



# Antenna specification

Name of material: T40

Sample color: Black

Sample type: FPC: GPS/WIFI/BT

customer model: \_\_\_\_\_

Opening piece       Other

supplier: Shenzhen Maya communication equipment Co., LTD

Address: Floor 202, Building 1, Guanghui Science Park, Minqing Road, Longhua Street, Longhua District, Shenzhen

Fictiones	structure	quality	ratify	datelanded
				2021.8.18

## Customer: Yidao Information

department	notarize	date	state	sign and seal
electronic				
structure				
quality				
project				

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## 1. frequency band

frequency	frequency band
three-in-one	GPS/WIFI2.4-5.8G/BT

## 2. antenna pattern





### 3. electrical property

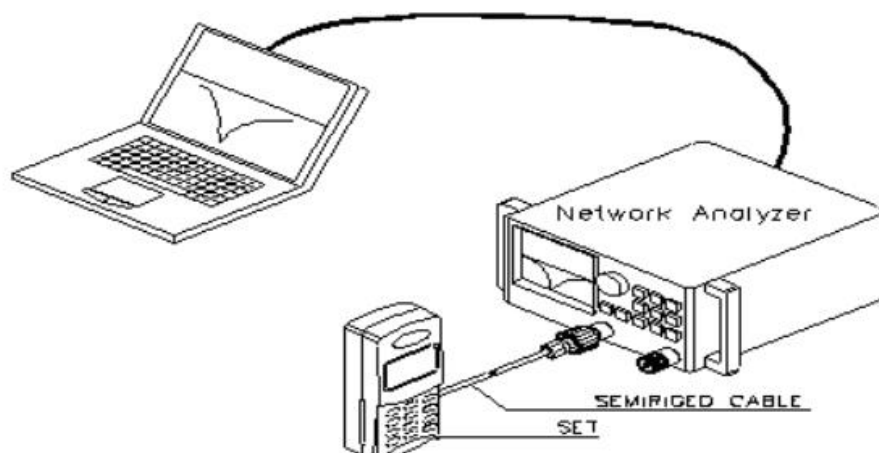
#### 3.1 Test method description and data

implementor name	Use
Vector Network Analyzer	S11/Impedance/ Passive Test
Agilent 8960 SP6010 R&S CMU200	contain GSM、 GPRS、 EDGE、 CDMA2000、 1xEV-DO 、 TD-SCDMA、 WCDMA、 HSDPA test of mobile phone mobile communication equipment
R&S CMW500 MT8820C	contaiTD-SCDMA、 WCDMA、 HSDPA、 LTE、 WIFI、 GPS mobile phone mobile communication device test
Agilent E4438C	Testing active GPS
MVG Chamber	Passive Test / OTA active Test / Efficiency/Gain

#### 3.2 Passive Test Report

##### Test equipment: Network analyzer

Test method: A 50 ohm CABLE is exported from the instrument test port, and the SMA connector of the hand mechanism is connected after calibration with the calibration part. The data such as return loss or standing wave ratio corresponding to the relevant frequency points are recorded.



