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# **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

Clover Mini **Product Name:** 

**Brand Name:** clover Model No.: C302U **Model Difference:** N/A

FCC ID: HFS-C302U IC: 1787B-C302U **Report Number:** E2/2018/80004 **FCC Rule Part:** §15.407, Cat:NII

IC Rule: RSS-247 issue 2 Feb. 2017

Issue Date: Sep. 10, 2018

Aug. 01, 2018~ Aug. 29, 2018 Date of Test:

Date of EUT Received: Aug. 01, 2018

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10:2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits.

The test results of this report relate only to the tested sample identified in this report.

Tested By:

Vito Pei / Sr. Engineer

Approved By:

Jim Chang / Manager





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# **Revision History**

Report Number	Revision	Description	Effected Page	Issue Date	Revised By
E2/2018/80004	Rev.00	Initial creation of docu- ment	All	Sep. 10, 2018	Stefanie Yu / Clerk

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### **GENERAL INFORMATION**

## 1.1 Product Description

#### General:

ileiai.				
Product Name:	Clover Mir	ni		
Brand Name:	clover	clover		
Model No.:	C302U			
Model Difference:	N/A			
Product SW/HW version:	N/A/ 1.0			
Radio SW/HW version:	N/A/ N/A	N/A/ N/A		
Test SW Version:	N/A			
RF power setting in TEST SW:	N/A			
	12V from AC/DC Adapter			
Power Supply:	Adapter:	<ol> <li>Model No.: FSP040-RHBN3, Supplier: clover</li> <li>Model No.: FSP040-RHBN2, Supplier: clover</li> </ol>		

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# FCC WLAN 5GHz.

Wi-Fi	Frequency Range	Channels	Avg. Power (dBm)	Modulation Technology
	5150~5250	4	16.47	
110 00	5250~5350	4	16.48	OFDM
11a_20	5470~5725	12	16.49	OFDM
	5725~5850	5	16.49	
	5150~5250	4	HT: 13.82	
11n_HT/	5250~5350	4	HT: 20.34	OFDM
ac_VHT 20M	5470~5725	12	HT: 20.44	
20101	5725~5850	5	HT: 20.49	
11n_HT / ac_VHT 40M	5150~5250	2	HT: 13.96	OFDM
	5250~5350	2	HT: 19.42	
	5470~5725	6	HT:19.40	
	5725~5850	2	HT: 19.48	
	5150~5250	1	14.34	
11ac	5250~5350	1	14.17	OFDM
VHT80M	5470~5725	3	18.45	
	5725~5850	1	18.40	
		PIFA Antenna, 1. P/N: GD93 Main Antenna:	20-15-001-R, Suppli	ier: SAA,

5150~5250MHz Peak Gain: 5.43dBi 5250~5350MHz Peak Gain: 5.61dBi 5470~5725MHz Peak Gain: 5.86dBi 5725~5850MHz Peak Gain: 5.04dBi

P/N: GD9321-15-001-R, Supplier: SAA,

Aux Antenna:

5150~5250MHz Peak Gain: 5.88dBi Antenna Designation: 5250~5350MHz Peak Gain: 4.73dBi 5470~5725MHz Peak Gain: 4.16dBi 5725~5850MHz Peak Gain: 4.28dBi

P/N: LA81FP017-1H, Supplier: Luxshare-ICT,

Main Antenna:

5150~5250MHz Peak Gain: 3.5dBi 5250~5350MHz Peak Gain: 4.8dBi 5470~5725MHz Peak Gain: 4.9dBi 5725~5850MHz Peak Gain: 4.9dBi

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P/N: LA81FP018-1H, Supplier: Luxshare-ICT,
Aux Antenna:
5150~5250MHz Peak Gain: 4.3dBi
5250~5350MHz Peak Gain: 4.6dBi
5470~5725MHz Peak Gain: 4.8dBi
5725~5850MHz Peak Gain: 5.1dBi

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

AN JULIZ.					
Wi-Fi	Frequency Range	Channels	Avg. or EIRP	Rated Power(dBm) (Worst Case)	Modulation Technology
	5150~5250	4	EIRP	22.23	
110	5250~5350	4	Avg.	16.48	OFDM
11a	5470~5725	12	Avg.	16.49	OFDIVI
	5725-5850	5	Avg.	16.49	
	5150~5250	4	EIRP	HT: 22.49	
11n_HT / ac_VHT	5250~5350	4	Avg.	HT: 20.34	OFDM
20M	5470~5725	12	Avg.	HT: 20.44	OFDIVI
	5725-5850	5	Avg.	HT: 20.49	
	5150~5250	2	EIRP	HT: 22.63	OFDM
11n_HT / ac VHT	5250~5350	2	Avg.	HT: 19.42	
40M	5470~5725	6	Avg.	HT: 19.40	
	5725-5850	2	Avg.	HT: 19.48	
	5150~5250	1	EIRP	23.01	
11ac	5250~5350	1	Avg.	18.45	OFDM
VHT80M	5470~5725	2	Avg.	18.25	OFDIVI
	5725-5850		Avg.	18.40	
Modulation type		64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 802.11ac only			
Transition Rate:		802.11 n_ 802.11 n_ 802.11 ac 802.11 ac	20MHz: 6. 40MHz: 1; 220MHz: 6; 40MHz: 6	24/36/48/54 Mbps 5 – 144.4Mbps 3.5 - 300.0Mbps 6.5 –144.4Mbps 13.5 -300.0Mbps 29.3 – 650Mbps	

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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

SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333 (TAF code 0513)

FCC Registration Numbers are: 735305 / TW0002

Canada Registration Number: 4620A-5

### 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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### 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.

#### **Radiated Emissions** 2.3.2

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.2-3 Conducted Emission (Antenna Port) Configuration

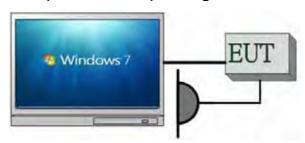
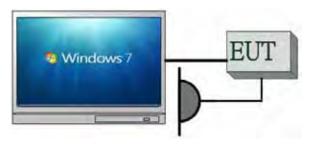


Fig. 2-2 Conducted Emission (AC Power Line) Configuration



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

Item	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	L420	S0012467	N/A	N/A

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### **SUMMARY OF TEST RESULT**

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 §6.6	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**

## 4.1 Operated in U-NII Bands

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

802.11a / n	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 \	/HT80 Mode
Channel	Frequency
58	5290

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## Operated band in 5470 MHz ~5725 MHz:

Operated Barra III 047 0 III				
802.11a / n HT20 Mode,				
802.11ac V	HT20 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			

77 23 WII IZ.				
802.11 n HT40 Mode,				
802.11ac V	HT40 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		

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#### 4.2 The Worst Test Modes and Channel Details

- 1. The EUT has been tested under operating condition.
- 2. 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.
- 4. The given UE is pre-scanned among 802.11n and ac modes, and 802.11n yields the highest reading that generates the highest emission.
- 5. The given UE is pre-scanned among SISO Main, SISO Aux and MIMO modes, and SISO Main mode yields the highest reading that generates the highest emission. Therefore, 802.11ac+SISO Main as the mode of radiated test configuration is chosen to carry out the relevantly mandatory test items.

### RADIATED EMISSION TEST

RADIAI ED EINI	3310N 1E31.					
	RADIATED EMISSION TEST (BELOW 1 GHz)					
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5180~5240	36 to 48	36,44,48	OFDM	6	Aux
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	Aux
802.11a	5500~5720	100 to 140	100,116,140	OFDM	6	Aux
802.11a	5745~5825	149 to 165	149,157,165	OFDM	6	Aux
	RADI	ATED EMISS	ION TEST (A	BOVE 1 GHz)		
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5180~5240	36 to 48	36,44,48	OFDM	6	Aux
802.11n_HT20	5160~5240	30 10 40	30,44,40	OFDM	MCS8	MIMO
802.11n_HT40	5190~5230	38 to 46	38,46	OFDM	MCS8	MIMO
802.11ac_VHT80	5210	42	42	OFDM	MCS8	MIMO
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	Aux
802.11n_HT20	3200~3320	52 10 64	32,00,04	OFDM	MCS8	MIMO
802.11n_HT40	5270~5310	54 to 62	54,62	OFDM	MCS8	MIMO
802.11ac_VHT80	5290	58	58	OFDM	MCS8	MIMO

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MODE	FREQUENCY BAND (MHz)		TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5500~5720	100 to 144	100,116,140	OFDM	6	Aux
802.11n_HT20	5500~5720	100 10 144	100,116,140	OFDM	MCS8	MIMO
802.11n_HT40	5510~5710	102 to 142	102,110,134	OFDM	MCS8	MIMO
802.11ac_VHT80	5530~5690	106 to 138	106,122,138	OFDM	MCS8	MIMO
802.11a	5745~5825	149 to 165	149,157,165	OFDM	6	Aux
802.11n_HT20	3743~3623	149 10 165	149,157,165	OFDM	MCS8	MIMO
802.11n_HT40	5755~5795	151 to 159	151,159	OFDM	MCS8	MIMO
802.11ac_VHT80	5775	155	155	OFDM	MCS8	MIMO

#### 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 E1 position was reported.

#### ANTENNA PORT CONDUCTED MEASUREMENT:

CONDUCTED TEST						
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a				OFDM	6	Aux
802.11n_HT20 802.11ac_VHT20	5180~5240	36 to 48	36,44,48	OFDM	MCS8	MIMO
802.11n_HT40 802.11ac_VHT40	5190~5230	38 to 46	38,46	OFDM	MCS8	MIMO
802.11ac_VHT80	5210	42	42	OFDM	MCS8	MIMO
802.11a				OFDM	6	Aux
802.11n_HT20 802.11ac_VHT20	5260~5320	52 to 64	52,60,64	OFDM	MCS8	MIMO
802.11n_HT40 802.11ac_VHT40	5270~5310	54 to 62	54,62	OFDM	MCS8	MIMO
802.11ac_VHT80		58	58	OFDM	MCS8	MIMO
802.11a				OFDM	6	Aux
802.11n_HT20 802.11ac_VHT20	5500~5720	100 to 144	100,116,140,144	OFDM	MCS8	MIMO
802.11n_HT40 802.11ac_VHT40	5510~5710	102 to 142	102,110,134,142	OFDM	MCS8	MIMO
802.11ac_VHT80	5530~5690	106 to 138	106,122,138	OFDM	MCS8	MIMO
802.11a				OFDM	6	Aux
802.11n_HT20 802.11ac_VHT20	5745~5825	149 to 165	149,157,165	OFDM	MCS8	MIMO
802.11n_HT40 802.11ac_VHT40	5755~5795	151 to 159	151,159	OFDM	MCS8	MIMO
802.11ac_VHT80	5775	155	155	OFDM	MCS8	MIMO

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#### **MEASUREMENT UNCERTAINTY**

Test Items	Uncertainty	
AC Power Line Conducted Emission	+/- 2.586 dB	
26dB & 6dB Emission Bandwidth	+/- 123.36 Hz	
The Maximum Output Power Measurement	+/- 0.96 dB	
Maximum Power Spectral Density Measurement	+/- 1.67 dB	
Frequency Stability	+/- 123.36 Hz	
Temperature	+/- 0.65 °C	
Humidity	+/- 4.6 %	
DC / AC Power Source	DC= +/- 0.13%, AC=+/- 0.2%	

### Radiated Spurious Emission:

	9kHz-30MHz: +/-2.87dB
	30MHz - 180MHz: +/- 3.37dB
Measurement uncertainty	180MHz -417MHz: +/- 3.19dB
(Polarization : <b>Vertical</b> )	0.417GHz-1GHz: +/- 3.19dB
	1GHz - 18GHz: +/- 4.04dB
	18GHz - 40GHz: +/- 4.04dB

	9kHz-30MHz: +/-2.87dB
	30MHz - 167MHz: +/- 4.22dB
Measurement uncertainty	167MHz -500MHz: +/- 3.44dB
(Polarization : <b>Horizontal</b> )	0.5GHz-1GHz: +/- 3.39dB
	1GHz - 18GHz: +/- 4.08dB
	18GHz - 40GHz: +/- 4.08dB

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

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### CONDUCTED EMISSION TEST

## 6.1 Standard Applicable

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

Frequency range	Limits dB(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			

#### Note

### 6.2 Measurement Equipment Used

Conducted Emission Test Site								
EQUIPMENT MFR MODEL SERIAL LAST CA NUMBER NUMBER CAL.								
LISN	TESEQ	NNB 51	36076	2018/02/14	2019/2/13			
EMI Test Receiver	R&S	ESCI	101300	2017/11/02	2018/11/1			

### 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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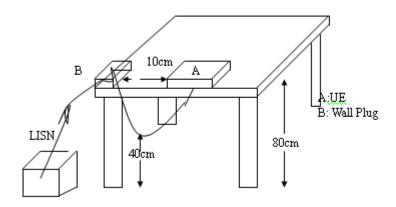
<sup>1.</sup> The lower limit shall apply at the transition frequencies

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



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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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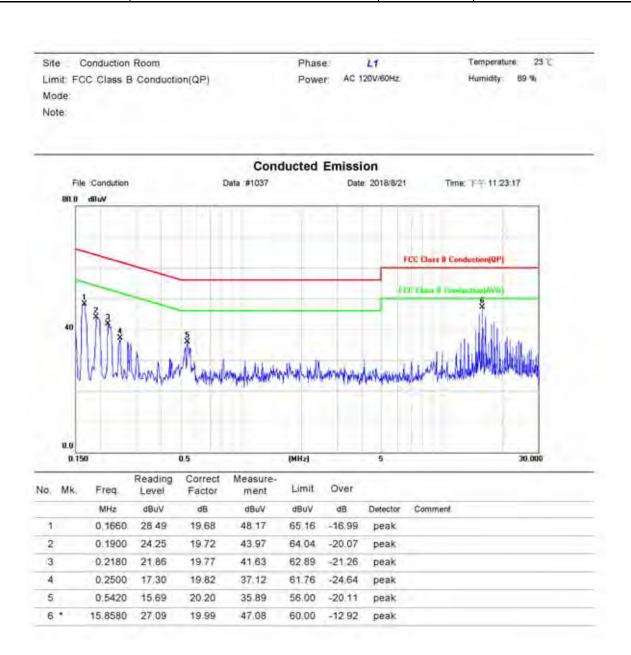
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### AC POWER LINE CONDUCTED EMISSION TEST DATA

Pony Operation Mode: Operation mode Test By:



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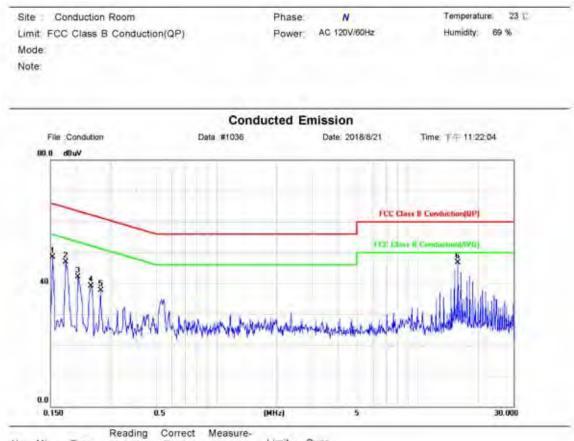
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No.	Mĸ	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV	dBuV	ďΒ	Detector	Comment	
1		0.1540	28.93	19.65	48.58	65.78	-17.20	peak		
2		0.1780	27.23	19,69	46.92	64.58	-17,66	peak		
3		0.2060	22.38	19.73	42.11	63.37	-21.26	peak		
4		0.2380	19.23	19.78	39.01	62.17	-23.16	peak		
5		0,2660	17.95	19.83	37.78	61.24	-23.46	peak		
6		15.8540	26.77	20.01	46.78	60.00	-13.22	peak		

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### **DUTY CYCLE TEST SIGNAL**

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	95.70	0.19	0.48	1.00
802.11n_20	92.30	0.35	1.02	2.00
802.11ac_20	95.40	0.20	0.52	1.00
802.11n_40	85.90	0.66	2.02	3.00
802.11ac_40	91.00	0.41	1.05	2.00
802.11ac_80	94.80	0.23	2.16	3.00

Duty Cycle Factor:  $10 * \log(1/0.957) = 0.19$ Duty Cycle Factor:  $10 * \log(1/0.923) = 0.35$ Duty Cycle Factor:  $10 * \log(1/0.954) = 0.2$ Duty Cycle Factor:  $10 * \log(1/0.859) = 0.66$ Duty Cycle Factor:  $10 * \log(1/0.91) = 0.41$ Duty Cycle Factor:  $10 * \log(1/0.948) = 0.23$ 

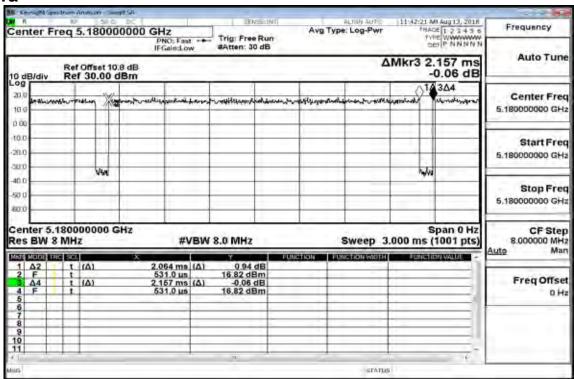
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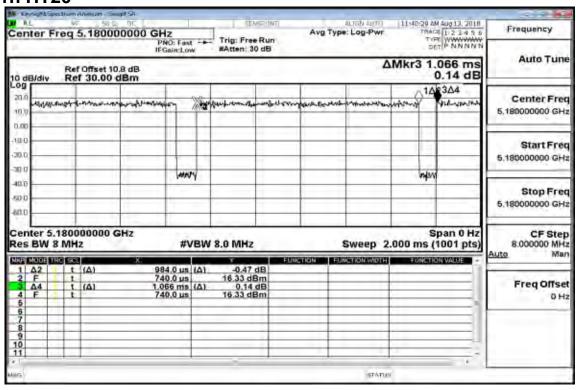


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## **DUTY CYCLE TEST SIGNAL Measurement Result** 802.11a



### 802.11n HT20



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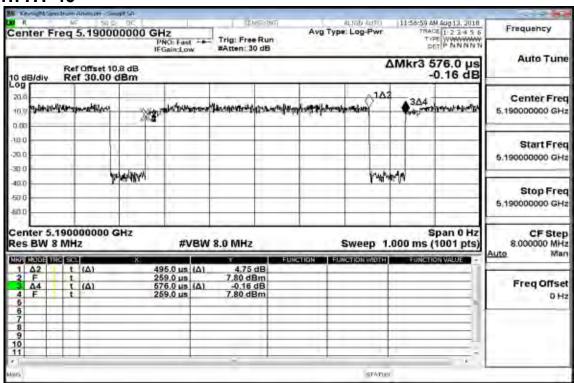
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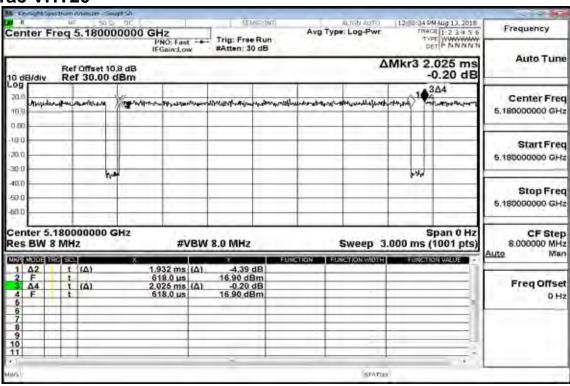


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#### 802.11n HT 40



### 802.11ac VHT20



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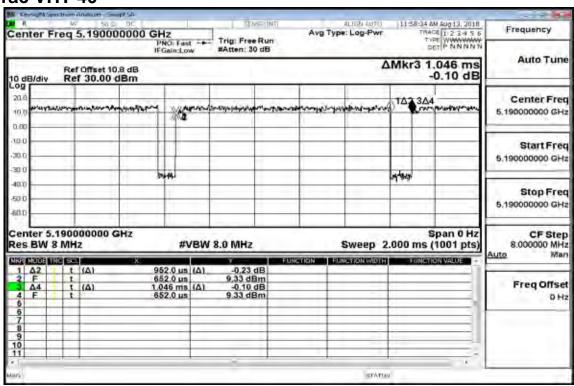
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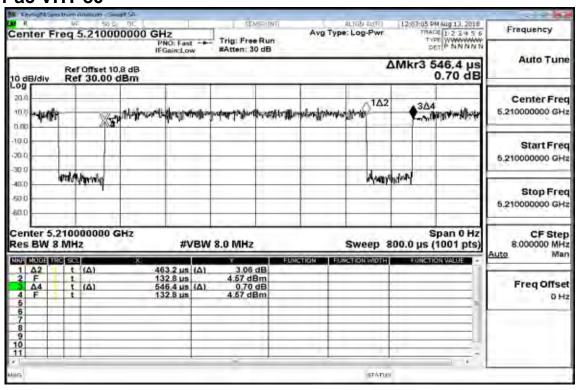


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### 802.11ac VHT 40



## 802.11 ac VHT 80



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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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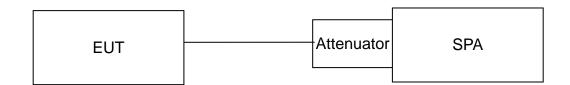


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### 8.3 Measurement Equipment Used

SGS Conducted Room								
Name of Equip- ment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due			
Spectrum Analyzer	Agilent	N9010A	MY51440113	2018/06/20	2019/6/19			
Attenuator	Marvelous	MVE2213-10	RF30	2017/12/26	2018/12/25			
DC Block	PASTERNACK	PE8210	RF29	2017/12/26	2018/12/25			
Notebook	Lenovo	L420	S0011721	N/A	N/A			
DC Power Supply	Agilent	E3640A	MY53140006	05/02/2017	05/01/2018			

### 8.4 Test Set-up



#### 8.5 Measurement Result

#### 26dB and 6dB Bandwidth

802.11a\_Ch0 802.11a\_Ch1

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)	Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	22.97	13.612	5180	23.42	13.696
5220	22.30	13.483	5220	23.84	13.773
5240	21.90	13.404	5240	23.57	13.724
5260	22.78	13.576	5260	23.24	13.662
5300	22.03	13.430	5300	23.43	13.698
5320	21.47	13.318	5320	23.19	13.653
5500	24.09	13.818	5500	21.95	13.414
5580	23.23	13.660	5580	24.13	13.826
5700	23.82	13.769	5700	24.24	13.845

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#### 802.11a\_Ch0

#### 802.11a\_Ch1

Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)	Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	15.32	11.853	5745	15.12	11.796
5785	16.30	12.122	5785	15.45	11.889
5825	16.31	12.125	5825	15.69	11.956

#### 802.11n HT20 Ch0

#### 802.11n HT20 Ch1

002:1111_11120_			002.1111_11120_0111			
Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)	Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)	
5180	23.87	13.779	5180	23.70	13.747	
5220	24.78	13.941	5220	23.96	13.795	
5240	24.34	13.863	5240	23.96	13.795	
5260	23.99	13.800	5260	25.81	14.118	
5300	24.22	13.842	5300	25.10	13.997	
5320	21.81	13.387	5320	22.98	13.614	
5500	25.22	14.017	5500	24.60	13.909	
5580	28.43	14.538	5580	25.85	14.125	
5700	27.41	14.379	5700	26.56	14.242	
5720(U-NII 2C)	19.42	12.883	5720(U-NII 2C)	20.55	13.129	
5720 (U-NII 3)	6.03	7.801	5720 (U-NII 3)	6.38	8.047	

#### 802.11n\_HT20\_Ch0

#### 802.11n\_HT20\_Ch1

Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)	Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	13.91	11.433	5745	15.07	11.781
5785	15.50	11.903	5785	16.69	12.225
5825	15.35	11.861	5825	17.29	12.378

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#### 802.11n \_HT40\_Ch0

#### 802.11n \_HT40\_Ch1

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)	Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5190	40.80	16.107	5190	41.07	16.135
5230	41.01	16.129	5230	41.03	16.131
5270	40.48	16.072	5270	40.71	16.097
5310	40.35	16.058	5310	40.76	16.102
5510	40.98	16.126	5510	40.98	16.126
5550	41.13	16.142	5550	41.04	16.132
5670	40.98	16.126	5670	41.01	16.129
5710 (U-NII 2C)	35.98	15.561	5710 (U-NII 2C)	35.95	15.557
5710 (U-NII 3)	4.95	6.942	5710 (U-NII 3)	4.94	6.938

#### 802.11n\_HT40\_Ch0

#### 802.11n\_HT40\_Ch1

Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)	Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5755	35.20	15.465	5755	35.18	15.463
5795	35.16	15.460	5795	35.15	15.459

### 802.11ac VHT80 Ch0

#### 802.11ac VHT80 Ch1

	_		*******		
Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)	Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5210	82.80	19.180	5210	82.43	19.161
5290	82.67	19.173	5290	82.70	19.175
5530	82.71	19.176	5530	83.29	19.206
5610	83.95	19.240	5610	83.55	19.219
5690 (U-NII 2C)	85.52	19.321	5690 (U-NII 2C)	79.19	18.987
5690 (U-NII 3)	5.53	7.429	5690 (U-NII 3)	5.12	7.095

#### 802.11ac \_VHT80\_Ch0

#### 802.11ac \_VHT80\_Ch1

Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)	Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5775	75.18	18.761	5775	75.17	18.760

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#### 99% Bandwidth

802.11a\_Ch0

802.11a\_Ch1

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)	Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5180	16.693	12.225	5180	16.688	12.224
5220	16.678	12.221	5220	16.669	12.219
5240	16.713	12.231	5240	16.710	12.230
5260	16.699	12.227	5260	16.642	12.212
5300	16.696	12.226	5300	16.656	12.216
5320	16.655	12.215	5320	16.640	12.212
5500	16.671	12.220	5500	16.665	12.218
5580	16.681	12.222	5580	16.673	12.220
5700	16.760	12.243	5700	16.730	12.235

#### 802.11a\_Ch0

#### 802.11a\_Ch1

Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)	Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	16.77	12.246	5745	16.75	12.241
5785	16.73	12.235	5785	16.72	12.233
5825	16.72	12.231	5825	16.70	12.226

#### 802.11n\_HT20\_Ch0

#### 802.11n\_HT20\_Ch1

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)	Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5180	17.801	12.504	5180	17.859	12.519
5220	17.830	12.512	5220	17.876	12.523
5240	17.888	12.526	5240	17.819	12.509
5260	17.967	12.545	5260	17.924	12.534
5300	17.833	12.512	5300	17.864	12.520
5320	17.803	12.505	5320	17.829	12.511
5500	17.914	12.532	5500	17.948	12.540
5580	17.947	12.540	5580	17.969	12.545
5700	17.979	12.548	5700	18.015	12.556
5720(U-NII 2C)	13.753	11.384	5720(U-NII 2C)	13.716	11.372
5720 (U-NII 3)	4.268	6.302	5720 (U-NII 3)	4.257	6.291

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### 802.11n\_HT20\_Ch0

### 802.11n\_HT20\_Ch1

Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)	Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	18.04	12.563	5745	17.99	12.551
5785	18.01	12.555	5785	17.99	12.550
5825	17.81	12.505	5825	17.85	12.515

#### 802.11n HT40 Ch0

#### 802.11n HT40 Ch1

002.1111 _111 40_0110			002.11111_11140_0111			
Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)	Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)	
5190	36.105	15.576	5190	36.099	15.575	
5230	36.141	15.580	5230	36.105	15.576	
5270	36.143	15.580	5270	36.090	15.574	
5310	36.149	15.581	5310	36.113	15.577	
5510	36.070	15.571	5510	36.122	15.578	
5550	36.097	15.575	5550	36.107	15.576	
5670	36.107	15.576	5670	36.085	15.573	
5710(U-NII 2C)	31.770	15.020	5710(U-NII 2C)	31.771	15.020	
5710 (U-NII 3)	4.366	6.401	5710 (U-NII 3)	4.366	6.401	

#### 802.11n \_HT40\_Ch0

#### 802.11n \_HT40\_Ch1

Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)	Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5755	36.11	15.576	5755	36.08	15.573
5795	36.13	15.579	5795	36.09	15.573

#### 802.11ac \_VHT80\_Ch0

#### 802.11ac \_VHT80\_Ch1

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)	Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5210	75.476	18.778	5210	75.488	18.779
5290	75.507	18.780	5290	75.586	18.784
5530	75.603	18.785	5530	75.463	18.777
5610	75.619	18.786	5610	75.649	18.788
5690(U-NII 2C)	71.039	18.515	5690(U-NII 2C)	70.967	18.511
5690 (U-NII 3)	4.595	6.623	5690 (U-NII 3)	4.591	6.619

### 802.11ac VHT80 Ch0

### 802.11ac VHT80 Ch1

Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)	Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5775	75.57	18.784	5775	75.56	18.783

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#### 802.11a\_Ch0

Frequency (MHz)	Measured Frequency (MHz)	Limit (MHz)
5240	5248.34	< 5250
5745	5736.78	> 5725

#### 802.11a\_Ch1

Frequency (MHz)	Measured Frequency (MHz)	Limit (MHz)
5240	5248.34	< 5250
5745	5736.72	> 5725

#### 802.11n\_HT20\_Ch0

Frequency (MHz)	Measured Frequency (MHz)	Limit (MHz)
5240	5249.00	< 5250
5745	5736.15	> 5725

#### 802.11n\_HT20\_Ch1

Frequency (MHz)	Measured Frequency (MHz)	Limit (MHz)
5240	5248.97	< 5250
5745	5736.15	> 5725

#### 802.11n \_HT40\_Ch0

Frequency (MHz)	Measured Frequency (MHz)	Limit (MHz)
5230	5248.15	< 5250
5755	5736.95	> 5725

#### 802.11n \_HT40\_Ch1

Frequency (MHz)	Measured Frequency (MHz)	Limit (MHz)
5230	5248.15	< 5250
5755	5736.95	> 5725

### 802.11ac \_VHT80\_Ch0

Frequency (MHz)	Measured Frequency (MHz)	Limit (MHz)
5210	5248.10	< 5250
5775	5737.30	> 5725

### 802.11n \_HT80\_Ch1

Frequency (MHz)	Measured Frequency (MHz)	Limit (MHz)
5210	5248.00	< 5250
5775	5737.30	> 5725

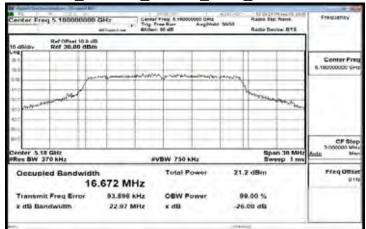
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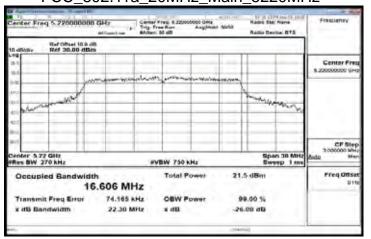


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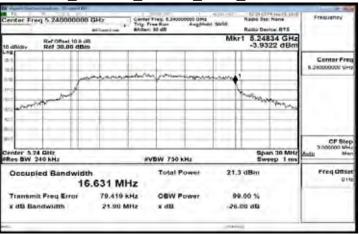
#### FCC 802.11a 20MHz Main 5180MHz



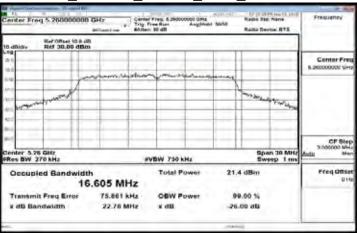
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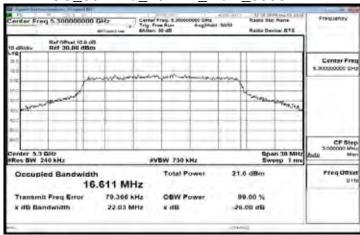
### FCC 802.11a 20MHz Main 5240MHz



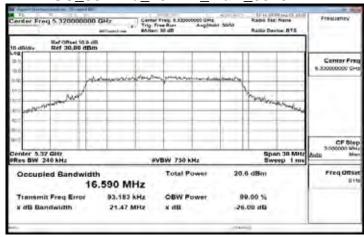
#### FCC 802.11a 20MHz Main 5260MHz



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



## FCC 802.11a 20MHz Main 5320MHz



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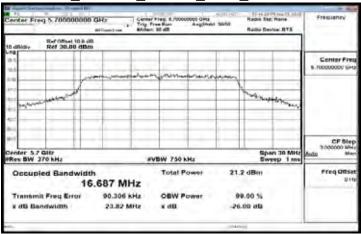
### FCC 802.11a 20MHz Main 5500MHz



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



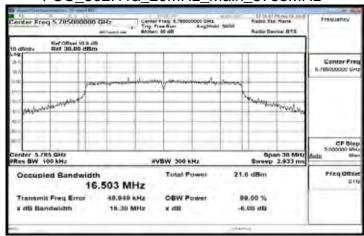
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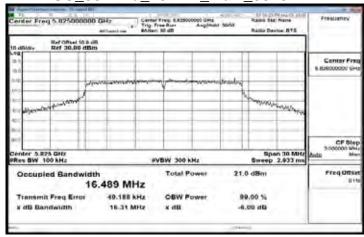
### FCC 802.11a 20MHz Main 5745MHz



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



### FCC 802.11a 20MHz Main 5825MHz



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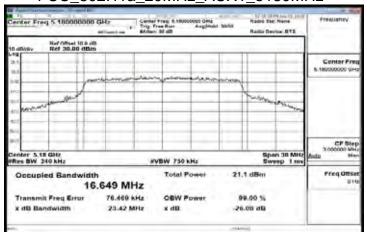
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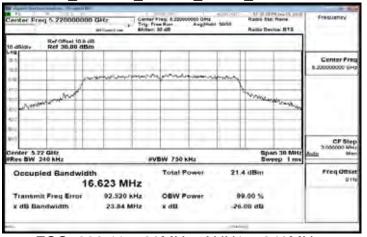


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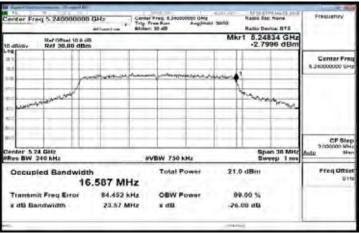
### FCC 802.11a 20MHz AUX1 5180MHz



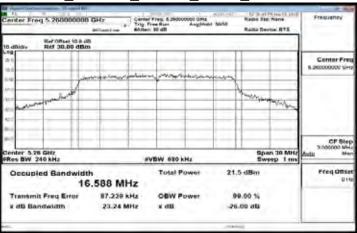
#### FCC\_802.11a\_20MHz\_AUX1 5220MHz



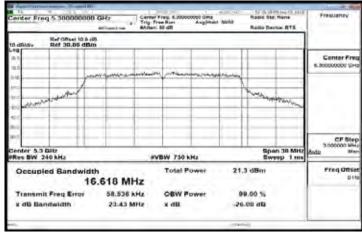
## FCC 802.11a 20MHz AUX1 5240MHz



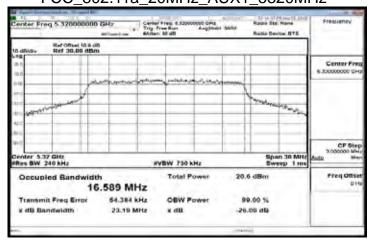
### FCC\_802.11a\_20MHz\_AUX1\_5260MHz



#### FCC\_802.11a\_20MHz\_AUX1\_ 5300MHz



### FCC 802.11a 20MHz AUX1 5320MHz



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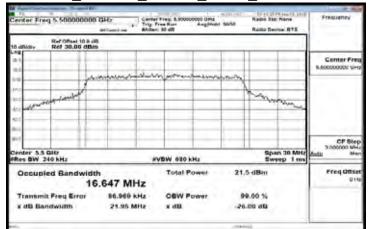
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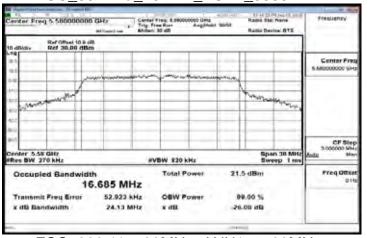


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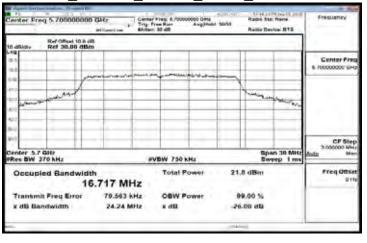
### FCC 802.11a 20MHz AUX1 5500MHz



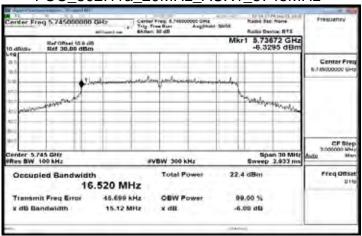
#### FCC\_802.11a\_20MHz\_AUX1 5580MHz



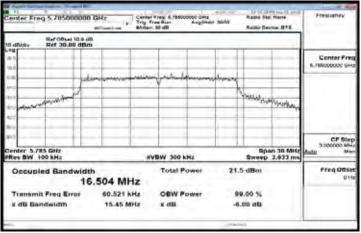
### FCC 802.11a 20MHz AUX1 5700MHz



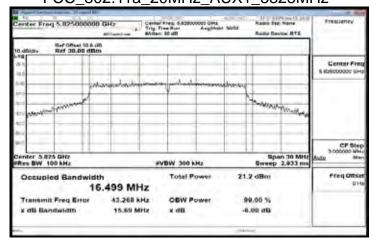
### FCC 802.11a 20MHz AUX1 5745MHz



### FCC\_802.11a\_20MHz\_AUX1\_5785MHz



### FCC 802.11a 20MHz AUX1 5825MHz



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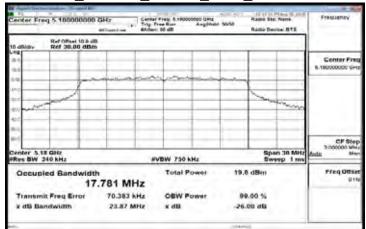
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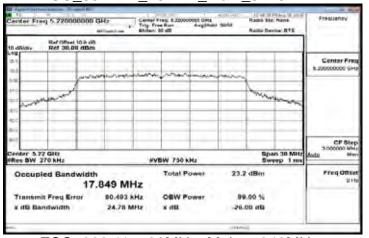


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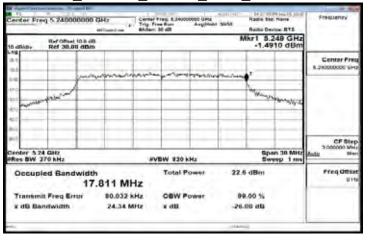
#### FCC 802.11n 20MHz Main 5180MHz



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



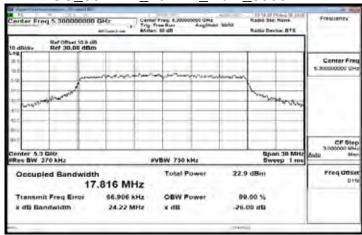
### FCC 802.11n 20MHz Main 5240MHz



#### FCC 802.11n 20MHz Main 5260MHz



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



### FCC 802.11n 20MHz Main 5320MHz



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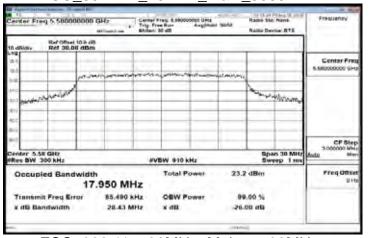


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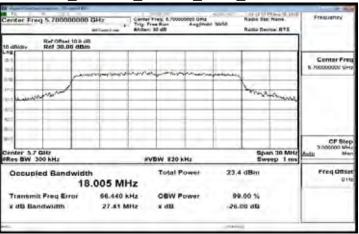
# FCC 802.11n 20MHz Main 5500MHz



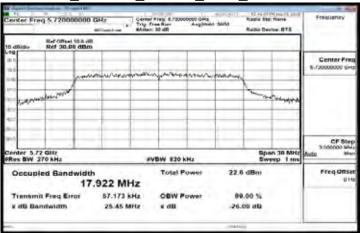
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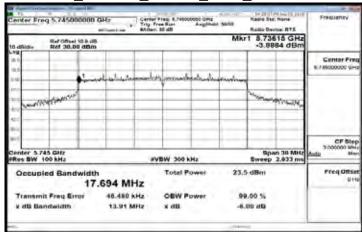
# FCC 802.11n 20MHz Main 5700MHz



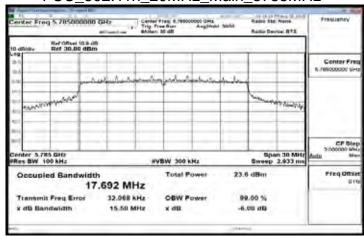
### FCC 802.11n 20MHz Main 5720MHz



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



# FCC 802.11n 20MHz Main 5785MHz



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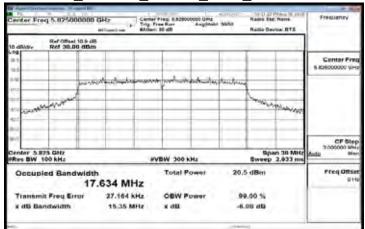
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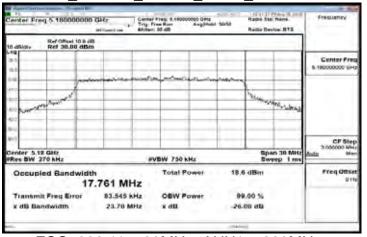


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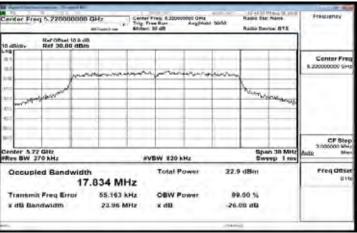
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# FCC\_802.11n\_20MHz\_AUX1\_5180MHz



