

【TN0022A】 Wi-Fi/Bluetooth Antenna

1.Specification

Antenna Type : Inverted F Antenna

Part No. ANT1 : ANT2312-A3.0-W/U-173-W

ANT2 : ANT2312-A3.0-W/U-296-A

Antenna Gain(Peak) : ANT1 Wi-Fi 2.4GHz 0.21dBi

ANT1 Wi-Fi 5GHz 1.90dBi

ANT2 Bluetooth 0.86dBi

ANT2 Wi-Fi 5GHz 0.85dBi

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)
(Calibration date : 2022/6/11)
- Measuring instrument : P9372A (Keysight network analyzer)
(Calibration date : 2022/3/31)
- 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)

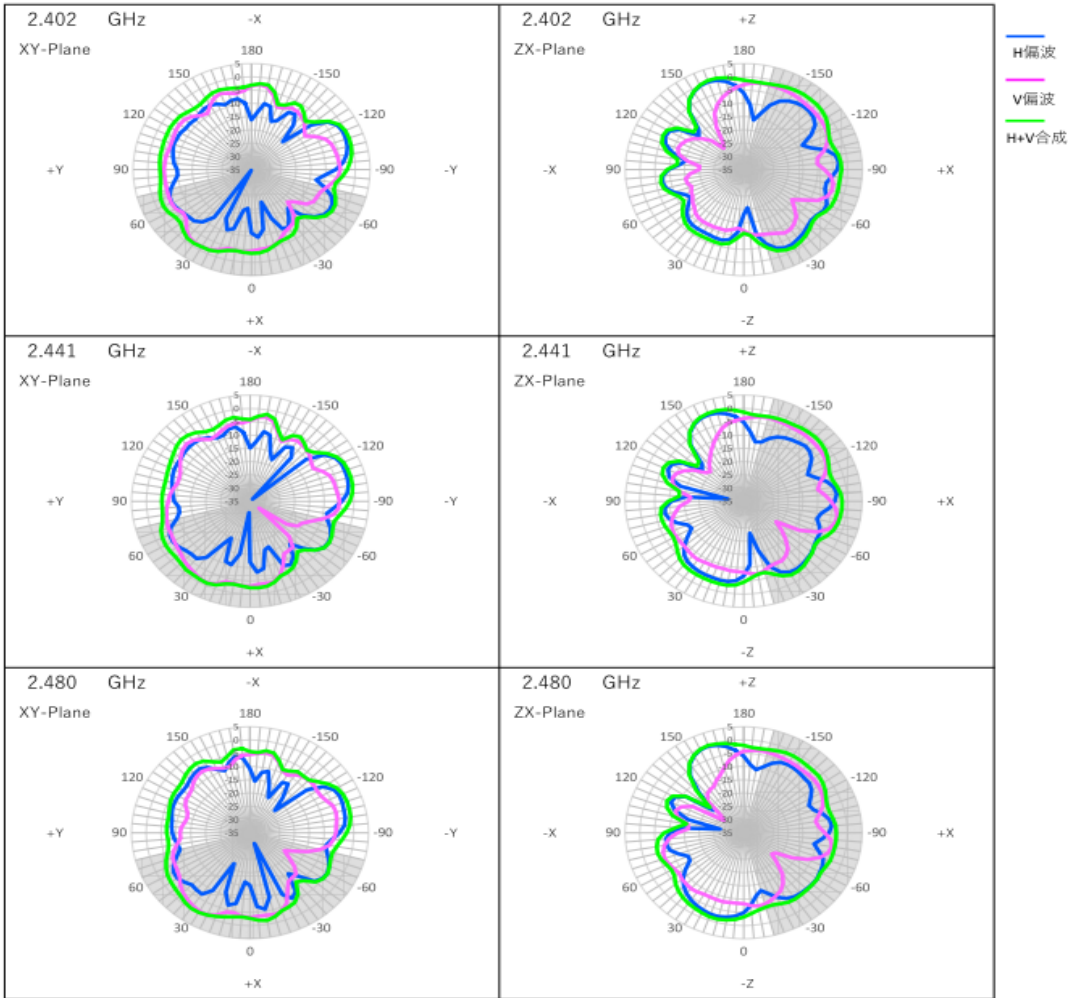
- Test dates : 2023/1/30
- Names of test personnel : Toshiaki Hirose(NISSEI ELECTRIC CO.,LTD.)
- Names of commercial test software being used : Antenna gain measurement system(NISSEI ELECTRONICS CO.,LTD.)

