DA.0147.L5.2ES

Antenna Specification

1. Application:

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

1. 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

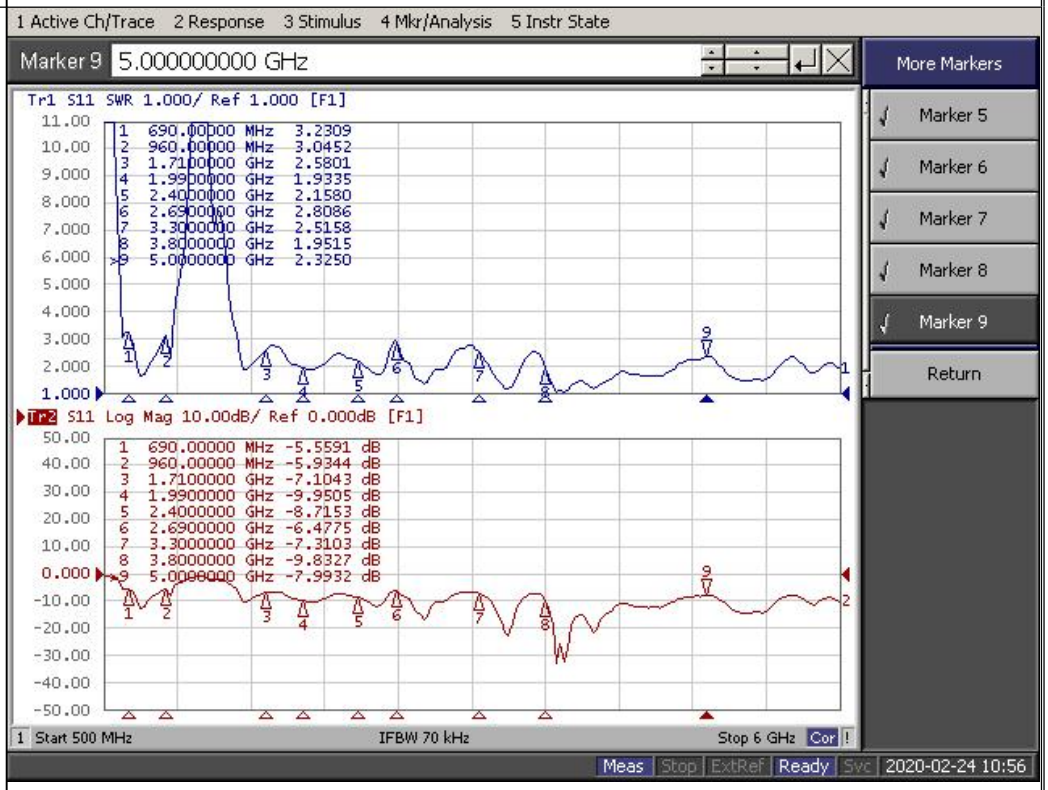
2-2. Impedance

50 ohm nominal

2-3. VSWR

2-3-1.Measurement frequency points and VSWR value

Frequency Band(MHz)	690	960	1710	2690	3300	5000
2-3-3. Typical Value:	3.2	3.0	2.5	2.8	2.5	2.3

