ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

OF

Product Name:	**7-inch Rugged Tablet**
Brand Name:	**Pioneerpos**
Marketing Name:	**DASH 7" Robust Tablet PC**
Model No.:	**DASH7E1**
Model Difference:	**N/A**
FCC ID:	**CPOD7E1-LTE**
Report No.:	**ER/2015/40016**
Issue Date:	**Jul. 09, 2015**
FCC Rule Part:	**§15.247, Cat: DTS**
Prepared for:	**Pioneer POS Solution, Inc. 238 Benton Ct., City of Industry, CA 91789**
Prepared by:	**SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803**

Testing Laboratory
0513

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VERIFICATION OF COMPLIANCE

Applicant:	Pioneer POS Solution, Inc. 238 Benton Ct., City of Industry, CA 91789
Product Name:	7-inch Rugged Tablet
Brand Name:	Pioneerpos
Marketing Name:	DASH 7" Robust Tablet PC
Model No.:	DASH7E1
Model Difference:	N/A
FCC ID:	CPOD7E1-LTE
Report Number:	ER/2015/40016
Date of test:	Apr. 02, 2015 ~ Jul. 03, 2015
Date of EUT Received:	Apr. 02, 2015

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10:2009 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:	Marcus Tseng	***Date***	Jul. 09, 2015
	Marcus Tseng / Engineer		
Prepared By:	Tiffany Kao	***Date***	Jul. 09, 2015
	Tiffany Kao / Clerk		
Approved By:	Jim Chang	***Date***	Jul. 09, 2015
	Jim Chang / Asst. Manager		

Revision History

Report Number	Revision	Description	Issue Date
ER/2015/40016	Rev.00	Initial creation of document	Jul. 09, 2015

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1 GENERAL INFORMATION

1.1 Product description

General:

Product Name:	7-inch Rugged Tablet	
Brand Name:	Pioneerpos	
Marketing Name:	DASH 7" Robust Tablet PC	
Model No.:	DASH7E1	
Model Difference:	N/A	
Product SW/HW version:	20150128 / A0.3_0_0	
Radio SW/HW version:	N/A	
Test SW Version:	N/A	
RF power setting in TEST SW:	N/A	
Power Supply:	7.4Vdc from Rechargeable Li-ion Battery or 12V from AC/DC Adapter	
	Battery:	Model No.: J1067, Supplier: JHT
	Adapter:	Model No.: LTE-24E-S2-2, Supplier: Li Tone Electronics Co., Ltd

WLAN 2.4GHz:

Wi-Fi	Frequency Range	Channels	Rated Power	Modulation Technology
11b/g	2412-2462	11	b: 15.56dBm g: 19.12dBm	DSSS, OFDM
11n	HT20 2412-2462	11	HT20: 19.81dBm (MIMO Chain 0+1)	OFDM
11n	HT40 2422-2452	7	HT40: 18.80dBm (MIMO Chain 0+1)	OFDM
Antenna Designation:		PIFA Antenna, Main: Gain: 4.92dBi Aux: Gain: 0.87dBi		
Modulation type:		CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM		
Transition Rate:		802.11 b: up to 11 Mbps; 802.11 g: up to 54 Mbps 802.11 n_20MHz: up to 144Mbps 802.11 n_40MHz: up to 300Mbps		

1.2 Product Feature of Equipment Under Test

The equipment under Test (Hereafter Called: EUT) is 7" Rugged Tablet supporting, GPRS / WCDMA / CDMA / LTE,
Wi-Fi 802.11abgn, Bluetooth with GPS and NFC features, and below is details of information.

Product Feature	
Product Name:	7-inch Rugged Tablet
Brand Name:	Pioneerpos
Marketing Name:	DASH 7" Robust Tablet PC
Model No.:	DASH7E1
Model Difference:	N/A
FCC ID	CPOD7E1-LTE
GPRS Operating Band(s)	GPRS 850/1900MHz
GPRS / EGPRS Multi Slot Class	GPRS Class 10 / Class 12
CDMA / EVDO	BC0 / BC1 / BC10
WCDMA Operating Band(s)	FDD Band II / IV / V
WCDMA Rel. Version	Rel.8
LTE Operating Band(s)	FCC Band 2 / 4 / 5 / 13 / 17 / 25
LTE Rel. Version	Rel.9
Wi-Fi Specification	802.11a/b/g/n
Bluetooth Version	V4.0 dual mode +EDR
NFC Specification	NFC

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

1.3 Test Methodology of Applied Standards

FCC Part 15, Subpart C §15.247

FCC KDB 558074 D01 DTS Meas. Guidance V03r03

ANSI C63.10:2009

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.
3. The EUT was placed 0.8m height for frequency above 1GHz in accordance with ANSI C63. 10 :2009

1.4 Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan. (TAF code 0513)

FCC Registration Numbers are: 990257

Canada Registration Number: 4620A-5.

1.5 Special Accessories

There are no special accessories used while test was conducted.

1.6 Equipment Modifications

There was no modification incorporated into the EUT.

2 SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

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

2.2 EUT Exercise

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

2.3 Test Procedure

2.3.1 Conducted Emissions

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

2.3.2 Radiated Emissions

The EUT is a placed on as turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 0.8 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 with cable loss 1.1dB and 10dB attenuator.

Single mode offset
= RF cable loss (dB)+ attenuation factor(dB) =11.1(dB)

N20 MIMO mode offset
= RF cable loss (dB)+ attenuation factor(dB)+ 10 log(NANT) dB+ duty factor=14.1(dB)

N40 MIMO mode offset
= RF cable loss (dB)+ attenuation factor(dB)+ 10 log(NANT) dB+ duty factor=14.1(dB)

2.5 Configuration of Tested System

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

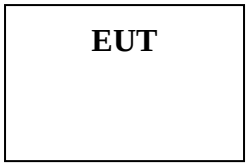


Fig. 2-2 AC Power Line Conducted Emission

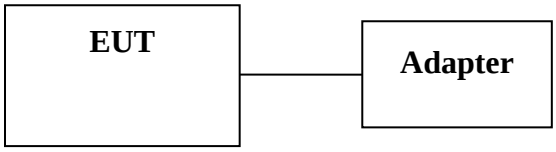


Table 2-1 Equipment Used in Tested System

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

3 SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.207(a)	AC Power Line Conducted Emission	Compliant
§15.247(b) (3)	Peak Output Power	Compliant
§15.247(a)(2)	6dB Bandwidth	Compliant
§15.247(d)	Conducted Band Edge and Spurious Emission	Compliant
§15.247(d)	Radiated Band Edge and Spurious Emission	Compliant
§15.247(e)	Power Spectral Density	Compliant
§15.203 §15.247(b)	Antenna Requirement	Compliant

4 DESCRIPTION OF TEST MODES

4.1 Operated in 2400 ~ 2483.5MHz Band

11 channels are provided for 802.11b, 802.11g and 802.11n_HT20

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412 MHz	7	2442 MHz
2	2417 MHz	8	2447 MHz
3	2422 MHz	9	2452 MHz
4	2427 MHz	10	2457 MHz
5	2432 MHz	11	2462 MHz
6	2437 MHz		

7 channels are provided for 802.11n_HT40

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
3	2422 MHz	7	2442 MHz
4	2427 MHz	8	2447 MHz
5	2432 MHz	9	2452 MHz
6	2437 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 and receiving mode is programmed.
3. Investigation has been done on all the possible configurations for searching the worst case.

RADIATED EMISSION TEST:

RADIATED EMISSION TEST (BELOW 1 GHz)					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11g	1 to 11	1,6,11	OFDM	6	MAIN
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	MCS 8	MIMO

RADIATED EMISSION TEST (ABOVE 1 GHz)					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11b	1 to 11	1, 6, 11	DSSS	1	MAIN
802.11g	1 to 11	1, 6, 11	OFDM	6	MAIN
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	MCS 8	MIMO
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	MCS 8	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 802.11b/g/n WLAN Transmitter for channel Low, Mid and High, the worst case H position was reported.

ANTENNA PORT CONDUCTED MEASUREMENT:

CONDUCTED TEST					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11b	1 to 11	1, 6, 11	DSSS	1	MAIN
802.11g	1 to 11	1, 6, 11	OFDM	6	MAIN
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	MCS 8	MIMO
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	MCS 8	MIMO

5 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.586 dB
Peak Output Power	+/- 0.84 dB
6dB Bandwidth	+/- 51.33 Hz
100 KHz Bandwidth Of Frequency Band Edges	+/- 0.84 dB
Peak Power Density	+/- 1.3 dB
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.

6 CONDUCTED EMISSION TEST

6.1 Standard Applicable

According to §15.207, frequency range within 150kHz to 30MHz shall not exceed the Limit table as below.

Frequency range MHz	Limits dB(uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

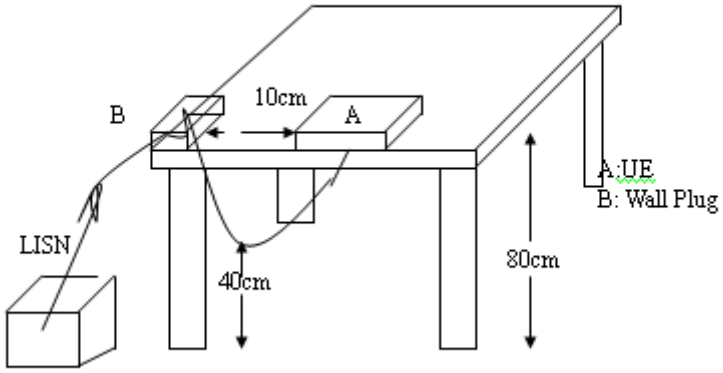
6.2 Measurement Equipment Used

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
EMI Test Receiver	R&S	ESCI7	100760	05/04/2014	05/03/2015
LISN	SCHWARZBECK	NSLK 8127	8127-649	05/15/2015	05/14/2016
LISN	FCC	FCC-LISN-50/250-25-2-01	04034	03/13/2015	03/12/2016
Coaxial Cables	N/A	WK CE Cable	N/A	11/26/2014	11/25/2015

6.3 EUT Setup

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI 63.10:2009.
2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
3. The LISN was connected with 120Vac/60Hz power source.

6.4 Test SET-UP (Block Diagram of Configuration)



6.5 Measurement Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all phases of power being supplied by given UE are completed

6.6 Measurement Result

Note: Refer to next page for measurement data and plots.

Note2: The * reveals the worst-case results that closet to the limit

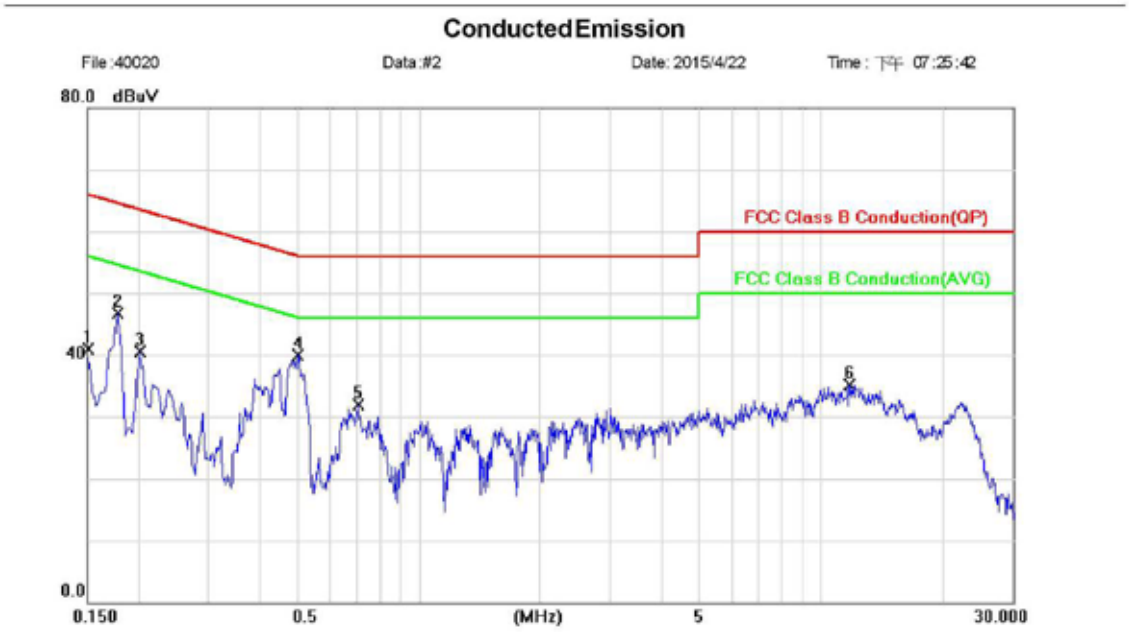
AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Operation mode			Test Date:	Apr. 22, 2015
Temperature:	24 ℃	Humidity:	66 %	Test By:	Marcus
				Phase:	L1

Site ConductionRoom
Limit: FCC Class B Conduction(QP)
Mode: Operation
Note: Adapter:LTE24E-S2-2

Phase: L1
Power: AC 120V/60Hz

Temperature: 24 ℃
Humidity: 66%



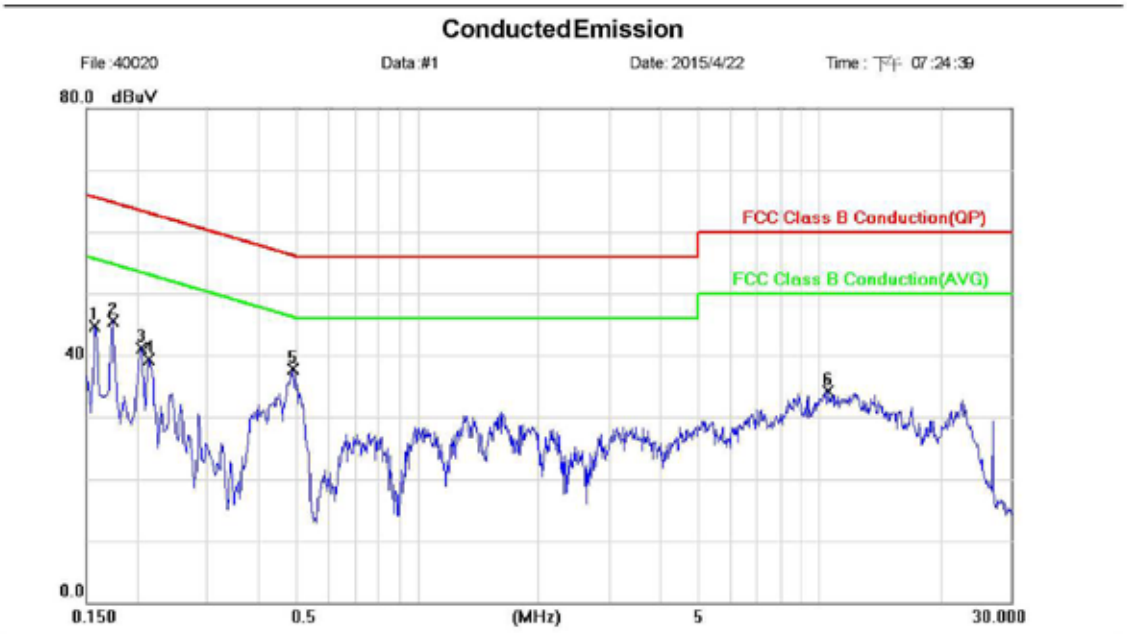
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	40.84	0.05	40.89	66.00	-25.11	peak	
2		0.1780	46.69	0.06	46.75	64.58	-17.83	peak	
3		0.2020	40.51	0.06	40.57	63.53	-22.96	peak	
4	*	0.5020	39.79	0.08	39.87	56.00	-16.13	peak	
5		0.7060	31.80	0.09	31.89	56.00	-24.11	peak	
6		11.7460	34.79	0.38	35.17	60.00	-24.83	peak	

Operation Mode:	Operation mode			Test Date:	Apr. 22, 2015
Temperature:	24 ℃	Humidity:	66 %	Test By:	Marcus
				Phase:	N

Site ConductionRoom
Limit: FCC Class B Conduction(QP)
Mode: Operation
Note: Adapter:LTE24E-S2-2

Phase: N
Power: AC 120V/60Hz

Temperature: 24 ℃
Humidity: 66%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1580	44.67	0.05	44.72	65.57	-20.85	peak	
2		0.1740	45.55	0.05	45.60	64.77	-19.17	peak	
3		0.2060	41.01	0.06	41.07	63.37	-22.30	peak	
4		0.2140	39.17	0.06	39.23	63.05	-23.82	peak	
5	*	0.4900	37.61	0.07	37.68	56.17	-18.49	peak	
6		10.5420	33.70	0.35	34.05	60.00	-25.95	peak	

7 DUTY CYCLE OF TEST SIGNAL

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle.

All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

Formula:

Duty Cycle = Ton / (Ton+Toff)

Measurement Procedure:

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

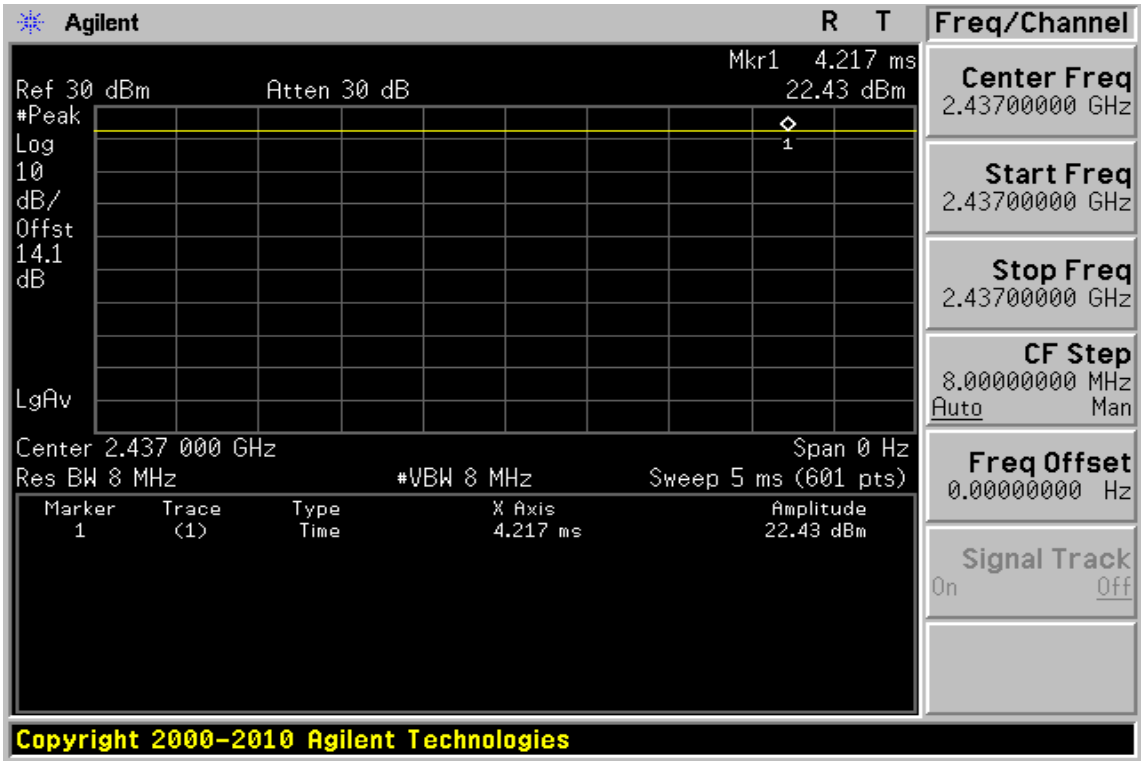
Duty Cycle:

	Duty Cycle	Duty Factor (dB)
802.11b	99%	0.04
802.11g	95.69%	0.19
802.11n_20	90.74%	0.42
802.11n_40	82.78%	0.82

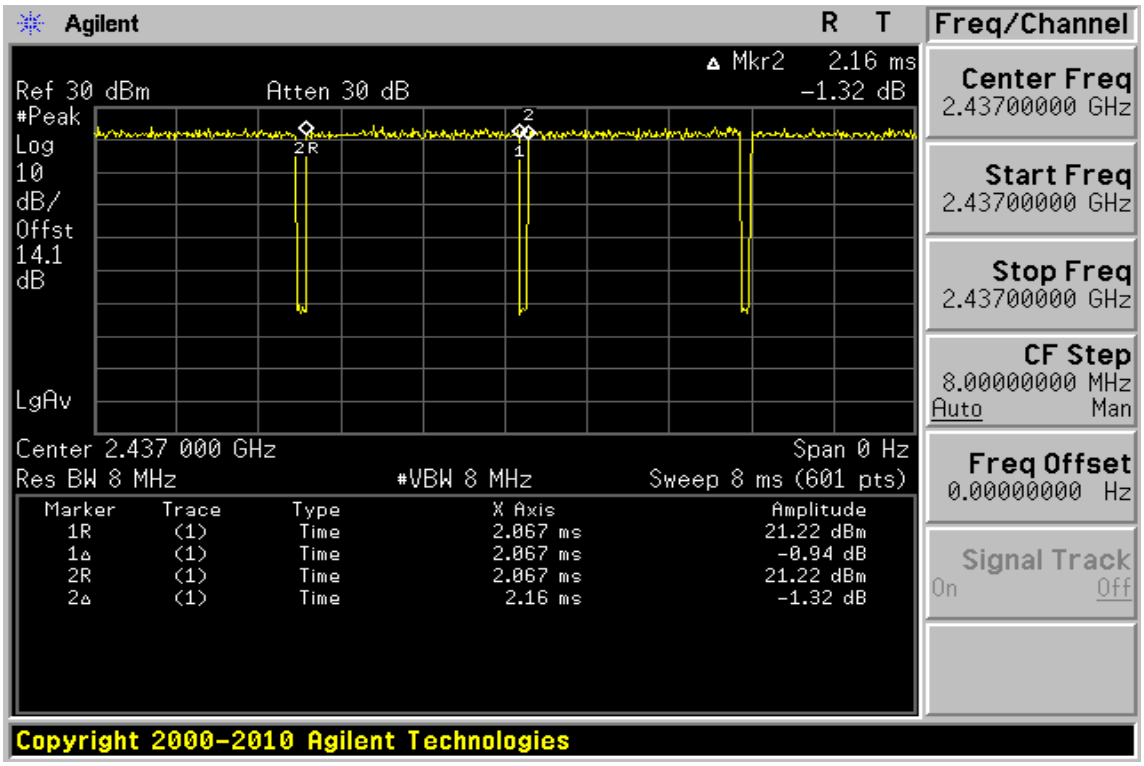
Duty Cycle Factor: 10 * log (1/0.99) = 0.04
Duty Cycle Factor: 10 * log (1/0.9569) = 0.19
Duty Cycle Factor: 10 * log (1/0.9074) = 0.42
Duty Cycle Factor: 10 * log (1/0.8278) = 0.82

7.1 DUTY CYCLE TEST SIGNAL Measurement Result

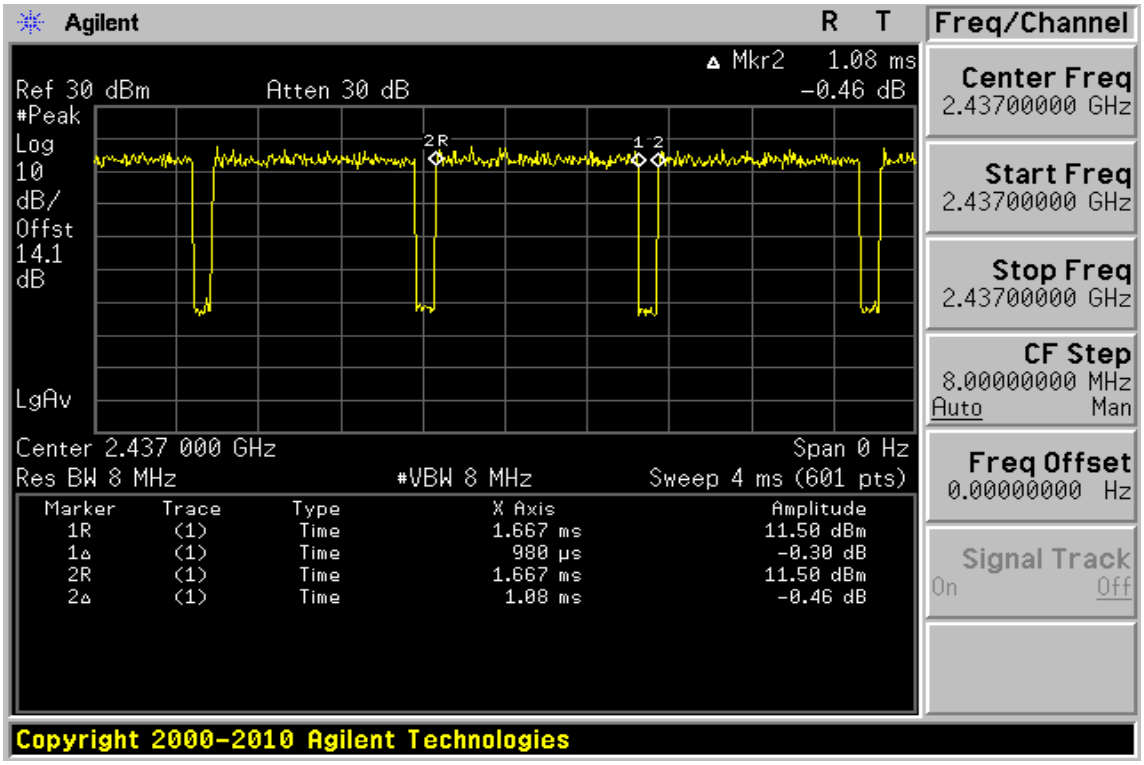
802.11 b



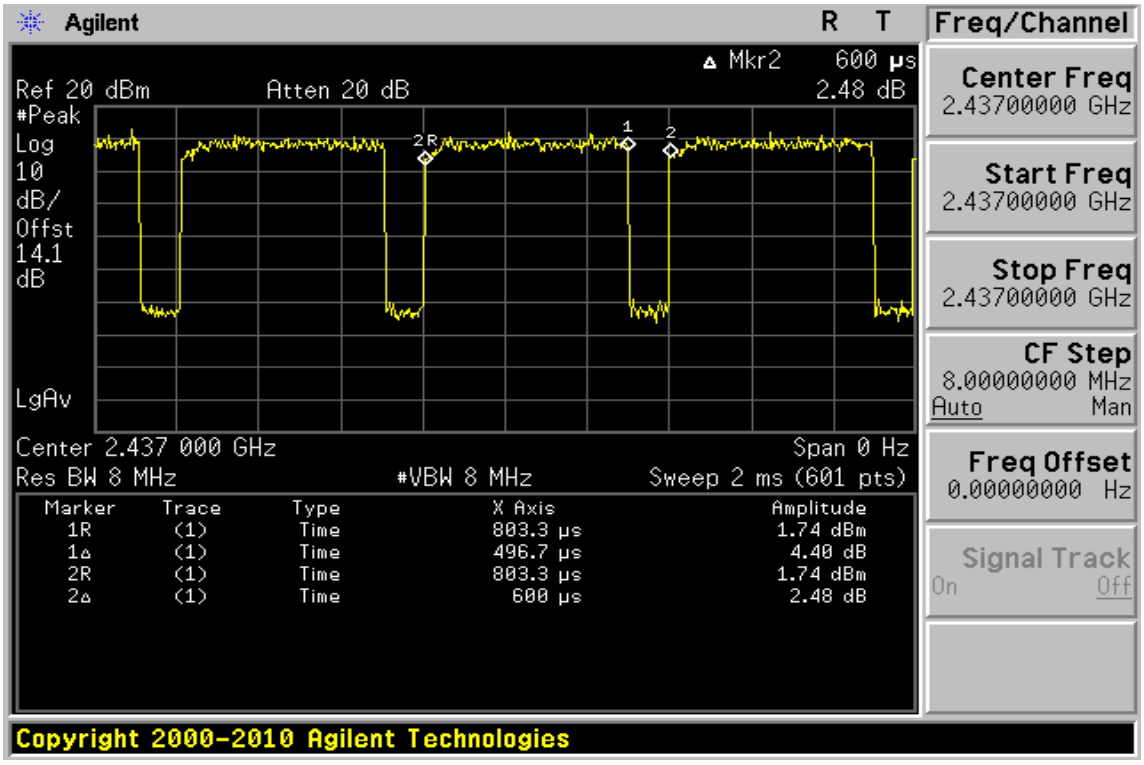
802.11 g



802.11 n_20 MHz



802.11 n_40 MHz



8 PEAK OUTPUT POWER MEASUREMENT

8.1 Standard Applicable

For systems using digital modulation in the 2400-2483.5 MHz bands, the limit for peak output power is 1Watt.

If the transmitting antenna of directional gain greater than 6dBi are used the peak output power form the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the Antenna exceeds 6dBi.

In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of Antenna exceeds 6dBi.

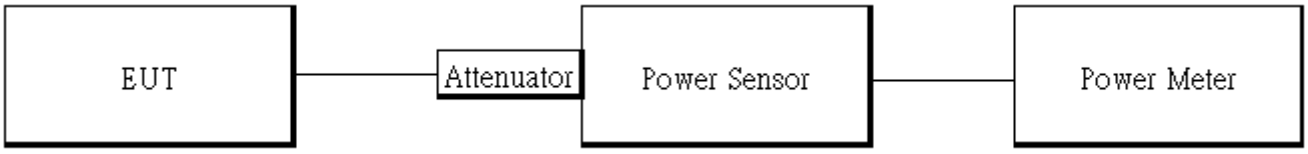
Note: The antenna gain is granter than 6dBi in MIMO mode the limit reduce as below:
Directional gain = gain of antenna element + 10 log (# of TX antenna elements)
Effective Legacy Gain (dBi) = 4.92+3.01=7.93dBi
Limit: 30dBm – (7.93– 6dBi) = 28.07dBm

8.2 Measurement Equipment Used

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Power Meter	Anritsu	ML2495A	1005007	12/20/2014	12/19/2015
Power Sensor	Anritsu	MA2411B	917032	12/20/2014	12/19/2015
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2015	01/01/2016
Attenuator	Mini-Circuit	BW-S10W2+	002	01/02/2015	01/01/2016

8.3 Test Set-up

Power Meter:



8.4 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance V03r03.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter .

Power Meter:

It is used as the auxiliary test equipment to conduct the output power measurement.

4. Record the max. Reading as observed from Spectrum or Power Meter.
5. 802.11n MIMO mode: offset is set following "measure and add 10 Log (N)" on spectrum to measure the PSD for MIMO mode. Offset = cable loss + 10 log (N), where N is number of transmitting antenna. N=2 for this given application.
6. Repeat above procedures until all frequency of interest measured was complete.

8.5 Measurement Result

802.11b

CH	Frequency (MHz)	Data Rate	Peak Output Power (dBm)	Peak Output Power (mW)	Limit
1	2412	1	13.93	24.72	1 Watt = 30 dBm
6	2437	1	13.64	23.12	1 Watt = 30 dBm
11	2462	1	**15.56**	35.97	1 Watt = 30 dBm

CH	Frequency (MHz)	Data Rate	Avg. Output Power (dBm)	Avg. Output Power (mW)	Limit
1	2412	1	13.50	22.39	1 Watt = 30 dBm
6	2437	1	13.00	19.95	1 Watt = 30 dBm
11	2462	1	12.62	18.28	1 Watt = 30 dBm

802.11g

CH	Frequency (MHz)	Data Rate	Peak Output Power (dBm)	Peak Output Power (mW)	Limit
1	2412	6	16.02	39.99	1 Watt = 30 dBm
6	2437	6	**19.12**	81.66	1 Watt = 30 dBm
11	2462	6	15.35	34.28	1 Watt = 30 dBm

CH	Frequency (MHz)	Data Rate	Avg. Output Power (dBm)	Avg. Output Power (mW)	Limit
1	2412	6	6.77	4.75	1 Watt = 30 dBm
6	2437	6	12.60	18.20	1 Watt = 30 dBm
11	2462	6	5.83	3.83	1 Watt = 30 dBm

802.11n_HT20 (MIMO)

CH	Frequency (MHz)	DATA RATE	Peak Outout Power (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
			CHAIN 0	CHAIN 1				
1	2412	MCS8	15.11	17.66	19.58	90.778	28.07 dBm	PASS
6	2437	MCS8	14.98	17.28	19.29	84.934	28.07 dBm	PASS
11	2462	MCS8	14.52	18.29	**19.81**	**95.767**	28.07 dBm	PASS

CH	Frequency (MHz)	DATA RATE	Avg. Outout Power (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
			CHAIN 0	CHAIN 1				
1	2412	MCS8	7.09	5.81	9.51	8.927	28.07 dBm	PASS
6	2437	MCS8	7.45	5.25	9.50	8.909	28.07 dBm	PASS
11	2462	MCS8	7.66	4.81	9.48	8.861	28.07 dBm	PASS

802.11n_HT40 (MIMO)

CH	Frequency (MHz)	DATA RATE	Peak Outout Power (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
			CHAIN 0	CHAIN 1				
3	2422	MCS8	12.84	15.06	17.10	51.294	28.07 dBm	PASS
6	2437	MCS8	13.88	17.11	**18.80**	**75.839**	28.07 dBm	PASS
9	2452	MCS8	12.66	16.18	17.78	59.946	28.07 dBm	PASS

CH	Frequency (MHz)	DATA RATE	Avg. Outout Power (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
			CHAIN 0	CHAIN 1				
3	2422	MCS8	5.29	3.59	7.53	5.666	28.07 dBm	PASS
6	2437	MCS8	7.11	4.83	9.13	8.181	28.07 dBm	PASS
9	2452	MCS8	6.15	2.88	7.83	6.062	28.07 dBm	PASS

**** Note: The duty cycle factor is compensated to obtain the maximum value of measurement in average.***

9 6dB BANDWIDTH

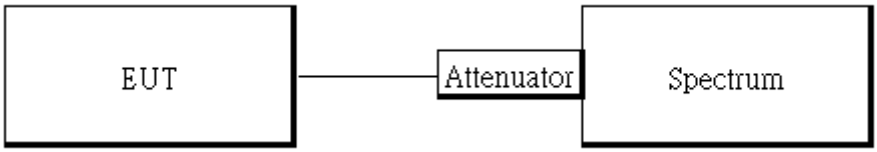
9.1 Standard Applicable

The minimum 6 dB bandwidth shall be at least 500 kHz.

9.2 Measurement Equipment Used

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4446A	MY51100003	01/29/2015	01/28/2016
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2015	01/01/2016
Attenuator	Mini-Circuit	BW-S10W2+	002	01/02/2015	01/01/2016

9.3 Test Set-up



9.4 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance V03r03.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 100 kHz, VBW = 3*RBW, Span = 30MHz/50MHz, Detector=Peak, Sweep=auto.
4. Mark the peak frequency and –6dB (upper and lower) frequency.
5. Repeat above procedures until all frequency of interest measured was complete.

