

# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

## INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART E AND INDUSTRY CANADA RSS 247 REQUIREMENT

	OF
Applicant:	Quanta Computer Inc.
	No. 188, Wenhua 2nd Road, Guishan District, Taoyuan City 33377,
	Taiwan
Product Name:	Clover Flex
Brand Name:	clover
Model No.:	C403
Model Difference:	N/A
FCC ID:	HFS-C403U
IC:	1787B-C403U
Report Number:	T190816W02-RP2
FCC Rule Part:	§15.407, Cat: NII
IC Rule:	RSS-247 issue 2 Feb. 2017
Issue Date:	Sep. 09, 2019
Date of Test:	Aug. 16, 2019 ~ Aug. 23, 2019
Date of EUT Received:	Aug. 16, 2019
Issued by	Compliance Certification Services Inc.Wugu Lab.
	No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan.
	(R.O.C.)
	service@ccsrf.com

The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.10: 2013 and compliance standards.

The test results of this report relate only to the tested sample (EUT) identified in this report. The test Report of full or partial shall not copy. Without written approval of Compliance Certification Services Inc. (Wugu Laboratory).

Tested By:

Hone Hsieh / Engineer

Approved By:

Kevin Tsai / Deputy Manager



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# **Revision History**

Report Number	Revision	Description	Effected Page	Issue Date	Revised By
T190816W02-RP2	Rev.00	Initial creation of document	All	Aug. 30, 2019	Elle Chang
T190816W02-RP2	Rev.01	Update the information	10	Sep. 09, 2019	Elle Chang

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## 1 GENERAL INFORMATION

## **1.1 Product Description**

#### General:

Product Name:	Clover Flex			
Brand Name:	clover	clover		
Model No.:	C403			
Model Difference:	N/A			
Product SW/HW version:	N/A / N/A			
Radio SW/HW version:	N/A / N/A			
Test SW Version:	N/A			
RF power setting in TEST SW:	N/A			
Micro Hub:	Model No.: H400, Supplier: clover			
Docking:	Model No.	: K400, Supplier: clover		
	7.6V from Li-ion Polymer rechargeable battery or 12V from Adapter			
Power Supply:	Battery:	Model No.: CA355772HV_POS5, Supplier: CosMX Battery Co., Ltd.		
	Adapter:	Model No.: FSP040-RHBN3, Supplier: FSP		

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#### FCC WLAN 5GHz:

Wi-Fi	Frequency Range	Channels	Avg. Power (dBm)	Modulation Technology
	5150~5250	4	12.76	
11- 20	5250~5350	4	16.34	OFDM
11a_20	5470~5725	12	16.48	OFDM
	5725~5850	5	16.39	
	5150~5250	4	HT: 13.59	
11n_HT /	5250~5350	4	HT: 17.50	
ac_VHT 20M	5470~5725	12	HT: 17.45	OFDM
20101	5725~5850	5	HT: 17.46	
	5150~5250	2	HT: 16.46	
11n_HT /	5250~5350	2	HT: 16.47	OFDM
ac_VHT 40M	5470~5725	6	HT: 16.49	
	5725~5850	2	HT: 16.44	
	5150~5250	1	15.48	
11ac	5250~5350	1	15.33	
VHT80M	5470~5725	3	15.49	OFDM
	5725~5850	1	15.29	
Anteni	Antenna Designation:		a, /F0002, Supplier: SAA IHz Peak Gain: 2.24dB IHz Peak Gain: 2.3dBi IHz Peak Gain: 3.97dB IHz Peak Gain: 3.97dB	i

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#### **IC WLAN 5GHz:**

Wi-Fi	Frequency Range	Channels	Avg. or EIRP	Rated Power(dBm) (Worst Case)	Modulation Technology	
	5150~5250	4	EIRP	15.00		
11 -	5250~5350	4	Avg.	16.34		
11a	5470~5725	9	Avg.	16.48	OFDM	
	5725-5850	5	Avg.	16.39		
	5150~5250	4	EIRP	HT: 15.83		
11n_HT /	5250~5350	4	Avg.	HT: 17.50		
ac_VHT 20M	5470~5725	9	Avg.	HT: 17.45	OFDM	
2011	5725-5850	5	Avg.	HT: 17.46		
	5150~5250	2	EIRP	HT: 18.70		
11n_HT /	5250~5350	2	Avg.	HT: 16.47	OFDM	
40M	ac_VHT 5470~5725		Avg.	HT: 16.49	OFDIM	
	5725-5850	2	Avg.	HT: 16.44		
	5150~5250	1	EIRP	17.72		
11ac	5250~5350	1	Avg.	15.33	OFDM	
VHT80M	5470~5725	2	Avg.	15.49	OFDIM	
	5725-5850	1	Avg.	15.29		
Modula	Modulation type			PSK, BPSK for OFI in 802.11ac only	DM	
Transition Rate:		802.11 a: 802.11 n_ 802.11 n_ 802.11 ac 802.11 ac	6/9/12/18/ 20MHz: 6. 40MHz: 13 20MHz: 6 40MHz: 6 40MHz: 6	24/36/48/54 Mbps 5 – 72.2Mbps 3.5 - 150.0Mbps 5.5 –86.7Mbps 13.5 -200.0Mbps 29.3 – 433.3Mbps		

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#### 1.2 Test Methodology of Applied Standards

FCC Part 15, Subpart E §15.407

FCC KDB 789033 D02 General UNII Test Procedures New Rules

KDB 789033 D02 v01r04 General UNII Test Procedures New Rules

KDB 644545 D03 v01 Guidance for IEEE 802.11ac

RSS-247 issue 2 Feb. 2017

RSS-Gen. issue 5 Apr. 2018

ANSI C63.10:2013

Note: All test items have been performed and record as per the above standards.

#### 1.3 Test Facility

Compliance Certification Services Inc. Wugu Lab. No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.) (TAF code 1309)

FCC Designation number: TW1309

Canada Registration Number: 2324G

#### **1.4 Special Accessories**

There are no special accessories used while test was conducted.

#### **1.5 Equipment Modifications**

There was no modification incorporated into the EUT.

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## 2 SYSTEM TEST CONFIGURATION

#### 2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

#### 2.2 EUT Exercise

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

#### 2.3 Test Procedure

#### 2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz,. The CISPR Quasi-Peak and Average detector mode is employed according to §15.207. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

#### 2.3.2 Radiated Emissions

The EUT is a placed on as turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plan. For emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

#### 2.4 Measurement Results Explanation

#### For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

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## 2.5 Configuration of Tested System

## Fig. 2-1 Radiated Emission Configuration



Fig. 2-2 Conducted Emission Configuration

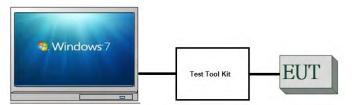
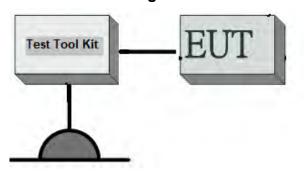


Fig 2-3 Conduction (AC Power Line) Configuration



#### Table 2-1 Equipment Used in Tested System

ltem	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1	WLAN Test Software	N/A	N/A	N/A	N/A	N/A
2	Notebook	Lenovo	T420	S0012483	Shielded	Unshielded
3	Test Tool Kit	N/A	N/A	N/A	N/A	N/A

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#### SUMMARY OF TEST RESULT 3

FCC Rules	IC Rules	Description Of Test	Result
§15.207	RSS-Gen §8.8	AC Power Line Conducted Emission	Compliant
§15.403(i) §15.407(e)	RSS-247 §6.2.1~ 4 (1) RSS-Gen §6.7	26 dB & 6dB & 99% Emission Bandwidth	Compliant
§15.407(a)	RSS-247 §6.2.1~ 4 (1)	Maximum Conducted Output Power	Compliant
§15.407(a)	RSS-247 §6.2.1~ 4 (1)	Power Spectral Density	Compliant
§15.407(b)	RSS-247 §6.2.1~ 4 (2)	Undesirable Radiated Emissions	Compliant
§15.407(c)	RSS-247 §6.4	Transmission in case of Absence of Information	Compliant
§15.407(g)	RSS-Gen §6.11	Frequency Stability	Compliant
§15.203 §15.407(a)	RSS- Gen §6.8	Antenna Requirement	Compliant

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#### **DESCRIPTION OF TEST MODES** 4

#### 4.1 Operated in U-NII Bands

#### Operated band in 5150 MHz ~5250 MHz:

802.11a / n HT20 Mode, 802.11ac VHT20 Mode		
Channel	Frequency	
36	5180	
40	5200	
44	5220	
48	5240	

802.11 n HT40 Mode, 802.11ac VHT40 Mode		
channel	Frequency	
38	5190	
46	5230	

802.11ac VHT80 Mode		
channel	Frequency	
42	5210	

#### Operated band in 5250 MHz ~5350 MHz:

802.11a / n HT20 Mode, 802.11ac VHT20 Mode		
channel	Frequency	
52	5260	
56	5280	
60	5300	
64	5320	

802.11 n HT40 Mode, 802.11ac VHT40 Mode					
channel Frequency					
54	5270				
62 5310					

802.11ac V	HT80 Mode
Channel	Frequency
58	5290

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#### Operated band in 5470 MHz ~5725 MHz:

802.11a / n HT20 Mode,					
802.11ac VHT20 Mode					
Channel	Freq (MHz)				
100	5500				
104	5520				
108	5540				
112	5560				
116	5580				
120	5600				
124	5620				
128	5640				
132	5660				
136	5680				
140	5700				
144	5720				

802.11 n HT40 Mode,						
802.11ac V	802.11ac VHT40 Mode					
Channel	Freq (MHz)					
102	5510					
110	5550					
118	5590					
126	5630					
134	5670					
142	5710					

802.11ac VHT80 Mode					
Channel	Freq (MHz)				
106	5530				
122	5610				
138	5690				

#### Operated band in 5745 MHz ~5850 MHz:

802.11a / n HT20 Mode, 802.11ac VHT20 Mode				
Channel Freq (MHz)				
149	5745			
153	5765			
157	5785			
161	5805			

802.11 n HT40 Mode, 802.11ac VHT40 Mode					
channel	Freq (MHz)				
151	5755				
159	5795				

802.11ac VHT80 Mode					
channel	Freq (MHz)				
155 5775					

Note: Operating at 5600~5650MHz is prohibited in Canada.

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## 4.2 The Worst Test Modes and Channel Details

- 1. The EUT has been tested under operating condition.
- Test program used to control the EUT for staying in continuous transmitting mode is programmed.
- 3. Investigation has been done on all the possible configurations for searching the worst case. The gevin UE is pre-scanned among below modes.

Modulation	Tr	ansmiss	ion Chai	Multiple Transmission Spatial	
⊠ 802.11 a	☑ Ch0	$\Box$ Ch1	□ Ch2	□ Ch3	□ 2TX
⊠ 802.11 n	☑ Ch0	$\Box$ Ch1	□ Ch2	□ Ch3	
☑ 802.11 ac	☑ Ch0	$\Box$ Ch1	□ Ch2	□ Ch3	

Therefore, below summary is the modes of test configuration that yield the highest reading and generate the highest emission chosen to carry out the relevantly mandatory test items.

#### AC POWER LINE CONDUCTED EMISSION TEST:

Test Condition	AC Power line conducted emission for line and neutral
Worst Case	Operation in normal mode

#### **RADIATED EMISSION TEST:**

RADIATED EMISSION TEST (BELOW 1 GHz)							
MODE	FREQUENCY			MODULATION	DATA RATE		
	BAND (MHz)	(MHz) CHANNEL CHANNEL			(Mbps)	PORT	
802.11a	5180~5240	36 to 48	44	OFDM	6	MAIN	
802.11a	5260~5320	52 to 64	60	OFDM	6	MAIN	
802.11a	5500~5720	100 to 144	116	OFDM	6	MAIN	
802.11a	5745~5825	149 to 165	157	OFDM	6	MAIN	

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RADIATED EMISSION TEST (ABOVE 1 GHz)							
MODE	FREQUENCY	AVAILABLE	TESTED	MODULATION	DATA RATE	ANTENNA	
NODE	BAND (MHz)	CHANNEL	CHANNEL		(Mbps)	PORT	
802.11a	5180~5240	36 to 48		OFDM	6	MAIN	
802.11n_HT20	5160~5240	30 10 40	36,44,48	OFDM	MCS0	MAIN	
802.11n_HT40	5190~5230	38 to 46	38,46	OFDM	MCS0	MAIN	
802.11ac_VHT80	5210	42	42	OFDM	MCS0	MAIN	
802.11a	5260~5320	52 to 64	52 60 64	OFDM	6	MAIN	
802.11n_HT20	5200~5520	52 10 04	52,60,64	OFDM	MCS0	MAIN	
802.11n_HT40	5270~5310	54 to 62	54,62	OFDM	MCS0	MAIN	
802.11ac_VHT80	5290	58	58	OFDM	MCS0	MAIN	
802.11a	5500~5720	100 to 144	00 to 144 100,116,140,144	OFDM	6	MAIN	
802.11n_HT20	5500~5720	100 10 144	100,110,140,144	OFDM	MCS0	MAIN	
802.11n_HT40	5510~5710	102 to 142	102,110,134,142	OFDM	MCS0	MAIN	
802.11ac_VHT80	5530~5690	106 to 138	106,122,138	OFDM	MCS0	MAIN	
802.11a	5745~5825	149 to 165	149,157,165	OFDM	6	MAIN	
802.11n_HT20	5745~5625	149 10 105	149,157,105	OFDM	MCS0	MAIN	
802.11n_HT40	5755~5795	151 to 159	151,159	OFDM	MCS0	MAIN	
802.11ac_VHT80	5775	155	155	OFDM	MCS0	MAIN	

#### Note:

The field strength of radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for 802.11a/n/ac WLAN Transmitter for channel Low, Mid and High, the worst case H position was reported.

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#### ANTENNA PORT CONDUCTED MEASUREMENT:

		CON	IDUCTED TEST			
MODE	FREQUENCY	AVAILABLE	TESTED	MODULATION	DATA RATE	ANTENNA
INIODE	BAND (MHz)	CHANNEL	CHANNEL	MODULATION	(Mbps)	PORT
802.11a	5180~5240	36 to 48	36,44,48	OFDM	6	MAIN
802.11n_HT20	5160~5240	50 10 40	30,44,40	OFDM	MCS0	MAIN
802.11n_HT40	5190~5230	38 to 46	38,46	OFDM	MCS0	MAIN
802.11ac_VHT80	5210	42	42	OFDM	MCS0	MAIN
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	MAIN
802.11n_HT20	5200~5520	52 10 04	52,00,04	OFDM	MCS0	MAIN
802.11n_HT40	5270~5310	54 to 62	54,62	OFDM	MCS0	MAIN
802.11ac_VHT80	5290	58	58	OFDM	MCS0	MAIN
802.11a	5500~5720	100 to 144	100,116,140,144	OFDM	6	MAIN
802.11n_HT20	5500~5720	100 10 144	100,110,140,144	OFDM	MCS0	MAIN
802.11n_HT40	5510~5710	102 to 142	102,110,134,142	OFDM	MCS0	MAIN
802.11ac_VHT80	5530~5690	106 to 138	106,122,138	OFDM	MCS0	MAIN
802.11a	5745~5825	149 to 165	149,157,165	OFDM	6	MAIN
802.11n_HT20	5745~5625	149 10 105	149,157,105	OFDM	MCS0	MAIN
802.11n_HT40	5755~5795	151 to 159	151,159	OFDM	MCS0	MAIN
802.11ac_VHT80	5775	155	155	OFDM	MCS0	MAIN

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#### MEASUREMENT UNCERTAINTY 5

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	+/- 1.2575 dB
26dB & 6dB Emission Bandwidth	+/- 147.256 Hz
The Maximum Output Power	+/- 1.924 dB
Peak Power Spectral Density	+/- 2.038 dB
Frequency Stability	+/- 147.256 Hz
3M Semi Anechoic Chamber / 30M~200M	+/- 4.12 dB
3M Semi Anechoic Chamber / 200M~1000M	+/- 4.68 dB
3M Semi Anechoic Chamber / 1G~8G	+/- 5.18 dB
3M Semi Anechoic Chamber / 8G~18G	+/- 5.47 dB
3M Semi Anechoic Chamber / 18G~26G	+/- 3.81 dB
3M Semi Anechoic Chamber / 26G~40G	+/- 3.87 dB

#### Note:

- 1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
- 2. The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

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#### CONDUCTED EMISSION TEST 6

#### 6.1 Standard Applicable

Frequency range within 150 kHz to 30 MHz shall not exceed the Limit table as below.

Frequency range	Lin dB(	nits uV)
MHz	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Nata		

Note

1. The lower limit shall apply at the transition frequencies

2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

#### 6.2 Measurement Equipment Used

	Conduc	ted Emission <sup>·</sup>	Test Site		
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
CABLE	EMCI	CFD300-NL	CERF	06/27/2019	06/26/2020
EMI Test Receiver	R&S	ESCI	101203	10/29/2018	10/28/2019
LISN	SCHWARZBECK	NSLK 8127	8127-541	01/31/2019	01/30/2020
LISN	SCHAFFNER	NNB 41	03/10013	02/13/2019	02/12/2020
Software		EZ-EMC	(CCS-3A1-CE)		

#### 6.3 EUT Setup

- 1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10:2013.
- 2. The AC/DC Power adaptor of EUT was plug-in LISN. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
- 3. The LISN was connected with 120Vac/60Hz power source.