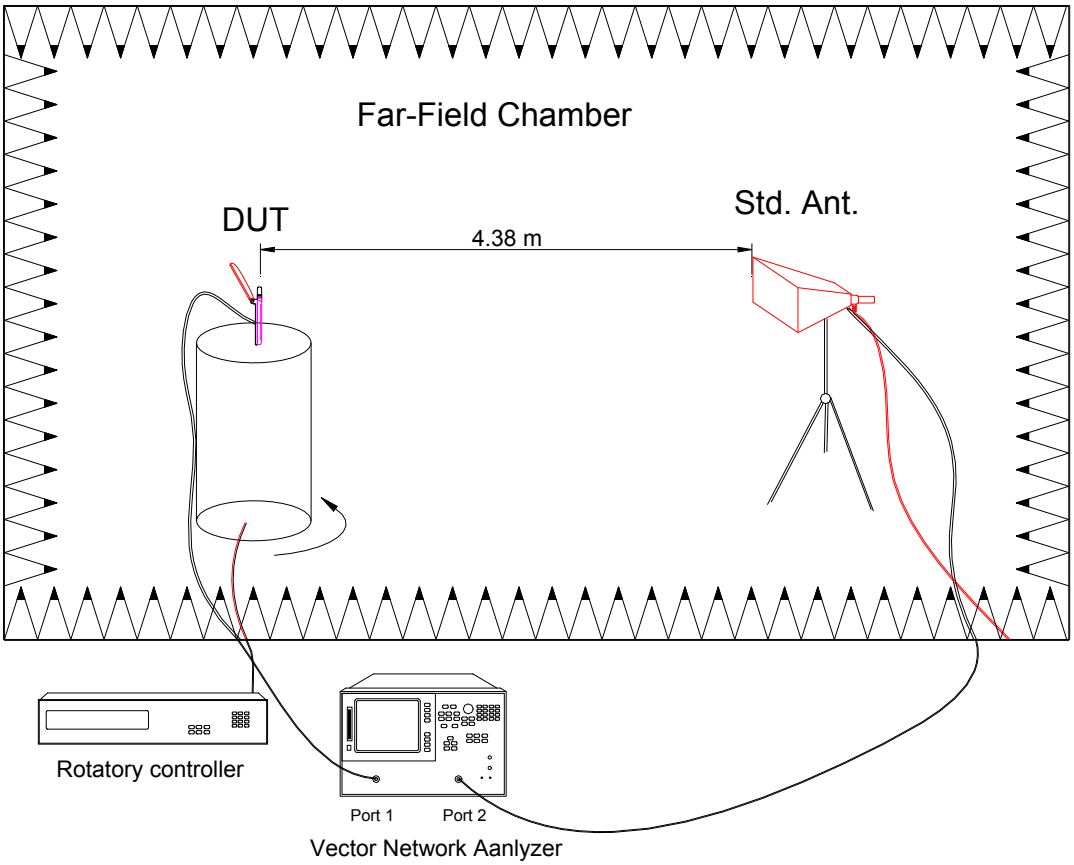
2-3-4 Measuring Method	1. A 50Ω coaxial cable is connected to the antenna. Then this cable is connected to a network analyzer to measure the VSWR. 2. Keeping this jig away from metal at least 20 cm
2-3-5 Picture	

2-4. Active test

4-5.1 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

4-5.2 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)

2-4-1 Efficiency and Gain

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
690	47.18	-3.26	1.46
700	41.55	-3.81	1.19
710	42.38	-3.73	1.11
720	41.43	-3.83	0.99
730	41.95	-3.77	0.59
740	43.59	-3.61	1
750	47.8	-3.21	1.5
760	56.81	-2.46	2.8
770	41.97	-3.77	1.85
780	43.18	-3.65	2.54
790	39.84	-4	2.21
800	50	-3.01	3.02
810	37.88	-4.22	1.84
820	42.43	-3.72	1.91
830	40.98	-3.87	0.94
840	45.09	-3.46	0.74
850	36.25	-4.41	-0.23
860	42.47	-3.72	0.18
870	43.83	-3.58	0.4
880	47.89	-3.2	0.97
890	46.7	-3.31	1.04
900	45.01	-3.47	0.82
910	35.99	-4.44	0.12
920	35.88	-4.45	0.28
930	31.81	-4.97	-0.06
940	33.96	-4.69	0.53
950	28.24	-5.49	-0.29
960	35.09	-4.55	0.56

1710	40.18	-3.96	-0.64
1720	40.4	-3.94	-0.04
1730	39.51	-4.03	-0.49
1740	38.71	-4.12	-0.31
1750	40.75	-3.9	-0.44
1760	40.59	-3.92	-0.3
1770	46.32	-3.34	-0.01
1780	46.29	-3.35	0.15
1790	47.88	-3.2	0.2
1800	42.71	-3.69	-0.31
1810	42.72	-3.69	-0.34
1820	42.46	-3.72	-0.36
1830	46.86	-3.29	0.42
1840	42.94	-3.67	0.07
1850	45.46	-3.42	0.71
1860	41.42	-3.83	0.28
1870	40.53	-3.92	0.19
1880	42.21	-3.75	0.1
1890	46.93	-3.29	0.73
1900	46.21	-3.35	0.72
1910	42.86	-3.68	0.54
1920	43.75	-3.59	0.41
1930	41.15	-3.86	0.51
1940	44.7	-3.5	0.14
1950	45.8	-3.39	0.26
1960	52.55	-2.79	0.09
1970	45.93	-3.38	-0.18
1980	51.14	-2.91	-0.23
1990	46.29	-3.34	-0.01
2000	49.29	-3.07	0.1
2010	49.18	-3.08	0.28
2020	58.17	-2.35	0.54