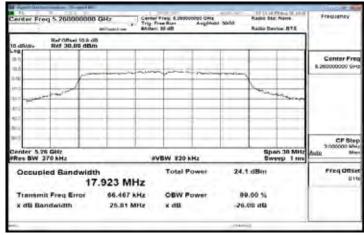
# FCC 802.11n 20MHz AUX1 5220MHz



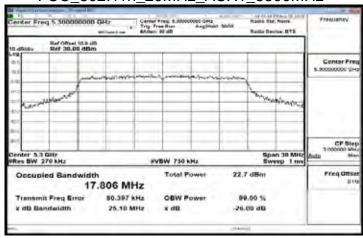
# FCC 802.11n 20MHz AUX1 5240MHz



#### FCC\_802.11n\_20MHz\_AUX1\_ 5260MHz



# FCC 802.11n 20MHz AUX1 5300MHz



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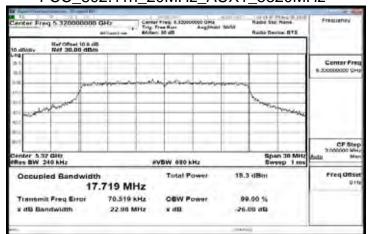
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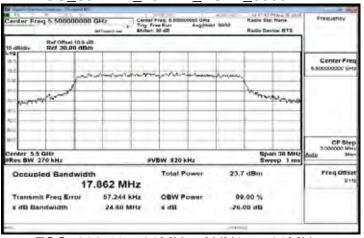


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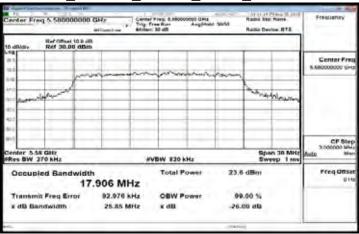
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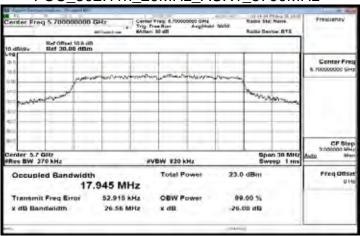
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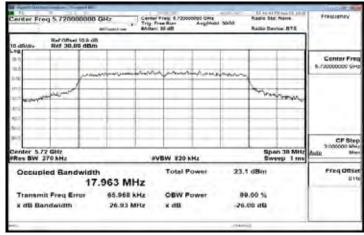
# FCC 802.11n 20MHz AUX1 5580MHz



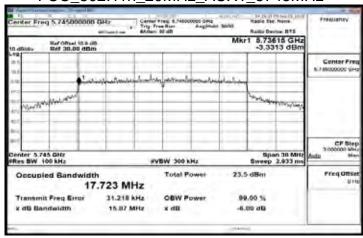
# FCC\_802.11n\_20MHz\_AUX1\_5700MHz



# FCC\_802.11n\_20MHz\_AUX1\_5720MHz



# FCC 802.11n 20MHz AUX1 5745MHz



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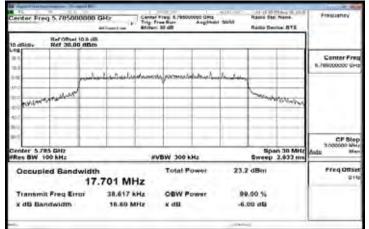
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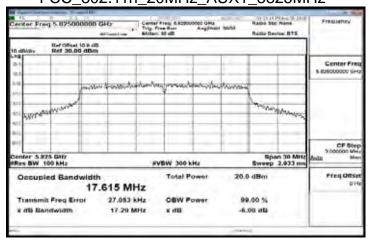


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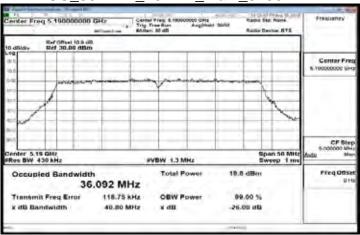
# FCC 802.11n 20MHz AUX1 5785MHz



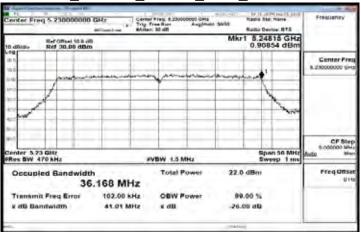
### FCC\_802.11n\_20MHz\_AUX1 5825MHz



# FCC 802.11n 40MHz Main 5190MHz



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



# FCC 802.11n 40MHz Main 5270MHz



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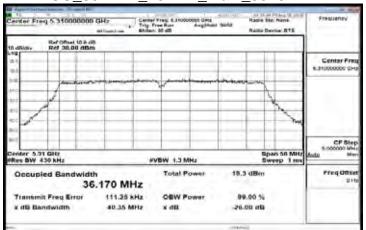
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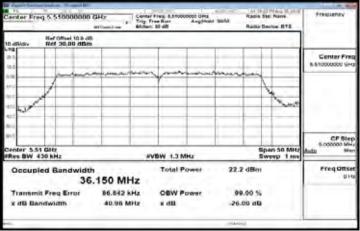


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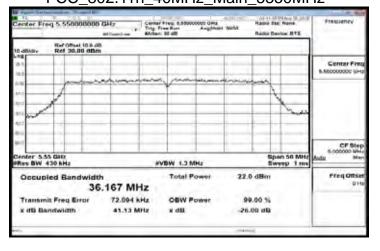
# FCC 802.11n 40MHz Main 5310MHz



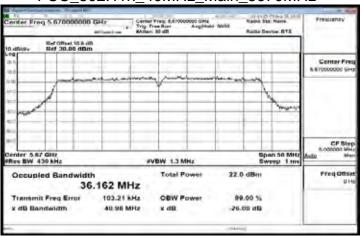
# FCC\_802.11n\_40MHz\_Main\_5510MHz



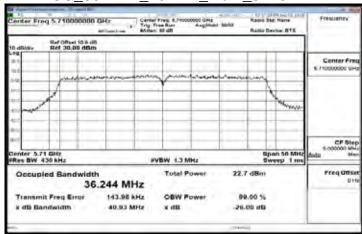
# FCC 802.11n 40MHz Main 5550MHz



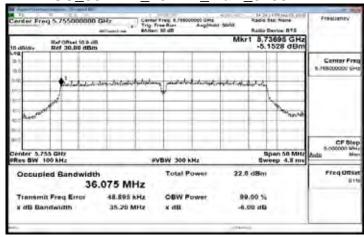
# FCC\_802.11n\_40MHz\_Main\_5670MHz



# FCC\_802.11n\_40MHz\_Main\_5710MHz



# FCC 802.11n 40MHz Main 5755MHz



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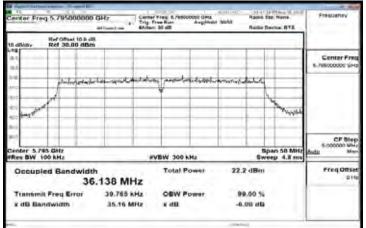
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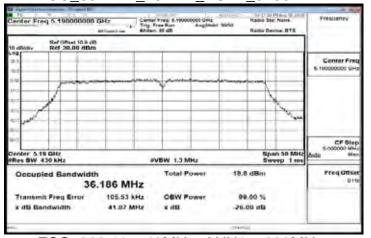


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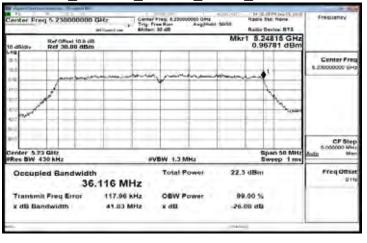
### FCC 802.11n 40MHz Main 5795MHz



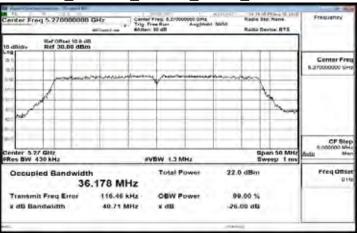
# FCC\_802.11n\_40MHz\_AUX1\_5190MHz



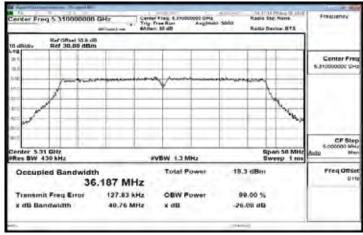
# FCC 802.11n 40MHz AUX1 5230MHz



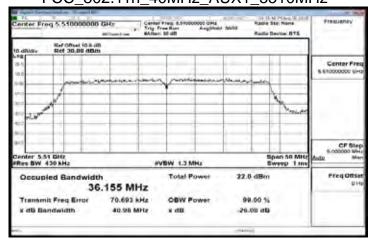
# FCC\_802.11n\_40MHz\_AUX1\_5270MHz



#### FCC\_802.11n\_40MHz\_AUX1\_ 5310MHz



# FCC 802.11n 40MHz AUX1 5510MHz



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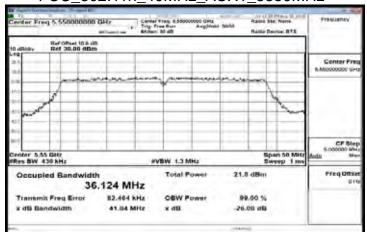
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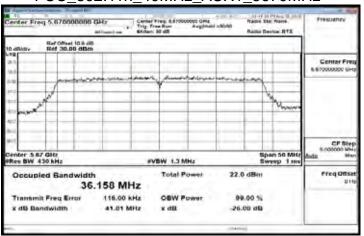


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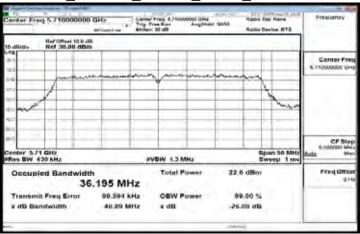
# FCC 802.11n 40MHz AUX1 5550MHz



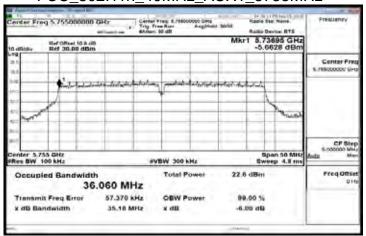
#### FCC\_802.11n\_40MHz\_AUX1 5670MHz



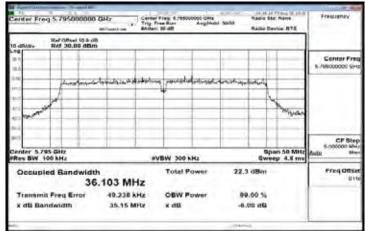
# FCC 802.11n 40MHz AUX1 5710MHz



# FCC 802.11n 40MHz AUX1 5755MHz



# FCC\_802.11n\_40MHz\_AUX1\_5795MHz



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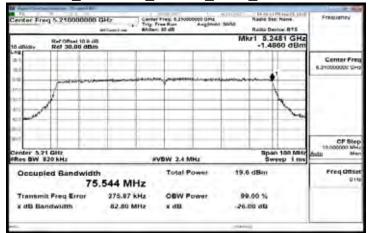
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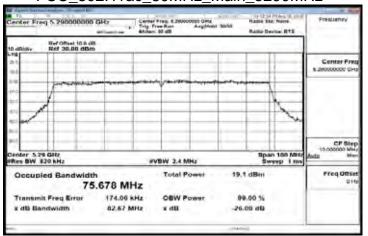


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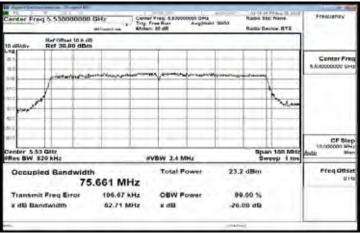
# FCC 802.11ac 80MHz Main 5210MHz



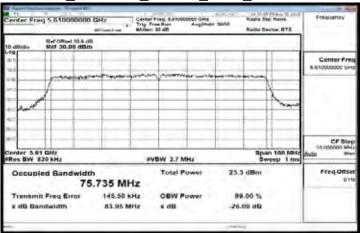
# FCC\_802.11ac\_80MHz\_Main\_5290MHz



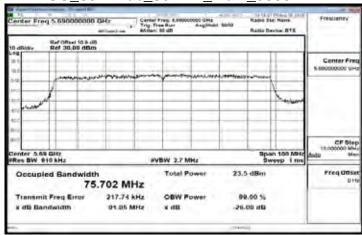
# FCC 802.11ac 80MHz Main 5530MHz



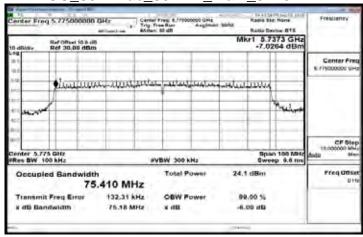
# FCC\_802.11ac\_80MHz\_Main\_5610MHz



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



# FCC 802.11ac 80MHz Main 5775MHz



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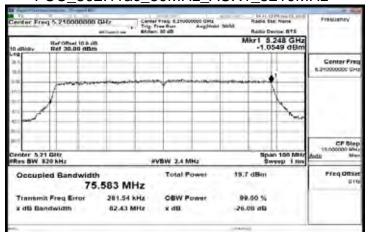
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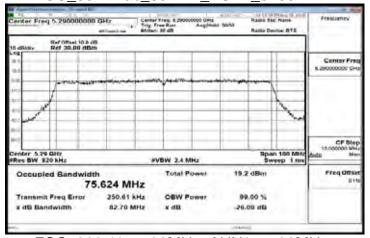


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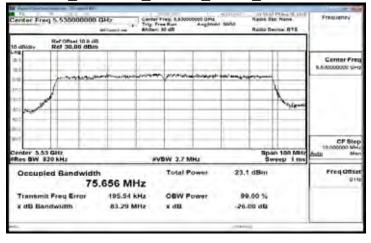
# FCC\_802.11ac\_80MHz\_AUX1\_5210MHz



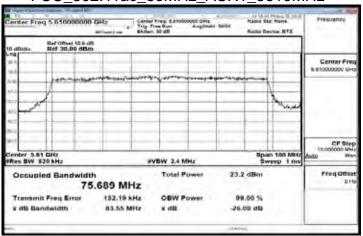
# FCC\_802.11ac\_80MHz\_AUX1\_5290MHz



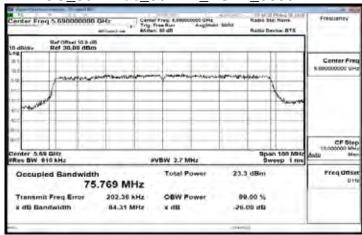
# FCC 802.11ac 80MHz AUX1 5530MHz



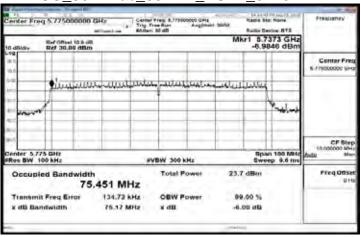
# FCC 802.11ac 80MHz AUX1 5610MHz



#### FCC\_802.11ac\_80MHz\_AUX1\_ 5690MHz



# FCC 802.11ac 80MHz AUX1 5775MHz



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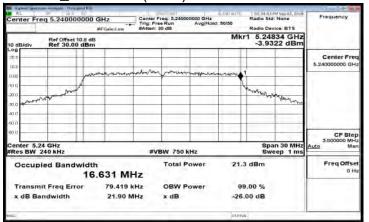
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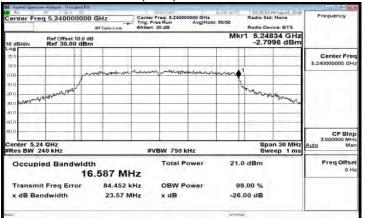
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# 99% BW to prove that all signals in band I is no over band U-NII-1

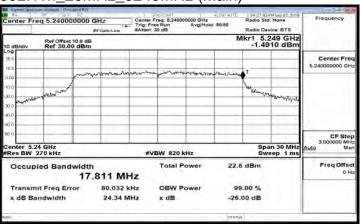
802.11a 5240MHz (Main)



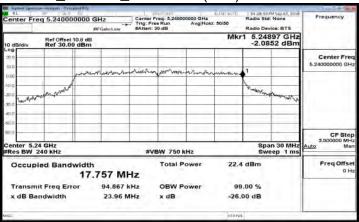
# 802.11a 5240MHz (Aux)



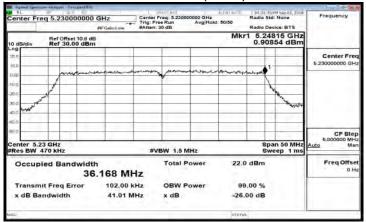
### 802.11n\_20MHz\_5240MHz (Main)



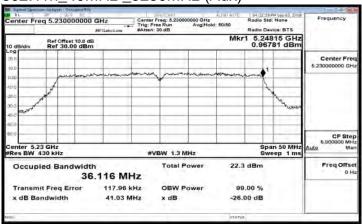
# 802.11n\_20MHz \_5240MHz (Aux)



# 802.11n 40MHz 5230MHz (Main)



#### 802.11n 40MHz 5230MHz (Aux)



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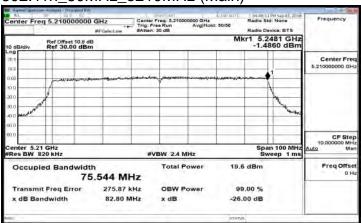
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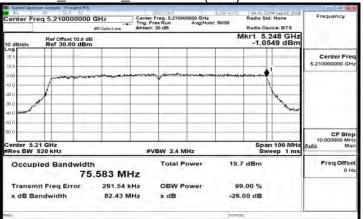


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# 802.11n 80MHz 5210MHz (Main)



#### 802.11n\_80MHz 5210MHz (Aux)



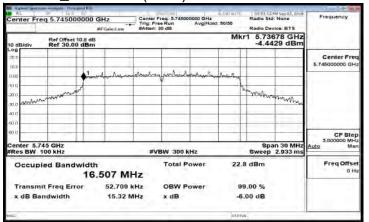
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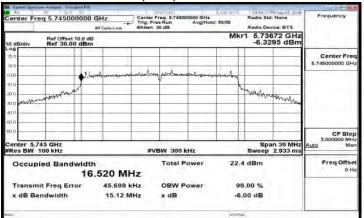
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# 99% BW to prove that all signals in band I is no over band U-NII-3

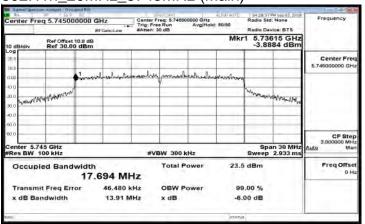
802.11a 5745MHz (Main)



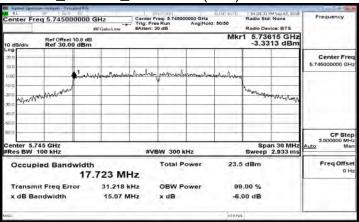
# 802.11a 5745MHz (Aux)



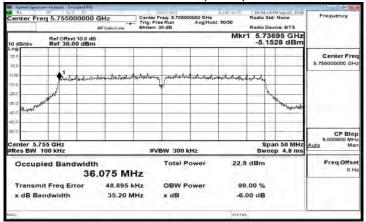
# 802.11n \_20MHz\_5745MHz (Main)



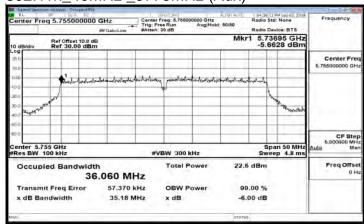
## 802.11n 20MHz 5745MHz (Aux)



# 802.11n 40MHz 5775MHz (Main)



#### 802.11n 40MHz 5775MHz (Aux)



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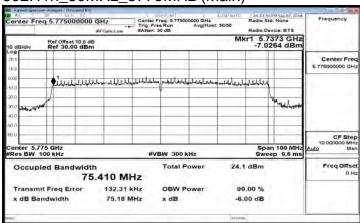
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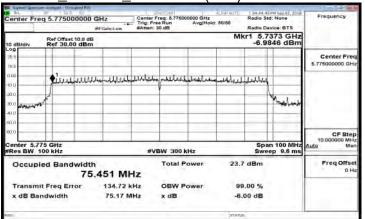


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# 802.11n 80MHz 5775MHz (Main)



#### 802.11n\_80MHz 5775MHz (Aux)



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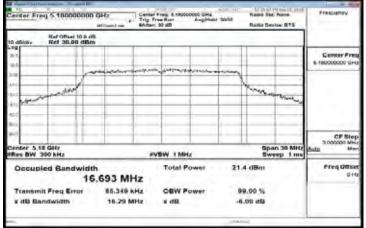
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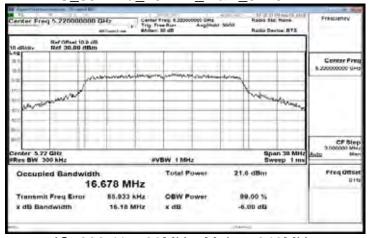
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### For 99%.

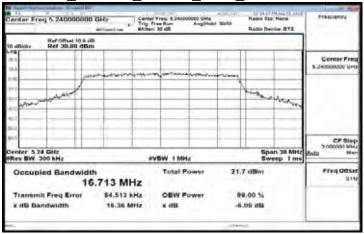
# IC\_802.11a\_20MHz\_Main\_5180MHz



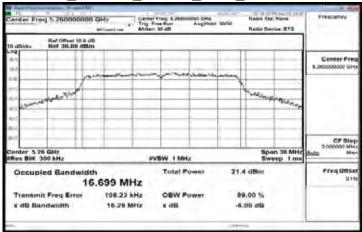
# IC 802.11a 20MHz Main 5220MHz



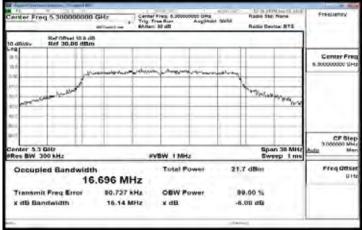
### IC 802.11a 20MHz Main 5240MHz



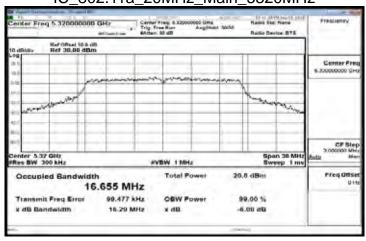
# IC\_802.11a\_20MHz\_Main\_5260MHz



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



# IC 802.11a 20MHz Main 5320MHz



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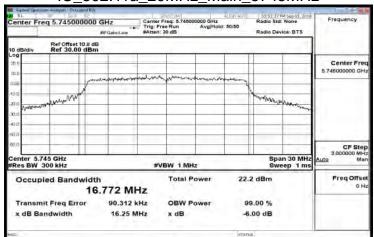


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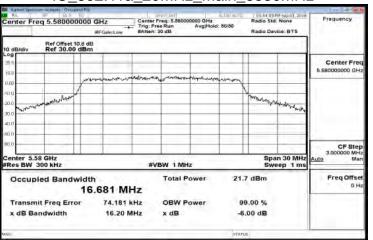
# IC 802.11a 20MHz Main 5500MHz



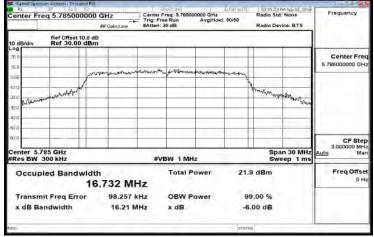
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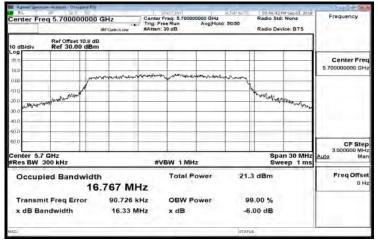
# \_802.11a\_20MHz\_Main\_5580MHz



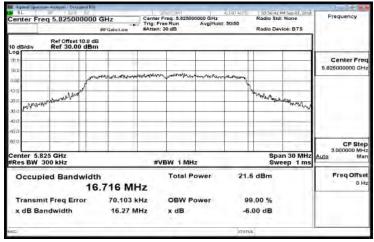
# IC\_802.11a\_20MHz\_Main\_5785MHz



# IC 802.11a 20MHz Main 5700MHz



IC\_802.11a\_20MHz\_Main\_5825MHz



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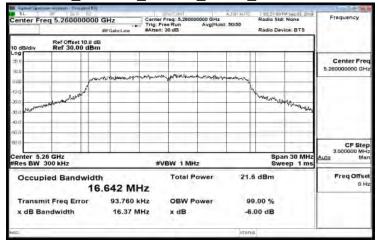


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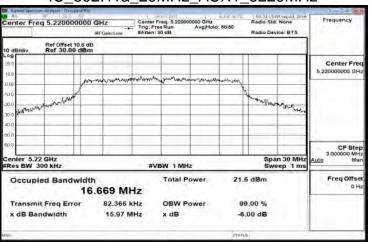
# IC 802.11a 20MHz AUX1 5180MHz



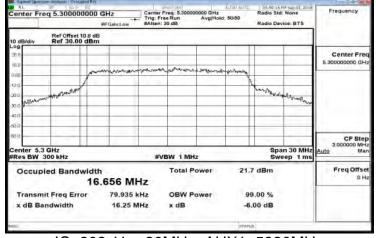
### IC 802.11a 20MHz AUX1 5260MHz



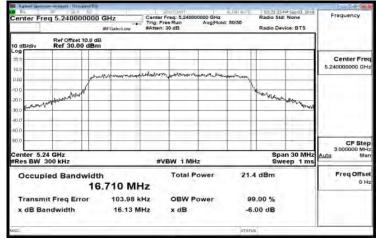
#### IC\_802.11a\_20MHz\_AUX1 5220MHz



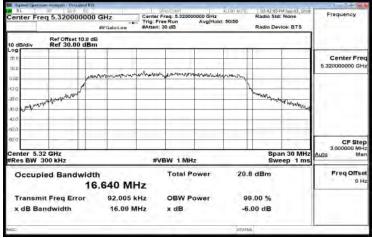
#### IC\_802.11a\_20MHz\_AUX1 5300MHz



# IC 802.11a 20MHz AUX1 5240MHz



IC 802.11a 20MHz AUX1 5320MHz



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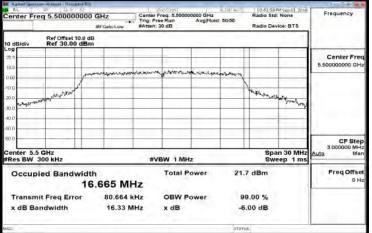
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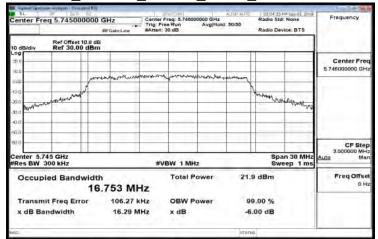


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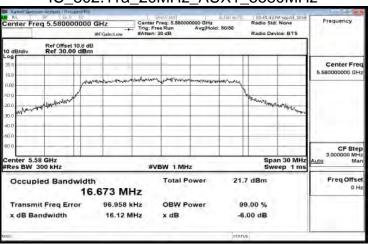
# IC\_802.11a\_20MHz\_AUX1\_5500MHz



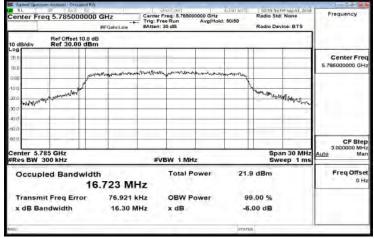
### IC 802.11a 20MHz AUX1 5745MHz



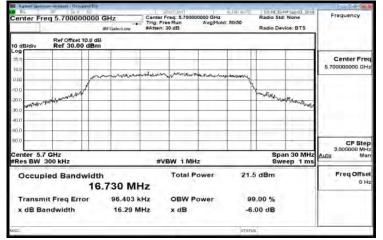
### IC\_802.11a\_20MHz\_AUX1 5580MHz



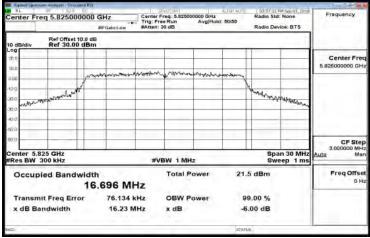
#### IC\_802.11a\_20MHz\_AUX1 5785MHz



# IC 802.11a 20MHz AUX1 5700MHz



## IC 802.11a 20MHz AUX1 5825MHz



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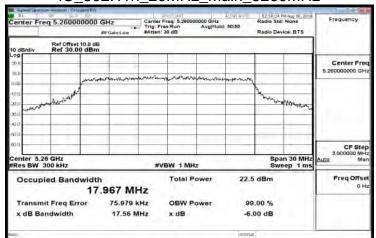


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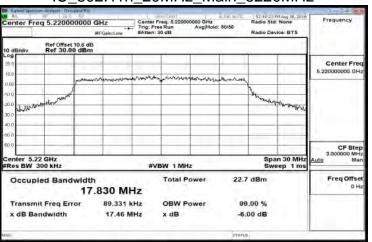
### IC 802.11n 20MHz Main 5180MHz



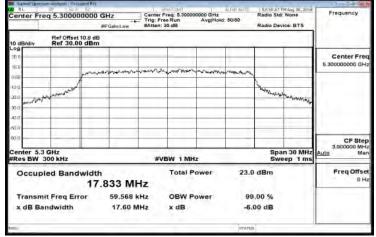
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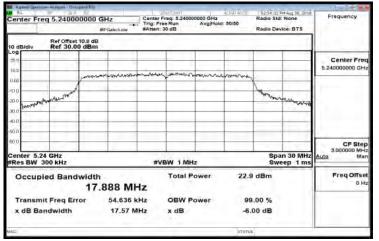
# \_802.11n\_20MHz\_Main\_5220MHz



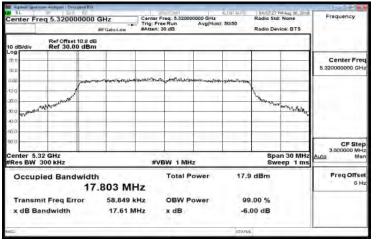
IC\_802.11n\_20MHz\_Main\_ 5300MHz



# IC 802.11n 20MHz Main 5240MHz



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



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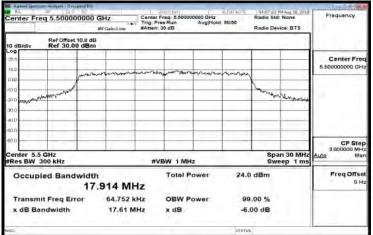
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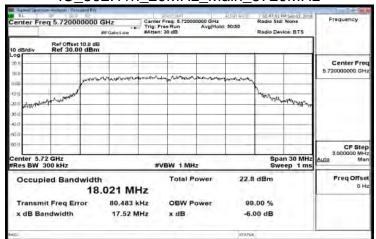


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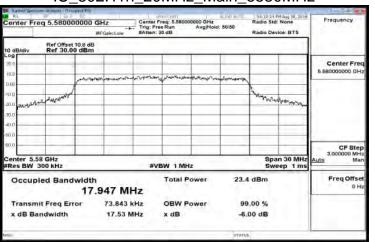
### IC 802.11n 20MHz Main 5500MHz



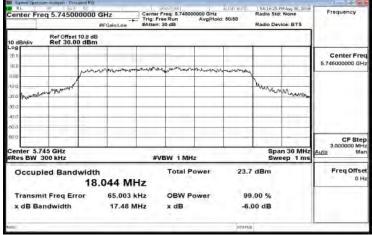
# IC\_802.11n\_20MHz\_Main\_5720MHz



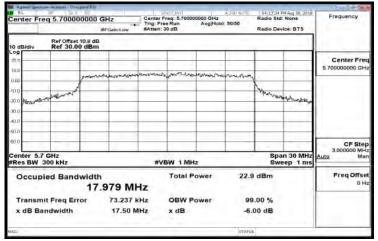
# \_802.11n\_20MHz\_Main\_5580MHz



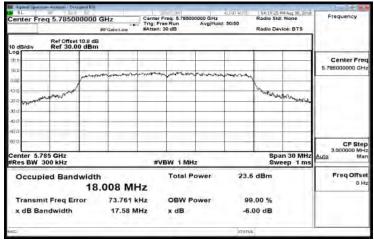
# IC\_802.11n\_20MHz\_Main\_5745MHz



# IC 802.11n 20MHz Main 5700MHz



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



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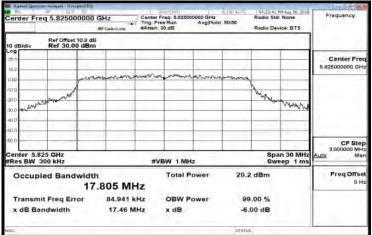
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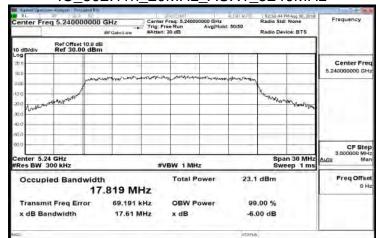


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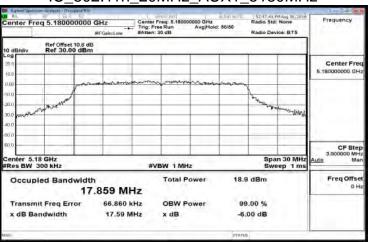
# IC 802.11n 20MHz Main 5825MHz



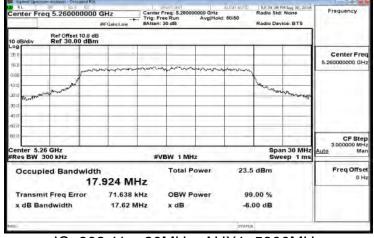
### IC 802.11n 20MHz AUX1 5240MHz



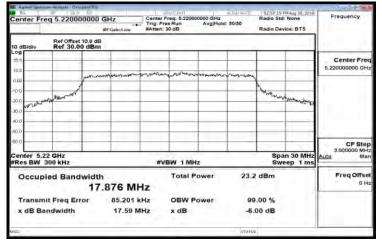
#### IC\_802.11n\_20MHz\_AUX1\_ 5180MHz



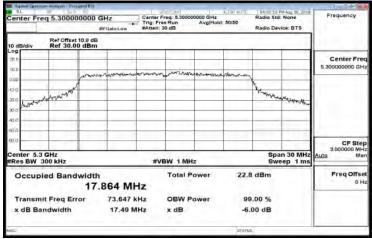
#### IC\_802.11n\_20MHz\_AUX1 5260MHz



# IC 802.11n 20MHz AUX1 5220MHz



IC 802.11n 20MHz AUX1 5300MHz



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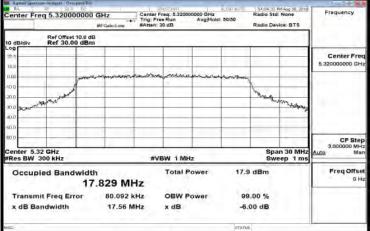
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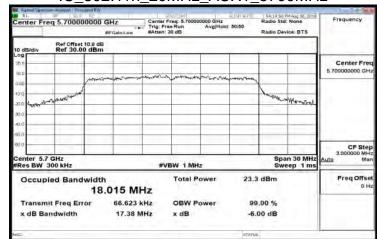


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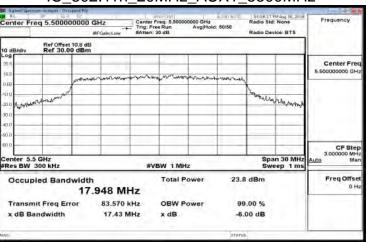
# IC 802.11n 20MHz AUX1 5320MHz



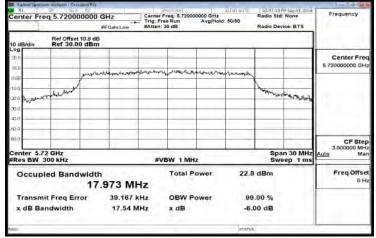
# IC 802.11n 20MHz AUX1 5700MHz



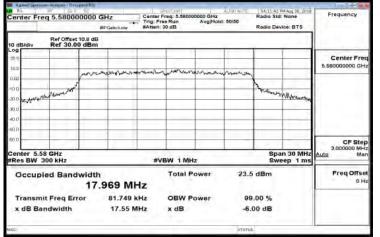
### IC\_802.11n\_20MHz\_AUX1 \_5500MHz



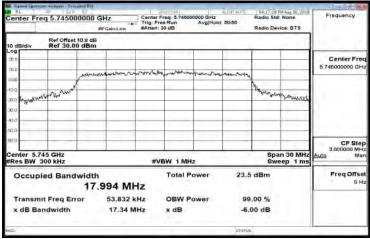
#### IC\_802.11n\_20MHz\_AUX1\_ 5720MHz



# IC 802.11n 20MHz AUX1 5580MHz



## IC 802.11n 20MHz AUX1 5745MHz



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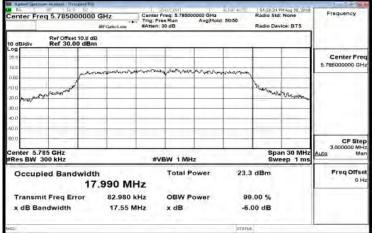
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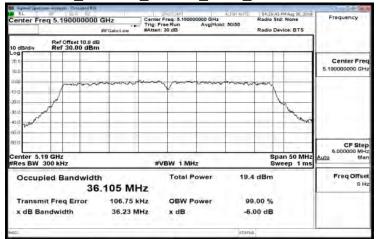


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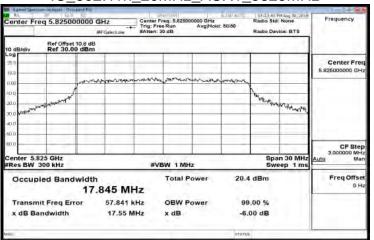
# IC\_802.11n\_20MHz\_AUX1\_5785MHz



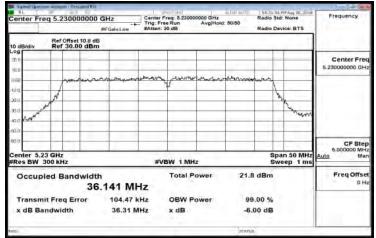
# IC\_802.11n\_40MHz\_Main\_5190MHz



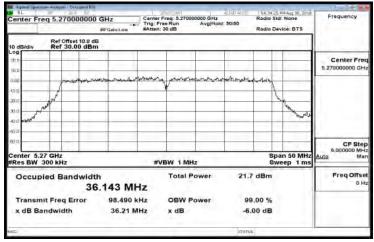
#### 5825MHz IC\_802.11n\_20MHz\_AUX1



# IC 802.11n 40MHz Main 5230MHz



## IC 802.11n 40MHz Main 5270MHz



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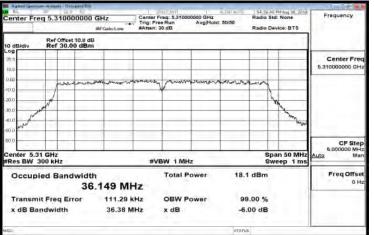
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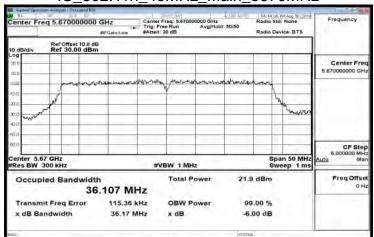


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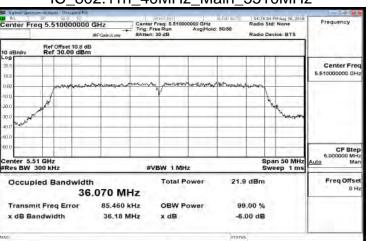
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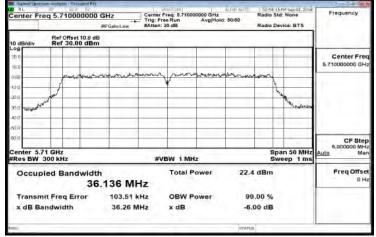
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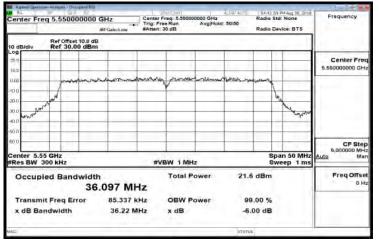
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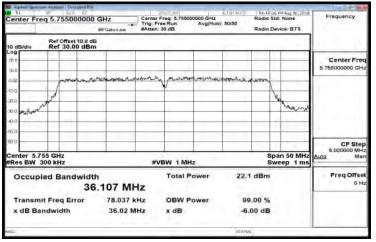
# IC 802.11n 40MHz Main 5710MHz



# IC 802.11n 40MHz Main 5550MHz



IC 802.11n 40MHz Main 5755MHz



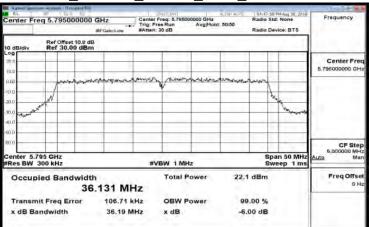
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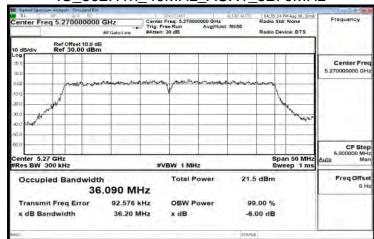


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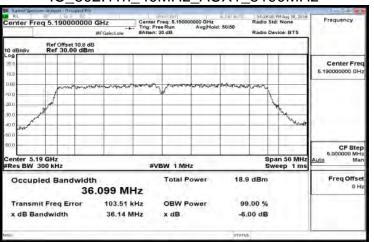
### IC 802.11n 40MHz Main 5795MHz



