



Test Report No. : 4790181997-JP-R1-V0

Page : 1 of 28

Issued date : 2021/12/16

RADIO TEST REPORT

Product : Wireless Headset

Model Name : A00151

Test Regulation : Article 2 paragraph 1 item 19, MIC notice 88 Appendix 43
ARIB STD-T66

Received Date : 2021/11/10

Test Date : 2021/11/10 ~ 2021/11/18

Issued Date : 2021/12/16

Applicant : Logitech Far East Ltd.
#2 Creation Rd. 4, Science-Based Ind. Park Hsinchu Taiwan,
R.O.C.

Issued By : Underwriters Laboratories Taiwan Co., Ltd.
Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd.,
Zhudong Township, Hsinchu County, Taiwan

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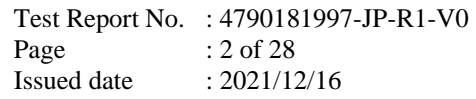
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Doc No: 17-EM-F0967 / 3.0



Original Test Report No.: 4790181997-JP-R1-V0

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Table of Contents

1. Attestation of Test Results	5
2. Summary of Test Results	6
3. Test Methodology and Reference Procedures.....	7
4. Facilities and Accreditation	7
5. Measurement Uncertainty	8
6. General Information	9
6.1. General Description of EUT	9
6.2. Description of test mode	11
6.3. Test Condition.....	12
6.4. Description of Available Antennas	12
6.4.1. Antenna Specification	12
6.4.2. Antenna Pattern.....	12
7. Test Instruments	13
8. Test Results.....	14
8.1. Frequency Tolerance.....	14
8.1.1 Requirements.....	14
8.1.2 Test Setup.....	14
8.1.3 Test Results	15
8.2. Occupied Bandwidth (99% Channel Power Bandwidth).....	16
8.2.1 Requirements.....	16
8.2.2 Test Setup.....	16
8.2.3 Test Results	17
8.3. Spreading Bandwidth (90% Channel Power Bandwidth).....	18
8.3.1 Requirements.....	18
8.3.2 Test Setup.....	18
8.3.3 Test Results	19
8.4. Spurious Emissions for Transmitter.....	20
8.4.1 Requirements.....	20
8.4.2 Test Setup.....	20
8.4.3 Test Results	21
8.5. Antenna Power	23
8.5.1 Requirements.....	23
8.5.2 Test Setup.....	23
8.5.3 Test Results	24
8.6. Spurious Emissions for Receiver	25
8.6.1 Requirements.....	25
8.6.2 Test Setup.....	25
8.6.3 Test Results	26

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8.7.	Interference Prevention Function.....	27
8.7.1	Requirements.....	27
8.7.2	Test Setup.....	27
8.7.3	Test Results	27
9.	Conducted Emission Measurement Setup Configurations	28



1. Attestation of Test Results

APPLICANT: Logitech Far East Ltd.
#2 Creation Rd. 4, Science-Based Ind. Park Hsinchu Taiwan, R.O.C.

MANUFACTURER: Logitech Europe S.A.
EPFL – Quartier de l’Innovation, Daniel Borel Innovation Center,
1015 Lausanne, Switzerland

EUT DESCRIPTION: Wireless Headset

BRAND: logicool G

MODEL: A00151

SAMPLE STAGE: Engineering Verification Test sample

DATE of TESTED: 2021/11/10 ~ 2021/11/18

APPLICABLE STANDARDS	
STANDARD	Test Results
Article 2 paragraph 1 item 19, MIC notice 88 Appendix 43	PASS
ARIB STD-T66	PASS

Underwriters Laboratories Taiwan Co., Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by Underwriters Laboratories Taiwan Co., Ltd. based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Underwriters Laboratories Taiwan Co., Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Underwriters Laboratories Taiwan Co., Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

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Date : 2021/12/16

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Date : 2021/12/16

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2. Summary of Test Results

Summary of Test Results		
Test Items	MIC Notice	Test Result
Frequency Tolerance	MIC Notice No. 88 Appendix No. 43	PASS
Occupied Bandwidth (99% channel power bandwidth)		PASS
Spreading Bandwidth (90% channel power bandwidth)		PASS
Spurious Emission Transmitter		PASS
Antenna Power		PASS
Spurious Emission Receiver		PASS
Interference Prevention Function		PASS



3. Test Methodology and Reference Procedures

The tests documented in this report were performed in accordance with Article 2 paragraph 1 item 19, MIC notice 88 Appendix 43.

4. Facilities and Accreditation

Test Location	Underwriters Laboratories Taiwan Co., Ltd.
Address	Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan
Accreditation Certificate	Underwriters Laboratories Taiwan Co., Ltd. is accredited by TAF, Laboratory Code 3398.



