



Antenna Test Report

For

AP3880P Main Antenna

Supplier: ShenZhen Deman Electronics Technology Co., Ltd

Address: 3rd Floor, Building C, Shunluo Industrial Park, Dafuyuan Industrial
Zone, Guanlan Sub-district, Longhua New District, Shenzhen City

Customer	ID TECH	Project	AP3880P
Band	LTE-B1/2/3/4/5/7/8/12/13/17/18/19/20/25/26/28/38/40/41/66	Color	Black
PRS PN	Deman	Version	V1.0

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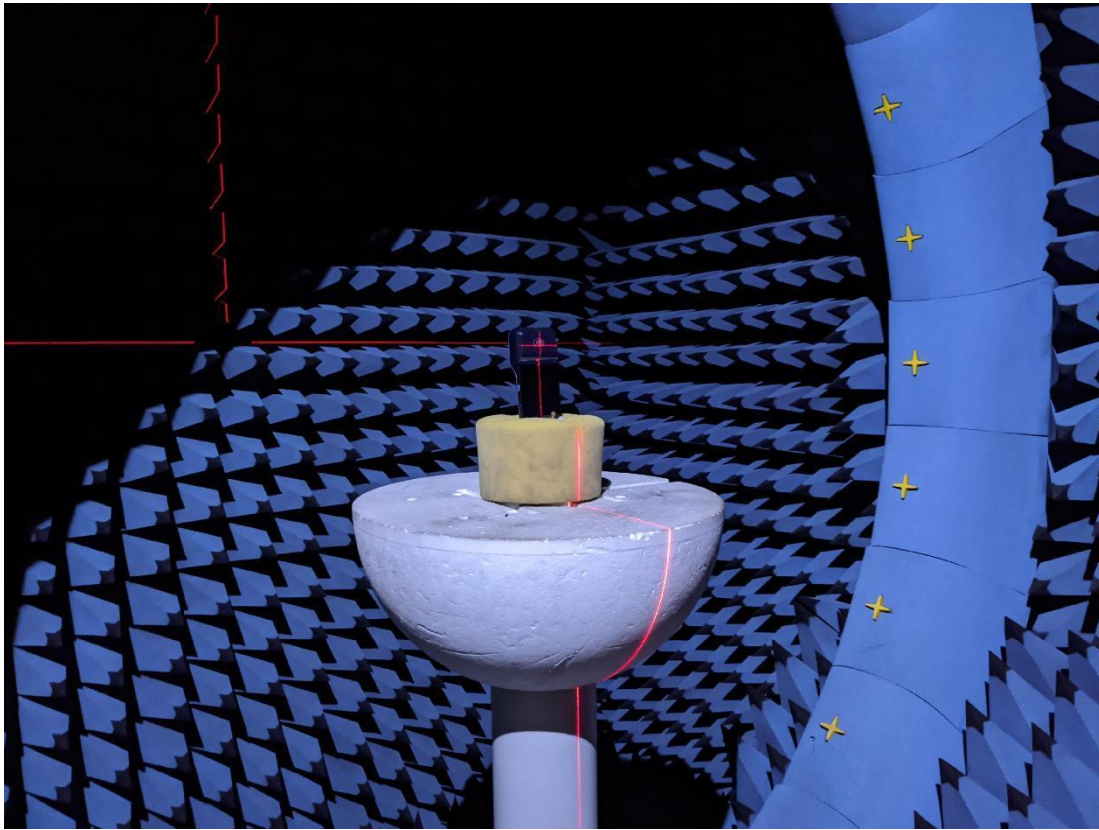
Issued by		Checked by	
Confirmed by		Date	2023.09.19

A.TEST INSTRUMENTATION

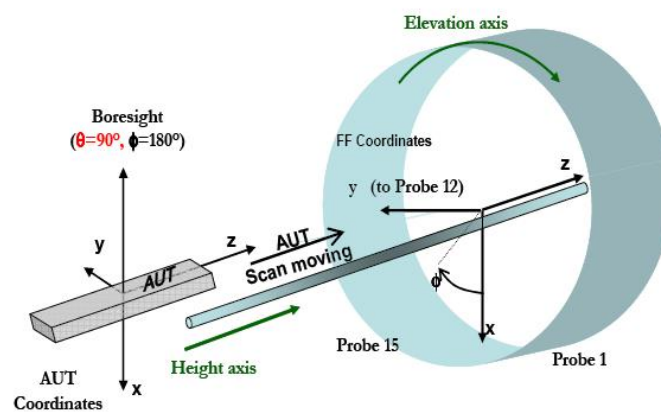
CHAMBER	SATIMO Chamber
Wireless Networking Test Set	Agilent 8960 5515C
NETWORK ANALYZER	Agilent 5072AD
COMPREHENSIVE TESTER	R&S CMW500
TEMPERATURE	20±2℃
HUMIDITY	50±20%rh



