

RF TEST REPORT

Test item : Cellular/PCS GSM/GPRS/EDGE and PCS WCDMA/HSPA Phone with Bluetooth and WLAN
Model No. : E906, LGE906, LG-E906
Order No. : 1107-01045
Date of receipt : 2011-07-29
Test duration : 2011-08-01 ~ 2011-08-06
Date of issue : 2011-08-30
Use of report : FCC Original Grant

Applicant : LG Electronics MobileComm U.S.A., Inc.
10101 Old Grove Road., San Diego, CA 92131

Test laboratory : Digital EMC Co., Ltd.
683-3, Yubang-Dong, Cheoin-Gu, Yongin-Si, Kyunggi-Do, 449-080, Korea

Test specification : FCC Part 15 Subpart C 247

Test environment : See appended test report

Test result : ☒ Pass ☐ Fail

The test results presented in this test report are limited only to the sample supplied by applicant and the use of this test report is inhibited other than its purpose. This test report shall not be reproduced except in full, without the written approval of DIGITAL EMC CO., LTD.

Tested by:



Engineer
S.K. Ryu

Witnessed by:

N/A

Reviewed by:



Manager
W.J. Lee

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1. GENERAL INFORMATION

Applicant : LG Electronics MobileComm U.S.A., Inc.
Address : 10101 Old Grove Road., San Diego, CA 92131
FCC ID : ZNFE906
EUT : Cellular/PCS GSM/GPRS/EDGE and PCS WCDMA/HSPA Phone with Bluetooth and WLAN
Model : E906
Additional Model(s) : LGE906, LG-E906
Data of Test : 2011-08-01 ~ 2011-08-06
Contact person : Hee Ju An

2. EUT DESCRIPTION

Product	Cellular/PCS GSM/GPRS/EDGE and PCS WCDMA/HSPA Phone with Bluetooth and WLAN
Model Name	E906, LGE906, LG-E906
Power Supply	DC 3.7V
Battery type	Standard Battery: Lithium Ion Battery
Frequency Range	2412 ~ 2462MHz
Max. RF Output Power	802.11b: 18.55dBm 802.11g: 21.20dBm 802.11n (HT20): 20.22dBm
Modulation Type	802.11b: DSSS(CCK, DQPSK, DBPSK) 802.11g: OFDM(64QAM, QPSK, BPSK) 802.11n (HT20): OFDM(64QAM, 16QAM, QPSK, BPSK)
Antenna Specification	Internal Antenna Gain: -0.43 dBi

3. TEST METHODOLOGY

The measurement procedure described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz(ANSI C63.4-2003)

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 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4. (Version :2003) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m 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 according to the requirements in Section 13.1.4.1 of ANSI C63.4. (Version: 2003)

3.4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Channel low, mid and high with highest data rate (worst case) is chosen for full testing.

4. 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 equipments, which is traceable to recognized national standards.

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

The 10m Chamber and conducted measurement facility used to collect the radiated data are located at the 683-3, Yubang-Dong, Yongin-Si, Gyunggi-Do, 449-080, South Korea. The site is constructed in conformance with the requirements.

- 10m Chamber registration Number: 678747

5.2 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. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

* The antennas of this E.U.T are permanently attached.

* The E.U.T Complies with the requirement of §15.203

7. TEST RESULT

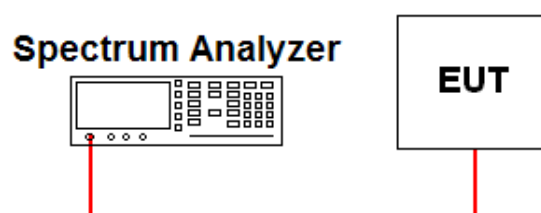
7.1 6dB Bandwidth Measurement (802.11b/g/n HT20)

Test Requirements and limit, §15.247(d)

The bandwidth at 6dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the receive antenna while the EUT is operating in transmission mode at the appropriate frequencies.

The minimum permissible 6dB bandwidth is 500 kHz.

■ TEST CONFIGURATION



■ TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to

RBW: 100 KHz

VBW: 300 KHz

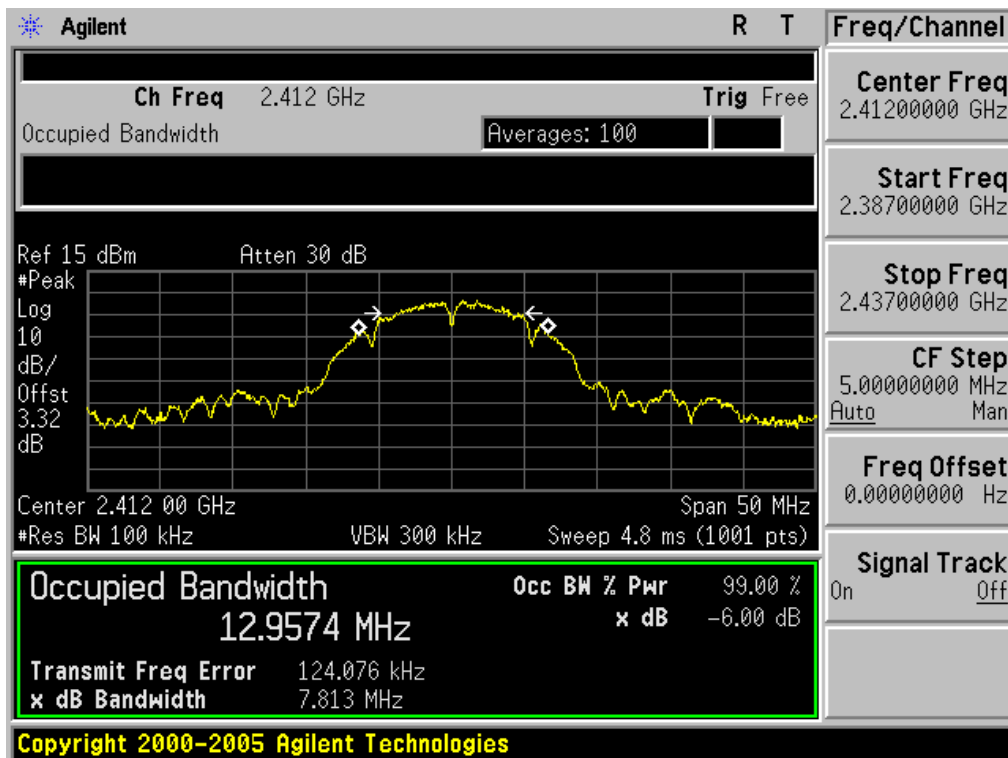
SPAN: 50 MHz

■ TEST RESULTS: **Comply**

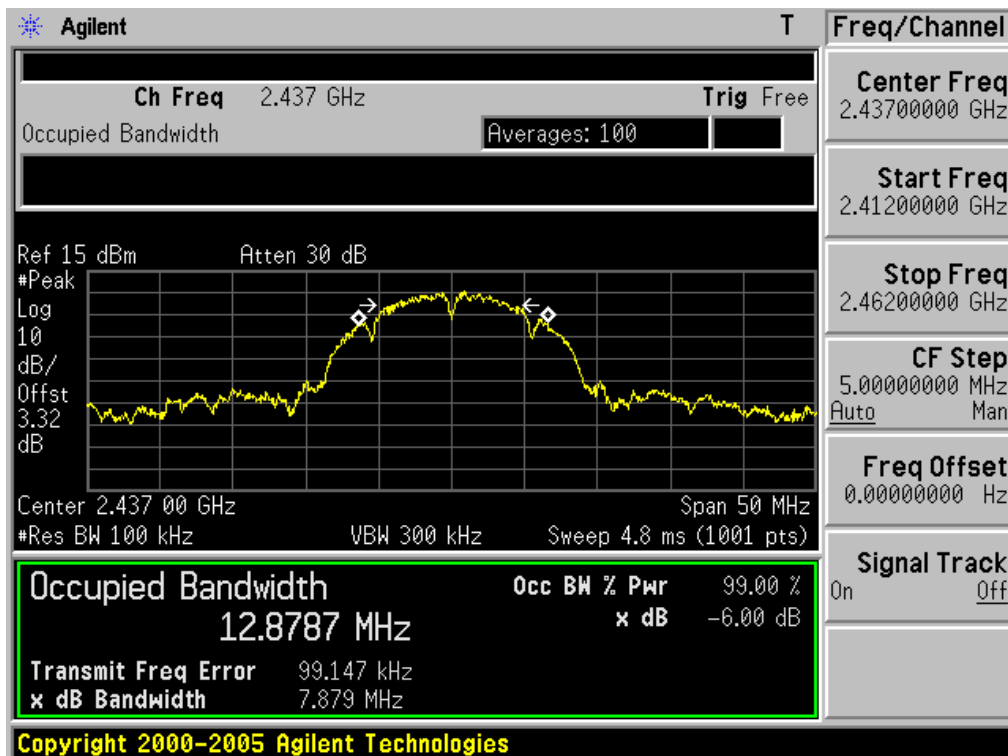
Test Mode	Data Rate	Tested Channel	Test Results [MHz]
802.11b	2Mbps	Lowest	7.813
		Middle	7.879
		Highest	8.404
802.11g	6Mbps	Lowest	15.430
		Middle	15.037
		Highest	15.301
802.11n HT20	MCS 0	Lowest	14.933
		Middle	15.078
		Highest	15.410

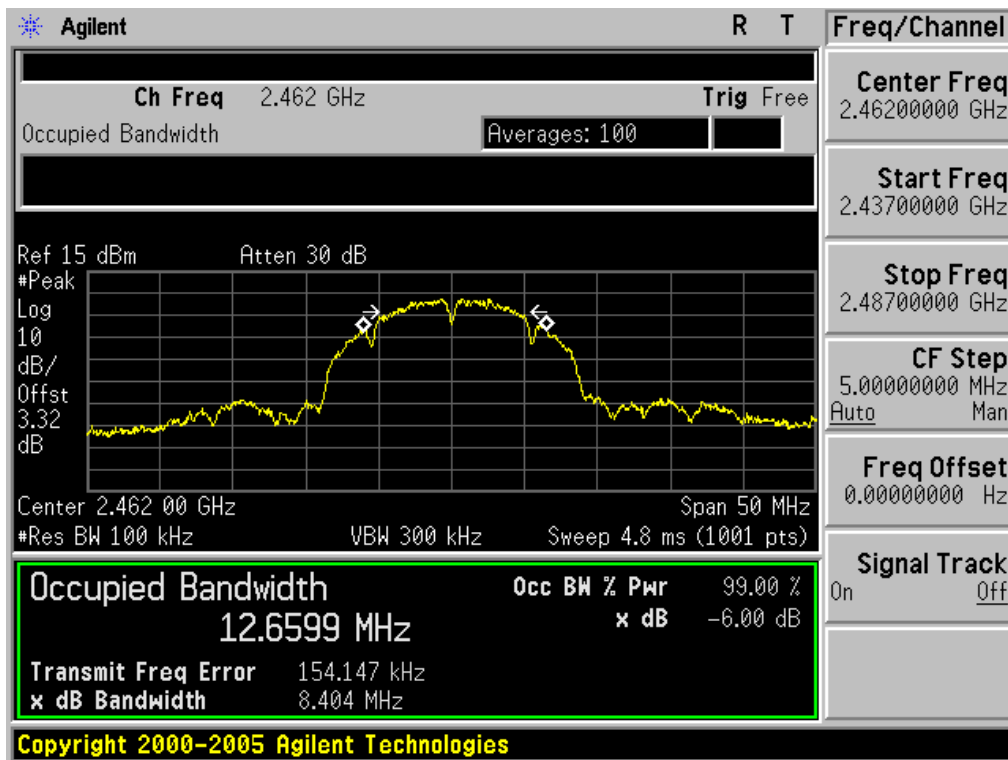
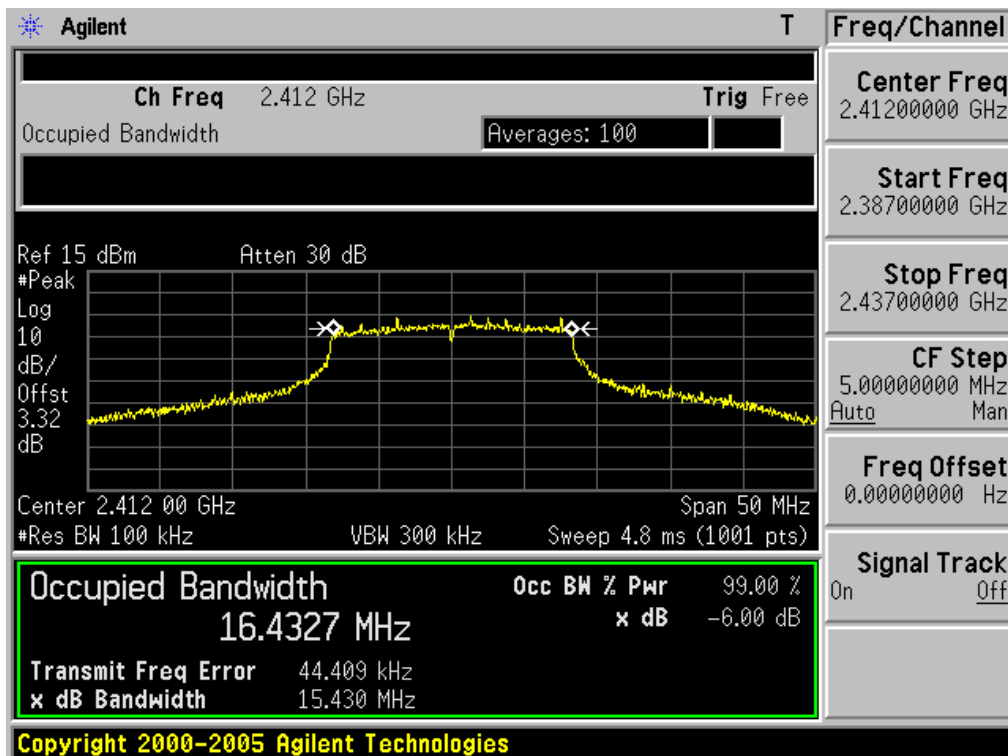
RESULT PLOTS

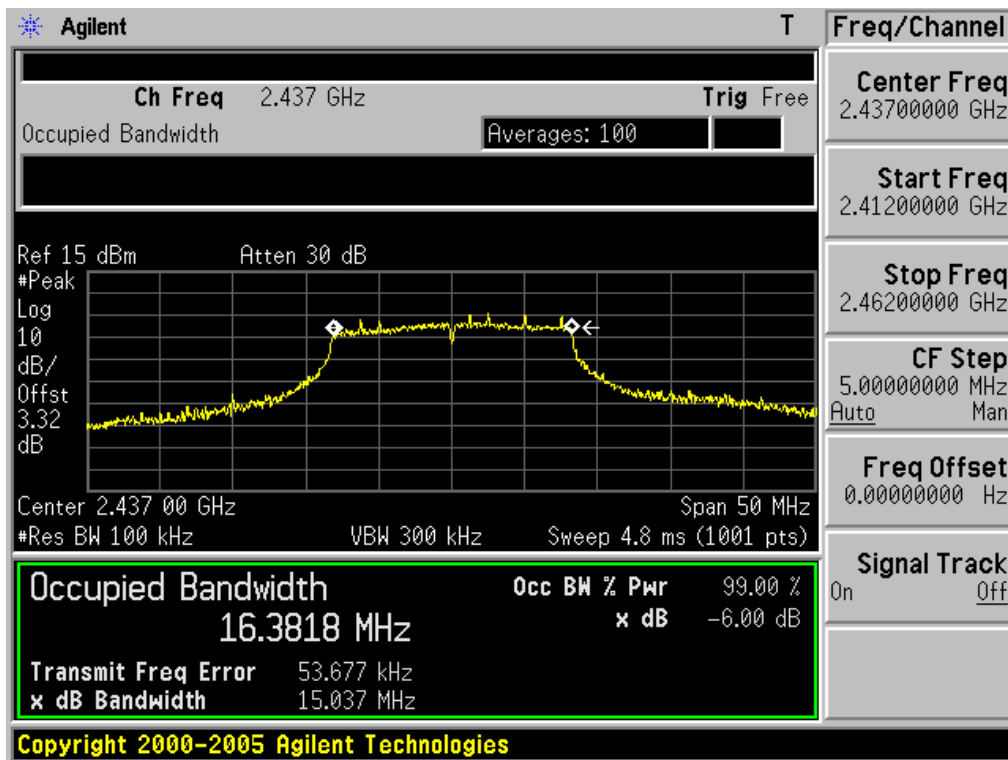
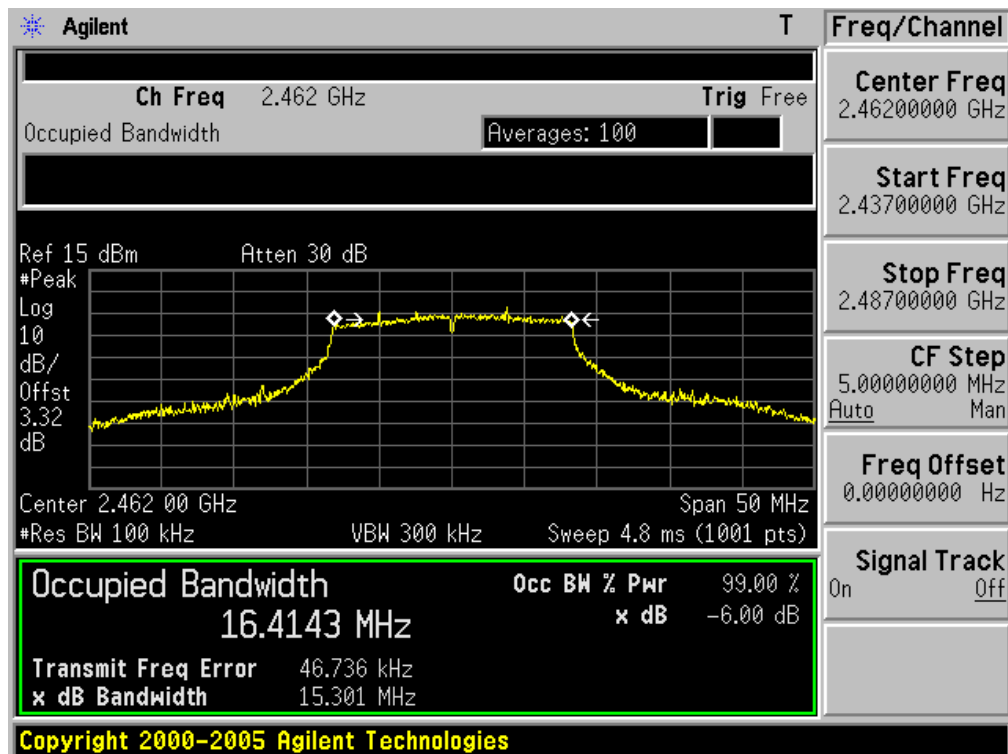
6 dB Bandwidth

