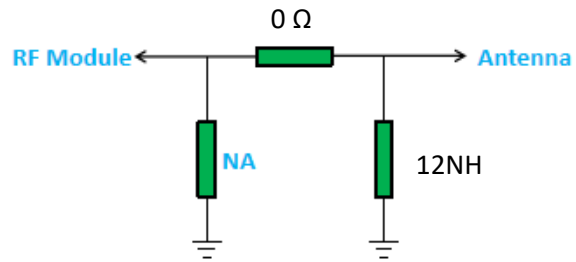
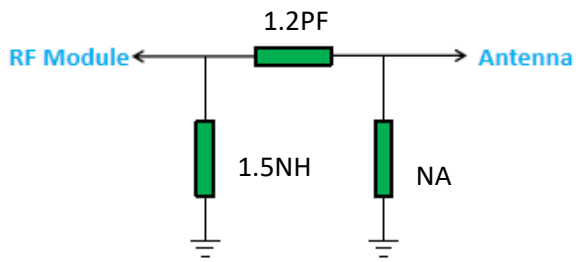


ANT Matching:

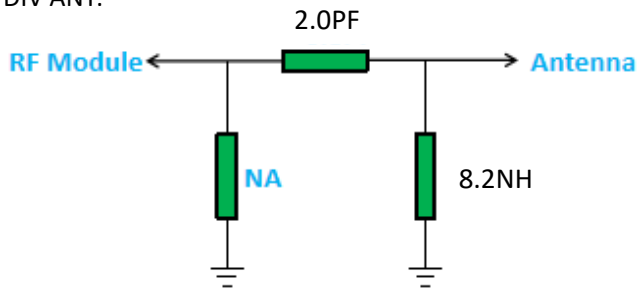
MAIN ANT:



WIFI2.4G+WIFI5G:



DIV ANT:



MAIN ANT:

RF1: $0\ \Omega$

RF2: 6.8NH

RF3: 18PF

RF4: NC

Manufacturer: Bluebird Inc.

Address: 3F, 115, Irwon ro, Gangnam gu, Seoul, Republic of Korea (06355)

