

Test Report

FCC Part15 Subpart E

Product Name : Radio Controller
Model No. : YKQ01FM
FCC ID : 2AG53YKQ01FM
IC : 21054-YKQ01FM

Applicant : BEIJING FIMI TECHNOLOGY LIMITED
Address : 07C, Block A, Floor 7, No.28 Xinxi Road Jia,
Haidian District, Beijing, China

Date of Receipt : Dec. 09, 2015
Test Date : Dec. 09, 2015~ Jan. 14, 2016
Issued Date : Jul. 01, 2016
Report No. : 15C2020R-RF-US-P09V01
Report Version : V1.3

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

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Test Report Certification

Issued Date : Jul. 01, 2016


Report No. : 15C2020R-RF-US-P09V01



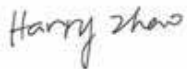
Product Name : Radio Controller
Applicant : BEIJING FIMI TECHNOLOGY LIMITED
Address : 07C, Block A, Floor 7, No.28 Xinxu Road Jia, Haidian District,
Beijing, China
Manufacturer : BEIJING FIMI TECHNOLOGY LIMITED
Address : 07C, Block A, Floor 7, No.28 Xinxu Road Jia, Haidian District,
Beijing, China
Model No. : YKQ01FM
Brand Name : 
FCC ID : 2AG53YKQ01FM
IC : 21054-YKQ01FM
EUT Voltage : DC 3.7V
Applicable Standard : FCC CFR Title 47 Part 15 Subpart E: 2015
ANSI C63.4:2014; ANSI C63.10:2013;
789033 D02 General UNII Test Procedures New Rules v01r02
Industry Canada RSS-Gen Issue 4
Industry Canada RSS-247 Issue 1
Test Result : Complied
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FCC Registration Number: 800392; IC Lab Code: 4075B

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We, **Quietek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted(audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scope:

Taiwan R.O.C.	:	BSMI, NCC,TAF
USA	:	FCC
Japan	:	VCCI
China	:	CNAS

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation's Web Site : <http://www.quietek.com/english/about/certificates.aspx?bval=5>

The address and introduction of Quietek Corporation's laboratories can be founded in our Web site : http://www.quietek.com/index_en.aspx

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
15C2020R-RF-US-P09V01	V1.0	Initial Issued Report	May. 09, 2016
15C2020R-RF-US-P09V01	V1.1	Modified the Antenna Delivery	Jun. 06, 2016
15C2020R-RF-US-P09V01	V1.2	Modified the limit of bandedge	Jun. 21, 2016
15C2020R-RF-US-P09V01	V1.3	Modified the test method of output power	Jul. 01, 2016

1. General Information

1.1. EUT Description

Product Name	Radio Controller
Brand Name	
Model No.	YKQ01FM
EUT Voltage	DC 3.7V
Frequency Range	For 5GHz Band 802.11a/n(20MHz): 5745~5825MHz 802.11n(40MHz): 5755~5795MHz
Channel Number	For 5GHz Band 802.11a/n(20MHz): 5 802.11n(40MHz): 2
Type of Modulation	802.11a/n: OFDM
Data Rate	802.11a: 6/9/12/18/24/36/48/54 Mbps 802.11n: up to 150 Mbps
Channel Control	Auto
Antenna Delivery	1*Tx + 2*Rx
Antenna Type	Reference to Antenna List
Peak Antenna Gain	Reference to Antenna List

For 5.0GHz Band

802.11a Working Frequency of Each Channel:							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
149	5745 MHz	153	5765 MHz	157	5785 MHz	161	5805 MHz
165	5825 MHz	N/A	N/A	N/A	N/A	N/A	N/A
802.11n(40MHz) Working Frequency of Each Channel:							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz	N/A	N/A	N/A	N/A

Antenna List

No.	Antenna	Manufacturer	Model No.	Peak Gain
#1	External Antenna	N/A	N/A	4.76dBi
#2	External Antenna	N/A	N/A	4.76dBi

Note: There are two antennas and only one antenna can transmit at the same time.

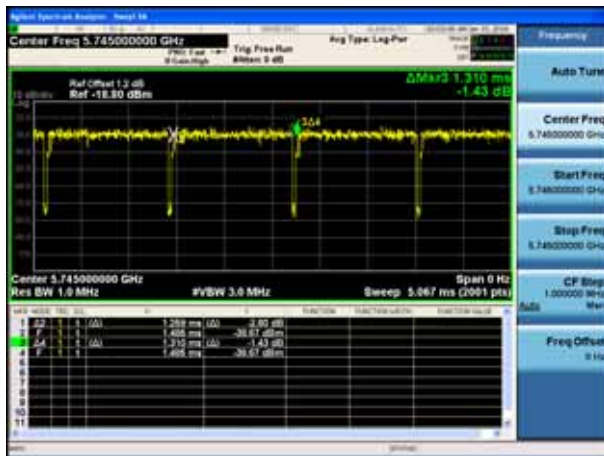
The test mode of the test software can support.

Test Mode	Ant 1	Ant 2	Ant 1+2
802.11a	✓	✓	✗
802.11n(20MHz)	✓	✓	✗
802.11n(40MHz)	✓	✓	✗

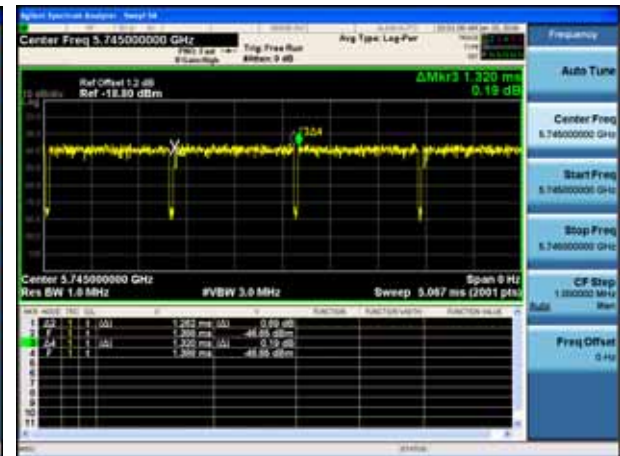
Duty Cycle

Test Mode	Duty Cycle
802.11a	96.11 %
802.11n(20MHz)	95.61 %
802.11n(40MHz)	89.86 %

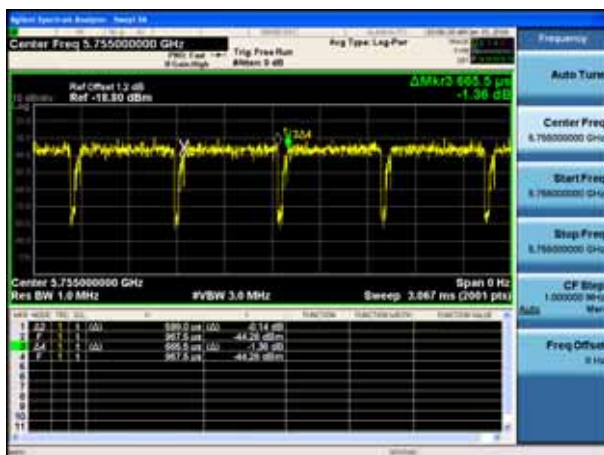
802.11a



802.11n (20MHz)



802.11n (40MHz)



1.2. Mode of Operation

QuieTek 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:

Test Mode
Mode 1: Transmit by 802.11a
Mode 2: Transmit by 802.11n(20MHz)
Mode 3: Transmit by 802.11n(40MHz)

Note:

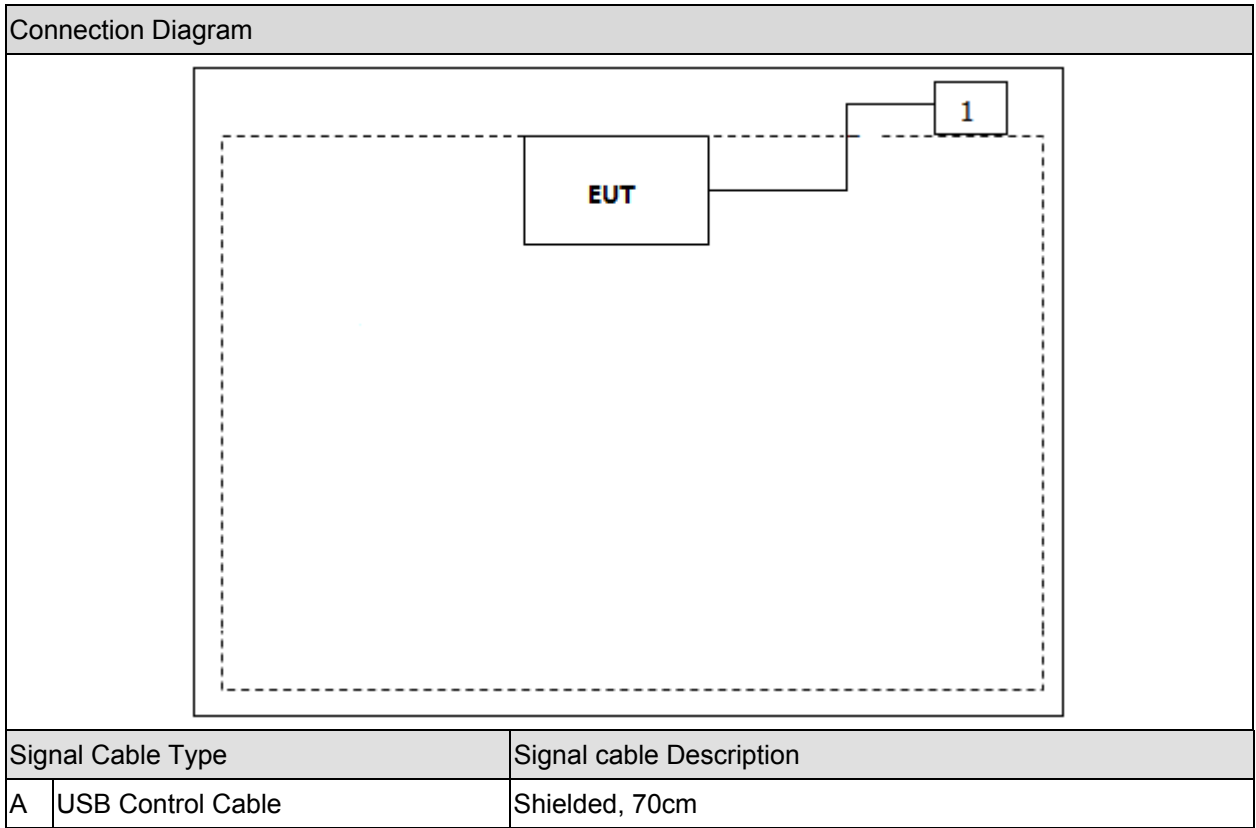
1. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.
2. The radiation measure measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

1.3. 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 No.	Serial No.	Power Cord
1	Notebook	Asus	N80V	8BN0AS226971468	N/A

1.4. Configuration of Tested System



1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of equipment.
3	Input the RF commands, and set the test mode and channel, then press OK to start continue Transmit or receive.

2. Technical Test

2.1. Summary of Test Result

- No deviations from the test standards
 Deviations from the test standards as below description:

For FCC

Performed Test Item	Normative References	Test Performed	Deviation
Conducted Emission	FCC CFR Title 47 Part 15 Subpart E: 2015 Section 15.207	No	No
Radiated Emission	FCC CFR Title 47 Part 15 Subpart E: 2015 Section 15.209	Yes	No
26dB Occupied Bandwidth	FCC CFR Title 47 Part 15 Subpart E: 2015 Section 15.407(a)	Yes	No
6dB Occupied Bandwidth	FCC CFR Title 47 Part 15 Subpart E:2014 Section 15.407(e)	Yes	No
Power Output	FCC CFR Title 47 Part 15 Subpart E: 2015 Section 15.407(a)	Yes	No
Peak Power Spectral Density	FCC CFR Title 47 Part 15 Subpart E: 2015 Section 15.407(a)	Yes	No
Radiated Emission Band Edge	FCC CFR Title 47 Part 15 Subpart E: 2015 Section 15.205, 15.407(b)	Yes	No
Frequency Stability	FCC CFR Title 47 Part 15 Subpart E: 2015 Section 15.407(g)	Yes	No

For IC

Performed Test Item	Normative References	Test Performed	Deviation
Conducted Emission	RSS-Gen Issue 4 November 2014 Section 8.8	No	No
Radiated Emission	RSS-247 Issue 1 May 2015 Section 5.5	Yes	No
99% Occupied Bandwidth	RSS-Gen Issue 4 November 2014 Section 6.6	Yes	No
6dB Occupied Bandwidth	RSS-247 Issue 1 May 2015 Section 6.2	Yes	No
Power Output	RSS-247 Issue 1 May 2015 Section 6.2	Yes	No
Peak Power Spectral Density	RSS-247 Issue 1 May 2015 Section 6.2	Yes	No
Radiated Emission Band Edge	RSS-Gen Issue 4 November 2014 Section 8.10	Yes	No
Frequency Stability	RSS-Gen Issue 4 November 2014 Section 8.11	Yes	No

Note: The EUT is powered by battery, so conducted emission is not tested.

2.2. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	21
Humidity (%RH)	25-75	50
Barometric pressure (mbar)	860-1060	950-1000

3. Conducted Emission

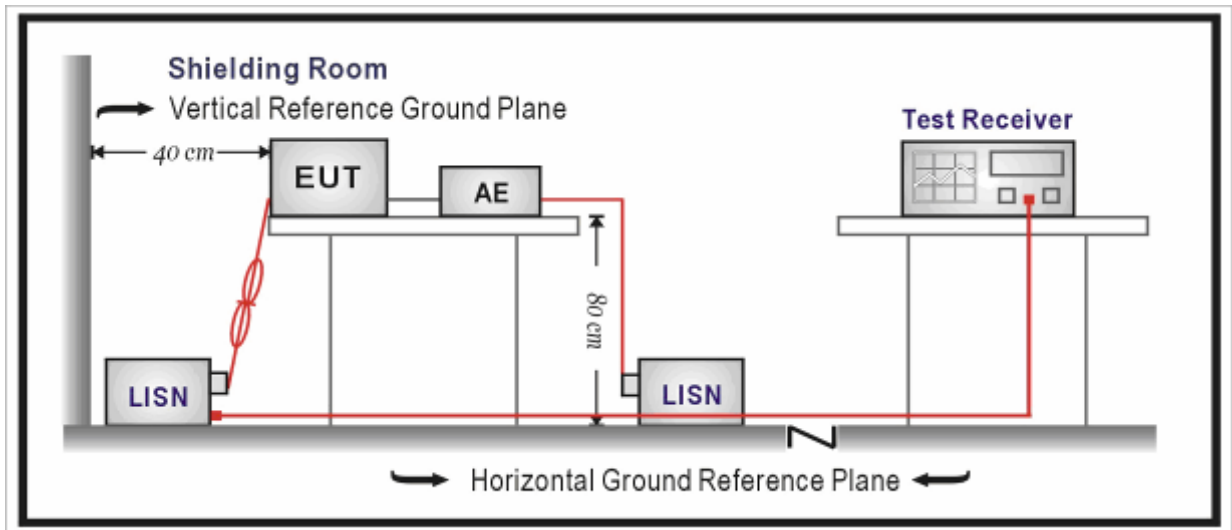
3.1. Test Equipment

Conducted Emission / TR-1

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100726	2016.03.28
Two-Line V-Network	R&S	ENV216	100043	2016.03.28
Two-Line V-Network	R&S	ENV216	100044	2016.09.16
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2016.03.01
50ohm Termination	SHX	TF2	07081401	2016.09.16
Temperature/Humidity Meter	zhicheng	ZC1-2	TR1-TH	2017.01.04

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

3.2. Test Setup



3.3. Limit

For FCC&IC

FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

3.4. Test Procedure

according to ANSI C63.4:2014& ANSI C63.10:2013&789033 D02 General UNII Test Procedures New Rules v01r02& FCC CFR Title 47 Part 15 Subpart E: 2015& Industry Canada RSS-Gen Issue 4 Industry Canada RSS-247 Issue 1

The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)

Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

3.5. Uncertainty

The measurement uncertainty is defined as ± 2.02 dB

3.6. Test Result

The device was powered by battery, so the test is not applied.

4. Radiated Emission

4.1. Test Equipment

Radiated Emission / AC-2

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100573	2016.03.28
Loop Antenna	R&S	HFH2-Z2	833799/003	2016.11.17
Bilog Chainenna	Teseq GmbH	CBL6112D	27611	2016.10.15
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2016.03.01
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC2-TH	2017.01.04

Radiated Emission / AC-5

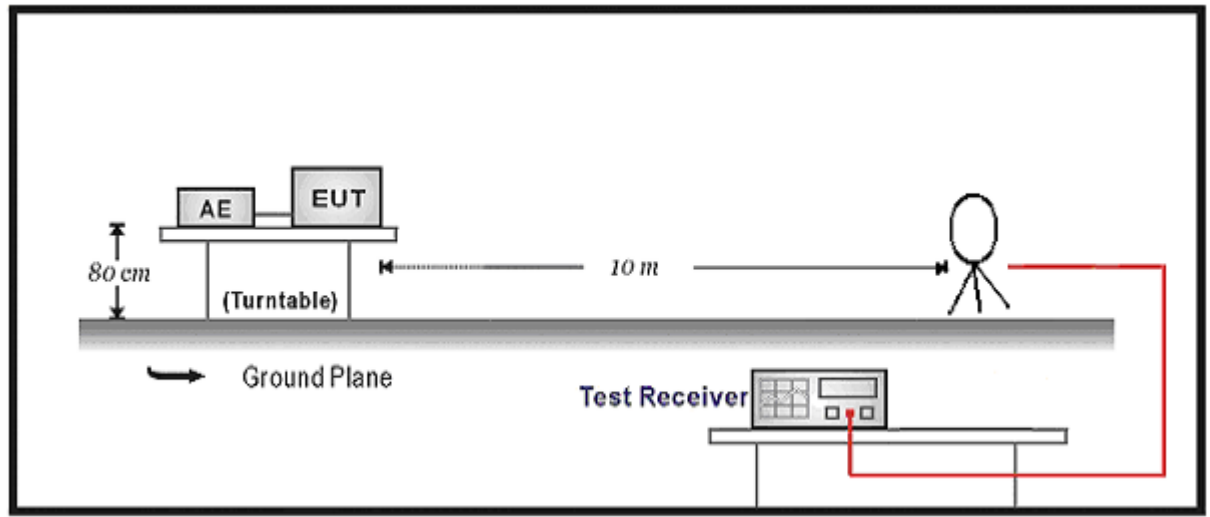
Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	N9020A	MY49100159	2016.03.28
Spectrum Analyzer	Agilent	E4446A	MY45300103	2017.01.04
Preamplifier	Miteq	NSP1800-25	1364185	2016.05.05
Preamplifier	Quietek	AP-040G	CHM-0906001	2016.05.05
DRG Horn	ETS-Lindgren	3117	00123988	2016.01.21
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2016.11.24
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2016.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2016.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2016.03.01
EMI Receiver	Agilent	N9038A	MY51210196	2016.06.09
Temperature/Humidity Meter	Zhichen	ZC1-2	AC5-TH	2017.01.04

Note 1: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

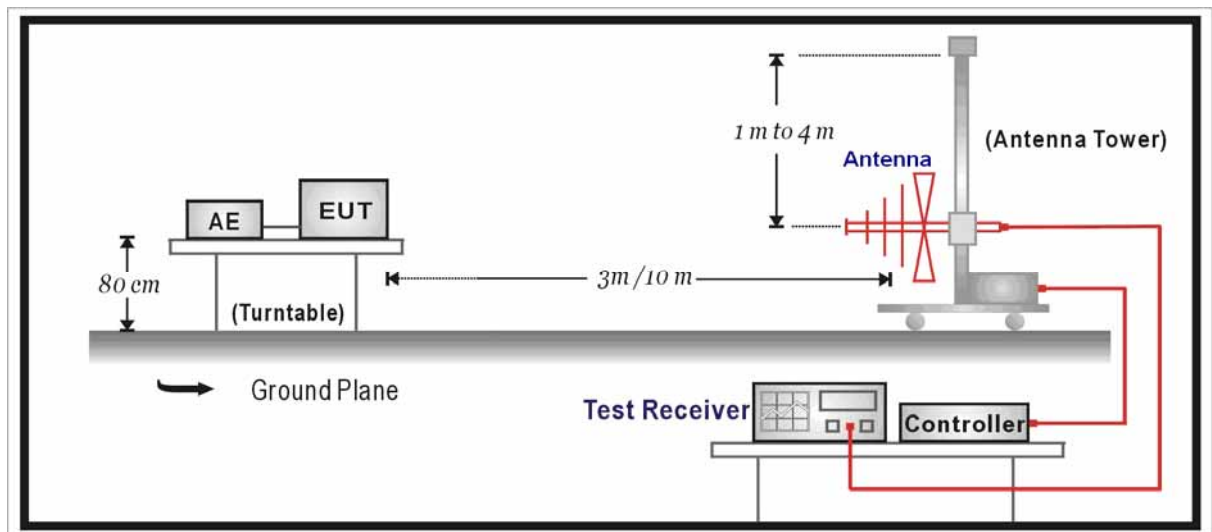
4.2. Test Setup

For FCC&IC

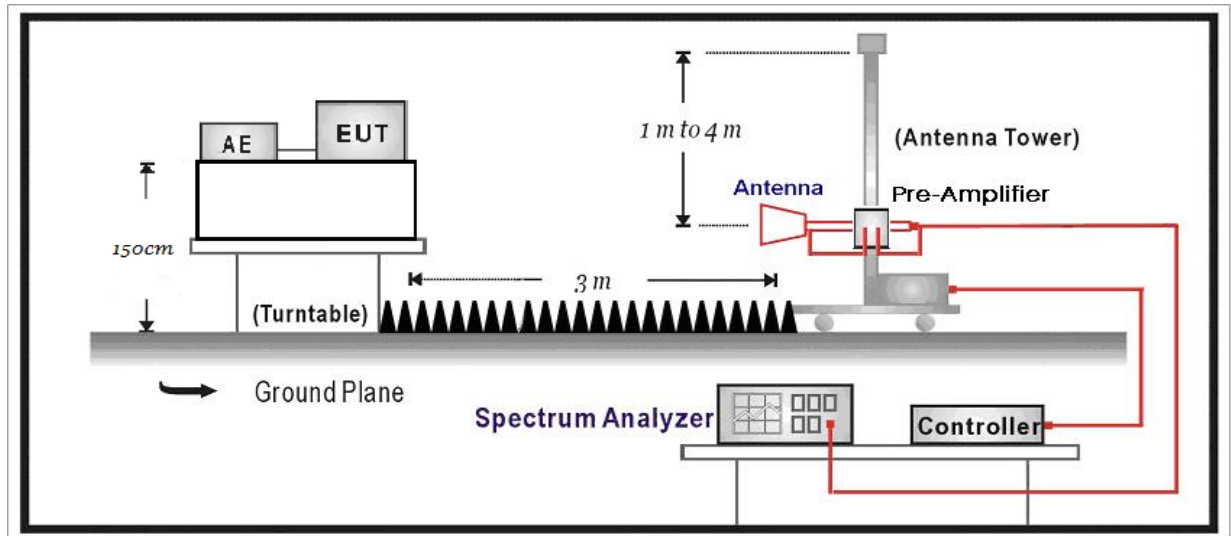
Below 30MHz Test Setup:



Below 1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limit

FCC Part 15 Subpart C Paragraph 15.209		
Frequency (MHz)	Distance (m)	Level (dBuV/m)
30 - 88	3	40
88 - 216	3	43.5
216 - 960	3	46
Above 960	3	54

Note 1: The lower limit shall apply at the transition frequency.

Note 2: Distance refers to the distance in meters between the measuring instrument Chainenna and the closed point of any part of the device or system.

Note 3: E field strength (dBuV/m) = 20 log E field strength (uV/m)

4.4. Test Procedure

According to ANSI C63.4:2014& ANSI C63.10:2013&789033 D02 General UNII Test Procedures New Rules v01r02& FCC CFR Title 47 Part 15 Subpart E: 2015& Industry Canada RSS-Gen Issue 4 Industry Canada RSS-247 Issue 1

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was

positioned such that the distance from Chainenna to the EUT was 3 meters.

The Chainenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the Chainenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4:2014 on radiated measurement.

The resolution bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

The frequency range from 30MHz to 10th harmonic is checked.

The procedure for peak unwanted emissions measurements above 1000 MHz is as follows:

Peak emission levels are measured by setting the instrument as follows:

- 1) RBW = 1 MHz.
- 2) VBW $\geq [3 \times \text{RBW}]$.
- 3) Detector = peak
- 4) Sweep time = auto.
- 5) Trace mode = max hold.
- 6) Allow sweeps to continue until the trace stabilizes. Note that if the transmission is not continuous, then the time required for the trace to stabilize will increase by a factor of approximately $1 / D$, where D is the duty cycle. For example, at 50% duty cycle, the measurement time will increase by a factor of two, relative to measurement time for continuous transmission.

Average emission levels are measured by setting the instrument as follows:

- a) RBW = 1 MHz.
- b) Video bandwidth:
 - 1) If the EUT is configured to transmit with $D \geq 98\%$, then set $\text{VBW} \leq \text{RBW} / 100$ (i.e., 10 kHz), but not less than 10 Hz.
 - 2) If the EUT D is $< 98\%$, then set $\text{VBW} \geq 1 / T$, where T is defined in item a1) of 12.2.
- c) Video bandwidth mode or display mode:
 - 1) The instrument shall be set with video filtering applied in the power domain. Typically, this requires setting the detector mode to RMS (power averaging) and setting the average-VBW type to power (rms).
 - 2) As an alternative, the instrument may be set to linear detector mode. Video filtering shall be applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode to accomplish this. Others have a setting for average-VBW type, which can be set to "voltage" regardless of the display mode.
- d) Detector = peak.
- e) Sweep time = auto.

f) Trace mode = max hold.

g) Allow max hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98% duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of $1/x$, where D is the duty cycle. For example, use at least 200 traces if the duty cycle is 25%. (If a specific emission is demonstrated to be continuous—i.e., 100% duty cycle—then rather than turning ON and OFF with the transmit cycle, at least 50 traces should be averaged.)

Note: When doing emission measurement above 1GHz, the horn Chainenna will be bended down a little (as horn antenna has the narrow beamwidth) in order to keeping the Chainenna in the “cone of radiation” of EUT. The 3dB beamwidth is 60~10 degrees for H-plane and 90~10 degrees for E-plane.

