

【TN0023A】 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-264-A

Antenna Gain(Peak) : ANT1 Wi-Fi 2.4GHz 0.28dBi

ANT1 Wi-Fi 5GHz 3.67dBi

ANT2 Bluetooth 0.08dBi

ANT2 Wi-Fi 5GHz 3.37dBi

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.(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.(Antenna Photo)

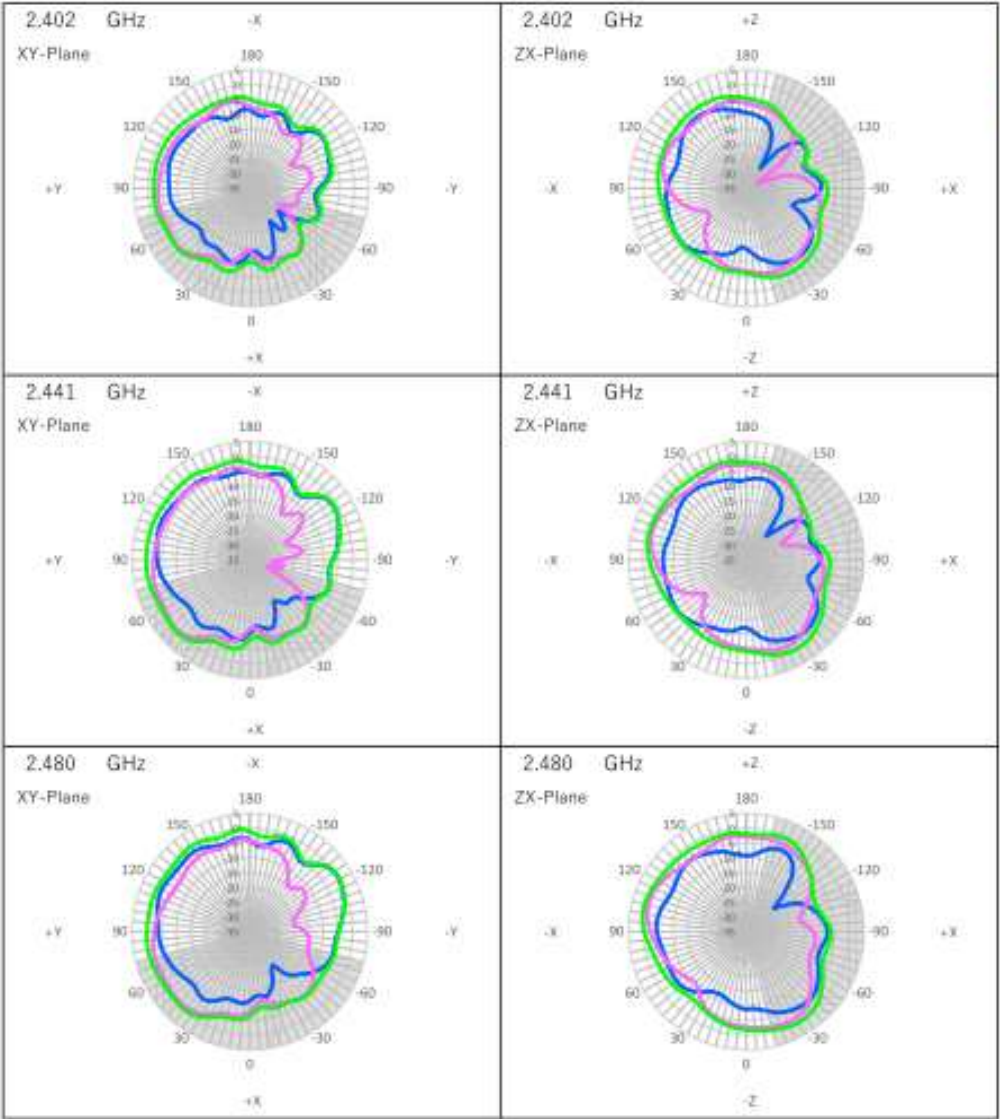
2.Measurement direction

See fig3 on another Document.(Antenna Photo)

- Test dates : 2023/8/31
- 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.)