9.5 Measurement Result

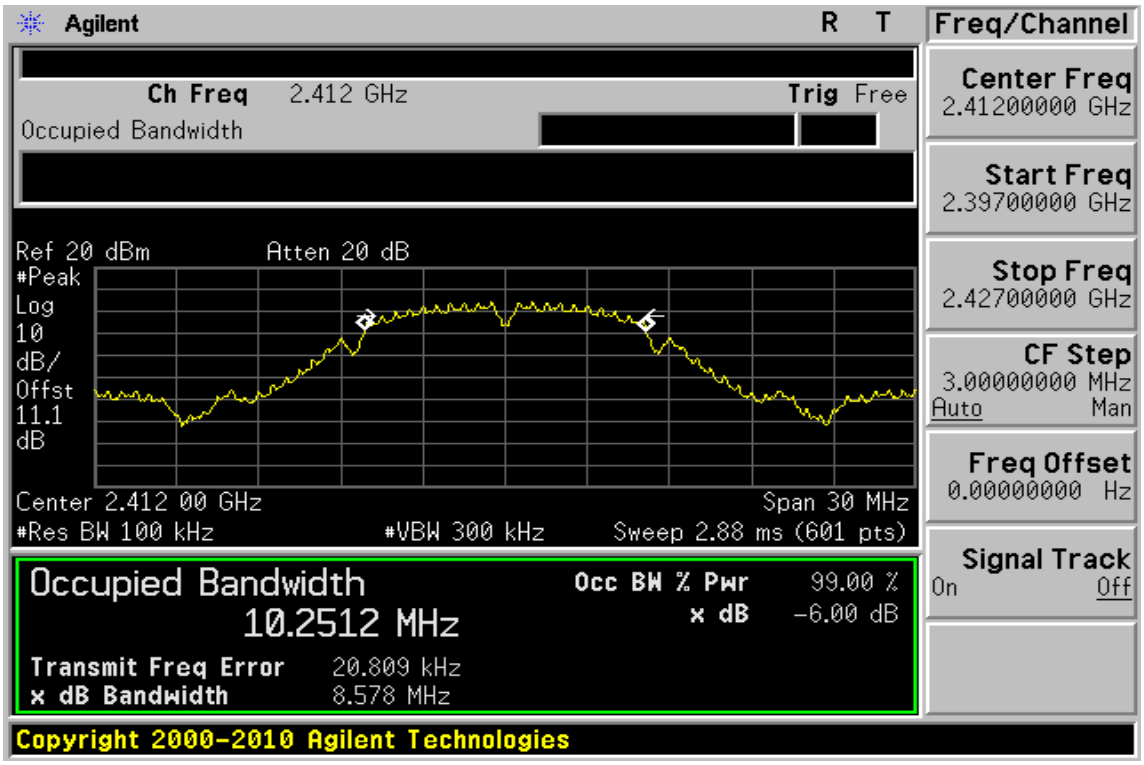
Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Result
802.11b			
2412	8578	> 500	PASS
2437	8622	> 500	PASS
2462	8151	> 500	PASS
802.11g			
2412	15442	> 500	PASS
2437	15660	> 500	PASS
2462	15762	> 500	PASS
802.11n_HT20 (Main)			
2412	15455	> 500	PASS
2437	14488	> 500	PASS
2462	15341	> 500	PASS
802.11n_HT20 (Aux)			
2412	15740	> 500	PASS
2437	15171	> 500	PASS
2462	14157	> 500	PASS
802.11n_HT40 (Main)			
2422	36150	> 500	PASS
2437	36028	> 500	PASS
2452	36165	> 500	PASS
802.11n_HT40 (Aux)			
2422	36073	> 500	PASS
2437	36180	> 500	PASS
2452	36175	> 500	PASS

** Note: The arrow "->" reveals X decibel level*

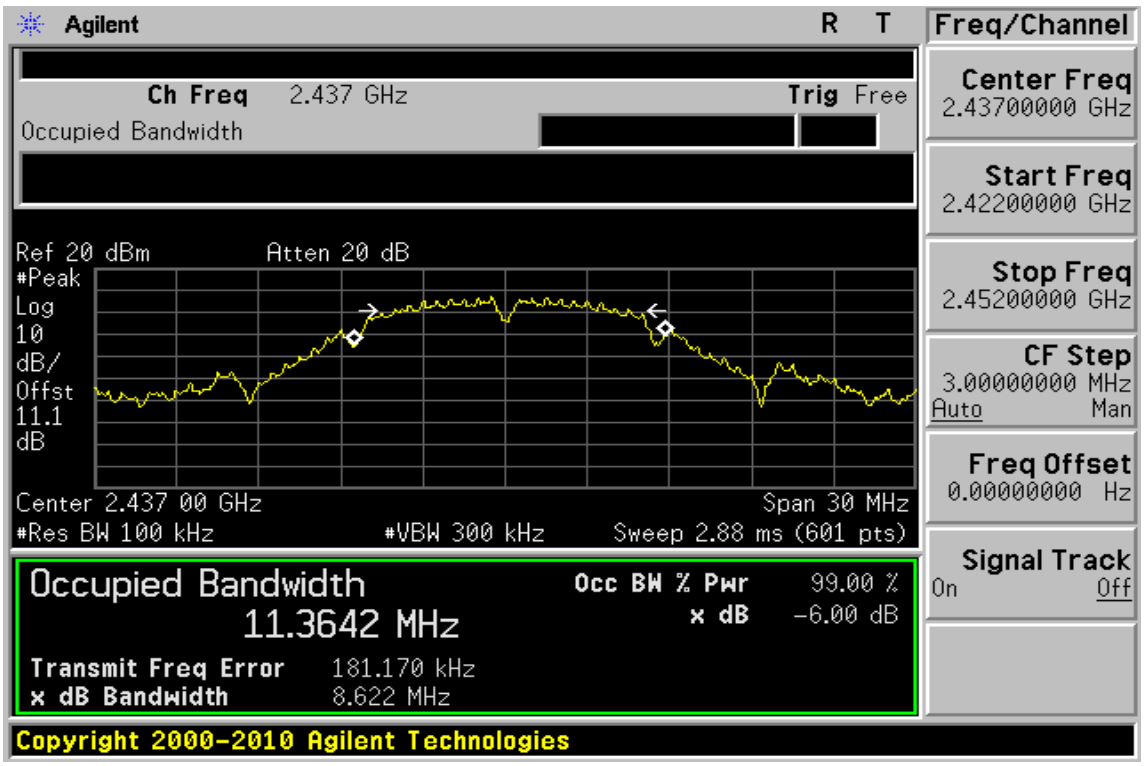
**Refer to next page for plots*

802.11b

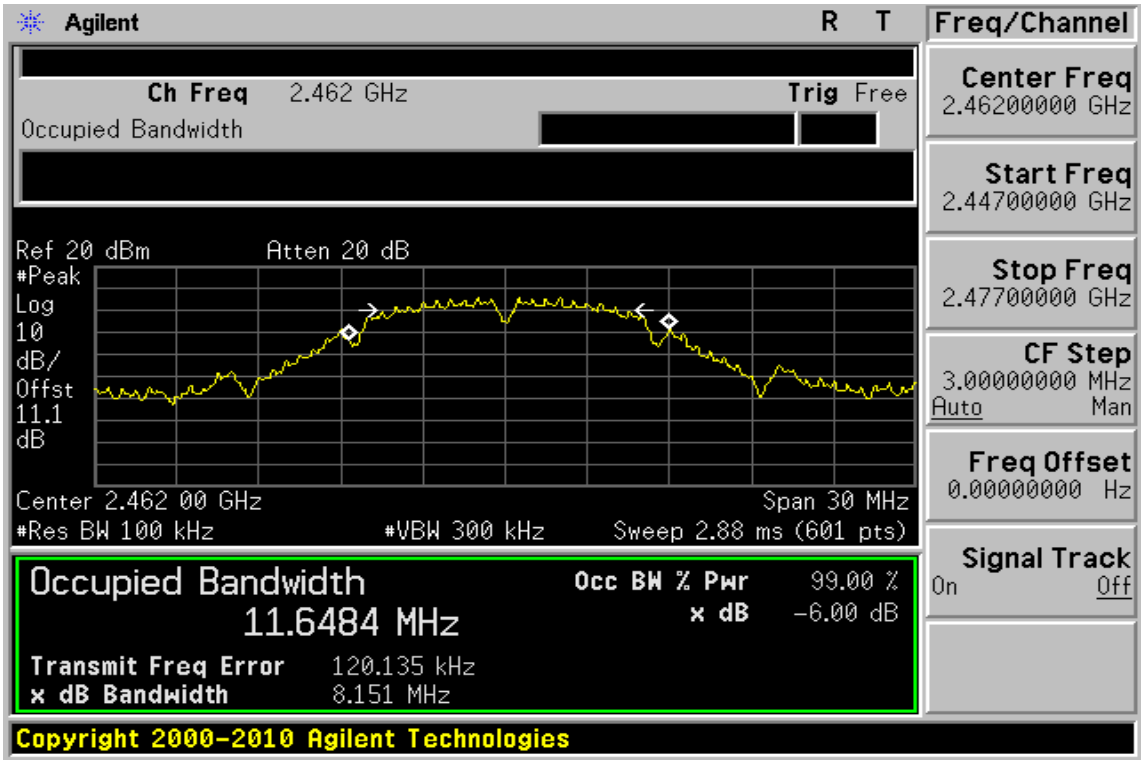
6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid

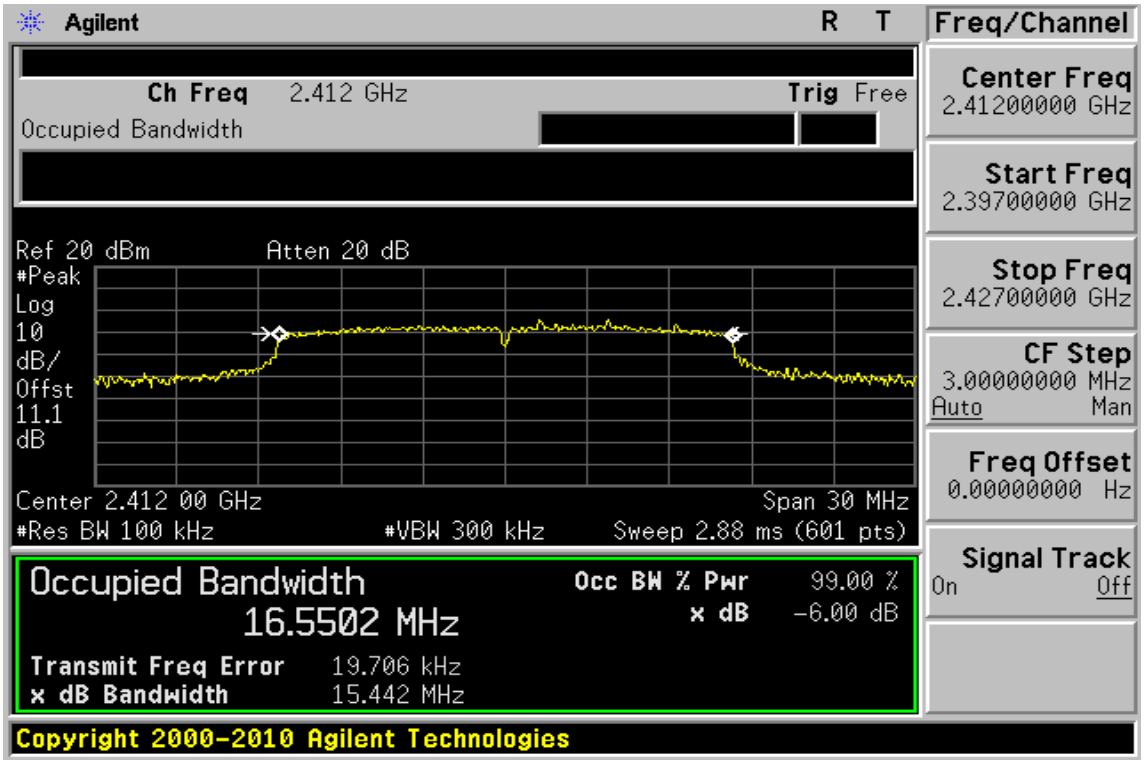


6dB Band Width Test Data CH-High

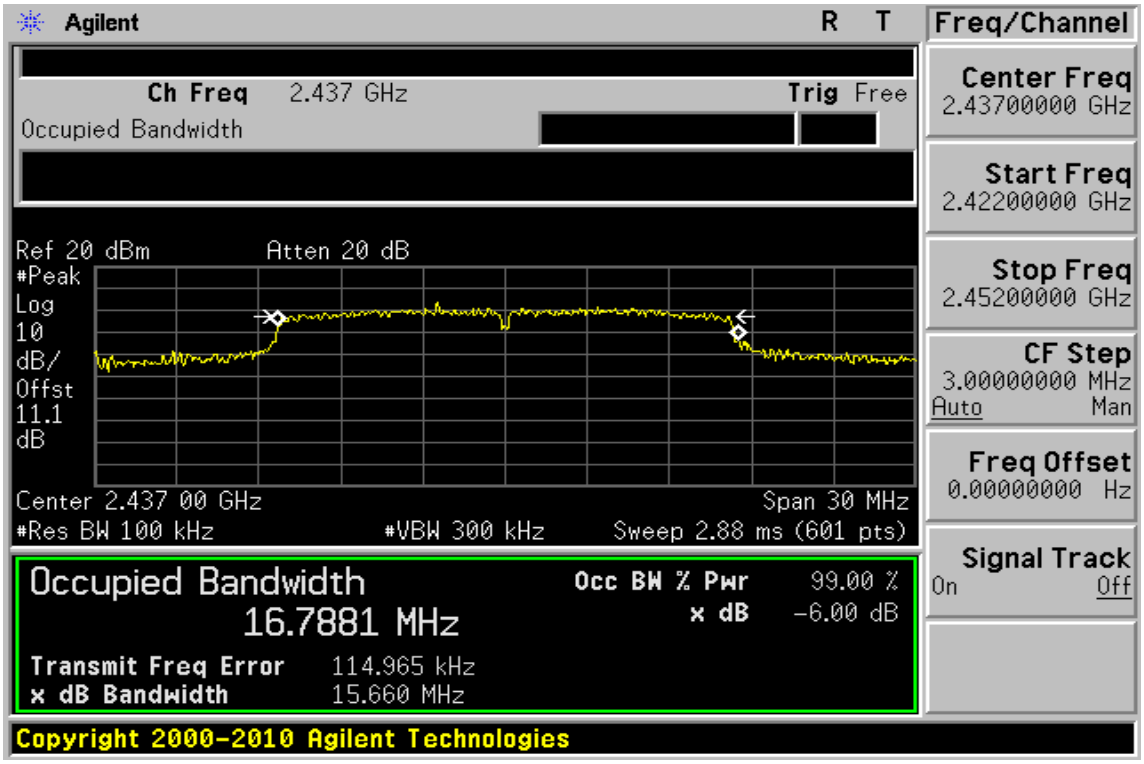


802.11g

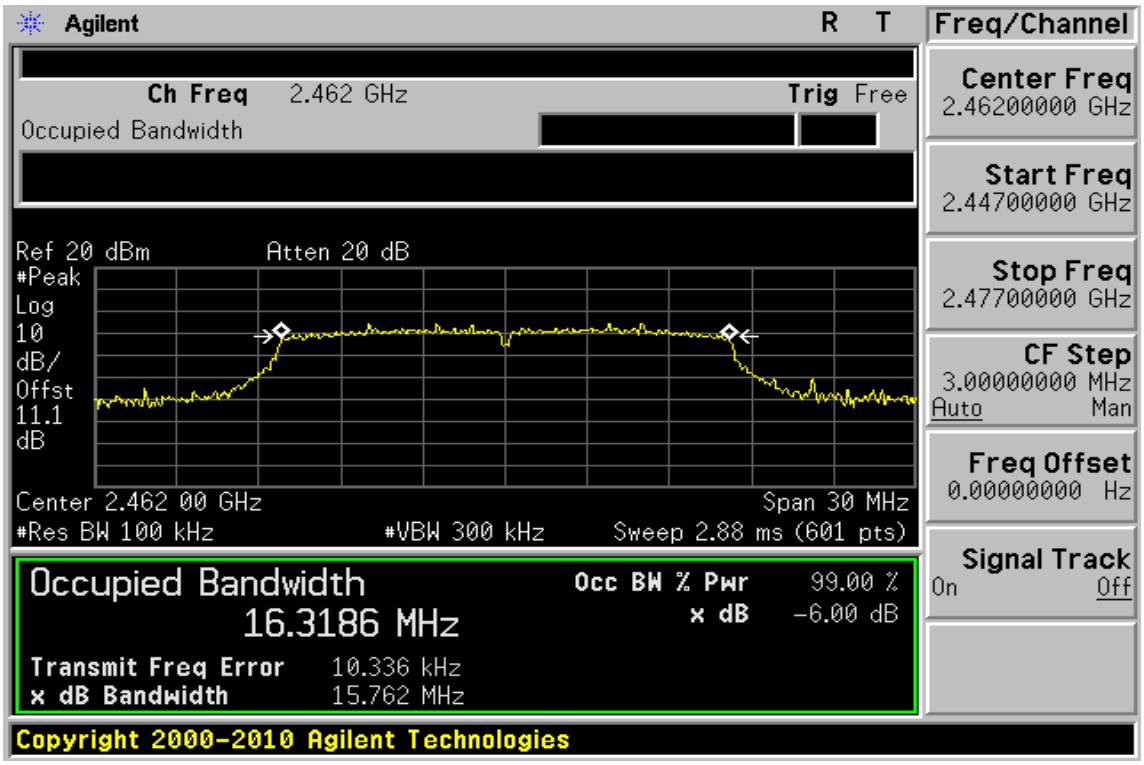
6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid

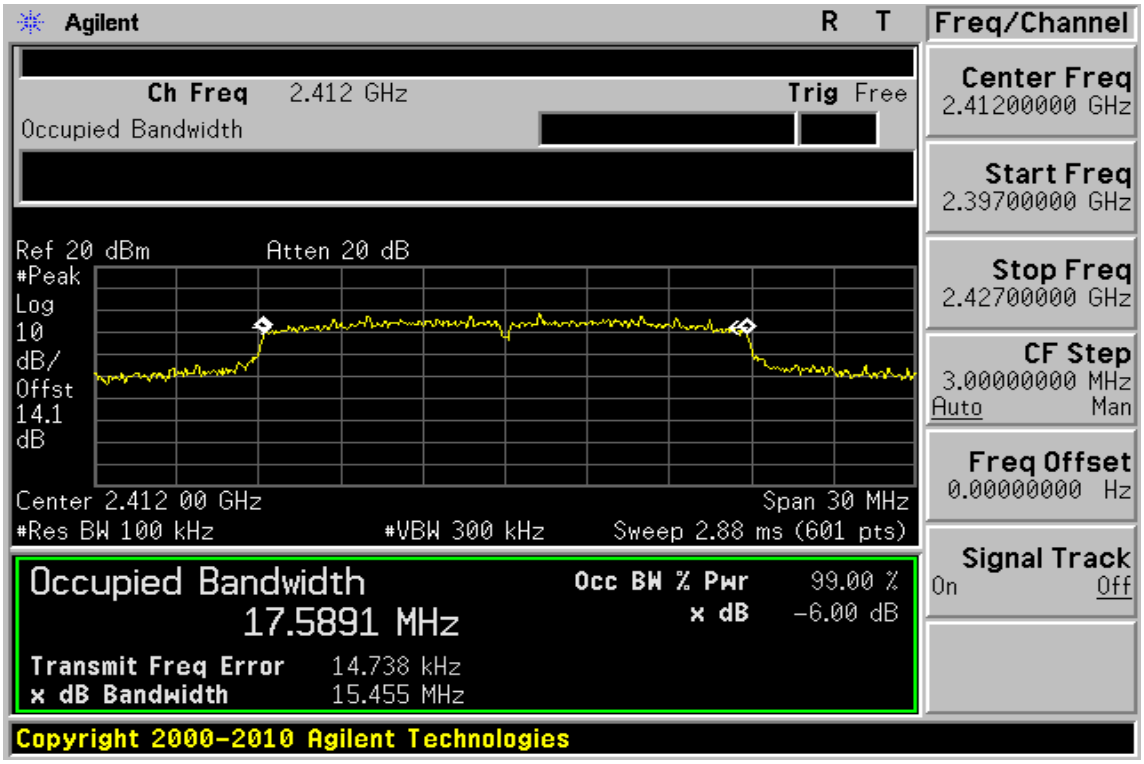


6dB Band Width Test Data CH-High

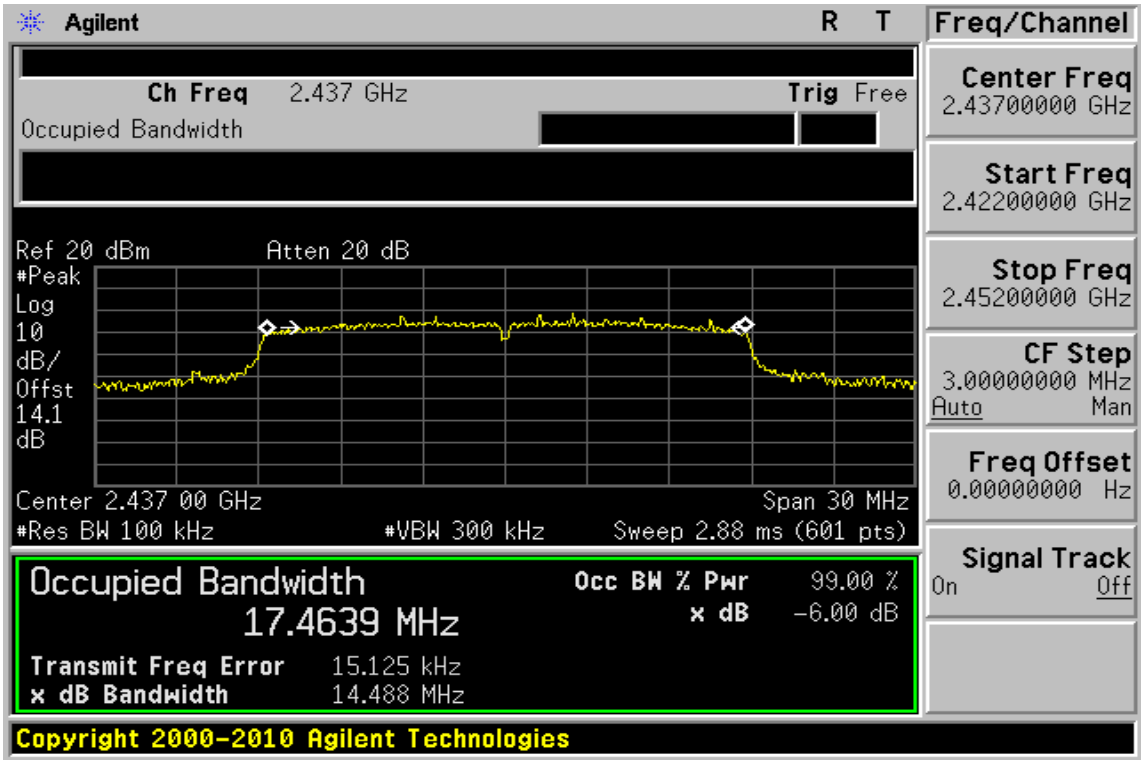


802.11n_20M (Main)

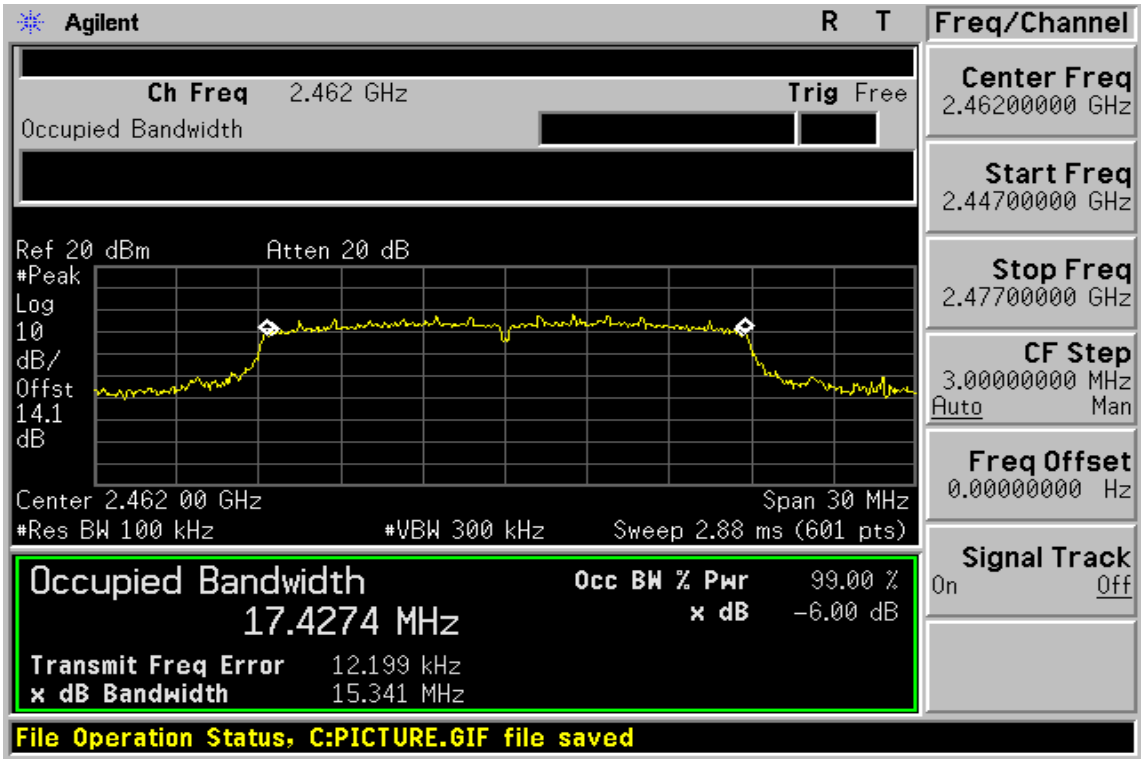
6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid

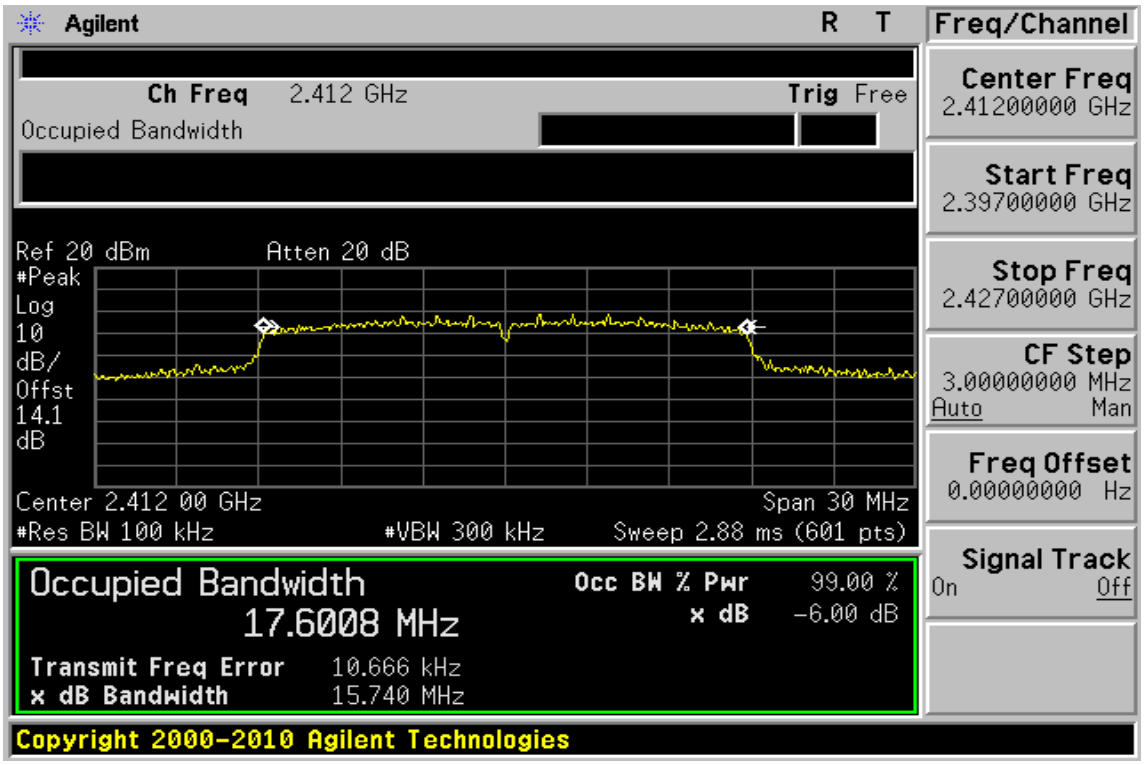


6dB Band Width Test Data CH-High

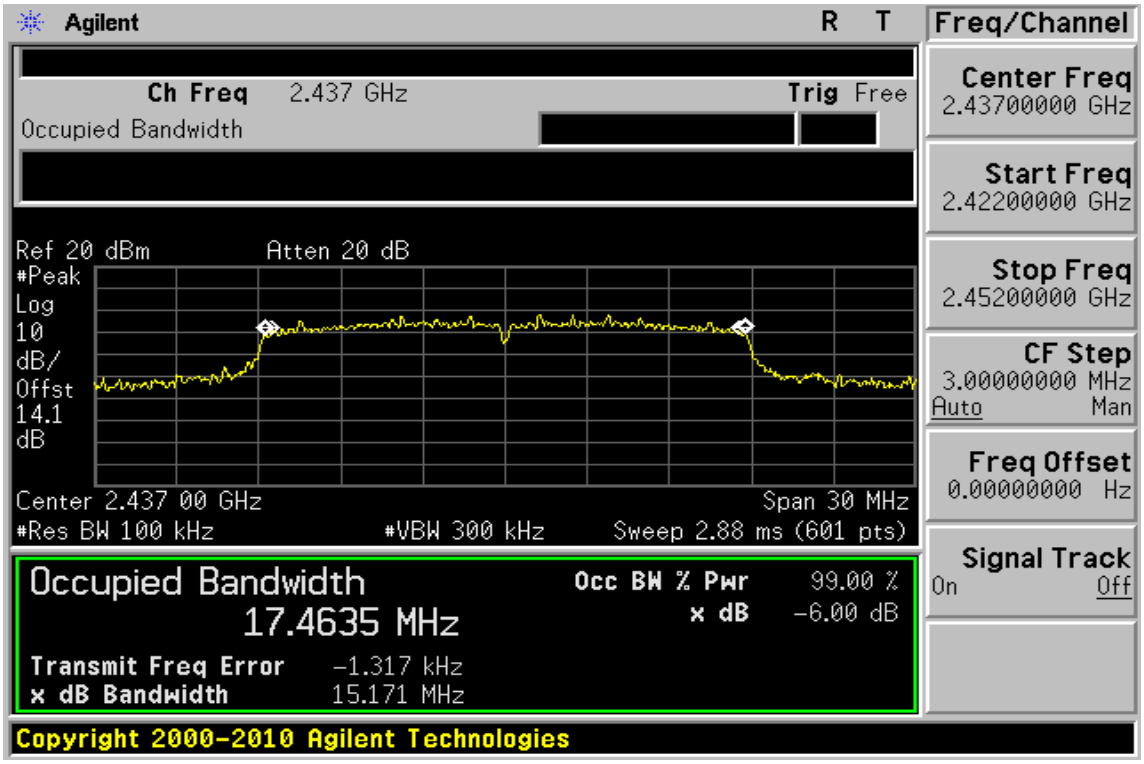


802.11n_20M (Aux)

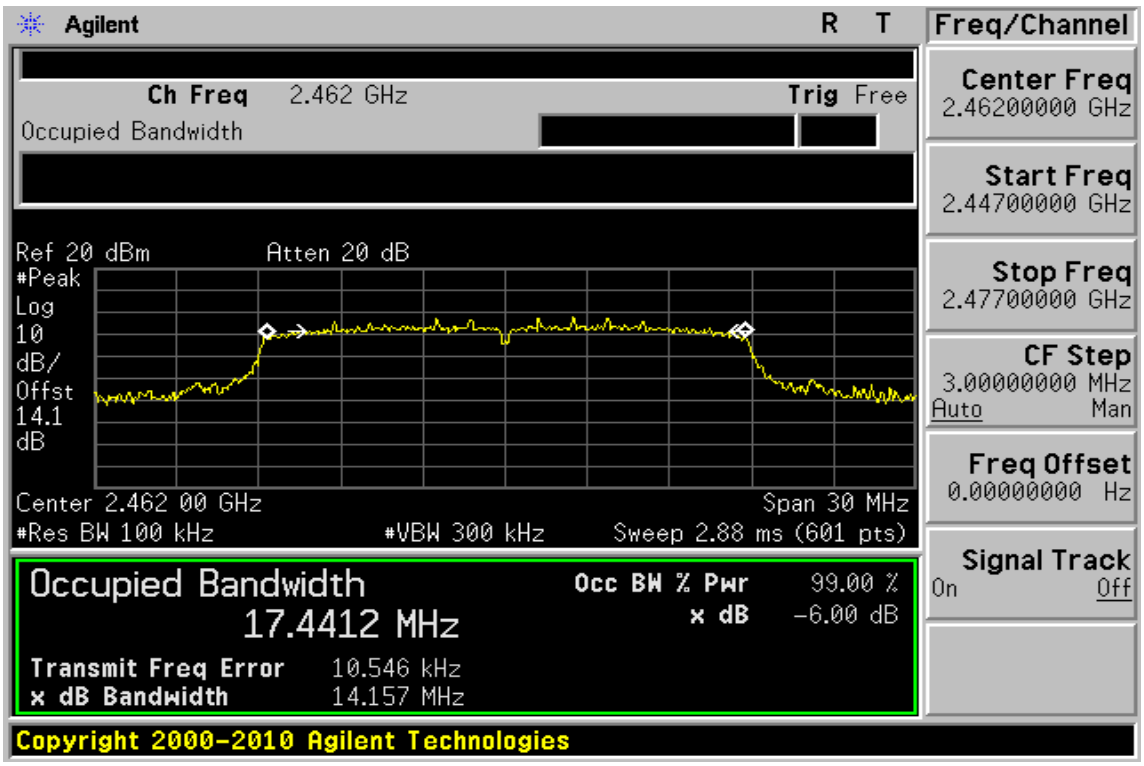
6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid

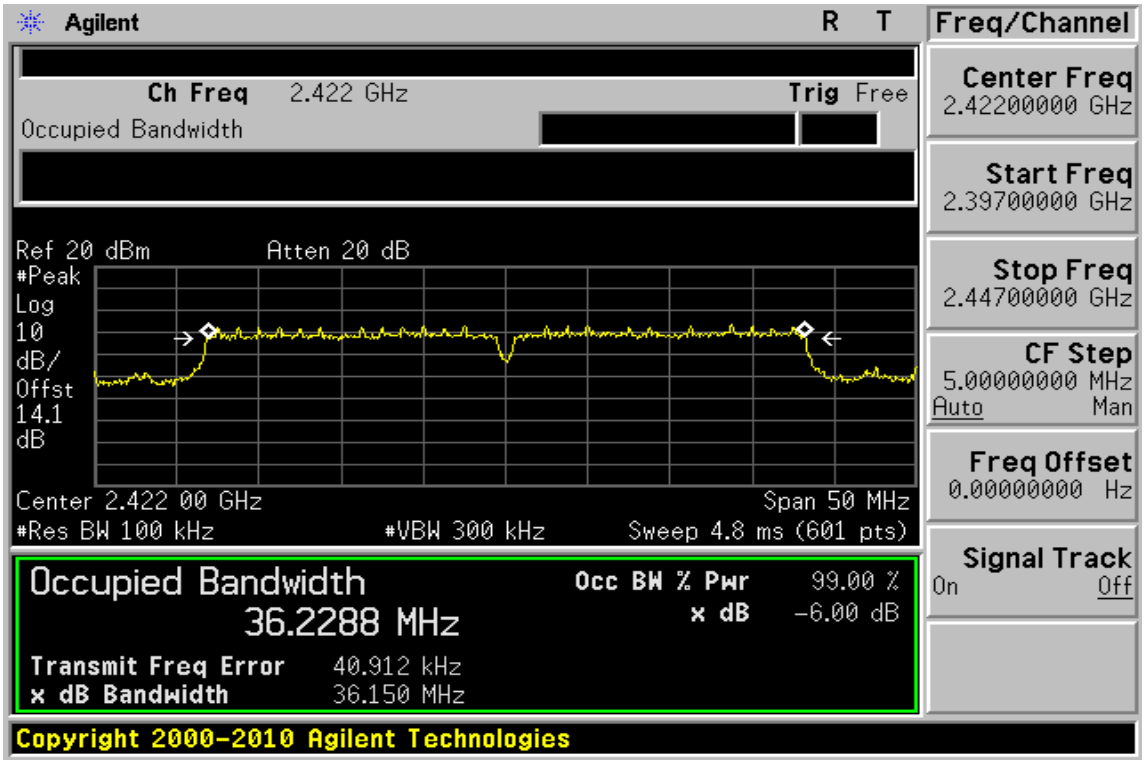


6dB Band Width Test Data CH-High

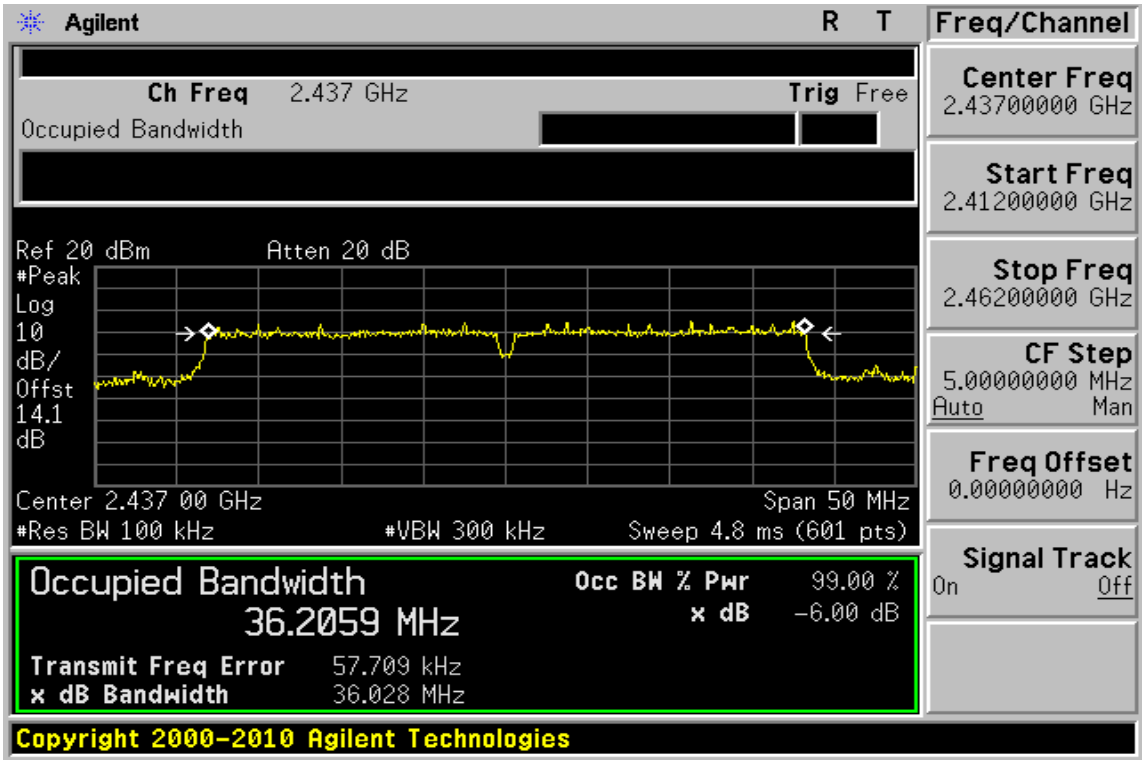


802.11 n_40M (Main)

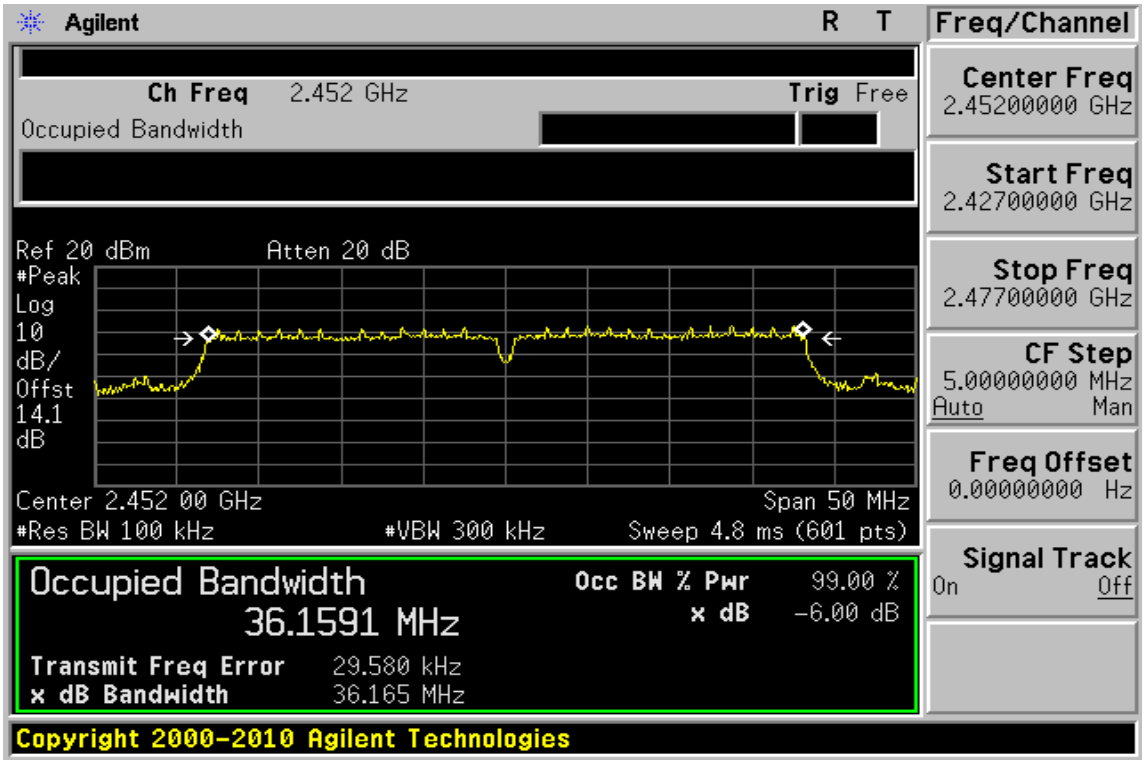
6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid

