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ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART E REQUIREMENT

OF

Product Name: Smart Phone FCC ID: APYHRO00258 ER/2017/A0175 **Report No.: Issue Date:** Nov. 06, 2017

FCC Rule Part: §15.407

Sharp Corporation, IoT Communication

B.U.

Prepared for: 2-13-1, Hachihonmatsu-lida, Hi-

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Japan

Sharp Corporation

Manufacturer: 1 Takumi-cho, Sakai-ku, Sakai-Shi, Osaka

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SGS Taiwan Ltd.

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VERIFICATION OF COMPLIANCE

Sharp Corporation, IoT Communication B.U.

Applicant: 2-13-1, Hachihonmatsu-lida, Higashi-hiroshima-shi, Hiroshima

739-0192, Japan

Sharp Corporation Manufacturer:

1 Takumi-cho, Sakai-ku, Sakai-Shi, Osaka 590-8522, Japan

Product Name: FCC ID: APYHRO00258 **Report Number:** ER/2017/A0172

Oct. 16, 2017 ~ Oct. 30, 2017 Date of test:

Date of EUT Received: Oct. 16 2017

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.

Test By: Date: Nov. 06, 2017

Tin Lin / Engineer

Prepared By: Date: Nov. 06, 2017

Tiffany Kao / Clerk

Approved By: Date: Nov. 06, 2017

Jim Chang / Asst. Manager

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Revision History

Report Number	Revision	Description	Issue Date
ER/2017/A0175	Rev.00	Initial creation of document	Nov. 06, 2017

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1. GENERAL INFORMATIOQN

1.1 Product Description

General:

TOTALL.		
Product Name:	Smart Phone	
Hardware Version:	DVT	
Software Version:	N/A	
	3.85V from	m Rechargeable Li-ion Battery
Power Supply:	Battery: Mode No.: UBATIA284AFN2, Supplier: SCUD(Fujian) Electronics Co., Ltd.	

FCC WLAN 5GHz:

Wi-Fi	Frequency Range	Channels	Avg. Power (dBm)	Modulation Technology	
	5150~5250	4	11.42		
11a_20	5250~5350	4	11.47	OFDM	
	5470~5725	11	11.25		
11n HT/	5150~5250	4	HT: 11.49		
ac_VHT	5250~5350	4	HT: 11.40	OFDM	
20M	5470~5725	11	HT: 11.47		
11n HT/	5150~5250	2	HT: 11.49		
ac_VHT	5250~5350	2	HT: 11.31	OFDM	
40M	5470~5725	5	HT: 11.24		
44	5150~5250	1	11.39		
11ac VHT80M	5250~5350	1	11.43	OFDM	
VIIIOOWI	5470~5725	2	11.48		
Modulation Type		64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 802.11ac only			
Transition Rate:		802.11 a: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz: 6.5 – 72.2Mbps 802.11 n_40MHz: 13.5 - 150.0Mbps 802.11 ac_20MHz: 6.5 –86.7Mbps 802.11 ac_40MHz: 13.5 -200.0Mbps 802.11 ac_80MHz: 29.3 – 433.3Mbps			
Antenna Designation:		PIFA Antenna, 5150~5250MHz G 5250~5350MHz G 5470~5725MHz G	Gain: 1.9dBi (Main) Gain: 1.9dBi (Main)		

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1.2 Test Methodology of Applied Standards

FCC Part 15, Subpart E §15.407

KDB 789033 D02 v01r04 General UNII Test Procedures New Rules

KDB 644545 D03 v01 Guidance for IEEE 802.11ac

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.134, Wu Kung Road, Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803

(TAF code 0513)

FCC Registration Numbers are: 509634 / TW0001

1.4 Special Accessories

There are no special accessories used while test was conducted.

1.5 Equipment Modifications

There was no modification incorporated into the EUT.

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2. SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

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

2.2 EUT Exercise

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

2.3 Test Procedure

2.3.1 **Conducted Emissions**

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

2.3.2 Radiated Emissions

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

2.4 Measurement Results Explanation Example

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.

Note:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor. Following shows an offset computation example with cable loss 2.2dB, and 10dB attenuator (SISO)

Offset:

SISO mode offset = RF cable loss (dB)+ attenuation factor(dB) =12.2(dB)

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2.5 Configuration of Tested System

Fig. 2-1 Radiated & AC Power Line Conducted Emission



Fig. 2-2 Conducted (Antenna Port) Emission

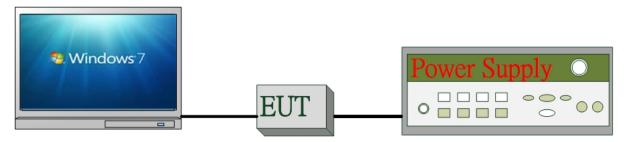


Table 2-1 Equipment Used in Tested System

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.	DC Power Supply	Agilent	E3640A	MY40000811	N/A	Unshielded
3.	Notebook	Lenovo	L430	P0000081	Shielded	Unshielded

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3. SUMMARY OF TEST RESULT

FCC Rules	Description Of Test	Result
§15.207	AC Power Line Conducted Emission	Compliant
§15.403(i) §15.407(e)	26 dB & 6dB & 99% Emission Bandwidth	Compliant
§15.407(a)	Maximum Conducted Output Power	Compliant
§15.407(a)	Power Spectral Density	Compliant
§15.407(b)	Undesirable Radiated Emissions	Compliant
§15.407(c)	Transmission in case of Absence of Information	Compliant
§15.407(g)	Frequency Stability	Compliant
§15.203 §15.407(a)	Antenna Requirement	Compliant

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4. DESCRIPTION OF TEST MODES

4.1 Operated in U-NII Bands

Operated band in 5150 MHz ~5250 MHz:

4 channels are provided for 802.11a, 802.11n HT20, 802.11ac VHT20

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

2 channels are provided for 802.11n HT40, 802.11ac VHT40

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac VHT80

Ī	OLIANINIEI	EDEOUENOV
	CHANNEL	FREQUENCY
	42	5210 MHz

Operated band in 5250 MHz ~5350 MHz:

4 channels are provided for 802.11a, 802.11n HT20, 802.11ac VHT20

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

2 channels are provided for 802.11n HT40, 802.11ac VHT40

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac_VHT80

CHANNEL	FREQUENCY
58	5290 MHz

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Operated band in 5470 MHz ~5725 MHz:

11 channels are provided for 802.11a, 802.11n HT20, 802.11ac VHT20

	· -	· —	
CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
100	5500 MHz	124	5620 MHz
104	5520 MHz	128	5640 MHz
108	5540 MHz	132	5660 MHz
112	5560 MHz	136	5680 MHz
116	5580 MHz	140	5700 MHz
120	5600 MHz		

5 channels are provided for 802.11n_HT40, 802.11ac_VHT40

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
102	5510 MHz	126	5630 MHz
110	5550 MHz	134	5670 MHz
118	5590 MHz		

2 channesl are provided for 802.11ac VHT80

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
106	5530 MHz	122	5610 MHz

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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 prorammed.
- 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.

RADIATED EMISSION TEST

RADIATED EMISS	SION TEST:					
	RADI	ATED EMISS	ION TEST (BE	ELOW 1 GHz)		
MODE	FREQUENCY		TESTED	MODULATION	DATA RATE	
WODL	BAND (MHz)	CHANNEL	CHANNEL	WODULATION	(Mbps)	PORT
802.11a	5180~5240	36 to 48	36,44,48	OFDM	6	MAIN
802.11ac_VHT80	5210	42	42	OFDM	MCS0	MAIN
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	MAIN
802.11ac_VHT80	5290	58	58	OFDM	MCS0	MAIN
802.11a	5500~5720	100 to 140	100,116,140	OFDM	6	MAIN
802.11ac_VHT80	5530~5690	106 to 138	106,122,138	OFDM	MCS0	MAIN
	RADI	ATED EMISS	ION TEST (AE	BOVE 1 GHz)		
MODE	FREQUENCY	AVAILABLE	TESTED	MODULATION	DATA RATE	ANTENNA
MODE	BAND (MHz)	CHANNEL	CHANNEL	WODULATION	(Mbps)	PORT
802.11a	5180~5240	36 to 48	36,44,48	OFDM	6	MAIN
802.11n_HT20	3100 3240	30 10 40		OFDM	MCS0	MAIN
802.11n_HT40	5190~5230	38 to 46	38,46	OFDM	MCS0	MAIN
802.11ac_VHT80	5210	42	42	OFDM	MCS0	MAIN
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	MAIN
802.11n_HT20	3200 3320	32 10 04	32,00,04	OFDM	MCS0	MAIN
802.11n_HT40	5270~5310	54 to 62	54,62	OFDM	MCS0	MAIN
802.11ac_VHT80	5290	58	58	OFDM	MCS0	MAIN
802.11a	5500~5720	100 to 144	100,116,140	OFDM	6	MAIN
802.11n_HT20			, ,	OFDM	MCS0	MAIN
802.11n_HT40	5510~5710	102 to 142	102,110,134	OFDM	MCS0	MAIN
802.11ac_VHT80	5530~5610	106 to 122	106,122	OFDM	MCS0	MAIN

Note:

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

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ANTENNA PORT CONDUCTED MEASUREMENT

ANTENNA FORT CONDUCTED MEASUREMENT.										
	CONDUCTED TEST									
MODE	FREQUENCY		TESTED	MODULATION	DATA RATE					
	BAND (MHz)	CHANNEL	CHANNEL		(Mbps)	PORT				
802.11a	5180~5240	36 to 48	36,44,48	OFDM	6	MAIN				
802.11n_HT20	3100 3240	30 10 40	30,77,70	OFDM	MCS0	MAIN				
802.11n_HT40	5190~5230	38 to 46	38,46	OFDM	MCS0	MAIN				
802.11ac_VHT80	5210	42	42	OFDM	MCS0	MAIN				
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	MAIN				
802.11n_HT20	5200~5520	52 10 04	52,00,04	OFDM	MCS0	MAIN				
802.11n_HT40	5270~5310	54 to 62	54,62	OFDM	MCS0	MAIN				
802.11ac_VHT80	5290	58	58	OFDM	MCS0	MAIN				
802.11a	5500~5720	100 to 144	100,116,140,144	OFDM	6	MAIN				
802.11n_HT20	802.11n_HT20 5500~5720		100,110,140,144	OFDM	MCS0	MAIN				
802.11n_HT40	5510~5710	102 to 142	102,110,134,142	OFDM	MCS0	MAIN				
802.11ac_VHT80	5530~5610	106 to 122	106,122	OFDM	MCS0	MAIN				

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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
Peak 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 : Vertical)	0.417GHz-1GHz: +/- 3.19dB			
	1GHz - 18GHz: +/- 4.04dB			
	18GHz - 40GHz: +/- 4.04dB			

	9kHz-30MHz: +/-2.87dB				
Measurement uncertainty	30MHz - 167MHz: +/- 4.22dB				
	167MHz -500MHz: +/- 3.44dB				
(Polarization : Horizontal)	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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6. 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	CAL DUE.					
TYPE		NUMBER	NUMBER	CAL.						
EMI Test Receiver	R&S	ESCI7	100760	05/11/2017	05/10/2018					
LISN	SCHWARZBECK	NSLK 8127	8127-649	05/22/2017	05/21/2018					
LISN	MESS TEC	FCC-LISN-50/2 50-25-2-01	4034	03/19/2017	03/18/2018					
Coaxial Cables	N/A	WK CE Cable	N/A	11/26/2016	11/25/2017					

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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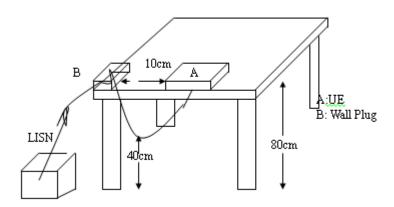
^{1.} The lower limit shall apply at the transition frequencies

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



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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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Temperature:

20 °C

AC POWER LINE CONDUCTED EMISSION TEST DATA

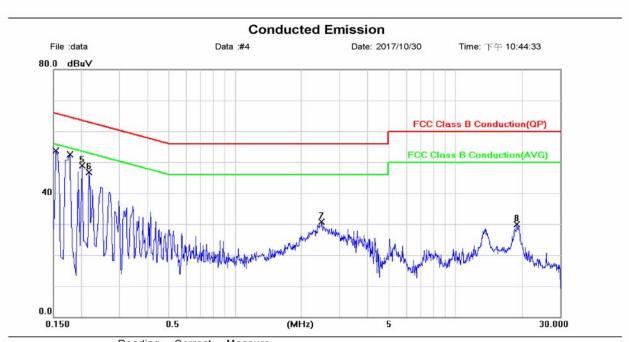
Operation Mode:	Operation mode			Test Date:	Oct. 30, 2017
Temperature:	20 ℃	Humidity:	56 %	Test By:	Tin
				Phase:	L1

Site Conduction Room Phase:

Limit: FCC Class B Conduction(QP) AC 120V/60Hz Humidity: 58 % Power:

Mode: Operation

Note:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment	
1	*	0.1540	55.40	0.07	55.47	65.78	-10.31	QP		
2		0.1540	36.00	0.07	36.07	55.78	-19.71	AVG		
3		0.1780	51.10	0.07	51.17	64.58	-13.41	QP		
4		0.1780	33.80	0.07	33.87	54.58	-20.71	AVG		
5		0.2020	48.75	0.07	48.82	63.53	-14.71	peak		
6		0.2180	46.55	0.07	46.62	62.89	-16.27	peak		
7		2.4740	30.64	0.14	30.78	56.00	-25.22	peak		
8		19.0300	29.39	0.49	29.88	60.00	-30.12	peak		

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Site Conduction Room Phase: Temperature: N AC 120V/60Hz Humidity: 58 % Limit: FCC Class B Conduction(QP) Power:

Mode: Operation

Note:

Conducted Emission File :data Data:#3 Date: 2017/10/30 Time: 下午 10:42:59 80.0 dBuV FCC Class B Conduction(QP) 0.0 0.150 0.5 (MHz) 5 30.000

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1660	54.40	0.07	54.47	65.16	-10.69	QP	
2		0.1660	29.70	0.07	29.77	55.16	-25.39	AVG	
3		0.1780	51.40	0.07	51.47	64.58	-13.11	QP	
4		0.1780	34.30	0.07	34.37	54.58	-20.21	AVG	
5		0.2020	47.76	0.07	47.83	63.53	-15.70	peak	
6		0.2260	45.02	0.07	45.09	62.60	-17.51	peak	
7		13.4100	31.11	0.40	31.51	60.00	-28.49	peak	
8		19.3340	34.64	0.49	35.13	60.00	-24.87	peak	

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7. 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
- VBW = 8MHz.
- 4. Detector = Peak

Duty Cycle:

Mode	Duty Cycle (%)	Duty Factor (dB) =10*log(1/Duty
802.11a	94.08	0.27
802.11n_20	93.55	0.29
802.11n_40	88.59	0.53
802.11ac_80	79.71	0.98

Duty Cycle Factor: $10 * \log(1/0.9408) = 0.27$ Duty Cycle Factor: $10 * \log(1/0.9355) = 0.29$ Duty Cycle Factor: $10 * \log(1/0.8859) = 0.53$ Duty Cycle Factor: $10 * \log(1/0.7971) = 0.98$

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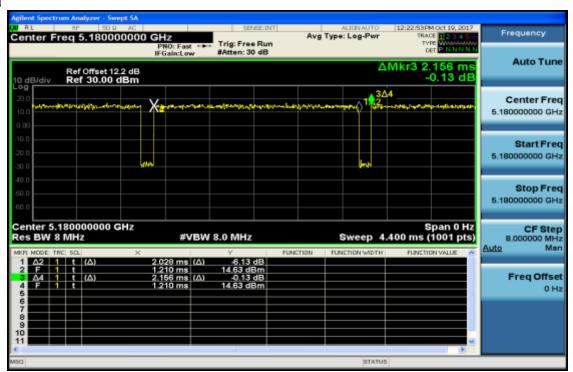
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DUTY CYCLE TEST SIGNAL Measurement Result 802.11a



802.11n HT20



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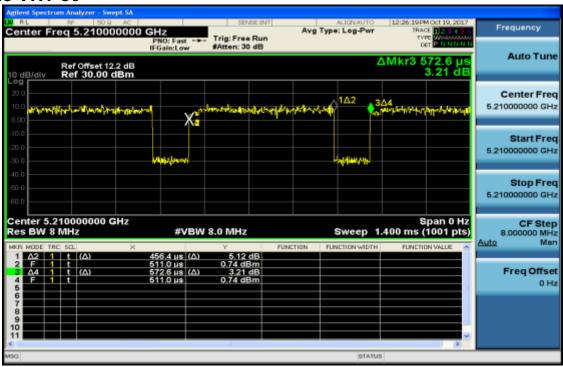


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802.11n HT 40



802.11 ac VHT 80



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8. 26DB 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. Repeat above procedures until all test default channel measured were complete.

8.3 Measurement Equipment Used

	SGS Conducted Room											
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due							
Power Meter	Anritsu	ML2495A	1005007	12/15/2016	12/14/2017							
Power Sensor	Anritsu	MA2411B	917032	12/15/2016	12/14/2017							
EXA Spectrum Analyzer	Agilent	N9030A	MY53120760	03/21/2017	03/20/2018							
DC Block	Mini-Circuits	BLK-18-S+	1	01/05/2017	01/04/2018							
Coaxial Cable	HUBER+SUHNER	SUCOFLEX 102	23670/2	01/05/2017	01/04/2018							
Attenuator	Mini-Circuit	BW-S10W2+	2	01/05/2017	01/04/2018							
Splitter	Agilent	11636B	N/A	01/05/2017	01/04/2018							
DC Power Supply	Agilent	E3640A	MY52410006	11/21/2016	11/20/2017							

8.4 Test Set-up



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8.5 Measurement Result

26dB and 6dB Bandwidth

802.11a Main

802.11n HT20 Main

002. 1 1a_IVIa			002.1111_111	ZO_IVIAIII	
Frequency (MHz) 26dB BW (MHz) 10		10 Log (B) (dB)	Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	22.59	13.539	5180	23.42	13.696
5220	23.07	13.630	5220	22.55	13.532
5240	22.23	13.470	5240	22.70	13.560
5260	22.66	13.553	5260	23.51	13.712
5300	22.17	13.457	5300	24.40	13.874
5320	23.17	13.649	5320	23.44	13.699
5500	23.20	13.655	5500	23.65	13.739
5580	22.96	13.610	5580	24.66	13.919
5700	22.84	13.587	5700	23.92	13.788

802.11n _HT40_Main

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5190	41.43	16.173
5230	41.66	16.197
5270	41.48	16.179
5310	41.38	16.168
5510	41.44	16.174
5550	41.30	16.159
5670	41.18	16.147

802.11ac _VHT80_Main

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5210	84.23	19.255
5290	83.43	19.213
5530	83.85	19.235
5610	83.58	19.221

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FCC 802.11a 20MHz Main 5180MHz

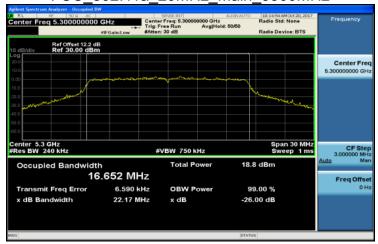
FCC 802.11a 20MHz Main 5260MHz



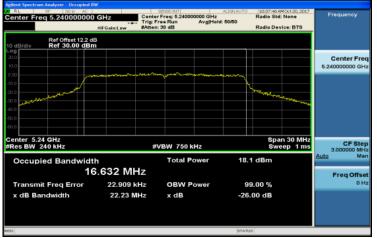
FCC 802.11a_20MHz_Main_5220MHz



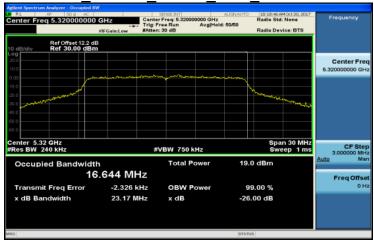
FCC 802.11a 20MHz Main 5300MHz



FCC 802.11a 20MHz Main 5240MHz



FCC 802.11a 20MHz Main 5320MHz



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SGS Taiwan Ltd.



nter 5.5 GHz

Occupied Bandwidth

Transmit Freq Error

dB Bandwidth

16.656 MHz

5.438 kHz

23.20 MHz

Report No.: ER/2017/A0175

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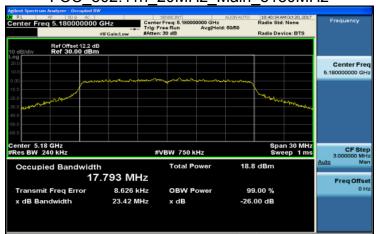
FCC 802.11a 20MHz Main 5500MHz

