RADIO TEST REPORT

Product	:	Wireless Dongle
Model Name	:	A00142
Test Regulation	:	Article 2 paragraph 1 item 19, MIC notice 88 Appendix 43 ARIB STD-T66
Received Date	:	2021/8/31
Test Date	:	2021/8/31 ~ 2021/9/13
Issued Date	:	2021/9/15
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

REVISION HISTORY

Original Test Report No.: 4790083314-JP-R0-V0

Rev.	Test report No.	Date	Page revised	Contents
Original	4790083314-JP-R0-V0	2021/9/15	-	Initial issue

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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 I'Innovation, Daniel Borel Innovation Center, 1015 Lausanne, Switzerland
EUT DESCRIPTION:	Wireless Dongle
BRAND:	logitech G
MODEL:	A00142
SAMPLE STAGE:	Engineering Verification Test sample
DATE of TESTED:	2021/8/31 ~ 2021/9/13

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.

Prepared By:

Sally Lu Date : 2021/9/15
Project Handler

Approved and Authorized By:

Waternil Guan Date : 2021/9/15
Engineer

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. The full scope of accreditation can be viewed at http://accreditation.taftw.org.tw/taf/public/basic/viewApplyItems.action?unitNo=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 Dongle
Brand	logitech G
Model Name	A00142
Sample ID	Conducted Test: 416340 Radiated Test: 416341
Radio Technology	SRD
Operating Frequency	2402 ~ 2480 MHz
Modulation	GFSK
Transfer Rate	Up to 2 Mbps
Nominal Voltage	5Vdc from host
Number of Channel	40
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 may have a lot of colors for marketing requirement.

2. The power table as below:

	Total Conducted RF Output Power Density (mW/MHz)	Rated Power (mW/MHz)	Radiated RF Output Power Density (mW/MHz)
SRD_1Mbps	1.23	1.23	1.75
SRD_2Mbps	1.20	1.20	1.72

3. 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.

4. Test Environment:
   Measurement temperature : 22 ℃ ~ 26 ℃
   Measurement humidity : 62% ~ 68%

5. Test Personnel: Mike Cai

6.2. Description of test mode

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

NOTE:

1. Ch0, Ch12, Ch39 maximum data rate only 1Mbps, all the other channels can only operate in 2Mbps mode.
2. By means of test software provided by manufacture, the power levels during the tests were set according to the following codes:

Modulation type: GFSK	
Channel	**Power Setting**
0	Default
1	Default
12	Default
19	Default
38	Default
39	Default

6.3. Test Condition

Test Conditions	Voltage (Vdc)
V_normal	5

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

6.4. Description of Available Antennas

6.4.1. Antenna Specification

Ant. No.	Transmitter Circuit	Brand Name	Model Name	Ant. Type	Maximum Gain (dBi)
1	Chain (0)	logitech G	A00142	PCB	1.55

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
FSV40 Signal Analyzer	Rohde & Schwarz	FSV40	101490	Electronics Testing Center	c)	2020/9/21	2021/9/20
EXA Spectrum Analyzer	Keysight Technologies	N9010A	MY56070834	Electronics Testing Center	c)	2020/11/6	2021/11/5
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 Syste～.

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).

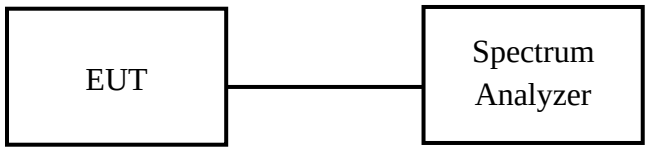
8. Test Results

8.1. Frequency Tolerance

9.1.1 Requirements

The limitation of Frequency Tolerance is less than or equal to +/-50ppm.

9.1.2 Test Setup



9.1.3 Test Results

Mode	Voltage (Vdc)	Freq. (MHz)	Carrier Frequency (MHz)	Frequency Tolerance (ppm)	Limits (ppm)
SRD_1Mbps	Normal	2402	2402.0232	9.6586	+/- 50ppm
		2426	2426.0261	10.7585	+/- 50ppm
		2480	2480.0261	10.5242	+/- 50ppm

