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## Specifications

The report mainly provides A91 GSM +LTE,performance parameter test, antenna for built-in antenna:

### 2、Electrical performance

#### 2-1Specification Standard

The A91 antenna operates in the LTE700/850/900 1800/1900/2100/2300/2700Mhz/3500Mhz/5000Mhz band, which generates resonances in this ;The following table shows the mass production performance test indicators for the A89 design antenna:

EGSM+WCDMA+TDSCDMA+LTEAntenna Indicator				
	Frequency (MHz)	VSWR	Frequency (MHz)	VSWR
Band	Transmitter		Receiver side	
GSM850	824-849	≤2.86	869-894	≤2.02
GSM900	880-915	≤2.1	925-960	≤3.1
DCS1800	1710-1785	≤3.3	1805-1880	≤3.7
PCS1900	1850-1910	≤2.01	1930-1990	≤2.12
TDSCDMF1900	1880-1980	≤2.0	2110-2170	≤2.74
TDSCDMA2100	1920-1980	≤2.10	2110-2025	≤2.74
WCDMA2100	1920-1980	≤2.10	2110-2090	≤2.97
LTE TDD, B38	2570-2620	≤1.07	2570-2620	≤2.07
LTE TDD, B39	1880-1920	≤3.2	1880-1920	≤3.7
LTE TDD, B40	2300-2400	≤2.17	2300-2400	≤1.43
LTE TDD, B41	2496-2690	≤2.36	2496-2690	≤2.67
LTE FDD, B1	1920-1980	≤2.10	2110-2170	≤2.74
LTE FDD, B3	1710-1785	≤2.01	1805-1880	≤2.12

Main antenna

### 3. Standing Wave Ratio(VSWR)test

#### 3-1 Test settings

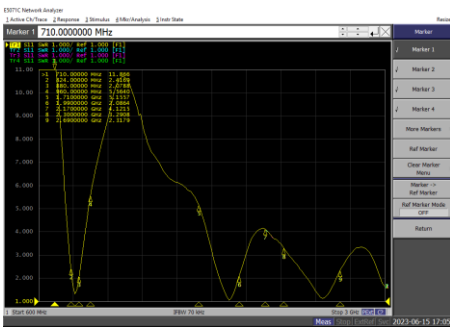
The VSWR test units are connected in turn: E5071B Network Analyzer → 50 ohm coaxial

Cable → 156mm long copper tube /b110> → Test fixtures. Processing of the test fixture: A hard cable is used from the antenna 50 ohm test point on the pcb of the mobile phone to lead out the SMA-J connector, connect it to the copper tube with a choke, and then connect the other devices in turn.

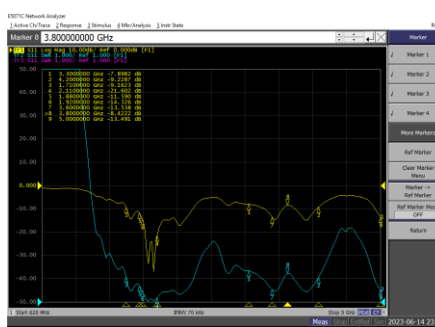
#### 3-2 VWR test

The following table shows the value of the standing wave ratio of the edge frequency point of the GSM+LTE antenna operating band, the return loss, VSWR, and the relevant waveform plot is shown in the annex:

A91 ANT1 VSWR/Return Loss

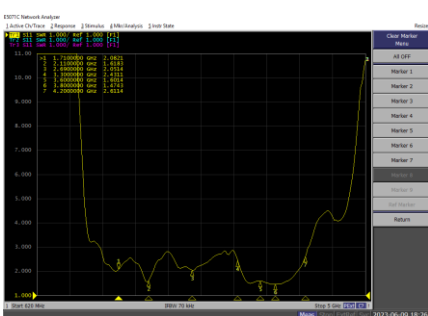


A91 ANT2 VSWR/Return Loss

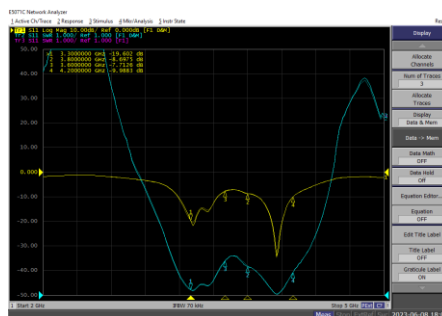


#### 3-3 test results

A91 ANT3 VSWR/Return Loss

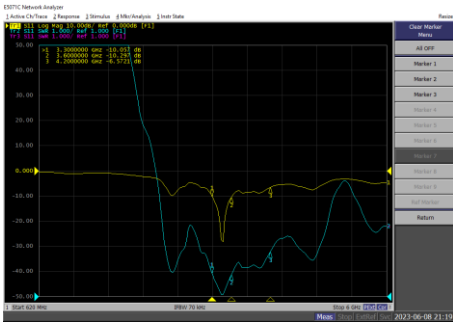


A91 ANT4 VSWR/Return Loss

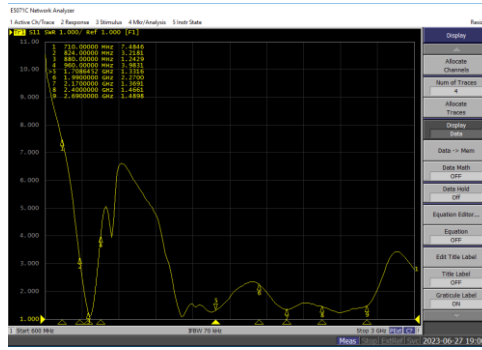


A91 ANT5 VSWR/Return Loss

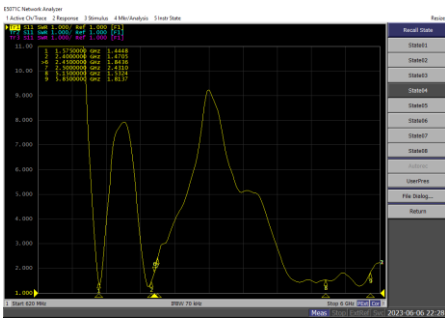
A91 ANT0 VSWR/Return Loss



A91 WIFI 1 VSWR/Return Loss



A91 WIFI 2 VSWR/Return Loss



3-4 gain test

ANT0 Gain

700	-2.8	1400	-4.2	2120	-2.8
710	-2.7	1420	-4.1	2140	-2.7
720	-2.5	1440	-3.9	2160	-2.8
730	-2.5	1460	-3.7	2180	-2.9
740	-2.6	1480	-3.8	2300	-3.6
750	-2.7	1500	-3.9	2320	-3.5
760	-2.8	1700	-3.5	2340	-3.4
770	-2.8	1720	-3.4	2360	-3.3
780	-2.9	1740	-3.4	2380	-3.5
790	-3.1	1760	-3.3	2400	-3.5
800	-2.8	1780	-3.3	2420	-3.6
810	-2.6	1800	-3.2	2440	-3.7
820	-2.4	1820	-3.2	2460	-3.8
830	-2.3	1840	-3.1	2480	-3.9
840	-2.2	1860	-2.9	2500	-4.1
850	-2.1	1880	-2.9	2520	-4.2
860	-2.2	1900	-2.8	2540	-4.1
870	-2.3	1920	-2.8	2560	-3.9
880	-2.5	1940	-2.7	2580	-3.8
890	-2.5	1960	-2.7	2600	-3.6
900	-2.4	1980	-2.9	2620	-3.7

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910	-2.4	2000	-2.8	2640	-3.8
920	-2.3	2020	-2.9	2660	-3.9
930	-2.3	2040	-3.1	2680	-3.9
940	-2.4	2060	-3.1	2700	-4.1
950	-2.4	2080	-2.9		
960	-2.5	2100	-2.9		