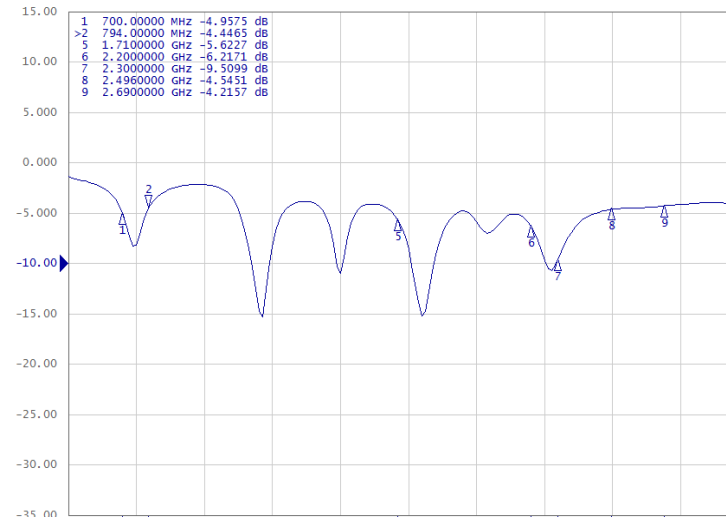
Model Name: SP60

Antenna Type: FPC Antenna

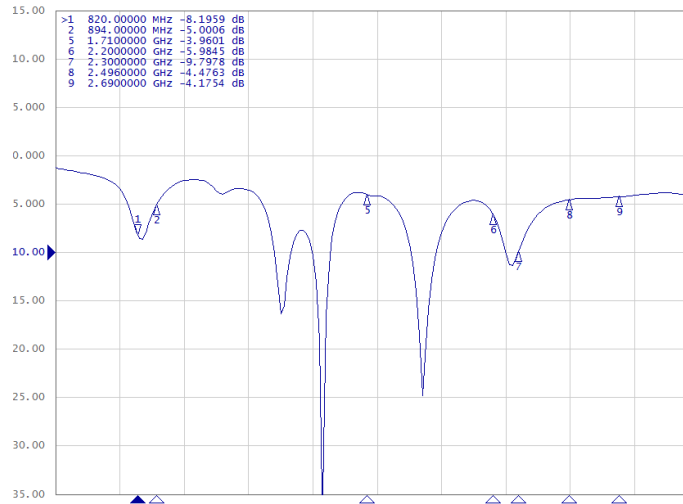
MAIN ANT S11&EFFICIENCY

S11

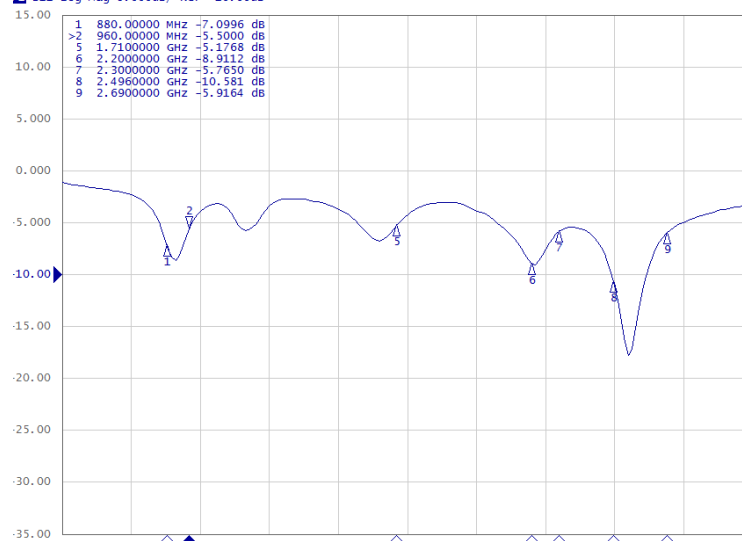
1 S11 Log Mag 5.000dB/ Ref -10.00dB



1 S11 Log Mag 5.000dB/ Ref -10.00dB



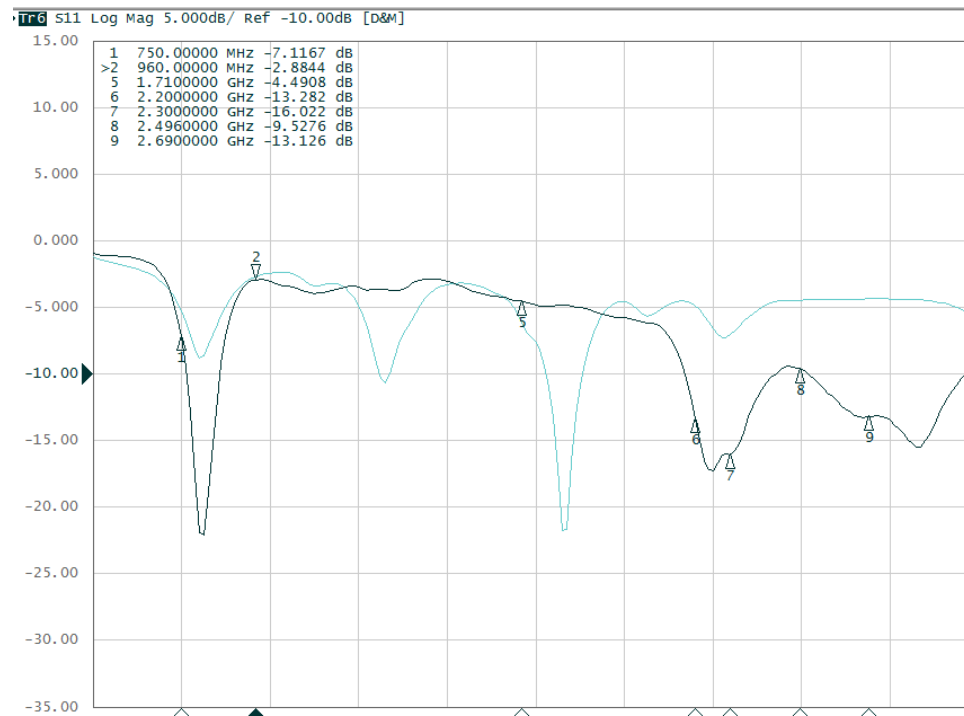
1 S11 Log Mag 5.000dB/ Ref -10.00dB



Effi&Gain									
	Fre	Effi(db)	Effi(%)	Gain(dBi)		Fre	Effi(db)	Effi(%)	Gain(dBi)
RF4: B12(699-746) B13(746-787) B17(704-746) B28(703-803)	700	-7.23	19%	-3.4	B2(1930-1990)	1820	-5.05	31%	0.3
	710	-6.84	21%	-2.9	B3(1805-1880)	1860	-4.82	33%	0.5
	720	-6.44	23%	-2.5	B1(2110-2170)	1880	-4.92	32%	0.3
	730	-6.28	24%	-2.0	B4(2110-2155)	1900	-5.12	31%	-0.1
	740	-6.27	24%	-2.0	B66(2110-2200)	1920	-5.56	28%	-0.3
	750	-6.91	20%	-2.6	B25(1855-1990)	1940	-6.29	24%	-1.0
	760	-7.68	17%	-3.4	B39(1890-1910)	1960	-7.21	19%	-1.8
	770	-8.61	14%	-4.3		1980	-8.06	16%	-2.5
	780	-9.67	11%	-5.2		2000	-8.87	13%	-3.1
	790	-10.82	8%	-6.4		2020	-9.82	10%	-4.3
	800	-11.66	7%	-7.3		2040	-10.1	10%	-4.9
	AVE	-8.04	17%	-3.81		2060	-9.25	12%	-4.5
						2080	-8.05	16%	-3.2
