



Antenna Test Report

TC: 斯迪乔

MN: HL160G

RF: 蔡林满

MD: 黄清清

MP: 19918388579

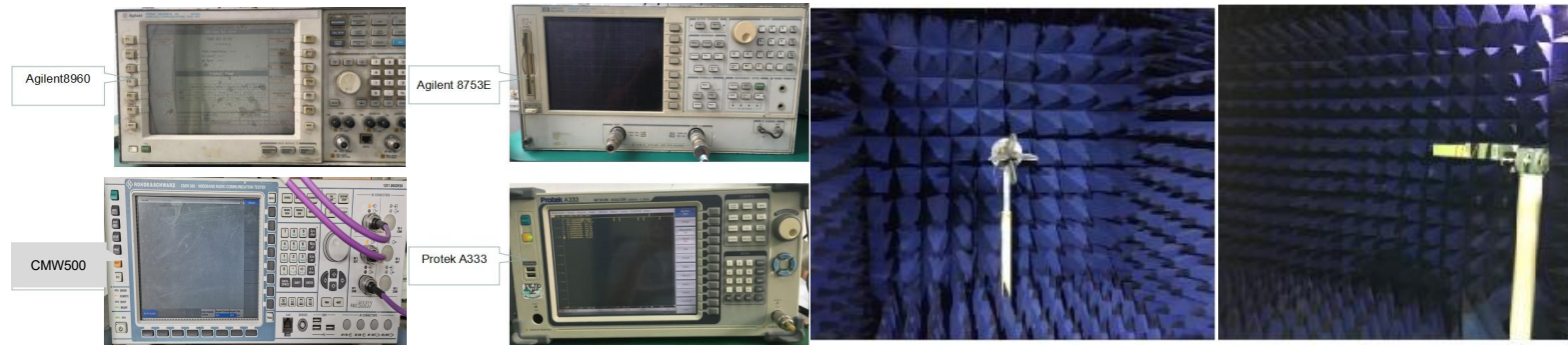
Date: 2023. 5. 19.
REV :V1. 0

Test information

WIFI ANT Test information		
Frequency	2. 4G (2402~2483) Mhz	5G (5150~5850) Mhz
Module information		
Driver version information		

Test environment

	测试项目	测试设备
S参数 (S-parameter)	1. 电压驻波比 (VSWR) 2. 回波损耗 (Rrtun Loss)	网络分析仪: Agilent8753ES
2. 有源测试 (Active)	1. 发射功率 (TRP) 2. 接收灵敏度 (TIS) 3. 屏灭/屏亮	1. 暗室: 5*3*3m (3D) Chamber 2. 综测仪: Agilent8960 CMW500
3. 无源测试 (Passive)	1. 天线增益 (Gain) 2. 天线效率 (Efficiency)	1. 暗室: 5*3*3m (3D) Chamber 2. 网络分析仪: Agilent 8753ES



