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TEST REPORT

FCC PART 15 SUBPART E 15.407 & RSS 247

Report Reference No. : CTL1708188063-WF10

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Product Name : Vehicle Communicator

Model/Type reference : UV350

List Model(s)..... : N/A

Trade Mark..... : Uniden

FCC ID..... : 2AOCX-UV350

IC..... : 23378-UV350

Applicant's name : Siyata Mobile Inc.

Address of applicant..... : 1001 Lenoir St Suite A, Montreal, Quebec H4C 2Z6 Canada

Test Firm..... : Shenzhen CTL Testing Technology Co., Ltd.

Address of Test Firm : Floor 1-A, Baisha Technology Park, No.3011, Shaheji Road,
Nanshan District, Shenzhen, China 518055

Test specification..... :

Standard : 47 CFR FCC Part 15 Subpart E 15.407 &
RSS 247 Issue 2, February 2017

TRF Originator : Shenzhen CTL Testing Technology Co., Ltd.

Master TRF..... : Dated 2011-01

Date of Receipt..... : Sep. 27, 2017

Date of Test Date..... : Sep. 28, 2017 –Nov. 24, 2017

Data of Issue..... : Nov. 25, 2017

Result..... : Pass

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TEST REPORT

Test Report No. :	CTL1708188063-WF10	Nov. 25, 2017
		Date of issue

Equipment under Test : Vehicle Communicator

Model /Type : UV350

Listed Models : N/A

Applicant : **Siyata Mobile Inc.**

Address : 1001 Lenoir St Suite A, Montreal, Quebec H4C 2Z6 Canada

Manufacturer : **Siyata Mobile Inc.**

Address : 1001 Lenoir St Suite A, Montreal, Quebec H4C 2Z6 Canada

Test result	Pass *
--------------------	---------------

* In the configuration tested, the EUT complied with the standards specified page 5.

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

**** Modified History ****

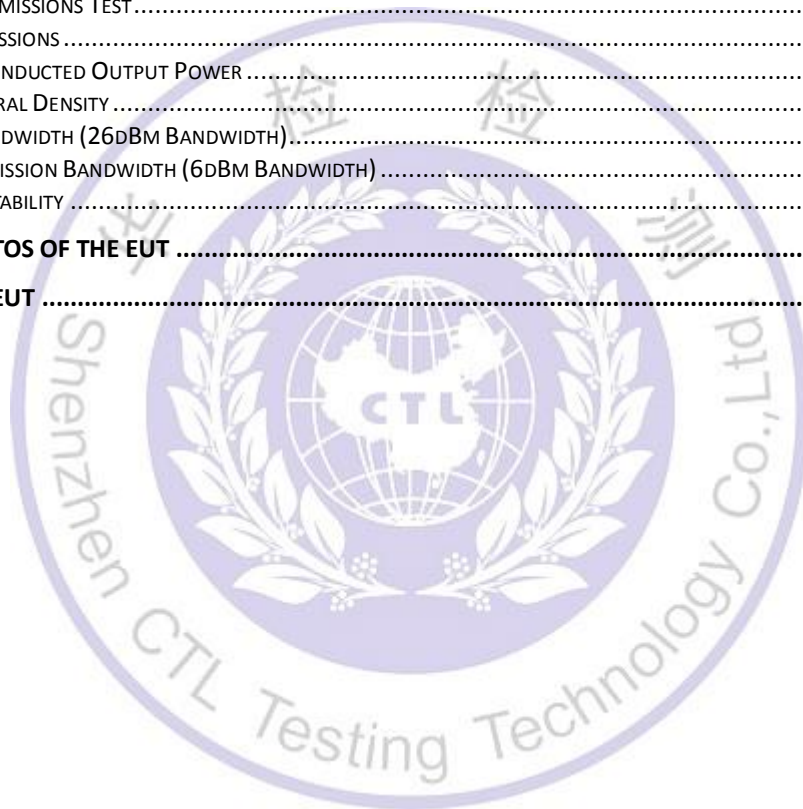
Revisions	Description	Issued Data	Report No.	Remark
Version 1.0	Initial Test Report Release	2017-11-25	CTL1708188063-WF10	Tracy Qi



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1. SUMMARY

1.1. TEST STANDARDS

The tests were performed according to following standards:

[FCC Rules Part 15 Subpart E](#)—Unlicensed National Information Infrastructure Devices

[RSS-247-Issue 2](#): Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices.

[RSS-Gen Issue 4](#): — General Requirements for Compliance of Radio Apparatus

[ANSI C63.10:2013](#): American National Standard for Testing Unlicensed Wireless Devices

[KDB789033 D02](#): General UNII Test Procedures New Rules v01r02

1.2. Test Description

FCC Requirement		
FCC Part 15.207 RSS-Gen 8.8	AC Power Conducted Emission	PASS
FCC Part 15.407(a) RSS 247 6.2.1/6.2.2/6.2.3	Emission Bandwidth(26dBm Bandwidth)	PASS ^{Note1}
FCC Part 15.407(e) RSS-247 6.2.4	Minimum Emission Bandwidth(6dBm Bandwidth)	PASS ^{Note2}
FCC Part 15.407(a) RSS-247 6.2.1/6.2.2/6.2.3/6.2.4	Maximum Conducted Output Power	PASS
FCC Part 15.407(a) RSS-247 6.2.1/6.2.2/6.2.3/6.2.4	Peak Power Spectral Density	PASS
FCC Part 15.407(g) RSS-Gen	Frequency Stability	PASS
FCC Part 15.407(b) RSS-247 6.2.1/6.2.2/6.2.3/6.2.4	Undesirable emission	PASS
FCC Part 15.407(b)/15.205/15.209 RSS-Gen RSS-247 6.2.1/6.2.2/6.2.3/6.2.4	Radiated Emissions	PASS
FCC Part 15.407(h) RSS-247 6.3	Dynamic Frequency Selection	PASS ^{Note 3}
FCC Part 15.203/15.247(b) RSS-Gen	Antenna Requirement	PASS

Note 1: Apply to U-NII 1, U-NII 2A, and U-NII 2C band.

Note 2: Apply to U-NII 3 band only.

Note 3: Test result see DFS report.

1.3. Test Facility

1.3.1 Address of the test laboratory

Shenzhen CTL Testing Technology Co., Ltd.

Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen 518055 China

There is one 3m semi-anechoic chamber and two line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.4 and CISPR 32/EN 55032 requirements.

1.3.2 Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

IC Registration No.: 9618B

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration No.: 9618B on November 13, 2013.

FCC-Registration No.: 970318

Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 970318, December 19, 2013.

1.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CTL laboratory is reported:

Test	Measurement Uncertainty	Notes
Transmitter power conducted	±0.57 dB	(1)
Transmitter power Radiated	±2.20 dB	(1)
Conducted spurious emission 9KHz-40 GHz	±2.20 dB	(1)
Occupied Bandwidth	±0.01ppm	(1)
Radiated Emission 30~1000MHz	±4.10dB	(1)
Radiated Emission Above 1GHz	±4.32dB	(1)
Conducted Disturbance0.15~30MHz	±3.20dB	(1)

- (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

2. GENERAL INFORMATION

2.1. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

2.2. General Description of EUT

Product Name:	Vehicle Communicator			
Model:	UV350			
Power supply:	DC 12V form battery			
WIFI				
Supported type:	20MHz system	40MHz system	80MHz system	160MHz system
	802.11a 802.11n 802.11ac	802.11n 802.11ac	802.11ac	N/A
Operation frequency:	5180-5240MHz 5260-5320MHz 5500-5700MHz 5745-5825MHz	5190-5230MHz 5270-5310MHz 5510-5670MHz 5755MHz,5795MHz	5210MHz; 5290MHz; 5530MHz; 5610MHz; 5775MHz	N/A
Modulation:	OFDM	OFDM	OFDM	N/A
Channel number:	24	11	5	N/A
Channel separation:	20MHz	40MHz	80MHz	N/A
Antenna type/gain:	FIFA Antenna: 1dBi on 5GHz			

Note: For more details, please refer to the user's manual of the EUT.

2.3. Description of Test Modes and Test Frequency

The Applicant provides communication tools software to control the EUT for staying in continuous transmitting (Duty Cycle more than 98%) and receiving mode for testing.

All test performed at the low, middle and high of operational frequency range of each mode.

Operation Frequency List WIFI on 5G Band:

Operating band	20MHz		40MHz		80MHz	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
U-NII 1 (5150MHz-5250MHz)	36	5180	38	5190	42	5210
	40	5200				
	44	5220	46	5230		
	48	5240				
U-NII 2A (5120MHz-5350MHz)	52	5260	54	5270	58	5290
	56	5280				
	60	5300	62	5310		
	64	5320				
U-NII 2C (5470MHz-5725MHz)	100	5500	102	5510	106	5530
	104	5520				
	108	5540	110	5550		
	112	5560				
	116	5580	118	5590	122	5610
	120	5600				
	124	5620	126	5630		
	128	5640				
	132	5660	134	5670	--	--
	136	5680			--	--
U-NII 3 (5725MHz-5850MHz)	140	5700	--	--	--	--
	149	5745	151	5755	155	5775
	153	5765				
	157	5785	159	5795		
	161	5805				
	165	5825	--	--	--	--

Note:

1. "--Means no channel(s) available any more.
2. The line display in grey is those Channels/Frequencies select to test in this report for each operation mode.

