Audix Technology Corp.
No. 53-11, Dingfu, Linkou, Dist.,
New Taipei City244, Taiwan

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RSS-247 Issue 2
5 GHz Test Report

for

LG Electronics Inc.

222, LG-ro Jinwi-myeon, Pyeongtaek-Si, Gyeonggi-Do, 451-713, Korea

Product Name	**:**	**Notebook Computer**
Model Name	**:**	**13Z980**
Brand	**:**	**LG**
IC	**:**	**2703H-13Z980**

Prepared by: **:** **AUDIX Technology Corporation, EMC Department**

Testing Laboratory
1724

TESTING
NVLAP LAB CODE 200077-0

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TEST REPORT CERTIFICATION

Applicant	:	LG Electronics Inc.
Factory	:	LG Electronics Nanjing New Technology Co., Ltd.
EUT Description		
(1) Product	:	Notebook Computer
(2) Model	:	13Z980
(3) Brand	:	LG
(4) Power Rating	:	DC 19V, 2.53A

Applicable Standards:

RSS-Gen (Issue 4), November 2014
RSS-247 (Issue 2), February 2017
ANSI C63.10:2013
KDB 789033 D02 General UNII Test Procedures New Rules v01r04

Audix Technology Corp. tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report.
Audix Technology Corp. does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens and samples.

Date of Report: 2017. 11. 30

Reviewed by: (Tina Huang/Administrator)

Approved by: (Ben Cheng/Manager)

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1. REVISION RECORD OF TEST REPORT

Edition No	Issued Data	Revision Summary	Report Number
0	2017. 11. 30	Original Report	EM-F170758

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2. SUMMARY OF TEST RESULTS

Rule	Description	Results
RSS-Gen §8.8	Conducted Emission	**PASS**
RSS-Gen §8.9/ RSS-247 §6.2.1.2/6.2.2.2/6.2.3.2/6.2.4.2	Radiated Band Edge and Radiated Spurious Emission	**PASS**
RSS-247 §6.2.1.1/6.2.2.1/6.2.3.1/6.2.4.1	Emission Bandwidth Measurement	**PASS**
RSS-247 §6.2.1.1/6.2.2.1/6.2.3.1/6.2.4.1	Maximum Output	**PASS**
RSS-247 §6.2.1.2/6.2.2.2/6.2.3.2/6.2.4.2	Conducted Band Edges and Conducted Spurious Emission	**PASS**
RSS-247 §6.2.1.1/6.2.2.1/6.2.3.1/6.2.4.1	Power Spectral Density	**PASS**
---	Antenna Requirement	**Compliance**
---	Frequency Stability	**PASS**

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3. GENERAL INFORMATION

3.1. Description of Application

Applicant	LG Electronics Inc. 222, LG-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do 451-713 Korea.
Factory	LG Electronics Nanjing New Technology Co., Ltd. No.346,Yaoxin Road, Economic & Technical Development Zone, Nanjing, China.
Product	Notebook Computer
Model	13Z980
Brand	LG

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3.2. Description of EUT

<table>
<tr><td>Test Model</td><td>13Z980</td></tr>
<tr><td>Serial Number</td><td>N/A</td></tr>
<tr><td>Power Rating</td><td>DC 19V, 2.53A</td></tr>
<tr><td>RF Features</td><td>WLAN:802.11a/b/g/n/ac
Bluetooth: BT and BLE</td></tr>
<tr><td>Transmit Type</td><td>
<table>
<tr><th colspan="2">2.4 GHz</th></tr>
<tr><td>802.11b</td><td>1T1R</td></tr>
<tr><td>802.11g</td><td>1T1R</td></tr>
<tr><td>802.11n-HT20</td><td>2T2R</td></tr>
<tr><td>802.11n-HT40</td><td>2T2R</td></tr>
<tr><td>BT/BLE</td><td>1T1R</td></tr>
</table>
<table>
<tr><th colspan="2">UNII Bands</th></tr>
<tr><td>802.11a</td><td>1T1R</td></tr>
<tr><td>802.11n-HT20/
802.11ac-VHT20</td><td>2T2R</td></tr>
<tr><td>802.11n-HT40/
802.11ac-VHT40</td><td>2T2R</td></tr>
<tr><td>802.11ac-VHT80</td><td>2T2R</td></tr>
</table>
</td></tr>
<tr><td>Device Category</td><td>☐Outdoor Access Point
☐Fixed point-to-point Access Point
☐Indoor Access Point
■Mobile and Portable client device</td></tr>
<tr><td>Sample Status</td><td>Production</td></tr>
<tr><td>Date of Receipt</td><td>2017. 11. 21</td></tr>
<tr><td>Date of Test</td><td>2017. 11. 28 ~ 30</td></tr>
<tr><td>Interface Ports of EUT</td><td>• One Micro SD Card Slot
• One Earphone Port
• Two USB 3.0 Ports
• One USB Type C Port
• One HDMI Port
• One DC Input Port</td></tr>
<tr><td>Accessories Supplied</td><td>• AC Adapter</td></tr>
</table>

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3.3. Antenna Information

2.4G Antenna					
No.	Antenna Part Number	Manufacture	Antenna Type	Frequency (MHz)	Max Gain (dBi)
1	WA-F-LBLB-04-057 (Main)	INPAQ	FPCB	2400	2.58
				2450	2.41
				2500	2.11
2	WA-F-LBLB-04-057 (AUX)	INPAQ	FPCB	2400	2.00
				2450	2.91
				2500	2.55

5G Antenna					
No.	Antenna Part Number	Manufacture	Antenna Type	Frequency (MHz)	Max Gain (dBi)
1	WA-F-LBLB-04-057 (Main)	INPAQ	FPCB	5100	1.97
				5400	1.70
				5800	1.18
2	WA-F-LBLB-04-057 (AUX)	INPAQ	FPCB	5100	1.03
				5400	2.03
				5800	1.34

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3.4. EUT Specifications Assessed in Current Report

Mode	UNII Band	Fundamental Range (MHz)	Channel Number
802.11a	I	5180-5240	4
	II	5260-5320	4
	III	5500-5720	9
	IV	5745-5825	5
802.11n-HT20/ 802.11ac-VHT20	I	5180-5240	4
	II	5260-5320	4
	III	5500-5720	9
	IV	5745-5825	5
802.11n-HT20/ 802.11ac-VHT20	I	5190-5230	2
	II	5270-5310	2
	III	5510-5710	5
	IV	5755-5795	2
802.11ac-VHT80	I	5210	1
	II-2A	5290	1
	II-2C	5530-5690	2
	III	5775	1
Remark: UNII Band II and III (DFS Function, Slave/no In service monitor, no Ad-Hoc mode)			

Mode	Modulation	Data Rate (Mbps)
802.11a	OFDM (BPSK/QPSK/16QAM/64QAM)	Up to 54
802.11n-HT20	OFDM (BPSK/QPSK/16QAM/64QAM)	Up to 144.4
802.11n-HT40		Up to 300
802.11ac-VHT20	OFDM (BPSK/QPSK/16QAM/64QAM/256QAM)	Up to 173.3
802.11ac-VHT40		Up to 400
802.11ac-VHT80		Up to 866.7

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Channel List					
802.11a/802.11n-HT20/802.11ac-VHT20					
UNII Band	Channel Number	Frequency (MHz)	UNII Band	Channel Number	Frequency (MHz)
I	36	5180	III	112	5560
	40	5200		116	5580
	44	5220		132	5660
	48	5240		136	5680
II	52	5260		140	5700
	56	5280		144	5720
	60	5300	IV	149	5745
	64	5320		153	5765
III	100	5500		157	5785
	104	5520		161	5805
	108	5540		165	5825

Channel List					
802.11n-HT40/802.11ac-VHT40					
UNII Band	Channel Number	Frequency (MHz)	UNII Band	Channel Number	Frequency (MHz)
I	38	5190	III	110	5550
	46	5230		134	5670
II	54	5270		142	5710
	62	5310	IV	151	5755
III	102	5510		159	5795

Channel List					
802.11ac-VHT80					
UNII Band	Channel Number	Frequency (MHz)	UNII Band	Channel Number	Frequency (MHz)
I	42	5210	IV	155	5775
II	58	5290			
III	106	5530			
	138	5690			

Note Test modes are presented at section 3.7.

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3.5. Description of Key Components

3.5.1. For the All Component Lists

Item	Supplier	Model / Type	Character
System	Microsoft	Win10 Home	---
Main Board	LG	13Z980 Main B/D PCB	(without Thunderbolt) Manufacturer: (1) Elec & Eltek Company (MCO) Limited (2) Hannstar Board Tech(Jiang Yin) Corp.,Ltd. (3) LG Innotek Co., Ltd.
	LG	13Z980 Main B/D PCB	(with Thunderbolt) Manufacturer: (1) Elec & Eltek Company (MCO) Limited (2) Hannstar Board Tech(Jiang Yin) Corp.,Ltd. (3) LG Innotek Co., Ltd.
SUB Board	LG	13Z980 WLAN SUB B/D	(with Finger Printer Manufacturer: (1) Hannstar Board Tech(Jiang Yin) Corp.,Ltd. (2) HYUNWOO
	LG	13Z980 WLAN SUB B/D	(without Finger Printer) Manufacturer: (3) Hannstar Board Tech(Jiang Yin) Corp.,Ltd. (4) HYUNWOO
CPU (Socket: BGA1356)	Intel	i7-8550U	1.8GHz, up to 4.0GHz
	Intel	i5-8250U	1.6GHz, up to 3.4GHz
13.3” LCD Panel	LG Display	LP133WF6(SP)(C1)	Resolution: 1920 x 1080, 60Hz FHD IPS e/ Touch (AIT Including touch)
	LG Display	LP133WF4(SP)(J1)	Resolution: 1920 x 1080, 60Hz FHD IPS (Normal Non touch)
Storage (SSD)	SK hynix	HFS256G39TND-N210A	256GB (SATA)
	Samsung	MZNLN256HMHQ-000	256GB (SATA)
Memory (RAM)	SK hynix	H5AN8GB6NAFR	8GB DDR4 (On Board)
	Samsung	K4AAG16 5WB MCRC	4GB DDR4 (On Board)
	SK hynix	HMA851S6AFR6N	4GB DDR4 (On Card)
Battery Pack	LG	LBS1224E	72Wh, DC7.7V, 9450mAh
WLAN Combo Card	Intel	8265D2W	802.11a/b/g/n/ac 2.4GHz/5GHz + BT 4.2 BLE
WLAN Combo Antenna	LG (INPAQ)	WA-F-LBLB-04-057	FPCB Type Main: Black, Aux: Gray
Keyboard	LG	SN3871	Black: BL, White: BL 1
Web Camera	Lite-On	7BF109N2	With two microphone
Finger Print	SUNTEL	SFPC-L0016A(White)	---
	SUNTEL	SFPC-L0016B(Black)	---

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Item	Supplier	Model / Type	Character
LAN Gender (Type C to LAN)	LG	80-5946-111 (White)	10/100 Megabit Ethernet Manufacturer: SUZHOU MEC ELECTRONICS
		80-5946-101 (Black)	
	LG	GD-08MF-36-WH-LP05 (White)	10/100 Megabit Ethernet Manufacturer: ARIN TECH CO. LTD
		GD-08MF-36-BK-LP06 (Black)	
	Type C to LAN: Shielded, Undetached, 0.12m		
AC Adapter (65W)	LG (Lite-on)	PA-1650-43	I/P: AC 100-240V, 50/60Hz, 1.6A, O/P: DC 19V, 3.42A
	DC Power Cord: Non-Shielded, Undetached, 1.8m, Bonded a ferrite core AC Power Cord: Non-Shielded, Detached, 1.0m (3C)		

Remark: For more detailed features description, please refer to the manufacturer's specifications or the user manual.

3.5.2. The EUT collocates with following worst components, which are used to establish a basic configuration of system during test:

SKU		1
Main Board	LG, 13Z980 Main B/D PCB (with Thunderbolt)	V
SUB Board	LG, 13Z980 WLAN SUB B/D	V
CPU	Intel, i7-8550U	V
13.3" LCD Panel	LG Display, LP133WF6(SP)(C1)/(AIT Including touch)	V
Storage (SSD)	Sk hynix, 256GB	V
Memory (RAM)	8GB (On Board)	V
Battery Pack	LG, LBS1224E	V
WLAN Combo Card	Intel, 8265D2W	V
WLAN Combo Antenna	LG (INPAQ), WA-F-LBLB-04-057	V
Keyboard	LG, SN3871	V
Web Camera	Lite-On, 7BF109N2	V
Finger Print	LG, SFPC-L0016B	V
LAN Gender (Type C to LAN)	LG, 80-5946-111 (White), 100Mbps	V
AC Adapter	LG (Lite-on), PA-1650-43	V

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3.6. Data Rate Relative to Output Power

802.11a				802.11n-HT20			
Channel	Modulation	Date Rate	Power (dBm)	Channel	Modulation	Date Rate	Power (dBm)
36	BPSK	6	15.02	36	BPSK	HT MCS8	18.24
36	QPSK	9	14.95	36	QPSK	HT MCS9	18.11
36	QPSK	12	14.82	36	QPSK	HT MCS10	17.96
36	16-QAM	18	14.66	36	16-QAM	HT MCS11	17.82
36	16-QAM	24	14.45	36	16-QAM	HT MCS12	17.66
36	64-QAM	36	14.37	36	64-QAM	HT MCS13	17.44
36	64-QAM	48	14.22	36	64-QAM	HT MCS14	17.32
36	64-QAM	54	14.15	36	64-QAM	HT MCS15	17.11

802.11n-HT40				802.11ac-VHT80			
Channel	Modulation	Date Rate	Power (dBm)	Channel	Modulation	Date Rate	Power (dBm)
38	BPSK	HT MCS8	15.43	42	BPSK	VHT MCS0	13.90
38	QPSK	HT MCS9	15.28	42	QPSK	VHT MCS1	13.74
38	QPSK	HT MCS10	15.10	42	QPSK	VHT MCS2	13.61
38	16-QAM	HT MCS11	14.98	42	16-QAM	VHT MCS3	13.49
38	16-QAM	HT MCS12	14.84	42	16-QAM	VHT MCS4	13.32
38	64-QAM	HT MCS13	14.72	42	64-QAM	VHT MCS5	13.18
38	64-QAM	HT MCS14	14.58	42	64-QAM	VHT MCS6	13.04
38	64-QAM	HT MCS15	14.41	42	64-QAM	VHT MCS7	13.90
				42	256-QAM	VHT MCS8	13.75
				42	256-QAM	VHT MCS9	13.52

Note: Above results are assessed in average power.

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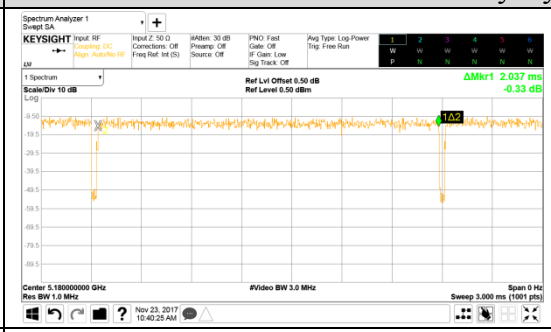
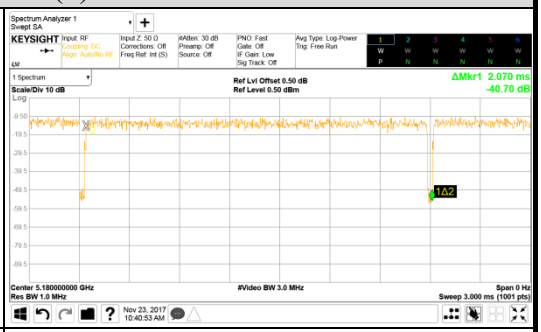
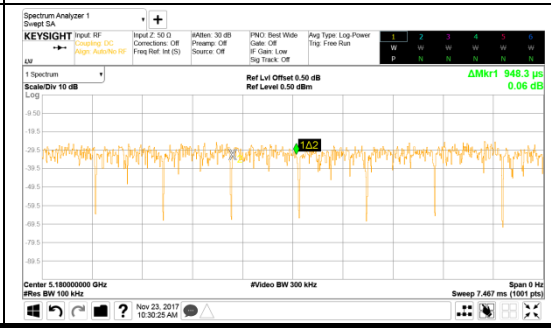
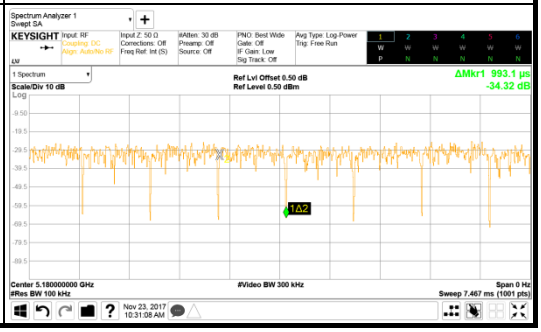
3.7. Test Configuration

Mode	Duty Cycle (x)	T (ms)	Duty Cycle Factor (dB)
802.11a	1.00	2.037	0
802.11n-HT20	0.95	0.9483	0.22
802.11n-HT40	0.97	0.9450	0.13
802.11ac-VHT80	0.67	0.0656	1.74

Note: When duty cycle is less than 98% (0.98) that duty cycle factor 10log(1/x) is needed to add in conducted test items measured in average detector.

Mode	Duty Cycle (x)	
802.11a		
802.11n-HT20		

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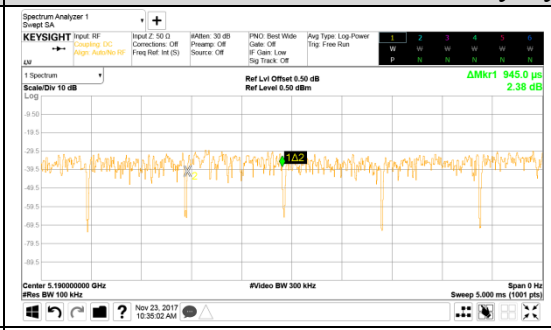
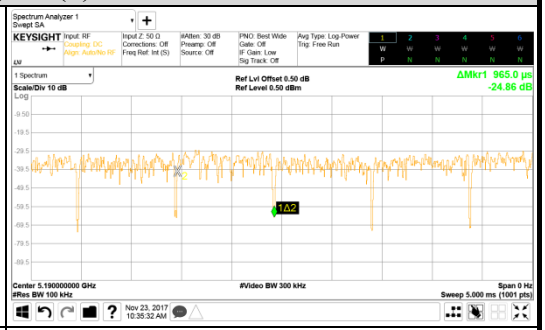
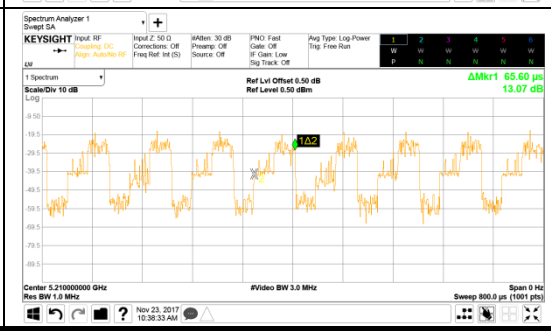
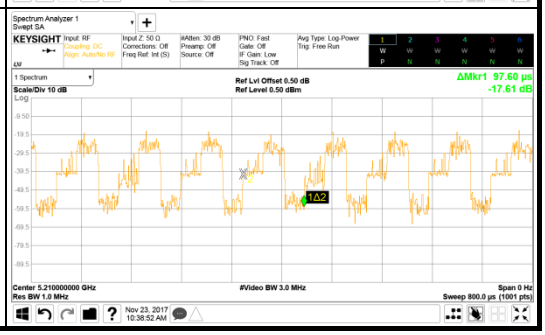
Mode	Duty Cycle (x)	
802.11n-HT40		
802.11ac-VHT80		

AC Conduction	
Test Case	Normal operation

Item		Mode	Data Rate	Test Channel
Radiated Test Case	Radiated Band Edge Note1	802.11a	6 Mbps	36/64/100/140
		802.11n-HT20	HT MCS8	36/64/100/140
		802.11n-HT40	HT MCS8	38/62/102/134
		802.11ac-VHT80	VHT MCS0	42/58/106/122
	Radiated Spurious Emission Note1 & 2	802.11a	6 Mbps	36/40/48/52/60/64/116/140/140/149/157/165
		802.11n-HT20	HT MCS8	36/40/48/52/60/64/116/140/140/149/157/165
		802.11n-HT40	HT MCS8	38/46/54/62/102/110/134/151/159
		802.11ac-VHT80	VHT MCS0	42/58/106/138/155
Conducted Test Case	Emission Bandwidth	802.11a	6 Mbps	36/40/48/52/60/64/100/116/140/149/157/165
		802.11n-HT20	HT MCS8	36/40/48/52/60/64/100/116/140/149/157/165
		802.11n-HT40	HT MCS8	38/46/54/62/102/110/134/142/151/159
		802.11ac-VHT80	VHT MCS0	42/58/106/138/155

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Item		Mode	Data Rate	Test Channel
Conducted Test Case	Maximum output power	802.11a	6 Mbps	36/40/48/52/60/64/ 100/116/140/149/157/165
		802.11n-HT20	HT MCS8	36/40/48/52/60/64/ 100/116/140/149/157/165
		802.11n-HT40	HT MCS8	38/46/54/62/ 102/110/134/142/151/159
		802.11ac-VHT80	VHT MCS0	42/58/106/138/155
	Emission Limitations	802.11a	6 Mbps	36/40/48/52/60/64/ 100/116/140/149/157/165
		802.11n-HT20	HT MCS8	36/40/48/52/60/64/ 100/116/140/149/157/165
		802.11n-HT40	HT MCS8	38/46/54/62/ 102/110/134/142/151/159
		802.11ac-VHT80	VHT MCS0	42/58/106/138/155
	Power spectral density	802.11a	6 Mbps	36/40/48/52/60/64/ 100/116/140/149/157/165
		802.11n-HT20	HT MCS8	36/40/48/52/60/64/ 100/116/140/149/157/165
		802.11n-HT40	HT MCS8	38/46/54/62/ 102/110/134/142/151/159
		802.11ac-VHT80	VHT MCS0	42/58/106/138/155

Note 1:
■Mobile Device
□Portable Device, and 3 axis were assessed.
- □ Lie
- □ Side
- □ Stand

Note 2: Low, mid, and high channels were measured, only the worst channel of each modulation was presented in this report.

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3.8. Tested Supporting System List

3.8.1. Support Peripheral Unit

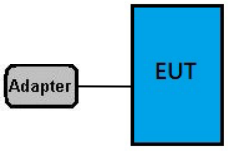
No.	Product	Brand	Model No.	Serial No.	Approval
1.	LCD Monitor	ASUS	VE228	N/A	FCC By DoC
2.	USB Mouse	Lenovo	45J4886	N/A	FCC By DoC
3.	Earphone	APPLE	N/A	N/A	FCC By DoC

3.8.2. Cable Lists

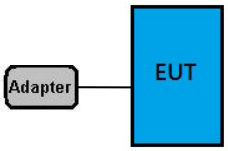
No.	Cable Description Of The Above Support Units
1.	HDMI Cable: Shielded, Detachable, 1.8m AC Power Cord: Unshielded, Detachable, 1.8m
2.	USB Cable: Unshielded, Undetachable, 1.8m
3.	Earphone Cable: Unshielded, Undetachable, 2.0m

3.9. Setup Configuration

3.9.1. EUT Configuration for Power Line & Radiated Emission



3.9.2. EUT Configuration for RF Conducted Test Items



3.10. Operating Condition of EUT

Test program “DRTU” is used for enabling EUT BT or WLAN function under continues transmitting and choosing data rate/ channel.

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3.11.Description of Test Facility

Name of Test Firm	Audix Technology Corporation / EMC Department No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan Tel: +886-2-26092133 Fax: +886-2-26099303 Website : www.audixtech.com Contact e-mail: attemc_report@audixtech.com
Accreditations	The laboratory is accredited by following organizations under ISO/IEC 17025:2005 (1) NVLAP(USA) NVLAP Lab Code 200077-0 (2) TAF(Taiwan) No. 1724 (3) FCC OET Designation No. TW1004 & TW1090 & TW1724
Test Facilities	(1) No. 7 Shielding Room (2) Semi-Anechoic Chamber (IC Test Site Registration No.: 5183B-1) (3) Fully Anechoic Chamber (IC Test Site Registration No.: 5183B-4)

3.12.Measurement Uncertainty

Test Item	Frequency Range	Uncertainty
Conduction Test	150kHz~30MHz	±3.50dB
Radiation Test (Distance: 3m)	30MHz~1000MHz	± 3.68dB
	Above 1GHz	± 5.82dB

Remark：Uncertainty = $ku_c(y)$

Test Item	Uncertainty
Emission Bandwidth	± 0.2kHz
Maximum output power	± 0.33dB
Power spectral density	± 0.13dB
Conducted Emission Limitations	± 0.13dB

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4. MEASUREMENT EQUIPMENT LIST

4.1. Conducted Emission Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Test Receiver	R&S	ESCI	101276	2017. 03. 23	1 Year
2.	A.M.N.	R&S	ESH2-Z5	100366	2017. 07. 20	1 Year
3.	L.I.S.N.	Kyoritsu	KNW-407	8-881-13	2016. 12. 28	1 Year
4.	Pulse Limiter	R&S	ESH3-Z2	101495	2017. 01. 16	1 Year
5.	Test Software	Audix	e3	V.120619C	N.C.R.	N.C.R.

4.2. Radiated Emission Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A-526	MY53400071	2017. 09. 13	1 Year
2.	Spectrum Analyzer	Agilent	N9010A-526	MY52220368	2016. 12. 01	1 Year
3.	Test Receiver	R & S	ESCS30	100338	2017. 06. 19	1 Year
4.	Amplifier	HP	8447D	2944A06305	2017. 02. 16	1 Year
5.	Amplifier	Sonoma	310N	187161	2017. 06. 08	1 Year
6.	Bilog Antenna	CHASE	CBL6112D	33821	2017. 01. 21	1 Year
7.	Loop Antenna	R&S	HFH2-Z2	891847/27	2016. 12. 23	1 Year
8.	Double-Ridged Waveguide Horn	ETS-Lindgren	3117	00135902	2017. 03. 08	1 Year
10.	5G Notch Filter	Microware Circuits	N0452502	459775	2016. 12. 28	1 Year
11.	5G Notch Filter	Microware Circuits	N0555983	459481	2017. 05. 05	1 Year
12.	5G Notch Filter	Microware Circuits	N0257881	459776	2017. 02. 03	1 Year
13.	Test Software	Audix	e3	V.6.110601	N.C.R.	N.C.R.

4.3. RF Conducted Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
1.	Spectrum Analyzer	Keysight	N9010B-544	MY55460198	2017. 04. 18	1 Year
2.	Power Meter	Anritsu	ML2495A	1145008	2017. 11. 03	1 Year
3.	Power Sensor	Anritsu	MA2411B	1126096	2017. 11. 03	1 Year

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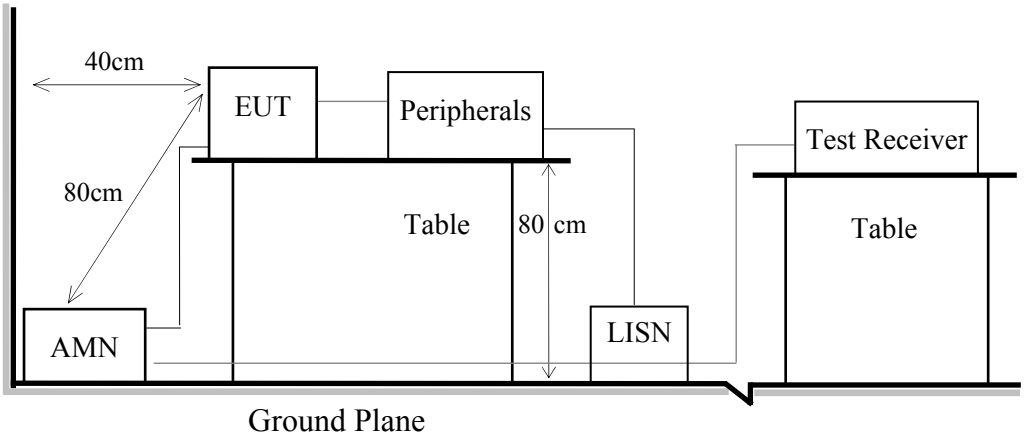
5. CONDUCTED EMISSION

5.1. Block Diagram of Test Setup

5.1.1. Block Diagram of EUT

Indicated as section 3.9

5.1.2. Shielded Room Setup Diagram



5.2. Conducted Emission Limit

Frequency	Conducted Limit	
	Quasi-Peak Level	Average Level
150kHz ~ 500kHz	66 ~ 56 dBμV	56 ~ 46 dBμV
500kHz ~ 5MHz	56 dBμV	46 dBμV
5MHz ~ 30MHz	60 dBμV	50 dBμV

Remark 1.: If the average limit is met when using a Quasi-Peak detector, the measurement using the average detector is not required.
2.: The lower limit applies to the band edges.

5.3. Test Procedure

5.3.1. To set up the EUT as indicated in ANSI C 63.10. The EUT was placed on the table which has 80 cm height to the ground and 40 cm distance to the conducting wall.

5.3.2. Power supplier of the EUT was connected to the AC mains through an Artificial Mains Network (A.M.N.).

5.3.3. The AC power supplies to all peripheral devices must be provided through line impedance stabilization network (L.I.S.N.)

5.3.4. Checking frequency range from 150 kHz to 30 MHz and record the emission which does not have 20 dB below limit.

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5.4. Test Results

Please refer to Appendix A.

