Specification of Marshall 8 Antenna

Supplier： Shenzhen qianzun Technology Co., Ltd

Client： Aratek Biometrics Co., Ltd.

Antenna Type： PIFA

Antenna Band：

GSM850/900/DCS1800/1900/W1/2/4/5/8

FDD-1/2/3/4/5/7/8/12/17/20/25/26/28/

TDD-38/39/40/41

WIFI/BT/GPS /NFC

Material： FPC

Material Description：

Main Antenna / BT+WIFI+GPS Antenna / Diversity Antenna / NFC Antenna

Version： V1.0

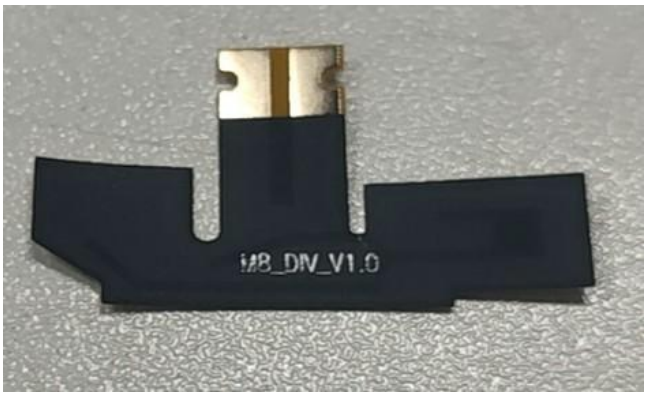
Material code：

Number	Name of Antenna	Material in Aratek
1	Main Antenna	3.34.M8XXXX-0000
2	BT+WIFI+GPS Antenna	3.34.M8XXXX-0002
3	Diversity Antenna	3.34.M8XXXX-0003
4	NFC Antenna	3.34.M8XXXX-0001
5	Coaxial Cable	3.26.M8XXXX-0000

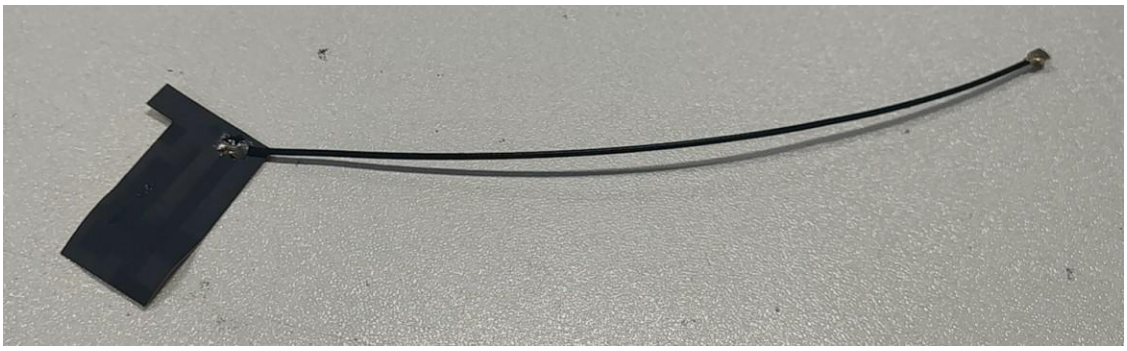
1. Picture of antenna and Marshall 8 sample device

