

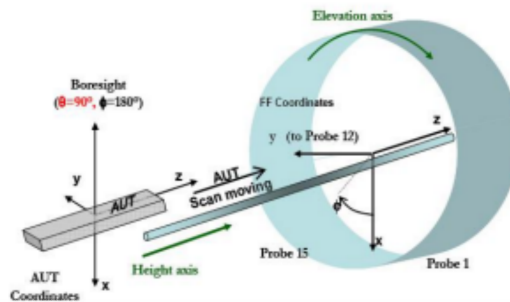
# F310 Main Antenna Test Report

## 1. TEST INSTRUMENTATION

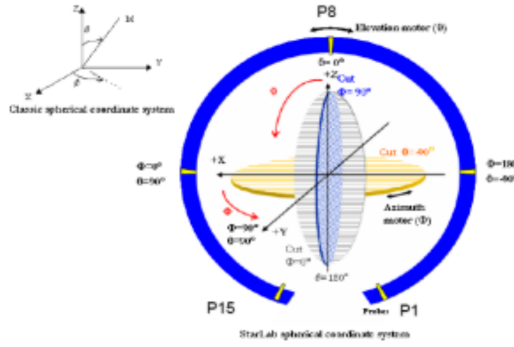
CHAMBER	SATIMO Chamber
Wireless Networking Test Set	General Test Rzi 1800
NETWORK ANALYZER	Agilent 5072AD
COMPREHENSIVE TESTER	R&S CMW500
TEMPERATURE	25±2°C
HUMIDITY	50±20%rh



Coordinate system – Cylindrical geometry



## Coordinate system – Spherical geometry



## 2. ANTENNA TRP & TIS

TRP: total radiated power & TIS: total isotropic sensitivity

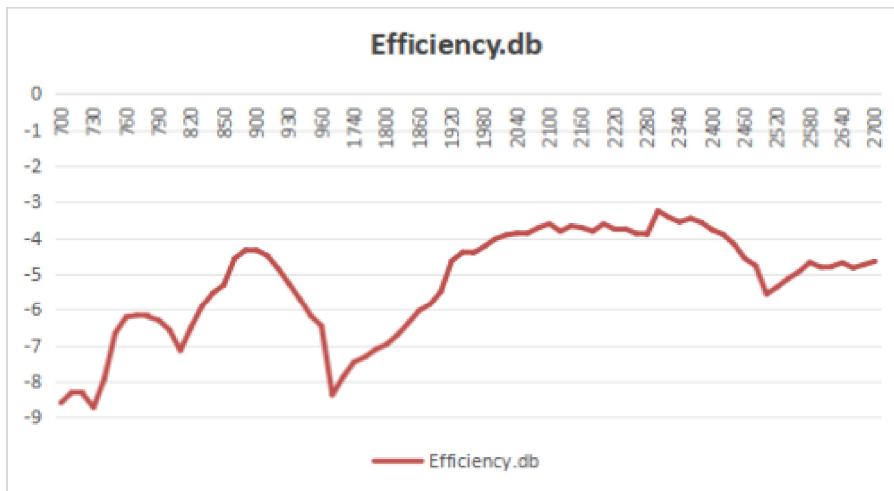
B1	18050	1925	16.17	50	2115	-94.06
	18300	1950	15.9	300	2140	-93.87
	18550	1975	15.62	550	2165	-94.26
B3	19250	1715	16.09	1250	1810	-96.03
	19575	1747.5	16.72	1575	1843	-96.01
	19900	1780	17.3	1900	1875	-96.26
B5	20450	829	16.26	2450	874	-93.64
	20525	836.5	16.95	2525	882	-94.01
	20600	844	16.5	2600	889	-93.87
B7	20850	2510	16.24	2850	2630	-91.01
	21100	2535	17.13	3100	2655	-91.32
	21350	2560	16.56	3350	2680	-91.29
B8	21500	885	16.21	3500	930	-93.82
	21625	897.5	16.84	3625	943	-94.01
	21750	910	17.35	3750	955	-94.11
B28	27260	708	14.16	9260	763	-90.26
	27435	725.5	14.32	9435	781	-91.03
	27610	743	14.58	9610	798	-90.07
B38	37850	2580	15.98	37850	2580	-89.03
	38000	2595	16.23	38000	2595	-88.94
	38150	2610	16.18	38150	2610	-89.73