Data Rate Used:

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate
Maximum Conducted Output Power Power Spectral Density Emission Bandwidth (26dBm Bandwidth) Minimum Emission Bandwidth (6dBm Bandwidth) Undesirable emission Frequency Stability	11a/OFDM	6 Mbps
	11n(20MHz),11ac(20MHz)/OFDM	7.2 Mbps
	11n(40MHz),11ac(40MHz)/OFDM	15.0Mbps
	11ac(80MHz)/OFDM	65.0Mbps

2.4. Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
LISN	R&S	ENV216	3560.6550.12	2017/06/02	2018/06/01
LISN	R&S	ESH2-Z5	860014/010	2017/06/02	2018/06/01
Power Meter	Agilent	U2531A	TW53323507	2017/06/02	2018/06/01
Power Sensor	Agilent	U2021XA	MY5365004	2017/05/21	2018/05/20
EMI Test Receiver	R&S	ESCI	103710	2017/06/02	2018/06/01
Spectrum Analyzer	Agilent	E4407B	MY41440676	2017/05/21	2018/05/20
Spectrum Analyzer	Agilent	N9020	US46220290	2017/01/17	2018/01/16
Controller	EM Electronics	Controller EM 1000	N/A	2017/05/21	2018/05/20
Active Loop Antenna	Daze	ZN30900A	N/A	2017/05/19	2018/05/18
Bilog Antenna	Sunol Sciences Corp.	JB1	A061713	2017/06/02	2018/06/01
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2017/05/19	2018/05/18
Horn Antenna	SCHWARZBACK	BBHA 9170	BBHA9170184	2017/05/19	2018/05/18
Amplifier	Agilent	8349B	3008A02306	2017/05/19	2018/05/18
Amplifier	Agilent	8447D	2944A10176	2017/05/19	2018/05/18
Temperature/Humidity Meter	Gangxing	CTH-608	02	2017/05/20	2018/05/19
High-Pass Filter	K&L	9SH10-2700/ X12750-O/O	N/A	2017/05/20	2018/05/19
High-Pass Filter	K&L	41H10-1375/ U12750-O/O	N/A	2017/05/20	2018/05/19
Coaxial Cables	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	2017/06/02	2018/06/01
Coaxial Cables	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	2017/06/02	2018/06/01
Coaxial Cables	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	2017/06/02	2018/06/01
RF Cable	Megalon	RF-A303	N/A	2017/06/02	2018/06/01

The calibration interval was one year

2.5. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended to comply with Section 15.407 of the FCC Part 15, Subpart E Rules.

2.6. Modifications

No modifications were implemented to meet testing criteria.

3. TEST CONDITIONS AND RESULTS

3.1. Conducted Emissions Test

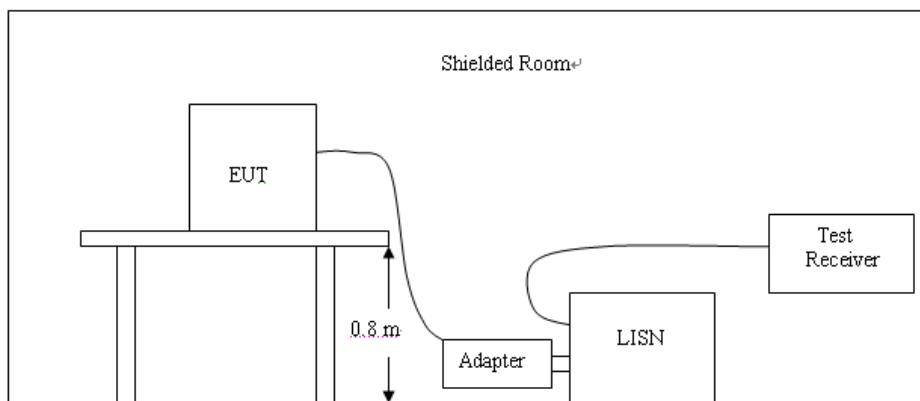
LIMIT

According to FCC CFR Title 47 Part 15 Subpart C Section 15.207 and RSS Gen 8.8, AC Power Line Conducted Emissions Limits for Licence-Exempt Radio Apparatus as below:

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST CONFIGURATION



TEST PROCEDURE

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10:2013.
2. Support equipment, if needed, was placed as per ANSI C63.10:2013.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10:2013.
4. The adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.

TEST RESULTS

Not applicable to this device, which is powered by battery.

3.2. Radiated Emissions

Limit

The maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (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 shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Undesirable emission limits

Requirement	Limit(EIRP)	Limit (Field strength at 3m) ^{Note1}
15.407(b)(1)	PK:-27(dBm/MHz)	PK:68.2(dBμV/m)
15.407(b)(2)		
15.407(b)(3)		
15.407(b)(4)		

Note1: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts)}$$

(5) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209

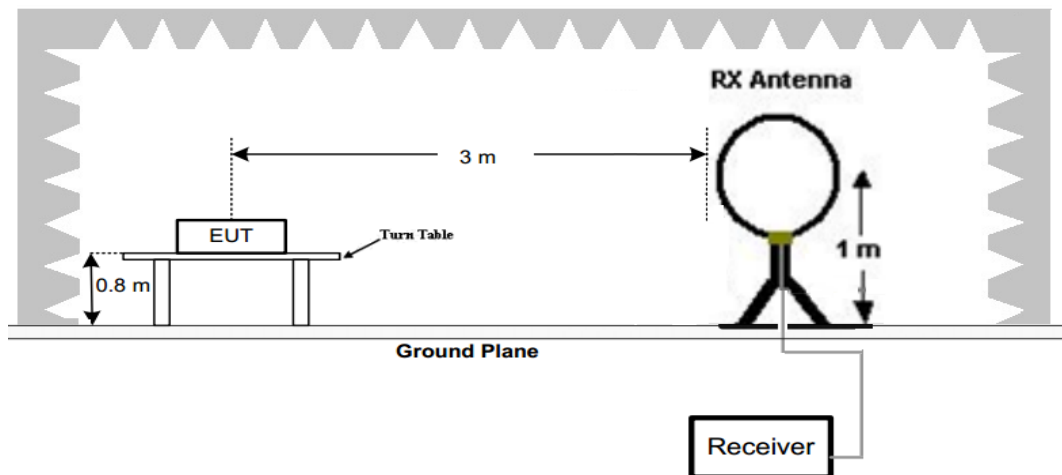
(6) In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Radiated emission limits

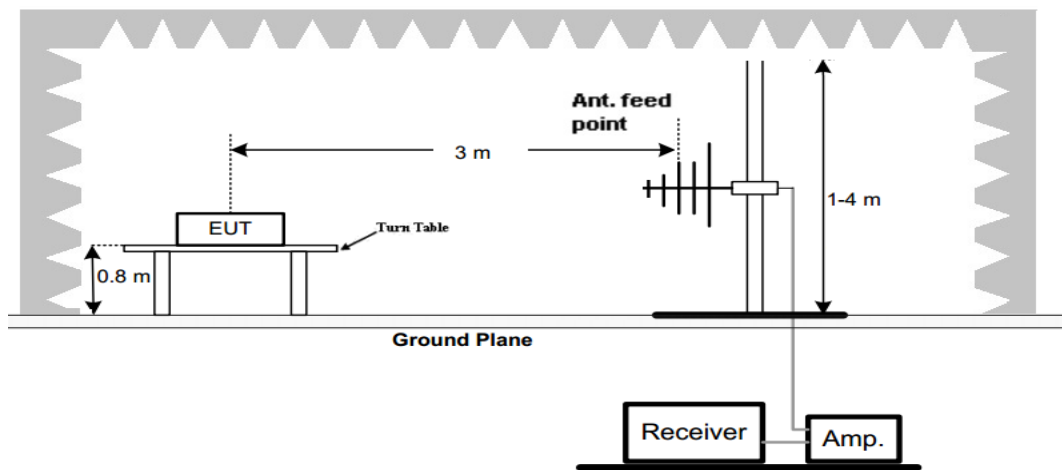
Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	3	$20\log(2400/F(\text{KHz}))+40\log(300/3)$	$2400/F(\text{KHz})$
0.49-1.705	3	$20\log(24000/F(\text{KHz}))+40\log(30/3)$	$24000/F(\text{KHz})$
1.705-30	3	$20\log(30)+40\log(30/3)$	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

TEST CONFIGURATION

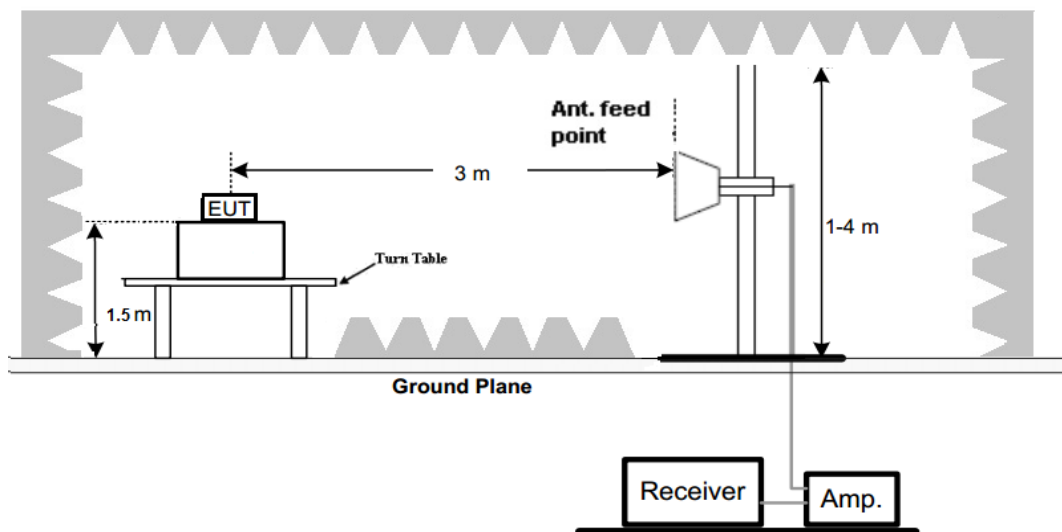
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



Test Procedure

1. Below 1GHz measurement the EUT is placed on a turntable which is 0.8m above ground plane, and above 1GHz measurement EUT was placed on a low permittivity and low loss tangent turn table which is 1.5m above ground plane.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
4. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.
5. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0° to 360° to acquire the highest emissions from EUT
6. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. Repeat above procedures until all frequency measurements have been completed.

