WX.0019.L5.MFF

Antenna Specification

1.Application:

This application shall apply for antenna unit which shall be used such as automotive, conventional communications, smart home, etc..

2.Electrical Specification:

Those specifications were specially defined for customer's model, and all characteristics were measured under the model's handset testing jig .

2-1. Frequency Band:

Frequency Band	MHz
5G rod antenna	690-960/1710-2690/3300-5000×4

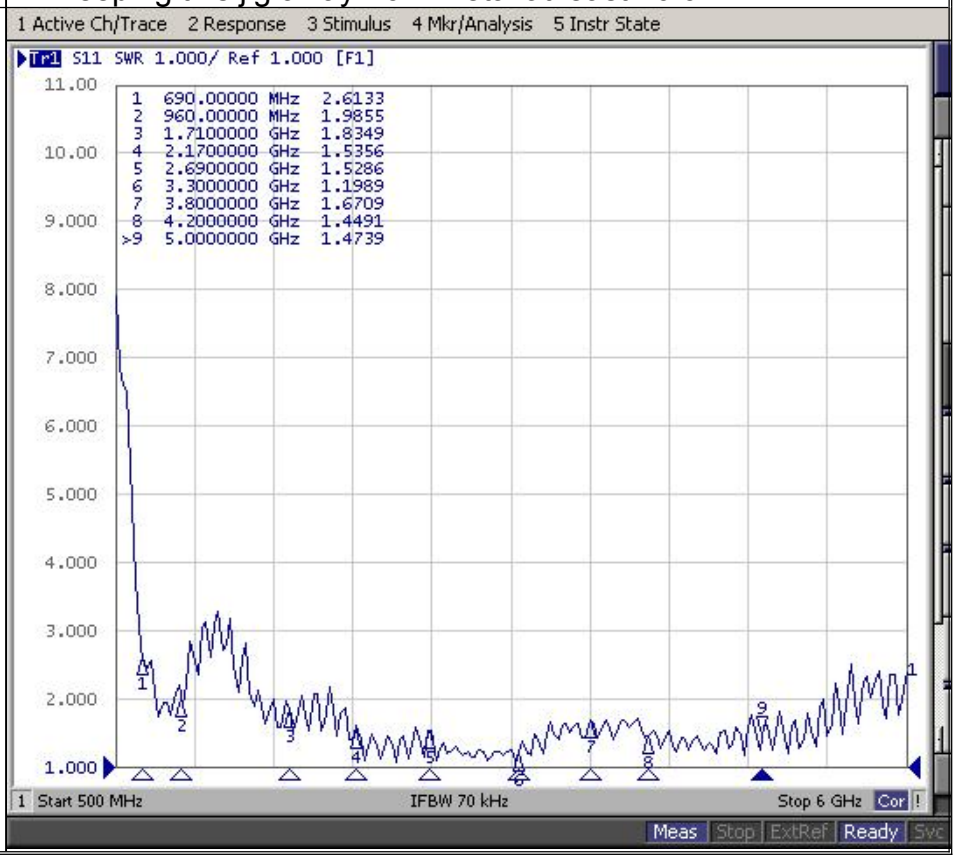
2-2. Impedance

50 ohm nominal

2-3. VSWR

Antenna 1#

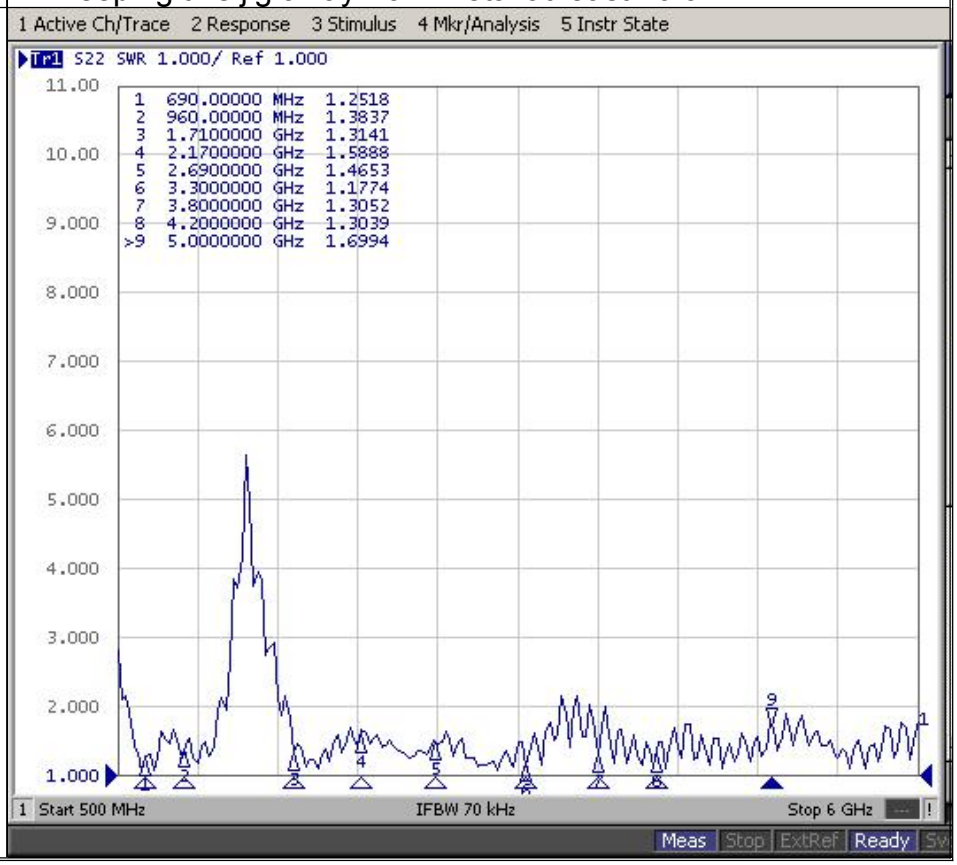
Frequency Band(MHz)	690	960	1710	2170	2690	3300	3800	4200	5000
Typical Value:	2.61	1.98	1.83	1.63	1.52	1.19	1.67	1.44	1.47

Measuring Method	1. A 50Ω coaxial cable is connected to the antenna. Then this cable is connected to a network analyzer to measure the VSWR. 2. Keeping this jig away from metal at least 20 cm
Picture	

2-3. VSWR

Antenna 2#

Frequency Band(MHz)	690	960	1710	2170	2690	3300	3800	4200	5000
Typical Value:	1.25	1.38	1.31	1.58	1.46	1.17	1.30	1.30	1.69

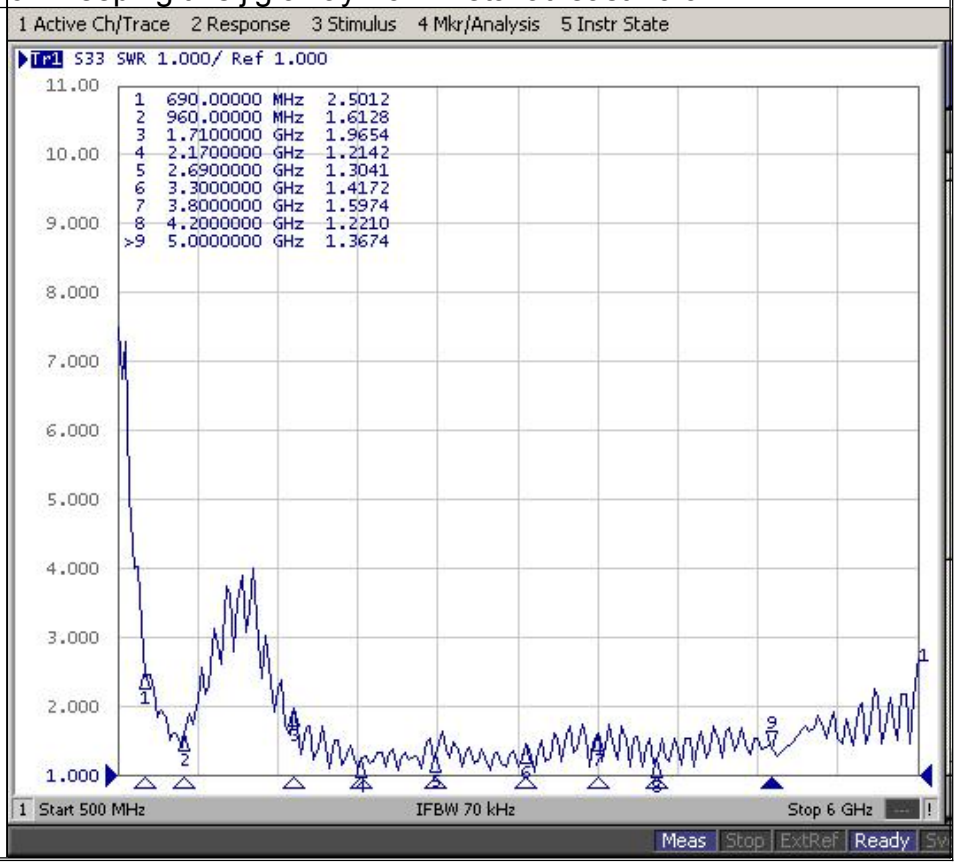
Measuring Method	3. A 50Ω coaxial cable is connected to the antenna. Then this cable is connected to a network analyzer to measure the VSWR. 4. Keeping this jig away from metal at least 20 cm
Picture	

