

【TN0022A】 Wi-Fi/Bluetooth Antenna

1.Specification

Antenna Type : Inverted F Antenna

Part No. ANT1 : ANT2312-A3.0-W/U-142-W

ANT2 : ANT2312-A3.0-W/U-272-A

Antenna Gain(Peak) : ANT1 Wi-Fi 2.4GHz 0.56dBi

ANT1 Wi-Fi 5GHz 2.18dBi

ANT2 Bluetooth -1.64dBi

ANT2 Wi-Fi 5GHz 3.69dBi

Frequency Band : Bluetooth 2402 - 2480 MHz

Wi-Fi 2.4GHz 2412 - 2462 MHz

Wi-Fi 5GHz(W52) 5180 - 5240 MHz

Wi-Fi 5GHz(W58) 5745 - 5825 MHz

2.Appearance / Dimension

See fig.1 on another Document.(TN0022A_Antenna Photo)

Measurement content

1.Measurement condition

- Measurement ANT : ETS-LINDGREN 3115 (1-18GHz)
- Reference ANT : ETS-LINDGREN 3160-03 (1.7-2.6GHz) / 3160-05 (3.95-5.85GHz)
- Measuring instrument : P9372A (Keysight network analyzer)
- Measured distance : 3m (1.5m high)
- Range of measurement : 360 degree/5 degree step
- Measurement layout : The measurement environment is measured with the following layout.

See fig2 on another Document.(TN0022A_Antenna Photo)

2.Measurement direction

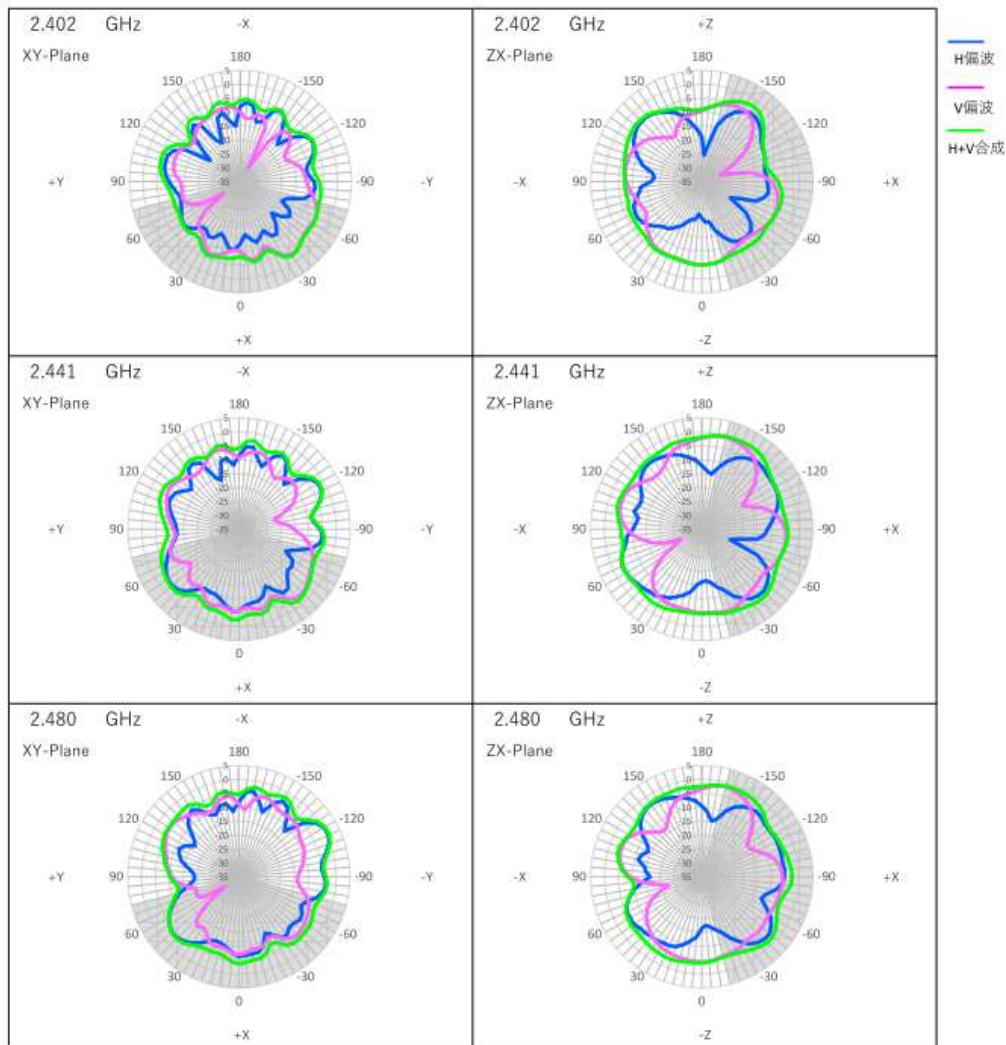
See fig3 on another Document.(TN0022A_Antenna Photo)

