FCC 47 CFR PART 15 SUBPART C

RF Test Report

Applicant	:	Shenzhen Longing Innovative Aviation Technology Co., Ltd.
Product Type	:	Remote Controller
Trade Name	:	LONGING
Model Number	:	LY-i6
Test Specification	:	FCC 47 CFR PART 15 SUBPART C ANSI C63.10:2013
Receive Date	:	Jul. 06, 2016
Test Period	:	Jul. 14 ~ Oct.17, 2016
Issue Date	:	Nov. 03, 2016

Issue by

A Test Lab Techno Corp.
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Taiwan Accreditation Foundation accreditation number: 1330

Revision History

Rev.	Issue Date	Revisions	Revised By
00	Sep. 20, 2016	Initial Issue	Snow Wang
01	Nov. 03, 2016	Revised report information.	Snow Wang

Verification of Compliance

Issued Date: Nov. 03, 2016

Applicant	:	Shenzhen Longing Innovative Aviation Technology Co., Ltd.
Product Type	:	Remote Controller
Trade Name	:	LONGING
Model Number	:	LY-i6
FCC ID	:	2AIWS160116
EUT Rated Voltage	:	DC 7.2V
Test Voltage	:	DC 7.2V
Applicable Standard	:	FCC 47 CFR PART 15 SUBPART C ANSI C63.10:2013
Test Result	:	Complied
Performing Lab.	:	A Test Lab Techno Corp. No. 140-1, Changan Street, Bade District, Taoyuan City 33465, Taiwan (R.O.C) Tel：+886-3-2710188 / Fax：+886-3-2710190 Taiwan Accreditation Foundation accreditation number: 1330 http://www.atl-lab.com.tw/e-index.htm

A Test Lab Techno Corp. 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 A Test Lab Techno Corp. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Approved By	: Fly Lu	Reviewed By	: Eric Ou Yang	
(Manager)	(Fly Lu)	(Testing Engineer)	(Eric Ou Yang)	

TABLE OF CONTENTS

1 General Information

1.1. Summary of Test Result

FCC Standard	Item	Result	Remark
15.207	AC Power Conducted Emission	N/A	Not applicable, This device use DC power source.
15.203	Antenna Requirement	PASS	-----
15.247(b)(1)	Max. Output Power	PASS	-----
15.247(d)	Transmitter Radiated Emissions	PASS	-----
15.247(a)(1)	20dB RF Bandwidth	PASS	-----
15.247(a)(1)	Carrier Frequency Separation	PASS	-----
15.247(a)(1)(iii)	Number of Hopping	PASS	-----
15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	PASS	-----
15.247(d)	Out of Band Conducted Spurious Emission	PASS	-----

The test results of this report relate only to the tested sample(s) identified in this report. Manufacturer or whom it may concern should recognize the pass or fail of the test result.

1.2. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB)
Conducted Emission	9kHz ~ 150KHz	2.7
	150kHz ~ 30MHz	2.8
Radiated Emission	9kHz ~ 30MHz	1.457
	30MHz ~ 1000MHz	6.300
	1000MHz ~ 18000MHz	5.474
	18000MHz ~ 26500MHz	5.630
	26500MHz ~ 40000MHz	5.054
Conducted Output Power	+0.27 dB / -0.28 dB	
RF Bandwidth	4.96%	
Power Spectral Density	+0.71 dB / -0.77 dB	

2 EUT Description

Applicant	Shenzhen Longing Innovative Aviation Technology Co., Ltd. A206 Industrialization Base of Virtual University Yuexing 3rd Rd. Nanshan District, Shenzhen 581001, China
Manufacturer	Shenzhen Longing Innovative Aviation Technology Co., Ltd. A206 Industrialization Base of Virtual University Yuexing 3rd Rd. Nanshan District, Shenzhen 581001, China
Product	Remote Controller
Trade Name	LONGING
Model Number	LY-i6
FCC ID	2AIWS160116
Frequency Range	2408 ~ 2475 MHz
Modulation Type	GFSK
Number of channels	135 channels
Channel space	0.5 MHz
Antenna Type	Fixed Antenna
Antenna Gain	1.7dBi
Antenna Delivery	1TX / 1RX
Max. Output Power	0.031 W / 14.96 dBm

Channel list									
CH	MHz	CH	MHz	CH	MHz	CH	MHz	CH	MHz
0	2408.0	30	2423.0	60	2438.0	90	2453.0	120	2468.0
1	2408.5	31	2423.5	61	2438.5	91	2453.5	121	2468.5
2	2409.0	32	2424.0	62	2439.0	92	2454.0	122	2469.0
3	2409.5	33	2424.5	63	2439.5	93	2454.5	123	2469.5
4	2410.0	34	2425.0	64	2440.0	94	2455.0	124	2470.0
5	2410.5	35	2425.5	65	2440.5	95	2455.5	125	2470.5
6	2411.0	36	2426.0	66	2441.0	96	2456.0	126	2471.0
7	2411.5	37	2426.5	67	2441.5	97	2456.5	127	2471.5
8	2412.0	38	2427.0	68	2442.0	98	2457.0	128	2472.0
9	2412.5	39	2427.5	69	2442.5	99	2457.5	129	2472.5
10	2413.0	40	2428.0	70	2443.0	100	2458.0	130	2473.0
11	2413.5	41	2428.5	71	2443.5	101	2458.5	131	2473.5
12	2414.0	42	2429.0	72	2444.0	102	2459.0	132	2474.0
13	2414.5	43	2429.5	73	2444.5	103	2459.5	133	2474.5
14	2415.0	44	2430.0	74	2445.0	104	2460.0	134	2475.0
15	2415.5	45	2430.5	75	2445.5	105	2460.5		
16	2416.0	46	2431.0	76	2446.0	106	2461.0		
17	2416.5	47	2431.5	77	2446.5	107	2461.5		
18	2417.0	48	2432.0	78	2447.0	108	2462.0		
19	2417.5	49	2432.5	79	2447.5	109	2462.5		
20	2418.0	50	2433.0	80	2448.0	110	2463.0		
21	2418.5	51	2433.5	81	2448.5	111	2463.5		
22	2419.0	52	2434.0	82	2449.0	112	2464.0		
23	2419.5	53	2434.5	83	2449.5	113	2464.5		
24	2420.0	54	2435.0	84	2450.0	114	2465.0		
25	2420.5	55	2435.5	85	2450.5	115	2465.5		
26	2421.0	56	2436.0	86	2451.0	116	2466.0		
27	2421.5	57	2436.5	87	2451.5	117	2466.5		
28	2422.0	58	2437.0	88	2452.0	118	2467.0		
29	2422.5	59	2437.5	89	2452.5	119	2467.5		

3 Test Methodology

3.1. Mode of Operation

Decision of Test ATL has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Pre-Test Mode
Mode 1: Continuous TX mode
Mode 2: Transmission Mode

By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “X axis” position was the worst, then the final test was executed the worst condition and test data were recorded in this report.

Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

	Product	Manufacturer	Model Number	Serial Number	Power Cord
1.	Bluetooth Tester	R & S	CBT	100350	NA

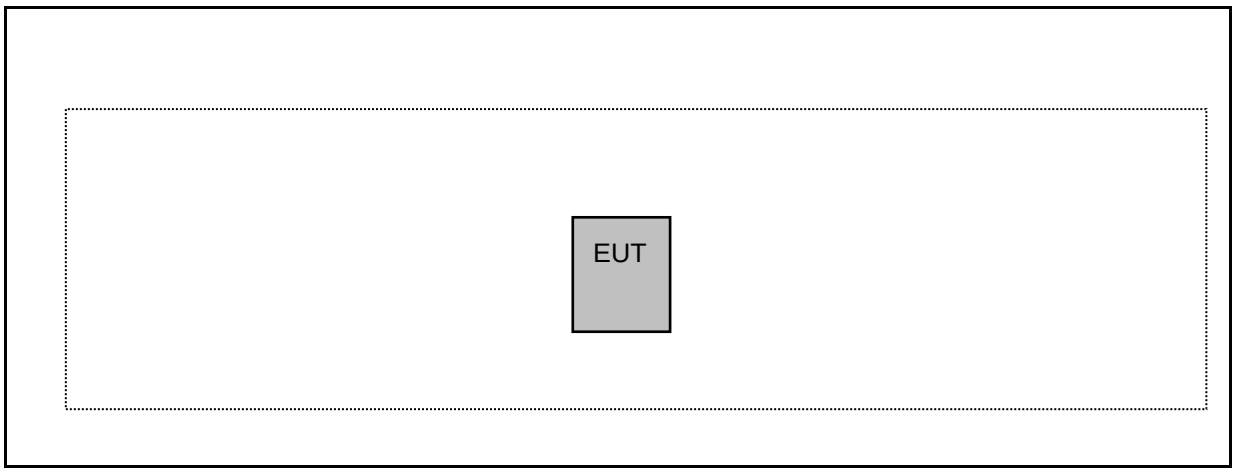
3.2. EUT Exercise Software

1	Setup the EUT and Bluetooth Tester (CBT) as shown on 3.3.
2	Turn on the power of all equipment.
3	Turn on Bluetooth function and link to Bluetooth tester
4	EUT run test program.

Measurement Software	
1	EZ-EMC Ver. ATL-03A1-1
2	EZ-EMC Ver ATL-ITC-3A1-1

3.3. Configuration of Test System Details

Radiated Emissions



3.4. Test Site Environment

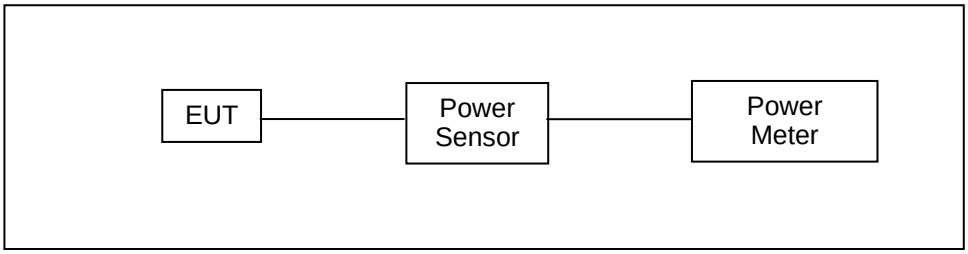
Items	Required (IEC 60068-1)	Actual
Temperature (°C)	15-35	26
Humidity (%RH)	25-75	60
Barometric pressure (mbar)	860-1060	950

4 Maximum Conducted Output Power Measurement

4.1. Limit

For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels < 0.125 watt.

4.2. Test Setup



4.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Power Sensor	Anritsu	MA2411B	1126022	08/29/2016	1 year
Power Meter	Anritsu	ML2495A	1135009	08/29/2016	1 year
Microwave Cable	EMCI	EMC104-SM-SM-1500	140303	02/23/2016	1 year
Test Site	ATL	TE05	TE05	N.C.R.	-----

NOTE: N.C.R. = No Calibration Request.

4.4. Test Procedure

Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. The tests below are run with the EUT's transmitter set at high power in TX mode. The EUT is needed to force selection of output power level and channel number. While testing, EUT was set to transmit continuously. Remove the Subjective device's antenna and connect the RF output port to power sensor. The maximum peak output power shall not exceed 1 watt.

Use a direct connection between the antenna port of transmitter and the power sensor, for prevent the power sensor input attenuation 40-50 dB. Set the RBW Bandwidth of the emission or use a channel power meter mode.

For antennas with gains of 6 dBi or less, maximum allowed transmitter output is 1 watt (+30 dBm). For antennas with gains greater than 6 dBi, transmitter output level must be decreased by an amount equal to (GAIN - 6)/3 dBm.

The antenna port of the EUT was connected to the input of a power sensor. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.

4.5. Test Result

Antenna	Frequency (MHz)	Average Power		Peak Power		Limit (W)
		(dBm)	(W)	(dBm)	(W)	
ANT-1	2408	10.13	0.010	**14.89**	**0.031**	< 0.125
	2440	9.86	0.010	14.29	0.027	< 0.125
	2475	9.14	0.008	13.65	0.023	< 0.125
ANT-2	2408	10.07	0.010	**14.96**	**0.031**	< 0.125
	2440	9.51	0.009	13.94	0.025	< 0.125
	2475	9.06	0.008	13.61	0.023	< 0.125

Note: The relevant measured result has the offset with cable loss already.

