

# FCC TEST REPORT

## FCC ID: 2AKWGM51-DGWW-L

Product : Mobile DVR

Model Name : M51-DGWW-L, M10H, M12H

Brand :  思拓系统  
CITOPS

Report No. : PTCDQ04161250201E-FC01

### Prepared for

Shenzhen Citops System Co., Ltd.  
1105-1113, Block C, QingHu Science Park, QingXiang Road, QingHu Community, Longhua  
new district, Shenzhen, China

### Prepared by

Dongguan Precise Testing & Certification Corp., Ltd.  
Building D, Baoding Technology Park, Guangming Road 2, Guangming Community,  
Dongcheng District, Dongguan, Guangdong, China

## 1 TEST RESULT CERTIFICATION

Applicant's name : Shenzhen Citops System Co., Ltd.

Address : 1105-1113, Block C, QingHu Science Park, QingXiang Road, QingHu Community, Longhua new district, Shenzhen, China

Manufacture's name : Shenzhen Citops System Co., Ltd.

Address : 1105-1113, Block C, QingHu Science Park, QingXiang Road, QingHu Community, Longhua new district, Shenzhen, China

Product name : Mobile DVR

Model name : M51-DGWW-L, M10H, M12H

Standards : FCC CFR47 Part 15 Section 15.247

Test procedure : ANSI C63.10:2013

Test Date : Dec.29. 2016 ~ July 06, 2017

Date of Issue : July 07, 2017

Test Result : Pass

This device described above has been tested by PTC, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

This report shall not be reproduced except in full, without the written approval of PTC, this document may be altered or revised by PTC, personal only, and shall be noted in the revision of the document.

Testing Engineer

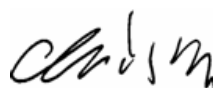
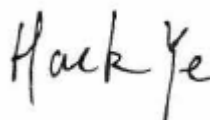
August Qiu

Technical Manager

Hack Ye

Authorized Signatory

Chris Du



## Contents

	Page
<b>1 TEST RESULT CERTIFICATION .....</b>	<b>2</b>
<b>2 TEST SUMMARY .....</b>	<b>5</b>
<b>3 GENERAL INFORMATION .....</b>	<b>6</b>
3.1 GENERAL DESCRIPTION OF E.U.T. ....	6
3.2 CHANNEL LIST .....	7
3.3 TEST MODE .....	7
3.4 TEST SITE .....	7
<b>4 EQUIPMENT DURING TEST .....</b>	<b>8</b>
4.1 EQUIPMENTS LIST .....	8
4.2 MEASUREMENT UNCERTAINTY .....	9
<b>5 CONDUCTED EMISSION .....</b>	<b>10</b>
5.1 E.U.T. OPERATION .....	10
5.2 EUT SETUP .....	11
5.3 MEASUREMENT DESCRIPTION .....	11
5.4 CONDUCTED EMISSION TEST RESULT .....	11
<b>6 RADIATED SPURIOUS EMISSIONS .....</b>	<b>12</b>
6.1 EUT OPERATION .....	12
6.2 TEST SETUP .....	13
6.3 SPECTRUM ANALYZER SETUP .....	14
6.4 TEST PROCEDURE .....	15
6.5 SUMMARY OF TEST RESULTS .....	16
<b>7 CONDUCTED SPURIOUS EMISSION .....</b>	<b>20</b>
7.1 TEST PROCEDURE .....	20
7.2 TEST RESULT .....	20
<b>8 CONDUCTED BAND EDGE MEASUREMENT .....</b>	<b>27</b>
8.1 TEST PROCEDURE .....	27
8.2 TEST RESULT .....	28
<b>9 6DB BANDWIDTH MEASUREMENT .....</b>	<b>32</b>
9.1 TEST PROCEDURE .....	32
9.2 TEST RESULT .....	32
<b>10 MAXIMUM PEAK OUTPUT POWER .....</b>	<b>39</b>
10.1 TEST PROCEDURE .....	39

10.2	TEST RESULT .....	39
<b>11</b>	<b>POWER SPECTRAL DENSITY .....</b>	<b>40</b>
11.1	TEST PROCEDURE .....	40
11.2	TEST RESULT .....	40
<b>12</b>	<b>ANTENNA REQUIREMENT .....</b>	<b>47</b>
<b>13</b>	<b>TEST SETUP .....</b>	<b>48</b>

## 2 Test Summary

Test Items	Test Requirement	Result
Conduct Emission	15.207	N/A
Radiated Spurious Emissions	15.205(a) 15.209 15.247(d)	PASS
Conducted Spurious Emission	15.247(d)	PASS
Band edge	15.247(d) 15.205(a)	PASS
6dB Bandwidth	15.247(a)(2)	PASS
Maximum Peak Output Power	15.247(b)(1)	PASS
Power Spectral Density	15.247(e)	PASS
Antenna Requirement	15.203	PASS
Remark: N/A: Not Applicable		

### 3 General Information

#### 3.1 General Description of E.U.T.

Product Name	:	Mobile DVR
Model Name	:	M51-DGWW-L, M10H, M12H
Model Description	:	Only different in model name and appearance
Operating frequency	:	802.11b/g/n 20: 2412~2462 MHz, 11channels 802.11n 40: 2422~2452MHz, 7channels
Antenna installation	:	Dipole Antenna
Antenna Gain	:	3dBi
Type of Modulation	:	CCK/BPSK/QPSK/16QAM
Power supply	:	DC12V 2A charging by AC car
Hardware Version	:	M013.03
Software Version	:	V010159
cable length	:	3meter

### 3.2 Channel List

Channel List for 802.11b/g/n(20MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	04	2427	07	2442	10	2457
02	2417	05	2432	08	2447	11	2462
03	2422	06	2437	09	2452		

Channel List for 802.11n(40MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
03	2422	06	2437	09	2452		
04	2427	07	2442				
05	2432	08	2447				

### 3.3 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

Modulation	Test mode	Low channel	Middle channel	High channel
802.11b/g/n-HT20	Transmitting	2412MHz	2437MHz	2462MHz
802.11n-HT40	Transmitting	2422MHz	2437MHz	2452MHz
Tests Carried Out Under FCC part 15.207				
Test Item		Test Mode		
Conduction Emission 0.15MHz to 30MHz		WIFI Communication		

### 3.4 Test Site

Dongguan Precise Testing & Certification Corp., Ltd.

Building D,Baoding Technology Park,Guangming Road2, Dongcheng District, Dongguan,  
Guangdong, China, Dongguan, 523129  
China

FCC Registration Number: 371540

IC Registration Number: 12191A-1

## 4 Equipment During Test

### 4.1 Equipments List

RF Conducted Test							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	EMC Analyzer (9k~26.5GHz)	Agilent	E4407B	MY45109572	Aug.04, 2017	Aug.03, 2018	1 year
2	EXA Signal Analyzer	Keysight	N9010A	MY50520207 526B25MPB W7X	Aug.04, 2017	Aug.03, 2018	1 year
3	EMI Test Receiver	R&S	ESCI	101155	Aug.04, 2017	Aug.03, 2018	1 year
4	Humidity Chamber	GF	GTH-225-40-1P	IAA061225	Aug.04, 2017	Aug.03, 2018	1 year
5	USB RF power sensor	DARE	RPR3006W	15100041SN 001	Aug.04, 2017	Aug.03, 2018	1 year
Radiated Emissions							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	EMI Test Receiver	Rohde&Schwarz	ESCI	101417	Aug.04, 2017	Aug.03, 2018	1 year
2	Trilog Broadband Antenna	SCHWARZB ECK	VULB9160	9160-3355	Aug.04, 2017	Aug.03, 2018	1 year
3	Amplifier	EM	EM-30180	060538	Aug.04, 2017	Aug.03, 2018	1 year
4	Horn Antenna	SCHWARZB ECK	BBHA9120 D	1246	Aug.04, 2017	Aug.03, 2018	1 year
5	Horn Antenna	SCHWARZB ECK	BBHA9170 D	1412	Aug.04, 2017	Aug.03, 2018	1 year
6	Coaxial Cable(below 1GHz)	LARGE	CALB1	-	Aug.04, 2017	Aug.03, 2018	1 year
7	Coaxial Cable(above 1GHz)	LARGE	CALB2	-	Aug.04, 2017	Aug.03, 2018	1 year
Conducted Emissions							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	EMI Test Receiver	R&S	ESCI	101155	Aug.04, 2017	Aug.03, 2018	1 year
2	LISN	SCHWARZB ECK	NSLK 8128	8128-289	Aug.04, 2017	Aug.03, 2018	1 year
3	Cable	LARGE	RF300	-	Aug.04, 2017	Aug.03, 2018	1 year



## 4.2 Measurement Uncertainty

Parameter	Uncertainty
RF output power, conducted	±1.0dB
Power Spectral Density, conducted	±2.2dB
Radio Frequency	± 1 x 10 <sup>-6</sup>
Bandwidth	± 1.5 x 10 <sup>-6</sup>
Time	±2%
Duty Cycle	±2%
Temperature	±1 °C
Humidity	±5%
DC and low frequency voltages	±3%
Conducted Emissions(150kHz~30MHz)	±3.64dB
Radiated Emission(30MHz~1GHz)	±5.03dB
Radiated Emission(1GHz~25GHz)	±4.74dB

## 5 Conducted Emission

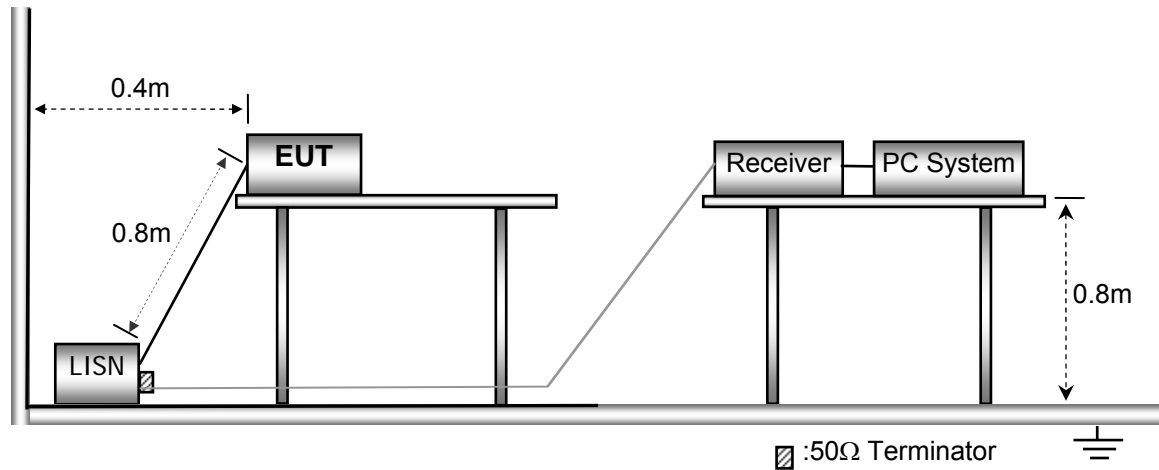
Test Requirement:	:	FCC CFR 47 Part 15 Section 15.207
Test Method:	:	ANSI C63.10:2013
Test Result:	:	PASS
Frequency Range:	:	150kHz to 30MHz
Class/Severity:	:	Class B
Limit:	:	66-56 dB $\mu$ V between 0.15MHz & 0.5MHz
	:	56 dB $\mu$ V between 0.5MHz & 5MHz
	:	60 dB $\mu$ V between 5MHz & 30MHz
Detector:	:	Peak for pre-scan(9kHz Resolution Bandwidth)