4.5. Uncertainty

The measurement uncertainty above 1GHz is defined as ± 3.9 dB
below 1GHz is defined as ± 3.8 dB

4.6. Test Result

Mode1: Transmit by 802.11a

Chain	CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Ant 1	149	H	11489.0	42.1	21.3	63.4	74.0	-10.6	PK
		H	11490.6	30.5	21.3	51.8	54.0	-2.2	AV
		H	17235.0	38.9	25.7	64.6	74.0	-9.4	PK
		H	27234.7	26.6	25.7	52.3	54.0	-1.7	AV
		V	11489.0	44.8	21.3	66.1	74.0	-7.9	PK
		V	11489.9	32.3	21.3	53.6	54.0	-0.4	AV
		V	17235.0	28.8	25.7	54.5	74.0	-19.5	PK
		V	17236.2	24.7	25.7	50.4	54.0	-3.6	AV
	157	H	11582.5	44.6	21.6	66.2	74.0	-7.8	PK
		H	11569.5	23.9	22.1	46.0	54.0	-8.0	AV
		H	17355.0	27.9	25.3	53.2	54(Note3)	-0.8	PK
		V	11565.5	48.4	22.2	70.6	74.0	-3.4	PK
		V	11570.2	30.9	22.1	53.0	54.0	-1.0	AV
		V	17345.5	31.2	25.8	57.0	74.0	-17.0	PK
		V	17346.9	23.9	25.8	49.7	54.0	-4.3	AV
	165	H	11667.5	44.3	23.9	68.2	74.0	-5.8	PK
		H	11650.0	29.4	23.0	52.4	54.0	-1.6	AV
		H	17490.0	35.7	24.6	60.3	74.0	-13.7	PK
		H	17488.3	20.1	24.6	44.7	54.0	-9.3	AV
		V	11667.5	43.8	23.9	67.7	74.0	-6.3	PK
		V	11649.7	29.4	23.0	52.4	54.0	-1.6	AV
		V	17490.0	33.2	24.6	57.8	74.0	-16.2	PK
		V	17491.3	20.3	24.6	44.9	54.0	-9.1	AV

Chain	CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Ant 2	149	H	11489.0	37.8	21.3	59.1	74.0	-14.9	PK
		H	11489.7	27.0	21.3	48.3	54.0	-5.7	AV
		H	17243.5	31.6	25.9	57.5	74.0	-16.5	PK
		H	17244.4	20.3	25.9	46.2	54.0	-7.8	AV
		V	11489.0	43.7	21.3	65.0	74.0	-9.0	PK
		V	11489.7	32.3	21.3	53.6	54.0	-0.4	AV
		V	17226.5	36.2	25.9	62.1	74.0	-11.9	PK
		V	17230.4	25.0	25.9	50.9	54.0	-3.1	AV
	157	H	11582.5	44.9	21.6	66.5	74.0	-7.5	PK
		H	11571.0	30.2	22.1	52.3	54.0	-1.7	AV
		H	17355.0	25.1	25.3	50.4	54(Note3)	-3.6	PK
		V	11582.5	47.6	21.6	69.2	74.0	-4.8	PK
		V	11571.0	31.5	22.1	53.6	54.0	-0.4	AV
		V	17355.0	25.1	25.3	50.4	54(Note3)	-3.6	PK
	165	H	11667.5	40.4	23.9	64.3	74.0	-9.7	PK
		H	11648.7	24.9	22.9	47.8	54.0	-6.2	AV
		H	17490.0	29.7	24.6	54.3	74.0	-19.7	PK
		H	17488.3	15.7	24.6	40.3	54.0	-13.7	AV
		V	11667.5	40.4	23.9	64.3	74.0	-9.7	PK
		V	11648.7	28.9	22.9	51.8	54.0	-2.2	AV
		V	17490.0	32.1	24.6	56.7	74.0	-17.3	PK
		V	17489.7	18.9	24.6	43.5	54.0	-10.5	AV

Note: 1. Measure Level = Reading Level + Factor.

2. The test frequency range, 9kHz~30MHz, 18GHz~25GHz, both of the worst case are at least 6dB below the limits, therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

Mode2: Transmit by 802.11n(20MHz)

Chain	CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Ant 1	149	H	11497.5	40.9	21.4	62.3	74.0	-11.7	PK
		H	11500.3	28.3	21.4	49.7	54.0	-4.3	AV
		H	17235.0	32.1	25.7	57.8	74.0	-16.2	PK
		H	17236.4	16.8	25.7	42.5	54.0	-11.5	AV
		V	11497.5	43.9	21.4	65.3	74.0	-8.7	PK
		V	11490.2	31.3	21.3	52.6	54.0	-1.4	AV
		V	17235.0	30.0	25.7	55.7	74.0	-18.3	PK
		V	17232.7	19.3	25.7	45.0	54.0	-9.0	AV
	157	H	11582.5	43.4	21.6	65.0	74.0	-9.0	PK
		H	17585.4	29.6	21.6	51.2	54.0	-2.8	AV
		H	17355.0	26.1	25.3	51.4	54(Note3)	-2.6	PK
		V	11540.0	43.7	22.0	65.7	74.0	-8.3	PK
		V	11569.5	29.9	22.1	52.0	54.0	-2.0	AV
		V	17355.0	26.4	25.3	51.7	54(Note3)	-2.3	PK
	165	H	11667.5	46.1	23.9	70.0	74.0	-4.0	PK
		H	11668.4	28.5	23.9	52.4	54.0	-1.6	AV
		H	17490.0	37.4	24.6	62.0	74.0	-12.0	PK
		H	17492.4	23.0	24.6	47.6	54.0	-6.4	AV
		V	11667.5	44.6	23.9	68.5	74.0	-5.5	PK
		V	11651.2	30.0	23.0	53.0	54.0	-1.0	AV
		V	17447.5	31.1	26.0	57.1	74.0	-16.9	PK
		V	17448.7	22.3	26.0	48.3	54.0	-5.7	AV

Chain	CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Ant 2	149	H	11497.5	38.6	21.4	60.0	74.0	-14.0	PK
		H	11500.5	28.5	21.4	49.9	54.0	-4.1	AV
		H	17235.0	28.0	25.7	53.7	54(Note3)	-0.3	PK
		V	11497.5	43.5	21.4	64.9	74.0	-9.1	PK
		V	11490.0	30.9	21.3	52.2	54.0	-1.8	AV
		V	17235.0	33.2	25.7	58.9	74.0	-15.1	PK
		V	17236.5	14.4	25.7	40.1	54.0	-13.9	AV
	157	H	11582.5	42.4	21.6	64.0	74.0	-10.0	PK
		H	11583.6	29.9	21.6	51.5	54.0	-2.5	AV
		H	17355.0	23.0	25.3	48.3	54(Note3)	-5.7	PK
		V	11582.5	45.1	21.6	66.7	74.0	-7.3	PK
		V	11570.7	31.1	22.1	53.2	54.0	-0.8	AV
		V	17355.0	25.9	25.3	51.2	54(Note3)	-2.8	PK
	165	H	11667.5	41.1	23.9	65.0	74.0	-9.0	PK
		H	11662.8	24.3	23.9	48.2	54.0	-5.8	AV
		H	17447.5	30.0	26.0	56.0	74.0	-18.0	PK
		H	17448.2	16.3	26.0	42.3	54.0	-11.7	AV
		V	11667.5	44.3	23.9	68.2	74.0	-5.8	PK
		V	11648.7	28.4	22.9	51.3	54.0	-2.7	AV
		V	17490.0	32.4	24.6	57.0	74.0	-17.0	PK
		V	17492.2	16.2	24.6	40.8	54.0	-13.2	AV

Note: 1. Measure Level = Reading Level + Factor.

2. The test frequency range, 9kHz~30MHz, 18GHz~25GHz, both of the worst case are at least 6dB below the limits, therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

Mode3: Transmit by 802.11n(40MHz)

Chain	CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Ant 1	151	H	11497.5	43.3	21.4	64.7	74	-9.3	PK
		H	11509.5	31.4	21.6	53	54	-1.0	AV
		H	17277.5	37.6	25	62.6	74	-11.4	PK
		H	17278.3	25.3	25	50.3	54	-3.7	AV
		V	11540.0	42.8	22	64.8	74	-9.2	PK
		V	11509.5	30.7	21.6	52.3	54	-1.7	AV
		V	17277.5	33.2	25	58.2	74	-15.8	PK
		V	17273.9	26.6	25	51.6	54	-2.4	AV
	159	H	11582.5	47.9	21.6	69.5	74	-4.5	PK
		H	11589.5	32.1	21.2	53.3	54	-0.7	AV
		H	17405.0	37.6	26.2	63.8	74	-10.2	PK
		H	17400.8	20.5	26.2	46.7	54	-7.3	AV
		V	11582.5	43.8	21.6	65.4	74	-8.6	PK
		V	11589.5	30.5	21.2	51.7	54	-2.3	AV
		V	17405.0	32.0	26.2	58.2	74	-15.8	PK
		V	17406.3	18.6	26.2	44.8	54	-9.2	AV

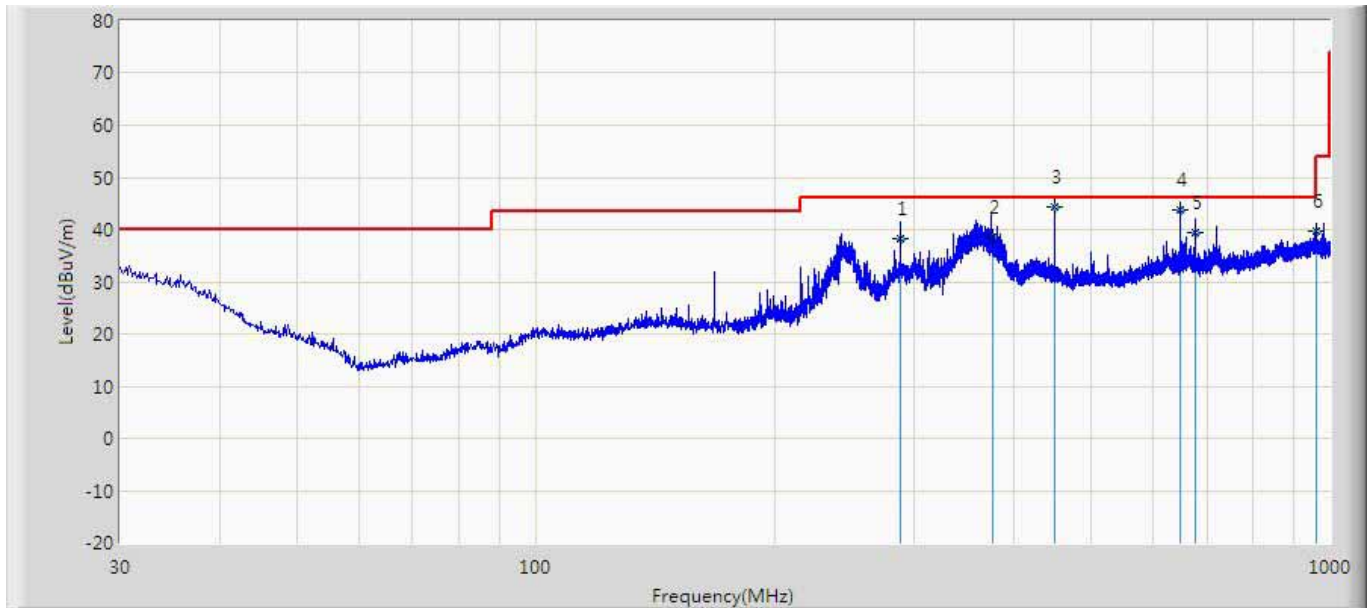
Chain	CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Ant 2	149	H	11497.5	39.7	21.4	61.1	74.0	-12.9	PK
		H	11498.3	28.4	21.4	49.8	54.0	-4.2	AV
		H	17277.5	34.5	25.0	59.5	74.0	-14.5	PK
		H	17283.4	22.6	25.0	47.6	54.0	-6.4	AV
		V	11497.5	43.0	21.4	64.4	74.0	-9.6	PK
		V	11514.2	31.0	21.7	52.7	54.0	-1.3	AV
		V	17277.5	37.8	25.0	62.8	74.0	-11.2	PK
		V	17276.8	33.3	25.0	58.3	54.0	4.3	AV
	157	H	11582.5	44.8	21.6	66.4	74.0	-7.6	PK
		H	11583.4	28.8	21.6	50.4	54.0	-3.6	AV
		H	17405.0	32.0	26.2	58.2	74.0	-15.8	PK
		H	17406.8	22.1	26.2	48.3	54.0	-5.7	AV
		V	11582.5	46.7	21.6	68.3	74.0	-5.7	PK
		V	11590.0	31.2	21.2	52.4	54.0	-1.6	AV
		V	17405.0	34.5	26.2	60.7	74.0	-13.3	PK
		V	17405.6	23.9	26.2	50.1	54.0	-3.9	AV

Note: 1. Measure Level = Reading Level + Factor.

2. The test frequency range, 9kHz~30MHz, 18GHz~25GHz, both of the worst case are at least 6dB below the limits, therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

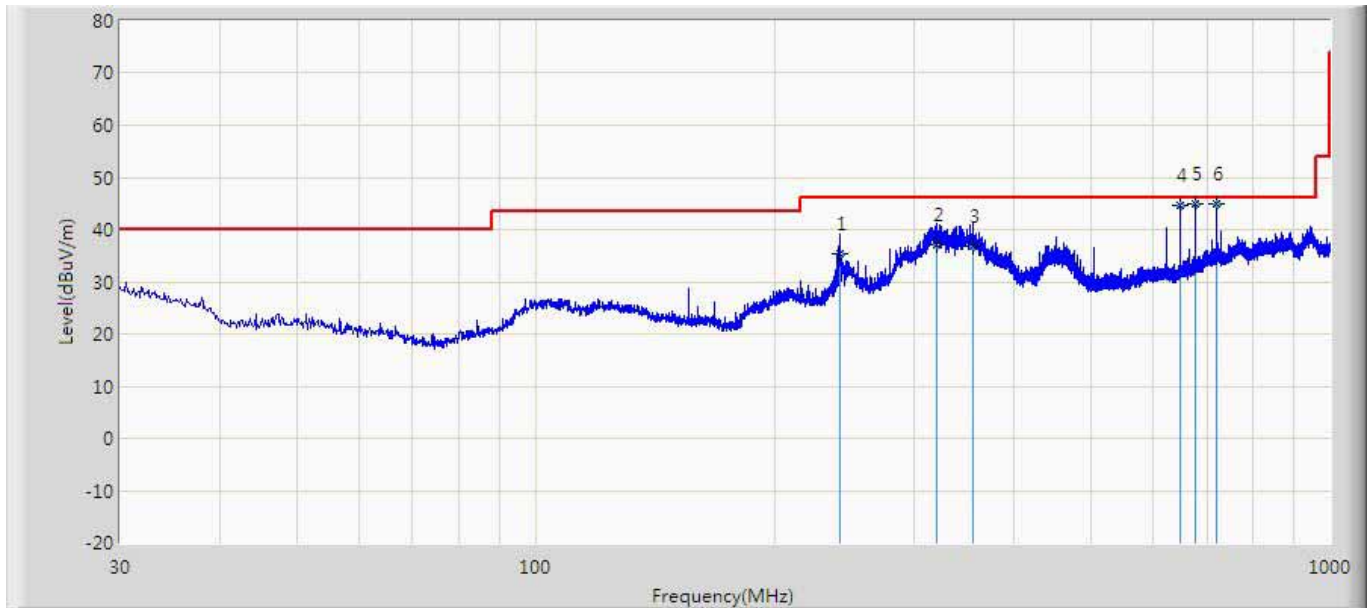
The worst case of Radiated Emission below 1GHz:

Engineer: Scott	
Site: AC2	Time: 2015/12/20 - 11:55
Limit: FCC_Part15.109_RE(3m)_ClassB	Margin: 0
Probe: AC2_10M(30-1000M)	Polarity: Horizontal
EUT: Radio Controller	Power: AC 120V/60Hz
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		288.610	38.362	17.600	-7.638	46.000	20.762	QP
2		375.860	38.681	15.100	-7.319	46.000	23.581	QP
3	*	450.014	44.374	17.300	-1.626	46.000	27.074	QP
4		648.026	43.746	15.100	-2.254	46.000	28.646	QP
5		676.330	39.349	10.600	-6.651	46.000	28.749	QP
6		960.203	39.822	7.100	-14.178	54.000	32.722	QP

Engineer: Scott	
Site: AC2	Time: 2015/12/20 - 12:15
Limit: FCC_Part15.109_RE(3m)_ClassB	Margin: 0
Probe: AC2_10M(30-1000M)	Polarity: Vertical
EUT: Radio Controller	Power: AC 120V/60Hz
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		241.330	35.360	12.100	-10.640	46.000	23.260	QP
2		320.160	37.091	13.800	-8.909	46.000	23.291	QP
3		355.263	36.924	12.100	-9.076	46.000	24.824	QP
4		648.037	44.763	17.400	-1.237	46.000	27.363	QP
5		676.034	44.897	16.400	-1.103	46.000	28.497	QP
6	*	720.035	44.993	14.800	-1.007	46.000	30.193	QP

5. Occupied Bandwidth

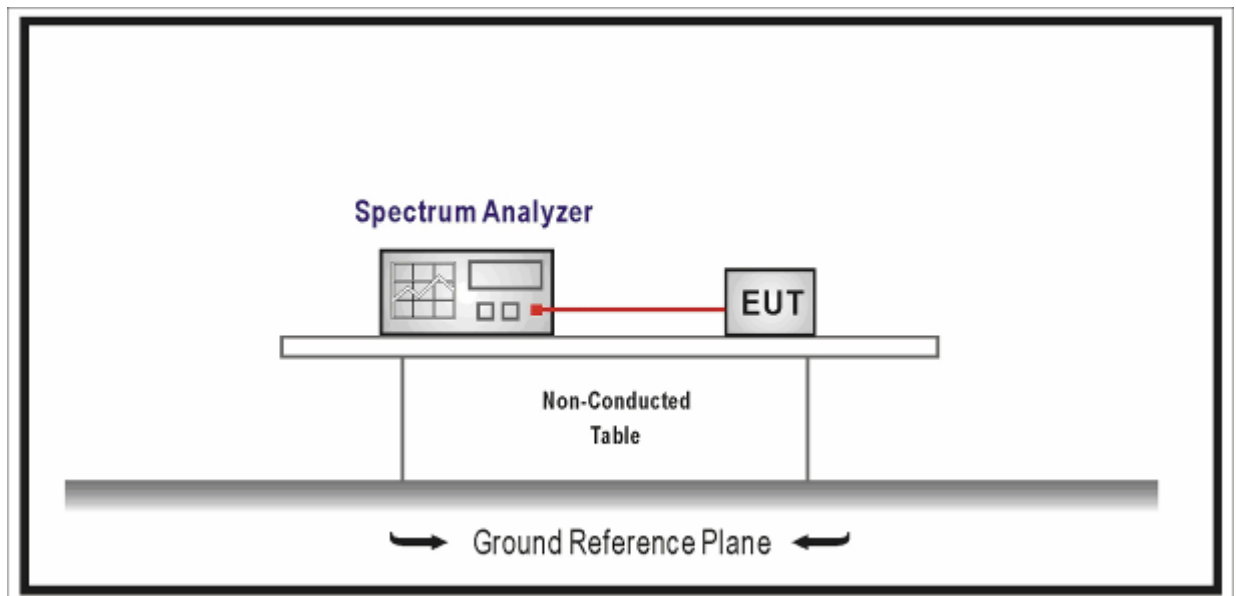
5.1. Test Equipment

Occupied Bandwidth / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2016.03.10
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2016.04.09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

5.2. Test Setup



5.3. Limit

N/A

5.4. Test Procedure

According to ANSI C63.4:2014& ANSI C63.10:2013&789033 D02 General UNII Test Procedures New Rules v01& FCC CFR Title 47 Part 15 Subpart E: 2015& Industry Canada RSS-Gen Issue 4 Industry Canada RSS-247 Issue 1

Emission Bandwidth

- a) Set RBW = approximately 1% of the emission bandwidth.
- b) Set the VBW > RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

99% Occupied Bandwidth

- a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.
- b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement.
- c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than $[10 \log (OBW/RBW)]$ below the reference level. Specific guidance is given in 4.1.5.2.
- d) Step a) through step c) might require iteration to adjust within the specified range.
- e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
- f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.
- g) If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies.
- h) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

5.5. Uncertainty

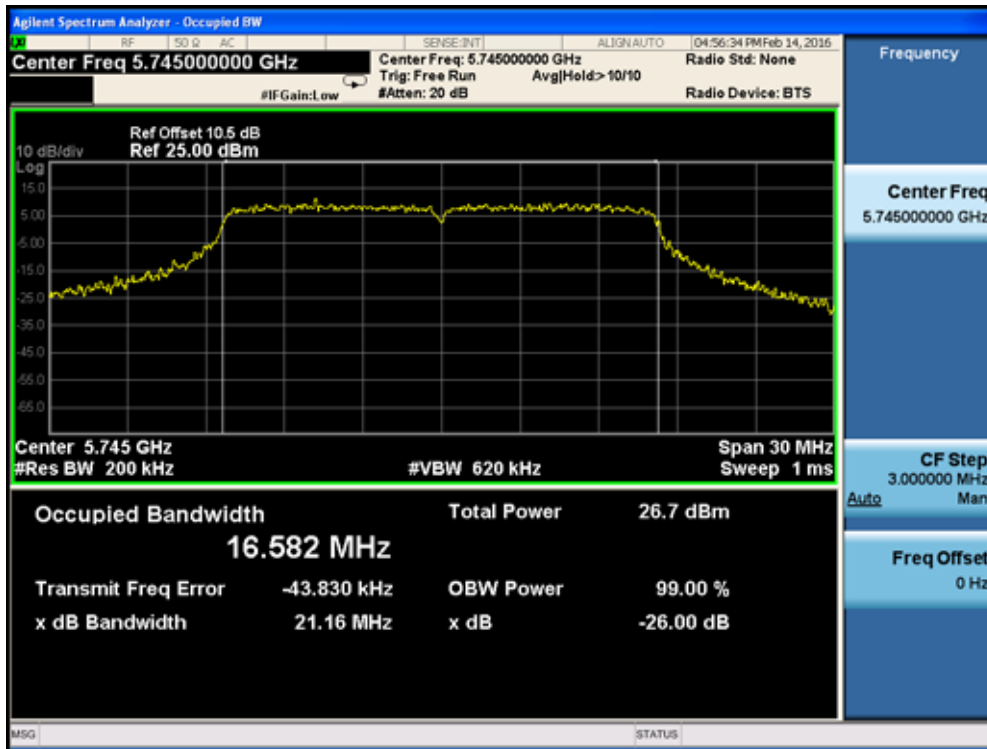
The measurement uncertainty is defined as ± 1 kHz

5.6. Test Result

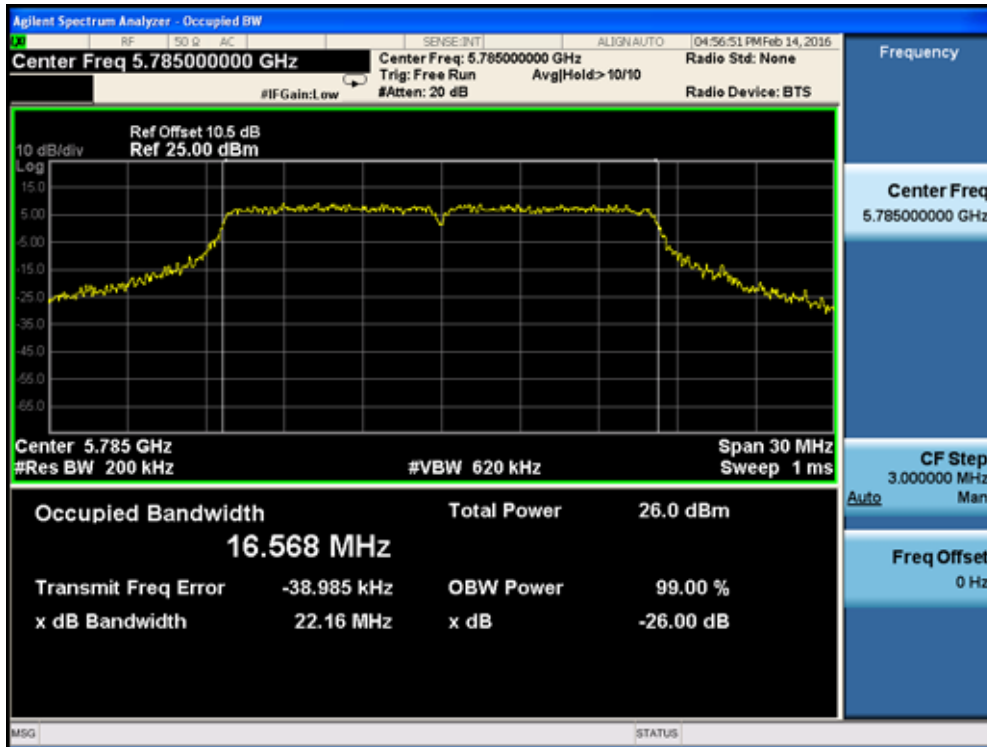
Product	:	RADIO CONTROLLER
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11a

Channel No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26dB Occupied Bandwidth (MHz)
149	5745	16.582	21.16
157	5785	16.568	22.16
165	5825	16.570	21.70

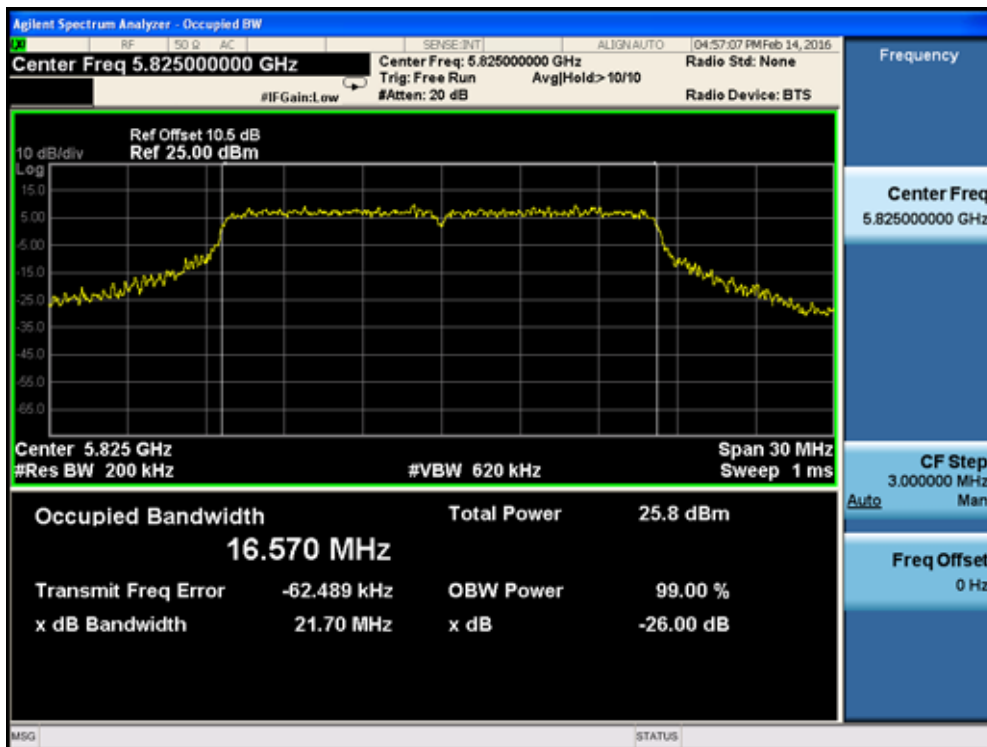
Channel 149 (5745MHz)



Channel 157(5785MHz)



Channel 165 (5825MHz)

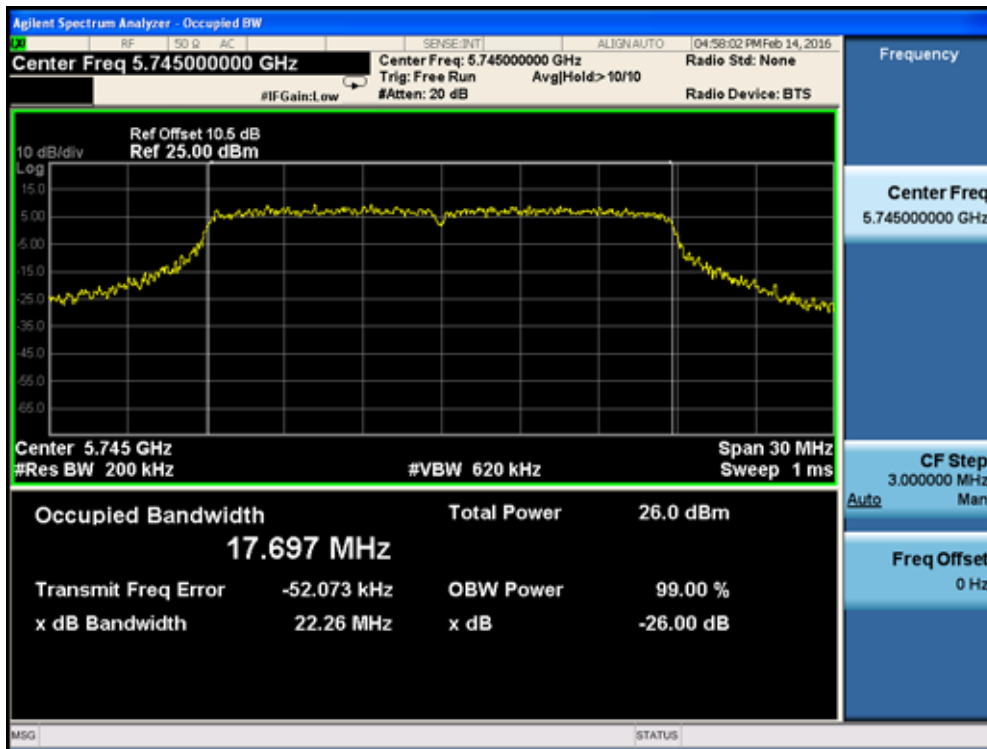


Note: For this test item, the modulation of this mode we have evaluated two antennas, presented data in the report is the worst case.