						2100	-7.1	19%	-2.2
RF2: B5(824-894) B18(820-870) B19(835-885) B20(796-857) B26(814-894)	810	-7.79	17%	-3.8		2120	-6.71	21%	-1.7
	820	-7.83	16%	-3.8		2140	-6.74	21%	-1.6
	830	-7.66	17%	-3.6		2160	-7.06	20%	-1.9
	840	-7.8	17%	-3.6		2180	-7.44	18%	-2.2
	850	-7.88	16%	-3.6		2200	-7.48	18%	-2.1
	860	-7.87	16%	-3.5		AVE	-7.0	21%	-1.6
	870	-8.14	15%	-3.8					
	880	-8.42	14%	-4.1					
	890	-8.98	13%	-4.8	RF3:	2300	-4.97	32%	-0.5
	AVE	-8.04	16%	-3.84	B7(2500-2570/2620-2690)	2350	-5.02	31%	0.2
RF1: B8 (880-960)	880	-6.76	21%	-2.6	B38(2570-2620)	2400	-5.28	30%	0.5
	890	-6.65	22%	-2.6	B40(2300-2400)	2490	-3.54	44%	1.0
	900	-6.76	21%	-2.7	B41(2496-2690)	2500	-3.15	48%	2.5
	910	-6.63	22%	-2.6		2520	-2.91	51%	2.8
	920	-6.49	22%	-2.5		2540	-2.94	51%	3.0
	930	-6.74	21%	-2.7		2560	-3.19	48%	3.1
	940	-7.15	19%	-3.2		2580	-3.5	45%	2.9
	950	-7.51	18%	-3.7		2600	-3.9	41%	2.5
	960	-8.07	16%	-4.5		2620	-4.57	35%	2.1
	AVE	-6.97	20%	-3.01		2640	-5.19	30%	1.5
						2660	-5.83	26%	1.0
RF4:	1700	-6.56	22%	-0.2		2680	-6.39	23%	0.4
	1740	-5.85	26%	0.4		AVE	-4.10	40%	2.06
	1780	-5.41	29%	0.3					