### 5.1 E.U.T. Operation

Operating Environment:	
Temperature:	: 25.5 °C
Humidity:	: 51 % RH
Atmospheric Pressure:	: 101.2kPa
EUT Operation:	: Refer to section 3.3
Test Voltage	: DC 12V

## 5.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10:2013.



## 5.3 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

## 5.4 Conducted Emission Test Result

Without adapter, Not apply

## 6 Radiated Spurious Emissions

Test Requirement: : FCC CFR47 Part 15 Section 15.209 & 15.247  
 Test Method: : ANSI C63.10:2013  
 Test Result: : PASS  
 Measurement Distance: : 3m  
 Limit: : See the follow table

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	$2400/F(\text{kHz})$	300	$10000 * 2400/F(\text{kHz})$	$20\log^{(2400/F(\text{kHz}))} + 80$
0.490 ~ 1.705	$24000/F(\text{kHz})$	30	$100 * 24000/F(\text{kHz})$	$20\log^{(24000/F(\text{kHz}))} + 40$
1.705 ~ 30	30	30	$100 * 30$	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

### 6.1 EUT Operation

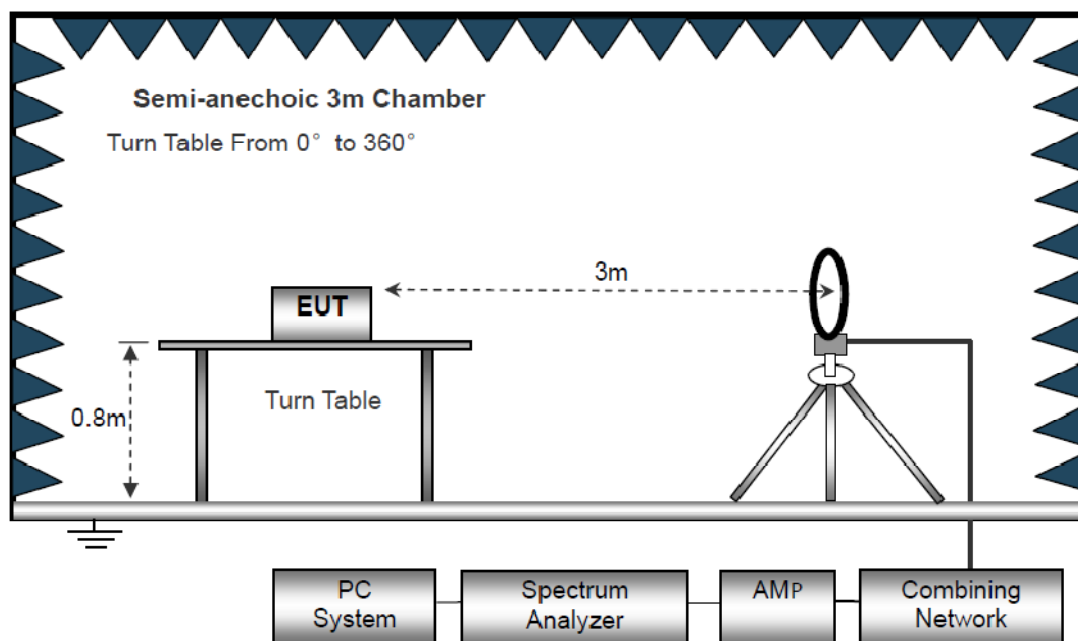
Operating Environment :

Temperature: : 23.5 °C  
 Humidity: : 51.1 % RH  
 Atmospheric Pressure: : 101.2kPa  
 EUT Operation : : Refer to section 3.3

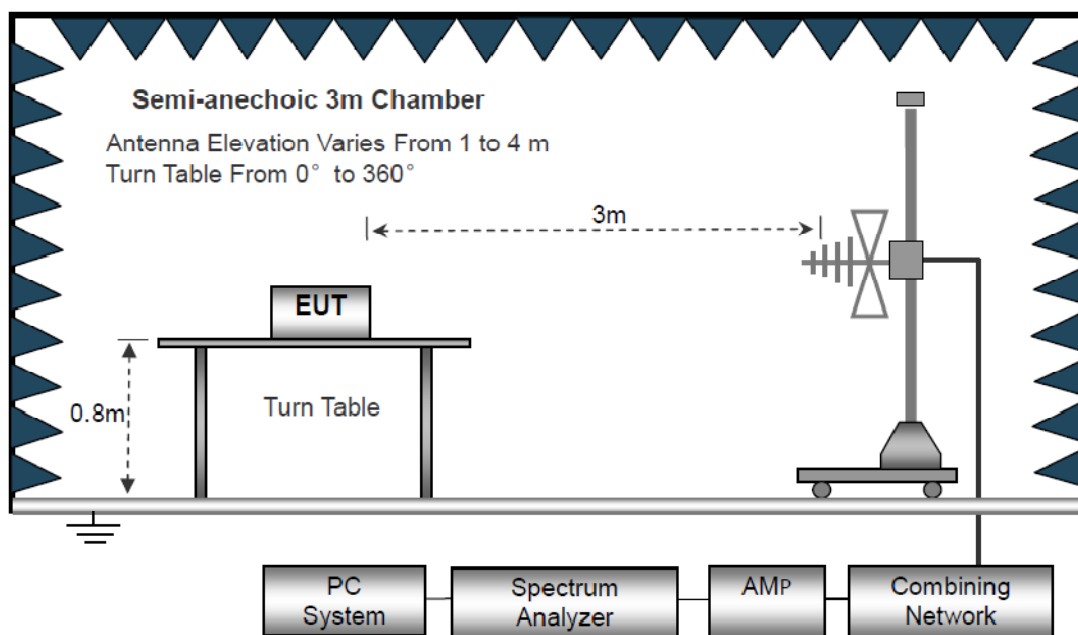
## 6.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber testsite

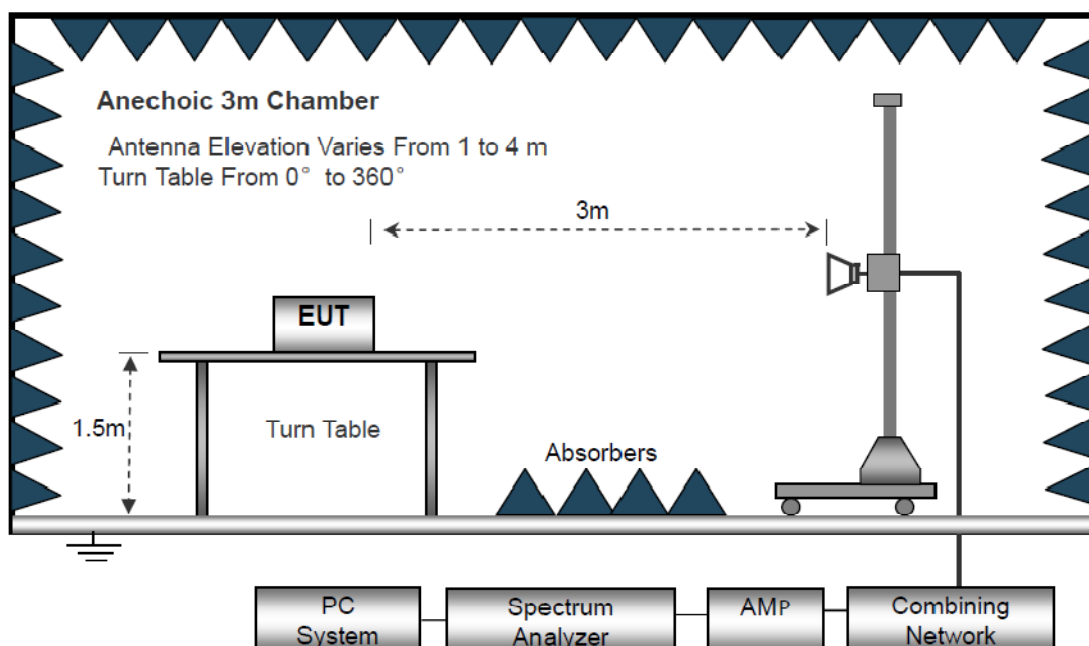
The test setup for emission measurement below 30MHz



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz



### 6.3 Spectrum Analyzer Setup

Below 30MHz

IF Bandwidth	10kHz
Resolution Bandwidth	10kHz
Video Bandwidth	10kHz

30MHz ~ 1GHz

Detector	: PK
Resolution Bandwidth	: 100kHz
Video Bandwidth	: 300kHz
Detector	: QP
Resolution Bandwidth	: 120kHz
Video Bandwidth	: 300kHz

Above 1GHz

Detector	: PK
Resolution Bandwidth	: 1MHz
Video Bandwidth	: 3MHz
Detector	: RMS
Resolution Bandwidth	: 1MHz
Video Bandwidth	: 3MHz

## 6.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane for below 1GHz and 1.5m for above 1GHz.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.
8. The test above 1GHz must be use the fully anechoic room and the test below 1GHz use the half anechoic room

## 6.5 Summary of Test Results

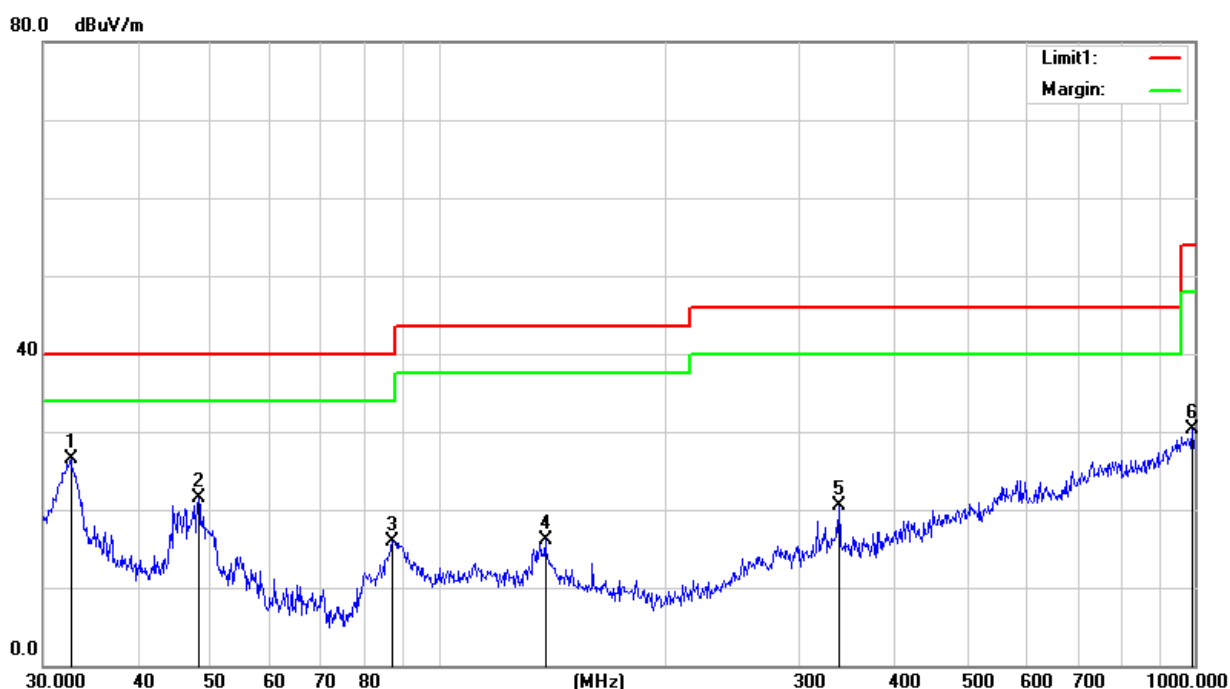
### Test Frequency: Below 30MHz

The measurements were more than 20 dB below the limit and not reported.

