

FCC Part 15C

Measurement and Test Report

For

BRK Brands Inc.

3901 Liberty Street Rd Aurora, IL 60504, USA

FCC ID: M7U-DWIP-720

FCC Rule(s): FCC Part 15C

Product Description: IP camera

Tested Model: DWIP-720

Report No.: STR16068027I

Tested Date: 2016-06-06 to 2016-06-15

Issued Date: 2016-06-15

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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen SEM.Test Technology Co., Ltd.

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: BRK Brands Inc.
Address of applicant: 3901 Liberty Street Rd Aurora, IL 60504, USA

Manufacturer: SHENZHEN DIT SECURITY&SURVEILLANCE TECHNOLOGY CO., LTD
Address of manufacturer: 3-4F, BUILDING 5TH, WANDAIHENG HIGH-TECH PARK GUANGMING SHENZHEN

General Description of EUT	
Product Name:	IP camera
Trade Name:	First Alert
Model No.:	DWIP-720
Adding Model(s):	/
Rated Voltage:	DC 5V Adapter
Power Adapter Model:	JK050200-S04USA INPUT:100-240V 50/60Hz 0.5A; OUTPUT: 5V/2.0A
<i>Note: The test data is gathered from a production sample provided by the manufacturer.</i>	

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:	12.28 dBm (Conducted)
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Data Rate:	1-11Mbps, 6-54Mbps, up to 135Mbps
Quantity of Channels:	11 for 802.11b/g/n(HT20); 7 for 802.11n(HT40)
Channel Separation:	5MHz
Type of Antenna:	External
Antenna Gain:	1dBi
Lowest Internal Frequency of EUT:	32.768kHz

1.2 Test Standards

The following report is prepared on behalf of the BRK Brands Inc. 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 v03r05 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

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
Adapter cable	1.2	Unshielded	Without Ferrite

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
Network cable	1.0	Unshielded	Without Ferrite

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Notebook	Lenovo	E23	EB12648265

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	$\pm 0.42\text{dB}$
Occupied Bandwidth	Conducted	$\pm 1.5\%$
Power Spectral Density	Conducted	$\pm 1.8\text{dB}$
Conducted Spurious Emission	Conducted	$\pm 2.17\text{dB}$
Conducted Emissions	Conducted	$\pm 2.88\text{dB}$
Transmitter Spurious Emissions	Radiated	$\pm 5.1\text{dB}$

1.7 Test Equipment List and Details

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2015-06-17	2016-06-16
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2015-06-17	2016-06-16
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2015-06-17	2016-06-16
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2015-06-17	2016-06-16
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2015-06-17	2016-06-16
SEMT-1011	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2015-06-17	2016-06-16
SEMT-1042	Horn Antenna	ETS	3117	00086197	2015-06-17	2016-06-16
SEMT-1121	Horn Antenna	ETS	3116B	00088203	2015-06-17	2016-06-16
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2015-06-17	2016-06-16
SEMT-1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2015-06-17	2016-06-16
SEMT-1003	L.I.S.N	Schwarz beck	NSLK8126	8126-224	2015-06-17	2016-06-16
SEMT-1002	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2015-06-17	2016-06-16

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 v03r05, 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: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- d) Set VBW $\geq 3 \times \text{RBW}$.
- e) Detector = power averaging (RMS) or sample detector (when RMS not available).
- f) Ensure that the number of measurement points in the sweep $\geq 2 \times \text{span/RBW}$.
- 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

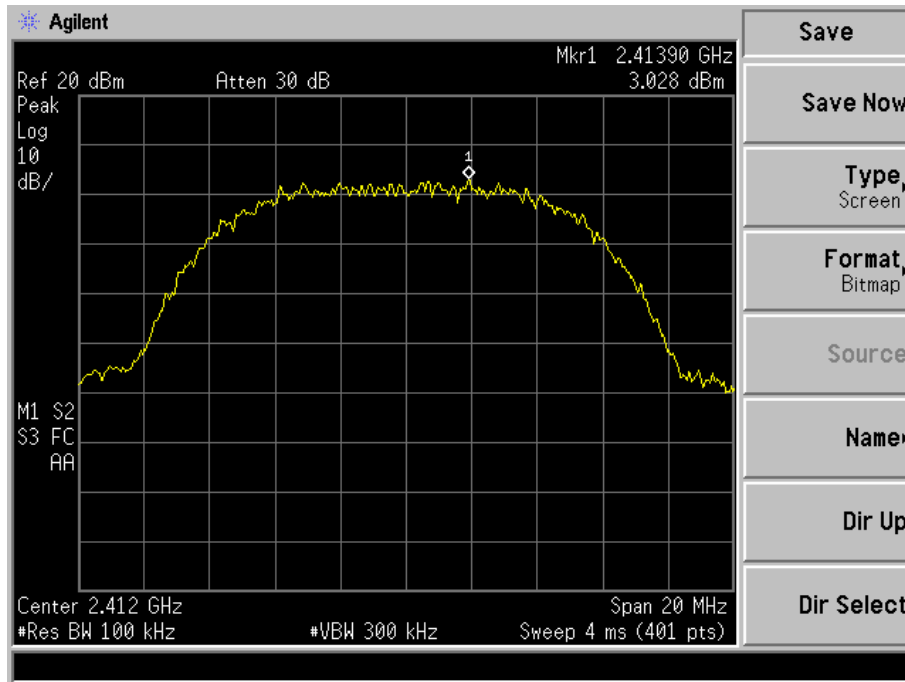
Temperature:	26° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

5.4 Summary of Test Results/Plots

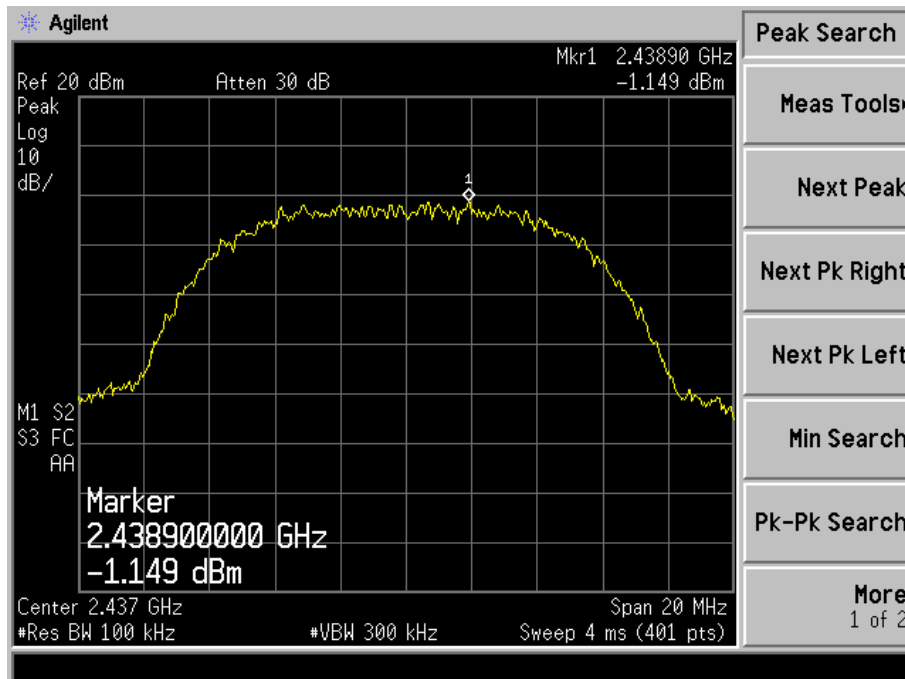
Test Mode	Test Channel MHz	Power Spectral Density dBm/100kHz	Limit dBm/3kHz
802.11b	2412	3.028	8
	2437	-1.149	8
	2462	-2.041	8
802.11g	2412	-1.922	8
	2437	-2.971	8
	2462	-4.136	8
802.11n HT20	2412	-2.513	8
	2437	-3.221	8
	2462	-4.467	8
802.11n HT40	2422	-6.117	8
	2437	-6.334	8
	2452	-6.150	8