99.00 %

-26.00 dB

CF Ste

FCC 802.11n 20MHz Main 5180MHz



FCC 802.11a 20MHz Main 5580MHz

OBW Power

#VBW 680 kHz

x dB



FCC 802.11n_20MHz_Main_5220MHz



FCC 802.11a 20MHz Main 5700MHz



FCC 802.11n 20MHz Main 5240MHz



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Occupied Bandwidth

Transmit Freq Error

dB Bandwidth

17.804 MHz

-882 Hz

23.51 MHz

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FCC 802.11n 20MHz Main 5260MHz

Ref Offset 12.2 dB Ref 30.00 dBm CF Ste nter 5.26 GHz #VBW 750 kHz

99.00 %

-26.00 dB

FCC 802.11n 20MHz Main 5500MHz



FCC_802.11n_20MHz_Main_5300MHz

OBW Power

x dB



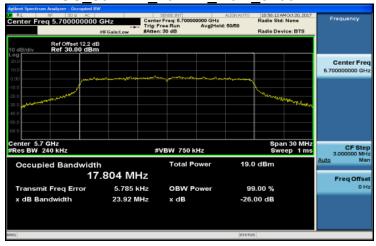
FCC_802.11n_20MHz_Main_5580MHz



FCC 802.11n 20MHz Main 5320MHz



FCC 802.11n 20MHz Main 5700MHz



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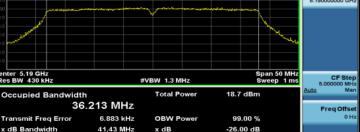
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FCC 802.11n 40MHz Main 5190MHz

Ref Offset 12.2 dB Ref 30.00 dBm



FCC 802.11n 40MHz Main 5310MHz



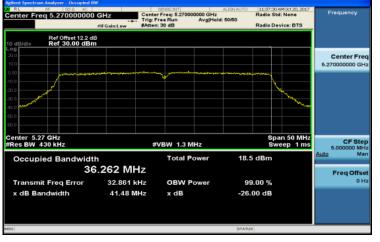
FCC 802.11n 40MHz Main 5230MHz



FCC 802.11n 40MHz Main 5510MHz



FCC 802.11n 40MHz Main 5270MHz



FCC 802.11n 40MHz Main 5550MHz



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FCC 802.11n 40MHz Main 5670MHz



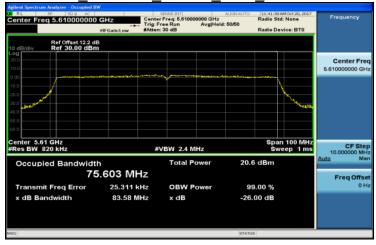
FCC 802.11ac 80MHz Main 5530MHz



FCC_802.11ac_80MHz_Main_5210MHz



FCC 802.11ac 80MHz Main 5610MHz



FCC 802.11ac 80MHz Main 5290MHz



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MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

9.1 Standard Applicable

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			250mW(23.98dBm) or 11dBm+10 log B
U-NII-2C	V		250mW(23.98dBm) or 11dBm+10 log B
U-NII-3			1 Watt(30dBm)

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

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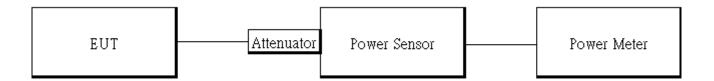
9.2 Measurement Procedure

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

	SGS Conducted Room										
Name of Equip- ment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due						
Power Meter	Anritsu	ML2495A	1005007	12/15/2016	12/14/2017						
Power Sensor	Anritsu	MA2411B	917032	12/15/2016	12/14/2017						
EXA Spectrum An- alyzer	Agilent	N9030A	MY53120760	03/21/2017	03/20/2018						
DC Block	Mini-Circuits	BLK-18-S+	1	01/05/2017	01/04/2018						
Coaxial Cable	HUBER+SUHNER	SUCOFLEX 102	23670/2	01/05/2017	01/04/2018						
Attenuator	Mini-Circuit	BW-S10W2+	2	01/05/2017	01/04/2018						
Splitter	Agilent	11636B	N/A	01/05/2017	01/04/2018						
DC Power Supply	Agilent	E3640A	MY52410006	11/21/2016	11/20/2017						

9.4 Test Set-up



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9.5 Measurement Result **Conducted output power**

802 11a Main

002.11a_	iviaiii							
СН	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)		RESULT
36	5180	6	11.20	13.167		30		PASS
44	5220	6	11.42	13.852		30		PASS
48	5240	6	11.24	13.289		30		PASS
52	5260	6	11.14	12.987	23.98	or 11+10log(B) =	24.55	PASS
60	5300	6	11.38	13.725	23.98	or 11+10log(B) =	24.46	PASS
64	5320	6	11.47	14.012	23.98	or 11+10log(B) =	24.65	PASS
100	5500	6	11.12	12.927	23.98	or 11+10log(B) =	24.65	PASS
116	5580	6	11.14	12.987	23.98	or 11+10log(B) =	24.61	PASS
140	5700	6	11.25	13.320	23.98	or 11+10log(B) =	24.59	PASS

802.11n_HT20_Main

СН	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)		RESULT
36	5180	MCS0	11.42	13.866		30		PASS
44	5220	MCS0	11.49	14.091		30		PASS
48	5240	MCS0	11.48	14.059		30		PASS
52	5260	MCS0	11.40	13.802	23.98	or 11+10log(B) =	24.71	PASS
60	5300	MCS0	11.33	13.582	23.98	or 11+10log(B) =	24.87	PASS
64	5320	MCS0	11.34	13.613	23.98	or 11+10log(B) =	24.70	PASS
100	5500	MCS0	11.47	14.027	23.98	or 11+10log(B) =	24.74	PASS
116	5580	MCS0	11.42	13.866	23.98	or 11+10log(B) =	24.92	PASS
140	5700	MCS0	11.46	13.994	23.98	or 11+10log(B) =	24.79	PASS

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802.11n HT40 Main

	+0							
СН	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)		RESULT
38	5190	MCS0	11.47	14.016		30		PASS
46	5230	MCS0	11.49	14.080		30		PASS
54	5270	MCS0	11.30	13.478	23.98	or 11+10log(B) =	27.18	PASS
62	5310	MCS0	11.31	13.509	23.98	or 11+10log(B) =	27.17	PASS
102	5510	MCS0	11.20	13.171	23.98	or 11+10log(B) =	27.17	PASS
110	5550	MCS0	11.14	12.990	23.98	or 11+10log(B) =	27.16	PASS
134	5670	MCS0	11.24	13.293	23.98	or 11+10log(B) =	27.15	PASS

802.11ac VHT80 Main

СН	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)		RESULT
42	5210	MCS0	11.39	13.788		30		PASS
58	5290	MCS0	11.43	13.915	23.98	or 11+10log(B) =	30.21	PASS
106	5530	MCS0	11.46	14.012	23.98	or 11+10log(B) =	30.23	PASS
122	5610	MCS0	11.48	14.076	23.98	or 11+10log(B) =	30.22	PASS

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10. POWER SPECTRAL DENSITY

Standard Applicable

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

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

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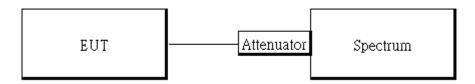
10.2 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules .
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to Spectrum.
- 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)
- 5. User the cursor on spectrum to peak search the highest level of trace
- 6. Record the max. reading and add 10 log(1/duty cycle).
- 7. Repeat above procedures until all default test channel (low, middle, and high) was complete.

Measurement Equipment Used 10.3

SGS Conducted Room							
Name of Equip- ment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due		
EXA Spectrum Ana- lyzer	Agilent	N9030A	MY53120760	03/21/2017	03/20/2018		
Coaxial Cable	HUBER+SUHNER	SUCOFLEX 102	23670/2	01/05/2017	01/04/2018		
DC Block	Mini-Circuits	BLK-18-S+	1	01/05/2017	01/04/2018		
Attenuator	Mini-Circuit	BW-S10W2+	2	01/05/2017	01/04/2018		
DC Power Supply	Agilent	E3640A	MY52410006	11/21/2016	11/20/2017		

10.4 **Test Set-up**



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10.5 **Measurement Result**

POWER DENSITY 802.11a MODE					
Frequency (MHz)	PPSD W/O Duty Factor (dBm)	Duty Factor	PPSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)
5180	-3.78	0.27	-3.51	17	-20.51
5220	-2.87	0.27	-2.60	17	-19.60
5240	-2.91	0.27	-2.64	17	-19.64
5260	-3.01	0.27	-2.74	11	-13.74
5300	-2.54	0.27	-2.27	11	-13.27
5320	-2.49	0.27	-2.22	11	-13.22
5500	-3.88	0.27	-3.61	11	-14.61
5580	-3.66	0.27	-3.39	11	-14.39
5700	-3.19	0.27	-2.92	11	-13.92

POWER DENSITY 802.11n HT20 MODE						
Frequency (MHz)	PPSD W/O Duty Factor (dBm)	Duty Factor	PPSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)	
5180	-3.31	0.29	-3.02	17	-20.02	
5220	-4.05	0.29	-3.76	17	-20.76	
5240	-4.17	0.29	-3.88	17	-20.88	
5260	-4.09	0.29	-3.80	11	-14.80	
5300	-3.51	0.29	-3.22	11	-14.22	
5320	-3.87	0.29	-3.58	11	-14.58	
5500	-3.00	0.29	-2.71	11	-13.71	
5580	-3.86	0.29	-3.57	11	-14.57	
5700	-3.45	0.29	-3.16	11	-14.16	

POWER DENSITY 802.11n HT40 MODE						
Frequency (MHz)	PPSD W/O Duty Factor (dBm)	Duty Factor	PPSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)	
5190	-7.51	0.53	-6.98	17	-23.98	
5230	-8.22	0.53	-7.69	17	-24.69	
5270	-8.54	0.53	-8.01	11	-19.01	
5310	-8.35	0.53	-7.82	11	-18.82	
5510	-9.16	0.53	-8.63	11	-19.63	
5550	-9.78	0.53	-9.25	11	-20.25	
5670	-8.59	0.53	-8.06	11	-19.06	

POWER DENSITY 802.11ac VHT80 MODE						
Frequency (MHz)	PPSD W/O Duty Factor (dBm)	Duty Factor	PPSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)	
5210	-13.48	0.98	-12.50	17	-29.50	
5290	-12.85	0.98	-11.87	11	-22.87	
5530	-14.06	0.98	-13.08	11	-24.08	
5610	-12.67	0.98	-11.69	11	-22.69	

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802.11a 20MHz_5180MHz



802.11a 20MHz 5220MHz



802.11a 20MHz 5240MHz



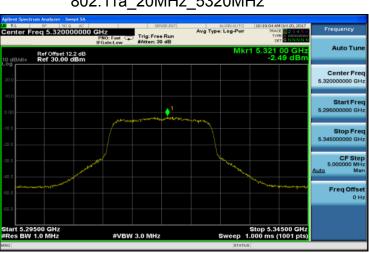
802.11a 20MHz 5260MHz



802.11a_20MHz_5300MHz



802.11a 20MHz 5320MHz



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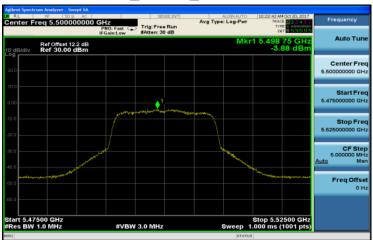
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802.11a 20MHz 5500MHz



802.11a 20MHz 5580MHz



802.11a 20MHz 5700MHz



802.11n 20MHz 5180MHz



802.11n 20MHz 5220MHz



802.11n 20MHz 5240MHz



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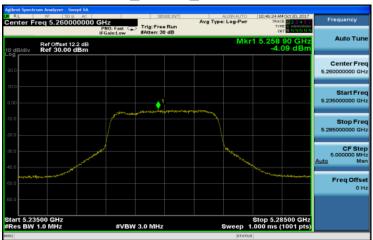
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802.11n 20MHz 5260MHz



802.11n 20MHz 5300MHz



802.11n 20MHz 5320MHz



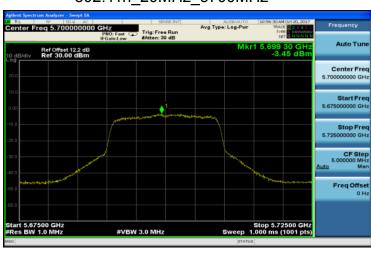
802.11n 20MHz 5500MHz



802.11n_20MHz_5580MHz



802.11n 20MHz 5700MHz



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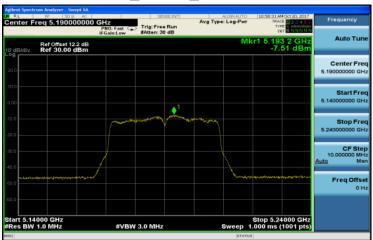
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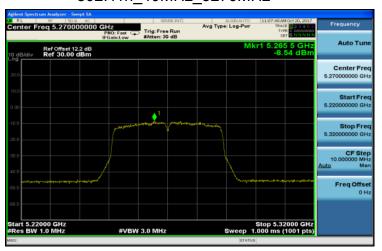
802.11n 40MHz 5190MHz



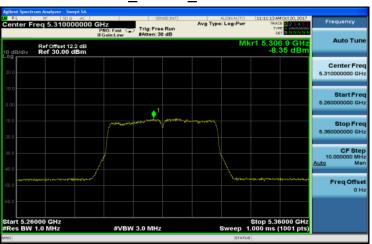
802.11n 40MHz 5230MHz



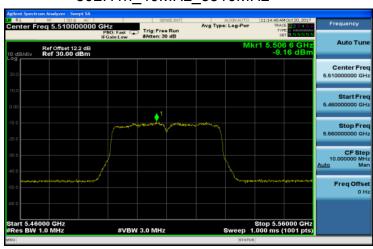
802.11n 40MHz 5270MHz



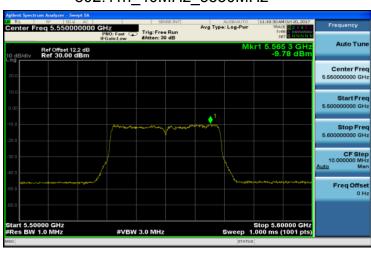
802.11n 40MHz 5310MHz



802.11n 40MHz 5510MHz



802.11n 40MHz 5550MHz



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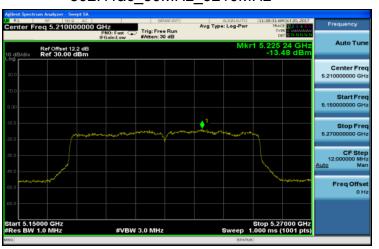


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802.11n 40MHz 5670MHz



802.11ac 80MHz 5210MHz



802.11ac 80MHz 5290MHz



802.11ac 80MHz 5530MHz



802.11ac 80MHz 5610MHz



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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	PK: -27 (dBm/MHz)	PK: 68.3 (dBμV/m)
15.407(b)(3) RSS-247 6.2.3.2		
	PK:-27 (dBm/MHz) *1	PK: 68.2(dBµV/m) *1
15.407(b)(4)(i)	PK:10 (dBm/MHz) *2	PK:105.2 (dBµV/m) *2
RSS-247 6.2.4.2	PK:15.6 (dBm/MHz) *3 PK:27 (dBm/MHz) *4	PK: 110.8(dBµV/m) *3 PK:122.2 (dBµV/m) *4

^{*1} 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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^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.

^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.

^{*4} 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:

<u> </u>		
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 11.2

	SGS 966 Chamber No.C									
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.					
EMI Test Receiver	R&S	ESCI7	100760	05/11/2017	05/10/2018					
Spectrum Analyzer	Agilent	E4446A	MY51100003	04/25/2017	04/24/2018					
Loop Antenna	ETS-Lindgren	6502	148045	09/20/2017	09/19/2018					
Bilog Antenna	SCHWAZBECK	VULB9168	378	12/19/2016	12/18/2017					
Horn Antenna	Schwarzbeck	BBHA9120D	1441	08/04/2017	08/03/2018					
Pre-Amplifier	Agilent	8447D	2944A07676	01/03/2017	01/02/2018					
Pre-Amplifier	EMC Instruments Corp.	EMC0126530	980038	01/03/2017	01/02/2018					
Turn Table	HD	DT420	N/A	N.C.R	N.C.R					
Antenna Tower	ChamPro	AM-BS-4500-B	060776-ABS	N.C.R	N.C.R					
Controller	ChamPro	EM1000	60776	N.C.R	N.C.R					
Low Loss Cable	Huber Suhner	966_RX	9	01/05/2017	01/04/2018					
3m Site NSA	SGS	966 chamber	N/A	07/01/2017	06/30/2018					
Low Loss Cable	Huber Suhner	966 TX	1	01/05/2017	01/04/2018					
Horn Antenna	Schwarzbeck	BBHA9170	184	12/12/2016	12/11/2017					
Pre-Amplifier	EMC Instruments Corp.	EMC184045	980135	01/05/2017	01/04/2018					

Note: N.C.R refers to Not Calibrated Required.

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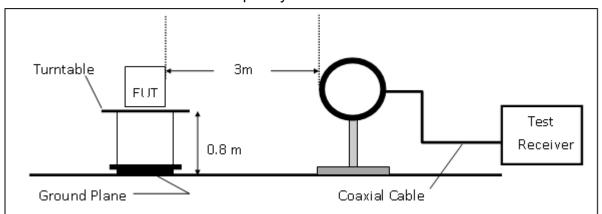
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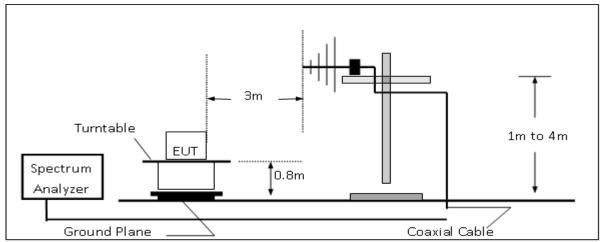
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11.3 **Test SET-UP**

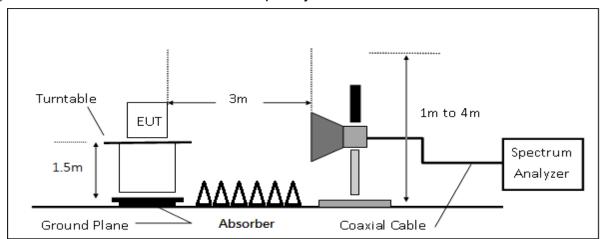
(A) Radiated Emission Test Set-UP Frequency Below 30MHz.



(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.
- 4. 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 emissions.
- Set the spectrum analyzer as RBW=120 kHz and VBW=300 kHz for Peak Detector (PK) and 6. Quasi-peak (QP) at frequency below 1 GHz.
- 7. Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz for Peak Detector at frequency above 1 GHz.
- Set the spectrum analyzer as RBW=1 MHz, VBW=10 Hz (Duty cycle > 98%) or VBW ≥ 1/T 8. (Duty cycle < 98%) for Average Detector at frequency above 1 GHz.
- 9. Maximum procedure was performed on the six highest emissions to ensure EUT compli-
- 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 μ V/m) = SPA. Reading level(dB μ V) + Factor(dB)

Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre Amplifier Gain(dB)

Note:

"F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

11.6 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.

Measurement Result 11.7

Refer to next page for tabular data sheets.