3.Antenna gain and Radio wave radiation pattern (directivity graph)
3-1. Ant1 (2.4GHz-Band)

【Ant Right_2GHz-Band】

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周波数 [GHz]	平面	偏波面 H(水平)/V(垂直)	Peak [dBi]	±100° 平均[dBi]	±100° 真値平均	合成真値	合成 [dBi]	DIP [dBi]	DIP-AVE [dBi]
2.402	XY	H	-0.97	-6.78	0.21	0.45	-3.47	-9.32	5.48
		V	-2.87	-6.20	0.24				
	ZX	H	0.21	-6.28	0.24	0.34	-4.65	-12.89	9.05
		V	-1.88	-9.70	0.11				
2.441	XY	H	-1.04	-6.25	0.24	0.47	-3.32	-9.32	5.47
		V	-2.85	-6.40	0.23				
	ZX	H	-0.27	-5.86	0.26	0.40	-3.96	-14.44	10.60
		V	-2.71	-8.46	0.14				
2.480	XY	H	-1.72	-6.72	0.21	0.39	-4.06	-8.79	4.94
		V	-4.37	-7.46	0.18				
	ZX	H	-0.24	-5.46	0.28	0.42	-3.73	-20.17	16.32
		V	-3.57	-8.58	0.14				
Average.Gain[dBi]			-3.84		Max.Peak[dBi]			0.21	

