OTA TEST REPORT

Applicant	Honeywell Integrated Technology (China) Co., Ltd.
Product	Built-On PCB Bluetooth Antenna
Model	200-02169
Brand	Honeywell
Report No.	Y2211A1104-T1
Issue Date	November 11, 2022

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **ANSI/IEEE Std 149-2008.** The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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TA Technology (Shanghai) Co., Ltd.

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1. Test Laboratory

1.1. Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA Technology (Shanghai) Co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2. Test facility

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform measurement.

1.3. Testing Location

Company:	TA Technology (Shanghai) Co., Ltd.
Address:	Building 3, No.145, Jintang Rd, Pudong Shanghai, P.R.China
City:	Shanghai
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Country:	P. R. China
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Website:	http://www.ta-shanghai.com
E-mail:	xukai@ta-shanghai.com

1.4. Laboratory Environment

Temperature	Min. =19℃, Max. = 25℃	
Relative humidity	Min. =40%, Max. =72%	
Shield effect	0.7-6GHz	> 100dB
Ground resistance	<0.5Ω	

2. General Description of Equipment under Test

2.1. Applicant and Manufacturer Information

Applicant Name	Honeywell Integrated Technology (China) Co., Ltd.
Applicant address	B3F5, 430 Li Bing Road, Shanghai, China
Manufacturer Name	NOVAR GmbH
Manufacturer address	Dieselstr-2, 41469 Neuss, GERMANY

2.2. General information

EUT Description	
Product Name:	Built-On PCB Bluetooth Antenna
Model	200-02169
HW Version:	Rev B
SW Version:	/
Antenna Type:	PCB Antenna
Antenna Size:	19mm * 5mm
Antenna Manufacturer:	NOVAR GmbH
Test Frequency:	2400MHz ~ 2500MHz
Note: The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant. All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.	

2.3. Test Date

The test is performed on November 8, 2022.

2.4. Received Date

The sample was received on November 8, 2022.

2.5. Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test Method: **ANSI/IEEE Std 149-2008**

3. Test Conditions

3.1. Test Configuration

Great-Circle-Cut method is used to measure the antenna 3D GAIN of EUT in OTA qualified anechoic chamber. Equipment Under Test (EUT) geometry centre vertical projection at the centre of platform, the distance from EUT to measurement antenna is 5m.

3.2. Test Measurement

Spherical coordinate system

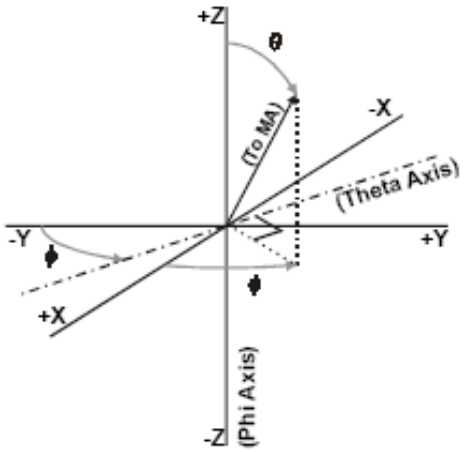
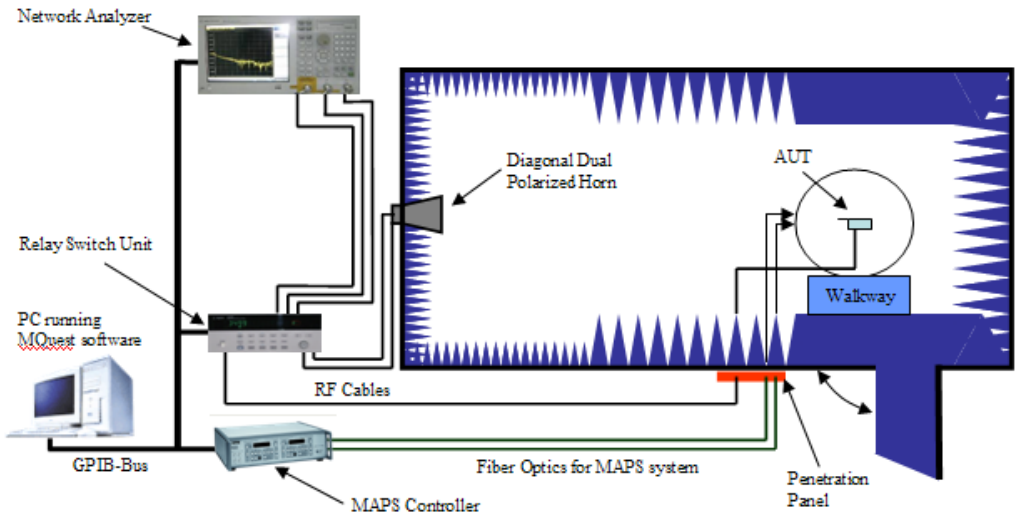


