

【TN0022A】 Wi-Fi/Bluetooth Antenna

1.Specification

Antenna Type : Inverted F Antenna
Part No. ANT1 : ANT2312-A3.0-W/U-185-W
ANT2 : ANT2312-A3.0-W/U-333-A
Antenna Gain(Peak) : ANT1 Wi-Fi 2.4GHz -1.25dBi
ANT1 Wi-Fi 5GHz 3.09dBi
ANT2 Bluetooth -1.74dBi
ANT2 Wi-Fi 5GHz 2.08dBi

Frequency Band : Wi-Fi 2.4GHz 2412 - 2462 MHz
Wi-Fi 5GHz(W52) 5180 - 5240 MHz
Wi-Fi 5GHz(W58) 5745 - 5825 MHz
Bluetooth 2402 - 2480 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

3-1. Antenna2-Left (2.4GHz-Band)

frequency [MHz]	Plane	plane of polarization	$\pm 100^\circ$ Average [dBi]	$\pm 100^\circ$ true mean	Composite true value	Composite [dBi]	DIP[dBi]	DIP-AVE [dB]
2402	XY	HOR.	-7.32	0.19	0.26	-5.92	-14.33	9.48
		VER.	-11.50	0.07				
	XZ	HOR.	-8.80	0.13	0.39	-4.11	-6.84	1.99
		VER.	-5.92	0.26				
2441	XY	HOR.	-7.63	0.17	0.28	-5.53	-12.92	8.07
		VER.	-9.71	0.11				
	XZ	HOR.	-9.52	0.11	0.36	-4.45	-8.05	3.21
		VER.	-6.07	0.25				
2480	XY	HOR.	-6.91	0.20	0.31	-5.14	-8.66	3.81
		VER.	-9.90	0.10				
	XZ	HOR.	-7.76	0.17	0.38	-4.24	-8.25	3.40
		VER.	-6.79	0.21				

-4.85 dBi Ave

-1.74 dBi Max Peak

3-2. Antenna2-Left (5GHz-Band1)

frequency [MHz]	Plane	plane of polarization	$\pm 100^\circ$ Average [dBi]	$\pm 100^\circ$ true mean	Composite true value	Composite [dBi]	DIP[dBi]	DIP-AVE [dB]
5170	XY	HOR.	-8.30	0.15	0.63	-1.98	-16.45	13.66
		VER.	-3.14	0.49				
	XZ	HOR.	-7.21	0.19	0.32	-4.98	-10.40	7.60
		VER.	-8.93	0.13				
5210	XY	HOR.	-7.56	0.18	0.73	-1.35	-16.18	13.39
		VER.	-2.54	0.56				
	XZ	HOR.	-7.61	0.17	0.33	-4.83	-10.46	7.67
		VER.	-8.08	0.16				
5250	XY	HOR.	-7.34	0.18	0.77	-1.15	-13.90	11.10
		VER.	-2.35	0.58				
	XZ	HOR.	-7.35	0.18	0.37	-4.30	-12.13	9.34
		VER.	-7.28	0.19				

-2.80 dBi Ave

2.08 dBi Max Peak

3-3. Antenna2-Left (5GHz-Band4)

frequency [MHz]	Plane	plane of polarization	$\pm 100^\circ$ Average [dBi]	$\pm 100^\circ$ true mean	Composite true value	Composite [dBi]	DIP[dBi]	DIP-AVE [dB]
5735	XY	HOR.	-9.24	0.12	0.50	-2.97	-15.41	11.01
		VER.	-4.14	0.39				
	XZ	HOR.	-8.47	0.14	0.25	-5.95	-11.36	6.95
		VER.	-9.52	0.11				
5785	XY	HOR.	-9.19	0.12	0.50	-2.99	-14.39	9.99
		VER.	-4.18	0.38				
	XZ	HOR.	-8.90	0.13	0.24	-6.23	-10.43	6.02
		VER.	-9.61	0.11				
5835	XY	HOR.	-9.93	0.10	0.45	-3.44	-12.45	8.04
		VER.	-4.55	0.35				
	XZ	HOR.	-9.41	0.11	0.23	-6.47	-10.89	6.49
		VER.	-9.56	0.11				