UNLESS OTHER SPECIFIED TOLERANCES ON： X=± X.X=± X.XX=± ANGLES=± HOLEDIA=±		KINGRF TECHNOLOGY CO., LTD.	
SCALE：	UNIT：mm	THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF KINGRF TECHNOLOGY CO.,LTD.AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION	
DRAWN BY： LI	CHECKED BY: YS		
DESIGNED BY: De wen	APPROVED BY: YS		
TITLE：WX.0019.I5.MFF Antenna Specification			SPEC REV. P0

2-3. VSWR

Antenna 3#

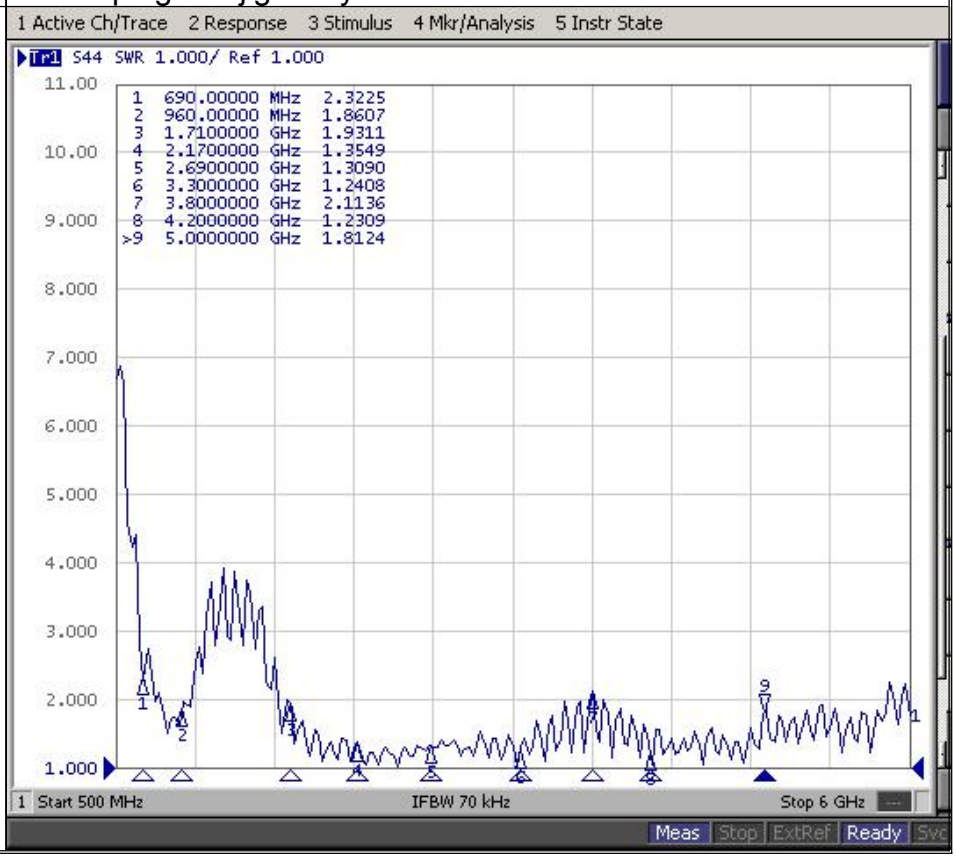
Frequency Band(MHz)	690	960	1710	2170	2690	3300	3800	4200	5000
Typical Value:	2.50	1.61	1.96	1.21	1.30	1.41	1.59	1.22	1.36

Measuring Method	5. A 50Ω coaxial cable is connected to the antenna. Then this cable is connected to a network analyzer to measure the VSWR. 6. Keeping this jig away from metal at least 20 cm
Picture	

2-3. VSWR

Antenna 4#

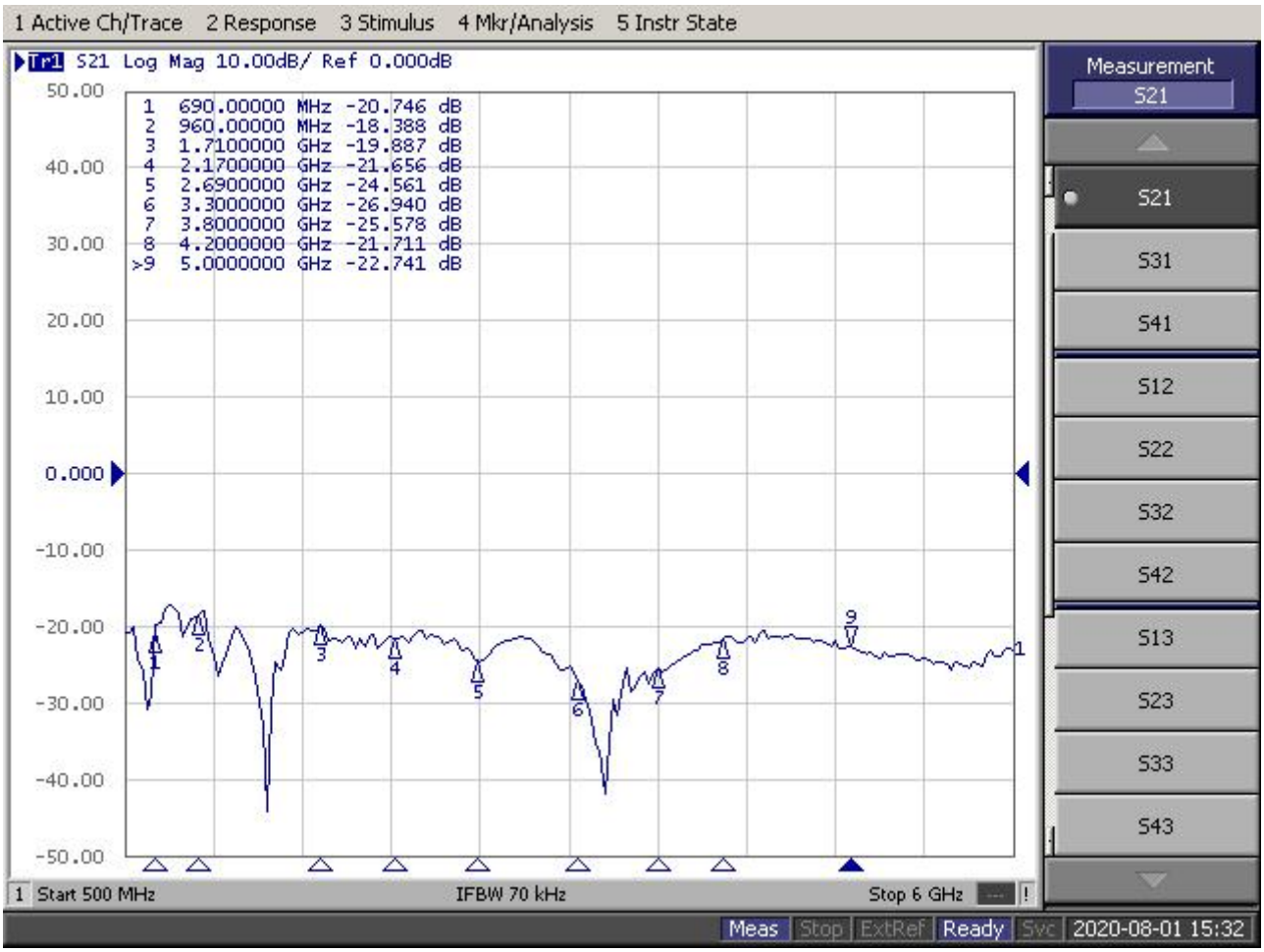
Frequency Band(MHz)	690	960	1710	2170	2690	3300	3800	4200	5000
Typical Value:	2.32	1.86	1.93	1.35	1.30	1.24	2.11	1.23	1.81

