CE RADIO TEST REPORT

Equipment	:	**Blues Wireless for Arduino Opta**
Brand Name	:	**Blues**
Model Name	:	**Blues Wireless for Arduino Opta – Cellular Edition (LTE Cat 1 EMEA)**
Applicant	:	**Blues Wireless Inc.** **50 Harbor Street, Manchester by the Sea, MA 01944, United States**
Manufacturer	:	**Blues Wireless Inc.** **50 Harbor Street, Manchester by the Sea, MA 01944, United States**
Standard	:	**ETSI EN 301 511 V12.5.1 (2017-03)**

The product was received on Sep. 18, 2024, and testing was performed from Nov. 07, 2024 to Nov. 07, 2024. We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ETSI EN 301 511 V12.5.1 (2017-03), and shown compliance with the applicable technical standards.

The test results in this partial report apply exclusively to the tested model / sample. Without written approval from Sporton International Inc. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Louis Wu

Approved by: Louis Wu

Sporton International Inc. EMC & Wireless Communications Laboratory
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History of this test report

Report No.	Version	Description	Issue Date
EG491806	01	Initial issue of report	Feb. 19, 2025

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	4.2.16	Radiated Spurious Emissions-MS Allocated a Channel	PASS	1.58 dB under the limit at 3495.00 MHz for Link Mode
	4.2.17	Radiated Spurious Emissions-MS in Idle Mode	PASS	5.47 dB under the limit at 137.40 MHz for Idle Mode
Note: This is partial test report only includes and demonstrates the compliance with the Radiated Spurious Emissions, and for the other test cases requested by this standard may be found in other test report.				

Conformity Assessment Condition:
1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the section “Measurement Uncertainty”.
Disclaimer:
The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: Leon Huang

Report Producer: Mila Chen

1. General Description

1.1 Product Feature of Equipment Under Test

Product Feature
General Specs GSM/WCDMA/LTE and Wi-Fi 2.4GHz 802.11b/g/n. **Antenna Type** WWAN: Omni-directional Antenna WLAN: Omni-directional Antenna

Remark: The EUT's information above is declared by manufacturer. Please refer to Disclaimer in report summary.

1.2 Modification of EUT

No modifications made to the EUT during the testing.

1.3 Testing Facility

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	**Sporton Site No. :** 05CH02-HY
Test Engineer	Tom Chiu
Temperature (˚C)	21~22
Relative Humidity (%)	56~57

1.4 Applied Standards

According to the specifications declared by the manufacturer, the EUT must complies with the requirements of **ETSI EN 301 511 V12.5.1 (2017-03)**.

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

1.5 Description of Test System

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	Agilent	E5515C	N/A	N/A	Unshielded, 1.8m

2. Test Configuration of Equipment under Test

2.1 Test Mode

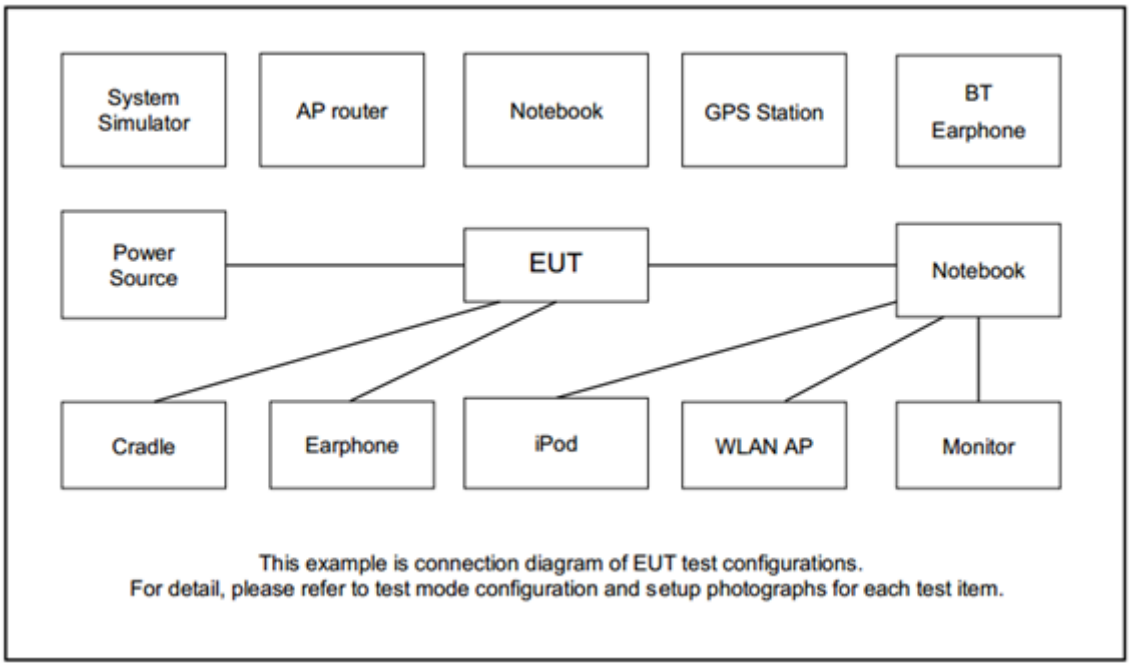
During testing, the interface cables and equipment positions were arranged according to European Standard ETSI EN 301 511 V12.5.1 (2017-03).