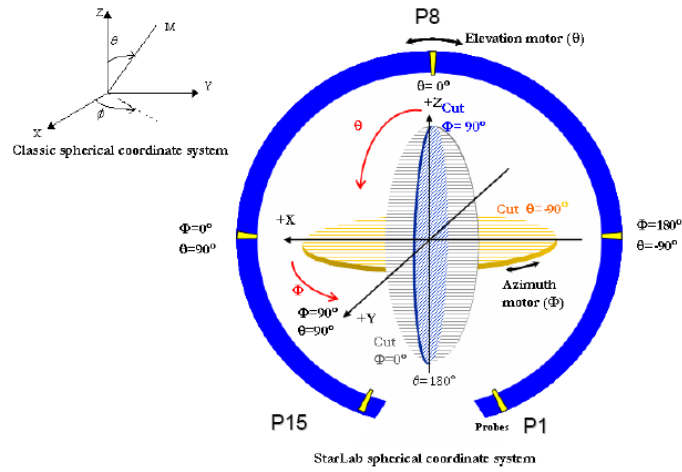
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Coordinate system – Cylindrical geometry

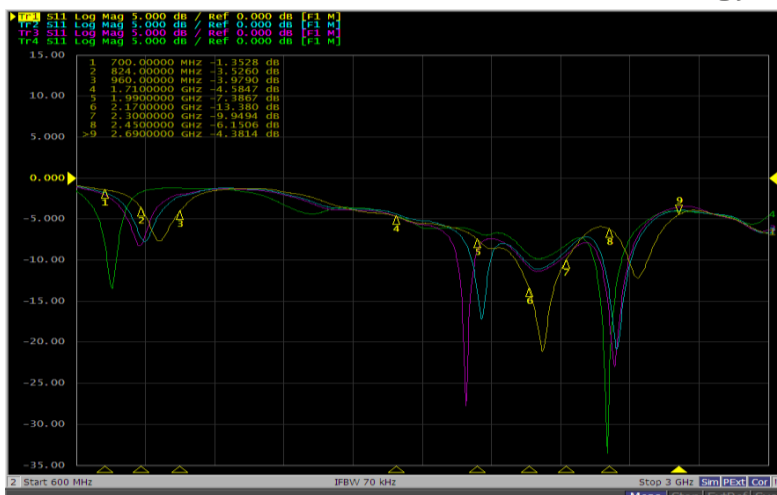


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B. Definitions

VSWR: Voltage Standing Wave Rate



TRP: total radiated power

LTE:

Band	Channel	TRP/dBm	Band	Channel	TRP/dBm	Band	Channel	TRP/dBm
B1	18050	18.05	B12	23035	13.98	B26(5M)	26715	14.78
	18300	17.44		23095	14.71		16865	15.24
	18550	17.47		23155	14.15		27015	15.65
B2	18650	17.37	B13			B28	27260	16.61
	18900	17.11		23230	13.5		27410	15.37
	19150	16.67					27610	15.19
B3	19250	18.41	B17	23780	15.54	B38	37850	15.76
	19575	18.35		23790	15.37		38000	16.24
	19900	18.48		23800	15.17		38150	15.88
B4	20000	18.83	B18	23900	15.08	B40	38750	17.6
	20175	19.02		23925	15.23		39150	18.26
	20350	18.84		23950	15.47		39550	17.83
B5	20450	15.15	B19	24050	15.26	B41	39750	16.17
	20525	15.2		24075	15.77		40620	15.95
	20600	15.63		24100	16.12		41490	16.09
B7	20850	16.02	B20	24200	15.13	B66	132022	18.67
	21100	15.83		24300	15.37		132322	18.81
	21350	15.14		24400	15.61		132622	18.95
B8	21500	15.2	B25	26090	15.9			
	21625	15.56		26365	15.82			
	21750	16.18		26640	15.61			



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WCDMA:

Band	Channel	TRP/dBm	Band	Channel	TRP/dBm	Band	Channel	TRP/dBm
B1	9612	19.73	B4	1312	19.91	B8	2712	16.96
	9750	18.96		1413	20.24		2788	17.31
	9888	18.64		1513	20.47		2863	18.12
B2	9262	19.77	B5	4132	15.12	B9	8762	20.44
	9400	19.59		4183	16.12		8837	20.4
	9538	18.98		4233	16.35		8912	20.3
B3	937	20.22	B6	4162	15.68			
	1075	20.2		4175	15.77			
	1213	20.27		4188	16.14			

TIS: total isotropic sensitivity

LTE:

Band	Channel	TIS/dBm	Band	Channel	TIS/dBm	Band	Channel	TIS/dBm
B1			B12			B26(5M)		
	550	-96.51		5155	-89.83		9015	-92.69
B2			B13			B28		
	1150	-96.26		5230	-86.91		9610	-88.51
B3			B17			B38		
	1900	-94.93		5800	-87.86		38150	-92.54
B4			B18			B40		
	2350	-94.32		5950	-91.24		39550	-91.94
B5			B19			B41		
	2600	-89.95		6100	-90.64		41490	-93.42
B7			B20			B66		

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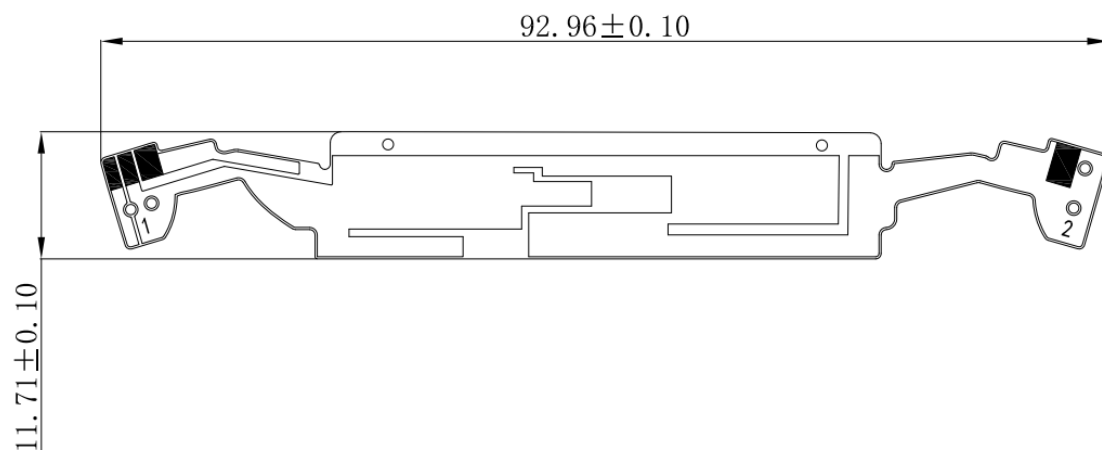
	3350	-95.74		6400	-87.97		67086	-95.84
B8			B25					
	3750	-88.41		8640	-96.52			

WCDMA:

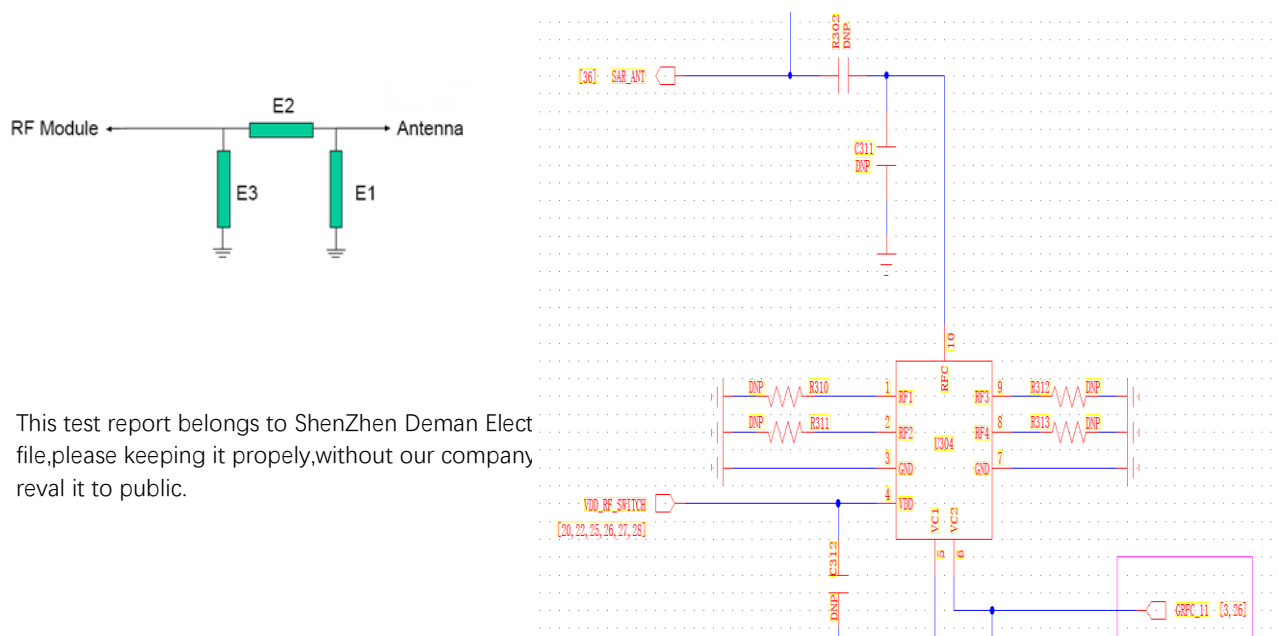
Band	Channel	TIS/dBm	Band	Channel	TIS/dBm	Band	Channel	TIS/dBm
B1			B4			B8		
	10838	-104.44		1738	-102.93		3088	-100.7
B2			B5			B9		
	9938	-99.56		4458	-103.25		9387	-103.57
B3			B6					
	1438	-102.93		4413	-102.93			

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Cell-Phone Photo and Dealing Methord



C. Matching Circuit Description





Element		Value
E1(0402)		7.5nH
E2(0402)		0Ω
E3(0402)		/
RF1	R310	0Ω
RF2	R311	5.6nH
RF3	R312	7.5nH
RF4	R313	12nH
/	C672	/

E. Cell-phone cable test (Conduct at the test hole and set the line loss as 0)

F. Efficiency test results

RF1	LTE B2/3/4/7/8/25/38/40/41/66 W-B1/2/3/4/8 GSM900/1800/1900 (880-960 & 1710-2170 & 2300-2700Mhz)
RF2	LTE B5/18/19/20/26 W-B5/6/19 GSM850 (800-894Mhz)
RF3	B13 (750-780Mhz)
RF4	LTE B1/12/17/28 (700-800Mhz)