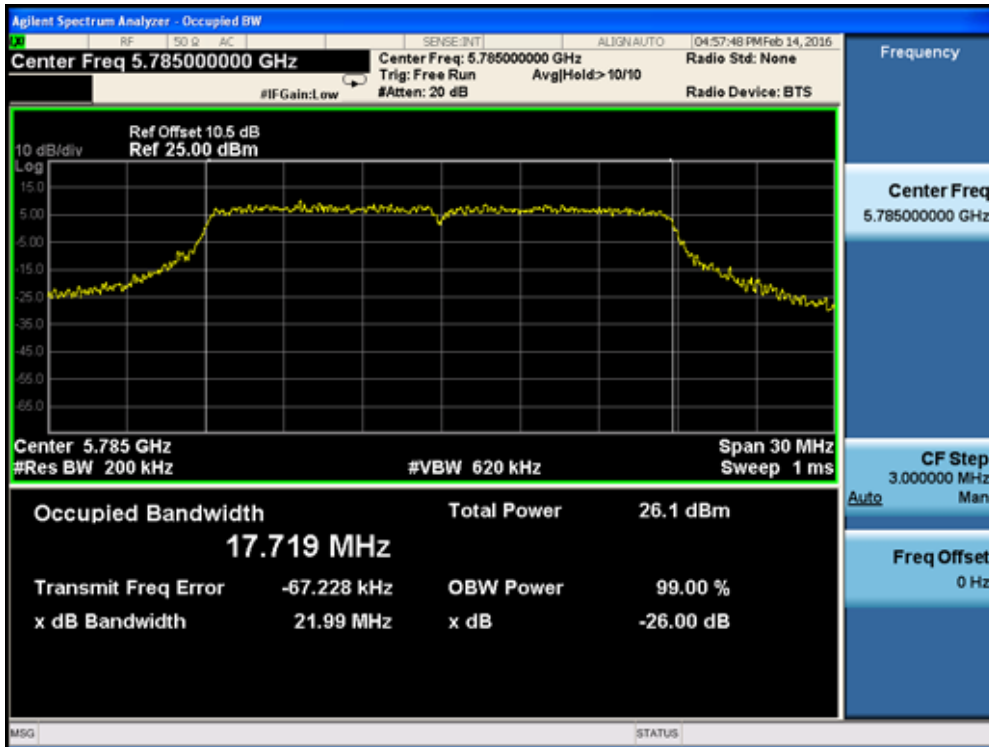
Product	:	RADIO CONTROLLER
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11n(20MHz)

Channel No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26dB Occupied Bandwidth (MHz)
149	5745	17.697	22.26
157	5785	17.719	21.99
165	5825	17.717	22.43

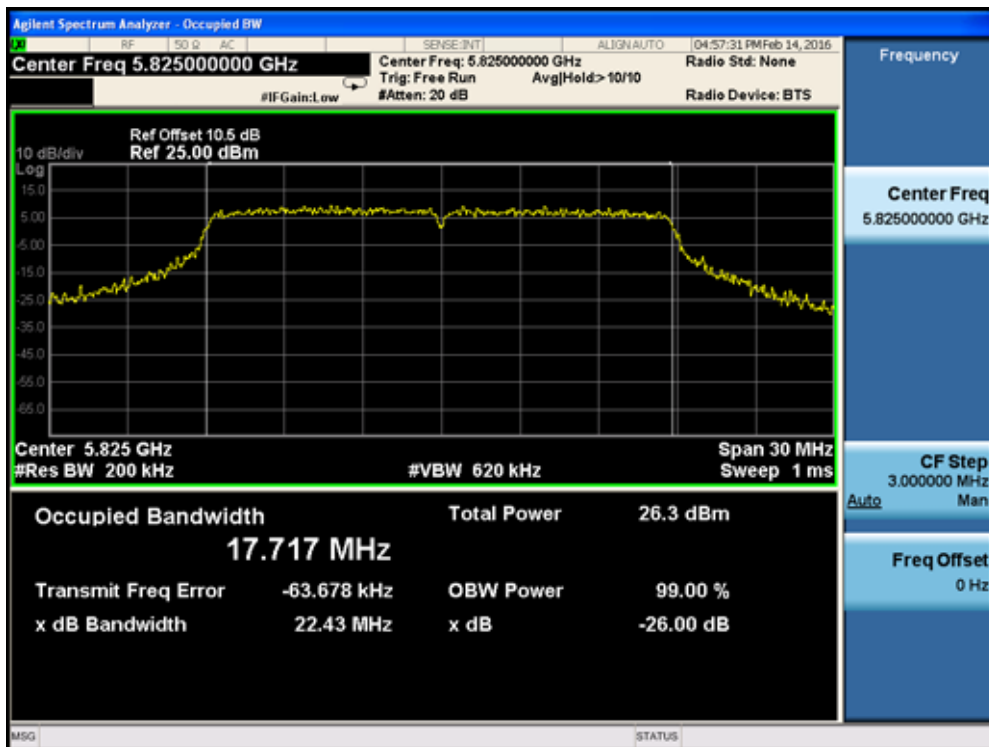
Channel 149 (5745MHz)



Channel 157(5785MHz)



Channel 165 (5825MHz)

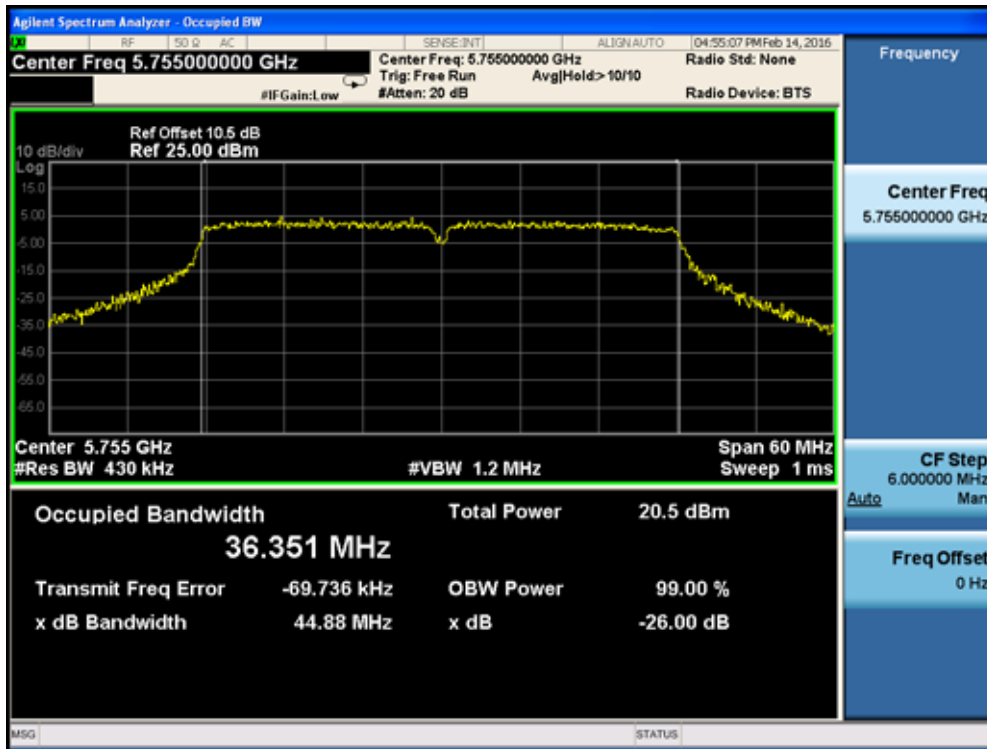


Note: For this test item, the modulation of this mode we have evaluated two antennas, presented data in the report is the worst case.

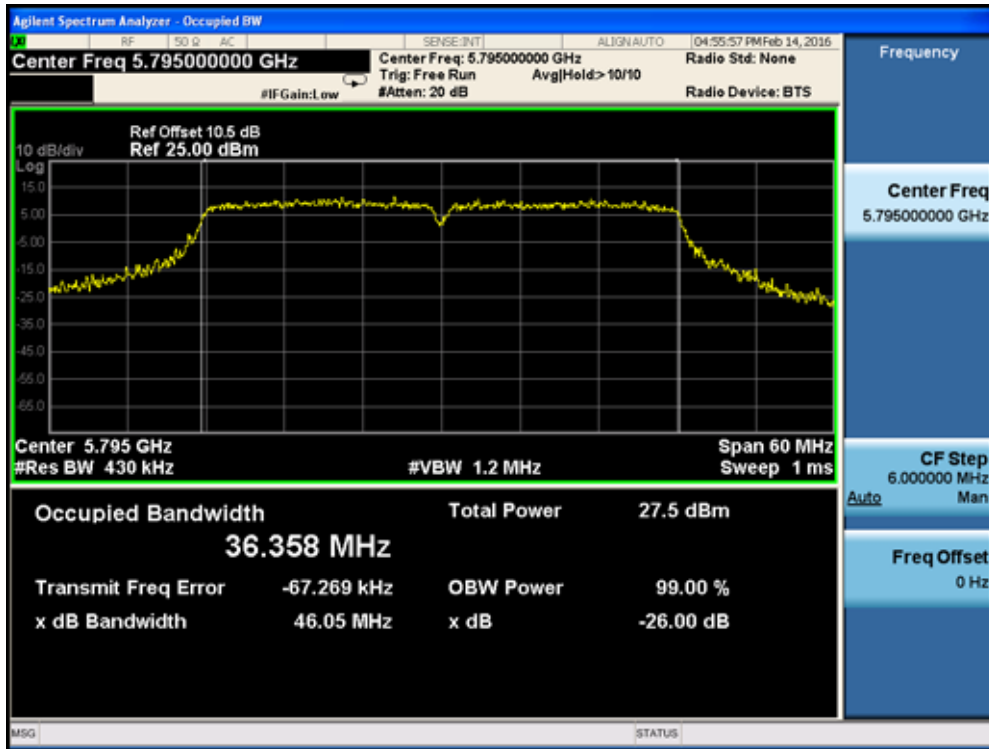
Product	:	RADIO CONTROLLER
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n(40MHz)

Channel No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26dB Occupied Bandwidth (MHz)
151	5755	36.351	44.88
159	5795	36.358	46.05

Channel 151 (5755MHz)



Channel 159(5795MHz)



Note: For this test item, the modulation of this mode we have evaluated two antennas, presented data in the report is the worst case.

6. 6dB Occupied Bandwidth

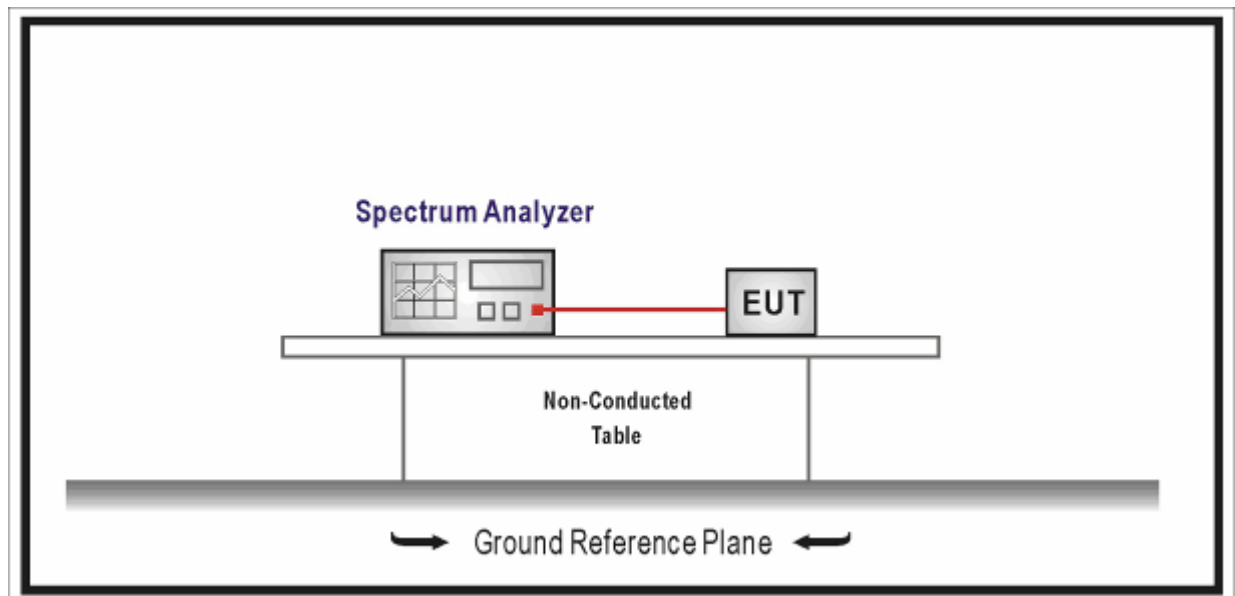
6.1. Test Equipment

Occupied Bandwidth / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2016.03.10
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2016.04.09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

6.2. Test Setup



6.3. Limit

For FCC&IC

The minimum 6 dB bandwidth shall be 500 kHz.

6.4. Test Procedure

According to ANSI C63.4:2014& ANSI C63.10:2013&789033 D02 General UNII Test Procedures New Rules v01& FCC CFR Title 47 Part 15 Subpart E: 2015& Industry Canada RSS-Gen Issue 4 Industry Canada RSS-247 Issue 1

- a) Set RBW = in the range of 1% to 5% of the OBW.
- b) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Use the -6dBm function of the instrument (if available) and report the measured bandwidth.

6.5. Uncertainty

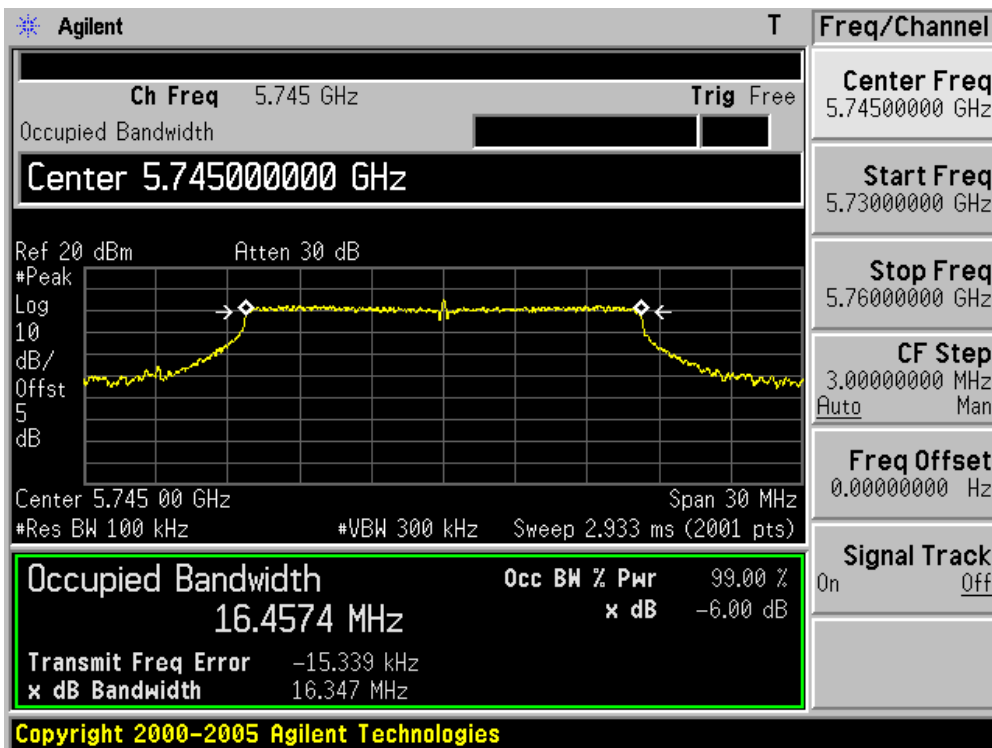
The measurement uncertainty is defined as ± 1 kHz

6.6. Test Result

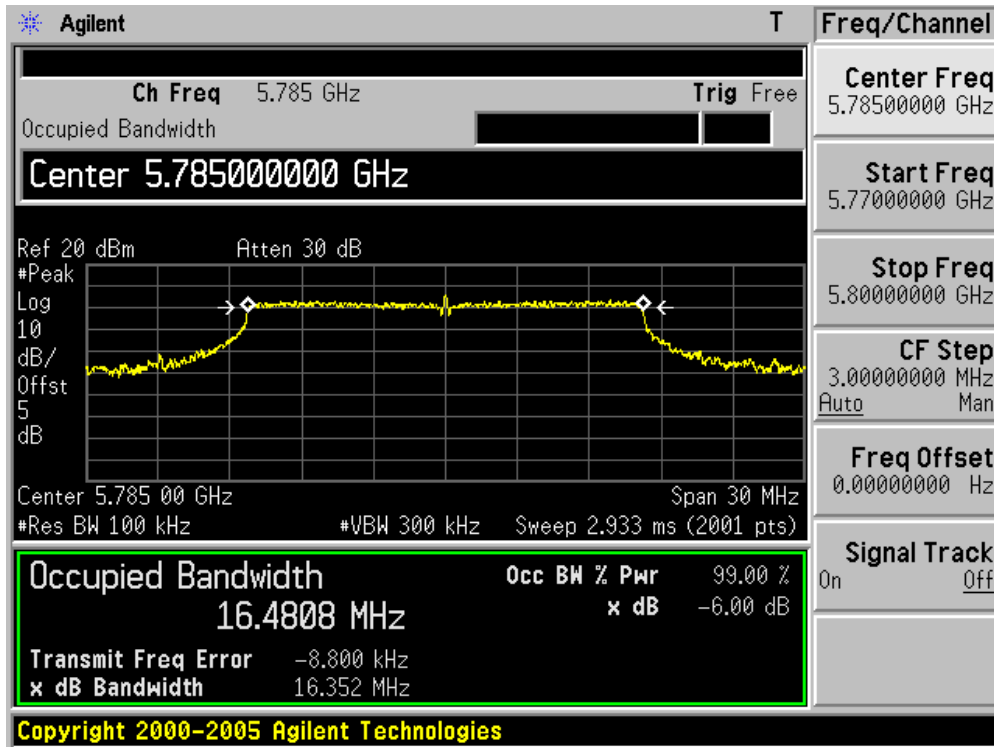
Product	:	RADIO CONTROLLER
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11a

Channel No.	Frequency (MHz)	6dB Occupied Bandwidth (MHz)
149	5745	16.45
157	5785	16.48
165	5825	16.50

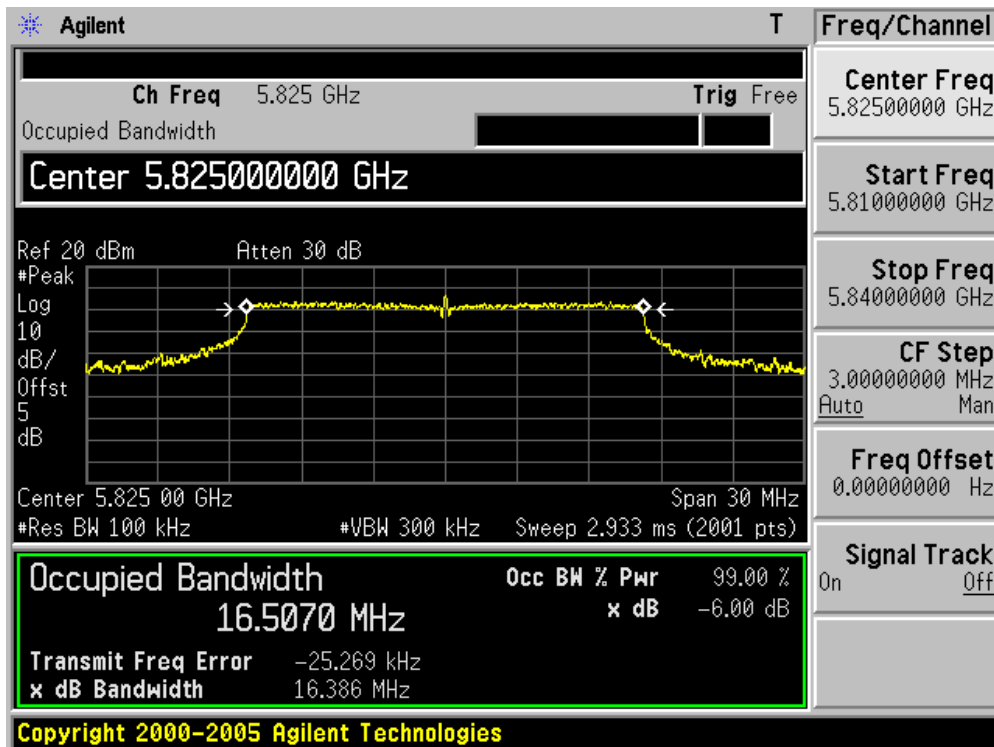
Channel 149 (5745MHz)



Channel 157(5785MHz)



Channel 165 (5825MHz)

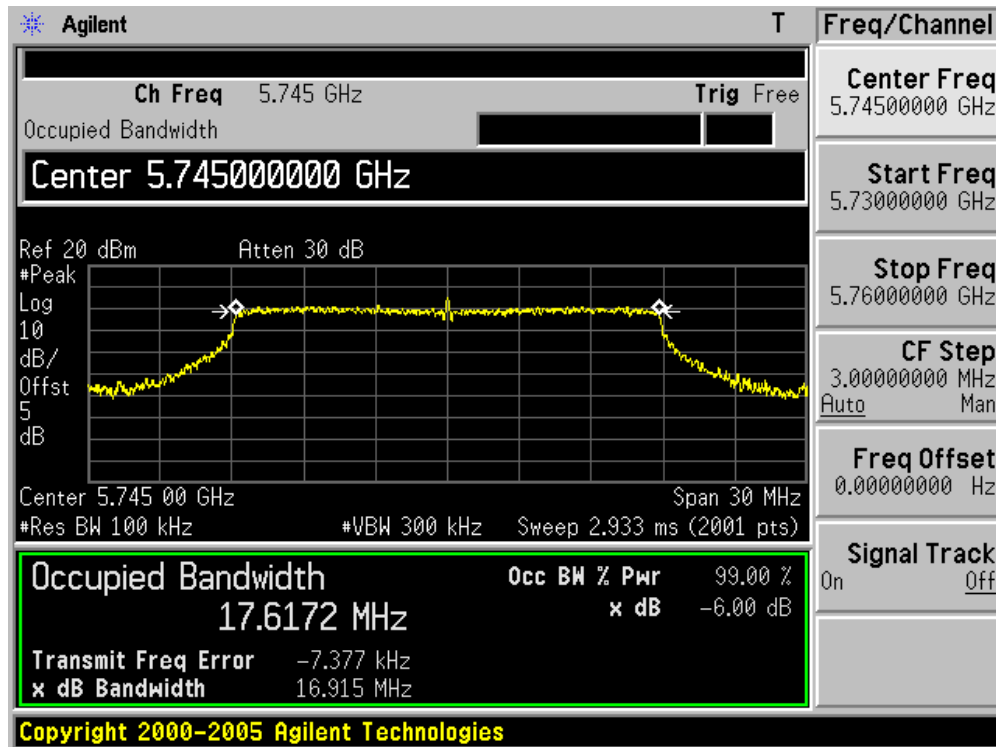


Note: For this test item, the modulation of this mode we have evaluated two antennas, presented data in the report is the worst case.