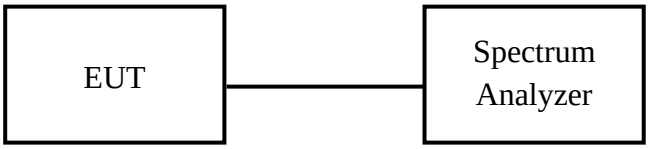
Mode	Voltage (Vdc)	Freq. (MHz)	Carrier Frequency (MHz)	Frequency Tolerance (ppm)	Limits (ppm)
SRD_2Mbps	Normal	2404	2403.9537	-19.2596	+/- 50ppm
		2440	2439.9392	-24.9180	+/- 50ppm
		2478	2477.9392	-24.5359	+/- 50ppm

8.2. Occupied Bandwidth (99% Channel Power Bandwidth)

9.2.1 Requirements

Item	Limits
Occupied Bandwidth	FH, FH+DS, FH+OFDM: ≤ 83.5MHz Others: ≤ 26MHz OFDM1: ≤ 26MHz OFDM2: 26MHz < BW≤38MHz

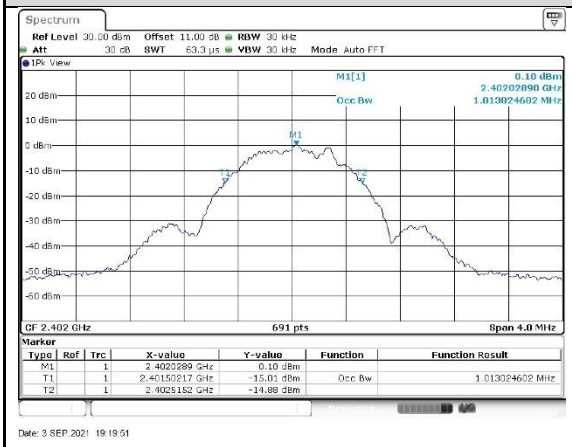
9.2.2 Test Setup



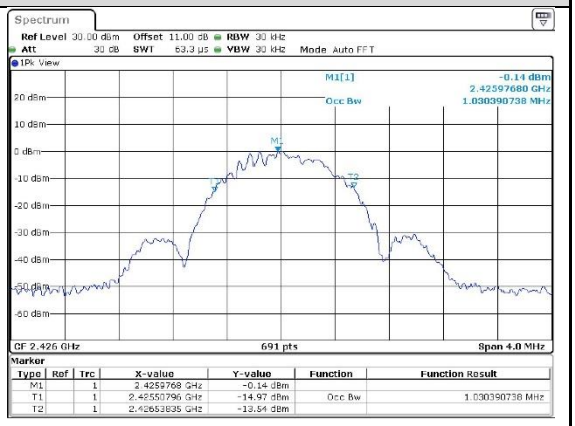
9.2.3 Test Results

Mode	Voltage	Frequency (MHz)	99% Bandwidth (MHz)	Limit (MHz)	Pass/Fail
SRD_1Mbps	Vnormal	2402	1.01	≤ 26	PASS
		2426	1.03	≤ 26	PASS
		2480	1.01	≤ 26	PASS

