Test Report

RSS 247 Issue 1

Product Name	:	IP-STB
Model No.	:	3600X
IC	:	5959A-RCB8

Applicant	:	Roku Inc.
Address	:	12980 Saratoga Ave, Suite D Saratoga, CA 95070

Date of Receipt	:	Dec.25, 2015
Test Date	:	Dec.26, 2015~Jan.15, 2016
Issued Date	:	Jan. 21, 2016
Report No.	:	15C2073R-RF-CA-P09V01
Report Version	:	V1.0

Test Report Certification

Issued Date : Jan. 21, 2016
Report No. : 15C2073R-RF-CA-P09V01

Product Name	:	IP-STB
Applicant	:	Roku Inc.
Address	:	12980 Saratoga Ave, Suite D Saratoga, CA 95070
Manufacturer	:	Ambit Mircosystems (Shanghai) LTD.
Address	:	1925, Nanle Road, Songjiang Export Processing Zone, Shanghai, China 201613
Model No.	:	3600X
IC	:	5959A-RCB8
EUT Voltage	:	DC 5V
Brand Name	:	Roku
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 v01 Industry Canada RSS-Gen Issue 4 Industry Canada RSS-247 Issue 1
Test Result	:	Complied
Performed Location	:	Quietek Corporation - Suzhou EMC Laboratory No.99 Hongye Rd., Suzhou Industrial Park, Suzhou,215006, Jiangsu, China TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098 IC Lab Code: 4075B

Documented By : Alice Ni
(Senior Adm. Specialist: Alice Ni)

Reviewed By : Frank he
(Senior Engineer: Frank He)

Approved By : Harry Zhao
(Engineering Manager : Harry Zhao)

Laboratory Information

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
If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

HsinChu Testing Laboratory :
No.75-2, 3rd Lin, Wangye Keng, Yonghxing Tsuen, Qionglin Shiang, Hsinchu County 307, Taiwan, R.O.C.
TEL:+886-3-592-8858 / FAX:+886-3-592-8859 E-Mail : service@quietek.com

LinKou Testing Laboratory :
No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C.
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789 E-Mail : service@quietek.com

Suzhou Testing Laboratory :
No.99 Hongye Rd., Suzhou Industrial Park, Suzhou, 215006, Jiangsu, China
TEL : +86-512-6251-5088 / FAX : 86-512-6251-5098 E-Mail : service@quietek.com

TABLE OF CONTENTS

History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
15C2073R-RF-CA-P09V01	V1.0	Initial Issued Report	Jan. 21, 2016

1. General Information

1.1. EUT Description

Product Name	IP-STB
Brand Name	Roku
Model No.	3600X
EUT Voltage	DC 5V
Frequency Range	**For 2.4GHz Band** 802.11b/g/n(20MHz): 2412~2462MHz 802.11n(40MHz): 2422~2452MHz **For 5.0GHz Band** 802.11a/n(20MHz): 5180~5240MHz, 5745~5825MHz 802.11n(40MHz): 5190~5230MHz, 5755~5795MHz
Channel Number	For 2.4GHz Band 802.11b/g/n(20MHz): 11 802.11n(40MHz): 7 For 5.0GHz Band 802.11a/n(20MHz): 9 802.11n(40MHz): 4
Type of Modulation	802.11b: DSSS
	802.11a/g/n: OFDM
Data Rate	802.11a/g: 6/9/12/18/24/36/48/54 Mbps
	802.11b: 1/2/5.5/11 Mbps
	802.11n: up to 300 Mbps
Channel Control	Auto
Antenna Delivery	2*Tx + 2*Rx
Antenna Type	Reference to Antenna List
Peak Antenna Gain	Reference to Antenna List
Components	
Power Adapter #1	Brand Name: LEI M/N:MU08-P050150-A1 Input: AC 100-240V~50/60Hz 0.25A Output: DC 5V, 1.5A
Power Adapter #2	Brand Name: Chicony M/N:W15-007N1A Input: AC 100-120V~50/60Hz 0.5A Output: DC 5V, 1.5A

For 2.4GHz Band

802.11b/g/n(20MHz) Working Frequency of Each Channel:							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
01	2412 MHz	02	2417 MHz	03	2422 MHz	04	2427 MHz
05	2432 MHz	06	2437 MHz	07	2442 MHz	08	2447 MHz
09	2452 MHz	10	2457 MHz	11	2462 MHz	N/A	N/A
802.11n(40MHz) Working Frequency of Each Channel:							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
03	2422 MHz	04	2427 MHz	05	2432 MHz	06	2437 MHz
07	2442 MHz	08	2447 MHz	09	2452 MHz	N/A	N/A

For 5.0GHz Band

802.11a/n(20MHz) Working Frequency of Each Channel:							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180 MHz	40	5200 MHz	44	5220 MHz	48	5240 MHz
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
38	5190 MHz	46	5230 MHz	151	5755 MHz	159	5795 MHz

802.11a/b/g/n Antenna List

Antenna	Manufacturer	Model No.	Peak Gain	Directional Gain
Antenna 1	TDK-EPC Corporation	ANT016008LCD2442MA1	2.38dBi for 2.4GHz 5.54dBi for 5GHz	5.39dBi for 2.4GHz 8.55dBi for 5GHz
Antenna 2	TDK-EPC Corporation	ANT016008LCD2442MA1	2.38dBi for 2.4GHz 5.54dBi for 5GHz	

Note: 1. The EUT uses MIMO technology and use basic methodology.

2. The EUT has two antennas, and each port has same gain, when transmit at MIMO modes, transmit signals are correlated with each other. The calculate formula is below according to KDB 662911 D01v02r01 2)a):

(1) 5G Directional gain for Directional Gain Calculation is:
Directional gain = G_{ANT} + 10 log(N_{ANT}) dBi≈8.55dBi.

(2) 2.4G Directional gain for Directional Gain Calculation is:
Directional gain = GANT + 10 log(NANT) dBi≈5.39dBi.

Power Parameter Value of the test software

Test Mode	Test Channel	Ant 1	Ant 2	Ant1+2
802.11a	5180	70	73	-
	5220	78	78	-
	5240	78	73	-
	5745	58	62	-
	5785	78	78	-
	5825	68	66	-
802.11n(20MHz)	5180	68	68	70
	5220	78	78	72
	5240	78	78	72
	5745	57	58	56
	5785	78	78	78
	5825	70	65	63
802.11n(40MHz)	5190	52	54	50
	5230	78	78	78
	5755	40	43	39
	5795	61	60	59

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)	√	√	√

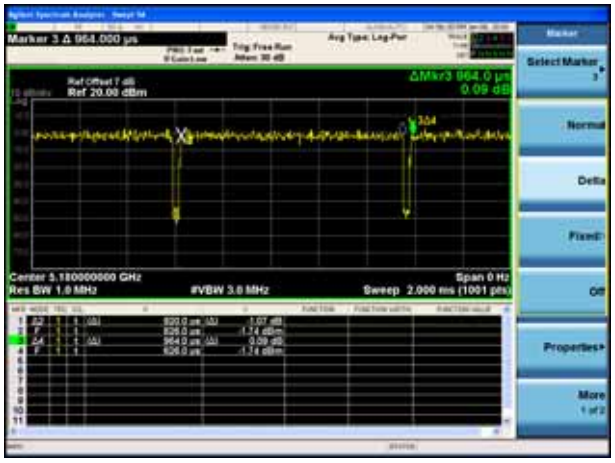
Duty Cycle

Test Mode	Duty Cycle
802.11a	97.8%
802.11n(20MHz)	98.0%
802.11n(40MHz)	95.4%

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:

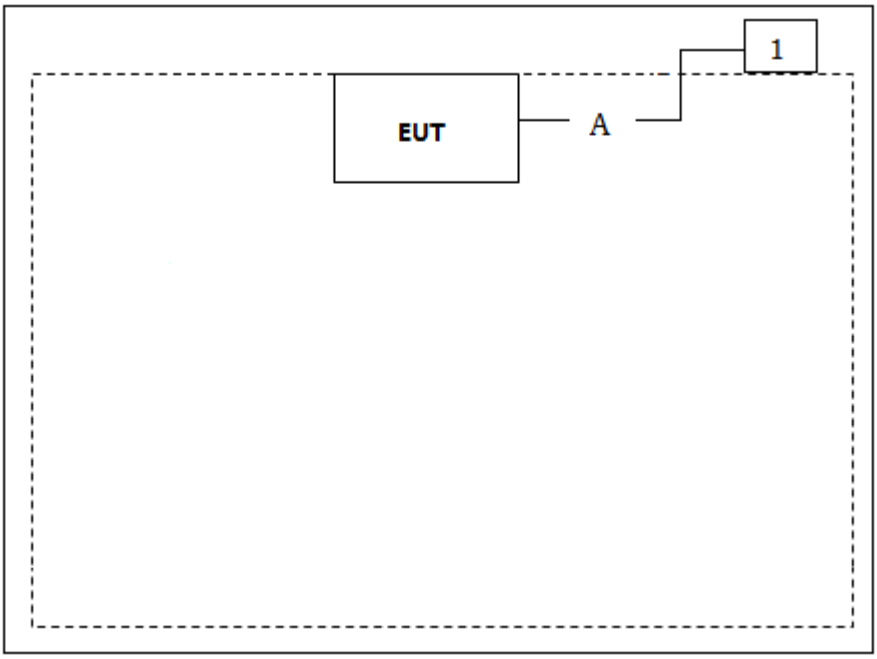
1. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.
2. The radiation measure measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

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	Laptop PC	Asus	N80V	8BN0AS226971468	N/A

1.4. Configuration of Tested System

Connection Diagram


Signal Cable Type		Signal cable Description
A	LAN Cable	Non-shielded

1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of equipment.
3	Run the test software, 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:

Performed Test Item	Normative References	Test Performed	Deviation
Conducted Emission	RSS-Gen Issue 4 November 2014 Section 8.8	Yes	No
Radiated Emission	RSS-Gen Issue 4 November 2014 Section 8.9	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 6.2.4	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 6.11	Yes	No

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

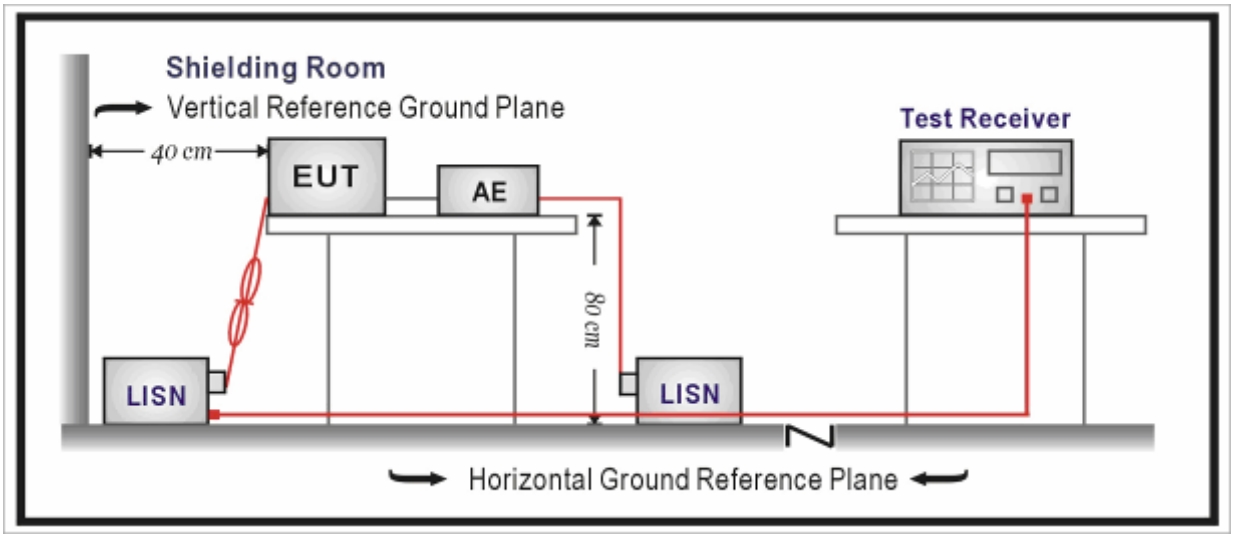
3.1. Test Equipment

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	2016.01.08

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 IC

RSS Gen Issue 4 chapter 8.8		
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 FCC ANSI C63.4: 2014 & ANSI C63.10: 2013& Industry Canada RSS-Gen Issue 4& RSS-247 Issue 1

According to RSS Gen Issue 4, it is required to perform the AC power-line conducted emissions testing and demonstrate compliance with the AC power-line emission requirements in Chapter 8.8.

The EUT was setup according to ANSI C63.4, 2014 for compliance to RSS Gen requirements. 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.

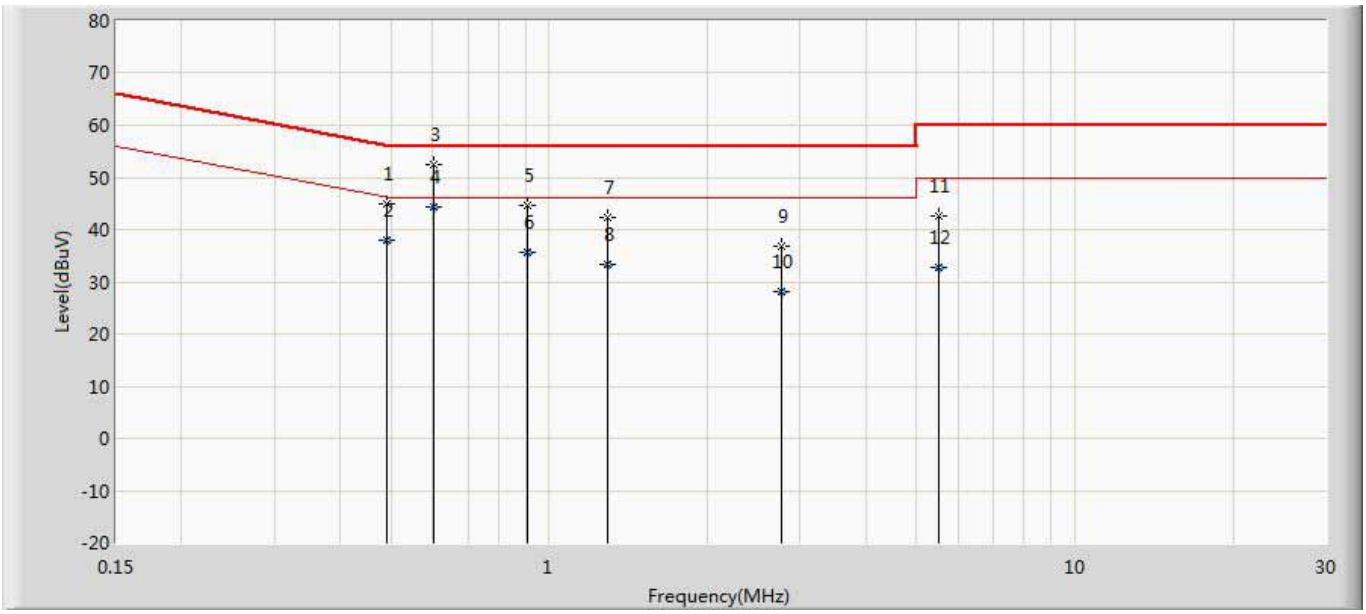
The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.

3.5. Uncertainty

The measurement uncertainty is defined as ± 2.02 dB

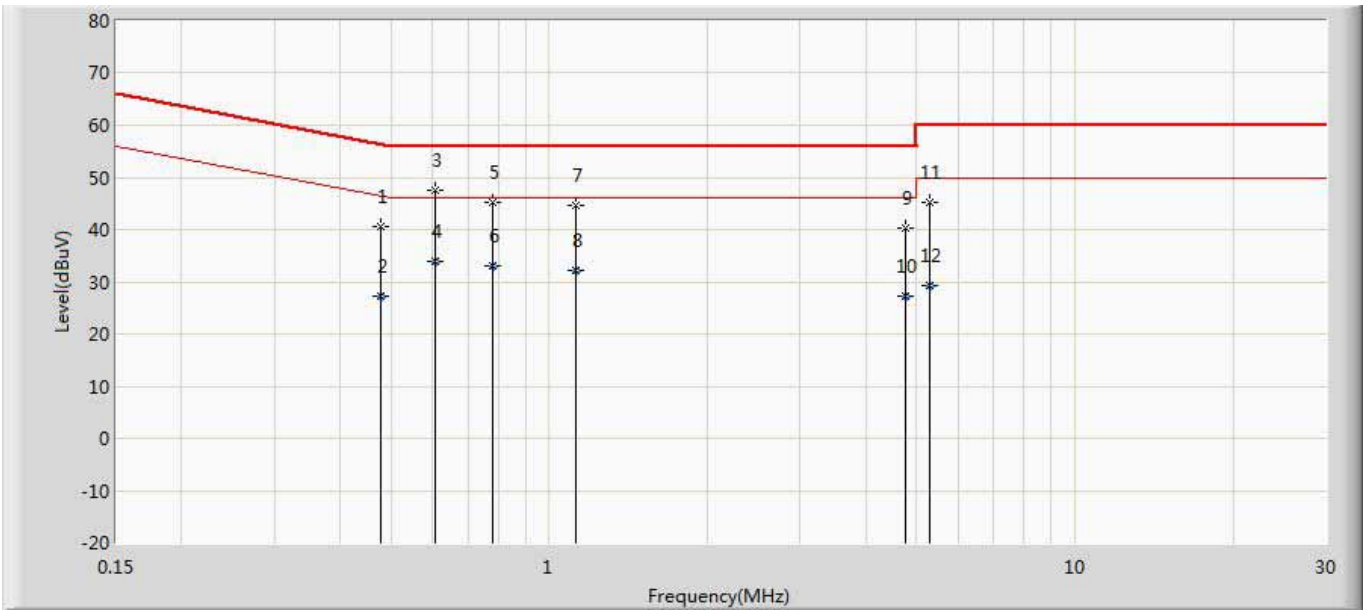
3.6. Test Result

Engineer: Scott	
Site: TR1	Time: 2016/01/04 - 18:36
Limit: FCC_Part15.107_CE_AC Power_ClassB	Margin: 0
Probe: ENV216_101044(0.009-30MHz)	Polarity: Line
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		0.490	45.028	35.395	-11.140	56.168	9.633	QP
2		0.490	37.885	28.252	-8.283	46.168	9.633	AV
3		0.602	52.418	42.781	-3.582	56.000	9.637	QP
4	*	0.602	44.440	34.802	-1.560	46.000	9.637	AV
5		0.910	44.654	35.002	-11.346	56.000	9.653	QP
6		0.910	35.538	25.885	-10.462	46.000	9.653	AV
7		1.290	42.343	32.675	-13.657	56.000	9.668	QP
8		1.290	33.418	23.750	-12.582	46.000	9.668	AV
9		2.766	36.934	27.209	-19.066	56.000	9.725	QP
10		2.766	28.190	18.465	-17.810	46.000	9.725	AV
11		5.498	42.660	32.884	-17.340	60.000	9.775	QP
12		5.498	32.712	22.936	-17.288	50.000	9.775	AV

Engineer: Scott	
Site: TR1	Time: 2016/01/04 - 18:40
Limit: FCC_Part15.107_CE_AC Power_ClassB	Margin: 0
Probe: ENV216_101044(0.009-30MHz)	Polarity: Neutral
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		0.478	40.608	30.987	-15.765	56.374	9.622	QP
2		0.478	27.300	17.679	-19.074	46.374	9.622	AV
3	*	0.606	47.468	37.825	-8.532	56.000	9.643	QP
4		0.606	33.845	24.202	-12.155	46.000	9.643	AV
5		0.782	45.267	35.611	-10.733	56.000	9.656	QP
6		0.782	32.925	23.270	-13.075	46.000	9.656	AV
7		1.122	44.746	35.101	-11.254	56.000	9.645	QP
8		1.122	32.262	22.617	-13.738	46.000	9.645	AV
9		4.774	40.347	30.596	-15.653	56.000	9.752	QP
10		4.774	27.299	17.548	-18.701	46.000	9.752	AV
11		5.302	45.312	35.550	-14.688	60.000	9.762	QP
12		5.302	29.186	19.424	-20.814	50.000	9.762	AV

Note: All the test modes are pretested and mode 1 802.11a mode was found to be the worst mode, so the data of this test mode was recorded.

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	2016.01.08

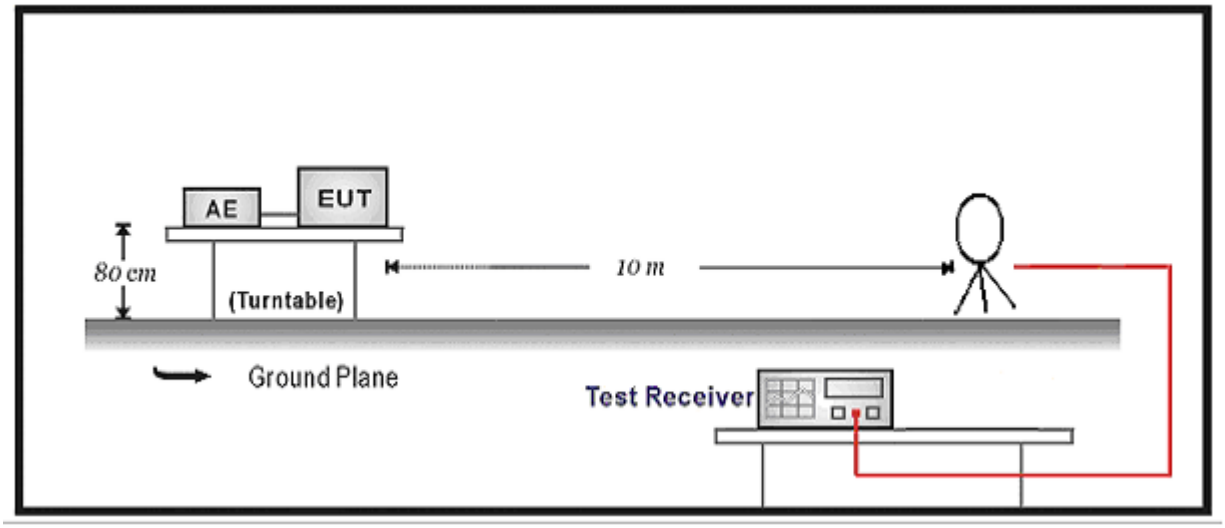
Radiated Emission / AC-5

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	N9020A	MY49100159	2016.03.28
Spectrum Analyzer	Agilent	E4446A	MY45300103	2016.01.07
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	2016.01.08

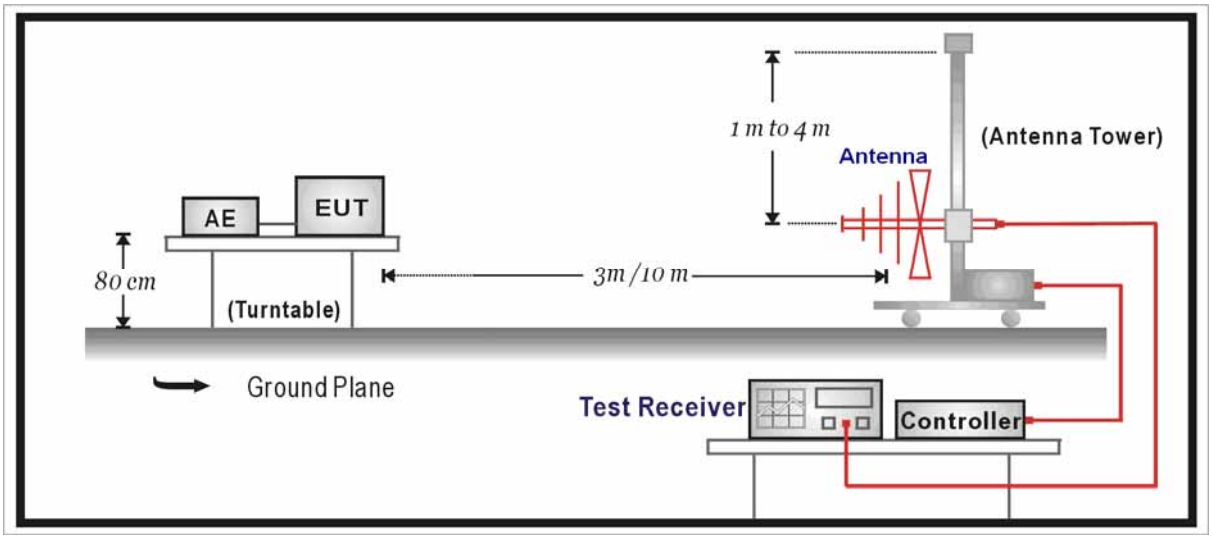
Note : All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

4.2. Test Setup

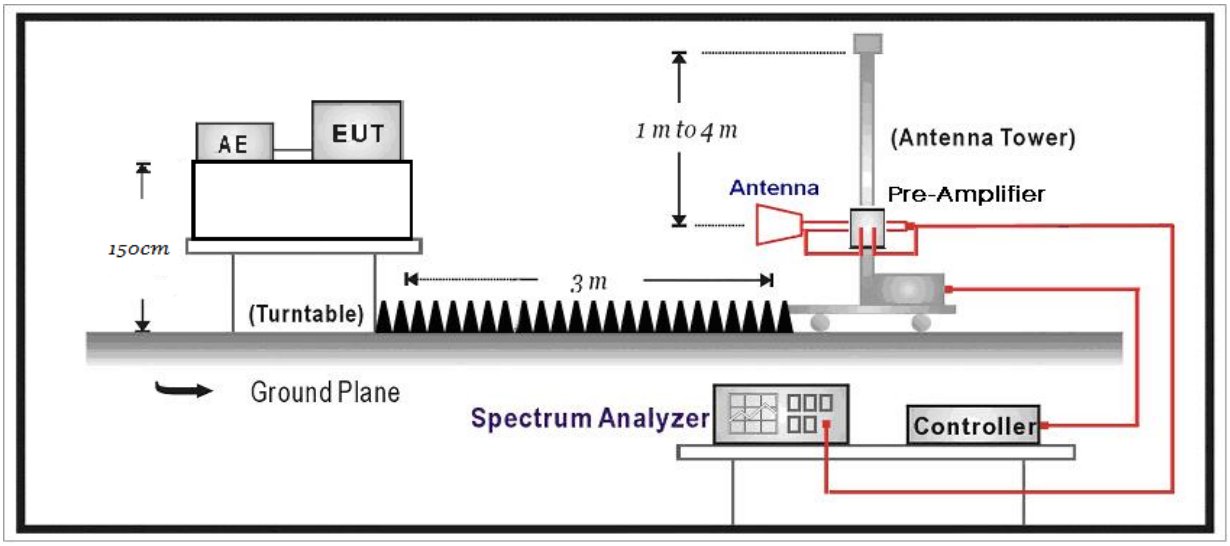
Below 30MHz Test Setup:



Below 1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limit

RSS Gen Issue 4 chapter 8.9		
Frequency (MHz)	Distance (m)	Level (uV/m)
30 - 88	3	100
88 - 216	3	150
216 - 960	3	200
Above 960	3	500

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

Note 2: Distance refers to the distance in meters between the measuring instrument Antenna 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 FCC ANSI C63.4: 2014 & ANSI C63.10: 2013& Industry Canada RSS-Gen Issue 4& 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 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 ≥ [3 × 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 ≥ 98%, then set VBW ≤ RBW / 100 (i.e., 10 kHz), but not less than 10 Hz.
2) If the EUT D is < 98%, then set VBW ≥ 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

Product	:	IP-STB
Test Item	:	Radiated Emission
Test Site	:	AC-5
Test Mode	:	Mode 1: Transmit by 802.11a

	CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Chain 1	36	H	10360.0	42.3	16.7	59.0	74	-15.0	PK
		H	10360.0	30.7	16.5	47.2	54	-6.8	AV
		V	10360.0	33.2	16.5	49.7	54(Note3)	-4.3	PK
		H	15540.0	18.2	24.1	42.3	54(Note3)	-11.7	PK
		V	15540.0	18.0	24.1	42.1	54(Note3)	-11.9	PK
	44	H	10440.0	44.1	16.8	60.9	74	-13.1	PK
		H	10440.0	33.5	16.8	50.3	54	-3.7	AV
		V	10440.0	35.1	16.8	51.9	54(Note3)	-2.1	PK
		H	15660.0	23.6	24.6	48.2	54(Note3)	-5.8	PK
		V	15660.0	24.0	24.6	48.6	54(Note3)	-5.4	PK
	48	H	10480.0	45.2	16.7	61.9	74	-12.1	PK
		H	10480.0	34.3	16.6	50.9	54	-3.1	AV
		V	10480.0	34.6	16.6	51.2	54(Note3)	-2.8	PK
		H	15720.0	19.6	26.8	46.4	54(Note3)	-7.6	PK
		V	15720.0	20.9	26.8	47.7	54(Note3)	-6.3	PK
	149	H	11490.0	25.2	21.3	46.5	54(Note3)	-7.5	PK
		V	11490.0	26.1	21.3	47.4	54(Note3)	-6.6	PK
		H	17235.0	21.0	25.7	46.7	54(Note3)	-7.3	PK
		V	17235.0	22.1	25.7	47.8	54(Note3)	-6.2	PK
	157	H	11570.0	29.5	22.1	51.6	54(Note3)	-2.4	PK
		V	11570.0	27.5	22.1	49.6	54(Note3)	-4.4	PK
		H	17355.0	22.6	25.3	47.9	54(Note3)	-6.1	PK
		V	17355.0	25.4	25.3	50.7	54(Note3)	-3.3	PK
	165	H	11650.0	28.5	23.0	51.5	54(Note3)	-2.5	PK
		V	11650.0	27.1	23.0	50.1	54(Note3)	-3.9	PK
		H	17475.0	22.6	25.3	47.9	54(Note3)	-6.1	PK
		V	17475.0	25.9	25.3	51.2	54(Note3)	-2.8	PK

	CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Chain 2	36	H	10360.0	40.0	16.7	56.7	74	-17.3	PK
		H	10360.0	27.8	16.5	44.3	54	-9.7	AV
		V	10360.0	32.8	16.7	49.5	54(Note3)	-4.5	PK
		H	15540.0	18.2	24.1	42.3	54(Note3)	-11.7	PK
		V	15540.0	18.1	24.1	42.2	54(Note3)	-11.8	PK
	44	H	10440.0	48.7	16.7	65.4	74	-8.6	PK
		H	10440.0	36.1	16.8	52.9	54	-1.1	AV
		V	10440.0	38.9	16.8	55.7	74	-18.3	PK
		V	10440.0	26.7	16.8	43.5	54	-10.5	AV
		H	15660.0	31.6	24.6	56.2	54(Note3)	2.2	PK
		V	15660.0	28.0	24.6	52.6	54(Note3)	-1.4	PK
	48	H	10480.0	41.5	16.6	58.1	74	-15.9	PK
		H	10480.0	30.3	16.6	46.9	54	-7.1	AV
		V	10480.0	33.0	16.6	49.6	54(Note3)	-4.4	PK
		H	15720.0	20.2	26.8	47	54(Note3)	-7.0	PK
		V	15720.0	23.1	26.8	49.9	54(Note3)	-4.1	PK
	149	H	11490.0	24.8	21.3	46.1	54(Note3)	-7.9	PK
		V	11490.0	25.2	21.3	46.5	54(Note3)	-7.5	PK
		H	17235.0	21.7	25.7	47.4	54(Note3)	-6.6	PK
		V	17235.0	22.6	25.7	48.3	54(Note3)	-5.7	PK
	157	H	11570.0	28.5	22.1	50.6	54(Note3)	-3.4	PK
		V	11570.0	29.5	22.1	51.6	54(Note3)	-2.4	PK
		H	17355.0	21.8	25.3	47.1	54(Note3)	-6.9	PK
		V	17355.0	24.6	25.3	49.9	54(Note3)	-4.1	PK
	165	H	11650.0	24.9	23.0	47.9	54(Note3)	-6.1	PK
		V	11650.0	26.4	23.0	49.4	54(Note3)	-4.6	PK
		H	17475.0	21.2	25.3	46.5	54(Note3)	-7.5	PK
		V	17475.0	23.2	25.3	48.5	54(Note3)	-5.5	PK

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.

Product	:	IP-STB
Test Item	:	Radiated Emission
Test Site	:	AC-5
Test Mode	:	Mode 2: Transmit by 802.11n(20MHz)

	CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Chain 1	36	H	10360.0	44.4	16.5	60.9	74	-13.1	PK
		H	10360.0	31.5	16.5	48.0	54	-6.0	AV
		V	10360.0	34.1	16.5	50.6	54(Note3)	-3.4	PK
		H	15540.0	17.9	24.1	42.0	54(Note3)	-12.0	PK
		V	15540.0	17.8	24.1	41.9	54(Note3)	-12.1	PK
	44	H	10440.0	44.7	16.8	61.5	74	-12.5	PK
		H	10440.0	32.7	16.8	49.5	54	-4.5	AV
		V	10440.0	34.1	16.7	50.8	54(Note3)	-3.2	PK
		H	15660.0	24.6	24.6	49.2	54(Note3)	-4.8	PK
		V	15660.0	23.6	24.6	48.2	54(Note3)	-5.8	PK
	48	H	10480.0	45.2	16.7	61.9	74	-12.1	PK
		H	10480.0	33.6	16.6	50.2	54	-3.8	AV
		V	10480.0	35.9	16.6	52.5	54(Note3)	-1.5	PK
		H	15720.0	19.4	26.8	46.2	54(Note3)	-7.8	PK
		V	15720.0	19.5	26.8	46.3	54(Note3)	-7.7	PK
	149	H	11490.0	26.5	21.3	47.8	54(Note3)	-6.2	PK
		V	11490.0	24.5	21.3	45.8	54(Note3)	-8.2	PK
		H	17235.0	21.6	25.7	47.3	54(Note3)	-6.7	PK
		V	17235.0	21.1	25.7	46.8	54(Note3)	-7.2	PK
	157	H	11570.0	31.8	22.1	53.9	54(Note3)	-0.1	PK
		V	11570.0	27.5	22.1	49.6	54(Note3)	-4.4	PK
		H	17355.0	22.5	25.3	47.8	54(Note3)	-6.2	PK
		V	17355.0	25.1	25.3	50.4	54(Note3)	-3.6	PK
	165	H	11650.0	29.8	23.0	52.8	54(Note3)	-1.2	PK
		V	11650.0	26.8	23.0	49.8	54(Note3)	-4.2	PK
		H	17475.0	22.8	25.3	48.1	54(Note3)	-5.9	PK
		V	17475.0	26.4	25.3	51.7	54(Note3)	-2.3	PK

	CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Chain 2	36	H	10360.0	41.5	16.5	58.0	74	-16.0	PK
		H	10360.0	30.5	16.5	47.0	54	-7.0	AV
		V	10360.0	32.7	16.5	49.2	54(Note3)	-4.8	PK
		H	15540.0	16.7	24.1	40.8	54(Note3)	-13.2	PK
		V	15540.0	18.6	24.1	42.7	54(Note3)	-11.3	PK
	44	H	10440.0	42.5	16.7	59.2	74	-14.8	PK
		H	10440.0	31.3	16.8	48.1	54	-5.9	AV
		V	10440.0	33.2	16.6	49.8	54(Note3)	-4.2	PK
		H	15660.0	23.1	24.6	47.7	54(Note3)	-6.3	PK
		V	15660.0	25.8	24.6	50.4	54(Note3)	-3.6	PK
	48	H	10480.0	40.9	16.6	57.5	74	-16.5	PK
		H	10480.0	28.6	16.8	45.4	54	-8.6	AV
		V	10480.0	33.3	16.6	49.9	54(Note3)	-4.1	PK
		H	15720.0	19.3	26.8	46.1	54(Note3)	-7.9	PK
		V	15720.0	21.4	26.8	48.2	54(Note3)	-5.8	PK
	149	H	11490.0	25.0	21.3	46.3	54(Note3)	-7.7	PK
		V	11490.0	24.6	21.3	45.9	54(Note3)	-8.1	PK
		H	17235.0	21.7	25.7	47.4	54(Note3)	-6.6	PK
		V	17235.0	21.1	25.7	46.8	54(Note3)	-7.2	PK
	157	H	11570.0	28.8	22.1	50.9	54(Note3)	-3.1	PK
		V	11570.0	30.2	22.1	52.3	54(Note3)	-1.7	PK
		H	17355.0	22.3	25.3	47.6	54(Note3)	-6.4	PK
		V	17355.0	26.4	25.3	51.7	54(Note3)	-2.3	PK
	165	H	11650.0	25.1	23.0	48.1	54(Note3)	-5.9	PK
		V	11650.0	25.9	23.0	48.9	54(Note3)	-5.1	PK
		H	17475.0	21.9	25.3	47.2	54(Note3)	-6.8	PK
		V	17475.0	24.0	25.3	49.3	54(Note3)	-4.7	PK

	CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Chain 1+2	36	H	10360.0	45.6	16.5	62.1	74	-11.9	PK
		H	10360.0	32.9	16.5	49.4	54	-4.6	AV
		V	10360.0	36.2	16.5	52.7	54(Note3)	-1.3	PK
		H	15540.0	17.8	24.1	41.9	54(Note3)	-12.1	PK
		V	15540.0	19.0	24.1	43.1	54(Note3)	-10.9	PK
	44	H	10440.0	44.8	16.7	61.5	74	-12.5	PK
		H	10440.0	33.3	16.8	50.1	54	-3.9	AV
		V	10440.0	35.4	16.7	52.1	54(Note3)	-1.9	PK
		H	15660.0	23.3	24.6	47.9	54(Note3)	-6.1	PK
		V	15660.0	25.6	24.6	50.2	54(Note3)	-3.8	PK
	48	H	10480.0	43.3	16.7	60.0	74	-14.0	PK
		H	10480.0	33.8	16.6	50.4	54	-3.6	AV
		V	10480.0	34.9	16.6	51.5	54(Note3)	-2.5	PK
		H	15720.0	19.0	26.8	45.8	54(Note3)	-8.2	PK
		V	15720.0	21.5	26.8	48.3	54(Note3)	-5.7	PK
	149	H	11490.0	27.0	21.3	48.3	54(Note3)	-5.7	PK
		V	11490.0	25.5	21.3	46.8	54(Note3)	-7.2	PK
		H	17235.0	21.6	25.7	47.3	54(Note3)	-6.7	PK
		V	17235.0	23.7	25.7	49.4	54(Note3)	-4.6	PK
	157	H	11570.0	30.7	22.1	52.8	54(Note3)	-1.2	PK
		V	11570.0	29.8	22.1	51.9	54(Note3)	-2.1	PK
		H	17355.0	23.4	25.3	48.7	54(Note3)	-5.3	PK
		V	17355.0	26.5	25.3	51.8	54(Note3)	-2.2	PK
	165	H	11650.0	26.4	23.0	49.4	54(Note3)	-4.6	PK
		V	11650.0	25.9	23.0	48.9	54(Note3)	-5.1	PK
		H	17475.0	21.7	25.3	47.0	54(Note3)	-7.0	PK
		V	17475.0	24.0	25.3	49.3	54(Note3)	-4.7	PK

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.

Product	:	IP-STB
Test Item	:	Radiated Emission
Test Site	:	AC-5
Test Mode	:	Mode 3: Transmit by 802.11n(40MHz)

CH		Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Chain 1	38	H	10380.0	35.2	17.5	52.7	54(Note3)	-1.3	PK
		V	10380.0	27.5	17.2	44.7	54(Note3)	-9.3	PK
		H	15570.0	16.7	27.1	43.8	54(Note3)	-10.2	PK
		V	15570.0	16.5	27.1	43.6	54(Note3)	-10.4	PK
	46	H	10460.0	42.5	16.5	59.0	74	-15.0	PK
		H	10460.0	29.9	16.5	46.4	54	-7.6	AV
		V	10460.0	19.6	23.6	43.2	54(Note3)	-10.8	PK
		H	15690.0	30.3	16.7	47.0	54(Note3)	-7.0	PK
		V	15690.0	20.1	23.6	43.7	54(Note3)	-10.3	PK
	151	H	11510.0	23.8	21.6	45.4	54(Note3)	-8.6	PK
		V	11510.0	23.7	21.6	45.3	54(Note3)	-8.7	PK
		H	17265.0	22.7	25.2	47.9	54(Note3)	-6.1	PK
		V	17265.0	22.7	25.2	47.9	54(Note3)	-6.1	PK
	159	H	11590.0	25.6	21.2	46.8	54(Note3)	-7.2	PK
		V	11590.0	26.3	21.2	47.5	54(Note3)	-6.5	PK
		H	17385.0	20.7	27.0	47.7	54(Note3)	-6.3	PK
		V	17385.0	22.7	27.0	49.7	54(Note3)	-4.3	PK

CH		Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Chain 2	38	H	10380.0	34.5	17.5	52.0	54(Note3)	-2.0	PK
		V	10380.0	27.3	17.2	44.5	54(Note3)	-9.5	PK
		H	15570.0	16.7	27.1	43.8	54(Note3)	-10.2	PK
		V	15570.0	16.0	27.1	43.1	54(Note3)	-10.9	PK
	46	H	10460.0	38.9	16.6	55.5	74	-18.5	PK
		H	10460.0	27.9	16.5	44.4	54	-9.6	AV
		V	10460.0	32.3	16.6	48.9	54(Note3)	-5.1	PK
		H	15690.0	20.1	23.6	43.7	54(Note3)	-10.3	PK
		V	15690.0	21.5	23.6	45.1	54(Note3)	-8.9	PK
	151	H	11510.0	24.6	21.6	46.2	54(Note3)	-7.8	PK
		V	11510.0	24.5	21.6	46.1	54(Note3)	-7.9	PK
		H	17265.0	22.5	25.2	47.7	54(Note3)	-6.3	PK
		V	17265.0	22.4	25.2	47.6	54(Note3)	-6.4	PK
	159	H	11590.0	25.8	21.2	47.0	54(Note3)	-7.0	PK
		V	11590.0	25.9	21.2	47.1	54(Note3)	-6.9	PK
		H	17385.0	21.6	27.0	48.6	54(Note3)	-5.4	PK
		V	17385.0	21.6	27.0	48.6	54(Note3)	-5.4	PK

CH		Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Chain 1+2	38	H	10380.0	36.7	17.0	53.7	54(Note3)	-0.3	PK
		V	10380.0	27.5	17.2	44.7	54(Note3)	-9.3	PK
		H	15570.0	16.1	27.1	43.2	54(Note3)	-10.8	PK
		V	15570.0	16.9	27.1	44.0	54(Note3)	-10.0	PK
	46	H	10460.0	41.8	16.5	58.3	74	4.3	PK
		H	10460.0	29.7	16.5	46.2	54	-7.8	AV
		V	10460.0	20.4	23.6	44.0	54(Note3)	-10.0	PK
		H	15690.0	29.2	16.5	45.7	54(Note3)	-8.3	PK
		V	15690.0	20.7	23.6	44.3	54(Note3)	-9.7	PK
	151	H	11510.0	24.2	21.6	45.8	54(Note3)	-8.2	PK
		V	11510.0	24.2	21.6	45.8	54(Note3)	-8.2	PK
		H	17265.0	22.0	25.2	47.2	54(Note3)	-6.8	PK
		V	17265.0	21.7	25.2	46.9	54(Note3)	-7.1	PK
	159	H	11590.0	27.1	21.2	48.3	54(Note3)	-5.7	PK
		V	11590.0	27.3	21.2	48.5	54(Note3)	-5.5	PK
		H	17385.0	21.1	27.0	48.1	54(Note3)	-5.9	PK
		V	17385.0	23.0	27.0	50.0	54(Note3)	-4.0	PK

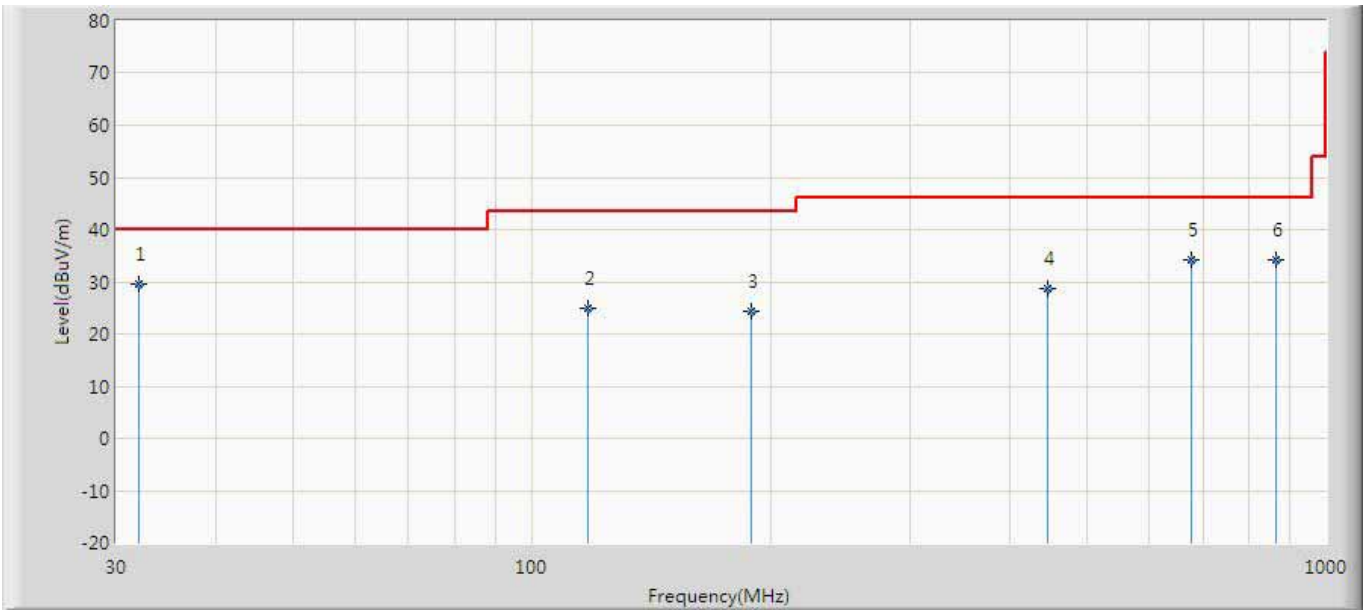
Note: 1. Measure Level = Reading Level + Factor.