5. Measurement Uncertainty

For statement of conformity, accuracy method (Section 8.2.4 and 8.2.5 of ISO Guide 98-4) was applied as decision rule for measurement in this test report.

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor $k=2$.

Parameter	Uncertainty
Occupied Bandwidth	± 0.12 %
Spurious emissions	± 1.9 dB
Output power density	± 2.0 dB
Out of band radiated power	± 1.9 dB
Frequency Tolerance	± 0.12 %



6. General Information

6.1. General Description of EUT

Product	Wireless Headset
Brand	logicool G
Model Name	A00151
Sample ID	Conducted Test: 4383734 Radiated Test: 4383731
Radio Technology	SRD
Operating Frequency	2403.35MHz ~ 2477.35MHz
Modulation	$\pi/4$ -DQPSK
Transfer Rate	Up to 3 Mbps
Nominal Voltage	3.7Vdc from battery 5Vdc from Host
Number of Channel	38
Rated RF Output Power Density	Refer to Note
Conducted RF Output Power Density	Refer to Note
Radiated RF Output Power Density	Refer to Note
Antenna Specification	Refer to item 6.4



Note:

1. The EUT contains following accessory devices:

Product	Brand	Model	Description
USB Cable	logicoool G	USB-C to USB-A Charging Cable	Length: 1.9m
Microphone	logicoool G	A00166	-
Type C to USB adapter	logicoool G	502-001387	-

2. The EUT could be option supplied with rechargeable battery as the following table:

Brand Name	Model No.	Spec.
HIGHPOWER	533-000181 / 604050	1500mAh 3.7V 5.55Wh

3. The power table as below:

	Total Conducted RF Output Power Density (mW)	Rated Power (mW)	Radiated RF Output Power Density (mW)
SRD	0.51	0.51	0.17

4. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

5. Test Environment:

Measurement temperature : 22 °C ~ 26°C

Measurement humidity : 55% ~ 65%

6. Test Personnel: Mike Cai.



6.2. Description of test mode

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	2403.35	10	2423.35	20	2443.35	30	2463.35
1	2405.35	11	2425.35	21	2445.35	31	2465.35
2	2407.35	12	2427.35	22	2447.35	32	2467.35
3	2409.35	13	2429.35	23	2449.35	33	2469.35
4	2411.35	14	2431.35	24	2451.35	34	2471.35
5	2413.35	15	2433.35	25	2453.35	35	2473.35
6	2415.35	16	2435.35	26	2455.35	36	2475.35
7	2417.35	17	2437.35	27	2457.35	37	2477.35
8	2419.35	18	2439.35	28	2459.35	-	-
9	2421.35	19	2441.35	29	2461.35	-	-

NOTE:

1. By means of test software provided by manufacture, the power levels during the tests were set according to the following codes:

Modulation type: $\pi/4$ -DQPSK	
Channel	Power Setting
0	Default
19	Default
37	Default



6.3. Test Condition

Test Conditions	Voltage (Vdc)
V_normal	3.7

Note: Since the input voltage to receiver RF circuit varies below $\pm 1\%$ when the input voltage from the external power supply to the receiver varies $\pm 10\%$, therefore only execute normal condition test.

6.4. Description of Available Antennas

6.4.1. Antenna Specification

Ant. No.	Transmitter Circuit	Ant. Type	Maximum Gain (dBi)
Ant0	Chain (0)	PCB	-4.7
Ant1	Chain (1)	PCB	-8

The above information was provided from customer and for more detailed features description, please refer to the customer's specifications.

6.4.2. Antenna Pattern

Please refer to the manufacturer's antenna report.



7. Test Instruments

Description	Manufacturer	Model No.	Serial No.	Calibration Authority	Cal. Method	Cal. Date	Expired date
Spectrum Analyzer	Rohde & Schwarz	FSV40	101490	Electronics Testing Center	c)	2021/9/7	2022/9/6
Power meter	Anritsu	MA2411B	1531202	Electronics Testing Center	c)	2020/12/21	2021/12/20
Power sensor	Anritsu	ML2495A	1645002	Electronics Testing Center	c)	2020/12/21	2021/12/20
Signal Generator	Keysight	N5182B	MY56200244	Electronics Testing Center	c)	2021/1/15	2022/1/14

Note: Calibration Method

- a) : Calibration conducted by the National Institute of Information and Communications Technology ~ NICT ~ or a designated calibration agency under Article 102-18 paragraph (1) ~ TELEC Engineering Center, Intertek Japan K.K., Keysight Technologies, Inc ~.
- b) : Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992) ~ Japan Calibration Service System ~.
- c) : Calibration conducted in foreign countries, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1) ~ TELEC Engineering Center, Intertek Japan K.K., Keysight Technologies, Inc ~.
- d) : Calibration conducted by using other equipment that listed above from a) to c).