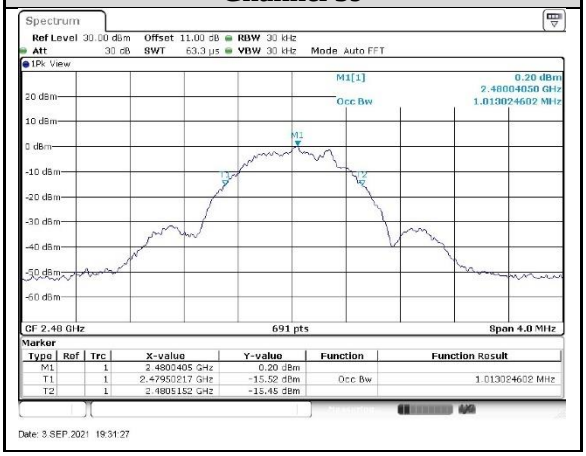
Channel 0



Channel 12

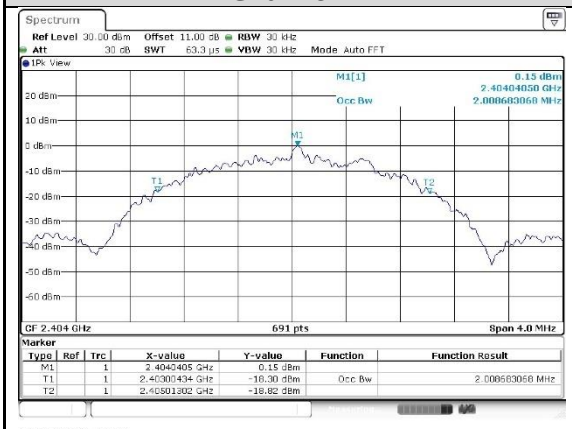


Channel 39

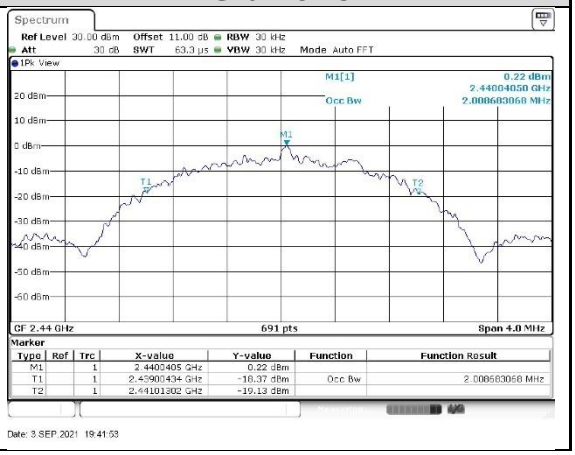


Mode	Voltage	Frequency (MHz)	99% Bandwidth (MHz)	Limit (MHz)	Pass/Fail
SRD_2Mbps	Vnormal	2404	2.01	≤ 26	PASS
		2440	2.01	≤ 26	PASS
		2478	2.01	≤ 26	PASS