TEST RESULTS

Remark:

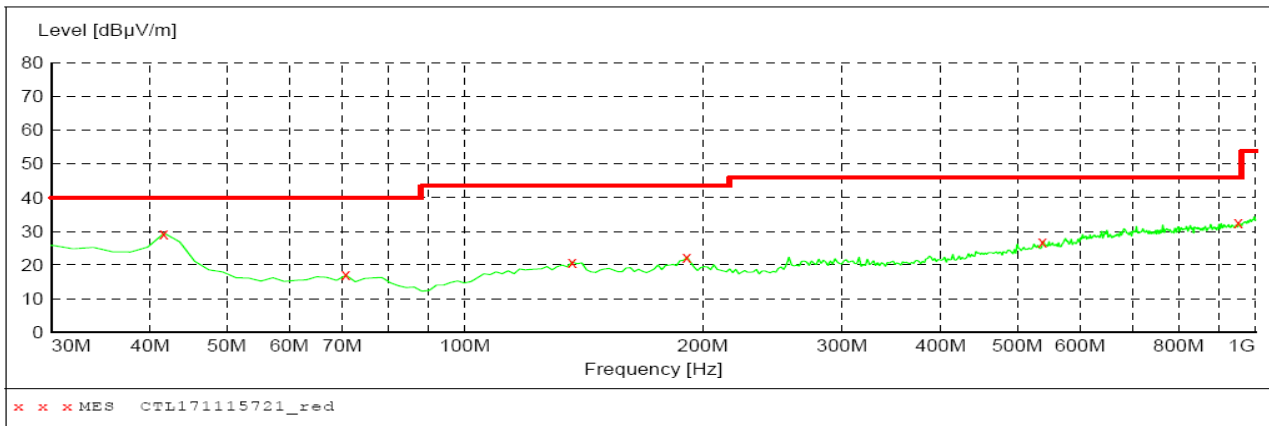
1. All 802.11a / 802.11n (HT20) / 802.11ac (HT20) / 802.11n (HT40) / 802.11ac (HT40) / 802.11ac (HT80) modes have been tested for below 1GHz test, only the worst case 802.11ac (HT20) low channel of U-NII 1 band was recorded.
2. All 802.11a / 802.11n (HT20) / 802.11ac (HT20) / 802.11n (HT40) / 802.11ac (HT40) / 802.11ac (HT80) modes have been tested for above 1GHz test, only the worst case 802.11ac (HT20) was recorded.
3. Radiated emission test from 9 KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9 KHz to 30MHz and not recorded in this report.

For 30MHz-1GHz

Horizontal

SWEEP TABLE: "test (30M-1G)"

Short Description:		Field Strength			
Start	Stop	Detector	Meas. Time	IF Bandw.	Transducer
Frequency 30.0 MHz	Frequency 1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1

***MEASUREMENT RESULT: "CTL171115721_red"***

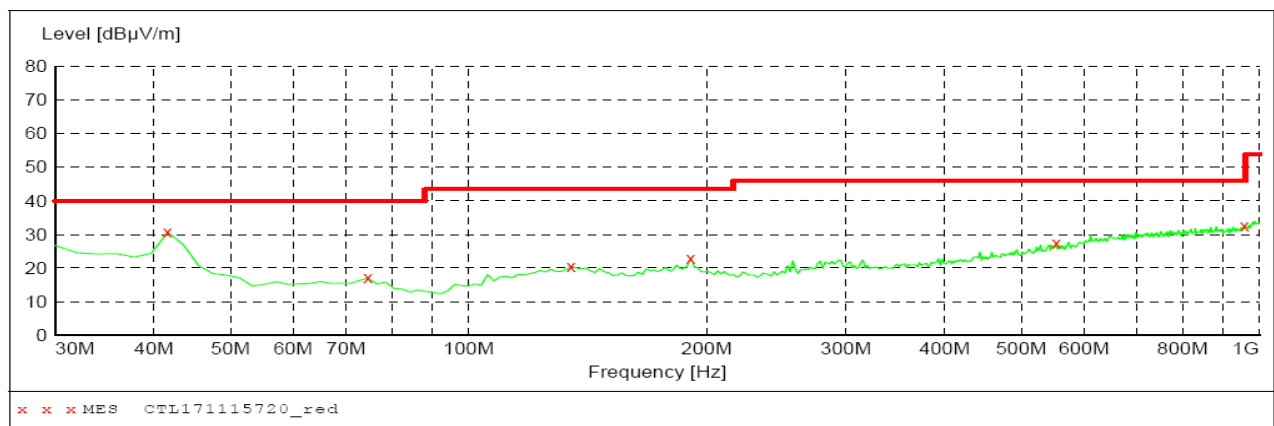
11/15/2017 3:09PM

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
41.640000	29.40	13.8	40.0	10.6	---	0.0	0.00	HORIZONTAL
70.740000	17.00	9.0	40.0	23.0	---	0.0	0.00	HORIZONTAL
136.700000	20.90	15.0	43.5	22.6	---	0.0	0.00	HORIZONTAL
191.020000	22.40	14.6	43.5	21.1	---	0.0	0.00	HORIZONTAL
538.280000	27.00	21.5	46.0	19.0	---	0.0	0.00	HORIZONTAL
951.500000	32.60	27.3	46.0	13.4	---	0.0	0.00	HORIZONTAL

Vertical

SWEEP TABLE: "test (30M-1G)"

Short Description:		Field Strength			
Start	Stop	Detector	Meas. Time	IF Bandw.	Transducer
Frequency 30.0 MHz	Frequency 1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1

***MEASUREMENT RESULT: "CTL171115720_red"***

11/15/2017 3:07PM

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
41.640000	30.70	13.8	40.0	9.3	---	0.0	0.00	VERTICAL
74.620000	17.00	9.0	40.0	23.0	---	0.0	0.00	VERTICAL
134.760000	20.50	15.1	43.5	23.0	---	0.0	0.00	VERTICAL
191.020000	23.00	14.6	43.5	20.5	---	0.0	0.00	VERTICAL
553.800000	27.30	21.9	46.0	18.7	---	0.0	0.00	VERTICAL
957.320000	32.50	27.4	46.0	13.5	---	0.0	0.00	VERTICAL

For 1GHz to 25GHz

Note: All 802.11a / 802.11n (HT20) / 802.11ac (HT20) / 802.11n (HT40) / 802.11ac (HT40) / 802.11ac (HT80) modes have been tested for above 1GHz test, only the worst case 802.11ac (HT20) was recorded.

U-NII 1 & 802.11ac (HT20) Mode (above 1GHz)

[illegible][illegible]

U-NII 2A & 802.11ac (HT20) Mode (above 1GHz)

[illegible]

U-NII 3 & 802.11ac (HT20) Mode (above 1GHz)

Tested Channel	Frequency (MHz)	Emission Level (dBuV/m)	Detector Mode	ANT Pol	Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre amplifier (dB)	Correction Factor (dB/m)
149 (5745MHz)	5720.00	50.23	PK	H	68.20	17.97	38.73	37.64	9.28	35.41	11.50
	11490.00	52.87	PK	H	68.20	15.33	34.61	39.69	12.90	34.33	18.26
	--	--	--	--	--	--	--	--	--	--	--
157 (5785MHz)	11570.00	51.69	PK	H	68.20	16.51	33.25	39.71	13.05	34.31	18.44
	--	--	--	--	--	--	--	--	--	--	--
165 (5825MHz)	5855.00	49.52	PK	H	68.20	18.68	37.98	37.64	9.28	35.38	11.54
	11650.00	52.77	PK	H	68.20	15.43	34.15	39.73	13.19	34.30	18.62
	--	--	--	--	--	--	--	--	--	--	--

Tested Channel	Frequency (MHz)	Emission Level (dBuV/m)	Detector Mode	ANT Pol	Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre amplifier (dB)	Correction Factor (dB/m)
149 (5745MHz)	5720.00	48.89	PK	V	68.20	19.31	37.39	37.64	9.28	35.41	11.50
	11490.00	52.74	PK	V	68.20	15.46	34.48	39.69	12.90	34.33	18.26
	--	--	--	--	--	--	--	--	--	--	--
157 (5785MHz)	11570.00	51.44	PK	V	68.20	16.76	33.00	39.71	13.05	34.31	18.44
	--	--	--	--	--	--	--	--	--	--	--
165 (5825MHz)	5855.00	49.69	PK	V	68.20	18.51	38.15	37.64	9.28	35.38	11.54
	11650.00	52.87	PK	V	68.20	15.33	34.25	39.73	13.19	34.30	18.62
	--	--	--	--	--	--	--	--	--	--	--

REMARKS:

1. Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
3. Margin value = Limit value- Emission level.
4. -- Mean the other emission levels were very low against the limit.
5. RBW1MHz VBW3MHz Peak detector is for PK value; RBW 1MHz VBW10Hz Peak detector is for AV value.

3.3. Maximum Conducted Output Power

Limit

FCC requirement:

For the band 5.15-5.25 GHz

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

For the 5.25-5.35 GHz and 5.47-5.725 GHz

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

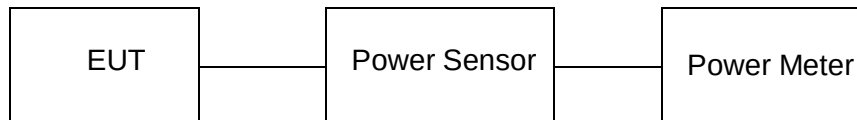
For the band 5.725-5.85 GHz

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

Test Procedure

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power sensor.

Test Configuration



Test Results

U-NII 1

Type	Channel	Output power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Result
802.11a	36	17.00	1.00	18.00	21	Pass
	40	17.49	1.00	18.49		
	48	16.43	1.00	17.43		
802.11n(HT20)	36	16.13	1.00	17.13	21	Pass
	40	16.89	1.00	17.89		
	48	16.16	1.00	17.16		
802.11n(HT40)	38	16.74	1.00	17.74	21	Pass
	46	16.93	1.00	17.93		
802.11ac(HT20)	36	16.94	1.00	17.94	21	Pass
	40	17.88	1.00	18.88		
	48	17.01	1.00	18.01		
802.11ac(HT40)	38	15.91	1.00	16.91	21	Pass
	46	16.14	1.00	17.14		
802.11ac(HT80)	42	15.58	1.00	16.58	21	Pass

U-NII 2A

Type	Channel	Output power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Result
802.11a	52	17.23	1.00	18.23	23.97	Pass
	56	17.08	1.00	18.08		
	64	16.84	1.00	17.84		
802.11n(HT20)	52	17.02	1.00	18.02	23.97	Pass
	56	17.00	1.00	18.00		
	64	16.65	1.00	17.65		
802.11n(HT40)	54	16.99	1.00	17.99	23.97	Pass
	62	17.57	1.00	18.57		
802.11ac(HT20)	52	17.62	1.00	18.62	23.97	Pass
	56	17.78	1.00	18.78		
	64	18.06	1.00	19.06		
802.11ac(HT40)	54	16.77	1.00	17.77	23.97	Pass
	62	16.66	1.00	17.66		
802.11ac(HT80)	58	16.65	1.00	17.65	23.97	Pass