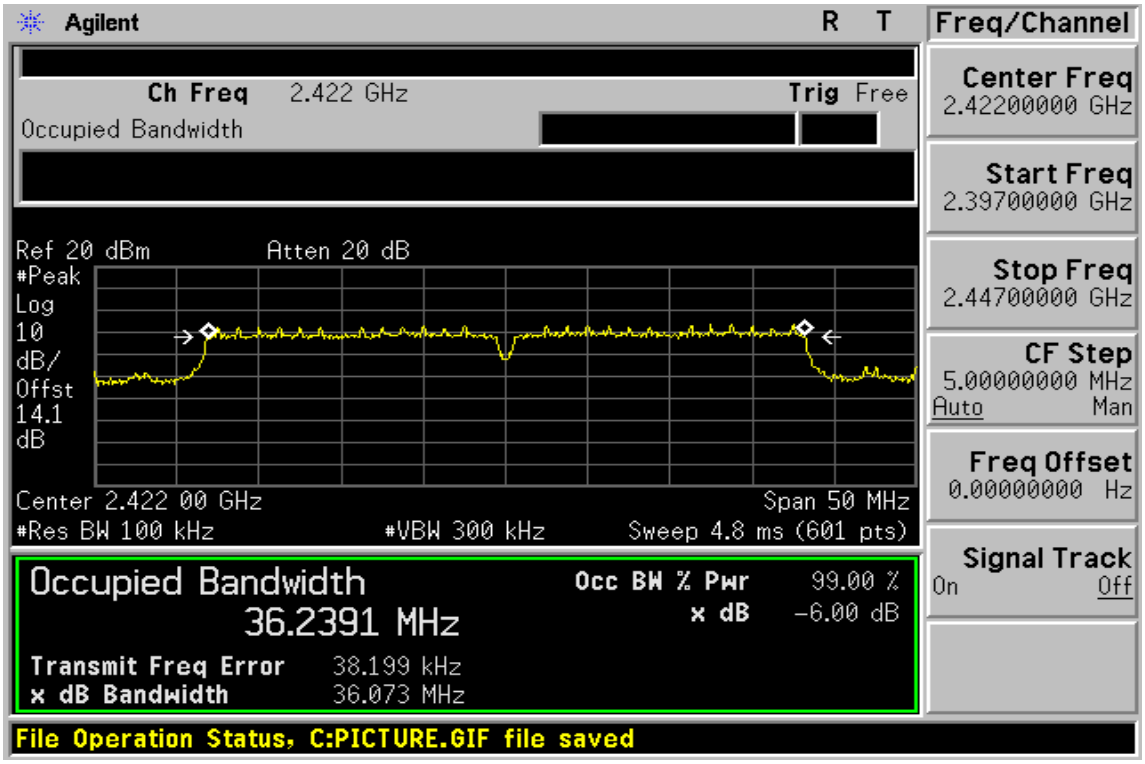


6dB Band Width Test Data CH-High

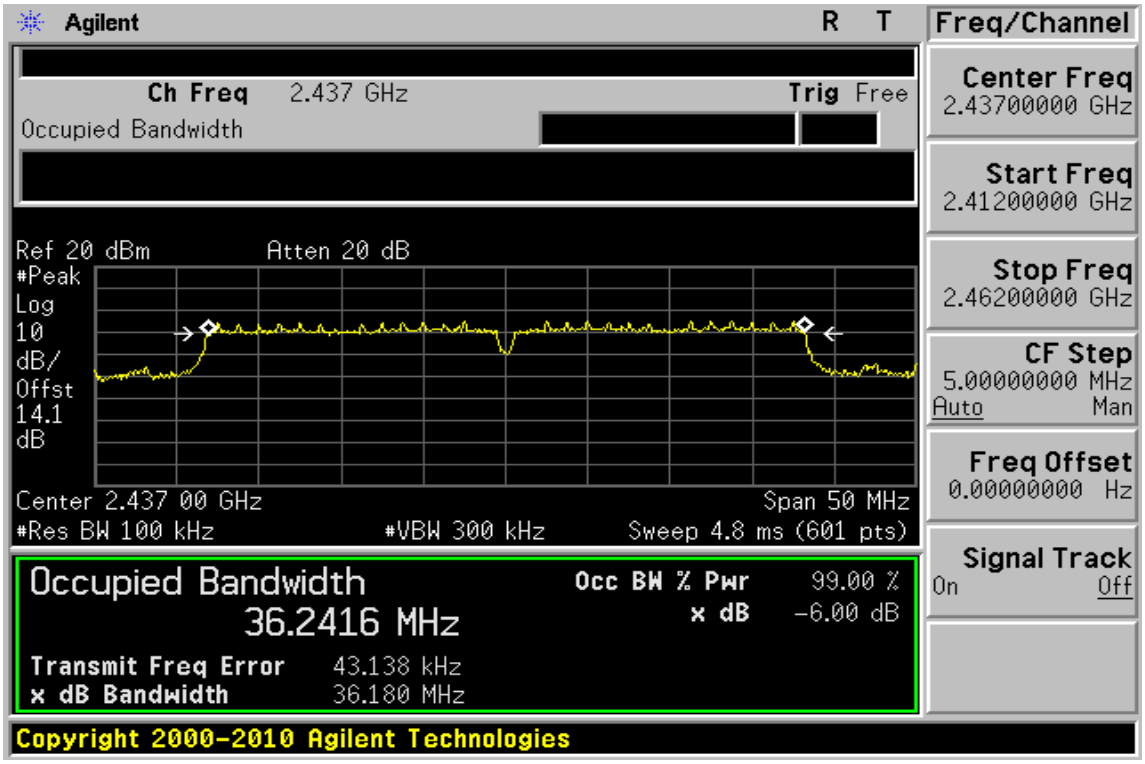


802.11 n_40M (Aux)

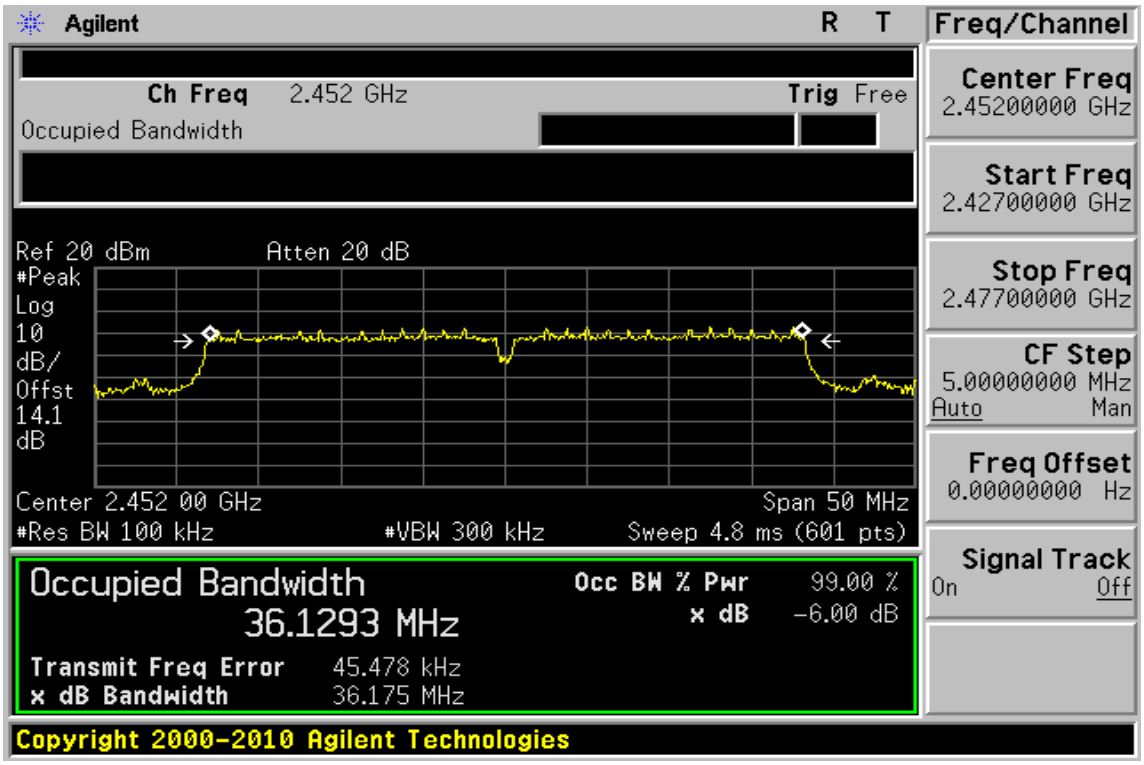
6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid



6dB Band Width Test Data CH-High



10 CONDUCTED BAND EDGES AND SPURIOUS EMISSION MEASUREMENT

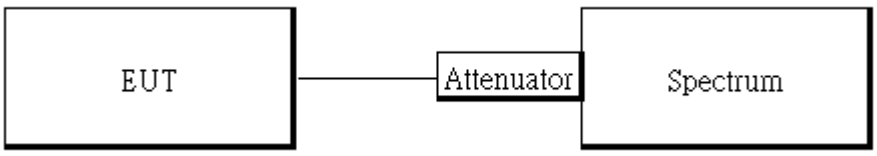
10.1 Standard Applicable

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. 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).

10.2 Measurement Equipment Used

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	Agilent	E4446A	MY51100003	01/29/2015	01/28/2016
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2015	01/01/2016
Attenuator	Mini-Circuit	BW-S10W2+	002	01/02/2015	01/01/2016

10.3 Test SET-UP



10.3.1 Measurement Procedure

Conducted Band Edge:

1. To connect Antenna Port of EUT to Spectrum.
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance V03r03.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
4. Set start to edge frequency, and stop frequency of spectrum analyzer so as to encompass the spectrum to be examined.
5. Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz, Detector = Peak, Sweep = auto
6. Mark the highest reading of the emission as the reference level measurement.
7. Set DL as the limit = reading on marker 1 – 20dBm
8. Marker on frequency, 2.3999GHz and 2.4836GHz, and examine shall 100 kHz immediately outside the authorized (2400~2483.5) be attenuated by 20dB at least relative to the maximum emission of power.
9. 802.11n MIMO mode: offset is set following "measure and add 10 Log (N)" on spectrum to measure for MIMO mode. Offset = cable loss + 10 log (N), where N is number of transmitting antenna. N=2 for this given application.
10. Repeat above procedures until all default test channel (low, middle, and high) was complete.

Conducted Spurious Emission:

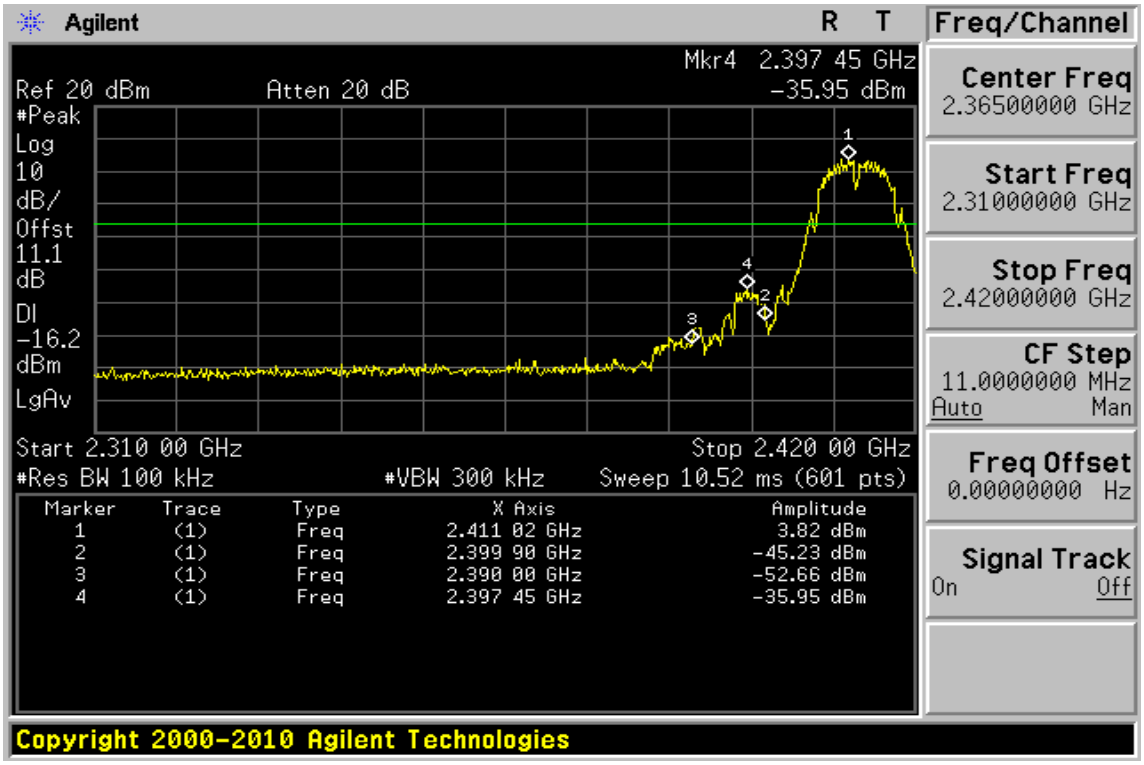
1. To connect Antenna Port of EUT to Spectrum
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance V03r03.
3. Set RBW = 100 kHz & VBW = 300 kHz, Detector =Peak, Sweep = Auto.
4. Allow trace to fully stabilize.
5. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
6. 802.11n MIMO mode: offset is set following "measure and add 10 Log (N)" on spectrum to measure for MIMO mode. Offset = cable loss + 10 log (N), where N is number of transmitting antenna. N=2 for this given application.
7. Repeat above procedures until all default test channel measured were complete.

10.4 Measurement Result

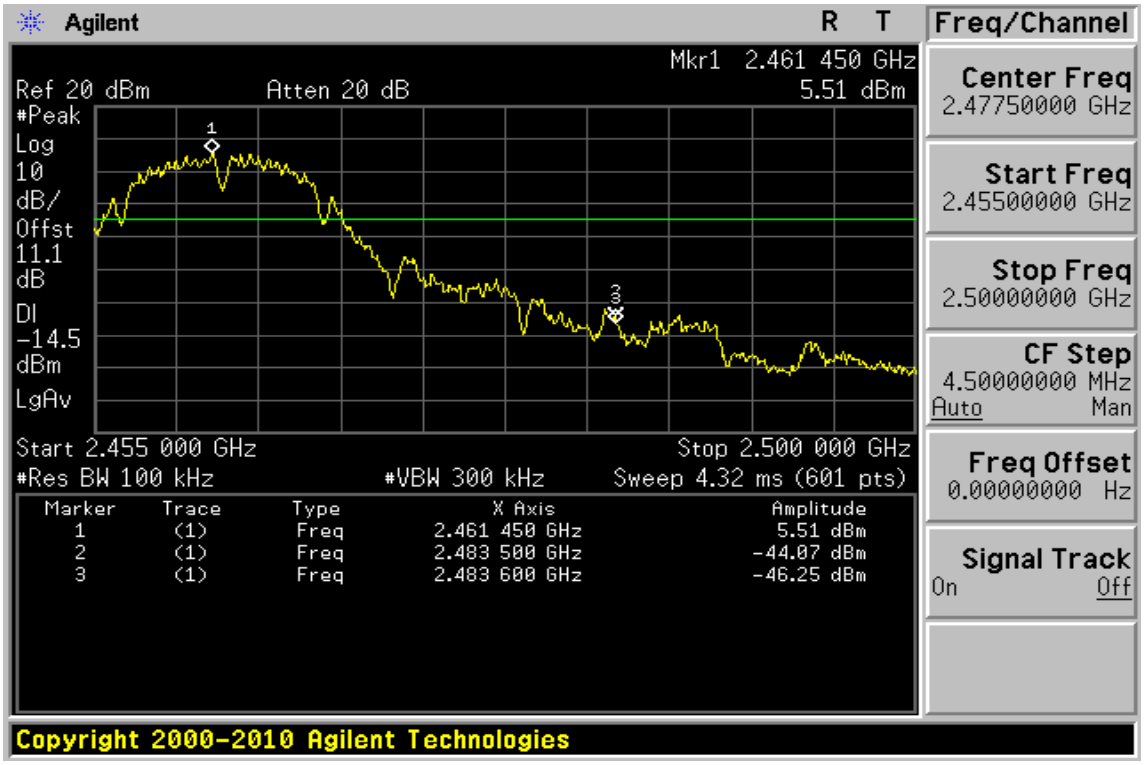
Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

