FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

Porto

Model : D710ET; TB-07E2D

Trade Name: TEC

FCC ID : WIPTB07D

Report No. : ST1308020F

Test lab. Registration : 880581

Prepared for

Top Eight lnd.,Corp
8F,NO.79-1,Zhouzi St.,Neihu District,Taipei City 11493,Taiwan

Prepared by

SINTEK LABORATORY CO., LTD.
NO.7,XINSHIDAI INDUSTRIAL,GUANTIAN VILLAGE,
SHIYAN TOWN,BAO'AN DISTRICT,SHENZHEN,
GUANGDONG,P.R.C.
TEL:86-755-27608353
FAX:86-755-27608359

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1. TEST RESULT CERTIFICATION

Applicant: Top Eight lnd.,Corp.

Address : 8F,NO.79-1,Zhouzi St.,Neihu District,Taipei City 11493,Taiwan

Equipment Under Test: Porto

Model: D710ET; TB-07E2D

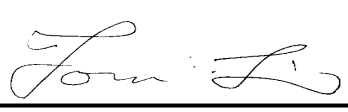
Summary of Test Results		
Test Item	**Standard**	**Result**
Antenna Requirement	FCC Part 15.203	PASS
Power Line Conducted Emission	FCC Part 15.207 ANSI C63.10:2009	PASS
6dB Bandwidth	FCC Part 15.247 ANSI C63.10:2009 KDB 558074	PASS
Peak Output Power	FCC Part 15.247 ANSI C63.10:2009 KDB 558074	PASS
Power Spectral Density	FCC Part 15.247 ANSI C63.10:2009 KDB 558074	PASS
Conducted spurious emissions	FCC Part 15.247 ANSI C63.10:2009 KDB 558074	PASS
Band edge Requirement	FCC Part 15.247 ANSI C63.10:2009 KDB 558074	PASS
Radiation Emission	FCC Part 15.209 ANSI C63.10:2009 KDB 558074	PASS

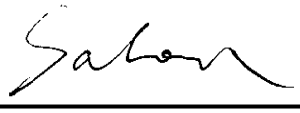
We hereby certify that:

The above equipment was tested by Waltek Services(Shenzhen) Co., Ltd.
The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2009 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.247

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

Approved by: *Reviewed by:*





2. EUT DESCRIPTION

Product	Porto
Trade Name	TEC
Model Number	D710ET; TB-07E2D
Model Discrepancy	Just model named different
Power supply	DC 3.7V from built-in battery and DC 5V from adapter
FCC ID	WIPTB07D
Radio Technology	IEEE 802.11b/g/n
Operation Frequency	IEEE 802.11b: 2412MHz~2462MHz IEEE 802.11g: 2412MHz~2462MHz IEEE 802.11n HT20: 2412MHz~2462MHz IEEE 802.11n HT40: 2422MHz~2452MHz
Modulation Technology	IEEE802.11b:DSSS(CCK,DQPSK,DBPSK) IEEE 802.11g:OFDM(64QAM,16QAM,QPSK,BPSK) IEEE 802.11n HT20,HT40:OFDM(64QAM,16QAM,QPSK,BPSK)
Channel Number	IEEE 802.11b/g,IEEE 802.11n HT20: 11 Channels IEEE 802.11n HT40:7 Channels
Antenna Gain	2dBi Gain
Antenna Type	Integrated PCB antenna
Sample Type	Prototype production

Note: *This submittal(s) (test report) is intended for FCC ID: WIPTB07D filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.*

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4 and ANSI C63.10 and KDB 558074 D01 DTS Meas Guidance v03r01.

3.1 EUT Configuration

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

3.2 EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.247 under the FCC Rules Part 15 Subpart C.

4. TEST INFORMATION

A special test software was used to control EUT work in Continuous TX mode (100% duty cycle), and select test channel, wireless mode,and data rate。

Mode	**Channel**	**Frequency** (MHz)
IEEE 802.11b	Low CH1	2412
	Middle CH6	2437
	High CH11	2462
IEEE 802.11g	Low CH1	2412
	Middle CH6	2437
	High CH11	2462
IEEE802.11n HT20	Low CH1	2412
	Middle CH6	2437
	High CH11	2462
IEEE802.11n HT40	Low CH3	2422
	Middle CH6	2437
	High CH9	2452
Note: Channel with highest data rate or “worst case”are chosen for full testing		

5. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

6. FACILITIES AND ACCREDITATIONS

6.1 Facilities

All measurement facilities used to collect the measurement data are located at

1/F., Fukangtai Building, West Baima Road, Songgang Street, Baoan District, Shenzhen, Guangdong, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

6.2 Equipment

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

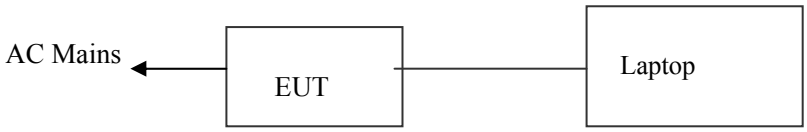
All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

6.3 Laboratory Accreditations And Listing

Waltek Services (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 880581, May 26, 2011.

7. SETUP OF EQUIPMENT UNDER TEST

7.1 Configuration of Tested System



Refer to attached Appendix 1.

7.2Support Equipment

No.	Equipment	Model#	Serial#	Trade Name	Data Cable	Power Cord
1.	Laptop	G470	CB13221856	LENOVE	N/A	Unshielded 1.5m

Notes:

All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

8. POWER LINE CONDUCTED EMISSIONS

Limit

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dBμV)	
	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

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Measurement Equipment Used

Name of Equipment	Manufacturer	Model	Serial Number	LAST CAL.	Calibration Due
EMI Test Receiver	SCHAFFNER	SCR3501	464	06/12/2013	06/12/2014
Spectrum Analyzer	ADVANTEST	R3132	140301570	06/12/2013	06/12/2014
LISN	COM-POWER	LI115	2027	06/12/2013	06/12/2014

Remark: *Each piece of equipment is scheduled for calibration once a year.*

Test Configuration

The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.4: 2009

The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of the test table and bundle when necessary.

The EUT is set to transmit in a continuous mode.

Test Procedure

The EUT was placed on a table, which is 0.8m above ground plane.

Maximum procedure was performed on the six highest emissions to ensure EUT compliance.

Repeat above procedures until all frequency measured were complete.

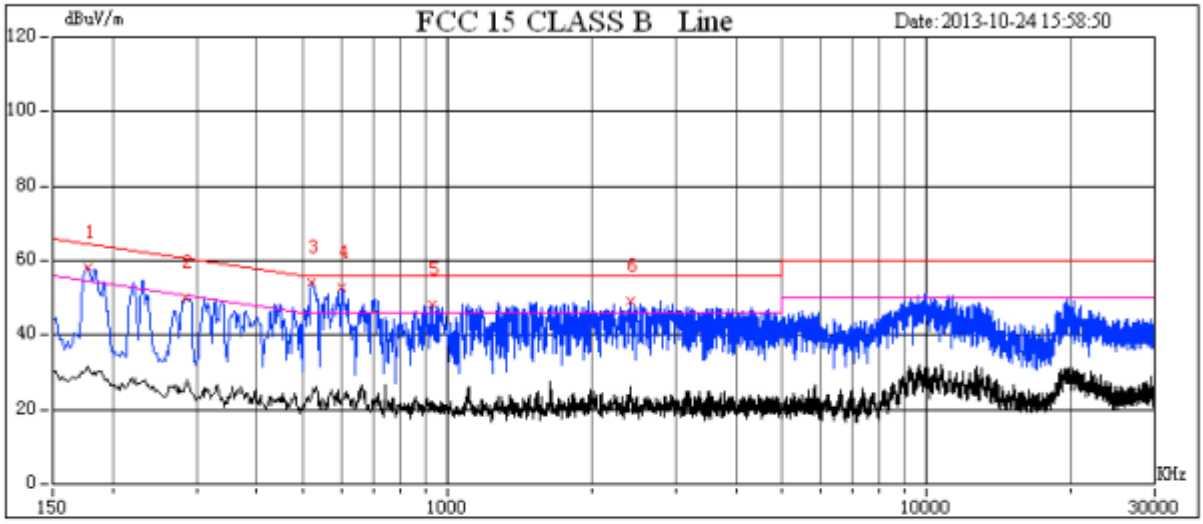
Test Results

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page.

Customer Name: BH
Model Name: D710ET
Test Mode: Charging by adapter
Index: 1

Project No.:
Engineer Name: ZNX

843

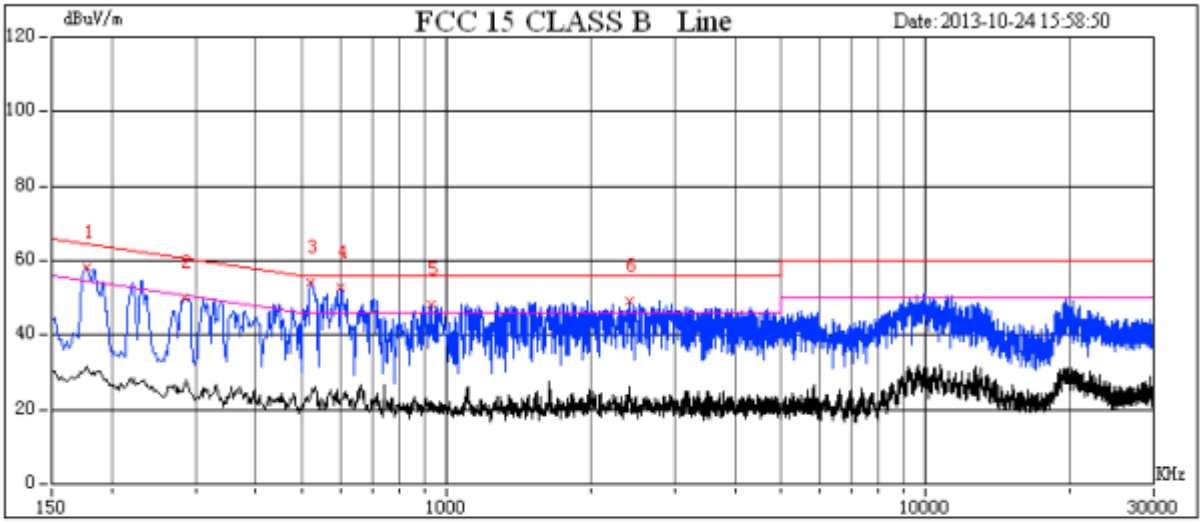


	Freq(KHz)	Peak Amptd(dBuV)	QP Amptd(dBuV)	Avg Amptd(dBuV)	QP Limit(dBuV)	Avg Limit(dBuV)	QP Margin(dB)	Avg Margin(dB)	Factor(dB)
1	177.7500	58.33	---	31.91	65.21	55.21	-6.87	-23.29	11.42
2	285.0500	49.95	---	29.47	62.14	52.14	-12.19	-22.67	11.54
3	521.8500	54.26	50.41	26.84	56.00	46.00	-5.59	-19.16	11.78
4	603.2500	52.66	50.21	24.54	56.00	46.00	-5.79	-21.46	12.30
5	927.0000	48.45	---	23.85	56.00	46.00	-7.55	-22.15	12.21
6	2415.1040	49.27	---	26.86	56.00	46.00	-6.73	-19.14	12.64

Customer Name: BH
Model Name: D710ET
Test Mode: Charging by adapter
Index: 1

Project No.:
Engineer Name: ZNX

843



	Freq(KHz)	Peak Amptd(dBuV)	QP Amptd(dBuV)	Avg Amptd(dBuV)	QP Limit(dBuV)	Avg Limit(dBuV)	QP Margin(dB)	Avg Margin(dB)	Factor(dB)
1	177.7500	58.33	---	31.91	65.21	55.21	-6.87	-23.29	11.42
2	285.0500	49.95	---	29.47	62.14	52.14	-12.19	-22.67	11.54
3	521.8500	54.26	50.41	26.84	56.00	46.00	-5.59	-19.16	11.78
4	603.2500	52.66	50.21	24.54	56.00	46.00	-5.79	-21.46	12.30
5	927.0000	48.45	---	23.85	56.00	46.00	-7.55	-22.15	12.21
6	2415.1040	49.27	---	26.86	56.00	46.00	-6.73	-19.14	12.64

L1 = Line One (Hot side) / L2 = Line Two (Neutral side)
NOTE: **"---" denotes the emission level was or more than 2dB below the Average limit, so no re-check anymore.

9. 6DB BANDWIDTH

Limit

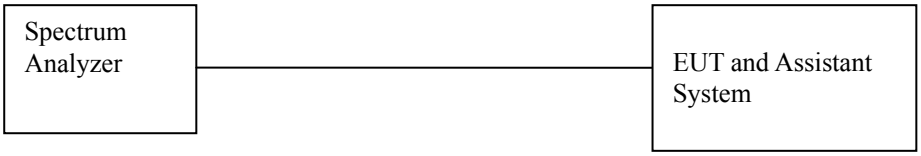
For direct sequence systems, the minimum 6dB bandwidth shall be at least 500 KHz.

Measurement Equipment Used

Name of Equipment	Manufacturer	Model	Serial Number	LAST CAL.	Calibration Due
Spectrum Analyzer	AGILENT	E4407B	MY41441082	06/12/2013	06/12/2014
RF Cable	TIME MICROWAVE	LMR-400	N-TYPE04	06/12/2013	06/12/2014

Remark: *Each piece of equipment is scheduled for calibration once a year.*

Test Configuration



Test Procedure

Connect the Spectrum Analyzer to the EUT using a RF cable connectd to the EUT's antenna output.

Configure the spectrum analyzer settings as described in KDB558074 D01 DTS Meas Guidance v03r01 clause 8.2 Option 2.

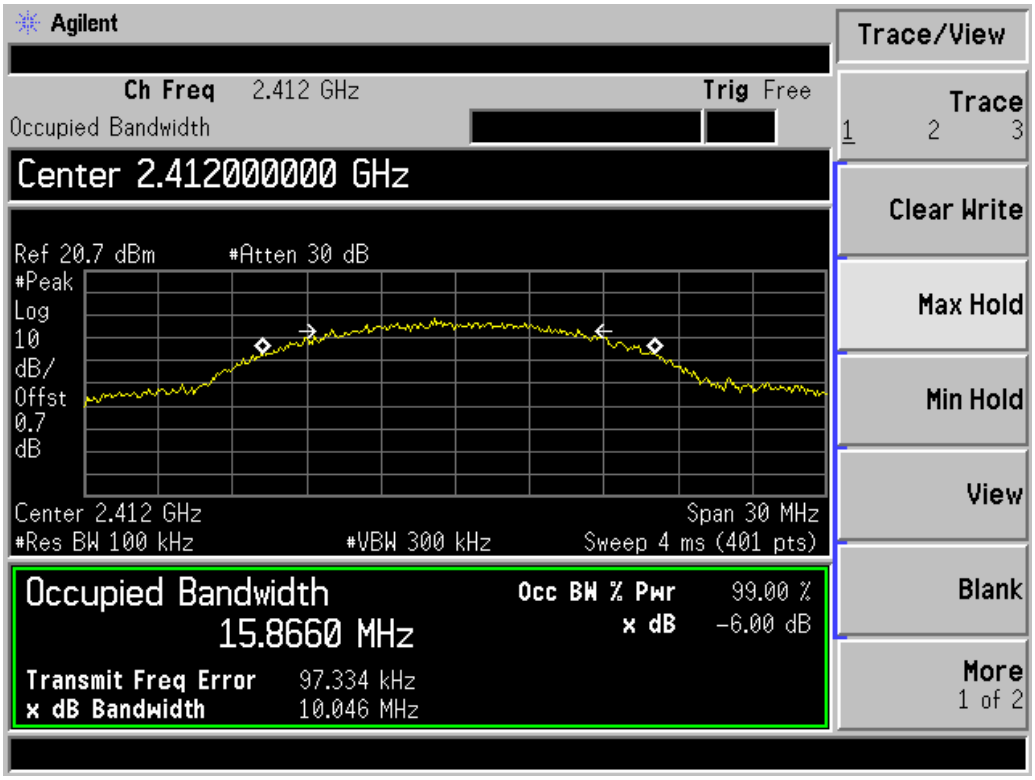
Measure out each mode band the bandwidth of the fundamental frequency,

Test Results

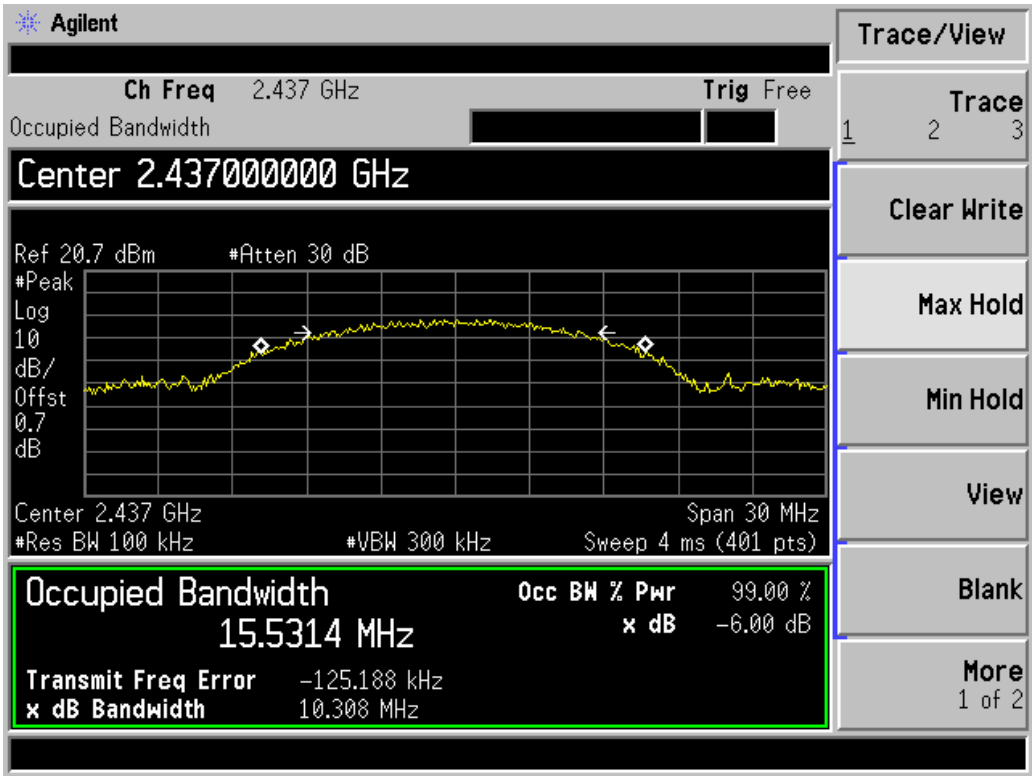
EUT: Porto M/N:D710ET			
Test Date : 2013-10-16		Test Engineer : leon	
Mode	CH	Result(MHz)	Limit(KHz)
11b	CH1	10.046	>500KHz
	CH6	10.308	>500KHz
	CH11	10.088	>500KHz
11g	CH1	16.544	>500KHz
	CH6	16.534	>500KHz
	CH11	16.563	>500KHz
11n HT20	CH1	17.752	>500KHz
	CH6	17.742	>500KHz
	CH11	17.815	>500KHz
11n HT40	CH3	35.160	>500KHz
	CH6	36.259	>500KHz
	CH9	36.255	>500KHz
Conclusion: PASS			