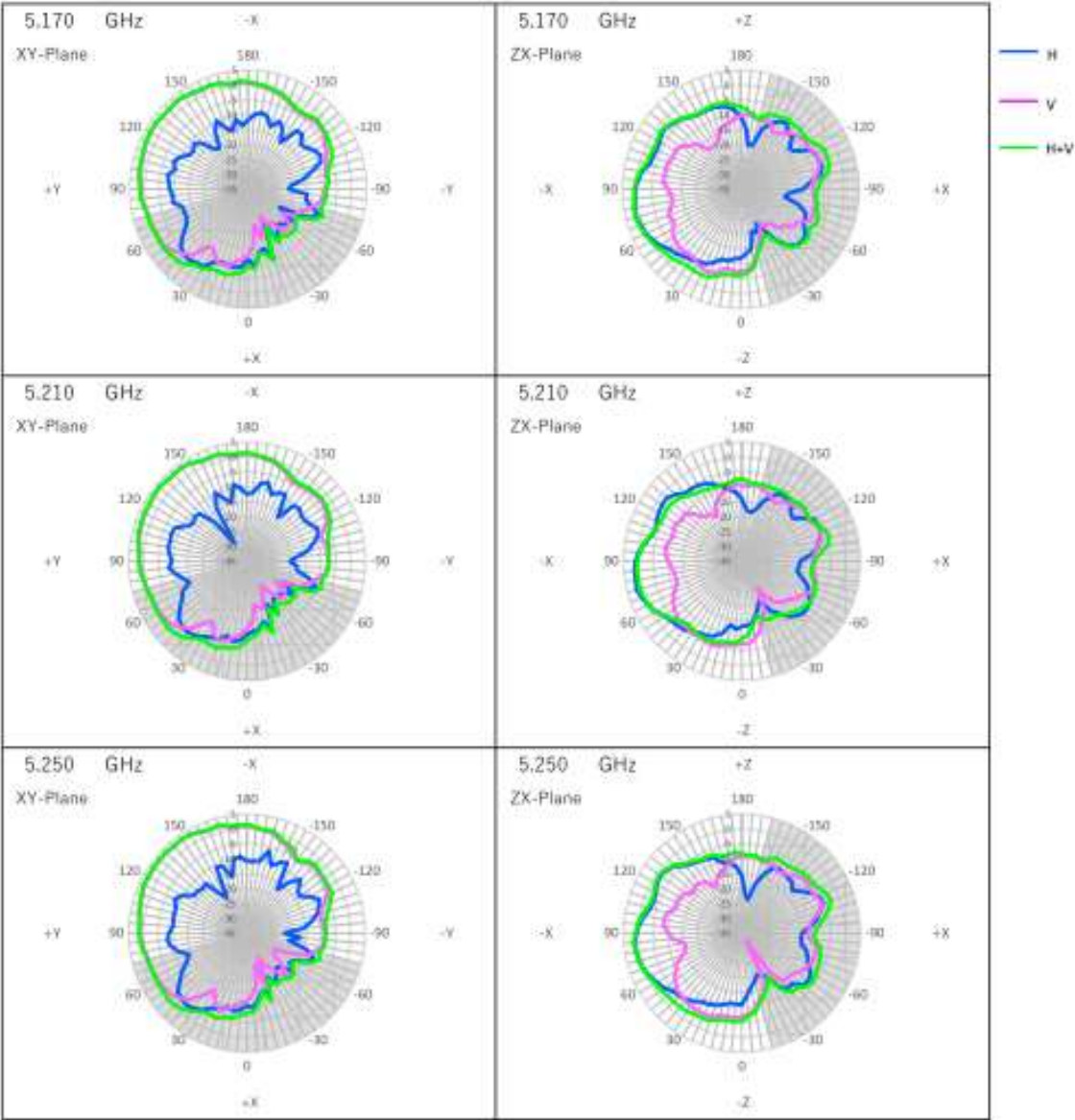
3.Antenna gain and Radio wave radiation pattern (directivity graph)
3-1. Ant1 (2.4GHz-Band)

