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# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

# INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART E REQUIREMENT

OF

**Product Name: Personal Device Assistant** 

**Datalogic Brand Name: DL-Axist** Model No.:

**Personal Device Assistant Model Difference:** 

TYPE with

**Issue Date:** 

00ANM4HL1FT1A4 WLAN/BT/NFC:

FCC ID: U4GDLNFCR1 E2/2015/B0092 Report No.:

**FCC Rule Part:** §15.407

**FUJITSU LIMITED** 

4-1-1, Kamikodanaka, Nakahara-ku, **Prepared for:** 

Mar. 14, 2016

Kawasaki-shi, Kanagawa, 211-8588, Japan

SGS Taiwan Ltd.

**Electronics & Communication Laboratory** Prepared by:

No.2, Keji 1st Rd., Guishan District,

Taoyuan City, Taiwan 333





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# **VERIFICATION OF COMPLIANCE**

**Applicant:** Datalogic ADC S.r.l.

Via San Vitalino no. 13, Calderara di Reno - 40012 (Bologna) Italy

Personal Device Assistant **Product Name:** 

Datalogic **Brand Name: DL-Axist** Model No.:

**TYPE** with

WLAN/BT/NFC:

00ANM4HL1FT1A4

N/A **Model Difference:** 

FCC ID: U4GDLNFCR1 E2/2015/B0092 File Number:

Date of test: Nov. 24, 2015 ~ Mar. 14, 2016

Date of EUT Received: Nov. 24, 2015

### 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:	Aken Huang	Date:	Mar. 14, 2016	
Prepared By:	Aken Huang / Engineer Tiffany Kao	Date:	Mar. 14, 2016	
Approved By:	Tiffany Kao / Clerk  Jim Chang / Asst. Manager	Date:	Mar. 14, 2016	

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# **Revision History**

Report Number	Revision	Description	Issue Date
E2/2015/B0092	Rev.00	Initial creation of document	Mar. 14, 2016

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### **GENERAL INFORMATION**

# 1.1 Product Description

#### General:

eneral.				
Product Name:	Personal Device Assistant			
Brand Name:	Datalogic			
Model No.:	DL-Axist			
TYPE with WLAN/BT/NFC:	00ANM4H	HL1FT1A4		
Model Difference:	N/A			
Product SW/HW version:	4.1.1 0.00.17.2015 1106 eng / DLX WLAN R1  N/A / N/A  N/A			
Radio SW/HW version:				
Test SW Version:				
RF power setting in TEST SW:	N/A			
	3.8Vdc from rechargeable battery and 5.0Vdc from adapter			
Power Supply:	Battery:	<ol> <li>Model No.: Standard BTDL1, Supplier: JMS</li> <li>Model No.: Extended BTDL1, Supplier: JMS</li> </ol>		
т отог сарргу.	Adapter:	<ol> <li>Model No.: SYS1460-1005, Supplier: Sunny</li> <li>Model No.: SYS1561-1005, Supplier: Sunny</li> </ol>		

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### WLAN 5GHz:

Wi-Fi	Frequency Range	Channels	Rated Power (Avg.)	Modulation Technology	
	5150~5250	4	11.12 dBm		
44.5	5250~5350	4	10.65 dBm	OFDM	
11a	5470~5725	12	9.49 dBm	OFDM	
	5725-5850	5	8.69 dBm		
	HT20 5150~5250	4	11.50 dBm		
11n 20M	HT20 5250~5350	4	10.69 dBm	OFDM	
1111 20101	HT20 5470~5725	12	9.54 dBm	OI DIVI	
	HT20 5725-5850	5	8.79 dBm		
	HT40 5150~5250	2	10.50 dBm		
11n 40M	HT40 5250~5350	2	10.12 dBm	OFDM	
	HT40 5470~5725	6	10.95 dBm	. OFDIVI	
	HT40 5725-5850	2	7.21 dBm		

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Antenna Designation	PIFA Antenna Main: 5GHz Gain: 2.88dBi (5150MHz-5250MHz) 5GHz Gain: 2.98dBi (5250MHz-5350MHz) 5GHz Gain: 3.69dBi (5470MHz-5725MHz) 5GHz Gain: 1.21dBi (5725MHz-5850MHz) Aux: 5GHz Gain: 2.59dBi (5150MHz-5250MHz) 5GHz Gain: 2.59dBi (5250MHz-5350MHz) 5GHz Gain: 2.37dBi (5470MHz-5725MHz) 5GHz Gain: 2.57dBi (5725MHz-5850MHz)
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 – 65Mbps 802.11 n_40MHz: 13.5 – 135Mbps

### 1.2 Product Feature of Equipment Under Test

The equipment under Test (Hereafter Called: EUT) is supporting Wi-Fi 802.11a/b/g/n and Bluetooth features, and below are details of information.

Product Feature			
Product Name:	Personal Device Assistant		
Brand Name:	Datalogic		
Model No.:	DL-Axist		
Model Difference:	N/A		
IC:	3862E-DLNFCR1		
Wi-Fi Specification	802.11a/b/g/n		
Bluetooth Version	V4.0 (dual mode)		
NFC Specification	NFC		

Note: The above EUT information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

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### 1.3 Test Methodology of Applied Standards

FCC Part 15, Subpart E §15.407

FCC KDB 789033 D02 General UNII Test Procedures New Rules.

ANSI C63.10:2013

#### Note:

- 1. All test items have been performed and record as per the above standards.
- The composite system is compliance with FCC Subpart B is authorized under the certification procedure.

### 1.4 Test Facility

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

FCC Registration Numbers are: 628985

Canada Registration Number: 4620A-5.

### 1.5 Special Accessories

There are no special accessories used while test was conducted.

### 1.6 Equipment Modifications

There was no modification incorporated into the EUT.

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### SYSTEM TEST CONFIGURATION

### 2.1 EUT Configuration

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

#### 2.2 EUT Exercise

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

#### 2.3 Test Procedure

#### 2.3.1 Conducted Emissions

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

#### 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 hand-held 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.

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### 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.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor. Following shows an offset computation example with cable loss 1dB, and 10dB attenuator.

#### offset

= RF cable loss (dB)+ attenuation factor(dB)=11(dB)

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### 2.5 Configuration of Tested System

Fig. 2-1 Radiated Emission Configuration



Fig. 2-2 Conducted (Antenna Port) Configuration

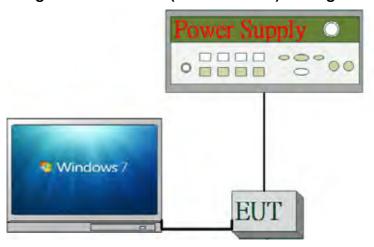


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	WLAN Test Software	N/A	N/A	N/A	N/A	N/A
2.	Notebook	Lenovo	L430	R9-YYG88	Shielded	Un-shielded
3.	DC Power Supply	Agilent	E3640A	MY53140006	N/A	Un-shielded

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### **SUMMARY OF TEST RESULT**

FCC Rules Description Of Test		Result
§15.207	§15.207 AC Power Line Conducted Emission	
§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)	§15.407(g) Frequency Stability	
§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

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

2 channels are provided for 802.11n\_HT40

•	CHANNEL	FREQUENCY	CHANNEL	FREQUENCY		
	38	5190 MHz	46	5230 MHz		

Operated band in 5250 MHz ~5350 MHz:

4 channels are provided for 802.11a, 802.11n HT20

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

2 channels are provided for 802.11n HT40

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
54	5270 MHz	62	5310 MHz

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

11 channels are provided for 802.11a, 802.11n HT20

510 Vided 101 002.114, 002.1111_11120					
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	144	5720 MHz		

5 channels are provided for 802.11n HT40

_						
	CHANNEL	FREQUENCY	CHANNEL	FREQUENCY		
	102	5510 MHz	126	5630 MHz		
ſ	110	5550 MHz	134	5670 MHz		
	118	5590 MHz	142	5710 MHz		

3

Operated band in 5725 MHz ~5850 MHz:

5 channels are provided for 802.11a, 802.11n HT20

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
149	5745 MHz	161	5805 MHz
153	5765 MHz	165	5825 MHz
157	5785 MHz		

2 channels are provided for 802.11n HT40

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
151	5755 MHz	159	5795 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 programmed.
- 3. Investigation has been done on all the possible configurations for searching the worst case.

#### **RADIATED EMISSION TEST**

NADIA I ED E	RADIATED EMISSION TEST:					
	RADIATED EMISSION TEST (BELOW 1 GHz)					
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5180~5240	36 to 48	44	OFDM	6	MAIN
802.11a	5260~5320	52 to 64	60	OFDM	6	MAIN
802.11a	5500~5720	100 to 140	116	OFDM	6	MAIN
802.11a	5745~5825	149 to 165	157	OFDM	6	MAIN
	RADIATED EMISSION TEST (ABOVE 1 GHz)					
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5180~5240	36 to 48	36,44,48	OFDM	6	MAIN
802.11n_HT20	3100~3240	30 10 40	30,44,40	OFDM	MCS0	MAIN
802.11n_HT40	5190~5230	38 to 46	38,46	OFDM	MCS0	MAIN
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	MAIN
802.11n_HT20	5200~5320	52 10 04	52,00,04	OFDM	MCS0	MAIN
802.11n_HT40	5270~5310	54 to 62	54,62	OFDM	MCS0	MAIN

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MODE	FREQUENCY BAND (MHz)		TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	FF00 F700	100 to 144	100 110 140	OFDM	6	MAIN
802.11n_HT20	5500~5720	100 to 144	100,116,140	OFDM	MCS0	MAIN
802.11n_HT40	5510~5710	102 to 142	102,110,134	OFDM	MCS0	MAIN
802.11a	5745~5825	140 to 165	140 157 165	OFDM	6	MAIN
802.11n_HT20	0/40~5825	149 to 165	149,157,165	OFDM	MCS0	MAIN
802.11n_HT40	5755~5795	151 to 159	151,159	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 E1 position was reported.

### ANTENNA DODT CONDUCTED MEASUDEMENT.

ANTENNA PORT CONDUCTED MEASUREMENT:						
		CON	IDUCTED TEST			
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5180~5240	26 to 49	26 44 49	OFDM	6	MAIN
802.11ac_HT20	3100~3240	36 to 48	36,44,48	OFDM	MCS0	MAIN
802.11ac_HT40	5190~5230	38 to 46	38,46	OFDM	MCS0	MAIN
802.11a	5260~5320	52 to 64	52 60 64	OFDM	6	MAIN
802.11ac_HT20	3200~3320	52 10 64	52,60,64	OFDM	MCS0	MAIN
802.11ac_HT40	5270~5310	54 to 62	54,62	OFDM	MCS0	MAIN
802.11a	5500, 5700	100 to 144	100,116,140,144	OFDM	6	MAIN
802.11ac_HT20	5500~5720	100 to 144	100,116,140,144	OFDM	MCS0	MAIN
802.11ac_HT40	5510~5710	102 to 142	102,110,134,142	OFDM	MCS0	MAIN
802.11a	E74E E00E	140 to 105	140 157 105	OFDM	6	MAIN
802.11ac_HT20	5745~5825	149 to 165	149,157,165	OFDM	MCS0	MAIN
802.11ac_HT40	5755~5795	151 to 159	151,159	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 : <b>Vertical</b> )	0.417GHz-1GHz: +/- 3.19dB
	1GHz - 18GHz: +/- 4.04dB
	18GHz - 40GHz: +/- 4.04dB

	9kHz-30MHz: +/-2.87dB
	30MHz - 167MHz: +/- 4.22dB
Measurement uncertainty	167MHz -500MHz: +/- 3.44dB
(Polarization : 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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#### 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

- 1. The lower limit shall apply at the transition frequencies
- 2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

### 6.2. Measurement Equipment Used

Conducted Emission Test Site					
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.
TYPE		NUMBER	NUMBER	CAL.	
EMI Test Receiver	R&S	ESCI 3	101311	06/18/2015	06/17/2016
Coaxial Cables	N/A	N30N30-1042-150 cm	N/A	02/07/2015	02/06/2016
LISN	Schwarzbeck	NSLK 8127	8127-648	06/09/2015	06/08/2016
LISN	Rolf-Heine	NNB-2/16Z	99012	03/04/2015	03/03/2016
Test Software	Farad	EZ-EMC	Ver. SGS-03A2	N.C.R.	N.C.R.

## 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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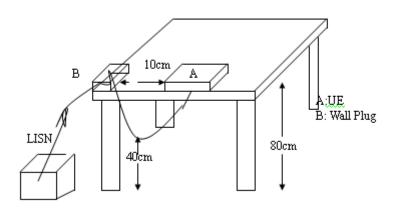
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#### 6.4. Test SET-UP



### 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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### AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode: Operation mode Test Date: Dec. 15, 2015

Temperature: 23.8

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Conduction Room

Phase:

Temperature: 21 %

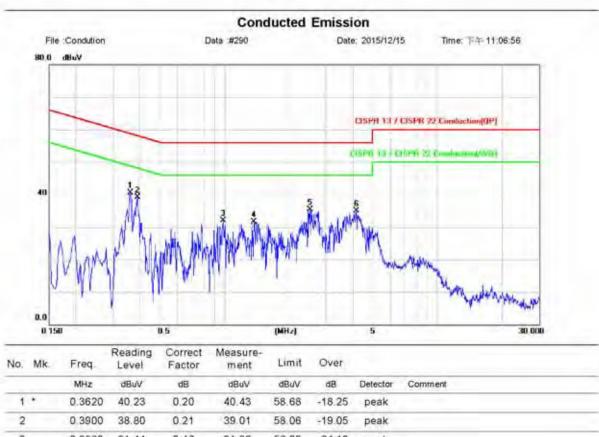
Limit CISPR 13 / CISPR 22 Conduction(QP)

AC 120V/60Hz Power:

69 % Humidity:

Mode:

Note: Adapter:SYS1460-1005



No.	Mk.	Freq.	Level	Factor	ment	Limit	Over			
		MHz	dBuV	dB	dBuV	dBuV	ďΒ	Detector	Comment	
1		0.3620	40.23	0.20	40.43	58.68	-18.25	peak		
2		0.3900	38.80	0.21	39.01	58.06	-19.05	peak		
3		0.9860	31.44	0.46	31.90	56.00	-24.10	peak		
4	4	1.3780	30.96	0.54	31.50	56.00	-24.50	peak		
5		2.5140	34.67	0.64	35.31	56.00	-20.69	peak		
6		4.1780	34.34	0.66	35.00	56.00	-21.00	peak		

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### AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode: Operation mode Test Date: Dec. 15, 2015

Temperature: 23.8

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22 °C

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Site Conduction Room Phase:

Temperature:

Limit CISPR 13 / CISPR 22 Conduction(QP)

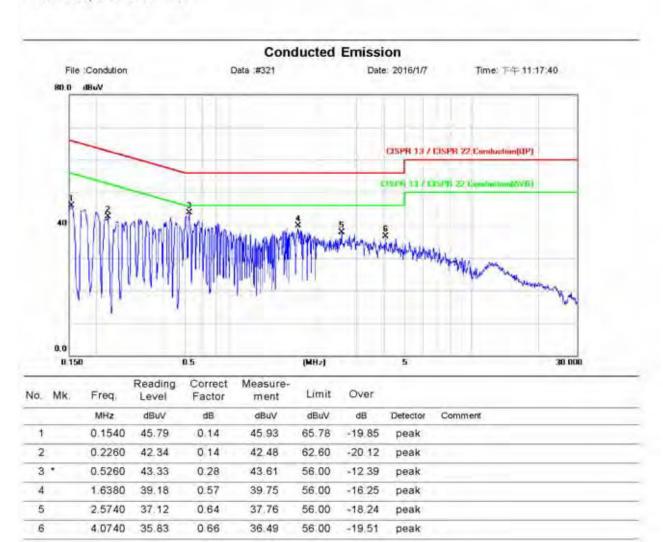
AC 120V/60Hz Power:

N

Humidity:

Mode:

Note: Adapter:SYS1561-1005



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

### **Duty Cycle:**

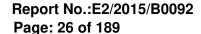
Mode	Duty Cycle (%)	Duty Factor (dB) =10*log ( 1/Duty Cycle
802.11a	86.71	0.62
802.11n_20	86.10	0.65
802.11n_40	75.23	1.24

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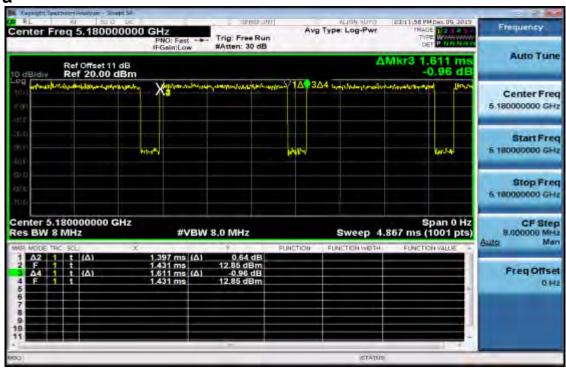
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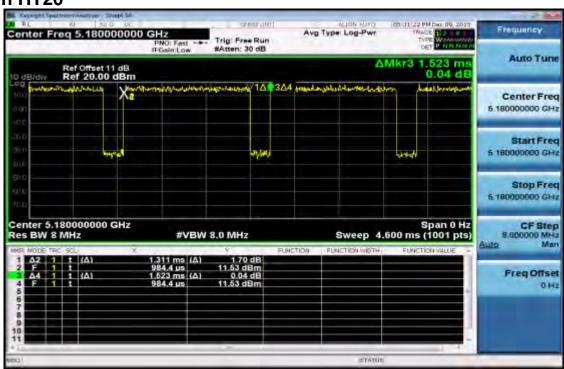




**DUTY CYCLE TEST SIGNAL Measurement Result** 802.11a



### 802.11n HT20



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### 802.11n HT 40



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### 8. 26dB & 6dB EMISSION BANDWIDTH MEASUREMENT

### 8.1 Standard Applicable

There is no limit bandwidth for U-NII-1, U-NII-2-A and U-NII-2-C.

The minimum of 6dB Bandwidth measurement is 0.5 MHz for U-NII-3

#### 8.2 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the Antenna port to the spectrum analyzer.
  - a. 26dB Band width Measurement: Set the spectrum analyzer as 1% of emission BW Sweep=auto, Detector = Peak, Trace Mode = Max Hold, Manually readjust RBW until the RBW/EBW ratio is 1% based on EBW as observed on the result of pre-sequence measurement.
  - b. Mark the peak frequency and -26dB (upper and lower) frequency.
- 4. Repeat the procedures as list above until all test default channels (low, middle, and high) are completed.
- 5. Minimum Emission Bandwidth for the band 5.725-5.850GHz.
  - a. Set the spectrum analyzer as RBW = 100 kHz, VBW = 3\*RBW, Span = 30M/50MHz, Detector=Peak, Sweep=auto
  - b. Mark the peak frequency and -6dB (upper and lower) frequency.
- 6. Repeat above procedures until all test default channel measured were complete.

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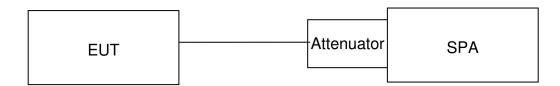


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### **Measurement Equipment Used**

Conducted Emission Test Site					
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.
TYPE		NUMBER	NUMBER	CAL.	
Spectrum Analyzer	KEYSIGHT	N9010A	MY54510568	04/14/2015	04/13/2016
Power Meter	Anritsu	ML2496A	1326001	06/23/2015	06/22/2016
Power Sensor	Anritsu	MA2411B	1315048	06/23/2015	06/22/2016
Power Sensor	Anritsu	MA2411B	1315049	06/23/2015	06/22/2016
Coaxial Cable 30cm	WOKEN	00100A1F1A1 95C	RF01	12/12/2014	12/11/2015
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2015	01/01/2016
Splitter	RF-LAMBAD	RFLT2W1G1 8G	RF35	12/12/2014	12/11/2015
Attenuator	Mini-Circuit	BW-S10W2+	002	01/02/2015	01/01/2016

### 8.4 Test Set-up



### 8.5 Measurement Result 26dB Bandwidth

802.11a Main

Frequency (MHz)	26dB Bandwidth (MHz)	10 Log (B) (dB)
5180	18.92	12.770
5220	18.89	12.763
5240	19.25	12.843
5260	19.10	12.811
5300	19.87	12.982
5320	19.78	12.962
5500	19.03	12.794
5580	19.28	12.850
5700	19.22	12.838

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802.11n HT20 Main

Frequency (MHz)	26dB Bandwidth (MHz)	10 Log (B) (dB)
5180	20.51	13.119
5220	20.25	13.063
5240	19.71	12.947
5260	19.94	12.998
5300	20.05	13.021
5320	21.13	13.248
5500	20.63	13.145
5580	20.23	13.059
5700	20.21	13.056

### 802.11n HT40 Main

Frequency (MHz)	26dB Bandwidth (MHz)	10 Log (B) (dB)
5190	40.34	16.057
5230	39.39	15.954
5270	39.65	15.983
5310	39.47	15.963
5510	39.64	15.982
5550	39.46	15.962
5670	39.74	15.992

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### 6dB Bandwidth (5725 MHz~ 5850 MHz)

#### 802.11a Main

Frequency (MHz)	6dB Bandwidth (MHz)	10 Log (B) (dB)
5745	15.37	11.867
5785	15.74	11.969
5825	14.31	11.557

#### 802.11n HT20 Main

Frequency (MHz)	6dB Bandwidth (MHz)	10 Log (B) (dB)
5745	16.43	12.157
5785	15.74	11.970
5825	16.76	12.242

#### 802.11n HT40 Main

Frequency	6dB Bandwidth	10 Log (B)
(MHz)	(MHz)	(dB)
5755	34.28	15.351
5795	32.65	15.139

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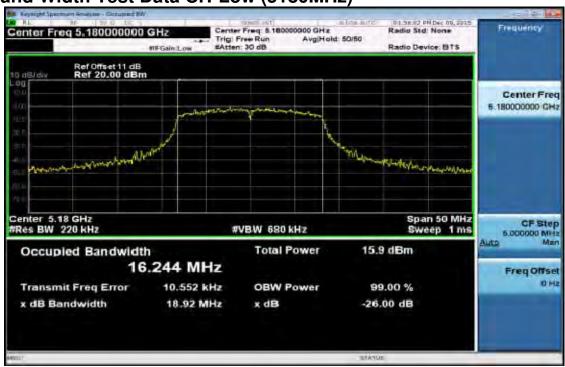
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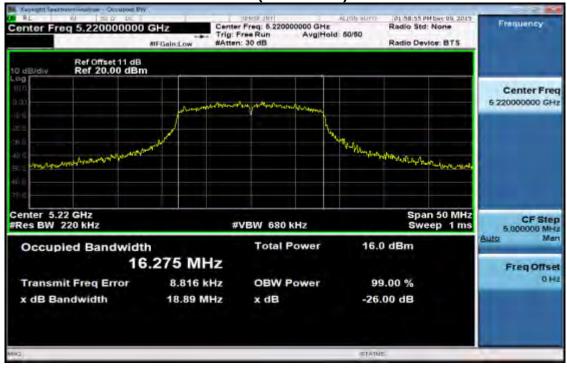
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# 802.11a, 5150~5250 MHz