Refer to attach spectrum analyzer data chart

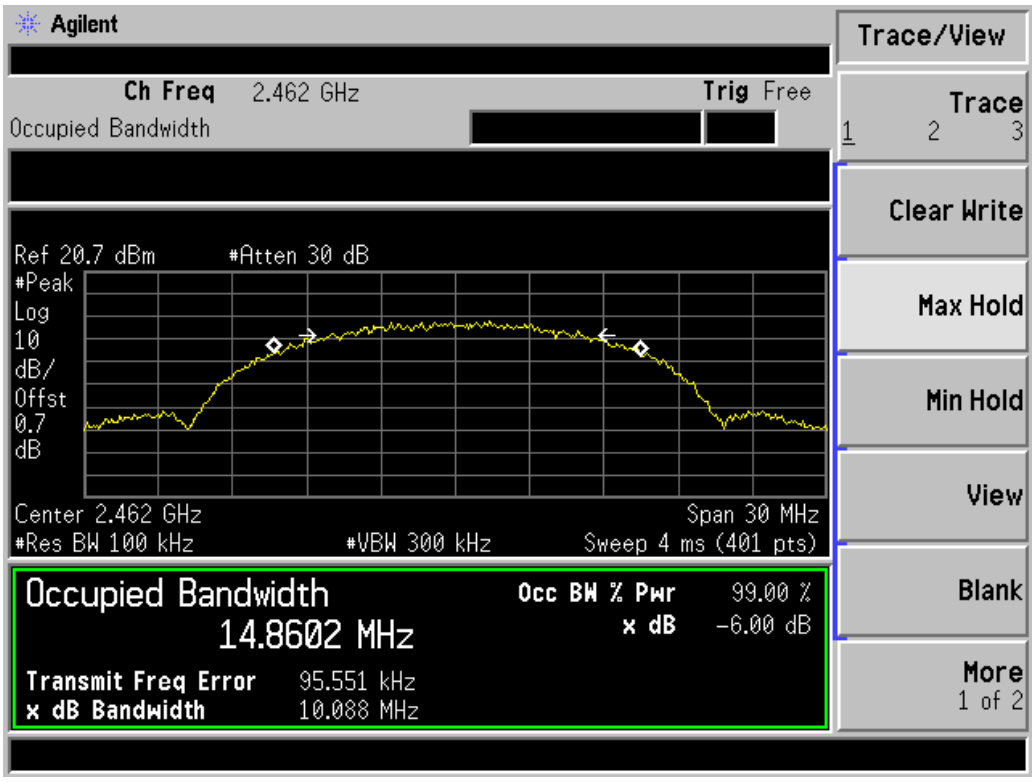
IEEE 802.11b CH1



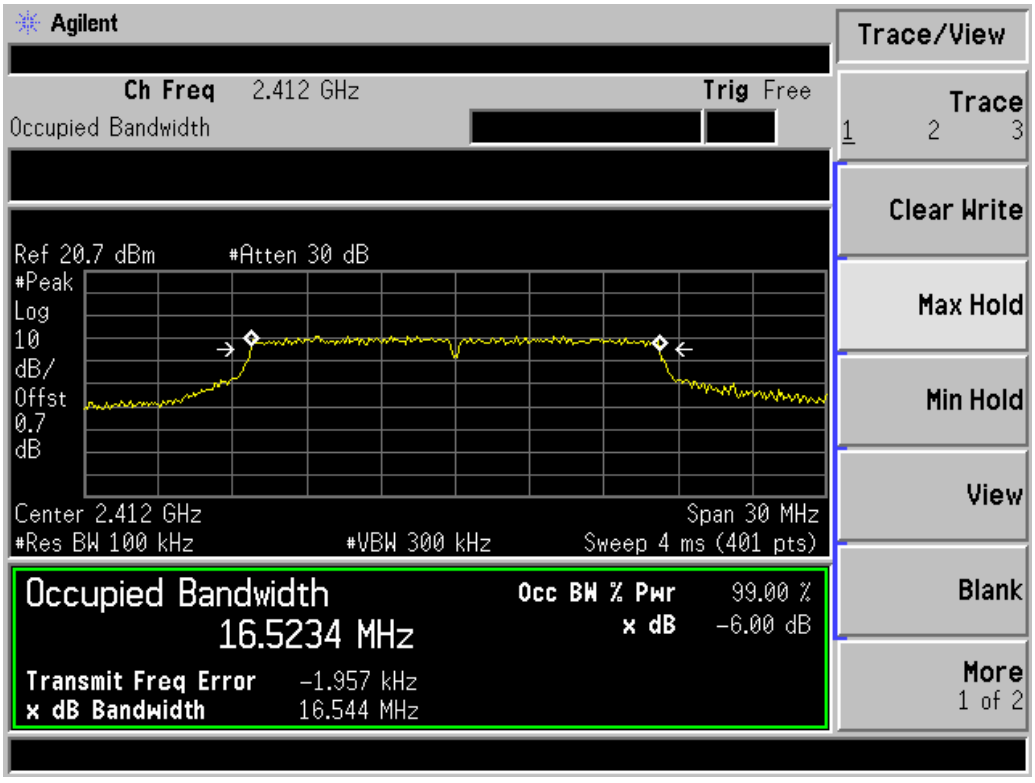
IEEE 802.11b CH6



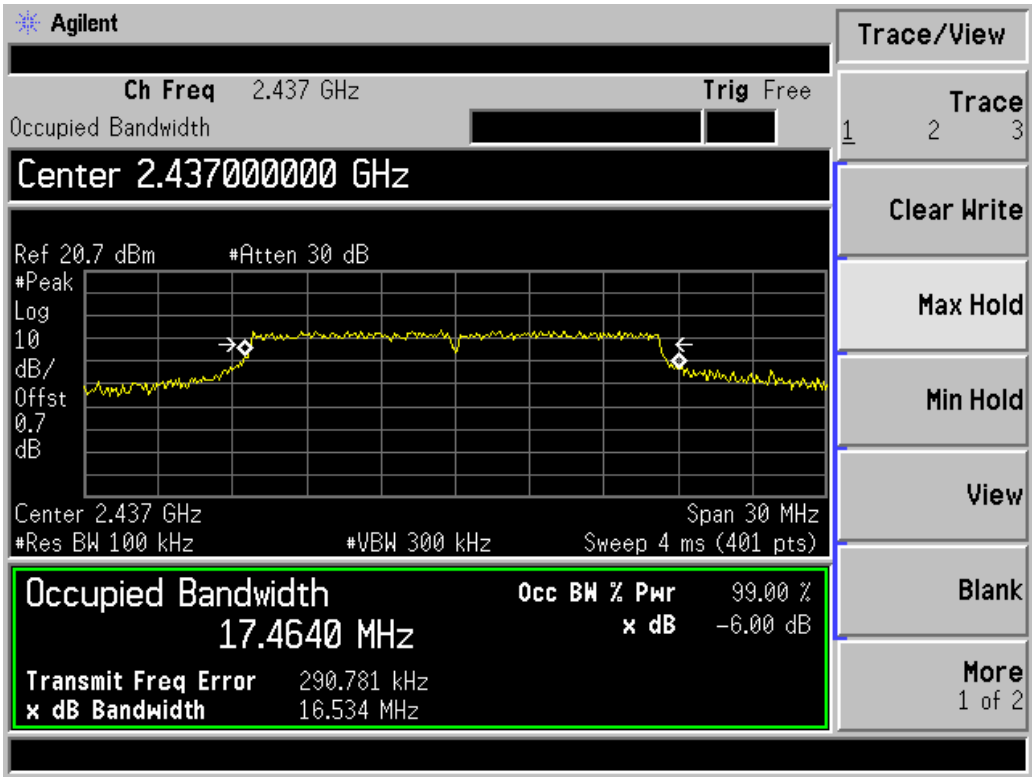
IEEE 802.11b CH11



IEEE 802.11g CH1



IEEE 802.11g CH6



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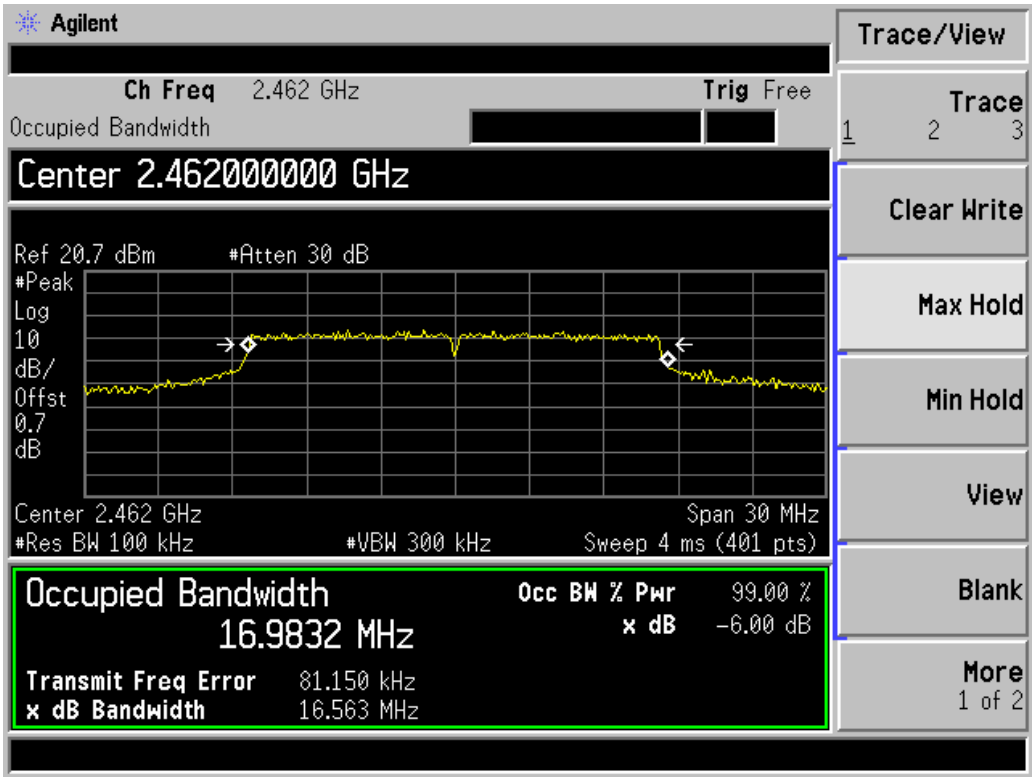
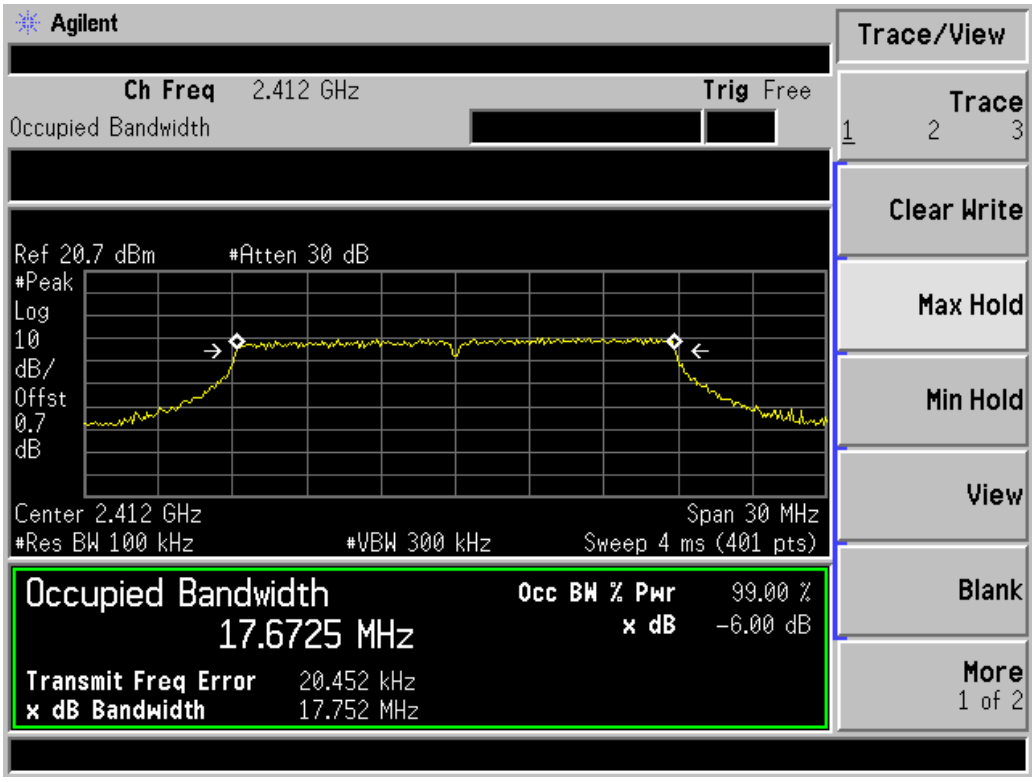


IEEE 802.11n20 CH1



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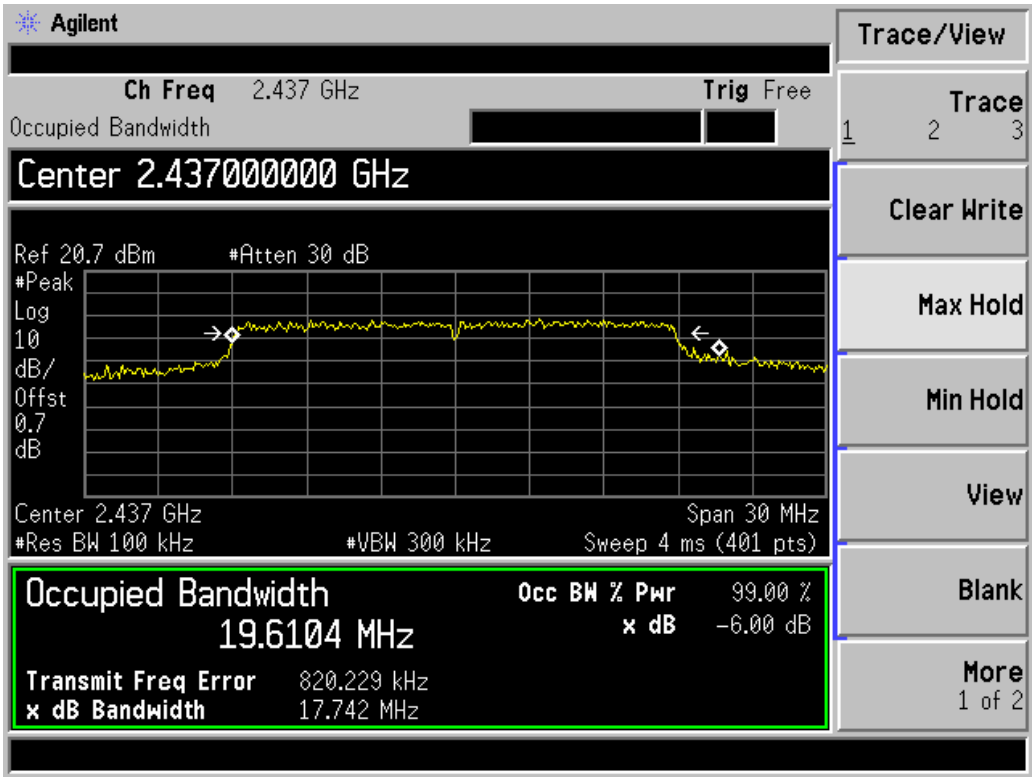
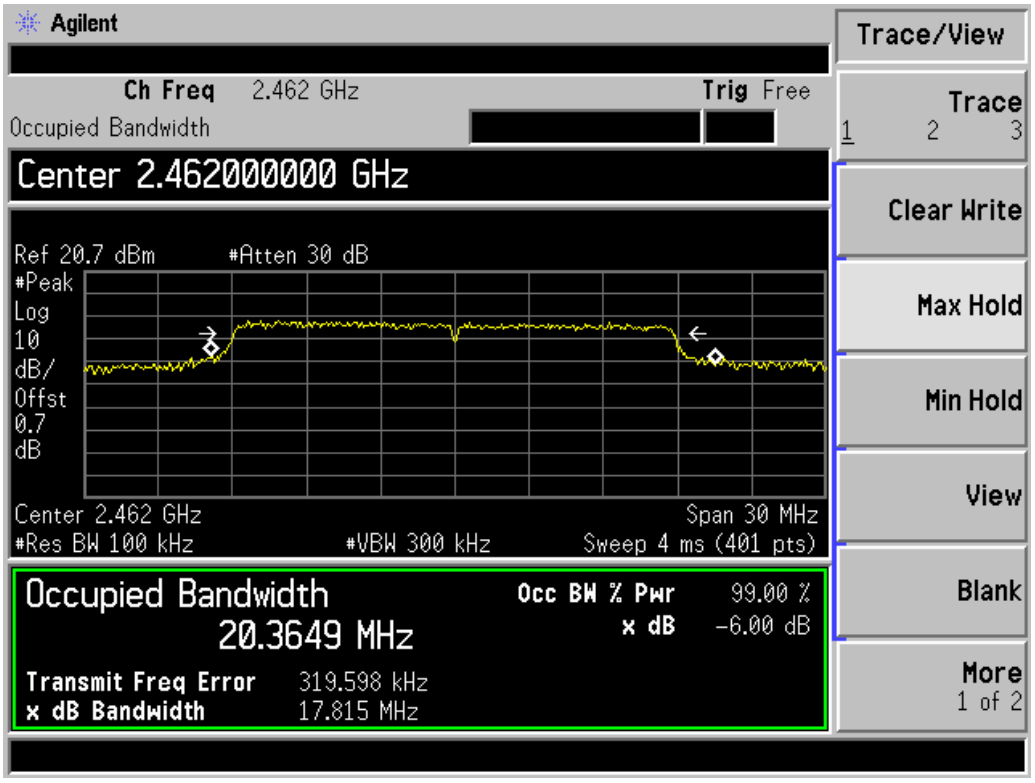
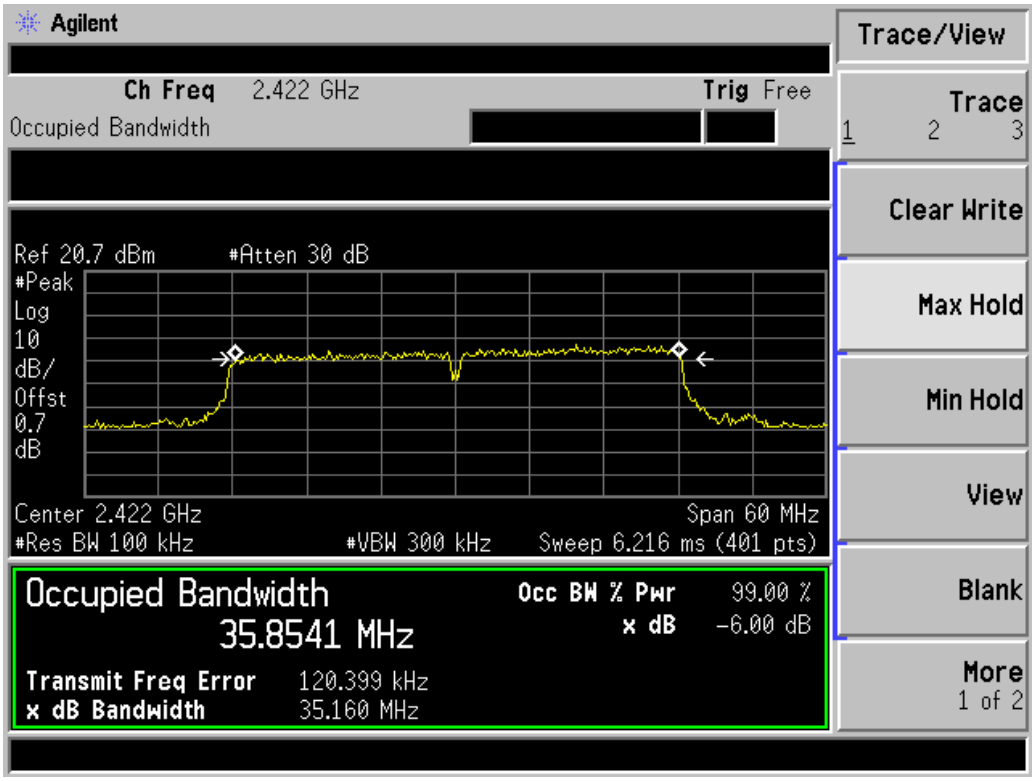


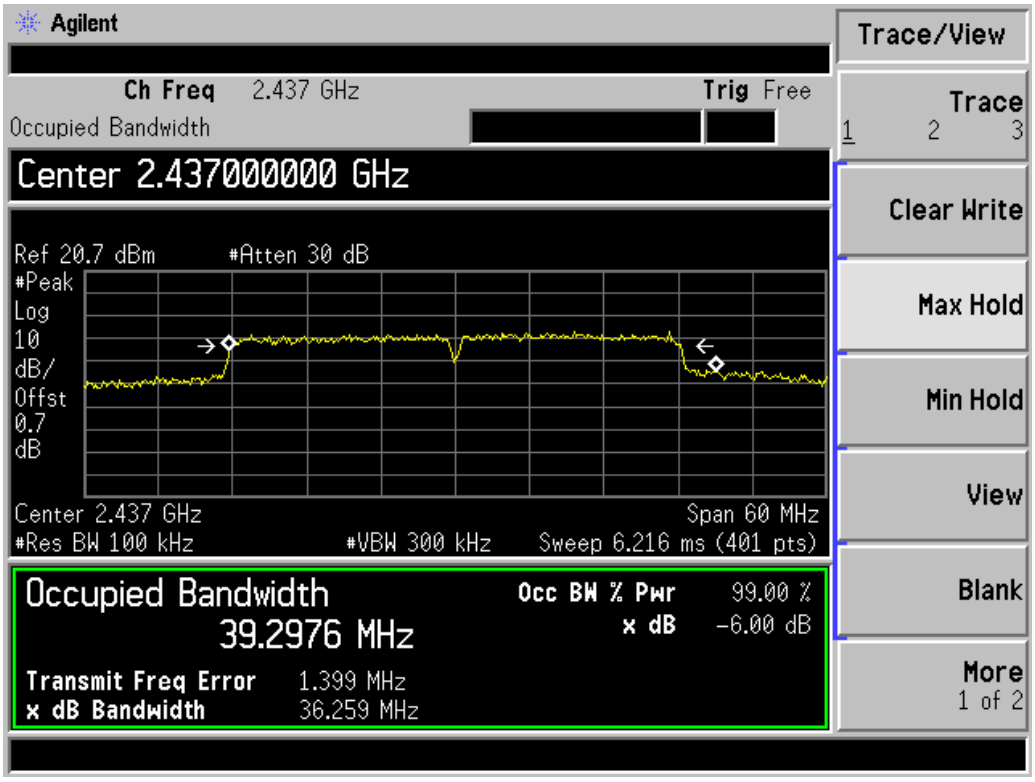
IEEE 802.11n20 CH11



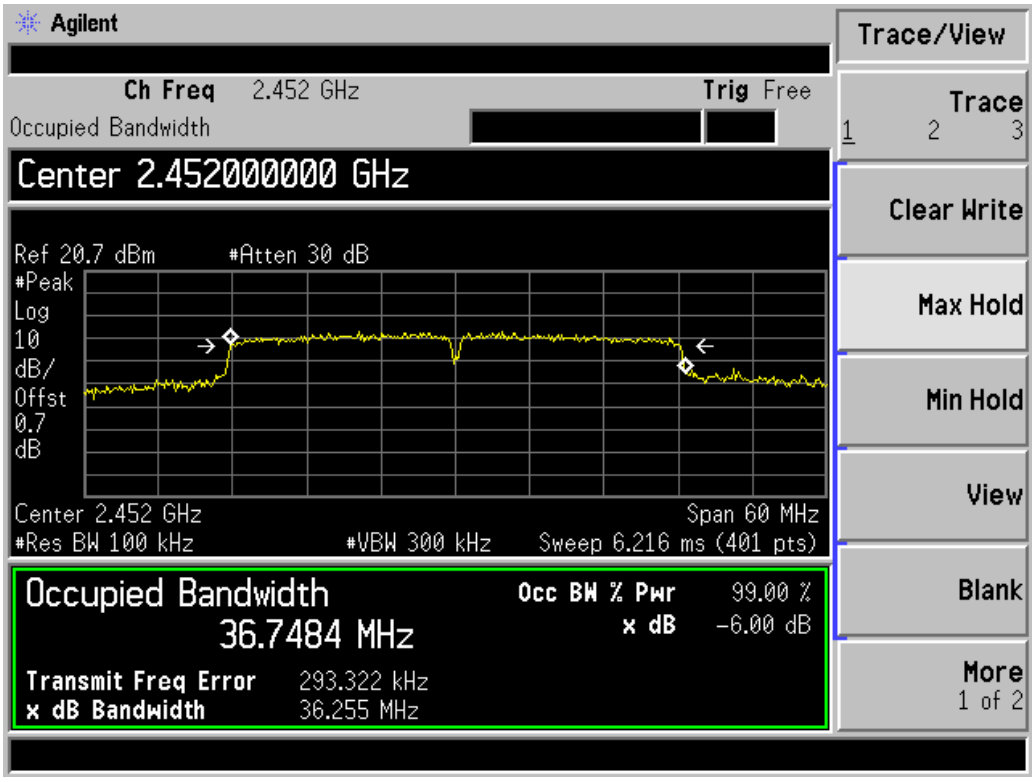
IEEE 802.11n40 CH3



IEEE 802.11n40 CH6



IEEE 802.11n40 CH9



10. MAXIMUM PEAK OUTPUT POWER

Limit

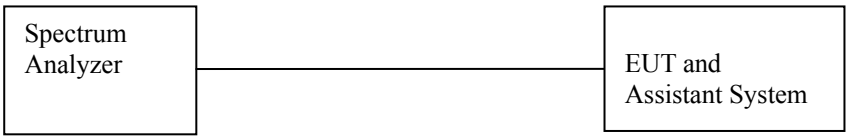
For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values as appropriate, by the amount in dBthat the directional gain of the antenna exceeds 6 dBi.

Measurement Equipment Used

Name of Equipment	Manufacturer	Model	Serial Number	LAST CAL.	Calibration Due
Spectrum Analyzer	AGILENT	E4407B	MY41441082	06/12/2014	06/12/2014
RF Cable	TIME MICROWAVE	LMR-400	N-TYPE04	06/12/2014	06/12/2014

Remark: *Each piece of equipment is scheduled for calibration once a year.*

Test Configuration



Test Procedure

Connect the Spectrum Analyzer to the EUT using a RF cable connectd to the EUT's antenna output.

Configure the spectrum analyzer settings as described in KDB558074 D01 DTS Meas Guidance v03r01 clause 9.1.2 integrated band power method.

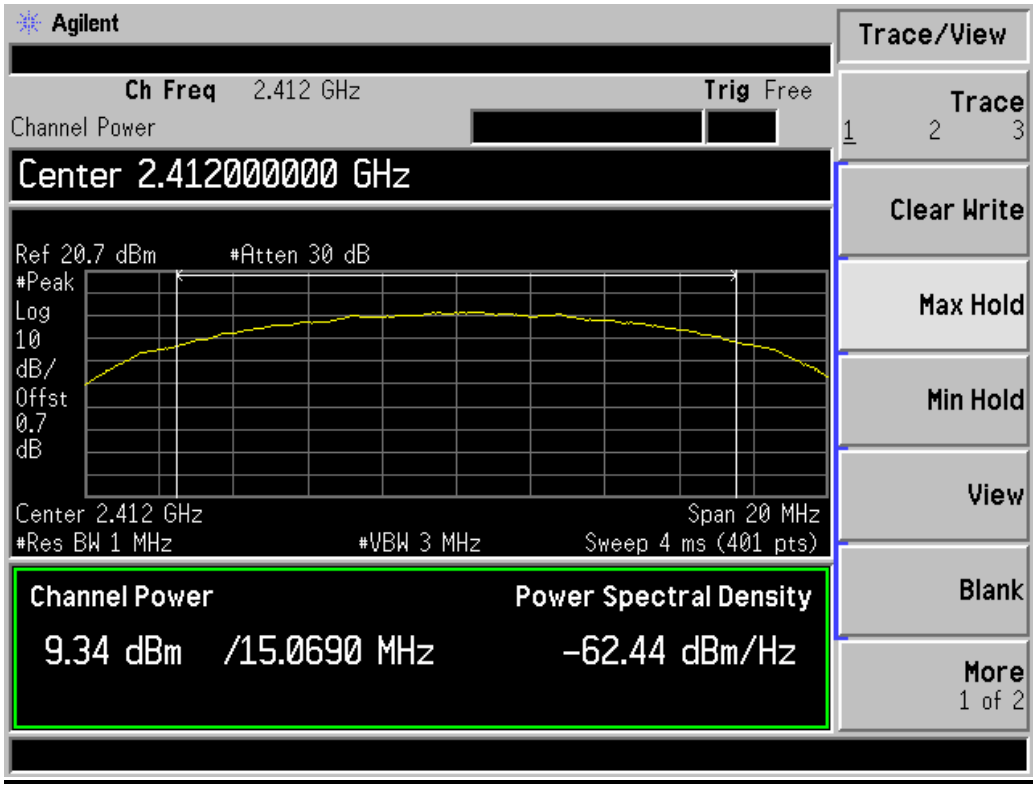
Measure out each mode peak output power of the fundamental frequency.

Test Results

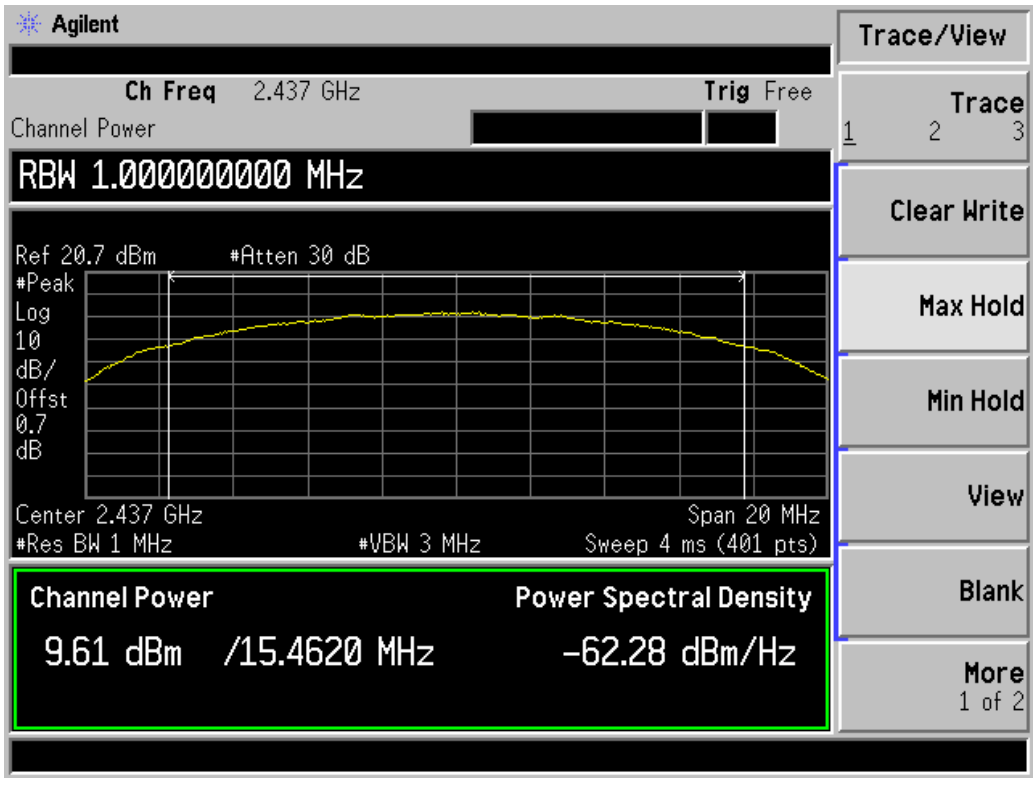
EUT: Porto M/N:D710ET				
Test Date : 2013-10-16			Test Engineer : leon	
Mode	CH	Result	Limit(dBm)	Margin(dB)
		Maximum PK Output Power(dBm)		
11b	CH1	9.34	30	-20.66
	CH6	9.61	30	-20.39
	CH11	9.88	30	-20.12
11g	CH1	7.62	30	-22.38
	CH6	7.11	30	-22.89
	CH11	6.04	30	-23.96
11n HT20	CH1	7.92	30	-22.08
	CH6	7.78	30	-22.22
	CH11	7.89	30	-22.11
11n HT40	CH3	6.66	30	-23.34
	CH6	7.20	30	-22.80
	CH9	7.31	30	-22.69
Conclusion: PASS				