5 Radiated Interference Measurement

5.1. Limit

According to §15.209(a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (µV/m at meter)	Measurement Distance (meters)
0.009 – 0.490	2400 / F (kHz)	300
0.490 – 1.705	24000 / F (kHz)	30
1.705 – 30.0	30	30
30 - 88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

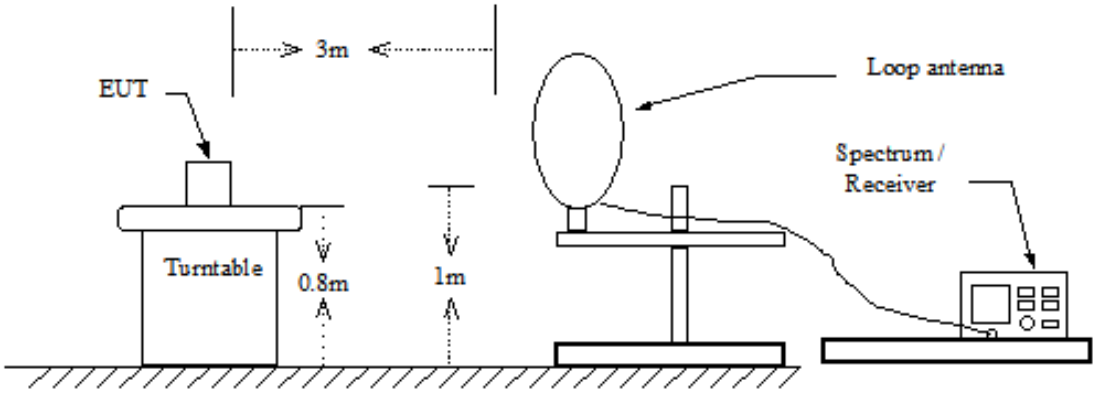
5.2. Test Instruments

3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
RF Pre-selector	Agilent	N9039A	MY46520256	01/08/2016	1 year
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/08/2016	1 year
Pre Amplifier	Agilent	8449B	3008A02237	10/07/2015	1 year
				10/11/2016	1 year
Pre Amplifier	Agilent	8447D	2944A11119	01/11/2016	1 year
Broadband Antenna	Schwarzbeck	VULB9168	416	09/25/2015	1 year
				10/13/2016	1 year
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/06/2016	1 year
Horn Antenna (18~40GHz)	ETS	3116	86467	09/01/2015	1 year
				09/05/2016	1 year
Loop Antenna	COM-POWER CORPORATION	AL-130	121014	02/01/2016	1 year
Microwave Cable	EMCI	EMC102-KM-KM-14000	151001	02/23/2016	1 year
Microwave Cable	EMCI	EMC-104-SM-SM-14000	140202	02/23/2016	1 year
Microwave Cable	EMCI	EMC104-SM-SM-600	140301	02/23/2016	1 year
Test Site	ATL	TE01	888001	08/27/2015	1 year
				08/29/2016	1 year

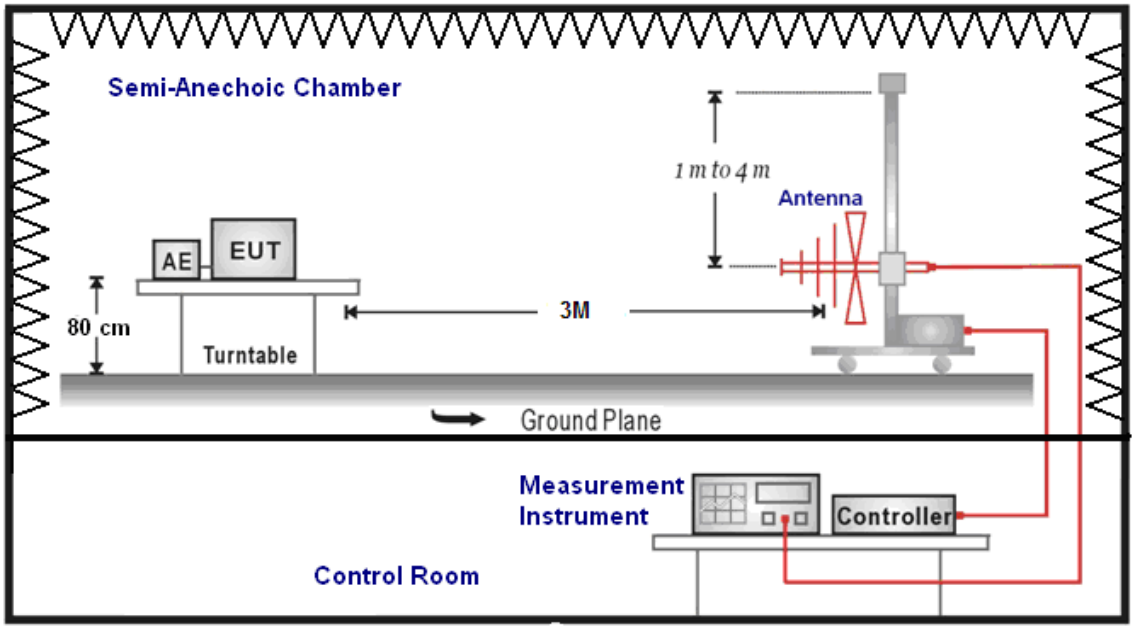
Note: N.C.R. = No Calibration Request.

5.3. Setup

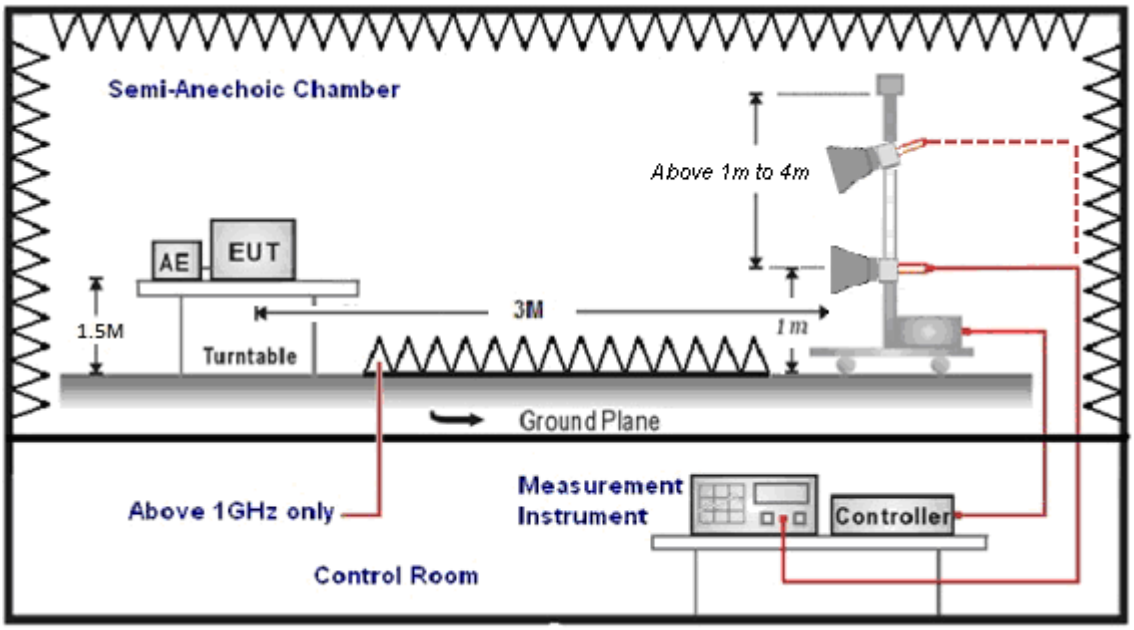
9kHz ~ 30MHz



Below 1GHz



Above 1GHz



5.4. Test Procedure

Final radiation measurements were made on a three-meter, Semi Anechoic Chamber. The EUT system was placed on a nonconductive turntable which is 0.8 or 1.5 meters height(below 1GHz use 0.8m turntable / above 1GHz use 1.5m turntable), top surface 1.0 x 1.5 meter. The spectrum was examined from 250 MHz to 2.5 GHz in order to cover the whole spectrum below 10th harmonic which could generate from the EUT. During the test, EUT was set to transmit continuously & Measurements spectrum range from 9 kHz to 26.5 GHz is investigated.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

A nonconductive material surrounded the EUT to supporting the EUT for standing on tree orthogonal planes. At each condition, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

SCHWARZBECK MESS-ELEKTRONIK Biconilog Antenna at 3 Meter and the SCHWARZBECK Double Ridged Guide Antenna was used in frequencies 1 – 26.5 GHz at a distance of 1 meter. All test results were extrapolated to equivalent signal at 3 meters utilizing an inverse linear distance extrapolation Factor (20dB/decade).

For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post – detector video filters were used in the test.

The spectrum analyzer's 6 dB bandwidth was set to 1 MHz, and the analyzer was operated in the peak detection mode, for frequencies both below and up 1 GHz. The average levels were obtained by subtracting the duty cycle correction factor from the peak readings.

The following procedures were used to convert the emission levels measured in decibels referenced to 1 microvolt (dBuV) into field intensity in micro volts pre meter (uV/m).

The actual field intensity in decibels referenced to 1 microvolt in to field intensity in micro colts per meter (dBuV/m).

The actual field is intensity in referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) and Subtracting the gain of preamplifier (dB) is auto calculate in spectrum analyzer.

(1) Amplitude (dBuV/m) = FI (dBuV) +AF (dBuV) +CL (dBuV)-Gain (dB)
FI= Reading of the field intensity.
AF= Antenna factor.
CL= Cable loss.
P.S Amplitude is auto calculate in spectrum analyzer.

(2) Actual Amplitude (dBuV/m) = Amplitude (dBuV)-Dis(dB)
The FCC specified emission limits were calculated according the EUT operating frequency and by following linear interpolation equations:
(a) For fundamental frequency : Transmitter Output < +30dBm
(b) For spurious frequency : Spurious emission limits = fundamental emission limit /10

Data of measurement within this frequency range without mark in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5.5. Test Result

Below 1GHz

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	DC 7.2V
Model Number:	LY-i6	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Test Mode:	Mode 1	Date:	07/16/2016
		Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
205.5700	52.60	-14.41	38.19	43.50	-5.31	QP	H
270.0050	50.27	-11.38	38.89	46.00	-7.11	QP	H
282.0150	53.60	-10.84	42.76	46.00	-3.24	QP	H
294.0100	54.22	-10.56	43.66	46.00	-2.34	QP	H
306.0050	51.57	-10.24	41.33	46.00	-4.67	QP	H
318.0200	50.35	-9.90	40.45	46.00	-5.55	QP	H
208.4800	42.09	-14.32	27.77	43.50	-15.73	QP	V
269.5900	43.34	-11.40	31.94	46.00	-14.06	QP	V
282.2000	43.05	-10.83	32.22	46.00	-13.78	QP	V
293.8400	40.78	-10.56	30.22	46.00	-15.78	QP	V
306.4500	40.54	-10.22	30.32	46.00	-15.68	QP	V
318.0900	38.23	-9.89	28.34	46.00	-17.66	QP	V

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

3.No emission found between lowest internal used/generated frequencies to 30MHz (9 kHz~30MHz).

Above 1GHz

Standard:	FCC Part 15C	Test Distance:	3m
Test Mode:	Mode 2	Power:	DC 7.2V
Frequency:	2408 MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Antenna	ANT1	Date:	07/18/2016
		Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4816.000	55.44	-4.46	50.98	74.00	-23.02	peak	H
4816.000	54.96	-4.46	50.50	74.00	-23.50	peak	V
7224.000	50.50	-0.60	49.90	74.00	-24.10	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test Mode:	Mode 2	Power:	DC 7.2V
Frequency:	2440 MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Antenna	ANT1	Date:	07/18/2016
		Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4880.000	53.56	-4.54	49.02	74.00	-24.98	peak	H
4880.000	54.27	-4.54	49.73	74.00	-24.27	peak	V
7320.000	50.42	-0.33	50.09	74.00	-23.91	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test Mode:	Mode 2	Power:	DC 7.2V
Frequency:	2475 MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Antenna	ANT1	Date:	07/18/2016
		Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4950.000	53.17	-4.63	48.54	74.00	-25.46	peak	H
4950.000	56.05	-4.63	51.42	74.00	-22.58	peak	V

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test Mode:	Mode 2	Power:	DC 7.2V
Frequency:	2408 MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Antenna	ANT2	Date:	07/18/2016
		Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4816.000	54.15	-4.46	49.69	74.00	-24.31	peak	H
4816.000	55.06	-4.46	50.60	74.00	-23.40	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test Mode:	Mode 2	Power:	DC 7.2V
Frequency:	2440 MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Antenna	ANT2	Date:	07/18/2016
		Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4880.000	54.35	-4.54	49.81	74.00	-24.19	peak	H
4880.000	54.87	-4.54	50.33	74.00	-23.67	peak	V
7320.000	50.98	-0.33	50.65	74.00	-23.35	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test Mode:	Mode 2	Power:	DC 7.2V
Frequency:	2475 MHz	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Antenna	ANT2	Date:	07/18/2016
		Test By:	Eric Ou Yang