## F310\_MAIN\_ANTENNA\_S11

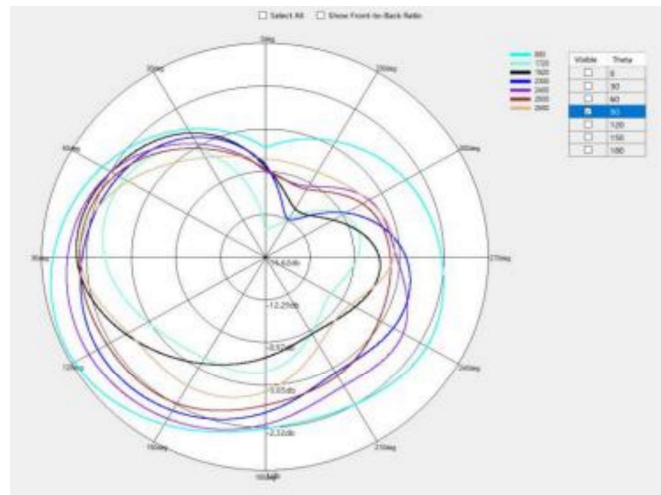


# F310\_MAIN\_ANTENNA Efficiency test results

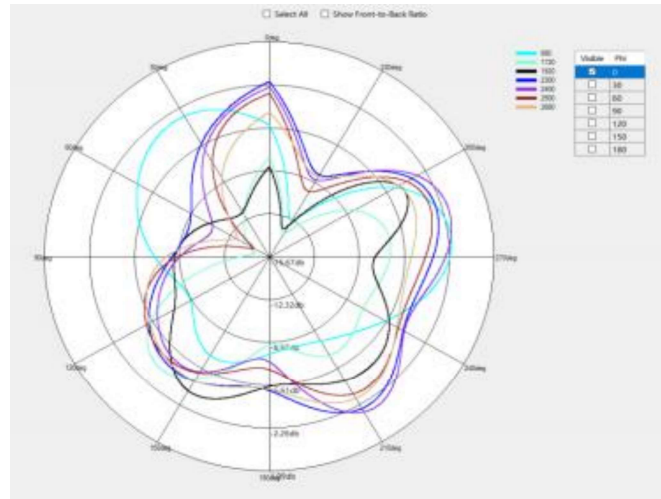
Frequency MHz	Efficiency db	Gain dbi	Efficiency %	Frequency MHz	Efficiency db	Gain dbi	Efficiency %
700	-8.59	-4.94	13.82	1960	-4.41	-0.32	36.24
710	-8.3	-4.46	14.79	1980	-4.23	-0.06	37.78
720	-8.34	-4.37	14.65	2000	-4.02	0.06	39.63
730	-8.72	-4.77	13.41	2020	-3.91	0.23	40.62
740	-7.92	-4.15	16.16	2040	-3.86	0.31	41.15
750	-6.66	-3.1	21.55	2060	-3.86	0.23	41.1
760	-6.21	-2.59	23.94	2080	-3.71	0.28	42.54
770	-6.16	-2.58	24.2	2100	-3.6	0.35	43.63
780	-6.2	-2.68	23.99	2120	-3.81	0.38	41.61
790	-6.3	-2.75	23.46	2140	-3.66	0.55	43.06
800	-6.57	-3.22	22.05	2160	-3.71	0.26	42.56
810	-7.14	-3.3	19.33	2180	-3.81	0.02	41.6
820	-6.49	-2.76	22.45	2200	-3.6	0.12	43.65
830	-5.9	-2.04	25.69	2220	-3.75	0.01	42.16
840	-5.52	-1.67	28.07	2240	-3.74	0.19	42.31
850	-5.3	-1.34	29.5	2260	-3.87	0.15	40.99
880	-4.56	-0.95	35.03	2280	-3.9	0.24	40.71
890	-4.33	-0.79	36.89	2300	-3.24	0.83	47.47
900	-4.33	-0.69	36.9	2320	-3.42	0.6	45.53
910	-4.48	-0.86	35.62	2340	-3.55	0.5	44.17
920	-4.84	-0.95	32.83	2360	-3.45	0.55	45.23
930	-5.26	-1.23	29.77	2380	-3.56	0.37	44.01
940	-5.69	-1.64	26.95	2400	-3.77	0.08	41.93
950	-6.17	-2.17	24.14	2420	-3.89	-0.14	40.82
960	-6.46	-2.47	22.62	2440	-4.16	-0.78	38.35
1700	-8.37	-2.6	14.55	2460	-4.56	-1.15	34.97
1720	-7.87	-2.28	16.34	2480	-4.76	-1.16	33.44
1740	-7.46	-1.85	17.94	2500	-5.55	-1.23	27.83
1760	-7.32	-1.72	18.55	2520	-5.35	-1.07	29.16
1780	-7.11	-1.7	19.44	2540	-5.12	-0.94	30.73
1800	-6.97	-1.41	20.09	2560	-4.93	-1.04	32.16
1820	-6.71	-1.04	21.33	2580	-4.67	-1.14	34.09
1840	-6.38	-0.82	22.99	2600	-4.8	-1.56	33.12
1860	-6.03	-0.48	24.97	2620	-4.78	-1.64	33.3
1880	-5.85	-0.49	26	2640	-4.68	-1.67	34.07
1900	-5.48	-0.35	28.31	2660	-4.82	-1.91	32.95
1920	-4.63	-0.58	34.47	2680	-4.73	-1.66	33.66
1940	-4.39	-0.42	36.42	2700	-4.64	-1.3	34.34