-4.40 dBi Ave
1.59 dBi Max Peak

3-4. Antenna1-Right (2.4GHz-Band)

frequency [MHz]	Plane	plane of polarization	$\pm 100^\circ$ Average [dBi]	$\pm 100^\circ$ true mean	Composite true value	Composite [dBi]	DIP[dBi]	DIP-AVE [dB]
2402	XY	HOR.	-9.72	0.11	0.17	-7.60	-12.75	7.93
		VER.	-11.73	0.07				
	XZ	HOR.	-6.91	0.20	0.41	-3.87	-8.26	3.44
		VER.	-6.84	0.21				
2441	XY	HOR.	-9.04	0.12	0.21	-6.79	-12.06	7.24
		VER.	-10.72	0.08				
	XZ	HOR.	-5.71	0.27	0.51	-2.96	-8.25	3.42
		VER.	-6.25	0.24				
2480	XY	HOR.	-5.95	0.25	0.38	-4.23	-8.02	3.20
		VER.	-9.09	0.12				
	XZ	HOR.	-7.93	0.16	0.30	-5.24	-10.48	5.66
		VER.	-8.60	0.14				

-4.82 dBi Ave
-1.25 dBi Max Peak

3-4. Antenna1-Right (5GHz-Band1)

frequency [MHz]	Plane	plane of polarization	± 100° Average [dBi]	± 100° true mean	Composite true value	Composite [dBi]	DIP[dBi]	DIP-AVE [dB]
5170	XY	HOR.	-7.27	0.19	0.88	-0.54	-15.97	14.34
		VER.	-1.57	0.70				
	XZ	HOR.	-5.50	0.28	0.44	-3.53	-7.91	6.28
		VER.	-7.91	0.16				
5210	XY	HOR.	-6.76	0.21	0.90	-0.46	-16.31	14.67
		VER.	-1.63	0.69				
	XZ	HOR.	-5.85	0.26	0.46	-3.39	-8.05	6.42
		VER.	-7.05	0.20				
5250	XY	HOR.	-6.54	0.22	0.94	-0.26	-10.65	9.02
		VER.	-1.42	0.72				
	XZ	HOR.	-5.48	0.28	0.49	-3.08	-8.16	6.52
		VER.	-6.79	0.21				

-1.63 dBi Ave
3.09 dBi Max Peak

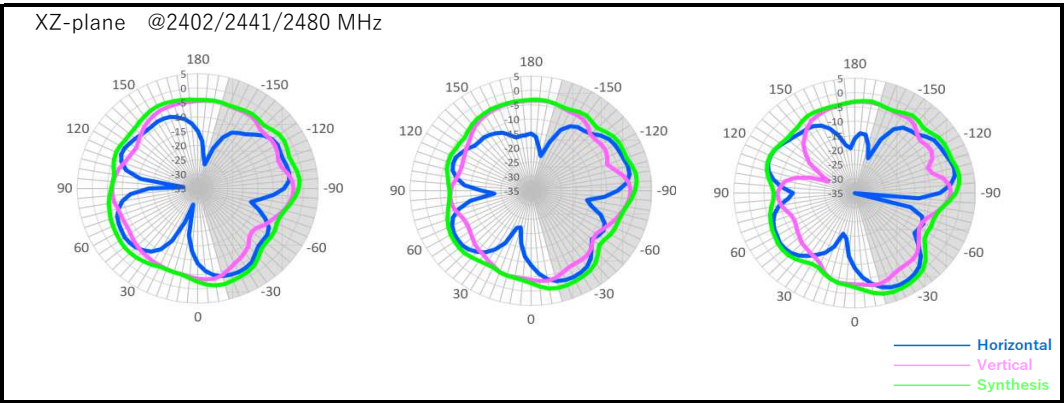
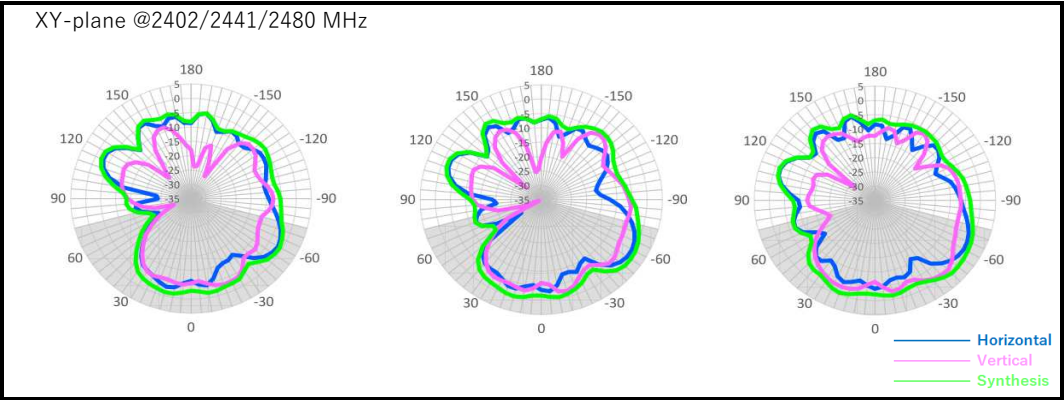
3-5. Antenna1-Right (5GHz-Band4)