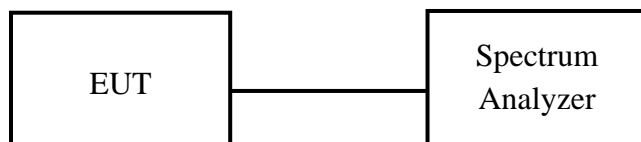
8. Test Results

8.1. Frequency Tolerance

8.1.1 Requirements

The limitation of Frequency Tolerance is less than or equal to $\pm 50\text{ppm}$.

8.1.2 Test Setup





8.1.3 Test Results

Mode	Voltage (Vdc)	Freq. (MHz)	Carrier Frequency (MHz)	Frequency Tolerance (ppm)	Limits (ppm)
SRD	Normal	2403.35	2403.382	13.3147	+/- 50ppm
		2441.35	2441.381	12.6979	+/- 50ppm
		2477.35	2477.38	12.1097	+/- 50ppm

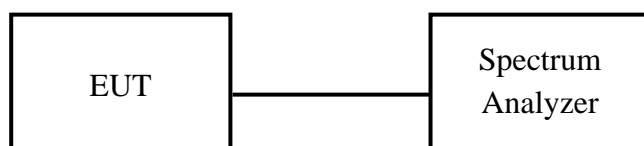


8.2. Occupied Bandwidth (99% Channel Power Bandwidth)

8.2.1 Requirements

Item	Limits
Occupied Bandwidth	FH, FH+DS, FH+OFDM: $\leq 83.5\text{MHz}$ Others: $\leq 26\text{MHz}$ OFDM1: $\leq 26\text{MHz}$ OFDM2: $26\text{MHz} < \text{BW} \leq 38\text{MHz}$