Frequency [GHz]	Plane	Polarization H(Horizontal) V(Vertical)	Peak [dBi]	±100° Average[dBi]	±100° Avg. linear value	Composite linear value	Composite [dBi]	DIP [dBi]	DIP-AVE [dBi]
2.402	XY	H	-5.27	-7.70	0.17	0.37	-4.35	-12.03	9.48
		V	-3.15	-7.04	0.20				
	ZX	H	-5.74	-8.20	0.15	0.33	-4.86	-7.02	4.47
		V	-5.05	-7.57	0.17				
2.441	XY	H	-1.32	-3.92	0.41	0.67	-1.71	-7.78	5.23
		V	-1.62	-5.71	0.27				
	ZX	H	-5.44	-7.29	0.19	0.54	-2.72	-5.93	3.38
		V	-1.72	-4.58	0.35				
2.480	XY	H	0.28	-2.83	0.52	0.77	-1.15	-5.24	2.69
		V	-1.78	-6.09	0.25				
	ZX	H	-4.22	-6.65	0.22	0.67	-1.77	-5.89	3.34
		V	-0.51	-3.48	0.45				
Average Gain[dBi]			-2.55		Max.Peak[dBi]			0.28	



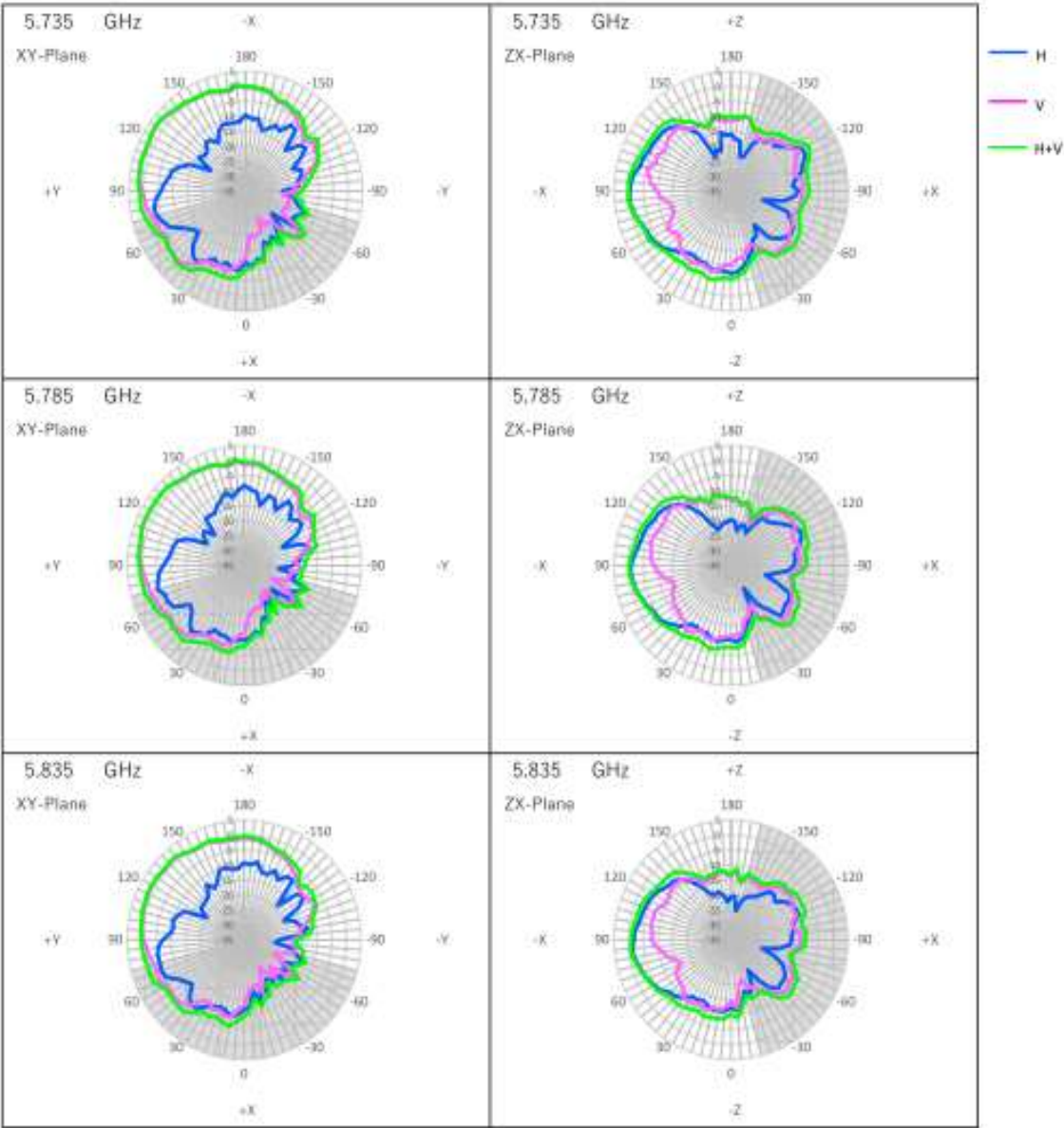
3-2. Ant1 (5GHz-Band1)