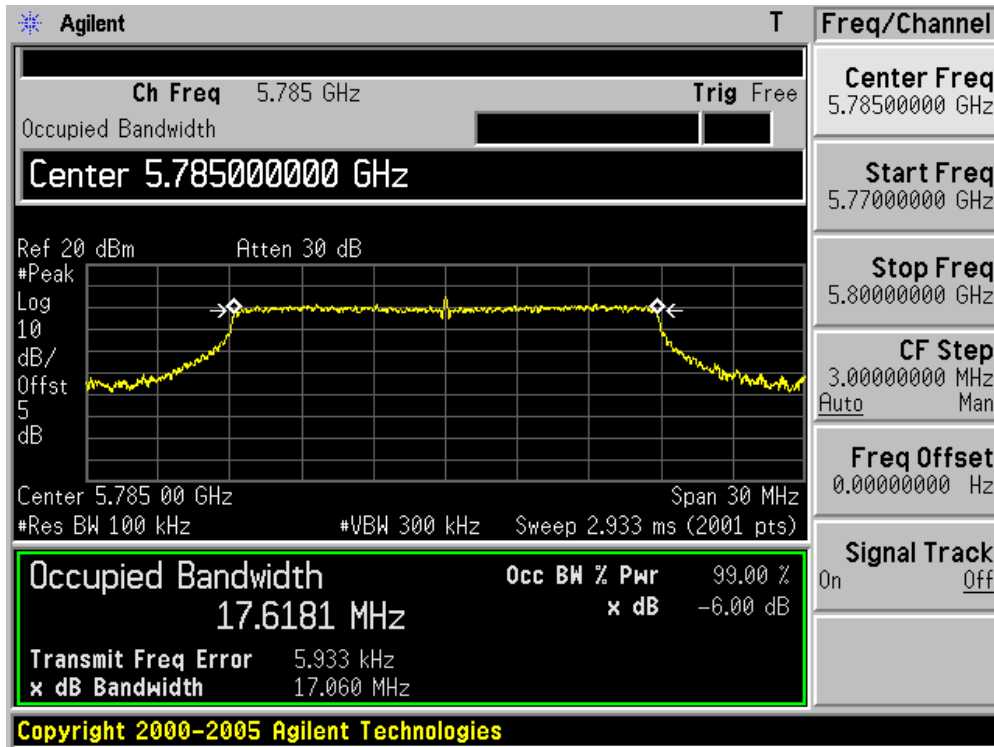
Product	:	RADIO CONTROLLER
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11n(20MHz)

Channel No.	Frequency (MHz)	6dB Occupied Bandwidth (MHz)
149	5745	17.61
157	5785	17.61
165	5825	17.62

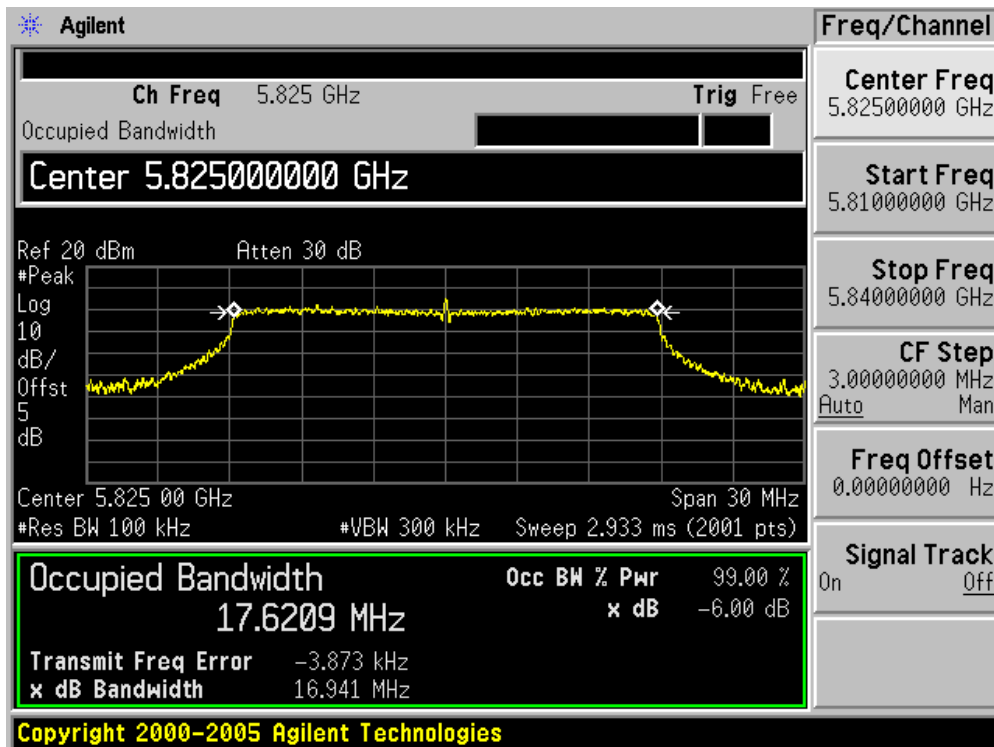
Channel 149 (5745MHz)



Channel 157(5785MHz)



Channel 165 (5825MHz)

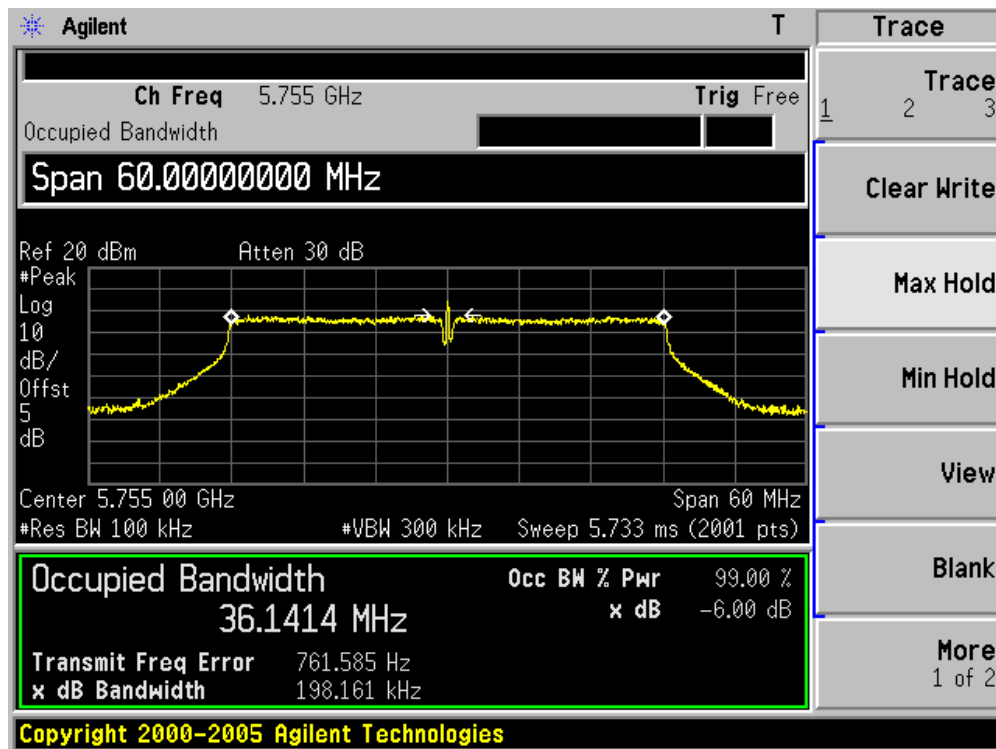


Note: For this test item, the modulation of this mode we have evaluated two antennas, presented data in the report is the worst case.

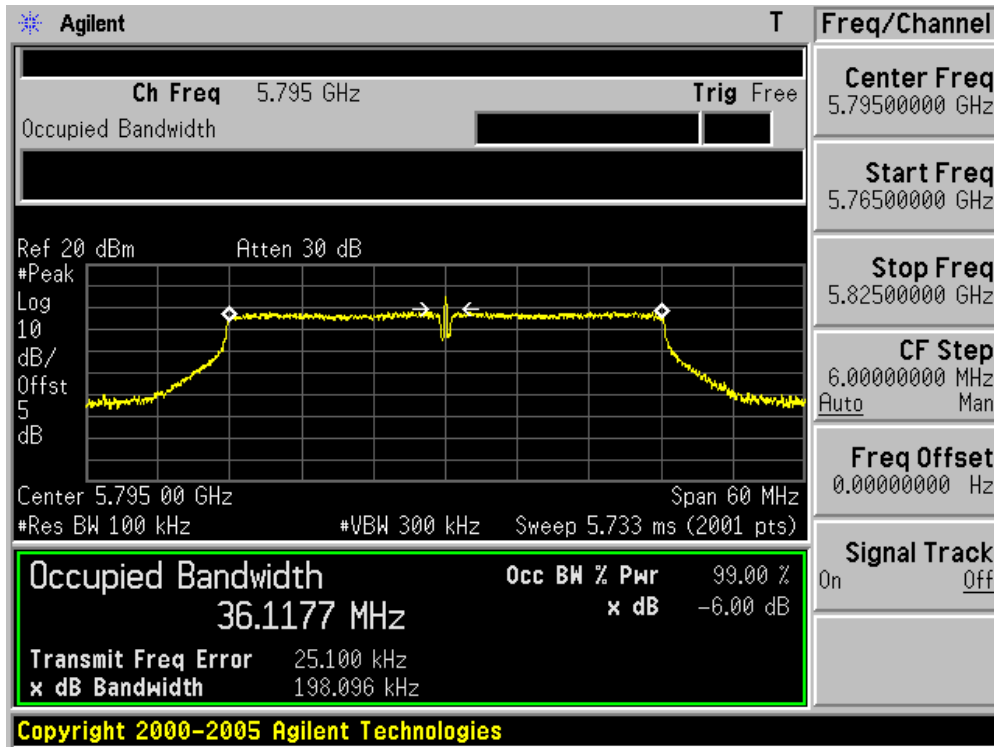
Product	:	RADIO CONTROLLER
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n(40MHz)

Channel No.	Frequency (MHz)	6dB Occupied Bandwidth (MHz)
151	5755	36.14
159	5795	36.11

Channel 151 (5755MHz)



Channel 159(5795MHz)



Note: For this test item, the modulation of this mode we have evaluated two antennas, presented data in the report is the worst case.

7. Power Output

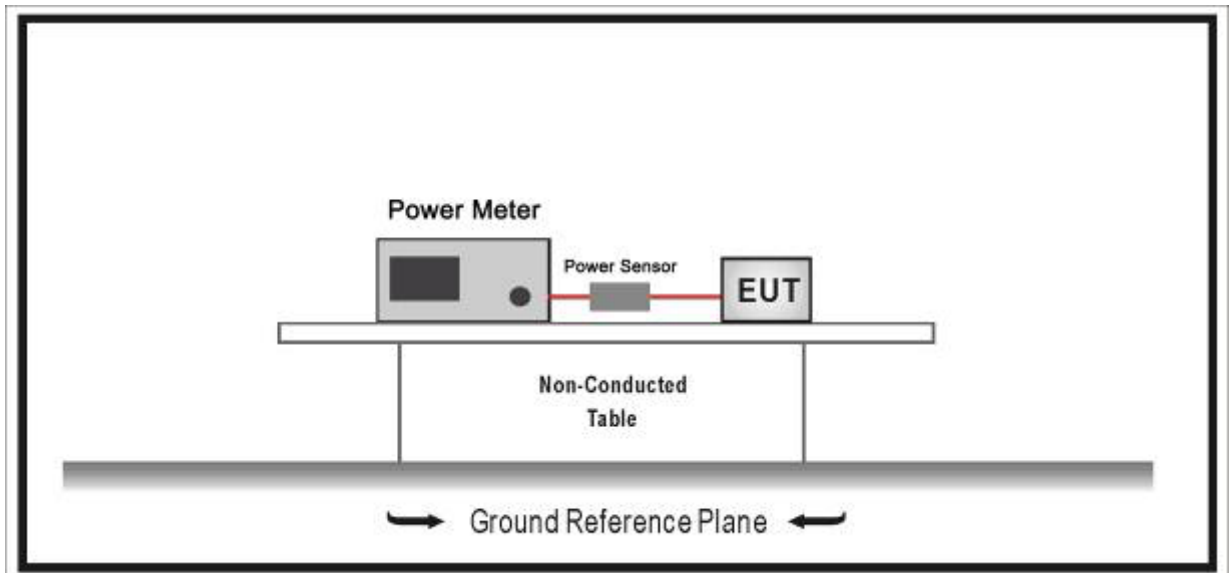
7.1. Test Equipment

Power Output / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2016.03.10
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2016.04.09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

7.2. Test Setup



7.3. Limit

For FCC

- For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

- For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
- For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

For IC

- For the Frequency Band 5150-5250MHz, the maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log 10B$, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band..
- For the Frequency Band 5250-5350MHz, the maximum conducted output power shall not exceed 250 mW or $11 + 10 \log 10B$, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.
The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log 10B$, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.
- For the Frequency Band 5470-5600, 5650-5725MHz, The maximum conducted output power shall not exceed 250 mW or $11 + 10 \log 10B$, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.
The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log 10B$, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p.

greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

- For the Frequency Band 5725-5850MHz, The maximum conducted output power shall not exceed 1 W. The power spectral density shall not exceed 30 dBm in any 500 kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed point-to-point operations exclude the use of point-to-multipointFootnote3 systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

7.4. Test Procedure

Fundamental emission output power Test Method					
	References Rule		Chapter	Description	
<input checked="" type="checkbox"/>	ANSI C63.10		12.3	Maximum conducted output power	
	<input type="checkbox"/>	ANSI C63.10	12.3.2	Maximum conducted output power measurement using a spectrum analyzer (SA) or EMI receiver	
		<input type="checkbox"/>	ANSI C63.10	12.3.2.2	Method SA-1
		<input type="checkbox"/>	ANSI C63.10	12.3.2.3	Method SA-1A (alternative)
		<input type="checkbox"/>	ANSI C63.10	12.3.2.4	Method SA-2
		<input type="checkbox"/>	ANSI C63.10	12.3.2.5	Method SA-2A (alternative)
		<input type="checkbox"/>	ANSI C63.10	12.3.2.6	Method SA-3
		<input type="checkbox"/>	ANSI C63.10	12.3.2.7	Method SA-3A (alternative)
	<input checked="" type="checkbox"/>	ANSI C63.10		12.3.3	Maximum conducted output power using a power meter
		<input type="checkbox"/>	ANSI C63.10	12.3.3.1	Method PM
		<input checked="" type="checkbox"/>	ANSI C63.10	12.3.3.2	Method PM-G
<input checked="" type="checkbox"/>	FCC KDB 789033 D02v01r02		E	Maximum conducted output power	
	<input type="checkbox"/>	FCC KDB 789033 D02v01r02	E.2	Measurement using a Spectrum Analyzer or EMI Receiver (SA)	
		<input type="checkbox"/>	FCC KDB 789033 D02v01r02	E.2.b	Method SA-1 (trace averaging with the EUT transmitting at full power throughout each

				sweep)
	<input type="checkbox"/>	FCC KDB 789033 D02v01r02	E.2.c	Method SA-1 Alternative (RMS detection with slow sweep and EUT transmitting continuously at full power)
	<input type="checkbox"/>	FCC KDB 789033 D02v01r02	E.2.d	Method SA-2 (trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction)
	<input type="checkbox"/>	FCC KDB 789033 D02v01r02	E.2.e	Method SA-2 Alternative (RMS detection with slow sweep with each spectrum bin averaging across on and off times of the EUT transmissions, followed by duty cycle correction)
	<input type="checkbox"/>	FCC KDB 789033 D02v01r02	E.2.f	Method SA-3 (RMS detection with max hold)
	<input type="checkbox"/>	FCC KDB 789033 D02v01r02	E.2.g	Method SA-3 Alternative (Reduced VBW with max hold)
	<input checked="" type="checkbox"/>	FCC KDB 789033 D02v01r02	E.3	Measurement using a Power Meter (PM)
	<input type="checkbox"/>	FCC KDB 789033 D02v01r02	E.3.a	Method PM (Measurement using an RF average power meter)
	<input checked="" type="checkbox"/>	FCC KDB 789033 D02v01r02	E.3.b	Method PM-G (Measurement using a gated RF average power meter)

7.5. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

7.6. Test Result

Power output test was verified over all data rates of each mode at Ant 1 shown as below, and then choose the maximum power output (blue marker) for final test of each channel.

Power output at various data rates:

Test Mode	Bandwidth	Frequency (MHz)	Channel	Data Rate	Average Power (dBm)
802.11a	20	5745	149	6	14.09
				24	13.96
				54	13.91
802.11n(20MHz)	20	5745	149	MCS0	13.09
				MCS4	13.06
				MCS7	12.98
802.11n(40MHz)	40	5755	151	MCS0	11.65
				MCS4	11.62
				MCS7	11.54

Product	:	RADIO CONTROLLER
Test Item	:	Power Output
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11a

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Limit (dBm)
		Ant 1	Ant 2	
149	5745	14.09	14.08	30
157	5785	13.86	14.09	30
165	5825	13.73	13.87	30

Product	:	RADIO CONTROLLER
Test Item	:	Power Output
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11n(20MHz)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Limit (dBm)
		Ant 1	Ant 2	
149	5745	13.09	12.62	30
157	5785	12.60	12.77	30
165	5825	12.09	12.47	30

Product	:	RADIO CONTROLLER
Test Item	:	Power Output
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n(40MHz)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Limit (dBm)
		Ant 1	Ant 2	
151	5755	11.65	11.50	30
159	5795	11.90	12.25	30

8. Peak Power Spectral Density

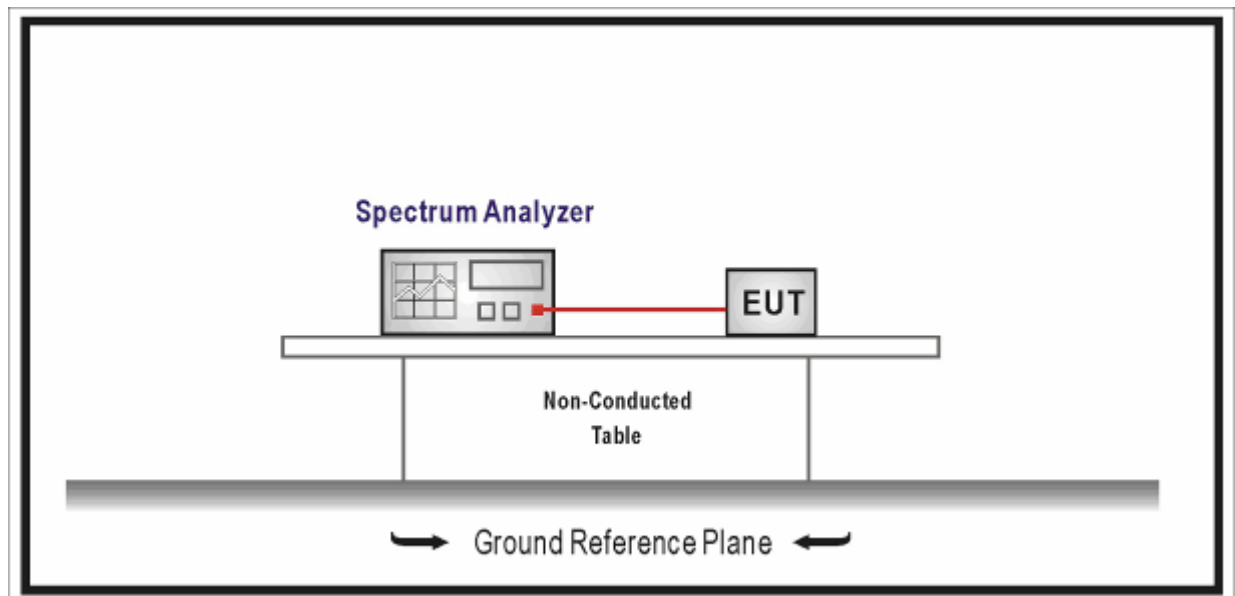
8.1. Test Equipment

Peak Power Spectral Density / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2016.03.10
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2016.04.09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

8.2. Test Setup



8.3. Limit

For FCC

- For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW

(21 dBm).

- For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
- For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

For IC

- For the Frequency Band 5150-5250MHz, the maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band..
- For the Frequency Band 5250-5350MHz, the maximum conducted output power shall not exceed 250 mW or $11 + 10 \log_{10} B$, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.
The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10} B$, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.
- For the Frequency Band 5470-5600, 5650-5725MHz, The maximum conducted output power shall not exceed 250 mW or $11 + 10 \log_{10} B$, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.
The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10} B$, dBm, whichever is less. B

is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

- For the Frequency Band 5725-5850MHz, The maximum conducted output power shall not exceed 1 W. The power spectral density shall not exceed 30 dBm in any 500 kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed point-to-point operations exclude the use of point-to-multipoint^{Footnote3} systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

8.4. Test Procedure

Fundamental emission output power Test Method			
	References Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10	12.5	Peak power spectral density
<input checked="" type="checkbox"/>	FCC KDB 789033 D02v01r02	F	Maximum Power Spectral Density (PSD)

The test was used Method SA-2 from KDB 789033 D02v01r02.

8.5. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

8.6. Test Result

Product	:	RADIO CONTROLLER
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11a

Channel No.	Frequency (MHz)	Reading PPSD (dBm/MHz)		Duty Cycle (%)	Measured PPSD (dBm/MHz)		Limit (dBm/MHz)
		Ant 1	Ant 2		Ant 1	Ant 2	
149	5745	2.177	3.881	96.11	2.349	4.053	30
157	5785	3.014	3.180	96.11	3.186	3.352	30
165	5825	2.256	2.595	96.11	2.428	2.767	30

Ant 1

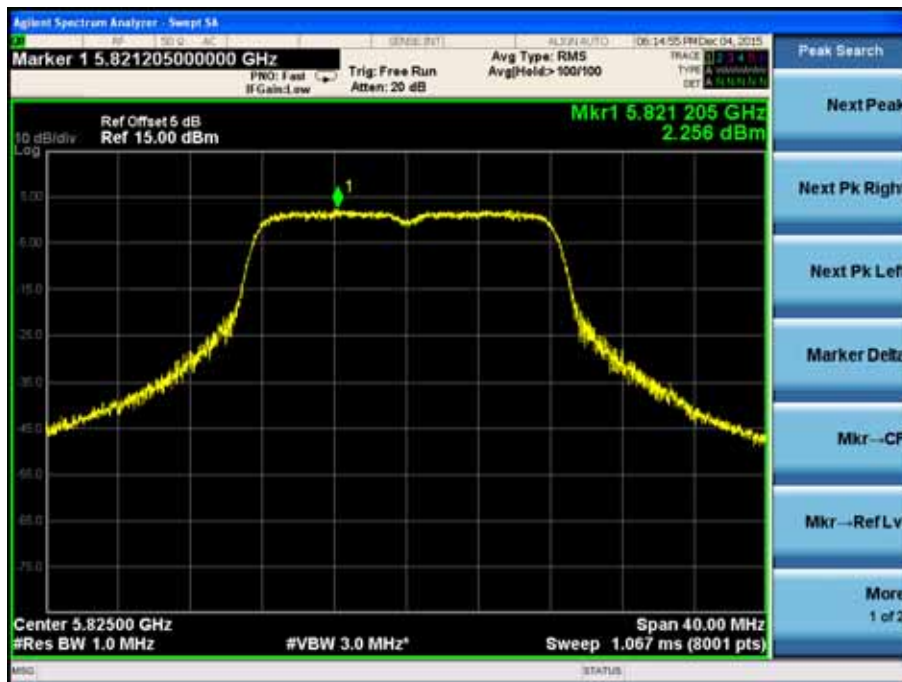
Channel 149 (5745MHz)



Channel 157(5785MHz)



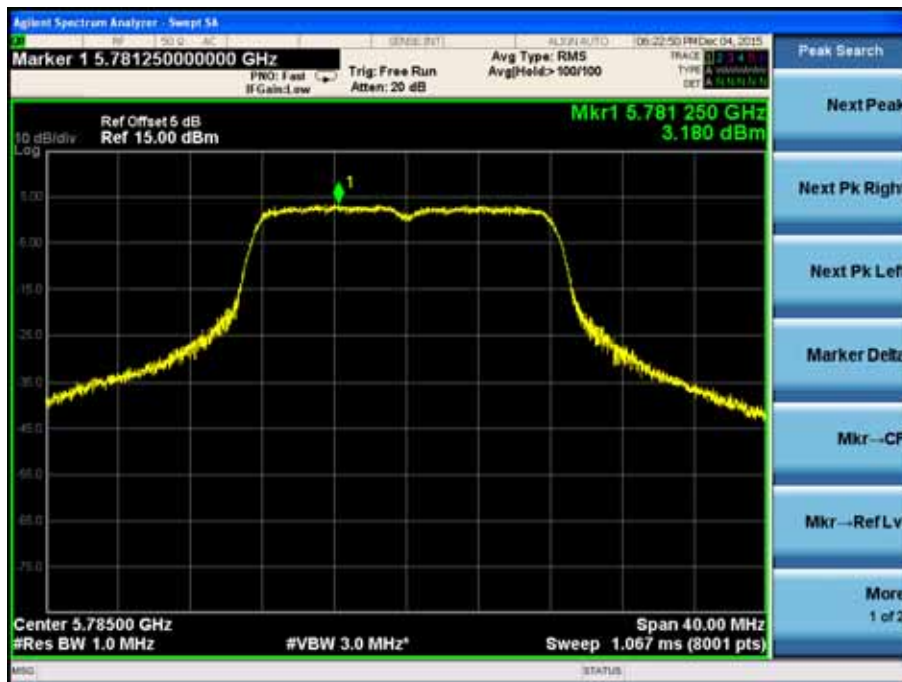
Channel 165 (5825MHz)



Ant 2
Channel 149 (5745MHz)



Channel 157(5785MHz)



Channel 165 (5825MHz)



Product	:	INTEGRATED GIMBAL CAMERA
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11n(20MHz)

Channel No.	Frequency (MHz)	Reading PPSD (dBm/MHz)		Duty Cycle (%)	Measured PPSD (dBm/MHz)		Limit (dBm/MHz)
		Ant 1	Ant 2		Ant 1	Ant 2	
149	5745	3.985	4.182	95.61	4.180	4.377	30
157	5785	3.692	4.309	95.61	3.887	4.504	30
165	5825	2.732	3.923	95.61	2.927	4.118	30

Ant 1
Channel 149 (5745MHz)



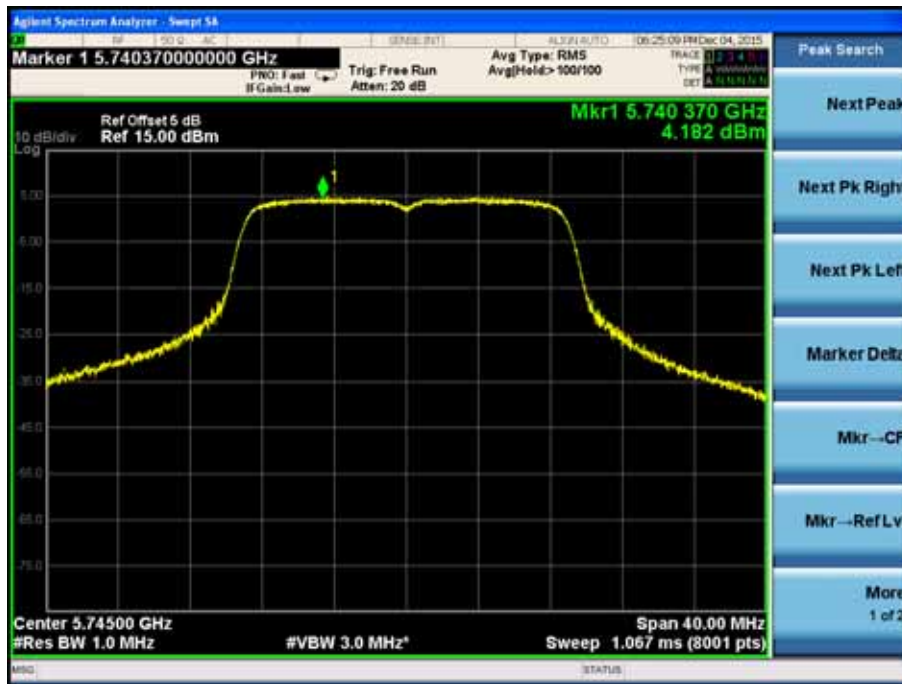
Channel 157(5785MHz)