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

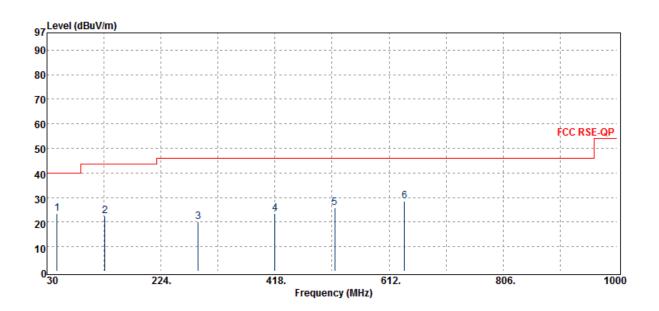
802.11a 5150~5250 MHz

Operation Band Test Date :2017-10-24 :802.11aB1

Fundamental Frequency :5220 MHz Temp./Humi. :21 deg_C / 62 RH

Operation Mode :Tx CH MID Engineer :Tin

EUT Pol. :H Plane Measurement Antenna Pol. :VERTICAL



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
47.46	S	Peak	31.47	-7.85	23.62	40.00	-16.38
128.94	S	Peak	31.93	-9.57	22.36	43.50	-21.14
287.05	S	Peak	26.38	-6.19	20.19	46.00	-25.81
418.00	S	Peak	26.93	-3.37	23.56	46.00	-22.44
519.85	S	Peak	27.45	-1.62	25.83	46.00	-20.17
638.19	S	Peak	28.03	0.40	28.43	46.00	-17.57

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

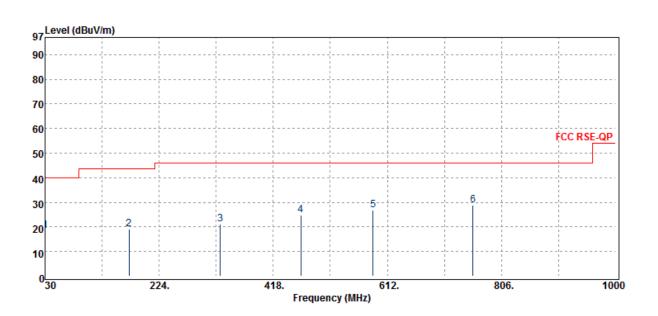
:802.11aB1 :5220 MHz :Tx CH MID :H Plane

Test Date Temp./Humi. :2017-10-24

:21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
30.00	S	Peak	27.74	-9.19	18.55	40.00	-21.45
172.59	S	Peak	27.00	-7.86	19.14	43.50	-24.36
327.79	S	Peak	26.53	-5.49	21.04	46.00	-24.96
464.56	S	Peak	27.25	-2.58	24.67	46.00	-21.33
587.75	S	Peak	27.00	-0.05	26.95	46.00	-19.05
757.50	S	Peak	25.95	3.01	28.96	46.00	-17.04

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802.11a 5250~5350 MHz

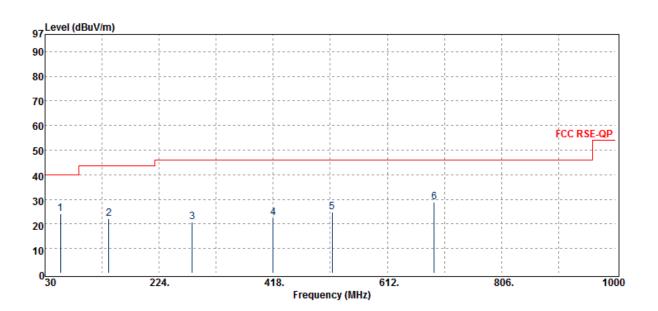
Operation Band :802.11aB2

Fundamental Frequency :5300 MHz **Operation Mode** :Tx CH MID

EUT Pol. :H Plane **Test Date** :2017-10-24 Temp./Humi. :21 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
56.19	S	Peak	31.99	-7.91	24.08	40.00	-15.92
138.64	S	Peak	30.80	-8.49	22.31	43.50	-21.19
280.26	S	Peak	27.08	-6.35	20.73	46.00	-25.27
418.00	S	Peak	26.02	-3.37	22.65	46.00	-23.35
517.91	S	Peak	26.74	-1.82	24.92	46.00	-21.08
691.54	S	Peak	27.42	1.47	28.89	46.00	-17.11

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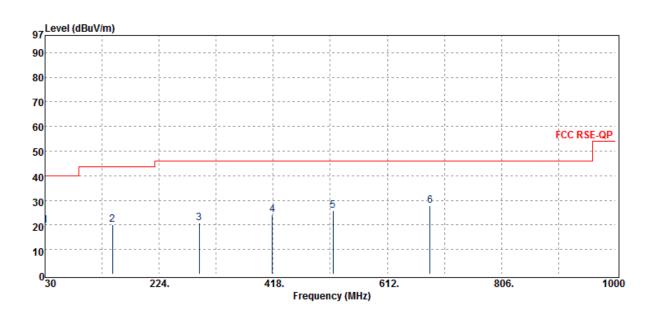
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11aB2 :5300 MHz :Tx CH MID :H Plane

Test Date :2017-10-24 Temp./Humi. :21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
30.00	S	Peak	28.87	-9.19	19.68	40.00	-20.32
144.46	S	Peak	28.30	-8.07	20.23	43.50	-23.27
291.90	S	Peak	26.83	-6.08	20.75	46.00	-25.25
416.06	S	Peak	27.57	-3.27	24.30	46.00	-21.70
519.85	S	Peak	27.44	-1.62	25.82	46.00	-20.18
684.75	S	Peak	26.59	1.28	27.87	46.00	-18.13

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802.11a, 5470~5725 MHz

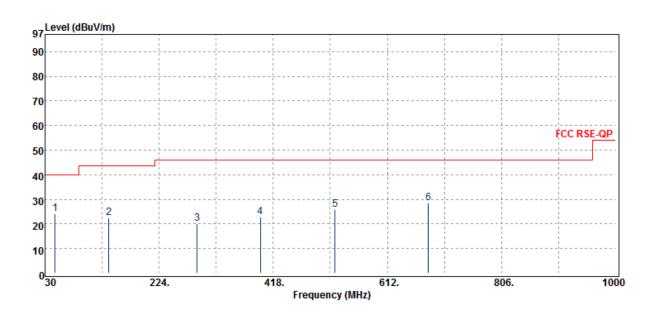
Operation Band :802.11aB3 Fundamental Frequency :5580 MHz

Operation Mode :Tx CH MID

EUT Pol. :H Plane **Test Date** :2017-10-24

Temp./Humi. :21 deg_C / 62 RH Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
47.46	S	Peak	32.14	-7.85	24.29	40.00	-15.71
138.64	S	Peak	31.02	-8.49	22.53	43.50	-20.97
288.99	S	Peak	26.08	-6.09	19.99	46.00	-26.01
395.69	S	Peak	26.98	-4.16	22.82	46.00	-23.18
522.76	S	Peak	27.48	-1.66	25.82	46.00	-20.18
681.84	S	Peak	27.53	0.92	28.45	46.00	-17.55

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Operation Band Fundamental Frequency

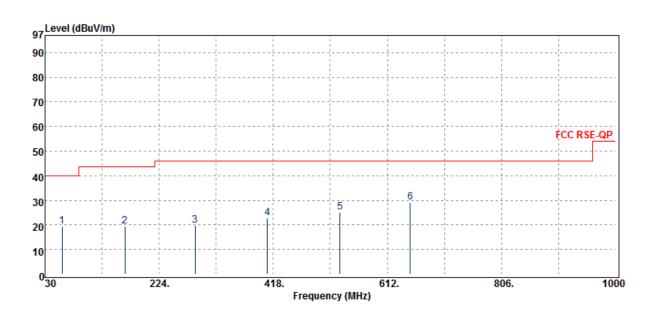
Operation Mode EUT Pol.

:802.11aB3 :5580 MHz :Tx CH MID :H Plane

Test Date :2017-10-24 Temp./Humi. :21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
59.10	S	Peak	27.42	-8.03	19.39	40.00	-20.61
165.80	S	Peak	26.85	-7.40	19.45	43.50	-24.05
285.11	S	Peak	26.01	-6.24	19.77	46.00	-26.23
408.30	S	Peak	26.47	-3.53	22.94	46.00	-23.06
531.49	S	Peak	26.82	-1.57	25.25	46.00	-20.75
650.80	S	Peak	28.63	0.49	29.12	46.00	-16.88

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Above 1GHz Worst-Case Data:

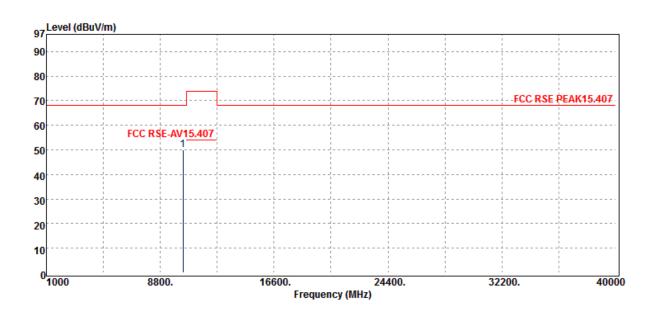
Radiated Spurious Emission Measurement Result 802.11a, 5150~5250 MHz

:2017-10-25 **Operation Band** :802.11aB1 **Test Date**

Fundamental Frequency Temp./Humi. :5180 MHz :21 deg_C / 62 RH

Operation Mode :Tx CH LOW Engineer :Tin

EUT Pol. :H Plane :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
10360.00	Н	Peak	31.82	18.29	50.11	68.30	-18.19

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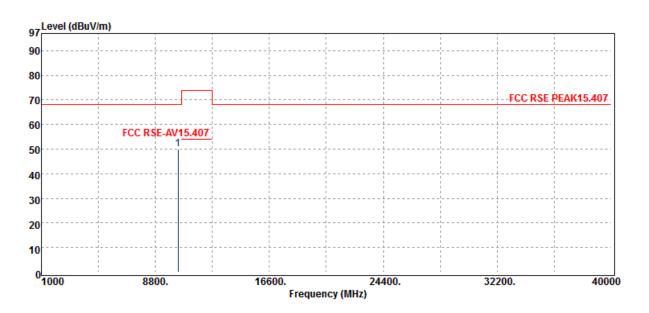
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11aB1 :5180 MHz :Tx CH LOW :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
10360.00	Н	Peak	31.70	18.29	49.99	68.30	-18.31

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Operation Band Fundamental Frequency **Operation Mode**

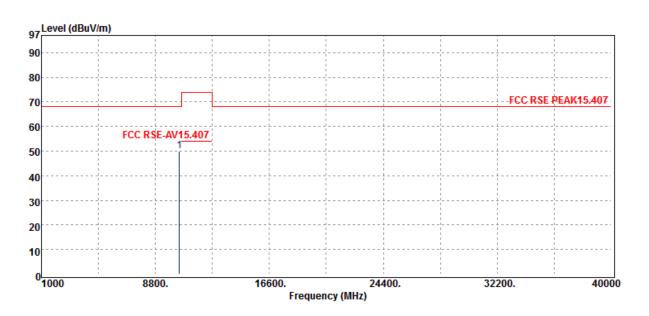
EUT Pol.

:802.11aB1 :5220 MHz :Tx CH MID :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
							_
10440.00	Н	Peak	31.29	18.69	49.98	68.30	-18.32

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Operation Band Fundamental Frequency **Operation Mode**

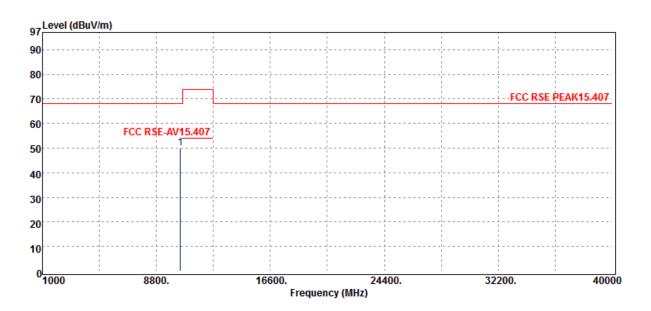
EUT Pol.

:802.11aB1 :5220 MHz :Tx CH MID :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
							_
10440.00	Н	Peak	31.37	18.69	50.06	68.30	-18.24

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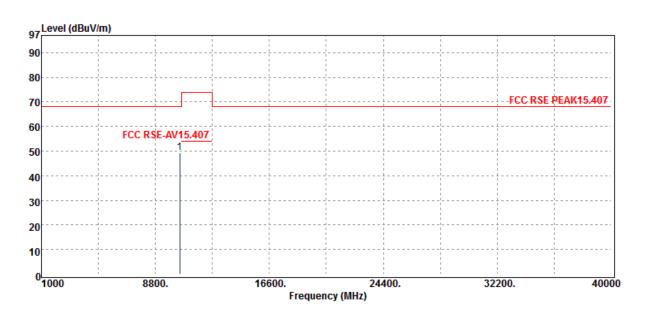
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11aB1 :5240 MHz :Tx CH HIGH :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
							_
10480.00	Н	Peak	30.96	18.30	49.26	68.30	-19.04

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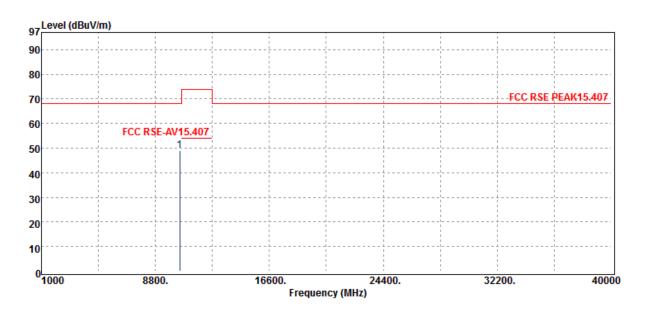
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11aB1 :5240 MHz :Tx CH HIGH :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
10480.00	Н	Peak	30.72	18.30	49.02	68.30	-19.28

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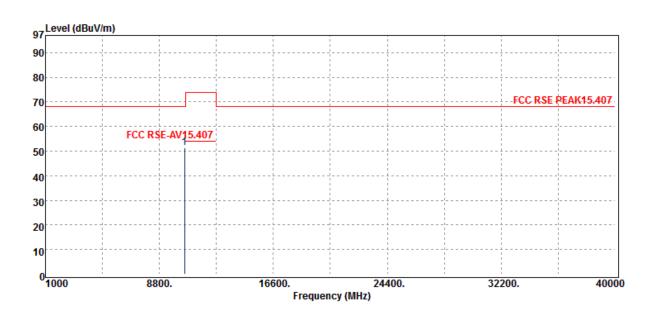
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Radiated Spurious Emission Measurement Result 802.11a, 5250MHz-5350MHz

Operation Band :802.11aB2 **Test Date** :2017-10-25

Fundamental Frequency :5260 MHz Temp./Humi. :21 deg_C / 62 RH **Operation Mode** :Tx CH LOW Engineer

EUT Pol. :H Plane :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB	
10520.00	Н	Peak	32.03	19.38	51.41	68.30	-16.89	

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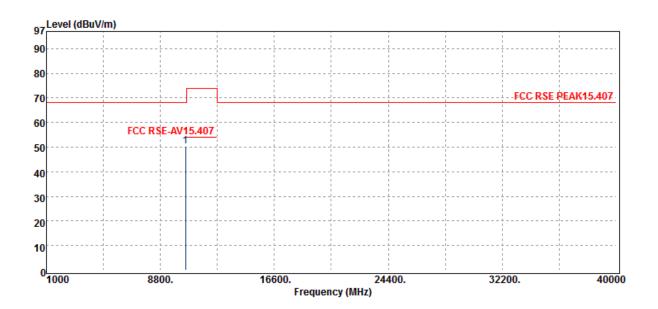
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11aB2 :5260 MHz :Tx CH LOW :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
10520.00	Н	Peak	30.95	19.38	50.33	68.30	-17.97

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Operation Band Fundamental Frequency

Operation Mode

EUT Pol.

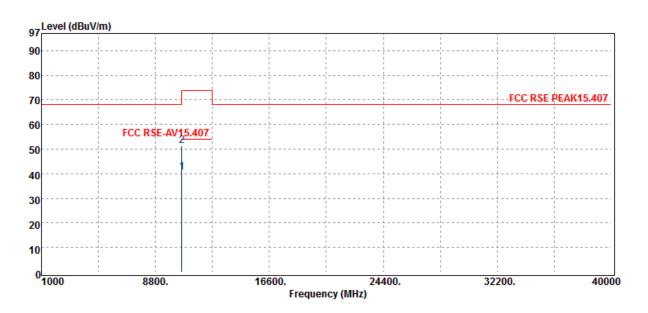
:802.11aB2 :5300 MHz :Tx CH MID :H Plane

Test Date :2017-10-25

Temp./Humi. :21 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
10600.00	Н	Average	21.76	18.91	40.67	54.00	-13.33
10600.00	Н	Peak	32.58	18.91	51.49	74.00	-22.51

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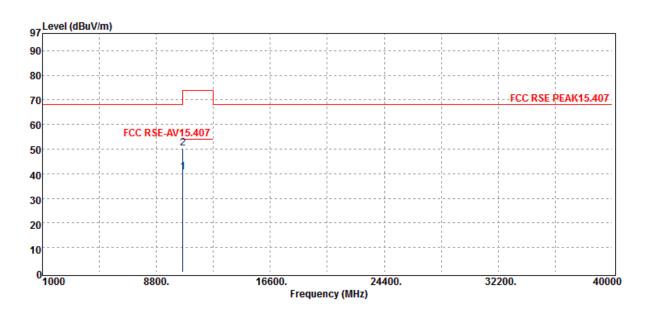
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Operation Band :802.11aB2 **Test Date**

:2017-10-25 Fundamental Frequency :5300 MHz Temp./Humi. :21 deg_C / 62 RH

Operation Mode :Tx CH MID Engineer

EUT Pol. :H Plane :HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
10600.00	Н	Average	21.87	18.91	40.78	54.00	-13.22
10600.00	Н	Peak	31.52	18.91	50.43	74.00	-23.57

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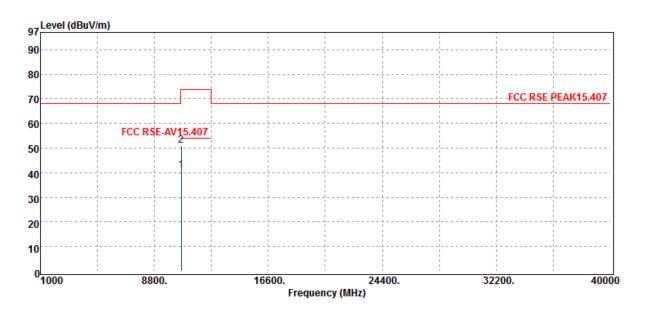
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11aB2 :5320 MHz :Tx CH HIGH :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
10640.00	Н	Average	21.83	19.19	41.02	54.00	-12.98
10640.00	Н	Peak	31.93	19.19	51.12	74.00	-22.88

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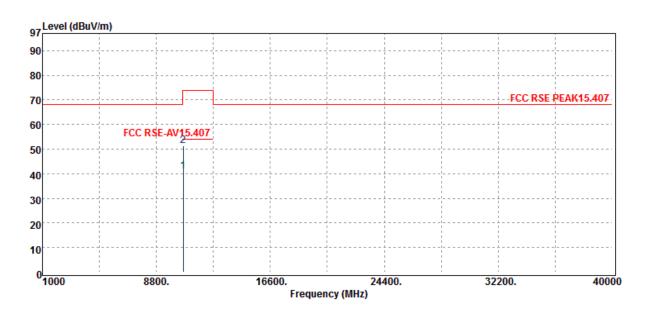
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11aB2 :5320 MHz :Tx CH HIGH :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
10640.00	Н	Average	21.92	19.19	41.11	54.00	-12.89
10640.00	Н	Peak	32.26	19.19	51.45	74.00	-22.55

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

Operation Band

Fundamental Frequency **Operation Mode**

EUT Pol.

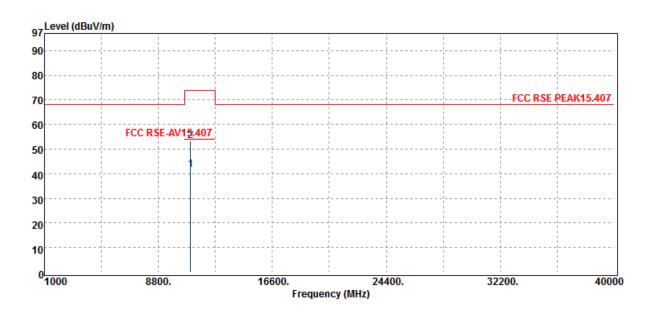
:802.11aB3 :5500 MHz :Tx CH LOW :H Plane

Test Date Temp./Humi. :2017-10-25

:21 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
11000.00	Н	Average	21.47	20.16	41.63	54.00	-12.37
11000.00	Н	Peak	33.14	20.16	53.30	74.00	-20.70

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SGS Taiwan Ltd. t (886-2) 2299-3279



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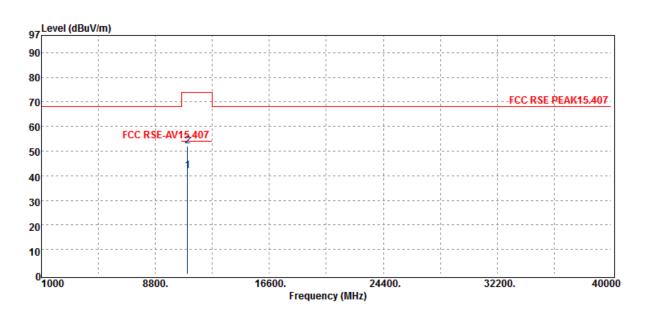
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11aB3 :5500 MHz :Tx CH LOW :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
11000.00	Н	Average	21.65	20.16	41.81	54.00	-12.19
11000.00	Н	Peak	31.94	20.16	52.10	74.00	-21.90

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Operation Band Fundamental Frequency **Operation Mode**

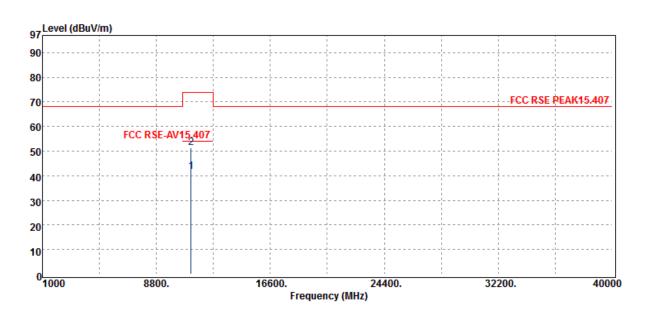
EUT Pol.

