FCC Part 15C
Measurement and Test Report

For

ShenZhen Foscam Intelligent Technology Co., Ltd.

Room A,9/F,Block F5, TCL International E City, No. 1001

Zhongshanyuan Road, Xili Shenzhen, China

FCC ID: ZDE-C1

FCC Rule(s):	FCC Part 15C
Product Description:	FHD Wireless IP Camera
Tested Model:	C1
Report No.:	STRD1706014I-1
Tested Date:	2017-06-06 to 2017-06-29
Issued Date:	2017-06-29
Tested By:	Neil Wong / Engineer
Reviewed By:	Silin Chen / EMC Manager
Approved & Authorized By:	Jandy So / PSQ Manager

Prepared By:

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	ShenZhen Foscam Intelligent Technology Co., Ltd.
Address of applicant:	Room A,9/F,Block F5, TCL International E City, No. 1001 Zhongshanyuan Road, Xili Shenzhen, China
Manufacturer:	ShenZhen Foscam Intelligent Technology Co., Ltd.
Address of manufacturer:	Room A,9/F,Block F5, TCL International E City, No. 1001 Zhongshanyuan Road, Xili Shenzhen, China

General Description of EUT	
Product Name:	FHD Wireless IP Camera
Trade Name:	FOSCAM
Model No.:	C1
Adding Model(s):	IQ, FC1406P, EH8115, FI9809P, FI9809W, C1S, FC1405P,FC1405PC, FC1406P, EH8105, C1E, C1 Lite, IQ Lite, C1 Plus, IQ Plus, C1 V2, C1 Lite V2, C1 Plus V2
Rated Voltage:	DC 3.7V
Power Adapter #1:	SAW06B-050-10000
	Input: 100-240V 50/60HZ 0.3A, Output: 5V 1000mA
Power Adapter #2:	FP01030
	Input: 100-240V 50/60HZ 0.3A, Output: 5V 2.0A
Software Version:	ver2.x.2.28
Hardware Version:	V3
Note: The test data is gathered from a production sample provided by the manufacturer. The appearance of others models listed in the report is different from main-test model C1, but the circuit and the electronic construction do not change, declared by the manufacturer.	

Technical Characteristics of EUT	
Support Standards:	802.11b, 802.11g, 802.11n
Frequency Range:	2412-2462MHz for 802.11b/g/n(HT20) 2422-2452MHz for 802.11n(HT40)
RF Output Power:	13.77dBm (Conducted)
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Data Rate:	1-11Mbps, 6-54Mbps, up to 150Mbps
Quantity of Channels:	11 for 802.11b/g/n(HT20); 7 for 802.11n(HT40)
Channel Separation:	5MHz
Type of Antenna:	Integral
Antenna Gain:	2.0dBi

1.2 Test Standards

The following report is prepared on behalf of the ShenZhen Foscam Intelligent Technology Co., Ltd. in accordance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 of the Federal Communication Commissions rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices, and ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. The measurement guide KDB 558074 D01 v04 for digital transmission systems shall be performed also.

1.4 Test Facility

FCC – Registration No.: 934118

Shenzhen SEM.Test Technology 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 and the Registration is 934118.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Shenzhen SEM.Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

CNAS Registration No.: L4062

Shenzhen SEM.Test Technology Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, P.R.C (518101).

1.5 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	802.11b	2412MHz, 2437MHz, 2462MHz
TM2	802.11g	2412MHz, 2437MHz, 2462MHz
TM3	802.11n-HT20	2412MHz, 2437MHz, 2462MHz
TM4	802.11n-HT40	2422MHz, 2437MHz, 2452MHz
Note: All test modes (different data rate and different modulation) are performed, but only the worst case is recorded in this report.		

Accessories Equipment List and Details			
Description	**Manufacturer**	**Model No.**	**Serial Number**
Adaptor 1	Szyingyuan	SAW06B-050-1000U	
Adaptor 2	FOSCAM	SAW06B-050-1000U	
Wireless router	/	/	
Accessories Cable List and Details			
Cable Description	**Length (m)**	**Shielded/Unshielded**	**With Core/Without Core**
USB Cable	1.0	Unshielded	Without Ferrite
EUT Cable List and Details			
Cable Description	**Length (m)**	**Shielded/Unshielded**	**With Core/Without Core**
/	/	/	/

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	±0.42dB
Occupied Bandwidth	Conducted	±1.5%
Power Spectral Density	Conducted	±1.8dB
Conducted Spurious Emission	Conducted	±2.17dB
Conducted Emissions	Conducted	±2.88dB
Transmitter Spurious Emissions	Radiated	±5.1dB

1.7 Test Equipment List and Details

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2017-06-12	2018-06-11
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2017-06-12	2018-06-11
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2017-06-12	2018-06-11
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2017-06-12	2018-06-11
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2017-06-12	2018-06-11
SEMT-1011	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2017-06-12	2018-06-11
SEMT-1042	Horn Antenna	ETS	3117	00086197	2017-06-12	2018-06-11
SEMT-1121	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170582	2017-06-12	2018-06-11
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2017-06-12	2018-06-11
SEMT-1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2017-06-12	2018-06-11
SEMT-1003	L.I.S.N	Schwarz beck	NSLK8126	8126-224	2017-06-12	2018-06-11
SEMT-1002	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2017-06-12	2018-06-11

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§ 2.1093	RF Exposure	Compliant
§ 15.203; § 15.247(b)(4)(i)	Antenna Requirement	Compliant
§15.205	Restricted Band of Operation	Compliant
§ 15.207(a)	Conducted Emission	Compliant
§ 15.247(e)	Power Spectral Density	Compliant
§ 15.247(a)(2)	6 dB Bandwidth	Compliant
§ 15.247(b)(3)	RF Output Power	Compliant
§ 15.209(a)	Radiated Emission	Compliant
§ 15.247(d)	Band Edge (Out of Band Emissions)	Compliant

N/A: not applicable

3. RF Exposure

3.1 Standard Applicable

According to § 1.1307 and § 2.1093, the portable transmitter must comply the RF exposure requirements.

3.2 Test Result

This product complied with the requirement of the RF exposure, please see the RF Exposure Report.

4. Antenna Requirement

4.1 Standard Applicable

According to FCC Part 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. 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.

4.2 Evaluation Information

This product has an integral antenna, fulfill the requirement of this section.

5. Power Spectral Density

5.1 Standard Applicable

According to 15.247(a)(1)(iii), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

5.2 Test Procedure

According to the KDB 558074 D01 v04, such specifications require that the same method as used to determine the conducted output power shall also be used to determine the power spectral density. The test method of power spectral density as below:

a) Set instrument center frequency to DTS channel center frequency.
b) Set span to at least 1.5 times the OBW.
c) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz. .
d) Set VBW ≥3 x RBW.
e) Detector = power averaging (RMS) or sample detector (when RMS not available).
f) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
g) Sweep time = auto couple.
h) Employ trace averaging (RMS) mode over a minimum of 100 traces.
i) Use the peak marker function to determine the maximum amplitude level.
j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span in order to meet the minimum measurement point requirement as the RBW is reduced).

5.3 Environmental Conditions

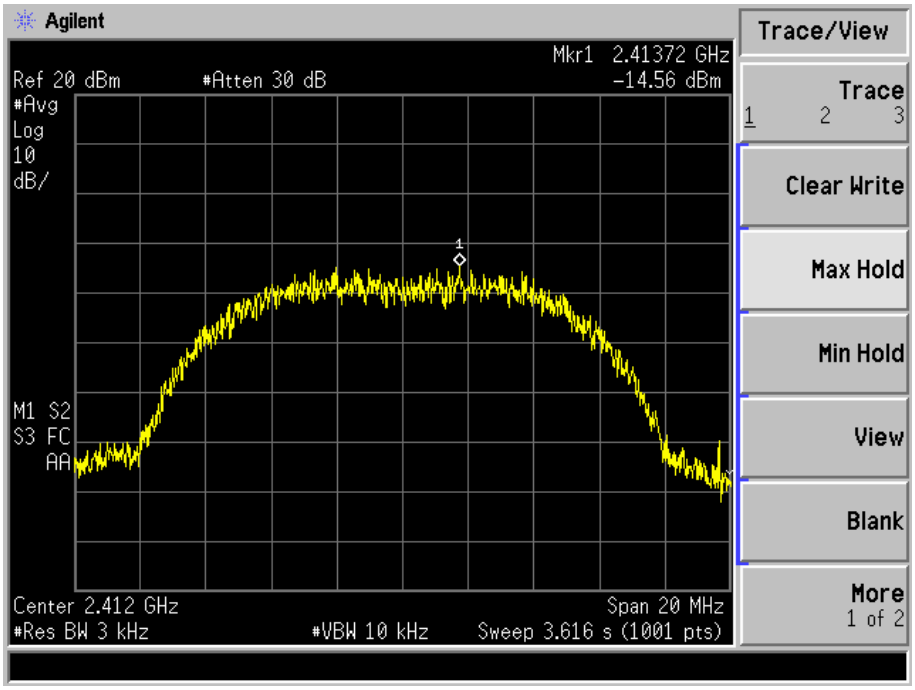
Temperature:	26° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

5.4 Summary of Test Results/Plots

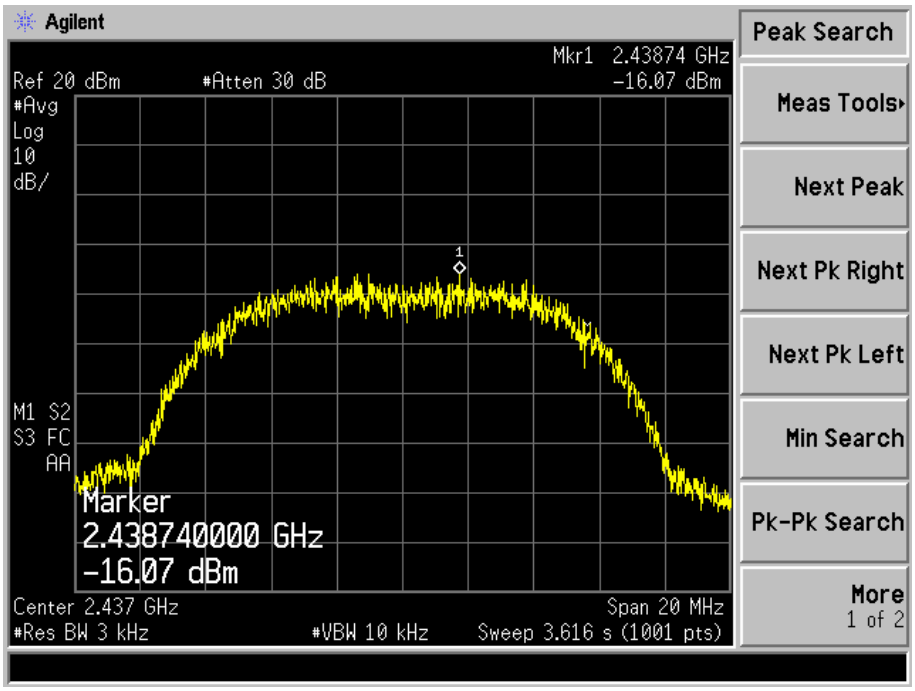
Test Mode	Test Channel MHz	Power Spectral Density dBm/3kHz	Limit dBm/3kHz
802.11b	2412	-14.56	8
	2437	-16.07	8
	2462	-16.84	8
802.11g	2412	-20.72	8
	2437	-20.65	8
	2462	-22.67	8
802.11n HT20	2412	-20.31	8
	2437	-20.25	8
	2462	-21.58	8
802.11n HT40	2422	-24.43	8
	2437	-25.08	8
	2452	-25.24	8

Please refer to the following test plots:

