

# FCC Part 15 Antenna Gain

## Test Report

(UC-352BLE)

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## 1. Overview

This test report presents the results of measuring the antenna gain for the Equipment Under Test (EUT) using the standard antenna method.

## **2. Test Objective**

**To measure the antenna gain of a specific EUT using the standard antenna method and evaluate its performance.**

**This test report demonstrates compliance with the antenna gain reporting requirements of FCC 2.1033(b)(4), 15.203, 15.212.**

### 3. Test Equipment

The equipment used for this test is shown below.

•Equipment Under Test (EUT):

Model: UC-352BLE

Antenna Type: Pattern Antenna

Antenna Manufacturer: A&D Company, Limited

Operating frequency range: 2402-2480MHz (ISM)

•Antenna Measurement System:

Fully anechoic chamber with Double-Ridged Horn Antenna, mechanical positioners of Phi axes.

Horn Antenna:

EMCO 3115

Calibration Date: 03/06/2024

•Spectrum analyzer:

Rohde & Schwarz FSW26

Calibration Date: 07/05/2024

•Signal Generators

Keysight Technology N1513B

Calibration Date: 07/05/2024

•Commercial Test Software:

MATEOS.NET sold by Microwave Factory Co., Ltd.

### 4. Test Method

The standard antenna method, which is an industry standard measurement method, is used to measure the antenna gain and directivity of the EUT.

Prepare a transmit antenna and a reference antenna, and install them in the anechoic chamber at a certain distance. Measuring the received power of reference antenna  $P_{rs}$  [dBm] in this state.

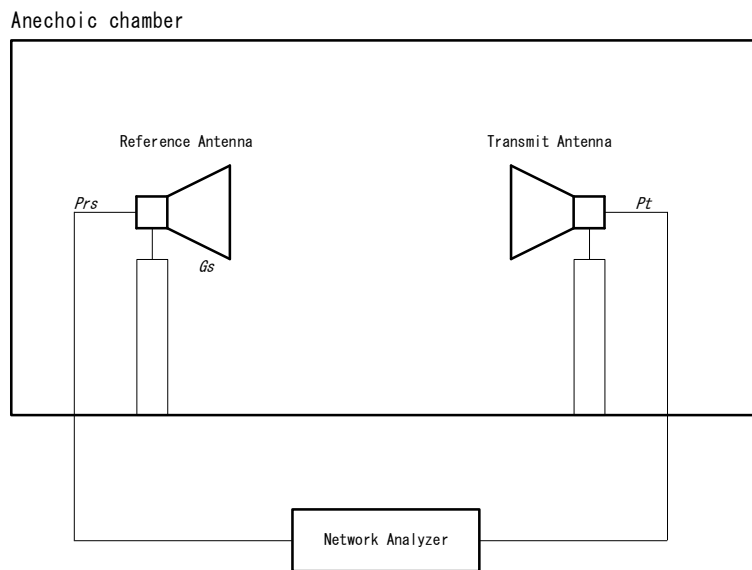


Fig.1 Measurement of Reference Antenna

Install the test antenna (EUT) in place of the reference antenna, and measuring the received power of EUT  $P_{rt}$  [dBm].