:802.11aB3 :5580 MHz :Tx CH MID :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
11160.00	Н	Average	21.34	20.44	41.78	54.00	-12.22
11160.00	Н	Peak	31.07	20.44	51.51	74.00	-22.49

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Operation Band Fundamental Frequency

Operation Mode

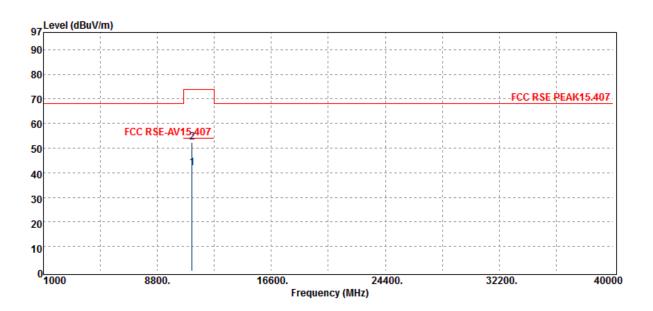
EUT Pol.

:802.11aB3 :5580 MHz :Tx CH MID :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
11160.00	Н	Average	21.53	20.44	41.97	54.00	-12.03
11160.00	Н	Peak	31.97	20.44	52.41	74.00	-21.59

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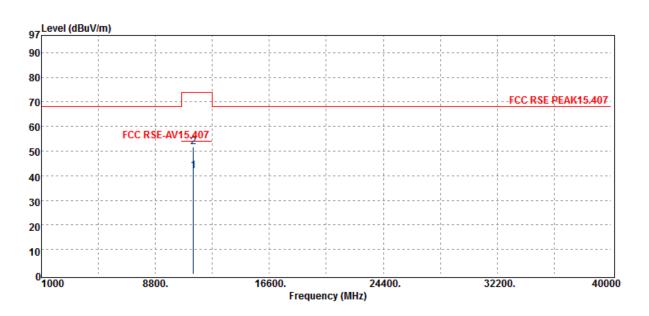
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11aB3 :5700 MHz :Tx CH HIGH :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
11400.00	Н	Average	21.34	20.56	41.90	54.00	-12.10
11400.00	Н	Peak	31.04	20.56	51.60	74.00	-22.40

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

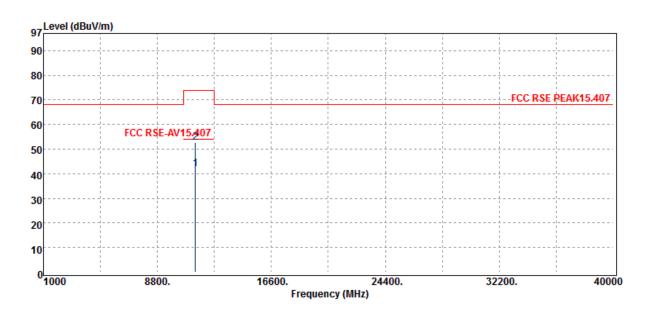
:802.11aB3 :5700 MHz :Tx CH HIGH :H Plane

Test Date Temp./Humi.

:2017-10-25 :21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
11400.00	Н	Average	21.42	20.56	41.98	54.00	-12.02
11400.00	Н	Peak	31.98	20.56	52.54	74.00	-21.46

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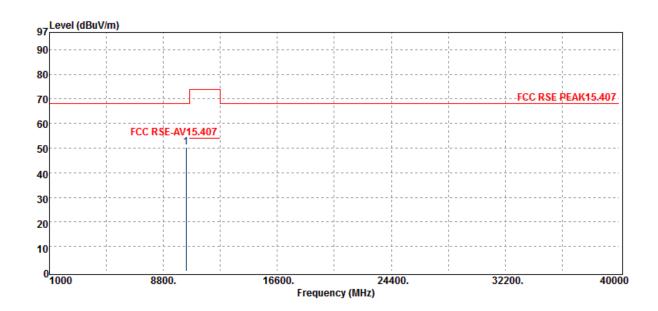
Radiated Spurious Emission Measurement Result 802.11n HT20, 5150~5250 MHz

Operation Band :802.11n20B1 **Test Date** :2017-10-25

Fundamental Frequency Temp./Humi. :5180 MHz :21 deg_C / 62 RH

Operation Mode :Tx CH LOW Engineer :Tin

EUT Pol. :H Plane :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
10360.00	Н	Peak	32.20	18.29	50.49	68.30	-17.81

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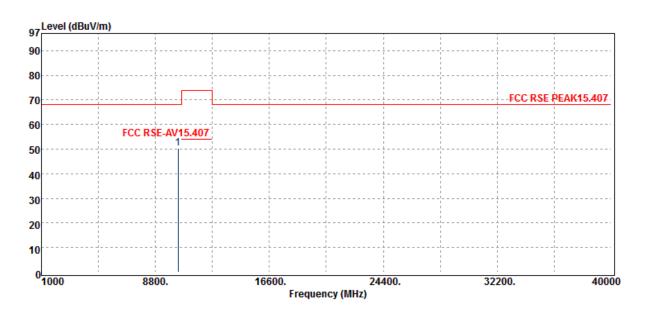
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20B1 :5180 MHz :Tx CH LOW :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
10360.00	Н	Peak	32.13	18.29	50.42	68.30	-17.88

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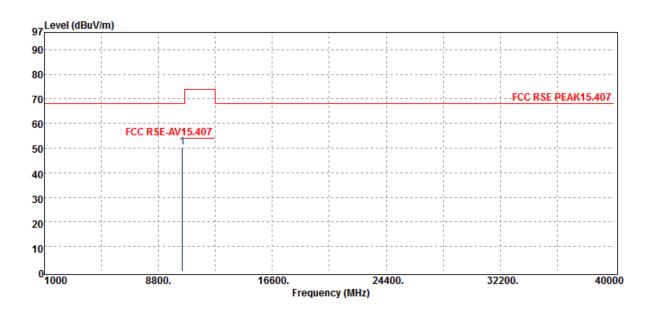
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20B1 :5220 MHz :Tx CH MID :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
10440.00	Н	Peak	31.53	18.69	50.22	68.30	-18.08

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

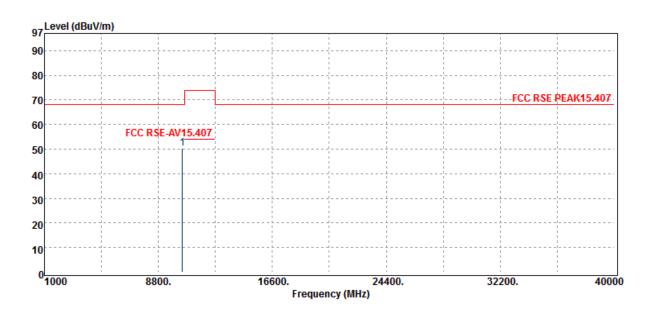
:802.11n20B1 :5220 MHz :Tx CH MID :H Plane

Test Date Temp./Humi.

:2017-10-25 :21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
10440.00	Н	Peak	31.49	18.69	50.18	68.30	-18.12

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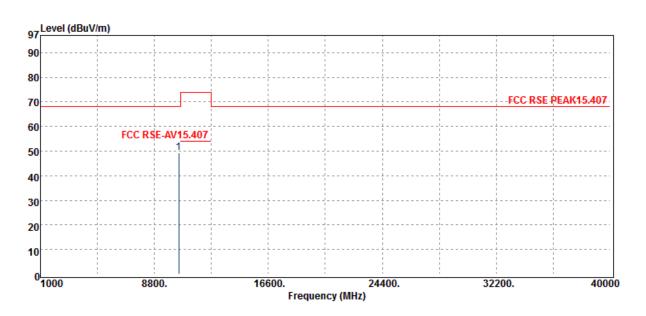
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20B1 :5240 MHz :Tx CH HIGH :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
							_
10480.00	Н	Peak	30.90	18.30	49.20	68.30	-19.10

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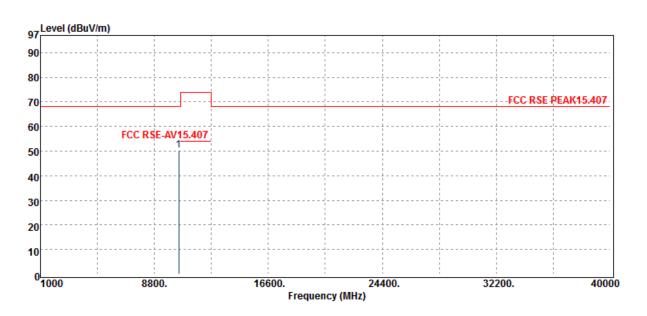
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20B1 :5240 MHz :Tx CH HIGH :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμ̈V	dB	dBμV/m	dBμV/m	dB
10480.00	Н	Peak	32.10	18.30	50.40	68.30	-17.90

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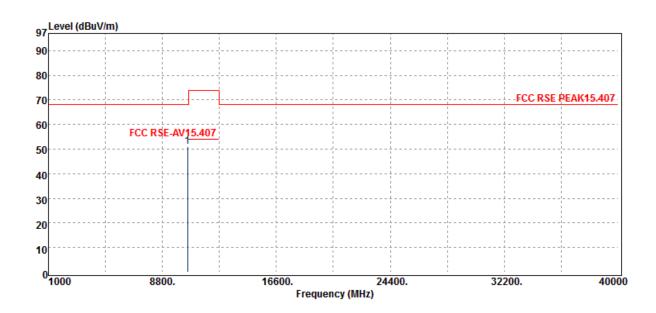
Radiated Spurious Emission Measurement Result 802.11n HT20, 5250~5350 MHz

:802.11n20B2 **Operation Band Test Date** :2017-10-25

Fundamental Frequency Temp./Humi. :5260 MHz :21 deg_C / 62 RH

Operation Mode :Tx CH LOW Engineer :Tin

EUT Pol. :H Plane :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
10520.00	Н	Peak	31.69	19.38	51.07	68.30	-17.23

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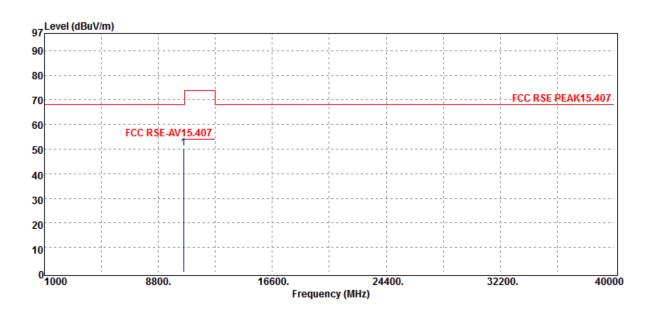
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20B2 :5260 MHz :Tx CH LOW :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
•							
10520.00	Н	Peak	30.83	19.38	50.21	68.30	-18.09

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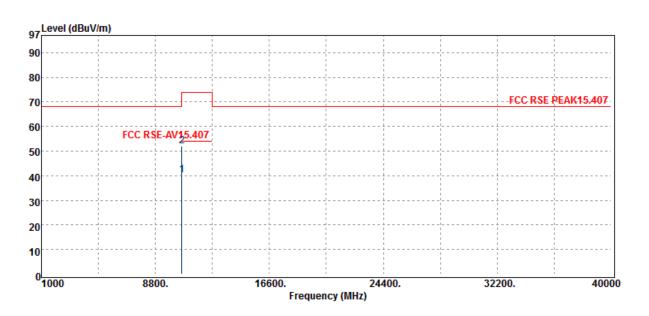
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20B2 :5300 MHz :Tx CH MID :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
10600.00	Н	Average	21.26	18.91	40.17	54.00	-13.83
10600.00	Н	Peak	33.05	18.91	51.96	74.00	-22.04

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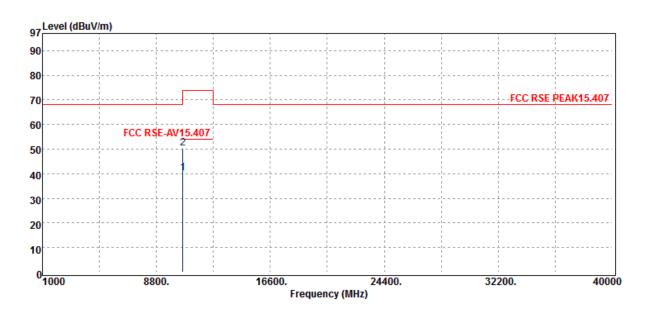
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20B2 :5300 MHz :Tx CH MID :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
10600.00	Н	Average	21.32	18.91	40.23	54.00	-13.77
10600.00	Н	Peak	31.53	18.91	50.44	74.00	-23.56

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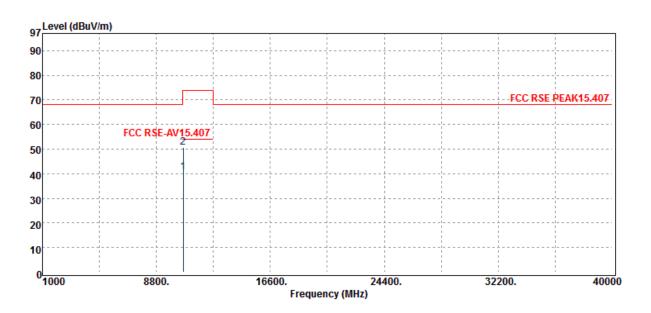
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20B2 :5320 MHz :Tx CH HIGH :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
10640.00	Н	Average	21.27	19.19	40.46	54.00	-13.54
10640.00	Н	Peak	31.49	19.19	50.68	74.00	-23.32

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

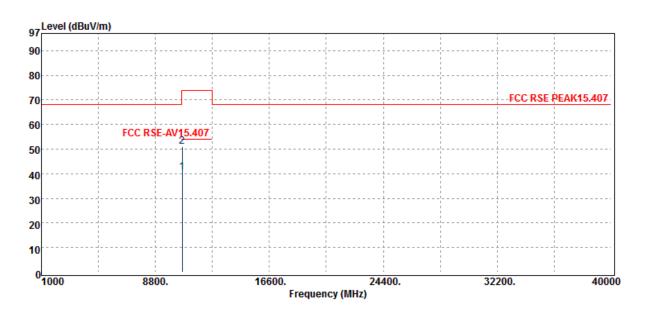
:802.11n20B2 :5320 MHz :Tx CH HIGH :H Plane

Test Date Temp./Humi.

:2017-10-25 :21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
10640.00	Н	Average	21.41	19.19	40.60	54.00	-13.40
10640.00	Н	Peak	31.96	19.19	51.15	74.00	-22.85

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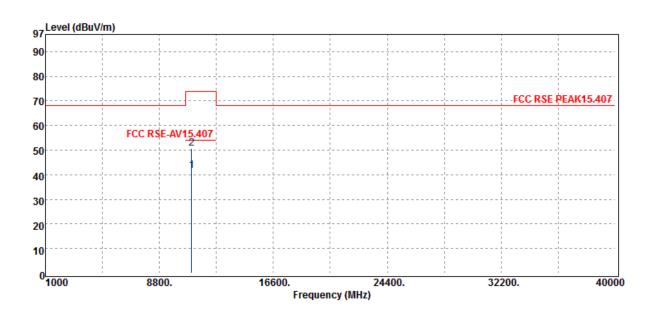
Radiated Spurious Emission Measurement Result 802.11n HT20, 5470~5725 MHz

:802.11n20B3 **Operation Band Test Date** :2017-10-25

Fundamental Frequency Temp./Humi. :5500 MHz :21 deg_C / 62 RH

Operation Mode :Tx CH LOW Engineer :Tin

EUT Pol. :H Plane :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
11000.00	Н	Average	21.37	20.16	41.53	54.00	-12.47
11000.00	Н	Peak	30.61	20.16	50.77	74.00	-23.23

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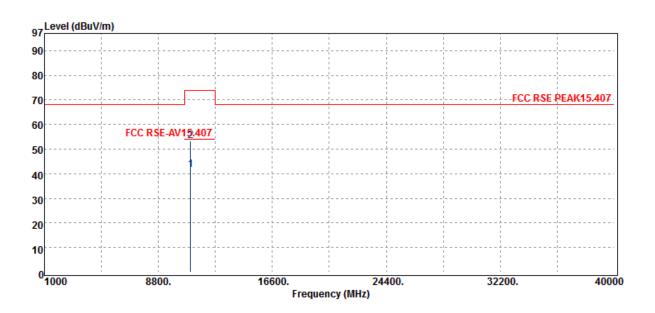
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20B3 :5500 MHz :Tx CH LOW :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
11000.00	Н	Average	21.58	20.16	41.74	54.00	-12.26
11000.00	Н	Peak	33.04	20.16	53.20	74.00	-20.80

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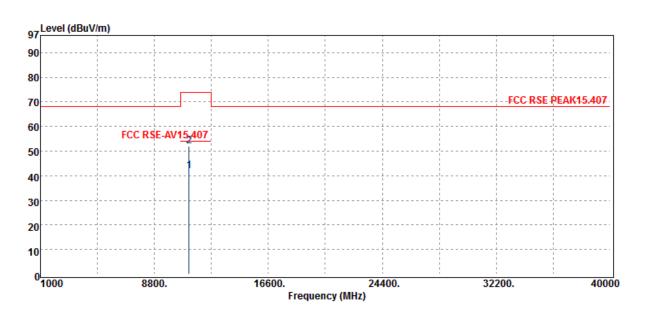
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20B3 :5580 MHz :Tx CH MID :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
11160.00	Н	Average	21.43	20.44	41.87	54.00	-12.13
11160.00	Н	Peak	31.49	20.44	51.93	74.00	-22.07

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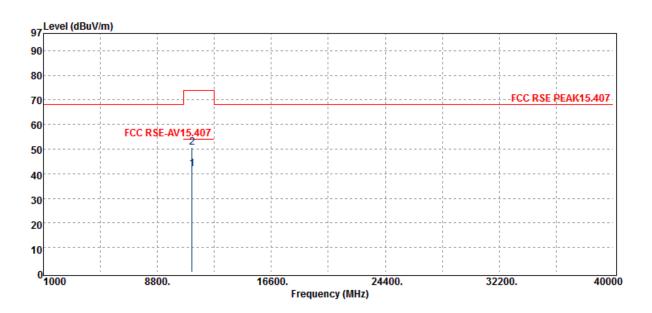
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20B3 :5580 MHz :Tx CH MID :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
11160.00	Н	Average	21.63	20.44	42.07	54.00	-11.93
11160.00	Н	Peak	30.22	20.44	50.66	74.00	-23.34

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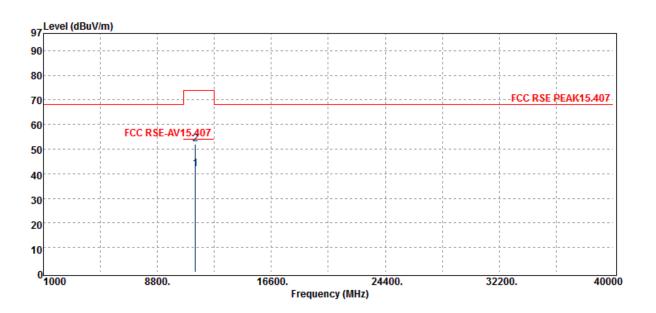
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20B3 :5700 MHz :Tx CH HIGH :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
11400.00	Н	Average	21.39	20.56	41.95	54.00	-12.05
11400.00	Н	Peak	31.55	20.56	52.11	74.00	-21.89

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

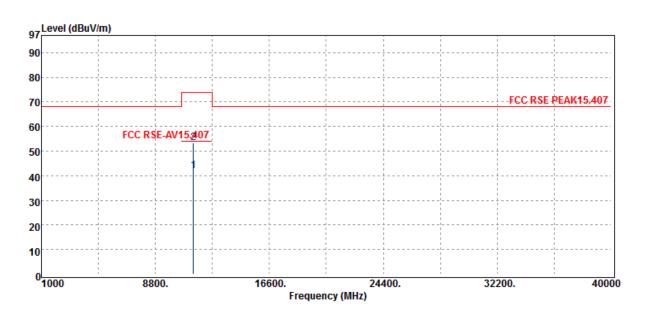
:802.11n20B3 :5700 MHz :Tx CH HIGH :H Plane

Test Date Temp./Humi.