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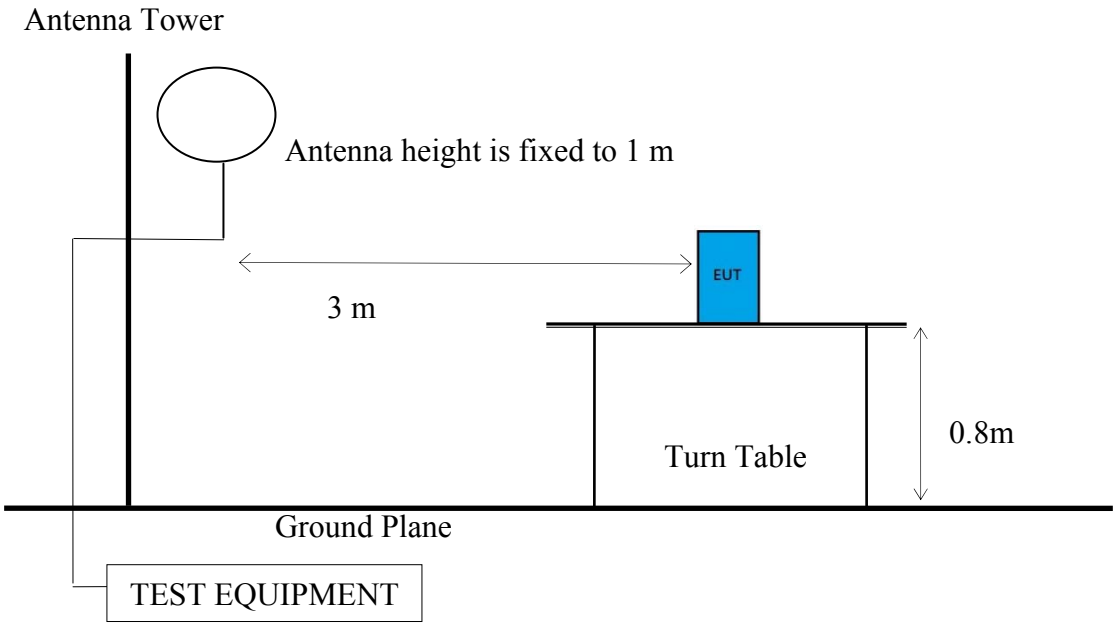
6. RADIATED EMISSION

6.1. Block Diagram of Test Setup

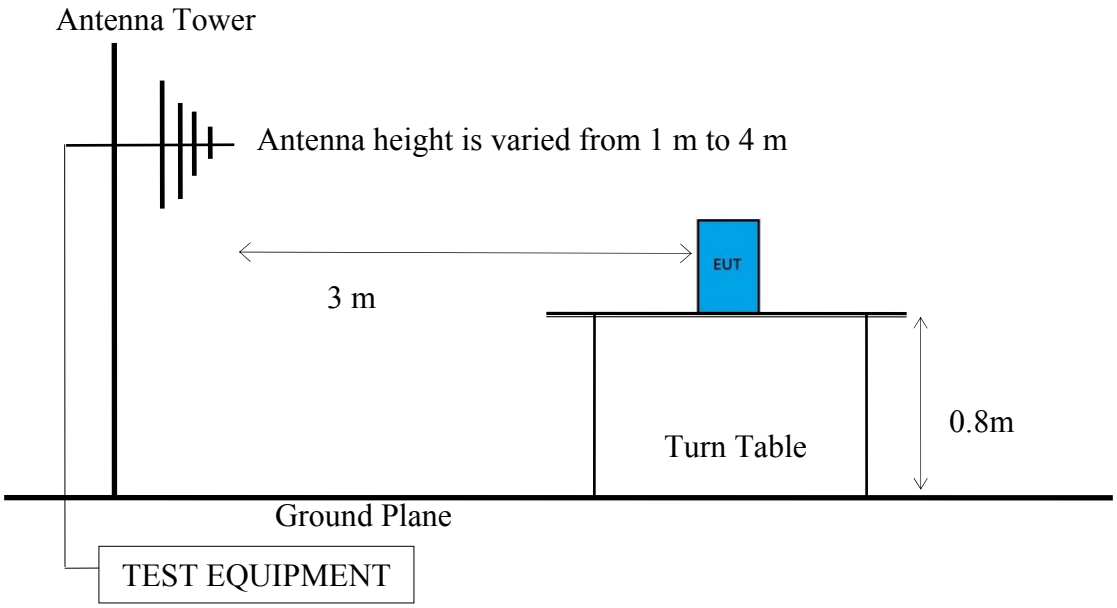
6.1.1. Block Diagram of EUT

Indicated as section 3.9

6.1.2. Setup Diagram for 9kHz-30MHz



6.1.3. Setup Diagram for 30-1000 MHz



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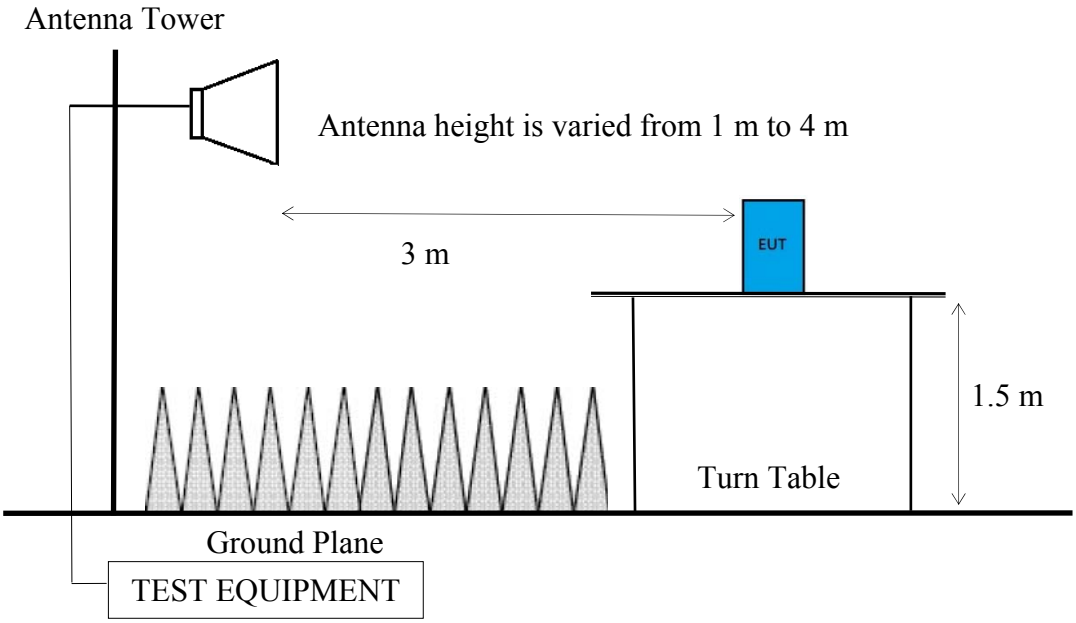
6.1.4. Setup Diagram for above 1GHz



6.2. Radiated Emission Limits

Radiated emissions fall in restricted bands, as defined in RSS-Gen table 6 must be in compliance with the radiated emission limits specified in RSS-Gen table 4 as below.

6.2.1. General Limit

Frequency (MHz)	Distance (m)	Limits	
		dBμV/m	μV/m
0.009 - 0.490	300	67.6	2400/kHz
0.490 - 1.705	30	87.6	24000/kHz
1.705 - 30	30	29.5	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
Above 1000	3	74.0 dBμV/m (Peak) 54.0 dBμV/m (Average)	

Remark：(1) dBμV/m = 20 log (μV/m)
(2) The tighter limit applies to the edge between two frequency bands.
(3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
(4) Fundamental and emission fall within operation band are exempted from this section.
(5) Pursuant to ANSI C63.10: 6.6.4.3, if the maximized peak measured value complies with the average limit, then it is unnecessary to perform an average measurement.

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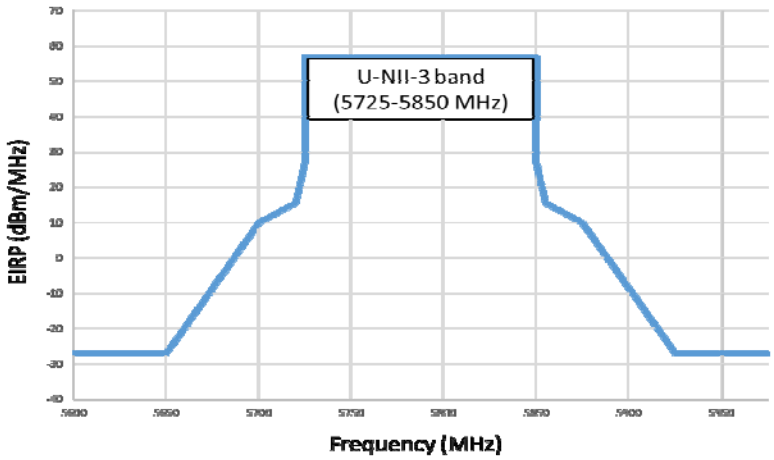
6.2.2. Limit for non-restricted frequency above 1 GHz

Frequency Band (MHz)	E.I.R.P. Limit	Field Strength Limit at 3 m
5150 to 5250	-27 dBm	68.2
5250 to 5350		68.2
5470 to 5725		68.2

Note: Field Strength at 3 m= E.I.R.P. + 95.2 dB

Frequency Band (MHz)	Field Strength Limit at 3 m	
5725 to 5850	☒	RSS-247 Section 6.2.4.2 a) 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges; b) 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges; c) 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and d) -27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.
	☐	RSS-247 Section 6.2.4.2, compliance with the emission limits in RSS-247 Section 5.5 Shall be at least 30dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power,. Attenuation below the general limits specified in RSS-Gen Section 8.9 table 4 is not required. In addition, radiated emissions which fall in the restricted bands, as defined in RSS-Gen Section 8.10 table 6, must also comply with the radiated emission limits specified in RSS-Gen Section 8.9 table 4



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6.3. Test Procedure

Frequency Range 9kHz~30MHz:
The EUT setup on the turn table which has 0.8 m height to the ground. The turn table rotated 360 degrees and antenna fixed to 1 m to find the maximum emission level.
In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2013 regulation.

(1) RBW = 9kHz with peak and average detector.
(2) Detector: average and peak (9kHz-490kHz)
Q.P. (490kHz-30MHz)

Frequency Range 30MHz ~ 40GHz:
The EUT setup on the turn find table which has 80 cm (for 30-1000 MHz) and 1.5m (for above 1GHz) height to the ground. The turn table rotated 360 degrees and antenna varied from 1 m to 4 m to find the maximum emission level. Both horizontal and vertical polarization are required. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2013 regulation.

Frequency below 1 GHz:
Spectrum Analyzer is used for pre-testing with following setting:
(1)RBW = 120KHz
(2)VBW ≥ 3 x RBW.
(3)Detector = Peak.
(4)Sweep time = auto.
(5)Trace mode = max hold.
(6)Allow sweeps to continue until the trace stabilizes.
(7)When peak-detected value is lower than limit that the measurement using the Q.P. detector is not required. Otherwise using Q.P. for finally measurement.

Frequency above 1GHz to 10th harmonic (up to 40 GHz):
Peak Detector:
(1)RBW = 1MHz
(2)VBW ≥ 3 x RBW.
(3)Detector = Peak.
(4)Sweep time = auto.
(5)Trace mode = max hold.
(6)Allow sweeps to continue until the trace stabilizes.
(7)When peak-detected value is lower than limit that the measurement using the average detector is not required. Otherwise using average detector for finally measurement.

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Average Detector:

■Option 1:

(1)RBW = 1MHz
(2)VBW ≥ 1/ T.

Modulation Type	T (ms)	1/ T (kHz)	VBW Setting (kHz)
802.11a	2.037	0.491	10Hz
802.11n-HT20	0.9843	1.055	1kHz
802.11n-HT40	0.9450	1.058	2kHz
802.11ac-VHT80	0.0656	1.524	15kHz

N/A: 1/ T is not implemented when duty cycle presented in section 3.7 is ≥98 %.
(1)Detector = Peak.
(2)Sweep time = auto.
(3)Trace mode = max hold.
(4)Allow sweeps to continue until the trace stabilizes.

□Option 2:

Average Emission Level= Peak Emission Level+ D.C.C.F.

6.4. Measurement Result Explanation

■Peak Emission Level=Antenna Factor + Cable Loss + Meter Reading
■Average Emission Level l=Antenna Factor + Cable Loss + Meter Reading
□Average Emission Level= Peak Emission Level+ DCCF
Duty Cycle Correction Factor (DCCF)= 20log (TX_{on}/TX_{on+off}) presented in section 3.7
□ERP= Peak Emission Level-95.2dB-2.14dB

6.5. Test Results

Please refer to Appendix A.

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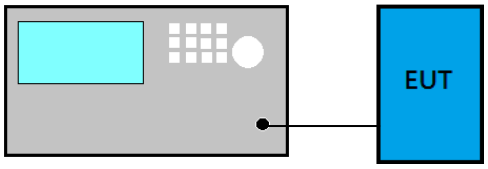
7. EMISSION BANDWIDTH

7.1. Block Diagram of Test Setup



7.2. Specification Limits

Frequency Band (MHz)	Limit
5150 to 5250	Reference only
5250 to 5350	
5470 to 5725	
5725 to 5850	≥ 500kHz

7.3. Test Procedure

Following measurement procedure is reference to KDB 789033 D02 General UNII Test Procedures New Rules v01r04:

■ Applicable to all bands except to 5725 MHz- 5850 MHz

(1) Set RBW= 1% of the emission bandwidth
(2) Set VBW > RBW
(3) Detector = Peak
(4) Trace mode = max hold
(5) Setting channel bandwidth function x dB to -26 dB to record the final bandwidth.

■ 5725 MHz- 5850 MHz

(1) Set RBW = 100 kHz.
(2) Set the video bandwidth (VBW) ≥ 3 × RBW.
(3) Detector = Peak.
(4) Trace mode = max hold.
(5) Sweep = auto couple.
(6) Allow the trace to stabilize.
(7) Setting channel bandwidth function x dB to -6 dB to record the final bandwidth.

7.4. Test Results

Please refer to Appendix A

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8. MAXIMUM OUTPUT POWER

8.1. Block Diagram of Test Setup

8.2. Specification Limits

Frequency Band (MHz)	Limit	
5150 to 5250	E.I.R.P.	200 mW or 11 dBm + 10 log B[Note1]
5250 to 5350	Maximum output power	250 mW or 11 dBm + 10 log B[Note1]
	E.I.R.P.	1.0 W or 17 dBm + 10 log B[Note1]
5470 to 5725	Maximum output power	250 mW or 11 dBm + 10 log B[Note1]
	E.I.R.P.	1.0 W or 17 dBm + 10 log B[Note1]
5725 to 5850	Maximum output power	1 W(30 dBm)

Note 1: B is the 99% emission bandwidth, which presented in section 7 and appendix A.1.

8.3. Test Procedure

Following measurement procedure is reference to KDB 789033 D02 General UNII Test Procedures New Rules v01r04:

■Method AVGPM (Measurement using an RF average power meter):

EUT is connected to power sensor and record the maximum average output power and duty cycle factor is added when duty cycle presented in section 3.5 is < 98%.

□Method AVGSA-2 (Spectrum channel power)

(1) Set span to at least 1.5 times the OBW
(2) Set RBW = 1 MHz
(3) Set the video bandwidth (VBW) ≥ 3 MHz.
(4) Detector = RMS.
(5) Trace mode = trace average at least 100 traces
(6) Sweep = auto couple.
(7) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function with band limits set equal to the OBW band edges.

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(8) Duty cycle factor is added when duty cycle presented in section 3.7 is < 98%.

8.4. Test Results

Please refer to Appendix A

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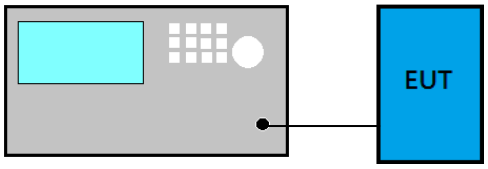
9. EMISSION LIMITATIONS MEASUREMENT

9.1. Block Diagram of Test Setup



9.2. Specification Limits

Frequency Band (MHz)	E.I.R.P. Limit
5150 to 5250	-27 dBm
5250 to 5350	
5470 to 5725	

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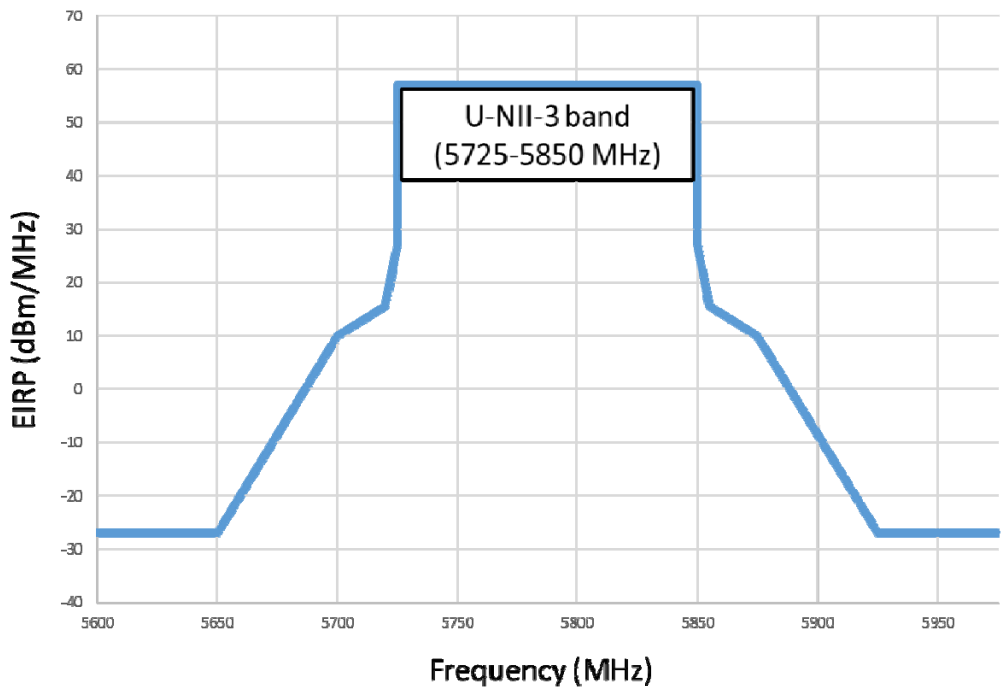
Frequency Band (MHz)	E.I.R.P. Limit	
5725 to 5850	☒	RSS-247 Section 6.2.4.2 a) 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges; b) 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges; c) 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and d) -27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.
	☐	RSS-247 Section 6.2.4.2, compliance with the emission limits in RSS-247 Section 5.5 Shall be at least 30dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power,. Attenuation below the general limits specified in RSS-Gen Section 8.9 table 4 is not required. In addition, radiated emissions which fall in the restricted bands, as defined in RSS-Gen Section 8.10 table 6, must also comply with the radiated emission limits specified in RSS-Gen Section 8.9 table 4



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9.3. Test Procedure

Following measurement procedure is reference to KDB 789033 D02 General UNII Test Procedures New Rules v01r04:

(1) RBW = 1 MHz
(2) VBW ≥ 3 x RBW
(3) Detector = Peak
(4) Sweep time = auto
(5) Trace mode = max hold
(6) Allow sweeps to continue until the trace stabilizes.

9.4. Test Results

Please refer to Appendix A

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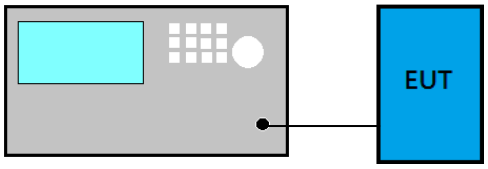
10. POWER SPECTRAL DENSITY

10.1. Block Diagram of Test Setup



10.2. Specification Limits

Frequency Band (MHz)	Limit
5150 to 5250	10 dBm/MHz
5250 to 5350	11 dBm/MHz
5470 to 5725	11 dBm/MHz
5725 to 5850	30dBm/500 kHz

10.3. Test Procedure

Following measurement procedure is reference to KDB 789033 D02 General UNII Test Procedures New Rules v01r04:

■Method AVGSA-2 (Spectrum channel power)

(1) Set span to at least 1.5 times the OBW
(2) Set RBW = 1 MHz
(3) Set the video bandwidth (VBW) ≥ 3 MHz.
(4) Detector = RMS.
(5) Trace mode = trace average at least 100 traces
(6) Sweep = auto couple.
(7) Use peak search function to find out the maximum power density.
(8) Duty cycle factor is added when duty cycle presented in section 3.7 is < 98%.

10.4. Test Results

Please refer to Appendix A

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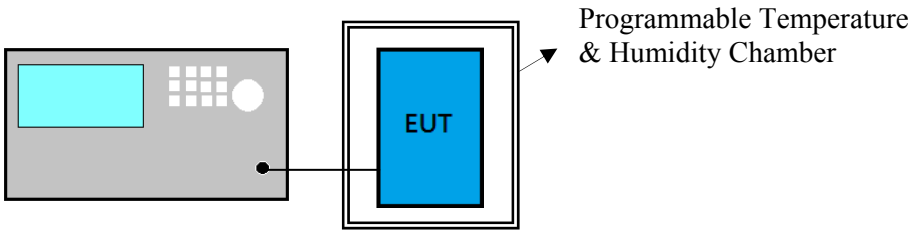
11. FREQUENCY STABILITY

11.1. Block Diagram of Test Setup



11.2. Specification Limits

NONE

11.3. Test Procedure

(1) Frequency: Test frequency.
(2) Span: enough to cover the complete power envelope
(3) RBW: 1MHz(modulation ON) ; 10KHz(CW)
(4) VBW: 1MHz(modulation ON) ; 10KHz(CW)
(5) Detector Mode: Positive Peak
(6) Indication mode: Max hold
(7) Find the peak frequency and take calculate by the formula:
(Measurement Value-declaration frequency)/ declaration frequency)

11.4. Test Results

Please refer to Appendix A

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12. DEVIATION TO TEST SPECIFICATIONS

【NONE】

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APPDNDIX A

TEST DATA AND PLOTS

(Model: 13Z980)

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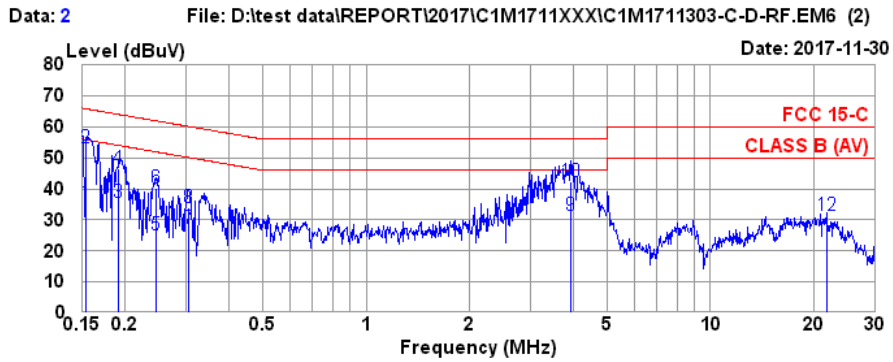
A.1 CONDUCTED EMISSION

Test Date	2017/11/30	Temp./Hum.	24℃/57%
Test Voltage	AC 120V, 60Hz (via AC Adapter)		




```
Site no.      : No.7 Shielded Room          Data no.   : 2
Condition     : ESH2-Z5 366(ADAPTER)        Phase      : NEUTRAL
Limit         : FCC 15-C
Env. / Ins.   : 24*C / 57% ESCI(1276)       Engineer   : Nick Du
EUT           : 13Z980
Power Rating  : 120Vac/60Hz
Test Mode     : Operaing
```

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBµV)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Remark
1	0.154	0.19	0.03	9.86	25.62	35.70	55.78	20.08	Average
2	0.154	0.19	0.03	9.86	43.10	53.18	65.78	12.60	QP
3	0.191	0.17	0.04	9.86	25.63	35.70	53.98	18.28	Average
4	0.191	0.17	0.04	9.86	36.26	46.33	63.98	17.65	QP
5	0.246	0.18	0.04	9.86	14.88	24.96	51.91	26.95	Average
6	0.246	0.18	0.04	9.86	30.08	40.16	61.91	21.75	QP
7	0.305	0.18	0.04	9.86	17.18	27.26	50.10	22.84	Average
8	0.305	0.18	0.04	9.86	23.89	33.97	60.10	26.13	QP
9	3.943	0.32	0.17	9.87	20.87	31.23	46.00	14.77	Average
10	3.943	0.32	0.17	9.87	31.92	42.28	56.00	13.72	QP
11	21.715	0.97	0.31	9.95	11.72	22.95	50.00	27.05	Average
12	21.715	0.97	0.31	9.95	20.36	31.59	60.00	28.41	QP

```
Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.
         2. If the average limit is met when useing a quasi-peak detector,
            the EUT shall be deemed to meet both limits and measurement
            with average detector is unnecessary.
```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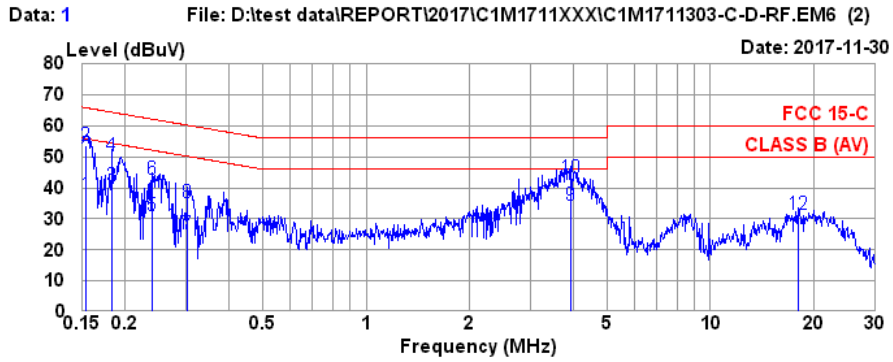
Test Date	2017/11/30	Temp./Hum.	24℃/57%
Test Voltage	AC 120V, 60Hz (via AC Adapter)		



Site no. : No.7 Shielded Room
Condition : ESH2-Z5 366(ADAPTER)
Limit : FCC 15-C
Env. / Ins. : 24*C / 57% ESCI(1276)
EUT : 13Z980
Power Rating : 120Vac/60Hz
Test Mode : Operaing

Data no. : 1
Phase : LINE
Engineer : Nick Du

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBµV)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Remark
1	0.154	0.18	0.03	9.86	27.81	37.88	55.78	17.90	Average
2	0.154	0.18	0.03	9.86	43.69	53.76	65.78	12.02	QP
3	0.183	0.17	0.04	9.86	30.50	40.57	54.33	13.76	Average
4	0.183	0.17	0.04	9.86	40.29	50.36	64.33	13.97	QP
5	0.239	0.17	0.04	9.86	20.83	30.90	52.13	21.23	Average
6	0.239	0.17	0.04	9.86	32.64	42.71	62.13	19.42	QP
7	0.303	0.17	0.04	9.86	15.09	25.16	50.15	24.99	Average
8	0.303	0.17	0.04	9.86	25.25	35.32	60.15	24.83	QP
9	3.943	0.33	0.17	9.87	23.83	34.20	46.00	11.80	Average
10	3.943	0.33	0.17	9.87	32.69	43.06	56.00	12.94	QP
11	17.944	1.04	0.29	9.93	12.88	24.14	50.00	25.86	Average
12	17.944	1.04	0.29	9.93	20.30	31.56	60.00	28.44	QP

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.
2. If the average limit is met when useing a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

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A.2 RADIATED EMISSION

Test Date	2017/11/30	Temp./Hum.	24℃/51%
Test Voltage	AC 120V, 60Hz (via AC Adapter)		

A.2.1 Emissions within Restricted Frequency Bands

A.2.1.1 Frequency 9kHz~30MHz

The emissions (9kHz~30MHz) not reported for there is no emission be found.