Lowest Channel & Modulation: 802.11b

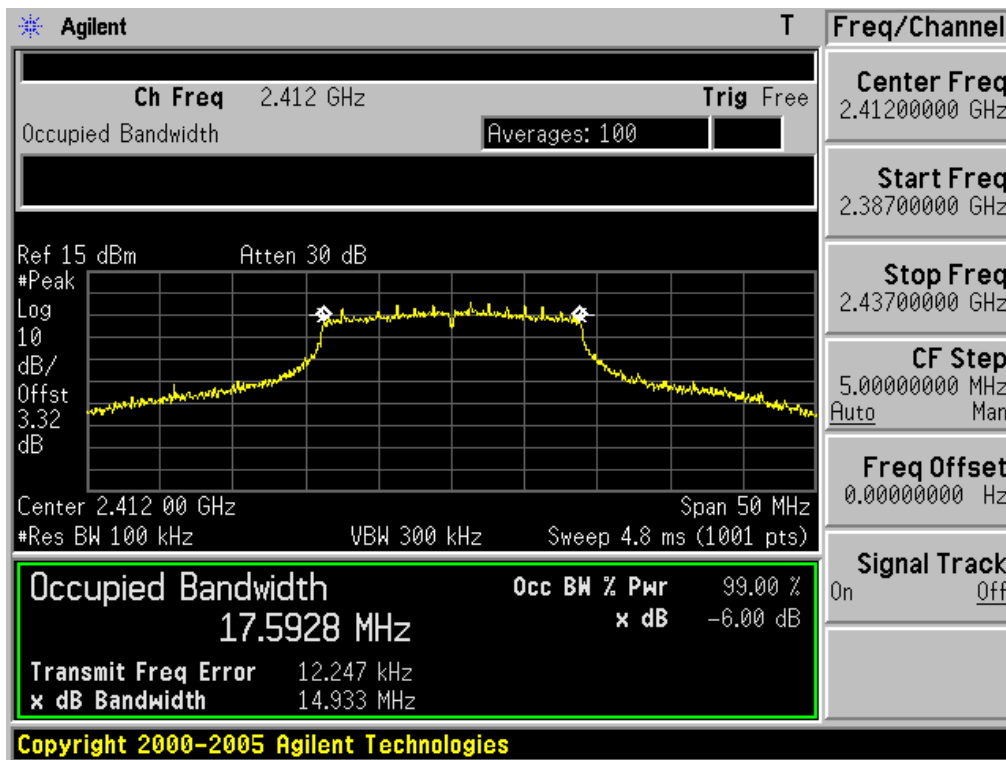
6 dB Bandwidth

Middle Channel & Modulation: 802.11b

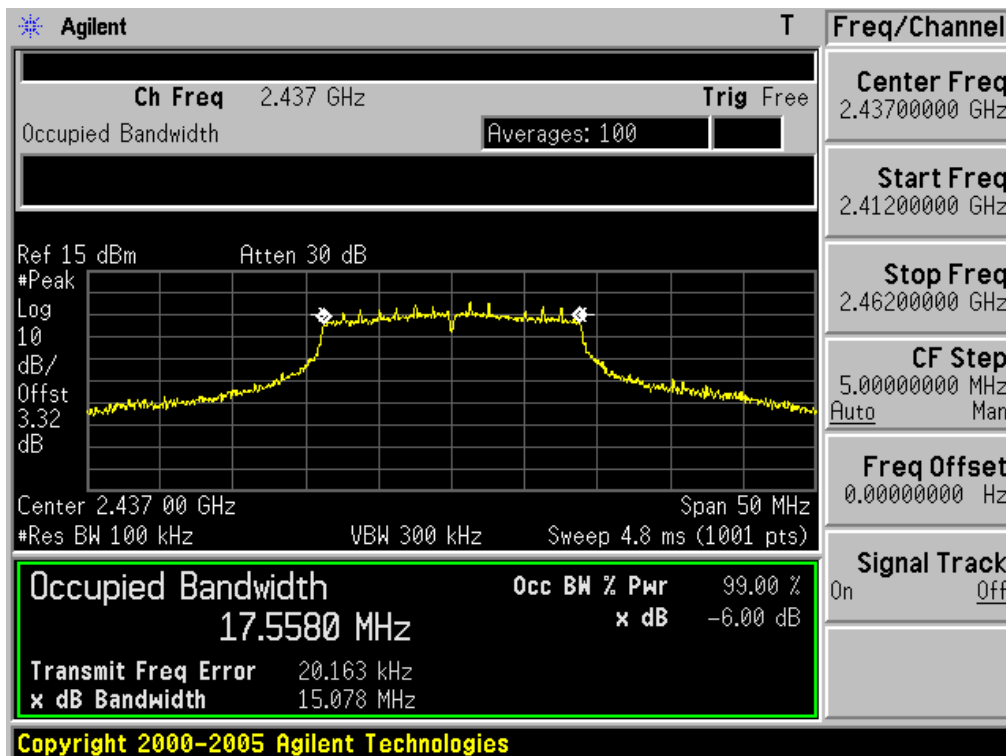
6 dB Bandwidth**Highest Channel** & Modulation: **802.11b****6 dB Bandwidth****Lowest Channel** & Modulation: **802.11g**

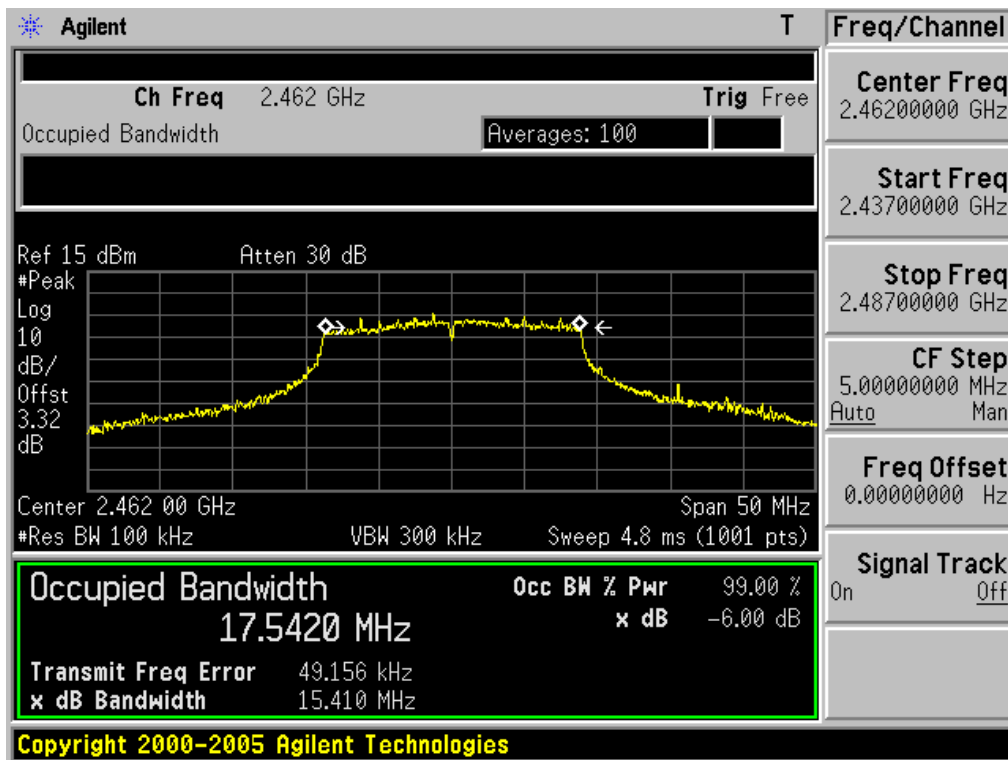
6 dB Bandwidth**Middle Channel** & Modulation: **802.11g****6 dB Bandwidth****Highest Channel** & Modulation: **802.11g**

6 dB Bandwidth

Lowest Channel & Modulation: 802.11n (HT20)

6 dB Bandwidth

Middle Channel & Modulation: 802.11n (HT20)

6 dB Bandwidth**Highest Channel** & Modulation: **802.11n (HT20)**

7.2 Peak Output Power

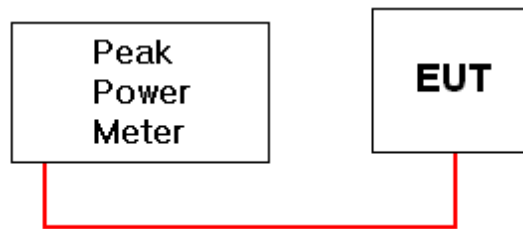
Test Requirements and limit, §15.247(d)

A transmitter antenna terminal of EUT is connected to the input of a RF power sensor.

Measurement is made while the EUT is operating in transmission mode at the appropriate frequencies.

The maximum permissible conducted output power is 1 Watt.

■ TEST CONFIGURATION



Note: Tests were performed all possible data rates and the worst cases were recorded.

■ TEST CONFIGURATION:

This test item was performed according to Power Output Option 1 in Measurement of Digital Transmission Systems Operating under Section 15.247(March 23, 2005)

■ TEST RESULTS: **Comply**

Test Mode	Data Rate	Tested Channel	Peak Output Power	
			dBm	W
802.11b	2Mbps	Lowest	18.55	0.072
		Middle	18.44	0.070
		Highest	18.21	0.066
802.11g	6Mbps	Lowest	20.79	0.120
		Middle	21.10	0.129
		Highest	21.20	0.132
802.11n (HT20)	MCS 0	Lowest	19.86	0.097
		Middle	20.15	0.104
		Highest	20.22	0.105

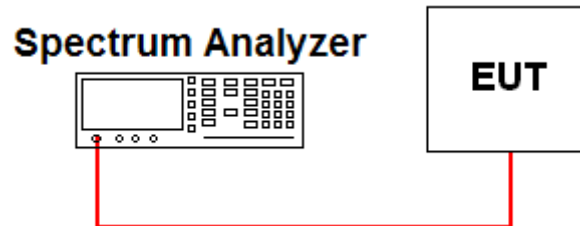
7.3 Power Spectral Density (802.11b/g/n HT20)

Test requirements and limit, §15.247(d)

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

Minimum Standard – The transmitter power density average over 1-second interval shall not be greater than 8dBm in any 3kHz BW.

■ TEST CONFIGURATION



■ TEST PROCEDURE:

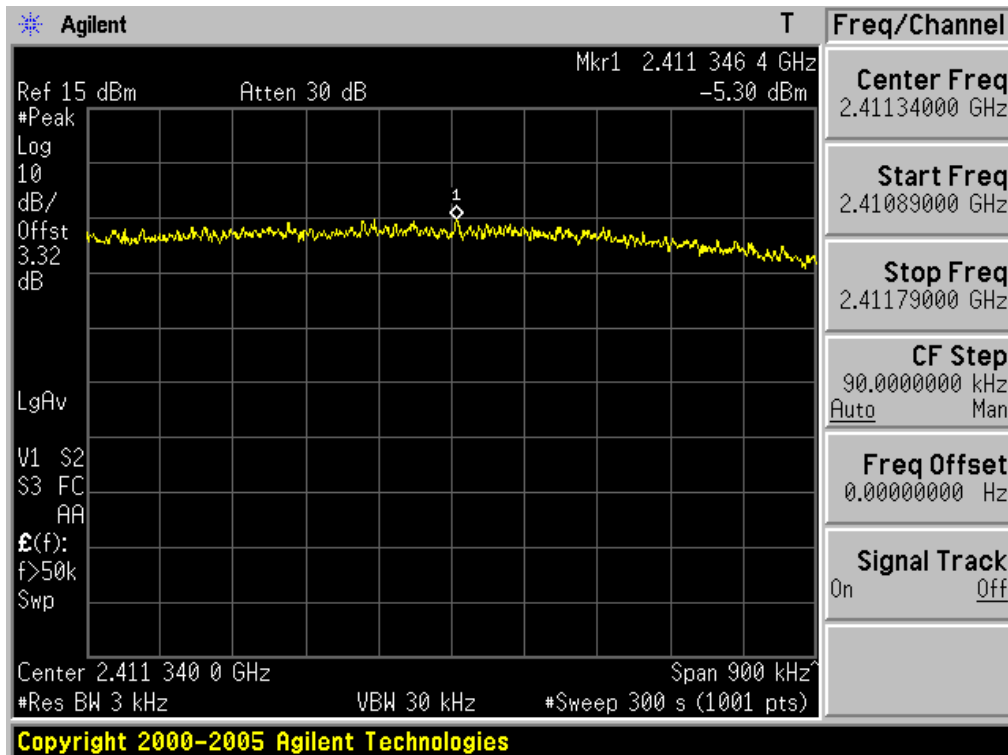
This test item was performed according to PSD Option 2 in Measurement of Digital Transmission Systems Operating under Section 15.247(March 23, 2005)

■ TEST RESULTS: **Comply**

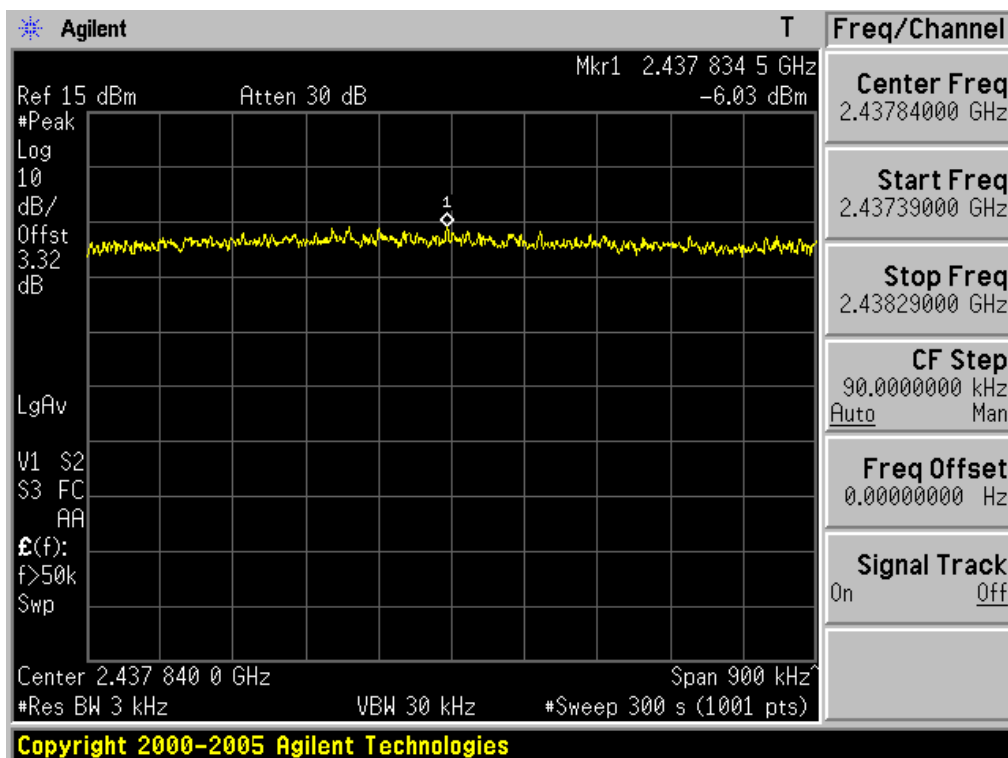
Test Mode	Data Rate	Frequency [MHz]	Test Results [dBm]
802.11b	2Mbps	Lowest	-5.30
		Middle	-6.03
		Highest	-5.90
802.11g	6Mbps	Lowest	-11.07
		Middle	-12.51
		Highest	-11.79
802.11n (HT20)	MCS 0	Lowest	-12.71
		Middle	-14.09
		Highest	-13.36