:2017-10-25 :21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
11400.00	Н	Average	21.46	20.56	42.02	54.00	-11.98
11400.00	Н	Peak	32.84	20.56	53.40	74.00	-20.60

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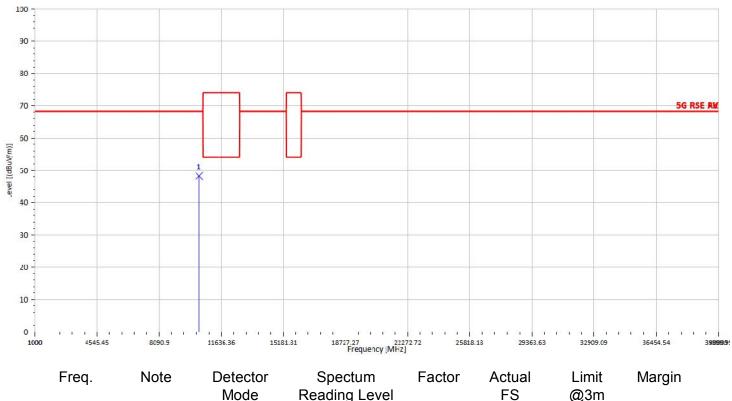
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Radiated Spurious Emission Measurement Result 802.11n HT40, 5150~5250 MHz

Operation Mode: 802.11n40B1 Test Date: 2017/9/27

Fundamental Frequency: 5190 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: TX CH LOW Test Engineer: Enzo EUT Pol.: Measurement Antenna Pol.: Vertical



	Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
			Mode	Reading Level		FS	@ 3m	
	MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
_	10380.00	Н	Peak	38.86	9.38	48.24	68.3	-20.06

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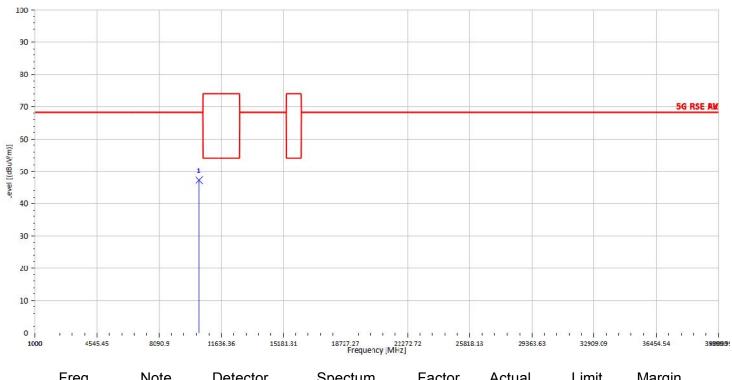


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Operation Mode: 802.11n40B1 Test Date: 2017/9/27

Fundamental Frequency: 22.7deg_C/57RH 5190 MHz Temp. / Humi. :

Operation Band: Test Engineer: TX CH LOW Enzo EUT Pol.: Η Measurement Antenna Pol.: Horizontal



Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@ 3m	-
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
10380 00	Н	Peak	37 92	9.38	47 30	68.3	-21 00

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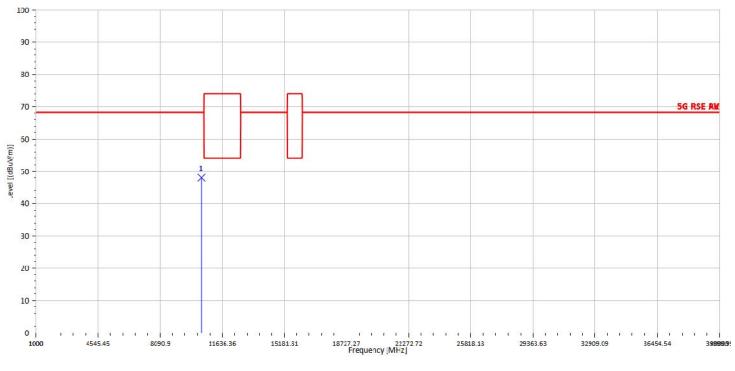


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Operation Mode: 802.11n40B1 Test Date: 2017/9/27

Fundamental Frequency: 22.7deg_C/57RH 5230 MHz Temp. / Humi. :

Operation Band: Test Engineer: TX CH HIGH Enzo EUT Pol.: Η Measurement Antenna Pol.: Vertical



Freq.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
10460.00	Н	Peak	38.45	9.61	48.06	68.3	-20.24

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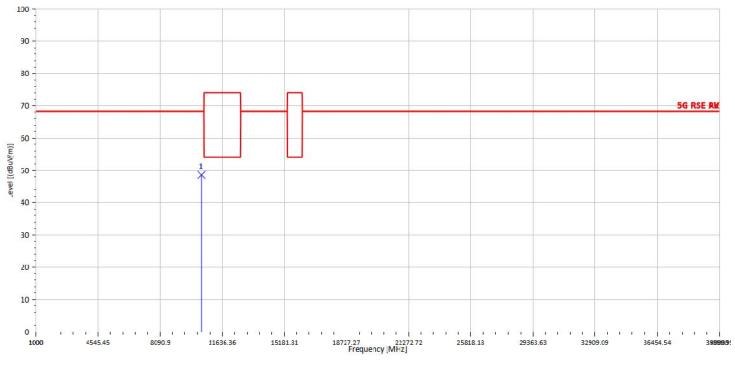


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Operation Mode: 802.11n40B1 Test Date: 2017/9/27

Fundamental Frequency: 22.7deg_C/57RH 5230 MHz Temp. / Humi. :

Operation Band: Test Engineer: TX CH HIGH Enzo EUT Pol.: Η Measurement Antenna Pol.: Horizontal



	Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
	MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBμV/m	dBµV/m	dB
•	10460 00	Н	Peak	38 97	9.61	48 57	68.3	-19 73

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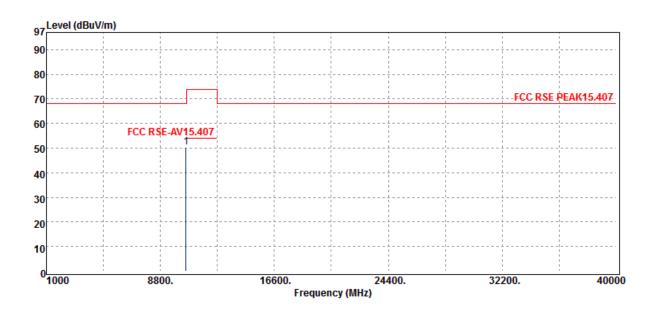
Radiated Spurious Emission Measurement Result 802.11n HT40, 5250~5350 MHz

Operation Band :802.11n40B2 **Test Date** :2017-10-25

Fundamental Frequency Temp./Humi. :5270 MHz :21 deg_C / 62 RH

Operation Mode :Tx CH LOW Engineer :Tin

EUT Pol. :H Plane :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
10540.00	Н	Peak	31.27	19.17	50.44	68.30	-17.86

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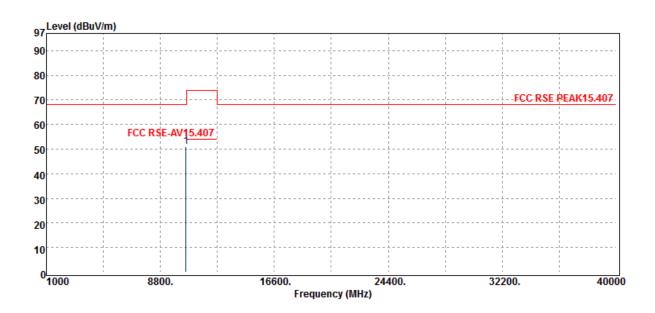
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n40B2 :5270 MHz :Tx CH LOW :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμ̈V	dB	dBμV/m	dBμV/m	dB
10540.00	Н	Peak	31.76	19.17	50.93	68.30	-17.37

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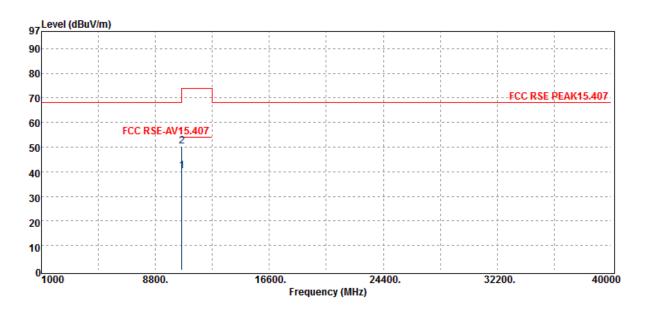
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n40B2 :5310 MHz :Tx CH HIGH :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
10620.00	Н	Average	21.28	19.11	40.39	54.00	-13.61
10620.00	Н	Peak	31.28	19.11	50.39	74.00	-23.61

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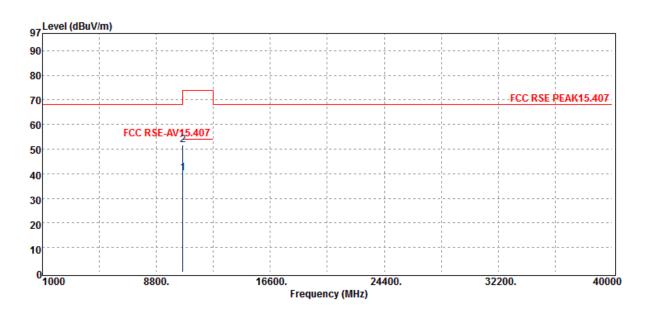
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n40B2 :5310 MHz :Tx CH HIGH :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
10620.00	Н	Average	21.31	19.11	40.42	54.00	-13.58
10620.00	Н	Peak	32.74	19.11	51.85	74.00	-22.15

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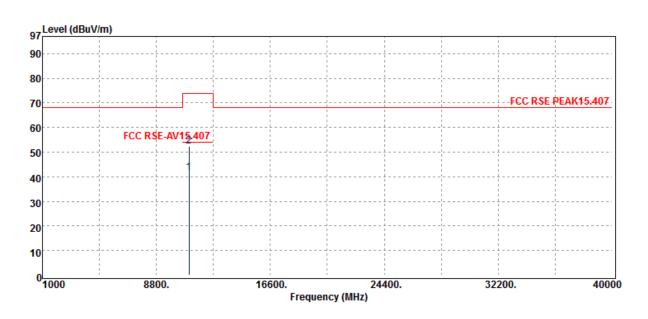
Radiated Spurious Emission Measurement Result 802.11n HT40, 5470~5725 MHz

Operation Band :802.11n40B3 **Test Date** :2017-10-25

Fundamental Frequency Temp./Humi. :5510 MHz :21 deg_C / 62 RH

Operation Mode :Tx CH LOW Engineer :Tin

EUT Pol. :H Plane :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
11020.00	Н	Average	21.34	20.16	41.50	54.00	-12.50
11020.00	Н	Peak	32.22	20.16	52.38	74.00	-21.62

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

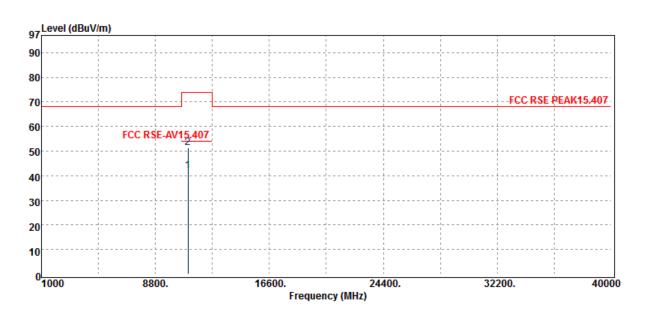
:802.11n40B3 :5510 MHz :Tx CH LOW :H Plane

Test Date Temp./Humi.

:2017-10-25 :21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
11020.00	Н	Average	21.63	20.16	41.79	54.00	-12.21
11020.00	Н	Peak	31.04	20.16	51.20	74.00	-22.80

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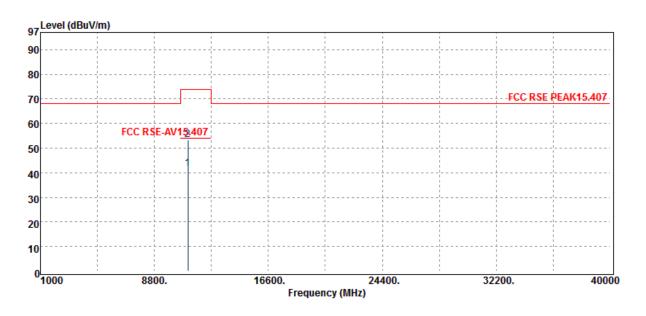
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n40B3 :5550 MHz :Tx CH MID :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
11100.00	Н	Average	21.44	20.32	41.76	54.00	-12.24
11100.00	Н	Peak	33.01	20.32	53.33	74.00	-20.67

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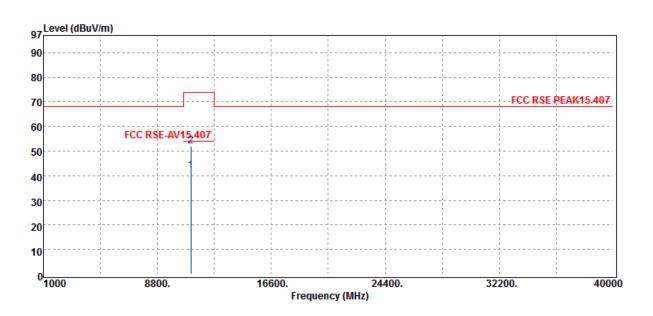
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n40B3 :5550 MHz :Tx CH MID :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
11100.00	Н	Average	21.62	20.32	41.94	54.00	-12.06
11100.00	Н	Peak	31.83	20.32	52.15	74.00	-21.85

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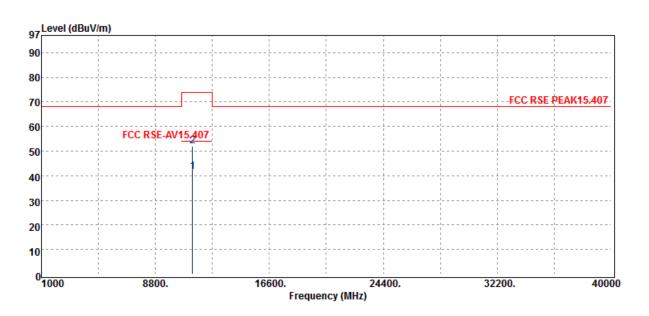
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n40B3 :5670 MHz :Tx CH HIGH :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
11340.00	Н	Average	21.38	20.38	41.76	54.00	-12.24
11340.00	Н	Peak	31.59	20.38	51.97	74.00	-22.03

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

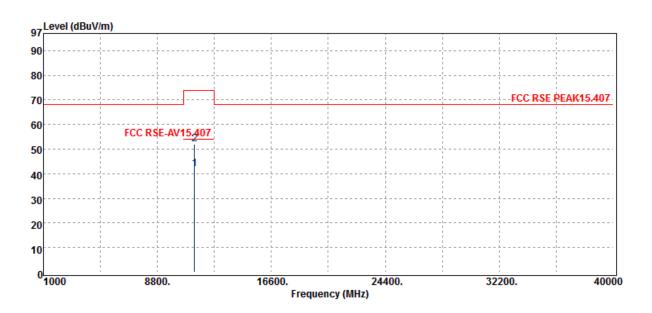
:802.11n40B3 :5670 MHz :Tx CH HIGH :H Plane

Test Date Temp./Humi.

:2017-10-25 :21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
11340.00	Н	Average	21.49	20.38	41.87	54.00	-12.13
11340.00	Н	Peak	31.77	20.38	52.15	74.00	-21.85

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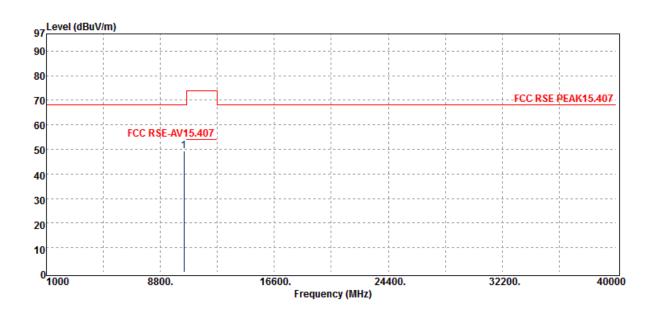
Radiated Spurious Emission Measurement Result 802.11ac VHT80, 5150~5250 MHz

Operation Band :802.11ac80B1 **Test Date** :2017-10-25

Fundamental Frequency :5210 MHz Temp./Humi. :21 deg C / 62 RH

Operation Mode :Tx CH LOW Engineer :Tin

EUT Pol. :H Plane :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
10420.00	Н	Peak	30.58	18.71	49.29	68.30	-19.01

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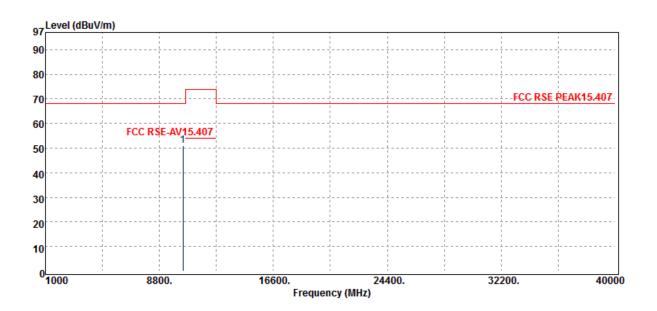
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11ac80B1 :5210 MHz :Tx CH LOW :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμ̈V	dB	dBμV/m	dBμV/m	dB
10420.00	Н	Peak	32.29	18.71	51.00	68.30	-17.30

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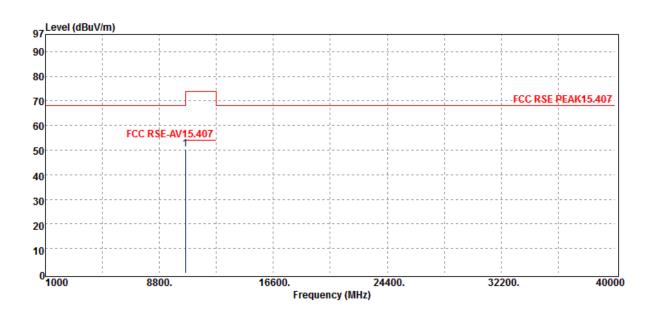
Radiated Spurious Emission Measurement Result 802.11ac VHT80, 5250~5350 MHz

:2017-10-25 **Operation Band** :802.11ac80B2 **Test Date**

Fundamental Frequency :5290 MHz Temp./Humi. :21 deg_C / 62 RH

Operation Mode :Tx CH HIGH Engineer :Tin

EUT Pol. :H Plane :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
10580.00	Н	Peak	31.35	18.88	50.23	68.30	-18.07

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

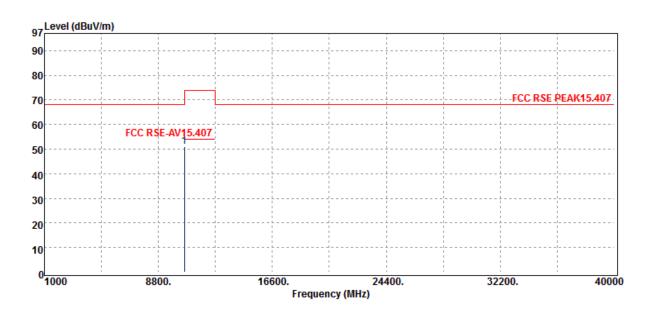
:802.11ac80B2 :5290 MHz :Tx CH HIGH :H Plane

Test Date :2017-10-25 Temp./Humi.