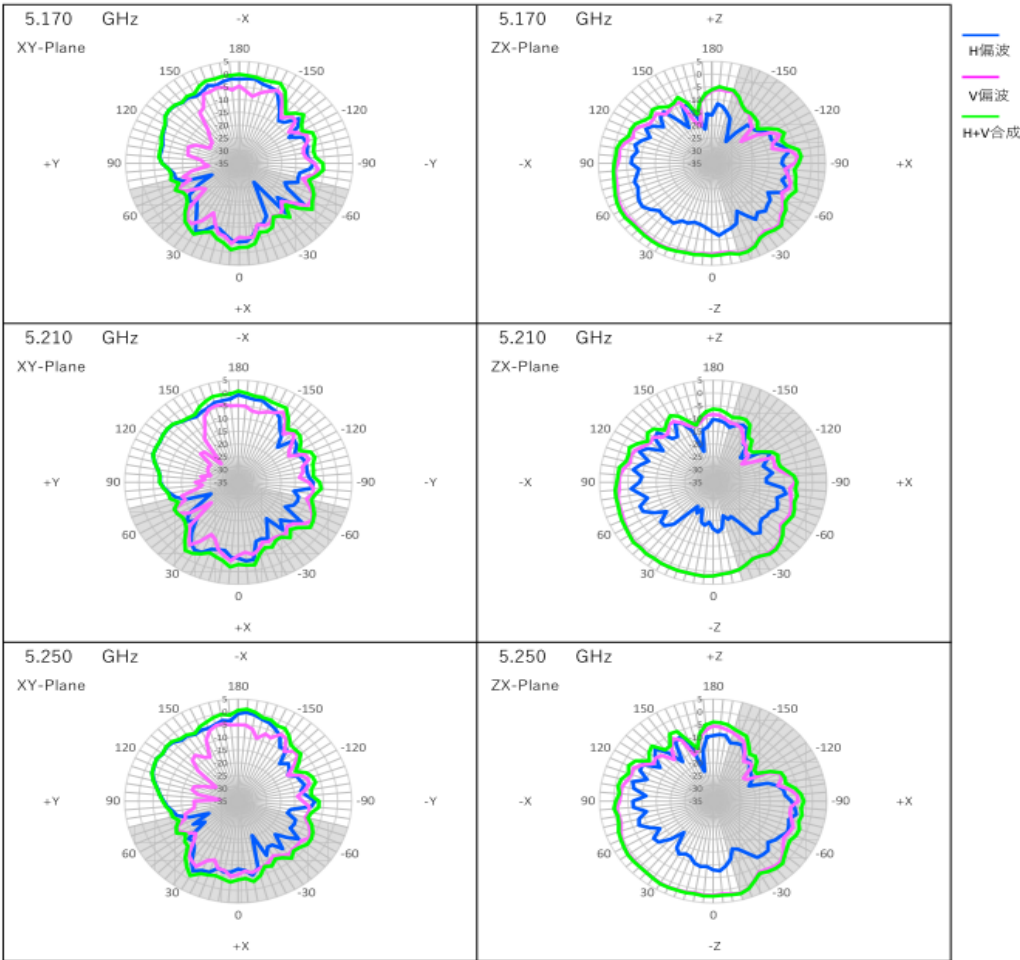


3-2. Ant1 (5GHz-Band1)

【Ant Right_5GHz-Band1】

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周波数 [GHz]	平面	偏波面 H(水平)/V(垂直)	Peak [dBi]	±100° 平均[dBi]	±100° 真値平均	合成真値	合成 [dBi]	DIP [dBi]	DIP-AVE [dBi]
5.170	XY	H	-1.58	-5.33	0.29	0.43	-3.70	-10.76	8.97
		V	-3.41	-8.73	0.13				
	ZX	H	-5.25	-8.91	0.13	0.85	-0.68	-15.21	13.42
		V	1.71	-1.39	0.73				
5.210	XY	H	-0.71	-4.98	0.32	0.45	-3.43	-10.13	8.34
		V	-3.28	-8.67	0.14				
	ZX	H	-3.55	-7.70	0.17	0.91	-0.43	-14.32	12.53
		V	1.90	-1.33	0.74				
5.250	XY	H	-0.08	-4.83	0.33	0.45	-3.45	-11.74	9.95
		V	-4.17	-9.11	0.12				
	ZX	H	-3.87	-7.63	0.17	0.88	-0.56	-15.44	13.65
		V	1.84	-1.51	0.71				
Average.Gain[dBi]			-1.79		Max.Peak[dBi]			1.90	