Figure 1 Test coordinate system

Note: Theta is from 0~180 degree. Phi is from 0~360. Rotate the EUT and record the Data, the step of rotation is 15 degree.

Test Setup



4. Test Results

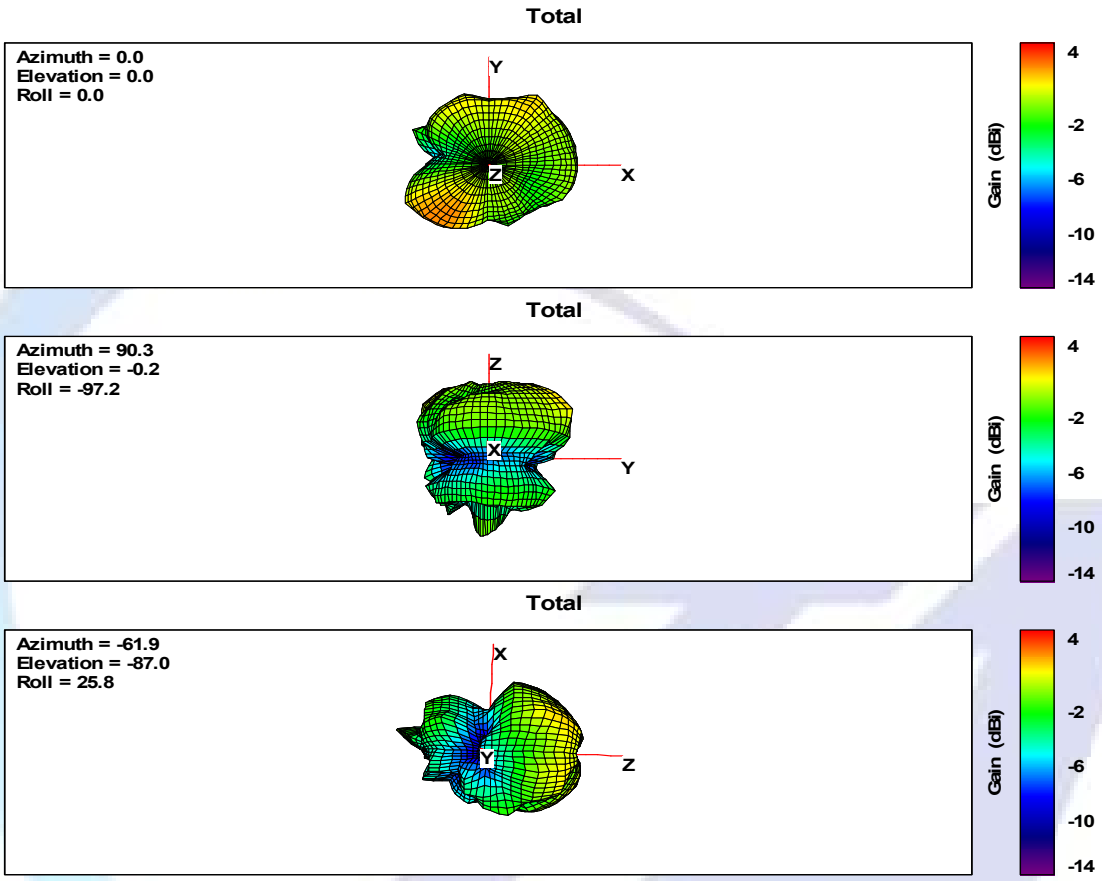
4.1. Gain and Efficiency

Test State	Frequency (MHz)	Efficiency (%)	Gain (dBi)	Note
Free Space	2400	53.98	2.55	/
	2410	56.72	2.60	
	2420	59.15	2.65	
	2430	59.13	2.80	
	2440	60.80	2.82	
	2450	63.20	3.03	
	2460	67.30	3.35	
	2470	69.47	3.53	
	2480	72.08	3.90	
	2490	75.42	3.89	
	2500	77.11	4.22	

5. Equipment List

Type of Equipment	Manufacture	Model Number	S/N	Calibration Date	Expiration Time
Anechoic Chamber	ETS	AMS-8500	CT-001157-1219	2020-05-17	2025-05-16
Test Software	ETS	EMQuest™	REV 1.0.9	--	--
Spectrum Analyzer	R&S	FSP7	100012	2021-12-12	2022-12-11
EMCenter_Switch Control System	ETS	7006/7001	00059957/MY42001152	--	--
Diagonal Dual Polarized Horn	ETS	ETS 3164-04	00062743	2020-04-14	2025-04-13
Network Analyzer	Keysight	E5071B	MY42404014	2022-05-14	2023-05-13