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.

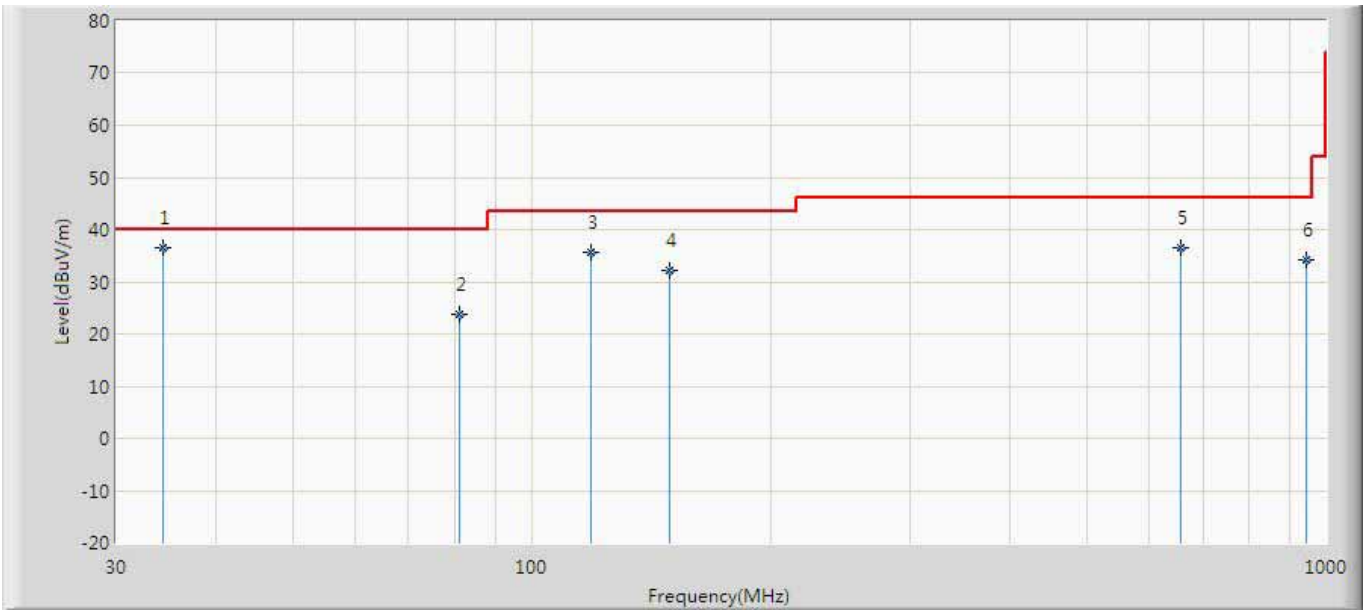
The worst case of Radiated Emission below 1GHz:

Engineer: Scott	
Site: AC3	Time: 2016/01/04 – 19:33
Limit: FCC_Part15.109_RE(3m)_ClassB	Margin: 0
Probe: AC3_10m (30-1000MHz)	Polarity: Horizontal
EUT: IP-STB	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	*	32.061	29.514	2.130	-10.486	40.000	27.384	QP
2		118.027	24.813	8.110	-18.687	43.500	16.703	QP
3		189.201	24.430	7.230	-19.070	43.500	17.200	QP
4		446.735	28.654	2.110	-17.346	46.000	26.545	QP
5		676.154	34.060	5.130	-11.940	46.000	28.930	QP
6		864.927	34.190	1.230	-11.810	46.000	32.960	QP

Engineer: Scott	
Site: AC3	Time: 2016/01/04 – 19:33
Limit: FCC_Part15.109_RE(3m)_ClassB	Margin: 0
Probe: AC3_10m (30-1000MHz)	Polarity: Horizontal
EUT: IP-STB	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	*	34.365	36.626	13.550	-3.374	40.000	23.075	QP
2		81.045	23.775	8.530	-16.225	40.000	15.245	QP
3		118.997	35.655	14.880	-7.845	43.500	20.775	QP
4		149.530	32.241	14.220	-11.259	43.500	18.021	QP
5		656.623	36.474	7.130	-9.526	46.000	29.344	QP
6		946.165	34.275	1.030	-11.725	46.000	33.245	QP

Note: All the test modes are pretested and mode 1 802.11a mode was found to be the worst mode, so the data of this test mode was recorded.

5. Occupied Bandwidth

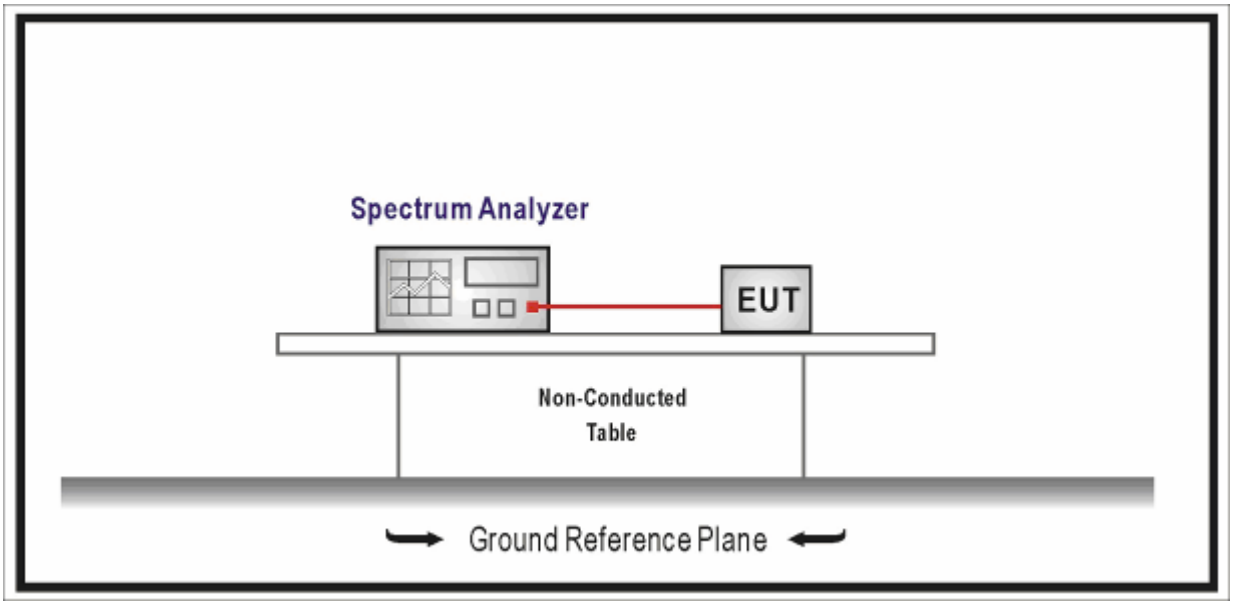
5.1. Test Equipment

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 FCC ANSI C63.4: 2014 & ANSI C63.10: 2013& Industry Canada RSS-Gen Issue 4& RSS-247 Issue 1

Emission Bandwidth

a) Set RBW = approximately 1% of the emission bandwidth.

b) Set the VBW > 3*RBW.

c) Detector = Peak.

d) Trace mode = max hold.

e) The trace data points are recovered and are directly summed in linear power level 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 and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded.

5.5. Uncertainty

The measurement uncertainty is defined as ± 1 kHz

5.6. Test Result

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

Channel No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180	29.12	17.072
44	5220	30.00	18.230
48	5240	30.00	18.092
149	5745	23.78	16.608
157	5785	29.27	16.841
165	5825	28.74	16.922

Channel 36 (5180MHz)

Channel 44 (5220MHz)

Channel 48 (5240MHz)

Channel 149 (5745MHz)

Channel 157 (5785MHz)

Channel 165 (5825MHz)

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

Channel No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180	29.34	17.868
44	5220	30.00	18.615
48	5240	30.00	20.159
149	5745	24.97	17.684
157	5785	29.94	17.969
165	5825	29.61	17.863

Channel 36 (5180MHz)

Channel 44 (5220MHz)

Channel 48 (5240MHz)

Channel 149 (5745MHz)

Channel 157 (5785MHz)

Channel 165 (5825MHz)

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

Channel No.	Frequency (MHz)	26dB Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
38	5190	39.96	36.450
46	5230	60.00	36.896
151	5755	39.44	36.328
159	5795	39.75	36.420

Channel 38 (5190MHz)

Channel 46 (5230MHz)

Channel 151 (5755MHz)

Channel 159 (5795MHz)

6. 6dB Occupied Bandwidth

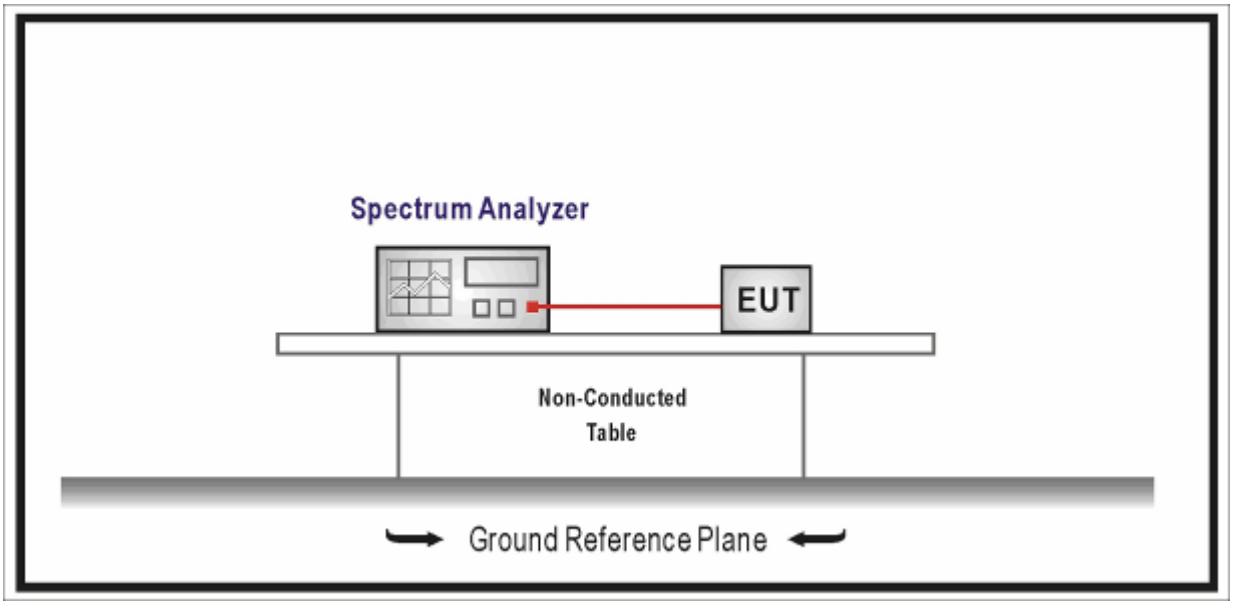
6.1. Test Equipment

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 IC

The minimum 6 dB bandwidth shall be 500 kHz.

6.4. Test Procedure

According to FCC ANSI C63.4: 2014 & ANSI C63.10: 2013& Industry Canada RSS-Gen Issue 4& RSS-247 Issue 1

a) Set RBW = in the range of 1% to 5% of the OBW.
b) Set the video bandwidth (VBW) ≥ 3 × 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	:	IP-STB
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	15.97
157	5785	16.08
165	5825	16.02

Channel 149 (5745MHz)

Channel 157 (5785MHz)

Channel 165 (5825MHz)

Product	:	IP-STB
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	17.22
157	5785	17.29
165	5825	17.17

Channel 149 (5745MHz)

Channel 157 (5785MHz)

Channel 165 (5825MHz)

Product	:	IP-STB
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	36.34
159	5795	36.41

Channel 151 (5755MHz)

Channel 159 (5795MHz)

7. Power Output

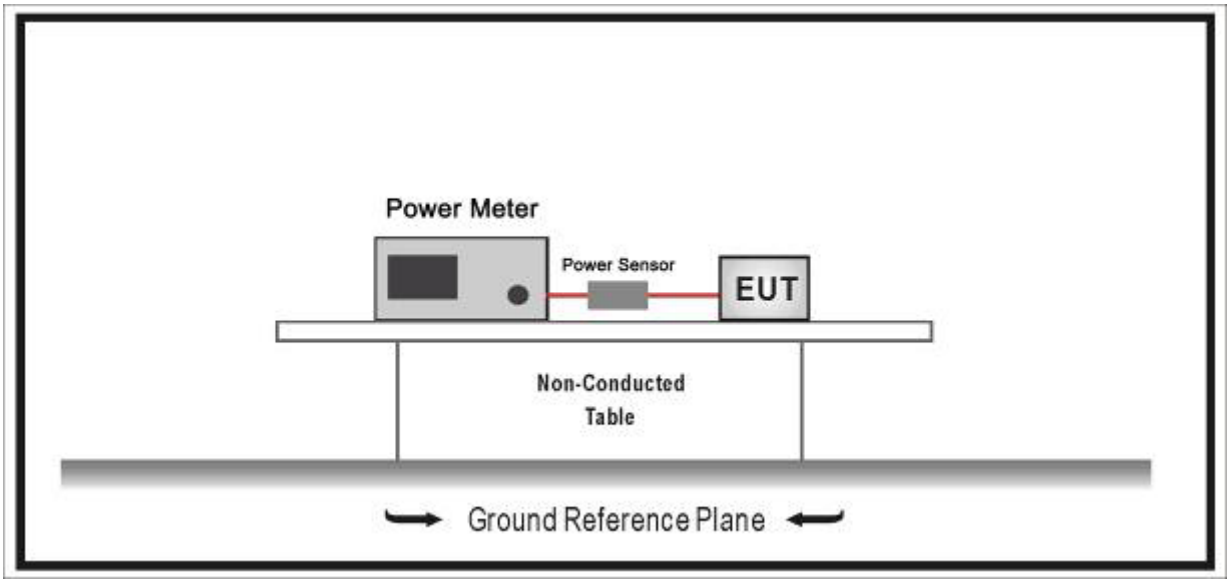
7.1. Test Equipment

Power Output / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
DC Power Supply	IDRC	CD-035-020PR	977272	2016.09.16
Power Meter	Anritsu	ML2495A	0905006	2016.10.29
Power Sensor	Anritsu	MA2411B	0846014	2016.10.29
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 the band 5.15-5.25 GHz, The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10B, 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 band 5.25-5.35 GHz, The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, 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 log10B, 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 band 5.47-5.6 GHz and 5.65-5.725 GHz, The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, 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 log10B, 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 band 5.725-5.85 GHz, 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-multipoint3 systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

7.4. Test Procedure

According to FCC ANSI C63.4: 2014 & ANSI C63.10: 2013& Industry Canada RSS-Gen Issue 4& RSS-247 Issue 1

Use the wideband power meter to test RMS power and record the result.
However, if the bandwidth of the single is higher than 40MHz, use the Spectrum Analyzer and the channel power function to test RMS power and record the result.

☒ **Maximum conducted output power using a power meter**

Method PM is Measurement using an RF average power meter. The procedure for this method is as follows:

a) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the following conditions are satisfied:

1) The EUT is configured to transmit continuously, or to transmit with a constant duty cycle.

2) At all times when the EUT is transmitting, it shall be transmitting at its maximum power control level.

3) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.

b) If the transmitter does not transmit continuously, measure the duty cycle D of the transmitter

output signal as described in 12.2.

c) Measure the average power of the transmitter. This measurement is an average over both the ON and OFF periods of the transmitter.

d) Adjust the measurement in dBm by adding [10 log (1 / D)], where D is the duty cycle {e.g., [10 log (1 / 0.25)], if the duty cycle is 25%}

Maximum conducted output power measurement using a spectrum analyzer

☐ **Method SA-1**

Method SA-1 uses trace averaging with the EUT transmitting at full power throughout each sweep. The procedure for this method is as follows:

a) Set span to encompass the entire 26 dB EBW or 99% OBW of the signal.

b) Set RBW = 1 MHz.

c) Set VBW ≥ 3 MHz.

d) Number of points in sweep ≥ [2 × span / RBW]. (This gives bin-to-bin spacing ≤ RBW / 2, so that narrowband signals are not lost between frequency bins.)

e) Sweep time = auto.

f) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

g) If transmit duty cycle < 98%, use a video trigger with the trigger level set to enable triggering only on full power pulses. The transmitter shall operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no OFF intervals) or at duty cycle ≥ 98%, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run.”

h) Trace average at least 100 traces in power averaging (rms) mode.

i) Compute power by integrating the spectrum across the 26 dB EBW or 99% OBW of the signal using the instrument’s band power measurement function, with band limits set equal to the EBW or OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in power units) at 1 MHz intervals extending across the 26 dB EBW or 99% OBW of the spectrum.

☒ **Method SA-2**

Method SA-2 uses trace averaging across ON and OFF times of the EUT transmissions, followed by duty cycle correction. The procedure for this method is as follows:

a) Measure the duty cycle D of the transmitter output signal as described in 12.2.

b) Set span to encompass the entire 26 dB EBW or 99% OBW of the signal.

c) Set RBW = 1 MHz.

d) Set VBW ≥ 3 MHz.

e) Number of points in sweep ≥ [2 × span / RBW]. (This gives bin-to-bin spacing ≤ RBW / 2, so that narrowband signals are not lost between frequency bins.)

f) Sweep time = auto.

g) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

h) Do not use sweep triggering. Allow the sweep to “free run.”

i) Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed such that the average accurately represents the true average over the ON and OFF periods of the transmitter.

j) Compute power by integrating the spectrum across the 26 dB EBW or 99% OBW of the signal using the instrument’s band power measurement function with band limits set equal to the EBW or OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in power units) at 1 MHz intervals extending across the 26 dB EBW or 99% OBW of the spectrum.

k) Add [10 log (1 / D)], where D is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the ON and OFF times of the transmission). For example, add [10 log (1 / 0.25)] = 6 dB if the duty cycle is 25%.

☐ **Method SA-3**

Method SA-3 uses rms detection with max hold. The procedure for this method is as follows:

a) Set span to encompass the entire 26 dB EBW or 99% OBW of the signal.

b) Set sweep trigger to “free run.”

c) Set RBW = 1 MHz

d) Set VBW ≥ 3 MHz

e) Number of points in sweep ≥ [2 × span / RBW]. (This gives bin-to-bin spacing ≤ RBW / 2, so that narrowband signals are not lost between frequency bins.)

f) Sweep time ≤ [(number of points in sweep) × *T*], where *T* is defined in 12.2. If this gives a sweep time less than the auto sweep time of the instrument, then method SA-3A shall not be used. (The purpose of this step is so that averaging time in each bin is less than or equal to the minimum time of a transmission.)

g) Detector = RMS (power averaging).

h) Trace mode = max hold.

i) Allow max hold to run for at least 60 s or longer as needed to allow the trace to stabilize.

j) Compute power by integrating the spectrum across the 26 dB EBW or 99% OBW of the signal using the instrument’s band power measurement function with band limits set equal to the EBW or OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in power units) at 1 MHz intervals extending across the 26 dB EBW of the spectrum.

7.5. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

7.6. Test Result

Product	:	IP-STB
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)	Result
		Ant 1	Ant 2		
36	5180	14.11	16.44	24.0	Pass
44	5220	15.82	16.48	24.0	Pass
48	5240	15.54	16.20	24.0	Pass
149	5745	12.94	12.85	30.0	Pass
157	5785	15.87	15.82	30.0	Pass
165	5825	15.95	13.94	30.0	Pass

Note1: 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.

Product	:	IP-STB
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)	Result
		Ant 1	Ant 2		
36	5180	13.87	14.82	24.0	Pass
44	5220	15.65	16.86	24.0	Pass
48	5240	15.52	16.64	24.0	Pass
149	5745	12.69	11.86	30.0	Pass
157	5785	16.52	16.30	30.0	Pass
165	5825	16.43	13.57	30.0	Pass

Note1: 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.

Product	:	IP-STB
Test Item	:	Power Output
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11n(20MHz) (Ant 1+2)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Total Power (dBm)	Limit (dBm)	Result
		Ant 1	Ant 2			
36	5180	13.75	14.70	17.26	21.45	Pass
44	5220	13.72	15.13	17.49	21.45	Pass
48	5240	13.54	14.68	17.16	21.45	Pass
149	5745	12.24	10.74	14.56	27.45	Pass
157	5785	14.38	14.64	17.52	27.45	Pass
165	5825	14.22	12.59	16.49	27.45	Pass

Note1: 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.

Note2 : Directional gain = GANT + 10 log(NANT) dBi=8.55dBi＞6dBi, so The Limit is 21.45dBm for Band I and 27.45dBm for Band IV.

Product	:	IP-STB
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)	Result
		Ant 1	Ant 2		
38	5190	10.01	11.24	24.0	Pass
46	5230	15.91	18.22	24.0	Pass
151	5755	8.59	8.04	30.0	Pass
159	5795	14.15	12.35	30.0	Pass

Note1: 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.

Product	:	IP-STB
Test Item	:	Power Output
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n(40MHz) (Ant 1 +2)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Total Power (dBm)	Limit (dBm)	Result
		Ant 1	Ant 2			
38	5190	9.60	10.41	13.03	21.45	Pass
46	5230	15.89	16.82	19.39	21.45	Pass
151	5755	8.53	7.51	11.06	27.45	Pass
159	5795	13.33	12.24	15.83	27.45	Pass

Note1: 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.

Note2 : Directional gain = GANT + 10 log(NANT) dBi=8.55dBi＞6dBi, so The Limit is 21.45dBm for Band I and 27.45dBm for Band IV.

8. Peak Power Spectral Density

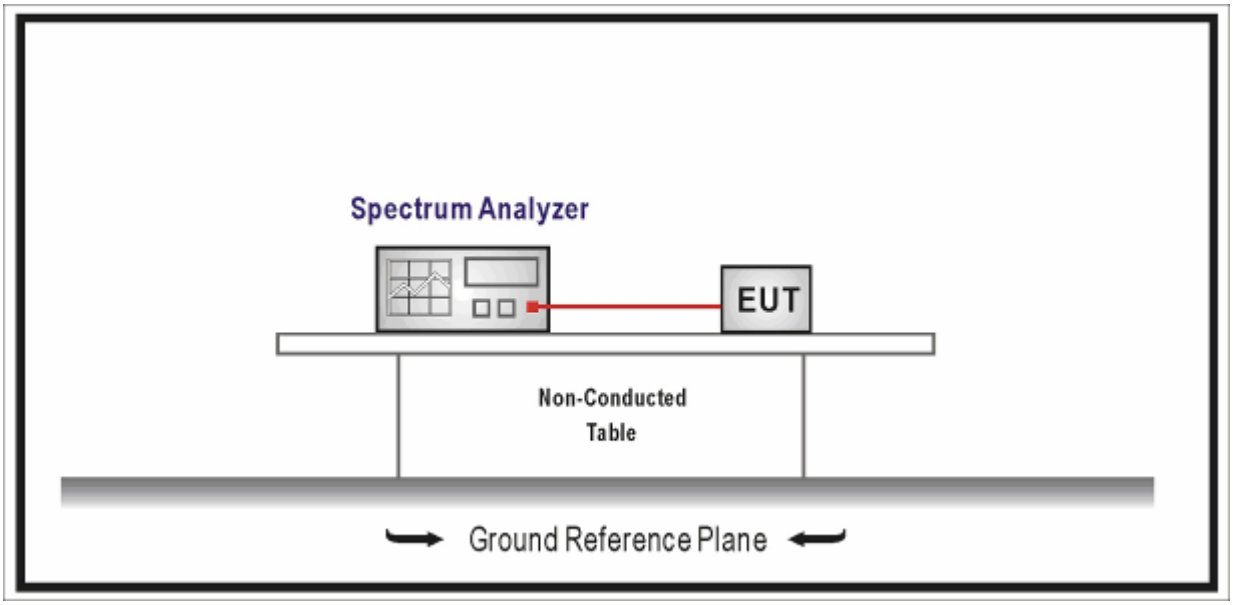
8.1. Test Equipment

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 the band 5.15-5.25 GHz, The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10B, 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 band 5.25-5.35 GHz, The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, 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 log10B, 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 band 5.47-5.6 GHz and 5.65-5.725 GHz, The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, 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 log10B, 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 band 5.725-5.85 GHz, 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-multipoint3 systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

8.4. Test Procedure

According to FCC ANSI C63.4: 2014 & ANSI C63.10: 2013& Industry Canada RSS-Gen Issue 4& RSS-247 Issue 1

Set span to encompass the entire emission bandwidth (EBW) of the signal.

For 5150-5725MHz

a) Set RBW = 1 MHz.
b) Set VBW ≥ 3 MHz.
c) Sweep time = auto.
d) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

For 5725-5875MHz

e) Set RBW=510KHz
f) VBW≥3RBW
g) Sweep time=auto
h) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

8.5. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

8.6. Test Result

Product	:	IP-STB
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11a (Ant 1)

Channel No.	Frequency (MHz)	Reading Value (dBm/MHz)	Duty Cycle (%)	Total PPSD (dBm/MHz)	Limit (dBm/MHz)
36	5180	4.134	97.8	4.231	10.0
44	5220	5.433	97.8	5.530	10.0
48	5240	5.497	97.8	5.594	10.0

Channel No.	Frequency (MHz)	Reading Value (dBm/500KHz)	Duty Cycle (%)	Total PPSD (dBm/500KHz)	Limit (dBm/500KHz)
149	5745	0.065	97.8	0.162	30.0
157	5785	2.635	97.8	2.732	30.0
165	5825	2.886	97.8	2.983	30.0

Note1: Total PSD = Reading Level + 10*log(1/duty cycle)

Note2: 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.

Channel 36 (5180MHz)

Channel 44 (5220MHz)

Channel 48 (5240MHz)

Channel 149 (5745MHz)

Channel 157(5785MHz)

Channel 165 (5825MHz)

Product	:	IP-STB
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11n(20MHz) (Ant 1)

Channel No.	Frequency (MHz)	Reading Value (dBm/MHz)	Duty Cycle (%)	Total PPSD (dBm/MHz)	Limit (dBm/MHz)
36	5180	3.192	98.0	3.280	10.0
44	5200	4.861	98.0	4.949	10.0
48	5240	4.939	98.0	5.027	10.0

Channel No.	Frequency (MHz)	Reading Value (dBm/500KHz)	Duty Cycle (%)	Total PPSD (dBm/500KHz)	Limit (dBm/500KHz)
149	5745	-0.860	98.0	-0.772	30.0
157	5785	2.574	98.0	2.662	30.0
165	5825	2.339	98.0	2.427	30.0

Note1: Total PSD = Reading Level + 10*log(1/duty cycle)

Note2: 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.

Channel 36 (5180MHz)

Channel 44 (5220MHz)

Channel 48 (5240MHz)

Channel 149 (5745MHz)

Channel 157(5785MHz)

Channel 165 (5825MHz)

Product	:	IP-STB
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 3 Transmit by 802.11n(40MHz) (Ant 1)

Channel No.	Frequency (MHz)	Reading Value (dBm/MHz)	Duty Cycle (%)	Total PPSD (dBm/MHz)	Limit (dBm/MHz)
38	5190	-3.825	95.4	-3.620	10.0
46	5230	2.278	95.4	2.483	10.0

Channel No.	Frequency (MHz)	Reading Value (dBm/500KHz)	Duty Cycle (%)	Total PPSD (dBm/500KHz)	Limit (dBm/500KHz)
151	5755	-7.616	95.4	-7.411	30.0
159	5795	-2.072	95.4	-1.867	30.0

Note1: Total PSD = Reading Level + 10*log(1/duty cycle)

Note2: 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.

Channel 38 (5190MHz)

Channel 46 (5230MHz)

Channel 151 (5755MHz)

Channel 159 (5795MHz)

Product	:	IP-STB
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11a (Ant 2)

Channel No.	Frequency (MHz)	Reading Value (dBm/MHz)	Duty Cycle (%)	Total PPSD (dBm/MHz)	Limit (dBm/MHz)
36	5180	5.751	97.8	5.848	10.0
44	5220	5.693	97.8	5.790	10.0
48	5240	5.922	97.8	6.019	10.0

Channel No.	Frequency (MHz)	Reading Value (dBm/500KHz)	Duty Cycle (%)	Total PPSD (dBm/500KHz)	Limit (dBm/500KHz)
149	5745	0.094	97.8	0.191	30.0
157	5785	2.616	97.8	2.713	30.0
165	5825	0.823	97.8	0.920	30.0

Note1: Total PSD = Reading Level + 10*log(1/duty cycle)

Note2: 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.

Channel 36 (5180MHz)

Channel 44 (5220MHz)

Channel 48 (5240MHz)

Channel 149 (5745MHz)

Channel 157(5785MHz)

Channel 165 (5825MHz)

Product	:	IP-STB
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11n(20MHz) (Ant 2)

Channel No.	Frequency (MHz)	Reading Value (dBm/MHz)	Duty Cycle (%)	Total PPSD (dBm/MHz)	Limit (dBm/MHz)
36	5180	4.462	98	4.550	10.0
44	5220	6.036	98	6.124	10.0
48	5240	5.600	98	5.688	10.0

Channel No.	Frequency (MHz)	Reading Value (dBm/500KHz)	Duty Cycle (%)	Total PPSD (dBm/500KHz)	Limit (dBm/500KHz)
149	5745	-1.146	98	-1.058	30.0
157	5785	2.662	98	2.750	30.0
165	5825	0.250	98	0.338	30.0

Note1: Total PSD = Reading Level + 10*log(1/duty cycle)

Note2: 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.

Channel 36 (5180MHz)

Channel 44 (5220MHz)

Channel 48 (5240MHz)

Channel 149 (5745MHz)

Channel 157(5785MHz)

Channel 165 (5825MHz)

Product	:	IP-STB
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 3 Transmit by 802.11n(40MHz) (Ant 2)

Channel No.	Frequency (MHz)	Reading Value (dBm/MHz)	Duty Cycle (%)	Total PPSD (dBm/MHz)	Limit (dBm/MHz)
38	5190	-2.158	95.4	-1.953	10.0
46	5230	4.364	95.4	4.569	10.0

Channel No.	Frequency (MHz)	Reading Value (dBm/500KHz)	Duty Cycle (%)	Total PPSD (dBm/500KHz)	Limit (dBm/500KHz)
151	5755	-8.571	95.4	-8.366	30.0
159	5795	-4.117	95.4	-3.912	30.0

Note1: Total PSD = Reading Level + 10*log(1/duty cycle)

Note2: 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.

Channel 38 (5190MHz)

Channel 46 (5230MHz)

Channel 151 (5755MHz)

Channel 159 (5795MHz)

Product	:	IP-STB
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11n(20MHz) (Ant 1+2)

Channel No.	Frequency (MHz)	Reading Value (dBm/MHz)		Duty Cycle (%)	Total PPSD (dBm/MHz)	Limit (dBm/MHz)
		Ant 1	Ant 2			
36	5180	3.616	4.672	98	7.274	7.45
44	5220	3.671	4.707	98	7.318	7.45
48	5240	3.512	4.719	98	7.256	7.45

Channel No.	Frequency (MHz)	Reading Value (dBm/500KHz)		Duty Cycle (%)	Total PPSD (dBm/500KHz)	Limit (dBm/500KHz)
		Ant 1	Ant 2			
149	5745	-0.992	-2.540	98	1.401	27.45
157	5785	0.365	0.852	98	3.714	27.45
165	5825	0.409	-1.175	98	2.787	27.45

Note1: Total PSD = Reading Level + 10*log(1/duty cycle)

Note2: 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.

Note3 : Directional gain = GANT + 10 log(NANT) dBi=8.55dBi＞6dBi, so The Limit is 7.45dBm for Band I and 27.45dBm for Band IV.

Ant 1

Channel 36 (5180MHz)

Channel 44 (5220MHz)

Channel 48 (5240MHz)

Channel 149 (5745MHz)

Channel 157(5785MHz)

Channel 165 (5825MHz)

Ant 2

Channel 36 (5180MHz)

Channel 44 (5220MHz)

Channel 48 (5240MHz)

Channel 149 (5745MHz)

Channel 157(5785MHz)

Channel 165 (5825MHz)

Product	:	IP-STB
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 3 Transmit by 802.11n(40MHz) (Ant 1+2)

Channel No.	Frequency (MHz)	Reading Value (dBm/MHz)		Duty Cycle (%)	Total PPSD (dBm/MHz)	Limit (dBm/MHz)
		Ant 1	Ant 2			
38	5190	-4.619	-3.753	95.4	-0.949	7.45
46	5230	2.017	2.464	95.4	5.462	7.45

Channel No.	Frequency (MHz)	Reading Value (dBm/500KHz)		Duty Cycle (%)	Total PPSD (dBm/500KHz)	Limit (dBm/500KHz)
		Ant 1	Ant 2			
151	5755	-8.316	-9.744	95.4	-5.756	27.45
159	5795	-3.821	-4.802	95.4	-1.069	27.45

Note1: Total PSD = Reading Level + 10*log(1/duty cycle)

Note2: 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.

Note3 : Directional gain = GANT + 10 log(NANT) dBi=8.55dBi＞6dBi, so The Limit is 7.45dBm for Band I and 27.45dBm for Band IV.

Ant 1

Channel 38 (5190MHz)

Channel 46 (5230MHz)

Channel 151 (5755MHz)

Channel 159 (5795MHz)

Ant 2

Channel 38 (5190MHz)

Channel 46 (5230MHz)

Channel 151 (5755MHz)

Channel 159 (5795MHz)

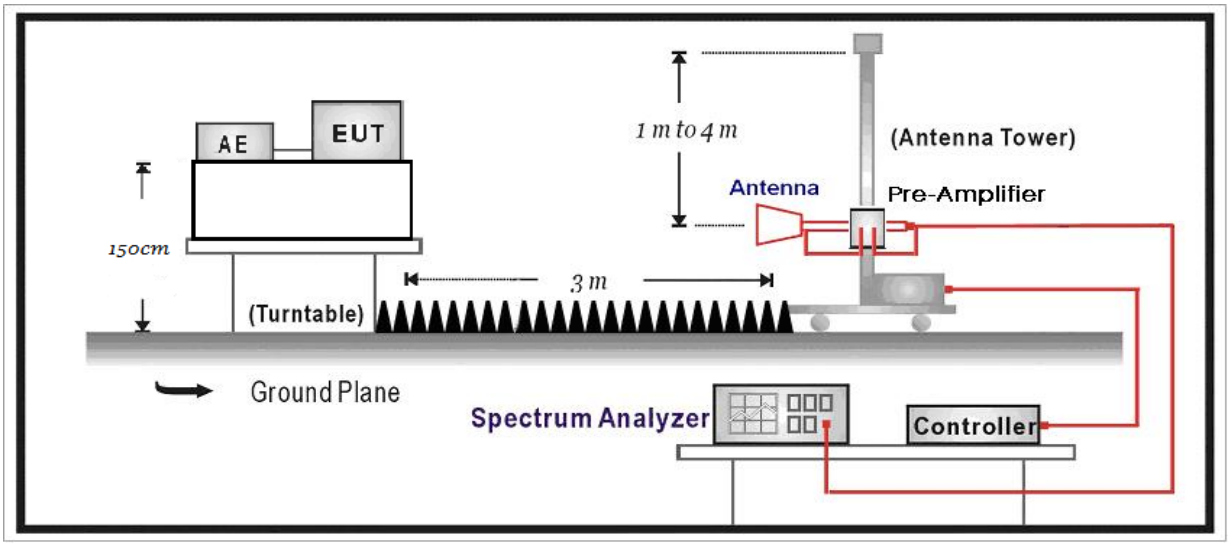
9. Radiated Emission Band Edge

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	2016.01.07
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	2016.01.08

9.2. Test Setup



9.3. Limit

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
[1]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 15.407(b) requirement:

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(4) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

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
5725 - 5825	-27 [Note(1)]	68.3
	-17 [Note(2)]	78.3

Note(1): Outside the frequency range 5715 - 5835MHz.
Note(2): Within the frequency range from the band edge to 10MHz below or above the band edge, 5715 – 5725MHz and 5825 - 5835MHz.

9.4. Test Procedure

According to FCC ANSI C63.4: 2014 & ANSI C63.10: 2013& Industry Canada RSS-Gen Issue 4& 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: 2014 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 ≥ [3 × 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 ≥ 98%, then set VBW ≤ RBW / 100 (i.e., 10 kHz), but not less than 10 Hz.
2) If the EUT D is < 98%, then set VBW ≥ 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.)

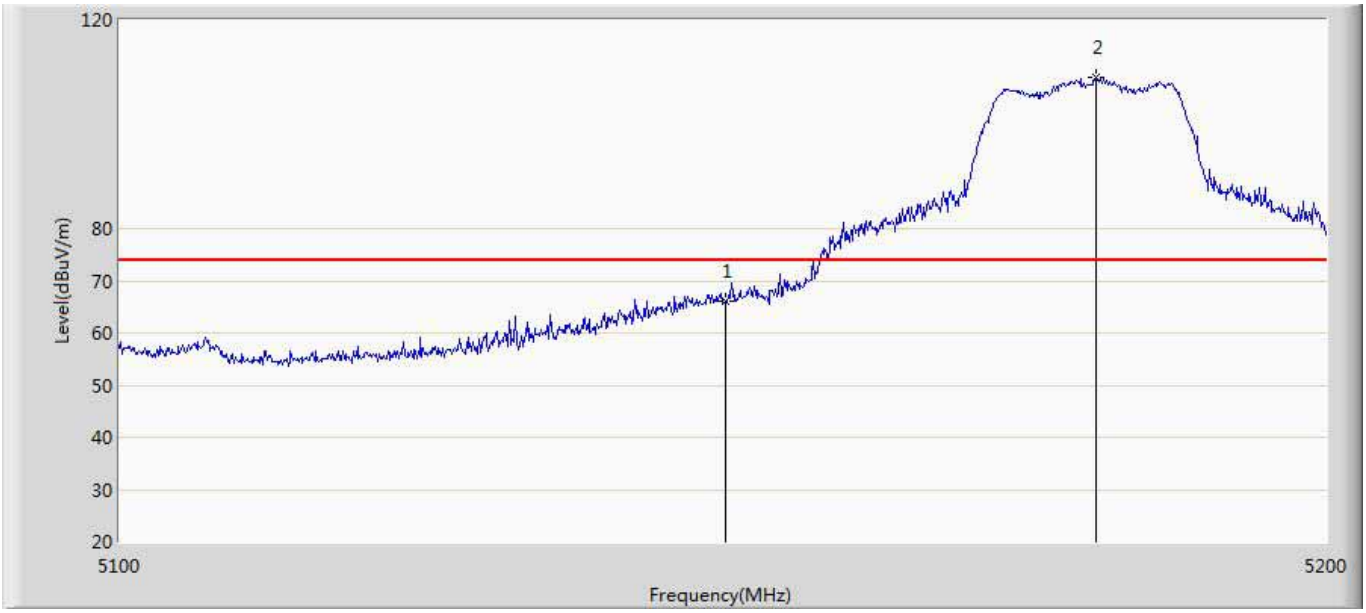
Note: When doing emission measurement above 1GHz, the horn Chainenna will be bended down a little (as horn Chainenna has the narrow beamwidth) in order to keeping the Chainenna in the “cone of radiation” of EUT. The 3dB beamwidth is 10~60 degrees for H-plane and 10~90 degrees for E-plane.

