

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART E REQUIREMENT CLASS II PC REPORT

OF

Product Name: 802.11abgn 2X2 MIMO + BT/BLE RADIO
MODULE

Brand Name: N/A

Marketing Name: N/A

Model No.: DWM-W095A

Model Difference: N/A

FCC ID EW4DWMW095A

Report No.: E2/2016/30076

Issue Date: Apr. 13, 2016

FCC Rule Part: §15.407

Prepared for: Mitsumi Electric Co Ltd
2-11-2, Tsurumaki, Tama-shi, Tokyo,
206-8567, Japan.

Prepared by: SGS Taiwan Ltd.
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VERIFICATION OF COMPLIANCE

Applicant: Mitsumi Electric Co Ltd
2-11-2, Tsurumaki, Tama-shi, Tokyo, 206-8567, Japan.

Product Name: 802.11abgn 2X2 MIMO + BT/BLE RADIO MODULE

Brand Name: N/A

Marketing Name: N/A

Model No.: DWM-W095A

Model Difference: N/A

FCC ID EW4DWMW095A

File Number: E2/2016/30076

Date of test: Mar. 23, 2016 ~ Apr. 11, 2015

Date of EUT Received: Mar. 23, 2016

We hereby certify that:

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

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

Test By:**Date:**

Apr. 13, 2016

Henry / Engineer**Prepared By:****Date:**

Apr. 13, 2016

Allen Tsai / Engineer**Approved By:****Date:**

Apr. 13, 2016

Jim Chang / Asst. Manager

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Revision History

Report Number	Revision	Description	Issue Date
E2/2016/30076	Rev.00	Initial creation of document	Apr. 13, 2016

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1 GENERAL INFORMATION

1.1 Product Description

General:

Product Name:	802.11abgn 2X2 MIMO + BT/BLE RADIO MODULE
Brand Name:	N/A
Marketing Name:	N/A
Model No.:	DWM-W095A
Model Difference:	N/A
Hardware Version:	N/A
Software Version:	N/A
Power Supply:	3.3Vdc from Power Supply
Class II Permissive change:	For the requirement that certain National Information Infrastructure (U-NII) devices must comply with revised Section 15.407 rules in order to be certified.

WLAN 5GHz:

Wi-Fi	Frequency Range	Channels	Rated Power (Avg.)	Modulation Technology
11a	5725-5850	5	15.51 dBm	OFDM
11n_20M	HT20 5725-5850	5	2TX(MCS0) :15.26 dBm MIMO (MCS8) :15.02 dBm	OFDM
11n_40M	HT40 5725-5850	2	2TX(MCS0) :15.38 dBm MIMO (MCS8) :15.06 dBm	OFDM

Antenna Designation:	PIFA Antenna *2 5GHz: 4.0 dBi (5725-5850MHz)
Modulation type	64QAM, 16QAM, QPSK, BPSK for OFDM
Transition Rate:	802.11 a: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz(MCS0): 6.5 – 72.2 Mbps 802.11 n_20MHz(MCS8): 6.5 – 144.4Mbps 802.11 n_40MHz(MCS0): 13.5 - 150.0 Mbps 802.11 n_40MHz(MCS8): 13.5 – 300Mbps

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1.2 Product Feature of Equipment Under Test

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

Product Feature	
Product Name:	802.11abgn 2X2 MIMO + BT/BLE RADIO MODULE
Brand Name:	N/A
Marketing Name:	N/A
Model No.:	DWM-W095A
Model Difference:	N/A
FCC ID	EW4DWMW095A
Wi-Fi Specification	802.11a/b/g/n

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

FCC KDB 662911 D01 Multiple Transmitter Output

FCC KDB 926956 D01 U-NII Transition Plan

ANSI C63.10:2013

Note:

1. All test items have been performed and record as per the above standards.
2. 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 333. (TAF code 0513)

FCC Registration Numbers are: 628985

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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2 SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

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

2.2 EUT Exercise

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

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is placed on a 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 §15.107. 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 placed on a 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.

2.4 Measurement Results Explanation Example

For all conducted test items:

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

Note:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Following shows an offset computation example.

$$= \text{RF cable loss (dB)} + \text{attenuation factor (dB)} + 10 \log(N_{\text{ANT}}) \text{ (dB)} = 15.3 \text{ (dB)}$$

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2.5 Configuration of Tested System

Fig. 2-1 Radiated & Conducted (Antenna Port) Configuration Emission

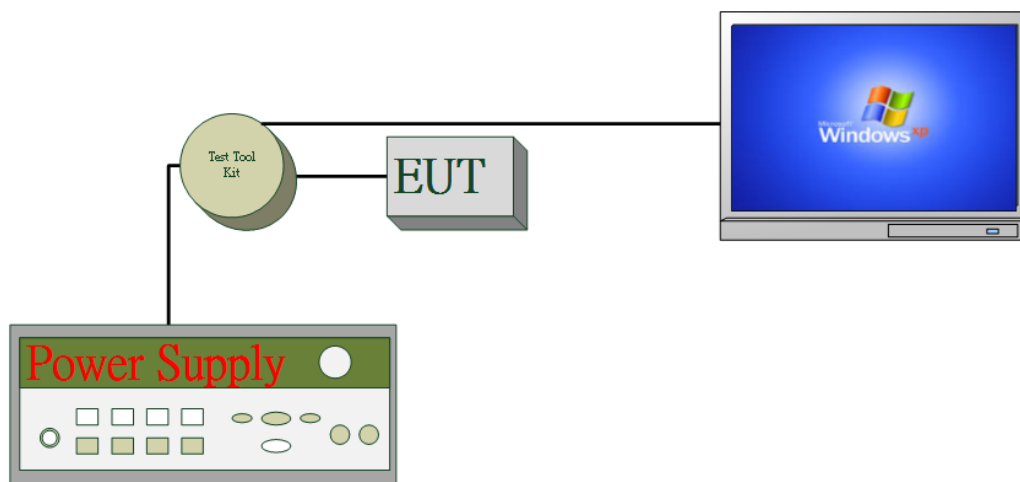


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	WLAN Test Software	N/A	N/A	N/A	N/A	N/A
2.	DC Power Supply	Agilent	E3640A	MY53140006	N/A	Unshielded

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3 SUMMARY OF TEST RESULT

FCC Rules	Description Of Test	Result
§15.407(a)	Maximum Conducted Output Power	Compliant
§15.407(a)	Power Spectral Density	Compliant
§15.407(b)	Undesirable Radiated Emissions	Compliant
§15.203 §15.407(a)	Antenna Requirement	Compliant

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4 DESCRIPTION OF TEST MODES

4.1 Operated in U-NII Bands

Operated band in 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

4.2 The Worst Test Modes and Channel Details

1. The EUT has been tested under operating condition.
2. Test program used to control the EUT for staying in continuous transmitting mode is programmed.
3. Investigation has been done on all the possible configurations for searching the worst case.
4. The given UE is supporting **2TX MODE** and **MIMO MODE**, both test configurations are chosen to carry out the relevantly mandatory test items.

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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	5745~5825	149 to 165	149, 165	OFDM	6	2TX
802.11n_HT20	5755~5795	149 to 165	149, 165	OFDM	MCS0 / MCS8	2TX / MIMO
802.11n_HT40	5755~5795	151 to 159	151, 159	OFDM	MCS0 / MCS8	2TX / MIMO
RADIATED EMISSION TEST (ABOVE 1 GHz)						
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5745~5825	149 to 165	149,165	OFDM	6	2TX
802.11n_HT20	5755~5795	149 to 165	149,165	OFDM	MCS0 / MCS8	2TX / MIMO
802.11n_HT40	5755~5795	151 to 159	151,159	OFDM	MCS0 / MCS8	2TX / MIMO

Note:

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

ANTENNA PORT CONDUCTED MEASUREMENT:

CONDUCTED TEST						
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5745~5825	149 to 165	149,157,165	OFDM	6	2TX
802.11n_HT20				OFDM	MCS0 / MCS8	2TX / MIMO
802.11n_HT40	5755~5795	151 to 159	151,159	OFDM	MCS0 / MCS8	2TX / MIMO

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5 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:

Measurement uncertainty (Polarization : Vertical)	30MHz - 180MHz: +/- 3.37dB
	180MHz -417MHz: +/- 3.19dB
	0.417GHz-1GHz: +/- 3.19dB
	1GHz - 18GHz: +/- 4.04dB
	18GHz - 40GHz: +/- 4.04dB

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

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

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6 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:

$$\text{Duty Cycle} = \text{Ton} / (\text{Ton} + \text{Toff})$$

Measurement Procedure:

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

Duty Cycle:

Mode	Duty Cycle (%)	Duty Factor (dB) = $10 \cdot \log (1 / \text{Duty Cycle})$
802.11a	99.40	0.03
802.11n_20 MIMO	99.80	0.01
802.11n_20 2TX	99.30	0.03
802.11n_40 MIMO	97.80	0.10
802.11n_40 2TX	98.70	0.06

802.11a Duty Cycle Factor: $10 \cdot \log(1/0.994) = 0.03$

802.11n_20 MIMO Duty Cycle Factor: $10 \cdot \log(1/0.998) = 0.01$

802.11n_20 2TX Duty Cycle Factor: $10 \cdot \log(1/0.993) = 0.03$

802.11n_40 MIMO Duty Cycle Factor: $10 \cdot \log(1/0.978) = 0.1$

802.11n_40 2TX Duty Cycle Factor: $10 \cdot \log(1/0.987) = 0.06$

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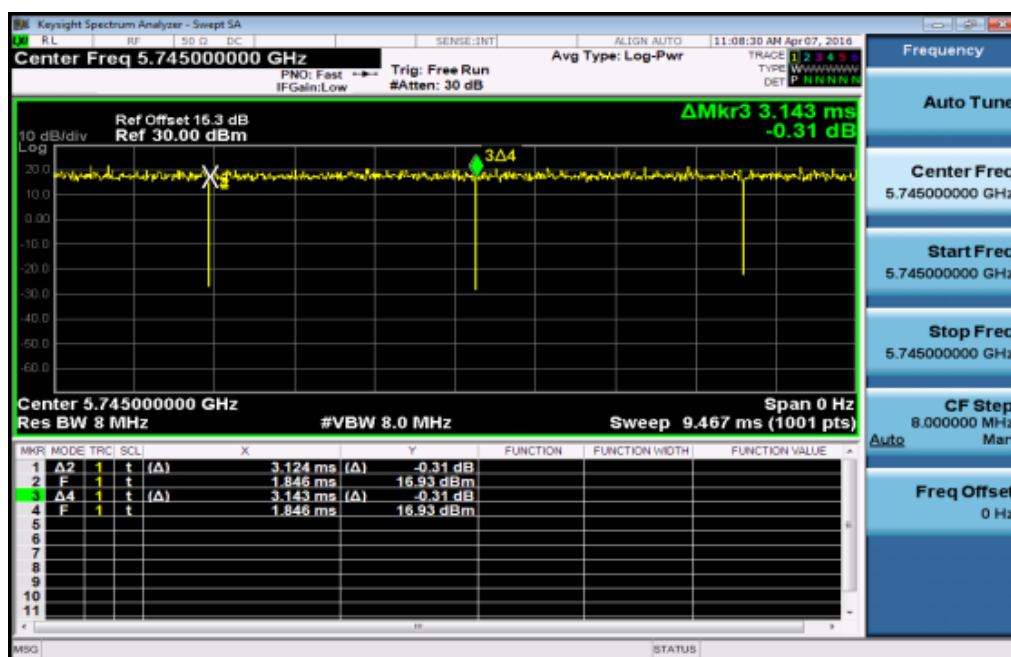
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DUTY CYCLE TEST SIGNAL Measurement Result



802.11n HT20 2TX



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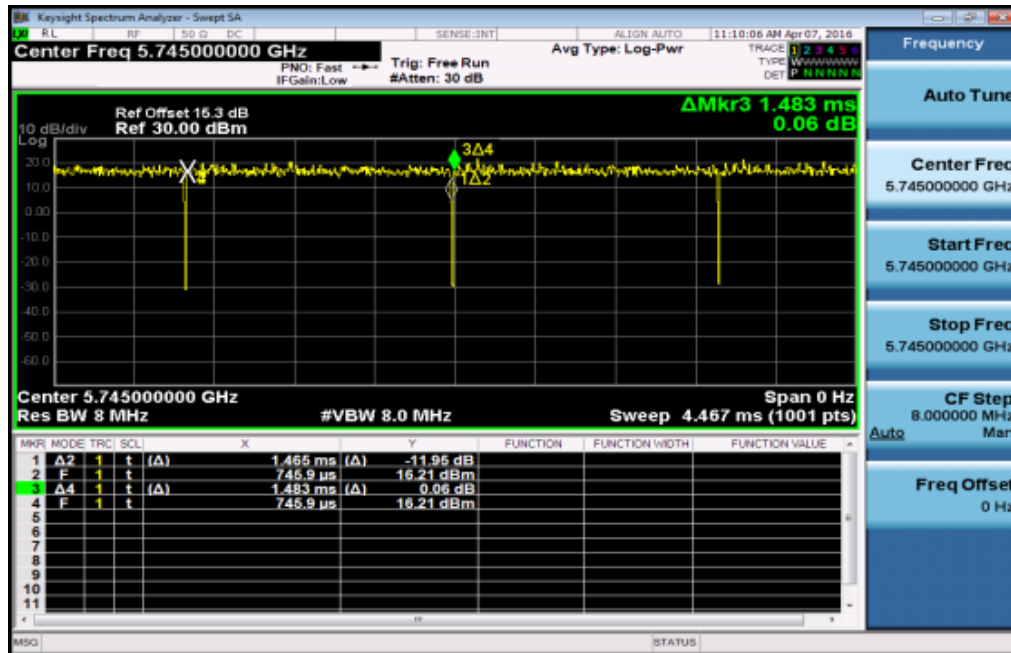
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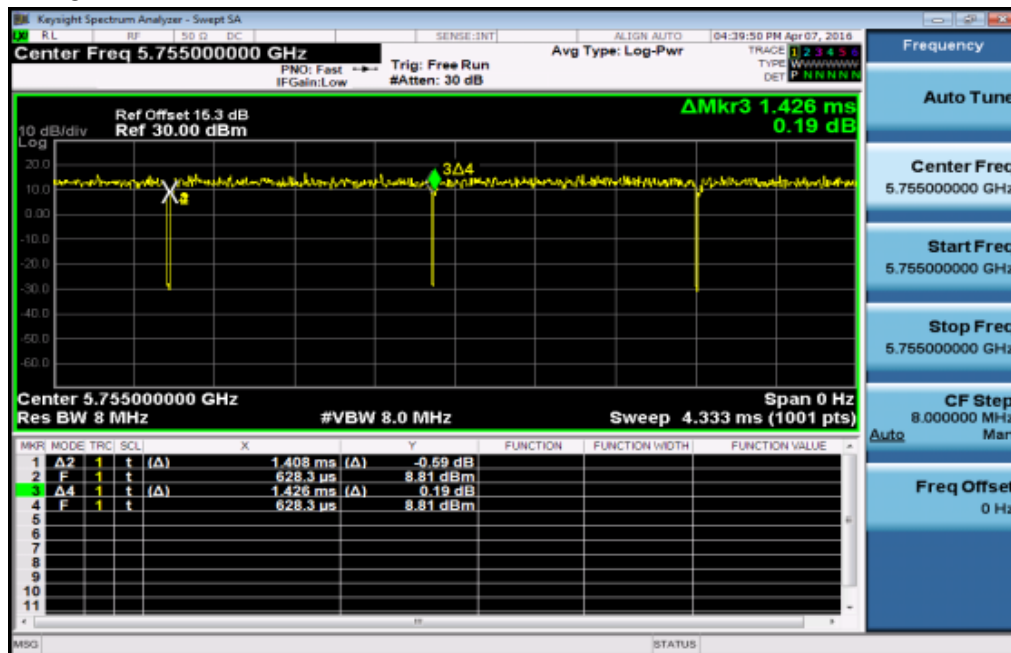
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802.11n HT20 MIMO



802.11 nHT 40 2TX



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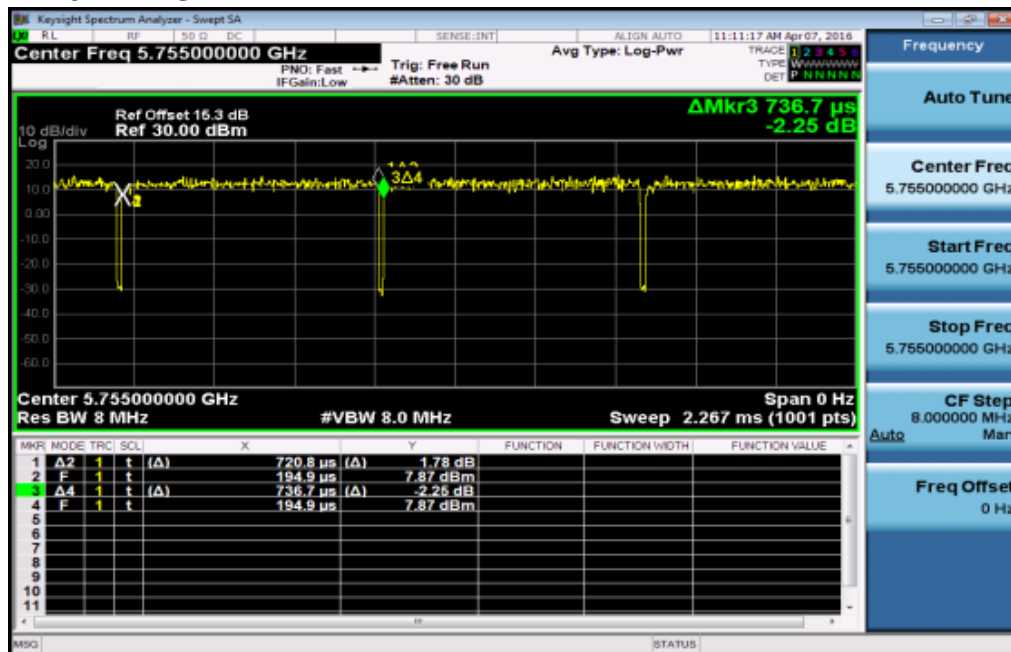
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802.11 nHT 40 MIMO



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7 MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

7.1 Standard Applicable

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

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

The antenna gain is granter than 6 dBi in MIMO mode the limit reduce as below:

Directional gain = gain of antenna element + 10 log (# of TX antenna elements)

	Effective Legacy Gain (dBi)	Limit
U-NII-3	4+3.01=7.01dBi	30dBm – (7.01– 6 dBi) = 28.99dBm

Therefore the limit needs to reduce for the U-NII-3 band.

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7.2 Measurement Procedure

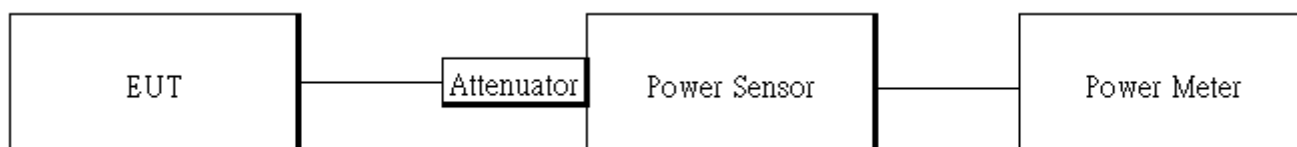
1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules .
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter
4. Power Meter is used as the auxiliary test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

7.3 Measurement Equipment Used

Refer to section 8.3 for details.

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Power Meter	Anritsu	ML2495A	1005007	12/09/2015	12/08/2016
Power Sensor	Anritsu	MA2411B	917032	12/09/2015	12/08/2016
Spectrum Analyzer	Agilent	N9010A	MY50420195	12/21/2015	12/20/2016
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2016	01/01/2017
Coaxial Cable	HUBER+SUHNER	SUCOFLEX 102	23670/2	01/02/2016	01/01/2017
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2016	01/01/2017

7.4 Test Set-up



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7.5 Measurement Result

802.11a_2TX

CH	Frequency (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
		CHAIN 0	CHAIN 1				
149	5745	12.74	12.24	15.51	35.543	28.99	PASS
157	5785	12.72	12.01	15.39	34.592	28.99	PASS
165	5825	12.65	12.01	15.35	34.293	28.99	PASS

802.11n_HT20_MIMO

CH	Frequency (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
		CHAIN 0	CHAIN 1				
149	5745	12.43	11.55	15.02	31.787	28.99	PASS
157	5785	12.38	11.53	14.99	31.521	28.99	PASS
165	5825	12.32	11.58	14.98	31.449	28.99	PASS

802.11n_20_2TX

CH	Frequency (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
		CHAIN 0	CHAIN 1				
149	5745	12.67	11.78	15.26	33.559	28.99	PASS
157	5785	12.46	11.71	15.11	32.445	28.99	PASS
165	5825	12.54	11.81	15.20	33.118	28.99	PASS

802.11n_HT40_MIMO

CH	Frequency (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
		CHAIN 0	CHAIN 1				
151	5755	12.49	11.56	15.06	32.064	28.99	PASS
159	5795	12.43	11.56	15.03	31.820	28.99	PASS

802.11n_40_2TX

CH	Frequency (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
		CHAIN 0	CHAIN 1				
151	5755	12.16	11.31	14.77	29.964	28.99	PASS
159	5795	12.79	11.91	15.38	34.535	28.99	PASS

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8 PEAK POWER SPECTRAL DENSITY

8.1 Standard Applicable

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

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

The antenna gain is granter than 6 dBi in MIMO mode the limit reduce as below:

Directional gain = gain of antenna element + 10 log (# of TX antenna elements)

	Effective Legacy Gain (dBi)	Limit
U-NII-3	4+3.01=7.01dBi	30dBm – (7.01– 6 dBi) = 28.99dBm

Therefore the limit needs to reduce for the U-NII-3 band.