### Test Frequency: 30MHz ~ 1GHz

All applicable test modes have been tested and only the worst case (802.11b TX in middle channel) is recorded.

Antenna Polarization: Horizontal

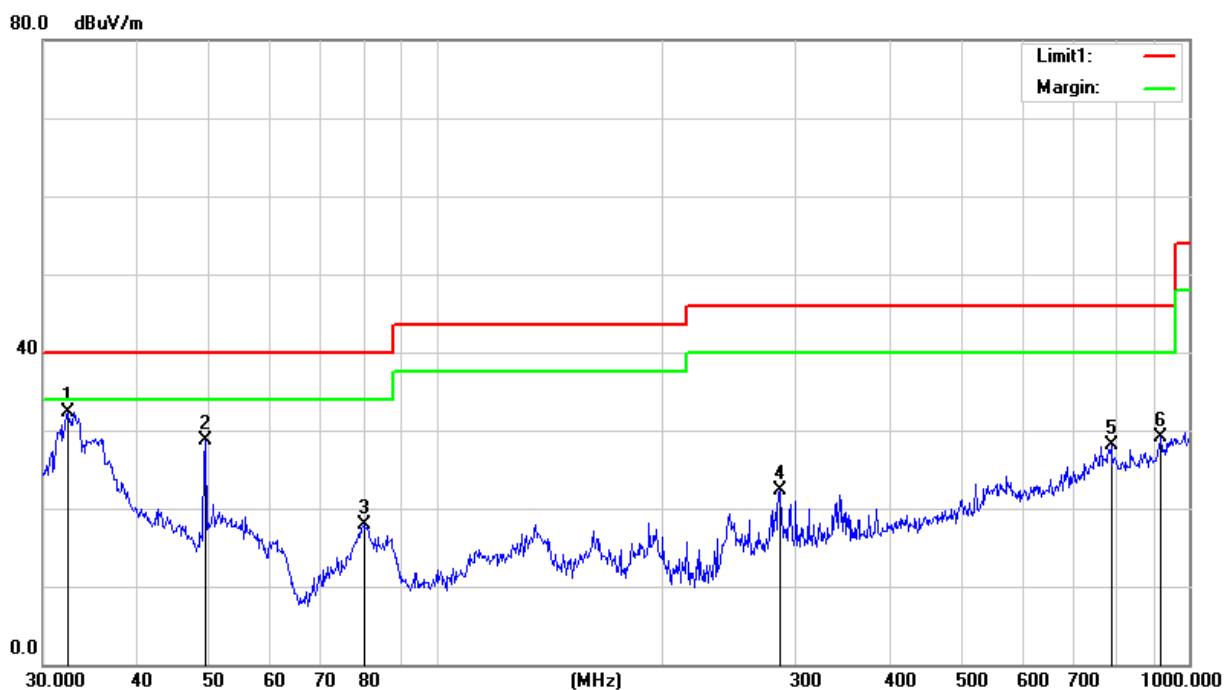


Frequency	Reading	Correct	Result	Limit	Margin	Remark
(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
32.6340	39.05	-12.50	26.55	40.00	-13.45	QP
48.1626	41.92	-20.50	21.42	40.00	-18.58	QP
86.8068	37.01	-21.13	15.88	40.00	-24.12	QP
138.3873	33.74	-17.70	16.04	43.50	-27.46	QP
338.4001	34.93	-14.39	20.54	46.00	-25.46	QP
993.0114	31.16	-0.93	30.23	54.00	-23.77	QP

Remark: Emission Level = Receiver Reading + Cable Loss + ANT Factor - AMP Factor



Antenna Polarization: Vertical



Frequency	Reading	Correct	Result	Limit	Margin	Remark
(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
32.4060	44.69	-12.38	32.31	40.00	-7.69	QP
49.3594	49.78	-21.12	28.66	40.00	-11.34	QP
80.0806	40.66	-22.78	17.88	40.00	-22.12	QP
285.9778	38.23	-15.88	22.35	46.00	-23.65	QP
787.8513	31.97	-3.91	28.06	46.00	-17.94	QP
916.0687	31.55	-2.45	29.10	46.00	-16.90	QP

Remark: Emission Level=Receiver Reading+Cable Loss+ANT Factor-AMP Factor

**Test Frequency: Above 1000MHz~10<sup>th</sup> Harmonics:**

Operation Mode: 802.11b Low Channel Test Date : 2017-06-08

Freq.	Ant. Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Margin(dB)	
(MHz)	H/V	PK	AV	PK	AV	PK	AV
4824	V	66.33	44.35	74	54	-7.67	-9.65
7236	V	65.01	43.15	74	54	-8.99	-10.85
9648	V	64.24	42.09	74	54	-9.76	-11.91
12060	V	63.18	41.85	74	54	-10.82	-12.15
14472	V	62.05	40.33	74	54	-11.95	-13.67
16884	V	61.74	39.65	74	54	-12.26	-14.35
4824	H	64.28	44.15	74	54	-9.72	-9.85
7236	H	63.04	43.26	74	54	-10.96	-10.74
9648	H	62.22	42.05	74	54	-11.78	-11.95
12060	H	61.28	41.25	74	54	-12.72	-12.75
14472	H	60.35	40.92	74	54	-13.65	-13.08
16884	H	59.48	39.55	74	54	-14.52	-14.45

Operation Mode: 802.11b Middle Channel Test Date : 2017-06-08

Freq.	Ant. Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Margin(dB)	
(MHz)	H/V	PK	AV	PK	AV	PK	AV
4874	V	65.33	44.35	74	54	-8.67	-9.65
7311	V	64.15	43.15	74	54	-9.85	-10.85
9748	V	63.51	42.09	74	54	-10.49	-11.91
12185	V	62.01	41.92	74	54	-11.99	-12.08
14622	V	61.35	40.24	74	54	-12.65	-13.76
17059	V	60.29	39.5	74	54	-13.71	-14.5
4874	H	66.26	44.15	74	54	-7.74	-9.85
7311	H	65.03	43.26	74	54	-8.97	-10.74
9748	H	64.18	42.05	74	54	-9.82	-11.95
12185	H	63	41.92	74	54	-11	-12.08
14622	H	62.59	40.28	74	54	-11.41	-13.72
17059	H	61.35	39.75	74	54	-12.65	-14.25

Operation Mode: 802.11b High Channel Test Date : 2017-06-08

Freq.	Ant. Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Margin(dB)	
(MHz)	H/V	PK	AV	PK	AV	PK	AV
4924	V	64.36	46.35	74	54	-9.64	-7.65
7386	V	63.15	45.01	74	54	-10.85	-8.99
9848	V	62.05	44.15	74	54	-11.95	-9.85
12310	V	61.35	43.62	74	54	-12.65	-10.38
14772	V	60.22	42.01	74	54	-13.78	-11.99
17234	V	59.34	41.39	74	54	-14.66	-12.61
4924	H	65.26	45.26	74	54	-8.74	-8.74
7386	H	64.15	44.33	74	54	-9.85	-9.67
9848	H	63.59	43.62	74	54	-10.41	-10.38
12310	H	62.04	42.15	74	54	-11.96	-11.85
14772	H	61.92	41.95	74	54	-12.08	-12.05
17234	H	60.35	40.26	74	54	-13.65	-13.74

Note:

- Remark: 1. Scan with all modulation, the worst case is 802.11b Mode  
2. All other emissions more than 30dB below the limit.

## 7 Conducted Spurious Emission

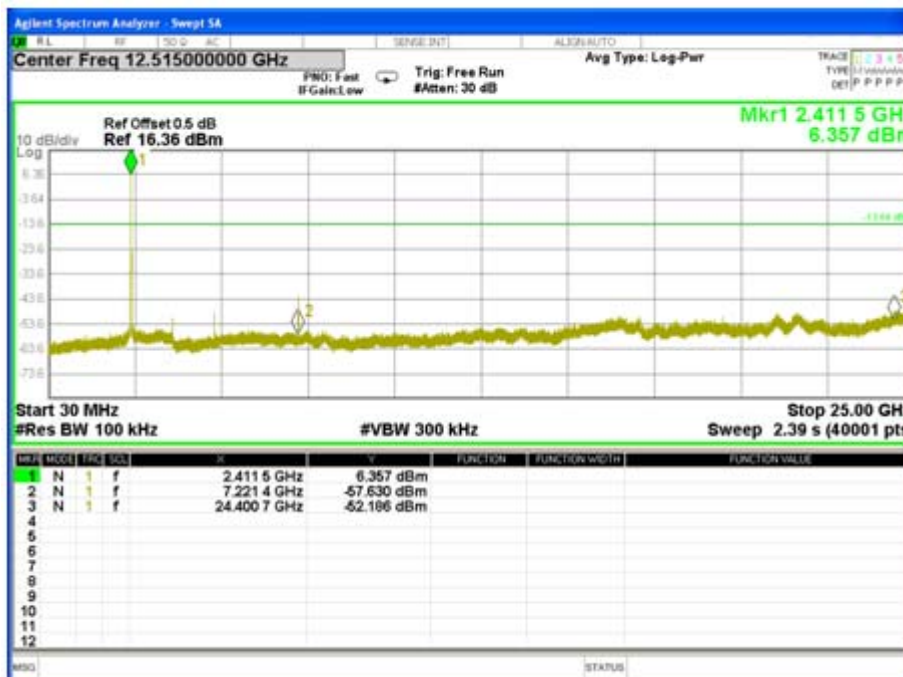
- Test Requirement : FCC CFR47 Part 15 Section 15.247
- Test Method : ANSI C63.10:2013
- Test Limit : Regulation 15.247 (d), In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
- Test Mode : Refer to section 3.3

### 7.1 Test Procedure

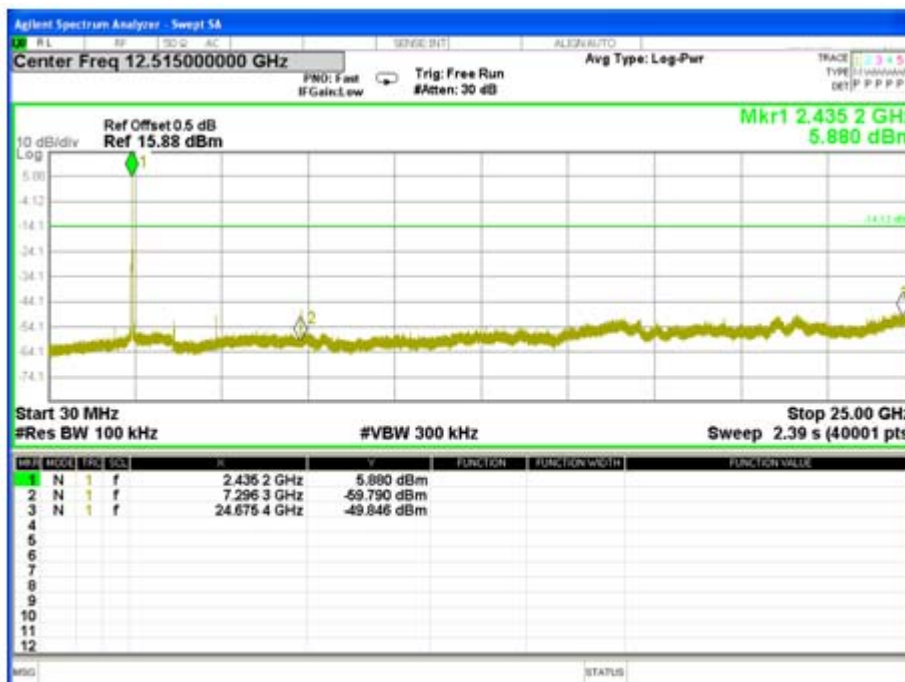
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz, Sweep = auto  
Detector function = peak, Trace = max hold