测试示意图

### 3.3 Active Test Report

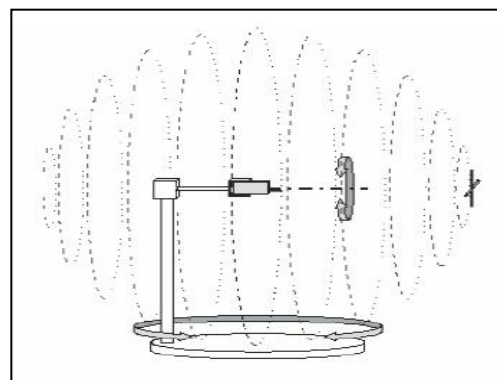
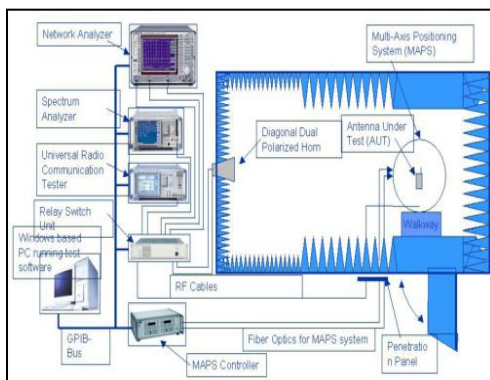
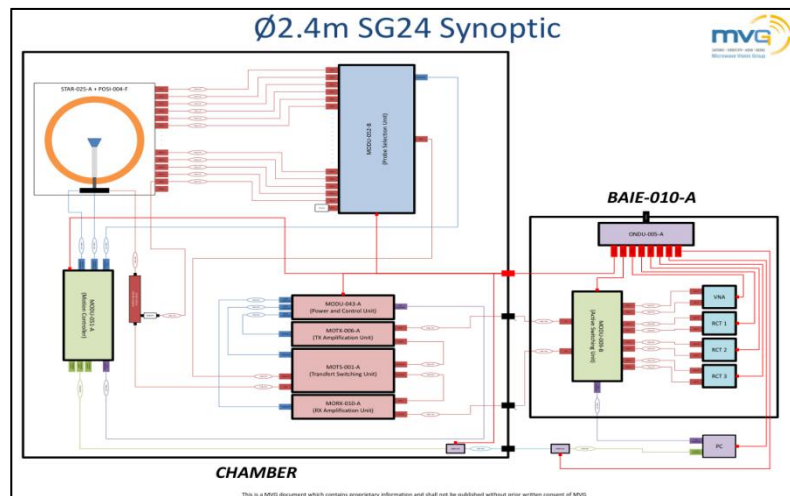
#### TRP/TIS

Test tools: integrated tester, network analyzer, all-wave far-field ETS, French MVGSG24LT (Satmio) near-field 3D microwave darkroom, high-precision positioning system and its controller and computer test environment with automatic test program: Temperature  $22^{\circ}\text{C} \pm 3^{\circ}\text{C}$ , humidity  $60\% \pm 15\%$  Test Method: Test method of TRP by EST or Satimo24LT system software and calculation During TRP test, DUT (Device Under Test) is in the state of maximum transmit power, and three channels of high, medium and low are selected for test. The position of DUT is controlled by positioning system, and the step length is 15 degrees. The effective radiated power (EIRP) of each point in the three-dimensional space is measured, and the average value on the sphere is calculated by integrating. The calculation formula is as follows:

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

During TIS test, DUT is in the maximum transmitting power state, and three channels of high, middle and low are selected for test. By controlling the position of DUT, the receiving sensitivity of each point in three-dimensional space is measured with the step length of 30 degrees, and the average value on the sphere is calculated by integrating. The calculation formula is as follows:

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





### 3.4 OTA TRP/TIS

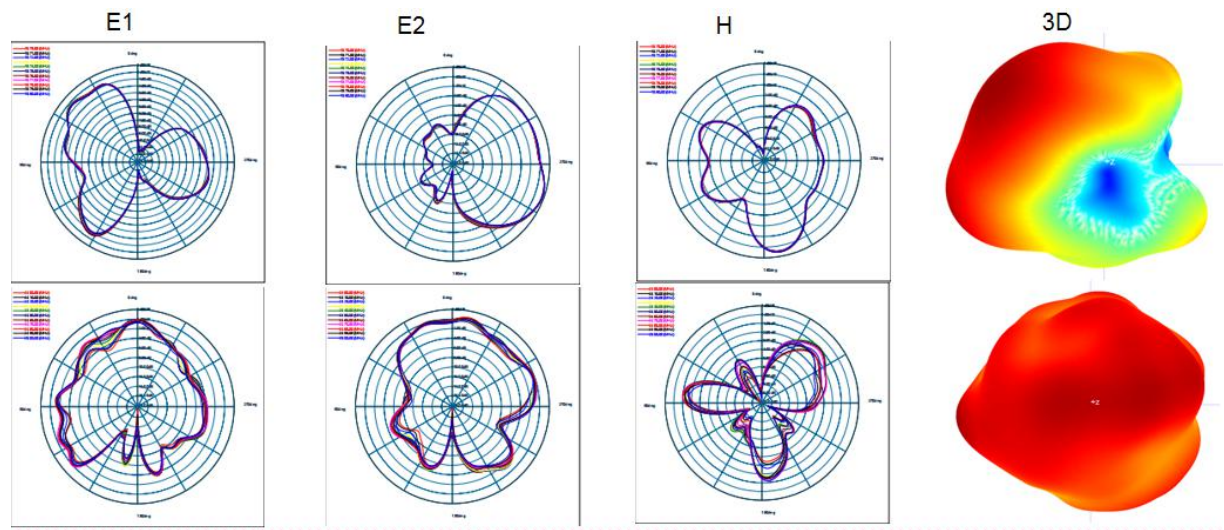
标准	BAND	2.4G-WIFI-B			2.4G-WIFI-G		
WIFI	CHANNAL	1	6	11	1	6	11
	TRP	11.8	11.79	11.69	9.82	9.84	9.19
	TIS			-80.17	--	--	-67.92
	BAND	2.4G-WIFI-N			5.8G-WIFI-A		
	CHANNAL	1	6	11	36	100	165
	TRP	10.28	10.05	9.73	7.82	8.04	8.25
	TIS	--	--	-63.45			-65.04