26dB Band Width Test Data CH-Low (5180MHz)



26dB Band Width Test Data CH-Mid (5220MHz)



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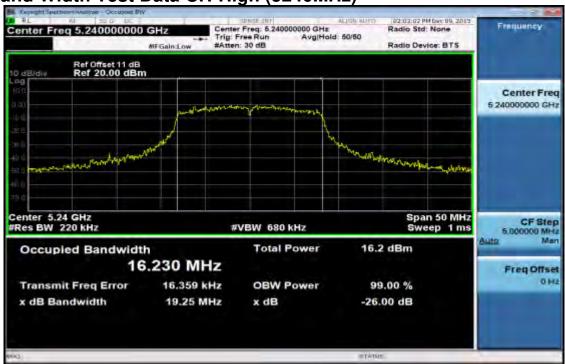
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# 26dB Band Width Test Data CH-High (5240MHz)



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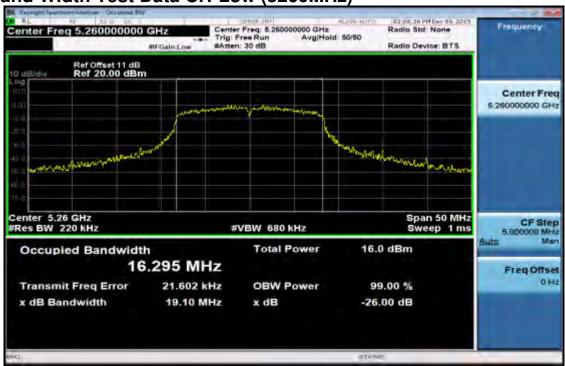
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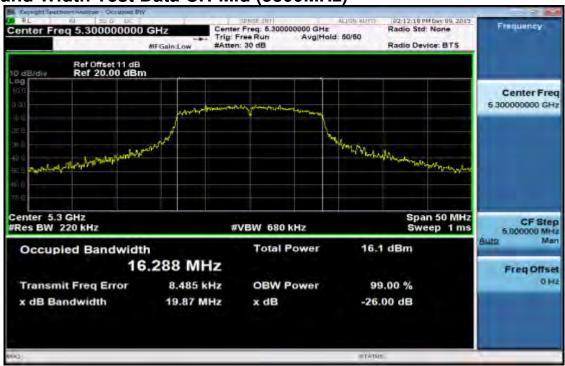


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# 802.11a, 5250~5350 MHz 26dB Band Width Test Data CH-Low (5260MHz)



26dB Band Width Test Data CH-Mid (5300MHz)



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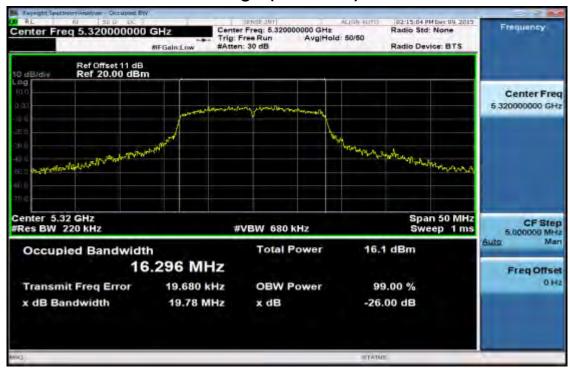
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# 26dB Band Width Test Data CH-High (5320MHz)



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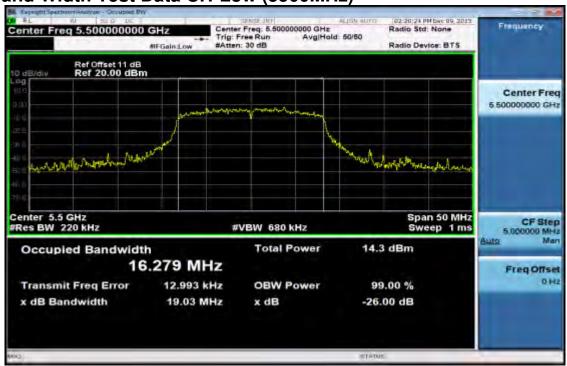
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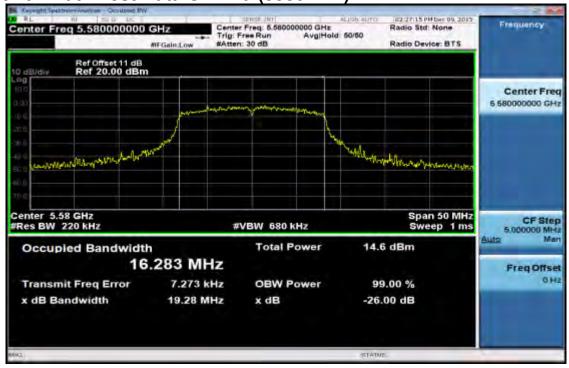


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# 802.11a, 5470~5725 MHz 26dB Band Width Test Data CH-Low (5500MHz)



# 26dB Band Width Test Data CH-Mid (5580MHz)



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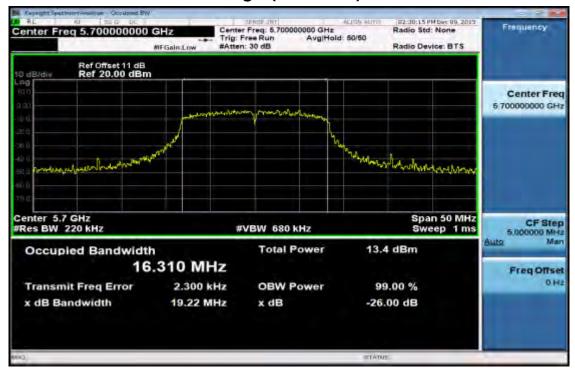
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### 26dB Band Width Test Data CH-High (5700MHz)



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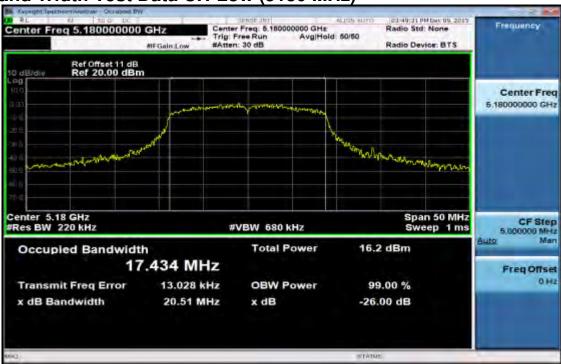
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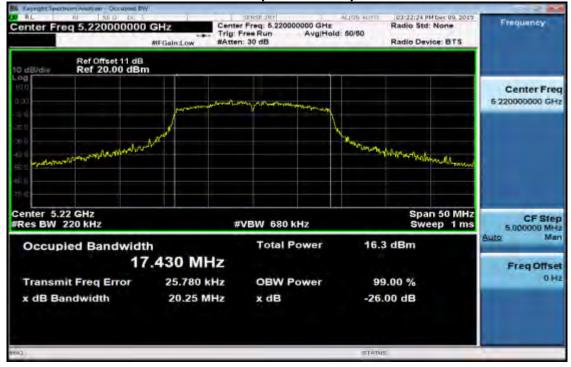


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### 802.11n HT20, 5150~5250 MHz 26dB Band Width Test Data CH-Low (5180 MHz)



# 26dB Band Width Test Data CH-Mid (5220 MHz)



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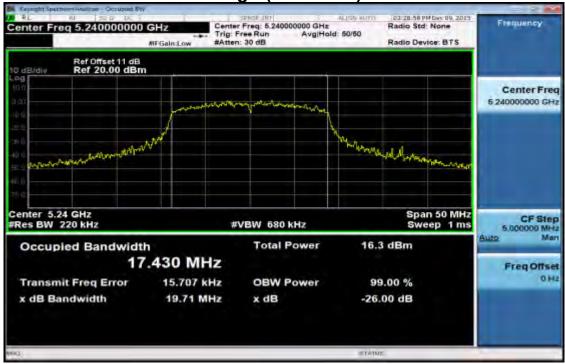
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# 26dB Band Width Test Data CH-High (5240 MHz)



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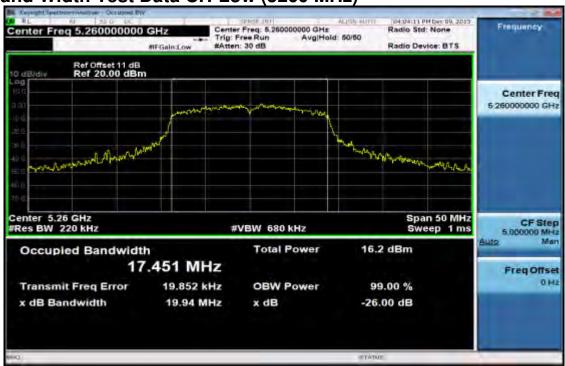
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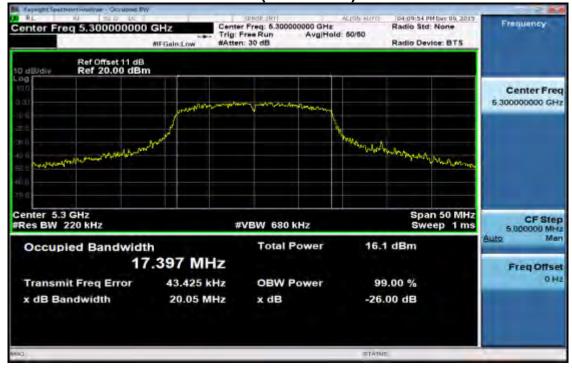


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### 802.11n HT20, 5250~5350 MHz 26dB Band Width Test Data CH-Low (5260 MHz)



# 26dB Band Width Test Data CH-Mid (5300 MHz)



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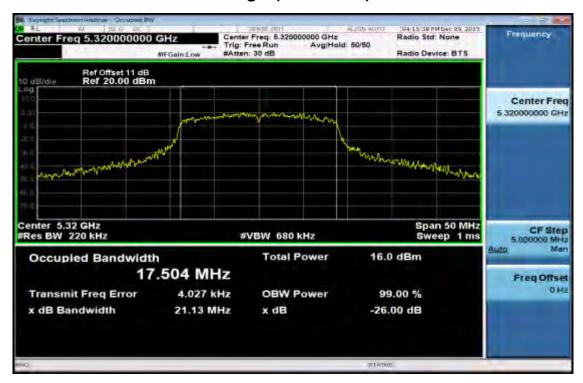
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# 26dB Band Width Test Data CH-High (5320 MHz)



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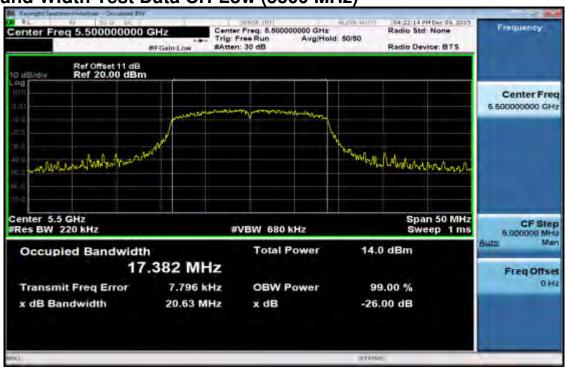
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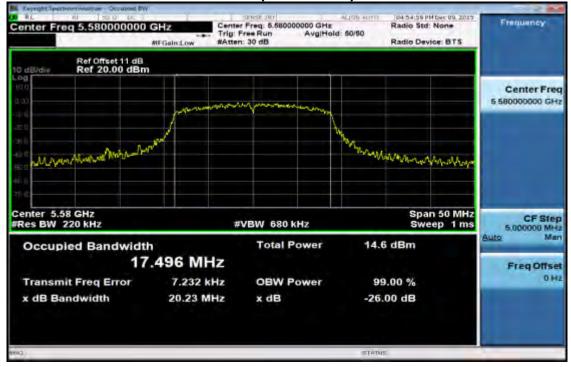


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### 802.11n HT20, 5470~5725 MHz 26dB Band Width Test Data CH-Low (5500 MHz)



# 26dB Band Width Test Data CH-Mid (5580 MHz)



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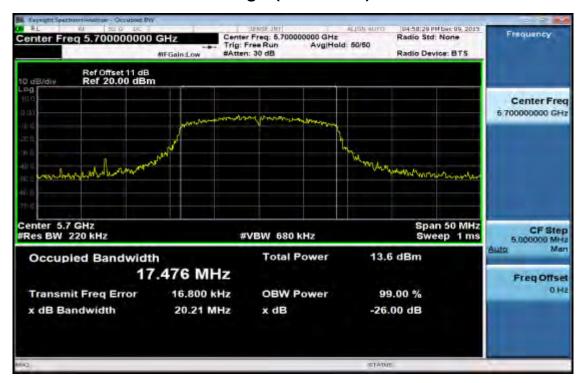
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# 26dB Band Width Test Data CH-High (5700 MHz)

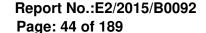


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### 802.11n HT40, 5150~5250 MHz 26dB Band Width Test Data CH-Low (5190 MHz)



# 26dB Band Width Test Data CH-High (5230 MHz)



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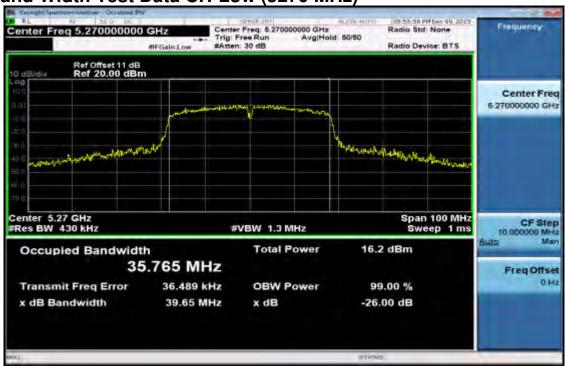
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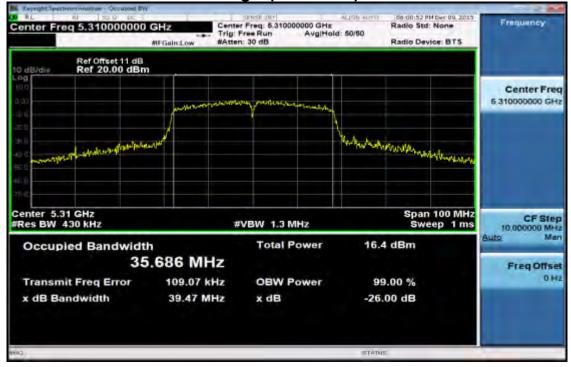


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### 802.11n HT40, 5250~5350 MHz 26dB Band Width Test Data CH-Low (5270 MHz)



26dB Band Width Test Data CH-High (5310MHz)



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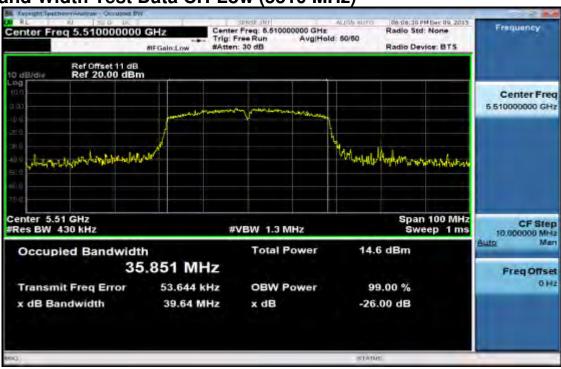
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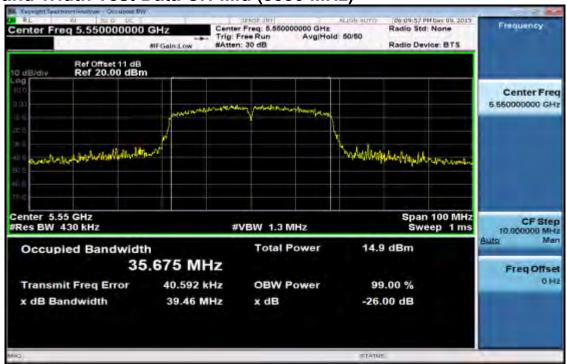


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### 802.11n HT40, 5470~5725 MHz 26dB Band Width Test Data CH-Low (5510 MHz)



# 26dB Band Width Test Data CH-Mid (5550 MHz)



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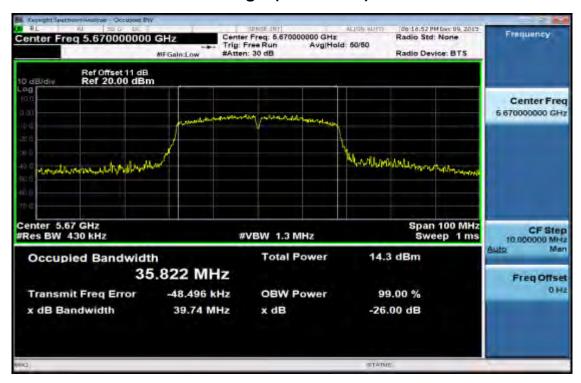
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# 26dB Band Width Test Data CH-High (5670 MHz)



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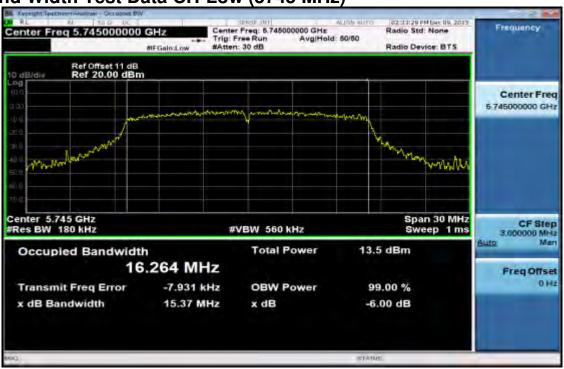
f (886-2) 2298-0488



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### 6dB Band Width 802.11a, 5725~5850 MHz

6dB Band Width Test Data CH-Low (5745 MHz)



6dB Band Width Test Data CH-Mid (5785 MHz)



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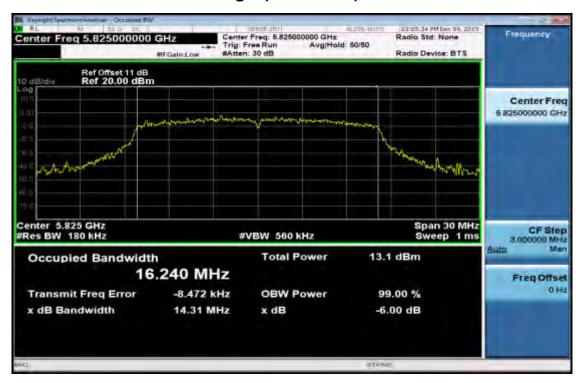
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# 6dB Band Width Test Data CH-High (5825 MHz)



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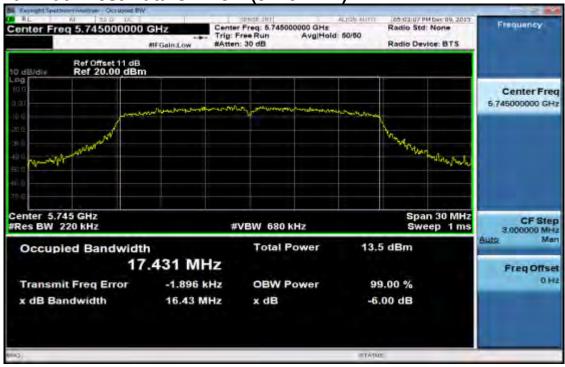
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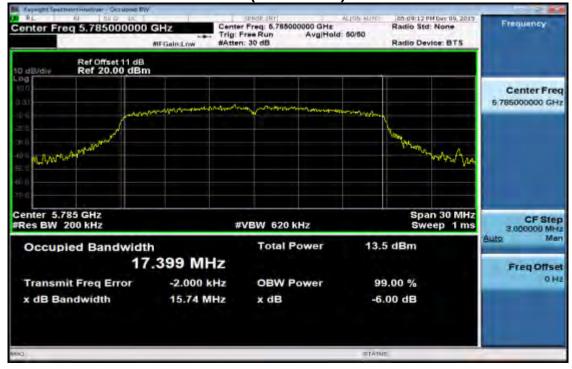


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### 802.11n HT20, 5725~5850 MHz 6dB Band Width Test Data CH-Low (5745 MHz)



# 6dB Band Width Test Data CH-Mid (5785 MHz)



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# 6dB Band Width Test Data CH-High (5825 MHz)



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### 802.11n HT40, 5725~5850 MHz 6dB Band Width Test Data CH-Low (5755 MHz)



# 6dB Band Width Test Data CH-Mid (5795 MHz)



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### MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

### **Standard Applicable**

**FCC** 

OPERZTION Band	EUT CATEGORY	LIMIT
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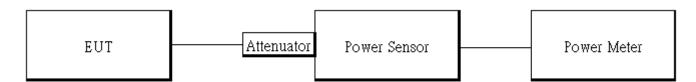


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### **Measurement Equipment Used**

Conducted Emission Test Site						
EQUIPMENT	EQUIPMENT MFR		SERIAL	LAST	CAL DUE.	
TYPE		NUMBER	NUMBER	CAL.		
Spectrum Analyzer	KEYSIGHT	N9010A	MY54510568	04/14/2015	04/13/2016	
Power Meter	Anritsu	ML2496A	1326001	06/23/2015	06/22/2016	
Power Sensor	Anritsu	MA2411B	1315048	06/23/2015	06/22/2016	
Power Sensor	Anritsu	MA2411B	1315049	06/23/2015	06/22/2016	
Coaxial Cable 30cm	WOKEN	00100A1F1A1 95C	RF01	12/12/2014	12/11/2015	
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2015	01/01/2016	
Splitter	RF-LAMBAD	RFLT2W1G1 8G	RF35	12/12/2014	12/11/2015	
Attenuator	Mini-Circuit	BW-S10W2+	002	01/02/2015	01/01/2016	

### 9.4 Test Set-up



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#### **Measurement Result**

### **Conducted output power**

#### 802 11a Main

СН	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)		RESULT
36	5180	11.12	12.942		23.98		PASS
44	5220	10.97	12.503		23.98		PASS
48	5240	10.95	12.445		23.98		PASS
52	5260	10.51	11.246	23.98 0	r 11+10log(B)	23.81	PASS
60	5300	10.65	11.614	23.98 0	r 11+10log(B)	23.98	PASS
64	5320	10.48	11.169	23.98 0	r 11+10log(B)	23.96	PASS
100	5500	9.13	8.185	23.98 0	r 11+10log(B)	23.79	PASS
116	5580	9.49	8.892	23.98 0	r 11+10log(B)	23.85	PASS
140	5700	8.71	7.430	23.98 0	r 11+10log(B)	23.84	PASS
149	5745	8.69	7.396		30		PASS
157	5785	8.47	7.031		30		PASS
165	5825	8.15	6.531		30		PASS

#### 802.11n HT20 Main

СН	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)	LII	UIRED MIT 3m)	RESULT
36	5180	11.10	12.882	23	.98	PASS
44	5220	11.50	14.125	23	.98	PASS
48	5240	11.49	14.093	23	.98	PASS
52	5260	10.69	11.722	23.98 or 11+10	Olog(B) 23.73	PASS
60	5300	10.67	11.668	23.98 or 11+10	log(B) 23.70	PASS
64	5320	10.66	11.641	23.98 or 11+10	Olog(B) 23.68	PASS
100	5500	9.31	8.531	23.98 or 11+10	olog(B) 23.75	PASS
116	5580	9.54	8.995	23.98 or 11+10	Olog(B) 23.73	PASS
140	5700	8.82	7.621	23.98 or 11+10	log(B) 23.67	PASS
149	5745	8.79	7.568	3	30	PASS
157	5785	8.57	7.194	3	30	PASS
165	5825	8.29	6.745	3	30	PASS

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#### 802.11n HT40 Main

СН	Frequency (MHz)	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
38	5190	10.50	11.220	23.98	PASS
46	5230	10.31	10.740	23.98	PASS
54	5270	10.05	10.116	23.98 or 11+10log(B) 26.62	PASS
62	5310	10.12	10.280	23.98 or 11+10log(B) 26.55	PASS
102	5510	10.65	11.614	23.98 or 11+10log(B) 26.56	PASS
110	5550	10.95	12.445	23.98 or 11+10log(B) 26.62	PASS
134	5670	9.68	9.290	23.98 or 11+10log(B) 26.58	PASS
151	5755	7.21	5.260	30	PASS
159	5795	6.77	4.753	30	PASS

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### 10. PEAK POWER SPECTRAL DENSITY

### 10.1 Standard Applicable

**FCC** 

OPERZTION Band	EUT CATEGORY	LIMIT
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U-NII-1

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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)

#### For U-NII-3 Band:

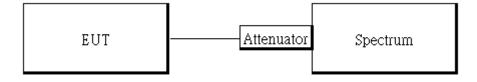
Set RBW=500 kHz, VBW≥ 3RBW, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)

- 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.