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

5. Use 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.

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

8.3 Measurement Equipment Used

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	N9010A	MY5042019 5	12/21/2015	12/20/2016
Coaxial Cable	HUBER+SUHNE R	SUCOFLEX 102	23670/2	01/02/2016	01/01/2017
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2016	01/01/2017
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2016	01/01/2017

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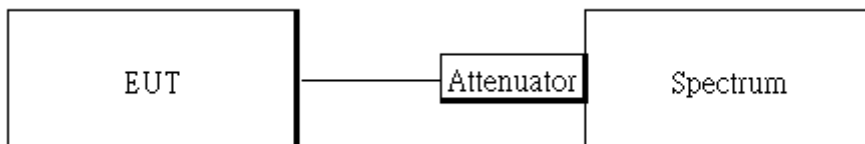
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8.4 Test Set-up



8.5 Measurement Result

POWER DENSITY 802.11a 2TX MODE			
Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5745	7.12	28.99	-21.87
5785	6.13	28.99	-22.86
5825	5.75	28.99	-23.24
POWER DENSITY 802.11n HT20 MIMO MODE			
Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5745	6.52	28.99	-22.47
5785	6.44	28.99	-22.55
5825	6.04	28.99	-22.95
POWER DENSITY 802.11n HT20 2TX MODE			
Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5745	6.95	28.99	-22.04
5785	6.88	28.99	-22.11
5825	6.73	28.99	-22.26
POWER DENSITY 802.11n HT40 MIMO MODE			
Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5755	3.82	28.99	-25.17
5795	2.99	28.99	-26.00
POWER DENSITY 802.11n HT40 2TX MODE			
Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5755	4.43	28.99	-24.56
5795	3.94	28.99	-25.05

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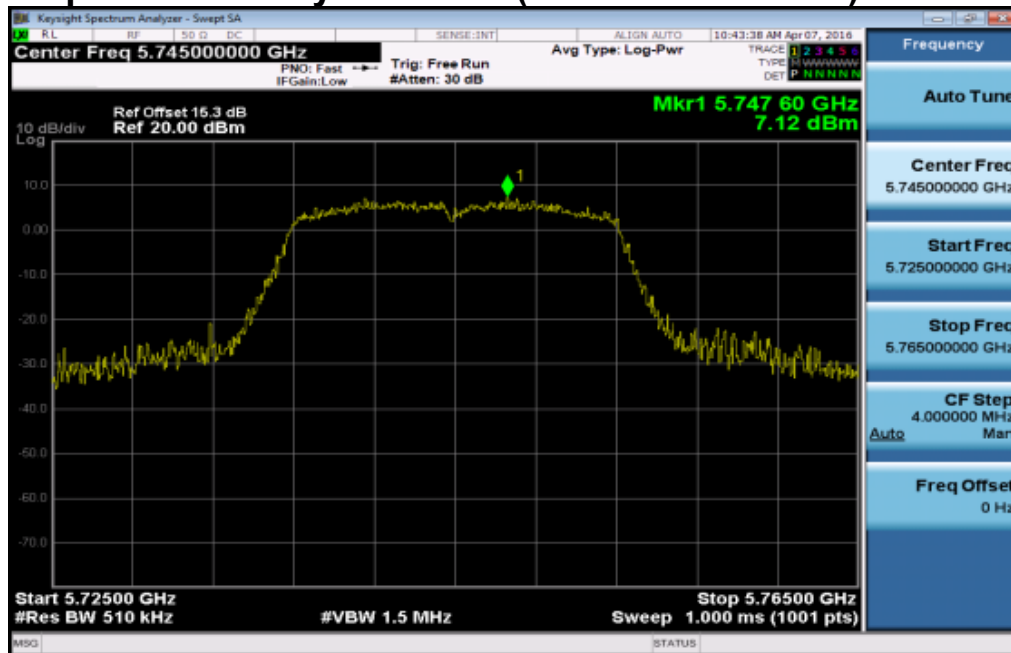
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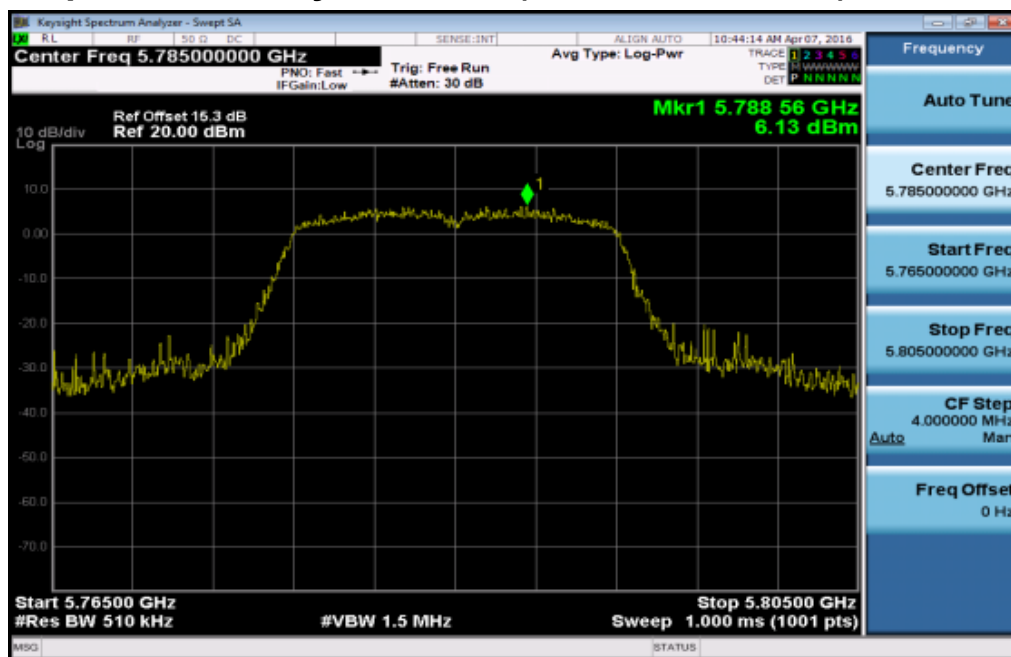
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802.11a (2TX MODE) 5725~5850 MHz

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



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



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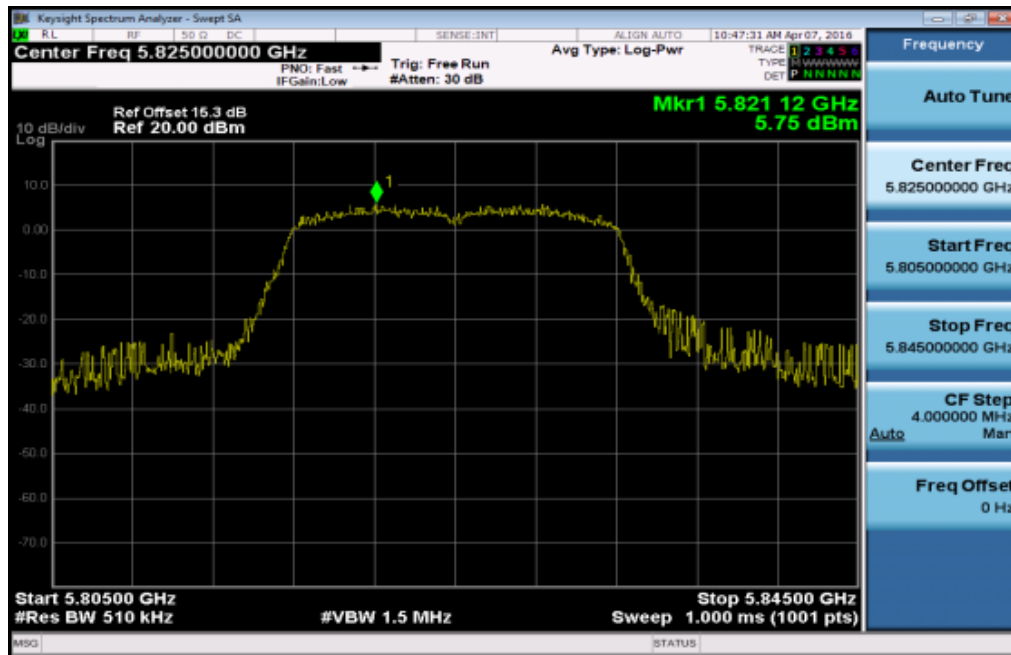
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Peak Power Spectral Density Data Plot (CH High 5825 MHz)



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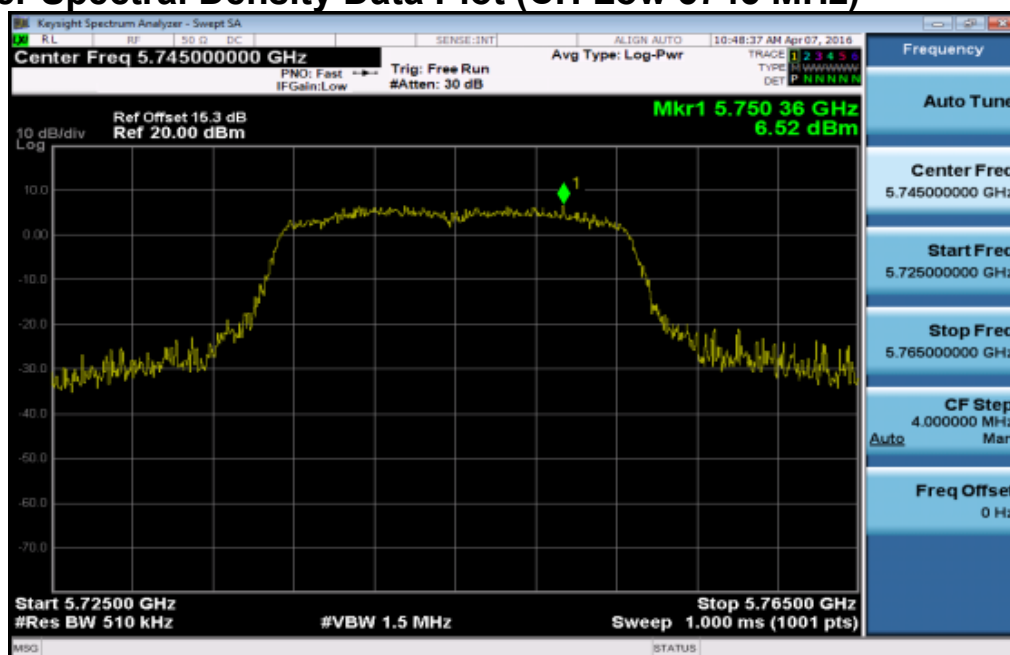
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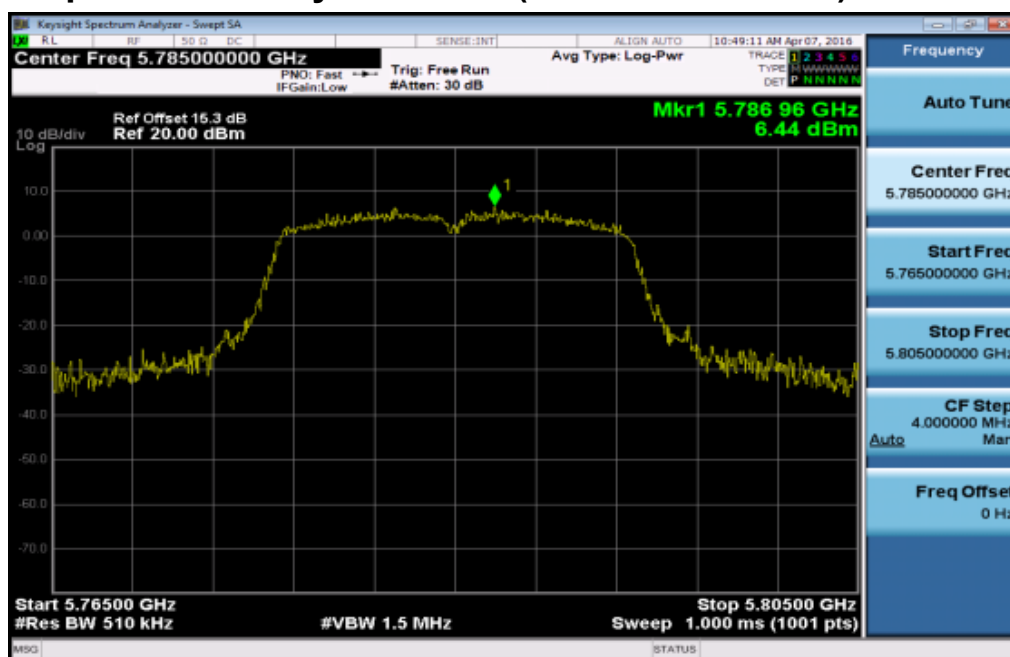
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802.11n HT20(MIMO MODE), 5725~5850 MHz Peak Power Spectral Density Data Plot (CH Low 5745 MHz)



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



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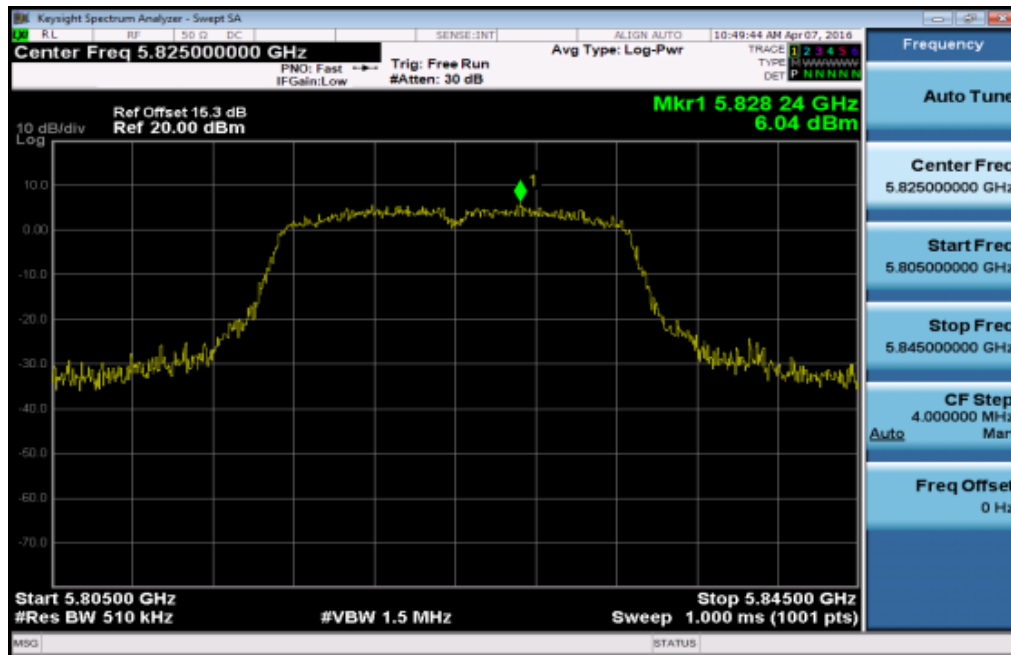
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Peak Power Spectral Density Data Plot (CH High 5825 MHz)



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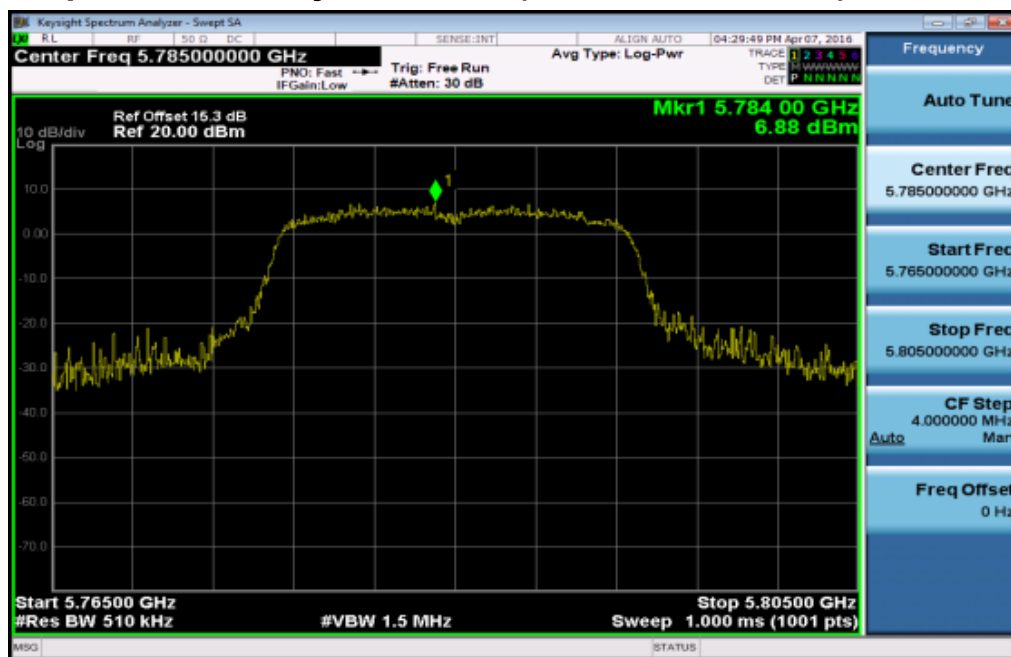
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802.11n HT20(2TX MODE), 5725~5850 MHz Peak Power Spectral Density Data Plot (CH Low 5745 MHz)



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



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



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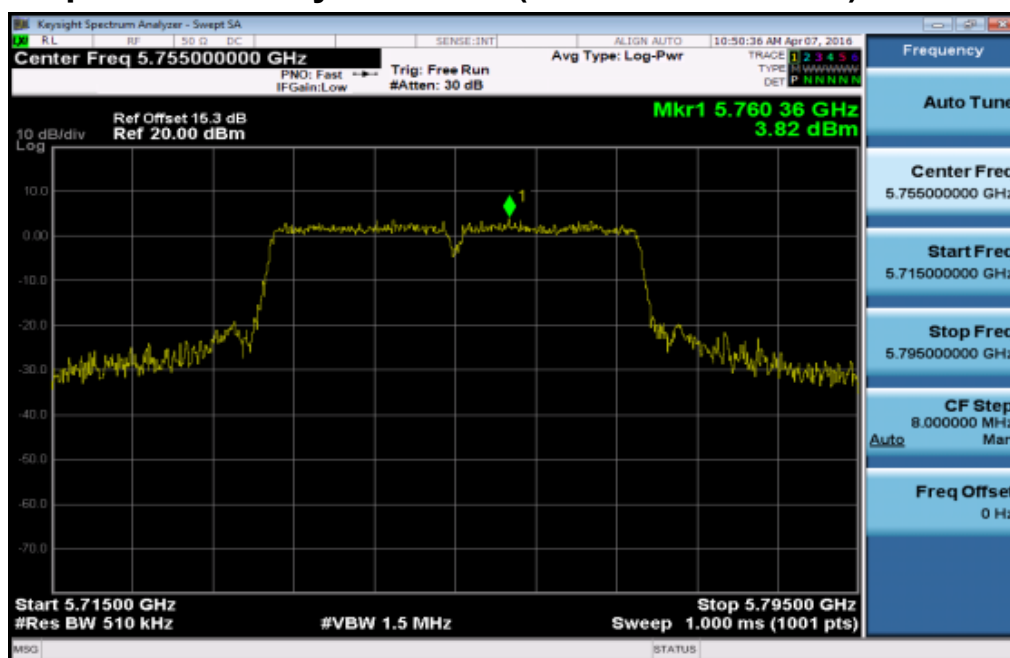
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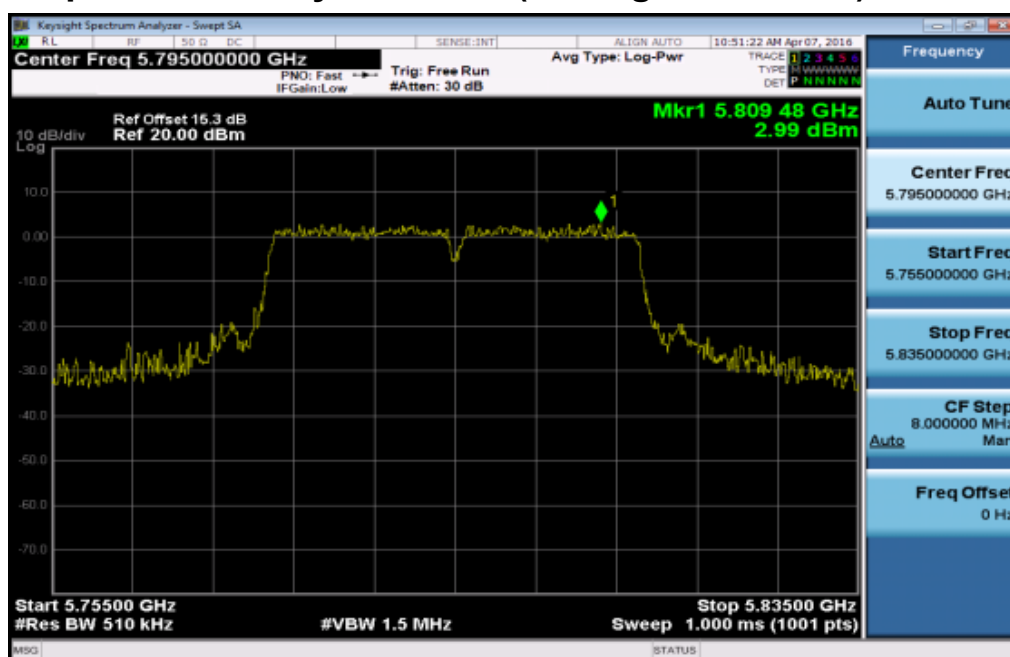
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802.11n HT40(MIMO MODE), 5725~5850 MHz Peak Power Spectral Density Data Plot (CH Low 5755 MHz)