### 7.2 Test Result

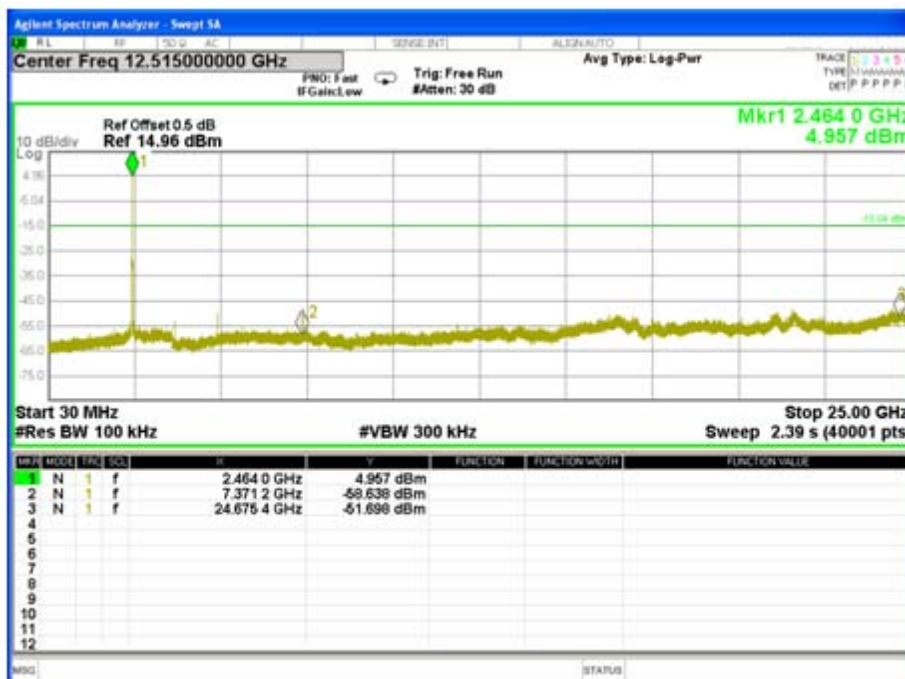
802.11b Low Channel



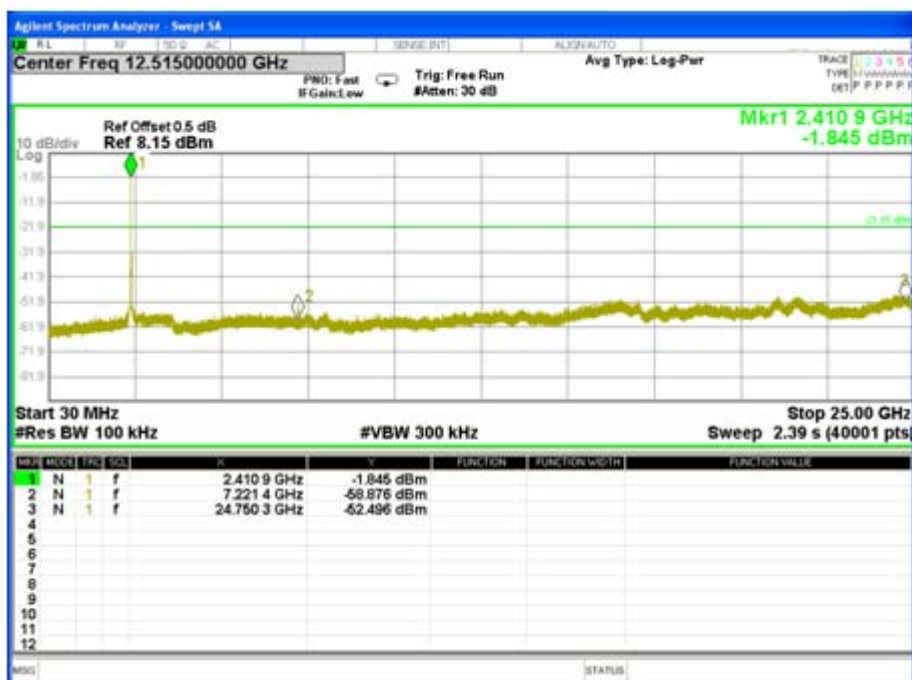
### 802.11b Middle Channel



### 802.11b High Channel



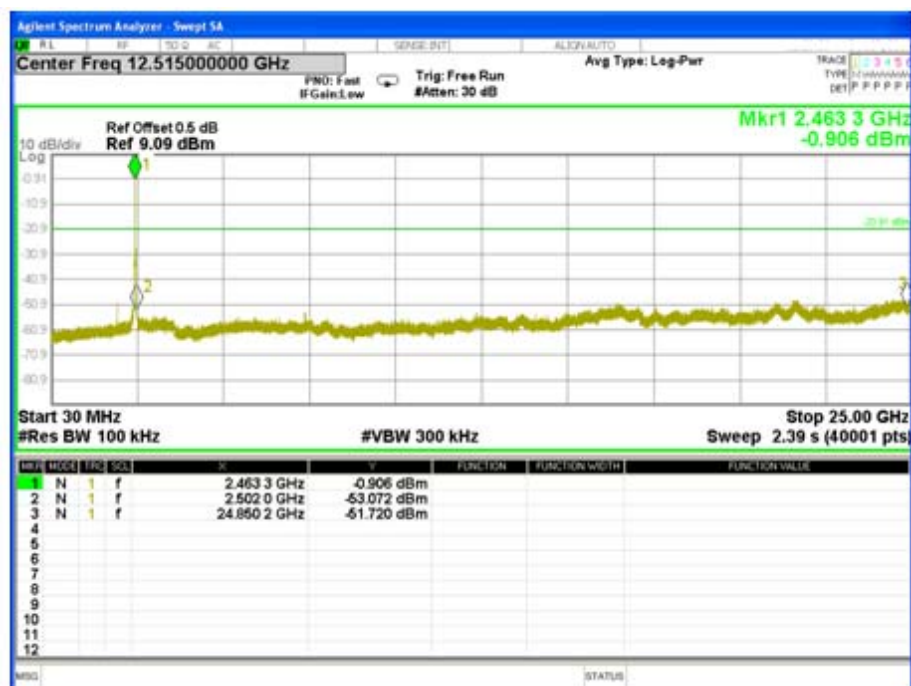
### 802.11g Low Channel



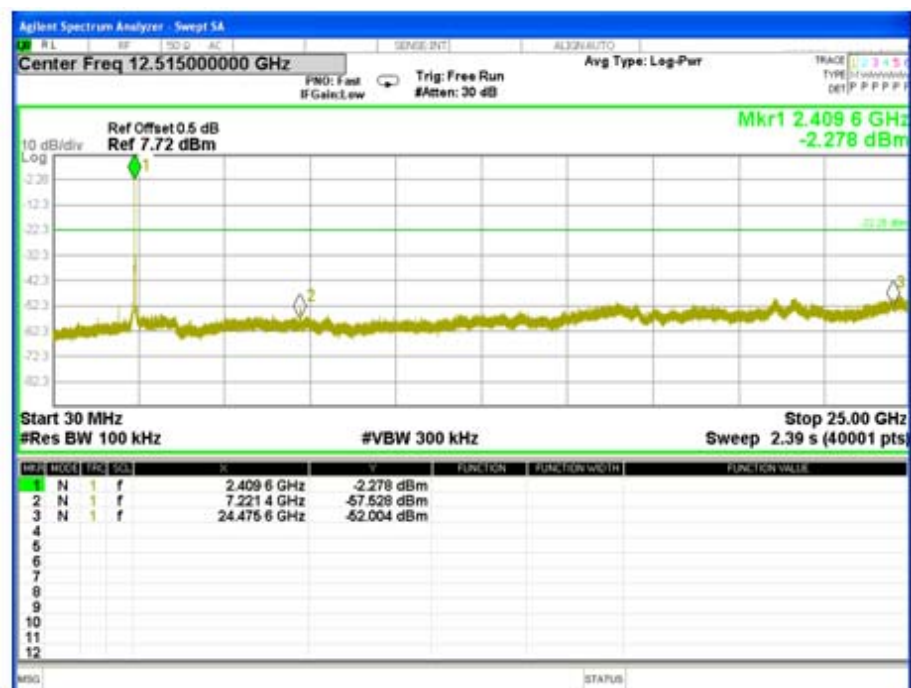
### 802.11g Middle Channel



### 802.11g High Channel

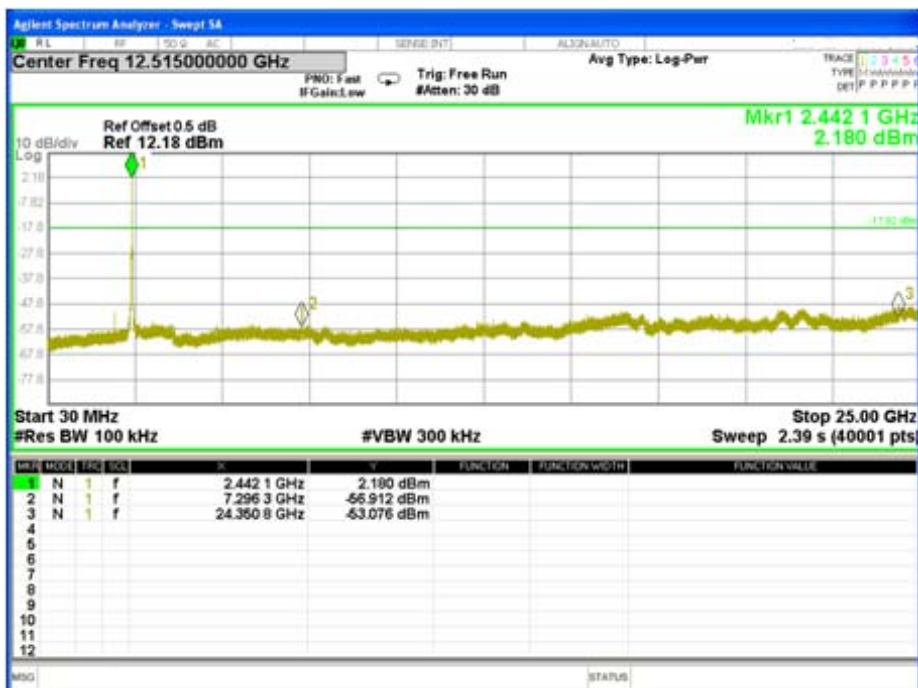


### 802.11 HT20 Low Channel





### 802.11 HT20 Middle Channel



### 802.11 HT20 High Channel





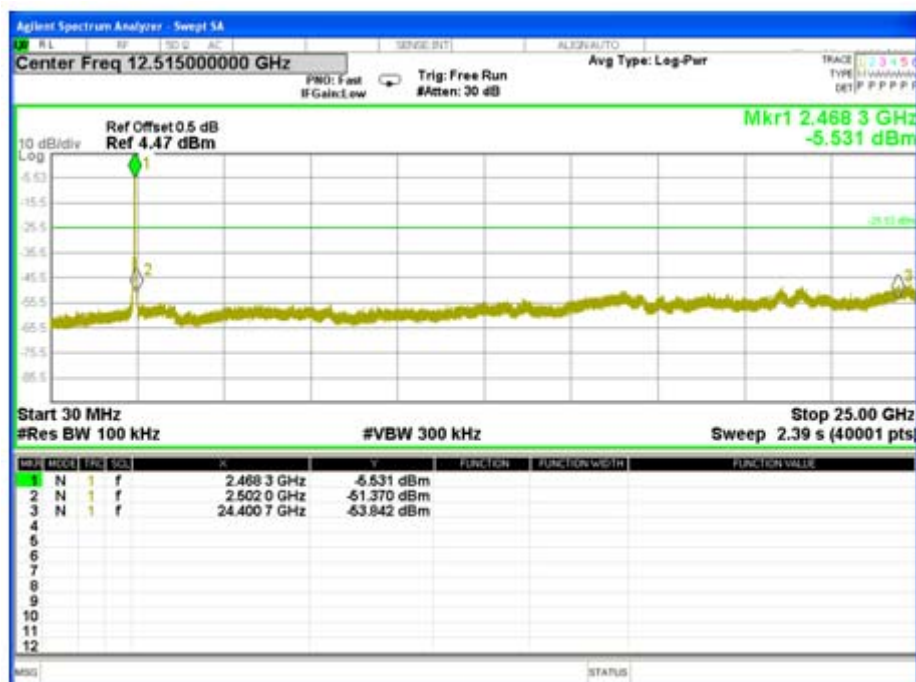
### 802.11HT40 Low Channel



### 802.11HT40 Middle Channel



### 802.11HT40 High Channel



## 8 Conducted Band Edge Measurement

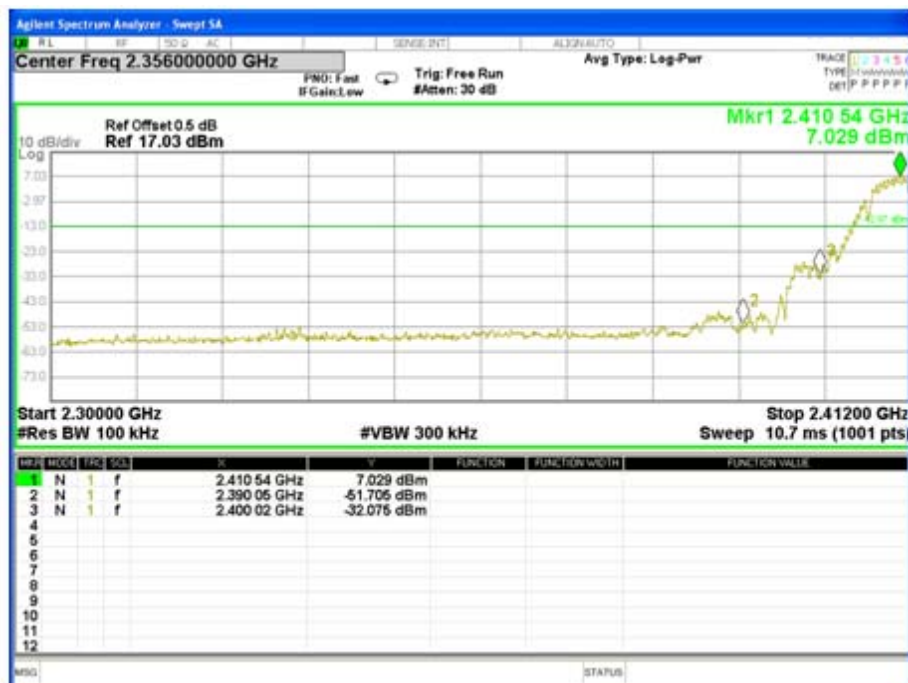
Test Requirement	: Section 15.247(d) In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Test Method	: ANSI C63.10:2013
Test Limit	: Regulation 15.247 (d),In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
Test Mode	: Refer to section 3.3