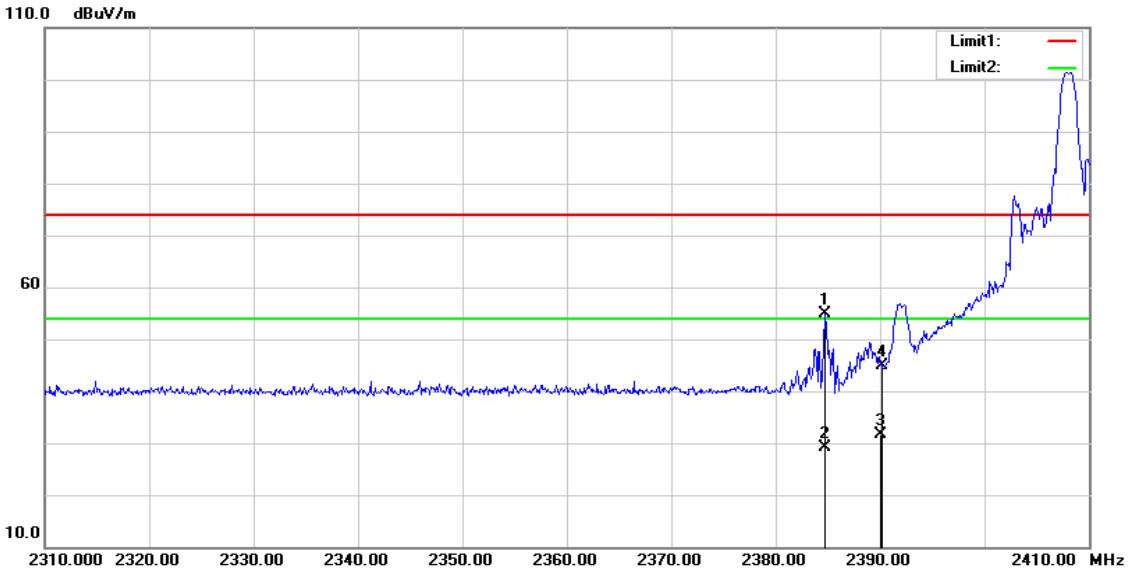
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
4950.000	54.64	-4.63	50.01	74.00	-23.99	peak	H
4950.000	55.17	-4.63	50.54	74.00	-23.46	peak	V

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Band Edge

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Band Edge	Power:	DC 7.2V
Test Mode:	Mode 2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Frequency:	2408 MHz	Date:	07/22/2016
Ant.Polar.:	Horizontal	Test By:	Eric Ou Yang
Description:		Antenna:	ANT1

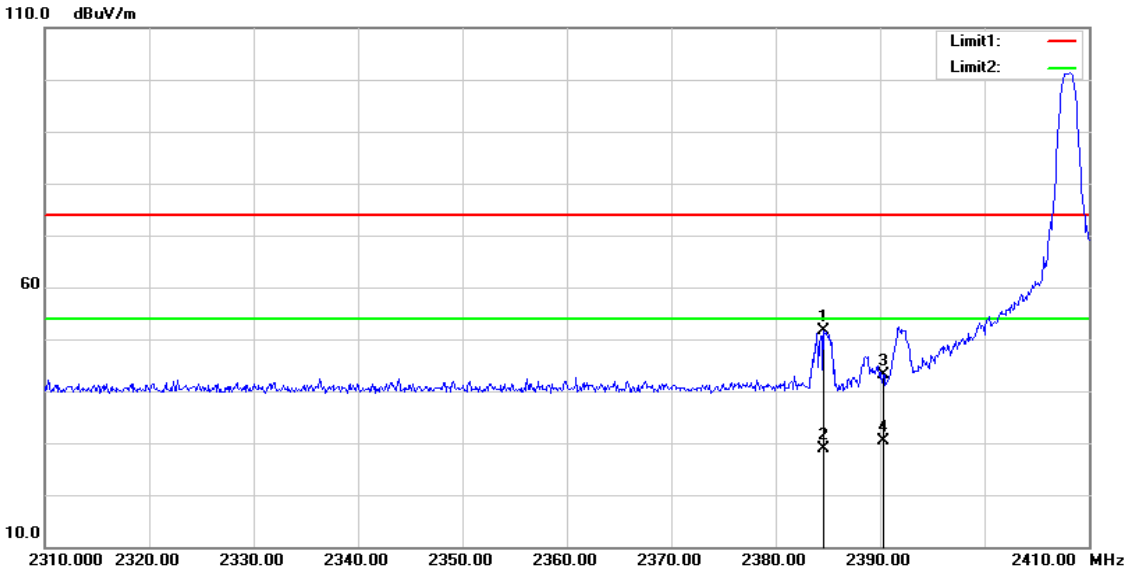


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2384.700	65.13	-10.33	54.80	74.00	-19.20	peak
2	2384.700	39.48	-10.33	29.15	54.00	-24.85	AVG
3	2390.100	41.83	-10.32	31.51	54.00	-22.49	AVG
4	2390.200	55.20	-10.32	44.88	74.00	-29.12	peak

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Band Edge	Power:	DC 7.2V
Test Mode:	Mode 2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Frequency:	2408 MHz	Date:	07/22/2016
Ant.Polar.:	Vertical	Test By:	Eric Ou Yang
Description:		Antenna:	ANT1

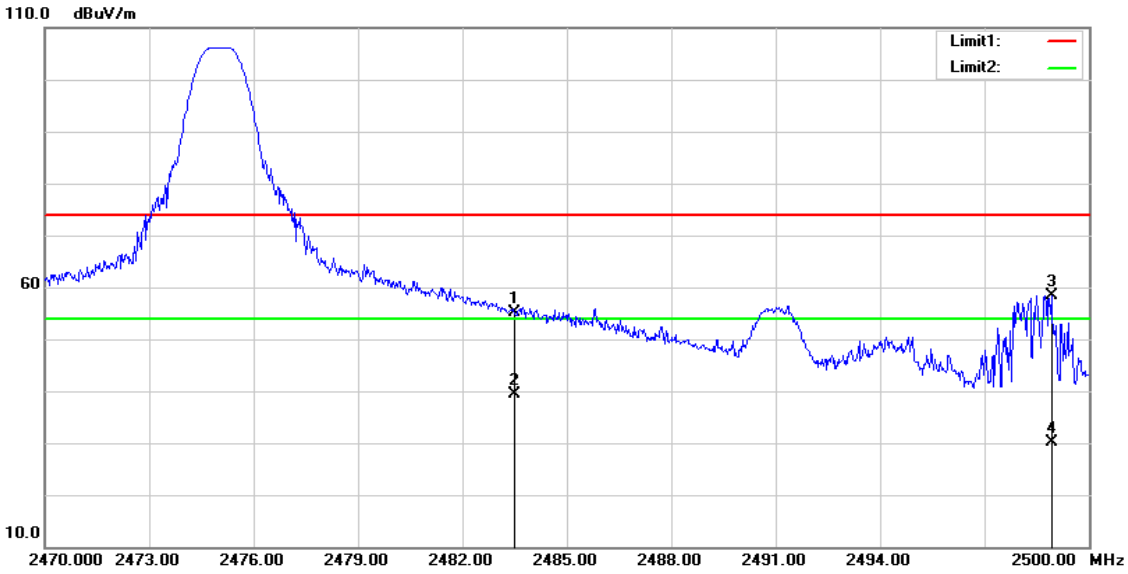


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2384.600	62.03	-10.33	51.70	74.00	-22.30	peak
2	2384.600	39.26	-10.33	28.93	54.00	-25.07	AVG
3	2390.300	53.37	-10.32	43.05	74.00	-30.95	peak
4	2390.300	40.66	-10.32	30.34	54.00	-23.66	AVG

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Band Edge	Power:	DC 7.2V
Test Mode:	Mode 2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Frequency:	2475 MHz	Date:	07/22/2016
Ant.Polar.:	Horizontal	Test By:	Eric Ou Yang
Description:		Antenna:	ANT1

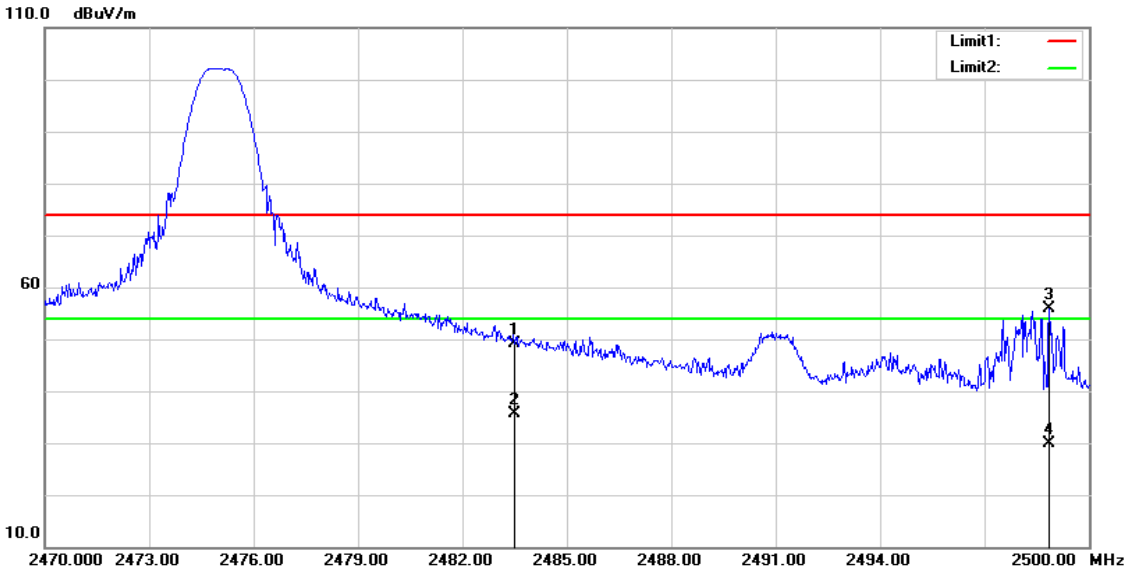


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	65.23	-10.02	55.21	74.00	-18.79	peak
2	2483.500	49.34	-10.02	39.32	54.00	-14.68	AVG
3	2498.920	68.26	-9.96	58.30	74.00	-15.70	peak
4	2498.920	40.07	-9.96	30.11	54.00	-23.89	AVG

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Band Edge	Power:	DC 7.2V
Test Mode:	Mode 2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Frequency:	2475 MHz	Date:	07/22/2016
Ant.Polar.:	Vertical	Test By:	Eric Ou Yang
Description:		Antenna:	ANT1

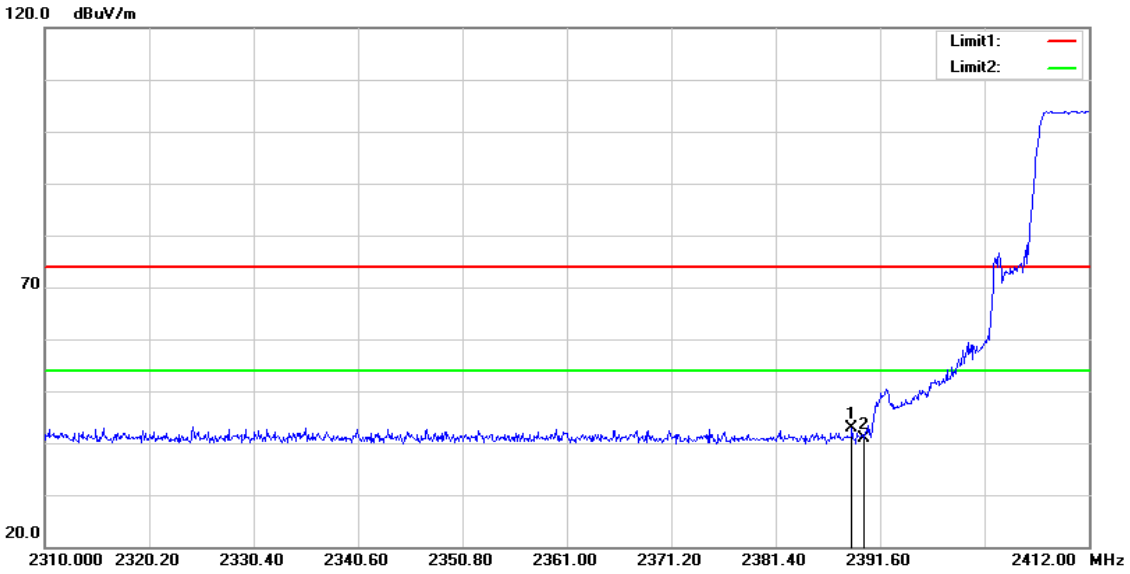


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	59.18	-10.02	49.16	74.00	-24.84	peak
2	2483.500	45.57	-10.02	35.55	54.00	-18.45	AVG
3	2498.860	65.75	-9.96	55.79	74.00	-18.21	peak
4	2498.860	39.85	-9.96	29.89	54.00	-24.11	AVG

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Band Edge	Power:	DC 7.2V
Test Mode:	Mode 2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Frequency:	2408 MHz	Date:	10/17/2016
Ant.Polar.:	Horizontal	Test By:	Eric Ou Yang
Description:	Hopping	Antenna:	ANT1