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



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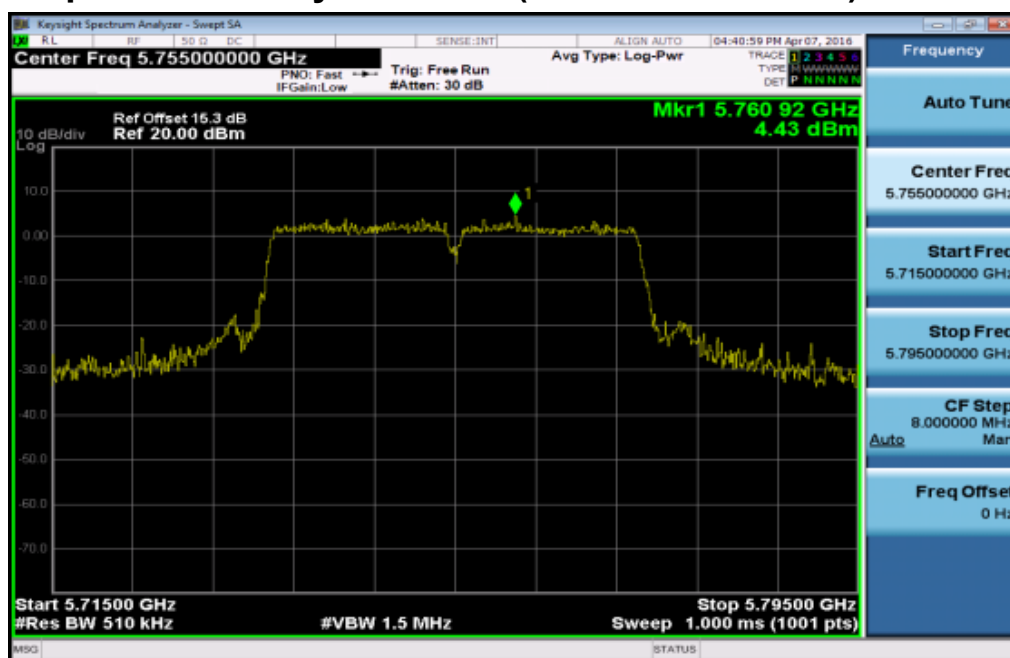
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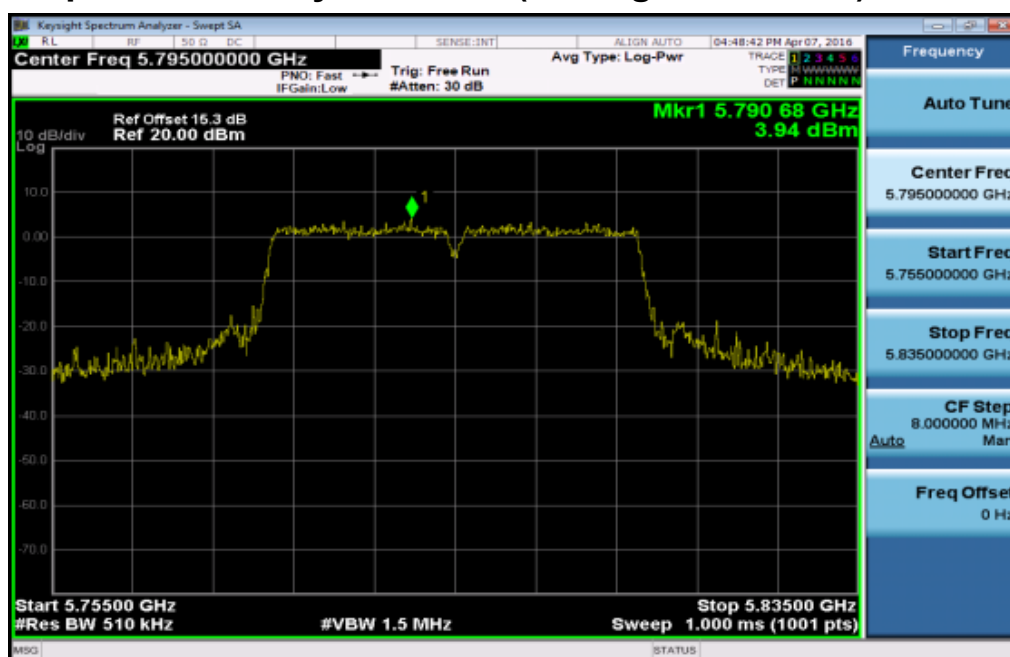
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802.11n HT40(2TX MODE), 5725~5850 MHz Peak Power Spectral Density Data Plot (CH Low 5755 MHz)



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



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9 UNDESIRABLE RADIATED EMISSION MEASUREMENT

9.1 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.

APPLICABLE TO	LIMIT	
FCC KDB 789033 D02 General UNII Test Procedures New Rules	FIELD STRENGTH AT 3m	
	PK: 74 (dBμV/m)	AV 54 (dBμV/m)
APPLICABLE TO	EIRP LIMIT	FIELD STRENGTH AT 3m
15.407(b)(1)	PK: -27 (dBm/MHz)	PK: 68.3 (dBμV/m)
15.407(b)(2)		
15.407(b)(3)		
15.407(b)(4)	PK: -27 (dBm/MHz) PK: -17 (dBm/MHz)	PK: 68.3 (dBμV/m) PK: 78.2 (dBμV/m)

$EIRP = (E \cdot d)^2 / 30$, 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 (dBμV/m) = 20 log Emission level (dBμV/m)

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9.2 Measurement Equipment Used

SGS 966 Chamber No.C					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	R&S	ESCI7	100760	05/04/2015	05/03/2016
Spectrum Analyzer	Agilent	E4446A	MY51100003	01/28/2016	01/27/2017
Loop Antenna	ETS.LINDGREN	6502	148045	09/07/2015	09/06/2016
Bilog Antenna	SCHWAZBECK	VULB9168	378	12/14/2015	12/13/2016
Horn antenna	ETS.LINDGREN	3117	123995	05/05/2015	05/04/2016
Pre-Amplifier	Agilent	8447D	2944A07676	01/02/2016	01/01/2017
Pre-Amplifier	EMC Instruments Corp.	EMC0126530	980038	01/02/2016	01/01/2017
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	ChamPro	AM-BS-4500-B	060776-ABS	N.C.R	N.C.R
Controller	ChamPro	EM1000	60776	N.C.R	N.C.R
Low Loss Cable	Huber Suhner	966_RX	9	01/02/2016	01/01/2017
3m Site NSA	SGS	966 chamber	N/A	07/02/2015	07/01/2016
Low Loss Cable	Huber Suhner	966 TX	1	01/02/2016	01/01/2017

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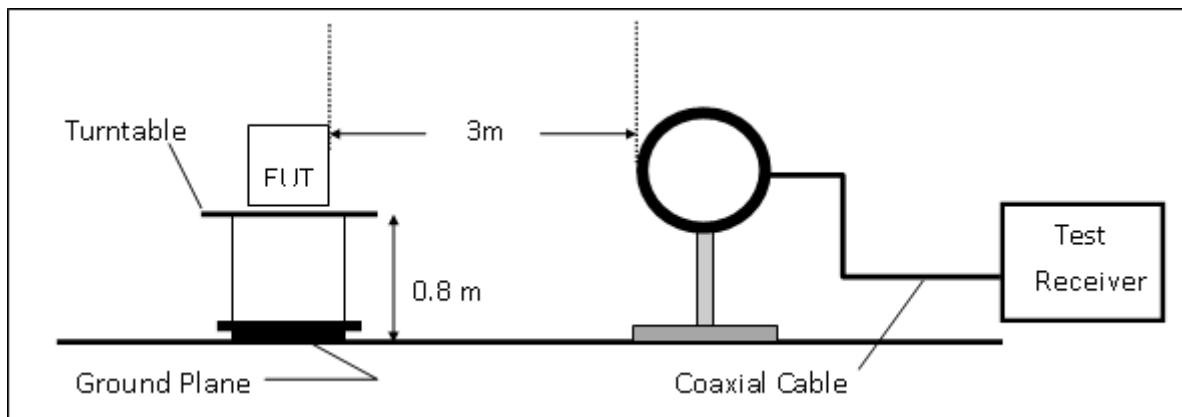
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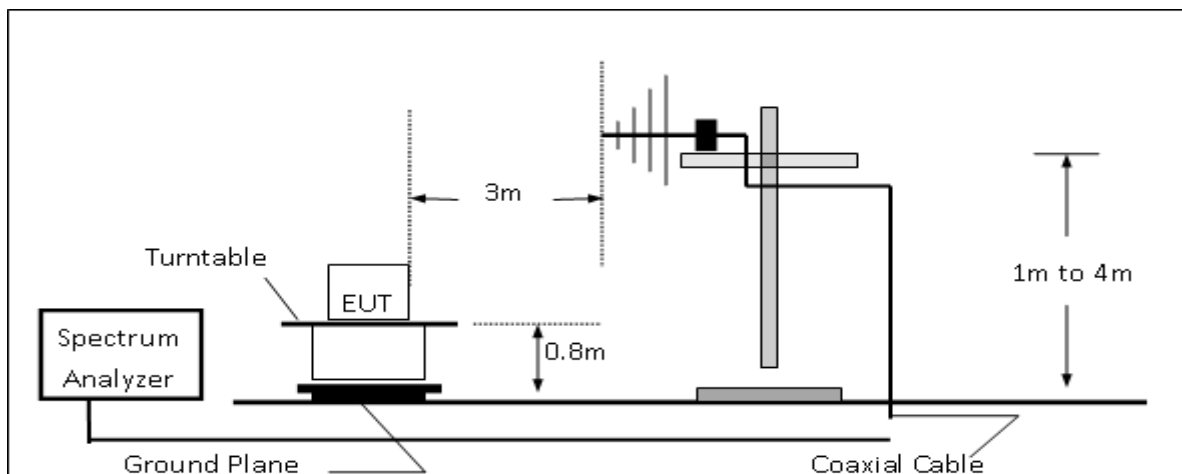
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9.3 Test SET-UP

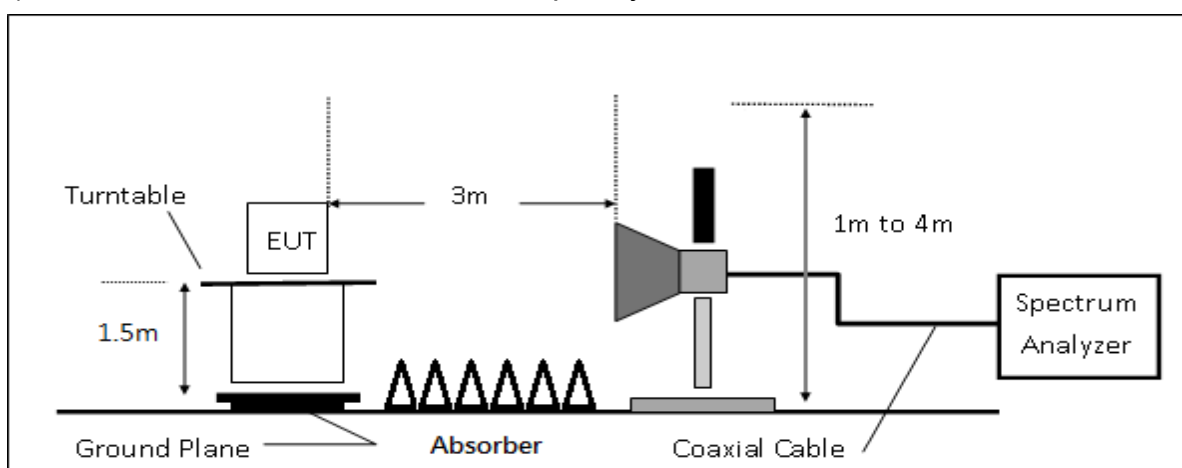
(A) Radiated Emission Test Set-UP Frequency Below 30MHz.



(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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9.4 Measurement Procedure

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

9.5 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(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/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.

9.6 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.

9.7 Measurement Result

Refer to attach tabular data sheets.

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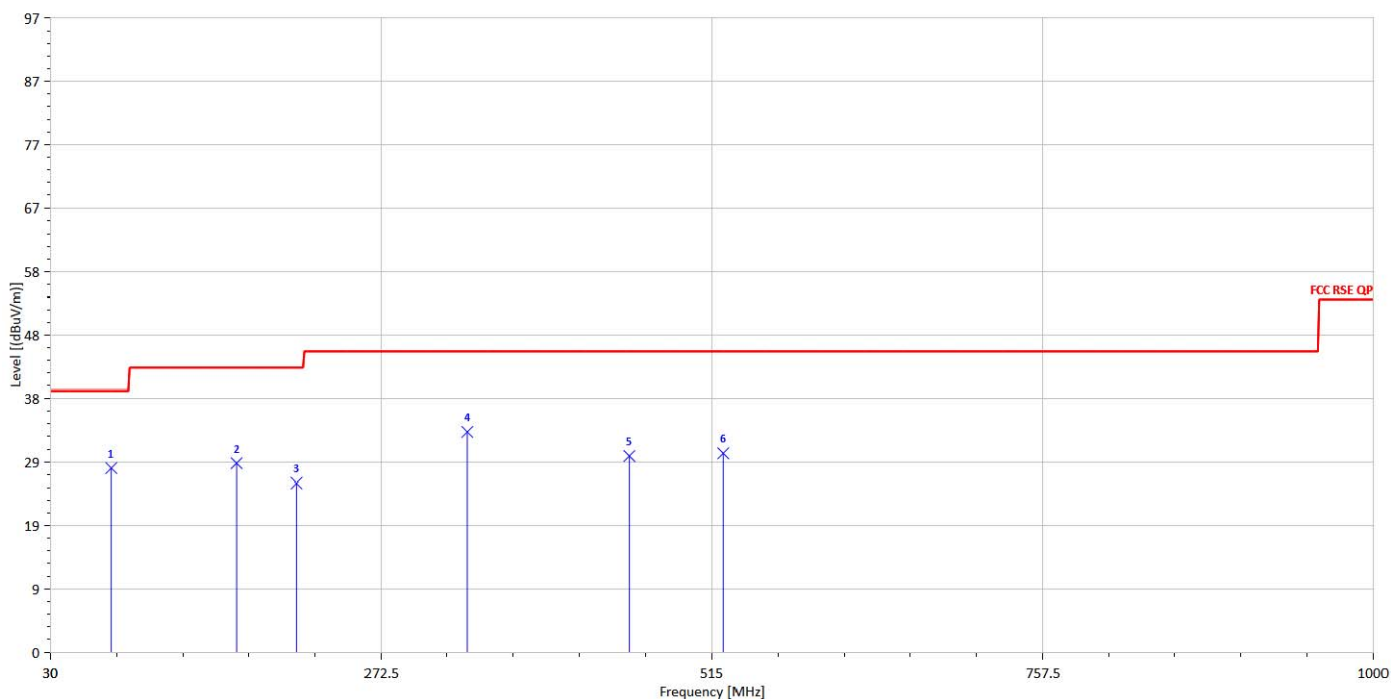
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9.8 Radiated Spurious Emission Measurement Result (2TX MODE)

Below 1GHz Worst-Case Data (2TX MODE):

802.11a, 5725~5850 MHz

Operation Mode :	802.11a	Test Date :	2016/4/7
Fundamental Frequency :	5745 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
74.62	S	QP	49.56	-21.43	28.13	40	-11.87
166.77	S	Peak	46.83	-17.95	28.88	43.5	-14.62
210.42	S	Peak	42.98	-17.10	25.88	43.5	-17.62
335.55	S	Peak	45.58	-11.88	33.70	46	-12.30
454.86	S	Peak	38.45	-8.46	29.99	46	-16.01
523.73	S	Peak	37.83	-7.41	30.41	46	-15.59

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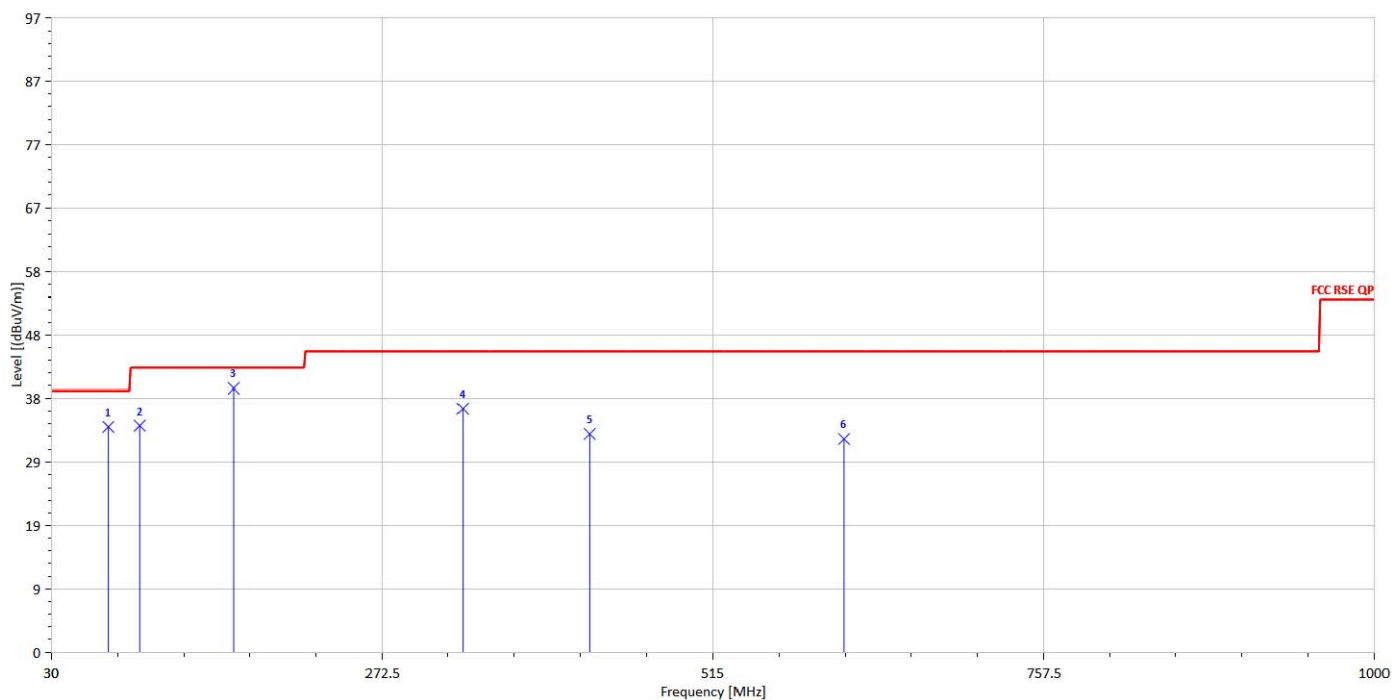
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Operation Mode : 802.11a Test Date : 2016/4/7
Fundamental Frequency : 5745 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : Tx CH Low Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
71.71	S	Peak	56.13	-21.65	34.48	40	-5.52
94.99	S	Peak	53.28	-18.61	34.67	43.5	-8.83
163.86	S	Peak	57.97	-17.61	40.36	43.5	-3.14
331.67	S	Peak	49.23	-11.94	37.29	46	-8.71
424.79	S	Peak	42.49	-9.10	33.40	46	-12.60
611.03	S	Peak	39.41	-6.80	32.61	46	-13.39

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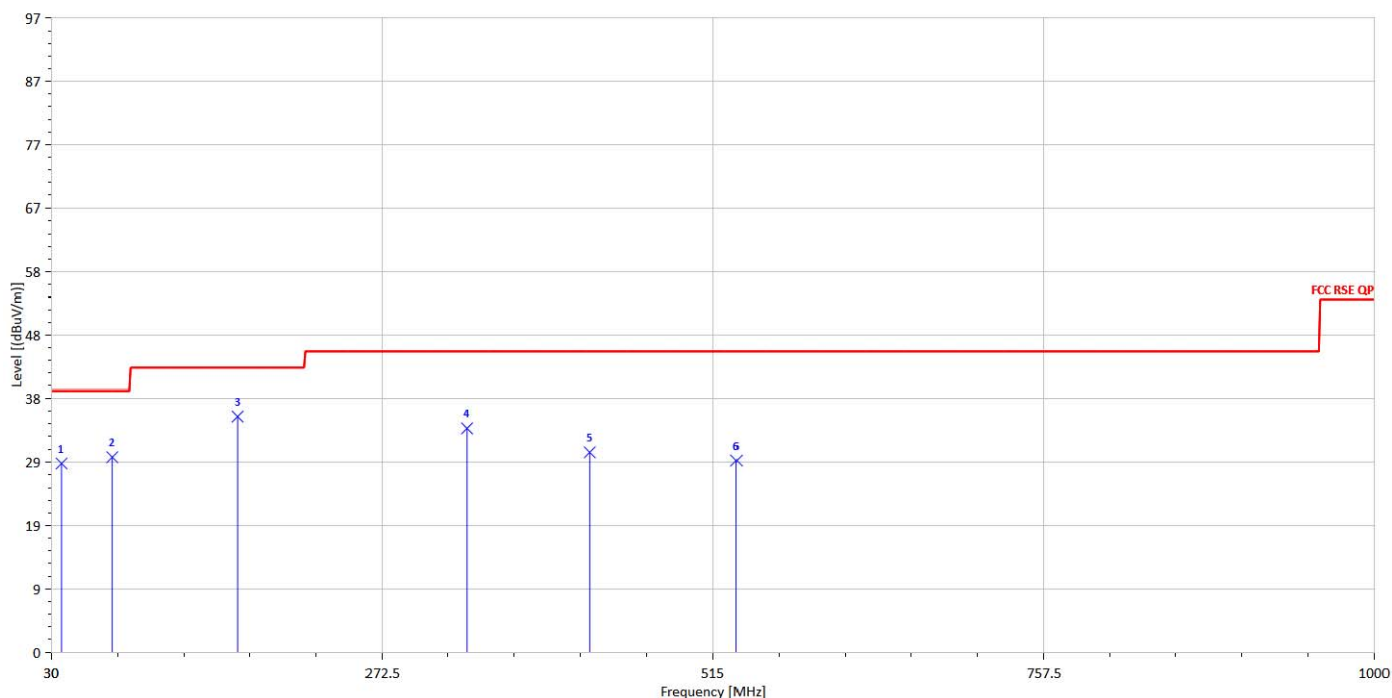
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Operation Mode : 802.11a Test Date : 2016/4/7
Fundamental Frequency : 5825 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : Tx CH High Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Vertical



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
37.76	S	QP	40.32	-11.49	28.83	40	-11.17
74.62	S	QP	51.23	-21.43	29.80	40	-10.20
166.77	S	Peak	54.02	-17.95	36.07	43.5	-7.43
334.58	S	Peak	46.09	-11.85	34.25	46	-11.75
424.79	S	Peak	39.65	-9.10	30.55	46	-15.45
532.46	S	Peak	36.38	-7.09	29.29	46	-16.71