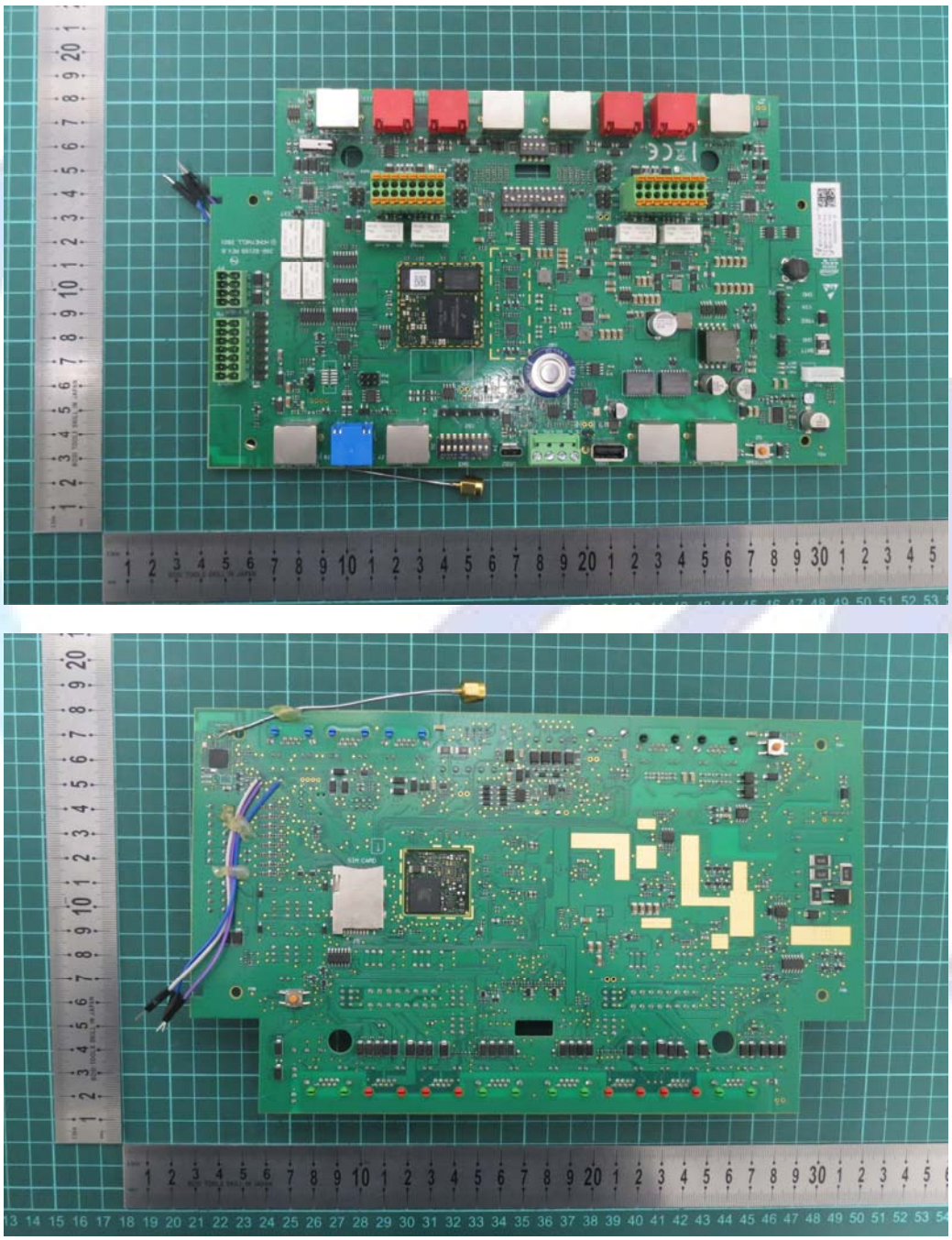
ANNEX A: 3-D Pattern Plots



2.4G 3D Gain

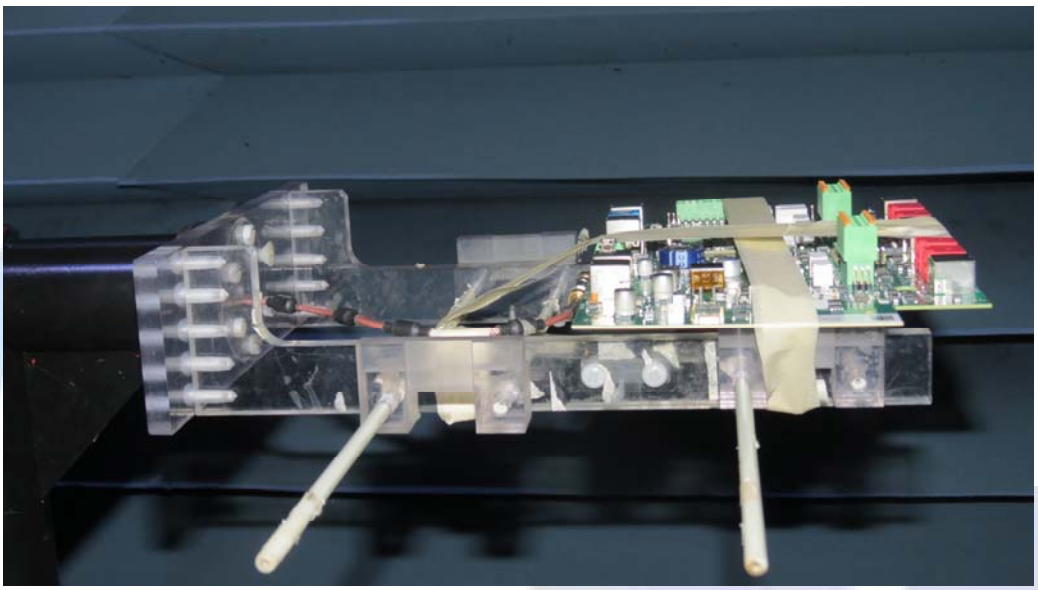
ANNEX B: The EUT Appearance and Test Configuration

B.1 EUT Appearance



Picture 1 Constituents of EUT

B.2 Test Configuration



Picture 2 Test Setup

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