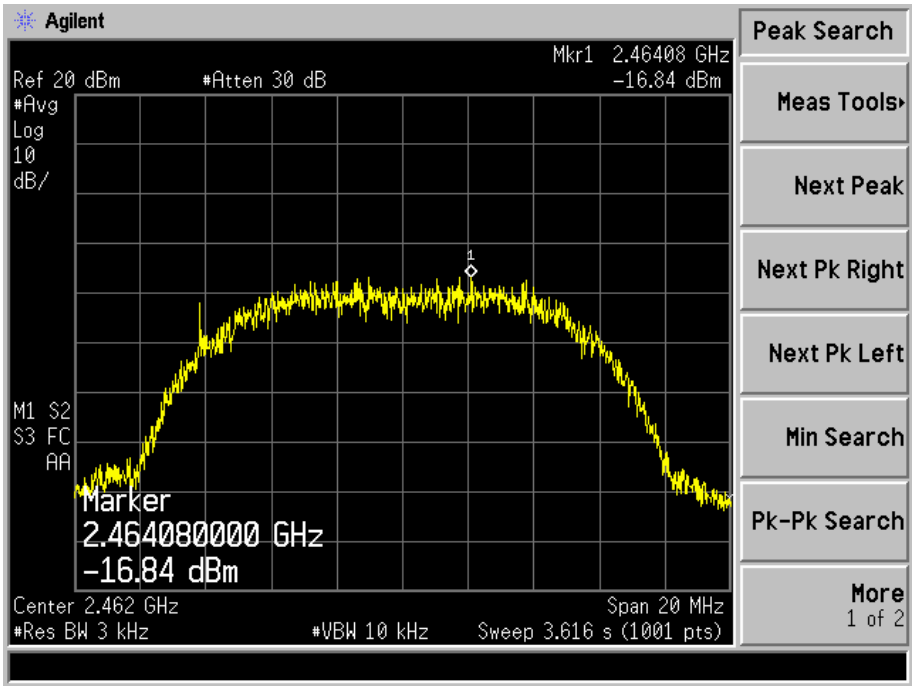
802.11b-Low Channel



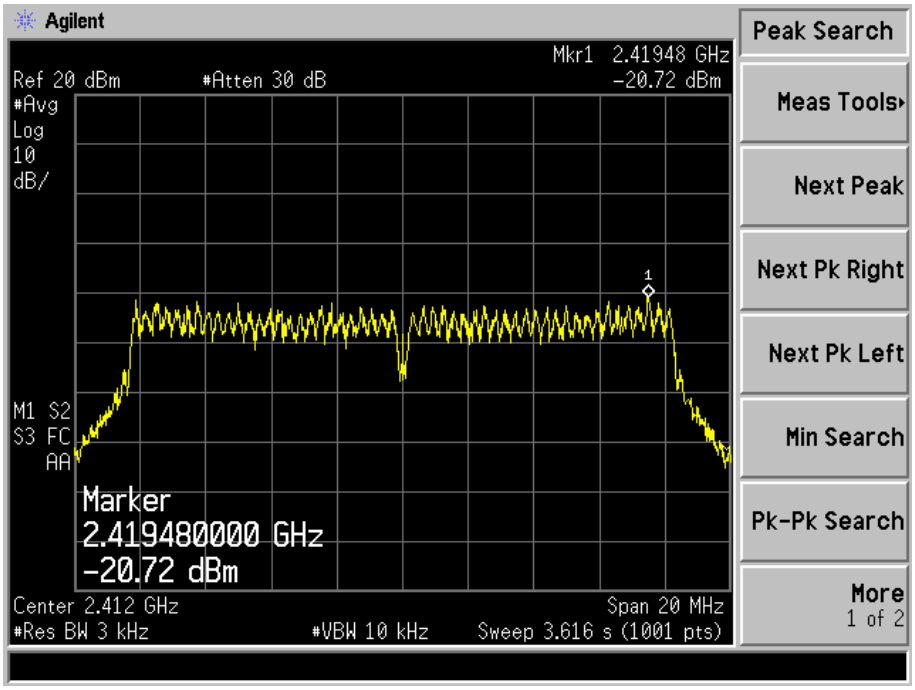
802.11b-Middle Channel



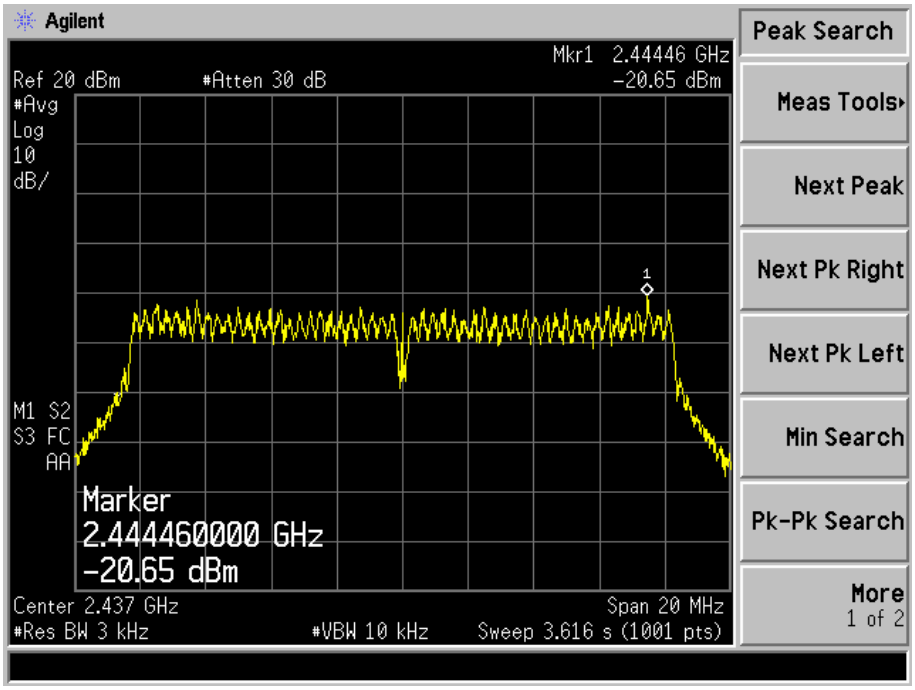
802.11b-High Channel



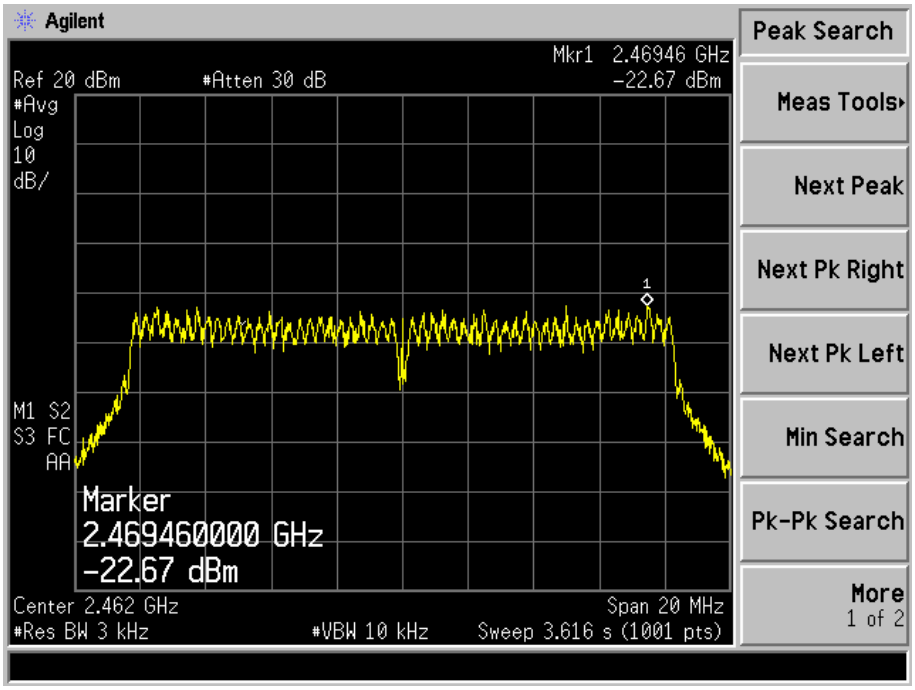
802.11g-Low Channel



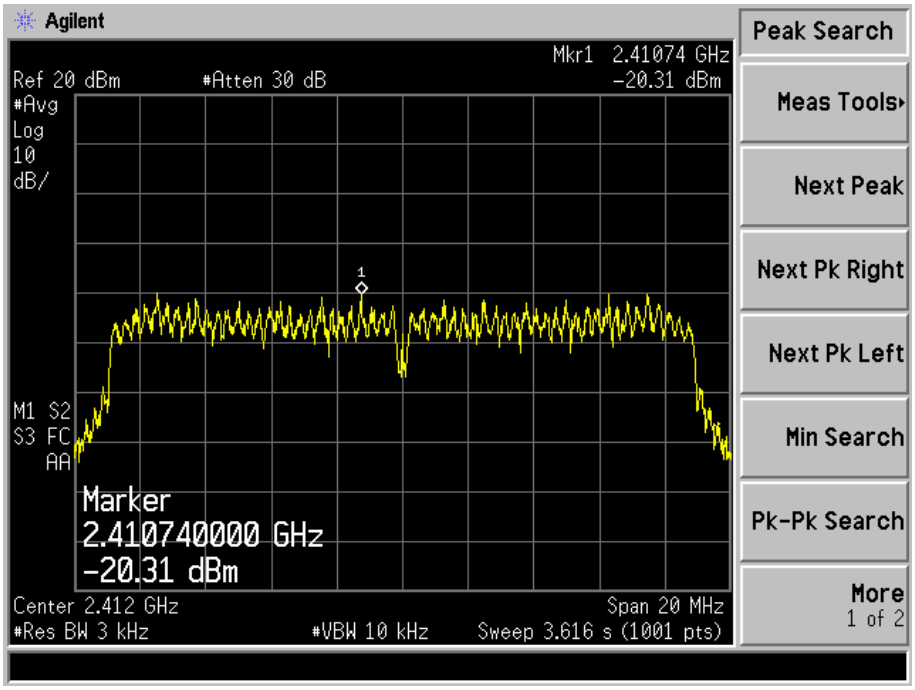
802.11g-Middle Channel



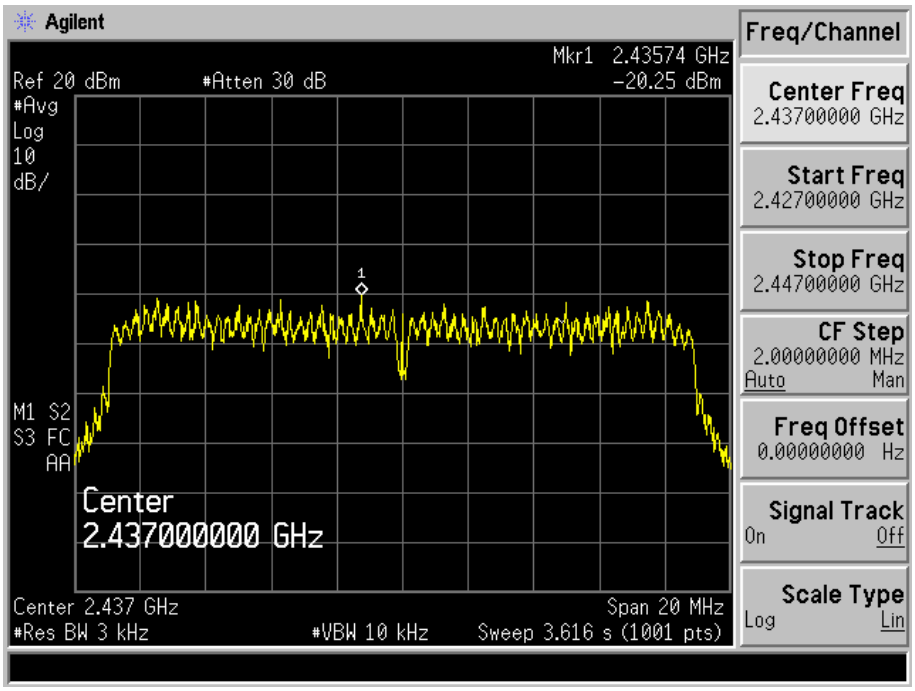
802.11g-High Channel



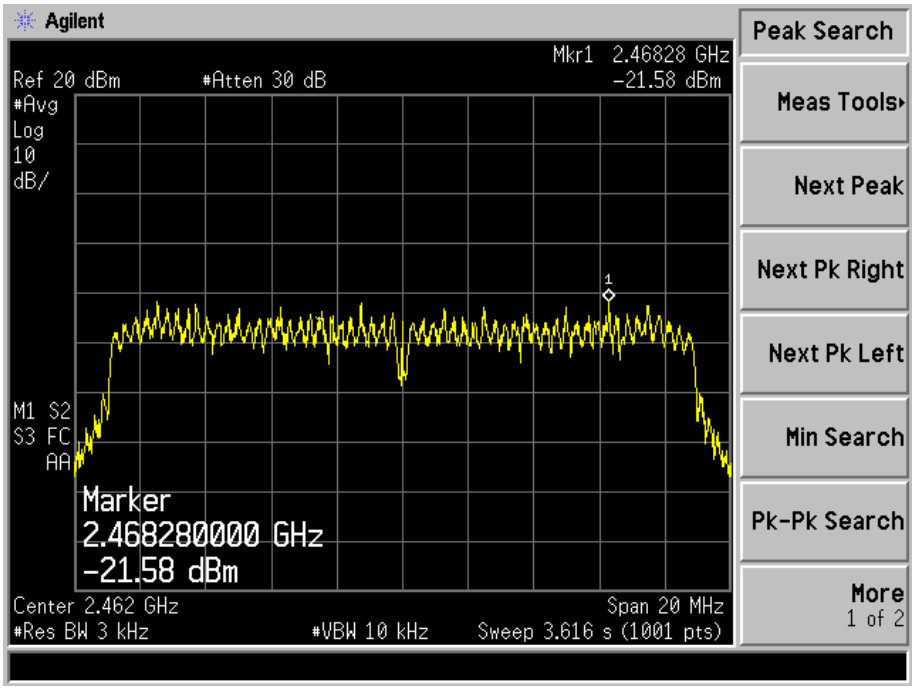
802.11n-HT20-Low Channel



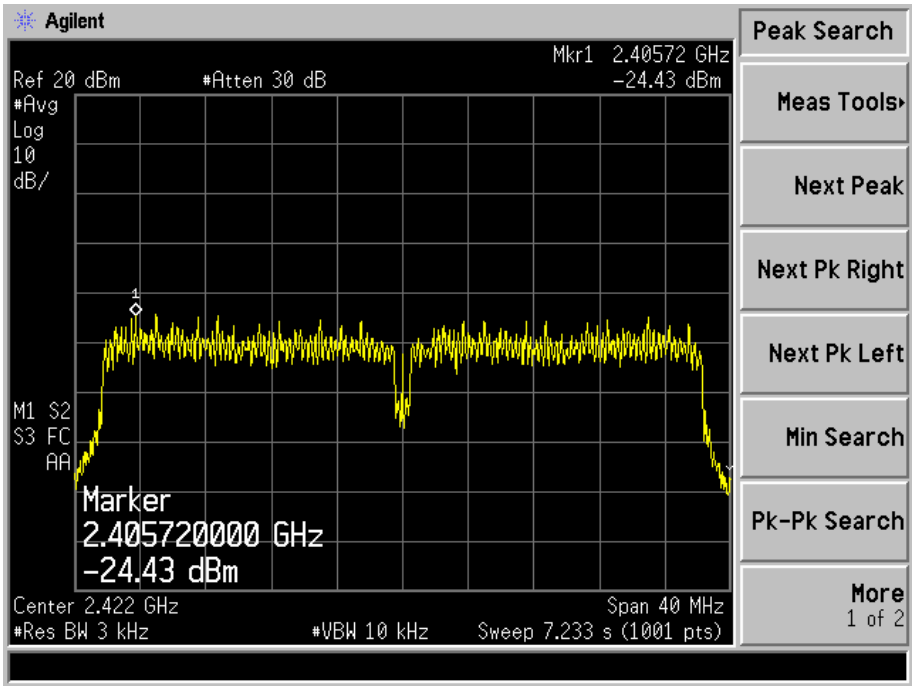
802.11n-HT20-Middle Channel



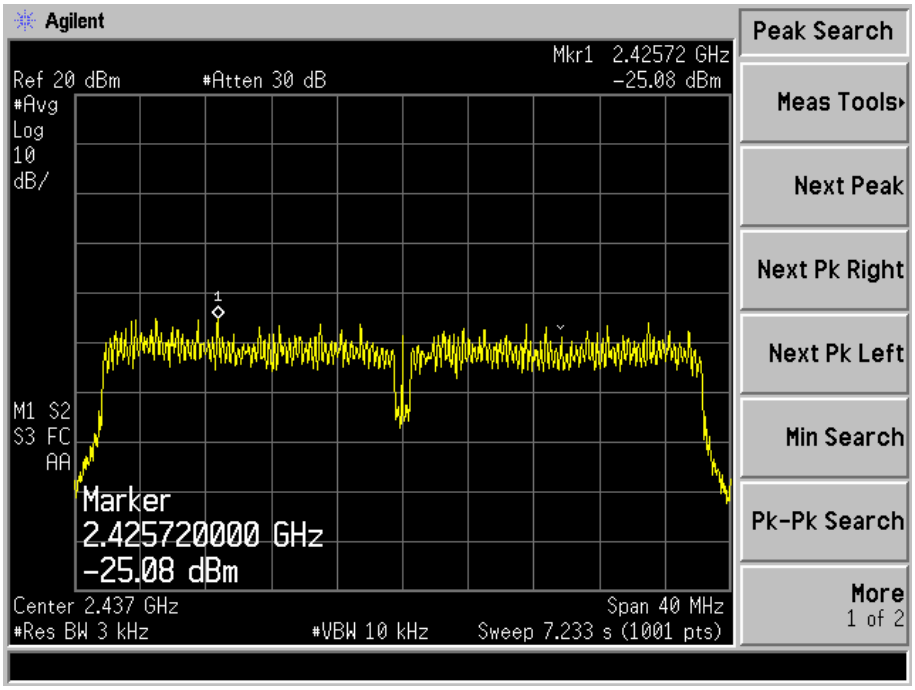
802.11n-HT20-High Channel



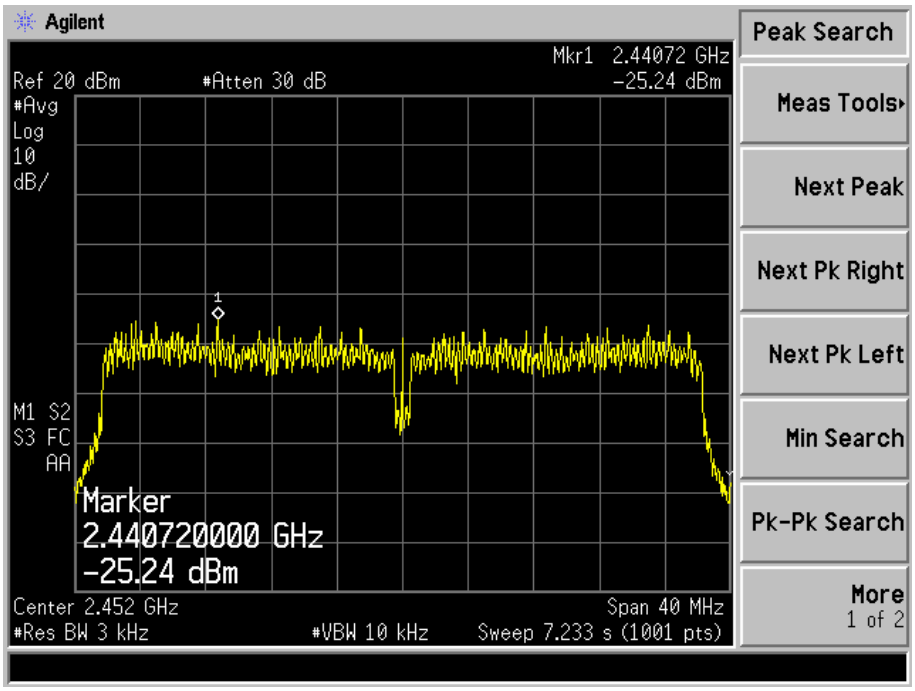
802.11n-HT40-Low Channel



802.11n-HT40-Middle Channel



802.11n-HT40-High Channel



6. 6dB Bandwidth

6.1 Standard Applicable

According to 15.247(a)(2). Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

6.2 Test Procedure

a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3 × RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

6.3 Environmental Conditions

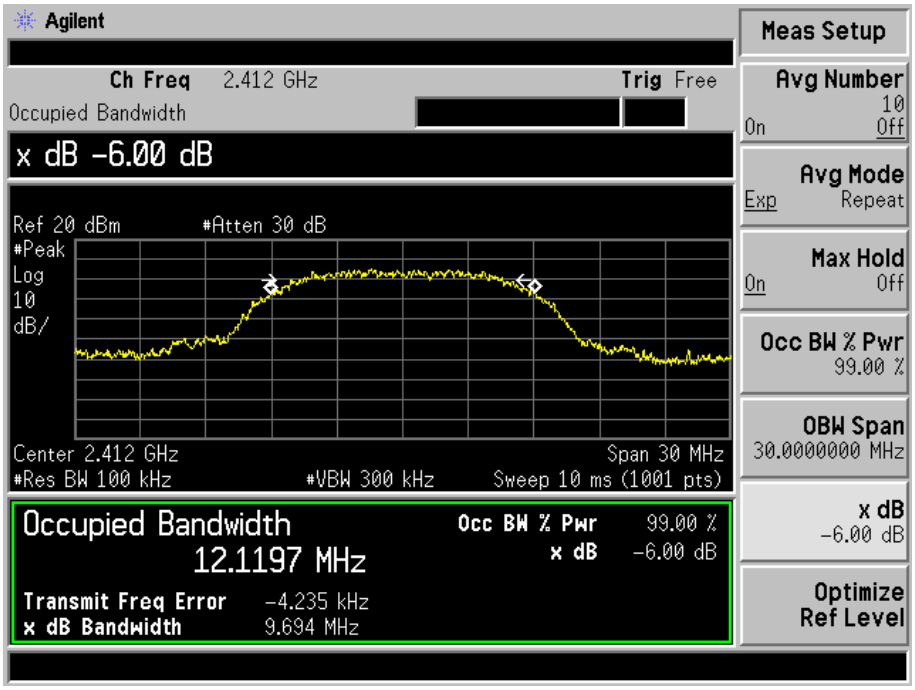
Temperature:	25° C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

6.4 Summary of Test Results/Plots

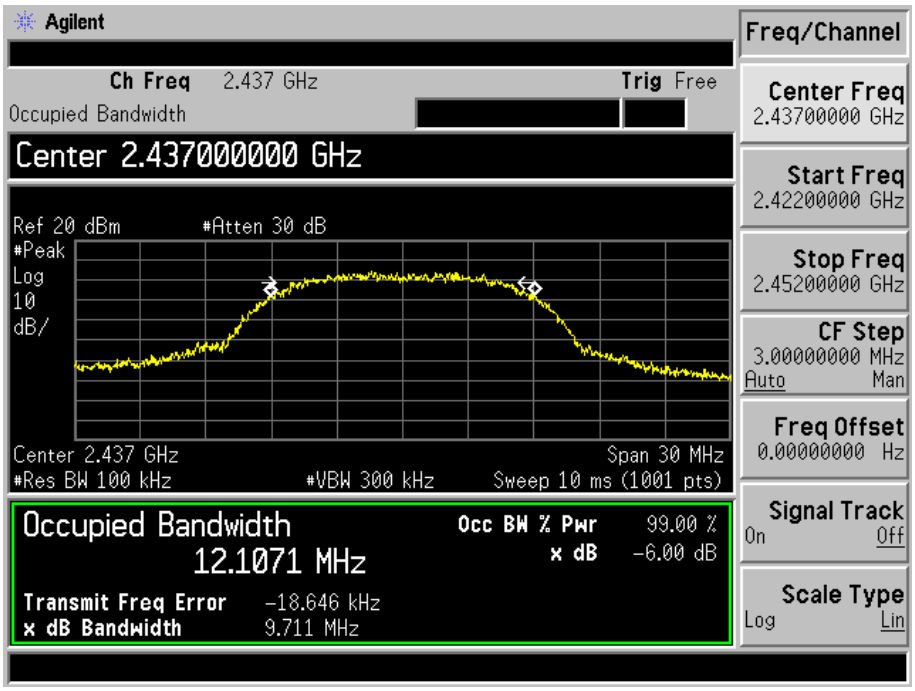
Test Mode	Test Channel MHz	6 dB Bandwidth MHz	99% Bandwidth MHz	Limit kHz
802.11b	2412	9.694	12.1197	≥500
	2437	9.711	12.1071	≥500
	2462	8.803	12.0970	≥500
802.11g	2412	16.419	16.4399	≥500
	2437	16.459	16.4386	≥500
	2462	16.467	16.4586	≥500
802.11n-HT20	2412	17.606	17.5496	≥500
	2437	17.592	17.5462	≥500
	2462	17.588	17.5533	≥500
802.11n-HT40	2422	35.549	35.9038	≥500
	2437	35.367	35.9548	≥500
	2452	35.561	35.9197	≥500

Please refer to the following test plots:

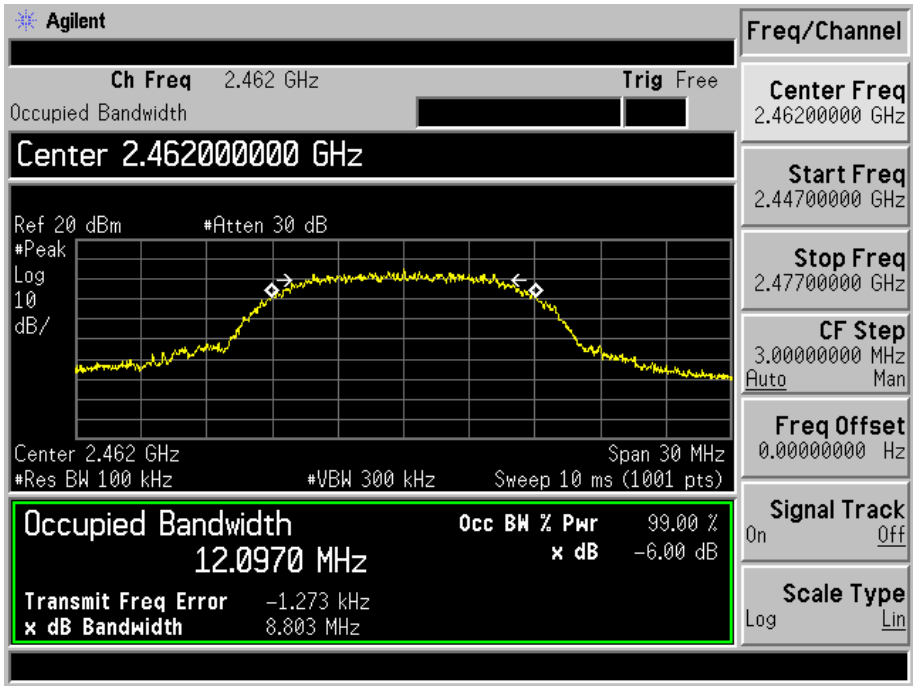
802.11b-Low Channel



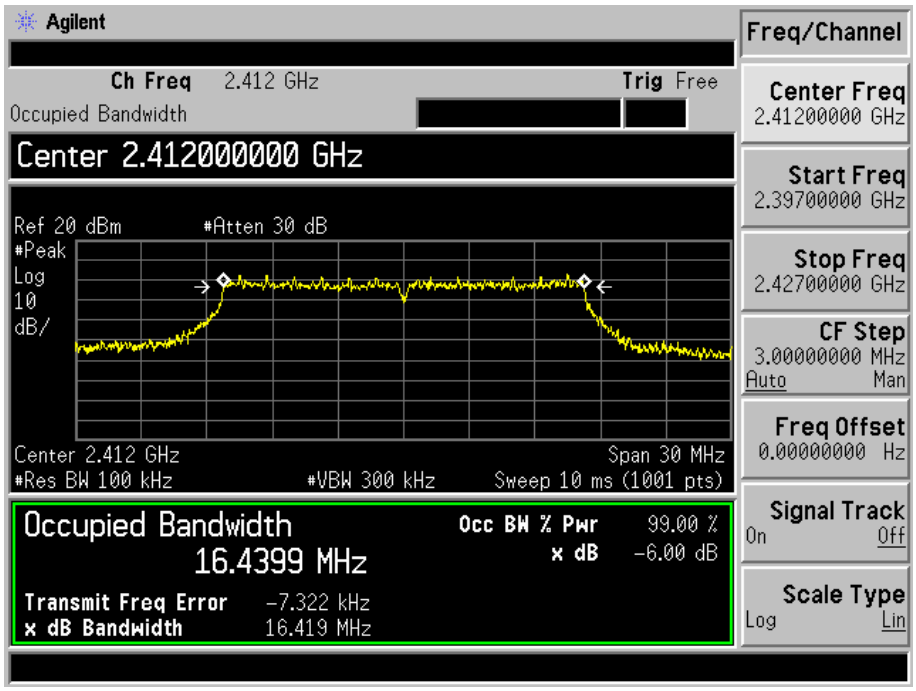
802.11b-Middle Channel



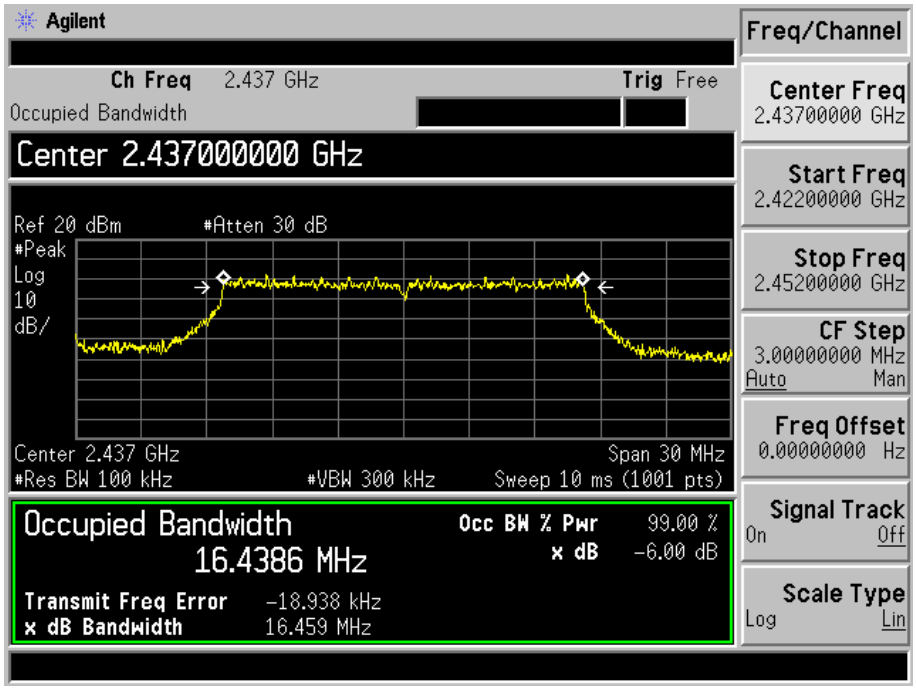
802.11b-High Channel



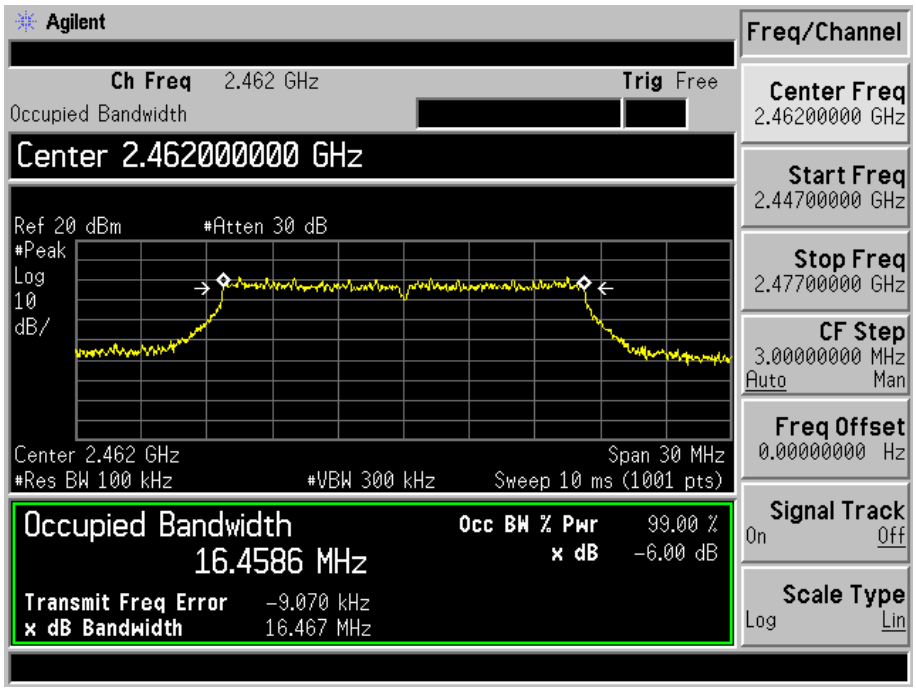
802.11g-Low Channel



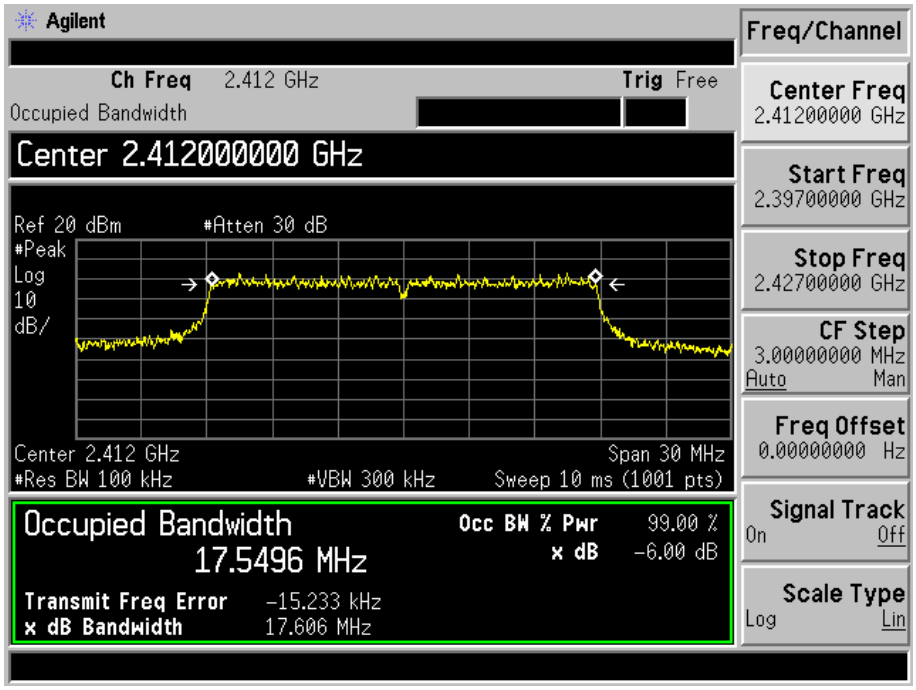
802.11g-Middle Channel



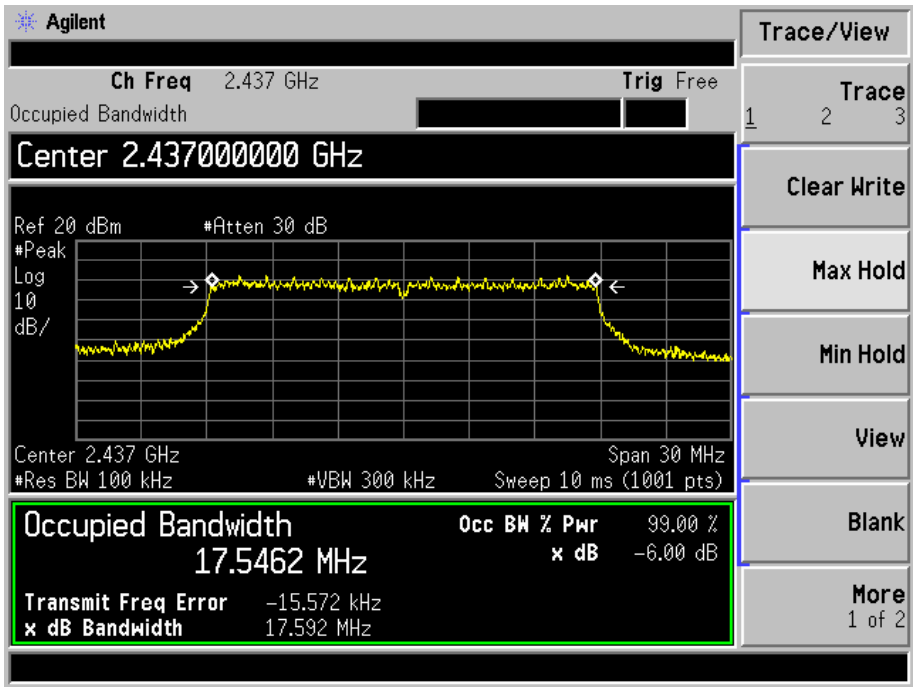
802.11g-High Channel



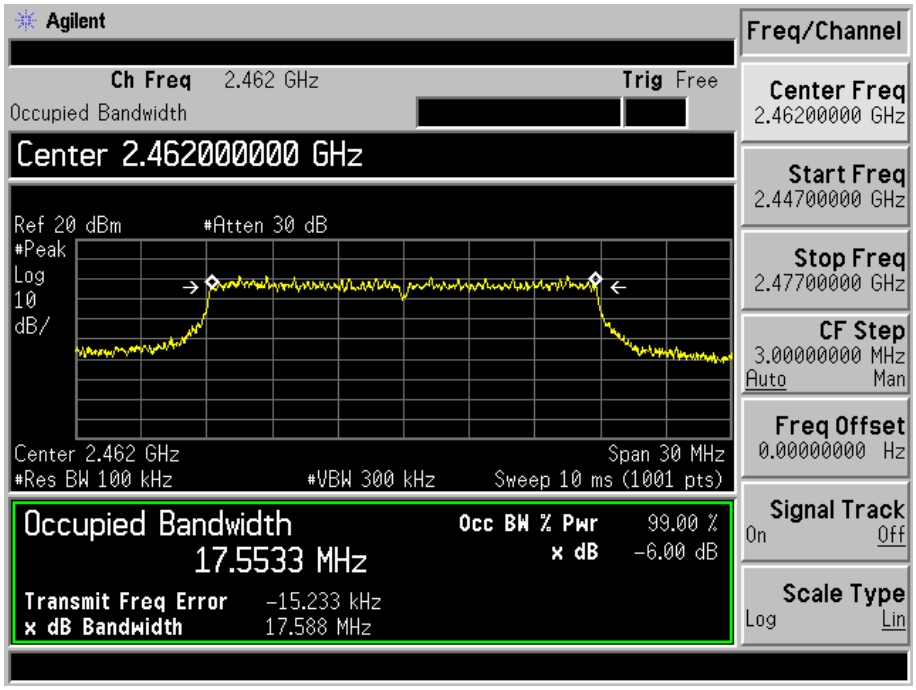
802.11n-HT20-Low Channel



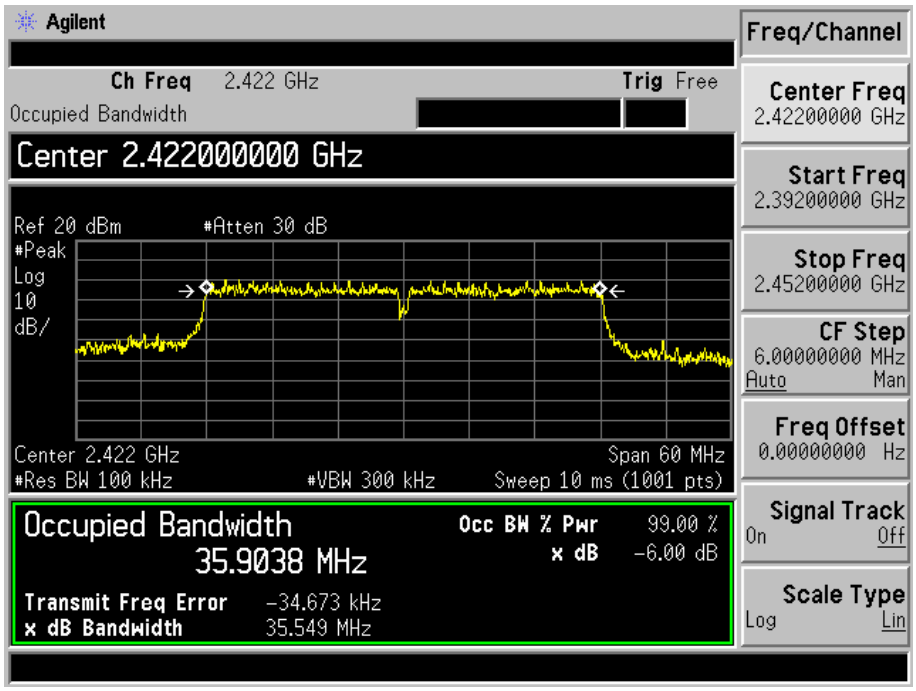
802.11n-HT20-Middle Channel



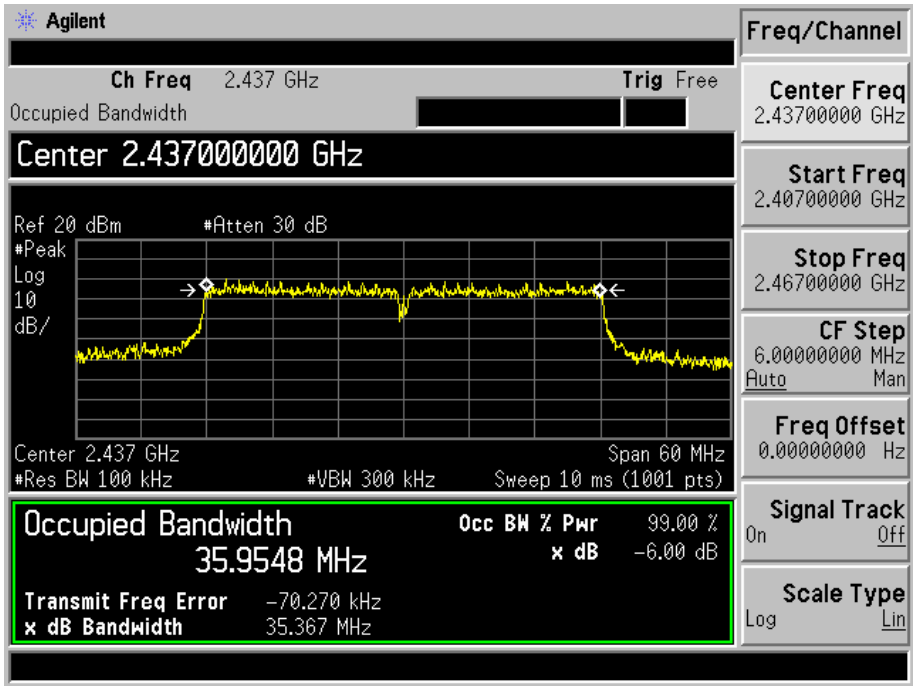
802.11n-HT20-High Channel



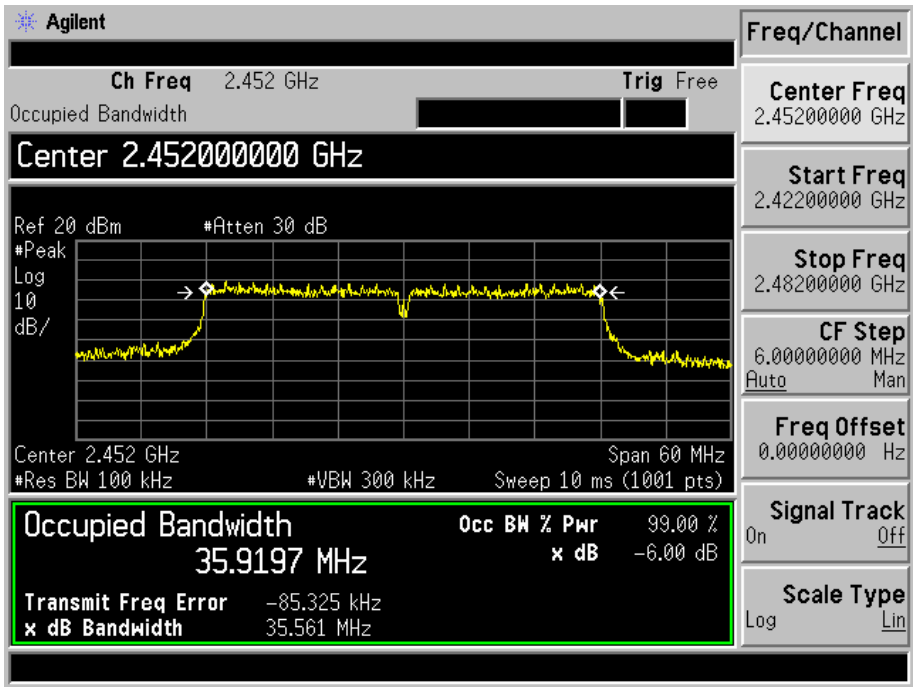
802.11n-HT40-Low Channel



802.11n-HT40-Middle Channel



802.11n-HT40-High Channel



7. RF Output Power

7.1 Standard Applicable

According to 15.247(b)(3). For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

7.2 Test Procedure

According to the KDB-558074 D01 v04, 9.2.2.2, when this option is exercised, the measured power is to be referenced to the OBW rather than the DTS bandwidth

a) Set span to at least 1.5 times the OBW.
b) Set RBW = 1-5% of the OBW, not to exceed 1 MHz.
c) Set VBW ≥ 3 x RBW.
d) Number of points in sweep ≥ 2 × span / RBW. (This gives bin-to-bin spacing ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
e) Sweep time = auto.
f) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
g) If transmit duty cycle < 98 %, use a sweep trigger with the level set to enable triggering only on full power pulses. The transmitter shall operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 %, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run".
h) Trace average at least 100 traces in power averaging (i.e., RMS) mode.
i) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function, with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

7.3 Environmental Conditions

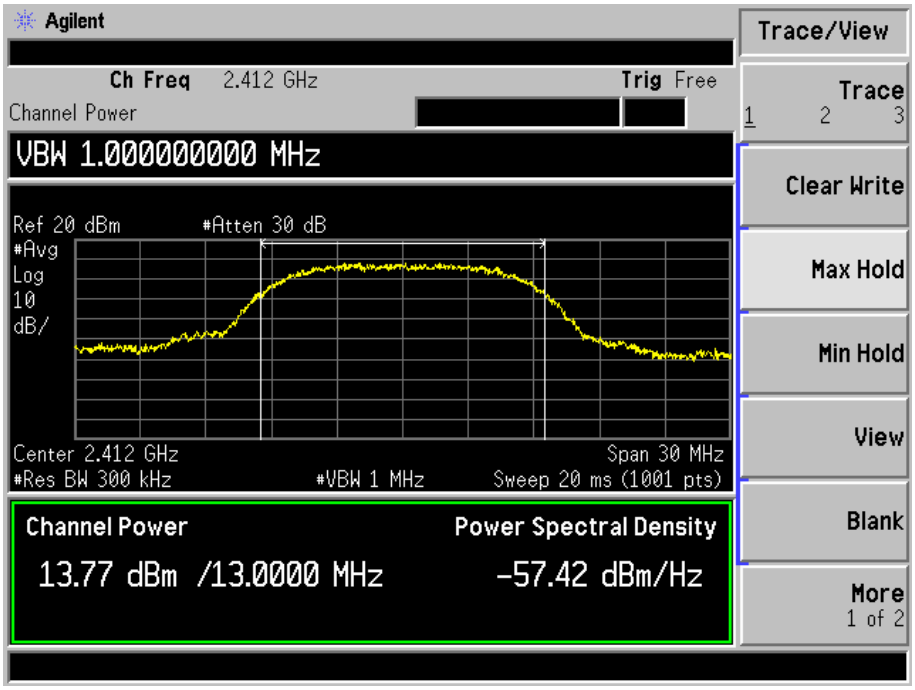
Temperature:	26° C
Relative Humidity:	57%
ATM Pressure:	1011 mbar

7.4 Summary of Test Results/Plots

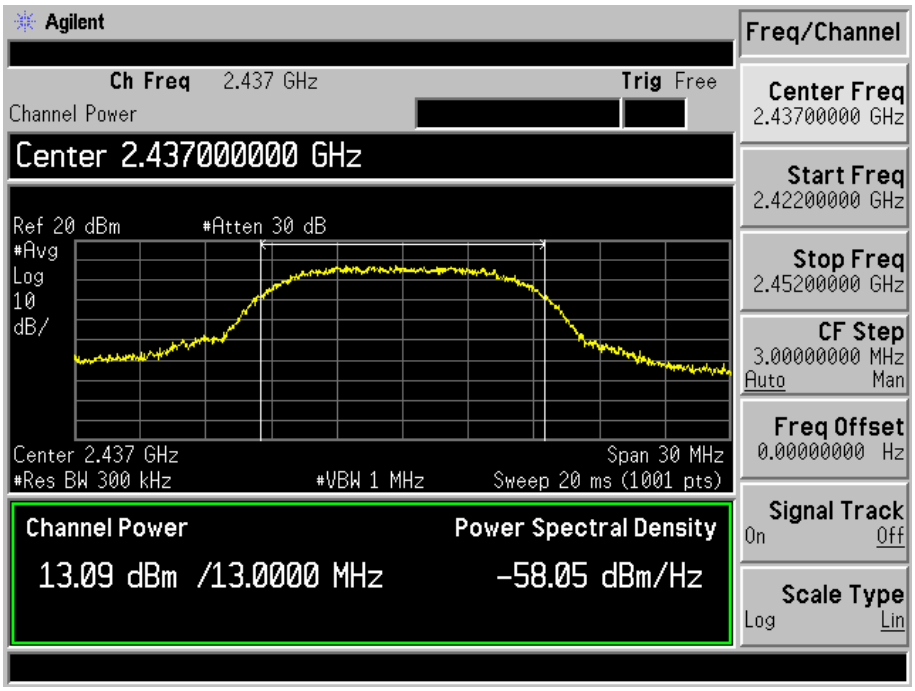
Test Mode	Frequency MHz	Reading dBm	Output Power mW	Limit mW
802.11b _ 11Mbps	2412	13.77	23.82	1000
	2437	13.09	20.37	1000
	2462	12.03	15.96	1000
802.11g_54Mbps	2412	10.16	10.38	1000
	2437	9.44	8.79	1000
	2462	8.61	7.26	1000
802.11n HT20_MCS7	2412	10.22	10.52	1000
	2437	9.5	8.91	1000
	2462	8.68	7.38	1000
802.11n HT40_MCS7	2422	8.51	7.10	1000
	2437	7.59	5.74	1000
	2452	6.86	4.85	1000

Please refer to the following test plots:

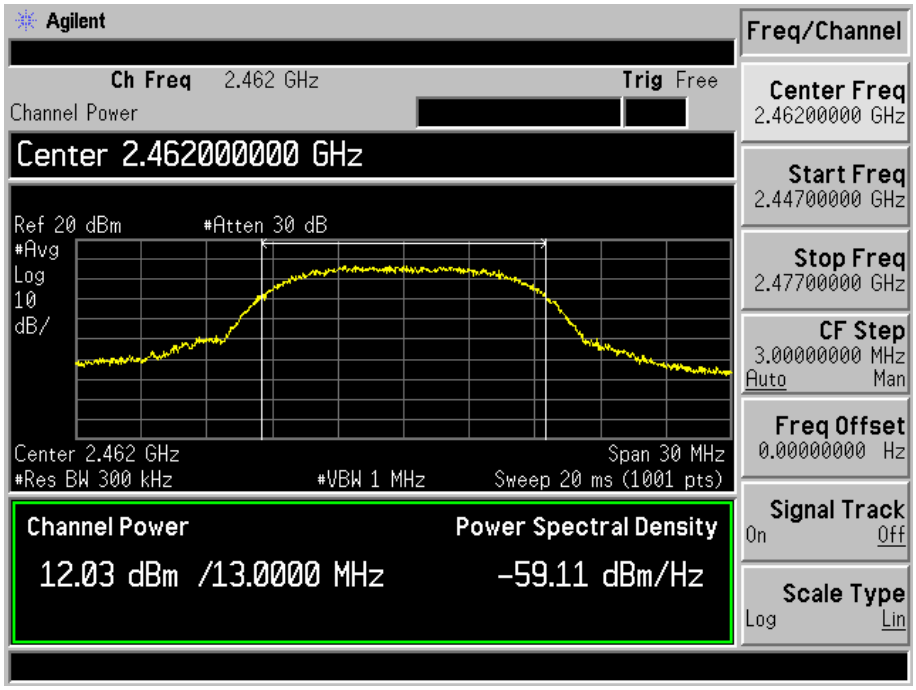
802.11b-11Mbps-Low Channel



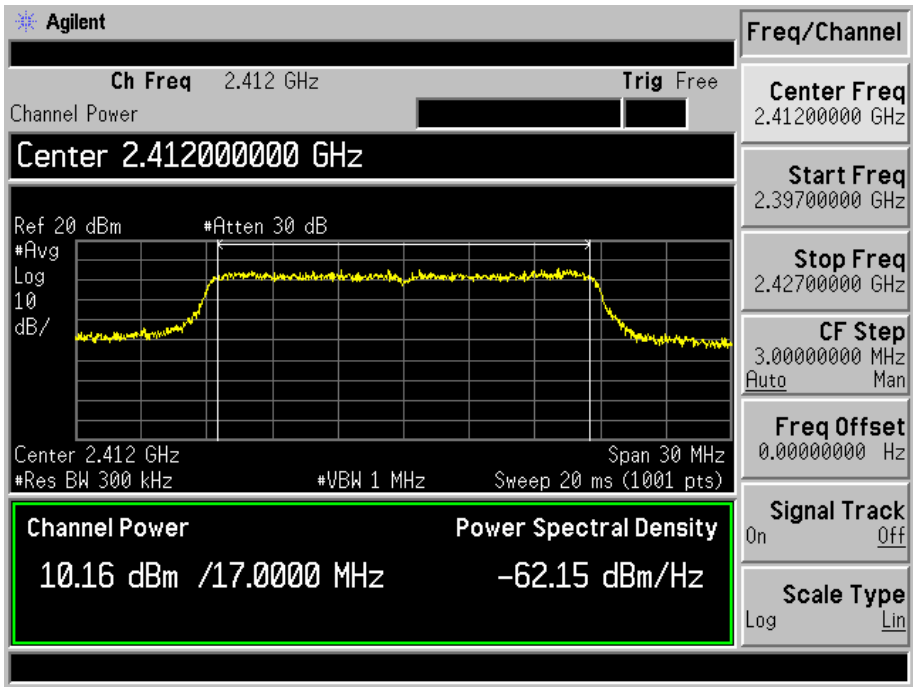
802.11b -11Mbps-Middle Channel



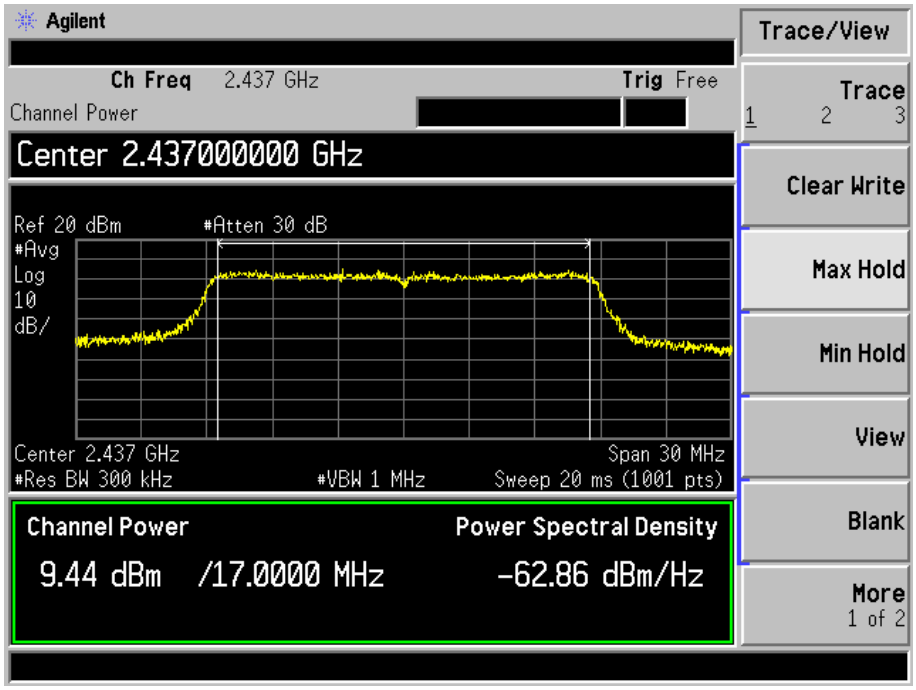
802.11b -11Mpbs-High Channel



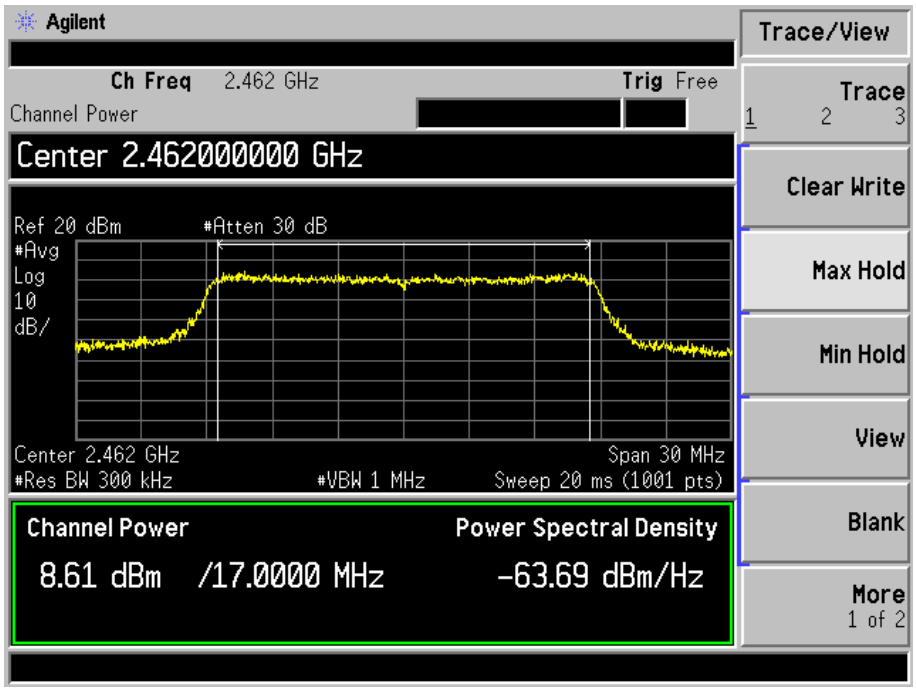
802.11g-54Mbps-Low Channel



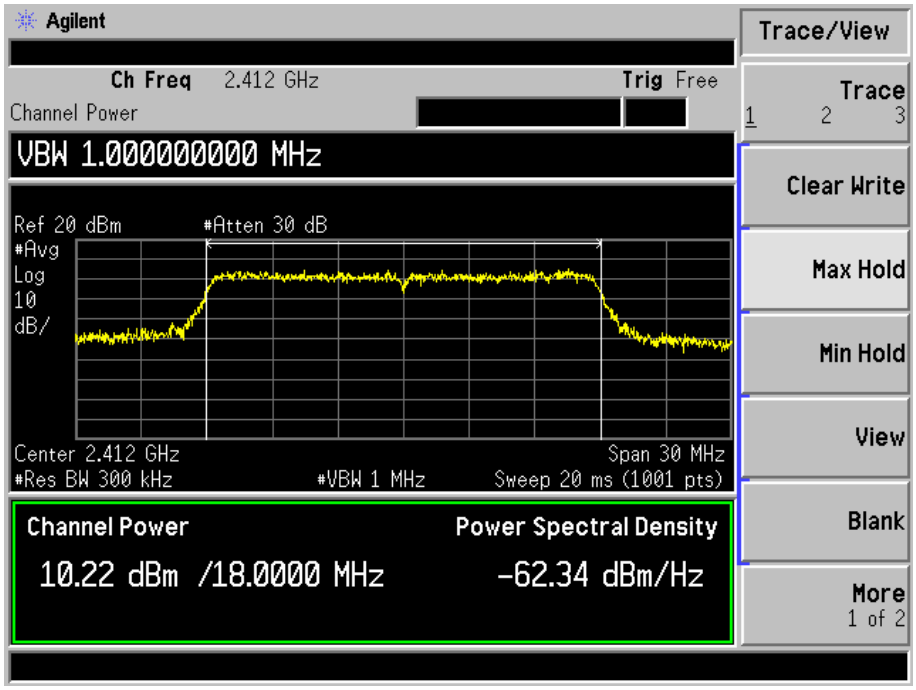
802.11g-54Mbps-Middle Channel



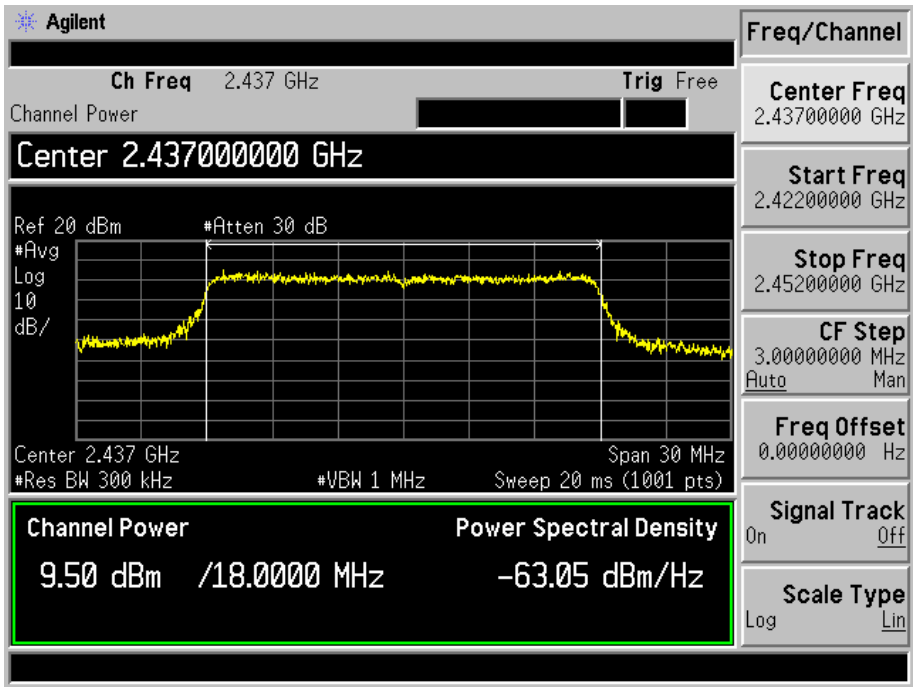
802.11g-54Mpbs-High Channel



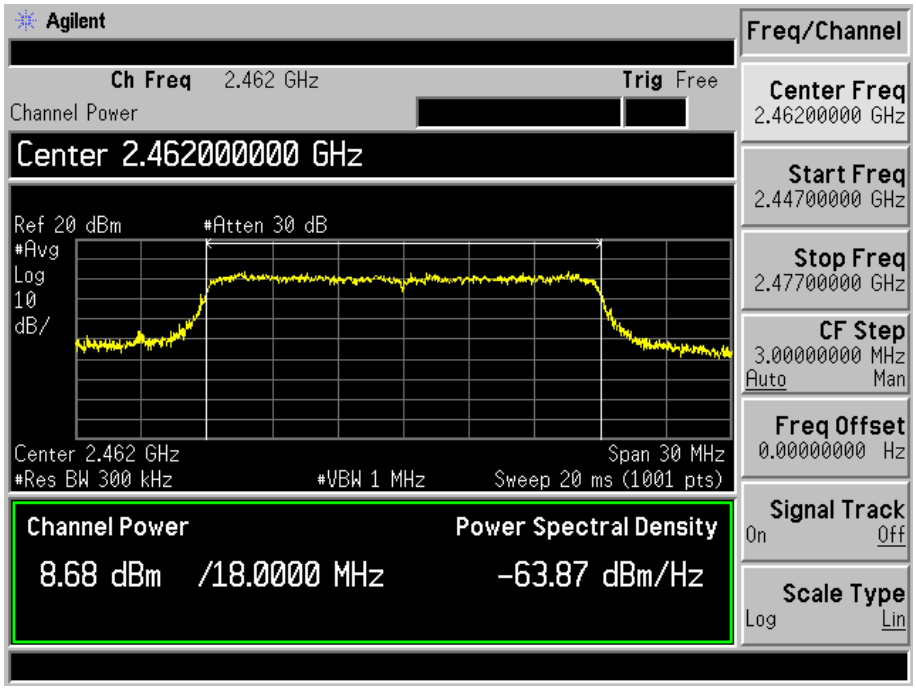
802.11n-HT20-MCS7-Low Channel



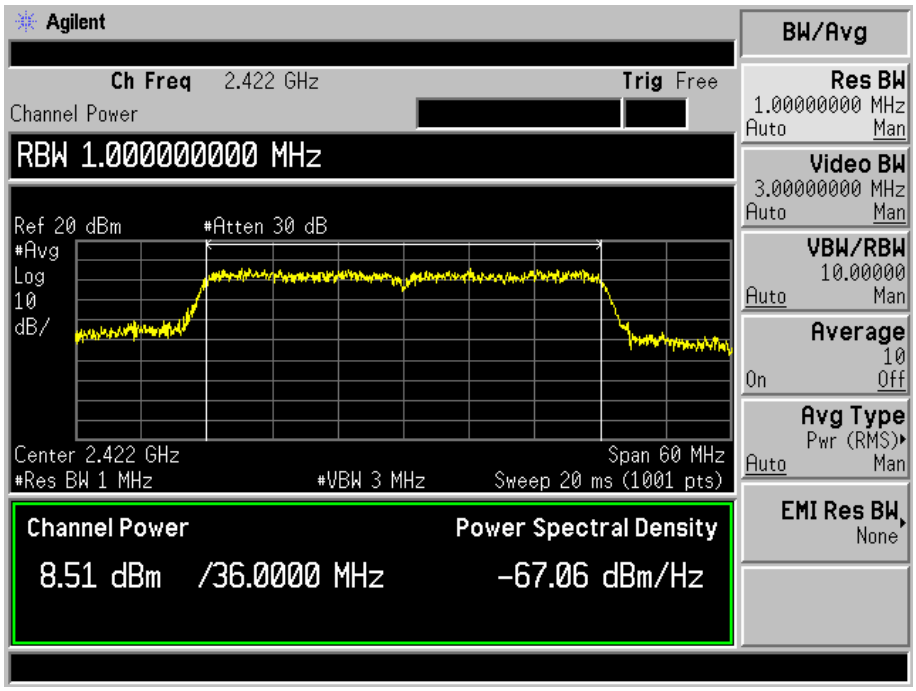
802.11n-HT20-MCS7-Middle Channel



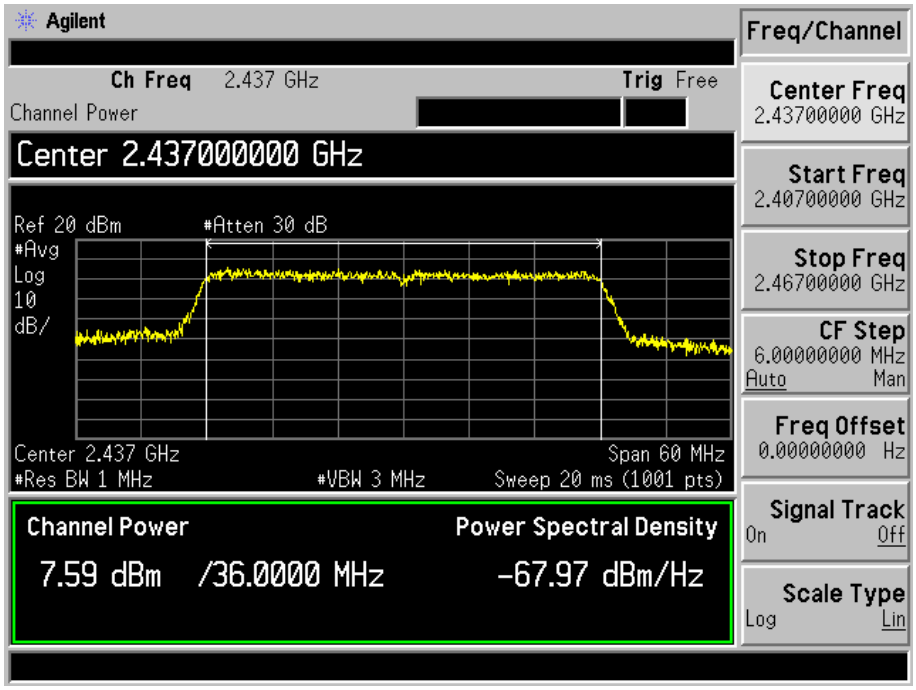
802.11n-HT20-MCS7-High Channel



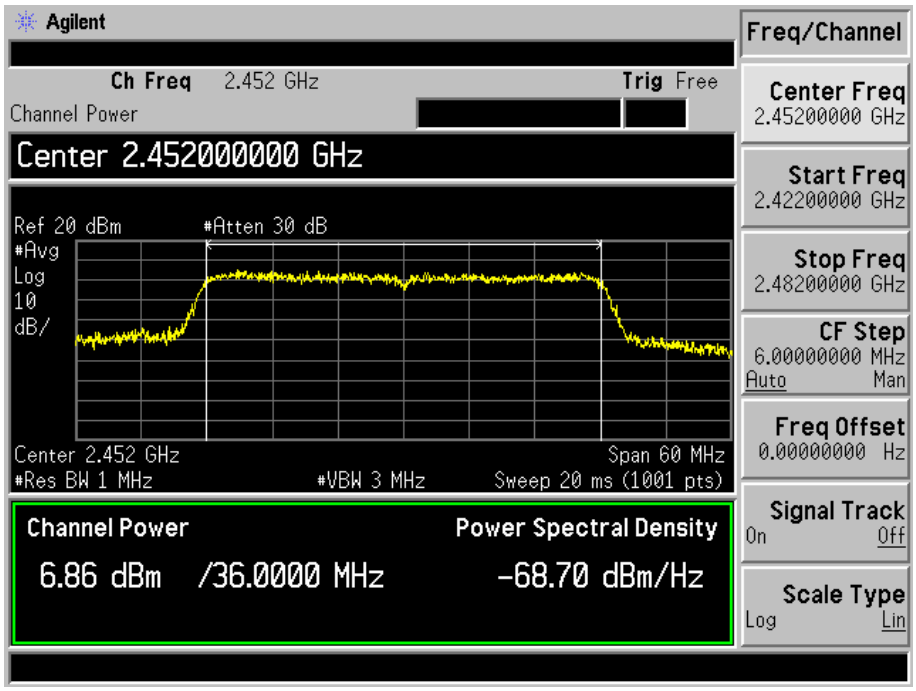
802.11n-HT40-MCS7-Low Channel



802.11n-HT40-MCS7-Middle Channel



802.11n-HT40-MCS7-High Channel



8. Field Strength of Spurious Emissions

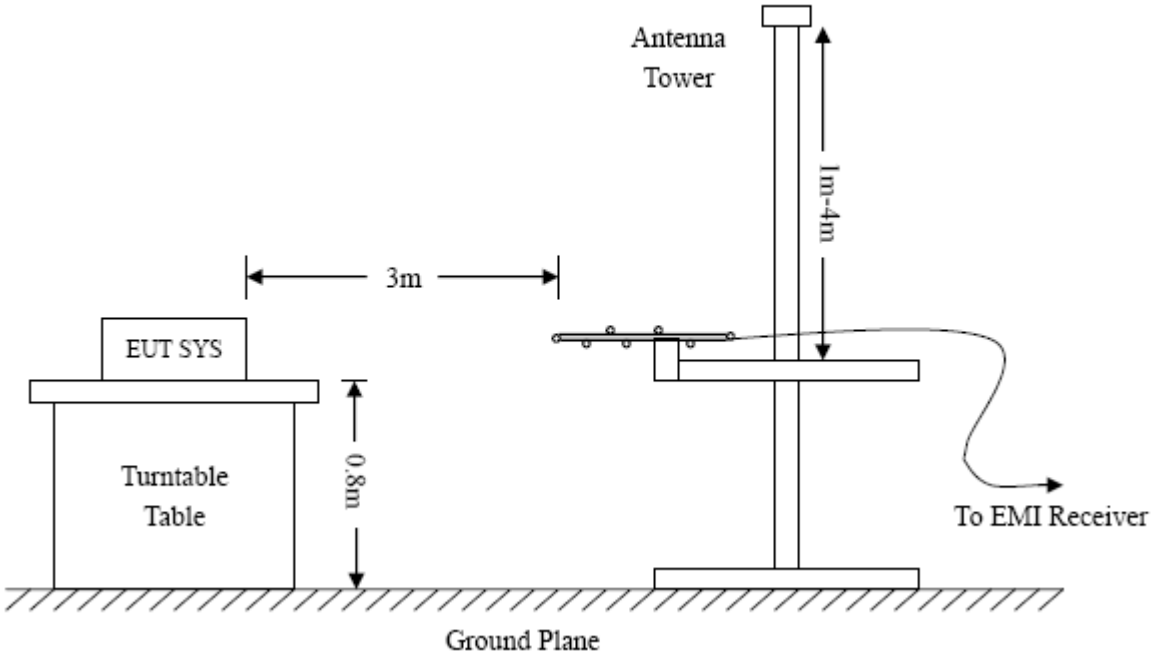
8.1 Standard Applicable

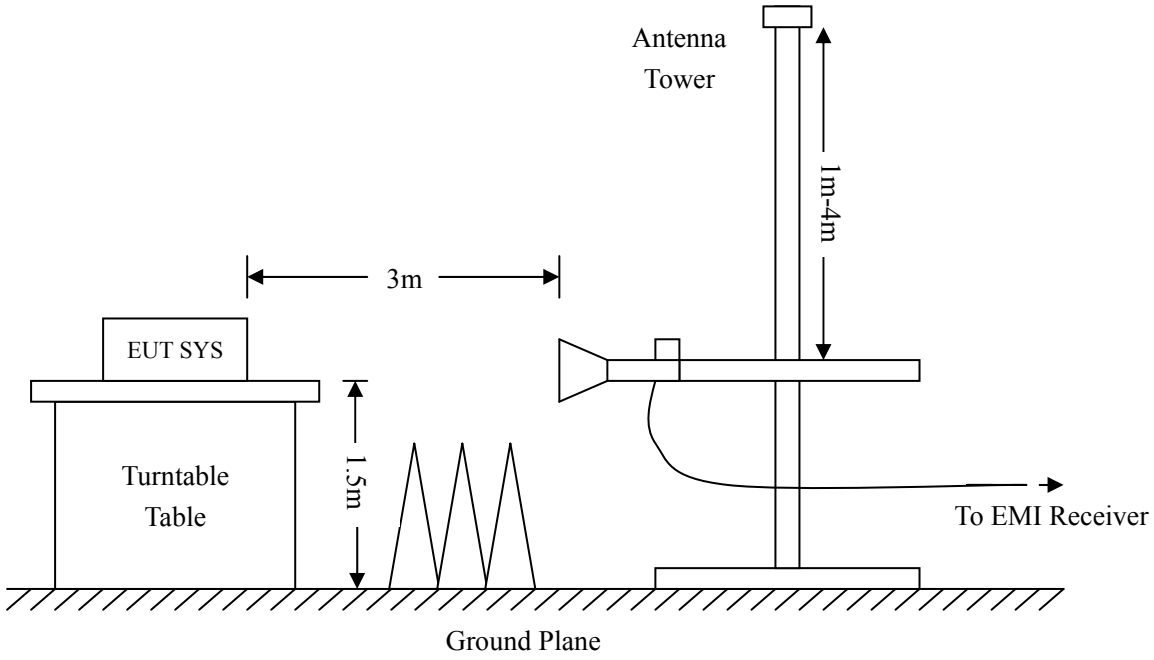
According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within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

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

8.2 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.205 15.247(a) and FCC Part 15.209 Limit.
The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.
The spacing between the peripherals was 10 cm.





Frequency :9kHz-30MHz	Frequency :30MHz-1GHz	Frequency :Above 1GHz
RBW=10KHz,	RBW=120KHz,	RBW=1MHz,
VBW =30KHz	VBW=300KHz	VBW=3MHz(Peak), 10Hz(AV)
Sweep time= Auto	Sweep time= Auto	Sweep time= Auto
Trace = max hold	Trace = max hold	Trace = max hold
Detector function = peak	Detector function = peak, QP	Detector function = peak, AV

8.3 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Ant. Factor + Cable Loss – Ampl. Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – FCC Part 15 Limit

8.4 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

8.5 Summary of Test Results/Plots

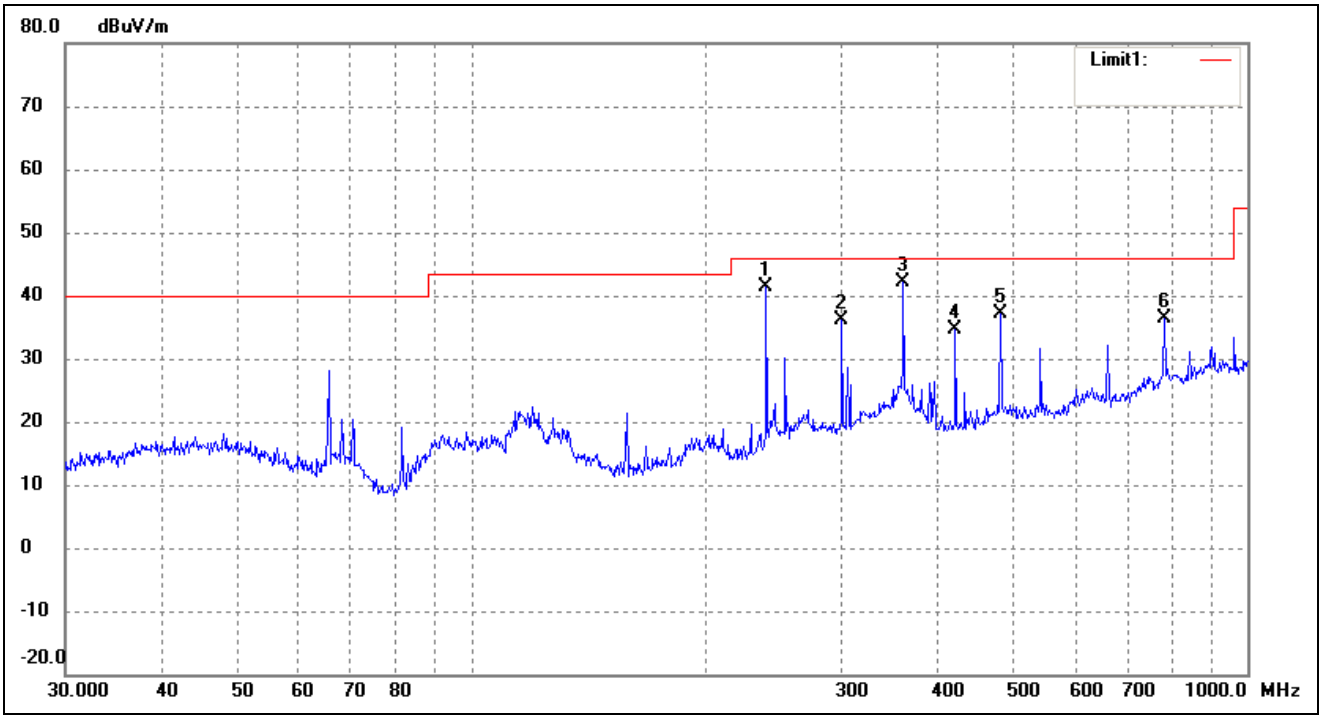
According to the data below, the FCC Part 15.205, 15.209 and 15.247 standards, and had the worst cases:

Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

Plot of Radiated Emissions Test Data (30MHz to 1GHz)