A.2.1.2 Frequency Below 1 GHz

Mode	802.11n-HT40	UNII Band	III
		Frequency	TX 5795MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
81.41	14.15	2.03	21.66	37.84	40.00	2.16	Peak
139.61	17.82	2.72	20.38	40.92	43.50	2.58	Peak
288.02	19.41	4.19	17.78	41.38	46.00	4.62	Peak
504.33	23.23	6.44	12.73	42.40	46.00	3.60	Peak
804.06	25.96	7.63	7.45	41.04	46.00	4.96	Peak
890.39	26.73	8.12	6.76	41.61	46.00	4.39	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
83.35	14.45	2.05	21.64	38.14	40.00	1.86	Peak
279.29	19.36	4.11	22.08	45.55	46.00	0.45	Peak
432.55	22.44	5.86	13.17	41.47	46.00	4.53	Peak
489.78	23.04	6.34	15.66	45.04	46.00	0.96	Peak
698.33	24.87	7.08	10.34	42.29	46.00	3.71	Peak
803.09	25.94	7.62	7.86	41.42	46.00	4.58	Peak

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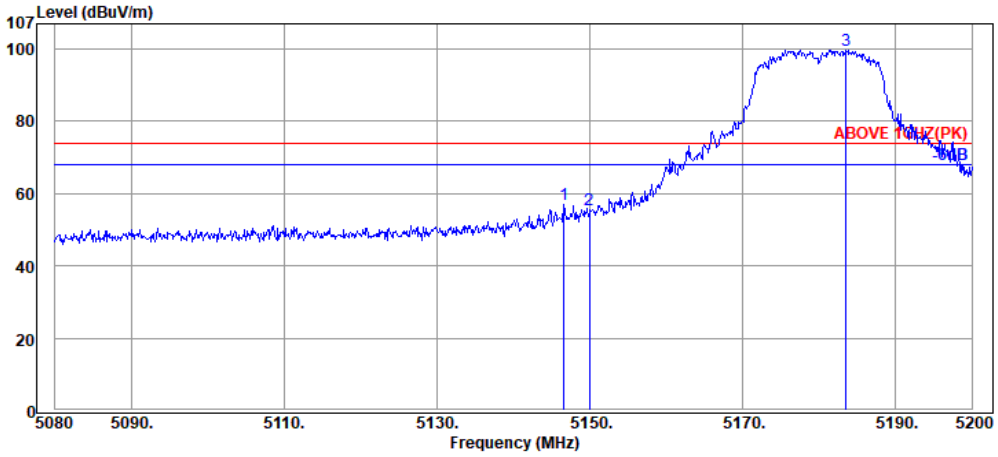
A.2.1.3 Frequency Above 1 GHz to 10th harmonics

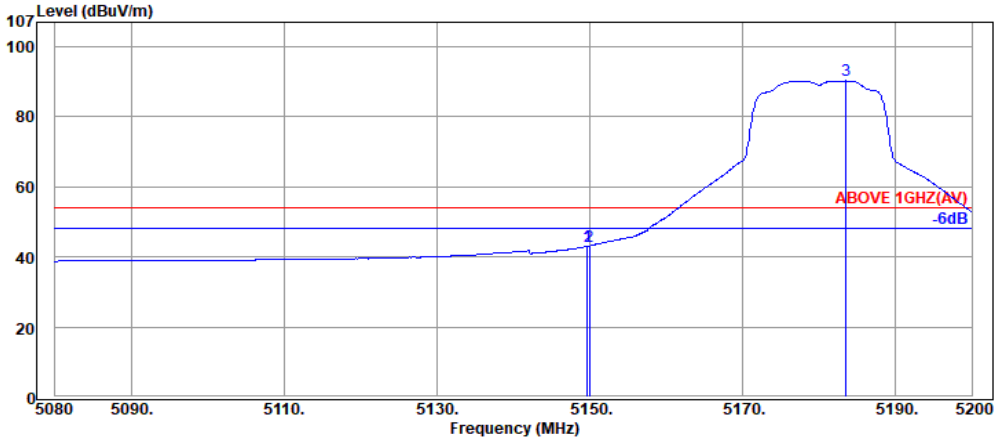
Band Edge:

Mode	802.11a	UNII Band	I
		Frequency	TX 5180MHz



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5146.60	34.45	9.83	12.78	57.06	74.00	16.94	Peak
5149.96	34.45	9.83	11.27	55.55	74.00	18.45	Peak
5183.56	34.48	9.88	55.22	99.58	---	---	Peak



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5149.72	34.45	9.83	-1.21	43.07	54.00	10.93	Average
5149.96	34.45	9.83	-1.14	43.14	54.00	10.86	Average
5183.56	34.48	9.88	45.92	90.28	---	---	Average

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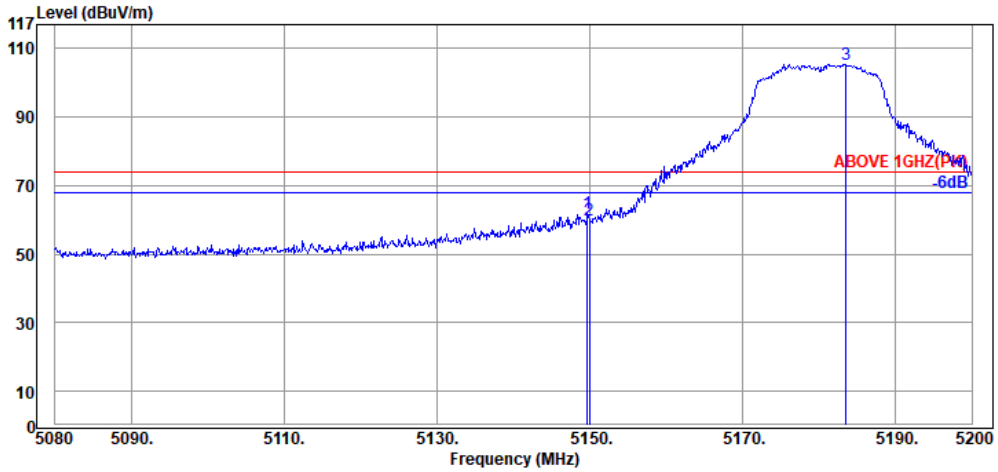
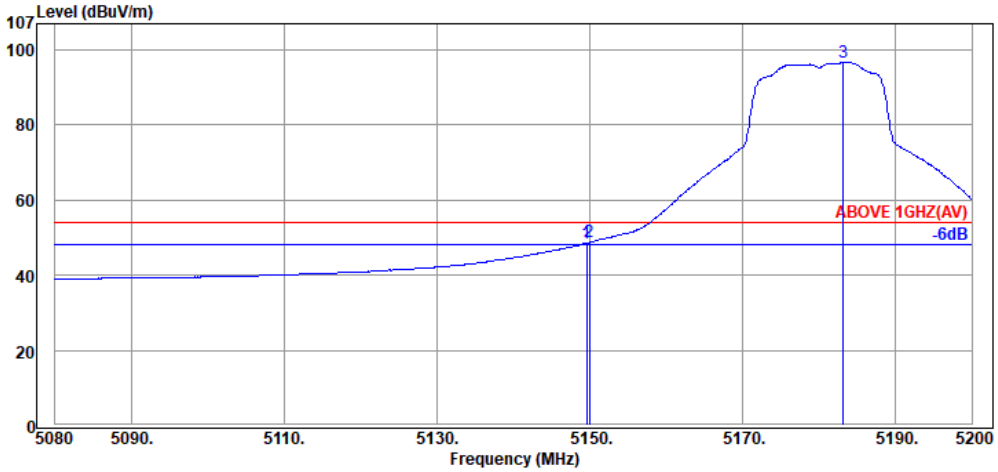
Mode	802.11a	UNII Band	I
		Frequency	TX 5180MHz



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5149.72	34.45	9.83	17.78	62.06	74.00	11.94	Peak
5149.96	34.45	9.83	15.67	59.95	74.00	14.05	Peak
5183.56	34.48	9.88	61.18	105.54	---	---	Peak



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5149.60	34.45	9.83	4.30	48.58	54.00	5.42	Average
5149.96	34.45	9.83	4.48	48.76	54.00	5.24	Average
5183.20	34.48	9.88	52.23	96.59	---	---	Average

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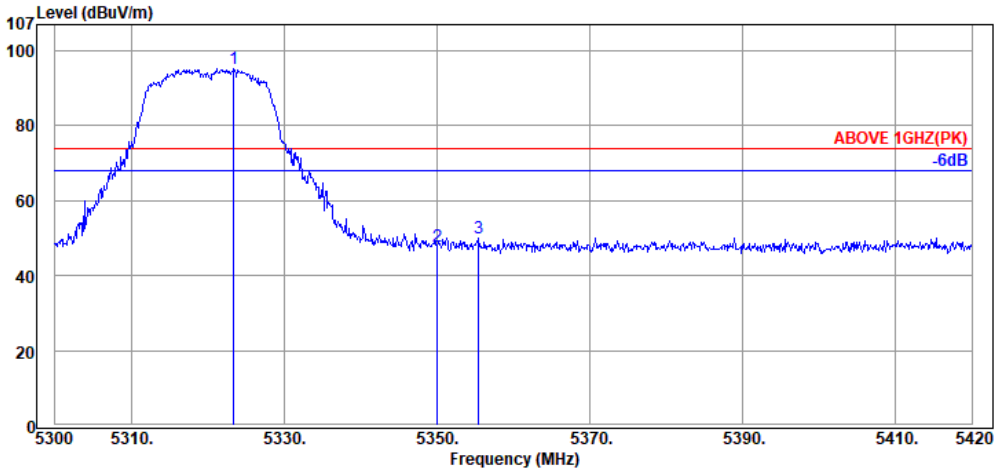
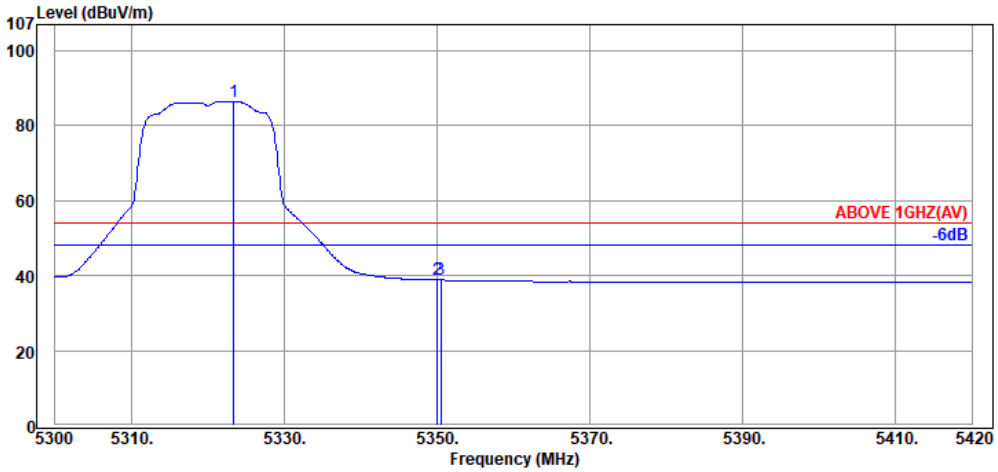
Mode	802.11a	UNII Band	II-2A
		Frequency	TX 5320MHz



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5323.40	34.62	10.08	50.56	95.26	---	---	Peak
5350.04	34.65	10.13	2.98	47.76	74.00	26.24	Peak
5355.44	34.65	10.13	5.38	50.16	74.00	23.84	Peak



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5323.40	34.62	10.08	41.77	86.47	---	---	Average
5350.04	34.65	10.13	-5.96	38.82	54.00	15.18	Average
5350.52	34.65	10.13	-5.96	38.82	54.00	15.18	Average

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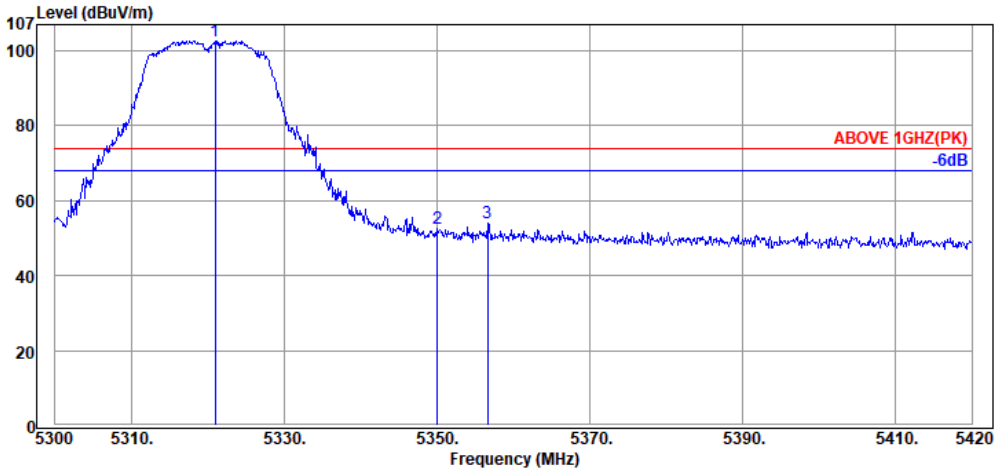
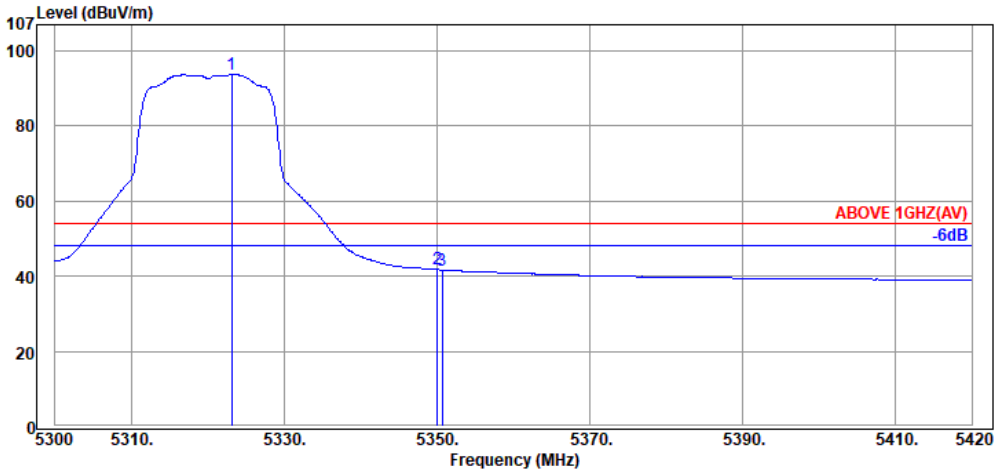
Mode	802.11a	UNII Band	II-2A
		Frequency	TX 5320MHz



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5321.00	34.62	10.08	58.00	102.70	---	---	Peak
5350.04	34.65	10.13	7.68	52.46	74.00	21.54	Peak
5356.64	34.65	10.13	9.37	54.15	74.00	19.85	Peak



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5323.16	34.62	10.08	48.94	93.64	---	---	Average
5350.04	34.65	10.13	-3.02	41.76	54.00	12.24	Average
5350.64	34.65	10.13	-3.11	41.67	54.00	12.33	Average

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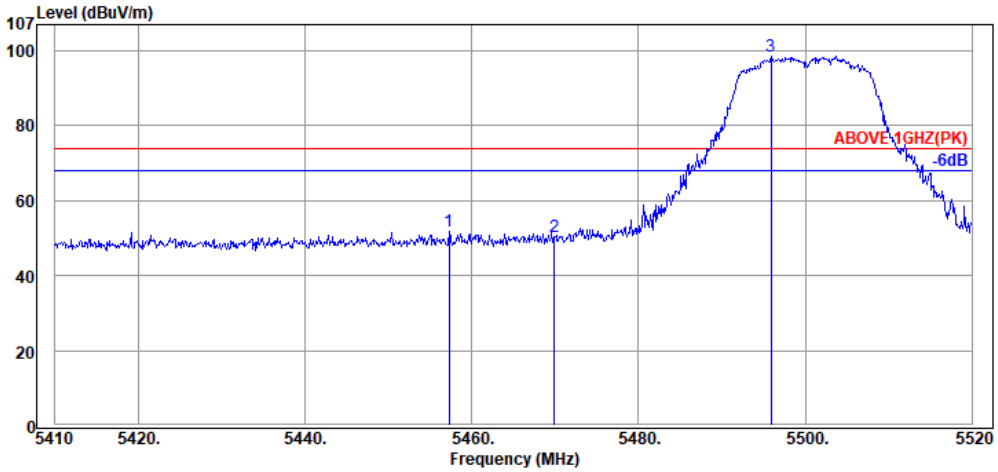
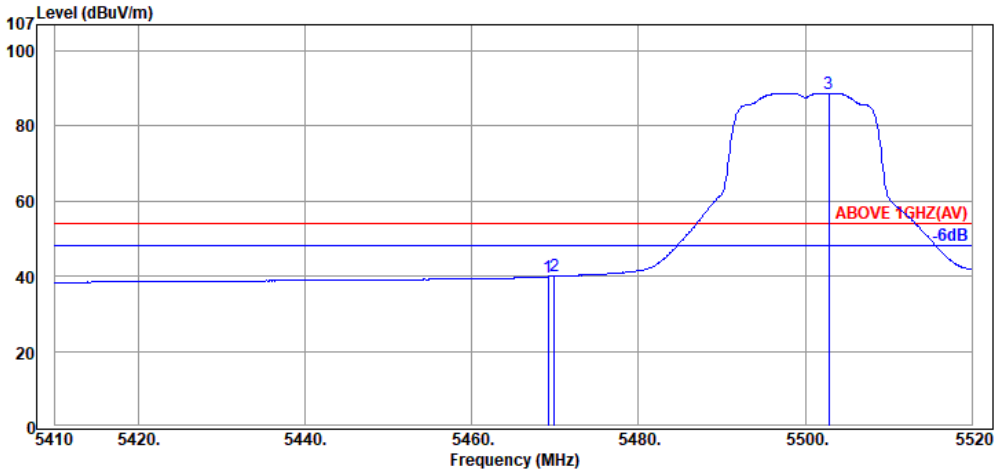
Mode	802.11a	UNII Band	II-2C
		Frequency	TX 5500MHz



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5457.30	34.75	10.28	6.64	51.67	74.00	22.33	Peak
5469.95	34.77	10.30	5.36	50.43	74.00	23.57	Peak
5495.91	34.78	10.33	53.60	98.71	---	---	Peak



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5469.18	34.77	10.30	-5.19	39.88	54.00	14.12	Average
5469.95	34.77	10.30	-5.14	39.93	54.00	14.07	Average
5502.84	34.80	10.35	43.53	88.68	---	---	Average

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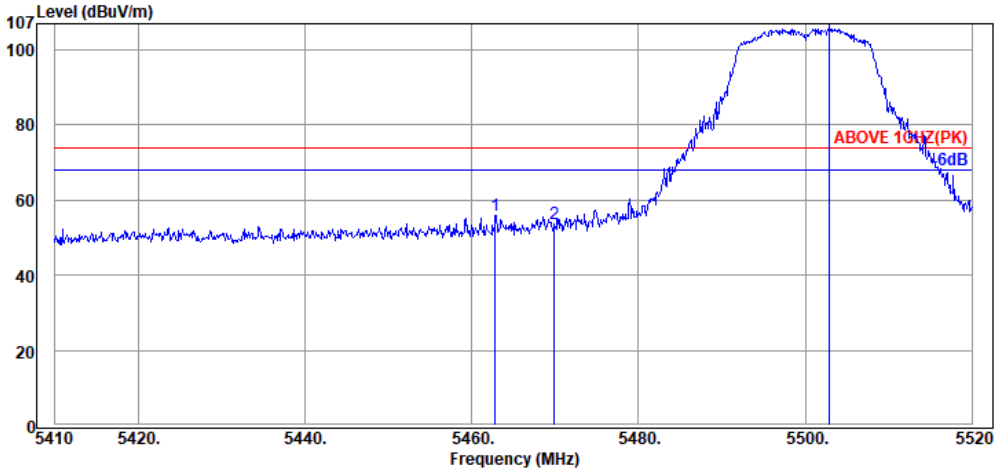
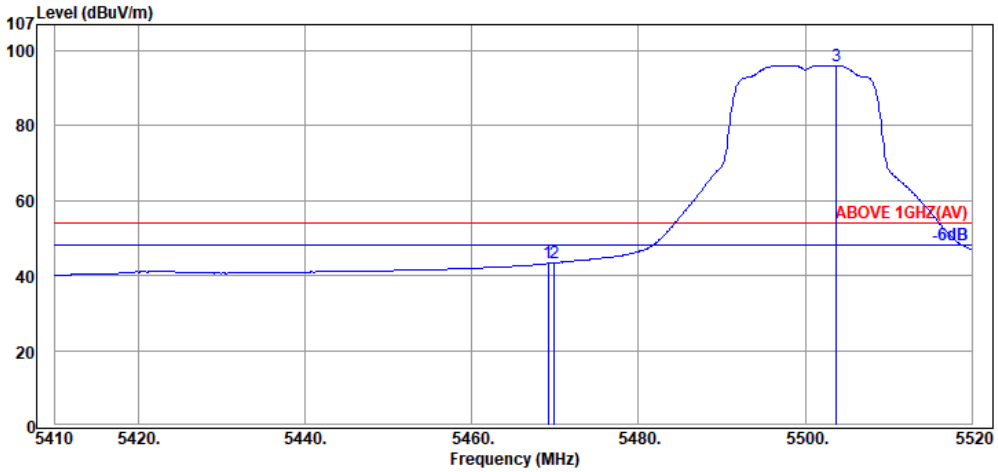
Mode	802.11a	UNII Band	II-2C
		Frequency	TX 5500MHz



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5462.80	34.77	10.30	10.73	55.80	74.00	18.20	Peak
5469.95	34.77	10.30	8.74	53.81	74.00	20.19	Peak
5502.95	34.80	10.35	61.49	106.64	---	---	Peak



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5469.18	34.77	10.30	-1.80	43.27	54.00	10.73	Average
5469.95	34.77	10.30	-1.64	43.43	54.00	10.57	Average
5503.72	34.80	10.35	50.97	96.12	---	---	Average

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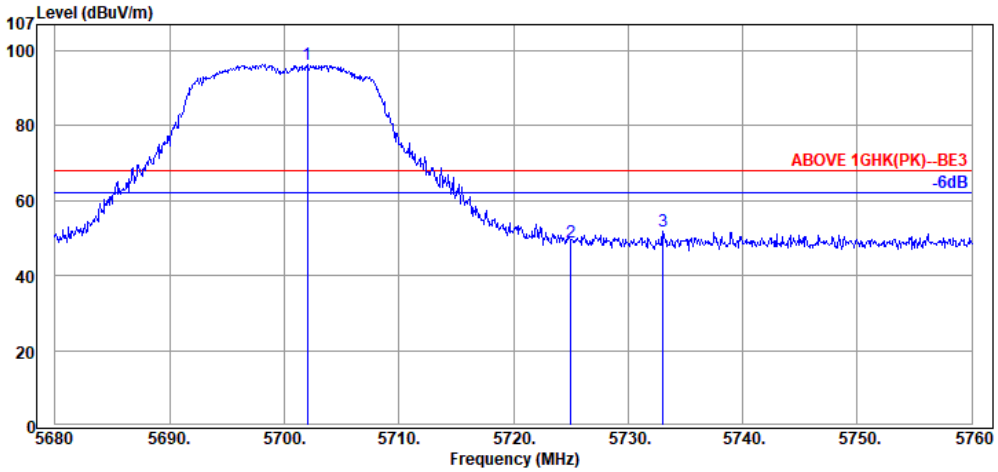
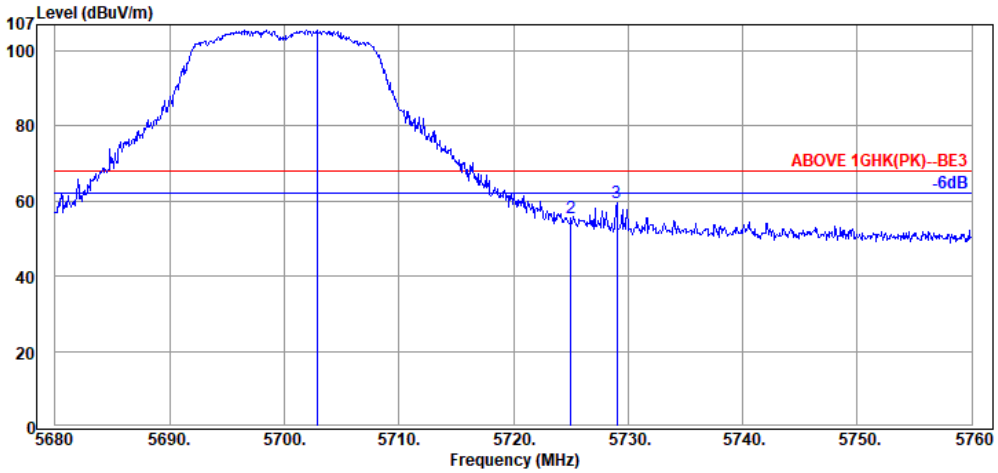
Mode	802.11a	UNII Band	II-2C
		Frequency	TX 5700MHz



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5702.00	35.05	10.51	50.69	96.25	68.20	---	Peak
5725.04	35.07	10.52	3.44	49.03	68.20	19.17	Peak
5733.04	35.07	10.52	6.18	51.77	68.20	16.43	Peak



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5702.88	35.05	10.51	60.07	105.63	68.20	---	Peak
5725.04	35.07	10.52	9.84	55.43	68.20	12.77	Peak
5729.04	35.07	10.52	14.06	59.65	68.20	8.55	Peak

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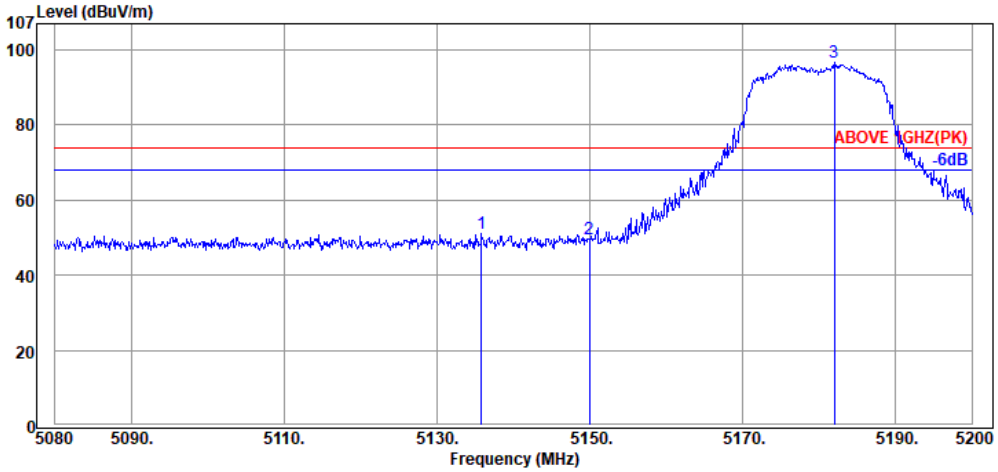
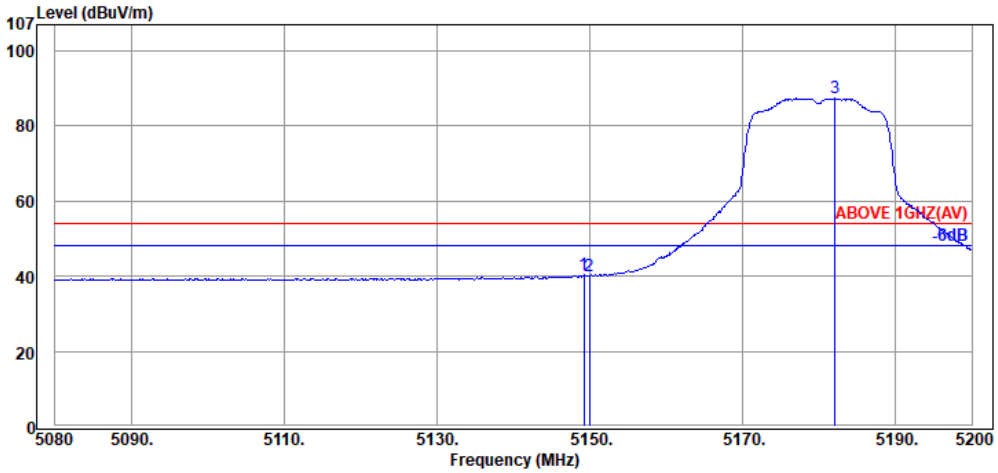
Mode	802.11n-HT20	UNII Band	I
		Frequency	TX 5180MHz



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5135.80	34.43	9.81	6.85	51.09	74.00	22.91	Peak
5149.96	34.45	9.83	5.18	49.46	74.00	24.54	Peak
5182.00	34.48	9.88	52.22	96.58	---	---	Peak



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5149.24	34.45	9.83	-3.94	40.34	54.00	13.66	Average
5149.96	34.45	9.83	-4.08	40.20	54.00	13.80	Average
5182.12	34.48	9.88	42.97	87.33	---	---	Average

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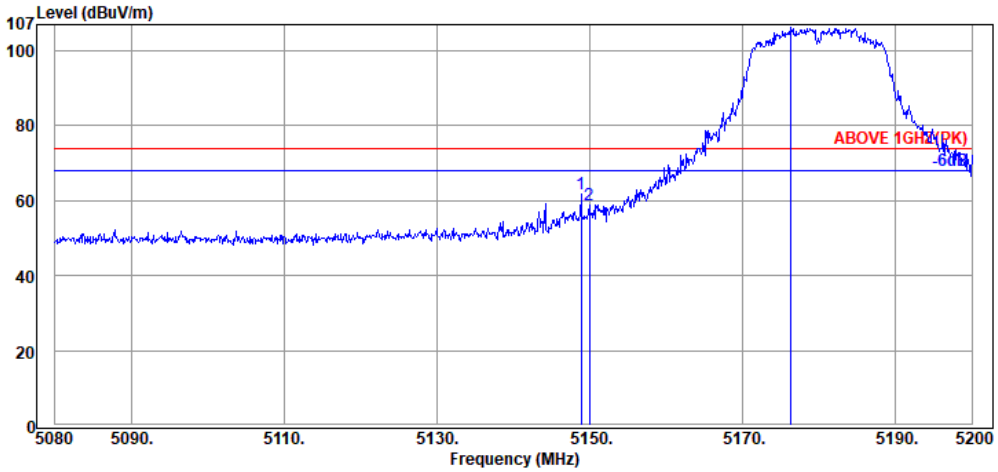
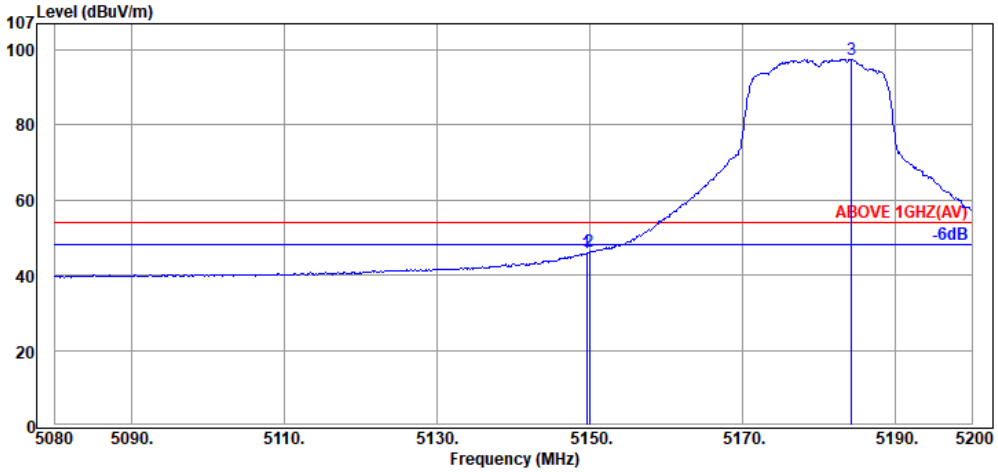
Mode	802.11n-HT20	UNII Band	I
		Frequency	TX 5180MHz



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5148.88	34.45	9.83	17.65	61.93	74.00	12.07	Peak
5149.96	34.45	9.83	14.67	58.95	74.00	15.05	Peak
5176.24	34.48	9.88	61.88	106.24	---	---	Peak



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5149.60	34.45	9.83	1.59	45.87	54.00	8.13	Average
5149.96	34.45	9.83	1.89	46.17	54.00	7.83	Average
5184.28	34.48	9.88	53.12	97.48	---	---	Average

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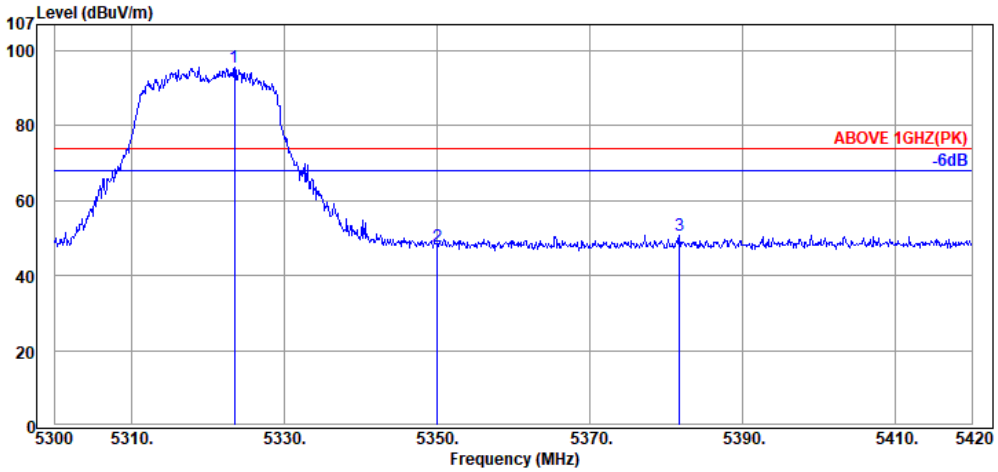
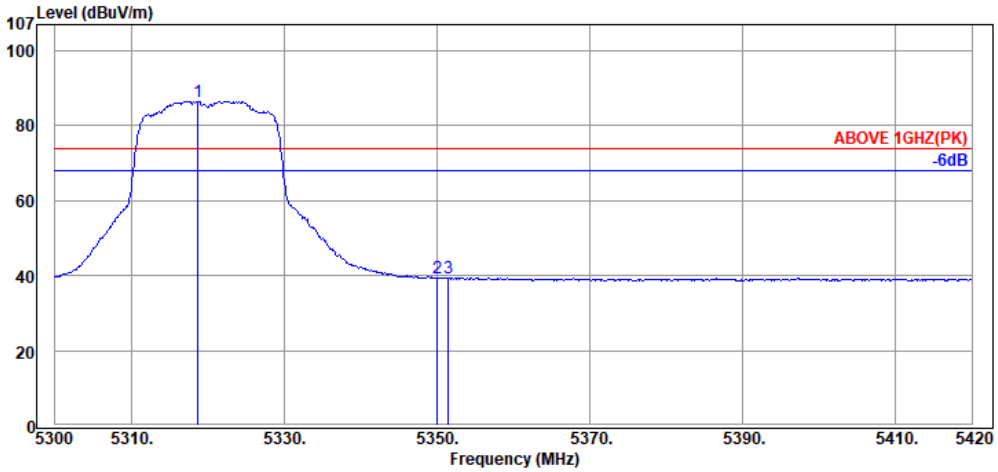
Mode	802.11n-HT20	UNII Band	II-2A
		Frequency	TX 5320MHz