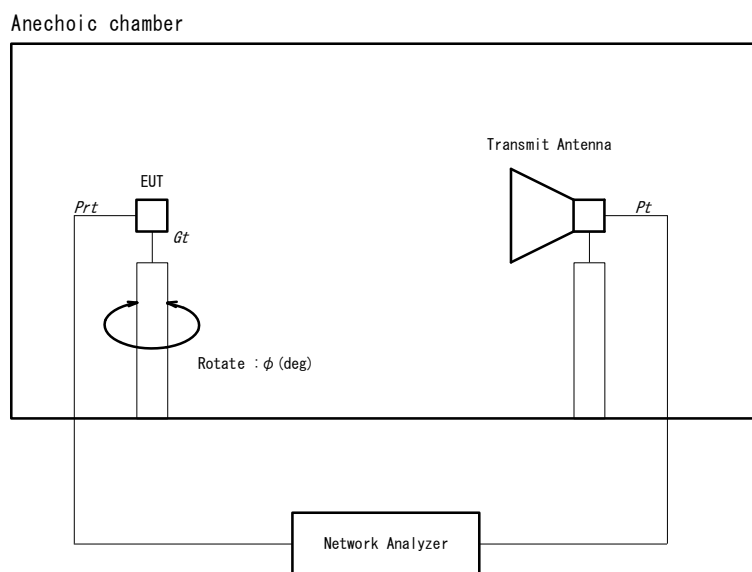


Fig.2 Measurement of EUT

EUT gain  $G_t$  [dBi] is calculated from the reference antenna gain  $G_s$  [dBi] and received power of reference antenna  $P_{rs}$  [dBm] using the following formula.

$$G_t = P_{rt} - P_{rs} + G_s$$

Also, measurement of antenna directivity by rotating the EUT in the Phi axes direction.