	RF1	RF2	RF3	RF4
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Frequency	Efficiency (%)	Efficiency (dB)	Gain (dbi)	Efficiency (%)	Efficiency (dB)	Gain (dbi)	Efficiency (%)	Efficiency (dB)	Gain	Efficiency (%)	Efficiency (dB)	Gain (dbi)
600	1%	-19.24	-13.92	2%	-17.75	-12.02	2%	-17.10	-11.26	5%	-13.17	-9.12
610	2%	-17.92	-13.05	2%	-16.40	-11.12	3%	-15.77	-10.32	7%	-11.63	-8.09
620	2%	-17.65	-13.08	2%	-16.09	-11.35	3%	-15.50	-10.65	8%	-11.20	-8.16
630	2%	-16.52	-12.68	3%	-14.92	-11.02	4%	-14.36	-10.50	10%	-9.90	-7.73
640	3%	-15.98	-12.43	4%	-14.34	-10.75	4%	-13.76	-10.51	12%	-9.19	-7.58
650	2%	-16.52	-13.57	3%	-14.77	-11.80	4%	-14.12	-11.55	11%	-9.41	-8.49
660	2%	-16.13	-13.63	4%	-14.29	-11.62	4%	-13.55	-11.00	13%	-8.79	-7.84
670	3%	-15.51	-13.10	4%	-13.54	-10.92	5%	-12.74	-10.06	17%	-7.79	-6.97
680	3%	-15.20	-12.22	5%	-13.15	-10.05	6%	-12.30	-9.29	19%	-7.18	-5.76
690	4%	-14.42	-11.38	6%	-12.27	-8.98	7%	-11.38	-8.29	25%	-5.97	-4.59
700	4%	-14.12	-11.16	6%	-11.89	-8.75	8%	-10.94	-7.99	29%	-5.45	-4.20
710	4%	-13.84	-11.10	7%	-11.52	-8.55	9%	-10.52	-7.81	31%	-5.15	-3.82
720	4%	-13.55	-11.38	8%	-11.12	-8.64	10%	-10.07	-7.71	32%	-5.01	-3.68
730	5%	-13.25	-11.55	8%	-10.73	-8.59	11%	-9.65	-7.45	31%	-5.12	-3.50
740	5%	-12.99	-11.43	9%	-10.34	-8.21	12%	-9.20	-7.37	30%	-5.23	-3.23
750	6%	-12.52	-10.80	10%	-9.82	-7.40	14%	-8.63	-6.73	27%	-5.73	-3.01
760	6%	-12.58	-10.88	11%	-9.77	-7.34	14%	-8.52	-6.75	22%	-6.53	-3.39
770	6%	-12.04	-10.00	12%	-9.16	-6.65	16%	-7.87	-5.73	18%	-7.33	-3.20
780	7%	-11.82	-9.46	13%	-8.86	-5.90	17%	-7.57	-4.94	15%	-8.18	-3.20
790	7%	-11.36	-8.42	15%	-8.36	-4.79	19%	-7.10	-3.98	12%	-9.26	-3.44
800	8%	-10.77	-7.49	16%	-7.89	-3.96	21%	-6.72	-3.25	10%	-9.79	-3.66
810	8%	-10.73	-7.19	16%	-7.86	-3.65	21%	-6.73	-2.93	8%	-10.86	-4.46
820	9%	-10.45	-6.71	17%	-7.78	-3.36	21%	-6.79	-2.85	7%	-11.75	-5.32
830	10%	-10.17	-6.12	18%	-7.56	-3.10	21%	-6.74	-2.77	5%	-12.61	-6.12
840	11%	-9.52	-5.26	18%	-7.35	-2.93	20%	-6.91	-2.94	5%	-13.45	-6.86
850	12%	-9.29	-4.74	18%	-7.50	-2.91	18%	-7.35	-3.04	4%	-14.06	-7.24
860	14%	-8.52	-3.69	18%	-7.36	-2.64	17%	-7.61	-3.00	4%	-14.48	-7.55
870	16%	-7.89	-2.90	19%	-7.26	-2.57	17%	-7.82	-3.08	4%	-14.45	-7.66
880	20%	-6.96	-2.03	20%	-7.05	-2.63	16%	-7.96	-3.34	4%	-14.49	-8.09
890	23%	-6.36	-1.33	20%	-6.98	-2.71	16%	-8.03	-3.49	4%	-14.12	-7.95
900	26%	-5.91	-1.20	21%	-6.84	-2.92	16%	-7.97	-3.57	4%	-14.01	-7.99
910	28%	-5.55	-1.09	20%	-6.93	-3.17	16%	-8.08	-3.90	4%	-14.13	-8.03
920	28%	-5.51	-1.17	19%	-7.22	-3.58	15%	-8.35	-4.43	4%	-14.55	-8.45
930	25%	-5.95	-1.49	15%	-8.10	-4.46	12%	-9.20	-5.44	3%	-15.40	-9.17
940	24%	-6.24	-1.99	15%	-8.34	-4.52	12%	-9.36	-5.47	3%	-15.36	-8.98
950	24%	-6.27	-2.15	14%	-8.43	-4.74	11%	-9.42	-5.69	3%	-15.30	-9.25
960	23%	-6.42	-2.83	14%	-8.46	-5.23	12%	-9.38	-6.17	3%	-15.03	-9.71