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5323.52	34.62	10.08	50.84	95.54	---	---	Peak
5350.04	34.65	10.13	3.11	47.89	74.00	26.11	Peak
5381.72	34.68	10.18	5.89	50.75	74.00	23.25	Peak



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5318.72	34.62	10.08	41.89	86.59	---	---	Average
5350.04	34.65	10.13	-5.42	39.36	54.00	14.64	Average
5351.48	34.65	10.13	-5.31	39.47	54.00	14.53	Average

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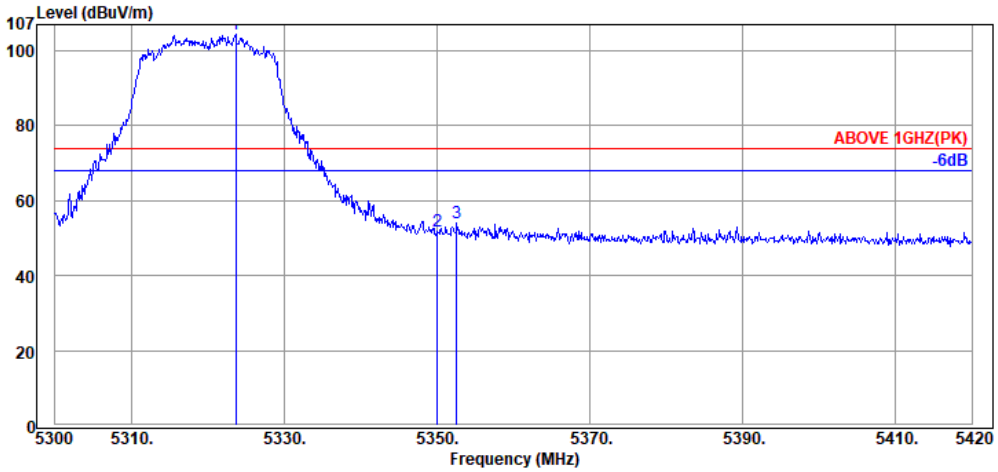
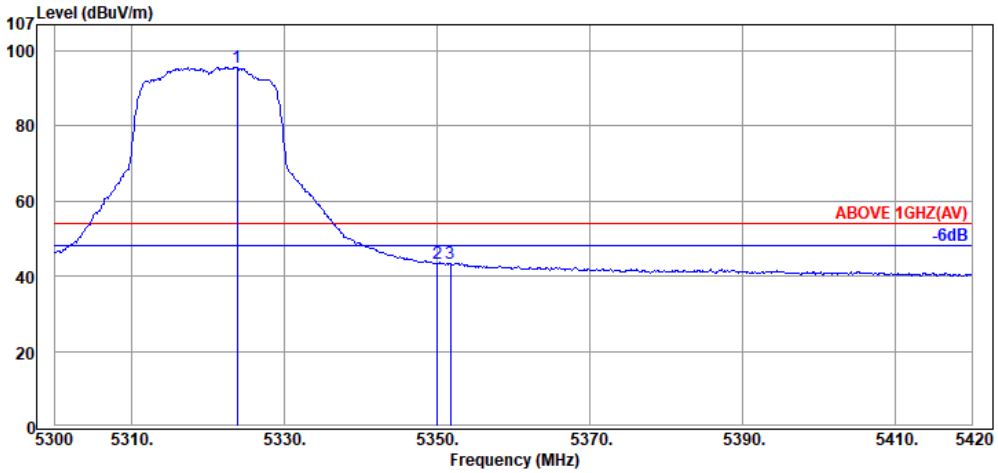
Mode	802.11n-HT20	UNII Band	II-2A
		Frequency	TX 5320MHz



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5323.64	34.62	10.08	59.54	104.24	---	---	Peak
5350.04	34.65	10.13	6.90	51.68	74.00	22.32	Peak
5352.56	34.65	10.13	9.17	53.95	74.00	20.05	Peak



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5323.88	34.62	10.08	51.03	95.73	54.00	---	Average
5350.04	34.65	10.13	-1.33	43.45	54.00	10.55	Average
5351.72	34.65	10.13	-1.38	43.40	54.00	10.60	Average

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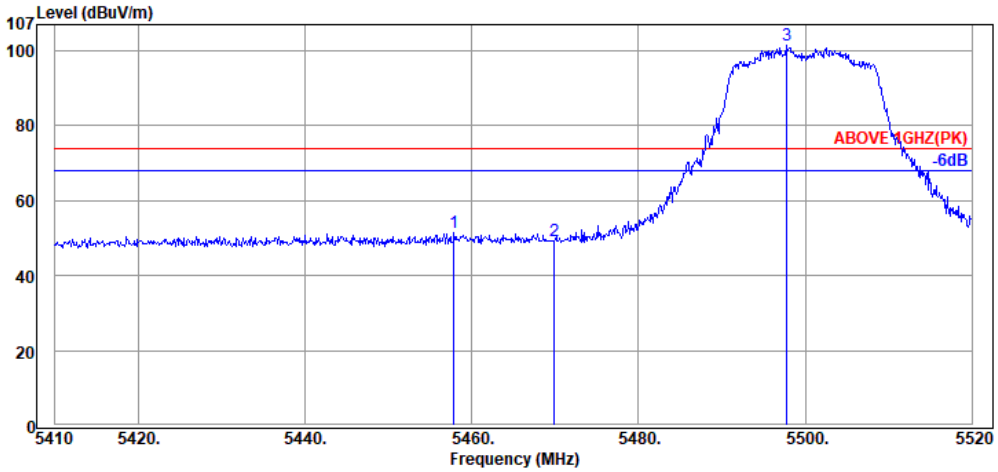
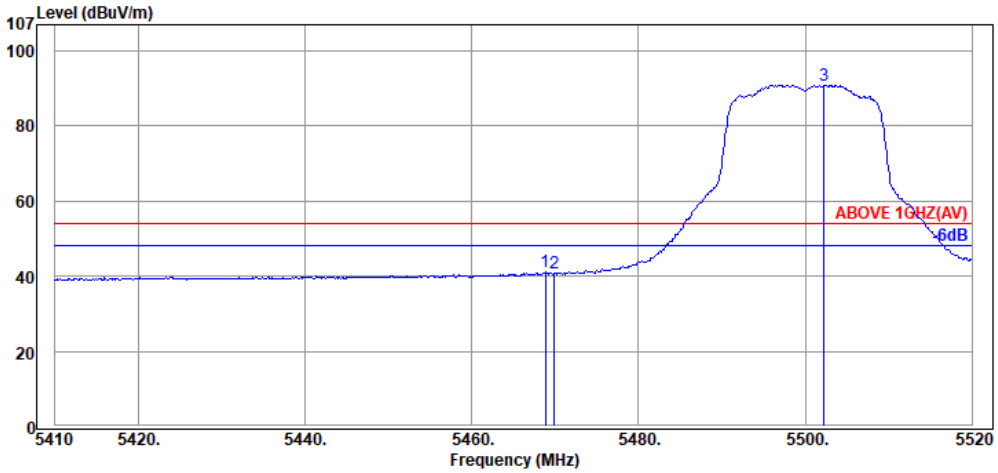
Mode	802.11n-HT20	UNII Band	II-2C
		Frequency	TX 5500MHz



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5457.85	34.75	10.28	6.31	51.34	74.00	22.66	Peak
5469.95	34.77	10.30	4.33	49.40	74.00	24.60	Peak
5497.78	34.80	10.35	56.25	101.40	---	---	Peak



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5468.85	34.77	10.30	-3.93	41.14	54.00	12.86	Average
5469.95	34.77	10.30	-4.41	40.66	54.00	13.34	Average
5502.29	34.80	10.35	45.78	90.93	---	---	Average

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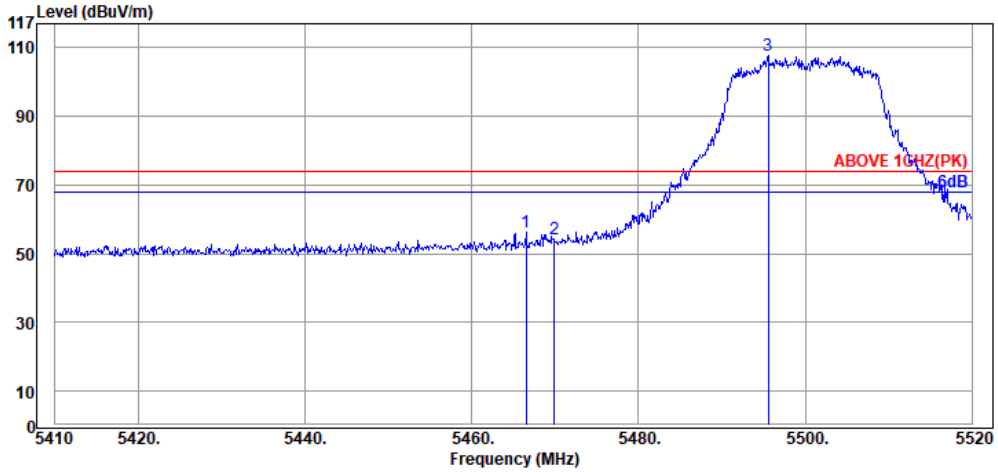
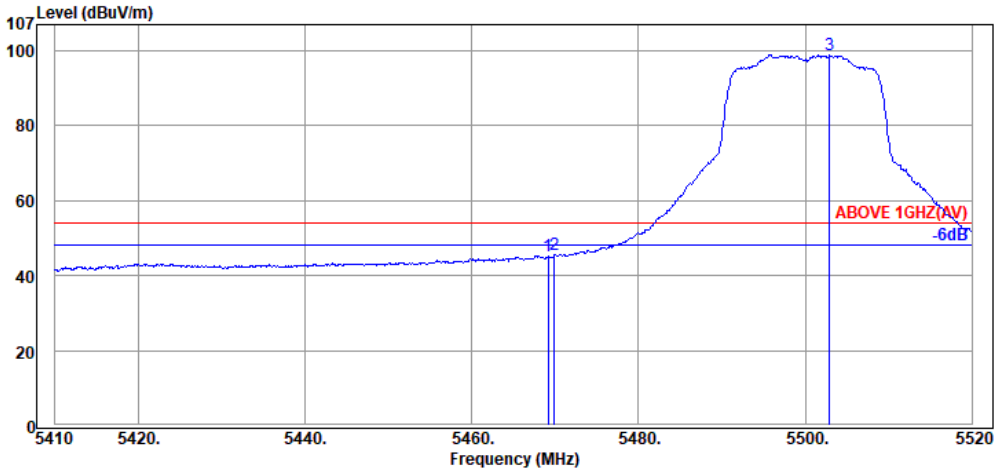
Mode	802.11n-HT20	UNII Band	II-2C
		Frequency	TX 5500MHz



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5466.54	34.77	10.30	11.03	56.10	74.00	17.90	Peak
5469.95	34.77	10.30	9.02	54.09	74.00	19.91	Peak
5495.58	34.78	10.33	62.67	107.78	---	---	Peak



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5469.18	34.77	10.30	0.20	45.27	54.00	8.73	Average
5469.95	34.77	10.30	0.38	45.45	54.00	8.55	Average
5502.95	34.80	10.35	53.68	98.83	---	---	Average

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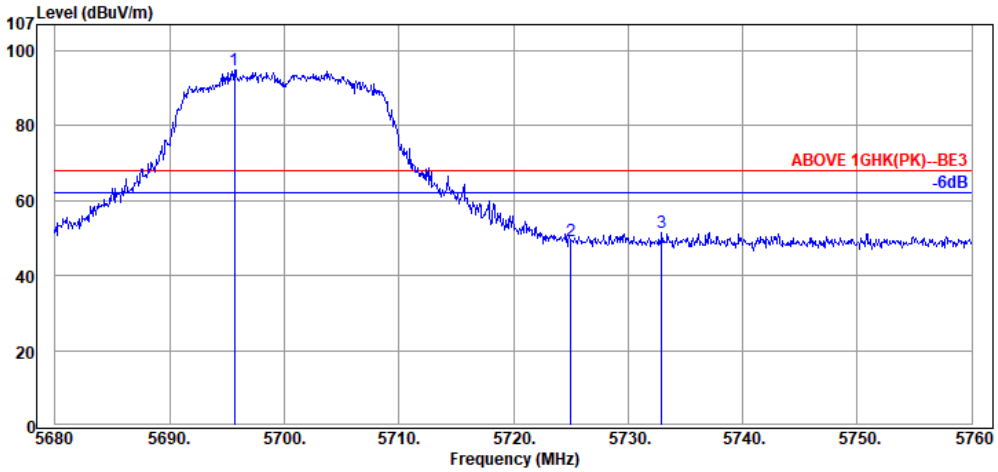
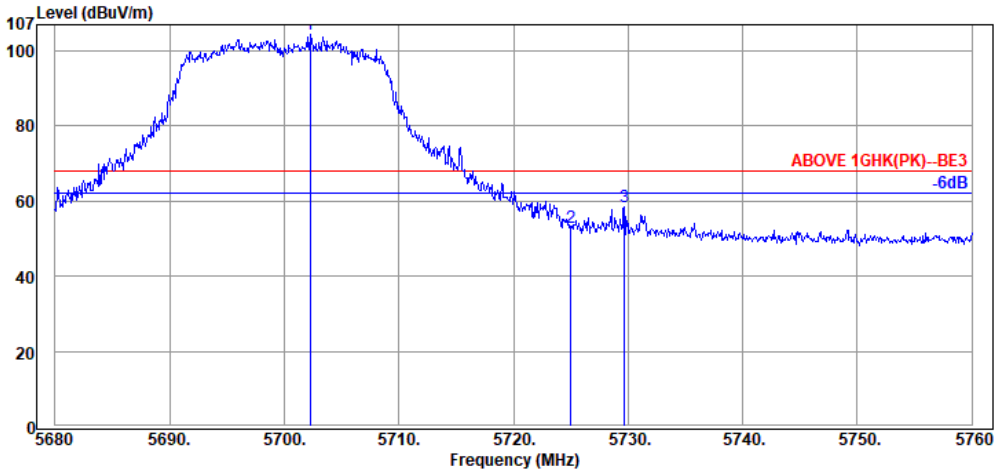
Mode	802.11n-HT20	UNII Band	II-2C
		Frequency	TX 5700MHz



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5695.68	35.03	10.50	49.47	95.00	68.20	---	Peak
5725.04	35.07	10.52	3.75	49.34	68.20	18.86	Peak
5732.96	35.07	10.52	5.91	51.50	68.20	16.70	Peak



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5702.24	35.05	10.51	58.73	104.29	68.20	---	Peak
5725.04	35.07	10.52	7.28	52.87	68.20	15.33	Peak
5729.68	35.07	10.52	12.82	58.41	68.20	9.79	Peak

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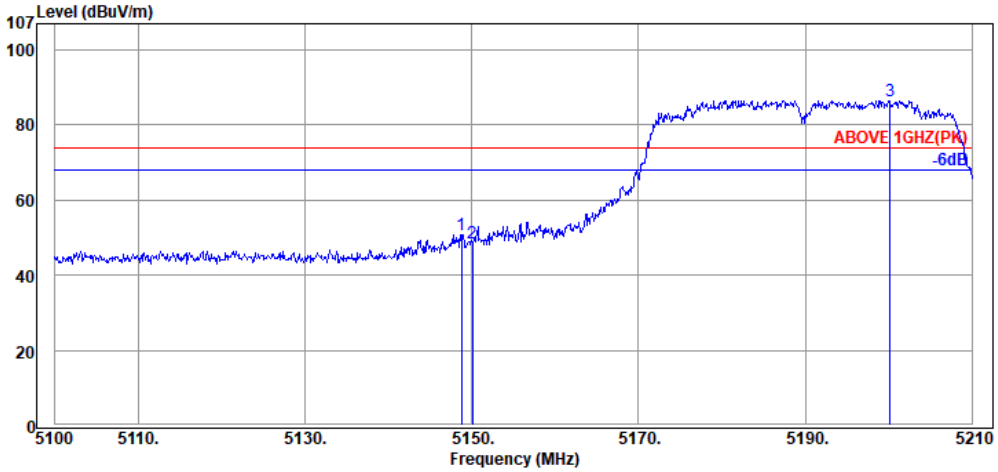
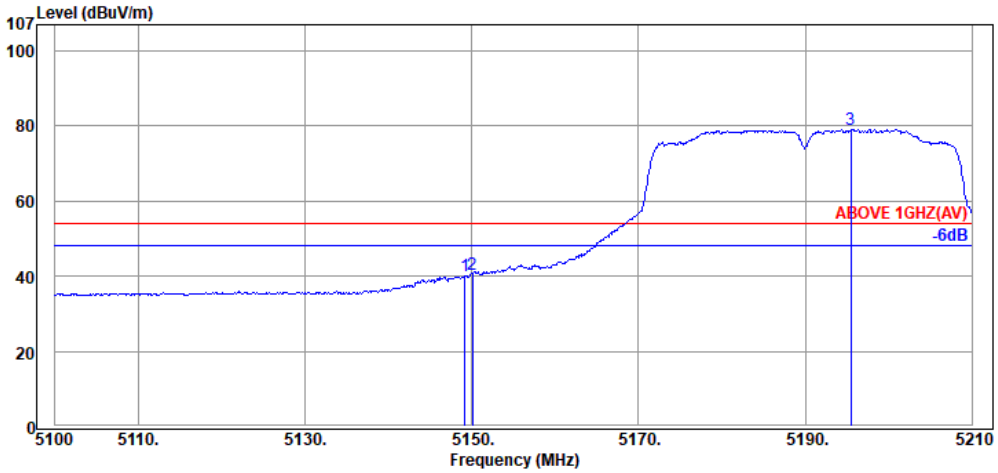
Mode	802.11n-HT40	UNII Band	I
		Frequency	TX 5190MHz



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5148.73	34.45	9.83	6.51	50.79	74.00	23.21	Peak
5150.05	34.45	9.83	4.41	48.69	74.00	25.31	Peak
5200.21	34.50	9.91	42.18	86.59	---	---	Peak



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5149.17	34.45	9.83	-4.02	40.26	54.00	13.74	Average
5150.05	34.45	9.83	-3.78	40.50	54.00	13.50	Average
5195.48	34.50	9.91	34.68	79.09	---	---	Average

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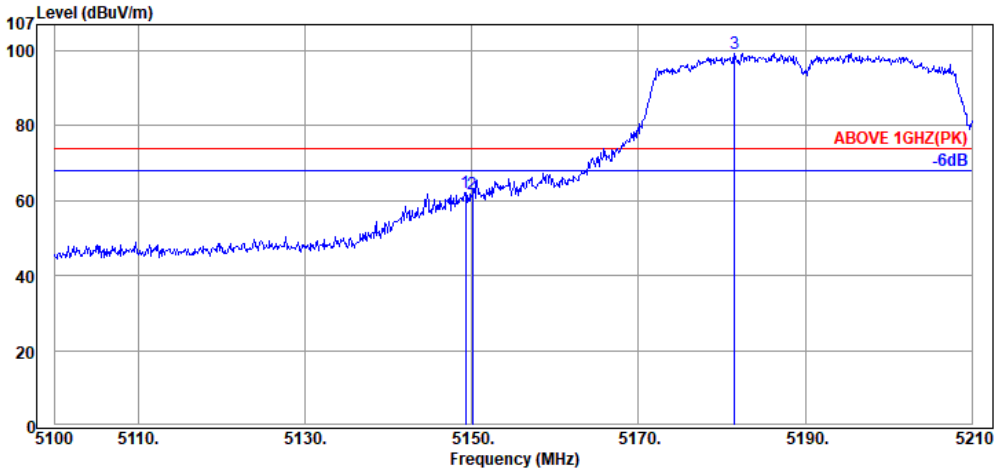
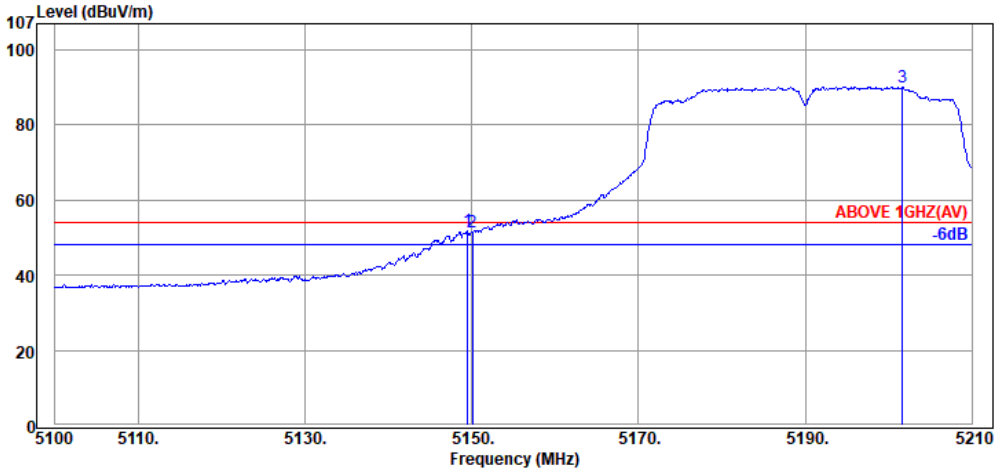
Mode	802.11n-HT40	UNII Band	I
		Frequency	TX 5190MHz



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5149.28	34.45	9.83	17.85	62.13	74.00	11.87	Peak
5150.05	34.45	9.83	17.37	61.65	74.00	12.35	Peak
5181.51	34.48	9.88	55.00	99.36	---	---	Peak



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5149.50	34.45	9.83	7.47	51.75	54.00	2.25	Average
5150.05	34.45	9.83	7.18	51.46	54.00	2.54	Average
5201.64	34.50	9.91	45.85	90.26	---	---	Average

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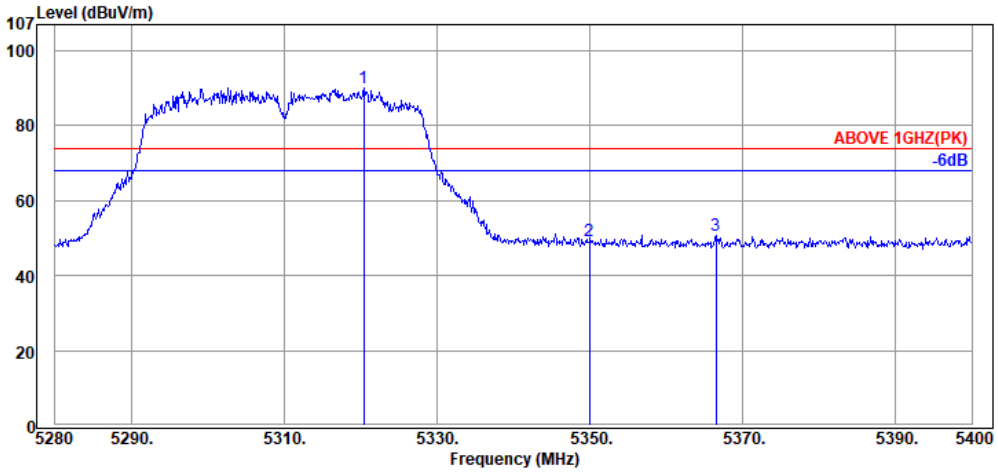
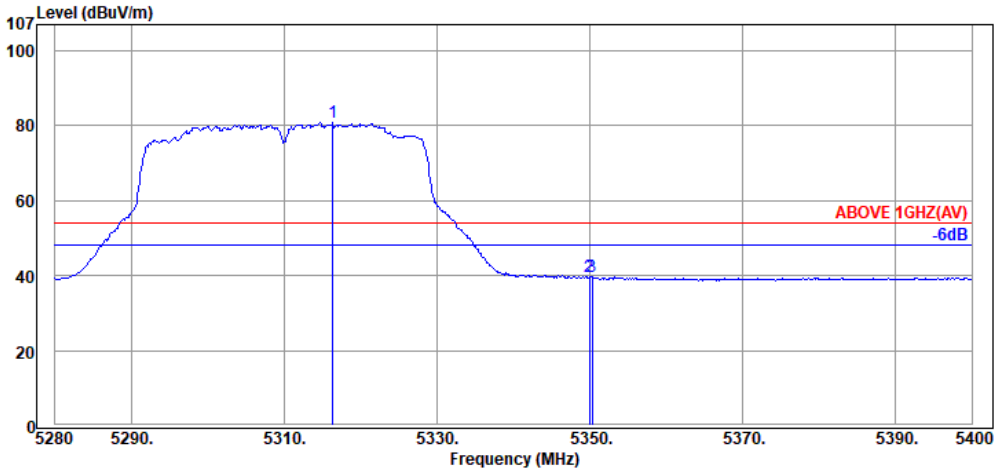
Mode	802.11n-HT40	UNII Band	II-2A
		Frequency	TX 5310MHz



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5320.44	34.62	10.08	45.41	90.11	---	---	Peak
5349.96	34.65	10.13	4.63	49.41	74.00	24.59	Peak
5366.52	34.67	10.15	5.89	50.71	74.00	23.29	Peak



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5316.36	34.62	10.08	36.14	80.84	---	---	Average
5349.96	34.65	10.13	-5.18	39.60	54.00	14.40	Average
5350.32	34.65	10.13	-5.21	39.57	54.00	14.43	Average

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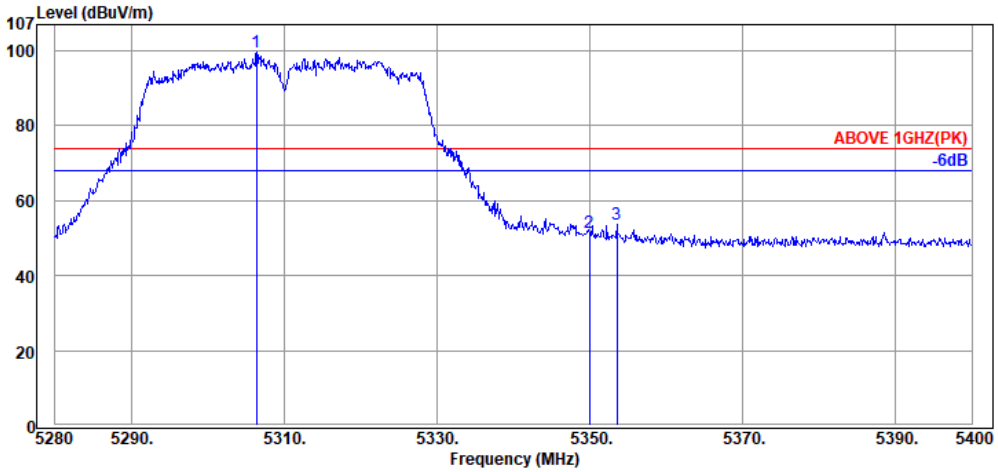
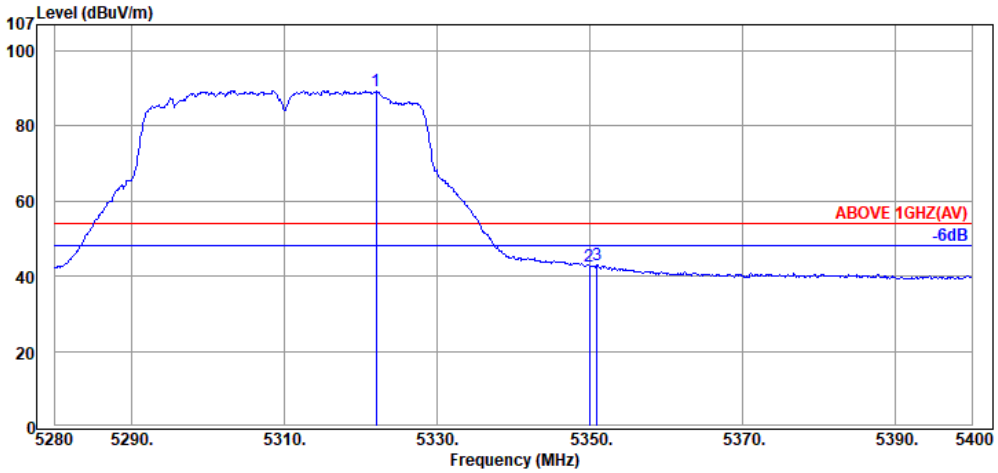
Mode	802.11n-HT40	UNII Band	II-2A
		Frequency	TX 5310MHz



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5306.40	34.60	10.05	54.82	99.47	---	---	Peak
5349.96	34.65	10.13	6.54	51.32	74.00	22.68	Peak
5353.56	34.65	10.13	8.99	53.77	74.00	20.23	Peak



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5322.00	34.62	10.08	44.75	89.45	---	---	Average
5349.96	34.65	10.13	-2.09	42.69	54.00	11.31	Average
5350.92	34.65	10.13	-1.72	43.06	54.00	10.94	Average

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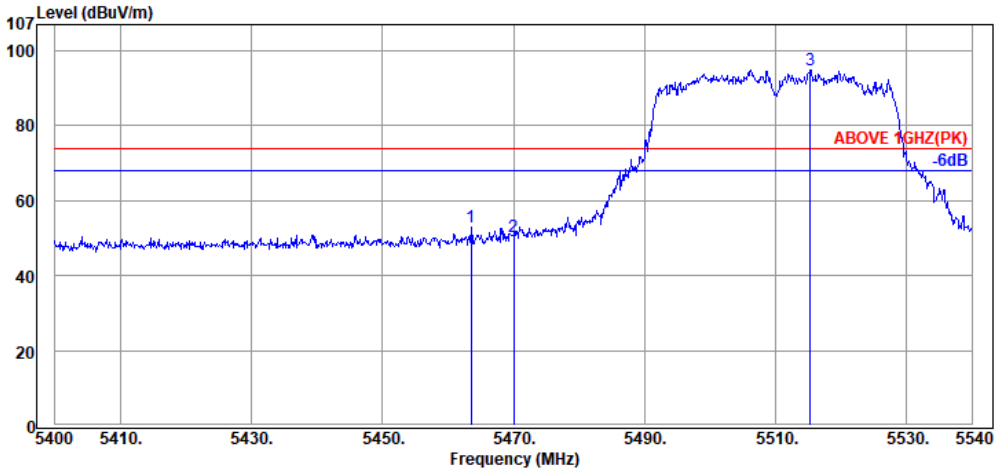
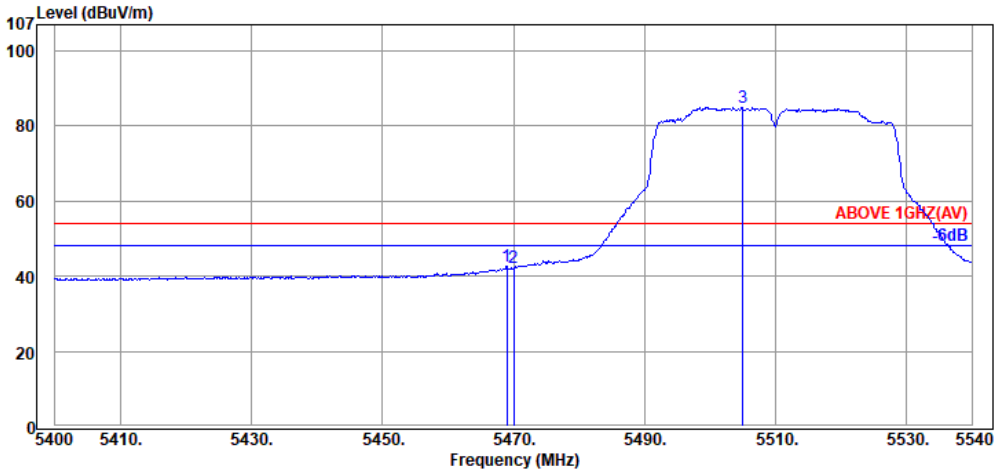
Mode	802.11n-HT40	UNII Band	II-2C
		Frequency	TX 5510MHz