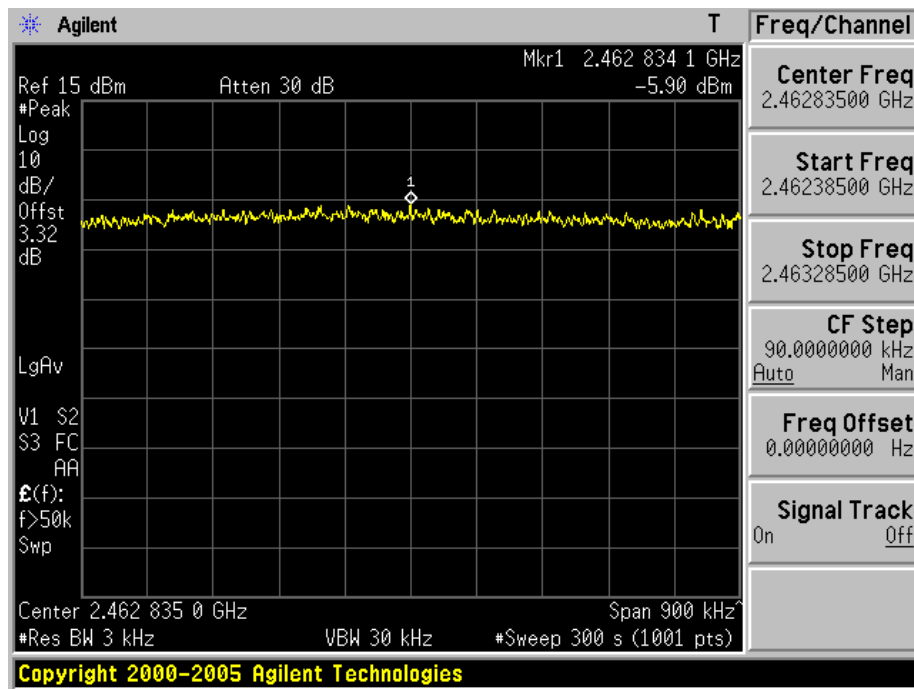
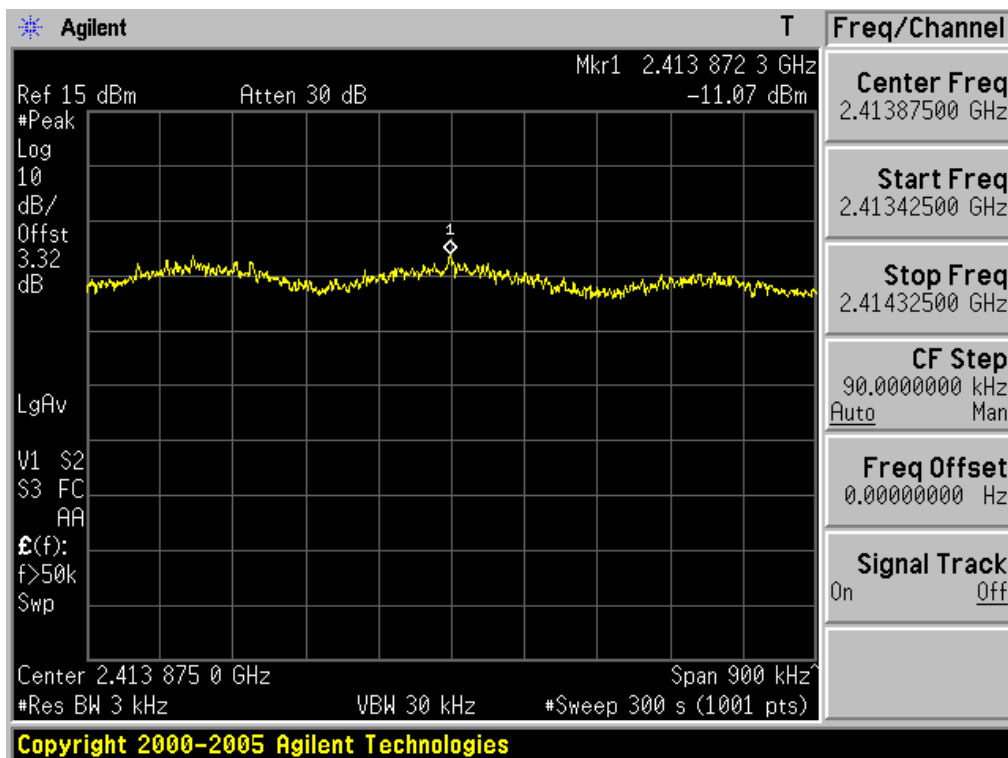
RESULT PLOTS

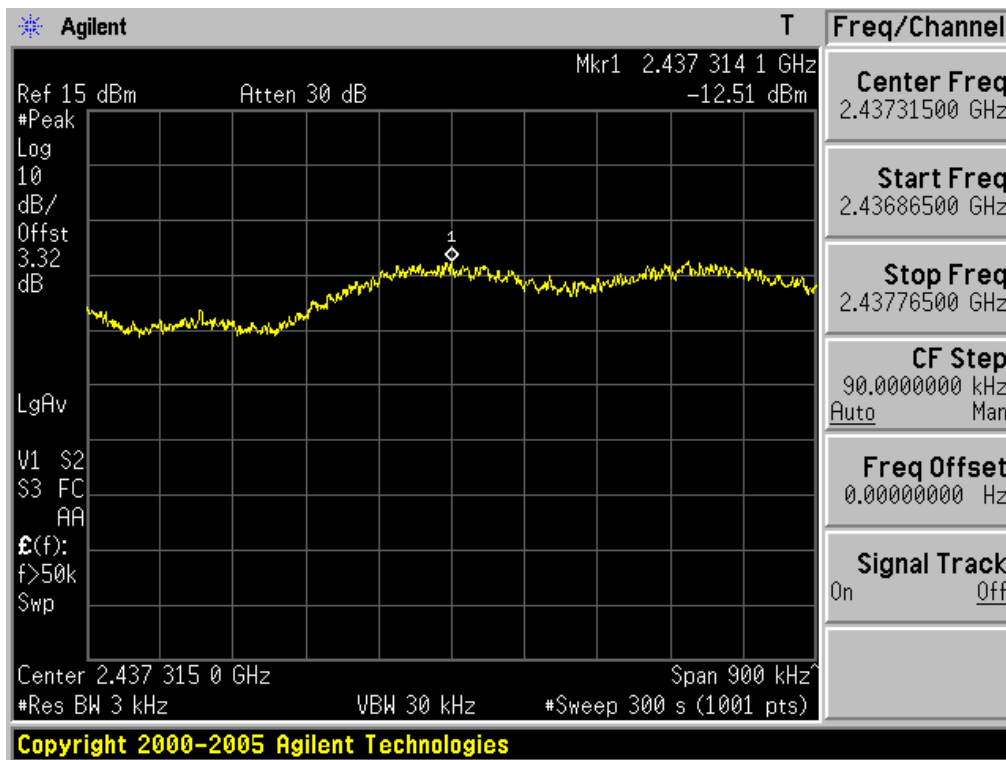
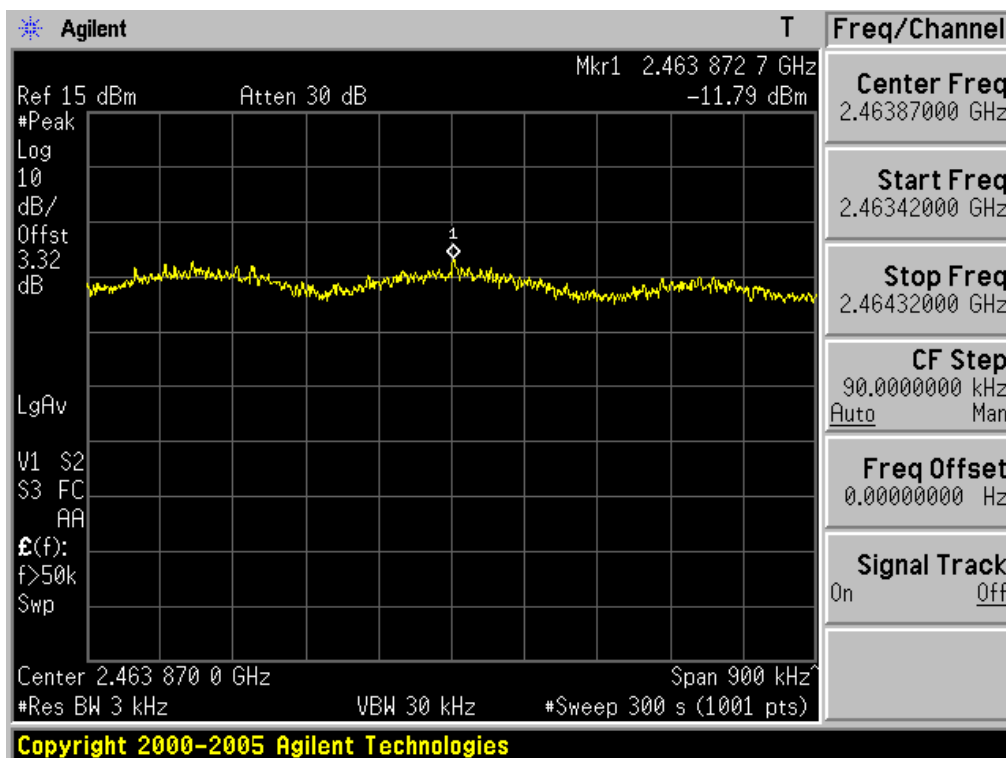
Power Spectral Density **Lowest Channel** & Modulation: **802.11b**

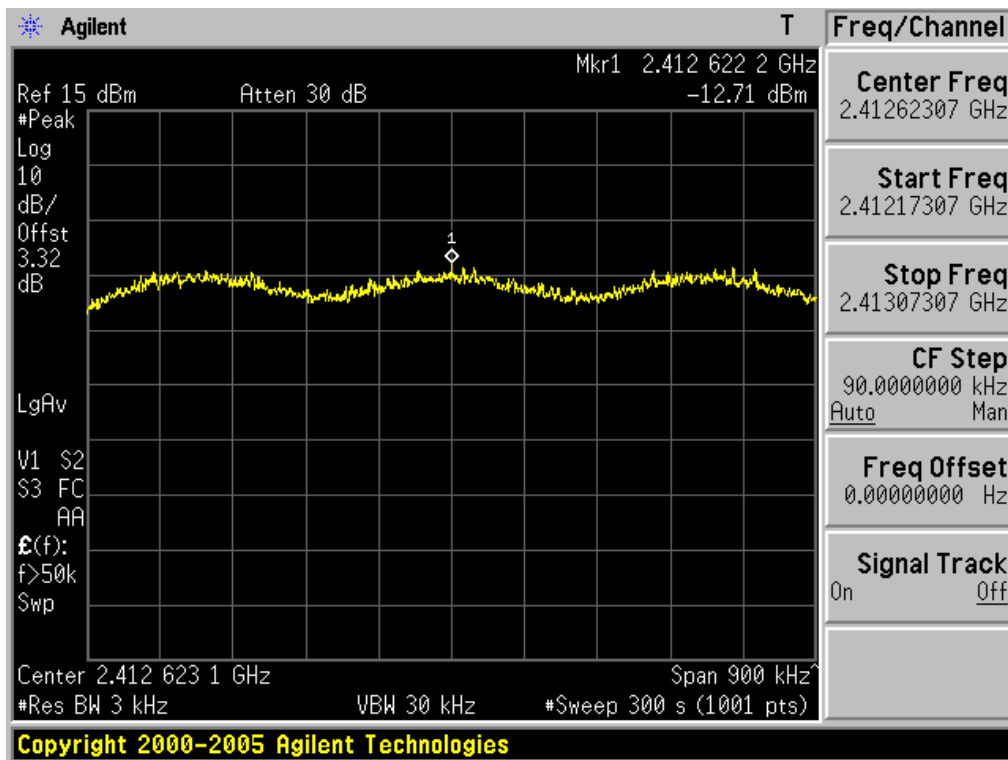
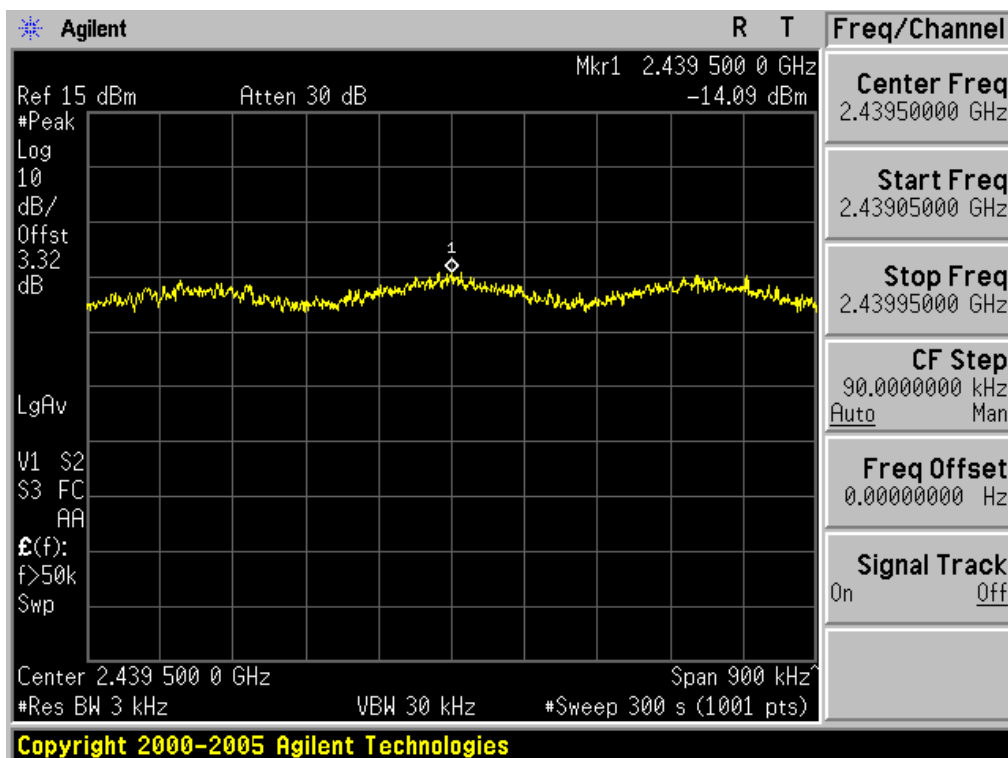


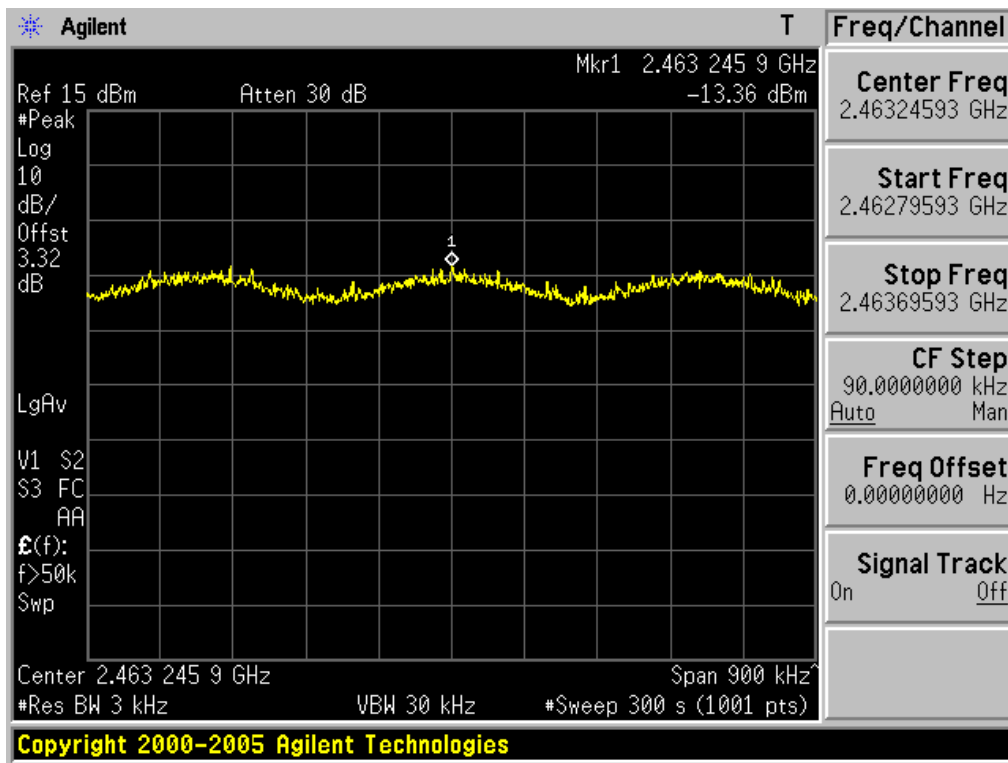
Power Spectral Density **Middle Channel** & Modulation: **802.11b**



Power Spectral Density **Highest Channel** & Modulation: **802.11b****Power Spectral Density** **Lowest Channel** & Modulation: **802.11g**

Power Spectral Density **Middle Channel** & Modulation: **802.11g****Power Spectral Density** **Highest Channel** & Modulation: **802.11g**

Power Spectral Density **Lowest Channel** & Modulation: **802.11n (HT20)****Power Spectral Density** **Middle Channel** & Modulation: **802.11n (HT20)**

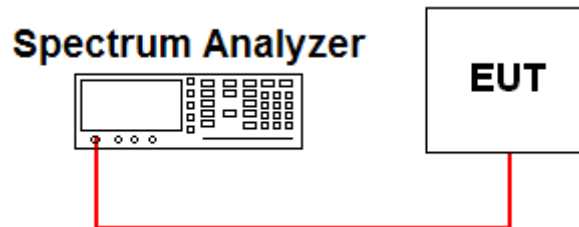
Power Spectral Density Highest Channel & Modulation: 802.11n (HT20)

7.4 Out of Band Emissions at the Band Edge/ Conducted Spurious Emissions

Test Requirements and limit, §15.247(d)

§15.247 (c) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB 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. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

■ TEST CONFIGURATION



■ TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer.