### 8.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz, Sweep = auto  
Detector function = peak, Trace = max hold

## 8.2 Test Result

802.11b Band edge-left side



802.11b Band edge-right side



802.11g Band edge-left side



802.11g Band edge-right side



802.11 n-HT20 Band edge-left side



802.11 n-HT20 Band edge-right side





802.11n-HT40 Band edge-left side



802.11n-HT40 Band edge-right side



## 9 6dB Bandwidth Measurement

Test Requirement : FCC CFR47 Part 15 Section 15.247

Test Method : ANSI C63.10:2013

Test Limit : Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Test Mode : Refer to section 3.3

### 9.1 Test Procedure

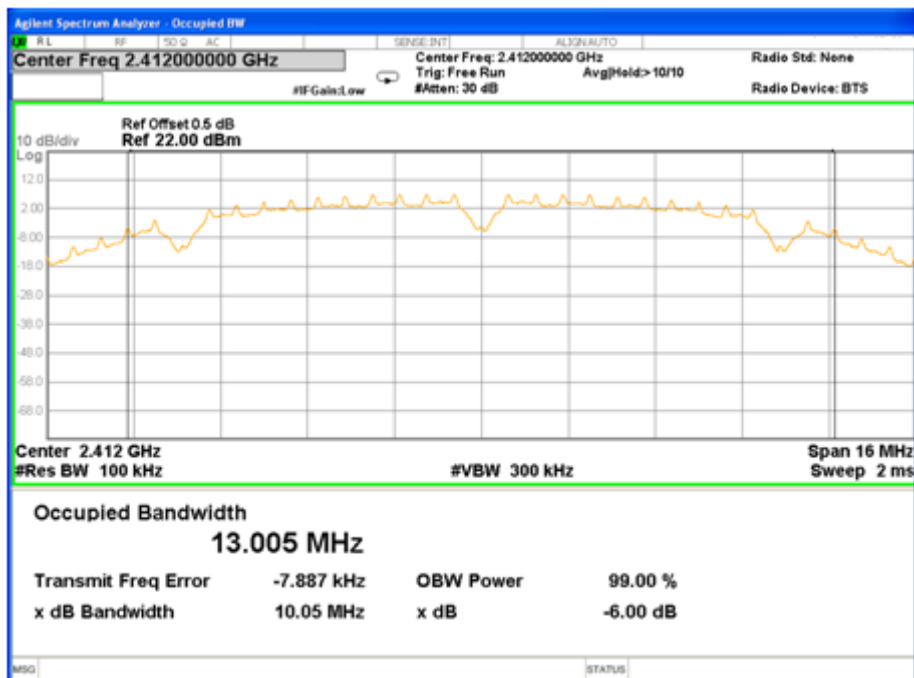
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

### 9.2 Test Result

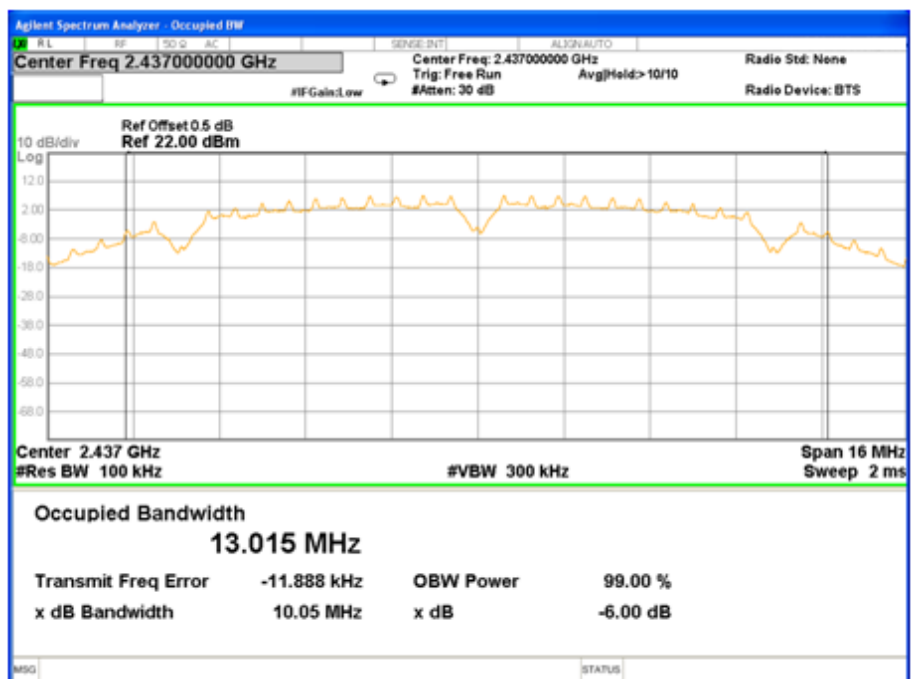
Modulation	Bandwidth(MHz)			Limit
	Low Channel	Middle Channel	High Channel	
802.11b	10.05	10.05	10.05	≥500kHz
802.11g	15.63	15.14	15.45	≥500kHz
802.11n-HT20	15.94	15.96	16.21	≥500kHz
802.11n-HT40	35.35	35.18	35.19	≥500kHz