9.5. Uncertainty

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

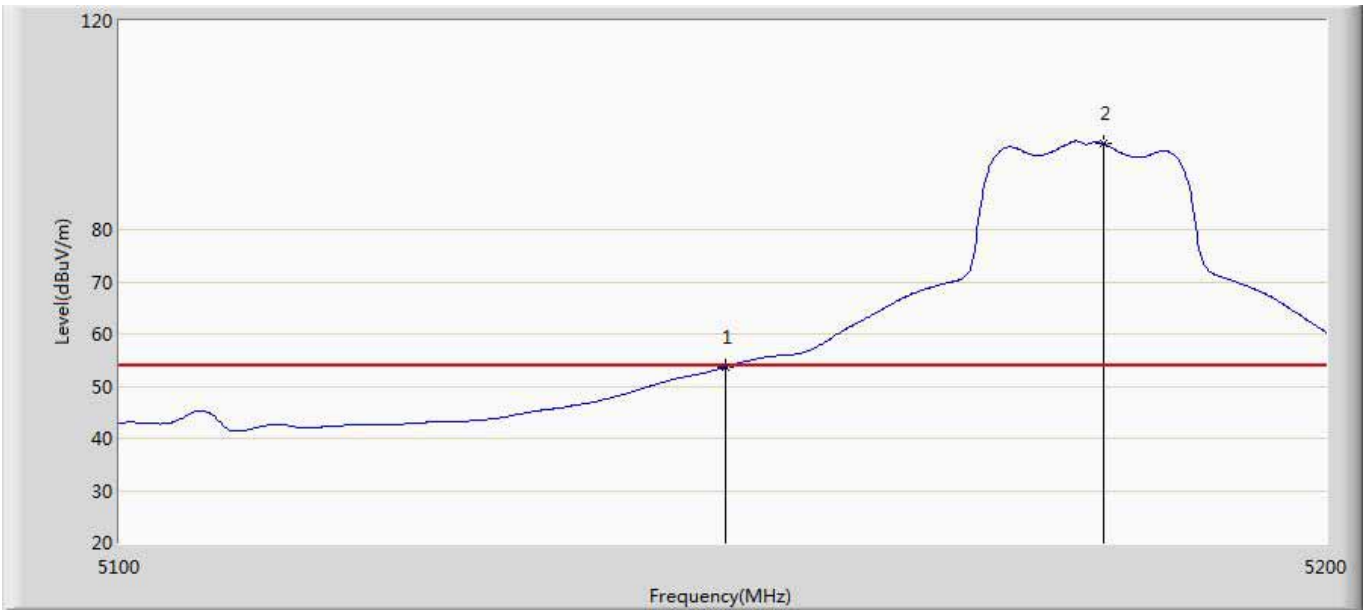
9.6. Test Result

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 10:09
Limit: FCC_Part15.209_RE(3m)	Limit: FCC_Part15.209_RE(3m)
Probe: Horn_3117_00167055(1-18GHz)	Probe: Horn_3117_00167055(1-18GHz)
EUT: IP-STB	EUT: IP-STB
Note: Mode 1:Transmit at CH5180MHz by 802.11a ant1	



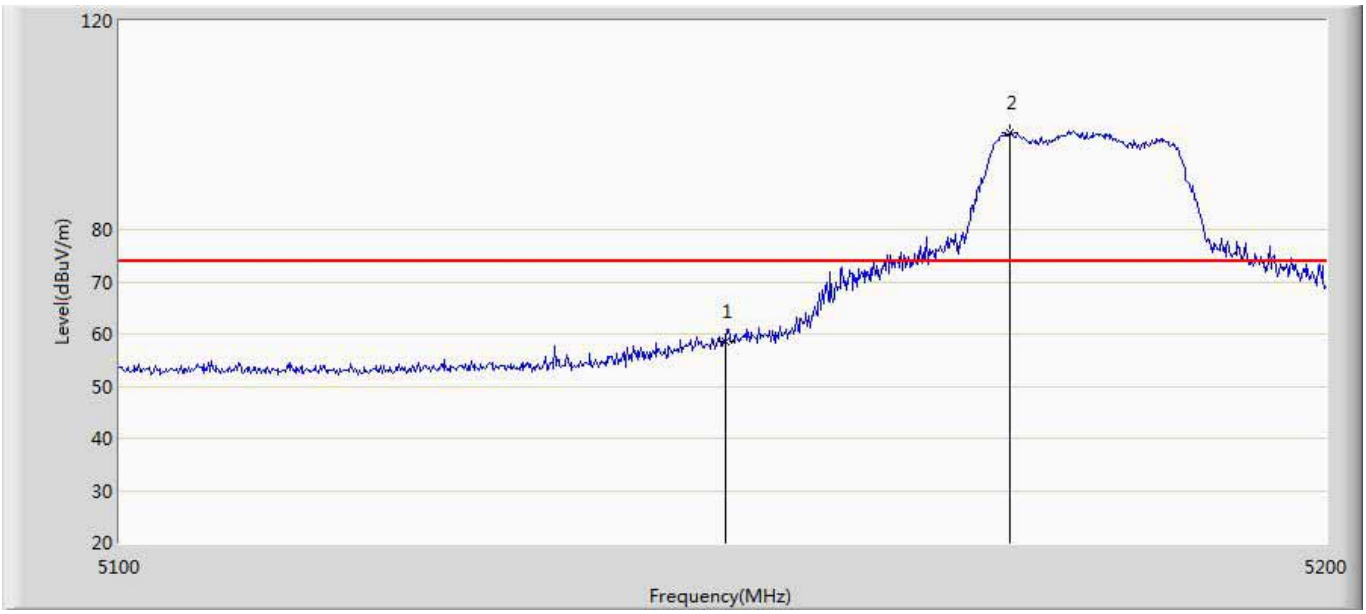
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	66.028	24.013	-7.972	74.000	42.015	PK
2	*	5180.800	109.060	66.915	N/A	N/A	42.146	PK

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 09:56
Limit: FCC_Part15.209_RE(3m)	Limit: FCC_Part15.209_RE(3m)
Probe: Horn_3117_00167055(1-18GHz)	Probe: Horn_3117_00167055(1-18GHz)
EUT: IP-STB	EUT: IP-STB
Note: Mode 1:Transmit at CH5180MHz by 802.11a ant1	



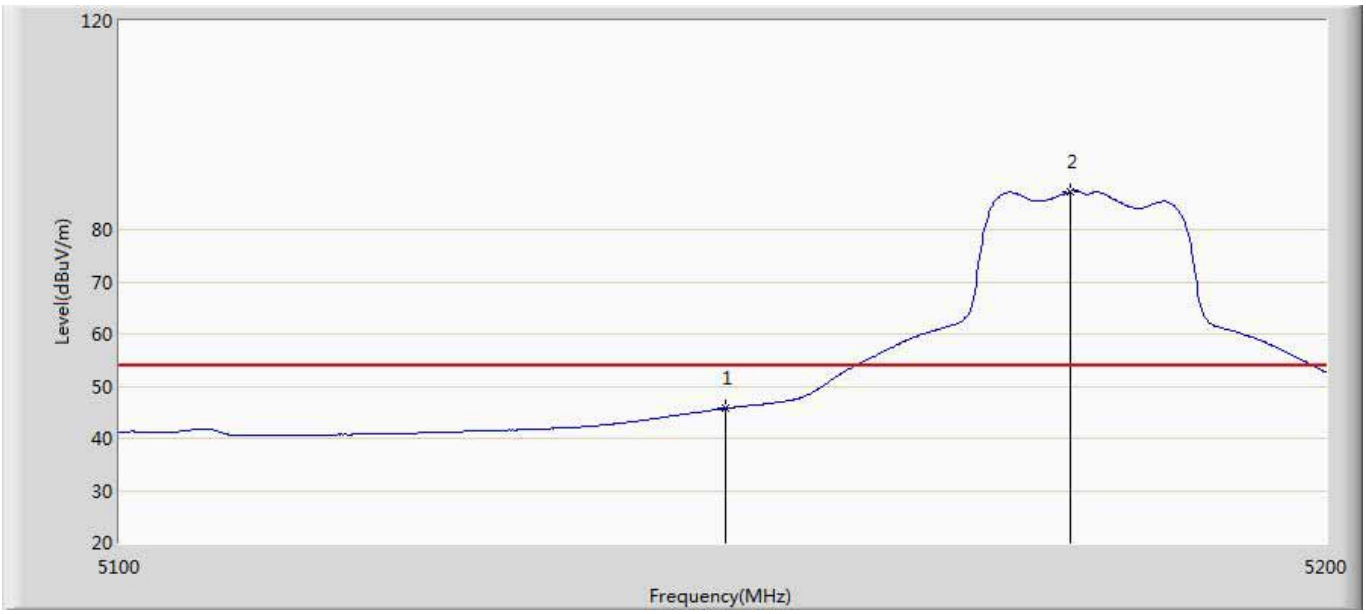
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	53.682	11.667	-0.318	54.000	42.015	AV
2	*	5181.400	96.553	54.408	N/A	N/A	42.145	AV

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 10:11
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH5180MHz by 802.11a ant1	



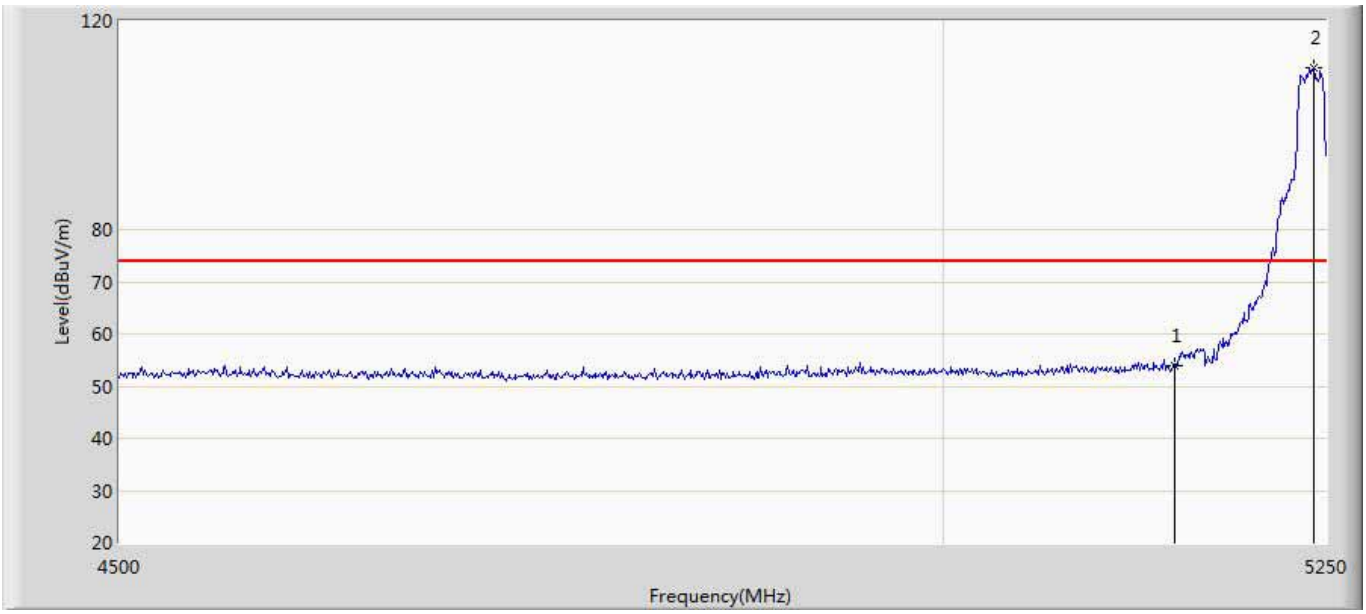
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	58.480	16.465	-15.520	74.000	42.015	PK
2	*	5173.600	98.562	56.417	N/A	N/A	42.146	PK

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 10:12
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH5180MHz by 802.11a ant1	



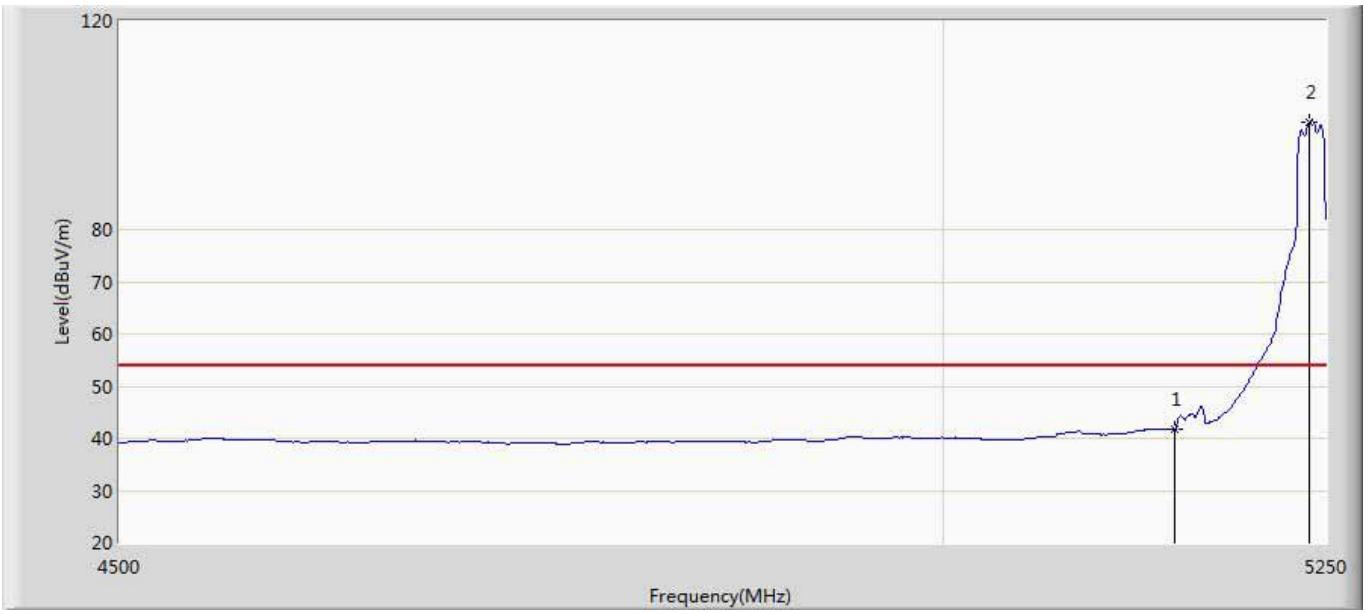
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	45.714	3.699	-8.286	54.000	42.015	AV
2	*	5178.600	87.271	45.126	N/A	N/A	42.146	AV

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 10:17
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH5240MHz by 802.11a ant1	



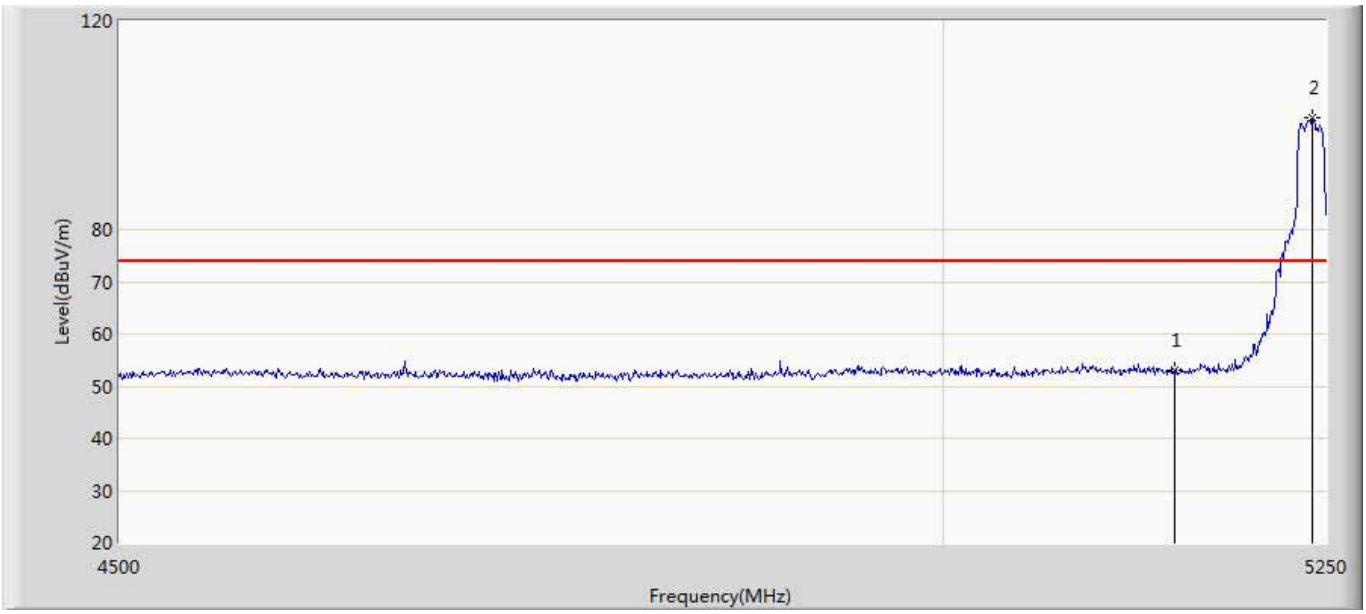
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	53.969	11.954	-20.031	74.000	42.015	PK
2	*	5241.750	111.142	68.993	N/A	N/A	42.149	PK

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 10:19
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH5240MHz by 802.11a ant1	



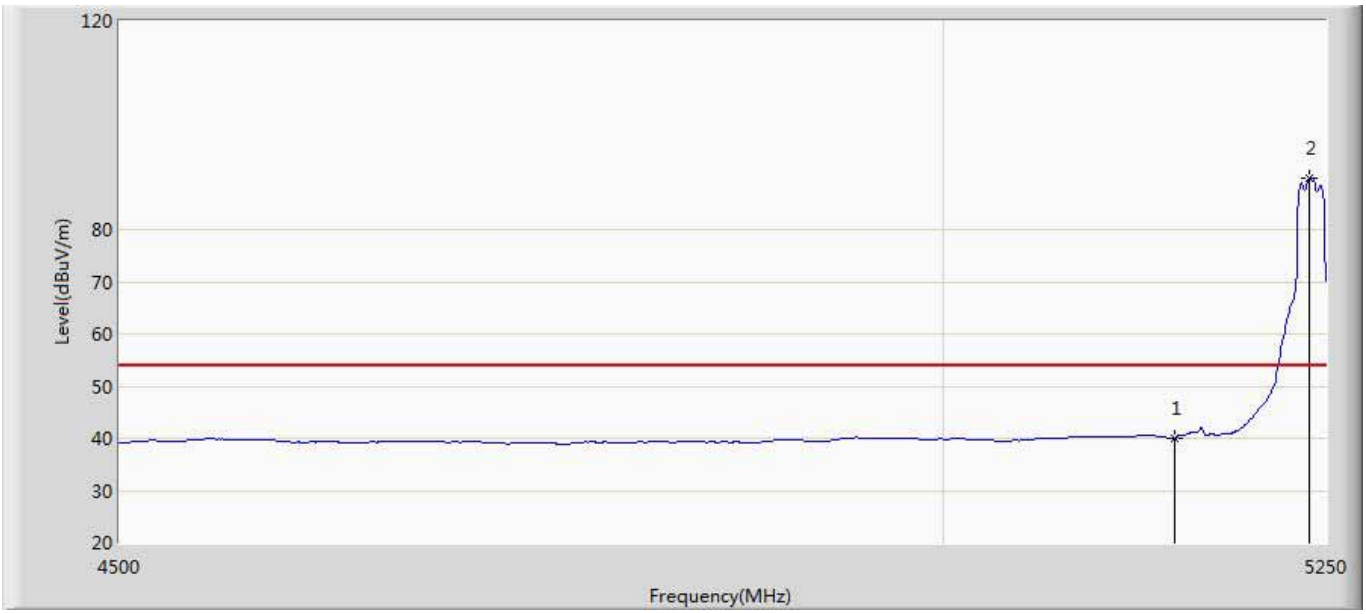
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	41.711	-0.304	-12.289	54.000	42.015	AV
2	*	5238.750	100.623	58.504	N/A	N/A	42.119	AV

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 10:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH5240MHz by 802.11a ant1	



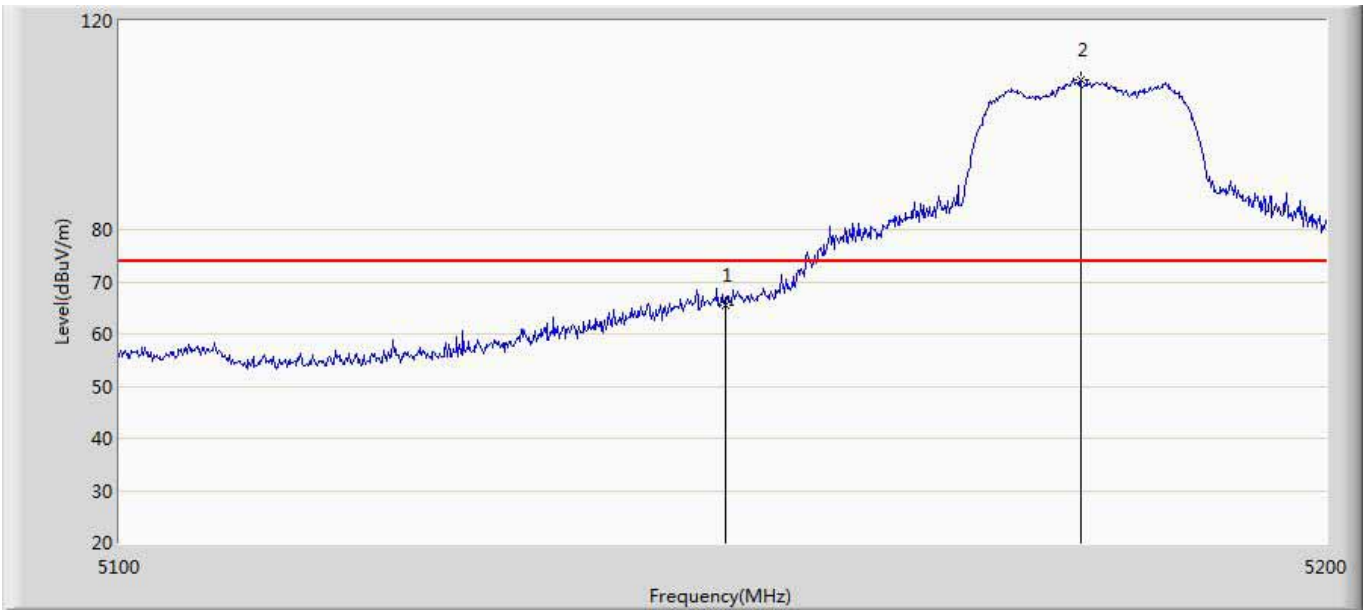
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	52.988	10.973	-21.012	74.000	42.015	PK
2	*	5241.000	101.593	59.452	N/A	N/A	42.141	PK

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 10:27
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH5240MHz by 802.11a ant1	



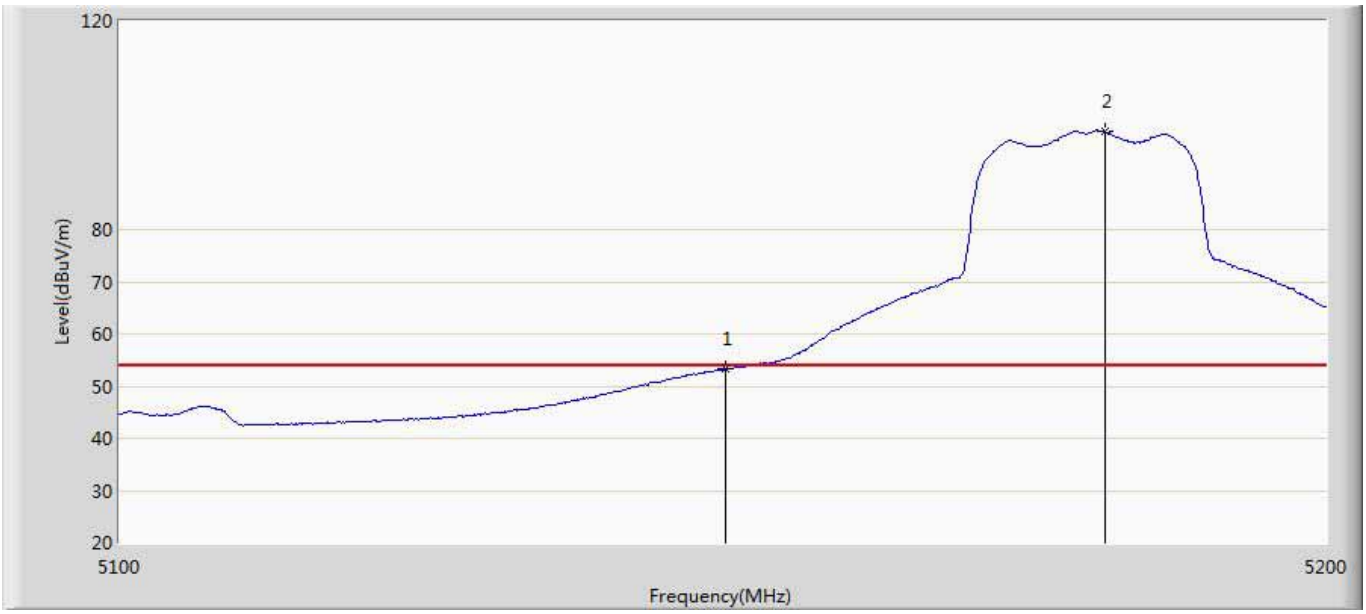
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	40.060	-1.955	-13.940	54.000	42.015	AV
2	*	5238.750	89.802	47.683	N/A	N/A	42.119	AV

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 10:32
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5180MHz by 802.11n20 ant1	



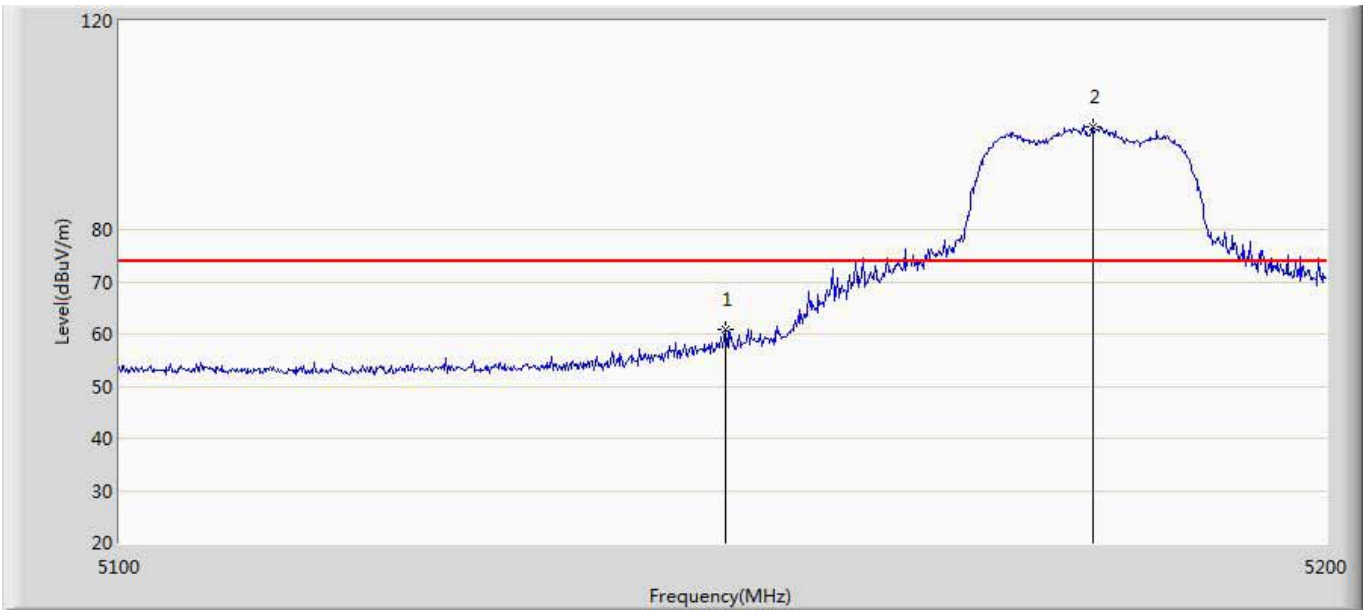
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	65.435	23.420	-8.565	74.000	42.015	PK
2	*	5179.500	108.806	66.661	N/A	N/A	42.146	PK

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 10:33
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5180MHz by 802.11n20 ant1	



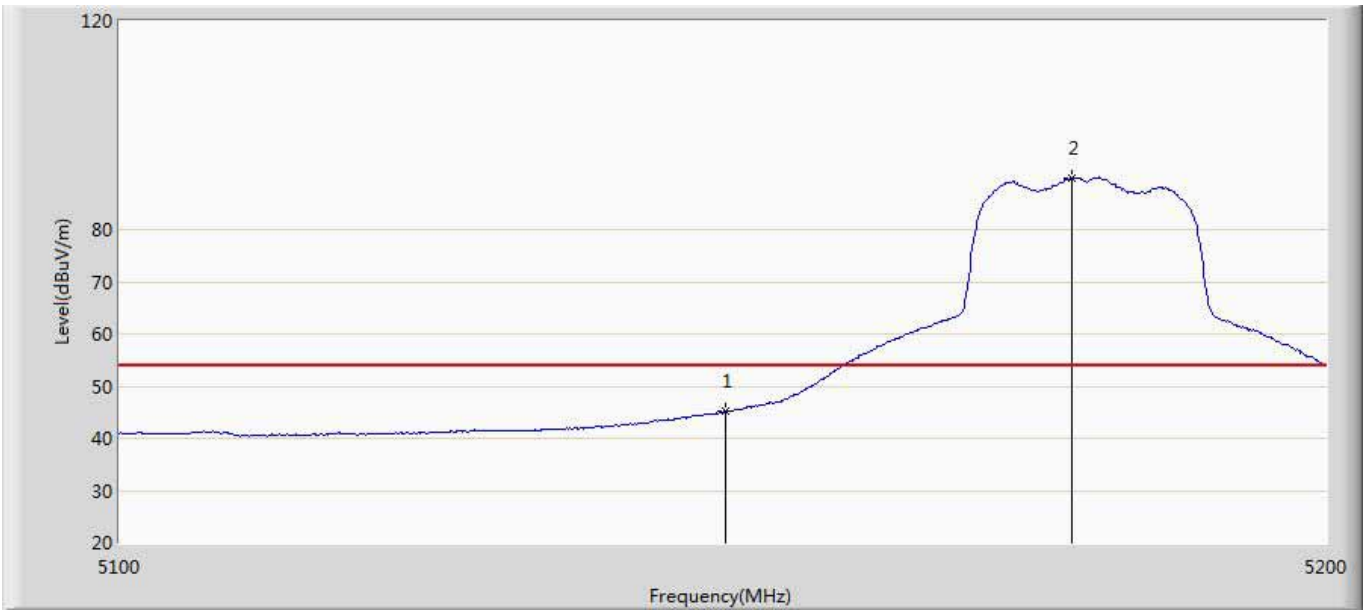
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	53.194	11.179	-0.806	54.000	42.015	AV
2	*	5181.500	98.850	56.705	N/A	N/A	42.145	AV

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 10:38
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5180MHz by 802.11n20 ant1	



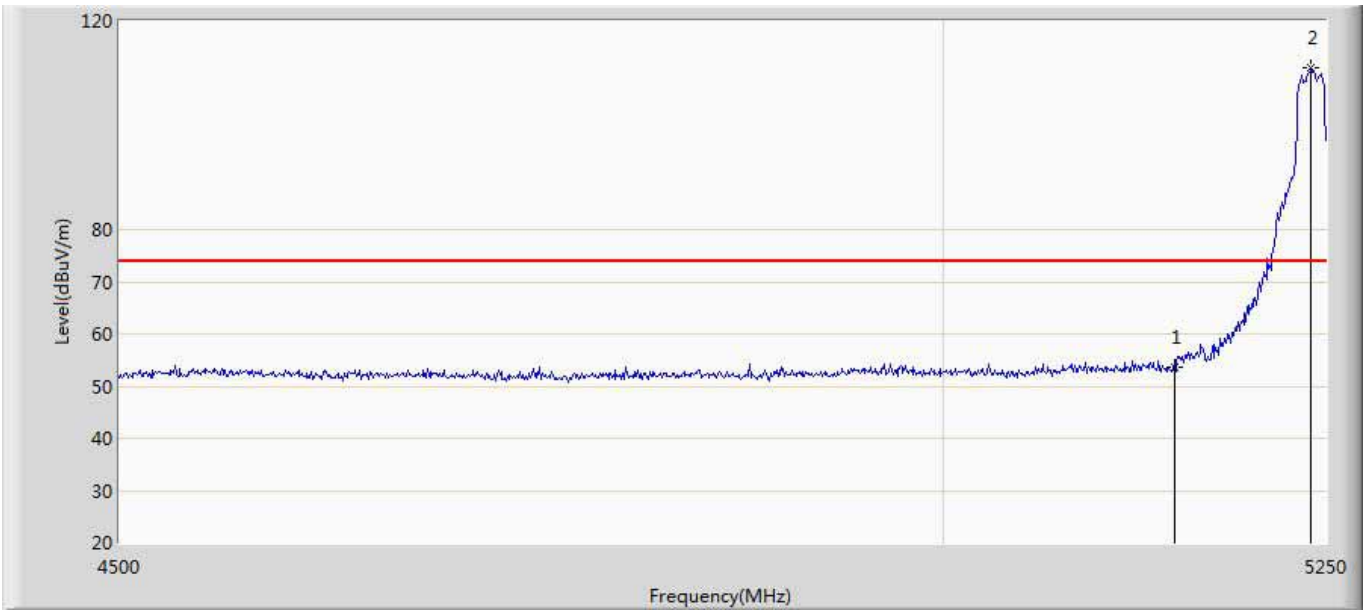
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	60.840	18.825	-13.160	74.000	42.015	PK
2	*	5180.500	99.675	57.530	N/A	N/A	42.146	PK

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 10:39
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5180MHz by 802.11n20 ant1	



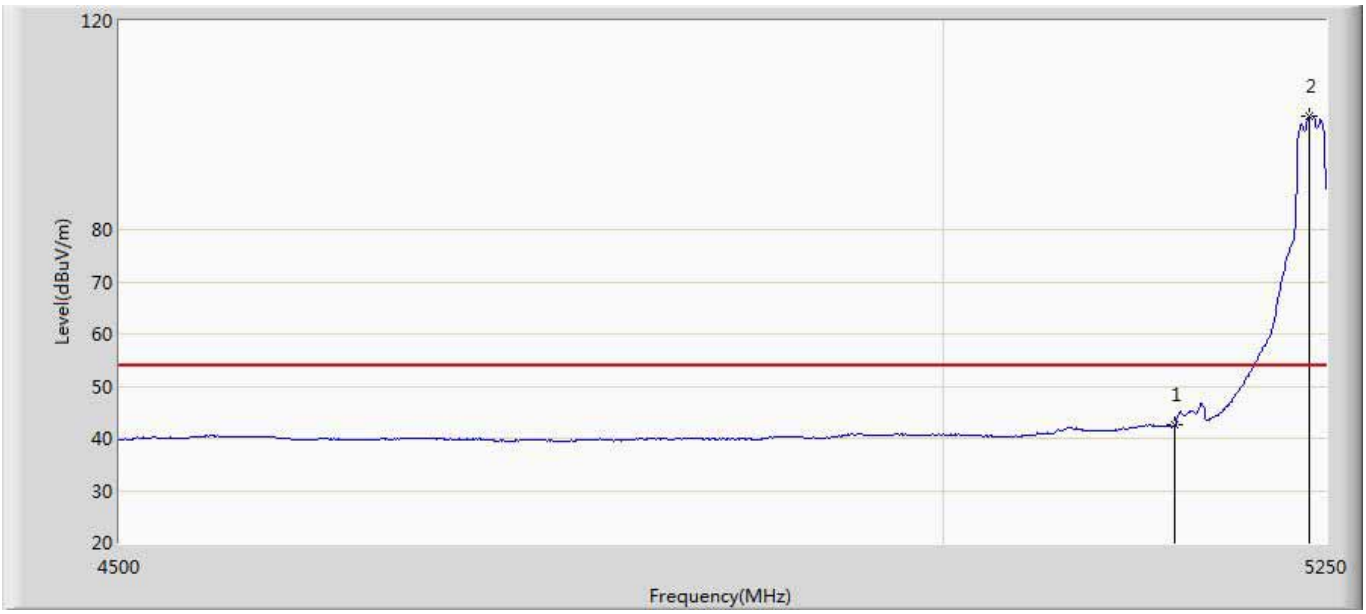
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	45.158	3.143	-8.842	54.000	42.015	AV
2	*	5178.800	89.892	47.747	N/A	N/A	42.146	AV

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 10:44
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5240MHz by 802.11n20 ant1	



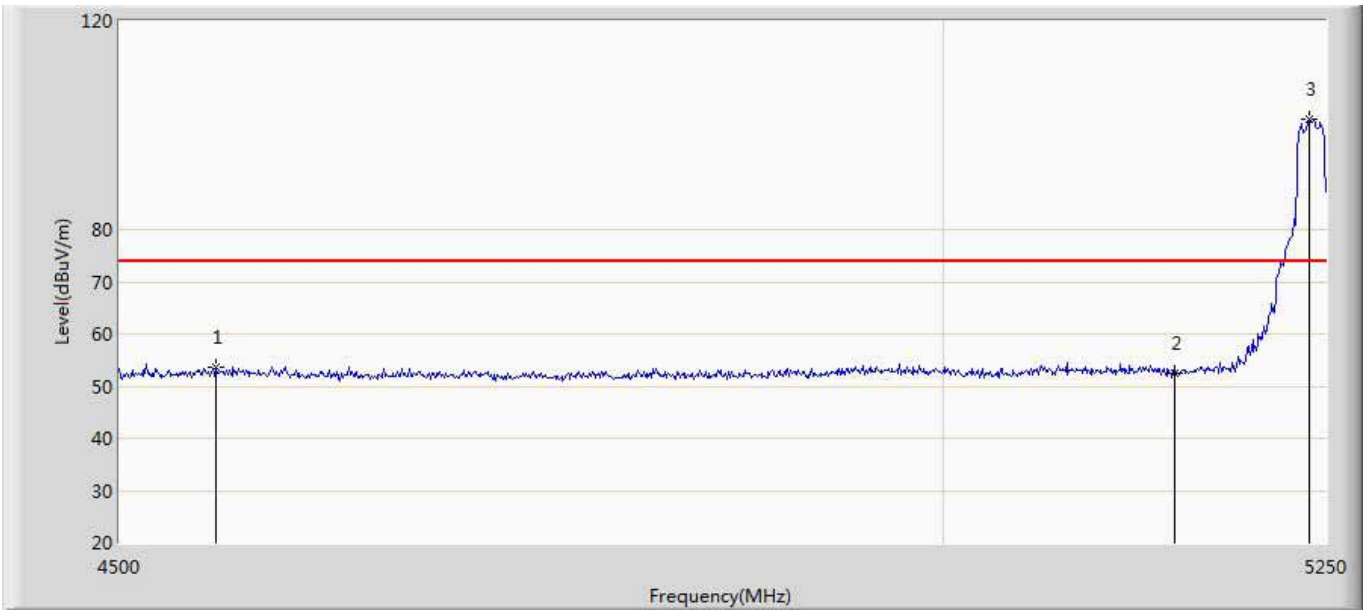
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	53.560	11.545	-20.440	74.000	42.015	PK
2	*	5240.250	111.048	68.914	N/A	N/A	42.134	PK

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 10:45
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5240MHz by 802.11n20 ant1	



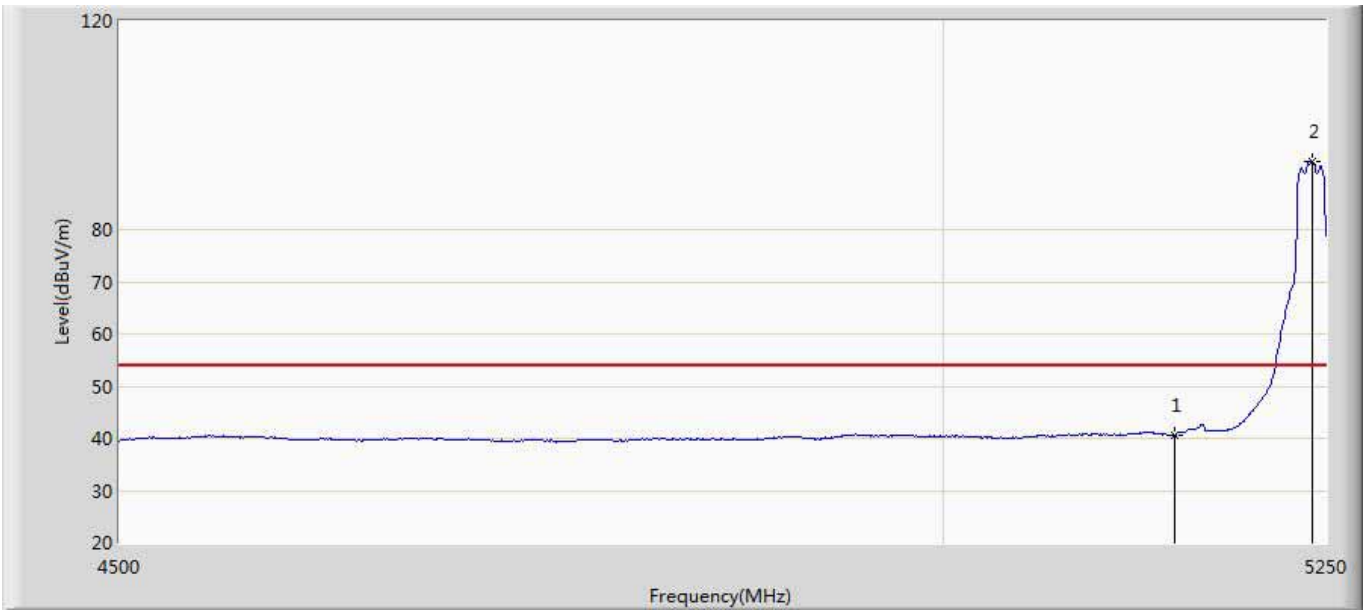
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	42.578	0.563	-11.422	54.000	42.015	AV
2	*	5238.750	101.743	59.624	N/A	N/A	42.119	AV

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 10:49
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5240MHz by 802.11n20 ant1	



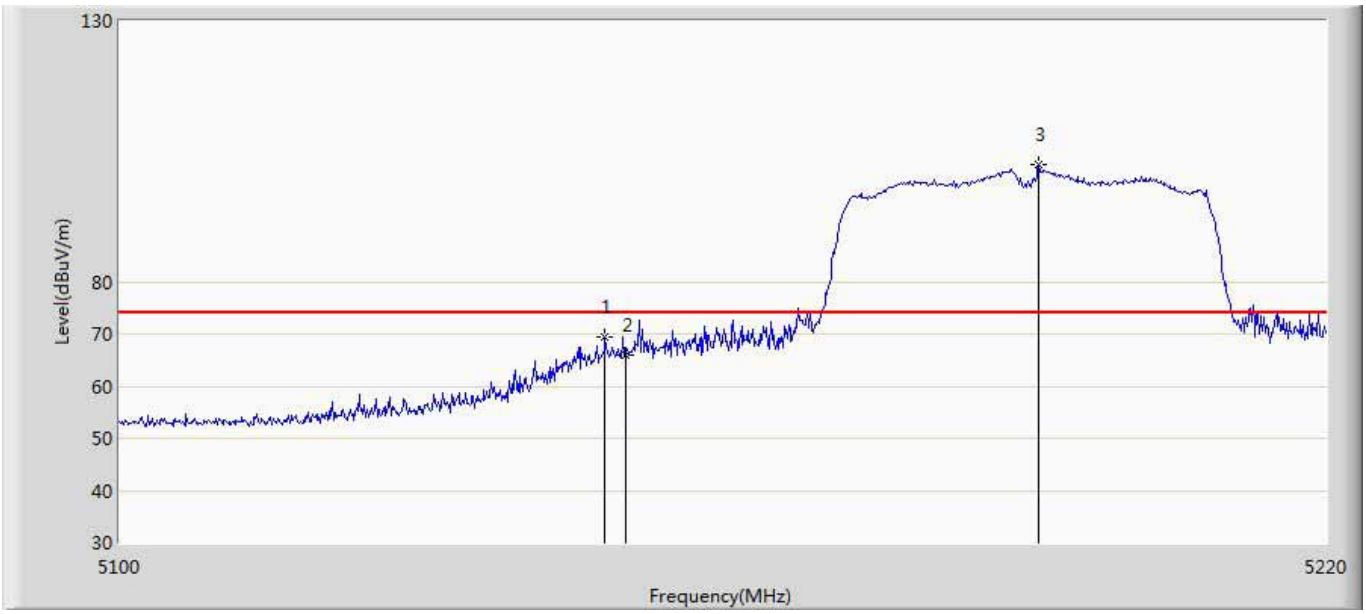
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		4556.250	53.726	12.409	-20.274	74.000	41.318	PK
2		5150.000	52.452	10.437	-21.548	74.000	42.015	PK
3	*	5238.750	101.280	59.161	N/A	N/A	42.119	PK

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 10:51
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5240MHz by 802.11n20 ant1	



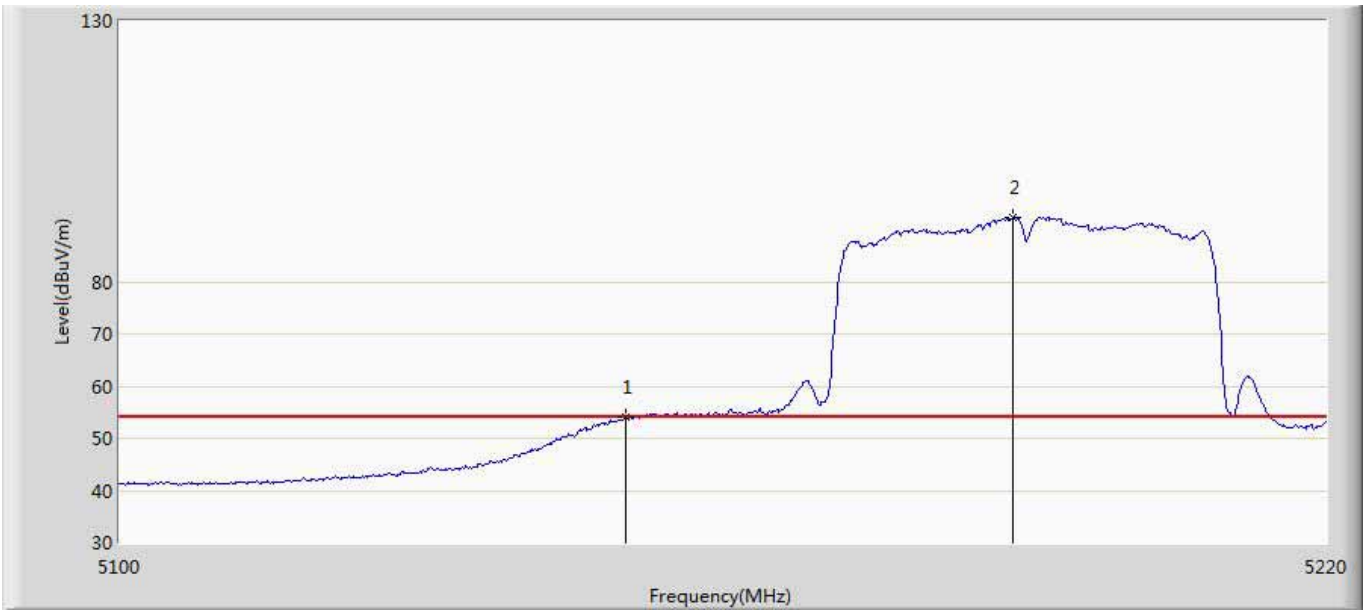
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	40.535	-1.480	-13.465	54.000	42.015	AV
2	*	5241.000	93.002	50.861	N/A	N/A	42.141	AV

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 10:57
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5190MHz by 802.11n40 ant1	