Frequency range of radiation was investigated from 30MHz to 4GHz.

Pre-scanned tests were conducted to determine the final configuration from all possible combinations. The following table shows the test modes as the worst cases and recorded in this report.

Mode	Channel	Condition
1.	M	GPRS1800 Link Mode
2.	M	GPRS1800 Idle Mode

2.2 Connection Diagram of Test System



3. Transceiver Parameters

3.1 Radiated Emissions

3.1.1 Limit of Radiated Emissions

Based on EN301511 chapter 4.2.16 and 4.2.17

3.1.2 Measuring Instruments

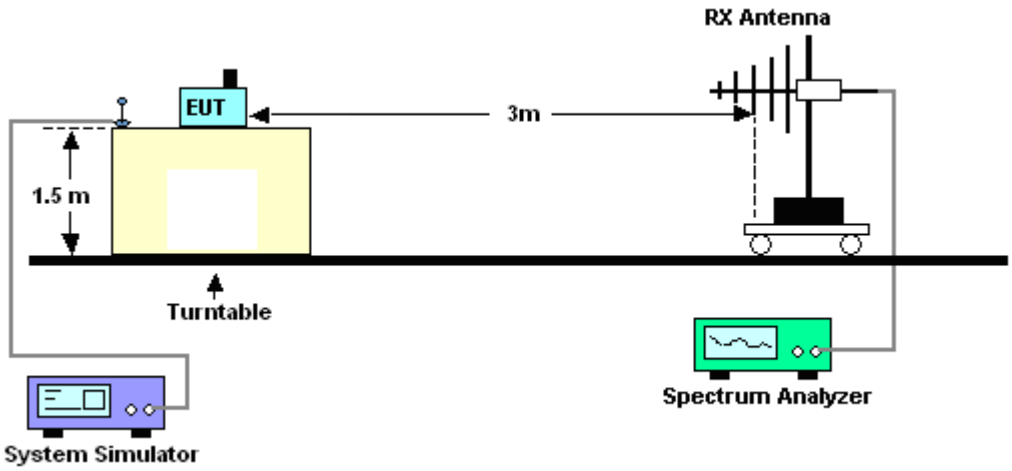
Please refer to the measuring equipment list in the section 4 of this test report.

3.1.3 Test Procedure

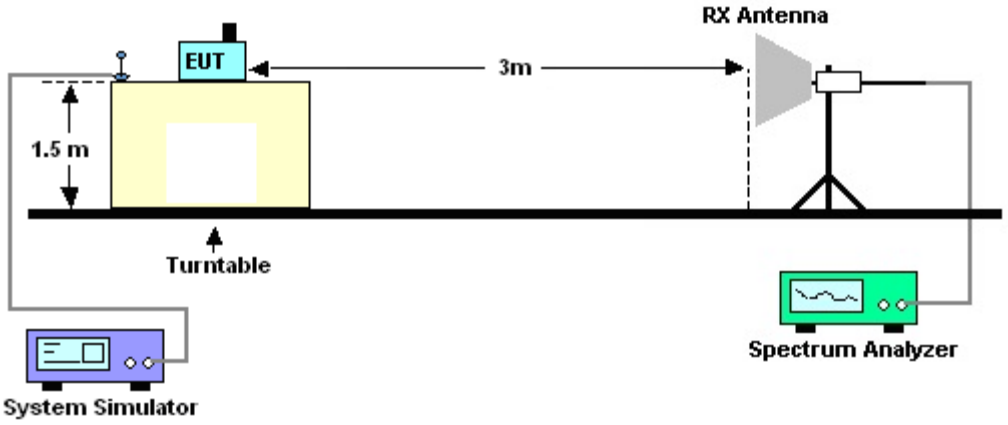
a. The equipment under test (EUT) is placed on a turntable inside a fully anechoic chamber.
b. Establish EUT link (dedicated mode) with system simulator (Base Station) and allocate a middle channel with maximum output power.
c. Compensate the air loss in Base Station, the BS level is set to –75 dBm.
d. The pre-calibration method has been performed ahead of testing so as to correct the readings from the spectrum analyzer.
e. All spurious emissions radiated by the EUT are detected by the receive antenna and the test frequency range is from 30 MHz to 4 GHz.
f. Repeat the testing for idle mode.