### 10.3 Measurement Equipment Used

Conducted Emission Test Site							
EQUIPMENT	EQUIPMENT MFR MODEL SERIAL LAST						
TYPE		NUMBER	NUMBER	CAL.			
Spectrum Analyzer	KEYSIGHT	N9010A	MY54510568	04/14/2015	04/13/2016		
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2015	01/01/2016		
Attenuator	Mini-Circuit	BW-S10W2+	002	01/02/2015	01/01/2016		

#### 10.4 Test Set-up



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#### 10.5 Measurement Result

	POWER DENSITY 802.11a MODE							
Frequency	PPSD	Offset	Limit	Margin				
(MHz)	(dBm)	Oliset	(dBm)	(dB)				
5180	-4.46	11.00	17	-21.46				
5220	-7.45	11.00	17	-24.45				
5240	-4.95	11.00	17	-21.95				
5260	-5.82	11.00	11	-16.82				
5300	-3.77	11.00	11	-14.77				
5320	-4.68	11.00	11	-15.68				
5500	-9.33	11.00	11	-20.33				
5580	-8.81	11.00	11	-19.81				
5700	-6.06	11.00	11	-17.06				
5745	2.00	11.00	30	-28.00				
5785	2.21	11.00	30	-27.79				
5825	1.53	11.00	30	-28.47				

	POWER DENSITY 802.11n HT20 MODE						
Frequency	PPSD	Offset	Limit	Margin			
(MHz)	(dBm)	Onoct	(dBm)	(dB)			
5180	-7.51	11.00	17	-24.51			
5220	-7.92	11.00	17	-24.92			
5240	-7.53	11.00	17	-24.53			
5260	-8.89	11.00	11	-19.89			
5300	-4.93	11.00	11	-15.93			
5320	-7.93	11.00	11	-18.93			
5500	-9.63	11.00	11	-20.63			
5580	-7.34	11.00	11	-18.34			
5700	-7.76	11.00	11	-18.76			
5745	2.50	11.00	30	-27.50			
5785	2.13	11.00	30	-27.87			
5825	1.85	11.00	30	-28.15			

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POWER DENSITY 802.11n HT40 MODE							
Frequency	PPSD	Offset	Limit	Margin			
5190	-11.5	11.00	17	-28.50			
5230	-15.04	11.00	17	-32.04			
5270	-17.42	11.00	11	-28.42			
5310	-13.45	11.00	11	-24.45			
5510	-15.14	11.00	11	-26.14			
5550	-10.02	11.00	11	-21.02			
5670	-12.77	11.00	11	-23.77			
5755	-0.27	11.00	30	-30.27			
5795	-1.02	11.00	30	-31.02			

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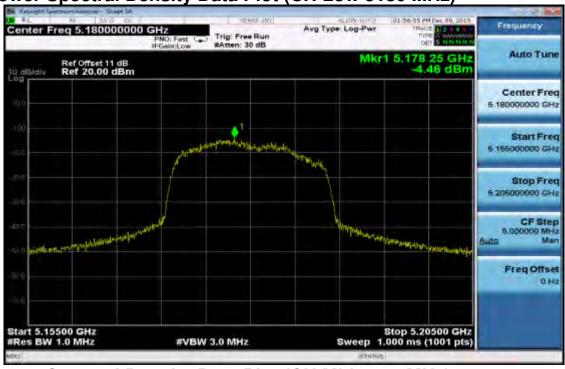
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# 802.11a 5150~5250 MHz

Peak Power Spectral Density Data Plot (CH Low 5180 MHz)



Peak Power Spectral Density Data Plot (CH Mid 5220 MHz)



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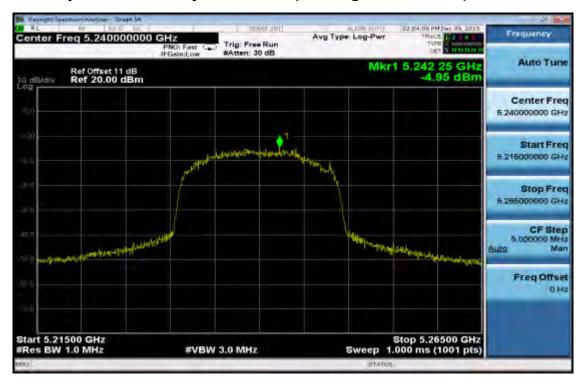
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# Peak Power Spectral Density Data Plot (CH High 5240 MHz)



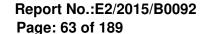
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### 802.11a 5250~5350 MHz Peak Power Spectral Density Data Plot (CH Low 5260 MHz)



### Peak Power Spectral Density Data Plot (CH Mid 5300 MHz)



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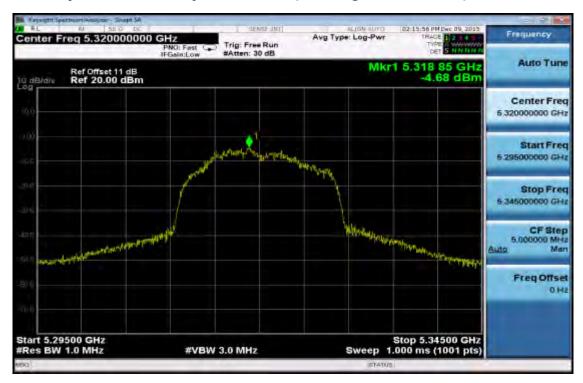
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### Peak Power Spectral Density Data Plot (CH High 5320 MHz)

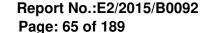


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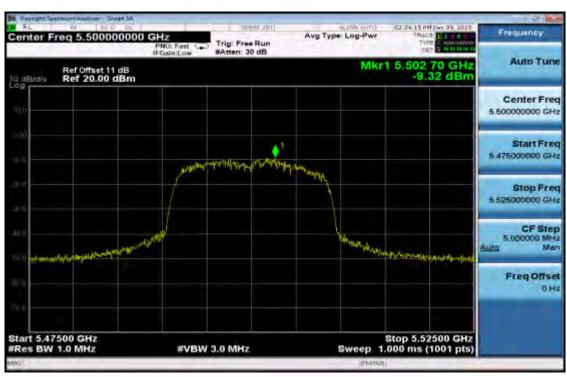
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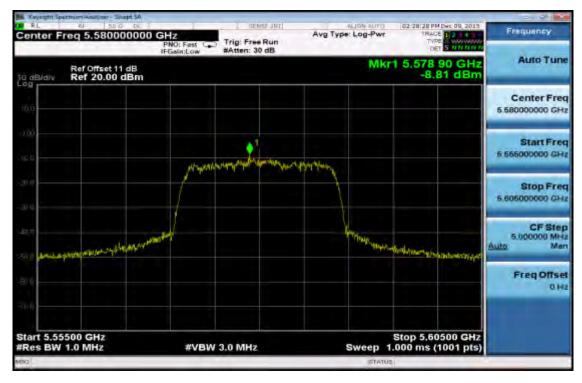




### 802.11a 5470~5725 MHz Peak Power Spectral Density Data Plot (CH Low 5500 MHz)



### Peak Power Spectral Density Data Plot (CH Mid 5580 MHz)



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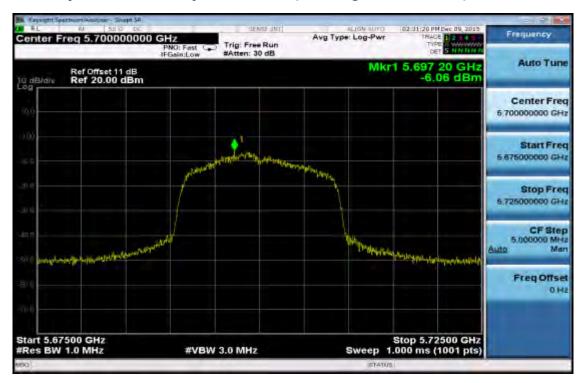
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### Peak Power Spectral Density Data Plot (CH High 5700 MHz)



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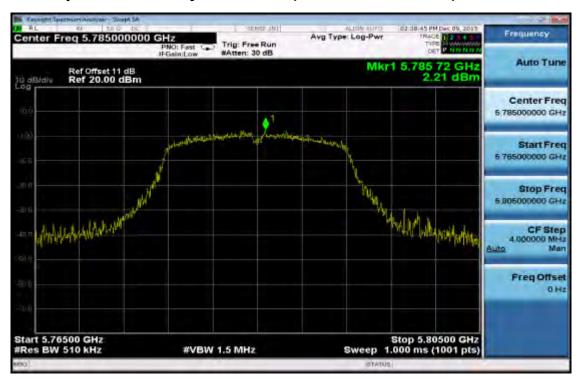
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### 802.11a 5725~5850 MHz

Peak Power Spectral Density Data Plot (CH Low 5745 MHz)



### Peak Power Spectral Density Data Plot (CH Mid 5785 MHz)



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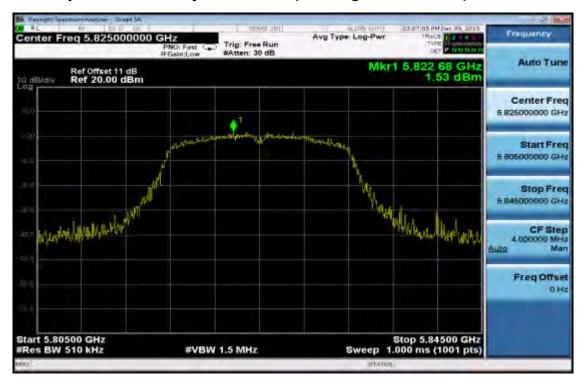
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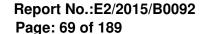
# Peak Power Spectral Density Data Plot (CH High 5825 MHz)



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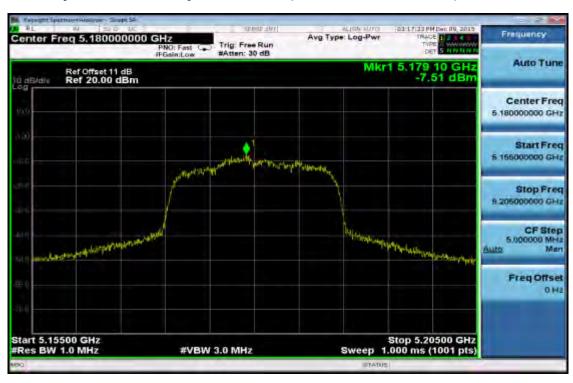
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### 802.11n HT20, 5150~5250 MHz Peak Power Spectral Density Data Plot (CH Low 5180 MHz)



### Peak Power Spectral Density Data Plot (CH Mid 5220 MHz)



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# Peak Power Spectral Density Data Plot (CH High 5240 MHz)

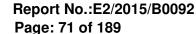


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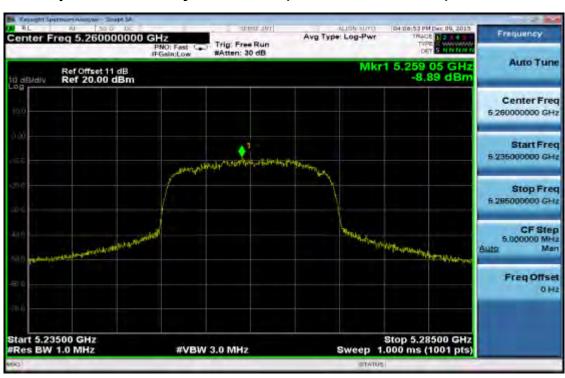
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### 802.11n HT20, 5250~5350 MHz Peak Power Spectral Density Data Plot (CH Low 5260MHz)



### Peak Power Spectral Density Data Plot (CH Mid 5300 MHz)



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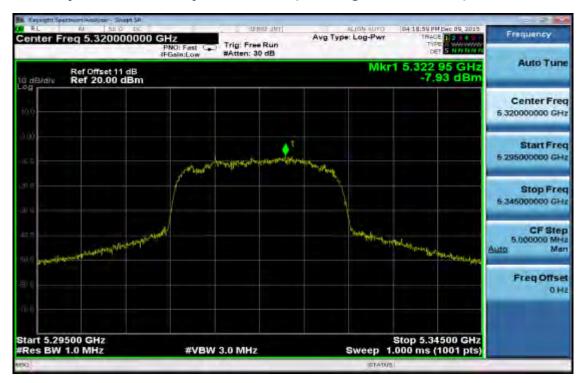
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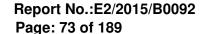
### Peak Power Spectral Density Data Plot (CH High 5320 MHz)



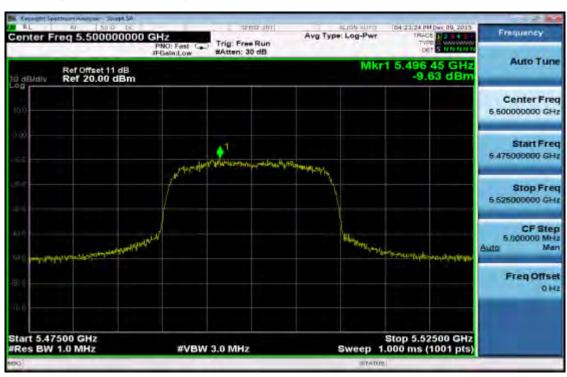
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### 802.11n HT20, 5470~5725 MHz Peak Power Spectral Density Data Plot (CH Low 5500 MHz)



# Peak Power Spectral Density Data Plot (CH Mid 5580MHz)



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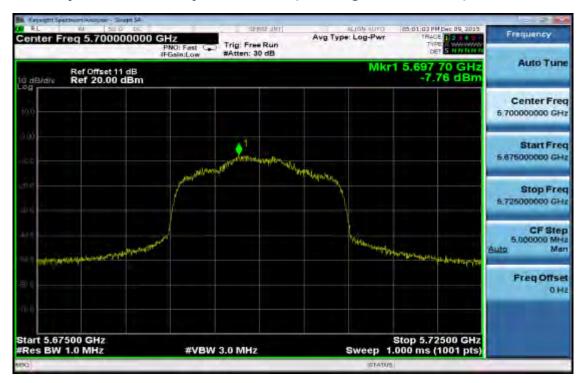
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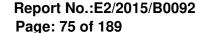
## Peak Power Spectral Density Data Plot (CH High 5700 MHz)



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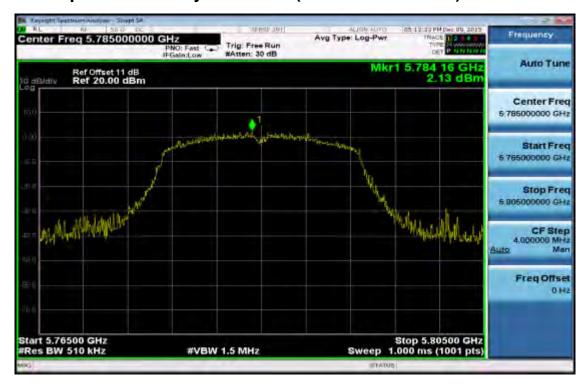


802.11n HT20, 5725~5850 MHz





### Peak Power Spectral Density Data Plot (CH Mid 5785 MHz)



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# Peak Power Spectral Density Data Plot (CH High 5825 MHz)



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# 802.11n HT40, 5150~5250 MHz Peak Power Spectral Density Data Plot (CH Low 5190 MHz)



# Peak Power Spectral Density Data Plot (CH High 5230 MHz)

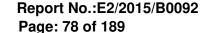


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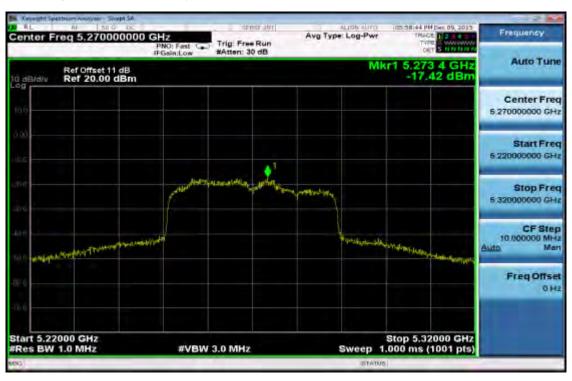
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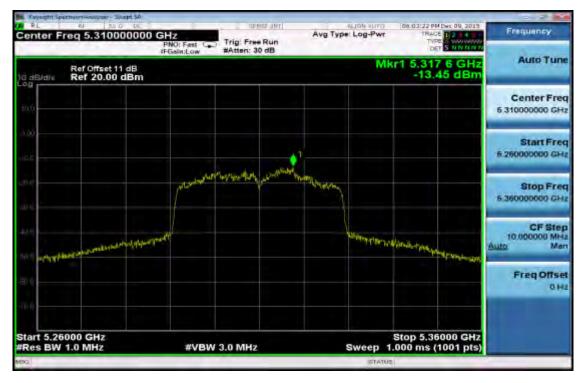




### 802.11n HT40, 5250~5350 MHz Peak Power Spectral Density Data Plot (CH Low 5270 MHz)



# Peak Power Spectral Density Data Plot (CH High 5310 MHz)

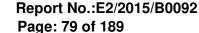


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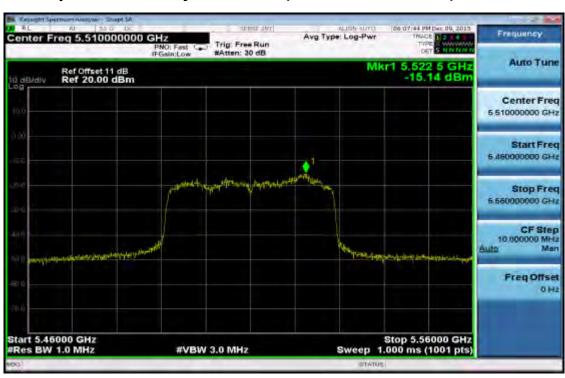
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### 802.11n HT40, 5470~5725 MHz Peak Power Spectral Density Data Plot (CH Low 5510 MHz)



# Peak Power Spectral Density Data Plot (CH Mid 5550 MHz)



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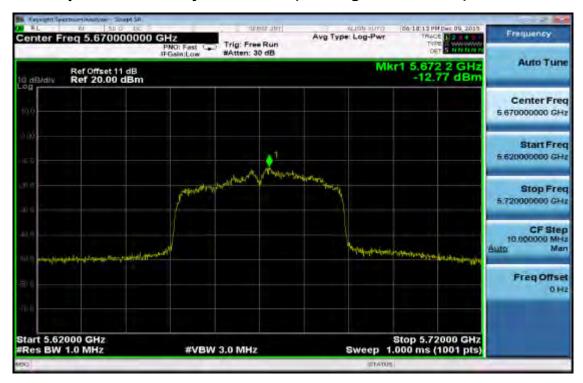
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# Peak Power Spectral Density Data Plot (CH High 5670 MHz)

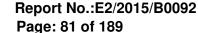


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### 802.11n HT40, 5725~5850 MHz Peak Power Spectral Density Data Plot (CH Low 5755 MHz)



Peak Power Spectral Density Data Plot (CH High 5795 MHz)



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### 11. UNDESIRABLE RADIATED EMISSION MEASUREMENT1

### 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 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
- 3. For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
- 4. For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

APPLI	CABLE TO	LII	MIT
UNII Test Prod	9033 D02 General cedures New Rules	FIELD STRE	NGTH AT 3m
V	01r01	PK: 74 (dBμV/m)	AV 54 (dBμV/m)
APPLI	CABLE 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)		
15.407(b)(4)	RSS-247 §6.2.4 (4)	PK: -27 (dBm/MHz) PK: -17 (dBm/MHz)	PK: 68.3 (dBμV/m) PK: 78.2 (dBμV/m)

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

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

#### Note:

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

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### 11.2 Measurement Equipment Used

SGS 966 Chamber No.C									
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.				
TYPE		NUMBER	NUMBER	CAL.					
EMI Test Receiver	R&S	ESU 40	100363	04/09/2015	04/08/2016				
Loop Antenna	ETS-Lindgren	6502	00143303	12/22/2015	12/23/2016				
Broadband Antenna	TESEQ	CBL 6112D	35240	10/28/2015	10/27/2016				
Horn Antenna	ETS-Lindgren	3117	00143272	12/16/2015	12/15/2016				
Horn Antenna	Schwarzbeck	BBHA9170	185	07/24/2015	07/23/2016				
Pre Amplifier	EMC Instruments	EMC330	980096	12/12/2015	12/11/2016				
Pre Amplifier	EMC Instruments	EMC0011830	980199	12/12/2015	12/11/2016				
Pre Amplifier	R&S	SCU-18	10204	12/12/2015	12/11/2016				
Pre Amplifier	EMC Instruments	EMC184045B	980135	12/12/2015	12/11/2016				
Coaxial Cable	Huber+Suhner	RG 214/U	966Rx 9K-30M	12/12/2015	12/11/2016				
Coaxial Cable	Huber+Suhner	RG 214/U SUCOFLEX 104	966Rx 30M-3G	12/12/2015	12/11/2016				
Coaxial Cable	Huber+Suhner	SUCOFLEX 104	966Rx 1G-18G	12/12/2015	12/11/2016				
Coaxial Cable	Huber+Suhner	mini 141-12 SUCOFLEX 104	966Rx 18G-40G	12/12/2015	12/11/2016				
Coaxial Cable	Huber+Suhner	SUCOFLEX 104	966Tx 30M-18G	12/12/2015	12/11/2016				
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	966Tx 18G-40G	12/12/2015	12/11/2016				
Attenuator	WOKEN	218FS-10	RF27	12/12/2015	12/11/2016				
Site NSA	SGS	966 Chamber C	SAC-C	03/04/2015	03/03/2016				
Site VSWR	SGS	966 Chamber C	SAC-C	03/04/2015	03/03/2016				
DC Power Supply	HOLA	DP-3003	D7070035	05/04/2015	05/03/2016				
Controller	MF	MF-7802	N/A	N.C.R.	N.C.R.				
Antenna Master	MF	N/A	N/A	N.C.R.	N.C.R.				
Turn Table	MF	N/A	N/A	N.C.R.	N.C.R.				
Test Software	World-Pallas	Dr. E	V 3.0 Lite	N.C.R.	N.C.R.				