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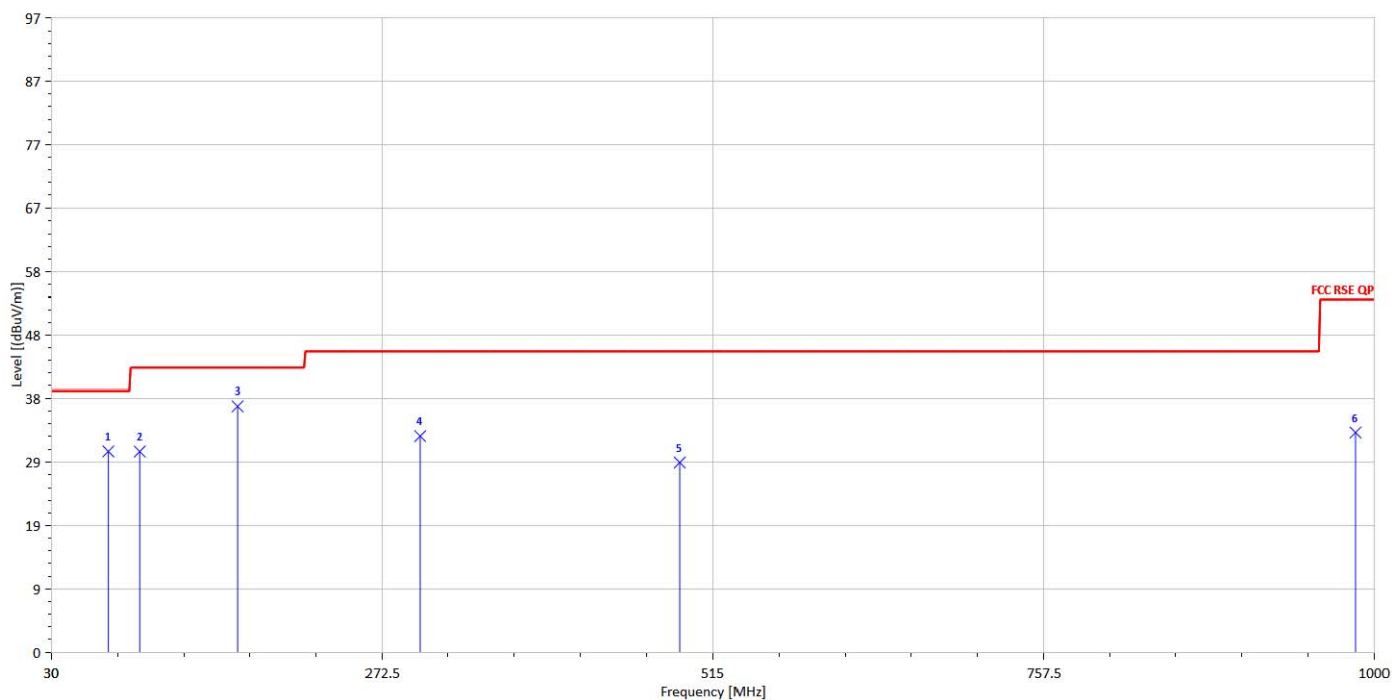
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Operation Mode :	802.11a	Test Date :	2016/4/7
Fundamental Frequency :	5825 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH High	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizontal



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
71.71	S	Peak	52.35	-21.65	30.70	40	-9.30
94.99	S	Peak	49.29	-18.61	30.68	43.5	-12.82
166.77	S	Peak	55.61	-17.95	37.66	43.5	-5.84
300.63	S	Peak	46.17	-13.12	33.06	46	-12.94
490.75	S	Peak	36.67	-7.68	28.98	46	-17.02
986.42	S	Peak	34.27	-0.65	33.61	54	-20.39

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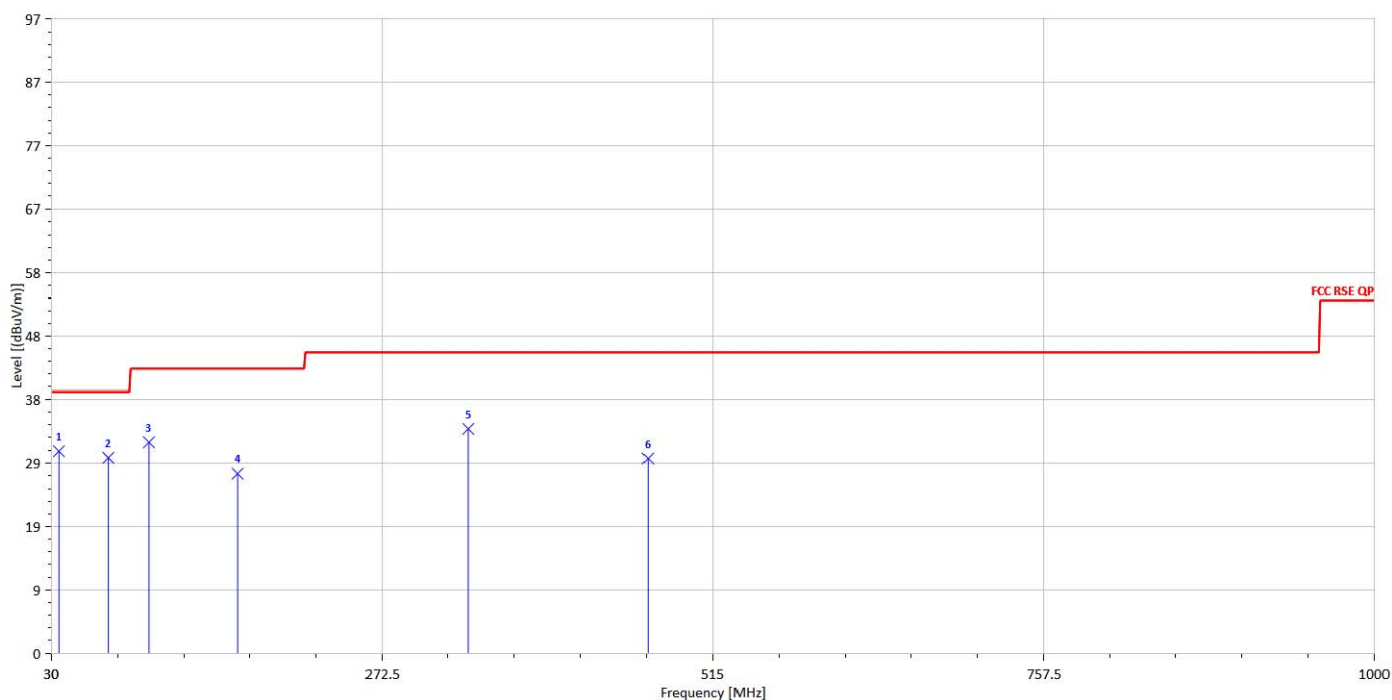
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802.11n HT40, 5725~5850 MHz

Operation Mode :	802.11n40	Test Date :	2016/4/7
Fundamental Frequency :	5755 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
35.82	S	QP	41.23	-10.35	30.88	40	-9.12
71.71	S	QP	51.51	-21.65	29.86	40	-10.14
101.78	S	Peak	49.78	-17.52	32.26	43.5	-11.24
166.77	S	Peak	45.36	-17.95	27.41	43.5	-16.09
335.55	S	Peak	46.21	-11.88	34.33	46	-11.67
467.47	S	Peak	37.49	-7.73	29.76	46	-16.24

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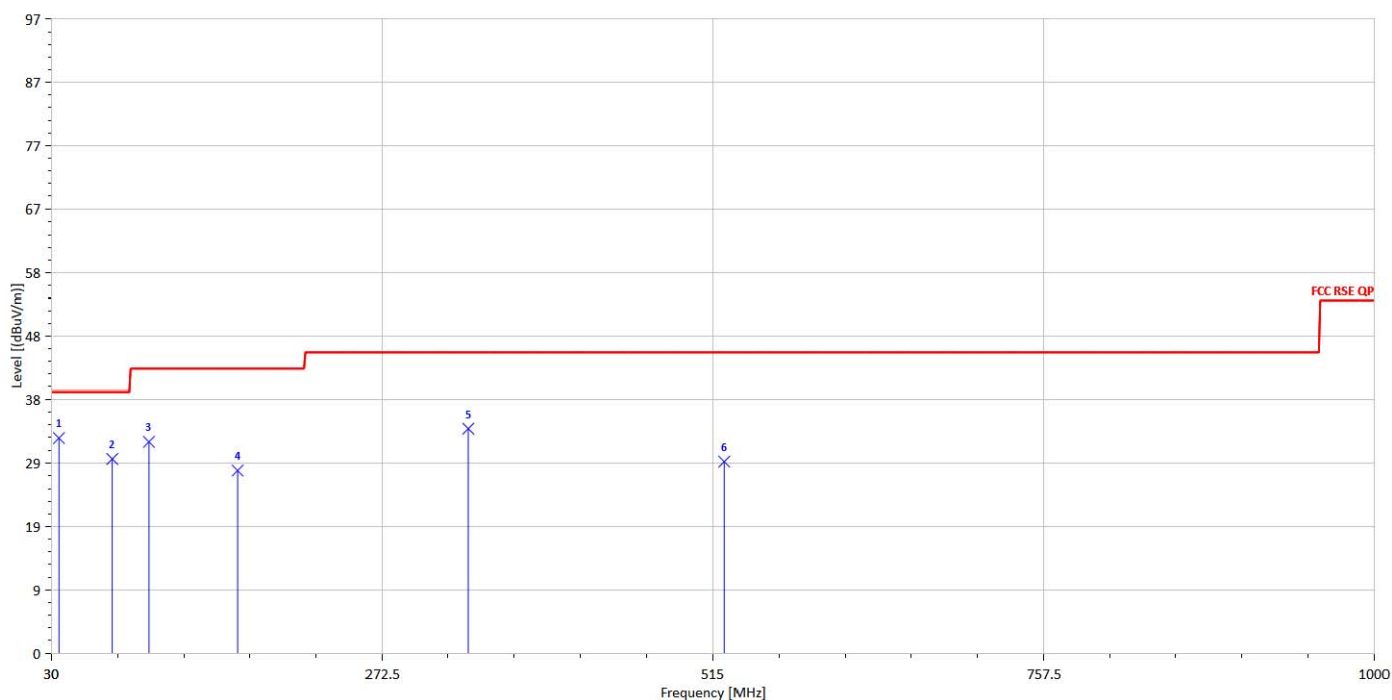
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Operation Mode : 802.11n40 Test Date : 2016/4/7
Fundamental Frequency : 5755 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : Tx CH Low Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
71.71	S	Peak	51.08	-21.65	29.43	40	-10.57
94.99	S	Peak	49.62	-18.61	31.01	43.5	-12.49
166.77	S	Peak	55.83	-17.95	37.88	43.5	-5.62
300.63	S	Peak	47.08	-13.12	33.96	46	-12.04
436.43	S	Peak	40.65	-9.20	31.45	46	-14.55
539.25	S	Peak	35.93	-7.38	28.55	46	-17.45

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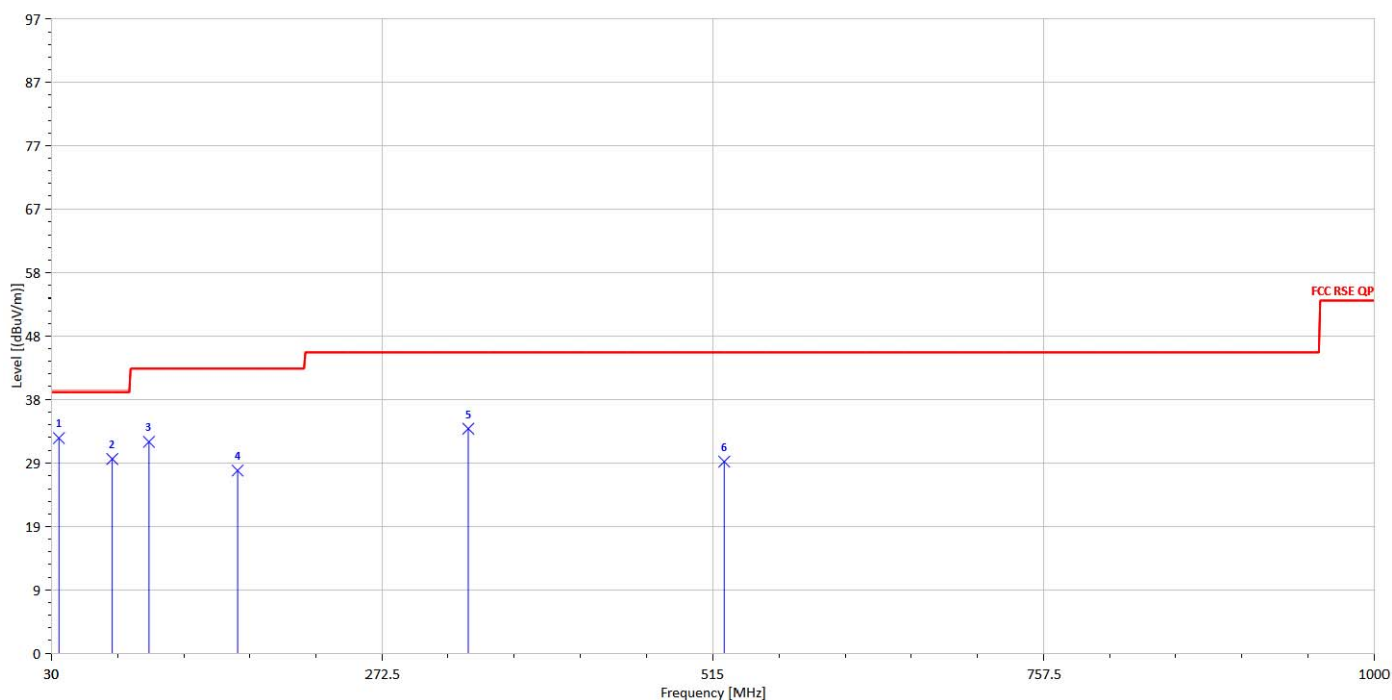
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Operation Mode : 802.11n40 Test Date : 2016/4/7
Fundamental Frequency : 5795 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : Tx CH High Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Vertical



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
35.82	S	QP	43.25	-10.35	32.90	40	-7.10
74.62	S	QP	51.11	-21.43	29.68	40	-10.32
101.78	S	Peak	49.85	-17.52	32.33	43.5	-11.17
166.77	S	Peak	45.84	-17.95	27.89	43.5	-15.61
335.55	S	Peak	46.24	-11.88	34.36	46	-11.64
523.73	S	Peak	36.68	-7.41	29.27	46	-16.73

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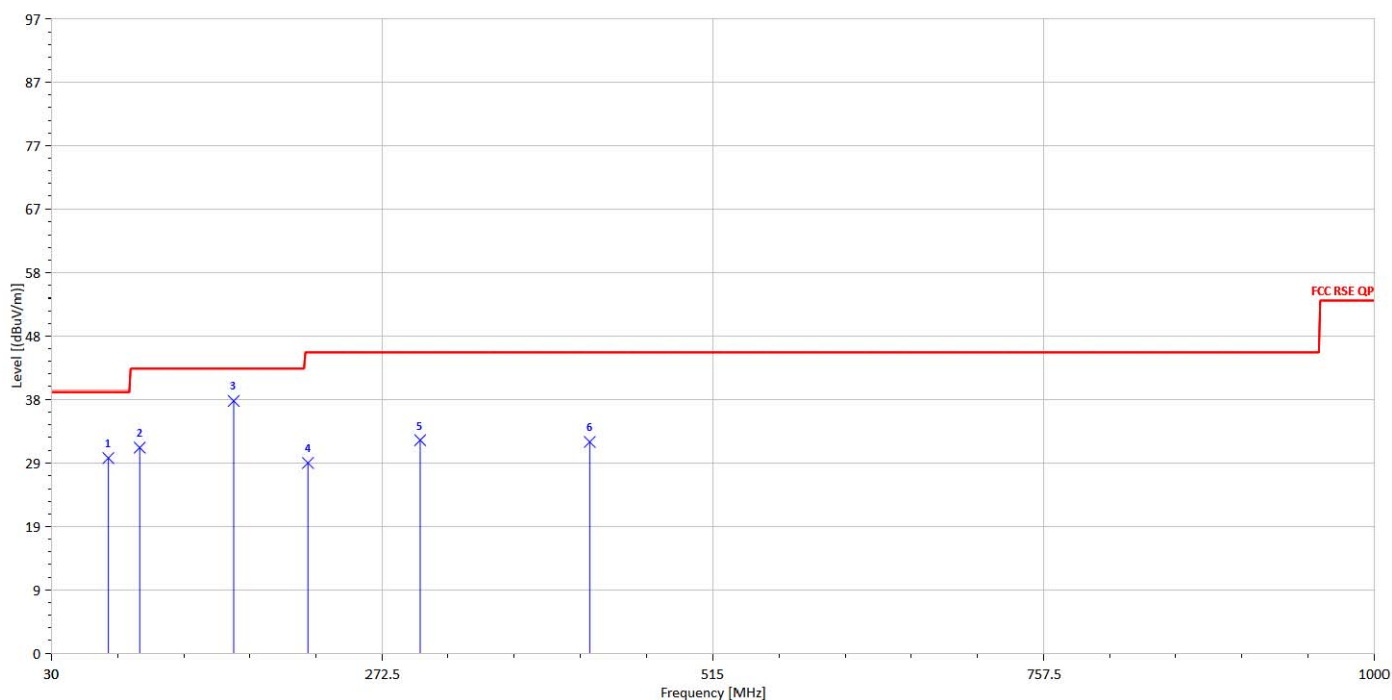
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Operation Mode : 802.11n40 Test Date : 2016/4/7
Fundamental Frequency : 5795 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : Tx CH High Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
71.71	S	Peak	51.47	-21.65	29.83	40	-10.17
94.99	S	Peak	50.05	-18.61	31.43	43.5	-12.07
163.86	S	Peak	56.25	-17.61	38.64	43.5	-4.86
218.18	S	Peak	46.21	-17.15	29.06	46	-16.94
300.63	S	Peak	45.70	-13.12	32.59	46	-13.41
424.79	S	Peak	41.41	-9.10	32.32	46	-13.68

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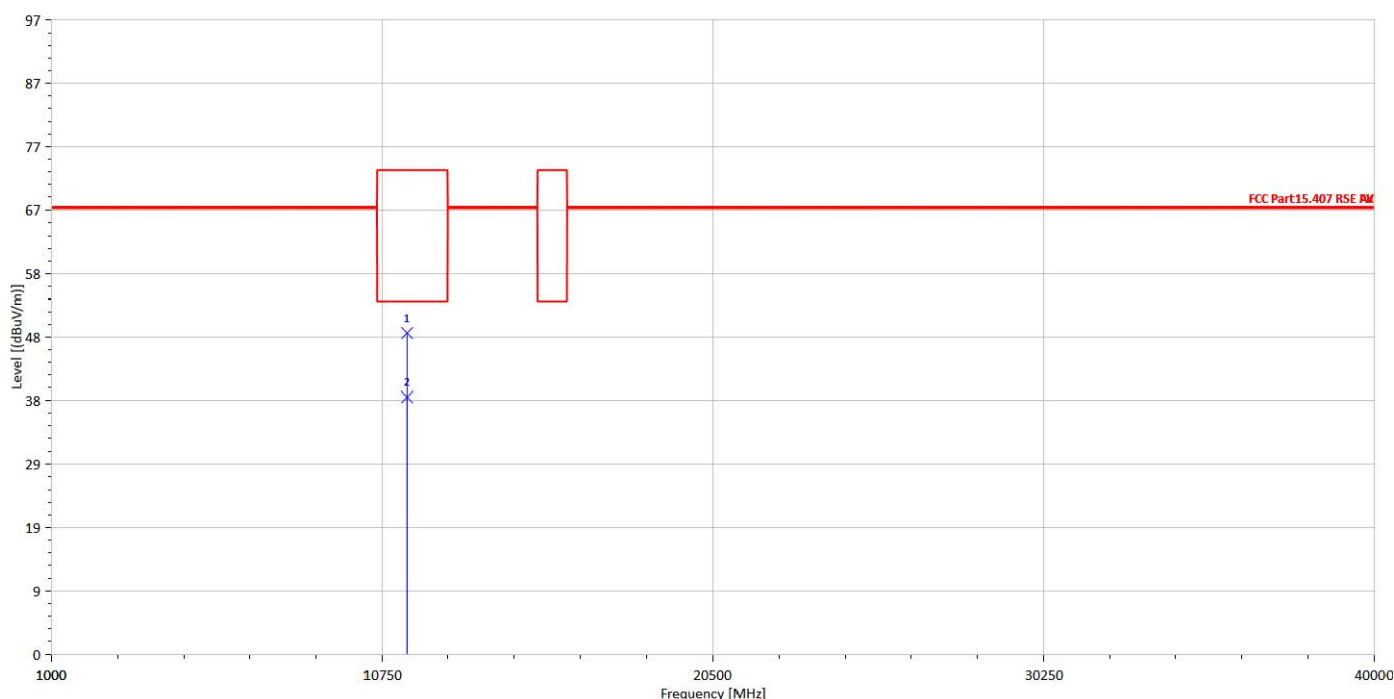
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Above 1GHz Worst-Case Data (2TX MODE):

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

Operation Mode :	802.11a	Test Date :	2016/4/7
Fundamental Frequency :	5745 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11490.00	H	Peak	30.75	18.39	49.14	74	-24.86
11490.00	H	Average	20.96	18.39	39.35	54	-14.65