- Test dates : 2023/4/4
- Names of test personnel : Toshiaki Hirose(NISSEI ELECTRIC CO.,LTD.)
- Names of commercial test software being used : Antenna gain measurement system(NISSEI ELECTRONICS CO.,LTD.)

3. Antenna gain and Radio wave radiation pattern (directivity graph)

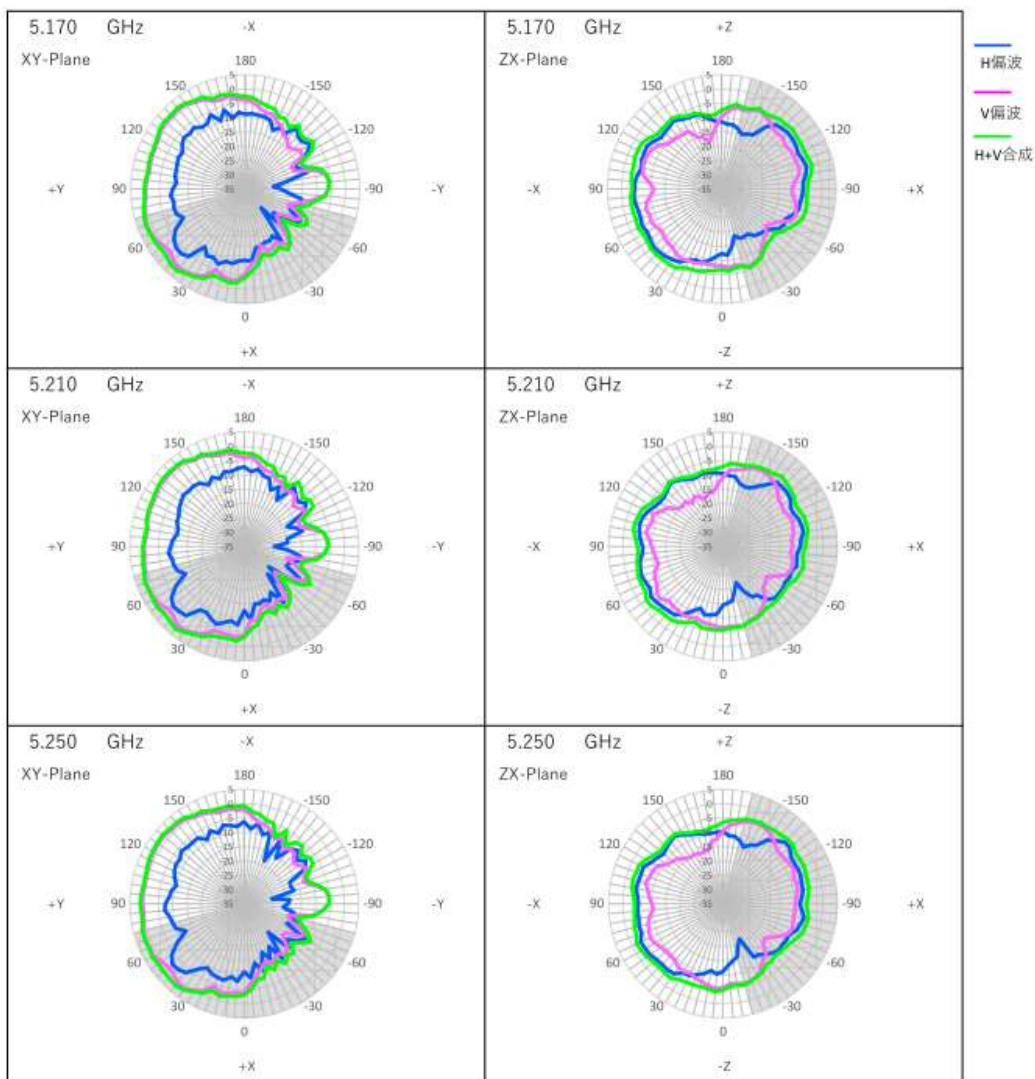
3-1. Ant1 (2.4GHz-Band)