3.1.4 Test Setup

<Below 1GHz>

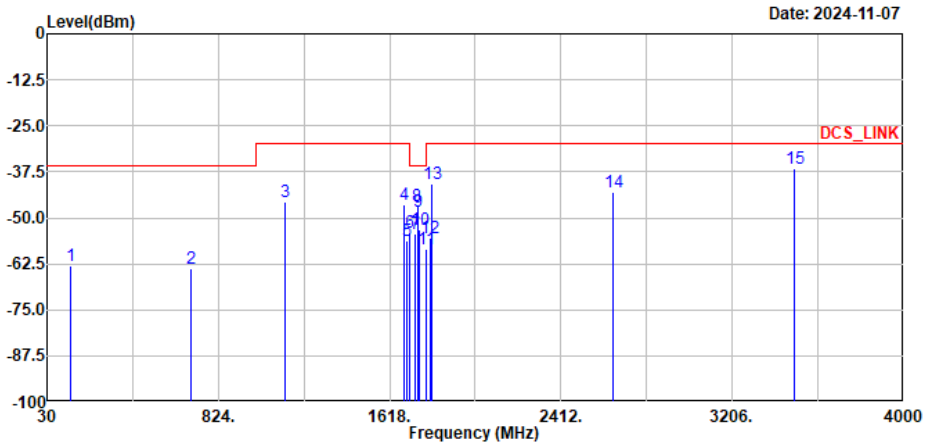


<Above 1GHz>



3.1.5 Test Data

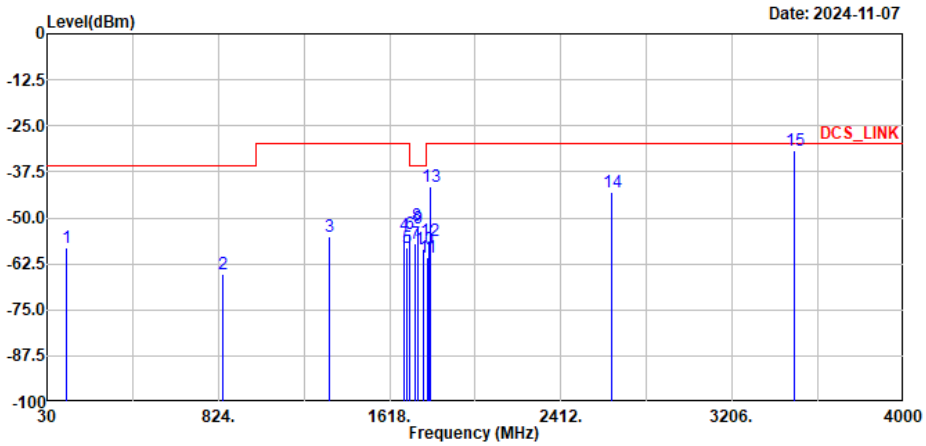
Test Mode :	Mode 1



Site : 05CH02-HY
Condition: DCS_LINK HORIZONTAL
Pretest : 491806
Mode : 1
Plane : Ant_0

