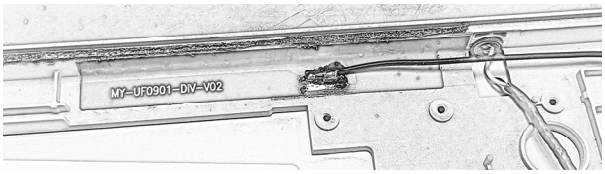
**For the Production from shenzhen maya communication equipment co., LTD. That mobile communication terminal antenna product specifications and test methods for specification, avoid the test conditions, the error caused by different methods**

**Antenna debug design requirement frequency band.**

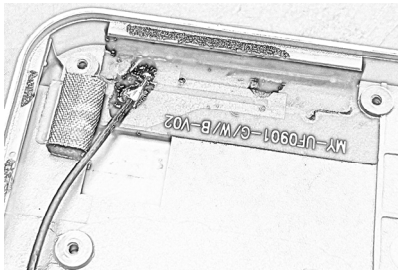
## Sky chart.




WWAN MAIN Antenna




DIV ANT




BT/Wi-Fi ANT

**Electrical**

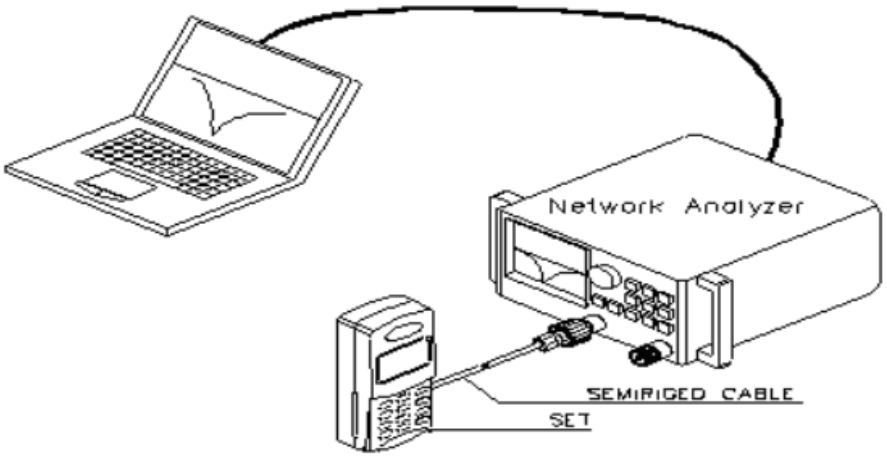
**Test method description and data.**

| Device name | use |
|---|---|
| Vector Network Analyzer | S11/Impedance/ Passive Test |
| Agilent 8960<br>SP6010<br>R&S CMU200 | **GSM, GPRS, EDGE, CDMA2000, 1xev-do, td-scdma, WCDMA, HSDPA mobile phone mobile communication equipment test.** |
| R&S CMW500<br>MT8820C | **Including td-scdma, WCDMA, HSDPA, LTE, Wi-Fi mobile phone mobile communication equipment test.** |
| SP9500E | 5G,SA,NSA |
| MVG Chamber | **Passive Test / OTA active Test / Efficiency/Gain** |

# Passive Test Report

**Test equipment: network analyzer.**

Test method: with a 50 ohm CABLE CABLE from the instrument test port is derived, using the calibration after a calibration mechanism of SMA connector, connecting hand records related to the frequency points corresponding return loss and standing wave ratio data.