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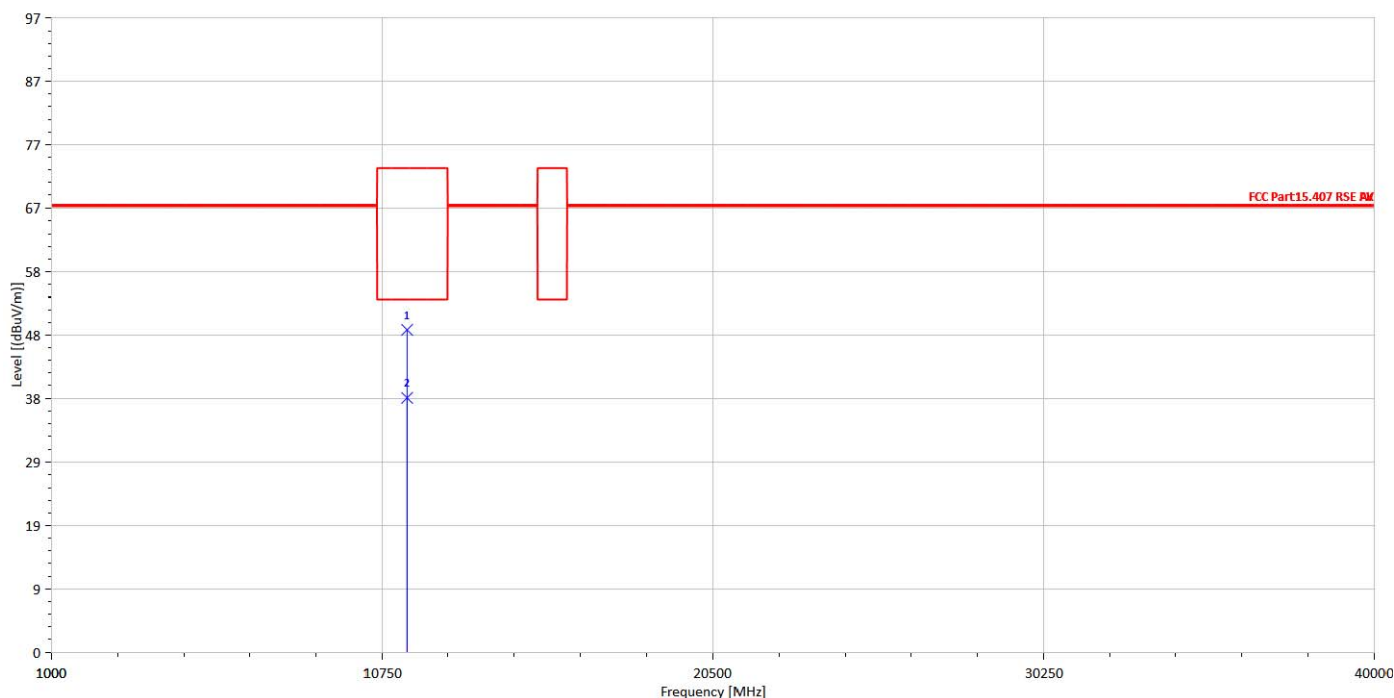
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Operation Mode : 802.11a Test Date : 2016/4/7
Fundamental Frequency : 5745 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : Tx CH Low Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
11490.00	H	Peak	30.93	18.39	49.32	74	-24.68
11490.00	H	Average	20.57	18.39	38.96	54	-15.04

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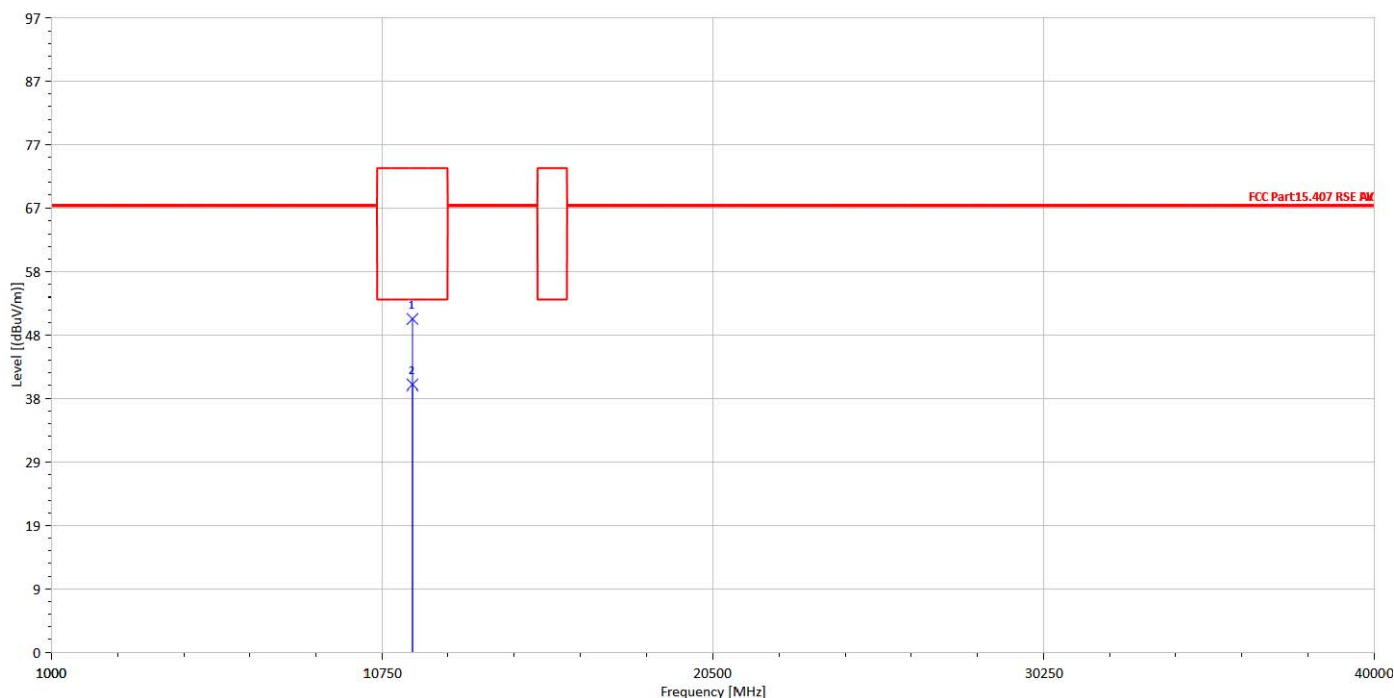
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Operation Mode : 802.11a Test Date : 2016/4/7
Fundamental Frequency : 5825 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : Tx CH High Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Vertical



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
11650.00	H	Peak	30.77	20.23	51.00	74	-23.00
11650.00	H	Average	20.66	20.23	40.89	54	-13.11

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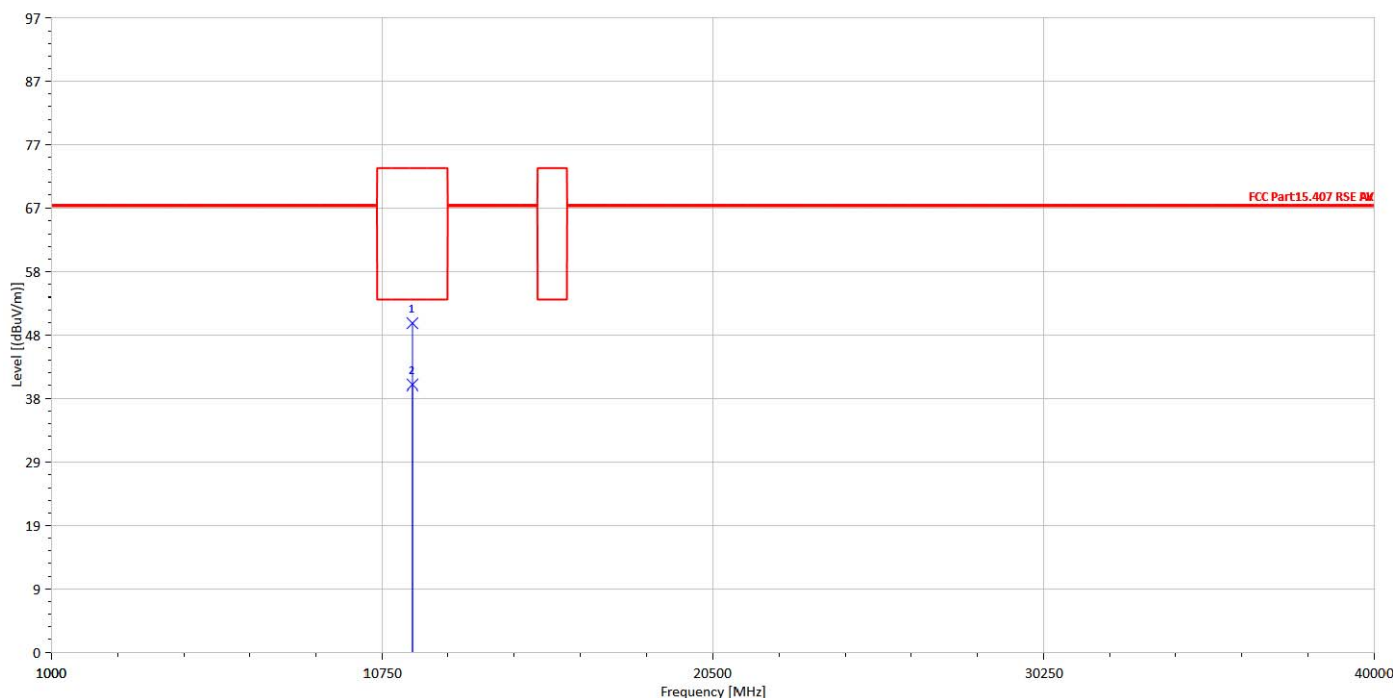
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Operation Mode :	802.11a	Test Date :	2016/4/7
Fundamental Frequency :	5825 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH High	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizontal



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
11650.00	H	Peak	30.11	20.23	50.35	74	-23.65
11650.00	H	Average	20.65	20.23	40.88	54	-13.12

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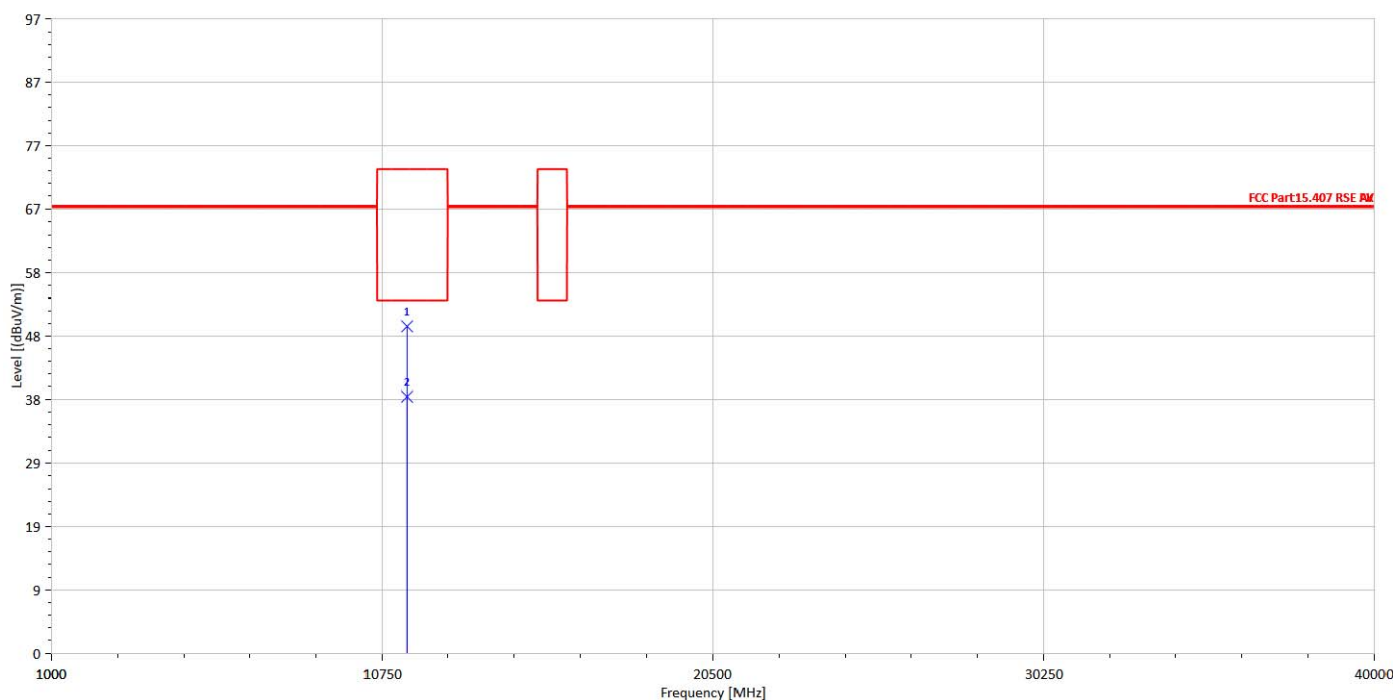
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Radiated Spurious Emission Measurement Result 802.11n HT20, 5725~5850 MHz

Operation Mode :	802.11n20	Test Date :	2016/4/7
Fundamental Frequency :	5745 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11490.00	H	Peak	31.63	18.39	50.02	74	-23.98
11490.00	H	Average	20.89	18.39	39.28	54	-14.72

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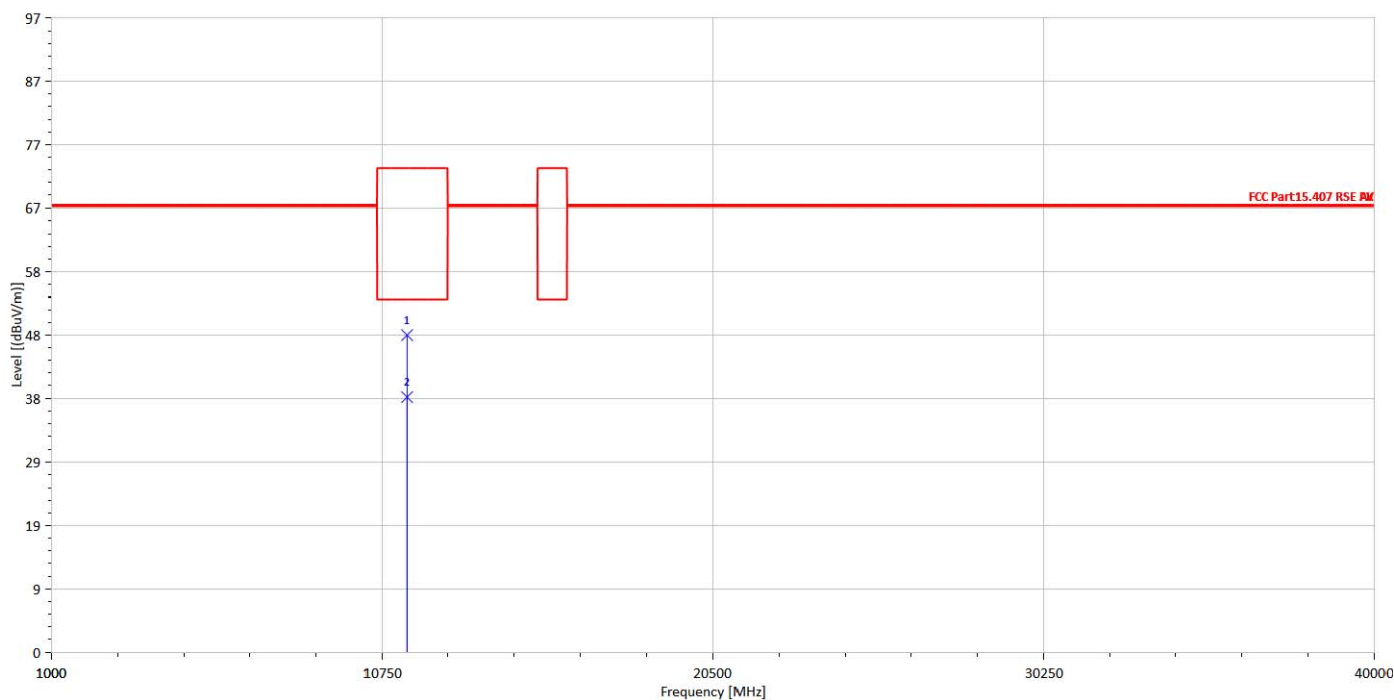
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Operation Mode : 802.11n20 Test Date : 2016/4/7
Fundamental Frequency : 5745 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : Tx CH Low Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11490.00	H	Peak	30.13	18.39	48.52	74	-25.48
11490.00	H	Average	20.69	18.39	39.08	54	-14.92

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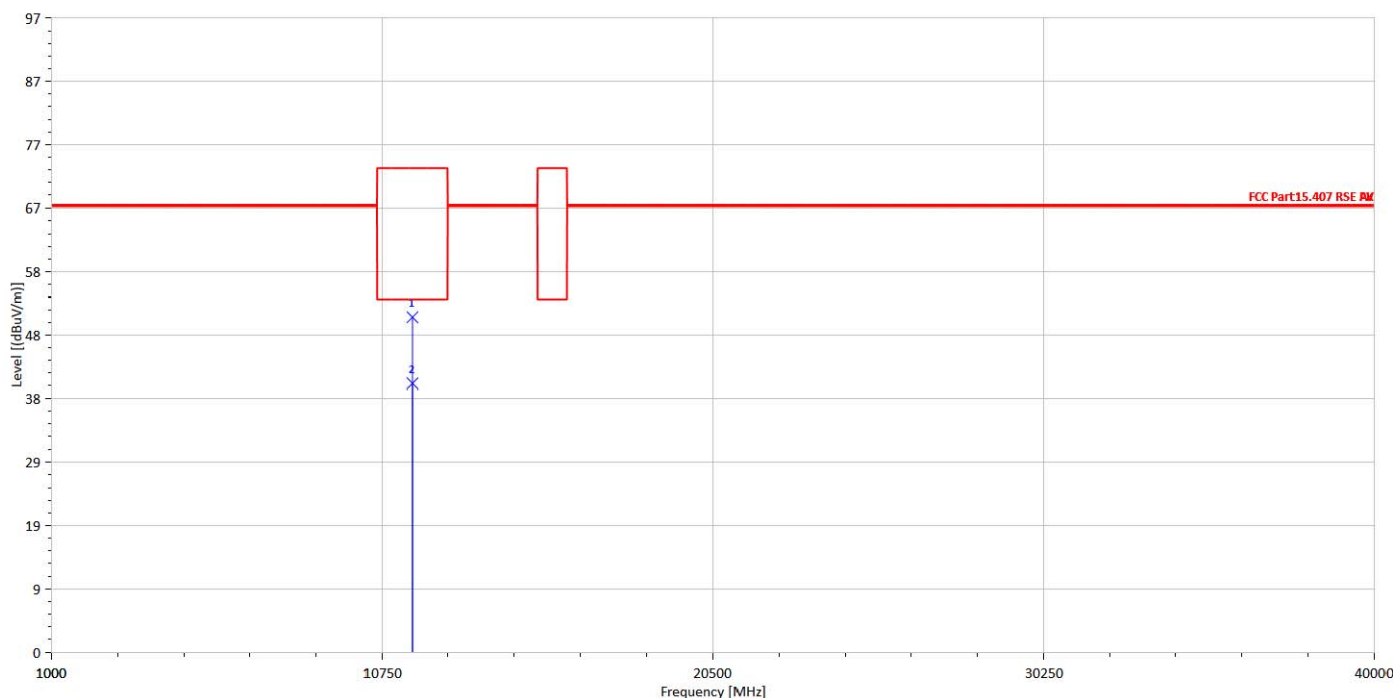
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Fundamental Frequency : 5825 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : Tx CH High Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Vertical



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
11650.00	H	Peak	31.04	20.23	51.27	74	-22.73
11650.00	H	Average	20.84	20.23	41.07	54	-12.93

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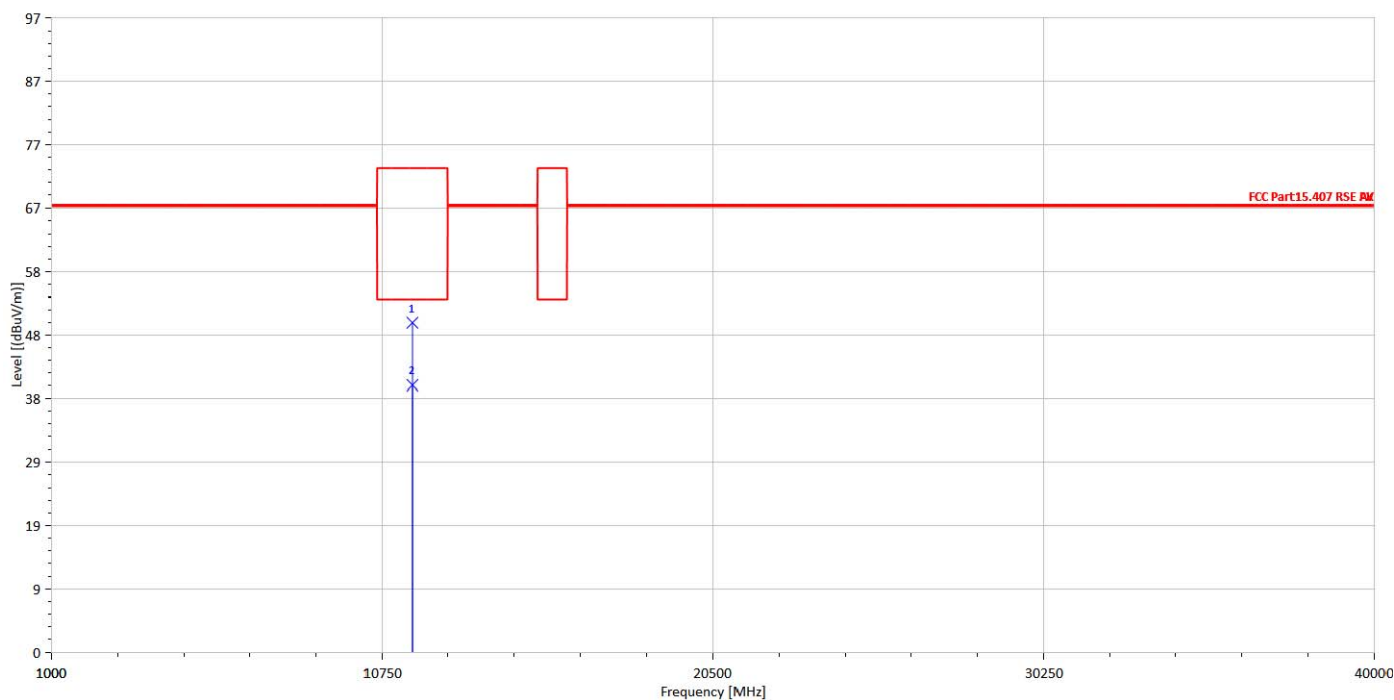
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Operation Mode : 802.11n20 Test Date : 2016/4/7
Fundamental Frequency : 5825 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : Tx CH High Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
11650.00	H	Peak	30.19	20.23	50.42	74	-23.58
11650.00	H	Average	20.59	20.23	40.82	54	-13.18