### 3.5 Passive Test

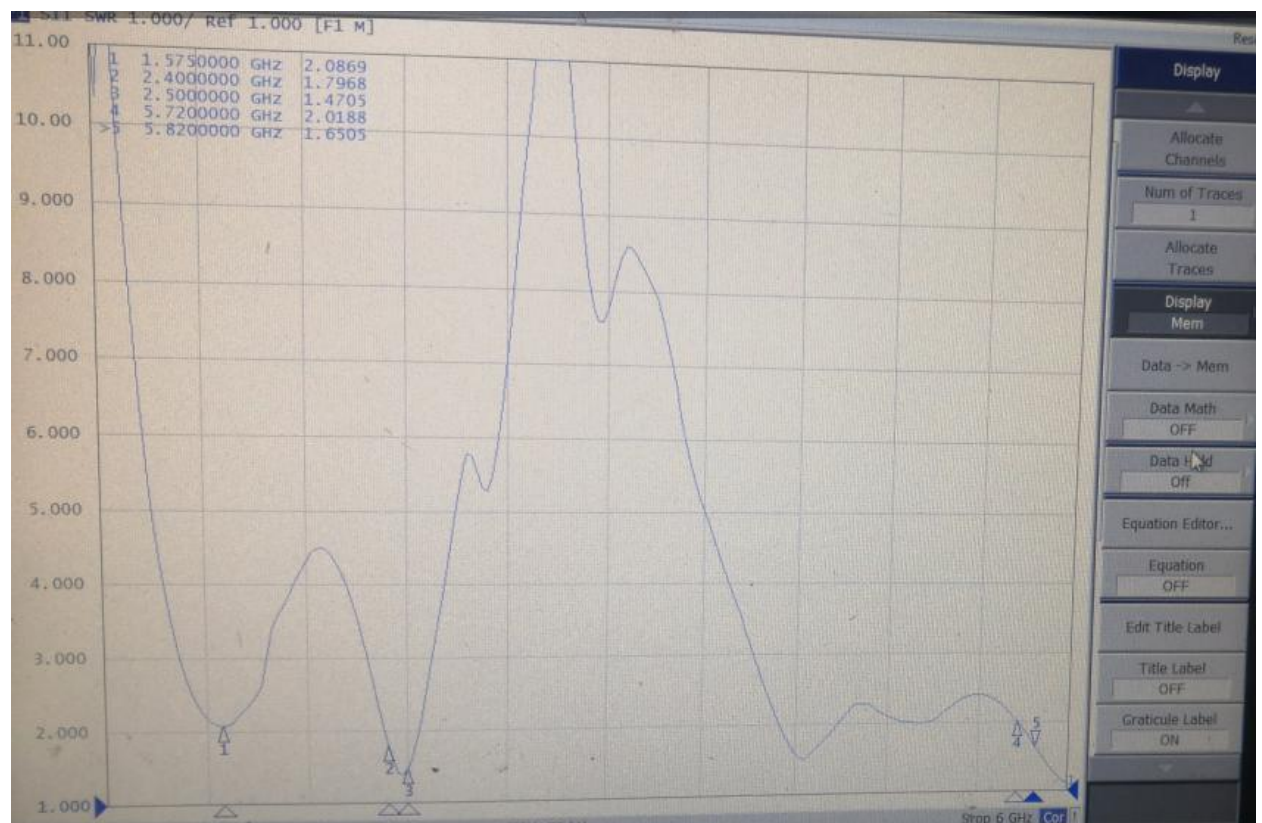
Freq (MHz)	Gain	Freq (MHz)	Gain
1550	0.088061232	2470	-0.109418745
1560	-0.083810032	2480	-0.406745239
1570	-0.219469595	2490	-0.702342456
1580	-0.347091895	2500	-1.014263093
1590	-0.565923232	5150	-0.014235331
1600	-0.543060612	5200	0.364993366
1610	-0.603162562	5250	0.501224168
1620	-0.686204975	5300	0.441667011
1630	-0.808989931	5350	0.500989427
1640	-0.863129215	5400	0.491930476
1650	-1.097927947	5450	0.54891734
2400	1.576046438	5500	0.399611316
2410	1.394252035	5550	0.40857706
2420	1.154601725	5600	1.008700816
2430	0.853946713	5650	1.488980344
2440	0.692799407	5700	1.889562487
2450	0.363772623	5750	1.64105013
2460	0.131833769	5800	1.982377222
		5850	2.479927995
		5900	2.701038017