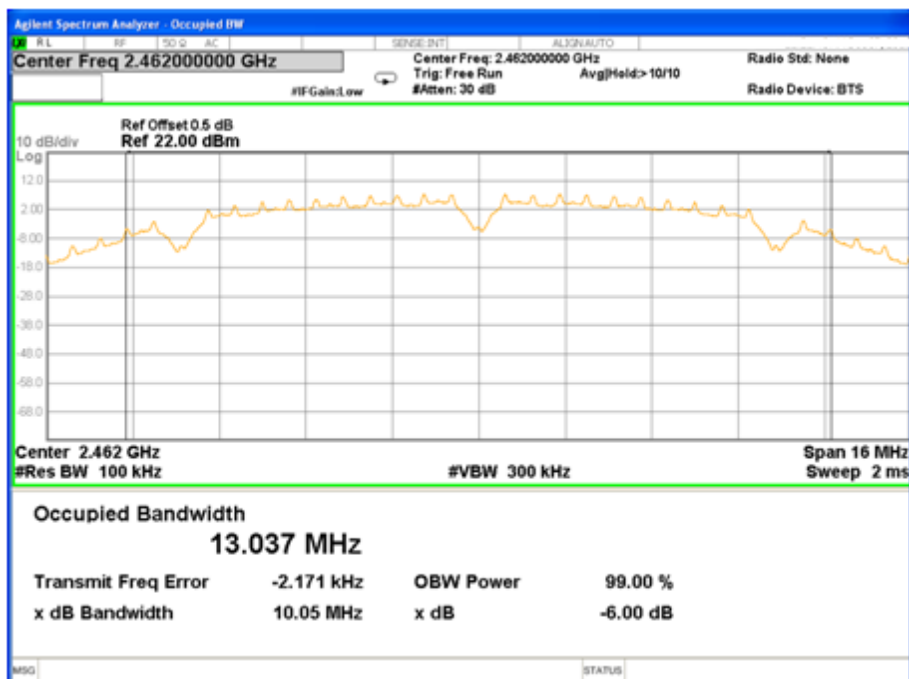
### 802.11b Low Channel



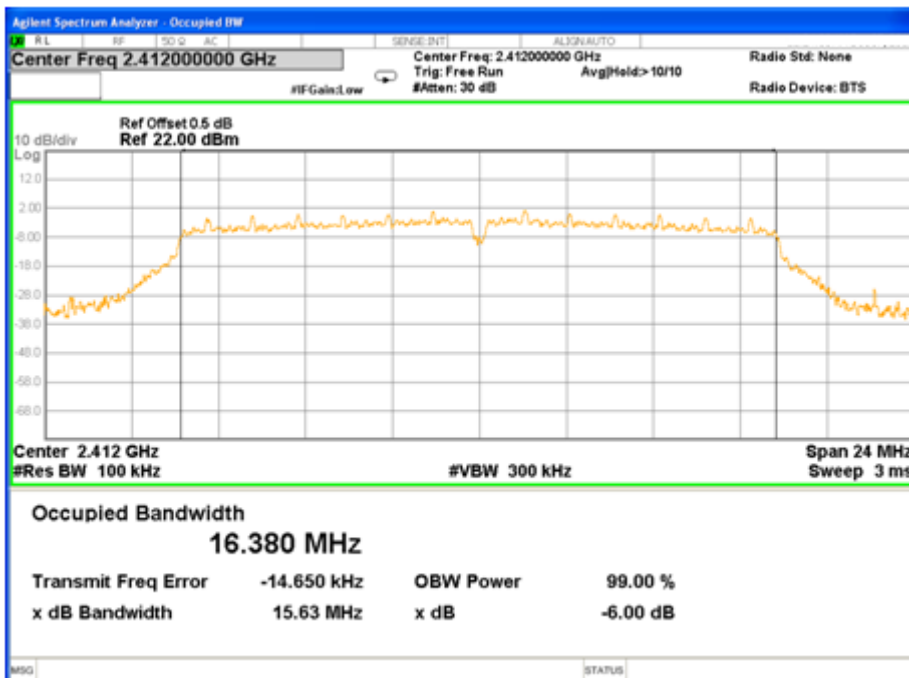
### 802.11b Middle Channel



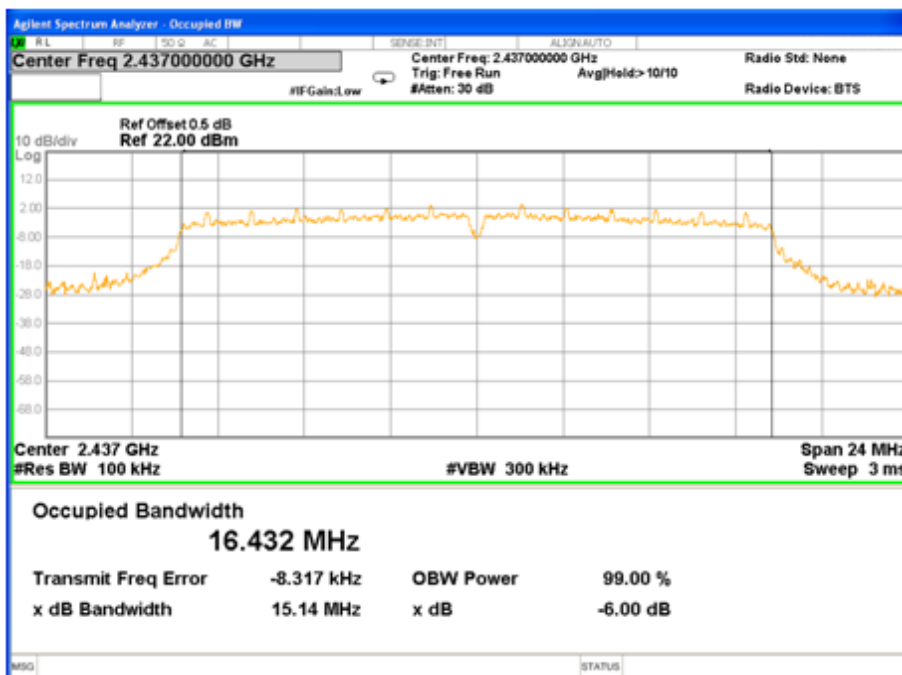
### 802.11b High Channel



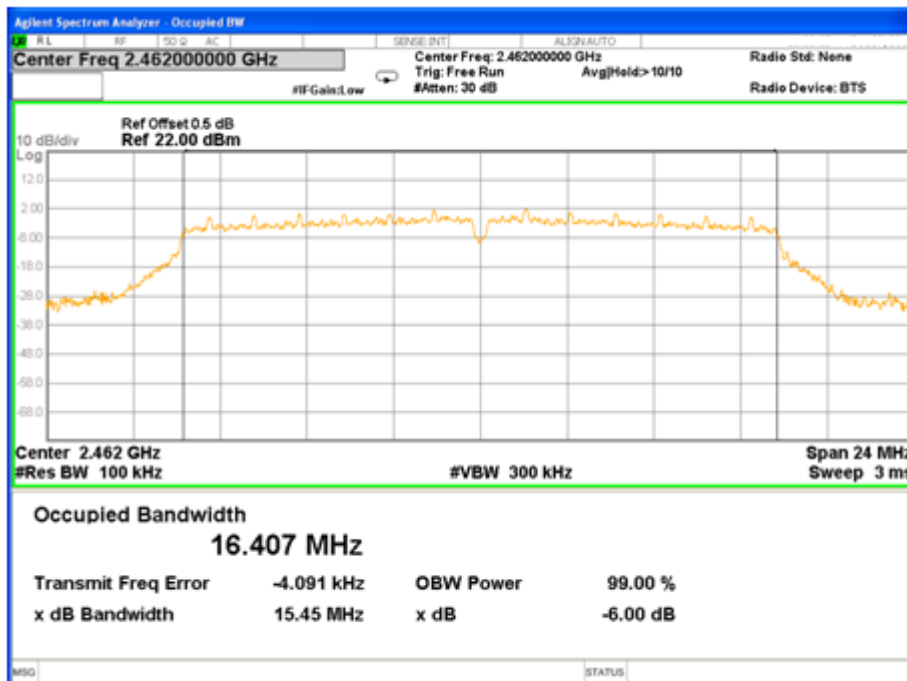
### 802.11g Low Channel



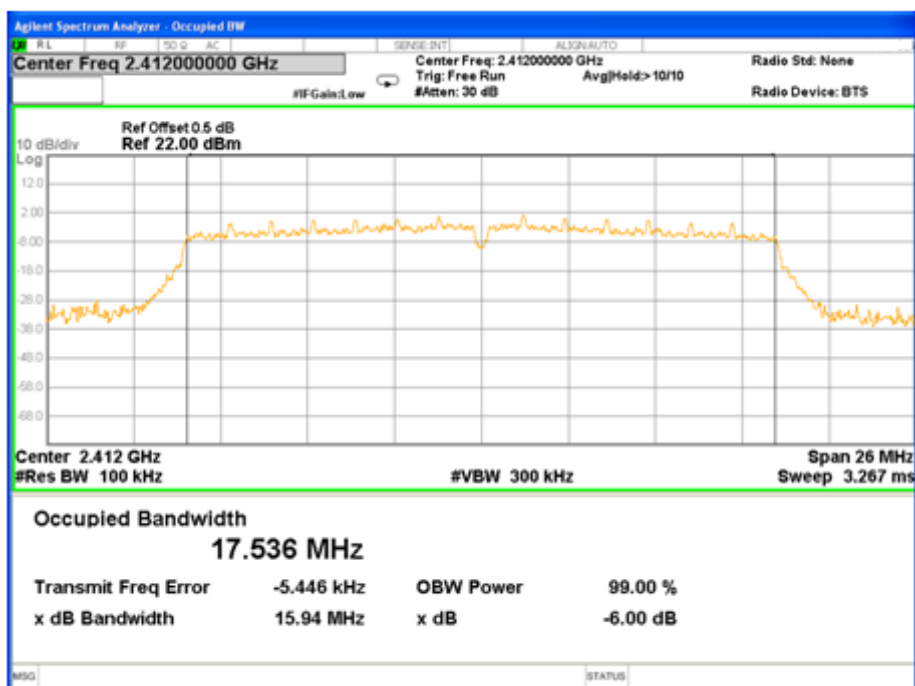
### 802.11g Middle Channel



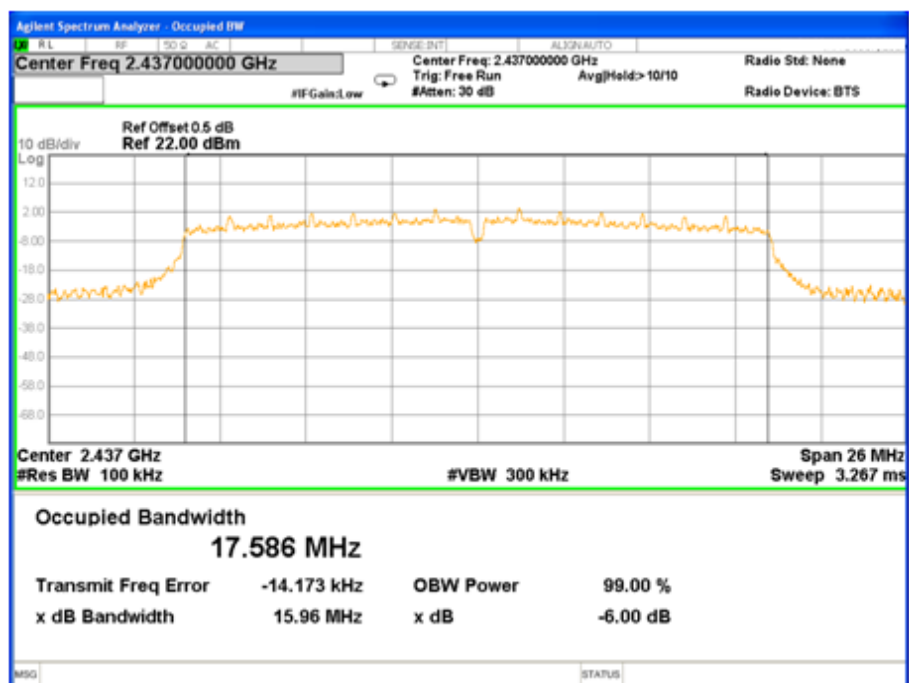
### 802.11g High Channel



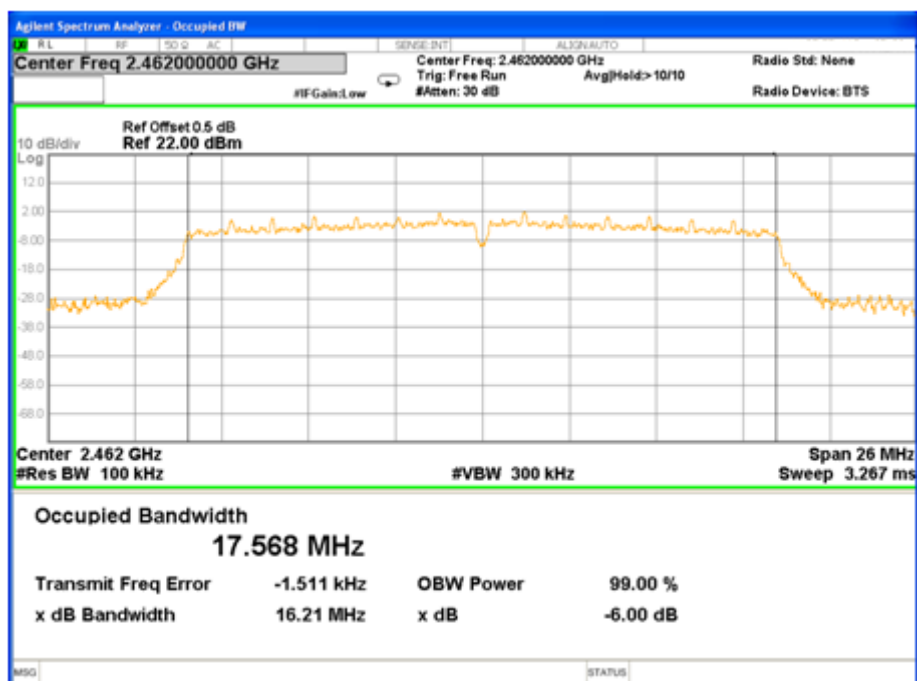
### 802.11n-HT20 Low Channel



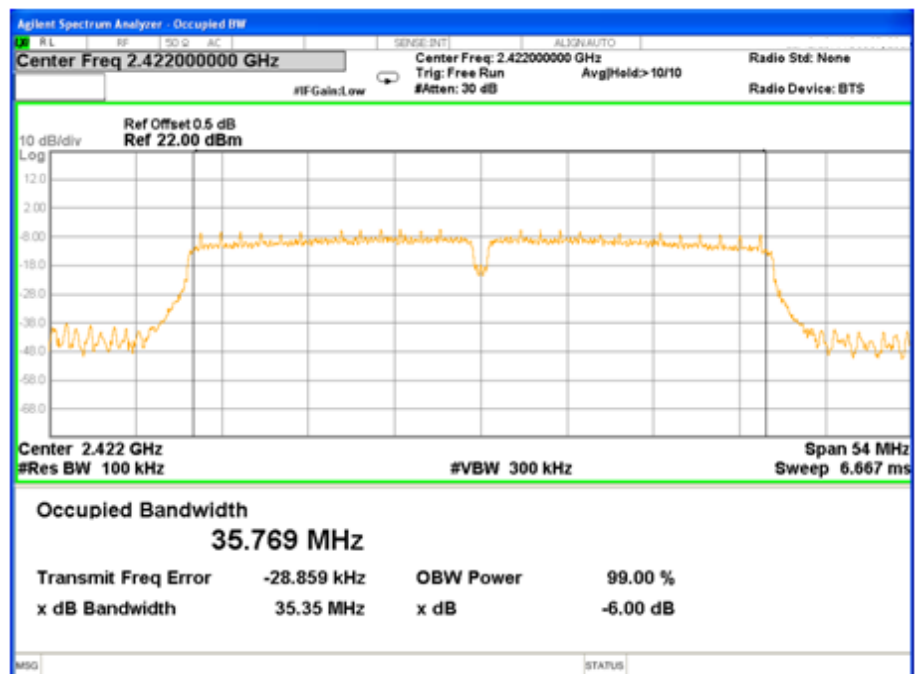
### 802.11n-HT20 Middle Channel



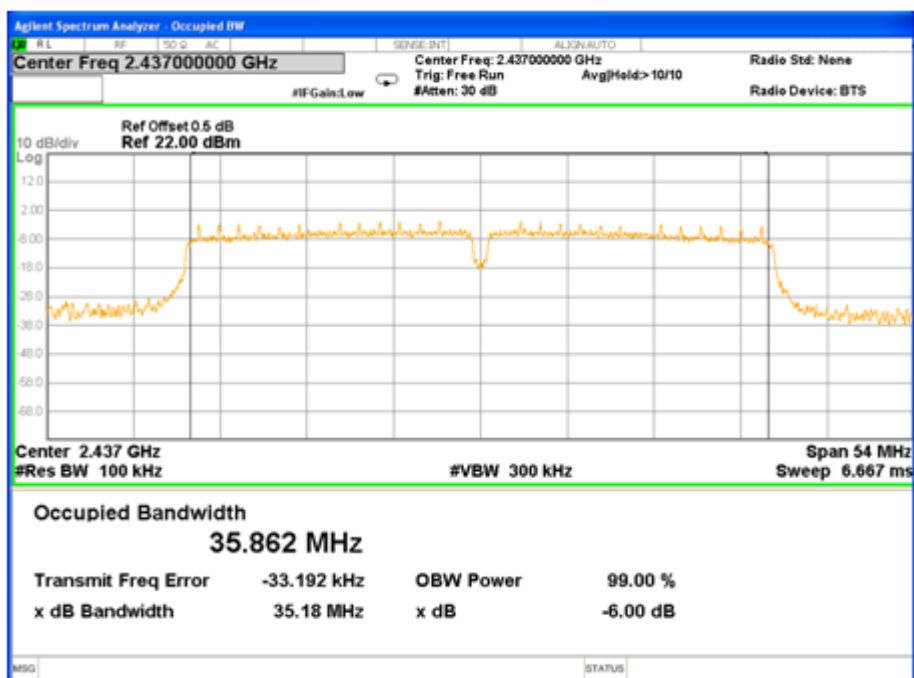
### 802.11n-HT20 High Channel



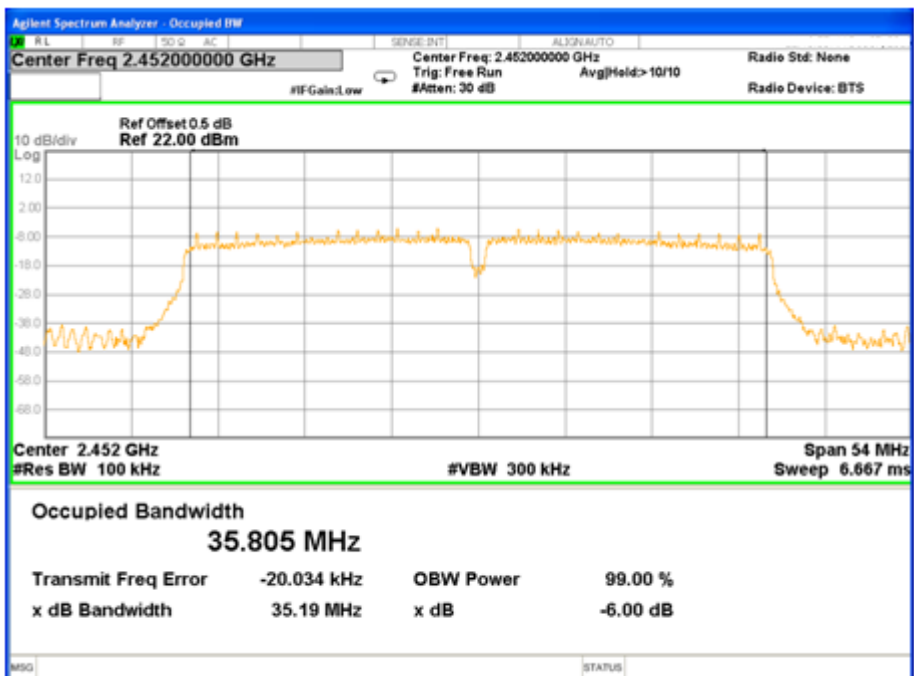
### 802.11n-HT40 Low Channel



### 802.11n-HT40 Middle Channel



### 802.11n-HT40 High Channel



## 10 Maximum Peak Output Power

Test Requirement	: FCC CFR47 Part 15 Section 15.247
Test Method	: ANSI C63.10:2013
Test Limit	: Regulation 15.247 (b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power.
Test Mode	: Refer to section 3.3

### 10.1 Test Procedure

The maximum peak conducted output power measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.



### 10.2 Test Result

Modulation	Maximum Peak Output Power (dBm)			Limit
	Low Channel	Middle Channel	High Channel	