frequency [GHz]	Plane	plane of polarization	Peak [dBi]	±100° Average [dBi]	±100° true mean	Composite true value	Composite [dBi]	DIP[dBi]	DIP-AVE [dB]
2.402	XY	H	-5.23	-9.06	0.12	0.20	-6.95	-11.96	7.27
		V	-7.76	-11.08	0.08				
	ZX	H	-4.33	-10.09	0.10	0.25	-6.02	-9.34	4.65
		V	-5.15	-8.18	0.15				
2.441	XY	H	-2.08	-7.17	0.19	0.32	-4.96	-9.36	4.67
		V	-5.38	-8.96	0.13				
	ZX	H	-3.52	-7.40	0.18	0.43	-3.66	-6.39	1.70
		V	-1.07	-6.05	0.25				
2.480	XY	H	0.56	-5.79	0.26	0.43	-3.64	-13.12	8.43
		V	-4.51	-7.73	0.17				
	ZX	H	-3.21	-7.58	0.17	0.40	-3.93	-10.48	5.79
		V	-1.82	-6.39	0.23				
Average.Gain[dBi]			-4.69		Max.Peak[dBi]			0.56	



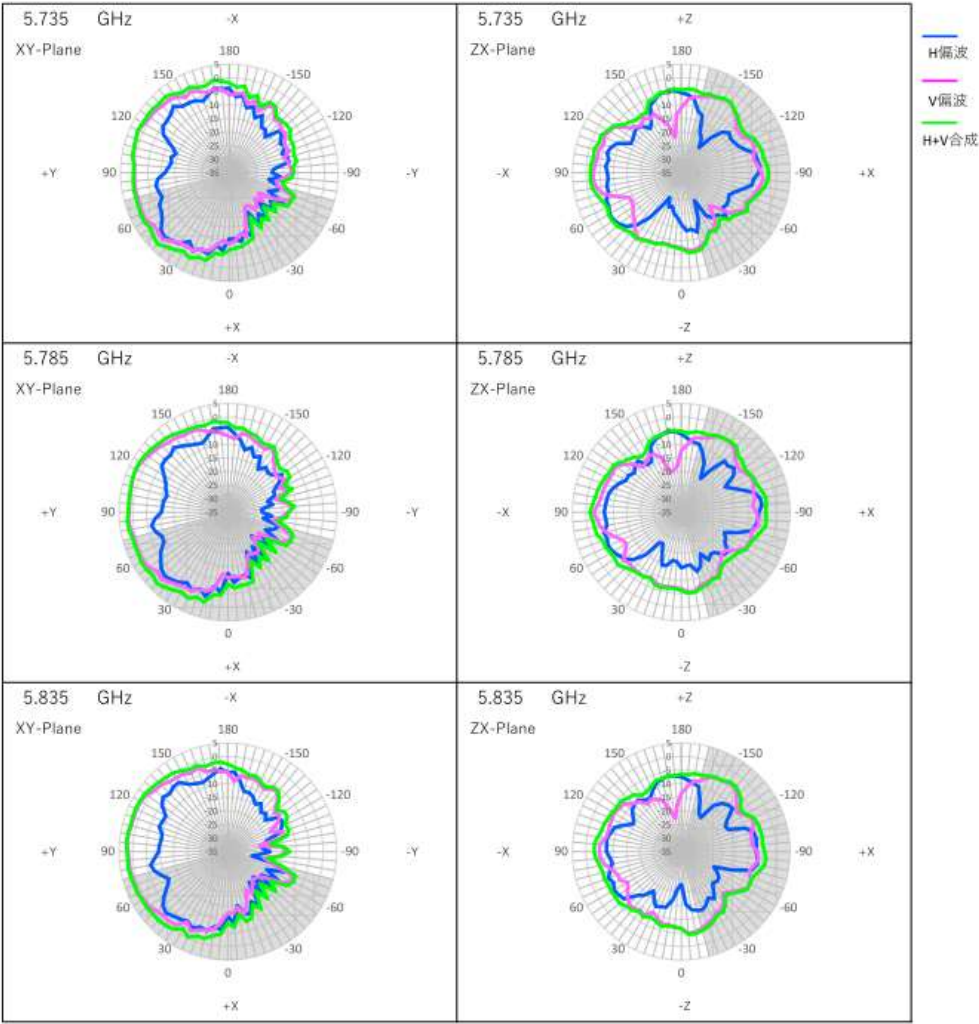
3-2. Ant1 (5GHz-Band1)