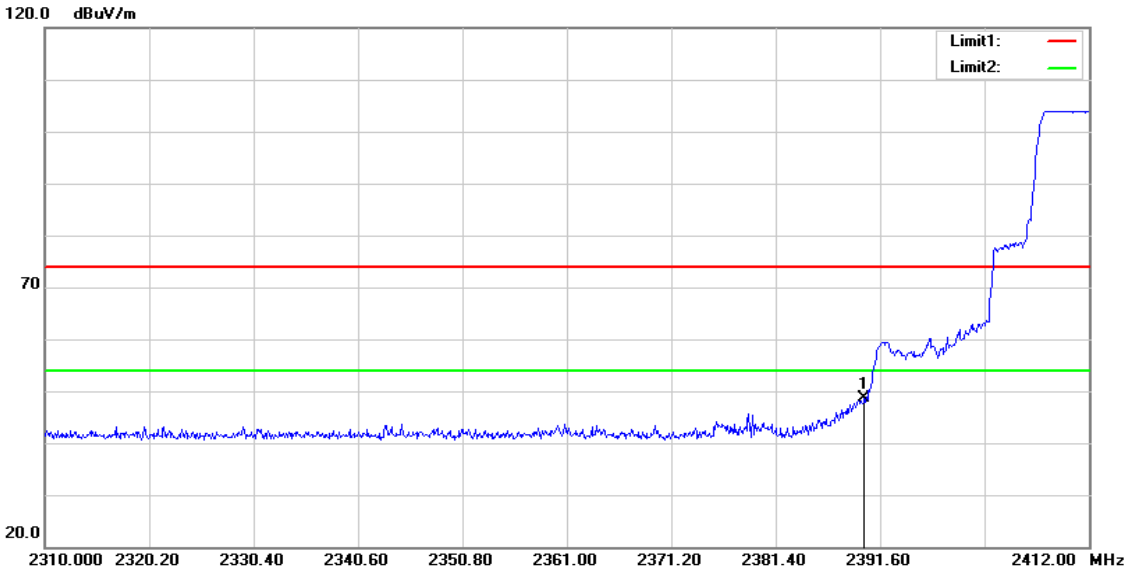


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2388.846	52.45	-9.49	42.96	74.00	-31.04	peak
2	2390.000	50.29	-9.49	40.80	74.00	-33.20	peak

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Band Edge	Power:	DC 7.2V
Test Mode:	Mode 2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Frequency:	2408 MHz	Date:	10/17/2016
Ant.Polar.:	Vertical	Test By:	Eric Ou Yang
Description:	Hopping	Antenna:	ANT1

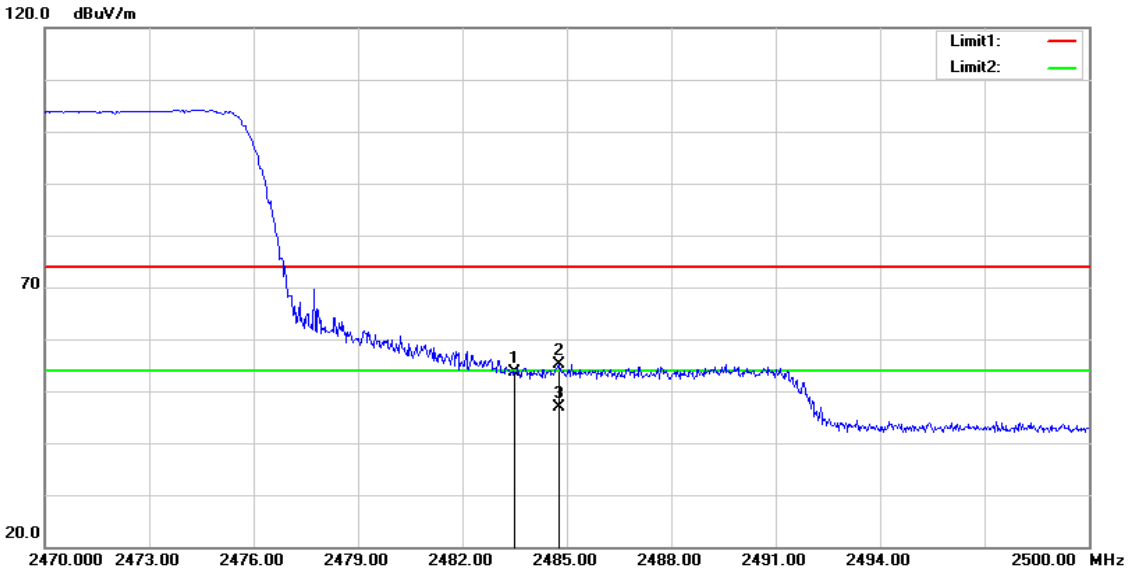


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	58.02	-9.49	48.53	74.00	-25.47	peak

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Band Edge	Power:	DC 7.2V
Test Mode:	Mode 2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Frequency:	2475 MHz	Date:	10/17/2016
Ant.Polar.:	Horizontal	Test By:	Eric Ou Yang
Description:	Hopping	Antenna:	ANT1

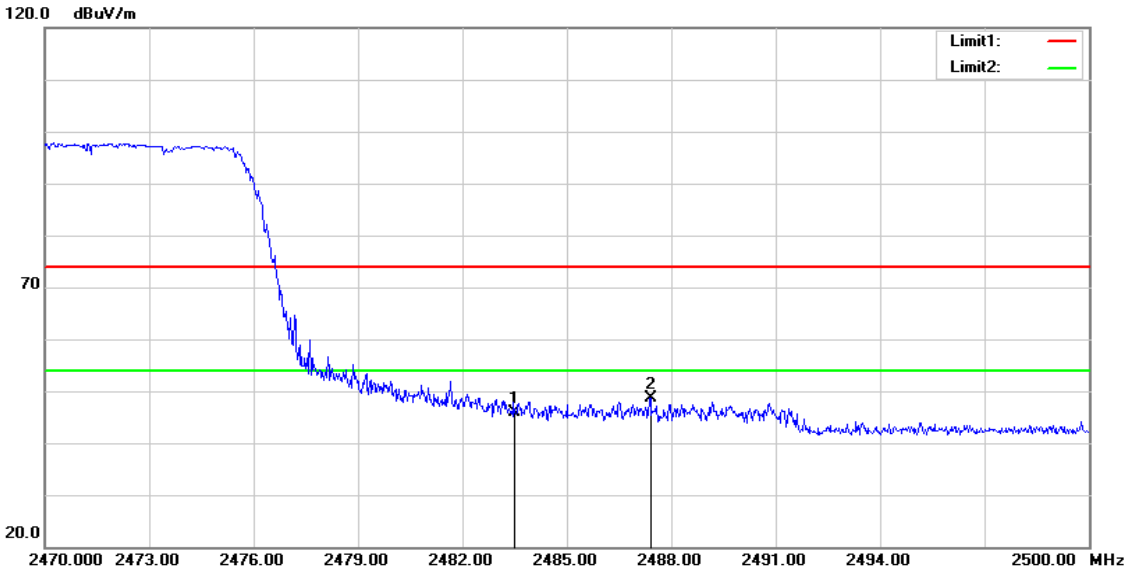


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	64.02	-10.49	53.53	74.00	-20.47	peak
2	2484.760	65.72	-10.48	55.24	74.00	-18.76	peak
3	2484.760	57.30	-10.48	46.82	54.00	-7.18	AVG

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Band Edge	Power:	DC 7.2V
Test Mode:	Mode 2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Frequency:	2475 MHz	Date:	10/17/2016
Ant.Polar.:	Vertical	Test By:	Eric Ou Yang
Description:	Hopping	Antenna:	ANT1

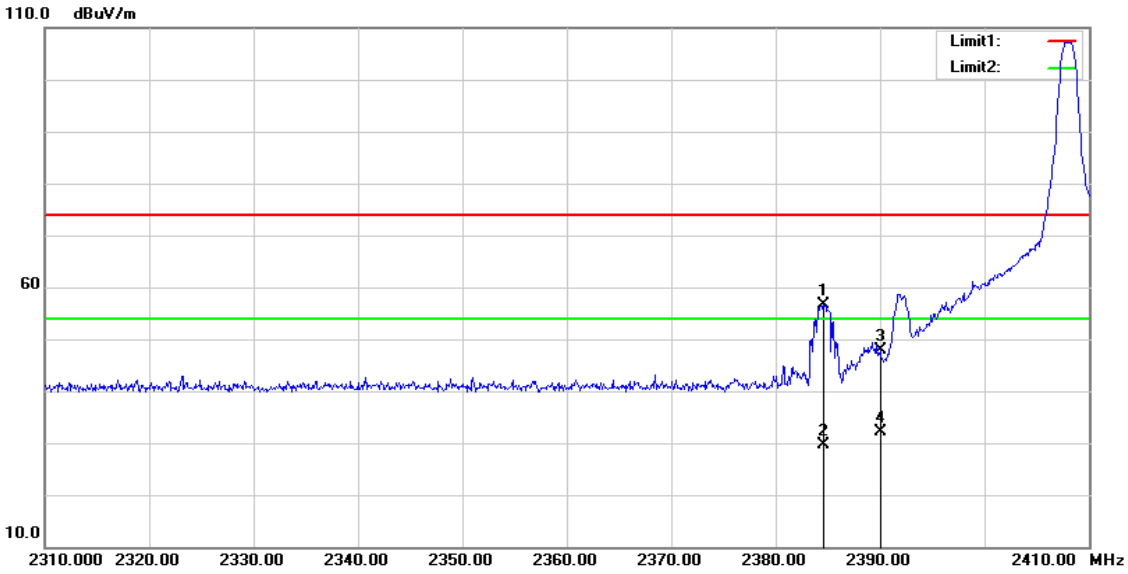


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	56.41	-10.49	45.92	74.00	-28.08	peak
2	2487.400	59.11	-10.49	48.62	74.00	-25.38	peak

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Band Edge	Power:	DC 7.2V
Test Mode:	Mode 2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Frequency:	2408 MHz	Date:	07/22/2016
Ant.Polar.:	Horizontal	Test By:	Eric Ou Yang
Description:		Antenna:	ANT2

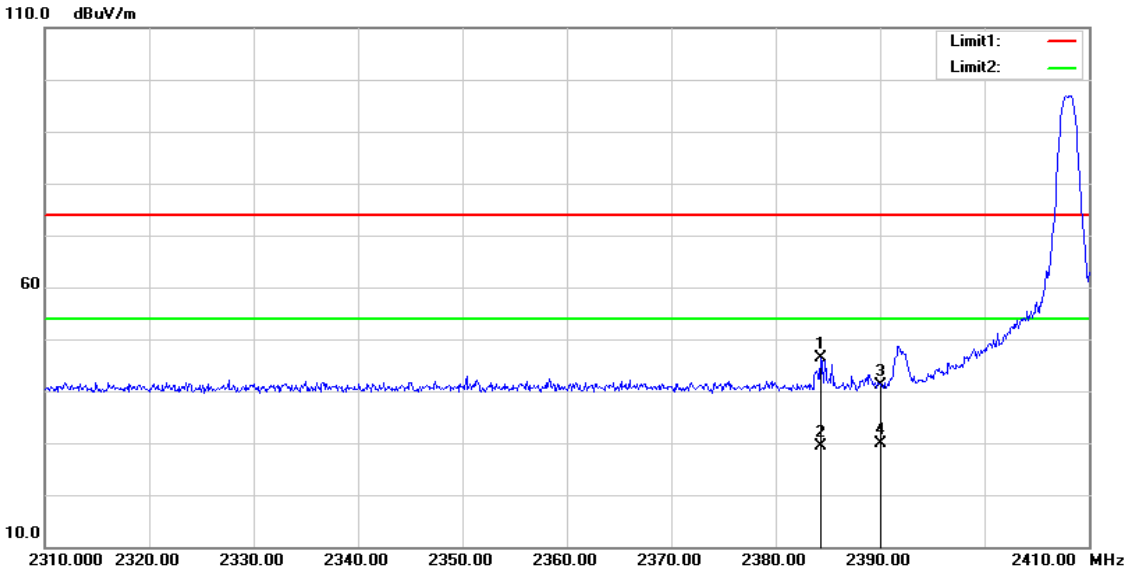


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2384.600	66.92	-10.33	56.59	74.00	-17.41	peak
2	2384.600	40.03	-10.33	29.70	54.00	-24.30	AVG
3	2390.000	58.27	-10.32	47.95	74.00	-26.05	peak
4	2390.000	42.54	-10.32	32.22	54.00	-21.78	AVG

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Band Edge	Power:	DC 7.2V
Test Mode:	Mode 2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Frequency:	2408 MHz	Date:	07/22/2016
Ant.Polar.:	Vertical	Test By:	Eric Ou Yang
Description:		Antenna:	ANT2