802.11b	9.07	9.11	9.24	1W(30dBm)
802.11g	7.36	8.15	8.09	1W(30dBm)
802.11n-HT20	7.40	7.82	8.05	1W(30dBm)
802.11n-HT40	5.18	5.39	5.50	1W(30dBm)

## 11 Power Spectral density

Test Requirement	: FCC CFR47 Part 15 Section 15.247
Test Method	: ANSI C63.10:2013
Test Limit	: Regulation 15.247(f) The power spectral density conducted from the intentional radiator to the antenna due to the digital modulation operation of the hybrid system, with the frequency hopping operation turned off, shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.
Test Mode	: Refer to section 3.3

### 11.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

2. Set the spectrum analyzer: RBW = 3kHz. VBW = 10kHz, Span = 1.5 times the DTS channel bandwidth (6 dB bandwidth). Sweep = auto; Detector Function = Peak. Trace = Max hold.

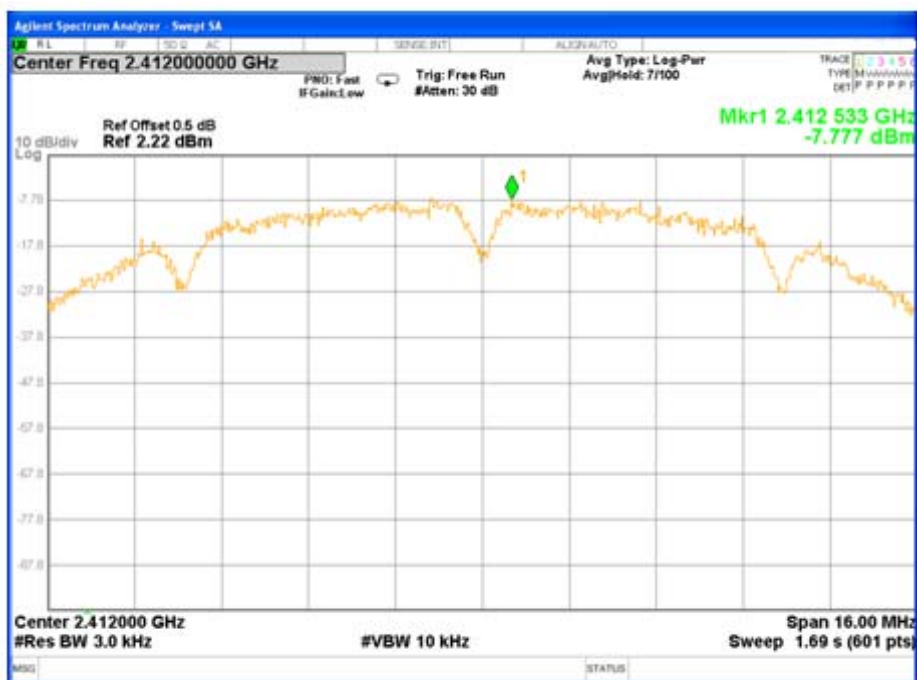
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section. Submit this plot.

### 11.2 Test Result

Modulation	Power Spectral density ( dBm/3kHz )			Limit
	Low Channel	Middle Channel	High Channel	
802.11b	-7.777	-6.131	-7.530	8dBm/3kHz
802.11g	-11.424	-10.351	-11.498	8dBm/3kHz
802.11n-HT20	-10.261	-11.073	-11.443	8dBm/3kHz
802.11n-HT40	-18.595	-14.247	-17.954	8dBm/3kHz