Please refer to the following test plots:

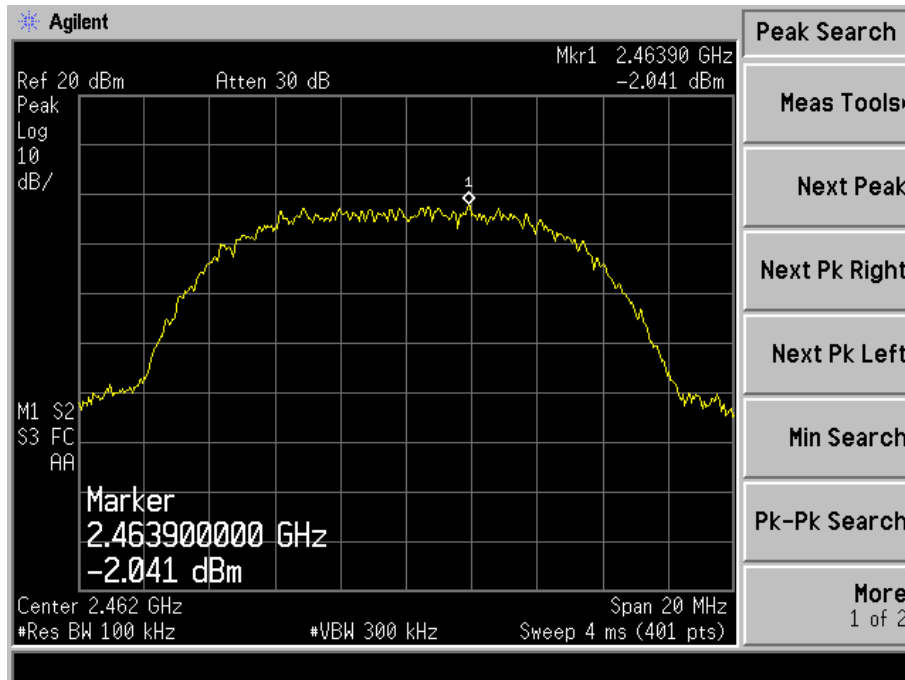
802.11b-Low Channel



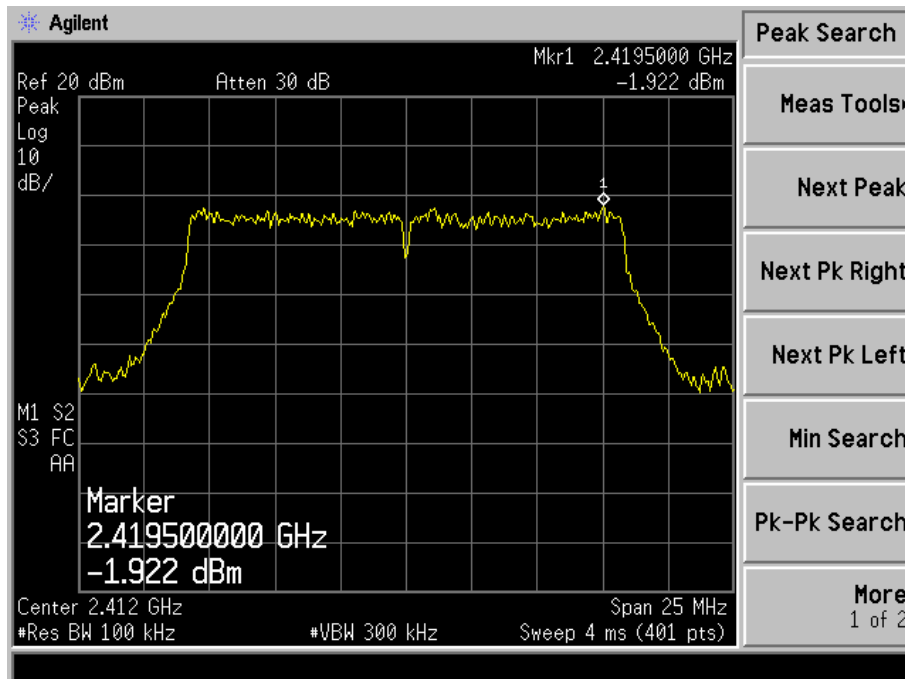
802.11b-Middle Channel



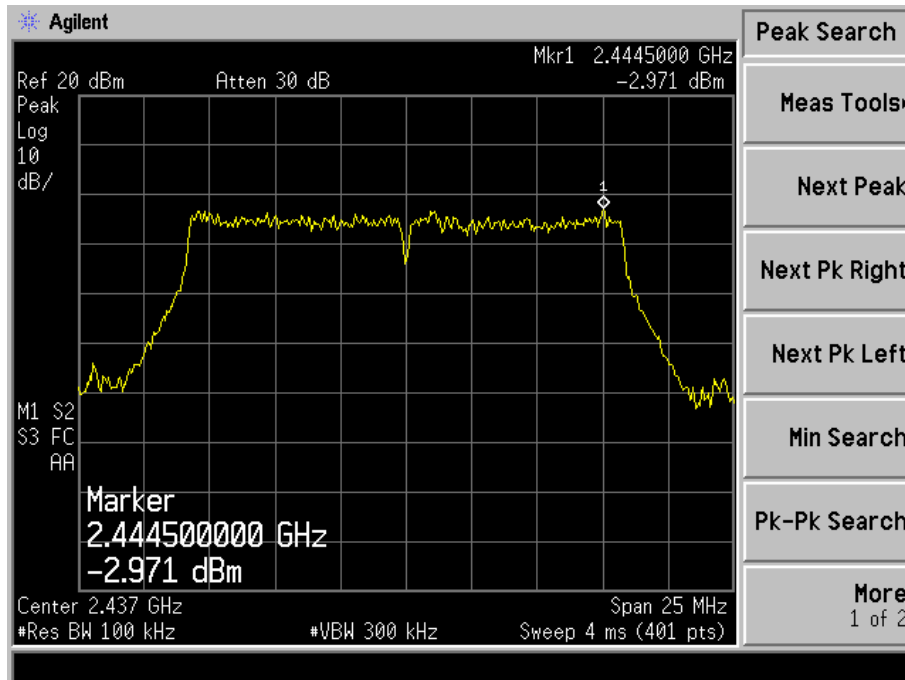
802.11b-High Channel



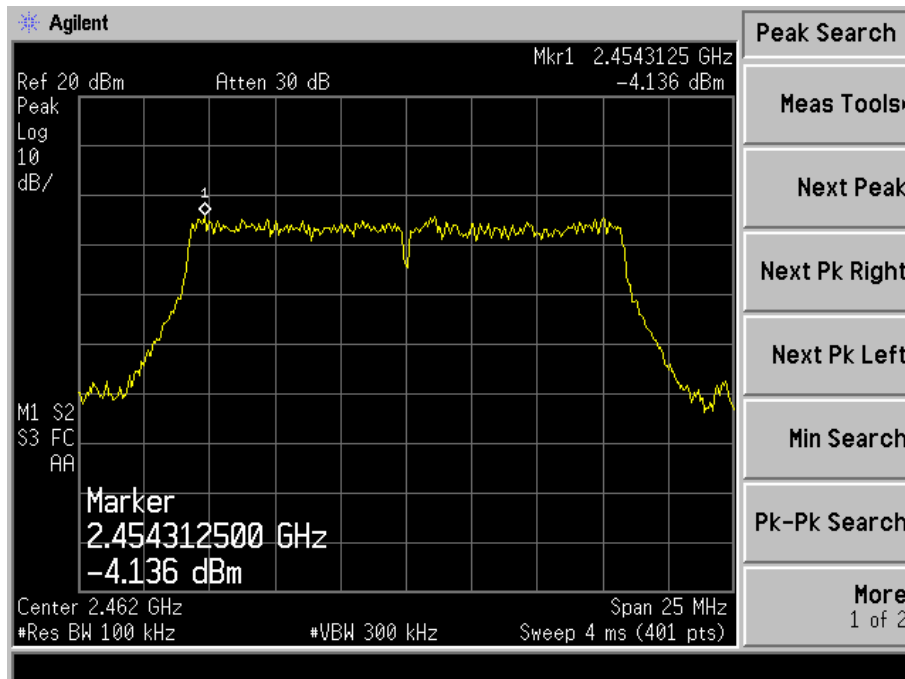
802.11g-Low Channel



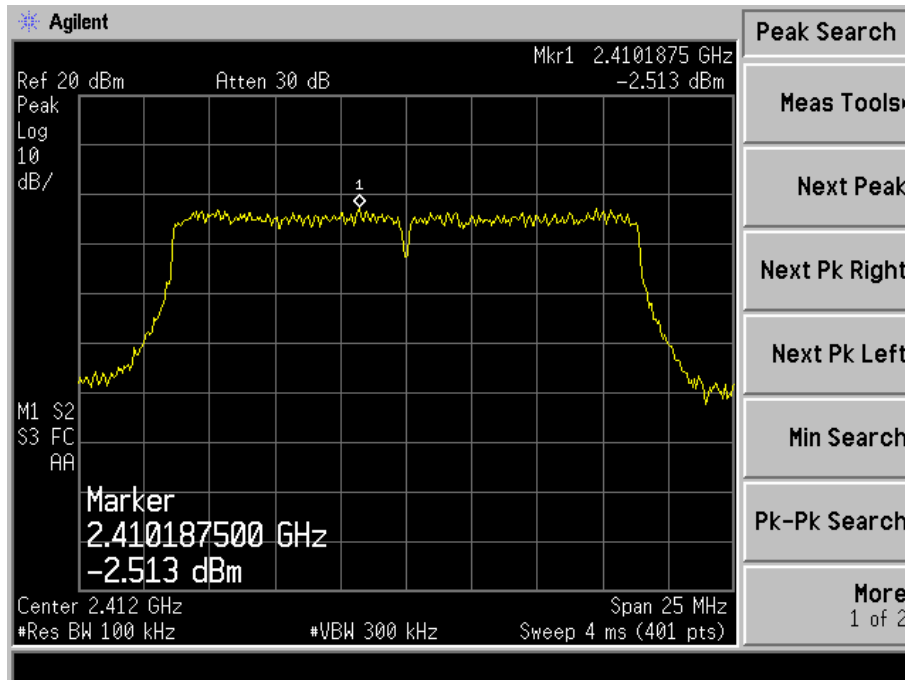
802.11g-Middle Channel



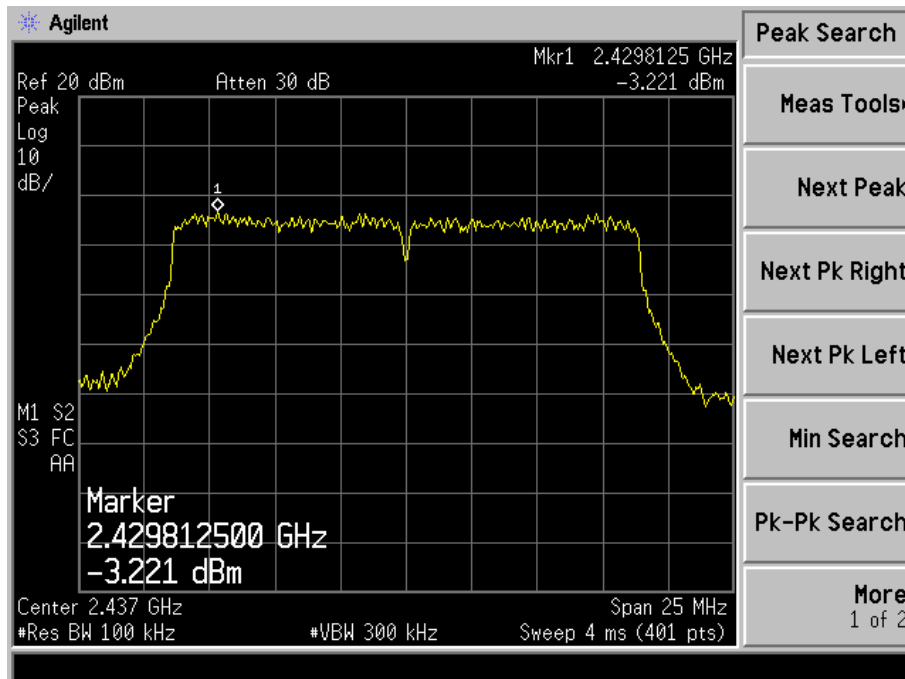