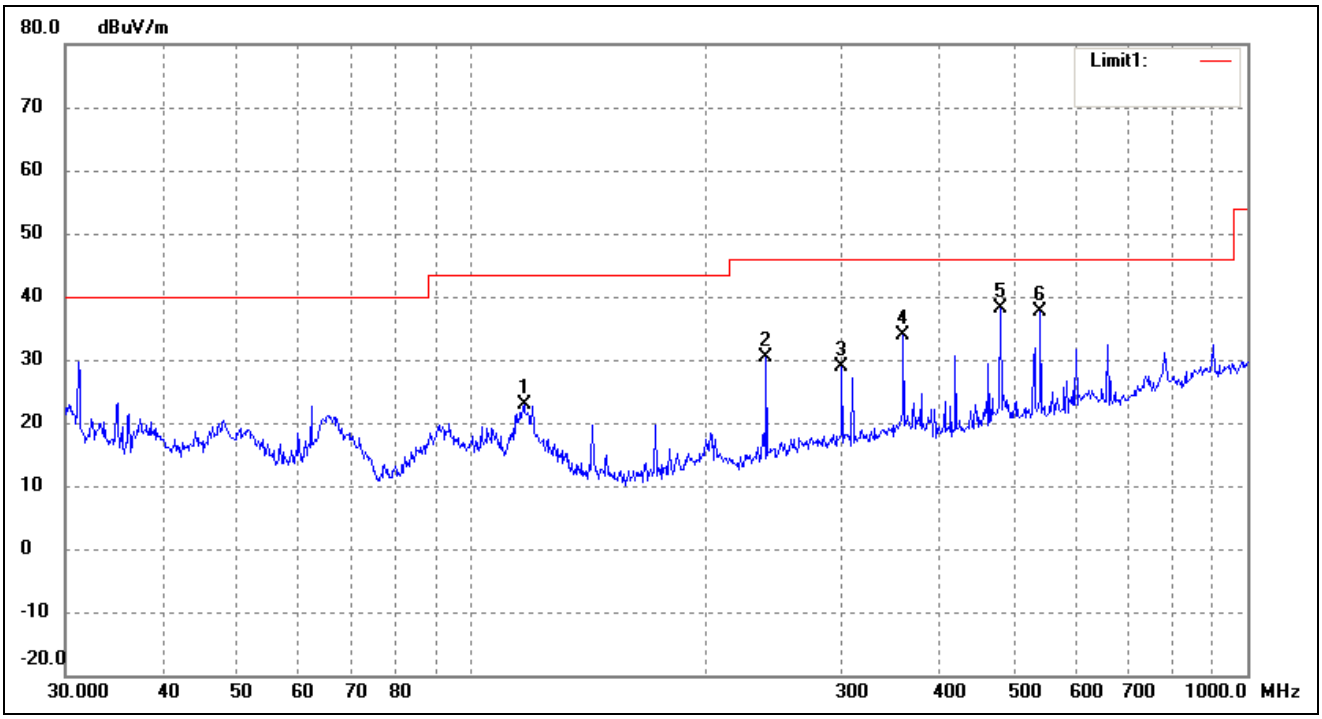
EUT: *FHD Wireless IP Camera*
Tested Model: *C1*
Operating Condition: *802.11b Transmitting Low Channel-2412MHz (worse case)*
Comment: *AC 120V/60Hz; Adapter DC 5V*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	239.9874	52.29	-10.96	41.33	46.00	-4.67	347	100	peak
2	300.3673	45.77	-9.75	36.02	46.00	-9.98	97	100	peak
3	360.4477	50.07	-7.88	42.19	46.00	-3.81	297	100	peak
4	420.5803	42.63	-7.91	34.72	46.00	-11.28	107	100	peak
5	480.5276	42.40	-5.36	37.04	46.00	-8.96	252	100	peak
6	782.3453	35.80	0.50	36.30	46.00	-9.70	265	100	peak

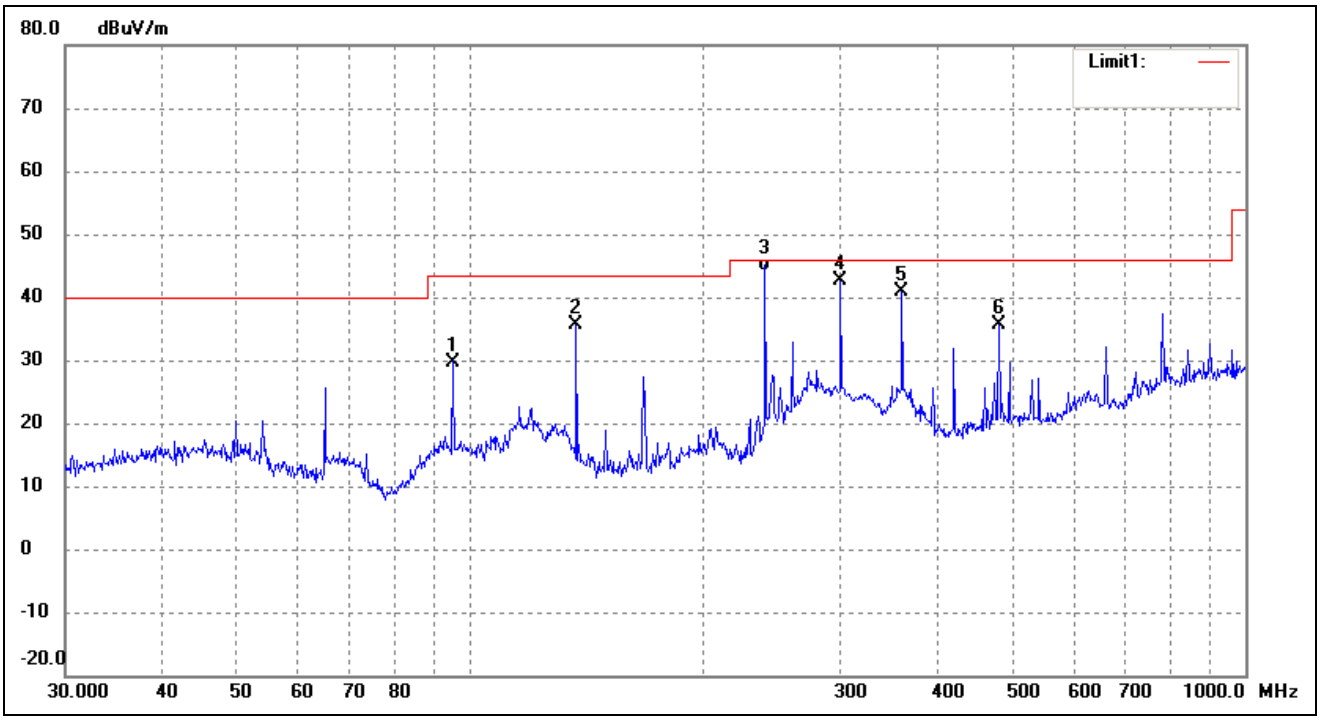
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	116.9495	36.15	-13.35	22.80	43.50	-20.70	70	100	peak
2	239.9874	41.34	-10.96	30.38	46.00	-15.62	124	100	peak
3	300.3673	38.68	-9.75	28.93	46.00	-17.07	88	100	peak
4	360.4477	41.72	-7.88	33.84	46.00	-12.16	123	100	peak
5	480.5276	43.38	-5.36	38.02	46.00	-7.98	55	100	peak
6	541.3725	43.37	-5.74	37.63	46.00	-8.37	323	100	peak

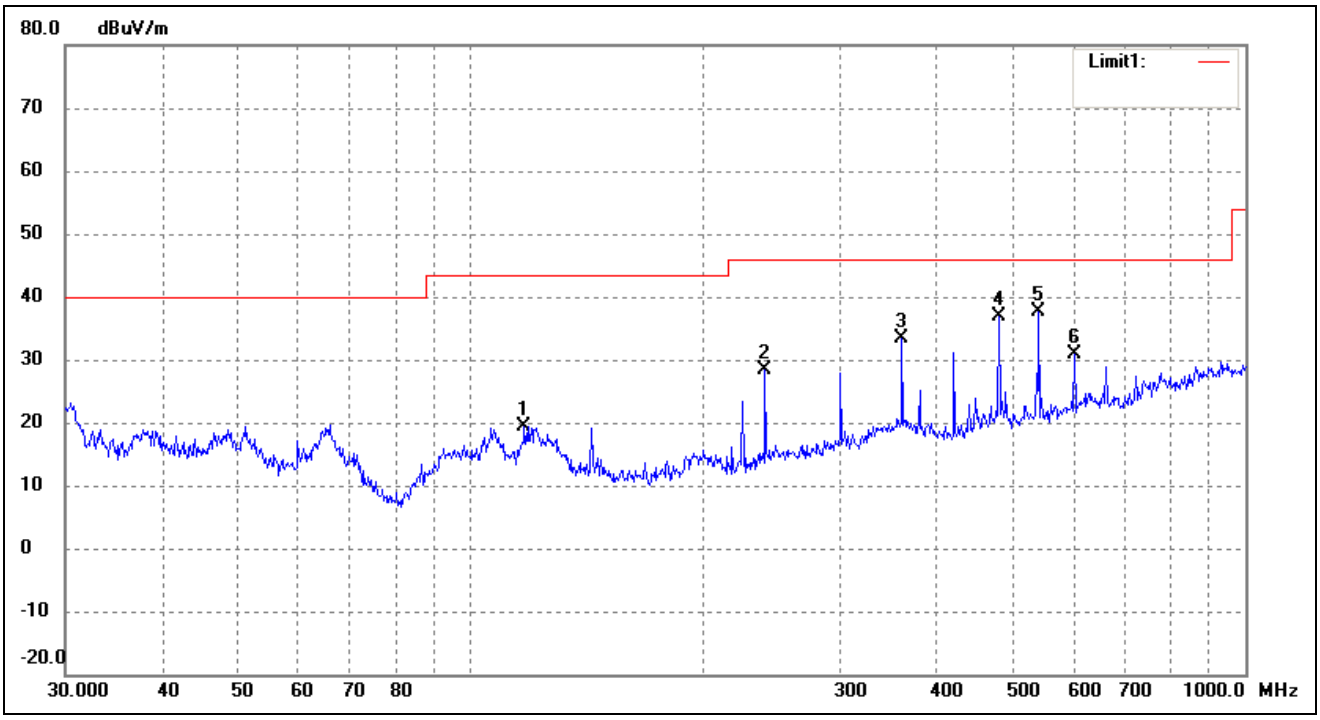
Operating Condition: *802.11b Transmitting Middle Channel-2437MHz (worse case)*
Comment: *AC 120V/60Hz; Adapter DC 5V*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	94.7601	42.31	-12.56	29.75	43.50	-13.75	292	100	peak
2	136.9392	50.20	-14.63	35.57	43.50	-7.93	90	100	peak
3	239.9874	55.15	-10.96	44.19	46.00	-1.81	61	100	QP
4	300.3673	52.32	-9.75	42.57	46.00	-3.43	97	100	peak
5	360.4477	48.73	-7.88	40.85	46.00	-5.15	282	100	peak
6	480.5276	40.99	-5.36	35.63	46.00	-10.37	127	100	peak

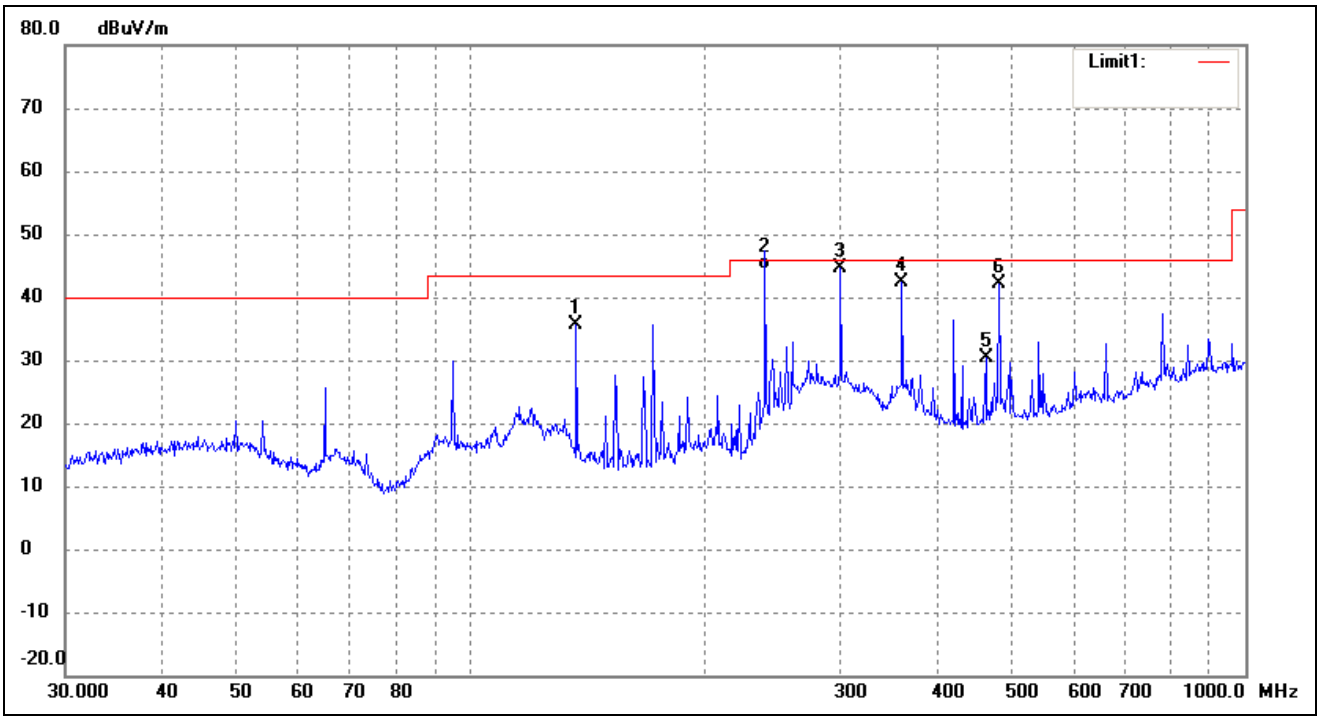
Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	117.3603	32.75	-13.40	19.35	43.50	-24.15	64	100	peak
2	239.9874	39.39	-10.96	28.43	46.00	-17.57	130	100	peak
3	360.4477	41.35	-7.88	33.47	46.00	-12.53	103	100	peak
4	480.5276	42.21	-5.36	36.85	46.00	-9.15	140	100	peak
5	541.3725	43.32	-5.74	37.58	46.00	-8.42	186	100	peak
6	601.4265	35.14	-4.20	30.94	46.00	-15.06	343	100	peak

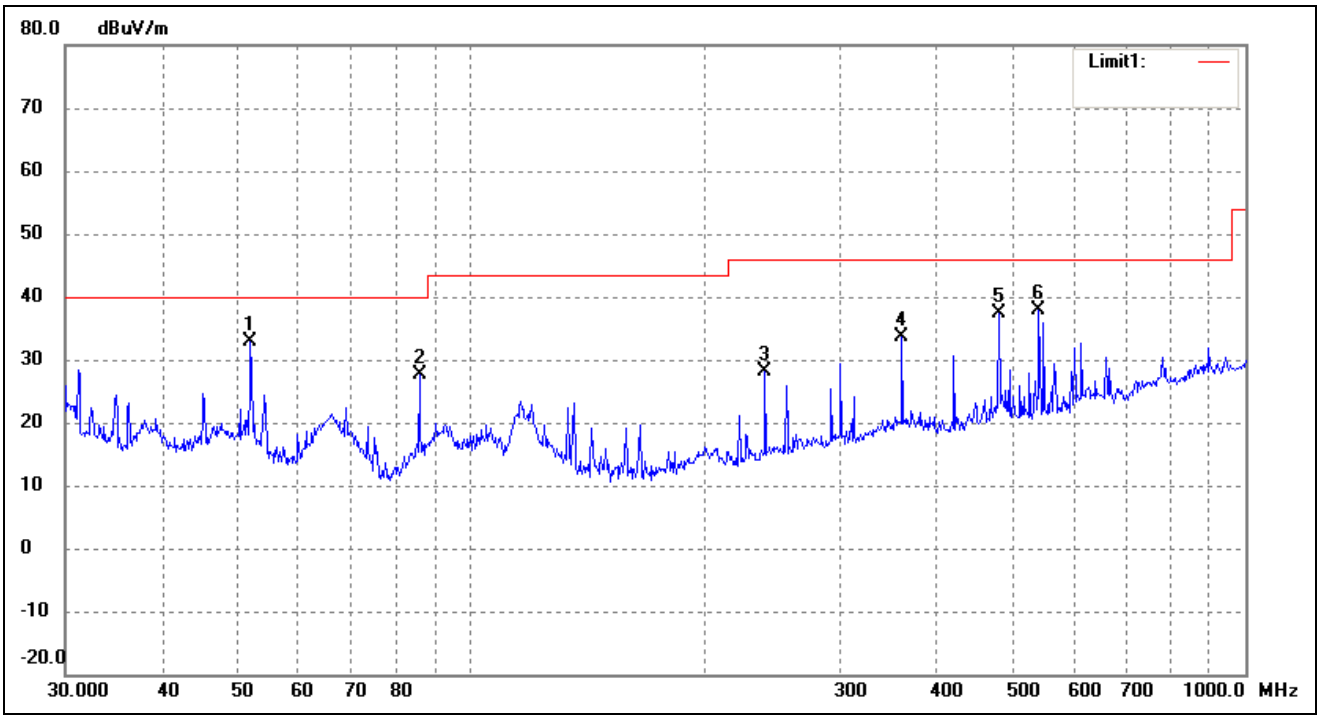
Operating Condition: *802.11b Transmitting High Channel-2462MHz (worse case)*
Comment: *AC 120V/60Hz; Adapter DC 5V*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	136.9392	50.20	-14.63	35.57	43.50	-7.93	146	100	peak
2	239.9874	55.41	-10.96	44.45	46.00	-1.55	116	100	QP
3	300.3673	54.32	-9.75	44.57	46.00	-1.43	50	100	peak
4	360.4477	50.35	-7.88	42.47	46.00	-3.53	312	100	peak
5	462.3455	36.99	-6.61	30.38	46.00	-15.62	340	100	peak
6	480.5276	47.54	-5.36	42.18	46.00	-3.82	336	100	peak

Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	52.0251	43.96	-11.07	32.89	40.00	-7.11	149	100	peak
2	85.8984	42.99	-15.48	27.51	40.00	-12.49	94	100	peak
3	239.9874	38.99	-10.96	28.03	46.00	-17.97	60	100	peak
4	360.4476	41.57	-7.88	33.69	46.00	-12.31	252	100	peak
5	480.5276	42.80	-5.36	37.44	46.00	-8.56	310	100	peak
6	541.3725	43.72	-5.74	37.98	46.00	-8.02	333	100	peak

Spurious Emissions Above 1GHz

Test Mode: 802.11b (worse case)

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2412MHz							
4824.000	65.93	-3.87	62.06	74	-11.94	H	PK
4824.000	51.36	-3.87	47.49	54	-6.51	H	AV
7236.000	66.98	1.14	68.12	74	-5.88	H	PK
7236.000	48.23	1.19	49.42	54	-4.58	H	AV
4824.000	65.23	-3.86	61.37	74	-12.63	V	PK
4824.000	51.24	-3.86	47.38	54	-6.62	V	AV
7236.000	65.80	1.1	66.90	74	-7.10	V	PK
7236.000	46.66	1.1	47.76	54	-6.24	V	AV
Middle Channel-2437MHz							
4874.000	66.34	-3.74	62.60	74	-11.40	H	PK
4874.000	53.43	-3.74	49.69	54	-4.31	H	AV
7311.000	67.70	1.47	69.17	74	-4.83	H	PK
7311.000	46.82	1.47	48.29	54	-5.71	H	AV
4874.000	66.62	-3.74	62.88	74	-11.12	V	PK
4874.000	51.74	-3.74	48.00	54	-6.00	V	AV
7311.000	66.16	1.47	67.63	74	-6.37	V	PK
7311.000	46.92	1.47	48.39	54	-5.61	V	AV
High Channel-2462MHz							
4924.000	67.02	-3.59	63.43	74	-10.57	H	PK
4924.000	51.72	-3.59	48.13	54	-5.87	H	AV
7386.000	65.41	1.79	67.20	74	-6.80	H	PK
7386.000	46.65	1.79	48.44	54	-5.56	H	AV
4924.000	67.27	-3.59	63.68	74	-10.32	V	PK
4924.000	50.08	-3.59	46.49	54	-7.51	V	AV
7386.000	67.87	1.79	69.66	74	-4.34	V	PK
7386.000	47.14	1.79	48.93	54	-5.07	V	AV

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

9. Out of Band Emissions

9.1 Standard Applicable

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

9.2 Test Procedure

According to the KDB 558074D01 v04, the band-edge radiated test method as follows:

Set span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation (2310MHz to 2420MHz for low bandedge, 2460MHz to 2500MHz for the high bandedge)
RBW = 1MHz, VBW = 1MHz for peak value measured
RBW = 1MHz, VBW = 10Hz for average value measured
Sweep = auto; Detector function = peak/average; Trace = max hold
All the trace to stabilize, set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. Those emission must comply with the 15.209 limit for fall in the restricted bands listed in section 15.205. Note that the method of measurement KDB publication number: 913591 may be used for the radiated bandedge measurements.

According to the KDB 558074 D01 v04, the conducted spurious emissions test method as follows:
1. Set start frequency to DTS channel edge frequency.
2. Set stop frequency so as to encompass the spectrum to be examined.
3. Set RBW = 100 kHz.
4. Set VBW ≥ 300 kHz.
5. Detector = peak.
6. Trace Mode = max hold.
7. Sweep = auto couple.
8. Allow the trace to stabilize (this may take some time, depending on the extent of the span).
9. Use peak marker function to determine maximum amplitude of all unwanted emissions within any 100 kHz bandwidth.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements specified in section 8.1. Report the three highest emissions relative to the limit.