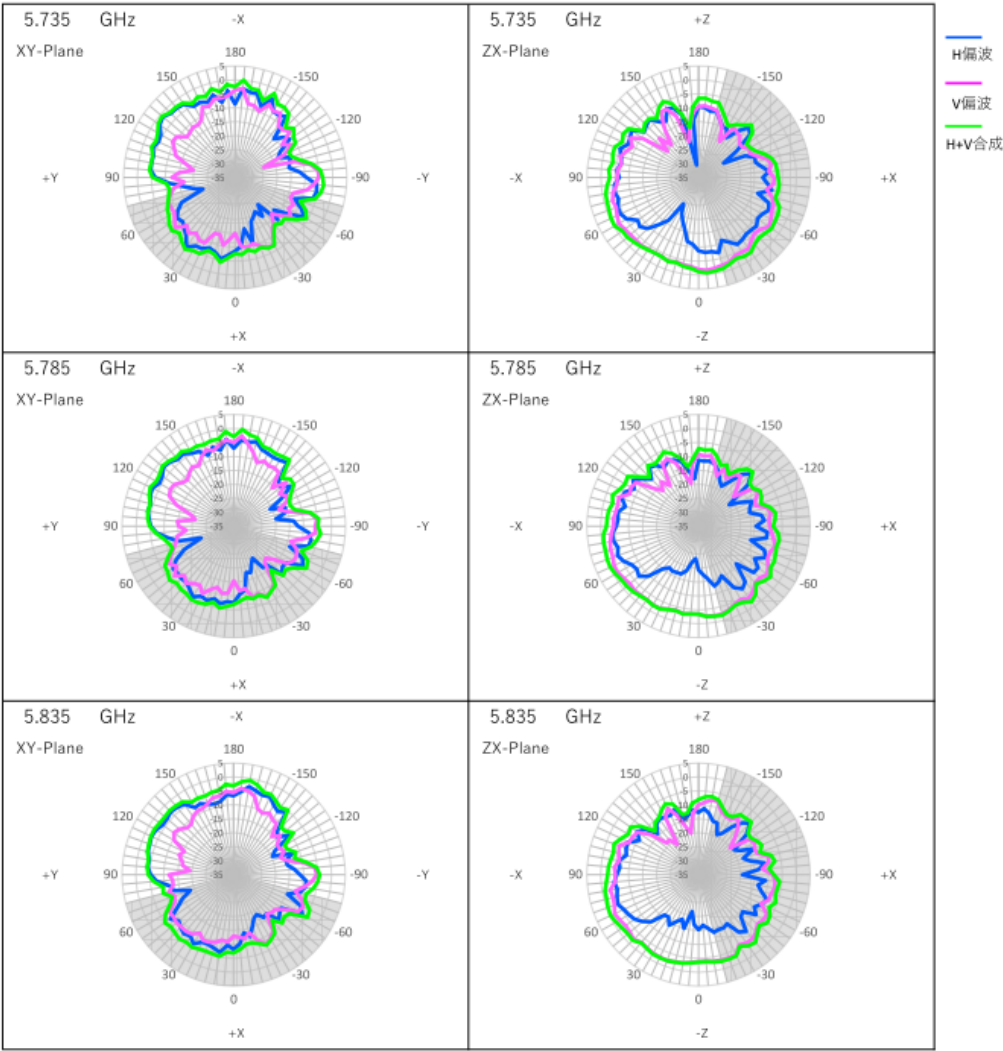


3-3. Ant1 (5GHz-Band4)

【Ant Right_5GHz-Band4】

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周波数 [GHz]	平面	偏波面 H(水平)/V(垂直)	Peak [dBi]	±100° 平均[dBi]	±100° 真値平均	合成真値	合成 [dBi]	DIP [dBi]	DIP-AVE [dBi]
5.735	XY	H	-1.14	-5.75	0.27	0.40	-3.94	-13.72	9.99
		V	-2.88	-8.62	0.14				
	ZX	H	-4.07	-8.02	0.16	0.46	-3.36	-16.84	13.10
		V	-1.64	-5.18	0.30				
5.785	XY	H	-2.07	-5.86	0.26	0.40	-4.01	-13.51	9.78
		V	-2.56	-8.63	0.14				
	ZX	H	-3.95	-8.61	0.14	0.47	-3.24	-13.51	9.77
		V	-1.66	-4.73	0.34				
5.835	XY	H	-2.56	-6.10	0.25	0.37	-4.35	-13.95	10.22
		V	-3.99	-9.13	0.12				
	ZX	H	-4.10	-9.25	0.12	0.44	-3.61	-12.96	9.22
		V	-1.80	-5.00	0.32				
Average.Gain[dBi]			-3.74		Max.Peak[dBi]			-1.14	