Sample device

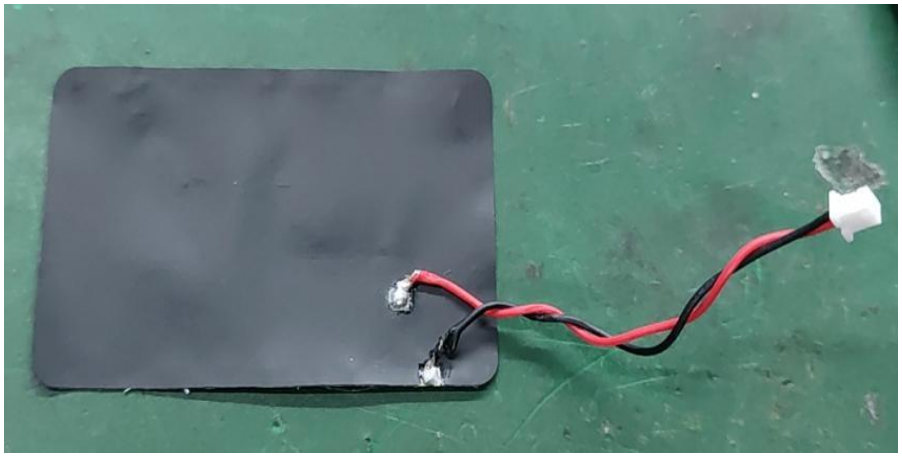
4G Main Antenna



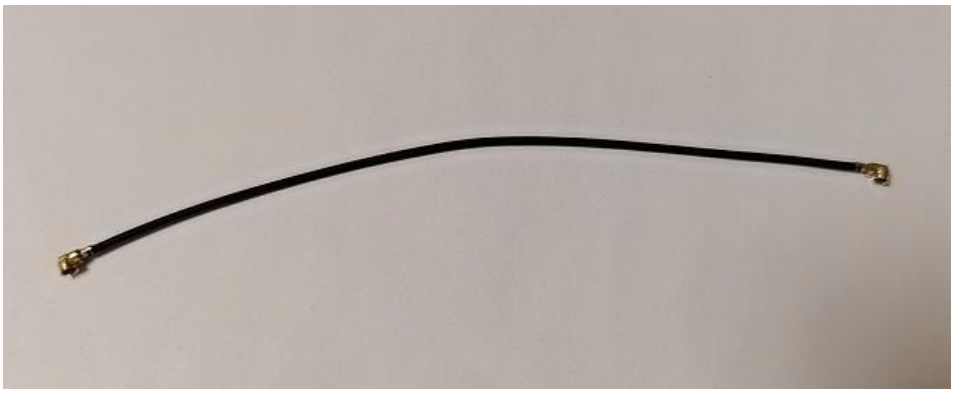
Diversity Antenna



BT+WIFI+GPS Antenna



NFC Antenna

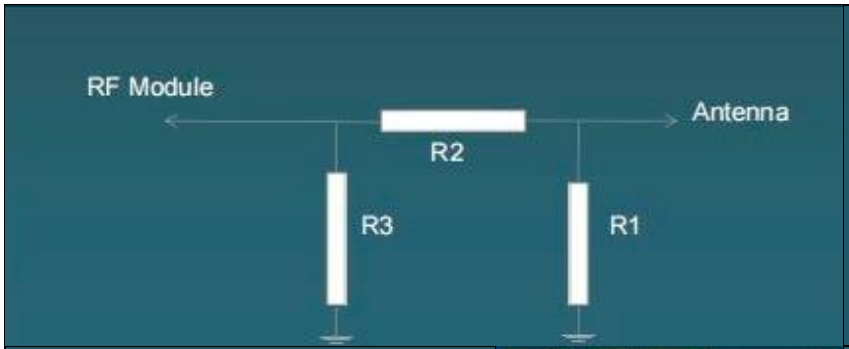


Coaxial Cable

2. Test Environment

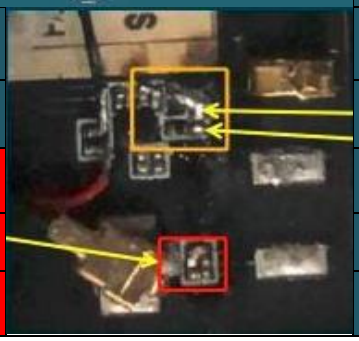
Test device			
			
Test System	**Test Environment**	**Active Test**	**Passive Test**
SG24 ETC	Temp: 22℃±3℃ Humidity： 50℃±15%	Support 2G/3G/4G Support BT/WIFI/GPS	600MHZ—6G