ANT1 Gain

Freq	Gain	Freq	Gain	Freq	Gain
700	-3.8	950	-4.2	2160	-1.7
710	-3.7	960	-4.2	2180	-1.9
720	-3.6	1700	-2.1	2300	-2.5
730	-3.6	1720	-2.1	2320	-2.3
740	-3.7	1740	-1.9	2340	-2.2
750	-3.8	1760	-1.9	2360	-2.3
760	-3.9	1780	-2.2	2380	-2.4
770	-3.9	1800	-2.1	2400	-2.5
780	-4.1	1820	-1.9	2420	-2.6
790	-4.1	1840	-1.8	2440	-2.6
800	-4.2	1860	-1.9	2460	-2.7
810	-4.2	1880	-1.8	2480	-2.6
820	-4.1	1900	-1.8	2500	-2.6
830	-3.9	1920	-1.8	2520	-2.5
840	-3.9	1940	-1.9	2540	-2.5
850	-4.1	1960	-1.9	2560	-2.4
860	-4.1	1980	-1.8	2580	-2.4
870	-4.2	2000	-1.8	2600	-2.3
880	-4.1	2020	-1.7	2620	-2.3
890	-3.9	2040	-1.7	2640	-2.5
900	-3.9	2060	-1.6	2660	-2.5
910	-3.8	2080	-1.6	2680	-2.6
920	-3.8	2100	-1.5	2700	-2.6
930	-3.9	2120	-1.5		
940	-4.1	2140	-1.5		

ANT2 Gain

Freq	Gain	Freq	Gain	Freq	Gain	Freq	Gain
1700	-2.1	2500	-2.3	3300	-1.7	3760	-1.9
1720	-2.1	2520	-2.2	3320	-1.9	3780	-1.9
1740	-1.9	2540	-2.6	3340	-2.5	3800	-2.2

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1760	-1.9	2560	-2.3	3360	-2.3	3820	-2.1
1780	-2.2	2580	-2.3	3380	-2.2	3840	-1.9
1800	-2.1	2600	-2.2	3400	-2.3	3860	-1.8
1820	-1.9	2620	-2.4	3420	-2.4	3880	-1.9
1840	-1.8	2640	-2.3	3440	-2.5	3900	-1.8
1860	-1.9	2660	-2.4	3460	-2.6	3920	-1.8
1880	-1.8	2680	-2.5	3480	-2.6	3940	-1.8
1900	-1.8	2700	-2.5	3500	-2.7	3960	-1.9
1920	-1.8			3520	-2.6	3980	-1.9
1940	-1.9			3540	-2.6	4000	-1.8
1960	-1.9			3560	-2.5	4020	-1.8
1980	-1.8			3580	-2.5	4040	-1.7
2000	-1.8			3600	-2.4	4060	-1.7
2020	-1.7			3620	-2.4	4080	-1.6
2040	-1.7			3640	-2.3	4100	-1.6
2060	-1.6			3660	-2.3	4120	-1.5
2080	-1.6			3680	-2.5	4140	-1.5
2100	-1.5			3700	-2.5	4160	-1.5
2120	-1.5			3720	-2.6	4180	-1.9
2140	-1.5			3740	-2.6	4200	-1.9
2160	-1.8						
2180	-1.9						

ANT3 Gain

Freq	Gain	Freq	Gain	Freq	Gain	Freq	Gain
1700	-2.24	2500	-2.3	3300	-1.7	3760	-1.9
1720	-2.54	2520	-2.2	3320	-1.9	3780	-1.9
1740	-1.88	2540	-2.6	3340	-2.5	3800	-2.2
1760	-1.64	2560	-2.3	3360	-2.3	3820	-2.1
1780	-1.55	2580	-2.3	3380	-2.2	3840	-1.9
1800	-1.9	2600	-2.2	3400	-2.3	3860	-1.8
1820	-1.87	2620	-2.4	3420	-2.4	3880	-1.9
1840	-1.67	2640	-2.3	3440	-2.5	3900	-1.8
1860	-1.87	2660	-2.4	3460	-2.6	3920	-1.8
1880	-1.67	2680	-2.5	3480	-2.6	3940	-1.8
1900	-1.78	2700	-2.5	3500	-2.7	3960	-1.9
1920	-1.8			3520	-2.6	3980	-1.9
1940	-1.84			3540	-2.6	4000	-1.8
1960	-1.89			3560	-2.5	4020	-1.8
1980	-1.77			3580	-2.5	4040	-1.7
2000	-1.88			3600	-2.4	4060	-1.7