Refer to attach spectrum analyzer data chart

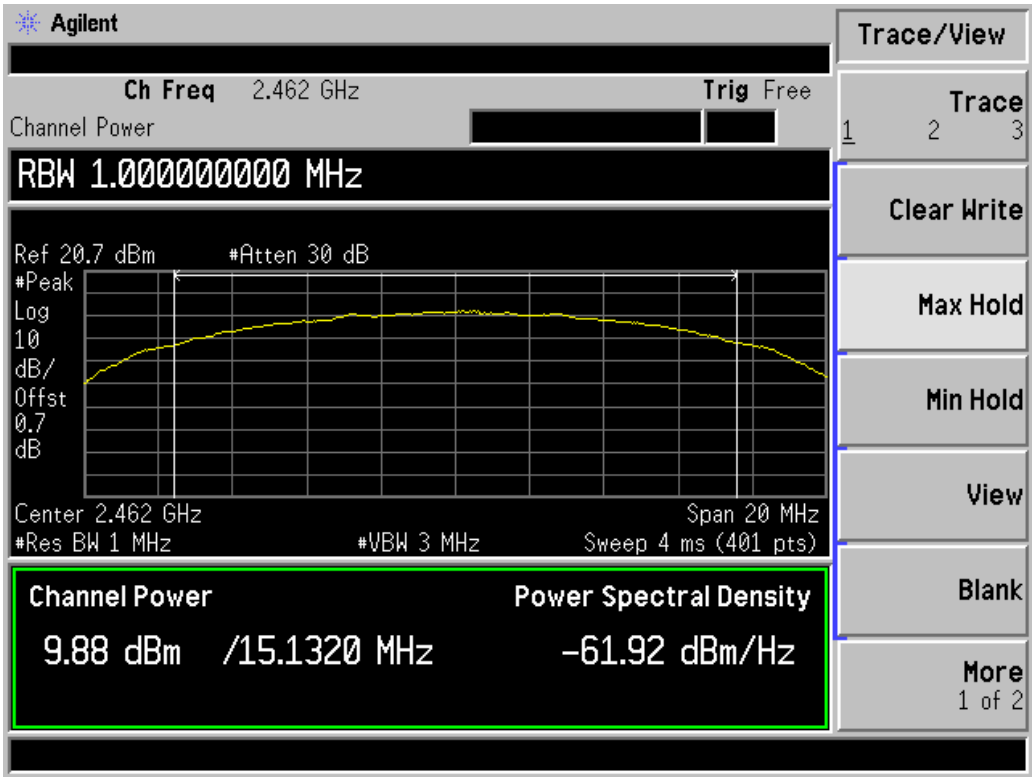
IEEE 802.11b CH1



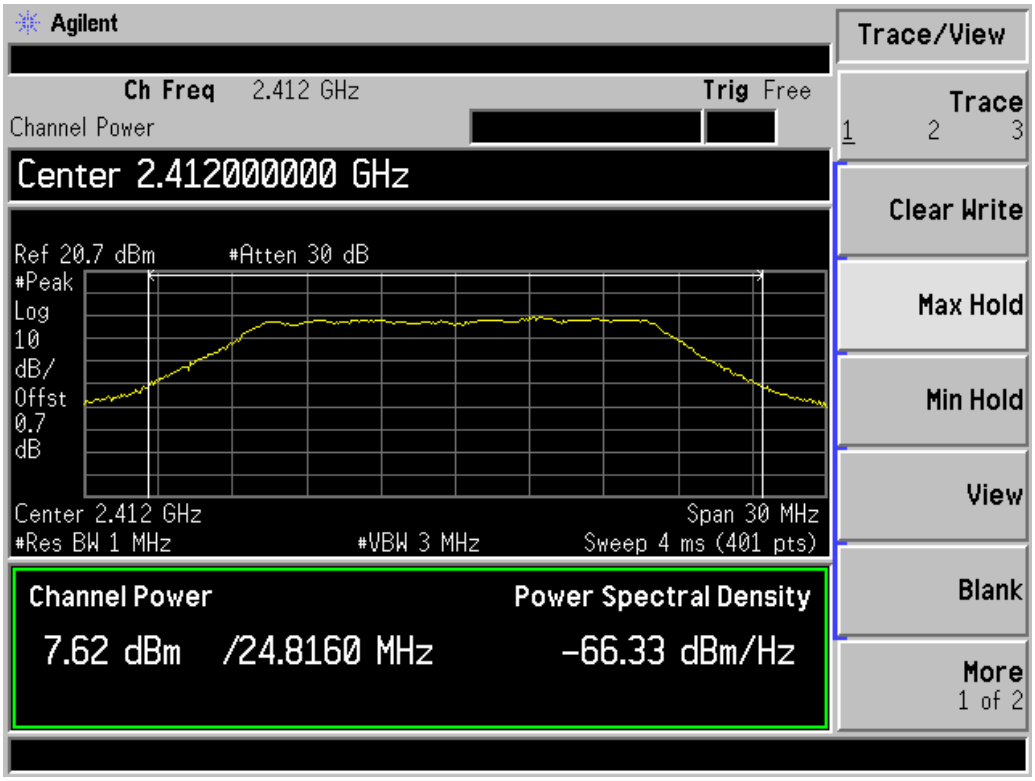
IEEE 802.11b CH6



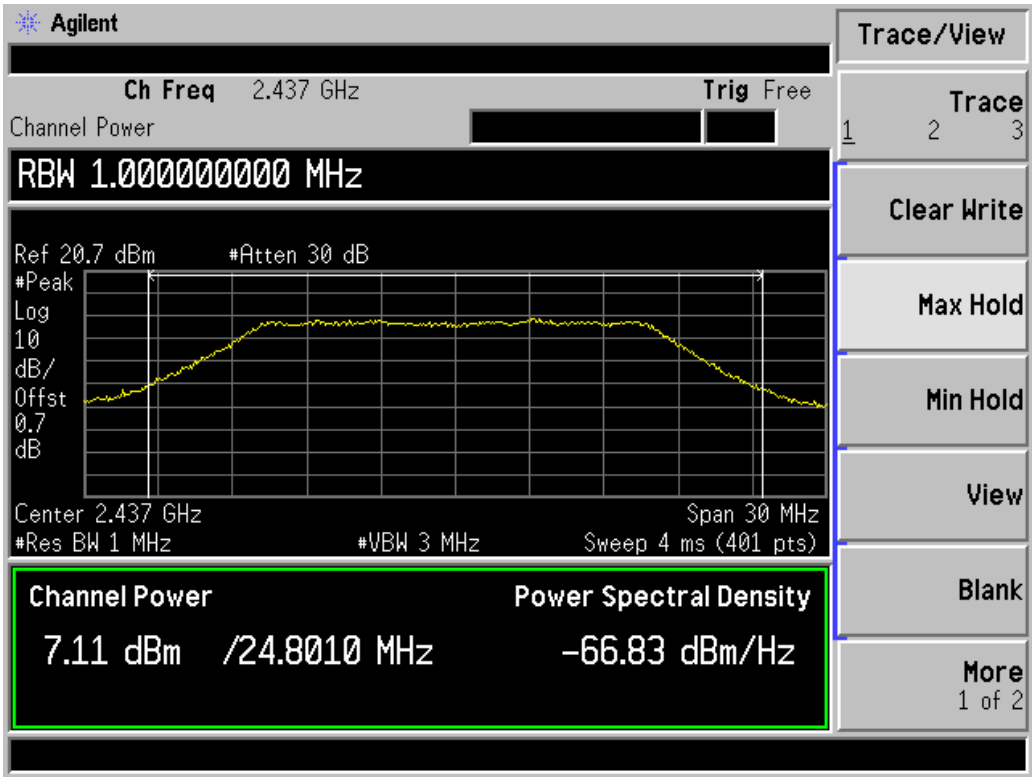
IEEE 802.11b CH11



IEEE 802.11g CH1



IEEE 802.11g CH6



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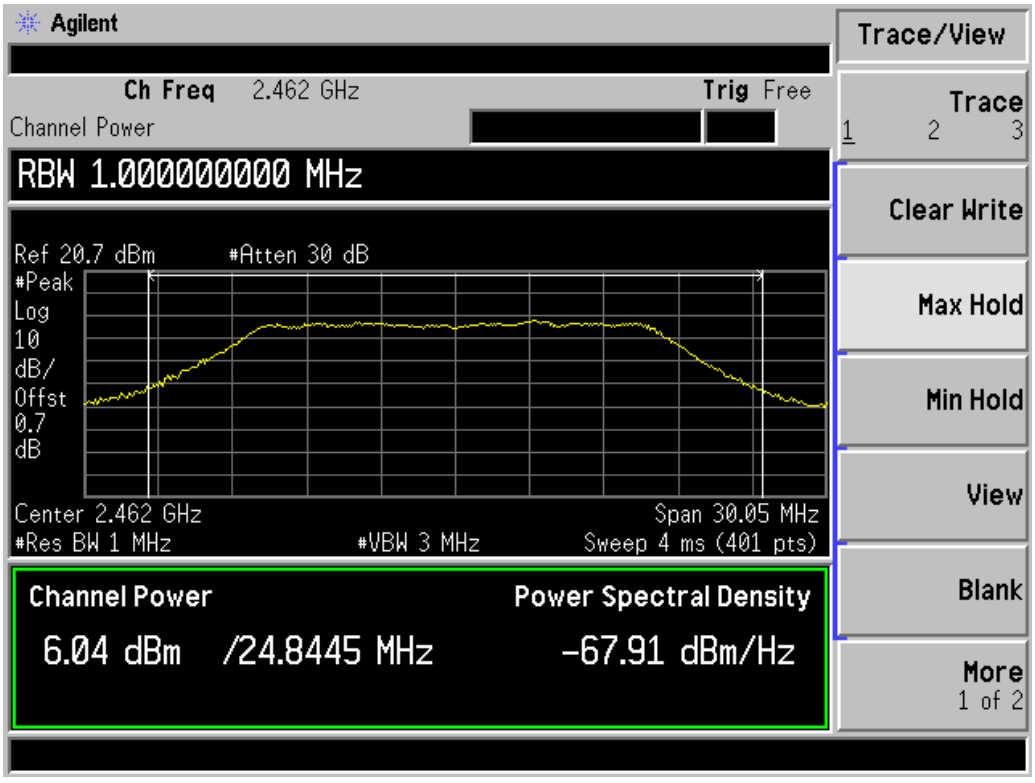
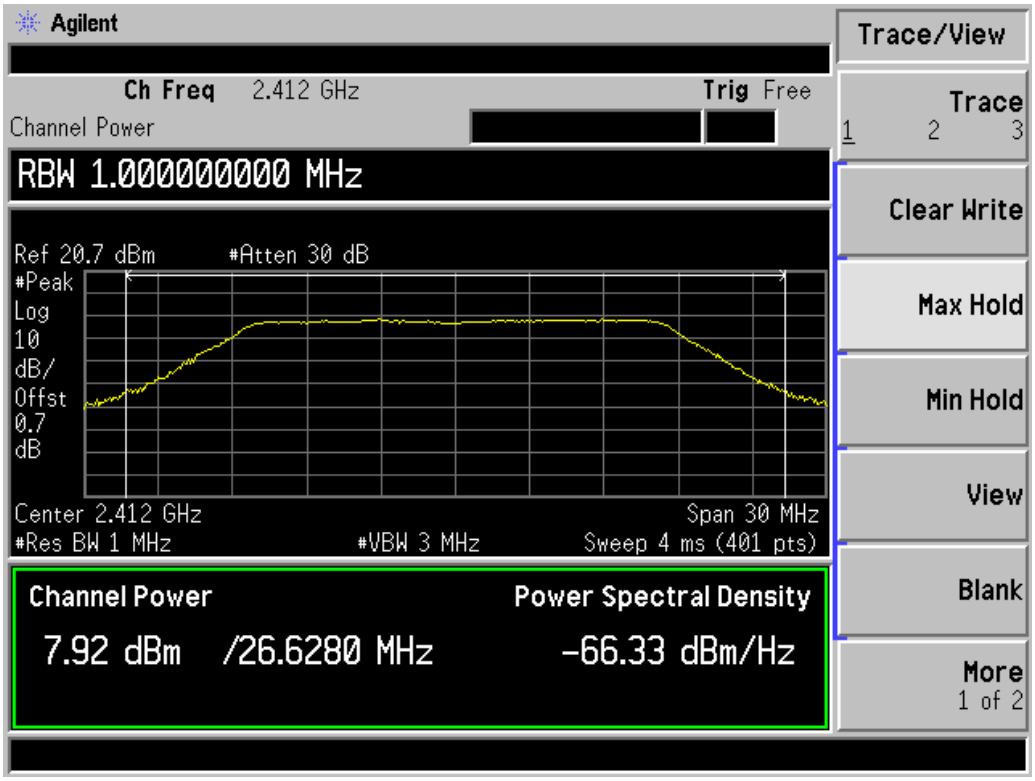
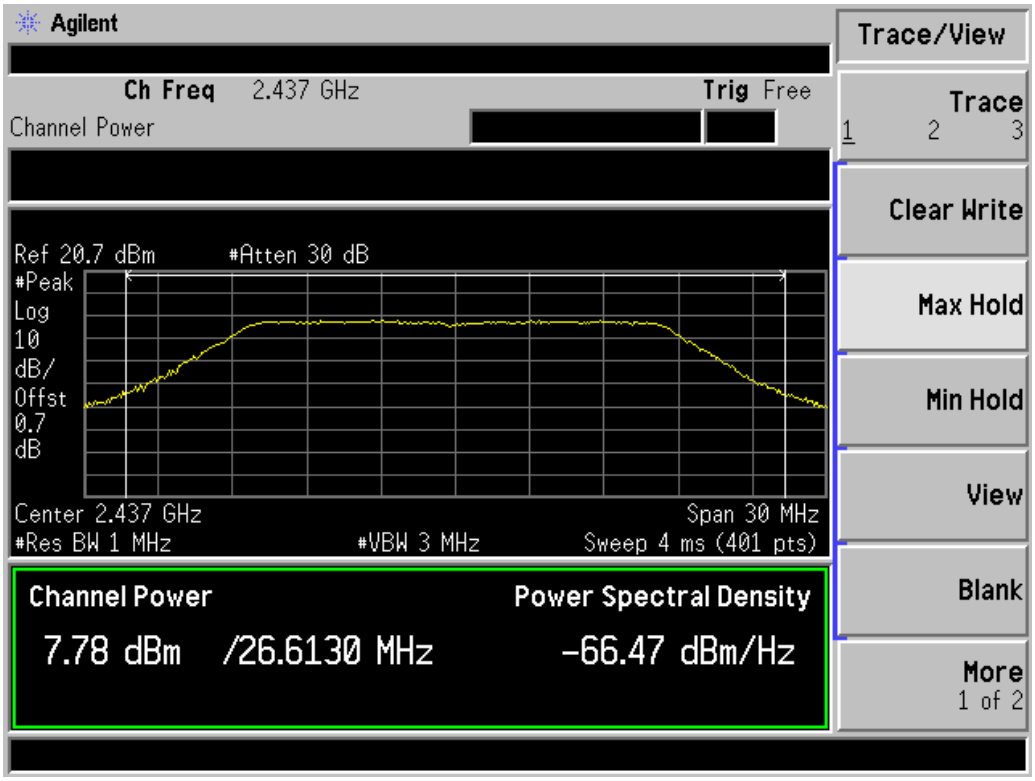


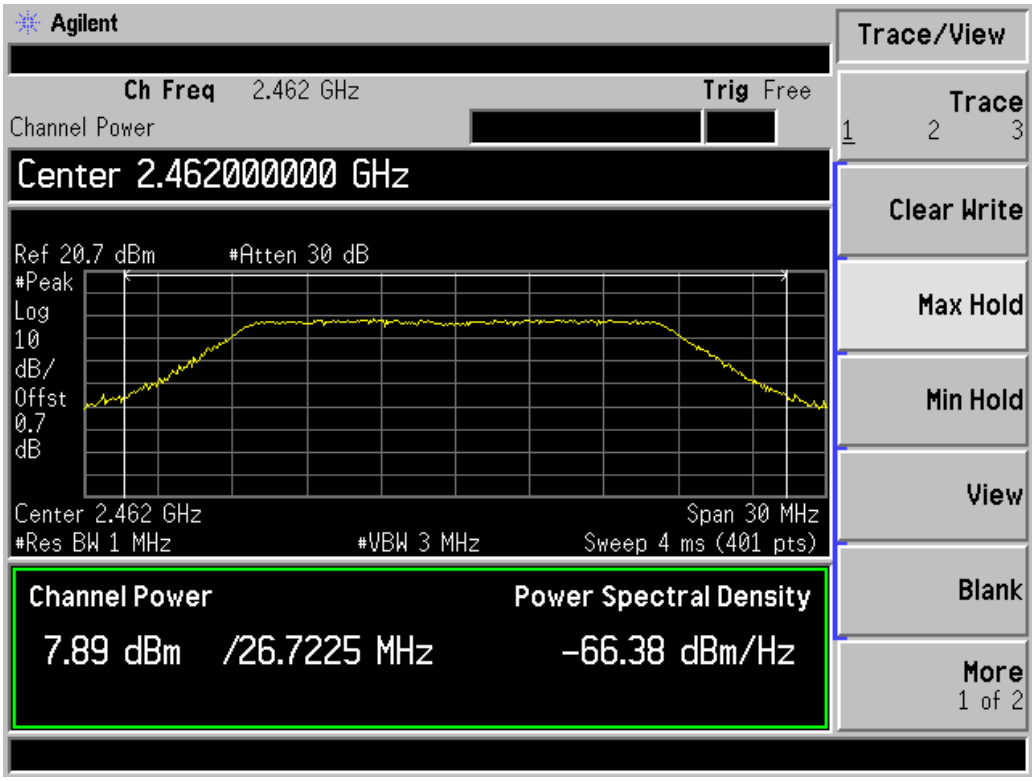
IEEE 802.11n20 CH1



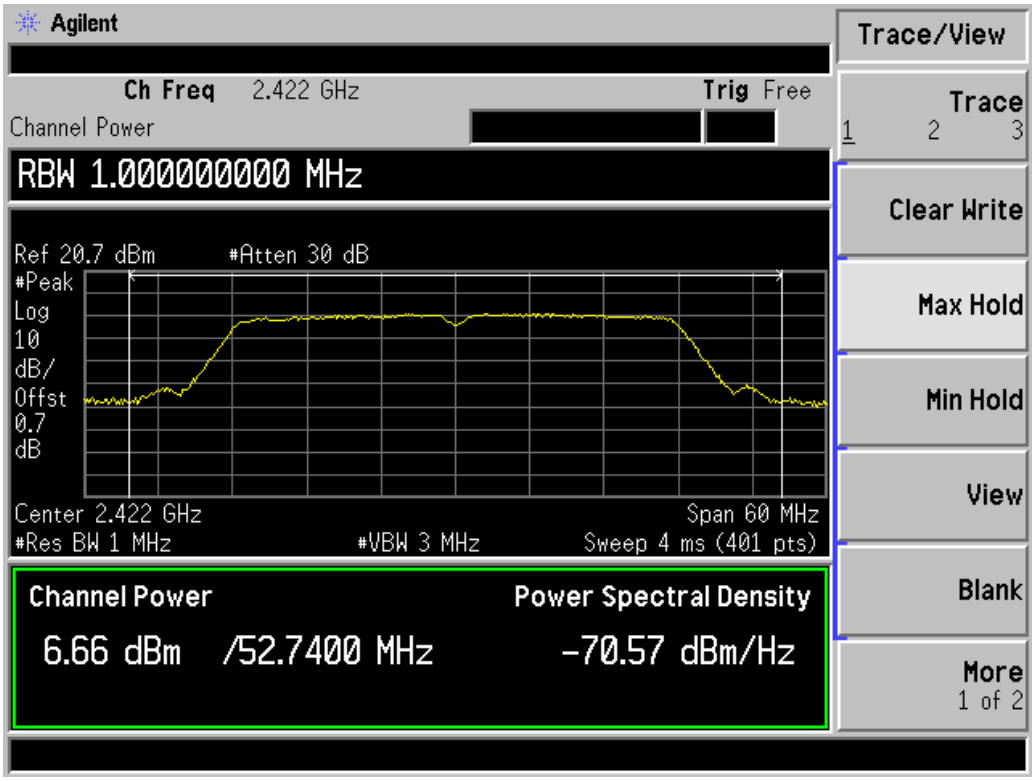
IEEE 802.11n20 CH6



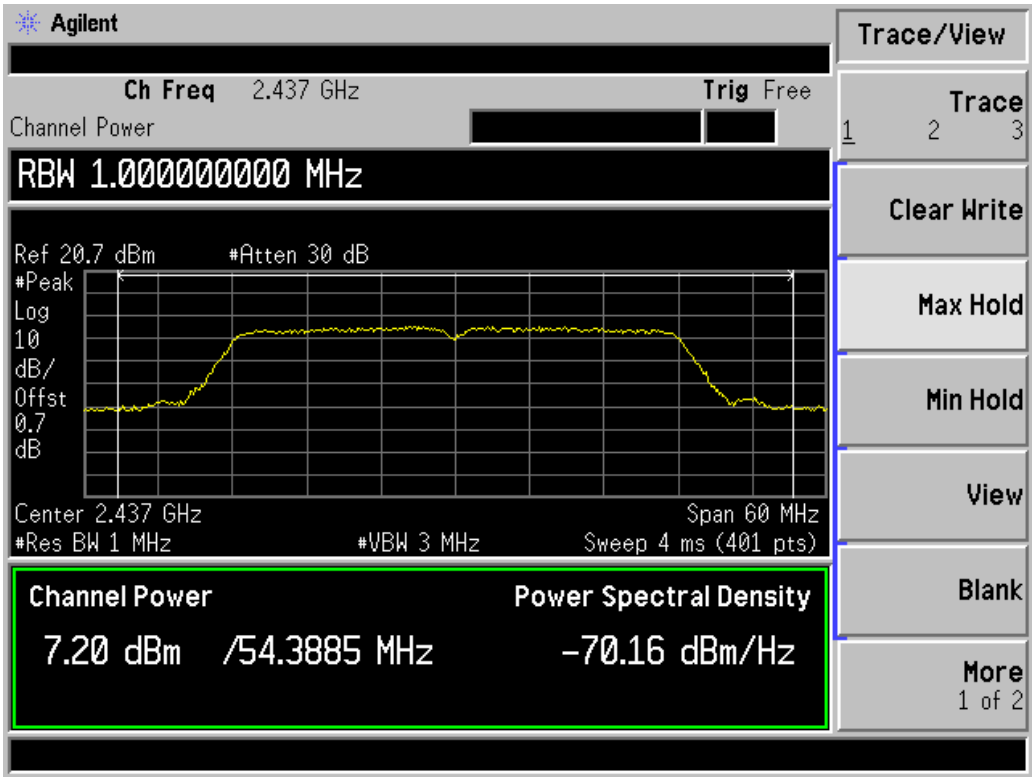
IEEE 802.11n20 CH11



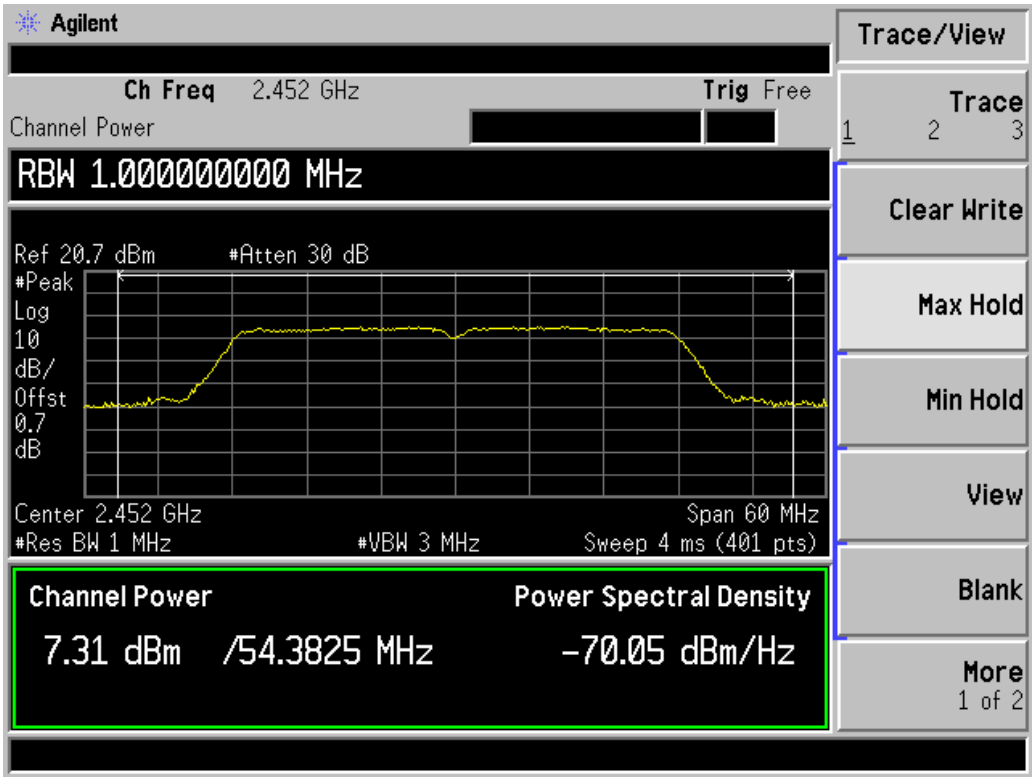
IEEE 802.11n40 CH3



IEEE 802.11n40 CH6



IEEE 802.11n40 CH9



11. POWER SPECTRAL DENSITY

Limit

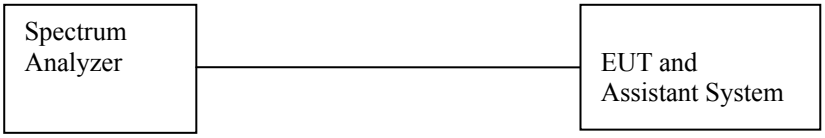
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission

Measurement Equipment Used

Name of Equipment	Manufacturer	Model	Serial Number	LAST CAL.	Calibration Due
Spectrum Analyzer	AGILENT	E4407B	MY41441082	06/12/2013	06/12/2014
RF Cable	TIME MICROWAVE	LMR-400	N-TYPE04	06/12/2013	06/12/2014

Remark: *Each piece of equipment is scheduled for calibration once a year.*

Test Configuration



Test Procedure

Connect the Spectrum Analyzer to the EUT using a RF cable connectd to the EUT's antenna output.

Configure the spectrum analyzer settings as described in KDB558074 D01 DTS Meas Guidance v03r01 clause10.2 Method PKPSD

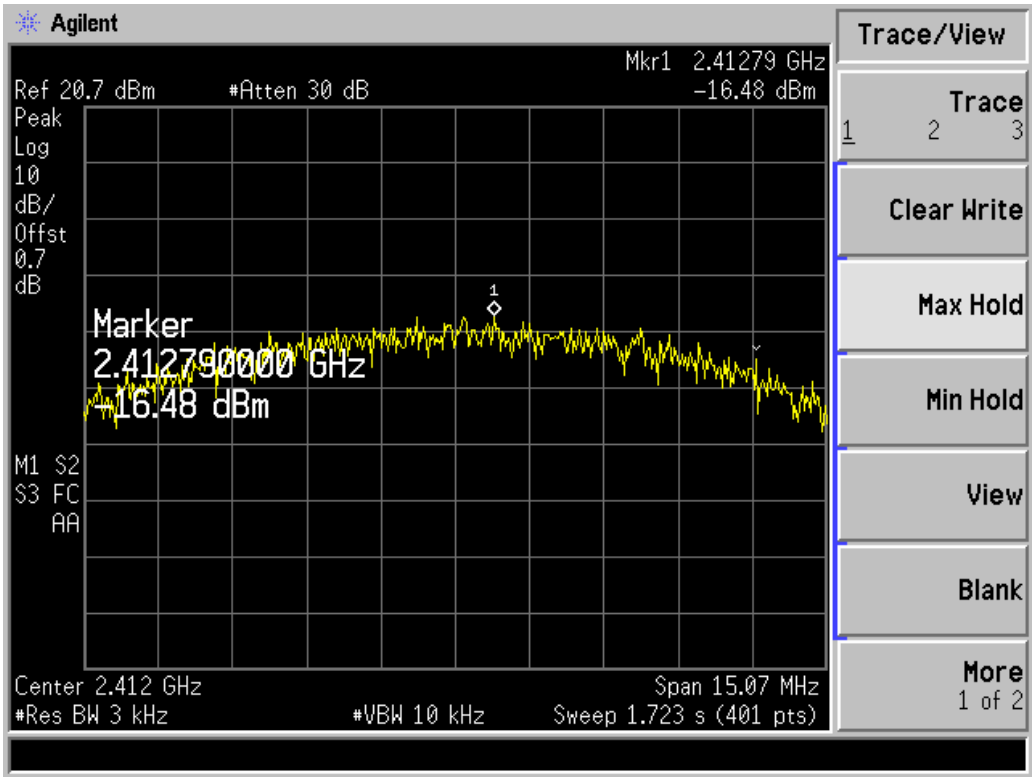
Measure out each mode peak power spectral density of the fundamental frequency.