3. Antenna Information



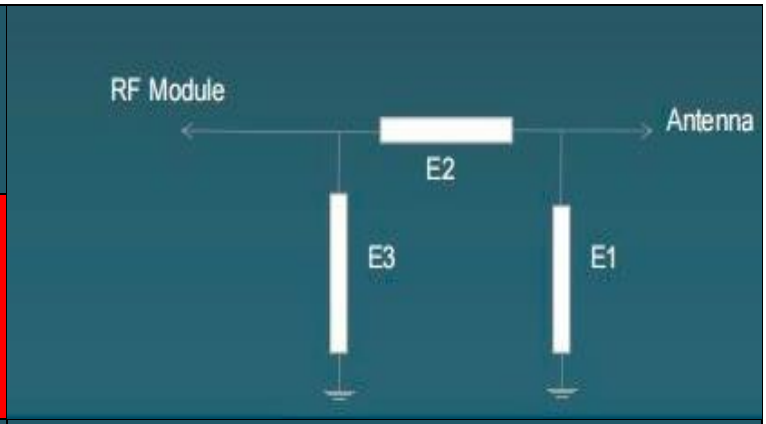
2G/3G/4G-Main Antenna-Matching Circuit

Main Antenna Matching	
Element	**Value**
R1	NC
R2	0 Ω
R3	NC



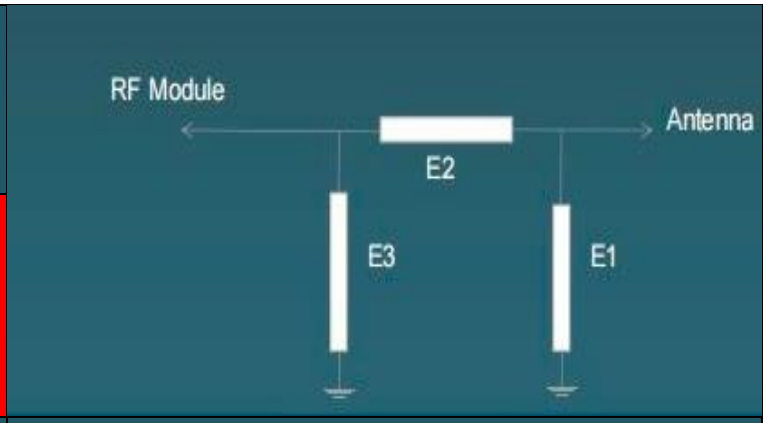
Switching Circuit	
RF 1	0 Ω
RF 2	22nH
RF 3	NC
RF 4	NC

LTE Diversity Antenna-Matching Circuit	
Whether the match has been changed?	NO



Diversity Antenna	
Element	Value
E1(0201)	NC
E2(0201)	OR
E3(0201)	NC

BT+WIFI+GPS Antenna-Matching Circuit	
Whether the match has been changed?	NO



BT+WIFI+GPS Antenna	
Element	Value
E1(0201)	NC
E2(0201)	OR
E3(0201)	NC

4. TRP&TIS Measurement

	OTA Measured data are as follows: - GSM&WCDMA					
GSM	TRP	TIS	TRP	TIS	TRP	TIS
Band	L	L	M	M	H	H
850	29.6		29.9		29.4	-106.5
900	29.4		29.4		29.3	-105.2
1800	25		25.4		25.6	-105.5
1900	26.2		26.2		26.5	-104.6
WCDMA	TRP	TIS	TRP	TIS	TRP	TIS
Band	L	L	M	M	H	H
B1	20.1		19.8		19.6	-108.6
B2	19.7		20		20.3	-107.8
B4	19.5		18.8		19	-106.8
B5	20		20		19.8	-108.8
B8	20.2		20		20.3	-108.3
	OTA Measured data are as follows -LTE					
LTE	TRP	TIS	TRP	TIS	TRP	TIS
Band	L	L	M	M	H	H
B1	20.5		20.5		20.4	-93.3
B2	20.3		20.4		20.4	-94.5
B3	17.5		17.7		18.5	-92.9
B4	17.7		18		18.2	-92.6
B5	20.1		20.5		20.5	-95.2
B7	17		18.1		17.6	-92.7