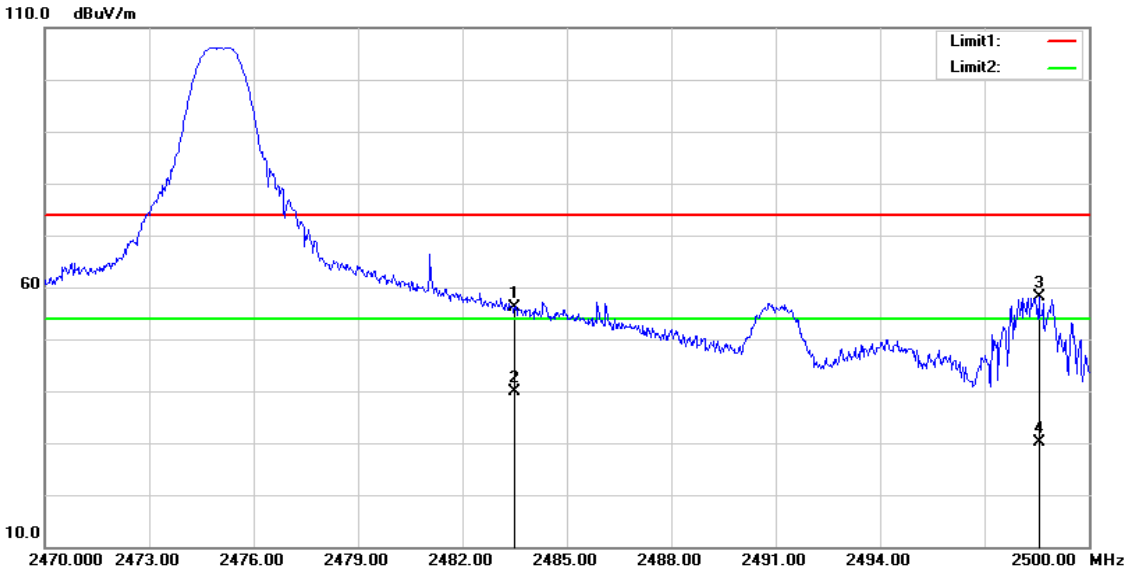


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2384.300	56.68	-10.34	46.34	74.00	-27.66	peak
2	2384.300	39.72	-10.34	29.38	54.00	-24.62	AVG
3	2390.100	51.44	-10.32	41.12	74.00	-32.88	peak
4	2390.100	40.19	-10.32	29.87	54.00	-24.13	AVG

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Band Edge	Power:	DC 7.2V
Test Mode:	Mode 2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Frequency:	2475 MHz	Date:	07/22/2016
Ant.Polar.:	Horizontal	Test By:	Eric Ou Yang
Description:		Antenna:	ANT2

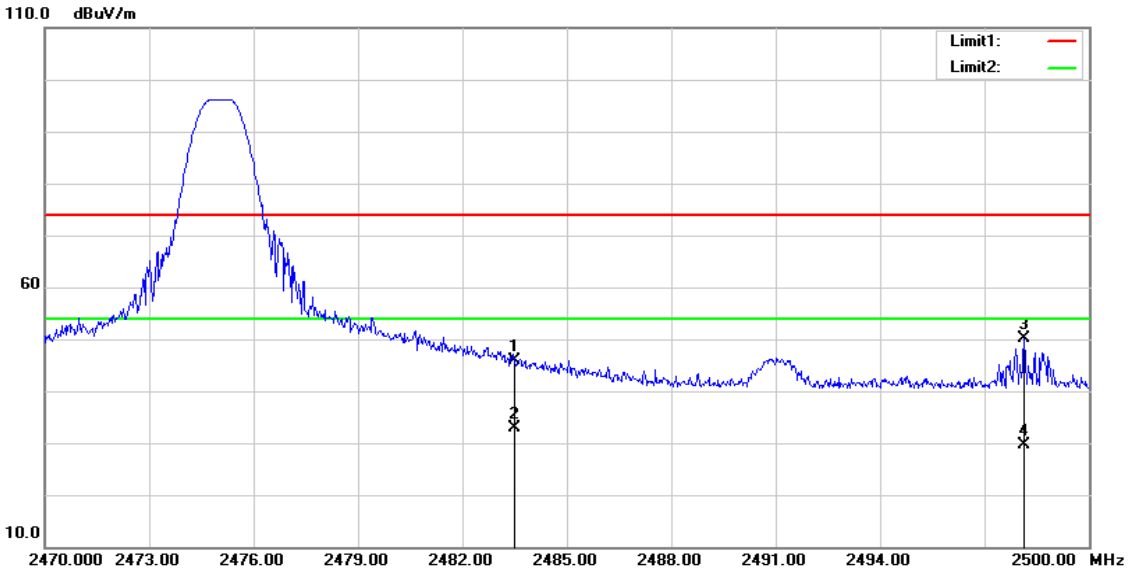


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	66.18	-10.02	56.16	74.00	-17.84	peak
2	2483.500	49.84	-10.02	39.82	54.00	-14.18	AVG
3	2498.560	68.16	-9.96	58.20	74.00	-15.80	peak
4	2498.560	39.97	-9.96	30.01	54.00	-23.99	AVG

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Band Edge	Power:	DC 7.2V
Test Mode:	Mode 2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Frequency:	2475 MHz	Date:	07/22/2016
Ant.Polar.:	Vertical	Test By:	Eric Ou Yang
Description:		Antenna:	ANT2

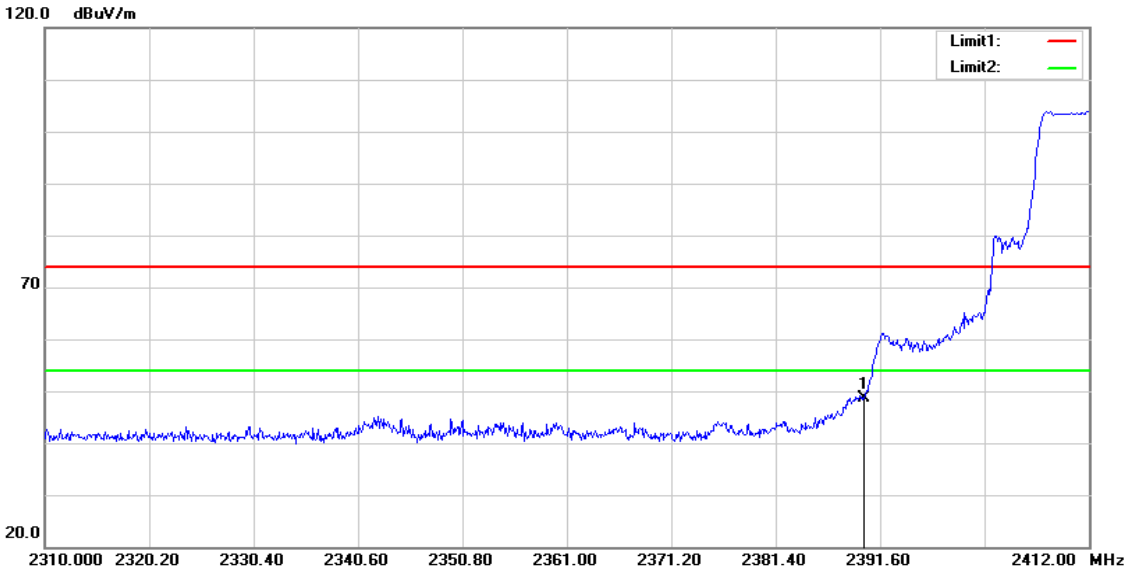


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	55.79	-10.02	45.77	74.00	-28.23	peak
2	2483.500	42.87	-10.02	32.85	54.00	-21.15	AVG
3	2498.140	59.99	-9.96	50.03	74.00	-23.97	peak
4	2498.140	39.69	-9.96	29.73	54.00	-24.27	AVG

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Band Edge	Power:	DC 7.2V
Test Mode:	Mode 2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Frequency:	2408 MHz	Date:	10/17/2016
Ant.Polar.:	Horizontal	Test By:	Eric Ou Yang
Description:	Hopping	Antenna:	ANT2

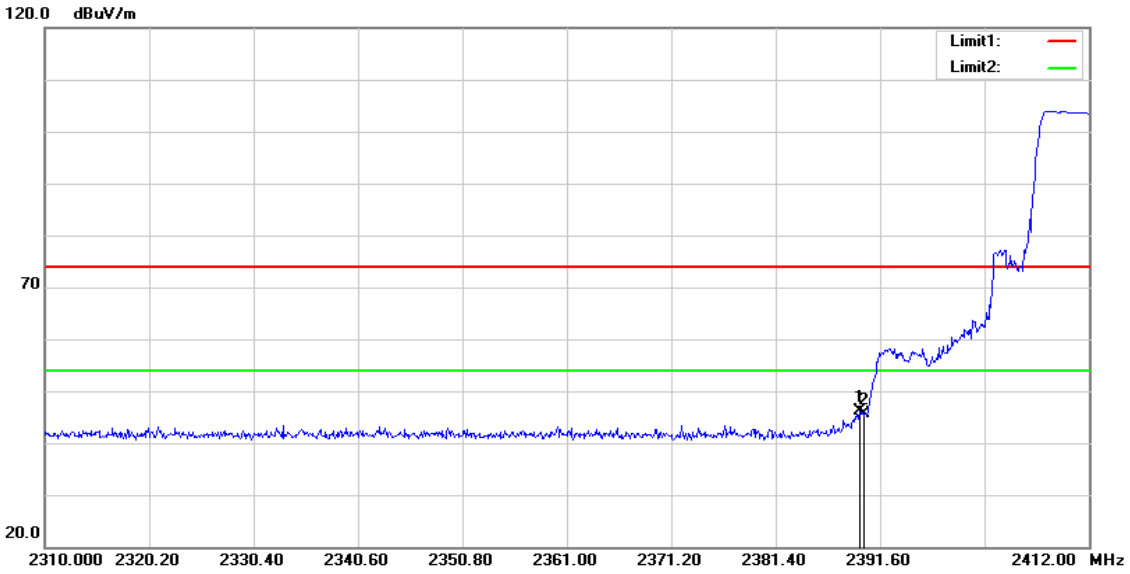


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	58.03	-9.49	48.54	74.00	-25.46	peak

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Band Edge	Power:	DC 7.2V
Test Mode:	Mode 2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Frequency:	2408 MHz	Date:	10/17/2016
Ant.Polar.:	Vertical	Test By:	Eric Ou Yang
Description:	Hopping	Antenna:	ANT2

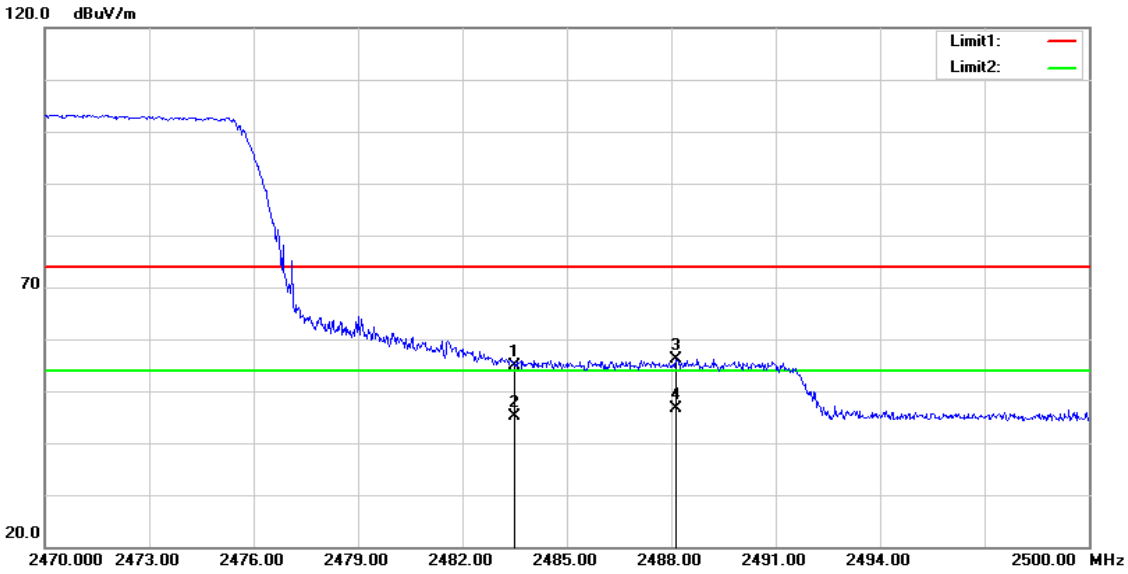


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.662	55.72	-9.49	46.23	74.00	-27.77	peak
2	2390.000	55.13	-9.49	45.64	74.00	-28.36	peak

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Band Edge	Power:	DC 7.2V
Test Mode:	Mode 2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Frequency:	2475 MHz	Date:	10/17/2016
Ant.Polar.:	Horizontal	Test By:	Eric Ou Yang
Description:	Hopping	Antenna:	ANT2