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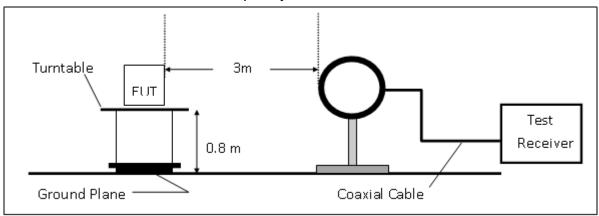
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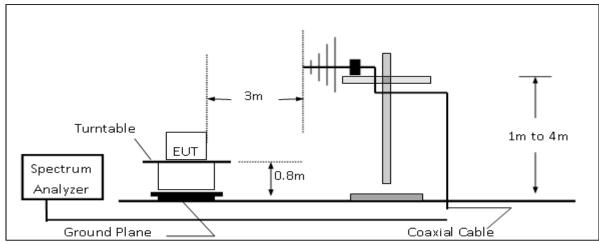
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#### 11.3 Test SET-UP

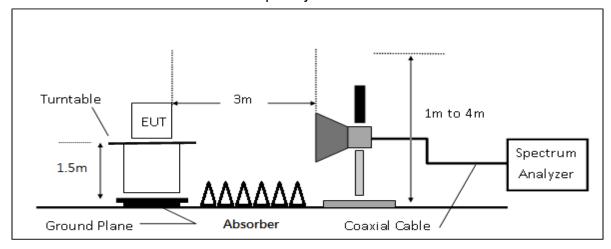
(A) Radiated Emission Test Set-UP Frequency Below 30MHz.



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

### 11.5 Field Strength Calculation

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

FS = RA + AF + CL - AG

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

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

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

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#### 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.

#### 11.7 **Measurement Result**

Refer to attach tabular data sheets.

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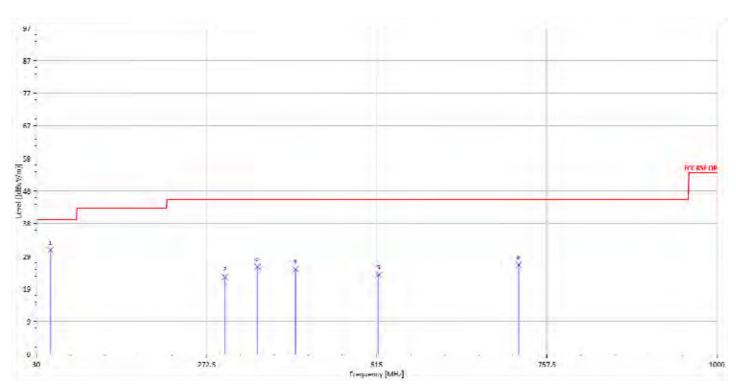
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### **Radiated Spurious Emission Measurement Result Below 1GHz Worst-Case Data:** 802.11a 5150~5250 MHz

Operation Mode: 802.11a Test Date: 2015/12/22

Fundamental Frequency: 5220 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: E1 Measurement Antenna Pol. : Vertical



Freq.	Note	De tector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
50.37	S	Peak	56.62	-25.65	30.97	40	-9.03
298.69	S	Peak	42.23	-19.27	22.96	46	-23.04
345.25	S	Peak	43.54	-17.54	26.00	46	-20.00
399.57	S	Peak	41.09	-15.88	25.21	46	-20.79
517.91	S	Peak	37.19	-13.60	23.59	46	-22.41
717.73	S	Peak	37.31	-10.77	26.54	46	-19.46

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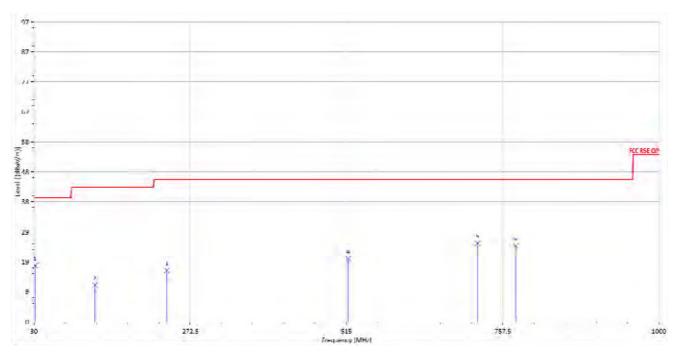


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Operation Mode: 802.11a Test Date: 2015/12/22

Fundamental Frequency: 5220 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: E1 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
31.94	S	Peak	32.35	-14.17	18.18	40	-21.82
125.06	S	Peak	33.26	-21.38	11.88	43.5	-31.62
236.61	S	Peak	38.07	-21.50	16.57	46	-29.43
517.91	S	Peak	33.96	-13.60	20.35	46	-25.65
718.70	S	Peak	36.07	-10.72	25.35	46	-20.65
777.87	S	Peak	34.85	-10.33	24.52	46	-21.48

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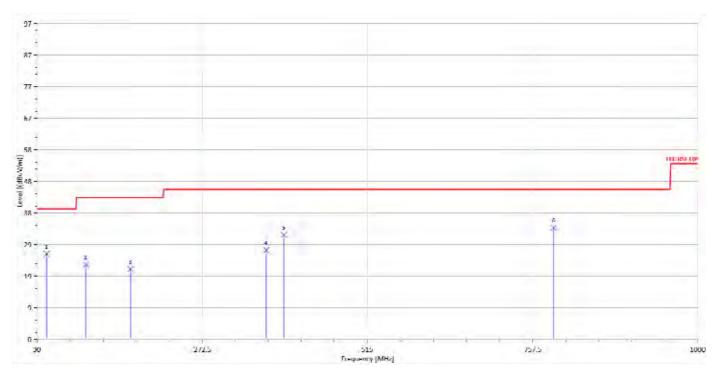


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#### 802.11a 5250~5350 MHz

Operation Mode: 802.11a Test Date: 2015/12/22 Fundamental Frequency: 5300 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: E1 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
49.40	S	Peak	56.22	-25.16	31.05	40	-8.95
299.66	S	Peak	42.28	-19.28	23.01	46	-22.99
345.25	S	Peak	43.49	-17.54	25.95	46	-20.05
399.57	S	Peak	40.43	-15.88	24.56	46	-21.44
517.91	S	Peak	37.37	-13.60	23.77	46	-22.23
717.73	S	Peak	38.11	-10.77	27.34	46	-18.66

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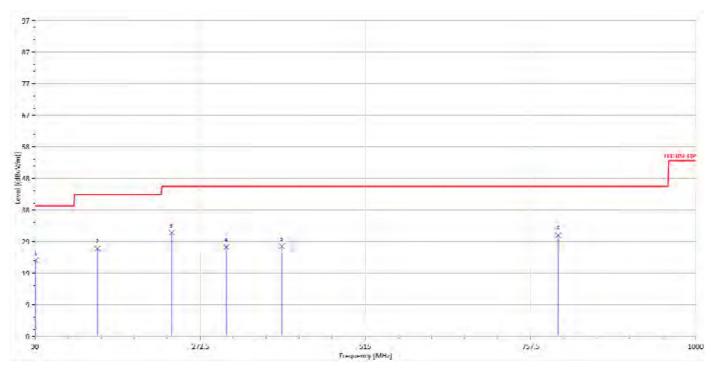


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Operation Mode: 802.11a Test Date: 2015/12/22

Fundamental Frequency: Temp. / Humi.: 24.1deg\_C/48RH 5300 MHz

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: E1 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	dΒμV	dB	dBµV/m	dBµV/m	dB
51.34	S	Peak	52.53	-25.94	26.59	40	-13.41
93.05	S	Peak	45.69	-25.06	20.62	43.5	-22.88
125.06	S	Peak	41.89	-21.38	20.51	43.5	-22.99
298.69	S	Peak	40.74	-19.27	21.47	46	-24.53
359.80	S	Peak	39.69	-17.16	22.53	46	-23.47
714.82	S	Peak	35.71	-10.78	24.93	46	-21.07

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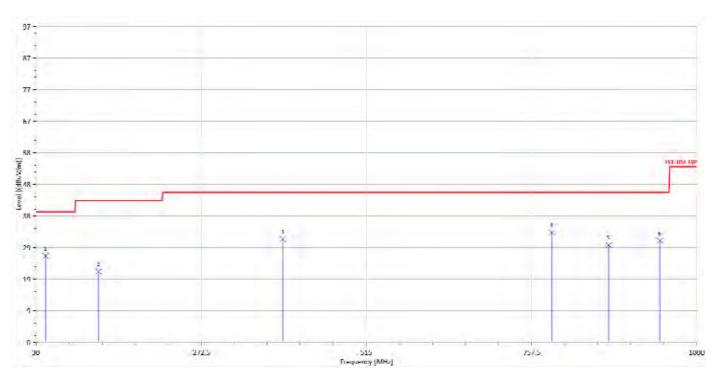


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#### 802.11a, 5470~5725 MHz

Operation Mode: 802.11a Test Date: 2015/12/22 Fundamental Frequency: 5580 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: E1 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
49.40	S	Peak	56.55	-25.16	31.39	40	-8.61
80.44	S	Peak	53.90	-26.83	27.07	40	-12.93
125.06	S	Peak	44.02	-21.38	22.65	43.5	-20.85
517.91	S	Peak	39.33	-13.60	25.72	46	-20.28
719.67	S	Peak	39.01	-10.73	28.28	46	-17.72
863.23	S	Peak	36.33	-8.53	27.80	46	-18.20

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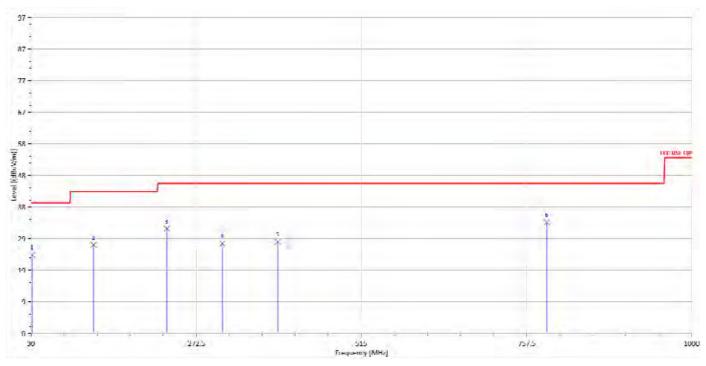


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Operation Mode: 802.11a Test Date: 2015/12/22

Fundamental Frequency: Temp. / Humi.: 24.1deg\_C/48RH 5580 MHz

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: E1 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	dΒμV	dB	dBµV/m	dBµV/m	dB
93.05	S	Peak	45.46	-25.06	20.40	43.5	-23.10
131.85	S	Peak	43.26	-21.38	21.88	43.5	-21.62
240.49	S	Peak	45.23	-21.03	24.20	46	-21.80
298.69	S	Peak	43.01	-19.27	23.73	46	-22.27
517.91	S	Peak	37.01	-13.60	23.40	46	-22.60
720.64	S	Peak	37.68	-10.77	26.90	46	-19.10

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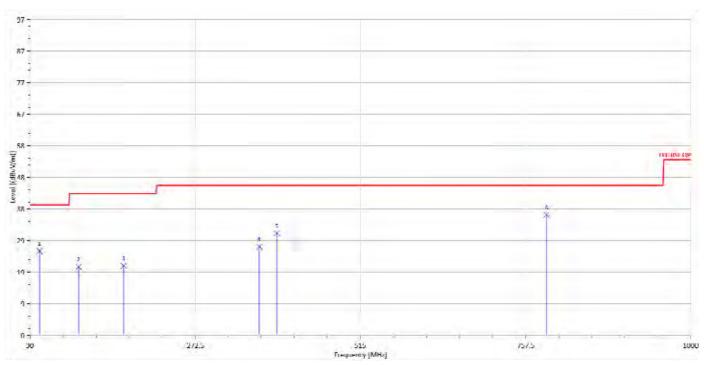


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### 802.11a, 5725~5850 MHz

Operation Mode: 802.11a Test Date: 2015/12/22 Fundamental Frequency: 5785 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: E1 Measurement Antenna Pol. : Vertical



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
49.40	S	Peak	58.60	-25.16	33.44	40	-6.56
78.50	S	Peak	54.64	-27.00	27.64	40	-12.36
136.70	S	Peak	42.58	-21.55	21.03	43.5	-22.47
239.52	S	Peak	44.25	-21.14	23.11	46	-22.89
345.25	S	Peak	46.71	-17.54	29.17	46	-16.83
717.73	S	Peak	37.27	-10.77	26.50	46	-19.50

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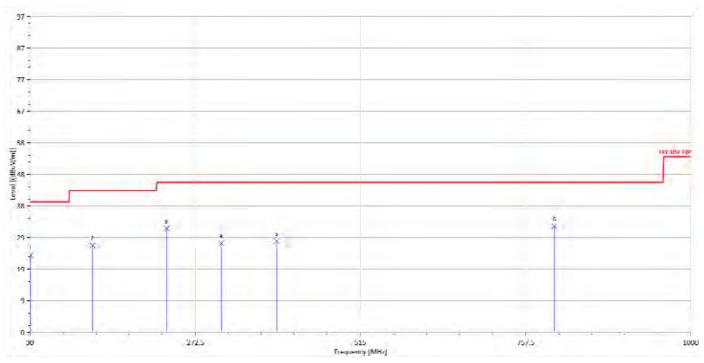


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Operation Mode: 802.11a Test Date: 2015/12/22

Fundamental Frequency: Temp. / Humi.: 5785 MHz 24.1deg\_C/48RH

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: E1 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	dΒμV	dB	dBµV/m	dBµV/m	dB
93.05	S	Peak	45.24	-25.06	20.17	43.5	-23.33
131.85	S	Peak	43.34	-21.38	21.96	43.5	-21.54
240.49	S	Peak	45.55	-21.03	24.52	46	-21.48
359.80	S	Peak	40.84	-17.16	23.68	46	-22.32
517.91	S	Peak	38.52	-13.60	24.92	46	-21.08
719.67	S	Peak	37.45	-10.73	26.72	46	-19.28

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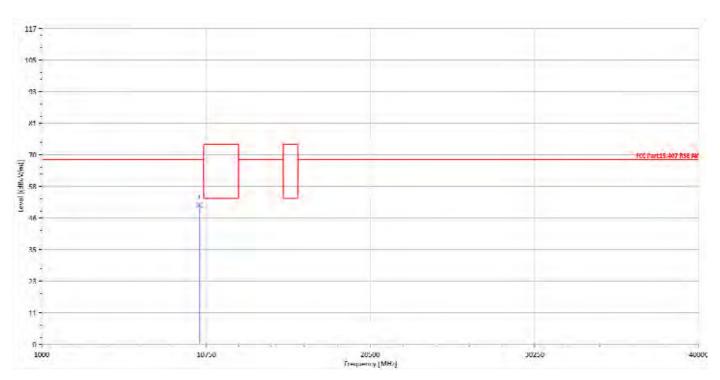
#### **Above 1GHz Worst-Case Data:**

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

Operation Mode: 802.11a Test Date: 2015/12/31

Fundamental Frequency: 5180 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: E1 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	dBµV	dB	dBµV/m	dBµV/m	dB
10360.00	Н	Peak	32.58	18.94	51.52	68.3	-16.78

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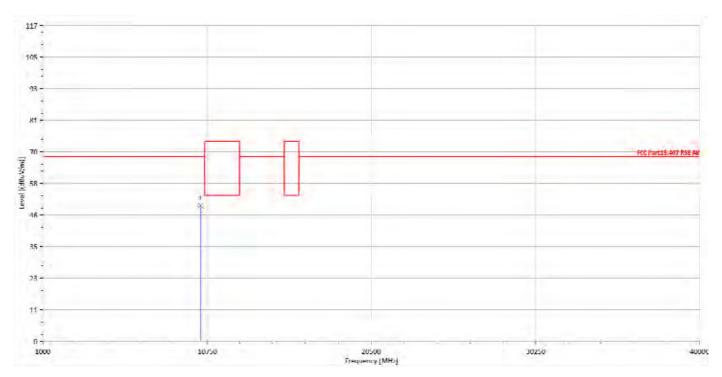


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Operation Mode: 802.11a Test Date: 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5180 MHz

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: E1 Measurement Antenna Pol. : Horizontal



F	req.	Note	Detector	Spectum	Factor	Actual	Limit	Margin
			Mode	Reading Level		FS	@3m	
	MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10	360.00	Н	Peak	31.29	18.94	50.23	68.3	-18.07

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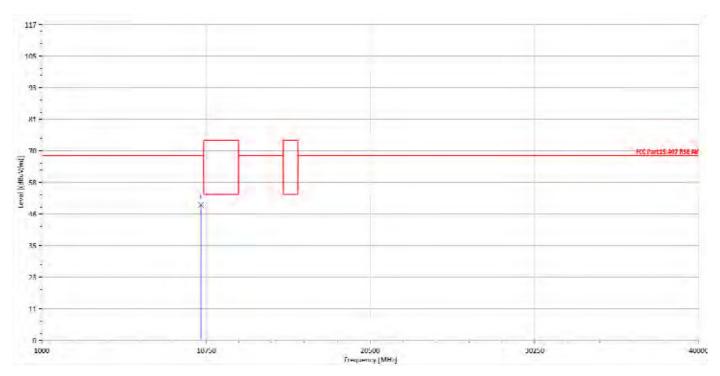


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Operation Mode: 802.11a Test Date: 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg\_C/48RH 5220 MHz

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: E1 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	dBµV	dB	dBµV/m	dBµV/m	dB
10440.00	Н	Peak	31.10	19.03	50.12	68.3	-18.18

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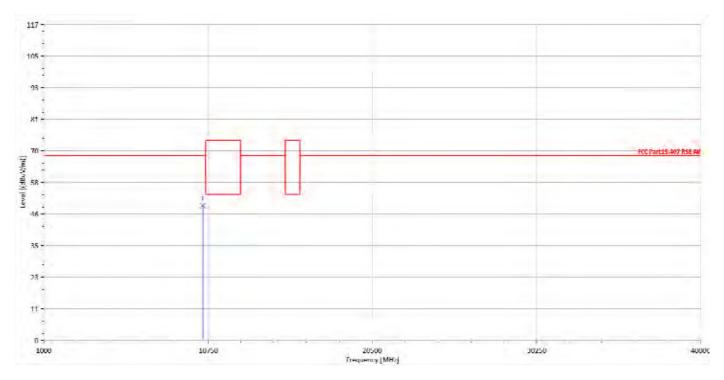


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Operation Mode: 802.11a Test Date: 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg\_C/48RH 5220 MHz

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: E1 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	dBµV	dB	dBµV/m	dBµV/m	dB
10440.00	Н	Peak	30.83	19.03	49.85	68.3	-18.45

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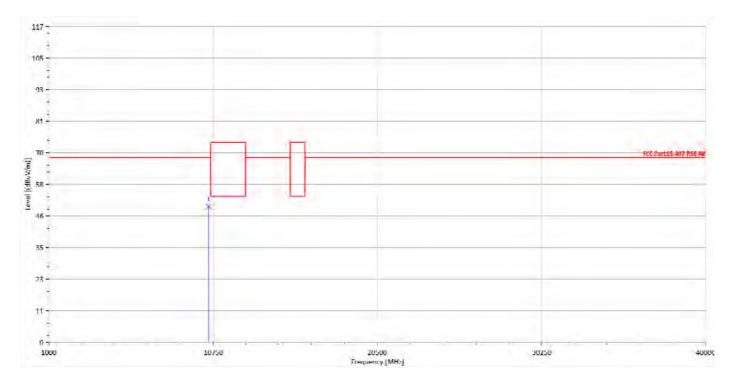


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Operation Mode: Test Date: 802.11a 2015/12/31

Fundamental Frequency: Temp. / Humi. : 24.1 deg\_C/48RH 5240 MHz

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: E1 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	dBµV	dB	dBµV/m	dBµV/m	dB
10480.00	Н	Peak	31.07	19.13	50.20	68.3	-18.10

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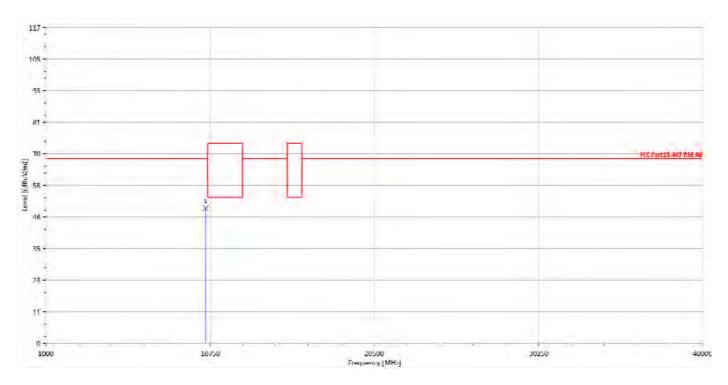


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Operation Mode: Test Date: 802.11a 2015/12/31

Fundamental Frequency: 5240 MHz Temp. / Humi. : 24.1 deg C/48RH

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: E1 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	dBµV	dB	dBµV/m	dBµV/m	dB
10480.00	Н	Peak	30.84	19.13	49.97	68.3	-18.33

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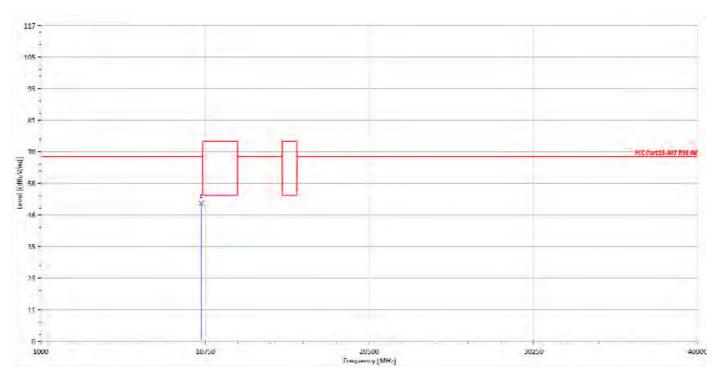
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### Radiated Spurious Emission Measurement Result 802.11a, 5250MHz-5350MHz

Operation Mode: 802.11a Test Date: 2015/12/31

Fundamental Frequency: 5260 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: E2 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
10520.00	Н	Peak	31.83	19.25	51.08	68.3	-17.22