Measuring Method	7. A 50Ω coaxial cable is connected to the antenna. Then this cable is connected to a network analyzer to measure the VSWR. 8. Keeping this jig away from metal at least 20 cm
Picture	

2-4. Isolation degree

Antenna 1#--2#

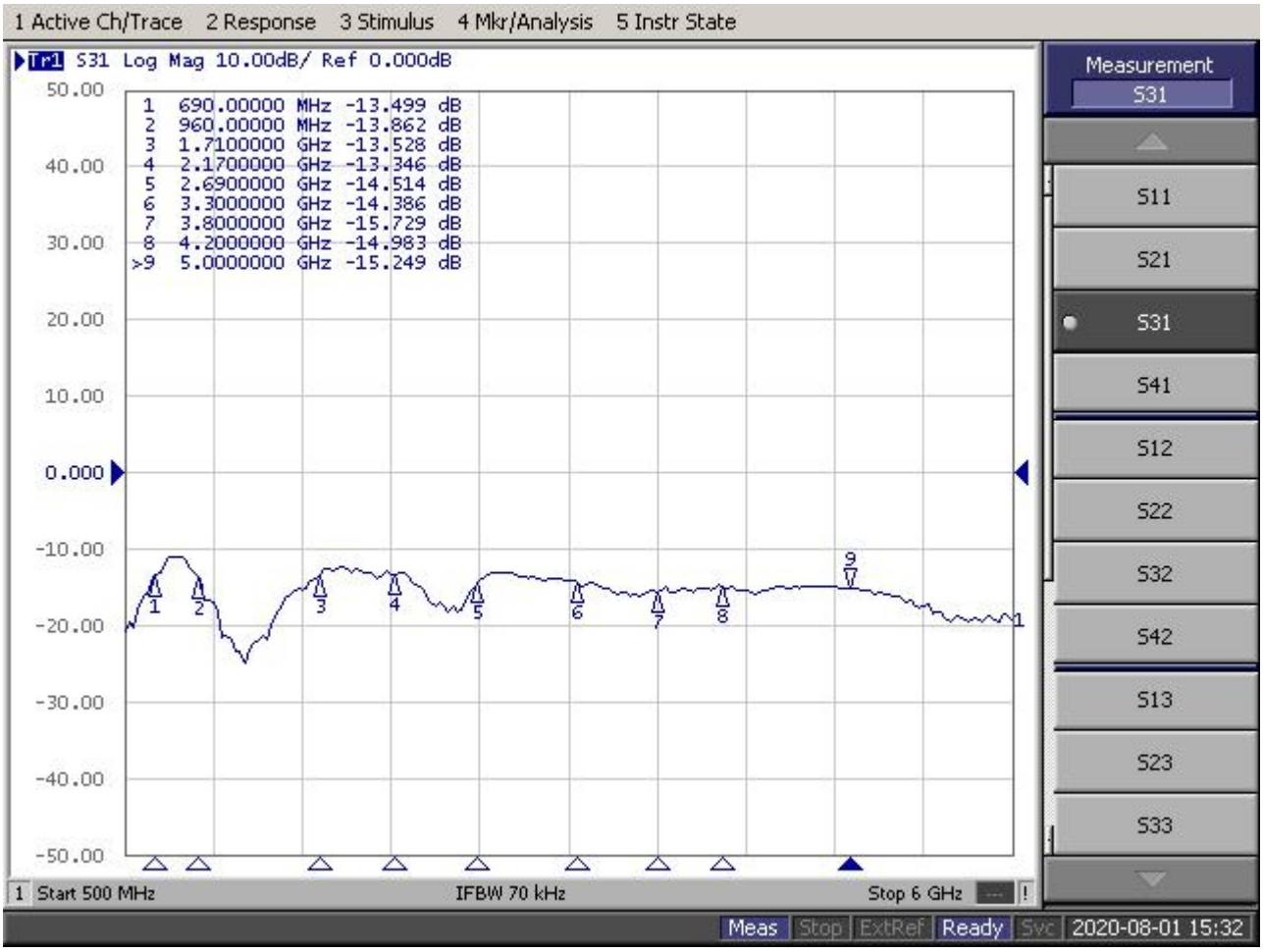
Frequency Band(MHz)	690	960	1710	2170	2690	3300	3800	4200	5000
Typical Value:	-20.74	-18.38	-19.88	-21.65	-24.56	-26.94	-25.57	-21.71	-22.74



2-4. Isolation degree

Antenna 1#--3#

Frequency Band(MHz)	690	960	1710	2170	2690	3300	3800	4200	5000
Typical Value:	-13.49	-13.86	-13.52	-13.34	-14.51	-14.38	-15.72	-14.98	-15.24



2-4. Isolation degree

Antenna 1#--4#

Frequency Band(MHz)	690	960	1710	2170	2690	3300	3800	4200	5000
Typical Value:	-14.38	-15.56	-22.81	-23.35	-26.06	-31.26	-40.85	-30.87	-29.65

2-4. Isolation degree

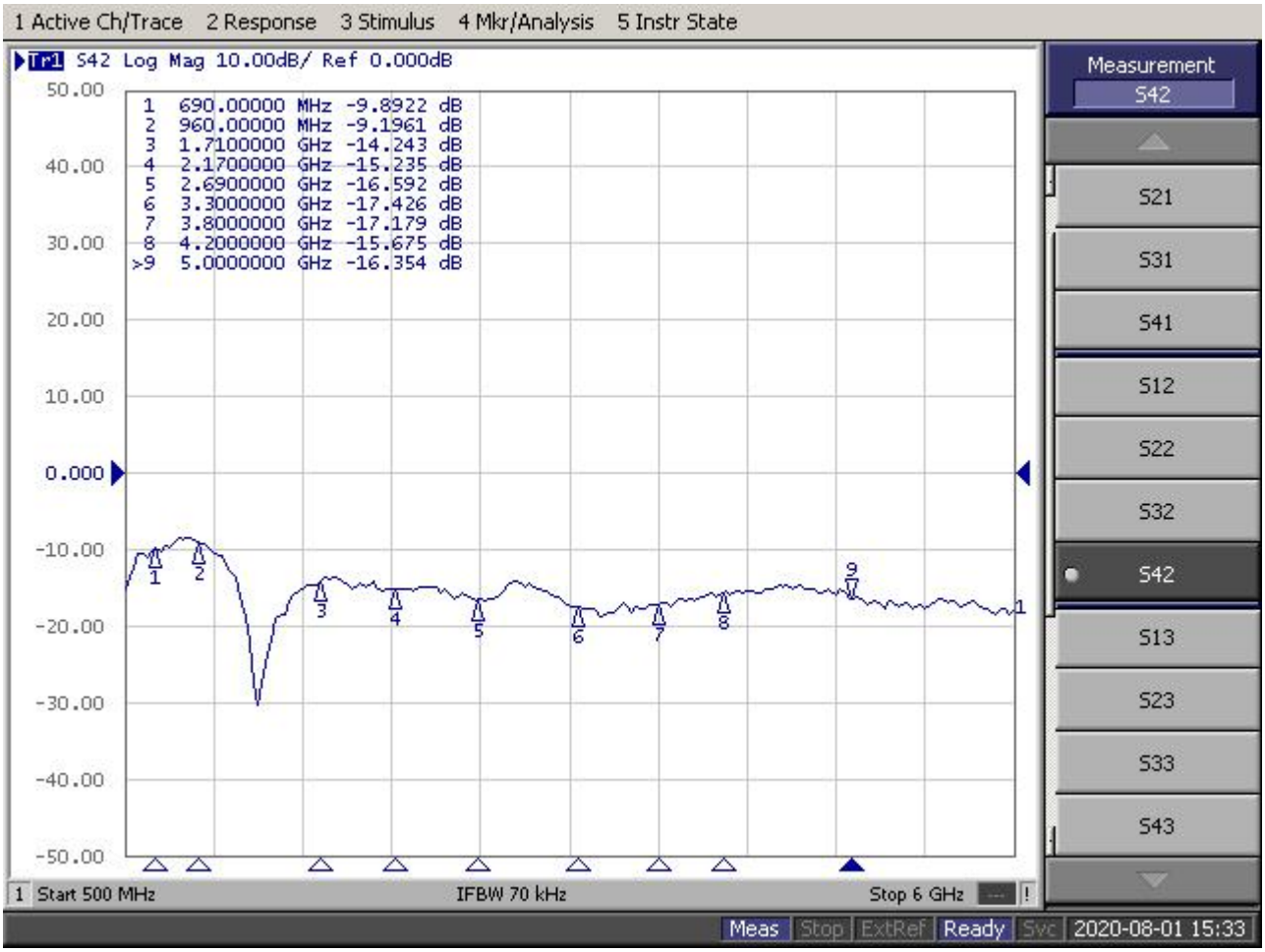
Antenna 2#--3#

Frequency Band(MHz)	690	960	1710	2170	2690	3300	3800	4200	5000
Typical Value:	-11.15	-14.92	-18.55	-18.13	-22.66	-31.51	-29.45	-30.25	-33.96