# Active Test Report

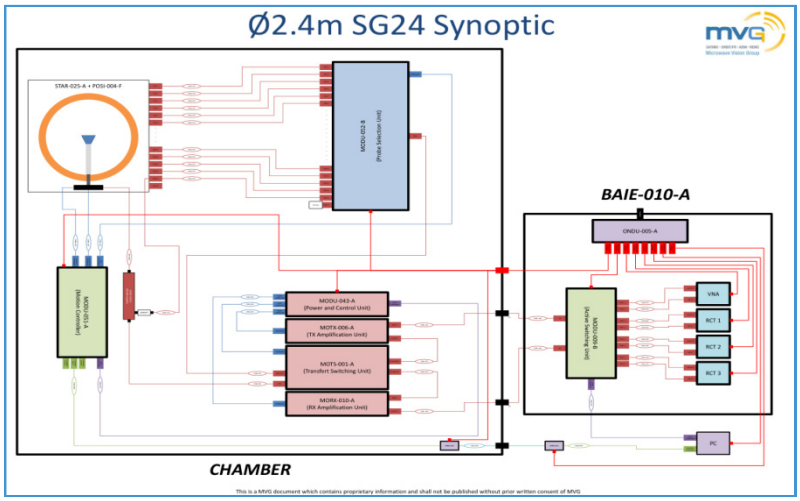
TRP/TIS

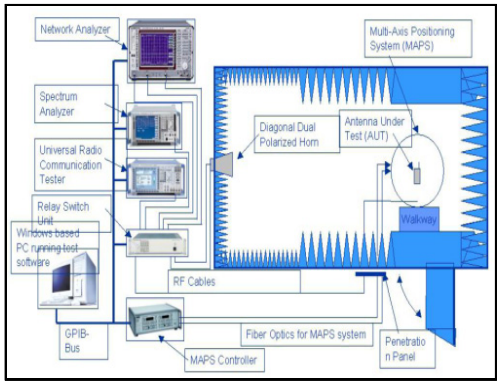
From testing tools, measuring, network analyzer, full waves far field ETS, French MVG SG24LT (Satmio) near field 3 d microwave dark room, the high precision positioning system and its controller and the computer with automatic test procedure test environment: the temperature of 22 ℃ + 3 ℃, humidity 60% plus or minus 60% test methods: Using EST or 24 lt Satimo system software Test method and calculation of TRP when tested TRP, DUT (Device Under Test) is in a state of maximum transmitted power, including three to choose channel Test, by positioning system control the location of the DUT, with 15 degrees for step length, measuring three dimensional space, the effective radiated power (EIRP) at various points through the average of the integral sphere, computation formula is as follows

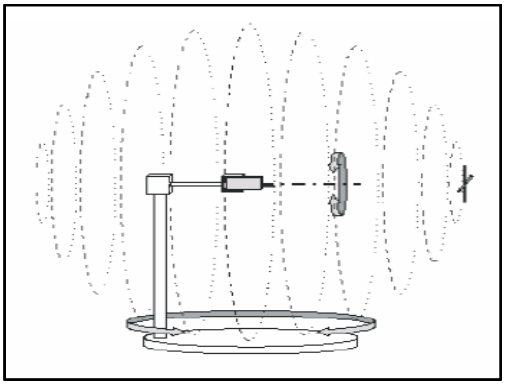
$$TRP \cong \frac{\pi}{2NM}\sum_{i=1}^{N-1}\sum_{j=0}^{M-1}\left[EiRP_{\theta}(\theta_i,\phi_j)+EiRP(\theta_i,\phi_j)\right]\sin(\theta_i)$$

In TIS test, the DUT at the maximum transmission power of the state, including three to choose channel test, by controlling the location of the DUT, at 30 degrees for the step length, measuring the three dimensional space each point receiving sensitivity, the average of the sphere by integral calculation, calculation formula is as follows:

$$TIS \cong \frac{2NM}{\pi\sum_{i=1}^{N-1}\sum_{j=0}^{M-1}\left[\frac{1}{EIS_{\theta}(\theta_i,\phi_j)}+\frac{1}{EIS_{\phi}(\theta_i,\phi_j)}\right]\sin(\theta_i)}$$




Network Analyzer
Multi-Axis Positioning System (MAPS)
Spectrum Analyzer
Diagonal Dual Polarized Horn
Antenna Under Test (AUT)
Universal Radio Communication Tester
Relay Switch Unit
Walkway
Windows based PC running test software
RF Cables
GPIB-Bus
Fiber Optics for MAPS system
Penetration Panel
MAPS Controller