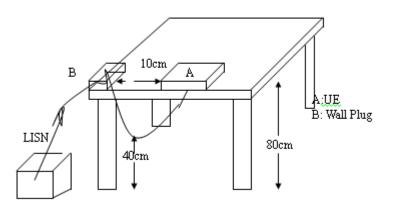
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#### 6.4 Test SET-UP



#### 6.5 Measurement Procedure

- 1. The EUT was placed on a table which is 0.8m above ground plane.
- 2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 3. Repeat above procedures until all phases of power being supplied by given UE are completed.

#### 6.6 Measurement Result

Note: Refer to next page for measurement data and plots. Note2: The \* reveals the worst-case results that closet to the limit

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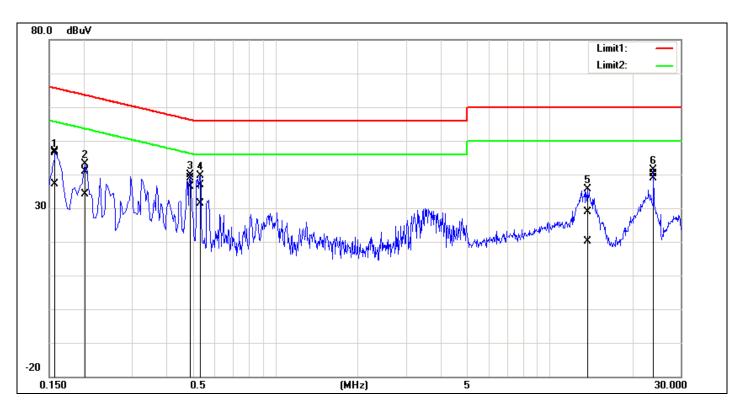
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## AC POWER LINE CONDUCTED EMISSION TEST DATA

Description:	Operation	Date:	2019/8/23
Line:	L1	Temp.(℃)/Hum.(%):	25.3(℃)/65%
Test Voltage: Job No.:	AC 120V/60Hz T190816W02	Test By:	Henry



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.1580	36.66	26.98	10.14	46.80	37.12	65.56	55.57	-18.76	-18.45	Pass
2	0.2020	30.87	24.06	10.13	41.00	34.19	63.52	53.53	-22.52	-19.34	Pass
3*	0.4900	28.72	26.23	10.14	38.86	36.37	56.17	46.17	-17.31	-9.80	Pass
4	0.5340	26.84	21.35	10.14	36.98	31.49	56.00	46.00	-19.02	-14.51	Pass
5	13.7220	18.52	9.83	10.36	28.88	20.19	60.00	50.00	-31.12	-29.81	Pass
6	23.9260	29.76	28.49	10.28	40.04	38.77	60.00	50.00	-19.96	-11.23	Pass

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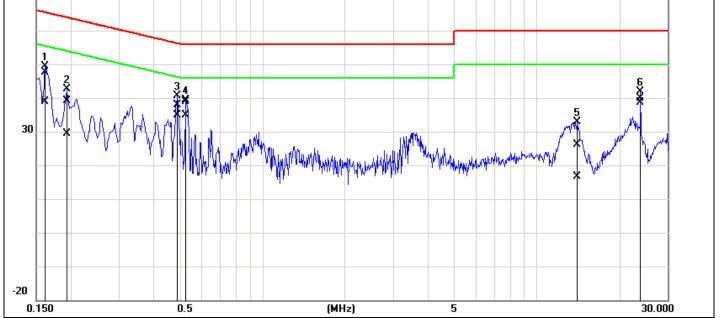
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Description: Line: Test Voltage:	Operation N AC 120V/60Hz		Date: Temp.(℃)/Hum.(%): Test By:	2019/8/23 25.3(℃)/65% Henry
BO.0 dBuV	T190816W02			
				nit1: — nit2: —



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
-	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.1620	37.63	28.97	10.02	47.65	38.99	65.36	55.36	-17.71	-16.37	Pass
2	0.1940	29.16	19.40	10.02	39.18	29.42	63.86	53.86	-24.68	-24.44	Pass
3	0.4900	27.79	24.84	10.03	37.82	34.87	56.17	46.17	-18.35	-11.30	Pass
4*	0.5265	28.73	24.78	10.03	38.76	34.81	56.00	46.00	-17.24	-11.19	Pass
5	14.0900	15.91	6.33	10.25	26.16	16.58	60.00	50.00	-33.84	-33.42	Pass
6	23.9260	29.51	28.36	10.36	39.87	38.72	60.00	50.00	-20.13	-11.28	Pass

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#### DUTY CYCLE TEST SIGNAL 7

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle.

All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

#### Formula:

Duty Cycle = Ton / (Ton+Toff)

#### Measurement Procedure:

- 1. Set span = Zero
- 2. RBW = 8MHz
- 3. VBW = 8MHz,
- 4. Detector = Peak

#### Duty Cycle:

Mode	Duty Cycle (%)	Duty Factor (dB) =10*log ( 1/Duty Cycle )	1/T (kHz)	VBW setting (kHz)
802.11a	95.47	0.20	0.48	1.00
802.11n_20	94.82	0.23	0.52	1.00
802.11ac_20	95.31	0.21	0.52	1.00
802.11n_40	90.91	0.41	1.05	2.00
802.11ac_40	90.91	0.41	1.05	2.00
802.11ac_80	83.45	0.79	2.16	3.00

Duty Cycle Factor:  $10 * \log(1/0.9547) = 0.2$ Duty Cycle Factor:  $10 * \log(1/0.9482) = 0.23$ Duty Cycle Factor:  $10 * \log(1/0.9531) = 0.21$ Duty Cycle Factor:  $10 * \log(1/0.9091) = 0.41$ Duty Cycle Factor:  $10 * \log(1/0.9091) = 0.41$ Duty Cycle Factor:  $10 * \log(1/0.8345) = 0.79$ 

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# DUTY CYCLE TEST SIGNAL Measurement Result 802.11a

🔤 Ke	ysight S	Spectr	um Ai	nalyzer	- Swe	pt SA																				×
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-40.0 -50.0 -60.0																								5.1	<b>Stop F</b> 80000000	
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I €		- 1	-						_			III				+		STA	TUS							

# 802.11n HT20

🔤 Keys	ight Spectrum	Analyzer - Swep	pt SA								
<mark>⊮</mark> ℝ Cent	er Freq	50 Ω 5.18000	DC 0000 G			SE:INT	Avg Typ	e: Voltage	TRA	MAug 19, 2019 CE 1 2 3 4 5 6 PE WWWWW	Frequency
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0.00 - -10.0 - -20.0 - -30.0 -											<b>Start Freq</b> 5.180000000 GHz
-30.0 - -40.0 - -50.0 -						•		•			<b>Stop Freq</b> 5.180000000 GHz
Res I	er 5.1800 BW 8 MH		Hz	VBW	8.0 MHz	FUNC		Sweep	7.533 ms (	Span 0 Hz (1001 pts) ONVALUE	CF Step 8.000000 MHz <u>Auto</u> Man
1 <u>/</u> 2 <u>3</u> <u>/</u>		(Δ) (Δ)	1	.921 ms (Δ .883 ms .026 ms (Δ .883 ms	15.83 dE	3m dB				=	Freq Offset 0 Hz
7 8 9 10											Scale Type
11 <					III			STATU	a	*	

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明.此報告結果僅對測試之樣品負責.同時此樣品僅保留90天。本報告未經本公司書面許可.不可部份複製。

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#### 802.11ac VHT 20

X/R	RF	50 Ω	DC				SE	NSE:IN	Т		<b>T</b>		03:	32:39 PM	4 Aug 1	9,2019	_	requency
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Keysight Spont           R         Center F           Conter F         Conter F           MKR Model Iff         Conter F	Ref Off Ref 3 reg 5.1	50 Ω 9000 5set 12 0.00 c	dB IBm	PNO IFGai	VB	AV 8.0	rig: Fre- Atten: 30 مرابع مرابع MHz 2,62	e Run 0 dB	11. 14			Voltage	033	raac De r3 1.	pan1	3 4 5 6 N N N N S MS S dB U U U U U U U U U U U U U	5.19	Auto <sup>-</sup> Center 00000000 Start 00000000 Stop 00000000
Keysight Spont           R         Center F           Center F         Center F           20.0	Ref Offine Ref 3	50 Ω 90000 <sup></sup>	dB IBm	PNQ IFGai 	VB1 0 us (1 0 ms	AV 8.0	MHz 2 2 2 2 2 2 2 2 2 2 2 2 2	e Run 0 dB	11. 14			Voltage	033	TRAC TYP De r3 1. -' 	pan1	3 4 5 6 N N N N S MS S dB U U U U U U U U U U U U U	5.19 5.19 5.19 <u>5.19</u>	Start           Stop           Stop           Stop           Stop           Stop           Stop           Stop           Stop
Keysight Spont           R         Center F           Center F         Center F           20.0         Center S           30.0         Center S           40.0         Center S           40.0         Center S	Ref Off Ref 3: 4************************************	50 Ω 90000 <sup></sup>	dB IBm	950. 1.045	VB3 0 us ( 0 ms ( 0 ms (	γγγι-ι- 	MHz 2.62 10.11 di -1.83	e Run 0 dB	11. 14			Voltage	033	TRAC TYP De r3 1. -' 	pan1	3 4 5 6 N N N N S MS S dB U U U U U U U U U U U U U	5.19 5.19 5.19 <u>5.19</u>	Start           Stop           Stop           Stop           Stop           Stop           Stop           Stop           Stop
Keysight Spont           R         Center F           Center F         Center F           20.0         Center F           20.0         Center F           20.0         Center F           20.0         Center F           30.0         Center S           Center S         Center S           Center S         Center S           Center S         Center S           Center S         Center S           S         A           4         F           5         S	Ref Offine Analysis of the second sec	50 Ω 90000 <sup></sup>	dB IBm	PNQ IFGai 	VB3 0 us ( 0 ms ( 0 ms (	γγγι-ι- 	MHz 2 2 2 2 2 2 2 2 2 2 2 2 2	e Run 0 dB	11. 14			Voltage	033	TRAC TYP De r3 1. -' 	pan1	3 4 5 6 N N N N S MS S dB U U U U U U U U U U U U U	5.19 5.19 5.19 <u>5.19</u>	Start           Start           00000000           Start           00000000           Stop           00000000           Stop           00000000           Stop           00000000
Keysight Spont           R         Center F           Center F         Center F           20.0         Center F           20.0         Center F           20.0         Center F           20.0         Center F           30.0         Center S           Center S         Center S           Center S         Center S           Center S         Center S           Center S         Center S           S         A           4         F           5         S	Ref Off Ref 3: 4************************************	50 Ω 90000 <sup></sup>	dB IBm	950. 1.045	VB3 0 us ( 0 ms ( 0 ms (	γγγι-ι- 	MHz 2.62 10.11 di -1.83	e Run 0 dB	11. 14			Voltage	033	TRAC TYP De r3 1. -' 	pan1	3 4 5 6 N N N N S MS S dB U U U U U U U U U U U U U	5.19 5.19 5.19 <u>5.19</u>	Start           Start           00000000           Start           000000000           Start           000000000           Stop           000000000           Stop           000000000           Stop           000000000
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Keysight Spont           R         Center F           Center F           Conter F           Center S           S           Center S           S           S           S           S           S           S           S           S           S	Ref Off Ref 3: 4************************************	50 Ω 90000 <sup></sup>	dB IBm	950. 1.045	VB3 0 us ( 0 ms ( 0 ms (	γγγι-ι- 	MHz 2.62 10.11 di -1.83	e Run 0 dB	11. 14			Voltage	033	TRAC TYP De r3 1. -' 	pan1	3 4 5 6 N N N N S MS S dB U U U U U U U U U U U U U	5.19 5.19 5.19 <u>5.19</u>	Start I           Stop I           S
Keysight Spont           R         Center F           Conter F         Conter F           Conter         Conter F	Ref Off Ref 3: 4************************************	50 Ω 90000 <sup></sup>	dB IBm	950. 1.045	VB3 0 us ( 0 ms ( 0 ms (	γγγι-ι- 	MHz 2.62 10.11 di -1.83	e Run 0 dB	11. 14			Voltage	033	TRAC TYP De r3 1. -' 	pan1	3 4 5 6 N N N N S MS S dB U U U U U U U U U U U U U	5.19 5.19 5.19	Auto T           Center I           00000000           Start I           000000000           Stop I           000000000           Stop I           000000000           Freq Of           Scale T

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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#### 802.11ac VHT 40

60.0       Span 0 Hz       CF Step         Center 5.190000000 GHz       Sweep 5.000 ms (1001 pts)       Sweep 5.000 ms (1001 pts)         MKR MODE HKG SCL       X       Y       FUNCTION WIDTH       FUNCTION VALUE         1       Δ2       1       t       1.040 ms (Δ)       4.35 dB       FUNCTION WIDTH       FUNCTION VALUE       FUNCTION VALUE         3       Δ4       1       t       1.930 ms (Δ)       -0.25 dB       FUNCTION VALUE       FUN	Keysight Spect	trum Analyzer - Swept SA						
Center Fred 5.190000000 GHZ     Trig: Free Run IFGain:Low     Trig: Free Run Atten: 30 dB     Auto Tune       0 dB/div     Ref 0.00 dBm     -0.25 dB     -0.25 dB       0 dB/div     Ref 30.00 dBm     -0.25 dB     -0.25 dB       0 dB/div     Image: State of the s				SENSE:I				
If Gain:Low     Atten: 30 dB     Derive NAME       Ref Offset 12 dB     Auto Tune       200     -0.25 dB       201     1 (A)       202     -0.25 dB       203     -0.25 dB       204     1 (A)       205     -0.25 dB       206     -0.25 dB       208     -0.25 dB	Senter Fre	eq 5.19000000		Trig: Free Ru		ype: voitage	TYPE WWWWW	v
Ref Offset 12 dB       ΔΜΚR3 1.045 mS         10 dB/div       Ref 30.00 dBm       -0.25 dB         200       -0.25 dB       -0.25 dB         10 dB/div       rm       -0.25 dB         20 dD       -0.25 dB       -0.25 dB         20 dD				Atten: 30 dB			DET P NNNN	
10 dB/div       Ref 30.00 dBm       -0.25 dB         10 dB/div       1324       1324         10 dB/div       1324       1324         10 dB/div       1324       140         10 dB/div       140       1324         10 dB/div       140       140         10 dB/div       1930 ms       8.29 dBm       140         10 dB/div       1930 ms       8.29 dBm       140       140		Ref Offset 12 dB				Δ		
20.0       10.0       30.4       30.4       Center Free         10.0       2       30.4       30.4       10.5       10.5         10.0       2       10.0       30.4       10.0							-0.25 dE	
10.0	-				1^2			Contor From
0.00     1.00	main sugar		-	ก <b>เทร</b> างสาวการสุด	www.23∆4	motherm	pyplaseralpaseralleresteratures	
10.0			1.11/4				,	5.190000000 GHz
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20.0	10.0							Start Fred
30.0         40.0         41.0         44.1 <t< td=""><td>20.0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	20.0							
10.0     10.0	30.0				-41			5.19000000 GH2
Stop Free           Stop Free <t< td=""><td></td><td>•44</td><td>4 P</td><td></td><td></td><td></td><td></td><td>1</td></t<>		•44	4 P					1
0.0         0.0 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Stop Freq</td>								Stop Freq
Center 5.190000000 GHz         Span 0 Hz         Span 0 Hz         CF Step           Lets BW 8 MHz         VBW 8.0 MHz         Sweep 5.000 ms (1001 pts)         8.00000 MHz           Image: Mode trice scu         ×         ×         Function         Function width         Function width <t< td=""><td>50.0</td><td></td><td></td><td></td><td></td><td></td><td></td><td>5.190000000 GHz</td></t<>	50.0							5.190000000 GHz
Les BW 8 MHz         VBW 8.0 MHz         Sweep 5.000 ms (1001 pts)         8.00000 MHz           1         Δ2         1         t         (Δ)         4.35 dB	,0.0							
Auto         Noncentration         Streep         5.000 ms (1001 pts)         8.000000 MHz           1         Δ2         1         t         (Δ)         9.50 d μs         (Δ)         4.35 d B         4.00000 MHz         4.00000 MHz         4.00000 MHz         4.00000 MHz         4.00000 MHz         4.000000 MHz         4.00000 MHz         4.000000 MHz         4.000000 MHz         4.00000 MHz         4.00000 MHz         4.00000 MHz         4.00000 MHz         4.000000  MHz         4.0000000 MHz <td></td> <td>000000000000</td> <td></td> <td></td> <td></td> <td></td> <td>0</td> <td></td>		000000000000					0	
KR         MODE         TRC         ScL         X         Y         FUNCTION         FUNCTION WIDTH         FUNCTION VALUE         Auto         Mar           1         Δ2         1         t         (Δ)         950.0 µs         (Δ)         4.35 dB         FUNCTION         FUNCTION WIDTH         FUNCTION VALUE         FUNCTION VALUE </td <td></td> <td></td> <td>VBM</td> <td></td> <td></td> <td>Sween 5</td> <td></td> <td></td>			VBM			Sween 5		
1       Δ2       1       t       (Δ)       950.0 μs       (Δ)       4.36 dB         2       F       1       t       1.930 ms       8.29 dBm       Freq Offset         3       Δ4       1       t       (Δ)       -0.25 dB       Freq Offset         4       F       1       t       1.930 ms       8.29 dBm       Freq Offset         5       -       -       -       -       -       Freq Offset         6       -       -       -       -       -       -         7       -       -       -       -       -       -         8       -       -       -       -       -       -       -         9       -       -       -       -       -       -       -       Log       Log       Lir         10       -       -       -       -       -       -       -       Log       Lir			10000	5.0 10112		<u> </u>	• •	
2         F         1         t         1.930 ms         8.29 dBm         Freq Offset         6         Freq Offset         6         6         6         6         6         6         6         6         6         6         7         8         7         7         7         9			950.0 us (A)	4 35 dB	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	
4         F         1         t         1.930 ms         8.29 dBm         0 Hz           5         -         -         -         -         -         0 Hz           6         -	2 F 1		1.930 ms	8.29 dBm				
S         S								
7         8         9         1         9         1         9         1         9         1         9         1         9         1		t	1.930 ms	8.29 dBm			=	0 Hz
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	9							
								Log <u>Lin</u>
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ISG STATUS	ISG					STATUS		