2-4. Isolation degree

Antenna 2#--4#

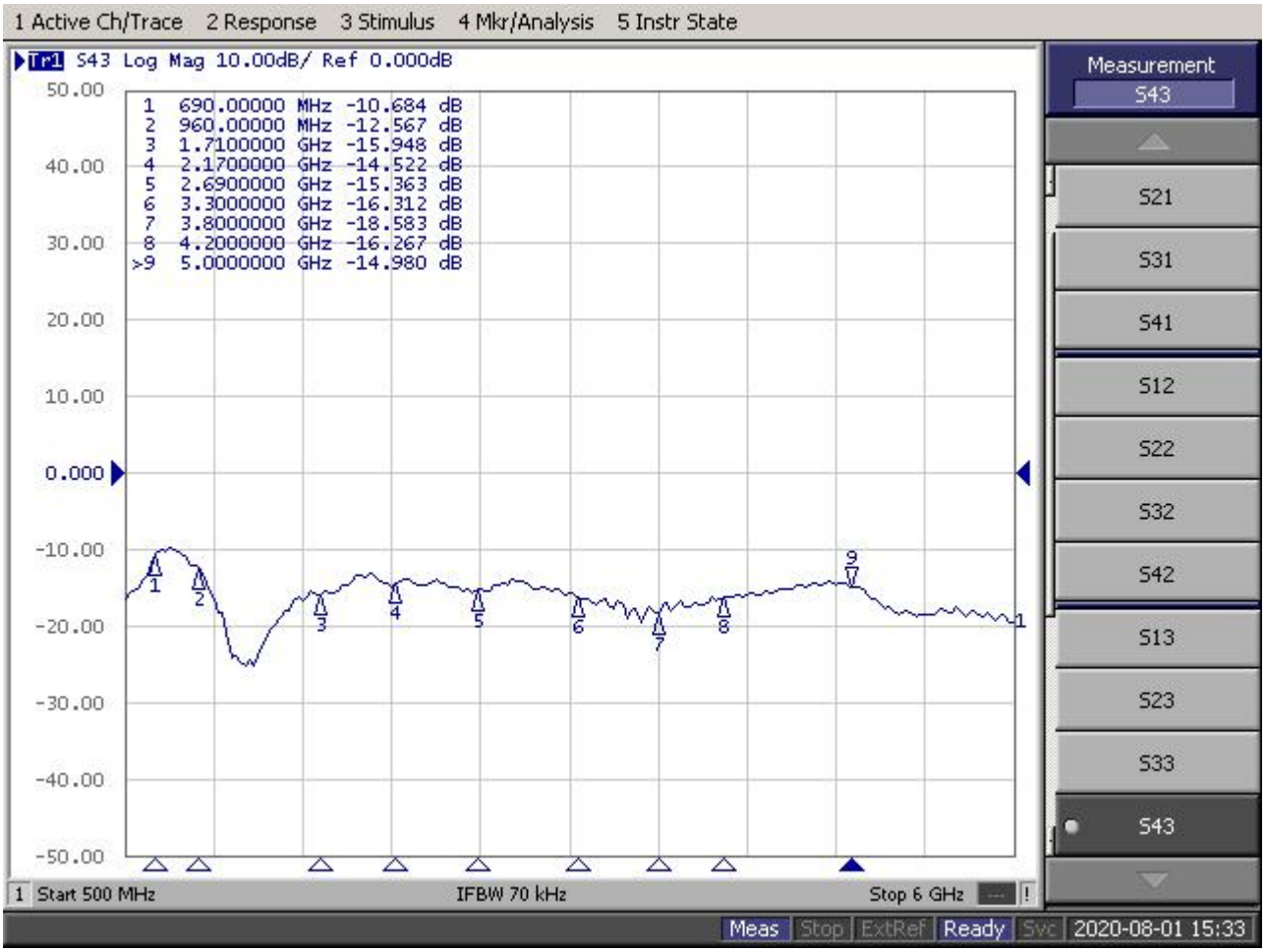
Frequency Band(MHz)	690	960	1710	2170	2690	3300	3800	4200	5000
Typical Value:	-9.89	-9.19	-14.24	-15.23	-16.59	-17.42	-17.17	-15.67	-16.35



2-4. Isolation degree

Antenna 3#--4#

Frequency Band(MHz)	690	960	1710	2170	2690	3300	3800	4200	5000
Typical Value:	-10.68	-12.56	-15.94	-14.52	-15.36	-16.31	-18.58	-16.26	-14.98

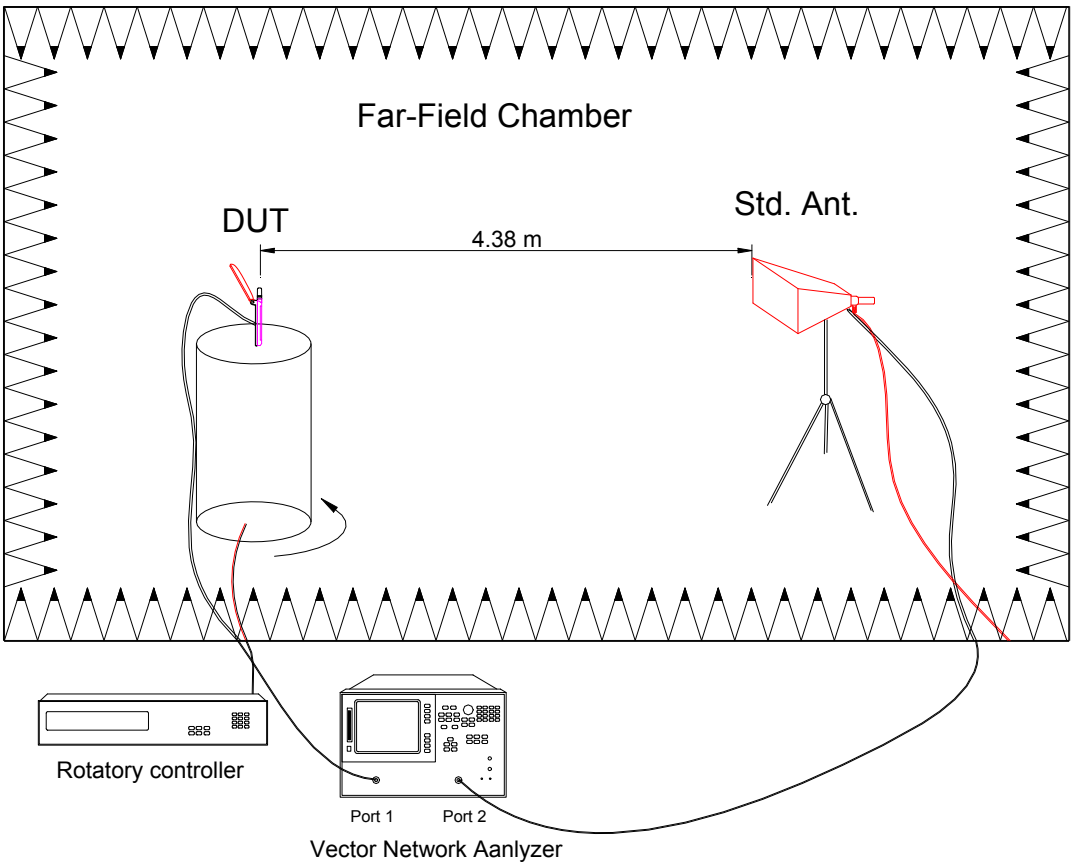


2-5. Active test

2-5.1 Measure method

1. Using a low loss coaxial cable to link a standard handset jig
2. Fixed this handset jig on chamber's rotator plane
3. Linking jig into network analyzer port and using a probing horn antenna to collect data.
4. Using another standard gain horn antenna to calibrated those data

2-5.2 Chamber definition



1. An anechoic chamber (7mx4mx3m) which satisfied far-field condition was applied to avoid multi-path effect
2. The quite room region is 40cmx40cmx40cm at the center of rotator
3. The distance between DUT and standard antenna is 4.38 m
4. Probing antenna (9120D horn antenna) and standard gain horn antenna (BBHA9120 LPF 600MHz ~6GHz)