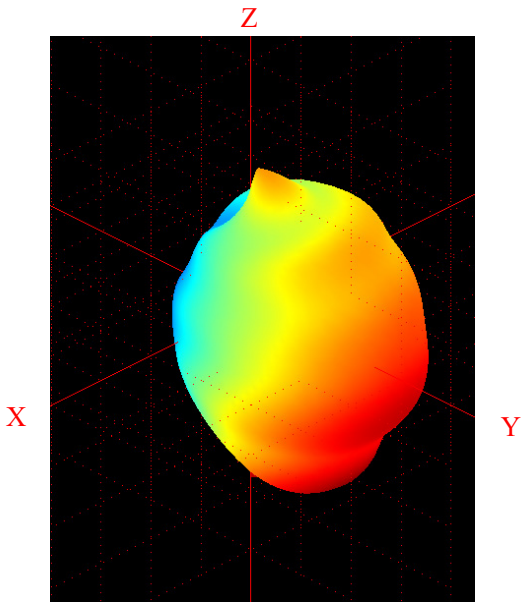


# Passive Test Report.

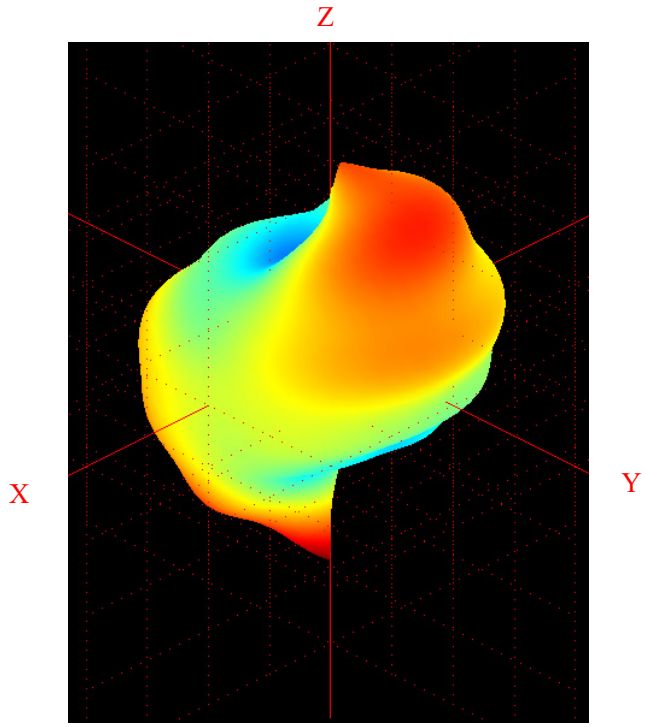
| Frequency Range | Antenna Gain |
|---|---|
| BT &BLE: 2402-2480MHz(TX/RX) | 3.66 dBi |
| 2.4G Wi-Fi: 2412-2462MHz(TX/RX) | 3.66 dBi |
| 5G Wi-Fi: 5150-5250MHz; 5250-5350MHz; 5725-5850MHz(TX/RX) | 5150-5250MHz: 4.73 dBi;<br>5250-5350MHz: 4.05 dBi<br>5725-5850MHz: 4.41 dBi |
| GSM 850& WCDMA Band 5& LTE Band 5: 824-849MHz(TX); 869-894MHz(RX) | -1.26 dBi |
| PCS 1900& WCDMA Band 2& LTE Band 2: 1850-1910MHz(TX); 1930-1990MHz(RX) | 0.23 dBi |
| WCDMA Band 4& LTE Band 4: 1710-1755MHz(TX); 2110-2155MHz(RX) | 0.15 dBi |
| LTE Band 7: 2500-2570MHz(TX); 2620-2690MHz(RX) | 0.88 dBi |
| LTE Band 12: 699-716MHz(TX); 729-746MHz(RX) | -3.06 dBi |
| LTE Band 13: 777-787MHz(TX); 746-756MHz(RX) | -2.43 dBi |
| LTE Band 17: 704-716MHz(TX); 734-746MHz(RX) | -3.06 dBi |
| LTE Band 26: 814-849MHz(TX); 859-894MHz(RX) | -1.26 dBi |