2030	53.2	-2.74	0.2
2040	52.74	-2.78	-0.01
2050	55.04	-2.59	0.39
2060	60.77	-2.16	1.08
2070	66.71	-1.76	1.58
2080	58.93	-2.3	0.94
2090	65.29	-1.85	1.45
2100	56.38	-2.49	0.68
2110	78.75	-1.04	2.25
2120	48.23	-3.17	0.49
2130	64.38	-1.91	1.8
2140	45.1	-3.46	0.44
2150	55.44	-2.56	1.3
2160	43.49	-3.62	0.36
2170	63.51	-1.97	2.04
2180	47.53	-3.23	0.9

2190	56.76	-2.46	1.7
2200	45.88	-3.38	0.83
2210	60.26	-2.2	2.1
2220	54.2	-2.66	1.58
2230	70.79	-1.5	2.66
2240	62.68	-2.03	1.94
2250	68.43	-1.65	2.34
2260	66.26	-1.79	2.01
2270	71.28	-1.47	2.71
2280	69.94	-1.55	2.48
2290	64.58	-1.9	2.25
2300	60.23	-2.2	1.78
2310	54.09	-2.67	1.46
2320	59.75	-2.24	1.75
2330	48.54	-3.14	1.29
2340	51.42	-2.89	1.58

2350	43.19	-3.65	1
2360	48.22	-3.17	1.32
2370	39.73	-4.01	0.49
2380	50.77	-2.94	1.32
2390	43.5	-3.62	0.61
2400	44.15	-3.55	0.79
2410	34.52	-4.62	-0.46
2420	38.71	-4.12	0.22
2430	33.3	-4.78	-0.61
2440	39.73	-4.01	0.21
2450	35.76	-4.47	-0.8
2460	39.82	-4	-0.13
2470	31.67	-4.99	-0.8
2480	37.72	-4.23	-0.34
2490	36.16	-4.42	-0.66
2500	42.7	-3.7	0.21
2510	33.91	-4.7	-0.74
2520	34.52	-4.62	-0.62

2530	34.23	-4.66	-0.7
2540	36.2	-4.41	-0.78
2550	33.12	-4.8	-1.21
2560	33.26	-4.78	-1.37
2570	34.84	-4.58	-1.06
2580	34.98	-4.56	-0.95
2590	37.25	-4.29	-0.58
2600	42.81	-3.68	0.22
2610	44.2	-3.55	0.8
2620	48.21	-3.17	1.16
2630	51.39	-2.89	1.73
2640	58.03	-2.36	2.19
2650	54.66	-2.62	2.18
2660	60.56	-2.18	2.18
2670	56	-2.52	2.07
2680	59.47	-2.26	2.35
2690	47.7	-3.21	1.78

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3300	69.56	-1.58	3.9
3310	62.08	0.34	3.16
3320	62.96	0.13	3.79
3330	66.34	-0.64	3.2
3340	64.1	-0.75	2.73
3350	64.05	0.94	3.39
3360	68.4	-0.54	3.45
3370	65.18	0.61	3.36
3380	63.89	-1.31	3.26
3390	64.85	-0.23	3.27
3400	59.83	-0.98	3.56
3410	60.09	-0.96	3.8
3420	64.8	-1.88	3.06
3430	65.33	0.62	3.34
3440	59.69	-0.47	3.63
3450	57.5	-0.58	3.34

3460	63.96	-1.94	2.96
3470	66.16	0.26	2.27
3480	57.15	-1.13	3.6
3490	61.53	-0.38	2.71
3500	74.94	-1.25	3.3
3510	66.31	-0.64	4.55
3520	65.56	-1.83	2.63
3530	75.54	-1.22	4.04
3540	70.57	-1.51	3.13
3550	71.53	-1.46	3.71
3560	77.6	-1.1	3.47
3570	67.97	-0.09	3.7
3580	75.35	-1.23	3.23
3590	67.87	-1.09	3.53
3600	66.2	-0.64	3.94
3610	67.82	-1.69	2.61