U-NII 2C

Type	Channel	Output power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Result
802.11a	100	16.52	1.00	17.52	23.97	Pass
	120	17.70	1.00	18.70		
	140	17.41	1.00	18.41		
802.11n(HT20)	100	16.25	1.00	17.25	23.97	Pass
	120	17.60	1.00	18.60		
	140	15.52	1.00	16.52		
802.11n(HT40)	102	16.66	1.00	17.66	23.97	Pass
	118	17.66	1.00	18.66		
	134	15.83	1.00	16.83		
802.11ac(HT20)	100	16.78	1.00	17.78	23.97	Pass
	120	17.45	1.00	18.45		
	140	15.21	1.00	16.21		
802.11ac(HT40)	102	16.29	1.00	17.29	23.97	Pass
	118	17.33	1.00	18.33		
	134	15.74	1.00	16.74		
802.11ac(HT80)	106	16.68	1.00	17.68	23.97	Pass
	122	16.86	1.00	17.86		

U-NII 3

Type	Channel	Output power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Result
802.11a	149	16.16	1.00	17.16	30.00	Pass
	157	15.56	1.00	16.56		
	165	17.62	1.00	18.62		
802.11n(HT20)	149	15.30	1.00	16.30	30.00	Pass
	157	16.28	1.00	17.28		
	165	18.08	1.00	19.08		
802.11n(HT40)	151	15.07	1.00	16.07	30.00	Pass
	159	16.10	1.00	17.10		
802.11ac(HT20)	149	14.78	1.00	15.78	30.00	Pass
	157	15.66	1.00	16.66		
	165	16.01	1.00	17.01		
802.11ac(HT40)	151	14.54	1.00	15.54	30.00	Pass
	159	15.49	1.00	16.49		
802.11ac(HT80)	155	17.07	1.00	18.07	30.00	Pass

3.4. Power Spectral Density

Limit

FCC requirement:

For the band 5.15-5.25 GHz

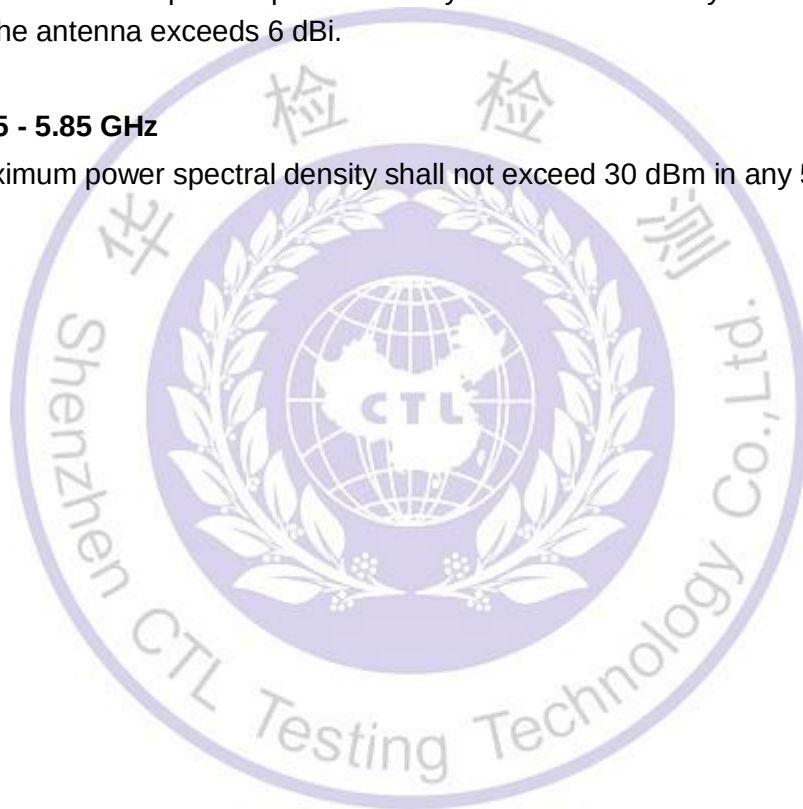
In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz

In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725 - 5.85 GHz

In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band



Test Procedure

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW = 1MHz for U-NII 1, U-NII 2A, U-NII C band and 510KHz for U-NII 3 band.
3. Set the VBW $\geq 3 \times$ RBW.
4. Set the span to encompass the entire EBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum power level.

Test Configuration



Test Results

U-NII 1

Type	Channel	P.S.D (dBm/MHz)	Antenna Gain (dBi)	EIRP P.S.D (dBm/ MHz)	Limit (dBm/ MHz)	Result
802.11a	36	8.530	1.00	9.530	17	Pass
	40	8.291	1.00	9.291		
	48	7.133	1.00	8.133		
802.11n(HT20)	36	8.032	1.00	9.032		Pass
	40	8.111	1.00	9.111		
	48	6.910	1.00	7.910		
802.11n(HT40)	38	6.731	1.00	7.731		Pass
	46	7.699	1.00	8.699		
802.11ac(HT20)	36	6.423	1.00	7.423		Pass
	40	5.590	1.00	6.590		
	48	5.987	1.00	6.987		
802.11ac(HT40)	38	6.200	1.00	7.200		Pass
	46	6.187	1.00	7.187		
802.11ac(HT80)	42	7.944	1.00	8.944		Pass

U-NII 2A

Type	Channel	P.S.D (dBm/MHz)	Antenna Gain (dBi)	EIRP P.S.D (dBm/ MHz)	Limit (dBm/ MHz)	Result
802.11a	52	8.793	1.00	9.793	11	Pass
	56	8.376	1.00	9.376		
	64	8.627	1.00	9.627		
802.11n(HT20)	52	8.233	1.00	9.233		Pass
	56	7.047	1.00	8.047		
	64	8.122	1.00	9.122		
802.11n(HT40)	54	6.998	1.00	7.998		Pass
	62	6.956	1.00	7.956		
802.11ac(HT20)	52	7.703	1.00	8.703		Pass
	56	7.607	1.00	8.607		
	64	7.230	1.00	8.230		
802.11ac(HT40)	54	6.334	1.00	7.334		Pass
	62	6.750	1.00	7.750		
802.11ac(HT80)	58	6.357	1.00	7.357		Pass

U-NII 2C

Type	Channel	P.S.D (dBm/MHz)	Antenna Gain (dBi)	EIRP P.S.D (dBm/ MHz)	Limit (dBm/ MHz)	Result
802.11a	100	8.463	1.00	9.463	11	Pass
	120	5.822	1.00	6.822		
	140	6.866	1.00	7.866		
802.11n(HT20)	100	7.832	1.00	8.832		Pass
	120	8.898	1.00	9.898		
	140	6.812	1.00	7.812		
802.11n(HT40)	102	5.629	1.00	6.629		Pass
	118	6.384	1.00	7.384		
	134	6.244	1.00	7.244		
802.11ac(HT20)	100	6.702	1.00	7.702		Pass
	120	8.487	1.00	9.487		
	140	7.011	1.00	8.011		
802.11ac(HT40)	102	6.455	1.00	7.455		Pass
	118	6.306	1.00	7.306		
	134	6.396	1.00	7.396		
802.11ac(HT80)	106	6.511	1.00	7.511		Pass
	122	6.227	1.00	7.227		

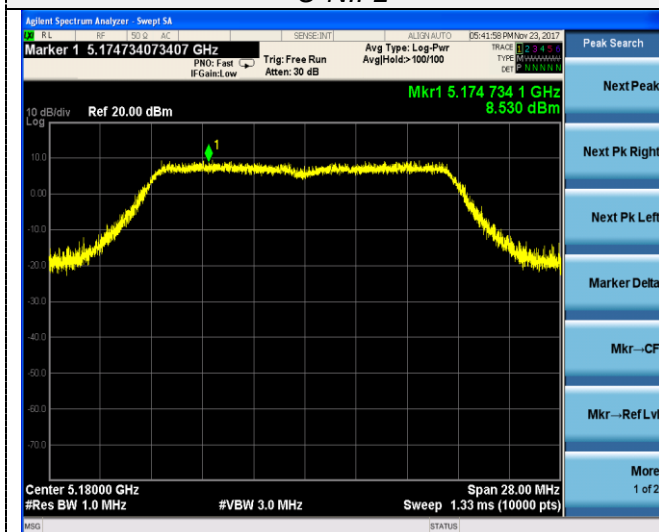
U-NII 3

Type	Channel	Power Spectral Density (dBm/500KHz)	Limit (dBm/500KHz)	Result
802.11a	149	5.471	30	Pass
	157	4.156		
	165	6.056		
802.11n(HT20)	149	5.522		
	157	6.277		
	165	6.044		
802.11n(HT40)	151	5.034		
	159	5.467		
802.11ac(HT20)	149	4.688		
	157	4.973		
	165	9.248		
802.11ac(HT40)	151	4.457		
	159	4.044		
802.11ac(HT80)	155	2.163		

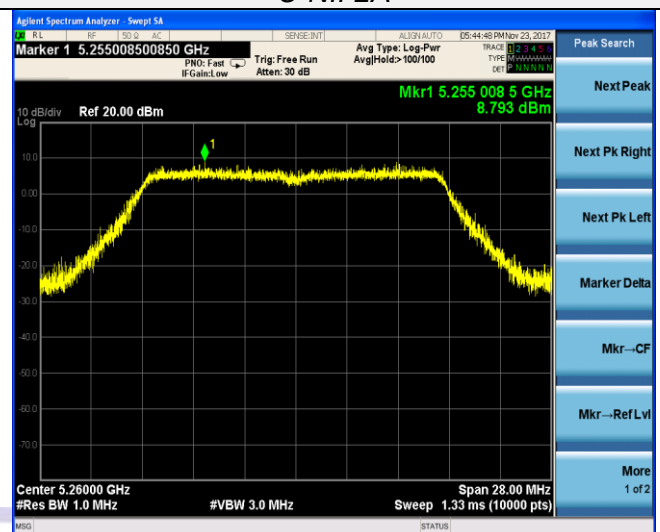
Test plot as follows:

802.11a

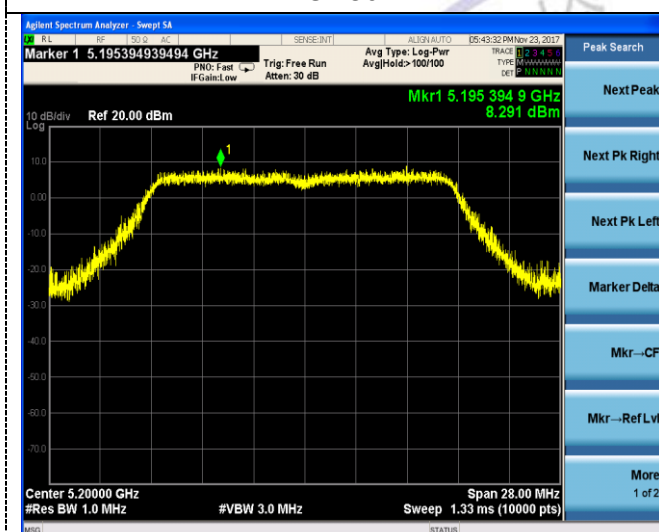
U-NII 1



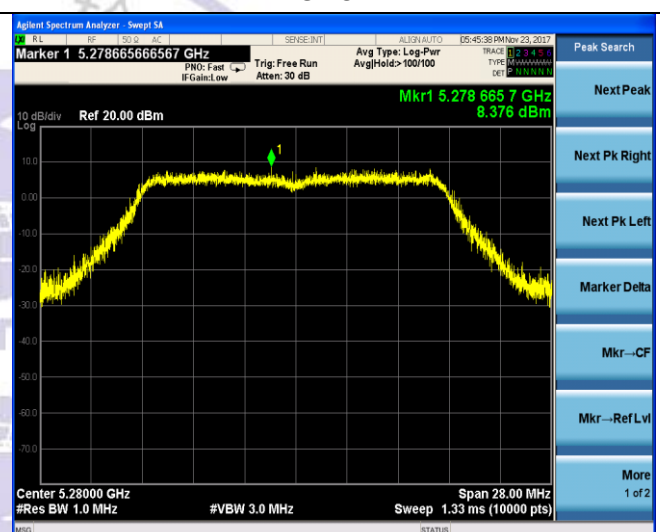
U-NII 2A



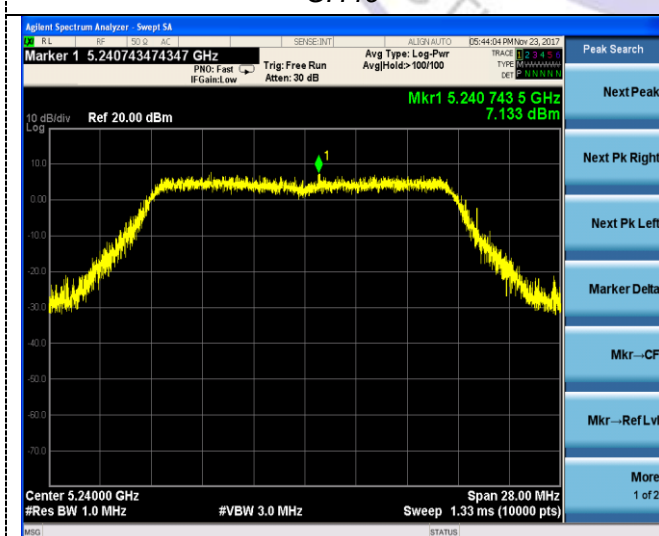
CH36



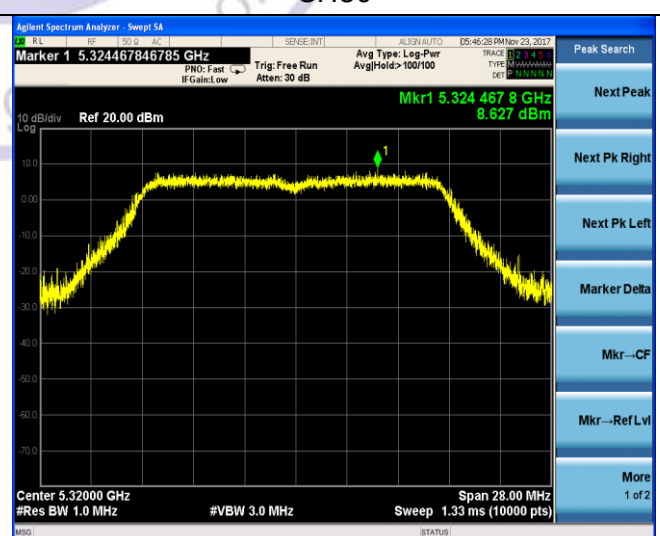
CH52



CH40

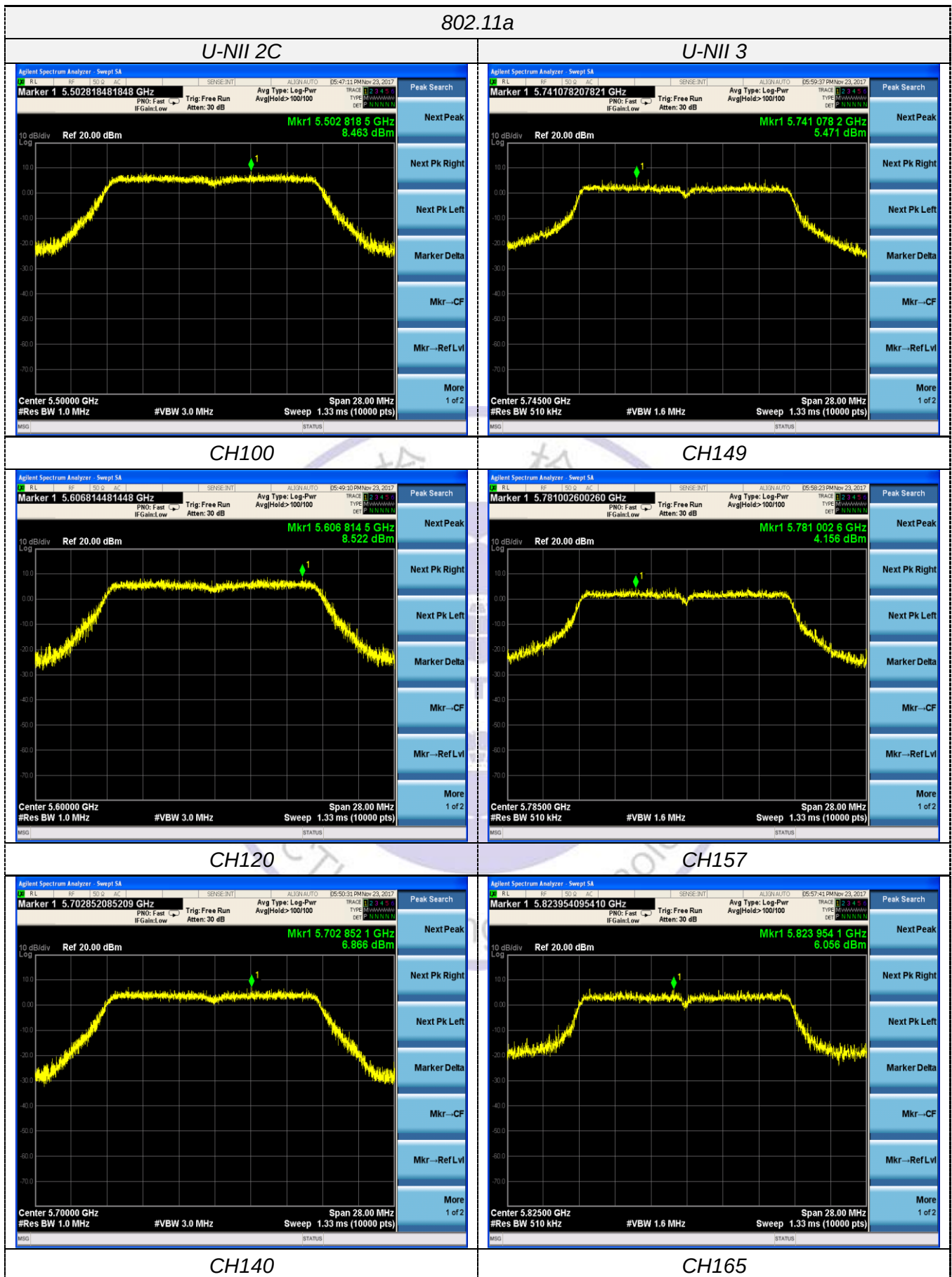


CH56



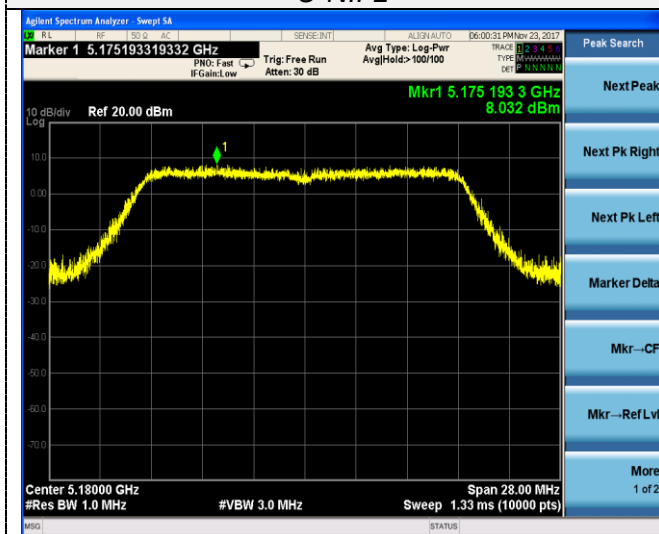
CH48

CH64

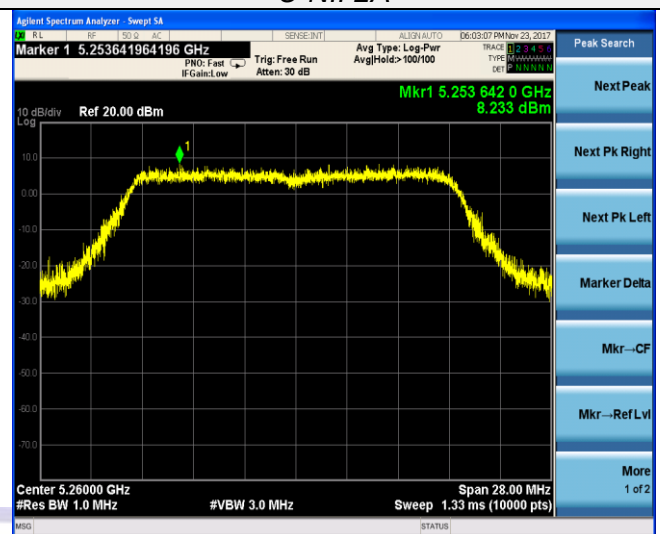


802.11n20

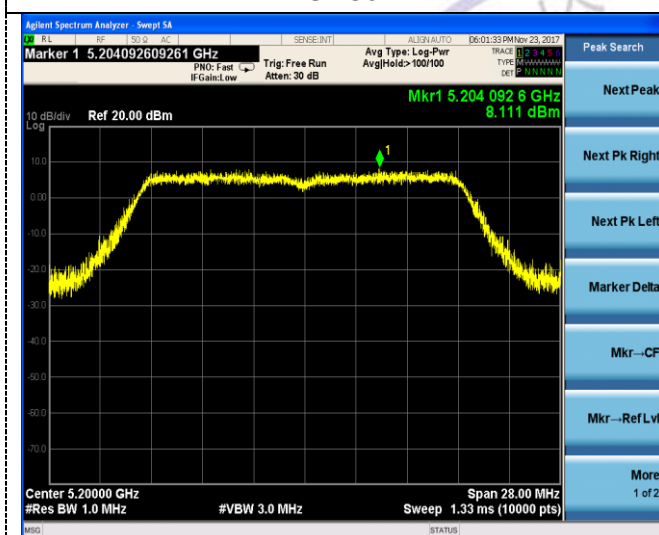