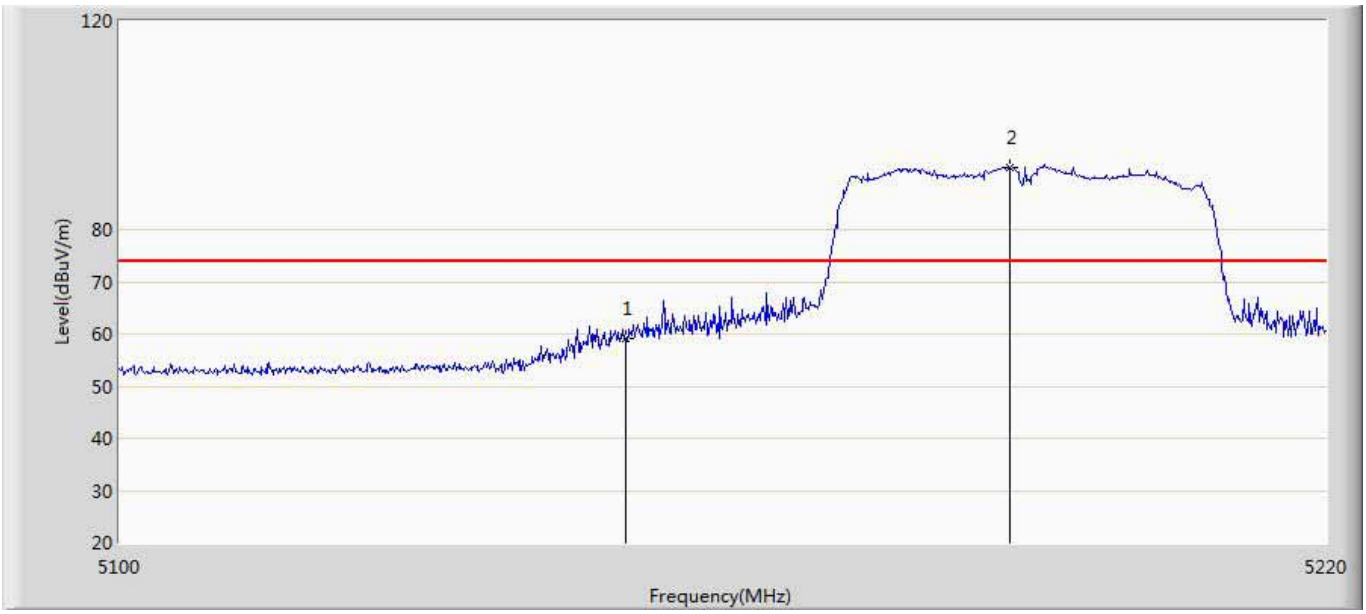
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5148.000	69.445	27.447	-4.555	74.000	41.998	PK
2		5150.000	65.913	23.898	-8.087	74.000	42.015	PK
3	*	5191.200	102.386	60.300	N/A	N/A	42.086	PK

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 10:59
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5190MHz by 802.11n40 ant1	



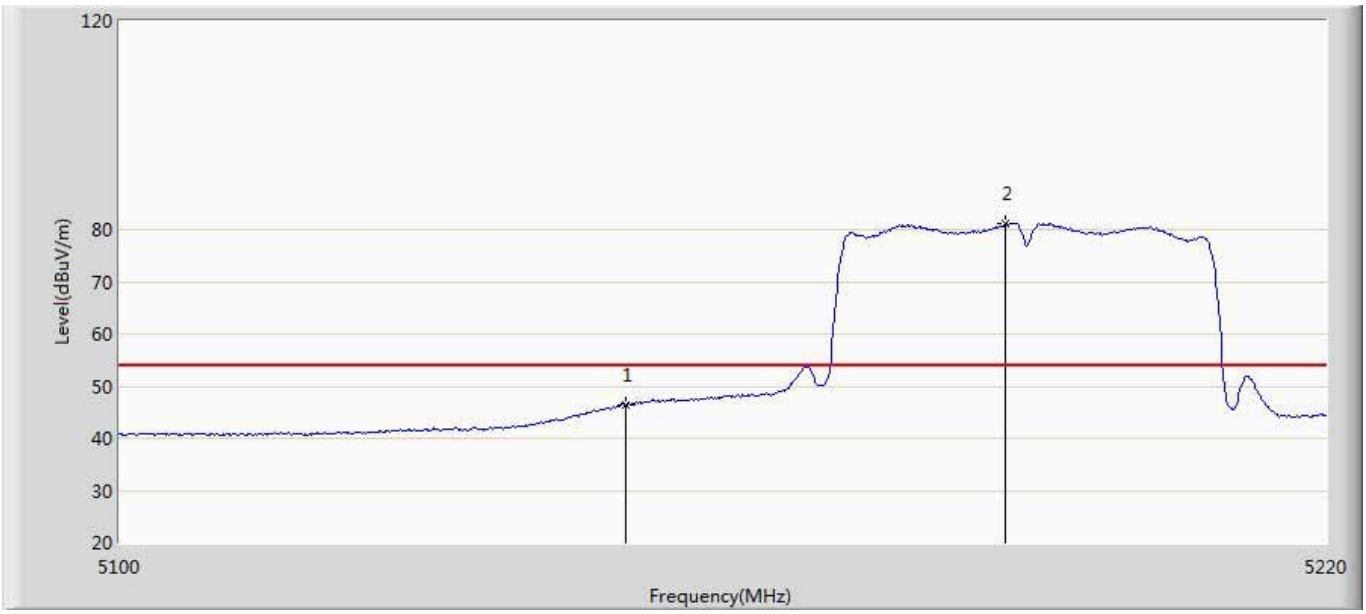
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	53.960	11.945	-0.040	54.000	42.015	AV
2	*	5188.560	92.330	50.227	N/A	N/A	42.104	AV

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 11:08
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5190MHz by 802.11n40 ant1	



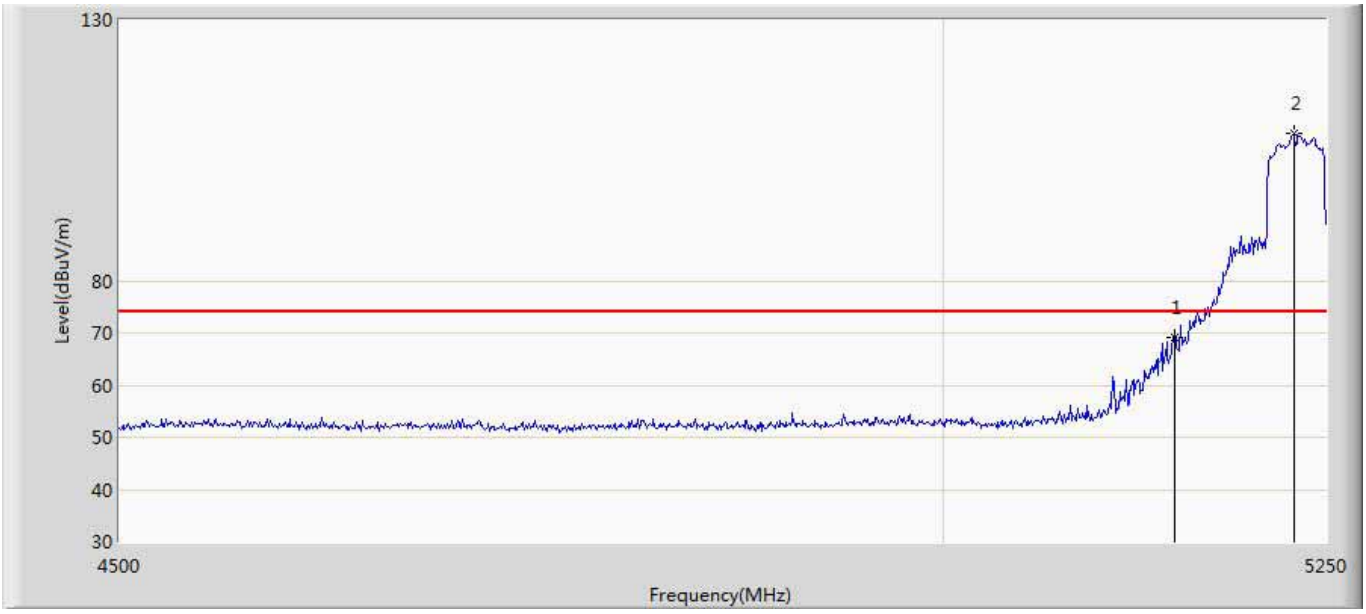
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	59.226	17.211	-14.774	74.000	42.015	PK
2	*	5188.320	91.948	49.843	N/A	N/A	42.105	PK

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 11:09
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5190MHz by 802.11n40 ant1	



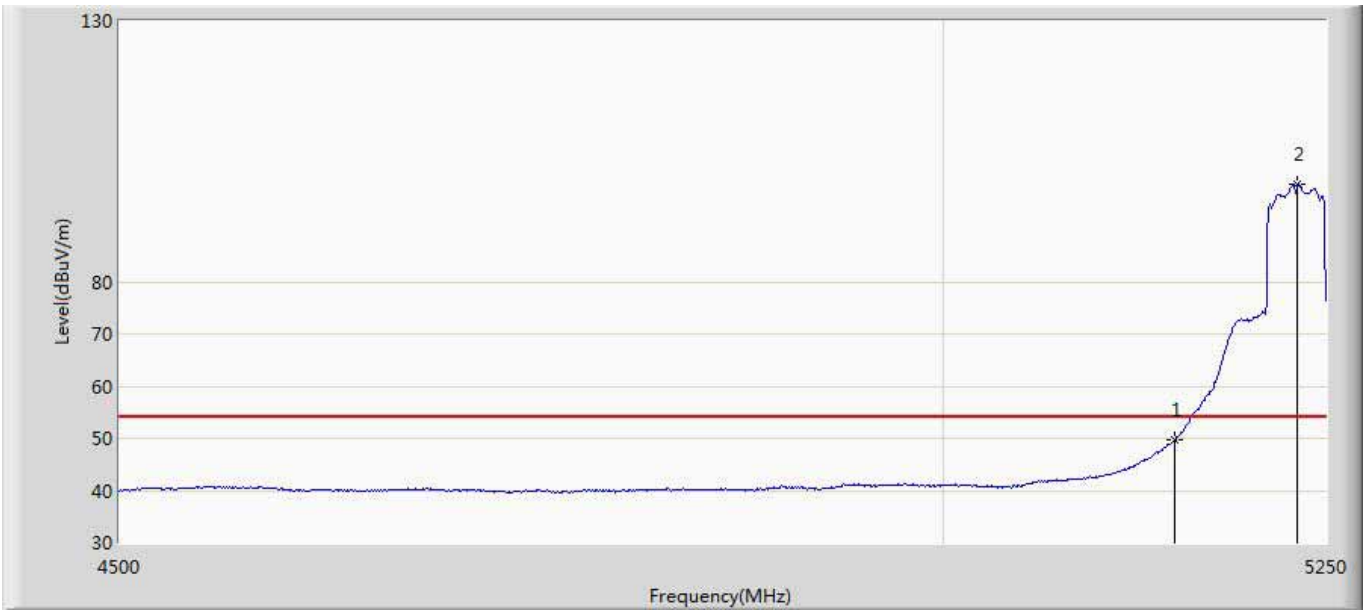
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	46.308	4.293	-7.692	54.000	42.015	AV
2	*	5187.840	81.046	38.938	N/A	N/A	42.108	AV

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 11:18
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5230MHz by 802.11n40 ant1	



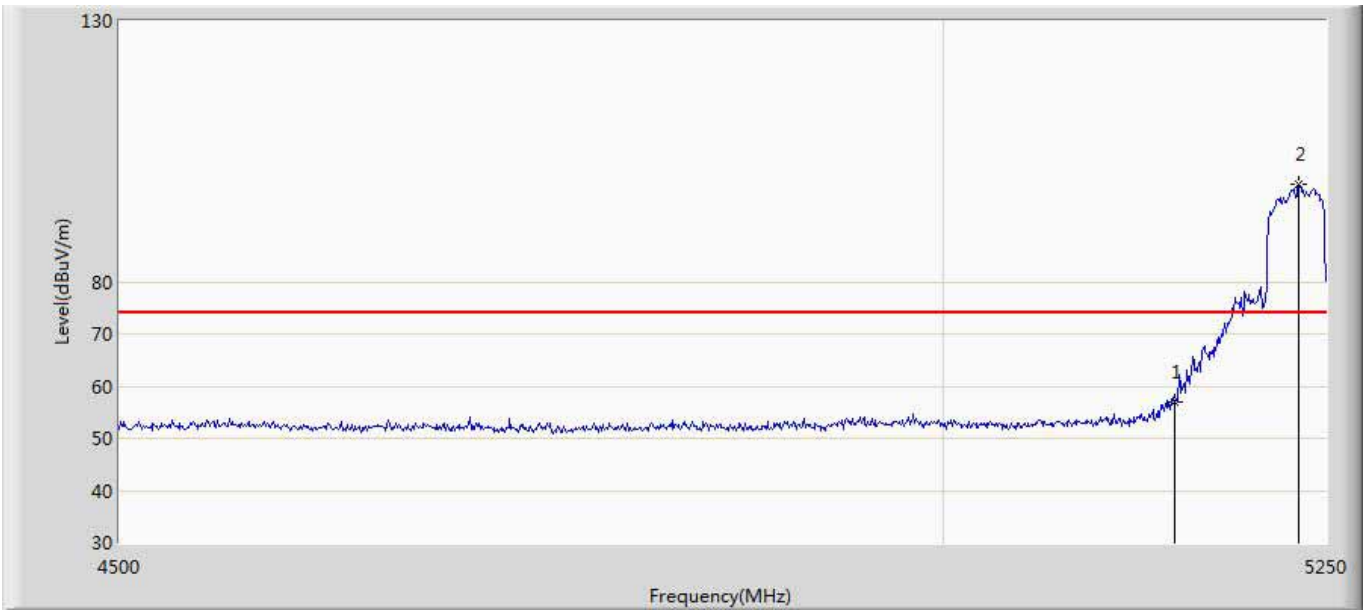
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	69.124	27.109	-4.876	74.000	42.015	PK
2	*	5228.250	108.377	66.337	N/A	N/A	42.040	PK

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 11:18
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5230MHz by 802.11n40 ant1	



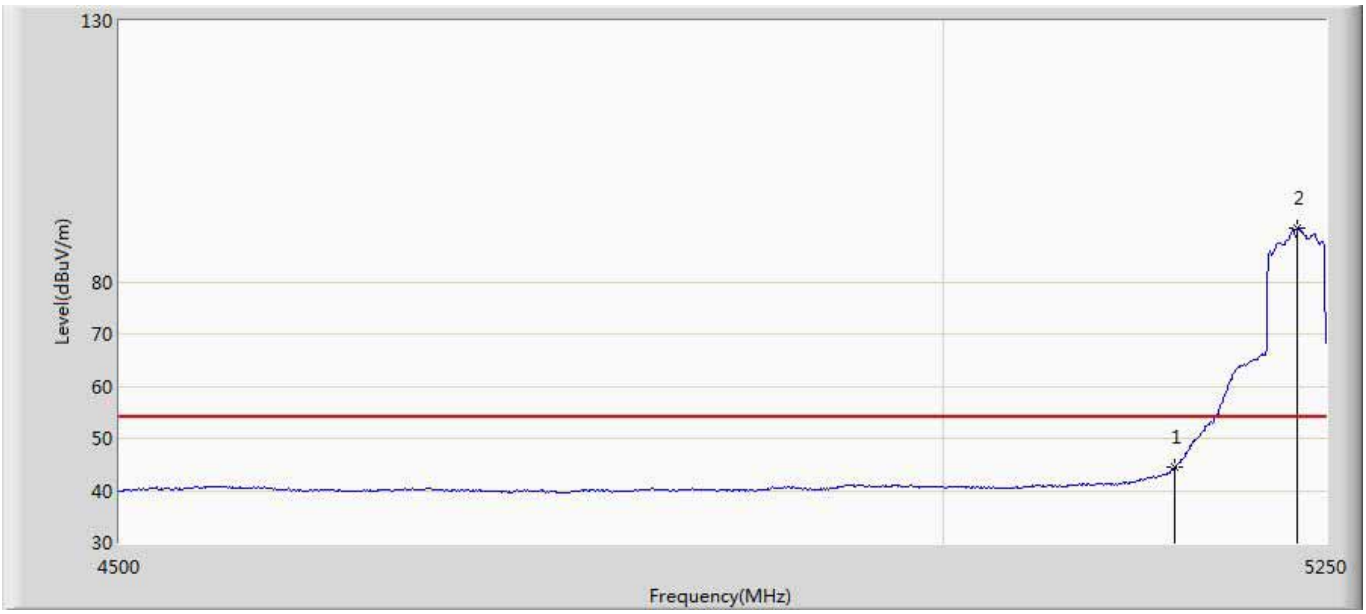
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	49.771	7.756	-4.229	54.000	42.015	AV
2	*	5231.250	98.819	56.765	N/A	N/A	42.054	AV

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 11:21
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5230MHz by 802.11n40 ant1	



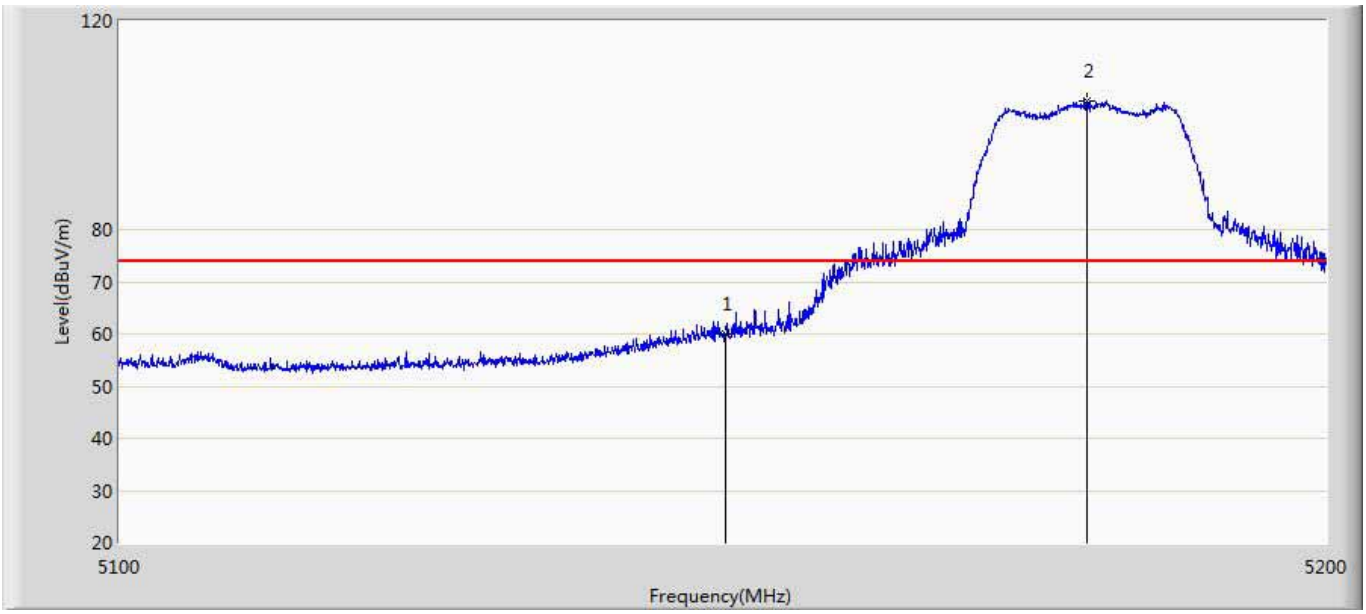
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	57.091	15.076	-16.909	74.000	42.015	PK
2	*	5232.000	98.563	56.505	N/A	N/A	42.058	PK

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 11:23
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5230MHz by 802.11n40 ant1	



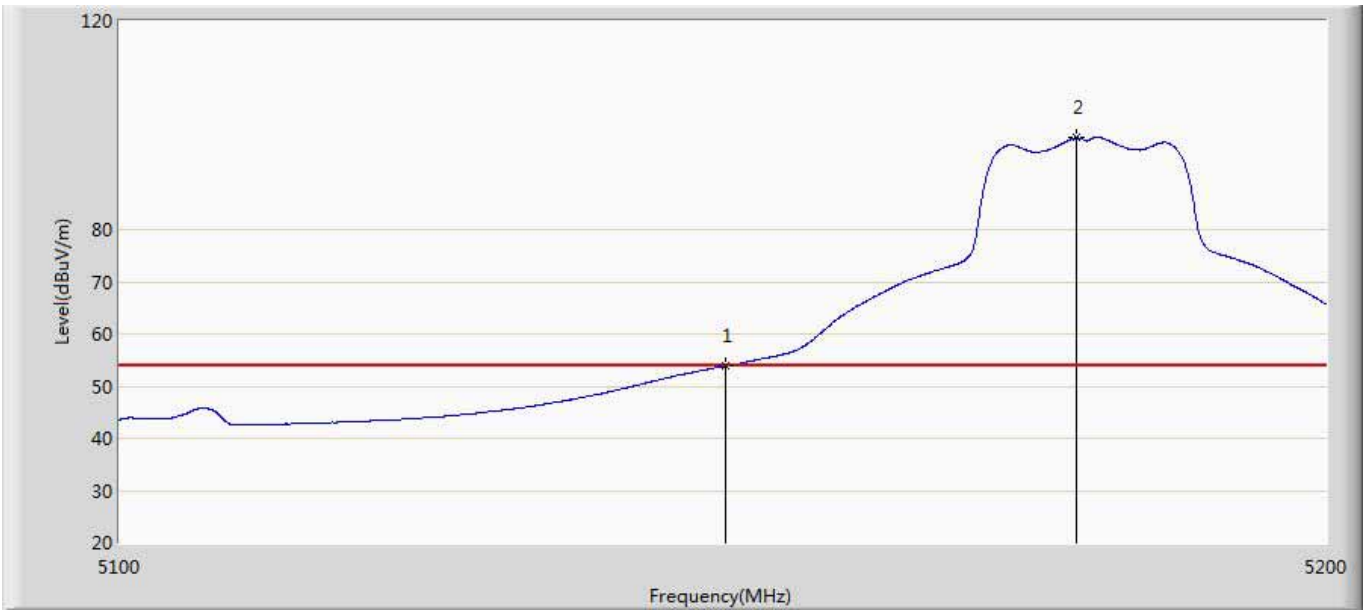
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	44.531	2.516	-9.469	54.000	42.015	AV
2	*	5231.250	90.407	48.353	N/A	N/A	42.054	AV

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 15:43
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH5180MHz by 802.11a ant2	



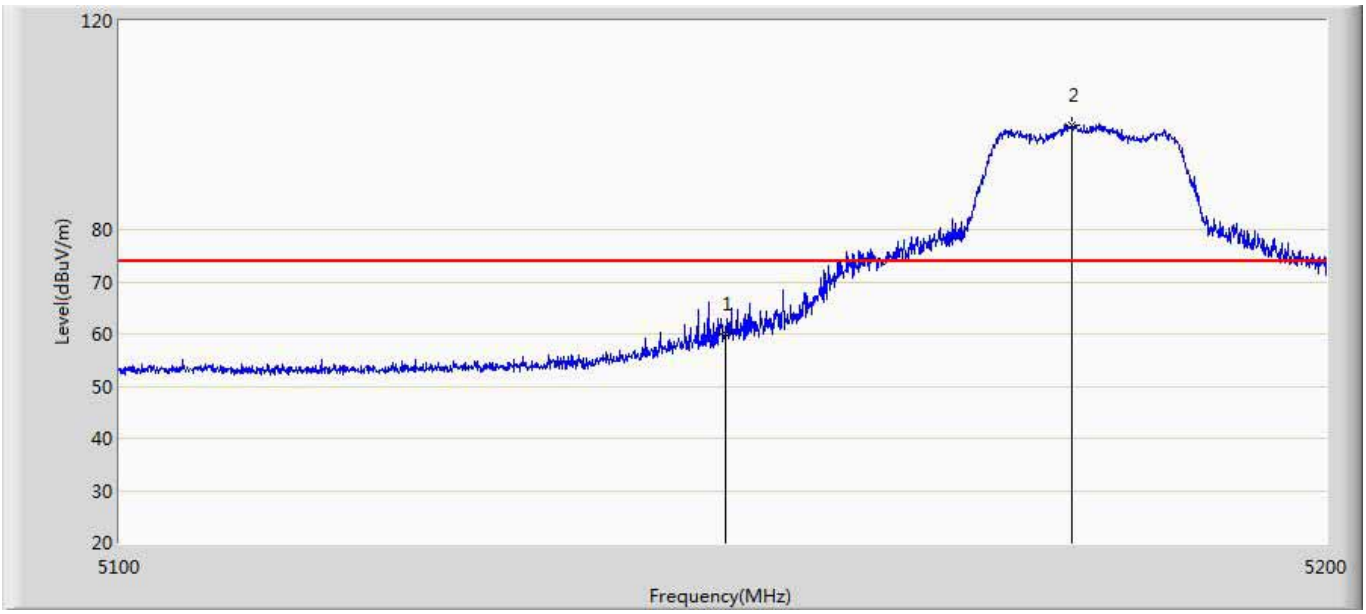
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	60.022	18.007	-13.978	74.000	42.015	PK
2	*	5180.000	104.680	62.535	N/A	N/A	42.145	PK

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 15:44
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH5180MHz by 802.11a ant2	



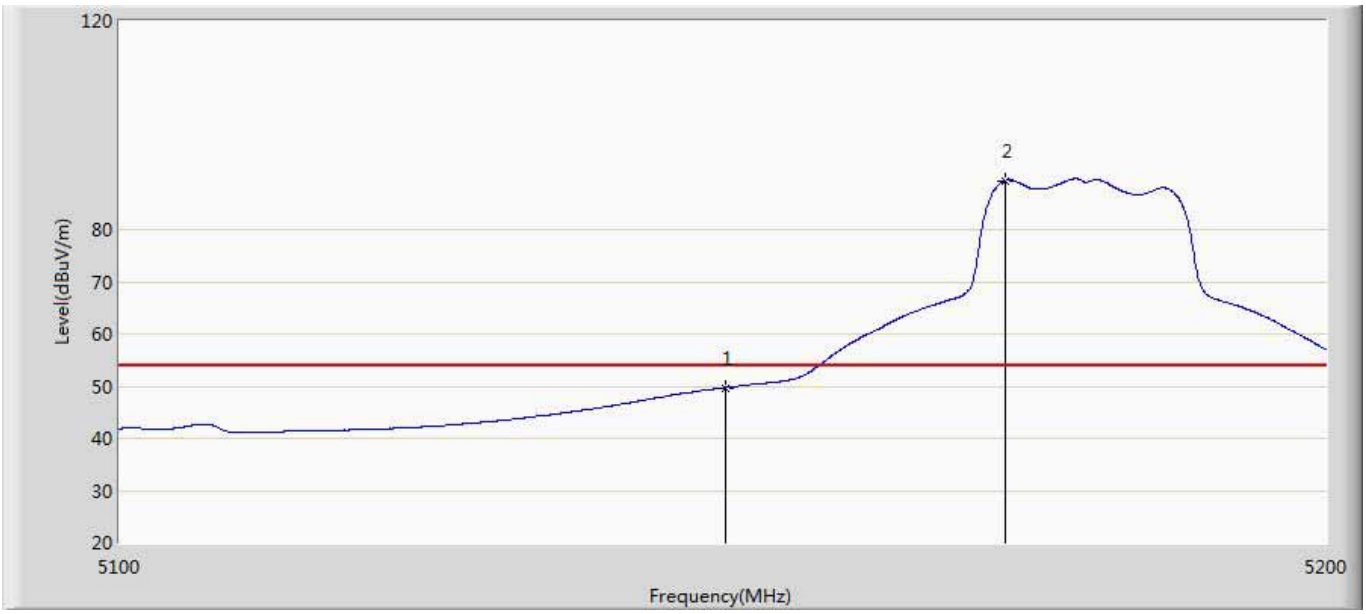
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	53.872	11.857	-0.128	54.000	42.015	AV
2	*	5179.150	97.622	55.477	N/A	N/A	42.145	AV

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 16:02
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH5180MHz by 802.11a ant2	



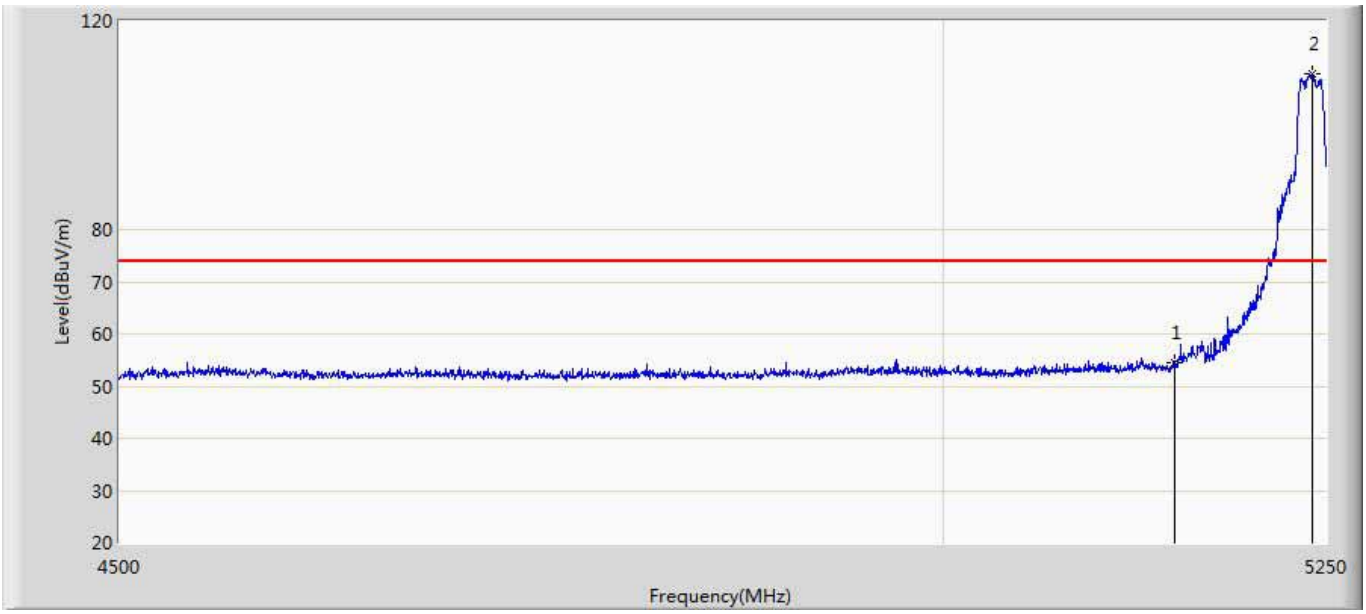
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	59.921	17.906	-14.079	74.000	42.015	PK
2	*	5178.750	99.979	57.834	N/A	N/A	42.146	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 10:12
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH5180MHz by 802.11a ant2	



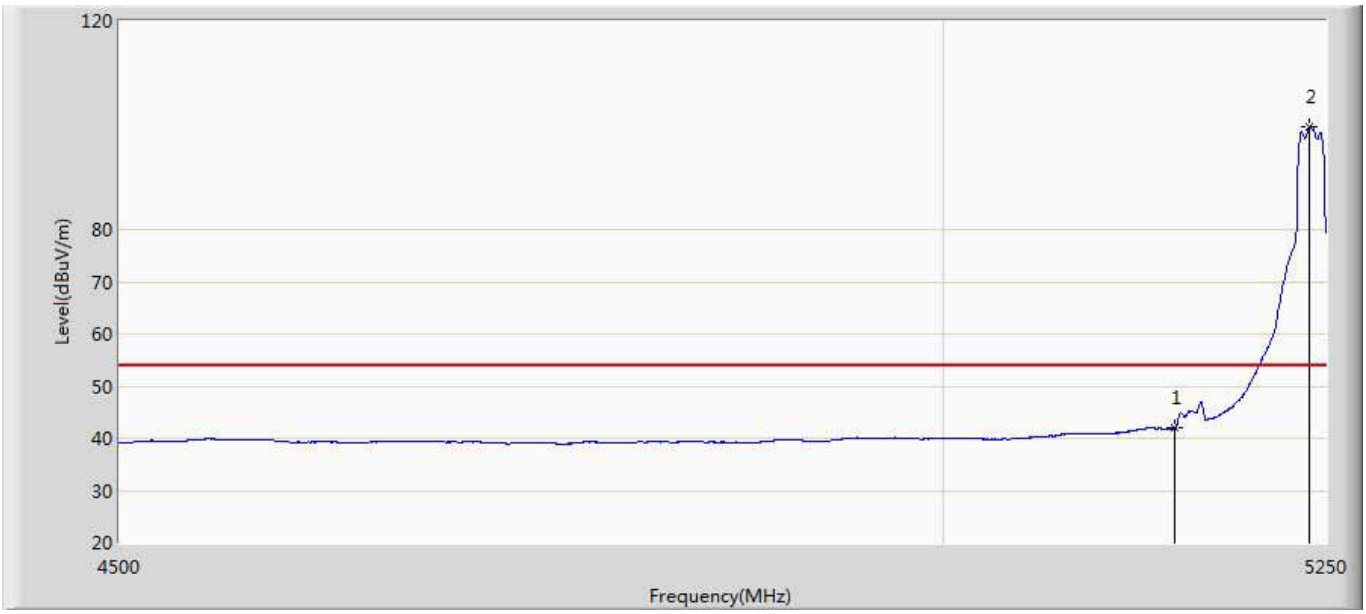
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	49.702	7.687	-4.298	54.000	42.015	AV
2	*	5173.300	89.417	47.272	N/A	N/A	42.145	AV

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 10:20
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH5240MHz by 802.11a ant2	



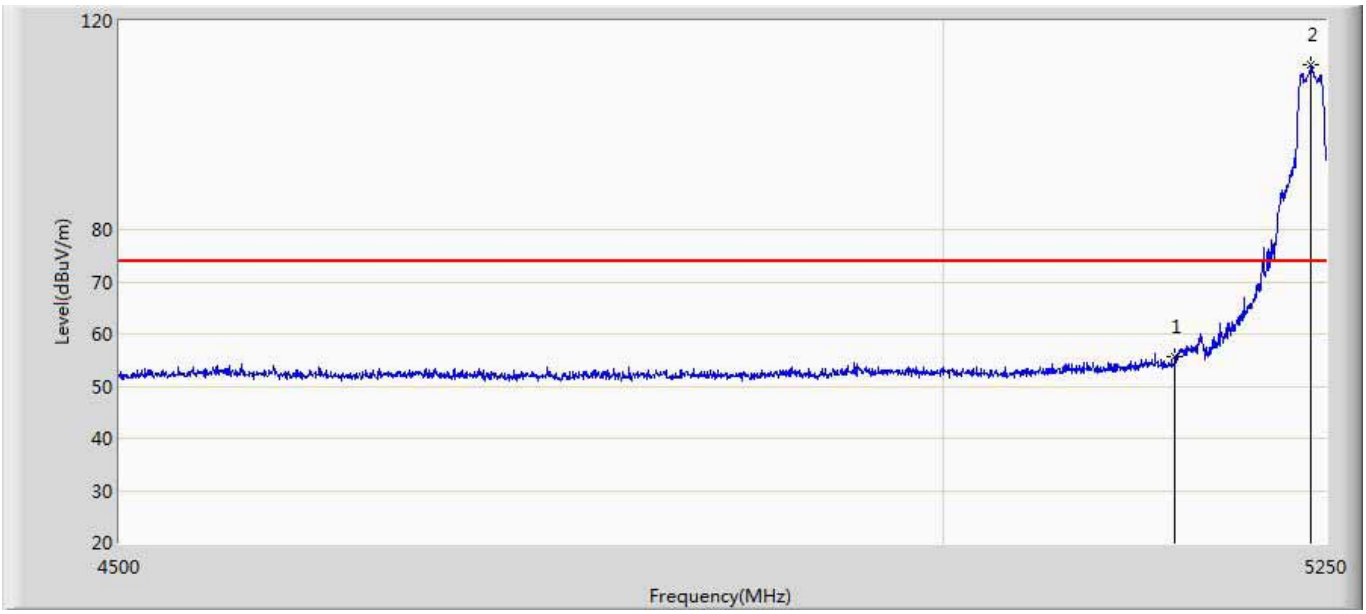
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	54.414	12.399	-19.586	74.000	42.015	PK
2	*	5241.000	109.994	67.853	N/A	N/A	42.141	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 10:21
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH5240MHz by 802.11a ant2	



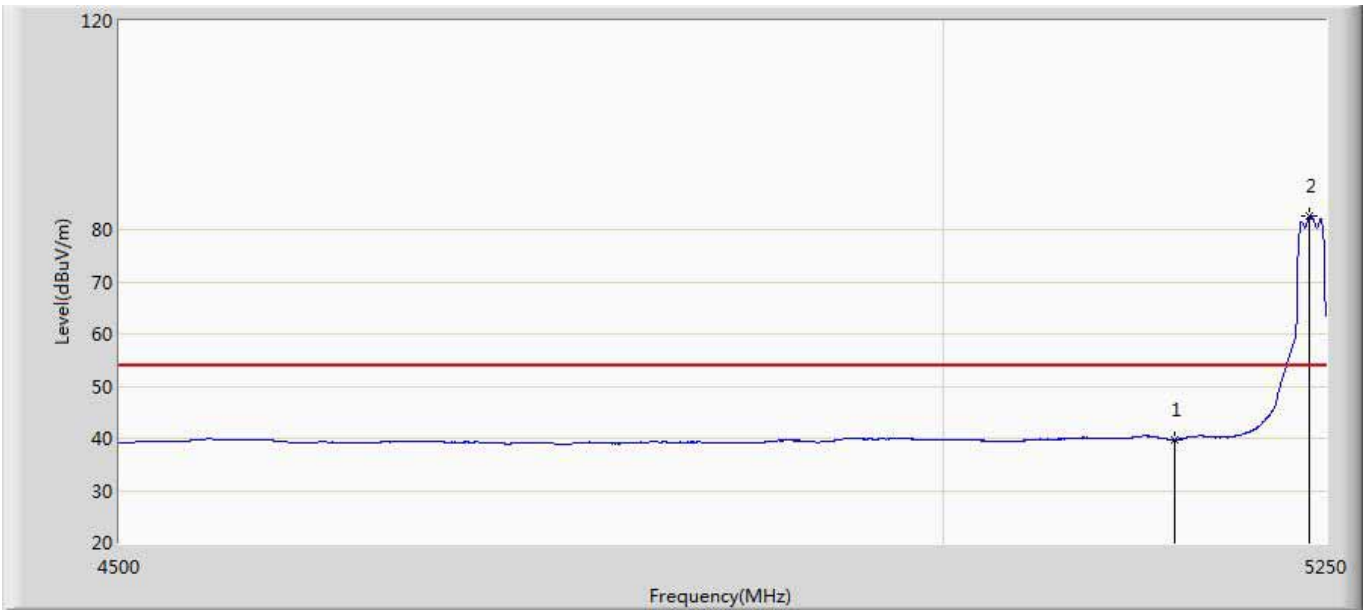
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	42.039	0.024	-11.961	54.000	42.015	AV
2	*	5238.750	99.780	57.661	N/A	N/A	42.119	AV

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 10:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH5240MHz by 802.11a ant2	



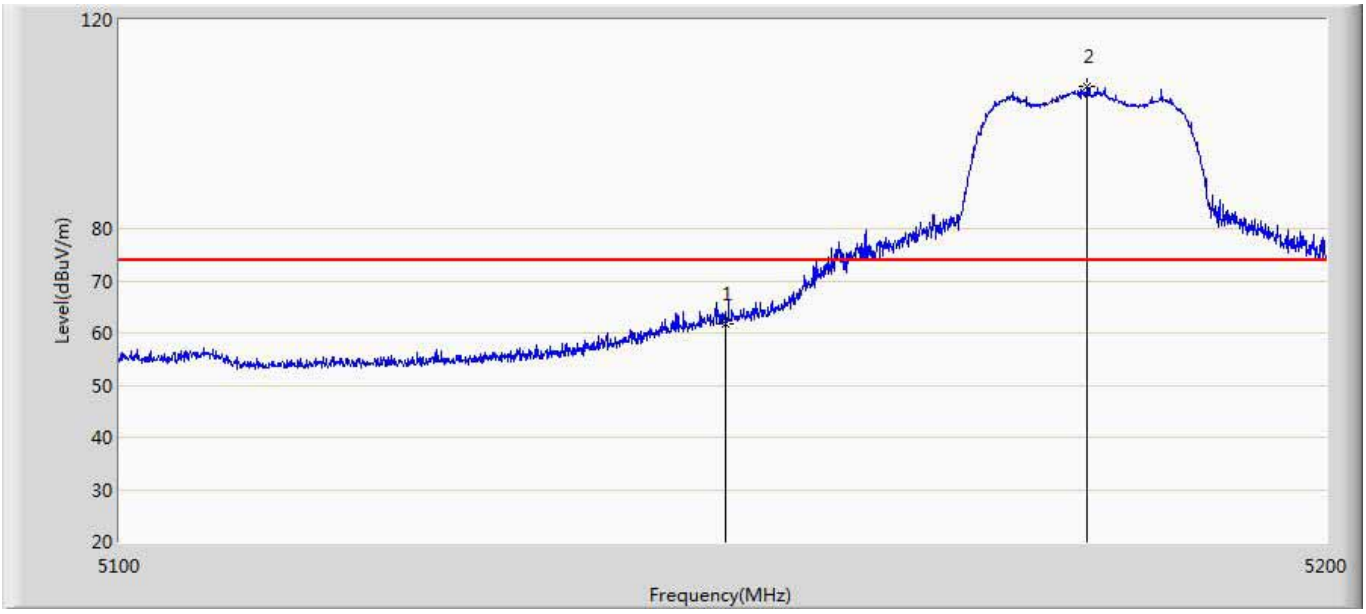
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	55.654	13.639	-18.346	74.000	42.015	PK
2	*	5239.875	111.674	69.544	N/A	N/A	42.130	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 10:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH5240MHz by 802.11a ant2	



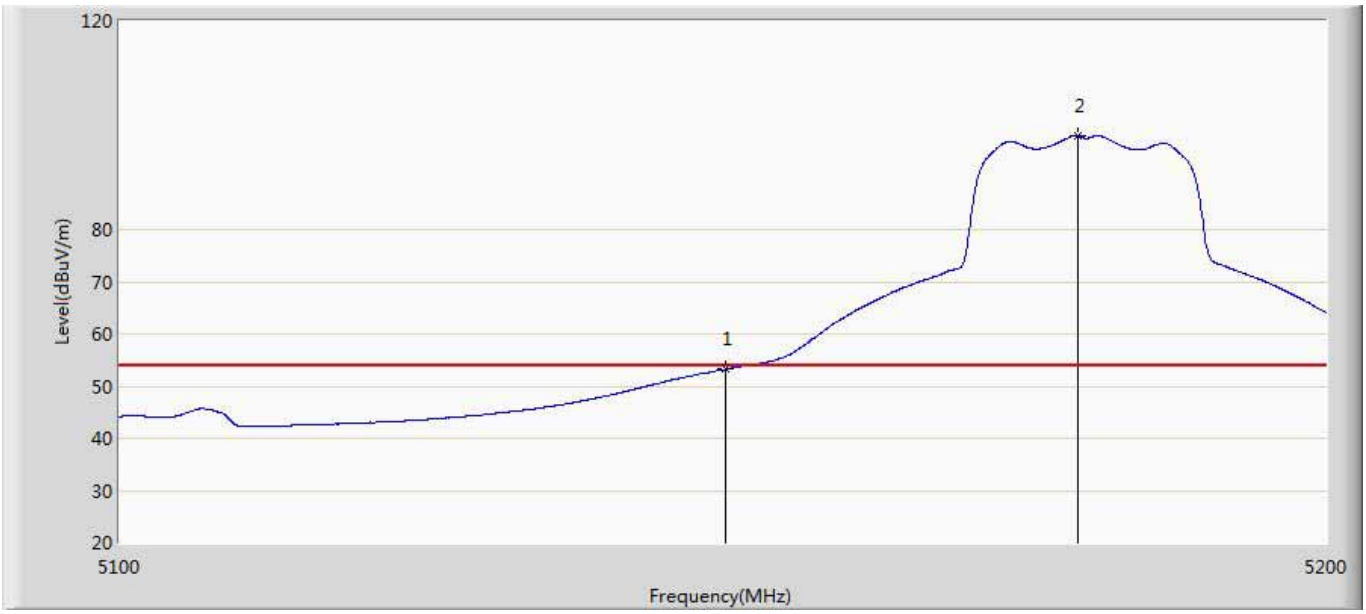
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	39.774	-2.241	-14.226	54.000	42.015	AV
2	*	5238.750	82.528	40.409	N/A	N/A	42.119	AV

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 10:34
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5180MHz by 802.11n20 ant2	