3620	62.47	-2.04	2.28
3630	63.43	-1.98	2.26
3640	57.97	-2.37	2.17
3650	49.41	-3.06	1.72
3660	47.33	-3.25	1.61
3670	44.96	-3.47	1.59
3680	55.25	-2.58	2.31
3690	44.59	-3.51	1.41
3700	42.74	-3.69	1.21
3710	60.53	-2.18	3.14
3720	49.06	-3.09	2.26
3730	46.02	-3.37	2.1
3740	56.79	-2.46	2.8
3750	54.46	-2.64	2.52
3760	64.08	-1.93	3.42
3770	55.74	-2.54	2.6

3780	52.41	-2.81	2.81
3790	58	-2.37	2.92
3800	71.91	-1.43	3.89
3810	72.65	-1.39	3.93
3820	62.2	-2.06	3.34
3830	60.48	-0.43	5.45
3840	60.33	-2.19	3.51
3850	65.12	-1.86	4.5
3860	66.34	-1.78	4.13
3870	45.14	-3.45	3.04
3880	52.83	-2.77	3.5
3890	47.01	-3.28	3.8
3900	45.55	-3.41	3.45
3910	42.63	-3.7	3.94
3920	36.17	-4.42	3.02
3930	41.16	-3.86	3.99

3940	37.02	-4.32	3.33
3950	36.13	-4.42	3.63
3960	47.71	-3.21	2.52
3970	54.36	-2.65	3.11
3980	54.85	-2.61	2.87
3990	41.99	-3.77	3.45
4000	42.63	-3.7	3.13
4010	50.09	-3	3.76
4020	53.85	-2.69	2.01
4030	50.6	-2.96	3.68
4040	42.6	-3.71	2.92
4050	42.91	-3.67	2.65
4060	63.91	-1.94	3.28
4070	42.62	-3.7	2.21
4080	38.91	-4.1	1.45
4090	34.5	-4.62	0.54

4100	39.5	-4.03	1.27
4110	30.65	-5.14	0.23
4120	31.08	-5.07	0.39
4130	27.8	-5.56	0.09
4140	46.85	-3.29	2.23
4150	34.21	-4.66	1.12
4160	32.77	-4.85	0.55
4170	33.74	-4.72	0.98
4180	49.44	-3.06	2.42
4190	38.39	-4.16	2.07
4200	39.88	-3.99	1.48
4210	27.17	-5.66	0.23
4220	48.58	-3.14	1.89
4230	45.09	-3.46	1.89
4240	69.66	-1.57	3.46
4250	43.16	-3.65	1.7

4260	57.71	-2.39	2.69
4270	43.76	-3.59	1.59
4280	47.45	-3.24	1.95
4290	46.2	-3.35	1.78
4300	56.98	-2.44	2.65
4310	49.14	-3.09	1.75
4320	55.55	-2.55	2.08
4330	44.56	-3.51	1.06
4340	49.92	-3.02	1.53
4350	48.96	-3.1	1.58
4360	51.03	-2.92	1.87
4370	33.96	-4.69	0.18
4380	49.77	-3.03	1.79
4390	46.8	-3.3	1.69
4400	50.16	-3	1.8
4410	40.03	-3.98	1.05

4420	58.66	-2.32	2.93
4430	50.54	-2.96	2.3
4440	44.02	-3.56	1.75
4450	54.93	-2.6	3.07
4460	49.56	-3.05	1.83
4470	42.72	-3.69	1.82
4480	49.46	-3.06	2.77
4490	52.21	-2.82	2.79
4500	38.42	-4.15	1.68
4510	35.48	-4.5	1.38
4520	43.01	-3.66	2.46
4530	33.96	-4.69	1.27
4540	36.9	-4.33	1.55
4550	36.37	-4.39	1.1
4560	42.33	-3.73	1.56
4570	42.03	-3.76	1.52

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4580	39.69	-4.01	1.49
4590	37.82	-4.22	1.17
4600	36.56	-4.37	0.9
4610	39.57	-4.03	1.08
4620	37.76	-4.23	0.76
4630	38.52	-4.14	0.99
4640	34.94	-4.57	0.87
4650	38.15	-4.18	1.42
4660	38.91	-4.1	1.59
4670	39.72	-4.01	2.02
4680	35.87	-4.45	1.23
4690	37.96	-4.21	1.16
4700	32.67	-4.86	0.48
4710	36.27	-4.4	1.19
4720	32.89	-4.83	0.88
4730	43.15	-3.65	2.21