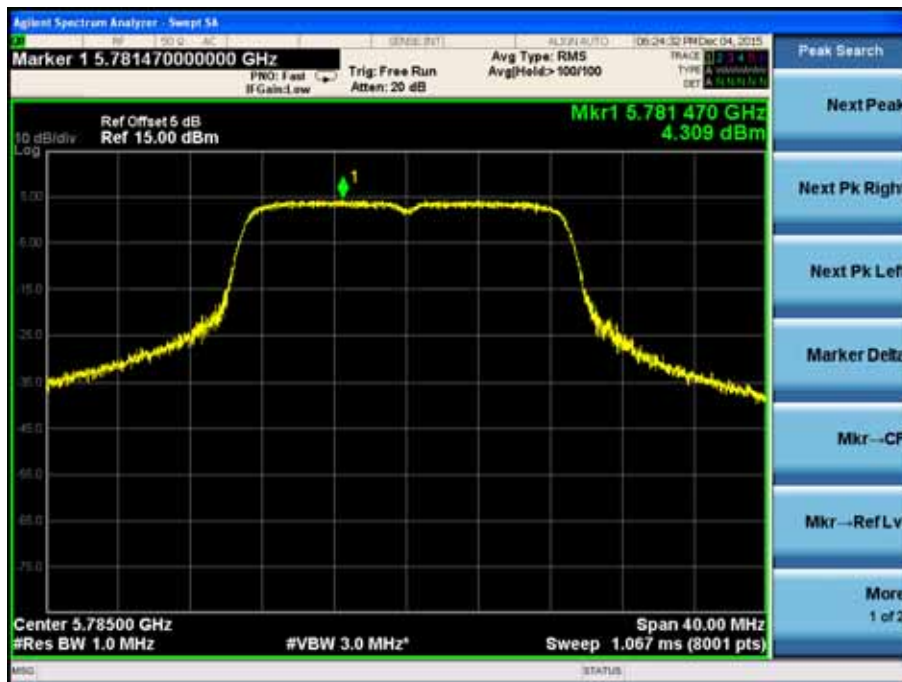
Channel 165 (5825MHz)



Ant 2
Channel 149 (5745MHz)



Channel 157(5785MHz)



Channel 165 (5825MHz)



Product	:	INTEGRATED GIMBAL CAMERA
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n(40MHz)

Channel No.	Frequency (MHz)	Reading PPSD (dBm/MHz)		Duty Cycle (%)	Measured PPSD (dBm/MHz)		Limit (dBm/MHz)
		Ant 1	Ant 2		Ant 1	Ant 2	
151	5745	-0.015	0.549	89.86	0.449	1.013	30
159	5785	-0.384	0.094	89.86	0.080	0.558	30

Ant 1
Channel 151 (5755MHz)



Channel 159(5795MHz)



Ant 2
Channel 151 (5755MHz)



Channel 159(5795MHz)



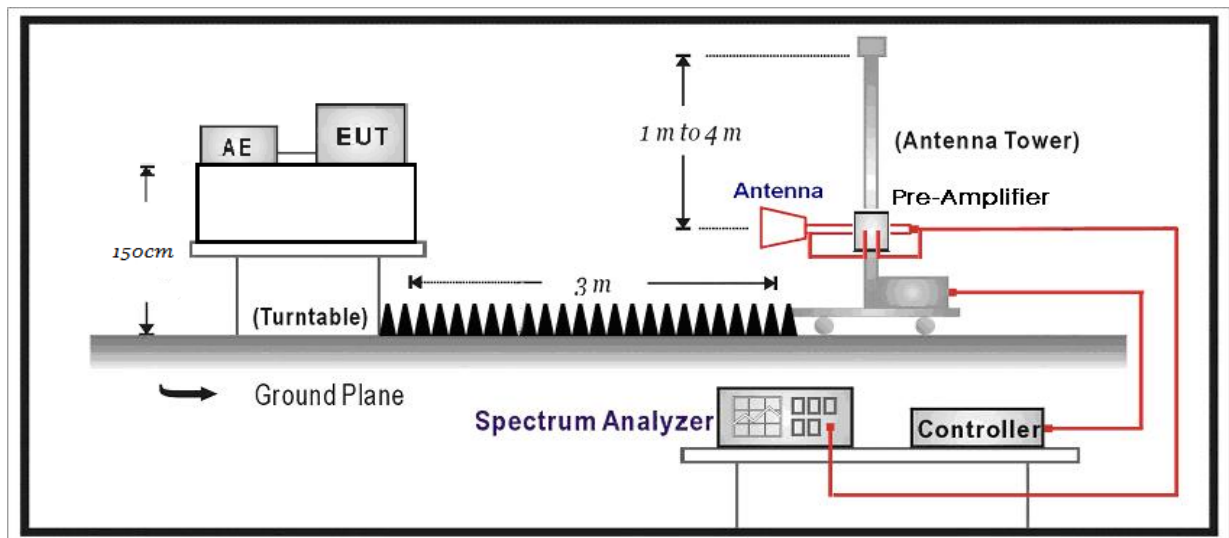
9. Radiated Emission Band Edge

9.1. Test Equipment

☒ Radiated Emission Band Edge / AC-5

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2016.03.10
Preamplifier	Miteq	NSP1800-25	1364185	2016.05.03
Preamplifier	QuieTek	AP-040G	CHM-0906001	2016.05.03
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2016.10.15
DRG Horn	ETS-Lindgren	3117	00123988	2017.01.04
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2016.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2016.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2016.03.01
EMI Receiver	Agilent	N9038A	MY51210196	2016.06.09
Temperature/Humidity Meter	Zhichen	ZC1-2	AC5-TH	2017.01.04

9.2. Test Setup



9.3. Limit

For FCC&IC

For 15.205 requirement:

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a).

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)

For RSS-GEN requirement:

Radiated emissions which fall in the restricted bands, as defined in Section 8.10 of RSS-GEN, must also comply with the radiated emission limits specified in Section 8.10.

MHz	MHz	GHz
0.090-0.110	74.8-75.2	9.0-9.2
2.1735-2.1905	108-138	9.3-9.5
3.020-3.026	156.52475-156.52525	10.6-12.7
4.125-4.128	156.7-156.9	13.25-13.4
4.17725-4.17775	240-285	14.47-14.5
4.20725-4.20775	322-335.4	15.35-16.2
5.677-5.683	399.9-410	17.7-21.4
6.215-6.218	608-614	22.01-23.12
6.26775-6.26825	960-1427	23.6-24.0
6.31175-6.31225	1435-1626.5	31.2-31.8
8.291-8.294	1645.5-1646.5	36.43-36.5
8.362-8.366	1660-1710	Above 38.6
8.37625-8.38675	1718.8-1722.2	
8.41425-8.41475	2200-2300	
12.29-12.293	2310-2390	
12.51975-12.52025	2655-2900	
12.57675-12.57725	3260-3267	
13.36-13.41	3332-3339	
16.42-16.423	3345.8-3358	
16.69475-16.69525	3500-4400	
16.80425-16.80475	4500-5150	
25.5-25.67	5350-5460	
37.5-38.25	7250-7750	
73-74.6	8025-8500	

For 15.407(b) requirement:

Operating Frequency Band (MHz)	EIRP Limit (dBm/MHz)	Equivalent Field Strength at 3m (dBuV/m)
5150 - 5250	-27	68.3
5250 - 5350	-27	68.3
5470 - 5725	-27	68.3

FCC 16-24-A1

Operating Frequency Band (MHz)	EIRP Limit (dBm/MHz)
5725 - 5825	<p>The graph plots EIRP (dBm/MHz) on the y-axis (ranging from -40 to 70) against Frequency (MHz) on the x-axis (ranging from 5600 to 5950). A blue line shows the EIRP profile. It is constant at -27 dBm/MHz from 5600 to 5650 MHz and from 5900 to 5950 MHz. Between 5650 and 5725 MHz, it rises to a peak of approximately 55 dBm/MHz. Between 5725 and 5850 MHz, it remains constant at 55 dBm/MHz. Between 5850 and 5900 MHz, it falls back to -27 dBm/MHz. A box highlights the U-NII-3 band (5725-5850 MHz) at the peak level.</p>

9.4. Test Procedure

According to ANSI C63.4:2014& ANSI C63.10:2013&789033 D02 General UNII Test Procedures New Rules v01r02& FCC CFR Title 47 Part 15 Subpart E: 2015& Industry Canada RSS-Gen Issue 4 Industry Canada RSS-247 Issue 1.

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4: 2009 on radiated measurement.

The procedure for peak unwanted emissions measurements above 1000 MHz is as follows:
Peak emission levels are measured by setting the instrument as follows:

- 1) RBW = 1 MHz.
- 2) VBW \geq [3 \times RBW].
- 3) Detector = peak
- 4) Sweep time = auto.
- 5) Trace mode = max hold.
- 6) Allow sweeps to continue until the trace stabilizes. Note that if the transmission is not continuous, then the time required for the trace to stabilize will increase by a factor of approximately 1 / D, where D is the duty cycle. For example, at 50% duty cycle, the measurement time will increase by a factor of two, relative to measurement time for continuous transmission.

Average emission levels are measured by setting the instrument as follows:

- a) RBW = 1 MHz.
- b) Video bandwidth:
 - 1) If the EUT is configured to transmit with $D \geq 98\%$, then set $VBW \leq RBW / 100$ (i.e., 10 kHz), but not less than 10 Hz.
 - 2) If the EUT D is $< 98\%$, then set $VBW \geq 1 / T$, where T is defined in item a1) of 12.2.
- c) Video bandwidth mode or display mode:
 - 1) The instrument shall be set with video filtering applied in the power domain. Typically, this requires setting the detector mode to RMS (power averaging) and setting the average-VBW type to power (rms).
 - 2) As an alternative, the instrument may be set to linear detector mode. Video filtering shall be applied in linear voltage domain (rather than in a log or dB domain). Some

instruments require linear display mode to accomplish this. Others have a setting for average-VBW type, which can be set to “voltage” regardless of the display mode.

d) Detector = peak.

e) Sweep time = auto.

f) Trace mode = max hold.

g) Allow max hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98% duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of $1/x$, where D is the duty cycle. For example, use at least 200 traces if the duty cycle is 25%. (If a specific emission is demonstrated to be continuous—i.e., 100% duty cycle—then rather than turning ON and OFF with the transmit cycle, at least 50 traces should be averaged.)

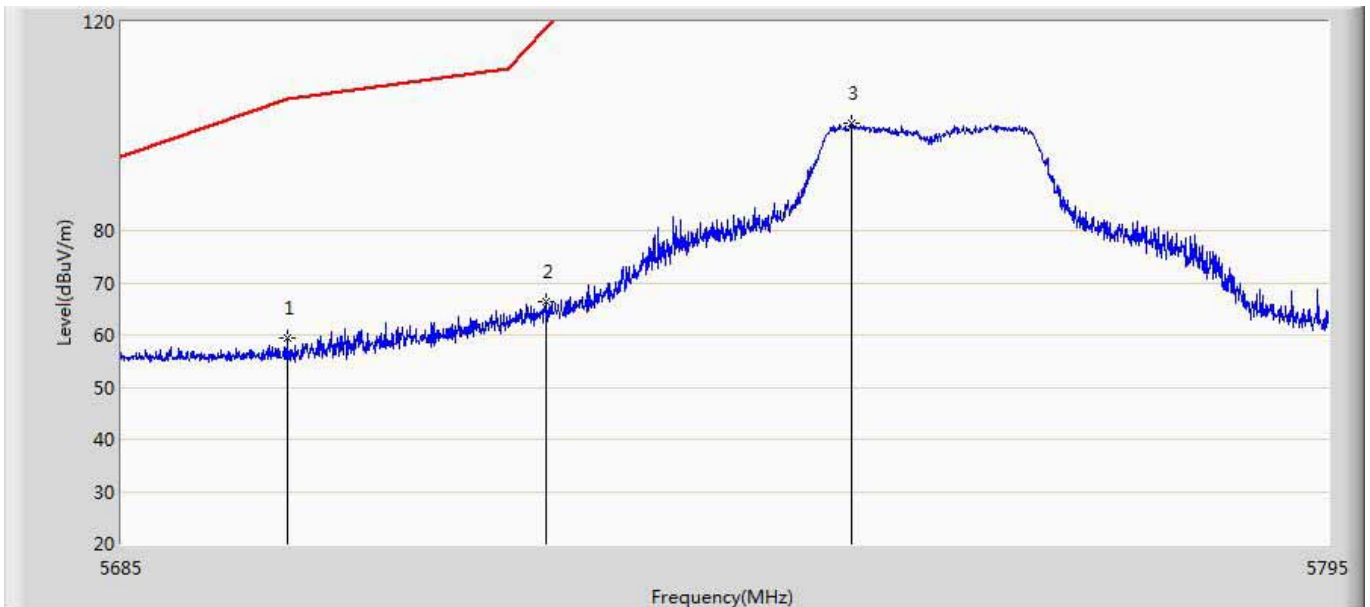
Note: When doing emission measurement above 1GHz, the horn Chainenna will be bended down a little (as horn Chainenna has the narrow beamwidth) in order to keeping the Chainenna in the “cone of radiation” of EUT. The 3dB beamwidth is 10~60 degrees for H-plane and 10~90 degrees for E-plane.

9.5. Uncertainty

The measurement uncertainty above 1GHz is defined as ± 3.9 dB

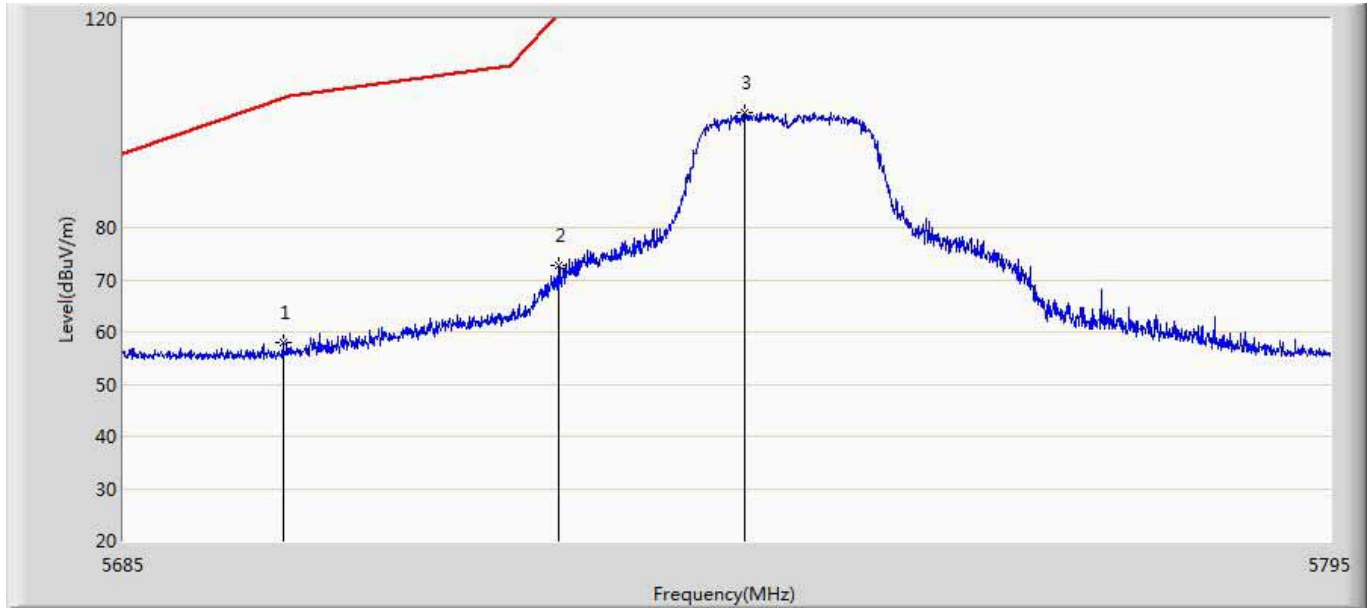
9.6. Test Result

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 10:29
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Radio Controller	Power: By Battery
Note: Mode 1:Transmit at channel 5745Mhz by 802.11a ant 1	



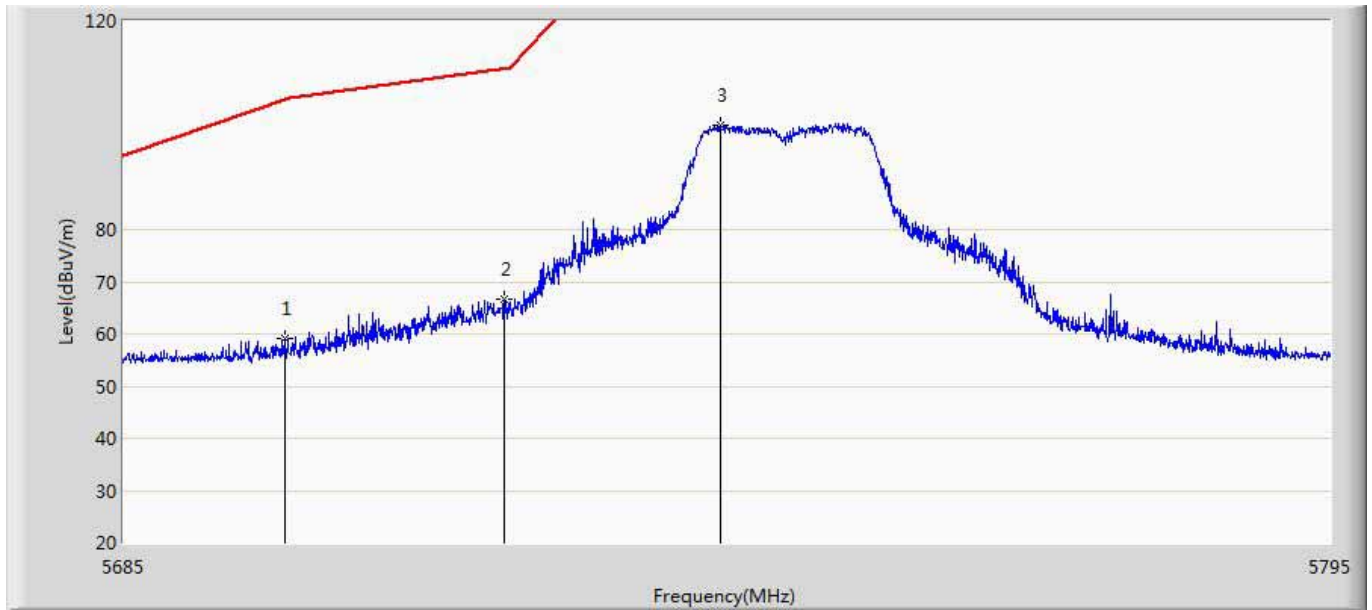
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5700.015	59.470	14.849	-45.835	105.304	44.620	PK
2		5723.555	66.263	22.190	-12.037	78.300	44.073	PK
3	*	5751.330	100.488	56.381	32.188	68.300	44.107	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 10:35
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5745Mhz by 802.11a ant 1	



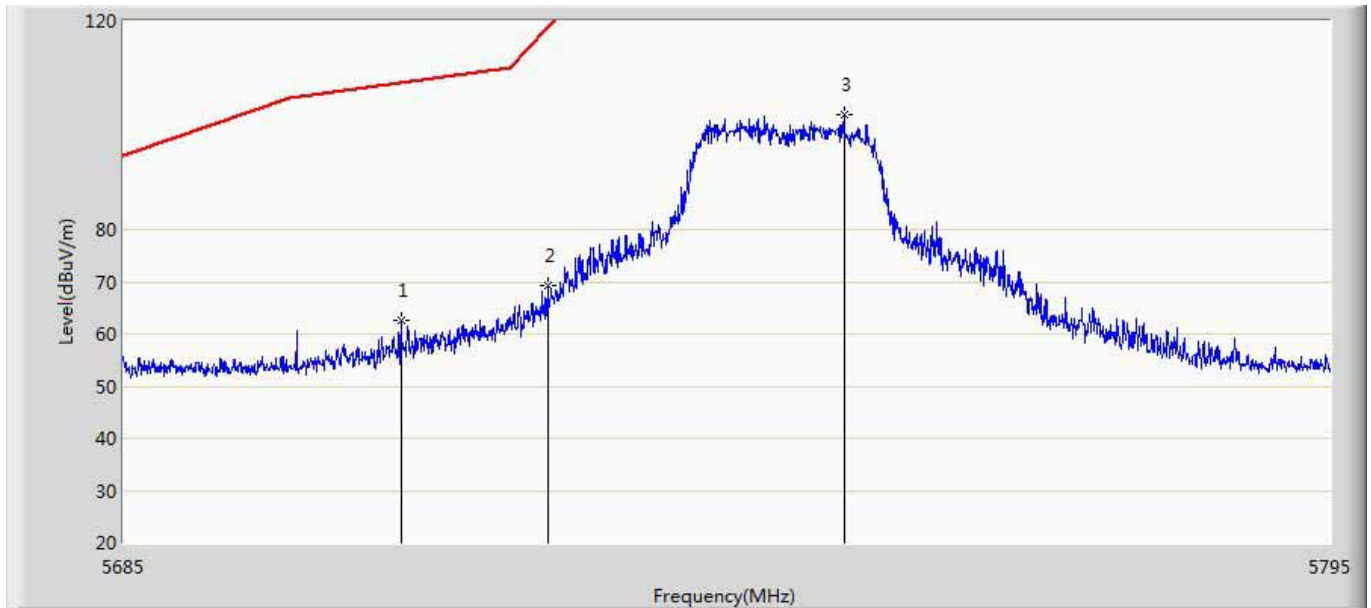
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5699.465	57.843	13.221	-47.063	104.906	44.622	PK
2		5724.435	72.831	28.755	-5.469	78.300	44.076	PK
3	*	5741.375	102.070	57.868	33.770	68.300	44.203	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 10:38
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5745Mhz by 802.11a ant 2	



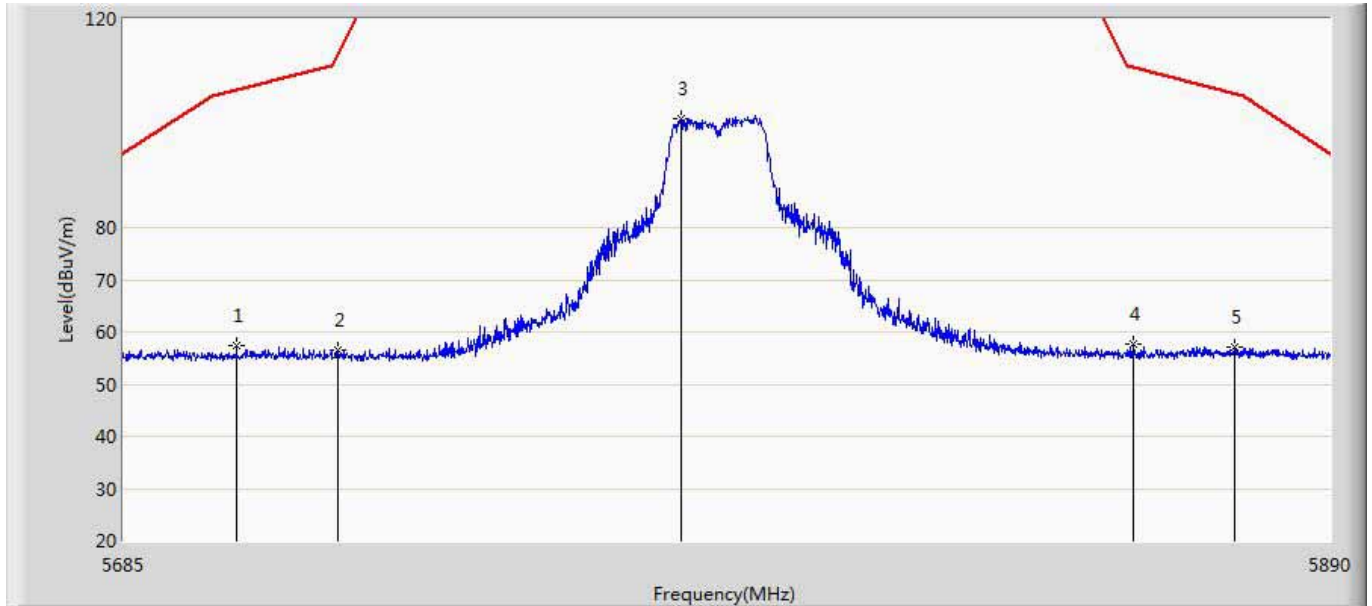
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5699.575	59.273	14.651	-45.714	104.987	44.622	PK
2		5719.485	66.548	21.940	-44.208	110.756	44.608	PK
3	*	5739.175	99.980	55.795	31.680	68.300	44.185	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 10:48
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5745Mhz by 802.11a ant 2	



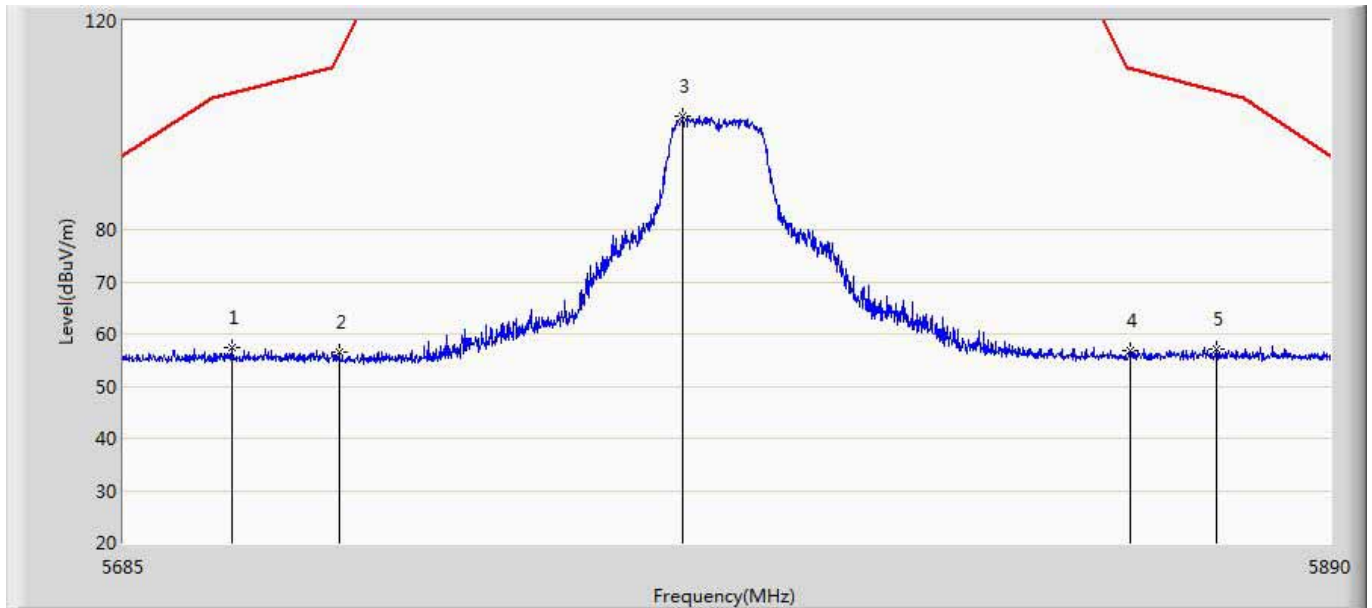
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5710.135	62.465	18.430	-5.835	68.300	44.036	PK
2		5723.500	69.365	25.292	-8.935	78.300	44.073	PK
3	*	5750.450	101.962	57.844	33.662	68.300	44.119	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 10:53
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5785Mhz by 802.11a ant 1	