	Result	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
		MHz	dBm	dB	dBm	dBm	dB	
1		137.75	-63.05	-27.05	-36.00	-57.34	-5.71	HORIZONTAL
2		696.50	-63.83	-27.83	-36.00	-64.58	0.75	HORIZONTAL
3		1131.24	-45.62	-15.62	-30.00	-50.32	4.70	HORIZONTAL
4		1683.02	-46.37	-16.37	-30.00	-55.47	9.10	HORIZONTAL
5		1699.41	-56.34	-26.34	-30.00	-65.68	9.34	HORIZONTAL
6		1708.84	-53.93	-23.93	-30.00	-63.41	9.48	HORIZONTAL
7		1735.60	-54.48	-18.48	-36.00	-64.36	9.88	HORIZONTAL
8		1745.73	-46.94	-10.94	-36.00	-56.97	10.03	HORIZONTAL
9		1749.49	-48.39	-12.39	-36.00	-58.47	10.08	HORIZONTAL
10		1754.23	-53.35	-17.35	-36.00	-63.51	10.16	HORIZONTAL
11		1785.47	-58.58	-28.58	-30.00	-69.21	10.63	HORIZONTAL
12		1803.63	-55.51	-25.51	-30.00	-66.36	10.85	HORIZONTAL
13		1814.44	-40.82	-10.82	-30.00	-51.71	10.89	HORIZONTAL
14		2651.61	-43.12	-13.12	-30.00	-56.05	12.93	HORIZONTAL
15	@	3495.00	-36.54	-6.54	-30.00	-53.50	16.96	HORIZONTAL

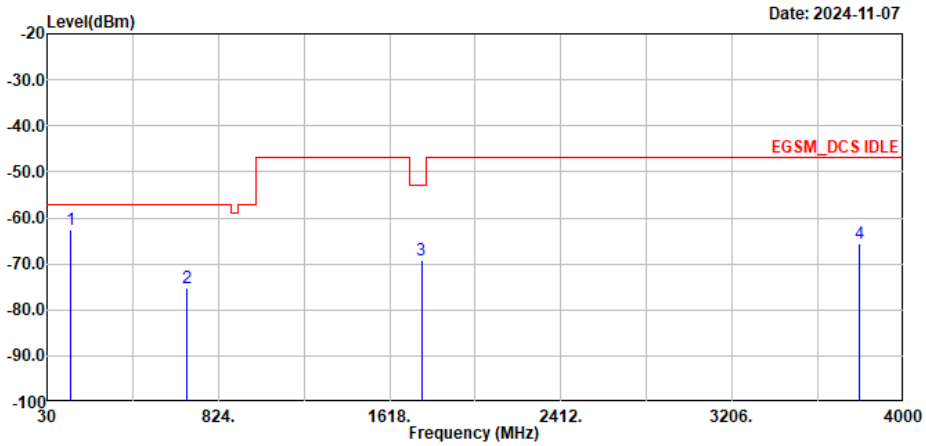
Test Mode :	Mode 1



Site : 05CH02-HY
Condition: DCS_LINK VERTICAL
Pretest : 491806
Mode : 1
Plane : Ant_0

	Result	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
		MHz	dBm	dB	dBm	dBm	dB	
1		120.65	-58.15	-22.15	-36.00	-55.60	-2.55	VERTICAL
2		847.00	-65.10	-29.10	-36.00	-66.45	1.35	VERTICAL
3		1340.68	-55.03	-25.03	-30.00	-61.81	6.78	VERTICAL
4		1685.89	-54.56	-24.56	-30.00	-63.00	8.44	VERTICAL
5		1698.26	-58.16	-28.16	-30.00	-66.77	8.61	VERTICAL
6		1709.99	-54.46	-24.46	-30.00	-63.25	8.79	VERTICAL
7		1735.69	-56.88	-20.88	-36.00	-66.02	9.14	VERTICAL
8		1745.73	-52.03	-16.03	-36.00	-61.32	9.29	VERTICAL
9		1749.47	-52.65	-16.65	-36.00	-61.98	9.33	VERTICAL
10		1773.63	-58.40	-22.40	-36.00	-68.08	9.68	VERTICAL
11		1794.29	-60.81	-30.81	-30.00	-70.77	9.96	VERTICAL
12		1800.79	-56.35	-26.35	-30.00	-66.39	10.04	VERTICAL
13		1806.52	-41.46	-11.46	-30.00	-51.51	10.05	VERTICAL
14		2644.50	-43.01	-13.01	-30.00	-55.99	12.98	VERTICAL
15	@	3495.00	-31.58	-1.58	-30.00	-47.82	16.24	VERTICAL