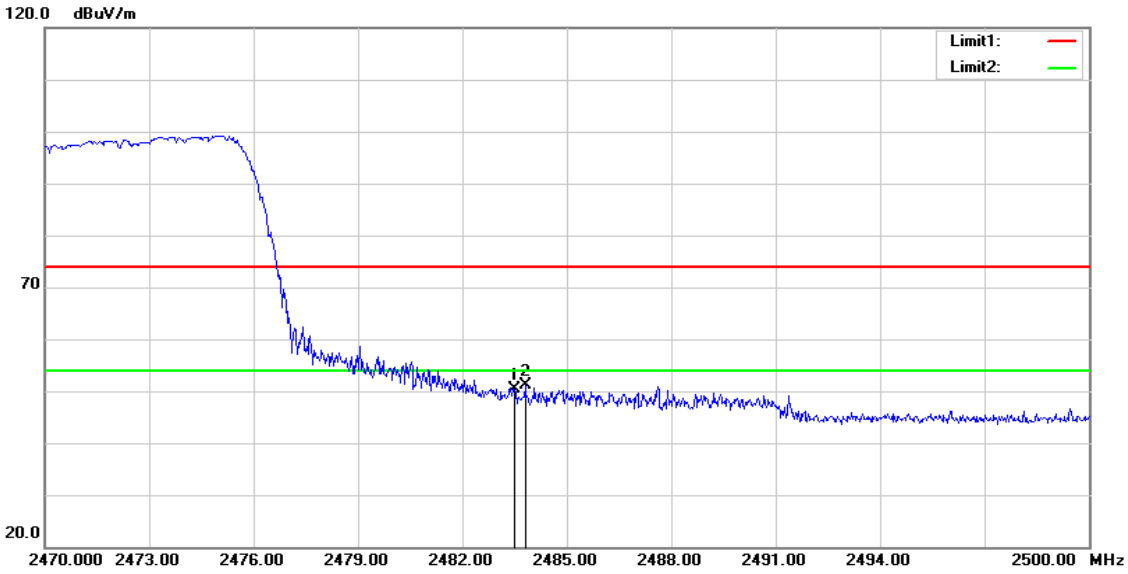


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	65.44	-10.49	54.95	74.00	-19.05	peak
2	2483.500	55.61	-10.49	45.12	54.00	-8.88	AVG
3	2488.120	66.72	-10.49	56.23	74.00	-17.77	peak
4	2488.120	57.08	-10.49	46.59	54.00	-7.41	AVG

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Band Edge	Power:	DC 7.2V
Test Mode:	Mode 2	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Frequency:	2475 MHz	Date:	10/17/2016
Ant.Polar.:	Vertical	Test By:	Eric Ou Yang
Description:	Hopping	Antenna:	ANT2



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	60.79	-10.49	50.30	74.00	-23.70	peak
2	2483.800	61.59	-10.49	51.10	74.00	-22.90	peak

Note:1.Result (dBuV/m) = Correct Factor (dB/m) + Reading(dBuV).

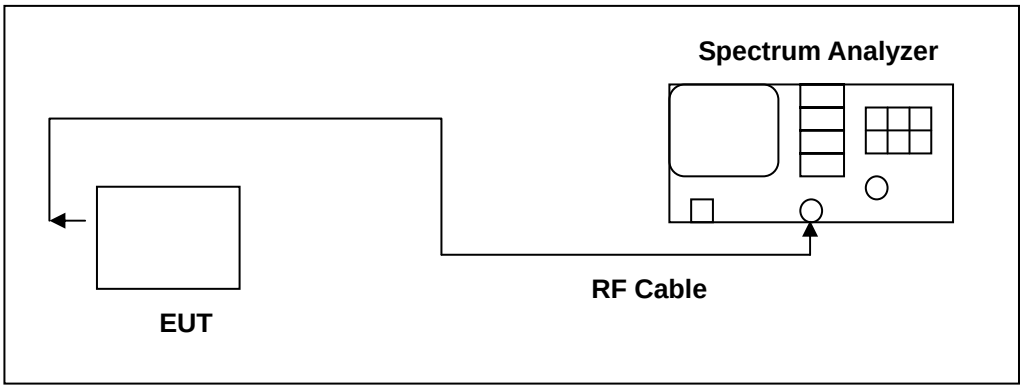
2.Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

6 20dB RF Bandwidth Measurement

6.1. Limit

N/A

6.2. Test Setup



6.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/15/2015	1 year
Microwave Cable	EMCI	EMC104-SM-SM-1500	140303	02/23/2016	1 year
Test Site	ATL	TE05	TE05	N.C.R.	-----

NOTE: N.C.R. = No Calibration Request.

6.4. Test Procedure

20dB RF Bandwidth

Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage. The Bluetooth frequency hopping function of the EUT was enabled. The spectrum analyzer used the following settings:

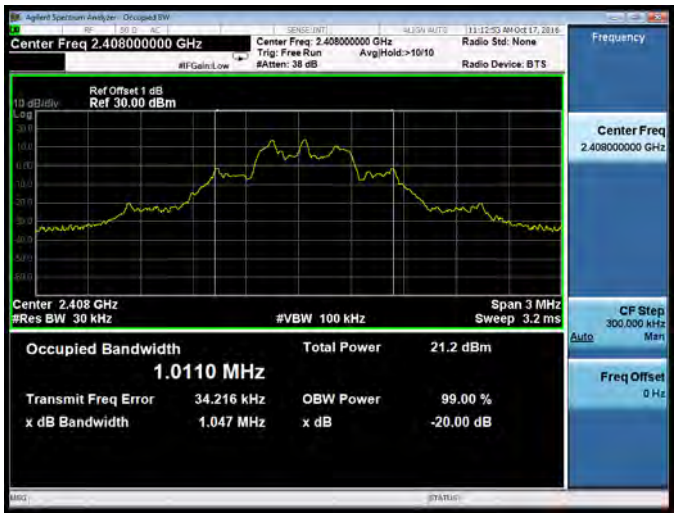
1. Span = approx. 2 to 3 times the 20dB bandwidth, centered on a hopping frequency
2. RBW ≥ 1% of the 20dB span
3. VBW ≥ RBW
4. Sweep = auto
5. Detector function = peak
6. Trace = max hold

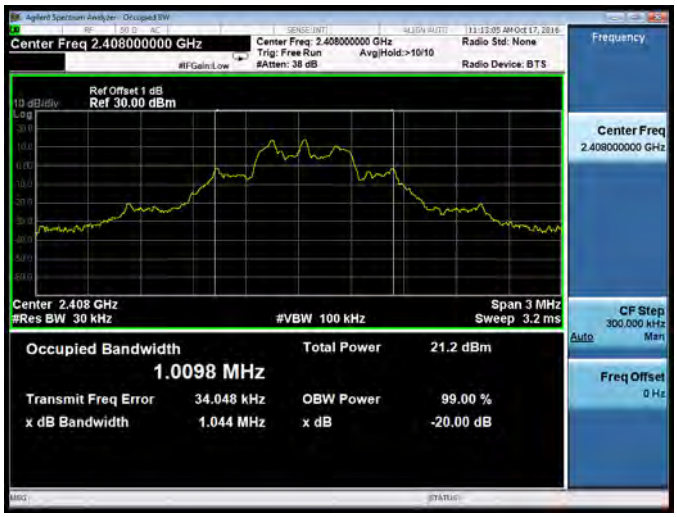
The trace was allowed to stabilize. The EUT was transmitting at its maximum data rate. The marker-to-peak function was used to set the marker to the peak of the emission. The marker-delta function was used to measure 20dB down one side of the emission. The marker-delta function and marker was moved to the other side of the emission until it was even with the reference marker. The marker-delta reading at this point was the 20dB bandwidth of the emission.

6.5. Test Result

Antenna	Frequency (MHz)	Measurement Results (MHz)
ANT1	2408	1.047
	2440	1.043
	2475	1.043
ANT2	2408	1.044
	2440	1.044
	2475	1.044

6.6. Test Graphs

Mode 2: Transmission Mode_ANT1	
2408 MHz	
2440 MHz	
2475 MHz	

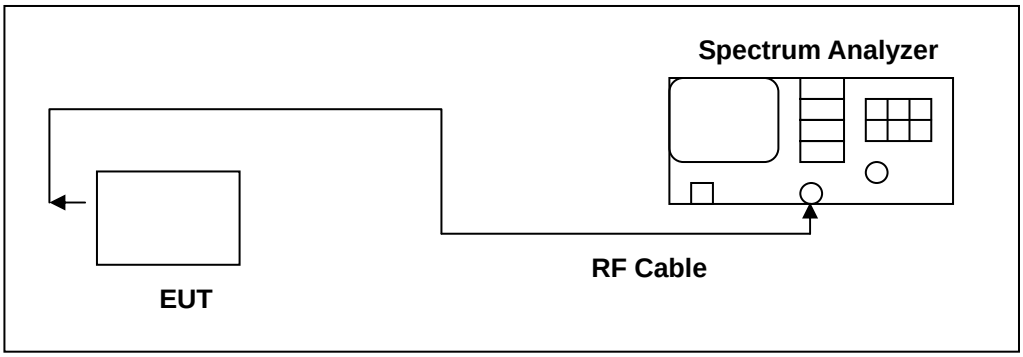
Mode 2: Transmission Mode_ANT2	
2408 MHz	
2440 MHz	
2475 MHz	

7 Carrier Frequency Separation Measurement

7.1. Limit

Title 47 of the CFR, Part 15 Subpart (c) 15.247(a)(1) requires the measurement of the bandwidth of the transmission between the -20 dB points on the transmitted spectrum. The results of this test determine the limits for channel spacing. The channel spacing shall be a minimum of 25 kHz or the 20 dB bandwidth, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel.

7.2. Test Setup



7.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/15/2015	1 year
Microwave Cable	EMCI	EMC104-SM-SM-1500	140303	02/23/2016	1 year
Test Site	ATL	TE05	TE05	N.C.R.	-----

NOTE: N.C.R. = No Calibration Request.

7.4. Test Procedure

Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage. The Bluetooth frequency hopping function of the EUT was enabled. The following spectrum analyzer settings were used:

1. Span = wide enough to capture the peaks of two adjacent channels
2. Resolution (or IF) Bandwidth (RBW) ≥ 1% of the span
3. Video (or Average) Bandwidth (VBW) ≥ RBW
4. Sweep = auto
5. Detector function = peak
6. Trace = max hold

The trace was allowed to stabilize. The marker-delta function was used to determine the separation between the peaks of the adjacent channels.

7.5. Test Result

Antenna	Frequency (MHz)	Measurement Results (MHz)	Limit (MHz)
ANT1	2408	0.807	> 0.698
	2440	0.807	> 0.695
	2475	0.807	> 0.695
ANT2	2408	0.806	> 0.696
	2440	0.806	> 0.696
	2475	0.806	> 0.696

7.6. Test Graphs

Mode 2: Transmission Mode_ANT1

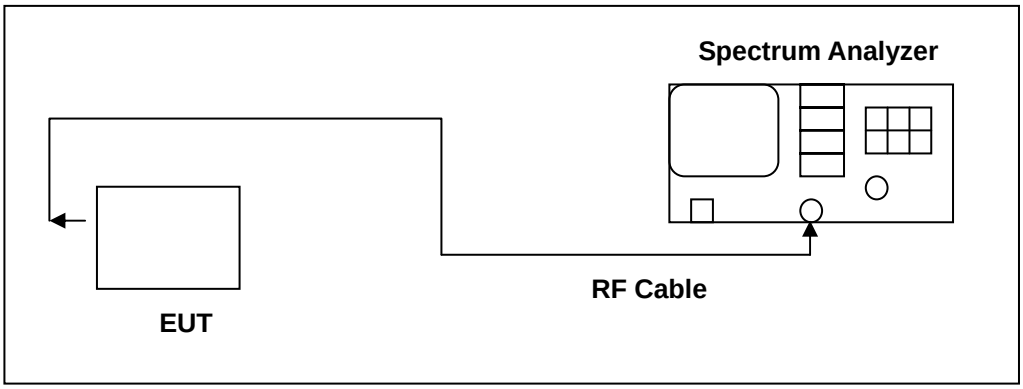

Mode 2: Transmission Mode_ANT2


8 Number of Hopping Measurement

8.1. Limit

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels.

8.2. Test Setup



8.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/15/2015	1 year
Microwave Cable	EMCI	EMC104-SM-SM-1500	140303	02/23/2016	1 year
Test Site	ATL	TE05	TE05	N.C.R.	-----

NOTE: N.C.R. = No Calibration Request.