Passive pattern

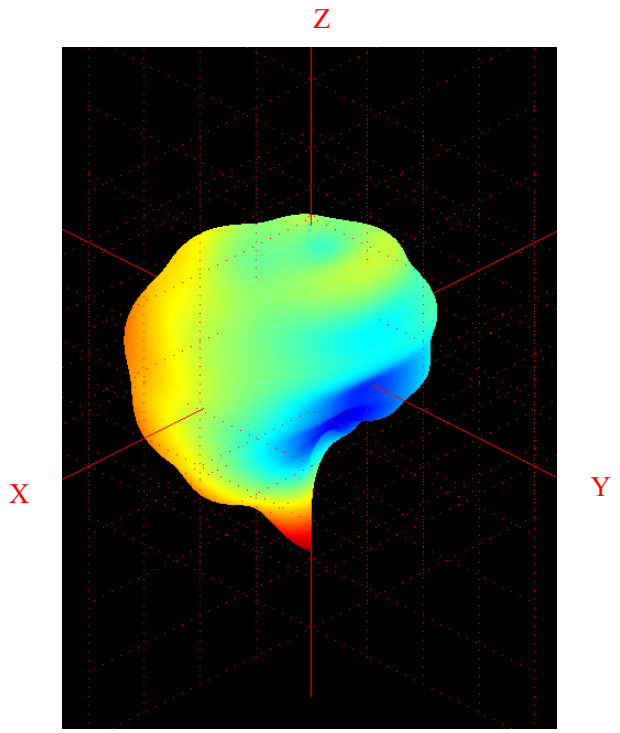
**700MHz**



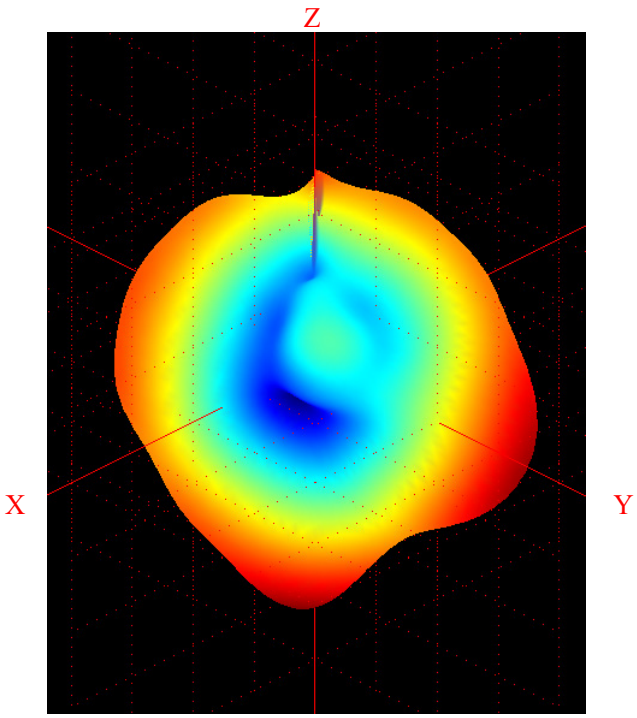

**824MHz**



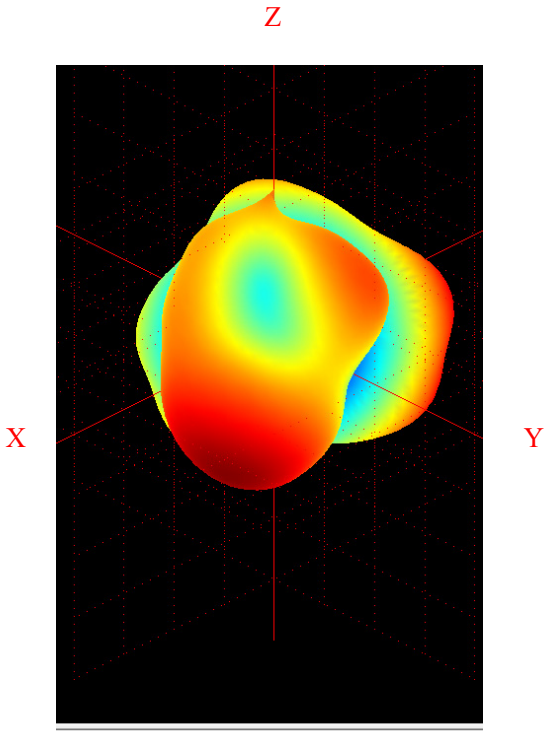