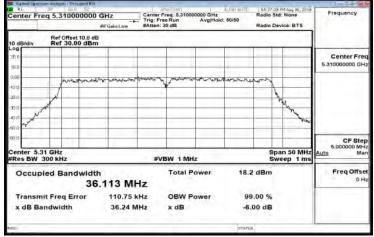
## IC 802.11n 40MHz AUX1 5270MHz



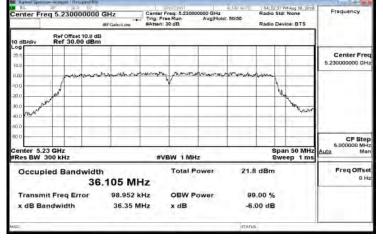
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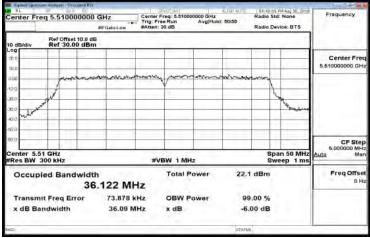
#### IC\_802.11n\_40MHz\_AUX1\_ 5310MHz



# IC 802.11n 40MHz AUX1 5230MHz



IC 802.11n 40MHz AUX1 5510MHz



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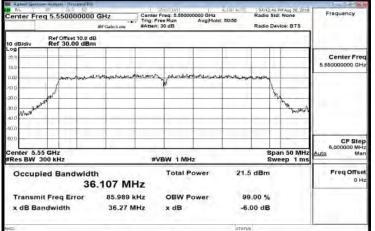
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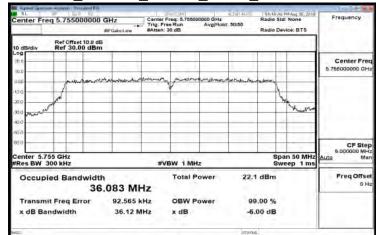


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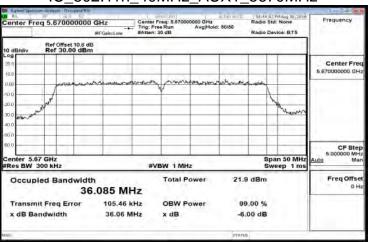
# IC\_802.11n\_40MHz\_AUX1\_5550MHz



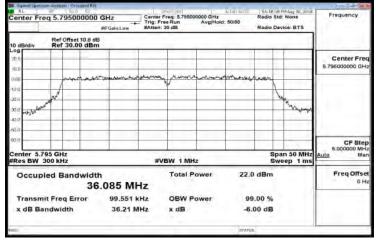
## IC 802.11n 40MHz AUX1 5755MHz



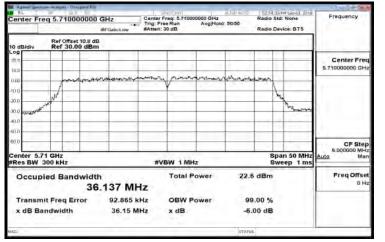
#### 5670MHz IC\_802.11n\_40MHz\_AUX1



#### IC\_802.11n\_40MHz\_AUX1 5795MHz



## IC 802.11n 40MHz AUX1 5710MHz



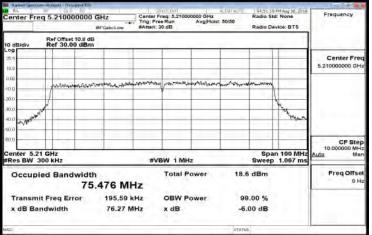
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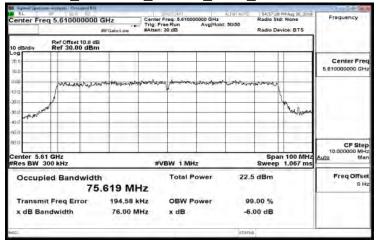


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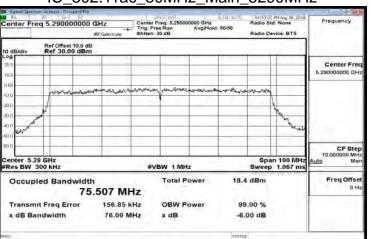
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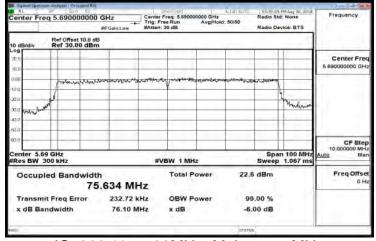
### IC 802.11ac 80MHz Main 5610MHz



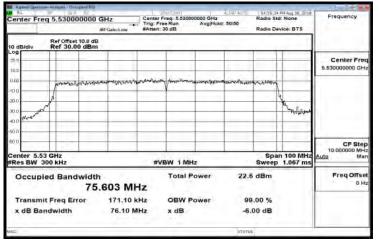
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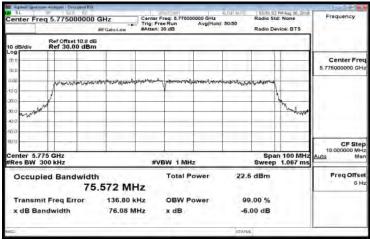
#### IC\_802.11ac\_80MHz\_Main 5690MHz



# IC 802.11ac 80MHz Main 5530MHz



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



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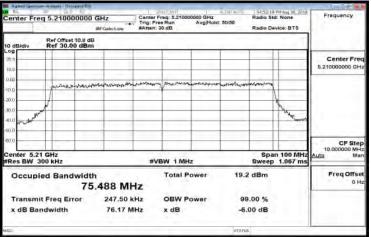
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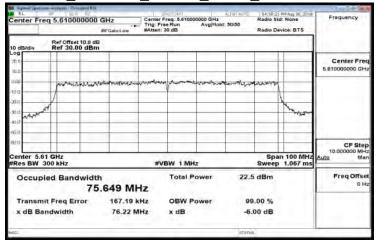


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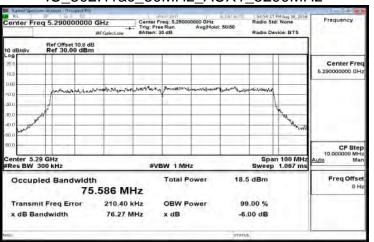
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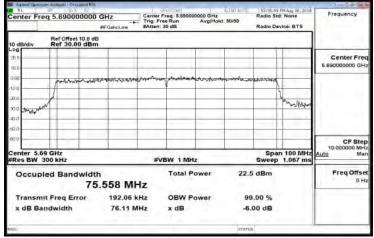
# IC 802.11ac 80MHz AUX1 5610MHz



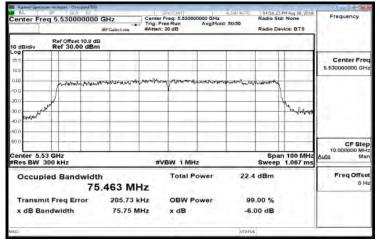
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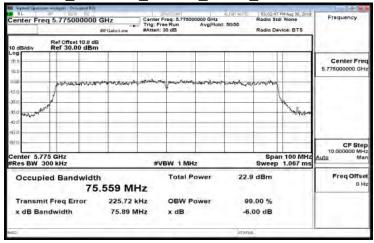
#### IC\_802.11ac\_80MHz\_AUX1\_ 5690MHz



# IC 802.11ac 80MHz AUX1 5530MHz



IC 802.11ac 80MHz AUX1 5775MHz



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## MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

# 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)
	V	Mobile and portable clinet device	250mW(23.98dBm)
U-NII-2A	V		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 log <sub>10</sub> B, dBm
5250~5350 MHz	Conducted output power shall not exceed 250 mW or 11 +10 log <sub>10</sub> B EIRP shall not exceed 1.0 W or 17 + 10 log <sub>10</sub> B, dBm
5470-5600 MHz and 5650-5725 MHz	Conducted output power shall not exceed 250 mW or 11 +10 log <sub>10</sub> B EIRP shall not exceed 1.0 W or 17 + 10 log <sub>10</sub> B, 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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## Note:

As per FCC KDB 662911 D01

Unequal antenna gains, with equal transmit powers. For antenna gains given by G1, G2, ..., GN dBi.

(i) If transmit signals are correlated, then Directional gain

= 
$$10 \log[(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N_{ANT}] dBi$$

[Note the "20"s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

The antenna gain is grater than 6 dBi in MIMO mode, therefore the limit needs to be reduced as below:

	Effective Legacy Gain (dBi)	Conducted Power Limit (dBm)				
UNII-1	8.67	21.31				
UNII-2A	8.19	21.79				
U-NII-2C	8.36	21.62				
U-NII-3	8.08	27.92				

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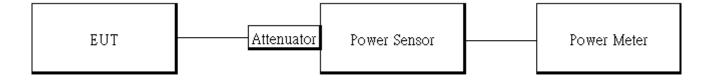
### 9.2 Measurement Procedure

- 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.
- Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter
- Power Meter is used as the auxiliary test equipment to conduct the output power measurement.
- Record the max. reading and add 10 log(1/duty cycle).
- Repeat above procedures until all frequency (low, middle, and high channel) measured were complete.

## 9.3 Measurement Equipment Used

	S	GS Conducted R	oom		
Name of Equip- ment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum Analyz- er	Agilent	N9010A	MY51440113	2018/06/20	2019/6/19
Power Sensor	Anritsu	MA2411B	1315048	2018/08/09	2019/8/2
Power Sensor	Anritsu	MA2411B	1315049	2018/08/09	2019/8/2
Power Sensor	Agilent	U2021X	MY53480015	2018/04/10	2019/4/9
Attenuator	Marvelous	MVE2213-10	RF30	2017/12/26	2018/12/25
Attenuator	Marvelous	MVE2213-10	RF31	2017/12/26	2018/12/25
DC Block	PASTERNACK	PE8210	RF29	2017/12/26	2018/12/25
Notebook	Lenovo	L420	S0011721	N/A	N/A

# 9.4 Test Set-up



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### 9.5 Measurement Result

# Conducted output power (FCC)

# 802 11a Ch0

802.11a_	1	1	TOTAL	TOTAL		REQUIRED			
СН	Frequency (MHz)	Data Rate	POWER (dBm)	POWER (mW)		LIMIT (dBm)		RESULT	
36	5180	6	14.31	26.949		23.98		PASS	
44	5220	6	16.47	44.314		23.98			
48	5240	6	16.44	44.009		23.98			
52	5260	6	16.45	44.111	23.98	or 11+10log(B) =	24.58	PASS	
60	5300	6	16.48	44.416	23.98	or 11+10log(B) =	24.43	PASS	
64	5320	6	14.23	26.457	23.98	or 11+10log(B) =	24.32	PASS	
100	5500	6	16.49	44.519	23.98	or 11+10log(B) =	24.82	PASS	
116	5580	6	16.47	44.314	23.98	or 11+10log(B) =	24.66	PASS	
140	5700	6	16.46	44.212	23.98	or 11+10log(B) =	24.77	PASS	
149	5745	6	16.46	44.212		30		PASS	
157	5785	6	16.48	44.416		30		PASS	
165	5825	6	16.49	44.519		30		PASS	

### 802 11a Ch1

802.11a_	1		TOTAL	TOTAL	ī	REQUIRED			
СН	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)		LIMIT (dBm)		RESULT	
36	5180	6	14.28	26.763		23.98		PASS	
44	5220	6	16.33	42.908		23.98			
48	5240	6	16.35	43.106		23.98			
52	5260	6	16.35	43.106	23.98	or 11+10log(B) =	24.66	PASS	
60	5300	6	16.48	44.416	23.98	or 11+10log(B) =	24.70	PASS	
64	5320	6	14.21	26.336	23.98	or 11+10log(B) =	24.65	PASS	
100	5500	6	16.42	43.807	23.98	or 11+10log(B) =	24.41	PASS	
116	5580	6	16.46	44.212	23.98	or 11+10log(B) =	24.83	PASS	
140	5700	6	16.44	44.009	23.98	or 11+10log(B) =	24.85	PASS	
149	5745	6	16.44	44.009		30		PASS	
157	5785	6	16.47	44.314		30		PASS	
165	5825	6	16.43	43.908		30		PASS	

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# 802.11n HT20 Ch0

	F	D-1-	TOTAL	TOTAL		REQUIRED		
СН	Frequency	Data	POWER	POWER		LIMIT		RESULT
	(MHz)	Rate	(dBm)	(mW)		(dBm)		
36	5180	MCS0	10.40	10.960		23.98		PASS
44	5220	MCS0	10.40	10.960		23.98		PASS
48	5240	MCS0	10.38	10.909		23.98		PASS
52	5260	MCS0	17.45	55.565	23.98 or 11+10log(B) = 24.80			PASS
60	5300	MCS0	17.43	55.309	23.98	or 11+10log(B) =	24.84	PASS
64	5320	MCS0	11.13	12.966	23.98 or 11+10log(B) = 24.39		24.39	PASS
100	5500	MCS0	17.45	55.565	23.98	or 11+10log(B) =	25.02	PASS
116	5580	MCS0	17.43	55.309	23.98	or 11+10log(B) =	25.54	PASS
140	5700	MCS0	17.44	55.437	23.98	or 11+10log(B) =	25.38	PASS
144	5720(U-NII 2C)	MCS0	13.28	21.269	23.98	or 11+10log(B) =	23.88	PASS
144	5720 (U-NII 3)	MCS0	4.12	2.583		30		PASS
149	5745	MCS0	17.41	55.055	30			PASS
157	5785	MCS0	17.46	55.693	30			PASS
165	5825	MCS0	17.44	55.437		30		PASS

### 802.11n HT20 Ch1

	_	D. (	TOTAL	TOTAL		REQUIRED		
СН	Frequency	Data	POWER	POWER		LIMIT		RESULT
	(MHz)	Rate	(dBm)	(mW)		(dBm)		
36	5180	MCS0	10.47	11.138		23.98		PASS
44	5220	MCS0	10.85	12.156		23.98		PASS
48	5240	MCS0	10.84	12.128		23.98		PASS
52	5260	MCS0	17.34	54.175	23.98 or 11+10log(B) = 25.12			PASS
60	5300	MCS0	17.41	55.055	23.98	or 11+10log(B) =	25.00	PASS
64	5320	MCS0	11.34	13.608	23.98 or 11+10log(B) = 24.61		24.61	PASS
100	5500	MCS0	17.37	54.550	23.98	or 11+10log(B) =	24.91	PASS
116	5580	MCS0	17.43	55.309	23.98	or 11+10log(B) =	25.12	PASS
140	5700	MCS0	17.43	55.309	23.98	or 11+10log(B) =	25.24	PASS
144	5720(U-NII 2C)	MCS0	13.25	21.157	23.98	or 11+10log(B) =	24.13	PASS
144	5720 (U-NII 3)	MCS0	4.11	2.578		30		PASS
149	5745	MCS0	17.29	53.555	30			PASS
157	5785	MCS0	17.34	54.175	30			PASS
165	5825	MCS0	17.39	54.802		30		PASS

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### 802.11n\_HT20\_MIMO

СН	Frequency	Data	Avg. POW	ER (dBm)	TOTAL POWER	TOTAL POWER		REQUIRED LIMIT		RESULT
Сп	(MHz)	Rate	CH 0	CH 1	(dBm)	(mW)		(dBm)		KESULI
36	5180	MCS8	10.41	10.51	13.82	22.236		21.31		PASS
44	5220	MCS8	10.27	10.52	13.76	21.913		21.31		PASS
48	5240	MCS8	10.22	10.51	13.73	21.766		21.31		PASS
52	5260	MCS8	16.69	17.15	20.28	98.546	21.79	or 11+10log(B) =	24.80	PASS
60	5300	MCS8	16.92	17.04	20.34	99.786	21.79	or 11+10log(B) =	24.84	PASS
64	5320	MCS8	10.84	11.08	14.32	24.957	21.79	or 11+10log(B) =	24.39	PASS
100	5500	MCS8	16.98	17.10	20.40	101.175	21.62	or 11+10log(B) =	24.91	PASS
116	5580	MCS8	16.94	17.13	20.39	101.073	21.62	or 11+10log(B) =	25.12	PASS
140	5700	MCS8	17.02	17.15	20.44	102.230	21.62	or 11+10log(B) =	25.24	PASS
144	5720(U-NII 2C)	MCS8	13.04	13.10	15.63	40.546	21.62	or 11+10log(B) =	23.88	PASS
144	5720 (U-NII 3)	MCS8	4.05	4.06	4.85	5.089		27.92		PASS
149	5745	MCS8	16.98	17.02	20.36	100.239		27.92		PASS
157	5785	MCS8	17.05	17.21	20.49	103.301		27.92		PASS
165	5825	MCS8	17.08	17.16	20.48	103.050		27.92	•	PASS

### 802.11n HT40 Ch0

СН	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)		
38	5190	MCS0	10.71	11.771			PASS	
46	5230	MCS0	10.85	12.157		PASS		
54	5270	MCS0	16.46	44.240	23.98	or 11+10log(B) =	27.07	PASS
62	5310	MCS0	11.49	14.087	23.98	or 11+10log(B) =	27.06	PASS
102	5510	MCS0	16.45	44.138	23.98	or 11+10log(B) =	27.13	PASS
110	5550	MCS0	16.40	43.633	23.98	or 11+10log(B) =	27.14	PASS
134	5670	MCS0	16.43	43.936	23.98	or 11+10log(B) =	27.13	PASS
142	5710(U-NII 2C)	MCS0	14.43	27.706	23.98	or 11+10log(B) =	26.56	PASS
142	5710 (U-NII 3)	MCS0	1.98	1.579		30		PASS
151	5755	MCS0	16.42	43.835		30		
159	5795	MCS0	16.40	43.633		30		PASS

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# 802.11n\_HT40\_Ch1

СН	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)		
38	5190	MCS0	10.84	12.129			PASS	
46	5230	MCS0	10.90	12.298		PASS		
54	5270	MCS0	16.42	43.835	23.98	or 11+10log(B) =	27.10	PASS
62	5310	MCS0	11.62	14.515	23.98	or 11+10log(B) =	27.10	PASS
102	5510	MCS0	16.41	43.734	23.98	or 11+10log(B) =	27.13	PASS
110	5550	MCS0	16.36	43.233	23.98	or 11+10log(B) =	27.13	PASS
134	5670	MCS0	16.41	43.734	23.98	or 11+10log(B) =	27.13	PASS
142	5710(U-NII 2C)	MCS0	14.36	27.316	23.98	or 11+10log(B) =	26.56	PASS
142	5710 (U-NII 3)	MCS0	1.97	1.575		23.98		PASS
151	5755	MCS0	16.38	43.433		23.98		PASS
159	5795	MCS0	16.35	43.134		30		PASS

### 802.11n HT40 MIMO

<b>6</b> 11	Frequency	Data	Avg. POW	ER (dBm)	TOTAL	TOTAL		REQUIRED		DECLUT
СН	(MHz)	Rate	CH 0	CH 1	POWER (dBm)	POWER (mW)		LIMIT (dBm)		RESULT
38	5190	MCS8	10.12	10.25	13.85	20.873		21.31		PASS
46	5230	MCS8	10.25	10.34	13.96	21.407		21.31		PASS
54	5270	MCS8	15.70	15.81	19.42	75.260	21.79	or 11+10log(B) =	27.07	PASS
62	5310	MCS8	10.85	11.01	14.60	24.780	21.79	or 11+10log(B) =	27.06	PASS
102	5510	MCS8	15.58	15.87	19.40	74.778	21.62	or 11+10log(B) =	27.13	PASS
110	5550	MCS8	15.42	15.78	19.27	72.678	21.62	or 11+10log(B) =	27.13	PASS
134	5670	MCS8	15.43	15.75	19.26	72.498	21.62	or 11+10log(B) =	27.13	PASS
142	5710(U-NII 2C)	MCS8	13.84	13.95	17.12	49.046	21.62	or 11+10log(B) =	26.56	PASS
142	5710 (U-NII 3)	MCS8	1.90	1.92	2.35	3.104		27.92		PASS
151	5755	MCS8	15.72	15.91	19.48	76.319		27.92		PASS
159	5795	MCS8	15.77	15.86	19.48	76.305		27.92		PASS

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### 802.11ac VHT80 Ch0

СН	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)		RESULT		
42	5210	MCS0	11.35	13.638		23.98		PASS
58	5290	MCS0	11.13	12.964	23.98	or 11+10log(B) =	30.17	PASS
106	5530	MCS0	15.47	35.216	23.98	or 11+10log(B) =	30.18	PASS
122	5610	MCS0	15.32	34.021	23.98	or 11+10log(B) =	30.24	PASS
138	5690(U-NII 2C)	MCS0	14.46	27.938	23.98	or 11+10log(B) =	30.32	PASS
138	5690 (U-NII 3)	MCS0	0.94	1.240		30		PASS
155	5775	MCS0	15.48	35.297		30		PASS

### 802.11ac VHT80 Ch1

СН	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)			RESULT
42	5210	MCS0	11.24	13.297		23.98		PASS
58	5290	MCS0	11.08	12.816	23.98	or 11+10log(B) =	30.18	PASS
106	5530	MCS0	15.44	34.974	23.98	or 11+10log(B) =	30.21	PASS
122	5610	MCS0	15.13	32.564	23.98	or 11+10log(B) =	30.22	PASS
138	5690(U-NII 2C)	MCS0	14.51	28.241	23.98	or 11+10log(B) =	29.99	PASS
138	5690 (U-NII 3)	MCS0	0.94	1.241		23.98		PASS
155	5775	MCS0	15.44	34.974		23.98		PASS

### 802.11ac VHT80 MIMO

СН	Frequency (MHz)	Data Rate	Avg. POWER (dBm)		TOTAL	TOTAL	REQUIRED			DECLUT
			CH 0	CH 1	POWER (dBm)	POWER (mW)	LIMIT (dBm)			RESULT
42	5210	MCS0	10.65	10.57	14.34	23.017		21.31		PASS
58	5290	MCS0	10.48	10.41	14.17	22.159	21.79	or 11+10log(B) =	30.17	PASS
106	5530	MCS0	14.86	14.57	18.45	59.261	21.62	or 11+10log(B) =	30.18	PASS
122	5610	MCS0	14.63	14.41	18.25	56.646	21.62	or 11+10log(B) =	30.22	PASS
138	5690(U-NII 2C)	MCS0	13.82	13.43	17.13	46.113	21.62	or 11+10log(B) =	29.99	PASS
138	5690 (U-NII 3)	MCS0	0.89	0.87	1.11	2.450		27.92		PASS
155	5775	MCS0	14.77	14.57	18.40	58.633		27.92		PASS

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# Conducted output power (IC)

## 802.11a Ch0

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СН	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)		RESULT
52	5260	16.45	44.111	23.98	or 11+10log(B) =	23.23	PASS
60	5300	16.48	44.416	23.98	or 11+10log(B) =	23.23	PASS
64	5320	14.23	26.457	23.98	or 11+10log(B) =	23.22	PASS
100	5500	16.49	44.519	23.98	or 11+10log(B) =	23.22	PASS
116	5580	16.47	44.314	23.98	or 11+10log(B) =	23.22	PASS
140	5700	16.46	44.212	23.98	or $11+10\log(B) =$	23.24	PASS
149	5745	16.46	44.212		30		PASS
157	5785	16.48	44.416		30		PASS
165	5825	16.49	44.519		30		PASS

### 802.11a Ch1

<u></u>	_ ~						
СН	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)		RESULT
52	5260	16.35	43.106	23.98	or 11+10log(B) =	23.21	PASS
60	5300	16.48	44.416	23.98	or 11+10log(B) =	23.22	PASS
64	5320	14.21	26.336	23.98	or 11+10log(B) =	23.21	PASS
100	5500	16.42	43.807	23.98	or 11+10log(B) =	23.22	PASS
116	5580	16.46	44.212	23.98	or 11+10log(B) =	23.22	PASS
140	5700	16.44	44.009	23.98	or 11+10log(B) =	23.23	PASS
149	5745	16.44	44.009		30		PASS
157	5785	16.47	44.314		30		PASS
165	5825	16.43	43.908		30		PASS

# 802.11n\_HT20\_Ch0

СН	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)		RESULT
52	5260	17.45	55.565	23.98	or 11+10log(B) =	23.54	PASS
60	5300	17.43	55.309	23.98	or 11+10log(B) =	23.51	PASS
64	5320	11.13	12.966	23.98	or 11+10log(B) =	23.50	PASS
100	5500	17.45	55.565	23.98	or $11+10\log(B) =$	23.53	PASS
116	5580	17.43	55.309	23.98	or 11+10log(B) =	23.54	PASS
140	5700	17.44	55.437	23.98	or 11+10log(B) =	23.55	PASS
144	5720(U-NII 2C)	13.28	21.269	23.98	or 11+11log(B) =	22.38	PASS
144	5720 (U-NII 3)	4.12	2.583		30		PASS
149	5745	17.41	55.055		30		PASS
157	5785	17.46	55.693		30		PASS
165	5825	17.44	55.437		30	_	PASS

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#### 802.11n HT20 Ch1

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СН	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)			
52	5260	17.34	54.175	23.98	or 11+10log(B) =	23.53	PASS	
60	5300	17.41	55.055	23.98	or 11+10log(B) =	23.52	PASS	
64	5320	11.34	13.608	23.98	or 11+10log(B) =	23.51	PASS	
100	5500	17.37	54.550	23.98	or 11+10log(B) =	23.54	PASS	
116	5580	17.43	55.309	23.98	or 11+10log(B) =	23.55	PASS	
140	5700	17.43	55.309	23.98	or $11+10\log(B) =$	23.56	PASS	
144	5720(U-NII 2C)	13.25	21.157	23.98	or 11+10log(B) =	22.37	PASS	
144	5720 (U-NII 3)	4.11	2.578		30		PASS	
149	5745	17.29	53.555		30		PASS	
157	5785	17.34	54.175		30		PASS	
165	5825	17.39	54.802		30		PASS	

## 802.11n\_HT20\_MIMO

СН	Frequency		RAGE VER	TOTAL POWER	TOTAL POWER		REQUIRED LIMIT		RESULT
	(MHz)	CH 0	CH 1	(dBm)	(mW)			I KEGGET	
52	5260	16.7	17.2	20.28	106.767	21.79	or 11+10log(B) =	23.53	PASS
60	5300	16.9	17	20.34	108.111	21.79	or 11+10log(B) =	23.51	PASS
64	5320	10.8	11.1	14.32	27.039	21.79	or 11+10log(B) =	23.50	PASS
100	5500	17	17.1	20.40	109.615	21.62	or 11+10log(B) =	23.53	PASS
116	5580	16.9	17.1	20.39	109.505	21.62	or 11+10log(B) =	23.54	PASS
140	5700	17	17.2	20.44	110.758	21.62	or 11+10log(B) =	23.55	PASS
144	5720(U-NII 2C)	13	13.1	15.63	36.577	21.62	or 11+10log(B) =	22.37	PASS
144	5720 (U-NII 3)	4.05	4.06	4.85	3.056		27.91964824		PASS
149	5745	17	17	20.36	108.601		27.91964824		PASS
157	5785	17.1	17.2	20.49	111.919		27.91964824		PASS
165	5825	17.1	17.2	20.48	111.647		27.91964824		PASS

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### 802.11n HT40 Ch0

СН	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)			
54	5270	16.46	44.240	23.98	or 11+10log(B) =	26.58	PASS	
62	5310	11.49	14.087	23.98	or 11+10log(B) =	26.58	PASS	
102	5510	16.45	44.138	23.98	or 11+10log(B) =	26.57	PASS	
110	5550	16.40	43.633	23.98	or 11+10log(B) =	26.57	PASS	
134	5670	16.43	43.936	23.98	or 11+10log(B) =	26.58	PASS	
142	37 10(0-1411	14.43	27.706	23.98	or 11+11log(B) =	26.02	PASS	
142	5710 (U-NII 3)	1.98	1.579		30		PASS	
151	5755	16.42	43.835		30		PASS	
159	5795	16.40	43.633		PASS			

### 802.11n\_HT40\_Ch1

СН	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)			
54	5270	16.42	43.835	23.98	or 11+10log(B) =	26.57	PASS	
62	5310	11.62	14.515	23.98	or 11+10log(B) =	26.58	PASS	
102	5510	16.41	43.734	23.98	or 11+10log(B) =	26.58	PASS	
110	5550	16.36	43.233	23.98	or 11+10log(B) =	26.58	PASS	
134	5670	16.41	43.734	23.98	or $11+10\log(B) =$	26.57	PASS	
142	37 10(U-NII	14.36	27.316	23.98	or 11+10log(B) =	26.02	PASS	
142	5710 (U-NII 3)	1.97	1.575		30		PASS	
151	5755	16.38	43.433		30		PASS	
159	5795	16.35	43.134		PASS			

## 802.11n\_HT40\_MIMO

СН	Frequency		RAGE VER	TOTAL POWER	TOTAL POWER		REQUIRED LIMIT		RESULT
	(MHz)	CH 0	CH 1	(dBm)	(mW)		(dBm)		
54	5270	15.7	15.8	19.42	87.575	21.79	or 11+10log(B) =	26.57	PASS
62	5310	10.9	11	14.60	28.835	21.79	or 11+10log(B) =	26.58	PASS
102	5510	15.6	15.9	19.40	87.014	21.95	or 11+10log(B) =	26.57	PASS
110	5550	15.4	15.8	19.27	84.571	21.95	or 11+10log(B) =	26.57	PASS
134	5670	15.4	15.8	19.26	84.361	21.95	or 11+10log(B) =	26.57	PASS
142	37 10(U-1411	13.8	14	17.12	51.535	21.95	or 11+10log(B) =	26.02	PASS
142	5710 (U-NII 3)	1.9	1.92	2.35	1.719		27.94949281		PASS
151	5755	15.7	15.9	19.48	88.808		27.94949281		PASS
159	5795	15.8	15.9	19.48	88.791		27.94949281		PASS

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## 802.11ac\_VHT80\_Ch0

СН	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)			
58	5290	11.13	12.964	23.98	or 11+10log(B) =	29.78	PASS	
106	5530	15.47	35.216	23.98	or 11+10log(B) =	29.79	PASS	
122	5610	15.32	34.021	23.98	or 11+11log(B) =	29.79	PASS	
138	3C)	14.46	27.938	23.98	or 11+12log(B) =	29.51	PASS	
138	5690 (U-NII 3)	0.94	1.240		30		PASS	
155	5775	15.48	35.297		30		PASS	

#### 802.11ac VHT80 Ch1

СН	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)			
58	5290	11.08	12.816	23.98	or 11+10log(B) =	29.78	PASS	
106	5530	15.44	34.974	23.98	or 11+10log(B) =	29.78	PASS	
122	5610	15.13	32.564	23.98	or 11+10log(B) =	29.79	PASS	
138	3C)	14.51	28.241	23.98	or 11+10log(B) =	29.51	PASS	
138	5690 (U-NII 3)	0.94	1.241		30	•	PASS	
155	5775	15.44	34.974		30		PASS	

#### 802.11ac VHT80 MIMO

СН	Frequency	Data	Avg. POW	ER (dBm)	TOTAL POWER	TOTAL POWER		REQUIRED LIMIT		RESULT
Сп	(MHz)	Rate	CH 0	CH 1	(dBm)	(mW)		(dBm)		KESULI
42	5210	MCS0	10.65	10.57	14.34	23.017		21.31		PASS
58	5290	MCS0	10.48	10.41	14.17	22.159	21.79	or 11+10log(B) =	30.17	PASS
106	5530	MCS0	14.86	14.57	18.45	59.261	21.62	or 11+10log(B) =	30.18	PASS
122	5610	MCS0	14.63	14.41	18.25	56.646	21.62	or 11+10log(B) =	30.22	PASS
138	5690(U-NII 2C)	MCS0	13.82	13.43	17.13	46.113	21.62	or 11+10log(B) =	29.99	PASS
138	5690 (U-NII 3)	MCS0	0.89	0.87	1.11	2.450		27.92		PASS
155	5775	MCS0	14.77	14.57	18.40	58.633		27.92		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	14.31	5.430	19.74	94.090	23.01	or 10+10log(B)=	22.23	PASS
44	5220	16.47	5.430	21.90	154.718	23.01	or 10+10log(B)=	22.22	PASS
48	5240	16.44	5.430	21.87	153.653	23.01	or 10+10log(B)=	22.23	PASS
52	5260	16.45	5.610	22.06	160.525	30	or 17+10log(B)=	29.23	PASS
60	5300	16.48	5.610	22.09	161.637	30	or 17+10log(B)=	29.23	PASS
64	5320	14.23	5.610	19.84	96.281	30	or 17+10log(B)=	29.22	PASS
100	5500	16.49	5.860	22.35	171.610	30	or 17+10log(B)=	29.22	PASS
116	5580	16.47	5.860	22.33	170.821	30	or 17+10log(B)=	29.22	PASS
140	5700	16.46	5.860	22.32	170.428	30	or 17+10log(B)=	29.24	PASS

#### 802.11n\_HT20\_MIMO

СН	Frequency (MHz)	TOTAL POWER (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)		REQUIRED LIMIT (dBm)		RESULT
36	5180	13.82	8.67	22.49	177.288	23.01	or 10+10log(B)=	22.50	PASS
44	5220	13.76	8.67	22.42	174.715	23.01	or 10+10log(B)=	22.51	PASS
48	5240	13.73	8.67	22.39	173.537	23.01	or 10+10log(B)=	22.51	PASS
52	5260	20.28	8.19	28.48	704.014	30	or 17+10log(B)=	29.53	PASS
60	5300	20.34	8.19	28.53	712.876	30	or 17+10log(B)=	29.51	PASS
64	5320	14.32	8.19	22.51	178.295	30	or 17+10log(B)=	29.50	PASS
100	5500	20.40	8.36	28.76	750.785	30	or 17+10log(B)=	29.53	PASS
116	5580	20.39	8.36	28.75	750.029	30	or 17+10log(B)=	29.54	PASS
140	5700	20.44	8.36	28.80	758.618	30	or 17+10log(B)=	29.55	PASS

## 802.11n\_HT40\_MIMO

СН	Frequency (MHz)	TOTAL POWER (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)		REQUIRED LIMIT (dBm)		RESULT
38	5190	13.85	8.67	22.52	178.738	23.01	or 10+10log(B)=	25.57	PASS
46	5230	13.96	8.67	22.63	183.312	23.01	or 10+10log(B)=	25.58	PASS
54	5270	19.42	8.19	27.62	577.466	30	or 17+10log(B)=	32.57	PASS
62	5310	14.60	8.19	22.79	190.136	30	or 17+10log(B)=	32.58	PASS
102	5510	19.40	8.36	27.75	595.985	30	or 17+10log(B)=	32.57	PASS
110	5550	19.27	8.36	27.63	579.250	30	or 17+10log(B)=	32.57	PASS
134	5670	19.26	8.36	27.62	577.814	30	or 17+10log(B)=	32.57	PASS

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#### 802.11ac\_VHT80\_MIMO

СН	Frequency (MHz)	TOTAL POWER (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)		REQUIRED LIMIT (dBm)		RESULT
42	5210	14.34	8.67	23.01	199.808	23.01	or 10+10log(B)=	28.78	PASS
58	5290	14.17	8.19	22.36	172.358	30	or 17+10log(B)=	35.78	PASS
106	5530	18.45	8.36	26.80	478.807	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	
	V	Mobile and portable clinet device	11dBm/ MHz
U-NII-2A			11dBm/ MHz
U-NII-2C	√		11dBm/ MHz
U-NII-3	V		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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#### Note:

As per FCC KDB 662911 D01

Unequal antenna gains, with equal transmit powers. For antenna gains given by G1, G2, ..., GN dBi.

- (i) If transmit signals are correlated, then Directional gain
- =  $10 \log[(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N_{ANT}] dBi$

[Note the "20"s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

	Effective Legacy Gain (dBi)	Limit (dBm / MHz)
UNII-1	8.67	8.33
UNII-2A	8.19	8.81
U-NII-2C	8.36	8.64
U-NII-3	8.08	27.92

## 10.2 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules.
- Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to Spectrum.
- 4. 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≥ 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)

- User the cursor on spectrum to peak search the highest level of trace
- 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.