B8	20.5	20.3	20.3	-95.1
B20	20.1	20.1	19.8	-95.3
B17	17.2	17.4	17.5	-89
B12	16	16.3	16.8	-94.5
B25	19.1	19.2	19.3	-95.5
B26	20	20.3	20.2	-95.8
B28	18	18.7	19.1	-85
B38	20.3	20.4	20.5	-88.1
B39	19.9	19.9	20.1	-91.3
B40	20.2	19.6	19	-87.5
B41	20.1	20.3	20	-87.7

5. The Gain and Efficiency of BT+WIFI+GPS Antenna

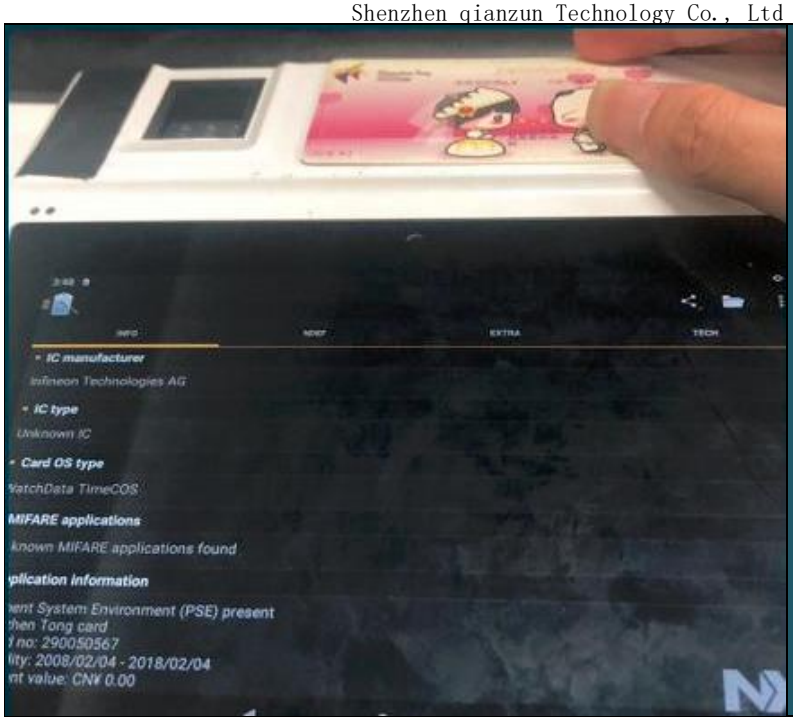
Frequency(MHz)	Gain(dB)	Efficiency(%)
1565	0.73	48.74
1570	0.6	47.2
1575	0.51	46.3
1580	0.48	45.71
1585	0.5	44.61
1590	0.42	42.67
1595	0.21	40.53
1600	-0.02	38.92
1605	-0.13	37.73

1610	-0.19	36.63
1615	-0.28	35.4
1620	-0.43	33.88
1625	-0.57	32.62

Frequency(MHz)	Gain(dB)	Efficiency(%)
2400	1.29	56.57
2410	1.28	56.1
2420	1.26	57.29
2430	1.24	57.05
2440	1.27	56.93
2450	1.29	57.41
2460	1.30	58.51
2470	1.28	54.95
2480	1.30	54.44

Frequency(MHz)	Gain(dB)	Efficiency(%)
5150	1.26	46.37
5160	1.28	46.5
5170	1.29	47.69
5180	1.27	47.45
5190	1.23	46.33
5200	1.26	47.31
5210	1.30	48.61
5220	1.27	48.85
5230	1.30	49.84
5240	1.24	47.85
5250	1.28	48.94

NFC Antenna measurement



Using the bus card to test, NFC card information can be normally identified within 10mm.