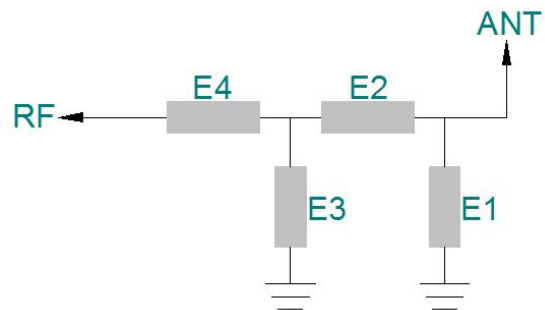
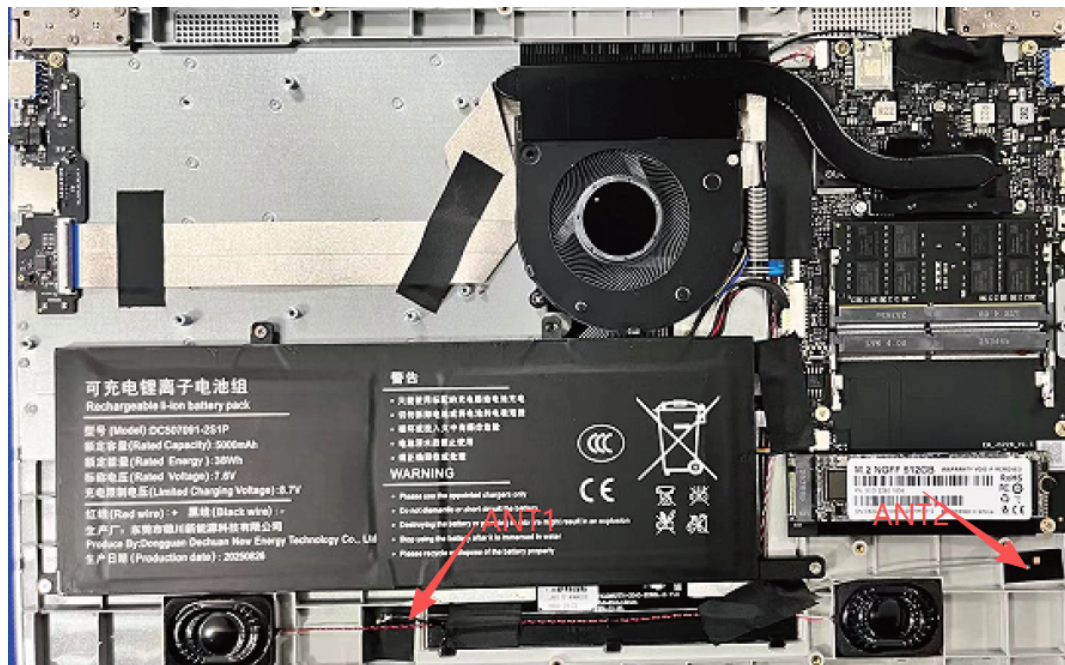


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匹配电路 Matching circuit

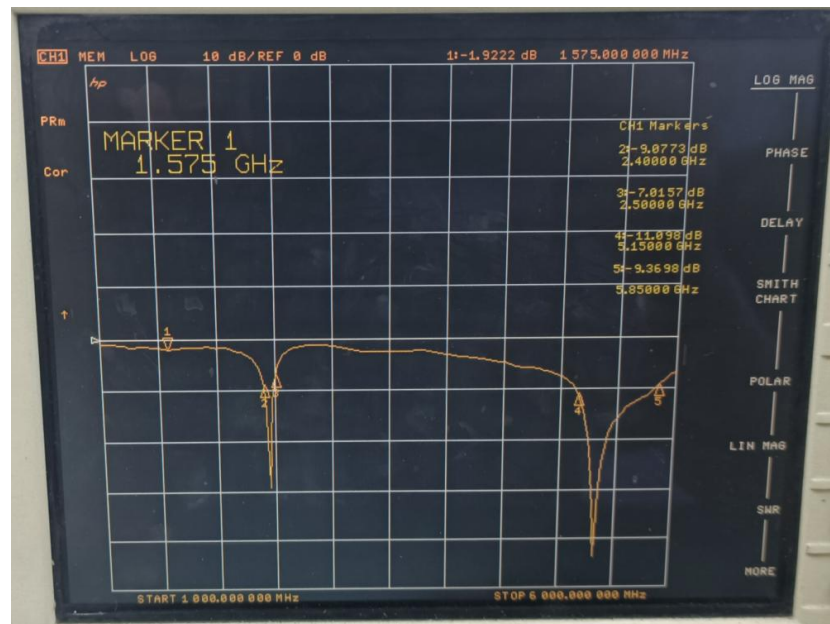


	电容 (PF)	电感 (NH)
E1(0402)		
E2(0402)		
E3(0402)		
E4(0402)		