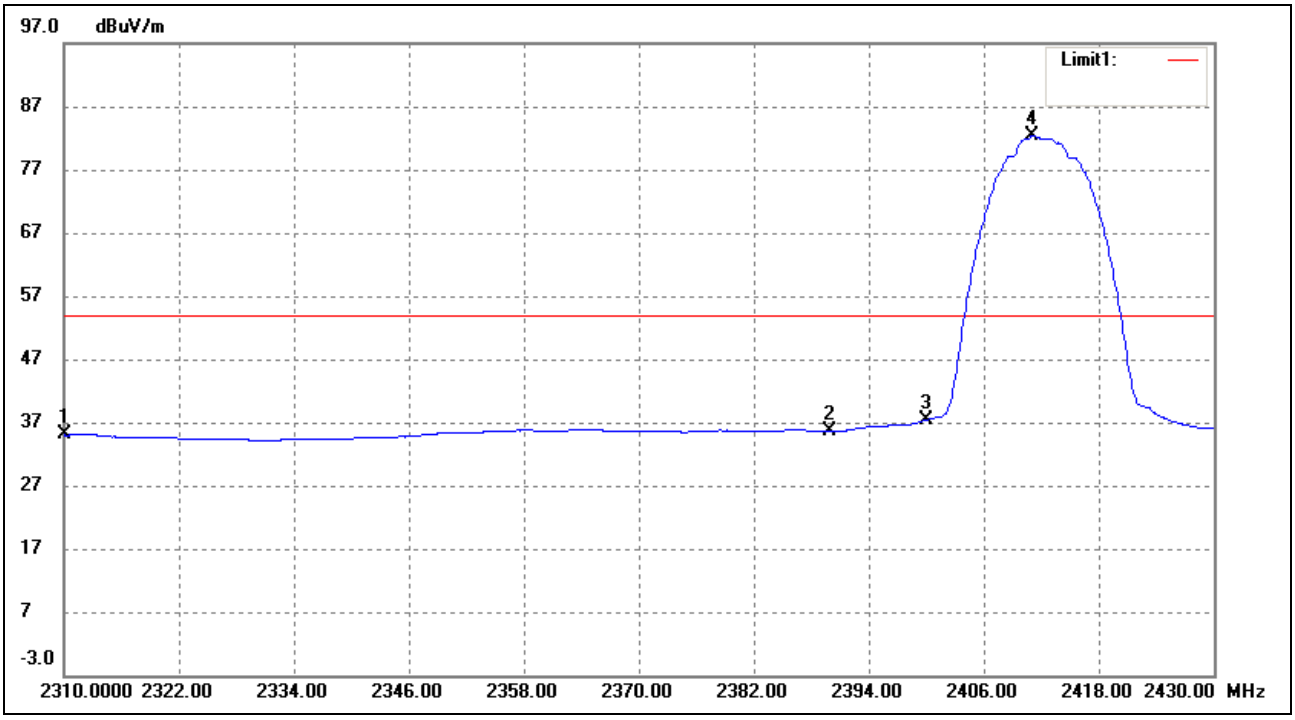
9.3 Environmental Conditions

Temperature:	23°C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

9.4 Summary of Test Results/Plots

802.11b-Lowest Bandedge

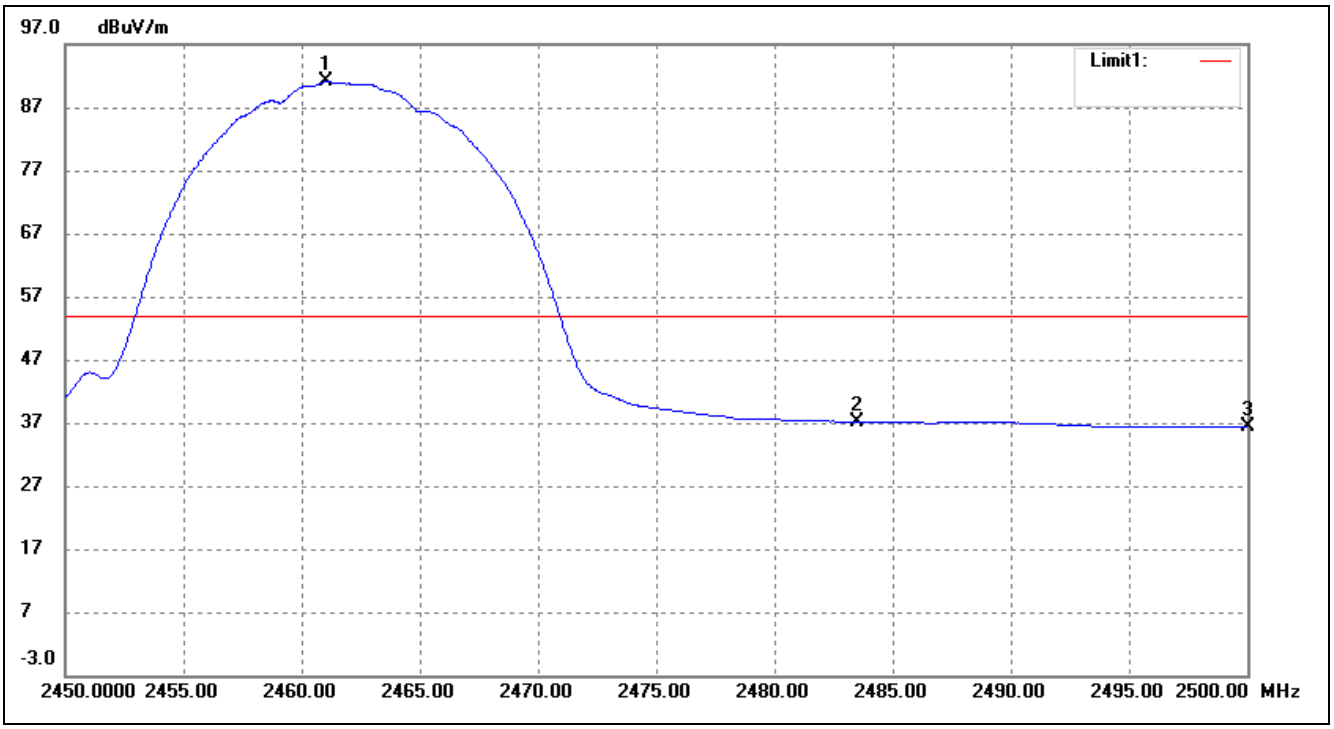
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	18.68	16.34	35.02	54.00	-18.98	Average Detector
	2310.000	31.80	16.34	48.14	74.00	-25.86	Peak Detector
2	2390.000	18.58	17.03	35.61	54.00	-18.39	Average Detector
	2390.000	32.56	17.03	49.59	74.00	-24.41	Peak Detector
3	2400.000	20.30	17.11	37.41	54.00	-16.59	Average Detector
	2400.000	39.71	17.11	56.82	74.00	-17.18	Peak Detector
4*	2411.040	65.20	17.19	82.39	/	/	Average Detector
	2411.400	82.75	17.19	99.94	/	/	Peak Detector

802.11b-Highest Bandedge

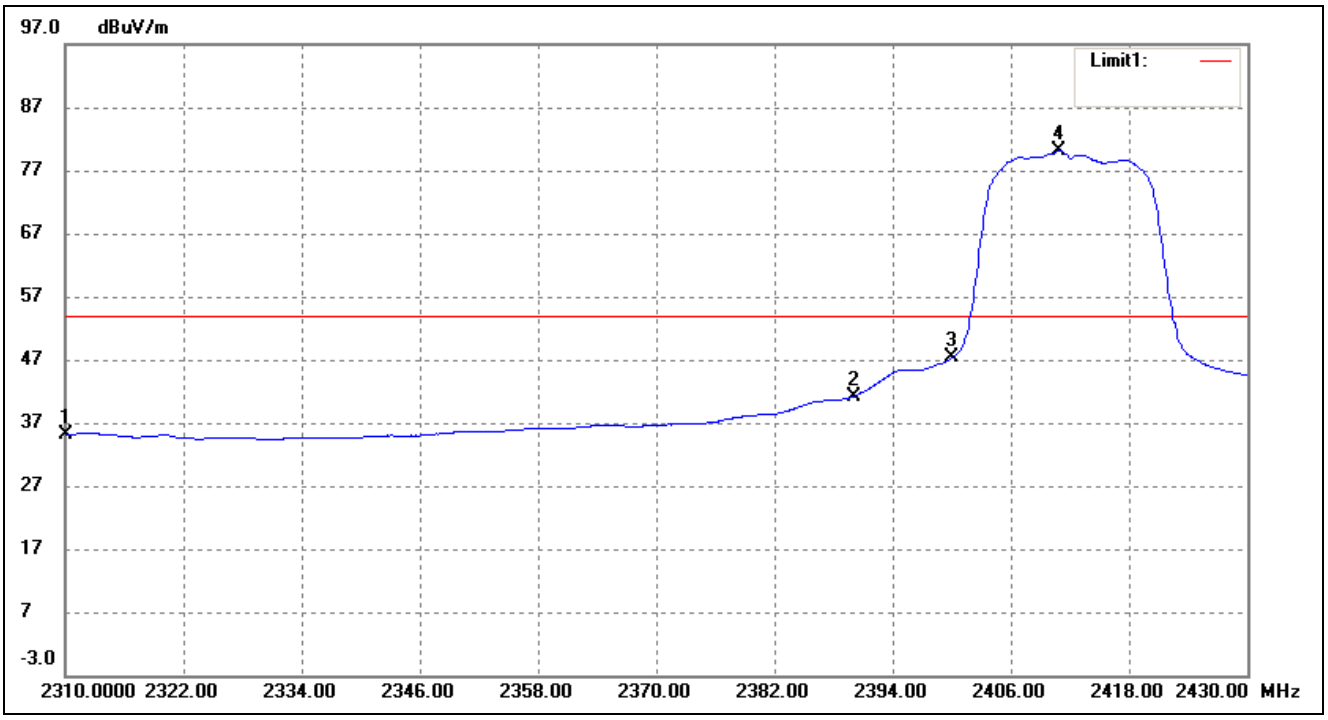
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1*	2461.050	73.57	17.56	91.13	/	/	Average Detector
	2461.850	81.73	17.57	99.30	/	/	Peak Detector
2	2483.500	19.42	17.73	37.15	54.00	-16.85	Average Detector
	2483.500	32.03	17.73	49.76	74.00	-24.24	Peak Detector
3	2500.000	18.55	17.86	36.41	54.00	-17.59	Average Detector
	2500.000	29.87	17.86	47.73	74.00	-26.27	Peak Detector

802.11g-Lowest Bandedge

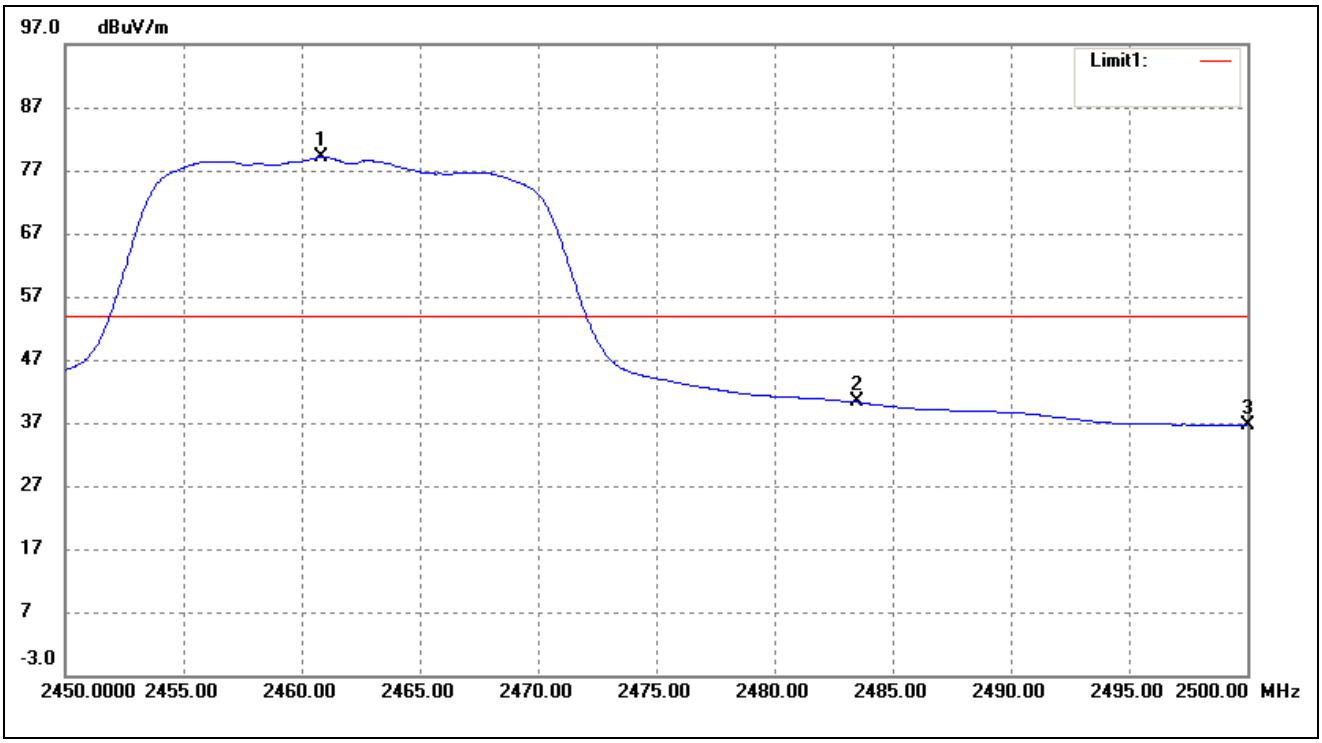
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	18.85	16.34	35.19	54.00	-18.81	Average Detector
	2310.000	30.04	16.34	46.38	74.00	-27.62	Peak Detector
2	2390.000	24.15	17.03	41.18	54.00	-12.82	Average Detector
	2390.000	34.76	17.03	51.79	74.00	-22.21	Peak Detector
3	2400.000	30.16	17.11	47.27	54.00	-6.73	Average Detector
	2400.000	40.33	17.11	57.44	74.00	-16.56	Peak Detector
4*	2410.800	62.88	17.19	80.07	/	/	Average Detector
	2411.400	74.26	17.19	91.45	/	/	Peak Detector

802.11g-Highest Bandedge

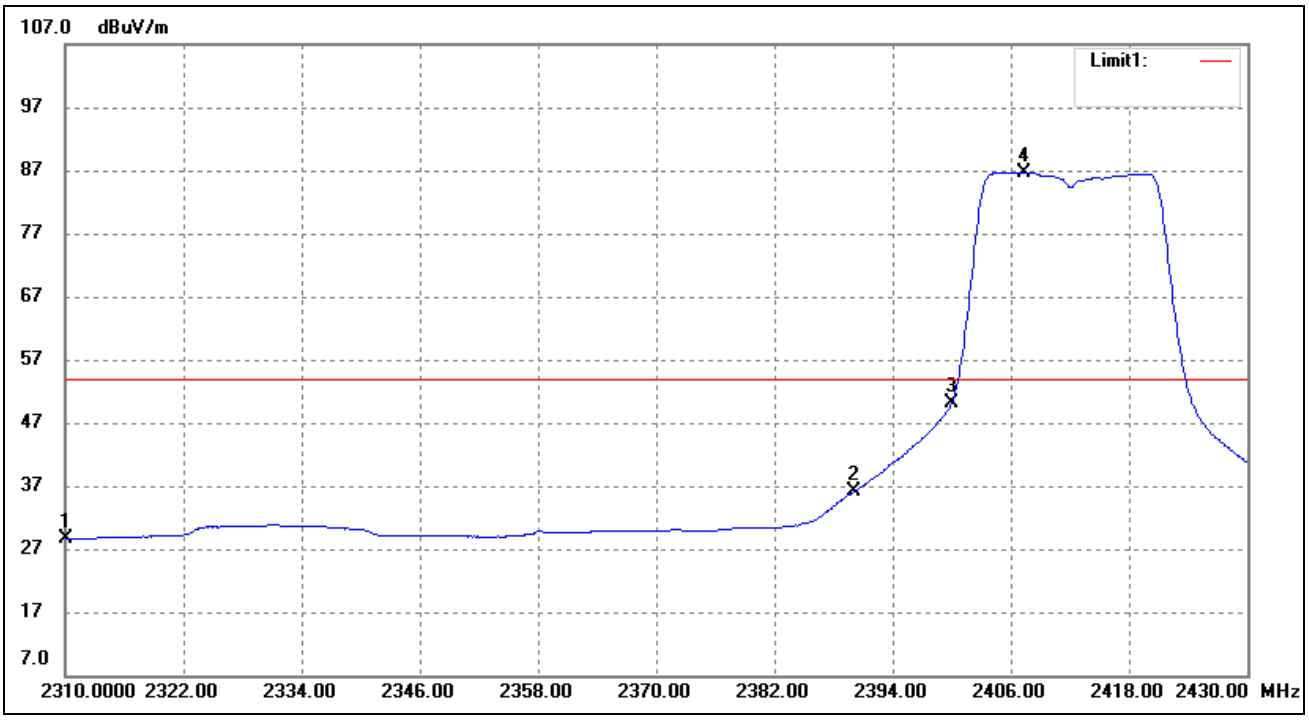
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1*	2460.850	61.58	17.56	79.14	/	/	Average Detector
	2461.250	82.48	17.57	100.05	/	/	Peak Detector
2	2483.500	22.53	17.73	40.26	54.00	-13.74	Average Detector
	2483.500	40.64	17.73	58.37	74.00	-15.63	Peak Detector
3	2500.000	18.71	17.86	36.57	54.00	-17.43	Average Detector
	2500.000	30.32	17.86	48.18	74.00	-25.82	Peak Detector

802.11n-HT20-Lowest Bandedge

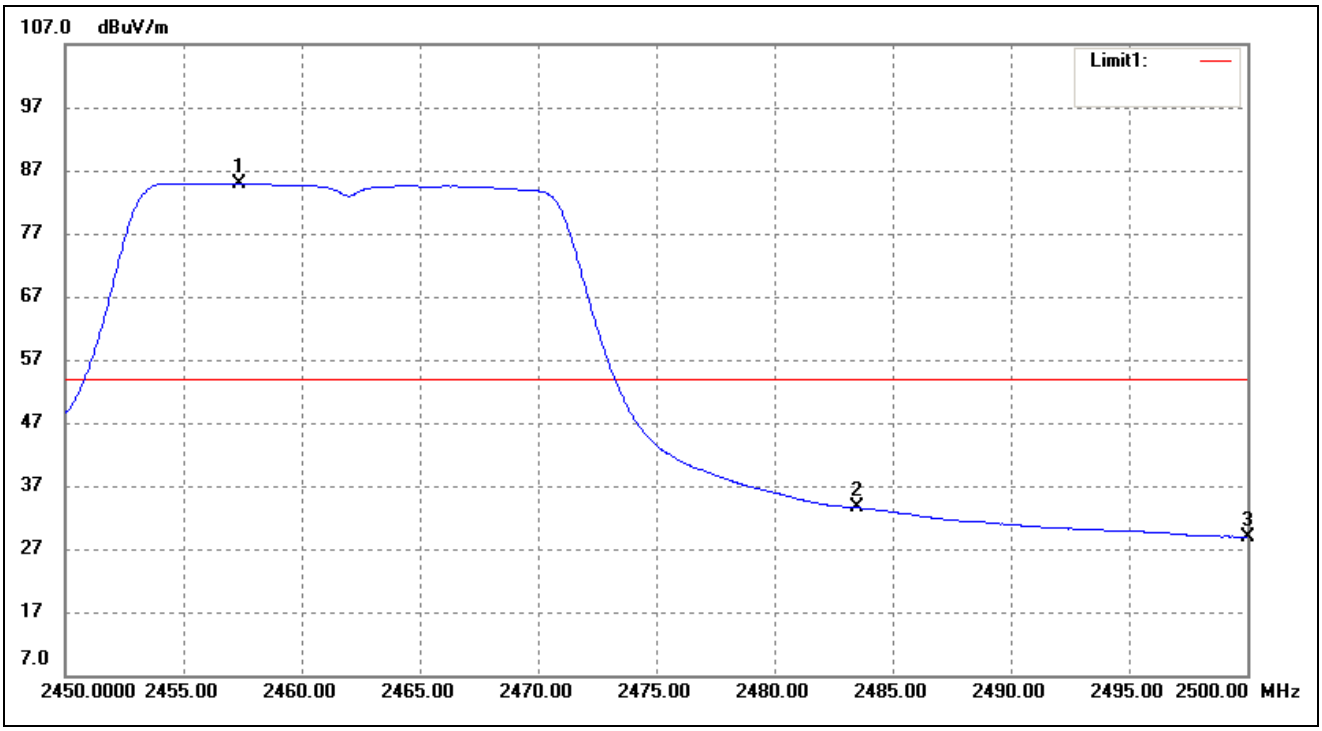
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	32.26	-3.71	28.55	54.00	-25.45	Average Detector
	2310.000	45.44	-3.71	41.73	74.00	-32.27	Peak Detector
2	2390.000	39.64	-3.54	36.10	54.00	-17.90	Average Detector
	2390.000	57.67	-3.54	54.13	74.00	-19.87	Peak Detector
3	2400.000	53.71	-3.51	50.20	54.00	-3.80	Average Detector
	2400.000	77.41	-3.51	73.90	74.00	-0.10	Peak Detector
4	2407.320	90.13	-3.49	86.64	/	/	Average Detector
	2407.440	101.28	-3.49	97.79	/	/	Peak Detector

802.11n-HT20-Highest Bandedge

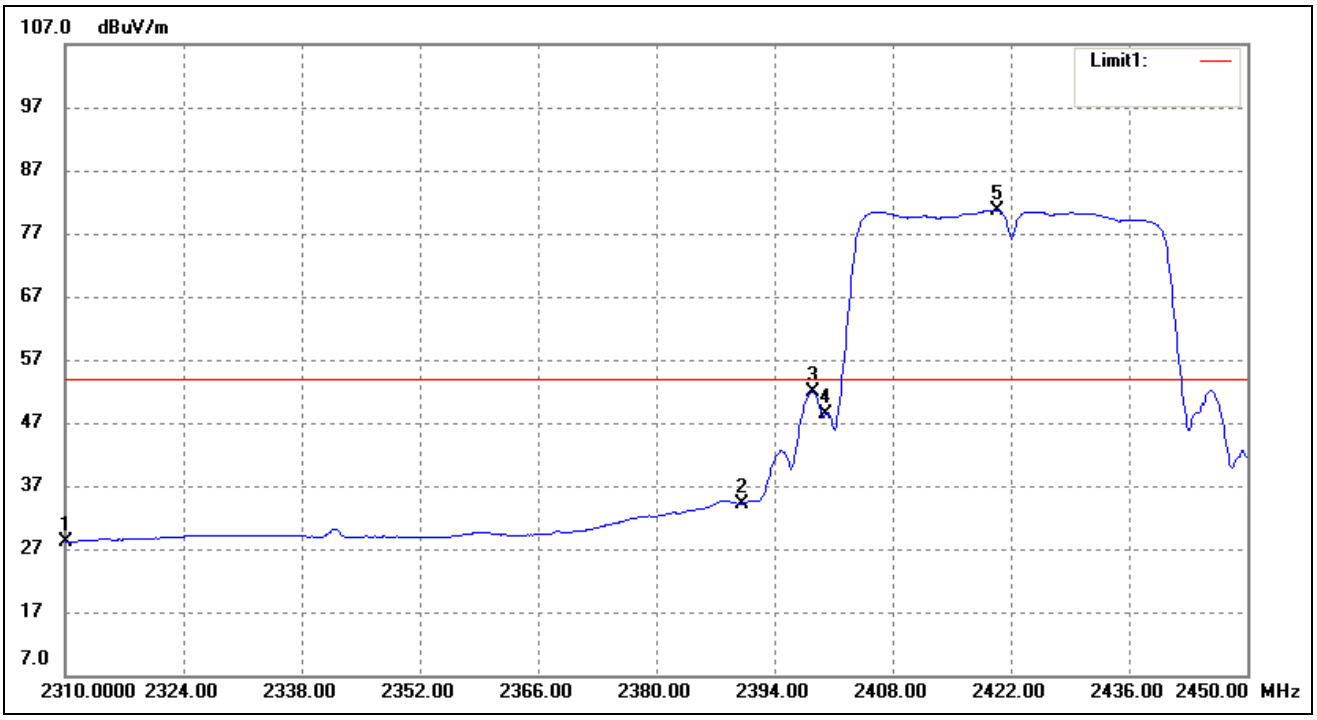
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2457.350	88.34	-3.38	84.96	/	/	Average Detector
	2459.000	99.44	-3.38	96.06	/	/	Peak Detector
2	2483.500	36.88	-3.33	33.55	54.00	-20.45	Average Detector
	2483.500	56.37	-3.33	53.04	74.00	-20.96	Peak Detector
3	2500.000	32.22	-3.28	28.94	54.00	-25.06	Average Detector
	2500.000	44.54	-3.28	41.26	74.00	-32.74	Peak Detector