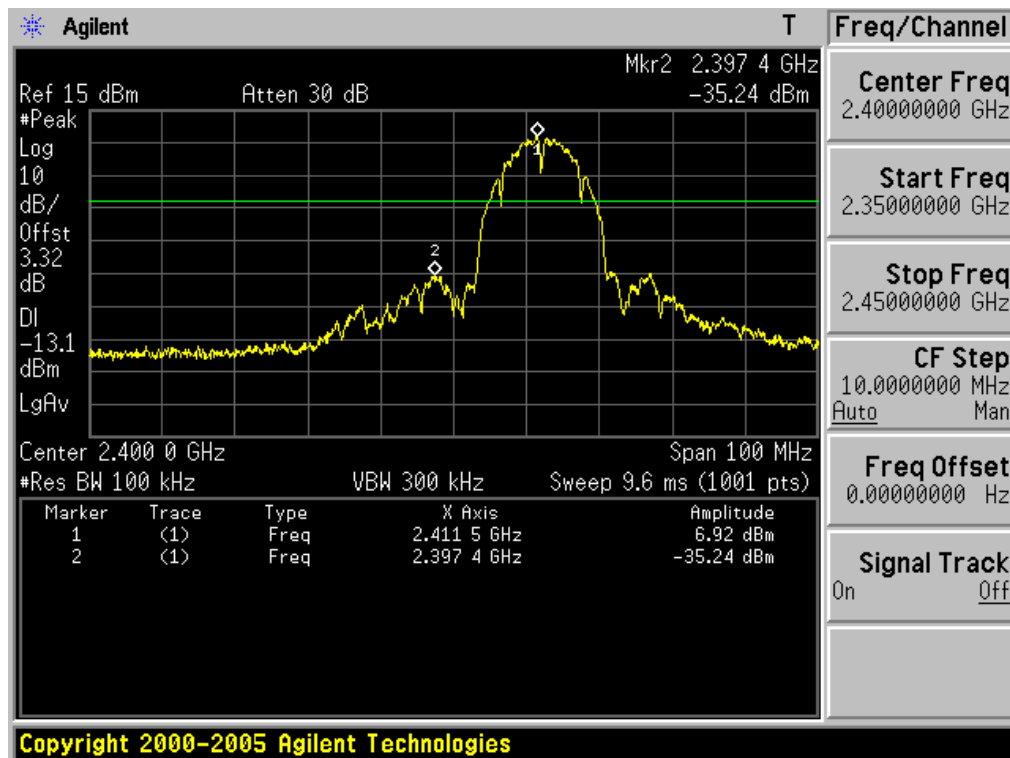
The resolution bandwidth is set to 100 kHz and the video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 10th harmonics is investigated with the transmitter set to the lowest, middle, and highest channels.

RESULT PLOTS

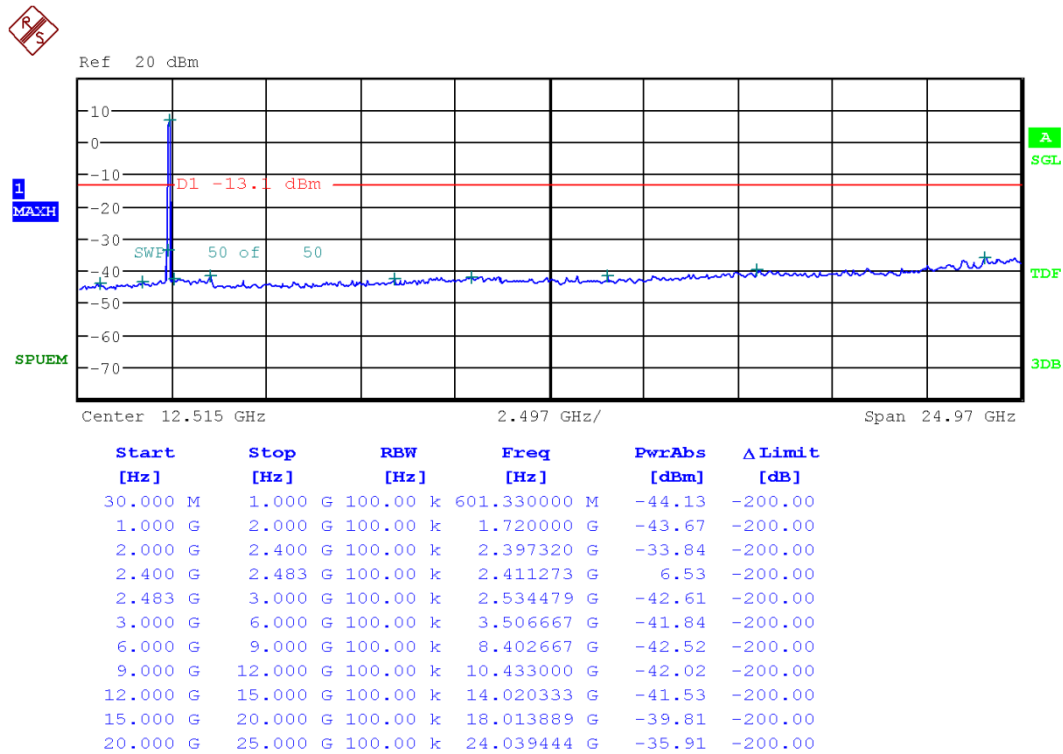
Low Band-edge

Lowest Channel & Modulation: **802.11b**

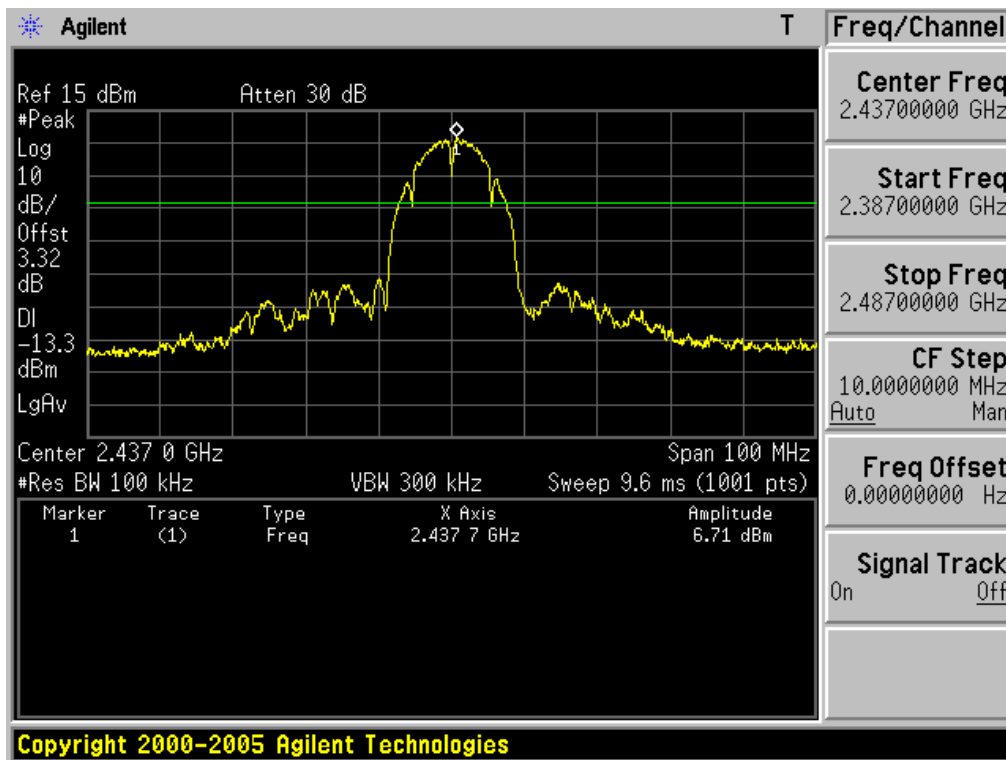


Conducted Spurious Emissions

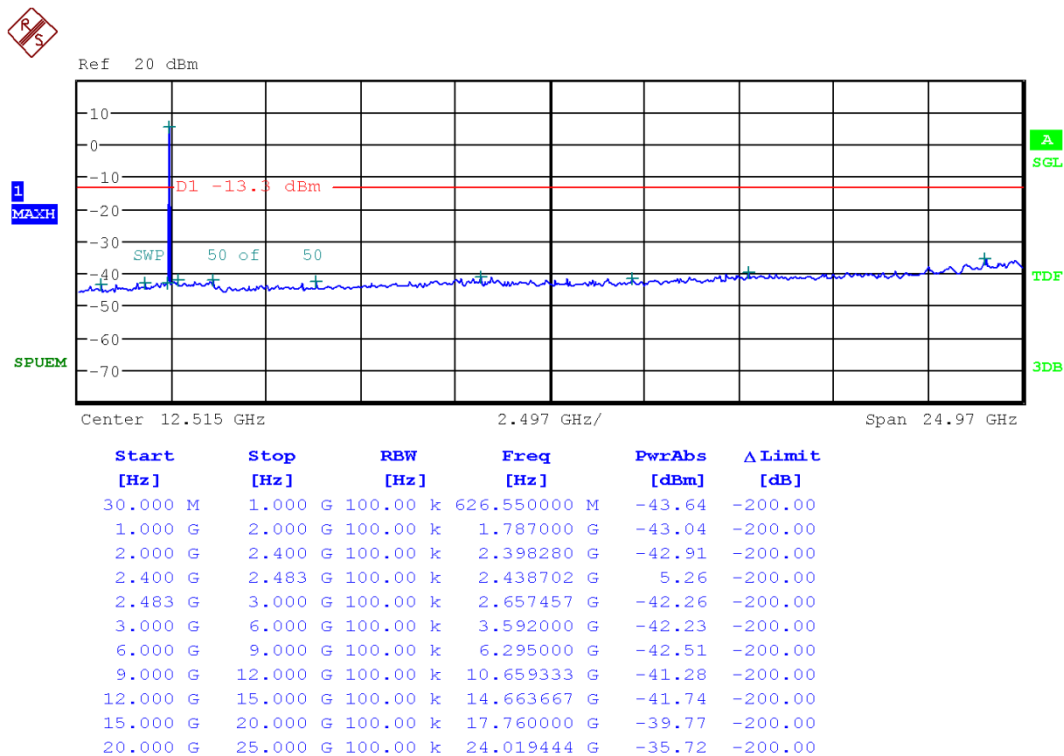
Lowest Channel & Modulation: **802.11b**