Frequency [GHz]	Plane	Plarization H(Horizontal) V(Vertical)	Peak [dBi]	±100° Average[dBi]	±100° Avg. linear value	Composite linear value	Composite [dBi]	D&P [dBi]	DIP-AVE [dBi]
5.170	XY	H	-7.52	-10.91	0.08	1.10	0.40	-8.90	8.21
		V	3.15	0.06	1.01				
	ZX	H	1.55	-3.44	0.45	0.58	-2.38	-9.76	9.07
		V	-5.16	-9.02	0.13				
5.210	XY	H	-7.61	-10.77	0.08	1.17	0.66	-8.04	7.36
		V	3.67	0.34	1.08				
	ZX	H	1.76	-3.53	0.44	0.58	-2.35	-9.09	8.40
		V	-4.95	-8.58	0.14				
5.250	XY	H	-6.31	-10.72	0.08	1.15	0.61	-8.47	7.78
		V	3.45	0.27	1.07				
	ZX	H	1.54	-3.79	0.42	0.55	-2.58	-8.80	8.12
		V	-4.92	-8.71	0.13				
Average Gain[dBi]			-0.68		Max.Peak[dBi]			3.67	



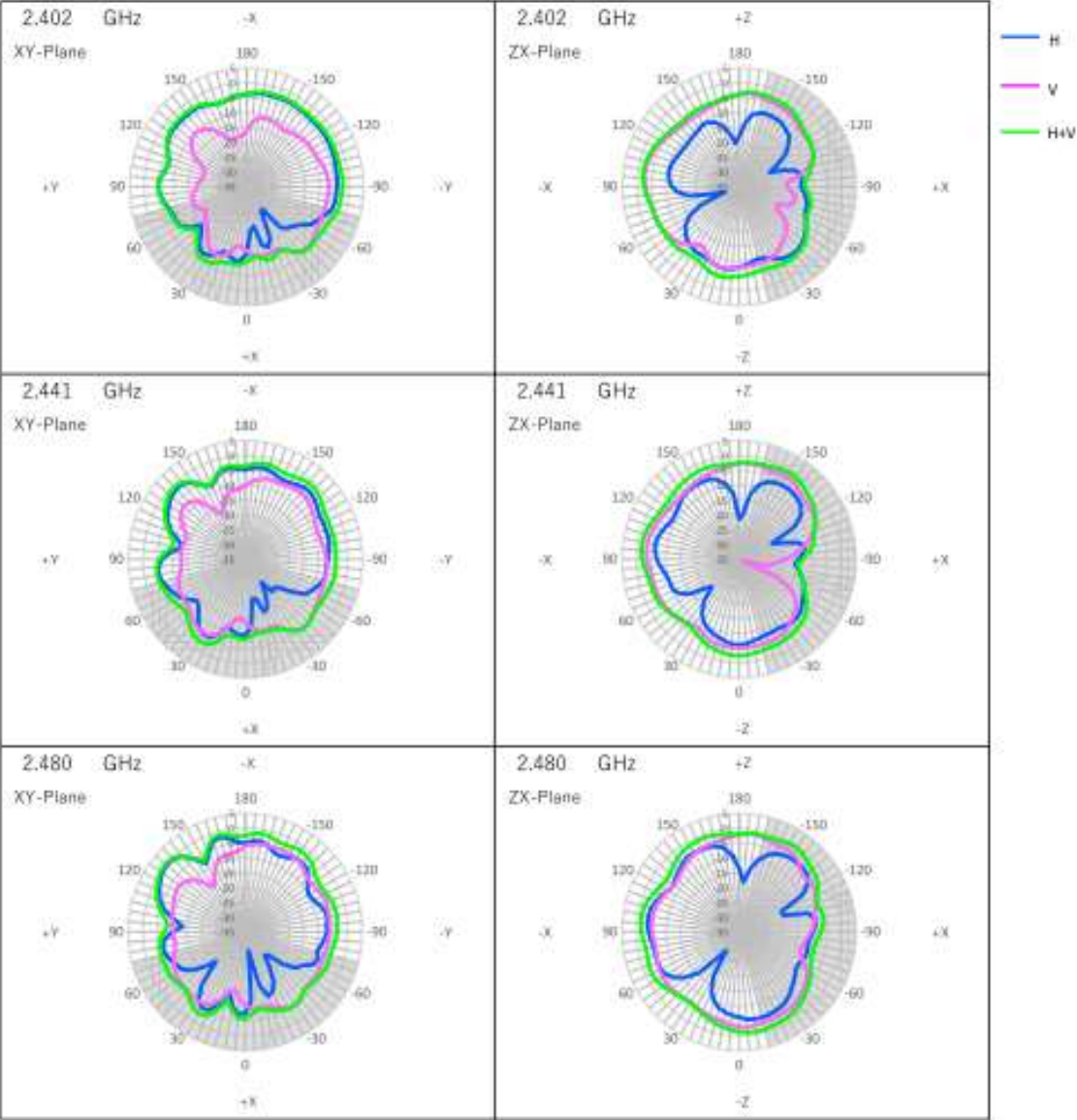
3-3. Ant1 (5GHz-Band4)

Frequency [GHz]	Plane	Plarization H(Horizontal) V(Vertical)	Peak [dBi]	±100° Average[dBi]	±100° Avg. linear value	Composite linear value	Composite [dBi]	DIP [dBi]	DIP-AVE [dBi]
5.735	XY	H	-3.19	-10.78	0.08	0.86	-0.66	-18.12	15.75
		V	2.65	-1.11	0.77				
	ZX	H	0.03	-5.17	0.30	0.42	-3.72	-11.91	9.53
		V	-5.24	-9.20	0.12				
5.785	XY	H	-4.99	-11.23	0.08	0.82	-0.87	-15.37	13.00
		V	2.21	-1.29	0.74				
	ZX	H	-0.67	-5.89	0.26	0.36	-4.43	-14.07	11.70
		V	-6.48	-9.87	0.10				
5.835	XY	H	-5.00	-11.21	0.08	0.70	-1.53	-17.12	14.74
		V	1.46	-2.02	0.63				
	ZX	H	-1.18	-6.51	0.22	0.31	-5.10	-15.46	13.08
		V	-7.11	-10.66	0.09				
Average Gain[dBi]			-2.37		Max.Peak[dBi]			2.65	