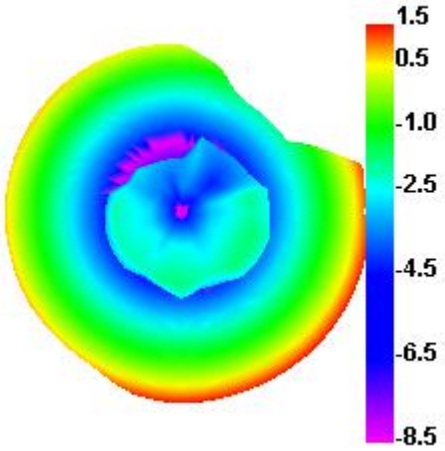
4740	39.1	-4.08	1.53
4750	42.44	-3.72	1.74
4760	32.94	-4.82	0.39
4770	39.71	-4.01	1.21
4780	35.86	-4.45	0.77
4790	43.56	-3.61	1.54
4800	31.94	-4.96	-0.05
4810	38.61	-4.13	0.36
4820	28.99	-5.38	-0.77
4830	34.14	-4.67	0.44
4840	29.66	-5.28	-0.16
4850	34.91	-4.57	1.02
4860	37.44	-5.62	0.32
4870	36.65	-5.74	0.86
4880	38.71	-7.28	-0.42
4890	30.86	-6.81	0.47

4900	39.01	-7.21	0.29
4910	33.92	-6.21	1.33
4920	34.74	-8.32	-1.01
4930	36.88	-7.73	-0.41
4940	33.37	-8.74	-1.26
4950	31.26	-6.72	0.54

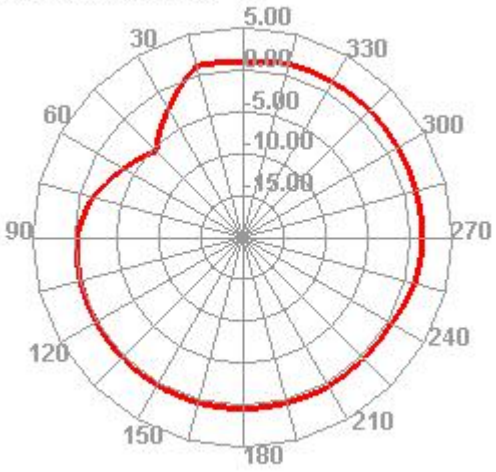
4960	37.91	-7.47	-0.17
4970	30.93	-6.79	0.29
4980	36.01	-7.96	-0.93
4990	31.11	-6.75	0
5000	38.77	-7.27	-0.51