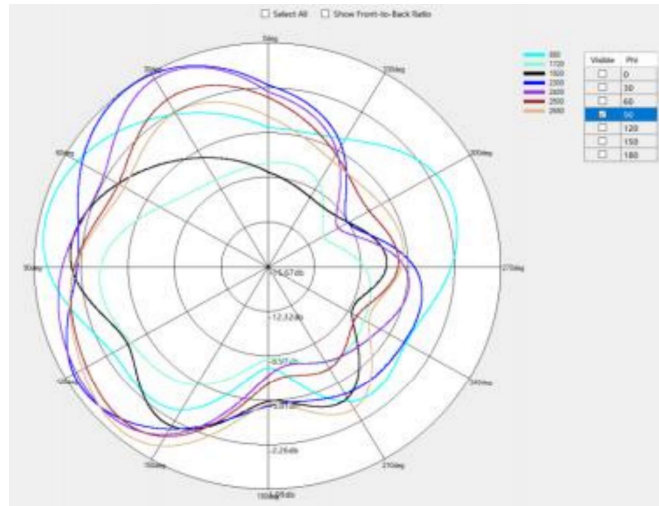
1D view:



Theta = 90

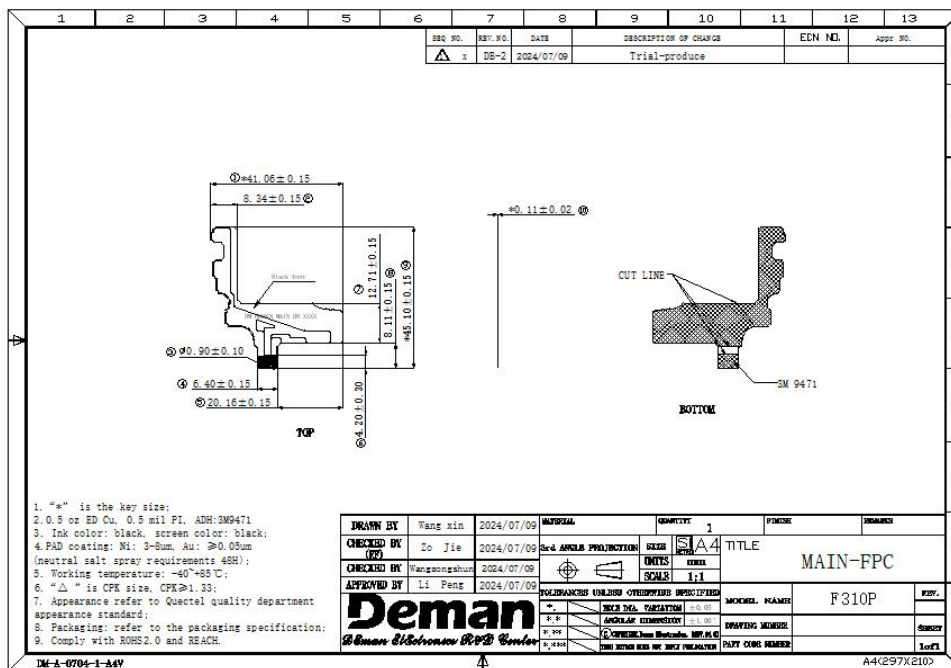


Phi = 90

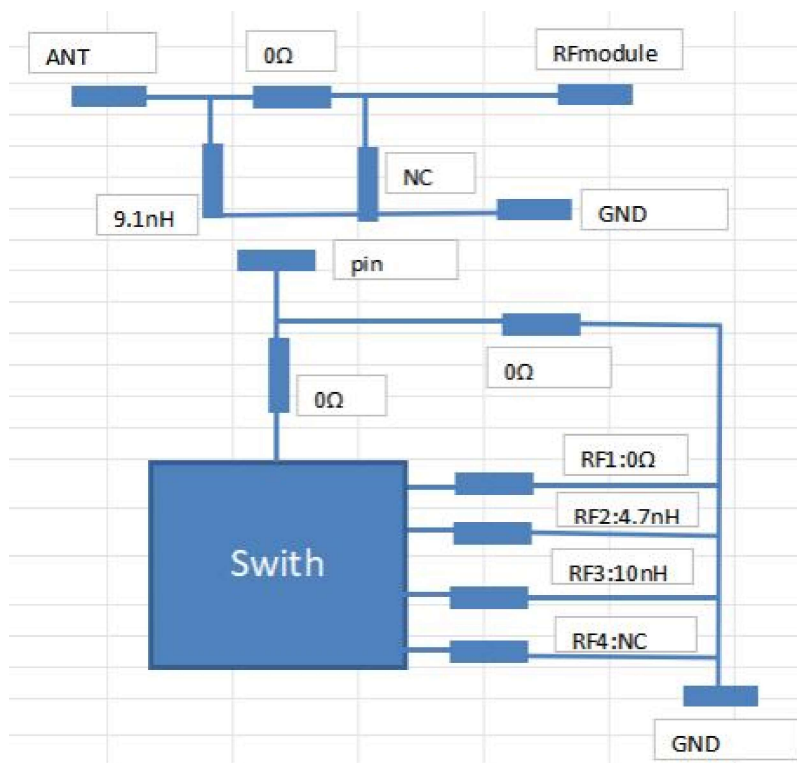


Theta = 0 °