Test Results

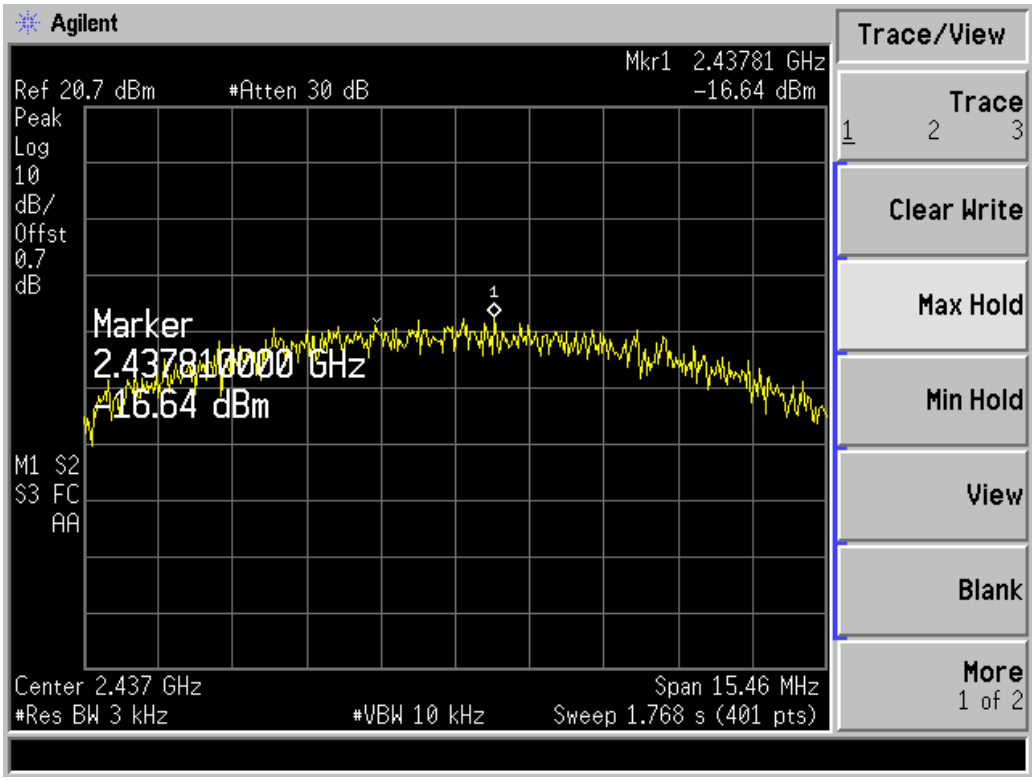
EUT: Porto M/N: D710ET			
Test Date : 2013-10-16 Test Engineer :leon			
Mode	CH	Power density (dBm/3KHz)	Limit (dBm/3KHz)
11b	CH1	-16.48	8.00
	CH6	-16.64	8.00
	CH11	-16.30	8.00
11g	CH1	-21.85	8.00
	CH6	-21.27	8.00
	CH11	-22.07	8.00
11n HT20	CH1	-24.29	8.00
	CH6	-22.00	8.00
	CH11	-23.29	8.00
11n HT40	CH3	-23.34	8.00
	CH6	-22.18	8.00
	CH9	-24.62	8.00
Conclusion:PASS			

Refer to attach spectrum analyzer data chart

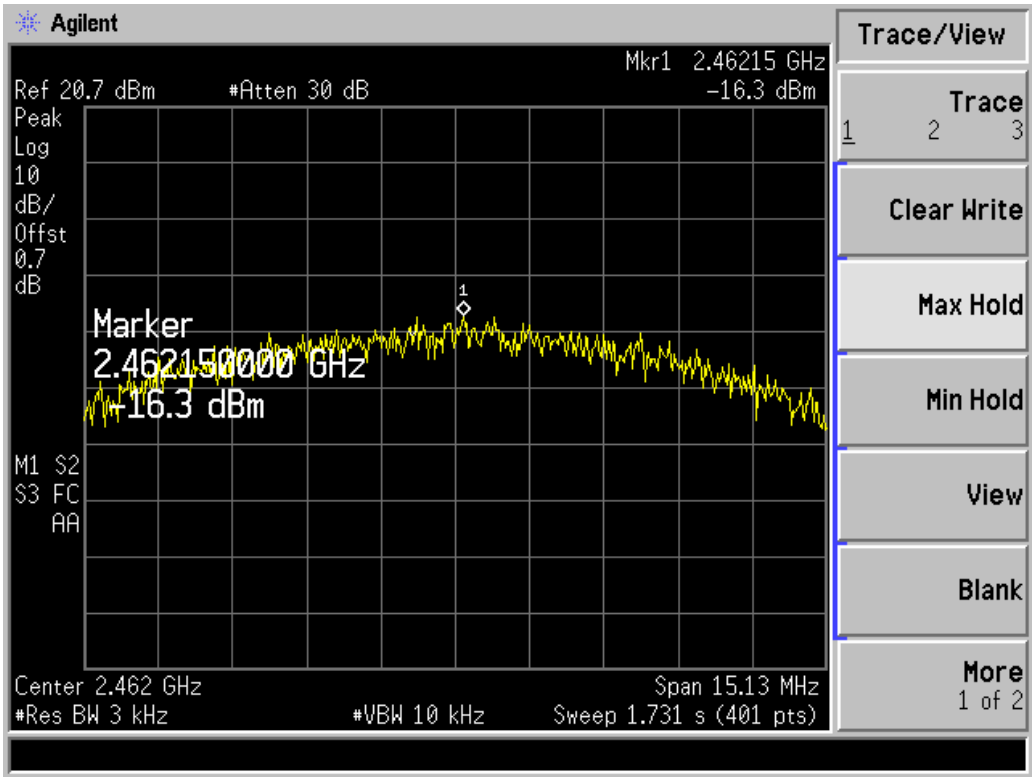
IEEE 802.11b CH1



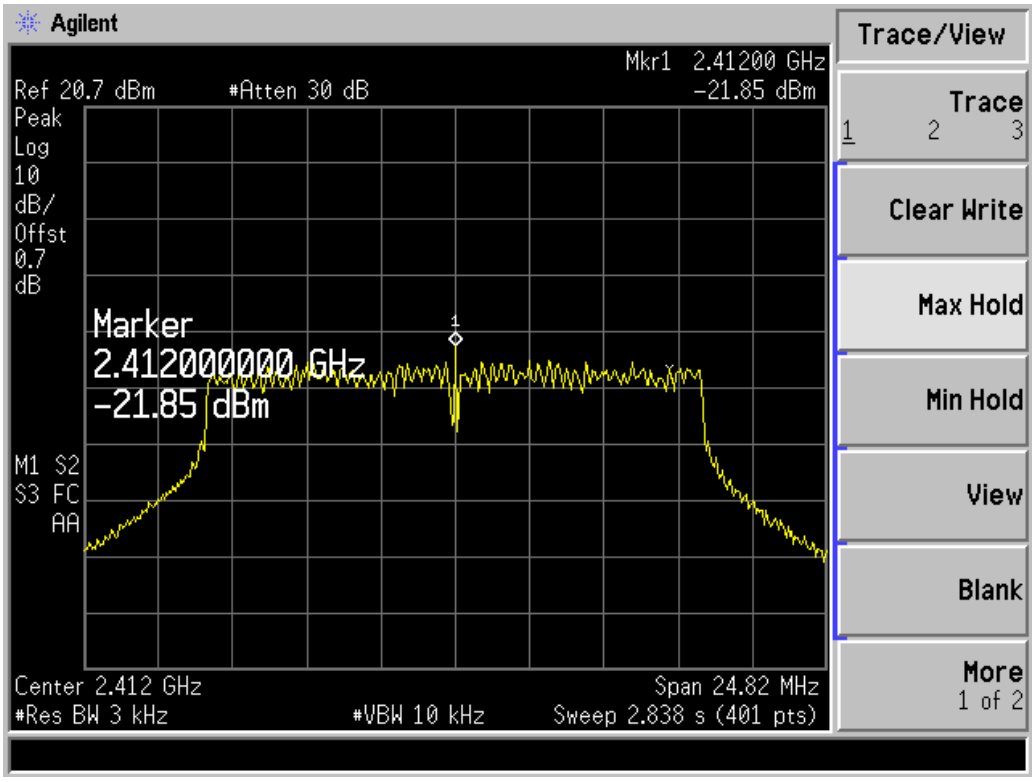
IEEE 802.11b CH6



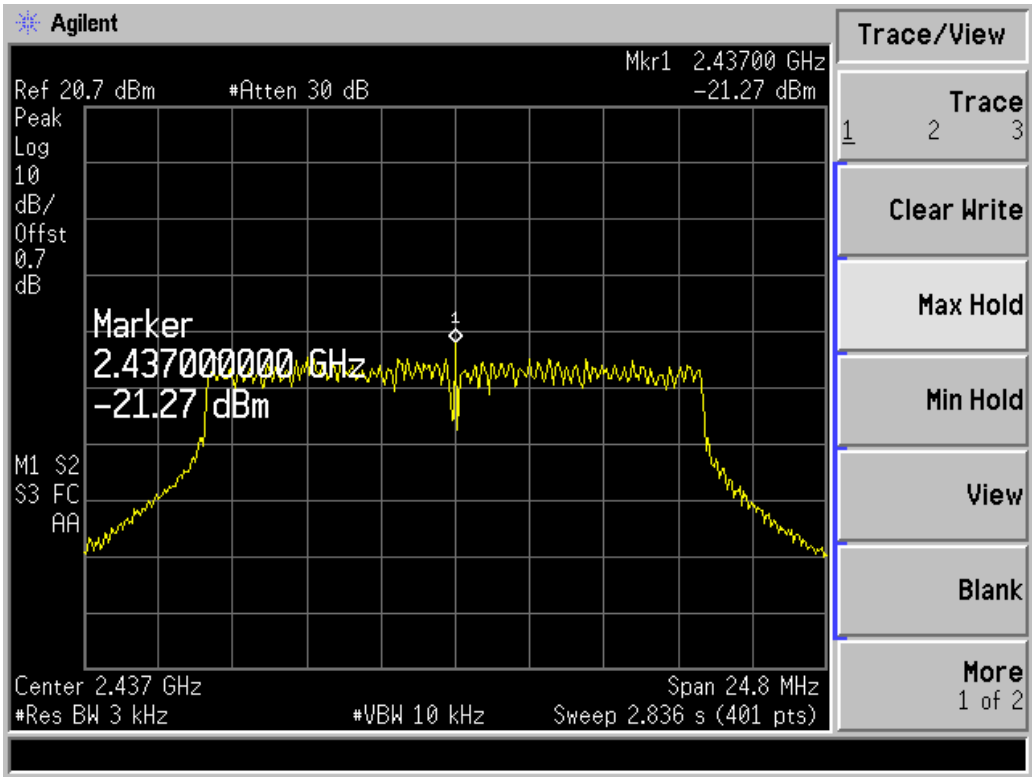
IEEE 802.11b CH11



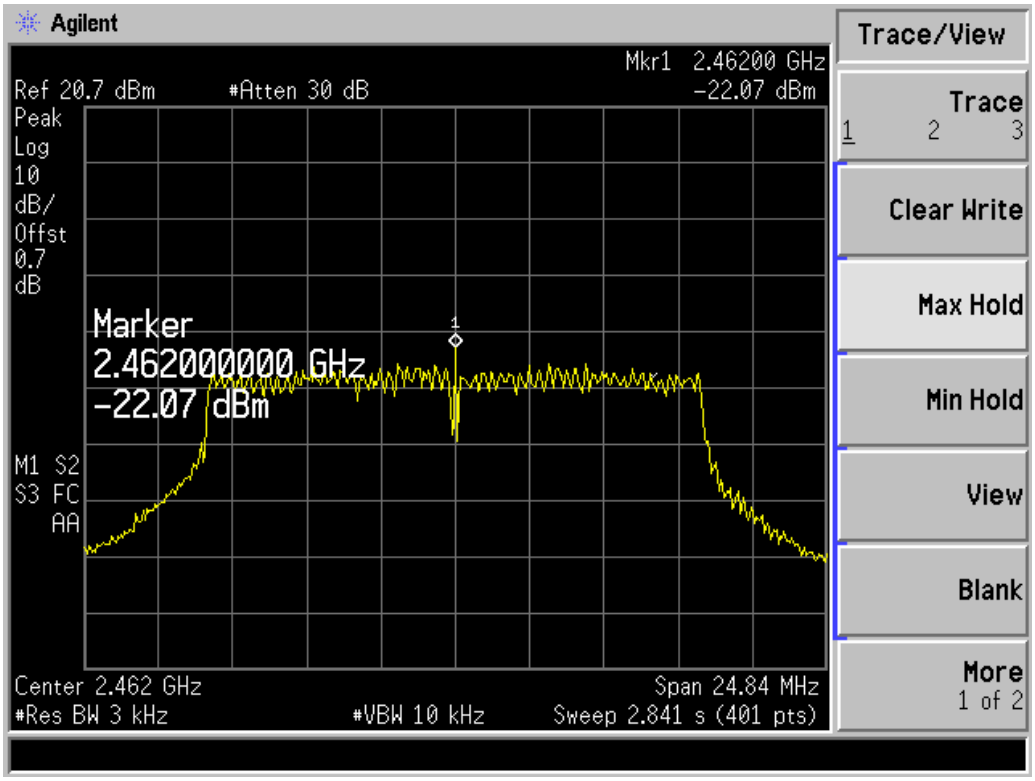
IEEE 802.11g CH1



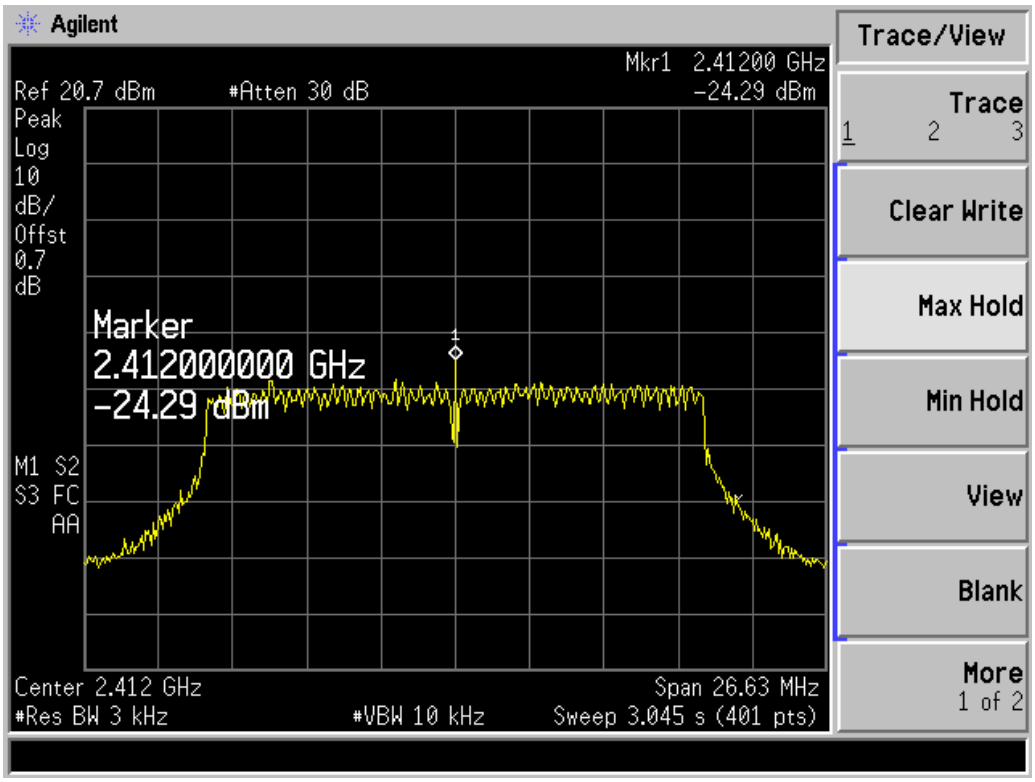
IEEE 802.11g CH6



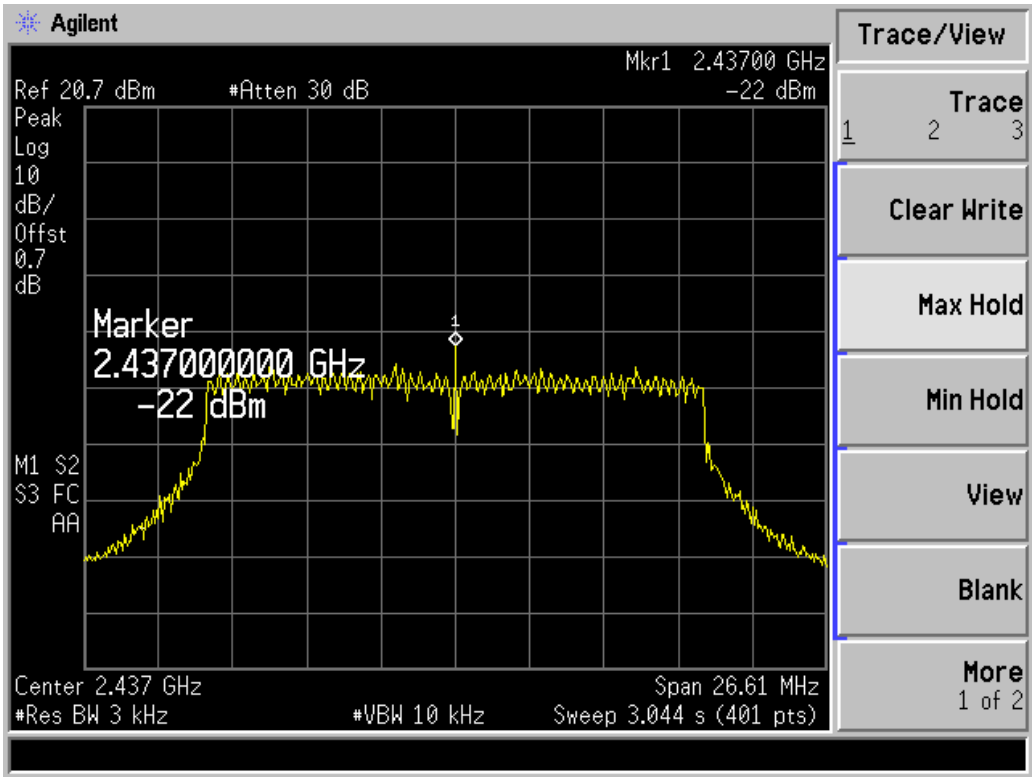
IEEE 802.11g CH11



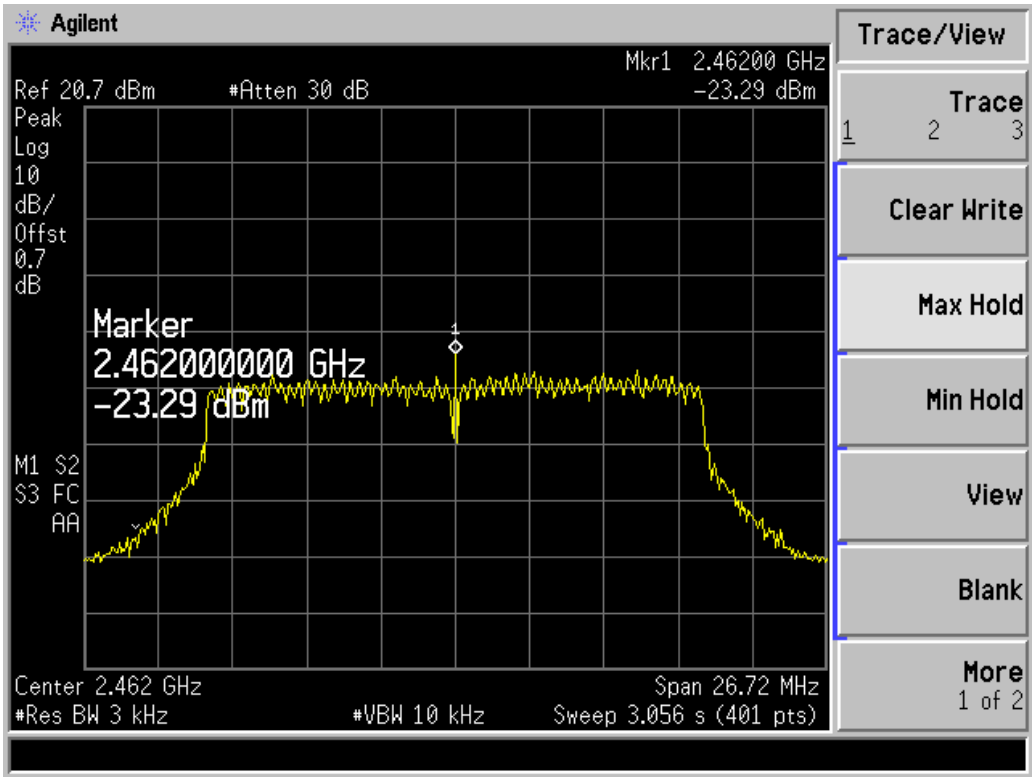
IEEE 802.11n20 CH1



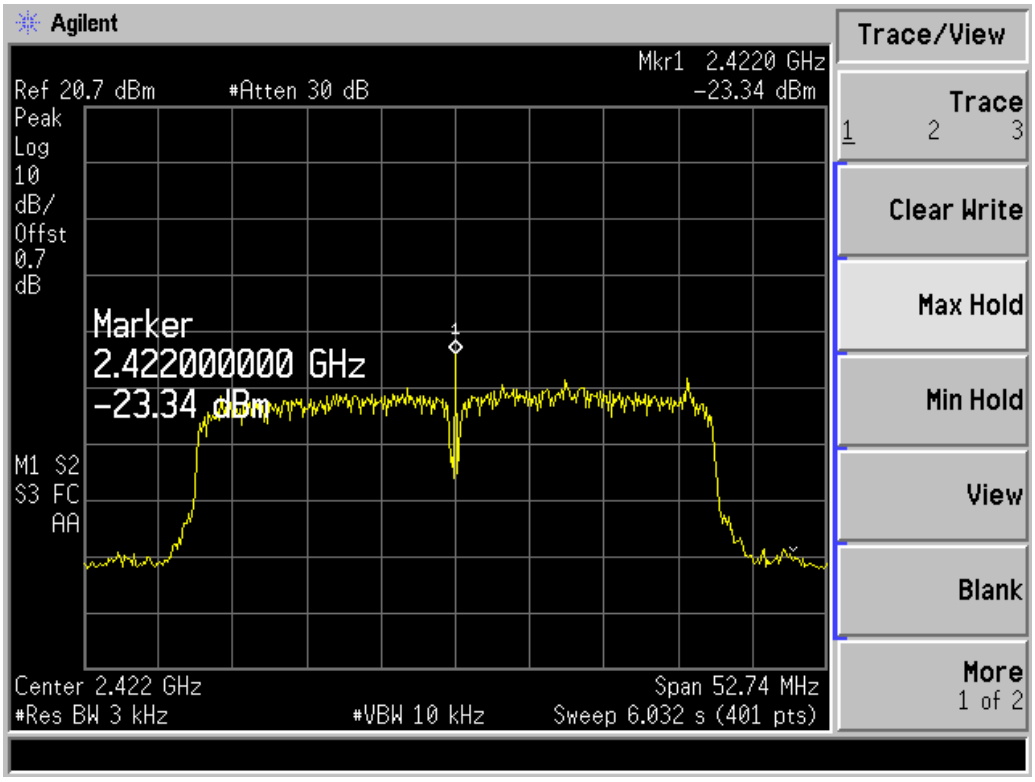
IEEE 802.11n20 CH6



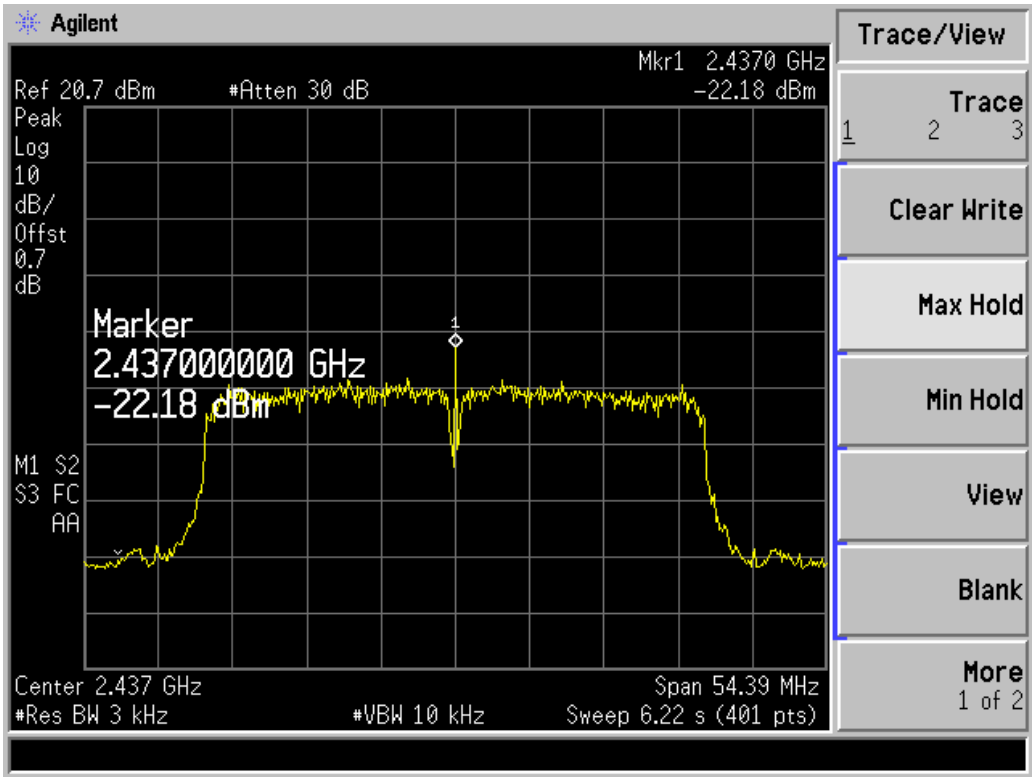
IEEE 802.11n20 CH11



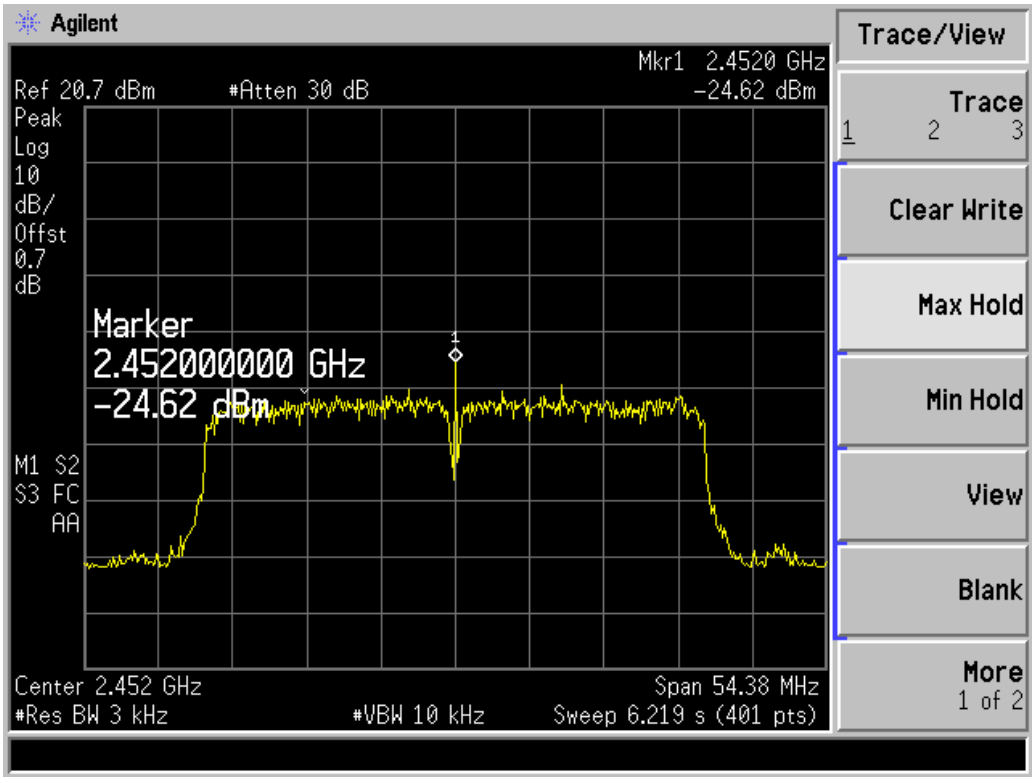
IEEE 802.11n40 CH3



IEEE 802.11n40 CH6



IEEE 802.11n40 CH9



12. CONDUCTED SPURIOUS EMISSIONS

Limit

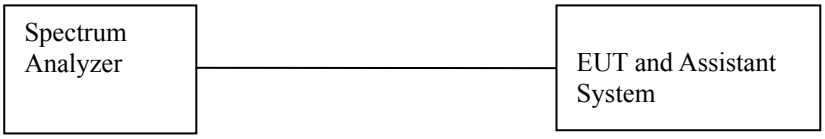
In any 100kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.
Attenuation below the general limits specified in Section 15.209(a) is not required.