## 802.11 ac VHT 80

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LXI R		Ť.	RF		0Ω	DC				_	]	NSE:INT	-	Avg	Туре	e: Voltage	03	TRAC	M Aug 19, 20 CE 1 2 3 4 PE WWWW	56	F	requency
									:Fast in:Low		Trig: Fre Atten: 3							D	ET P N N N	NN		Auto Tune
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-20.0 -30.0																					5.21	0000000 GHz
-40.0	r						diney'n	·				- Ving	41			,	elt <sub>i</sub> n'			_		Stop Freq
-50.0 -60.0																					5.21	0000000 GHz
Cen	ter	5.2	100	00000	0 Gł	Ηz													Span 0 F	١z		CF Step
Res		_							VB	w	8.0 MHz					Sweep 2	.000	) ms (	(1001 pt		Auto	3.000000 MHz Man
MKR 1 2	Δ2 F	1 1	t t	(Δ)		×	4		0 µs 0 µs	( <b>∆</b> )	5.19 5.12 d		FUNC	CTION	FUN	ICTION WIDTH		FUNCTI	ON VALUE	Î		
4	Δ4 F	1	t	(Δ)				556.0	0 µs 0 µs	<b>(Δ)</b>	0.91 5.12 d	dB										Freq Offset 0 Hz
5 6 7																						
8 9 10																						Scale Type
11																			•	+	Log	Lin
MSG																STATUS	5					

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## 8 26DB & 6DB EMISSION BANDWIDTH MEASUREMENT

#### 8.1 Standard Applicable

There is no limit bandwidth for U-NII-1, U-NII-2-A and U-NII-2-C. The minimum of 6dB Bandwidth measurement is 0.5 MHz for U-NII-3

#### 8.2 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules .
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the Antenna port to the spectrum analyzer.
  - a. 26dB Band width Measurement: Set the spectrum analyzer as 1% of emission BW Sweep=auto, Detector = Peak, Trace Mode = Max Hold, Manually readjust RBW until the RBW/EBW ratio is 1% based on EBW as observed on the result of pre-sequence measurement.
  - b. Mark the peak frequency and -26dB (upper and lower) frequency.
- 4. Repeat the procedures as list above until all test default channels (low, middle, and high) are completed.
- 5. Minimum Emission Bandwidth for the band 5.725-5.850GHz.
  - a. Set the spectrum analyzer as RBW = 100 kHz, VBW = 3\*RBW, Span = 30M/50MHz, Detector=Peak,

Sweep=auto

- b. Mark the peak frequency and -6dB (upper and lower) frequency.
- 6. Repeat above procedures until all test default channel measured were complete.

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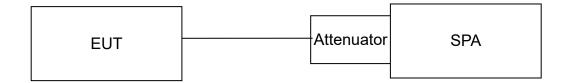
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#### 8.3 Measurement Equipment Used

	Conducted Room								
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.				
DC Block	PASTERNACK	PE8210	RF256	02/26/2019	02/25/2020				
Spectrum Analyzer	Agilent	N9010A	MY53400256	11/21/2018	11/20/2019				
Thermostatic/Hrgrosatic Chamber	GWINSTEK	GTC-288MH-CC	TH160402	05/16/2019	05/15/2020				
Attenuator	Marvelous	MVE2213-10	RF80	02/26/2019	02/25/2020				

#### 8.4 Test Set-up



#### 8.5 Measurement Result

#### 26dB and 6dB Bandwidth

802.11a Ch0

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)			
5180	23.99	13.800			
5220	23.79	13.764			
5240	23.87	13.779			
5260	24.51	13.893	802.11a_Ch0		
5300	24.1	13.820	<b>F</b>	6dB	40 L e m (D)
5320	24.31	13.858	Frequency (MHz)	BW	10 Log (B) (dB)
5500	24.55	13.901	(14112)	(MHz)	(dB)
5580	23.35	13.683	5745	14.4	11.584
5700	24.6	13.909	5785	15.36	11.864
5720	23.57	13.724	5825	15.82	11.992

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#### 802.11n\_HT20\_Ch0

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)			
5180	24.2	13.838			
5220	23.17	13.649			
5240	22.51	13.524			
5260	24.64	13.916	802.11n_HT20_	Ch0	
5300	25.33	14.036	<b>F m m m m m m m m m m</b>	6dB	40 L o c (D)
5320	26.07	14.161	Frequency (MHz)	BW	10 Log (B) (dB)
5500	24.61	13.911	(1112)	(MHz)	(00)
5580	26.45	14.224	5745	17.56	12.445
5700	26.95	14.306	5785	16.86	12.269
5720	25.93	14.138	5825	17.29	12.378

#### 802.11n \_HT40\_Ch0

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)			
5190	41.71	16.202			
5230	41.44	16.174			
5270	41.41	16.171	802.11n_HT40_	Ch0	
5310	41.11	16.139	-	6dB	40 L
5510	40.99	16.127	Frequency (MHz)	BW	10 Log (B) (dB)
5550	41.55	16.186	(1112)	(MHz)	(ub)
5670	41.69	16.200	5755	35.18	15.463
5710	40.77	16.103	5795	35.36	15.485

#### 802.11ac \_VHT80\_Ch0

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)			
5210	82.25	19.151	802.11ac _VHT8	0_Ch0	
5290	82.4	19.159	<b>F</b>	6dB	40 L a m (D)
5530	82.98	19.190	Frequency (MHz)	BW	10 Log (B) (dB)
5610	83.38	19.211	(1112)	(MHz)	(ub)
5690	83	19.191	5775	75.21	18.763

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#### 802.11a\_Ch0

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)			
5180	16.755	12.241			
5220	16.799	12.253			
5240	16.679	12.222			
5260	16.751	12.240			
5300	16.773	12.246	802.11a_Ch0	CHD	1
5320	16.724	12.233	Frequency	6dB BW	10 Log (B)
5500	16.794	12.252	(MHz)	(MHz)	(dB)
5580	16.762	12.243	5745	16.4	12.148
5700	16.778	12.247	5785	16.21	12.098
5720	16.771	12.246	5825	16.33	12.130

#### 802.11n\_HT20\_Ch0

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)			
5180	17.875	12.522			
5220	17.866	12.520			
5240	17.843	12.515			
5260	17.902	12.529		<b>.</b>	
5300	17.936	12.537	802.11n_HT20_0		
5320	17.975	12.547	Frequency	6dB BW	10 Log (B)
5500	17.955	12.542	(MHz)	(MHz)	(dB)
5580	17.98	12.548	5745	17.58	12.450
5700	17.965	12.544	5785	17.51	12.433
5720	17.956	12.542	5825	17.54	12.440

#### 802.11n \_HT40\_Ch0

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)			
5190	36.107	15.576			
5230	36.123	15.578			
5270	36.113	15.577		01-0	
5310	36.115	15.577	802.11n _HT40_		<b></b>
5510	36.15	15.581	Frequency	6dB BW	10 Log (B)
5550	36.138	15.580	(MHz)	(MHz)	(dB)
5670	36.144	15.580	5755	36.31	15.600
5710	36.138	15.580	5795	36.29	15.598

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#### 802.11ac \_VHT80\_Ch0

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)			
5210	75.658	18.789			
5290	75.659	18.789	802.11ac _VHT8	_	
5530	75.583	18.784	Frequency	6dB BW	10 Log (B)
5610	75.559	18.783	(MHz)	(MHz)	(dB)
5690	75.748	18.794	5775	76.15	18.817

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#### 99% BW to prove that all signals in band I is no over band U-NII-1

802.11a\_Ch0

002.11a_0110								
Measured Frequency (MHz)	Limit (MHz)							
5248.35	< 5250							
5736.73	> 5725							
0_Ch0								
Measured Frequency (MHz)	Limit (MHz)							
5248.88	< 5250							
5736.12	> 5725							
802.11n _HT40_Ch0								
Measured Frequency (MHz)	Limit (MHz)							
5248.12	< 5250							
5736.93	> 5725							
802.11ac_VHT80_Ch0								
Measured Frequency (MHz)	Limit (MHz)							
5247.83	< 5250							
	Frequency (MHz) 5248.35 5736.73 0_Ch0 Measured Frequency (MHz) 5248.88 5736.12 H0_Ch0 Measured Frequency (MHz) 5248.12 5736.93 IT80_Ch0 Measured Frequency							

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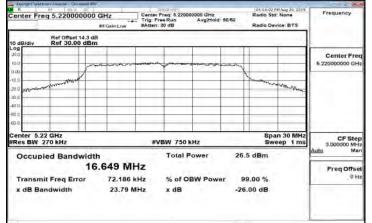
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#### FCC\_802.11a\_20MHz\_Main\_5180MHz

Frequency	t: None vice: BTS	Radio Sto	50/50	AvgiHold	Freq: 5.1800 ee Run 30 dB	Center	Hz	00000 G	g 5.18000	enter Fre							
	()								Ref Offset Ref 30.0	0 dB/div							
Center Fre 5.180000000 GH			entrum	-			Pres Break	Jan	-	.og 20.0 10.0							
	marine	-	1			-		/	- Martin Martin	0.00							
	Contraction of the second			-	-		-			30,0							
					-					46 0 90 0 50 0							
CF Ste	an 30 MHz eep 1 ms			Hz	BW 8201	#1				Center 5.1 Res BW 2							
Auto Ma		6 dBm	26.	1,0,000 0,000 0,000 0,000				Occupied Bandwidth					Bandwidth 16.705 MHz				
Freq Offse		9.00 %	r 91														
		8b 00.	-26.		x dB	MHz	23.99		ndwidth	x dB Ba							

#### FCC\_802.11a\_20MHz\_Main\_5220MHz



#### FCC\_802.11a\_20MHz\_Main\_5240MHz

R I	0.05 10				:2010:221:23/07					H Aug 20, 2019	Frequency
Center Fre	rq 5.24000		GHz MFGaint.nw	Trig: F	r Freq: 5.2400 Free Run 1: 30 dB	AvgiHold:	60/60			t: None vice: BTS	requency
10 dB/div	Ref Offset Ref 30.0			Mk		835 GHz 87 dBm					
20.0 10.0 0.00		m		ablanniaiga	-		and	1-			Center Fred 5.240000000 GH
10 0 20 0 x 4	monthed				-			to mais	nie nye	and the second	1
40.0								-			
Center 5.2 #Res BW				#	VBW 8201	KHZ	-	-		an 30 MHz eep 1 ms	CF Step 3.000000 MH
Occup	led Band		696 M	1.0,00000000000000000000000000000000000				.4 dB	m		Auto Mar
	it Freq Err ndwidth	or	61.026 23.87		% of O x dB		99.00 % 26.00 dB			0 Ha	
wing								05			

#### FCC\_802.11a\_20MHz\_Main\_5260MHz

50/50 Radio Std: None Frequency Radio Conce BTS	Trig: Free Run AvgiHold: 50/50						ter Freq 5.260000000 GHz							
	Ref Offset 14.3 dB B/div Ref 30.00 dBm													
Center F 5.26000000	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Mumur	mandedar	~~	www	-	m		00 200					
mannan	1						1	-	0.00 10.00 20.0					
		-		-		-	-		30.0. 46.0.					
									50.0					
Span 30 MHz CFS Sweep 1 ms 3.000000			50 kHz	#VBW	4				Res BW 2					
26.2 dBm	26.2 dB						Occupied Bandwidth 16.684 MH							
er 99.00 %. -26.00 dB		ower	r obw r B	% d		Transmit Freq Error 88.504 k x dB Bandwidth 24.51 M								

## FCC\_802.11a\_20MHz\_Main\_5300MHz

None	Radio Std		60/60		eq: 5.30000 Run	Center Fr Trig: Fre						
- 1			_			_				3/div		
				-	provincer	an all a second	-m-ant	ma				
www.	- and a start of the	1						/	- way of the start	-		
	-											
		11	1	Hz	W 750 k	#VE				ter 5.3 G s BW 24		
	dBm	6.1	20	ower	Total P	Ηz	13 MI		d Bandy	ccupie		
				BW Powe	% of OE x dB							
	n 30 MHz	Radio Std: None Radio Device: BTS Span 30 MHz Sweep 1 ms dBm 00 %.	Radio Stir None Radio Device: BTS	Radio Std: None Radio Device: BTS	Avgihald: 6060 Radio Std: None Avgihald: 6060 Radio Device: B15	Radio Stel Nore Radio Stel Nore Radio Device BTS Radio De	Center Free 6.30000000 GHz Trig: Free Markin Avgitted 6.600 Addition Avgitted 6.6000 Addition Avgitted 6.600 Addition Avgitted 6.6000 Addition Avgitted 6.6000 Addited 6.6000 Addition Avgitted 6.600	Trig Free Run BankLow Trig Pree Run BankLow Radio Device: BTS Radio Device: BTS Radi	D000 GHz     Center Free 5.3000000 GHz     Ratio Stor. None       17/16 Free Run     Avgittedid 5050       13 dB     Avgittedid 5050       10Bm     Image: Stor. None       10Bm     Image: Stor. None	5.30000000 GHz BitGalatow Center Freq. 5.30000000 GHz Trig: Pres Million Ref 30.00 dBm Center Freq. 5.3000 dBm Ref 30.00 dBm Center Freq. 5.3000 dBm Center Freq. 5		

#### FCC\_802.11a\_20MHz\_Main\_5320MHz

10 R	Hr Dig G	DC			1112:12:1				PH Aug 20, 2019	Frequency
Center Fre	q 5.32000		Hz FGalmLow		req: 5.32000 = Run 10 dB	AvgiHald	60/60	Radio St Radio De	t: None vice: BTS	requency
10 dB/div	Ref Offset Ref 30.00		_							
20.0 10.0		m	- norther north	and the second		and the starting	many			Center Free 5.320000000 GH;
10.00 -10.0 -21.0	manna	1	-					-	winner	
30.0. 48.0	-									
-50.0										1
Center 5.3 Res BW 2				#VI	BW 7501	kHz			an 30 MHz eep 1 ms	CF Step 3.000000 MH
Occupi	ed Band	width		Total Power				.1 dBm	-	Auto Mar
		16.6	645 MI	Ηz						Freq Offset
Transmi	t Freq Err	or	57.984	KHz % of OBW Power			99.00 %		0 Hz	
x dB Ba	ndwidth		24.31 M	IHz	x dB		-26	5.00 dB		1
00							-011	114		

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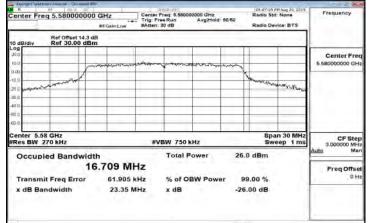
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#### FCC\_802.11a\_20MHz\_Main\_5500MHz

Arrest: Sparte	nen Aner/an - Occased By	γ.	31933/1					
Center Fre	q 5.500000000	MFGain:Low #Atte	AvgiHold	60/60	Radio St	MAng 20, 2019 d: None wice: BTS	Frequency	
10 dB/div	Ref Offset 14.3 d Ref 30.00 dBn							
200				man	-			Center Free 5.50000000 GH
0.00 -10.0 -20.0 %%%	manuel		-			-	man	
-20 0 <b>N-4-10</b>			-				- MAN	
-80 0						-		
Center 5.5 #Res BW 2			VBW 8201	KHZ	-		an 30 MHz eep 1 ms	CF Step 3.000000 MH
Occupi	led Bandwidt		1,0,000,000,000,000,000,000,000,000,000			5 dBm		Auto Mar
	16	6.711 MHz						Freq Offse
Transmi	it Freq Error	64.448 kHz	448 kHz % of OBW Power 9			9.00 %		0 H
x dB Ba	ndwidth	24.55 MHz	x dB		-26	.00 dB		