Structural diagram:



RF link:

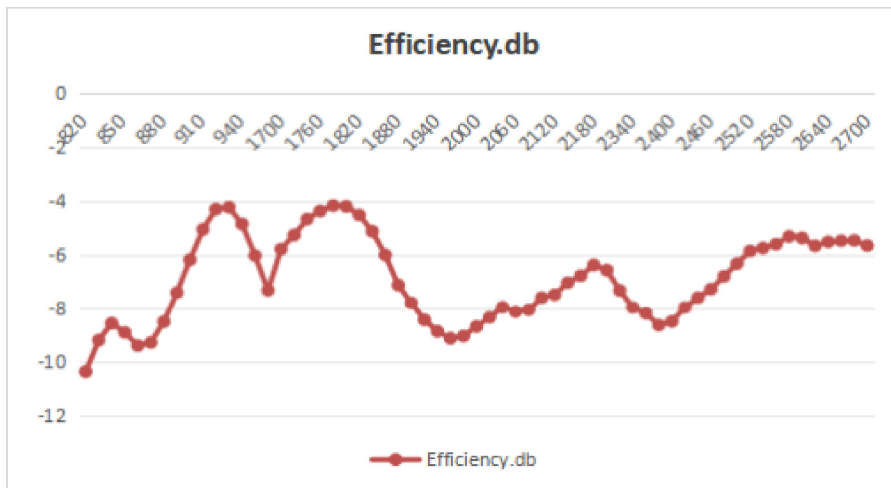


## F310\_DIV\_ANTENNA S11



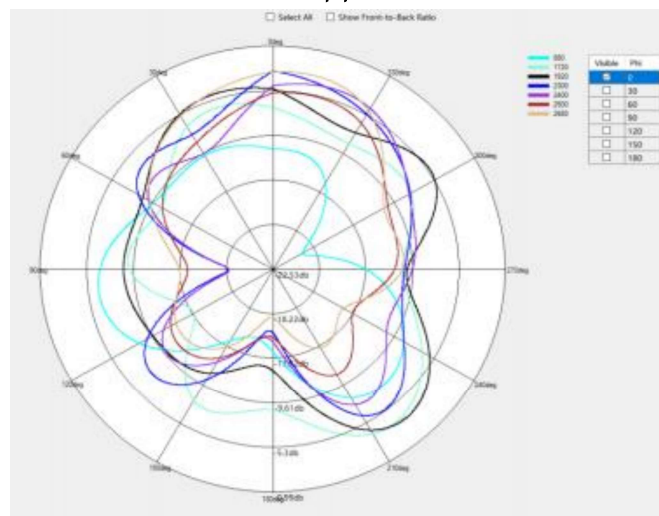
## F310\_DIV\_ANTENNA Efficiency test results