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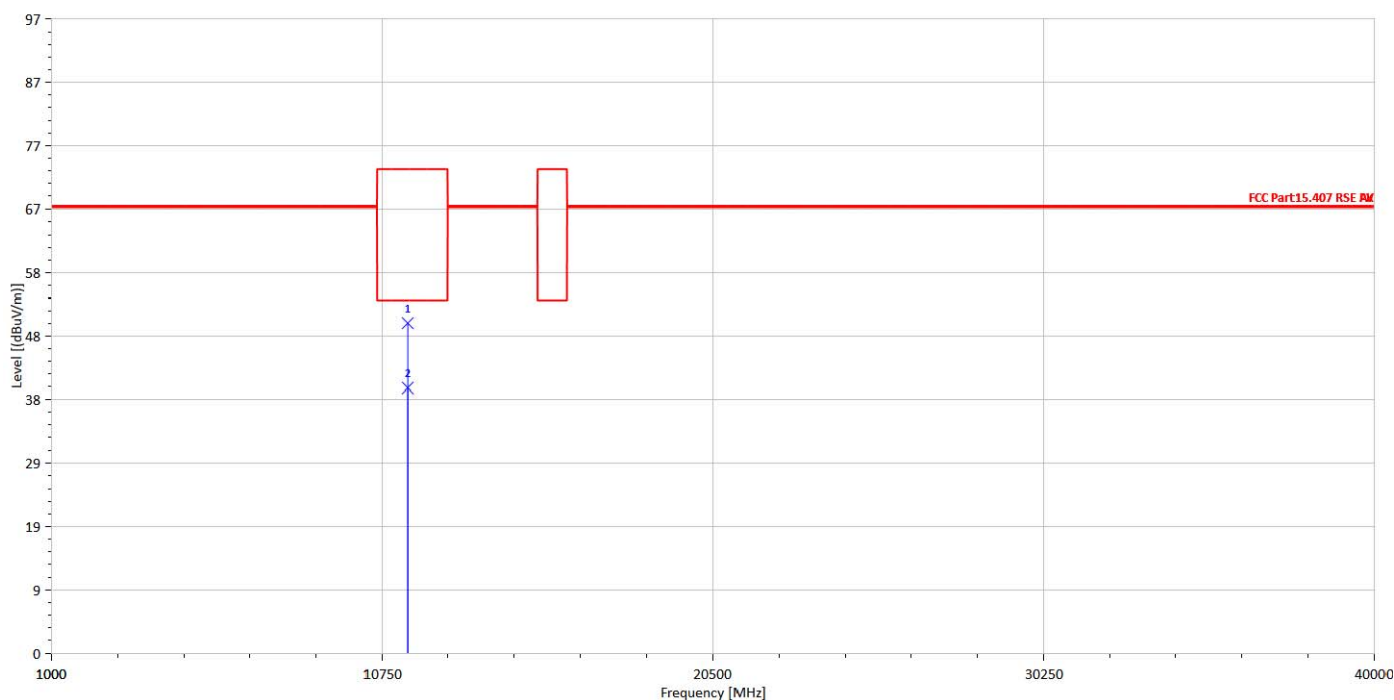
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Radiated Spurious Emission Measurement Result 802.11n HT40, 5725~5850 MHz

Operation Mode :	802.11n40	Test Date :	2016/4/7
Fundamental Frequency :	5755 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11510.00	H	Peak	30.61	19.90	50.51	74	-23.49
11510.00	H	Average	20.67	19.90	40.57	54	-13.43

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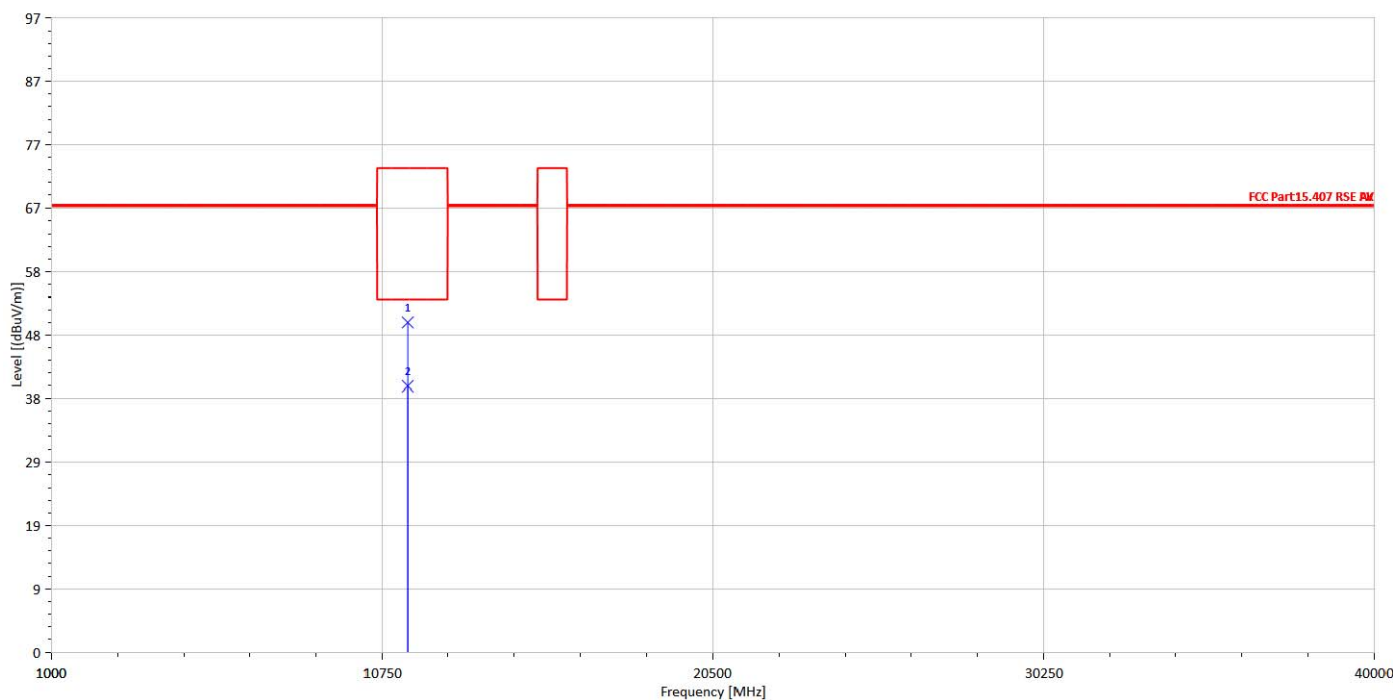
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Operation Mode : 802.11n40 Test Date : 2016/4/7
Fundamental Frequency : 5755 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : Tx CH Low Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11510.00	H	Peak	30.57	19.90	50.47	74	-23.53
11510.00	H	Average	20.78	19.90	40.68	54	-13.32

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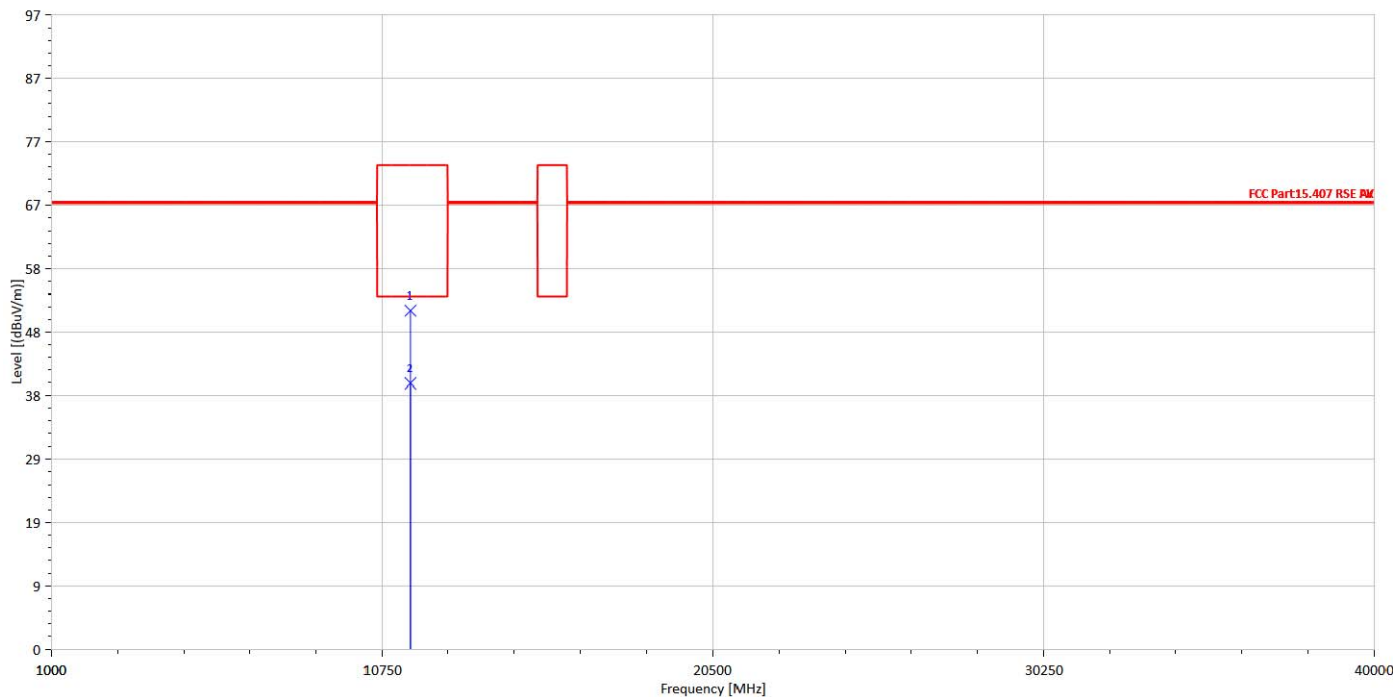
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Operation Mode : 802.11n40 Test Date : 2016/4/7
Fundamental Frequency : 5795 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : Tx CH High Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Vertical



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
11590.00	H	Peak	31.96	19.85	51.81	74	-22.19
11590.00	H	Average	20.81	19.85	40.66	54	-13.34

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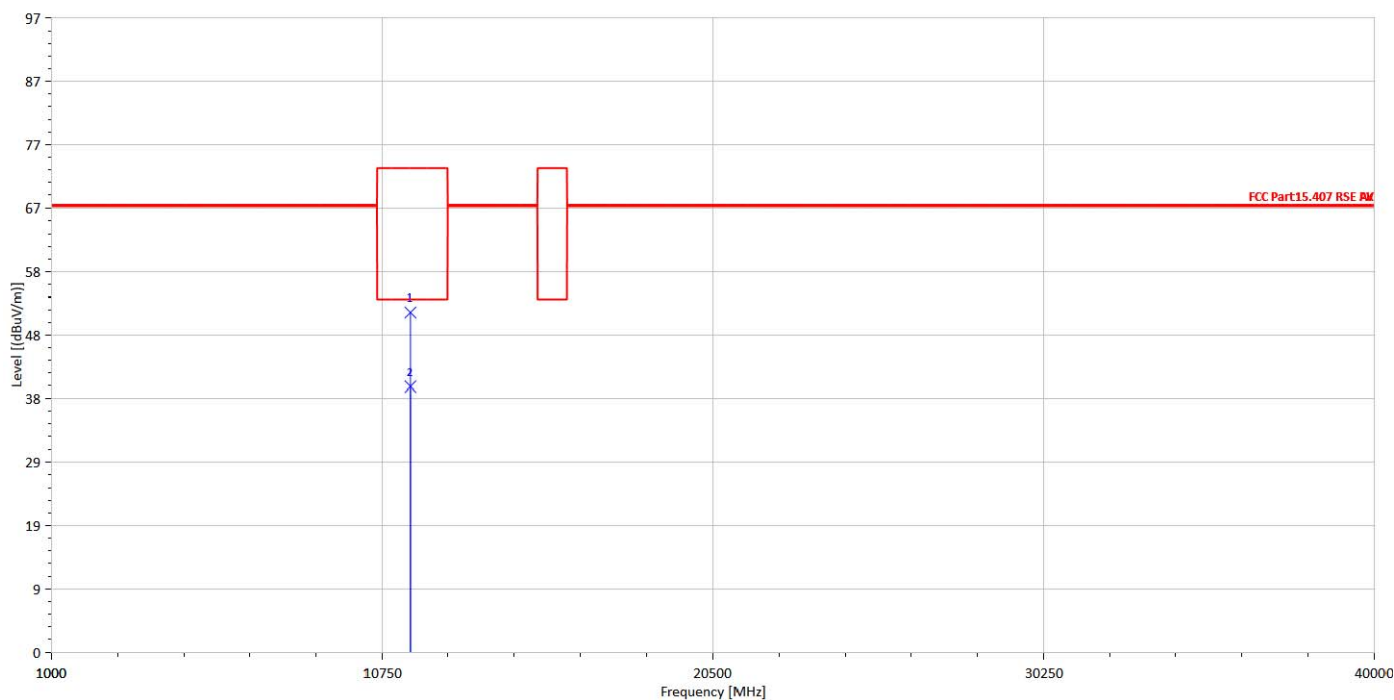
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Operation Mode : 802.11n40 Test Date : 2016/4/7
Fundamental Frequency : 5795 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : Tx CH High Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
11590.00	H	Peak	32.14	19.85	51.99	74	-22.01
11590.00	H	Average	20.77	19.85	40.62	54	-13.38

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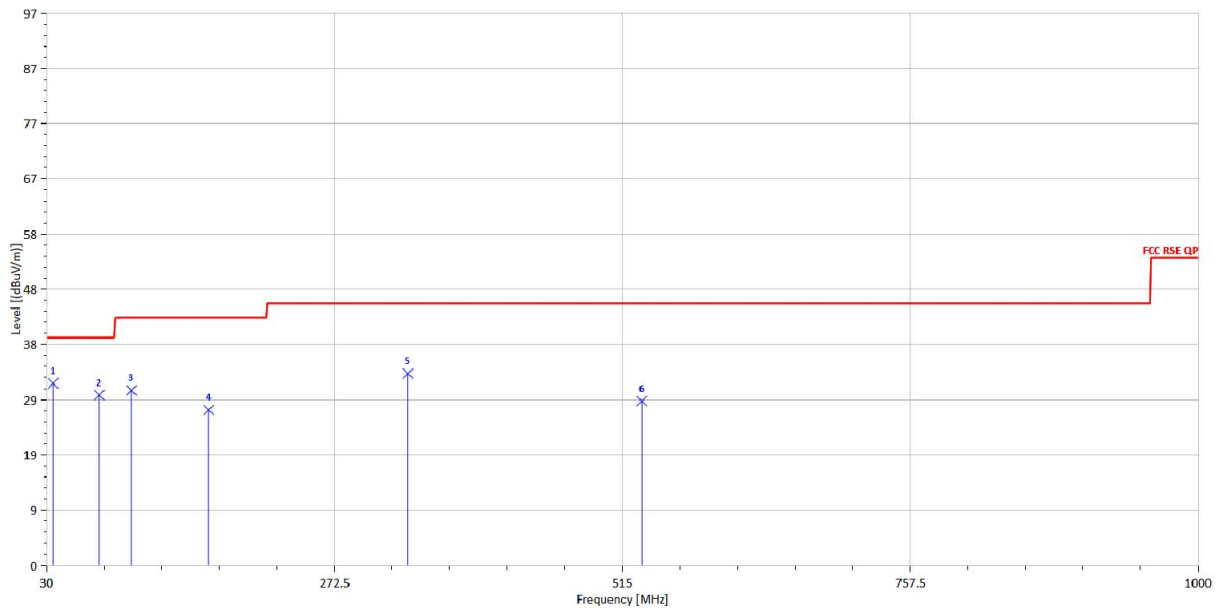
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9.9 Radiated Spurious Emission Measurement Result (MIMO MODE)

Below 1GHz Worst-Case Data (MIMO MODE):

802.11n HT20, 5725~5850 MHz

Operation Mode :	802.11n20	Test Date :	2016/4/7
Fundamental Frequency :	5745 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
35.82	S	QP	42.32	-10.35	31.97	40	-8.03
74.62	S	QP	51.35	-21.43	29.92	40	-10.08
101.78	S	Peak	48.26	-17.52	30.74	43.5	-12.76
166.77	S	Peak	45.24	-17.95	27.30	43.5	-16.20
334.58	S	Peak	45.55	-11.85	33.70	46	-12.30
531.49	S	Peak	36.07	-7.22	28.85	46	-17.15

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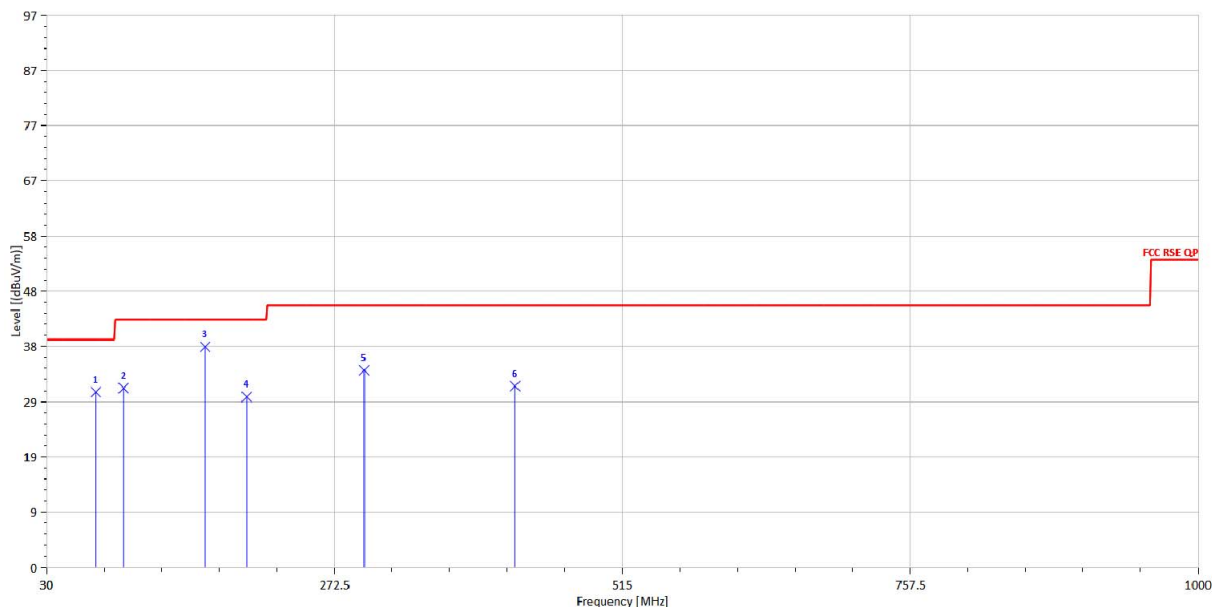
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Operation Mode : 802.11n20 Test Date : 2016/4/8
Fundamental Frequency : 5745 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : Tx CH Low Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
71.71	S	Peak	52.45	-21.65	30.80	40	-9.20
94.99	S	Peak	50.09	-18.61	31.48	43.5	-12.02
163.86	S	Peak	56.35	-17.61	38.74	43.5	-4.76
198.78	S	Peak	47.52	-17.58	29.94	43.5	-13.56
297.72	S	Peak	47.76	-13.15	34.61	46	-11.39
424.79	S	Peak	40.93	-9.10	31.83	46	-14.17

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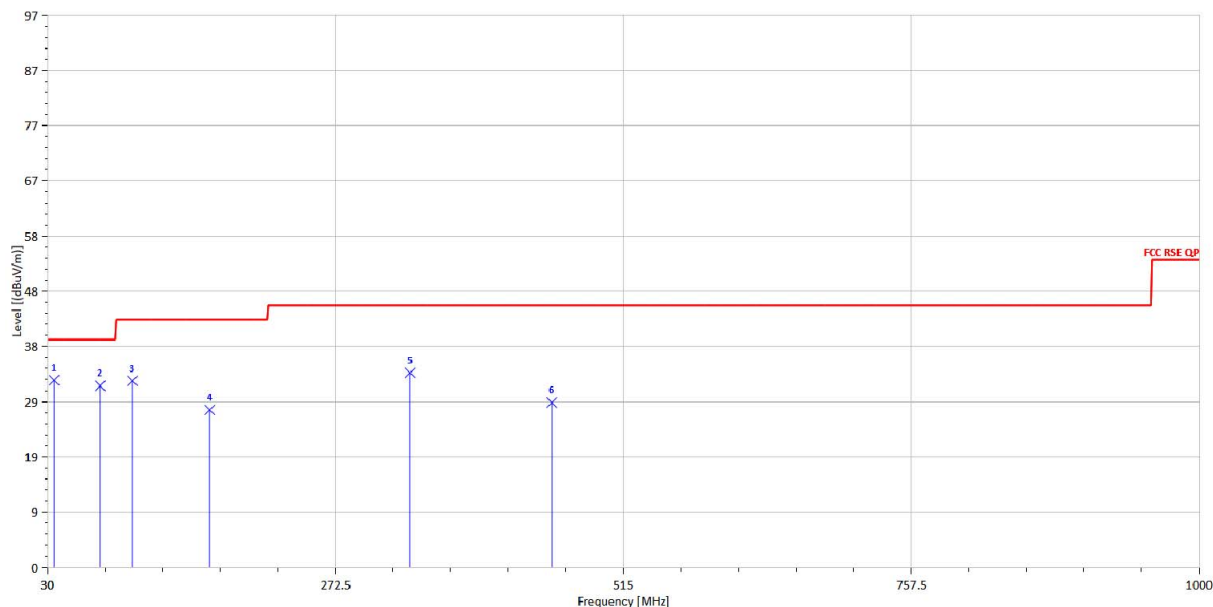
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Operation Mode : 802.11n20 Test Date : 2016/4/8
Fundamental Frequency : 5825 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : Tx CH High Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Vertical



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
35.82	S	QP	43.21	-10.35	32.86	40	-7.14
74.62	S	QP	53.32	-21.43	31.89	40	-8.11
101.78	S	Peak	50.27	-17.52	32.75	43.5	-10.75
166.77	S	Peak	45.60	-17.95	27.65	43.5	-15.85
335.55	S	Peak	46.05	-11.88	34.17	46	-11.83
454.86	S	Peak	37.40	-8.46	28.93	46	-17.07