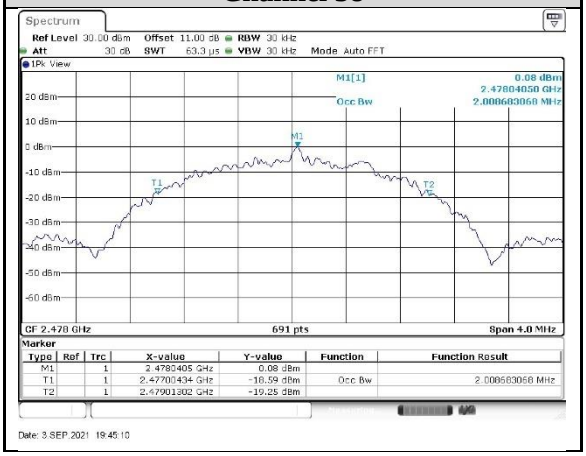
Channel 1



Channel 19



Channel 38

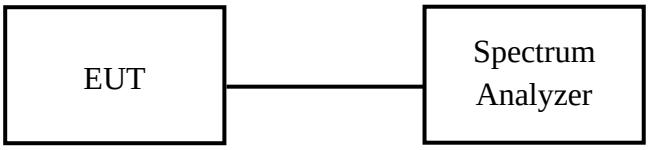


8.3. Spreading Bandwidth (90% Channel Power Bandwidth)

9.3.1 Requirements

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

9.3.2 Test Setup

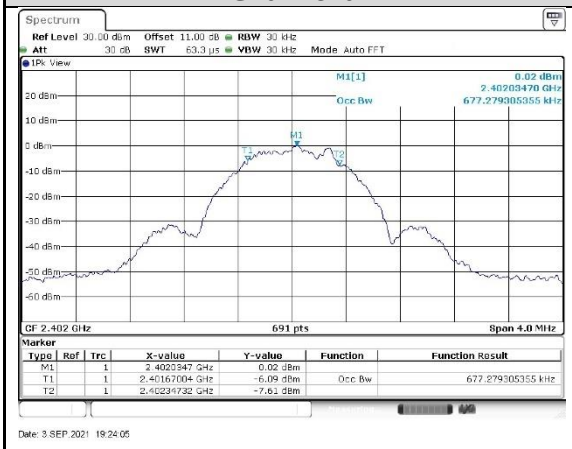


9.3.3 Test Results

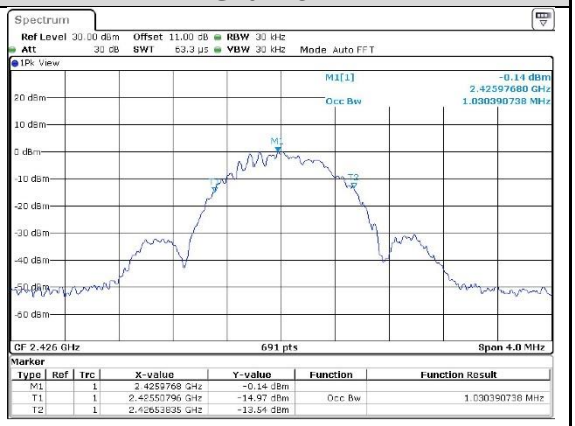
Mode	Voltage	Frequency (MHz)	Occupied Bandwidth (MHz)	Spreading Factor	Limit	Pass/Fail
SRD_1Mbps	Vnormal	2402	0.68	10.84	≥ 5	PASS
		2426	0.67	10.74	≥ 5	PASS
		2480	0.67	10.74	≥ 5	PASS

Note: 1. For the test plots please refer to the below pages.
2. Spreading Factor: 90 % channel power bandwidth / 0.0625.

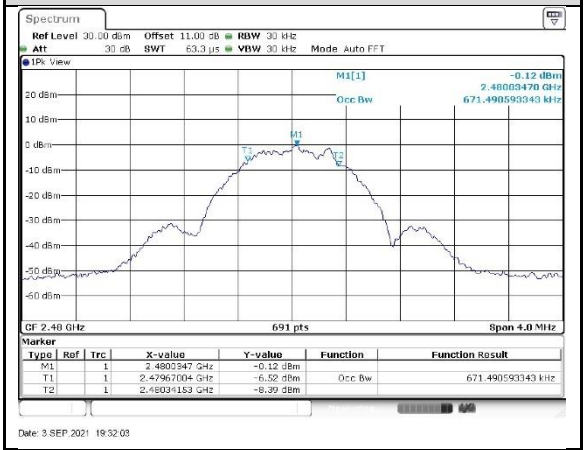
Channel 0



Channel 12



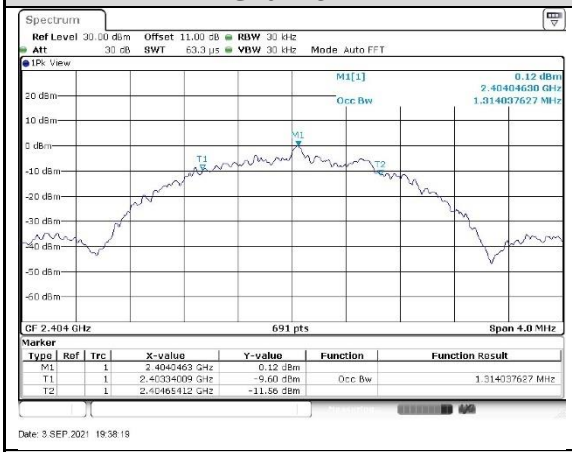
Channel 39



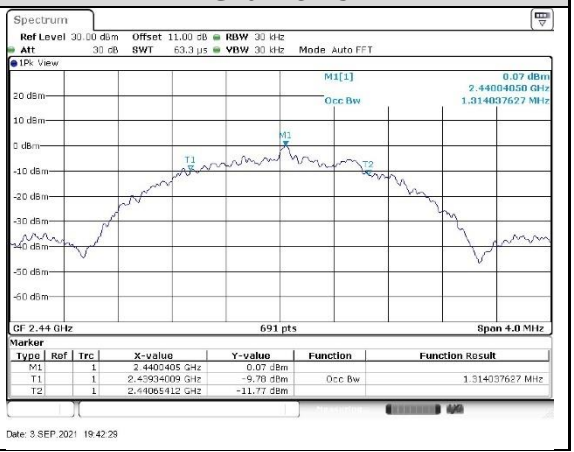
Mode	Voltage	Frequency (MHz)	Occupied Bandwidth (MHz)	Spreading Factor	Limit	Pass/Fail
SRD_2Mbps	Vnormal	2404	1.31	21.02	≥ 5	PASS
		2440	1.31	21.02	≥ 5	PASS
		2478	1.31	21.02	≥ 5	PASS

Note: 1. For the test plots please refer to the below pages.
2. Spreading Factor: 90 % channel power bandwidth / 0.0625.