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970	23%	-6.44	-2.90	14%	-8.49	-5.54	11%	-9.40	-6.45	3%	-14.97	-9.95
980	21%	-6.78	-3.35	13%	-8.74	-5.99	11%	-9.58	-6.85	3%	-14.91	-10.23
990	21%	-6.74	-3.57	14%	-8.56	-6.15	12%	-9.35	-6.88	4%	-14.50	-10.05
1000	22%	-6.52	-3.68	15%	-8.32	-6.05	12%	-9.07	-6.82	4%	-14.08	-9.74
1700	27%	-5.72	-1.72	27%	-5.63	-0.74	26%	-5.80	-0.72	6%	-12.26	-6.14
1720	27%	-5.67	-1.76	27%	-5.63	-0.52	26%	-5.84	-0.86	5%	-12.64	-6.99
1740	26%	-5.77	-1.87	27%	-5.73	-0.82	25%	-6.00	-1.24	6%	-12.09	-7.56
1760	29%	-5.44	-1.55	28%	-5.45	-0.33	26%	-5.82	-0.94	9%	-10.55	-7.34
1780	32%	-4.95	-1.01	31%	-5.04	-0.06	27%	-5.64	-0.65	15%	-8.25	-5.64
1800	33%	-4.80	-0.72	32%	-4.95	0.12	27%	-5.75	-0.45	23%	-6.47	-3.97
1820	34%	-4.72	-0.82	32%	-4.93	0.02	26%	-5.86	-1.04	29%	-5.39	-2.68
1840	35%	-4.61	-1.10	32%	-4.93	-0.30	25%	-5.96	-1.26	36%	-4.41	-1.99
1860	34%	-4.67	-1.32	31%	-5.10	-0.37	24%	-6.24	-2.02	40%	-4.00	-1.64
1880	34%	-4.69	-1.56	30%	-5.18	-0.35	22%	-6.54	-2.82	41%	-3.88	-1.23
1900	32%	-4.91	-1.41	29%	-5.40	-0.06	20%	-7.06	-3.25	39%	-4.13	-1.47
1920	32%	-4.95	-1.25	28%	-5.47	-0.67	18%	-7.49	-2.37	37%	-4.28	-1.61
1940	28%	-5.47	-1.82	25%	-6.05	-3.16	17%	-7.76	-2.56	32%	-4.94	-1.87
1960	29%	-5.32	-1.56	26%	-5.92	-3.76	21%	-6.69	-2.69	32%	-5.01	-2.39
1980	30%	-5.21	-0.88	25%	-6.07	-3.13	25%	-6.01	-2.50	31%	-5.05	-2.33
2000	28%	-5.53	-0.43	22%	-6.63	-3.31	26%	-5.93	-2.66	29%	-5.44	-2.58
2020	29%	-5.39	-0.15	24%	-6.29	-2.59	28%	-5.51	-2.07	29%	-5.35	-1.88
2040	28%	-5.56	-0.40	26%	-5.77	-2.26	29%	-5.32	-1.63	28%	-5.46	-1.51
2060	27%	-5.71	-0.38	29%	-5.45	-1.82	30%	-5.17	-1.23	28%	-5.46	-1.01
2080	27%	-5.68	0.09	30%	-5.24	-1.34	31%	-5.03	-0.83	29%	-5.31	-0.72
2100	27%	-5.71	-0.01	30%	-5.19	-1.28	31%	-5.06	-0.55	30%	-5.25	-0.61
2120	28%	-5.59	0.02	31%	-5.13	-0.52	31%	-5.04	0.27	30%	-5.17	0.03
2140	27%	-5.68	-1.00	30%	-5.24	-0.07	30%	-5.18	0.43	30%	-5.25	0.51
2160	27%	-5.72	-2.61	29%	-5.36	0.15	30%	-5.30	0.69	29%	-5.33	0.92
2180	27%	-5.70	-3.25	29%	-5.37	0.44	29%	-5.32	0.99	29%	-5.31	1.20
2200	26%	-5.93	-3.87	29%	-5.41	0.49	29%	-5.40	0.95	29%	-5.34	1.05
2220	23%	-6.46	-3.44	29%	-5.42	0.70	29%	-5.43	1.31	29%	-5.33	1.27
2240	23%	-6.31	-2.69	34%	-4.70	1.97	34%	-4.74	2.39	35%	-4.59	2.25
2260	24%	-6.17	-1.89	34%	-4.63	2.62	34%	-4.67	2.77	35%	-4.53	2.28
2280	24%	-6.25	-1.43	33%	-4.82	2.20	33%	-4.83	2.47	34%	-4.67	1.63
2300	24%	-6.25	-0.94	32%	-4.92	2.62	32%	-4.91	2.28	34%	-4.74	1.54
2320	24%	-6.25	-0.72	32%	-4.97	2.76	32%	-4.95	2.23	34%	-4.75	0.92
2340	25%	-5.96	-0.31	34%	-4.68	2.71	35%	-4.62	2.13	36%	-4.42	0.56
2360	24%	-6.15	-0.20	33%	-4.83	2.69	34%	-4.71	1.56	35%	-4.53	0.30
2380	26%	-5.89	0.15	36%	-4.45	2.26	37%	-4.30	0.92	38%	-4.19	-0.17
2400	27%	-5.64	0.67	38%	-4.20	1.06	39%	-4.13	-0.26	37%	-4.31	-1.52