frequency [GHz]	Plane	plane of polarization	Peak [dBi]	± 100° Average [dBi]	± 100° true mean	Composite true value	Composite [dBi]	DIP[dBi]	DIP-AVE [dB]
5.170	XY	H	-6.29	-9.52	0.11	0.66	-1.84	-13.76	11.12
		V	1.36	-2.65	0.54				
	ZX	H	-3.75	-6.38	0.23	0.37	-4.35	-9.02	6.38
		V	-5.89	-8.64	0.14				
5.210	XY	H	-7.10	-9.79	0.11	0.69	-1.60	-12.65	10.02
		V	1.52	-2.32	0.59				
	ZX	H	-3.43	-6.21	0.24	0.40	-3.99	-7.50	4.86
		V	-5.91	-7.95	0.16				
5.250	XY	H	-6.33	-9.12	0.12	0.75	-1.24	-11.67	9.03
		V	1.75	-2.01	0.63				
	ZX	H	-2.86	-6.51	0.22	0.40	-3.96	-7.03	4.39
		V	-5.25	-7.48	0.18				
Average.Gain[dBi]			-2.64		Max.Peak[dBi]			1.75	



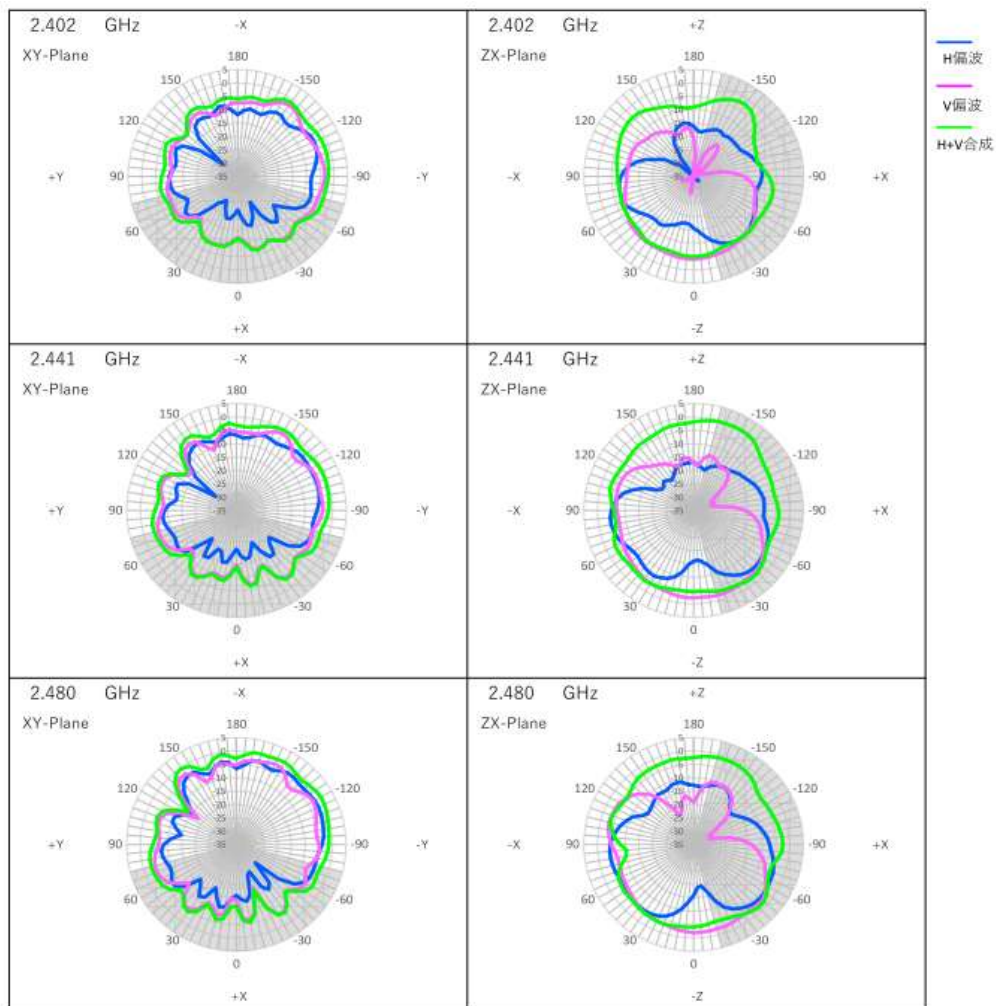
3-3. Ant1 (5GHz-Band4)