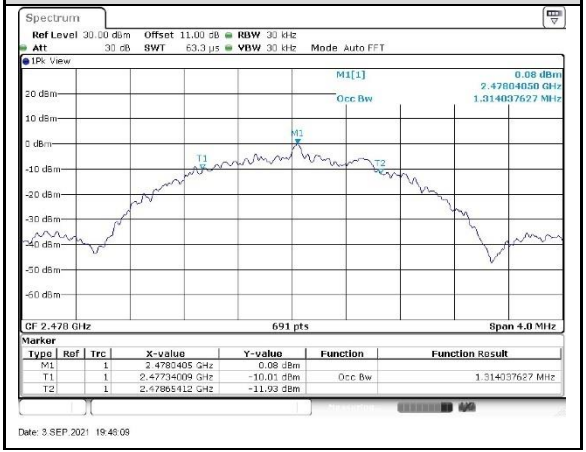
Channel 1



Channel 19



Channel 38

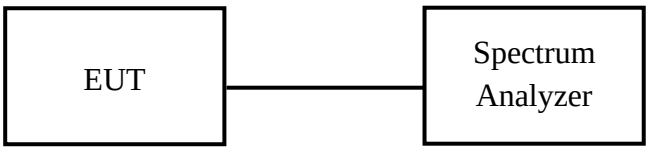


8.4. Spurious Emissions for Transmitter

9.4.1 Requirements

Frequencies(MHz)	Limits
30MHz-1GHz	≤ 0.25 μW/100kHz
1GHz-2.387GHz	≤ 2.5 μW/MHz
2.387GHz-2.4GHz	≤ 25 μW/MHz
2.4835GHz-2.4965GHz	≤ 25 μW/MHz
2.4965GHz -13GHz	≤ 2.5 μW/MHz

9.4.2 Test Setup

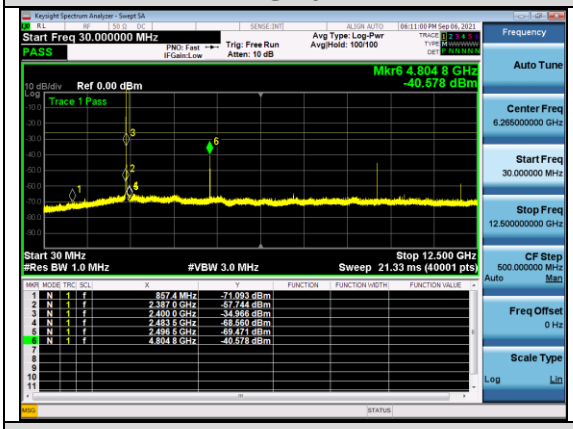
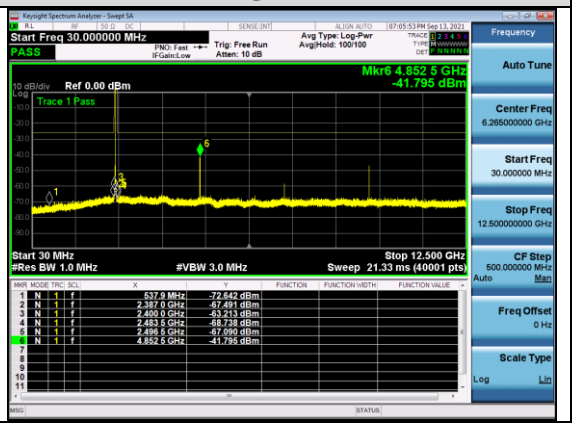