802.11b

Band Edges Test Data CH-Low

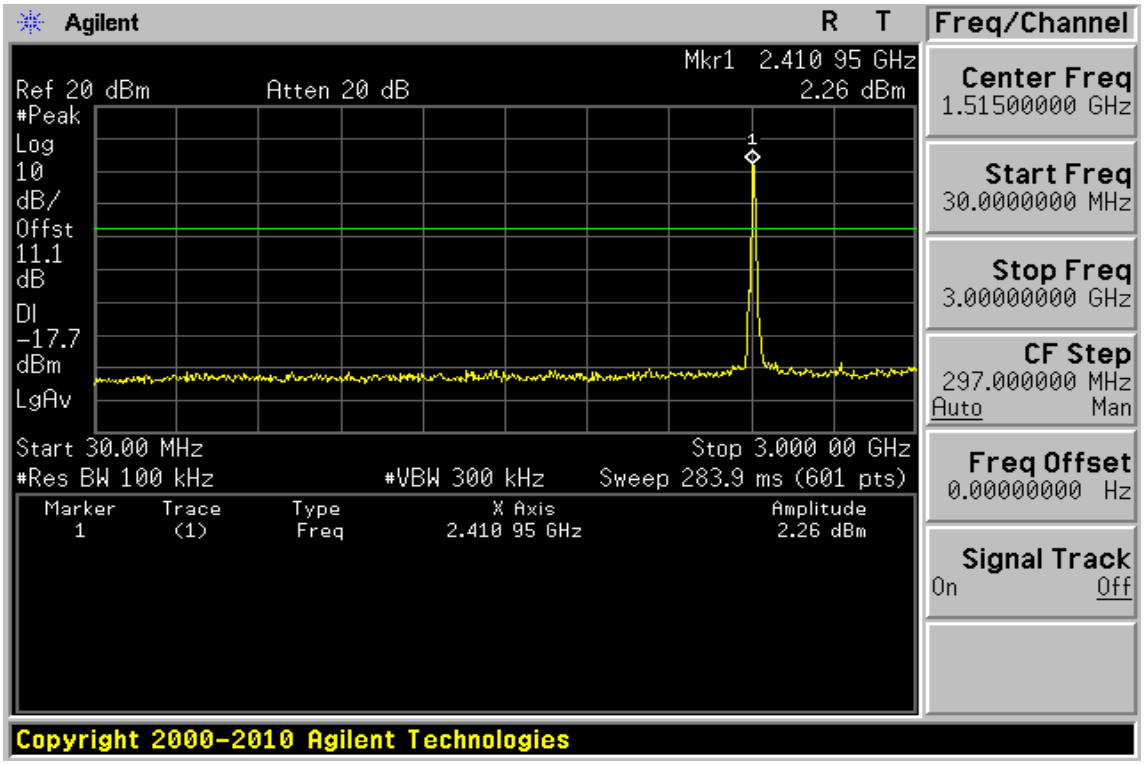


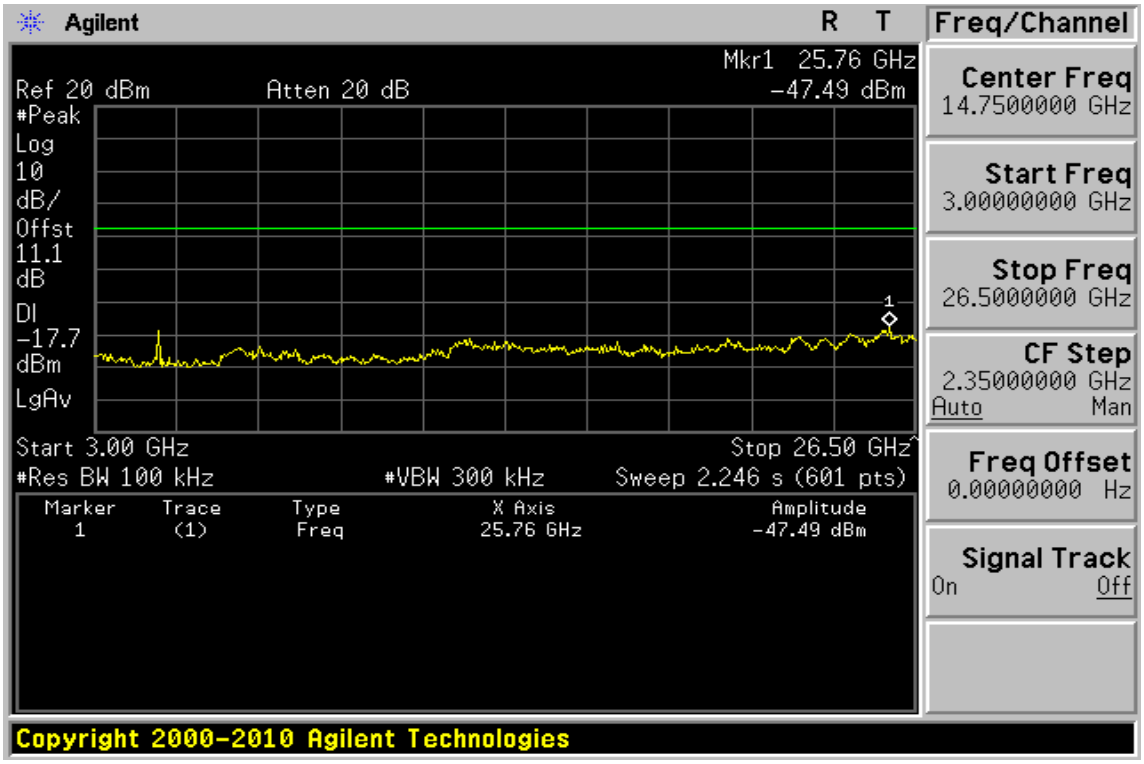
Band Edges Test Data CH-High



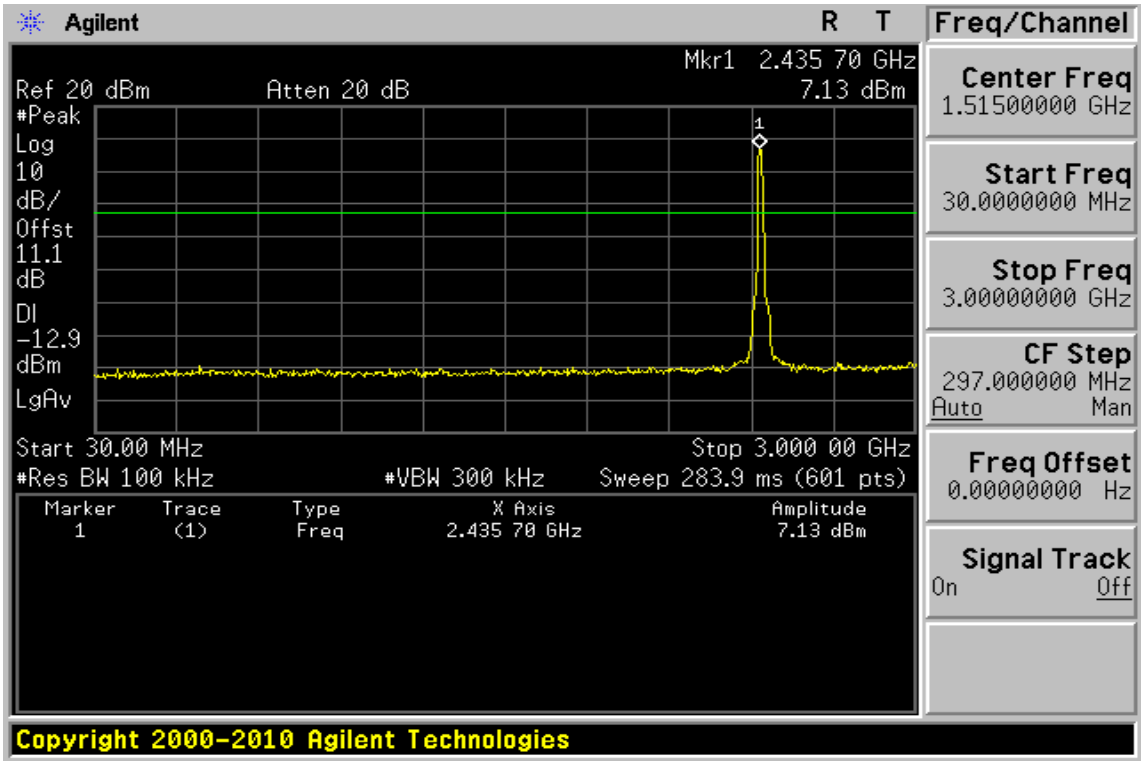
802.11b

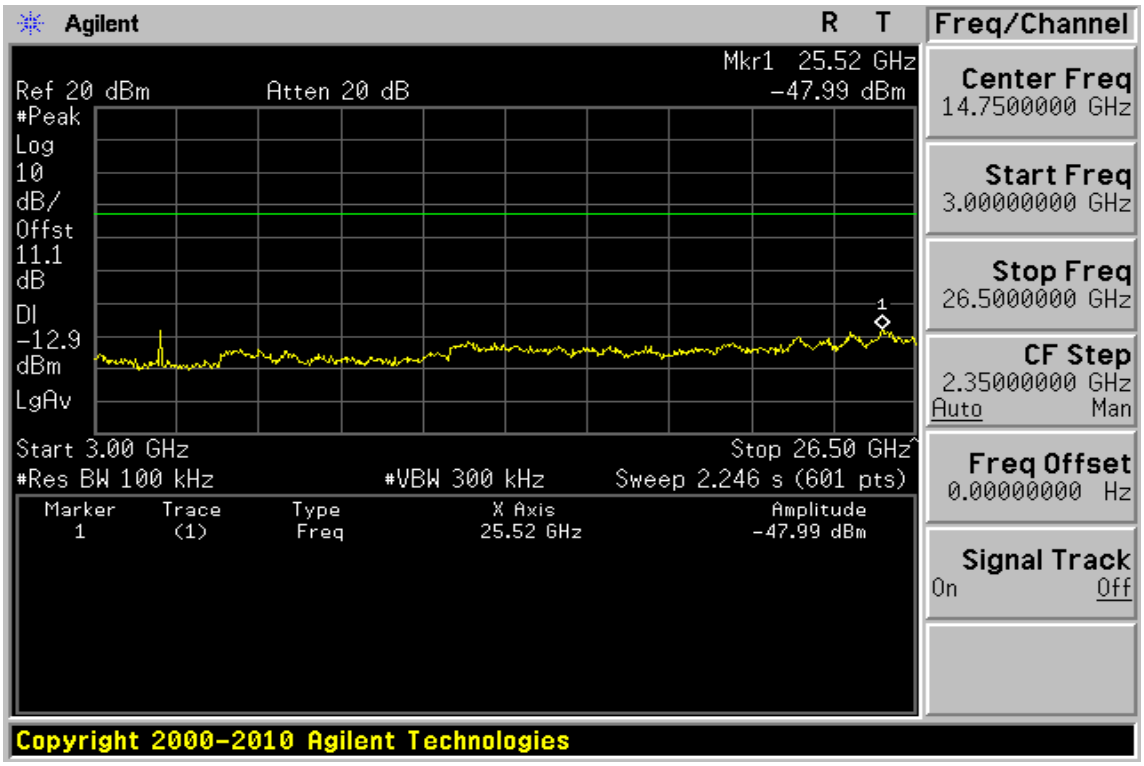
Spurious Emission Test Data CH-Low



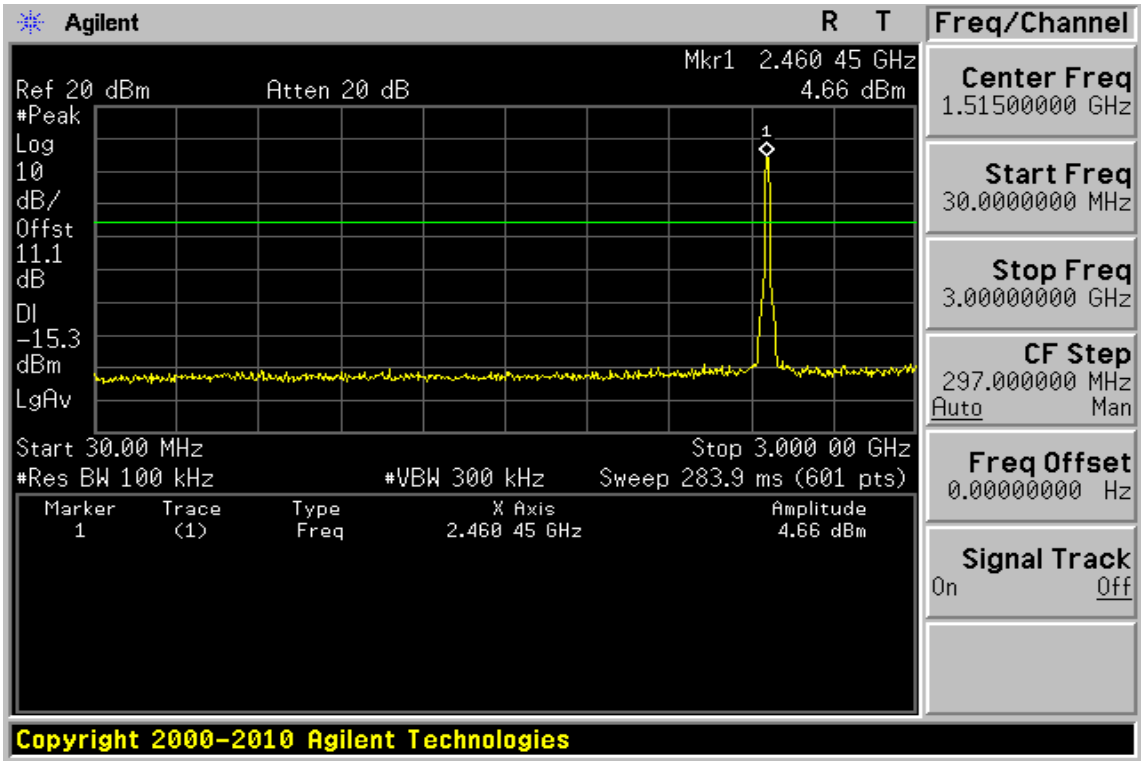


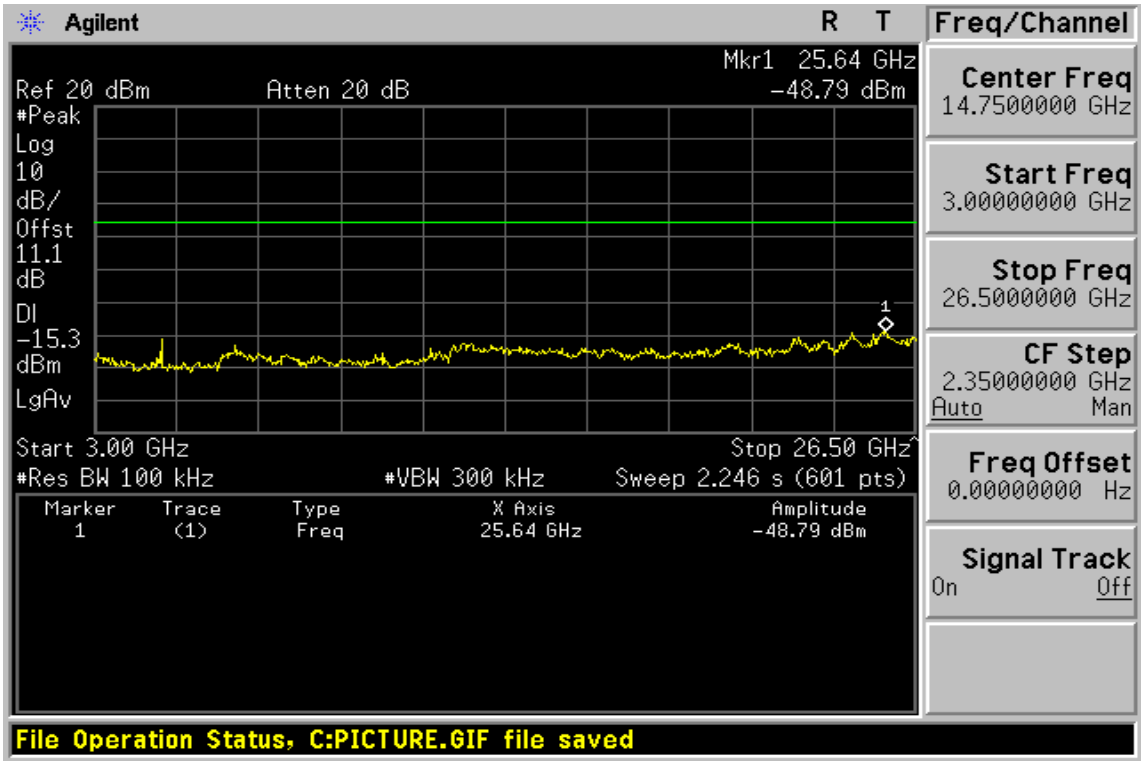
Spurious Emission Test Data CH-Mid





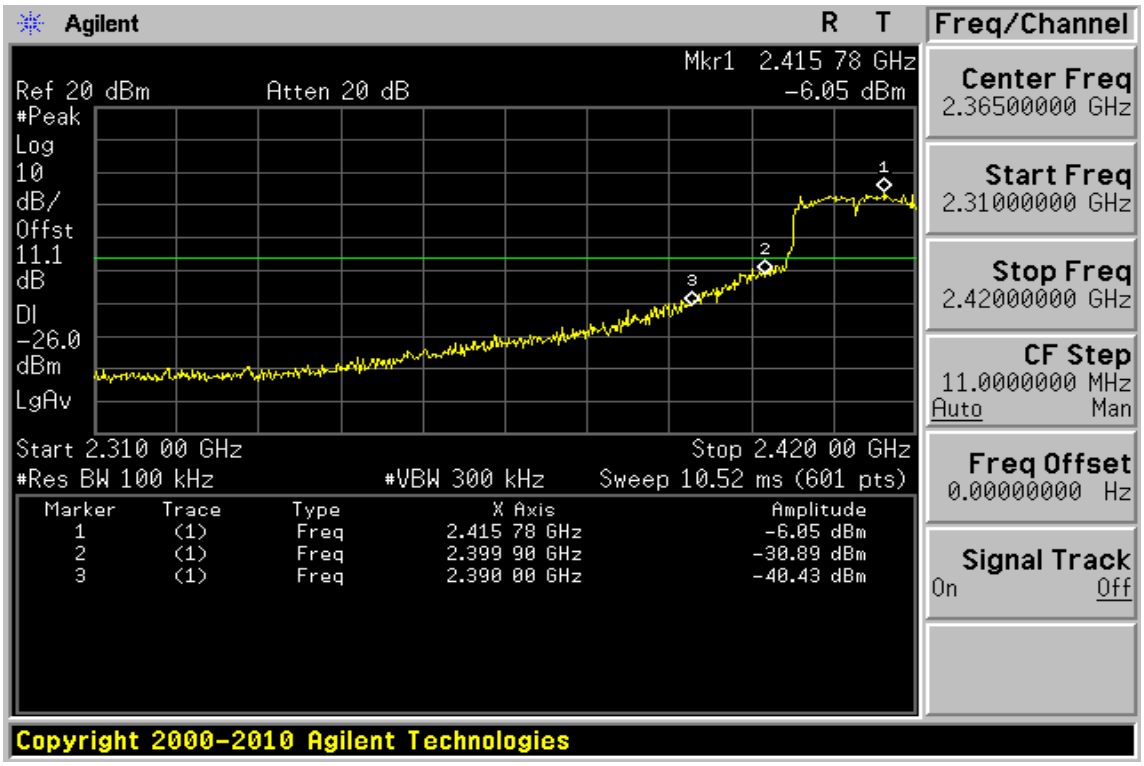
Spurious Emission Test Data CH-High



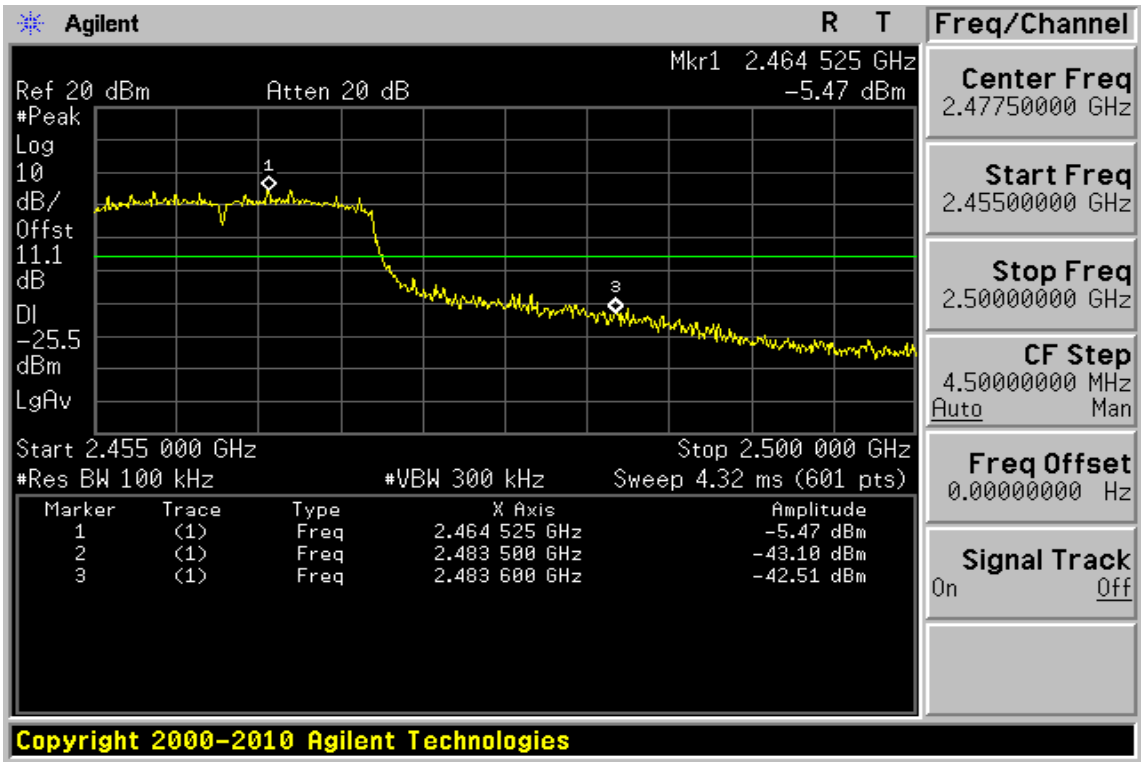


802.11g

Band Edges Test Data CH-Low

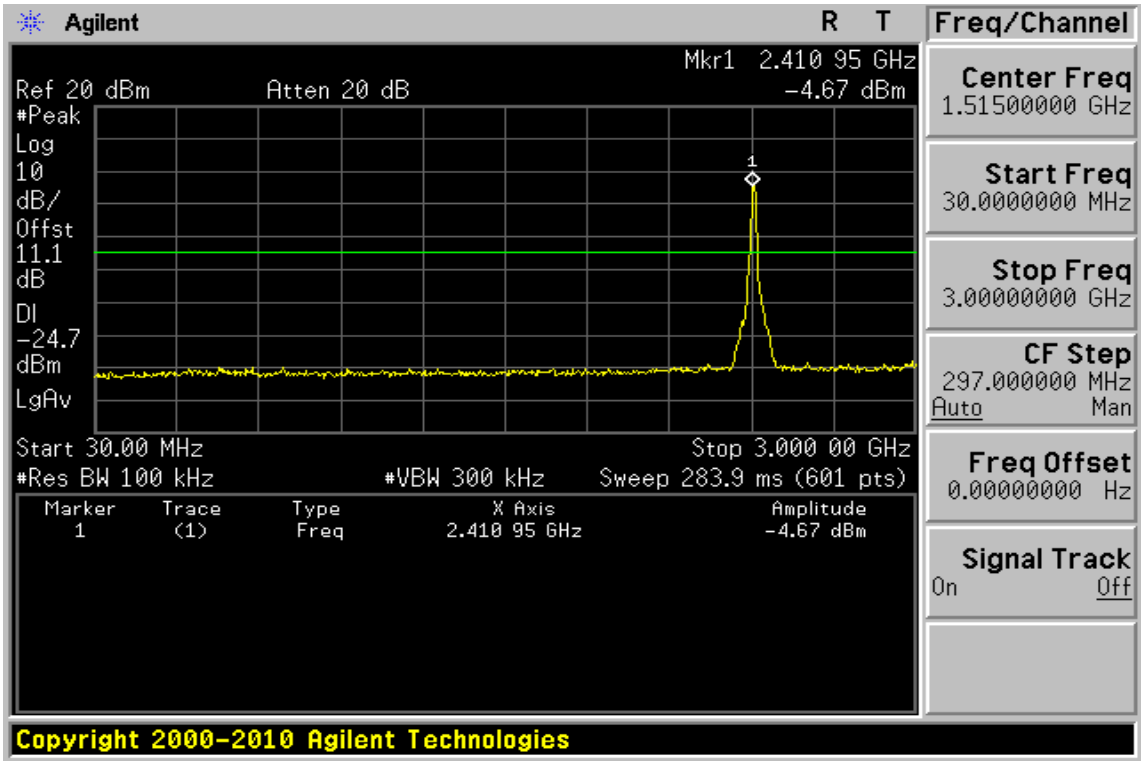


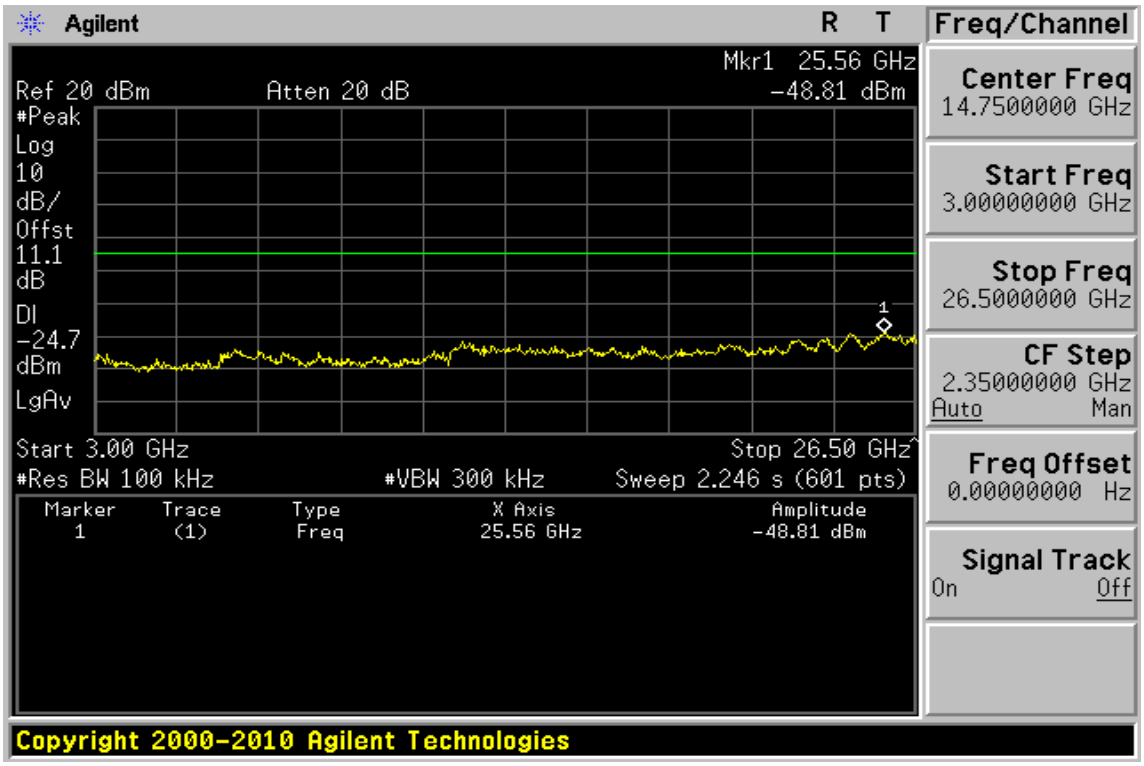
Band Edges Test Data CH-High



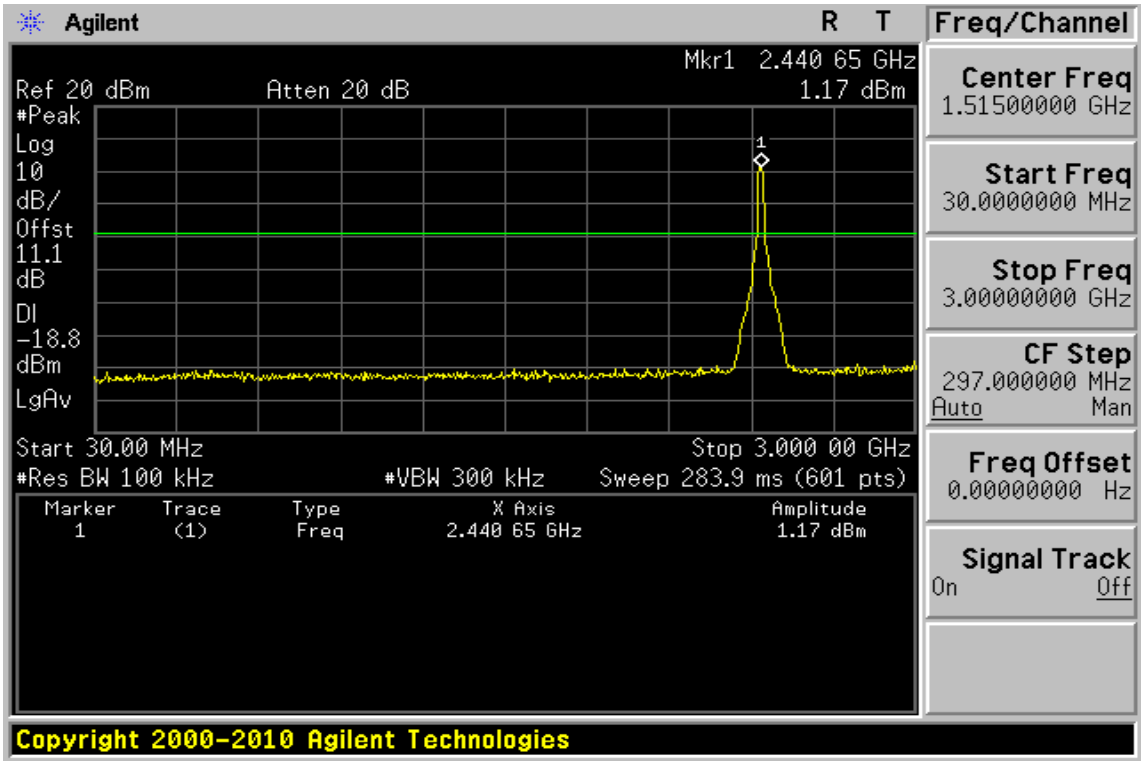
802.11g

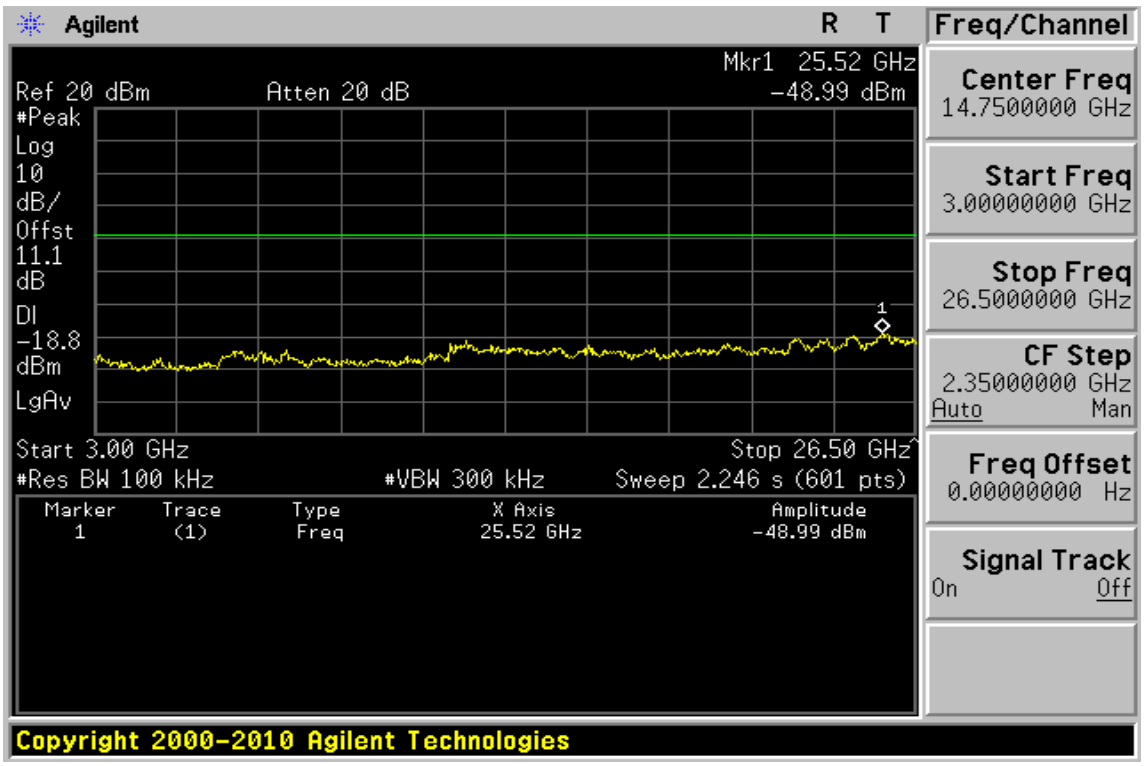
Spurious Emission Test Data CH-Low



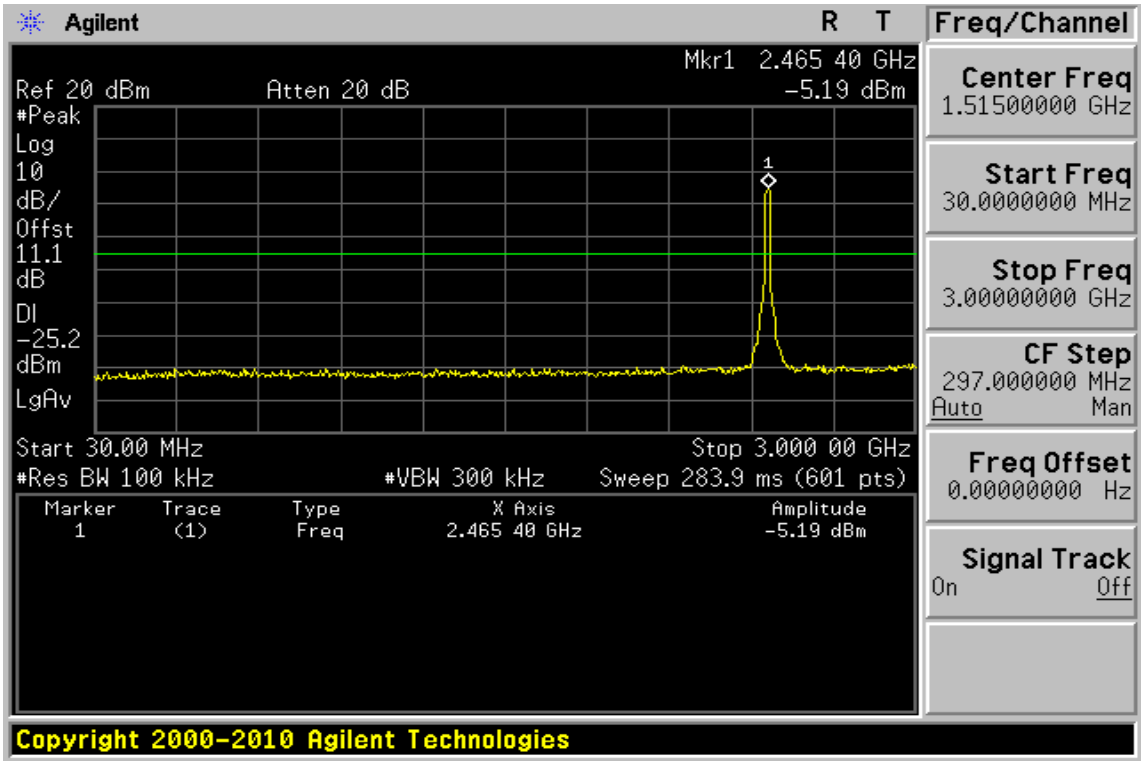


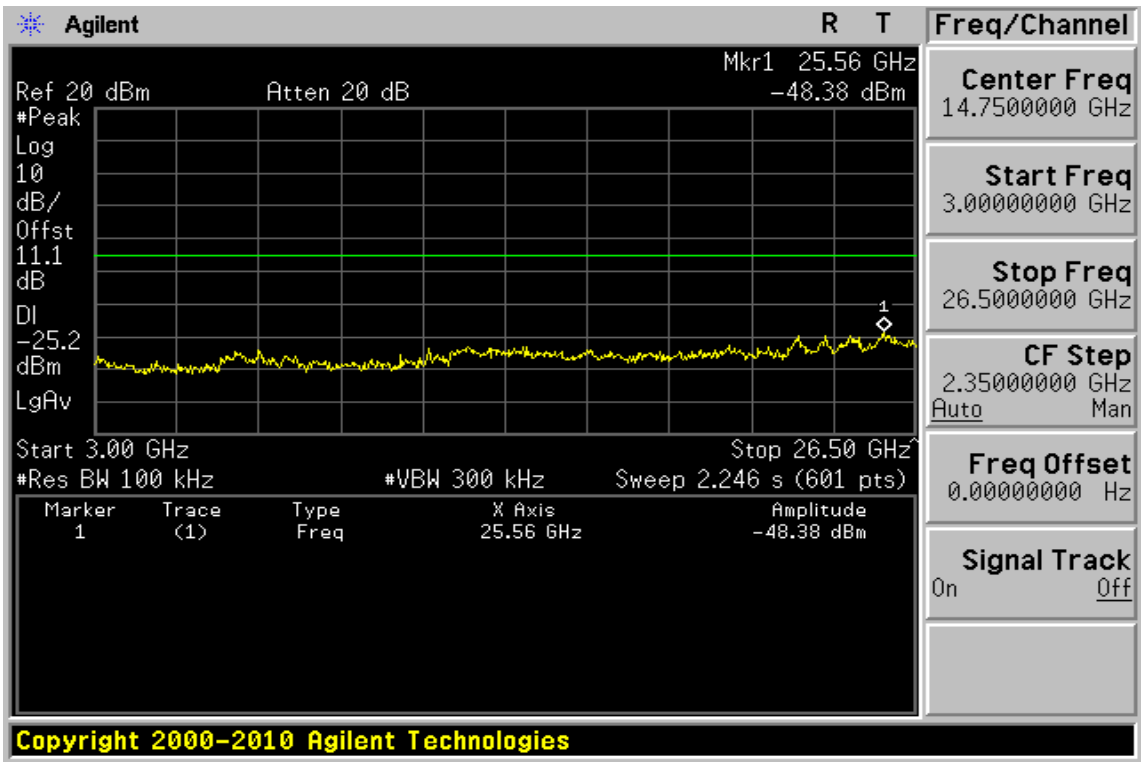
Spurious Emission Test Data CH-Mid





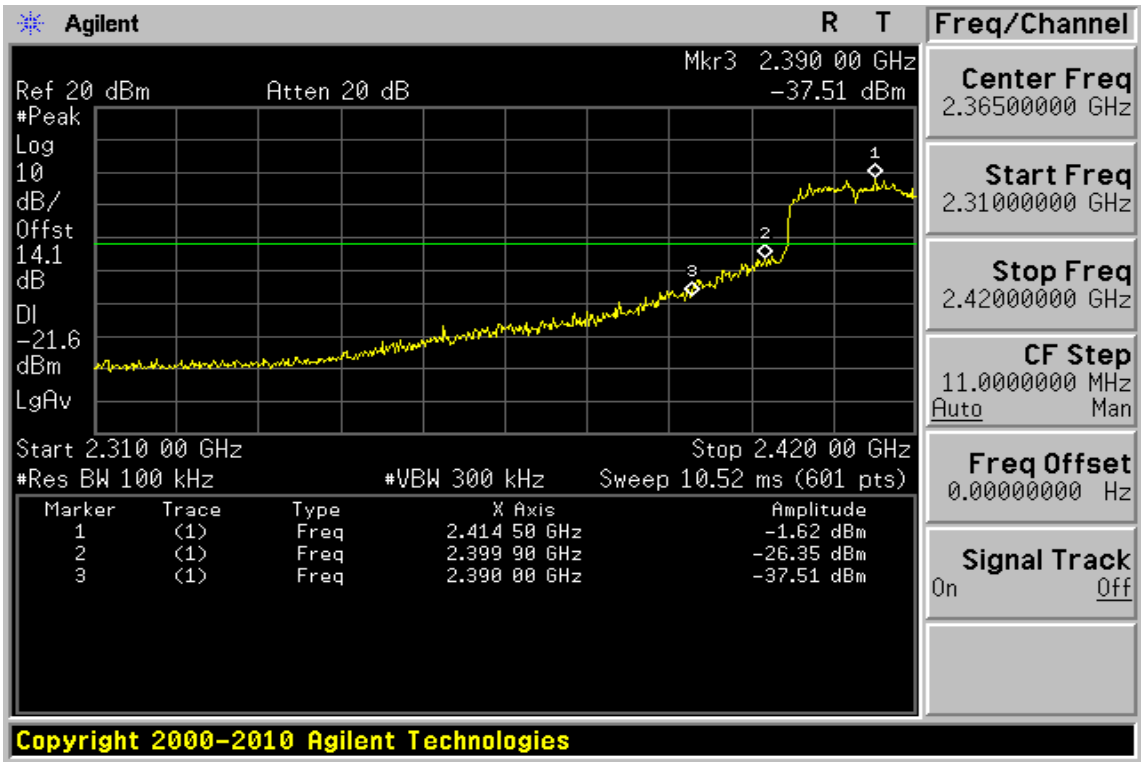
Spurious Emission Test Data CH-High



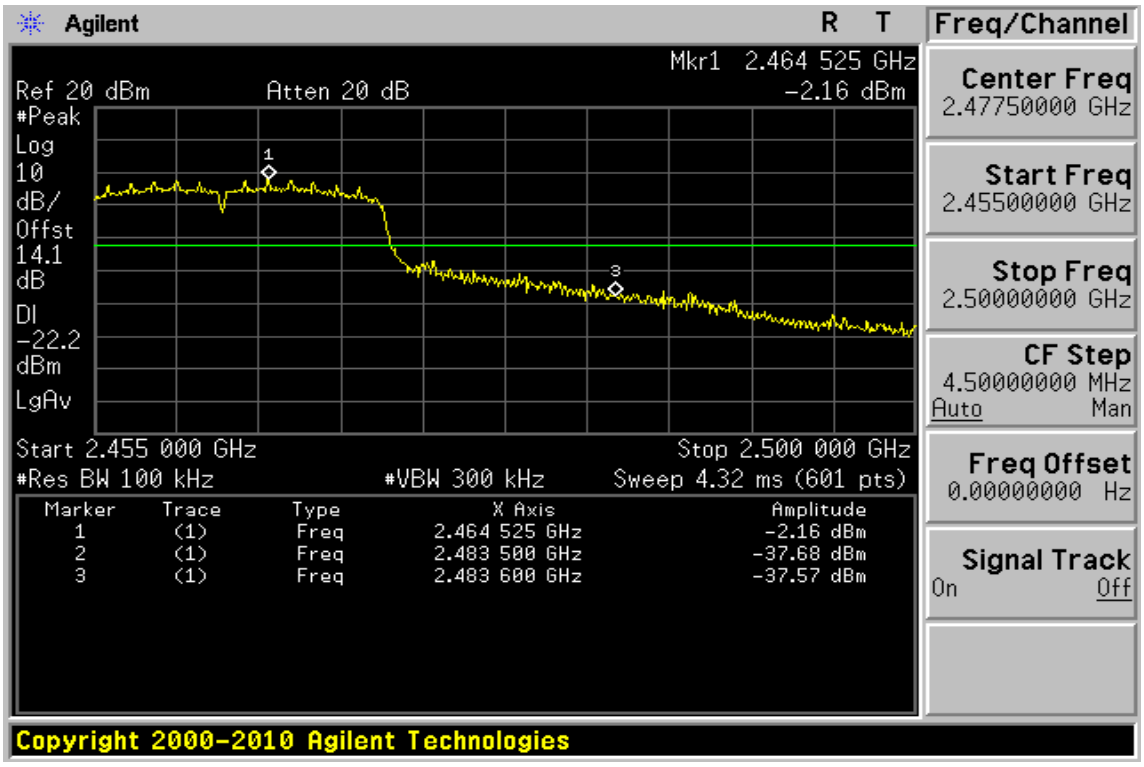


802.11n_HT20 (MIMO)

Band Edges Test Data CH-Low

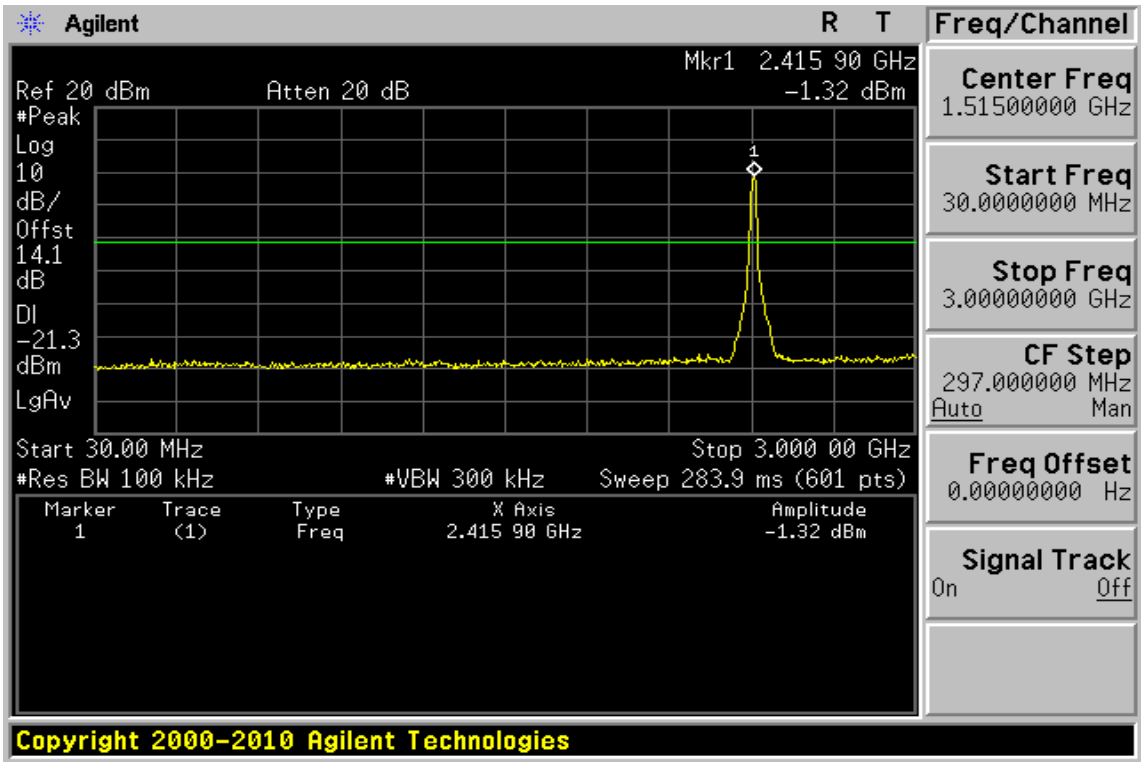


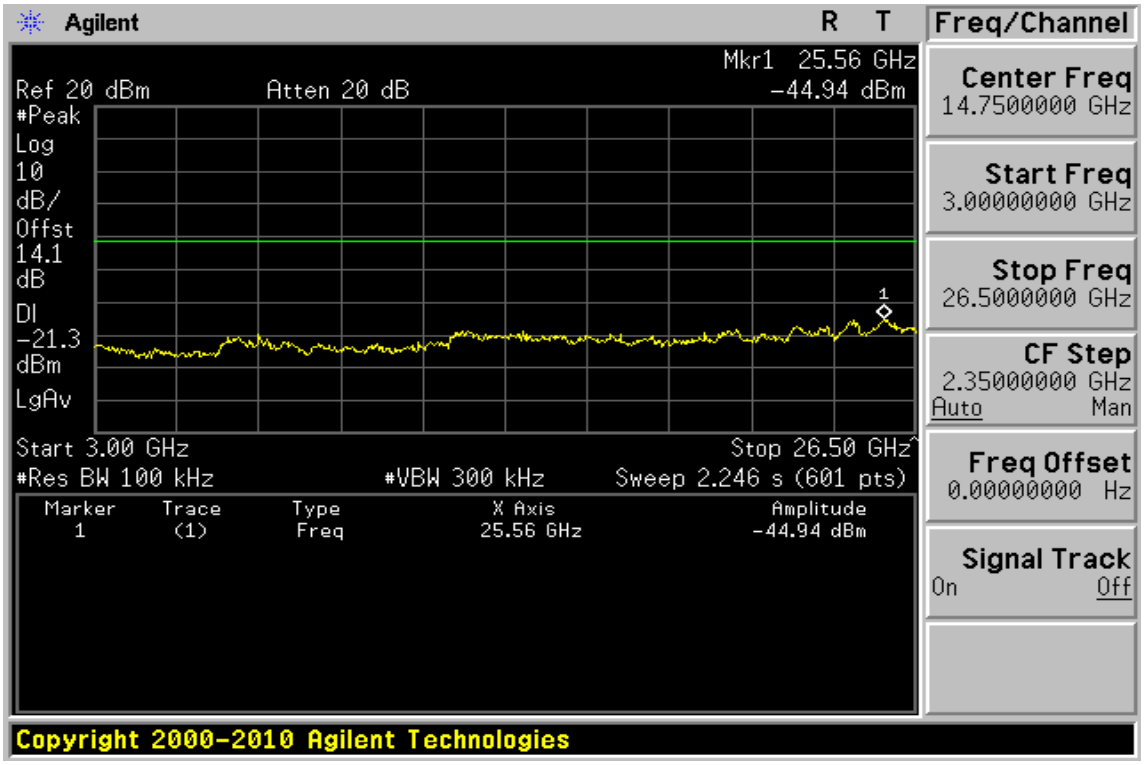
Band Edges Test Data CH-High



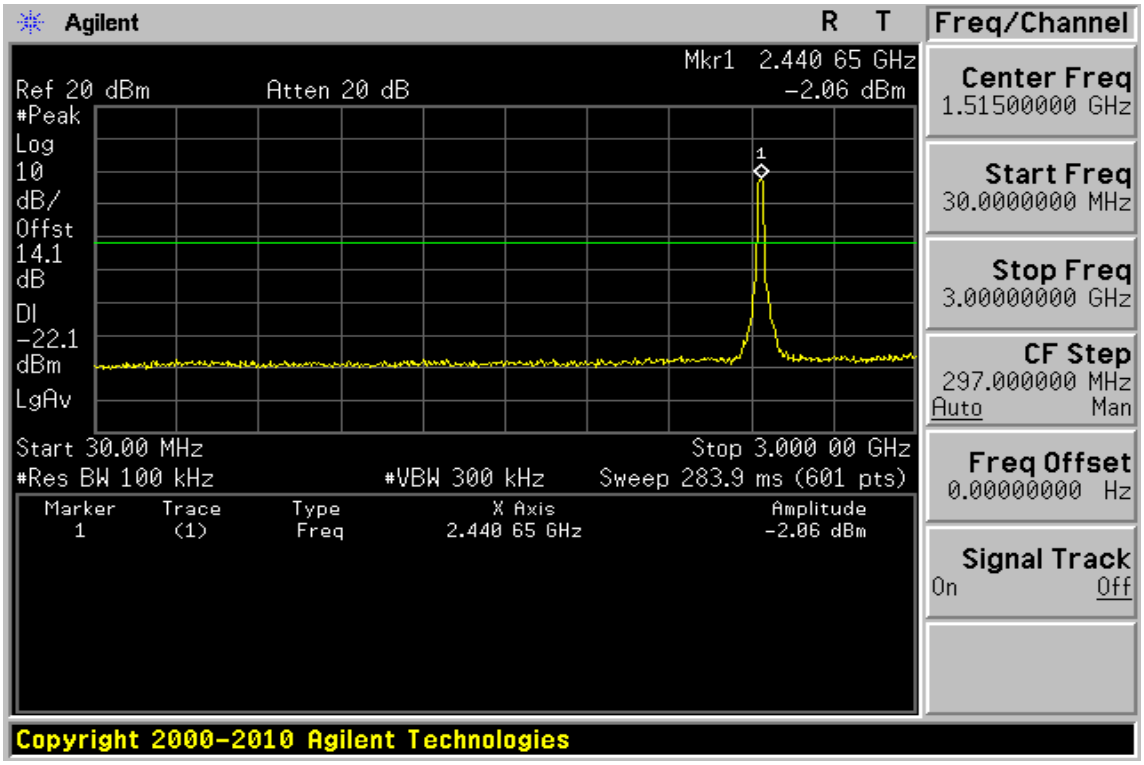
802.11n_HT20 (MIMO)

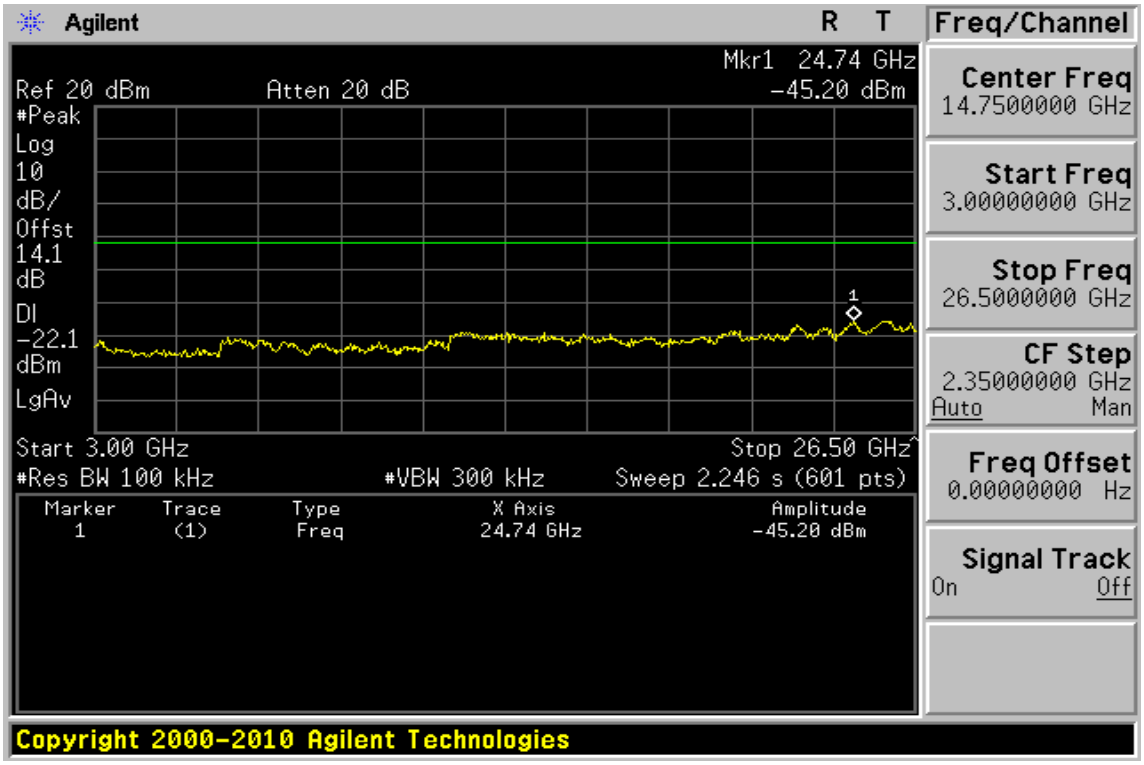
Spurious Emission Test Data CH-Low



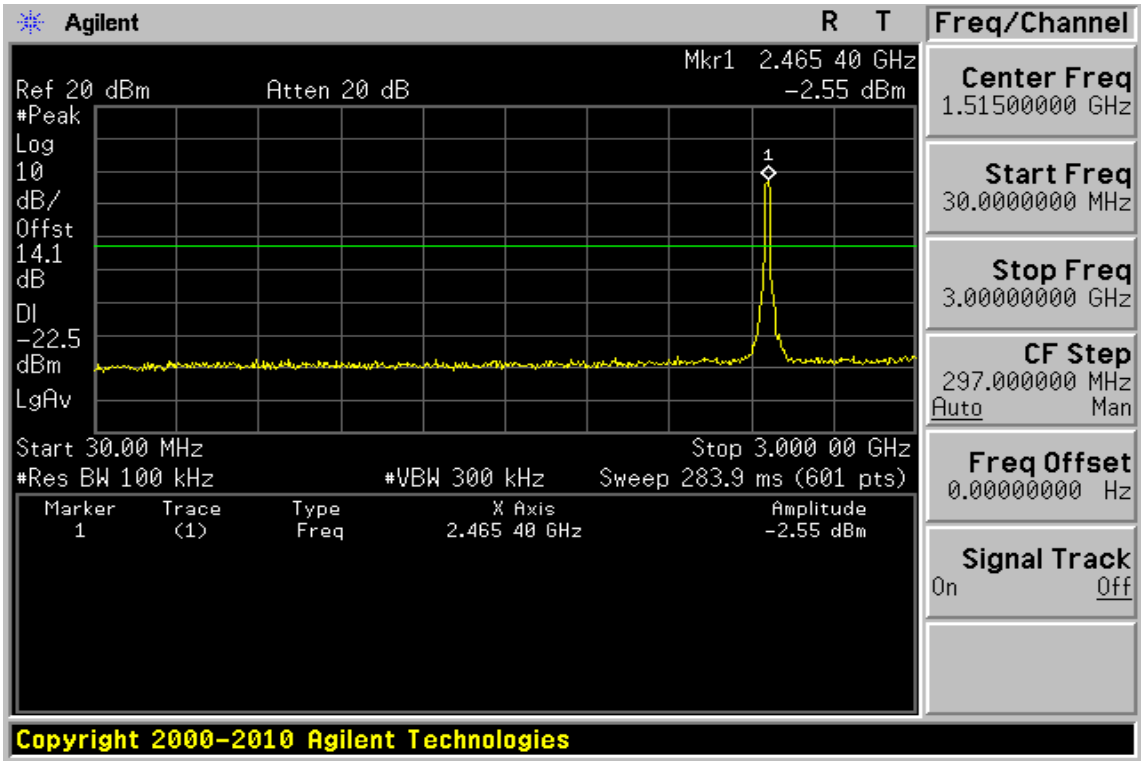


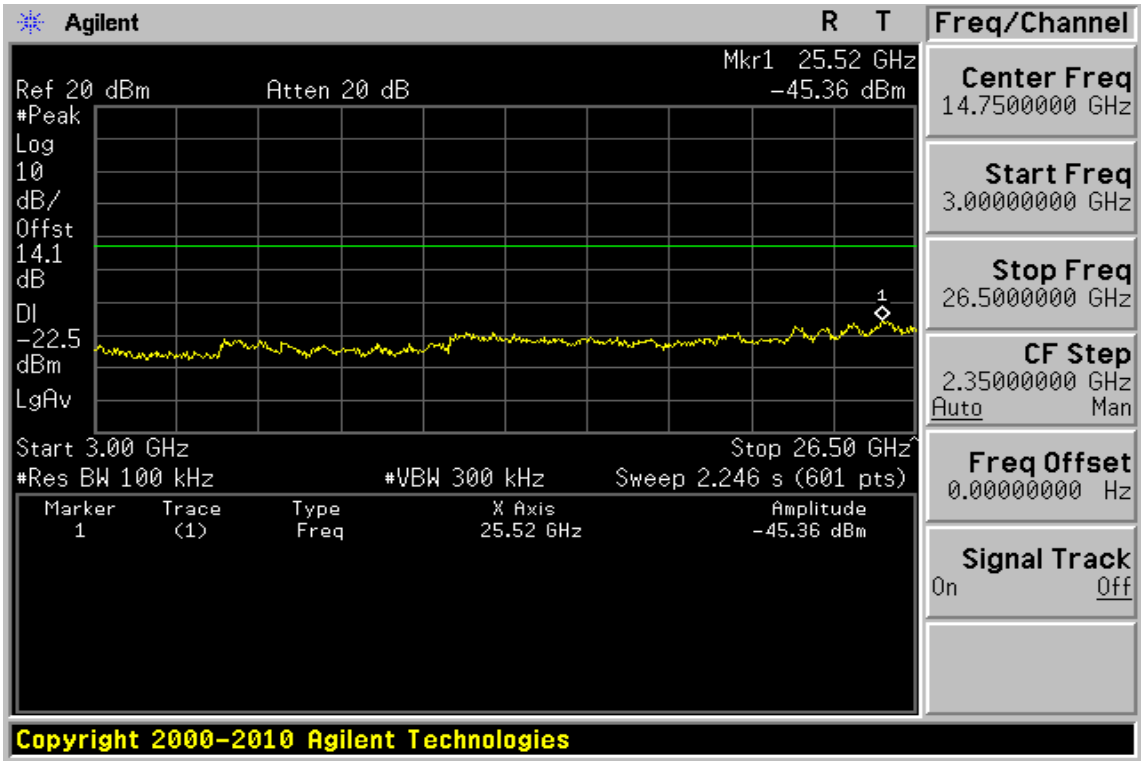
Spurious Emission Test Data CH-Mid





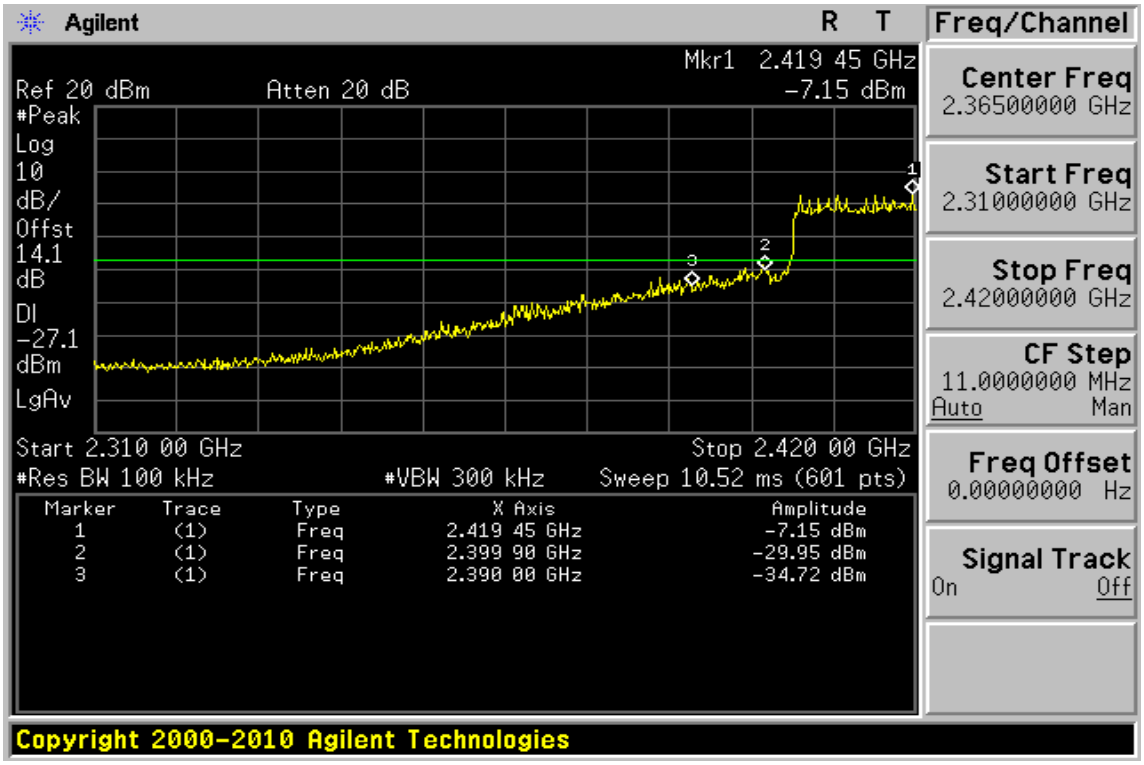
Spurious Emission Test Data CH-High



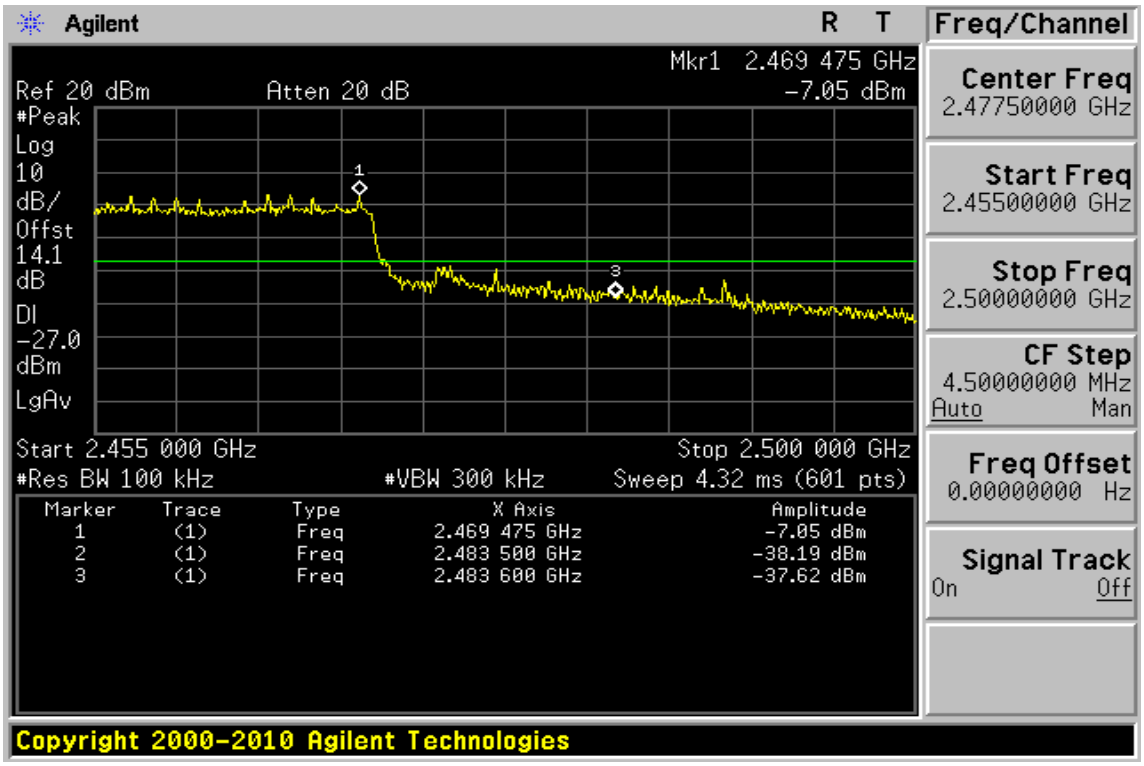


802.11n_HT40 (MIMO)