U-NII 1



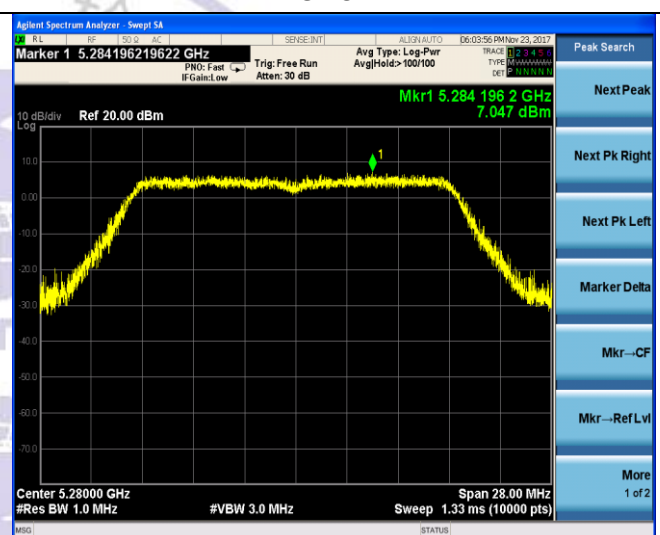
U-NII 2A



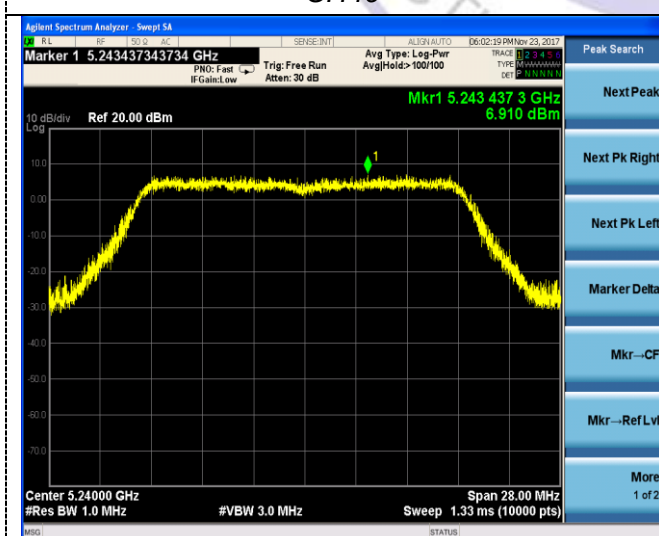
CH36



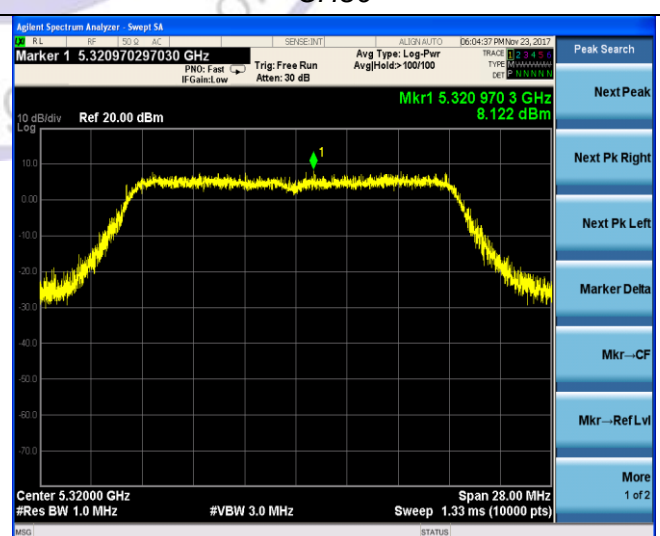
CH52



CH40



CH56

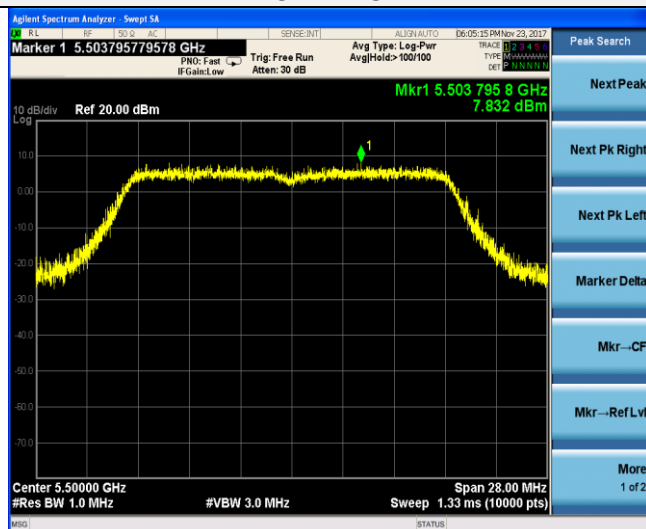


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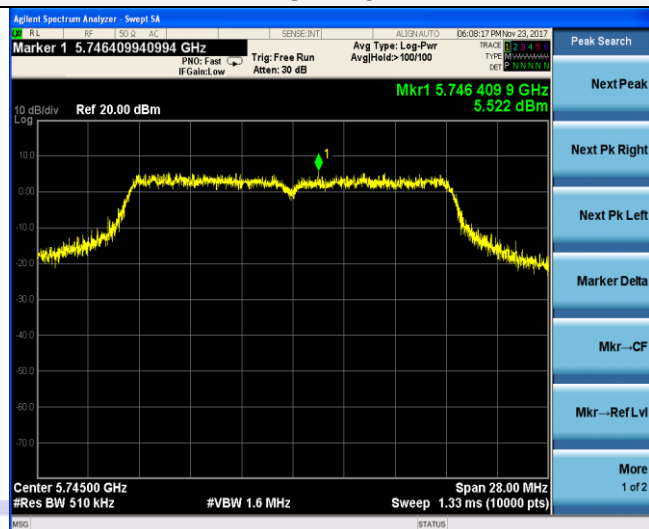
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802.11n20