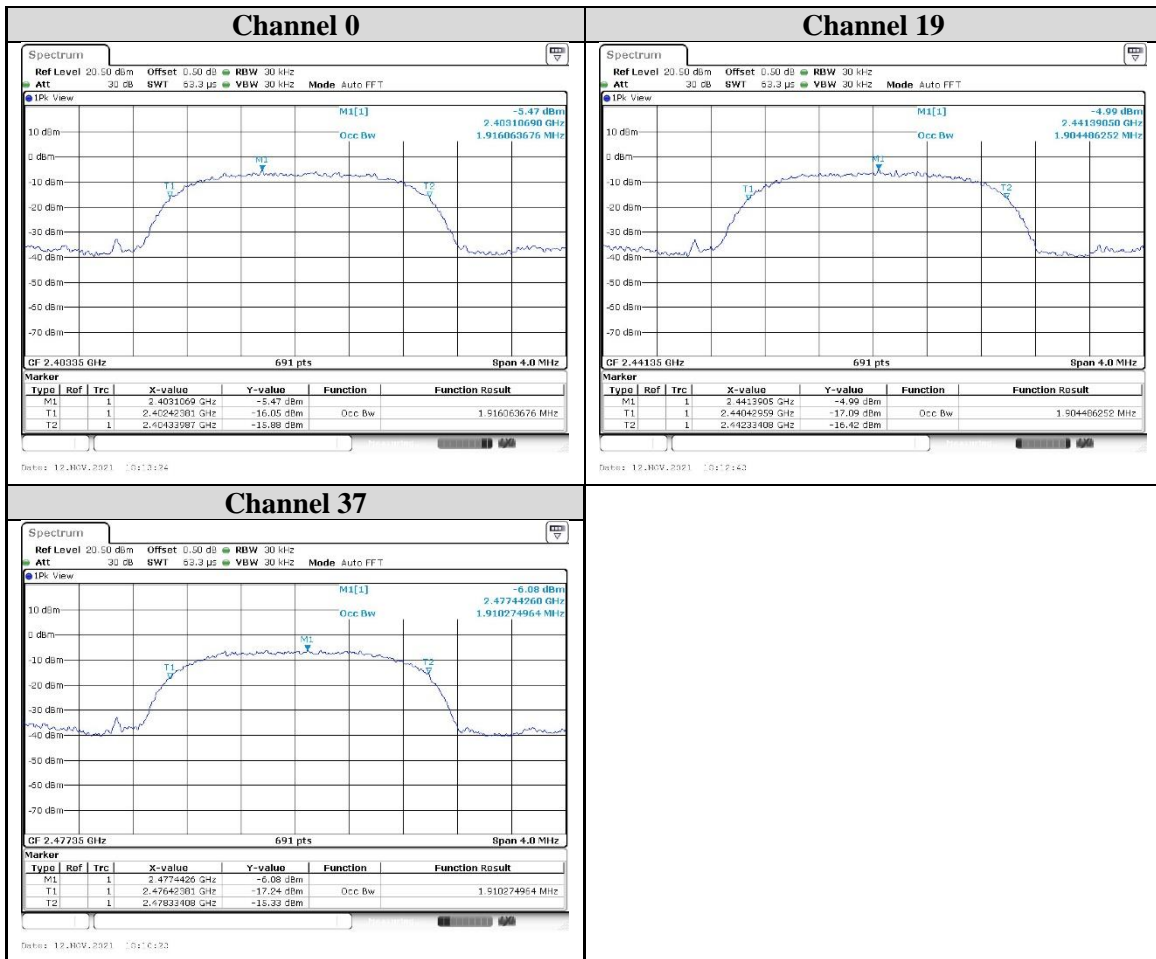
8.2.2 Test Setup





8.2.3 Test Results

Mode	Voltage	Frequency (MHz)	99% Bandwidth (MHz)	Limit (MHz)	Pass/Fail
SRD	Vnormal	2403.35	1.92	≤ 26	PASS
		2441.35	1.90	≤ 26	PASS
		2477.35	1.91	≤ 26	PASS



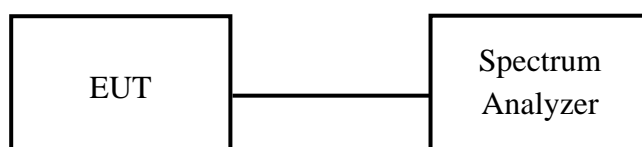


8.3. Spreading Bandwidth (90% Channel Power Bandwidth)

8.3.1 Requirements

Item	Limit	Remark
Spreading Bandwidth	≥ 500 kHz	(For DSSS, FHSS)
Spreading Factor	≥ 5	Operating frequency 2400 to 2483.5 MHz