无源测试数据
Passive test data

ANT1 S11-VSWR&Return Loss



Frequency (MHZ)	2400	2500	5150	5850
Return Loss (DB)	-9.07	-7.01	-11.09	-9.36



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无源测试数据

Passive test data

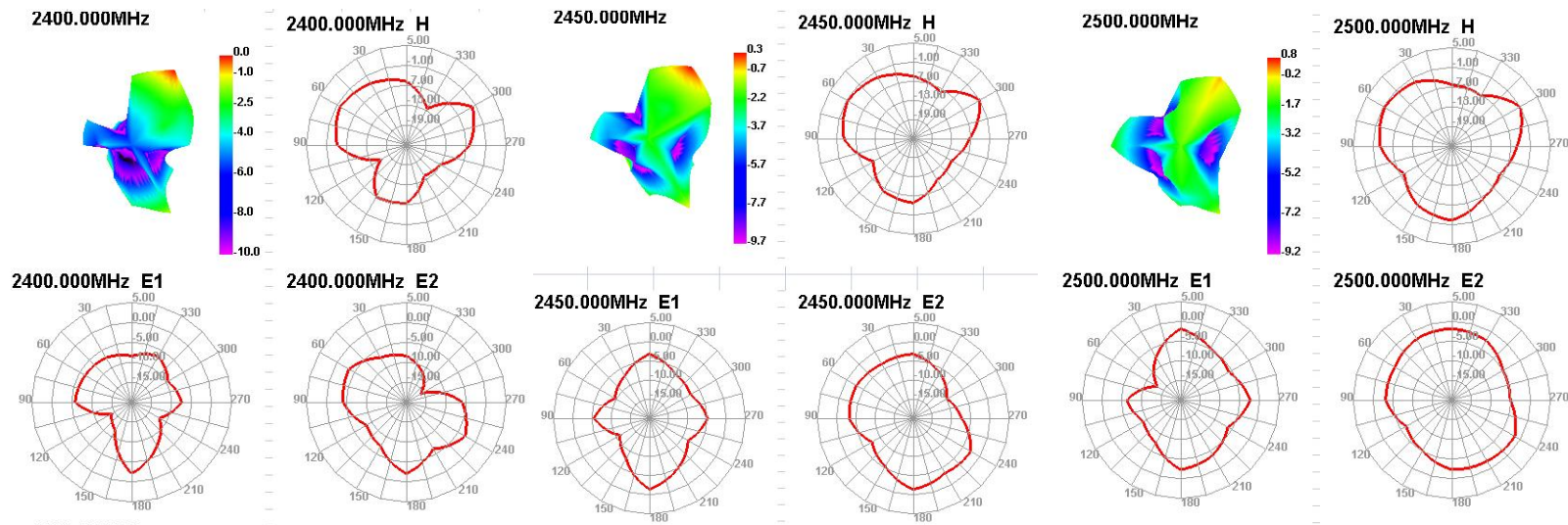
ANT1 GAIN&Efficiency-WIFI2.4G/BT

Passive Test For WIFI2.4								
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHS (%)	DHS (%)	Max (dB)	Min (dB)
2400	21.29	-6.72	0.04	-2.11	10.664	10.629	0.04	-16.25
2410	19.85	-7.02	-0.41	-2.56	9.862	9.989	-0.41	-17.19
2420	24.12	-6.18	0.2	-1.95	11.937	12.181	0.2	-21.35
2430	26.6	-5.75	0.39	-1.76	13.355	13.247	0.39	-23.65
2440	25.9	-5.87	0.1	-2.05	13.094	12.802	0.1	-19.38
2450	28.19	-5.5	0.31	-1.84	14.176	14.016	0.31	-16.07
2460	33.69	-4.72	1.03	-1.12	16.897	16.795	1.03	-13.83
2470	34.57	-4.61	1.07	-1.08	17.462	17.112	1.07	-13.66
2480	36.7	-4.35	1.14	-1.01	18.565	18.131	1.14	-12.78
2490	38.91	-4.1	1.38	-0.77	19.479	19.43	1.38	-12.57
2500	34.54	-4.62	0.77	-1.38	17.268	17.273	0.77	-13.58



无源测试数据 Passive test data

ANT1 Direction of figure (2.4/BT)