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2020	-1.78			3620	-2.4	4080	-1.6
2040	-1.78			3640	-2.3	4100	-1.6
2060	-1.78			3660	-2.3	4120	-1.5
2080	-1.78			3680	-2.5	4140	-1.5
2100	-1.78			3700	-2.5	4160	-1.5
2120	-1.67			3720	-2.6	4180	-1.9
2140	-1.78			3740	-2.6	4200	-1.9
2160	-1.64						
2180	-1.87						

ANT4 Gain

Freq	Gain	Freq	Gain
3300	-1.7	3760	-1.9
3320	-1.9	3780	-1.9
3340	-2.5	3800	-2.2
3360	-2.3	3820	-2.1
3380	-2.2	3840	-1.9
3400	-2.3	3860	-1.8
3420	-2.4	3880	-1.9
3440	-2.5	3900	-1.8
3460	-2.6	3920	-1.8
3480	-2.6	3940	-1.8
3500	-2.7	3960	-1.9
3520	-2.6	3980	-1.9
3540	-2.6	4000	-1.8
3560	-2.5	4020	-1.8
3580	-2.5	4040	-1.7
3600	-2.4	4060	-1.7
3620	-2.4	4080	-1.6
3640	-2.3	4100	-1.6
3660	-2.3	4120	-1.5
3680	-2.5	4140	-1.5
3700	-2.5	4160	-1.5
3720	-2.6	4180	-1.9
3740	-2.6	4200	-1.9

ANT5 Gain

Freq	Gain	Freq	Gain
3300	-1.7	3760	-1.9
3320	-1.9	3780	-1.9

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3340	-2.5	3800	-2.2
3360	-2.3	3820	-2.1
3380	-2.2	3840	-1.9
3400	-2.3	3860	-1.8
3420	-2.4	3880	-1.9
3440	-2.5	3900	-1.8
3460	-2.6	3920	-1.8
3480	-2.6	3940	-1.8
3500	-2.7	3960	-1.9
3520	-2.6	3980	-1.9
3540	-2.6	4000	-1.8
3560	-2.5	4020	-1.8
3580	-2.5	4040	-1.7
3600	-2.4	4060	-1.7
3620	-2.4	4080	-1.6
3640	-2.3	4100	-1.6
3660	-2.3	4120	-1.5
3680	-2.5	4140	-1.5
3700	-2.5	4160	-1.5
3720	-2.6	4180	-1.9
3740	-2.6	4200	-1.9

**GPS/WIFI/BT L1**

Freq	Gain	Freq	Gain	Freq	Gain
1560	-1.3	2400	-1.4	5100	1.1
1570	-1.2	2420	-1.3	5200	1.2
1580	-1.2	2440	-1.2	5300	1.0
1590	-1.3	2460	-1.2	5400	1.2
		2480	-1.2	5500	1.2
		2500	-1.3	5600	1.1
				5700	1.0
				5800	1.1

**GPS/WIFI/BT L2**



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Freq	Gain	Freq	Gain	Freq	Gain
1160	-1.64	2400	-0.6	5100	0.87
1170	-1.65	2420	-0.7	5200	0.72
1180	-1.54	2440	-0.7	5300	1.0
		2460	-0.6	5400	1.1
		2480	-0.7	5500	1.14
		2500	-0.8	5600	1.24
				5700	1.2
				5800	1.13