Note: For the test of PSD at MIMO mode, the highest emission of worst case employing Measure and add 10 log (N) technical is reported on this report after the comparison between Main Antenna at single transmitting mode and Aux that yields the higher value. The MIMO transmitting mode produces higher value of outcome

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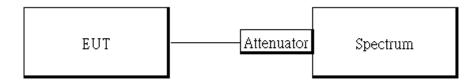


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#### 10.3 **Measurement Equipment Used**

SGS Conducted Room										
Name of Equip- ment	Manufacturer	facturer Model		Calibration Date	Calibration Due					
Spectrum Analyzer	Agilent	N9010A	MY51440113	2018/06/20	2019/6/19					
Attenuator	Marvelous	MVE2213-10	RF30	2017/12/26	2018/12/25					
DC Block	PASTERNACK	PE8210	RF29	2017/12/26	2018/12/25					
Notebook	Lenovo	L420	S0011721	N/A	N/A					

#### 10.4 **Test Set-up**



#### 10.5 **Measurement Result**

	POWER DENSITY 802.11a MODE								
Frequency (MHz)	PPSD W/O Duty Factor (dBm)	Offset	Duty Factor	PPSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)			
5180	2.58	10.80	0.19	2.77	11	-8.23			
5220	2.64	10.80	0.19	2.83	11	-8.17			
5240	3.13	10.80	0.19	3.32	11	-7.68			
5260	3.71	10.80	0.19	3.90	11	-7.10			
5300	3.48	10.80	0.19	3.67	11	-7.33			
5320	1.75	10.80	0.19	1.94	11	-9.06			
5500	3.38	10.80	0.19	3.57	11	-7.43			
5580	2.71	10.80	0.19	2.90	11	-8.10			
5700	1.91	10.80	0.19	2.10	11	-8.90			
5745	10.77	10.80	0.19	10.77	30	-19.23			
5785	10.17	10.80	0.19	10.17	30	-19.83			
5825	9.21	10.80	0.19	9.21	30	-20.79			

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	POWER DENSITY 802.11n HT20 MODE									
	FOWER DENSIT   602.1111 H120 WODE									
Frequency (MHz)	PPSD W/O Duty Factor (dBm)	Offset	Duty Factor	PPSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)				
5180	-0.17	10.80	0.35	0.18	8.33	-8.15				
5220	0.06	10.80	0.35	0.41	8.33	-7.92				
5240	0.03	10.80	0.35	0.38	8.33	-7.95				
5260	3.81	10.80	0.35	4.16	8.81	-4.65				
5300	4.56	10.80	0.35	4.91	8.81	-3.90				
5320	2.44	10.80	0.35	2.79	8.81	-6.02				
5500	5.50	10.80	0.35	5.85	8.64	-2.80				
5580	6.68	10.80	0.35	7.03	8.64	-1.62				
5700	4.10	10.80	0.35	4.45	8.64	-4.20				
5720 (U-NII 2C)	4.99	10.80	0.35	5.34	8.64	-3.31				
5720 (U-NII 3)	3.51	10.80	0.35	3.86	27.92	-24.06				
5745	13.92	10.80	0.35	13.92	27.92	-14.00				
5785	13.93	10.80	0.35	13.93	27.92	-13.99				
5825	10.74	10.80	0.35	10.74	27.92	-17.18				

	POWER DENSITY 802.11n HT40 MODE									
Frequency (MHz)	PPSD W/O Duty Factor (dBm)	Offset	Duty Factor	PPSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)				
5190	-4.4	10.80	0.66	-3.74	8.33	-12.07				
5230	0.25	10.80	0.66	0.91	8.33	-7.42				
5270	-0.92	10.80	0.66	-0.26	8.81	-9.07				
5310	-2.56	10.80	0.66	-1.90	8.81	-10.71				
5510	-0.66	10.80	0.66	0.00	8.64	-8.64				
5550	-1.49	10.80	0.66	-0.83	8.64	-9.47				
5670	-0.75	10.80	0.66	-0.09	8.64	-8.73				
5710 (U-NII 2C)	-0.52	10.80	0.66	0.14	8.64	-8.50				
5710 (U-NII 3)	-5.08	10.80	0.66	-4.42	27.92	-32.34				
5755	9.61	10.80	0.66	9.61	27.92	-18.31				
5795	9.47	10.80	0.66	9.47	27.92	-18.45				

	POWER DENSITY 802.11ac VHT80 MODE									
Frequency (MHz)	PPSD W/O Duty Factor (dBm)	Offset	Duty Factor	PPSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)				
5210	-6.82	10.80	0.23	-6.59	8.33	-14.92				
5290	-5.89	10.80	0.23	-5.66	8.81	-14.47				
5530	-2.21	10.80	0.23	-1.98	8.64	-10.62				
5610	-2.67	10.80	0.23	-2.44	8.64	-11.08				
5690 (U-NII 2C)	-4.45	10.80	0.23	-4.22	8.64	-12.86				
5690 (U-NII 3)	-10.83	10.80	0.23	-10.60	27.92	-38.52				
5775	7.62	10.80	0.23	7.62	27.92	-20.30				

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E	EIRP spectral density 802.11a MODE					EIRI	P spectra	ıl densit	ty 802.11	n HT20 l	MODE
Freq. (MHz)	PPSD (dBm)	Ant. Gain (dBi)	EIRP SD (dBm)	Limit (dBm)	Margin (dB)	Freq. (MHz)	PPSD (dBm)	Ant. Gain (dBi)	EIRP SD (dBm)	Limit (dBm)	Margin (dB)
5180	2.77	5.88	8.65	10	-1.35	5180	0.18	8.67	8.85	10	-1.15
5220	2.83	5.88	8.71	10	-1.29	5220	0.41	8.67	9.08	10	-0.92
5240	3.32	5.88	9.20	10	-0.80	5240	0.38	8.67	9.05	10	-0.95

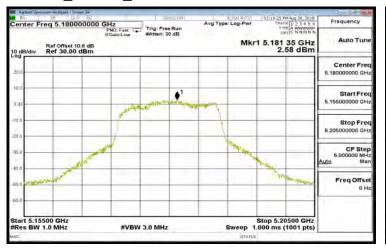
EIRF	spectra	ıl densit	ty 802.11	n HT40 l	MODE						
Freg.	PPSD	Ant.	EIRP	Limit	Margin EIRP spectral dens			density	<sup>,</sup> 802.11a	c VHT80	MODE
(MHz)	(dBm)	Gain (dBi)	SD (dBm)	(dBm)	(dB)	Freq.	PPSD	Ant. Gain	EIRP SD	Limit	Margin
5180	-3.74	8.67	4.93	10	-5.07	(MHz)	(dBm)	(dBi)	(dBm)	(dBm)	(dB)
5220	0.91	8.67	9.58	10	-0.42	5210	-6.59	8.67	2.08	10	-7.92

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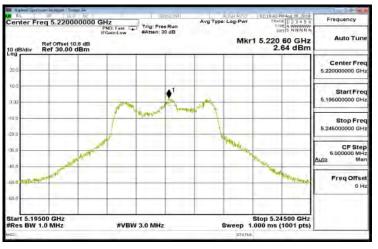
### 802.11a 20MHz 5180MHz



#### 802.11a 20MHz 5260MHz



#### 802.11a\_20MHz\_5220MHz



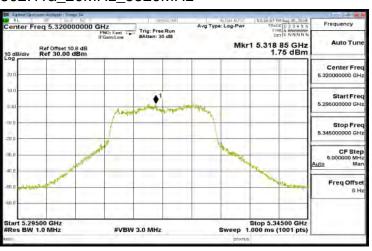
802.11a 20MHz 5300MHz



#### 802.11a 20MHz 5240MHz



#### 802.11a 20MHz 5320MHz



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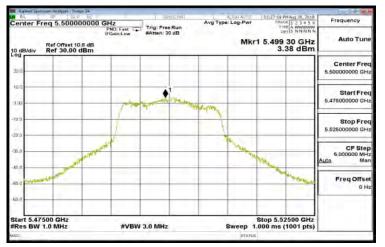
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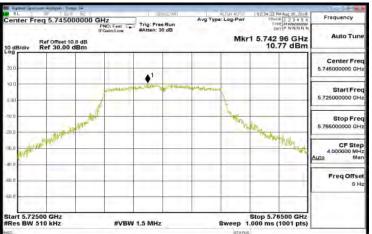


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#### 802.11a 20MHz 5500MHz



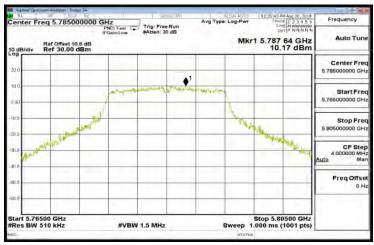
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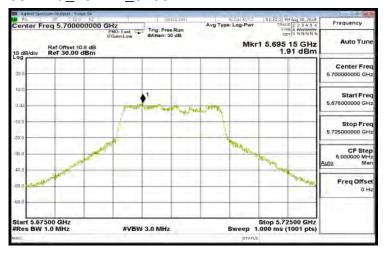
#### 802.11a 20MHz 5580MHz



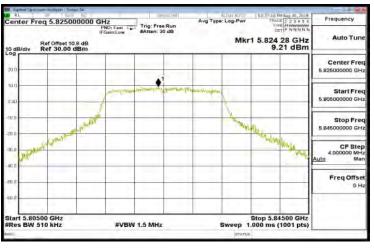
802.11a 20MHz 5785MHz



#### 802.11a 20MHz 5700MHz



#### 802.11a 20MHz 5825MHz



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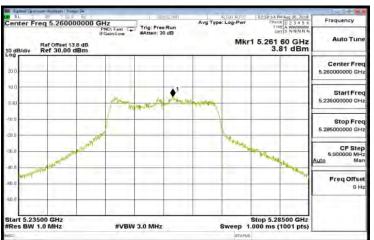


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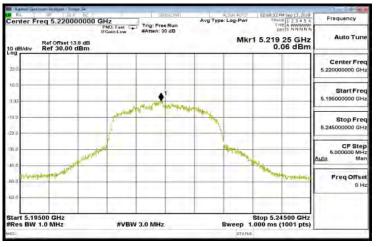
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## 802.11n 20MHz 5260MHz



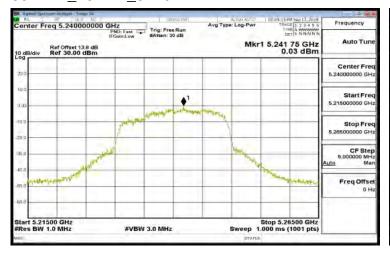
#### 802.11n\_20MHz\_5220MHz



802.11n 20MHz 5300MHz



#### 802.11n 20MHz 5240MHz



#### 802.11n 20MHz 5320MHz



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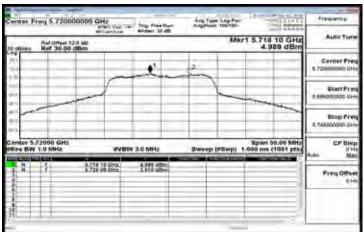


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#### 802.11n 20MHz 5500MHz



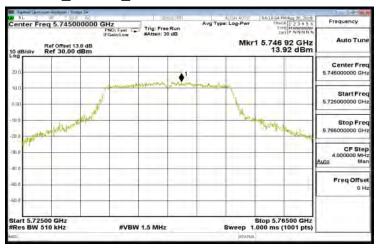
#### 802.11n 20MHz 5720MHz



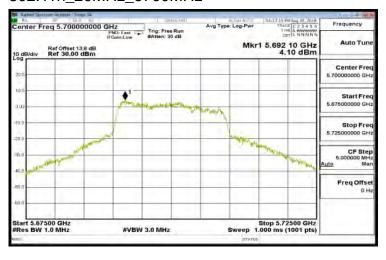
## 802.11n\_20MHz\_5580MHz



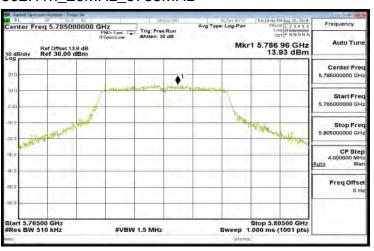
802.11n\_20MHz\_5745MHz



#### 802.11n 20MHz 5700MHz



#### 802.11n 20MHz 5785MHz



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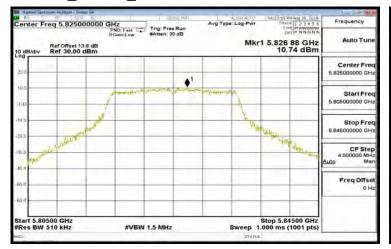
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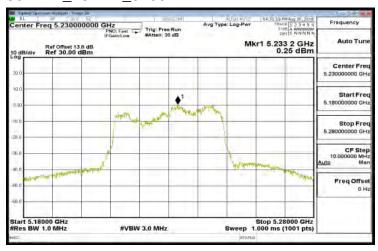
### 802.11n 20MHz 5825MHz



#### 802.11n 40MHz 5190MHz



## 802.11n\_40MHz\_5230MHz



#### 802.11n 40MHz 5270MHz



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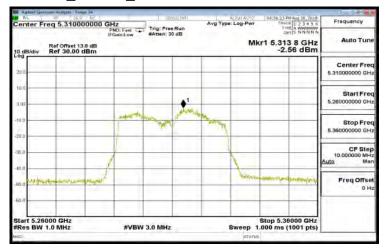
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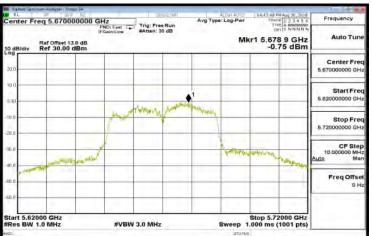


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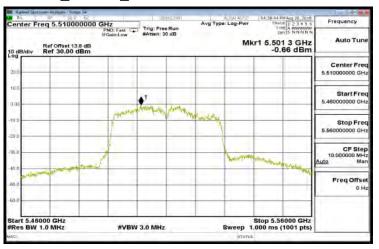
### 802.11n 40MHz 5310MHz



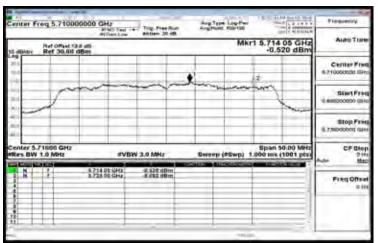
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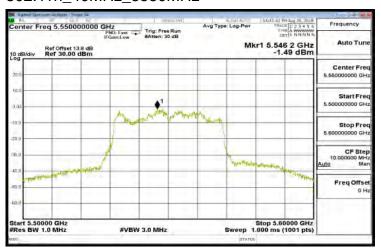
#### 802.11n\_40MHz\_5510MHz



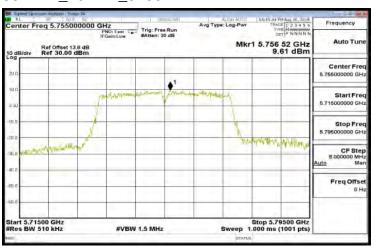
802.11n\_40MHz\_5710MHz



#### 802.11n 40MHz 5550MHz



802.11n 40MHz 5755MHz



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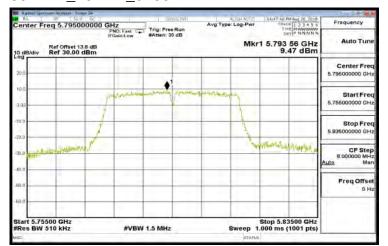
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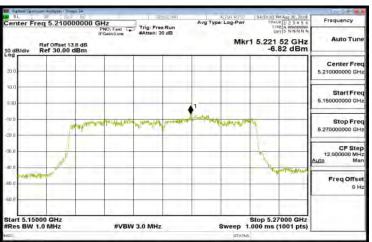


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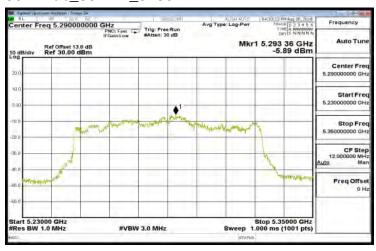
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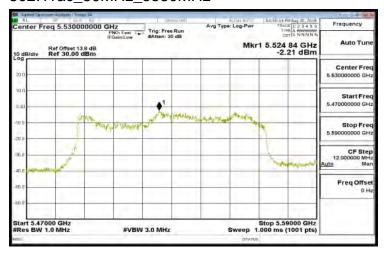
#### 802.11ac 80MHz 5210MHz



## 802.11ac 80MHz 5290MHz



#### 802.11ac 80MHz 5530MHz



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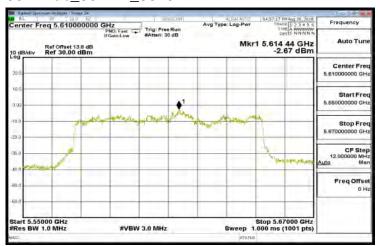
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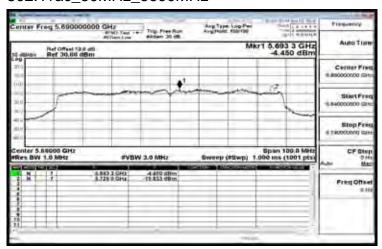


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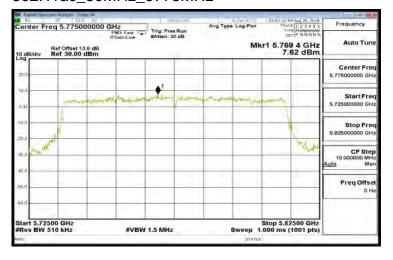
### 802.11ac 80MHz 5610MHz



## 802.11ac 80MHz 5690MHz



#### 802.11ac 80MHz 5775MHz



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#### 11 UNDESIRABLE RADIATED EMISSION MEASUREMENT

#### 11.1 **Standard Applicable**

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

- 1. For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
- 2. For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

APPLICABLE TO	LI	MIT
FCC KDB 789033 D02 General UNII Test Procedures New Rules	FIELD STRE	ENGTH AT 3m
	PK: 74 (dBμV/m)	AV 54 (dBμV/m)
APPLICABLE TO	EIRP LIMIT	FIELD STRENGTH AT 3m
15.407(b)(1) RSS-247 6.2.1.2 15.407(b)(2) RSS-247 6.2.2.2 15.407(b)(3) RSS-247 6.2.3.2	PK: -27 (dBm/MHz)	PK: 68.3 (dBμV/m)
15.407(b)(4)(i) RSS-247 6.2.4.2	PK:-27 (dBm/MHz) *1 PK:10 (dBm/MHz) *2 PK:15.6 (dBm/MHz) *3 PK:27 (dBm/MHz) *4	PK: 68.2(dBµV/m) *1 PK:105.2 (dBµV/m) *2 PK: 110.8(dBµV/m) *3 PK:122.2 (dBµV/m) *4

<sup>\*1</sup> beyond 75 MHz or more above of the bandedge.

EIRP = ( (E\*d)^2) / 30, where E is the field in V/m, d is the measurement distance (3m), EIRP is the equivalent isotropically radiated power in Watts.

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<sup>\*2</sup> below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.

<sup>\*3</sup> below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.

<sup>\*4</sup> from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.



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Unwanted spurious emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table:

Frequency (MHz)	Field strength (microvolts/meter)	Distance (meters)
0.009-0.490	2400/F(KHz)	300
0.490-1.705	24000/F(KHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

#### Note:

- 1. The lower limit shall apply at the transition frequencies.
- 2. Emission level  $(dB\mu V/m) = 20 \log Emission level (dB\mu V/m)$

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## **Measurement Equipment Used**

SGS SAC-III								
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due			
Broadband Antenna	SCHWAZBECK	VULB 9168	9168-617	2017/10/27	2018/10/26			
Horn An- tenna	Schwarzbeck	BBHA9120D	1341	2018/06/07	2019/6/6			
Loop An- tenna	ETS.LINDGREN	6502	148045	2017/09/26	2018/9/25			
3m Site NSA	SGS	966 chamber D	N/A	2018/07/06	2019/7/5			
Spectrum Analyzer	Agilent	N9010A	MY53400256	2017/10/30	2018/10/29			
Pre-Amplifier	ments	EMC184045B	980135	2017/10/27	2018/10/26			
Pre-Amplifier	EMC Instru- ments	EMC9135	980234	2017/12/26	2018/12/25			
Pre-Amplifier	EMC Instru- ments	EMC12630SE	980271	2017/12/26	2018/12/25			
Attenuator	Marvelous	WATT-218FS-10	RF246	2017/12/26	2018/12/25			
DC Block	PASTERNACK	PE8210	RF81	2017/12/26	2018/12/25			
Band Rejection Filter	Micro-Tronics	G015	RF100	2017/12/26	2018/12/25			
Band Rejection Filter	Micro-Tronics	G016	RF101	2017/12/26	2018/12/25			
Band Rejection Filter	Micro-Tronics	G021	RF102	2017/12/26	2018/12/25			
Coaxial Ca- ble	Huber+Suhner	RG 214/U	W21.01	2017/12/26	2018/12/25			
Coaxial Ca- ble	Huber Suhner	EMC106-SM-SM-7200	150703	2017/12/26	2018/12/25			
Notebook	Lenovo	L420	S0012467	N/A	N/A			

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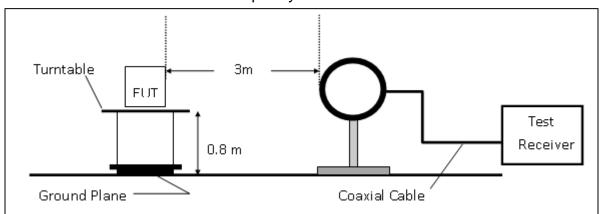
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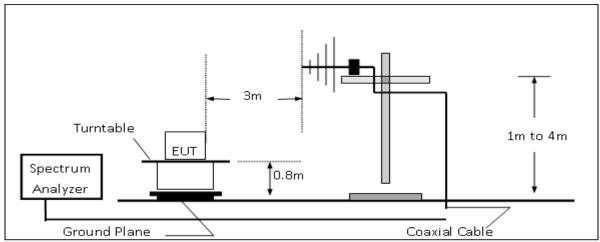
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#### 11.3 **Test SET-UP**

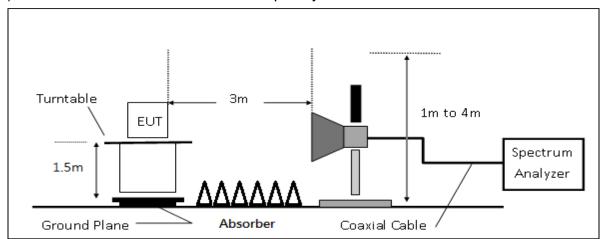
(A) Radiated Emission Test Set-UP Frequency Below 30MHz.



## (B) Radiated Emission Test Set-Up, Frequency form 30MHz to 1000MHz



## (C) Radiated Emission Test Set-UP Frequency Over 1 GHz



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#### 11.4 **Measurement Procedure**

- The EUT was placed on a turn table which is 0.8m above ground plane. 1.
- The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules. 2.
- The EUT was placed on a turn table with 0.8m for frequency< 1GHz and 1.5m for frequency> 3. 1GHz above ground plane.
- The turn table shall rotate 360 degrees to determine the position of maximum emission 4.
- EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
- Set the spectrum analyzer as RBW=120 kHz and VBW=300 kHz for Peak Detector (PK) 6. and Quasi-peak (QP) at frequency below 1 GHz.
- Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz for Peak Detector at frequency 7. above 1 GHz.
- Set the spectrum analyzer as RBW=1 MHz, VBW=10 Hz (Duty cycle > 98%) or VBW ≥ 1/T (Duty cycle < 98%) for Average Detector at frequency above 1 GHz.
- Maximum procedure was performed on the six highest emissions to ensure EUT compli-9. ance.
- 10. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 11. Repeat above procedures until all frequency measured were complete.

### 11.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre Amplifier Gain(dB)

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## Test Results of Radiated Spurious Emissions form 9 KHz to 30 MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit per 15.31(o) was not reported.

#### 11.7 **Measurement Result**

Refer to next page for tabular data sheets.

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# **Radiated Spurious Emission Measurement Result Below 1GHz Worst-Case Data:**

## 802.11a 5150~5250 MHz

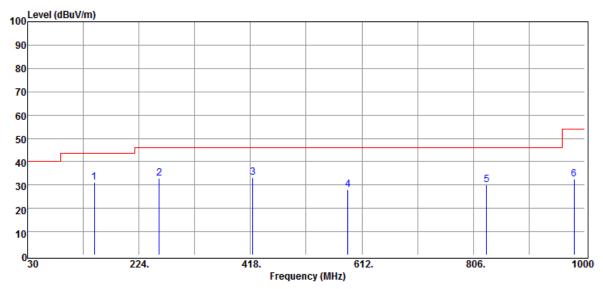
:802.11a / Band1 **Operation Mode** :Tx CH Mid Test Mode

**EUT Pol** :E1 Plan :5220 MHz **Test Channel** 

**Test Date** :2018-08-17 :25/60 Temp./Humi.

Antenna Pol. :VERTICAL

Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
146.40	Peak	47.58	-16.28	31.30	43.50	-12.20
258.92	Peak	49.57	-16.69	32.88	46.00	-13.12
421.88	Peak	45.41	-12.19	33.22	46.00	-12.78
587.75	Peak	36.89	-8.77	28.12	46.00	-17.88
829.28	Peak	36.57	-6.37	30.20	46.00	-15.80
981.57	Peak	36.03	-3.54	32.49	54.00	-21.51

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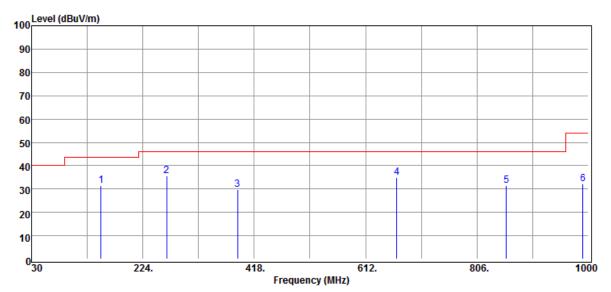
:HORIZONTAL

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**Operation Mode** :802.11a / Band1 **Test Date** :2018-08-17 Test Mode :Tx CH Mid Temp./Humi. :25/60

**EUT Pol** :E1 Plan Antenna Pol.

:5220 MHz Test Channel Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
151.25	Peak	47.62	-16.17	31.45	43.50	-12.05
265.71	Peak	52.16	-16.42	35.74	46.00	-10.26
388.90	Peak	43.00	-13.07	29.93	46.00	-16.07
666.32	Peak	43.54	-8.72	34.82	46.00	-11.18
857.41	Peak	36.98	-5.51	31.47	46.00	-14.53
990.30	Peak	36.01	-3.87	32.14	54.00	-21.86

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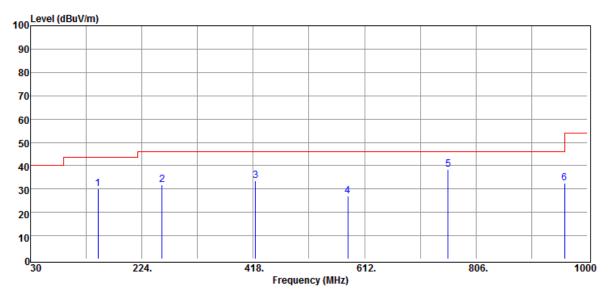
### 802.11a 5250~5350 MHz

:802.11a / Band2 **Test Date Operation Mode** :2018-08-17

Test Mode :Tx CH Mid Temp./Humi. :25/60

:E1 Plan **EUT Pol** Antenna Pol. :VERTICAL

:5300 MHz Test Channel Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
147.37	Peak	46.27	-16.24	30.03	43.50	-13.47
258.92	Peak	48.48	-16.69	31.79	46.00	-14.21
421.88	Peak	45.60	-12.19	33.41	46.00	-12.59
582.90	Peak	35.96	-8.89	27.07	46.00	-18.93
757.50	Peak	45.18	-6.76	38.42	46.00	-7.58
960.23	Peak	36.51	-4.07	32.44	54.00	-21.56

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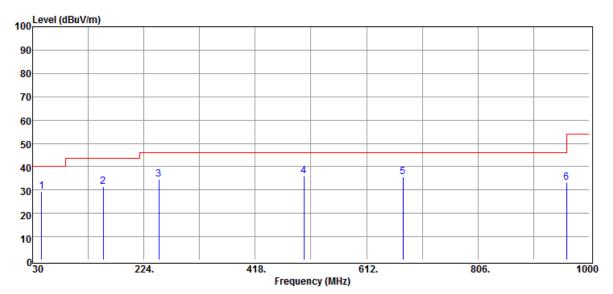
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**Operation Mode** :802.11a / Band2 **Test Date** :2018-08-17

Test Mode :Tx CH Mid Temp./Humi. :25/60

**EUT Pol** :E1 Plan Antenna Pol. :HORIZONTAL :5300 MHz Test Channel

Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBμV/m	dBµV/m	dB
45.52	Peak	46.50	-17.01	29.49	40.00	-10.51
153.19	Peak	47.80	-16.17	31.63	43.50	-11.87
250.19	Peak	51.62	-16.91	34.71	46.00	-11.29
502.39	Peak	47.27	-11.11	36.16	46.00	-9.84
675.05	Peak	43.79	-8.25	35.54	46.00	-10.46
960.23	Peak	37.46	-4.07	33.39	54.00	-20.61

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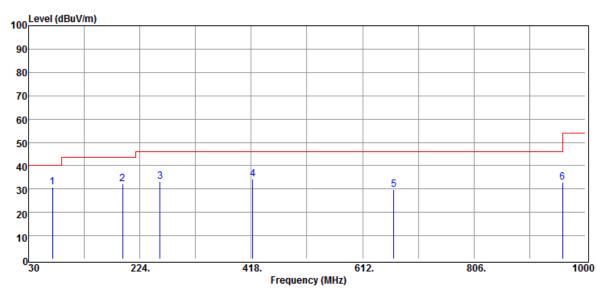
## 802.11a, 5470~5725 MHz

:802.11a / Band3 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Mid Temp./Humi. :25/60

**EUT Pol** :E1 Plan Antenna Pol. :VERTICAL

:5580 MHz Test Channel Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	50.56	-19.83	30.73	40.00	-9.27
193.93	Peak	50.79	-18.45	32.34	43.50	-11.16
258.92	Peak	49.77	-16.69	33.08	46.00	-12.92
420.91	Peak	46.32	-12.22	34.10	46.00	-11.90
666.32	Peak	38.39	-8.72	29.67	46.00	-16.33
960.23	Peak	36.97	-4.07	32.90	54.00	-21.10

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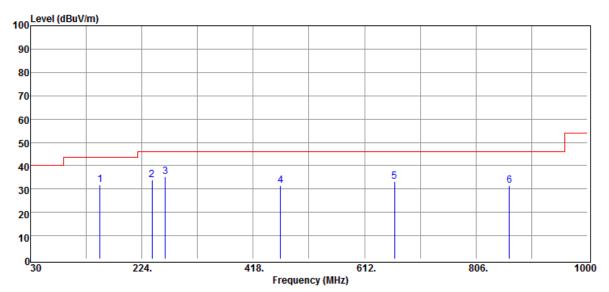
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**Operation Mode** :802.11a / Band3 **Test Date** :2018-08-17

Test Mode :Tx CH Mid Temp./Humi. :25/60

**EUT Pol** :E1 Plan Antenna Pol. :HORIZONTAL

:5580 MHz Test Channel Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
151.25	Peak	48.02	-16.17	31.85	43.50	-11.65
241.46	Peak	51.60	-17.78	33.82	46.00	-12.18
264.74	Peak	51.60	-16.47	35.13	46.00	-10.87
465.53	Peak	42.92	-11.52	31.40	46.00	-14.60
664.38	Peak	42.17	-8.78	33.39	46.00	-12.61
864.20	Peak	36.77	-5.18	31.59	46.00	-14.41

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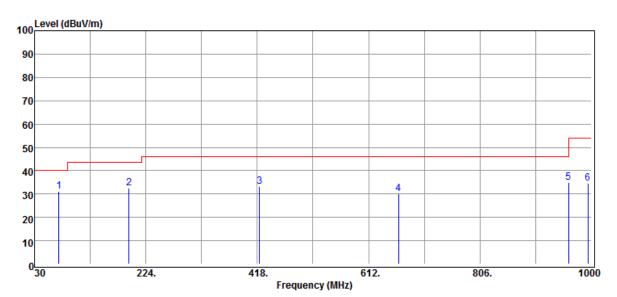
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## 802.11a, 5725~5850 MHz

:802.11a / Band4 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Mid Temp./Humi. :25/60 :E1 Plan

**EUT Pol** Antenna Pol. :VERTICAL :5785 MHz Test Channel Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
72.68	Peak	51.28	-20.03	31.25	40.00	-8.75
194.90	Peak	50.92	-18.48	32.44	43.50	-11.06
421.88	Peak	45.38	-12.19	33.19	46.00	-12.81
664.38	Peak	38.78	-8.78	30.00	46.00	-16.00
960.23	Peak	39.00	-4.07	34.93	54.00	-19.07
994.18	Peak	38.38	-3.83	34.55	54.00	-19.45

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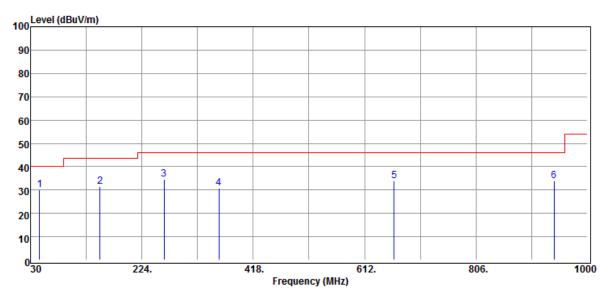
:HORIZONTAL

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**Operation Mode** :802.11a / Band4 **Test Date** :2018-08-17

Test Mode :Tx CH Mid Temp./Humi. :25/60 **EUT Pol** :E1 Plan Antenna Pol.

:5785 MHz Test Channel Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBμV/m	dBµV/m	dB
45.52	Peak	47.00	-17.01	29.99	40.00	-10.01
151.25	Peak	47.65	-16.17	31.48	43.50	-12.02
262.80	Peak	51.12	-16.55	34.57	46.00	-11.43
357.86	Peak	44.67	-13.79	30.88	46.00	-15.12
663.41	Peak	42.81	-8.80	34.01	46.00	-11.99
941.80	Peak	38.66	-4.59	34.07	46.00	-11.93

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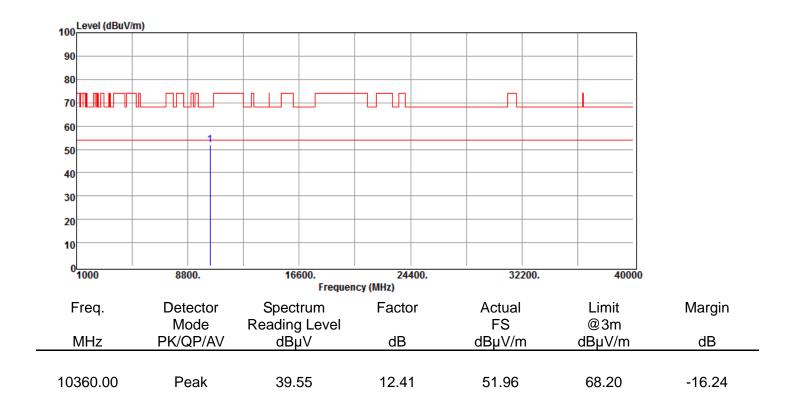
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### **Above 1GHz Worst-Case Data:**

## Radiated Spurious Emission Measurement Result 802.11a, 5150~5250 MHz

:802.11a / Band1 **Test Date** :2018-08-17 **Operation Mode** 

:Tx CH Low :25/60 Test Mode Temp./Humi. :E1 Plan **EUT Pol** Antenna Pol. :VERTICAL :5180 MHz Test Channel Engineer :Jerry



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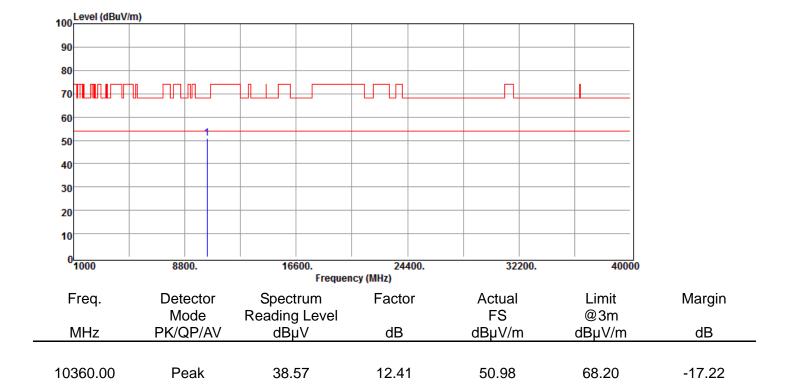
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:802.11a / Band1 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Low Temp./Humi. :25/60

**EUT Pol** :E1 Plan Antenna Pol. :HORIZONTAL

:5180 MHz Test Channel :Jerry Engineer



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Test Channel

Report No.: E2/2018/80004

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:802.11a / Band1 **Operation Mode** Test Mode :Tx CH Mid :E1 Plan **EUT Pol** 

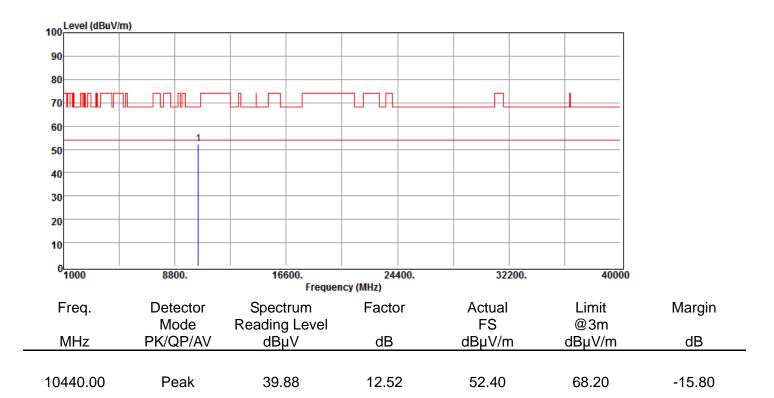
:5220 MHz

**Test Date** Temp./Humi. Antenna Pol.

:2018-08-17 :25/60

:VERTICAL

:Jerry Engineer



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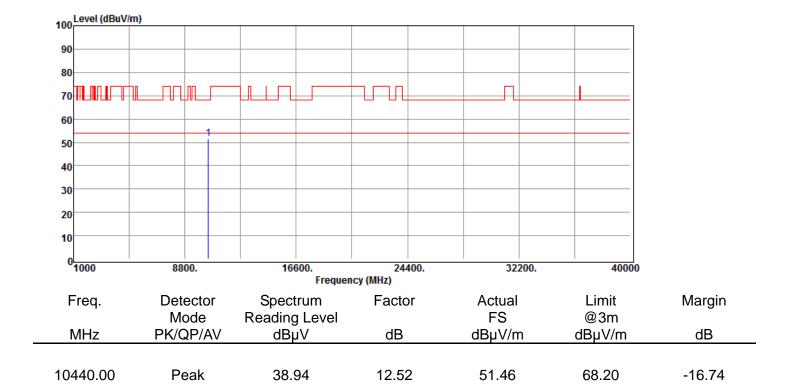
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:802.11a / Band1 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Mid Temp./Humi. :25/60

:E1 Plan **EUT Pol** Antenna Pol. :HORIZONTAL

:5220 MHz Test Channel :Jerry Engineer



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**Operation Mode** Test Mode **EUT Pol** 

Test Channel

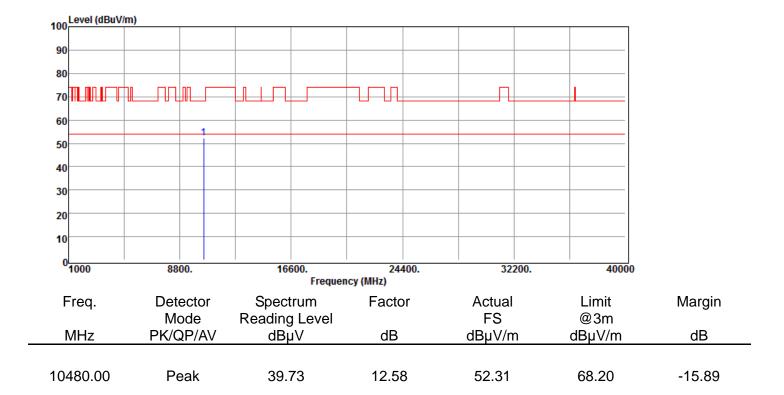
:802.11a / Band1 :Tx CH High :E1 Plan

:5240 MHz

**Test Date** :2018-08-17 Temp./Humi. :25/60

Antenna Pol. :VERTICAL

:Jerry Engineer



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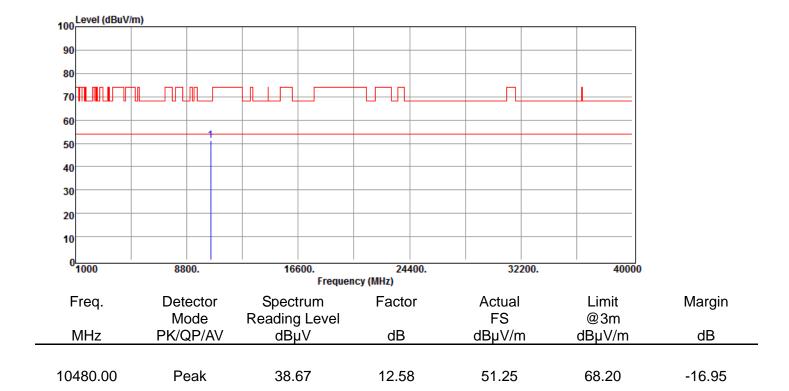
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:802.11a / Band1 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH High Temp./Humi. :25/60

:E1 Plan **EUT Pol** Antenna Pol. :HORIZONTAL

:5240 MHz Test Channel :Jerry Engineer



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:VERTICAL

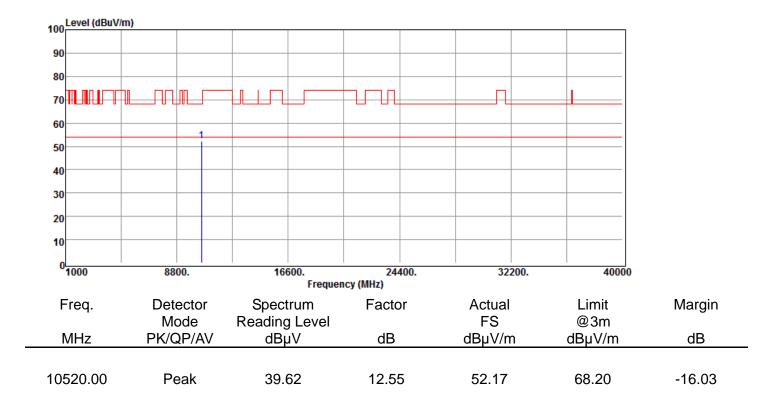
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### Radiated Spurious Emission Measurement Result 802.11a, 5250MHz-5350MHz

:802.11a / Band2 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Low Temp./Humi. :25/60 :E1 Plan **EUT Pol** Antenna Pol.

:5260 MHz :Jerry **Test Channel** Engineer



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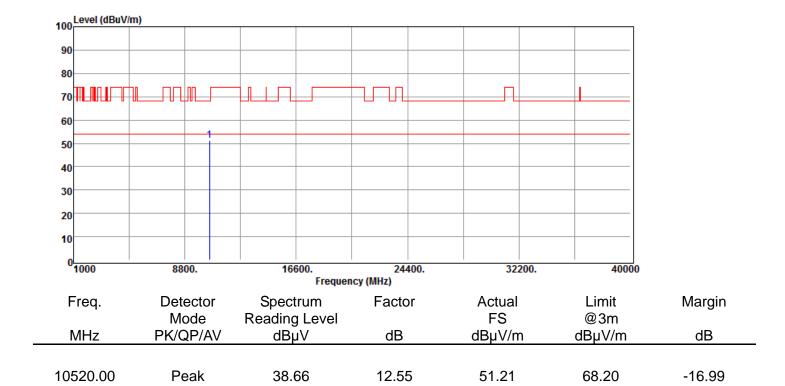
:HORIZONTAL

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:802.11a / Band2 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Low Temp./Humi. :25/60 **EUT Pol** :E1 Plan Antenna Pol.

