

Wi-Fi/Bluetooth SF Antenna
2.4GHz in-bandwidth Performance Measurement Results

No. EGR-9967-00

29 June 2022

Yokowo Co., Ltd.

1. Purpose:

To review the Measurement Results of the 2.4GHz In-Bandwidth Performance of the Wi-Fi/Bluetooth Antenna

2. Conclusion:

The 2.4GHz Peak Gain and In-Band Performance has a Peak Gain of less than 5[dBi] and an Average Gain of less than 4[dBi].

3. Specifications:

3-1. Wi-Fi-1/Bluetooth:

WiFi/Bluetooth	
使用周波数帯 Frequency range	WiFi Bluetooth 2400MHz~2485MHz
偏波 Polarization	垂直偏波 Vertical polarization
アンテナ利得 Antenna Gain	Peak Gain Min. 2 dBi
Elevation θ : 88°, ϕ :135°~225° (※2)	Average Gain Min. 1 dBi
VSWR	Max. 2.0
出力インピーダンス Output impedance (※3)	50 $\pm$ 10 Ω
アイソレーション Isolation	WiFi to Bluetooth (※2) Min. 10 dB
※1: ϕ 1000mm地板上にて Measuring the ϕ 1000mm ground plate. ※2: 2.5DS-QFB/1.5DS-QFB 150mm相当 Use 150mm cable. ※3 上限は、アンテナのVSWRによる。 ※3 The upper limit is defined by the VSWR of the antenna	

3-2. Wi-Fi-2:

WiFi	
使用周波数帯 Frequency range	2400MHz~2485MHz
偏波 Polarization	垂直偏波 Vertical polarization
アンテナ利得 Antenna Gain	Peak Gain Min. 2 dBi
Elevation θ : 88°, ϕ :135°~225° (※2)	Average Gain Min. 1 dBi
VSWR	Max. 2.0
出力インピーダンス Output impedance (※3)	50 $\pm$ 10 Ω
※1: ϕ 1000mm地板上にて Measuring the ϕ 1000mm ground plate. ※2: 2.5DS-QFB/1.5DS-QFB 150mm相当 Use 150mm cable. ※3 上限は、アンテナのVSWRによる。 ※3 The upper limit is defined by the VSWR of the antenna	

4. Measurement Conditions:

Measurement Date : 23 June 2022
 Measurement Location : Yokowo Co., Ltd. Site #5
 Tester : Yuta Nakatani
 Measurement Devices :

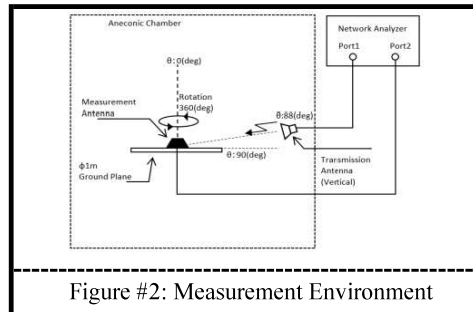
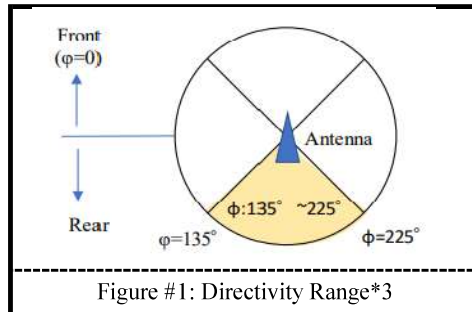
	Calibration Date	Calibration Due Date
Network Analyzer (N5221B Keysight)	2022/2/4	2023/2/3
AMP (83006A Keysight)	Calibration is not necessary (*1)	
Coupler (86205A Keysight)	Calibration is not necessary (*1)	
PIN Semiconductor Switch (P9402A Keysight)	Calibration is not necessary (*1)	

*1; Devices in the Measurement System do not require Calibration because corrections are done with a Reference Back.

Transmitting Antenna : BBHX 9120E (Made by SCHWARZBECK)
 Reference Antenna : BBHA 9120D (Made by SCHWARZBECK)
 Software : Antenna Radiation Pattern Measurement System (Microwave Factory Co., Ltd.)

6. Measurement Results:

		SPEC	Media	Measurement Data (In Band)			Measurement Data(2nd Harmonic)	
				2400 MHz	2440 MHz	2485 MHz		4823 MHz
Vertical Antenna Gain ^{*1*2}	Peak Gain of $\phi 135^{\circ}$ to 225°	Min. 2 [dBi]	Wi-Fi-1	3.87 [dBi]	4.20 [dBi]	4.04 [dBi]	Peak Gain of $\phi 0^{\circ}$ to 360° ^{*1*2}	-2.96 [dBi]
			Wi-Fi-2	4.60 [dBi]	4.61 [dBi]	4.36 [dBi]		-2.03 [dBi]
			Bluetooth	3.57 [dBi]	3.86 [dBi]	3.76 [dBi]		-1.15 [dBi]
	Average Gain of $\phi 135^{\circ}$ to 225°	Min. 1 [dBi]	Wi-Fi-1	2.73 [dBi]	2.97 [dBi]	2.64 [dBi]	Average Gain of $\phi 0^{\circ}$ to 360° ^{*1*2}	-6.93 [dBi]
			Wi-Fi-2	3.59 [dBi]	3.74 [dBi]	3.58 [dBi]		-8.64 [dBi]
			Bluetooth	2.42 [dBi]	2.68 [dBi]	2.51 [dBi]		-5.33 [dBi]



*1 On Ground Plane ($\phi 1m$ GND plane) at Yokowo Chamber

*2 In Plane of $\theta = 88^{\circ}$

*3 Antenna Front Direction is $\phi 0^{\circ}$

●Antenna Directionality (0=88°):