### 802.11b Low Channel



### 802.11b Middle Channel



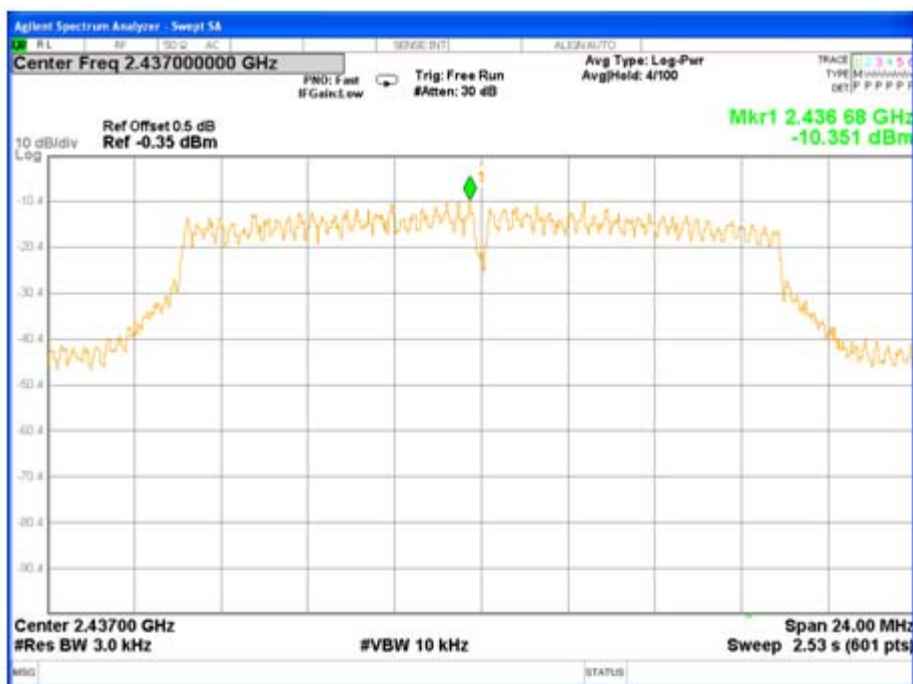
### 802.11b High Channel



### 802.11g Low Channel



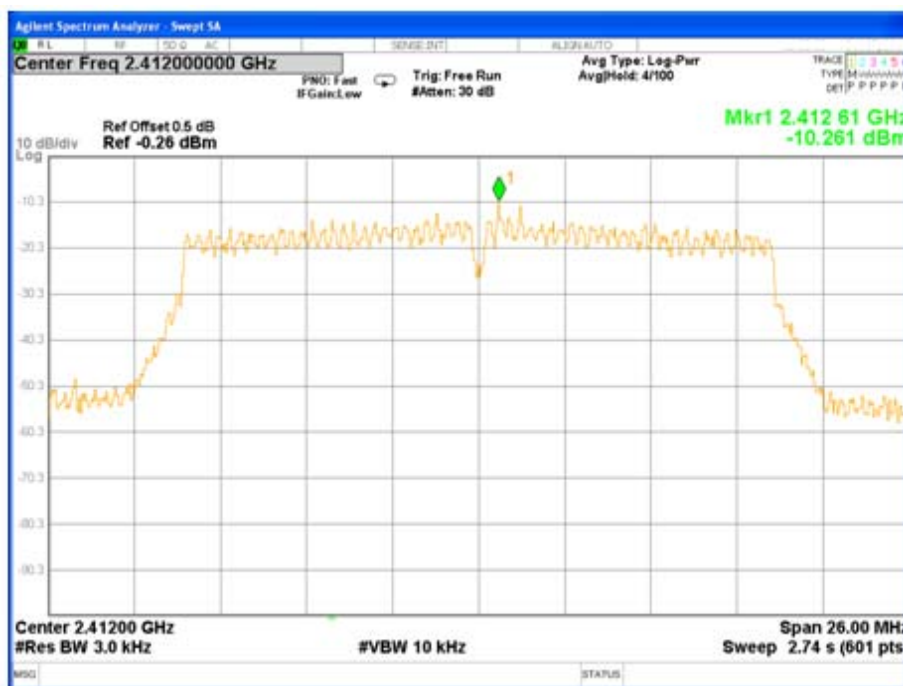
### 802.11g Middle Channel



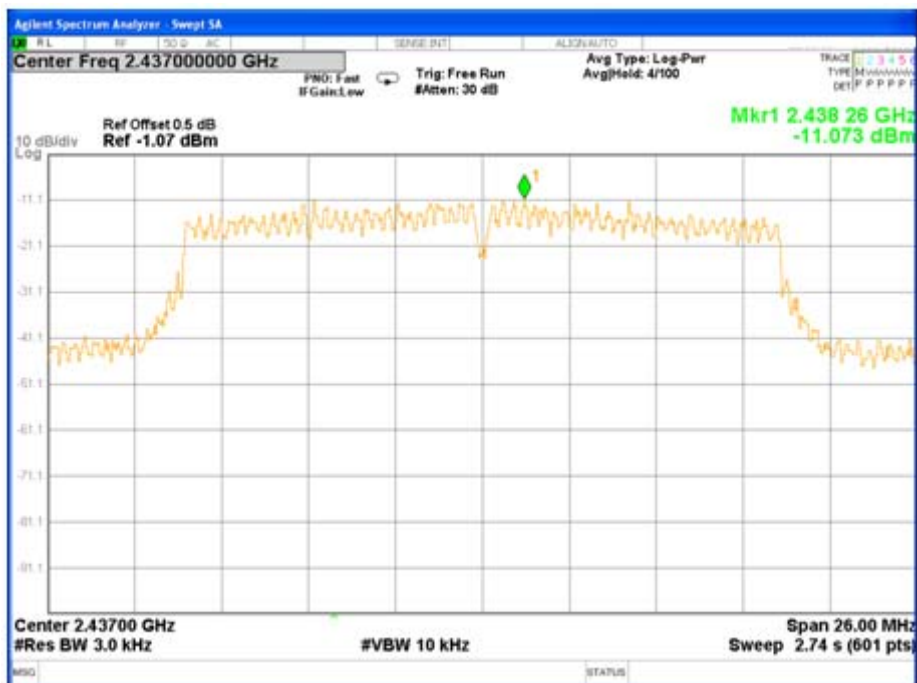
### 802.11g High Channel



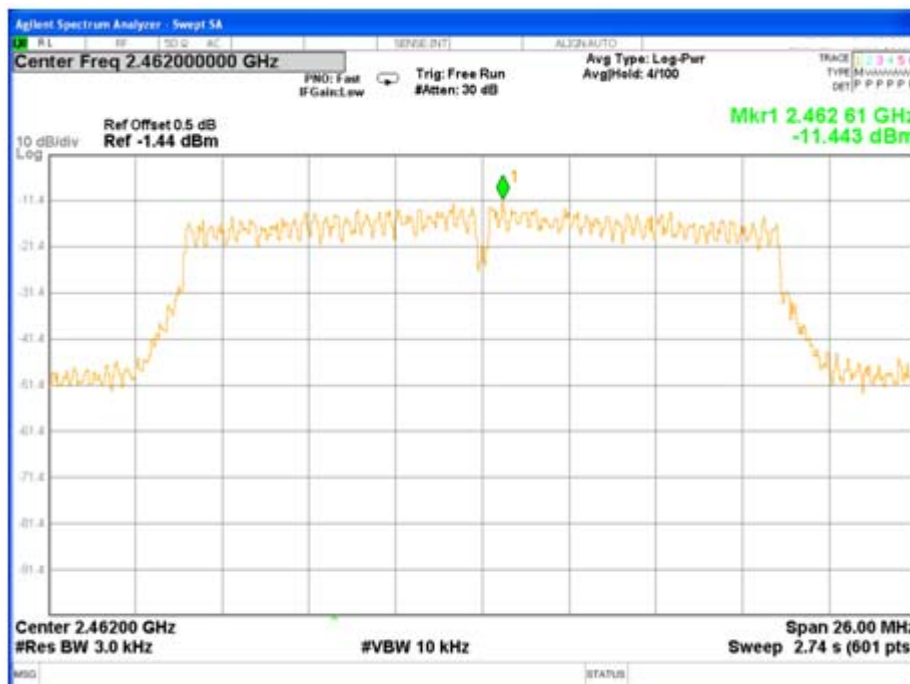
### 802.11n-HT20 Low Channel



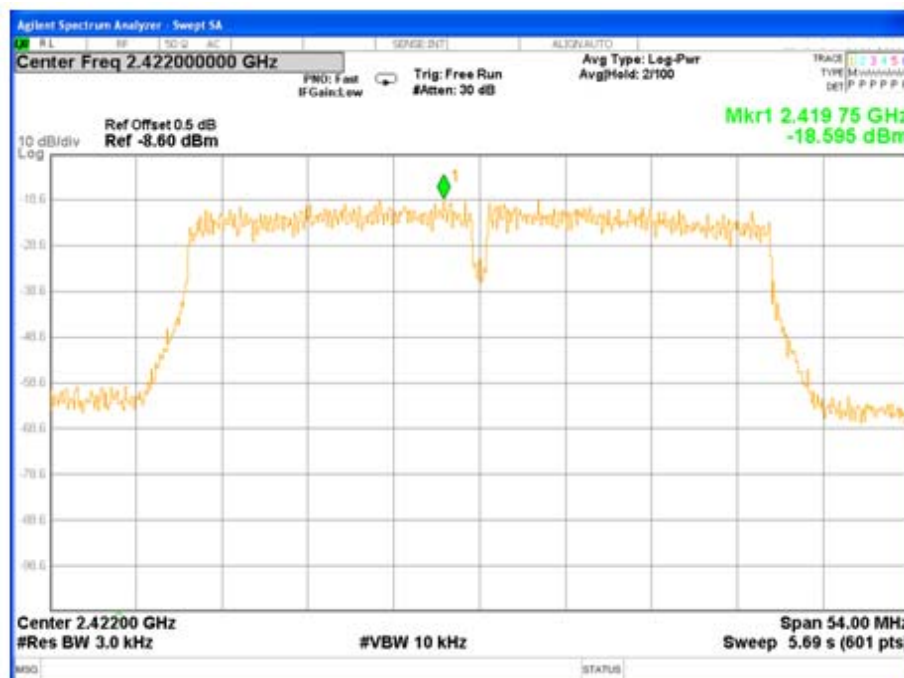
### 802.11n-HT20 Middle Channel



### 802.11n-HT20 High Channel



### 802.11n-HT40 Low Channel



### 802.11n-HT40 Middle Channel



### 802.11n-HT40 High Channel



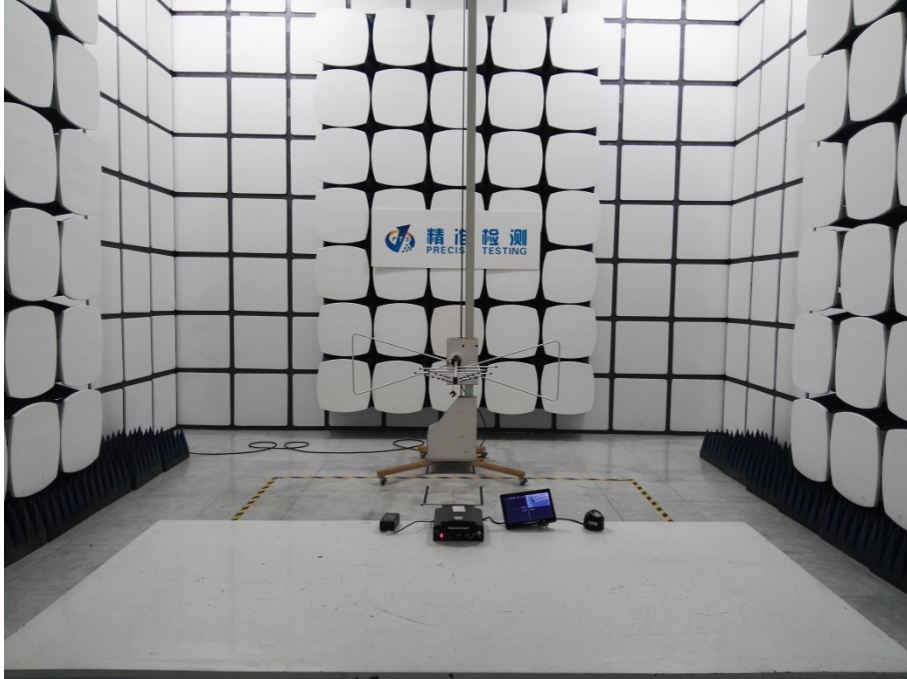
## 12 Antenna Requirement

According to the FCC part15.203, a transmitter can only be sold or operated with antennas with which it was approved. The antenna for product is a unique antenna connector (RP-SMA), it meets the requirement of this section.



## 13 Test Setup

Radiated Spurious Emissions  
From 30MHz-1000MHz



Above 1GHz