directivity diagram

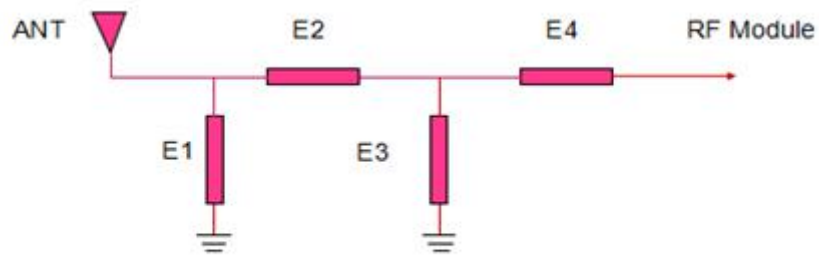


Standing wave pattern





#### 4. Matching circuit specification



The matching circuit of WiFi is unchanged

#### 5.Placement position







## 6.GPS/WIFI

### GPS

SATE	LLITES	INFO	MATIO	NMEA	GPS
CNR	LOC	N	LOG	TEST	
G-GPS	R-GLN	B-BD	E-GAL	Q-QZS	LL1S IIRNSS
S-SBAS					
Average CNR <input type="checkbox"/> Show in single page					
0.37.6/-	R-37.4/-	B-33.3/-	E-39.3/-	Q-38.0/-	L-/- L-/-
S-39.0/-					
SVID	Fq	CNR	Elevatio	Azmut	
n	h				
5 L1		38.3	9.00	122.00	
10 L1		46.0	36.00	329.00	
12 L1		36.4	25.00	123.00	
15 L1		38.5	21.00	60.00	
18 L1		35.7	55.00	210.00	
23 L1		43.1	64.00	7.00	
24 L1		44.2	50.00	39.00	

SATE	LLITES	INFO	MATIO	NMEA	GPS
CNR	LOC	N	LOG	TEST	
G-GPS	R-GLN	B-BD	E-GAL	Q-QZS	LL1S IIRNSS
S-SBAS					
Average CNR <input type="checkbox"/> Show in single page					
0.37.0/-	R-35.5/-	B-35.5/-	E-40.0/-	Q-38.7/-	L-/- L-/-
S-38.0/-					
SVID	Fq	CNR	Elevatio	Azmut	
n	h				
5 L1		22.8	10.00	121.00	
10 L1		41.3	36.00	329.00	
12 L1		34.4	25.00	123.00	
15 L1		31.3	21.00	60.00	
18 L1		45.4	55.00	210.00	
23 L1		42.4	64.00	7.00	
24 L1		35.5	50.00	39.00	

SATE	LLITES	INFO	MATIO	NMEA	GPS
CNR	LOC	N	LOG	TEST	
G-GPS	R-GLN	B-BD	E-GAL	Q-QZS	LL1S IIRNSS
S-SBAS					
Average CNR <input type="checkbox"/> Show in single page					
0.38.6/-	R-35.2/-	B-35.6/-	E-34.2/-	Q-39.7/-	L-/- L-/-
S-34.0/-					
SVID	Fq	CNR	Elevatio	Azmut	
n	h				
5 L1		34.0	10.00	121.00	
10 L1		42.8	36.00	329.00	
12 L1		38.4	25.00	123.00	
15 L1		31.8	21.00	60.00	
18 L1		46.1	55.00	210.00	
23 L1		37.8	64.00	7.00	
24 L1		38.3	50.00	39.00	

定位时间：35S

### WIFI



距离路由器5米测试，信号满格。

距离路由器15米，浏览网页 播放视频流畅。



距离路由器10米测试，信号满格。



## 7. structural drawings