:21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBμV/m	dBμV/m	dB
10580.00	Н	Peak	32.21	18.88	51.09	68.30	-17.21

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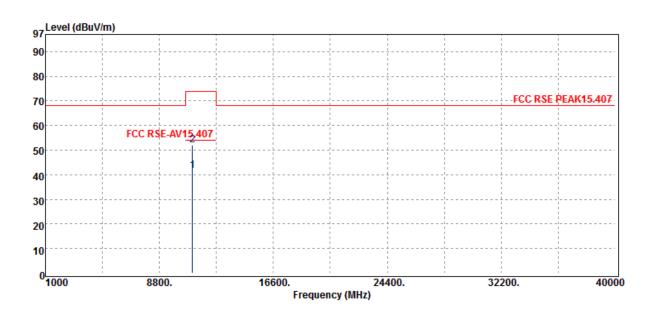
Radiated Spurious Emission Measurement Result 802.11ac VHT80, 5470~5725 MHz

:2017-10-25 **Operation Band** :802.11ac80B3 **Test Date**

Fundamental Frequency :5530 MHz Temp./Humi. :21 deg_C / 62 RH

Operation Mode :Tx CH LOW Engineer :Tin

EUT Pol. :H Plane :VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
11060.00	Н	Average	21.40	20.27	41.67	54.00	-12.33
11060.00	Н	Peak	31.91	20.27	52.18	74.00	-21.82

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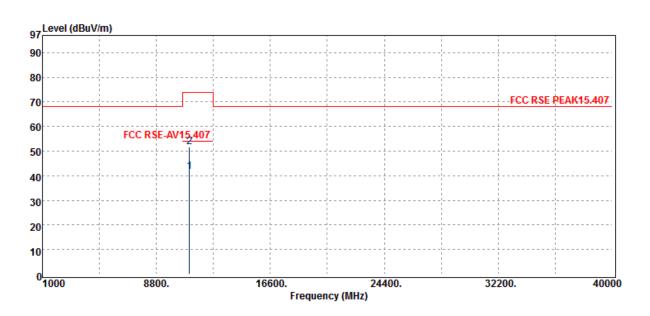
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11ac80B3 :5530 MHz :Tx CH LOW :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
11060.00	Н	Average	21.51	20.27	41.78	54.00	-12.22
11060.00	Н	Peak	31.32	20.27	51.59	74.00	-22.41

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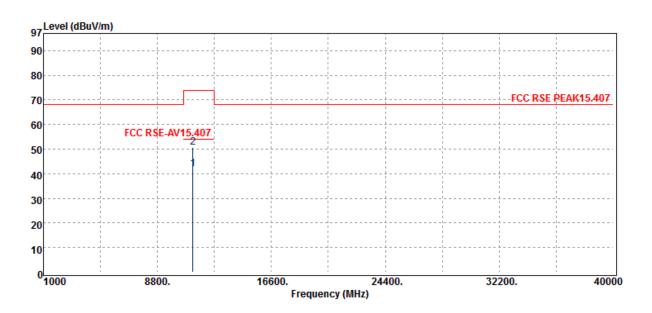
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11ac80B3 :5610 MHz :Tx CH HIGH :H Plane

Test Date :2017-10-25 Temp./Humi. :21 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
11220.00	Н	Average	21.39	20.47	41.86	54.00	-12.14
11220.00	Н	Peak	30.10	20.47	50.57	74.00	-23.43

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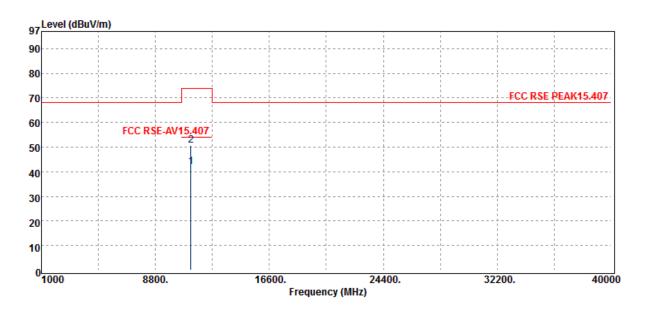
Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11ac80B3 :5610 MHz :Tx CH HIGH :H Plane

Test Date Temp./Humi.

:2017-10-25 :21 deg_C / 62 RH

Engineer :HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Safe Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
							_
11220.00	Н	Average	21.48	20.47	41.95	54.00	-12.05
11220.00	Н	Peak	30.10	20.47	50.57	74.00	-23.43

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Band edge falling to restricted band

802.11a mode

Operation Band :802.11aB1 **Fundamental Frequency** :5180 MHz

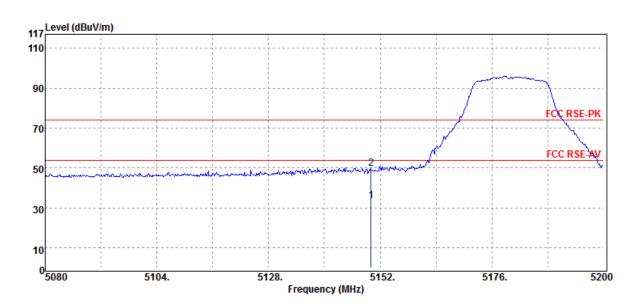
Operation Mode :Bandedge CH LOW

EUT Pol. :H Plane **Test Date** :2017-10-24

Temp./Humi. :23 deg_C / 62 RH

Engineer :Tin

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5150.00	Е	Average	27.60	5.88	33.48	54.00	-20.52
5150.00	E	Peak	44.03	5.88	49.91	74.00	-24.09

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11aB1 :5180 MHz

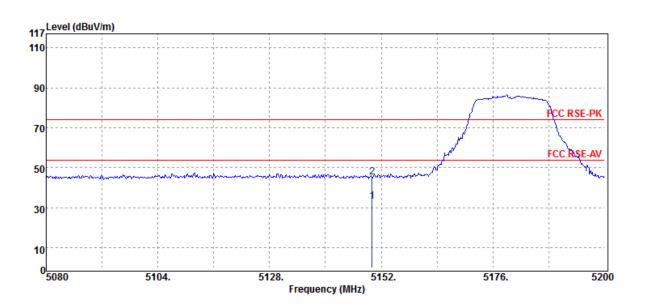
:Bandedge CH LOW

:H Plane

Test Date Temp./Humi. :2017-10-24 :23 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5150.00	E	Average	27.23	5.88	33.11	54.00	-20.89
5150.00	E	Peak	39.56	5.88	45.44	74.00	-28.56

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11aB2 :5320 MHz

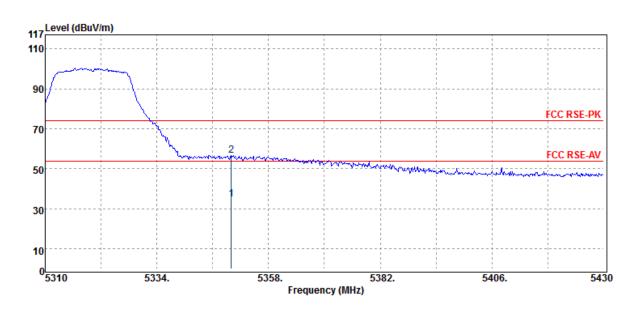
:Bandedge CH HIGH

:H Plane

Test Date :2017-10-24 Temp./Humi. :23 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5350.00	E	Average	28.83	6.16	34.99	54.00	-19.01
5350.00	Е	Peak	50.49	6.16	56.65	74.00	-17.35

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11aB2 :5320 MHz

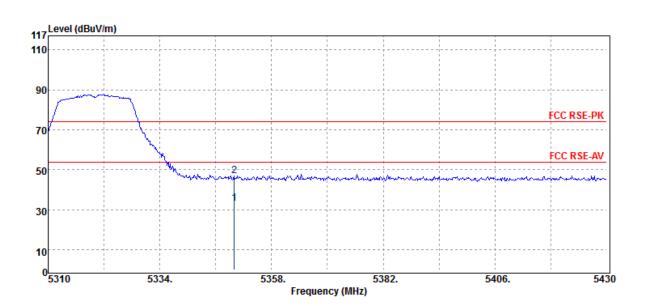
:Bandedge CH HIGH

:H Plane

Test Date :2017-10-24 Temp./Humi. :23 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
5350.00	E	Average	26.99	6.16	33.15	54.00	-20.85
5350.00	Е	Peak	40.86	6.16	47.02	74.00	-26.98

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11aB3 :5500 MHz

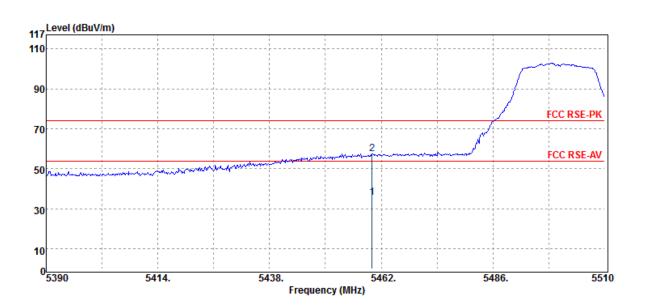
:Bandedge CH LOW

:H Plane

Test Date :2017-10-24 Temp./Humi. :23 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5460.00	E	Average	29.56	6.23	35.79	54.00	-18.21
5460.00	Е	Peak	51.17	6.23	57.40	74.00	-16.60

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11aB3 :5500 MHz

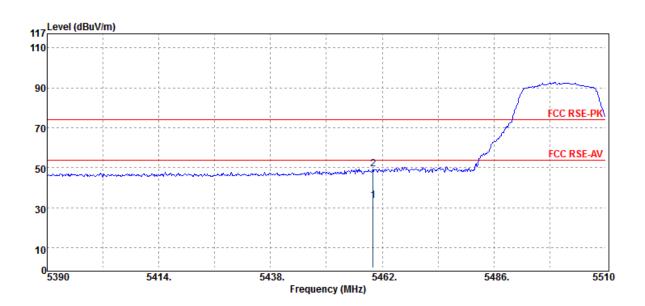
:Bandedge CH LOW

:H Plane

Test Date :2017-10-24 Temp./Humi. :23 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5460.00	Е	Average	27.25	6.23	33.48	54.00	-20.52
5460.00	E	Peak	43.20	6.23	49.43	74.00	-24.57

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11aB3 :5500 MHz

:Bandedge CH LOW RSE

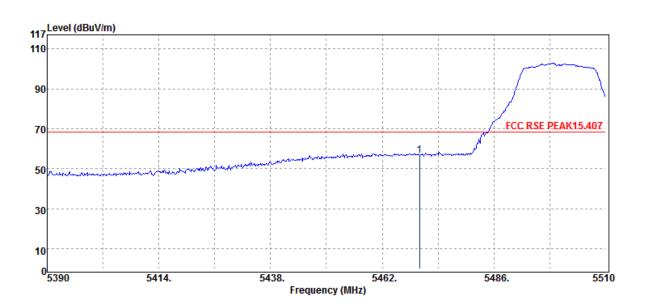
:H Plane

Test Date Temp./Humi. :2017-10-24

:23 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



	Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
			Mode	Reading Level		FS	@3m		
	MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB	
_	5470.00	E	Peak	50.34	6.26	56.60	68.30	-11.70	

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11aB3 :5500 MHz

:Bandedge CH LOW RSE

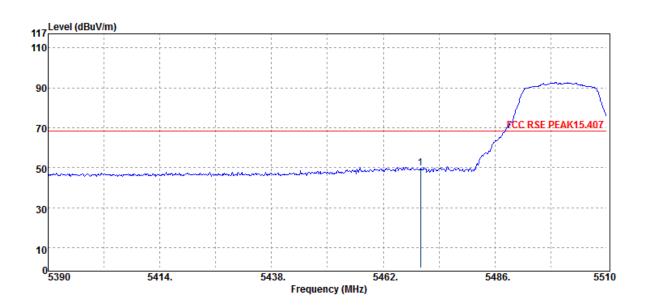
:H Plane

Test Date Temp./Humi. Engineer

:2017-10-24

:23 deg_C / 62 RH

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB	
5470.00	E	Peak	43.42	6.26	49.68	68.30	-18.62	_

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11aB3 :5700 MHz

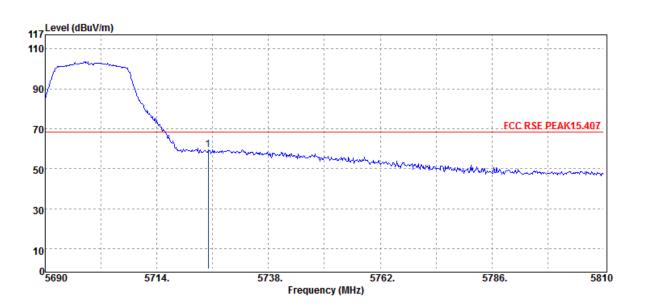
:Bandedge CH HIGH

:H Plane

Test Date :2017-10-24 Temp./Humi. :23 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBμV/m	dB
5725.0	00 E	Peak	52.88	6.59	59.47	68.30	-8.83

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11aB3 :5700 MHz

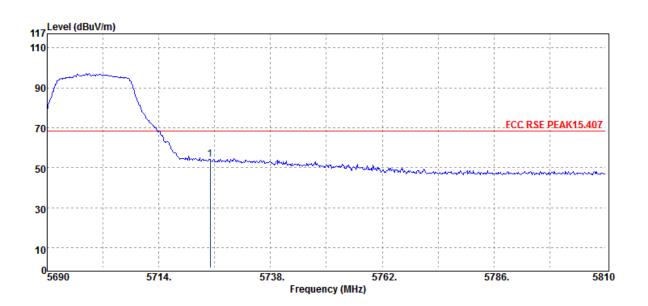
:Bandedge CH HIGH

:H Plane

Test Date Temp./Humi. Engineer

:2017-10-24 :23 deg_C / 62 RH

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
5725.00	Е	Peak	47.63	6.59	54.22	68.30	-14.08

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802.11n20 HT mode

Operation Band Fundamental Frequency

Operation Mode

EUT Pol.

:802.11n20B1 :5180 MHz

:Bandedge CH LOW

:H Plane

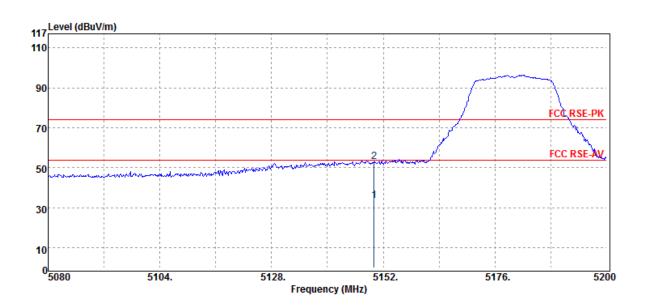
Test Date

Temp./Humi.

:2017-10-24 :23 deg_C / 62 RH

Engineer :Tin

Measurement Antenna Pol. :VERTICAL



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5150.00	E	Average	27.84	5.88	33.72	54.00	-20.28
5150.00	Е	Peak	47.34	5.88	53.22	74.00	-20.78

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20B1 :5180 MHz

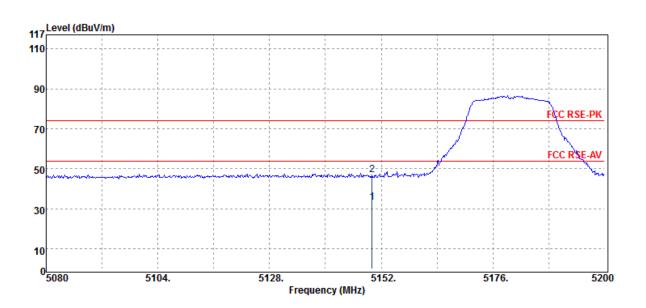
:Bandedge CH LOW

:H Plane

Test Date :2017-10-24 Temp./Humi. :23 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5150.00	E	Average	27.23	5.88	33.11	54.00	-20.89
5150.00	Е	Peak	40.99	5.88	46.87	74.00	-27.13

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

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Page: 122 of 170

Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20B2 :5320 MHz

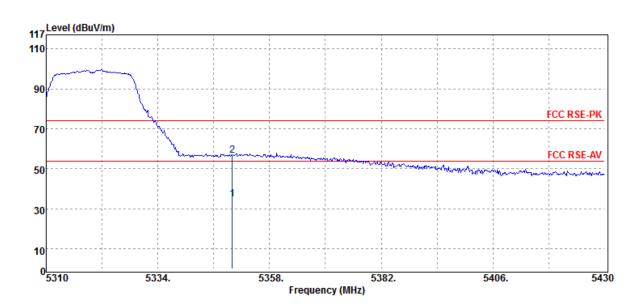
:Bandedge CH HIGH

:H Plane

Test Date :2017-10-24 Temp./Humi. :23 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5350.00	E	Average	28.76	6.16	34.92	54.00	-19.08
5350.00	Е	Peak	50.56	6.16	56.72	74.00	-17.28

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

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Page: 123 of 170

Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20B2 :5320 MHz

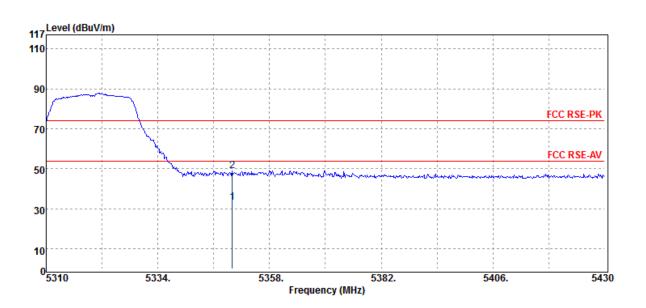
:Bandedge CH HIGH

:H Plane

Test Date :2017-10-24 Temp./Humi. :23 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
5350.00	E	Average	27.02	6.16	33.18	54.00	-20.82
5350.00	Е	Peak	42.81	6.16	48.97	74.00	-25.03

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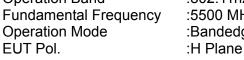
Page: 124 of 170

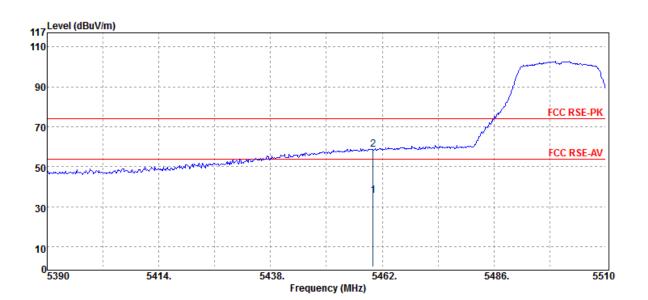
Operation Band Fundamental Frequency **Operation Mode**

:802.11n20B3 :5500 MHz :Bandedge CH LOW **Test Date** :2017-10-24 Temp./Humi. :23 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.





Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
5460.00	E	Average	29.55	6.23	35.78	54.00	-18.22
5460.00	E	Peak	52.51	6.23	58.74	74.00	-15.26

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20B3 :5500 MHz

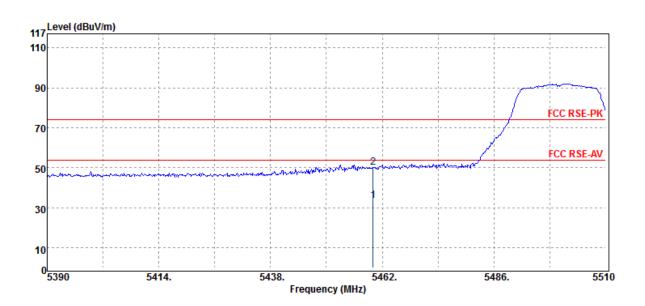
:Bandedge CH LOW

:H Plane

Test Date :2017-10-24 Temp./Humi. :23 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
5460.00	Е	Average	27.26	6.23	33.49	54.00	-20.51
5460.00	E	Peak	44.14	6.23	50.37	74.00	-23.63

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20B3 :5500 MHz

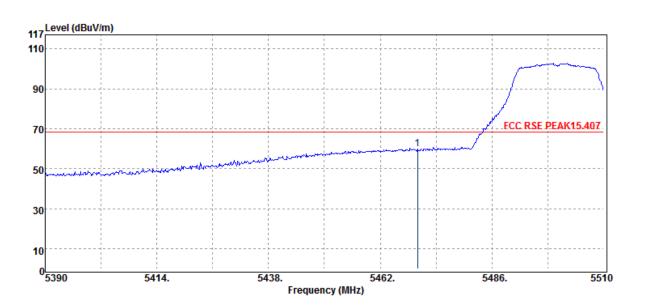
:Bandedge CH LOW RSE

:H Plane

Test Date :2017-10-24 Temp./Humi. :23 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5470.00	Е	Peak	53.54	6.26	59.80	68.30	-8.50

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20B3 :5500 MHz

:Bandedge CH LOW RSE

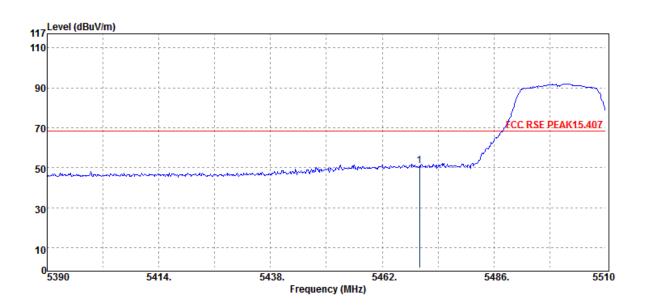
:H Plane

Test Date Temp./Humi. Engineer

:2017-10-24

:23 deg_C / 62 RH

:HORIZONTAL Measurement Antenna Pol.



	Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
			Mode	Reading Level		FS	@3m		
	MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB	
_	5470.00	E	Peak	44.80	6.26	51.06	68.30	-17.24	_

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20B3 :5700 MHz

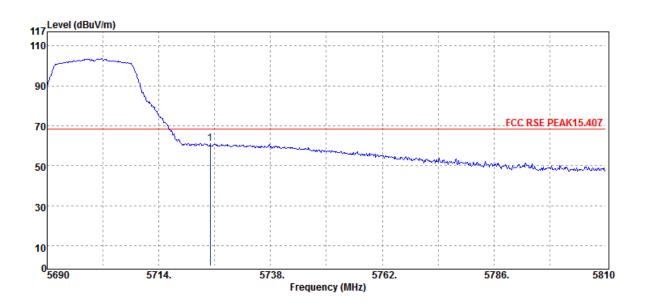
:Bandedge CH HIGH

:H Plane

Test Date :2017-10-24 Temp./Humi. :23 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	-
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
5725.00	Ē	Peak	54.40	6.59	60.99	68.30	-7.31

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n20B3 :5700 MHz

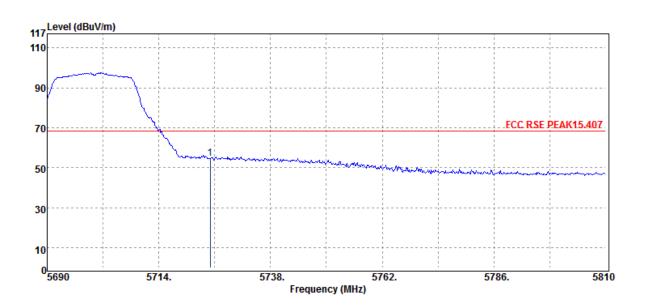
:Bandedge CH HIGH

:H Plane

Test Date :2017-10-24 Temp./Humi. :23 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq	. Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	z F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
5725.	00 E	Peak	48.24	6.59	54.83	68.30	-13.47

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SGS Taiwan Ltd.