#### FCC\_802.11a\_20MHz\_Main\_5580MHz



#### FCC\_802.11a\_20MHz\_Main\_5700MHz

Center Fre	ing 5.700000		Hz FGalmLow	Center F		AvgiHold	60/60	Radio St	the state of the s	Frequency
10 dB/div	Ref Offset 1 Ref 30.00								)	
20.0		1-1-10	,	10-1-10 <sup>1</sup> 00-1 <sup>-00</sup> 1						Center Freq 5.700000000 GHz
	walter in Alasker	•			-			Margary -	mun	
-30.0. -46.0 -90.0										
60.0 Center 5.7	CHI								an 30 MHz	
#Res BW				#V	BW 820 H	Hz			eep 1 ms	CF Step 3.000000 MHz
Occup	led Bandy	305 MH	Total Power 26 MHz						Auto Man Freq Offset	
	Transmit Freq Error 77 x dB Bandwidth 2							9.00 % 5.00 dB		0 Hz
(IN)								05		

#### FCC\_802.11a\_20MHz\_Main\_5720MHz

An operation	tr dharter-Go	S FVr		T a	NR OIL			10.44.2	F FM Aug 20, 2018	
Center Fre	eq 5.720000		Hz Galn Low	Water Street		Avg Hold;	06/30	Radio S		Frequency
10 dB/div	Ref Offset 1 Ref 30.00		-				Mk		877 GHz 078 dBm	
20.0 10.0		and a state	antimotor	south	-	windows	mum	-		Center Free 5.720000000 GH
000 100 300 مىرى 100	mun	1						haven	whereas	
30 0 40 0					-		_			
66.0 60.0		-		-	-					
Res BW				#VI	BW 680 P	KHZ	_		an 30 MHz veep 1 ms	CF Ster 3.000000 MH
Occup	ied Bandy		517 MI	-Iz	Total P	ower	26.	6 dBm		Auto Ma
			58.616	country and a second						
it Freq Error 58.616 kHz % of O Indwidth 23.57 MHz x dB						BW Power		- care pro		0 Ha

#### FCC\_802.11a\_20MHz\_Main\_5745MHz

Center Fre	q 5.745000		Hz	Center	Freq: 5,74500	0000 GHz AvgiHold	60/60	Radio St	HI Aug 20, 2019 d: None	Frequency
10 dB/div	Ref Offset 1 Ref 30.00	4.3 dB	HGdinLow	#Anten	30 00		Mk	r1 5.73	673 GHz 317 dBm	
00 200 100		1.ms	menter and	unhar	motion	e consecutory of	manday			Center Fred 5.745000000 GHp
10 0 20 0 30 0	AMANNA							mun	menning	
48 0 90 0 60 0		-	-				_			
enter 5.74 Res BW 1				#\	/BW 300 k	Hz			an 30 MHz 2.933 ms	CF Step 3.000000 MH
Occupi	ed Bandy		537 M	Hz	Total P	ower	27.	0 dBm	n	Auto Man Freq Offset
Transmi x dB Bar	t Freq Erro	or	48.187		% of OE x dB	BW Powe		9.00 %		0 Hz

#### FCC\_802.11a\_20MHz\_Main\_5785MHz

R Ar		Desc BW	- T.		1112-12-1				104-510-78 B	M Aug 20, 2019	2000
Center Freq 5.		0000 G	iHz IFGalitizhw	Center Freq: 6,785000000 GHz Trig: Free Run AvgiHold: 50/50 #Atten: 30 dB					Radio Std	I: None	Frequency
10 dB/div Re	f Offset 1 of 30.00						_			()	
20.0 10.0		day	malandar	arturn	n mitrorito	moli	Aunto				Center Free 5.785000000 GH
0.00 -10.0 -20.0 7070-7070	winer	al and			Y	1		14	minin	Minday	
-30,0 46.0										- and the second	
-sñ n -60.0		-			-						
Center 5.785 G #Res BW 100 k				#1	/BW 300 k	Hz				n 30 MHz 2.933 ms	CF Step 3.000000 MH
Occupied I		6 4 9 MI	Total Power			27	.5	dBm		Auto Mar	
Transmit Fre	eq Erro		542 MH 51.629 k	100	A CONTRACTOR OF A CONTRACT  CONTRACT OF A CONTRACT. CONTRACT OF A CONTRACT OF A CONTRACT. CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT. CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT. CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT. CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT. CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT. CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT. CONTRACT OF A CONTRA			99.	00 %		Freq Offse 0 H
x dB Bandw	idth		15.36 M	Hz	x dB			6.0	0 dB		

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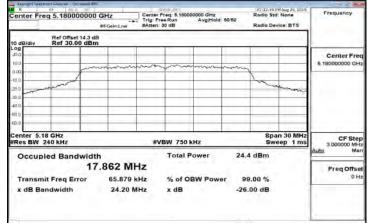
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#### FCC\_802.11a\_20MHz\_Main\_5825MHz

		_		_		_		_	_		
Swangert Speaker	ALC: 100	Manuel BW/			anastri					M Apr 20, 2019	
Center Fre			GHz #FGalm1.nw	Trig: I	r Freq: 5.825 Free Run h: 30 dB	000000 GHz AvgiHald	60/60	3	Radio Std	1: None	Frequency
10 dB/div	Ref Offset Ref 30.0						_			]	
200			-	-				-			Center Free 5.825000000 GH
0.00		port	mbushish	holeintra	an with	monturations	march				5.82500000 64
200	- Manager	2				1		2	- ACHINA	namen	
30,0			-		-	-		1		. a self	
sñ ŋ				-						-	
60.0 Center 5.82	DE CHIS								Dese	n 30 MHz	
Res BW 1		-		#	VBW 300	kHz		0		2.933 ms	CF Ste 3.000000 MH
Occupi	ed Band				Total Power			5.9	dBm		Auto Mi
		16	.508 N	IHz							Freq Offse
Transmi	Fransmit Freq Error 40.418 k				Hz % of OBW Power 99.0				.00 %		0 H
x dB Ba	ndwidth		15.82	MHz	x dB			6.0	00 dB		

#### FCC\_802.11n\_20MHz\_Main\_5180MHz



## FCC\_802.11n\_20MHz\_Main\_5220MHz

R i		DE		Freq: 5.22000				PM Aug 20, 2019	Frequency
Center Fre	rq 5.220000	MFGain	50/50	Radio St	d: None vice: BTS				
10 dB/div	Ref Offset 1 Ref 30.00					-			
20.0 10.0 0.00		-manuar	maria		-	-	_		Center Fred 5.220000000 GHz
10.00	mannant						- Walnut	and survives	
-40.0				-		_		14240	
-80.0		-		-					
Center 5.2 #Res BW			#1	/BW 750 k	Hz	-		an 30 MHz /eep 1 ms	CF Step 3.000000 MHz
Occup	led Bandy	vidth 17.809	MHz	Total P	ower	22.9	dBm		Auto Man
	it Freq Erro	r 55	.701 kHz				.00 %		Freq Offsel 0 Hz
x dB Ba	ndwidth	23	3.17 MHz	x dB		-26.	00 dB		
Mile						#7#102	_	-	

#### FCC 802.11n 20MHz Main 5240MHz

Center Freg 5,240000000 GHz Center Freg 5,24000000 GHz Radio Strike artiGainLow Radio Center Strike Freg Freg 5,24000000 GHz Radio Strike Nem S Radio Strike Nem S									
Mk		Ref Offset 14.3 dB Ref 30.00 dBm	10 dB/div						
man		1	200 100						
- and an and a second second	with the second s		0.00 10.0 20.0						
			30.0 M A A						
		GHZ	60.0 Center 5.2						
W 750 kHz	#		#Res BW						
Occupied Bandwidth Total Power 23.0 dBm 17.764 MHz									
% of OBW Power 9 x dB -26	55.148 kHz 22.51 MHz								
r 23 Power 9	VBW 750 kHz Total Powe	#VBW 750 kHz Total Powe .764 MHz 55.148 kHz % of OBW F	4 GHz 4						

## FCC\_802.11n\_20MHz\_Main\_5260MHz

Frequency		Radio Sto	0/60	AvgiHold		Center F	łz Galinskow	0000 GH	5.26000	
	- 0						_		Ref Offset Ref 30.00	B/div
Center Freq 5.26000000 GHz	man and the second an									
		La	_						A	1
	month	34							1 BURNES	- ALANNER A
		_			-	_	-			1
				-	-		-		-	
		-	-		-			-		-
		1						-	-	1
CF Step 3.000000 MHz	eep 1 ms			Hz	W 820 k	#VE				nter 5.26 Is BW 27
Auto Man		dBm	27.1	ower	Total P			width	d Band	Decunia
Freq Offset		Occupied Bandwidth Total Power 27.1 dBm 17.923 MHz								
0 Hz		Transmit Freq Error 53.549 kHz % of OBW Power 99.00 %								
		DO dB			x dB		24.64 N			dB Ban
			-20.0				24.04 1		aman	o Dan

#### FCC\_802.11n\_20MHz\_Main\_5300MHz

Center Fre	q 5.30000	0000 G	Hz	Center	Freq: 5.30000 ee Run 30 dB	AvgiHold	60/60	Radio St	d: None vice: BTS	Frequency.
10 dB/div	Ref Offset		-			-			()	
200		بمنصمر	and the second	main	-	personan and and and and and and and and and	1H-19" 14-			Center Freq 5.30000000 GHz
0.00	1	-						N		
-10.0	- and and and			1				- Marco	- Marian Maria	
30.0		-			-	-		-	-	
40.0	-			_	-			-		
en p	-		-		-		_	-	-	
-60.0	-	-	1		-		_	1		
Center 5.3 #Res BW 2				#V	BW 8201	Hz			an 30 MHz eep 1 ms	CF Step 3.000000 MH
Occupi	ed Bandy	width			Total P	ower	27.	2 dBm		Auto Man
	6 4 4 4 V V		931 MH	1z						Freq Offset
Transmi	Transmit Freg Error 63.807					BW Powe	r a	9.00 %		0 Hz
x dB Bar	1.1.1.1.1.1.1		25.33 M		x dB			.00 dB		
(CRI)										-

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#### FCC\_802.11n\_20MHz\_Main\_5320MHz

	_	_		_				_		
10 R	ar   38 d eq 5.32000	0000 G		Center F Trig: Fre		AvgiHold	50/50	Radio St		Frequency
		an	FGainLow	#Atten: 3	10 dB		-	Radio De	evice: BTS	
10 dB/div	Ref Offset Ref 30.00						_			
20.0	1.1.1.1.1.1.1	-	1				-	1	1	Center Fre 5.32000000 GH
10.0	-	amore	The second	min	have	mint, may	-			
0.00		1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	1.000					1		
10.0	1. marine		-	_	-		-	mention	an mo	
200 1000	op r	-			-			-	. walker	
30.0			-	-	-	1	-	-	-	
48.0	-			-		-				
sn p		-		-			1			
60.0								1		
Center 5.3 Res BW				#VI	BW 8201	KHZ			an 30 MHz /eep 1 ms	CF Step 3.000000 MH
Occup	led Band	width			Total P	ower	27.	1 dBm	-	Auto Mar
			917 M	17						The second
2.51										
		or			% of OBW Power			99.00 %		
x dB Ba	indwidth		26.07 N	Hz	x dB		-26	00 dB		
17.917 MHz it Freq Error 59.276 kH ndwidth 26.07 MH:	or 59.276 kH	59.276 kH	(H)	Hz % of OBW Power				9.00 % .00 dB		Freq Offset 0 Hz

#### FCC\_802.11n\_20MHz\_Main\_5500MHz



#### FCC\_802.11n\_20MHz\_Main\_5580MHz

Center Fre	ng 5.58000	0000 G	Hz FisaliniLow	Trig: Fre	Center Freq: 5,58000000 GHz Trig: Free Run AvgiHold: 50/50 #Atten: 30 dB				MAng 20, 2039 1: None vice: BTS	Frequency
10 dB/div	Ref Offset Ref 30.00								(	
200							Center Freq 5.58000000 GHz			
	mannen							-	manany.	
-30,0				-			_			
-60.0	-		-				_			
Center 5.5 #Res BW				#VI	SW 820 H	Hz			an 30 MHz eep 1 ms	CF Step 3.000000 MHz
Occup	led Band		938 MI	Hz	Total P	ower	27.0	dBm		Auto Man Freq Offset
Transmit Freq Error 49.46 x dB Bandwidth 26.4								00 % 00 dB		0 Hz
(international state)							=1010	_	_	

#### FCC 802.11n 20MHz Main 5700MHz

- Avenuent Space	telen Analyzer - Occupied B	W			_			1 C C C
R Center Fre	eq 5.700000000	Tri	tter Freq: 5.700 g: Free Run ten: 30 dB	000000 GHz AvgiHold (	50/50	Radio Sta	rif Aug 20, 2019 1: None vice: BTS	Frequency
10 dB/div	Ref Offset 14.3 d Ref 30.00 dBr					0		
200								Center Free 5.700000000 GH
0.00 10.0 20.0	man					Sound	anonmul	
30,0. 46 D		_	-					
80.0 60.0		-	-					
Center 5.7 #Res BW			#VBW 750	kHz			an 30 MHz eep 1 ms	CF Step 3.000000 MH
Occup	ccupled Bandwidth Total Power 26.9 dBm 17.944 MHz						Auto Mar	
Transm	hit Freq Error	58.298 kHz				.00 %		0H
x dB Ba	andwidth	26.95 MHz	x dB		-26.	00 dB		

## FCC\_802.11n\_20MHz\_Main\_5720MHz

Center Freq 5.720000000 GHz er Gaint Care 5 720000000 GHz r dio Device: BTS Radio Device: BTS 10.7111 GHZ 10.7111 GHZ 5.72000000 GHZ 10.711 GHZ 10.7
0 dBldiv Ref 30.00 dBm 10.711 dBm 5.72000000 G
00 Center Fre 5 72000000 G
Do manufar and the second
Res BW 220 kHz #VBW 680 kHz Sweep 1 ms 300000 Miles 400
Occupied Bandwidth Total Power 26.3 dBm
17.861 MHz Freq Offs Transmit Freq Error 34.740 kHz % of OBW Power 99.00 %
x dB Bandwidth 25.93 MHz x dB -26.00 dB

#### FCC\_802.11n\_20MHz\_Main\_5745MHz

Averant Spatterry										
Center Freq			Hz FGalmLnw	Center		AvgiHold: 5	0/60	Radio Sto		Frequency
10 dB/div F	Ref Offset Ref 30.00						Mkr		612 GHz 45 dBm	
20.0 10.0		history	harring	mindin	y waters	-	interin			Center Fred 5.745000000 GH:
-10.0 20.0	NE SUN VIN VIN AND							Marris	a www.	
30,0 46 0 80 0				_	-					
60.0 Center 5.745 #Res BW 100				#V	BW 300 k	Hz	-		n 30 MHz 2.933 ms	CF Step
Occupied	Band	width			Total Power 27.					Auto Mar
17.751 MHz Transmit Freq Error 46.176 kHz % of OB							OBW Power 99.00 %			Freq Offsel 0 Hz
x dB Band	width		17.56 M	Hz	x dB		-6.	00 dB		
-										

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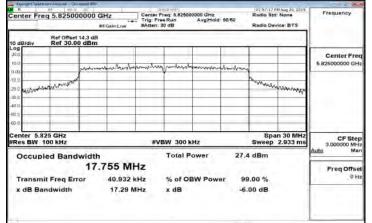
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#### FCC\_802.11n\_20MHz\_Main\_5785MHz

Experience Speakers	ant Analyzer - Occili	peed 67V/								
Center Fre	q 5.785000		1z Galitzinw	Center F	req: 5,78500 e Run 30 dB	AvgiHald 6	50/60	Radio St	d: None evice: BTS	Frequency
10 dB/div	Ref Offset 1 Ref 30.00		_							
20.0 10.0	0					manha	madam			Center Free 5.785000000 GH
0.00 -10.0 20.0 and June	1				1			montre	manan	
30,0					-					
-60.0		_			-				-	
Center 5.78 #Res BW 1				#V	BW 300 H	KHZ	_		an 30 MHz 2.933 ms	CF Ster 3.000000 MH
Occupi	Occupied Bandwidth 17.753 MHz					Total Power 27				Auto Mar
Transmit Freq Error 39.646 kHz								.00 %		Freq Offse 0 H
x dB Bar	ndwidth		16.86 N	IHz	x dB		-6.	00 dB		

#### FCC\_802.11n\_20MHz\_Main\_5825MHz



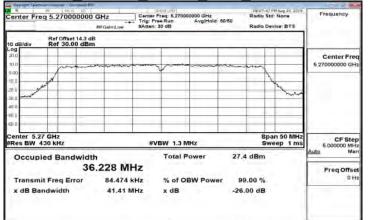
#### FCC\_802.11n\_40MHz\_Main\_5190MHz

R ar 380 00 Center Freg 5.190000000	Trig	er Freq: 5.190000000 GHz Free Run AvgiHol m: 30 dB	d: 60/60	Radio St	d: None evice: BTS	Frequency
Ref Offset 14.3 d 0 dB/div Ref 30.00 dBr					(	
200		-		many		Center Freq 5.19000000 GHz
9.00 10.0 20.0					1	
30.0					- www	
50 0 60.0					-	
Center 5.19 GHz Res BW 430 kHz		VBW 1.3 MHz			an 50 MHz /eep 1 ms	CF Step 5.000000 MHz
Occupied Bandwid	h 6.211 MHz	Total Power	27	.6 dBm		Auto Mar
Transmit Freq Error x dB Bandwidth	87.453 kHz 41.71 MHz	% of OBW Pov x dB		99.00 % 6.00 dB		0 Hz