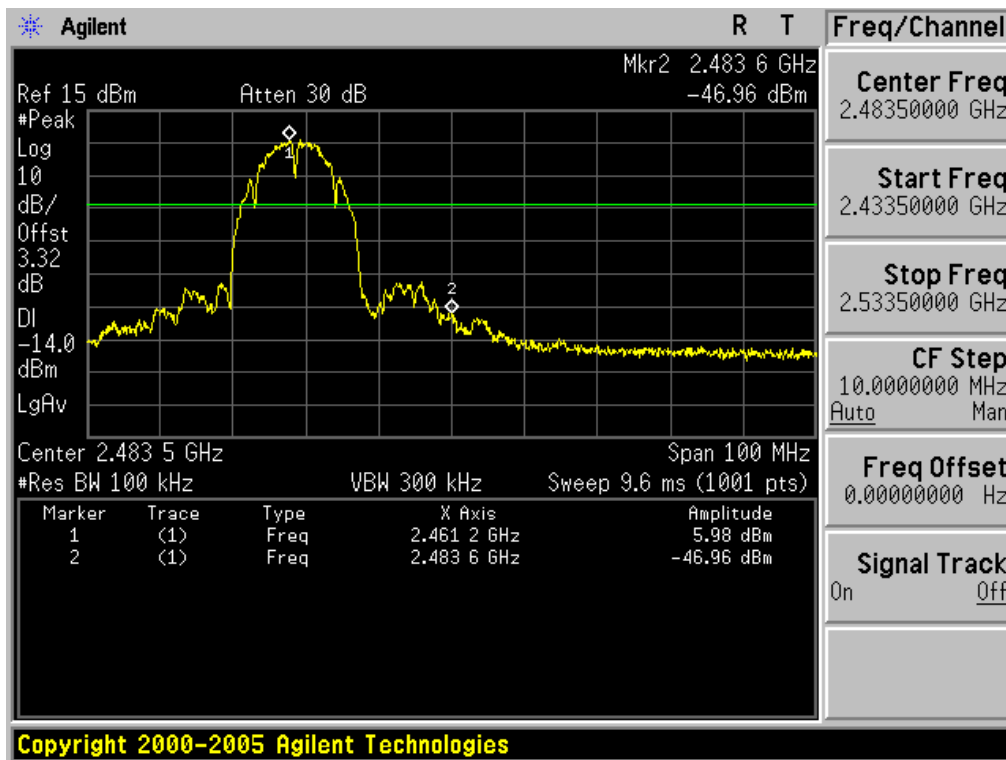
Reference for limit

Middle Channel & Modulation: 802.11b

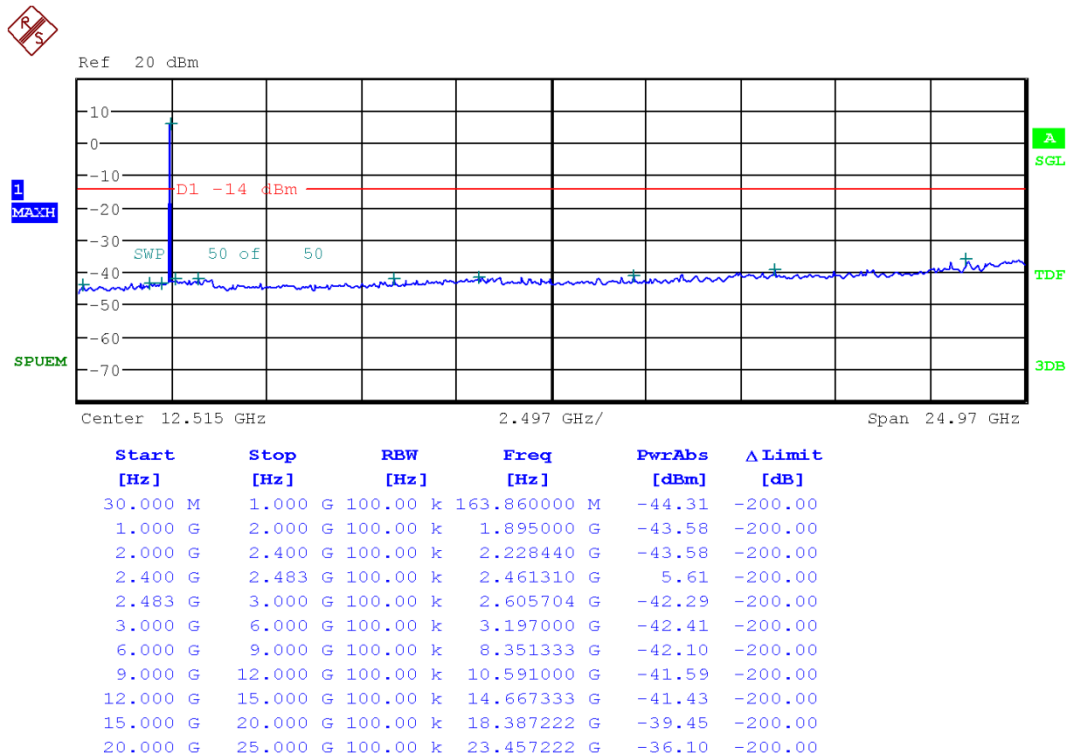
Conducted Spurious Emissions

Middle Channel & Modulation: 802.11b

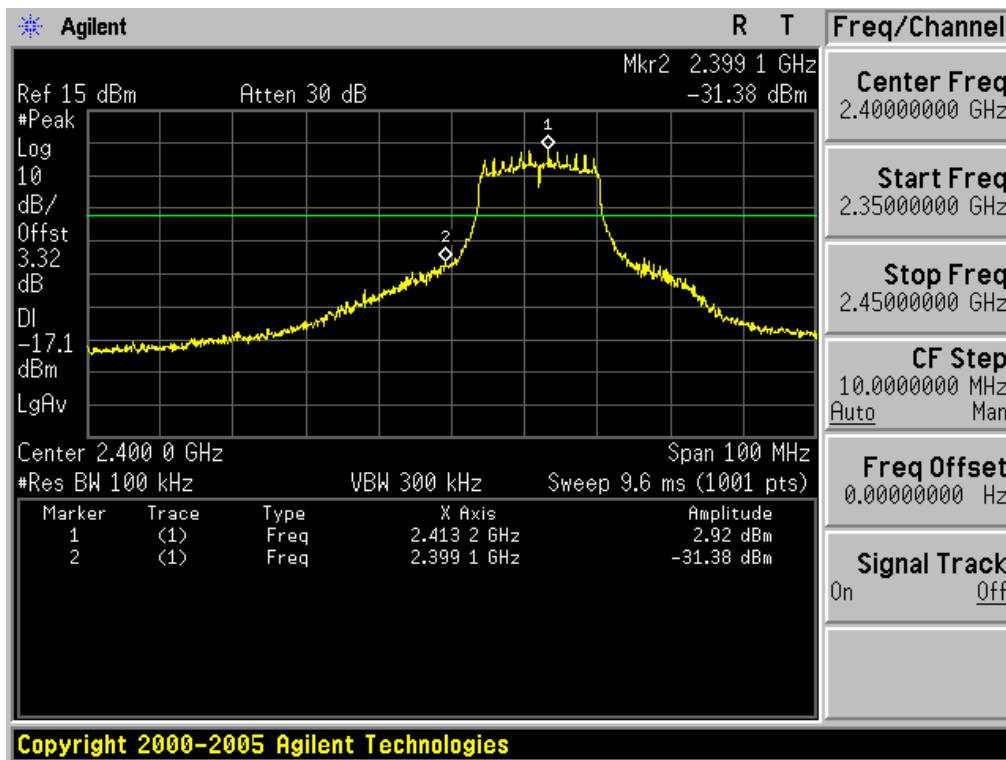
High Band-edge

Highest Channel & Modulation: 802.11b

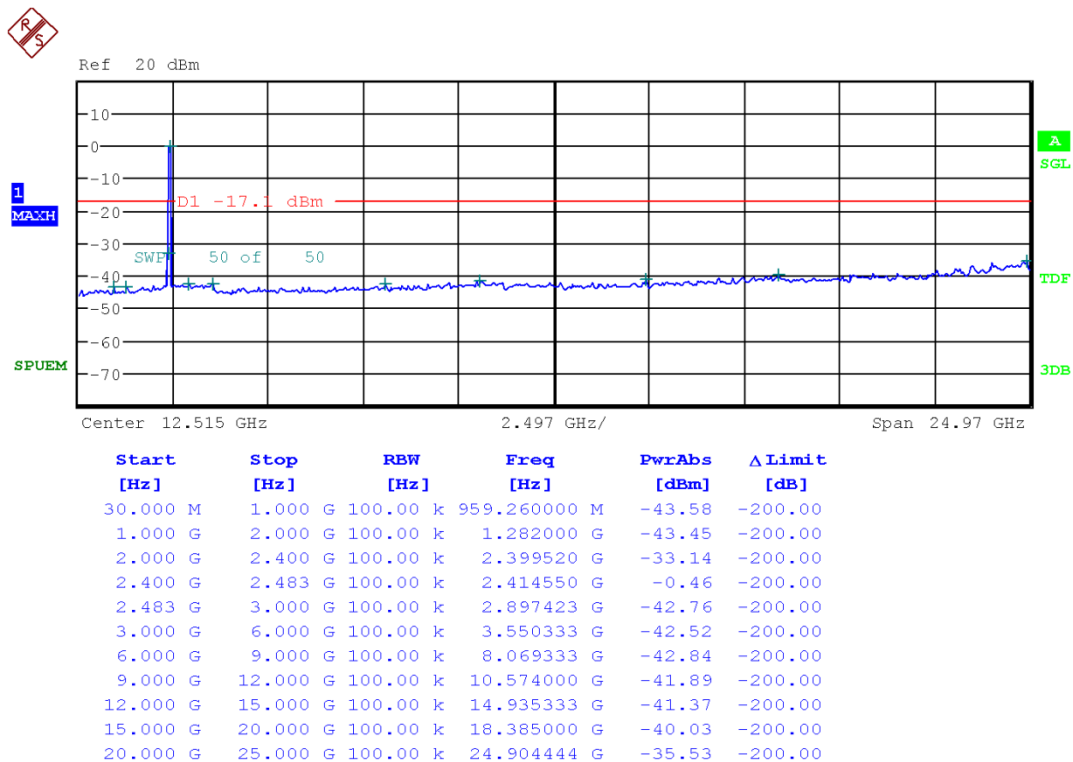
Conducted Spurious Emissions

Highest Channel & Modulation: 802.11b

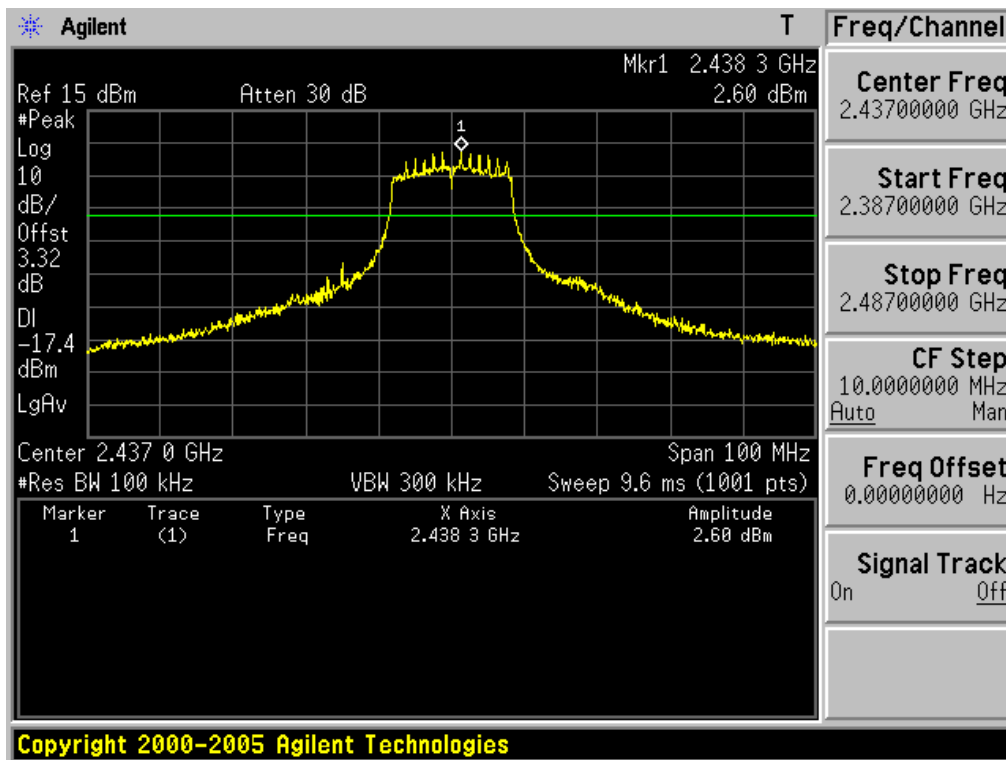
Low Band-edge

Lowest Channel & Modulation: 802.11g

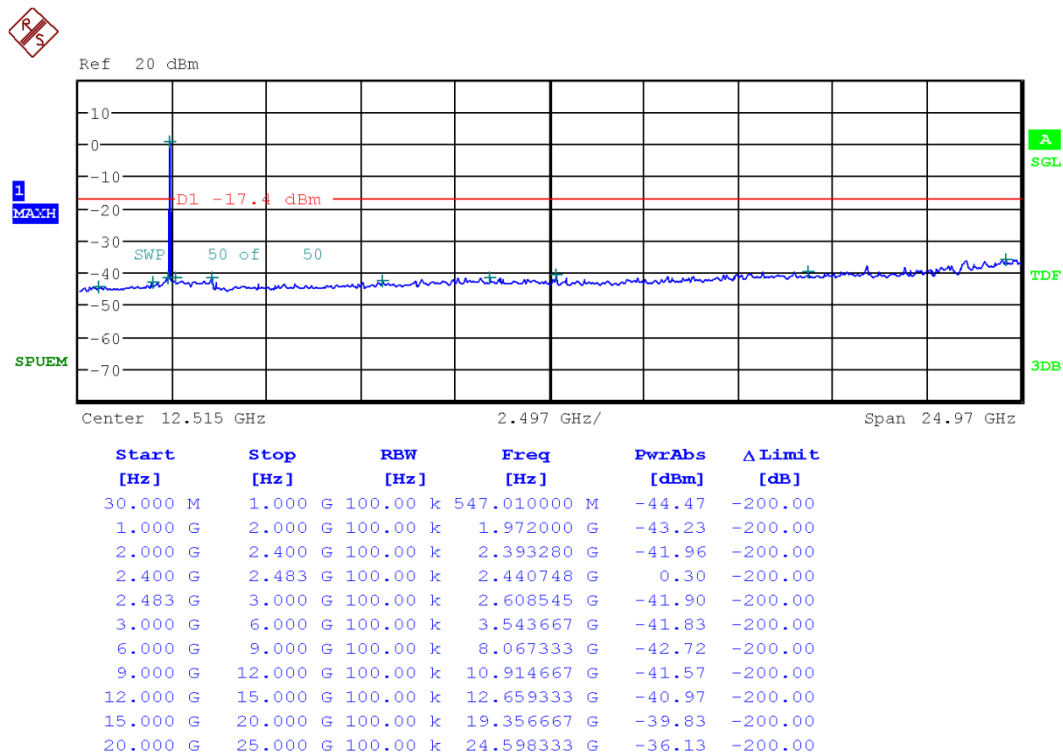
Conducted Spurious Emissions

Lowest Channel & Modulation: 802.11g

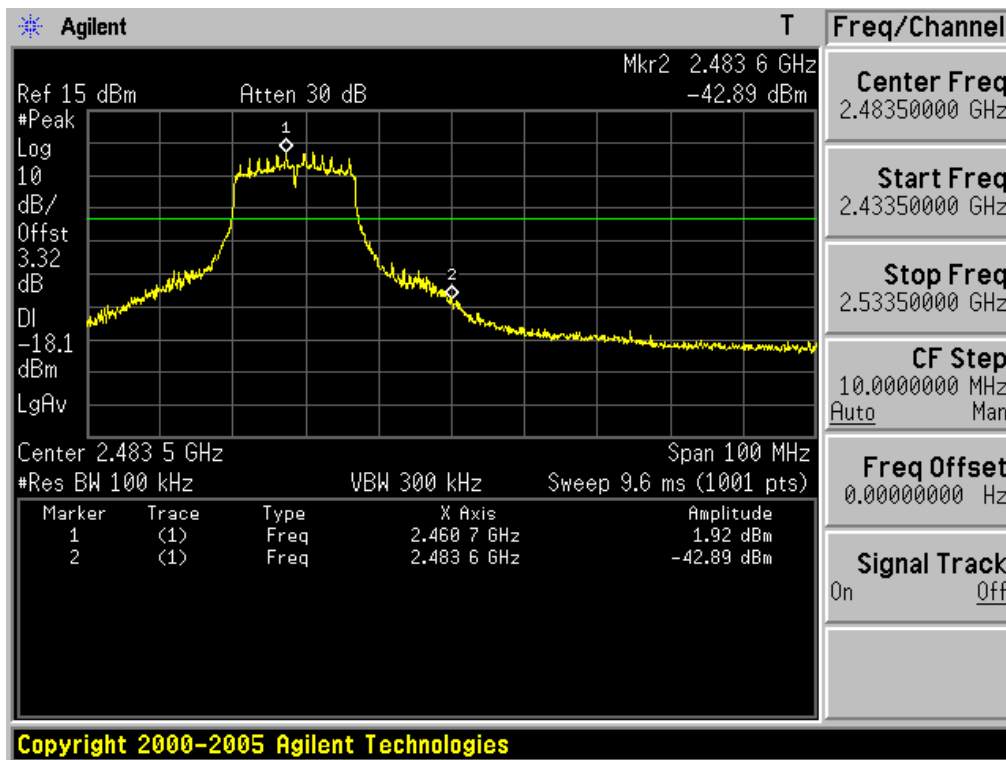
Reference for limit

Middle Channel & Modulation: 802.11g

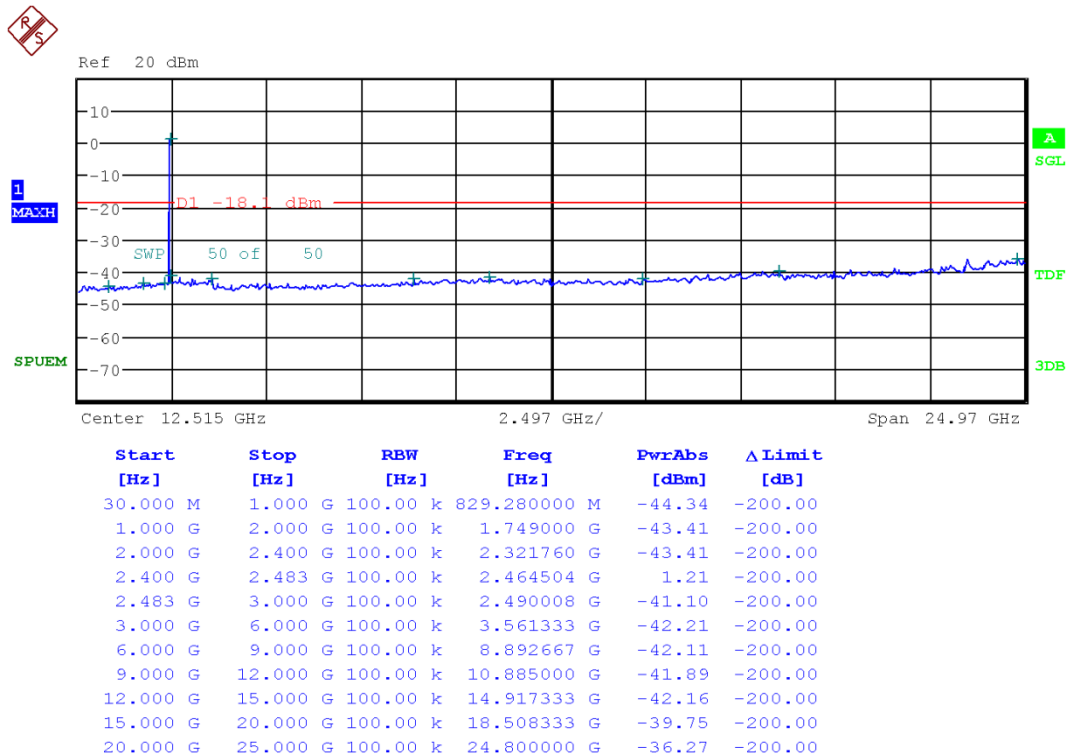
Conducted Spurious Emissions

Middle Channel & Modulation: 802.11g

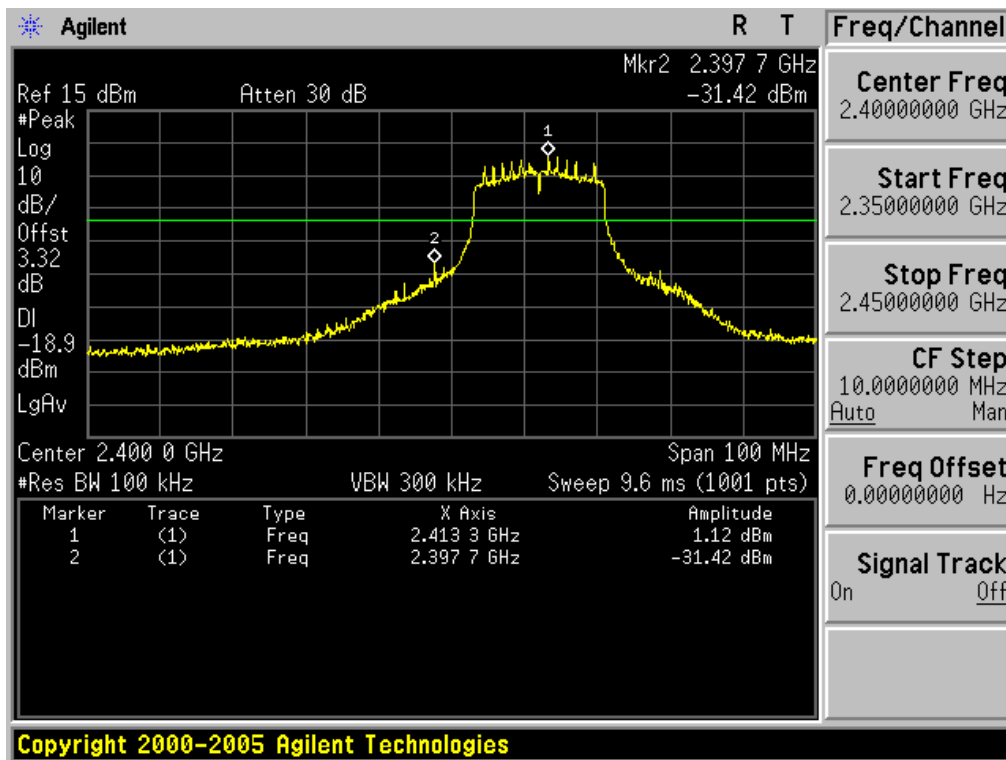
High Band-edge

Highest Channel & Modulation: 802.11g

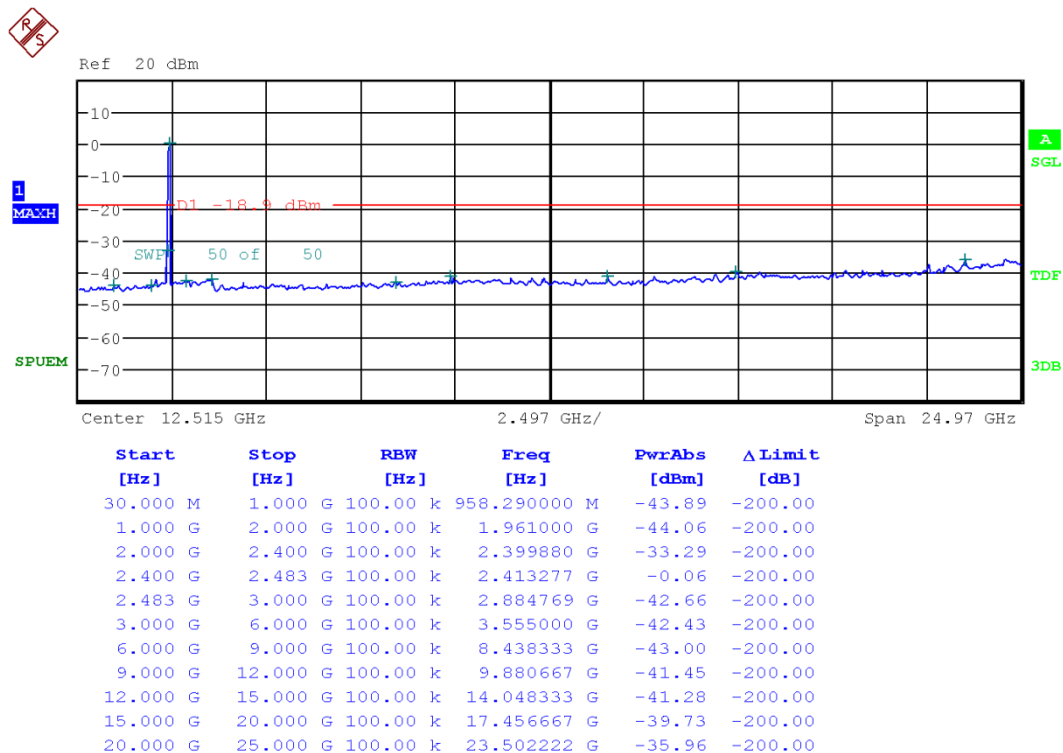
Conducted Spurious Emissions

Highest Channel & Modulation: 802.11g

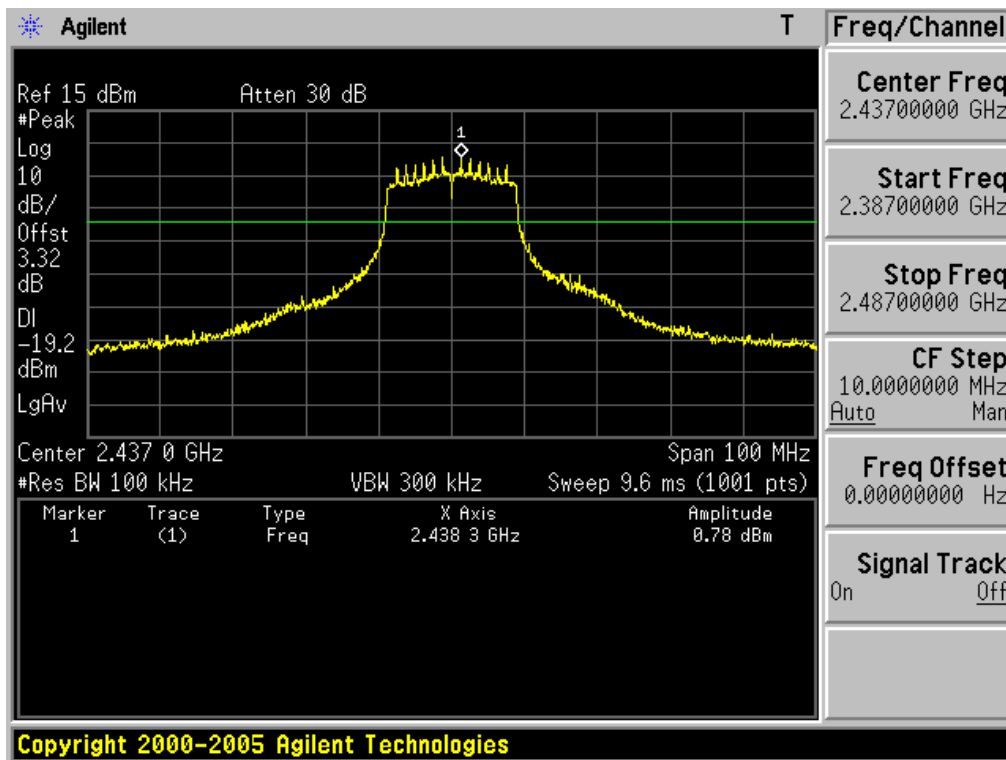
Low Band-edge

Lowest Channel & Modulation: 802.11n (HT20)

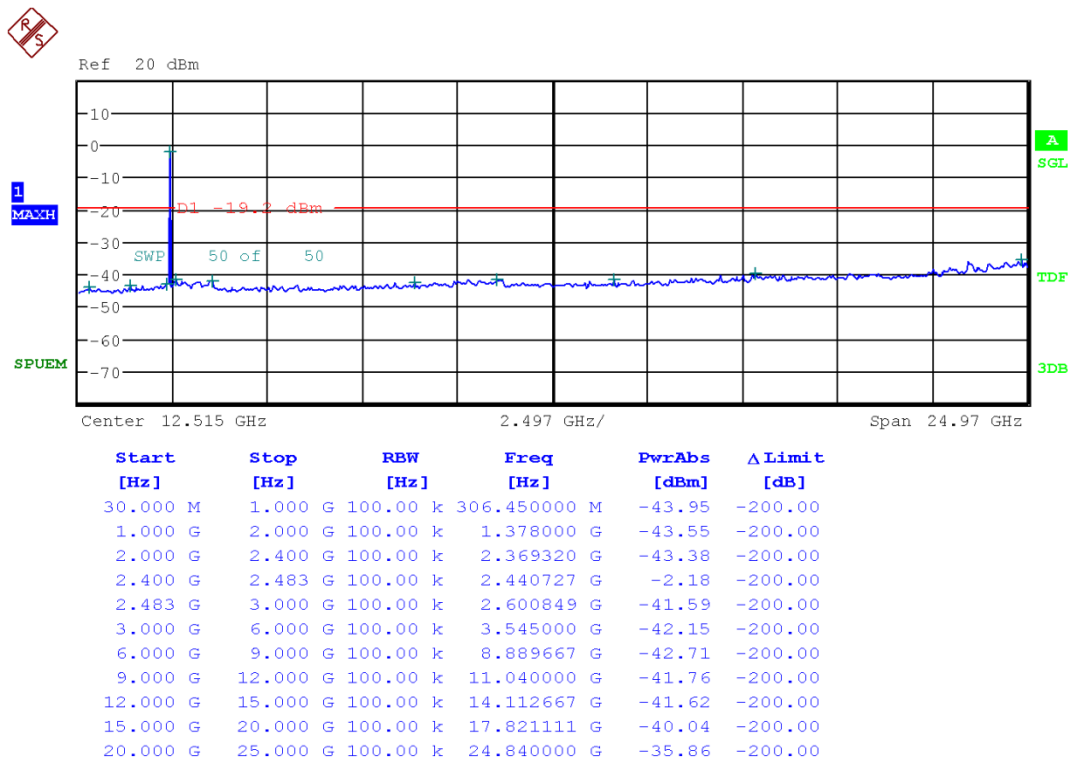
Conducted Spurious Emissions

Lowest Channel & Modulation: 802.11n (HT20)

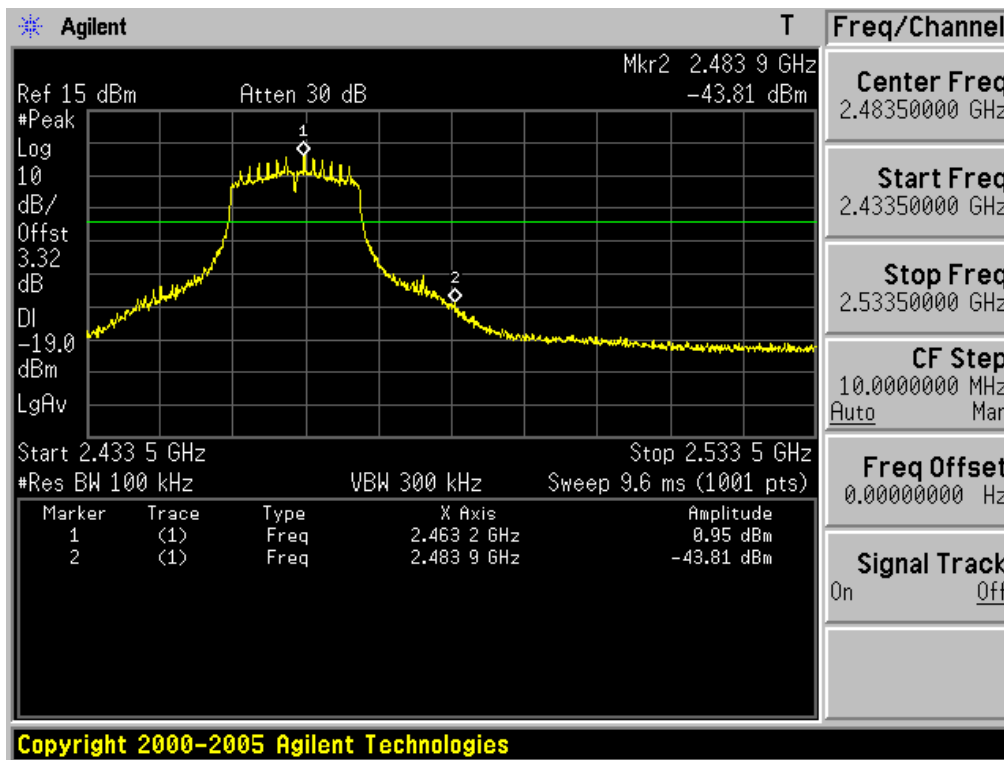
Reference for limit

Middle Channel & Modulation: 802.11n (HT20)

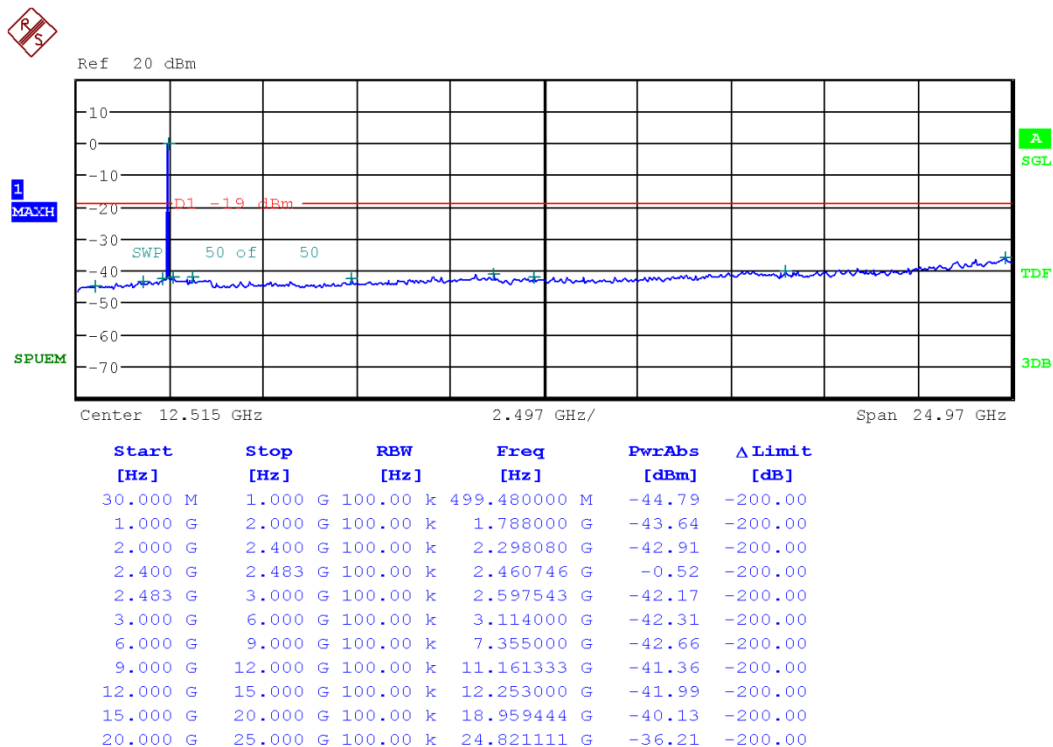
Conducted Spurious Emissions

Middle Channel & Modulation: 802.11n (HT20)

High Band-edge

Highest Channel & Modulation: 802.11n (HT20)

Conducted Spurious Emissions

Highest Channel & Modulation: 802.11n (HT20)

7.5 Radiated Measurement.

Test Requirements and limit, §15.247(d)

1. In any 100kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a) and (b), then the 15.209(a) limit in the table below has to be followed

▪ FCC Part 15.209(a) and (b)

Frequency (MHz)	Limit (uV/m) @ 3m
30 ~ 88	100 **
88 ~ 216	150 **
216 ~ 960	200 **
Above 960	500

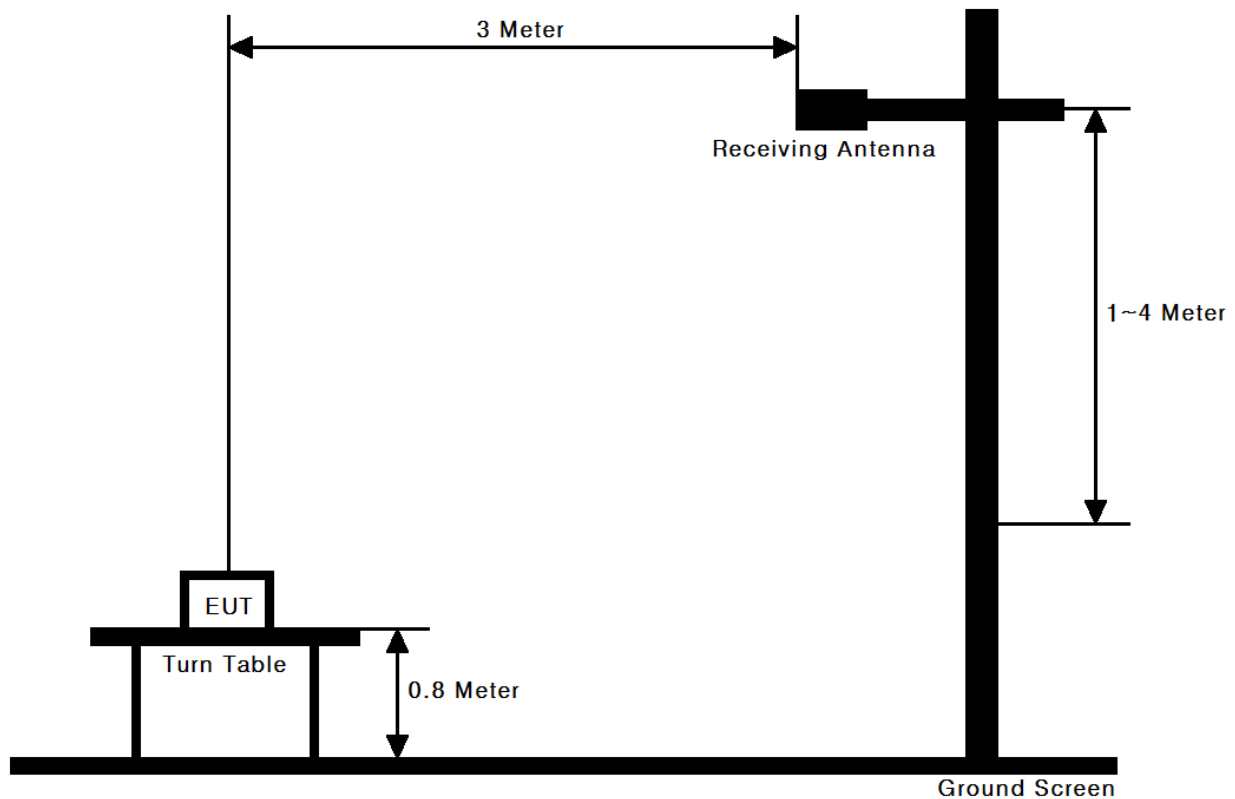
** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88MHz, 174-216MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

▪ FCC Part 15.205 (a): Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	MHz	GHz	GHz