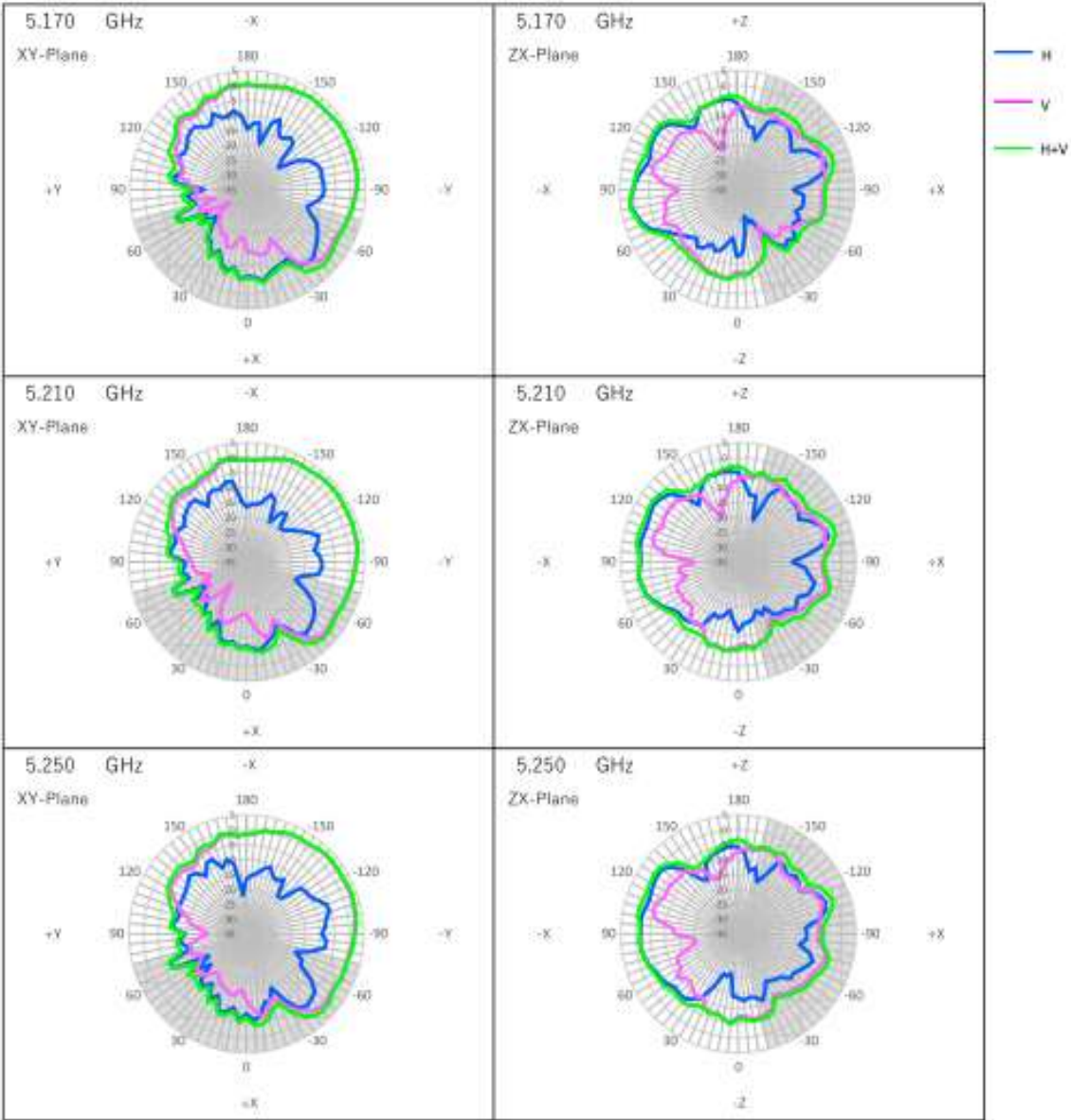
3-4. Ant2 (2.4GHz-Band)