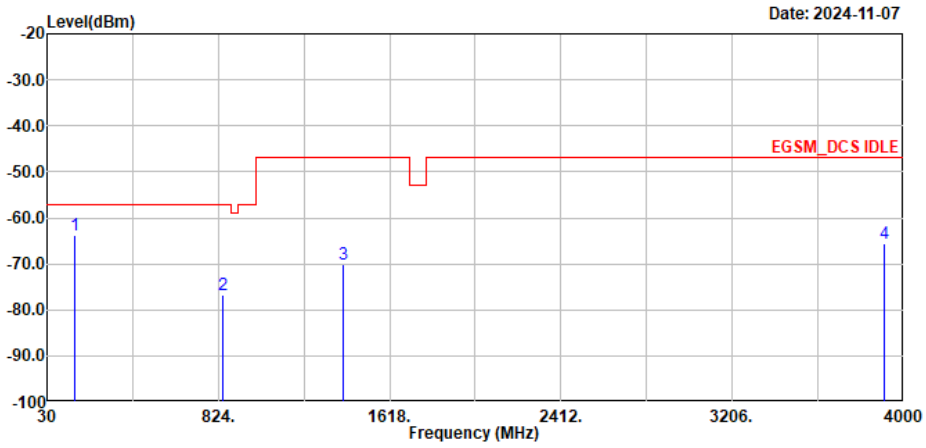
Test Mode :	Mode 2



Site : 05CH02-HY
Condition: EGSM_DCS IDLE HORIZONTAL
Pretest : 491806
Mode : 2
Plane : Ant_0

	Result	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
		MHz	dBm	dB	dBm	dBm	dB	
1	@	137.40	-62.47	-5.47	-57.00	-56.89	-5.58	HORIZONTAL
2		677.95	-75.33	-18.33	-57.00	-76.29	0.96	HORIZONTAL
3		1765.00	-69.30	-16.30	-53.00	-49.32	-19.98	HORIZONTAL
4		3796.00	-65.71	-18.71	-47.00	-50.73	-14.98	HORIZONTAL

Test Mode :	Mode 2



Site : 05CH02-HY
Condition: EGSM_DCS IDLE VERTICAL
Pretest : 491806
Mode : 2
Plane : Ant_0

	Result	Freq	Level	Over Limit	Limit Line	Read Level	Factor	Pol/Phase
		MHz	dBm	dB	dBm	dBm	dB	
1	@	160.20	-63.63	-6.63	-57.00	-56.64	-6.99	VERTICAL
2		846.10	-76.87	-19.87	-57.00	-78.35	1.48	VERTICAL
3		1405.00	-70.00	-23.00	-47.00	-47.35	-22.65	VERTICAL
4		3910.00	-65.60	-18.60	-47.00	-51.02	-14.58	VERTICAL