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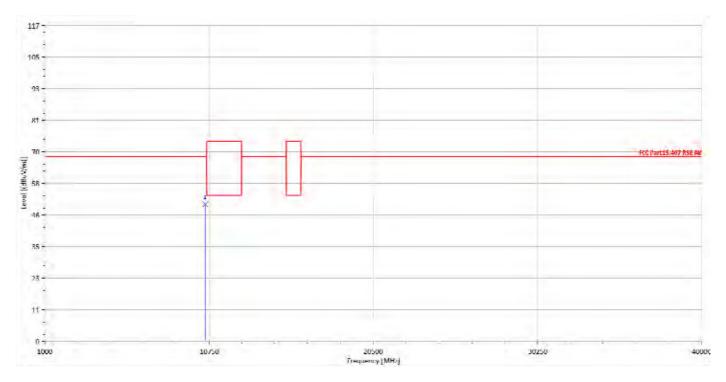


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Operation Mode: 802.11a Test Date: 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5260 MHz

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: E2 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	dBµV	dB	dBµV/m	dBµV/m	dB
10520.00	Н	Peak	31.41	19.25	50.66	68.3	-17.64

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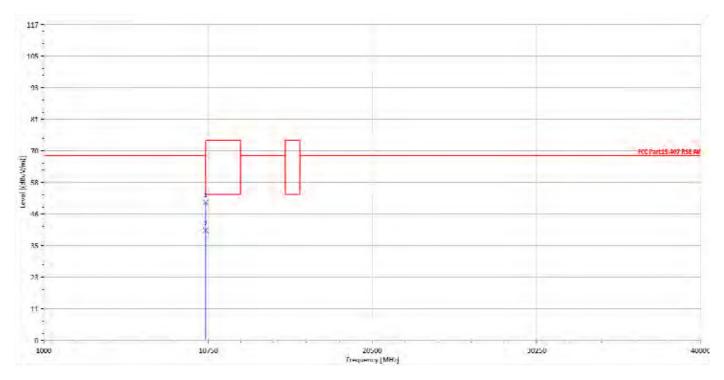


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Operation Mode: 802.11a Test Date: 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5300 MHz

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: E2 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
10600.00	Н	Peak	31.65	19.38	51.03	74	-22.97
10600.00	Н	Average	21.32	19.38	40.70	54	-13.30

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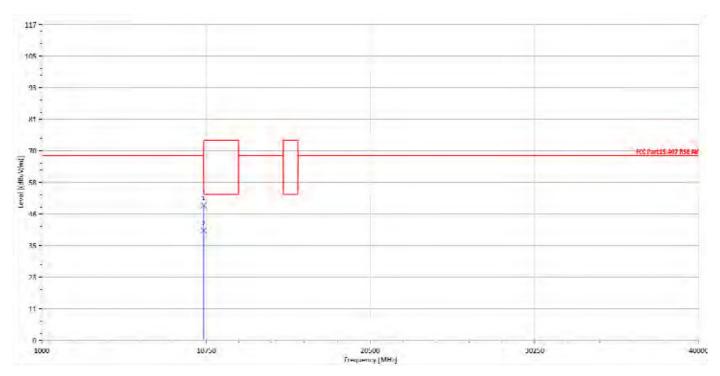


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Operation Mode: 802.11a Test Date: 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg\_C/48RH 5300 MHz

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: E2 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
10600.00	Н	Peak	30.53	19.38	49.90	74	-24.10
10600.00	Н	Average	21.32	19.38	40.70	54	-13.30

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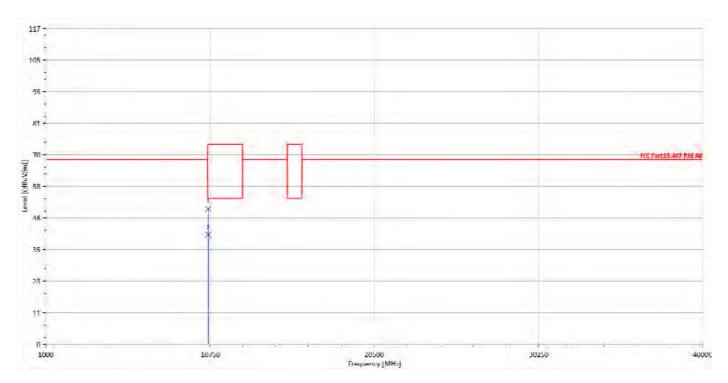


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Operation Mode: Test Date: 802.11a 2015/12/31

Fundamental Frequency: Temp. / Humi. : 24.1 deg\_C/48RH 5320 MHz

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: E2 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
10640.00	Н	Peak	30.86	19.28	50.14	74	-23.86
10640.00	Н	Average	21.37	19.28	40.65	54	-13.35

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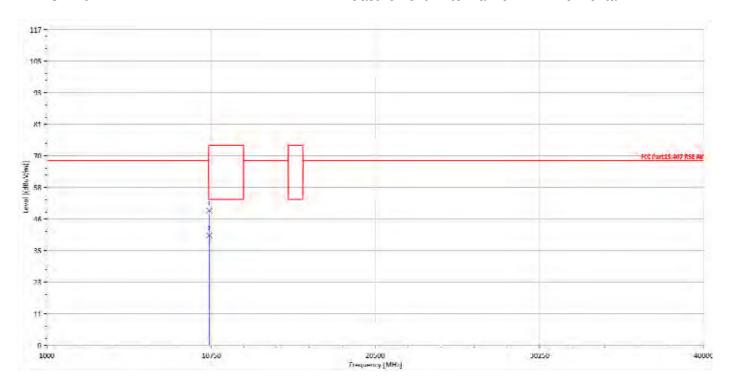


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Operation Mode: Test Date: 802.11a 2015/12/31

Fundamental Frequency: Temp. / Humi. : 5320 MHz 24.1 deg C/48RH

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: E2 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
10640.00	Н	Peak	30.58	19.28	49.86	74	-24.14
10640.00	Н	Average	21.40	19.28	40.68	54	-13.32

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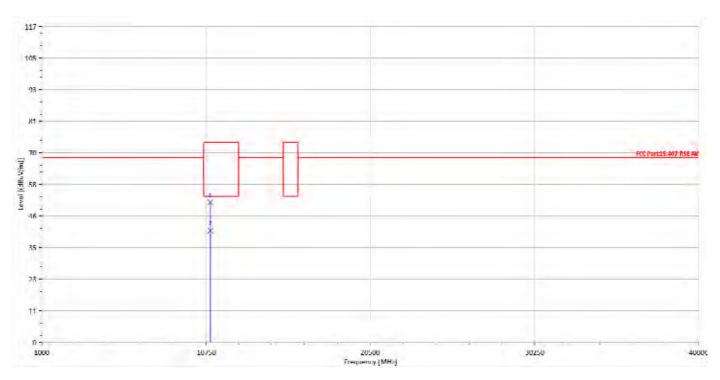
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### Radiated Spurious Emission Measurement Result 802.11a, 5470~5725 MHz

Operation Mode: 802.11a Test Date: 2015/12/31

Fundamental Frequency: 5500 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: E2 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
11000.00	Н	Peak	31.78	20.02	51.79	74	-22.21
11000.00	Н	Average	21.30	20.02	41.32	54	-12.68

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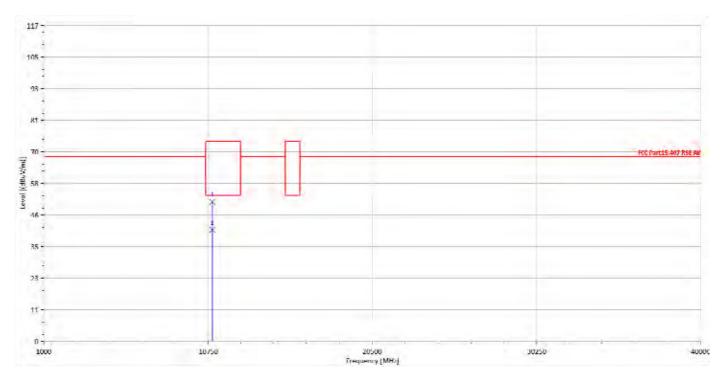


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Operation Mode: 802.11a Test Date: 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg\_C/48RH 5500 MHz

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: E2 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
11000.00	Н	Peak	31.59	20.02	51.60	74	-22.40
11000.00	Н	Average	21.27	20.02	41.29	54	-12.71

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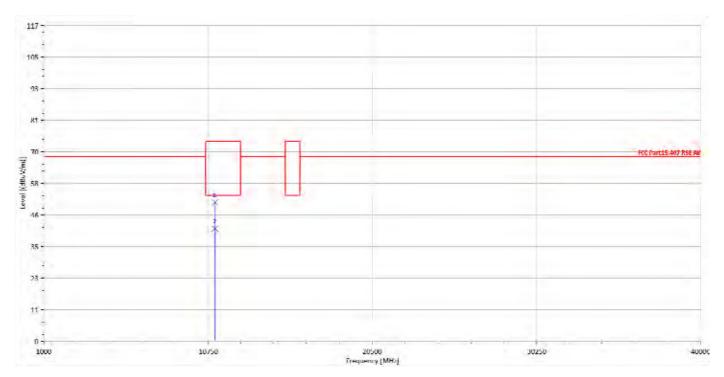


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Operation Mode: 802.11a Test Date: 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg\_C/48RH 5580 MHz

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: E2 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
11160.00	Н	Peak	30.99	20.38	51.37	74	-22.63
11160.00	Н	Average	21.35	20.38	41.73	54	-12.27

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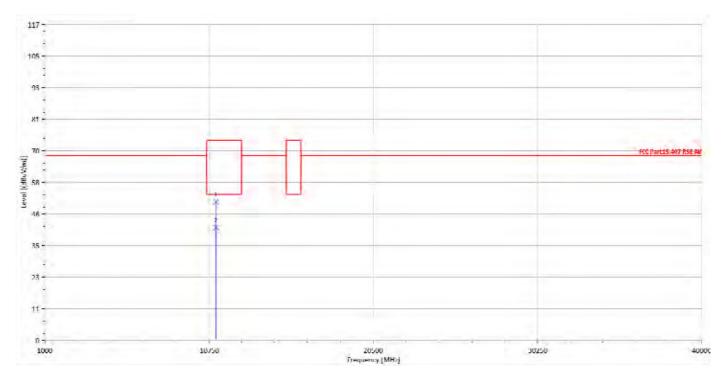


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Operation Mode: 802.11a Test Date: 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg\_C/48RH 5580 MHz

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: E2 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
11160.00	Н	Peak	30.88	20.38	51.26	74	-22.74
11160.00	Н	Average	21.36	20.38	41.74	54	-12.26

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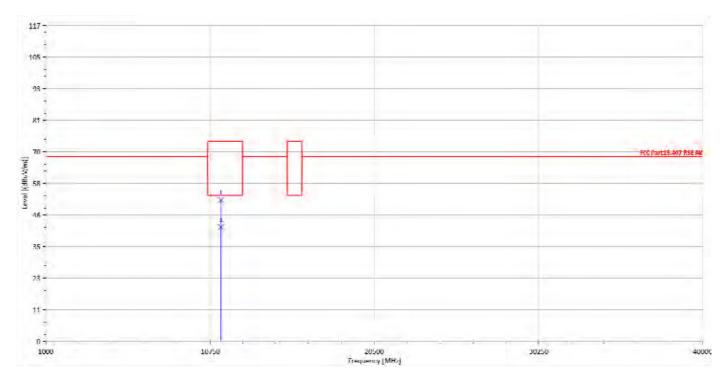


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Operation Mode: Test Date: 802.11a 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1 deg\_C/48RH 5700 MHz

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: E2 Measurement Antenna Pol.: Vertical



	Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
	MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
_	11400.00	Н	Peak	31.43	20.81	52.24	74	-21.76
	11400.00	Н	Average	21.49	20.81	42.30	54	-11.70

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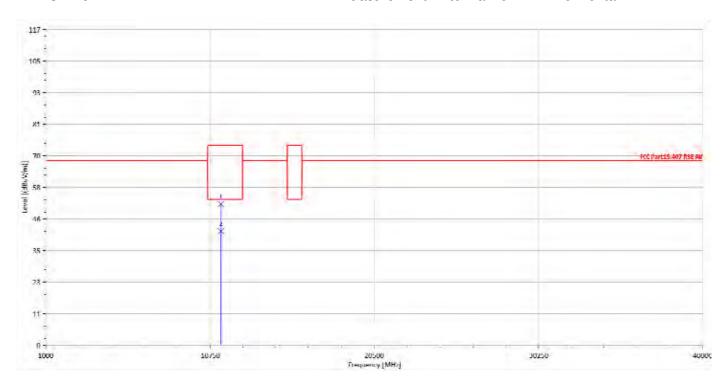


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Operation Mode: Test Date: 802.11a 2015/12/31

Fundamental Frequency: Temp. / Humi.: 5700 MHz 24.1 deg C/48RH

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: E2 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
11400.00	Н	Peak	31.42	20.81	52.23	74	-21.77
11400.00	Н	Average	21.50	20.81	42.31	54	-11.69

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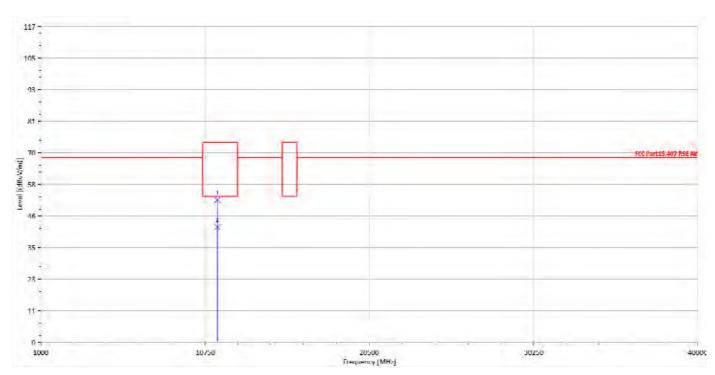
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### Radiated Spurious Emission Measurement Result 802.11a, 5725~5850 MHz

Operation Mode: 802.11a Test Date: 2015/12/31

Fundamental Frequency: 5745 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: E2 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
11490.00	Н	Peak	31.57	21.08	52.65	74	-21.35
11490.00	Н	Average	21.57	21.08	42.65	54	-11.35

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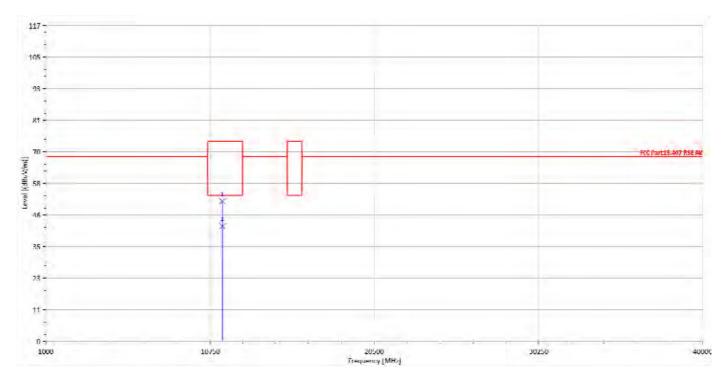


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Operation Mode: 802.11a Test Date: 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg\_C/48RH 5745 MHz

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: E2 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
11490.00	Н	Peak	30.74	21.08	51.83	74	-22.17
11490.00	Н	Average	21.57	21.08	42.65	54	-11.35

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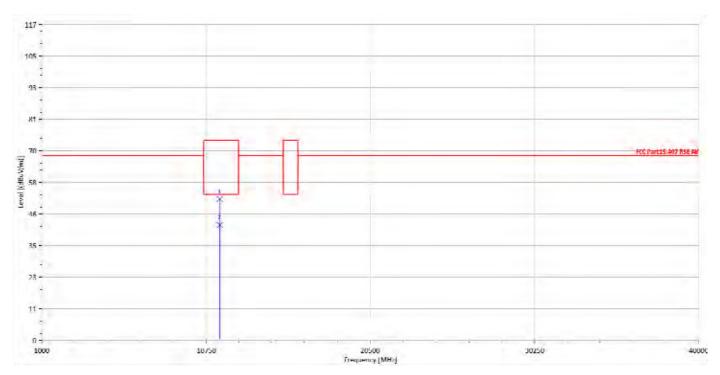


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Operation Mode: 802.11a Test Date: 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg\_C/48RH 5785 MHz

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: E2 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
11570.00	Н	Peak	31.18	21.14	52.32	74	-21.68
11570.00	Н	Average	21.62	21.14	42.76	54	-11.24

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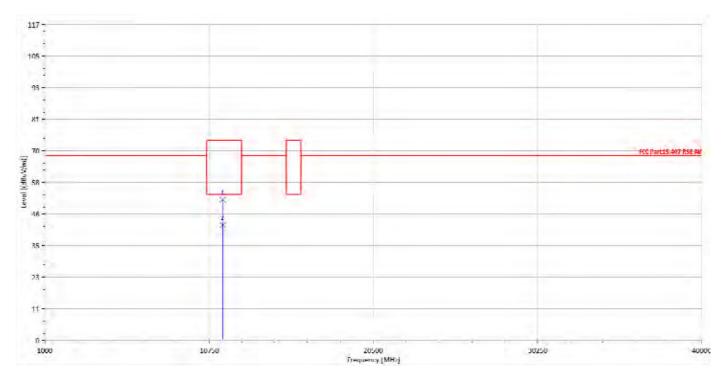


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Operation Mode: 802.11a Test Date: 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg\_C/48RH 5785 MHz

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: E2 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
11570.00	Н	Peak	30.90	21.14	52.04	74	-21.96
11570.00	Н	Average	21.58	21.14	42.72	54	-11.28

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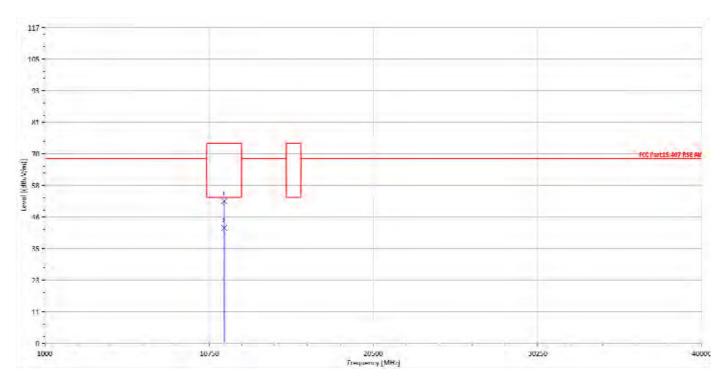


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Operation Mode: Test Date: 802.11a 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1 deg\_C/48RH 5825 MHz

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: E2 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
11650.00	Н	Peak	31.32	21.27	52.59	74	-21.41
11650.00	Н	Average	21.47	21.27	42.74	54	-11.26

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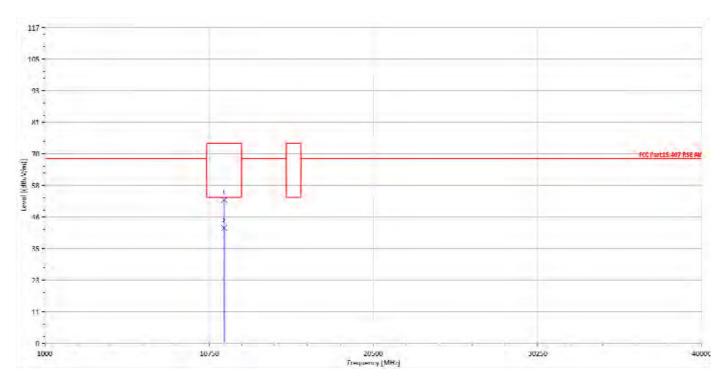


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Operation Mode: Test Date: 802.11a 2015/12/31

Fundamental Frequency: Temp. / Humi.: 5825 MHz 24.1 deg C/48RH

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: E2 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
11650.00	Н	Peak	31.80	21.27	53.07	74	-20.93
11650.00	Н	Average	21.48	21.27	42.75	54	-11.25

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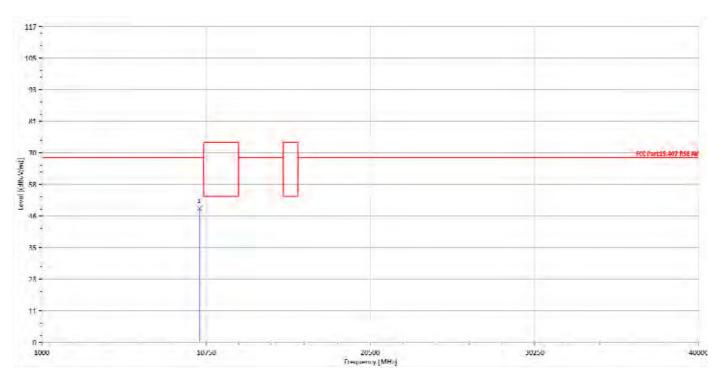
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# Radiated Spurious Emission Measurement Result 802.11n HT20, 5150~5250 MHz

Operation Mode: 802.11n20 Test Date: 2015/12/22

Fundamental Frequency: 5180 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: E1 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	dBµV	dB	dBµV/m	dBµV/m	dB
10360.00	Н	Peak	30.64	18.94	49.57	68.3	-18.73

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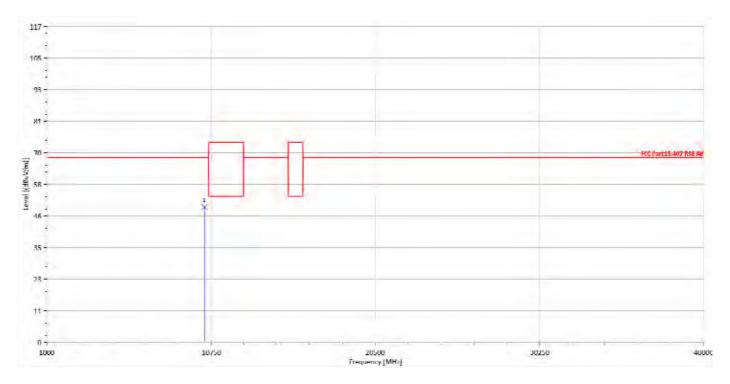


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Operation Mode: Test Date: 802.11n20 2015/12/22

Fundamental Frequency: Temp. / Humi.: 5180 MHz 24.1deg C/48RH

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: E1 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
10360.00	Н	Peak	31.11	18.94	50.05	68.3	-18.25

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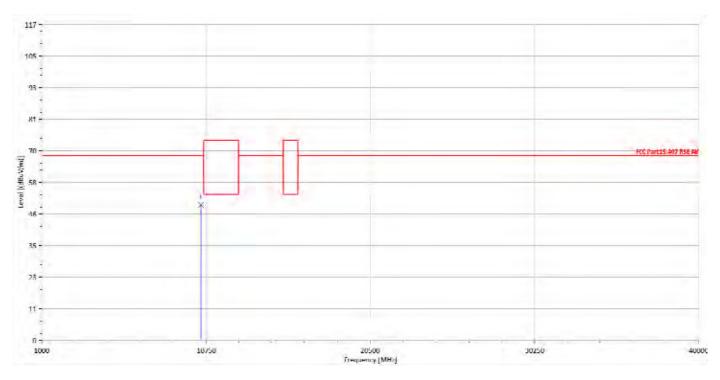


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Operation Mode: Test Date: 802.11n20 2015/12/22

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5220 MHz

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: E1 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
10440.00	Н	Peak	31.08	19.03	50.11	68.3	-18.19