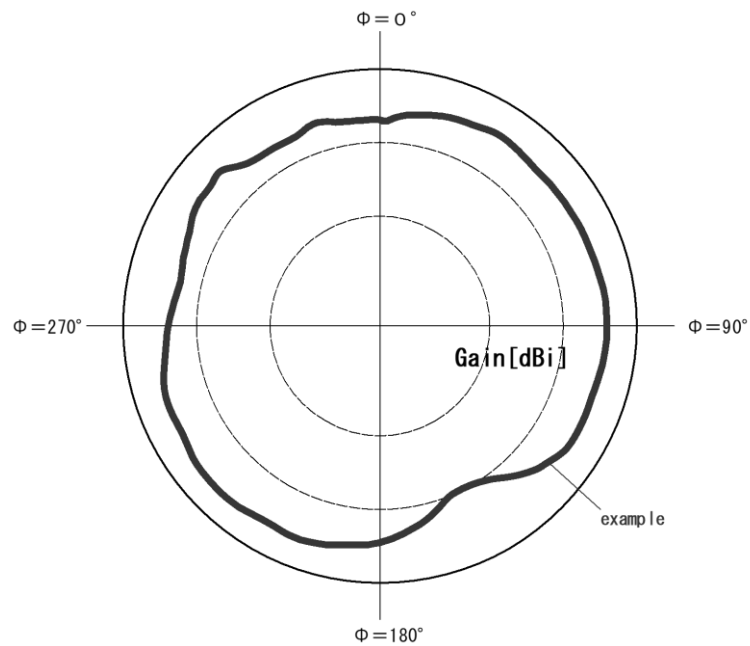


Fig.3 Antenna directivity diagram

## 5. Test Information

**Test Lab: Telecom Engineering Center**

**Test Lab Address: 580-2, Takatsukashinden, Matsudo-city, Chiba, Japan**

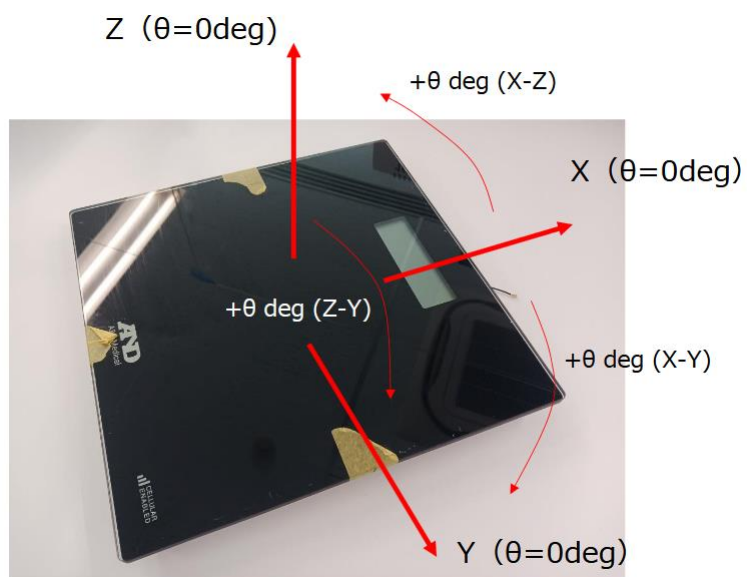
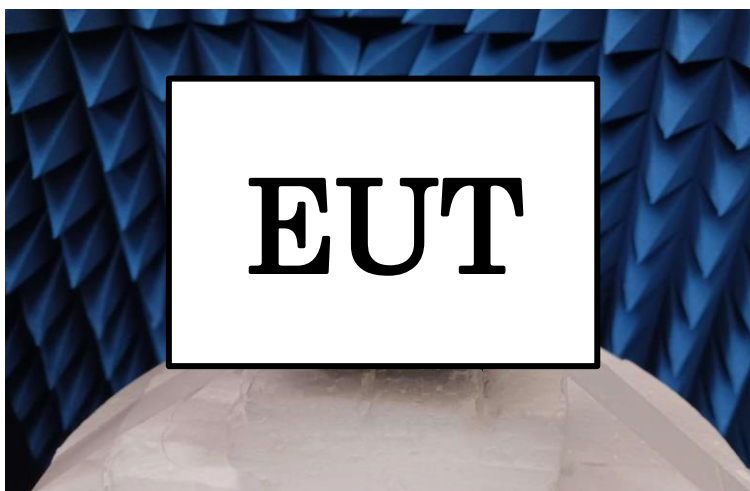
**Test Date: 7, Oct, 2024**

**Test Person: Hiroto Yamaguchi**



## 6. Test Setup Photos

The device containing the integral antenna is placed on the styrofoam pylon.