Measurement Equipment Used

Name of Equipment	Manufacturer	Model	Serial Number	LAST CAL.	Calibration Due
Spectrum Analyzer	AGILENT	E4407B	MY41441082	06/12/2013	06/12/2014
RF Cable	TIME MICROWAVE	LMR-400	N-TYPE04	06/12/2013	06/12/2014

Remark: *Each piece of equipment is scheduled for calibration once a year.*

Test Configuration



Test Procedure

Connect the Spectrum Analyzer to the EUT using a RF cable connectd to the EUT's antenna output.

Configure the spectrum analyzer settings as described in KDB558074 D01 DTS Meas Guidance v03r01 clause 11.2 Reference level measurement &11.3 Emission level measurement.

Measure out each mode Reference level and Emission level in any 100kHz bandwidth outside of authorized frequency band.

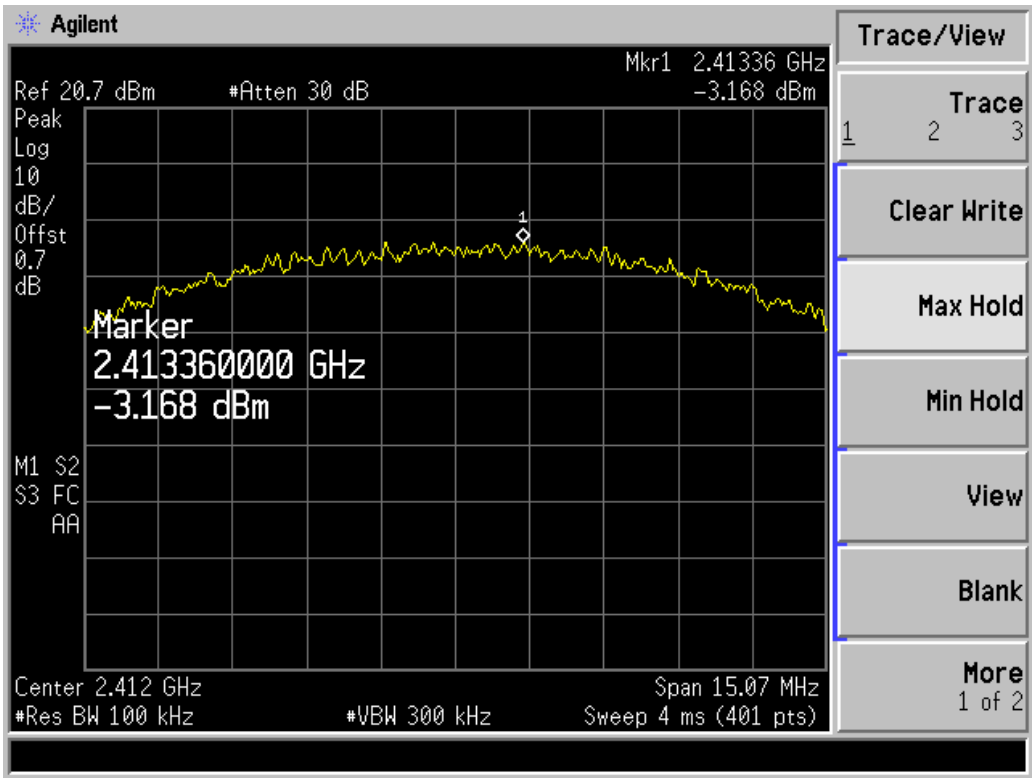
Test Results

EUT: Porto	**M/N:** D710ET	
Test Date : 2013-10-17		**Test Engineer :**leon
Mode	CH	Conducted spurious emissions test results
11b	CH1	PASS
	CH6	PASS
	CH11	PASS
11g	CH1	PASS
	CH6	PASS
	CH11	PASS
11n HT20	CH1	PASS
	CH6	PASS
	CH11	PASS
11n HT40	CH3	PASS
	CH6	PASS
	CH9	PASS

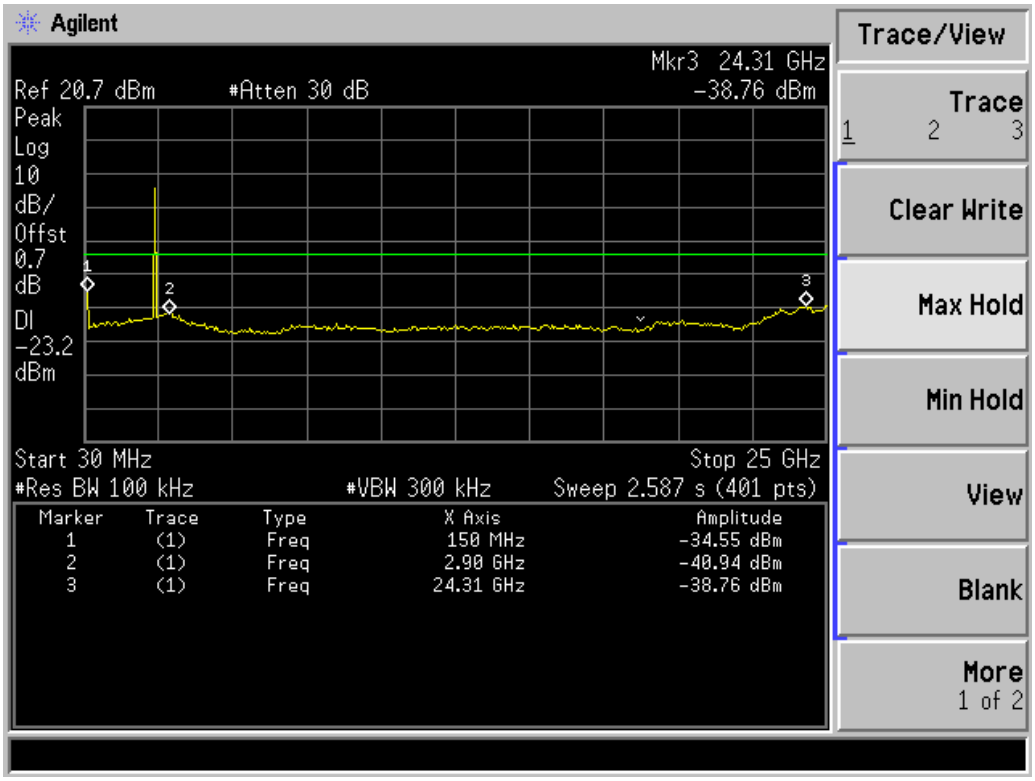
Refer to attach spectrum analyzer data chart

IEEE 802.11b CH1

Reference level:

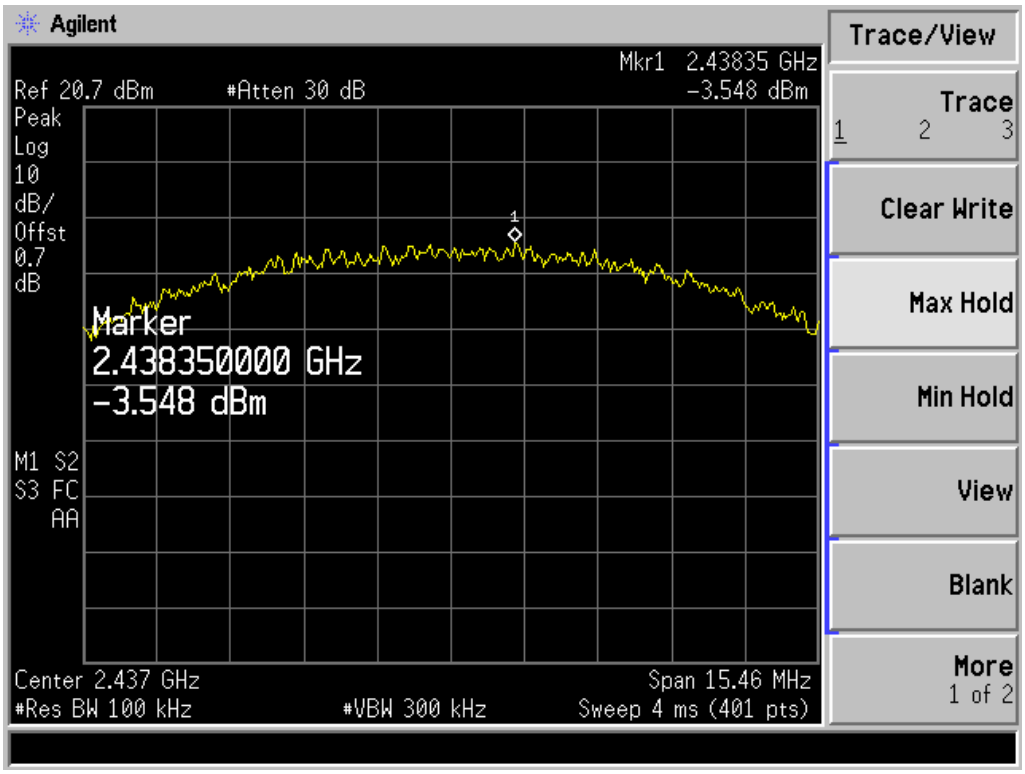


Emission level:

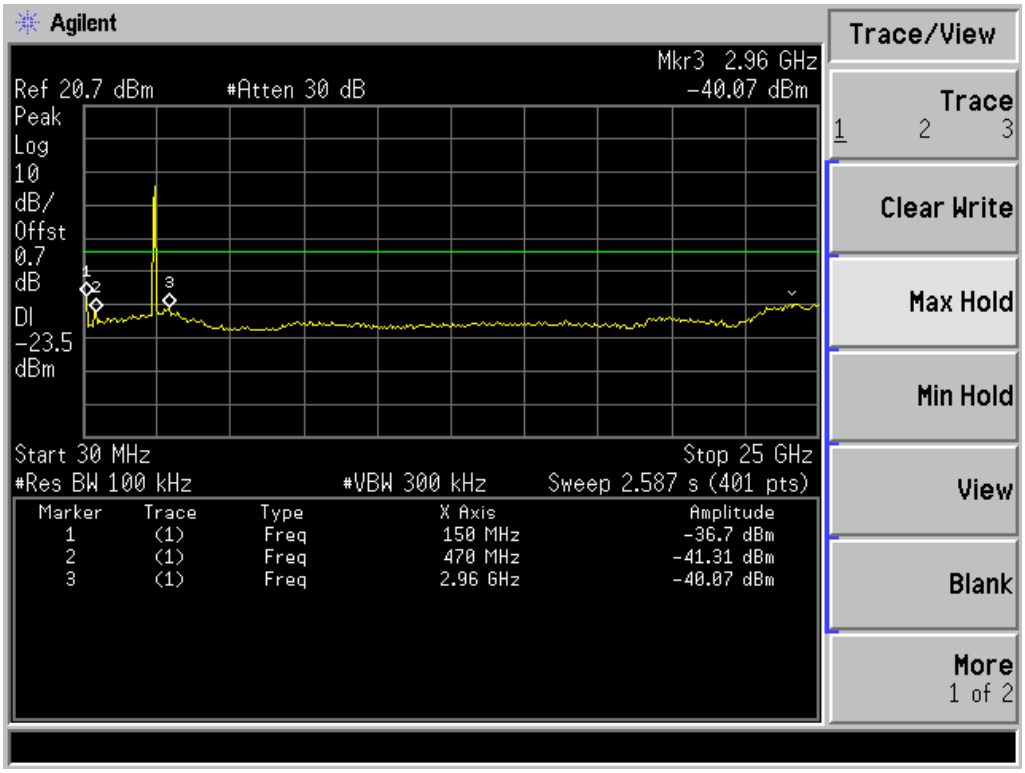


IEEE 802.11b CH6

Reference level:

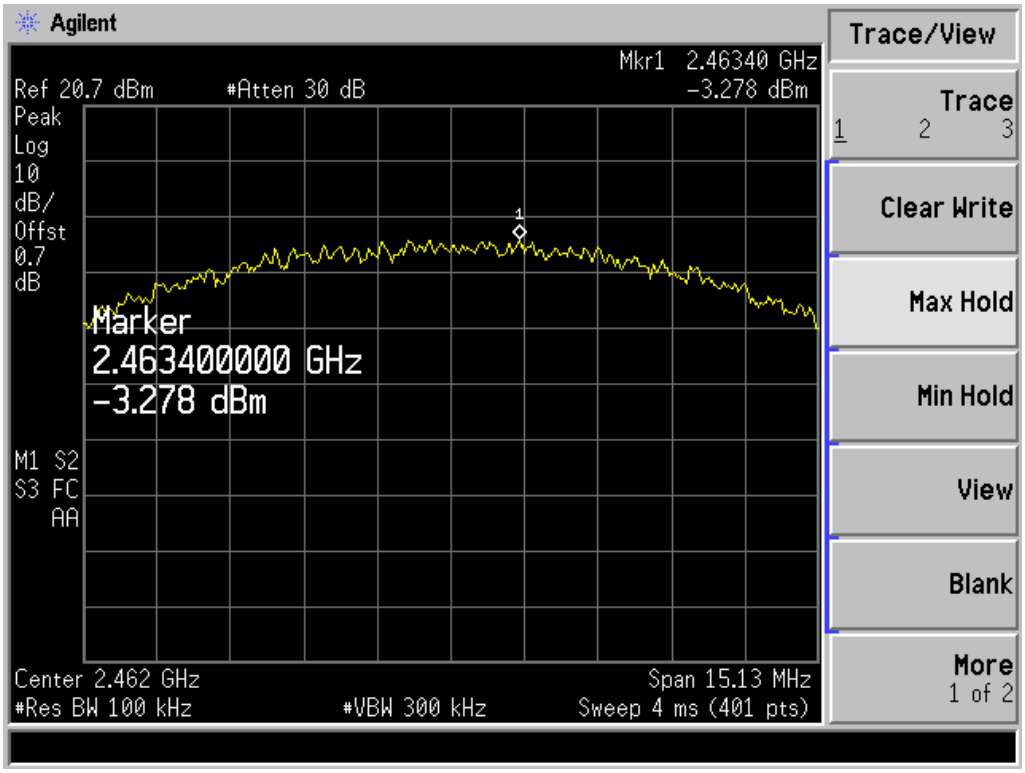


Emission level:



IEEE 802.11b CH11

Reference level:



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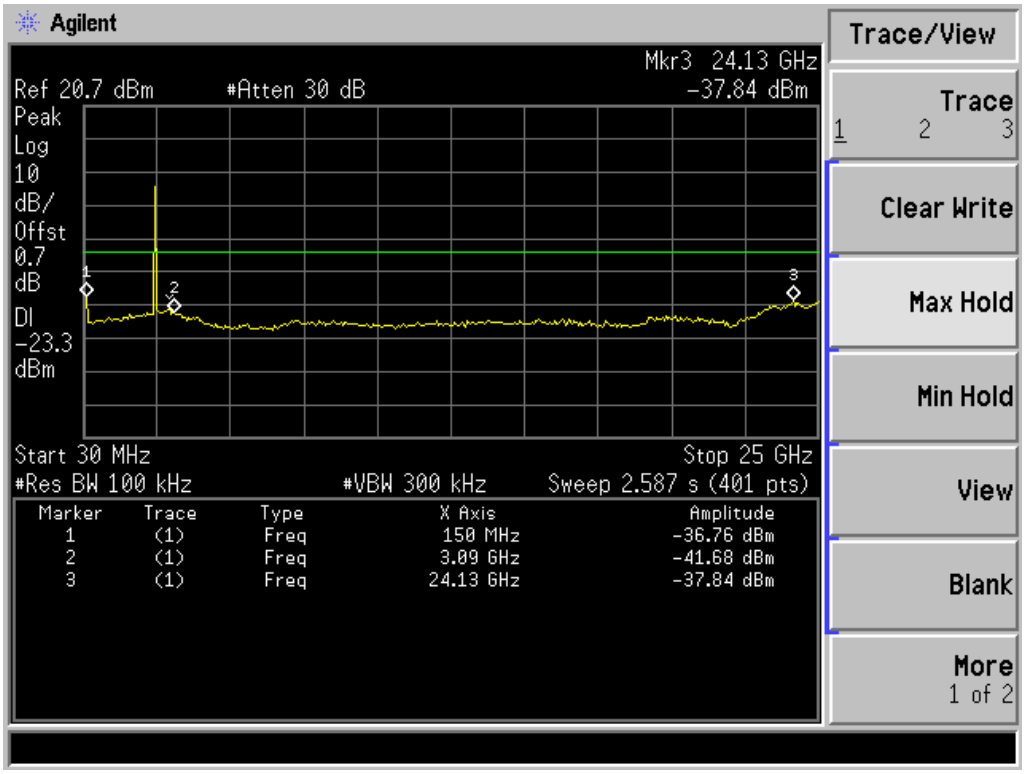
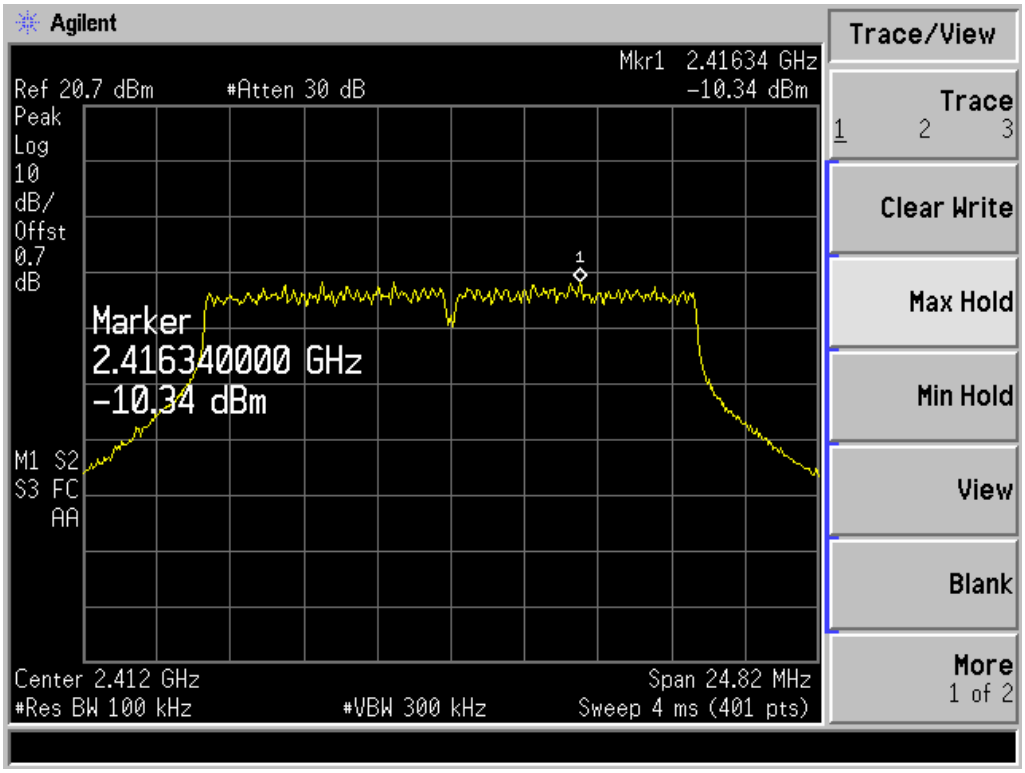
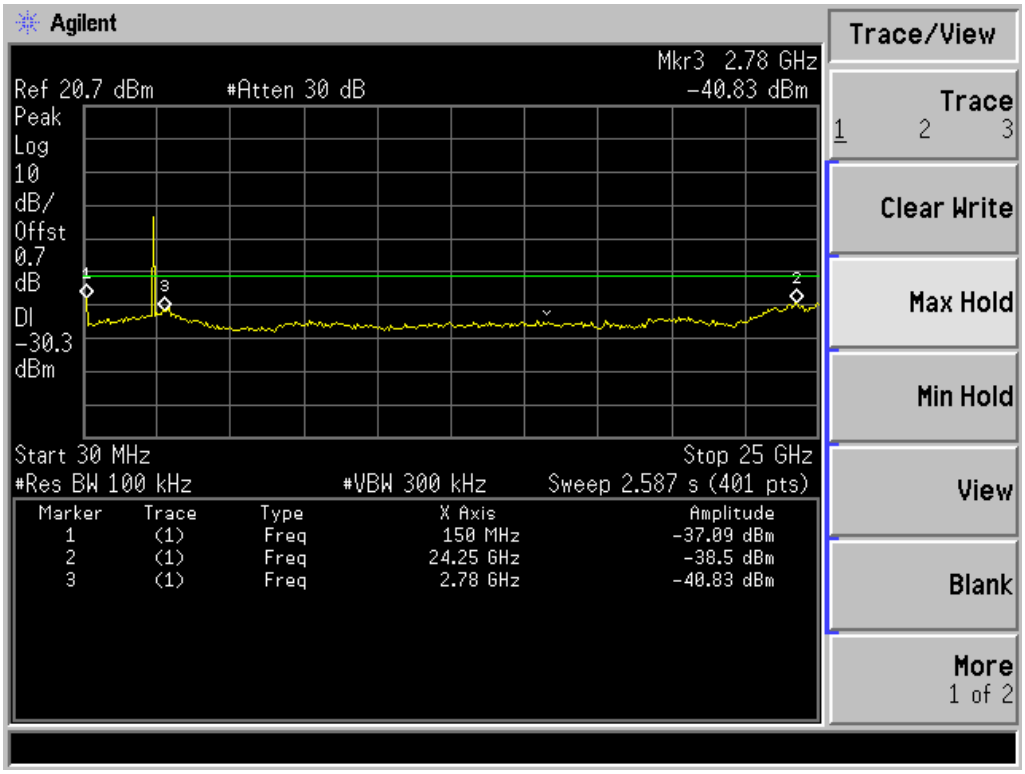


IEEE 802.11g CH1

Reference level:



Emission level:



IEEE 802.11g CH6

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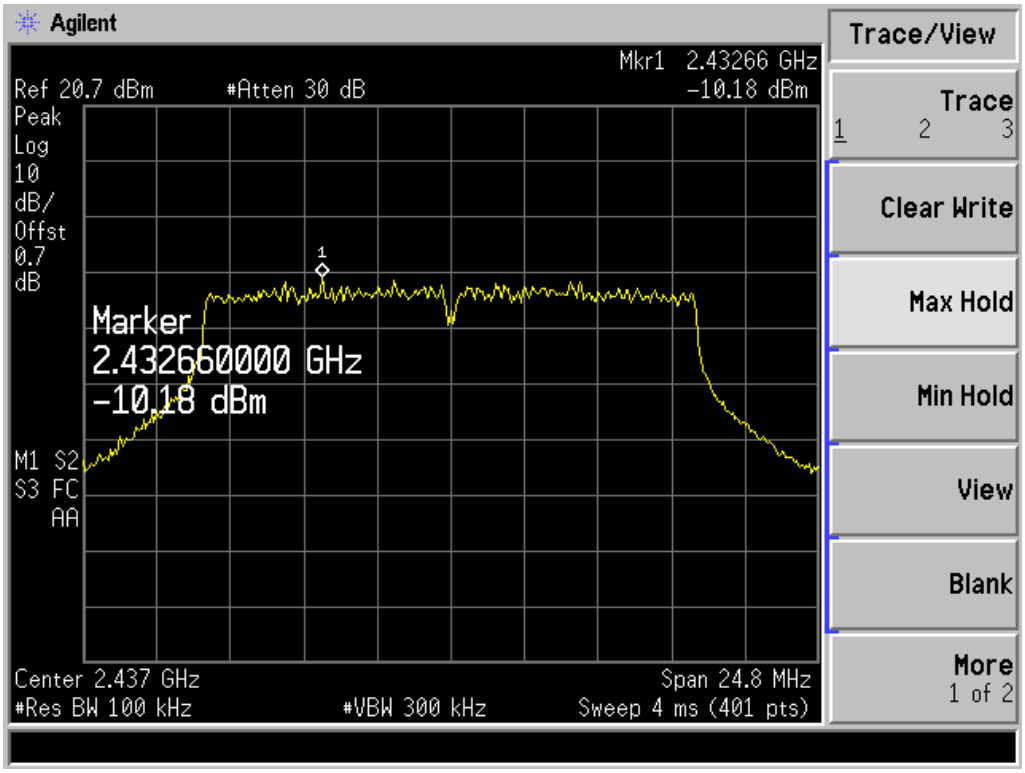

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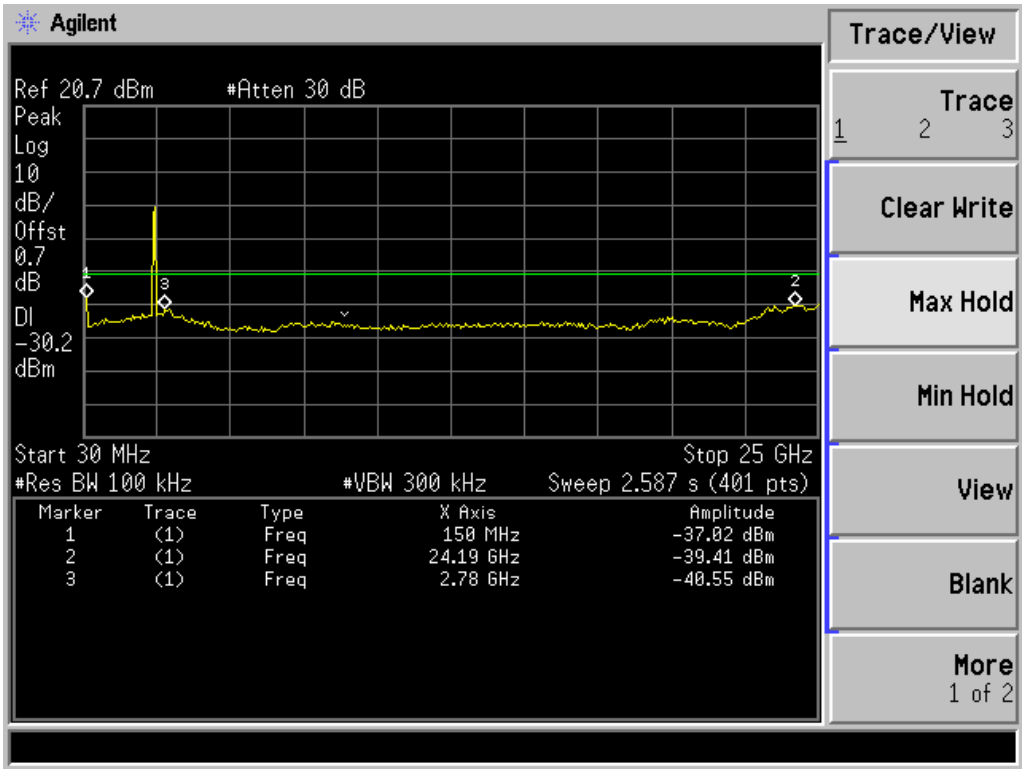