802.11g-High Channel



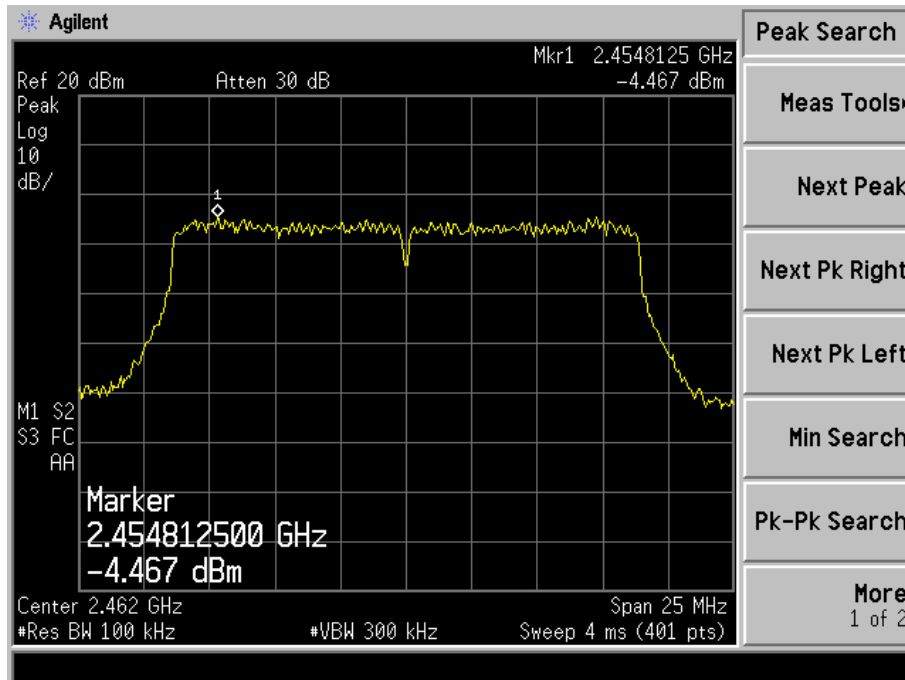
802.11n-HT20-Low Channel



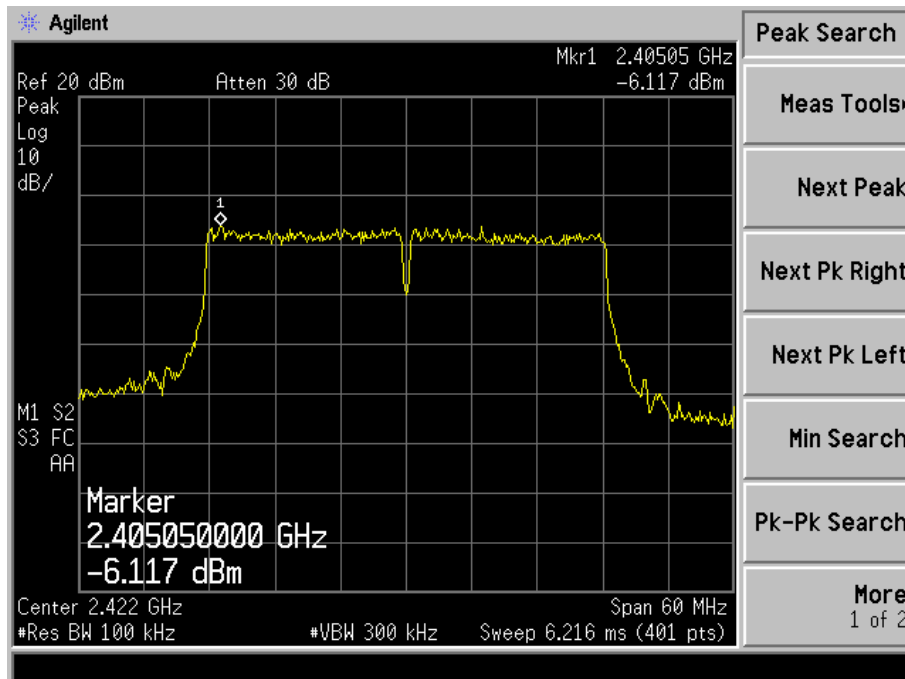
802.11n-HT20-Middle Channel



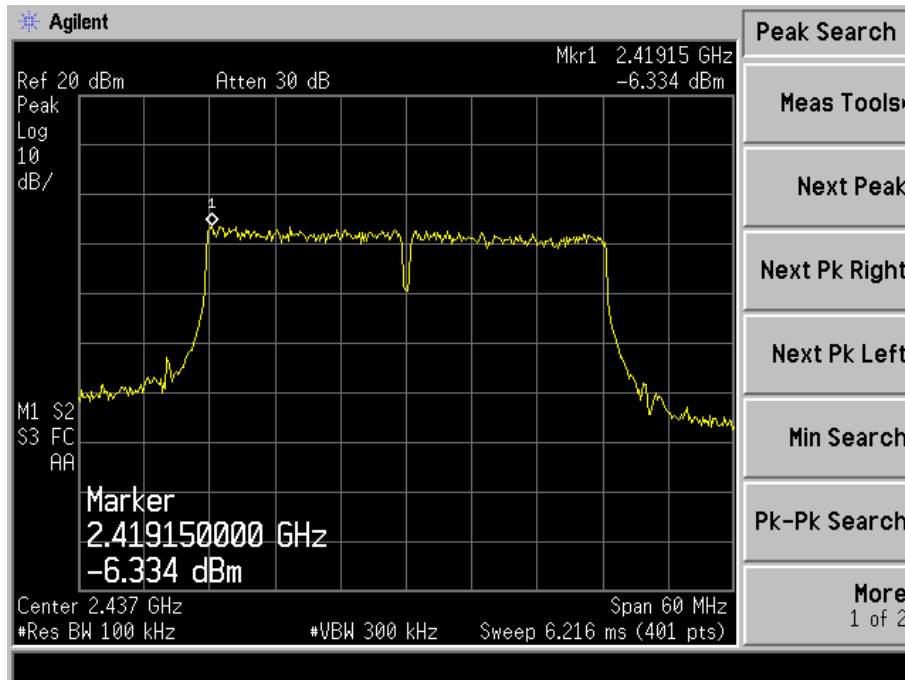
802.11n-HT20-High Channel



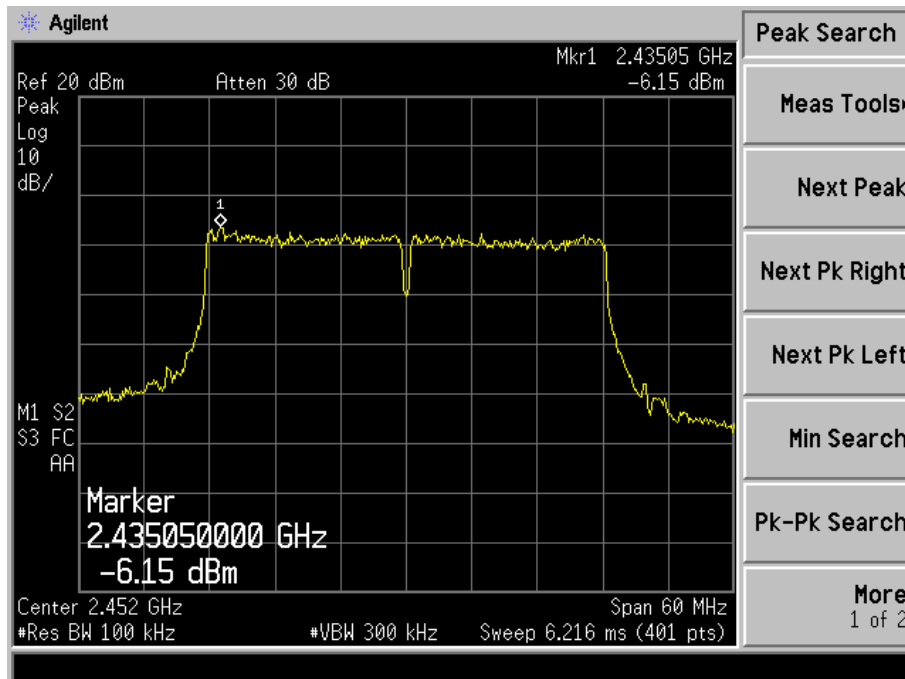
802.11n-HT40-Low Channel



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

- Set RBW = 100 kHz.