#### FCC 802.11n 40MHz Main 5230MHz

R	g 5.230000000	GHz Cent	er Freq: 5,2300 Free Run In: 30 dB	000000 GHz AvgiHold: 50/	Radio	Std: None Device: BTS	Frequency	
10 dB/div	Ref Offset 14.3 dB Ref 30.00 dBm					24812 GHz 7613 dBm		
200	manna	1						
0.00								
20 0 30 0 min	1		-		_	June .		
-48.0			-					
60.0			-					
Center 5.23 #Res BW 4			WBW 1.3	MHz		pan 50 MHz Weep 1 ms	CF Step	
Occupi	ed Bandwidt	h	Total I	Power	27,2 dBm		Auto Mar	
	36	36.231 MHz						
Transmi	it Freq Error	80.595 kHz	% of C	BW Power	99.00 %		OH	
x dB Ba	ndwidth	41.44 MHz	x dB		-26.00 dB			

#### FCC\_802.11n\_40MHz\_Main\_5270MHz



#### FCC\_802.11n\_40MHz\_Main\_5310MHz

Center Fre	q 5.31000	0000 GH	iz Salin£nw	Center Fr		AvgiHold	60/60	Radio	Std: None Device: BTS	Frequency
10 dB/div	Ref Offset 1 Ref 30.00			_			_			
20.0								Center Freq 5.310000000 GHz		
0.00 -10.0 -20.0	1								A MARINA	
-30.0 greegen and									Weener	
-80.0		-					_			
Center 5.31 #Res BW 4				#VE	SW 1.3 N	IHz			Span 50 MHa Sweep 1 ms	5,000000 MHz
Occupi	ed Bandy				Total P	ower	26	.7 dBm		Auto Man
Transmi	36.230 MHz Transmit Freg Error 75.256 kHz % of OBW Power 99.00 %								Freq Offset 0 Hz	
x dB Bar	1		41.11 N		x dB	BWPOWE		6.00 dB		
							-			

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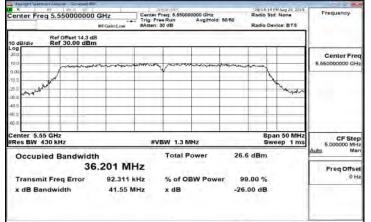
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#### FCC\_802.11n\_40MHz\_Main\_5510MHz

		_		_		_		_	_		
Avancent Space	10 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -							- Lound A			22
Center Fr		000000 G	Hz FGalitiziow	Center F	Center Freq. 5.510000000 GHz Trig: Free Run AvgiHold: 50/50 #Atten: 30 dB			Radio Std: None Radio Device: BTS			Frequency
10 dB/div	Ref 0ffset 14.3 dB Ref 30.00 dBm										
20.0					1					-	Center Free 5.51000000 GH
0.00	1	forman	No. and Antipological for	resserved	-		marker	-	2		
200	part -	-			-			-	2	Luna	
-30.0											
-80 () -60.0		-								-	
Center 5.51 GHz Span 50 MHz #Res BW 430 KHz #VBW 1.3 MHz Sweep 1 ms									CF Step		
Occup	ied Ban	dwidth	· · · · · ·	Total Power 26.				.3 dBm			Auto Man
36.194 MHz										Freq Offse	
Transmit Freq Error 85.279 ki			Hz % of OBW Power 9			99.00 %			0 H		
x dB Ba	andwidth		40.99 M	Hz	x dB		-20	6.00 dB	E.		
1											

#### FCC\_802.11n\_40MHz\_Main\_5550MHz



#### FCC\_802.11n\_40MHz\_Main\_5670MHz

Represent Splatte	Alt Star	Assect BWY	7	21122-2011			I manual address	PH Aug 20 2029	222
	g 5.67000		Trig: F	Center Freq: 5,67000000 GHz Trig: Free Run AvgiHold: 50/50 #Atten: 30 dB				td: None evice: BTS	Frequency
10 dB/div									
20.0	Jun	manne		- Annone	-	mum	any		Center Freq 5,67000000 GHz
0.00 -10.0 -20.0				¥				N.	
-30.0						-		July Contra	
-80 0 -60.0								-	
	Center 5.67 GHz Span 50 MHz Span 50 MHz #VBW 1.3 MHz Sweep 1 ms								CF Step 5.000000 MH
Occupi	led Bandy	width 36.228	MHz	Total Power 26			dBm		Auto Man Freq Offset
Transmit Freq Error 68.739 kHz x dB Bandwidth 41.69 MHz				z % of OBW Power 9			.00 %		ÖH
CRIM						#7#108	-	-	

#### FCC 802.11n 40MHz Main 5710MHz

Any signer Salace	the down the Occupied By			_			1		
Center Fre	eq 5.710000000	Trig	er Freq: 5,710000000 C Free Run Avg in: 30 dB	SHz Hold; 30/30	Radio St	d: None wice: BTS	Frequency		
10 dB/div	Ref Offset 14.6 dl Ref 30.00 dBm			M		255 GHz 079 dBm			
20.0 10.0	preserve	-	-	manne	hand		Center Freq 5.710000000 GHz		
1000 1000 3000	- W				7	Marchen			
40.0		_		-		- galater			
60.0									
	Center 5.71 GHz Span 50 MHz Span 50 MHz #Res BW 430 kHz #VBW 1.3 MHz Sweep 1 ms								
Occup	Auto Mar								
36.145 MH Transmit Freq Error 66.013 k			the second second and a second se				Freq Offse 0 H		
x dB Ba	andwidth	40.77 MHz	x dB	-20	6.00 dB				

#### FCC\_802.11n\_40MHz\_Main\_5755MHz

Avances Space	tearr Analyzer - Occillat	ext BW/							
enter Fre	ng 5.755000	000 GHz	Center Trig F	Center Freq: 6.755000000 GHz Frig: Free Run AvgiHold: 50/50 Atten: 30 dB				Std: None Device: BTS	Frequency
0 dB/div									
00 100 100		. And sugar the	and some so	is mobile	Annelia	Anton	Inhull		Center Fred 5.755000000 GHz
n n 0 0	por and			Y				No.	
0.0 249-14 <sup>248</sup> 8.0 8.0			_	-				L'Alman,	
	0 enter 5.755 GHz Span 50 MHz kes BW 100 kHz \$VBW 300 kHz Sweep 4.8 ms								
Occup	led Bandw	idth 36,138	MH <sub>7</sub>	Total Power 26.8 dBm					5,000000 MH
Transmit Freq Error 55.759 k				State of the state			9.00 %		Freq Offse
x dB Ba	indwidth	35.1	8 MHz	z xdB -			00 dB		1

#### FCC\_802.11n\_40MHz\_Main\_5795MHz

Angent Spatian Angen Contact SW (1997) 139 PH Ang 20, 2019 Center Freq. 5,755000000 GHz (1997) 400 20 20 20 20 20 20 20 20 20 20 20 20 2										Frequency	
10 dB/div											
20.0	Ref 30.00		- the hold may	and man more and more south			witchnest			Center Fred 5.796000000 GHz	
-100 200 -300 ang ma	Normal Contraction			Ų.				han	ware well		
-50.0 -60.0 Center 5.79 #Res BW 1				VBW 300	kHz	-			50 MHz 4.8 ms	CF Step	
Occupied Bandwidth Total Power 27.0 dBm 36.155 MHz									Auto Mar		
Transmit Freq Error 47.749 k x dB Bandwidth 35.36 M			49 kHz				99.00 % -6.00 dB			Freq Offse 0 H	
									_		

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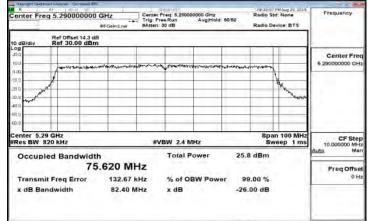
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#### FCC\_802.11ac\_80MHz\_Main\_5210MHz

Frequency	1: None	Internationage         Contract Effect, S210000000 GHz         (00215.7 FM Aug 20.2 K           Freg 5.2100000000 GHz         Center Freg, S210000000 GHz         Radio Std: None F           Atten: 20 dB         Trig: Free Run         AvgiHald: 50 kD           BFGainLinw         Trig: Free Run         AvgiHald: 50 kD									
	Ref Offset 14.3 dB Mkr1 5.24783 GHz 3/div Ref 30.00 dBm 6.9909 dBm										
Center Free 5.210000000 GH	1		unannan	1900000,794a-m. <sup>0</sup> /2	manne	-	W. m.l.etn		-		
						1				1	
	Tutor					-			-	when	
	n 100 MHz	Ena						-	244	ter 5.21	
CF Step 10.000000 MH	eep 1 ms		_	IHz	SW 2.4 N	#V				BW 82	
Auto Mar		2 dBm	26.	ower	Total P	Ηz	pled Bandwidth 75.665 MHz				
0 H	- 6	9.00 % 5.00 dB					nsmit Freq Error 145.03 kHz 8 Bandwidth 82.25 MHz				

## FCC\_802.11ac\_80MHz\_Main\_5290MHz



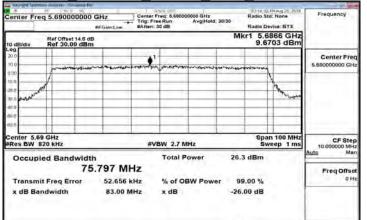
## FCC\_802.11ac\_80MHz\_Main\_5530MHz

Center Fre	er se o co ter Freg 5,530000000 GHz ter Freg 5,530000000 GHz trig Free Run AvgiHold: 5080 mFGain_trw #Atten: 30 dB Radio Device BTS										
10 dB/div	Ref Offset Ref 30.0		_				_				
20.0	inverse		Harmon	water water	manutan			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		Center Freq 5.53000000 GHz	
-10.0 -20.0	J.		1						X		
30.0 <b>30.0</b>		-			-		_	-	Marin		
-50.0		-			-		_	-			
Center 5.5 #Res BW 8				#VI	BW 2.7 M	IHz			an 100 MHz weep 1 ms	CF Step 10.000000 MHz	
Occupi	led Band		66 MH	łz	Total P	ower	25	6 dBm		Auto Man Freg Offset	
	it Freq En ndwidth	ror	101.10 k 82.98 M		% of Of x dB	BW Powe		9.00 % 5.00 dB		0 Hz	
eino i								05			

#### FCC 802.11ac 80MHz Main 5610MHz

Frequency	1: None	R error Freq 5.610000000 GHz Center Freq 5.61000000 GHz Radio Stet: Non #FGalin.Low #Attan: 30 dB Radio Center Freq 5.000000 GHz Radio Stet: Non #FGalin.Low #Attan: 30 dB Radio Center Freq 5.000000 GHz Radio Stet: Non #Galin.Low #Attan: 30 dB Radio Center Freq 5.000000 GHz Radio Stet: Non										
		Ref Offset 14.3 dB dB/div Ref 30.00 dBm										
Center Fre 5.610000000 GH		-	Achine	and the second	M. A. Prater	Janan-Inge-eury	March 2 lorde	and a second				
		- and							1	-		
	the share					_	-			and all and a second		
					-	_	-					
										er 5.61		
CF Ste 10.000000 MH	n 100 MHz eep 1 ms		_	Hz	W 2.4 M	#VE				BW 82		
Auto Ma		dBm	25.1	ower	Total P	17	47 MH	cupled Bandwidth 75.647 M				
Freq Offse 0 H		99.00 %			It Freq Error 36.754 kHz % of OBW Power							
		00 dB	-26.		x dB	Hz	83.38 M		width	B Ban		

## FCC\_802.11ac\_80MHz\_Main\_5690MHz



## FCC\_802.11ac\_80MHz\_Main\_5775MHz

Available Contract Contract President Contract Diversion of the Contract Co	W					324						
Center Freg 5.775000000	enter Freg 5.775000000 GHz Center Freg 5.775000000 GHz Radio Std: None Trig: Free Run AvgiHold: 50/50 Radio Device: BTS											
Ref Offset 14.3 d 10 dB/div Ref 30.00 dBr	25 GHz 80 dBm											
20.0						Center Free 5.775000000 GH						
0.00 <b>x</b> i.t. <b>t.t.t</b> AA	An an an all All Industrial Started	ster patricks the table to	northeritych	Asakie .	_							
20.0 30.0 46.0		-			the aller							
-50 0						1						
Center 5.775 GHz Res BW 100 kHz		VBW 300 kHz			100 MHz 9.6 ms	CF Step 10.000000 MH						
Occupied Bandwidt		Total Power	26.6	dBm		Auto Man						
	5.504 MHz	Sec. Sec. 1	10			Freq Offsel						
Transmit Freq Error x dB Bandwidth	107.83 kHz 75.21 MHz	% of OBW Pow x dB		.00 % 00 dB								
170			10110									

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# 99% BW to prove that all signals in band I is no over band U-NII-1 802.11a 5240MHz

Frequency	I: None	R priter Freq 5.240000000 GHz Center Freq 5.24000000 GHz Center Freq 5.24000000 GHz August 20000000 GHz August 20000000 GHz August 20000000 GHz August 20000000 GHz August 2000000 GHz August 2000000 GHz August 20000000 GHz August 2000000  GHz August 2000000 GHz August 20000000  GHz August 20000000  GHz August 20000000  GHZ August 20000000 GHZ August 2000									
	334 GHz 83 dBm		Mkr	_	Ref Offset 14.3 dB B/div Ref 30.00 dBm						
Center Free 5.240000000 GH;		and the second		trongt a character	j.cliberry.co.ina		ayar ta card		ware ward	•g 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	
	and marker and									0.0 0.0 8 0 0 0 0 0	
CF Step 3.000000 MH	n 30 MHz eep 1 ms			r	W 1 MH	#VE				enter 5.24 Res BW 30	
Auto Mar Freq Offse		dBm	22.5	ower	Total P	Ηz	ccupled Bandwidth 16.679 MHz				
0 H		.00 % 00 dB		W Power	% of OE x dB		72.236 k 16.34 M	r	Freq Erro dwidth	Transmit x dB Ban	

## 802.11n\_20MHz\_5240MHz

R I	er 190 0 00 eq 5.24000000	00 GHz	Center Freq: 5.2400 Frig: Free Run Atten: 30 dB	AvgiHold: 50/	Radio St	PH Aug 20, 2039 d: None evice: BTS	Frequency
10 dB/div	Ref Offset 14,3 Ref 30.00 dE				892 GHz 601 dBm		
20.0		erens to the more realist	and when	monterrest			Center Free 5.240000000 GH
-10.00 -10.0 -20.0	manum				form	-	
-46 0 -80 0 -60 0							
Center 5.2 #Res BW			#VBW 1 M	Hz		an 30 MHz Veep 1 ms	CF Step 3.000000 MH
Occup	ied Bandwid	th 7.843 MHz	Total I	Power	23.0 dBm		Auto Mar Freq Offsel
	it Freq Error Indwidth	62.991 kH 17.54 MH		BW Power	99.00 % -6.00 dB		0 Hz
(initial)					#7#705		

## 802.11n\_40MHz\_5230MHz

Frequency	d: None vice: BTS	Radio Sto	50/60	AvgiHold	req: 5,23000 e Run 0 dB	Center F	enter Freg 5.230000000 GHz							
	Ref Offset 14.3 dB Mkr1 5.24806 GHz 0 dB/div Ref 30.00 dBm 4.6395 dBm													
Center Freq 5.230000000 GHz		met 1	-	mmm	mound	www.		protection to the matter of						
-	5	1	-		-				1					
	New									Munda				
						_		-						
CF Step 5.000000 MHz	an 50 MHz eep 1 ms			z	SW 1 MH	#VI				ter 5.23 s BW 3				
Auto Man		dBm	27.1	ower	Total P		upled Bandwidth							
Freq Offset			60			100	36.123 MH							
		-6.00 dB						or						
0 Hz		00 % 00 dB		Power	BW									

## 802.11n\_80MHz\_5210MHz

	Agegnt Spathaer Anagze - Occased BW R. Mr. 199 G. DC												
Frequency	None	enter Freg 5.210000000 GHz Trig Freg 5.210000000 GHz Trig Freg 7.210000000 GHz Radio Std: None Radio Std: None Radio Std: None Radio Std: None Radio Std: None Radio Std: Std: None											
	Ref 0ffset 14.3 dB Mkr1 5.24783 GHz dB/div Ref 30.00 dBm 0.97046 dBm												
Center Free 5.210000000 GH		ament	uman	er)niwajiwawe	phanana	Marine Marine	neterhaneterh	water	quara				
	and the second								/	malteral			
CF Step 10.000000 MH	100 MHz 1.067 ms			z	SW 1 MH	#VE		-		ter 5.21 G s BW 300			
Auto Mai		dBm	25.1	ower	Total P	47	58 MI		Band	ccupied			
Freq Offse 0 H		9.00 % 00 dB		BW Powe	% of OF x dB	Hz	168.32 ) 76.38 M			ransmit F dB Band			
	-	_	=7×10										

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# 99% BW to prove that all signals in band I is no over band U-NII-3 802.11a 5745MHz