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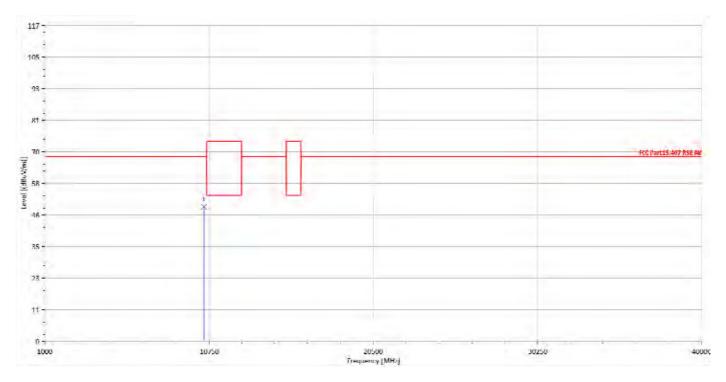


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Operation Mode: Test Date: 802.11n20 2015/12/22

Fundamental Frequency: Temp. / Humi.: 5220 MHz 24.1deg C/48RH

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: E1 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
10440.00	Н	Peak	30.75	19.03	49.77	68.3	-18.53

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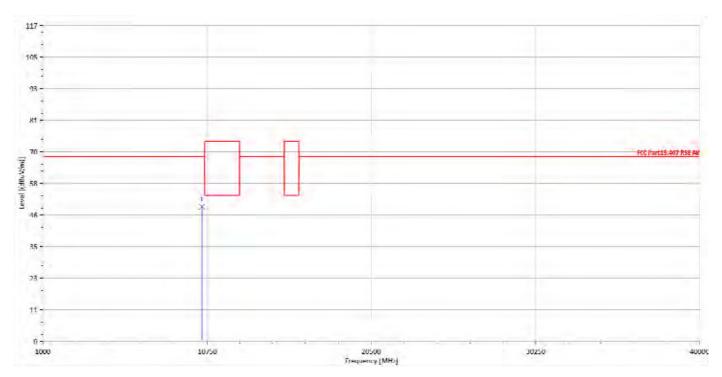


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Operation Mode: 802.11n20 Test Date: 2015/12/22

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5240 MHz

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: E1 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
	10440.00	Н	Peak	30.75	19.03	49.77	68.3	-18.53

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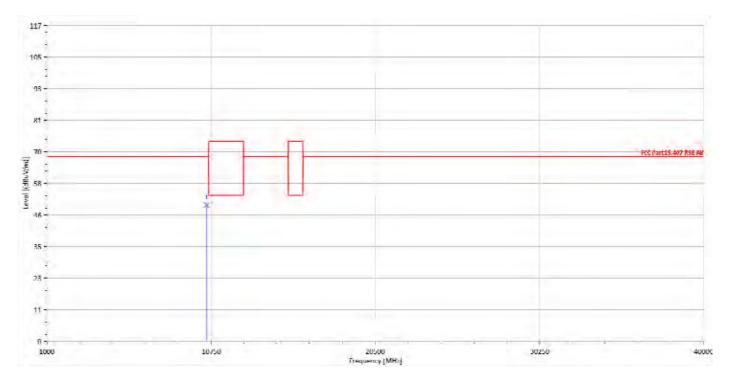


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Operation Mode: 802.11n20 Test Date: 2015/12/22

Fundamental Frequency: Temp. / Humi.: 5240 MHz 24.1deg C/48RH

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: E1 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
10480.00	Н	Peak	31.31	19.13	50.44	68.3	-17.86

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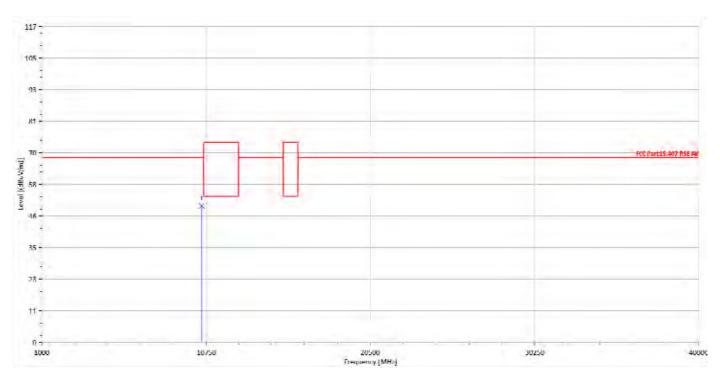
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## Radiated Spurious Emission Measurement Result 802.11n HT20, 5250~5350 MHz

Operation Mode: 802.11n20 Test Date: 2015/12/31

Fundamental Frequency: 5260 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: E1 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	dBµV	dB	dBµV/m	dBµV/m	dB
10480.00	Н	Peak	31.37	19.13	50.50	68.3	-17.80

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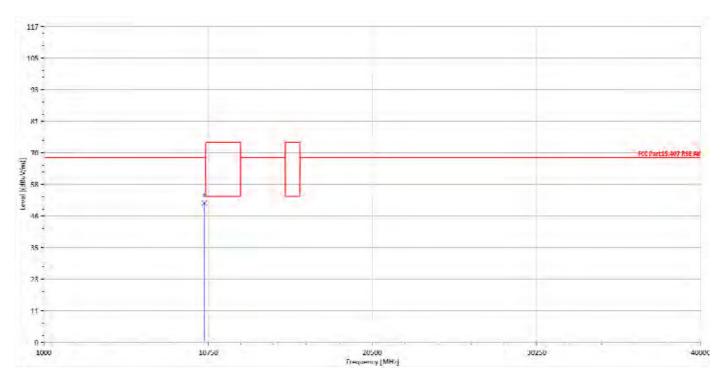


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Operation Mode: Test Date: 802.11n20 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5260 MHz

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: E1 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
10520.00	Н	Peak	32.27	19.25	51.52	68.3	-16.78

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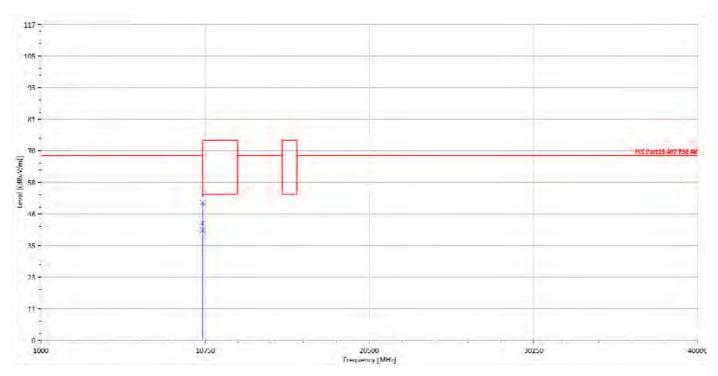


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Operation Mode: Test Date: 802.11n20 2015/12/22

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5300 MHz

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: E1 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
10600.00	Н	Peak	31.55	19.38	50.93	74	-23.07
10600.00	Н	Average	21.42	19.38	40.80	54	-13.20

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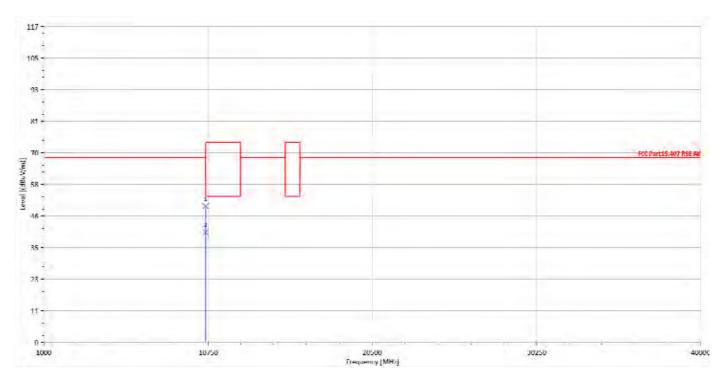


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Operation Mode: Test Date: 802.11n20 2015/12/22

Fundamental Frequency: Temp. / Humi.: 5300 MHz 24.1deg C/48RH

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: E1 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
10600.00	Н	Peak	31.01	19.38	50.39	74	-23.61
10600.00	Н	Average	21.40	19.38	40.78	54	-13.22

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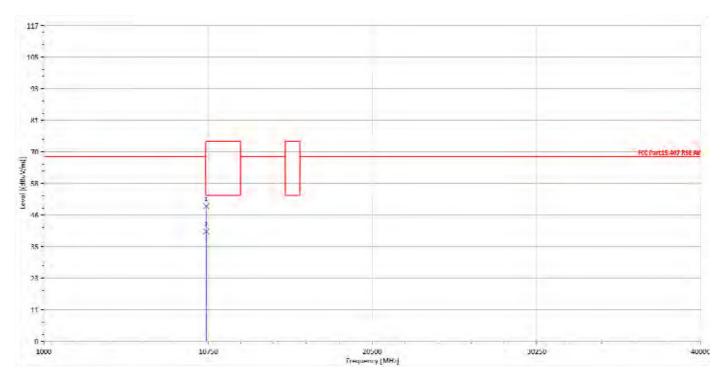


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Operation Mode: 802.11n20 Test Date: 2015/12/22

Fundamental Frequency: Temp. / Humi.: 5320 MHz 24.1deg C/48RH

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: E1 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
10640.00	Н	Peak	30.73	19.28	50.00	74	-24.00
10640.00	Н	Average	21.43	19.28	40.71	54	-13.29

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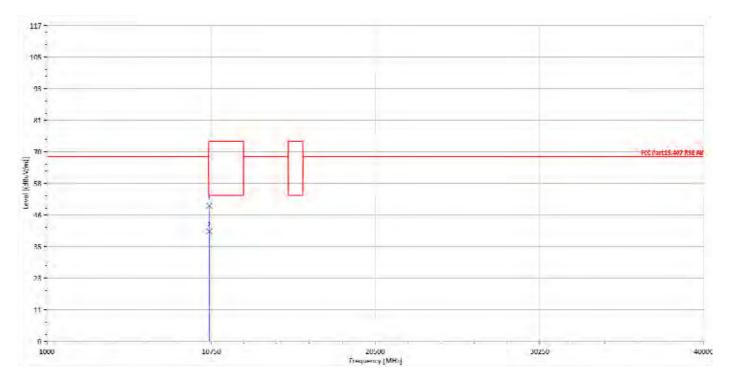


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Operation Mode: 802.11n20 Test Date: 2015/12/22

Fundamental Frequency: Temp. / Humi.: 5320 MHz 24.1deg C/48RH

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: E1 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
10640.00	Н	Peak	30.92	19.28	50.20	74	-23.80
10640.00	Н	Average	21.47	19.28	40.75	54	-13.25

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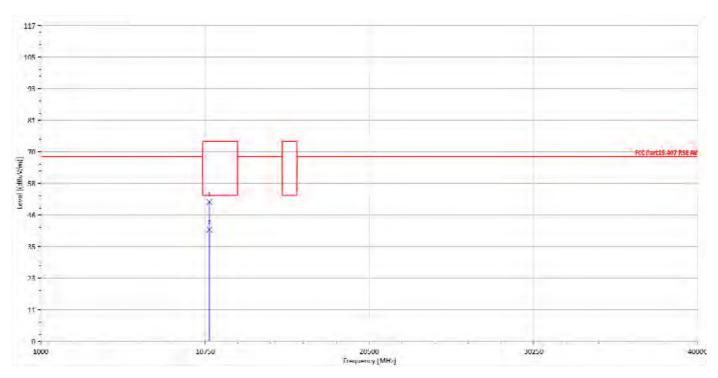
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### Radiated Spurious Emission Measurement Result 802.11n HT20, 5470~5725 MHz

Operation Mode: 802.11n20 Test Date: 2015/12/31

Fundamental Frequency: 5500 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: E1 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
11000.00	) H	Peak	31.56	20.02	51.57	74	-22.43
11000.00	) H	Average	21.35	20.02	41.37	54	-12.63

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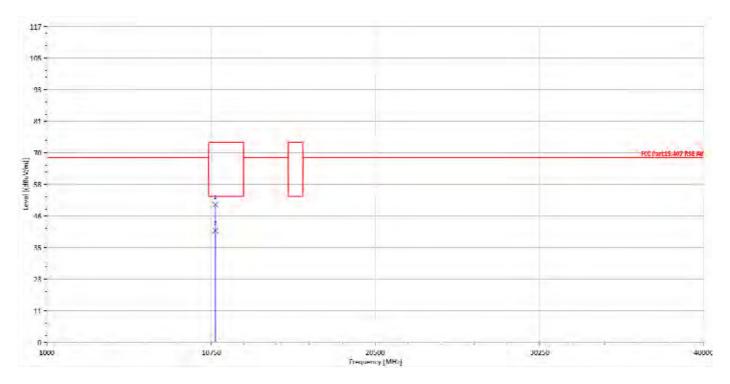


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Operation Mode: Test Date: 802.11n20 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5500 MHz

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: E1 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	dΒμV	dB	dBµV/m	dBµV/m	dB
•	11000.00	Н	Peak	30.98	20.02	51.00	74	-23.00
	11000.00	Н	Average	21.32	20.02	41.34	54	-12.66

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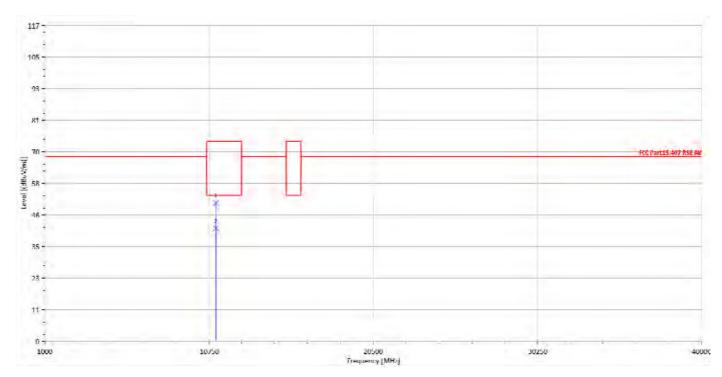


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Operation Mode: Test Date: 802.11n20 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5580 MHz

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: E1 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
11160.00	Н	Peak	30.80	20.38	51.18	74	-22.82
11160.00	Н	Average	21.44	20.38	41.82	54	-12.18

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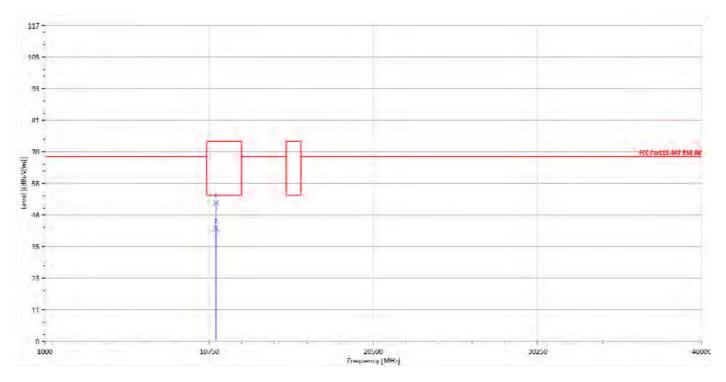


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Operation Mode: Test Date: 802.11n20 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5580 MHz

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: E1 Measurement Antenna Pol.: Horizontal



ı	Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
	MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
11	160.00	Н	Peak	30.90	20.38	51.28	74	-22.72
11	160.00	Н	Average	21.40	20.38	41.78	54	-12.22

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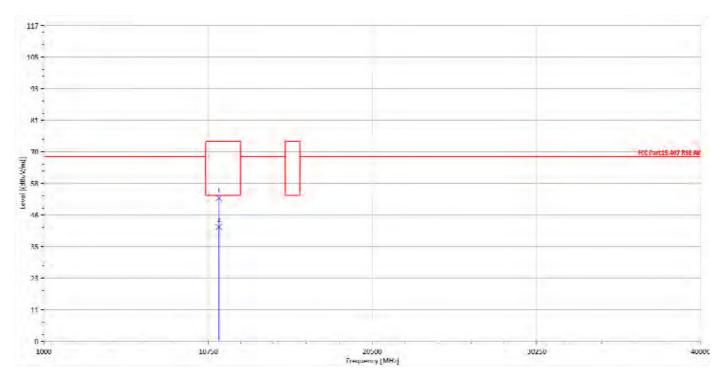


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Operation Mode: 802.11n20 Test Date: 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5700 MHz

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: E1 Measurement Antenna Pol.: Vertical



Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
11400.00	Н	Peak	32.20	20.81	53.01	74	-20.99
11400.00	Н	Average	21.54	20.81	42.35	54	-11.65

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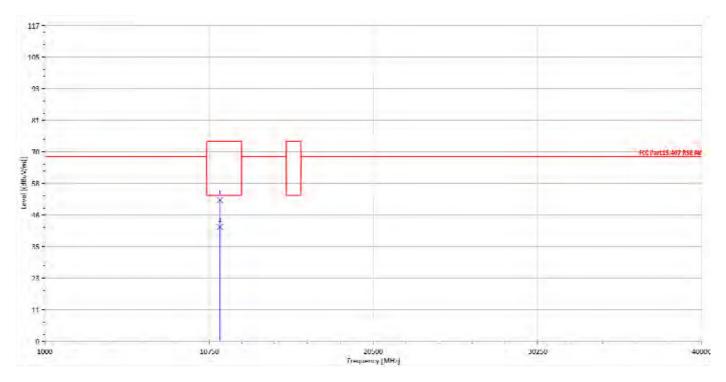


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Operation Mode: 802.11n20 Test Date: 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5700 MHz

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: E1 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	dΒμV	dB	dBµV/m	dBµV/m	dB
11400.00	Н	Peak	31.47	20.81	52.28	74	-21.72
11400.00	Н	Average	21.54	20.81	42.35	54	-11.65

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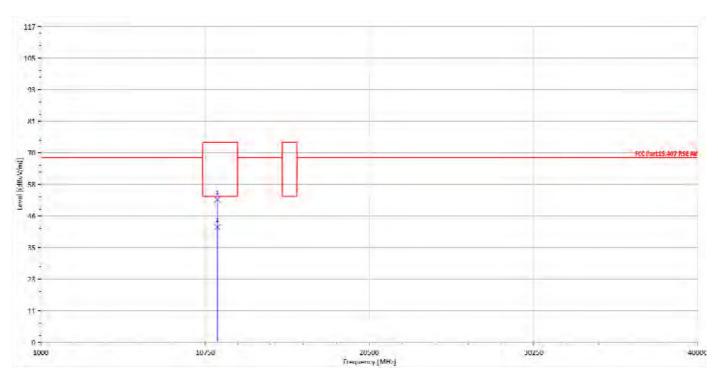
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### Radiated Spurious Emission Measurement Result 802.11n HT20, 5725~5850 MHz

Operation Mode: 802.11n20 Test Date: 2015/12/31

Fundamental Frequency: 5745 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: E1 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
1	1490.00	Н	Peak	31.71	21.08	52.79	74	-21.21
1	1490.00	Н	Average	21.59	21.08	42.67	54	-11.33

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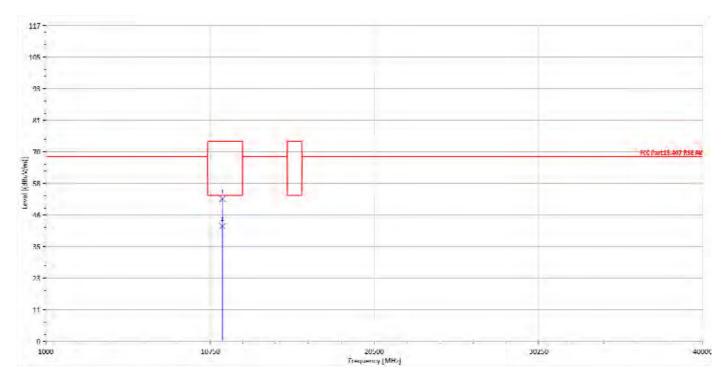


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Operation Mode: Test Date: 802.11n20 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5745 MHz

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: E1 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
11490.00	E	Peak	31.59	21.08	52.67	74	-21.33
11490.00	Е	Average	21.58	21.08	42.66	54	-11.34

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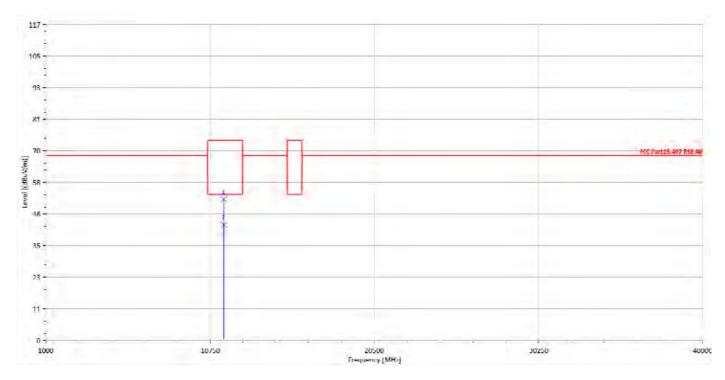


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Operation Mode: Test Date: 802.11n20 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5785 MHz

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: E1 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
11570.00	Н	Peak	31.07	21.14	52.20	74	-21.80
11570.00	Н	Average	21.61	21.15	42.76	54	-11.24

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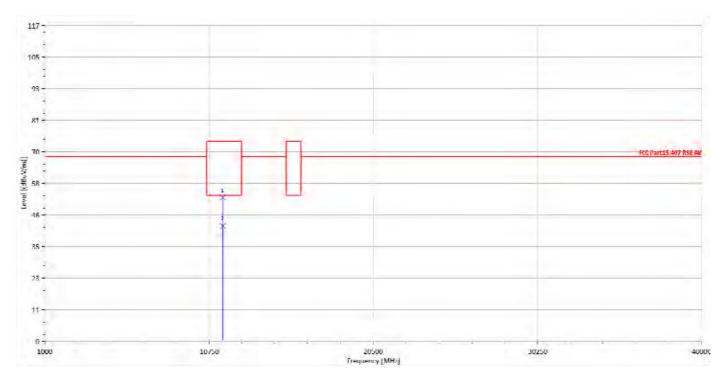


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Operation Mode: Test Date: 802.11n20 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5785 MHz

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: E1 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
11570.00	Н	Peak	32.09	21.14	53.22	74	-20.78
11570.00	Н	Average	21.60	21.14	42.74	54	-11.26

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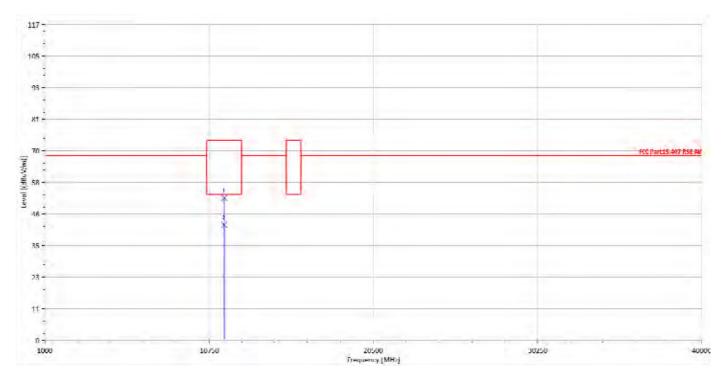