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Allow the trace to stabilize.
- 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

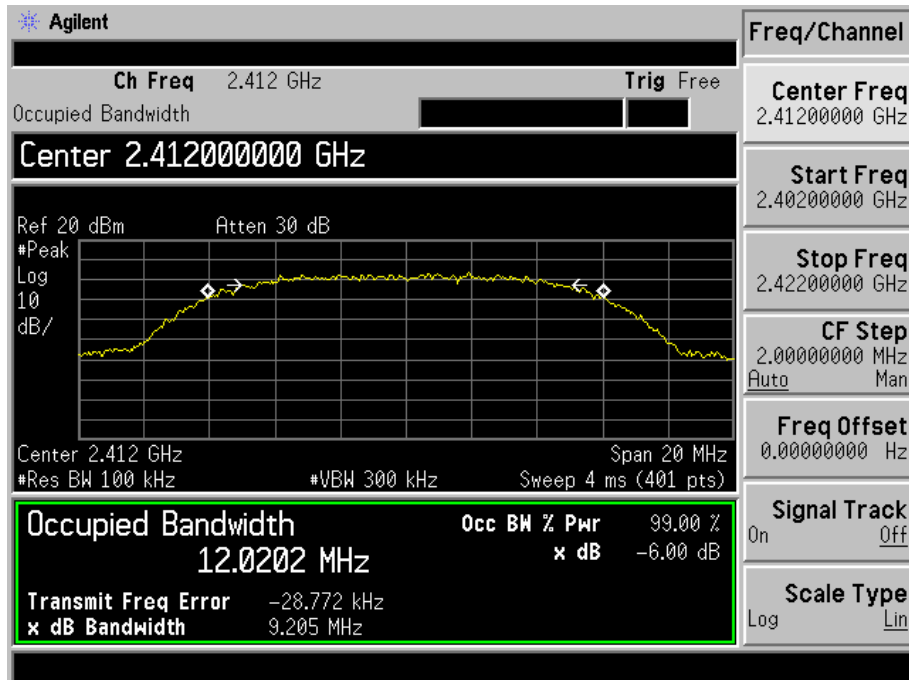
Temperature:	25° C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

6.4 Summary of Test Results/Plots

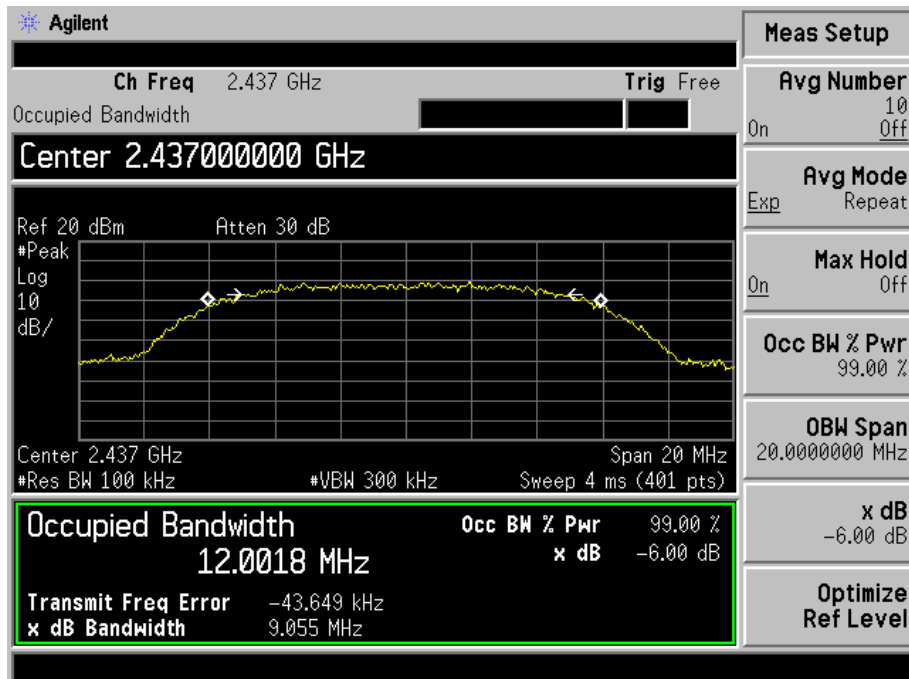
Test Mode	Test Channel MHz	6 dB Bandwidth kHz	99% Bandwidth kHz	Limit kHz
802.11b	2412	9205	12020.2	≥ 500
	2437	9055	12001.8	≥ 500
	2462	9200	12027.5	≥ 500
802.11g	2412	16589	16486.9	≥ 500
	2437	16568	16473.4	≥ 500
	2462	16628	16496.7	≥ 500
802.11n-HT20	2412	17773	17585.4	≥ 500
	2437	17791	17574.5	≥ 500
	2462	17774	17593.5	≥ 500
802.11n-HT40	2422	36576	36171.0	≥ 500
	2437	36593	36168.5	≥ 500
	2452	36554	36162.8	≥ 500

Please refer to the following test plots:

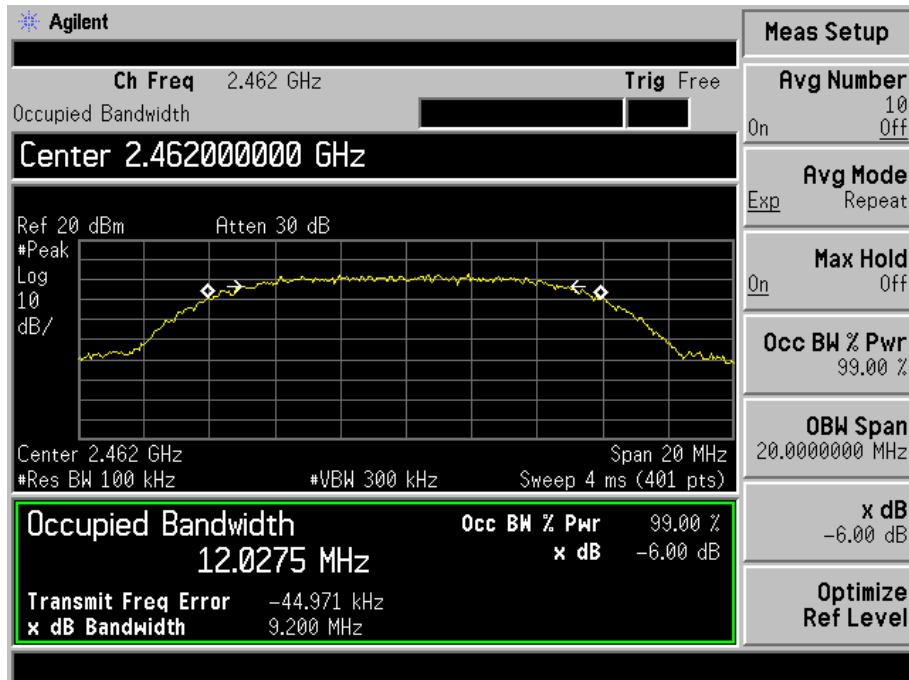
802.11b-Low Channel



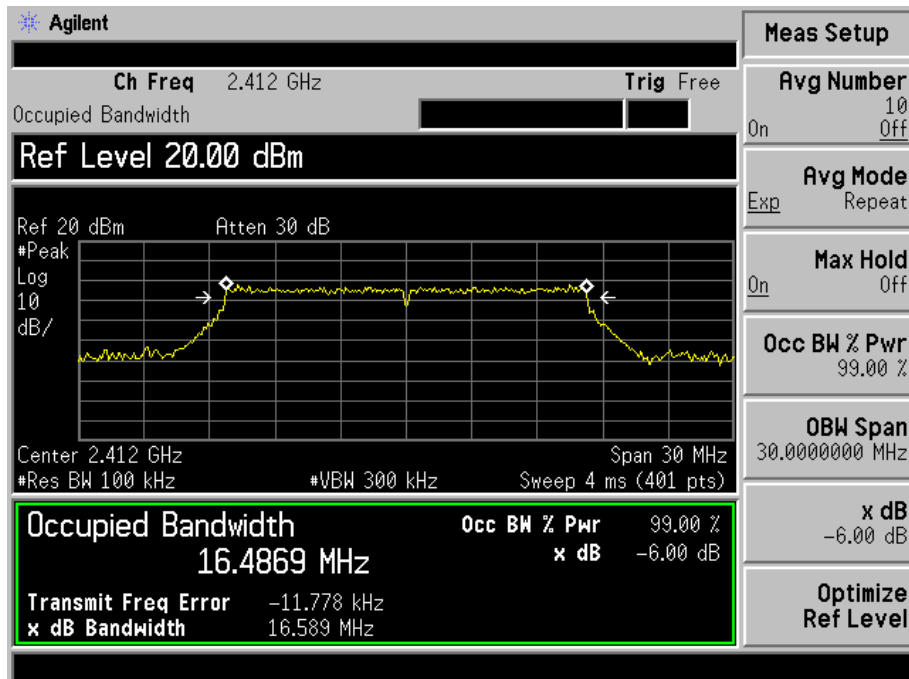
802.11b-Middle Channel



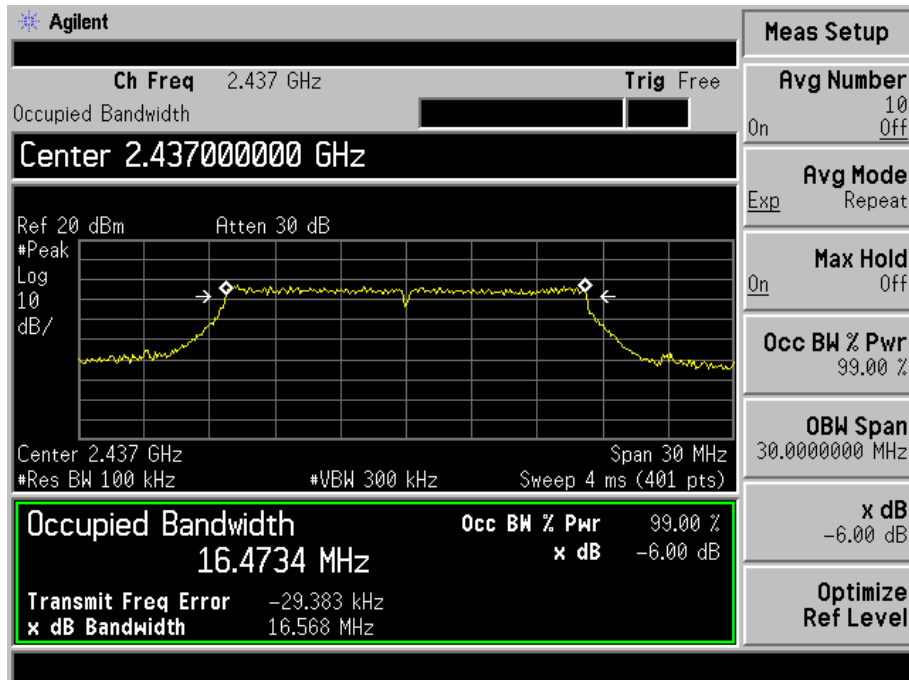
802.11b-High Channel



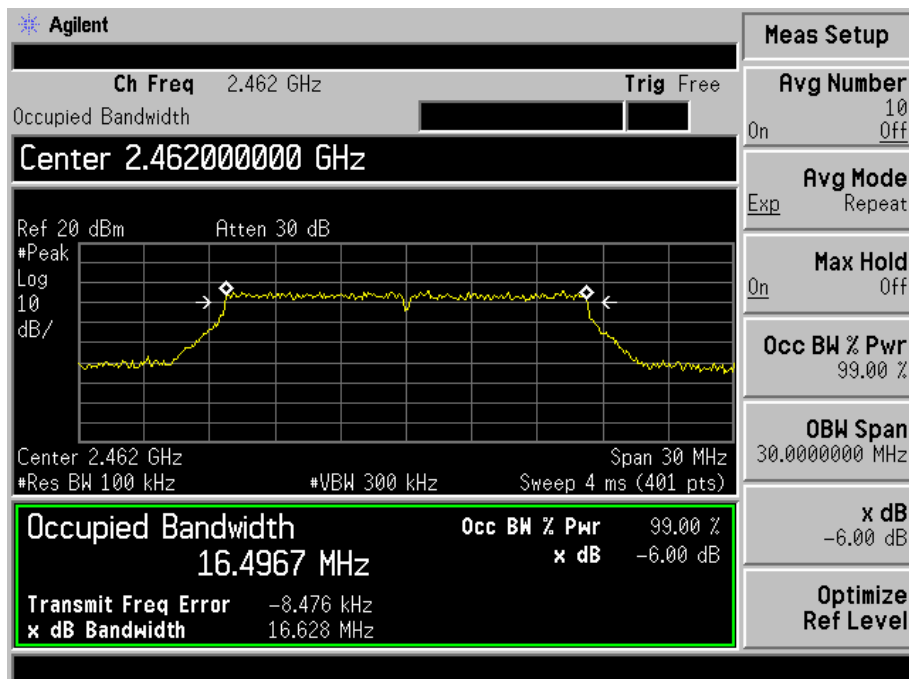
802.11g-Low Channel



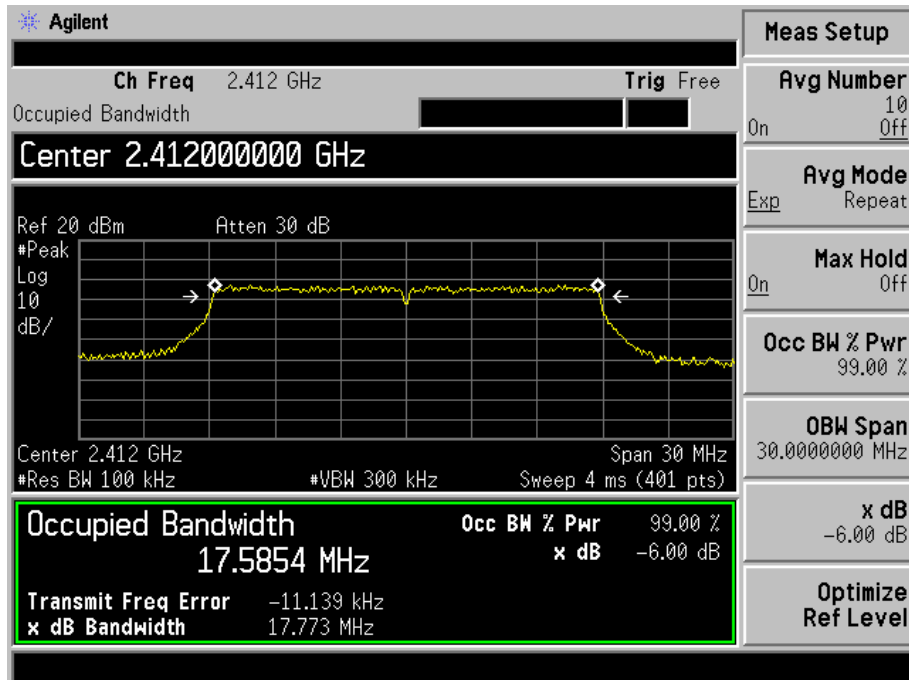
802.11g-Middle Channel



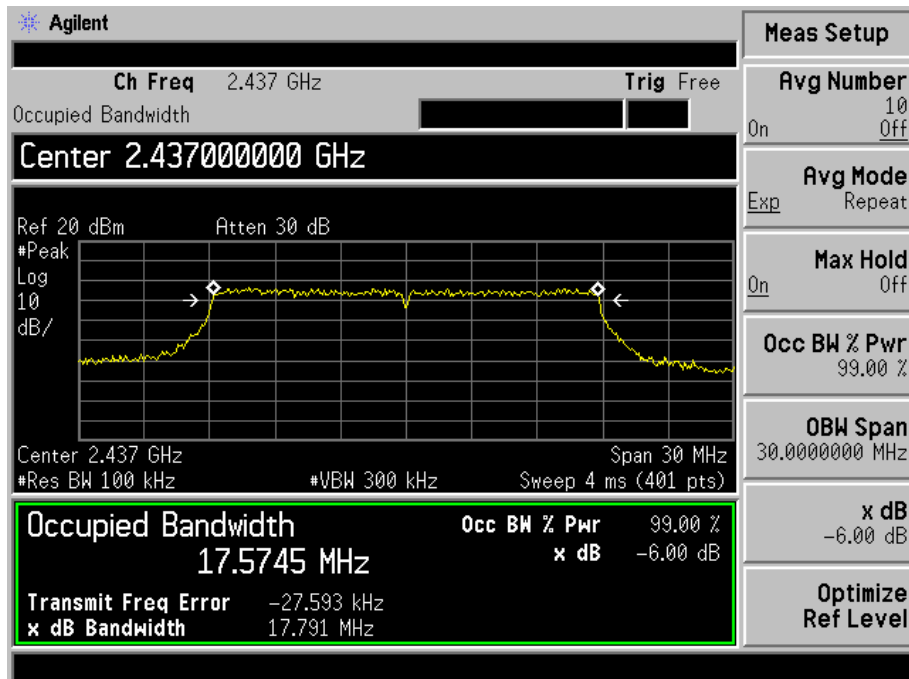