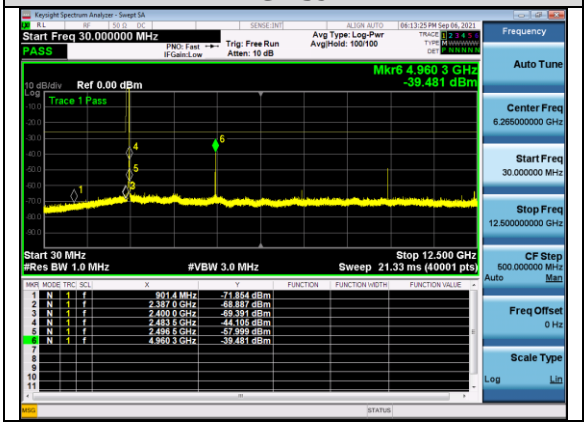
9.4.3 Test Results

Normal Voltage

SRD_1Mbps

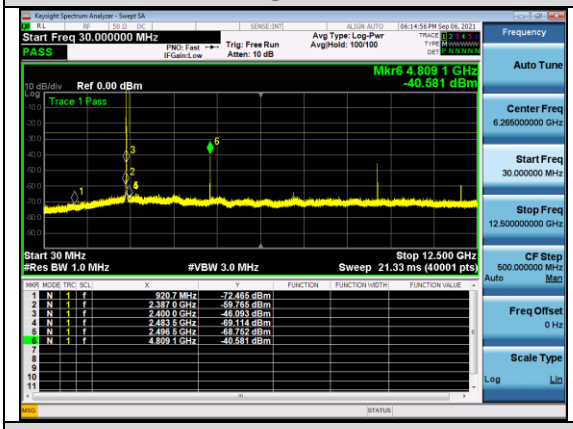
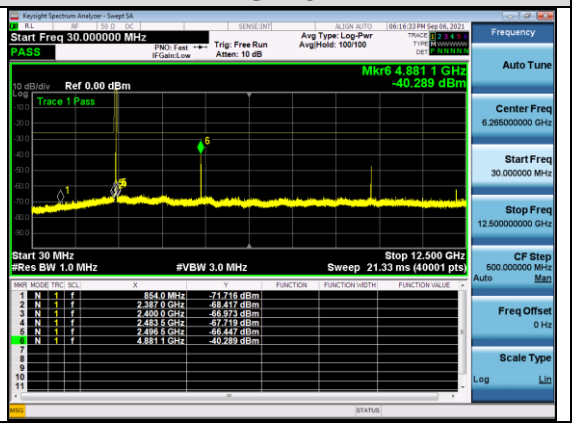
Test Ch.	Tested Freq. Range (MHz)	Test Result		Limit (µW)	Result
		Freq. (MHz)	Value (µW)		
0	30.0 to 1000.0	857.400	0.000078	0.25	PASS
	1000.0 to 2387.0	2387.000	0.001681	2.5	PASS
	2387.0 to 2400.0	2400.000	0.318713	25	PASS
	2483.5 to 2496.5	2483.500	0.000139	25	PASS
	2496.5 to 12500.0	4804.800	0.087539	2.5	PASS
12	30.0 to 1000.0	537.900	0.000054	0.25	PASS
	1000.0 to 2387.0	2387.000	0.000178	2.5	PASS
	2387.0 to 2400.0	2400.000	0.000477	25	PASS
	2483.5 to 2496.5	2496.500	0.000195	25	PASS
	2496.5 to 12500.0	4852.500	0.066145	2.5	PASS
39	30.0 to 1000.0	901.400	0.000065	0.25	PASS
	1000.0 to 2387.0	2387.000	0.000129	2.5	PASS
	2387.0 to 2400.0	2400.000	0.000115	25	PASS
	2483.5 to 2496.5	2483.500	0.001585	25	PASS
	2496.5 to 12500.0	4960.300	0.112694	2.5	PASS

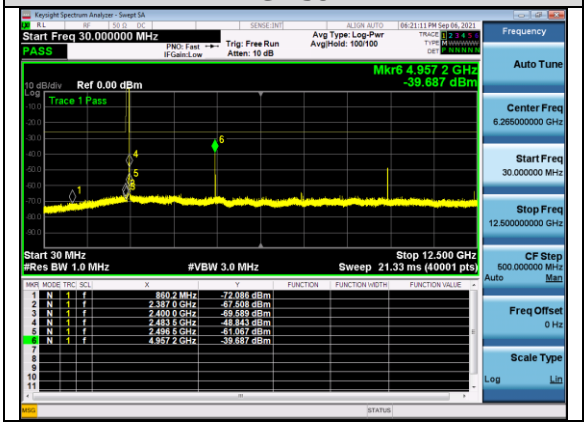
Ch 0	Ch 12
	

Ch 39


SRD_2Mbps

Test Ch.	Tested Freq. Range (MHz)	Test Result		Limit (μW)	Result
		Freq. (MHz)	Value (μW)		
1	30.0 to 1000.0	920.700	0.000057	0.25	PASS
	1000.0 to 2387.0	2387.000	0.001056	2.5	PASS
	2387.0 to 2400.0	2400.000	0.024587	25	PASS
	2483.5 to 2496.5	2496.500	0.000133	25	PASS
	2496.5 to 12500.0	4809.100	0.087478	2.5	PASS
19	30.0 to 1000.0	854.000	0.000067	0.25	PASS
	1000.0 to 2387.0	2387.000	0.000144	2.5	PASS
	2387.0 to 2400.0	2400.000	0.000201	25	PASS
	2483.5 to 2496.5	2496.500	0.000227	25	PASS
	2496.5 to 12500.0	4881.100	0.093562	2.5	PASS
38	30.0 to 1000.0	860.200	0.000062	0.25	PASS
	1000.0 to 2387.0	2387.000	0.000178	2.5	PASS
	2387.0 to 2400.0	2400.000	0.000110	25	PASS
	2483.5 to 2496.5	2483.500	0.013053	25	PASS
	2496.5 to 12500.0	4957.200	0.107473	2.5	PASS