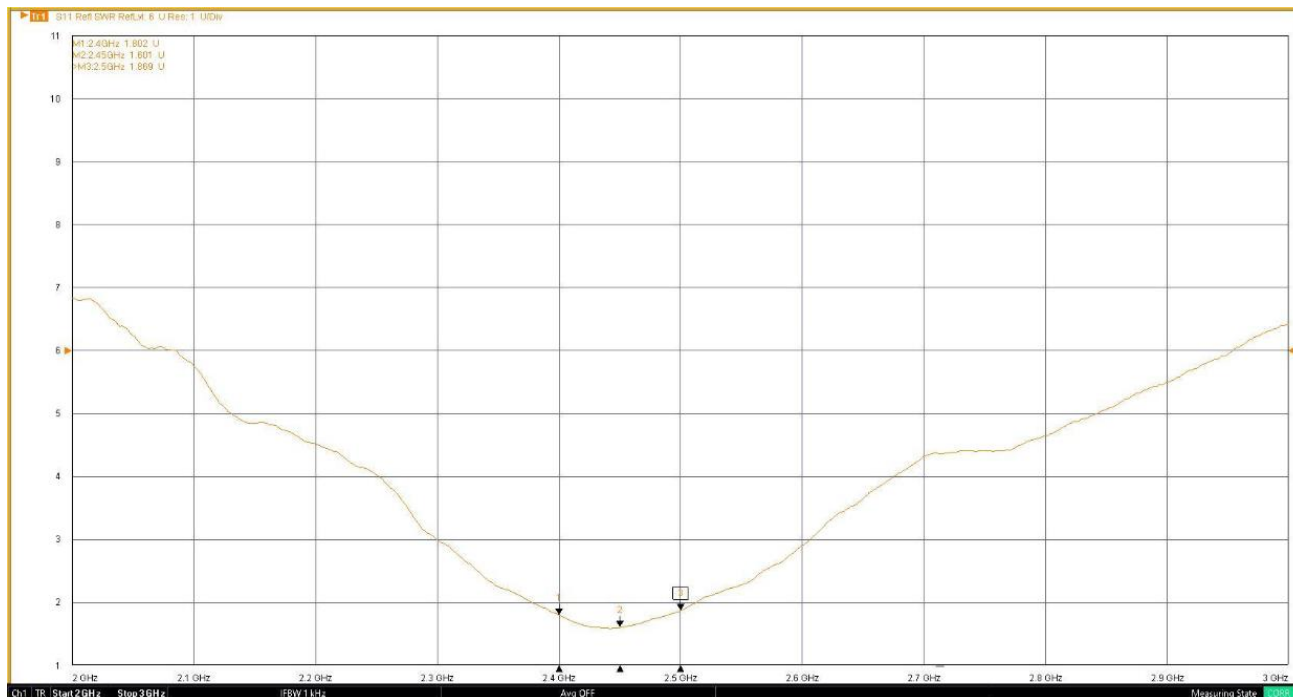


Definition of antenna measurement axis

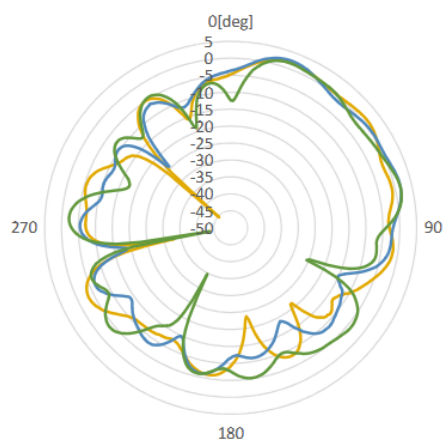
## 7. Test Result

The following is the result of the antenna test.