frequency [MHz]	Plane	plane of polarization	± 100° Average [dBi]	± 100° true mean	Composite true value	Composite [dBi]	DIP[dBi]	DIP-AVE [dB]
5735	XY	HOR.	-7.62	0.17	0.54	-2.70	-15.12	11.09
		VER.	-4.38	0.36				
	XZ	HOR.	-8.73	0.13	0.24	-6.23	-11.42	7.39
		VER.	-9.82	0.10				
5785	XY	HOR.	-6.53	0.22	0.57	-2.41	-12.01	7.99
		VER.	-4.54	0.35				
	XZ	HOR.	-8.57	0.14	0.25	-5.99	-12.24	8.22
		VER.	-9.47	0.11				
5835	XY	HOR.	-6.52	0.22	0.55	-2.60	-13.03	9.00
		VER.	-4.86	0.33				
	XZ	HOR.	-9.27	0.12	0.22	-6.48	-13.65	9.63
		VER.	-9.73	0.11				

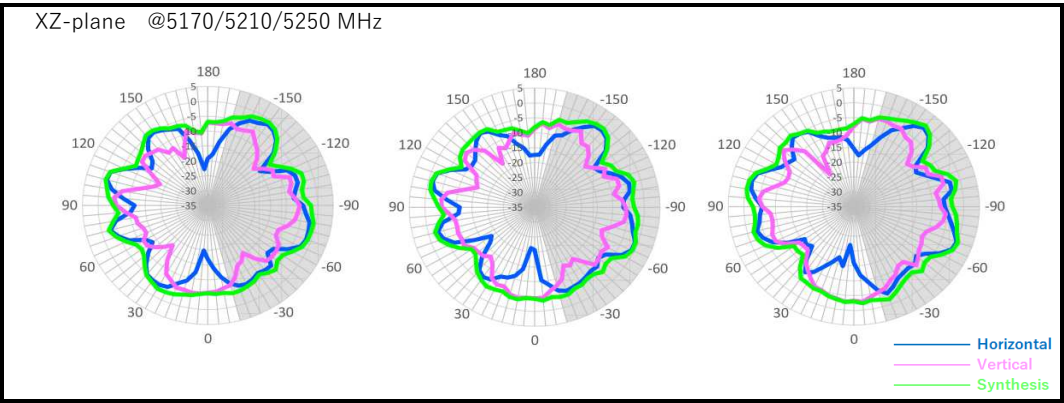
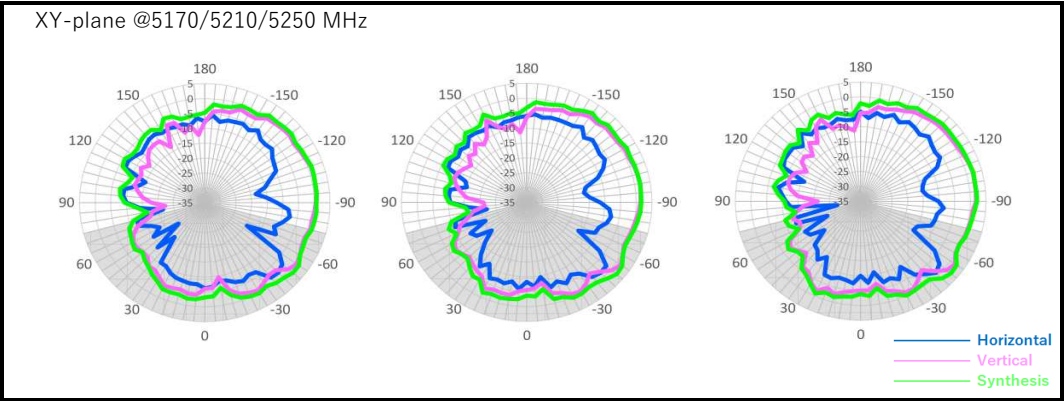
-4.03 dBi Ave
0.53 dBi Max Peak