IEEE 802.11g CH11

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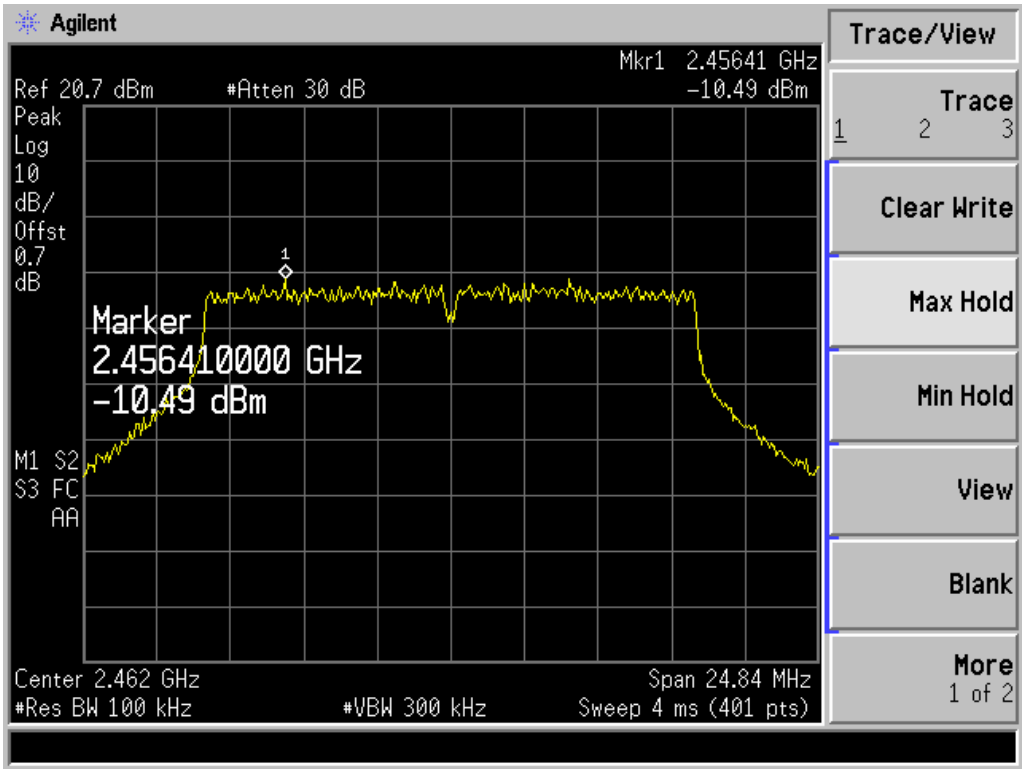
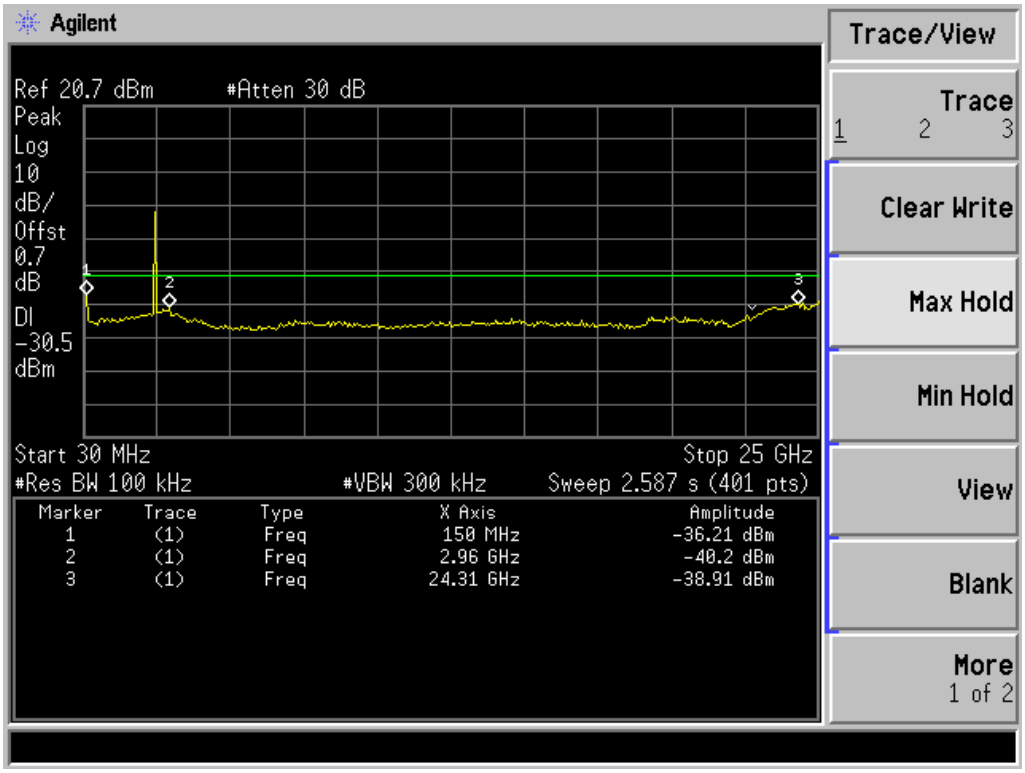
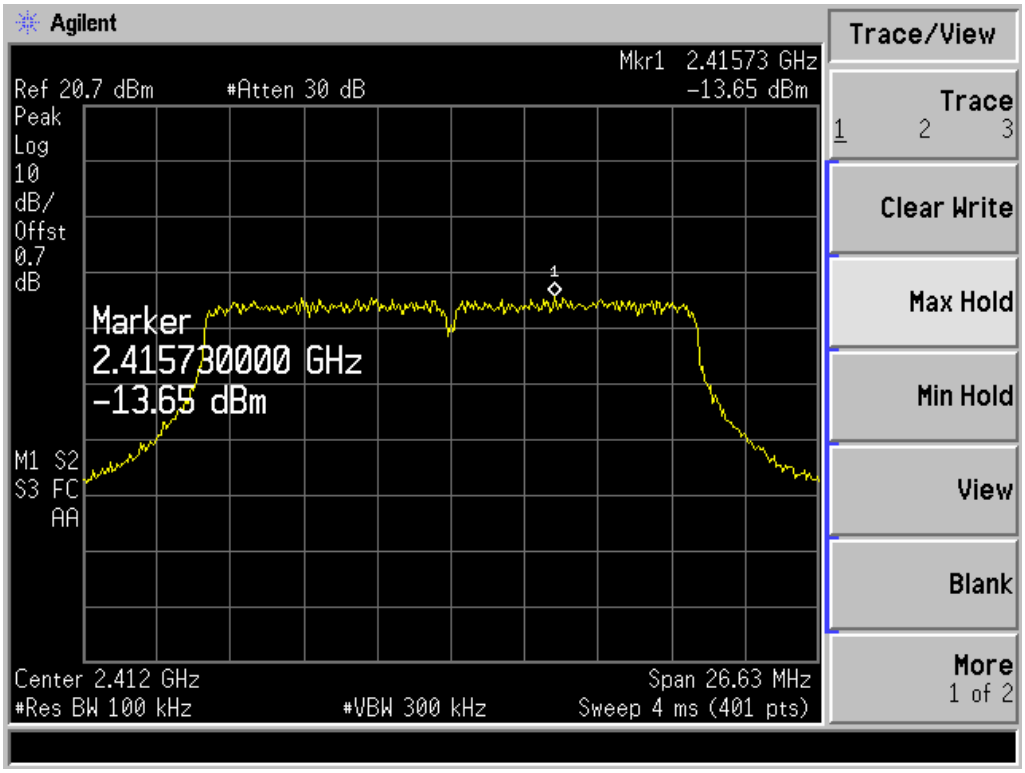


Emission level:

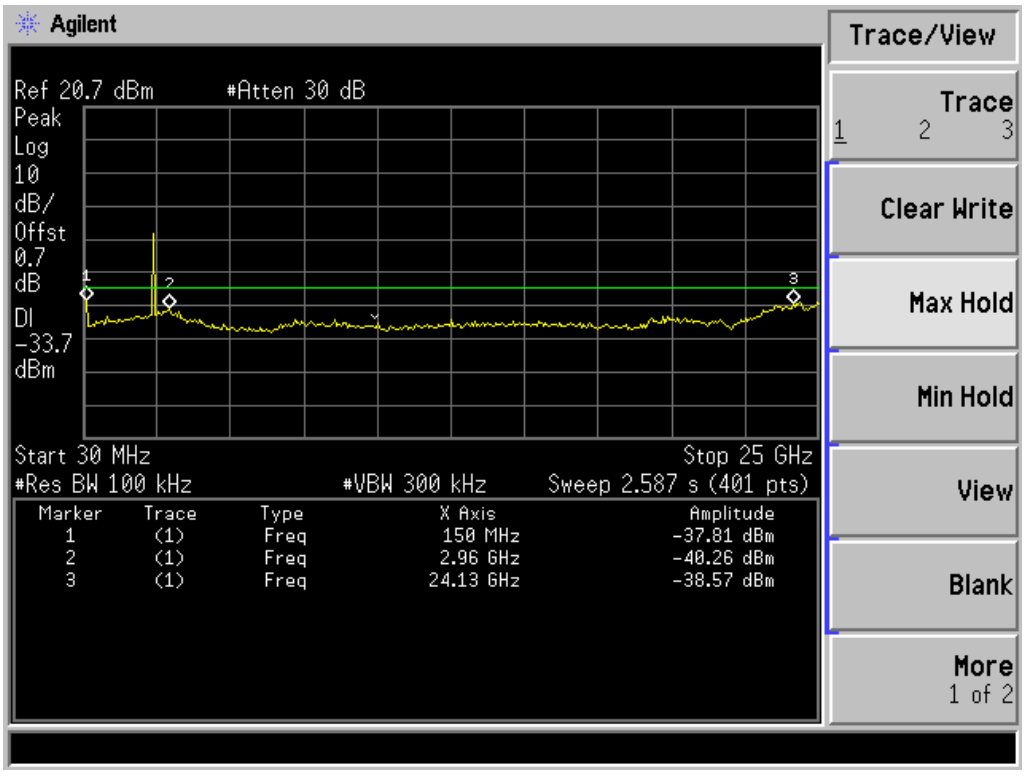


IEEE 802.11n20 CH1

Reference level:

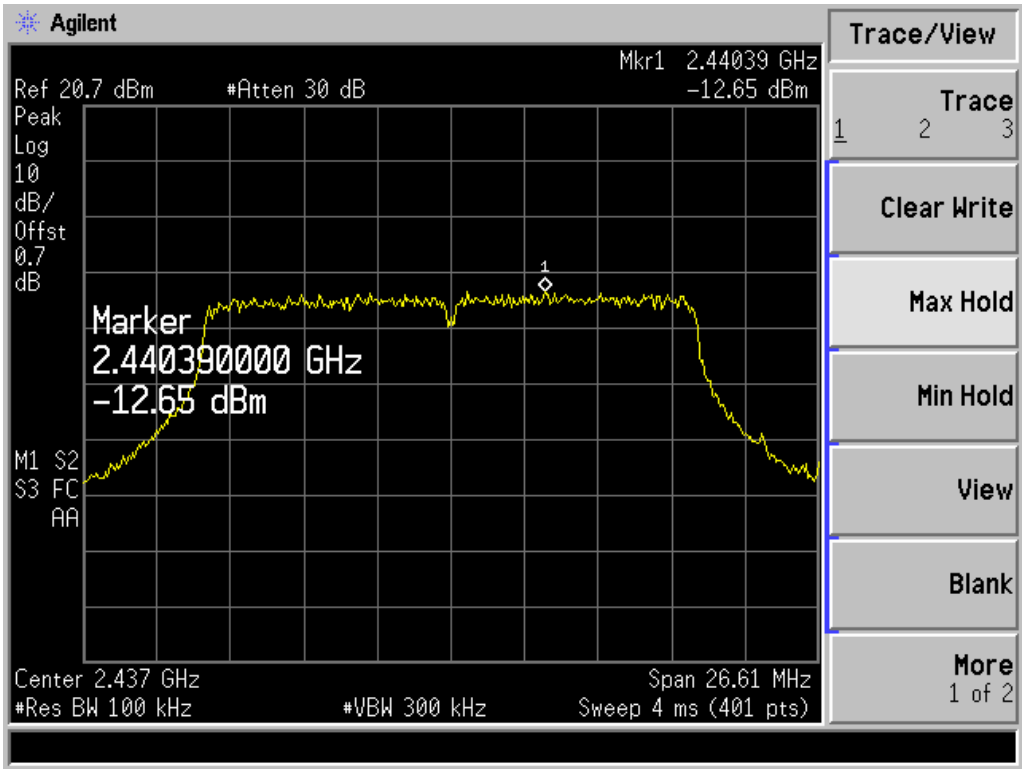


Emission level:

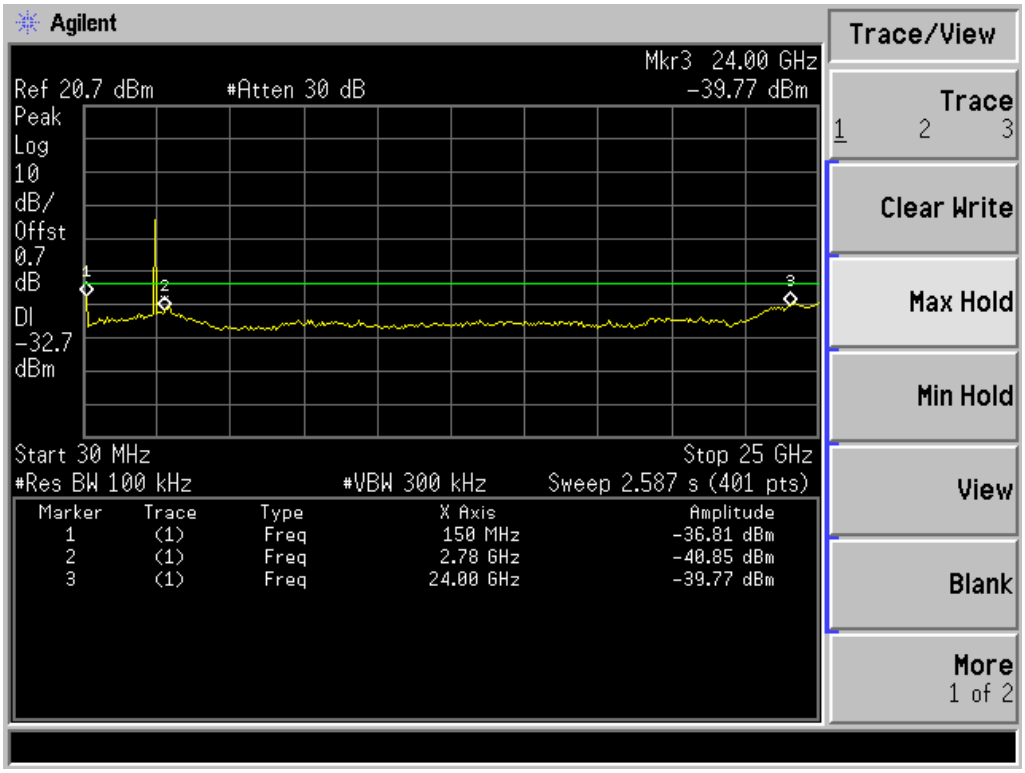


IEEE 802.11n20 CH6

Reference level:

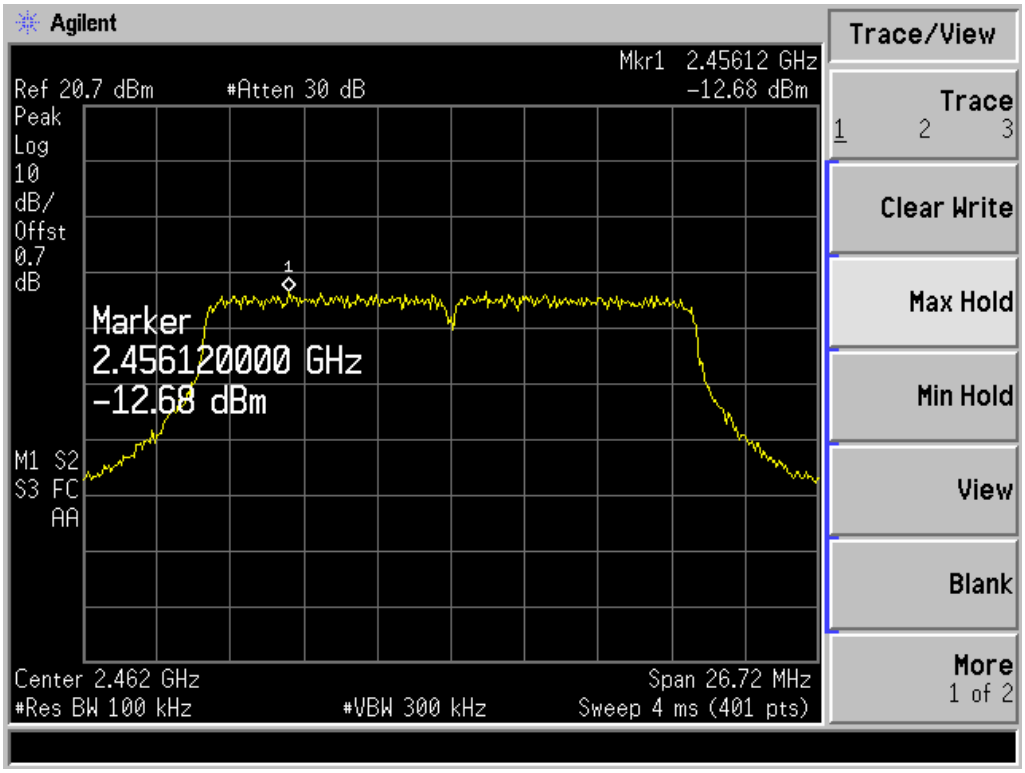


Emission level:



IEEE 802.11n20 CH11

Reference level:



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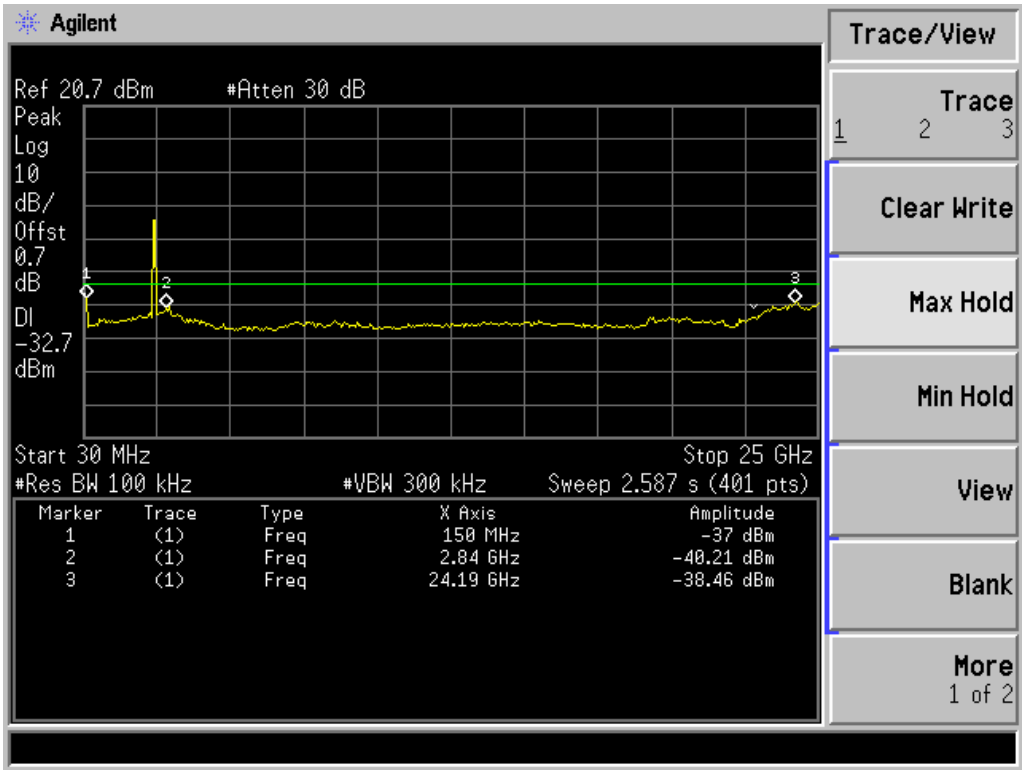
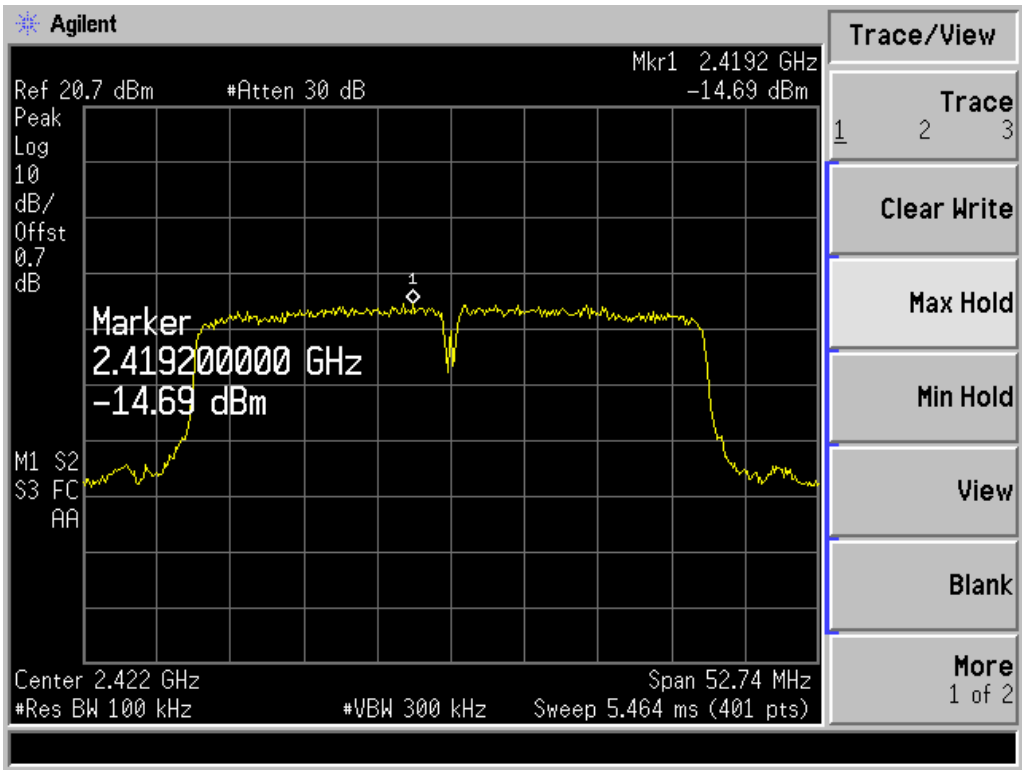
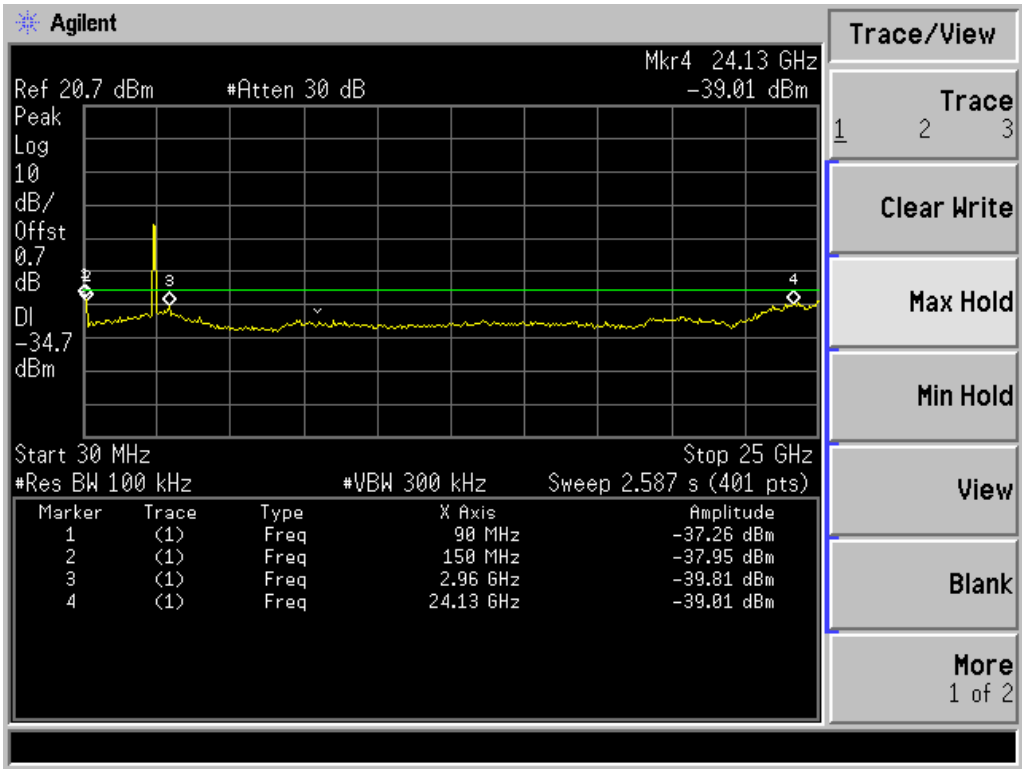


IEEE 802.11n40 CH3

Reference level:

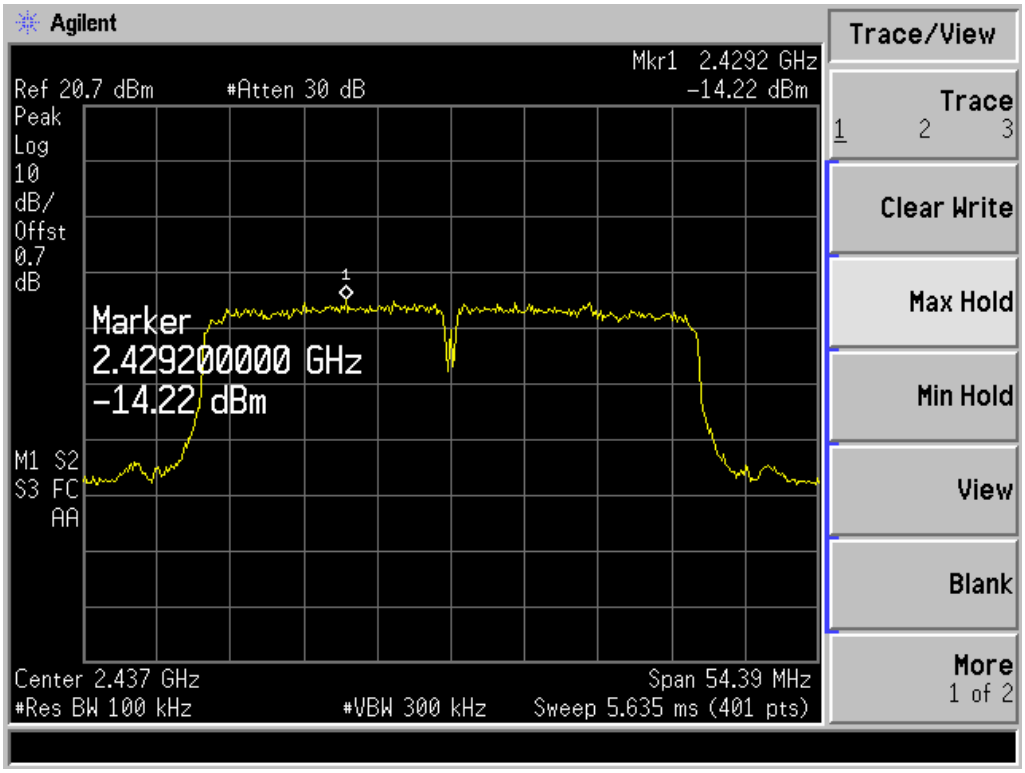


Emission level:



IEEE 802.11n40 CH6

Reference level:



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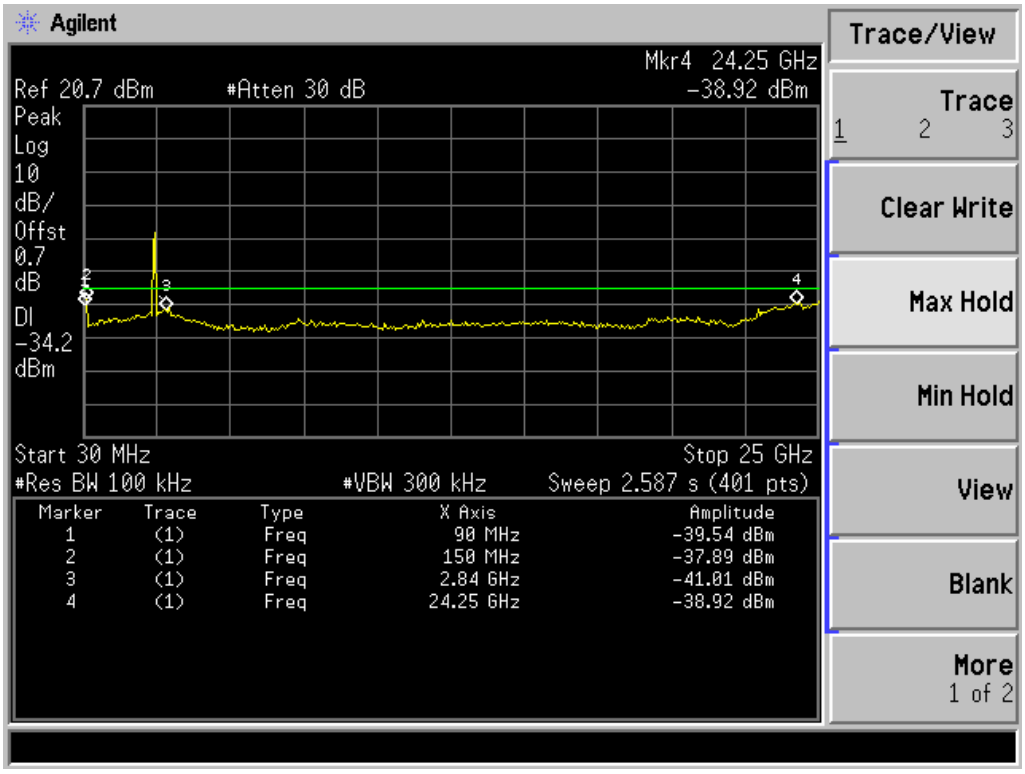
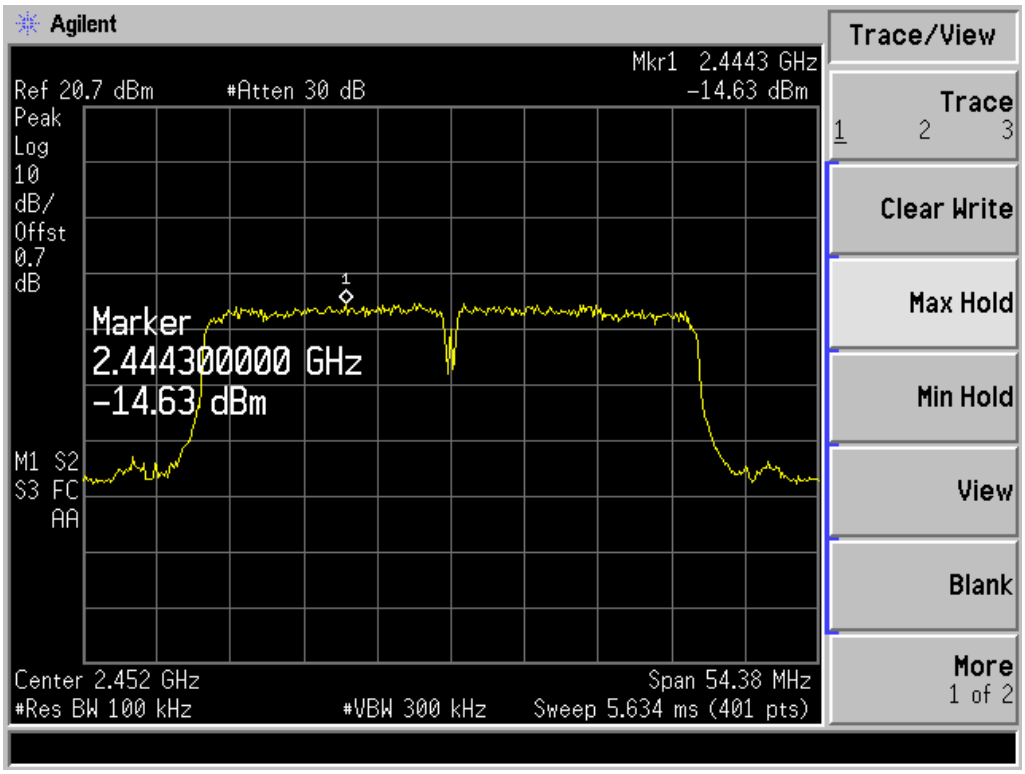
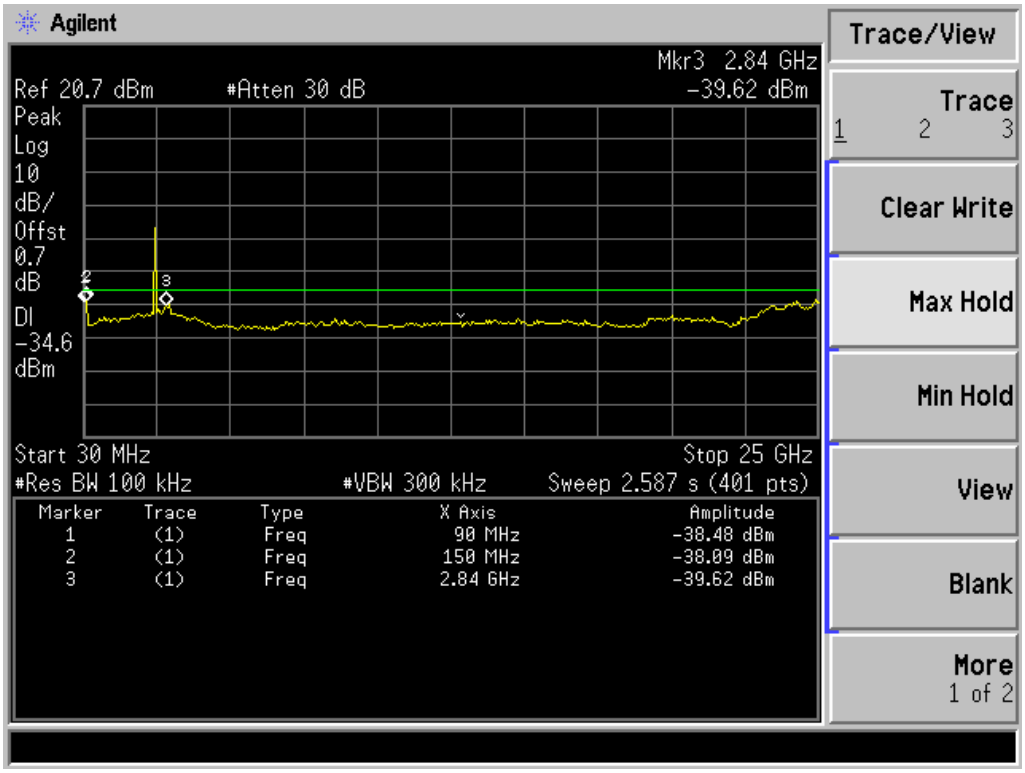


IEEE 802.11n40 CH9

Reference level:



Emission level:



13. BAND EDGES MEASUREMENT

Limit

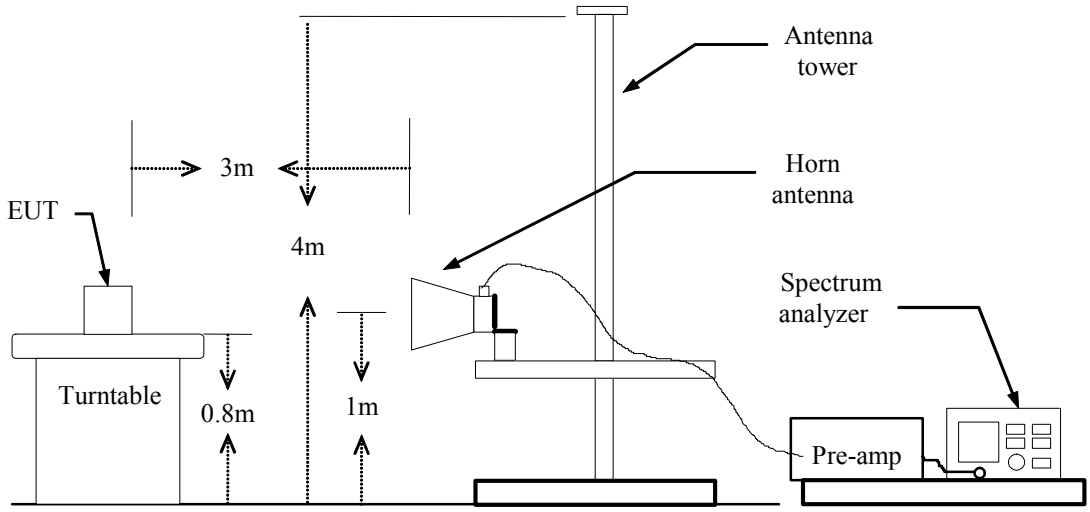
All the lower and upper band-edges emissions appearing within 2310MHz to 2390MHz and 2483.5MHz to 2500MHz restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation frequency band 2400MHz to 2483.5MHz and 5725MHz to 5850MHz shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

Measurement Equipment Used

Name of Equipment	Manufacturer	Model	Serial Number	LAST CAL.	Calibration Due
Spectrum Analyzer	ADVANTEST	R3132	140301570	06/12/2013	06/12/2014
Turn Table	SINTEK	N/A	N/A	N.C.R	N.C.R
Antenna Tower	SINTEK	N/A	N/A	N.C.R	N.C.R
Controller	SINTEK	N/A	N/A	N.C.R	N.C.R
Horn antenna	EMCO	3115	9602-4659	06/12/2013	06/12/2014
Pre-Amplifier	HP	8449B	3008B00965	06/12/2013	06/12/2014

Remark: *Each piece of equipment is scheduled for calibration once a year.*

Test Configuration



TEST PROCEDURE

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal form an external generator.
2. The EUT is placed on a turntable, which is 0.8m above the ground plane.
3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
4. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
5. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
6. PEAK: RBW/VBW=1MHz / Sweep=AUTO

AVERAGE: RBW=1MHz/VBW=10Hz/Sweep=AUTO

7. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured. with highest data rate (worst case) are chosen for full testing.

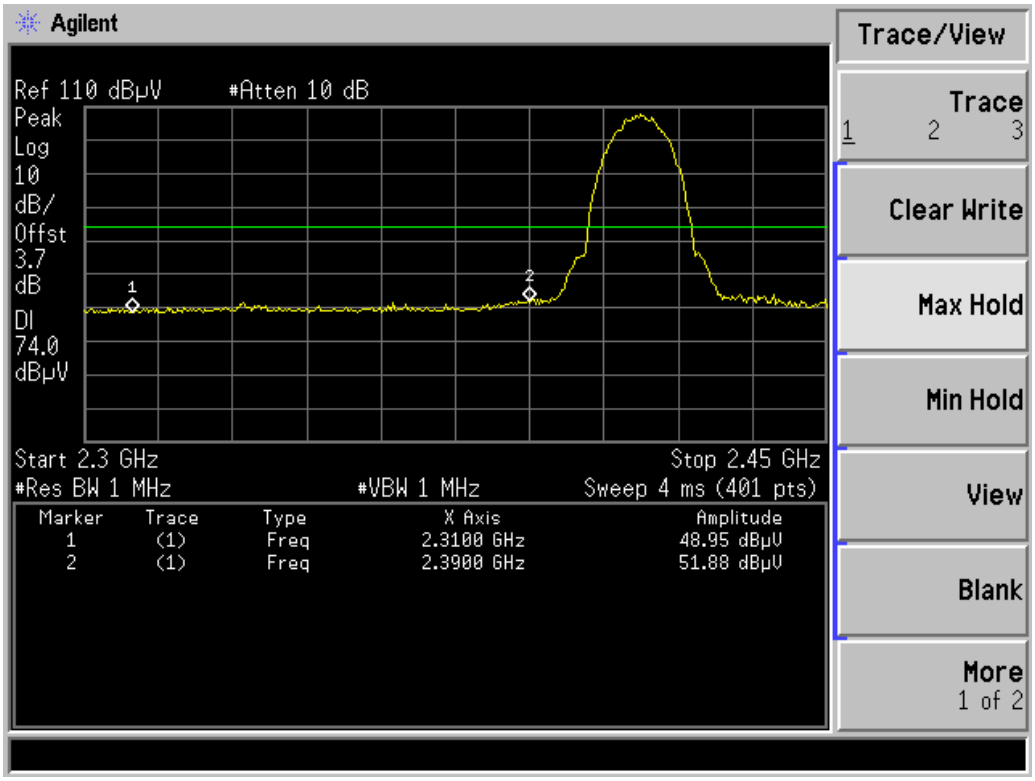
Test Results

Low band edge:

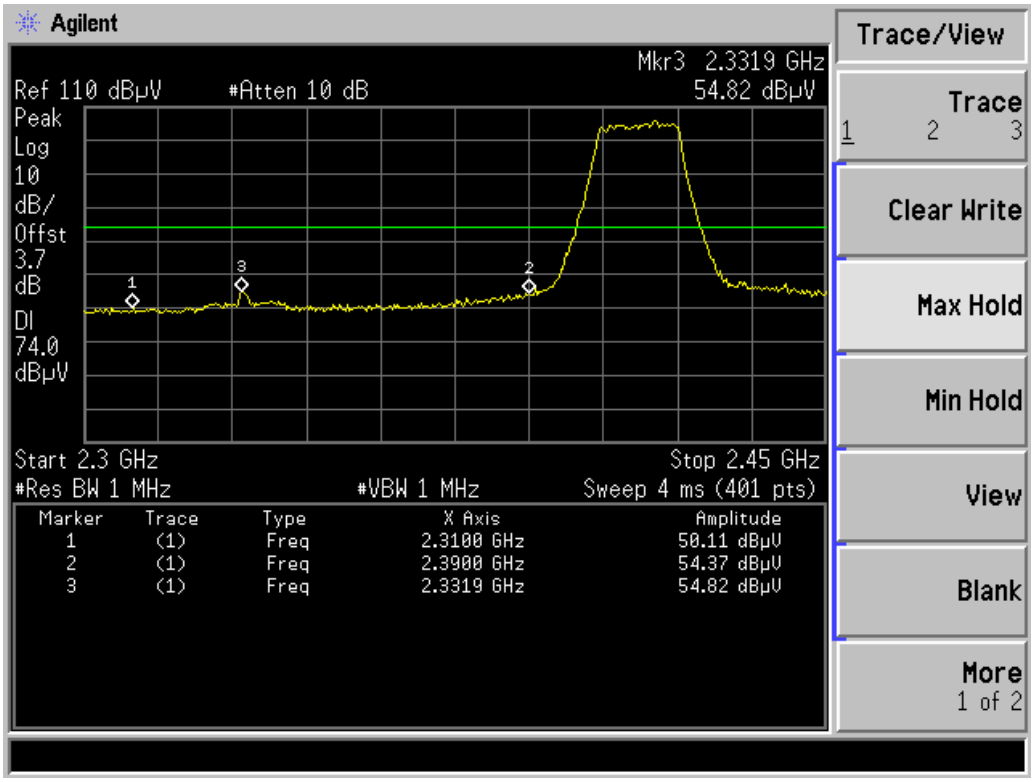
Test mode	BAND EDGES MEASUREMENT					
	Frequency (MHz)	Maximum emission levels (dBuV/m)		PK Limit (dBuV/m)	AVG Limit (dBuV/m)	Test results
		PK	AVG			
IEEE 802.11b CH1	2310MHz~2390MHz	51.88	40.32	74	54	PASS
IEEE 802.11g CH1		54.82	42.01	74	54	PASS
IEEE 802.11n20 CH1		58.20	43.02	74	54	PASS
IEEE 802.11n40 CH3		63.31	43.97	74	54	PASS

Refer to attach spectrum analyzer Peak mode data chart

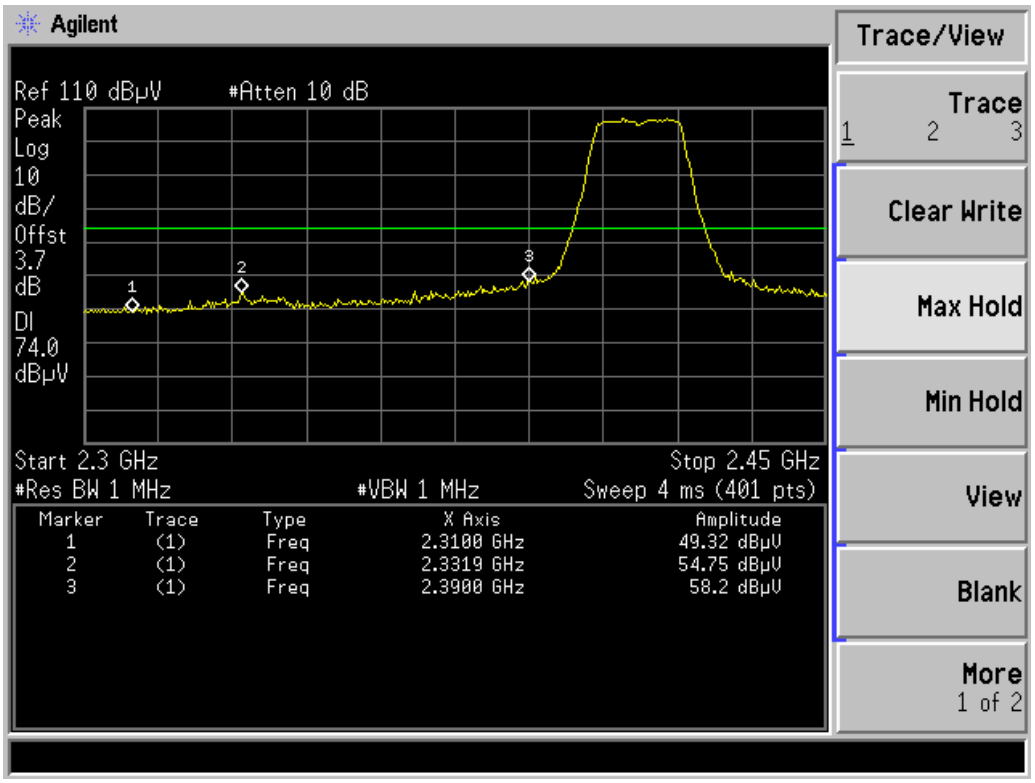
802.11b CH1



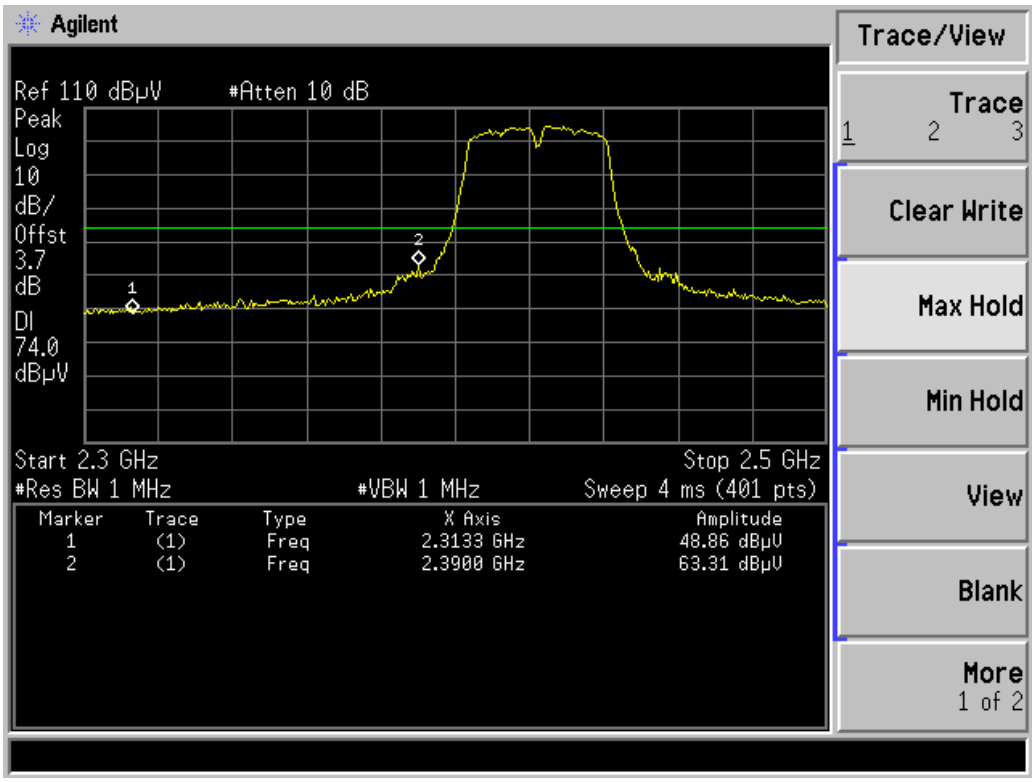
802.11g CH1



802.11n20 CH1



802.11n40 CH3

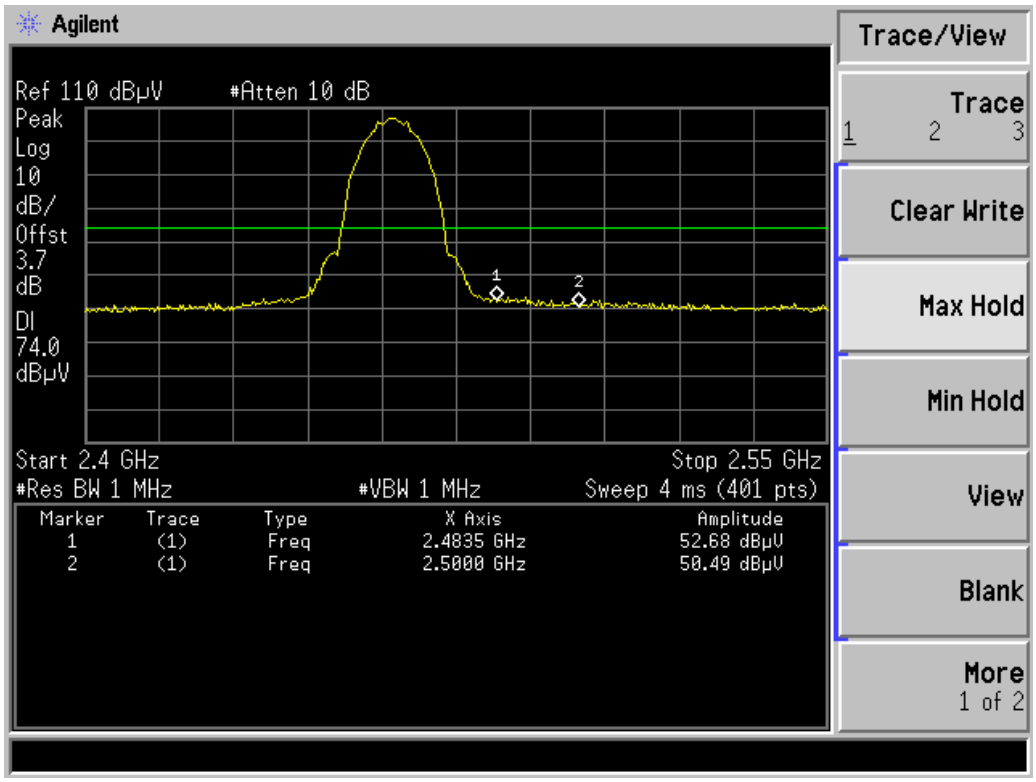


High band edge:

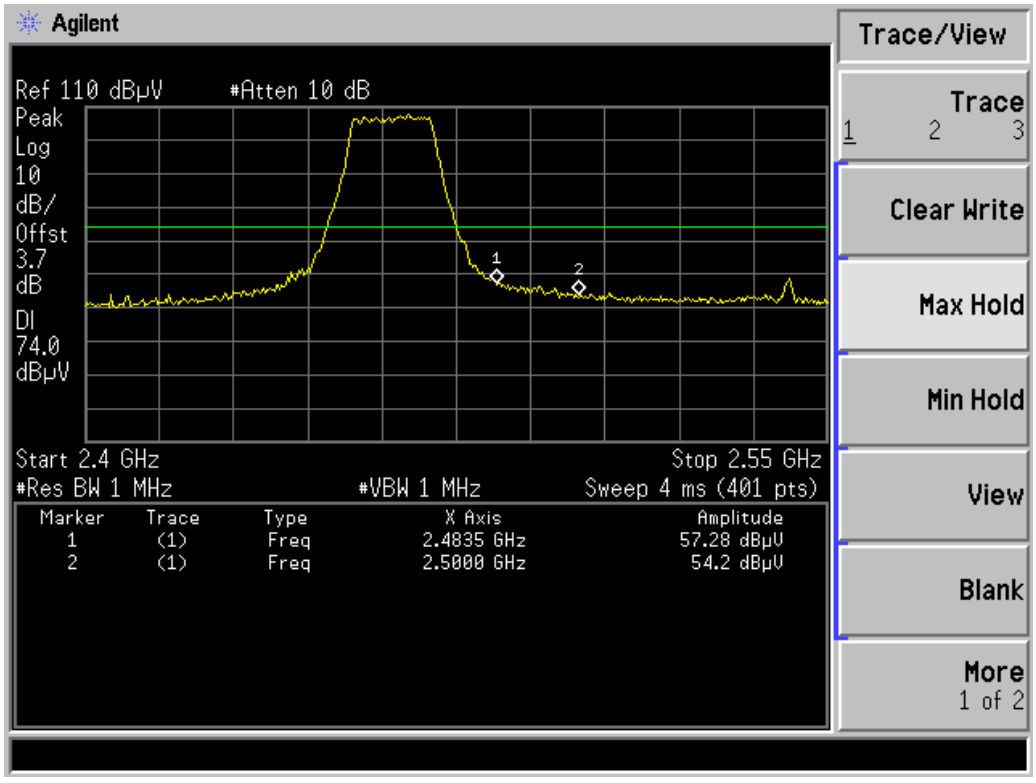
Test mode	BAND EDGES MEASUREMENT					
	Frequency (MHz)	Maximum emission levels (dBuV/m)		PK Limit (dBuV/m)	AVG Limit (dBuV/m)	Test results
IEEE 802.11b CH11	2483.5MHz~2500MHz	52.68	39.52	74	54	PASS
IEEE 802.11g CH11		57.28	42.75	74	54	PASS
IEEE 802.11n20 CH11		57.49	42.83	74	54	PASS
IEEE 802.11n40 CH9		60.41	43.82	74	54	PASS