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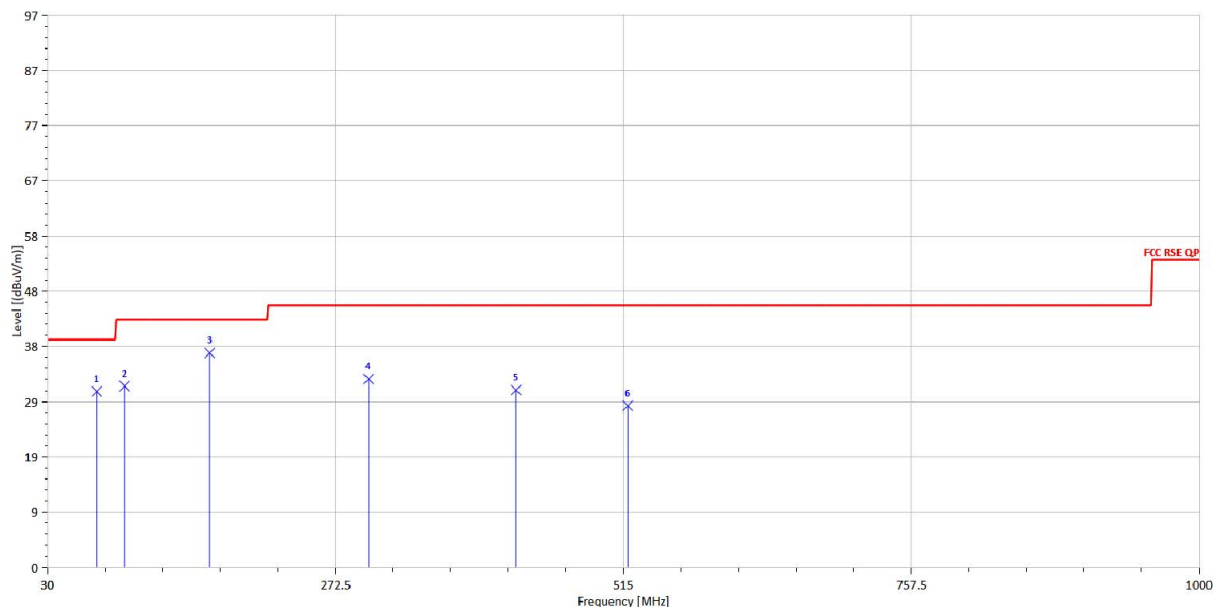
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Operation Mode : 802.11n20 Test Date : 2016/4/8
Fundamental Frequency : 5825 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : Tx CH High Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
71.71	S	Peak	52.55	-21.65	30.90	40	-9.10
94.99	S	Peak	50.45	-18.61	31.84	43.5	-11.66
166.77	S	Peak	55.61	-17.95	37.66	43.5	-5.84
300.63	S	Peak	46.20	-13.12	33.08	46	-12.92
424.79	S	Peak	40.24	-9.10	31.15	46	-14.85
518.88	S	Peak	35.81	-7.40	28.41	46	-17.59

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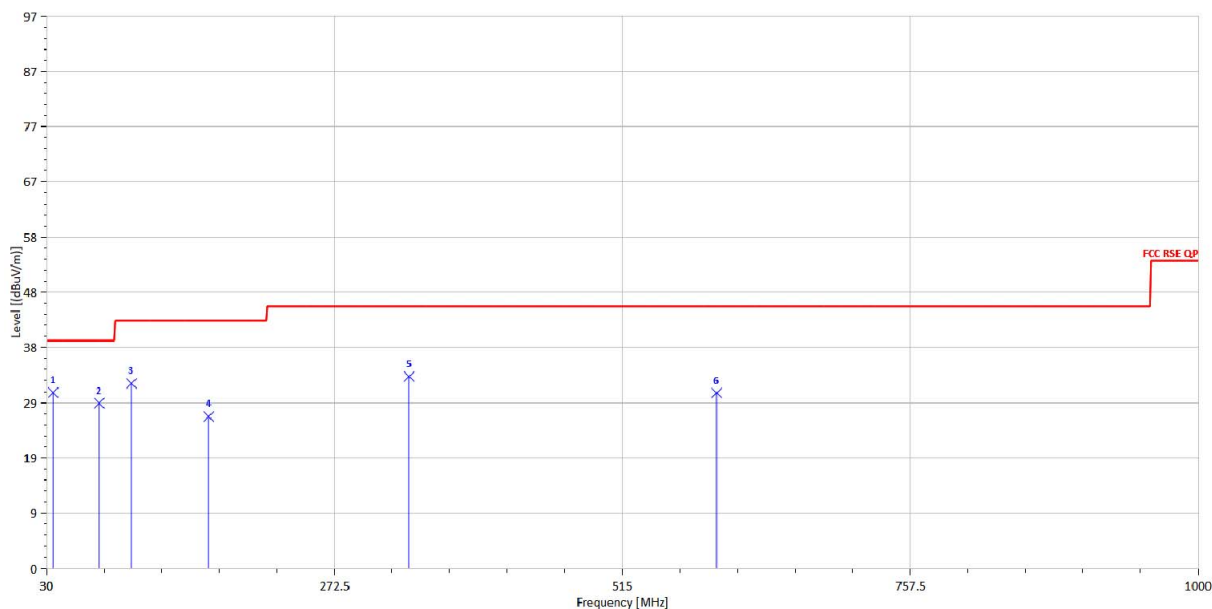
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802.11n HT40, 5725~5850 MHz

Operation Mode :	802.11n40	Test Date :	2016/4/8
Fundamental Frequency :	5755 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
35.82	S	QP	41.23	-10.35	30.88	40	-9.12
74.62	S	QP	50.45	-21.43	29.02	40	-10.98
101.78	S	Peak	50.00	-17.52	32.48	43.5	-11.02
166.77	S	Peak	44.62	-17.95	26.67	43.5	-16.83
335.55	S	Peak	45.58	-11.88	33.70	46	-12.30
594.54	S	Peak	36.58	-5.76	30.82	46	-15.18

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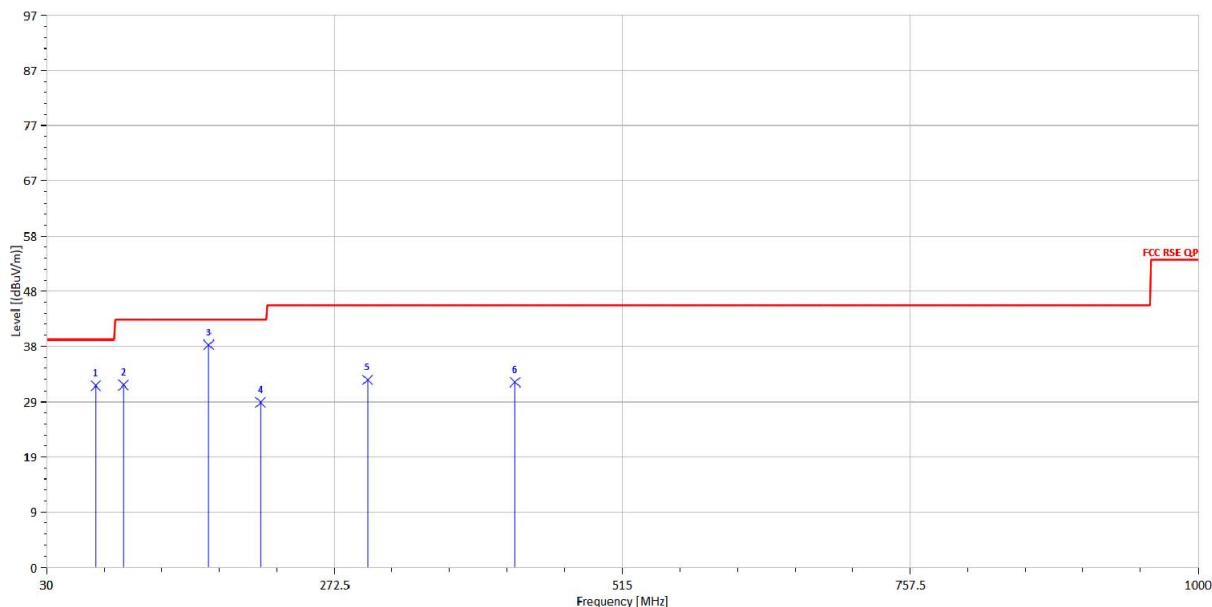
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Operation Mode : 802.11n40 Test Date : 2016/4/8
Fundamental Frequency : 5755 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : Tx CH Low Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
71.71	S	Peak	53.56	-21.65	31.91	40	-8.09
94.99	S	Peak	50.64	-18.61	32.03	43.5	-11.47
166.77	S	Peak	57.04	-17.95	39.10	43.5	-4.40
210.42	S	Peak	46.08	-17.10	28.98	43.5	-14.52
300.63	S	Peak	46.04	-13.12	32.93	46	-13.07
424.79	S	Peak	41.61	-9.10	32.52	46	-13.48

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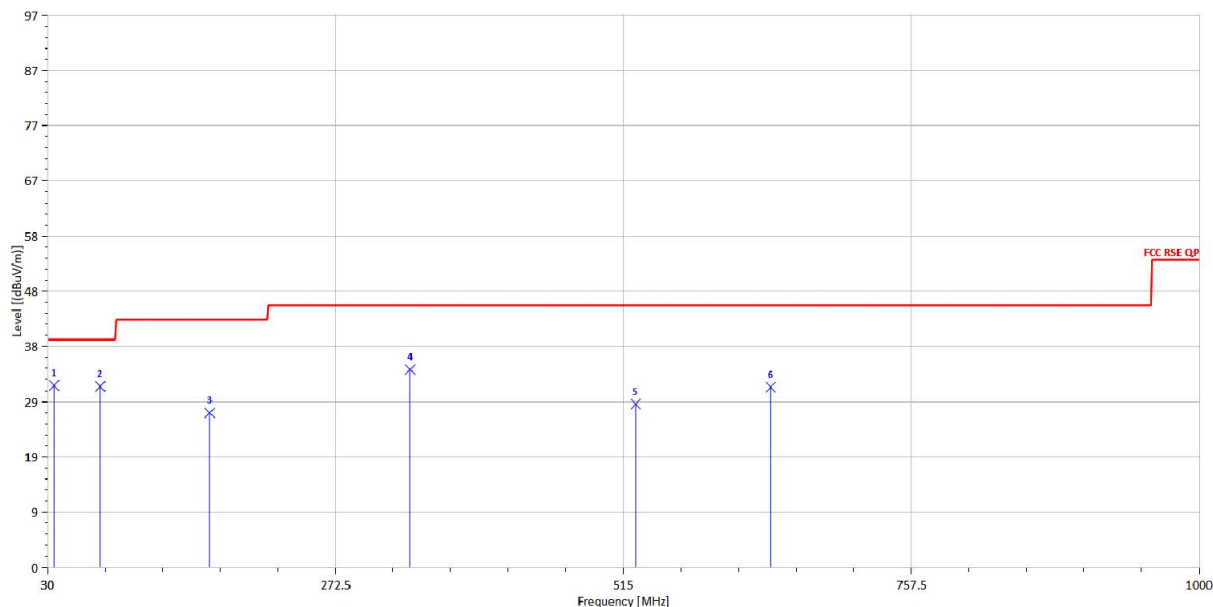
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Operation Mode : 802.11n40 Test Date : 2016/4/8
Fundamental Frequency : 5795 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : Tx CH High Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Vertical



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
35.82	S	QP	42.28	-10.35	31.93	40	-8.07
74.62	S	QP	53.21	-21.43	31.78	40	-8.22
166.77	S	Peak	45.07	-17.95	27.12	43.5	-16.38
335.55	S	Peak	46.61	-11.88	34.73	46	-11.27
525.67	S	Peak	36.15	-7.47	28.68	46	-17.32
639.16	S	Peak	36.90	-5.26	31.64	46	-14.36

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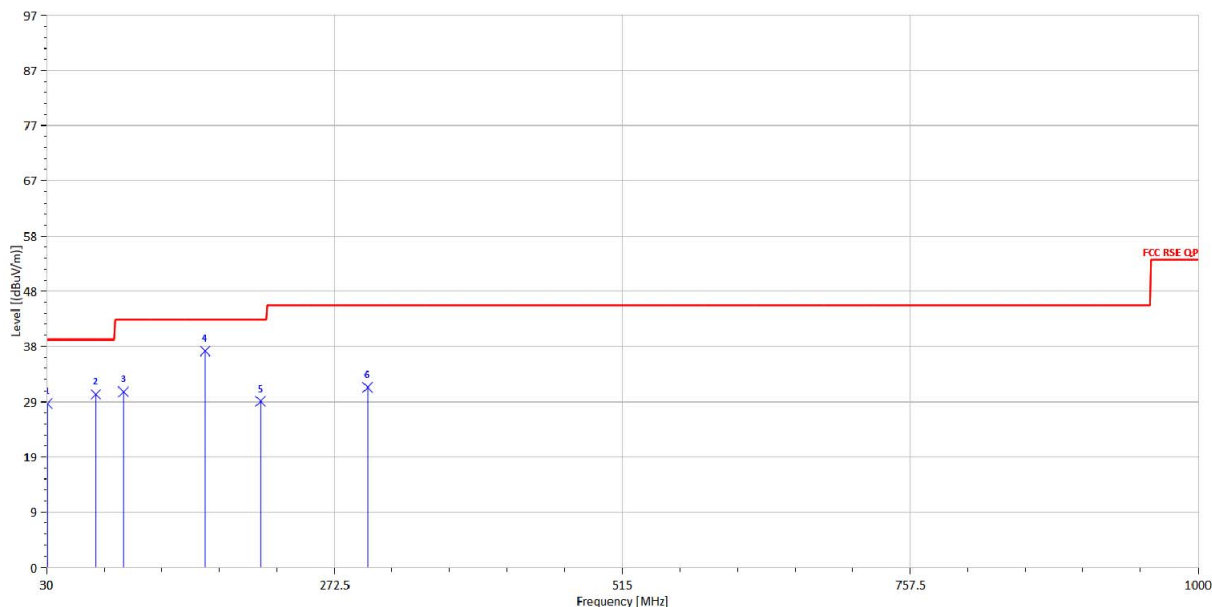
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Operation Mode : 802.11n40 Test Date : 2016/4/8
Fundamental Frequency : 5795 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : Tx CH High Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
30.97	S	Peak	36.47	-7.70	28.76	40	-11.24
71.71	S	Peak	52.03	-21.65	30.38	40	-9.62
94.99	S	Peak	49.45	-18.61	30.84	43.5	-12.66
163.86	S	Peak	55.60	-17.61	37.99	43.5	-5.51
210.42	S	Peak	46.28	-17.10	29.18	43.5	-14.32
300.63	S	Peak	44.72	-13.12	31.60	46	-14.40

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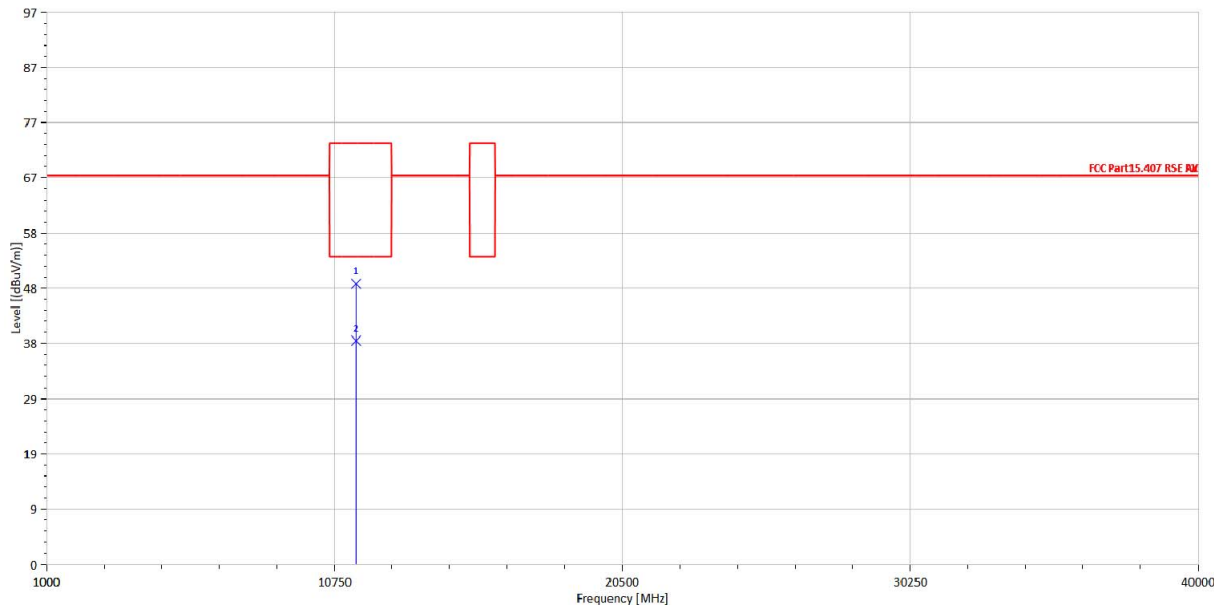
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Above 1GHz Worst-Case Data (MIMO MODE):

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

Operation Mode :	802.11n20	Test Date :	2016/4/7
Fundamental Frequency :	5745 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
11490.00	H	Peak	30.89	18.39	49.28	74	-24.72
11490.00	H	Average	20.90	18.39	39.29	54	-14.71

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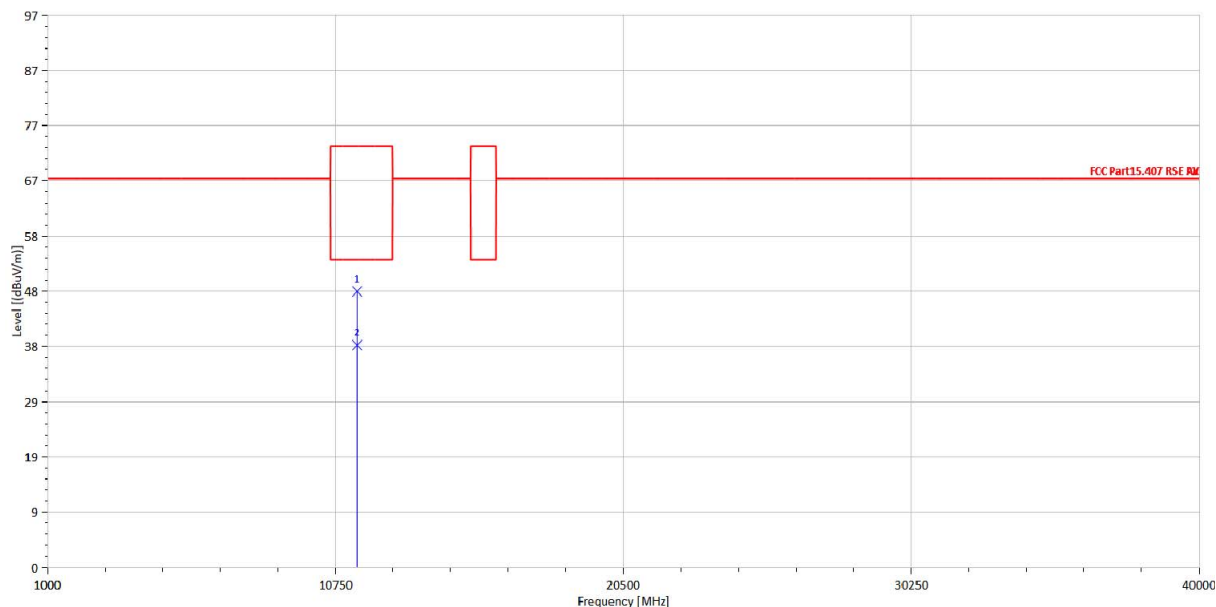
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Operation Mode :	802.11n20	Test Date :	2016/4/7
Fundamental Frequency :	5745 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizontal



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
11490.00	H	Peak	30.08	18.39	48.47	74	-25.53
11490.00	H	Average	20.65	18.39	39.04	54	-14.96

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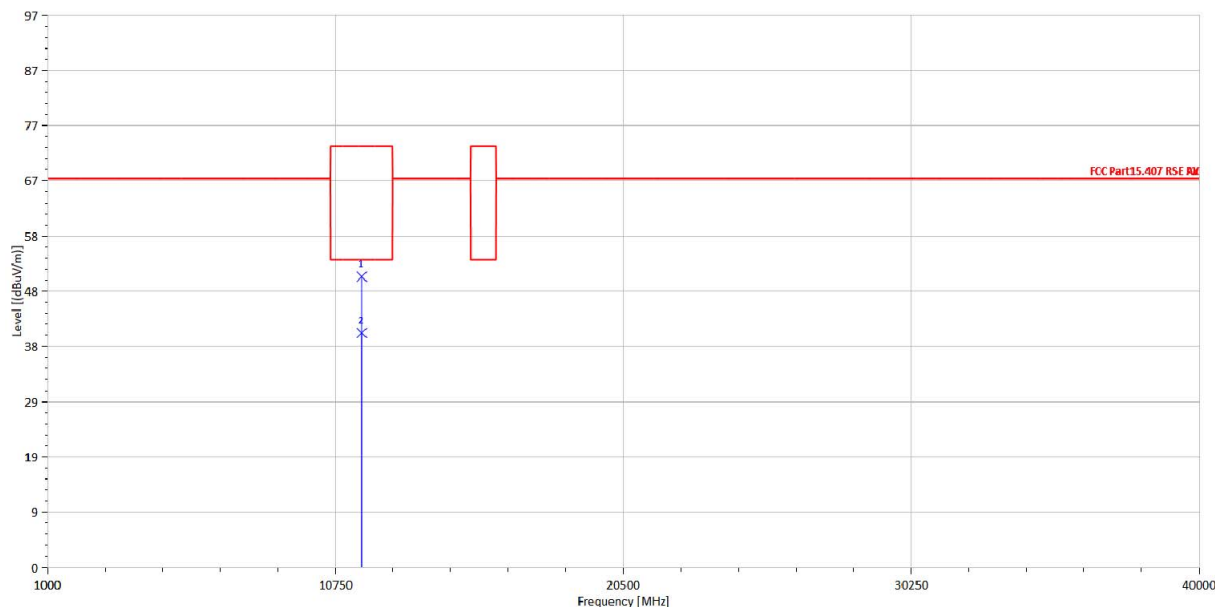
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Operation Mode : 802.11n20 Test Date : 2016/4/7
Fundamental Frequency : 5825 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : Tx CH High Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Vertical



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11650.00	H	Peak	30.83	20.23	51.07	74	-22.93
11650.00	H	Average	20.94	20.23	41.17	54	-12.83