DIV ANT S11&EFFICIENCY

S11

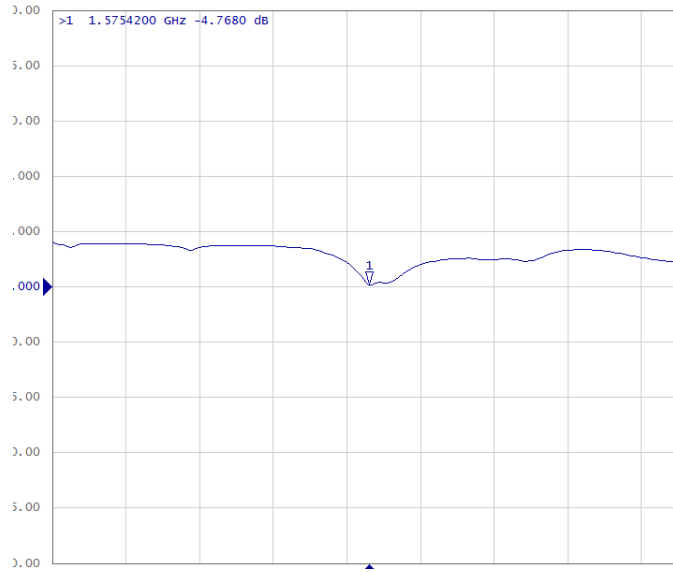


Effi&Gain									
Fre		Effi(db)	Effi(%)	Gain(dBi)	Fre		Effi(db)	Effi(%)	Gain(dBi)
B12(699-746)	730	-15.39	3%	-13.1	B2(1930-1990)	1870	-4.81	33%	-2.1
B13(746-787)	740	-14.25	4%	-11.3	B3(1805-1880)	1890	-4.8	33%	-1.8
B17(704-746)	750	-13.08	5%	-9.5	B1(2110-2170)	1910	-4.62	34%	-1.3
B28(703-803)	760	-11.96	6%	-8.3	B4(2110-2155)	1930	-4.51	35%	-1.2
B5(824-894)	770	-11.07	8%	-7.4	B66(2110-2200)	1950	-4.46	36%	-1.0
B18(820-870)	780	-10.42	9%	-6.7	B25(1855-1990)	1970	-4.51	35%	-1.0
B19(835-885)	790	-9.94	10%	-6.1	B39(1890-1910)	1990	-4.34	37%	-0.9
B20(796-857)	800	-9.37	12%	-5.3	B7(2500-2570/2620-2690)	2010	-4.65	34%	-1.6
B26(814-894)	810	-9.1	12%	-5.0	B38(2570-2620)	2030	-4.64	34%	-1.8
B8 (880-960)	820	-8.99	13%	-4.7	B40(2300-2400)	2050	-4.43	36%	-1.7
	830	-8.68	14%	-4.3	B41(2496-2690)	2070	-4.39	36%	-1.3
	840	-8.49	14%	-3.9		2090	-4.47	36%	-1.0
	850	-8.34	15%	-3.6		2110	-4.26	38%	-0.4
	860	-7.9	16%	-3.0		2130	-4.26	38%	-0.3
	870	-7.75	17%	-2.8		2150	-4	40%	0.2
	880	-7.29	19%	-2.4		2170	-3.49	45%	0.9
	890	-7.16	19%	-2.4		2190	-3.2	48%	1.4
	900	-7.4	18%	-2.7		2300	-2.97	50%	1.1
	910	-7.16	19%	-2.3		2350	-3.25	47%	0.9
	920	-6.62	22%	-2.0		2400	4.2	38%	0.5
	930	-6.3	23%	-2.0		2490	-3.96	40%	1.6
	940	-6.39	23%	-2.3		2500	-3.9	41%	1.9
	950	-6.39	23%	-2.3		2520	-3.8	42%	2.2
	960	-6.8	21%	-2.8		2540	-3.89	41%	2.2
	AVE	-9.0	14%	-4.8		2560	-3.98	40%	2.0
						2580	-4.09	39%	1.6
						2600	-4.15	38%	1.1
						2620	-4.01	40%	0.8
						2640	-3.9	41%	0.5
	1710	-5.85	26%	-3.4		2660	-3.9	41%	0.3
	1730	-5.53	28%	-2.8		2680	-3.84	41%	0.5
	1750	-5.43	29%	-2.6		AVE	-4.2	37%	-0.5
	1770	-5.59	28%	-3.0					
	1790	-5.61	27%	-3.1					
	1810	-5.47	28%	-2.8					
	1830	-5.25	30%	-2.6					
	1850	-4.92	32%	-2.1					