Refer to attach spectrum analyzer Peak mode data chart

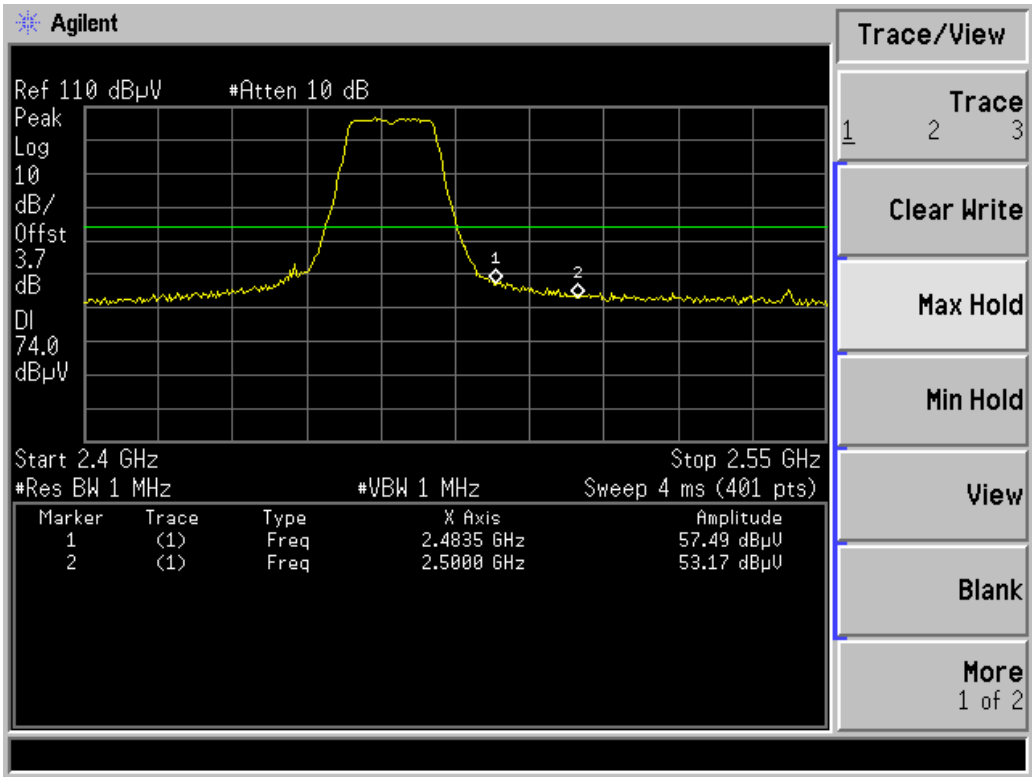
802.11b CH11



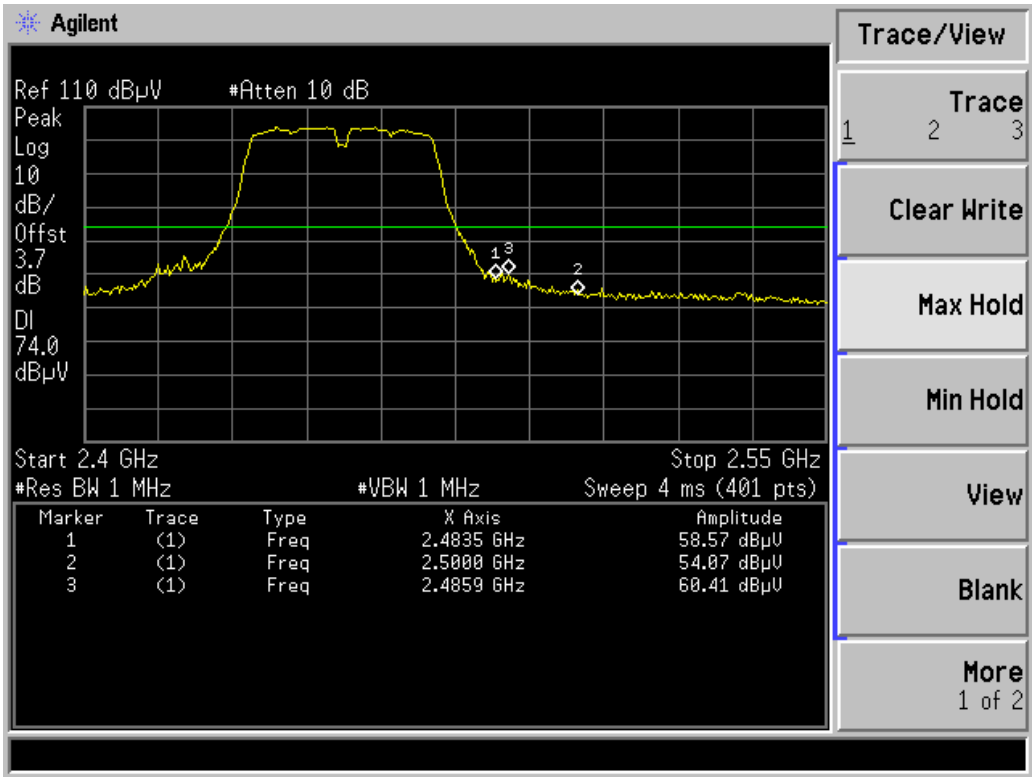
802.11g CH11



802.11n20 CH11



802.11n40 CH9



14. RADIATED EMISSIONS

Limit

Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

FCC PART 15 subpart C section 15.209 :

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

Fcc Part 15.205 Restricted Bands Of Operations

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])
13.36 - 13.41			

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

In the above emission table, the tighter limit applies at the band edges.

Frequency (Hz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
960-1000	500	54
Above1000	54dBμV/m(Average) 74dBμV/m(peak)	

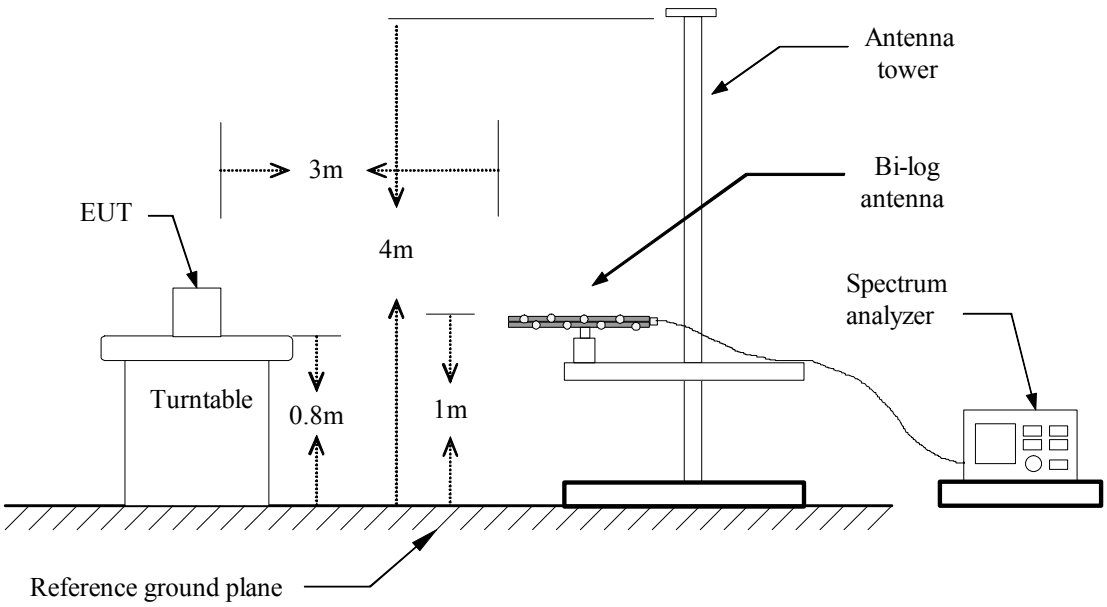
Measurement Equipment Used

Open Area Test Site					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**LAST CAL.**	**Calibration Due**
Spectrum Analyzer	ADVANTEST	R3271A	85060231	06/12/2013	06/12/2014
Spectrum Analyzer	ADVANTEST	R3132	140301570	06/12/2013	06/12/2014
EMI Test Receiver	SCHAFFNER	SCR3501	464	06/12/2013	06/12/2014
Pre-Amplifier	COM-POWER	PA-103	161062	06/12/2013	06/12/2014
Bilog Antenna	SCHAFFNER	CBL6111C	2775	06/12/2013	06/12/2014
Turn Table	SINTEK	N/A	N/A	N.C.R	N.C.R
Antenna Tower	SINTEK	N/A	N/A	N.C.R	N.C.R
Controller	SINTEK	N/A	N/A	N.C.R	N.C.R
RF Switch	ANRITSU	MP59B	M53867	N.C.R	N.C.R
Horn antenna	EMCO	3115	9602-4659	06/12/2013	06/12/2014
Pre-Amplifier	HP	8449B	3008B00965	06/12/2013	06/12/2014

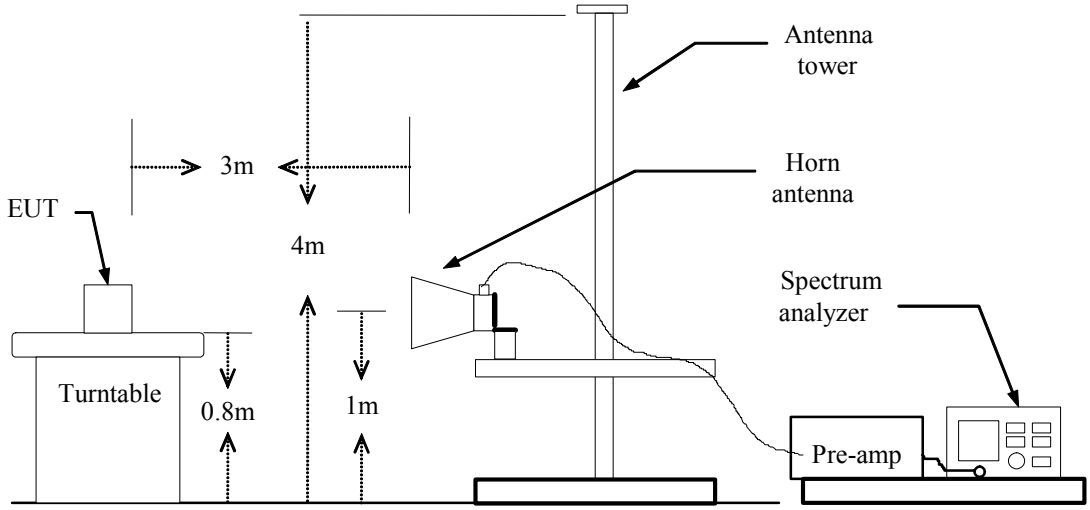
Remark: *Each piece of equipment is scheduled for calibration once a year.*

Test Configuration

Below 1 GHz



Above 1 GHz



Test Procedure

The EUT is placed on a turntable, which is 0.8m above ground plane.

The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.

EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.

Maximum procedure was performed on the six highest emissions to ensure EUT compliance.

And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

Repeat above procedures until the measurements for all frequencies are complete.

Test Results

Below 1 GHz

Operation Mode: TX **Test Date:** 2013-10-22

Temperature: 20°C **Tested by:** Laura

Humidity: 70 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. H/V	Reading (RA) (dBuV)	Corr.Factor (CF) (dB)	Measured (FS) (dBuV/m)	Limits (QP) (dBuV/m)	Safe Margins (dBuV/m)	Detector Mode (PK/QP)
65.89	V	16.35	8.87	25.22	30.00	-4.78	P
82.38	V	10.38	14.68	25.06	30.00	-4.94	P
124.09	V	15.02	11.41	26.43	30.00	-3.57	P
149.31	V	13.12	10.72	23.84	30.00	-6.16	P
216.24	V	10.73	16.05	26.78	30.00	-3.22	P
282.20	V	7.59	18.89	26.48	37.00	-10.52	P
47.46	H	14.70	9.29	23.99	30.00	-6.01	P
95.69	H	16.61	5.83	22.44	30.00	-7.56	P
149.31	H	16.75	10.18	26.93	30.00	-3.07	P
158.04	H	12.71	10.88	23.59	30.00	-6.41	P
182.29	H	11.30	10.48	21.78	30.00	-8.22	P
216.24	H	13.70	10.30	24.00	30.00	-6.00	P

Notes:

1. Measuring frequencies from 30 MHz to the 1GHz.

2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.

3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.

Above 1 GHz

IEEE 802.11b:

Operation Mode: 802.11b Ch low (2412MHz) **Test Date:** 2013-10-22

Temperature: 20°C **Tested by:** Laura

Humidity: 70 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Peak Margin (dB)	AV Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)				
2415.00	V	90.12	---	19.21	109.33	---	74.00	54.00	N/A	N/A
2895.00	V	25.65	---	25.24	50.89	---	74.00	54.00	-23.11	---
4830.00	V	18.35	---	33.87	52.22	---	74.00	54.00	-21.78	---
N/A										
N/A										
N/A										
N/A										
2415.00	H	88.03	---	19.21	107.24	---	74.00	54.00	N/A	N/A
3610.00	H	21.32	---	26.98	48.30	---	74.00	54.00	-25.70	---
4824.00	H	16.32	---	33.85	50.17	---	74.00	54.00	-23.83	---
N/A										
N/A										
N/A										
N/A										

Notes:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *2412MHz is the fundamental emission of device and exclude to comply with the limit show in here.*
5. *Spectrum setting:*
   a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW =3MHz, Sweep time = 200 ms.

b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

Operation Mode: 802.11b Ch mid (2437MHz) **Test Date:** 2013-10-22

Temperature: 20°C **Tested by:** Laura

Humidity: 70 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Peak Margin (dB)	AV Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)				
2440.00	V	91.37	---	19.85	111.22	---	74.00	54.00	N/A	N/A
2840.00	V	22.35	---	24.35	46.70	---	74.00	54.00	-27.30	---
4875.00	V	16.98	---	34.63	51.61	---	74.00	54.00	-22.39	---
N/A										
N/A										
N/A										
N/A										
2435.00	H	89.65	---	19.67	109.32	---	74.00	54.00	N/A	N/A
2880.00	H	25.21	---	24.73	49.94	---	74.00	54.00	-24.06	---
4880.00	H	16.21	---	34.67	50.88	---	74.00	54.00	-23.12	---
N/A										
N/A										
N/A										
N/A										

Notes:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *2437MHz is the fundamental emission of device and exclude to comply with the limit show in here.*
5. *Spectrum setting:*

a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 3MHz, Sweep time = 200 ms.

b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

Operation Mode: 802.11b Ch high (2462MHz) **Test Date:** 2013-10-22

Temperature: 20°C **Tested by:** Laura

Humidity: 70 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Peak Margin (dB)	AV Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)				
2460.00	V	90.75	---	19.91	110.66	---	74.00	54.00	N/A	N/A
3665.00	V	24.52	---	27.49	52.01	---	74.00	54.00	-21.99	---
4925.00	V	18.21	---	34.66	52.87	---	74.00	54.00	-21.13	---
N/A										
N/A										
N/A										
N/A										
2465.00	H	89.34	---	19.97	109.31	---	74.00	54.00	N/A	N/A
2905.00	H	23.24	---	25.12	48.36	---	74.00	54.00	-25.64	---
4924.00	H	17.37	---	34.66	52.03	---	74.00	54.00	-21.97	---
N/A										
N/A										
N/A										
N/A										

Notes:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*

a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 3MHz, Sweep time = 200 ms.

b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

IEEE 802.11g:

Operation Mode: 802.11g Ch low (2412MHz) **Test Date:** 2013-10-22

Temperature: 20°C **Tested by:** Laura

Humidity: 70 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Peak Margin (dB)	AV Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)				
2410.00	V	88.65	---	19.16	107.81	---	74.00	54.00	N/A	N/A
2810.00	V	23.04	---	24.24	47.28	---	74.00	54.00	-26.72	---
4825.00	V	16.24	---	33.65	49.89	---	74.00	54.00	-24.11	---
N/A										
N/A										
N/A										
N/A										
2415.00	H	86.84	---	19.21	106.05	---	74.00	54.00	N/A	N/A
3200.00	H	25.35	---	26.19	51.54	---	74.00	54.00	-22.46	---
4830.00	H	17.62	---	33.93	51.55	---	74.00	54.00	-22.45	---
N/A										
N/A										
N/A										
N/A										

Notes:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *2412MHz is the fundamental emission of device and exclude to comply with the limit show in here.*
5. *Spectrum setting:*
   a. *Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW =3MHz, Sweep time = 200 ms.*

b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

Operation Mode: 802.11g Ch mid (2437MHz) **Test Date:** 2013-10-22

Temperature: 20°C **Tested by:** Laura

Humidity: 70 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Peak Margin (dB)	AV Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)				
2430.00	V	89.35	---	19.58	108.93	---	74.00	54.00	N/A	N/A
3660.00	V	21.98	---	27.37	49.35	---	74.00	54.00	-24.65	---
4870.00	V	17.42	---	34.73	52.15	---	74.00	54.00	-21.85	---
N/A										
N/A										
N/A										
N/A										
2440.00	H	86.97	---	19.85	106.82	---	74.00	54.00	N/A	N/A
2890.00	H	25.21	---	24.73	49.94	---	74.00	54.00	-24.06	---
4865.00	H	16.21	---	34.63	50.84	---	74.00	54.00	-23.16	---
N/A										
N/A										
N/A										
N/A										

Notes:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *2437MHz is the fundamental emission of device and exclude to comply with the limit show in here.*
5. *Spectrum setting:*
   a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 3MHz, Sweep time = 200 ms.

b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

Operation Mode: 802.11g Ch high (2462MHz) **Test Date:** 2013-10-22

Temperature: 20°C **Tested by:** Laura

Humidity: 70 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Peak Margin (dB)	AV Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)				
2460.00	V	88.18	---	19.91	108.09	---	74.00	54.00	N/A	N/A
2920.00	V	25.69	---	25.37	51.06	---	74.00	54.00	-22.94	---
4920.00	V	18.21	---	34.50	52.71	---	74.00	54.00	-21.29	---
N/A										
N/A										
N/A										
N/A										
2465.00	H	86.34	---	19.97	106.31	---	74.00	54.00	N/A	N/A
2920.00	H	23.97	---	25.37	49.34	---	74.00	54.00	-24.66	---
4925.00	H	17.37	---	34.67	52.04	---	74.00	54.00	-21.96	---
N/A										
N/A										
N/A										
N/A										

Notes:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*

a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 3MHz, Sweep time = 200 ms.

b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

IEEE 802.11n HT20:

Operation Mode: 802.11n20 Ch low (2412MHz) **Test Date:** 2013-10-22

Temperature: 20°C **Tested by:** Laura

Humidity: 70 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Peak Margin (dB)	AV Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)				
2410.00	V	87.64	---	19.16	106.80	---	74.00	54.00	N/A	N/A
3210.00	V	24.65	---	24.37	49.02	---	74.00	54.00	-24.98	---
4825.00	V	17.24	---	33.85	51.09	---	74.00	54.00	-22.91	---
N/A										
N/A										
N/A										
N/A										
2415.00	H	85.39	---	19.21	104.60	---	74.00	54.00	N/A	N/A
3610.00	H	25.36	---	25.64	51.00	---	74.00	54.00	-23.00	---
4824.00	H	17.35	---	33.85	51.20	---	74.00	54.00	-22.81	---
N/A										
N/A										
N/A										
N/A										

Notes:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *2412MHz is the fundamental emission of device and exclude to comply with the limit show in here.*
5. *Spectrum setting:*
   a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW =3MHz, Sweep time = 200 ms.

b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

Operation Mode: 802.11n20 Ch mid (2437MHz) **Test Date:** 2013-10-22

Temperature: 20°C **Tested by:** Laura

Humidity: 70 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Peak Margin (dB)	AV Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)				
2430.00	V	89.32	---	19.55	108.87	---	74.00	54.00	N/A	N/A
4000.00	V	22.32	---	29.65	51.97	---	74.00	54.00	-22.04	---
4875.00	V	17.06	---	34.63	51.69	---	74.00	54.00	-22.31	---
N/A										
N/A										
N/A										
N/A										
2440.00	H	85.20	---	19.85	105.05	---	74.00	54.00	N/A	N/A
3400.00	H	26.35	---	25.34	51.69	---	74.00	54.00	-22.31	---
4865.00	H	17.55	---	34.63	52.18	---	74.00	54.00	-21.82	---
N/A										
N/A										
N/A										
N/A										

Notes:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *2437MHz is the fundamental emission of device and exclude to comply with the limit show in here.*
5. *Spectrum setting:*

a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 3MHz, Sweep time = 200 ms.

b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

Operation Mode: 802.11n20 Ch high (2462MHz) **Test Date:** 2013-10-22

Temperature: 20°C **Tested by:** Laura

Humidity: 70 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Peak Margin (dB)	AV Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)				
2460.00	V	87.64	---	19.91	107.55	---	74.00	54.00	N/A	N/A
2860.00	V	28.52	---	23.45	51.97	---	74.00	54.00	-22.03	---
4900.00	V	17.72	---	34.01	51.73	---	74.00	54.00	-22.27	---
N/A										
N/A										
N/A										
N/A										
2465.00	H	84.37	---	19.97	104.34	---	74.00	54.00	N/A	N/A
3000.00	H	26.37	---	24.13	50.50	---	74.00	54.00	-23.50	---
4924.00	H	18.21	---	34.66	52.87	---	74.00	54.00	-21.13	---
N/A										
N/A										
N/A										
N/A										

Notes:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*

a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 3MHz, Sweep time = 200 ms.

b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

IEEE 802.11n HT40:

Operation Mode: 802.11n40 Ch low (2422MHz) **Test Date:** 2013-10-22

Temperature: 20°C **Tested by:** Laura

Humidity: 70 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Peak Margin (dB)	AV Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)				
2420.00	V	86.24	---	19.25	105.49	---	74.00	54.00	N/A	N/A
2850.00	V	24.35	---	25.04	49.39	---	74.00	54.00	-24.61	---
4850.00	V	16.24	---	33.91	50.15	---	74.00	54.00	-23.85	---
N/A										
N/A										
N/A										
N/A										
2425.00	H	83.54	---	19.31	102.85	---	74.00	54.00	N/A	N/A
3640.00	H	22.31	---	26.89	49.20	---	74.00	54.00	-24.80	---
4840.00	H	17.24	---	33.34	50.58	---	74.00	54.00	-23.42	---
N/A										
N/A										
N/A										
N/A										

Notes:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *2412MHz is the fundamental emission of device and exclude to comply with the limit show in here.*
5. *Spectrum setting:*
   a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW =3MHz, Sweep time = 200 ms.

b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

Operation Mode: 802.11n40 Ch mid (2437MHz) **Test Date:** 2013-10-22

Temperature: 20°C **Tested by:** Laura

Humidity: 70 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Peak Margin (dB)	AV Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)				
2435.00	V	86.34	---	19.18	105.52	---	74.00	54.00	N/A	N/A
3000.00	V	25.97	---	24.13	50.10	---	74.00	54.00	-23.90	---
4870.00	V	18.54	---	34.63	53.17	---	74.00	54.00	-20.83	---
N/A										
N/A										
N/A										
N/A										
2440.00	H	82.94	---	19.22	102.16	---	74.00	54.00	N/A	N/A
3630.00	H	22.34	---	26.24	48.58	---	74.00	54.00	-25.42	---
4880.00	H	17.55	---	34.85	52.40	---	74.00	54.00	-21.60	---
N/A										
N/A										
N/A										
N/A										

Notes:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*

4.2437MHz is the fundamental emission of device and exclude to comply with the limit show in here.

5.Spectrum setting:

a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 3MHz, Sweep time = 200 ms.

b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

Operation Mode: 802.11n40 Ch high (2452MHz) **Test Date:** 2013-10-22

Temperature: 20°C **Tested by:** Laura

Humidity: 70 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Peak Margin (dB)	AV Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)				
2450.00	V	87.35	---	19.11	106.46	---	74.00	54.00	N/A	N/A
3700.00	V	24.35	---	27.80	52.15	---	74.00	54.00	-21.85	---
4900.00	V	18.34	---	34.37	52.71	---	74.00	54.00	-21.29	---
N/A										
N/A										
N/A										
N/A										
2455.00	H	84.01	---	19.11	103.12	---	74.00	54.00	N/A	N/A
2900.00	H	23.60	---	25.30	48.90	---	74.00	54.00	-25.10	---
4900.00	H	17.95	---	34.37	52.32	---	74.00	54.00	-21.68	---
N/A										
N/A										
N/A										
N/A										

Notes:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
4. *Spectrum setting:*

a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 3MHz, Sweep time = 200 ms.

b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

15. ANTENNA REQUIREMENT

15.1 Standard applicable

For intentional device,according to FCC 47 CFR Section 15.203,an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.and according to fcc 47 CFR Section 15.247(b),if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

15.2 Antenna inspection result.

The antennas used for this product are integral PCB Antenna and that no antenna other than that furnished by the responsible party shall be used with the device,the maximum peak gain of transmit antenna is only 2dBi.

16. MEASUREMENT UNCERTAINTY (95% CONFIDENCE LEVELS)

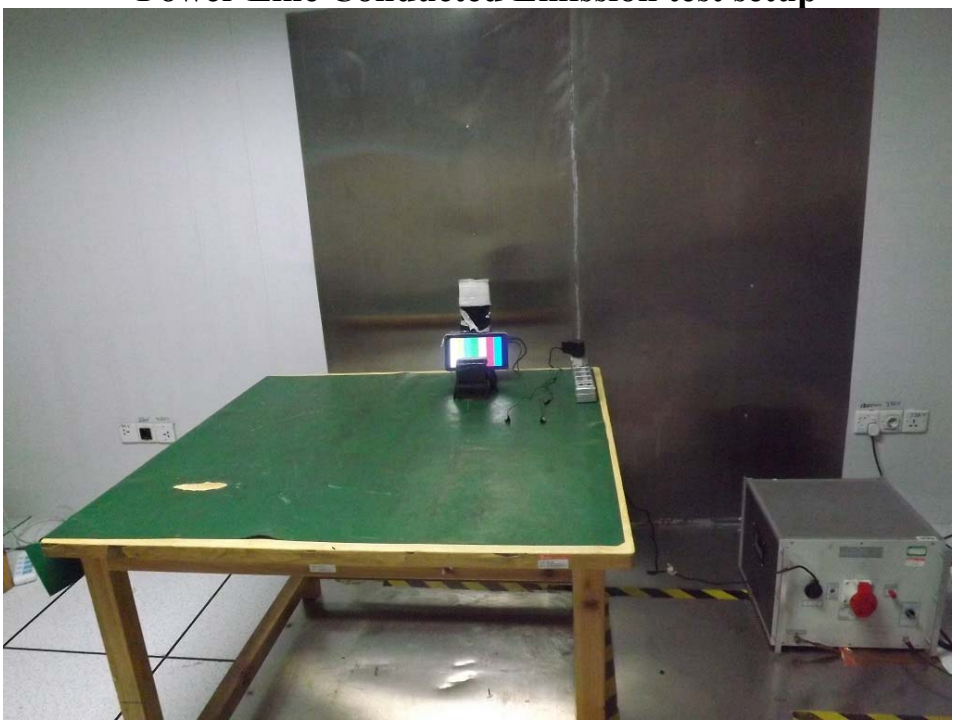
Item	Uncertainty
Uncertainty for Conduction Spurious emission test	2.11dB
Uncertainty for Output power test	0.81dB
Uncertainty for Power density test	1.83dB
Uncertainty for Radiated Emission	3.3dB (30M~1GHz Polarize: H)
	3.2dB (30M~1GHz Polarize: V)
	3.7dB (1~18GHz Polarize: H)
	3.6dB (1~18GHz Polarize: V)
Uncertainty for Bandwidth test	$1*10^{-9}$
Power Line Conducted Emission	2.8dB

--------End of test report-------

APPENDIX 1

PHOTOGRAPHS OF TEST SETUP

Power Line Conducted Emission test setup



Radiated Emission test setup