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5463.56	34.77	10.30	7.76	52.83	74.00	21.17	Peak
5470.00	34.77	10.30	5.43	50.50	74.00	23.50	Peak
5515.36	34.82	10.36	49.72	94.90	---	---	Peak



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5469.02	34.77	10.30	-2.52	42.55	54.00	11.45	Average
5470.00	34.77	10.30	-2.96	42.11	54.00	11.89	Average
5505.00	34.80	10.35	39.88	85.03	---	---	Average

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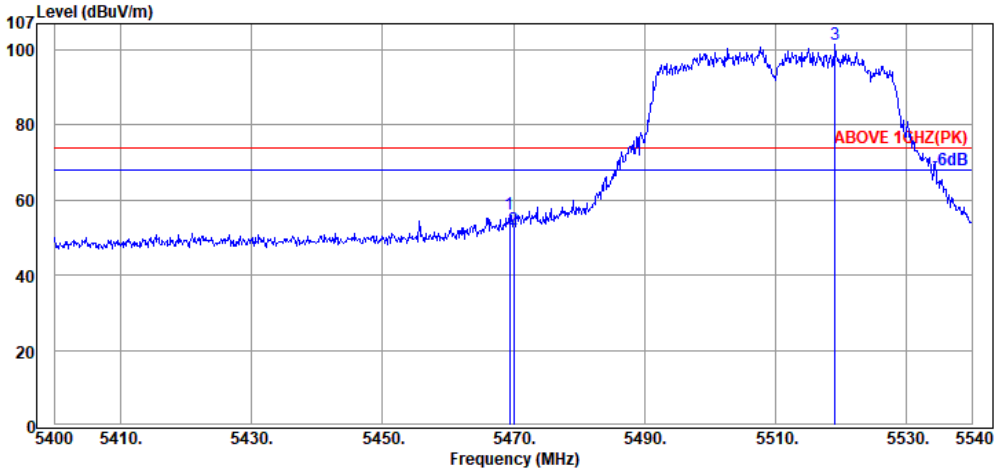
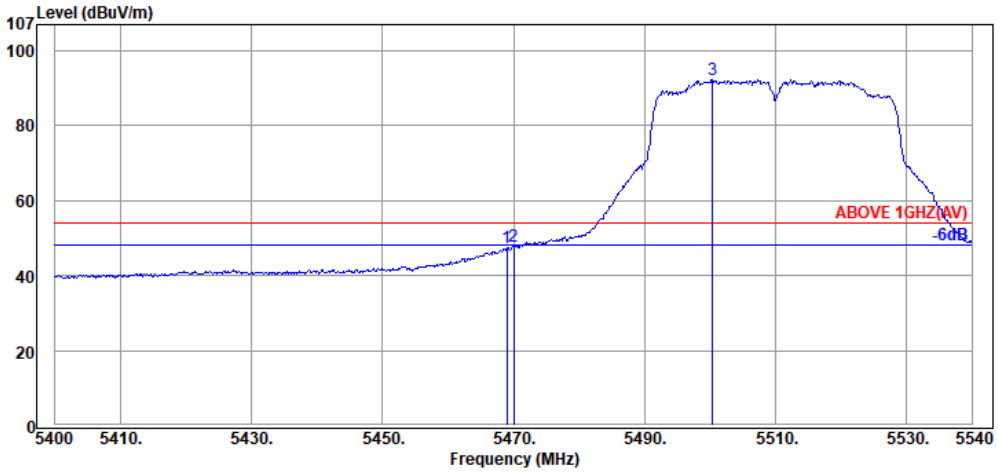
Mode	802.11n-HT40	UNII Band	II-2C
		Frequency	TX 5510MHz



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5469.44	34.77	10.30	11.24	56.31	74.00	17.69	Peak
5470.00	34.77	10.30	7.25	52.32	74.00	21.68	Peak
5519.14	34.82	10.36	56.30	101.48	---	---	Peak



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5469.02	34.77	10.30	2.23	47.30	54.00	6.70	Average
5470.00	34.77	10.30	2.88	47.95	54.00	6.05	Average
5500.38	34.80	10.35	47.02	92.17	---	---	Average

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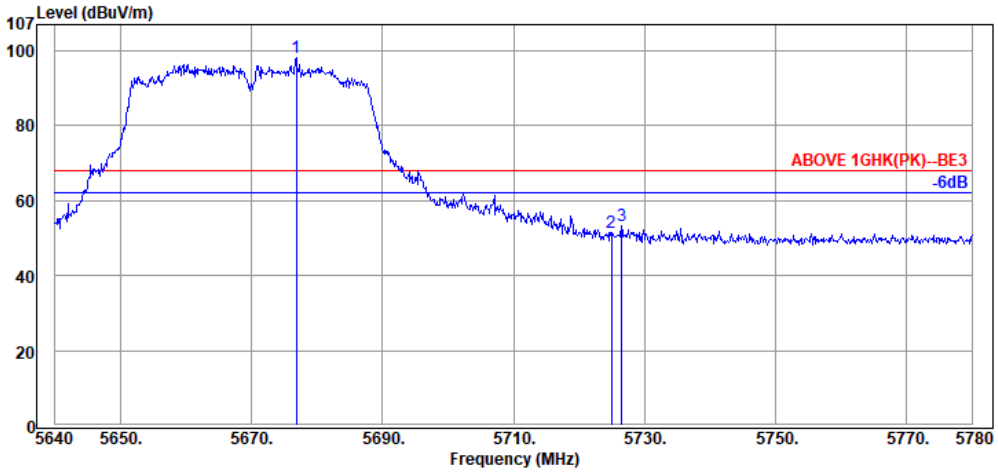
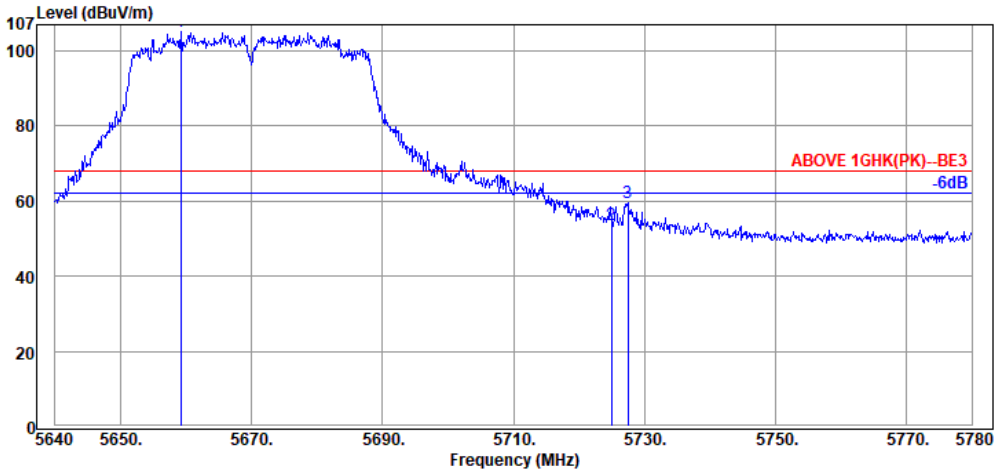
Mode	802.11n-HT40	UNII Band	II-2C
		Frequency	TX 5670MHz



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5676.82	35.01	10.48	52.73	98.22	68.20	---	Peak
5724.98	35.07	10.52	5.78	51.37	68.20	16.83	Peak
5726.52	35.07	10.52	7.67	53.26	68.20	14.94	Peak



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5659.18	34.99	10.47	59.65	105.11	68.20	---	Peak
5724.98	35.07	10.52	8.07	53.66	68.20	14.54	Peak
5727.50	35.07	10.52	13.79	59.38	68.20	8.82	Peak

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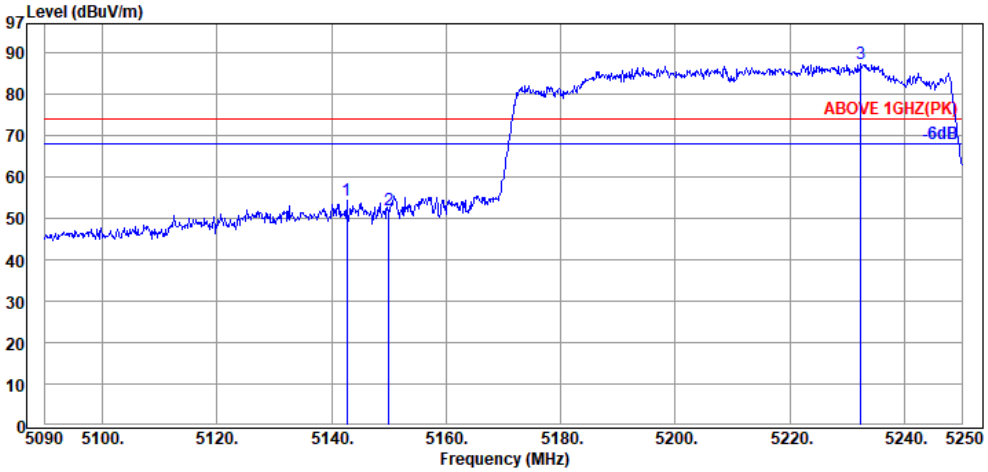
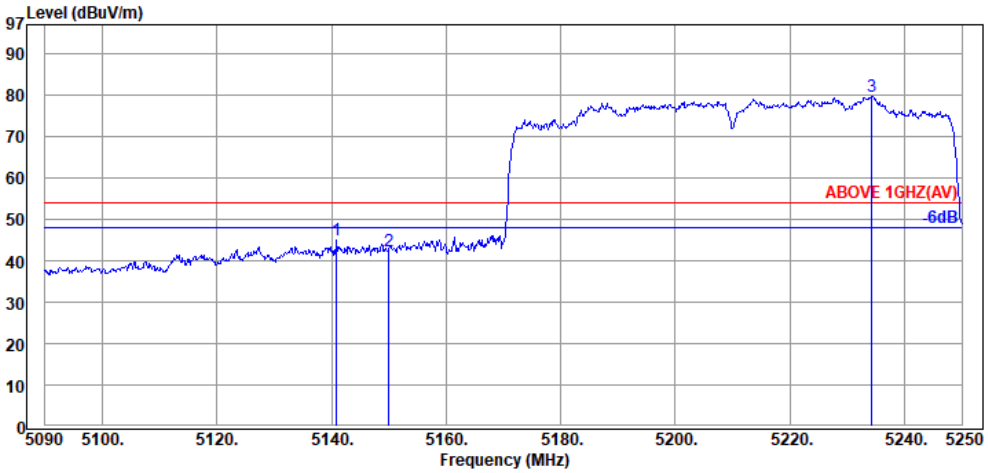
Mode	802.11ac-VHT80	UNII Band	I
		Frequency	TX 5210MHz



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5142.64	34.45	9.83	9.92	54.20	74.00	19.80	Peak
5150.00	34.45	9.83	7.59	51.87	74.00	22.13	Peak
5232.40	34.53	9.96	42.79	87.28	---	---	Peak



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5140.88	34.45	9.83	0.84	45.12	54.00	8.88	Average
5150.00	34.45	9.83	-2.07	42.21	54.00	11.79	Average
5234.32	34.53	9.96	35.26	79.75	---	---	Average

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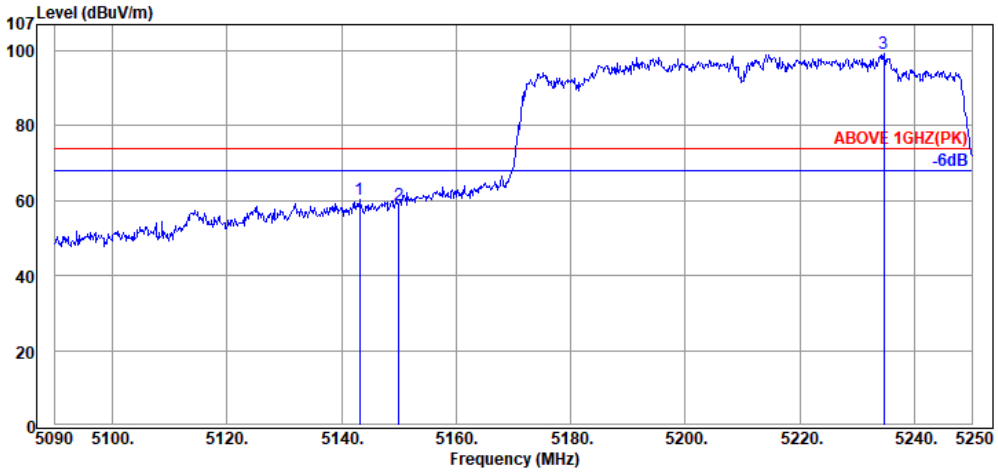
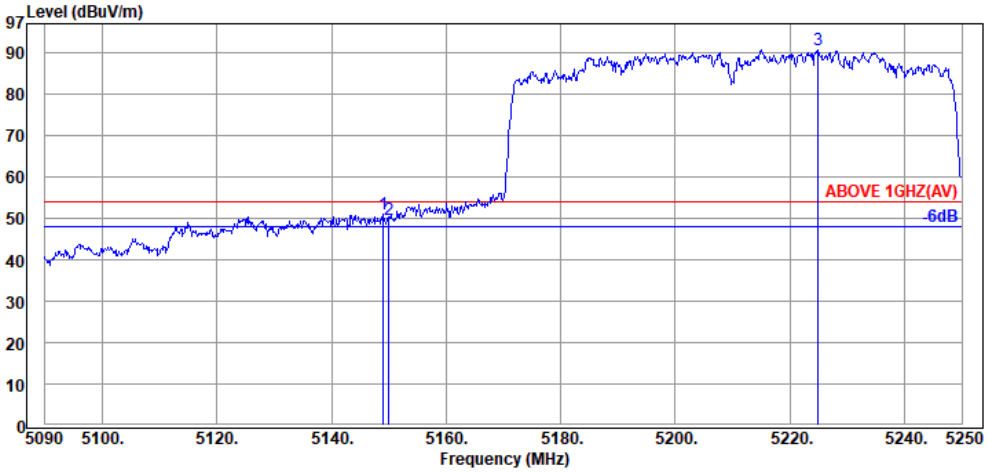
Mode	802.11ac-VHT80	UNII Band	I
		Frequency	TX 5210MHz



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5143.12	34.45	9.83	16.07	60.35	74.00	13.65	Peak
5150.00	34.45	9.83	14.59	58.87	74.00	15.13	Peak
5234.64	34.53	9.96	54.91	99.40	---	---	Peak



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5149.04	34.45	9.83	6.72	51.00	54.00	3.00	Average
5150.00	34.45	9.83	5.45	49.73	54.00	4.27	Average
5224.88	34.53	9.96	46.19	90.68	---	---	Average

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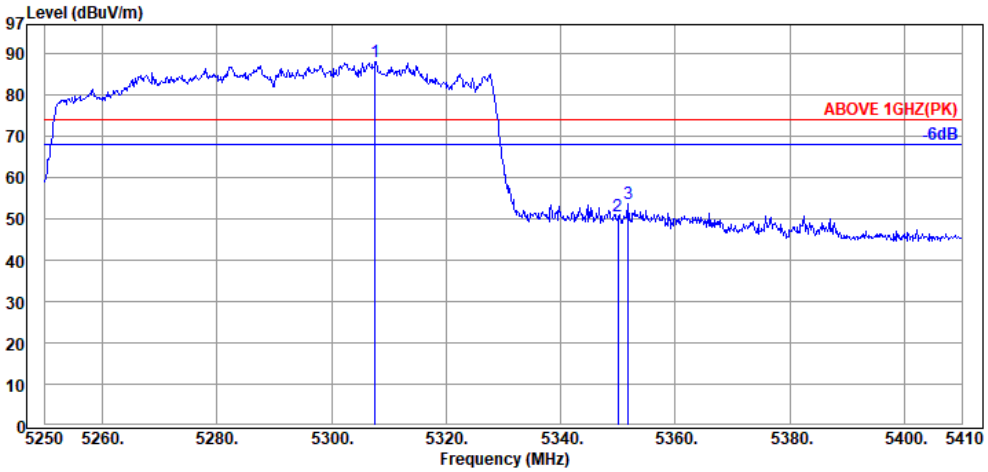
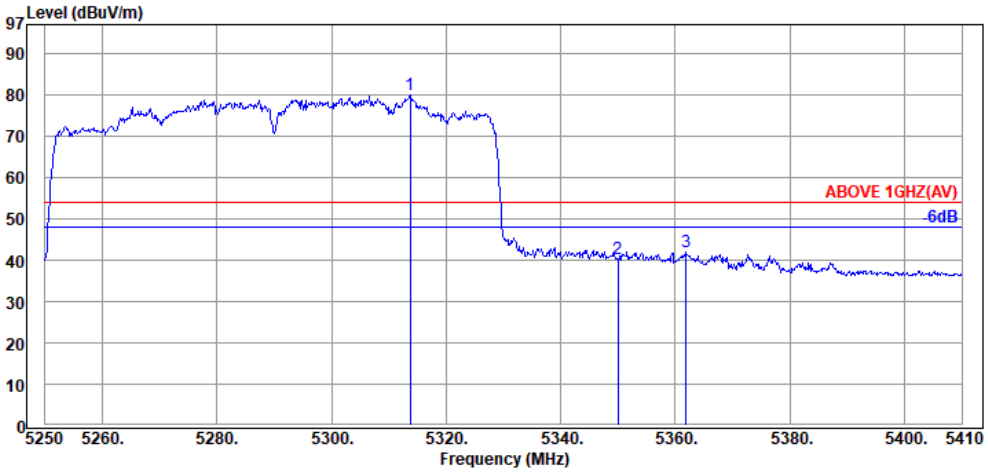
Mode	802.11ac-VHT80	UNII Band	II-2A
		Frequency	TX 5290MHz



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5307.60	34.60	10.05	43.35	88.00	---	---	Peak
5350.00	34.65	10.13	5.81	50.59	74.00	23.41	Peak
5351.76	34.65	10.13	8.74	53.52	74.00	20.48	Peak



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5313.68	34.62	10.08	35.32	80.02	---	---	Average
5350.00	34.65	10.13	-4.43	40.35	54.00	13.65	Average
5361.84	34.67	10.15	-2.90	41.92	54.00	12.08	Average

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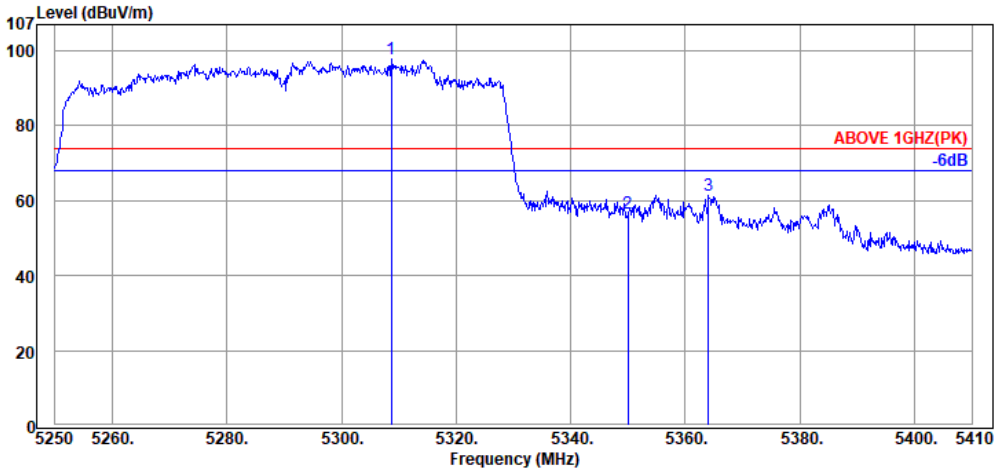
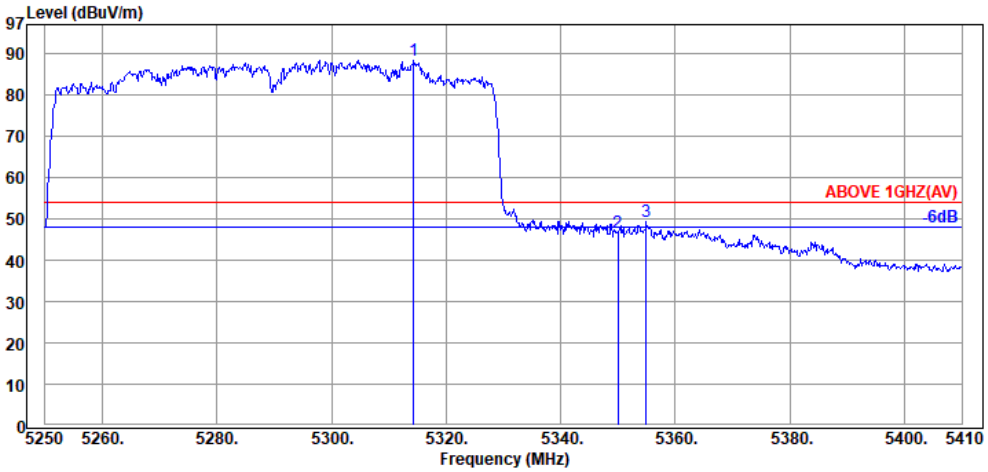
Mode	802.11ac-VHT80	UNII Band	II-2A
		Frequency	TX 5290MHz



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5308.72	34.60	10.05	53.28	97.93	---	---	Peak
5350.00	34.65	10.13	11.84	56.62	74.00	17.38	Peak
5364.08	34.67	10.15	16.72	61.54	74.00	12.46	Peak



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5314.32	34.62	10.08	43.78	88.48	---	---	Average
5350.00	34.65	10.13	1.84	46.62	54.00	7.38	Average
5354.96	34.65	10.13	4.54	49.32	54.00	4.68	Average

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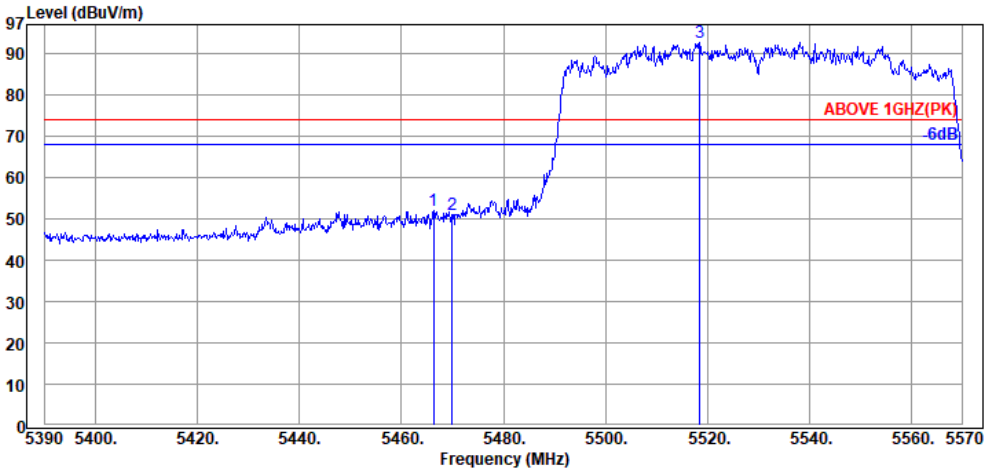
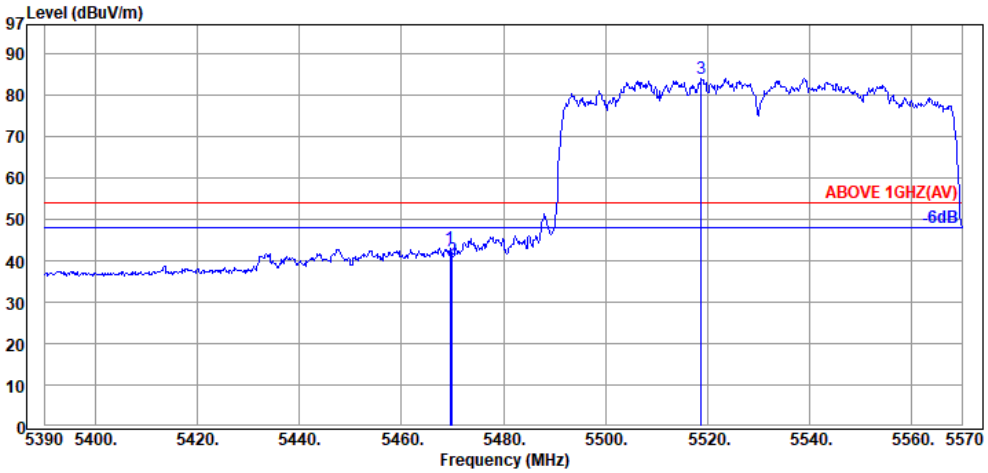
Mode	802.11ac-VHT80	UNII Band	II-2C
		Frequency	TX 5530MHz



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5466.32	34.77	10.30	7.06	52.13	74.00	21.87	Peak
5469.92	34.77	10.30	5.85	50.92	74.00	23.08	Peak
5518.52	34.82	10.36	47.59	92.77	---	---	Peak



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5469.56	34.77	10.30	-1.97	43.10	54.00	10.90	Average
5469.92	34.77	10.30	-4.62	40.45	54.00	13.55	Average
5518.88	34.82	10.36	38.83	84.01	---	---	Average

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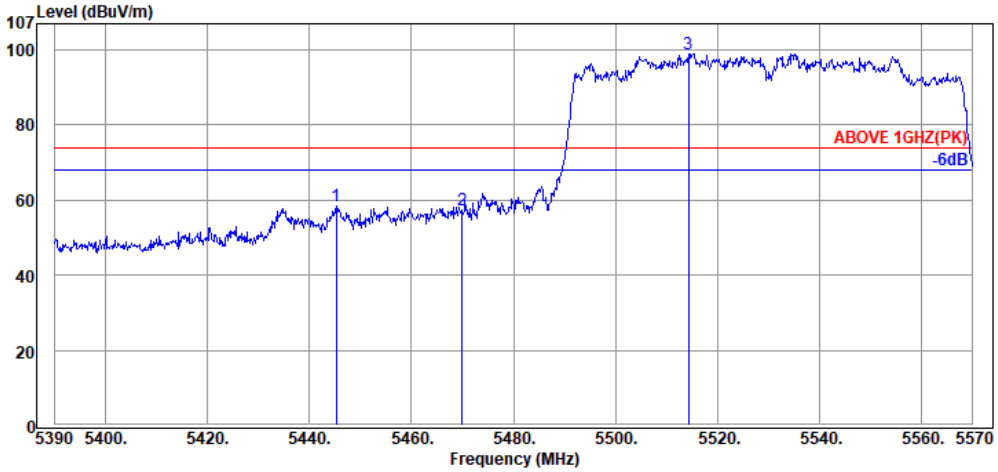
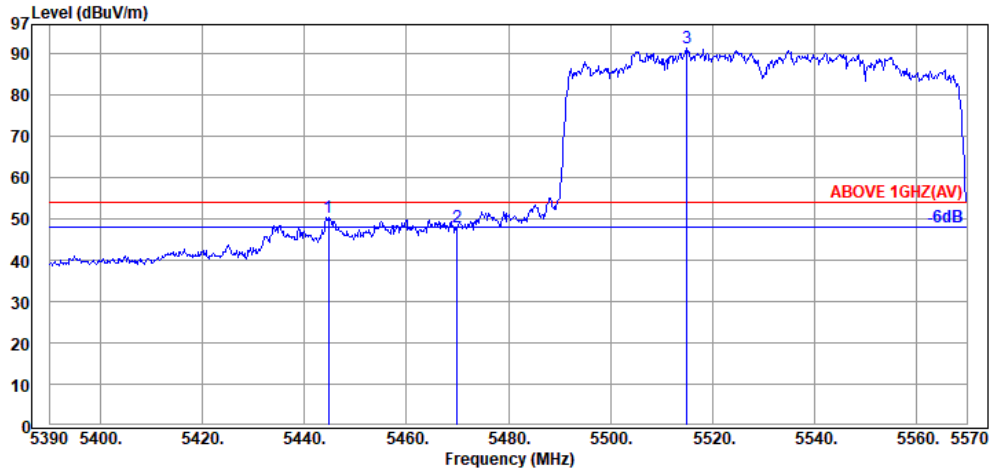
Mode	802.11ac-VHT80	UNII Band	II-2C
		Frequency	TX 5530MHz



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5445.26	34.73	10.25	13.39	58.37	74.00	15.63	Peak
5469.92	34.77	10.30	12.16	57.23	74.00	16.77	Peak
5514.38	34.82	10.36	53.86	99.04	---	---	Peak



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
5444.72	34.73	10.25	5.49	50.47	54.00	3.53	Average
5469.92	34.77	10.30	2.97	48.04	54.00	5.96	Average
5515.10	34.82	10.36	46.07	91.25	---	---	Average

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A.2.2 Emissions outside the frequency band

The emissions (up to 40GHz) not reported for there is no emission be found.