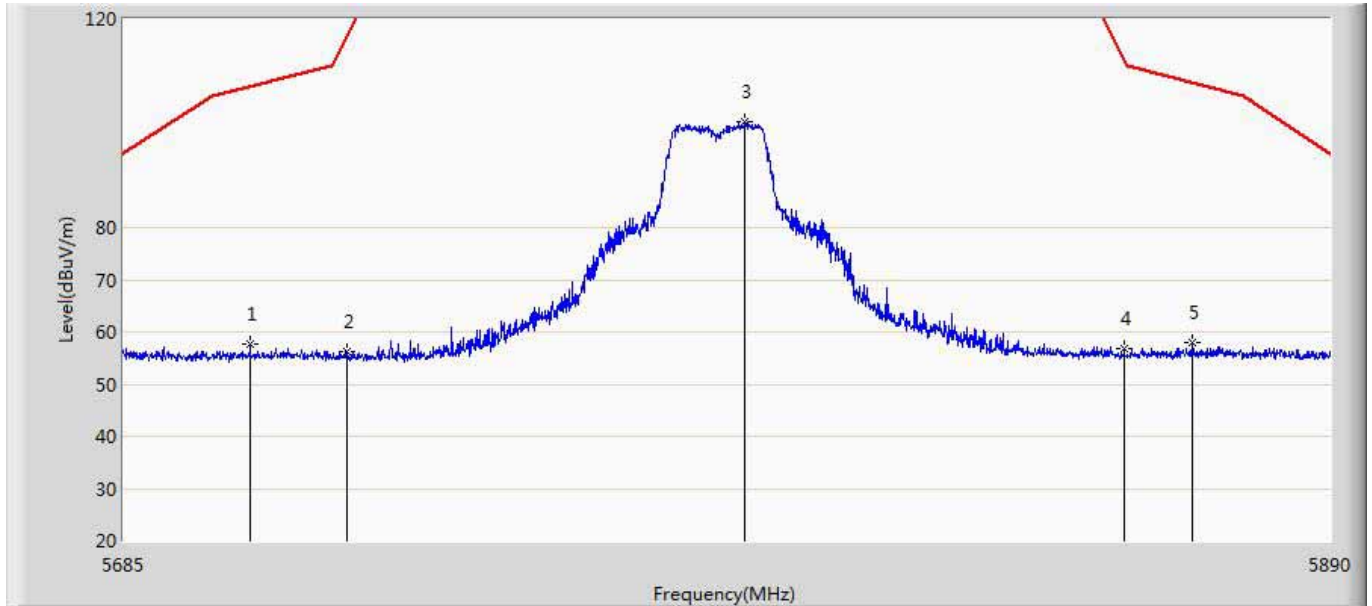
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5703.962	57.436	13.401	-10.864	68.300	44.035	PK
2		5720.978	56.538	12.472	-21.762	78.300	44.066	PK
3	*	5778.788	100.949	56.928	32.649	68.300	44.022	PK
4		5856.175	57.554	13.223	-20.746	78.300	44.331	PK
5		5873.600	57.009	12.558	-11.291	68.300	44.451	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 10:55
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5785Mhz by 802.11a ant 1	



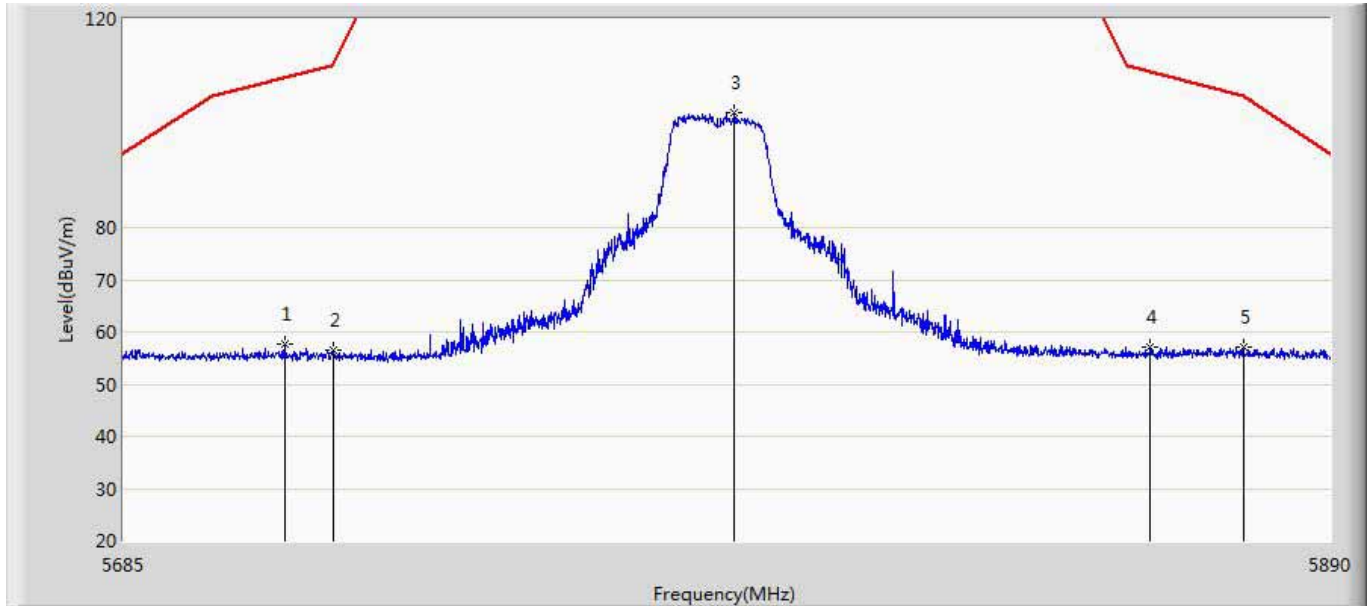
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5703.245	57.437	13.401	-10.863	68.300	44.036	PK
2		5721.080	56.604	12.538	-21.696	78.300	44.066	PK
3	*	5779.197	101.669	57.647	33.369	68.300	44.022	PK
4		5855.560	56.905	12.581	-21.395	78.300	44.324	PK
5		5870.525	57.172	12.735	-11.128	68.300	44.437	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 10:57
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5785Mhz by 802.11a ant 2	



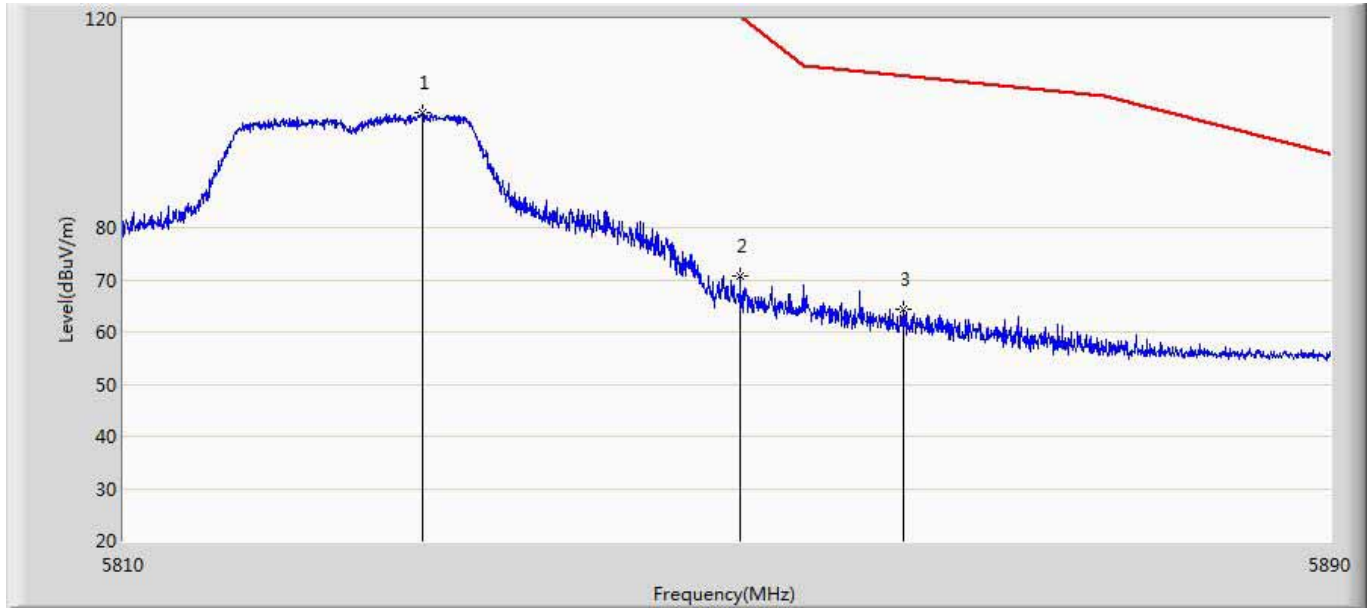
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5706.217	57.546	13.512	-10.754	68.300	44.034	PK
2		5722.515	56.227	12.157	-22.073	78.300	44.070	PK
3	*	5789.652	100.411	56.372	32.111	68.300	44.039	PK
4		5854.535	56.728	12.415	-21.572	78.300	44.312	PK
5		5866.322	58.089	13.672	-10.211	68.300	44.417	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 10:58
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5785Mhz by 802.11a ant 2	



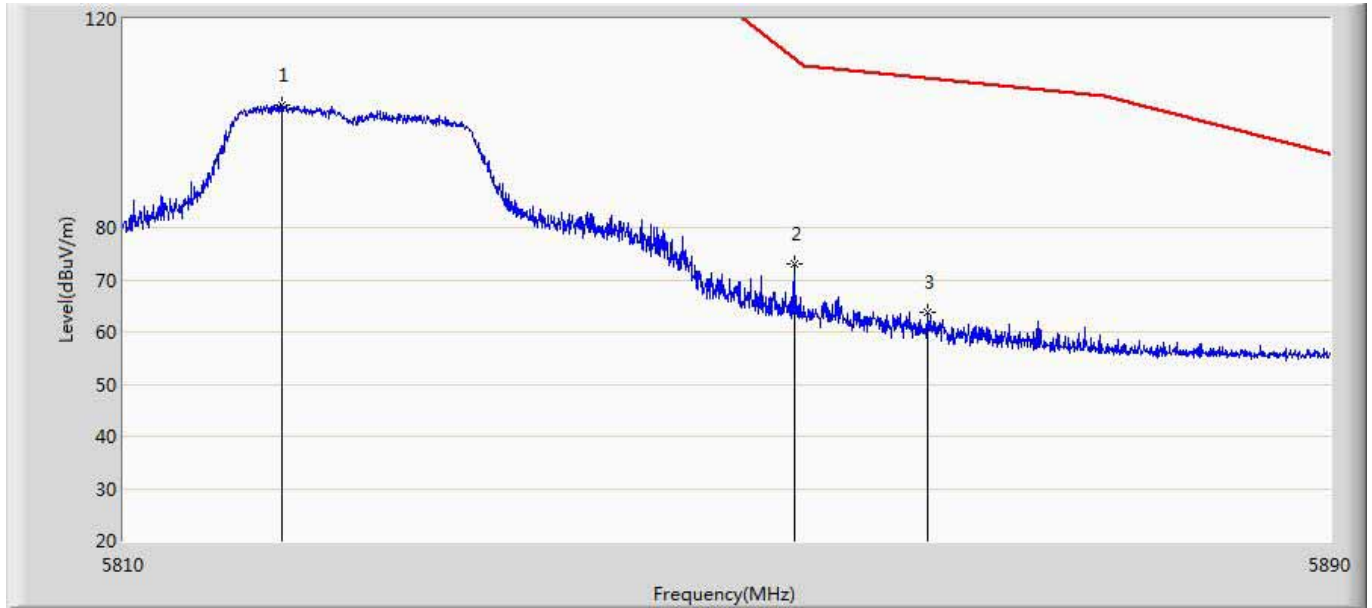
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5711.958	57.553	13.513	-10.747	68.300	44.040	PK
2		5720.260	56.441	12.377	-21.859	78.300	44.064	PK
3	*	5787.910	102.055	58.019	33.755	68.300	44.035	PK
4		5859.045	56.976	12.612	-21.324	78.300	44.364	PK
5		5875.138	57.111	12.652	-11.189	68.300	44.459	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 11:02
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5825Mhz by 802.11a ant 1	



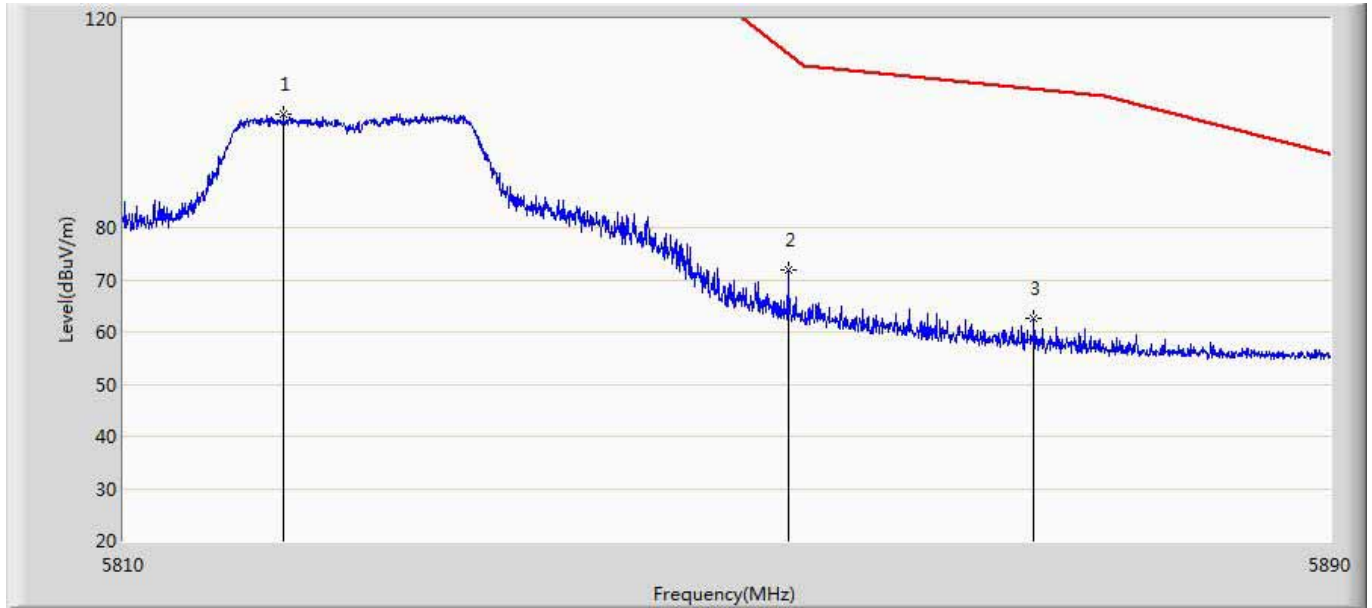
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5829.720	102.035	57.769	33.735	68.300	44.265	PK
2		5850.760	70.845	26.575	-7.455	78.300	44.270	PK
3		5861.640	64.420	20.027	-3.880	68.300	44.392	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 11:04
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5825Mhz by 802.11a ant 1	



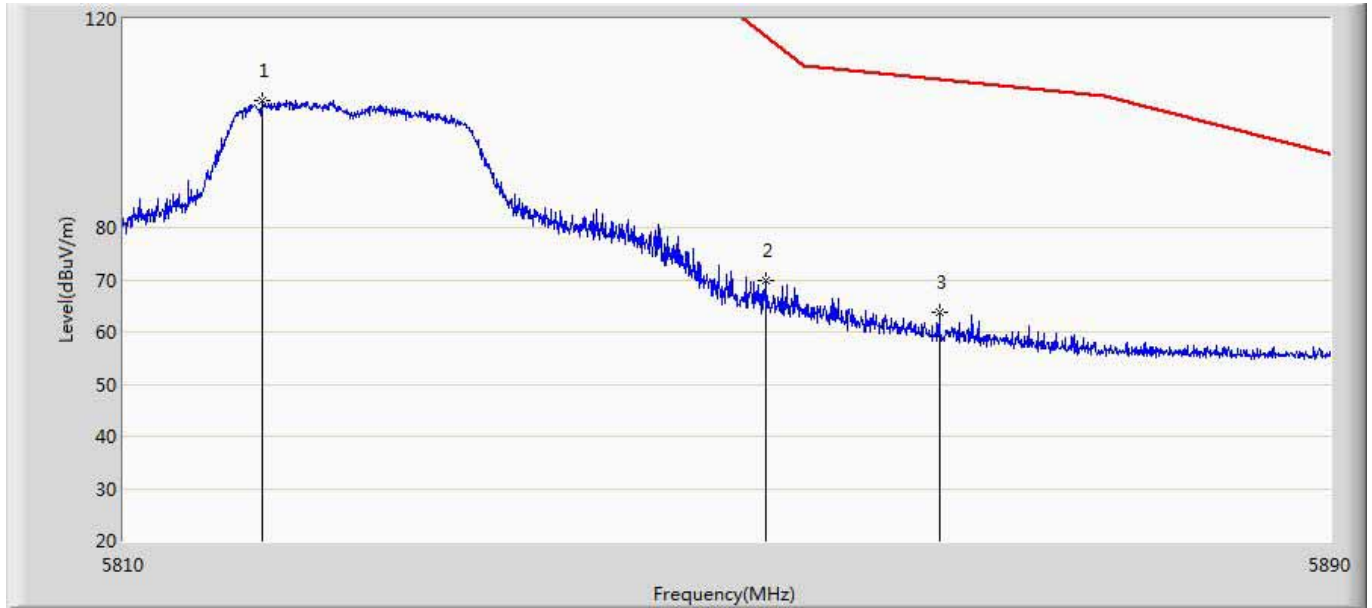
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5820.440	103.412	59.220	35.112	68.300	44.192	PK
2		5854.360	72.947	28.636	-5.353	78.300	44.310	PK
3		5863.200	63.651	19.248	-4.649	68.300	44.403	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 11:06
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5825Mhz by 802.11a ant 2	



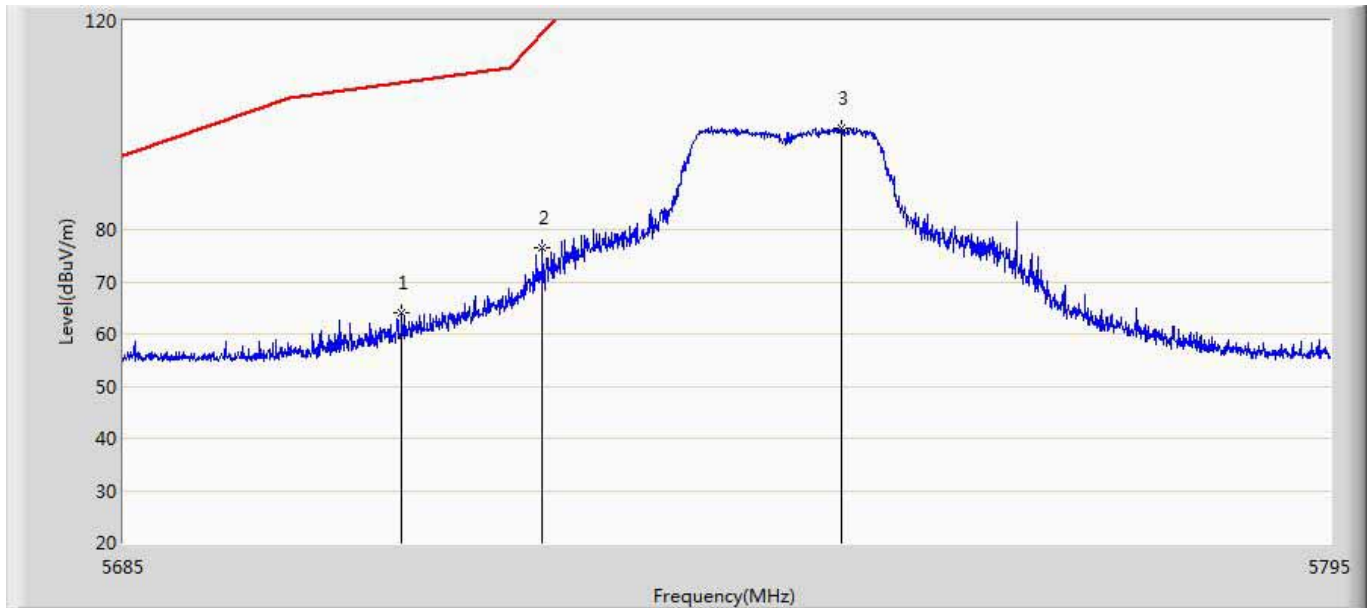
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5820.560	101.656	57.463	33.356	68.300	44.193	PK
2		5853.960	71.741	27.435	-6.559	78.300	44.306	PK
3		5870.280	62.670	18.234	-5.630	68.300	44.436	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 11:11
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5825Mhz by 802.11a ant 2	



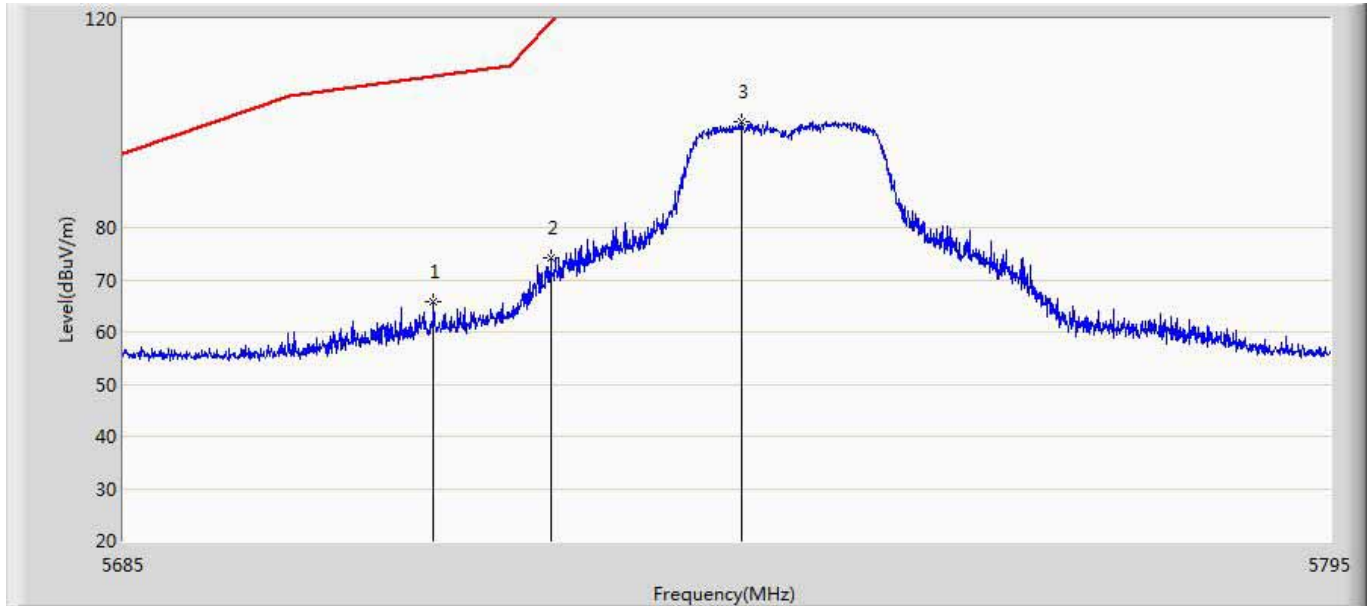
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5819.200	104.326	60.147	36.026	68.300	44.179	PK
2		5852.480	69.983	25.694	-8.317	78.300	44.290	PK
3		5864.000	63.901	19.495	-4.399	68.300	44.406	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 11:14
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5745Mhz by 802.11n20 ant 1	



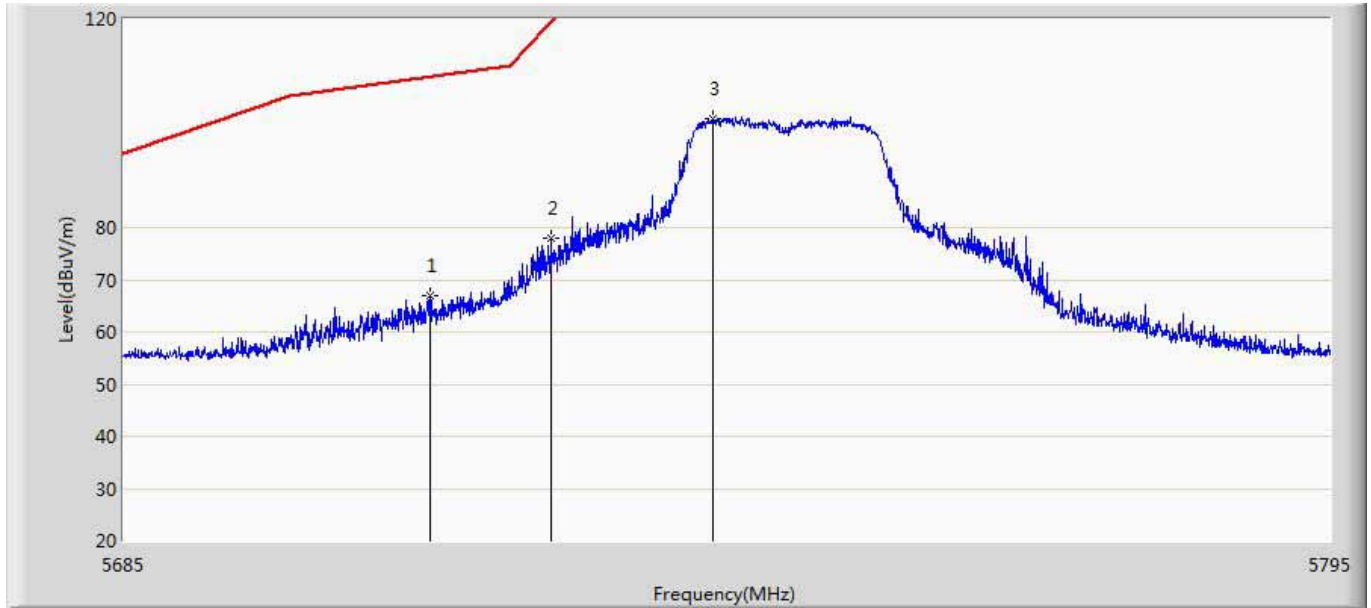
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5710.245	63.994	19.959	-4.306	68.300	44.036	PK
2		5723.005	76.473	32.401	-1.827	78.300	44.072	PK
3	*	5750.285	99.390	55.270	31.090	68.300	44.120	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 11:16
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5745Mhz by 802.11n20 ant 1	