:5260 MHz Test Channel :Jerry Engineer



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**Operation Mode** Test Mode **EUT Pol** 

**Test Channel** 

:802.11a / Band2

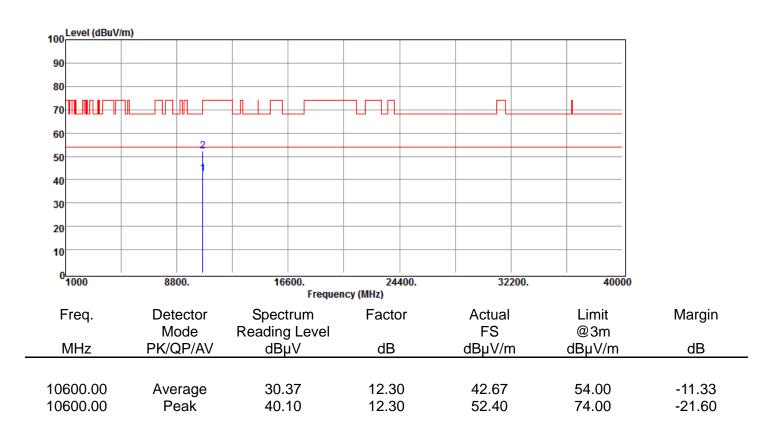
:Tx CH Mid

:E1 Plan :5300 MHz **Test Date** Temp./Humi. Antenna Pol. :2018-08-17

:25/60

:VERTICAL

:Jerry Engineer



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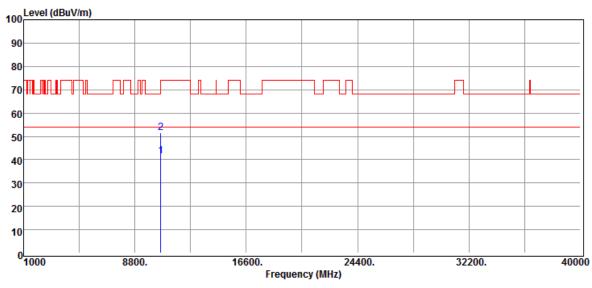
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**Operation Mode** :802.11a / Band2 **Test Date** :2018-08-17

Test Mode :Tx CH Mid Temp./Humi. :25/60

**EUT Pol** :E1 Plan Antenna Pol. :HORIZONTAL

:5300 MHz Test Channel :Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
10600.00	Average	29.05	12.30	41.35	54.00	-12.65
10600.00	Peak	39.12	12.30	51.42	74.00	-22.58

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**Operation Mode** Test Mode **EUT Pol** 

Test Channel

:802.11a / Band2 :Tx CH High :E1 Plan

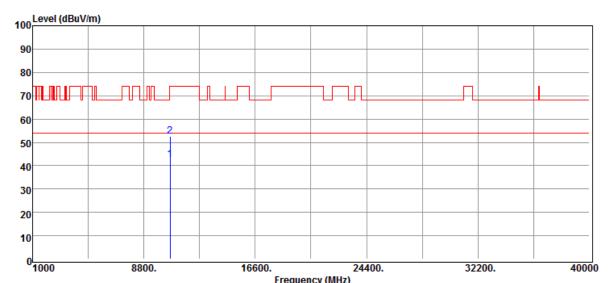
:5320 MHz

**Test Date** Temp./Humi. Antenna Pol. Engineer

:2018-08-17

:25/60 :VERTICAL

:Jerry



		rroquom	oy (mile)			
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
10640.00	Average	30.52	12.04	42.56	54.00	-11.44
10640.00	Peak	40.69	12.04	52.73	74.00	-21.27

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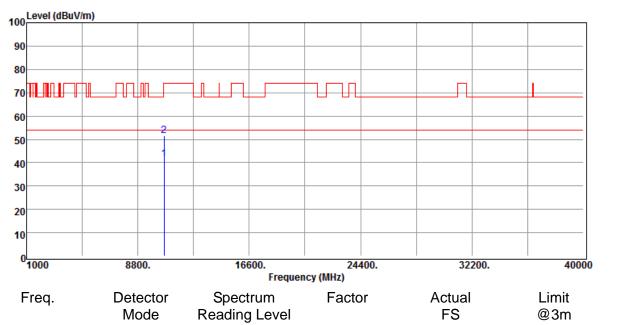


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:802.11a / Band2 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH High Temp./Humi. :25/60

**EUT Pol** :E1 Plan Antenna Pol. :HORIZONTAL :5320 MHz Test Channel :Jerry Engineer



		oquo	o				
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin	
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB	
10640.00	Average	29.34	12.04	41.38	54.00	-12.62	
10640.00	Peak	39.53	12.04	51.57	74.00	-22.43	

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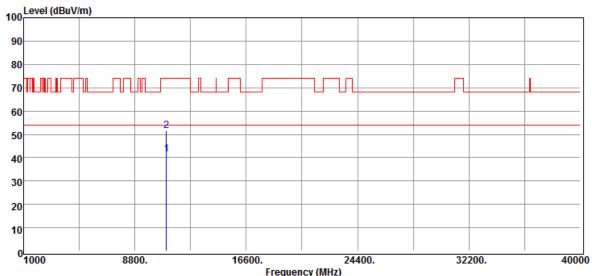
Page: 117 of 258

### Radiated Spurious Emission Measurement Result 802.11a, 5470~5725 MHz

:802.11a / Band3 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Low Temp./Humi. :25/60 :E1 Plan

**EUT Pol** Antenna Pol. :VERTICAL :5500 MHz :Jerry **Test Channel** Engineer



		oquo	o				
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin	
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB	
11000.00	Average	30.59	10.96	41.55	54.00	-12.45	
11000.00	Peak	40.60	10.96	51.56	74.00	-22.44	

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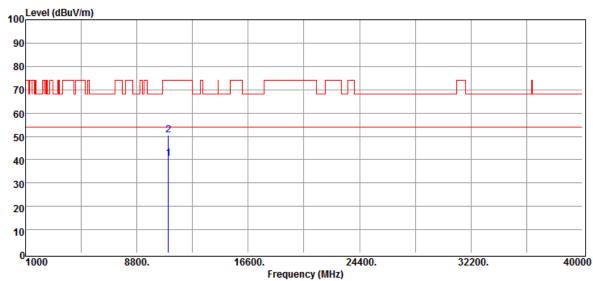
Page: 118 of 258

:802.11a / Band3 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Low Temp./Humi. :25/60

**EUT Pol** :E1 Plan Antenna Pol. :HORIZONTAL

:5500 MHz Test Channel :Jerry Engineer



			oquo	o				
	Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin	
_	MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB	
	11000.00	Average	29.39	10.96	40.35	54.00	-13.65	
	11000.00	Peak	39.69	10.96	50.65	74.00	-23.35	

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**Operation Mode** Test Mode **EUT Pol** 

:802.11a / Band3

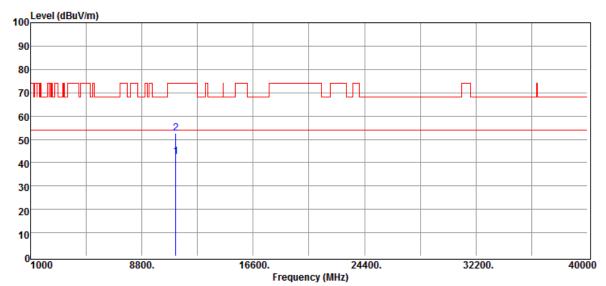
:Tx CH Mid :E1 Plan

:5580 MHz Test Channel

**Test Date** :2018-08-17 Temp./Humi. :25/60

Antenna Pol. :VERTICAL

:Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
11160.00	Average	30.40	12.11	42.51	54.00	-11.49
11160.00	Peak	40.32	12.11	52.43	74.00	-21.57

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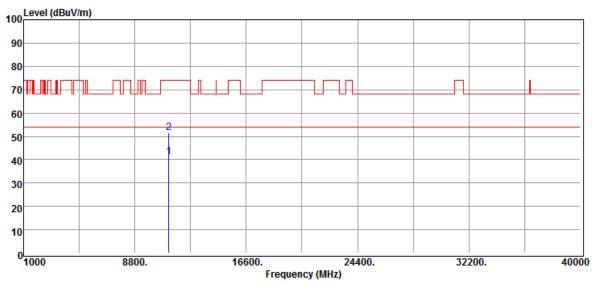
Page: 120 of 258

:802.11a / Band3 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Mid Temp./Humi. :25/60

**EUT Pol** :E1 Plan Antenna Pol. :HORIZONTAL

:5580 MHz Test Channel :Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
11160.00	Average	29.17	12.11	41.28	54.00	-12.72
11160.00	Peak	39.39	12.11	51.50	74.00	-22.50

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**Operation Mode** Test Mode **EUT Pol** 

Test Channel

:802.11a / Band3 :Tx CH High :E1 Plan

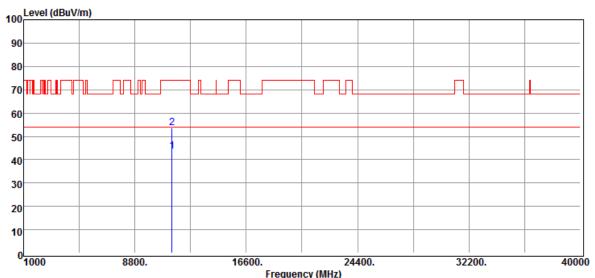
:5700 MHz

**Test Date** Temp./Humi. Antenna Pol. Engineer

:2018-08-17

:25/60 :VERTICAL

:Jerry



		oquo	o				
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin	
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB	
11400.00	Average	30.56	12.98	43.54	54.00	-10.46	
11400.00	Peak	40.68	12.98	53.66	74.00	-20.34	

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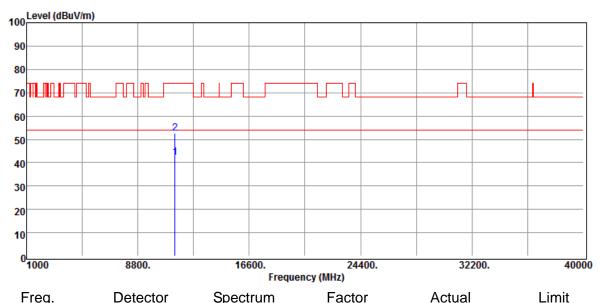


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:802.11a / Band3 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH High Temp./Humi. :25/60 **EUT Pol** :E1 Plan Antenna Pol. :HORIZONTAL

:5700 MHz Test Channel :Jerry Engineer



		•	, , ,				
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin	
 MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB	
11400.00	Average	29.34	12.98	42.32	54.00	-11.68	
11400.00	Peak	39.56	12.98	52.54	74.00	-21.46	

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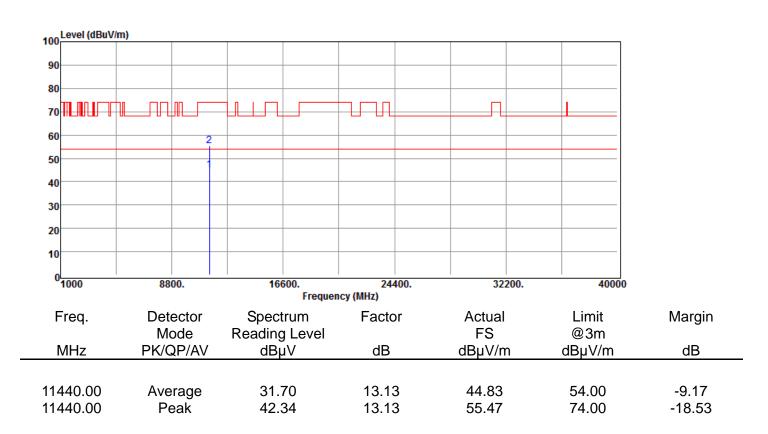
Page: 123 of 258

### Radiated Spurious Emission Measurement Result 802.11a, 5725~5850 MHz

:802.11a / Band3/4 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH 144 :25/60 Temp./Humi.

:E1 Plan **EUT Pol** Antenna Pol. :VERTICAL :5720 MHz :Jerry **Test Channel** Engineer



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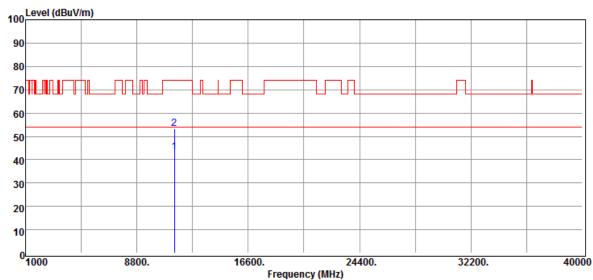
Page: 124 of 258

:802.11a / Band3/4 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH 144 Temp./Humi. :25/60

**EUT Pol** :E1 Plan Antenna Pol. :HORIZONTAL

:5720 MHz Test Channel :Jerry Engineer



		•	, , ,				
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin	
 MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB	
11440.00	Average	30.18	13.13	43.31	54.00	-10.69	
11440.00	Peak	40.26	13.13	53.39	74.00	-20.61	

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**Operation Mode** Test Mode **EUT Pol** Test Channel

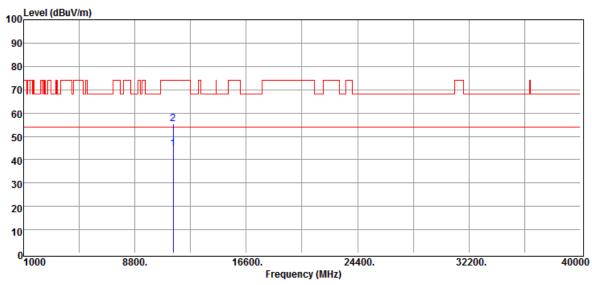
:802.11a / Band4 :Tx CH Low

:E1 Plan :5745 MHz

**Test Date** :2018-08-17 Temp./Humi. :25/60

Antenna Pol. :VERTICAL

:Jerry Engineer



		•	, , ,				
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin	
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB	
11490.00	Average	31.36	13.32	44.68	54.00	-9.32	
11490.00	Peak	42.13	13.32	55.45	74.00	-18.55	

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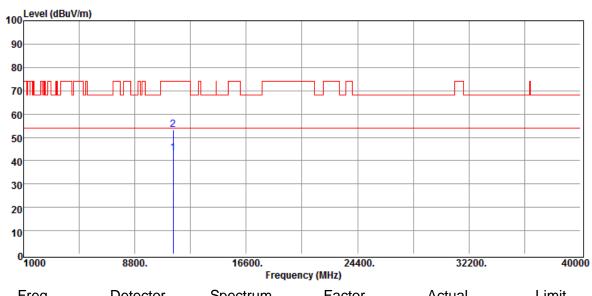
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:802.11a / Band4 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Low Temp./Humi. :25/60

**EUT Pol** :E1 Plan Antenna Pol. :HORIZONTAL :5745 MHz Test Channel

:Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
11490.00	Average	30.02	13.32	43.34	54.00	-10.66
11490.00	Peak	39.83	13.32	53.15	74.00	-20.85

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**Operation Mode** Test Mode **EUT Pol** 

Test Channel

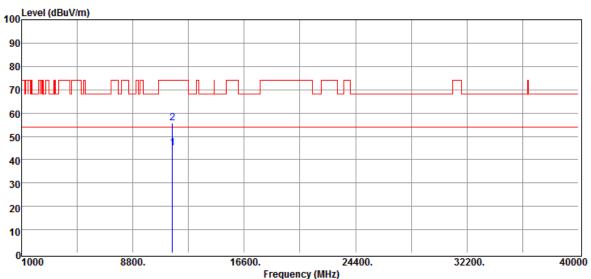
:802.11a / Band4

:Tx CH Mid

:E1 Plan :5785 MHz **Test Date** :2018-08-17 Temp./Humi. :25/60

Antenna Pol. :VERTICAL

:Jerry Engineer



			, , ,			
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
 MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
11570.00	Average	31.84	13.01	44.85	54.00	-9.15
11570.00	Peak	42.70	13.01	55.71	74.00	-18.29

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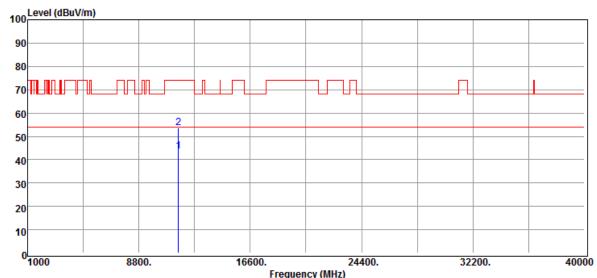
Page: 128 of 258

:802.11a / Band4 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Mid Temp./Humi. :25/60

**EUT Pol** :E1 Plan Antenna Pol. :HORIZONTAL

:5785 MHz Test Channel :Jerry Engineer



risquisity (mile)								
	Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin	
	MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB	
	11570.00	Average	30.58	13.01	43.59	54.00	-10.41	
	11570.00	Peak	40.70	13.01	53.71	74.00	-20.29	

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**Operation Mode** Test Mode **EUT Pol** 

Test Channel

:802.11a / Band4 :Tx CH High :E1 Plan

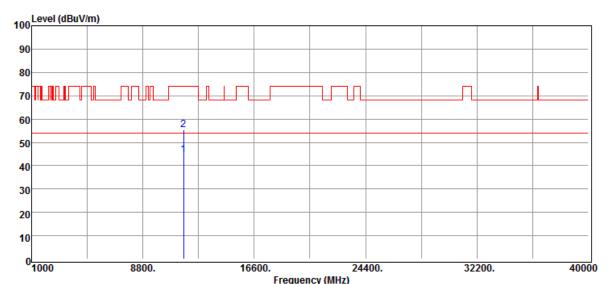
:5825 MHz

**Test Date** Temp./Humi. Antenna Pol. Engineer

:2018-08-17

:25/60 :VERTICAL

:Jerry



rioquonoj (mile)							
	Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
	MHz	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
	11650.00	Average	31.74	12.95	44.69	54.00	-9.31
	11650.00	Peak	42.54	12.95	55.49	74.00	-18.51

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:802.11a / Band4 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH High :25/60 Temp./Humi. **EUT Pol** :E1 Plan Antenna Pol. :HORIZONTAL

:5825 MHz :Jerry **Test Channel** Engineer



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:VERTICAL

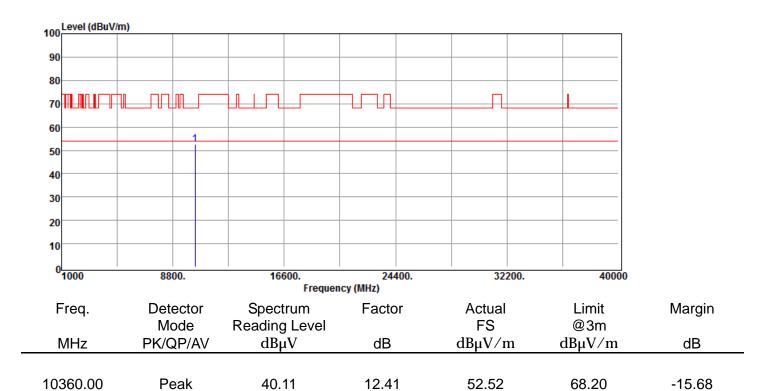
Page: 131 of 258

# Radiated Spurious Emission Measurement Result 802.11n HT20, 5150~5250 MHz

:802.11n20 / Band1 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Low Temp./Humi. :25/60 :E1 Plan **EUT Pol** Antenna Pol.

:5180 MHz :Jerry Test Channel Engineer



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:802.11n20 / Band1 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Low Temp./Humi. :25/60

:E1 Plan **EUT Pol** Antenna Pol. :HORIZONTAL

:5180 MHz Test Channel :Jerry Engineer



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**Operation Mode** Test Mode

:802.11n20 / Band1

:Tx CH Mid

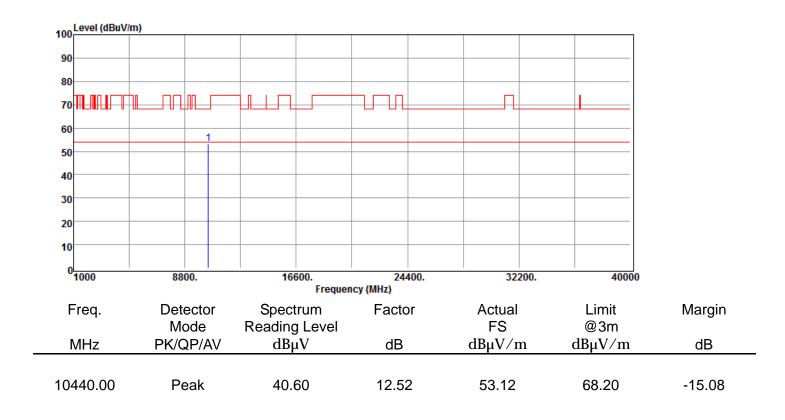
:E1 Plan **EUT Pol** :5220 MHz Test Channel

**Test Date** Temp./Humi. Antenna Pol. :2018-08-17

:25/60

:VERTICAL

:Jerry Engineer



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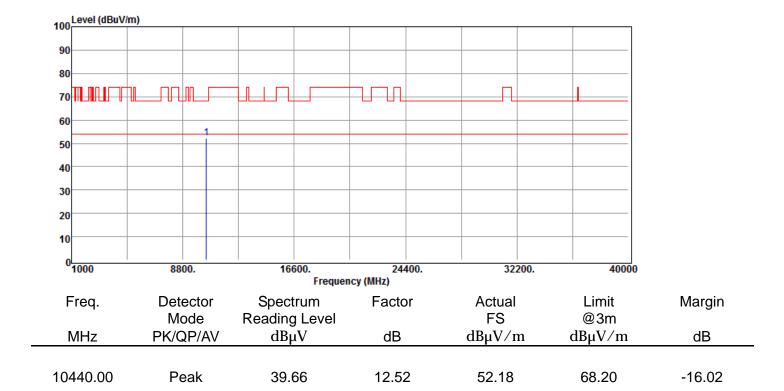
Page: 134 of 258

:802.11n20 / Band1 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Mid Temp./Humi. :25/60

:E1 Plan **EUT Pol** Antenna Pol. :HORIZONTAL

:5220 MHz Test Channel :Jerry Engineer



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**Operation Mode** Test Mode **EUT Pol** 

Test Channel

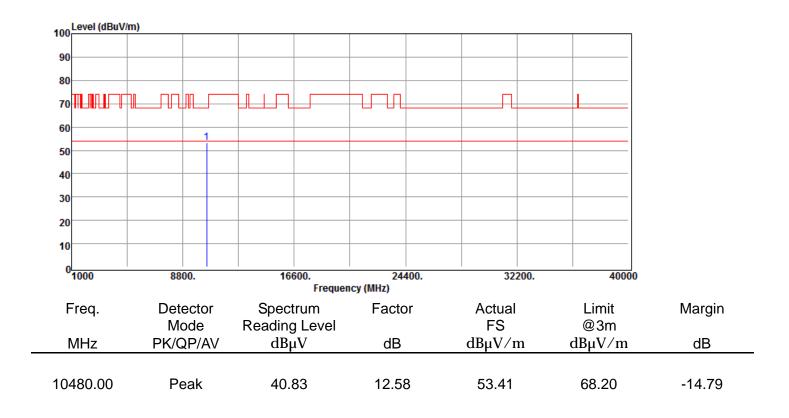
:802.11n20 / Band1

:Tx CH High

:E1 Plan :5240 MHz **Test Date** :2018-08-17 Temp./Humi. :25/60

Antenna Pol. :VERTICAL

:Jerry Engineer



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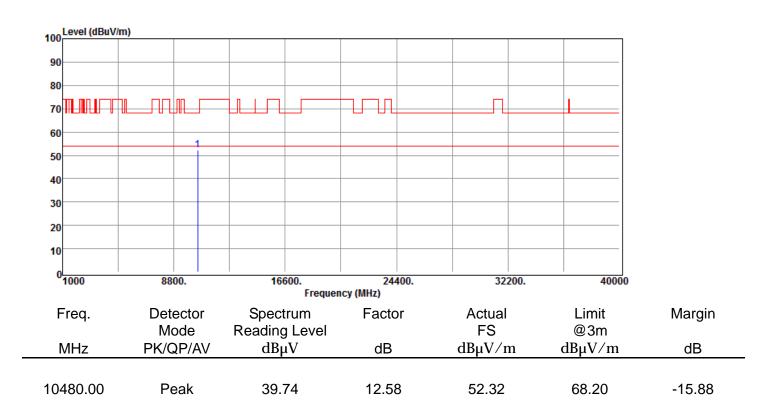
:HORIZONTAL

Page: 136 of 258

:802.11n20 / Band1 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH High Temp./Humi. :25/60 :E1 Plan **EUT Pol** Antenna Pol.

:5240 MHz Test Channel :Jerry Engineer



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:VERTICAL

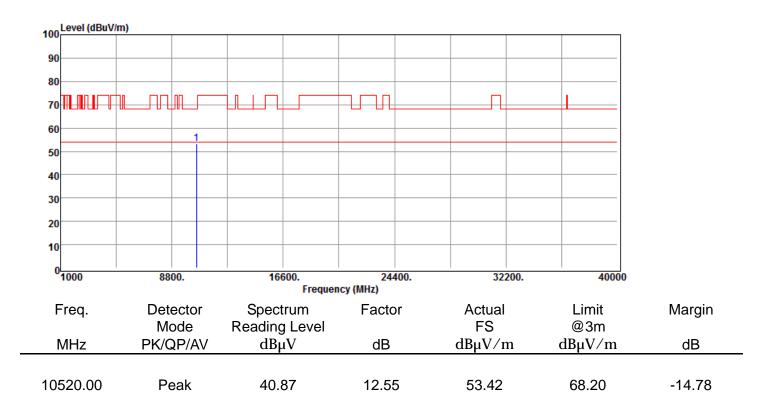
Page: 137 of 258

# Radiated Spurious Emission Measurement Result 802.11n HT20, 5250~5350 MHz

:802.11n20 / Band2 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Low Temp./Humi. :25/60 :E1 Plan **EUT Pol** Antenna Pol.

:5260 MHz :Jerry Test Channel Engineer



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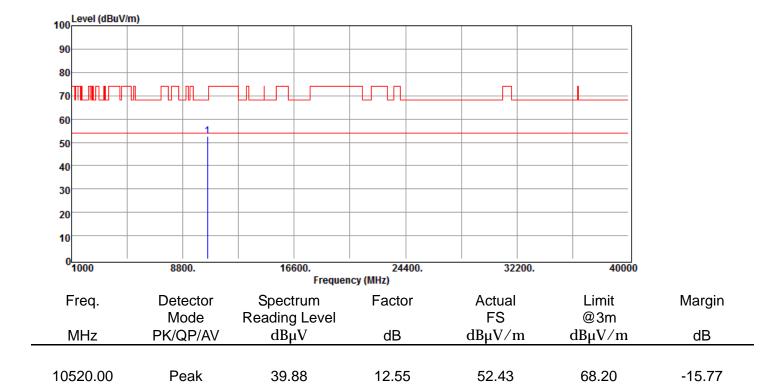
Page: 138 of 258

:802.11n20 / Band2 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Low Temp./Humi. :25/60

:E1 Plan **EUT Pol** Antenna Pol. :HORIZONTAL

:5260 MHz Test Channel :Jerry Engineer



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**EUT Pol** 

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:802.11n20 / Band2 **Operation Mode** Test Mode :Tx CH Mid

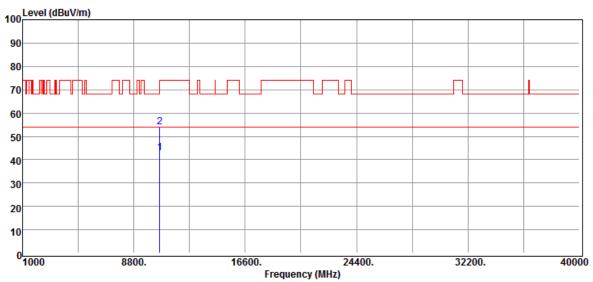
:E1 Plan

:5300 MHz Test Channel

**Test Date** :2018-08-17 Temp./Humi. :25/60

Antenna Pol. :VERTICAL

:Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV∕m	dBμV/m	dB
10600.00	Average	30.69	12.30	42.99	54.00	-11.01
10600.00	Average Peak	41.56	12.30	53.86	74.00	-11.01 -20.14
10000.00	reak	41.36	12.30	33.00	74.00	-20.14

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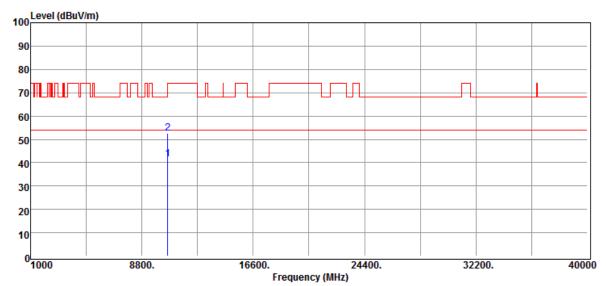
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:802.11n20 / Band2 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Mid Temp./Humi. :25/60

**EUT Pol** :E1 Plan Antenna Pol. :HORIZONTAL

:5300 MHz Test Channel :Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
10600.00	Average	29.38	12.30	41.68	54.00	-12.32
10600.00	Peak	40.22	12.30	52.52	74.00	-21.48

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**Operation Mode** Test Mode **EUT Pol** 

Test Channel

:802.11n20 / Band2

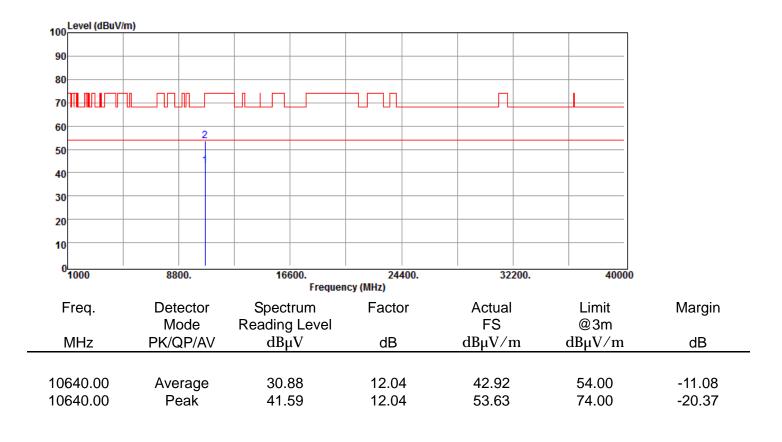
:Tx CH High

:E1 Plan :5320 MHz **Test Date** Temp./Humi. :2018-08-17

:25/60

Antenna Pol. :VERTICAL

:Jerry Engineer



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**Operation Mode** Test Mode

**EUT Pol** 

Test Channel

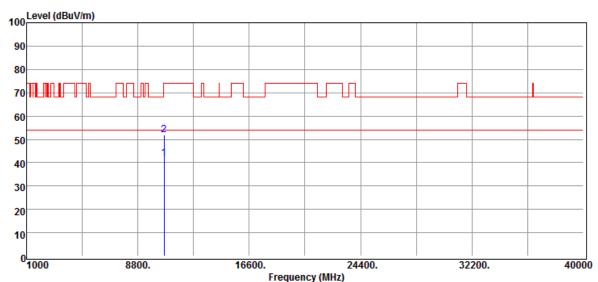
:802.11n20 / Band2 :Tx CH High

:E1 Plan :5320 MHz **Test Date** Temp./Humi. :2018-08-17

:25/60

Antenna Pol. :HORIZONTAL

:Jerry Engineer



			, , ,				
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin	
MHz	PK/QP/AV	$\mathrm{d} B \mu V$	dB	$\mathrm{d} B \mu V / m$	$\mathrm{dB}\mu\mathrm{V/m}$	dB	
10640.00	Average	29.73	12.04	41.77	54.00	-12.23	
10640.00	Peak	40.02	12.04	52.06	74.00	-21.94	

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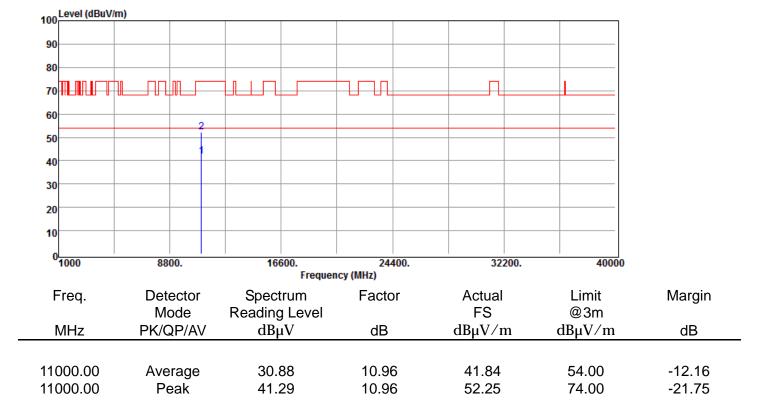
# Radiated Spurious Emission Measurement Result 802.11n HT20, 5470~5725 MHz

:802.11n20 / Band3 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Low :25/60 Temp./Humi.

:E1 Plan **EUT Pol** Antenna Pol. :VERTICAL

:5500 MHz :Jerry Test Channel Engineer



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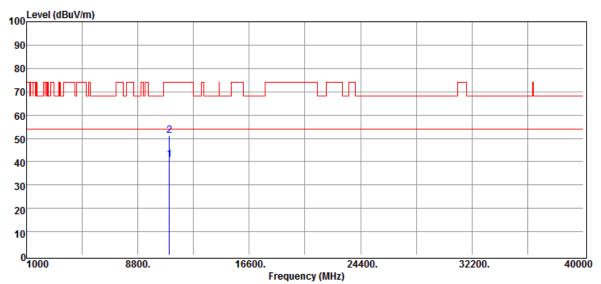
Page: 144 of 258

:802.11n20 / Band3 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Low Temp./Humi. :25/60

**EUT Pol** :E1 Plan Antenna Pol. :HORIZONTAL

:5500 MHz Test Channel :Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV∕m	dBμV/m	dB
11000.00	Average	29.90	10.96	40.86	54.00	-13.14
11000.00	Peak	40.11	10.96	51.07	74.00	-22.93

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**Operation Mode** Test Mode

**EUT Pol** 

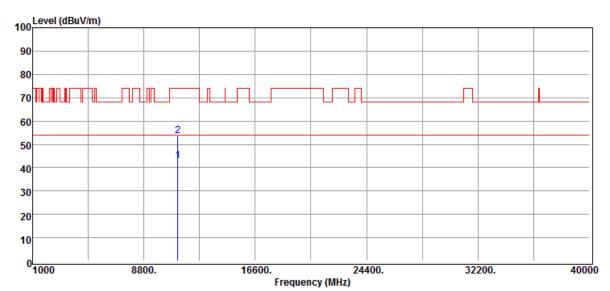
Test Channel

:802.11n20 / Band3 :Tx CH Mid

:E1 Plan :5580 MHz **Test Date** :2018-08-17 Temp./Humi. :25/60

Antenna Pol. :VERTICAL

:Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
11160.00	Average	30.94	12.11	43.05	54.00	-10.95
11160.00	Peak	41.54	12.11	53.65	74.00	-20.35

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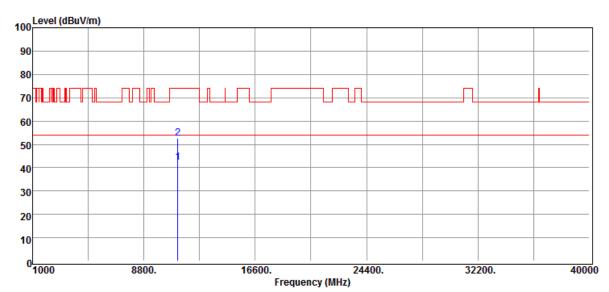
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:802.11n20 / Band3 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Mid Temp./Humi. :25/60

**EUT Pol** :E1 Plan Antenna Pol. :HORIZONTAL

:5580 MHz Test Channel :Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	$dB\mu V/m$	dB
11160.00	Average	30.02	12.11	42.13	54.00	-11.87
11160.00	Peak	40.53	12.11	52.64	74.00	-21.36

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**Operation Mode** Test Mode **EUT Pol** 

**Test Channel** 

:802.11n20 / Band3

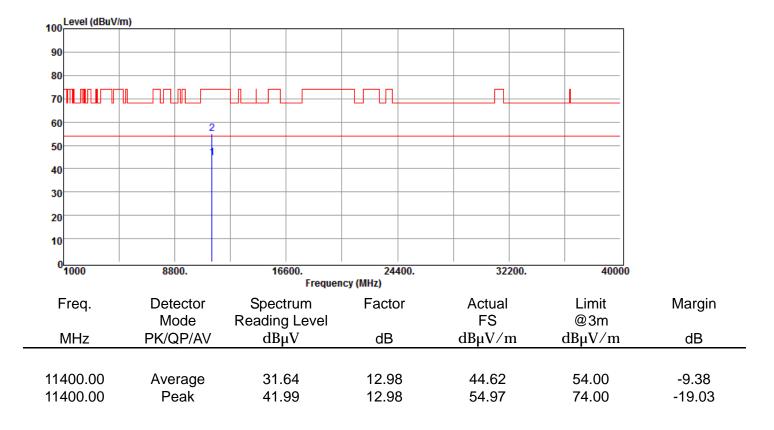
:Tx CH High

:E1 Plan :5700 MHz **Test Date** Temp./Humi. Antenna Pol. :2018-08-17

:25/60

:VERTICAL

:Jerry Engineer



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:2018-08-17

:HORIZONTAL

:25/60

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**Operation Mode** Test Mode

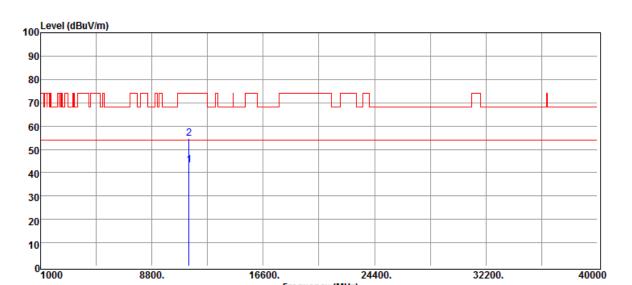
:802.11n20 / Band3

Temp./Humi. Antenna Pol.

**Test Date** 

:5700 MHz Test Channel :Jerry Engineer

:Tx CH High :E1 Plan **EUT Pol** 



Frequency (MHz)									
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin			
MHz	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	$\mathrm{d} B \mu V / m$	dB			
11400.00	Average	30.13	12.98	43.11	54.00	-10.89			
11400.00	Peak	41.67	12.98	54.65	74.00	-19.35			

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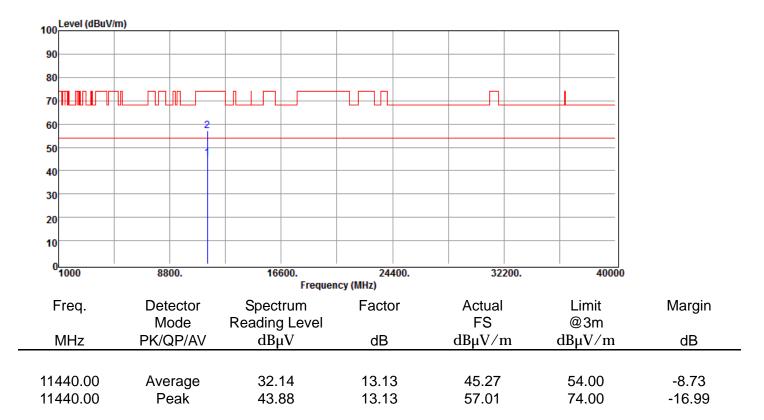


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:802.11n20 / Band3/4 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH 144 :25/60 Temp./Humi. :E1 Plan **EUT Pol** Antenna Pol. :VERTICAL

:5720 MHz :Jerry **Test Channel** Engineer



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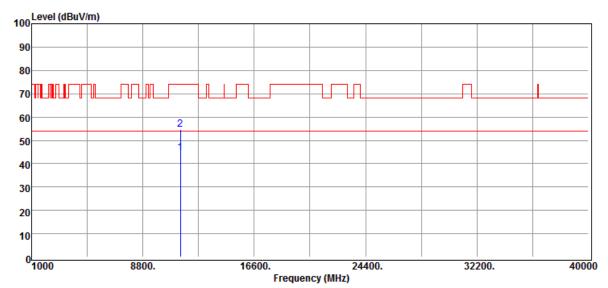
Page: 150 of 258

:802.11n20 / Band3/4 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH 144 Temp./Humi. :25/60

:E1 Plan **EUT Pol** Antenna Pol. :HORIZONTAL

:5720 MHz Test Channel :Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
11440.00	Average	31.56	13.13	44.69	54.00	-9.31
11440.00	Peak	41.64	13.13	54.77	74.00	-19.23

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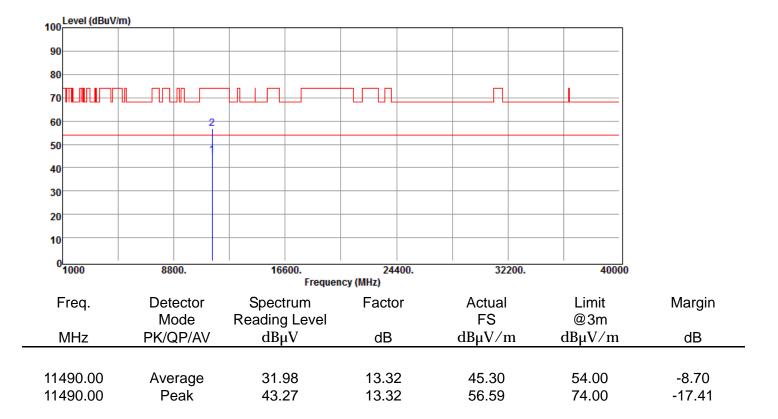


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#### Radiated Spurious Emission Measurement Result 802.11n HT20, 5725~5850 MHz

:802.11n20 / Band4 **Operation Mode Test Date** :2018-08-17

:Tx CH Low :25/60 Test Mode Temp./Humi. **EUT Pol** :E1 Plan Antenna Pol. :VERTICAL :5745 MHz Test Channel Engineer :Jerry



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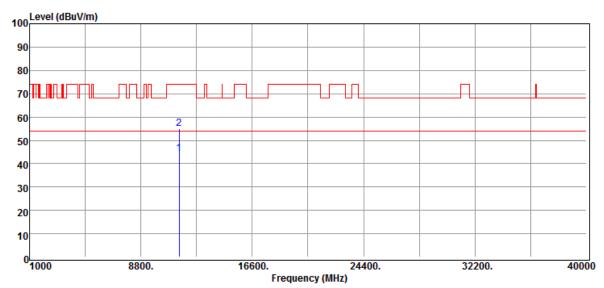
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:802.11n20 / Band4 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Low Temp./Humi. :25/60

**EUT Pol** :E1 Plan Antenna Pol. :HORIZONTAL

:5745 MHz Test Channel :Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
11490.00	Average	31.10	13.32	44.42	54.00	-9.58
11490.00	Peak	41.78	13.32	55.10	74.00	-18.90

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**Operation Mode** Test Mode **EUT Pol** Test Channel

:802.11n20 / Band4

:Tx CH Mid

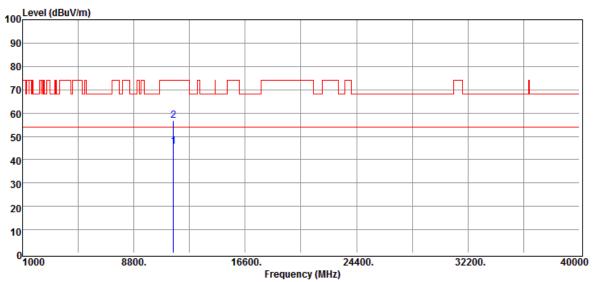
:E1 Plan

:5785 MHz

**Test Date** :2018-08-17 Temp./Humi. :25/60

Antenna Pol. :VERTICAL

:Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV∕m	dBμV/m	dB
11570.00	Average	32.54	13.01	45.55	54.00	-8.45
11570.00	Peak	43.87	13.01	56.88	74.00	-17.12

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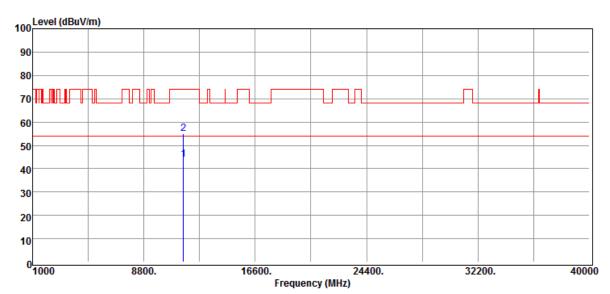


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:802.11n20 / Band4 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Mid Temp./Humi. :25/60

**EUT Pol** :E1 Plan Antenna Pol. :HORIZONTAL :5785 MHz Test Channel :Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
11570.00	Average	30.99	13.01	44.00	54.00	-10.00
11570.00	Peak	41.90	13.01	54.91	74.00	-19.09

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**Operation Mode** Test Mode **EUT Pol** Test Channel

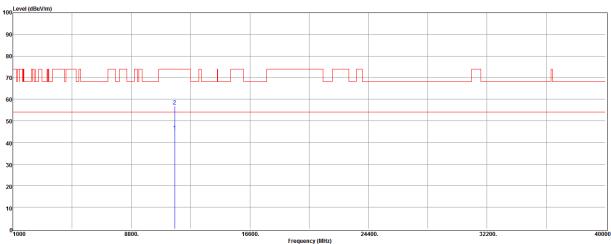
:802.11n20 / Band4

:Tx CH High

:E1 Plan :5825 MHz **Test Date** :2018-08-17 Temp./Humi. :25/60

Antenna Pol. :VERTICAL

:Jerry Engineer



		Frequenc	cy (MHz)				
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin	
MHz	PK/QP/AV	$\mathrm{d} \mathrm{B} \mu \mathrm{V}$	dB	dBμV/m	dBμV/m	dB	
11650.00	Average	32.24	12.95	45.19	54.00	-8.81	
11650.00	Peak	43.99	12.95	56.94	74.00	-17.06	

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**Operation Mode** Test Mode

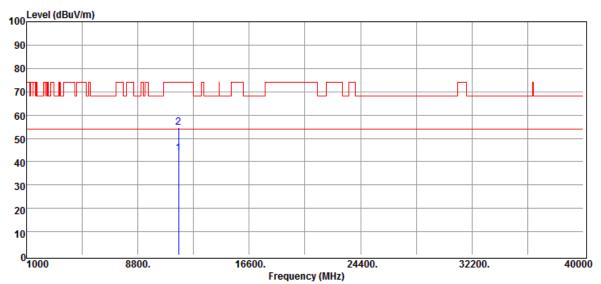
:802.11n20 / Band4 :Tx CH High :E1 Plan

**EUT Pol** :5825 MHz Test Channel

**Test Date** :2018-08-17 Temp./Humi. :25/60

Antenna Pol. :HORIZONTAL

:Jerry Engineer



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
		α2μ.	<u> </u>	α2μ., 111	u2 p V / 111	
11650.00 11650.00	Average Peak	30.77 41.77	12.95 12.95	43.72 54.72	54.00 74.00	-10.28 -19.28

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:VERTICAL

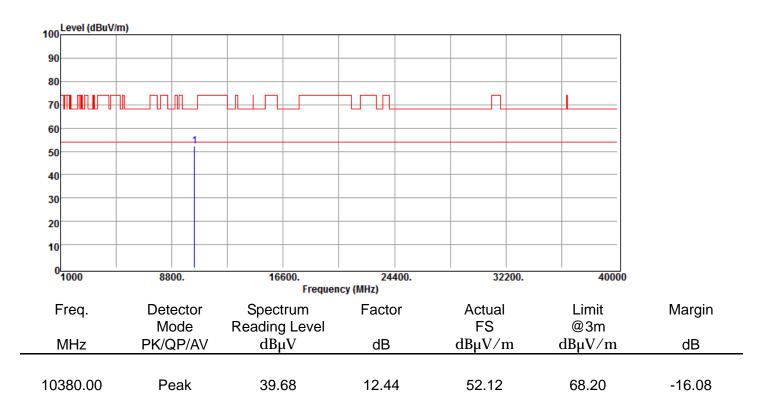
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### Radiated Spurious Emission Measurement Result 802.11n HT40, 5150~5250 MHz

:802.11n40 / Band1 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Low :25/60 Temp./Humi. :E1 Plan **EUT Pol** Antenna Pol.