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Operation Mode: 802.11n20 Test Date: 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5825 MHz

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: E1 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
11650.00	Н	Peak	31.41	21.27	52.69	74	-21.31
11650.00	Н	Average	21.48	21.27	42.75	54	-11.25

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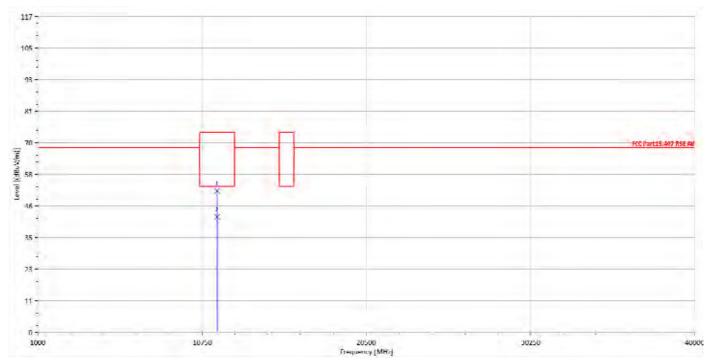


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Operation Mode: 802.11n20 Test Date: 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5825 MHz

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: E1 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
11650.00	Н	Peak	31.06	21.27	52.34	74	-21.66
11650.00	Н	Average	21.50	21.27	42.77	54	-11.23

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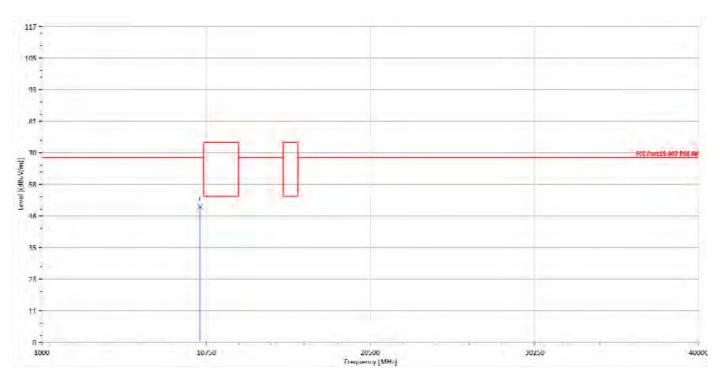
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# Radiated Spurious Emission Measurement Result 802.11n HT40, 5150~5250 MHz

Operation Mode: 802.11n40 Test Date: 2015/12/22

Fundamental Frequency: 5190 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: E1 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	dBµV	dB	dBµV/m	dBµV/m	dB
10380.00	Н	Peak	31.17	19.01	50.19	68.3	-18.11

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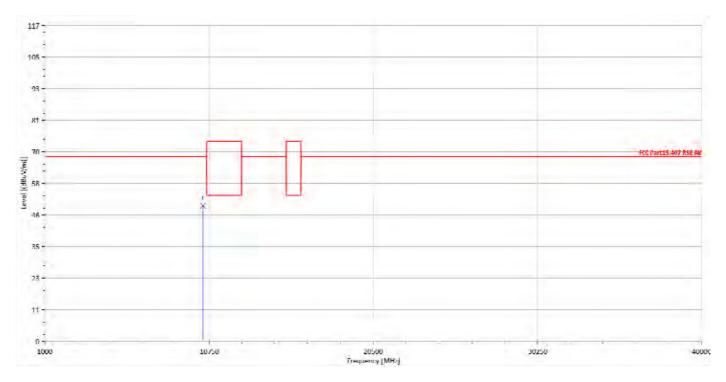


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Operation Mode: Test Date: 802.11n40 2015/12/22

Fundamental Frequency: Temp. / Humi.: 5190 MHz 24.1deg C/48RH

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: E1 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	31.13	19.01	50.15	68.3	-18.15

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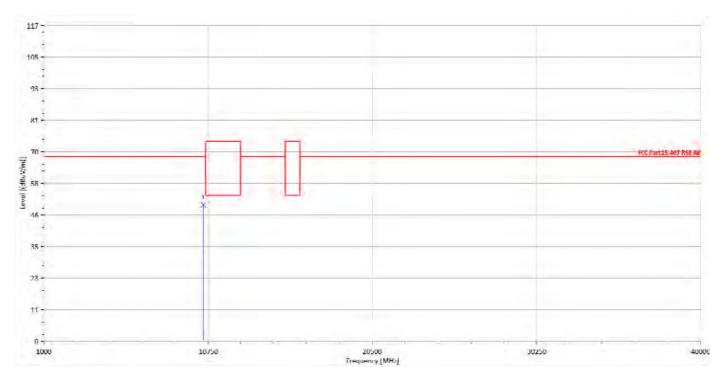


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Operation Mode: 802.11n40 Test Date: 2015/12/22

Fundamental Frequency: Temp. / Humi.: 5230 MHz 24.1deg C/48RH

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: E1 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	31.35	19.11	50.46	68.3	-17.84

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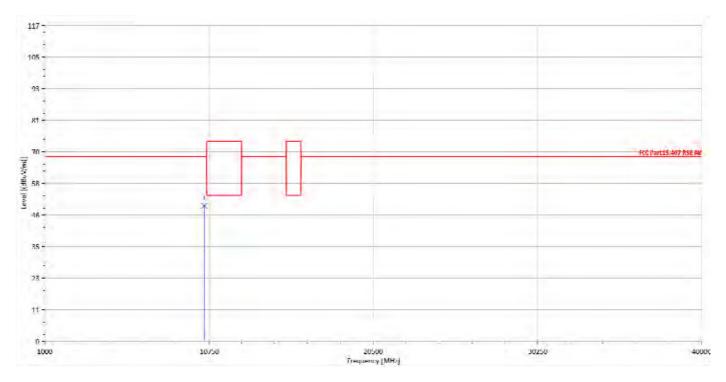


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Operation Mode: 802.11n40 Test Date: 2015/12/22

Fundamental Frequency: Temp. / Humi.: 5230 MHz 24.1deg C/48RH

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: E1 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
10460.00	Н	Peak	31.01	19.11	50.12	68.3	-18.18

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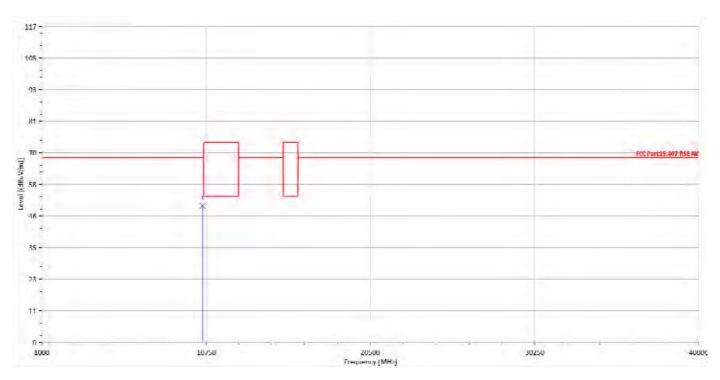
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# Radiated Spurious Emission Measurement Result 802.11n HT40, 5250~5350 MHz

Operation Mode: 802.11n40 Test Date: 2015/12/31

Fundamental Frequency: 5270 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: E1 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	dBµV	dB	dBµV/m	dBµV/m	dB
10540.00	Н	Peak	31.33	19.13	50.47	68.3	-17.83

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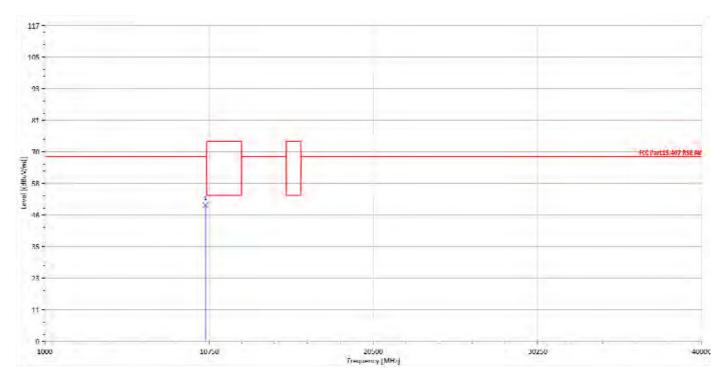


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Operation Mode: Test Date: 802.11n40 2015/12/31

Fundamental Frequency: 5270 MHz Temp. / Humi.: 24.1deg C/48RH

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: E1 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
	10540.00	Н	Peak	31.24	19.11	50.36	68.3	-17.94

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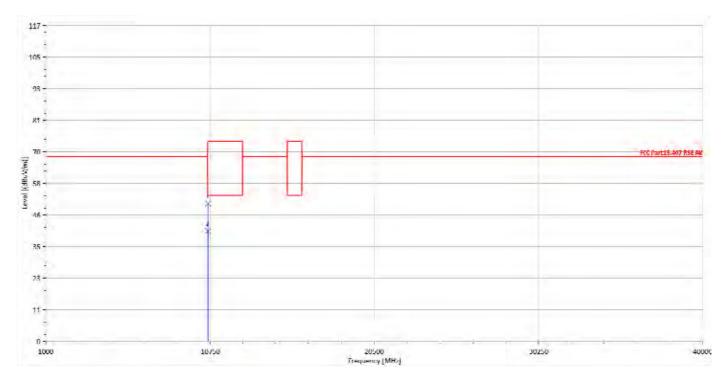


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Operation Mode: 802.11n40 Test Date: 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5310 MHz

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: E1 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
10620.00	Н	Peak	31.55	19.38	50.92	74	-23.08
10620.00	Н	Average	21.46	19.38	40.84	54	-13.16

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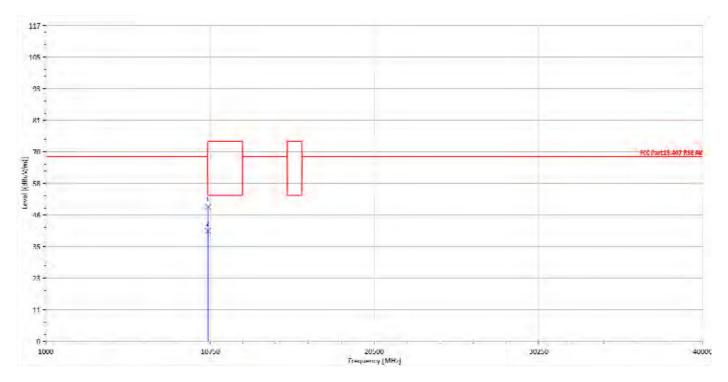


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Operation Mode: 802.11n40 Test Date: 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5310 MHz

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: E1 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
10620.00	Н	Peak	30.35	19.38	49.73	74	-24.27
10620.00	Н	Average	21.48	19.38	40.86	54	-13.14

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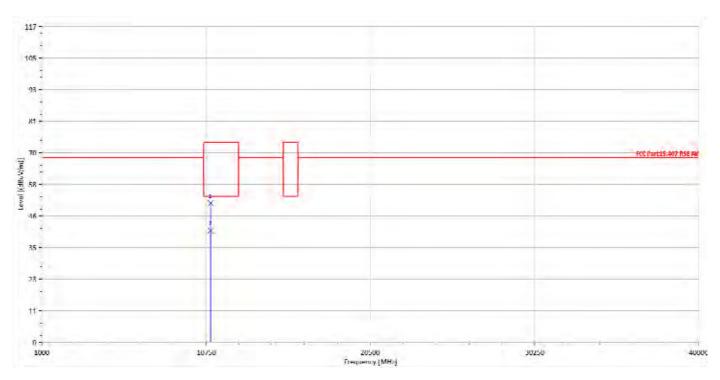
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# Radiated Spurious Emission Measurement Result 802.11n HT40, 5470~5725 MHz

Operation Mode: 802.11n40 Test Date: 2015/12/31

Fundamental Frequency: 5510 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: E1 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
	11020.00	Н	Peak	31.43	20.04	51.48	74	-22.52
	11020.00	Н	Average	21.34	20.04	41.38	54	-12.62

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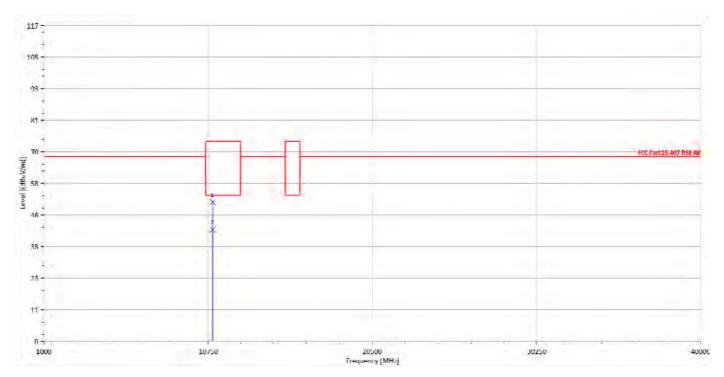


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Operation Mode: Test Date: 802.11n40 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5510 MHz

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: E1 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
11020.00	Н	Peak	31.46	20.04	51.51	74	-22.49
11020.00	Н	Average	21.35	20.04	41.39	54	-12.61

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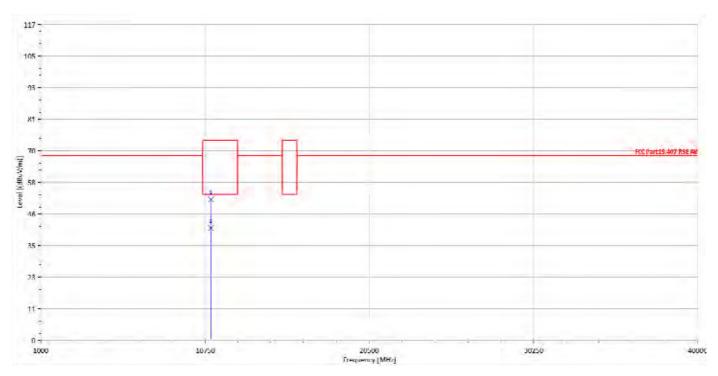


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Operation Mode: Test Date: 802.11n40 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5550 MHz

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: E1 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
11100.00	Н	Peak	31.94	20.21	52.15	74	-21.85
11100.00	Н	Average	21.39	20.21	41.60	54	-12.40

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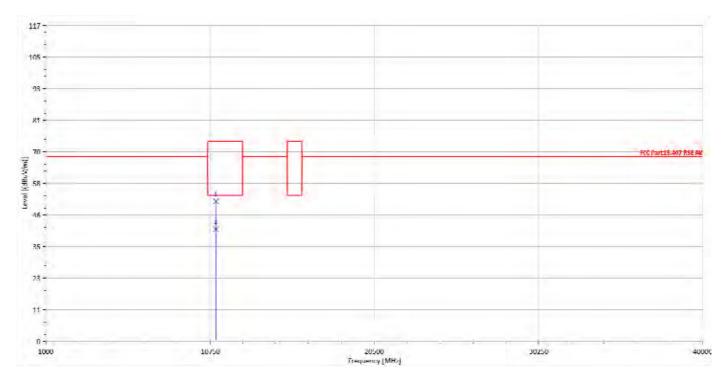


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Operation Mode: Test Date: 802.11n40 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5550 MHz

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: E1 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	dΒμV	dB	dΒμV/m	dBµV/m	dB
11100.00	Н	Peak	31.56	20.21	51.77	74	-22.23
11100.00	Н	Average	21.38	20.21	41.59	54	-12.41

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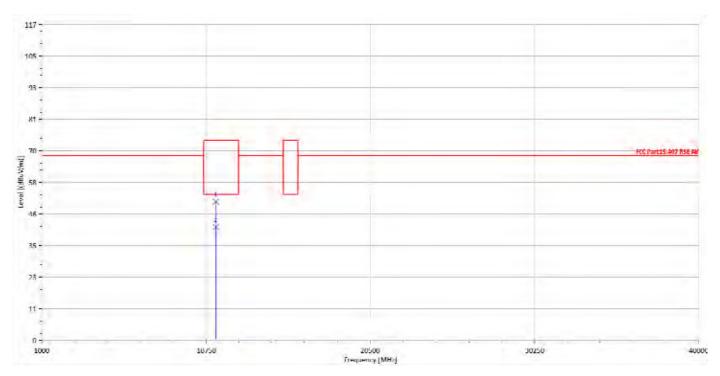


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Operation Mode: 802.11n40 Test Date: 2015/12/31

Fundamental Frequency: 5670 MHz Temp. / Humi.: 24.1deg C/48RH

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: E1 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
11340.00	Н	Peak	30.70	20.61	51.31	74	-22.69
11340.00	Н	Average	21.38	20.61	41.99	54	-12.01

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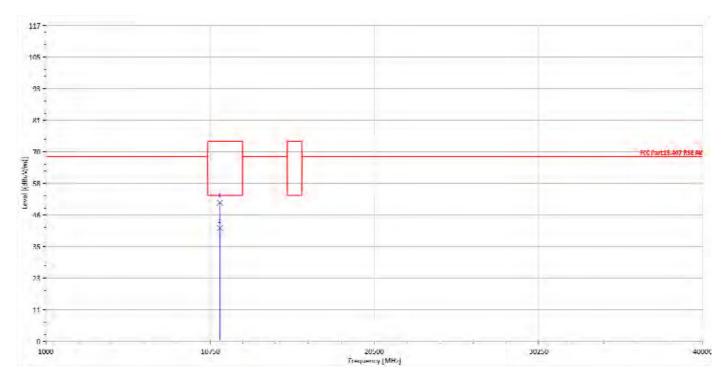


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Operation Mode: 802.11n40 Test Date: 2015/12/31

Fundamental Frequency: 5670 MHz Temp. / Humi.: 24.1deg C/48RH

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: E1 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
11340.00	Н	Peak	30.66	20.61	51.27	74	-22.73
11340.00	Н	Average	21.39	20.61	42.00	54	-12.00

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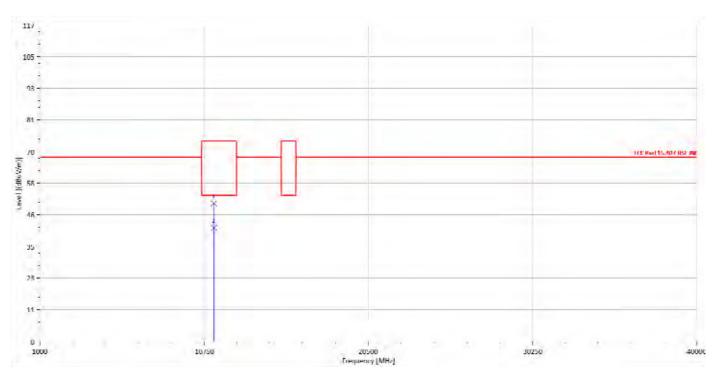
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# Radiated Spurious Emission Measurement Result 802.11n HT40, 5725~5850 MHz

Operation Mode: 802.11n40 Test Date: 2015/12/31

Fundamental Frequency: 5755 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: Test Engineer: Tx CH Low Ashton EUT Pol.: Measurement Antenna Pol.: E1 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
11340.00	Н	Peak	30.51	20.61	51.12	74	-22.88
11340.00	Н	Average	21.40	20.61	42.01	54	-11.99

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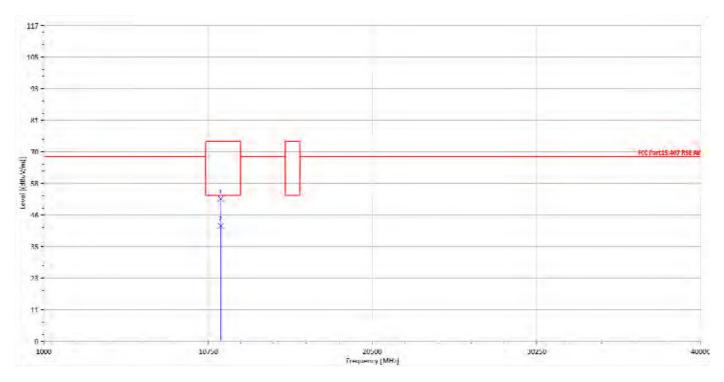


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Operation Mode: Test Date: 802.11n40 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5755 MHz

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: E1 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
11510.00	Н	Peak	31.56	21.17	52.73	74	-21.27
11510.00	Н	Average	21.60	21.17	42.77	54	-11.23

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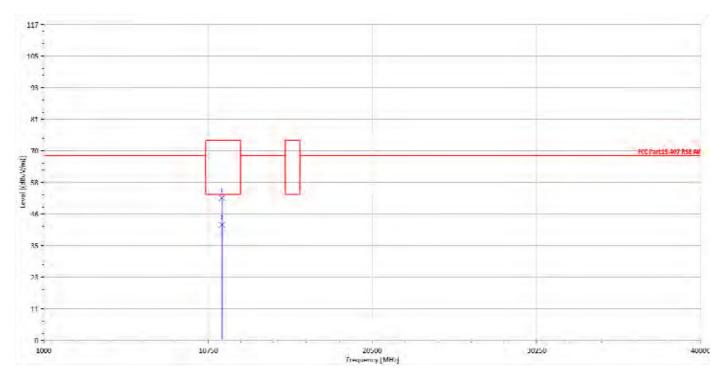


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Operation Mode: 802.11n40 Test Date: 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5795 MHz

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: E1 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
11590.00	Н	Peak	31.53	21.17	52.70	74	-21.30
11590.00	Н	Average	21.64	21.17	42.81	54	-11.19

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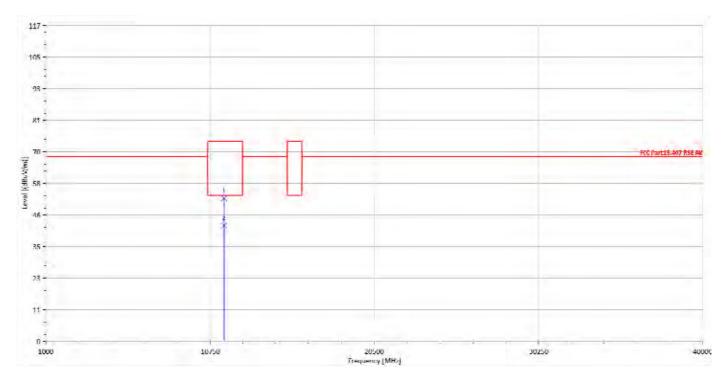


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Operation Mode: 802.11n40 Test Date: 2015/12/31

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5795 MHz

Operation Band: Tx CH High Test Engineer: Ashton EUT Pol.: E1 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
11590.00	Н	Peak	31.70	21.28	52.97	74	-21.03
11590.00	Н	Average	21.64	21.28	42.92	54	-11.08

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# Band edge falling to restricted band 802.11a mode

Operation Mode: 802.11a Test Date: 2015/12/22

Fundamental Frequency: Temp. / Humi.: 5180 MHz 24.1deg\_C/48RH

Operation Band: BE CH Low Test Engineer: Ashton EUT Pol.: E1 Measurement Antenna Pol. : Vertical

Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
5148.52	S	Peak	46.53	11.15	57.68	74	-16.32
5148.52	S	Average	31.86	11.15	43.01	54	-10.99
5150.00	E	Peak	45.67	11.14	56.81	74	-17.19
5150.00	Е	Average	31.85	11.14	42.99	54	-11.01