2-5 Efficiency and Gain/ Antenna 1#

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
690	40.59	-2.18	3.4
700	42.8	-3.69	2.61
710	41.14	-3.86	2.21
720	46.92	-3.29	2.74
730	35.96	-4.44	0.86
740	51.53	-2.88	2.69
750	63.65	-1.96	3.63
760	64.57	-1.9	4.22
770	41.34	-3.84	3.48
780	38.12	-4.19	3.06
790	38.61	-4.13	2.62
800	41.19	-3.85	1.67
810	48.43	-3.15	2.51
820	40.25	-2.2	3.33
830	48.85	-3.11	2.13
840	43.9	-3.58	2.04
850	39.22	-4.07	1.49
860	39.99	-3.98	1.37
870	41.48	-3.82	2.01
880	46.33	-3.34	0.79
890	50.57	-2.96	1.69
900	54.29	-2.65	2.52
910	52.36	-2.81	1.86
920	42.88	-3.68	1.6
930	33.63	-4.73	-0.18
940	39.69	-4.01	0.86
950	45.99	-3.37	1.93
960	48.66	-2.32	2.42

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
1710	59.67	-2.24	3.83
1720	57.73	-1.09	4.94
1730	57.59	-1.1	3.58
1740	59.29	-1.59	2.91
1750	61.56	-1.45	2.86
1760	53.39	-2.73	2.16
1770	53.69	-1.96	2.39
1780	50.61	-2.96	1.88
1790	57.83	-2.38	2.62
1800	56.96	-1.74	3.29
1810	58.04	-1.67	3.81
1820	63.67	-1.96	3.43
1830	54.14	-1.93	3.04
1840	49.97	-3.01	2.44
1850	51.9	-2.85	2.75
1860	47.9	-3.2	2.1
1870	57.91	-2.37	3.37
1880	61.21	-1.47	3.85
1890	57.12	-1.73	3.28
1900	61.1	-1.48	3.68
1910	60.32	-1.53	4.31
1920	60.28	-1.53	3.76
1930	57.13	-2.43	3.26
1940	62.09	-2.07	2.97
1950	70.23	-1.54	3.4
1960	69.98	-1.55	3.53
1970	70.81	-1.5	3.78
1980	64.68	-0.72	4.38
1990	60.45	-2.19	2.92
2000	59.56	-2.25	2.76
2010	33.16	-4.79	0.07
2020	44.91	-3.48	1.32

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
2030	44.23	-3.54	1.16
2040	48.39	-3.15	1.72
2050	46.66	-2.47	2.37
2060	40.24	-3.95	1.23
2070	44.14	-3.55	1.69
2080	42.96	-3.67	1.71
2090	43.52	-3.61	1.45
2100	43.26	-3.64	1.3
2110	46.48	-2.48	2.63
2120	43.09	-3.66	0.97
2130	51.26	-2.9	2.28
2140	44.89	-4.57	0.14
2150	47.42	-4.27	0.87
2160	41.91	-4.96	-0.22
2170	47.46	-3.24	1.87
2180	39.53	-4.03	1.19
2190	44.66	-3.5	1
2200	46.03	-3.37	1.29
2210	50.63	-2.96	2.13
2220	48.77	-3.12	2.29
2230	47.47	-3.24	2.47
2240	45.64	-3.41	1.92
2250	49.52	-3.05	2.34
2260	51.1	-2.92	2.12
2270	51.35	-2.89	1.86
2280	57.49	-2.4	1.88
2290	52.34	-2.81	1.96
2300	49.19	-3.08	2.06
2310	39.7	-4.01	1.84
2320	51.02	-2.92	2.46
2330	43.87	-3.58	2.03
2340	51.11	-2.91	3.11
2350	46.41	-3.33	2.33
2320	51.02	-2.92	2.46
2330	43.87	-3.58	2.03

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
2360	49.07	-3.09	2.05
2370	45.42	-3.43	1.47
2380	48.63	-3.13	2.13
2390	41.06	-3.87	1.53
2400	62.46	-2.04	3.34
2410	63.76	-1.32	4.42
2420	61.92	-1.43	5.63
2430	69.55	-0.99	6.49
2440	63.33	-1.98	5.09
2450	73.93	-1.31	4.51
2460	64.55	-1.9	3.57
2470	62.31	-1.41	3.05
2480	62.62	-2.03	2.55
2490	61.43	-1.46	3.29
2500	69.85	-1.56	4.27
2510	45.3	-3.44	3.39
2520	38.44	-4.15	3.47
2530	42.53	-3.71	3.16
2540	45.23	-3.45	2.22
2550	41.76	-3.79	1.12
2560	46.79	-4.34	0.38
2570	45.31	-3.44	1.15
2580	44.02	-3.56	1.1
2590	41.64	-3.8	1.32
2600	45.58	-3.41	2.63
2610	38.67	-4.13	2.64
2620	43.78	-3.59	2.47
2630	44.6	-3.51	1.93
2640	43.97	-3.57	1.37
2650	44.91	-3.48	1.6
2660	49.73	-3.03	1.87
2670	50.51	-2.97	2.04
2680	47.71	-3.21	2.33
2690	41.56	-3.81	1.64

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
3300	65.48	-1.84	4.38
3320	62.87	0.12	5.7
3340	63.06	-0.31	5.26
3360	61.78	-0.37	4.98
3380	65.05	-0.7	5.27
3400	69.27	-1.01	4.95
3420	61.14	-1.48	4.11
3440	64.36	-0.74	4.95
3460	63.77	-1.95	3.19
3480	64.73	-1.89	3.46
3500	63.8	-1.95	3.65
3520	57.34	-2.42	3.14
3540	66.22	-1.79	3.37
3560	61.65	-1.45	3.79
3580	63.86	-1.32	4.18
3600	61.38	-1.46	4.59
3620	67.28	-1.72	3.56
3640	64.28	-1.92	3.53
3660	57.01	-2.44	3.31
3680	66.32	-1.78	3.49
3700	55.73	-2.54	2.61
3720	67.27	-1.72	3.15
3740	60.16	-2.21	2.64
3760	74.61	-1.27	3.25
3780	53.48	-2.72	1.84
3800	72.82	-1.38	3.48

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
4200	58.09	-2.36	3.01
4230	53.09	-2.75	2.68
4260	54.77	-1.89	4.93
4290	52.92	-2.01	3.15
4320	52.01	-1.43	4.34
4350	57.26	-1.12	4.52
4380	59.83	-0.47	5.56
4410	58.37	-2.34	3.16
4440	52.65	-2.03	3.29
4470	58.44	-1.65	3.56
4500	40.35	-3.94	2.43
4530	33.58	-4.74	1
4560	40.08	-3	2.57
4590	34.12	-4.67	1.12
4620	35.36	-4.52	0.72
4650	34.64	-4.6	0.85
4680	37.9	-5.54	-0.19
4710	37.82	-4.22	1.36
4740	41.12	-3.86	2.05
4770	33.71	-4.72	1.22
4800	35.21	-5.98	0.4
4830	35.82	-4.46	0.9
4860	35.95	-4.44	1.44
4890	38.25	-5.19	0.43
4920	38.88	-5.39	0.42
4950	40.55	-3.92	1.71
4980	37.41	-5.62	0.58
5010	39.27	-3.07	3.74
5040	35.64	-4.48	1.38
5070	32.9	-4.83	1.54
5100	39.1	-5.36	1.43

Efficiency and Gain/ Antenna 2#

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
690	39.22	-3.08	1.94
700	32.54	-4.88	0.61
710	34.01	-4.68	-0.67
720	49.16	-2.28	1.39
730	51	-2.15	2.25
740	58.84	-1.03	3.91
750	48.78	-3.12	2.35
760	42.56	-4.87	0.78
770	40.64	-3.91	1.63
780	45.22	-3.45	1.75
790	48.4	-3.15	1.62
800	59.32	-2.27	1.25
810	50.87	-2.94	0.76
820	57.98	-2.37	2.03
830	48.79	-3.12	1.52
840	35.99	-4.44	-0.02
850	45.96	-3.38	2.18
860	65.25	-1.85	3.02
870	76.53	-1.16	3.92
880	65.52	-1.84	3.56
890	51.13	-2.91	2.05
900	53.32	-2.73	1.55
910	53.21	-2.74	2.11
920	57.86	-2.38	1.65
930	58.24	-2.35	2.19
940	64.39	-1.91	3.22
950	58.62	-2.32	3.63
960	44.47	-3.52	2.5