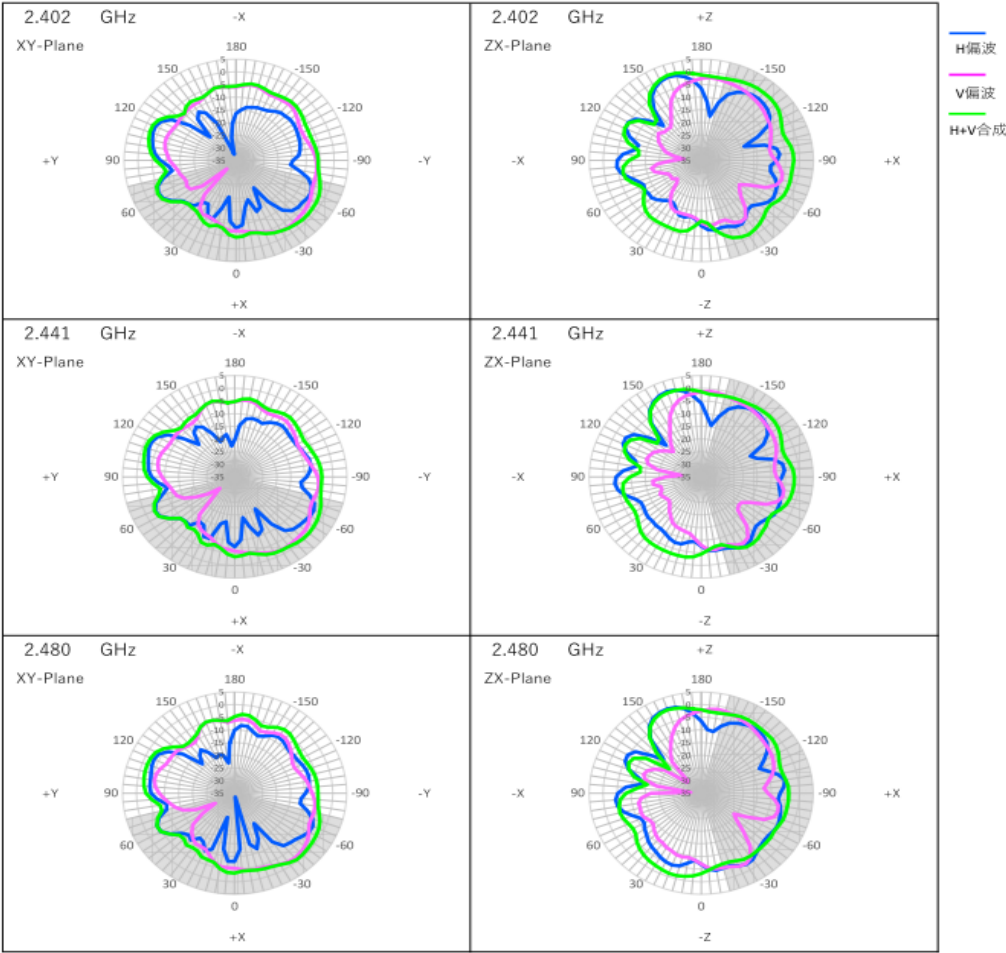


3-4. Ant2 (2.4GHz-Band)

【Ant Left_2GHz-Band】

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周波数 [GHz]	平面	偏波面 H(水平)/V(垂直)	Peak [dBi]	±100° 平均[dBi]	±100° 真値平均	合成真値	合成 [dBi]	DIP [dBi]	DIP-AVE [dBi]
2.402	XY	H	-3.23	-9.72	0.11	0.29	-5.34	-9.71	5.33
		V	-4.78	-7.32	0.19				
	ZX	H	0.02	-6.46	0.23	0.33	-4.82	-13.66	9.28
		V	-2.17	-9.86	0.10				
2.441	XY	H	-2.28	-8.13	0.15	0.36	-4.41	-8.09	3.71
		V	-4.17	-6.81	0.21				
	ZX	H	0.86	-5.35	0.29	0.43	-3.65	-15.78	11.39
		V	-1.12	-8.55	0.14				
2.480	XY	H	-3.27	-8.26	0.15	0.32	-4.91	-9.27	4.89
		V	-5.25	-7.60	0.17				
	ZX	H	0.51	-5.14	0.31	0.45	-3.48	-15.79	11.40
		V	-1.37	-8.45	0.14				
Average.Gain[dBi]			-4.38		Max.Peak[dBi]			0.86	