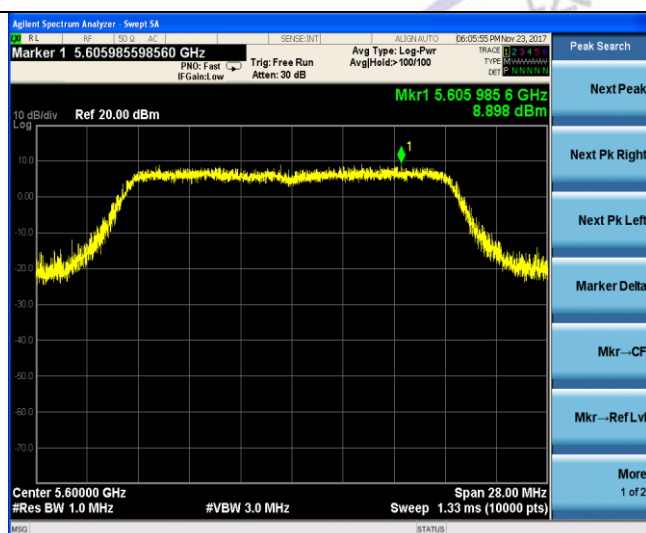
U-NII 2C



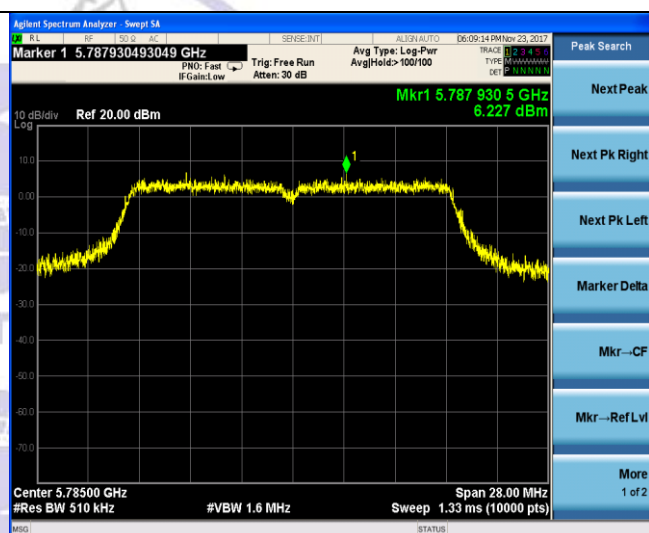
U-NII 3



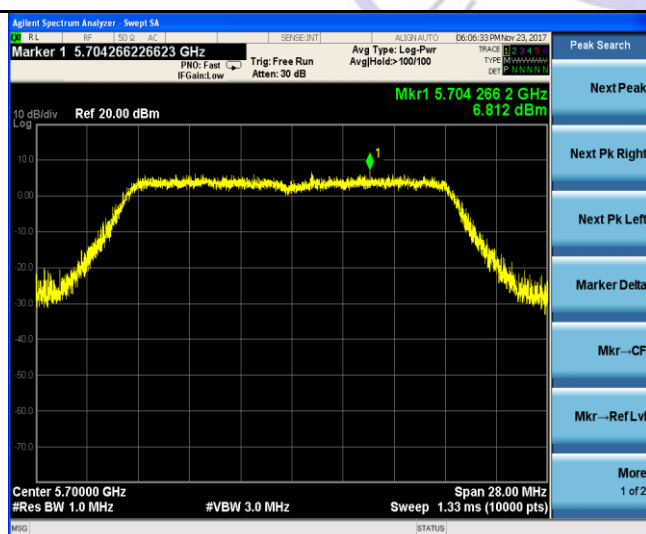
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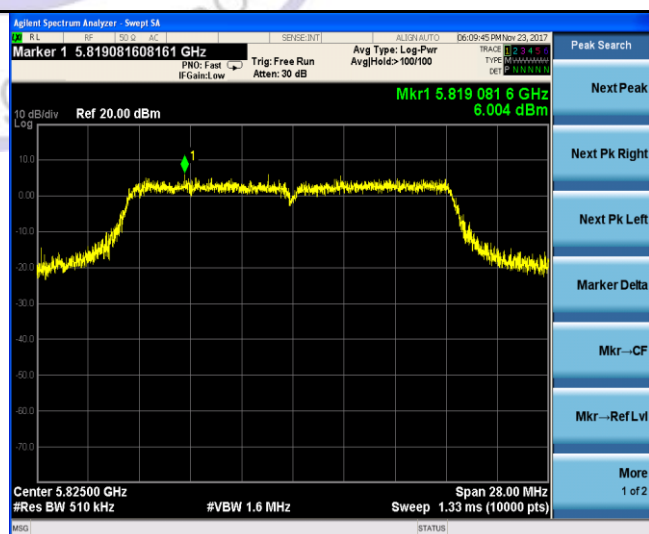
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CH120



CH157

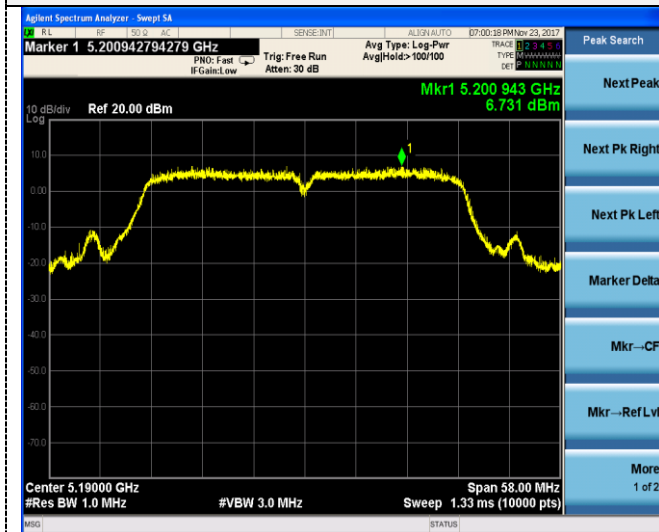


CH140

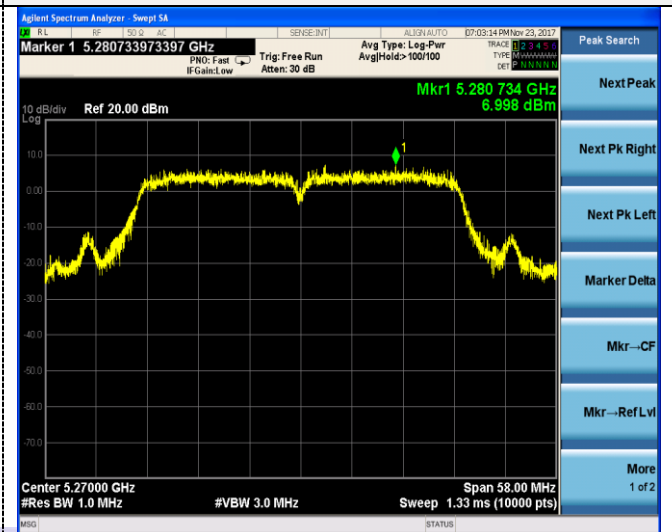
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802.11n(HT40)

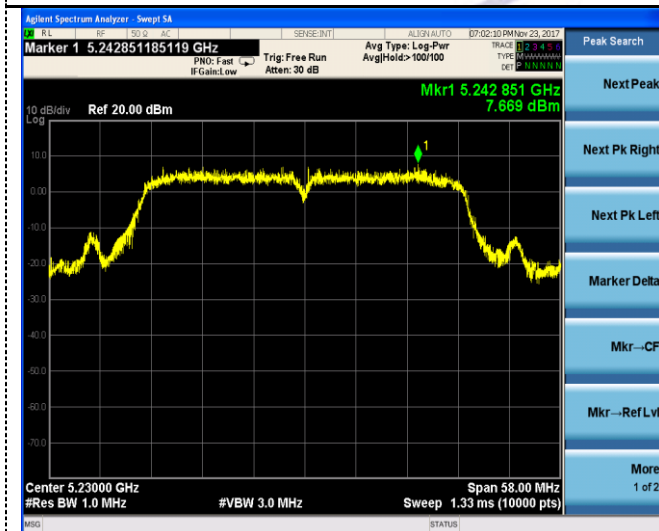
U-NII 1



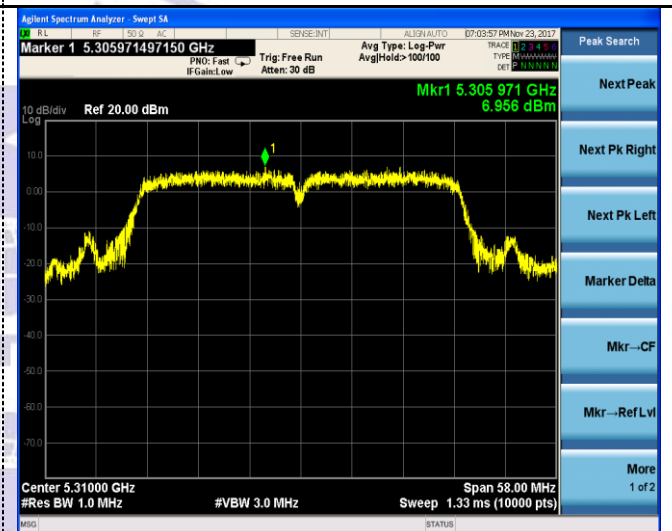
U-NII 2A



CH38



CH54



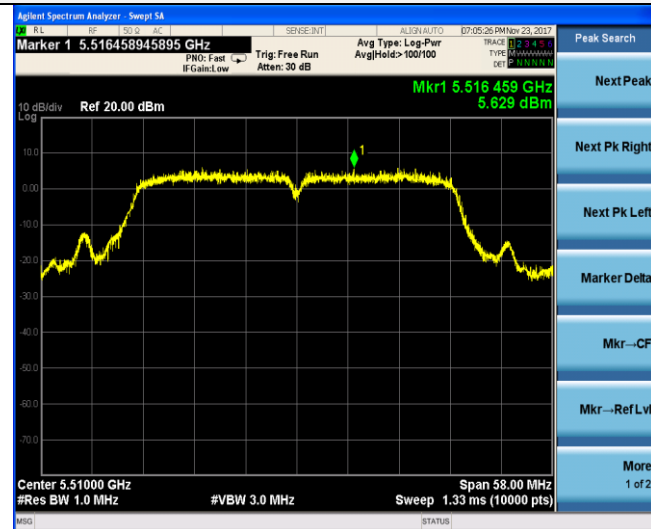
CH46

CH62

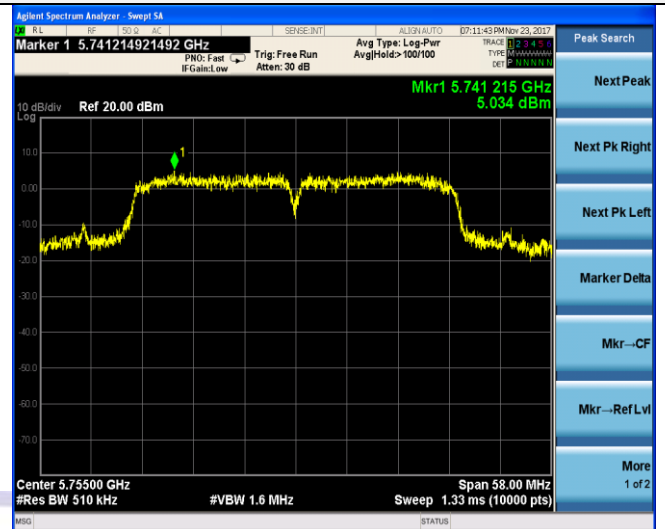


802.11n(HT40)