0.009 ~ 0.110	8.41425 ~ 8.41475	108 ~ 121.94	1300 ~ 1427	3600 ~ 4400	14.47 ~ 14.5
0.495 ~ 0.505	12.29 ~ 12.293	123 ~ 138	1435 ~ 1626.5	4.5 ~ 5.15	15.35 ~ 16.2
2.1735 ~ 2.1905	12.51975 ~	149.9 ~ 150.05	1645.5 ~ 1646.5	5.35 ~ 5.46	17.7 ~ 21.4
4.125 ~ 4.128	12.52025	156.52475 ~	1660 ~ 1710	7.25 ~ 7.75	22.01 ~ 23.12
4.17725 ~ 4.17775	12.57675 ~	156.52525	1718.8 ~ 1722.2	8.025 ~ 8.5	23.6 ~ 24.0
4.20725 ~ 4.20775	12.57725	156.7 ~ 156.9	2200 ~ 2300	9.0 ~ 9.2	31.2 ~ 31.8
6.215 ~ 6.218	13.36 ~ 13.41	162.0125 ~ 167.17	2310 ~ 2390	9.3 ~ 9.5	36.43 ~ 36.5
6.26775 ~ 6.26825	16.42 ~ 16.423	167.72 ~ 173.2	2483.5 ~ 2500	10.6 ~ 12.7	Above 38.6
6.31175 ~ 6.31225	16.69475 ~	240 ~ 285	2655 ~ 2900	13.25 ~ 13.4	
8.291 ~ 8.294	16.69525	322 ~ 335.4	3260 ~ 3267		
8.362 ~ 8.366	16.80425 ~	399.90 ~ 410	3332 ~ 3339		
8.37625 ~ 8.38675	16.80475	608 ~ 614	3345.8 ~ 3358		
	25.5 ~ 25.67	960 ~ 1240			
	37.5 ~ 38.25				
	73 ~ 74.6				
	74.8 ~ 75.2				

▪ **FCC Part 15.205(b):** The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

Test Configuration



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8 m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.

TEST RESULTS**30MHz ~ 25GHz Data(802.11b & 2Mbps)**▪ **Lowest Channel**

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
47.384	V	Z	QP	26.50	-9.70	16.80	40.00	23.20
2389.200	H	Z	PK	55.48	-4.03	51.45	74.00	22.55
2389.280	H	Z	AV	45.10	-4.03	41.07	54.00	12.93
4824.320	V	Z	PK	46.36	5.16	51.52	74.00	22.48
4824.040	V	Z	AV	35.14	5.16	40.30	54.00	13.70
-	-	-	-	-	-	-	-	-

▪ **Middle Channel**

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
47.400	H	Y	QP	24.40	-9.70	14.70	40.00	25.30
4874.010	V	Z	PK	47.15	6.08	53.23	74.00	20.77
4874.020	V	Z	AV	37.22	6.08	43.30	54.00	10.70
-	-	-	-	-	-	-	-	-

▪ **Highest Channel**

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
47.398	X	V	QP	25.60	-9.70	15.90	40.00	24.10
2486.870	H	Z	PK	57.36	-3.65	53.71	74.00	20.29
2487.510	H	Z	AV	46.65	-3.65	43.00	54.00	11.00
4923.880	V	Z	PK	47.54	6.21	53.75	74.00	20.25
4924.050	V	Z	AV	38.17	6.21	44.38	54.00	9.62
-	-	-	-	-	-	-	-	-

Note.