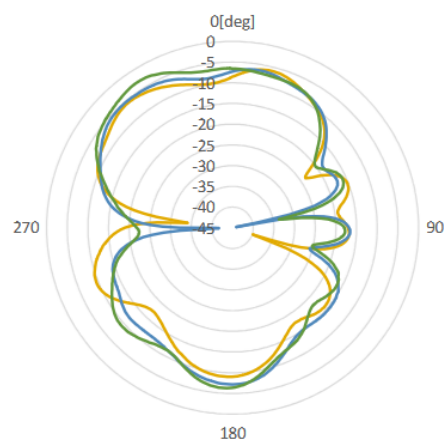
### (1) VSWR



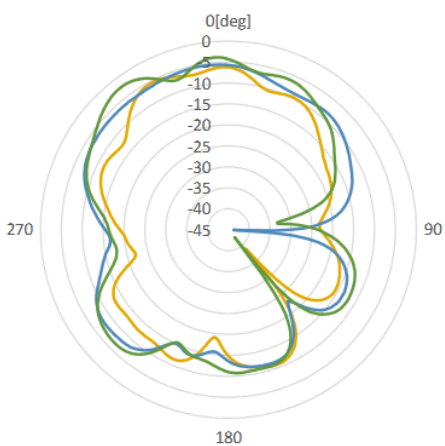
## (2) Directivity



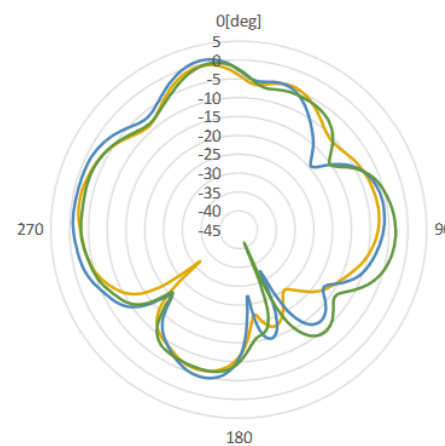
— 2400MHz  
— 2450MHz  
— 2500MHz



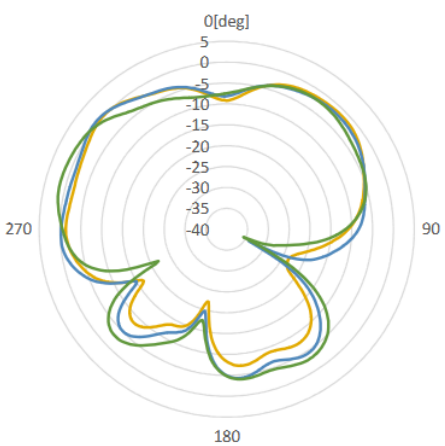
### XY-Plane



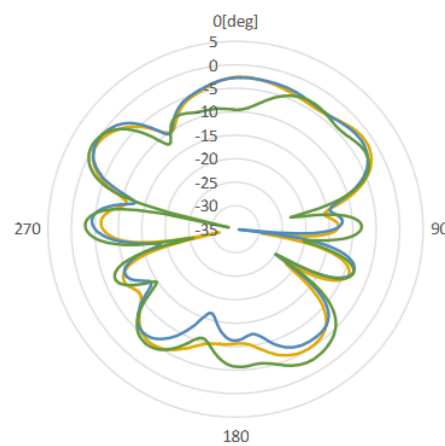
— 2400MHz  
— 2450MHz  
— 2500MHz



### ZY-Plane



— 2400MHz  
— 2450MHz  
— 2500MHz



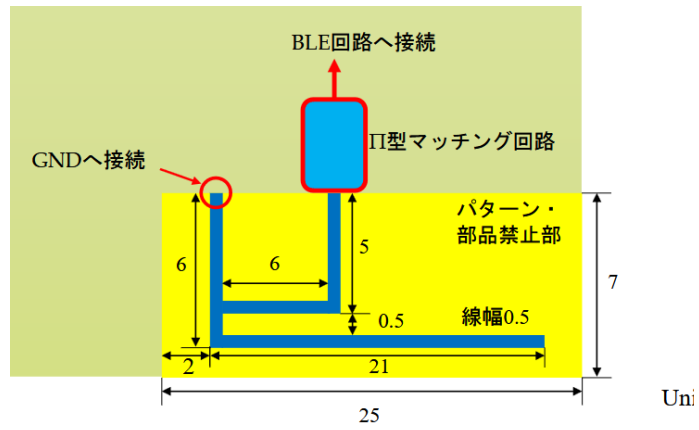
### XZ-Plane

**(3) Antenna Efficiency & Maximum Gain**

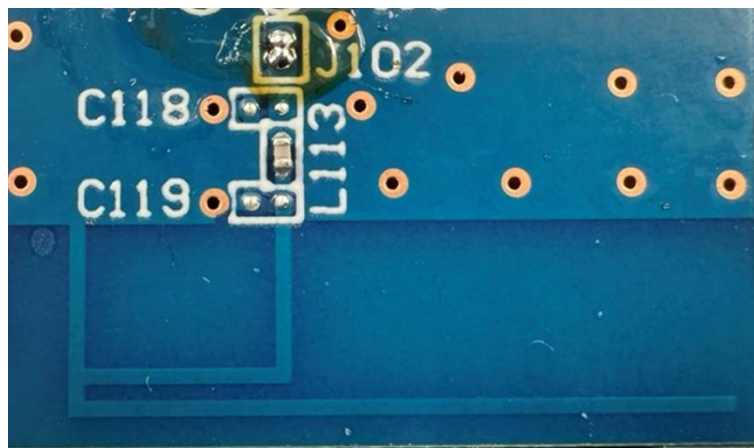
	<b>2400MHz</b>	<b>2450MHz</b>	<b>2500MHz</b>
<b>Antenna Efficiency</b>	<b>-3.5dB</b>	<b>-2.9dB</b>	<b>-2.9dB</b>

	<b>XY-Plane</b>	<b>ZY-Plane</b>	<b>XZ-Plane</b>
<b>Maximum Gain</b>	<b>+2.5dBi</b>	<b>+0.9dBi</b>	<b>+1.4dBi</b>

## 8. Antenna Photos or Drawings



Antenna Dimension



RF circuit

## 9. Revision History

Revision#	Date	Description of Change
1.00	14/01/2025	Original

**END OF DOCUMENT**