Mode	802.11a	UNII Band	I
		Frequency	TX 5200MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
10400.00	37.62	15.77	-8.11	45.28	54.00	8.72	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
10400.00	37.62	15.77	-7.71	45.68	54.00	8.32	Peak

Mode	802.11a	UNII Band	II-2A
		Frequency	TX 5260MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
10520.00	37.70	15.76	-7.07	46.39	54.00	7.61	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
10520.00	37.70	15.76	-7.62	45.84	54.00	8.16	Peak

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Mode	802.11a	UNII Band	II-2C
		Frequency	TX 5580MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
11160.00	38.03	15.85	-8.17	45.71	54.00	8.29	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
11160.00	38.03	15.85	-7.84	46.04	54.00	7.96	Peak

Mode	802.11a	UNII Band	II-2C
		Frequency	TX 5720MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
11440.00	38.41	16.08	-7.95	46.54	54.00	7.46	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
11440.00	38.41	16.08	-8.03	46.46	54.00	7.54	Peak

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Mode	802.11a	UNII Band	III
		Frequency	TX 5785MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
11570.00	38.56	16.20	-8.19	46.57	54.00	7.43	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
11570.00	38.56	16.20	-8.75	46.01	54.00	7.99	Peak

Mode	802.11n-HT20	UNII Band	I
		Frequency	TX 5200MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
10400.00	37.62	15.77	-8.95	44.44	54.00	9.56	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
10400.00	37.62	15.77	-8.45	44.94	54.00	9.06	Peak

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Mode	802.11n-HT20	UNII Band	II-2A
		Frequency	TX 5260MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
10520.00	37.70	15.76	-7.35	46.11	54.00	7.89	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
10520.00	37.70	15.76	-7.91	45.55	54.00	8.45	Peak

Mode	802.11n-HT20	UNII Band	II-2C
		Frequency	TX 5580MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
11160.00	38.03	15.85	-8.48	45.40	54.00	8.60	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
8000.00	35.90	12.91	-9.10	39.71	54.00	14.29	Peak
11160.00	38.03	15.85	-7.21	46.67	54.00	7.33	Peak

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Mode	802.11n-HT20	UNII Band	II-2C
		Frequency	TX 5720MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
11440.00	38.41	16.08	-8.83	45.66	54.00	8.34	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
11440.00	38.41	16.08	-8.52	45.97	54.00	8.03	Peak

Mode	802.11n-HT20	UNII Band	III
		Frequency	TX 5785MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
11570.00	38.56	16.20	-7.74	47.02	54.00	6.98	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
11570.00	38.56	16.20	-7.63	47.13	54.00	6.87	Peak

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Mode	802.11n-HT40	UNII Band	I
		Frequency	TX 5230MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
10460.00	37.66	15.76	-7.78	45.64	54.00	8.36	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
10460.00	37.66	15.76	-8.35	45.07	54.00	8.93	Peak

Mode	802.11n-HT40	UNII Band	II-2A
		Frequency	TX 5270MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
10540.00	37.71	15.76	-7.57	45.90	54.00	8.10	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
10540.00	37.71	15.76	-6.71	46.76	54.00	7.24	Peak

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Mode	802.11n-HT40	UNII Band	II-2C
		Frequency	TX 5550MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
11100.00	37.94	16.88	-8.49	46.33	54.00	7.67	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
11100.00	37.94	16.88	-8.44	46.38	54.00	7.62	Peak

Mode	802.11n-HT40	UNII Band	II-2C
		Frequency	TX 5710MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
11420.00	38.38	16.07	-8.73	45.72	54.00	8.28	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
11420.00	38.38	16.07	-7.96	46.49	54.00	7.51	Peak

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Mode	802.11n-HT40	UNII Band	III
		Frequency	TX 5795MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
11590.00	38.57	16.21	-8.53	46.25	54.00	7.75	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
11590.00	38.57	16.21	-8.05	46.73	54.00	7.27	Peak

Mode	802.11ac-VHT80	UNII Band	I
		Frequency	TX 5210MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
10420.00	37.63	15.77	-7.97	45.43	54.00	8.57	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
10420.00	37.63	15.77	-7.52	45.88	54.00	8.12	Peak

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Mode	802.11ac-VHT80	UNII Band	II-2A
		Frequency	TX 5290MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
10580.00	37.72	15.75	-8.15	45.32	54.00	8.68	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
10580.00	37.72	15.75	-8.14	45.33	54.00	8.67	Peak

Mode	802.11ac-VHT80	UNII Band	II-2C
		Frequency	TX 5690MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
11380.00	38.34	16.04	-8.10	46.28	54.00	7.72	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
11380.00	38.34	16.04	-7.69	46.69	54.00	7.31	Peak

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Mode	802.11ac-VHT80	UNII Band	III
		Frequency	TX 5775MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
11550.00	38.54	16.19	-7.56	47.17	54.00	6.83	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
11550.00	38.54	16.19	-8.50	46.23	54.00	7.77	Peak

A.2.3 Emissions in Non-restricted Frequency Bands

Pursuant to KDB 789033 D02 General UNII Test Procedures New Rules v01r04 that emission levels below the 15.209 general radiated emissions limits is not required.

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A.3 EMISSION BANDWIDTH

Test Date	2017/11/28 ~ 30	Temp./Hum.	23℃/55%
Cable Loss	---	Test Voltage	AC 120V, 60Hz (via AC Adapter)

A.3.1 Emission Bandwidth Result

Mode	UNII Band	Centre Frequency (MHz)	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit
802.11a	I	5180	26.49	17.039	Reference only
		5200	23.16	16.484	
		5240	32.22	19.189	
	II-2A	5260	30.53	17.598	
		5300	32.25	18.271	
		5320	22.73	16.510	
	II-2C	5500	22.69	16.532	
		5580	27.18	16.849	
		5700	22.70	16.451	
		5720	16.28	17.618	
802.11n-HT20	I	5180	23.66	17.728	Reference only
		5200	27.21	17.920	
		5240	27.76	18.000	
	II-2A	5260	27.74	17.940	
		5300	27.23	18.005	
		5320	23.31	17.671	
	II-2C	5500	27.47	18.064	
		5580	24.32	17.765	
		5700	23.34	17.672	
		5720	16.54	17.609	

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Mode	UNII Band	Centre Frequency (MHz)	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit
802.11n-HT40	I	5190	45.47	36.180	Reference only
		5230	44.55	36.229	
	II-2A	5270	45.11	36.331	
		5310	43.79	36.127	
	II-2C	5510	43.01	36.161	
		5550	44.83	36.214	
		5670	43.25	36.127	
		5710	35.08	36.247	
802.11ac-VHT80	I	5210	78.68	74.951	Reference only
	II-2A	5290	78.56	74.962	
	II-2C	5530	78.94	75.038	
		5690	75.22	75.098	

Mode	UNII Band	Centre Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit
802.11a	III	5745	14.45	17.018	≥ 500kHz
		5785	15.26	18.882	
		5825	16.27	21.482	
802.11n-HT20	III	5745	16.29	18.092	
		5785	15.68	18.014	
		5825	16.29	18.354	
802.11n-HT40	III	5755	35.65	37.748	
		5795	35.67	37.602	
802.11ac-VHT80	III	5775	64.01	74.824	

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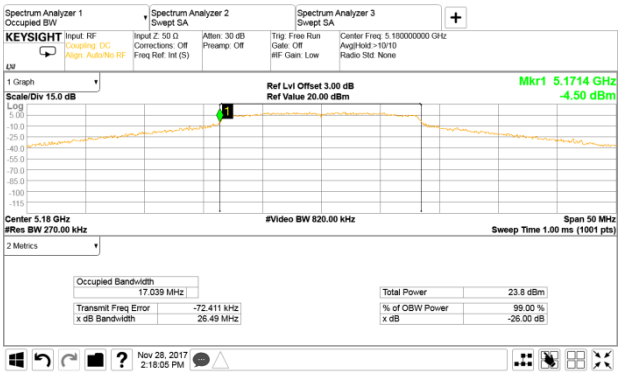
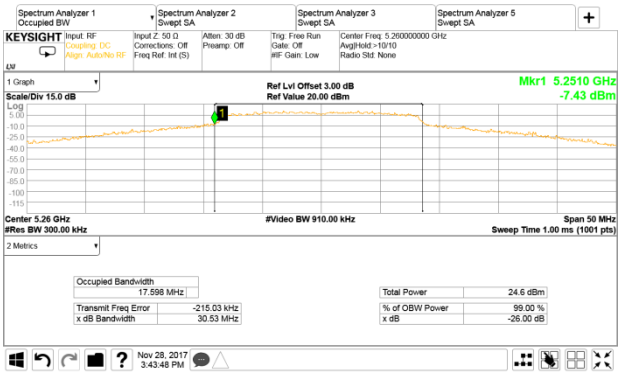
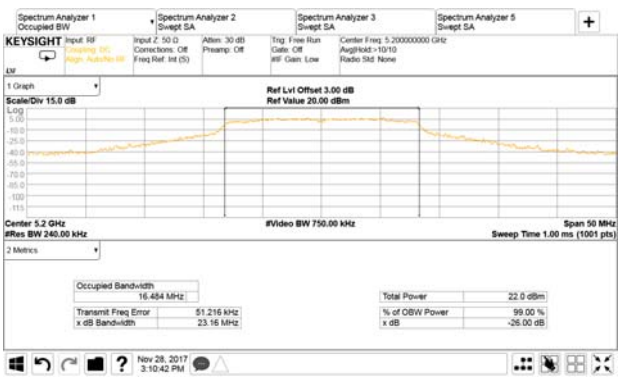
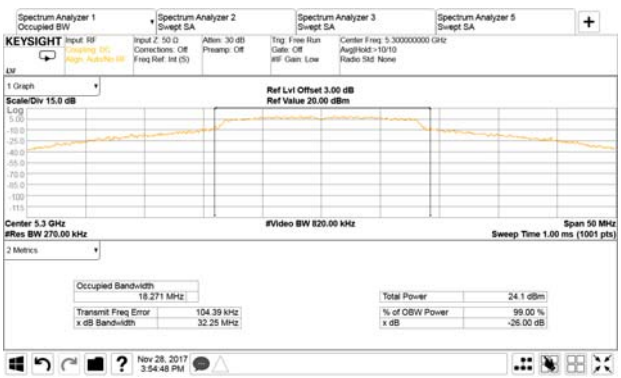
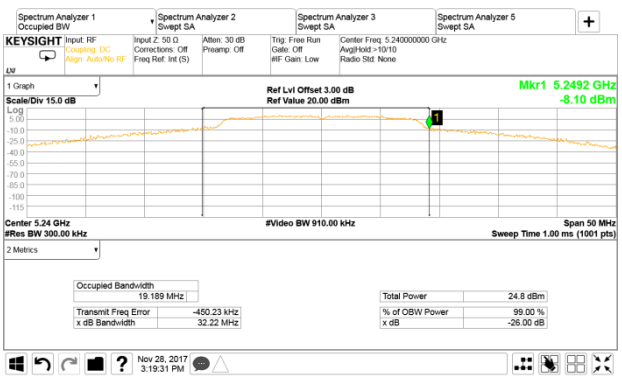
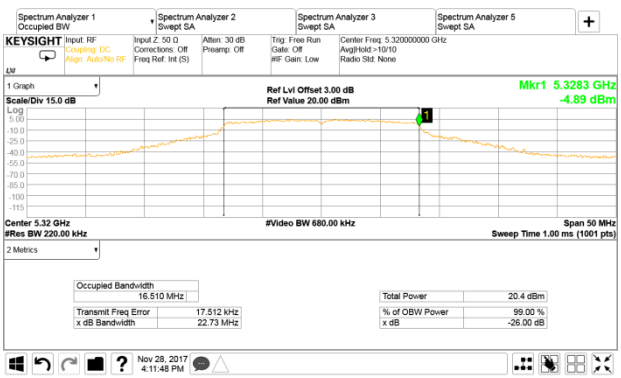
A.3.2 Measurement Plots

802.11a	
UNII Band I	UNII Band II-2A
	
	
	

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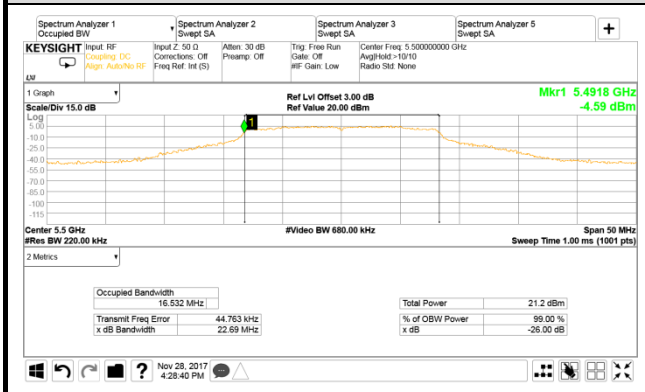
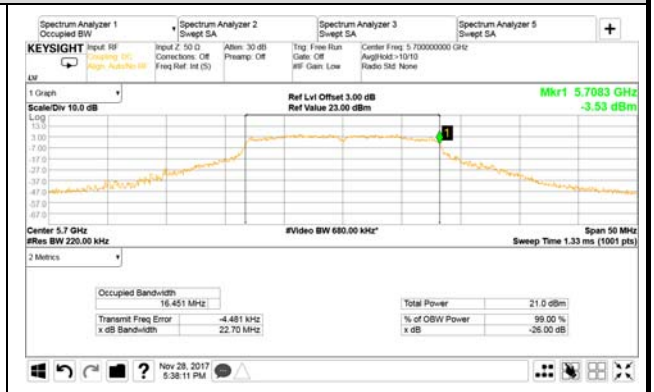
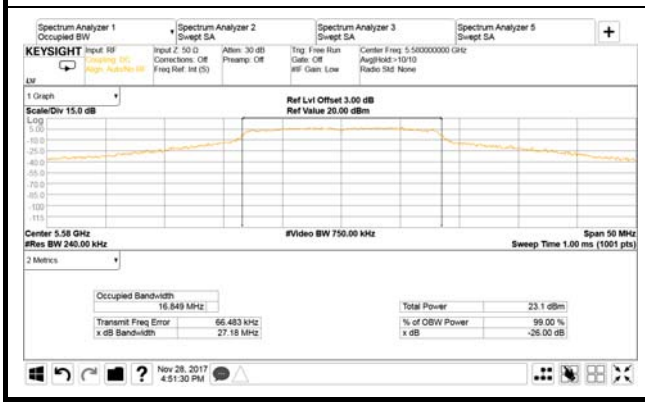
802.11a
UNII Band II-2C







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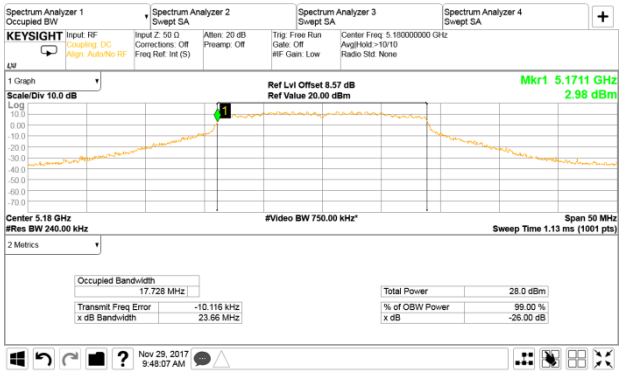
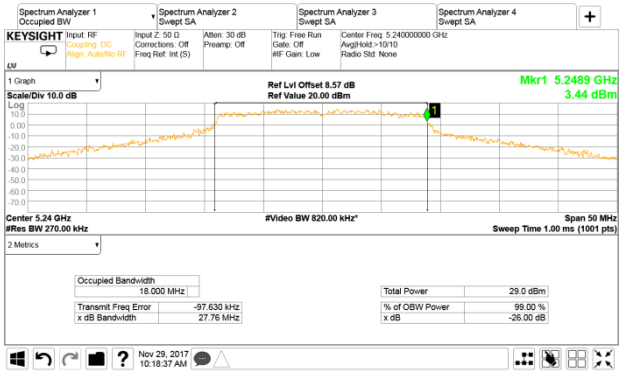
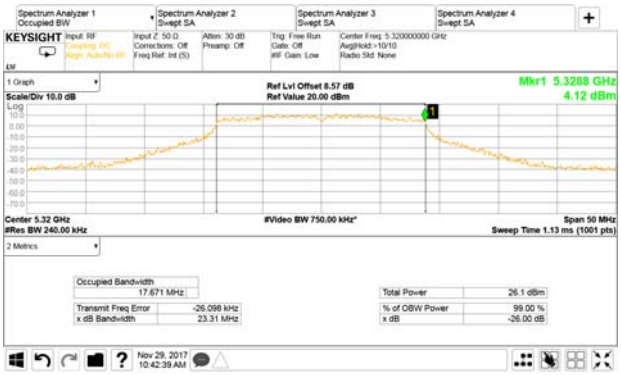
802.11n-HT20	
UNII Band I	UNII Band II-2A
	
	

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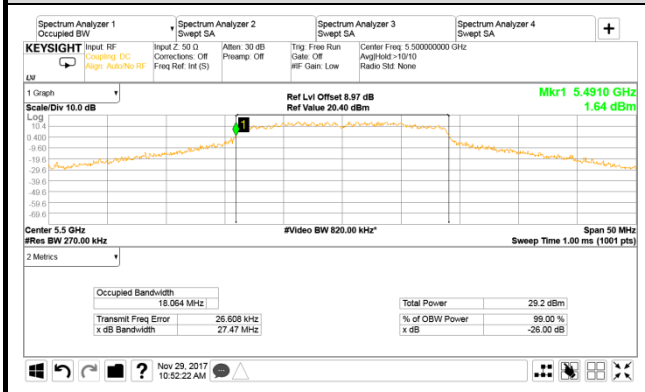
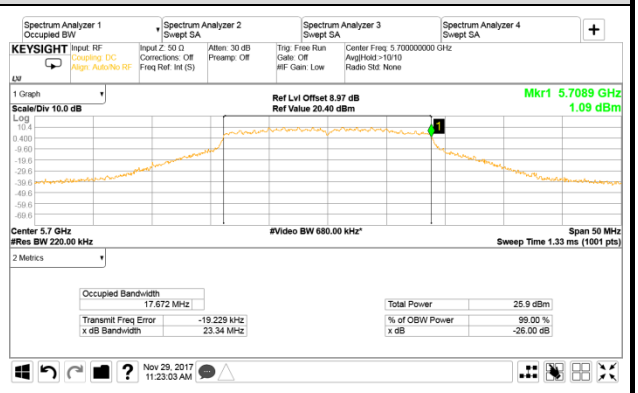
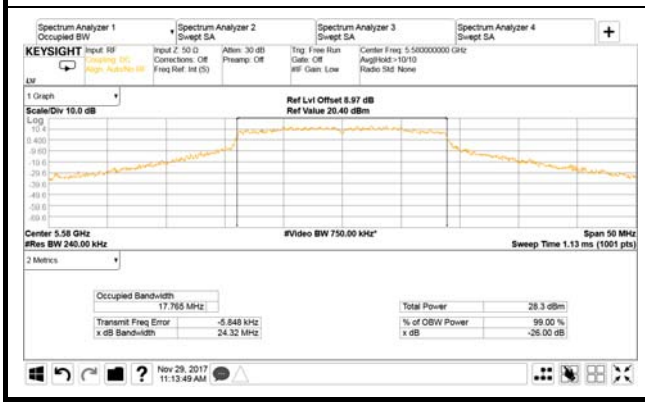
802.11n-HT20	
UNII Band II-2C	
	
	

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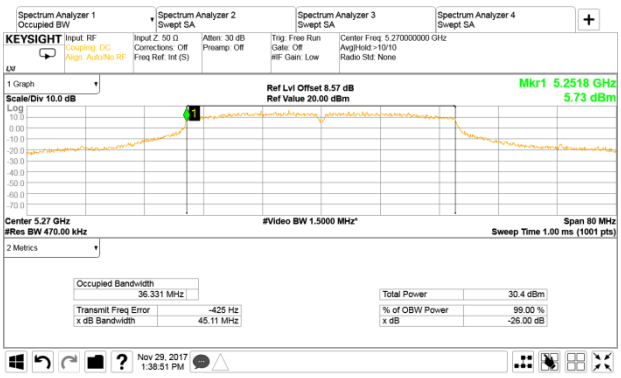
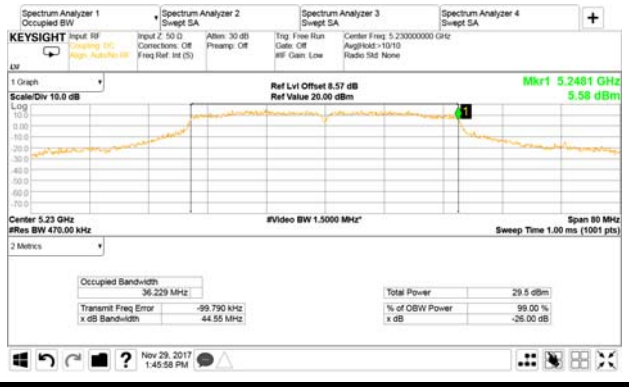
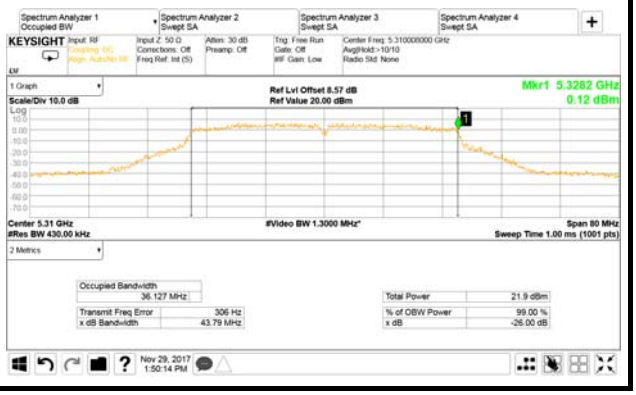
802.11n-HT40	
UNII Band I	UNII Band II-2A
	
	

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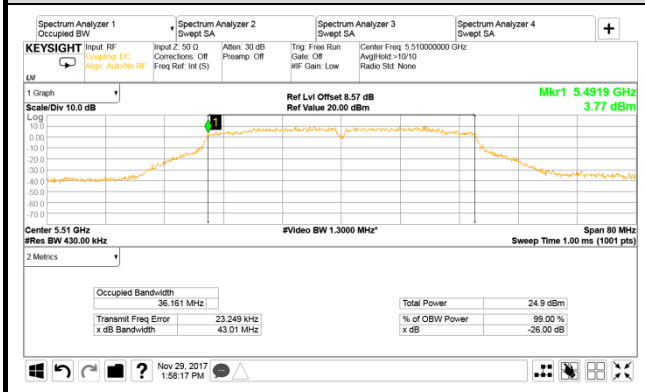
802.11n-HT40	
UNII Band II-2C	
	

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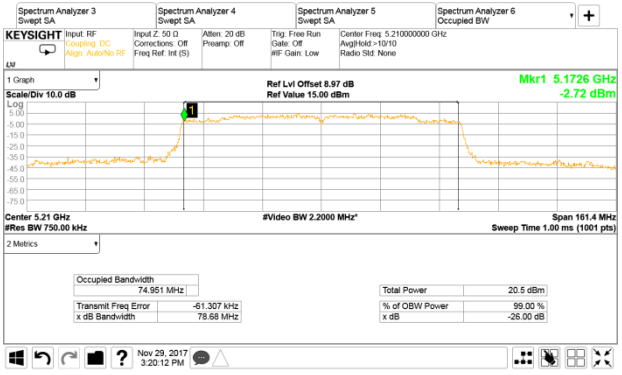
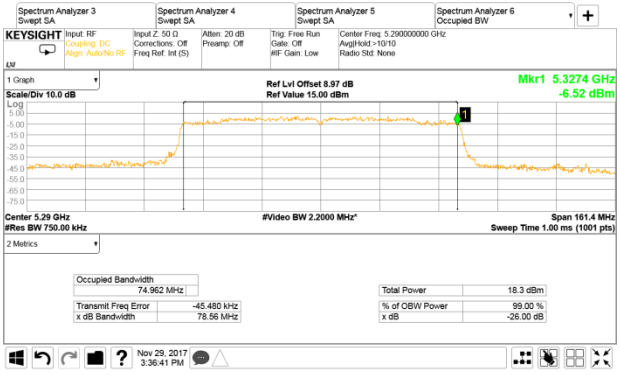
802.11ac-VHT80	
UNII Band I	UNII Band II-2A
	
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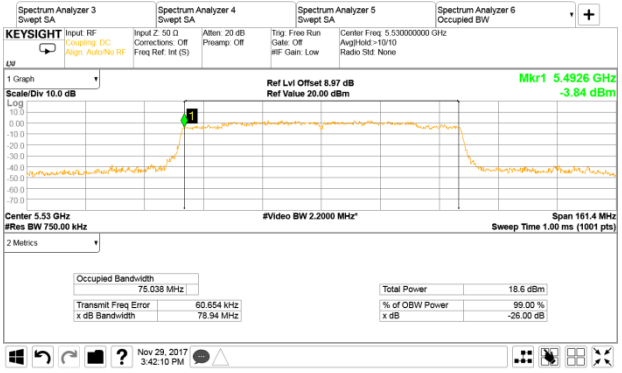	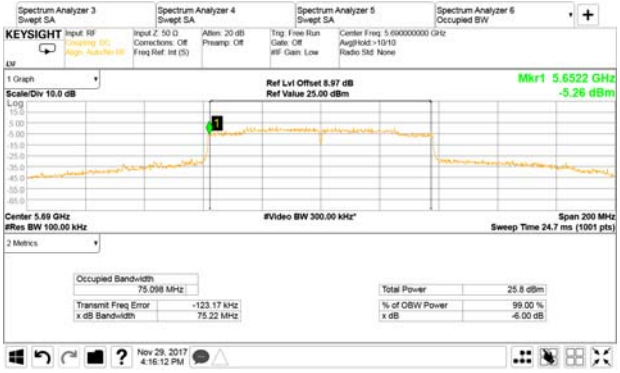

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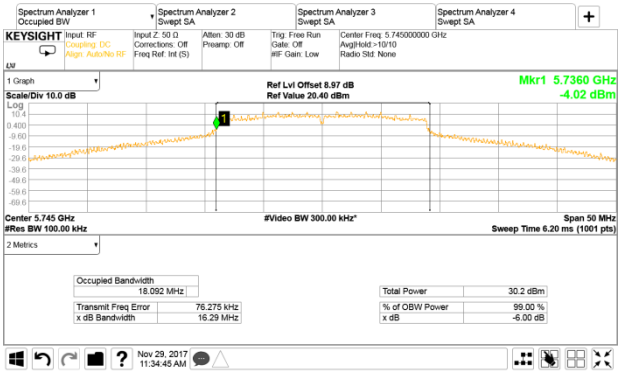
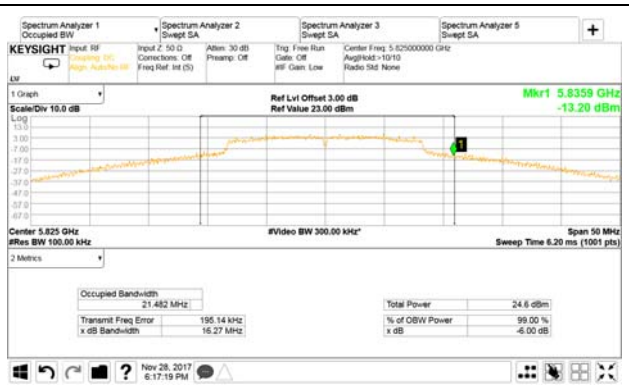
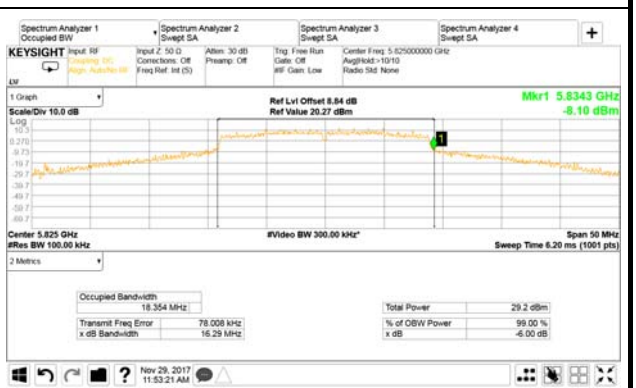
802.11a	802.11n-HT20
UNII Band III	UNII Band III
	
	

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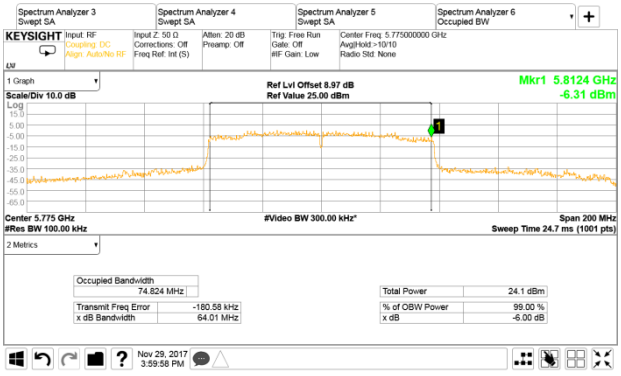
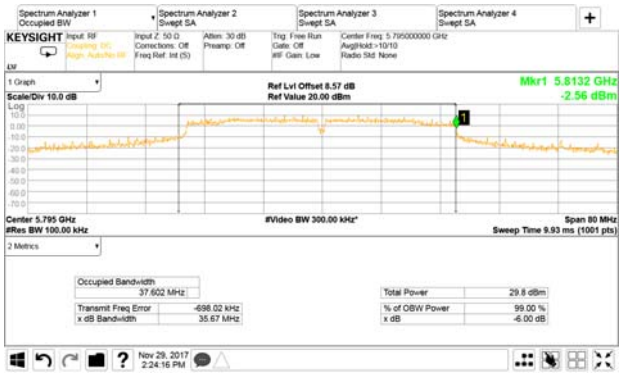
802.11n-HT40	802.11ac-VHT80
UNII Band III	UNII Band III
	
	

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A.4 MAXIMUM OUTPUT POWER

Test Date	2017/11/28~29	Temp./Hum.	25℃/55%
Cable Loss	3dB	Test Voltage	AC 120V, 60Hz (via AC Adapter)

A.4.1 Average Output Power

Mode	UNII Band	Centre Frequency (MHz)	Average Output Power(dBm)		10log (1/X)	Antenna Gain (dBi)	MAX Average Output Power		Limit
			Chain 0	Chain 1			(dBm)	(W)	
802.11a	I	5180	15.02	14.98	0	1.97	16.99	0.050003	< 200 mW (23 dBm) (E.I.R.P.)
		5200	18.36	18.43			20.33	0.107895	
		5240	16.40	16.00			18.37	0.068707	
	II	5260	18.88	18.77			20.85	0.121619	< 1 W (30 dBm) (E.I.R.P.)
		5300	18.81	18.77			20.78	0.119674	
		5320	16.55	15.47			18.52	0.071121	
	III	5500	15.49	16.47		2.03	17.52	0.056494	
		5580	19.03	18.80			21.06	0.127644	
		5700	14.99	14.88			17.02	0.050350	
		5720	16.26	16.03			18.29	0.067453	
	IV	5720	8.63	8.13			8.63	0.007295	< 1 W (30 dBm)
		5745	18.75	18.99			18.75	0.074989	
		5785	19.05	18.92			19.05	0.080353	
		5825	18.99	18.87			18.99	0.079250	

Note: The results have been included cable loss.