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
1710	62.37	-2.05	2.13
1720	66.51	-1.16	4.3
1730	65.46	-1.22	4.4
1740	61.71	-0.88	4.94
1750	61.56	-0.89	5.01
1760	63.53	-1.97	3.69
1770	65.65	-1.21	5.04
1780	56.57	-2.47	3.73
1790	58.55	-2.32	3.29
1800	62.8	-2.02	2.69
1810	69.98	-1.55	3.08
1820	63.04	-2	2.79
1830	69.95	-1.55	3.52
1840	65.66	-1.83	3.77
1850	70.41	-1.52	4.27
1860	65.37	-1.85	4
1870	67.41	-1.71	3.93
1880	62.73	-1.38	3.67
1890	69.95	-0.97	4.16
1900	68.76	-1.04	3.71
1910	67.82	-0.56	4.74
1920	66.95	-0.61	5.09
1930	66.53	-1.16	4.59
1940	60.21	-0.96	5.21
1950	68.43	-1.05	5.31
1960	65.37	-1.23	4.59
1970	65.83	-1.2	4.6
1980	74.48	-0.25	5.58
1990	69.19	-1.01	4.17
2000	68.18	-1.07	3.91
2010	46.2	-3.35	1.22

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
2040	54.18	-2.66	3.19
2050	58.68	-2.31	3.7
2060	48.94	-3.1	2.61
2070	51.21	-2.91	1.99
2080	52.84	-2.77	2.12
2090	52.02	-2.84	1.89
2100	47.97	-3.19	1.72
2110	62.09	-2.07	2.79
2120	44.6	-3.51	2
2130	53.52	-2.71	3.19
2140	43.49	-3.62	2.33
2150	44.67	-3.5	2.18
2160	38.66	-4.13	1.32
2170	53.39	-2.73	2.52
2180	45.93	-3.38	1.62
2190	48.04	-3.18	1.85
2200	45.46	-3.42	1.88
2210	54.59	-2.63	3.14
2220	53.57	-2.71	3.09
2230	55.53	-2.55	3.35
2240	50.89	-2.93	2.62
2250	55.69	-2.54	2.62
2260	57.33	-2.42	2.18
2270	50.91	-2.93	1.83
2280	53.08	-2.75	2.22
2290	51.05	-2.92	2.28
2300	49.63	-3.04	2.11
2310	42.42	-3.72	1.04
2320	50.81	-2.94	1.8
2330	46.51	-3.32	1.61
2340	51.32	-2.9	2.19
2350	43.14	-3.65	1.58
2360	47.39	-3.24	1.71

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
2370	44.87	-3.48	1.18
2380	51.13	-2.91	1.21
2390	44.79	-3.49	0.48
2400	65.73	-1.82	2.63
2410	79.87	-0.98	4.08
2420	67.24	-1.72	3.79
2430	69.14	-1.6	4.19
2440	57.05	-2.44	3.13
2450	65.33	-1.85	3.09
2460	69.96	-1.55	3.33
2470	72.35	-1.41	3.29
2480	67.87	-1.68	2.77
2490	73.83	-1.32	3.12
2500	63.79	-1.95	3.29
2510	45.46	-3.42	2.55
2520	36.7	-4.35	2.26
2530	38.94	-4.1	2.12
2540	46.28	-3.35	2.59
2550	43.03	-3.66	1.81
2560	42.99	-3.67	1.7
2570	46.71	-3.31	1.41
2580	43.63	-3.6	1.05
2590	42.69	-3.7	0.88
2600	42.56	-3.71	1.09
2610	41.48	-3.82	1.65
2620	43.96	-3.57	2.21
2630	45.04	-3.46	1.86
2640	44.44	-3.52	1.22
2650	41.67	-3.8	0.95
2660	50.52	-2.97	1.68
2670	50.43	-2.97	1.9
2680	46.94	-3.28	1.93
2690	44.91	-3.48	1.53

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
3300	61.67	-2.1	3.06
3320	64.79	0.2	5.58
3340	67.36	-0.59	5.1
3360	63.89	-0.76	5.1
3380	68.79	-1.04	4.59
3400	68.75	-1.04	3.96
3420	64.27	-1.29	4.45
3440	62.62	-0.83	4.62
3460	61.68	-2.1	3.46
3480	62.11	-2.07	3.6
3500	63.28	-1.99	2.91
3520	61.69	-2.1	3.14
3540	68.54	-1.64	3.05
3560	69.17	-1.6	4.42
3580	67	-1.74	4.47
3600	72.22	-1.41	3.98
3620	65.96	-1.81	4.45
3640	61.46	-2.11	3.29
3660	48.85	-3.11	2.85
3680	63.19	-1.99	3.18
3700	58.83	-2.3	3.13
3720	65.12	-1.86	3.84
3740	52.81	-2.77	1.82
3760	62.83	-1.38	3.31
3780	54.17	-2.66	2.11
3800	62.37	-2.05	3.08

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
4200	55.13	-2.59	2.33
4230	65.91	-1.81	3.36
4260	58.03	-2.36	2.99
4290	56.22	-2.5	2.97
4320	61.92	-0.87	5.14
4350	62.77	-1.38	3.92
4380	66.36	-0.64	5.15
4410	52.82	-2.02	3.62
4440	50.04	-2.22	3.41
4470	52.58	-2.04	3.77
4500	43.93	-3.57	1.77
4530	40.87	-5.1	0.57
4560	35.14	-3.45	2.58
4590	33.84	-4.71	1.96
4620	31.25	-5.05	1.39
4650	31.87	-4.97	0.52
4680	38.4	-5.47	1.29
4710	34.8	-4.58	2.05
4740	39.29	-4.06	2.06
4770	31.39	-5.03	1.84
4800	33.7	-6.25	-0.03
4830	34.66	-4.6	1.16
4860	35.39	-4.51	2.85
4890	38.86	-5.4	1.11
4920	39.51	-5.3	1.07
4950	38.38	-4.16	2.4
4980	34.37	-6.13	1.34
5010	37.78	-3.21	4.47
5040	33.15	-4.8	1.57
5070	31.15	-5.07	2.48
5100	30.44	-5.17	2.77

2-5 Efficiency and Gain/ Antenna 3#

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
690	45.17	-3.45	3.51
700	46.71	-3.31	2.5
710	51.41	-2.12	2.66
720	60.95	-0.92	3.17
730	67.21	-0.59	2.78
740	61.54	-0.38	2.94
750	57.46	-2.41	2.03
760	41.67	-3.8	0.62
770	45.22	-3.45	1.58
780	58.93	-2.3	1.43
790	65.84	-1.82	1.96
800	61.09	-1.48	2.06
810	58.23	-2.35	1.16
820	59.26	-2.27	1.56
830	45.11	-3.46	1.12
840	40.31	-3.95	1
850	45.17	-3.45	1.2
860	64.91	-1.88	3.14
870	65.95	-1.19	3.73
880	67.25	-1.72	2.65
890	66.35	-1.78	2.66
900	66.3	-1.78	2.88
910	57.79	-2.38	2.74
920	58.2	-2.35	3.17
930	56.74	-2.46	2.92
940	60.63	-2.17	2.01
950	54.3	-2.65	1.89
960	49.19	-3.08	2

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
1710	56.74	-2.46	1.35
1720	69.35	-1.59	2.29
1730	71.15	-1.48	2.94
1740	68.82	-1.03	3.99
1750	60.71	-0.93	3.86
1760	66.26	-1.79	2.86
1770	60.35	-1.53	3.23
1780	54.84	-3.48	1.91
1790	57.11	-3.27	2.29
1800	57.5	-2.4	2.77
1810	66.69	-1.76	2.66
1820	63.33	-1.98	2.15
1830	69.93	-1.55	3.11
1840	68.26	-1.66	3.17
1850	69.35	-1.59	2.86
1860	61.01	-2.15	2.55
1870	62.89	-2.77	1.93
1880	60.8	-2.16	3.59
1890	62.79	-1.38	3.74
1900	66.08	-1.19	3.32
1910	64.99	-0.71	3.71
1920	66.42	-0.63	4.42
1930	60.93	-1.49	3.08
1940	64.95	-1.25	4.05
1950	65.7	-1.82	3.9
1960	69.07	-1.61	4.7
1970	69.98	-1.55	4.59
1980	69.12	-0.5	5.09
1990	63.48	-1.34	3.48
2000	65.1	-1.24	3.75
2010	64.86	-3.48	1.33
2020	57.84	-3.2	1.79