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无源测试数据

Passive test data

ANT1 GAIN&Efficiency-WIFI 5G

Passive Test For WIFI5G								
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHS (%)	DHIS (%)	Max (dB)	Min (dB)
5150	32.66	-4.86	0.7	-1.45	21.349	11.309	0.7	-14.13
5170	31.95	-4.96	0.65	-1.5	21.186	10.764	0.65	-15.81
5190	35.19	-4.54	1.34	-0.81	23.657	11.534	1.34	-15.75
5210	36.19	-4.41	1.48	-0.67	24.405	11.785	1.48	-15.71
5230	38.72	-4.12	1.34	-0.81	26.261	12.454	1.34	-16.7
5250	38.78	-4.11	0.95	-1.2	26.497	12.279	0.95	-17.54
5270	43.78	-3.59	1.32	-0.83	30.21	13.574	1.32	-17.3
5290	41.67	-3.8	1.04	-1.11	28.977	12.693	1.04	-18.03
5310	43.52	-3.61	1.48	-0.67	30.42	13.097	1.48	-20.13
5330	43.6	-3.61	1.51	-0.64	30.649	12.951	1.51	-19.63
5350	48.87	-3.11	1.87	-0.28	34.612	14.259	1.87	-18.28
5370	46.05	-3.37	1.51	-0.64	32.623	13.423	1.51	-17.62
5390	45.27	-3.44	1.42	-0.73	31.977	13.295	1.42	-17.66
5410	51.23	-2.9	1.75	-0.4	36.184	15.05	1.75	-18.43
5430	49.89	-3.02	1.68	-0.47	35.273	14.615	1.68	-17.52
5450	51.66	-2.87	2.05	-0.1	36.435	15.225	2.05	-15.2
5470	51.66	-2.87	1.96	-0.19	35.967	15.691	1.96	-14.76
5490	51.44	-2.89	2.14	-0.01	35.246	16.196	2.14	-15.7
5510	53.44	-2.72	2.53	0.38	36.663	16.78	2.53	-17.48
5530	53.68	-2.7	2.6	0.45	36.938	16.747	2.6	-16.66
5550	57.25	-2.42	2.74	0.59	38.962	18.292	2.74	-14.44
5570	54.67	-2.62	2.29	0.14	36.655	18.018	2.29	-14.73
5590	59.13	-2.28	2.53	0.38	39.43	19.701	2.53	-16.67
5610	54.73	-2.62	2.26	0.11	36.872	17.861	2.26	-17.45
5630	58.59	-2.32	2.4	0.25	39.23	19.357	2.4	-14.83
5650	53.39	-2.73	1.71	-0.44	35.056	18.331	1.71	-14.68
5670	59.41	-2.26	2	-0.15	38.432	20.974	2	-14.81
5690	54.61	-2.63	1.76	-0.39	35.302	19.303	1.76	-17.75
5710	55.56	-2.55	1.71	-0.44	35.656	19.902	1.71	-20.48
5730	57.88	-2.37	1.77	-0.38	36.361	21.519	1.77	-18.74
5750	54.1	-2.67	1.69	-0.46	33.361	20.739	1.69	-18.68
5770	57.61	-2.39	2.41	0.26	35.509	22.106	2.41	-19.23
5790	53.46	-2.72	2.24	0.09	32.748	20.709	2.24	-21.87
5810	55.73	-2.54	2.56	0.41	33.59	22.145	2.56	-21.14
5830	55.08	-2.59	2.82	0.67	32.821	22.255	2.82	-17.34
5850	57.74	-2.39	3.11	0.96	34.205	23.533	3.11	-15.98