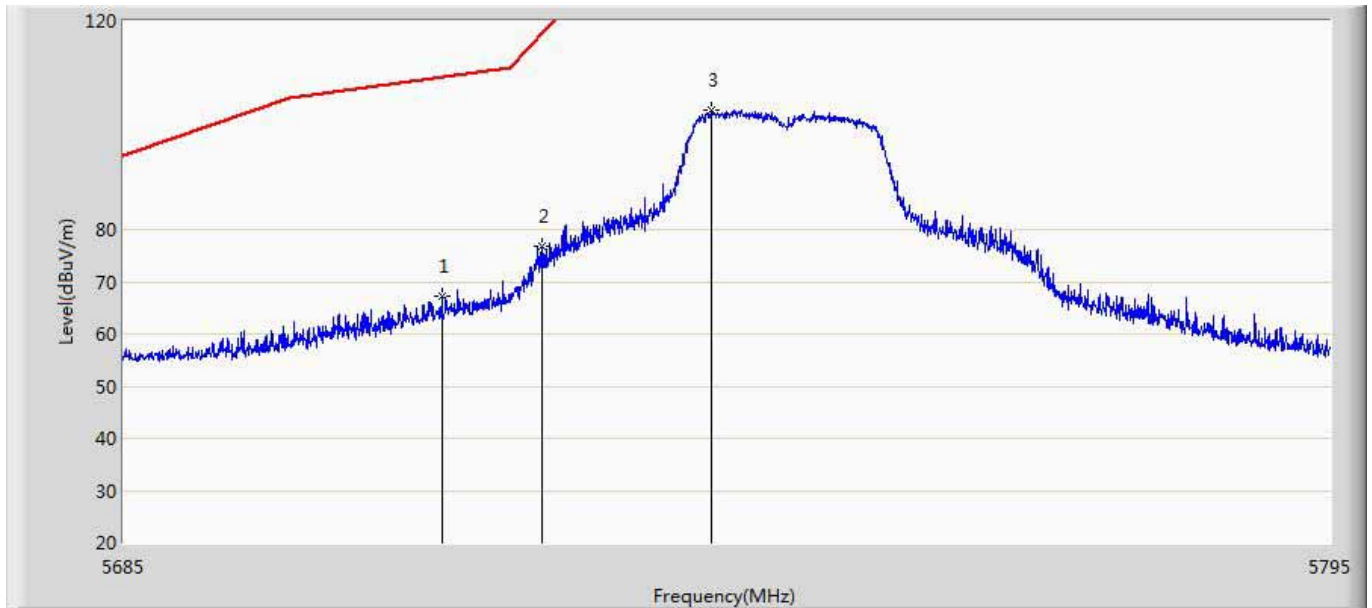
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5713.105	65.858	21.814	-2.442	68.300	44.044	PK
2		5723.775	74.076	30.002	-4.224	78.300	44.074	PK
3	*	5741.155	100.284	56.083	31.984	68.300	44.200	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 11:19
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5745Mhz by 802.11n20 ant 2	



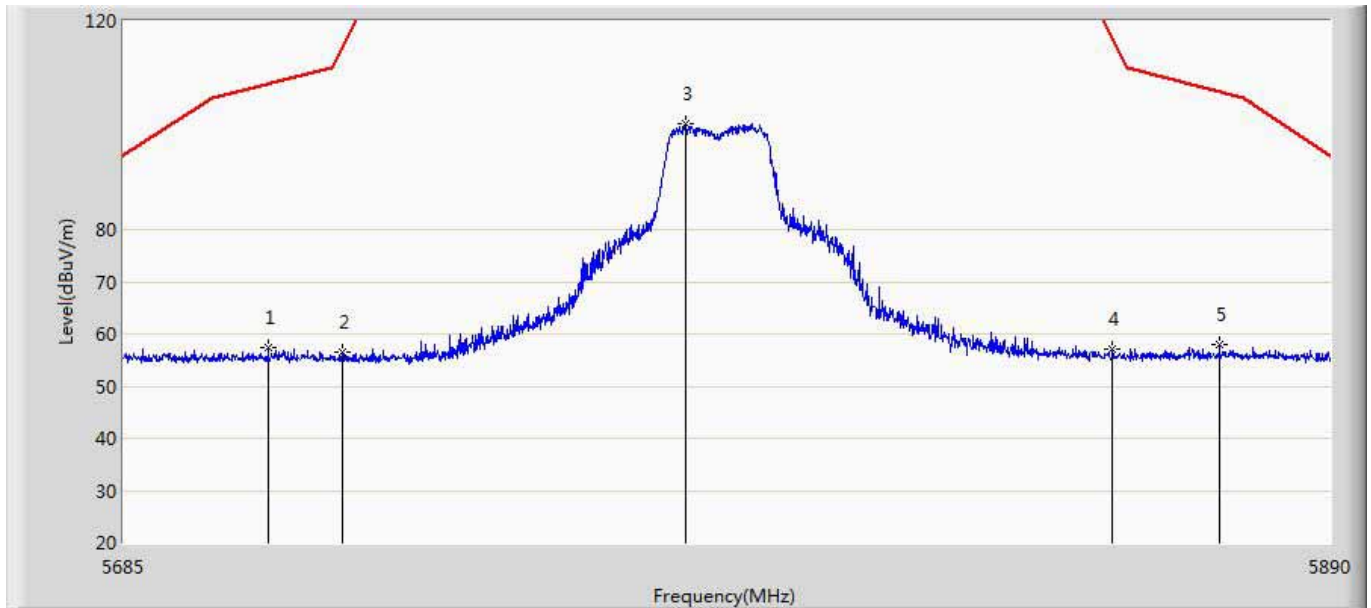
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5712.775	66.994	22.951	-1.306	68.300	44.043	PK
2		5723.775	77.889	33.815	-0.411	78.300	44.074	PK
3	*	5738.515	100.902	56.722	32.602	68.300	44.180	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 11:20
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5745Mhz by 802.11n20 ant 2	



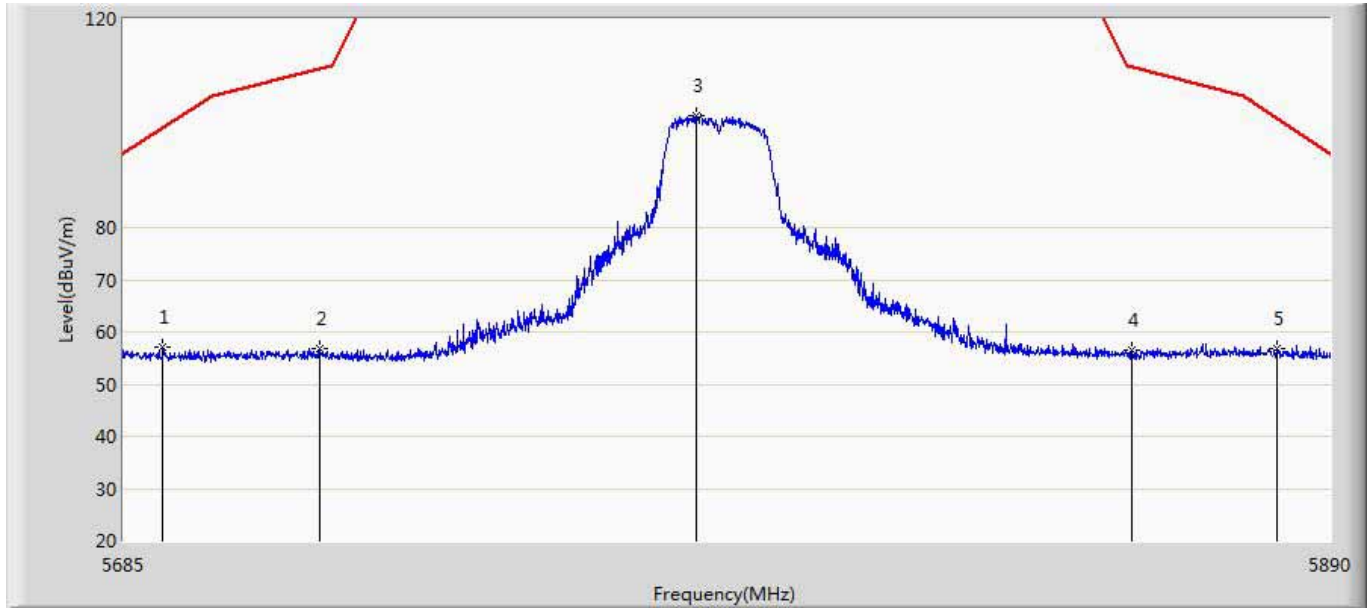
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5713.875	67.178	23.132	-1.122	68.300	44.046	PK
2		5723.005	76.741	32.669	-1.559	78.300	44.072	PK
3	*	5738.295	102.877	58.699	34.577	68.300	44.177	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 11:24
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5785Mhz by 802.11n20 ant 1	



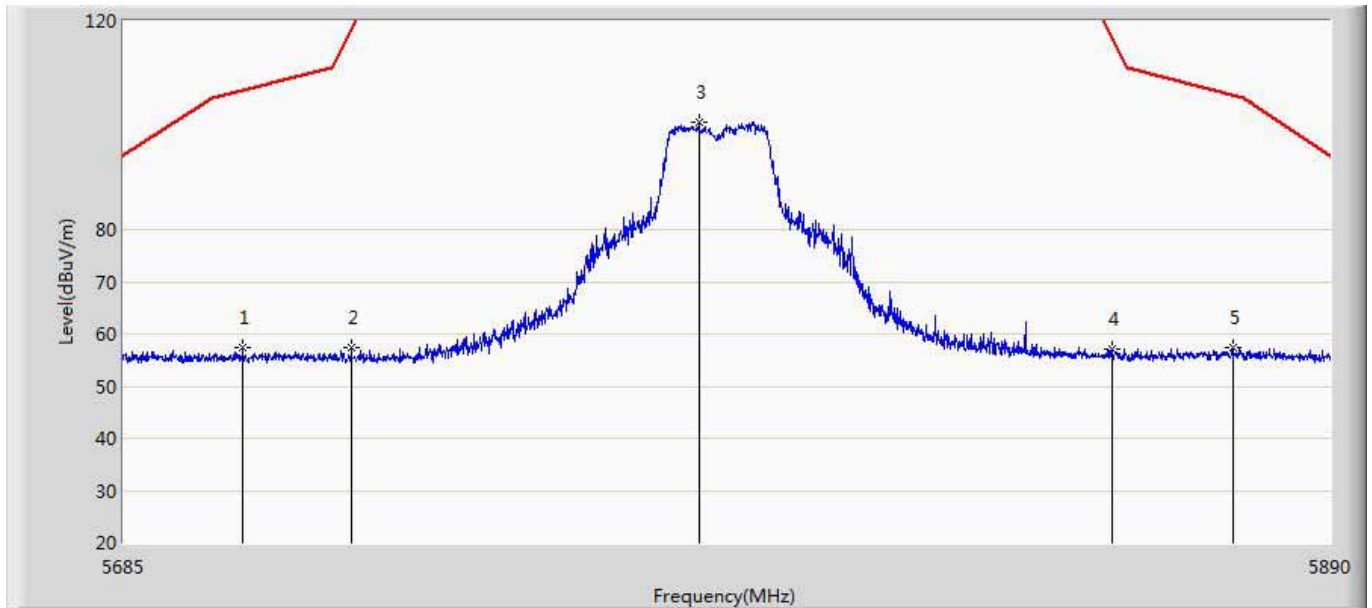
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5709.292	57.369	13.336	-10.931	68.300	44.032	PK
2		5721.695	56.482	12.414	-21.818	78.300	44.068	PK
3	*	5779.710	100.322	56.299	32.022	68.300	44.023	PK
4		5852.587	57.158	12.867	-21.142	78.300	44.291	PK
5		5870.935	57.970	13.531	-10.330	68.300	44.439	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 11:26
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Radio Controller	Power: By Battery
Note: Mode 1:Transmit at channel 5785Mhz by 802.11n20 ant 1	



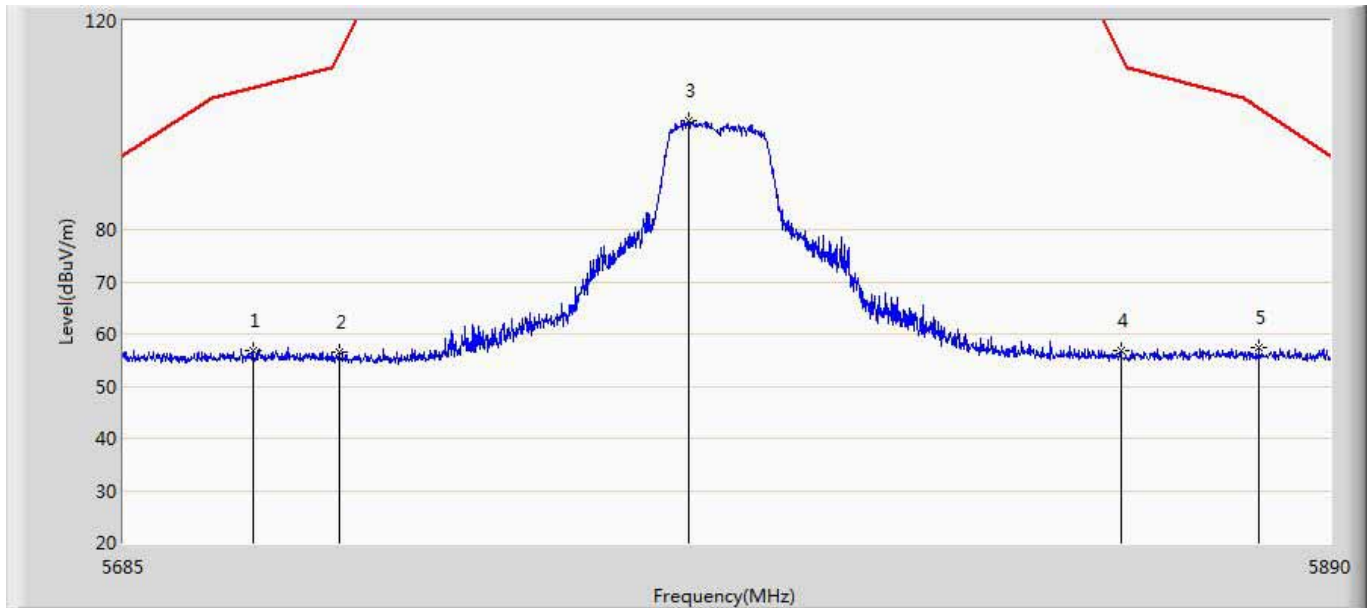
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5691.663	57.079	13.039	-11.221	68.300	44.041	PK
2		5718.005	56.867	12.810	-21.433	78.300	44.057	PK
3	*	5781.453	101.546	57.520	33.246	68.300	44.025	PK
4		5855.970	56.640	12.311	-21.660	78.300	44.328	PK
5		5880.877	56.855	12.395	-11.445	68.300	44.460	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 11:28
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5785Mhz by 802.11n20 ant 2	



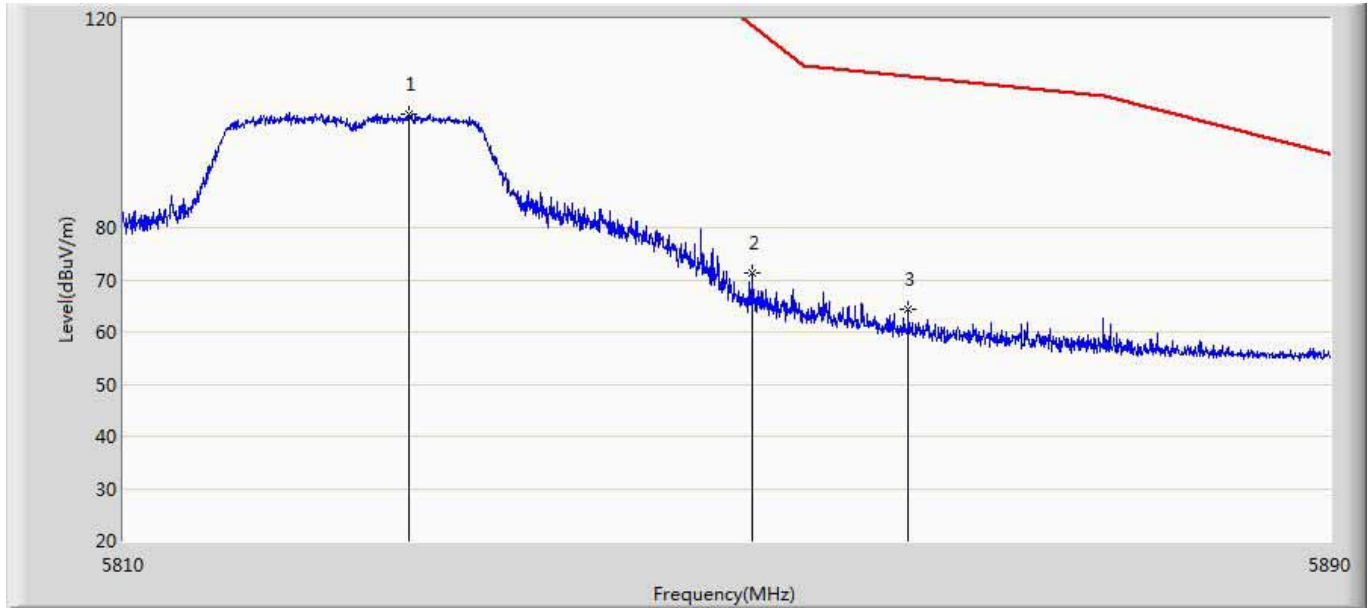
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5704.987	57.406	13.372	-10.894	68.300	44.034	PK
2		5723.232	57.342	13.270	-20.958	78.300	44.072	PK
3	*	5781.862	100.487	56.461	32.187	68.300	44.026	PK
4		5852.485	57.058	12.769	-21.242	78.300	44.290	PK
5		5873.292	57.325	12.875	-10.975	68.300	44.450	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 11:29
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5785Mhz by 802.11n20 ant 2	



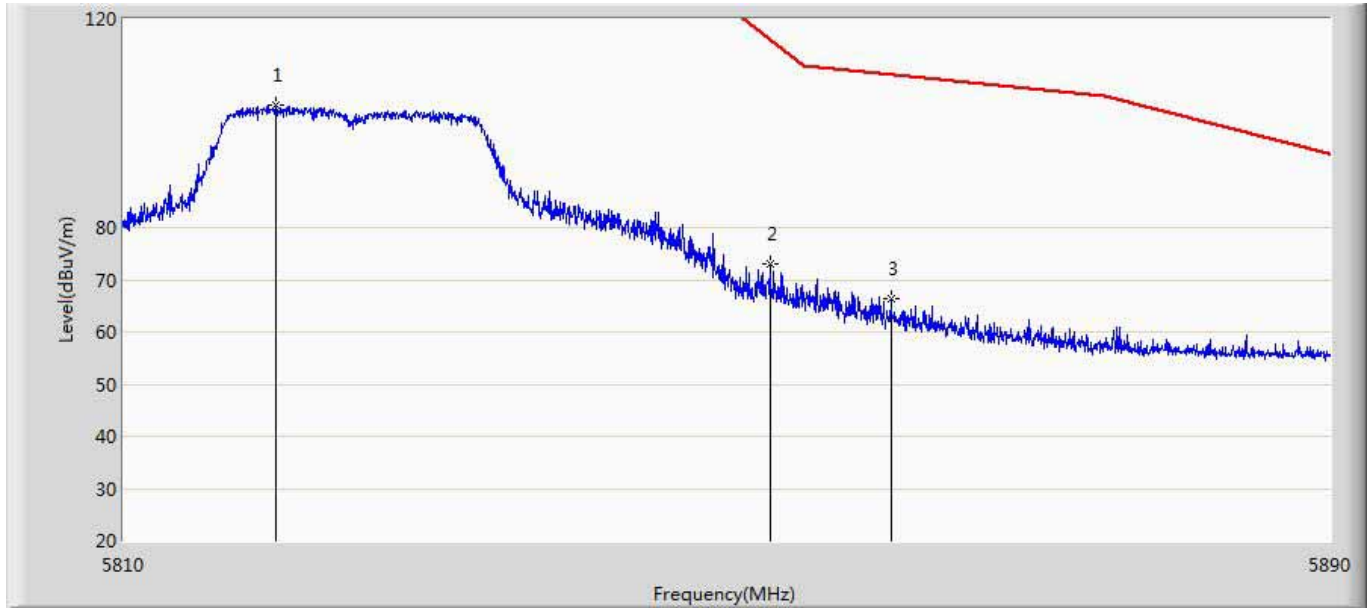
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5706.730	56.869	12.836	-11.431	68.300	44.034	PK
2		5721.080	56.608	12.542	-21.692	78.300	44.066	PK
3	*	5780.120	100.903	56.879	32.603	68.300	44.023	PK
4		5853.920	56.713	12.407	-21.587	78.300	44.306	PK
5		5877.700	57.309	12.838	-10.991	68.300	44.470	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 11:32
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5825Mhz by 802.11n20 ant 1	



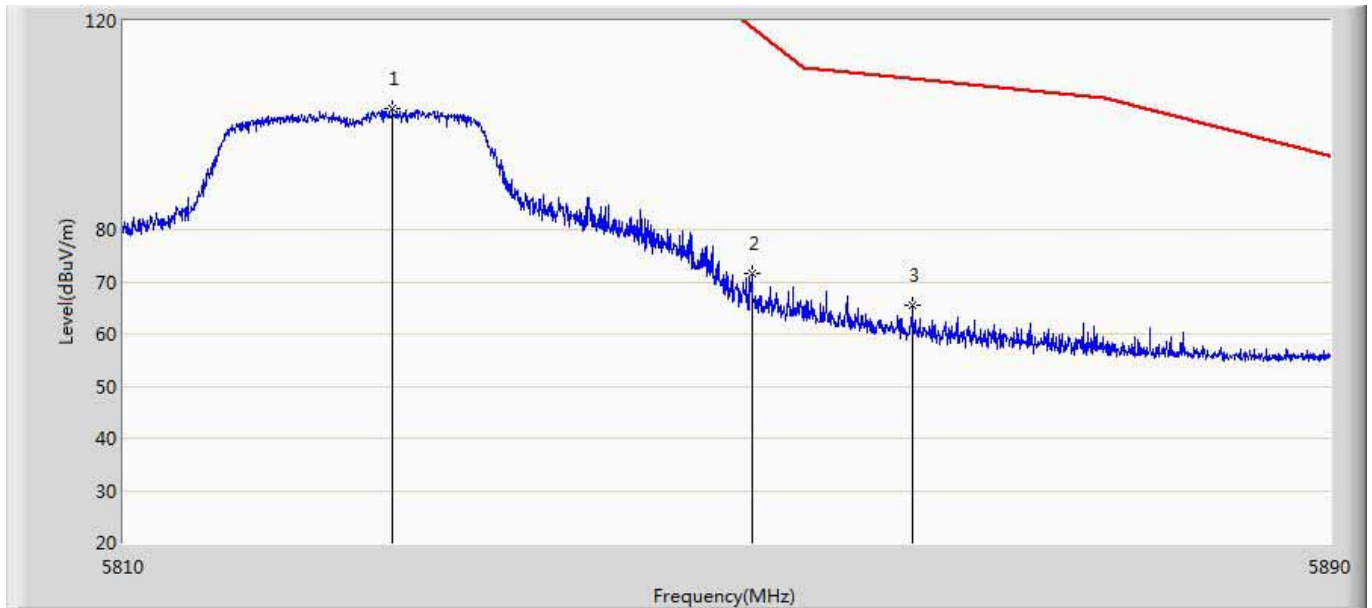
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5828.800	101.636	57.367	33.336	68.300	44.269	PK
2		5851.600	71.423	27.144	-6.877	78.300	44.279	PK
3		5861.920	64.397	20.001	-3.903	68.300	44.396	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 11:33
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5825Mhz by 802.11n20 ant 1	



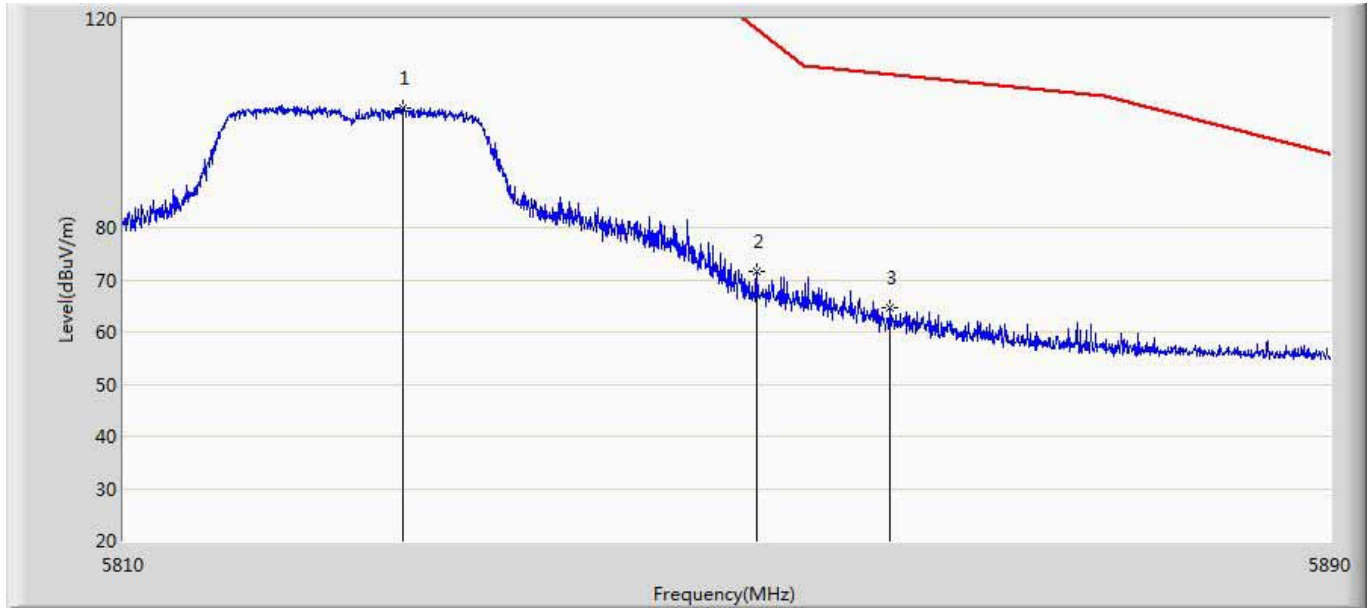
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5820.040	103.487	59.299	35.187	68.300	44.188	PK
2		5852.760	72.989	28.696	-5.311	78.300	44.293	PK
3		5860.760	66.373	21.990	-1.927	68.300	44.383	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 11:35
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5825Mhz by 802.11n20 ant 2	