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802.11n40 HT mode

Operation Band Fundamental Frequency Operation Mode EUT Pol.

:802.11n40B1 :5190 MHz

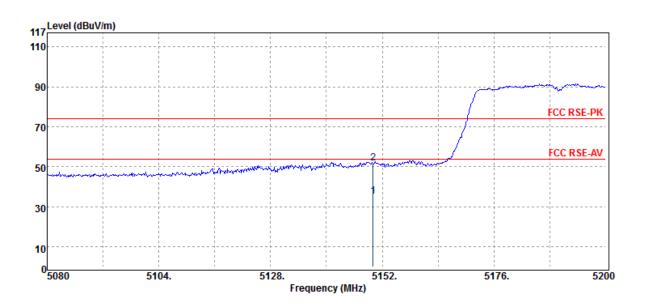
:Bandedge CH LOW

:H Plane

:2017-10-24 **Test Date**

Temp./Humi. :23 deg_C / 62 RH Engineer :Tin

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
5150.00	E	Average	29.15	5.88	35.03	54.00	-18.97
5150.00	E	Peak	46.07	5.88	51.95	74.00	-22.05

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n40B1 :5190 MHz

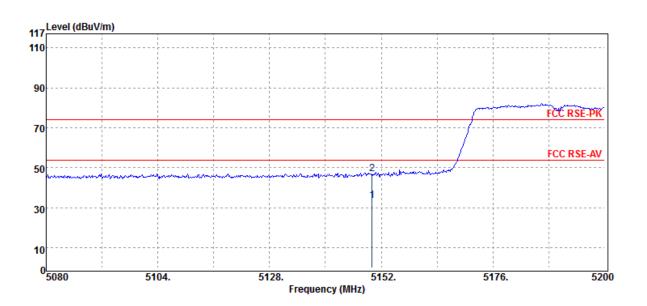
:Bandedge CH LOW

:H Plane

Test Date :2017-10-24 Temp./Humi. :23 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
5150.00	E	Average	27.62	5.88	33.50	54.00	-20.50
5150.00	Е	Peak	41.22	5.88	47.10	74.00	-26.90

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n40B2 :5310 MHz

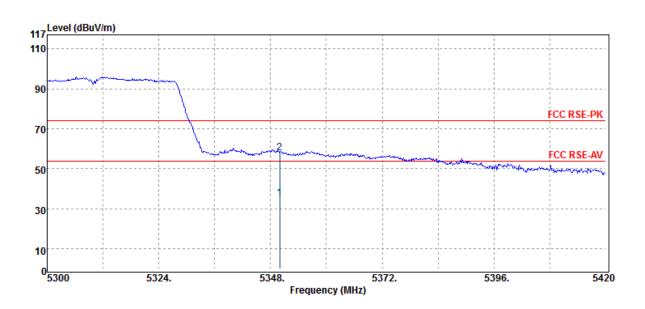
:Bandedge CH HIGH

:H Plane

Test Date :2017-10-24 Temp./Humi. :23 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5350.00	E	Average	28.89	6.16	35.05	54.00	-18.95
5350.00	Е	Peak	51.80	6.16	57.96	74.00	-16.04

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n40B2 :5310 MHz

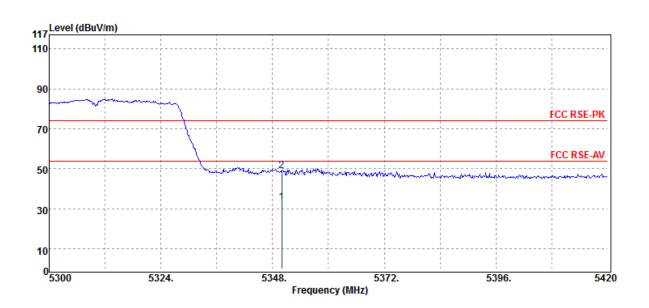
:Bandedge CH HIGH

:H Plane

Test Date :2017-10-24 Temp./Humi. :23 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
5350.00	E	Average	27.04	6.16	33.20	54.00	-20.80
5350.00	Е	Peak	43.00	6.16	49.16	74.00	-24.84

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n40B3 :5510 MHz

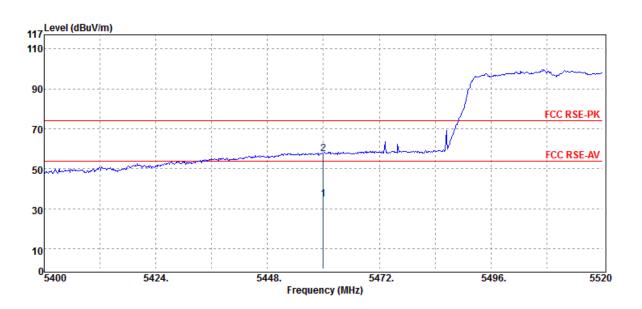
:Bandedge CH LOW

:H Plane

Test Date :2017-10-24 Temp./Humi. :23 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5460.00	E	Average	28.78	6.23	35.01	54.00	-18.99
5460.00	Е	Peak	51.38	6.23	57.61	74.00	-16.39

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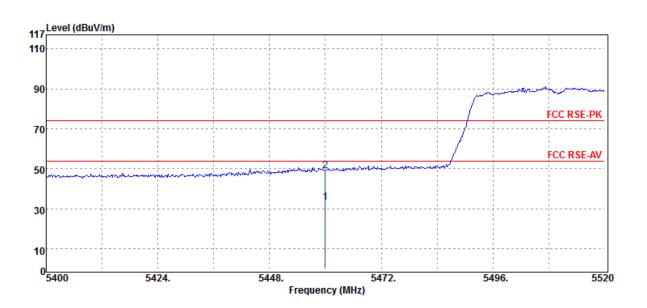
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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n40B3 :5510 MHz :Bandedge CH LOW **Test Date** Temp./Humi. Engineer

:2017-10-24 :23 deg_C / 62 RH

:H Plane :HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
5460.00	E	Average	27.16	6.23	33.39	54.00	-20.61
5460.00	E	Peak	42.91	6.23	49.14	74.00	-24.86

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n40B3 :5510 MHz

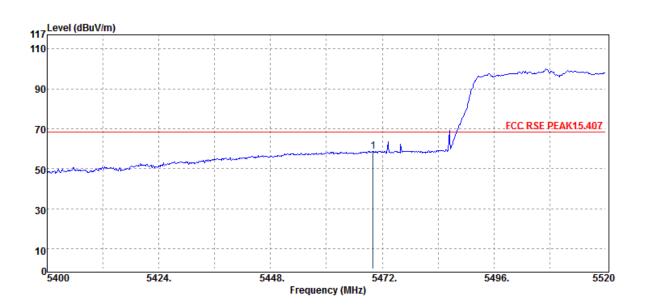
:Bandedge CH LOW RSE

:H Plane

Test Date :2017-10-24 Temp./Humi. :23 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



	Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
			Mode	Reading Level		FS	@3m		
	MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB	
_	5470.00	E	Peak	52.41	6.26	58.67	68.30	-9.63	•

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n40B3 :5510 MHz

:Bandedge CH LOW RSE

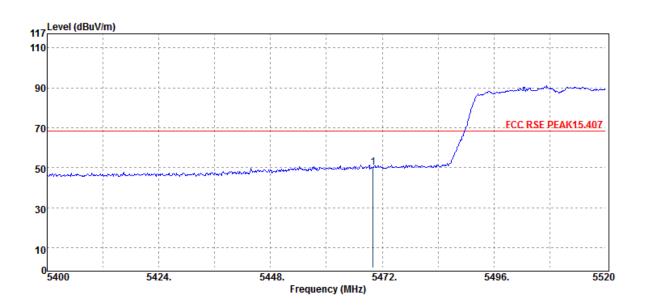
:H Plane

Test Date Temp./Humi. Engineer

:2017-10-24

:23 deg_C / 62 RH

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin	
		Mode	Reading Level		FS	@3m		
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB	
5470.00	E	Peak	43.88	6.26	50.14	68.30	-18.16	_

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n40B3 :5670 MHz

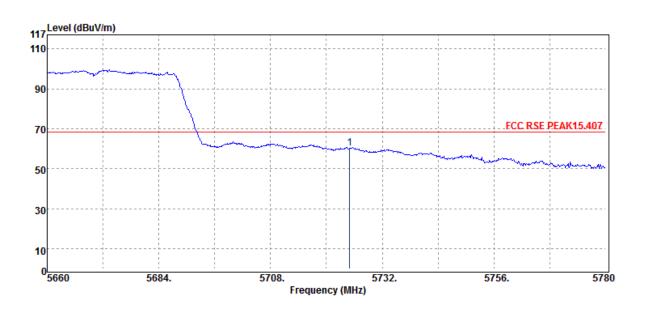
:Bandedge CH HIGH

:H Plane

Test Date :2017-10-24 Temp./Humi. :23 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5725.00	E	Peak	53.86	6.59	60.45	68.30	-7.85

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11n40B3 :5670 MHz

:Bandedge CH HIGH

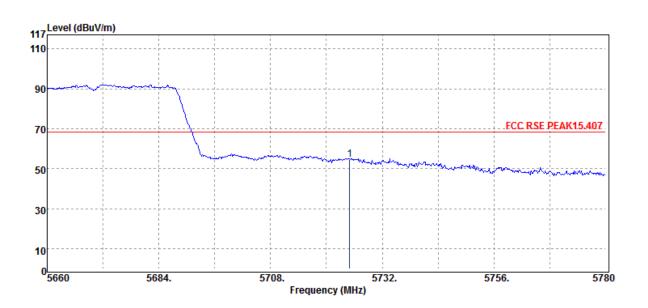
:H Plane

Test Date Temp./Humi. Engineer

:2017-10-24

:23 deg_C / 62 RH

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
5725.00	Е	Peak	48.02	6.59	54.61	68.30	-13.69

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802.11ac80 VHT mode

Operation Band :802.11ac80B1 Fundamental Frequency :5210 MHz

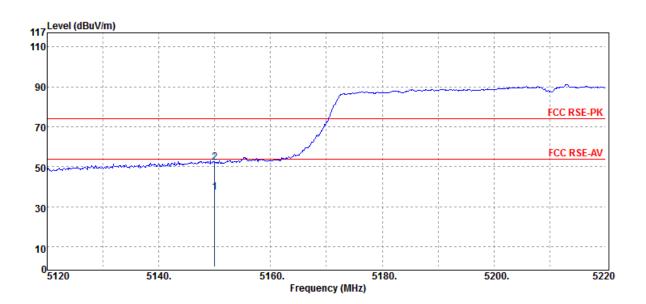
Operation Mode :Bandedge CH LOW

EUT Pol. :H Plane **Test Date** :2017-10-24

Temp./Humi. :23 deg_C / 62 RH

Engineer :Tin

Measurement Antenna Pol. :VERTICAL



	Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin	
	MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB	
_	5150.00	Е	Average	31.33	5.88	37.21	54.00	-16.79	-
	5150.00	Е	Peak	46.50	5.88	52.38	74.00	-21.62	

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

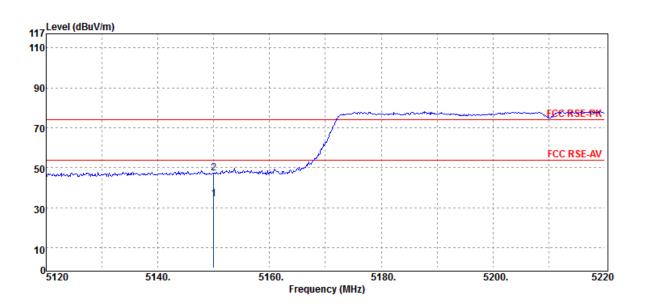
:802.11ac80B1 :5210 MHz

:Bandedge CH LOW Engineer

:H Plane

Test Date :2017-10-24 Temp./Humi. :23 deg_C / 62 RH

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5150.00	E	Average	28.38	5.88	34.26	54.00	-19.74
5150.00	Е	Peak	41.34	5.88	47.22	74.00	-26.78

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11ac80B2 :5290 MHz

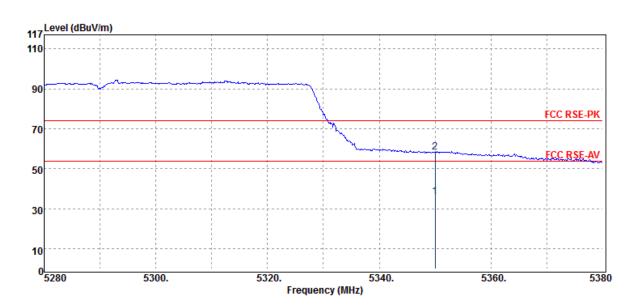
:Bandedge CH HIGH

:H Plane

Test Date :2017-10-25 Temp./Humi. :23 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
5350.00	E	Average	29.69	6.16	35.85	54.00	-18.15
5350.00	Е	Peak	51.95	6.16	58.11	74.00	-15.89

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11ac80B2 :5290 MHz

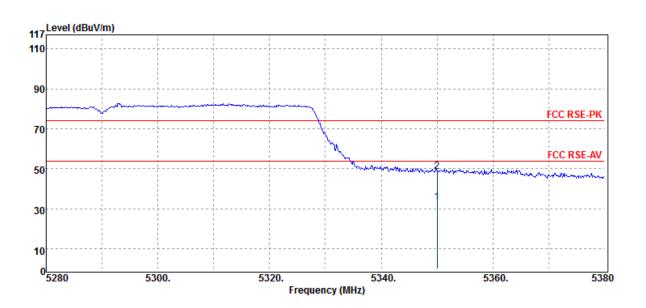
:Bandedge CH HIGH

:H Plane

Test Date :2017-10-25 Temp./Humi. :23 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBμV/m	dB
5350.00	E	Average	27.22	6.16	33.38	54.00	-20.62
5350.00	Е	Peak	42.29	6.16	48.45	74.00	-25.55

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Operation Band Fundamental Frequency **Operation Mode**

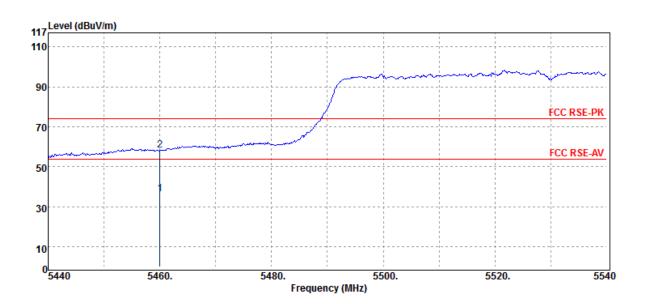
:802.11ac80B3 :5530 MHz :Bandedge CH LOW **Test Date** Temp./Humi. :2017-10-25 :23 deg_C / 62 RH

Engineer

Measurement Antenna Pol.

:VERTICAL

EUT Pol. :H Plane



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5460.00	E	Average	30.19	6.23	36.42	54.00	-17.58
5460.00	Е	Peak	52.24	6.23	58.47	74.00	-15.53

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11ac80B3 :5530 MHz

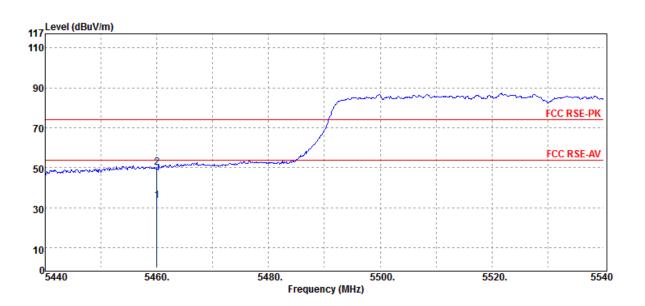
:Bandedge CH LOW

:H Plane

Test Date :2017-10-25 Temp./Humi. :23 deg_C / 62 RH

Engineer

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBµV/m	dB
5460.00	E	Average	27.53	6.23	33.76	54.00	-20.24
5460.00	E	Peak	43.78	6.23	50.01	74.00	-23.99

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11ac80B3 :5530 MHz

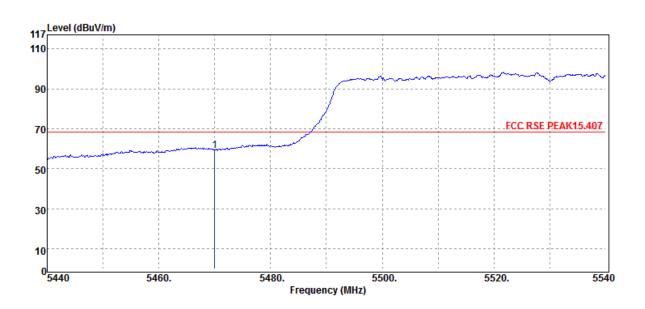
:Bandedge CH LOW RSE

:H Plane

Test Date :2017-10-25 Temp./Humi. :23 deg_C / 62 RH

Engineer

:VERTICAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5470.00	Е	Peak	53.05	6.26	59.31	68.30	-8.99

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Operation Band Fundamental Frequency **Operation Mode** EUT Pol.

:802.11ac80B3 :5530 MHz

:Bandedge CH LOW RSE

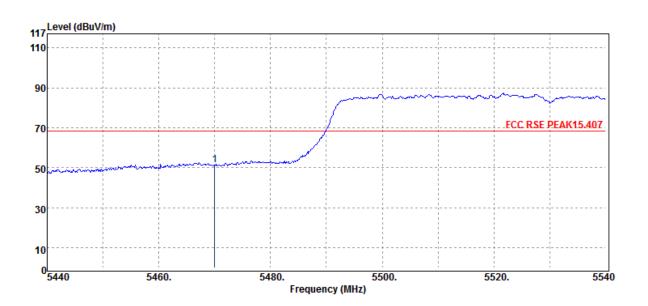
:H Plane

Test Date Temp./Humi. Engineer

:2017-10-25

:23 deg_C / 62 RH

:HORIZONTAL Measurement Antenna Pol.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBμV/m	dBμV/m	dB
5470.00	E	Peak	45.34	6.26	51.60	68.30	-16.70

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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

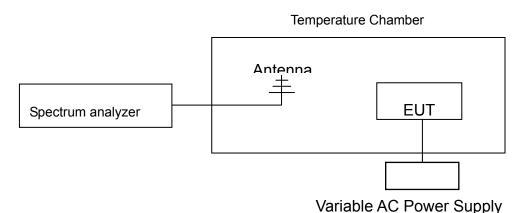
Standard Applicable

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**

- 1. 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.