Band Edges Test Data CH-Low

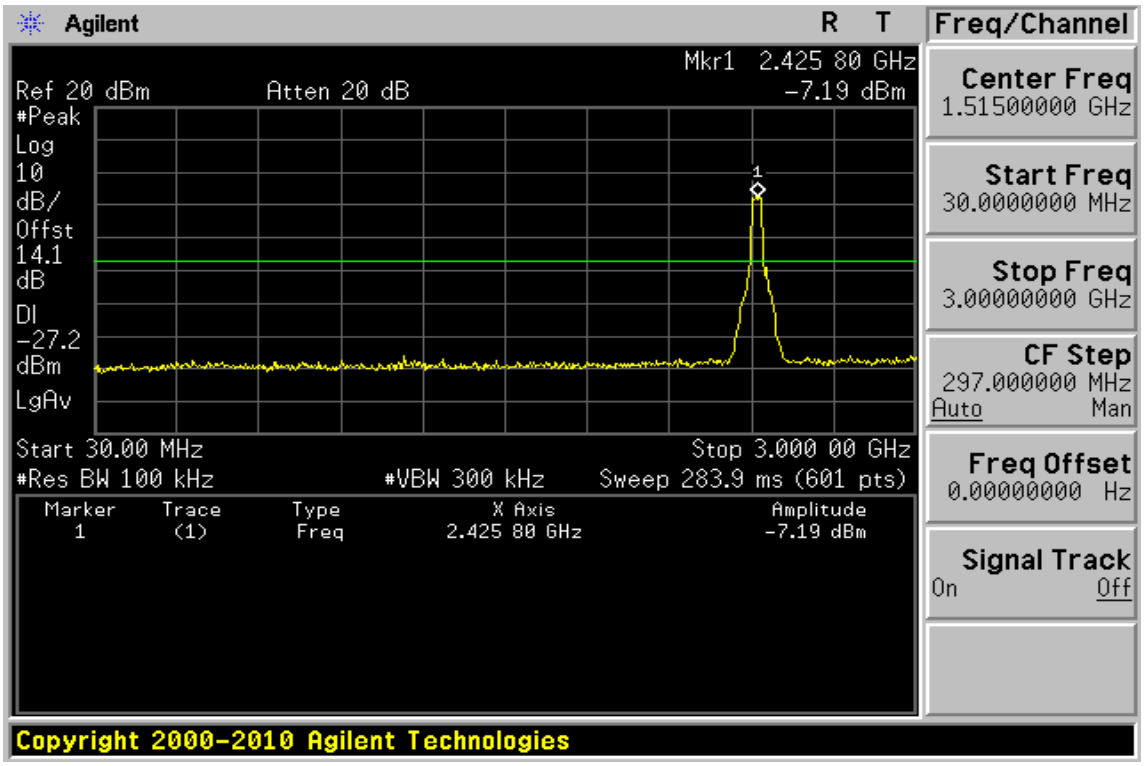


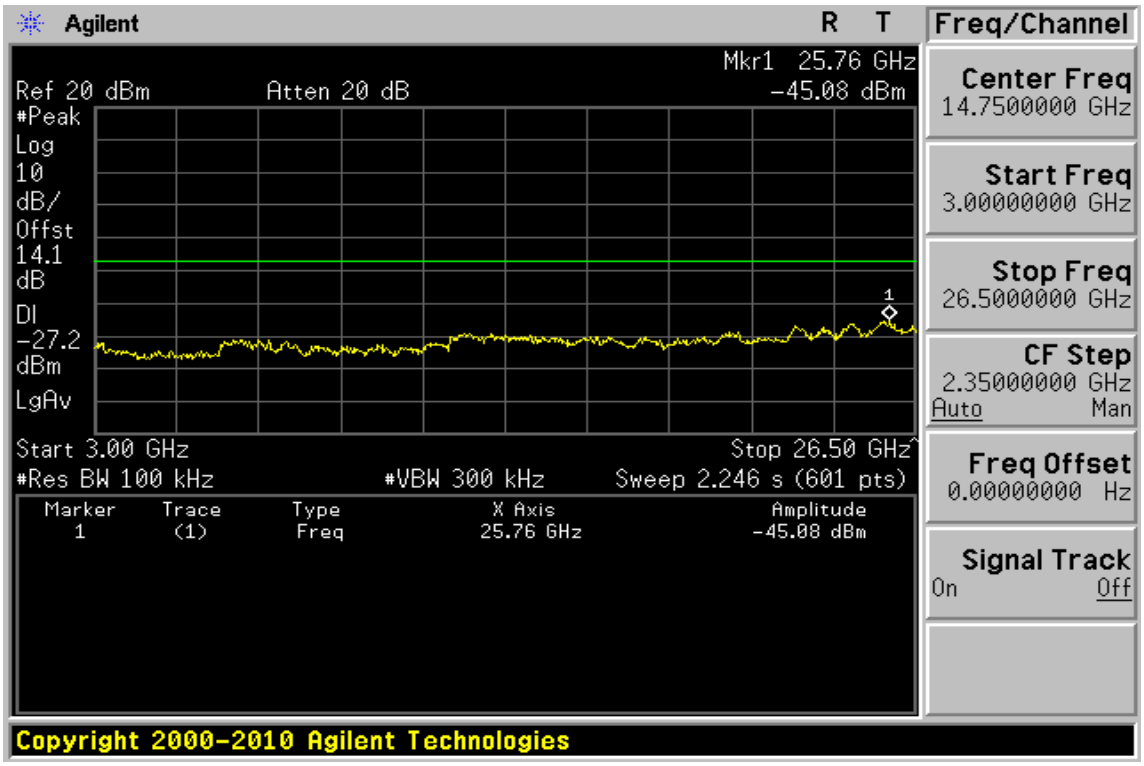
Band Edges Test Data CH-High



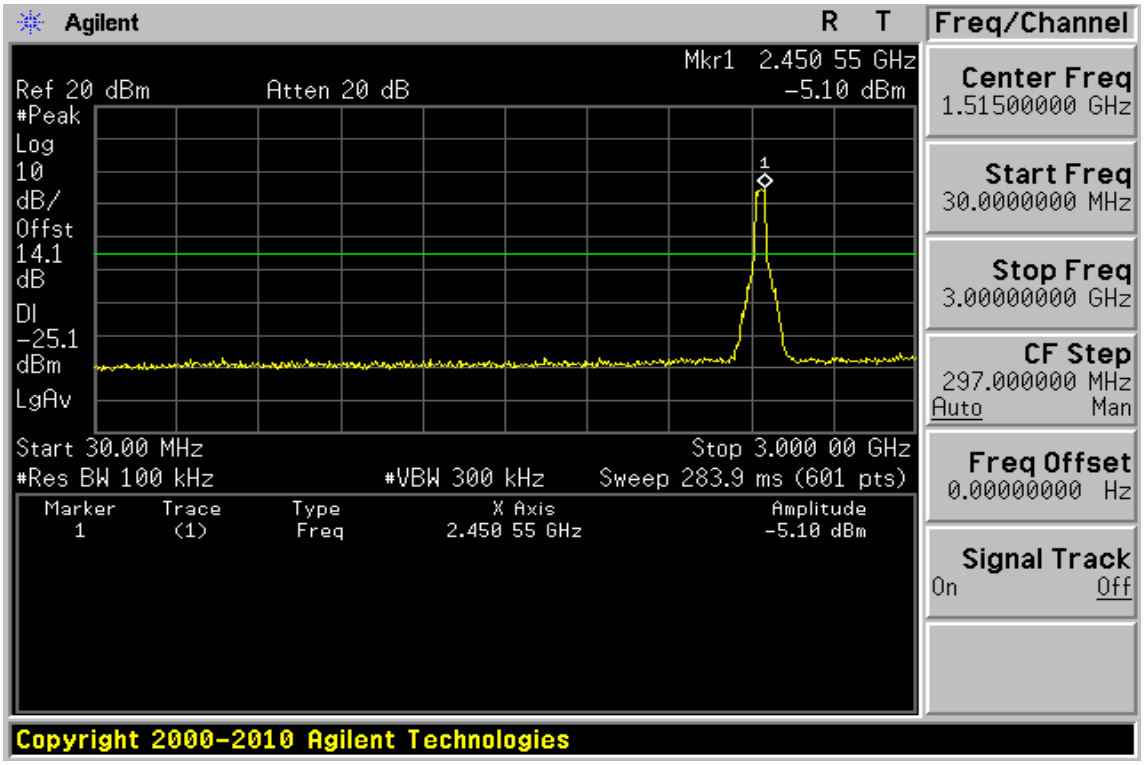
802.11n_HT40 (MIMO)

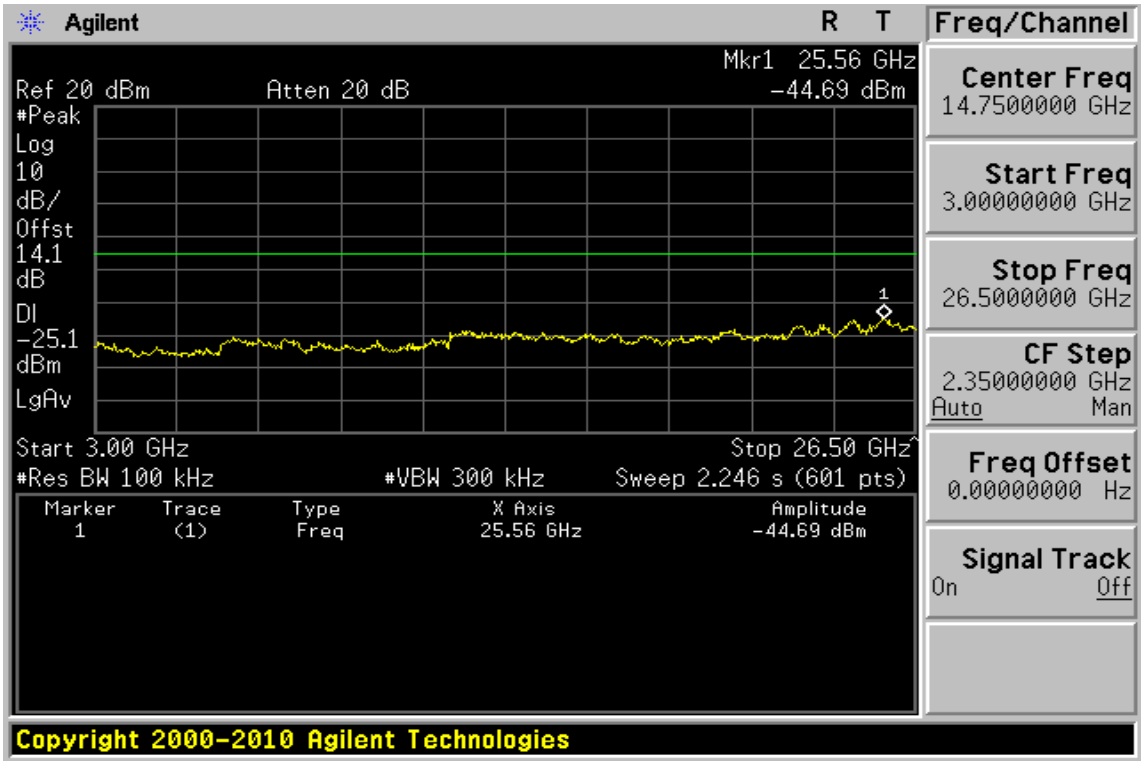
Spurious Emission Test Data CH-Low



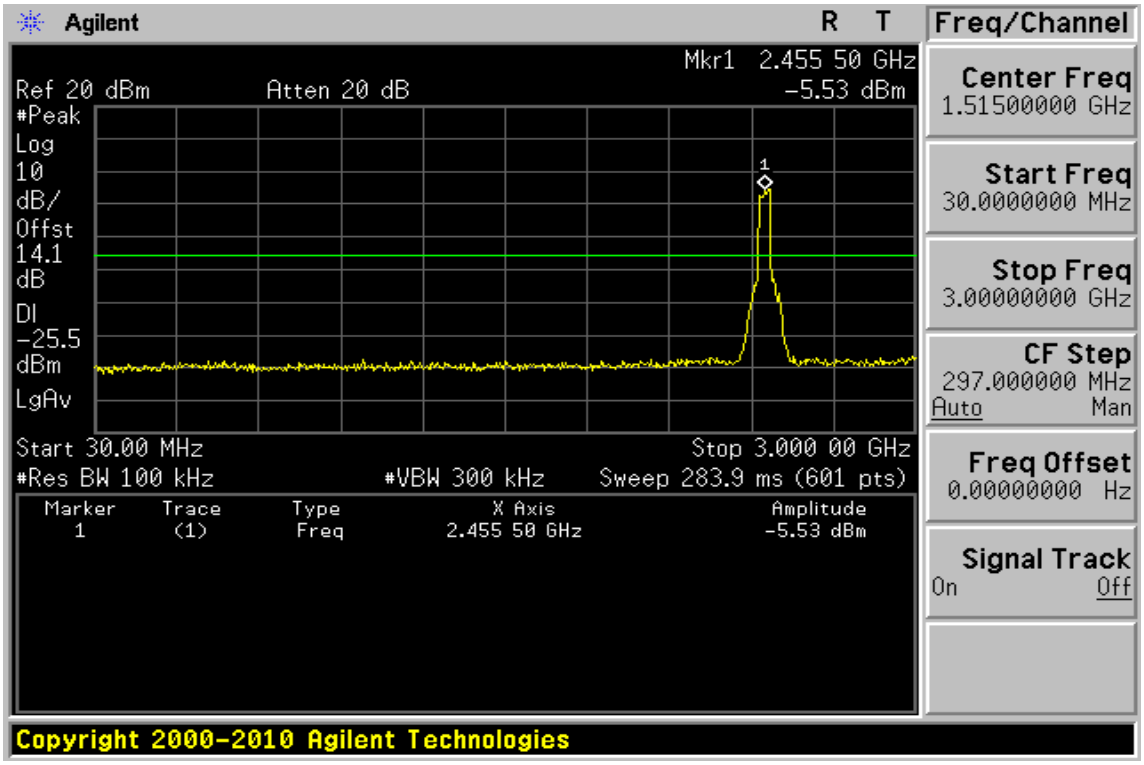


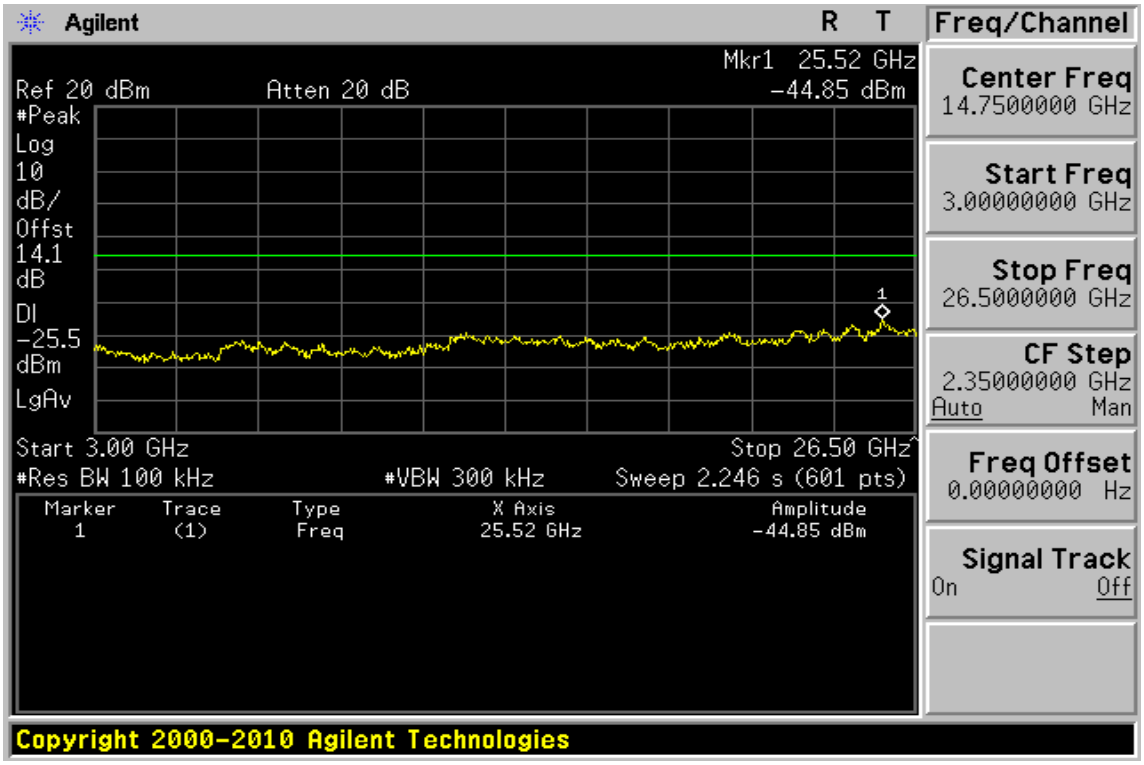
Spurious Emission Test Data CH-Mid





Spurious Emission Test Data CH-High





11 RADIATED BANDEDGE AND SPURIOUS EMISSION MEASUREMENT

11.1 Standard Applicable

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. In addition, radiated emissions which fall in the restricted bands must also comply with the §15.209 limit as below.

And according to §15.33(a) (1), for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

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:

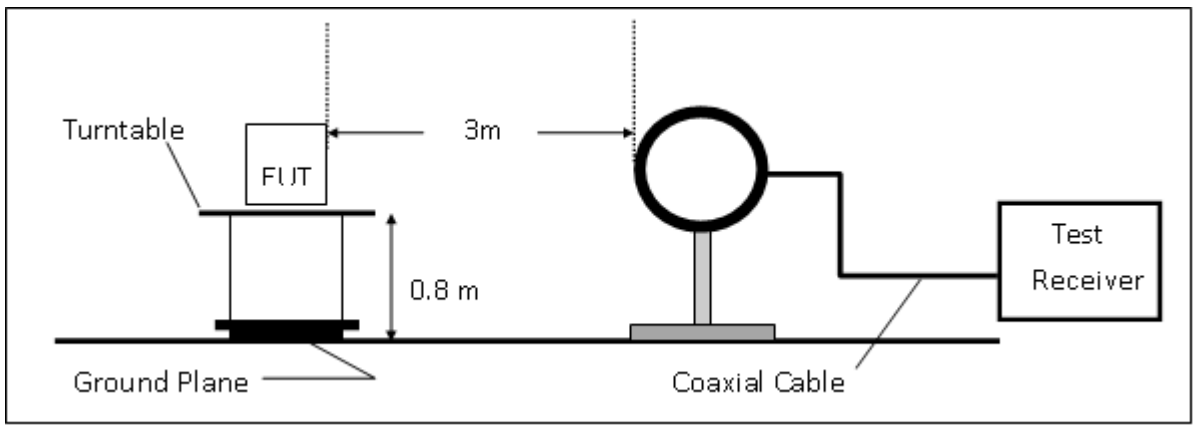
1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBμV/m) = 20 log Emission level (dBμV/m)

11.2 Measurement Equipment Used:

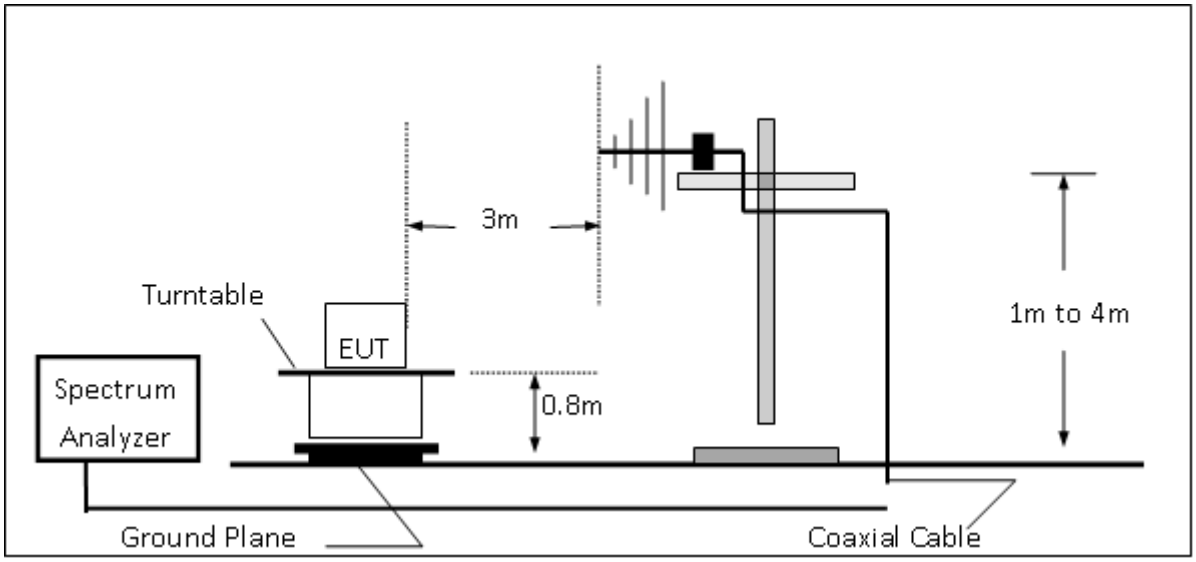
966 Chamber					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	R&S	ESCI7	100760	05/04/2015	05/03/2016
EXA Spectrum Analyzer	Agilent	N9010A	MY50420195	12/22/2014	12/21/2015
Spectrum Analyzer	R&S	FSV-30	101398	10/07/2014	10/06/2015
Loop Antenna	ETS.LINDGREN	6502	00148045	07/03/2014	07/02/2015
Bilog Antenna	SCHWAZBECK	VULB9168	378	12/23/2014	12/22/2015
Horn antenna	ETS.LINDGREN	3117	123995	05/05/2015	05/04/2016
Horn Antenna	Schwarzbeck	BBHA9170	184	12/25/2014	12/24/2015
Pre-Amplifier	Agilent	8447D	2944A07676	01/02/2015	01/01/2016
Pre-Amplifier	Agilent	8449B	3008A00578	01/02/2015	01/01/2016
Pre-Amplifier	EMC Instruments Corp.	EMC184045	980135	01/02/2015	01/01/2016
Filter 2400-2483.5 MHz	EWT	EWT-14-0166	M2	01/02/2015	01/01/2016
Attenuator	Mini-Circuit	BW-S10W2+	004	01/02/2015	01/01/2016
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
Low Loss Cable	Huber Suhner	966_Rx	9	01/02/2015	01/01/2016

11.3 Test SET-UP

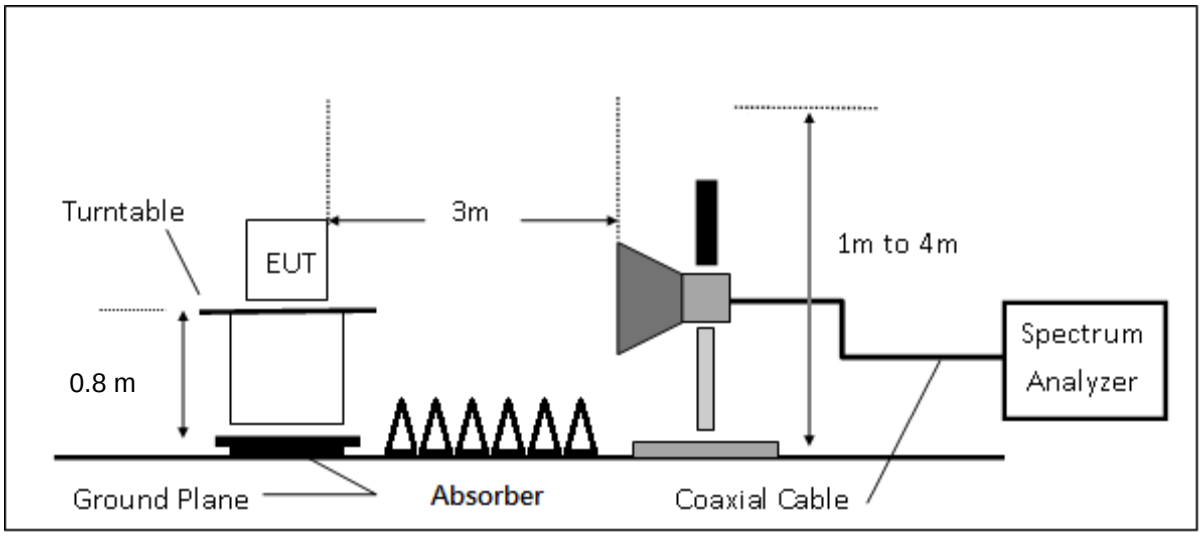
(A) Radiated Emission Test Set-UP Frequency Below 30MHz.



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



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



11.3.1 Measurement Procedure

1. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance V03r03.
2. The EUT was placed on a turn table with 0.8m for frequency< 1GHz and 0.8m 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. When 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.
6. 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.
7. Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz for Peak Detector at frequency above 1 GHz.
8. Set the spectrum analyzer as RBW=1 MHz, VBW=10 Hz (Duty cycle > 98%) or VBW ≥ 1/T (Duty cycle < 98%) for Average Detector at frequency above 1 GHz.
9. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
10. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
11. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. On spectrum, change spectrum mode in linear display mode, and reduce VBW = 10Hz if average reading is measured.
12. Repeat above procedures until all default test channel measured were complete.

11.4 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)

Note :

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

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

11.5 Test Results of Radiated Spurious Emissions form 9 kHz to 30 MHz

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

11.6 Measurement Result

Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

Radiated Band Edge Measurement Result (802.11b)

Operation Band	:802.11 b	Test Date	:2015-06-23
Fundamental Frequency	:2412 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:Band Edge LOW	Engineer	:Curry
EUT Pol.	:H Plan	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
2390.00	E	Average	33.26	4.80	38.06	54.00	-15.94
2390.00	E	Peak	44.41	4.80	49.21	74.00	-24.79

Operation Band	:802.11 b	Test Date	:2015-06-23
Fundamental Frequency	:2412 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:Band Edge LOW	Engineer	:Curry
EUT Pol.	:H Plan	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
2390.00	E	Average	39.07	4.80	43.87	54.00	-10.13
2390.00	E	Peak	49.75	4.80	54.55	74.00	-19.45

Operation Band	:802.11 b	Test Date	:2015-06-23
Fundamental Frequency	:2462 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:Band Edge HIGH	Engineer	:Curry
EUT Pol.	:H Plan	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
2483.50	E	Average	47.85	5.64	53.49	54.00	-0.51
2483.50	E	Peak	53.77	5.64	59.41	74.00	-14.59

Operation Band	:802.11 b	Test Date	:2015-06-23
Fundamental Frequency	:2462 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:Band Edge HIGH	Engineer	:Curry
EUT Pol.	:H Plan	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
2483.50	E	Average	47.50	5.64	53.14	54.00	-0.86
2483.50	E	Peak	53.04	5.64	58.68	74.00	-15.32

Radiated Band Edge Measurement Result (802.11g)

Operation Band	:802.11 g	Test Date	:2015-06-23
Fundamental Frequency	:2412 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:Band Edge LOW	Engineer	:Curry
EUT Pol.	:H Plan	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
2390.00	E	Average	33.89	4.80	38.69	54.00	-15.31
2390.00	E	Peak	61.62	4.80	66.42	74.00	-7.58

Operation Band	:802.11 g	Test Date	:2015-06-23
Fundamental Frequency	:2412 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:Band Edge LOW	Engineer	:Curry
EUT Pol.	:H Plan	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
2390.00	E	Average	38.61	4.80	43.41	54.00	-10.59
2390.00	E	Peak	67.62	4.80	72.42	74.00	-1.58

Operation Band	:802.11 g	Test Date	:2015-06-23
Fundamental Frequency	:2462 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:Band Edge HIGH	Engineer	:Curry
EUT Pol.	:H Plan	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
2483.50	E	Average	34.39	5.64	40.03	54.00	-13.97
2483.50	E	Peak	60.99	5.64	66.63	74.00	-7.37

Operation Band	:802.11 g	Test Date	:2015-06-23
Fundamental Frequency	:2462 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:Band Edge HIGH	Engineer	:Curry
EUT Pol.	:H Plan	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
2483.50	E	Average	37.05	5.64	42.69	54.00	-11.31
2483.50	E	Peak	67.06	5.64	72.70	74.00	-1.30

Radiated Band Edge Measurement Result (802.11_HT20) (MIMO)

Operation Band	:802.11 n20M	Test Date	:2015-06-23
Fundamental Frequency	:2412 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:Band Edge LOW	Engineer	:Curry
EUT Pol.	:H Plan	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
2390.00	E	Average	37.94	4.80	42.74	54.00	-11.26
2390.00	E	Peak	68.02	4.80	72.82	74.00	-1.18

Operation Band	:802.11 n20M	Test Date	:2015-06-23
Fundamental Frequency	:2412 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:Band Edge LOW	Engineer	:Curry
EUT Pol.	:H Plan	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
2390.00	E	Average	39.29	4.80	44.09	54.00	-9.91
2390.00	E	Peak	68.46	4.80	73.26	74.00	-0.74

Operation Band	:802.11 n20M	Test Date	:2015-06-23
Fundamental Frequency	:2462 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:Band Edge HIGH	Engineer	:Curry
EUT Pol.	:H Plan	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
2483.50	E	Average	38.16	5.64	43.80	54.00	-10.20
2483.50	E	Peak	66.26	5.64	71.90	74.00	-2.10

Operation Band	:802.11 n20M	Test Date	:2015-06-23
Fundamental Frequency	:2462 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:Band Edge HIGH	Engineer	:Curry
EUT Pol.	:H Plan	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
2483.50	E	Average	38.23	5.64	43.87	54.00	-10.13
2483.50	E	Peak	67.62	5.64	73.26	74.00	-0.74

Radiated Band Edge Measurement Result (802.11_HT40) (MIMO)

Operation Band	:802.11 n40M	Test Date	:2015-06-23
Fundamental Frequency	:2422 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:Band Edge LOW	Engineer	:Curry
EUT Pol.	:H Plan	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
2390.00	E	Average	40.32	4.80	45.12	54.00	-8.88
2390.00	E	Peak	68.59	4.80	73.39	74.00	-0.61

Operation Band	:802.11 n40M	Test Date	:2015-06-23
Fundamental Frequency	:2422 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:Band Edge LOW	Engineer	:Curry
EUT Pol.	:H Plan	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
2390.00	E	Average	44.07	4.80	48.87	54.00	-5.13
2390.00	E	Peak	62.83	4.80	67.63	74.00	-6.37

Operation Band	:802.11 n40M	Test Date	:2015-06-23
Fundamental Frequency	:2452 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:Band Edge HIGH	Engineer	:Curry
EUT Pol.	:H Plan	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
2483.50	E	Average	40.58	5.64	46.22	54.00	-7.78
2483.50	E	Peak	67.00	5.64	72.64	74.00	-1.36
2487.80	S	Average	39.30	5.70	45.00	54.00	-9.00
2487.80	S	Peak	67.23	5.70	72.93	74.00	-1.07

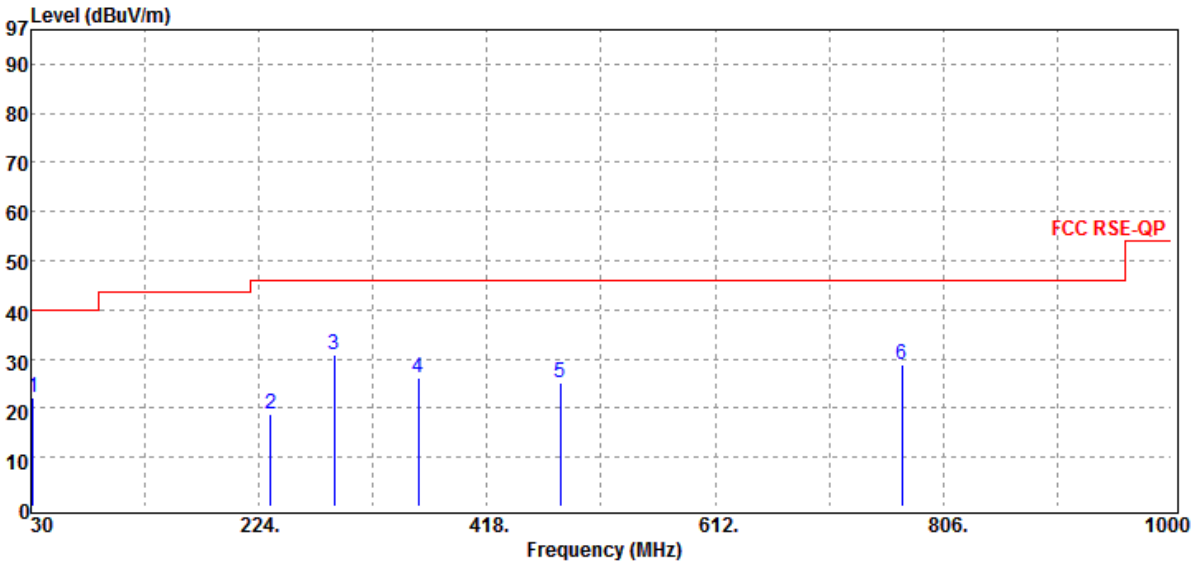
Operation Band	:802.11 n40M	Test Date	:2015-06-23
Fundamental Frequency	:2452 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:Band Edge HIGH	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

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
2483.50	E	Average	43.20	5.64	48.84	54.00	-5.16
2483.50	E	Peak	65.70	5.64	71.34	74.00	-2.66

Radiated Spurious Emission Measurement Result (802.11 g)

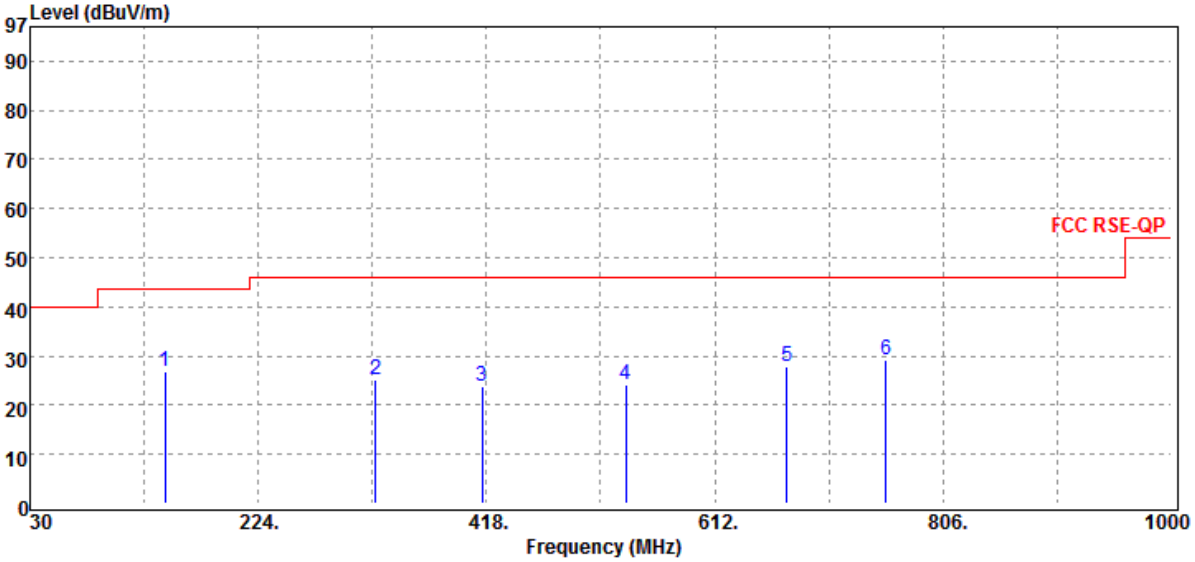
Below 1GHz Worst-Case Data:

Operation Band	:802.11 g	Test Date	:2015-06-24
Fundamental Frequency	:2412 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL



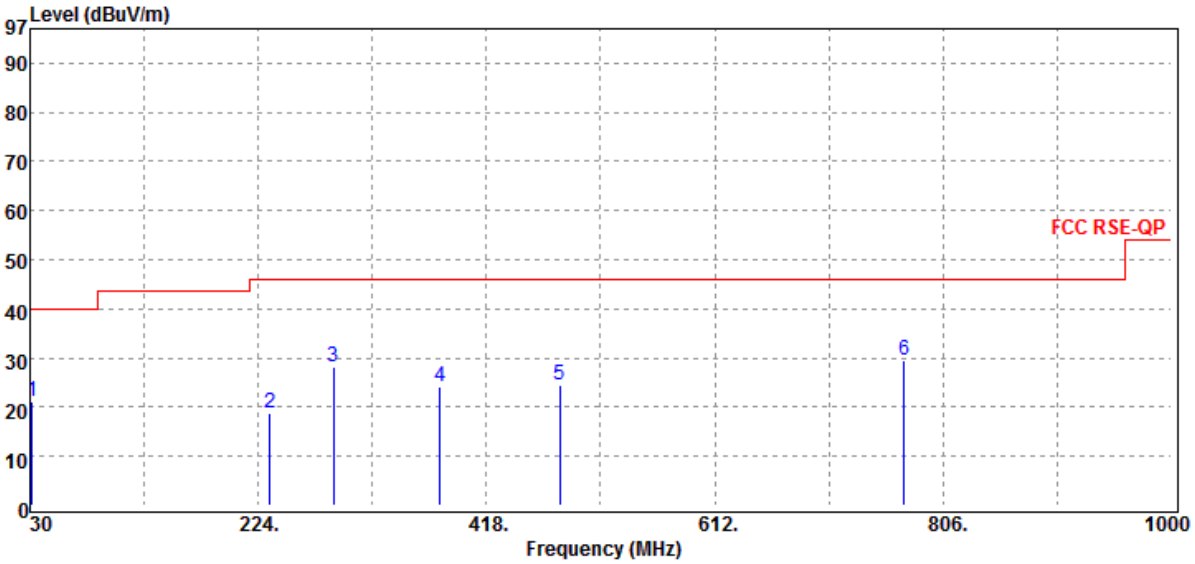
Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
31.94	S	Peak	32.26	-10.22	22.04	40.00	-17.96
233.70	S	Peak	29.42	-10.69	18.73	46.00	-27.27
288.02	S	Peak	39.20	-8.24	30.96	46.00	-15.04
359.80	S	Peak	33.16	-7.03	26.13	46.00	-19.87
480.08	S	Peak	29.65	-4.59	25.06	46.00	-20.94
771.08	S	Peak	27.88	0.90	28.78	46.00	-17.22

Operation Band	:802.11 g	Test Date	:2015-06-24
Fundamental Frequency	:2412 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL



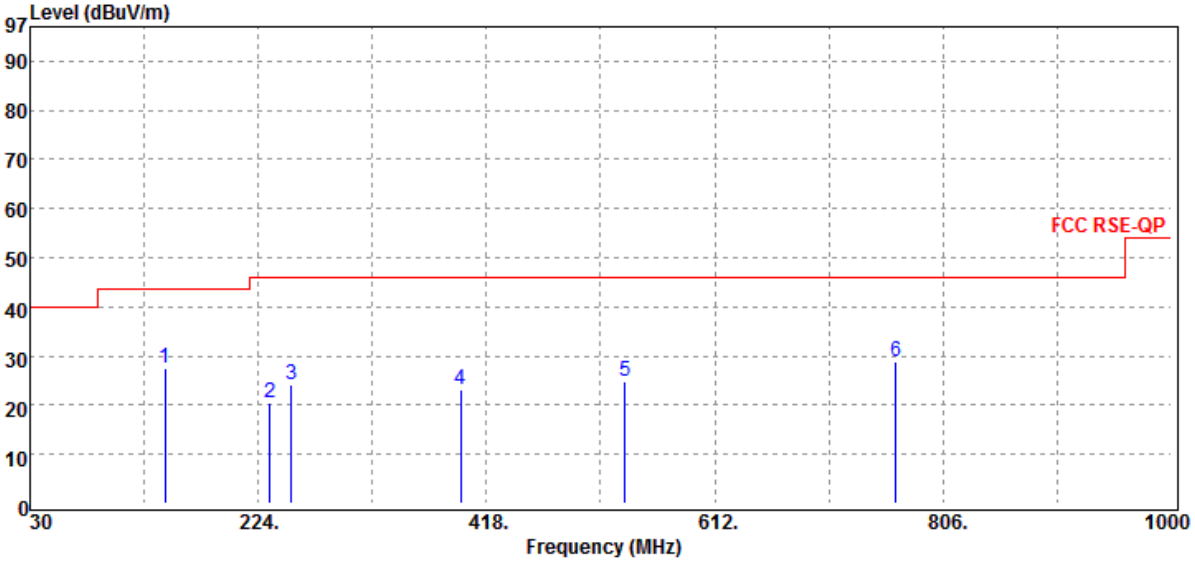
Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
144.46	S	Peak	36.42	-9.69	26.73	43.50	-16.77
323.91	S	Peak	32.72	-7.67	25.05	46.00	-20.95
414.12	S	Peak	29.50	-5.75	23.75	46.00	-22.25
536.34	S	Peak	28.03	-3.99	24.04	46.00	-21.96
673.11	S	Peak	28.95	-1.14	27.81	46.00	-18.19
757.50	S	Peak	28.18	0.97	29.15	46.00	-16.85

Operation Band	:802.11 g	Test Date	:2015-06-24
Fundamental Frequency	:2437 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX MID	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL



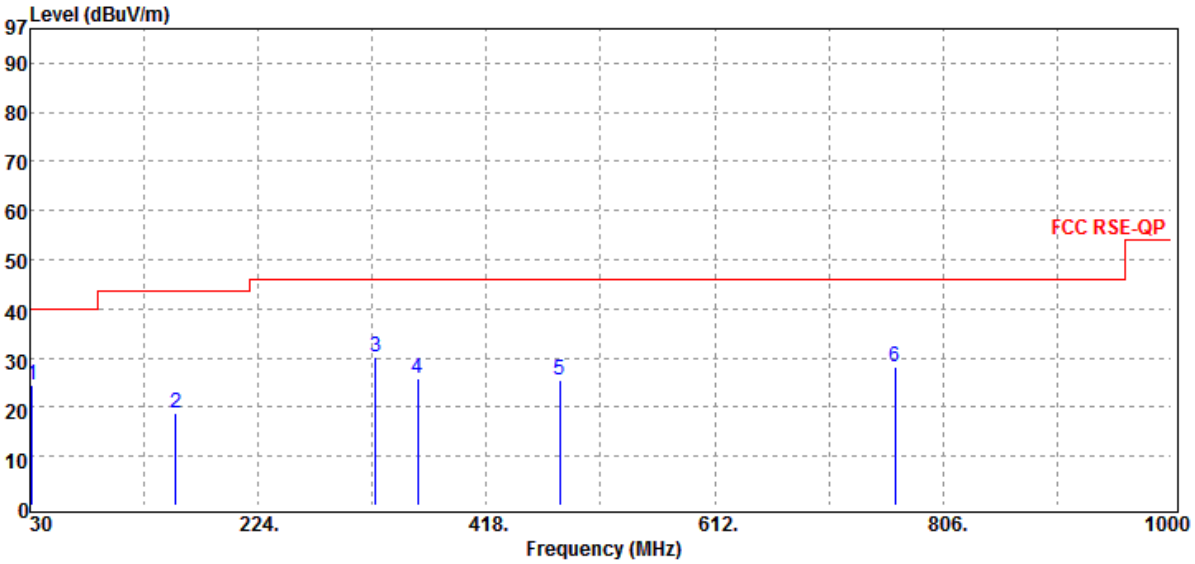
Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
31.94	S	Peak	31.41	-10.22	21.19	40.00	-18.81
233.70	S	Peak	29.45	-10.69	18.76	46.00	-27.24
288.02	S	Peak	36.34	-8.24	28.10	46.00	-17.90
378.23	S	Peak	30.62	-6.49	24.13	46.00	-21.87
480.08	S	Peak	29.06	-4.59	24.47	46.00	-21.53
773.02	S	Peak	28.72	0.82	29.54	46.00	-16.46

Operation Band	:802.11 g	Test Date	:2015-06-24
Fundamental Frequency	:2437 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX MID	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL



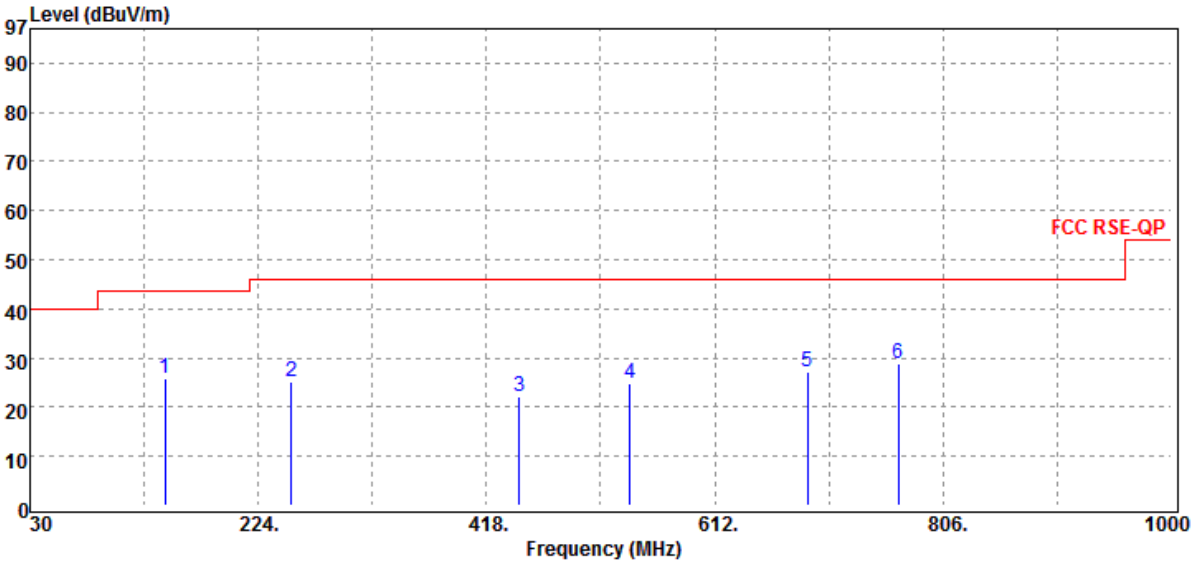
Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
144.46	S	Peak	37.07	-9.69	27.38	43.50	-16.12
233.70	S	Peak	31.11	-10.69	20.42	46.00	-25.58
252.13	S	Peak	33.79	-9.79	24.00	46.00	-22.00
395.69	S	Peak	29.19	-6.07	23.12	46.00	-22.88
535.37	S	Peak	28.75	-3.99	24.76	46.00	-21.24
766.23	S	Peak	27.88	1.09	28.97	46.00	-17.03

Operation Band	:802.11 g	Test Date	:2015-06-24
Fundamental Frequency	:2462 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:H Plan	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
31.94	S	Peak	34.81	-10.22	24.59	40.00	-15.41
154.16	S	Peak	27.87	-9.07	18.80	43.50	-24.70
323.91	S	Peak	37.79	-7.67	30.12	46.00	-15.88
359.80	S	Peak	32.87	-7.03	25.84	46.00	-20.16
480.08	S	Peak	29.96	-4.59	25.37	46.00	-20.63
765.26	S	Peak	27.23	1.11	28.34	46.00	-17.66

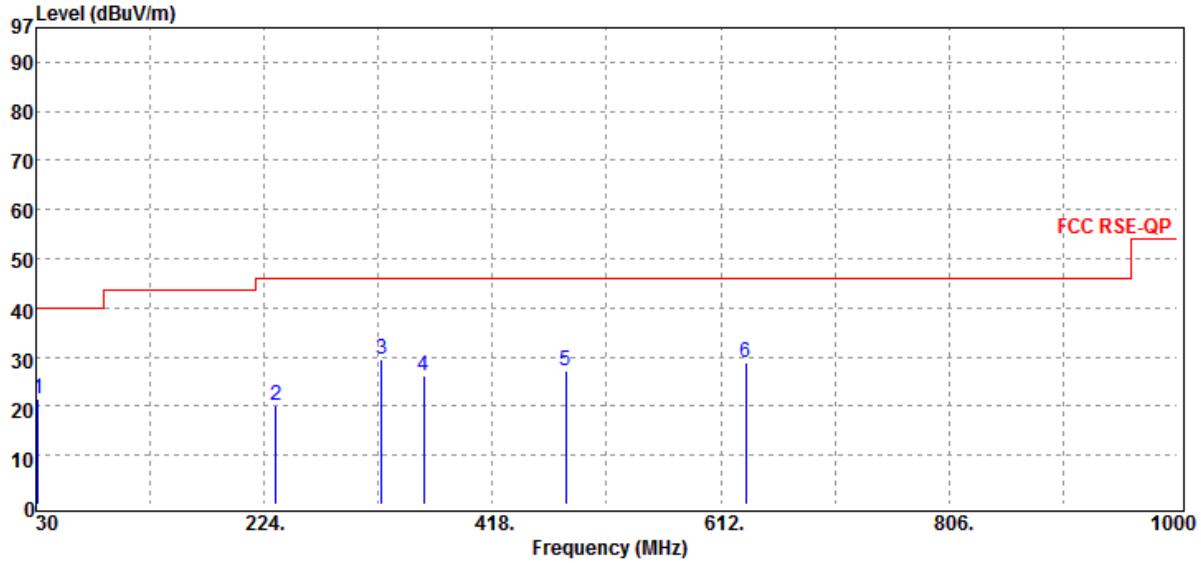
Operation Band	:802.11 g	Test Date	:2015-06-24
Fundamental Frequency	:2462 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL



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
144.46	S	Peak	35.44	-9.69	25.75	43.50	-17.75
252.13	S	Peak	34.81	-9.79	25.02	46.00	-20.98
446.13	S	Peak	27.76	-5.75	22.01	46.00	-23.99
540.22	S	Peak	28.93	-4.01	24.92	46.00	-21.08
690.57	S	Peak	27.91	-0.83	27.08	46.00	-18.92
768.17	S	Peak	27.72	1.03	28.75	46.00	-17.25

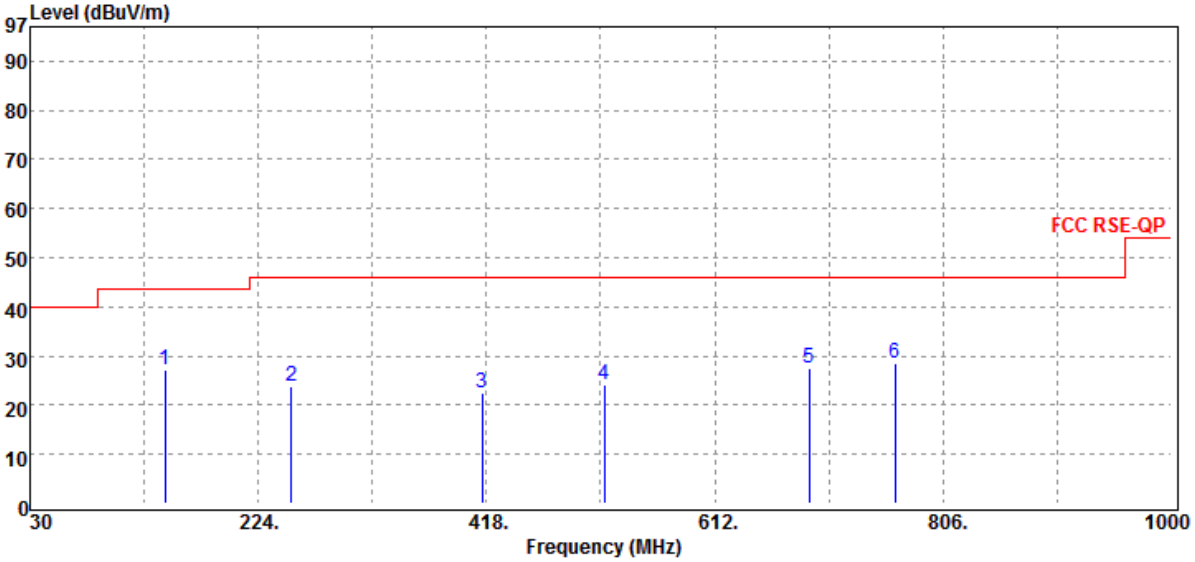
Radiated Spurious Emission Measurement Result (802.11_HT40) (MIMO)

Operation Band	: 802.11 n40M	Test Date	:2015-06-24
Fundamental Frequency	:2422 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL



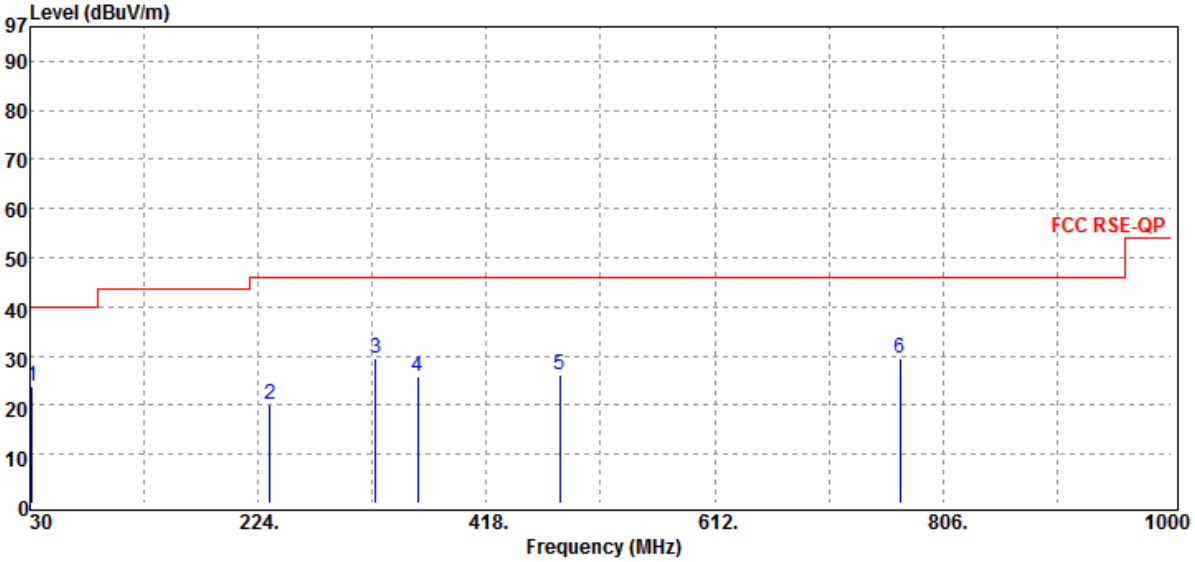
Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
31.94	S	Peak	31.81	-10.22	21.59	40.00	-18.41
233.70	S	Peak	30.73	-10.69	20.04	46.00	-25.96
323.91	S	Peak	37.05	-7.67	29.38	46.00	-16.62
359.80	S	Peak	33.31	-7.03	26.28	46.00	-19.72
480.08	S	Peak	31.84	-4.59	27.25	46.00	-18.75
633.34	S	Peak	31.34	-2.44	28.90	46.00	-17.10

Operation Band	: 802.11 n40M	Test Date	:2015-06-24
Fundamental Frequency	:2422 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL



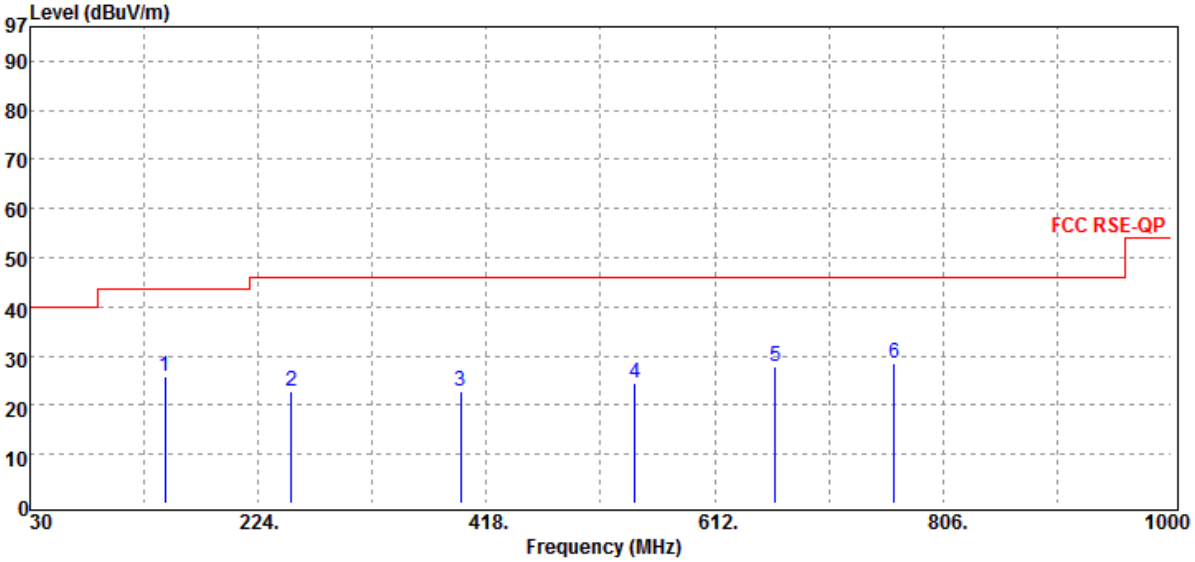
Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
144.46	S	Peak	36.96	-9.69	27.27	43.50	-16.23
252.13	S	Peak	33.54	-9.79	23.75	46.00	-22.25
414.12	S	Peak	28.29	-5.75	22.54	46.00	-23.46
517.91	S	Peak	28.65	-4.47	24.18	46.00	-21.82
692.51	S	Peak	28.20	-0.81	27.39	46.00	-18.61
765.26	S	Peak	27.55	1.11	28.66	46.00	-17.34

Operation Band	: 802.11 n40M	Test Date	:2015-06-24
Fundamental Frequency	:2437 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX MID	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL



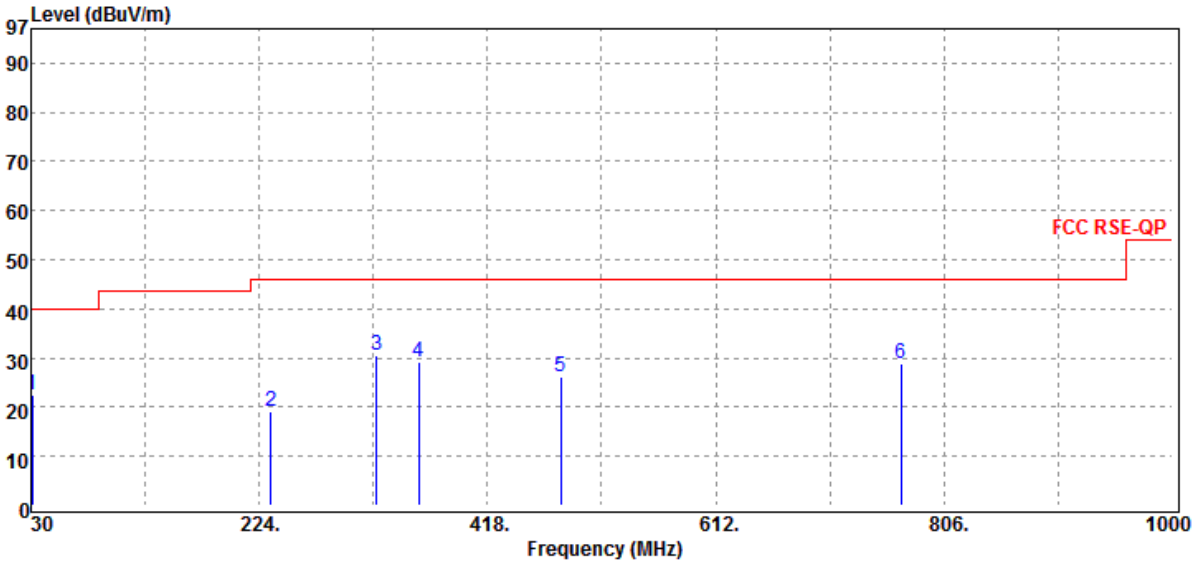
Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
31.94	S	Peak	33.91	-10.22	23.69	40.00	-16.31
233.70	S	Peak	30.87	-10.69	20.18	46.00	-25.82
323.91	S	Peak	37.13	-7.67	29.46	46.00	-16.54
359.80	S	Peak	32.73	-7.03	25.70	46.00	-20.30
480.08	S	Peak	30.73	-4.59	26.14	46.00	-19.86
769.14	S	Peak	28.51	0.99	29.50	46.00	-16.50

Operation Band	: 802.11 n40M	Test Date	:2015-06-24
Fundamental Frequency	:2437 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX MID	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL



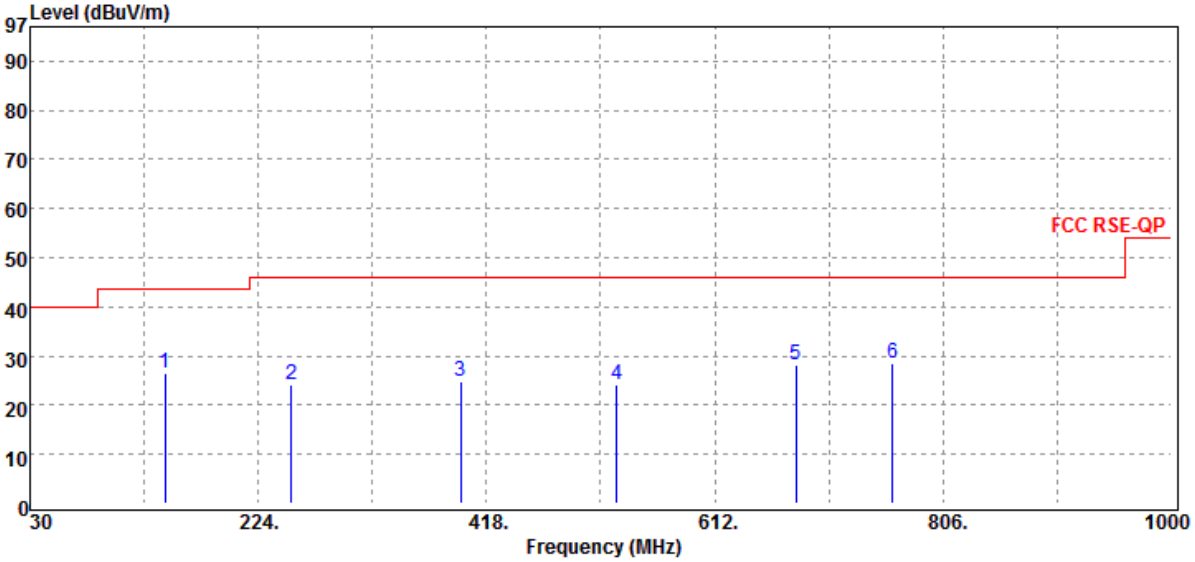
Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
144.46	S	Peak	35.66	-9.69	25.97	43.50	-17.53
252.13	S	Peak	32.54	-9.79	22.75	46.00	-23.25
395.69	S	Peak	29.02	-6.07	22.95	46.00	-23.05
544.10	S	Peak	28.54	-4.01	24.53	46.00	-21.47
663.41	S	Peak	29.04	-1.16	27.88	46.00	-18.12
764.29	S	Peak	27.54	1.13	28.67	46.00	-17.33

Operation Band	:802.11 n40M	Test Date	:2015-06-24
Fundamental Frequency	:2452 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:H Plan	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
30.97	S	Peak	32.73	-10.24	22.49	40.00	-17.51
233.70	S	Peak	29.97	-10.69	19.28	46.00	-26.72
323.91	S	Peak	38.13	-7.67	30.46	46.00	-15.54
359.80	S	Peak	36.31	-7.03	29.28	46.00	-16.72
480.08	S	Peak	30.69	-4.59	26.10	46.00	-19.90
769.14	S	Peak	27.91	0.99	28.90	46.00	-17.10

Operation Band	:802.11 n40M	Test Date	:2015-06-24
Fundamental Frequency	:2452 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

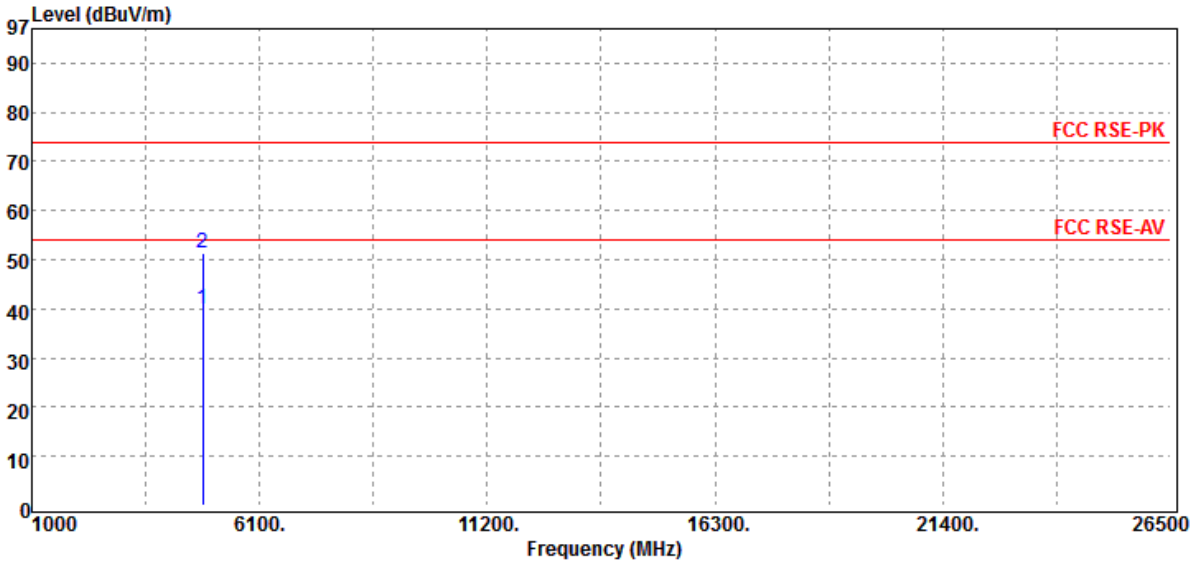


Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
144.46	S	Peak	36.15	-9.69	26.46	43.50	-17.04
252.13	S	Peak	34.10	-9.79	24.31	46.00	-21.69
395.69	S	Peak	30.91	-6.07	24.84	46.00	-21.16
528.58	S	Peak	28.28	-4.14	24.14	46.00	-21.86
680.87	S	Peak	29.28	-1.07	28.21	46.00	-17.79
763.32	S	Peak	27.52	1.14	28.66	46.00	-17.34

Radiated Spurious Emission Measurement Result (802.11 b)

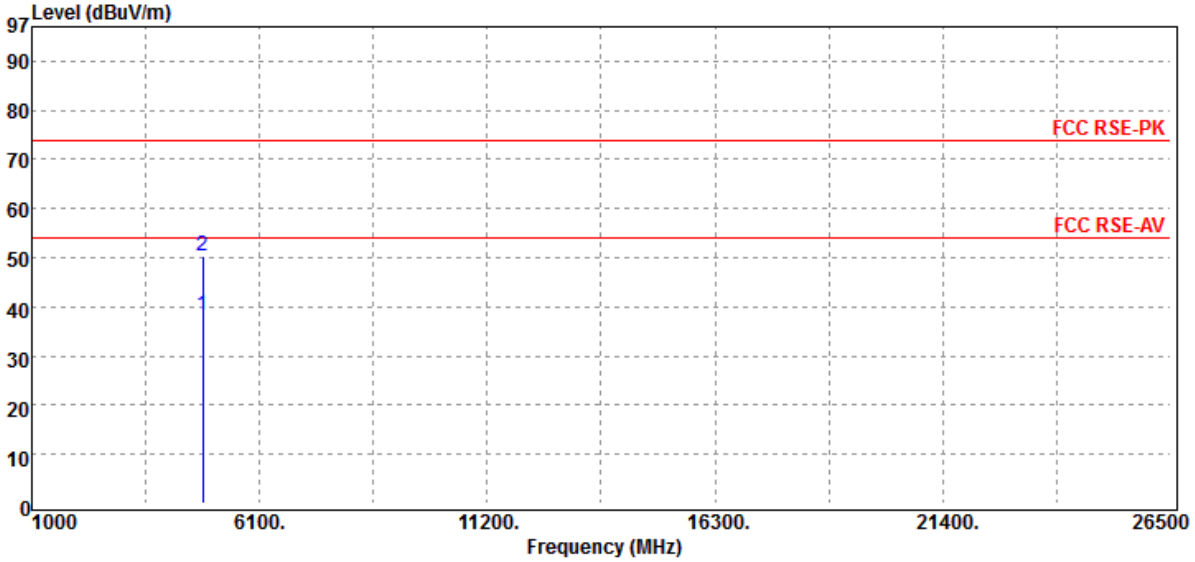
Above 1GHz Worst-Case Data:

Operation Band	:802.11 b	Test Date	:2015-06-24
Fundamental Frequency	:2412 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL



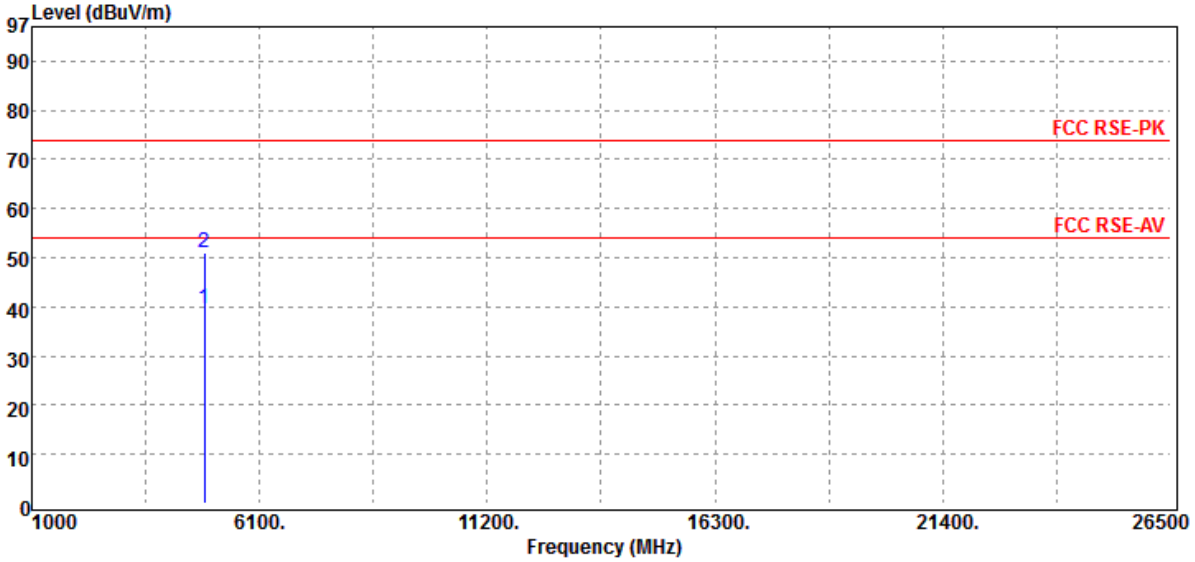
Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
4824.00	H	Average	30.85	9.14	39.99	54.00	-14.01
4824.00	H	Peak	42.36	9.14	51.50	74.00	-22.50

Operation Band	:802.11 b	Test Date	:2015-06-24
Fundamental Frequency	:2412 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL



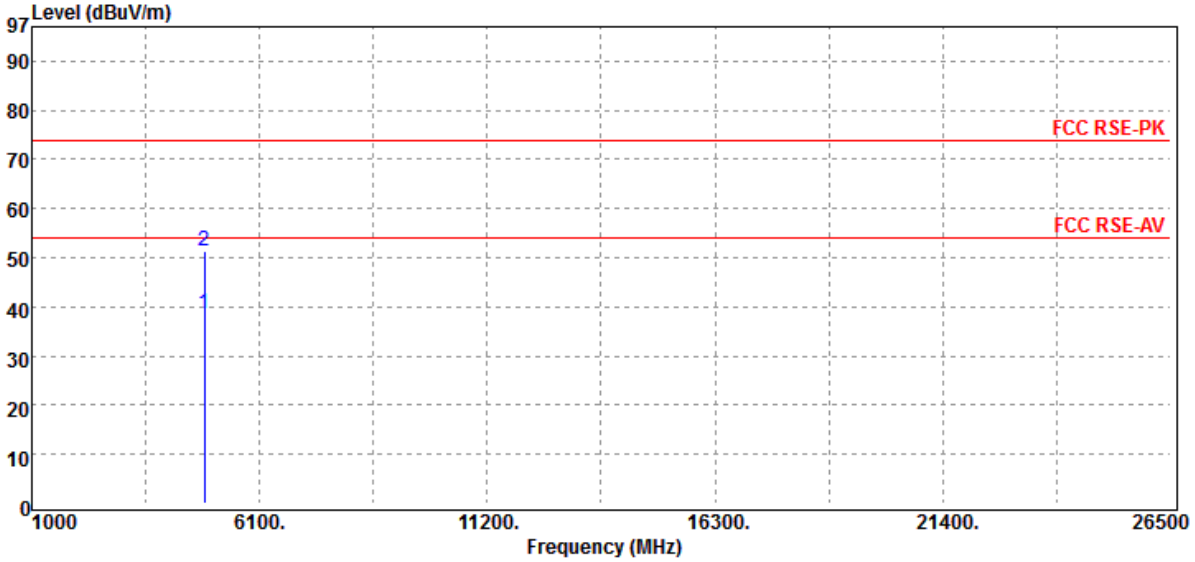
Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
4824.00	H	Average	29.09	9.14	38.23	54.00	-15.77
4824.00	H	Peak	41.29	9.14	50.43	74.00	-23.57

Operation Band	:802.11 b	Test Date	:2015-06-24
Fundamental Frequency	:2437 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX MID	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL



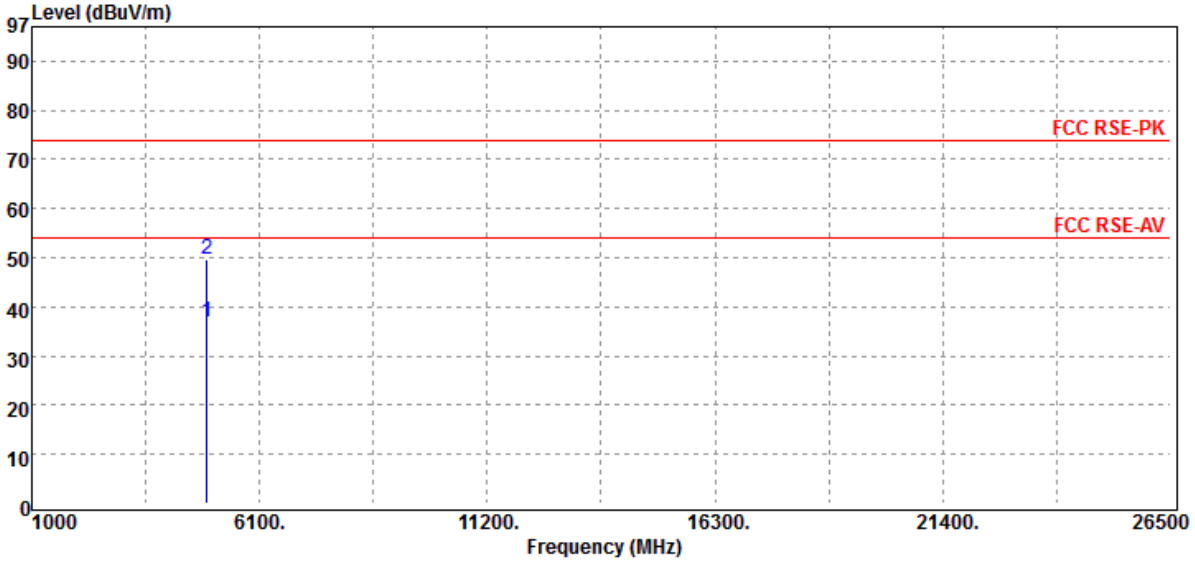
Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
4874.00	H	Average	30.31	9.40	39.71	54.00	-14.29
4874.00	H	Peak	41.77	9.40	51.17	74.00	-22.83

Operation Band	:802.11 b	Test Date	:2015-06-24
Fundamental Frequency	:2437 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX MID	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL



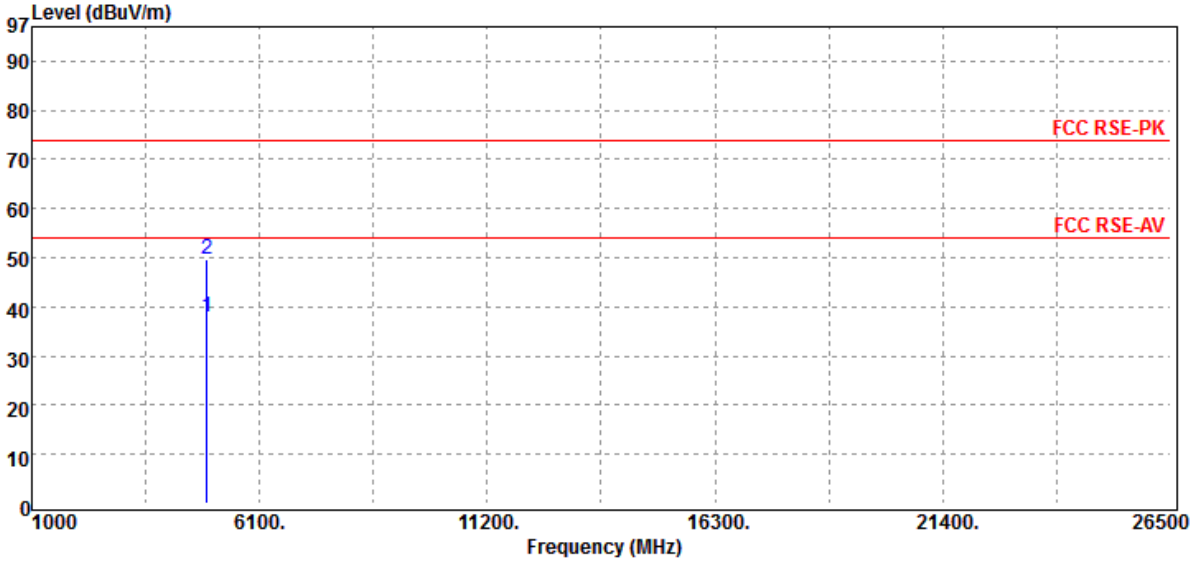
Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
4874.00	H	Average	29.29	9.40	38.69	54.00	-15.31
4874.00	H	Peak	41.86	9.40	51.26	74.00	-22.74

Operation Band	:802.11 b	Test Date	:2015-06-24
Fundamental Frequency	:2462 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:H Plan	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
4924.00	H	Average	27.55	9.32	36.87	54.00	-17.13
4924.00	H	Peak	40.46	9.32	49.78	74.00	-24.22