Frequency [GHz]	Plane	Plarization H(Horizontal) V(Vertical)	Peak [dBi]	±100° Average[dBi]	±100° Avg. linear value	Composite linear value	Composite [dBi]	DIP [dBi]	DIP-AVE [dBi]
2.402	XY	H	-2.96	-4.00	0.40	0.47	-3.24	-7.10	3.92
		V	-6.80	-11.20	0.08				
	ZX	H	-6.82	-10.81	0.08	0.37	-4.28	-6.66	3.48
		V	-2.34	-5.37	0.29				
2.441	XY	H	-1.62	-4.91	0.32	0.46	-3.41	-9.89	6.71
		V	-5.79	-8.76	0.13				
	ZX	H	-5.93	-8.37	0.15	0.48	-3.17	-6.80	3.62
		V	-2.40	-4.72	0.34				
2.480	XY	H	0.08	-4.72	0.34	0.53	-2.75	-8.47	5.30
		V	-4.43	-7.13	0.19				
	ZX	H	-3.57	-6.50	0.22	0.57	-2.43	-6.04	2.86
		V	-1.68	-4.59	0.35				
Average Gain[dBi]			-3.18		Max.Peak[dBi]			0.08	



3-5. Ant2 (5GHz-Band1)

Frequency [GHz]	Plane	Plarization H(Horizontal) V(Vertical)	Peak [dBi]	$\pm 100^\circ$ Average[dBi]	$\pm 100^\circ$ Avg. linear value	Composite linear value	Composite [dBi]	DIP [dBi]	DIP-AVE [dBi]
5.170	XY	H	-6.84	-10.56	0.09	1.07	0.29	-16.06	14.95
		V	3.16	-0.09	0.98				
	ZX	H	1.46	-4.35	0.37	0.51	-2.92	-8.05	6.94
		V	-5.08	-8.45	0.14				
5.210	XY	H	-7.16	-10.68	0.09	1.11	0.43	-12.19	11.08
		V	3.37	0.08	1.02				
	ZX	H	-0.45	-4.47	0.36	0.51	-2.92	-7.30	6.19
		V	-4.78	-8.16	0.15				
5.250	XY	H	-5.85	-10.07	0.10	1.00	0.00	-13.49	12.38
		V	2.96	-0.45	0.90				
	ZX	H	-1.14	-5.05	0.31	0.45	-3.44	-8.51	7.40
		V	-4.91	-8.53	0.14				
Average Gain[dBi]			-1.11		Max.Peak[dBi]			3.37	



3-6. Ant2 (5GHz-Band4)

Frequency [GHz]	Plane	Plarization (H(Horizontal) /V(Vertical))	Peak [dBi]	$\pm 10^\circ$ Average[dBi]	$\pm 100^\circ$ Avg. linear value	Composite linear value	Composite [dBi]	DIP [dBi]	DIP-AVE [dBi]
5.735	XY	H	-1.90	-5.93	0.26	0.98	-0.09	-15.02	12.74
		V	2.38	-1.40	0.72				
	ZX	H	0.11	-6.13	0.24	0.39	-4.08	-13.67	11.39
		V	-5.34	-8.32	0.15				
5.785	XY	H	-2.39	-6.45	0.23	0.86	-0.65	-15.84	13.56
		V	1.90	-1.97	0.64				
	ZX	H	-0.82	-6.90	0.20	0.34	-4.66	-13.30	11.02
		V	-4.82	-8.60	0.14				
5.835	XY	H	-2.78	-6.55	0.22	0.70	-1.53	-20.46	18.19
		V	0.78	-3.17	0.48				
	ZX	H	-2.32	-8.19	0.15	0.27	-5.62	-17.40	15.12
		V	-5.17	-9.11	0.12				
Average Gain[dBi]			-2.28		Max.Peak[dBi]			2.38	