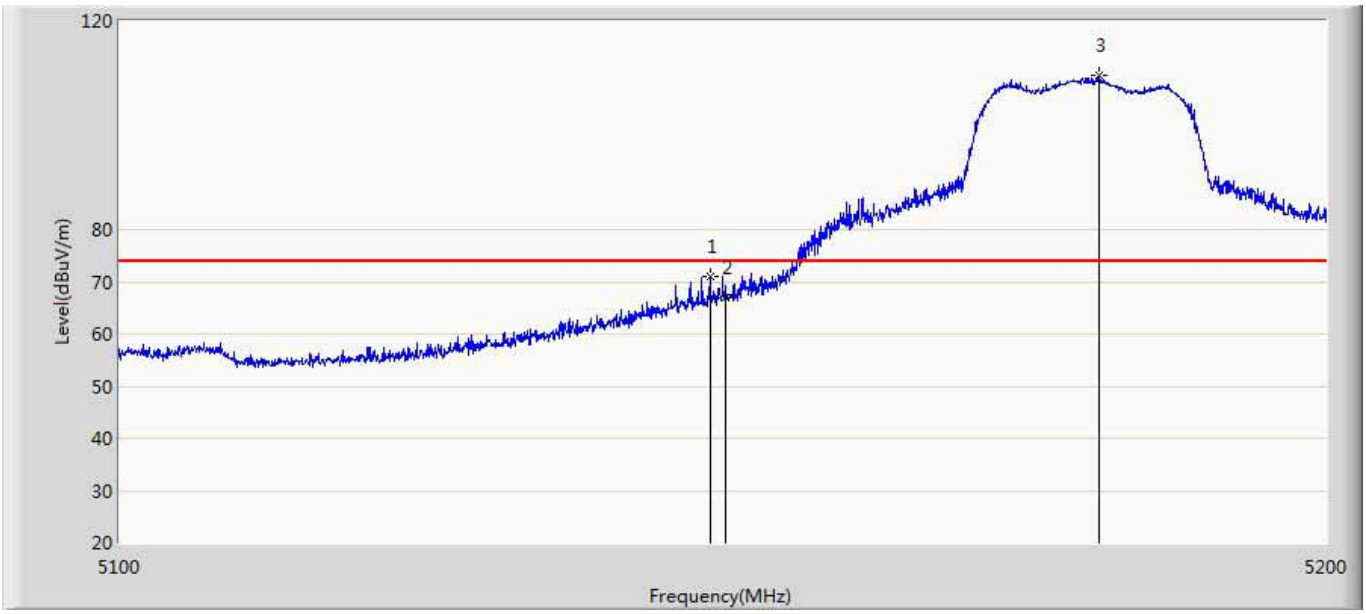
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	61.707	19.692	-12.293	74.000	42.015	PK
2	*	5180.000	107.280	65.135	N/A	N/A	42.145	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 10:34
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5180MHz by 802.11n20 ant2	



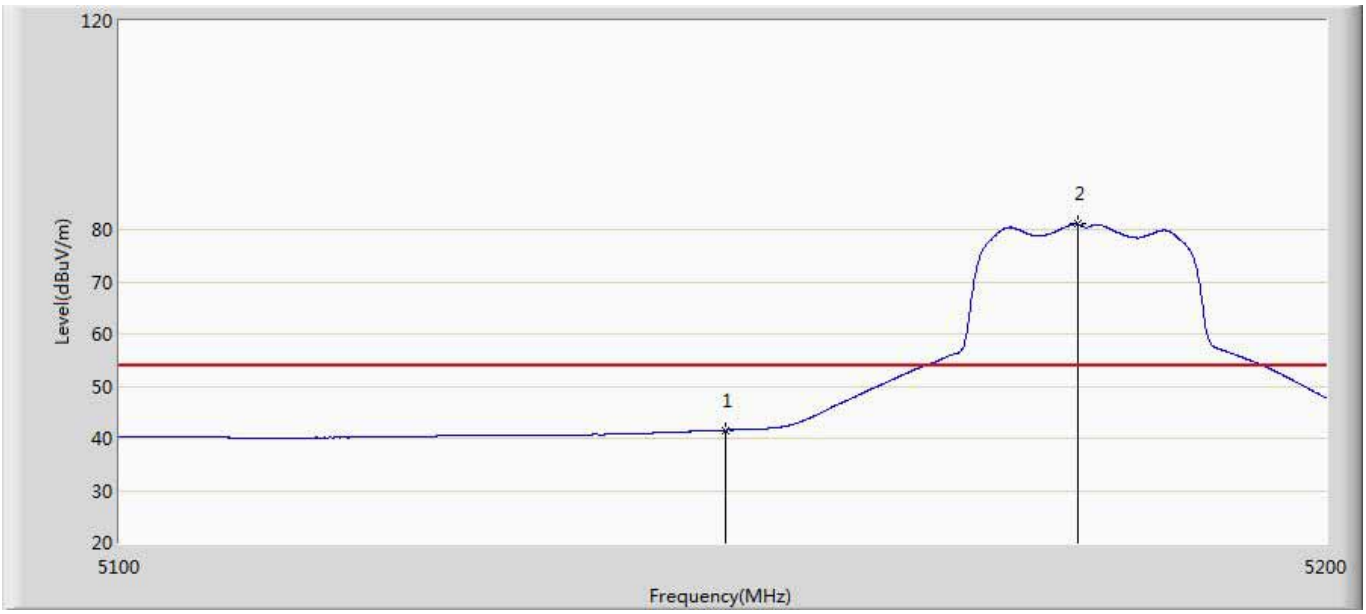
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	53.240	11.225	-0.760	54.000	42.015	AV
2	*	5179.300	97.997	55.852	N/A	N/A	42.145	AV

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 10:40
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5180MHz by 802.11n20 ant2	



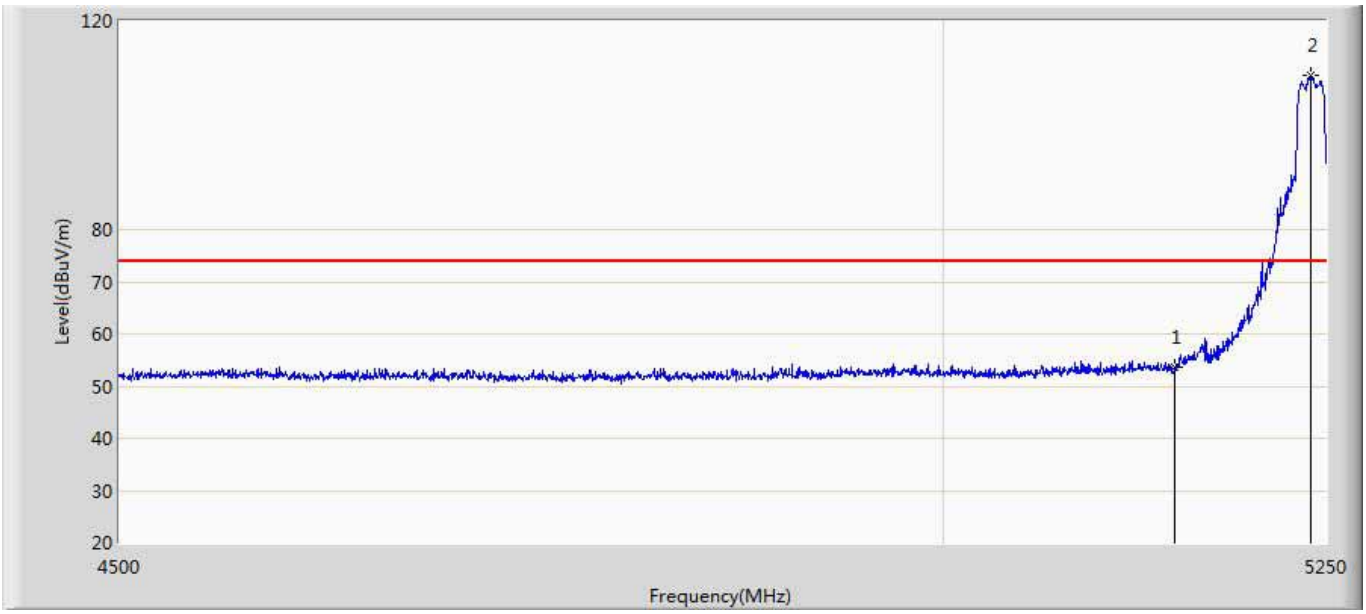
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5148.700	71.118	29.114	-2.882	74.000	42.004	PK
2		5150.000	66.904	24.889	-7.096	74.000	42.015	PK
3	*	5181.100	109.426	67.281	N/A	N/A	42.145	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 10:40
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5180MHz by 802.11n20 ant2	



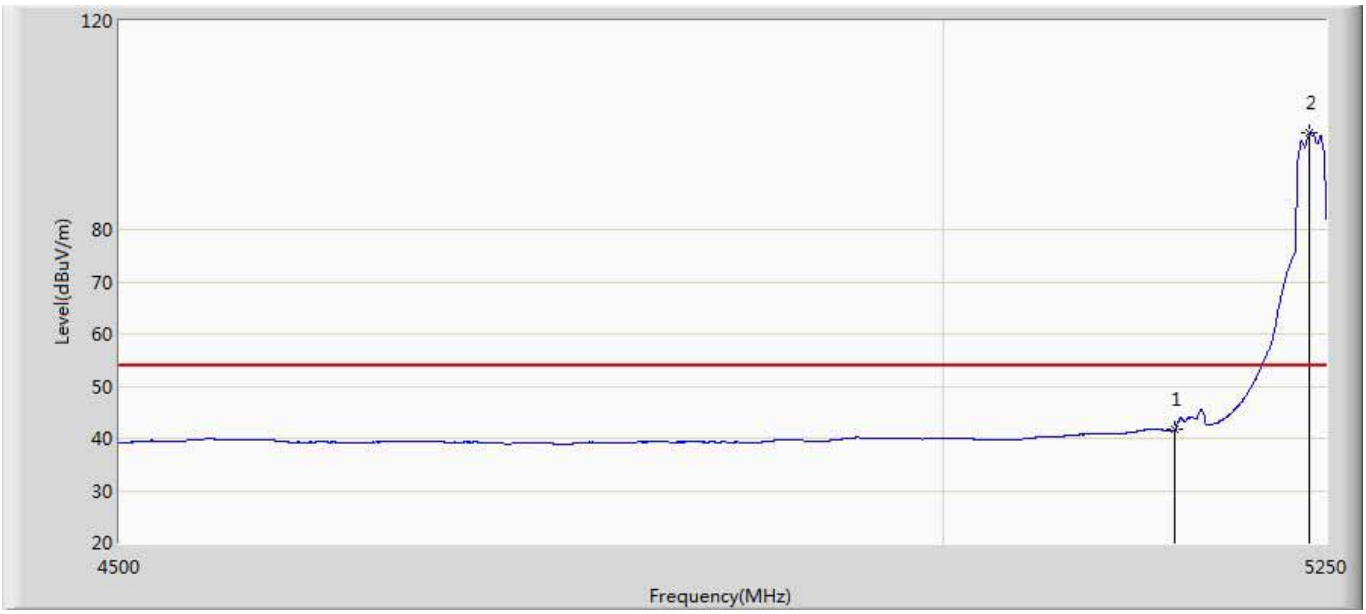
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	41.577	-0.438	-12.423	54.000	42.015	AV
2	*	5179.300	81.048	38.903	N/A	N/A	42.145	AV

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 10:44
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5240MHz by 802.11n20 ant2	



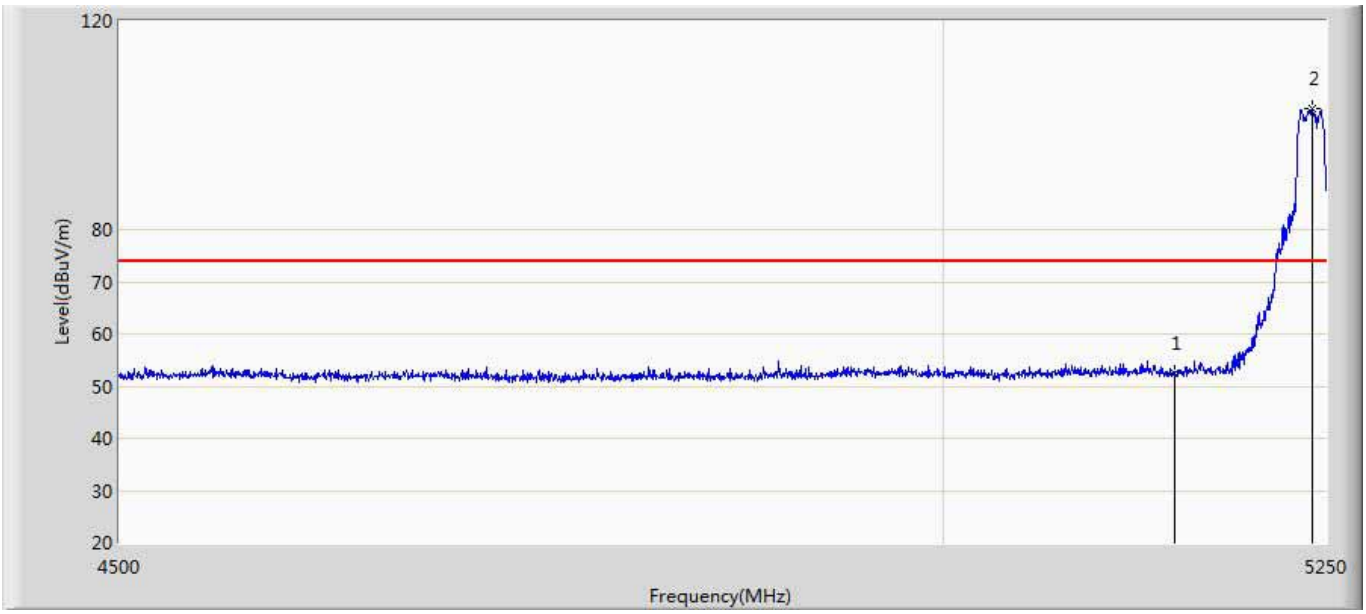
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	53.586	11.571	-20.414	74.000	42.015	PK
2	*	5240.250	109.566	67.432	N/A	N/A	42.134	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 10:45
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5240MHz by 802.11n20 ant2	



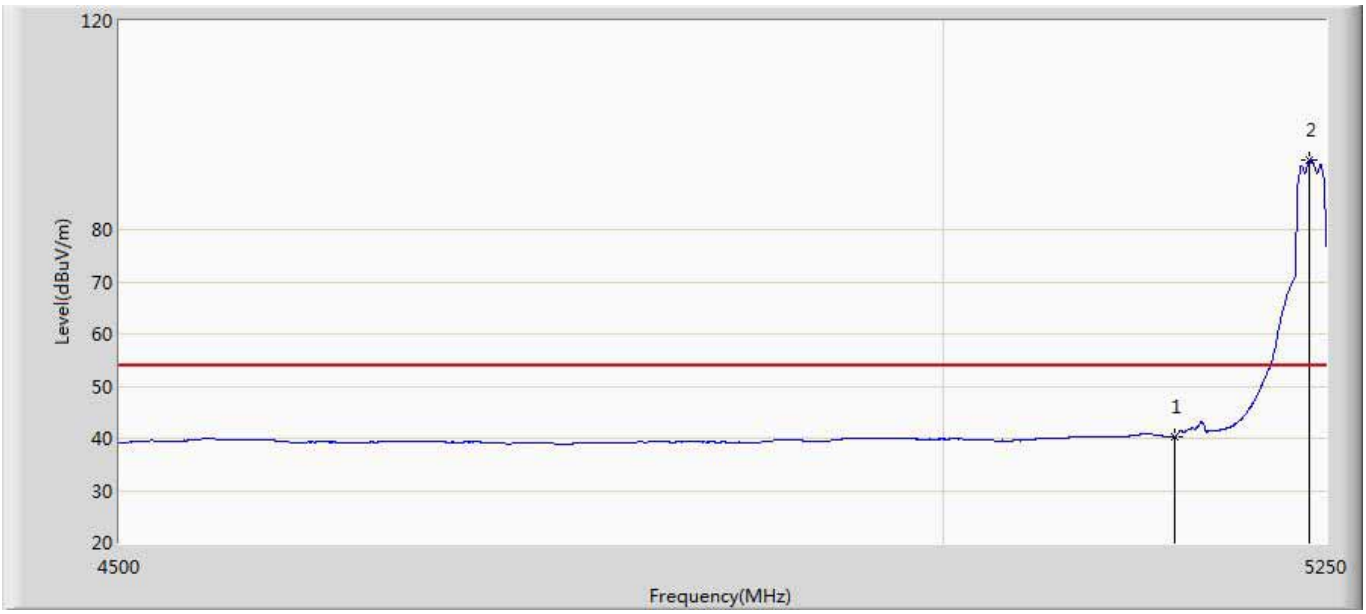
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	41.656	-0.359	-12.344	54.000	42.015	AV
2	*	5238.750	98.523	56.404	N/A	N/A	42.119	AV

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 10:49
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5240MHz by 802.11n20 ant2	



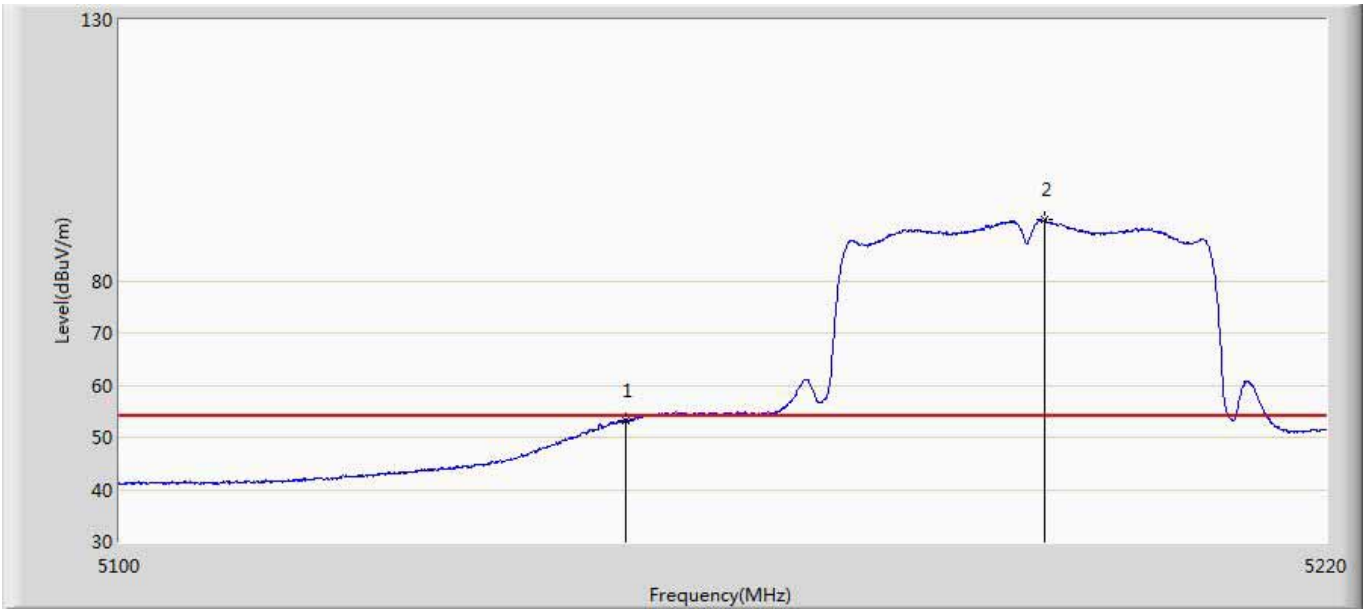
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	52.526	10.511	-21.474	74.000	42.015	PK
2	*	5240.625	103.179	61.041	N/A	N/A	42.138	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 10:49
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5240MHz by 802.11n20 ant2	



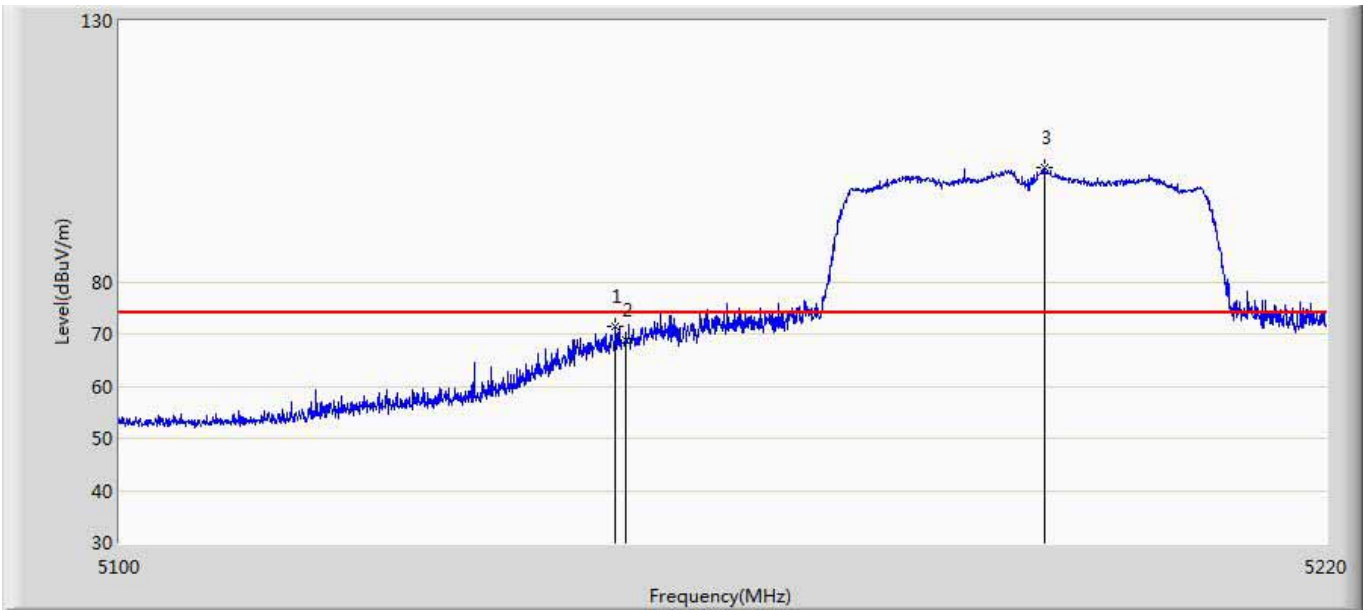
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	40.381	-1.634	-13.619	54.000	42.015	AV
2	*	5238.750	93.223	51.104	N/A	N/A	42.119	AV

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 10:58
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5190MHz by 802.11n40 ant2	



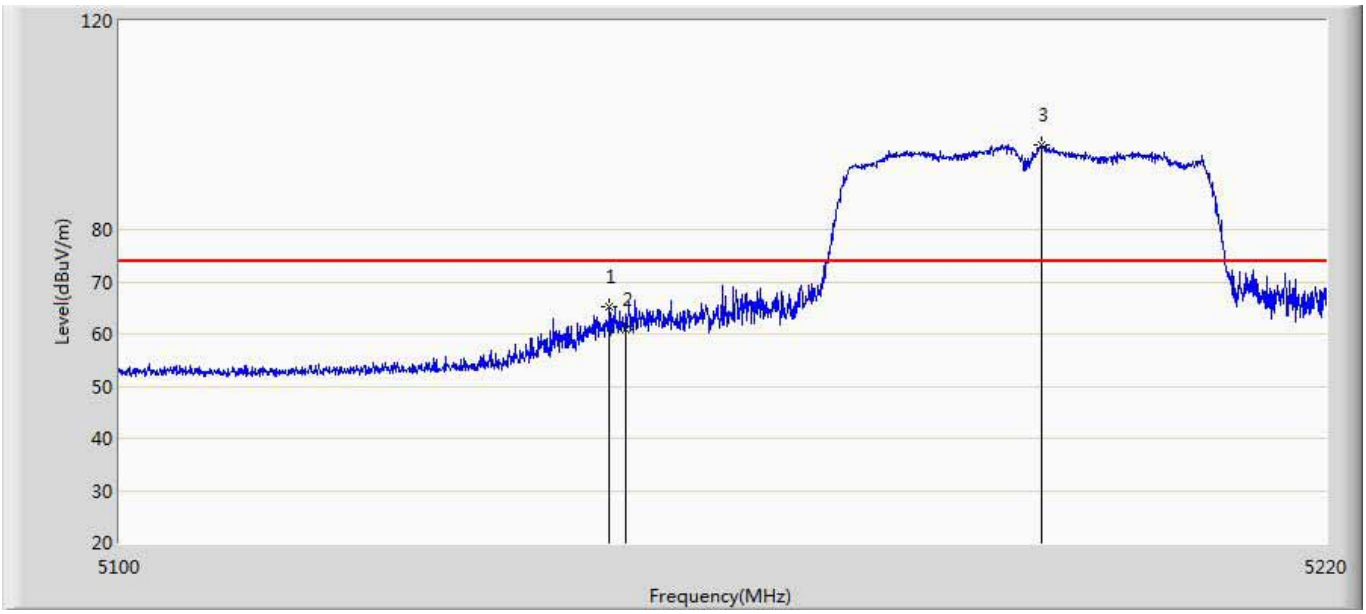
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	53.293	11.278	-0.707	54.000	42.015	AV
2	*	5191.800	91.647	49.564	N/A	N/A	42.083	AV

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 11:06
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5190MHz by 802.11n40 ant2	



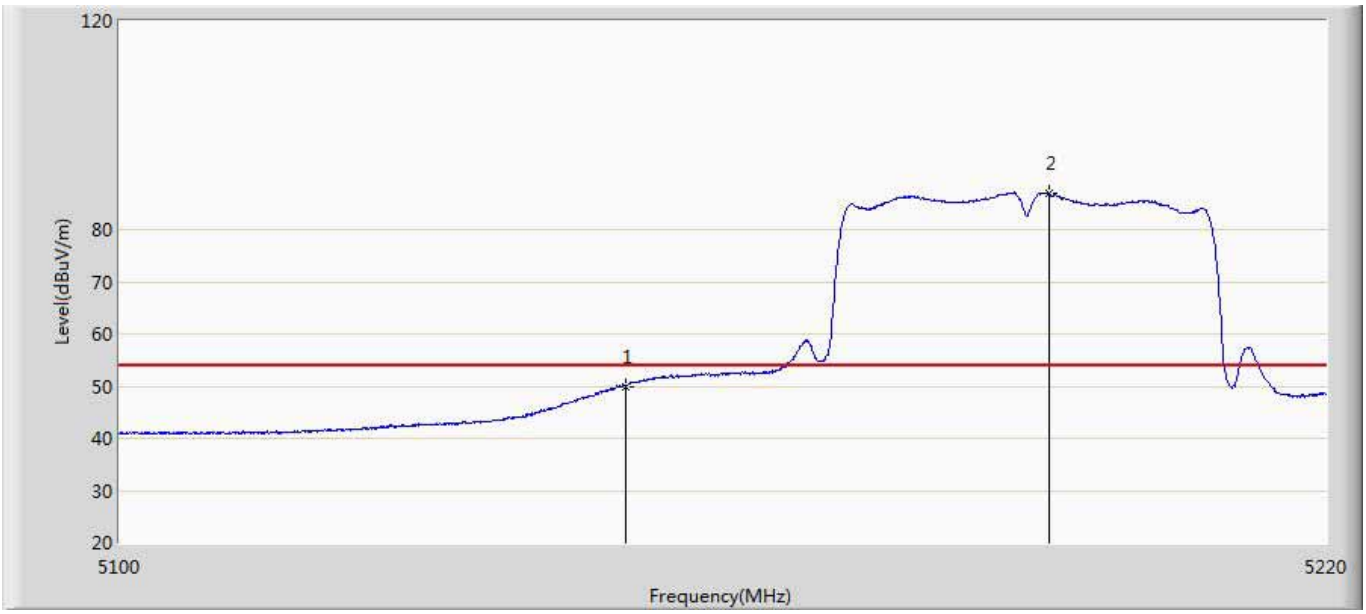
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5149.020	71.306	29.299	-2.694	74.000	42.007	PK
2		5150.000	68.916	26.901	-5.084	74.000	42.015	PK
3	*	5191.740	101.928	59.845	N/A	N/A	42.083	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 11:07
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5190MHz by 802.11n40 ant2	



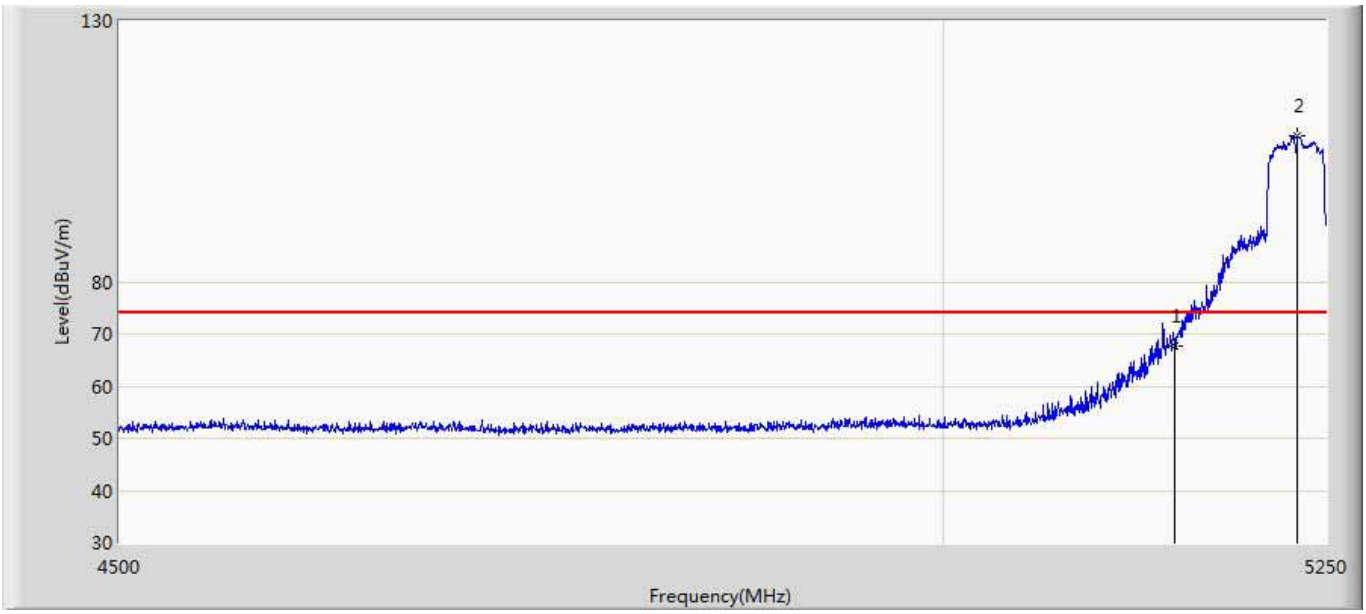
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5148.420	65.282	23.281	-8.718	74.000	42.001	PK
2		5150.000	60.948	18.933	-13.052	74.000	42.015	PK
3	*	5191.500	96.334	54.250	N/A	N/A	42.084	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 11:14
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5190MHz by 802.11n40 ant2	



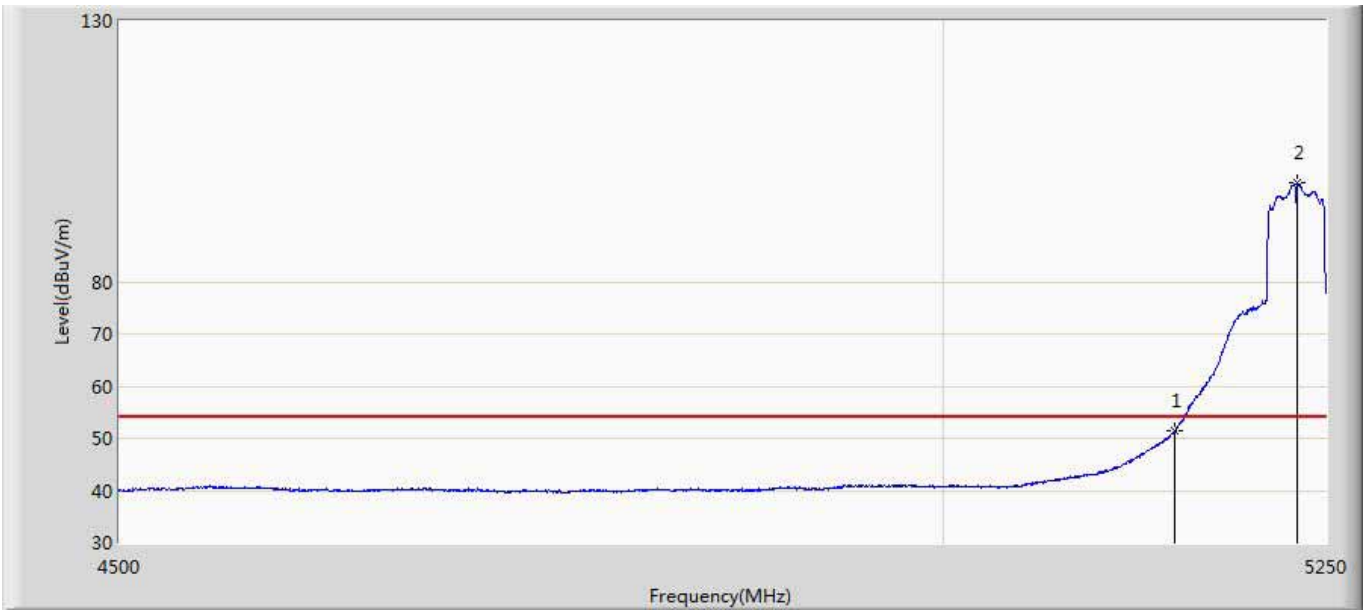
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	49.979	7.964	-4.021	54.000	42.015	AV
2	*	5192.160	86.947	44.867	N/A	N/A	42.080	AV

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 11:20
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5230MHz by 802.11n40 ant2	



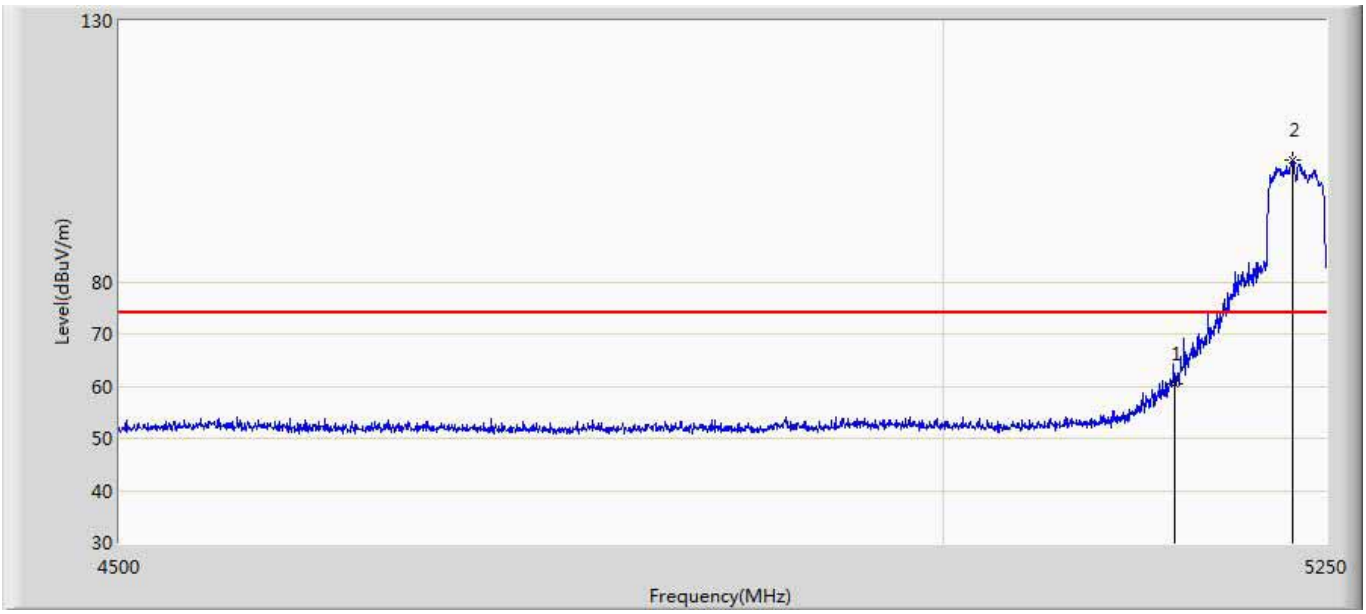
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	67.715	25.700	-6.285	74.000	42.015	PK
2	*	5231.250	107.987	65.933	N/A	N/A	42.054	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 11:21
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5230MHz by 802.11n40 ant2	



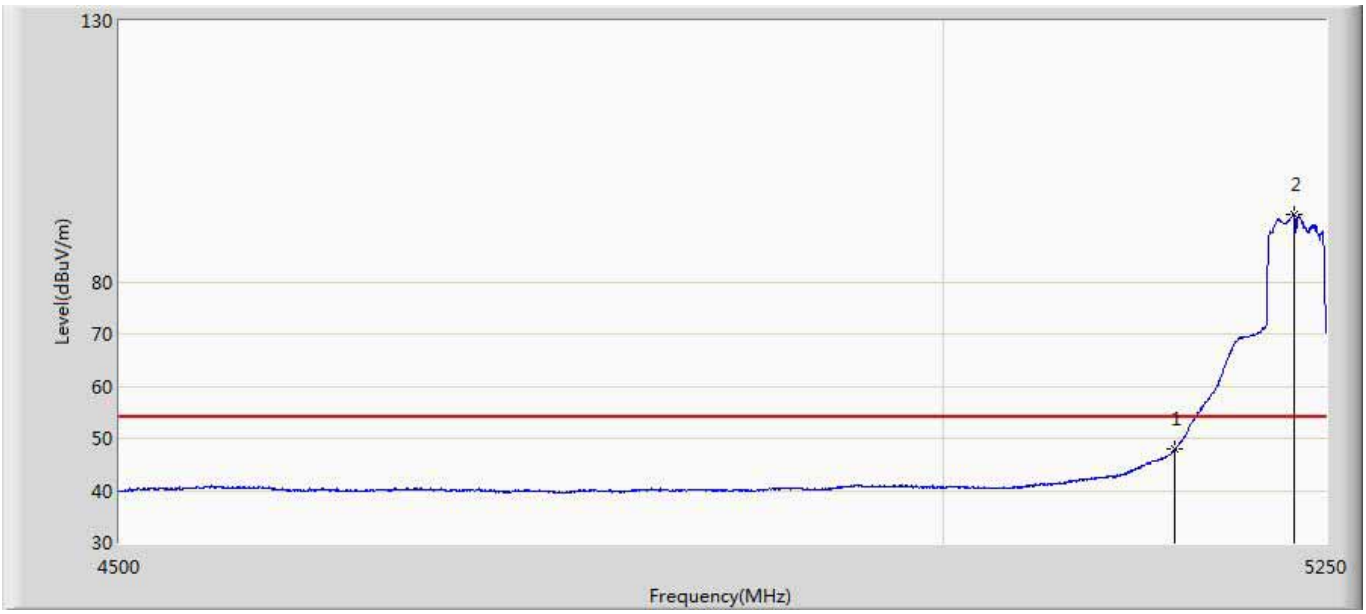
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	51.387	9.372	-2.613	54.000	42.015	AV
2	*	5231.250	98.841	56.787	N/A	N/A	42.054	AV

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 11:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5230MHz by 802.11n40 ant2	



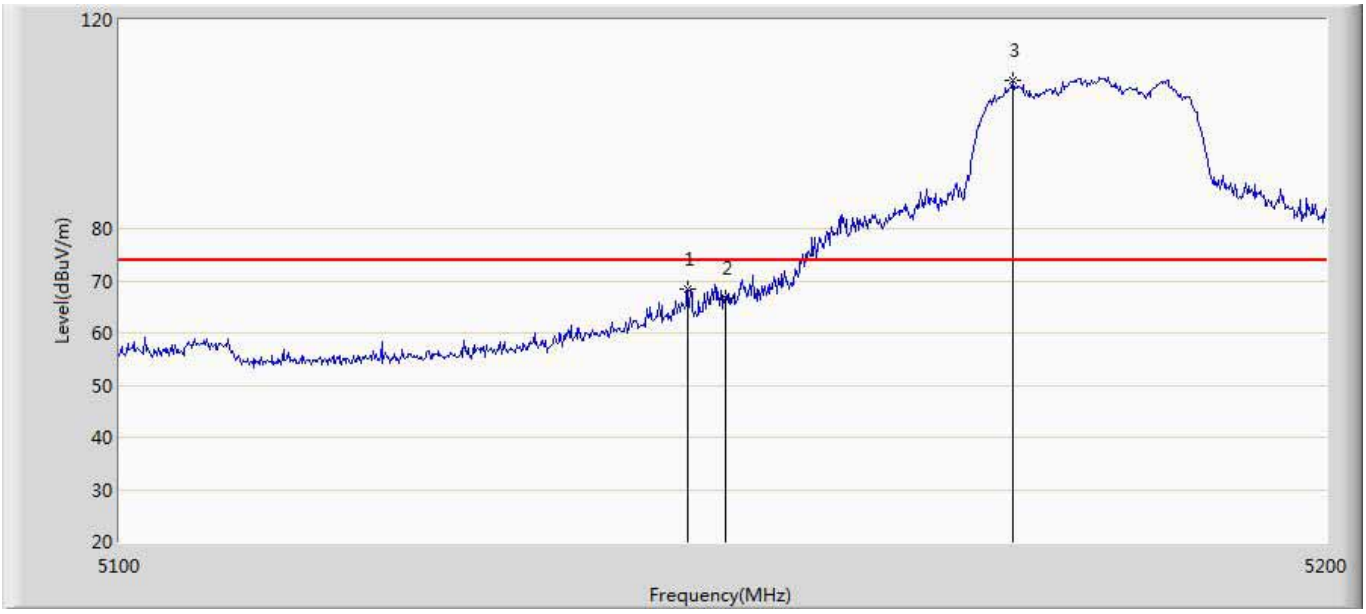
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	60.577	18.562	-13.423	74.000	42.015	PK
2	*	5227.500	103.206	61.169	N/A	N/A	42.036	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 11:25
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5230MHz by 802.11n40 ant2	



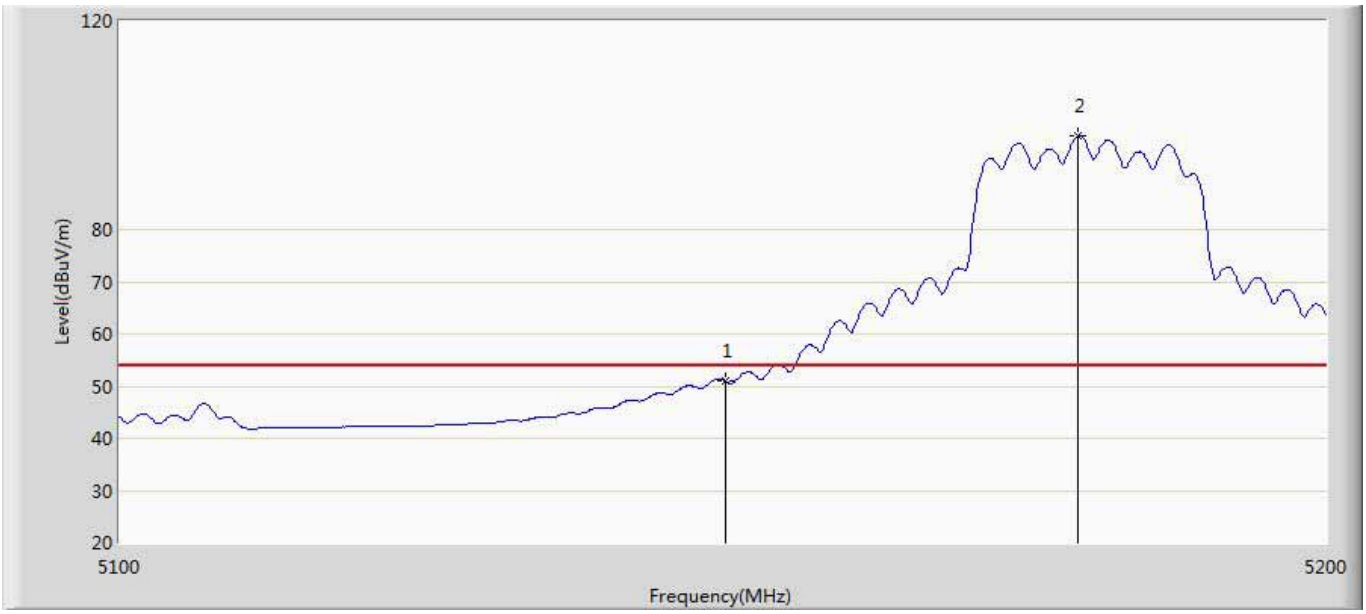
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	47.967	5.952	-6.033	54.000	42.015	AV
2	*	5228.625	92.930	50.888	N/A	N/A	42.042	AV

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 11:54
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5180MHz by 802.11n20 ant1+2	