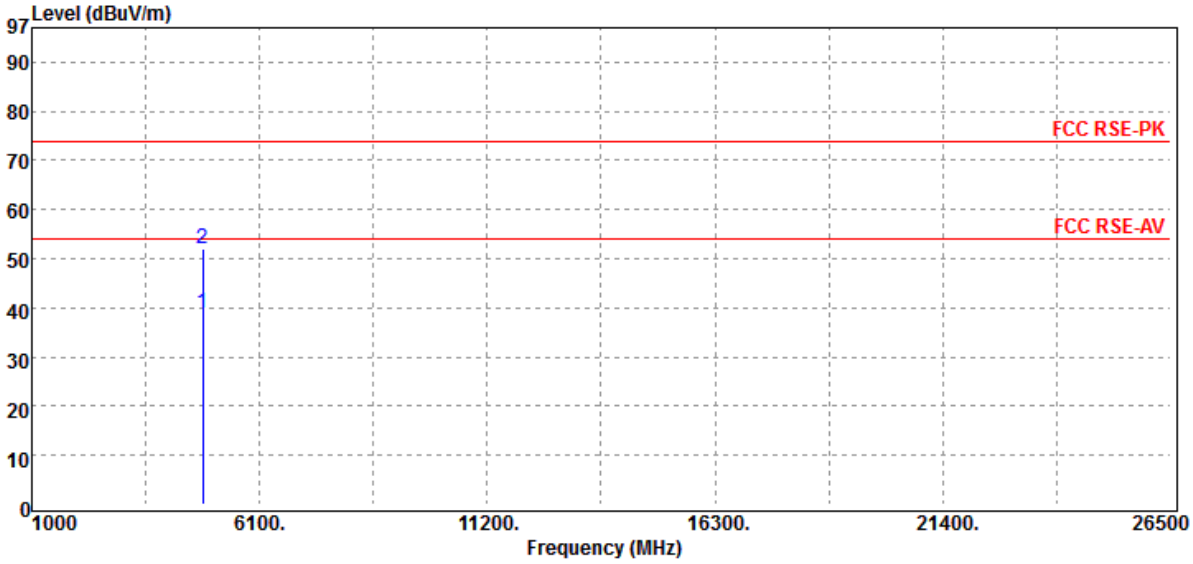
Operation Band	:802.11 b	Test Date	:2015-06-24
Fundamental Frequency	:2462 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL



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
4924.00	H	Average	28.61	9.32	37.93	54.00	-16.07
4924.00	H	Peak	40.19	9.32	49.51	74.00	-24.49

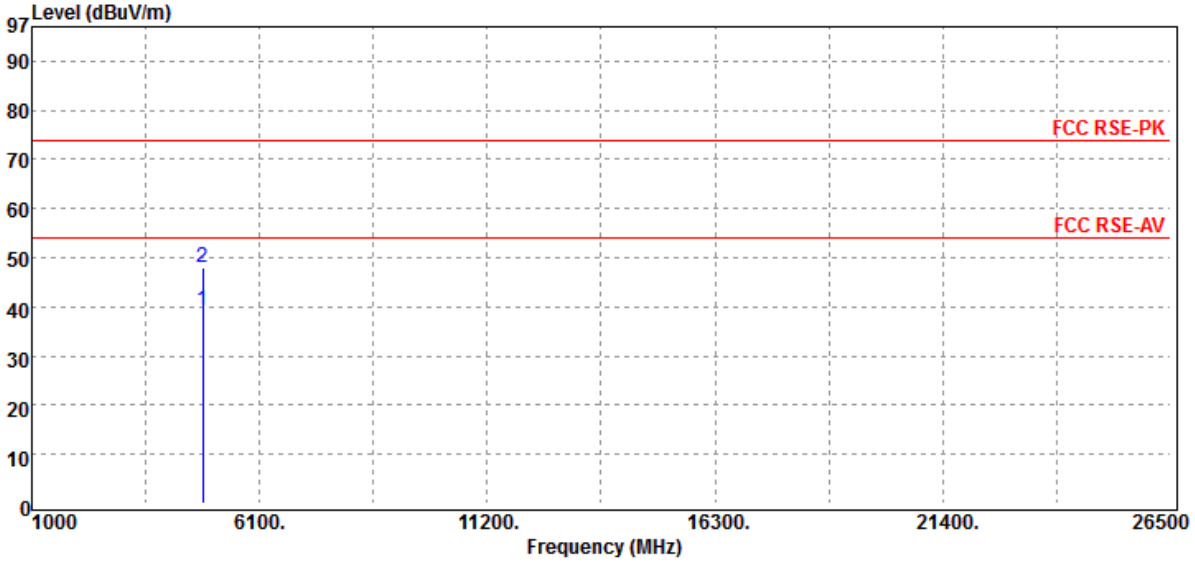
Radiated Spurious Emission Measurement Result (802.11 g)

Operation Band	:802.11 g	Test Date	:2015-06-24
Fundamental Frequency	:2412 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL



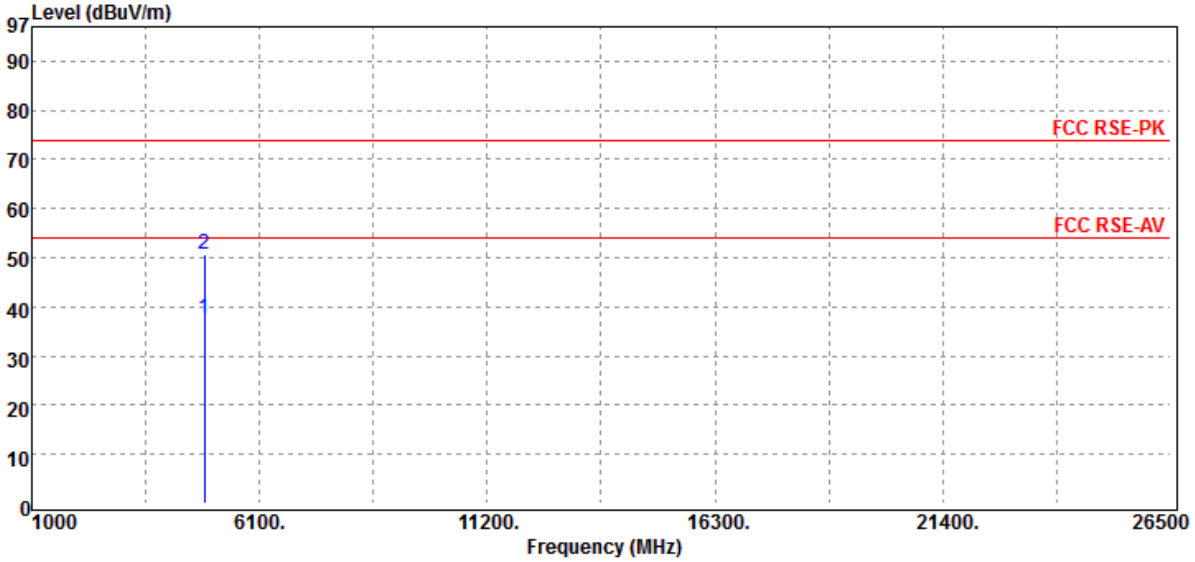
Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
4824.00	H	Average	29.31	9.63	38.94	54.00	-15.06
4824.00	H	Peak	42.23	9.63	51.86	74.00	-22.14

Operation Band	:802.11 g	Test Date	:2015-06-24
Fundamental Frequency	:2412 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL



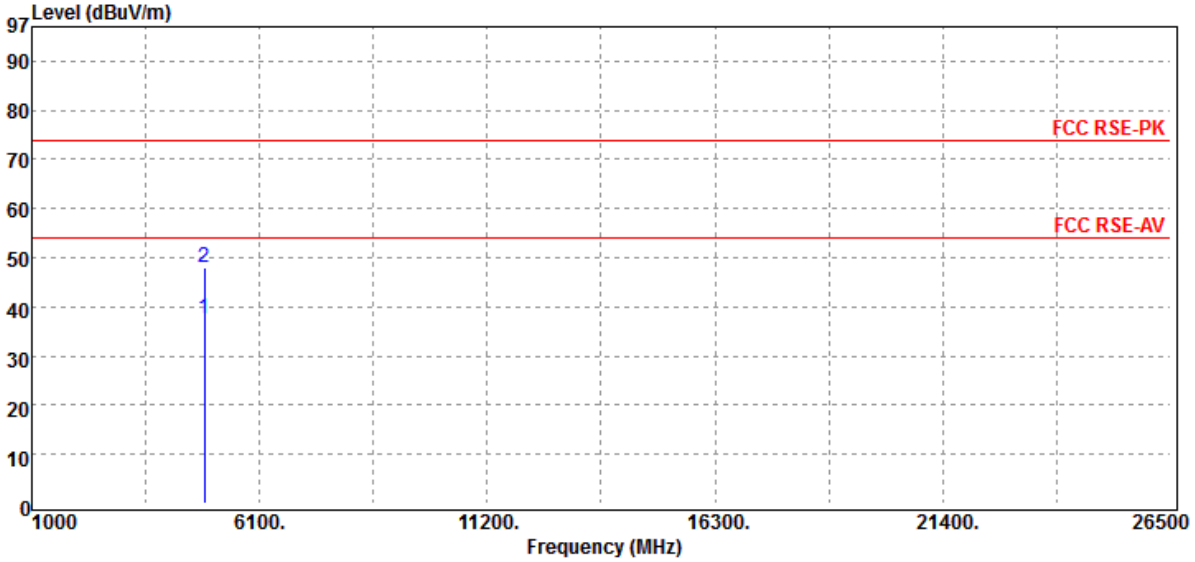
Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
4824.00	H	Average	29.54	9.63	39.17	54.00	-14.83
4824.00	H	Peak	38.50	9.63	48.13	74.00	-25.87

Operation Band	:802.11 g	Test Date	:2015-06-24
Fundamental Frequency	:2437 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX MID	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL



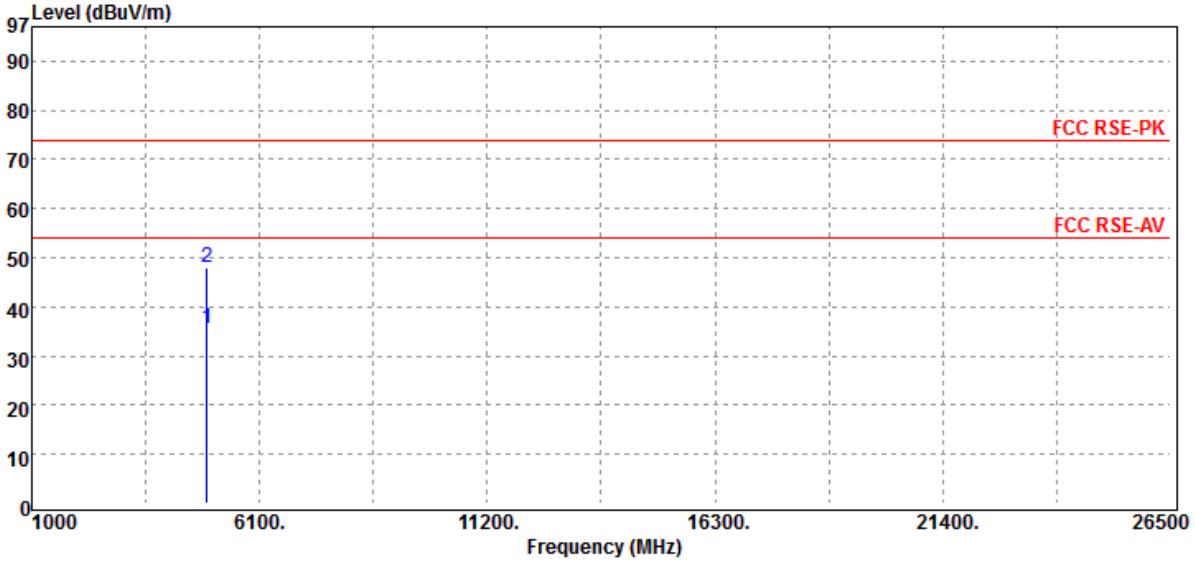
Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
4874.00	H	Average	27.61	9.85	37.46	54.00	-16.54
4874.00	H	Peak	40.87	9.85	50.72	74.00	-23.28

Operation Band	:802.11 g	Test Date	:2015-06-24
Fundamental Frequency	:2437 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX MID	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL



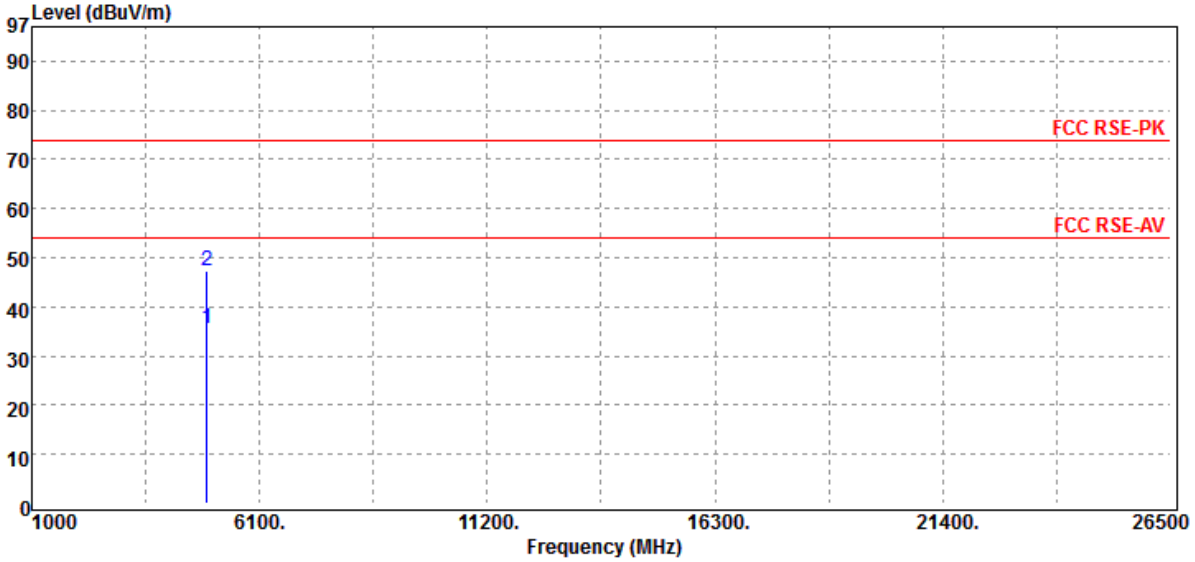
Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
4874.00	H	Average	27.84	9.85	37.69	54.00	-16.31
4874.00	H	Peak	38.11	9.85	47.96	74.00	-26.04

Operation Band	:802.11 g	Test Date	:2015-06-24
Fundamental Frequency	:2462 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:H Plan	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
4924.00	H	Average	25.67	9.86	35.53	54.00	-18.47
4924.00	H	Peak	38.18	9.86	48.04	74.00	-25.96

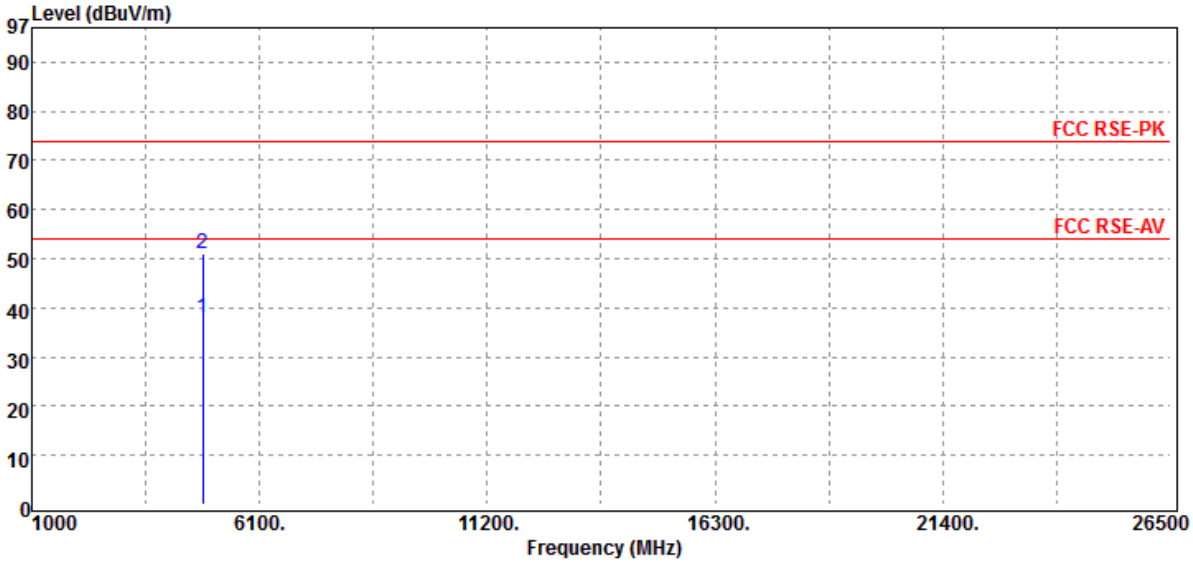
Operation Band	:802.11 g	Test Date	:2015-06-24
Fundamental Frequency	:2462 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL



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
4924.00	H	Average	25.87	9.86	35.73	54.00	-18.27
4924.00	H	Peak	37.44	9.86	47.30	74.00	-26.70

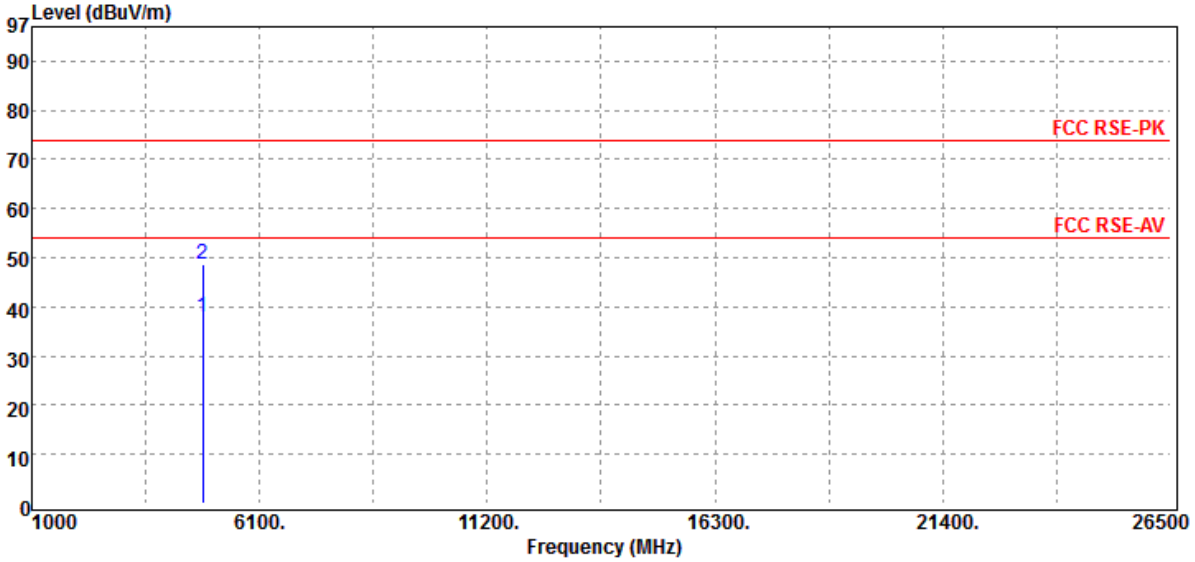
Radiated Spurious Emission Measurement Result (802.11_HT20) (MIMO)

Operation Band	:802.11 n20M	Test Date	:2015-06-24
Fundamental Frequency	:2412 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL



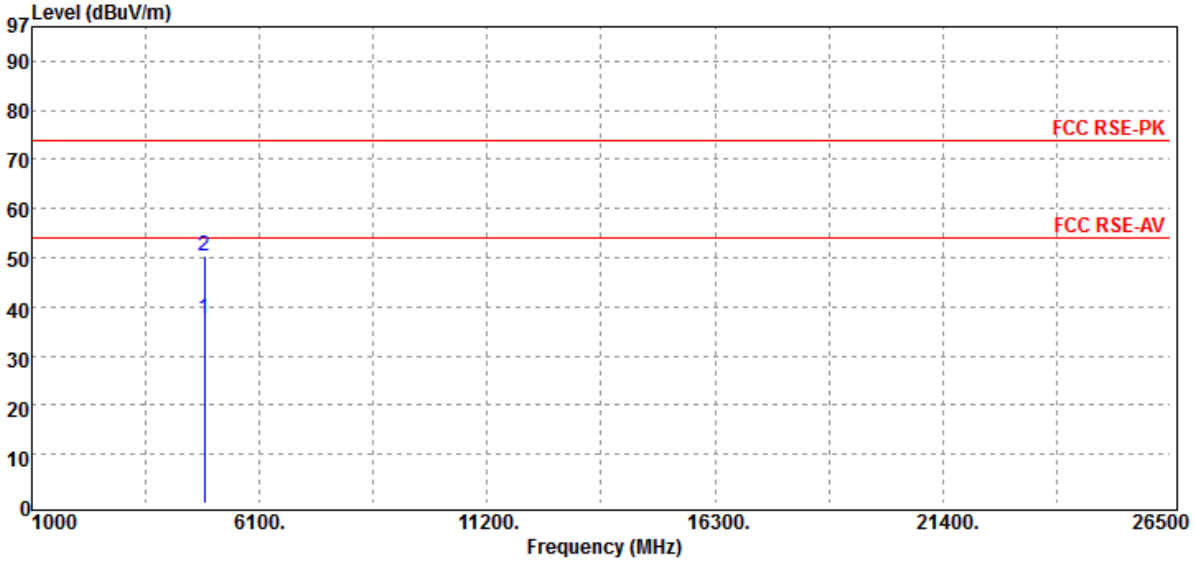
Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
4824.00	H	Average	28.46	9.63	38.09	54.00	-15.91
4824.00	H	Peak	41.41	9.63	51.04	74.00	-22.96

Operation Band	:802.11 n20M	Test Date	:2015-06-24
Fundamental Frequency	:2412 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL



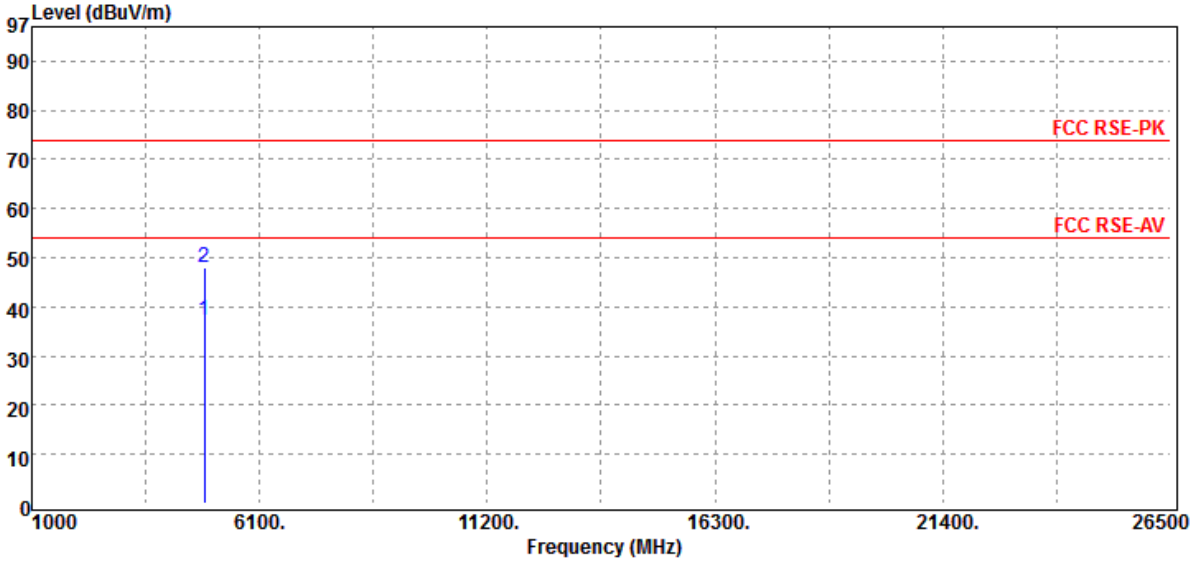
Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
4824.00	H	Average	28.34	9.63	37.97	54.00	-16.03
4824.00	H	Peak	38.90	9.63	48.53	74.00	-25.47

Operation Band	:802.11 n20M	Test Date	:2015-06-24
Fundamental Frequency	:2437 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX MID	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL



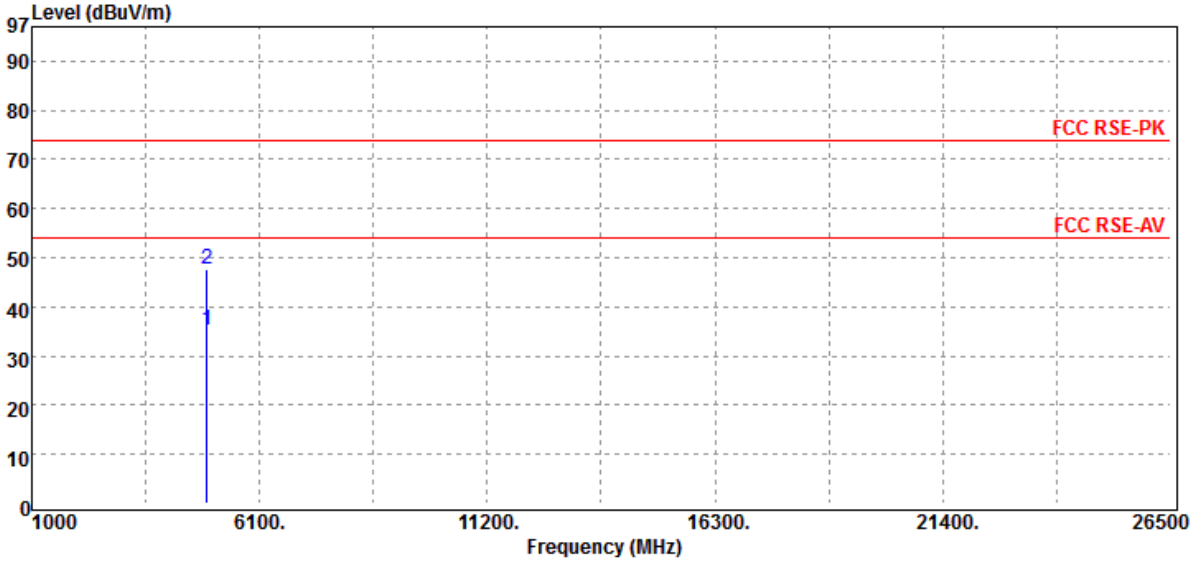
Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
4874.00	H	Average	27.88	9.85	37.73	54.00	-16.27
4874.00	H	Peak	40.58	9.85	50.43	74.00	-23.57

Operation Band	:802.11 n20M	Test Date	:2015-06-24
Fundamental Frequency	:2437 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX MID	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL



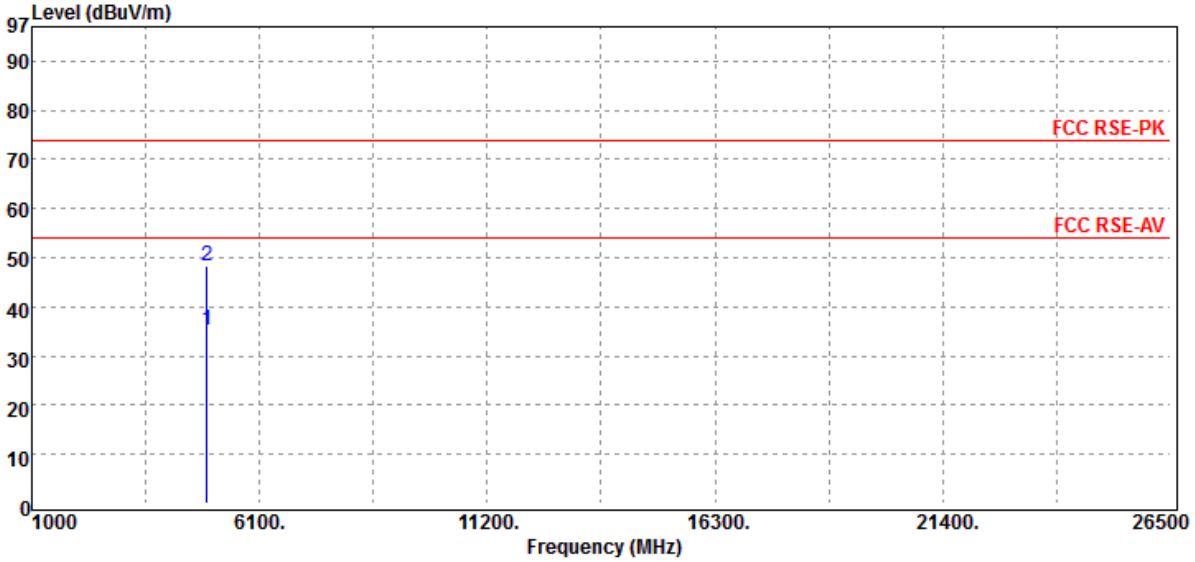
Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
4874.00	H	Average	27.45	9.85	37.30	54.00	-16.70
4874.00	H	Peak	38.31	9.85	48.16	74.00	-25.84

Operation Band	:802.11 n20M	Test Date	:2015-06-24
Fundamental Frequency	:2462 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:H Plan	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
4924.00	H	Average	25.32	9.86	35.18	54.00	-18.82
4924.00	H	Peak	37.72	9.86	47.58	74.00	-26.42

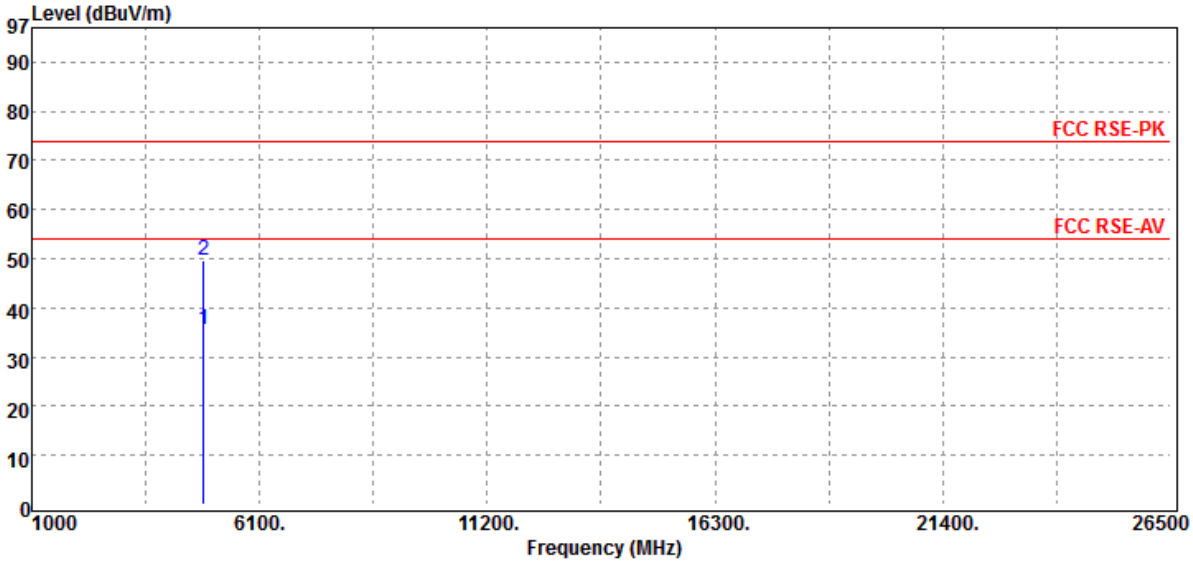
Operation Band	:802.11 n20M	Test Date	:2015-06-24
Fundamental Frequency	:2462 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL



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
4924.00	H	Average	25.29	9.86	35.15	54.00	-18.85
4924.00	H	Peak	38.60	9.86	48.46	74.00	-25.54

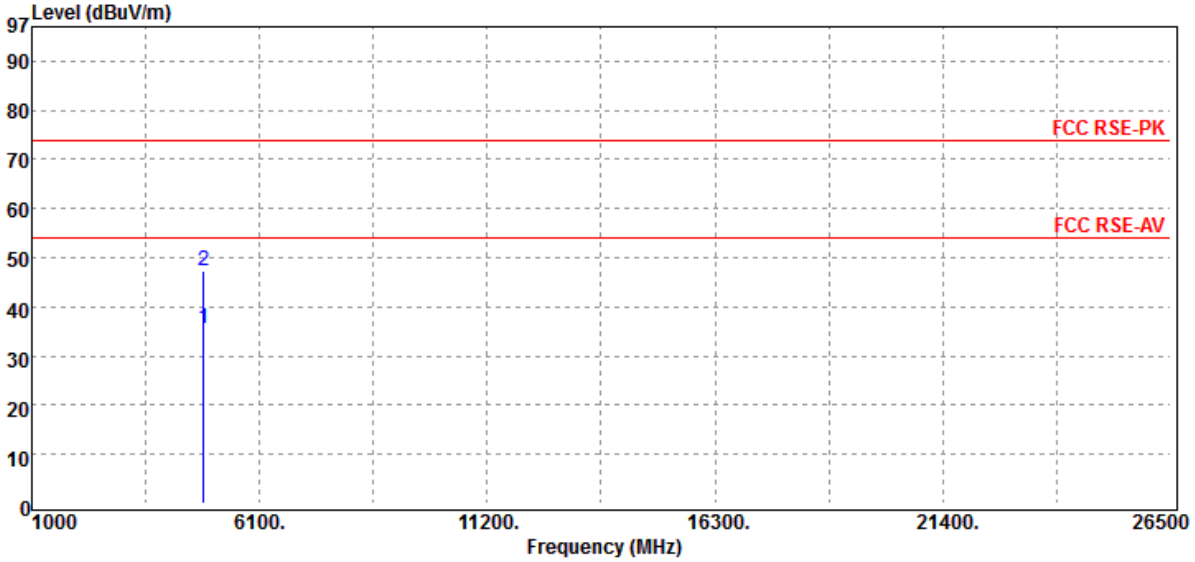
Radiated Spurious Emission Measurement Result (802.11_HT40) (MIMO)

Operation Band	:802.11 n40M	Test Date	:2015-06-24
Fundamental Frequency	:2422 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL



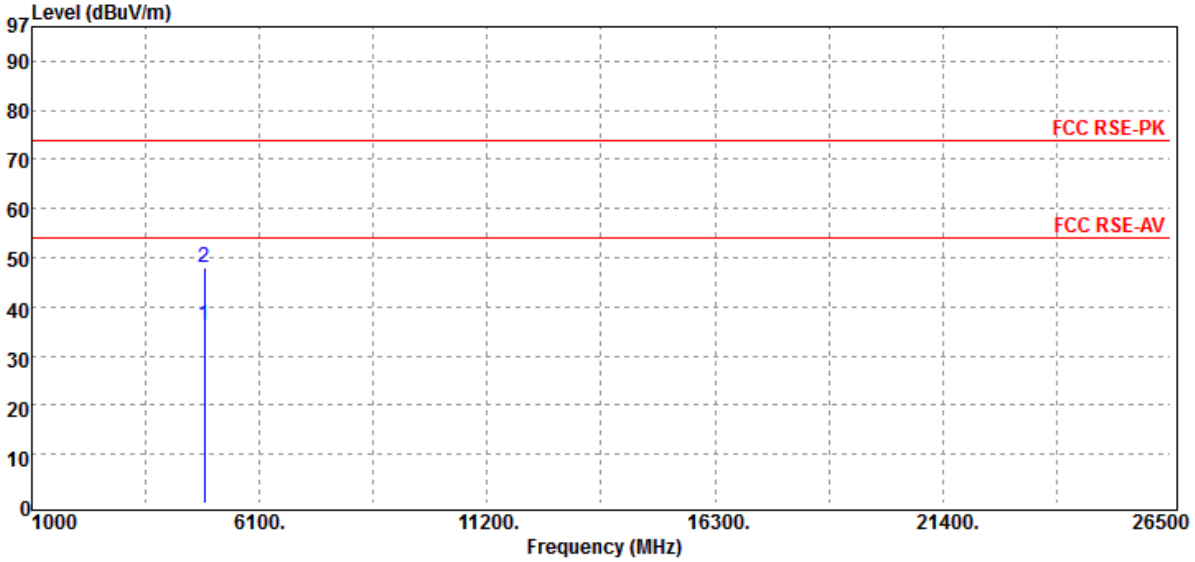
Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
4844.00	H	Average	25.88	9.74	35.62	54.00	-18.38
4844.00	H	Peak	39.82	9.74	49.56	74.00	-24.44

Operation Band	:802.11 n40M	Test Date	:2015-06-24
Fundamental Frequency	:2422 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL



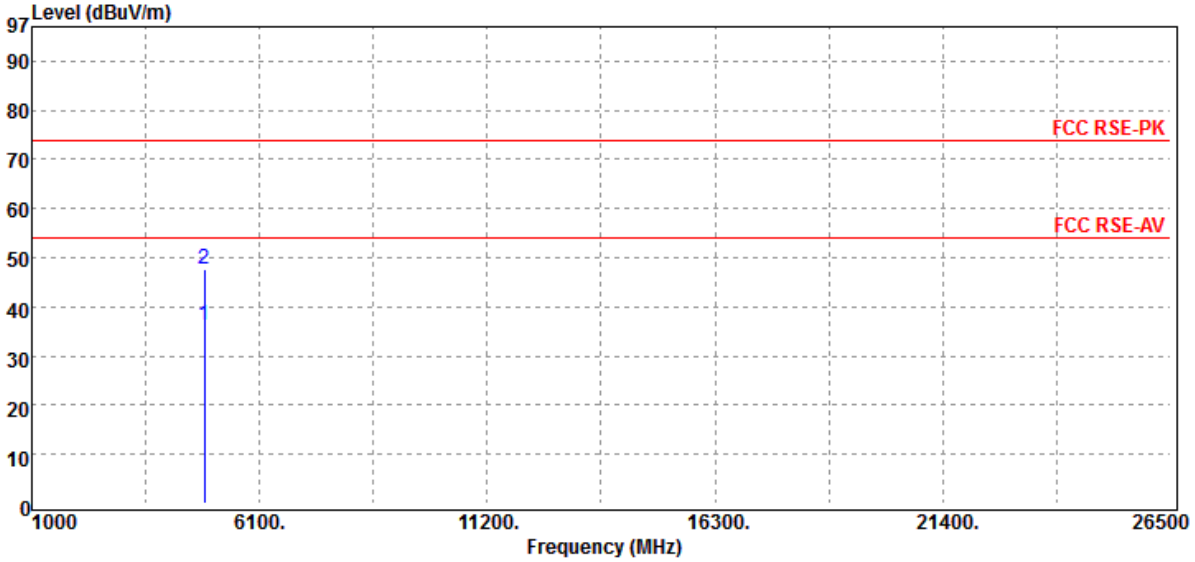
Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
4844.00	H	Average	25.92	9.74	35.66	54.00	-18.34
4844.00	H	Peak	37.49	9.74	47.23	74.00	-26.77

Operation Band	:802.11 n40M	Test Date	:2015-06-24
Fundamental Frequency	:2437 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX MID	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL



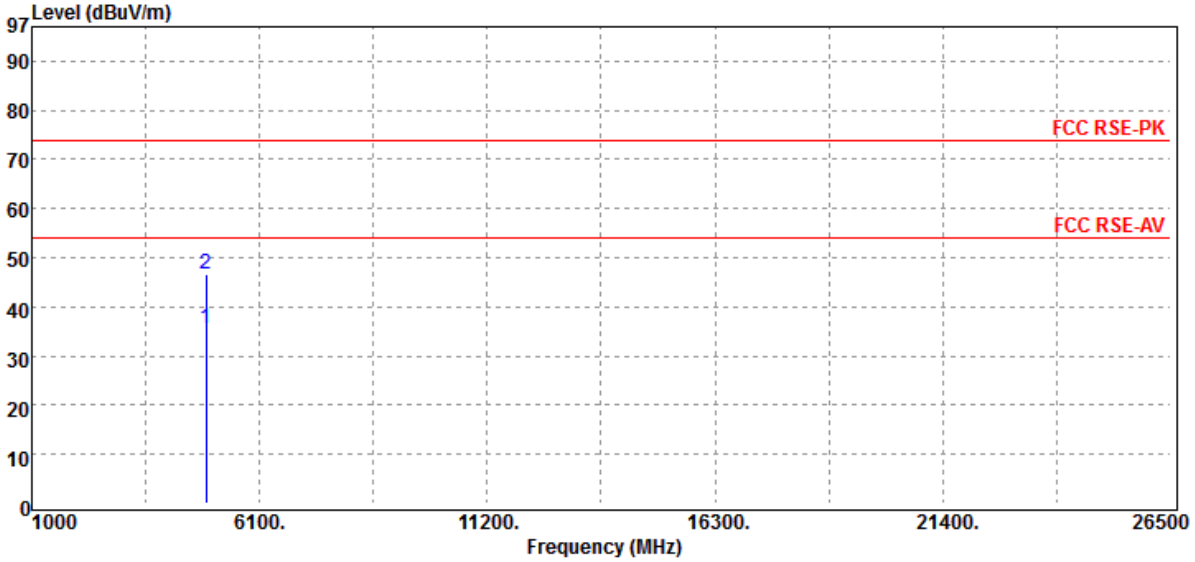
Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
4874.00	H	Average	26.41	9.85	36.26	54.00	-17.74
4874.00	H	Peak	38.03	9.85	47.88	74.00	-26.12

Operation Band	:802.11 n40M	Test Date	:2015-06-24
Fundamental Frequency	:2437 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX MID	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL



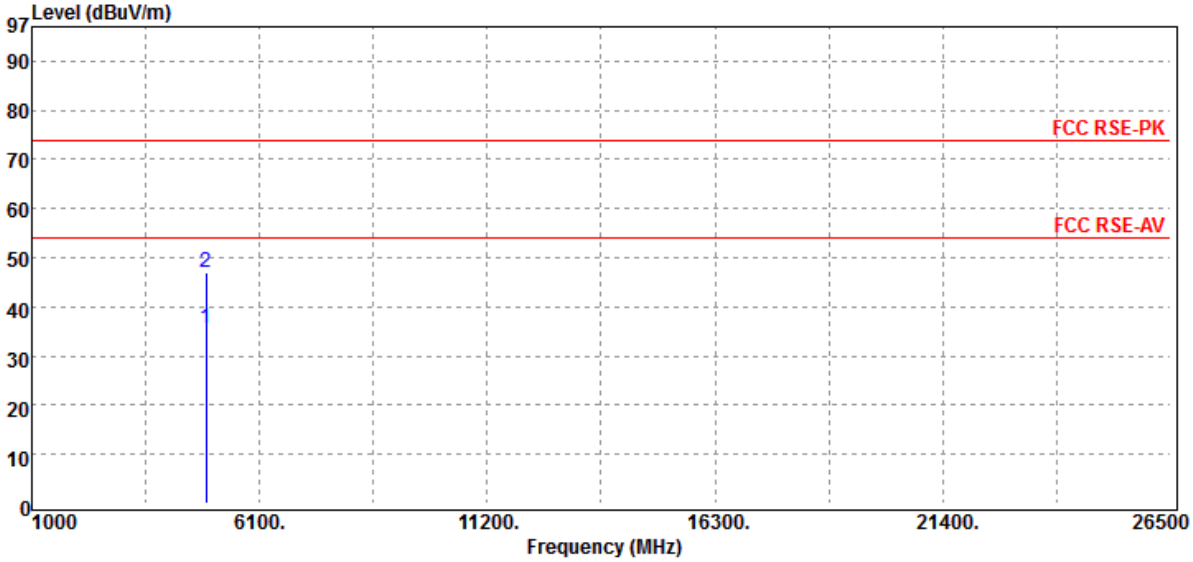
Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
4874.00	H	Average	26.53	9.85	36.38	54.00	-17.62
4874.00	H	Peak	37.91	9.85	47.76	74.00	-26.24

Operation Band	:802.11 n40M	Test Date	:2015-06-24
Fundamental Frequency	:2452 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:H Plan	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
4904.00	H	Average	25.66	9.84	35.50	54.00	-18.50
4904.00	H	Peak	36.94	9.84	46.78	74.00	-27.22

Operation Band	:802.11 n40M	Test Date	:2015-06-24
Fundamental Frequency	:2452 MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:H Plan	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
4904.00	H	Average	25.74	9.84	35.58	54.00	-18.42
4904.00	H	Peak	37.24	9.84	47.08	74.00	-26.92

12 PEAK POWER SPECTRAL DENSITY

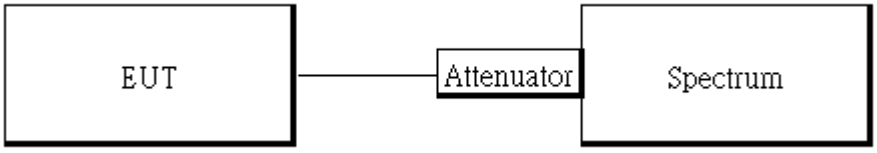
12.1 Standard Applicable

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

12.2 Measurement Equipment Used

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	Agilent	E4446A	MY51100003	01/29/2015	01/28/2016
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2015	01/01/2016
Attenuator	Mini-Circuit	BW-S10W2+	002	01/02/2015	01/01/2016

12.3 Test Set-up



12.4 Measurement Procedure

1. Set analyzer center frequency to DTS channel center frequency.
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance V03r03.
3. Set the span to 1.5 times the DTS channel bandwidth.
4. Set the RBW = 3 kHz.
5. Set the VBW = 10 kHz.
6. Detector = peak.
7. Sweep time = auto couple.
8. Trace mode = max hold.
9. Allow trace to fully stabilize.
10. Use the peak marker function to determine the maximum amplitude level.
11. 802.11n MIMO mode: offset is set following “measure and add 10 Log (N)” on spectrum to measure the PSD for MIMO mode. Offset = cable loss + 10 log (N), where N is number of transmitting antenna. N=2 for this given application.