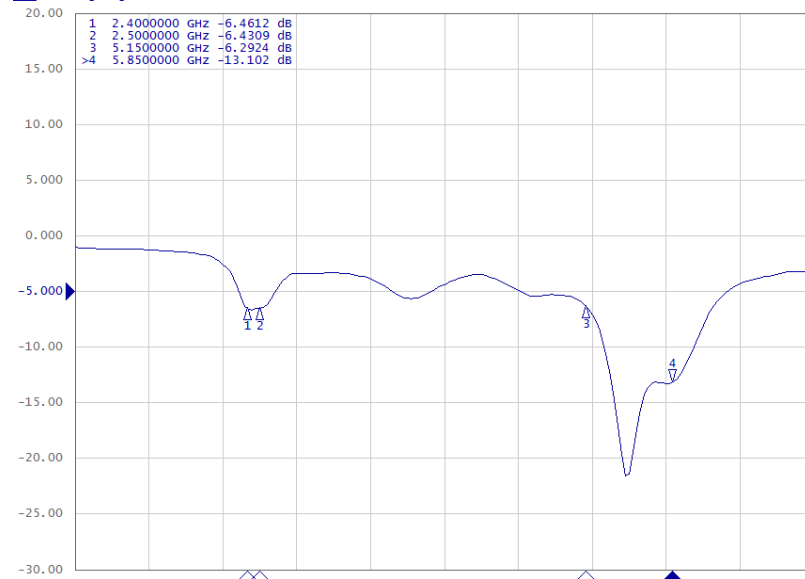
GPS+WIFI ANT S11&EFFICIENCY

S11

| S11 Log Mag 5.000dB/ Ref -5.000dB



| S11 Log Mag 5.000dB/ Ref -5.000dB



Effi&Gain									
GPS	GPS+WIFI-2.4G				WIFI-5G	WIFI-5G			
	Fre	Effi(db)	Effi(%)	Gain(dBi)		Fre	Effi(db)	Effi(%)	Gain(dBi)
	1560	-7.08	20%	-3.4		5100	-5.08	31%	1.6
	1570	-7.07	20%	-3.5		5140	-5.03	31%	1.5
	1580	-7.19	19%	-3.6		5200	-4.97	32%	1.3
	1590	-7.26	19%	-3.4		5260	-4.72	34%	1.6
	1600	-7.19	19%	-3.0		5300	-4.68	34%	1.7
	1610	-7.21	19%	-2.6		5360	-4.58	35%	1.8
	1620	-7.16	19%	-2.4		5400	-4.51	35%	1.9
	AVE	-7.17	19%	-3.1		5460	-4.52	35%	1.6
WIFI-2.4G	Fre	Effi(db)	Effi(%)	Gain(dBi)	5500	-4.21	38%	1.8	
	2400	-4.51	35%	-0.1	5540	-4.21	38%	1.8	
	2410	-4.35	37%	-0.2	5600	-4.34	37%	1.8	
	2420	-4.36	37%	-0.4	5640	-4.26	38%	2.0	
	2430	-4.37	37%	-0.5	5700	-4.37	37%	1.8	
	2440	-4.3	37%	-0.6	5740	-4.34	37%	1.5	
	2450	-4.02	40%	-0.1	5800	-4.31	37%	1.3	
	2460	-3.78	42%	0.3	5840	-4.36	37%	0.9	
	2470	-3.63	43%	0.6	5900	-4.47	36%	0.4	
	2480	-3.53	44%	0.8	AVE	-4.53	35%	1.5	
	2490	-3.47	45%	1.0					
	2500	-3.4	46%	1.2					
	AVE	-3.97	40%	0.2					