1. No other spurious and harmonic emissions were reported greater than listed emissions above table.
2. Above listed point data is the worst case data.
3. Sample Calculation.

$$\text{Margin} = \text{Limit} - \text{Result} \quad / \quad \text{Result} = \text{Reading} + \text{T.F} \quad / \quad \text{T.F} = \text{AF} + \text{CL} - \text{AG}$$

Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

30MHz ~ 25GHz Data(802.11g & 6Mbps)

▪ Lowest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
47.387	V	Z	QP	25.90	-9.70	16.20	40.00	23.80
2389.680	H	Z	PK	68.03	-4.03	64.00	74.00	10.00
2390.000	H	Z	AV	49.36	-4.03	45.33	54.00	8.67
4811.600	V	Z	PK	45.31	5.16	50.47	74.00	23.53
4819.150	V	Z	AV	33.04	5.16	38.20	54.00	15.80
-	-	-	-	-	-	-	-	-

▪ Middle Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
47.326	V	Y	QP	24.80	-9.70	15.10	40.00	24.90
4877.380	V	Z	PK	46.17	6.08	52.25	74.00	21.75
4875.240	V	Z	AV	33.49	6.08	39.57	54.00	14.43
-	-	-	-	-	-	-	-	-

▪ Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
47.367	X	Z	QP	24.80	-9.70	15.10	40.00	24.90
2483.890	V	Z	PK	68.56	-3.65	64.91	74.00	9.09
2483.500	V	Z	AV	51.58	-3.65	47.93	54.00	6.07
4928.260	V	Z	PK	47.10	6.21	53.31	74.00	20.69
4921.190	V	Z	AV	33.05	6.21	39.26	54.00	14.74
-	-	-	-	-	-	-	-	-

Note.

1. No other spurious and harmonic emissions were reported greater than listed emissions above table.
2. Above listed point data is the worst case data.
3. Sample Calculation.

$$\text{Margin} = \text{Limit} - \text{Result} \quad / \quad \text{Result} = \text{Reading} + \text{T.F} \quad / \quad \text{T.F} = \text{AF} + \text{CL} - \text{AG}$$

Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

30MHz ~ 25GHz Data(802.11n (HT20) & MCS 0)

▪ Lowest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
47.399	H	X	QP	25.30	-9.70	15.60	40.00	24.40
2389.760	H	Z	PK	64.62	-4.03	60.59	74.00	13.41
2390.000	H	Z	AV	47.96	-4.03	43.93	54.00	10.07
4831.750	H	Z	PK	46.23	5.16	51.39	74.00	22.61
4819.100	H	Z	AV	33.43	5.16	38.59	54.00	15.41
-	-	-	-	-	-	-	-	-

▪ Middle Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
47.358	H	X	QP	24.60	-9.70	14.90	40.00	25.10
4876.280	V	Z	PK	46.66	6.08	52.74	74.00	21.26
4875.230	V	Z	AV	33.19	6.08	39.27	54.00	14.73
-	-	-	-	-	-	-	-	-

▪ Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
47.388	H	Z	QP	25.30	-9.70	15.60	40.00	24.40
2483.900	V	Z	PK	65.57	-3.65	61.92	74.00	12.08
2483.500	V	Z	AV	50.22	-3.65	46.57	54.00	7.43
4927.940	V	Z	PK	46.89	6.21	53.10	74.00	20.90
4924.990	V	Z	AV	33.47	6.21	39.68	54.00	14.32
-	-	-	-	-	-	-	-	-

Note.

1. No other spurious and harmonic emissions were reported greater than listed emissions above table.
2. Above listed point data is the worst case data.
3. Sample Calculation.

$$\text{Margin} = \text{Limit} - \text{Result} \quad / \quad \text{Result} = \text{Reading} + \text{T.F} \quad / \quad \text{T.F} = \text{AF} + \text{CL} - \text{AG}$$

Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

7.6 POWERLINE CONDUCTED EMISSIONS

Test Requirements and limit, §15.247(d)

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)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 ~ 0.5	66 to 56 *	56 to 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50

* Decreases with the logarithm of the frequency

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.

Test Configuration

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

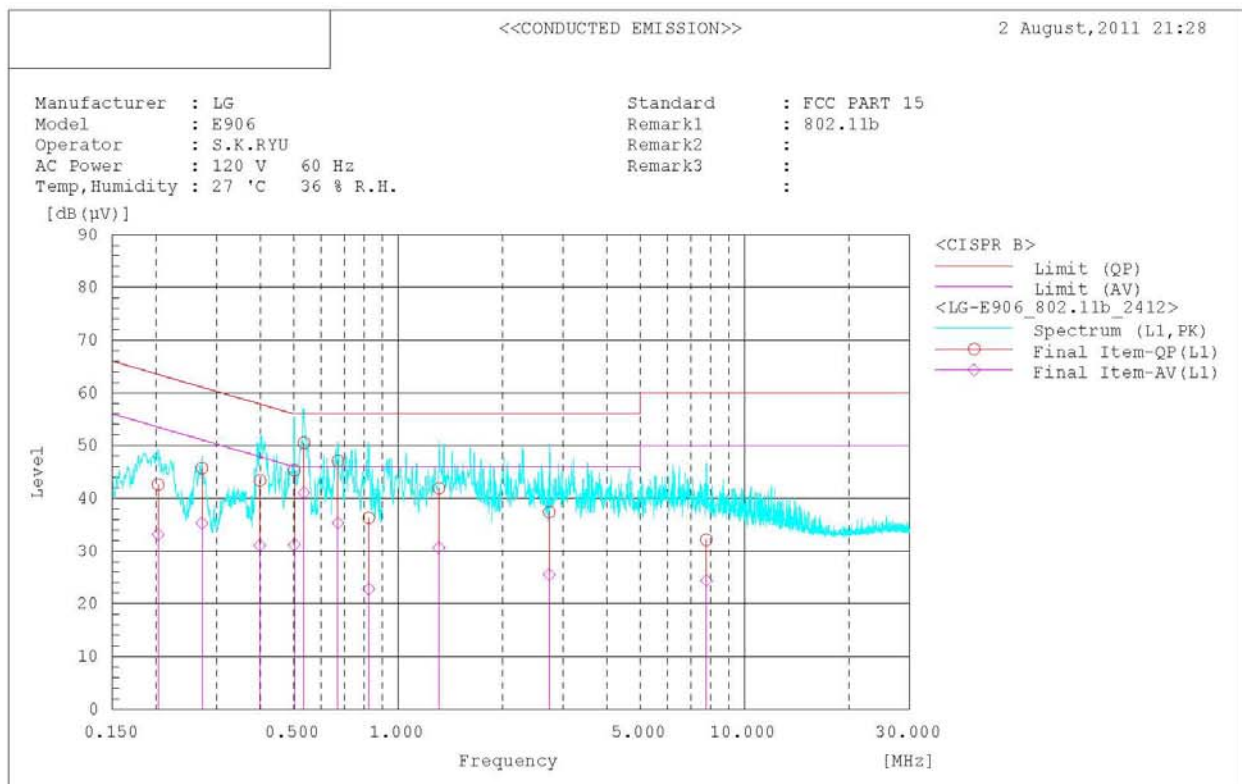
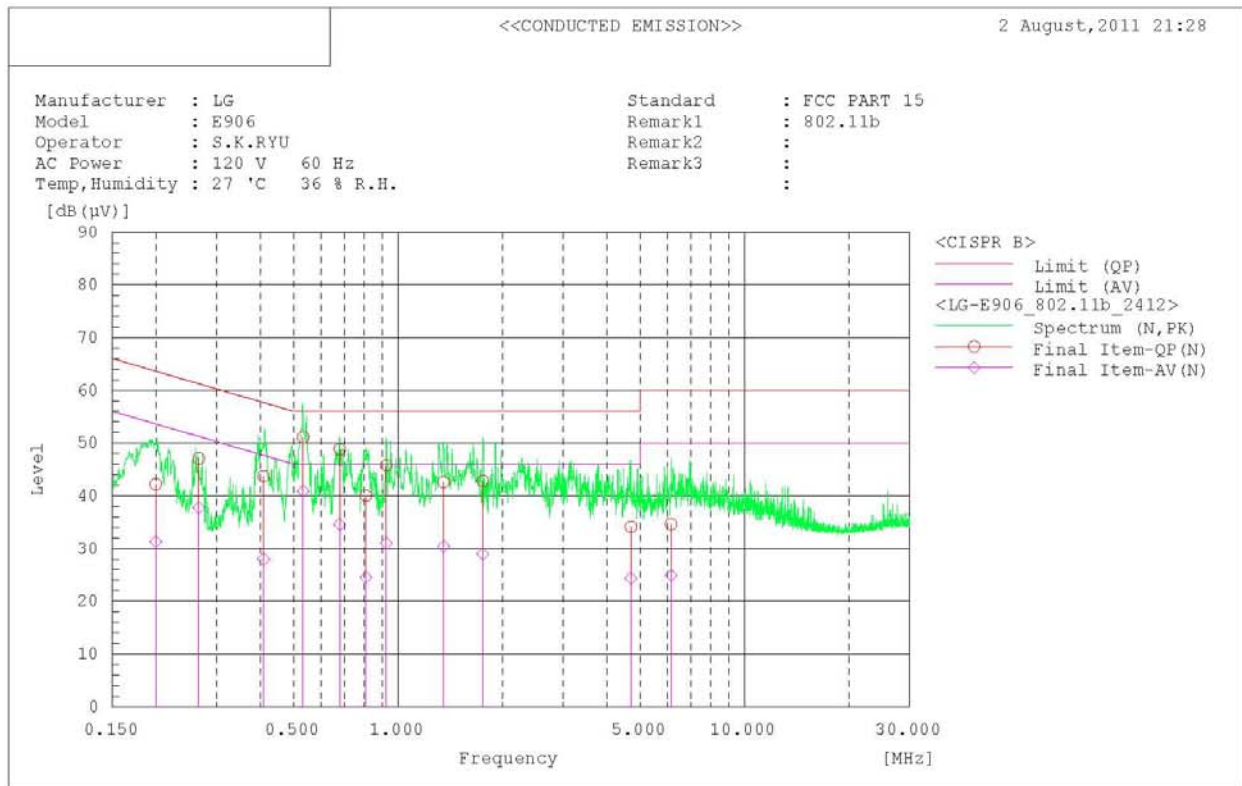
TEST PROCEDURE

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors – Quasi Peak and Average Detector.

RESULT PLOTS

AC Line Conducted Emissions (Graph)

Test Mode: 802.11b & 2Mbps



AC Line Conducted Emissions (List)

Test Mode: 802.11b & 2Mbps

<<CONDUCTED EMISSION>>

2 August, 2011 21:28

Standard : FCC PART 15
Manufacturer : LG
Model : E906
Operator : S.K.RYU
AC Power : 120 V 60 Hz
Temp, Humidity : 27 °C 36 % R.H.
Remark1 : 802.11b
Remark2 :
Remark3 :

Final Result

--- N Phase ---

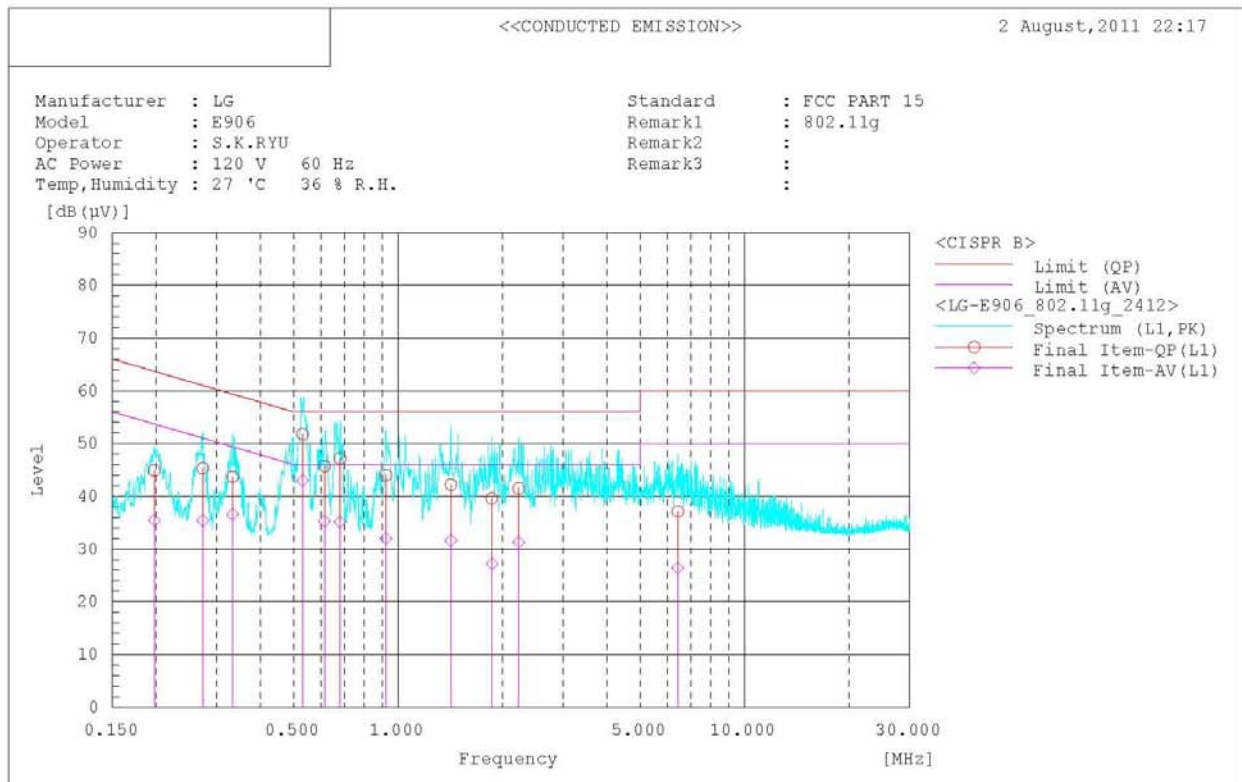
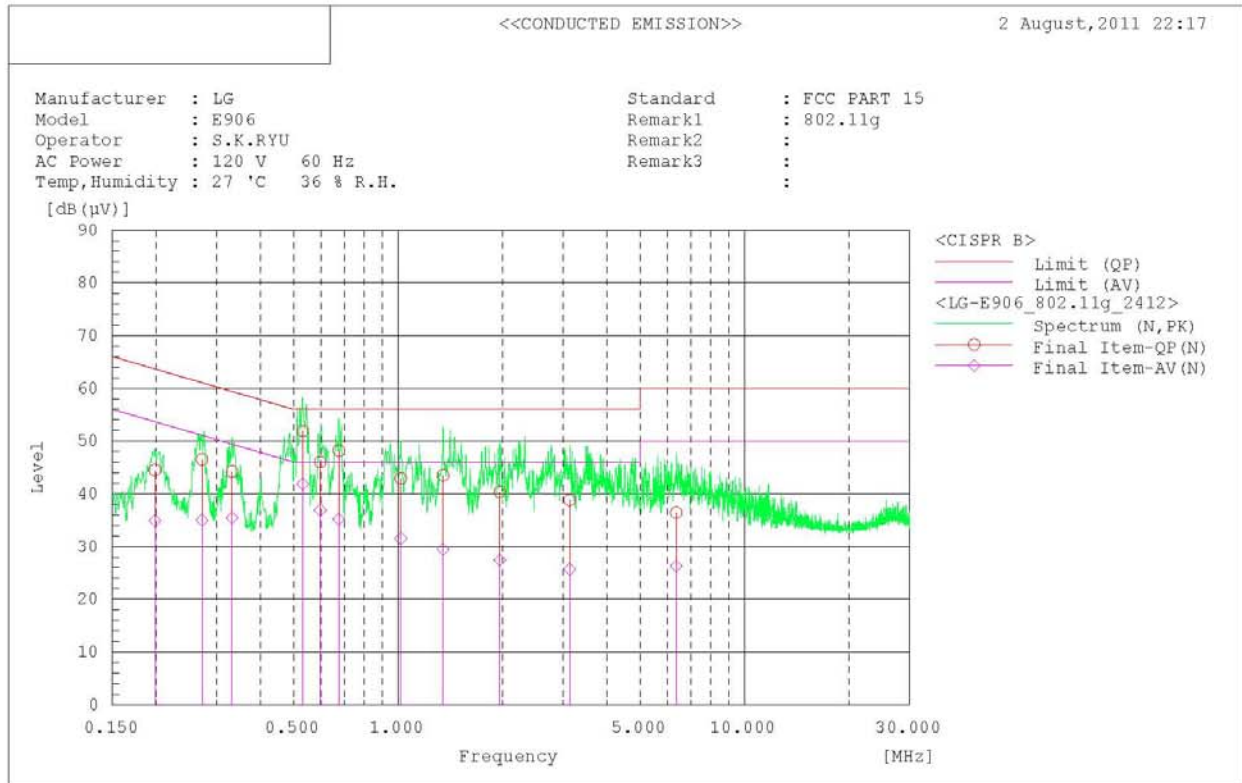
No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV	Remark
	[MHz]	[dB (μV)]	[dB (μV)]	[dB]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB]	[dB]	
1	0.200	42.1	31.2	0.1	42.2	31.3	63.6	53.6	21.4	22.3	
2	0.266	47.0	37.7	0.1	47.1	37.8	61.2	51.2	14.1	13.4	
3	0.409	43.6	27.9	0.1	43.7	28.0	57.7	47.7	14.0	19.7	
4	0.532	51.0	40.8	0.1	51.1	40.9	56.0	46.0	4.9	5.1	
5	0.679	48.7	34.5	0.1	48.8	34.6	56.0	46.0	7.2	11.4	
6	0.808	39.9	24.5	0.1	40.0	24.6	56.0	46.0	16.0	21.4	
7	0.925	45.7	30.9	0.1	45.8	31.0	56.0	46.0	10.2	15.0	
8	1.354	42.5	30.3	0.1	42.6	30.4	56.0	46.0	13.4	15.6	
9	1.755	42.6	28.8	0.2	42.8	29.0	56.0	46.0	13.2	17.0	
10	4.700	33.8	24.1	0.3	34.1	24.4	56.0	46.0	21.9	21.6	
11	6.135	34.2	24.5	0.4	34.6	24.9	60.0	50.0	25.4	25.1	