Note: 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 single transmitting mode is only reported measurement that produces higher value of outcome.

Note: 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) = 4.92+3.01=7.93dBi

Limit: 8dBm – (7.93– 6dBi) = 6.07dBm

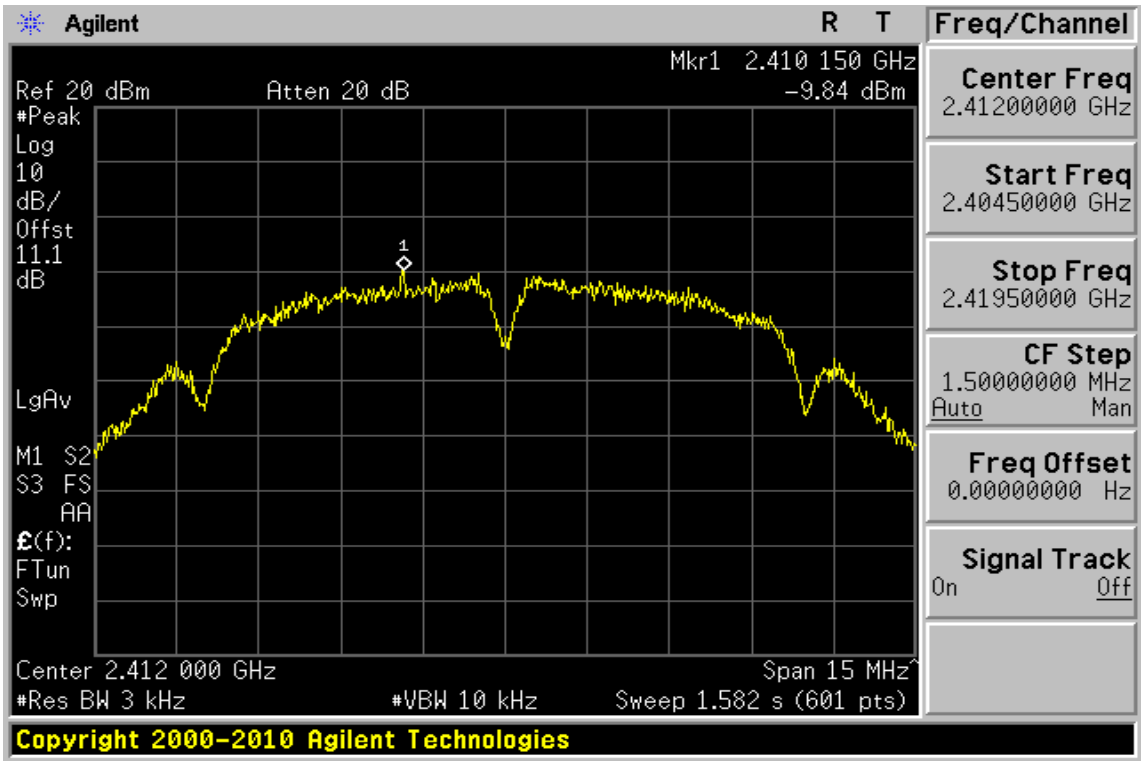
12.5 Measurement Result

Frequency (MHz)	RF Power Density (dBm)	Maximum Limit (dBm)	Result
802.11b			
2412	-9.84	8	PASS
2437	-6.96	8	PASS
2462	-8.25	8	PASS
802.11g			
2412	-17.54	8	PASS
2437	-10.45	8	PASS
2462	-20.78	8	PASS
802.11n_HT20 (MIMO)			
2412	-14.33	6.07	PASS
2437	-15.68	6.07	PASS
2462	-16.69	6.07	PASS
802.11n_HT40 (MIMO)			
2422	-21.24	6.07	PASS
2437	-19.39	6.07	PASS
2452	-21.12	6.07	PASS

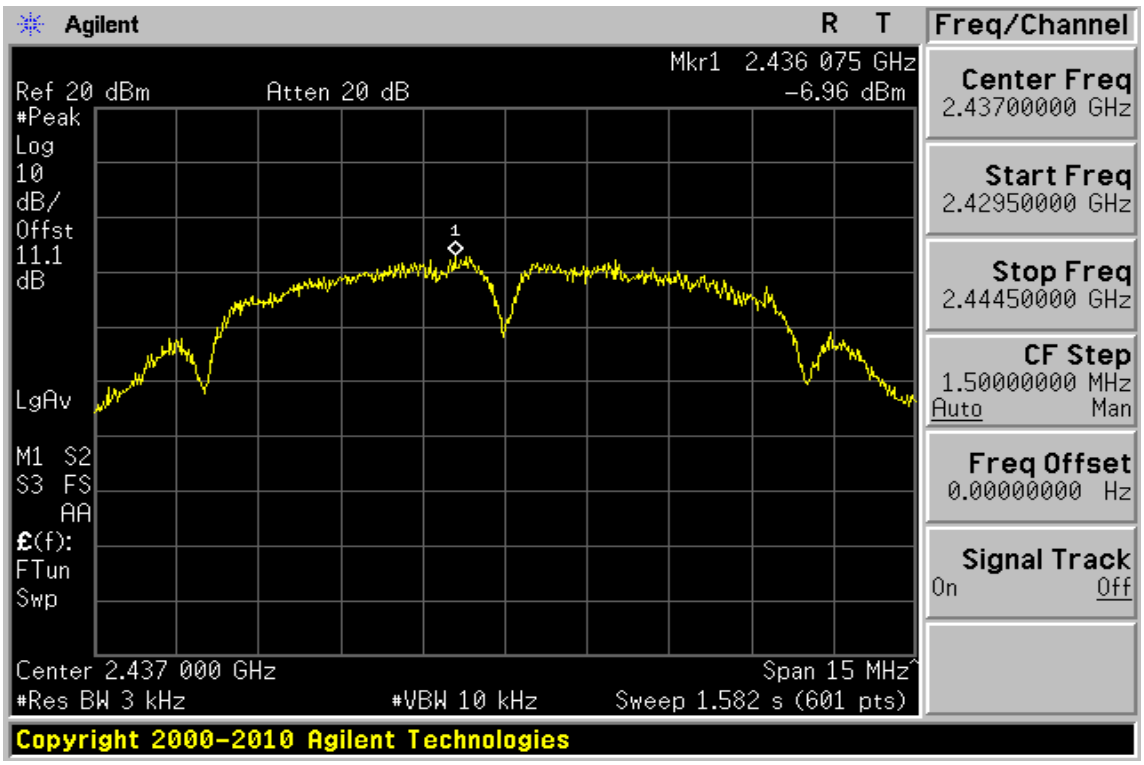
Refer to next page for plots

802.11b

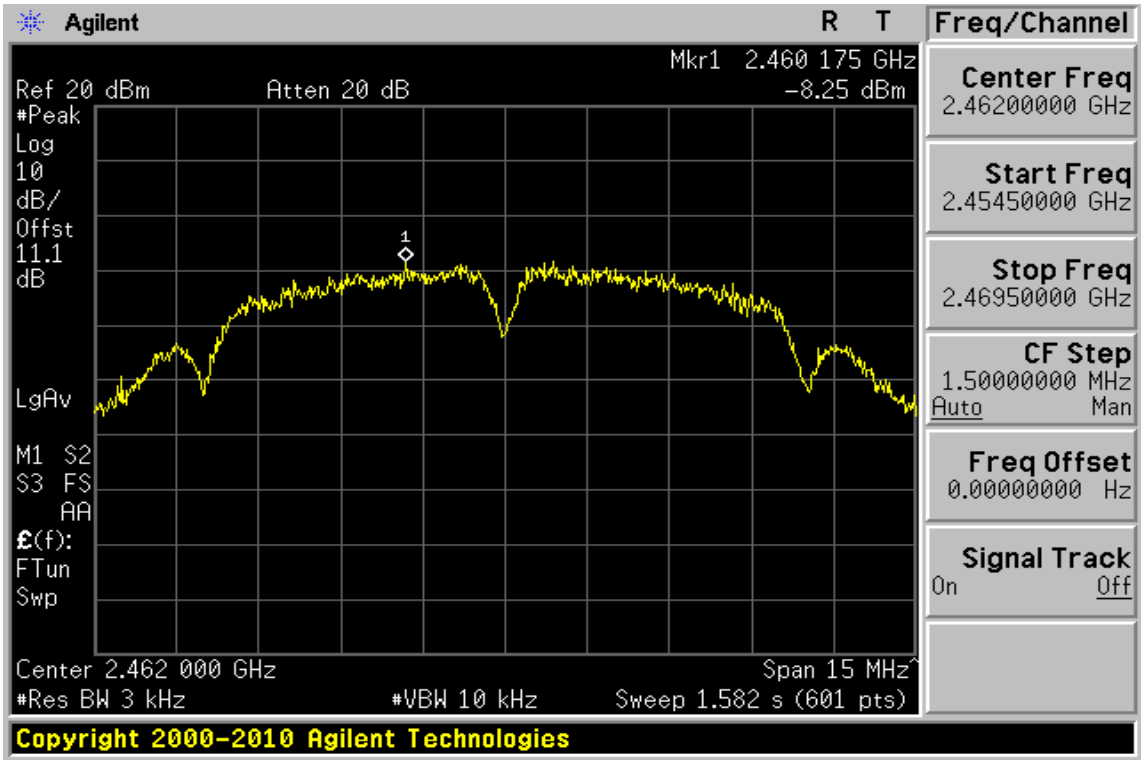
Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)

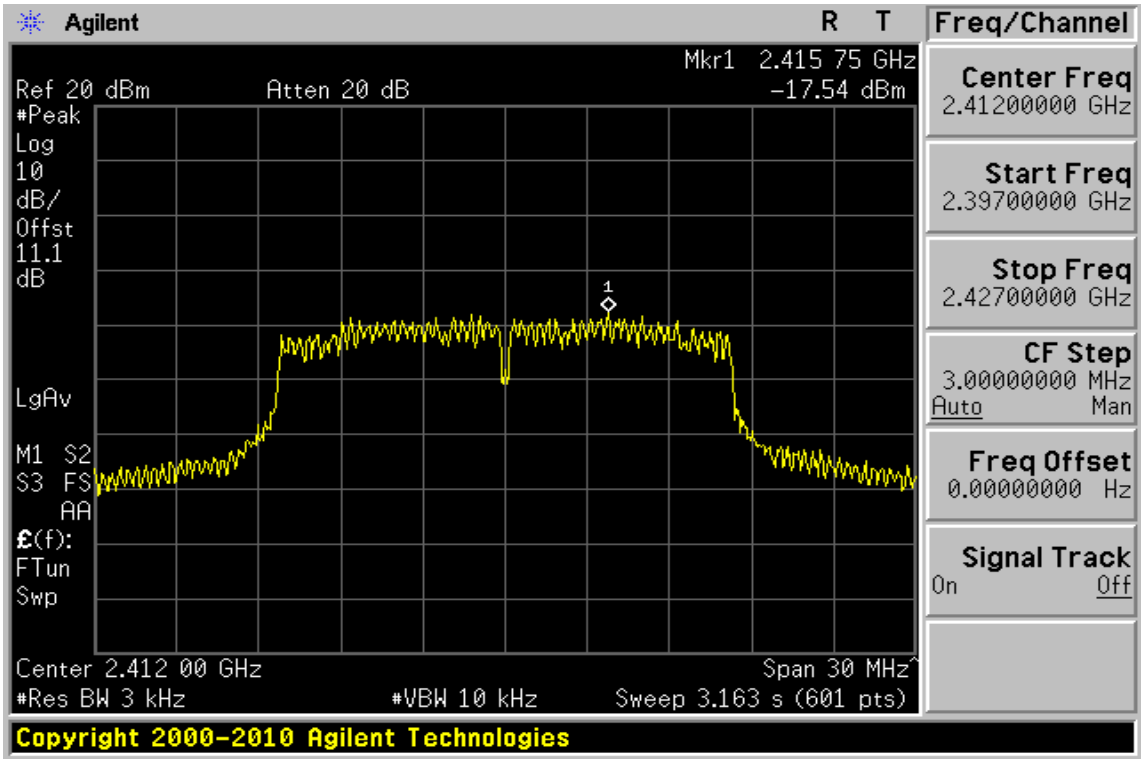


Power Spectral Density Test Plot (CH-High)

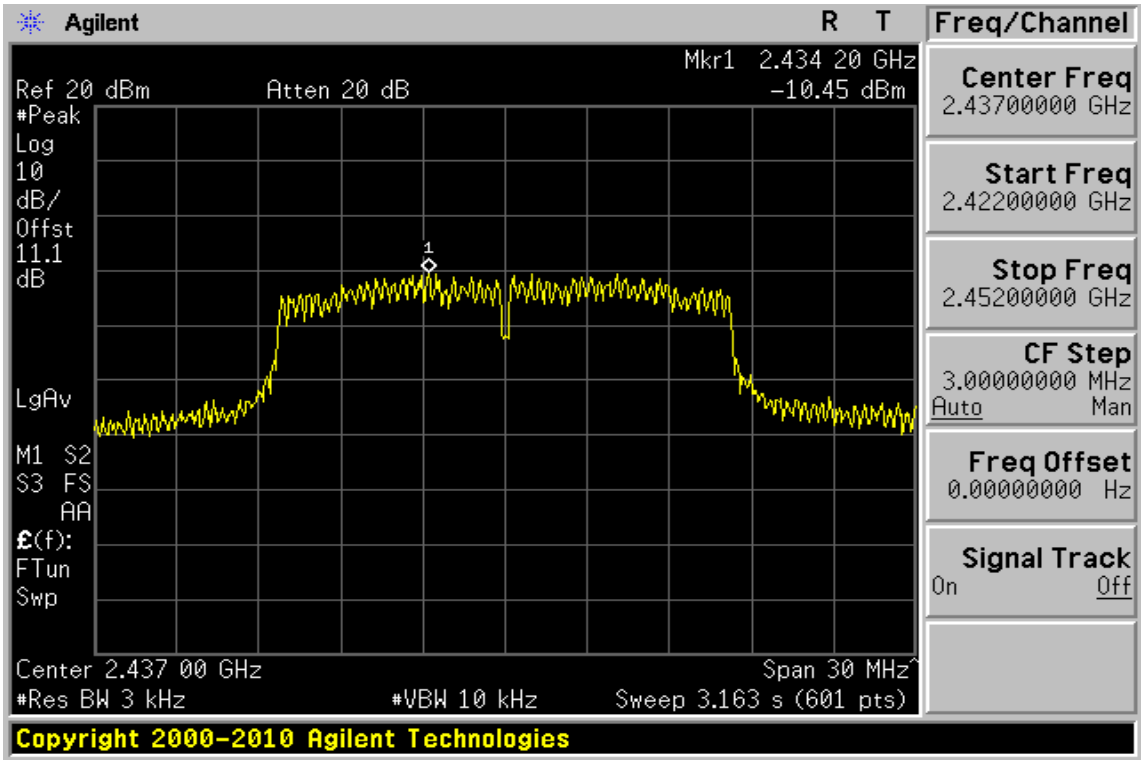


802.11g

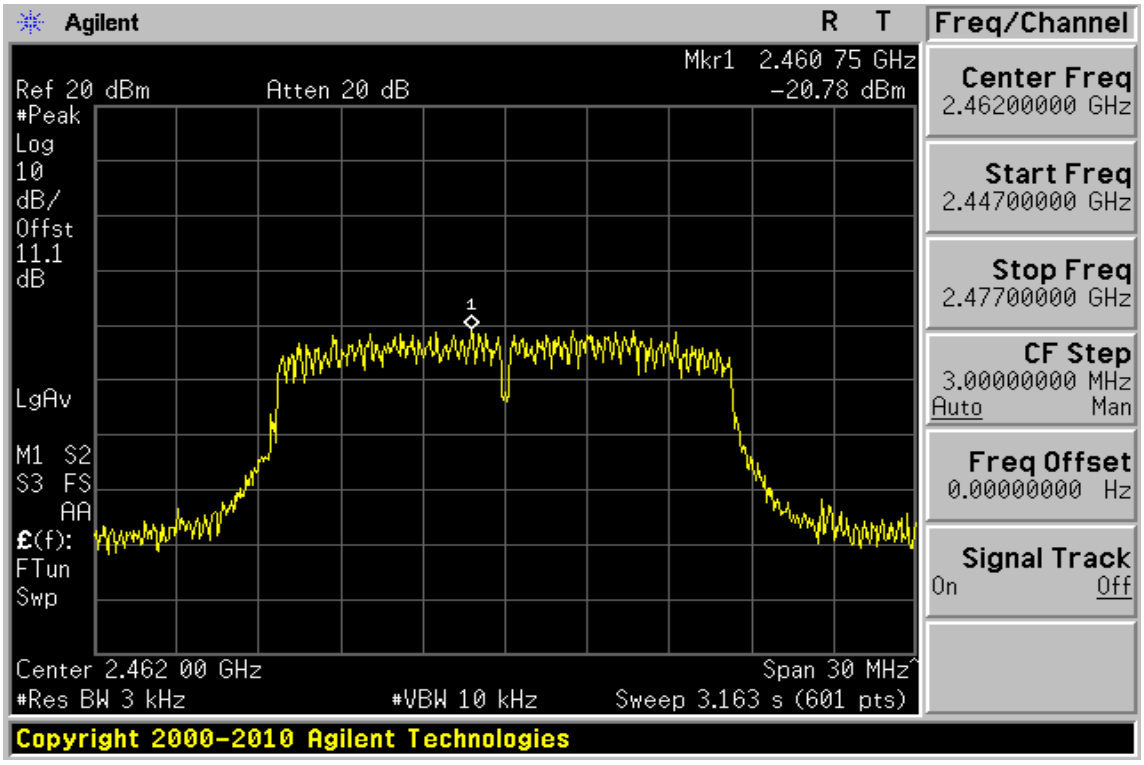
Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)

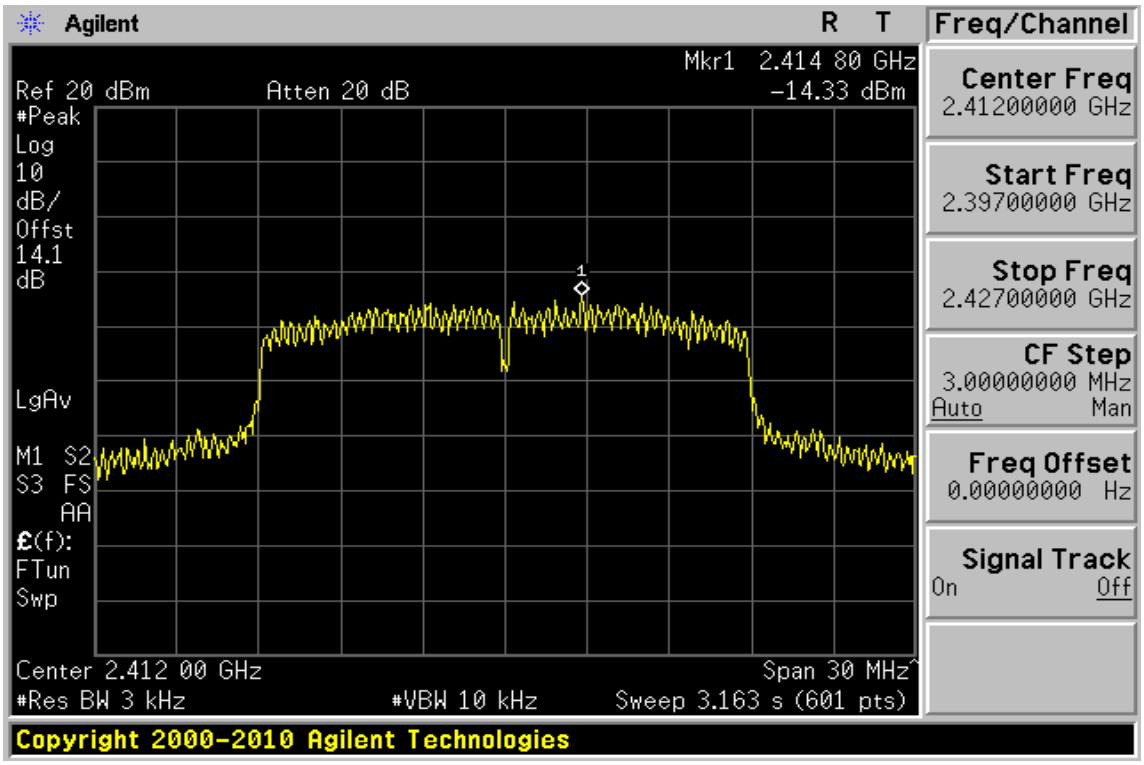


Power Spectral Density Test Plot (CH-High)

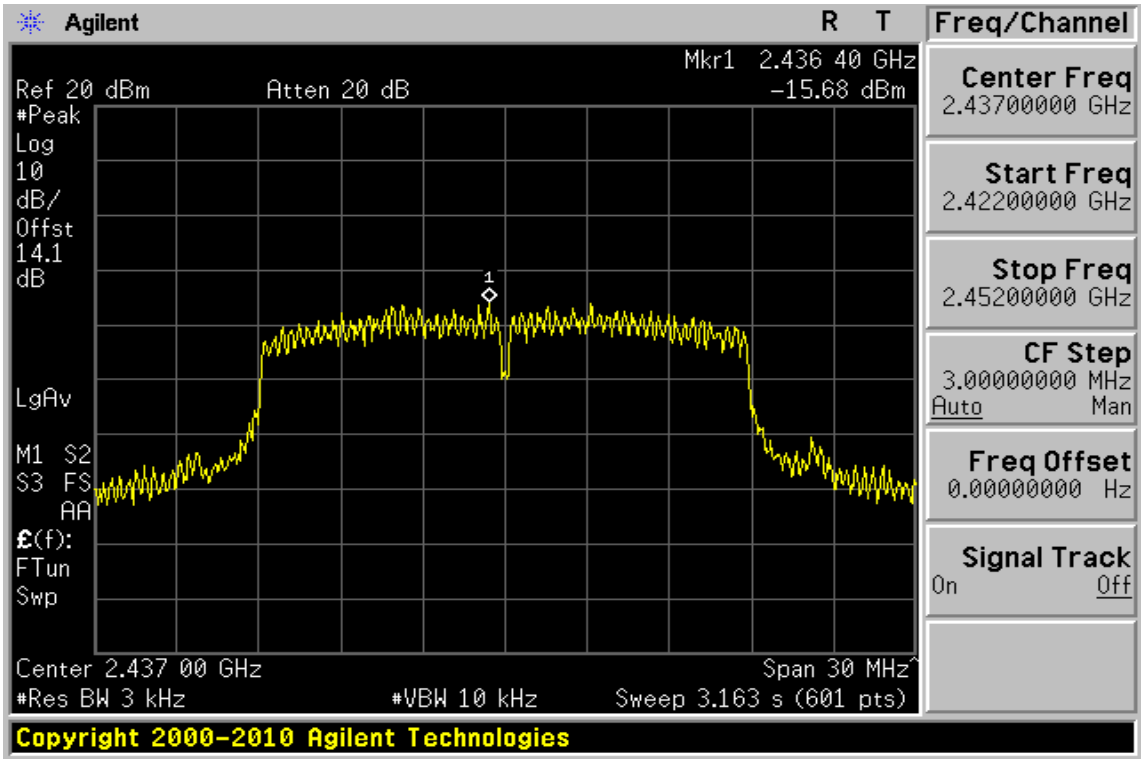


802.11n_HT20 (MIMO)

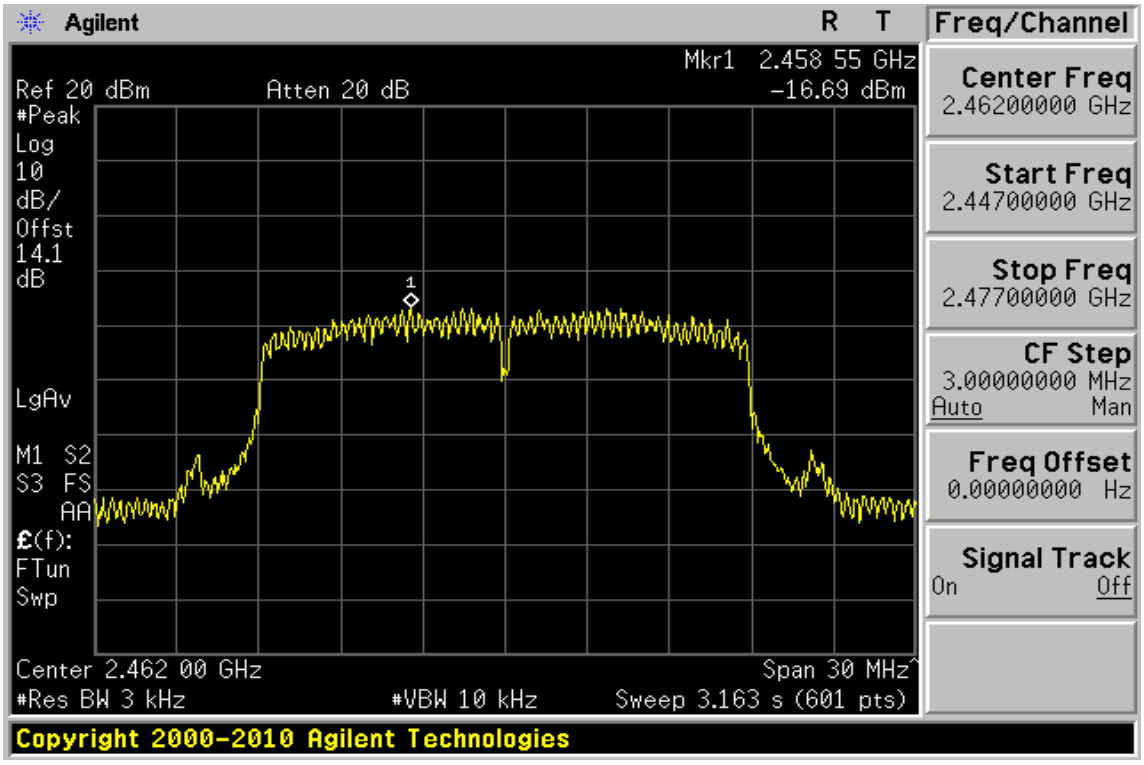
Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)

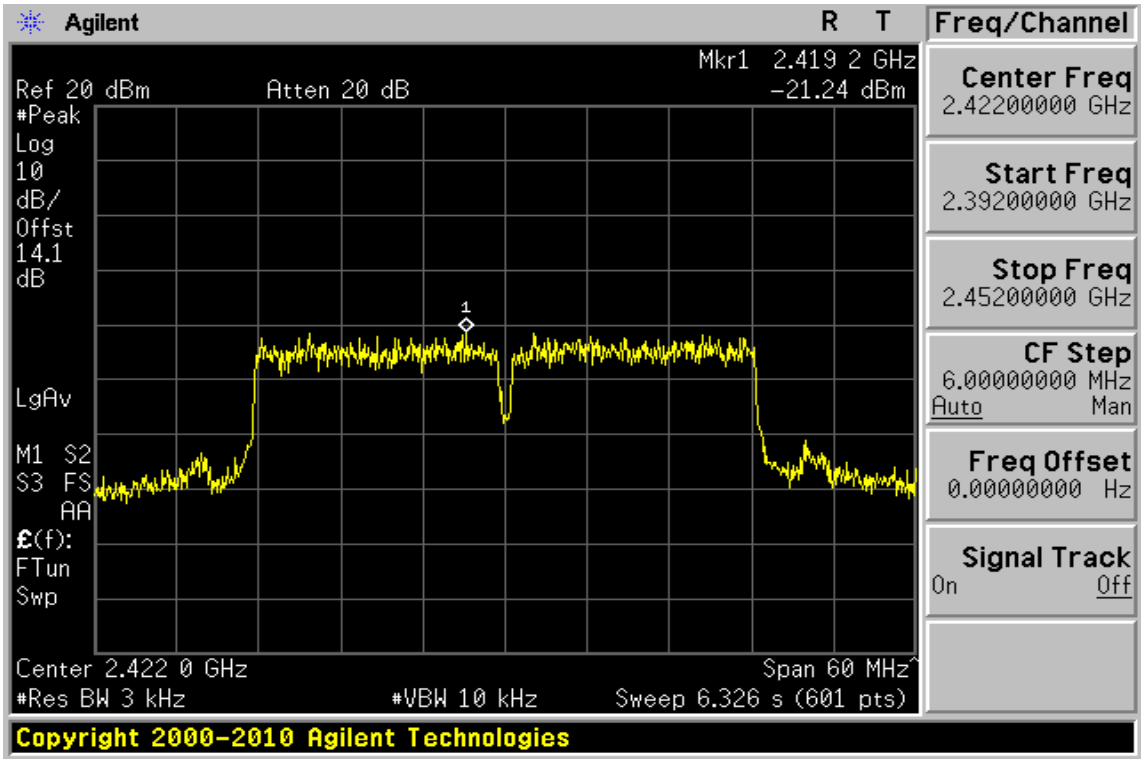


Power Spectral Density Test Plot (CH-High)

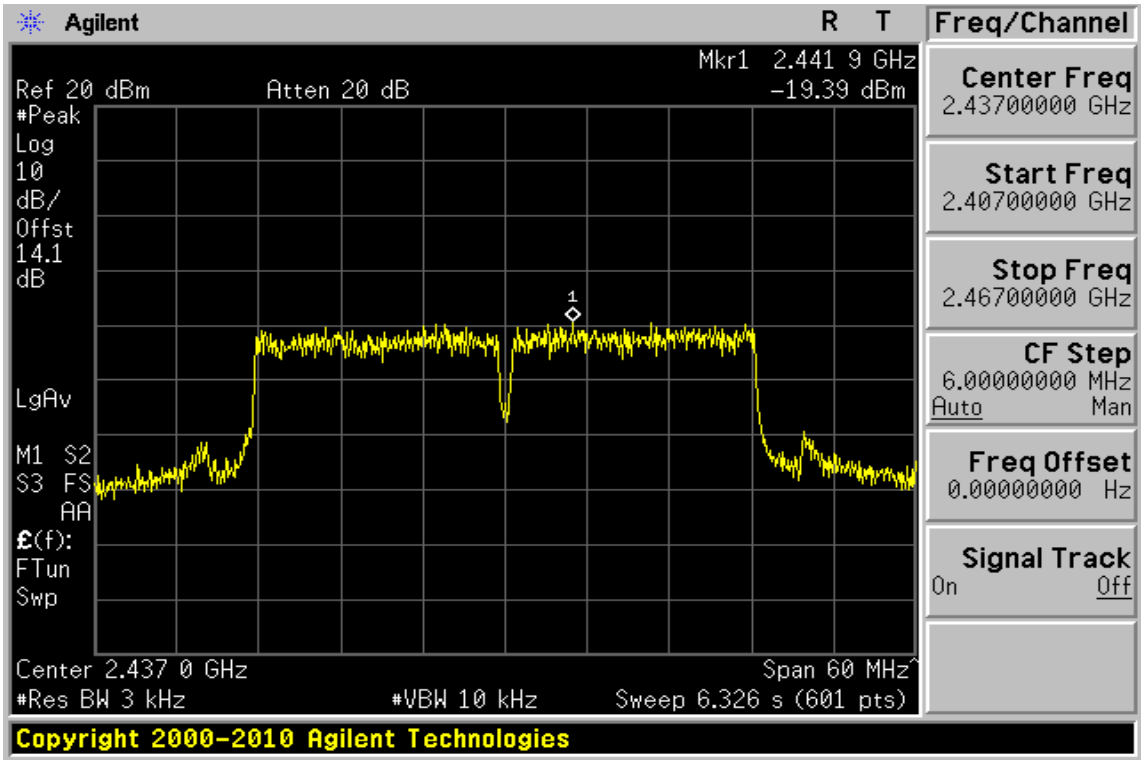


802.11n_HT40 (MIMO)

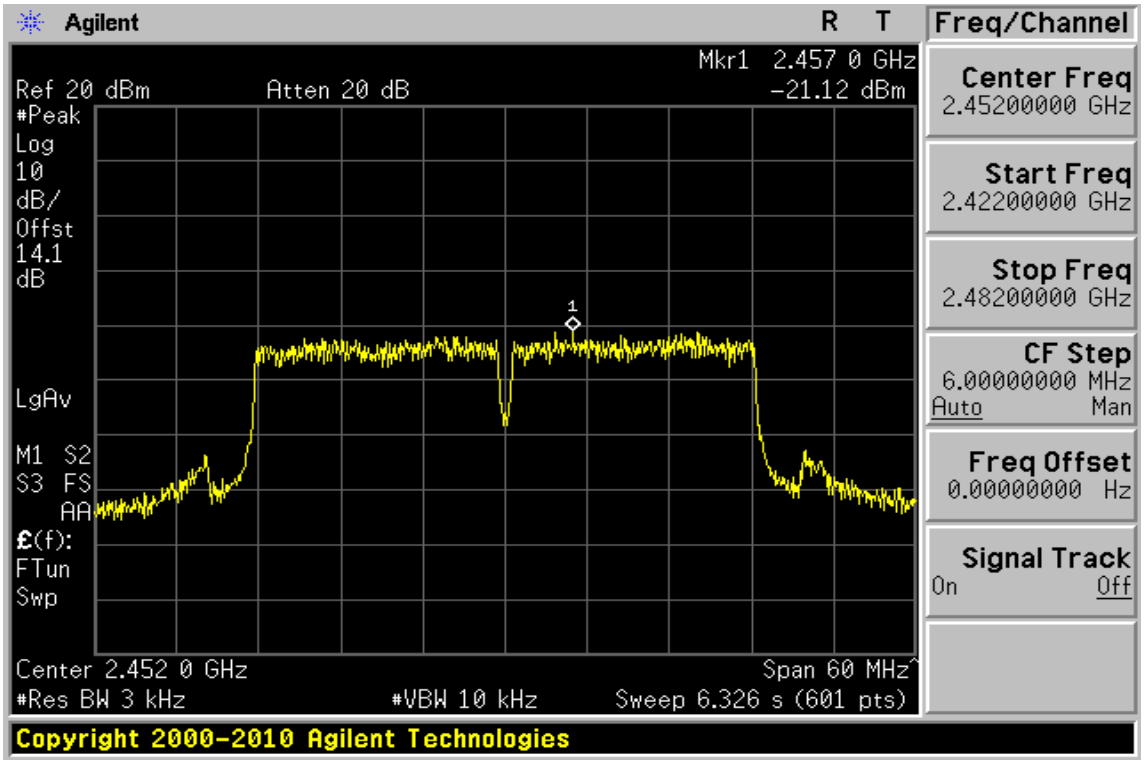
Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)



Power Spectral Density Test Plot (CH-High)



13 ANTENNA REQUIREMENT

13.1 Standard Applicable

For intentional device, 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.

If the transmitting antenna is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi.

In case of point-to-point operation, the power shall be reduced by the one dB for every 3 dB that the directional gain of antenna exceeds 6dBi.

13.2 Antenna Connected Construction

An embedded-in antenna design is used.

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

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