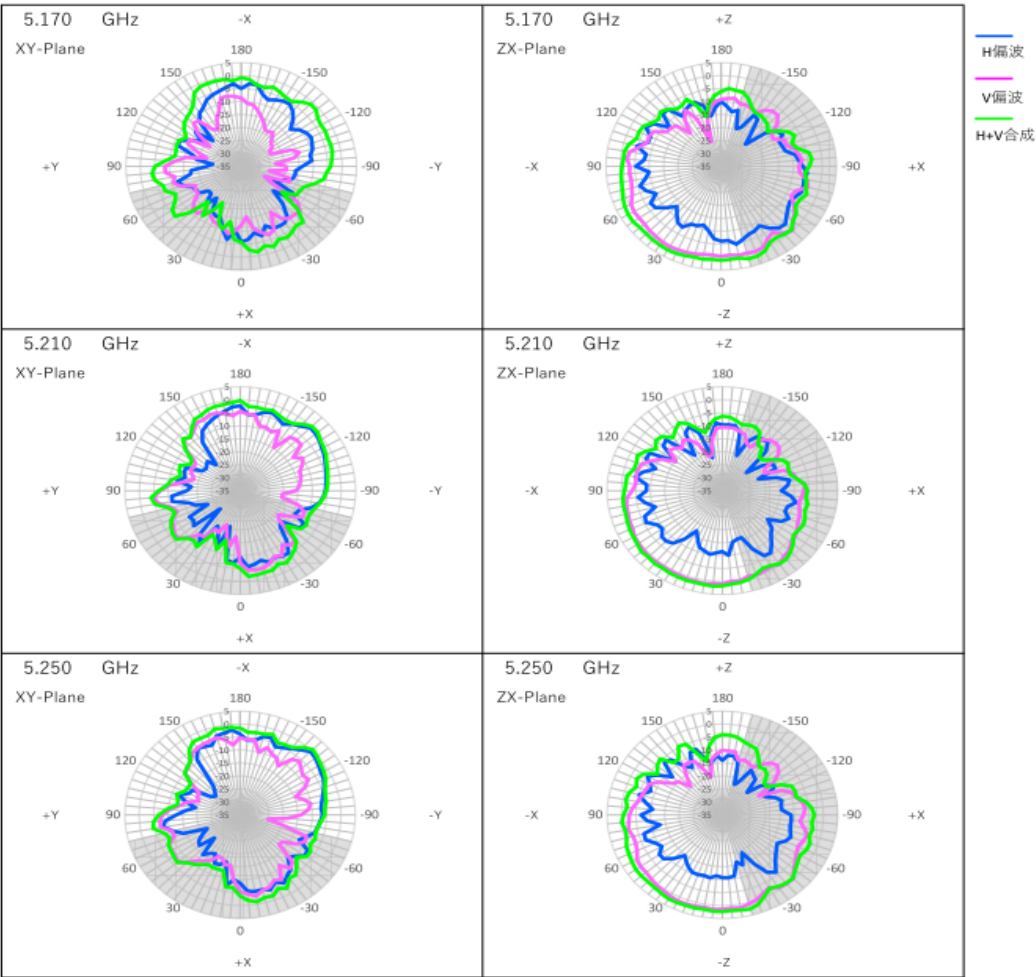


3-5. Ant2 (5GHz-Band1)

【Ant Left_5GHz-Band1】

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周波数 [GHz]	平面	偏波面 H(水平)/V(垂直)	Peak [dBi]	±100° 平均[dBi]	±100° 真値平均	合成真値	合成 [dBi]	DIP [dBi]	DIP-AVE [dBi]
5.170	XY	H	-1.95	-5.63	0.27	0.43	-3.70	-13.04	10.57
		V	-2.66	-8.15	0.15				
	ZX	H	-4.52	-8.18	0.15	0.67	-1.74	-10.63	8.16
		V	0.79	-2.86	0.52				
5.210	XY	H	-0.73	-5.42	0.29	0.44	-3.60	-14.91	12.45
		V	-3.83	-8.25	0.15				
	ZX	H	-2.64	-7.54	0.18	0.70	-1.52	-11.49	9.03
		V	0.85	-2.77	0.53				
5.250	XY	H	-0.51	-5.53	0.28	0.42	-3.73	-14.17	11.71
		V	-4.14	-8.40	0.14				
	ZX	H	-2.19	-6.74	0.21	0.74	-1.31	-10.07	7.61
		V	0.60	-2.77	0.53				
Average.Gain[dBi]			-2.46		Max.Peak[dBi]			0.85	



3-6. Ant2 (5GHz-Band4)

【Ant Left_5GHz-Band4】

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周波数 [GHz]	平面	偏波面 H(水平)/V(垂直)	Peak [dBi]	± 100° 平均[dBi]	± 100° 真値平均	合成真値	合成 [dBi]	DIP [dBi]	DIP-AVE [dBi]
5.735	XY	H	-2.94	-8.50	0.14	0.27	-5.63	-14.19	9.80
		V	-4.15	-8.79	0.13				
	ZX	H	-1.59	-5.00	0.32	0.55	-2.61	-14.49	10.09
		V	-2.04	-6.33	0.23				
5.785	XY	H	-3.98	-8.84	0.13	0.25	-6.06	-13.37	8.97
		V	-4.88	-9.31	0.12				
	ZX	H	-2.57	-6.19	0.24	0.49	-3.13	-14.60	10.20
		V	-1.83	-6.09	0.25				
5.835	XY	H	-3.46	-9.31	0.12	0.22	-6.59	-13.36	8.96
		V	-5.94	-9.92	0.10				
	ZX	H	-3.73	-6.97	0.20	0.40	-3.93	-13.73	9.33
		V	-1.88	-6.91	0.20				
Average.Gain[dBi]			-4.40		Max.Peak[dBi]		-1.59		