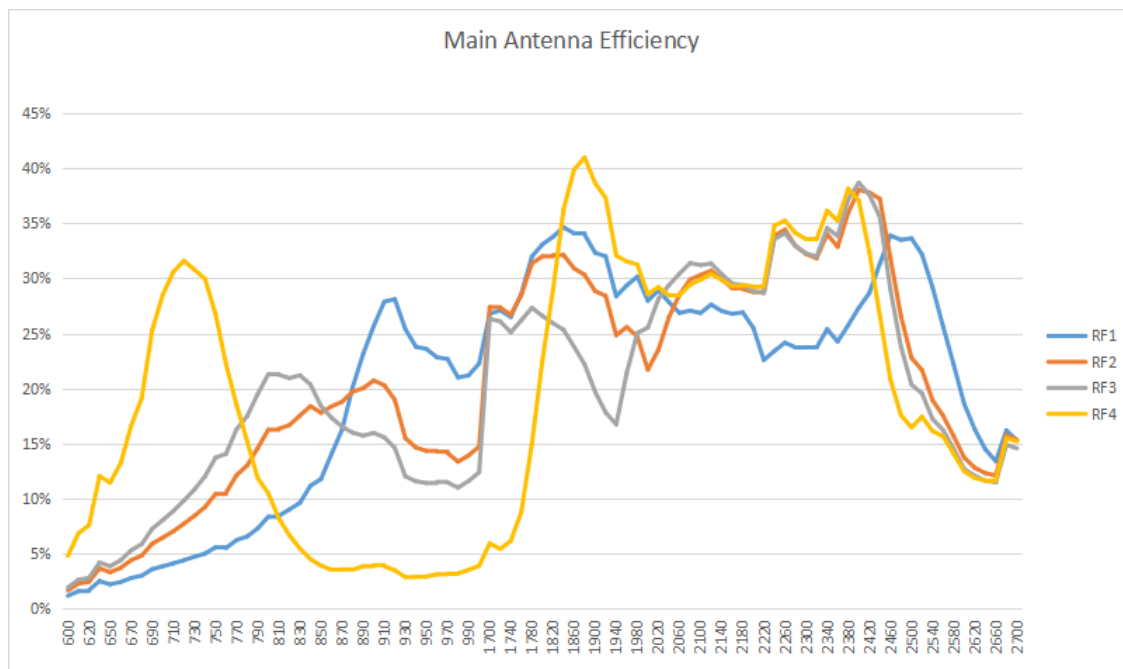
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2420	29%	-5.43	1.00	38%	-4.23	-0.33	38%	-4.25	-1.49	32%	-4.89	-2.76
2440	31%	-5.04	1.19	37%	-4.29	-2.23	36%	-4.49	-2.99	27%	-5.75	-4.15
2460	34%	-4.70	1.30	32%	-4.97	-3.25	29%	-5.38	-3.43	21%	-6.82	-4.83
2480	33%	-4.75	1.14	27%	-5.75	-3.49	24%	-6.23	-3.51	18%	-7.55	-4.88
2500	34%	-4.73	1.50	23%	-6.42	-3.49	20%	-6.91	-3.58	16%	-7.83	-4.47
2520	32%	-4.93	1.65	22%	-6.64	-3.04	20%	-7.09	-2.76	17%	-7.58	-3.18
2540	29%	-5.35	0.97	19%	-7.23	-3.13	17%	-7.64	-2.97	16%	-7.92	-2.91
2560	26%	-5.91	0.54	18%	-7.56	-3.34	16%	-7.90	-2.95	16%	-8.05	-2.74
2580	22%	-6.54	-0.03	16%	-8.05	-3.08	15%	-8.38	-2.97	14%	-8.51	-2.65
2600	19%	-7.30	-1.09	14%	-8.62	-2.84	13%	-8.97	-2.84	12%	-9.04	-2.48
2620	16%	-7.88	-1.68	13%	-8.92	-2.62	12%	-9.18	-2.64	12%	-9.26	-2.60
2640	14%	-8.39	-1.74	12%	-9.09	-2.54	12%	-9.34	-2.66	12%	-9.34	-2.57
2660	13%	-8.73	-1.51	12%	-9.17	-2.25	11%	-9.40	-2.41	12%	-9.32	-2.38
2680	16%	-7.90	-0.68	16%	-8.03	-1.25	15%	-8.27	-1.27	15%	-8.10	-1.36
2700	15%	-8.15	-1.06	15%	-8.14	-1.40	15%	-8.37	-1.41	15%	-8.18	-1.54