8.3.2 Test Setup



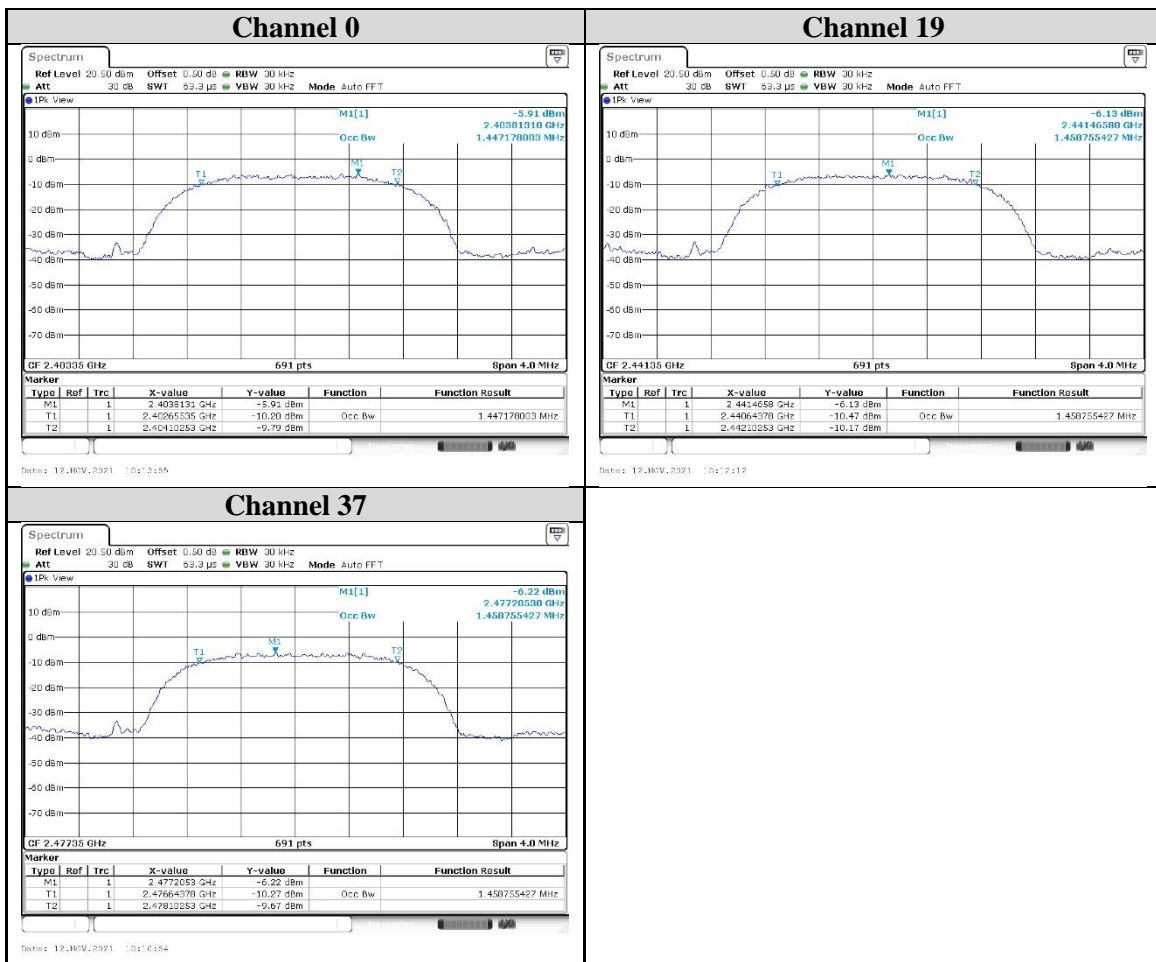


8.3.3 Test Results

Mode	Voltage	Frequency (MHz)	Occupied Bandwidth (MHz)	Spreading Factor	Limit	Pass/Fail
SRD	Vnormal	2403.35	1.45	23.15	≥ 5	PASS
		2441.35	1.46	23.33	≥ 5	PASS
		2477.35	1.46	23.33	≥ 5	PASS

Note: 1. For the test plots please refer to the below pages.

2. Spreading Factor: 90 % channel power bandwidth / 0.0625.



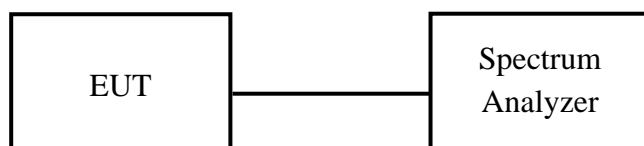


8.4. Spurious Emissions for Transmitter

8.4.1 Requirements

Frequencies(MHz)	Limits
30MHz-1GHz	$\leq 0.25 \mu\text{W}/100\text{kHz}$
1GHz-2.387GHz	$\leq 2.5 \mu\text{W}/\text{MHz}$
2.387GHz-2.4GHz	$\leq 25 \mu\text{W}/\text{MHz}$
2.4835GHz-2.4965GHz	$\leq 25 \mu\text{W}/\text{MHz}$
2.4965GHz -13GHz	$\leq 2.5 \mu\text{W}/\text{MHz}$