Center Fre	ng 5.745000000	GHz MFGelmLow	Center		AvgiHold	60/60	Radio S	td: None	Frequency
10 dB/div	Ref Offset 14.3 di Ref 30.00 dBn				3656 GHz 150 dBm				
200 200 0.00 0.00	1	and the second	ىغى ئەتەرىپىنى مەن			wind		martin share	Center Fred 5.745000000 GH;
30.0. 48 B	male and a filler of the			-				and a strange	
en o conter 5.7	45 GHz						Si	oan 30 MHz	
Res BW			#\	BW 1 MH	z			weep 1 ms	CF Step 3.000000 MH
Occupi	led Bandwidt 16	17	Total P	ower	26.	7 dBm		Langes .	
Transm	it Freq Error	Hz % of OBW Power			r 91	9.00 %		Freq Offse 0 H:	
x dB Ba	ndwidth	16.40 M	Hz	x dB		-6	.00 dB		

## 802.11n\_20MHz\_5745MHz

R R	iq 5.74500	0000 G		Center Trig: F	Center Freq: 5,745000000 GHz Trig: Free Run AvgiHold: 50/50 #Atten: 30 dB				M Aug 20, 2029 f: None	Frequency
10 dB/div	Ref Offset 14.3 dB Mkr1 5.736 GHz dB/div Ref 30.00 dBm 2.0405 dBm									
200 10.0						money	manteria			Center Fred 5.745000000 GHz
0.00 -10.0 -20.0 mwwww	- margan			-			-	magnes		
-30,0	-				-			-		
-60.0										
Center 5.7 #Res BW		-		#	BW 1 MH	z		Spa Sw	eep 1 ms	CF Step 3.000000 MH
Occup	led Band				Total P	ower	27.1	dBm		Auto Mar
12.100	17.994 MHz				5.45		6 12			Freq Offsel
	it Freq Err ndwidth	or	65.662 ) 17.58 N		% of O x dB	BW Power		00 % 00 dB		
(International International I								_		

## 802.11n\_40MHz\_5755MHz

Frequency	evice: BTS	Radio St	50/50	AvgiHold	eq: 5,75500 Run				.75500	Ref Offset 14.3 dB							
		Ref Offset 14.3 dB Mkr1 5.73693 GHz 0 dB/div Ref 30.00 dBm 3.9471 dBm															
Center Fre 5.755000000 GH	1 1 1	mm	Ammer.	www.	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	mon	www.	war war	+ iner								
									1	. All							
	- mar		-							and for the second							
CF Ste	an 50 MHz Veep 1 ms			z	W 1 MH	#VE				ter 5.755 G s BW 300 I							
Auto Ma		1 dBm	27.	ower	Total P		pled Bandwidth										
Freq Offse		36.134 MHz ansmit Freq Error 77.976 kHz % of OBW Power 99.00 %						36.134 MHz Ismit Freg Error 77.976 kH									
	m. 13	9.00 %		SW Powe	x dB		36.31 M	or	1.1.1	dB Bandw							

## 802.11n\_80MHz\_5775MHz

Keynomi Spectromi Analyzer - Occeloned By	γ.	and the second sec			
R ar 200 00 Center Freg 5.775000000	Trig:	Free Run AvgiHold: 5 n: 30 dB	Radio St	ritoe: BTS	Frequency
Ref Offset 14.3 d Ref 30.00 dBn					
	and a second strate to the association	with the with any resolution	and a second and and and		Center Freq 5.775000000 GHz
200				an Marine	
40.0 MAA				"New?	
Center 5.775 GHz Res BW 300 kHz		VBW 1 MHz		n 100 MHz 1.067 ms	CF Step 10.000000 MHz
Occupied Bandwidt	h	Total Power	25.7 dBm		Auto Man
75	5.515 MHz				Freq Offset
Transmit Freq Error x dB Bandwidth	97.195 kHz 76.15 MHz	% of OBW Power x dB	99.00 % -6.00 dB		0 Hz
iio)			-7*102		

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#### For 99%,

IC 802.11a 20MHz Main 5180MHz Radio Std: None enter Freq 5.180000000 GHz Center Freq: 5.18 Trig: Free Run AvgiHold: 50/50 Ref Offset 14.3 a Ref 30.00 dB Center Free enter 5.18 GHz Res BW 300 kHz Span 30 MHz Sweep 1 ms CF Step #VBW 1 MHz 27.1 dBm Occupied Bandwidth Total Power 16.755 MHz Freq Offse 0 H Transmit Freq Error 69.768 kHz % of OBW Power 99.00 % dB Bandwidth 16.30 MHz x dB -6.00 dB

#### IC\_802.11a\_20MHz\_Main\_5220MHz



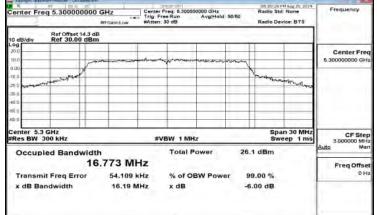
## IC\_802.11a\_20MHz\_Main\_5240MHz

Center Fre	eg 5.24000	0000	GHz MFGalmLnw	Center Trig: F	Freq: 5.24000 ree Run : 30 dB	0000 GHz AvgiHold: 60		Radio S Radio D	td: None	Frequency
10 dB/div	Ref Offset Ref 30.00						Mkr		1834 GHz 783 dBm	
200 100					a gribman	-		<u></u>		Center Free 5.240000000 GH
	and and and the second	1	-	1	-			man	Change and the state	
30.0					-		-	-	~~~~	
Genter 5.2	LI CHY								an 30 MHz	1
Res BW				#	VBW 1 MH	z			weep 1 ms	CF Step 3.000000 MHz Auto Man
Occup	led Band		679 MI	Ηz	Total P	ower	22.5	5 dBm		Freq Offset
	it Freq Err	or	72.236 I 16.34 N		% of OE x dB	BW Power		9.00 % .00 dB		0 Hz
80							17810			

## IC\_802.11a\_20MHz\_Main\_5260MHz

								DIRC STW	eyzer - Occide	States and states of	CONT. Spielton	- 5AU
Frequency	Contra 1	Radio Std	60	gHz vgHold: 50/			Z Saliti Linw	000 GH	260000	rq 5.2	er Fre	lent
		_					_		Offset 1 f 30.00		/div	10 dE
Center Fm 5.260000000 Gi			~	-		iterit.	Cashidadaa	min				200 100
	-	×	1					1	100			0.00
	man	- Marine			_			_	law	A	man	20.0
		-				_		-	-	-	-	30,0
			-		-	_		+	-	1	-	46.0
		-	-					-				ED.0
CF Sto 3.000000 M	o 30 MHz ep 1 ms				V 1 MHz	#VE		-			er 5.20 BW 3	
Auto M		5 dBm	26.5	er	Total Po			vidth	Bandy	led E	ccupi	0
Freq Offse 0 H	1					z	51 MH					
		9.00 %	99	Power	of OB	Hz	77.807 H	r	eq Erro	it Fre	ansmi	T
					dB		16.28 M		dth			

#### IC\_802.11a\_20MHz\_Main\_5300MHz



## IC\_802.11a\_20MHz\_Main\_5320MHz

Center Fre	g 5.32000		Hz FGalmLow	Center F	req: 5.32000 e Run 30 dB	AvgiHald	60/60	Radio Sta	vice: BTS	Frequency
10 dB/div	Ref Offset Ref 30.0									
200- 100-		Janas			Junior		-			Center Fre 5.320000000 GH
	non-manager							- waren	where a	
46 D 80 D 60 D										
Center 5.3 Res BW				#VI	BW 1 MH	z	-		an 30 MHz eep 1 ms	CF Ster 3.000000 MH
Occup	led Band		724 MI	Hz	Total P	ower	26	2 dBm		Auto Ma
	it Freq Err ndwidth		59.032   16.29 N		% of O x dB	BW Powe		9.00 % 5.00 dB		0 Hz
80							1011	05		

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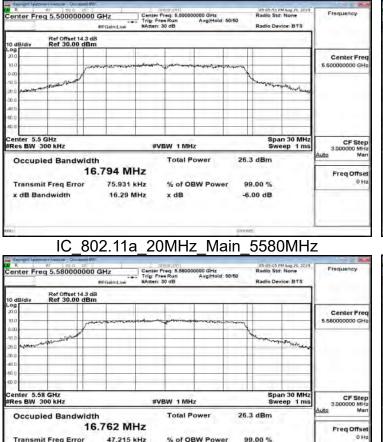
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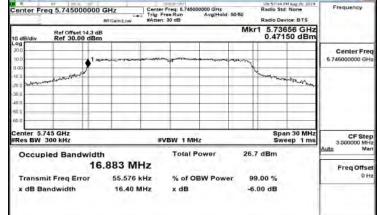
## IC\_802.11a\_20MHz\_Main\_5500MHz



## IC\_802.11a\_20MHz\_Main\_5720MHz

Keynight Samon	un inaver Go					No. AT			-	PHAng 25 Jp19	Frequency
Center Fre	q 5.72000		00 G	Hz FGaireLow	Center F	eq: 5.72000	Avg Hold	30/30	Radio St		Frequency
10 dB/div	Ref Offset Ref 30.0							-			
20.0 10.0			14140	*****			ulturano co				
100 200	www.www.www.	ľ								waterwater	
40.0											
Center 5.7 #Res BW 3			_		#VE	SW 1 MH	z			an 30 MHz Jeep 1 ms	CF Ste 3.000000 MH
Occupi	ed Band			771 MI	Hz	Total P	ower	26.	5 dBm		Auto Ma
	it Freq Err ndwidth	or		67.465 ) 16.28 N		% of OI x dB	BW Powe	U 2	9.00 % .00 dB		Freq Offset 0 Hz
495								stat	4)		

## IC\_802.11a\_20MHz\_Main\_5745MHz



5785MHz

## IC\_802.11a\_20MHz\_Main\_5700MHz

-6.00 dB

x dB

16.28 MHz

Swampitt Space	An 20 G	NORE BYWY		313330			Co.abizz	PH Aug 20, 2019	Frequency		
Center Fre	g 5.700000	000 GHz MFGalmL	Trig: F	Freq: 6,7000 Free Run 1: 30 dB	AvgiHold	60/60	Radio Sta		Frequency		
10 dB/div	Ref Offset 14 Ref 30.00							0			
200		-				m			Center Free 5.700000000 GH		
0.00 -10.0 -20.0	and the second state of the	1			-		have	method and a start			
30.0											
80.0				-							
Center 5.7 Res BW 3			#	VBW 1 M	Hz			an 30 MHz eep 1 ms	CF Step 3.000000 MH		
Occup	led Bandw	idth 16.778	1 A/-HET 6/11 P				.8 dBm		Auto Mar		
	it Freq Erro ndwidth	r 62.8	168 kHz 26 MHz	% of C x dB	BW Powe		99.00 % 5.00 dB		Freq Offset 0 Hz		
(RO)						19.83	0.5				

#### Radio Std: None enter Freq 5.785000000 GHz Frequency Center Freq: 5,78500 Trig: Free Run #Atten: 30 dB AvgiHald: 50/50 Radio Device: BTS Ref Offset 14.3 a Center Free nter 5.785 GHz es BW 300 kHz Span 30 MH Sweep 1 m CF Ste 3.000000 MH #VBW 1 MHz Occupied Bandwidth **Total Power** 27.1 dBm 16.834 MHz Freq Offs % of OBW Pov 77.420 kHz 99.00 % 0H Transmit Freq Error x dB dB Bandwidth 16.21 MHz -6.00 dB

IC 802.11a 20MHz Main

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x dB Bandwidth

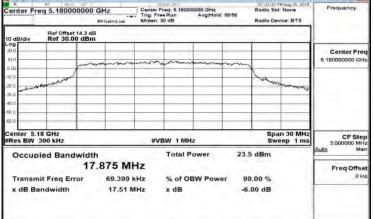
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## IC 802.11a 20MHz Main 5825MHz

Center Fre	eq 5.82500000	Trig	er Freq: 5,8250000 Free Run n: 30 dB	00 GHz AvgiHold: 50/50	Radio St	PMAng 20, 2019 d: None wice: BTS	Frequency
10 dB/div	Ref Offset 14.3 d Ref 30.00 dBi				- 0		
200 100 0.00		Canadra in Cranangardin					Center Freq 5.825000000 GHz
-10.0	work				1 m	more	
-46 0 -60 0							
Center 5.8 #Res BW			VBW 1 MHz			an 30 MHz eep 1 ms	CF Step 3.000000 MHz
Occup	ied Bandwid	th 6.804 MHz	Total Po	wer 2	27.1 dBm		Auto Man Freq Offset
	it Freq Error andwidth	52.760 kHz 16.33 MHz	% of OB x dB	W Power	99.00 % -6.00 dB		0 Hz
ANIRO					FRINS		



## IC 802.11n 20MHz Main 5220MHz

Columned BW/							Frequency		
00000 GHz	Center Trig: F	Freq: 5.22000		60/60	Radio St	d: None	Frequency		
			o .			()			
							Center Fred		
1	Anteranter	A for the second		and a start of the	La		-		
		-				And ala faith			
		-		-	-				
	#	VBW 1 MH	z				CF Step 3.000000 MHz Auto Man		
	ML	Total P	ower	23.	2 dBm				
		% of O	BW Powe	er 91	9.00 %		Freq Offset 0 Hz		
17.	56 MHz	x dB		-6	8b 00.				
				=7810					
	dwidth 17.866 rror 65.2	dwidth 17.866 MHz		a de control         Cardenilio           000000000000000000000000000000000000	000000 GHz         Center Fred: 5.20000000 dHz           NFGelnzine         Trig Fred Run         AvgiHold: 5080           NFGelnzine         Trig Fred Run         AvgiHold: 5080           strate: 30 dB         Strate: 30 dB           strat	Constrained by the second seco	Constrained by the second		

Frequency	None	Radio Std Radio Dev	Hz Hold: 50/50		Center	GHz MFGainLow	240000000	nter Fred	
	92 GHz 01 dBm						of Offset 14.3 dB	dB/div	
Center Fre								0	
0,240000000 01)		me :	man	with the second with	manna	- and the man	Å	o	
	- ANN	anter and	-		-	-	man Star	Aprentication	
								6 <b></b>	
								0 0	
CF Ste	n 30 MHz ep 1 ms			W 1 MHz	#V			nter 5.24 es BW 30	
Auto Ma		23.0 dBm	6 (	Total Powe		i	Bandwidth	Occupie	
Freq Offse					Hz	843 M	17.843 N		
ÓН		99.00 %	ower	% of OBW	kHz	62.991	eq Error	Transmit	
		-6.00 dB		x dB	MHz	17.54 1	vidth	dB Ban	

IC 802.11n 20MHz Main 5240MHz

#### IC 802.11n 20MHz Main 5260MHz



## IC 802.11n 20MHz Main 5300MHz

Center Freq	5.30000		Hz FGaliniLnw	Center	Freq: 5.3000 ree Run 30 dB	AvgiHold	50/50	Radio Ste	PM Aug 20, 2019 d: None wice: BTS	Frequency
10 dB/div	Ref Offset Ref 30.0			_						
200		unnor								Center Free 5.300000000 GH
0.00	- A	1						hue		
10.0 20.0 manuta	A MARCAN MARCH								muhanda	
30.0						_				
46.0	-	-		_	-			-	_	
en o			-		-				-	
6D.0			1		-		_	1		
Center 5.3 C #Res BW 30				#V	/BW 1 MH	lz			an 30 MHz eep 1 ms	CF Step 3.000000 MH
Occupie	d Band	width			Total F	ower	27.	4 dBm		Auto Mar
101000.0		17.9	36 MH	Ηz						Freq Offse
Transmit	Freg Err	or	57.009	Hz	% of O	BW Powe	r 91	9.00 %		0 H
x dB Ban			17.54 N	Hz	x dB		-6	00 dB		
(R)							=7810			-

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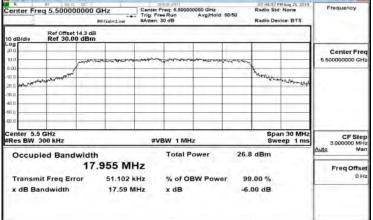
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## IC\_802.11n\_20MHz\_Main\_5320MHz

R	er iso a q 5.320000	000 GH		Center Freq: 6 320900000 GHz Trig: Free Run AvgiHald: 50/60 #Atten: 30 dB				Radio St	PH Aug 20, 2029 d: None tvice: BTS	Frequency		
10 dB/div	Ref Offset 1- Ref 30.00								0			
200					-	minana				Center Freq 5.32000000 GHz		
0.00	1							14.0		-		
20.0	www.							-with	the mapping			
30.0				_								
46.0					-				_			
en n	-	_		_	-		_	-				
60.0		-	-		-							
Center 5.33 #Res BW 3				#VE	SW 1 MH	z	-		an 30 MHz leep 1 ms	CF Step 3.000000 MH		
Occupi	ed Bandw	ldth		-	Total P	ower	27.0	dBm		Auto Mar		
occupi	cu banu.		75 MH	,					1.11			
Transmi	t Freg Erro		47.643 kH			SW Powe		9.00 %		Freq Offsel		
x dB Ba			17.55 MH		100.00	Svv Fowe		00 dB	- 13			
X OB Ba	ndwidth		17.55 MH	Z	x dB		-0.	00 08				
							=0.810					