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Mode	UNII Band	Centre Frequency (MHz)	Average Output Power(dBm)		10log (1/X)	Antenna Gain (dBi)	Total Average Output Power		Limit
			Chain 0	Chain 1			(dBm)	(W)	
802.11n-HT20	I	5180	14.94	15.07	0.22	1.97	21.24	0.133045	< 200 mW (23 dBm) (E.I.R.P.)
		5200	13.79	14.50			22.23	0.167109	
		5240	13.98	14.40			22.18	0.165196	
	II	5260	17.42	17.01			22.21	0.166341	< 1 W (30 dBm) (E.I.R.P.)
		5300	17.36	16.99			22.17	0.164816	
		5320	15.77	15.55			20.65	0.116145	
	III	5500	15.39	15.11		2.03	20.31	0.107399	
		5580	17.10	17.00			22.10	0.162181	
		5700	13.74	13.99			18.93	0.078163	
		5720	17.66	17.97			22.86	0.193197	
	IV	5720	10.49	11.03			13.82	0.024099	< 1 W (30 dBm)
		5745	17.75	18.18			20.99	0.125603	
		5785	18.85	18.34			21.62	0.145211	
		5825	18.74	18.06			21.43	0.138995	

Note: The results have been included cable loss.

Mode	UNII Band	Centre Frequency (MHz)	Average Output Power(dBm)		10log (1/X)	Antenna Gain (dBi)	Total Average Output Power		Limit
			Chain 0	Chain 1			(dBm)	(W)	
802.11n-HT40	I	5190	13.35	13.22	0.13	1.97	17.40	0.054954	< 200 mW (23 dBm) (E.I.R.P.)
		5230	16.12	16.79			22.64	0.183654	
	II	5270	17.48	17.27			22.49	0.177419	< 1 W (30 dBm) (E.I.R.P.)
		5310	11.74	12.00			16.98	0.049888	
	III	5510	11.90	12.05		2.03	17.15	0.051880	
		5550	17.28	17.38			22.50	0.177828	
		5670	16.28	16.71			21.67	0.146893	
		5710	16.33	16.19			21.44	0.139316	
	IV	5710	11.52	11.29			14.55	0.028510	< 1 W (30 dBm)
		5755	18.84	18.44			21.79	0.151008	
		5795	18.87	18.65			21.90	0.154882	

Note: The results have been included cable loss.

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Mode	UNII Band	Centre Frequency (MHz)	Average Output Power(dBm)		10log (1/X)	Antenna Gain (dBi)	Total Average Output Power		Limit
			Chain 0	Chain 1			(dBm)	(W)	
802.11ac-VHT80	I	5210	9.36	9.57	1.74	1.97	16.19	0.041591	< 200 mW (23 dBm) (E.I.R.P.)
	II	5290	7.52	7.64			14.30	0.026915	< 1 W (30 dBm) (E.I.R.P.)
	III	5530	7.69	7.98		2.03	14.62	0.028973	
		5690	17.10	16.61			23.64	0.231206	
	IV	5690	0.96	0.29			5.39	0.003459	< 1 W (30 dBm)
		5775	14.05	14.10			18.82	0.076208	

Note: The results have been included cable loss.

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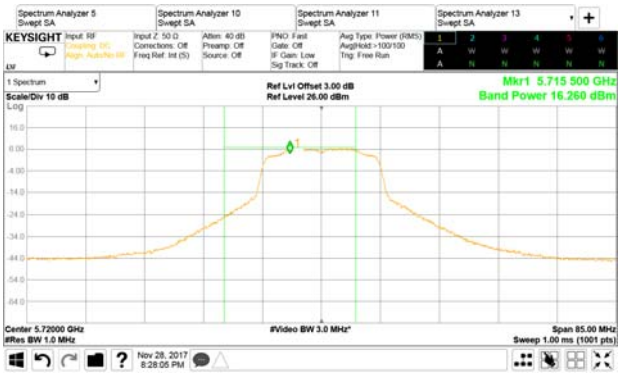
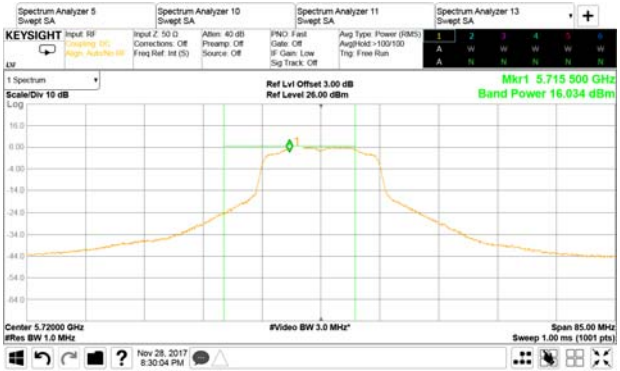
A.4.2 Measurement Plots

- Band Power

802.11a	
UNII Band II-2C	
Chain 0	Chain 1
	
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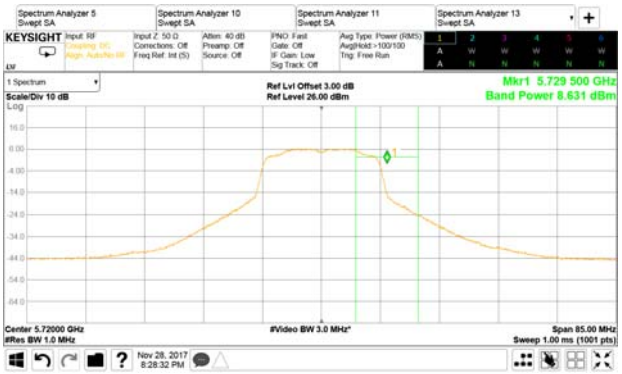	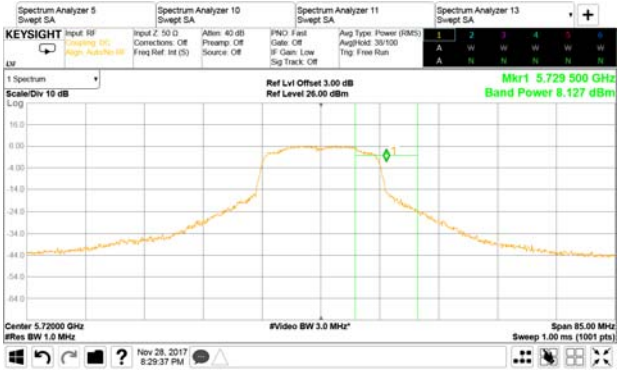

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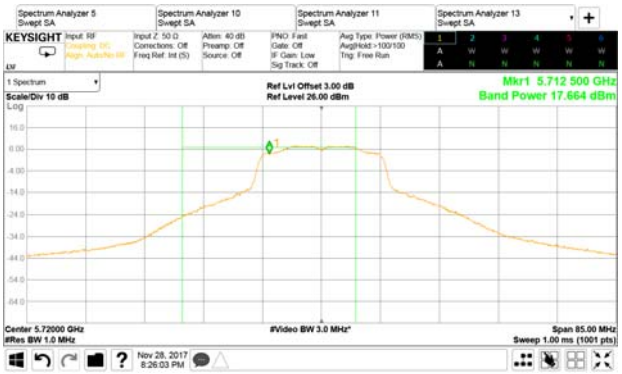
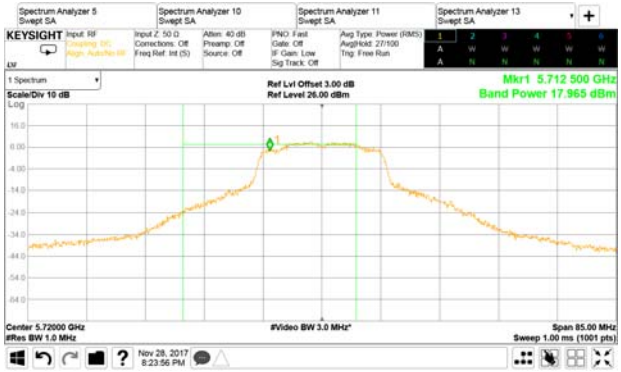
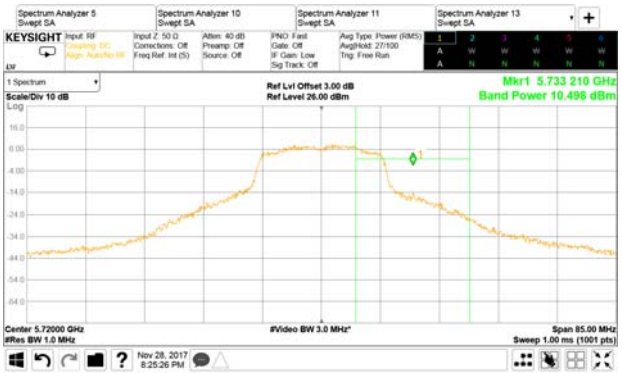
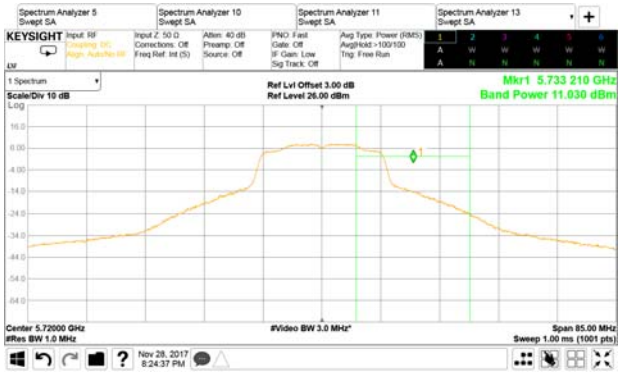
802.11n-HT20	
UNII Band II-2C	
Chain 0	Chain 1
	
UNII Band III	
	

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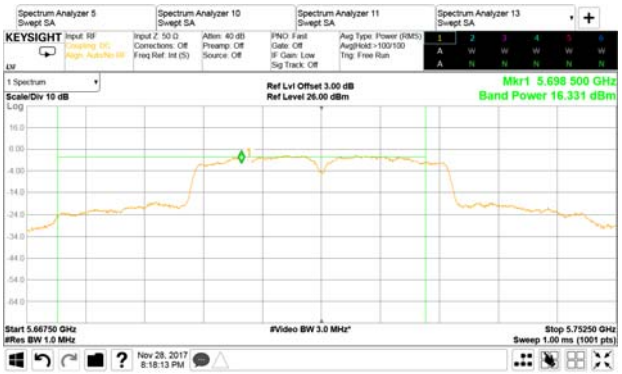
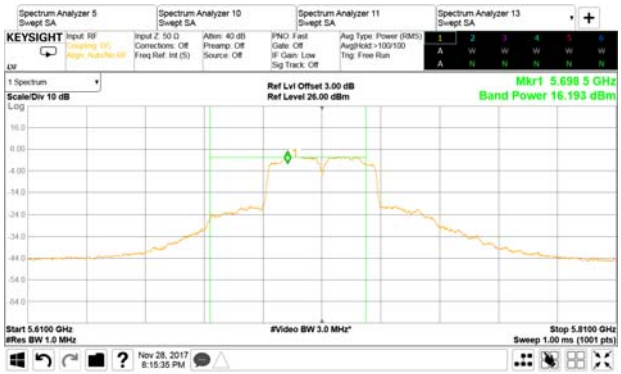
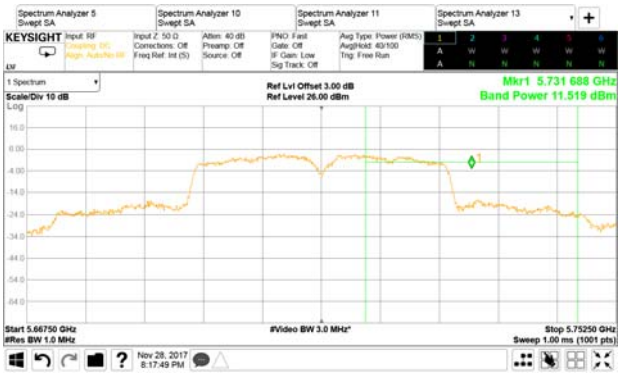
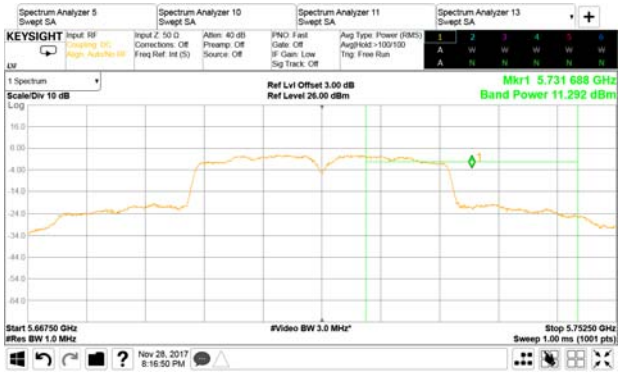
802.11n-HT40	
UNII Band II-2C	
Chain 0	Chain 1
	
UNII Band III	
	

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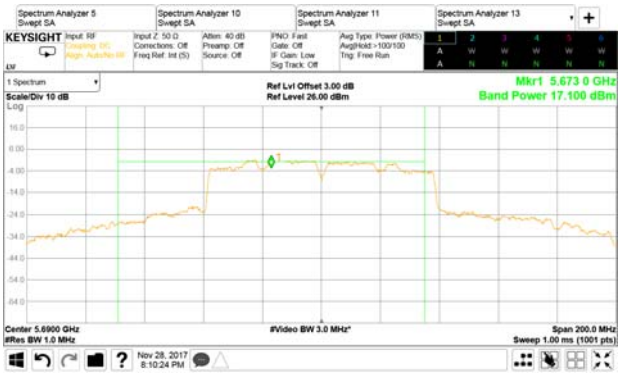
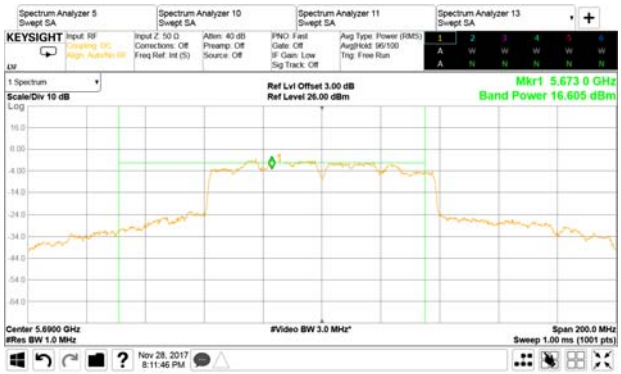
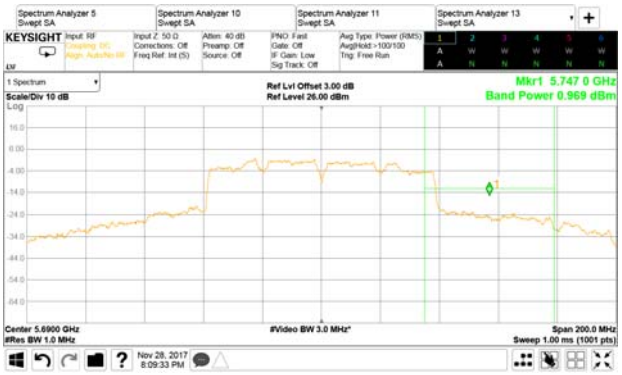
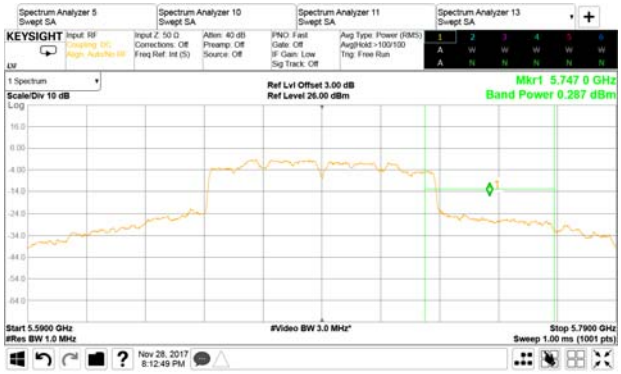
802.11ac-VHT80	
UNII Band II-2C	
Chain 0	Chain 1
	
UNII Band III	
	

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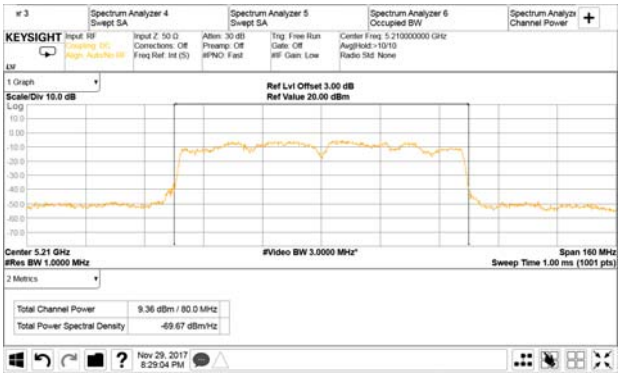
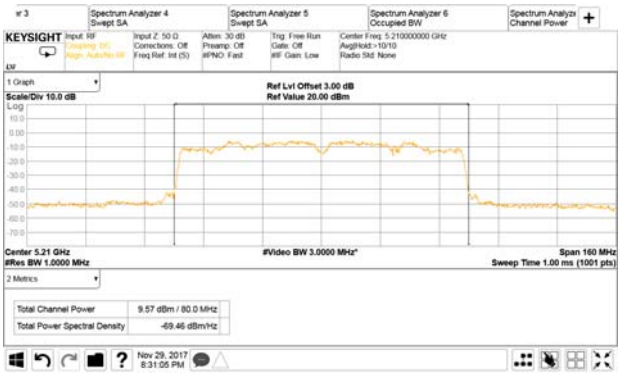
- Output Power

802.11ac-VHT80	
UNII Band I	
Chain 0	Chain 1
	
UNII Band II-2A	

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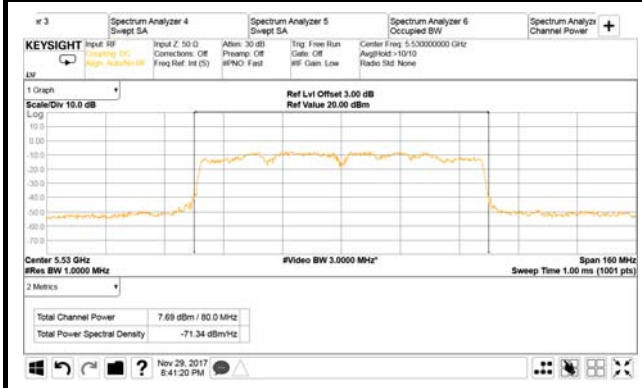
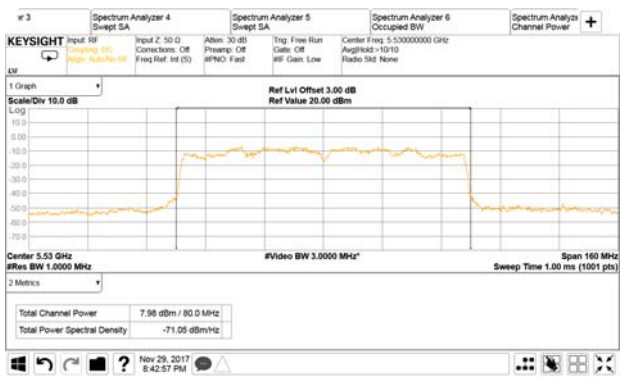
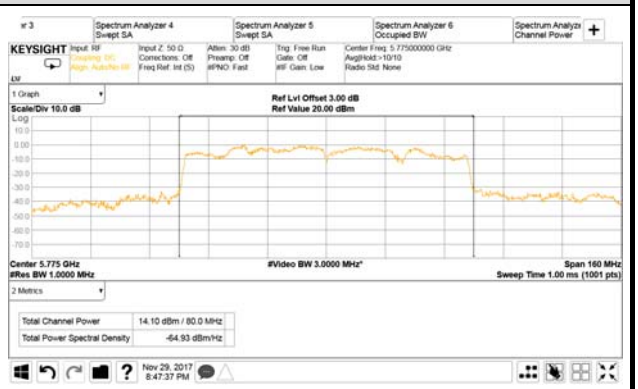
802.11ac-VHT80	
UNII Band II-2C	
Chain 0	Chain 1
	
UNII Band III	
	

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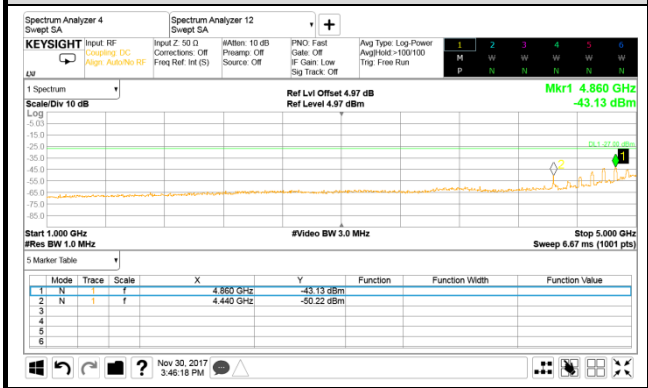
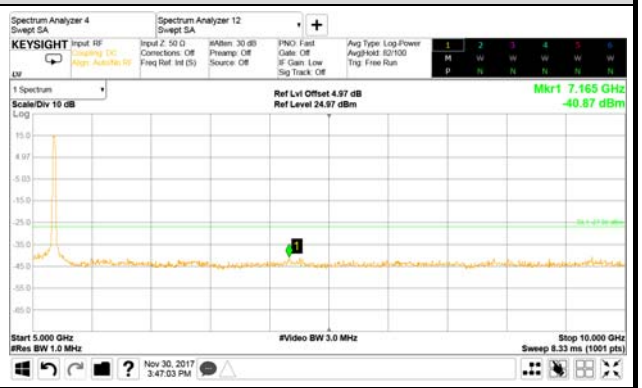
A.5 EMISSION LIMITATIONS MEASUREMENT

Test Date	2017/11/30	Temp./Hum.	25℃/55%
Mode	802.11a	UNII Band	I
		Frequency	TX 5180MHz
Cable Loss	3dB	Test Voltage	AC 120V, 60Hz (via AC Adapter)
Simultaneous Factor 10 log(n) (Note: “n” is antenna number)		0	

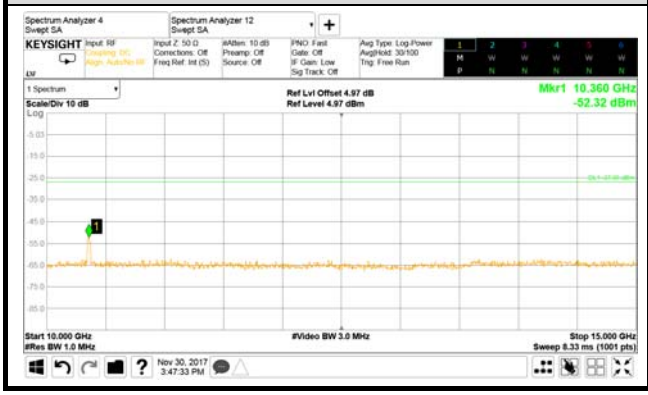
1GHz – 5GHz



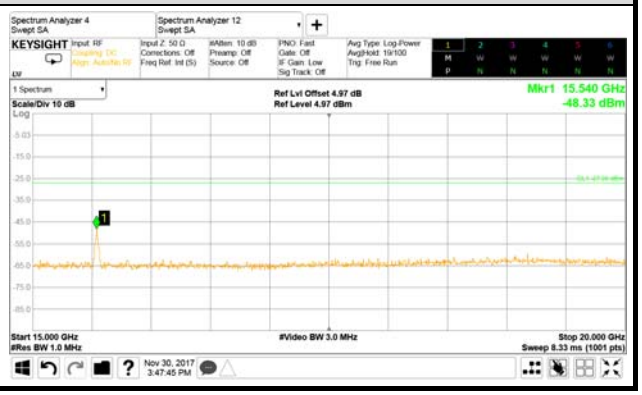
5GHz – 10GHz



10GHz – 15GHz



15GHz – 20GHz



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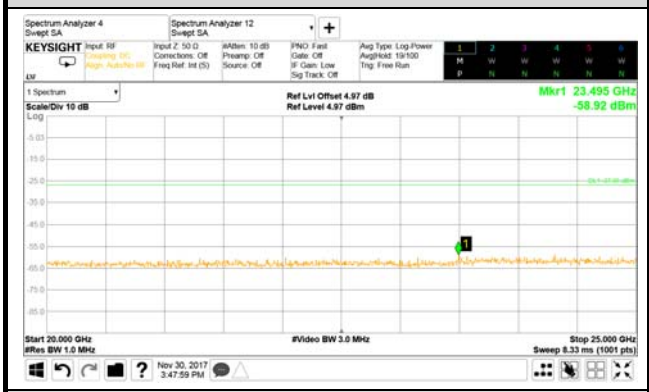
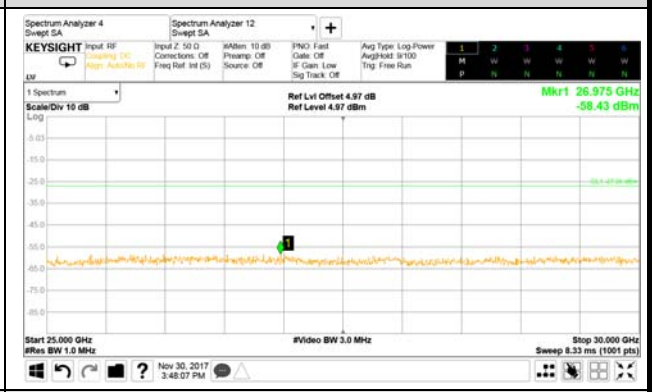
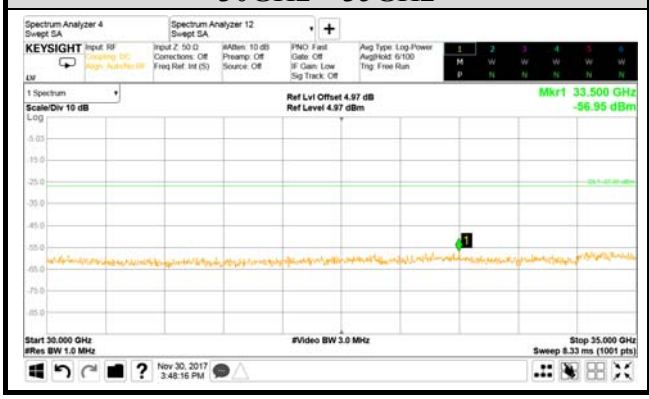
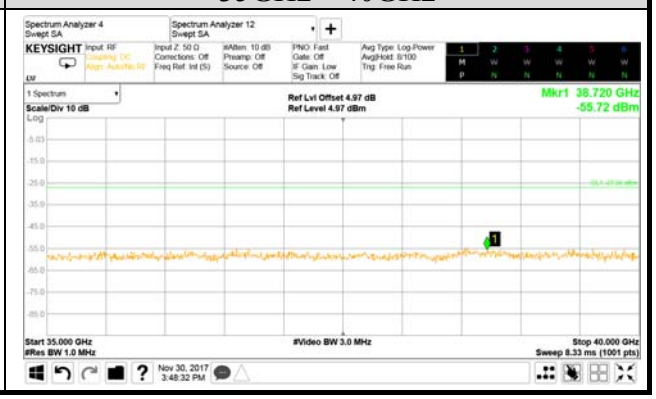
20GHz – 25GHz	25GHz – 30GHz
	
30GHz – 35GHz	**35GHz – 40GHz**
	

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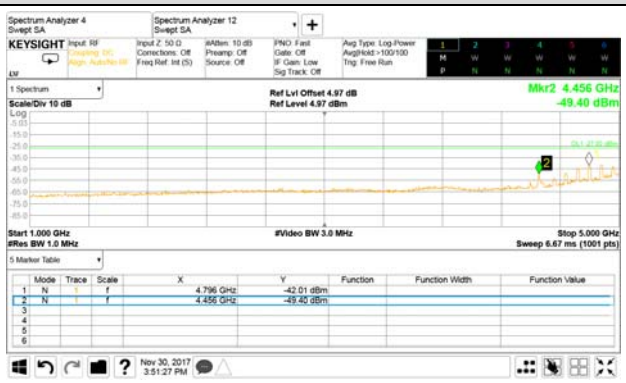
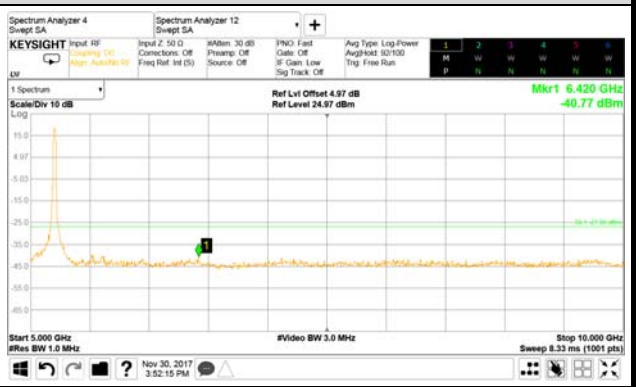
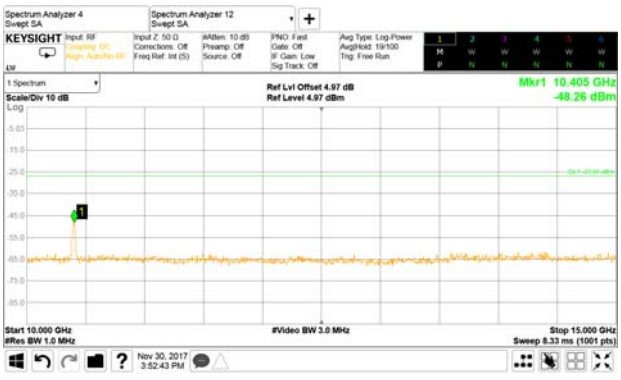
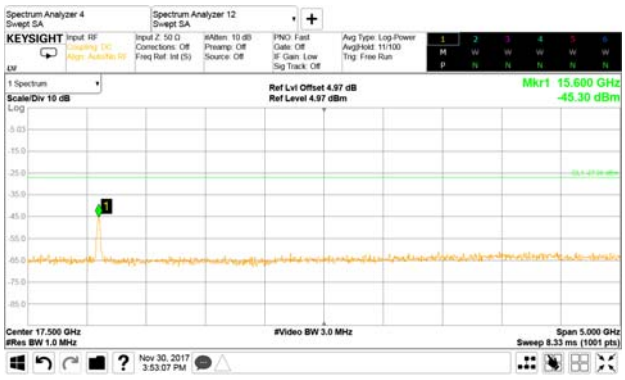
Test Date	2017/11/30	Temp./Hum.	25℃/55%
Mode	802.11a	UNII Band	I
		Frequency	TX 5200MHz
Cable Loss	3dB	Test Voltage	AC 120V/60HZ (via AC Adapter)
Simultaneous Factor 10 log(n) (Note: "n" is antenna number)		0	