8.4. Test Procedure

Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage. The Bluetooth frequency hopping function of the EUT was enabled. The spectrum analyzer used the following settings:

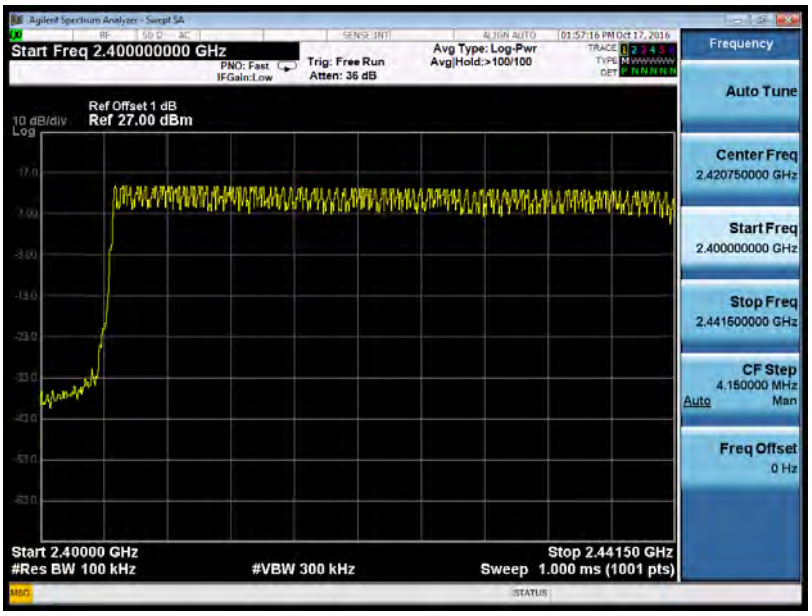
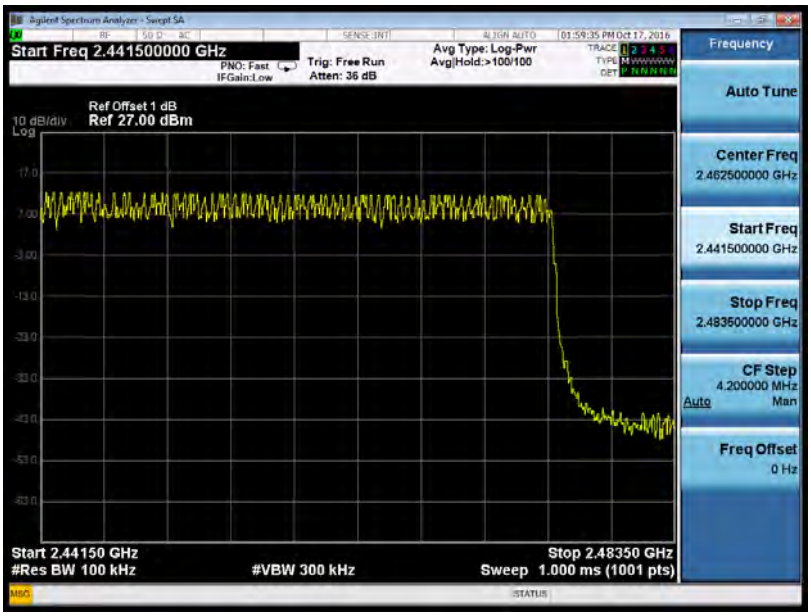
1. Span = the frequency band of operation
2. RBW ≥ 1% of the span
3. VBW ≥ RBW
4. Sweep = auto
5. Detector function = peak
6. Trace = max hold

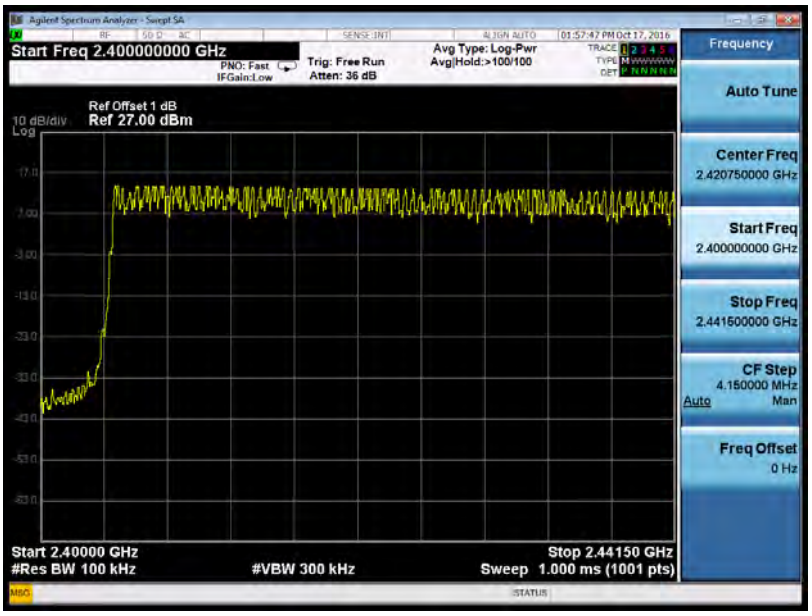
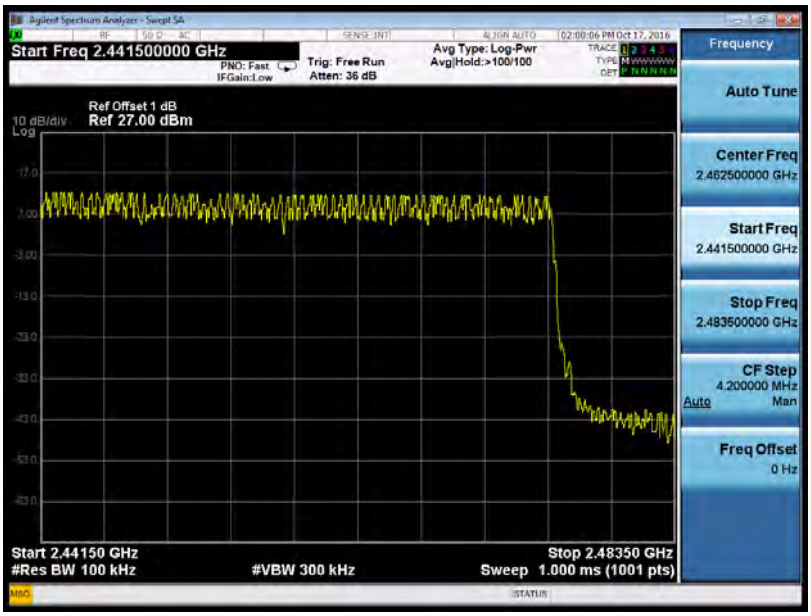
The trace was allowed to stabilize.

8.5. Test Result

Antenna	Frequency Range (MHz)	Measurement Results (Ch)	Limit (ch)
Mode 2	2408 - 2475	135	> 15
Mode 3	2408 - 2475	135	> 15
Mode 4	2408 - 2475	135	> 15

8.6. Test Graphs

Mode 2: Transmission Mode_ANT1



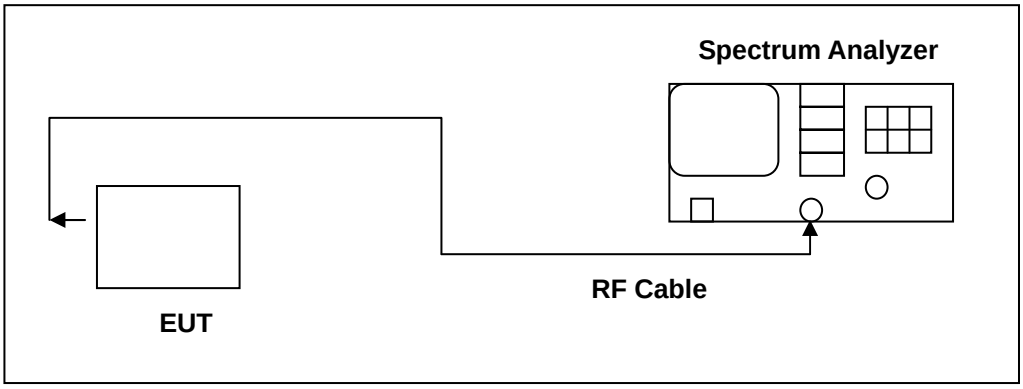
Mode 2: Transmission Mode_ANT2



9 Time of Occupancy (Dwell Time) Measurement

9.1. Limit

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

9.2. Test Setup



9.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/15/2015	1 year
Microwave Cable	EMCI	EMC104-SM-SM-1500	140303	02/23/2016	1 year
Test Site	ATL	TE05	TE05	N.C.R.	-----

NOTE: N.C.R. = No Calibration Request.

9.4. Test Procedure

Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. The RF output port of the Equipment-Under-Test is directly coupled to the input of the spectrum through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage. The Bluetooth hopping function of the EUT was enabled. The following spectrum analyzer settings were used:

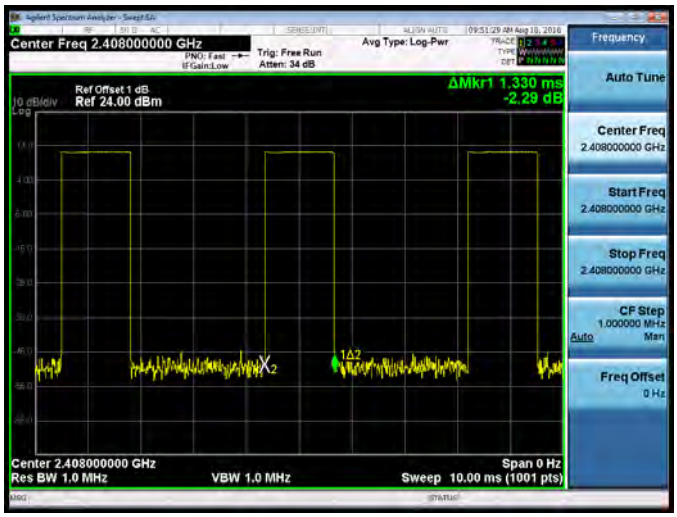
1. Span = zero span, centered on a hopping channel
2. RBW = 1 MHz
3. VBW ≥ RBW
4. Sweep = as necessary to capture the entire dwell time per hopping channel
5. Detector function = peak
6. Trace = max hold

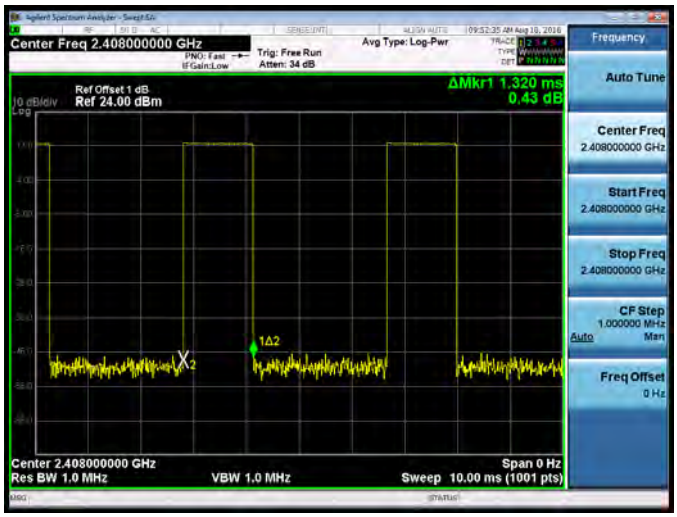
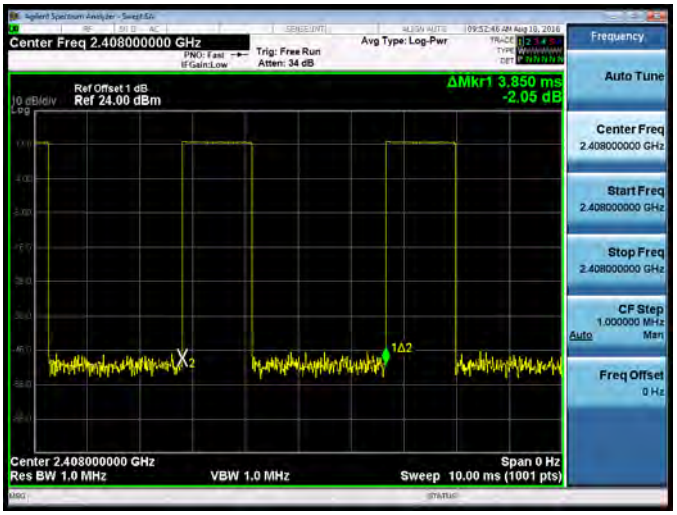
The marker-delta function was used to determine the dwell time.