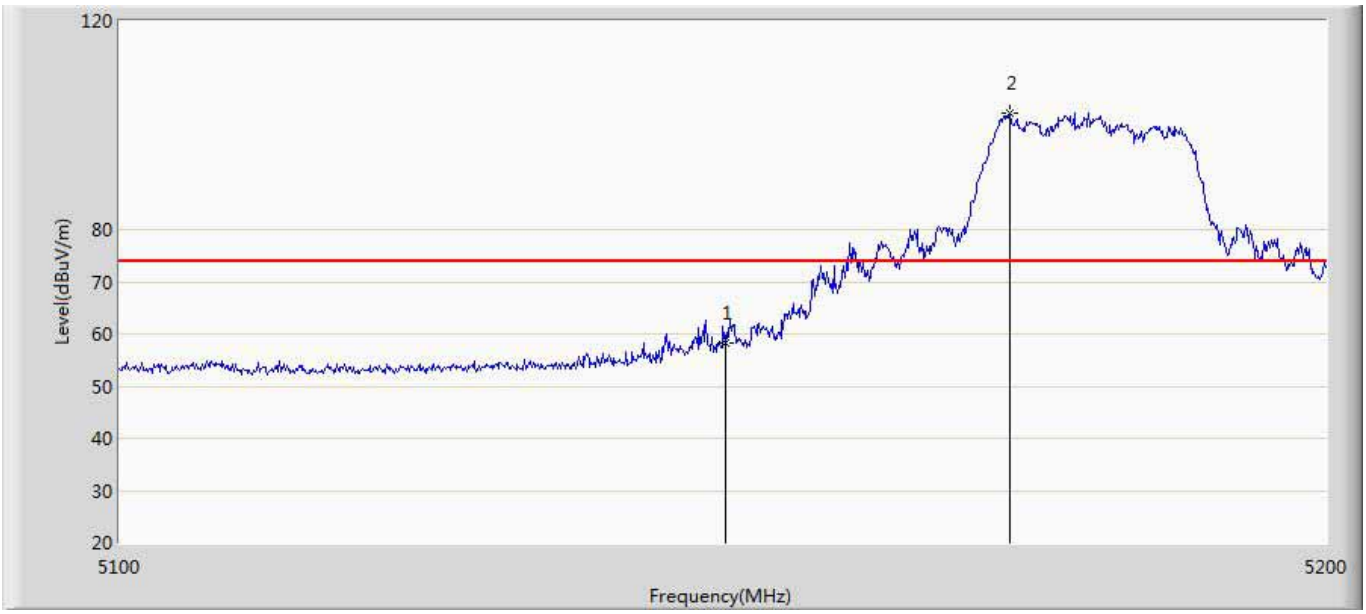
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5146.900	68.353	26.339	-5.647	74.000	42.014	PK
2		5150.000	66.542	24.527	-7.458	74.000	42.015	PK
3	*	5173.900	108.352	66.207	N/A	N/A	42.146	PK

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 11:49
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5180MHz by 802.11n20 ant1+2	



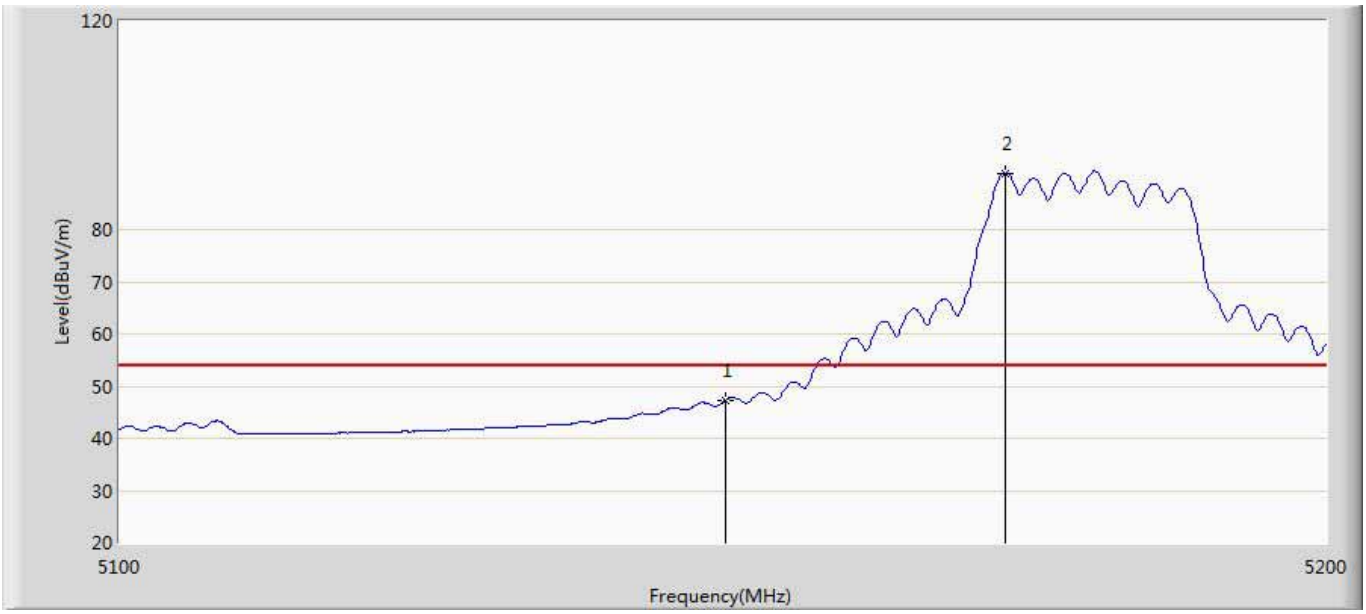
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	50.956	8.941	-3.044	54.000	42.015	AV
2	*	5179.300	97.896	55.751	N/A	N/A	42.145	AV

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 11:55
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5180MHz by 802.11n20 ant1+2	



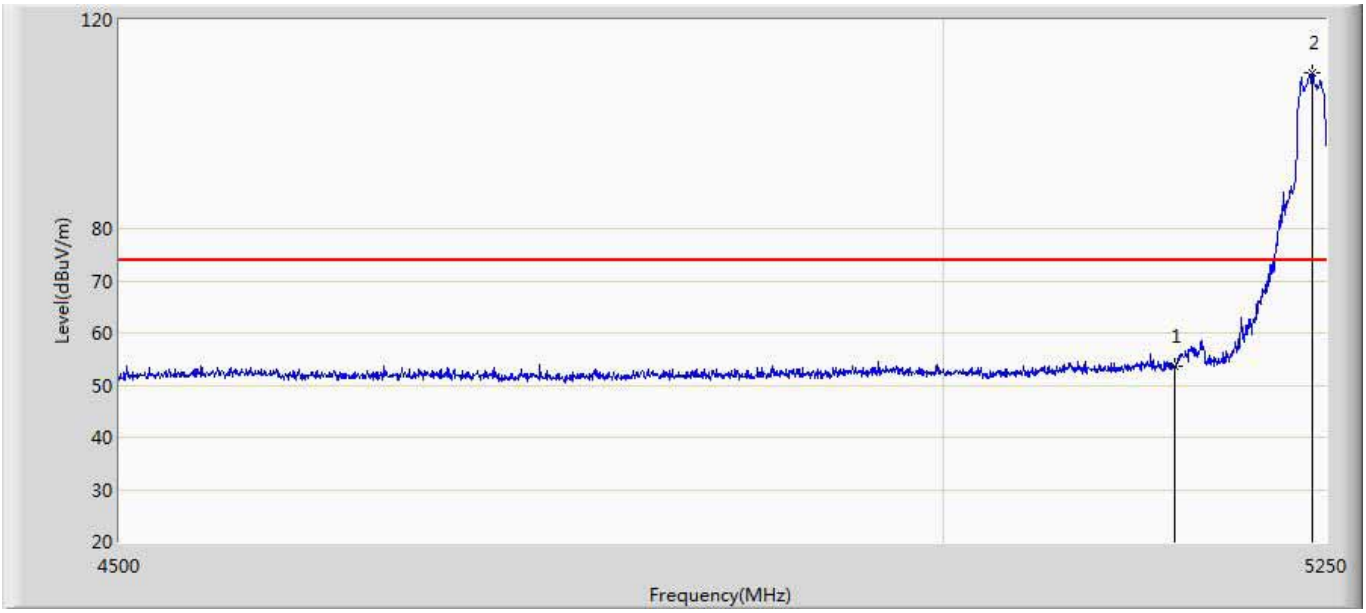
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	58.389	16.374	-15.611	74.000	42.015	PK
2	*	5173.600	102.347	60.202	N/A	N/A	42.146	PK

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 11:56
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5180MHz by 802.11n20 ant1+2	



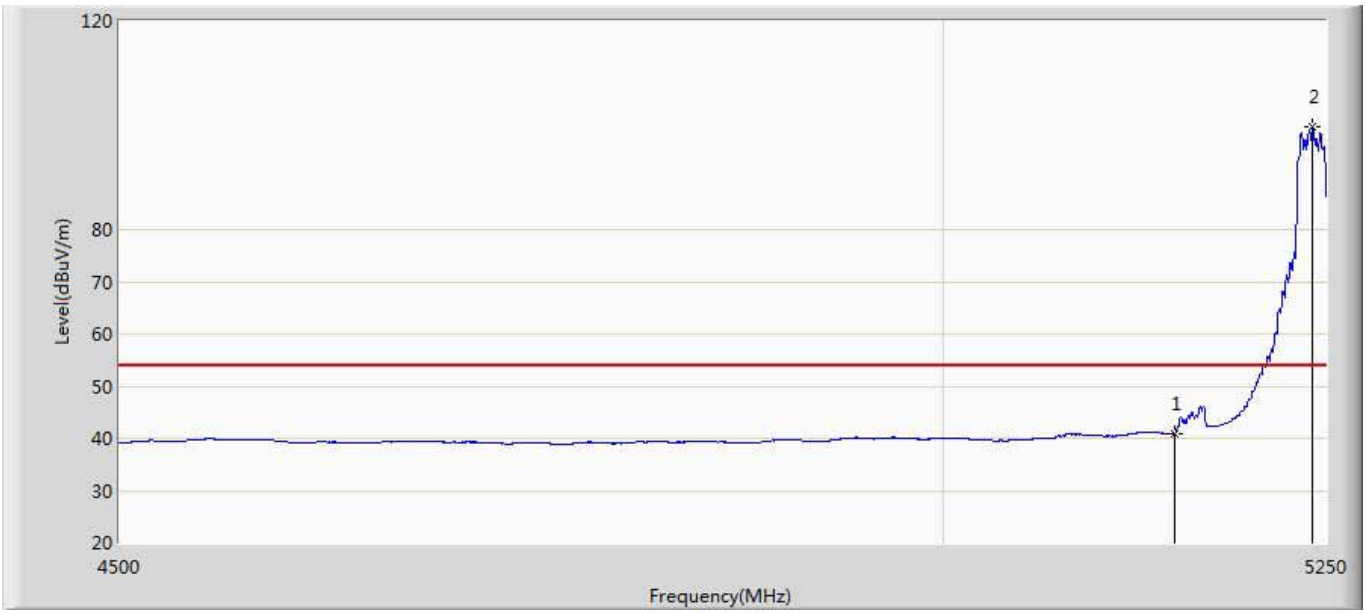
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	47.332	5.317	-6.668	54.000	42.015	AV
2	*	5173.300	90.845	48.700	N/A	N/A	42.145	AV

Engineer: Scott	
Site: AC5	Time: 2016/01/16 - 15:37
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5240MHz by 802.11n20 ant1+2	



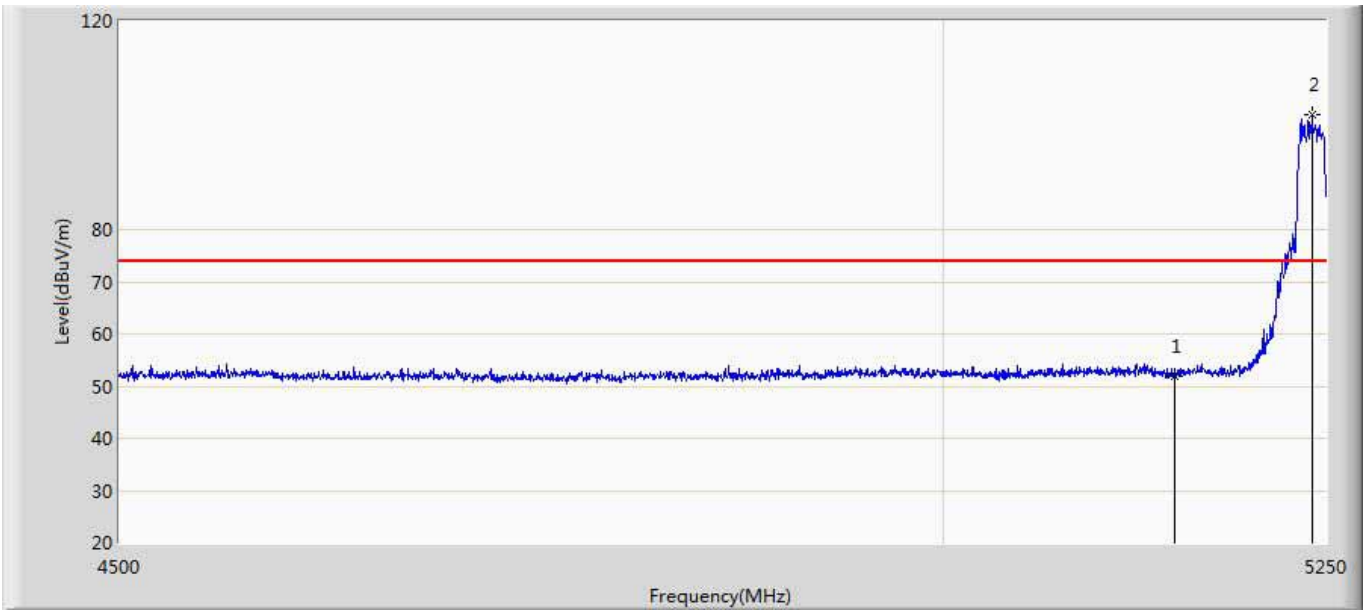
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	53.545	11.530	-20.455	74.000	42.015	PK
2	*	5241.000	109.780	67.639	N/A	N/A	42.141	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/16 - 15:55
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5240MHz by 802.11n20 ant1+2	



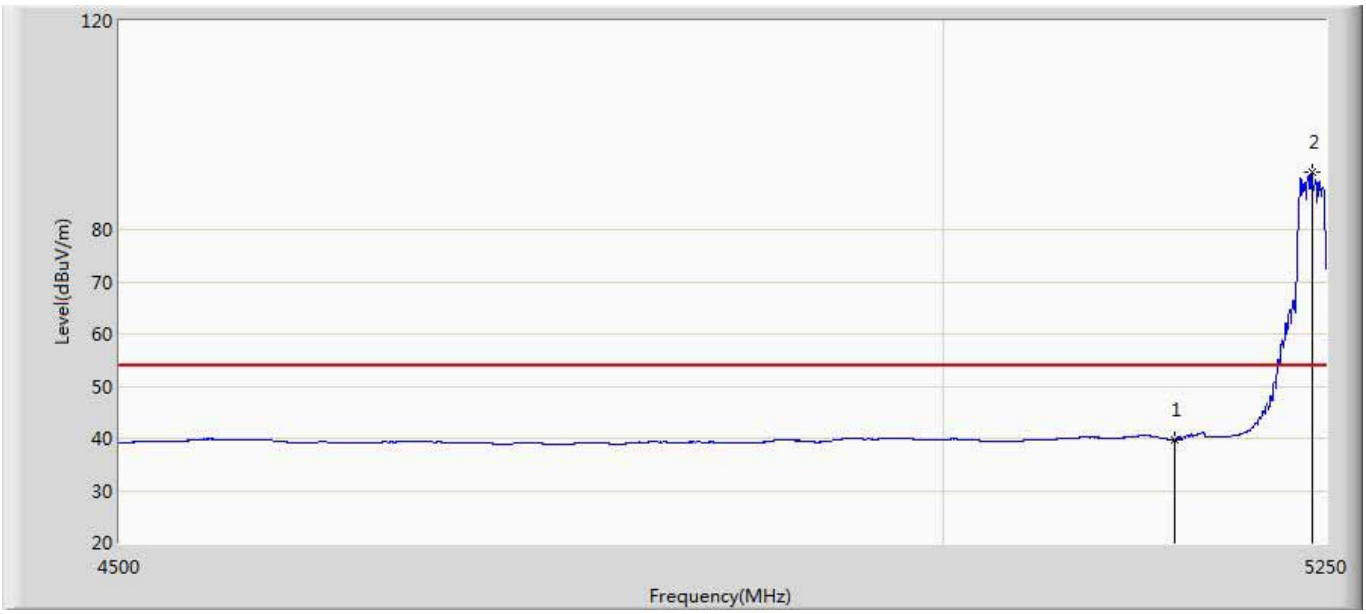
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	40.987	-1.028	-13.013	54.000	42.015	AV
2	*	5241.000	99.786	57.645	N/A	N/A	42.141	AV

Engineer: Scott	
Site: AC5	Time: 2016/01/16 - 15:58
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5240MHz by 802.11n20 ant1+2	



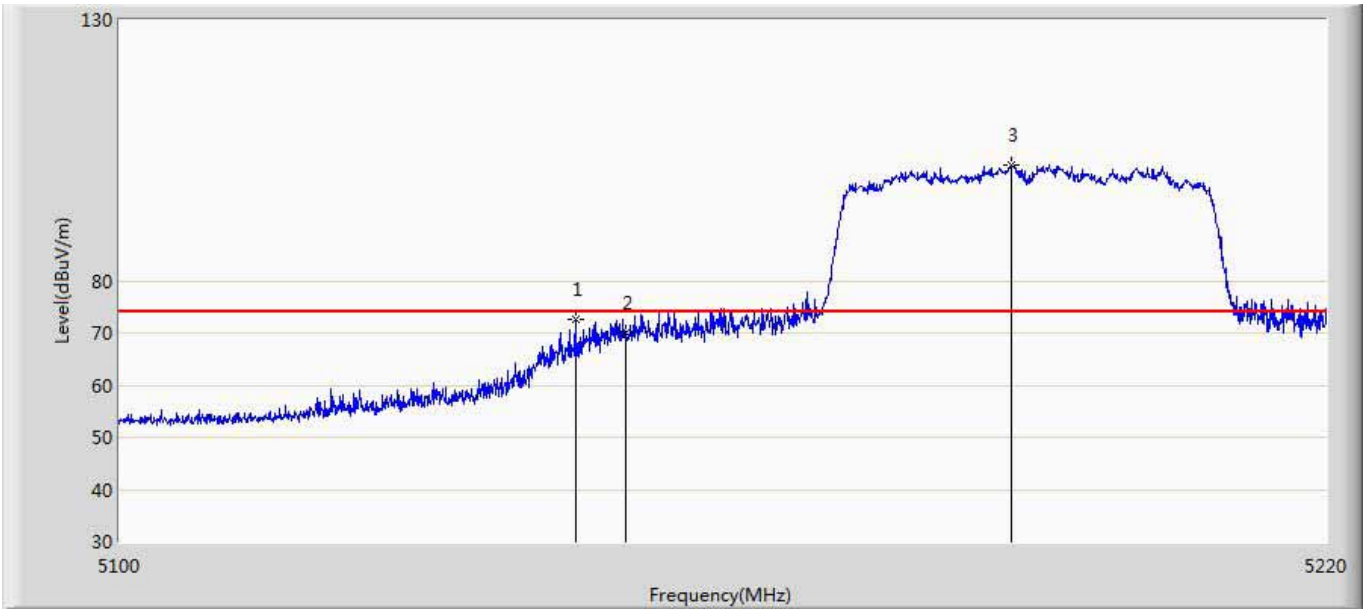
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	51.922	9.907	-22.078	74.000	42.015	PK
2	*	5241.000	102.025	59.884	N/A	N/A	42.141	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/16 - 15:59
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5240MHz by 802.11n20 ant1+2	



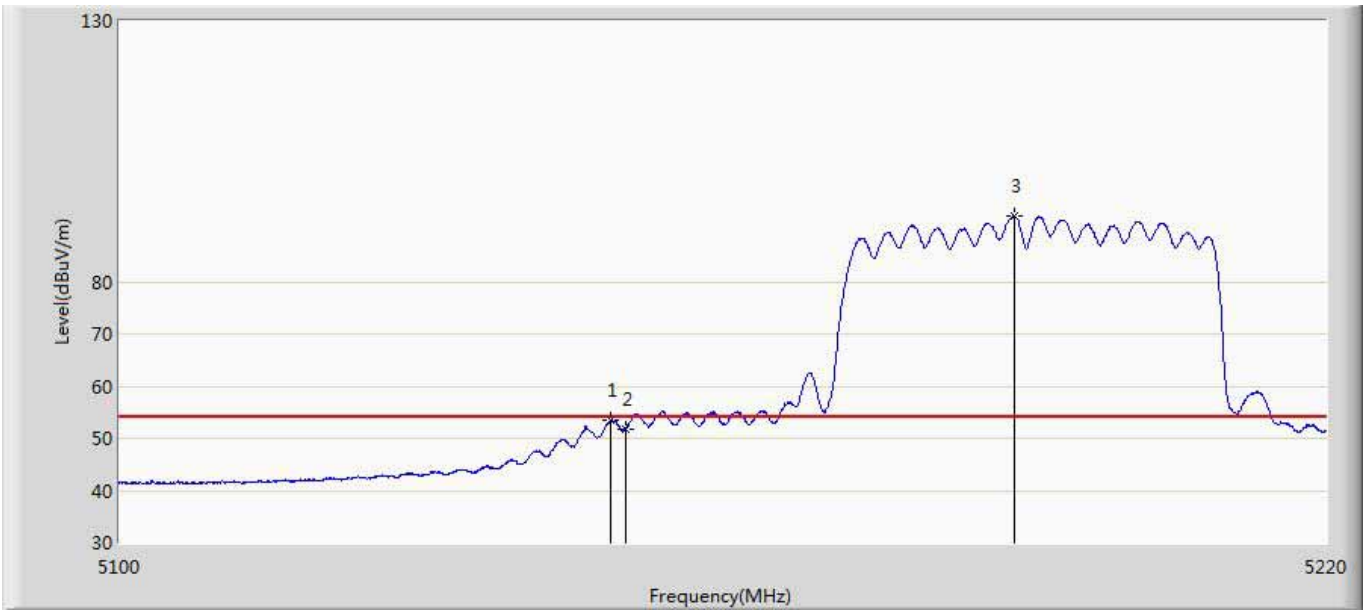
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	39.778	-2.237	-14.222	54.000	42.015	AV
2	*	5240.625	91.030	48.892	N/A	N/A	42.138	AV

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 15:21
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5190MHz by 802.11n40 ant1+2	



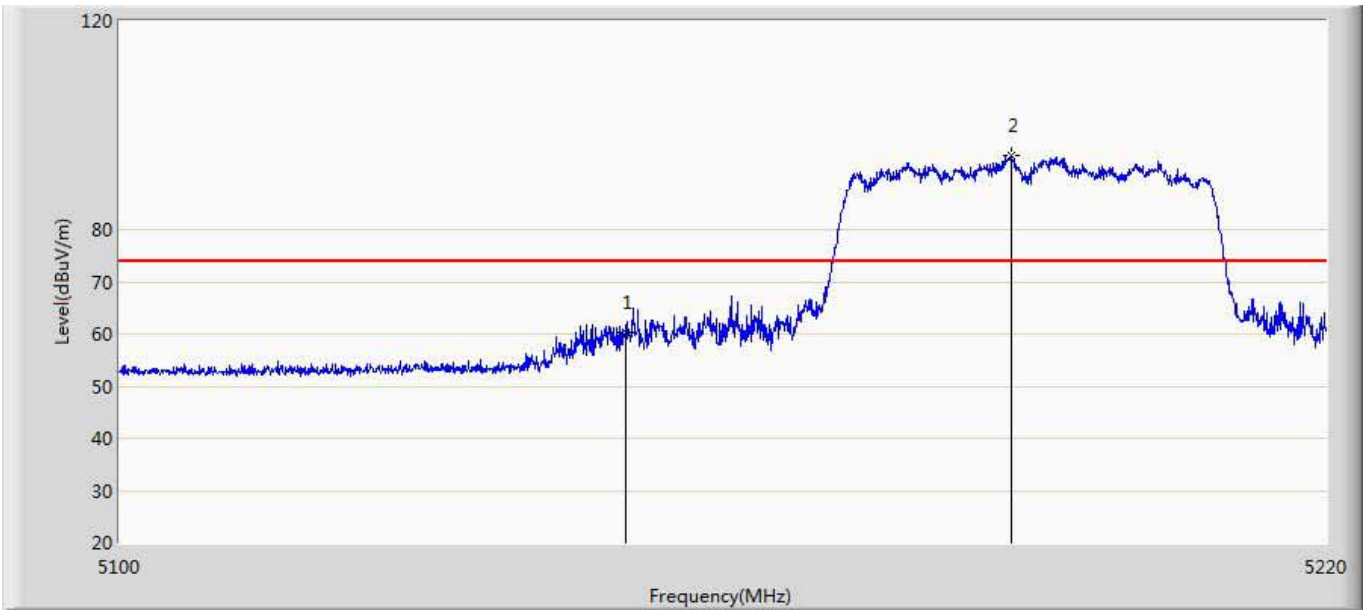
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5145.060	72.492	30.451	-1.508	74.000	42.041	PK
2		5150.000	70.073	28.058	-3.927	74.000	42.015	PK
3	*	5188.500	102.243	60.139	N/A	N/A	42.103	PK

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 15:22
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5190MHz by 802.11n40 ant1+2	



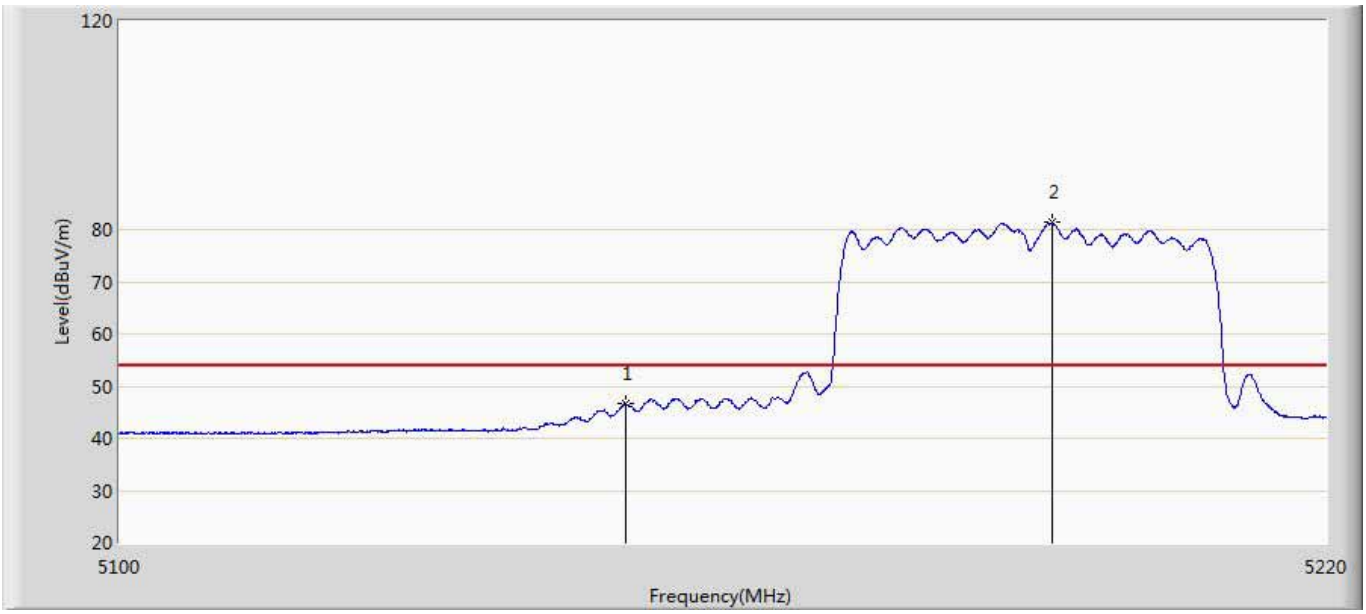
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5148.480	53.500	11.498	-0.500	54.000	42.001	AV
2		5150.000	51.779	9.764	-2.221	54.000	42.015	AV
3	*	5188.680	92.653	50.550	N/A	N/A	42.103	AV

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 15:29
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5190MHz by 802.11n40 ant1+2	



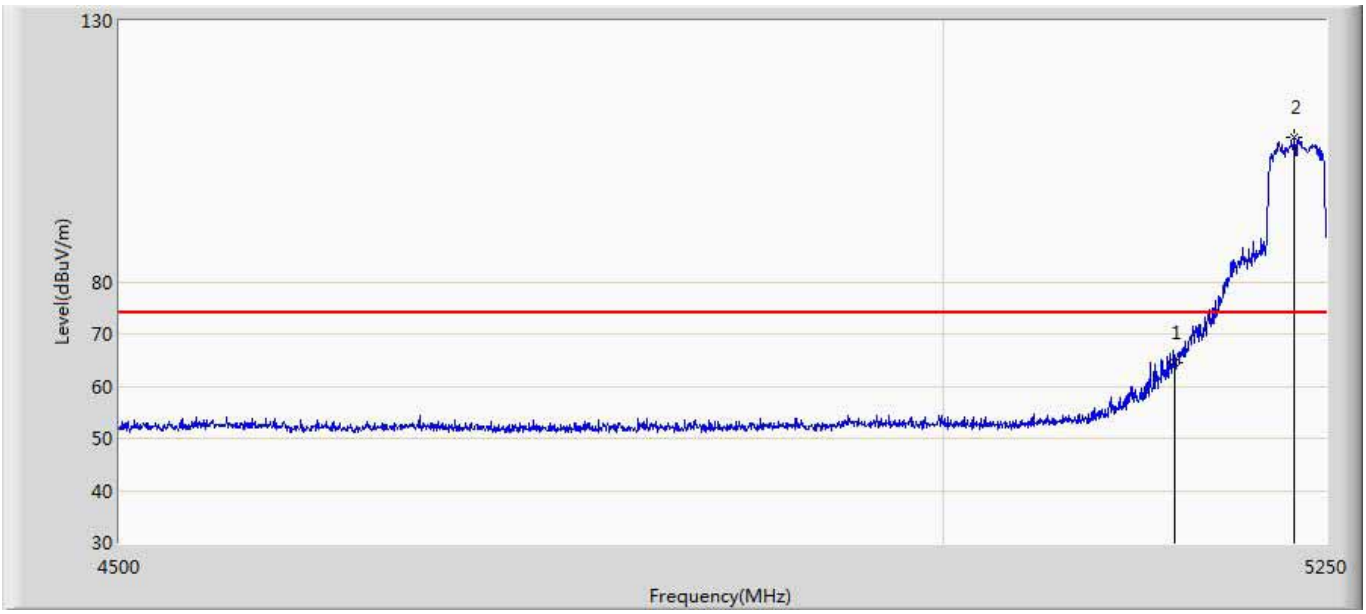
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	60.184	18.169	-13.816	74.000	42.015	PK
2	*	5188.440	94.117	52.013	N/A	N/A	42.104	PK

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 15:29
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5190MHz by 802.11n40 ant1+2	



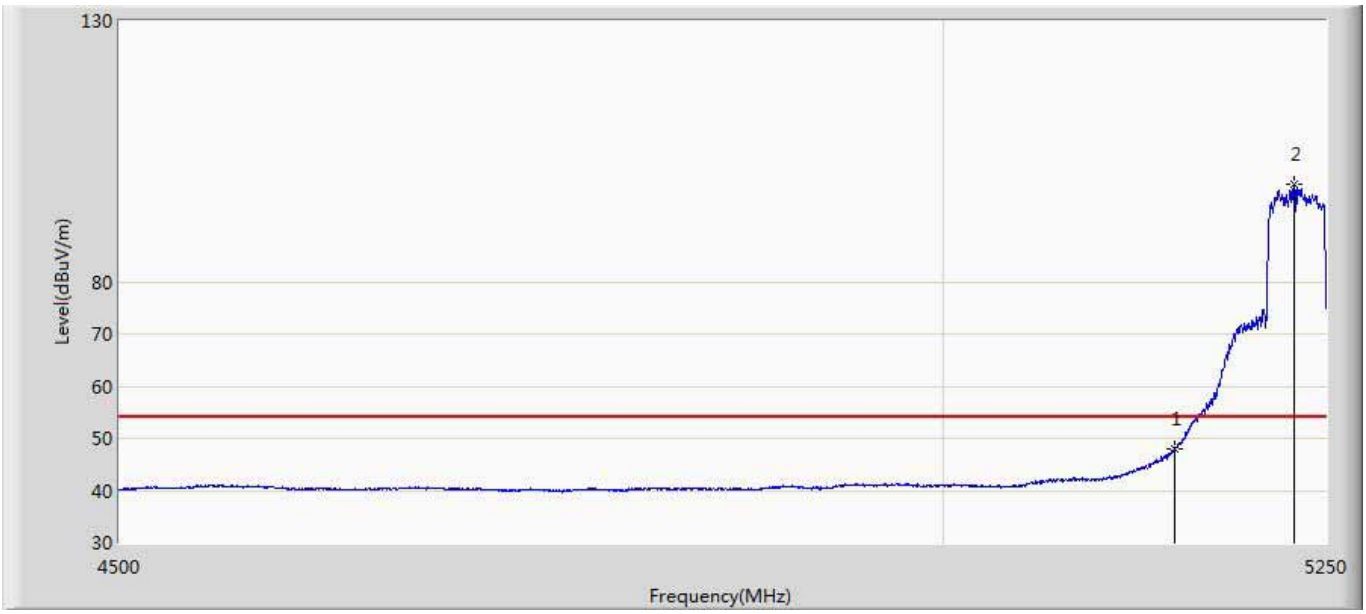
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	46.564	4.549	-7.436	54.000	42.015	AV
2	*	5192.520	81.336	39.258	N/A	N/A	42.078	AV

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 15:34
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5230MHz by 802.11n40 ant1+2	



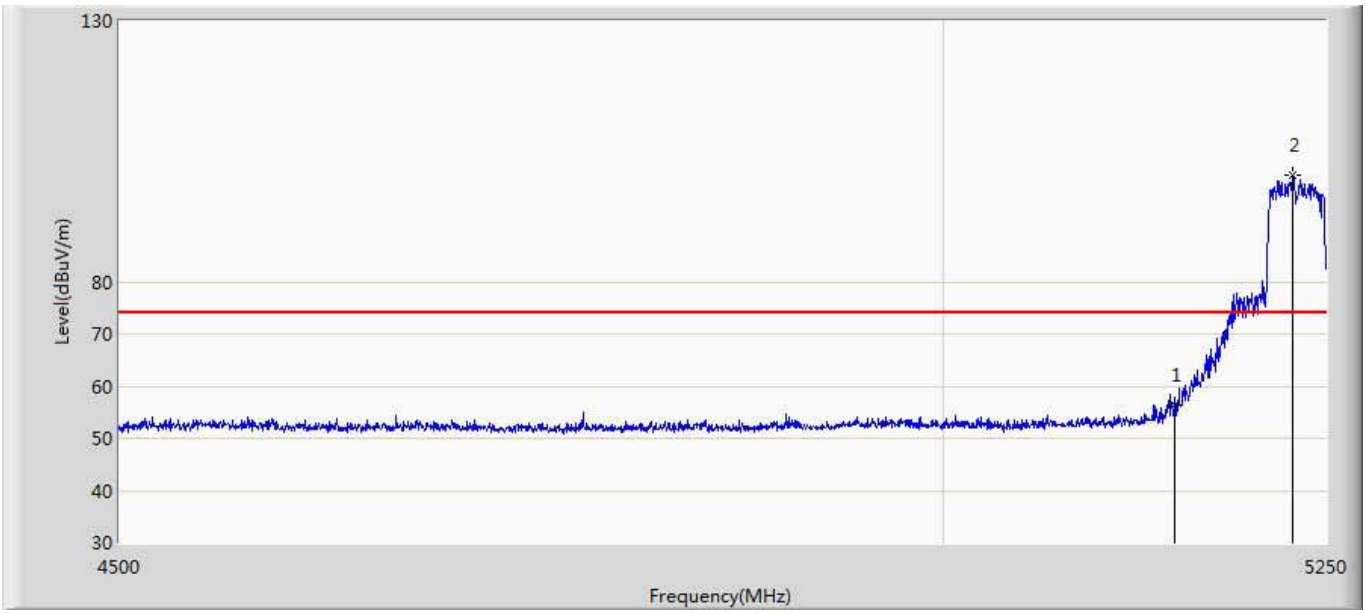
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	64.531	22.516	-9.469	74.000	42.015	PK
2	*	5228.625	107.764	65.722	N/A	N/A	42.042	PK

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 15:34
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5230MHz by 802.11n40 ant1+2	



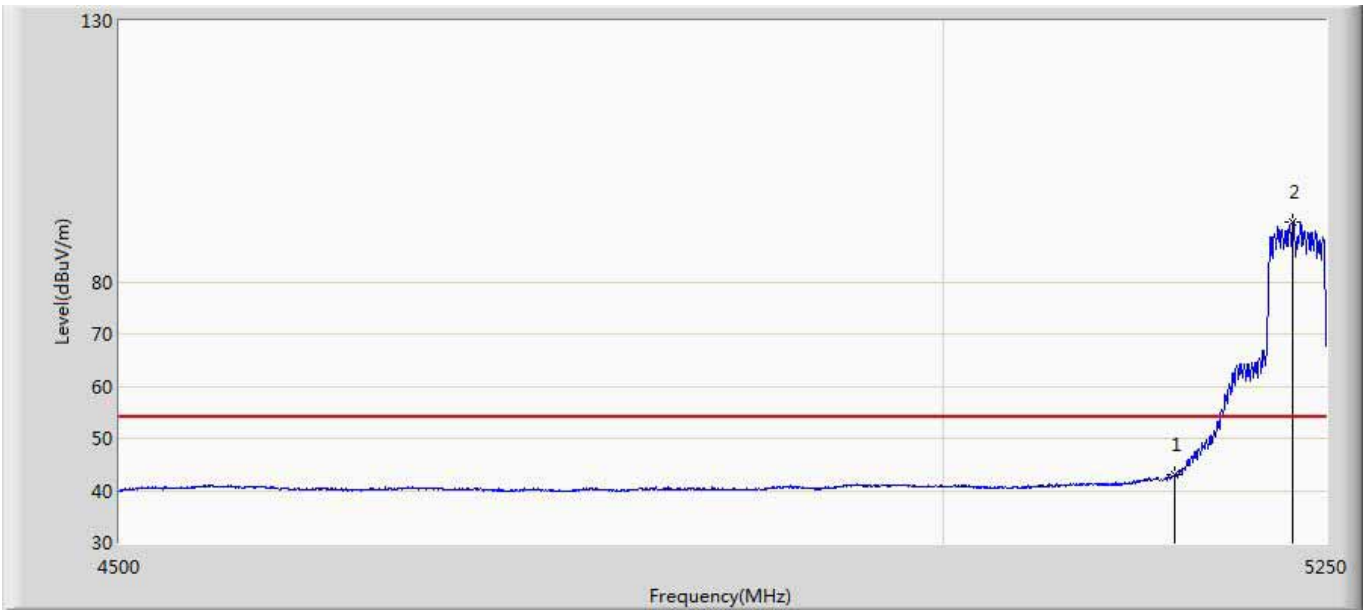
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	48.092	6.077	-5.908	54.000	42.015	AV
2	*	5228.625	98.618	56.576	N/A	N/A	42.042	AV

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 15:38
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5230MHz by 802.11n40 ant1+2	



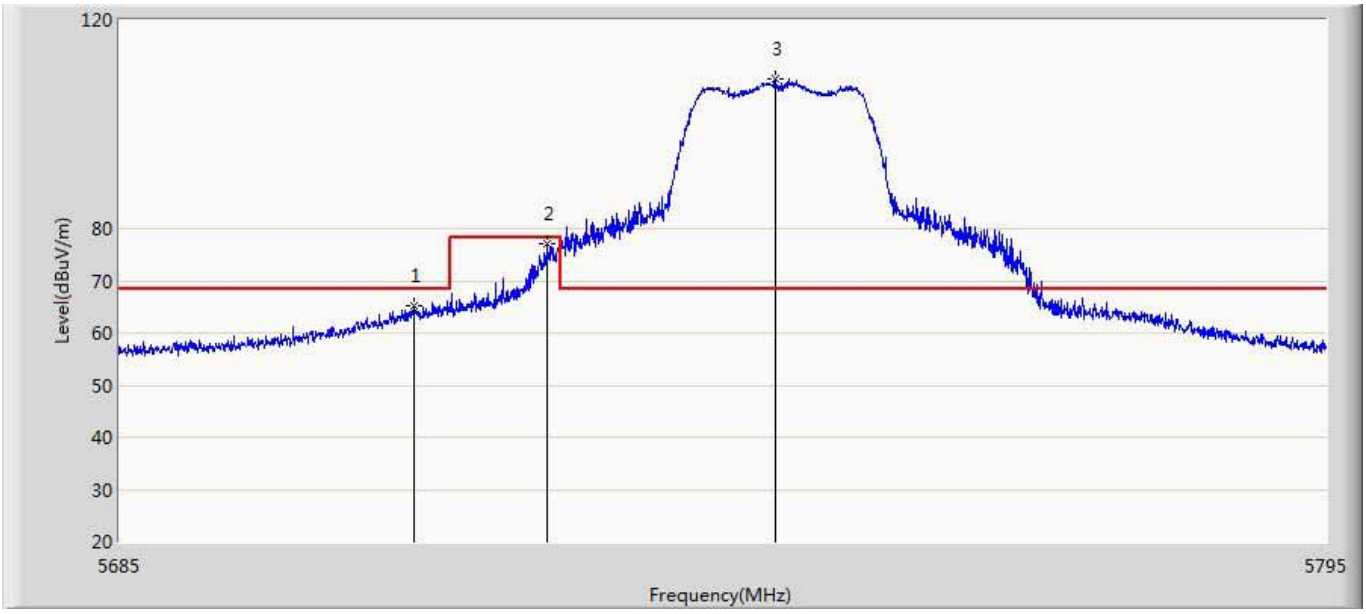
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	56.457	14.442	-17.543	74.000	42.015	PK
2	*	5227.875	100.439	58.401	N/A	N/A	42.039	PK

Engineer: Scott	
Site: AC5	Time: 2015/12/31 - 15:38
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5230MHz by 802.11n40 ant1+2	



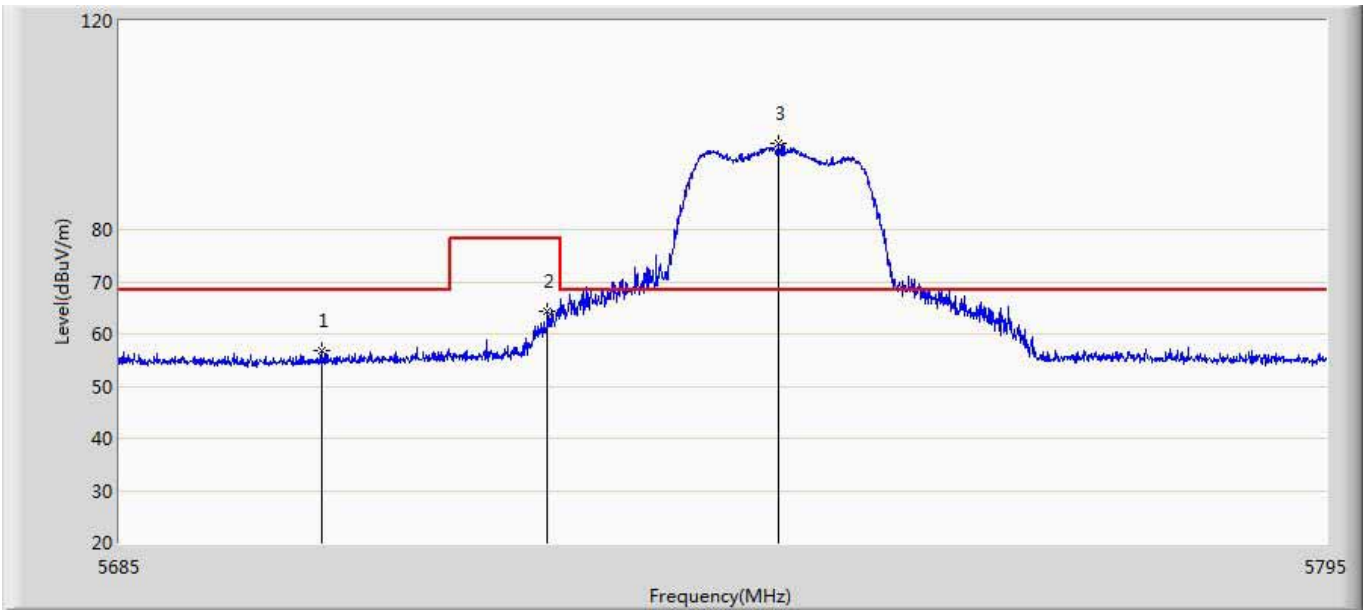
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5150.000	43.025	1.010	-10.975	54.000	42.015	AV
2	*	5227.875	91.353	49.315	N/A	N/A	42.039	AV

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 11:28
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH5745MHz by 802.11a ant1	