8.4.2 Test Setup





8.4.3 Test Results

Normal Voltage

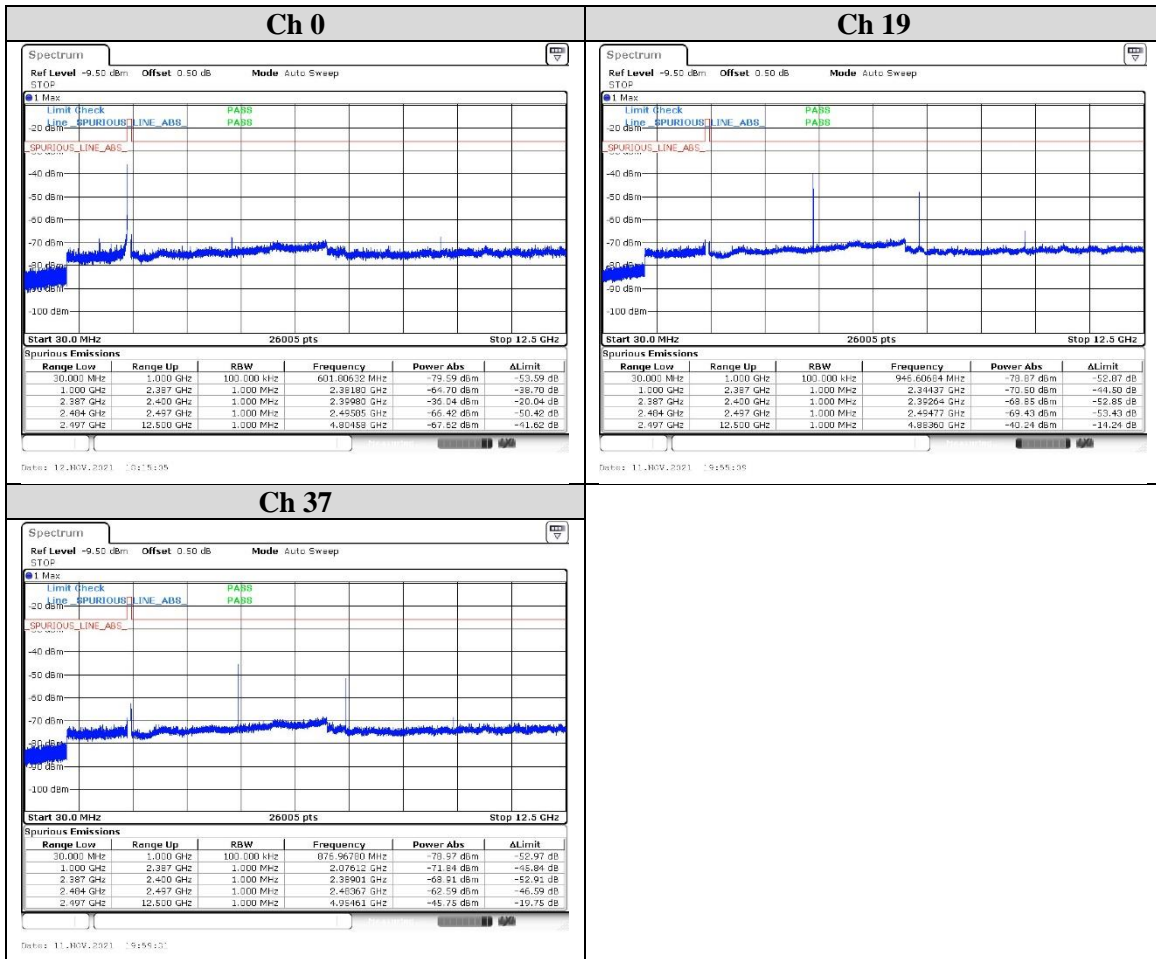
Test Ch.	Tested Freq. Range (MHz)	Test Result		Limit per Chain (μW)	Worst (μW)	Limit (μW)	Result
		Freq. (MHz)	Value (μW)				
0	30.0 to 1000.0	601.806	0.000011	0.25	0.000011	0.25	PASS
	1000.0 to 2387.0	2381.801	0.000339	2.5	0.000339	2.5	PASS
	2387.0 to 2400.0	2399.802	0.248886	25	0.248886	25	PASS
	2483.5 to 2496.5	2495.847	0.000228	25	0.000228	25	PASS
	2496.5 to 12500.0	4804.577	0.000173	2.5	0.000173	2.5	PASS
19	30.0 to 1000.0	946.607	0.000013	0.25	0.000013	0.25	PASS
	1000.0 to 2387.0	2344.371	0.000089	2.5	0.000089	2.5	PASS
	2387.0 to 2400.0	2392.642	0.000130	25	0.00013	25	PASS
	2483.5 to 2496.5	2494.769	0.000114	25	0.000114	25	PASS
	2496.5 to 12500.0	4883.597	0.094624	2.5	0.094624	2.5	PASS
37	30.0 to 1000.0	876.968	0.000013	0.25	0.000013	0.25	PASS
	1000.0 to 2387.0	2076.121	0.000065	2.5	0.000065	2.5	PASS
	2387.0 to 2400.0	2389.011	0.000129	25	0.000129	25	PASS
	2483.5 to 2496.5	2483.672	0.000551	25	0.000551	25	PASS
	2496.5 to 12500.0	4954.614	0.026607	2.5	0.026607	2.5	PASS



Test Report No. : 4790181997-JP-R1-V0

Page : 22 of 28

Issued date : 2021/12/16



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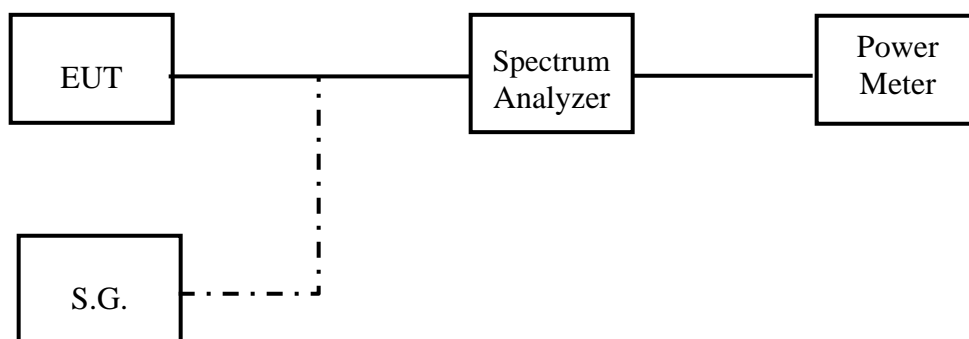


8.5. Antenna Power

8.5.1 Requirements

Item	Limits
Antenna Power Density	$\leq 3 \text{ mW/MHz}$ (2427~2470.75MHz)
	DS: $\leq 10 \text{ mW/MHz}$
	OFDM: $\leq 10 \text{ mW/MHz}$ (Bandwidth $\leq 26\text{MHz}$)
	OFDM: $\leq 5 \text{ mW/MHz}$ ($26\text{MHz} < \text{Bandwidth} \leq 38\text{MHz}$)
	Others: $\leq 10 \text{ mW}$