Frequency MHz	Efficiency db	Gain dbi	Efficiency %	Frequency MHz	Efficiency db	Gain dbi	Efficiency %
820	-10.34	-6.63	9.24	2020	-8.32	-4.19	14.71
830	-9.17	-5.79	12.1	2040	-7.93	-3.99	16.12
840	-8.54	-5.56	13.99	2060	-8.1	-3.36	15.48
850	-8.88	-6.01	12.95	2080	-8.03	-2.47	15.74
860	-9.37	-5.98	11.56	2100	-7.57	-1.62	17.52
870	-9.26	-5.96	11.85	2120	-7.46	-1.41	17.93
880	-8.48	-4.95	14.2	2140	-7.01	-1.12	19.89
890	-7.38	-4.25	18.3	2160	-6.75	-1.31	21.11
900	-6.16	-3.17	24.24	2180	-6.35	-1.14	23.16
910	-5.03	-2.01	31.4	2200	-6.54	-0.61	22.2
920	-4.28	-1.37	37.32	2220	-7.3	-1.32	18.61
930	-4.21	-1.08	37.89	2240	-7.94	-1.97	16.05
940	-4.83	-1.49	32.88	2260	-8.16	-2.14	15.28
950	-6	-2.48	25.1	2280	-8.61	-2.57	13.78
960	-7.29	-3.62	18.65	2300	-8.47	-2.48	14.23
1700	-5.76	0.11	26.55	2320	-7.94	-2.09	16.06
1720	-5.24	0.11	29.9	2340	-7.57	-1.89	17.51
1740	-4.65	0.28	34.29	2360	-7.25	-1.69	18.84
1760	-4.35	0.17	36.74	2380	-6.77	-1.2	21.05
1780	-4.15	-0.06	38.49	2400	-6.3	-0.79	23.43
1800	-4.18	-0.39	38.2	2420	-5.83	-0.24	26.12
1820	-4.5	-1	35.48	2440	-5.72	-0.06	26.76
1840	-5.1	-1.4	30.92	2460	-5.58	-0.03	27.64
1860	-5.98	-2.03	25.24	2480	-5.29	0.03	29.6
1880	-7.1	-2.89	19.51	2500	-5.35	-0.31	29.19
1900	-7.77	-3.63	16.73	2520	-5.64	-0.41	27.28
1920	-8.41	-4.34	14.43	2540	-5.49	-0.23	28.25
1940	-8.84	-4.88	13.06	2560	-5.45	-0.29	28.54
1960	-9.1	-5.36	12.3	2580	-5.44	-0.59	28.6
1980	-9.02	-5.26	12.52	2600	-5.63	-0.92	27.33
2000	-8.66	-4.58	13.61				



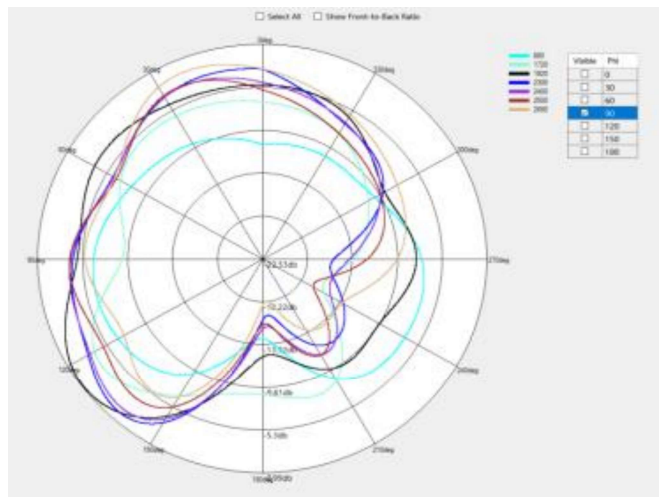
1D view:

H 面



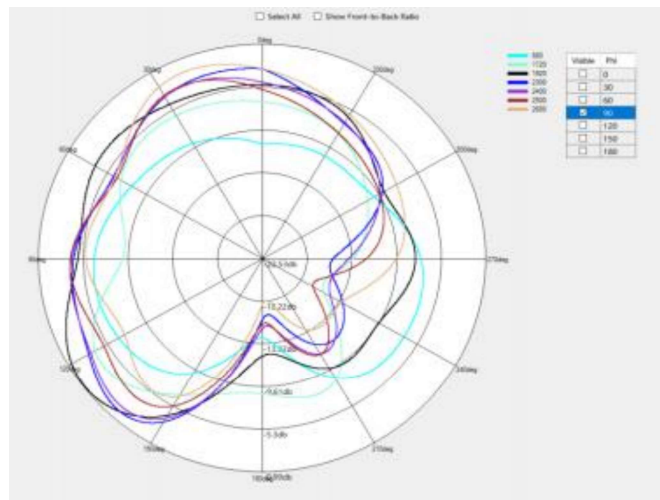
Theta = 90 °

E1



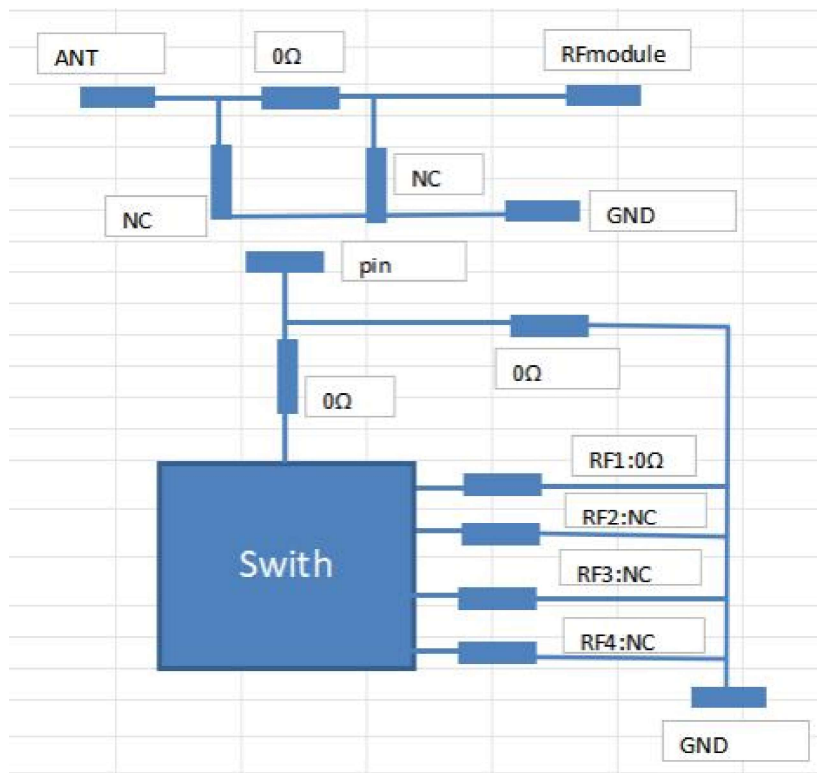
Phi = 90 °

E2

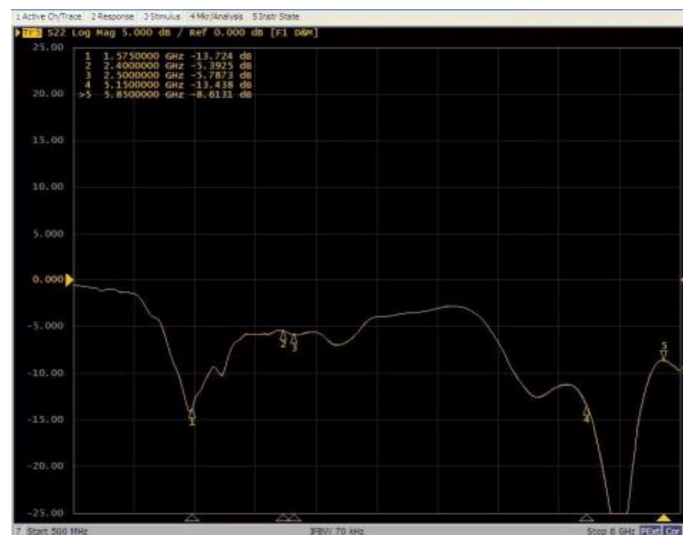


Theta = 0.

RF link:

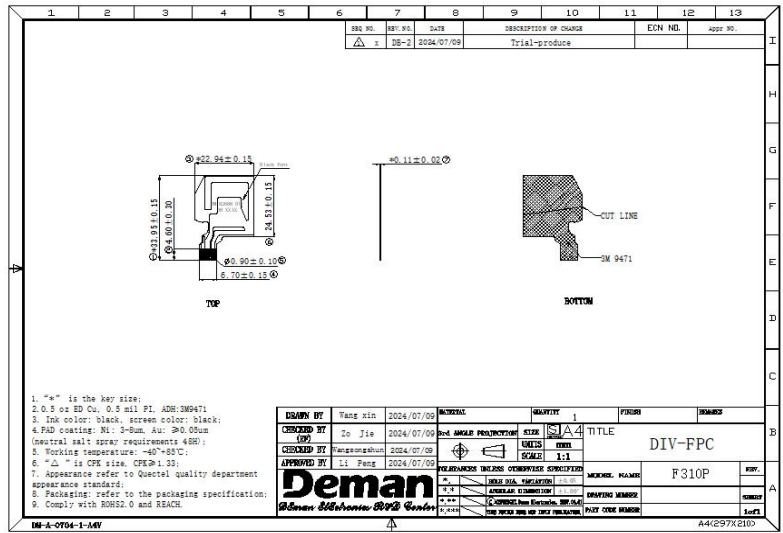


### F310\_3IN1\_ANTENNA S11



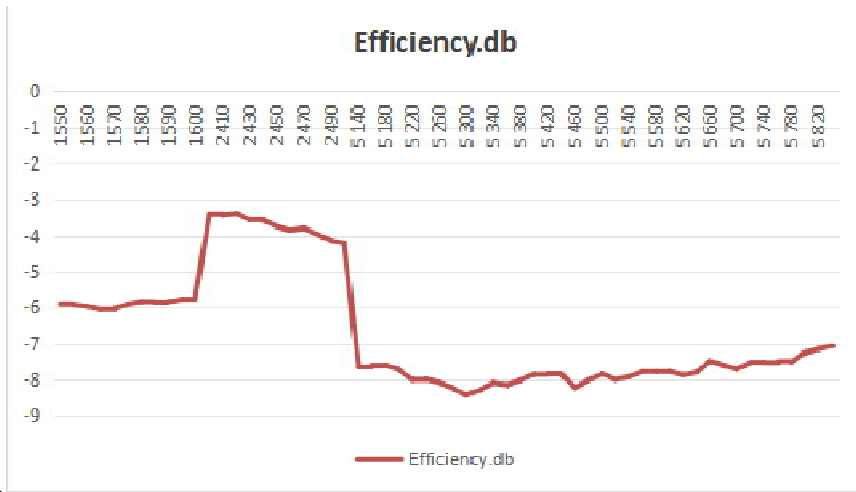


Structural diagram:



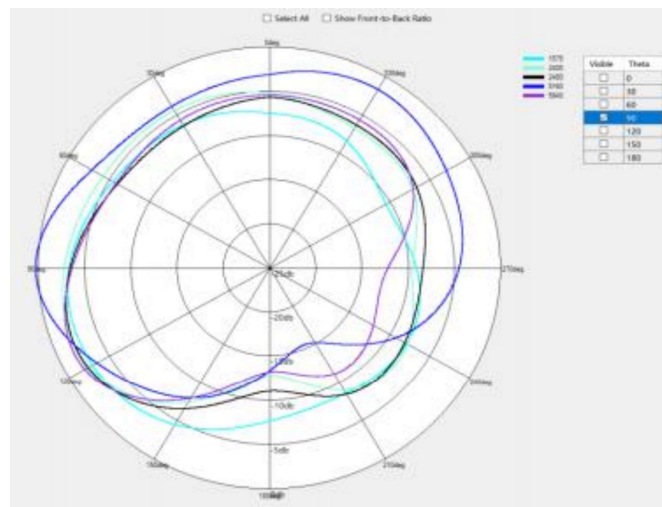
**F310\_3IN1\_ANTENNA Efficiency test results**

Frequency MHz	Efficiency db	Gain dbi	Efficiency %	Frequency MHz	Efficiency db	Gain dbi	Efficiency %
1550	-5.9	-1.33	25.71	5280	-8.23	-3.42	15.04
1555	-5.91	-1.18	25.65	5300	-8.41	-3.68	14.43
1560	-5.97	-1.13	25.27	5320	-8.27	-3.64	14.9
1565	-6.04	-1.01	24.9	5340	-8.08	-3.31	15.54
1570	-6.02	-0.79	25.02	5360	-8.14	-3.23	15.35
1575	-5.91	-0.57	25.66	5380	-8.01	-3.05	15.81
1580	-5.84	-0.45	26.07	5400	-7.85	-2.53	16.41
1585	-5.86	-0.39	25.96	5420	-7.83	-2.24	16.5
1590	-5.84	-0.28	26.08	5440	-7.85	-2	16.42
1595	-5.77	-0.14	26.5	5460	-8.22	-2.15	15.07
1600	-5.73	-0.05	26.72	5480	-8.01	-1.85	15.81
2400	-3.41	3.03	45.6	5500	-7.83	-1.6	16.49
2410	-3.44	3.12	45.3	5520	-7.99	-1.54	15.87
2420	-3.39	3.24	45.84	5540	-7.91	-1.32	16.19
2430	-3.56	3.12	44.01	5560	-7.77	-1.12	16.7
2440	-3.58	3.2	43.89	5580	-7.77	-1.08	16.72
2450	-3.74	3.07	42.23	5600	-7.76	-1.1	16.73
2460	-3.85	3.05	41.25	5620	-7.86	-1.18	16.36
2470	-3.79	3.15	41.77	5640	-7.79	-1.08	16.63
2480	-3.95	2.97	40.23	5660	-7.48	-0.81	17.85
2490	-4.14	2.79	38.57	5680	-7.6	-0.99	17.37
2500	-4.21	2.7	37.94	5700	-7.7	-1.2	16.99
5140	-7.64	-1.76	17.23	5720	-7.51	-1.16	17.75
5160	-7.6	-1.91	17.38	5740	-7.52	-1.21	17.68
5180	-7.59	-2.12	17.42	5760	-7.48	-1.1	17.86
5200	-7.71	-2.47	16.94	5780	-7.51	-1.14	17.72
5220	-7.99	-2.97	15.89	5800	-7.25	-0.85	18.83
5240	-7.97	-3.14	15.96	5820	-7.15	-0.76	19.26
5260	-8.07	-3.38	15.58	5840	-7.07	-0.73	19.65