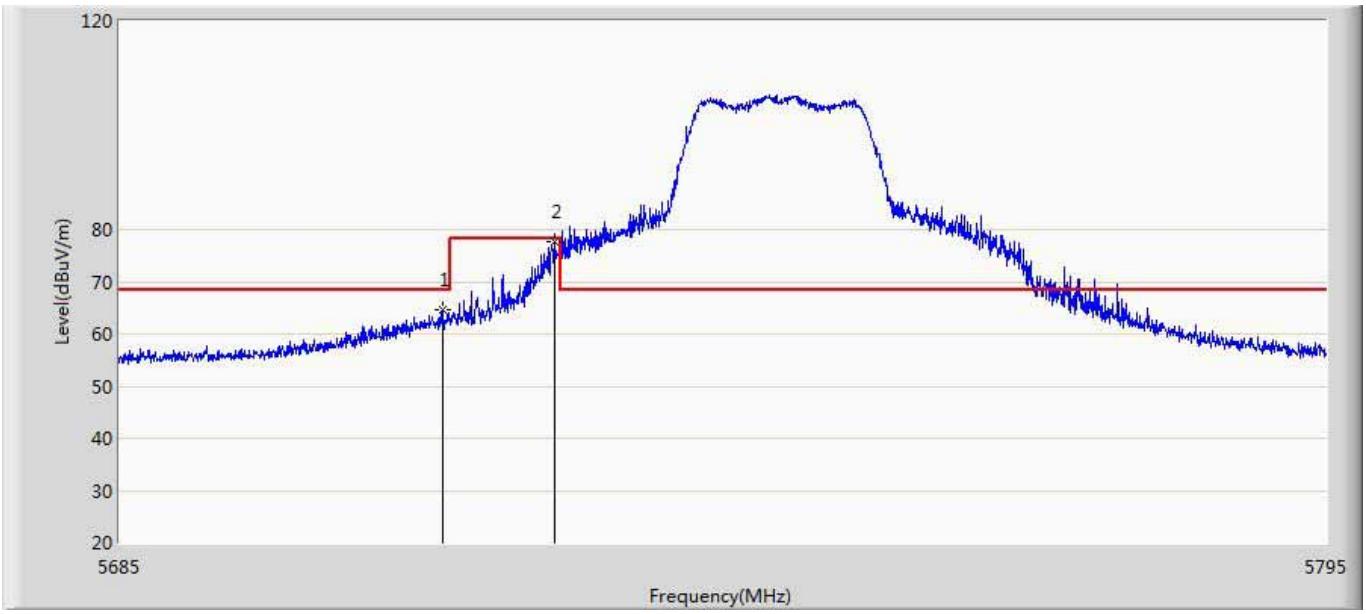
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5711.730	65.362	22.051	-2.938	68.300	43.311	PK
2		5723.775	77.225	33.955	-1.075	78.300	43.270	PK
3	*	5744.510	108.559	65.262	N/A	N/A	43.297	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 11:38
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH5745MHz by 802.11a ant1	



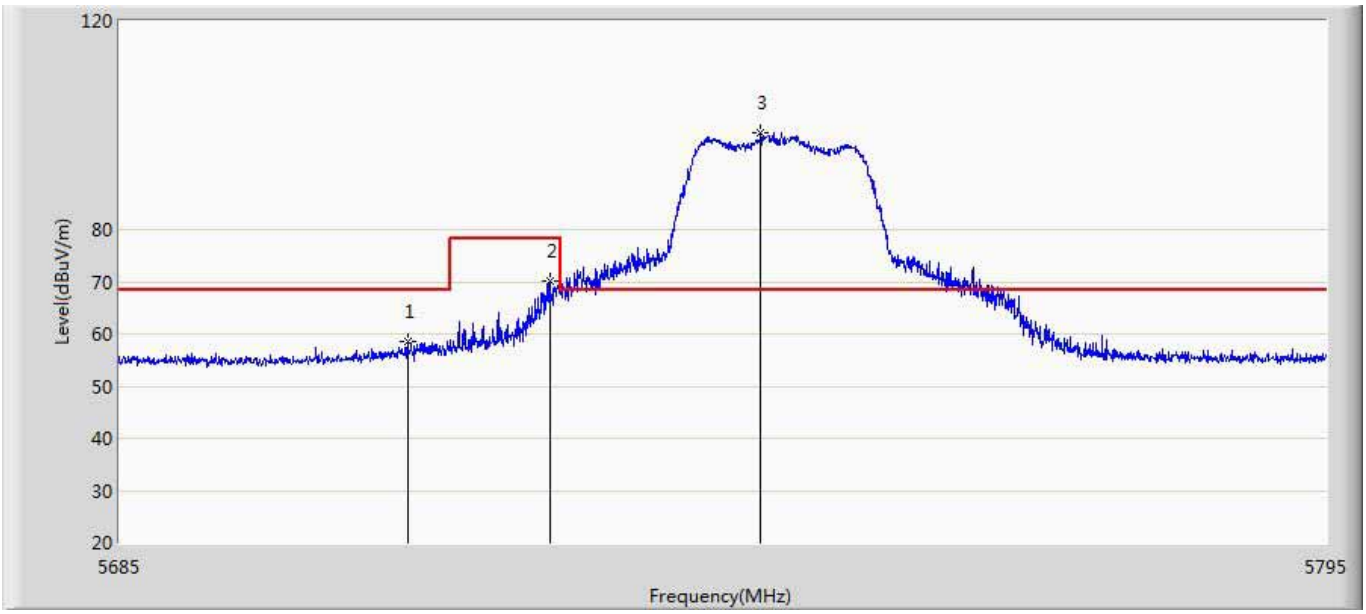
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5703.260	56.887	13.585	-11.413	68.300	43.302	PK
2		5723.775	64.263	20.993	-14.037	78.300	43.270	PK
3	*	5744.840	96.535	53.239	N/A	N/A	43.297	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 11:40
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH5745MHz by 802.11a ant2	



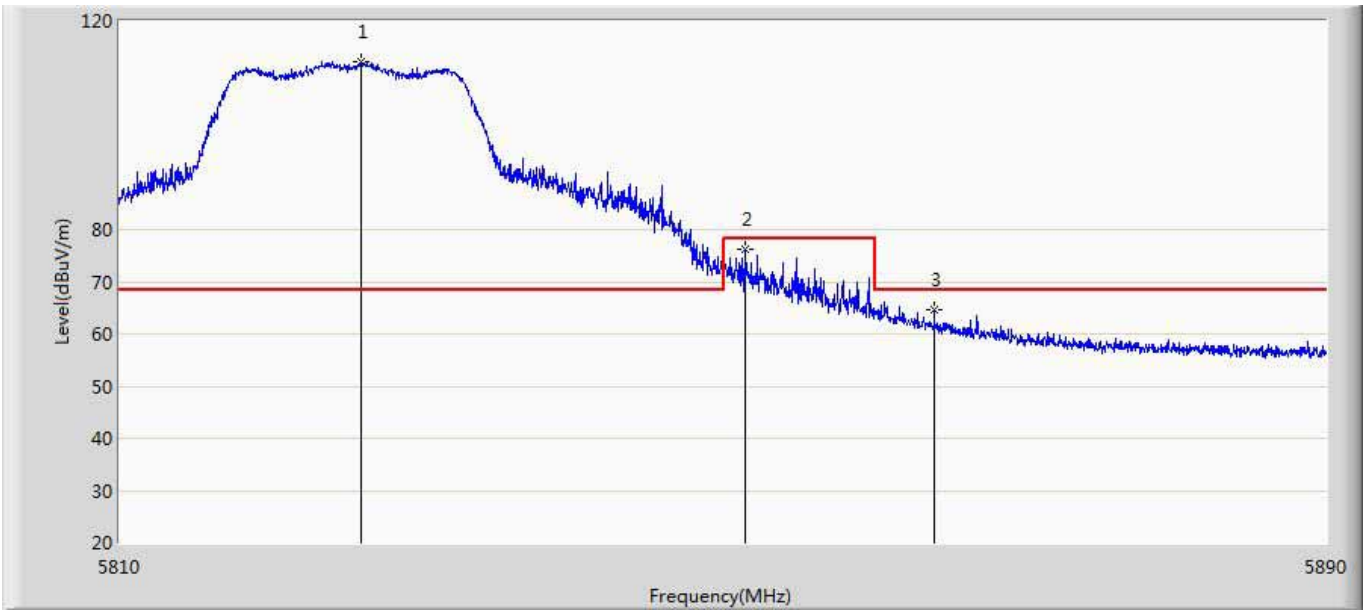
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5714.315	64.639	21.337	-3.661	68.300	43.302	PK
2	*	5724.490	77.563	34.295	-0.737	78.300	43.268	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 11:47
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH5745MHz by 802.11a ant2	



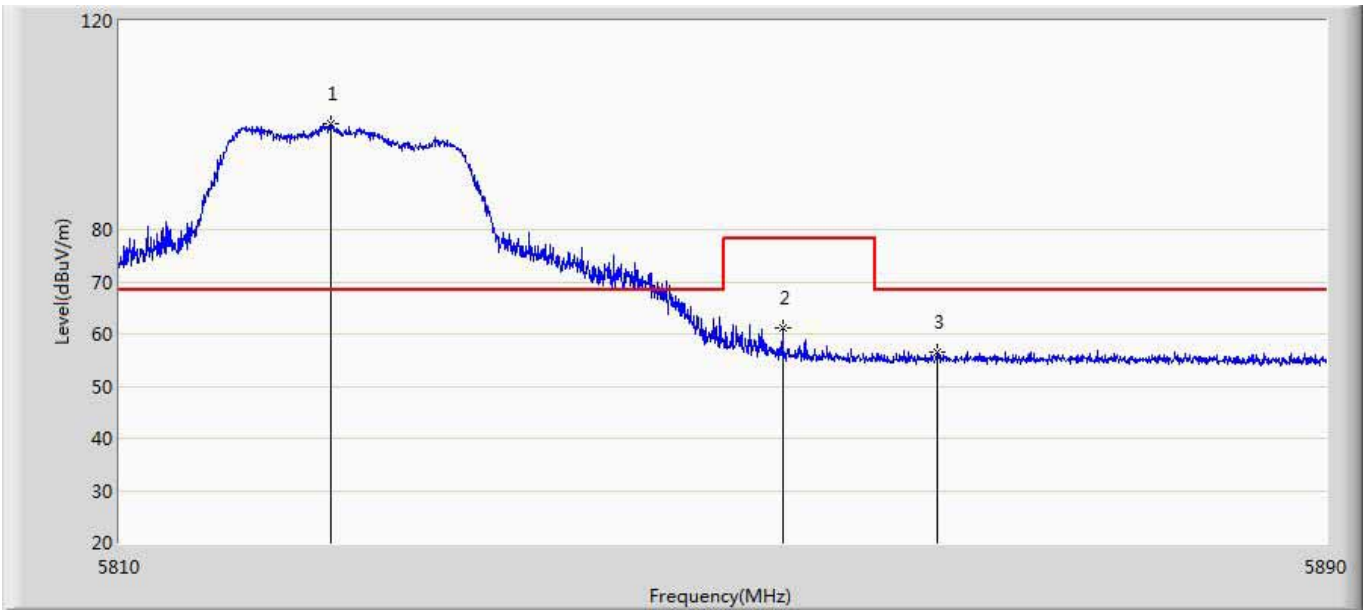
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5711.070	58.464	15.151	-9.836	68.300	43.314	PK
2		5724.050	70.096	26.827	-8.204	78.300	43.269	PK
3	*	5743.245	98.446	55.144	N/A	N/A	43.302	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 11:49
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH5825MHz by 802.11a ant1	



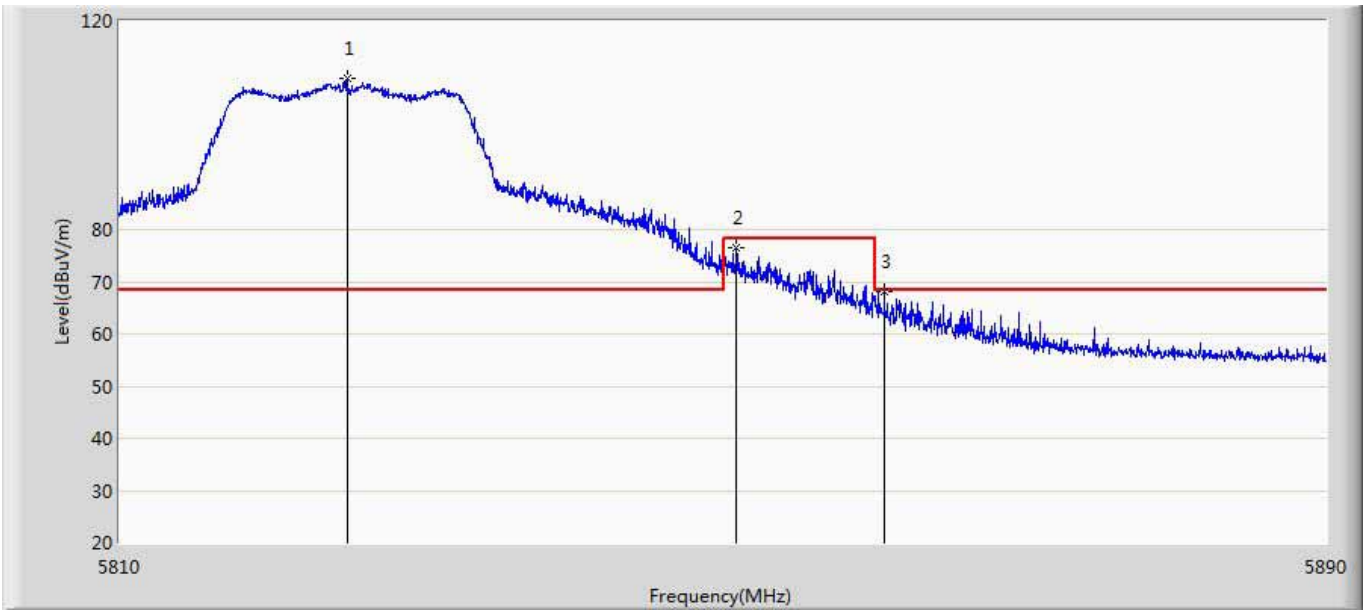
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5825.920	112.246	68.841	N/A	N/A	43.405	PK
2		5851.400	76.256	32.776	-2.044	78.300	43.480	PK
3		5863.920	64.590	21.023	-3.710	68.300	43.567	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 11:52
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH5825MHz by 802.11a ant1	



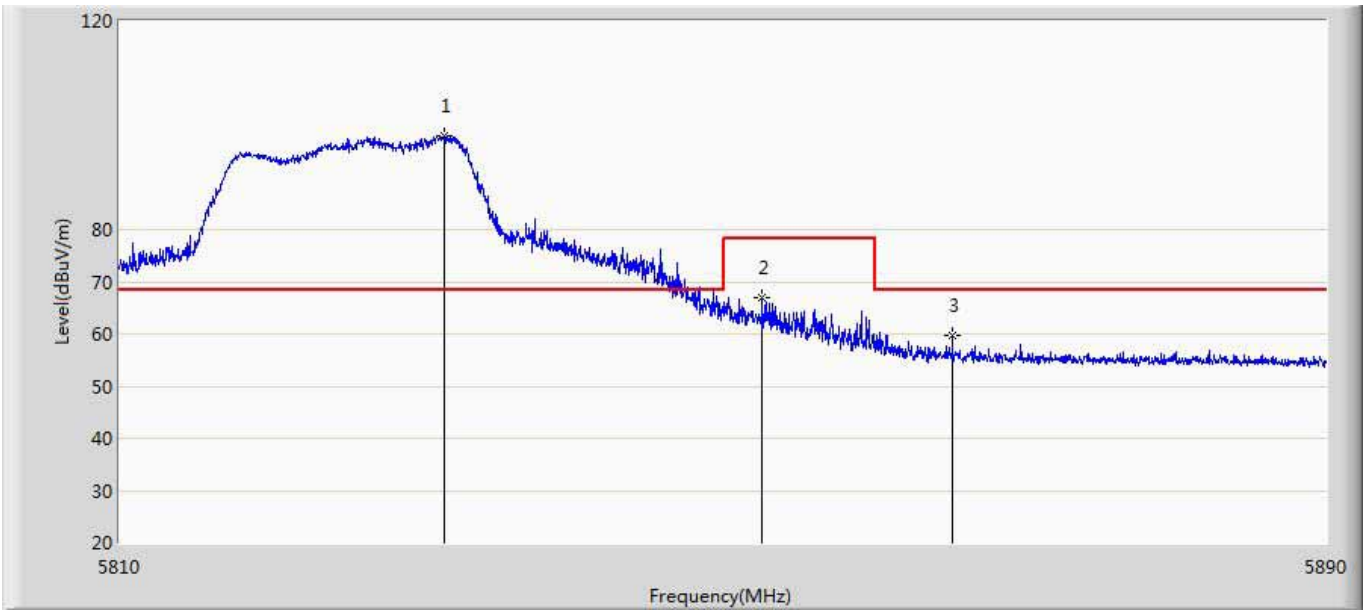
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5824.000	100.397	56.997	N/A	N/A	43.400	PK
2		5853.840	61.052	17.553	-17.248	78.300	43.498	PK
3		5864.080	56.639	13.071	-11.661	68.300	43.568	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 11:53
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH5825MHz by 802.11a ant2	



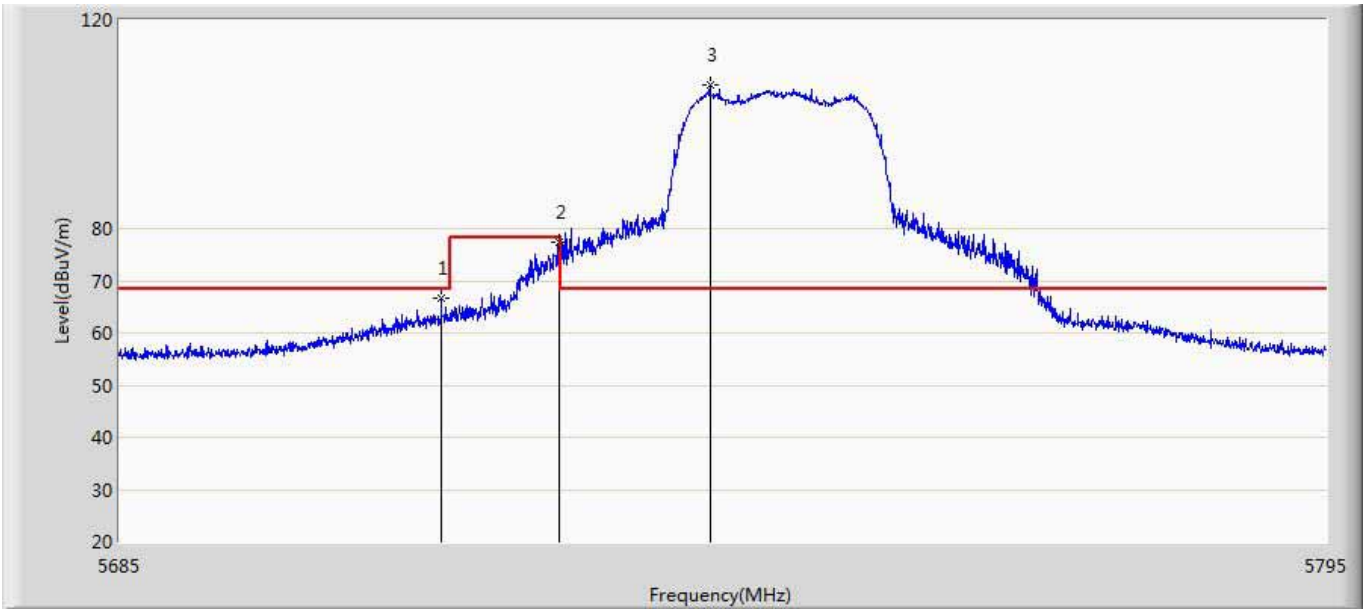
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5825.040	108.868	65.465	N/A	N/A	43.403	PK
2		5850.800	76.462	32.987	-1.838	78.300	43.475	PK
3		5860.600	68.197	24.647	-0.103	68.300	43.550	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/04 - 11:58
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH5825MHz by 802.11a ant2	



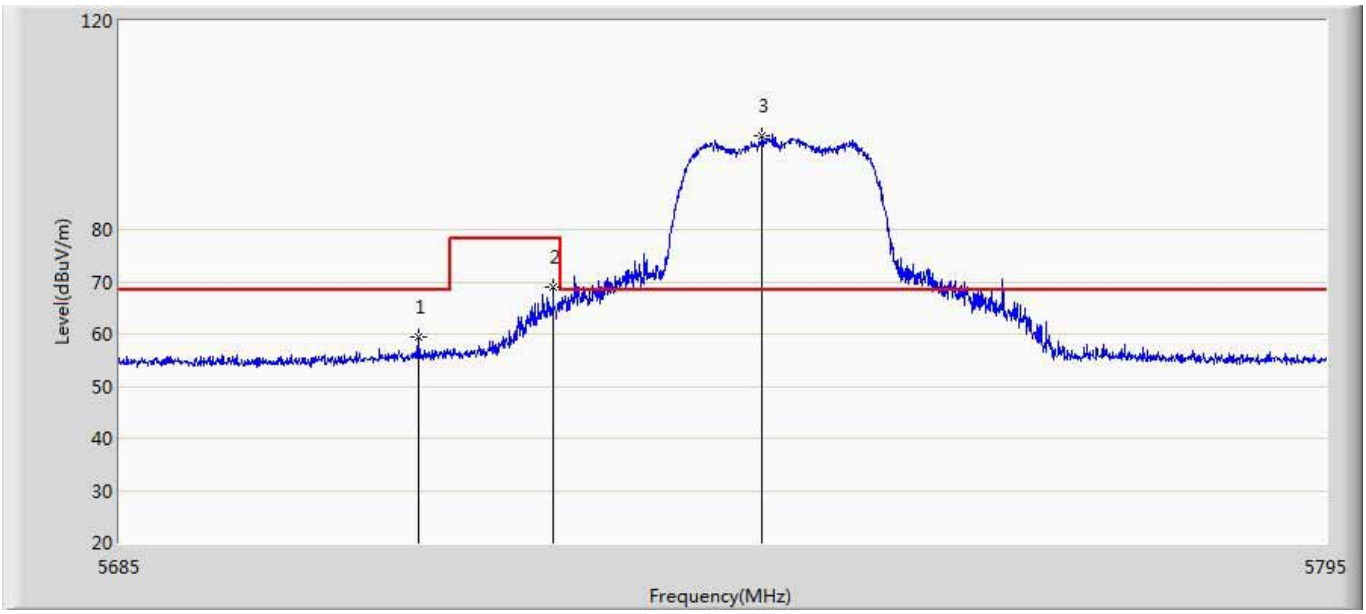
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5831.480	97.852	54.438	N/A	N/A	43.414	PK
2		5852.520	66.842	23.353	-11.458	78.300	43.489	PK
3		5865.120	59.734	16.163	-8.566	68.300	43.571	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/05 - 09:35
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5745MHz by 802.11n20 ant1	



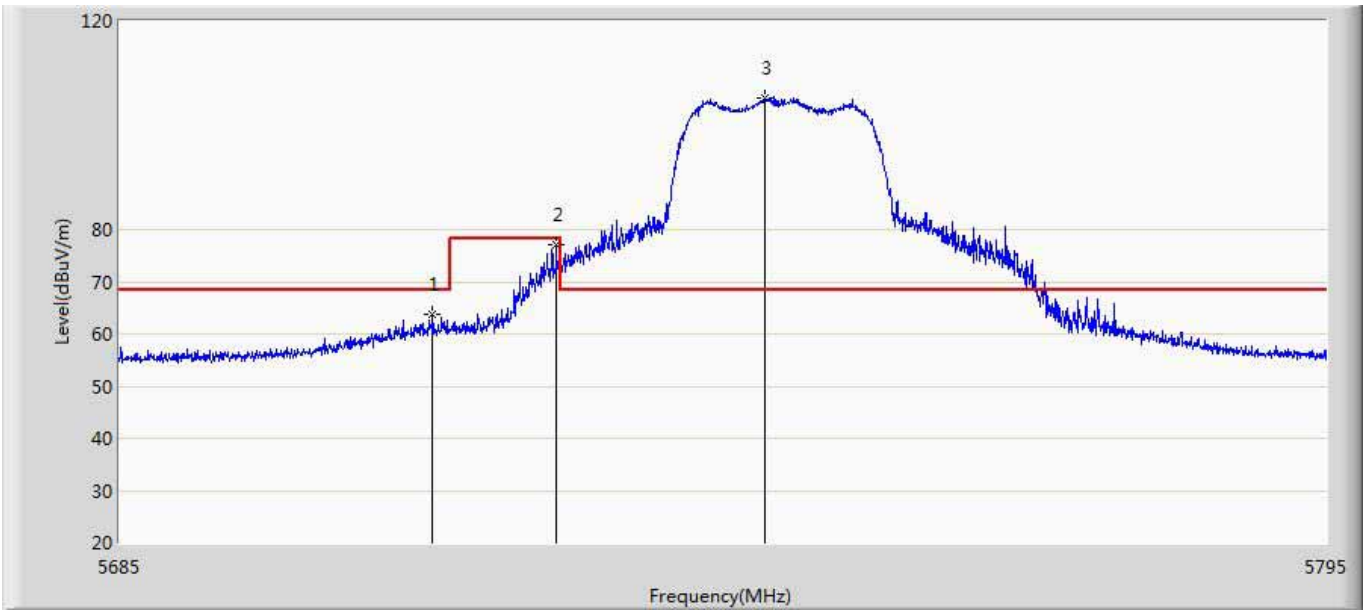
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5714.150	66.646	23.343	-1.654	68.300	43.303	PK
2		5724.930	77.465	34.199	-0.835	78.300	43.267	PK
3	*	5738.570	107.550	64.258	N/A	N/A	43.293	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/05 - 09:48
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5745MHz by 802.11n20 ant1	



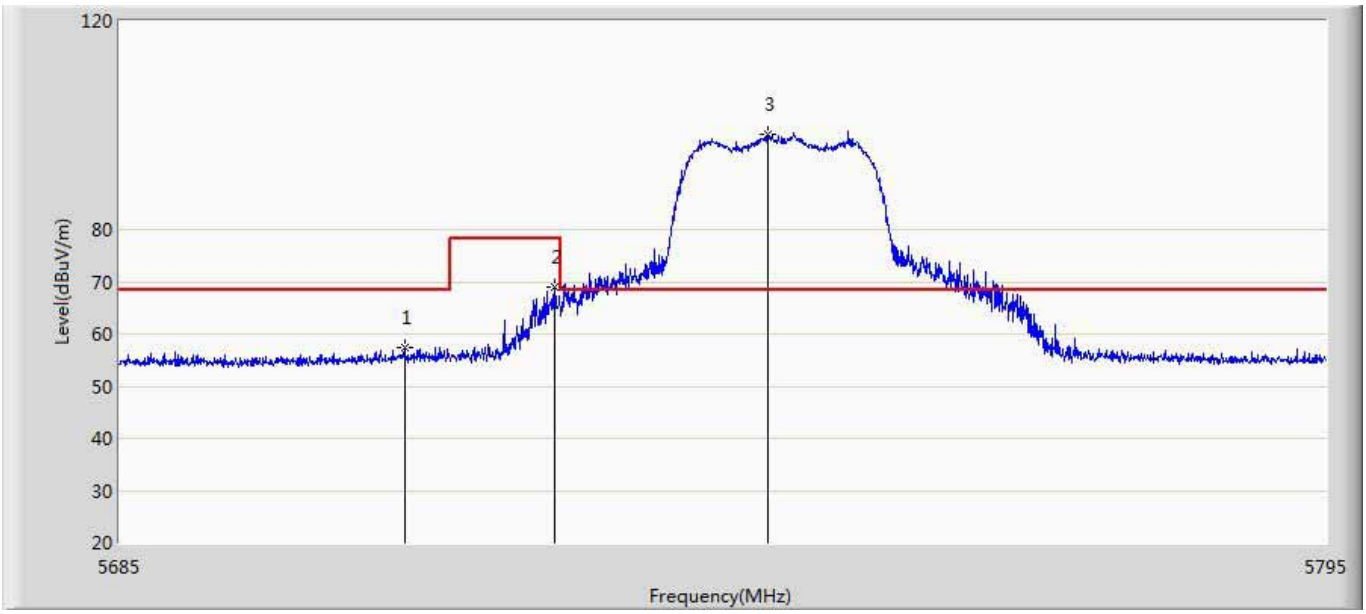
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5712.060	59.300	15.990	-9.000	68.300	43.310	PK
2		5724.325	68.965	25.697	-9.335	78.300	43.269	PK
3	*	5743.355	98.075	54.774	N/A	N/A	43.302	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/05 - 09:50
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5745MHz by 802.11n20 ant2	



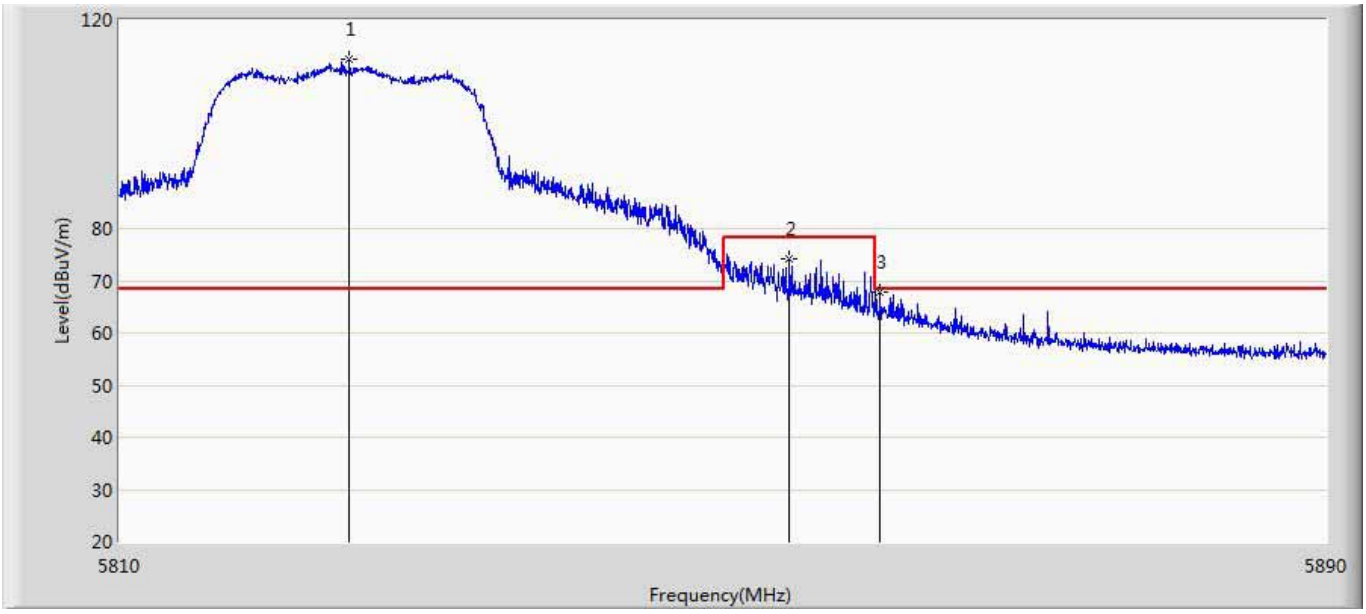
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5713.325	63.799	20.493	-4.501	68.300	43.306	PK
2		5724.600	77.151	33.884	-1.149	78.300	43.267	PK
3	*	5743.575	105.357	62.056	N/A	N/A	43.301	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/05 - 09:53
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5745MHz by 802.11n20 ant2	



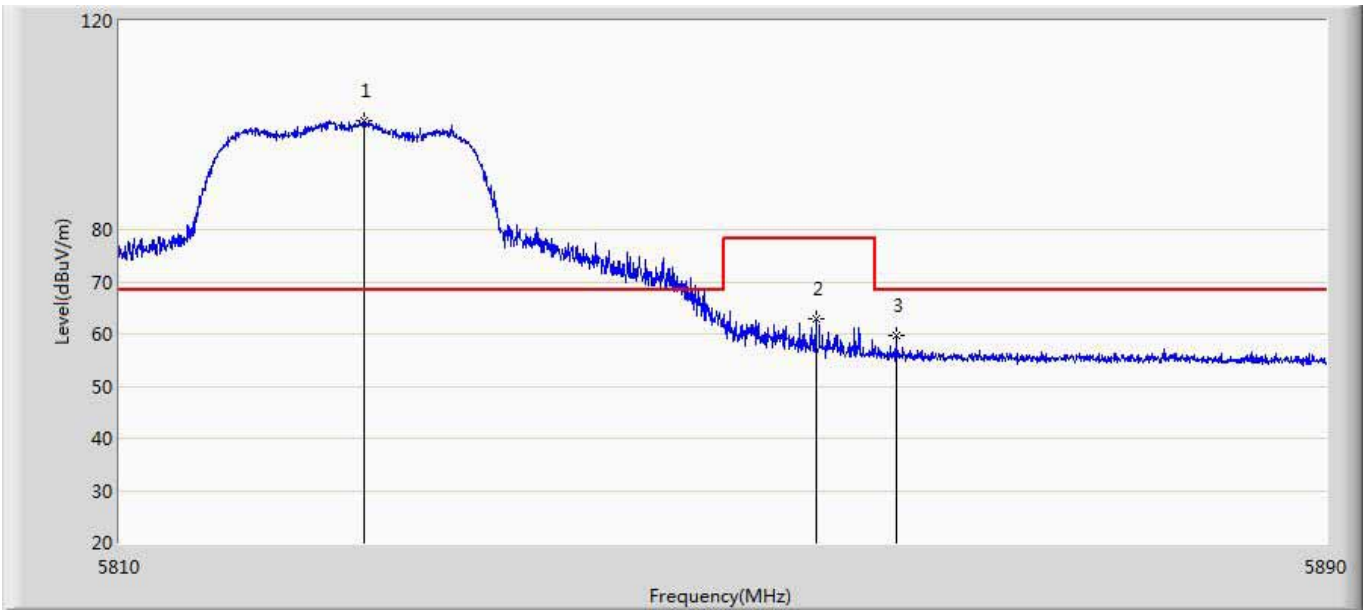
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5710.795	57.285	13.971	-11.015	68.300	43.314	PK
2		5724.435	69.011	25.743	-9.289	78.300	43.268	PK
3	*	5743.905	98.303	55.003	N/A	N/A	43.299	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/05 - 09:55
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5825MHz by 802.11n20 ant1	



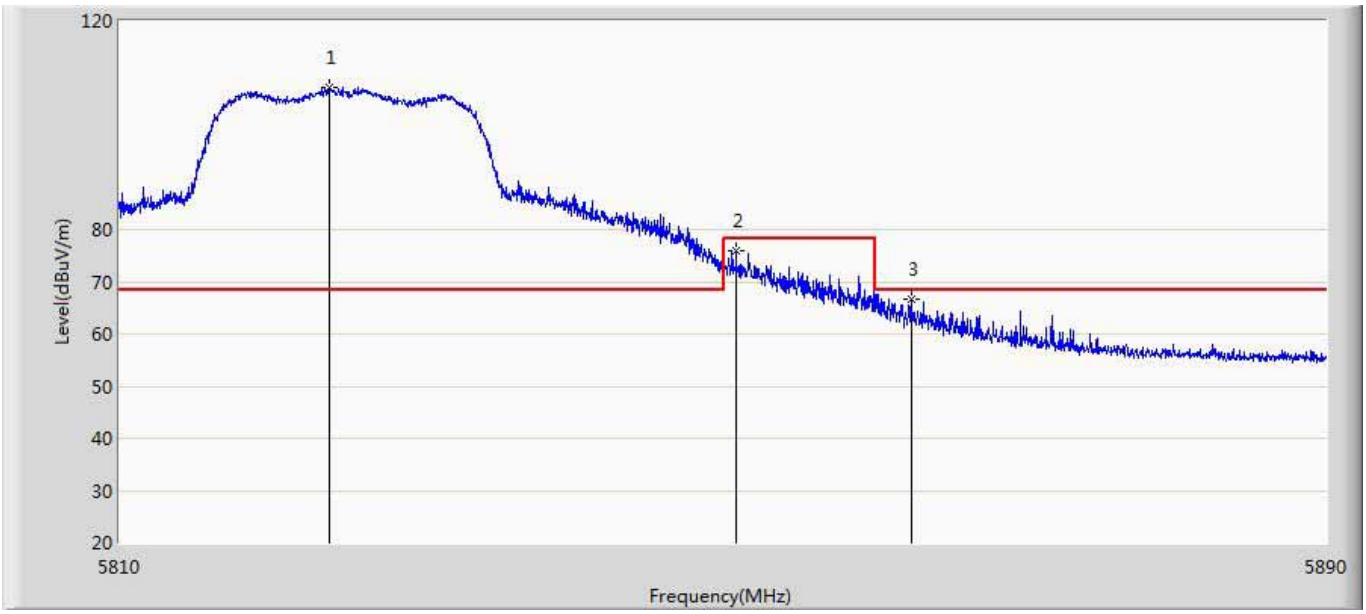
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5825.200	112.381	68.978	N/A	N/A	43.403	PK
2		5854.320	74.235	30.733	-4.065	78.300	43.502	PK
3		5860.320	67.697	24.149	-0.603	68.300	43.549	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/05 - 10:05
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5825MHz by 802.11n20 ant1	



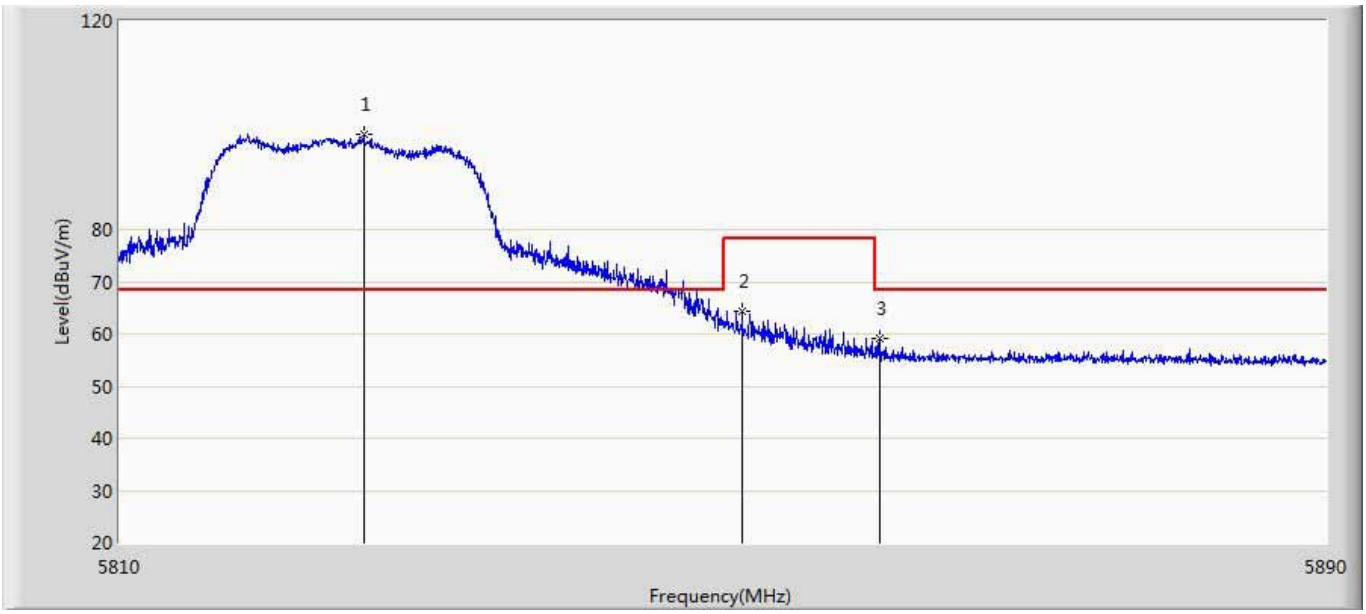
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5826.160	100.905	57.500	N/A	N/A	43.405	PK
2		5856.040	62.829	19.313	-15.471	78.300	43.516	PK
3		5861.360	59.658	16.102	-8.642	68.300	43.556	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/05 - 10:08
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5825MHz by 802.11n20 ant2	



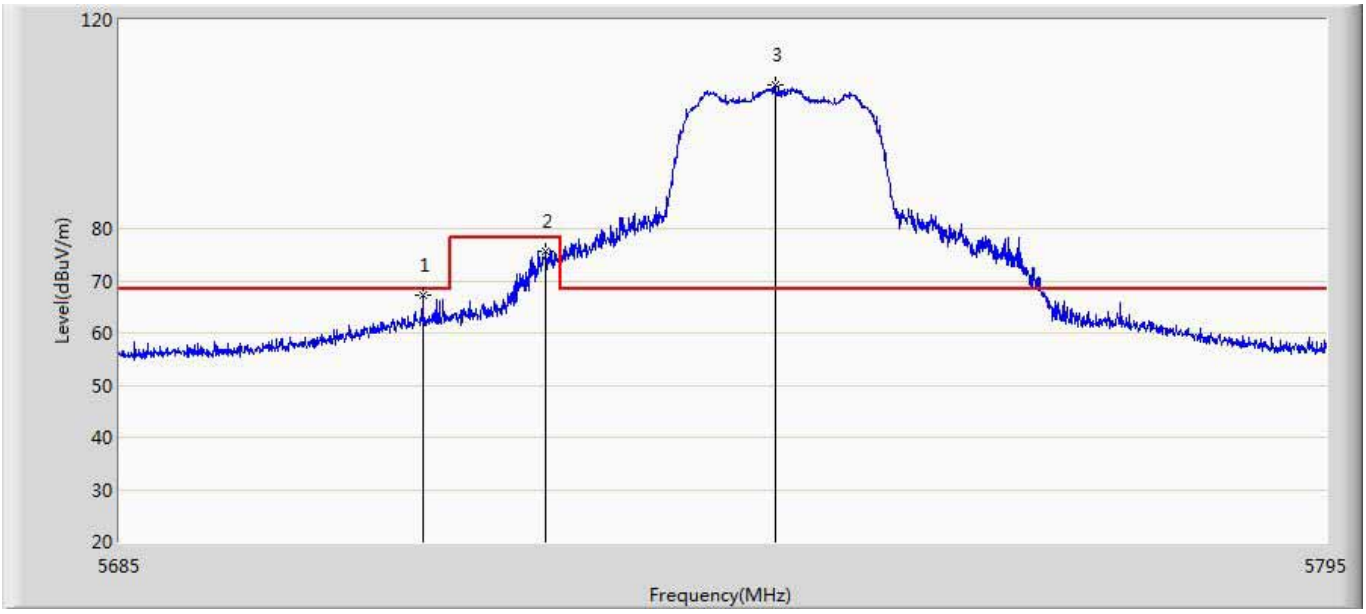
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5823.880	107.365	63.965	N/A	N/A	43.400	PK
2		5850.760	75.920	32.445	-2.380	78.300	43.475	PK
3		5862.360	66.538	22.976	-1.762	68.300	43.563	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/05 - 10:23
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5825MHz by 802.11n20 ant2	



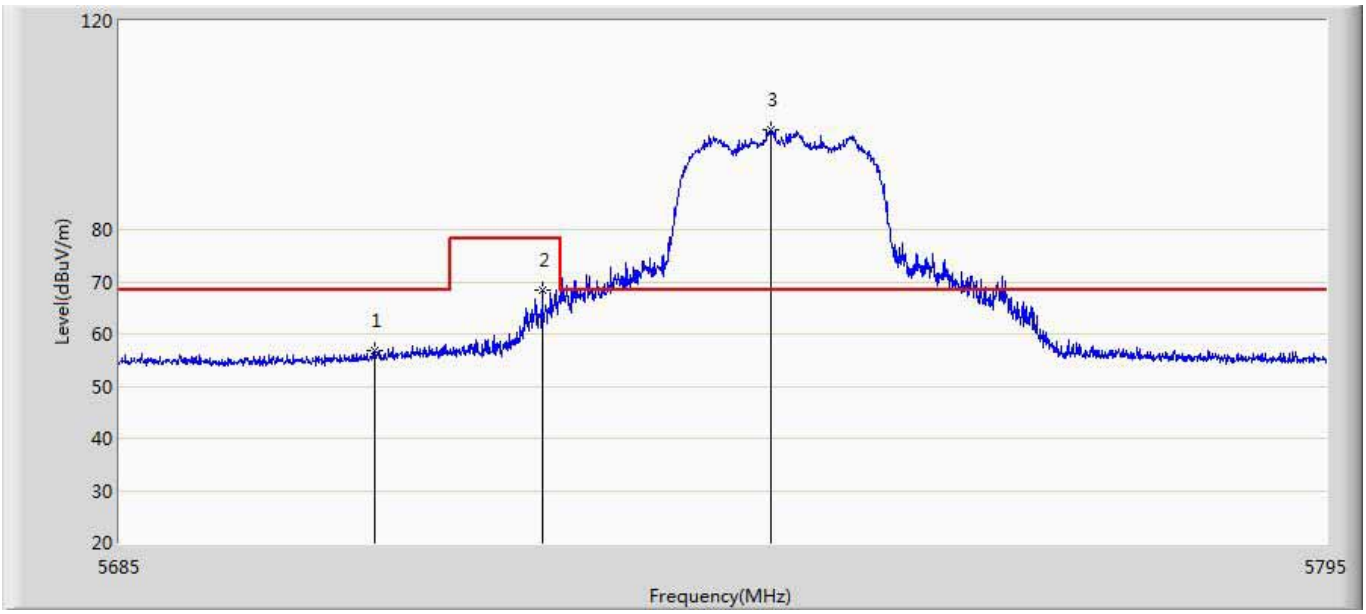
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5826.120	98.292	54.887	N/A	N/A	43.405	PK
2		5851.160	64.309	20.831	-13.991	78.300	43.478	PK
3		5860.280	59.030	15.482	-9.270	68.300	43.548	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/05 - 10:25
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5745MHz by 802.11n20 ant1+2	