9.5. Test Result

Mode 2: Transmission Mode	
ANT1	
Cycle Calculate	135CH * 0.4 = 54 (sec)
The EUT Hopping Number per Sec	256.5 times/sec
Each Channel Dwell Times per Sec	256.5/135CH = 1.9(times/sec)
Each Channel Dwell Times on Cycle(1)	54 * 1.9 = 102.6(times)
Each Channel Dwell Times (2)	1.330 ms (sec)
Dwell Times on Cycle (1) * (2)	136.458 ms (sec)
LIMIT(msec)	< = 400
ANT2	
Cycle Calculate	135CH * 0.4 = 54 (sec)
The EUT Hopping Number per Sec	256.5 times/sec
Each Channel Dwell Times per Sec	256.5/135CH = 1.9(times/sec)
Each Channel Dwell Times on Cycle(1)	54 * 1.9 = 102.6(times)
Each Channel Dwell Times (2)	1.320 ms (sec)
Dwell Times on Cycle (1) * (2)	135.432 ms (sec)
LIMIT(msec)	< = 400

9.6. Test Graphs

Mode 2: Transmission Mode_ANT1	
on	
on+off	
Number of Channels	

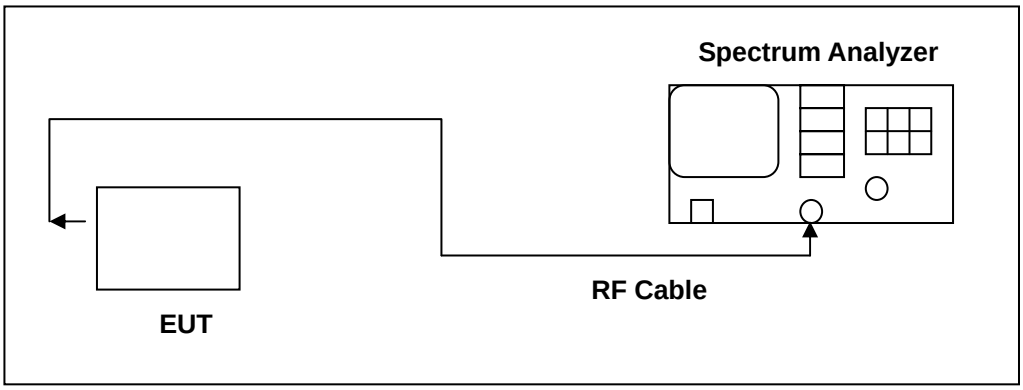
Mode 2: Transmission Mode_ANT2	
on	
on+off	
Number of Channels	

10 Out of Band Conducted Emissions Measurement

10.1. Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power

10.2. Test Setup



10.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/15/2015	1 year
Spectrum Analyzer	Agilent	E4408B	MY45107753	08/08/2016	1 year
Microwave Cable	EMCI	EMC104-SM-SM-1500	140303	02/23/2016	1 year
Test Site	ATL	TE05	TE05	N.C.R.	-----

NOTE: N.C.R. = No Calibration Request.

10.4. Test Procedure

Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. In any 100 kHz bandwidth outside the EUT pass band, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission, antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.
All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the pass band. The test was performed at 3 channels (Channel 0, 39, 78)

10.5. Test Graphs

Reference level

Mode 2: Transmission Mode_ANT1	
2408 MHz	
2440 MHz	
2475 MHz	

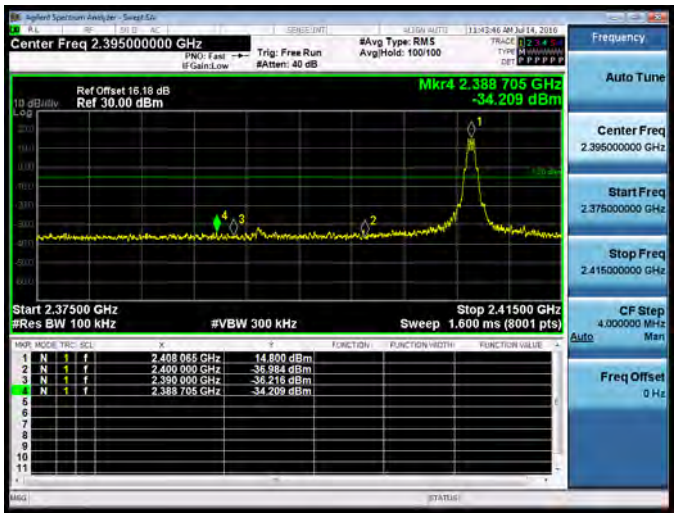
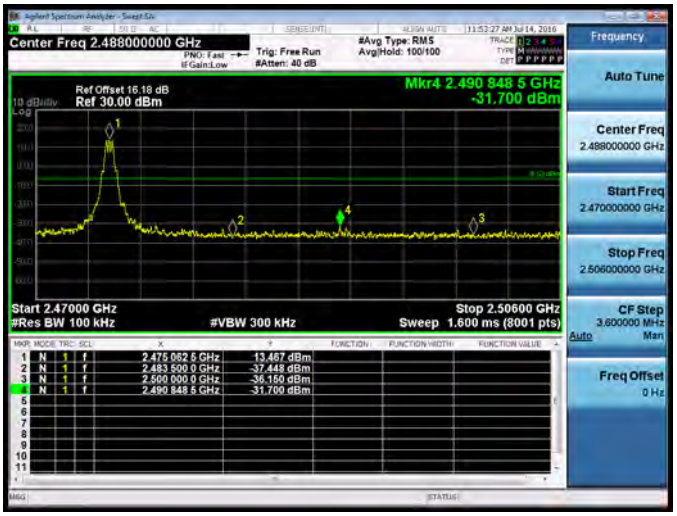
Mode 2: Transmission Mode_ANT2	
2408 MHz	
2440 MHz	
2475 MHz	

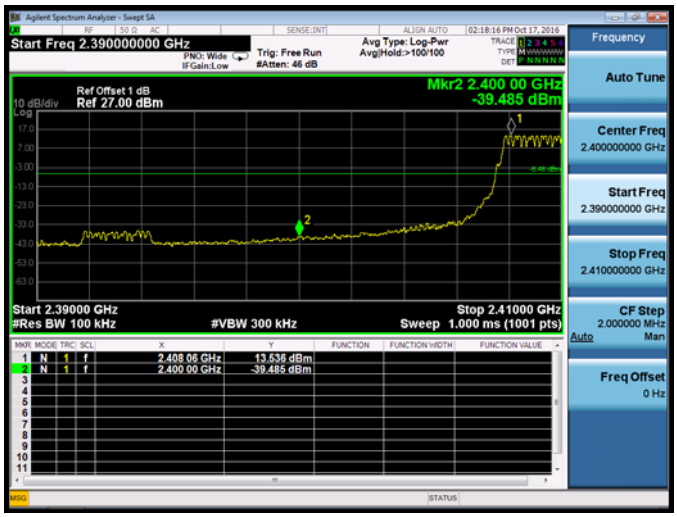
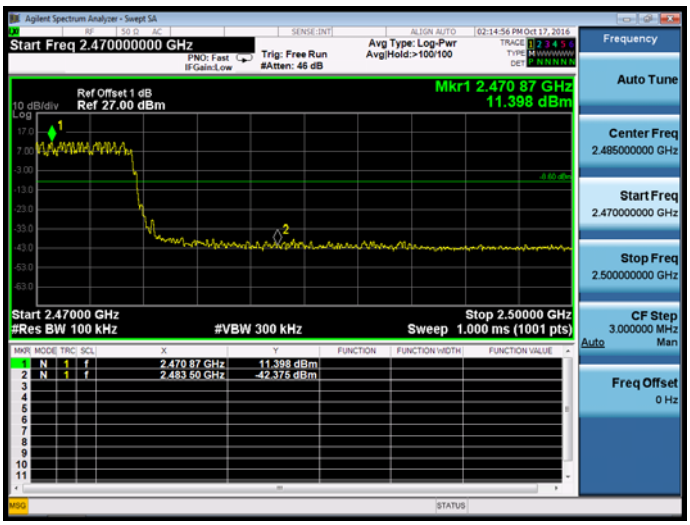
Out of Band Conducted Emissions

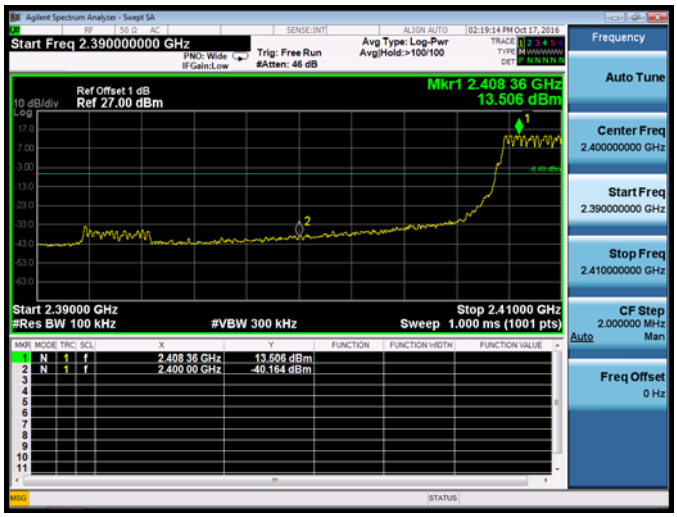
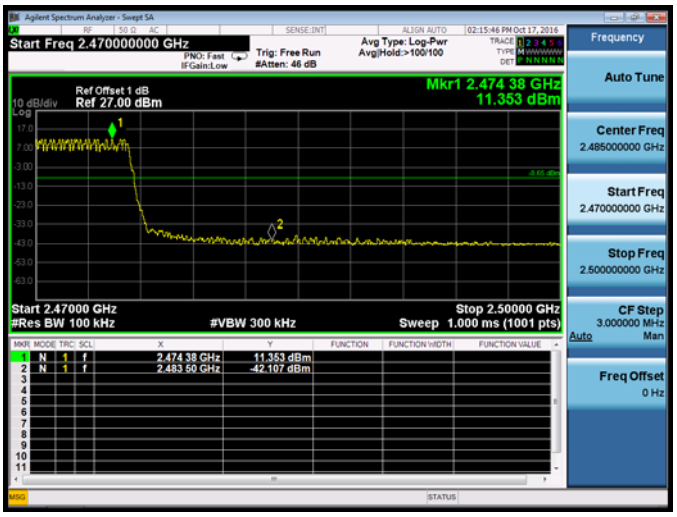
Mode 2: Transmission Mode_ANT1	
2408 MHz	
2440 MHz	
2475 MHz	

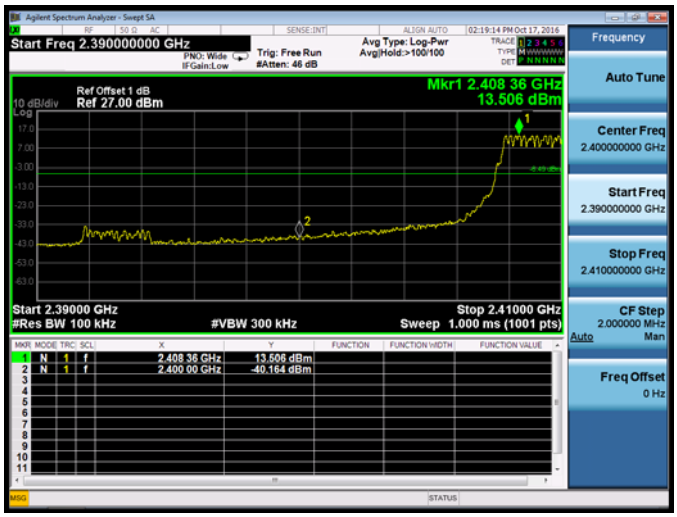
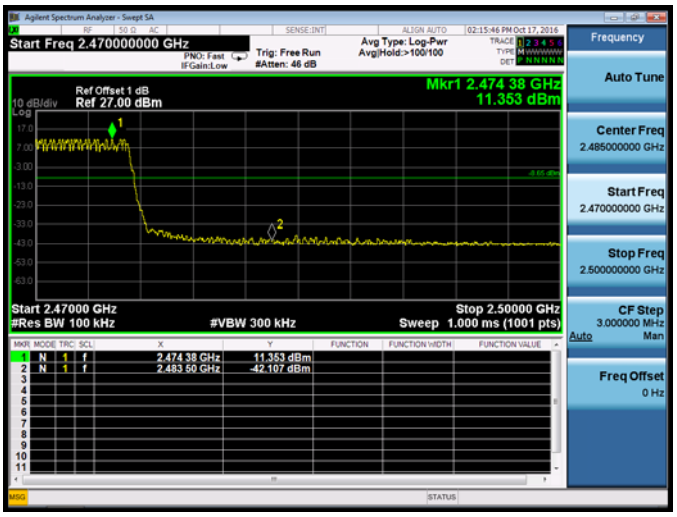
Mode 2: Transmission Mode_ANT2	
2408 MHz	
2440 MHz	
2475 MHz	

Conducted Band Edge

Mode 2: Transmission Mode_ANT1	
2408 MHz	
2475 MHz	

Mode 2: Transmission Mode_Hopping_ANT1	
2408 MHz	
2475 MHz	

Mode 2: Transmission Mode_Hopping_ANT2	
2408 MHz	
2475 MHz	

Mode 2: Transmission Mode_Hopping_ANT2	
2408 MHz	
2475 MHz	

11 Antenna Measurement

11.1. Limit

For intentional device, according to 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.
And According to 15.247 (b)(4), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

11.2. Antenna Connector Construction

See section 2 – antenna information.