2-4-2：Radiation direction

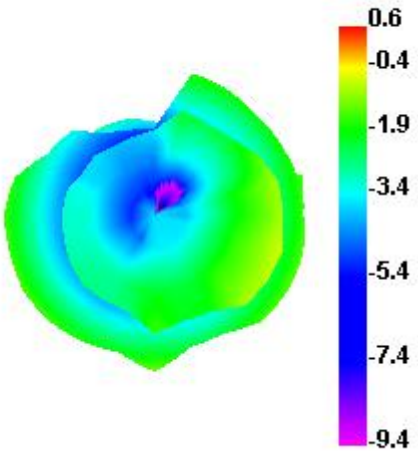
690.000MHz



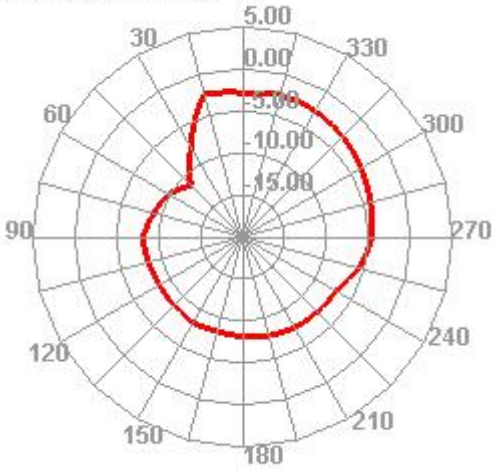
690.000MHz H



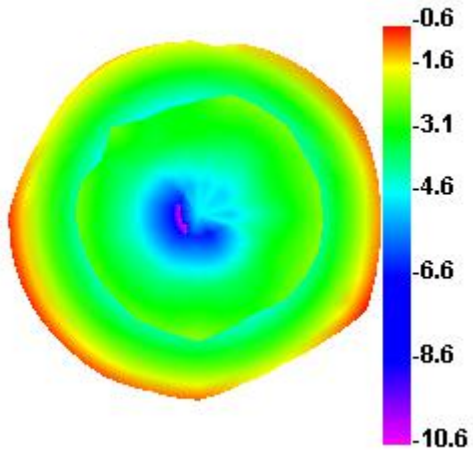
960.000MHz



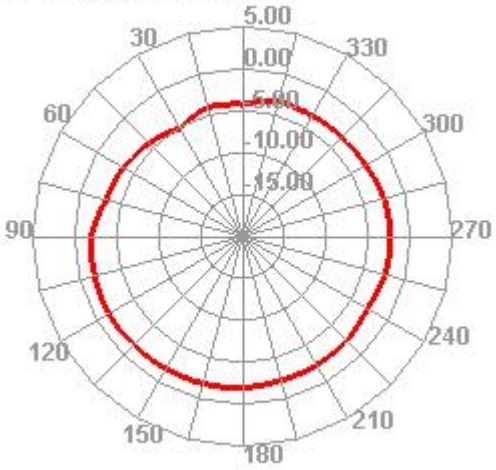
960.000MHz H



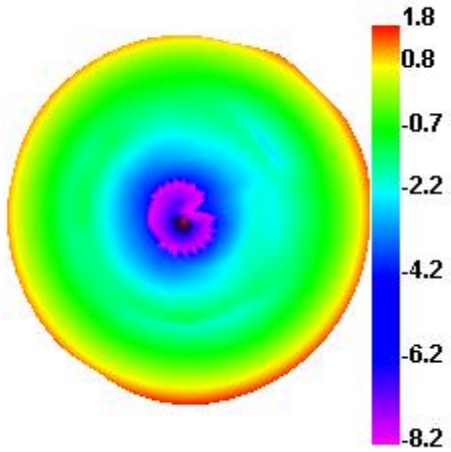
1710.000MHz



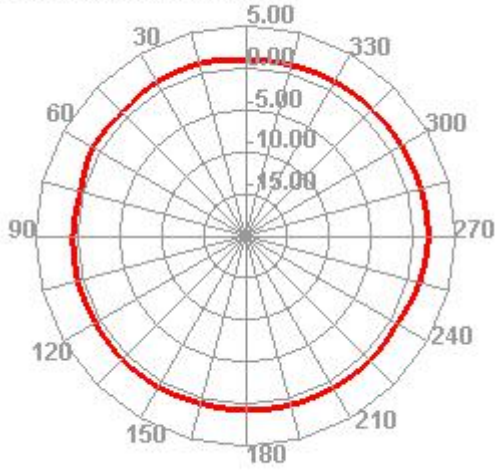
1710.000MHz H



2690.000MHz



2690.000MHz H



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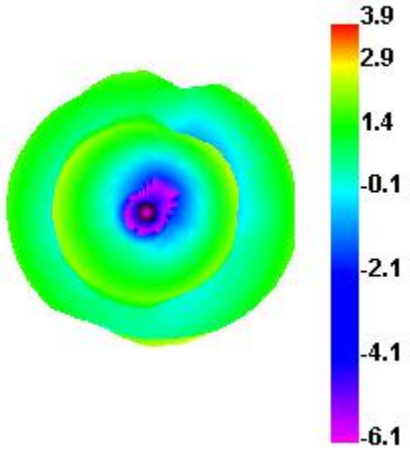
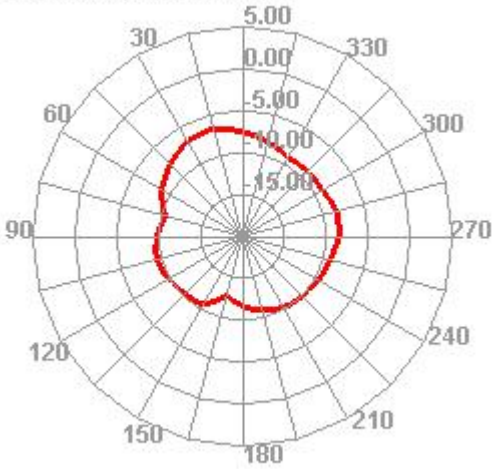
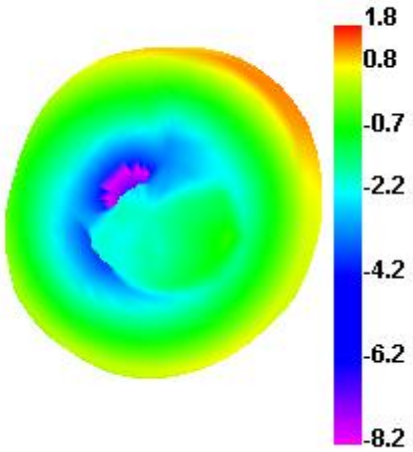
3300.000MHz