:5190 MHz :Jerry **Test Channel** Engineer



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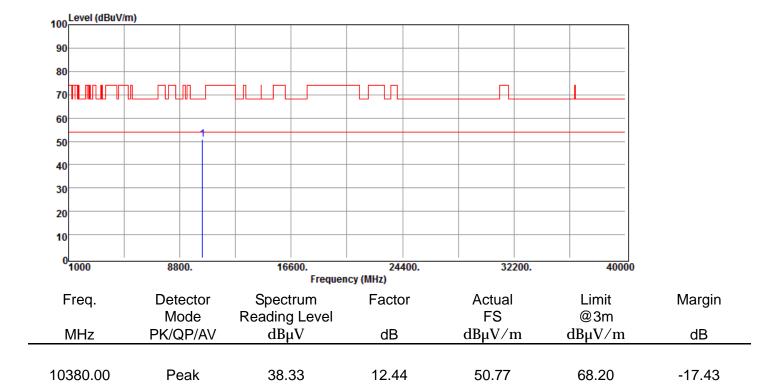
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:802.11n40 / Band1 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Low Temp./Humi. :25/60

:E1 Plan **EUT Pol** Antenna Pol. :HORIZONTAL

:5190 MHz Test Channel :Jerry Engineer



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**Operation Mode** Test Mode **EUT Pol** 

:802.11n40 / Band1

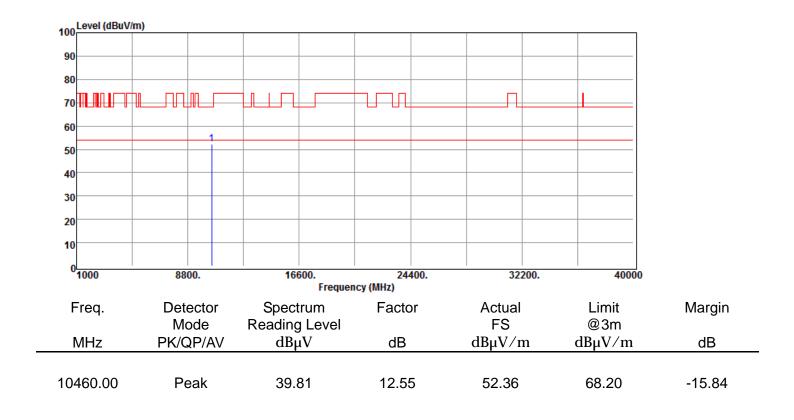
:Tx CH High :E1 Plan

:5230 MHz Test Channel

**Test Date** :2018-08-17 Temp./Humi. :25/60

Antenna Pol. :VERTICAL

:Jerry Engineer



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**Operation Mode** Test Mode

:802.11n40 / Band1

**Test Date** Temp./Humi.

:2018-08-17 :25/60

**EUT Pol** 

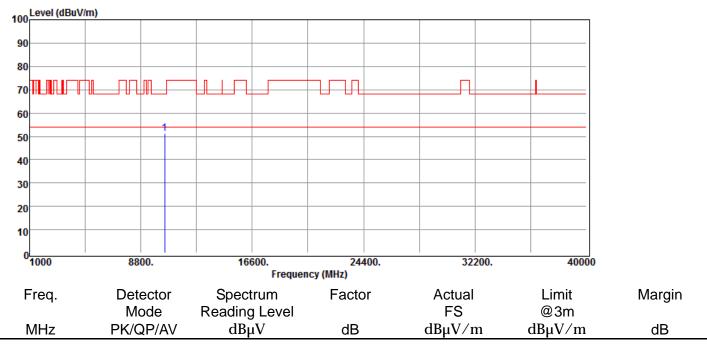
Test Channel

:Tx CH High :E1 Plan

:5230 MHz

Antenna Pol. :HORIZONTAL

:Jerry Engineer



rieq.	Mode	Reading Level	Factor	FS	@3m	iviaigiii
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
10460.00	Peak	38.65	12.55	51.20	68.20	-17.00

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**EUT Pol** 

Report No.: E2/2018/80004

:VERTICAL

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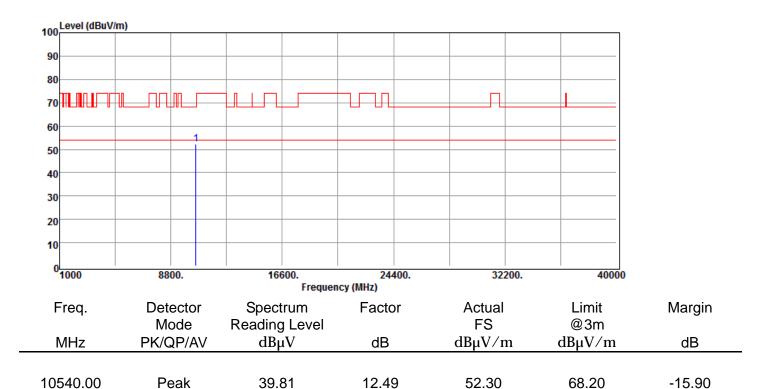
# Radiated Spurious Emission Measurement Result 802.11n HT40, 5250~5350 MHz

:802.11n40 / Band2 **Operation Mode Test Date** :2018-08-17

Antenna Pol.

Test Mode :Tx CH Low :25/60 Temp./Humi. :E1 Plan

:5270 MHz :Jerry **Test Channel** Engineer



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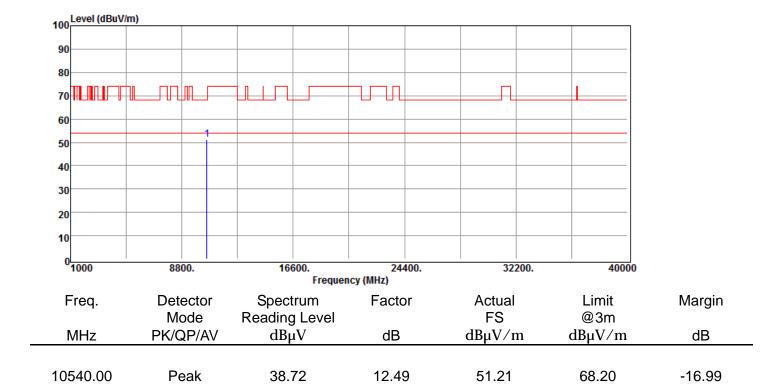
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:802.11n40 / Band2 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Low Temp./Humi. :25/60

**EUT Pol** :E1 Plan Antenna Pol. :HORIZONTAL

:5270 MHz Test Channel :Jerry Engineer



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**Operation Mode** Test Mode **EUT Pol** 

**Test Channel** 

:802.11n40 / Band2

:Tx CH High

:E1 Plan

:5310 MHz

**Test Date** :2018-08-17

:25/60 Temp./Humi. Antenna Pol. :VERTICAL

:Jerry Engineer



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**Operation Mode** Test Mode

**EUT Pol** 

:802.11n40 / Band2

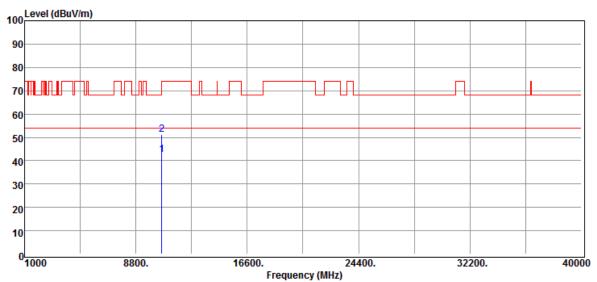
:Tx CH High :E1 Plan

:5310 MHz Test Channel

**Test Date** :2018-08-17 Temp./Humi. :25/60

Antenna Pol. :HORIZONTAL

:Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV∕m	dBμV/m	dB
10620.00 10620.00	Average Peak	30.33 39.12	12.17 12.17	42.50 51.29	54.00 74.00	-11.50 -22.71

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:VERTICAL

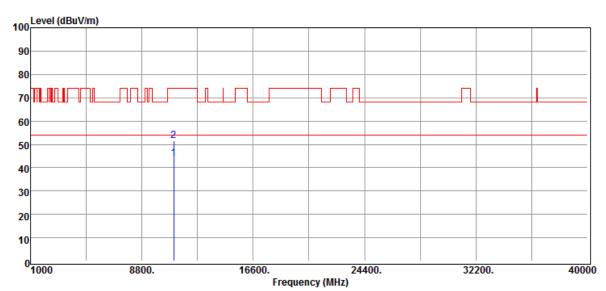
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### Radiated Spurious Emission Measurement Result 802.11n HT40, 5470~5725 MHz

:802.11n40 / Band3 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Low Temp./Humi. :25/60 :E1 Plan **EUT Pol** Antenna Pol.

:5510 MHz **Test Channel** Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	$\mathrm{d} \mathrm{B} \mu \mathrm{V}$	dB	dBμV/m	dBμV/m	dB
11020.00	Average	32.71	11.10	43.81	54.00	-10.19
11020.00	Peak	40.63	11.10	51.73	74.00	-22.27

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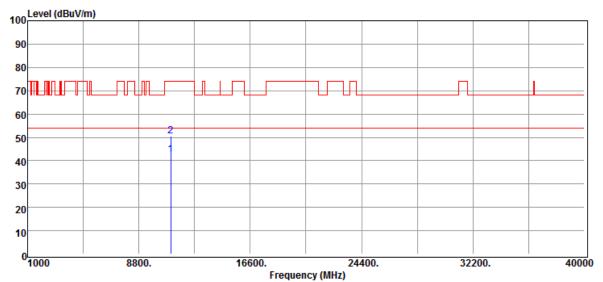
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:802.11n40 / Band3 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Low Temp./Humi. :25/60

**EUT Pol** :E1 Plan Antenna Pol. :HORIZONTAL

:5510 MHz Test Channel :Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV∕m	dBμV/m	dB
11020.00	Average	31.57	11.10	42.67	54.00	-11.33
11020.00	Peak	39.55	11.10	50.65	74.00	-23.35

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**Operation Mode** Test Mode **EUT Pol** 

:802.11n40 / Band3

:Tx CH Mid

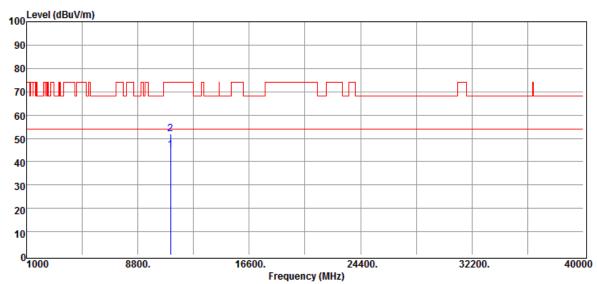
:E1 Plan :5550 MHz Test Channel

**Test Date** Temp./Humi. Antenna Pol. :2018-08-17

:25/60

:VERTICAL

:Jerry Engineer



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
1711 12	110/00/1//10	αρμν	ub_	αρμ ν / πι	αΒμνγιιι	<u> </u>
11100.00	Average	33.27	11.63	44.90	54.00	-9.10
11100.00	Peak	40.36	11.63	51.99	74.00	-22.01

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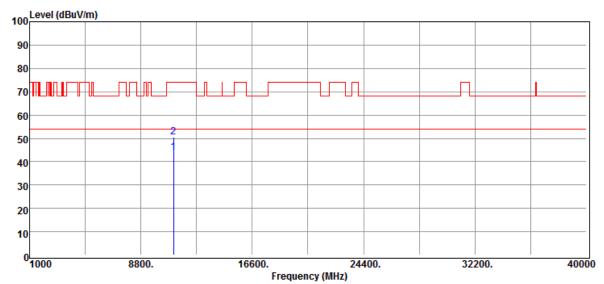
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:802.11n40 / Band3 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Mid Temp./Humi. :25/60

**EUT Pol** :E1 Plan Antenna Pol. :HORIZONTAL

:5550 MHz Test Channel :Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV∕m	dBμV/m	dB
11100.00	Average	32.30	11.63	43.93	54.00	-10.07
11100.00	Peak	38.94	11.63	50.57	74.00	-23.43

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**Operation Mode** Test Mode **EUT Pol Test Channel** 

11340.00

:802.11n40 / Band3

:Tx CH High

:E1 Plan

:5670 MHz

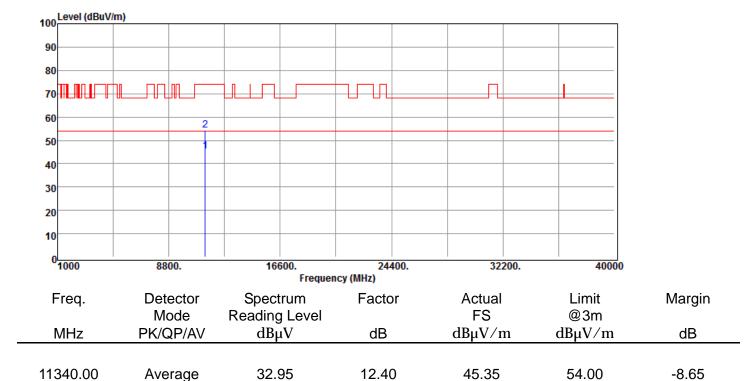
**Test Date** :2018-08-17 :25/60 Temp./Humi.

Antenna Pol. :VERTICAL

74.00

-19.77

:Jerry Engineer



12.40

54.23

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41.83

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Peak



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**Operation Mode** Test Mode

**EUT Pol** 

:802.11n40 / Band3 :Tx CH High

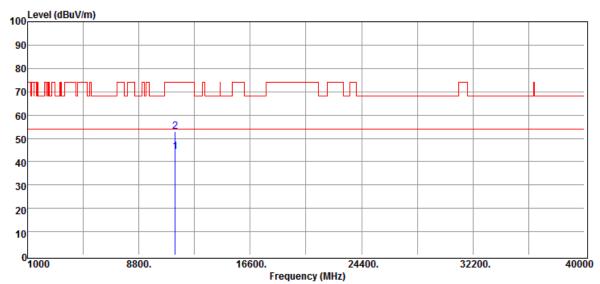
:E1 Plan

:5670 MHz Test Channel

**Test Date** :2018-08-17 Temp./Humi. :25/60

Antenna Pol. :HORIZONTAL

:Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV∕m	dBμV∕m	dB
11340.00	Average	31.87	12.40	44.27	54.00	-9.73
11340.00	Peak	40.55	12.40	52.95	74.00	-21.05

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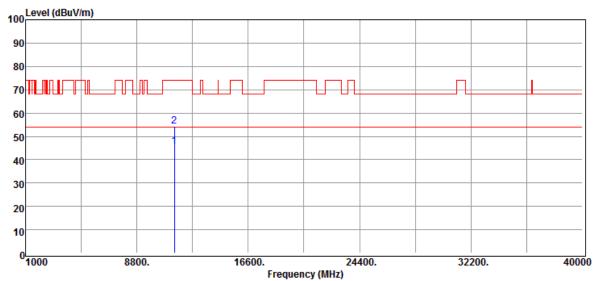
Page: 171 of 258

:802.11n40 / Band3/4 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH 142 Temp./Humi. :25/60

**EUT Pol** :E1 Plan Antenna Pol. :VERTICAL





Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV∕m	dBμV∕m	dB
11420.00	Average	32.53	13.05	45.58	54.00	-8.42
11420.00	Peak	41.24	13.05	54.29	74.00	-19.71

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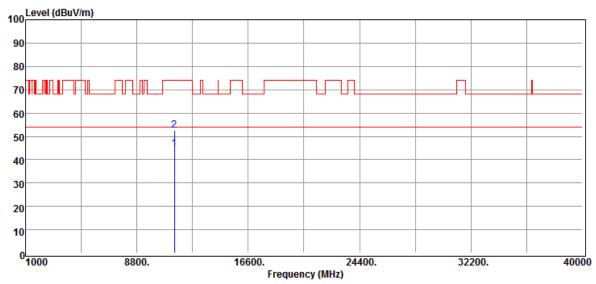
Page: 172 of 258

:802.11n40 / Band3/4 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH 142 Temp./Humi. :25/60

**EUT Pol** :E1 Plan Antenna Pol. :HORIZONTAL

:5710 MHz Test Channel :Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	$dB\mu V/m$	dB
11420.00	Average	31.56	13.05	44.61	54.00	-9.39
11420.00	Peak	39.69	13.05	52.74	74.00	-21.26

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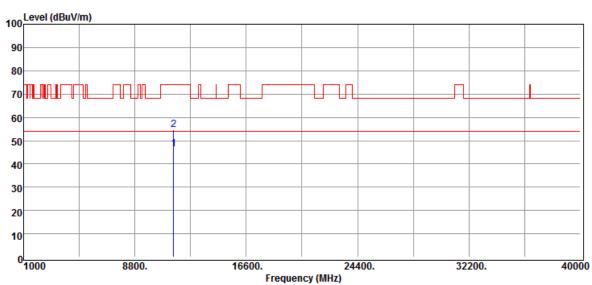
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### Radiated Spurious Emission Measurement Result 802.11n HT40, 5725~5850 MHz

:802.11n40 / Band4 **Operation Mode Test Date** :2018-08-17

:Tx CH Low :25/60 Test Mode Temp./Humi. **EUT Pol** :E1 Plan

Antenna Pol. :VERTICAL :5755 MHz :Jerry **Test Channel** Engineer



			-, (			
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
11510.00	Average	33.13	13.31	46.44	54.00	-7.56
11510.00	Peak	41.32	13.31	54.63	74.00	-19.37

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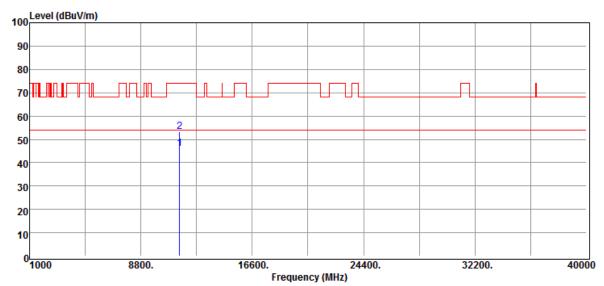
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:802.11n40 / Band4 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Low Temp./Humi. :25/60

**EUT Pol** :E1 Plan Antenna Pol. :HORIZONTAL

:5755 MHz Test Channel :Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB
11510.00	Average	32.67	13.31	45.98	54.00	-8.02
11510.00	Peak	40.02	13.31	53.33	74.00	-20.67

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**Operation Mode** Test Mode **EUT Pol** Test Channel

:802.11n40 / Band4

:Tx CH High

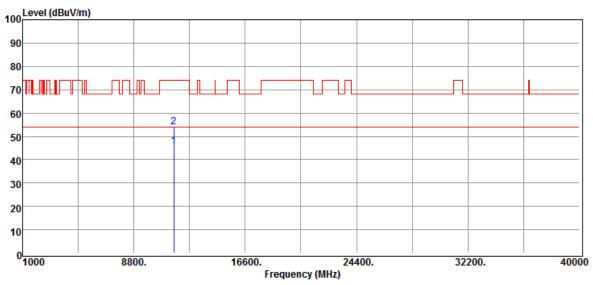
:E1 Plan

:5795 MHz

**Test Date** :2018-08-17 Temp./Humi. :25/60

Antenna Pol. :VERTICAL

:Jerry Engineer



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBµV/m	Margin dB
IVII IZ	I IV QI /AV	αΔμν	QD_	αυμ ν / ΙΙΙ	αυμ ν / ΙΙΙ	uD
11590.00 11590.00	Average Peak	32.73 40.94	12.92 12.92	45.65 53.86	54.00 74.00	-8.35 -20.14

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**Operation Mode** Test Mode

Test Channel

**EUT Pol** 

:802.11n40 / Band4

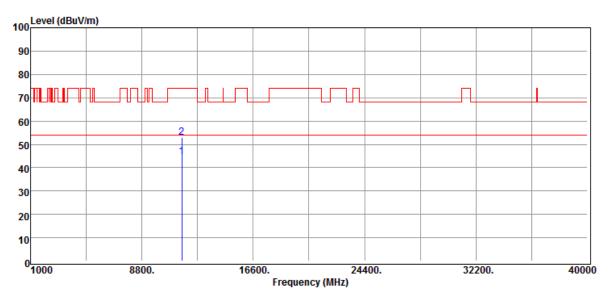
:Tx CH High

:E1 Plan :5795 MHz **Test Date** :2018-08-17

Temp./Humi. :25/60

Antenna Pol. :HORIZONTAL

:Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
11590.00	Average	31.55	12.92	44.47	54.00	-9.53
11590.00	Peak	39.87	12.92	52.79	74.00	-21.21

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**EUT Pol** 

Report No.: E2/2018/80004

:VERTICAL

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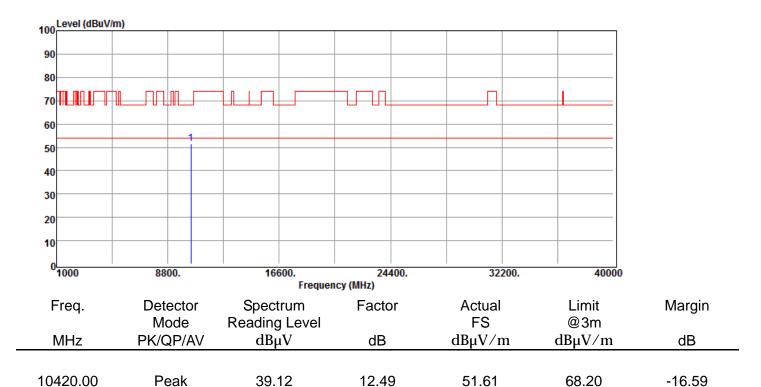
# Radiated Spurious Emission Measurement Result 802.11ac VHT80, 5150~5250 MHz

:802.11ac80 / Band1 **Operation Mode Test Date** :2018-08-17

Antenna Pol.

Test Mode :Tx CH Low Temp./Humi. :25/60 :E1 Plan

:5210 MHz **Test Channel** Engineer :Jerry



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:802.11ac80 / Band1 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Low Temp./Humi. :25/60

**EUT Pol** :E1 Plan Antenna Pol. :HORIZONTAL

:5210 MHz Test Channel :Jerry Engineer



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**EUT Pol** 

Report No.: E2/2018/80004

:VERTICAL

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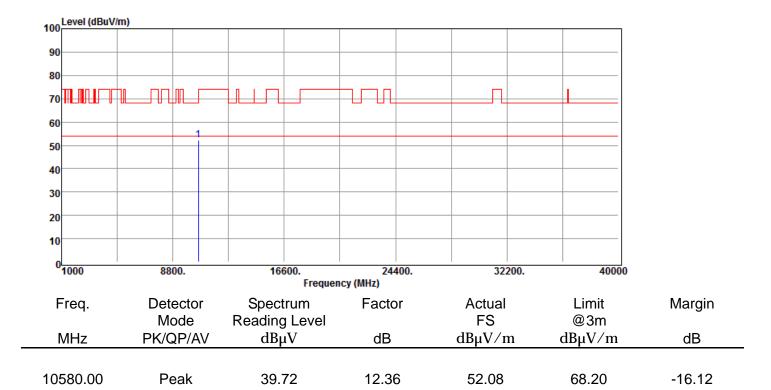
# Radiated Spurious Emission Measurement Result 802.11ac VHT80, 5250~5350 MHz

:802.11ac80 / Band2 **Operation Mode Test Date** :2018-08-17

Antenna Pol.

Test Mode :Tx CH High Temp./Humi. :25/60 :E1 Plan

:5290 MHz **Test Channel** Engineer :Jerry



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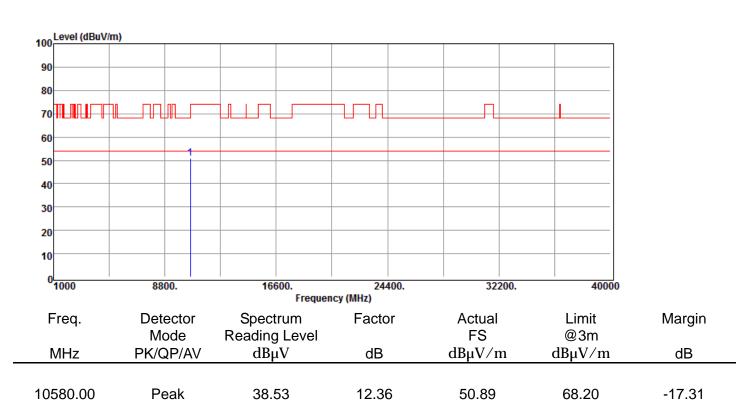


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:802.11ac80 / Band2 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH High Temp./Humi. :25/60 :E1 Plan **EUT Pol** Antenna Pol. :HORIZONTAL

:5290 MHz Test Channel :Jerry Engineer



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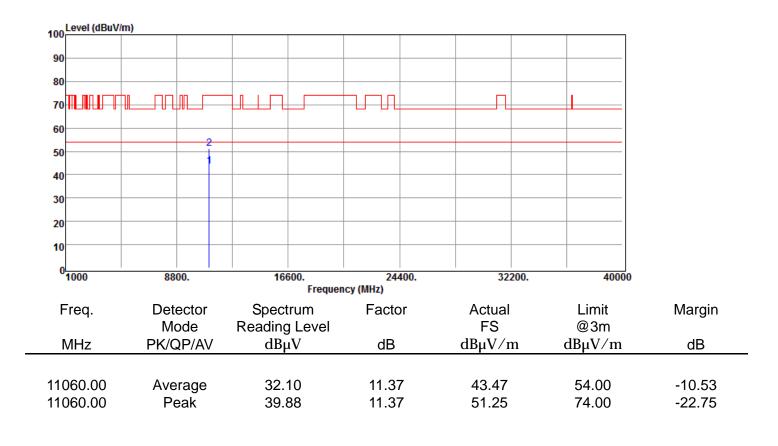
## Radiated Spurious Emission Measurement Result 802.11ac VHT80, 5470~5725 MHz

:802.11ac80 / Band3 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Low :25/60 Temp./Humi.

:E1 Plan **EUT Pol** Antenna Pol. :VERTICAL

:5530 MHz **Test Channel** Engineer :Jerry



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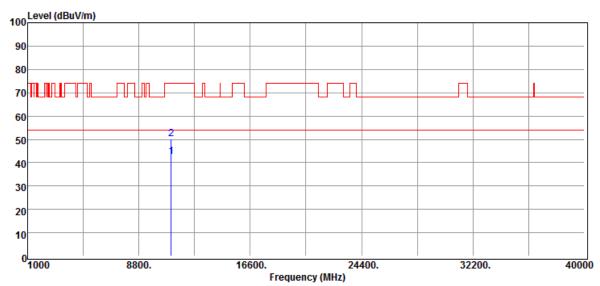
Page: 182 of 258

:802.11ac80 / Band3 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Low Temp./Humi. :25/60

**EUT Pol** :E1 Plan Antenna Pol. :HORIZONTAL

:5530 MHz Test Channel :Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
11060.00	Average	31.05	11.37	42.42	54.00	-11.58
11060.00	Peak	38.65	11.37	50.02	74.00	-23.98

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**Operation Mode** Test Mode

:802.11ac80 / Band3

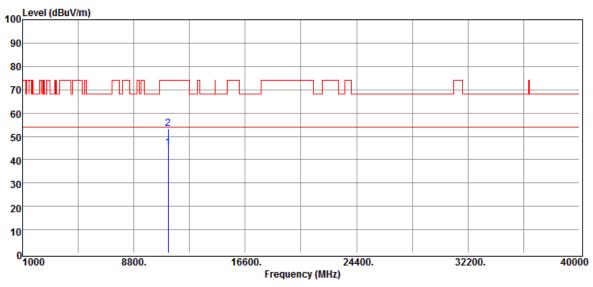
:Tx CH Mid

**EUT Pol** :E1 Plan :5610 MHz Test Channel

**Test Date** :2018-08-17 Temp./Humi. :25/60

Antenna Pol. :VERTICAL

:Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
11210.00	Average	32.53	12.39	44.92	54.00	-9.08
11210.00	Peak	40.98	12.39	53.37	74.00	-20.63

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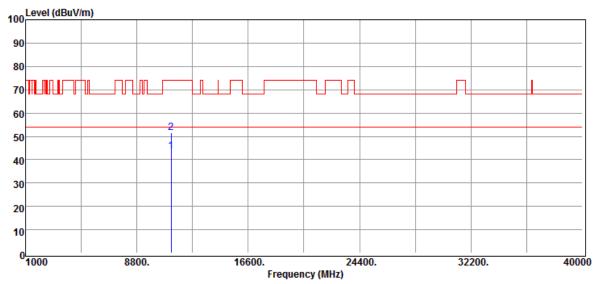
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:802.11ac80 / Band3 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Mid Temp./Humi. :25/60

**EUT Pol** :E1 Plan Antenna Pol. :HORIZONTAL

:5610 MHz Test Channel :Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
11210.00	Average	31.23	12.39	43.62	54.00	-10.38
11210.00	Peak	39.02	12.39	51.41	74.00	-22.59

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**Operation Mode** Test Mode **EUT Pol** 

**Test Channel** 

:802.11ac80 / Band3

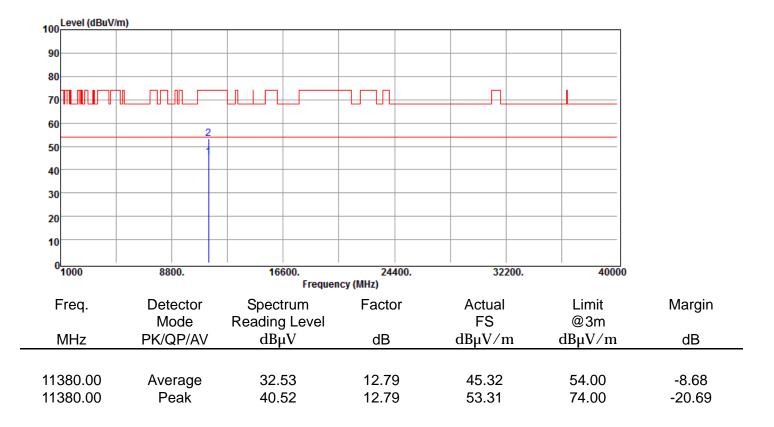
:Tx CH High

:E1 Plan :5690 MHz **Test Date** Temp./Humi. :2018-08-17

:25/60

Antenna Pol. :VERTICAL

:Jerry Engineer



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**EUT Pol** 

Report No.: E2/2018/80004

:2018-08-17

:HORIZONTAL

:25/60

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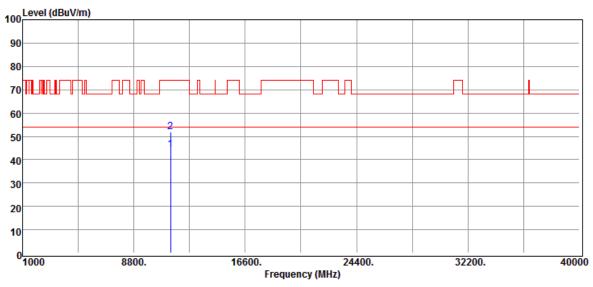
:802.11ac80 / Band3 **Operation Mode** Test Mode

:Tx CH High Temp./Humi. :E1 Plan Antenna Pol.

**Test Date** 

:5690 MHz Test Channel :Jerry





Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
IVII IZ	I IVQI /AV	ασμν	uБ	ασμ ν / ΙΙΙ	ασμ ν / π	αБ
11380.00 11380.00	Average Peak	31.53 39.26	12.79 12.79	44.32 52.05	54.00 74.00	-9.68 -21.95

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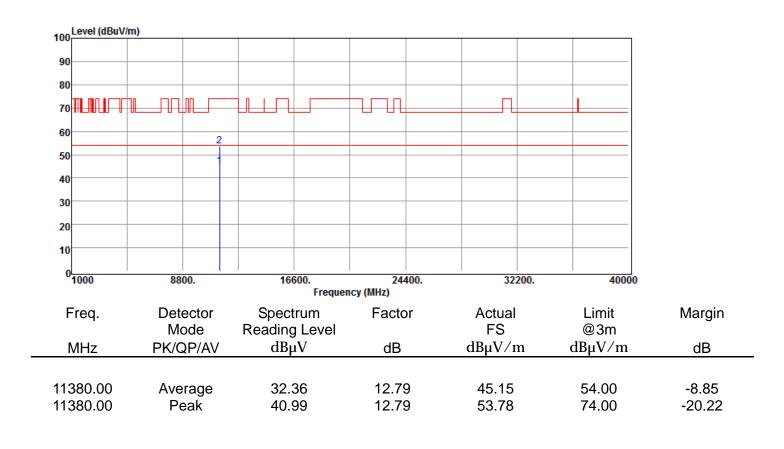
## Radiated Spurious Emission Measurement Result 802.11ac VHT80, 5725~5850 MHz

:802.11ac80 / Band4 **Operation Mode Test Date** :2018-08-17

:Tx CH Low :25/60 Test Mode Temp./Humi.