4. Radio wave radiation pattern (directivity graph)

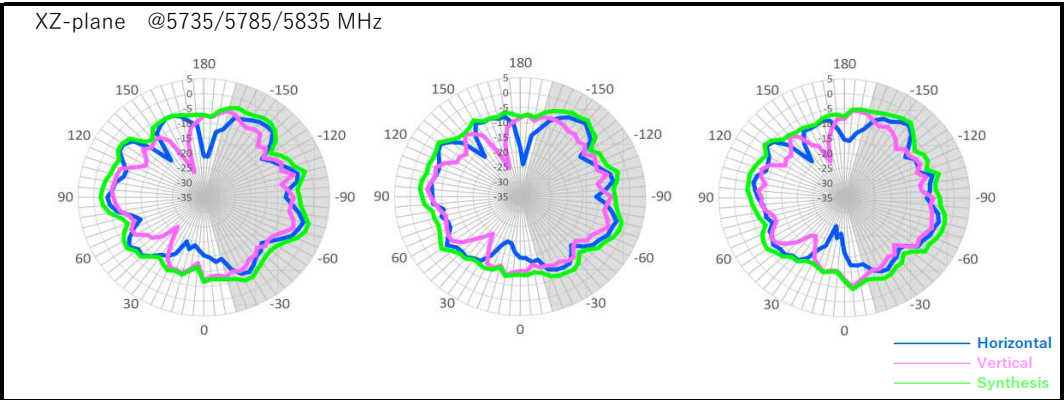
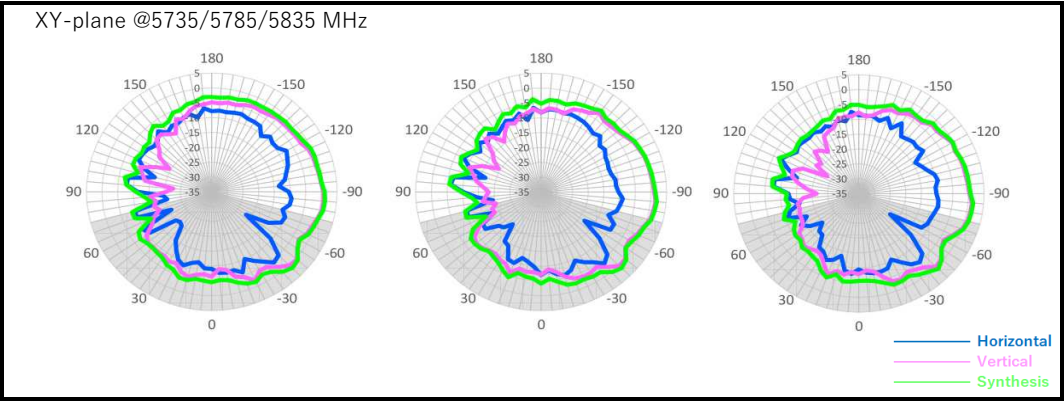
4-1. Antenna2-Left (2.4GHzBand)



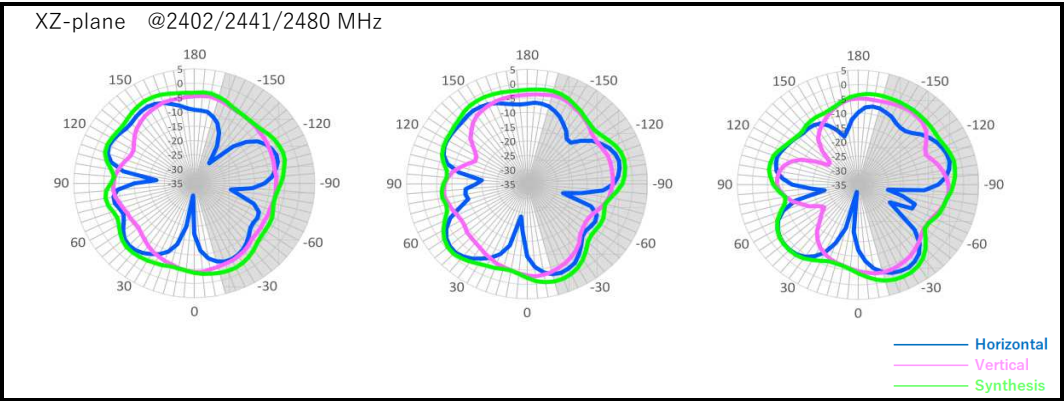
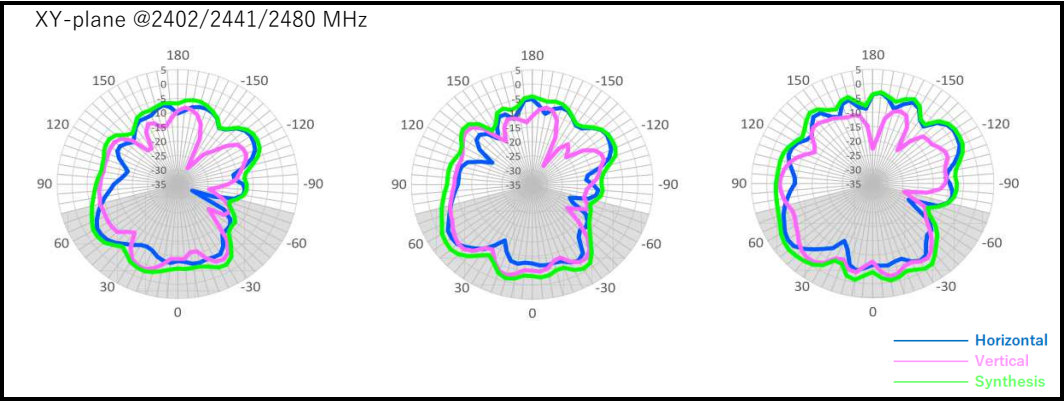
4-2. Antenna2-Left (5GHz-Band1)