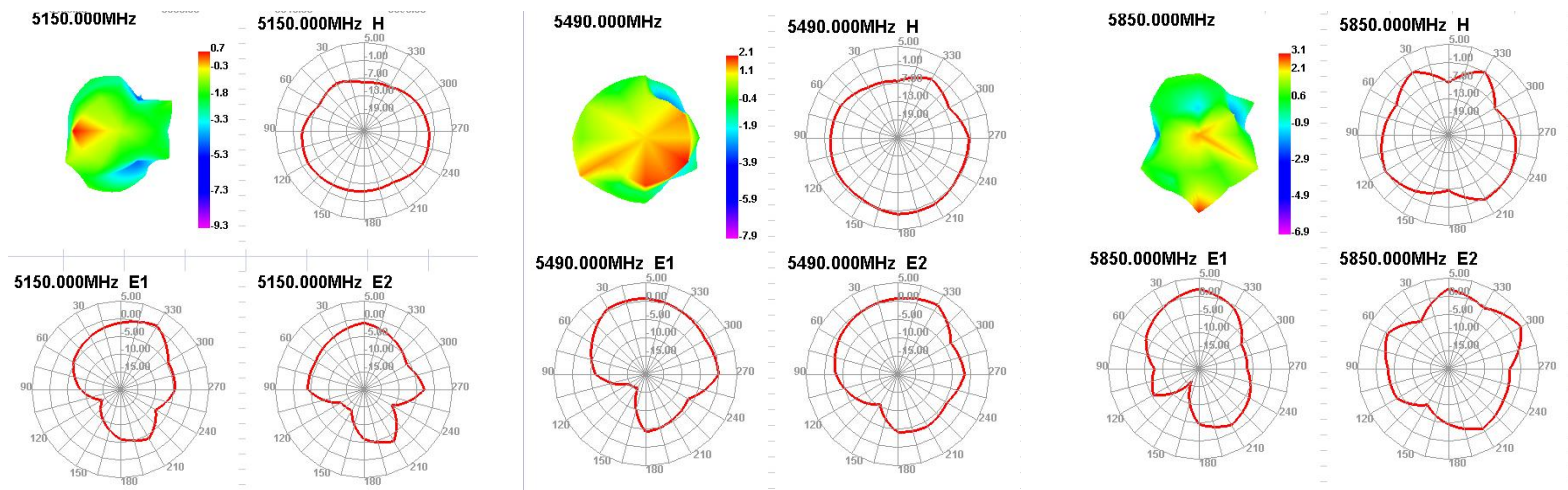
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无源测试数据
Passive test data

ANT1 Direction of figure(5G)





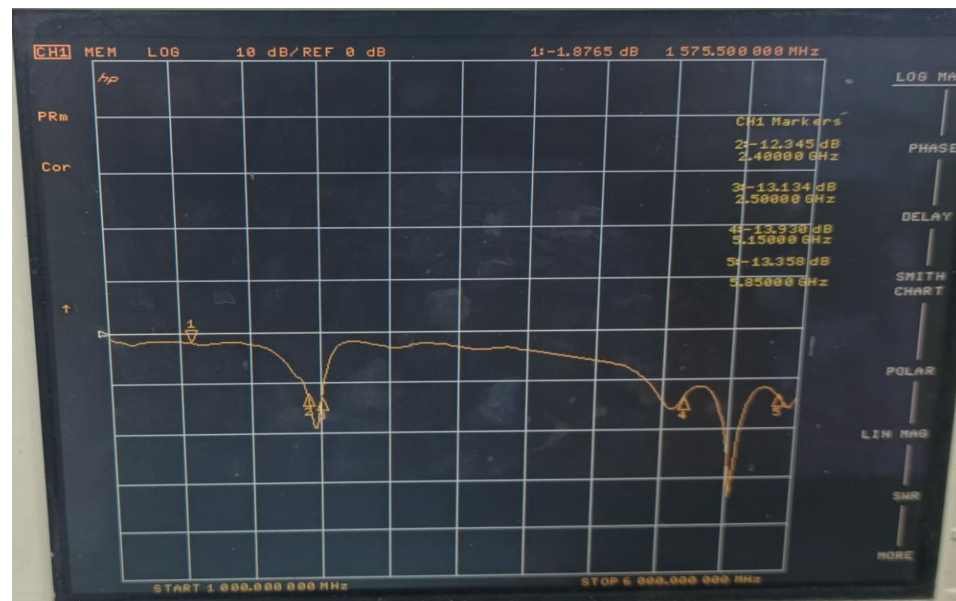
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无源测试数据
Passive test data