**EUT Pol** :E1 Plan Antenna Pol. :VERTICAL

:5755 MHz :Jerry **Test Channel** Engineer



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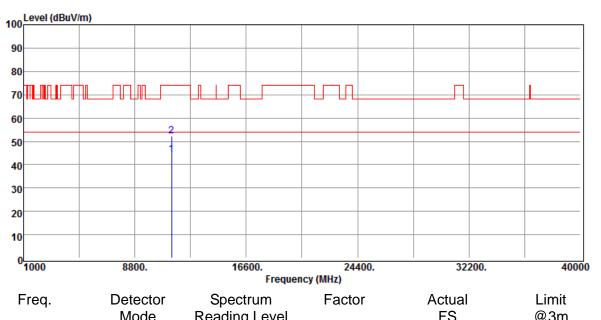


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:802.11ac80 / Band4 **Operation Mode Test Date** :2018-08-17

Test Mode :Tx CH Low Temp./Humi. :25/60 **EUT Pol** :E1 Plan Antenna Pol. :HORIZONTAL

:5755 MHz Test Channel :Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
11380.00	Average	31.53	12.79	44.32	54.00	-9.68
11380.00	Peak	39.32	12.79	52.11	74.00	-21.89

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# Band edge falling to restricted band

#### 802.11a mode

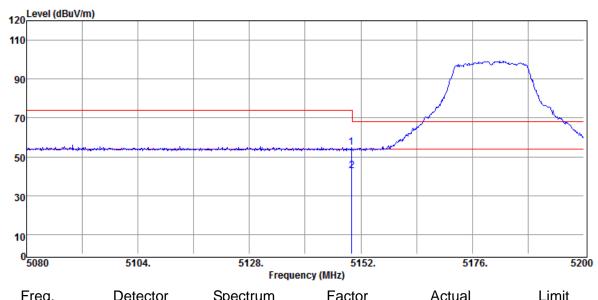
:802.11a / Band1 **Operation Mode** :BE CH Low Test Mode

**EUT Pol** :E1 Plan :5180 MHz Test Channel

**Test Date** :2018-08-16 :25/60 Temp./Humi.

Antenna Pol. :VERTICAL

Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5149.96	Peak	52.99	1.84	54.83	74.00	-19.17
5150.00	Average	40.89	1.84	42.73	54.00	-11.27

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**Operation Mode** Test Mode

**EUT Pol** 

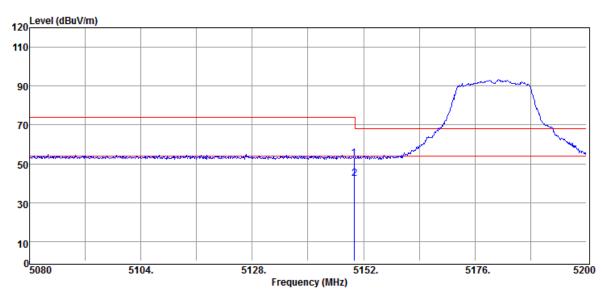
Test Channel

:802.11a / Band1 :BE CH Low

:E1 Plan :5180 MHz **Test Date** :2018-08-16 Temp./Humi. :25/60

Antenna Pol. :HORIZONTAL

:Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	$dB\mu V/m$	dB
5149.96	Peak	51.10	1.84	52.94	74.00	-21.06
5150.00	Average	40.57	1.84	42.41	54.00	-11.59

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**Operation Mode** Test Mode **EUT Pol** Test Channel

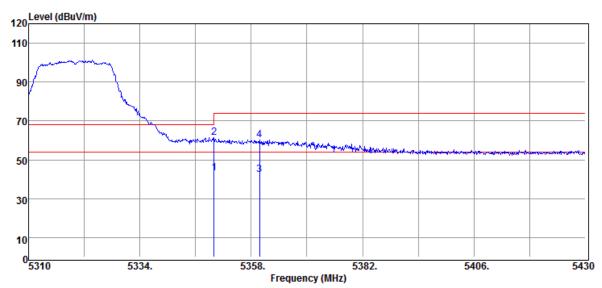
:802.11a / Band2 :BE CH High :E1 Plan

:5320 MHz

**Test Date** :2018-08-16 Temp./Humi. :25/60

Antenna Pol. :VERTICAL

:Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5350.00	Average	41.07	2.24	43.31	54.00	-10.69
5350.00	Peak	59.20	2.24	61.44	74.00	-12.56
5359.80	Average	40.03	2.29	42.32	54.00	-11.68
5359.80	Peak	58.08	2.29	60.37	74.00	-13.63

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**Operation Mode** Test Mode **EUT Pol** 

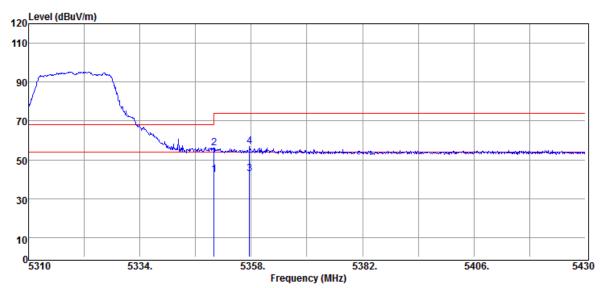
Test Channel

:802.11a / Band2 :BE CH High

:E1 Plan :5320 MHz **Test Date** :2018-08-16 Temp./Humi. :25/60

Antenna Pol. :HORIZONTAL

:Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5350.00	Average	40.23	2.24	42.47	54.00	-11.53
5350.00	Peak	53.95	2.24	56.19	74.00	-17.81
5357.64	Average	40.41	2.26	42.67	54.00	-11.33
5357.64	Peak	54.74	2.26	57.00	74.00	-17.00

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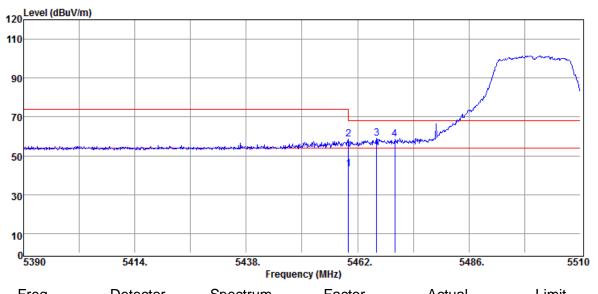
**Operation Mode** Test Mode **EUT Pol** Test Channel

:802.11a / Band3 :BE CH Low

:E1 Plan :5500 MHz **Test Date** :2018-08-16 Temp./Humi. :25/60

Antenna Pol. :VERTICAL





Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5460.00	Average	40.89	2.22	43.11	54.00	-10.89
5460.00	Peak	56.13	2.22	58.35	74.00	-15.65
5466.08	Peak	56.58	2.19	58.77	68.20	-9.43
5470.00	Peak	56.34	2.18	58.52	68.20	-9.68

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**Operation Mode** Test Mode **EUT Pol** 

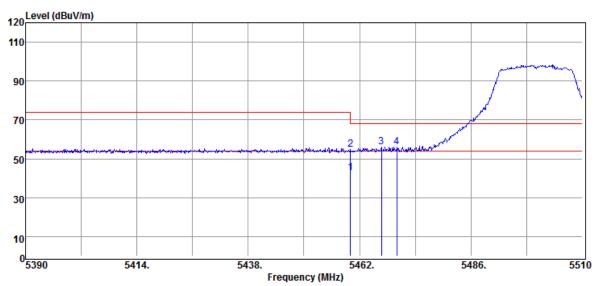
Test Channel

:802.11a / Band3 :BE CH Low

:E1 Plan :5500 MHz **Test Date** :2018-08-16 Temp./Humi. :25/60

Antenna Pol. :HORIZONTAL

Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	${ m d} B \mu V$	dB	dBμV/m	dBμV/m	dB
5460.00	Average	40.55	2.22	42.77	54.00	-11.23
5460.00	Peak	52.55	2.22	54.77	74.00	-19.23
5466.68	Peak	53.79	2.19	55.98	68.20	-12.22
5470.00	Peak	53.86	2.18	56.04	68.20	-12.16

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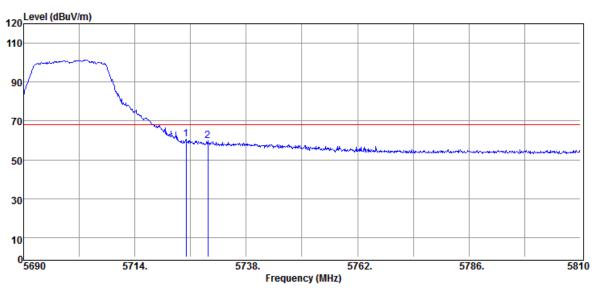
**Operation Mode** Test Mode **EUT Pol** Test Channel

:802.11a / Band3 :BE CH High

:E1 Plan :5700 MHz **Test Date** :2018-08-16 Temp./Humi. :25/60

Antenna Pol. :VERTICAL

Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5725.00	Peak	58.39	2.28	60.67	68.20	-7.53
5729.72	Peak	57.59	2.26	59.85	68.20	-8.35

t (886-2) 2299-3279

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**Operation Mode** Test Mode **EUT Pol** 

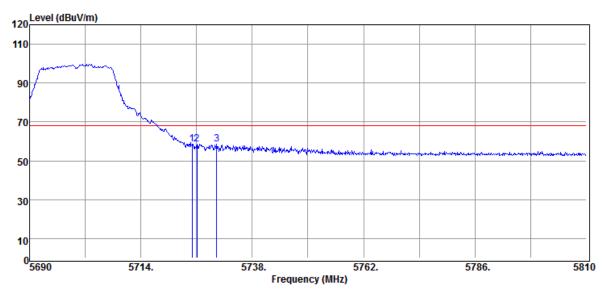
Test Channel

:802.11a / Band3 :BE CH High

:E1 Plan :5700 MHz **Test Date** :2018-08-16 Temp./Humi. :25/60

Antenna Pol. :HORIZONTAL

:Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5725.00	Peak	56.23	2.28	58.51	68.20	-9.69
5726.12	Peak	56.43	2.28	58.71	68.20	-9.49
5730.32	Peak	56.36	2.25	58.61	68.20	-9.59

t (886-2) 2299-3279

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**Operation Mode** Test Mode **EUT Pol** Test Channel

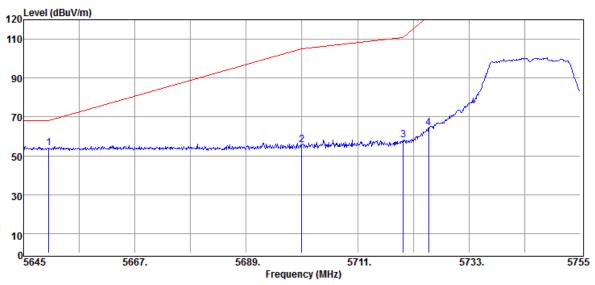
:802.11a / Band4 :BE CH Low :E1 Plan

:5745 MHz

**Test Date** :2018-08-16 Temp./Humi. :25/60

Antenna Pol. :VERTICAL

Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5650.00	Peak	51.81	2.25	54.06	68.20	-14.14
5700.00	Peak	53.27	2.42	55.69	105.20	-49.51
5720.00	Peak	55.93	2.32	58.25	110.80	-52.55
5725.00	Peak	62.25	2.28	64.53	122.20	-57.67

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**Operation Mode** Test Mode **EUT Pol** 

Test Channel

:802.11a / Band4 :BE CH Low

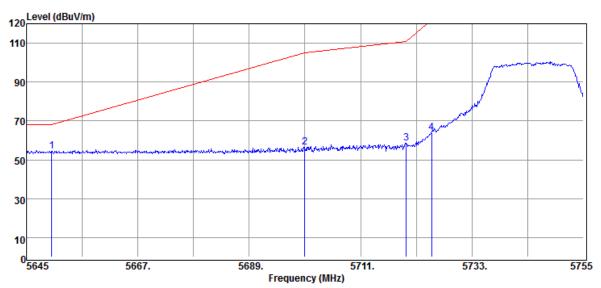
:E1 Plan

:5745 MHz

**Test Date** :2018-08-16 Temp./Humi. :25/60

Antenna Pol. :HORIZONTAL

Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5650.00	Peak	52.11	2.25	54.36	68.20	-13.84
5700.00	Peak	54.00	2.42	56.42	105.20	-48.78
5720.00	Peak	56.39	2.32	58.71	110.80	-52.09
5725.00	Peak	61.67	2.28	63.95	122.20	-58.25

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**Operation Mode** Test Mode **EUT Pol** 

Test Channel

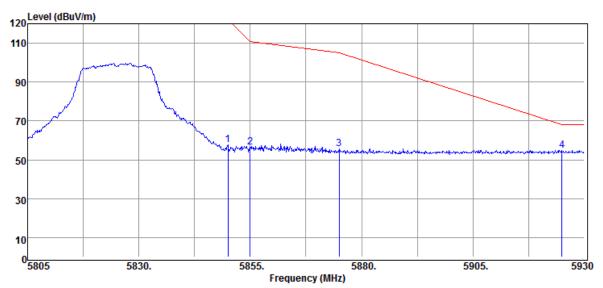
:802.11a / Band4 :BE CH High :E1 Plan

:5825 MHz

**Test Date** Temp./Humi. Antenna Pol. Engineer

:2018-08-16 :25/60

:VERTICAL :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	$\mathrm{d} \mathrm{B} \mu \mathrm{V}$	dB	dBμV/m	dBμV/m	dB
5850.00	Peak	55.91	1.88	57.79	122.20	-64.41
5855.00	Peak	54.77	1.89	56.66	110.80	-54.14
5875.00	Peak	53.56	1.90	55.46	105.20	-49.74
5925.00	Peak	52.57	2.16	54.73	68.20	-13.47

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**Operation Mode** Test Mode **EUT Pol** 

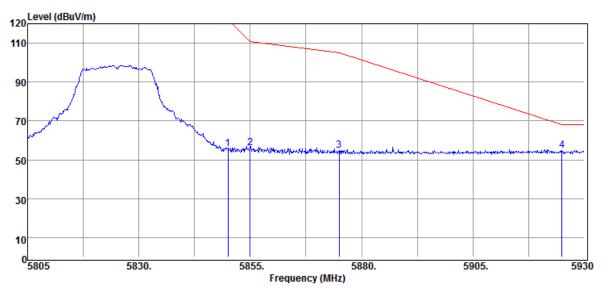
Test Channel

:802.11a / Band4 :BE CH High

:E1 Plan :5825 MHz **Test Date** :2018-08-16 Temp./Humi. :25/60

Antenna Pol. :HORIZONTAL

Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5850.00	Peak	53.72	1.88	55.60	122.20	-66.60
5855.00	Peak	54.00	1.89	55.89	110.80	-54.91
5875.00	Peak	52.90	1.90	54.80	105.20	-50.40
5925.00	Peak	52.86	2.16	55.02	68.20	-13.18

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#### 802.11n20 HT mode

**Operation Mode** Test Mode **EUT Pol** 

Test Channel

:802.11n20 / Band1

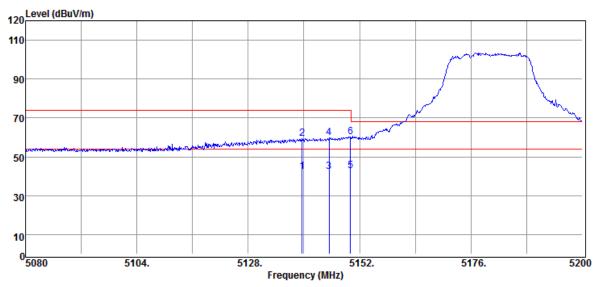
:BE CH Low

:E1 Plan :5180 MHz **Test Date** Temp./Humi. Antenna Pol. :2018-08-22

:25/60

:VERTICAL

Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5139.64	Average	40.53	1.81	42.34	54.00	-11.66
5139.64	Peak	57.57	1.81	59.38	74.00	-14.62
5145.40	Average	40.66	1.83	42.49	54.00	-11.51
5145.40	Peak	57.94	1.83	59.77	74.00	-14.23
5150.00	Average	40.74	1.84	42.58	54.00	-11.42
5150.00	Peak	58.30	1.84	60.14	74.00	-13.86

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**Operation Mode** Test Mode **EUT Pol** 

:802.11n20 / Band1

:BE CH Low

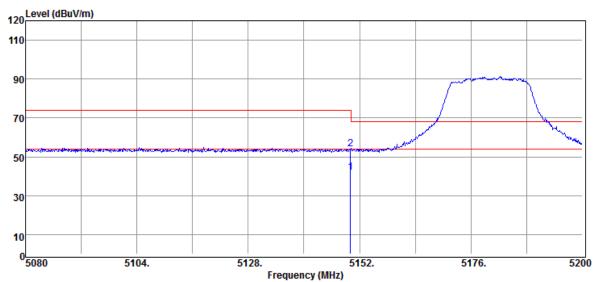
:E1 Plan

:5180 MHz Test Channel

**Test Date** :2018-08-22 Temp./Humi. :25/60

Antenna Pol. :HORIZONTAL

Engineer :Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBµV/m	Margin dB
IVITZ	PN/QP/AV	ασμν	<u>ub</u>	ασμν/ ΙΙΙ	ασμν/ ΙΙΙ	ив
5150.00 5150.00	Average Peak	40.19 51.96	1.84 1.84	42.03 53.80	54.00 74.00	-11.97 -20.20

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**Operation Mode** Test Mode **EUT Pol** Test Channel

:802.11n20 / Band2

:BE CH High

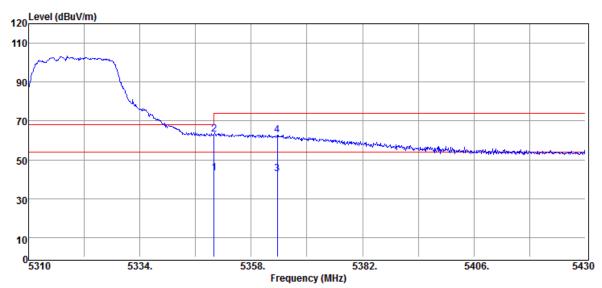
:E1 Plan

:5320 MHz

**Test Date** :2018-08-22 Temp./Humi. :25/60

Antenna Pol. :VERTICAL

:Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5350.00	Average	40.83	2.24	43.07	54.00	-10.93
5350.00	Peak	60.97	2.24	63.21	74.00	-10.79
5363.64	Average	40.65	2.30	42.95	54.00	-11.05
5363.64	Peak	60.39	2.30	62.69	74.00	-11.31

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**Operation Mode** Test Mode **EUT Pol** 

:802.11n20 / Band2

:BE CH High

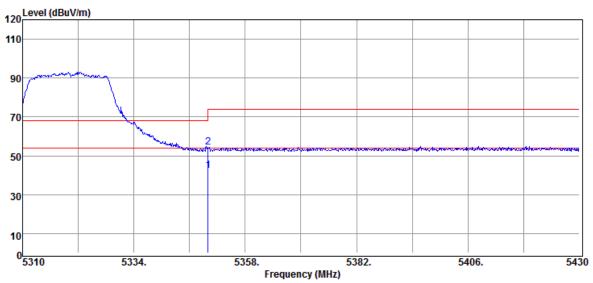
:E1 Plan

:5320 MHz Test Channel

**Test Date** :2018-08-22 Temp./Humi. :25/60

Antenna Pol. :HORIZONTAL

:Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB
5350.00	Average	39.98	2.24	42.22	54.00	-11.78
5350.00	Peak	52.21	2.24	54.45	74.00	-19.55

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**Operation Mode** Test Mode **EUT Pol** 

Test Channel

:802.11n20 / Band3

:BE CH Low

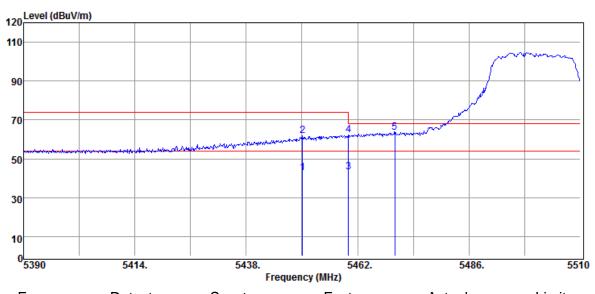
:E1 Plan

:5500 MHz

**Test Date** :2018-08-22 Temp./Humi. :25/60

Antenna Pol. :VERTICAL

Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5450.12	Average	40.63	2.26	42.89	54.00	-11.11
5450.12	Peak	59.47	2.26	61.73	74.00	-12.27
5460.00	Average	40.83	2.22	43.05	54.00	-10.95
5460.00	Peak	60.02	2.22	62.24	74.00	-11.76
5470.00	Peak	61.27	2.18	63.45	68.20	-4.75

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:2018-08-22

:25/60

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**Operation Mode** Test Mode **EUT Pol** 

Test Channel

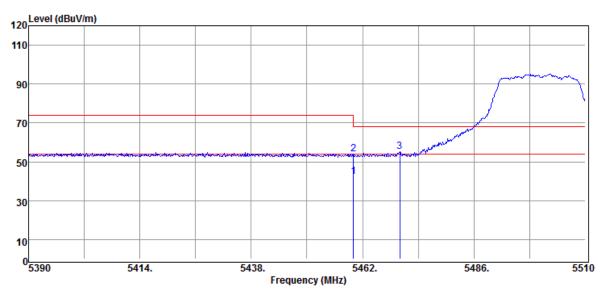
:802.11n20 / Band3

:BE CH Low

:E1 Plan :5500 MHz **Test Date** Temp./Humi.

Antenna Pol. :HORIZONTAL

Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB
5460.00	Average	40.04	2.22	42.26	54.00	-11.74
5460.00	Peak	51.84	2.22	54.06	74.00	-19.94
5470.00	Peak	52.93	2.18	55.11	68.20	-13.09

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**Operation Mode** Test Mode **EUT Pol** Test Channel

:802.11n20 / Band3

:BE CH High

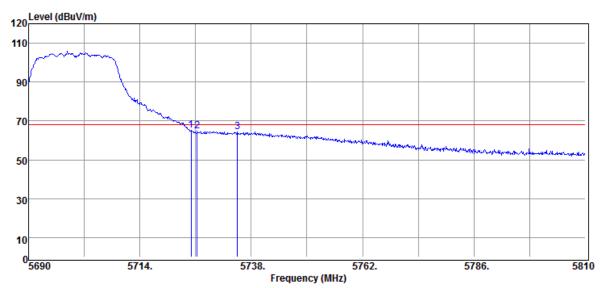
:E1 Plan

:5700 MHz

**Test Date** :2018-08-22 Temp./Humi. :25/60

Antenna Pol. :VERTICAL

:Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5725.00	Peak	62.92	2.28	65.20	68.20	-3.00
5726.36	Peak	62.34	2.28	64.62	68.20	-3.58
5735.00	Peak	62.29	2.22	64.51	68.20	-3.69

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**Operation Mode** Test Mode **EUT Pol** 

Test Channel

:802.11n20 / Band3

:BE CH High

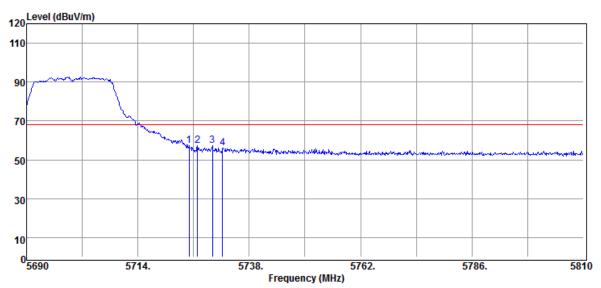
:E1 Plan

:5700 MHz

**Test Date** :2018-08-22 Temp./Humi. :25/60

Antenna Pol. :HORIZONTAL

:Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	$\mathrm{d} \mathrm{B} \mu \mathrm{V}$	dB	dBμV/m	dBμV/m	dB
5725.00	Peak	55.22	2.28	57.50	68.20	-10.70
5726.84	Peak	55.13	2.27	57.40	68.20	-10.80
5730.08	Peak	55.08	2.25	57.33	68.20	-10.87
5732.24	Peak	53.96	2.25	56.21	68.20	-11.99

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**Operation Mode** Test Mode **EUT Pol** 

Test Channel

:802.11n20 / Band4

:BE CH Low

:E1 Plan

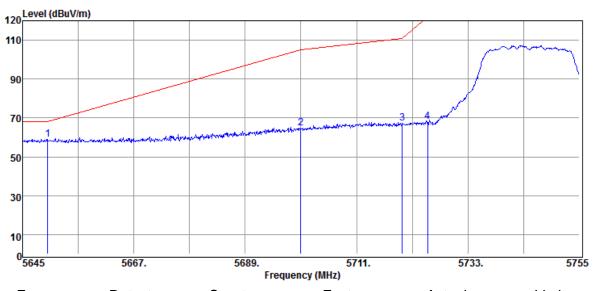
:5745 MHz

**Test Date** :2018-08-22

Temp./Humi. :25/60

Antenna Pol. :VERTICAL

Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	$dB\mu V$	dB	dBμV/m	dBμV/m	dB
5650.00	Peak	56.54	2.25	58.79	68.20	-9.41
5700.00	Peak	62.20	2.42	64.62	105.20	-40.58
5720.00	Peak	65.15	2.32	67.47	110.80	-43.33
5725.00	Peak	65.84	2.28	68.12	122.20	-54.08

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:HORIZONTAL

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**Operation Mode** Test Mode **EUT Pol** 

Test Channel

:802.11n20 / Band4

:BE CH Low

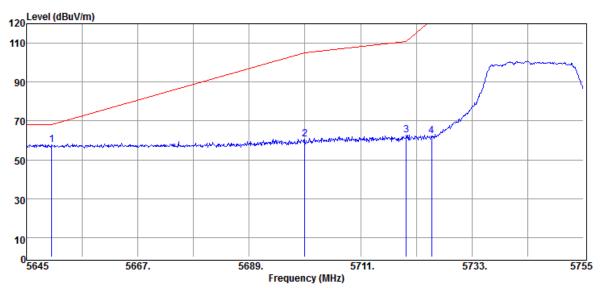
:E1 Plan

:5745 MHz

**Test Date** :2018-08-22

Temp./Humi. :25/60 Antenna Pol.

Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	${ m d} B \mu V$	dB	dBμV/m	dBµV∕m	dB
5650.00	Peak	55.41	2.25	57.66	68.20	-10.54
5700.00	Peak	58.15	2.42	60.57	105.20	-44.63
5720.00	Peak	60.42	2.32	62.74	110.80	-48.06
5725.00	Peak	60.07	2.28	62.35	122.20	-59.85

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**Operation Mode** Test Mode **EUT Pol** Test Channel

:802.11n20 / Band4

:BE CH High

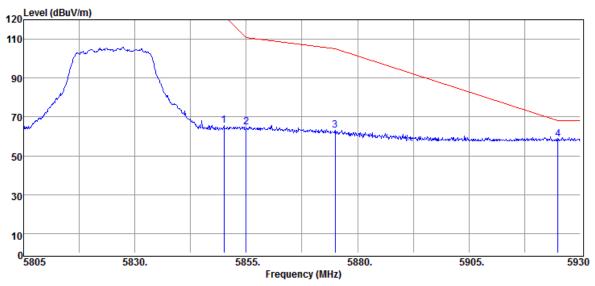
:E1 Plan

:5825 MHz

**Test Date** :2018-08-22 Temp./Humi. :25/60

Antenna Pol. :VERTICAL

:Jerry Engineer



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dΒμV/m	Limit @3m dBμV/m	Margin dB
5850.00 5855.00 5875.00	Peak Peak Peak	63.56 63.02 61.17	1.88 1.89 1.90	65.44 64.91 63.07	122.20 110.80 105.20	-56.76 -45.89 -42.13
5925.00	Peak	56.42	2.16	58.58	68.20	-9.62

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**Operation Mode** Test Mode **EUT Pol** 

:802.11n20 / Band4

:BE CH High

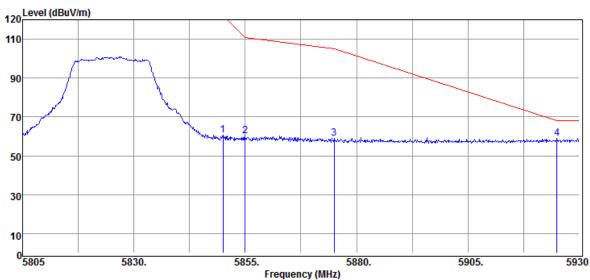
:E1 Plan

:5825 MHz Test Channel

**Test Date** :2018-08-22 Temp./Humi. :25/60

Antenna Pol. :HORIZONTAL

Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	$\mathrm{d}\mathrm{B}\mu\mathrm{V}$	dB	dBμV/m	dBμV/m	dB
5850.00	Peak	58.74	1.88	60.62	122.20	-61.58
5855.00	Peak	58.48	1.89	60.37	110.80	-50.43
5875.00	Peak	57.20	1.90	59.10	105.20	-46.10
5925.00	Peak	56.66	2.16	58.82	68.20	-9.38

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#### 802.11n40 HT mode

**Operation Mode** Test Mode **EUT Pol** 

Test Channel

:802.11n40 / Band1

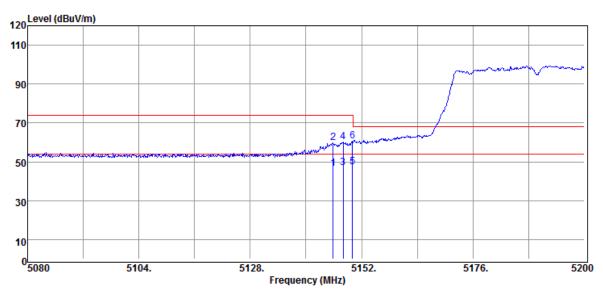
:BE CH Low

:E1 Plan :5180 MHz **Test Date** Temp./Humi. Antenna Pol. :2018-08-22

:25/60

:VERTICAL

Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB
5145.88	Average	44.73	1.83	46.56	54.00	-7.44
5145.88	Peak	57.86	1.83	59.69	74.00	-14.31
5148.04	Average	45.09	1.84	46.93	54.00	-7.07
5148.04	Peak	58.42	1.84	60.26	74.00	-13.74
5150.00	Average	45.37	1.84	47.21	54.00	-6.79
5150.00	Peak	58.97	1.84	60.81	74.00	-13.19

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**Operation Mode** Test Mode

**EUT Pol** 

:802.11n40 / Band1

:BE CH Low

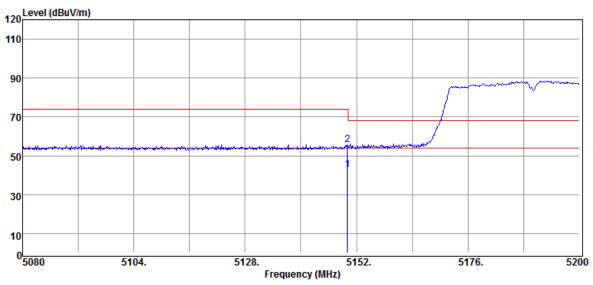
:E1 Plan

:5180 MHz Test Channel

**Test Date** :2018-08-22 Temp./Humi. :25/60

Antenna Pol. :HORIZONTAL

Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5150.00 5150.00	Average Peak	40.74 53.66	1.84 1.84	42.58 55.50	54.00 74.00	-11.42 -18.50

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**Operation Mode** Test Mode **EUT Pol** 

Test Channel

:802.11n40 / Band2

:BE CH High

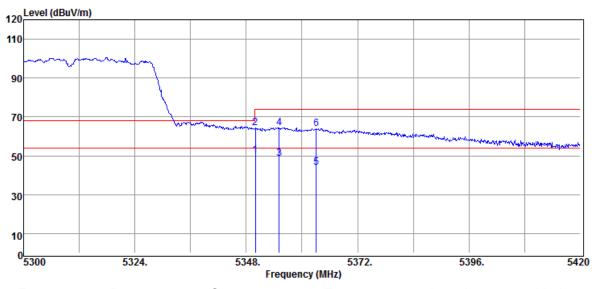
:E1 Plan

:5310 MHz

**Test Date** :2018-08-22 Temp./Humi. :25/60

Antenna Pol. :VERTICAL

Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5350.00	Average	48.15	2.24	50.39	54.00	-3.61
5350.00	Peak	62.16	2.24	64.40	74.00	-9.60
5355.08	Average	46.33	2.25	48.58	54.00	-5.42
5355.08	Peak	62.31	2.25	64.56	74.00	-9.44
5363.12	Average	41.68	2.30	43.98	54.00	-10.02
5363.12	Peak	61.84	2.30	64.14	74.00	-9.86

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**Operation Mode** Test Mode

**EUT Pol** 

:802.11n40 / Band2

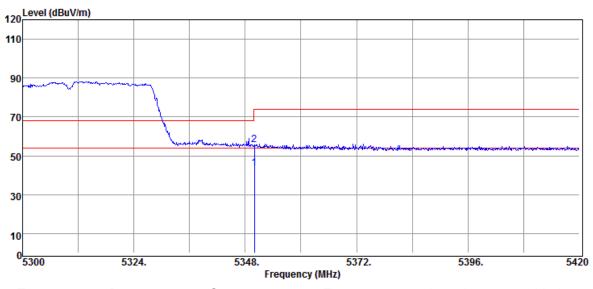
:BE CH High

Test Channel

:E1 Plan :5310 MHz **Test Date** :2018-08-22 Temp./Humi. :25/60

Antenna Pol. :HORIZONTAL

:Jerry Engineer



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBµV/m	Margin dB
	1 10 01 77 10	α2μ,	<u> </u>	α2μ	G2 pr 17 111	
5350.00 5350.00	Average Peak	41.37 53.33	2.24 2.24	43.61 55.57	54.00 74.00	-10.39 -18.43

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**Operation Mode** Test Mode **EUT Pol** 

Test Channel

:802.11n40 / Band3

:BE CH Low

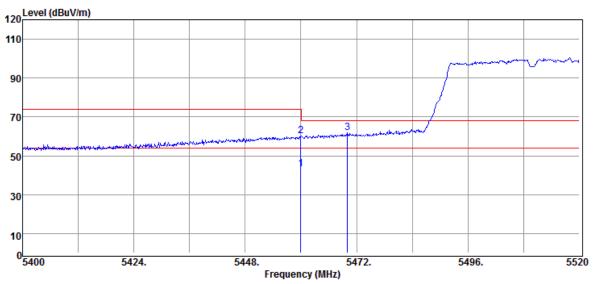
:E1 Plan

:5510 MHz

**Test Date** :2018-08-22 Temp./Humi. :25/60

Antenna Pol. :VERTICAL

Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5460.00	Average	41.12	2.22	43.34	54.00	-10.66
5460.00	Peak	58.12	2.22	60.34	74.00	-13.66
5470.00	Peak	59.69	2.18	61.87	68.20	-6.33

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**Operation Mode** Test Mode

**EUT Pol** 

:802.11n40 / Band3

:BE CH Low

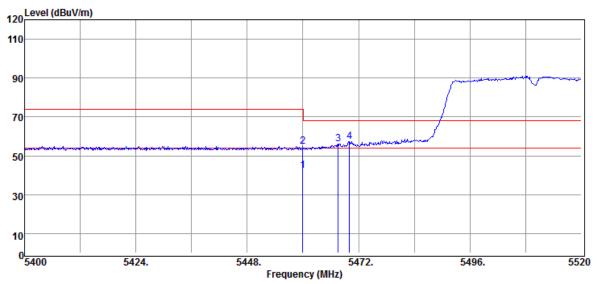
:E1 Plan

:5510 MHz Test Channel

**Test Date** :2018-08-22 Temp./Humi. :25/60

Antenna Pol. :HORIZONTAL

Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5460.00	Average	40.23	2.22	42.45	54.00	-11.55
5460.00	Peak	52.62	2.22	54.84	74.00	-19.16
5467.56	Peak	53.99	2.19	56.18	68.20	-12.02
5470.00	Peak	55.28	2.18	57.46	68.20	-10.74

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**Operation Mode** Test Mode **EUT Pol** 

Test Channel

:802.11n40 / Band3

:BE CH High

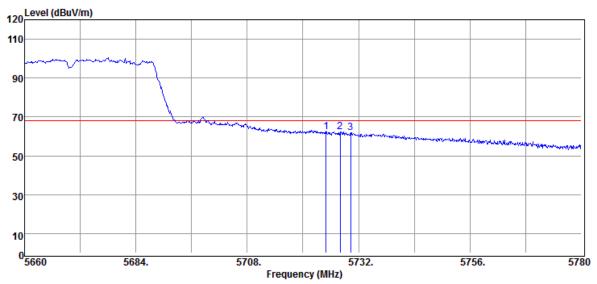
:E1 Plan

:5670 MHz

**Test Date** :2018-08-22 Temp./Humi. :25/60

Antenna Pol. :VERTICAL

Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5725.00	Peak	60.00	2.28	62.28	68.20	-5.92
5728.04	Peak	60.09	2.26	62.35	68.20	-5.85
5730.32	Peak	59.68	2.25	61.93	68.20	-6.27

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**Operation Mode** Test Mode **EUT Pol** 

:802.11n40 / Band3

:BE CH High

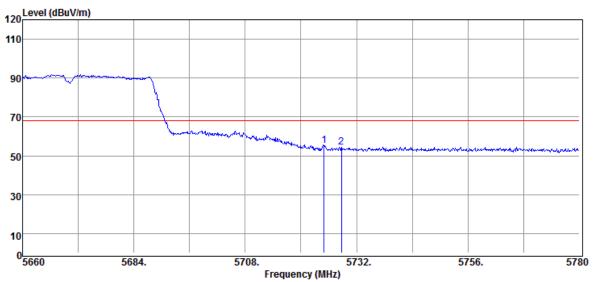
:E1 Plan

:5670 MHz Test Channel

**Test Date** :2018-08-22 Temp./Humi. :25/60

Antenna Pol. :HORIZONTAL

:Jerry Engineer



Freq.	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor	Actual FS dBuV/m	Limit @3m dBuV/m	Margin
MHz	PK/QP/AV	аьμν	dB	ασμν/π	ασμν/π	dB
5725.00	Peak	52.90	2.28	55.18	68.20	-13.02
5728.76	Peak	52.23	2.26	54.49	68.20	-13.71

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:2018-08-22

:VERTICAL

:25/60

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**Operation Mode** Test Mode **EUT Pol** 

Test Channel

:802.11n40 / Band4

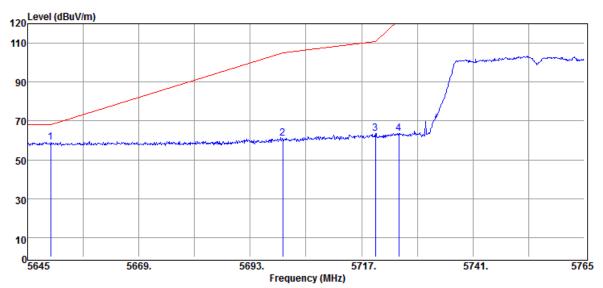
:BE CH Low

:E1 Plan

:5755 MHz

**Test Date** Temp./Humi. Antenna Pol.

Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5650.00	Peak	56.59	2.25	58.84	68.20	-9.36
5700.00	Peak	58.43	2.42	60.85	105.20	-44.35
5720.00	Peak	61.10	2.32	63.42	110.80	-47.38
5725.00	Peak	61.42	2.28	63.70	122.20	-58.50

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**Operation Mode** Test Mode **EUT Pol** 

Test Channel

:802.11n40 / Band4

:BE CH Low

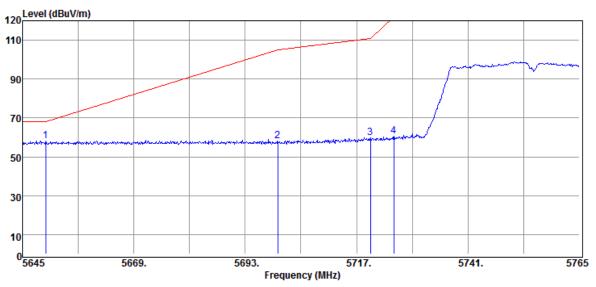
:E1 Plan

:5755 MHz

**Test Date** :2018-08-22 Temp./Humi. :25/60

Antenna Pol. :HORIZONTAL

Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5650.00	Peak	55.70	2.25	57.95	68.20	-10.25
5700.00	Peak	55.59	2.42	58.01	105.20	-47.19
5720.00	Peak	57.40	2.32	59.72	110.80	-51.08
5725.00	Peak	58.29	2.28	60.57	122.20	-61.63

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**Operation Mode** Test Mode **EUT Pol** 

Test Channel

:802.11n40 / Band4

:BE CH High

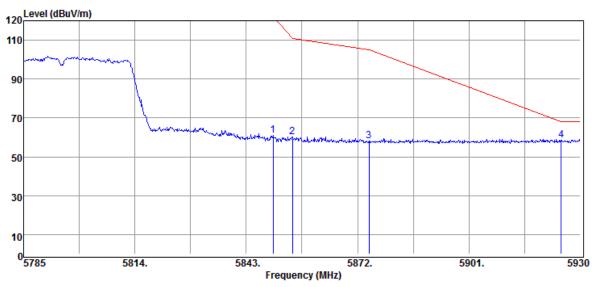
:E1 Plan

:5795 MHz

**Test Date** :2018-08-22 Temp./Humi. :25/60

Antenna Pol. :VERTICAL

Engineer :Jerry



11040003 (11112)									
	Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin		
	MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB		
								_	
	5850.00	Peak	59.28	1.88	61.16	122.20	-61.04		
	5855.00	Peak	58.16	1.89	60.05	110.80	-50.75		
	5875.00	Peak	56.36	1.90	58.26	105.20	-46.94		
	5925.00	Peak	56.51	2.16	58.67	68.20	-9.53		

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**Operation Mode** Test Mode **EUT Pol** 

:802.11n40 / Band4

:BE CH High

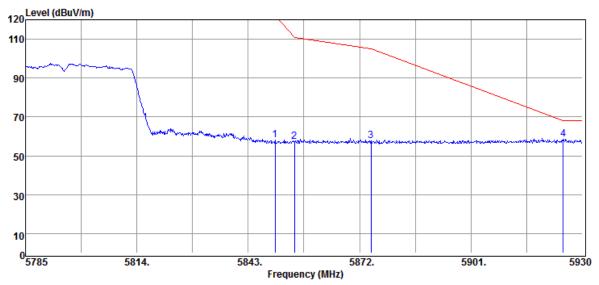
:E1 Plan

:5795 MHz Test Channel

**Test Date** :2018-08-22 Temp./Humi. :25/60

Antenna Pol. :HORIZONTAL

:Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5850.00	Peak	56.25	1.88	58.13	122.20	-64.07
5855.00	Peak	55.25	1.89	57.14	110.80	-53.66
5875.00	Peak	55.77	1.90	57.67	105.20	-47.53
5925.00	Peak	56.36	2.16	58.52	68.20	-9.68

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## 802.11ac80 VHT mode

:802.11ac80 / Band1 **Operation Mode** 

Test Mode :BE CH Low

**EUT Pol** :E1 Plan

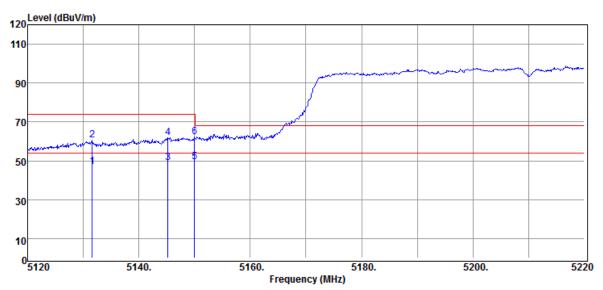
:5210 MHz Test Channel

**Test Date** :2018-08-22

Temp./Humi. :25/60

Antenna Pol. :VERTICAL

Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5131.60	Average	45.23	1.78	47.01	54.00	-6.99
5131.60	Peak	58.92	1.78	60.70	74.00	-13.30
5145.20	Average	47.23	1.83	49.06	54.00	-4.94
5145.20	Peak	59.97	1.83	61.80	74.00	-12.20
5150.00	Average	47.74	1.84	49.58	54.00	-4.42
5150.00	Peak	60.29	1.84	62.13	74.00	-11.87

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**Operation Mode** Test Mode

:802.11ac80 / Band1

:BE CH Low

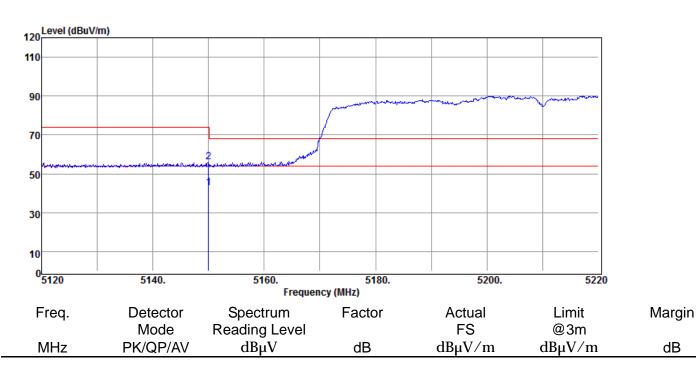
**EUT Pol** :E1 Plan :5210 MHz Test Channel

**Test Date** Temp./Humi. Antenna Pol. :2018-08-22

:25/60

:HORIZONTAL

Engineer :Jerry



5150.00	Average	41.00	1.84	42.84	54.00	-11.16
5150.00	Peak	54.24	1.84	56.08	74.00	-17.92

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**Operation Mode** Test Mode **EUT Pol** 

Test Channel

:802.11ac80 / Band2

:BE CH High

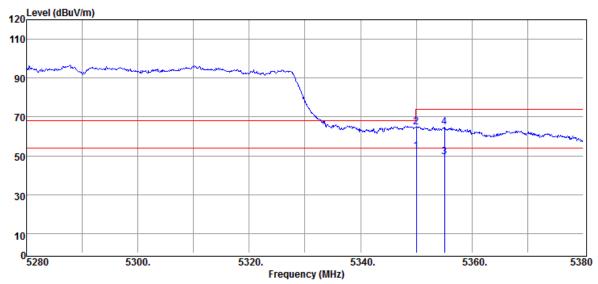
:E1 Plan

:5290 MHz

**Test Date** :2018-08-22 Temp./Humi. :25/60

Antenna Pol. :VERTICAL

:Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5350.00	Average	50.20	2.24	52.44	54.00	-1.56
5350.00	Peak	62.48	2.24	64.72	74.00	-9.28
5355.10	Average	47.00	2.25	49.25	54.00	-4.75
5355.10	Peak	62.40	2.25	64.65	74.00	-9.35

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**Operation Mode** Test Mode