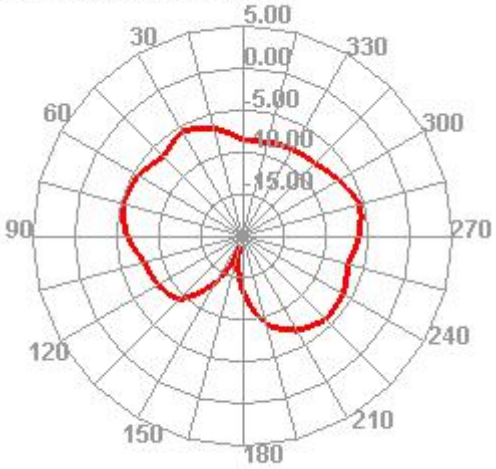
3300.000MHz H



4400.000MHz



4400.000MHz H



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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	
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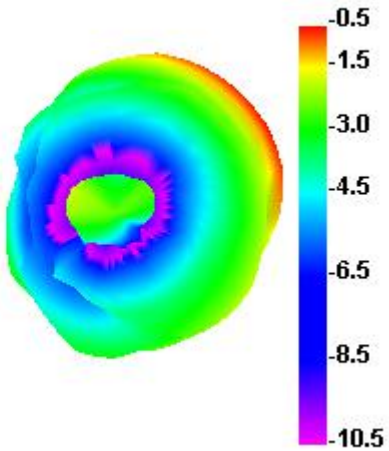
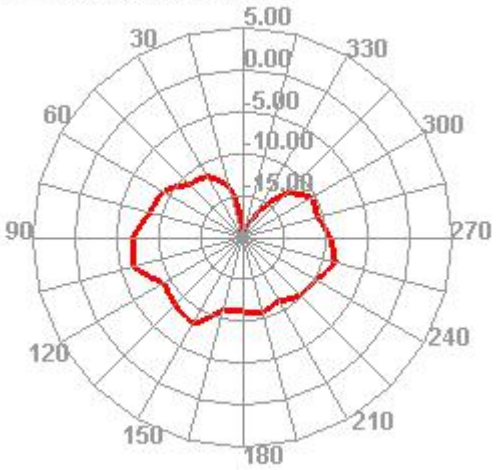
TITLE：DA.0147.L5.2ES Antenna Specification			SPEC REV. P0