ANT2 S11-VSWR&Return Loss



Frequency (MHZ)	2400	2500	5150	5850
Return Loss (DB)	-12.34	-13.13	-13.93	-13.35



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无源测试数据

Passive test data

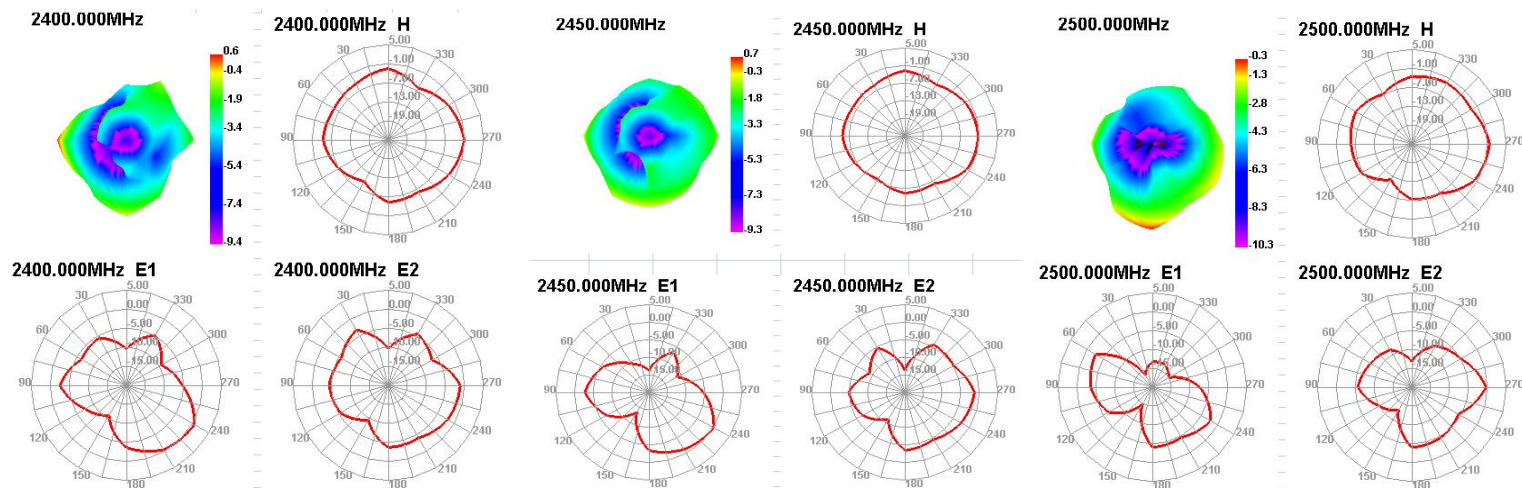
ANT2 GAIN&Efficiency-WIFI2.4G/BT

Passive Test For WIFI2.4								
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHS (%)	DHS (%)	Max (dB)	Min (dB)
2400	37.29	-4.28	0.61	-1.54	13.863	23.431	0.61	-13.81
2410	33.14	-4.8	0.26	-1.89	12.317	20.827	0.26	-15.47
2420	35.5	-4.5	0.65	-1.5	12.971	22.526	0.65	-16.23
2430	37.3	-4.28	0.88	-1.27	13.488	23.817	0.88	-17.79
2440	36.48	-4.38	0.96	-1.19	13.375	23.101	0.96	-19.84
2450	33.84	-4.71	0.73	-1.42	12.569	21.267	0.73	-18.91
2460	34.33	-4.64	0.76	-1.39	12.787	21.543	0.76	-15.96
2470	36.73	-4.35	0.78	-1.37	13.911	22.821	0.78	-18.03
2480	36.39	-4.39	0.43	-1.72	14.24	22.148	0.43	-18.33
2490	34.9	-4.57	0.15	-2	14.161	20.739	0.15	-16.18
2500	29.43	-5.31	-0.33	-2.48	12.672	16.758	-0.33	-16.33