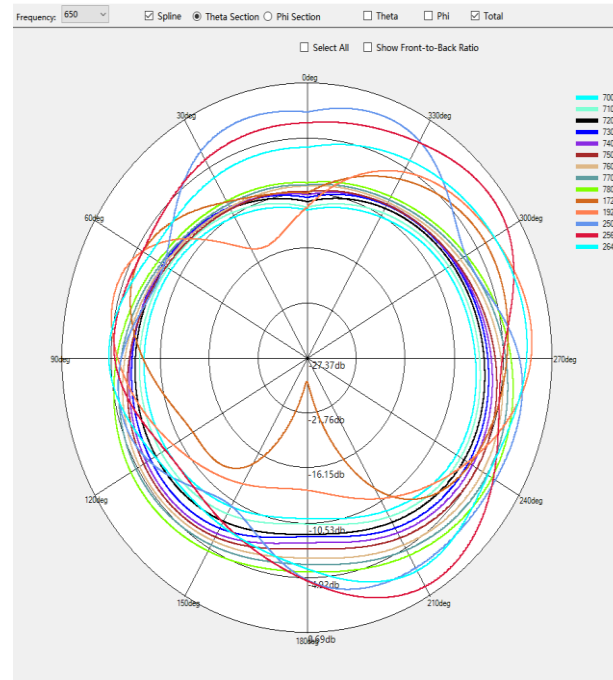
1D view:

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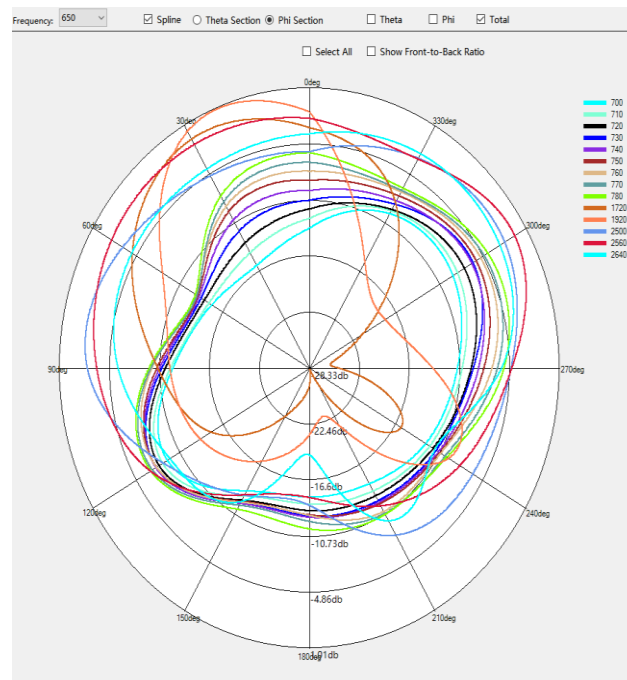


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Theta = 90



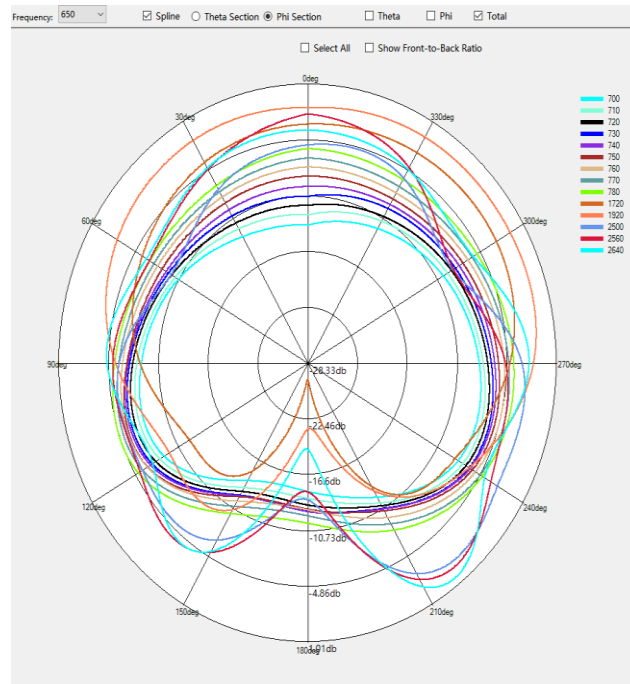
Theta = 0

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Phi = 90

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