--- L1 Phase ---

No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV	Remark
	[MHz]	[dB (μV)]	[dB (μV)]	[dB]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB]	[dB]	
1	0.203	42.3	32.8	0.3	42.6	33.1	63.5	53.5	20.9	20.4	
2	0.272	45.4	35.0	0.3	45.7	35.3	61.1	51.1	15.4	15.8	
3	0.399	43.1	30.8	0.3	43.4	31.1	57.9	47.9	14.5	16.8	
4	0.502	45.0	30.9	0.3	45.3	31.2	56.0	46.0	10.7	14.8	
5	0.535	50.2	40.8	0.3	50.5	41.1	56.0	46.0	5.5	4.9	
6	0.671	46.8	35.0	0.3	47.1	35.3	56.0	46.0	8.9	10.7	
7	0.823	36.0	22.5	0.3	36.3	22.8	56.0	46.0	19.7	23.2	
8	1.313	41.6	30.3	0.3	41.9	30.6	56.0	46.0	14.1	15.4	
9	2.730	37.0	25.1	0.4	37.4	25.5	56.0	46.0	18.6	20.5	
10	7.759	31.5	23.8	0.6	32.1	24.4	60.0	50.0	27.9	25.6	

AC Line Conducted Emissions (Graph)

Test Mode: 802.11g & 6Mbps



AC Line Conducted Emissions (List)

Test Mode: 802.11g & 6Mbps

<<CONDUCTED EMISSION>>

2 August, 2011 22:17

Standard : FCC PART 15
 Manufacturer : LG
 Model : E906
 Operator : S.K.RYU
 AC Power : 120 V 60 Hz
 Temp, Humidity : 27 °C 36 % R.H.
 Remark1 : 802.11g
 Remark2 :
 Remark3 :

Final Result

--- N Phase ---

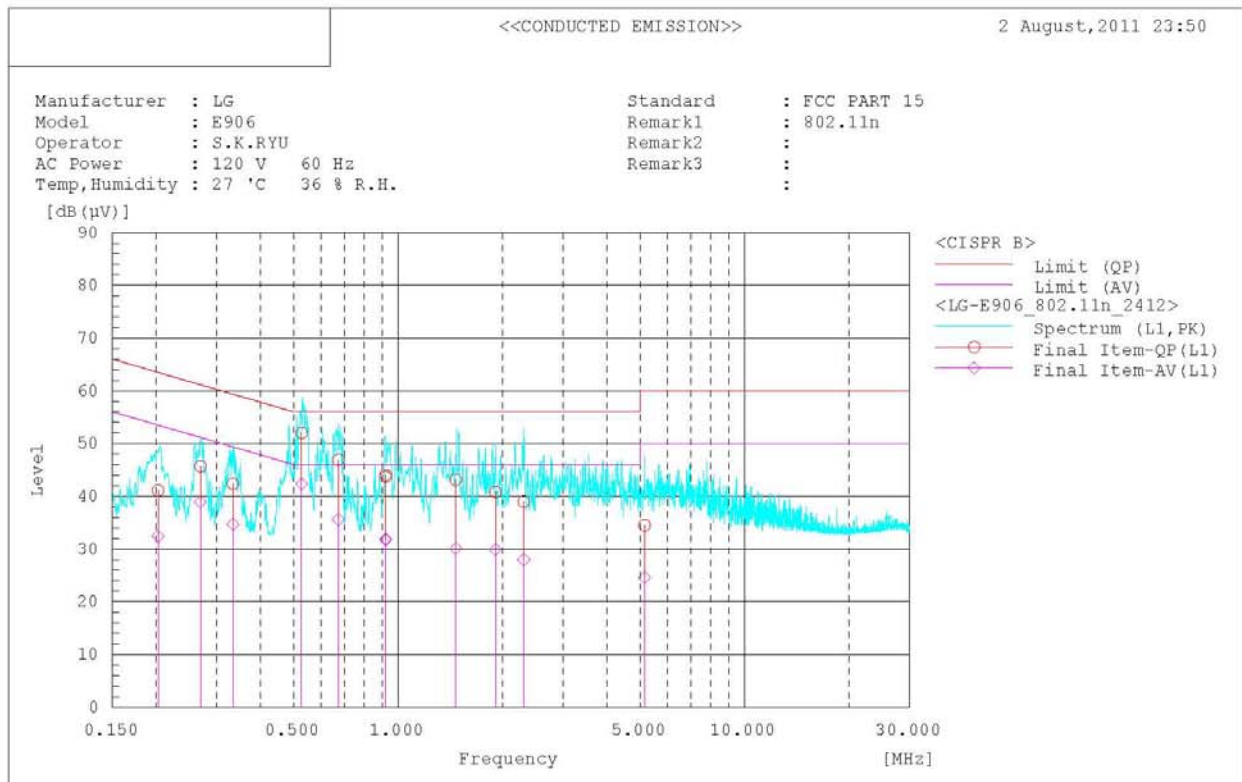
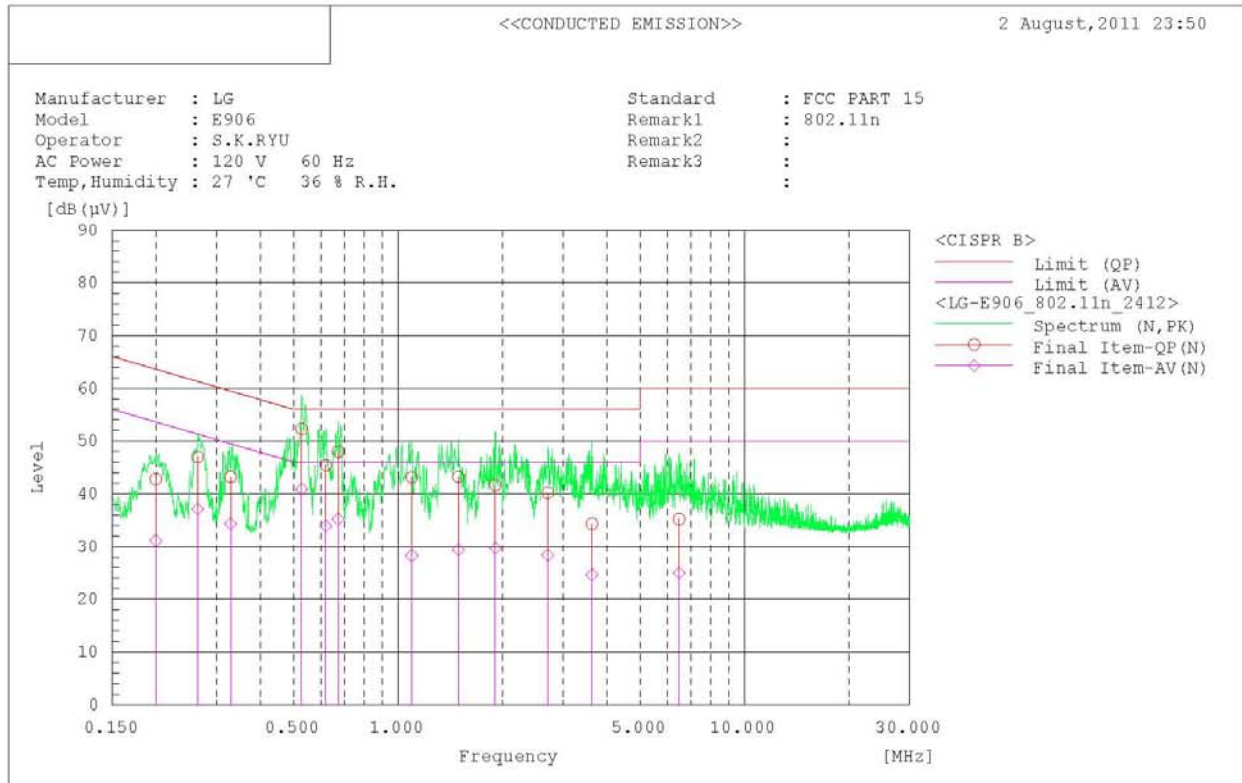
No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV	Remark
	[MHz]	[dB (μV)]	[dB (μV)]	[dB]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB]	[dB]	
1	0.199	44.4	34.8	0.1	44.5	34.9	63.7	53.7	19.2	18.8	
2	0.272	46.4	34.9	0.1	46.5	35.0	61.1	51.1	14.6	16.1	
3	0.332	44.1	35.4	0.1	44.2	35.5	59.4	49.4	15.2	13.9	
4	0.531	51.8	41.8	0.1	51.9	41.9	56.0	46.0	4.1	4.1	
5	0.596	45.9	36.8	0.1	46.0	36.9	56.0	46.0	10.0	9.1	
6	0.675	48.1	35.1	0.1	48.2	35.2	56.0	46.0	7.8	10.8	
7	1.018	42.8	31.4	0.1	42.9	31.5	56.0	46.0	13.1	14.5	
8	1.348	43.4	29.4	0.1	43.5	29.5	56.0	46.0	12.5	16.5	
9	1.968	40.1	27.2	0.2	40.3	27.4	56.0	46.0	15.7	18.6	
10	3.130	38.6	25.5	0.2	38.8	25.7	56.0	46.0	17.2	20.3	
11	6.354	36.0	25.9	0.4	36.4	26.3	60.0	50.0	23.6	23.7	

--- L1 Phase ---

No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV	Remark
	[MHz]	[dB (μV)]	[dB (μV)]	[dB]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB]	[dB]	
1	0.198	44.6	35.1	0.3	44.9	35.4	63.7	53.7	18.8	18.3	
2	0.273	45.0	35.1	0.3	45.3	35.4	61.0	51.0	15.7	15.6	
3	0.333	43.4	36.3	0.3	43.7	36.6	59.4	49.4	15.7	12.8	
4	0.530	51.5	42.7	0.3	51.8	43.0	56.0	46.0	4.2	3.0	
5	0.614	45.4	35.0	0.3	45.7	35.3	56.0	46.0	10.3	10.7	
6	0.680	46.9	34.8	0.3	47.2	35.1	56.0	46.0	8.8	10.9	
7	0.922	43.7	31.7	0.3	44.0	32.0	56.0	46.0	12.0	14.0	
8	1.423	41.9	31.3	0.3	42.2	31.6	56.0	46.0	13.8	14.4	
9	1.865	39.3	26.9	0.3	39.6	27.2	56.0	46.0	16.4	18.8	
10	2.230	41.2	31.0	0.3	41.5	31.3	56.0	46.0	14.5	14.7	
11	6.415	36.6	25.9	0.5	37.1	26.4	60.0	50.0	22.9	23.6	

AC Line Conducted Emissions (Graph)

Test Mode: 802.11n HT20 & MCS 0



AC Line Conducted Emissions (List)

Test Mode: 802.11n HT20 & MCS0

<<CONDUCTED EMISSION>>

2 August, 2011 23:50

Standard : FCC PART 15
 Manufacturer : LG
 Model : E906
 Operator : S.K.RYU
 AC Power : 120 V 60 Hz
 Temp, Humidity : 27 °C 36 % R.H.
 Remark1 : 802.11n
 Remark2 :
 Remark3 :

Final Result

--- N Phase ---

No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV	Remark
	[MHz]	[dB (μV)]	[dB (μV)]	[dB]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB]	[dB]	
1	0.200	42.7	31.0	0.1	42.8	31.1	63.6	53.6	20.8	22.5	
2	0.264	46.9	37.0	0.1	47.0	37.1	61.3	51.3	14.3	14.2	
3	0.329	43.1	34.2	0.1	43.2	34.3	59.5	49.5	16.3	15.2	
4	0.527	52.2	40.8	0.1	52.3	40.9	56.0	46.0	3.7	5.1	
5	0.619	45.3	33.8	0.1	45.4	33.9	56.0	46.0	10.6	12.1	
6	0.672	47.9	35.1	0.1	48.0	35.2	56.0	46.0	8.0	10.8	
7	1.095	43.0	28.2	0.1	43.1	28.3	56.0	46.0	12.9	17.7	
8	1.494	43.0	29.2	0.2	43.2	29.4	56.0	46.0	12.8	16.6	
9	1.909	41.4	29.5	0.2	41.6	29.7	56.0	46.0	14.4	16.3	
10	2.705	40.0	28.2	0.2	40.2	28.4	56.0	46.0	15.8	17.6	
11	3.625	34.0	24.4	0.3	34.3	24.7	56.0	46.0	21.7	21.3	
12	6.476	34.8	24.6	0.4	35.2	25.0	60.0	50.0	24.8	25.0	

--- L1 Phase ---

No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV	Remark
	[MHz]	[dB (μV)]	[dB (μV)]	[dB]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB]	[dB]	
1	0.203	40.8	32.1	0.3	41.1	32.4	63.5	53.5	22.4	21.1	
2	0.269	45.4	38.6	0.3	45.7	38.9	61.1	51.1	15.4	12.2	
3	0.334	42.1	34.4	0.3	42.4	34.7	59.4	49.4	17.0	14.7	
4	0.527	51.7	42.1	0.3	52.0	42.4	56.0	46.0	4.0	3.6	
5	0.673	46.6	35.3	0.3	46.9	35.6	56.0	46.0	9.1	10.4	
6	0.921	43.7	31.5	0.3	44.0	31.8	56.0	46.0	12.0	14.2	
7	0.921	43.4	31.5	0.3	43.7	31.8	56.0	46.0	12.3	14.2	
8	1.469	42.8	29.8	0.3	43.1	30.1	56.0	46.0	12.9	15.9	
9	1.912	40.5	29.6	0.3	40.8	29.9	56.0	46.0	15.2	16.1	
10	2.305	38.7	27.7	0.3	39.0	28.0	56.0	46.0	17.0	18.0	
11	5.146	34.0	24.1	0.5	34.5	24.6	60.0	50.0	25.5	25.4	

8. LIST OF TEST EQUIPMENT

Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N
Spectrum Analyzer	Agilent	E4440A	10/09/30	11/09/30	MY45304199
Spectrum Analyzer	Rohde Schwarz	FSQ26	11/01/11	12/01/11	200445
Spectrum Analyzer	Agilent	N9020A	11/01/07	12/01/07	MY49100833
Power Splitter	Anritsu	K241B	10/10/05	11/10/05	020611
Digital Multimeter	H.P	34401A	11/03/07	12/03/07	3146A13475, US36122178
Signal Generator	Rohde Schwarz	SMR20	11/03/08	12/03/08	101251
Vector Signal Generator	Rohde Schwarz	SMJ100A	11/01/11	12/01/11	100148
Power SENSOR	Rohde Schwarz	NRP-Z81	11/06/04	12/06/04	1137.9009.02-101001-EA
Thermo hygrometer	BODYCOM	BJ5478	11/01/13	12/01/13	090205-2
DC Power Supply	HP	6622A	11/03/07	12/03/07	3448A03760
High-pass filter	Wainwright	WHNX3.0	N/A	N/A	9
BICONICAL ANT.	Schwarzbeck	VHA 9103	10/12/21	12/12/21	91031946
LOG-PERIODIC ANT.	Schwarzbeck	UHALP9108A	10/07/07	12/07/07	590
BILOG ANTENNA	SCHAFFNER	CBL6112B	10/07/14	12/07/14	2737
HORN ANT	ETS	3115	11/03/22	12/03/22	6419
HORN ANT	A.H.Systems	SAS-574	11/03/25	13/03/25	154
Amplifier (22dB)	H.P	8447E	11/01/11	12/01/11	2945A02865
Amplifier (25dB)	Agilent	8447D	11/03/07	12/03/07	2944A10144
Amplifier (30dB)	Agilent	8449B	11/03/07	12/03/07	3008A01590
Attenuator(10dB)	WEINSCHEL	23-10-34	10/10/01	11/10/01	BP4386
EMI TEST RECEIVER	R&S	ESU	11/01/20	12/01/20	100014
Spectrum Analyzer(CE)	H.P	8591E	11/03/07	12/03/07	3649A05889
LISN	Kyoritsu	KNW-407	11/01/11	12/01/11	8-317-8
LISN	Kyoritsu	KNW-242	11/07/02	12/07/02	8-654-15
CVCF	NF Electronic	4420	11/03/08	12/03/08	304935/337980
50 ohm Terminator	HME	CT-01	11/01/11	12/01/11	N/A
RFI/FIELD Intensity Meter	Kyoritsu	KNM-2402	11/07/02	12/07/02	4N-170-3