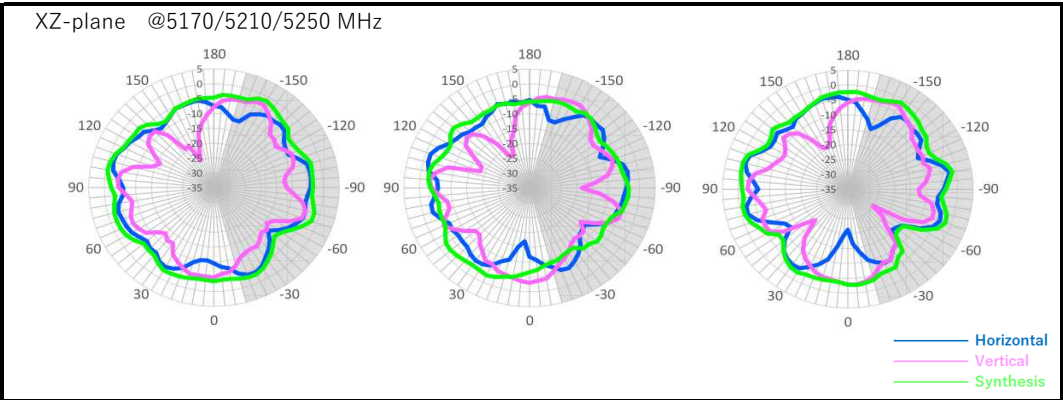
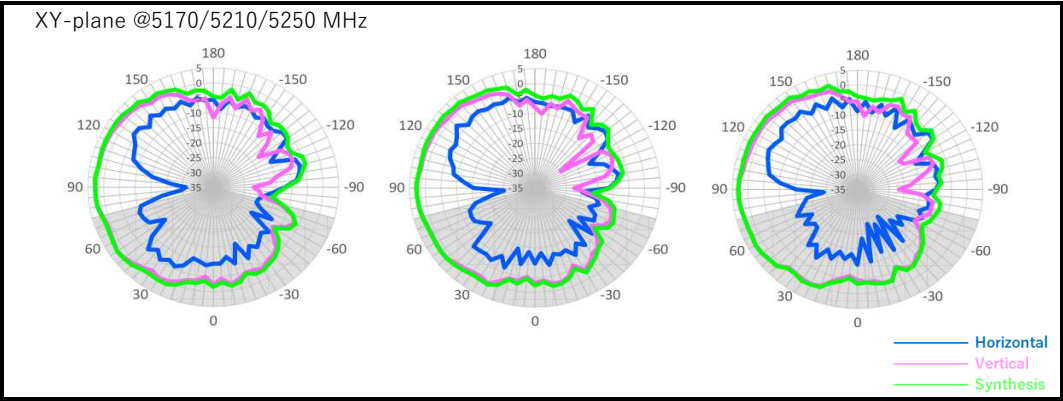
4-3. Antenna2-Left (5GHz-Band4)



4-4. Antenna1-Right (2.4GHzBand)



4-5. Antenna1-Right (5GHz-Band1)



4-6. Antenna1-Right (5GHz-Band4)