frequency [GHz]	Plane	plane of polarization	Peak [dBi]	± 100° Average [dBi]	± 100° true mean	Composite true value	Composite [dBi]	DIP[dBi]	DIP-AVE [dB]
5.735	XY	H	-3.13	-8.16	0.15	0.67	-1.76	-15.53	12.50
		V	1.91	-2.89	0.51				
	ZX	H	-4.49	-8.31	0.15	0.35	-4.57	-9.47	6.45
		V	-2.55	-6.96	0.20				
5.785	XY	H	-3.69	-8.46	0.14	0.70	-1.52	-16.62	13.60
		V	2.18	-2.51	0.56				
	ZX	H	-4.96	-8.80	0.13	0.31	-5.06	-9.89	6.86
		V	-2.96	-7.45	0.18				
5.835	XY	H	-3.85	-8.60	0.14	0.70	-1.52	-20.09	17.07
		V	2.05	-2.47	0.57				
	ZX	H	-6.52	-9.70	0.11	0.25	-5.96	-9.68	6.66
		V	-4.75	-8.34	0.15				
Average.Gain[dBi]			-3.02		Max.Peak[dBi]			2.18	



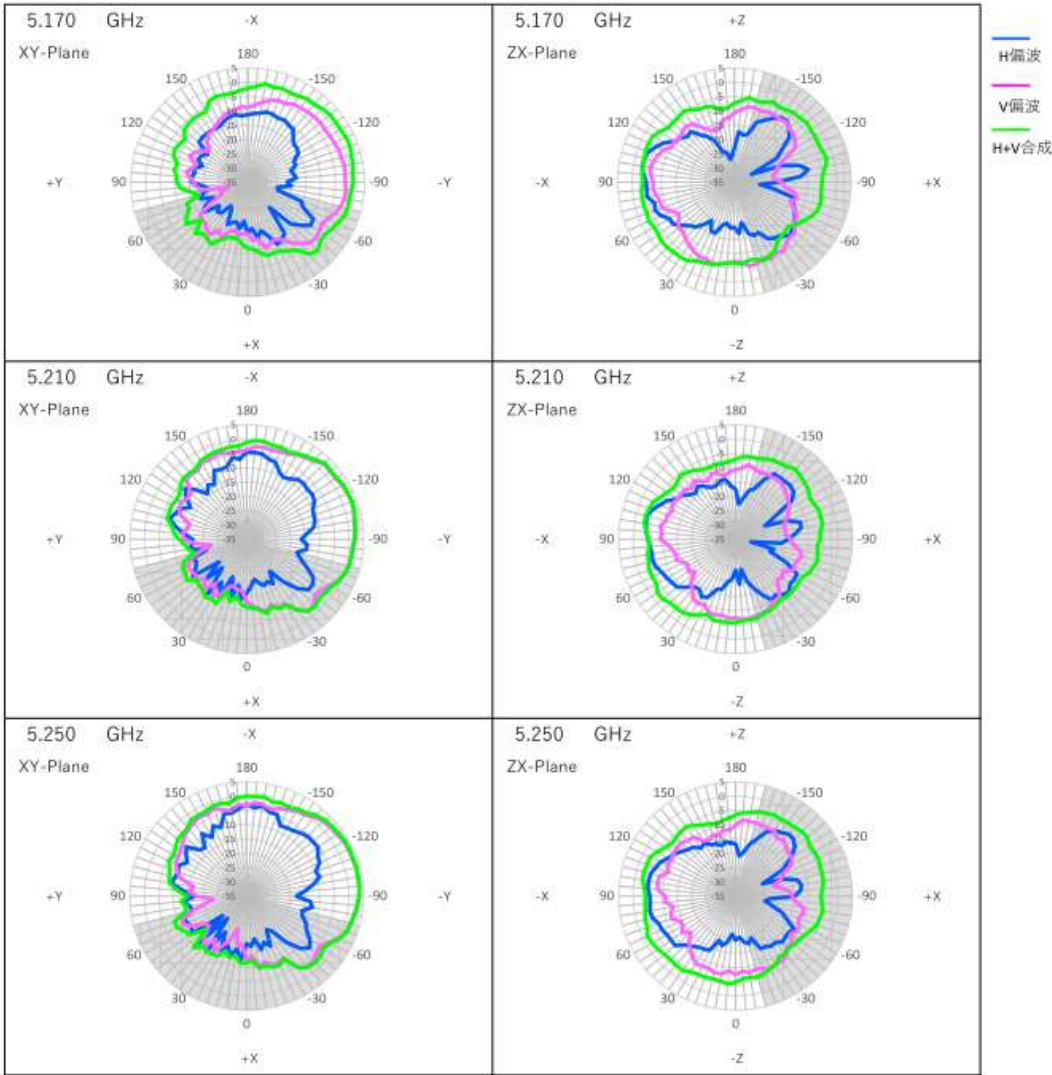
3-4. Ant2 (2.4GHz-Band)