无源测试数据 Passive test data

ANT2 Direction of figure(2.4/BT)





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无源测试数据

Passive test data

ANT2 GAIN&Efficiency-WIFI 5G

Passive Test For WIFI5G								
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHS (%)	DHS (%)	Max (dB)	Min (dB)
5150	34.25	-4.65	1.15	-1	16.321	17.928	1.15	-16.51
5170	37.01	-4.32	1.36	-0.79	17.892	19.12	1.36	-16.01
5190	37.21	-4.29	1.29	-0.86	18.301	18.913	1.29	-15.1
5210	41.88	-3.78	1.35	-0.8	20.889	20.995	1.35	-14.39
5230	39.1	-4.08	0.75	-1.4	19.599	19.506	0.75	-16.85
5250	43.99	-3.57	1.49	-0.66	22.387	21.599	1.49	-19.12
5270	44.6	-3.51	1.83	-0.32	22.847	21.752	1.83	-21.91
5290	46.85	-3.29	1.57	-0.58	24.26	22.588	1.57	-25.24
5310	43.44	-3.62	0.64	-1.51	22.747	20.696	0.64	-22.06
5330	45.14	-3.45	0.99	-1.16	24.078	21.067	0.99	-16.93
5350	47.69	-3.22	1.58	-0.57	25.541	22.147	1.58	-14.52
5370	47.27	-3.25	1.43	-0.72	25.336	21.932	1.43	-13.52
5390	41.91	-3.78	1.05	-1.1	22.679	19.231	1.05	-14.77
5410	50.29	-2.98	1.73	-0.42	27.545	22.748	1.73	-15.82
5430	45.51	-3.42	1.57	-0.58	24.917	20.591	1.57	-18.68
5450	51.76	-2.86	2.23	0.08	28.094	23.667	2.23	-19.84
5470	47.73	-3.21	1.67	-0.48	26.071	21.662	1.67	-18.4
5490	49.91	-3.02	1.79	-0.36	27.493	22.421	1.79	-16.56
5510	51.82	-2.85	2.3	0.15	28.443	23.379	2.3	-15.74
5530	54.03	-2.67	2.65	0.5	29.688	24.346	2.65	-14.15
5550	54.67	-2.62	2.56	0.41	30.094	24.579	2.56	-13.24
5570	49.44	-3.06	2.06	-0.09	27.497	21.939	2.06	-13.64
5590	54.34	-2.65	2.89	0.74	30.204	24.134	2.89	-13
5610	49.55	-3.05	2.76	0.61	27.508	22.045	2.76	-13.29
5630	53.19	-2.74	2.86	0.71	29.758	23.427	2.86	-14
5650	43.08	-3.66	1.95	-0.2	24.296	18.781	1.95	-15.57
5670	48.16	-3.17	2.55	0.4	27.266	20.899	2.55	-14.87
5690	41.66	-3.8	2.06	-0.09	23.224	18.431	2.06	-15.22
5710	43.92	-3.57	2.26	0.11	24.721	19.201	2.26	-14.29
5730	41.62	-3.81	1.91	-0.24	23.692	17.927	1.91	-14.22
5750	38.36	-4.16	1.21	-0.94	22.11	16.247	1.21	-14.25
5770	38.07	-4.19	1.13	-1.02	21.861	16.213	1.13	-13.91
5790	35.55	-4.49	0.74	-1.41	20.663	14.882	0.74	-14.7
5810	34.88	-4.57	0.28	-1.87	20.444	14.439	0.28	-15.13
5830	33.26	-4.78	-0.03	-2.18	19.54	13.715	-0.03	-13.49
5850	32.97	-4.82	-0.03	-2.18	19.167	13.801	-0.03	-13.52



无源测试数据 Passive test data

ANT2 Direction of figure(5G)