8.5.2 Test Setup





8.5.3 Test Results

Normal Voltage

Channel	Antenna Power (mW)	Antenna Power Limit (mW)	Rated Power (mW)	Antenna Power Tolerance (%)	Tolerance Range Limit (%)	Antenna Gain (dBi)	EIRP Antenna Power (mW)	EIRP Antenna Power Limit (mW)
0	0.48	10.00	0.51	-5.88	+20% ~ -80%	-4.7	0.16	16.37
19	0.51	10.00	0.51	0.00	+20% ~ -80%	-4.7	0.17	16.37
37	0.50	10.00	0.51	-1.96	+20% ~ -80%	-4.7	0.17	16.37

Note:

1. Antenna Power Tolerance (%) = {(Conducted Antenna Power – Rated power)/Rated power*100}.
2. EIRP Antenna Power = Conducted Antenna Power + Antenna gain.

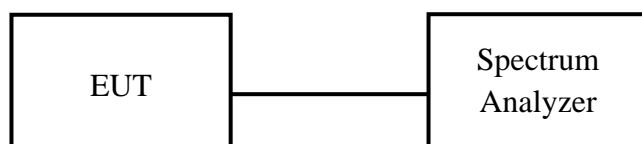


8.6. Spurious Emissions for Receiver

8.6.1 Requirements

Frequencies (MHz)	Limit
Below 1 GHz	≤ 4 nW (-54 dBm)
Above 1 GHz	≤ 20 nW (-47 dBm)