Operation Mode: 802.11a Test Date: 2015/12/22

Fundamental Frequency: 5180 MHz Temp. / Humi. : 24.1deg\_C/48RH

Operation Band: Test Engineer: BE CH Low Ashton EUT Pol.: Measurement Antenna Pol. : E1 Horizontal

Freq.	Note	Detector Mode	Spectum 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	Peak	43.60	11.14	54.74	74	-19.26	
5150.00	Е	Average	31.74	11.14	42.88	54	-11.12	

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Operation Mode: 802.11a Test Date: 2015/12/22

Fundamental Frequency: Temp. / Humi.: 5320 MHz 24.1deg C/48RH

Operation Band: BE CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: Vertical E1

Freq.	Note	Detector Mode	Spectum 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	Е	Peak	43.60	11.30	54.90	74	-19.10
5350.00	E	Average	32.19	11.30	43.49	54	-10.51
5351.16	S	Peak	44.54	11.31	55.85	74	-18.15
5351.16	S	Average	32.13	11.31	43.44	54	-10.56

Test Date: Operation Mode: 802.11a 2015/12/22

Fundamental Frequency: 5320 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: BE CH High Test Engineer: Ashton EUT Pol.: 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
5350.00	E	Peak	43.53	11.30	54.83	74	-19.17
5350.00	E	Average	32.09	11.30	43.39	54	-10.61

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Operation Mode: 802.11a Test Date: 2015/12/22

Fundamental Frequency: 5500 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: BE CH Low Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol. : Vertical E1

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
5455.28	S	Peak	45.82	11.46	57.28	74	-16.72
5455.28	S	Average	32.21	11.46	43.67	54	-10.33
5460.00	E	Peak	43.91	11.46	55.37	74	-18.63
5460.00	Е	Average	32.03	11.46	43.49	54	-10.51

Operation Mode: Test Date: 2015/12/22 802.11a

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5500 MHz

Operation Band: Test Engineer: Ashton BE CH Low EUT Pol. : Measurement Antenna Pol. : Horizontal E1

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
5458.40	S	Peak	45.85	11.46	57.31	74	-16.69
5458.40	S	Average	32.05	11.46	43.51	54	-10.49
5460.00	Е	Peak	44.26	11.46	55.72	74	-18.28
5460.00	E	Average	32.21	11.46	43.67	54	-10.33

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802.11a Test Date: Operation Mode: 2015/12/22

Fundamental Frequency: 5500 MHz 24.1deg C/48RH Temp. / Humi.:

Operation Band: BE CH Low RSE Test Engineer: Ashton EUT Pol.: E1 Measurement Antenna Pol.: Vertical

Spectum Freq. Note Detector Factor Actual Limit Margin Reading Level Mode FS @3m PK/QP/AV dBµV dBµV/m dBµV/m F/H/E/S dB dB MHz 48.75 5470.00 Peak 11.46 60.21 68.3 -8.09

Operation Mode: 802.11a Test Date: 2015/12/22

Fundamental Frequency: 5500 MHz Temp. / Humi.: 24.1deg C/48RH

Operation Band: BE CH Low RSE Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: E1 Horizontal

Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
5469.80	S	Peak	50.76	11.46	62.22	68.3	-6.08
5470.00	E	Peak	49.79	11.46	61.25	68.3	-7.05

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Operation Mode: 802.11a Test Date: 2015/12/22

Fundamental Frequency: 5700 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: BE CH High Test Engineer: Ashton EUT Pol.: E1 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
5725.00	Е	Peak	46.31	12.27	58.58	68.3	-9.72
5725.40	S	Peak	48.43	12.27	60.69	68.3	-7.61

Operation Mode: 802.11a Test Date: 2015/12/22

Fundamental Frequency: Temp. / Humi.: 5700 MHz 24.1deg\_C/48RH

Operation Band: BE CH High Test Engineer: Ashton EUT Pol. : Measurement Antenna Pol.: Horizontal E1

Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
5725.00	E	Peak	49.31	12.27	61.58	68.3	-6.72
5725.64	S	Peak	51.31	12.27	63.58	68.3	-4.72

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Operation Mode: 802.11a Test Date: 2015/12/22

Fundamental Frequency: 5745 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: BE CH Low Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol. : Vertical E1

Freq. Note Detector Spectum Factor Actual Limit Margin Reading Level FS Mode @3m PK/QP/AV dBµV dBµV/m F/H/E/S dΒ dBµV/m 5725.00 53.45 78.2 Peak 65.72

Operation Mode: 802.11a Test Date: 2015/12/22

Fundamental Frequency: Temp. / Humi.: 5745 MHz 24.1deg\_C/48RH

Operation Band: BE CH Low Test Engineer: **Ashton** EUT Pol.: Measurement Antenna Pol.: Horizontal E1

Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB	
5724.80	S	Peak	55.01	12.27	67.28	78.2	-10.92	
5725.00	Е	Peak	53.71	12.27	65.98	78.2	-12.22	

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Operation Mode: 802.11a Test Date: 2015/12/22

Fundamental Frequency: Temp. / Humi.: 5825 MHz 24.1deg C/48RH

Operation Band: BE CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: Vertical E1

Spectum Freq. Note Detector Factor Actual Limit Margin Reading Level Mode FS @3m PK/QP/AV dΒμV dBµV/m dBµV/m MHz F/H/E/S dB dB 45.07 5850.00 Peak 12.61 57.68 78.2 -20.52

Operation Mode: 802.11a Test Date: 2015/12/22

Fundamental Frequency: 5825 MHz Temp. / Humi.: 24.1deg C/48RH

Operation Band: BE CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: E1 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
5850.00	F	Peak	43.71	12.61	56.32	78.2	-21.88

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#### 802.11n20 HT mode

Operation Mode: 802.11n20 Test Date: 2015/12/22

Fundamental Frequency: 5180 MHz Temp. / Humi.: 24.1deg\_C/48RH

Ashton Operation Band: BE CH Low Test Engineer: EUT Pol.: Measurement Antenna Pol. : Vertical E1

Freq.	Note	Detector Mode	Spectum 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	Peak	47.19	11.14	58.34	74	-15.66
5150.00	Е	Average	31.92	11.14	43.06	54	-10.94

Operation Mode: 802.11n20 Test Date: 2015/12/22

Fundamental Frequency: Temp. / Humi.: 5180 MHz 24.1deg\_C/48RH

Test Engineer: Operation Band: BE CH Low **Ashton** EUT Pol.: Measurement Antenna Pol. : Horizontal E1

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
5148.64	S	Peak	45.40	11.15	56.55	74	-17.45
5148.64	S	Average	31.76	11.15	42.91	54	-11.09
5150.00	E	Peak	43.76	11.14	54.90	74	-19.10
5150.00	E	Average	31.75	11.14	42.89	54	-11.11

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Operation Mode: 802.11n20 Test Date: 2015/12/22

Fundamental Frequency: 5320 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: BE CH High Test Engineer: Ashton EUT Pol. : E1 Measurement Antenna Pol.: Vertical

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
5350.00	Е	Peak	43.46	11.30	54.76	74	-19.24
5350.00	Е	Average	32.11	11.30	43.41	54	-10.59

Operation Mode: 802.11n20 Test Date: 2015/12/22

Fundamental Frequency: 5320 MHz Temp. / Humi.: 24.1deg C/48RH

Operation Band: BE CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: Horizontal E1

Freq.	Note	Detector Mode	Spectum 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	Peak	42.87	11.30	54.17	74	-19.83
5350.00	Е	Average	32.09	11.30	43.39	54	-10.61

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Operation Mode: 802.11n20 Test Date: 2015/12/22

Fundamental Frequency: 5500 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: BE CH Low Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol. : Vertical E1

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
5455.88	S	Peak	45.69	11.46	57.15	74	-16.85
5455.88	S	Average	32.06	11.46	43.52	54	-10.48
5460.00	E	Peak	44.02	11.46	55.48	74	-18.52
5460.00	E	Average	32.07	11.46	43.53	54	-10.47

Operation Mode: 802.11n20 Test Date: 2015/12/22

Fundamental Frequency: 5500 MHz Temp. / Humi.: 24.1deg C/48RH

Operation Band: Test Engineer: Ashton BE CH Low EUT Pol. : Measurement Antenna Pol. : Horizontal E1

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
5458.88	S	Peak	47.69	11.46	59.16	74	-14.84
5458.88	S	Average	32.28	11.46	43.74	54	-10.26
5460.00	E	Peak	45.88	11.46	57.34	74	-16.66
5460.00	E	Average	32.26	11.46	43.72	54	-10.28

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Operation Mode: 802.11n20 Test Date: 2015/12/22

Fundamental Frequency: 24.1deg C/48RH 5500 MHz Temp. / Humi.:

Operation Band: BE CH Low RSE Test Engineer: Ashton EUT Pol.: E1 Measurement Antenna Pol.: Vertical

Freq. Note Detector Spectum Factor Actual Limit Margin @3m Reading Level FS Mode MHz F/H/E/S PK/QP/AV dΒμV dB dB<sub>u</sub>V/m dBµV/m dB 5469.32 S Peak 51.47 11.46 62.92 68.3 -5.38 5470.00 Ε 49.49 11.46 60.95 -7.35 Peak 68.3

Operation Mode: 802.11n20 Test Date: 2015/12/22

Fundamental Frequency: 5500 MHz Temp. / Humi.: 24.1deg C/48RH

Operation Band: BE CH Low RSE Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: E1 Horizontal

	Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
	MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
-	5469.80	S	Peak	55.30	11.46	66.76	68.3	-1.54
	5470.00	E	Peak	53.03	11.46	64.48	68.3	-3.82

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Operation Mode: 802.11n20 Test Date: 2015/12/22

Fundamental Frequency: 5700 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: BE CH High Test Engineer: Ashton EUT Pol.: E1 Measurement Antenna Pol.: Vertical

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	46.33	12.27	58.60	68.3	-9.70
5725.40	S	Peak	47.89	12.27	60.16	68.3	-8.14

Operation Mode: 802.11n20 Test Date: 2015/12/22

Fundamental Frequency: 5700 MHz Temp. / Humi.: 24.1deg C/48RH

Operation Band: BE CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: Horizontal E1

Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
5725.00	E	Peak	49.10	12.27	61.37	68.3	-6.93
5725.76	S	Peak	51.06	12.27	63.33	68.3	-4.97

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Operation Mode: 802.11n20 Test Date: 2015/12/22

Fundamental Frequency: 5745 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: BE CH Low Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: Vertical E1

Factor Margin Freq. Note Detector Spectum Actual Limit Reading Level Mode FS @3m PK/QP/AV dBµV dBµV/m F/H/E/S dΒ dBµV/m 5725.00 53.16 65.43 78.2 Peak

Operation Mode: 802.11n20 Test Date: 2015/12/22

Temp. / Humi.: Fundamental Frequency: 5745 MHz 24.1deg\_C/48RH

Operation Band: BE CH Low Test Engineer: **Ashton** EUT Pol.: Measurement Antenna Pol.: Horizontal E1

Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin	
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB	
5722.70	S	Peak	56.52	12.28	68.80	78.2	-9.40	-
5725.00	E	Peak	55.08	12.27	67.35	78.2	-10.85	

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Operation Mode: 802.11n20 Test Date: 2015/12/22

Fundamental Frequency: Temp. / Humi.: 5825 MHz 24.1deg C/48RH

Operation Band: BE CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: Vertical E1

Spectum Freq. Note Detector Factor Actual Limit Margin Reading Level Mode FS @3m PK/QP/AV dBµV dBµV/m dBµV/m MHz F/H/E/S dB dB 5850.00 Peak 44.56 12.61 57.17 78.2 -21.03

Operation Mode: 802.11n20 Test Date: 2015/12/22

Fundamental Frequency: 5825 MHz Temp. / Humi.: 24.1deg C/48RH

Operation Band: BE CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: E1 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
-	5850.00	E	Peak	43.00	12.61	55.61	78.2	-22.59

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#### 802.11n40 HT mode

Operation Mode: 802.11n40 Test Date: 2015/12/22

Fundamental Frequency: 5190 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: BE CH Low Test Engineer: Ashton EUT Pol. : Measurement Antenna Pol. : Vertical E1

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
5148.04	S	Peak	52.91	11.15	64.06	74	-9.94
5148.04	S	Average	32.07	11.15	43.22	54	-10.78
5150.00	Е	Peak	49.68	11.14	60.82	74	-13.18
5150.00	Е	Average	32.12	11.14	43.26	54	-10.74

Operation Mode: 802.11n40 Test Date: 2015/12/22

Fundamental Frequency: 5190 MHz Temp. / Humi.: 24.1deg C/48RH

Operation Band: Test Engineer: Ashton BE CH Low EUT Pol. : Measurement Antenna Pol. : Horizontal E1

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
5148.76	S	Peak	50.98	11.15	62.13	74	-11.87
5148.76	S	Average	31.96	11.15	43.11	54	-10.89
5150.00	E	Peak	48.86	11.14	60.01	74	-13.99
5150.00	E	Average	31.95	11.14	43.09	54	-10.91

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Operation Mode: 802.11n40 Test Date: 2015/12/22

Fundamental Frequency: 5310 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: BE CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: Vertical E1

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
5350.00	Е	Peak	51.65	11.30	62.95	74	-11.05
5350.00	Е	Average	32.75	11.30	44.05	54	-9.95
5353.52	S	Peak	52.59	11.32	63.91	74	-10.09
5353.52	S	Average	32.46	11.32	43.78	54	-10.22

Operation Mode: 802.11n40 Test Date: 2015/12/22

Fundamental Frequency: 5310 MHz Temp. / Humi.: 24.1deg C/48RH

Operation Band: Test Engineer: BE CH High Ashton EUT Pol.: Measurement Antenna Pol.: Horizontal E1

	Freq.	Note	Detector Mode	Spectum 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	Peak	49.67	11.30	60.97	74	-13.03	
	5350.00	Е	Average	32.35	11.30	43.65	54	-10.35	

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Operation Mode: 802.11n40 Test Date: 2015/12/22

Fundamental Frequency: Temp. / Humi.: 24.1deg C/48RH 5510 MHz

Operation Band: BE CH Low Test Engineer: Ashton EUT Pol.: E1 Measurement Antenna Pol. : Vertical

Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dΒμV/m	dBµV/m	dB
5459.16	S	Peak	51.86	11.46	63.33	74	-10.67
5459.16	S	Average	32.33	11.46	43.79	54	-10.21
5460.00	E	Peak	50.04	11.46	61.51	74	-12.49
5460.00	E	Average	32.35	11.46	43.81	54	-10.19

Operation Mode: 802.11n40 Test Date: 2015/12/22

Fundamental Frequency: 5510 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: BE CH Low Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol. : E1 Horizontal

Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
5459.28	S	Peak	48.94	11.46	60.40	74	-13.60
5459.28	S	Average	32.16	11.46	43.62	54	-10.38
5460.00	E	Peak	48.35	11.46	59.81	74	-14.19
5460.00	E	Average	32.16	11.46	43.62	54	-10.38

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Operation Mode: 802.11n40 Test Date: 2015/12/22

Fundamental Frequency: 5510 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: BE CH Low RSE Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: Vertical E1

	Freq.	Note	Detector Mode	Spectum Reading Level	Factor	Actual FS	Limit @3m	Margin
	MHz	F/H/E/S	PK/QP/AV	dΒμV	dB	dBµV/m	dBµV/m	dB
•	5469.84	S	Peak	56.36	11.46	67.81	68.3	-0.49
	5470.00	E	Peak	54.84	11.46	66.30	68.3	-2.00

Operation Mode: 802.11n40 Test Date: 2015/12/22

Fundamental Frequency: 5510 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: BE CH Low RSE Test Engineer: Ashton EUT Pol.: E1 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	dΒμV	dB	dBµV/m	dBµV/m	dB
•	5468.76	S	Peak	53.35	11.46	64.81	68.3	-3.49
	5470.00	E	Peak	52.12	11.46	63.58	68.3	-4.72

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Operation Mode: Test Date: 802.11n40 2015/12/22

Fundamental Frequency: Temp. / Humi.: 5670 MHz 24.1deg C/48RH

Operation Band: BE CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: Vertical E1

Spectum Freq. Note Detector Factor Actual Limit Margin Reading Level Mode FS @3m PK/QP/AV dBµV dBµV/m dBµV/m F/H/E/S dB dB MHz 42.70 5725.00 Peak 12.27 54.97 68.3 -13.33

Operation Mode: 802.11n40 Test Date: 2015/12/22

Fundamental Frequency: 5670 MHz Temp. / Humi.: 24.1deg C/48RH

Operation Band: BE CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: E1 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
-	5725.00	E	Peak	45.50	12.27	57.77	68.3	-10.53

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Operation Mode: 802.11n40 Test Date: 2015/12/22

Fundamental Frequency: 5755 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: BE CH Low Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol. : Vertical E1

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
5714.00	S	Peak	51.19	12.31	63.50	68.3	-4.80
5724.10	S	Peak	55.26	12.27	67.53	78.2	-10.67
5725.00	Е	Peak	52.66	12.27	64.93	78.2	-13.27

Operation Mode: 802.11n40 Test Date: 2015/12/22

Fundamental Frequency: 5755 MHz Temp. / Humi.: 24.1deg\_C/48RH

Operation Band: Test Engineer: BE CH Low Ashton EUT Pol.: Measurement Antenna Pol. : E1 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
5714.40	S	Peak	55.46	12.30	67.77	68.3	-0.53
5724.00	S	Peak	61.81	12.27	74.08	78.2	-4.12
5725.00	E	Peak	59.20	12.27	71.47	78.2	-6.73

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Operation Mode: Test Date: 802.11n40 2015/12/22

Fundamental Frequency: Temp. / Humi.: 5795 MHz 24.1deg C/48RH

Operation Band: BE CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: Vertical E1

Spectum Freq. Note Detector Factor Actual Limit Margin Reading Level Mode FS @3m PK/QP/AV dΒμV dBµV/m dBµV/m MHz F/H/E/S dB dB 42.28 5850.00 Peak 12.61 54.89 78.2 -23.31

Operation Mode: 802.11n40 Test Date: 2015/12/22

Fundamental Frequency: 5795 MHz Temp. / Humi.: 24.1deg C/48RH

Operation Band: BE CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: E1 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
5850.00	F	Peak	41.70	12.61	54.31	78.2	-23.89

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## TRANSMISSION IN THE ABSENCE OF DATA

# **Standard Applicable**

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

No non-compliance noted:

Refer to the theory of operation.

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## 13. FREQUENCY STABILITY

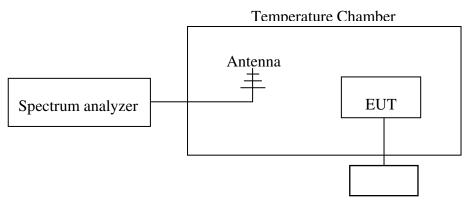
#### **Standard Applicable** 13.1

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.

#### 13.3 Test SET-UP



Variable AC Power Supply

## 13.4 Measurement Equipment Used

Conducted Emission Test Site					
EQUIPMENT		MODEL	SERIAL LAST		CAL DUE
TYPE	MFR	NUMBER	NUMBER	CAL.	CAL DUE.
Spectrum Analyzer	KEYSIGHT	N9010A	MY54510568	04/14/2015	04/13/2016
Temperature Chamber	TERCHY	MHK-120LK	1020582	06/23/2015	06/22/2016
DC Power Supply	Agilent	E3640A	MY53140006	05/04/2015	05/03/2016

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**Description AFrequency** 

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#### 13.5 Measurement Result

Operation Mode 802.11 a **Test Date** 2015.11.18

Temperature :17 Test By Tank

			(MHz)
36	5180	5,179.99563	0.0000084
44	5220	5,219.99573	0.00000082
48	5240	5,239.99498	0.00000096
52	5260	5,259.99421	0.00000110
60	5300	5,299.99448	0.00000104
64	5320	5,319.99602	0.00000075
100	5500	5,499.99507	0.00000090
116	5580	5,579.99432	0.00000102
140	5700	5,699.99518	0.00000085
149	5745	5,744.99609	0.00000068
157	5785	5,784.99499	0.00000087
165	5825	5,824.99493	0.00000087
36	5180	5,179.99544	0.00000088
44	5220	5,219.99443	0.00000107
48	5240	5,239.99573	0.00000081
52	5260	5,259.99453	0.00000104
60	5300	5,299.99497	0.00000095
64	5320	5,319.99497	0.00000095
100	5500	5,499.99508	0.00000089
116	5580	5,579.99442	0.00000100
140	5700	5,699.99570	0.00000075
149	5745	5,744.99431	0.00000099
157	5785	5,784.99423	0.0000100
165	5825	5,824.99390	0.00000105



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36	5180	5,179.99425	0.00000111
44	5220	5,219.99389	0.00000117
48	5240	5,239.99411	0.00000112
52	5260	5,259.99397	0.00000115
60	5300	5,299.99432	0.00000107
64	5320	5,319.99482	0.00000097
100	5500	5,499.99475	0.00000095
116	5580	5,579.99422	0.00000104
140	5700	5,699.99450	0.00000096
149	5745	5,744.99418	0.00000101
157	5785	5,784.99393	0.00000105
165	5825	5,824.99358	0.00000110

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Operation Mode Temperature

802.11 n HT40 :17

Test Date

2015.11.18

Test By Tank

38	5190	5,189.99469	0.00000102
46	5230	5,229.99580	0.00000080
54	5270	5,269.99575	0.00000081
62	5310	5,309.99427	0.00000108
102	5510	5,509.99579	0.00000076
110	5550	5,549.99446	0.00000100
134	5670	5,669.99497	0.00000089
151	5755	5,754.99486	0.00000089
159	5795	5,794.99379	0.00000107
38	5190	5,189.99509	0.00000095
46	5230	5,229.99495	0.00000097
54	5270	5,269.99624	0.00000071
62	5310	5,309.99522	0.00000090
102	5510	5,509.99595	0.00000074
110	5550	5,549.99458	0.00000098
134	5670	5,669.99574	0.00000075
151	5755	5,754.99474	0.00000091
159	5795	5,794.99484	0.00000089



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38	5190	5,189.99414	0.00000113
46	5230	5,229.99407	0.00000113
54	5270	5,269.99442	0.00000106
62	5310	5,309.99420	0.00000109
102	5510	5,509.99432	0.00000103
110	5550	5,549.99415	0.00000105
134	5670	5,669.99417	0.00000103
151	5755	5,754.99386	0.00000107
159	5795	5,794.99358	0.00000111
38	5190	5,189.99377	0.00000120
46	5230	5,229.99313	0.00000131
54	5270	5,269.99285	0.00000136
62	5310	5,309.99399	0.00000113
102	5510	5,509.99353	0.00000117
110	5550	5,549.99326	0.00000121
134	5670	5,669.99257	0.00000131
151	5755	5,754.99230	0.00000134
159	5795	5,794.99324	0.00000117
38	5190	5,189.99318	0.00000131
46	5230	5,229.99363	0.00000122
54	5270	5,269.99404	0.00000113
62	5310	5,309.99401	0.00000113
102	5510	5,509.99233	0.00000139
110	5550	5,549.99244	0.00000136
134	5670	5,669.99293	0.00000125
151	5755	5,754.99304	0.00000121
159	5795	5,794.99258	0.00000128

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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

A PIFA antenna design is used.

The antenna is designed with permanent attached 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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