Test SET-UP 13.3



13.4 **Measurement Equipment Used:**

SGS Conducted Room										
Name of Equip- ment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due					
EXA Spectrum Ana- lyzer	Agilent	N9030A	MY53120760	03/21/2017	03/20/2018					
Coaxial Cable	HUBER+SUHNER	SUCOFLEX 102	23670/2	01/05/2017	01/04/2018					
DC Block	Mini-Circuits	BLK-18-S+	1	01/05/2017	01/04/2018					
Attenuator	Mini-Circuit	BW-S10W2+	2	01/05/2017	01/04/2018					
DC Power Supply	Agilent	E3640A	MY52410006	11/21/2016	11/20/2017					

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13.5Measurement Result

Startup:

Operation Mode	802.11 a	Test Date	2017.10.20
Temperature	:23 ℃	Test By	Mike
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		36	5180	5,180.00000	0.00000000
		44	5220	5,220.00000	0.00000000
		48	5240	5,240.01489	-0.00000284
		52	5260	5,260.00000	0.00000000
		60	5300	5,300.00000	0.00000000
	4.43V	64	5320	5,319.98511	0.00000280
		100	5500	5,499.98511	0.00000271
		116	5580	5,579.98511	0.00000267
		140	5700	5,700.00000	0.00000000
-10 ℃		36	5180	5,180.01489	-0.00000288
		44	5220	5,220.00000	0.00000000
		48	5240	5,240.00000	0.00000000
		52	5260	5,260.00000	0.00000000
		60	5300	5,300.00000	0.00000000
	3.27	64	5320	5,319.98511	0.00000280
		100	5500	5,500.01489	-0.00000271
		116	5580	5,579.96997	0.00000538
		140	5700	5,699.98511	0.00000261

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		36	5180	5,180.01489	-0.00000288
		44	5220	5,220.01514	-0.00000290
		48	5240	5,240.00000	0.00000000
		52	5260	5,260.01489	-0.00000283
		60	5300	5,300.01489	-0.00000281
25 °C	3.85	64	5320	5,320.01489	-0.00000280
		100	5500	5,500.01489	-0.00000271
		116	5580	5,580.00000	0.00000000
		140	5700	5,700.00000	0.00000000
	<u> </u>	36	5180	5,179.98511	0.00000288
		44	5220	5,219.98511	0.00000285
		48	5240	5,240.00000	0.00000000
		52	5260	5,260.00000	0.00000000
		60	5300	5,299.98511	0.00000281
		64	5320	5,319.98511	0.00000280
	4.43V	100	5500	5,500.00000	0.00000000
		116	5580	5,580.00000	0.00000000
		140	5700	5,699.98511	0.00000261
55 °C		36	5180	5,180.01489	-0.00000288
		44	5220	5,220.00000	0.00000000
		48	5240	5,240.00000	0.00000000
		52	5260	5,260.00000	0.00000000
		60	5300	5,299.98511	0.00000281
	3.27	64	5320	5,320.00000	0.00000000
		100	5500	5,500.02979	-0.00000542
		116	5580	5,579.98511	0.00000267
		140	5700	5,700.00000	0.00000000

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Operation Mode	802.11 n_HT40	Test Date	2017.10.20
Temperature	:23 ℃	Test By	Mike
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		38	5190	5,190.00000	0.00000000
		46	5230	5,229.97510	0.00000476
		54	5270	5,270.00000	0.00000000
		62	5310	5,310.00000	0.00000000
	4.43V	102	5510	5,510.00000	0.00000000
		110	5550	5,549.97510	0.00000449
		134	5670	5,670.00000	0.00000000
-10 °C		38	5190	5,189.97510	0.00000480
		46	5230	5,230.00000	0.00000000
		54	5270	5,269.97510	0.00000473
		62	5310	5,310.00000	0.00000000
	3.27	102	5510	5,509.97510	0.00000452
		110	5550	5,550.00000	0.00000000
		134	5670	5,670.00000	0.00000000

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i.	•		•		
		38	5190	5,189.97510	0.00000480
		46	5230	5,229.97510	0.00000476
		54	5270	5,269.97510	0.00000473
		62	5310	5,310.00000	0.00000000
25 ℃	3.85	102	5510	5,510.00000	0.00000000
		110	5550	5,550.00000	0.00000000
		134	5670	5,669.97510	0.00000439
		38	5190	5,190.00000	0.00000000
		46	5230	5,229.97510	0.00000476
		54	5270	5,270.00000	0.00000000
		62	5310	5,309.97510	0.00000469
	4.43V	102	5510	5,510.00000	0.00000000
		110	5550	5,550.00000	0.00000000
		134	5670	5,669.97510	0.00000439
55 ℃		38	5190	5,190.00000	0.00000000
		46	5230	5,229.97510	0.00000476
		54	5270	5,269.97510	0.00000473
		62	5310	5,309.97510	0.00000469
	3.27	102	5510	5,509.97510	0.00000452
		110	5550	5,549.97510	0.00000449
		134	5670	5,669.97510	0.00000439

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Operation Mode	802.11 ac_VHT80	Test Date	2017.10.20
Temperature	:23 ℃	Test By	Mike
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		42	5210	5,210.00000	0.00000000
		58	5290	5,290.00000	0.00000000
	4.43V	106	5530	5,530.00000	0.00000000
		122	5610	5,610.00000	0.00000000
-10 °C		42	5210	5,210.04981	-0.00000956
		58	5290	5,290.00000	0.00000000
	3.27	106	5530	5,530.00000	0.00000000
		122	5610	5,610.00000	0.00000000
		42	5210	5,210.00000	0.00000000
		58	5290	5,290.00000	0.00000000
25 ℃	3.85	106	5530	5,530.00000	0.00000000
		122	5610	5,610.00000	0.00000000
		42	5210	5,210.00000	0.00000000
		58	5290	5,290.00000	0.00000000
	4.43V	106	5530	5,530.00000	0.00000000
		122	5610	5,610.00000	0.00000000
55 ℃		42	5210	5,210.00000	0.00000000
		58	5290	5,290.00000	0.00000000
	3.27	106	5530	5,530.00000	0.00000000
		122	5610	5,610.00000	0.00000000

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2 Minutes:

Operation Mode	802.11 a	Test Date	2017.10.20
Temperature	:23 ℃	Test By	Mike
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		36	5180	5,179.99287	0.00000138
		44	5220	5,220.00759	-0.00000145
		48	5240	5,240.01378	-0.00000263
		52	5260	5,260.00070	-0.00000013
		60	5300	5,299.99553	0.00000084
	4.43	64	5320	5,319.98588	0.00000265
		100	5500	5,499.98218	0.00000324
		116	5580	5,579.99421	0.00000104
		140	5700	5,699.99622	0.00000066
-10 °C		36	5180	5,180.00852	-0.00000164
		44	5220	5,219.99308	0.00000133
		48	5240	5,239.99664	0.00000064
		52	5260	5,259.99309	0.00000131
		60	5300	5,299.99586	0.00000078
	3.27	64	5320	5,319.98804	0.00000225
		100	5500	5,500.01749	-0.00000318
		116	5580	5,579.97358	0.00000473
		140	5700	5,699.99073	0.00000163
		36	5180	5,180.02355	-0.00000455
		44	5220	5,220.01814	-0.00000347
		48	5240	5,240.00723	-0.00000138
		52	5260	5,260.01504	-0.00000286
		60	5300	5,300.00535	-0.00000101
25 ℃	3.85	64	5320	5,320.01557	-0.00000293
		100	5500	5,500.02024	-0.00000368
		116	5580	5,579.99511	0.00000088
		140	5700	5,699.99605	0.00000069

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		36	5180	5,179.97964	0.00000393
		44	5220	5,219.98435	0.00000300
		48	5240	5,239.99256	0.00000142
		52	5260	5,260.00813	-0.00000155
		60	5300	5,299.98117	0.00000355
		64	5320	5,319.98511	0.00000280
	4.43	100	5500	5,500.00075	-0.00000014
		116	5580	5,579.99070	0.00000167
		140	5700	5,699.98992	0.00000177
55 °C		36	5180	5,180.01016	-0.00000196
		44	5220	5,220.00260	-0.00000050
		48	5240	5,240.00052	-0.00000010
		52	5260	5,260.00612	-0.00000116
		60	5300	5,299.99468	0.00000100
	3.27	64	5320	5,319.99784	0.00000041
		100	5500	5,500.03113	-0.00000566
		116	5580	5,579.97763	0.00000401
		140	5700	5,700.00147	-0.00000026

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Operation Mode	802.11 n_HT40	Test Date	2017.10.20
Temperature	:23 ℃	Test By	Mike
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		38	5190	5,189.99292	0.00000136
		46	5230	5,229.98240	0.00000337
		54	5270	5,270.00971	-0.00000184
		62	5310	5,309.99800	0.0000038
	4.43	102	5510	5,509.99041	0.00000174
		110	5550	5,549.97112	0.00000520
		134	5670	5,670.00246	-0.00000043
-10 °C		38	5190	5,189.98393	0.00000310
		46	5230	5,229.99807	0.0000037
		54	5270	5,269.97333	0.00000506
		62	5310	5,310.00486	-0.00000091
	3.27	102	5510	5,509.97340	0.00000483
		110	5550	5,549.99204	0.00000143
		134	5670	5,669.99166	0.00000147

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-	•		-		
		38	5190	5,189.98475	0.00000294
		46	5230	5,229.97197	0.00000536
		54	5270	5,269.98143	0.00000352
		62	5310	5,310.00877	-0.00000165
25 ℃	3.85	102	5510	5,509.99097	0.00000164
		110	5550	5,550.00276	-0.00000050
		134	5670	5,669.97716	0.00000403
		38	5190	5,189.99182	0.00000158
		46	5230	5,229.97973	0.00000388
		54	5270	5,270.00815	-0.00000155
		62	5310	5,309.98157	0.00000347
	4.43	102	5510	5,509.99305	0.00000126
		110	5550	5,549.99104	0.00000162
		134	5670	5,669.97613	0.00000421
55 °C		38	5190	5,189.99658	0.00000066
		46	5230	5,229.97373	0.00000502
		54	5270	5,269.97398	0.00000494
		62	5310	5,309.97656	0.00000442
	3.27	102	5510	5,509.97088	0.00000528
		110	5550	5,549.98162	0.00000331
		134	5670	5,669.97368	0.00000464

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Operation Mode	802.11 ac_VHT80	Test Date	2017.10.20
Temperature	:23 ℃	Test By	Mike
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		42	5210	5,209.99454	0.00000105
		58	5290	5,290.00172	-0.00000032
	4.43	106	5530	5,530.00014	-0.00000003
		122	5610	5,610.00854	-0.00000152
-10 °C		42	5210	5,210.05263	-0.00001010
		58	5290	5,289.99430	0.00000108
	3.27	106	5530	5,529.99185	0.00000147
		122	5610	5,610.00141	-0.00000025
		42	5210	5,209.99176	0.00000158
		58	5290	5,290.00854	-0.00000161
25 ℃	3.85	106	5530	5,529.99031	0.00000175
		122	5610	5,610.00504	-0.00000090
		42	5210	5,209.99798	0.00000039
		58	5290	5,289.99893	0.00000020
	4.43	106	5530	5,530.00730	-0.00000132
		122	5610	5,610.00594	-0.00000106
55 ℃		42	5210	5,209.99660	0.00000065
		58	5290	5,290.00437	-0.00000083
	3.27	106	5530	5,529.99229	0.00000139
		122	5610	5,609.99392	0.00000108

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5 Minutes:

Operation Mode	802.11 a	Test Date	2017.10.20
Temperature	:23 ℃	Test By	Mike
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		36	5180	5,179.99236	0.00000148
		44	5220	5,220.00384	-0.00000074
		48	5240	5,240.00903	-0.00000172
		52	5260	5,259.99679	0.00000061
		60	5300	5,300.00522	-0.00000098
	4.43	64	5320	5,319.99243	0.00000142
		100	5500	5,499.97967	0.00000370
		116	5580	5,579.98472	0.00000274
		140	5700	5,699.99706	0.00000052
-10 °C		36	5180	5,180.02273	-0.00000439
		44	5220	5,219.99204	0.00000152
		48	5240	5,240.00007	-0.00000001
		52	5260	5,260.00221	-0.00000042
		60	5300	5,300.00316	-0.00000060
	3.27	64	5320	5,319.99427	0.00000108
		100	5500	5,500.02256	-0.00000410
		116	5580	5,579.96412	0.00000643
		140	5700	5,699.98874	0.00000198
	<u> </u>	36	5180	5,180.01886	-0.00000364
		44	5220	5,220.02350	-0.00000450
		48	5240	5,240.00864	-0.00000165
		52	5260	5,260.00970	-0.00000184
		60	5300	5,300.01415	-0.00000267
25 ℃	3.85	64	5320	5,320.02067	-0.00000389
		100	5500	5,500.00967	-0.00000176
		116	5580	5,579.99139	0.00000154
		140	5700	5,699.99417	0.00000102

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	1	36	5180	5,179.97746	0.00000435
		44	5220	5,219.98561	0.00000276
		48	5240	5,239.99803	0.00000038
		52	5260	5,260.00961	-0.00000183
		60	5300	5,299.99136	0.00000163
		64	5320	5,319.99078	0.00000173
	4.43	100	5500	5,500.00397	-0.00000072
		116	5580	5,580.00350	-0.00000063
		140	5700	5,699.98300	0.00000298
55 °C		36	5180	5,180.00955	-0.00000184
		44	5220	5,219.99758	0.00000046
		48	5240	5,240.00356	-0.00000068
		52	5260	5,260.00307	-0.00000058
		60	5300	5,299.98187	0.00000342
	3.27	64	5320	5,320.00371	-0.00000070
		100	5500	5,500.02361	-0.00000429
		116	5580	5,579.99011	0.00000177
		140	5700	5,700.00645	-0.00000113

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Operation Mode	802.11 n_HT40	Test Date	2017.10.20
Temperature	:23 ℃	Test By	Mike
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		38	5190	5,190.00895	-0.00000173
		46	5230	5,229.96733	0.00000625
		54	5270	5,269.99373	0.00000119
		62	5310	5,309.99338	0.00000125
	4.43	102	5510	5,510.00796	-0.00000144
		110	5550	5,549.97986	0.00000363
		134	5670	5,669.99926	0.00000013
-10 °C		38	5190	5,189.97494	0.00000483
		46	5230	5,230.00049	-0.00000009
		54	5270	5,269.97236	0.00000524
		62	5310	5,309.99617	0.00000072
	3.27	102	5510	5,509.97658	0.00000425
		110	5550	5,550.00661	-0.00000119
		134	5670	5,669.99473	0.00000093

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		38	5190	5,189.97270	0.00000526
		46	5230	5,229.98023	0.00000378
		54	5270	5,269.98428	0.00000298
		62	5310	5,310.00088	-0.00000016
25 ℃	11.55V	102	5510	5,509.99588	0.0000075
		110	5550	5,549.99652	0.00000063
		134	5670	5,669.98402	0.00000282
		38	5190	5,189.99951	0.00000009
		46	5230	5,229.96984	0.00000577
		54	5270	5,269.99630	0.0000070
		62	5310	5,309.97017	0.00000562
	13.283V	102	5510	5,509.99051	0.00000172
		110	5550	5,550.00813	-0.00000146
		134	5670	5,669.98507	0.00000263
55 ℃		38	5190	5,189.99203	0.00000153
		46	5230	5,229.97217	0.00000532
		54	5270	5,269.97378	0.00000498
		62	5310	5,309.97958	0.00000385
	10.1V	102	5510	5,509.96681	0.00000602
		110	5550	5,549.97741	0.00000407
		134	5670	5,669.97152	0.00000502

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Operation Mode	802.11 ac_VHT80	Test Date	2017.10.20
Temperature	:23 ℃	Test By	Mike
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		42	5210	5,210.00927	-0.00000178
		58	5290	5,289.99087	0.00000173
	4.43	106	5530	5,530.00862	-0.00000156
		122	5610	5,610.00942	-0.00000168
-10 °C		42	5210	5,210.04753	-0.00000912
		58	5290	5,289.99489	0.00000097
	3.27	106	5530	5,529.99130	0.00000157
		122	5610	5,609.99459	0.00000096
		42	5210	5,209.99646	0.00000068
		58	5290	5,289.99148	0.00000161
25 ℃	3.85	106	5530	5,529.99784	0.0000039
		122	5610	5,609.99089	0.00000162
		42	5210	5,209.99023	0.00000188
		58	5290	5,289.99361	0.00000121
	4.43	106	5530	5,529.99608	0.00000071
		122	5610	5,609.99277	0.00000129
55 ℃		42	5210	5,210.00169	-0.00000032
		58	5290	5,289.99843	0.00000030
	3.27	106	5530	5,530.00060	-0.00000011
		122	5610	5,610.00657	-0.00000117

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10 Minutes:

Operation Mode	802.11 a	Test Date	2017.10.20
Temperature	:23 ℃	Test By	Mike
Humidity	:68 %		

			Measured	Spectrum	
Test Temp.	Test Voltage	Channel	Frequency	Frequency	ΔFrequency
1000 10			(MHz)	(MHz)	(MHz)
		36	5180	5,180.00996	-0.00000192
		44	5220	5,219.99887	0.00000022
		48	5240	5,240.01408	-0.00000269
		52	5260	5,260.00134	-0.00000025
		60	5300	5,299.99354	0.00000122
	4.43	64	5320	5,319.97898	0.00000395
		100	5500	5,499.99295	0.00000128
		116	5580	5,579.98367	0.00000293
		140	5700	5,700.00598	-0.00000105
-10 °C		36	5180	5,180.01673	-0.00000323
		44	5220	5,220.00517	-0.00000099
		48	5240	5,240.00270	-0.00000052
		52	5260	5,260.00965	-0.00000183
		60	5300	5,300.00319	-0.00000060
	3.27	64	5320	5,319.99384	0.00000116
		100	5500	5,500.02346	-0.00000427
		116	5580	5,579.96658	0.00000599
		140	5700	5,699.98866	0.00000199
		36	5180	5,180.00911	-0.00000176
		44	5220	5,220.01803	-0.00000345
		48	5240	5,239.99960	0.00000008
		52	5260	5,260.02375	-0.00000452
		60	5300	5,300.00547	-0.00000103
25 °C	3.85	64	5320	5,320.01111	-0.00000209
		100	5500	5,500.01147	-0.00000209
		116	5580	5,579.99142	0.00000154
		140	5700	5,700.00400	-0.00000070

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		36	5180	5,179.97750	0.00000434
		44	5220	5,219.99435	0.00000108
		48	5240	5,240.00157	-0.00000030
		52	5260	5,260.00593	-0.00000113
		60	5300	5,299.97837	0.00000408
		64	5320	5,319.98423	0.00000297
	4.43	100	5500	5,500.00000	0.00000000
		116	5580	5,579.99710	0.00000052
		140	5700	5,699.98814	0.00000208
55 °C		36	5180	5,180.00940	-0.00000182
		44	5220	5,220.00190	-0.00000036
		48	5240	5,239.99287	0.00000136
		52	5260	5,259.99951	0.00000009
		60	5300	5,299.98914	0.00000205
	3.27	64	5320	5,320.00851	-0.00000160
		100	5500	5,500.02123	-0.00000386
		116	5580	5,579.99232	0.00000138
		140	5700	5,700.00999	-0.00000175

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Operation Mode	802.11 n_HT40	Test Date	2017.10.20
Temperature	:23 ℃	Test By	Mike
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		38	5190	5,190.00358	-0.00000069
		46	5230	5,229.97026	0.00000569
		54	5270	5,270.00046	-0.00000009
		62	5310	5,309.99792	0.00000039
	4.43	102	5510	5,509.99861	0.00000025
		110	5550	5,549.96979	0.00000544
		134	5670	5,669.99720	0.00000049
-10 °C		38	5190	5,189.98072	0.00000371
		46	5230	5,230.00850	-0.00000162
		54	5270	5,269.98118	0.00000357
		62	5310	5,309.99686	0.00000059
	3.27	102	5510	5,509.97153	0.00000517
		110	5550	5,550.00438	-0.00000079
		134	5670	5,670.00943	-0.00000166

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_	_		_	_	_
		38	5190	5,189.98037	0.00000378
		46	5230	5,229.96802	0.00000612
		54	5270	5,269.98129	0.00000355
		62	5310	5,310.00529	-0.00000100
25 ℃	3.85	102	5510	5,510.00164	-0.00000030
		110	5550	5,549.99571	0.00000077
		134	5670	5,669.97315	0.00000474
		38	5190	5,190.00878	-0.00000169
		46	5230	5,229.97513	0.00000476
		54	5270	5,269.99249	0.00000143
		62	5310	5,309.97646	0.00000443
	4.43	102	5510	5,509.99392	0.00000110
		110	5550	5,550.00132	-0.00000024
		134	5670	5,669.97555	0.00000431
55 °C		38	5190	5,190.00906	-0.00000175
		46	5230	5,229.96791	0.00000614
		54	5270	5,269.98487	0.00000287
		62	5310	5,309.96805	0.00000602
	3.27	102	5510	5,509.97393	0.00000473
		110	5550	5,549.97436	0.00000462
		134	5670	5,669.96834	0.00000558

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Operation Mode	802.11 ac_VHT80	Test Date	2017.10.20
Temperature	:23 ℃	Test By	Mike
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		42	5210	5,210.00477	-0.00000091
		58	5290	5,290.00906	-0.00000171
	4.43	106	5530	5,529.99118	0.00000160
		122	5610	5,610.00994	-0.00000177
-10 °C		42	5210	5,210.05911	-0.00001135
		58	5290	5,290.00771	-0.00000146
	3.27	106	5530	5,530.00353	-0.00000064
		122	5610	5,609.99545	0.00000081
		42	5210	5,209.99880	0.00000023
		58	5290	5,289.99461	0.00000102
25 ℃	3.85	106	5530	5,530.00952	-0.00000172
		122	5610	5,610.00976	-0.00000174
		42	5210	5,209.99800	0.0000038
		58	5290	5,290.00222	-0.00000042
	4.43	106	5530	5,529.99233	0.00000139
		122	5610	5,609.99730	0.00000048
55 ℃		42	5210	5,210.00411	-0.00000079
		58	5290	5,290.00593	-0.00000112
	3.27	106	5530	5,530.00057	-0.00000010
		122	5610	5,610.00704	-0.00000125

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14. ANTENNA REQUIREMENT

14.1 Standard Applicable

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

An embedded-in antenna design is used.

The antenna is designed with unique type RF connector and no consideration of replacement. Please see EUT photo and antenna spec. for details.

The antenna gain is less than 6dBi. Therefore, it is not necessary to reduce maximum output power limit.

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