802.11n-HT40-Lowest Bandedge

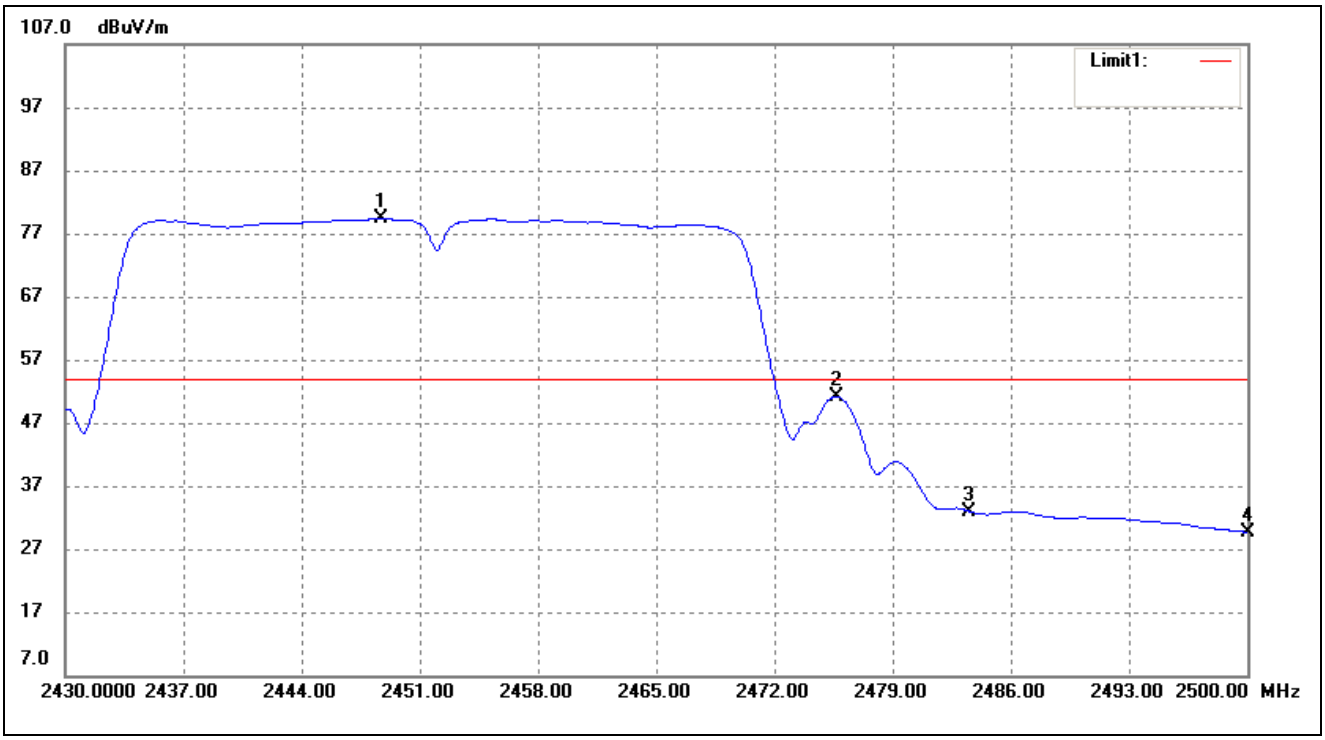
Vertical (Worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	31.89	-3.71	28.18	54.00	-25.82	Average Detector
	2310.000	44.45	-3.71	40.74	74.00	-33.26	Peak Detector
2	2390.000	37.74	-3.54	34.20	54.00	-19.80	Average Detector
	2390.000	53.88	-3.54	50.34	74.00	-23.66	Peak Detector
3	2398.480	55.35	-3.51	51.84	54.00	-2.16	Average Detector
4	2400.000	51.98	-3.51	48.47	54.00	-5.53	Average Detector
	2400.000	66.12	-3.51	62.61	74.00	-11.39	Peak Detector
5	2420.320	84.05	-3.46	80.59	/	/	Average Detector
	2425.220	95.57	-3.46	92.11	/	/	Peak Detector

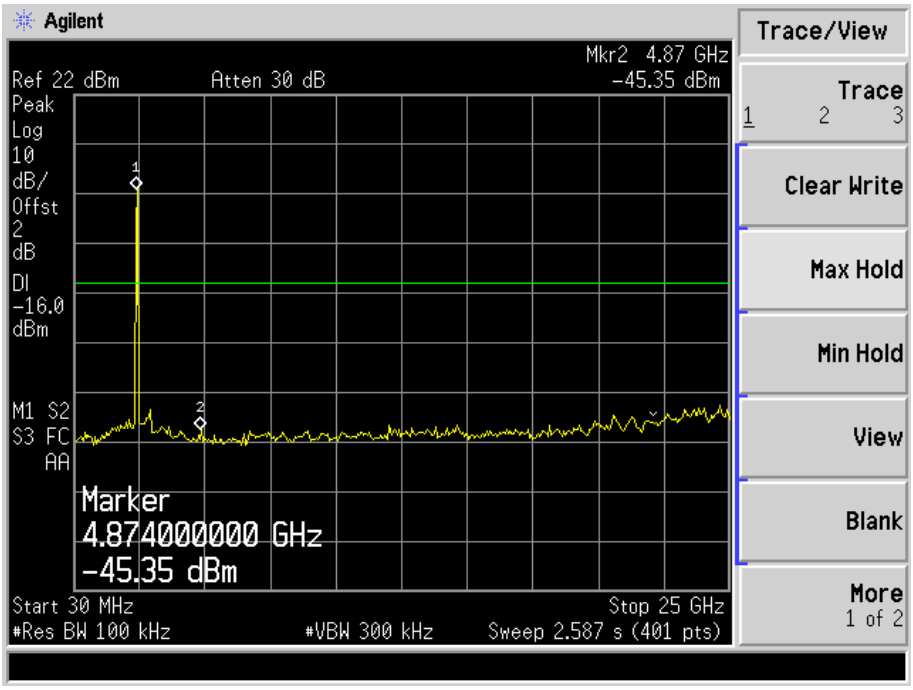
802.11n-HT40-Highest Bandedge

Vertical (Worst case)

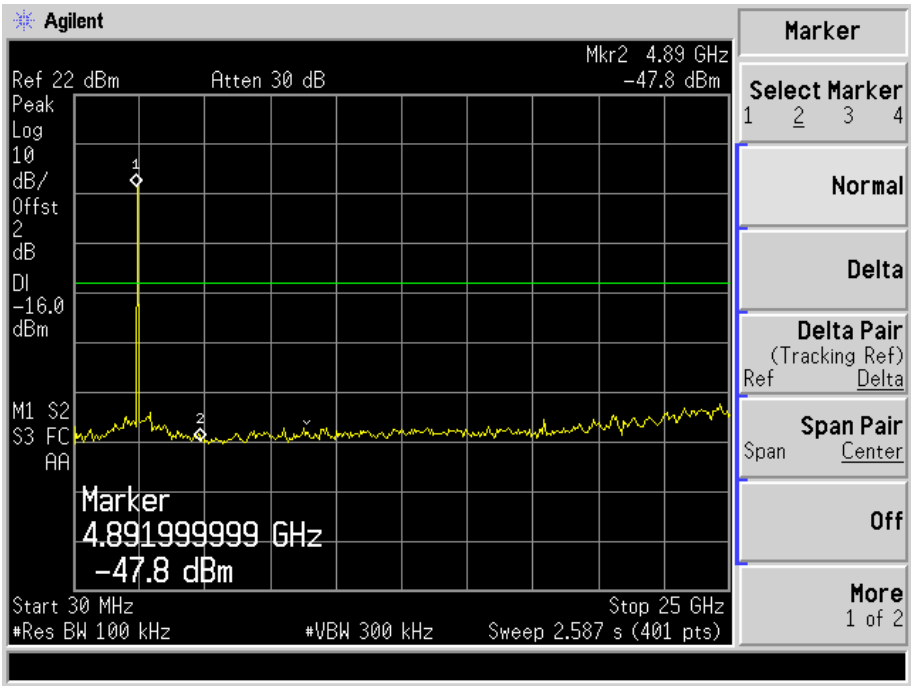


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2448.690	82.73	-3.40	79.33	/	/	Average Detector
	2455.130	94.23	-3.38	90.85	/	/	Peak Detector
2	2475.640	54.46	-3.34	51.12	54.00	-2.88	Average Detector
	2475.570	66.14	-3.34	62.80	74.00	-11.20	Peak Detector
3	2483.500	36.32	-3.33	32.99	54.00	-21.01	Average Detector
	2483.500	49.70	-3.33	46.37	74.00	-27.63	Peak Detector
4	2500.000	32.97	-3.28	29.69	54.00	-24.31	Average Detector
	2500.000	47.05	-3.28	43.77	74.00	-30.23	Peak Detector

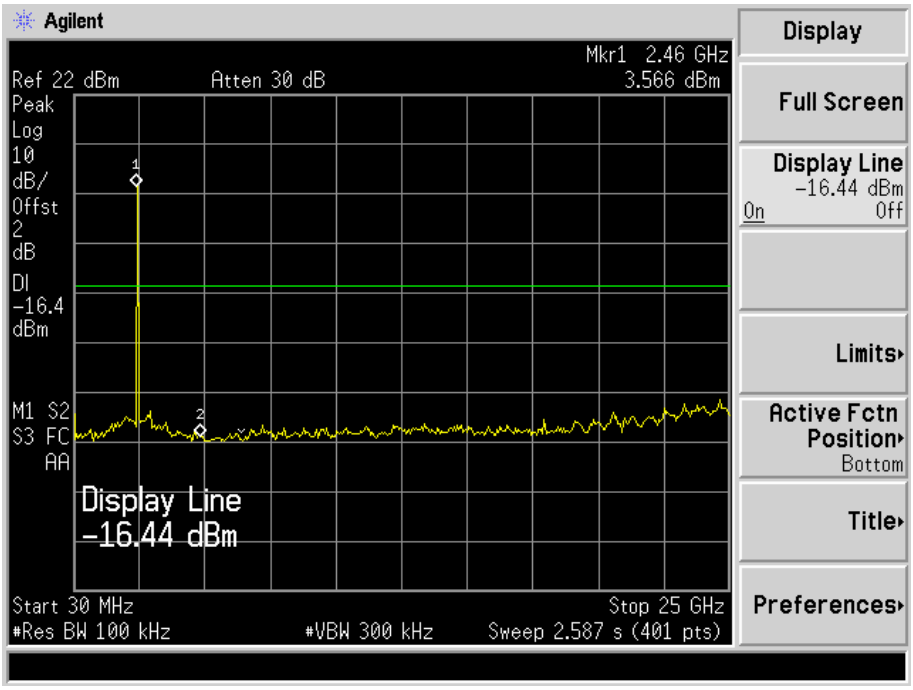
Spurious (Conducted)
802.11b-Lowest
Lowest



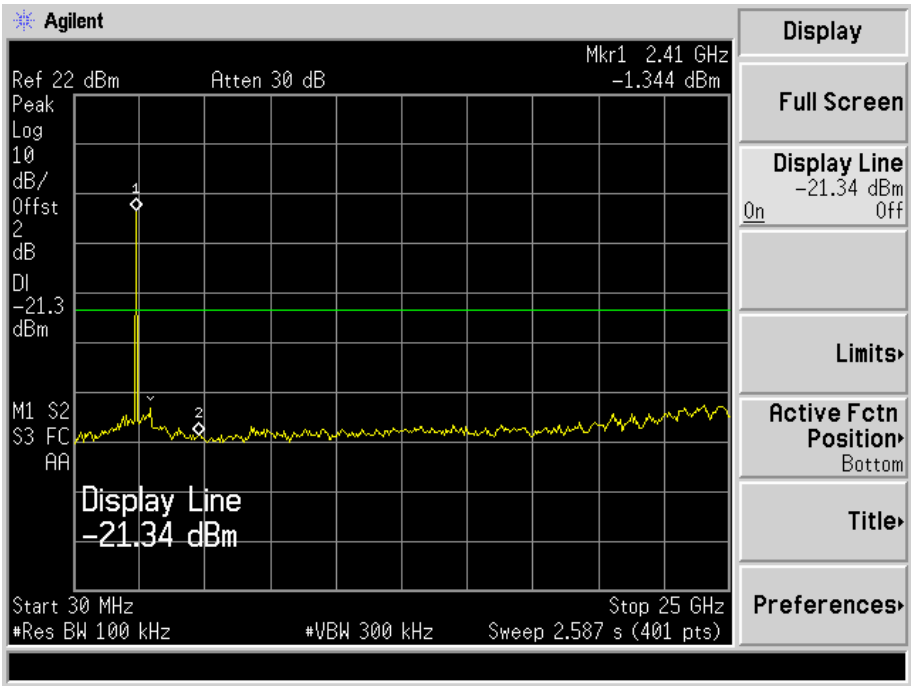
Middle



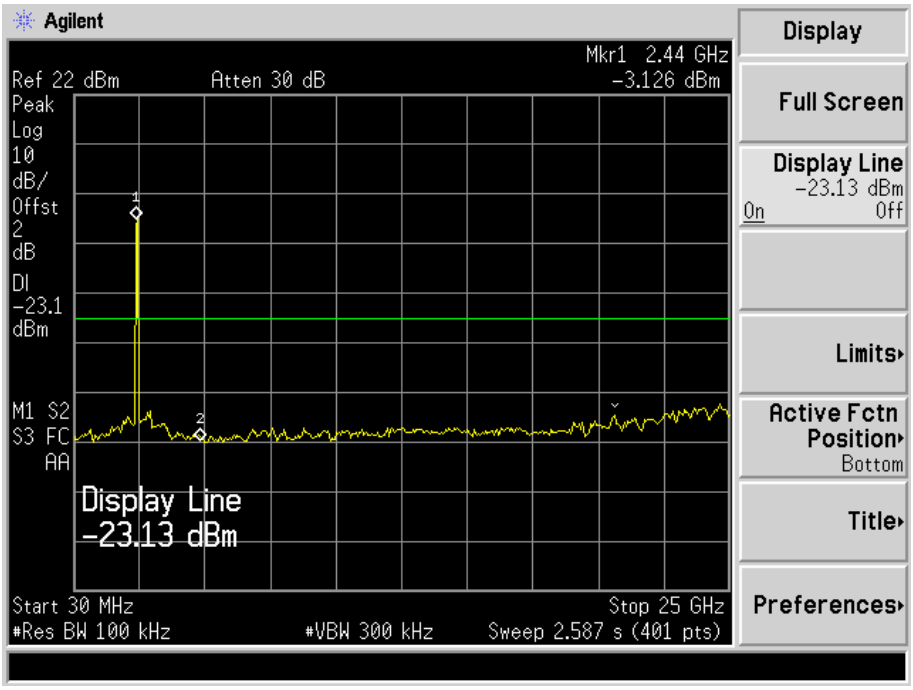
Highest



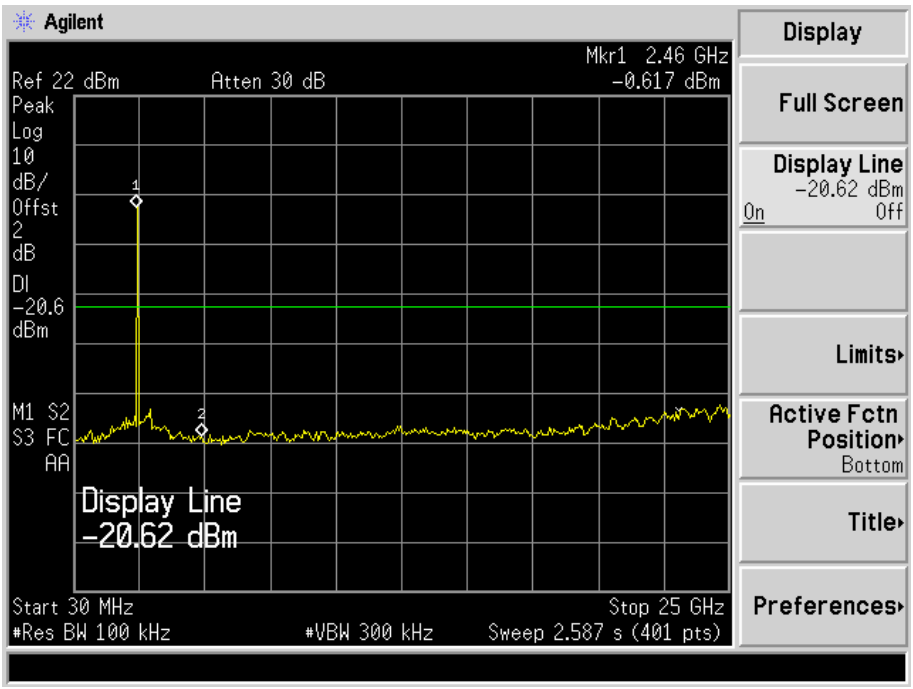
Spurious (Conducted)
802.11g-Lowest
Lowest



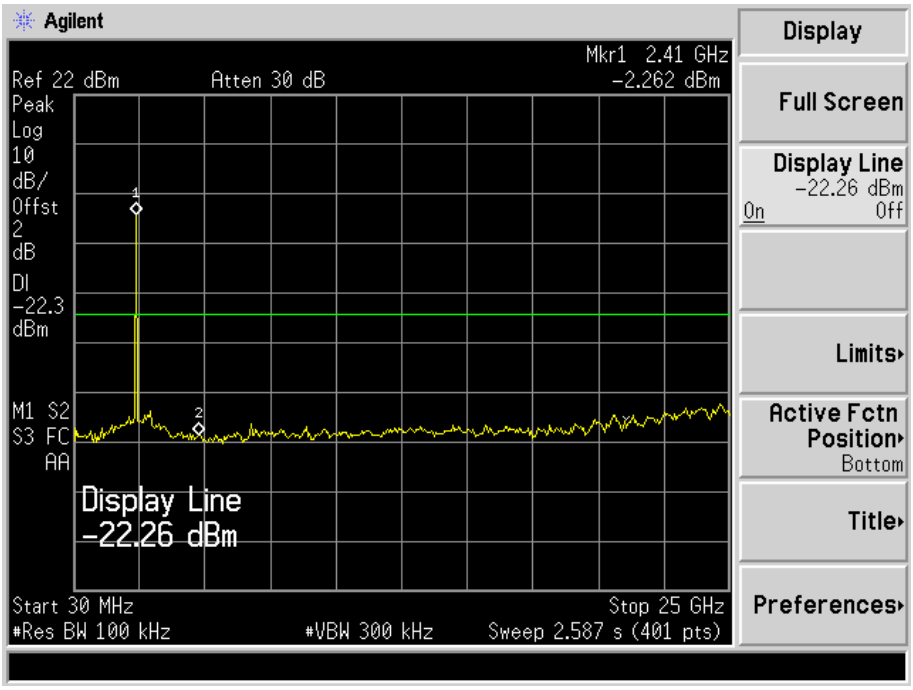
Middle



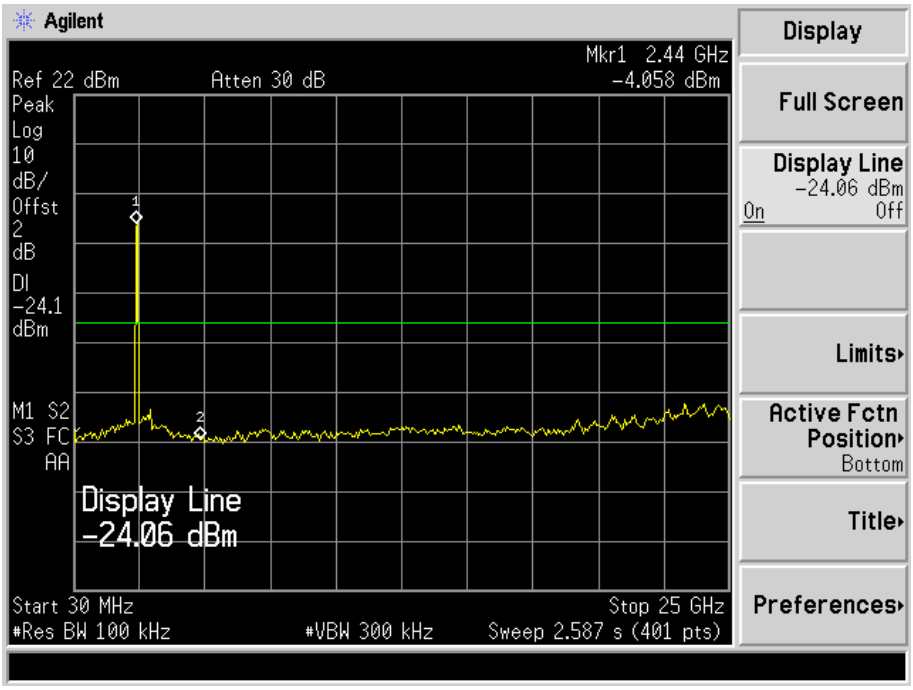
Highest



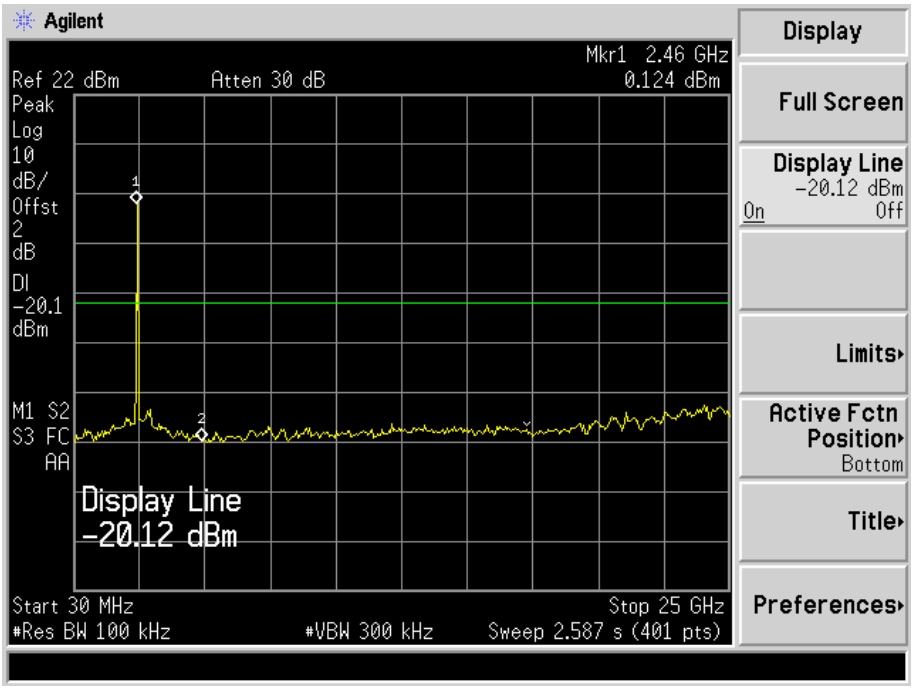
Spurious (Conducted)
802.11n-HT20-Lowest
Lowest