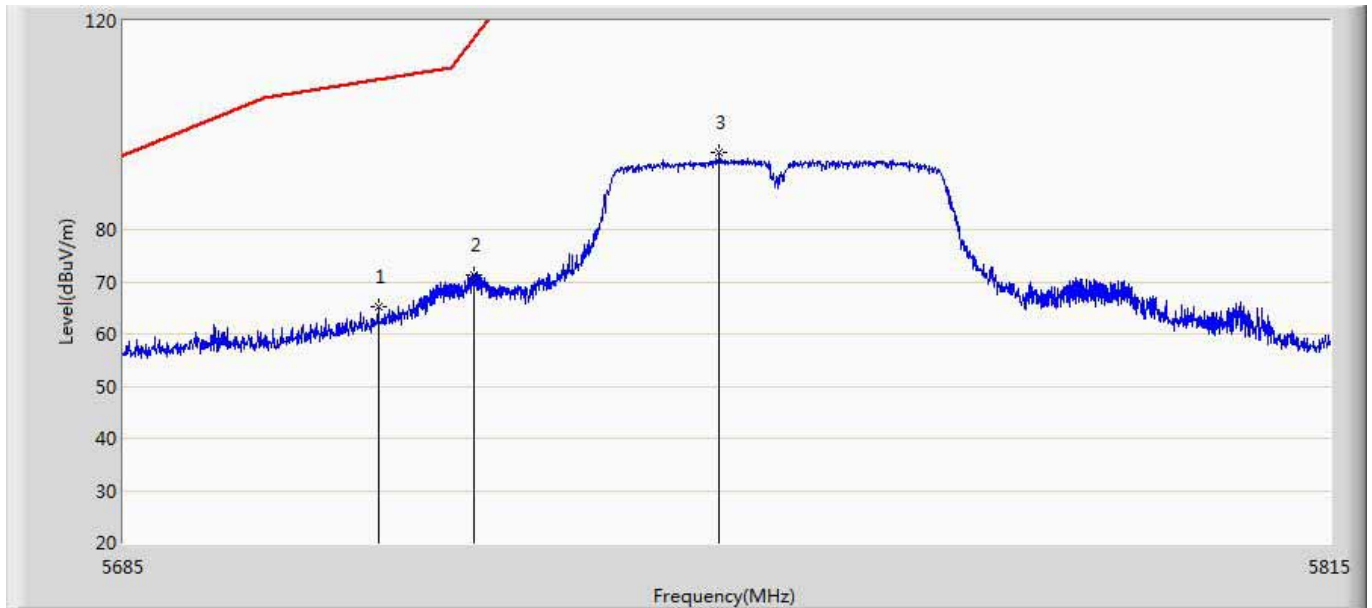
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5827.760	103.101	58.831	34.801	68.300	44.270	PK
2		5851.520	71.610	27.331	-6.690	78.300	44.278	PK
3		5862.200	65.606	21.208	-2.694	68.300	44.398	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 11:36
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5825Mhz by 802.11n20 ant 2	



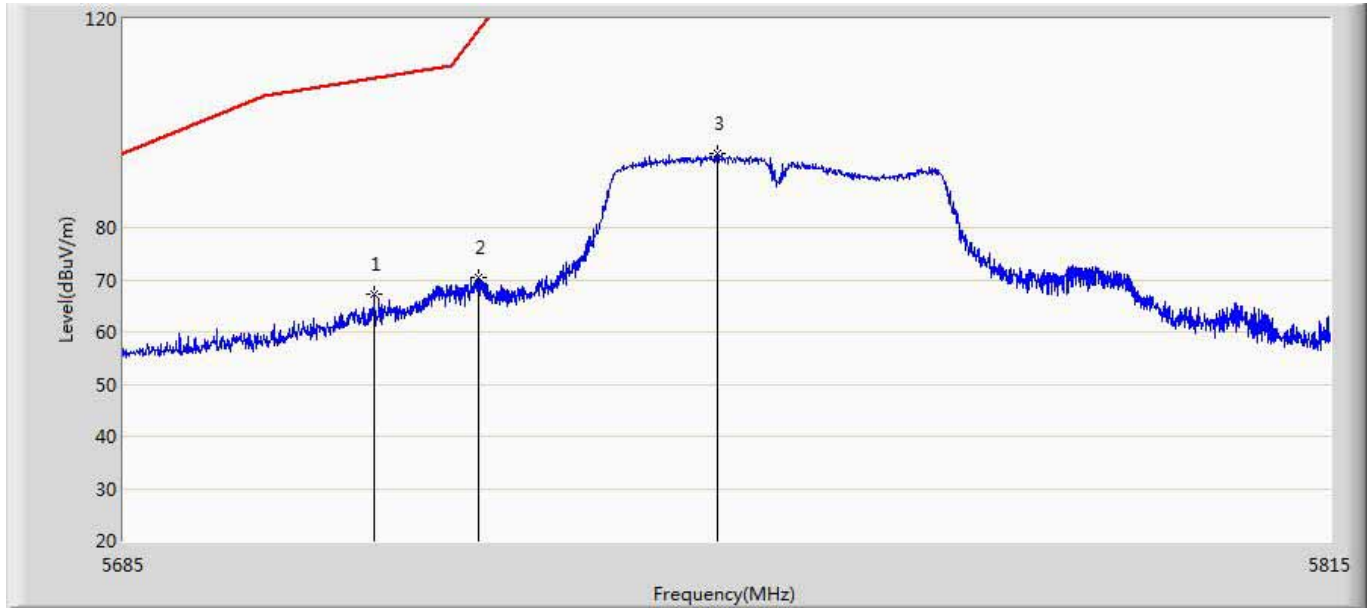
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5828.400	102.849	58.578	34.549	68.300	44.271	PK
2		5851.840	71.699	27.417	-6.601	78.300	44.282	PK
3		5860.680	64.583	20.201	-3.717	68.300	44.382	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 11:54
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5755Mhz by 802.11n40 ant 1 19	



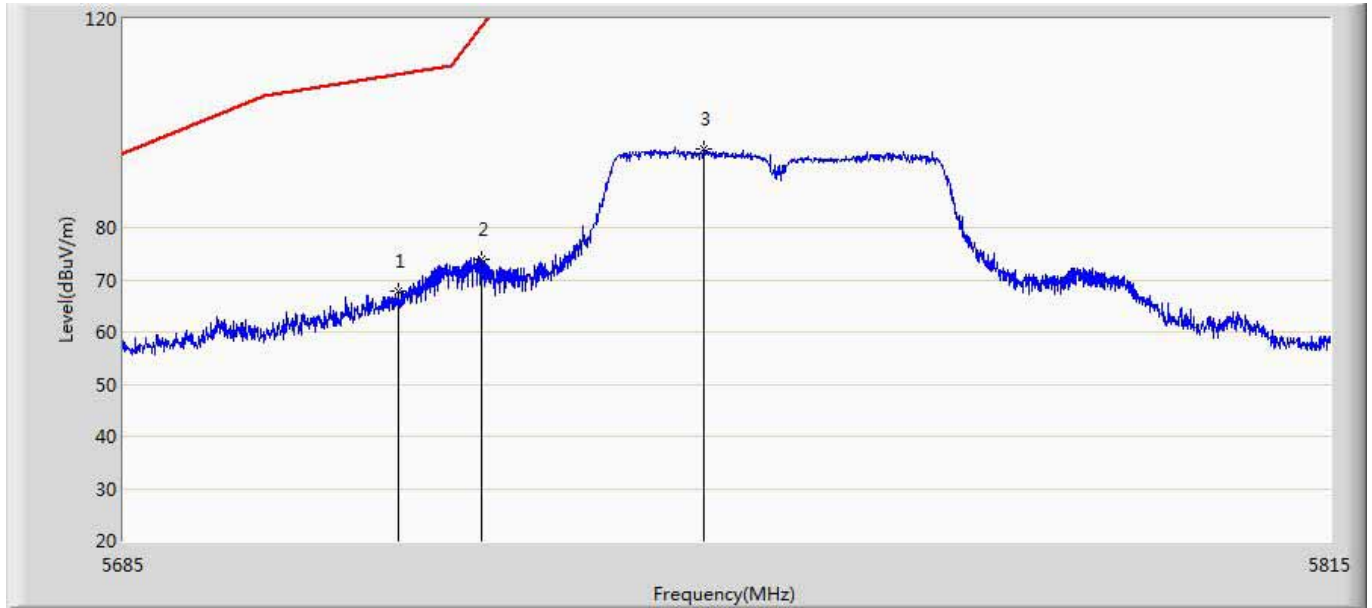
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5712.235	65.078	21.037	-3.222	68.300	44.041	PK
2		5722.505	71.409	27.339	-6.891	78.300	44.070	PK
3	*	5748.895	94.905	50.767	26.605	68.300	44.138	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 11:56
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5755Mhz by 802.11n40 ant 1 19	



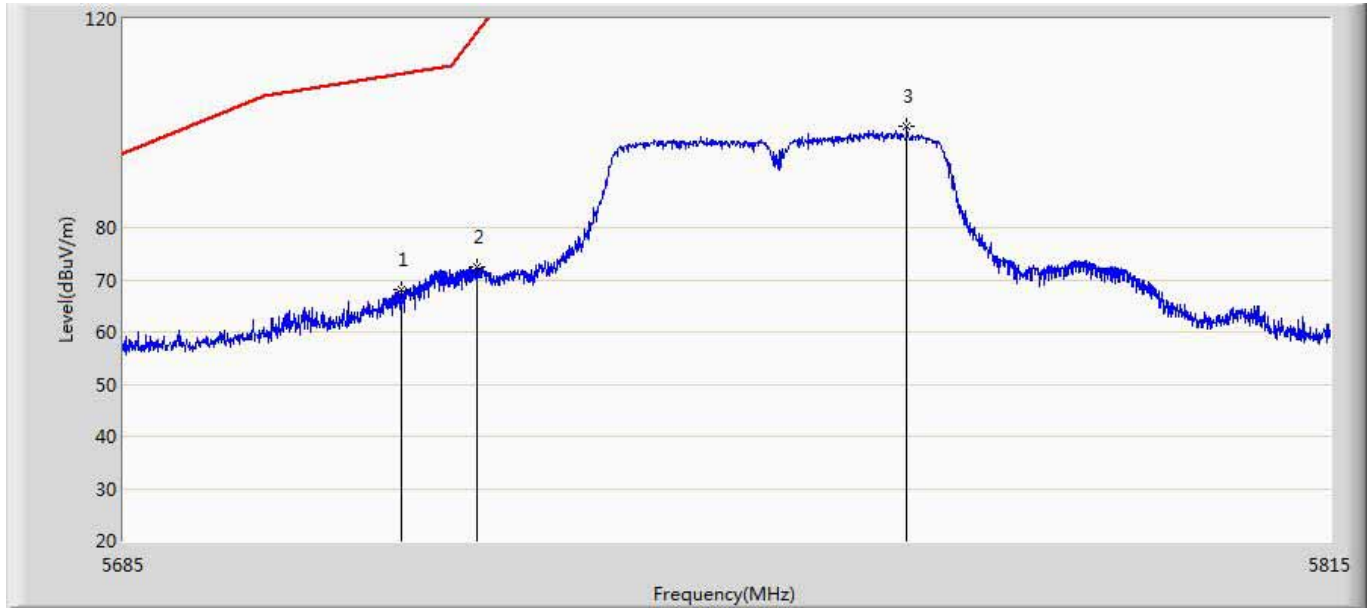
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5711.845	67.252	23.212	-1.048	68.300	44.040	PK
2		5722.960	70.493	26.422	-7.807	78.300	44.072	PK
3	*	5748.635	94.326	50.184	26.026	68.300	44.142	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 13:16
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5755Mhz by 802.11n40 ant 2 18	



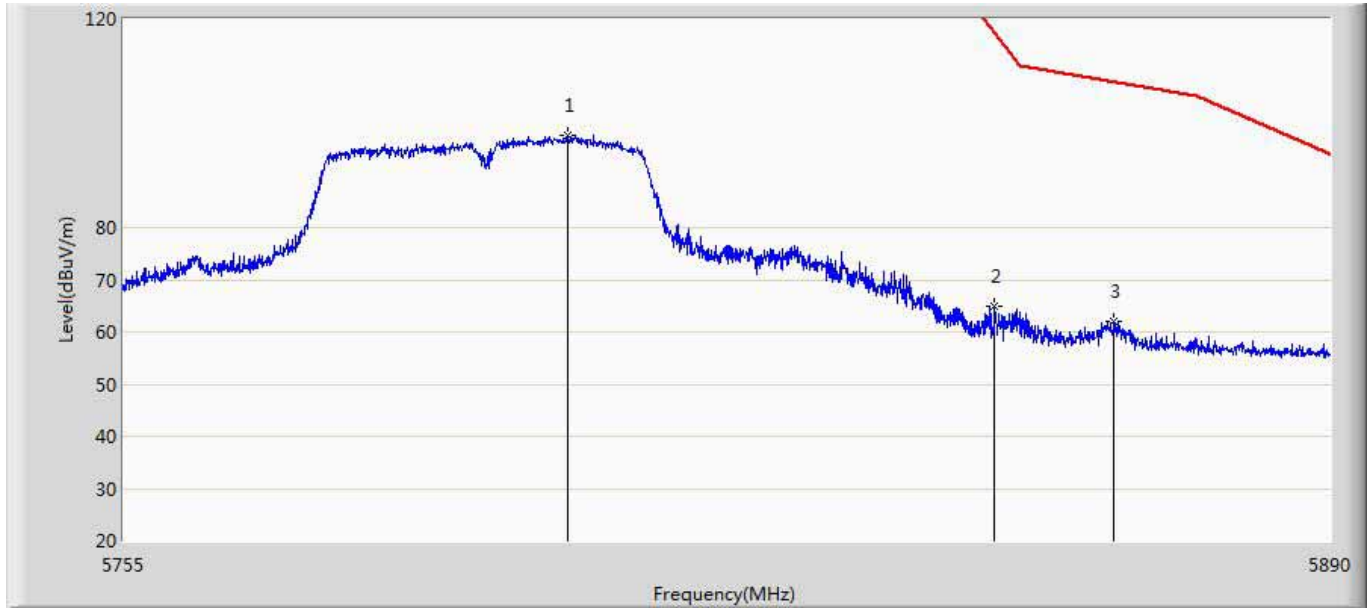
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5714.315	67.964	23.917	-0.336	68.300	44.047	PK
2		5723.285	73.950	29.878	-4.350	78.300	44.072	PK
3	*	5747.270	95.106	50.946	26.806	68.300	44.160	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 13:20
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5755Mhz by 802.11n40 ant 2 18	



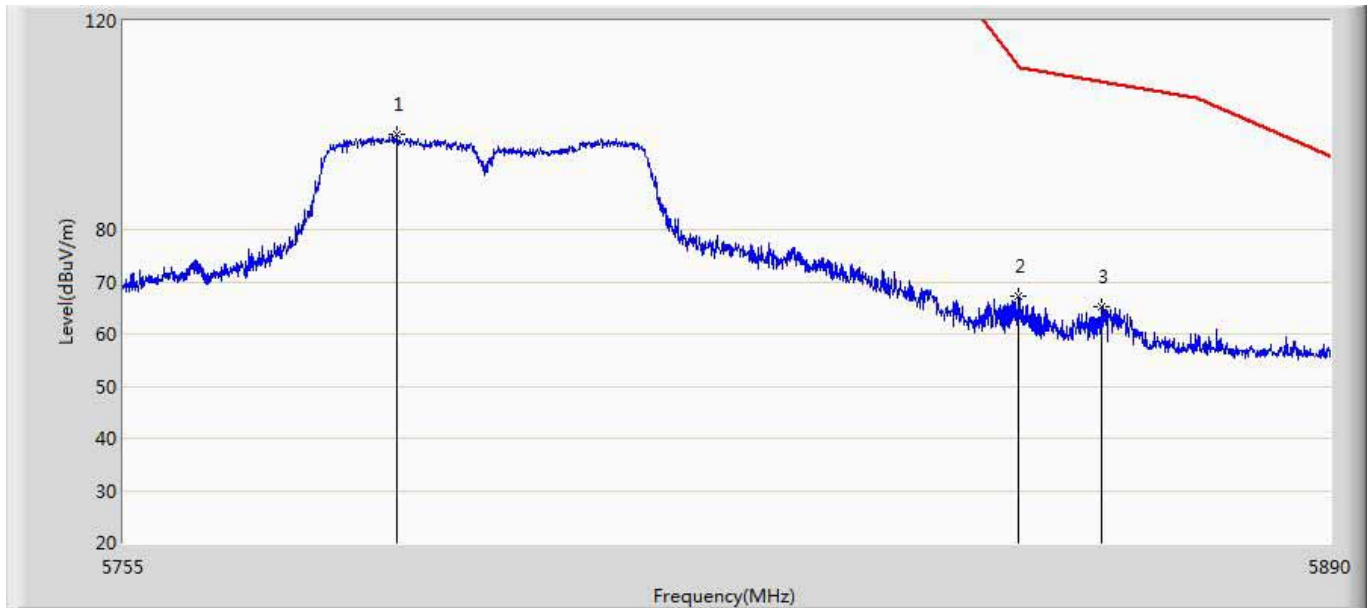
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5714.640	68.085	24.037	-0.215	68.300	44.048	PK
2		5722.765	72.406	28.335	-5.894	78.300	44.071	PK
3	*	5769.110	99.280	55.273	30.980	68.300	44.007	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 13:24
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5795Mhz by 802.11n40 ant 1	



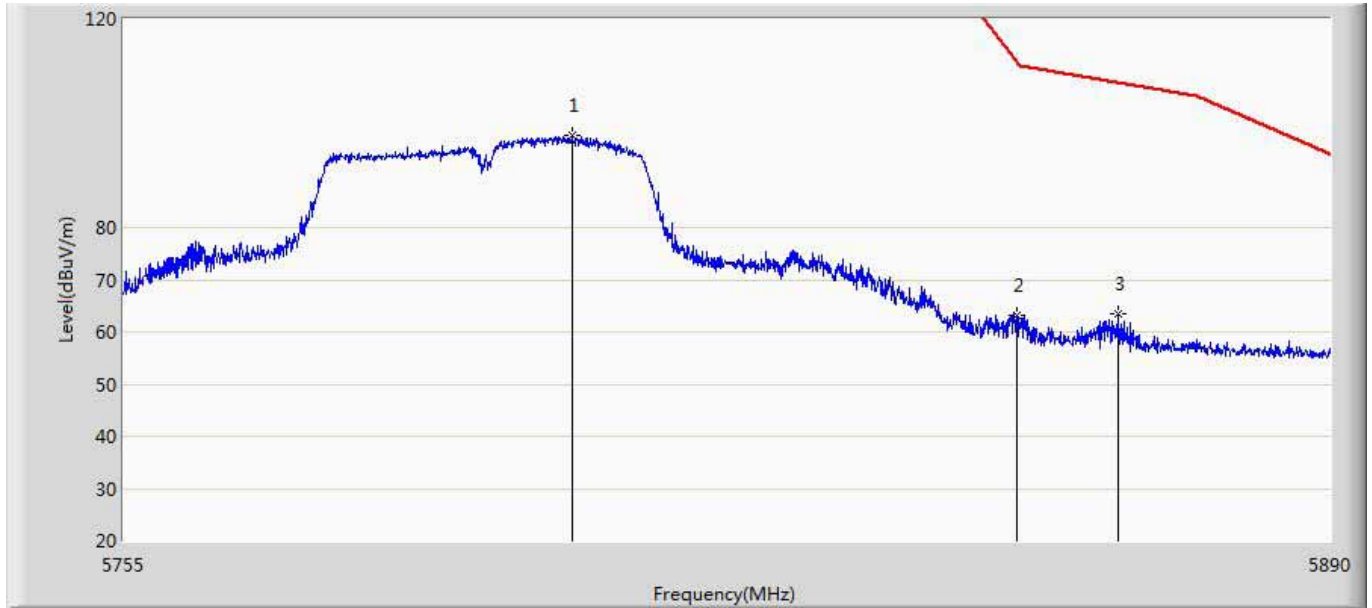
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5804.342	97.568	53.494	29.268	68.300	44.074	PK
2		5852.132	65.029	20.744	-13.271	78.300	44.285	PK
3		5865.632	62.077	17.663	-6.223	68.300	44.414	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 13:27
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5795Mhz by 802.11n40 ant 1	



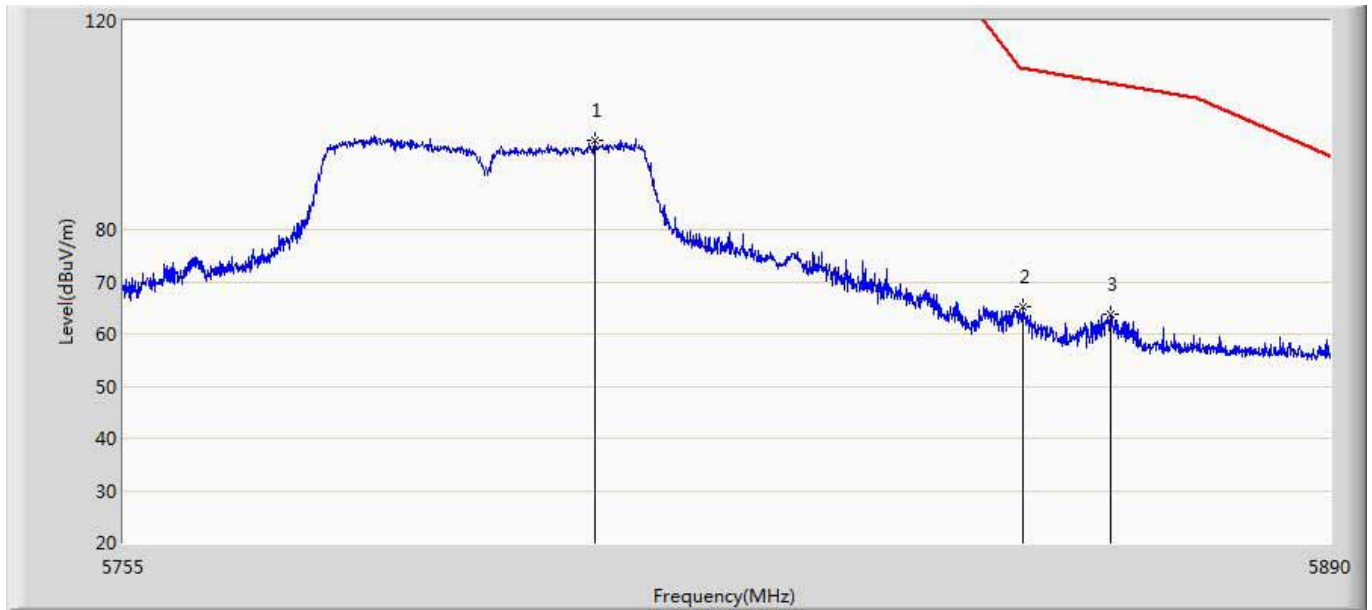
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5785.375	98.385	54.353	30.085	68.300	44.032	PK
2		5854.900	67.259	22.942	-11.041	78.300	44.317	PK
3		5864.215	65.260	20.853	-3.040	68.300	44.407	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 13:29
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5795Mhz by 802.11n40 ant 2	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5804.882	97.581	53.506	29.281	68.300	44.075	PK
2		5854.630	63.330	19.016	-14.970	78.300	44.314	PK
3		5866.038	63.550	19.134	-4.750	68.300	44.416	PK

Engineer: Damon	
Site: AC5	Time: 2015/12/23 - 13:31
Limit: FCC-15.407 new new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Radio Controller	Power: By Battery
Note: Mode 1: Transmit at channel 5795Mhz by 802.11n40 ant 2	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5807.380	97.099	53.017	28.799	68.300	44.082	PK
2		5855.305	65.168	20.847	-13.132	78.300	44.322	PK
3		5865.228	63.789	19.377	-4.511	68.300	44.413	PK

10. Frequency Stability

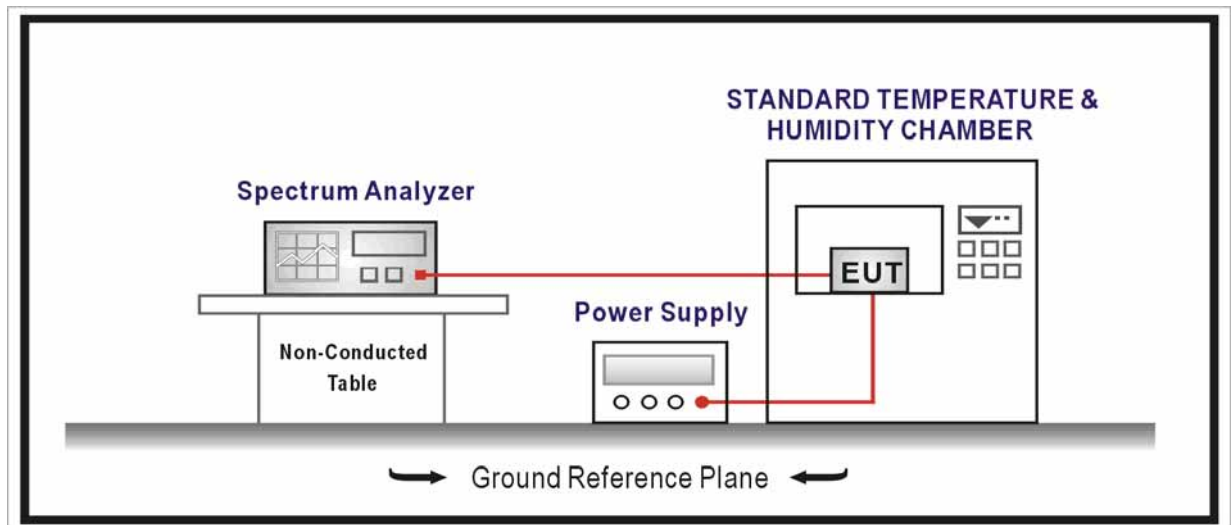
10.1. Test Equipment

Frequency Stability / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2017.01.04
AC Power Supply	IDRC	CF-500TP	979422	2016.09.16
DC Power Supply	IDRC	CD-035-020PR	977272	2016.09.16 </td
Programmable Temperature & Humidity Chamber	Gaoyu	TH-1P-B	WIT-05121302	2017.01.04
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2016.04.09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

10.2. Test Setup



10.3. Limit

For FCC&IC

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

10.4. Test Procedure

Frequency Stability Under Temperature Variations:

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to highest. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C decreased per stage until the lowest temperature reached.

Frequency Stability Under Voltage Variations:

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation ($\pm 15\%$) and endpoint, record the maximum frequency change.

10.5. Uncertainty

The measurement uncertainty is defined as ± 100 Hz

10.6. Test Result

Product	:	RADIO CONTROLLER
Test Item	:	Frequency Stability
Test Site	:	TR-8
Test Mode	:	Carrier Transmit

Frequency Stability under Temperature

Temperature Interval (°C)	Test Frequency (MHz)	Deviation (Hz)
-30	5785.000	-1400
-20	5785.000	1100
-10	5785.000	-600
0	5785.000	-500
10	5785.000	400
20	5785.000	-900
30	5785.000	-300
40	5785.000	2200
50	5785.000	-2100

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)
3.5	5785.000	300
3.7	5785.000	-3200
4.2	5785.000	1100

Note: For this test item, the modulation of this mode we have evaluated two antennas, presented data in the report is the worst case.

_____ The End _____