frequency [GHz]	Plane	plane of polarization	Peak [dBi]	± 100° Average [dBi]	± 100° true mean	Composite true value	Composite [dBi]	DIP[dBi]	DIP-AVE [dB]
2.402	XY	H	-4.31	-8.54	0.14	0.38	-4.19	-10.80	7.16
		V	-2.41	-6.18	0.24				
	ZX	H	-7.42	-12.88	0.05	0.21	-6.80	-18.08	14.44
		V	-4.04	-8.02	0.16				
2.441	XY	H	-3.72	-6.55	0.22	0.52	-2.81	-11.85	8.21
		V	-1.64	-5.20	0.30				
	ZX	H	-4.48	-9.49	0.11	0.35	-4.53	-15.20	11.56
		V	-2.27	-6.20	0.24				
2.480	XY	H	-2.03	-4.70	0.34	0.67	-1.72	-13.65	10.01
		V	-1.70	-4.77	0.33				
	ZX	H	-4.32	-7.73	0.17	0.46	-3.38	-12.04	8.41
		V	-1.85	-5.37	0.29				
Average.Gain[dBi]			-3.64		Max.Peak[dBi]			-1.64	



3-5. Ant2 (5GHz-Band1)

frequency [GHz]	Plane	plane of polarization	Peak [dBi]	± 100° Average [dBi]	± 100° true mean	Composite true value	Composite [dBi]	DIP[dBi]	DIP-AVE [dB]
5.170	XY	H	-4.87	-10.23	0.09	0.72	-1.40	-15.26	13.04
		V	2.05	-2.01	0.63				
	ZX	H	-3.00	-9.25	0.12	0.26	-5.84	-15.26	13.05
		V	-5.22	-8.49	0.14				
5.210	XY	H	-4.53	-8.94	0.13	0.88	-0.57	-14.68	12.47
		V	3.19	-1.26	0.75				
	ZX	H	-4.35	-9.67	0.11	0.30	-5.28	-16.36	14.14
		V	-3.85	-7.25	0.19				
5.250	XY	H	-2.93	-7.61	0.17	1.06	0.24	-14.69	12.47
		V	3.69	-0.54	0.88				
	ZX	H	-2.82	-7.81	0.17	0.39	-4.11	-18.48	16.27
		V	-2.57	-6.53	0.22				
Average.Gain[dBi]			-2.21		Max.Peak[dBi]			3.69	



3-6. Ant2 (5GHz-Band4)

frequency [GHz]	Plane	plane of polarization	Peak [dBi]	± 100° Average [dBi]	± 100° true mean	Composite true value	Composite [dBi]	DIP[dBi]	DIP-AVE [dB]
5.735	XY	H	-3.41	-8.02	0.16	0.56	-2.55	-12.42	8.15
		V	1.22	-4.00	0.40				
	ZX	H	-3.62	-9.52	0.11	0.28	-5.48	-13.80	9.53
		V	-2.19	-7.66	0.17				
5.785	XY	H	-4.03	-8.41	0.14	0.52	-2.88	-14.69	10.43
		V	1.09	-4.30	0.37				
	ZX	H	-4.37	-10.81	0.08	0.23	-6.40	-16.63	12.36
		V	-3.93	-8.35	0.15				
5.835	XY	H	-4.07	-8.81	0.13	0.45	-3.48	-15.37	11.11
		V	0.44	-4.98	0.32				
	ZX	H	-5.48	-10.58	0.09	0.21	-6.69	-12.91	8.64
		V	-5.42	-8.98	0.13				
Average.Gain[dBi]			-4.27		Max.Peak[dBi]			1.22	