**EUT Pol** 

:802.11ac80 / Band2

:BE CH High

:E1 Plan

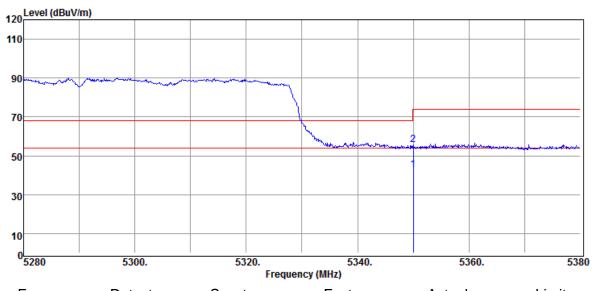
:5290 MHz Test Channel

**Test Date** :2018-08-23

Temp./Humi. :25/60

Antenna Pol. :HORIZONTAL

:Jerry Engineer



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
	11001771	αΣμν	<u> </u>	αρμίνιπ	αρμίνιπ	
5350.00 5350.00	Average Peak	40.53 53.32	2.24 2.24	42.77 55.56	54.00 74.00	-11.23 -18.44

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**Operation Mode** Test Mode **EUT Pol** Test Channel

:802.11ac80 / Band3

:BE CH Low

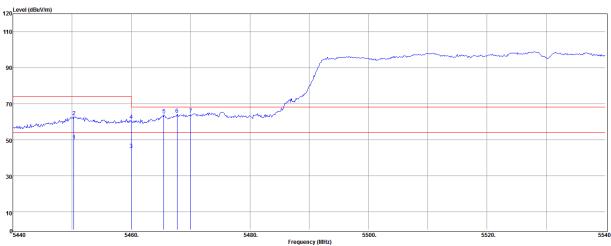
:E1 Plan

:5530 MHz

**Test Date** :2018-08-22 Temp./Humi. :25/60

Antenna Pol. :VERTICAL

:Jerry Engineer



		Frequenc	cy (MHz)			
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	$\mathrm{d} \mathrm{B} \mu \mathrm{V}$	dB	dBμV/m	dBμV/m	dB
5450.30	Average	47.14	2.26	49.40	54.00	-4.60
5450.30	Peak	60.61	2.26	62.87	74.00	-11.13
5460.00	Average	42.39	2.22	44.61	54.00	-9.39
5460.00	Peak	58.59	2.22	60.81	74.00	-13.19
5465.50	Peak	61.65	2.20	63.85	68.20	-4.35
5467.70	Peak	61.99	2.19	64.18	68.20	-4.02
5470.00	Peak	61.94	2.18	64.12	68.20	-4.08
	MHz  5450.30 5450.30 5460.00 5460.00 5465.50 5467.70	Mode PK/QP/AV  5450.30 Average 5450.30 Peak 5460.00 Average 5460.00 Peak 5465.50 Peak 5467.70 Peak	Freq.Detector Mode PK/QP/AVSpectrum Reading Level dBμV5450.30Average47.145450.30Peak60.615460.00Average42.395460.00Peak58.595465.50Peak61.655467.70Peak61.99	Mode PK/QP/AV         Reading Level dBμV         dB           5450.30         Average         47.14         2.26           5450.30         Peak         60.61         2.26           5460.00         Average         42.39         2.22           5460.00         Peak         58.59         2.22           5465.50         Peak         61.65         2.20           5467.70         Peak         61.99         2.19	Freq.Detector Mode PK/QP/AVSpectrum Reading Level dBμVFactor GBActual FS dBμV/m5450.30Average Peak 47.1442.26 60.61 2.26 49.4049.40 62.875450.30Peak 40.60 60.6160.61 2.26 42.39 2.22 	Freq.         Detector Mode Reading Level PK/QP/AV         Spectrum Reading Level ABμV         Factor ABμV         Actual FS         Limit @3m ABμV/m           5450.30         Average Average A7.14         2.26         49.40         54.00           5450.30         Peak 60.61         2.26         62.87         74.00           5460.00         Average Average A2.39         2.22         44.61         54.00           5460.00         Peak 58.59         2.22         60.81         74.00           5465.50         Peak 61.65         2.20         63.85         68.20           5467.70         Peak 61.99         2.19         64.18         68.20

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**Operation Mode** Test Mode

:802.11ac80 / Band3

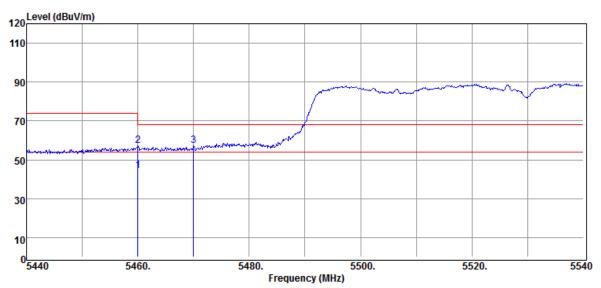
:BE CH Low

**EUT Pol** :E1 Plan :5530 MHz Test Channel

**Test Date** :2018-08-22 Temp./Humi. :25/60

Antenna Pol. :HORIZONTAL

:Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dΒμV	dB	dBµV∕m	dBμV/m	dB
5460.00	Average	42.31	2.22	44.53	54.00	-9.47
5460.00	Peak	54.90	2.22	57.12	74.00	-16.88
5470.00	Peak	54.92	2.18	57.10	68.20	-11.10

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**Operation Mode** Test Mode **EUT Pol** 

Test Channel

:802.11ac80 / Band4

:BE CH Low

:E1 Plan

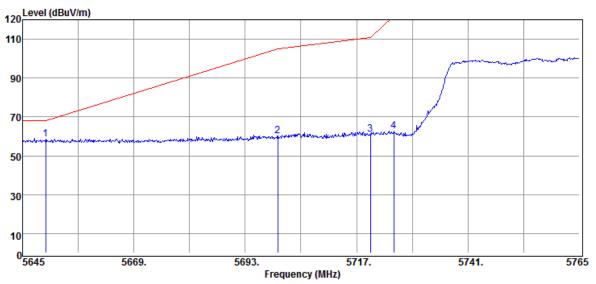
:5775 MHz

**Test Date** Temp./Humi. :2018-08-23

:25/60

Antenna Pol. :VERTICAL

Engineer :Jerry



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	$\mathrm{d} \mathrm{B} \mu \mathrm{V}$	dB	dBμV/m	dBμV/m	dB
5650.00	Peak	56.31	2.25	58.56	68.20	-9.64
5700.00	Peak	57.82	2.42	60.24	105.20	-44.96
5720.00	Peak	58.61	2.32	60.93	110.80	-49.87
5725.00	Peak	60.45	2.28	62.73	122.20	-59.47

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**Operation Mode** Test Mode **EUT Pol** 

:802.11ac80 / Band4

:BE CH Low

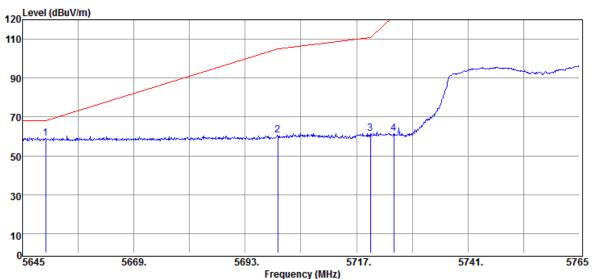
:E1 Plan

:5775 MHz Test Channel

**Test Date** :2018-08-23 Temp./Humi. :25/60

Antenna Pol. :HORIZONTAL

Engineer :Jerry



			-, (,				
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin	
MHz	PK/QP/AV	$\mathrm{d} B \mu V$	dB	dBμV/m	dBμV/m	dB	
5650.00	Peak	56.88	2.25	59.13	68.20	-9.07	
5700.00	Peak	58.14	2.42	60.56	105.20	-44.64	
5720.00	Peak	59.05	2.32	61.37	110.80	-49.43	
5725.00	Peak	59.38	2.28	61.66	122.20	-60.54	

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**Operation Mode** Test Mode **EUT Pol** 

Test Channel

:802.11ac80 / Band4

:BE CH High

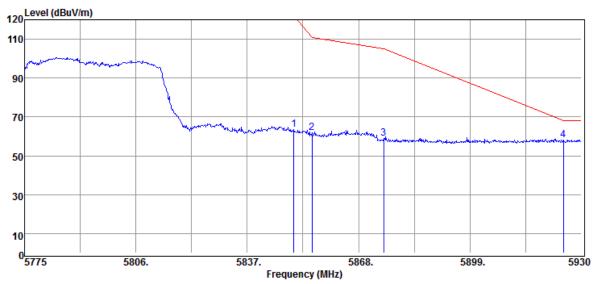
:E1 Plan

:5775 MHz

**Test Date** :2018-08-23 Temp./Humi. :25/60

Antenna Pol. :VERTICAL

:Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	$\mathrm{d} \mathrm{B} \mu \mathrm{V}$	dB	dBμV/m	dBμV∕m	dB
5850.00	Peak	61.71	1.88	63.59	122.20	-58.61
5855.00	Peak	60.02	1.89	61.91	110.80	-48.89
5875.00	Peak	57.22	1.90	59.12	105.20	-46.08
5925.00	Peak	55.95	2.16	58.11	68.20	-10.09

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**Operation Mode** Test Mode **EUT Pol** 

:802.11ac80 / Band4

:BE CH High

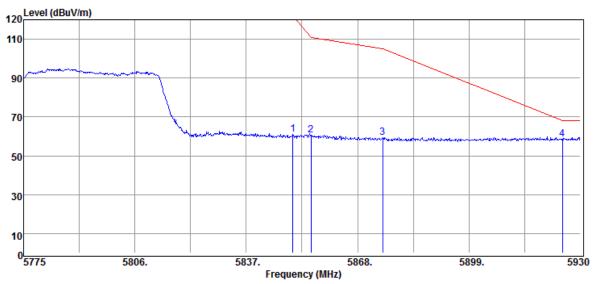
:E1 Plan

:5775 MHz Test Channel

**Test Date** :2018-08-22 Temp./Humi. :25/60

Antenna Pol. :HORIZONTAL

:Jerry Engineer



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	${ m d} B \mu V$	dB	dBμV/m	dBμV/m	dB
5850.00	Peak	59.10	1.88	60.98	122.20	-61.22
5855.00	Peak	58.83	1.89	60.72	110.80	-50.08
5875.00	Peak	57.29	1.90	59.19	105.20	-46.01
5925.00	Peak	56.58	2.16	58.74	68.20	-9.46

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### 12 TRANSMISSION IN THE ABSENCE OF DATA

#### **Standard Applicable** 12.1

According to §15.407(c)

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

#### 12.2 Result

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ASK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

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## 13 FREQUENCY STABILITY

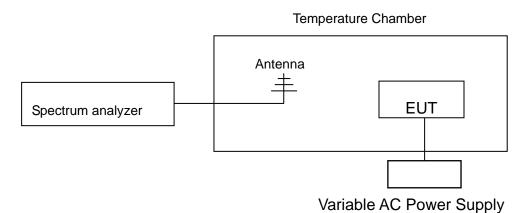
### 13.1 Standard Applicable

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

### 13.2 Measurement Procedure

- The EUT was placed inside temperature chamber and powered and powered by nominal DC voltage.
- 2. Set EUT as normal operation.
- 3. Turn the EUT on and couple its output to spectrum.
- 4. Turn the EUT off and set the chamber to the highest temperature specified.
- 5. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT and measure the operating frequency.
- 6. Repeat step with the temperature chamber set to the lowest temperature.

### 13.3 Test SET-UP



# 13.4 Measurement Equipment Used:

SGS Conducted Room									
Name of Equip- ment Manufacturer Model Serial Calibration Ca Number Date									
Spectrum Analyzer	Agilent	N9010A	MY51440113	2018/06/20	2019/6/19				
Attenuator	Marvelous	MVE2213-10	RF30	2017/12/26	2018/12/25				
DC Block	PASTERNACK	PE8210	RF29	2017/12/26	2018/12/25				
Notebook	Lenovo	L420	S0011721	N/A	N/A				

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#### 13.5 **Measurement Result**

# Startup:

Operation Mode	802.11 a	Test Date	2018.08.30
Temperature	:27	Test By	Hone
Humidity	:55 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	<b>Δ</b> Frequency (MHz)
		36	5180	5,179.93052	0.00001341
		44	5220	5,219.96379	0.00000694
		48	5240	5,239.99000	0.00000191
		52	5260	5,259.96222	0.00000718
		60	5300	5,299.99788	0.00000040
	13.2V	64	5320	5,319.93769	0.00001171
		100	5500	5,499.96955	0.00000554
		116	5580	5,579.96937	0.00000549
		140	5700	5,699.91642	0.00001466
		144	5720	5,719.96595	0.00000595
		149	5745	5,744.92822	0.00001249
		157	5785	5,784.92266	0.00001337
		165	5825	5,824.90200	0.00001682
0		36	5180	5,179.96690	0.00000639
		44	5220	5,219.92470	0.00001443
		48	5240	5,239.99131	0.00000166
		52	5260	5,259.97647	0.00000447
		60	5300	5,299.90553	0.00001782
	10.8V	64	5320	5,319.99181	0.00000154
		100	5500	5,499.97153	0.00000518
		116	5580	5,579.94307	0.00001020
		140	5700	5,699.96880	0.00000547
		144	5720	5,719.91498	0.00001486
		149	5745	5,744.98517	0.00000258
		157	5785	5,784.95964	0.00000698
		165	5825	5,824.96153	0.00000660

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			1		
		36	5180	5,179.99067	0.00000180
		44	5220	5,219.92783	0.00001383
		48	5240	5,239.90793	0.00001757
		52	5260	5,259.95136	0.00000925
		60	5300	5,299.99459	0.00000102
25	12V	64	5320	5,319.90473	0.00001791
		100	5500	5,499.97352	0.00000481
		116	5580	5,579.92089	0.00001418
		140	5700	5,699.91940	0.00001414
		144	5720	5,719.91191	0.00001540
		149	5745	5,744.96334	0.00000638
		157	5785	5,784.95328	0.00000808
		165	5825	5,824.94790	0.00000894
		36	5180	5,179.95738	0.00000823
		44	5220	5,219.98756	0.00000238
		48	5240	5,239.94700	0.00001011
		52	5260	5,259.96088	0.00000744
		60	5300	5,299.95968	0.00000761
		64	5320	5,319.97296	0.00000508
	13.2V	100	5500	5,499.98064	0.00000352
		116	5580	5,579.91980	0.00001437
		140	5700	5,699.91578	0.00001478
		144	5720	5,719.94753	0.00000917
		149	5745	5,744.90102	0.00001723
		157	5785	5,784.92572	0.00001284
		165	5825	5,824.94831	0.00000887
40		36	5180	5,179.96857	0.00000607
		44	5220	5,219.96552	0.00000661
		48	5240	5,239.91051	0.00001708
		52	5260	5,259.90465	0.00001813
		60	5300	5,299.94170	0.00001100
	10.8V	64	5320	5,319.91123	0.00001669
		100	5500	5,499.95816	0.00000761
		116	5580	5,579.95964	0.00000723
		140	5700	5,699.99823	0.00000031
		144	5720	5,719.99486	0.00000090
		149	5745	5,744.99126	0.00000152
		157	5785	5,784.94995	0.00000865
		165	5825	5,824.94995	0.00000859

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Operation Mode	802.11 n_HT40	Test Date	2018.08.30
Temperature	:27	Test By	Hone
Humidity	:55 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	<b>Δ</b> Frequency (MHz)
		38	5190	5,189.92110	0.00001520
		46	5230	5,229.98260	0.00000333
		54	5270	5,269.92976	0.00001333
		62	5310	5,309.92059	0.00001495
	13.2V	102	5510	5,509.93691	0.00001145
		110	5550	5,549.96823	0.00000572
		134	5670	5,669.97307	0.00000475
		142	5710	5,709.91652	0.00001462
		151	5755	5,754.97072	0.00000509
0		159	5795	5,794.90605	0.00001621
		38	5190	5,189.91256	0.00001685
		46	5230	5,229.98859	0.00000218
		54	5270	5,269.94927	0.00000963
		62	5310	5,309.90875	0.00001718
	10.8V	102	5510	5,509.92111	0.00001432
		110	5550	5,549.96644	0.00000605
		134	5670	5,669.90236	0.00001722
		142	5710	5,709.95193	0.00000842
		151	5755	5,754.93808	0.00001076
		159	5795	5,794.99495	0.00000087

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		38	5190	5,189.93477	0.00001257
		46	5230	5,229.96168	0.00000733
		54	5270	5,269.98765	0.00000234
		62	5310	5,309.99816	0.00000035
25	12V	102	5510	5,509.99628	0.00000068
		110	5550	5,549.99467	0.00000096
		134	5670	5,669.96278	0.00000656
		142	5710	5,709.93723	0.00001099
		151	5755	5,754.98543	0.00000253
		159	5795	5,794.97291	0.00000467
		38	5190	5,189.93969	0.00001162
		46	5230	5,229.90257	0.00001863
	13.2V	54	5270	5,269.91438	0.00001625
		62	5310	5,309.90372	0.00001813
		102	5510	5,509.95866	0.00000750
		110	5550	5,549.98704	0.00000234
		134	5670	5,669.92455	0.00001331
		142	5710	5,709.94108	0.00001032
		151	5755	5,754.94341	0.00000983
		159	5795	5,794.98112	0.00000326
40		38	5190	5,189.92812	0.00001385
		46	5230	5,229.93795	0.00001186
		54	5270	5,269.99259	0.00000141
		62	5310	5,309.92747	0.00001366
	10.8V	102	5510	5,509.94855	0.00000934
		110	5550	5,549.90330	0.00001742
		134	5670	5,669.95396	0.00000812
		142	5710	5,709.90218	0.00001713
		151	5755	5,754.99769	0.00000040
		159	5795	5,794.97803	0.00000379

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# 2 Minutes:

Operation Mode	802.11 a	Test Date	2018.08.30
Temperature	:27	Test By	Hone
Humidity	:55 %		

T 1.T	T	01 1	Measured	Spectrum	ΔFrequency
Test Temp.	Test Voltage	Channel	Frequency (MHz)	Frequency (MHz)	(MHz)
		36	5180	5,179.94920	0.00000981
		44	5220	5,219.95714	0.00000821
		48	5240	5,239.97297	0.00000516
		52	5260	5,259.93460	0.00001243
		60	5300	5,299.96372	0.00000685
	13.2V	64	5320	5,319.99216	0.00000147
		100	5500	5,499.98631	0.00000249
		116	5580	5,579.95908	0.00000733
		140	5700	5,699.97342	0.00000466
		144	5720	5,719.97159	0.00000497
		149	5745	5,744.96354	0.00000635
		157	5785	5,784.91860	0.00001407
		165	5825	5,824.94294	0.00000980
0	10.8V	36	5180	5,179.94200	0.00001120
		44	5220	5,219.98122	0.00000360
		48	5240	5,239.94917	0.00000970
		52	5260	5,259.96985	0.00000573
		60	5300	5,299.99638	0.00000068
		64	5320	5,319.97318	0.00000504
		100	5500	5,499.92129	0.00001431
		116	5580	5,579.99099	0.00000161
		140	5700	5,699.95615	0.00000769
		144	5720	5,719.97284	0.00000475
		149	5745	5,744.94726	0.00000918
		157	5785	5,784.92398	0.00001314
		165	5825	5,824.95922	0.00000700

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44     5220     5,219.97528     0.000       48     5240     5,239.91435     0.000       52     5260     5,259.96683     0.000       60     5300     5,299.90369     0.000       25     12V     64     5320     5,319.91492     0.000	000176 000474 001635 000631 001817
48 5240 5,239.91435 0.000 52 5260 5,259.96683 0.000 60 5300 5,299.90369 0.000 25 12V 64 5320 5,319.91492 0.000	001635 000631 001817
52 5260 5,259.96683 0.000 60 5300 5,299.90369 0.000 25 12V 64 5320 5,319.91492 0.000	000631
60 5300 5,299.90369 0.000 25 12V 64 5320 5,319.91492 0.000	001817
25 12V 64 5320 5,319.91492 0.000	
	\ <u>01500</u>
100   5500   5,499,92439   0,000	JU 1 J 7 7
100   3300   3,477.72437   0.000	001375
116 5580 5,579.95310 0.000	000841
140 5700 5,699.93038 0.000	001221
144 5720 5,719.98476 0.000	000266
149 5745 5,744.99533 0.000	000081
157 5785 5,784.91557 0.000	001459
165 5825 5,824.95841 0.000	000714
36 5180 5,179.99139 0.000	000166
	000342
	000782
52 5260 5,259.94861 0.000	000977
60 5300 5,299.90795 0.000	001737
64 5320 5,319.95367 0.000	000871
13.2V 100 5500 5,499.95992 0.000	000729
116 5580 5,579.96304 0.000	000662
140 5700 5,699.95343 0.000	000817
144 5720 5,719.97467 0.000	000443
149 5745 5,744.98664 0.000	000233
157 5785 5,784.90757 0.000	01598
165 5825 5,824.93048 0.000	001193
40 36 5180 5,179.96884 0.000	000602
44 5220 5,219.96842 0.000	000605
48 5240 5,239.99946 0.000	000010
52 5260 5,259.93717 0.000	001194
60 5300 5,299.98300 0.000	000321
10.8V 64 5320 5,319.92316 0.000	001444
100 5500 5,499.99123 0.000	000159
116 5580 5,579.92025 0.000	001429
140 5700 5,699.97843 0.000	000378
144 5720 5,719.90603 0.000	001643
149 5745 5,744.96760 0.000	000564
157 5785 5,784.91728 0.000	001430
165 5825 5,824.94038 0.000	001024

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Operation Mode	802.11 n_HT40	Test Date	2018.08.30
Temperature	:27	Test By	Hone
Humidity	:55 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	<b>Δ</b> Frequency (MHz)
		38	5190	5,189.92265	0.00001490
		46	5230	5,229.96481	0.00000673
		54	5270	5,269.98984	0.00000193
		62	5310	5,309.97570	0.00000458
	13.2V	102	5510	5,509.93513	0.00001177
		110	5550	5,549.93264	0.00001214
		134	5670	5,669.98339	0.00000293
		142	5710	5,709.95181	0.00000844
		151	5755	5,754.92934	0.00001228
0		159	5795	5,794.92098	0.00001364
	10.8V	38	5190	5,189.98471	0.00000295
		46	5230	5,229.94532	0.00001046
		54	5270	5,269.94409	0.00001061
		62	5310	5,309.93581	0.00001209
		102	5510	5,509.98139	0.00000338
		110	5550	5,549.96771	0.00000582
		134	5670	5,669.94144	0.00001033
		142	5710	5,709.98514	0.00000260
		151	5755	5,754.90842	0.00001591
		159	5795	5,794.90048	0.00001717

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		38	5190	5,189.94277	0.00001103
		46	5230	5,229.93127	0.00001314
		54	5270	5,269.92651	0.00001394
		62	5310	5,309.95197	0.00000905
25	12V	102	5510	5,509.94790	0.00000946
		110	5550	5,549.90869	0.00001645
		134	5670	5,669.96806	0.00000563
		142	5710	5,709.95244	0.00000833
		151	5755	5,754.91669	0.00001448
		159	5795	5,794.98227	0.00000306
		38	5190	5,189.97813	0.00000421
		46	5230	5,229.98490	0.00000289
		54	5270	5,269.95999	0.00000759
		62	5310	5,309.95142	0.00000915
	13.2V	102	5510	5,509.94098	0.00001071
		110	5550	5,549.99683	0.00000057
		134	5670	5,669.99422	0.00000102
		142	5710	5,709.91295	0.00001525
		151	5755	5,754.95549	0.00000773
		159	5795	5,794.97351	0.00000457
40		38	5190	5,189.92712	0.00001404
		46	5230	5,229.92368	0.00001459
		54	5270	5,269.99729	0.00000051
		62	5310	5,309.95028	0.00000936
	10.8V	102	5510	5,509.99387	0.00000111
		110	5550	5,549.95814	0.00000754
		134	5670	5,669.92194	0.00001377
		142	5710	5,709.95690	0.00000755
		151	5755	5,754.98383	0.00000281
		159	5795	5,794.97736	0.00000391

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### 5 Minutes:

Operation Mode	802.11 a	Test Date	2018.08.30
Temperature	:27	Test By	Hone
Humidity	:55 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	<b>Δ</b> Frequency (MHz)
		36	5180	5,179.97250	0.00000531
		44	5220	5,219.93188	0.00001305
		48	5240	5,239.96231	0.00000719
		52	5260	5,259.91937	0.00001533
		60	5300	5,299.93535	0.00001220
	13.2V	64	5320	5,319.97563	0.00000458
		100	5500	5,499.97992	0.00000365
		116	5580	5,579.92564	0.00001333
		140	5700	5,699.92963	0.00001235
		144	5720	5,719.97626	0.00000415
		149	5745	5,744.93415	0.00001146
		157	5785	5,784.97885	0.00000366
		165	5825	5,824.99223	0.00000133
0		36	5180	5,179.97995	0.00000387
		44	5220	5,219.91842	0.00001563
		48	5240	5,239.97139	0.00000546
		52	5260	5,259.95248	0.00000903
		60	5300	5,299.98385	0.00000305
	10.8V	64	5320	5,319.94191	0.00001092
		100	5500	5,499.93518	0.00001179
		116	5580	5,579.90863	0.00001637
		140	5700	5,699.95808	0.00000735
		144	5720	5,719.94371	0.00000984
		149	5745	5,744.92788	0.00001255
		157	5785	5,784.97715	0.00000395
		165	5825	5,824.90522	0.00001627

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		36	5180	5,179.94235	0.00001113
		44	5220	5,219.92532	0.00001431
		48	5240	5,239.91753	0.00001574
		52	5260	5,259.94794	0.00000990
		60	5300	5,299.95740	0.00000804
25	12V	64	5320	5,319.99396	0.00000114
		100	5500	5,499.93777	0.00001131
		116	5580	5,579.93621	0.00001143
		140	5700	5,699.91158	0.00001551
		144	5720	5,719.98130	0.00000327
		149	5745	5,744.93084	0.00001204
		157	5785	5,784.90121	0.00001708
		165	5825	5,824.98991	0.00000173
		36	5180	5,179.96470	0.00000681
		44	5220	5,219.94748	0.00001006
		48	5240	5,239.95319	0.00000893
		52	5260	5,259.90237	0.00001856
		60	5300	5,299.96576	0.00000646
		64	5320	5,319.95219	0.00000899
	13.2V	100	5500	5,499.96825	0.00000577
		116	5580	5,579.97153	0.00000510
		140	5700	5,699.99608	0.00000069
		144	5720	5,719.92121	0.00001377
		149	5745	5,744.96540	0.00000602
		157	5785	5,784.99436	0.00000097
		165	5825	5,824.94662	0.00000916
40		36	5180	5,179.95509	0.00000867
		44	5220	5,219.97175	0.00000541
		48	5240	5,239.94202	0.00001106
		52	5260	5,259.94800	0.00000989
		60	5300	5,299.96536	0.00000654
	10.8V	64	5320	5,319.93566	0.00001209
		100	5500	5,499.90267	0.00001770
		116	5580	5,579.91840	0.00001462
		140	5700	5,699.98928	0.00000188
		144	5720	5,719.99066	0.00000163
		149	5745	5,744.91528	0.00001475
		157	5785	5,784.98814	0.00000205
		165	5825	5,824.98725	0.00000219

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Operation Mode	802.11 n_HT40	Test Date	2018.08.30
Temperature	:27	Test By	Hone
Humidity	:55 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		38	5190	5,189.98058	0.00000374
		46	5230	5,229.99049	0.00000182
		54	5270	5,269.99757	0.00000046
		62	5310	5,309.92541	0.00001405
	13.2V	102	5510	5,509.93049	0.00001262
		110	5550	5,549.99060	0.00000169
		134	5670	5,669.91095	0.00001571
		142	5710	5,709.91313	0.00001521
		151	5755	5,754.98227	0.00000308
0		159	5795	5,794.92670	0.00001265
		38	5190	5,189.99891	0.00000021
		46	5230	5,229.96864	0.00000600
	10.8V	54	5270	5,269.99485	0.00000098
		62	5310	5,309.97783	0.00000418
		102	5510	5,509.92264	0.00001404
		110	5550	5,549.97404	0.00000468
		134	5670	5,669.97900	0.00000370
		142	5710	5,709.98829	0.00000205
		151	5755	5,754.97207	0.00000485
		159	5795	5,794.97723	0.00000393

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		38	5190	5,189.92019	0.00001538
		46	5230	5,229.91519	0.00001622
		54	5270	5,269.97156	0.00000540
		62	5310	5,309.97594	0.00000453
25	12V	102	5510	5,509.98345	0.00000300
		110	5550	5,549.90638	0.00001687
		134	5670	5,669.90007	0.00001762
		142	5710	5,709.96262	0.00000655
		151	5755	5,754.94422	0.00000969
		159	5795	5,794.98863	0.00000196
		38	5190	5,189.97868	0.00000411
		46	5230	5,229.91070	0.00001707
		54	5270	5,269.92253	0.00001470
	13.2V	62	5310	5,309.99204	0.00000150
		102	5510	5,509.97425	0.00000467
		110	5550	5,549.93561	0.00001160
		134	5670	5,669.94918	0.00000896
		142	5710	5,709.91229	0.00001536
		151	5755	5,754.90676	0.00001620
		159	5795	5,794.93769	0.00001075
40		38	5190	5,189.99170	0.00000160
		46	5230	5,229.95783	0.00000806
		54	5270	5,269.91419	0.00001628
		62	5310	5,309.97557	0.00000460
	10.8V	102	5510	5,509.94491	0.00001000
		110	5550	5,549.96216	0.00000682
		134	5670	5,669.96611	0.00000598
		142	5710	5,709.99762	0.00000042
		151	5755	5,754.91004	0.00001563
		159	5795	5,794.99813	0.00000032

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Operation Mode	802.11 ac_VHT80	Test Date	2018.08.30
Temperature	:27	Test By	Hone
Humidity	:55 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		42	5210	5,209.92072	0.00001522
		58	5290	5,289.93221	0.00001281
	13.2V	106	5530	5,529.99278	0.00000131
		122	5610	5,609.96125	0.00000691
		138	5690	5,689.92067	0.00001394
0		155	5775	5,774.96693	0.00000573
		42	5210	5,209.99115	0.00000170
		58	5290	5,289.95682	0.00000816
	10.8V	106	5530	5,529.90378	0.00001740
		122	5610	5,609.90820	0.00001636
		138	5690	5,689.96183	0.00000671
		155	5775	5,774.96945	0.00000529
		42	5210	5,209.92468	0.00001446
		58	5290	5,289.90740	0.00001750
25	12V	106	5530	5,529.96166	0.00000693
		122	5610	5,609.97461	0.00000453
		138	5690	5,689.98408	0.00000280
		155	5775	5,774.95481	0.00000783
		42	5210	5,209.93675	0.00001214
		58	5290	5,289.95151	0.00000917
	13.2V	106	5530	5,529.92095	0.00001429
		122	5610	5,609.92685	0.00001304
		138	5690	5,689.90898	0.00001600
40		155	5775	5,774.99743	0.00000045
		42	5210	5,209.91660	0.00001601
	[	58	5290	5,289.98243	0.00000332
	10.8V	106	5530	5,529.94173	0.00001054
		122	5610	5,609.99456	0.00000097
	[	138	5690	5,689.93577	0.00001129
		155	5775	5,774.92533	0.00001293

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### 10 Minutes:

Operation Mode	802.11 a	Test Date	2018.08.30
Temperature	:27	Test By	Hone
Humidity	:55 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	<b>Δ</b> Frequency (MHz)
		36	5180	5,179.99293	0.00000136
		44	5220	5,219.92259	0.00001483
		48	5240	5,239.90834	0.00001749
		52	5260	5,259.91399	0.00001635
		60	5300	5,299.91480	0.00001608
	13.2V	64	5320	5,319.91778	0.00001545
		100	5500	5,499.90379	0.00001749
		116	5580	5,579.96376	0.00000649
		140	5700	5,699.96353	0.00000640
		144	5720	5,719.96952	0.00000533
		149	5745	5,744.98937	0.00000185
		157	5785	5,784.98735	0.00000219
		165	5825	5,824.95866	0.00000710
0		36	5180	5,179.92366	0.00001474
		44	5220	5,219.98734	0.00000243
		48	5240	5,239.96029	0.00000758
		52	5260	5,259.97484	0.00000478
		60	5300	5,299.99792	0.00000039
	10.8V	64	5320	5,319.96707	0.00000619
		100	5500	5,499.95348	0.00000846
		116	5580	5,579.96079	0.00000703
		140	5700	5,699.90012	0.00001752
		144	5720	5,719.90284	0.00001699
		149	5745	5,744.99955	800000008
		157	5785	5,784.96478	0.00000609
		165	5825	5,824.93782	0.00001067

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60 5300 5,299.99853 0.000	
48     5240     5,239.99393     0.000       52     5260     5,259.98052     0.000       60     5300     5,299.99853     0.000	00854
52     5260     5,259.98052     0.000       60     5300     5,299.99853     0.000	
60 5300 5,299.99853 0.000	00116
	00370
	00028
25   12V   64   5320   5,319.93862   0.000	01154
100 5500 5,499.90758 0.000	01680
116 5580 5,579.98318 0.000	00301
140 5700 5,699.93394 0.000	01159
144 5720 5,719.97044 0.000	00517
149 5745 5,744.94742 0.000	00915
157 5785 5,784.97242 0.000	00477
165 5825 5,824.94073 0.000	01018
36 5180 5,179.90564 0.000	01822
	01403
48 5240 5,239.98705 0.000	
52 5260 5,259.92156 0.000	01491
60 5300 5,299.92683 0.000	) 1381
64 5320 5,319.97003 0.000	00563
13.2V 100 5500 5,499.93215 0.000	01234
116 5580 5,579.97300 0.000	00484
140 5700 5,699.95106 0.000	00859
144 5720 5,719.92432 0.000	01323
149 5745 5,744.96907 0.000	00538
157 5785 5,784.95178 0.000	00834
165 5825 5,824.93051 0.000	01193
40 36 5180 5,179.92409 0.000	01465
44 5220 5,219.91742 0.000	01582
48 5240 5,239.93190 0.000	01300
52 5260 5,259.94747 0.000	00999
60 5300 5,299.97356 0.000	00499
10.8V 64 5320 5,319.98365 0.000	00307
100 5500 5,499.90149 0.000	01791
116 5580 5,579.94935 0.000	00908
140 5700 5,699.91324 0.000	)1522
144 5720 5,719.99839 0.000	00028
149 5745 5,744.94236 0.000	01003
157 5785 5,784.95750 0.000	00735
165 5825 5,824.95128 0.000	00836

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Operation Mode	802.11 n_HT40	Test Date	2018.08.30
Temperature	:27	Test By	Hone
Humidity	:55 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		38	5190	5,189.93223	0.00001306
		46	5230	5,229.99021	0.00000187
		54	5270	5,269.90502	0.00001802
		62	5310	5,309.92566	0.00001400
	13.2V	102	5510	5,509.92873	0.00001293
		110	5550	5,549.95448	0.00000820
		134	5670	5,669.98966	0.00000182
		142	5710	5,709.96320	0.00000644
		151	5755	5,754.97531	0.00000429
0		159	5795	5,794.93952	0.00001044
	10.8V	38	5190	5,189.95669	0.00000834
		46	5230	5,229.93556	0.00001232
		54	5270	5,269.97837	0.00000410
		62	5310	5,309.97822	0.00000410
		102	5510	5,509.93327	0.00001211
		110	5550	5,549.90381	0.00001733
		134	5670	5,669.93909	0.00001074
		142	5710	5,709.98284	0.00000301
	[	151	5755	5,754.98169	0.00000318
		159	5795	5,794.90276	0.00001678

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		38	5190	5,189.92068	0.00001528
		46	5230	5,229.99823	0.00000034
		54	5270	5,269.95984	0.00000762
		62	5310	5,309.90261	0.00001834
25	12V	102	5510	5,509.95642	0.00000791
		110	5550	5,549.93321	0.00001203
		134	5670	5,669.94361	0.00000995
		142	5710	5,709.91605	0.00001470
		151	5755	5,754.99035	0.00000168
		159	5795	5,794.98979	0.00000176
		38	5190	5,189.93751	0.00001204
		46	5230	5,229.93073	0.00001324
		54	5270	5,269.96883	0.00000591
	13.2V	62	5310	5,309.96113	0.00000732
		102	5510	5,509.96717	0.00000596
		110	5550	5,549.91935	0.00001453
		134	5670	5,669.95884	0.00000726
		142	5710	5,709.95166	0.00000847
		151	5755	5,754.98981	0.00000177
		159	5795	5,794.95768	0.00000730
40		38	5190	5,189.99000	0.00000193
		46	5230	5,229.91754	0.00001577
		54	5270	5,269.97650	0.00000446
		62	5310	5,309.94082	0.00001115
	10.8V	102	5510	5,509.98435	0.00000284
		110	5550	5,549.94121	0.00001059
		134	5670	5,669.96215	0.00000668
		142	5710	5,709.91197	0.00001542
		151	5755	5,754.92746	0.00001260
		159	5795	5,794.92270	0.00001334

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Operation Mode	802.11 ac_VHT80	Test Date	2018.08.30
Temperature	:27	Test By	Hone
Humidity	:55 %	_	-

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	<b>Δ</b> Frequency (MHz)
		42	5210	5,209.97830	0.00000417
		58	5290	5,289.91339	0.00001637
	13.2V	106	5530	5,529.96814	0.00000576
		122	5610	5,609.96334	0.00000653
		138	5690	5,689.97391	0.00000459
0		155	5775	5,774.99989	0.00000002
		42	5210	5,209.98191	0.00000347
		58	5290	5,289.96292	0.00000701
	10.8V	106	5530	5,529.98256	0.00000315
		122	5610	5,609.99699	0.00000054
		138	5690	5,689.92879	0.00001251
		155	5775	5,774.98179	0.00000315
		42	5210	5,209.99525	0.00000091
		58	5290	5,289.95304	0.00000888
25	12V	106	5530	5,529.90117	0.00001787
		122	5610	5,609.95129	0.00000868
		138	5690	5,689.97063	0.00000516
		155	5775	5,774.90283	0.00001683
		42	5210	5,209.91221	0.00001685
		58	5290	5,289.97765	0.00000422
	13.2V	106	5530	5,529.93158	0.00001237
		122	5610	5,609.90334	0.00001723
		138	5690	5,689.91799	0.00001441
40		155	5775	5,774.94186	0.00001007
		42	5210	5,209.99078	0.00000177
		58	5290	5,289.90923	0.00001716
	10.8V	106	5530	5,529.92903	0.00001283
		122	5610	5,609.91115	0.00001584
		138	5690	5,689.91027	0.00001577
		155	5775	5,774.90849	0.00001585

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## 14 ANTENNA REQUIREMENT

#### **Standard Applicable** 14.1

According to §15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.

According to §15.407, If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### 14.2 **Antenna Connected Construction**

The antenna is designed as permanently attached and no consideration of replacement. Please see EUT photo for details.

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# 15 MAXIMUM PERMISSIBLE EXPOSURE (MPE)

# 15.1 FCC Standard Applicable

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

This is a Mobile device, the MPE is required.

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for Maximum Permissive Exposure (MPE)

Frequency Range	Electric Field	Magnetic Field	Power Density	Averaging Time
(MHz)	Strength (V/m)	Strength (A/m)	(mW/cm <sup>2</sup> )	(minute)
	Limits for Genera	al Population/Uncon	trolled Exposure	
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-15000	/	/	1.0	30

f = frequency in MHz

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<sup>\* =</sup> Plane-wave equipment power density



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#### 15.2 **ISED Standard Applicable**

This submittal(s) (test report) is intended to comply with RSS-102 issue 5 Radio frequency Radiation Exposure requirement.

This is a Mobile device, the MPE is required.

Limits for Maximum Permissive Exposure (MPE)

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field Strength (A/m rms)	Power Density (W/m²)	Reference Period (minutes)
0.003-10	83	90	-	Instantaneous*
0.1-10	-	0.73/ f	-	6**
1.1-10	87/ f <sup>0.5</sup>	-	-	6**
10-20	27.46	0.0728	2	6
20-48	58.07/ f <sup>0.25</sup>	0.1540/ f <sup>0.25</sup>	8.944/ f <sup>0.5</sup>	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 f <sup>0.3417</sup>	$0.008335 f^{0.3417}$	$0.02619f^{0.6834}$	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/ f <sup>1.2</sup>
150000-300000	0.158 <i>f</i> <sup>0.5</sup>	4.21 x 10-4 f <sup>0.5</sup>	6.67 x 10-5 <i>f</i>	616000/ f <sup>1.2</sup>

F = frequency in MHz

Maximum Permissible Exposure (MPE) Evaluation

Prediction of MPE limit at a given distance

 $S=PG/4\pi R^2$ 

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

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<sup>\* =</sup> Based on nerve stimulation (NS).

<sup>\*\* =</sup> Based on specific absorption rate (SAR)



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#### 15.3 **Power Density Calculation (Worst Case)**

Total Tames Demony Cureation (Trotter Curea)								
FCC								
Operation Mode	Evaluation Frequency (MHz)	Operation Distance (cm)	Output Power EIRP (dBm)	Output Power EIRP (mW)	Power Density (mW/cm2)	Limit (mW/cm2)	Pass / Fail	
802.11a	5500.00	20	22.35	171.79	0.034	1.000	Pass	
802.11n_HT20	5785.00	20	28.57	719.45	0.143	1.000	Pass	
802.11n_HT40	5755.00	20	27.56	570.16	0.113	1.000	Pass	
802.11n_ac80	5530.00	20	26.80	478.63	0.095	1.000	Pass	

ISED					
Power Density (W/cm2)	Limit (W/cm2)	Pass / Fail			
0.342	9.425	Pass			
1.432	9.756	Pass			
1.135	9.722	Pass			
0.953	9.460	Pass			

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