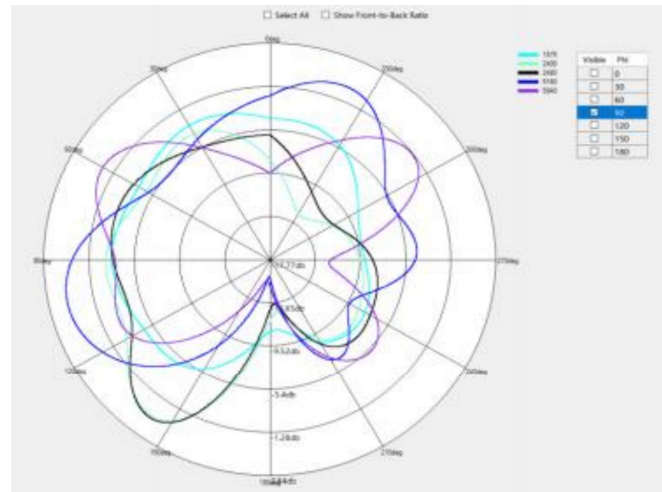
1D view:

H 面



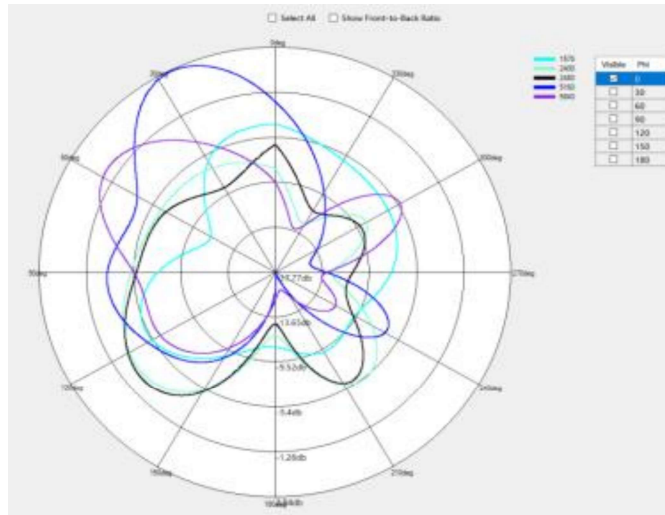
Theta = 90.

E1



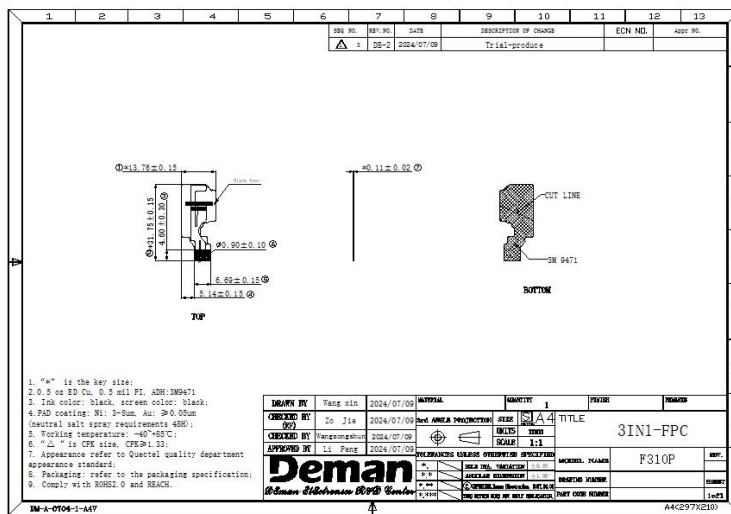
Phi = 90 .

E2

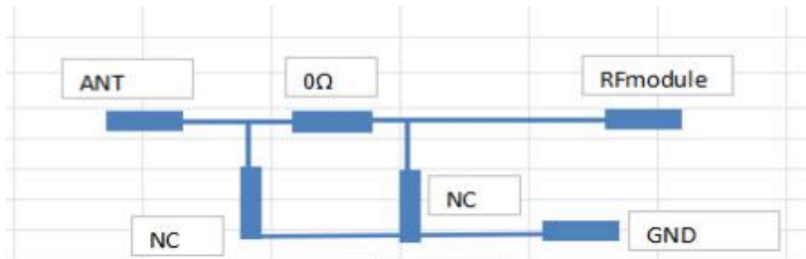


Theta = 0.

Structural diagram:



RF link:



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