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
2030	43.96	-3.57	1.48
2040	48.3	-3.16	2.24
2050	51.59	-2.87	2.91
2060	45.02	-3.47	2.37
2070	46.95	-3.28	2.25
2080	48.58	-3.14	2.59
2090	50.78	-2.94	1.71
2100	45.75	-3.4	1.41
2110	52.52	-2.04	2.71
2120	41.97	-3.77	1.37
2130	51.79	-2.86	2.28
2140	41.04	-3.87	1.34
2150	41.6	-3.81	1.25
2160	34.63	-4.61	0.32
2170	50.57	-2.96	1.84
2180	44.51	-3.51	1.55
2190	46.63	-3.31	0.87
2200	44.82	-3.49	1.04
2210	53.54	-2.71	2.28
2220	51.81	-2.86	2.48
2230	49.36	-3.07	2.57
2240	46.62	-3.31	2.31
2250	52.99	-2.76	3.04
2260	57.16	-2.43	2.59
2270	48.04	-3.18	1.43
2280	52.35	-2.81	1.94
2290	48.9	-3.11	1.18
2300	47.64	-3.22	1.83
2310	37.86	-4.22	1.48
2320	48.36	-3.16	2.8
2330	44.87	-3.48	2.74
2340	50.51	-2.97	3.28
2350	49.88	-3.99	1.68
2360	45.08	-3.66	1.22

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
2370	45.47	-3.93	1.46
2380	48.41	-3.15	2.26
2390	51.59	-3.81	1.5
2400	63.33	-1.98	4.29
2410	75.42	-1.22	5.04
2420	69.18	-1.6	5.06
2430	69.57	-1.58	4.95
2440	54.37	-2.65	3.53
2450	66.89	-1.75	4.32
2460	67.89	-1.68	3.5
2470	72.94	-1.37	3.6
2480	63.46	-1.97	2.89
2490	70.61	-1.51	3.77
2500	65.51	-1.84	4.56
2510	45.23	-3.45	2.91
2520	36.88	-4.33	2.2
2530	39.72	-4.01	1.63
2540	46.02	-3.37	1.78
2550	41.16	-3.86	1.35
2560	40.5	-3.93	1.86
2570	44.78	-3.49	2.47
2580	43.3	-3.64	2.05
2590	40.7	-3.9	1.38
2600	42.48	-3.72	1.84
2610	40.02	-3.98	2.21
2620	43.25	-3.64	2.12
2630	44.46	-3.52	1.92
2640	42.75	-3.69	2.03
2650	37.81	-4.22	2.33
2660	49.04	-3.09	3.23
2670	46.02	-3.37	2.78
2680	44.92	-3.48	2.12
2690	39.08	-4.08	1.13

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
3300	57.67	-2.39	2.52
3320	62.72	0.12	5.18
3340	67.81	-0.56	4.17
3360	66.56	-0.63	4.36
3380	60.65	-0.93	4.35
3400	69.99	-0.97	4.82
3420	64.39	-1.28	3.43
3440	64	-0.76	4.91
3460	63.69	-1.96	3.86
3480	65.1	-1.86	2.86
3500	64.35	-1.91	4.13
3520	61.59	-2.1	3.09
3540	71.98	-1.43	4.54
3560	72.17	-1.42	5.01
3580	71.33	-1.47	4.38
3600	73.04	-1.36	3.96
3620	68.76	-1.63	3.29
3640	65.3	-1.85	3.38
3660	51.98	-2.84	2.62
3680	64.88	-1.88	3.05
3700	57.68	-2.39	2.39
3720	68.84	-1.62	3.72
3740	58.68	-2.31	3.05
3760	76.83	-1.14	3.79
3780	57.67	-2.39	2.64
3800	69.86	-1.56	3.72

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
4200	56.73	-2.46	3.36
4230	68.38	-1.65	4.01
4260	62.78	-2.02	3.58
4290	60.38	-2.19	4.5
4320	68.05	-1.08	5.52
4350	64.18	-1.3	4.46
4380	67.54	-0.58	6.81
4410	62.65	-2.03	5.43
4440	58.98	-2.29	4.32
4470	43.61	-1.96	6.37
4500	46.13	-3.36	4.55
4530	42.98	-4.82	1.72
4560	44.33	-3.53	3.99
4590	44.58	-4.61	3.12
4620	42.49	-4.88	1.19
4650	41.42	-5.03	1.5
4680	47.44	-5.62	2.51
4710	42.9	-4.83	2.1
4740	45.28	-4.52	1.36
4770	49.4	-5.32	2.69
4800	31.24	-6.73	1.27
4830	31.24	-5.05	0.57
4860	36.29	-4.4	3.64
4890	37.57	-5.6	2.63
4920	34	-6.2	0.51
4950	38.81	-4.11	4.67
4980	30.26	-5.19	3.18
5010	38.17	-3.17	4.08
5040	31.49	-5.02	2.91
5070	34.08	-4.68	3.77
5100	39.5	-5.3	2

2-5 Efficiency and Gain/ Antenna 4#

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
690	57.03	-1.13	4.12
700	57.31	-1.12	3.96
710	55.59	-0.68	4.26
720	64.17	-0.75	3.28
730	49.9	-3.02	1.35
740	59.63	-3.04	2.55
750	59.79	-1.56	2.16
760	55.23	-1.24	3.38
770	52.13	-1.42	2.98
780	54.3	-1.29	2.5
790	66.08	-1.8	2.34
800	64.41	-1.91	1.44
810	50.19	-3.96	0.1
820	54.8	-4.58	0.19
830	50.84	-3.89	1.53
840	57.96	-2.37	2.27
850	65.68	-1.83	2.94
860	70.18	-1.54	3.27
870	63.91	-1.94	3.62
880	58.22	-2.35	2.48
890	55.17	-3.45	1.17
900	53.27	-3.64	1.72
910	51.52	-2.88	2.77
920	57.44	-1.71	2.56
930	60.29	-2.2	1.85
940	63.73	-1.96	3.04
950	59.11	-2.28	2.43
960	56.48	-2.48	2.48

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
1710	68.27	-1.06	5.37
1720	60.55	-0.94	6.54
1730	67.05	-1.13	6.47
1740	69.9	-1.56	6.11
1750	65.13	-1.24	6.01
1760	64.93	-1.88	5.53
1770	66.55	-1.16	6.29
1780	63.37	-1.34	6.38
1790	66.04	-1.19	6.11
1800	61.65	-1.45	5.81
1810	60.63	-1.51	6.81
1820	63.2	-1.99	6.87
1830	60.69	-1.51	6.86
1840	67.62	-1.7	6.65
1850	65.07	-1.25	6.94
1860	65.82	-1.2	6.8
1870	62.77	-1.38	6.65
1880	69.63	-0.99	6.45
1890	68.2	-1.07	6.01
1900	65.51	-1.22	6.55
1910	66.37	-0.64	7.5
1920	67.3	-0.59	7.57
1930	65.29	-1.23	7.16
1940	60.73	-0.93	7.22
1950	65.66	-1.21	7.01
1960	69.14	-1.02	6.54
1970	66.55	-1.16	6.05
1980	61.83	-0.37	5.7
1990	61.45	-0.89	5.7
2000	67.98	-1.08	6.34
2010	43.95	-3.57	4.68
2020	50.56	-2.96	5.4

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
2030	46.07	-3.37	4.75
2040	52.37	-2.81	4.97
2050	54.68	-2.62	4.69
2060	51.88	-2.85	4.35
2070	54.36	-2.65	3.61
2080	50.43	-2.97	3.48
2090	49.99	-3.01	4.47
2100	46.38	-3.34	4.93
2110	50.23	-2.2	5.87
2120	45.03	-3.47	4.8
2130	53.27	-2.74	5.04
2140	44.83	-3.48	4.11
2150	45.2	-3.45	3.8
2160	48.05	-4.2	2.16
2170	50.54	-2.96	3.06
2180	40.45	-3.93	2.74
2190	45.64	-3.41	3.88
2200	44.23	-3.54	4.03
2210	54.87	-2.61	4.86
2220	56.36	-2.49	4.86
2230	52.19	-2.82	4.3
2240	50.38	-2.98	3.74
2250	51.23	-2.91	3.29
2260	49.89	-3.02	2.73
2270	47.13	-3.27	3.11
2280	51.93	-2.85	3.48
2290	54.06	-2.67	4.18
2300	50.17	-3	3.95
2310	50.89	-3.88	3.08
2320	51.38	-2.89	3.67
2330	50.71	-3.9	2.21
2340	46.42	-3.33	1.89
2350	47.31	-4.28	1.7
2360	46.83	-3.29	2.16