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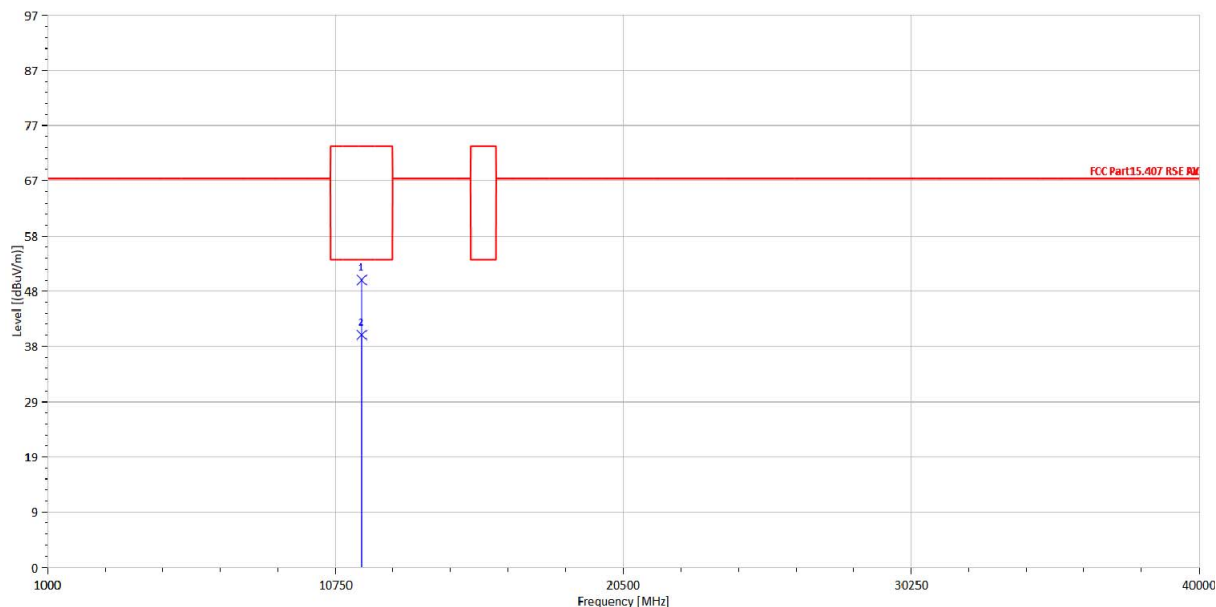
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Operation Mode :	802.11n20	Test Date :	2016/4/7
Fundamental Frequency :	5825 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH High	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizontal



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
11650.00	H	Peak	30.23	20.23	50.47	74	-23.53
11650.00	H	Average	20.59	20.23	40.82	54	-13.18

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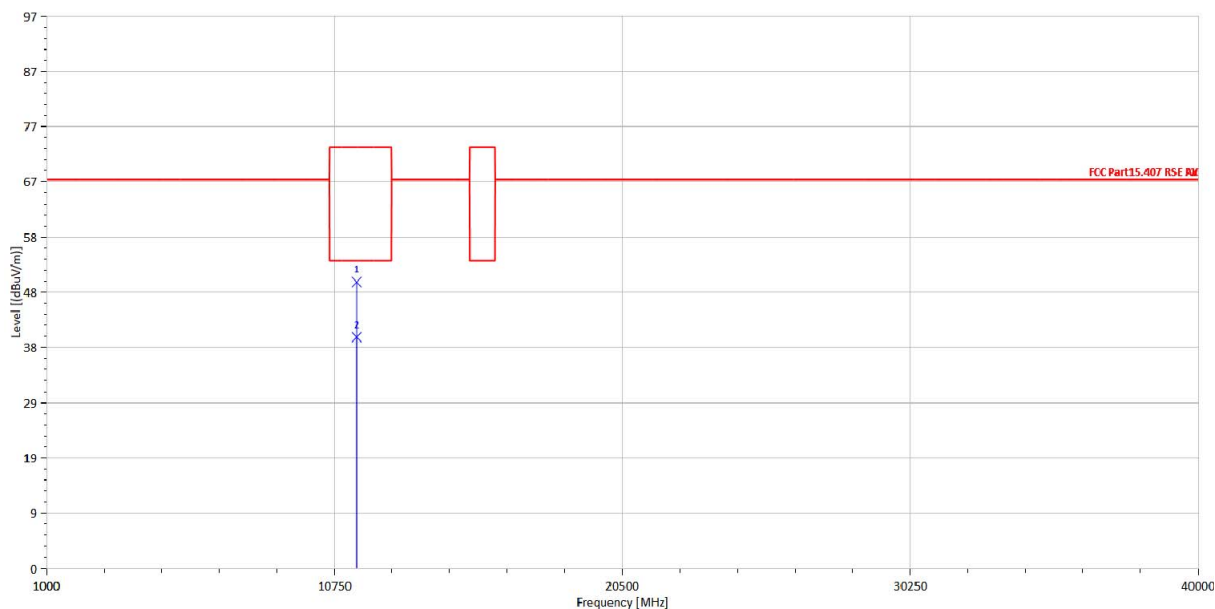
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Radiated Spurious Emission Measurement Result 802.11n HT40, 5725~5850 MHz

Operation Mode :	802.11n40	Test Date :	2016/4/7
Fundamental Frequency :	5755 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
11510.00	H	Peak	30.39	19.90	50.29	74	-23.71
11510.00	H	Average	20.72	19.90	40.62	54	-13.38

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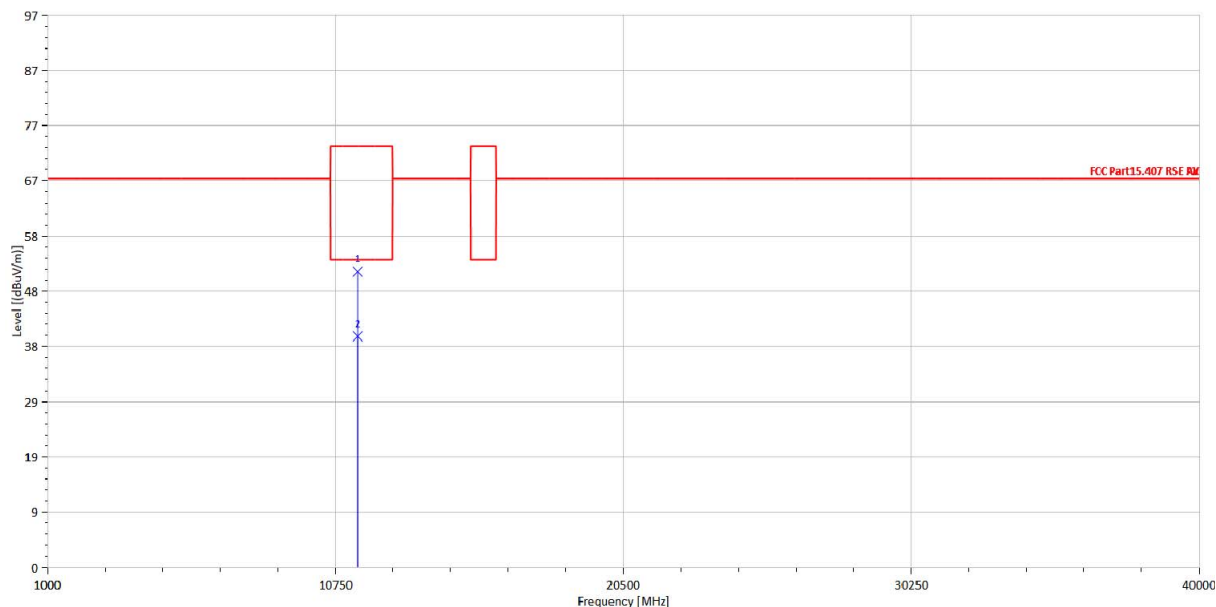
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Operation Mode :	802.11n40	Test Date :	2016/4/7
Fundamental Frequency :	5755 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH Low	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizontal



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
11510.00	H	Peak	32.03	19.90	51.93	74	-22.07
11510.00	H	Average	20.69	19.90	40.59	54	-13.41

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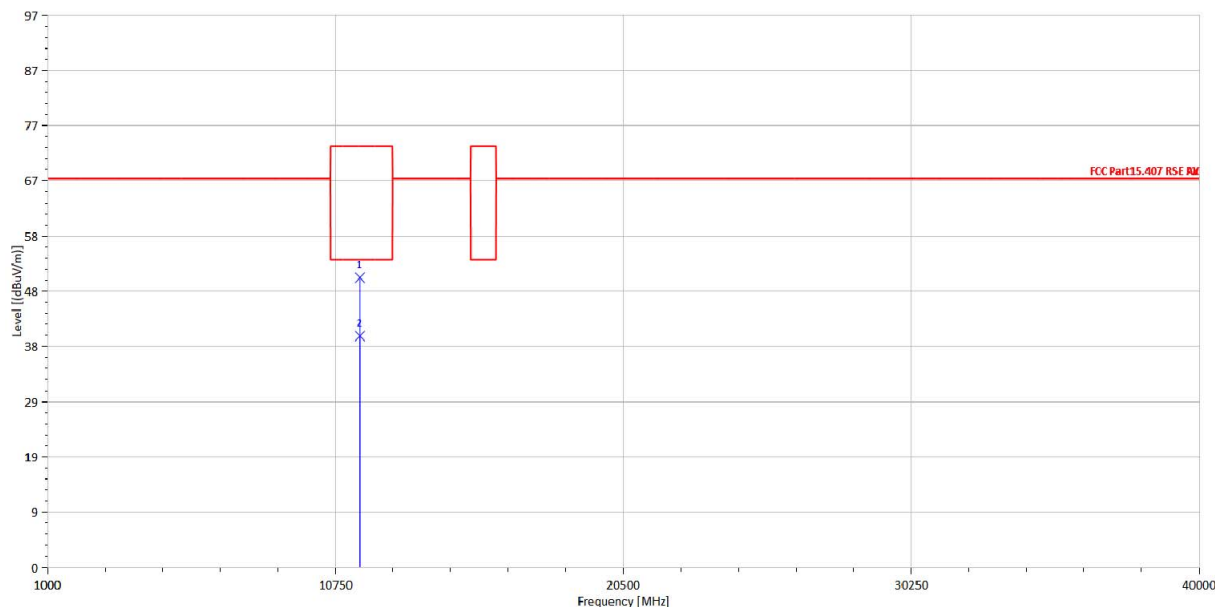
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Operation Mode :	802.11n40	Test Date :	2016/4/7
Fundamental Frequency :	5795 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	Tx CH High	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol. :	Vertical



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
11590.00	H	Peak	31.04	19.85	50.89	74	-23.11
11590.00	H	Average	20.78	19.85	40.63	54	-13.37

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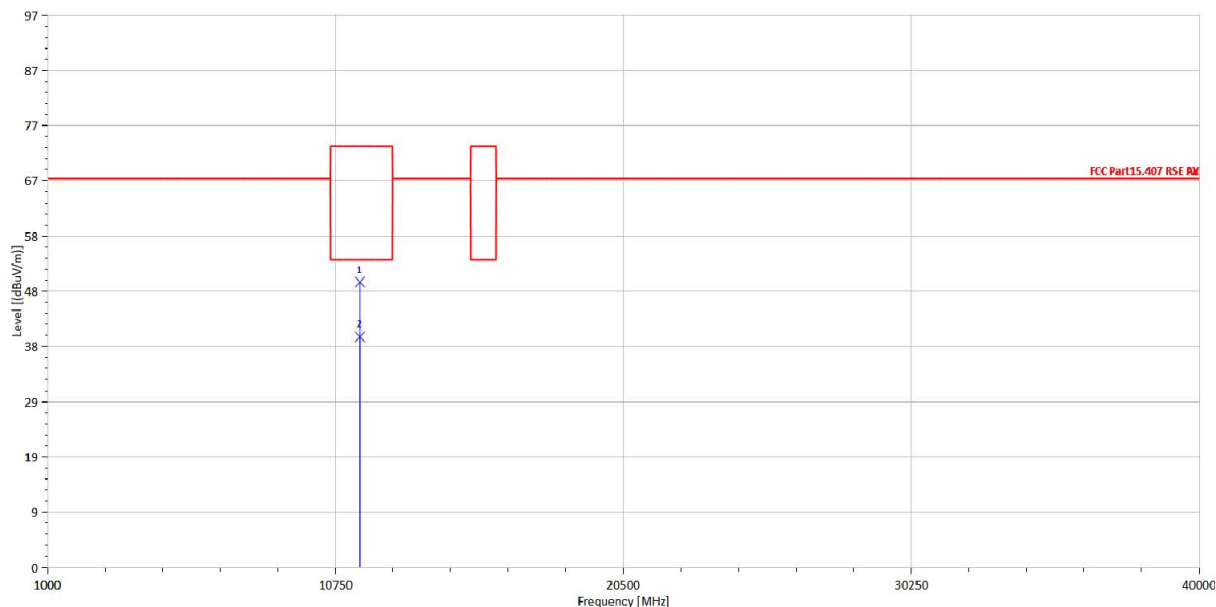
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Operation Mode : 802.11n40 Test Date : 2016/4/7
Fundamental Frequency : 5795 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : Tx CH High Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
11590.00	H	Peak	30.27	19.85	50.12	74	-23.88
11590.00	H	Average	20.64	19.85	40.49	54	-13.51

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Band edge falling to restricted band (2TX MODE)

802.11a 5725~5850 MHz

Operation Mode : 802.11a Test Date : 2016/4/7
 Fundamental Frequency : 5745 MHz Temp. / Humi. : 22.7deg_C/57RH
 Operation Band : BE CH Low Test Engineer : Ashton
 EUT Pol. : E2 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	dBμV	dB	dBμV/m	dBμV/m	dB
5713.90	S	Peak	51.10	11.97	63.07	68.3	-5.23
5724.80	S	Peak	54.73	12.01	66.74	78.2	-11.46
5725.00	E	Peak	52.38	12.01	64.39	78.2	-13.81

Operation Mode : 802.11a Test Date : 2016/4/7
 Fundamental Frequency : 5745 MHz Temp. / Humi. : 22.7deg_C/57RH
 Operation Band : BE CH Low Test Engineer : Ashton
 EUT Pol. : E2 Measurement Antenna Pol. : Horizontal

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5714.10	S	Peak	55.82	11.97	67.79	68.3	-0.51
5723.70	S	Peak	62.34	12.01	74.35	78.2	-3.85
5725.00	E	Peak	60.37	12.01	72.38	78.2	-5.82

Operation Mode : 802.11a Test Date : 2016/4/7
 Fundamental Frequency : 5825 MHz Temp. / Humi. : 22.7deg_C/57RH
 Operation Band : BE CH High Test Engineer : Ashton
 EUT Pol. : E2 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	dBμV	dB	dBμV/m	dBμV/m	dB
5850.00	E	Peak	55.13	12.15	67.27	78.2	-10.93
5860.20	S	Peak	51.89	12.33	64.22	68.3	-4.08

Operation Mode : 802.11a Test Date : 2016/4/7
 Fundamental Frequency : 5825 MHz Temp. / Humi. : 22.7deg_C/57RH
 Operation Band : BE CH High Test Engineer : Ashton
 EUT Pol. : E2 Measurement Antenna Pol. : Horizontal

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5850.00	E	Peak	57.55	12.15	69.70	78.2	-8.50
5850.50	S	Peak	57.78	12.16	69.94	78.2	-8.26
5860.50	S	Peak	54.09	12.34	66.42	68.3	-1.88

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802.11n_HT20, 5725~5850 MHz

Operation Mode :	802.11n20	Test Date :	2016/4/7
Fundamental Frequency :	5745 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	BE CH Low	Test Engineer :	Ashton
EUT Pol. :	E2	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	dBμV	dB	dBμV/m	dBμV/m	dB
5714.10	S	Peak	50.25	11.97	62.22	68.3	-6.08
5724.60	S	Peak	56.63	12.01	68.64	78.2	-9.56
5725.00	E	Peak	54.89	12.01	66.90	78.2	-11.30

Operation Mode :	802.11n20	Test Date :	2016/4/7
Fundamental Frequency :	5745 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	BE CH Low	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizontal

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5714.90	S	Peak	55.44	11.97	67.42	68.3	-0.88
5724.90	S	Peak	60.37	12.01	72.38	78.2	-5.82
5725.00	E	Peak	59.03	12.01	71.04	78.2	-7.16

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Operation Mode : 802.11n20 Test Date : 2016/4/7
 Fundamental Frequency : 5825 MHz Temp. / Humi. : 22.7deg_C/57RH
 Operation Band : BE CH High Test Engineer : Ashton
 EUT Pol. : E2 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	dBμV	dB	dBμV/m	dBμV/m	dB
5850.00	E	Peak	53.89	12.15	66.04	78.2	-12.16
5850.30	S	Peak	55.08	12.15	67.23	78.2	-10.97
5860.70	S	Peak	51.09	12.34	63.44	68.3	-4.86

Operation Mode : 802.11n20 Test Date : 2016/4/7
 Fundamental Frequency : 5825 MHz Temp. / Humi. : 22.7deg_C/57RH
 Operation Band : BE CH High Test Engineer : Ashton
 EUT Pol. : E2 Measurement Antenna Pol. : Horizontal

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5850.00	E	Peak	57.60	12.15	69.75	78.2	-8.45
5850.80	S	Peak	57.60	12.16	69.76	78.2	-8.44
5862.00	S	Peak	53.49	12.37	65.85	68.3	-2.45

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802.11n_HT40, 5725~5850 MHz

Operation Mode : 802.11n40 Test Date : 2016/4/7
Fundamental Frequency : 5755 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : BE CH Low Test Engineer : Ashton
EUT Pol. : E2 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	dBμV	dB	dBμV/m	dBμV/m	dB
5713.20	S	Peak	50.61	11.97	62.58	68.3	-5.72
5722.00	S	Peak	54.60	12.00	66.60	78.2	-11.60
5725.00	E	Peak	53.09	12.01	65.10	78.2	-13.10

Operation Mode : 802.11n40 Test Date : 2016/4/7
Fundamental Frequency : 5755 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : BE CH Low Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5714.80	S	Peak	55.78	11.97	67.76	68.3	-0.54
5721.40	S	Peak	60.87	12.00	72.87	78.2	-5.33
5725.00	E	Peak	60.46	12.01	72.47	78.2	-5.73

Operation Mode : 802.11n40 Test Date : 2016/4/7
Fundamental Frequency : 5795 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : BE CH High Test Engineer : Ashton
EUT Pol. : E2 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	dBμV	dB	dBμV/m	dBμV/m	dB
5850.00	E	Peak	45.63	12.15	57.78	78.2	-20.42
5850.70	S	Peak	46.56	12.16	58.72	78.2	-19.48
5860.50	S	Peak	44.80	12.34	57.13	68.3	-11.17

Operation Mode : 802.11n40 Test Date : 2016/4/7
Fundamental Frequency : 5795 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : BE CH High Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5850.00	E	Peak	50.79	12.15	62.94	78.2	-15.26
5850.50	S	Peak	51.73	12.16	63.89	78.2	-14.31
5860.20	S	Peak	49.70	12.33	62.03	68.3	-6.27

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Band edge falling to restricted band (MIMO MODE)

802.11n_HT20, 5725~5850 MHz

Operation Mode : 802.11n20 Test Date : 2016/4/7
Fundamental Frequency : 5745 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : BE CH Low Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Vertical

Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
5712.30	S	Peak	50.13	11.97	62.10	68.3	-6.20
5725.00	E	Peak	53.09	12.01	65.10	78.2	-13.10

Operation Mode : 802.11n20 Test Date : 2016/4/7
Fundamental Frequency : 5745 MHz Temp. / Humi. : 22.7deg_C/57RH
Operation Band : BE CH Low Test Engineer : Ashton
EUT Pol. : E2 Measurement Antenna Pol. : Horizontal

Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
5714.70	S	Peak	53.86	11.97	65.84	68.3	-2.46
5725.00	E	Peak	58.80	12.01	70.81	78.2	-7.39

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Operation Mode : 802.11n20 Test Date : 2016/4/7
 Fundamental Frequency : 5825 MHz Temp. / Humi. : 22.7deg_C/57RH
 Operation Band : BE CH High Test Engineer : Ashton
 EUT Pol. : E2 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	dBμV	dB	dBμV/m	dBμV/m	dB
5850.00	E	Peak	52.41	12.15	64.56	78.2	-13.64
5850.80	S	Peak	52.50	12.16	64.66	78.2	-13.54
5860.60	S	Peak	50.22	12.34	62.55	68.3	-5.75

Operation Mode : 802.11n20 Test Date : 2016/4/7
 Fundamental Frequency : 5825 MHz Temp. / Humi. : 22.7deg_C/57RH
 Operation Band : BE CH High Test Engineer : Ashton
 EUT Pol. : E2 Measurement Antenna Pol. : Horizontal

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5850.00	E	Peak	56.07	12.15	68.22	78.2	-9.98
5860.20	S	Peak	53.13	12.33	65.46	68.3	-2.84

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802.11n_HT40, 5725~5850 MHz

Operation Mode :	802.11n40	Test Date :	2016/4/7
Fundamental Frequency :	5755 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	BE CH Low	Test Engineer :	Ashton
EUT Pol. :	E2	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	dBμV	dB	dBμV/m	dBμV/m	dB
5714.40	S	Peak	51.37	11.97	63.34	68.3	-4.96
5723.60	S	Peak	55.07	12.01	67.08	78.2	-11.12
5725.00	E	Peak	53.32	12.01	65.33	78.2	-12.87

Operation Mode :	802.11n40	Test Date :	2016/4/7
Fundamental Frequency :	5755 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	BE CH Low	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizontal

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5714.40	S	Peak	55.81	11.97	67.78	68.3	-0.52
5723.50	S	Peak	61.16	12.01	73.17	78.2	-5.03
5725.00	E	Peak	59.25	12.01	71.26	78.2	-6.94

Operation Mode :	802.11n40	Test Date :	2016/4/7
Fundamental Frequency :	5795 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	BE CH High	Test Engineer :	Ashton
EUT Pol. :	E2	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	dBμV	dB	dBμV/m	dBμV/m	dB
5850.00	E	Peak	45.54	12.15	57.69	78.2	-20.51
5851.90	S	Peak	47.43	12.18	59.61	78.2	-18.59
5863.50	S	Peak	44.87	12.36	57.23	68.3	-11.07

Operation Mode :	802.11n40	Test Date :	2016/4/7
Fundamental Frequency :	5795 MHz	Temp. / Humi. :	22.7deg_C/57RH
Operation Band :	BE CH High	Test Engineer :	Ashton
EUT Pol. :	E2	Measurement Antenna Pol. :	Horizontal

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5850.00	E	Peak	49.35	12.15	61.50	78.2	-16.70
5851.60	S	Peak	50.73	12.18	62.90	78.2	-15.30
5864.40	S	Peak	48.36	12.35	60.71	68.3	-7.59

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

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10 ANTENNA REQUIREMENT

10.1 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.

10.2 Antenna Connected Construction

A PIFA antenna design is used.

The antenna is designed with unique type connector and has 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.

~ End of Report ~

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