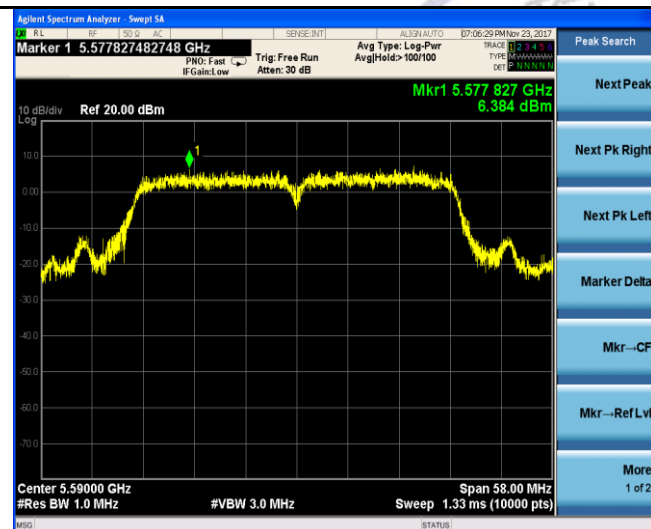
U-NII 2C



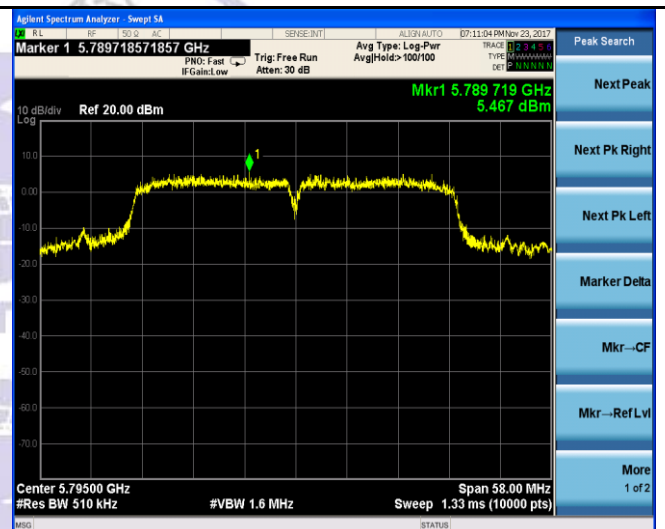
U-NII 3



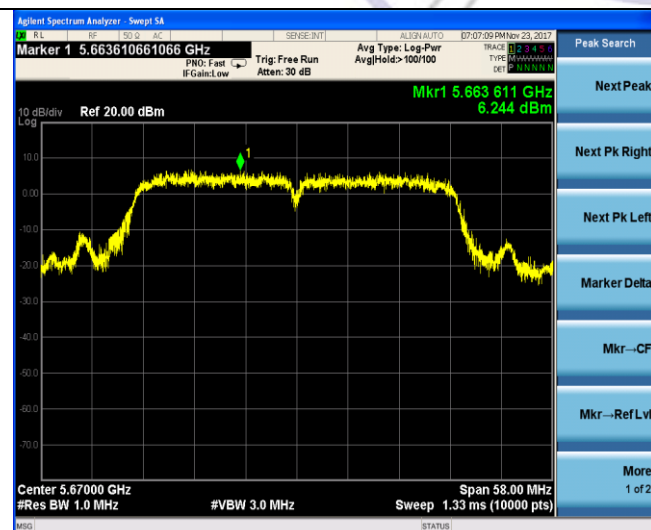
CH102



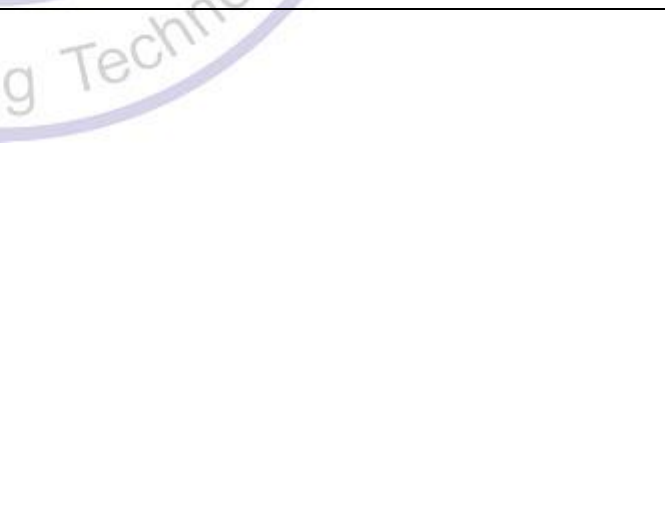
CH151



CH118



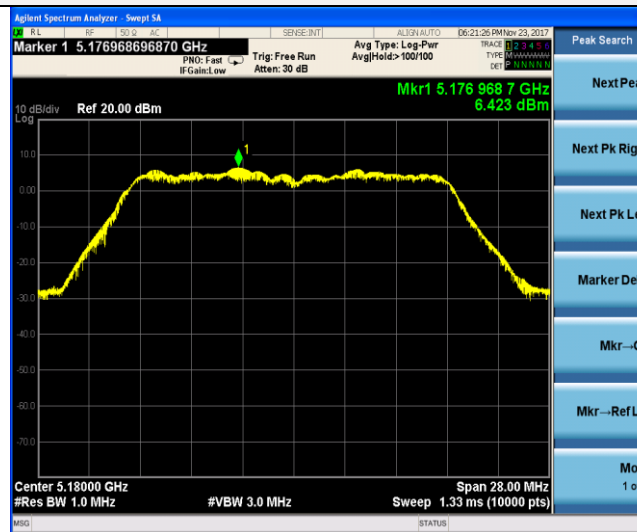
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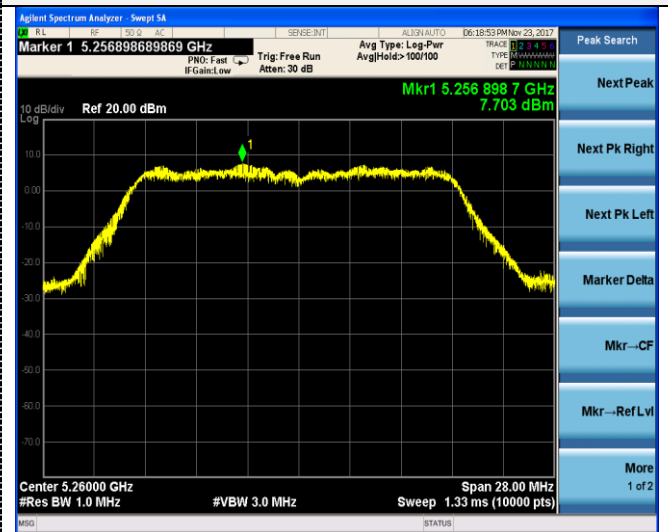
CH134

802.11ac(HT20)

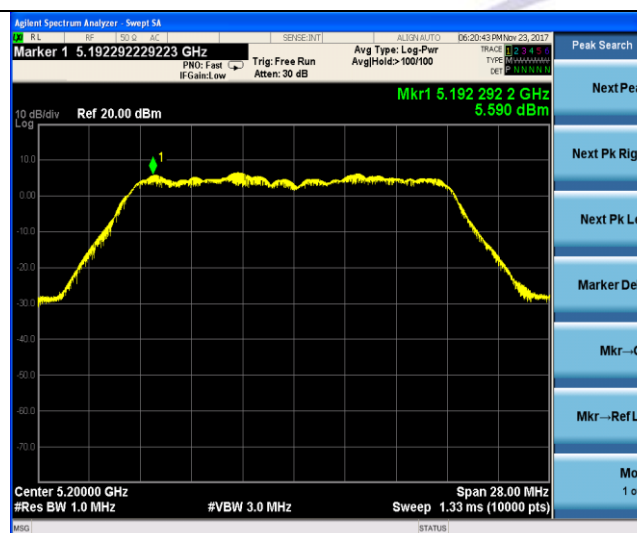
U-NII 1



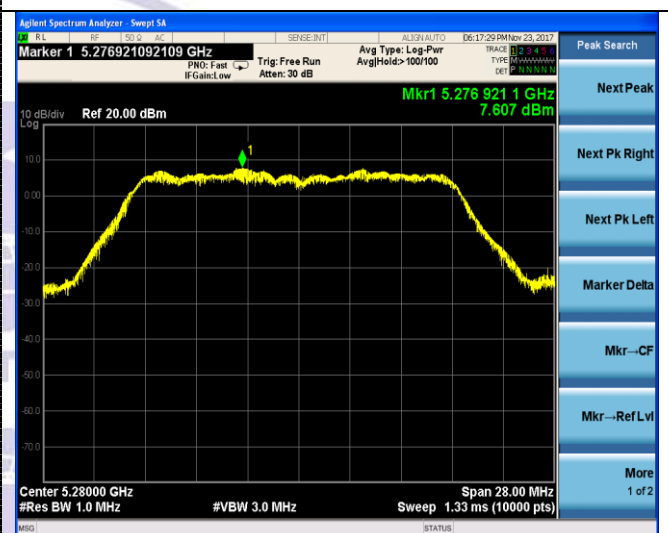
U-NII 2A



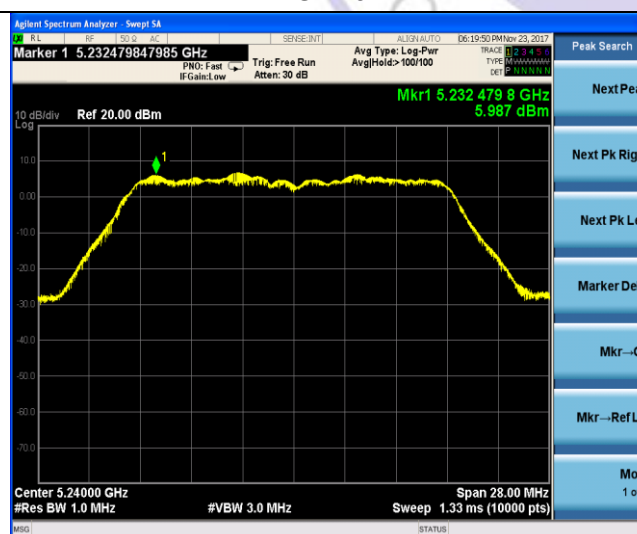
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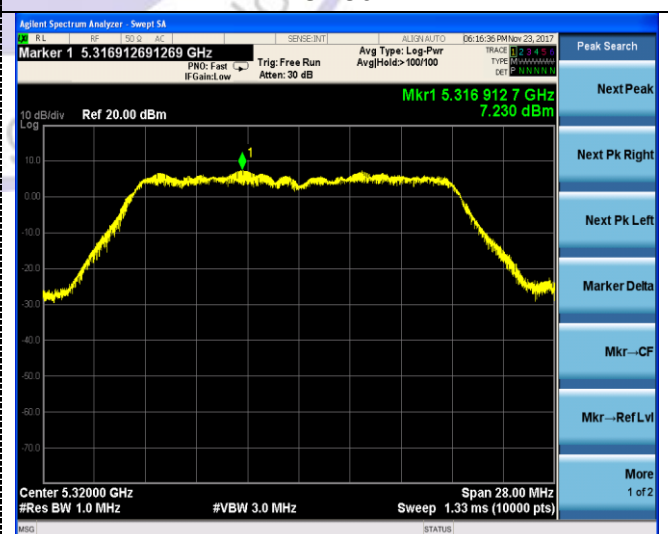
CH52



CH40



CH56



CH48



CH64