Ch 1	Ch 19
	

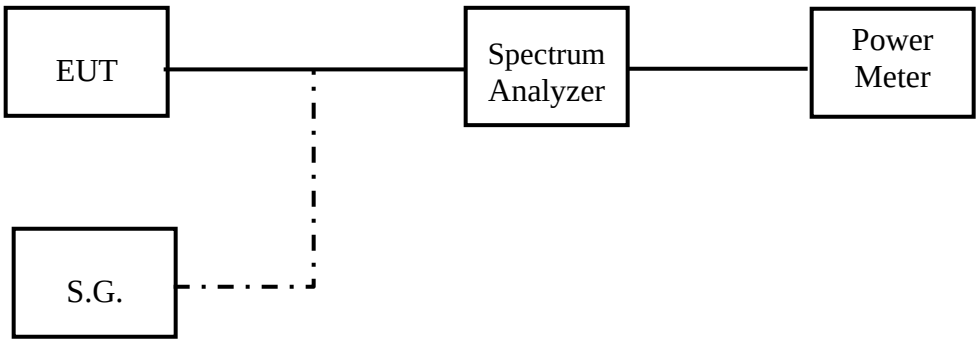
Ch 38


8.5. Antenna Power

9.5.1 Requirements

Item	Limits
Antenna Power Density	≤ 3 mW/MHz (2427~2470.75MHz)
	DS: ≤ 10 mW/MHz OFDM: ≤ 10 mW/MHz (Bandwidth ≤ 26MHz) OFDM: ≤ 5 mW/MHz (26MHz<Bandwidth ≤ 38MHz)
	Others: ≤ 10 mW

9.5.2 Test Setup



9.5.3 Test Results

Normal Voltage

SRD_1Mbps

Channel	Antenna Power (mW/MHz)	Antenna Power Limit (mW/MHz)	Rated Power (mW/MHz)	Antenna Power Tolerance (%)	Tolerance Range Limit (%)	Antenna Gain (dBi)	EIRP Antenna Power (mW/MHz)	EIRP Antenna Power Limit (mW/MHz)
0	1.23	10.00	1.23	0.00	+20% ~ -80%	1.55	1.75	16.37
12	1.15	10.00	1.23	-6.50	+20% ~ -80%	1.55	1.64	16.37
39	1.15	10.00	1.23	-6.50	+20% ~ -80%	1.55	1.64	16.37

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

SRD_2Mbps

Channel	Antenna Power (mW/MHz)	Antenna Power Limit (mW/MHz)	Rated Power (mW/MHz)	Antenna Power Tolerance (%)	Tolerance Range Limit (%)	Antenna Gain (dBi)	EIRP Antenna Power (mW/MHz)	EIRP Antenna Power Limit (mW/MHz)
1	1.20	10.00	1.20	0.00	+20% ~ -80%	1.55	1.72	16.37
19	1.17	10.00	1.20	-2.50	+20% ~ -80%	1.55	1.67	16.37
38	1.14	10.00	1.20	-5.00	+20% ~ -80%	1.55	1.63	16.37

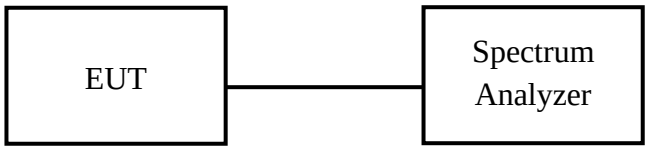
Note:
1. Antenna Power Tolerance (%) = {(Conducted Antenna Power – Rated power)/Rated power*100}.
2. EIRP Antenna Power = Conducted Antenna Power + Antenna gain.