8.6.2 Test Setup

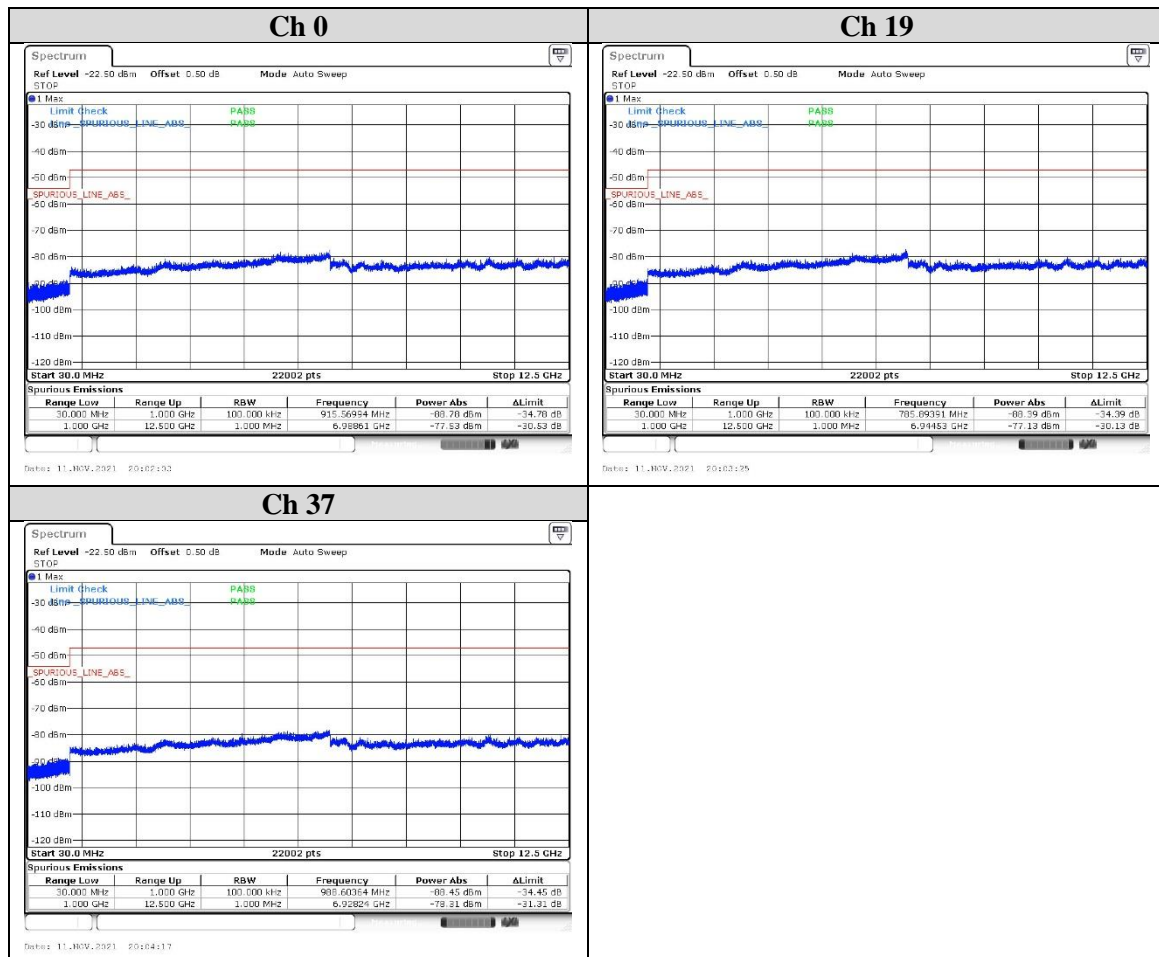




8.6.3 Test Results

Normal Voltage

Test Ch.	Tested Freq. Range (MHz)	Test Result		Per Chain Limit (nW)	Total Value (nW)	Total Limit (nW)	Result
		Freq. (MHz)	Value (nW)				
0	Below 1 GHz	915.570	0.001324	4	0.001324	4	PASS
	Above 1 GHz	6988.605	0.017660	20	0.01766	20	PASS
19	Below 1 GHz	785.894	0.001449	4	0.001449	4	PASS
	Above 1 GHz	6944.525	0.019364	20	0.019364	20	PASS
37	Below 1 GHz	988.604	0.001429	4	0.001429	4	PASS
	Above 1 GHz	6928.235	0.014757	20	0.014757	20	PASS



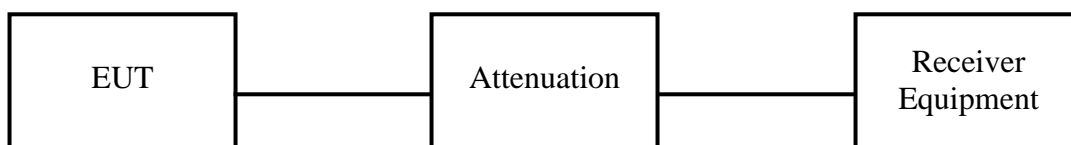


8.7. Interference Prevention Function

8.7.1 Requirements

Radio equipment used mainly on the same premises and automatically transmits or receives identification code.

8.7.2 Test Setup



8.7.3 Test Results

Link Mode	Test Result
SRD	PASS

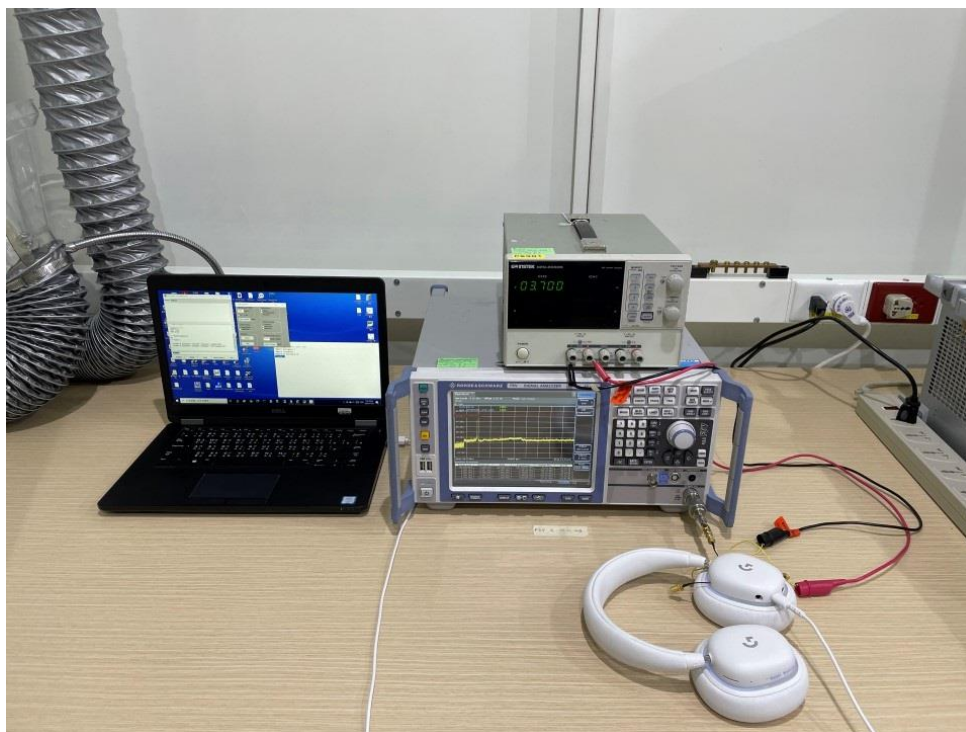


Test Report No. : 4790181997-JP-R1-V0

Page : 28 of 28

Issued date : 2021/12/16

9. Conducted Emission Measurement Setup Configurations



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