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
2370	47.04	-3.28	2.56
2380	51.65	-2.87	3.21
2390	45.82	-3.39	2.89
2400	56.36	-1.78	4.61
2410	56.09	-1.19	4.88
2420	58.77	-1.63	4.45
2430	59.01	-1.61	4.44
2440	63.83	-1.95	4.09
2450	57.57	-1.7	3.5
2460	60.68	-1.51	3.86
2470	65.68	-1.21	3.99
2480	57.73	-1.69	3.87
2490	65.03	-1.25	4.48
2500	64.04	-1.94	3.87
2510	57.78	-3.21	2.93
2520	51.89	-3.78	2.35
2530	51.7	-3.8	1.37
2540	50.77	-2.94	2.05
2550	46.75	-3.69	1.39
2560	42.36	-3.73	1.28
2570	45.85	-3.39	2.13
2580	43.28	-3.64	1.91
2590	44.69	-3.5	2.17
2600	44.64	-3.5	2.42
2610	43.71	-3.59	2.33
2620	46.6	-3.32	2.81
2630	46.29	-3.34	2.09
2640	44.61	-3.51	2.18
2650	38.97	-4.09	1.42
2660	40.59	-2.96	2.71
2670	49.47	-3.06	2.84
2680	47.03	-3.28	2.29
2690	45.49	-3.42	2.49

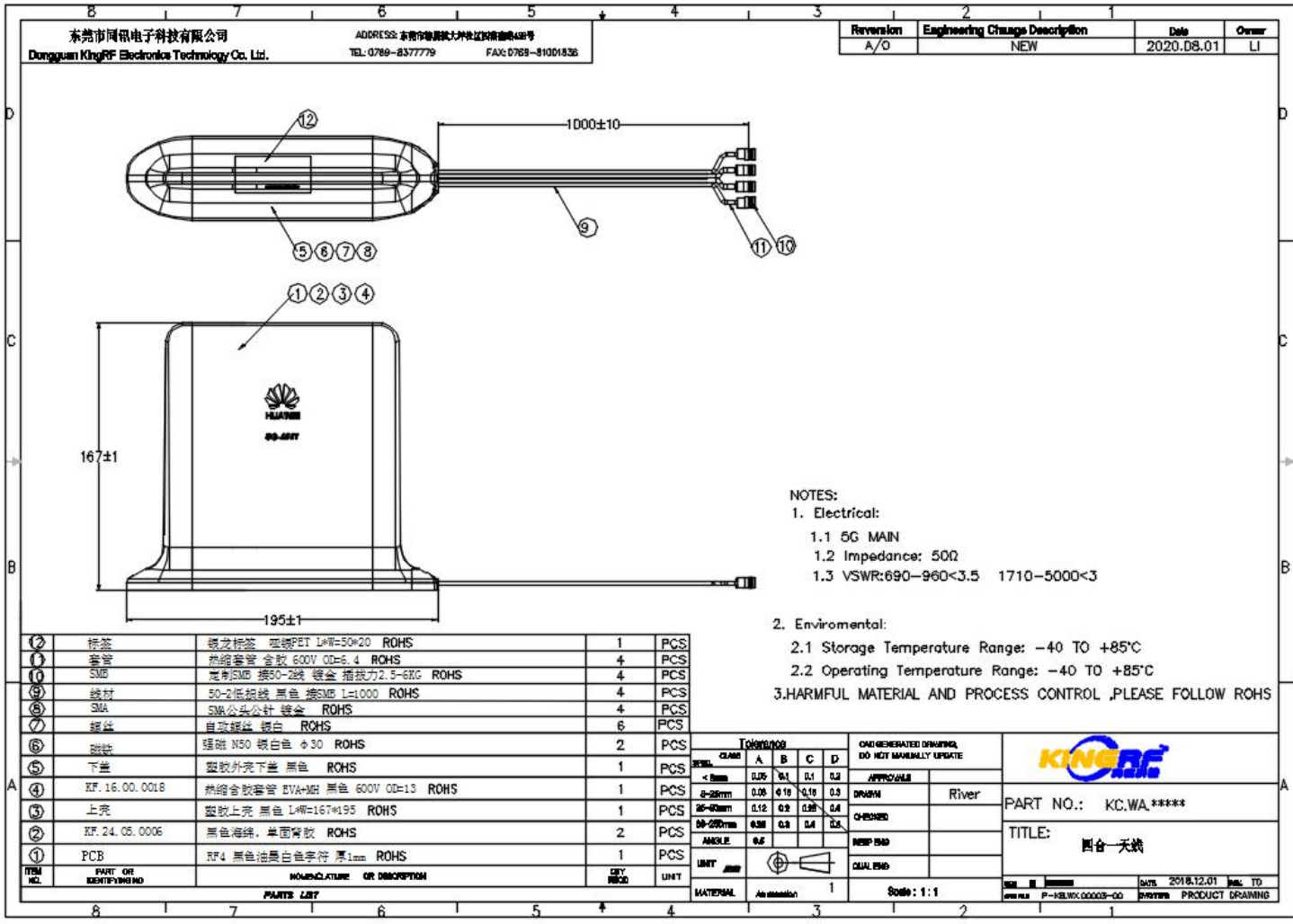
(MHz)	(%)	(dB)	(dBi)
3300	67.46	-1.71	3.98
3320	63.12	0.13	5.36
3340	67.97	-0.56	5.29
3360	61.91	-0.37	4.83
3380	65.63	-0.67	5.19
3400	68.06	-1.08	4.99
3420	69.86	-1.56	3.78
3440	68.85	-1.03	4.54
3460	56.92	-2.45	4.43
3480	58.67	-2.32	4.89
3500	61.66	-2.1	4.81
3520	53.53	-2.71	3.25
3540	53.71	-2.7	3.19
3560	54.27	-2.65	2.97
3580	60.45	-2.19	3.37
3600	64.23	-1.92	3.08
3620	56.65	-2.47	2.62
3640	53.6	-2.71	3.54
3660	50.77	-2.94	3.31
3680	61.22	-2.13	3.41
3700	51.29	-2.9	2.38
3720	63.54	-1.97	3.18
3740	58.05	-2.36	3.24
3760	63.15	-1.36	4.73
3780	52.47	-2.8	2.66
3800	58.23	-1.66	3.96

(MHz)	(%)	(dB)	(dBi)
4200	64.43	-1.91	3.53
4230	64.19	-1.93	3.62
4260	69.42	-1.58	4.38
4290	67.06	-1.74	3.75
4320	64.11	-1.3	4.09
4350	64.18	-1.3	4.69
4380	62.25	-0.35	5.18
4410	59.35	-2.27	3.13
4440	57.18	-2.43	3.53
4470	66.51	-1.77	4.02
4500	57.18	-3.26	2.15
4530	53.92	-4.7	1.32
4560	57.63	-3.22	2.6
4590	57.01	-4.32	1.91
4620	55.96	-4.44	2.02
4650	44.12	-4.67	1.63
4680	40.57	-5.15	0.93
4710	47.51	-4.26	2.25
4740	40.19	-3.96	2.77
4770	42.5	-4.88	0.53
4800	42.29	-6.52	-0.82
4830	38.21	-5.06	1.21
4860	38.97	-4.09	3.48
4890	39.78	-5.26	1.23
4920	36.75	-5.73	0.98
4950	43.66	-3.6	2.22
4980	40.08	-5.22	1.03
5010	40.15	-3.08	4.48
5040	35.04	-4.55	0.91
5070	35.96	-4.44	1.42
5100	38.77	-5.41	1.02

3. Mechanical Specification:

3-1. Mechanical Configuration (Unit: mm)

The appearance of the antenna is according to drawing



UNLESS OTHER SPECIFIED TOLERANCES ON： X=± X.X=± X.XX=± ANGLES=± HOLEDIA=±		KINGRF	KINGRF TECHNOLOGY CO., LTD.
SCALE：	UNIT：mm	THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF KINGRF TECHNOLOGY CO.,LTD.AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION	
DRAWN BY： LI	CHECKED BY: YS		
DESIGNED BY: De wen	APPROVED BY: YS		
TITLE：WX.0019.I5.MFF Antenna Specification			SPEC REV. P0

3-2. Connector appearance: SMB

3-2.Product Image：

5 .Packaging specification：

Product number： xxx			
Product model： xxx			

一、Label requirements：

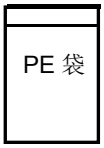
Customer	**xxx**		
supplier	**xxxxx**		
Material coding	**xx**		
Product model	**xx**		
Number	**XXX PCS**	**Factory date**	**X X X**
Remarks			

二、Boxing：

Job description：

1. Inner packaging：

XXpcs A bag



2. External packaging：

Xx PCS ；

3. Matters needing attention：

a. Whether to add partition and pearl cotton；

b. Label attachments, such as ROHS, etc.；