8.6. Spurious Emissions for Receiver

9.6.1 Requirements

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

9.6.2 Test Setup



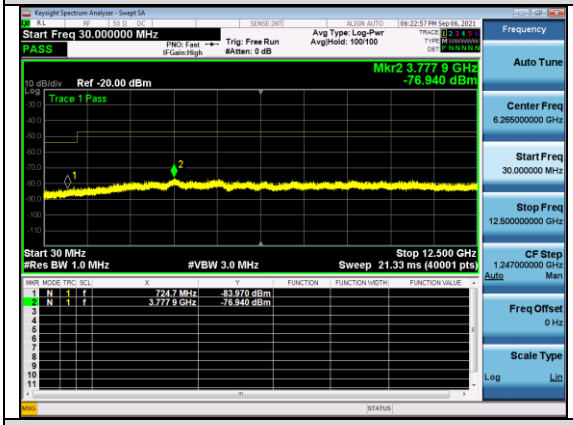
9.6.3 Test Results

Normal Voltage

SRD_1Mbps

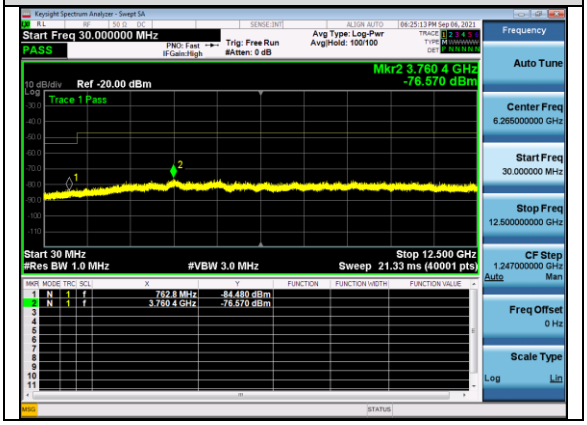
Test Ch.	Tested Freq. Range (MHz)	Test Result		Total Limit (nW)	Result
		Freq. (MHz)	Value (nW)		
0	Below 1 GHz	724.700	0.004009	4	PASS
	Above 1 GHz	3777.900	0.020230	20	PASS
12	Below 1 GHz	687.000	0.003146	4	PASS
	Above 1 GHz	3821.800	0.022167	20	PASS
39	Below 1 GHz	762.800	0.003565	4	PASS
	Above 1 GHz	3760.400	0.022029	20	PASS

Ch 0



Ch 12

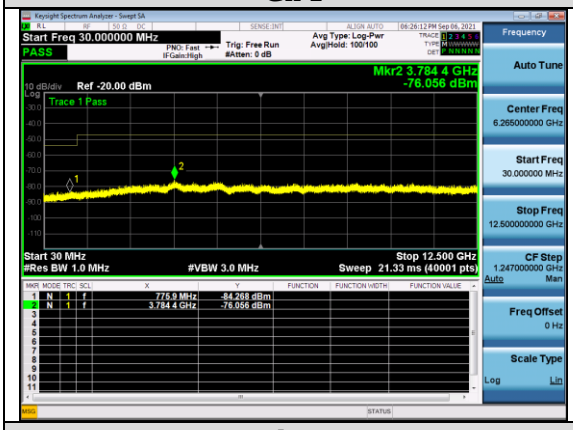
Ch 39



SRD_2Mbps

Test Ch.	Tested Freq. Range (MHz)	Test Result		Total Limit (nW)	Result
		Freq. (MHz)	Value (nW)		
1	Below 1 GHz	775.900	0.003743	4	PASS
	Above 1 GHz	3784.400	0.024797	20	PASS
19	Below 1 GHz	772.800	0.003388	4	PASS
	Above 1 GHz	3809.700	0.021963	20	PASS
38	Below 1 GHz	753.100	0.004194	4	PASS
	Above 1 GHz	3732.700	0.023561	20	PASS

Ch 1



Ch 19

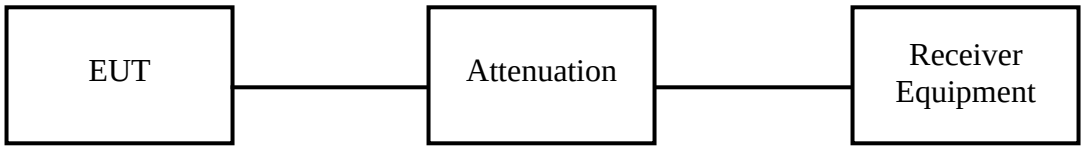
Ch 38

9.6 Interference Prevention Function

9.7.1 Requirements

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

9.7.2 Test Setup



9.7.3 Test Results

Link Mode	Test Result
SRD	PASS

9. Conducted Emission Measurement Setup Configurations

END OF REPORT