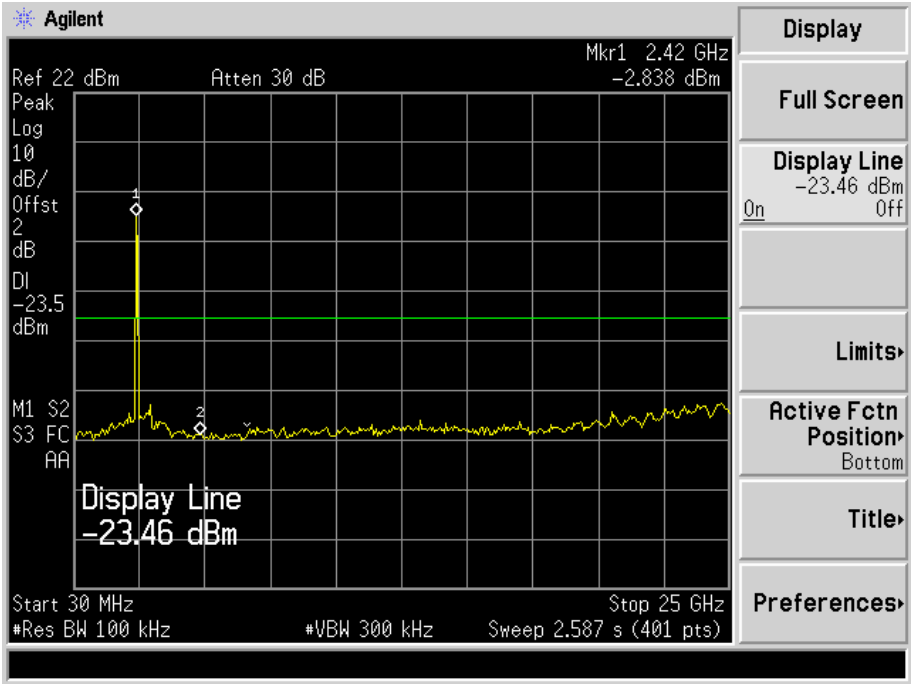
Middle



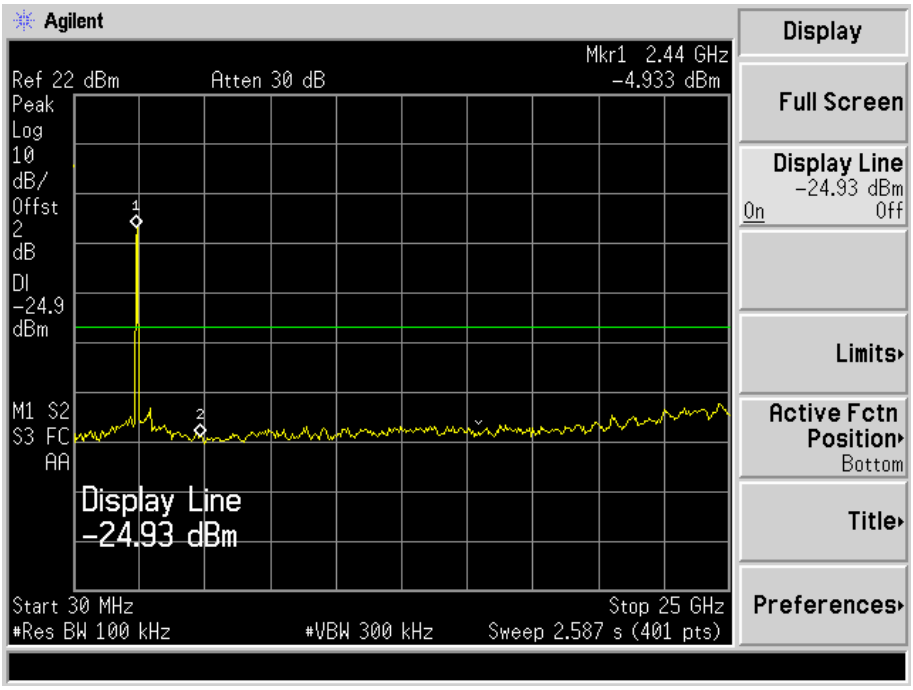
Highest



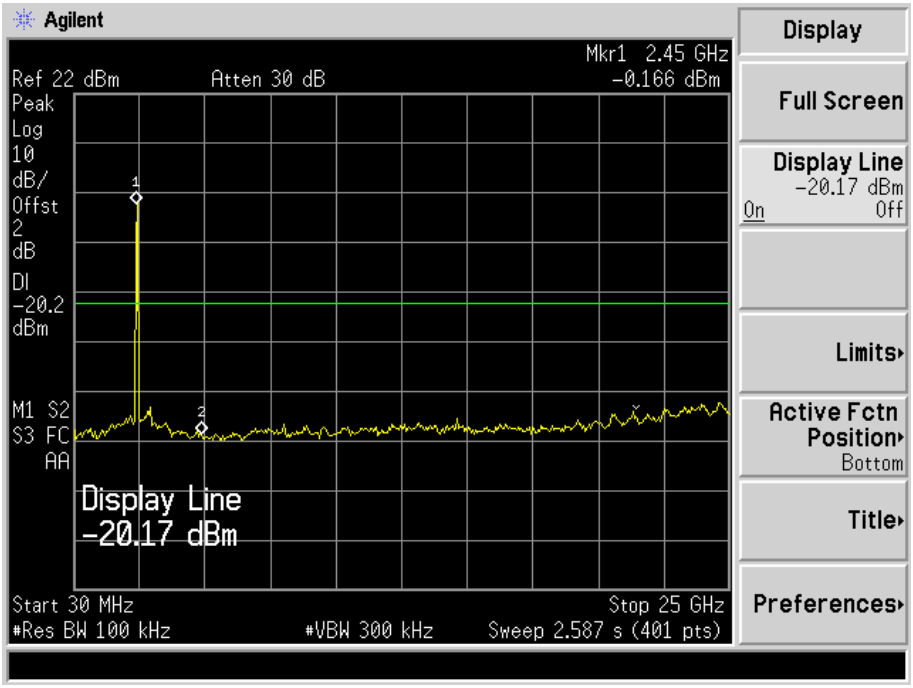
Spurious (Conducted)
802.11n-HT40-Lowest
Lowest



Middle



Highest

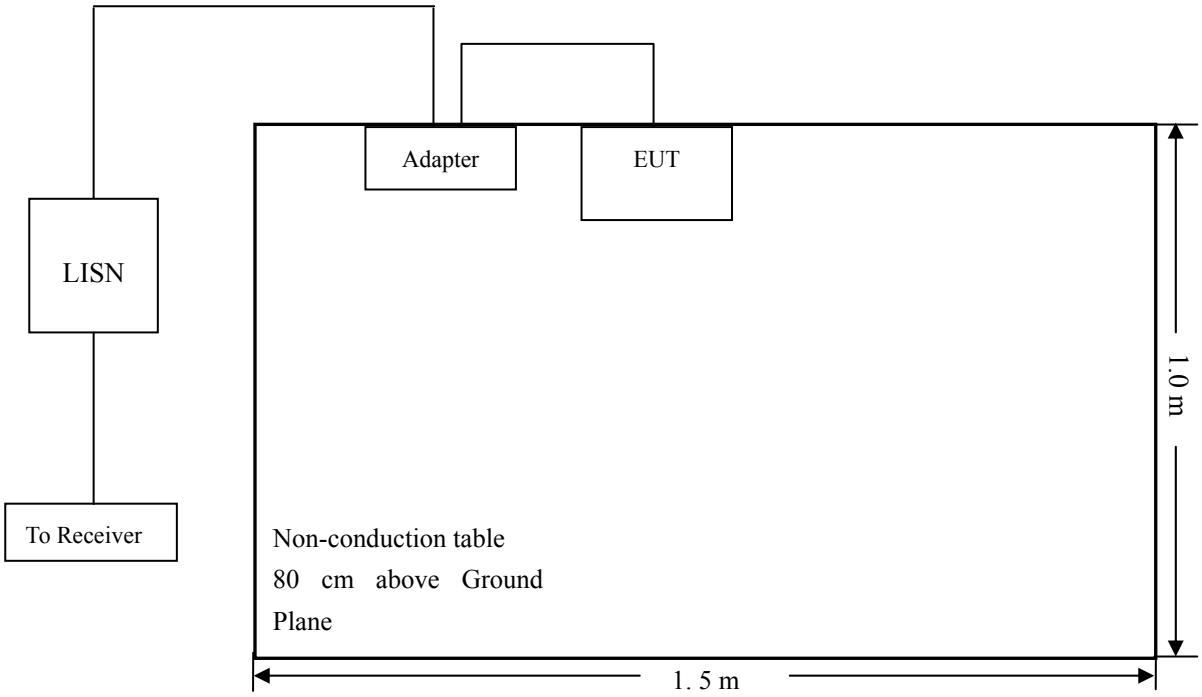


10. Conducted Emissions

10.1 Test Procedure

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15.207 Limit.
The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.
The spacing between the peripherals was 10 cm.

10.2 Basic Test Setup Block Diagram



10.3 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

10.4 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency ..... 150 kHz
Stop Frequency..... 30 MHz
Sweep Speed ..... Auto
IF Bandwidth..... 10 kHz
Quasi-Peak Adapter Bandwidth ..... 9 kHz
Quasi-Peak Adapter Mode ..... Normal

10.5 Summary of Test Results/Plots

According to the data in section 10.6, the EUT complied with the FCC Part 15.207 Conducted margin for this device, with the *worst* margin reading of:

-8.19 dB at 0.4900 MHz in the **Neutral** mode**, Average** detector, **Power Adapter #1**, **0.15-30MHz**

10.6 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

Power Adapter #1

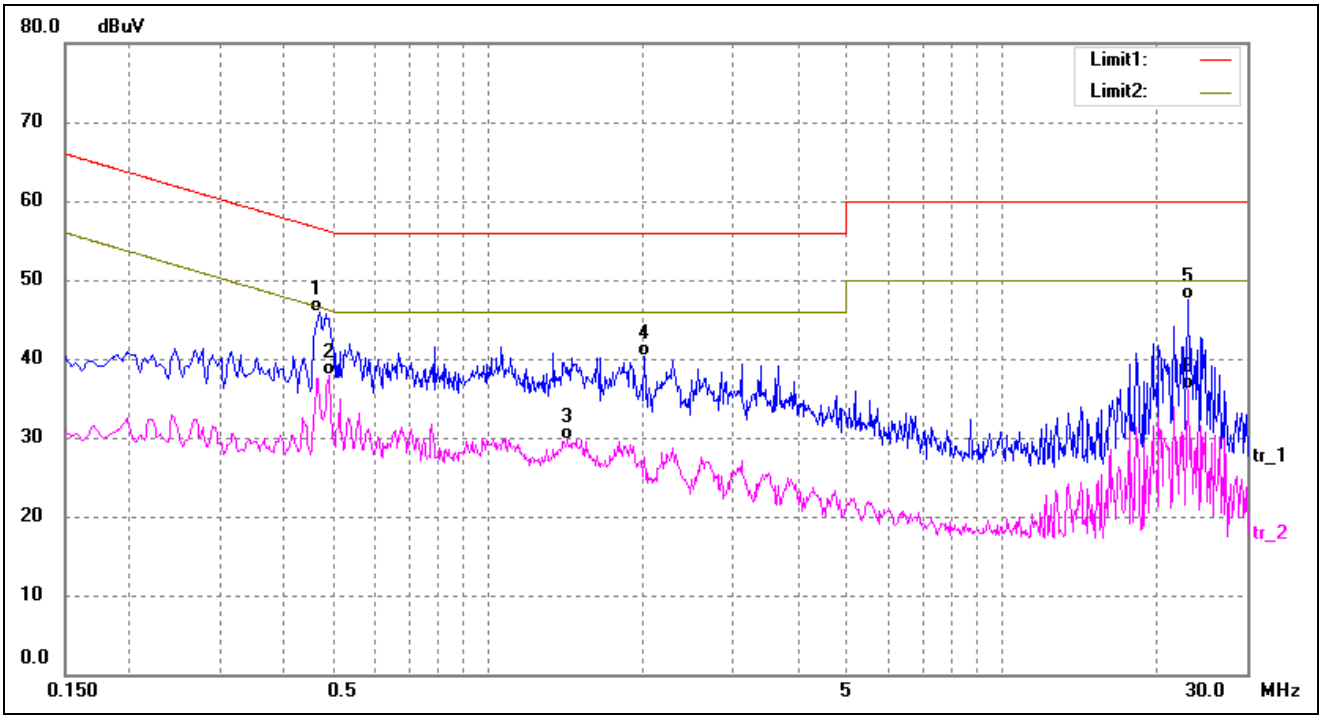
EUT: *FHD Wireless IP Camera*

Tested Model: *C1*

Operating Condition: *Transmitting(Wi-Fi)*

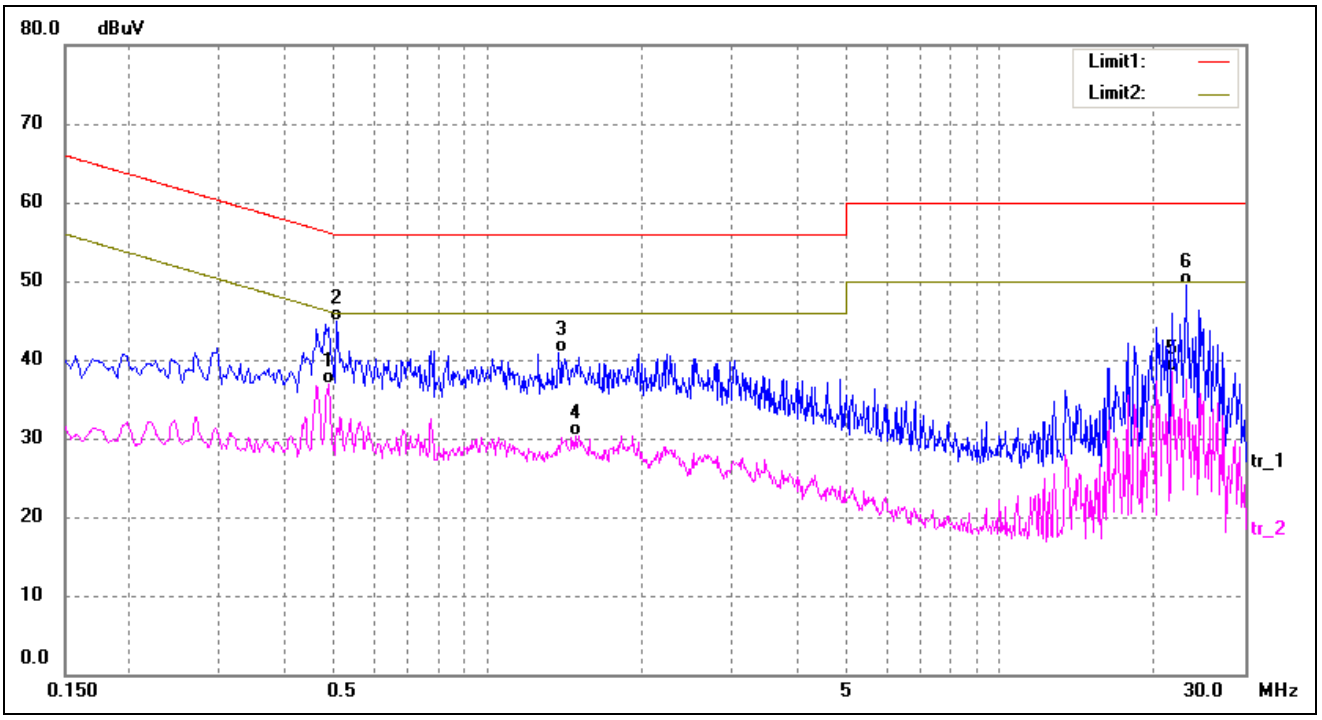
Comment: *AC 120V/60Hz; Adapter DC 5V*

Test Specification: *Neutral*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	0.4700	36.17	9.80	45.97	56.51	-10.54	QP
2*	0.4900	28.18	9.80	37.98	46.17	-8.19	AVG
3	1.4260	20.04	9.75	29.79	46.00	-16.21	AVG
4	2.0180	30.64	9.73	40.37	56.00	-15.63	QP
5	23.1300	37.87	9.69	47.56	60.00	-12.44	QP
6	23.1300	26.33	9.69	36.02	50.00	-13.98	AVG

Test Specification: *Line*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1*	0.4900	27.13	9.80	36.93	46.17	-9.24	AVG
2	0.5100	35.01	9.80	44.81	56.00	-11.19	QP
3	1.3740	31.06	9.75	40.81	56.00	-15.19	QP
4	1.4820	20.65	9.75	30.40	46.00	-15.60	AVG
5	21.6620	28.85	9.68	38.53	50.00	-11.47	AVG
6	23.1300	39.85	9.69	49.54	60.00	-10.46	QP

Plot of Conducted Emissions Test Data

Power Adapter #2

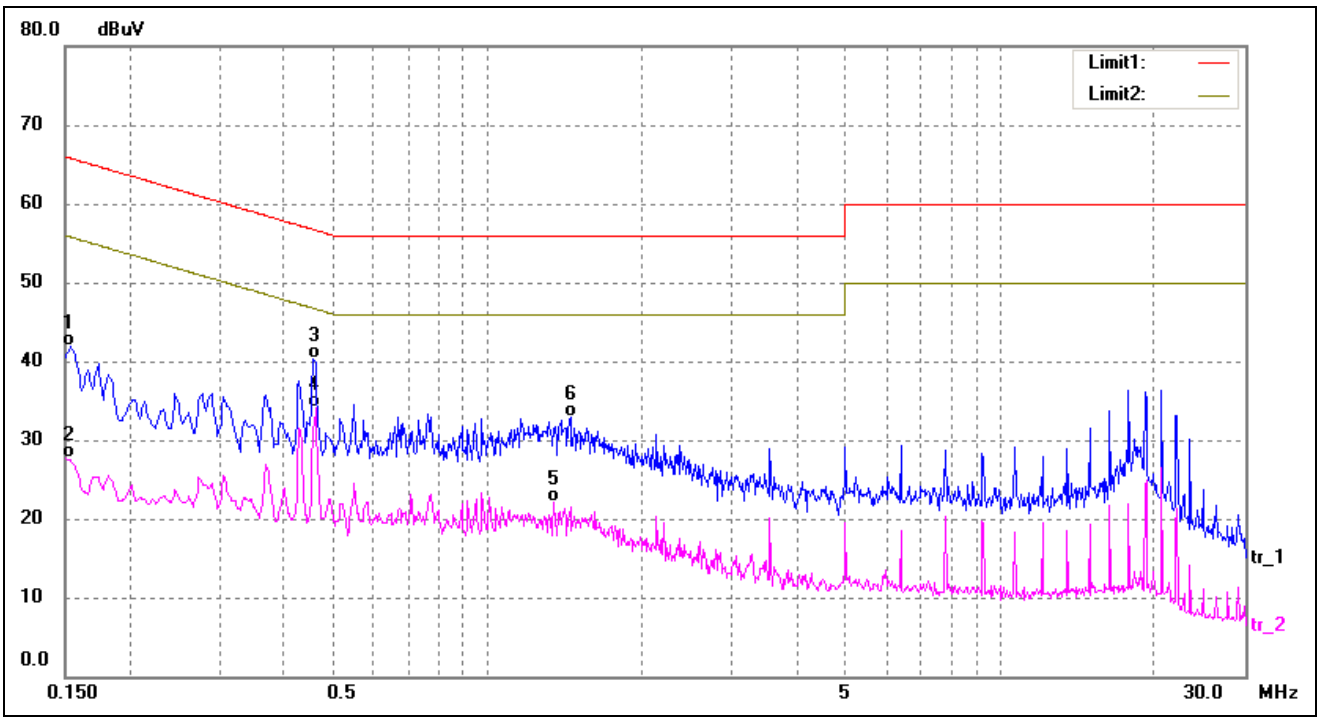
EUT: *FHD Wireless IP Camera*

Tested Model: *C1*

Operating Condition: *Transmitting(Wi-Fi)*

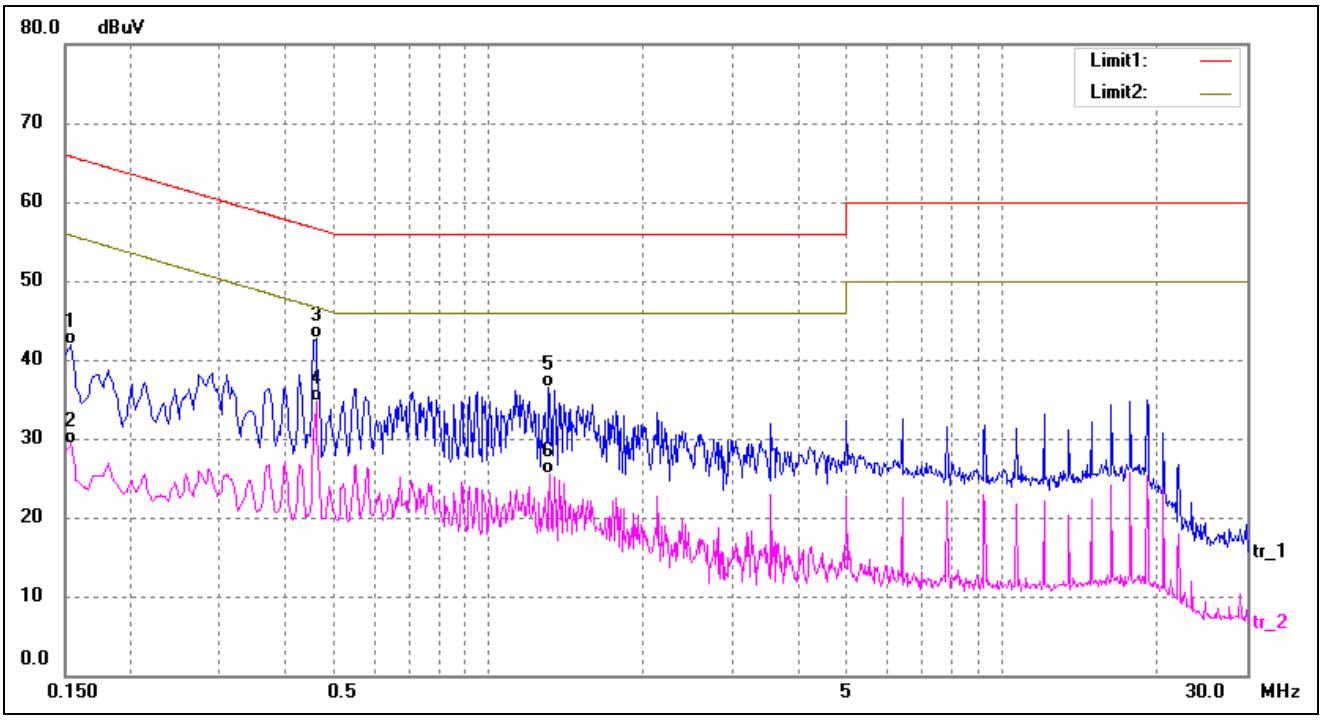
Comment: *AC 120V/60Hz; Adapter DC 5V*

Test Specification: *Neutral*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	0.1540	32.05	9.85	41.90	65.78	-23.88	QP
2	0.1540	17.84	9.85	27.69	55.78	-28.09	AVG
3	0.4580	30.57	9.80	40.37	56.73	-16.36	QP
4*	0.4620	24.25	9.80	34.05	46.66	-12.61	AVG
5	1.3500	12.27	9.75	22.02	46.00	-23.98	AVG
6	1.4500	23.06	9.75	32.81	56.00	-23.19	QP

Test Specification: *Line*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	0.1540	32.10	9.85	41.95	65.78	-23.83	QP
2	0.1540	19.55	9.85	29.40	55.78	-26.38	AVG
3	0.4620	32.86	9.80	42.66	56.66	-14.00	QP
4*	0.4620	24.87	9.80	34.67	46.66	-11.99	AVG
5	1.3140	26.84	9.75	36.59	56.00	-19.41	QP
6	1.3180	15.75	9.75	25.50	46.00	-20.50	AVG

******* END OF REPORT *******