5000.000MHz



5000.000MHz H



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	
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DESIGNED BY: De wen	APPROVED BY: YS		
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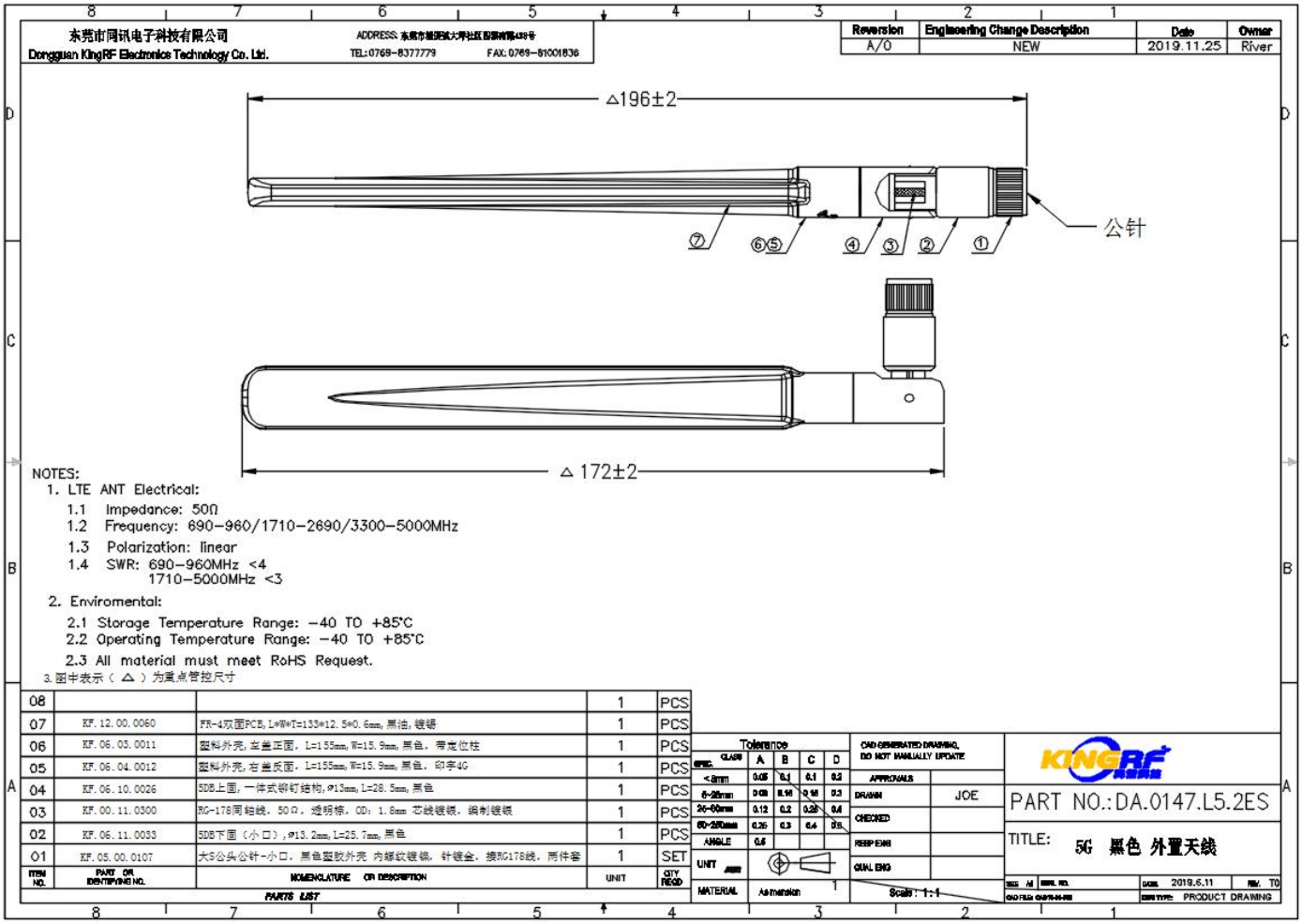
3. Mechanical Specification:

3-1. Mechanical Configuration (Unit: mm)

The appearance of the antenna is according to drawing



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DESIGNED BY: De wen	APPROVED BY: YS	
TITLE：DA.0147.L5.2ES Antenna Specification		SPEC REV. P0

3-2. Connector appearance:

SMA-J

4.Product Image：

5 .Packaging specification：

UNLESS OTHER SPECIFIED TOLERANCES ON： X=± X.X=± X.XX=± ANGLES=± HOLEDIA=±		KINGRF	KINGRF TECHNOLOGY CO., LTD.
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DRAWN BY： LI	CHECKED BY: YS		
DESIGNED BY: De wen	APPROVED BY: YS		
TITLE：DA.0147.L5.2ES Antenna Specification			SPEC REV. P0

Product number： xxx

Product model： xxx

一、Label requirements：

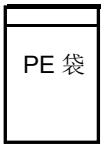
Customer	**xxx**		
supplier	**xxxxx**		
Material coding	**xx**		
Product model	**xx**		
Number	**XXX PCS**	**Factory date**	**X X X**
Remarks			

二、Boxing：

Job description：

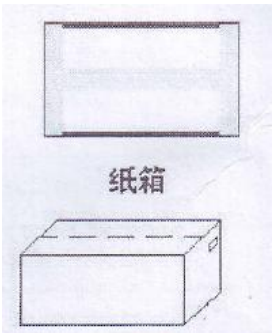
1. Inner packaging：

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.；