4. List of Measuring Equipment

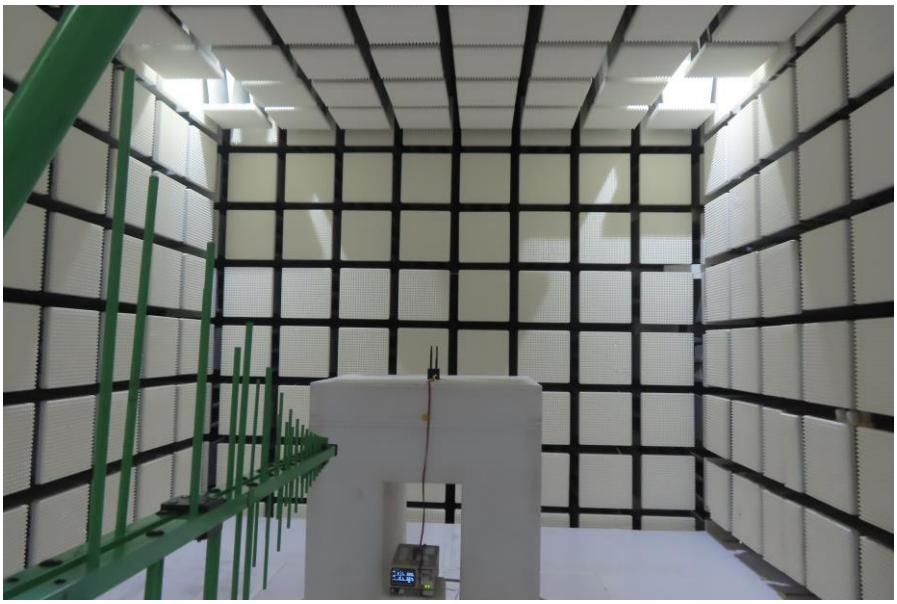
Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Signal Analyzer	R&S	FSV3044	101247	10Hz~44GHz	May 23, 2024	Nov. 07, 2024	May 22, 2025	Radiation (05CH02-HY)
Bilog Antenna	Schaffner	CBL6112B	2892	25MHz ~ 2GHz	Oct. 05, 2024	Nov. 07, 2024	Oct. 04, 2025	Radiation (05CH02-HY)
Preamplifier	Keysight	83017A	MY57280138	1GHz ~ 26.5GHz	Oct. 11, 2024	Nov. 07, 2024	Oct. 10, 2025	Radiation (05CH02-HY)
Hygrometer	Testo	608-H1	34893240	N/A	Nov. 01, 2024	Nov. 07, 2024	Oct. 31, 2025	Radiation (05CH02-HY)
Horn Antenna	ESCO	3117	00143261	1GHz~18GHz	Feb. 29, 2024	Nov. 07, 2024	Feb. 28, 2025	Radiation (05CH02-HY)
Preamplifier	Langer	EM330	060364	100kHz~3GHz	Oct. 07, 2024	Nov. 07, 2024	Oct. 06, 2025	Radiation (05CH02-HY)
Antenna Mast	INN-CO	MM 3000	N/A	1m~2m	N/A	Nov. 07, 2024	N/A	Radiation (05CH02-HY)
Turn Table	INN-CO	DS2000	520604	Deg 0~ 360	N/A	Nov. 07, 2024	N/A	Radiation (05CH02-HY)
software	AUDIX	e3 210616 sporton	RK-002309	N/A	N/A	Nov. 07, 2024	N/A	Radiation (05CH02-HY)
Preamplifier	Jet-Power	JPA00101800-30-10P	1601180001	1GHz~18GHz	Jul. 15, 2024	Nov. 07, 2024	Jul. 14,2025	Radiation (05CH02-HY)

5. Measurement Uncertainty

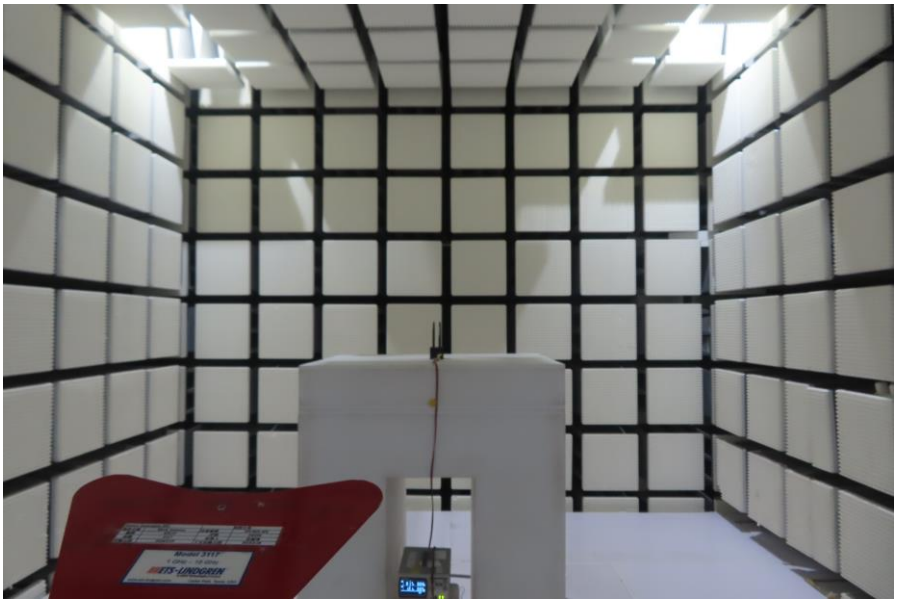
Test Item	Frequency Range	Uncertainty
Radiated emissions	30MHz ~ 1GHz	±2.92dB
	1GHz ~ 12.75GHz	±3.06dB

Appendix A. Photographs of Radiated Emission Test Configuration

25MHz ~ 1GHz



1GHz ~ 18GHz



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