1GHz – 5GHz	5GHz – 10GHz
	
10GHz – 15GHz	**15GHz – 20GHz**
	

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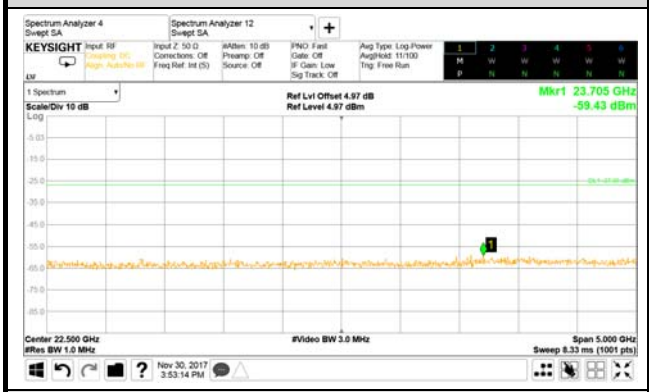
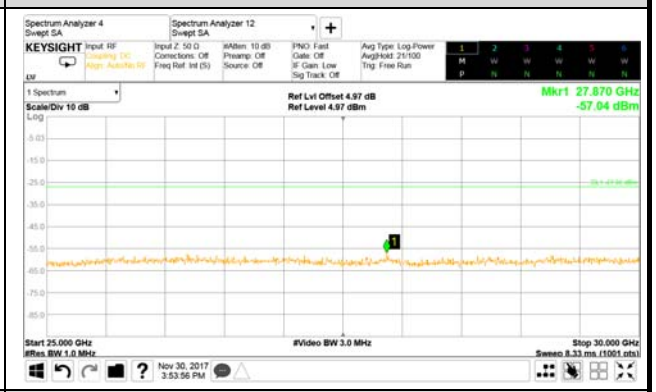
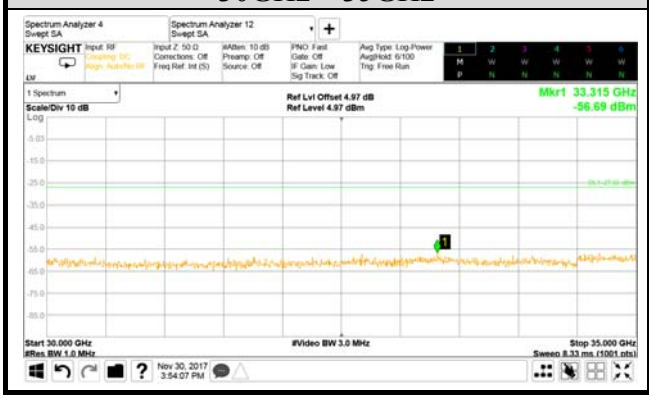
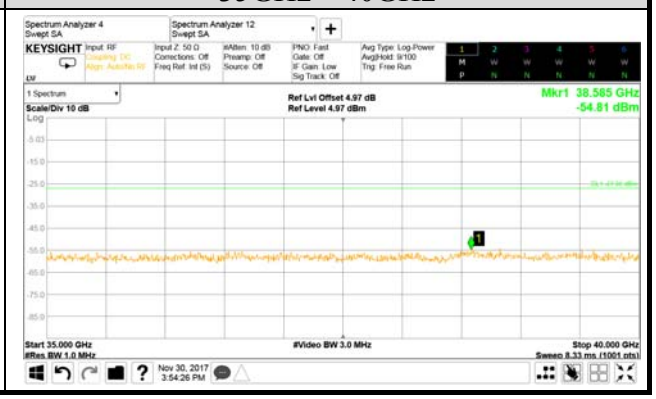
20GHz – 25GHz	25GHz – 30GHz
	
30GHz – 35GHz	**35GHz – 40GHz**
	

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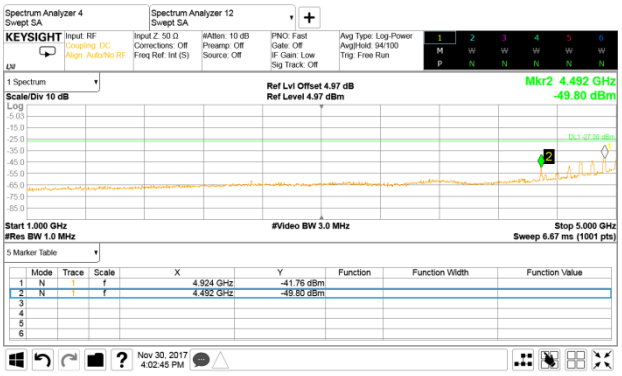
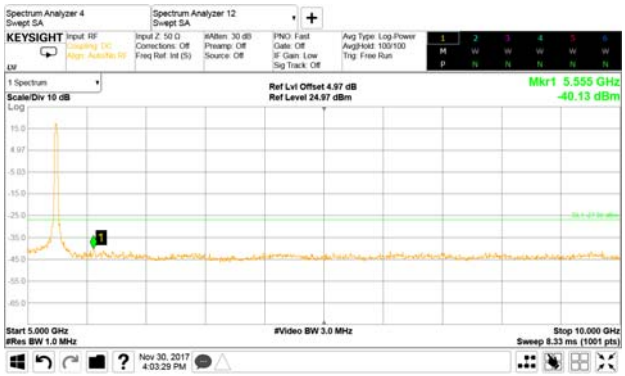
Test Date	2017/11/30	Temp./Hum.	25℃/55%
Mode	802.11a	UNII Band	I
		Frequency	TX 5240MHz
Cable Loss	3dB	Test Voltage	AC 120V/60HZ (via AC Adapter)
Simultaneous Factor 10 log(n) (Note: "n" is antenna number)		0	

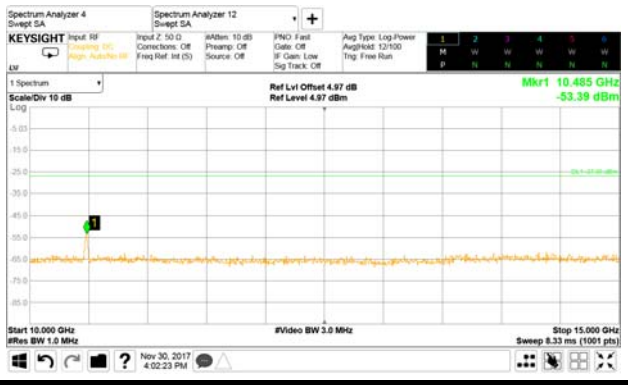
1GHz – 5GHz



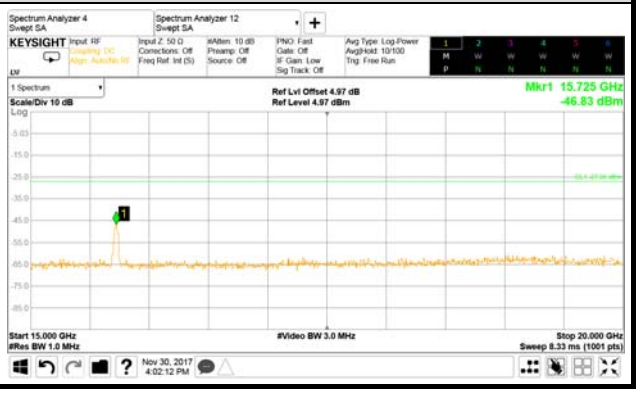
5GHz – 10GHz



10GHz – 15GHz



15GHz – 20GHz



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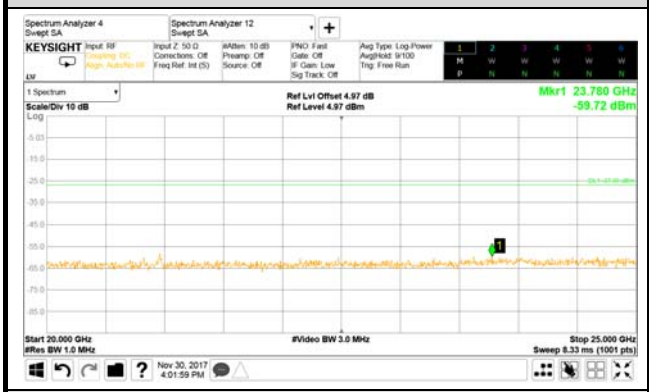
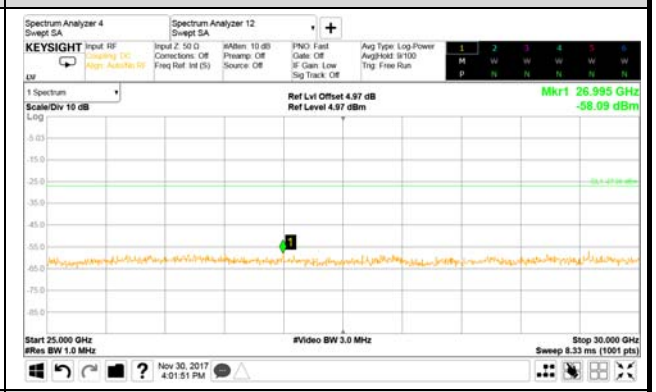
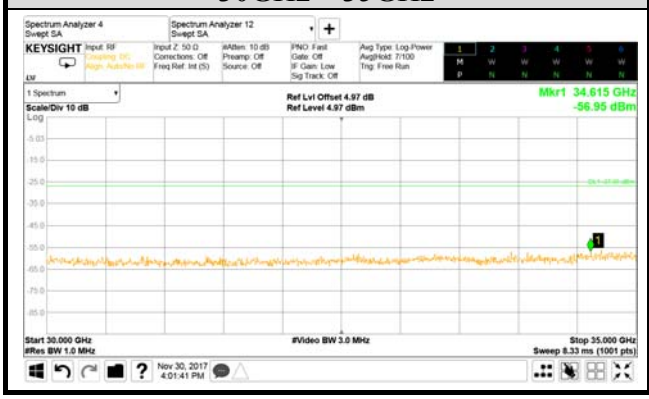
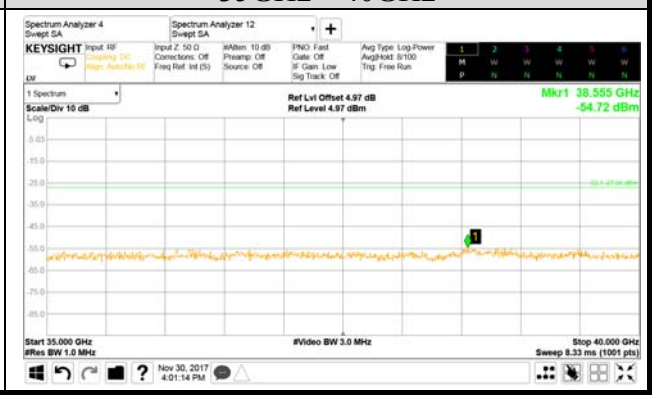
20GHz – 25GHz	25GHz – 30GHz
	
30GHz – 35GHz	**35GHz – 40GHz**
	

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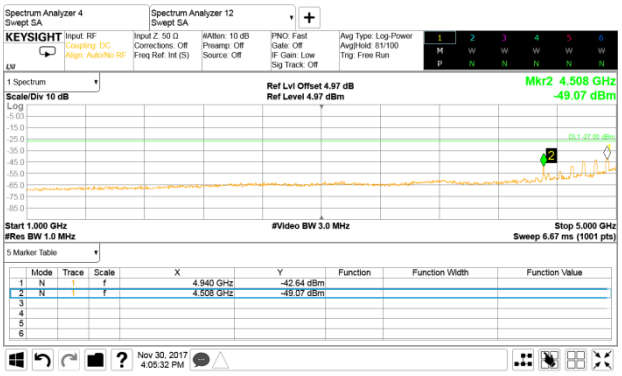
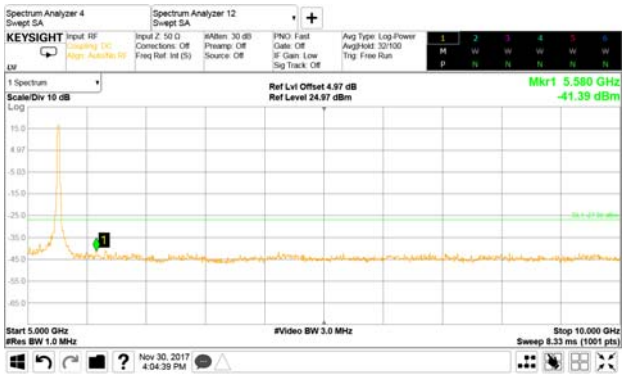
Test Date	2017/11/30	Temp./Hum.	25℃/55%
Mode	802.11a	UNII Band	II-2A
		Frequency	TX 5260MHz
Cable Loss	3dB	Test Voltage	AC 120V/60HZ (via AC Adapter)
Simultaneous Factor 10 log(n) (Note: "n" is antenna number)		0	

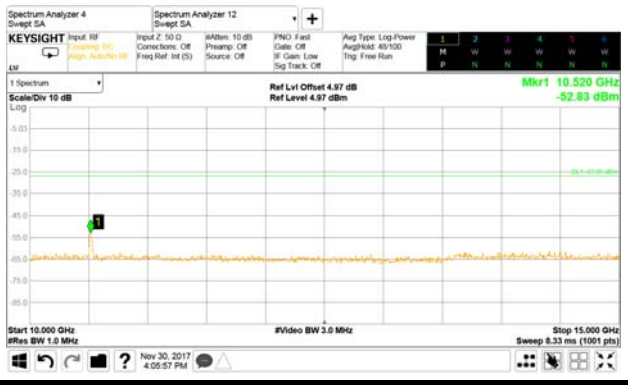
1GHz – 5GHz



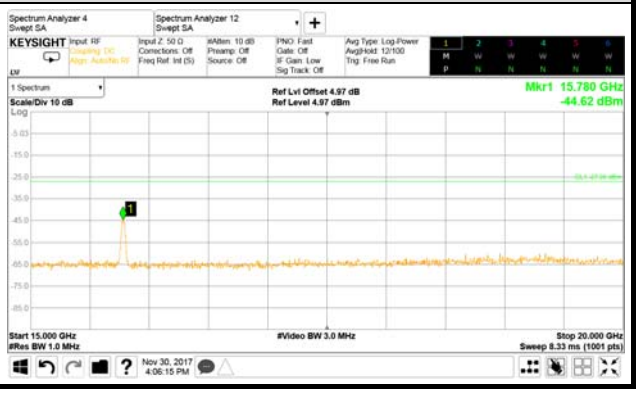
5GHz – 10GHz



10GHz – 15GHz



15GHz – 20GHz



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No. 53-11, Dingfu, Linkou, Dist.,
New Taipei City244, Taiwan

Tel: +886 2 26099301
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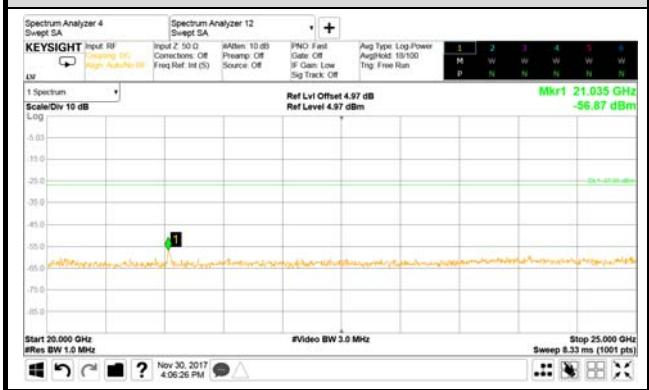
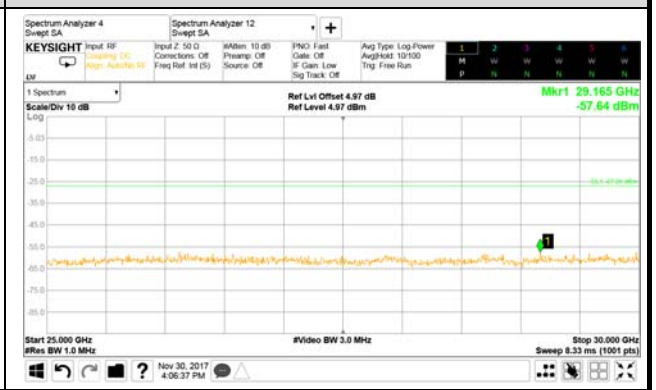
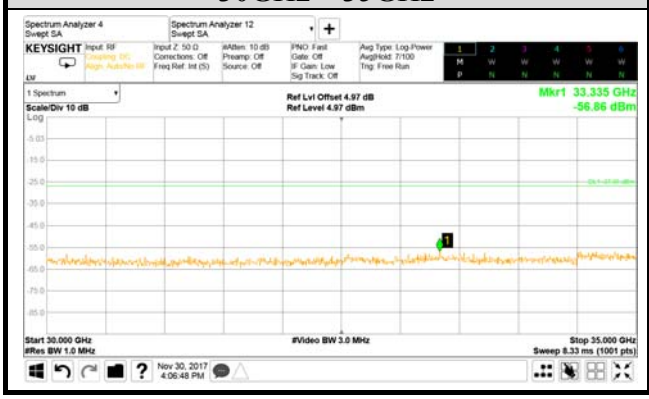
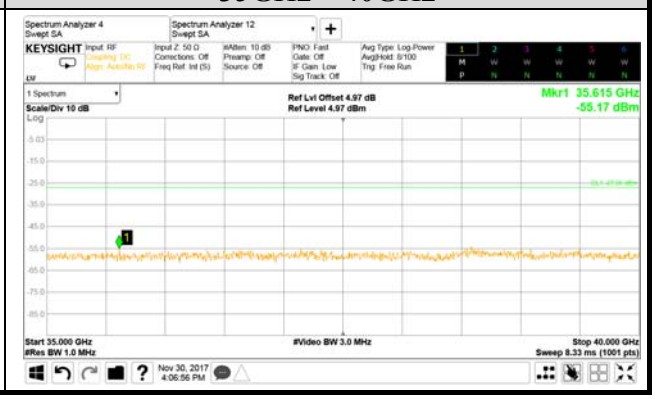
20GHz – 25GHz	25GHz – 30GHz
	
30GHz – 35GHz	**35GHz – 40GHz**
	

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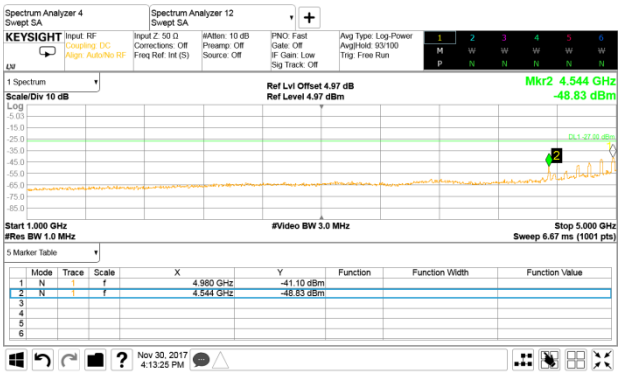
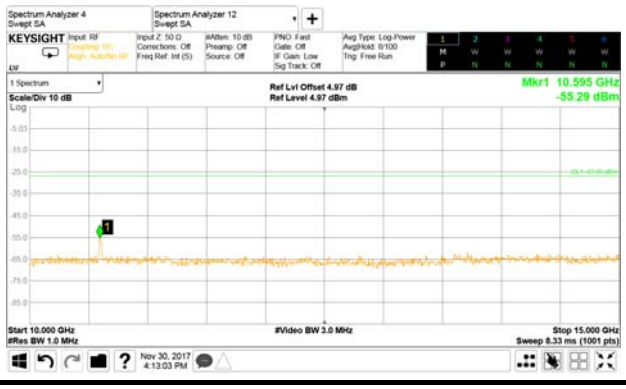
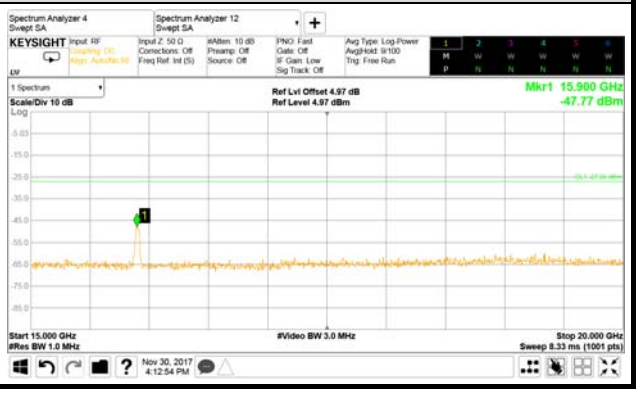
Test Date	2017/11/30	Temp./Hum.	25℃/55%
Mode	802.11a	UNII Band	II-2A
		Frequency	TX 5300MHz
Cable Loss	3dB	Test Voltage	AC 120V/60HZ (via AC Adapter)
Simultaneous Factor 10 log(n) (Note: "n" is antenna number)		0	

1GHz – 5GHz	5GHz – 10GHz
	
10GHz – 15GHz	**15GHz – 20GHz**
	

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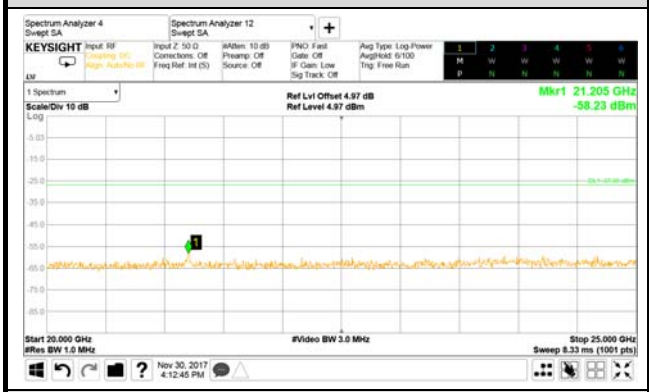
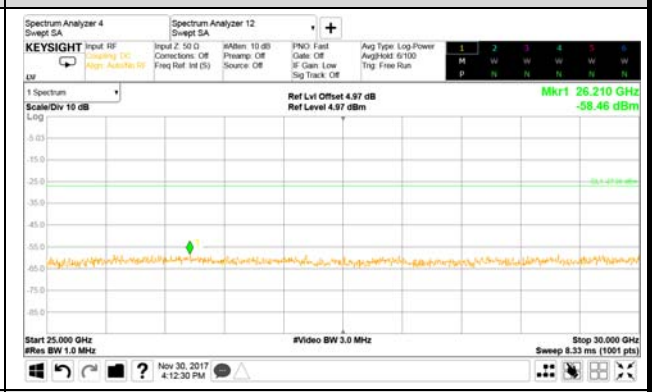
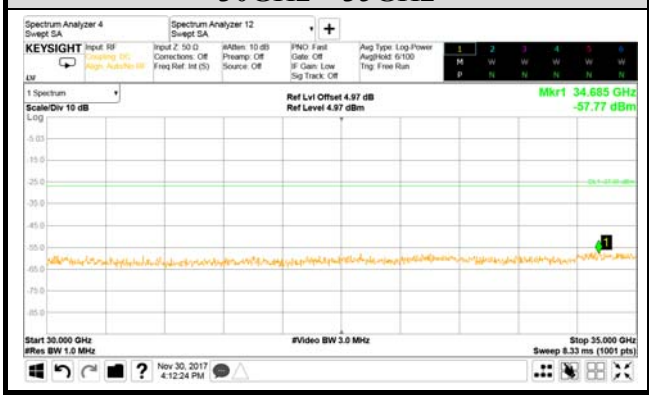
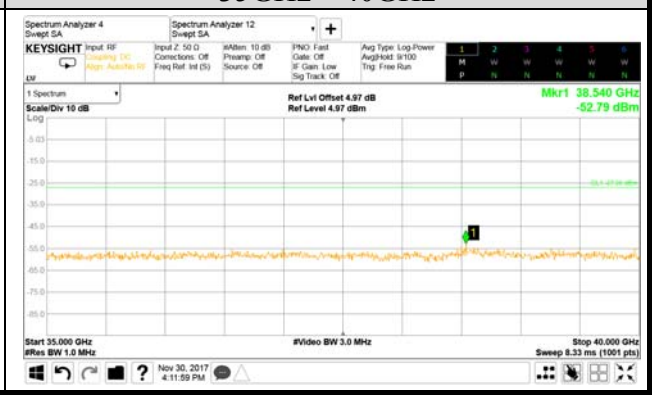
20GHz – 25GHz	25GHz – 30GHz
	
30GHz – 35GHz	**35GHz – 40GHz**
	

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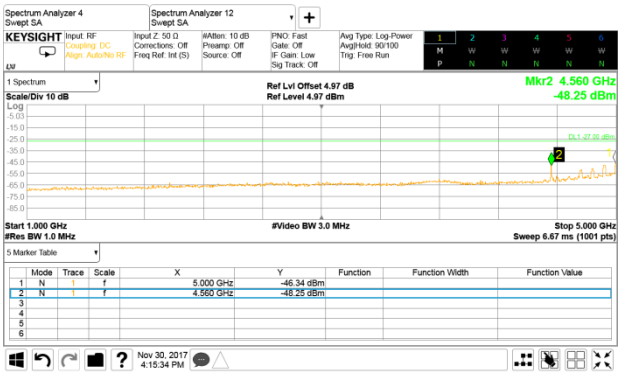
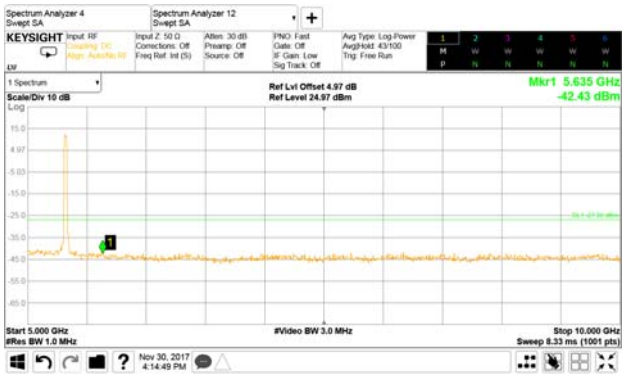
Test Date	2017/11/30	Temp./Hum.	25℃/55%
Mode	802.11a	UNII Band	II-2A
		Frequency	TX 5320MHz
Cable Loss	3dB	Test Voltage	AC 120V/60HZ (via AC Adapter)
Simultaneous Factor 10 log(n) (Note: "n" is antenna number)		0	

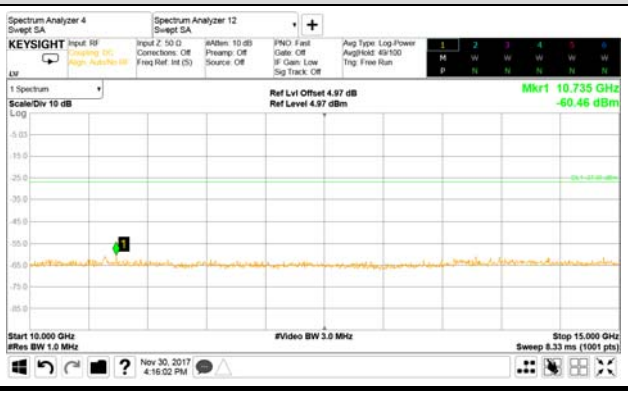
1GHz – 5GHz



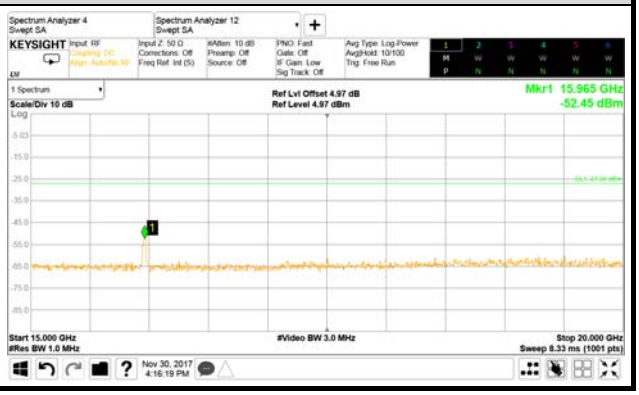
5GHz – 10GHz



10GHz – 15GHz



15GHz – 20GHz



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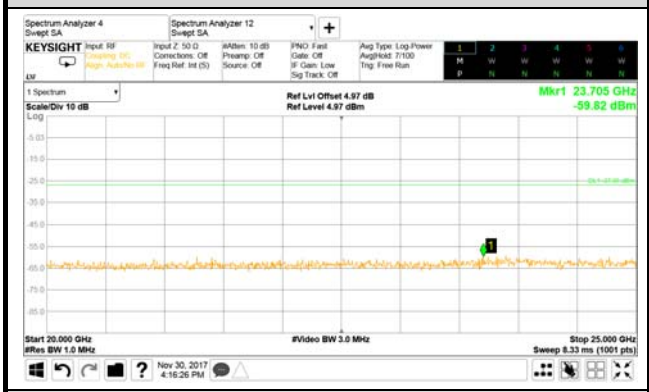
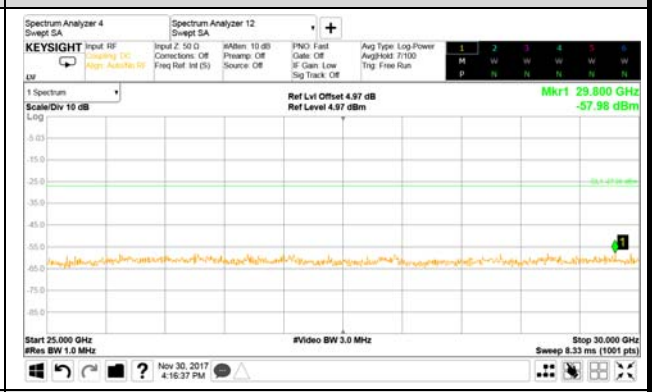
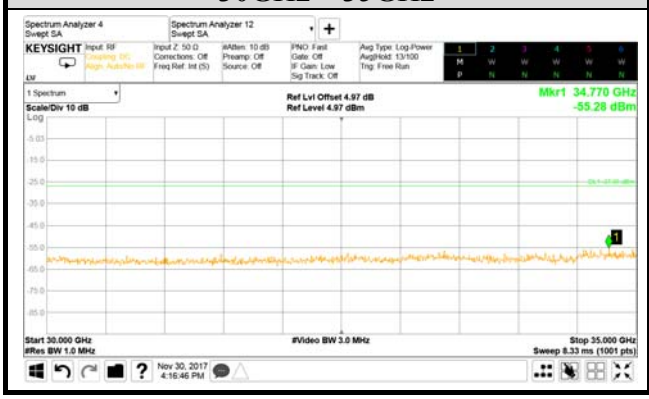
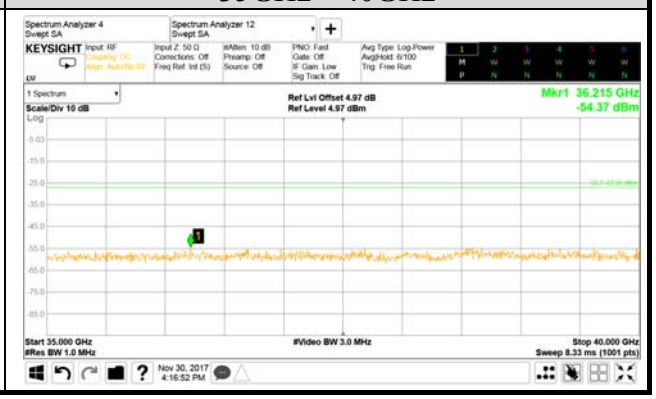
20GHz – 25GHz	25GHz – 30GHz
	
30GHz – 35GHz	**35GHz – 40GHz**
	

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