**900MHz**



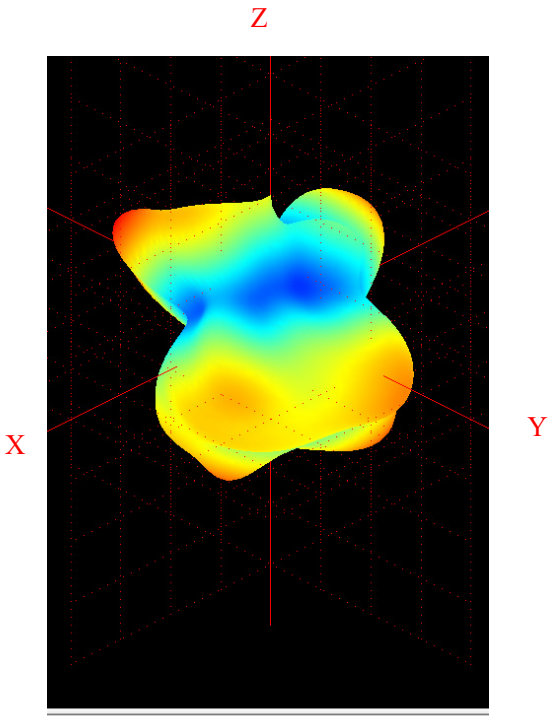

**1710MHz**



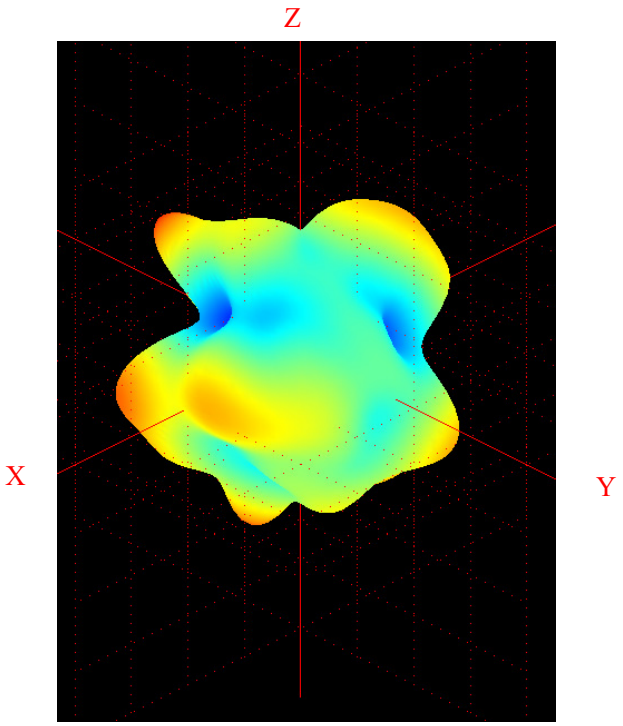
**1880MHz**




**2550MHz**



**2450 MHz**




5250 **MHz**