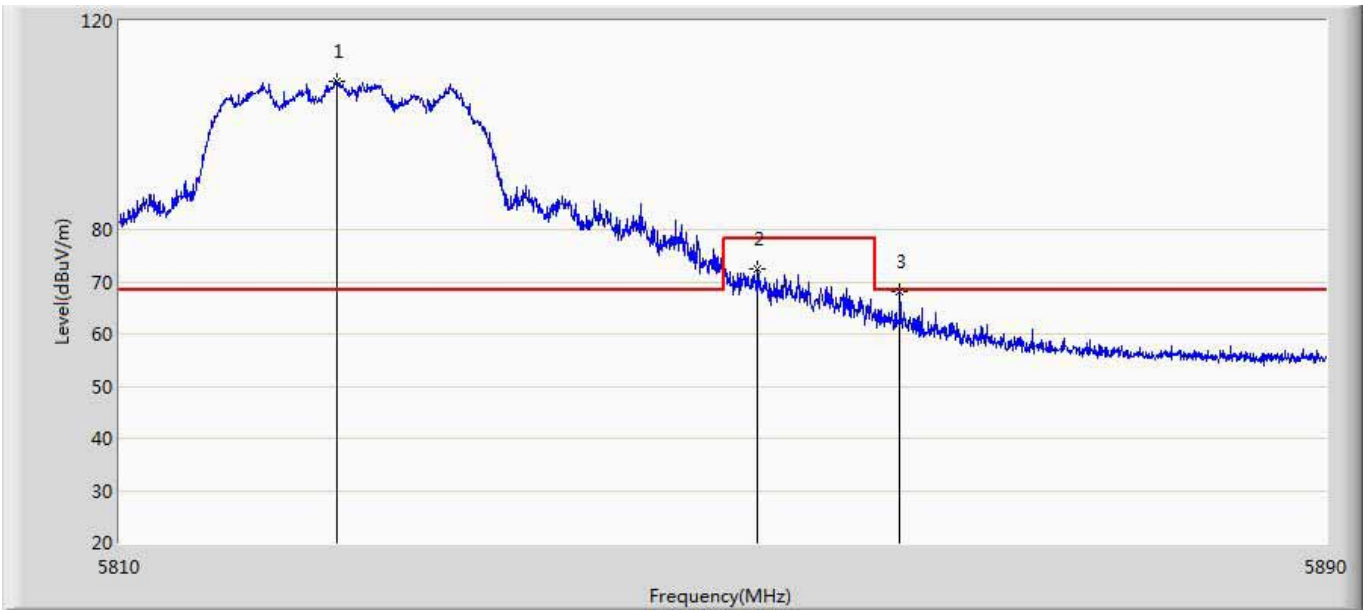
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5712.445	67.327	24.018	-0.973	68.300	43.309	PK
2		5723.665	75.601	32.331	-2.699	78.300	43.271	PK
3	*	5744.565	107.556	64.259	N/A	N/A	43.297	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/05 - 10:27
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5745MHz by 802.11n20 ant1+2	



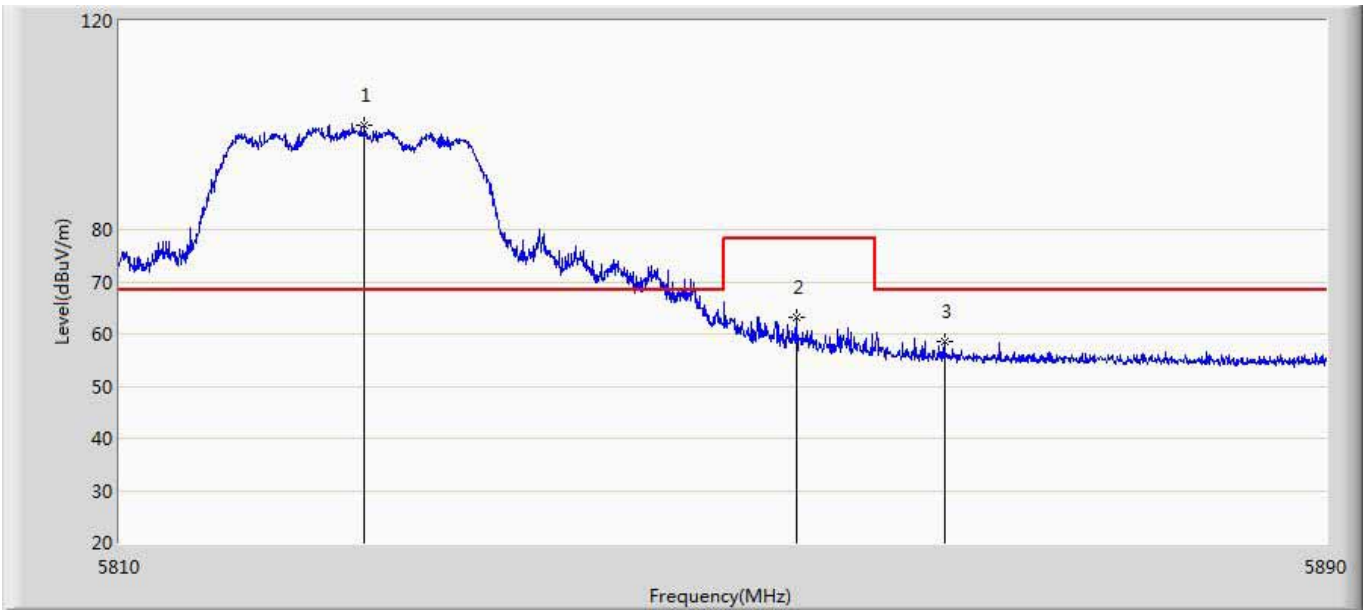
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5708.155	56.926	13.608	-11.374	68.300	43.318	PK
2		5723.335	68.441	25.169	-9.859	78.300	43.271	PK
3	*	5744.125	99.070	55.771	N/A	N/A	43.299	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/05 - 10:28
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5825MHz by 802.11n20 ant1+2	



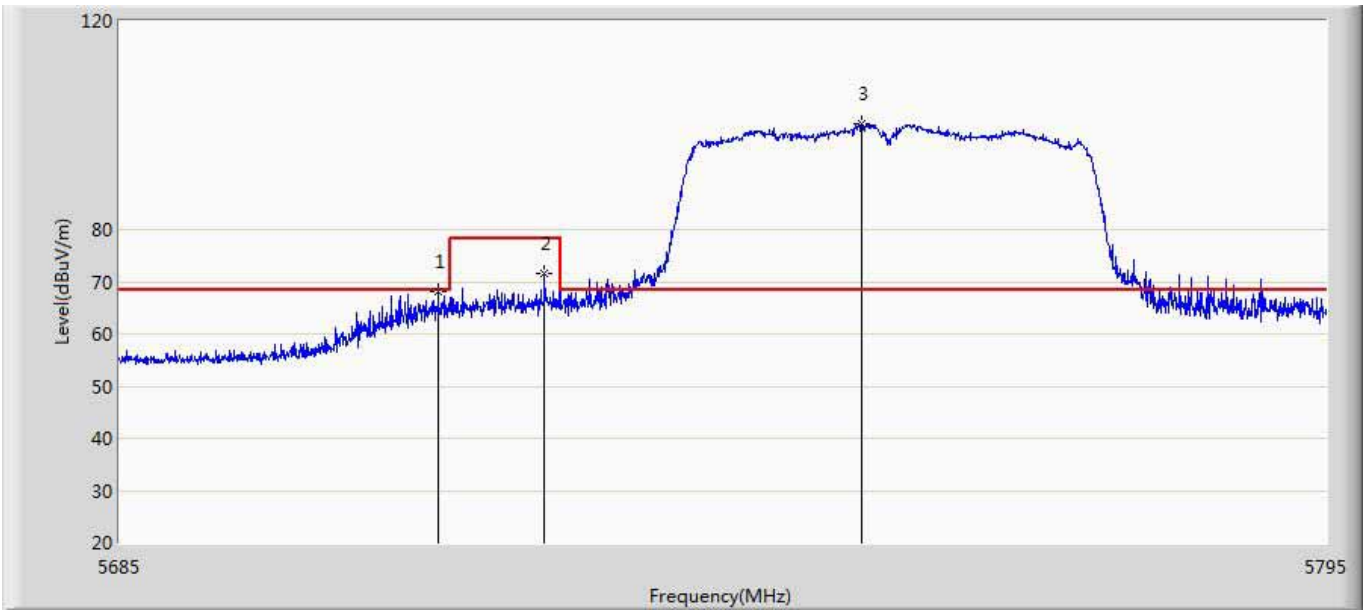
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5824.400	108.483	65.082	N/A	N/A	43.401	PK
2		5852.200	72.496	29.010	-5.804	78.300	43.486	PK
3		5861.600	67.976	24.418	-0.324	68.300	43.558	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/05 - 10:35
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH5825MHz by 802.11n20 ant1+2	



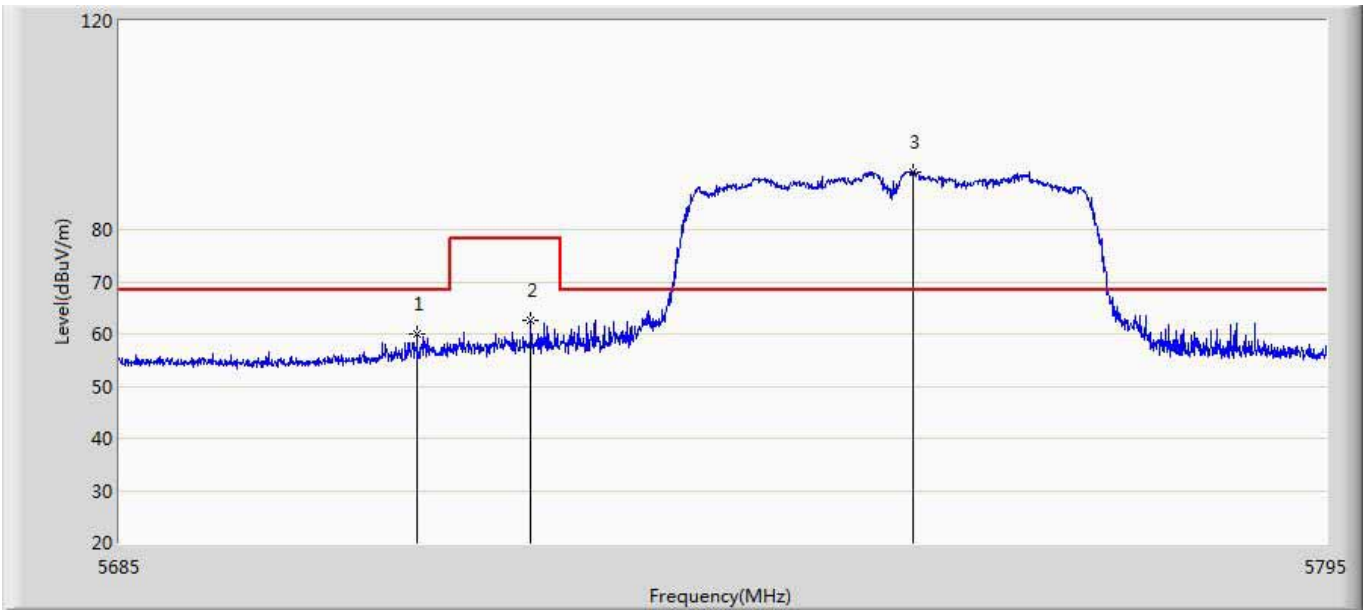
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5826.160	100.032	56.627	N/A	N/A	43.405	PK
2		5854.760	63.116	19.610	-15.184	78.300	43.506	PK
3		5864.600	58.583	15.014	-9.717	68.300	43.570	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/05 - 10:47
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5755MHz by 802.11n40 ant1	



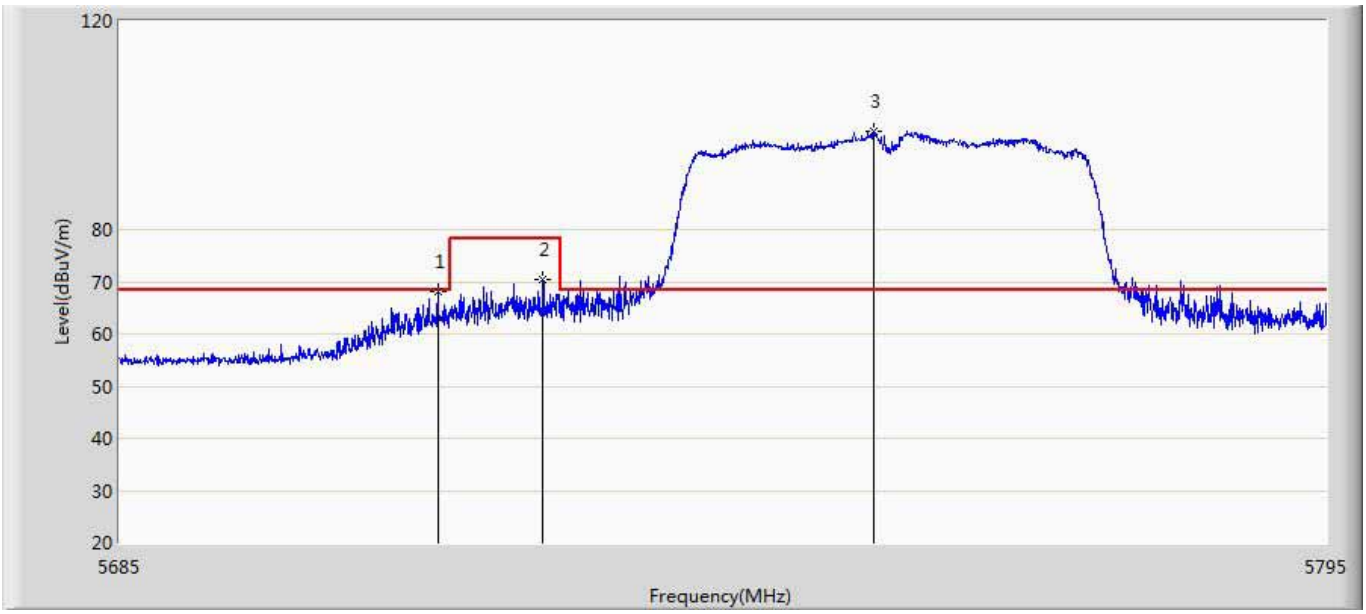
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5713.875	67.994	24.690	-0.306	68.300	43.304	PK
2		5723.555	71.561	28.290	-6.739	78.300	43.271	PK
3	*	5752.375	100.423	57.153	N/A	N/A	43.269	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/05 - 10:47
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5755MHz by 802.11n40 ant1	



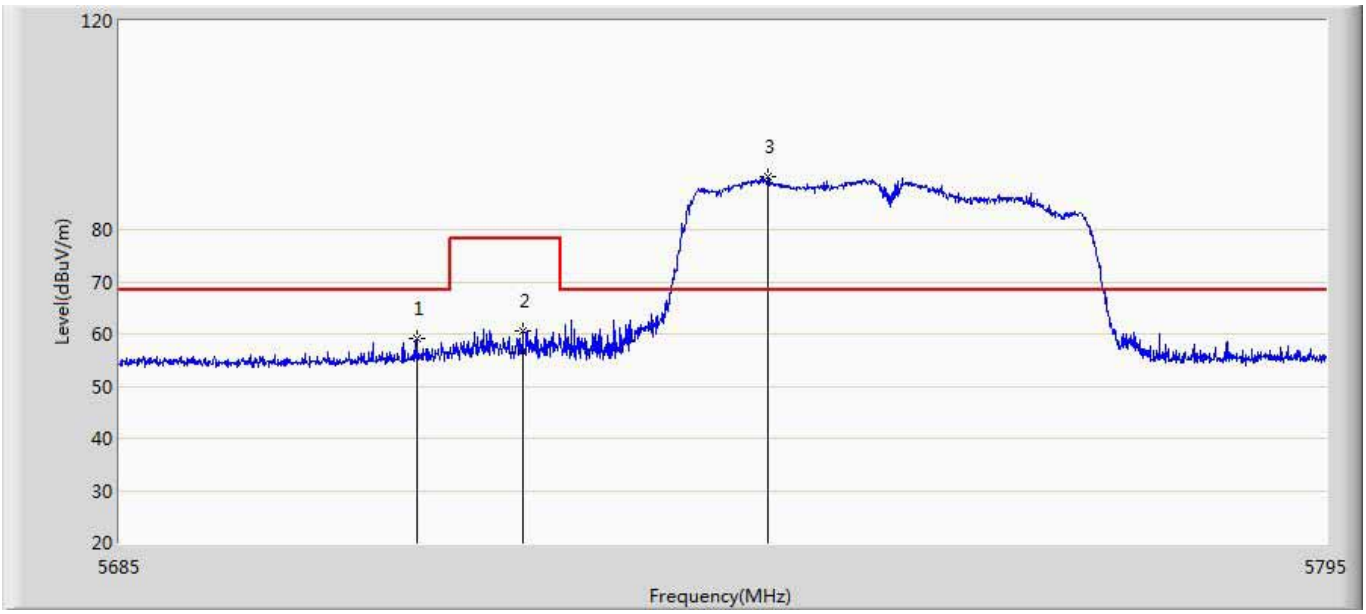
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5711.950	59.996	16.686	-8.304	68.300	43.310	PK
2		5722.290	62.720	19.445	-15.580	78.300	43.275	PK
3	*	5757.105	91.122	47.869	N/A	N/A	43.253	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/05 - 10:48
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5755MHz by 802.11n40 ant2	



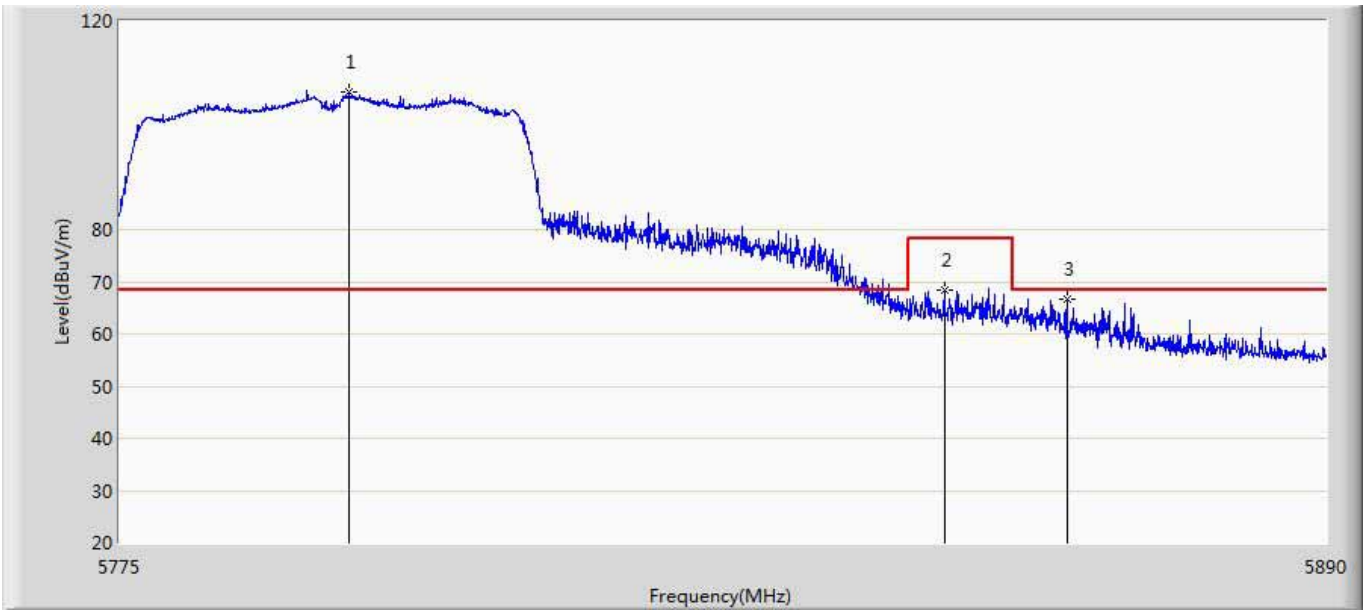
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5713.820	68.030	24.726	-0.270	68.300	43.304	PK
2		5723.390	70.497	27.226	-7.803	78.300	43.271	PK
3	*	5753.585	98.785	55.520	N/A	N/A	43.265	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/05 - 10:53
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5755MHz by 802.11n40 ant2	



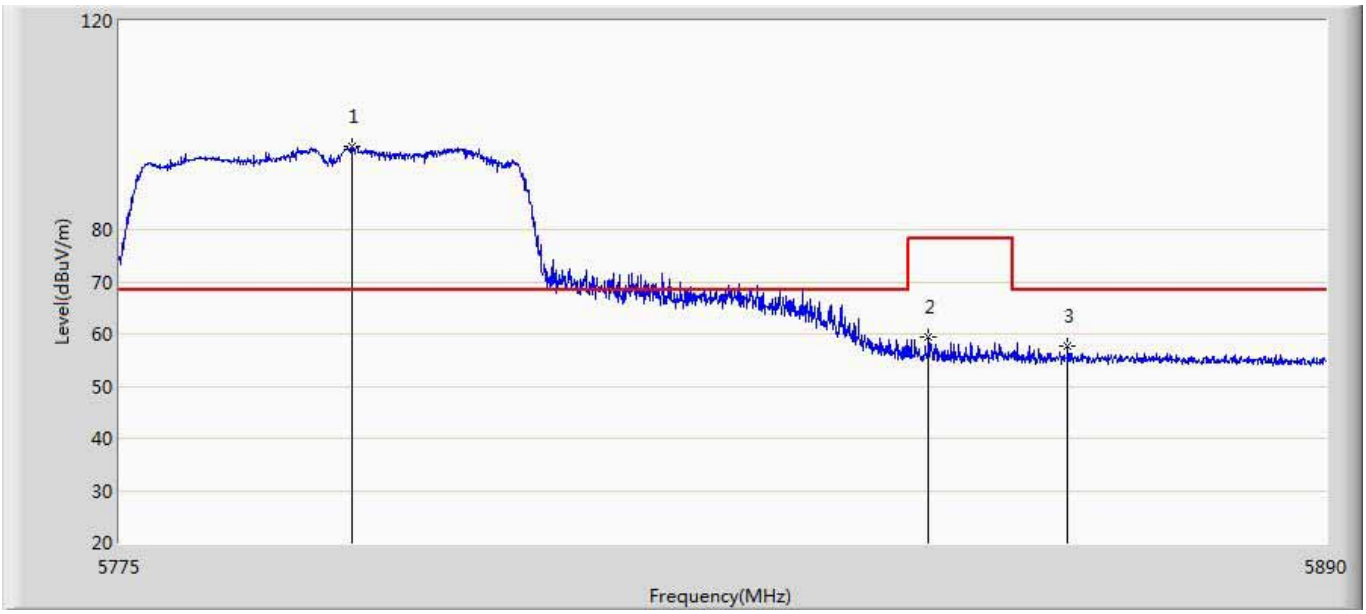
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5711.950	59.030	15.720	-9.270	68.300	43.310	PK
2		5721.575	60.623	17.345	-17.677	78.300	43.278	PK
3	*	5743.905	90.140	46.840	N/A	N/A	43.299	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/05 - 10:55
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5795MHz by 802.11n40 ant1	



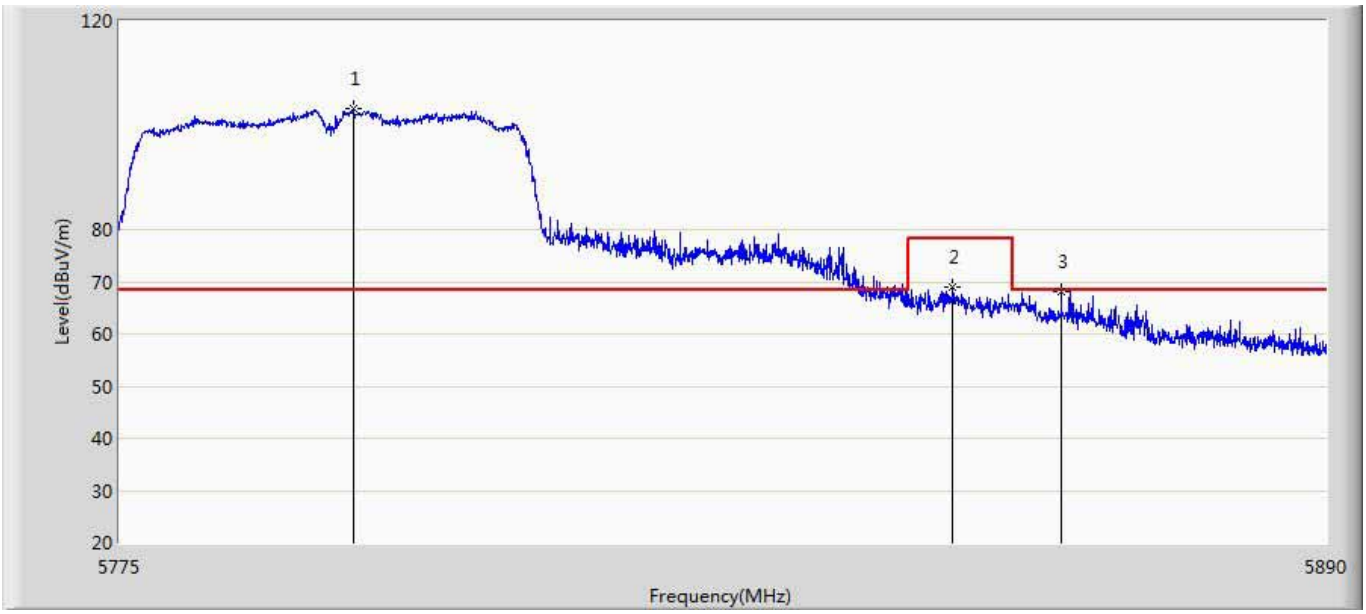
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5796.792	106.392	63.092	N/A	N/A	43.300	PK
2		5853.373	68.517	25.022	-9.783	78.300	43.495	PK
3		5865.103	66.541	22.970	-1.759	68.300	43.570	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/05 - 11:06
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5795MHz by 802.11n40 ant1	



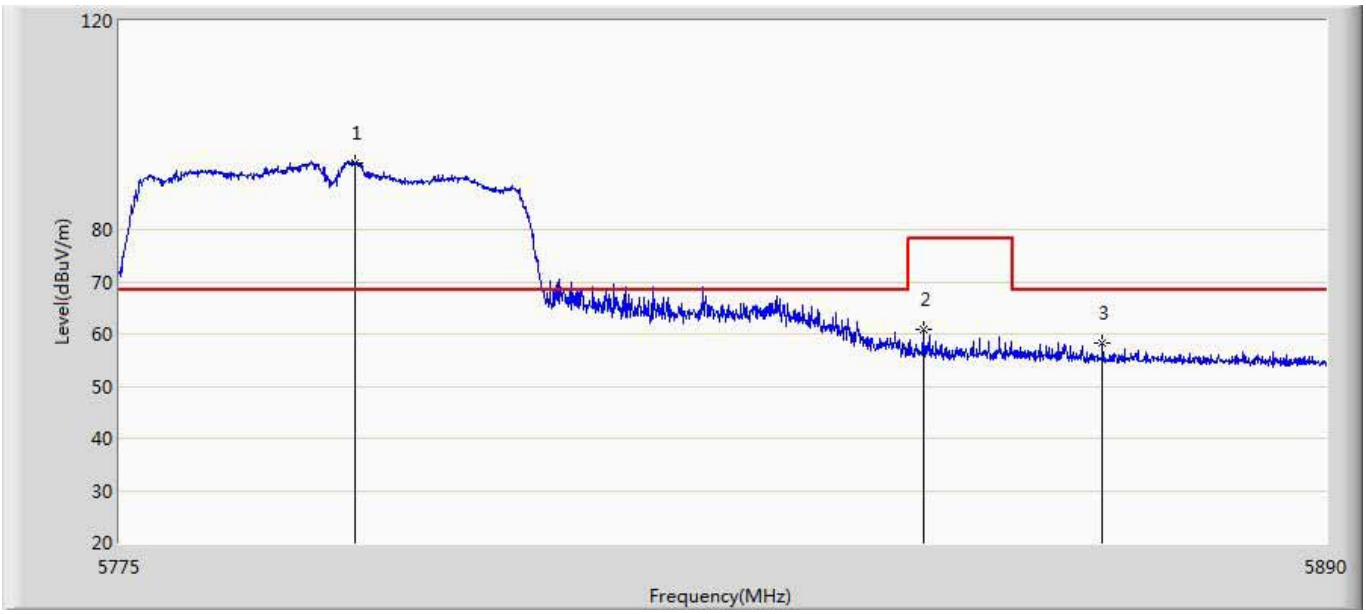
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5796.965	96.006	52.705	N/A	N/A	43.301	PK
2		5851.877	59.497	16.013	-18.803	78.300	43.484	PK
3		5865.160	57.677	14.106	-10.623	68.300	43.571	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/05 - 11:08
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5795MHz by 802.11n40 ant2	



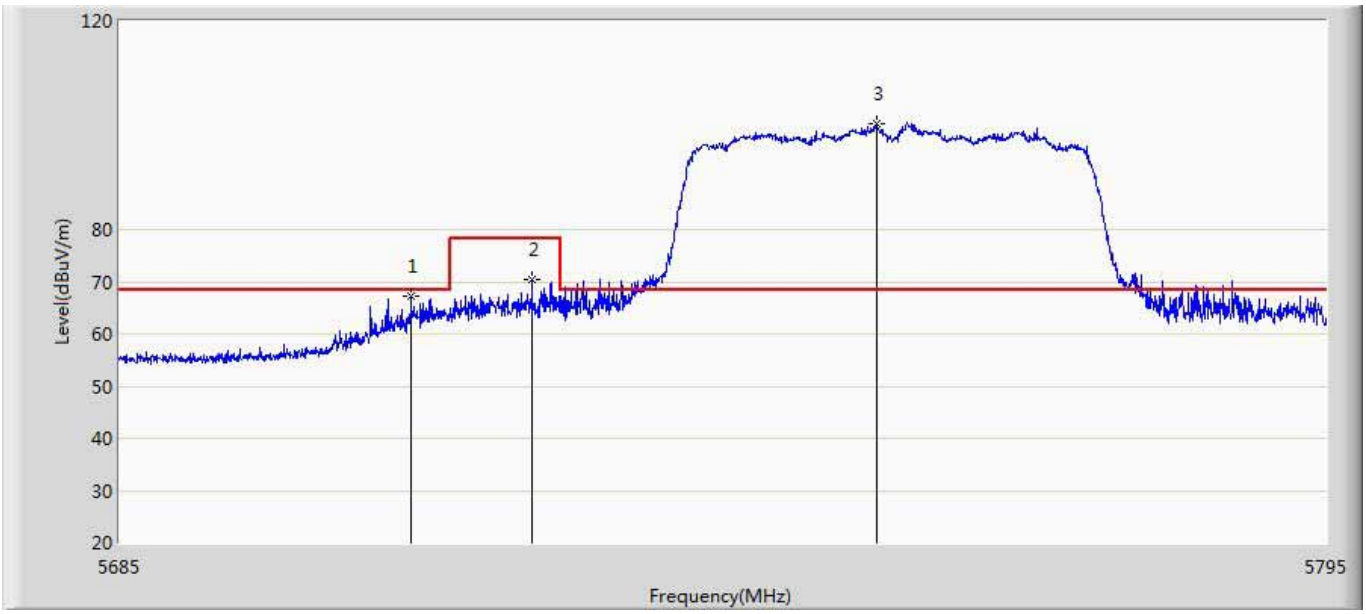
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5797.138	103.118	59.816	N/A	N/A	43.302	PK
2		5854.178	69.003	25.502	-9.297	78.300	43.501	PK
3		5864.585	68.064	24.495	-0.236	68.300	43.570	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/05 - 11:09
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5795MHz by 802.11n40 ant2	



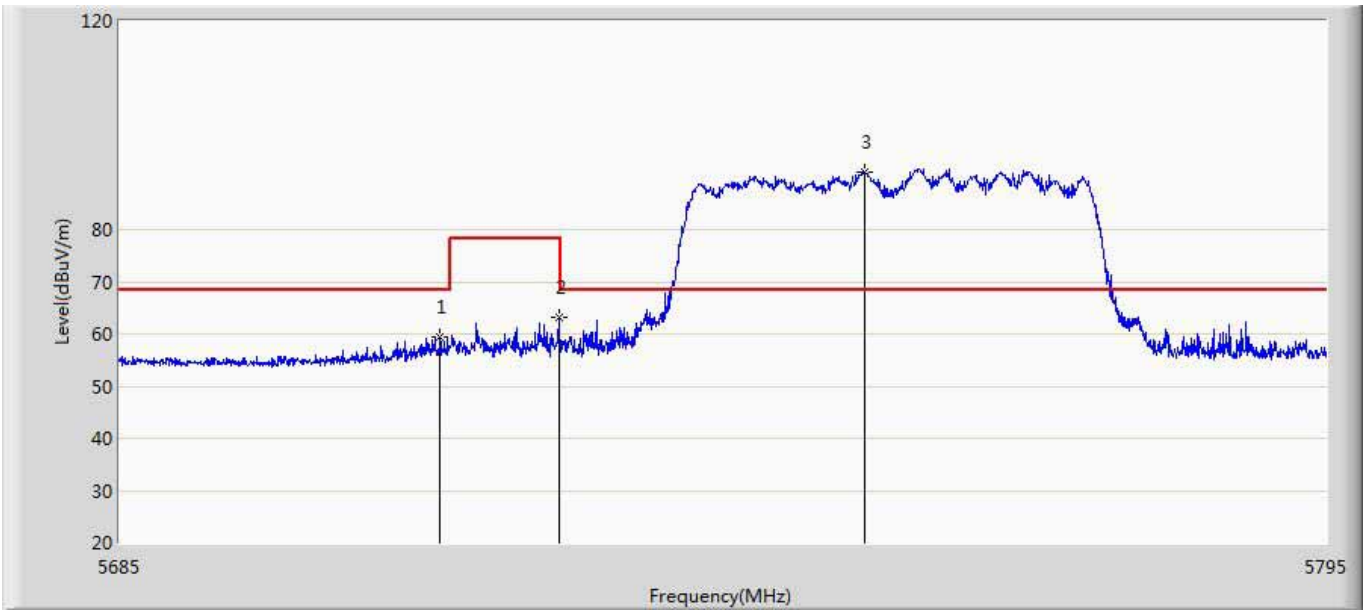
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5797.368	92.829	49.526	N/A	N/A	43.304	PK
2		5851.360	60.967	17.487	-17.333	78.300	43.480	PK
3		5868.495	58.241	14.660	-10.059	68.300	43.581	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/05 - 11:22
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5755MHz by 802.11n40 ant1+2	



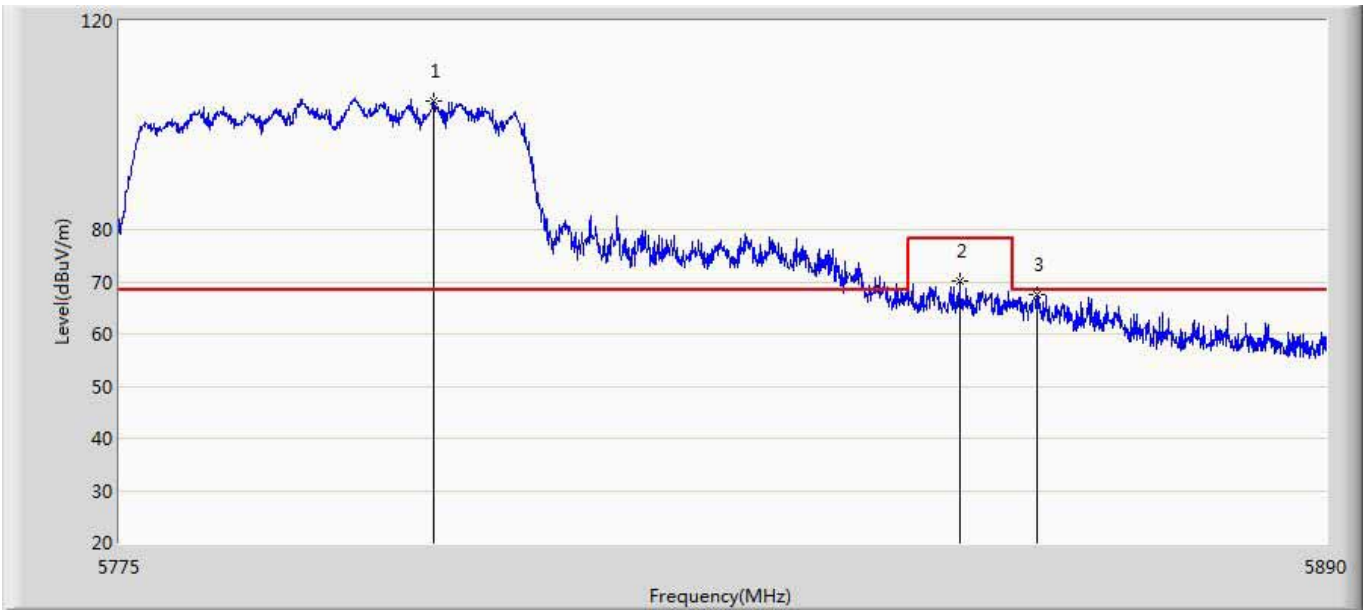
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5711.400	67.377	24.065	-0.923	68.300	43.312	PK
2		5722.400	70.540	27.265	-7.760	78.300	43.275	PK
3	*	5753.805	100.203	56.938	N/A	N/A	43.264	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/05 - 11:27
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5755MHz by 802.11n40 ant1+2	



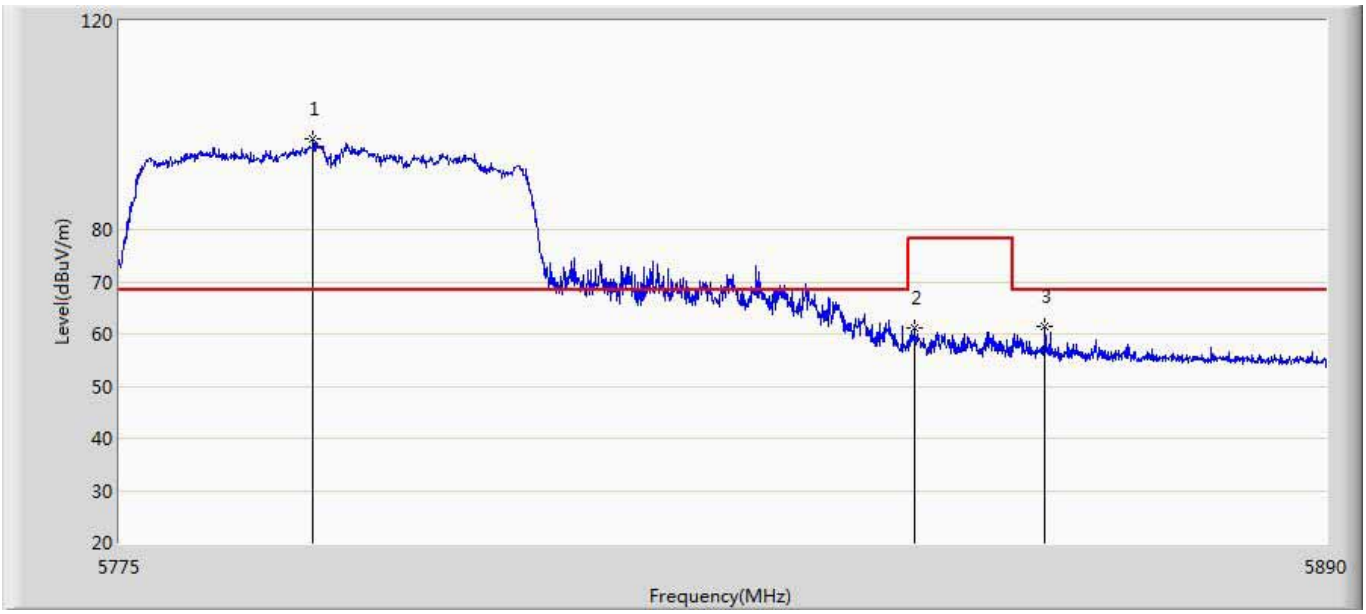
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		5714.040	59.297	15.994	-9.003	68.300	43.303	PK
2		5724.820	63.143	19.876	-15.157	78.300	43.266	PK
3	*	5752.705	91.038	47.770	N/A	N/A	43.269	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/05 - 11:28
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5795MHz by 802.11n40 ant1+2	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5804.785	104.570	61.230	N/A	N/A	43.340	PK
2		5854.868	70.150	26.643	-8.150	78.300	43.507	PK
3		5862.228	67.490	23.928	-0.810	68.300	43.562	PK

Engineer: Scott	
Site: AC5	Time: 2016/01/05 - 11:33
Limit: FCC-15.407 new	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH5795MHz by 802.11n40 ant1+2	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	5793.285	97.320	54.031	N/A	N/A	43.289	PK
2		5850.555	61.167	17.694	-17.133	78.300	43.474	PK
3		5863.033	61.576	18.012	-6.724	68.300	43.564	PK

10. Frequency Stability

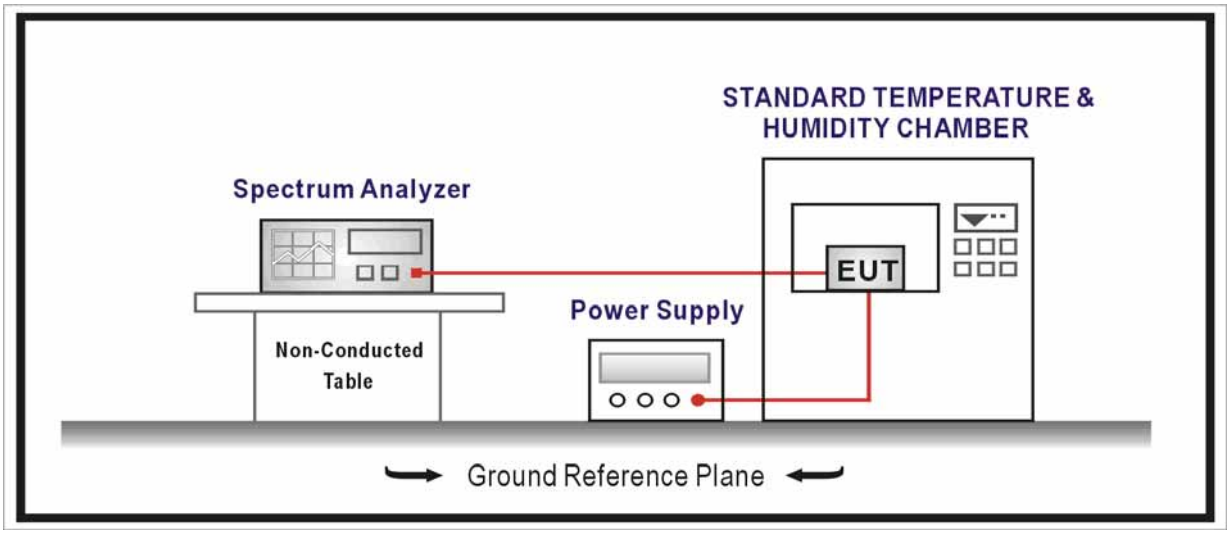
10.1. Test Equipment

Frequency Stability / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2016.01.07
AC Power Supply	IDRC	CF-500TP	979422	2016.09.16
DC Power Supply	IDRC	CD-035-020PR	977272	2016.09.16
Programmable Temperature & Humidity Chamber	Gaoyu	TH-1P-B	WIT-05121302	2016.01.07
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 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℃ 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℃ decreased per stage until the lowest temperature reached.

Frequency Stability Under Voltage Variations:

Set chamber temperature to 20℃. 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 (±15%) and endpoint, record the maximum frequency change.

10.5. Uncertainty

The measurement uncertainty is defined as ± 100 Hz

10.6. Test Result

Product	:	IP-STB
Test Item	:	Frequency Stability
Test Site	:	TR-8
Test Mode	:	Carrier Transmit

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)
-30	5220.000	157
-20	5220.000	147
-10	5220.000	-148
0	5220.000	-117
10	5220.000	-146
20	5220.000	-175
30	5220.000	133
40	5220.000	162
50	5220.000	-151

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)
102	5220.000	149
120	5220.000	131
138	5220.000	155

Product	:	IP-STB
Test Item	:	Frequency Stability
Test Site	:	TR-8
Test Mode	:	Carrier Transmit

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)
-30	5785.000	-144
-20	5785.000	-132
-10	5785.000	-120
0	5785.000	-111
10	5785.000	114
20	5785.000	-135
30	5785.000	-172
40	5785.000	156
50	5785.000	-137

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)
102	5785.000	112
120	5785.000	221
138	5785.000	102

The End