## IC\_802.11n\_20MHz\_Main\_5500MHz



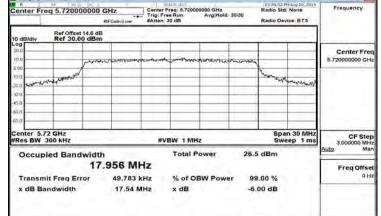
## IC\_802.11n\_20MHz\_Main\_5580MHz

				11-22-23/17			07:50:54	PH Aug 20, 2019	Frequency.	
	0000 G		Trig: Fn	Run		50/60	Radio St	d: None	Frequency	
								()		
	in		-	-	and the second second	the street				
mont				1			Lan	Madman		
		-		-					5.580000000 GH	
		-	-	-						
8 6 87							Sn	an 30 MHz		
300 kHz			#V	BW 1 MH	z				CF Step 3.000000 MH	
led Band		980 MH	17	Total F	ower	27.	0 dBm			
1		50.787 k	Hz		BW Powe				Freq Offset 0 Hz	
ndwidth		17.47 M	Hz	x dB		-6	8b 00.			
	Ref 30.0 Ref 30.0 8 GHz 30 GHz 10 KHz Red Band 1t Freq Ern	Ref 30.00 dBm Ref 30.00 dBm Mef 30.00 dBm Me	er = 0 to to the second	Ref 30.00 dBm Ref 30.00 dBm set office frager set office frager se	er of so of the solution of th	er o oc o	er of set of the set o	reg 5.580000000 GHz reg 5.580000000 GHz reg 5.580000000 GHz reg 5.580000000 GHz reg 5.580000000 GHz reg 5.58000000 GHz Red 508 Red	error Bright State and Sta	

Frequency		Radio Std Radio Dev	50/50	AvgiHold	req: 5.70000 e Run 10 dB	Center	Hz FGalmLow	0000 G	5.70000		ent
	- 1								Ref Offset Ref 30.0	B/div	
Center Fre 5.700000000 GH			rearent	www.	m		-	-			.00 200
	mansp	making							wooders	1.000	0.00
			_		-	-	-			And a state	20.0 30.0
	_		-			-	-	_			40.0
	n 30 MHz	Sna	-			1			HZ	ter 5.7 G	so.g
CF Ste 3.000000 MH	eep 1 ms		_	z	BW 1 MH	#1	_			s BW 30	
Auto Ma		0 dBm	27.0	ower	Total P	Hz	965 M		ccupied Bandwidth		
Freq Offse 0 H		9.00 %	r 99	W Powe	% of Of		67.048		Freq Err	ransmit	т
		.00 dB	-6.		x dB	AHz	17.44 1		dwidth	dB Ban	×

IC 802.11n 20MHz Main 5700MHz

## IC\_802.11n\_20MHz\_Main\_5720MHz



#### IC 802.11n 20MHz Main 5745MHz

Center Fre	g 5.74500		Trig	Freq: 5,74500 Free Run n: 30 dB	0000 GHz AvgiHold: 6	6/60	Radio Std: Radio Dev		Frequency
10 dB/div									
200		1 atmand		a.,a	mana	w.w.			Center Fre 5.745000000 GH
0.00	1	1					A.		
10.0 20.0 mm/sauff	- wind			-			- Anterior		
									1.0
-30.0									
-80.0									
-60.0									
10									
Center 5.7 #Res BW			4	VBW 1 MH	z			ep 1 ms	CF Step 3.000000 MH
Occup	led Band	width		Total P	ower	27.1	dBm		Auto Ma
occup	ou build		994 MHz						1000000
12.10				11.14		1.1.2	1.00		Freq Offse
	Transmit Freq Error		65.662 kHz	% of OF	3W Power		.00 %		
x dB Ba	x dB Bandwidth 17.58 MH		17.58 MHz	x dB -			00 dB		
COR						=7×105			

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enter 5.825 GHz Res BW 300 kHz

**Occupied Bandwidth** 

Transmit Freg Error

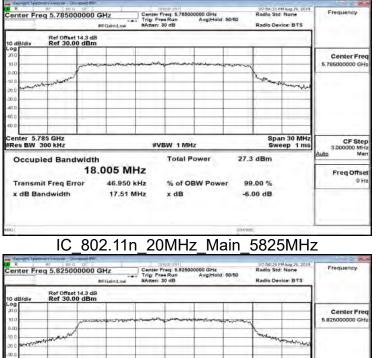
k dB Bandwidth

17.944 MHz

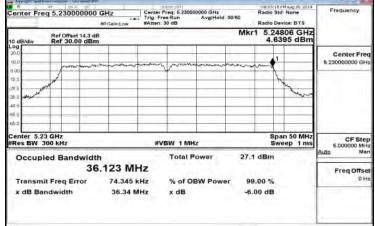
41 473 kHz

17.54 MHz

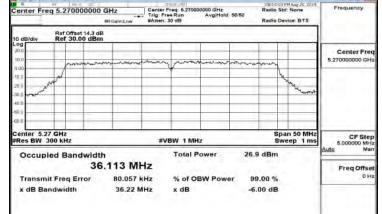
## IC\_802.11n\_20MHz\_Main\_5785MHz



## IC\_802.11n\_40MHz\_Main\_5230MHz



## IC\_802.11n\_40MHz\_Main\_5270MHz



IC 802.11n 40MHz Main 5310MHz

## IC\_802.11n\_40MHz\_Main\_5190MHz

TVBW 1 MH2

x dB

**Total Power** 

% of OBW Power

Span 30 MHz Sweep 1 ms

26.9 dBm

99.00 %

-6.00 dB

CF Step 3.000000 MH

Freq Offs

0 H

Everyont Space	er so			1.00	1-2 -397			Insuran	10 PH Aug 20, 2019		
Center Fre		Center Fre	Center Freq: 5.19000000 GHz			Radio	Std: None Device: BTS	Frequency			
Ref Offset 14.3 dB 10 dB/div Ref 30.00 dBm Log											
200 100	~	-	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	mony	mone	a man	man	~~~~		Center Freq 5.190000000 GHz	
-10.0	N -								Lun		
-30.0								-			
-60.0 Center 5.1							_		span 50 MHz	CF Step	
WRes BW	ied Band	width		#VE	#VBW 1 MHz Total Power 27				Sweep 1ms	5.000000 MHz Auto Man	
36.107 MH: Transmit Freq Error 83.667 kH			100	tz % of OBW Power			99.00 %		Freq Offset		
x dB Bandwidth 36.22 M			6.00 dE								
(Celler)							stre-	102			

#### Radio Std: None enter Freq 5.310000000 GHz Frequency Center Freq. 5.310000 Trig: Free Run AvgiHold: 50/60 Radio Device: BTS Ref Offset 14.3 c Ref 30.00 dBi Center Free 5 310000000 G Span 50 MH ter 5.31 GHz s BW 300 kHz CF Step 5.000000 MH #VBW 1 MH Occupied Bandwidth Total Power 26.9 dBm 36.115 MHz Freq Offse 55.345 kHz 0 Hz Transmit Freq Error % of OBW Pow 99.00 % -6.00 dB 36.25 MHz dB Bandwidth x dB

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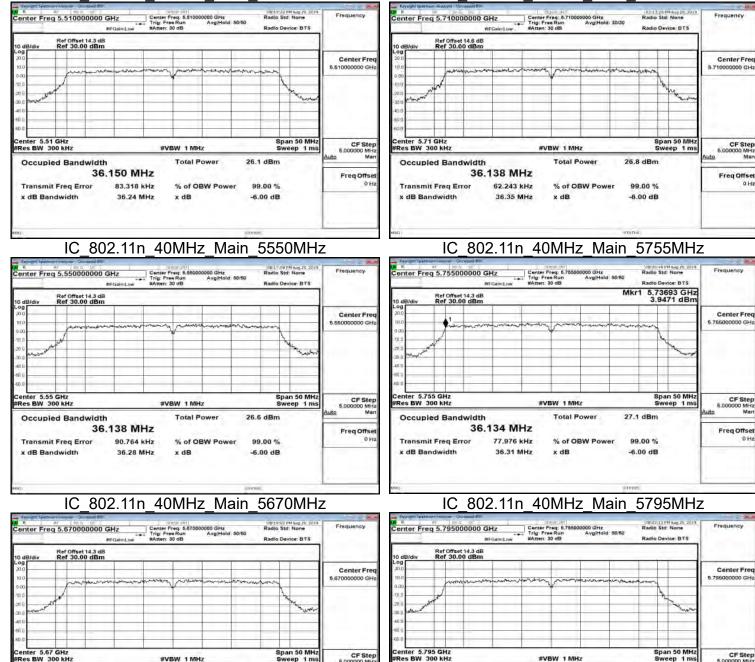
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IC 802.11n 40MHz Main 5710MHz

## IC 802.11n 40MHz Main 5510MHz



Center Freg 5.670000000 GHz			Center Free Run AvgiHald: 50/50 Trig: Free Run AvgiHald: 50/50 #Atten: 30 dB			evice: BTS	Frequency
10 dB/div	Ref Offset 14.3 Ref 30.00 dB						
20.0 10.0	man	umanan	my man	manun	mann		Center Freq 5,67000000 GHz
-10.0		-	Ť			Mr.	
-30.0 -40.0			-			- Augusta	
-60.0							
Center 5.6 #Res BW 3			#VBW 1 M	Hz		an 50 MHz veep 1 ms	CF Step 5.000000 MHz <u>Auto</u> Man
Occup	led Bandwid	ith 6.144 MHz	Total	Power	26.6 dBm		
Transmit Freq Error 79.732 k		79.732 kHz 36.27 MHz	% of C x dB	BW Power	99.00 % -6.00 dB		Freq Offset 0 Hz
NIK) I					#1010g		

Center Fre	Frequency					
10 dB/div						
200	www.	manner	~ ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Manana		Center Free 5.796000000 GH
9.00 -10.0 -70.0	ma		¥.	1	~	1
-20.0 -30.0					Low	
-80 () -60 ()						
Center 5.7 #Res BW		#	VBW 1 MHz		an 50 MHz eep 1 ms	5.000000 MHz Auto Man
Occup	led Bandwidt	h 5.101 MHz	Total Power	27.0 dBm		
Transmit Freq Error 88.699 kHz			% of OBW Power	99.00 %		Freq Offse 0 Hi
x dB Bandwidth		36.29 MHz	x dB	-6.00 dB		
(CALA)				14105		

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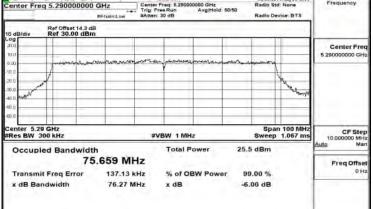
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## IC\_802.11ac\_80MHz\_Main\_5210MHz

R		DC .			152:510	trans alterna			H Aug 20, 2019	Frequency	
Center Fred	5.210000		Gaintow			AvgiHold	60/60	Radio Std		requency	
10 dB/div											
200		works the second star		Human	an many secon		contract	1	Center Free 5.210000000 GH		
10.0 20.0 30.0 40.0	/				V				and the second		
60.0											
Center 5.21 #Res BW 30		uldth		#V	BW 1 MH	-	25.5		100 MHz 1.067 ms	CF Step 10.000000 MHz Auto Man	
b un		75.6	58 MH							Freq Offse	
Transmit Freq Error 168.32 kł x dB Bandwidth 76.38 Mł							9.00 % 00 dB				
80					-			-	_		
	IC_	802	.11a	c_8	ЭМН	z_M	ain_	529	0MH	Z	
R R	5.290000		1. I.		red: 5.29000	0000 GHz		Radio Std	M Aug 20, 2019	Frequency	

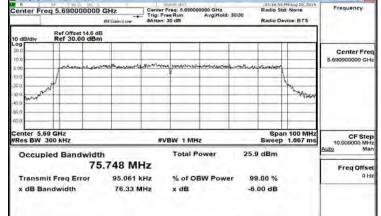


## IC\_802.11ac\_80MHz\_Main\_5530MHz

Expedit Spectrum Analyzer - Occupied SW					
Center Freq 5.530000000 (	Trig I	r Freq: 5.530000000 GHz Free Run AvgiHold 1: 30 dB	60/60 F	tedio Std: None Radio Device: BTS	Frequency
Ref Offset 14.3 dB 10 dB/div Ref 30.00 dBm					
20.0	more we down	may prove the many second	Aurothenhauppenses	ndurla	Center Freq 5.530000000 GHz
10.0 20.0 30.0 40.0 Million Andrews		¥.		hand	
46.0					
Center 5.53 GHz #Res BW 300 kHz	#	VBW 1 MHz		Span 100 MH Weep 1.067 m	s 10.000000 MH
Occupied Bandwidth 75.	583 MHz	Total Power	25.2 0	IBm	Auto Man
Transmit Freq Error 65.825 kH x dB Bandwidth 76.34 MH		% of OBW Powe x dB	er 99.0 -6.00		0 Hz
eag.)			=7#105		

#### IC 802.11ac 80MHz Main 5610MHz ter Freq 5.61000000 GHz Center Freq: 5,610 Radio Device: BTS Ref Offset 14.3 dB Ref 30.00 dBm Center Fre enter 5.61 GHz Res BW 300 kHz Span 100 MH Sweep 1.067 ms CF Step 10.000000 MH #VBW 1 MHz Occupied Bandwidth Total Power 25.2 dBm 75.559 MHz Freq Offse Transmit Freg Error 60,500 kHz % of OBW Power 99.00 % 76.14 MHz x dB Bandwidth x dB -6.00 dB

## IC\_802.11ac\_80MHz\_Main\_5690MHz



#### IC\_802.11ac\_80MHz\_Main\_5775MHz

Frequency.	(cene	adio Std	0/60	AvgiHold		Center F	Hz Galintaw	00000 GI		
Center Freq 5.775000000 GHz	Ref Offset 14.3 dB Mkr1 5.73724 GHz 10 dB/div Ref 30.00 dBm -0.32115 dBm									
				-	Analitan	manthematic	ANALL IN AU		•1	
		- A			-				A	_
	Winni					-		-		NA State
CF Step 10.000000 MH3 Auto Mar	100 MHz 1.067 ms			z	W 1 MH	#VI				ter 5.77 s BW 30
		Bm	25.7	Total Power 25.					d Band	ccupie
Freq Offse							515 Mł			
			99.0 -6.0	3W Powe	% of Of x dB		97.195 ) 76.15 N		Transmit Freq Error x dB Bandwidth	
			14105							

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#### MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT 9

## 9.1 Standard Applicable

#### FCC

OPERZTION Band	EUT CATEGORY	LIMIT
U-NII-1	Access Point (Mater device )	1 Watt(30dBm)
	Fixed point-to-point Acess Ponit	1 Watt(30dBm)
	 Mobile and portable clinet device	250mW(23.98dBm)
U-NII-2A		250mW(23.98dBm) or 11dBm+10 log B
U-NII-2C		250mW(23.98dBm) or 11dBm+10 log B
U-NII-3		1 Watt(30dBm)

IC

OPERZTION FREQUENCY BAND	LIMIT
5150~5250 MHz	EIRP shall not exceed 200 mW or 10 + 10 log10B, dBm
5250~5350 MHz	Conducted output power shall not exceed 250 mW or 11 +10 log10B EIRP shall not exceed 1.0 W or 17 + 10 log10B, dBm
5470-5600 MHz and	Conducted output power shall not exceed 250 mW or 11 +10 log10 B
5650-5725 MHz	EIRP shall not exceed 1.0 W or 17 + 10 log10B, dBm
5725~5850 MHz	Conducted output power shall not exceed 1 W

If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the Maximum Power Spectral Density shall be reduced by the amount in dB that the direction-al gain of the antenna exceeds 6 dBi.

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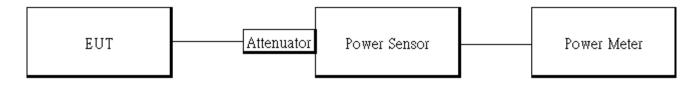
## 9.2 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter
- 4. Power Meter is used as the auxiliary test equipment to conduct the output power measurement.
- 5. Record the max. reading and add 10 log(1/duty cycle).
- 6. Repeat above procedures until all frequency (low, middle, and high channel) measured were complete.

	Conducted Room											
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.							
Power Meter	Anritsu	ML2496A	1242004	10/23/2018	10/22/2019							
Power Sensor	Anritsu	MA2411B	1207365	10/23/2018	10/22/2019							
Power Sensor	Anritsu	MA2411B	1207368	10/24/2018	10/23/2019							
Attenuator	Marvelous	MVE2213-10	RF80	02/26/2019	02/25/2020							
DC Block	PASTERNACK	PE8210	RF256	02/26/2019	02/25/2020							
Spectrum Analyzer	Agilent	N9010A	MY53400256	11/21/2018	11/20/2019							
Thermostatic/Hrgrosatic Chamber	GWINSTEK	GTC-288MH-CC	TH160402	05/16/2019	05/15/2020							

## 9.3 Measurement Equipment Used

## 9.4 Test Set-up



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## 9.5 Measurement Result

## Conducted output power (FCC)

## 802.11a\_Ch0

СН	Frequency (MHz)	Data Rate	TOTAL POWER		REQUIRED LIMIT			RESULT
36	5180	6	(dBm) 12.76	<b>(mW)</b> 18.886		(dBm) 23.98		PASS
		-						
44	5220	6	12.54	17.953		23.98		PASS
48	5240	6	12.72	18.713		23.98		PASS
52	5260	6	16.34	43.066	23.98	or 11+10log(B) =	24.89	PASS
60	5300	6	16.31	42.769	23.98	or 11+10log(B) =	24.82	PASS
64	5320	6	16.25	42.183	23.98	or 11+10log(B) =	24.86	PASS
100	5500	6	16.42	43.867	23.98	or 11+10log(B) =	24.90	PASS
116	5580	6	16.46	44.272	23.98	or 11+10log(B) =	24.68	PASS
140	5700	6	16.48	44.477	23.98	or 11+10log(B) =	24.91	PASS
144	5720(U-NII 2C)	6	14.91	30.95	23.98	or 11+10log(B) =	24.72	PASS
144	5720 (U-NII 3)	6	10.97	12.51		30		PASS
149	5745	6	16.37	43.364		30		PASS
157	5785	6	16.39	43.565		30		PASS
165	5825	6	16.35	43.165		30		PASS

#### 802.11n\_HT20\_Ch0

СН	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)		RESULT	
36	5180	MCS0	13.59	22.861		23.98			
44	5220	MCS0	13.42	21.984		23.98			
48	5240	MCS0	13.46	22.187		23.98			
52	5260	MCS0	17.43	55.348	23.98	or 11+10log(B) =	24.92	PASS	
60	5300	MCS0	17.50	56.247	23.98	or 11+10log(B) =	25.04	PASS	
64	5320	MCS0	17.24	52.979	23.98	or 11+10log(B) =	25.16	PASS	
100	5500	MCS0	17.40	54.967	23.98	or 11+10log(B) =	24.91	PASS	
116	5580	MCS0	17.37	54.588	23.98	or 11+10log(B) =	25.22	PASS	
140	5700	MCS0	17.45	55.603	23.98	or 11+10log(B) =	25.31	PASS	
144	5720(U-NII 2C)	MCS0	15.32	34.02	23.98	or 11+10log(B) =	25.14	PASS	
144	5720 (U-NII 3)	MCS0	11.78	15.08		30		PASS	
149	5745	MCS0	17.32	53.963		30		PASS	
157	5785	MCS0	17.46	55.731		30		PASS	
165	5825	MCS0	17.39	54.840		30		PASS	

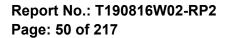
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#### 802.11n\_HT40\_Ch0

сн	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)		RESULT
38	5190	MCS0	16.45	44.197		23.98		PASS
46	5230	MCS0	16.46	44.298		23.98		
54	5270	MCS0	16.42	43.892	23.98	or 11+10log(B) =	27.17	PASS
62	5310	MCS0	16.47	44.401	23.98	or 11+10log(B) =	27.14	PASS
102	5510	MCS0	16.23	42.013	23.98	or 11+10log(B) =	27.13	PASS
110	5550	MCS0	16.49	44.605	23.98	or 11+10log(B) =	27.19	PASS
134	5670	MCS0	16.23	42.013	23.98	or 11+10log(B) =	27.20	PASS
142	5710(U-NII 2C)	MCS0	15.87	38.62	23.98	or 11+10log(B) =	27.10	PASS
142	5710 (U-NII 3)	MCS0	7.69	5.88		30		PASS
151	5755	MCS0	16.29	42.598		30		PASS
159	5795	MCS0	16.44	44.095		30		PASS

#### 802.11ac\_VHT80\_Ch0

СН	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)		
42	5210	MCS0	15.48	35.284		23.98		PASS
58	5290	MCS0	15.33	34.086	23.98	or 11+10log(B) =	30.16	PASS
106	5530	MCS0	15.49	35.365	23.98	or 11+10log(B) =	30.19	PASS
122	5610	MCS0	15.10	32.328	23.98	or 11+10log(B) =	30.21	PASS
138	5690(U-NII 2C)	MCS0	15.13	32.60	23.98	or 11+10log(B) =	30.19	PASS
138	5690 (U-NII 3)	MCS0	4.42	2.77		30		PASS
155	5775	MCS0	15.29	33.773		30		PASS

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## Conducted output power (IC)

#### 802.11a\_Ch0

СН	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)		RESULT
52	5260	16.34	43.066	23.98	or 11+10log(B) =	23.24	PASS
60	5300	16.31	42.769	23.98	or 11+10log(B) =	23.25	PASS
64	5320	16.25	42.183	23.98	or 11+10log(B) =	23.23	PASS
100	5500	16.42	43.867	23.98	or 11+10log(B) =	23.25	PASS
116	5580	16.46	44.272	23.98	or 11+10log(B) =	23.24	PASS
140	5700	16.48	44.477	23.98	or 11+10log(B) =	23.25	PASS
144	5720(U-NII 2C)	14.91	30.952	23.98	or 11+11log(B) =	23.25	PASS
144	5720 (U-NII 3)	10.97	12.512		30		PASS
149	5745	16.37	43.364	30			PASS
157	5785	16.39	43.565	30			PASS
165	5825	16.35	43.165		30		PASS

#### 802.11n\_HT20\_Ch0

СН	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)		RESULT
52	5260	17.43	55.348	23.98	or 11+10log(B) =	23.53	PASS
60	5300	17.50	56.247	23.98	or 11+10log(B) =	23.54	PASS
64	5320	17.24	52.979	23.98	or 11+10log(B) =	23.55	PASS
100	5500	17.40	54.967	23.98	or 11+10log(B) =	23.54	PASS
116	5580	17.37	54.588	23.98	or 11+10log(B) =	23.55	PASS
140	5700	17.45	55.603	23.98	or 11+10log(B) =	23.54	PASS
144	5720(U-NII 2C)	15.32	34.019	23.98	or 11+11log(B) =	23.54	PASS
144	5720 (U-NII 3)	11.78	15.083		30		PASS
149	5745	17.32	53.963		30		PASS
157	5785	17.46	55.731		30		PASS
165	5825	17.39	54.840		30		PASS

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#### 802.11n\_HT40\_Ch0

СН	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)		RESULT
54	5270	16.42	43.892	23.98	or 11+10log(B) =	26.58	PASS
62	5310	16.47	44.401	23.98	or 11+10log(B) =	26.58	PASS
102	5510	16.23	42.013	23.98	or 11+10log(B) =	26.58	PASS
110	5550	16.49	44.605	23.98	or 11+10log(B) =	26.58	PASS
134	5670	16.23	42.013	23.98	or 11+10log(B) =	26.58	PASS
142	5710(U-NII 2C)	15.87	38.625	23.98	or 11+11log(B) =	26.58	PASS
142	5710 (U-NII 3)	7.69	5.878		30		PASS
151	5755	16.29	42.598		30		PASS
159	5795	16.44	44.095		30		PASS

#### 802.11ac\_VHT80\_Ch0

СН	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)			
58	5290	15.33	34.086	23.98	or 11+10log(B) =	29.79	PASS	
106	5530	15.49	35.365	23.98	or 11+10log(B) =	29.78	PASS	
138	5690(U-NII 2C)	15.13	32.595	23.98	or 11+12log(B) =	29.79	PASS	
138	5690 (U-NII 3)	4.42	2.770		30		PASS	
155	5775	15.29	33.773		PASS			

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#### EIRP

#### 802.11a\_Ch0

СН	Frequency (MHz)	TOTAL POWER (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)		REQUIRED LIMIT (dBm)		RESULT
36	5180	12.76	2.240	15.00	31.632	23.01	or 10+10log(B)=	22.24	PASS
44	5220	12.54	2.240	14.78	30.070	23.01	or 10+10log(B)=	22.25	PASS
48	5240	12.72	2.240	14.96	31.342	23.01	or 10+10log(B)=	22.22	PASS
52	5260	16.34	2.300	18.64	73.136	30	or 17+10log(B)=	29.24	PASS
60	5300	16.31	2.300	18.61	72.633	30	or 17+10log(B)=	29.25	PASS
64	5320	16.25	2.300	18.55	71.636	30	or 17+10log(B)=	29.23	PASS
100	5500	16.42	3.640	20.06	101.422	30	or 17+10log(B)=	29.25	PASS
116	5580	16.46	3.640	20.10	102.361	30	or 17+10log(B)=	29.24	PASS
140	5700	16.48	3.640	20.12	102.833	30	or 17+10log(B)=	29.25	PASS

#### 802.11n\_HT20\_Ch0

СН	Frequency (MHz)	TOTAL POWER (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)		REQUIRED LIMIT (dBm)		RESULT
36	5180	13.59	2.240	15.83	38.291	23.01	or 10+10log(B)=	22.52	PASS
44	5220	13.42	2.240	15.66	36.821	23.01	or 10+10log(B)=	22.52	PASS
48	5240	13.46	2.240	15.70	37.162	23.01	or 10+10log(B)=	22.51	PASS
52	5260	17.43	2.300	19.73	93.994	30	or 17+10log(B)=	29.53	PASS
60	5300	17.50	2.300	19.80	95.521	30	or 17+10log(B)=	29.54	PASS
64	5320	17.24	2.300	19.54	89.970	30	or 17+10log(B)=	29.55	PASS
100	5500	17.40	3.640	21.04	127.087	30	or 17+10log(B)=	29.54	PASS
116	5580	17.37	3.640	21.01	126.212	30	or 17+10log(B)=	29.55	PASS
140	5700	17.45	3.640	21.09	128.558	30	or 17+10log(B)=	29.54	PASS

#### 802.11n\_HT40\_Ch0

СН	Frequency (MHz)	TOTAL POWER (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)		REQUIRED LIMIT (dBm)		RESULT
38	5190	16.45	2.240	18.69	74.027	23.01	or 10+10log(B)=	25.58	PASS
46	5230	16.46	2.240	18.70	74.197	23.01	or 10+10log(B)=	25.58	PASS
54	5270	16.42	2.300	18.72	74.540	30	or 17+10log(B)=	32.58	PASS
62	5310	16.47	2.300	18.77	75.403	30	or 17+10log(B)=	32.58	PASS
102	5510	16.23	3.640	19.87	97.138	30	or 17+10log(B)=	32.58	PASS
110	5550	16.49	3.640	20.13	103.131	30	or 17+10log(B)=	32.58	PASS
134	5670	16.23	3.640	19.87	97.138	30	or 17+10log(B)=	32.58	PASS

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#### 802.11ac\_VHT80\_Ch0

сн	Frequency (MHz)	TOTAL POWER (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	REQUIRED LIMIT (dBm)			RESULT
42	5210	15.48	2.240	17.72	59.098	23.01	or 10+10log(B)=	28.79	PASS
58	5290	15.33	2.300	17.63	57.886	30	or 17+10log(B)=	35.79	PASS
106	5530	15.49	3.640	19.13	81.766	30	or 17+10log(B)=	35.78	PASS

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## **10 MAXIMUM POWER SPECTRAL DENSITY**

## 10.1 Standard Applicable

#### FCC

OPERZTION Band	EUT CATEGORY		LIMIT	
U-NII-1		Access Point (Mater device )	17dBm/ MHz	
		Fixed point-to-point Acess Ponit		
		Mobile and portable clinet device	11dBm/ MHz	
U-NII-2A			11dBm/ MHz	
U-NII-2C			11dBm/ MHz	
U-NII-3			30dBm/ 500kHz	

IC

OPERZTION FREQUENCY BAND	LIMIT
5150~5250 MHz	EIRP spectral density 10 dBm / MHz
5250~5350 MHz	11dBm / MHz
5470-5600 MHz and 5650-5725 MHz	11dBm / MHz
5725~5850 MHz	30dBm / 500 kHz

If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the Maximum Power Spectral Density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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## 10.2 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to Spectrum.
- For U-NII1, U-NII-2A, U-NII-2C Band: Set RBW=1MHz, VBW=3MHz, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth) For U-NII-3 Band:

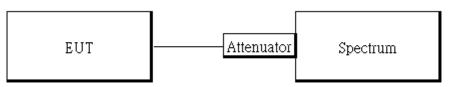
Set RBW=500 kHz, VBW $\geq$  3RBW, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)

- 5. User the cursor on spectrum to peak search the highest level of trace
- 6. Record the max. reading and add 10 log(1/duty cycle).
- 7. Repeat above procedures until all default test channel (low, middle, and high) was complete.

Conducted Room								
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.			
DC Block	PASTERNACK	PE8210	RF256	02/26/2019	02/25/2020			
Spectrum Analyzer	Agilent	N9010A	MY53400256	11/21/2018	11/20/2019			
Thermostatic/Hrgrosatic Chamber	GWINSTEK	GTC-288MH-CC	TH160402	05/16/2019	05/15/2020			
Attenuator	Marvelous	MVE2213-10	RF80	02/26/2019	02/25/2020			

## 10.3 Measurement Equipment Used

## 10.4 Test Set-up



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#### 10.5 Measurement Result

POWER DENSITY 802.11a MODE							
Frequency (MHz)	PSD W/O Duty Factor (dBm)	Duty Factor	PSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)		
5180.00	6.57	0.20	6.77	11	-4.23		
5220.00	6.16	0.20	6.36	11	-4.64		
5240.00	5.95	0.20	6.15	11	-4.85		
5260.00	9.93	0.20	10.13	11	-0.87		
5300.00	9.74	0.20	9.94	11	-1.06		
5320.00	9.61	0.20	9.81	11	-1.19		
5500.00	9.64	0.20	9.84	11	-1.16		
5580.00	9.54	0.20	9.74	11	-1.26		
5700.00	10.55	0.20	10.75	11	-0.25		
5720 (U-NII 2C)	10.55	0.20	10.75	11	-0.25		
5720 (U-NII 3)	6.67	0.20	6.88	30	-23.12		
5745.00	7.11	0.20	7.31	30	-22.69		
5785.00	7.45	0.20	7.65	30	-22.35		
5825.00	6.93	0.20	7.13	30	-22.87		

	POWER DENSITY 802.11n HT20 MODE							
Frequency (MHz)	PSD W/O Duty Factor (dBm)	Duty Factor	PSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)			
5180	6.84	0.23	7.07	11	-3.93			
5220	6.52	0.23	6.75	11	-4.25			
5240	6.84	0.23	7.07	11	-3.93			
5260	10.72	0.23	10.95	11	-0.05			
5300	10.21	0.23	10.44	11	-0.56			
5320	10.03	0.23	10.26	11	-0.74			
5500	9.79	0.23	10.02	11	-0.98			
5580	9.94	0.23	10.17	11	-0.83			
5700	10.38	0.23	10.61	11	-0.39			
5720 (U-NII 2C)	10.67	0.23	10.90	11	-0.10			
5720 (U-NII 3)	6.50	0.23	6.73	30	-23.27			
5745	7.32	0.23	7.55	30	-22.45			
5785	7.99	0.23	8.22	30	-21.78			
5825	7.23	0.23	7.46	30	-22.54			

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POWER DENSITY 802.11n HT40 MODE							
Frequency (MHz)	PSD W/O Duty Factor (dBm)	Duty Factor	PSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)		
5190	6.72	0.41	7.13	11	-3.87		
5230	6.41	0.41	6.82	11	-4.18		
5270	6.34	0.41	6.75	11	-4.25		
5310	6.23	0.41	6.64	11	-4.36		
5510	6.05	0.41	6.46	11	-4.54		
5550	6.3	0.41	6.71	11	-4.29		
5670	6.41	0.41	6.82	11	-4.18		
5710 (U-NII 2C)	7.21	0.41	7.62	11	-3.38		
5710 (U-NII 3)	2.44	0.41	2.85	30	-27.15		
5755	3.93	0.41	4.34	30	-25.66		
5795	3.78	0.41	4.19	30	-25.81		
F		FY 802.11a	c VHT80 M	ODE			
Frequency (MHz) PSD W/O Duty Factor (dBm)		Duty Factor	PSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)		
5210	2.21	0.79	3.00	11	-8.00		

0.79

0.79

0.79

0.79

0.79

0.79

2.97

2.32

2.29

3.11

-1.37

0.68

11

11

11

11

30

30

-8.03

-8.68

-8.71

-7.89

-31.37

-29.32

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5290

5530

5610

5690 (U-NII 2C)

5690 (U-NII 3)

5775

2.18

1.53

1.50

2.33

-2.16

-0.11

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EIRP spectral density 802.11a MODE							
Freq. (MHz)	PSD (dBm)	Ant. Gain (dBi)	EIRP SD (dBm)	Limit (dBm)	Margin (dB)		
5180	6.77	2.24	9.01	10	-0.99		
5220	6.36	2.24	8.60	10	-1.40		
5240	6.15	2.24	8.39	10	-1.61		

EIRP spectral density 802.11n HT20 MODE							
Freq. (MHz)	PSD (dBm)	Ant. Gain (dBi)	EIRP SD (dBm)	Limit (dBm)	Margin (dB)		
5180	7.07	2.24	9.31	10	-0.69		
5220	6.75	2.24	8.99	10	-1.01		
5240	7.07	2.24	9.31	10	-0.69		

EIRP spectral density 802.11n HT40 MODE						
Freq. (MHz)	PSD (dBm)	Ant. Gain (dBi)	EIRP SD (dBm)	Limit (dBm)	Margin (dB)	
5180	7.13	2.24	9.37	10	-0.63	
5220	6.82	2.24	9.06	10	-0.94	

EIRP spectral density 802.11ac VHT80 MODE							
Freq. (MHz)	PSD (dBm)	Ant. Gain (dBi)	EIRP SD (dBm)	Limit (dBm)	Margin (dB)		
5210	3.00	2.24	5.24	10	-4.76		

Note:

Cable Loss=

14.3 dB

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