802.11g-High Channel



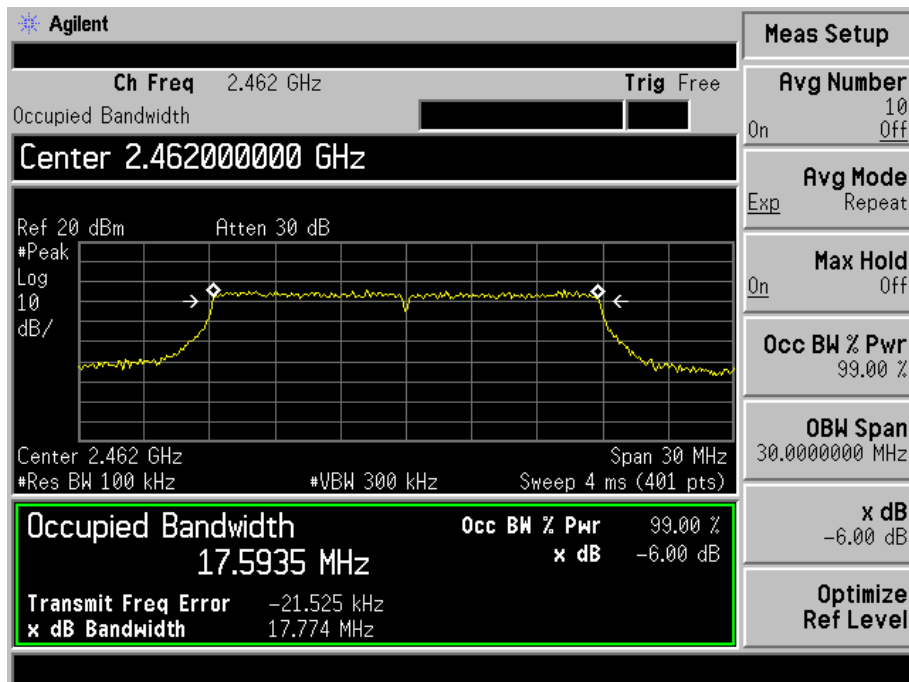
802.11n-HT20-Low Channel



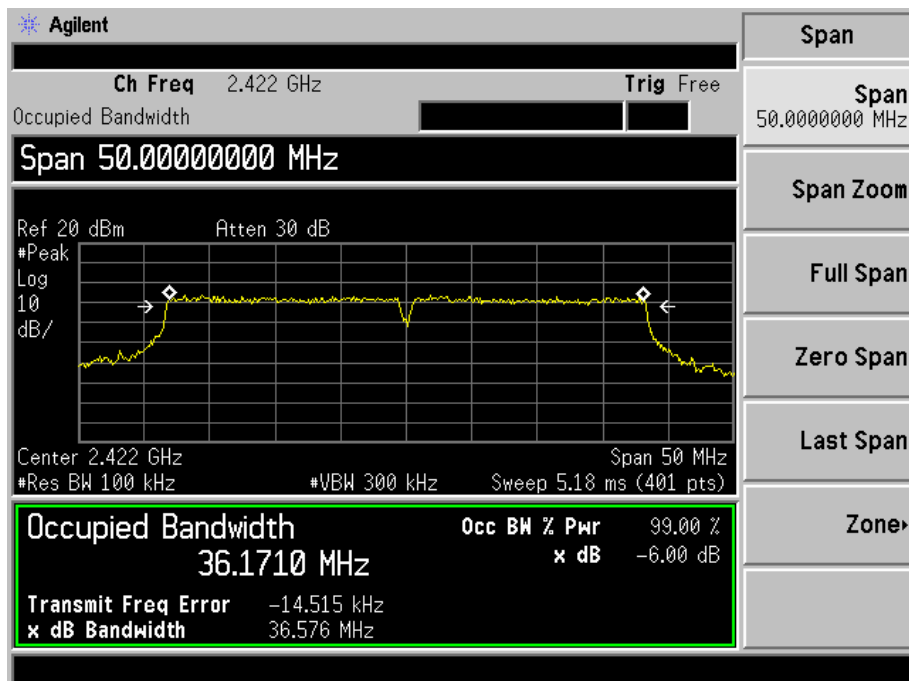
802.11n-HT20-Middle Channel



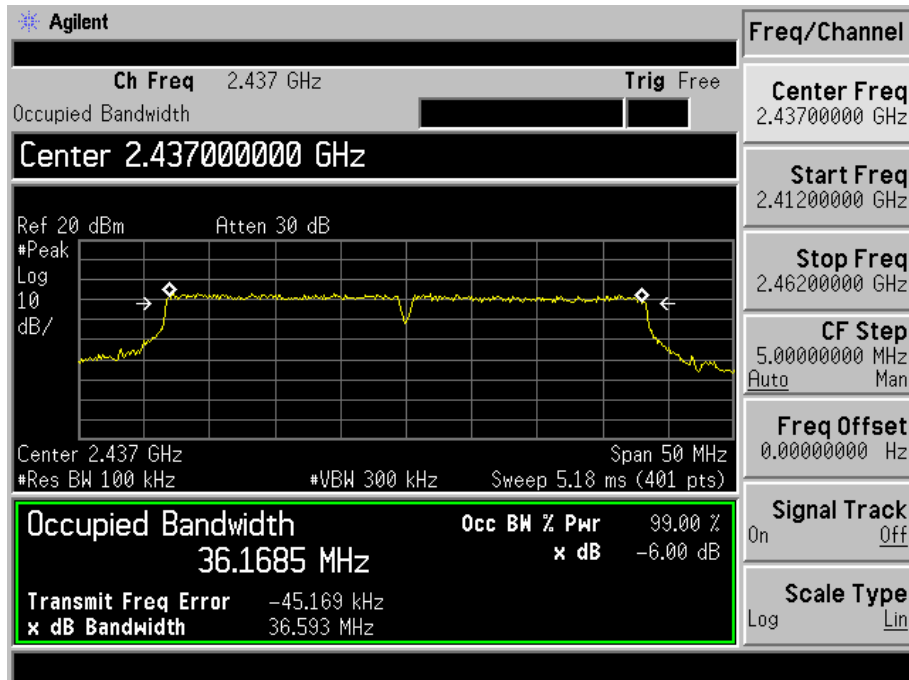
802.11n-HT20-High Channel



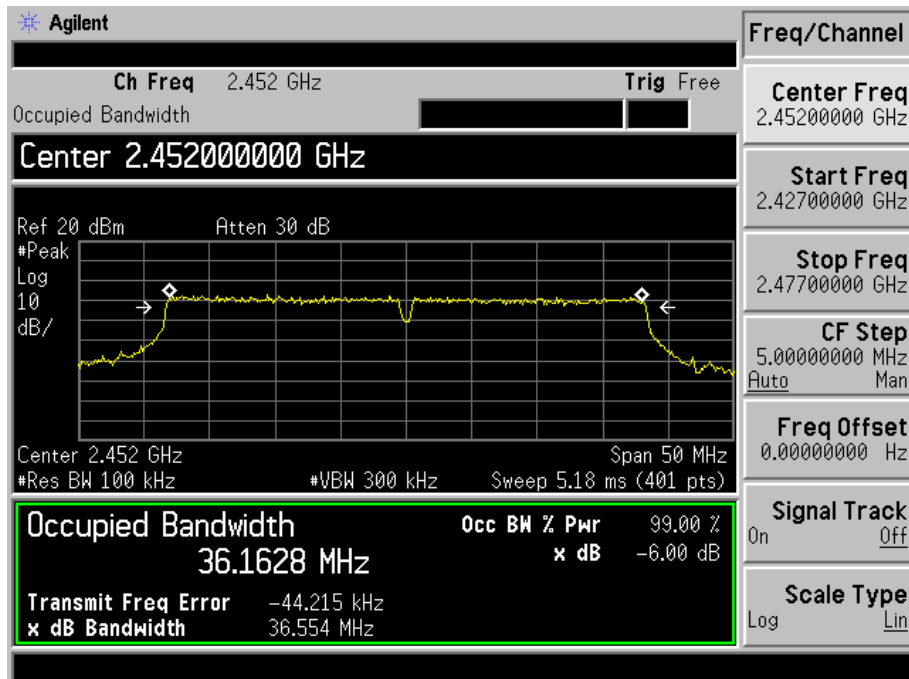
802.11n-HT40-Low Channel



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 v03r05, 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 $\geq 3 \times$ RBW.
- d) Number of points in sweep $\geq 2 \times \text{span} / \text{RBW}$. (This gives bin-to-bin spacing $\leq \text{RBW}/2$, 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 $\geq 98\%$, 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

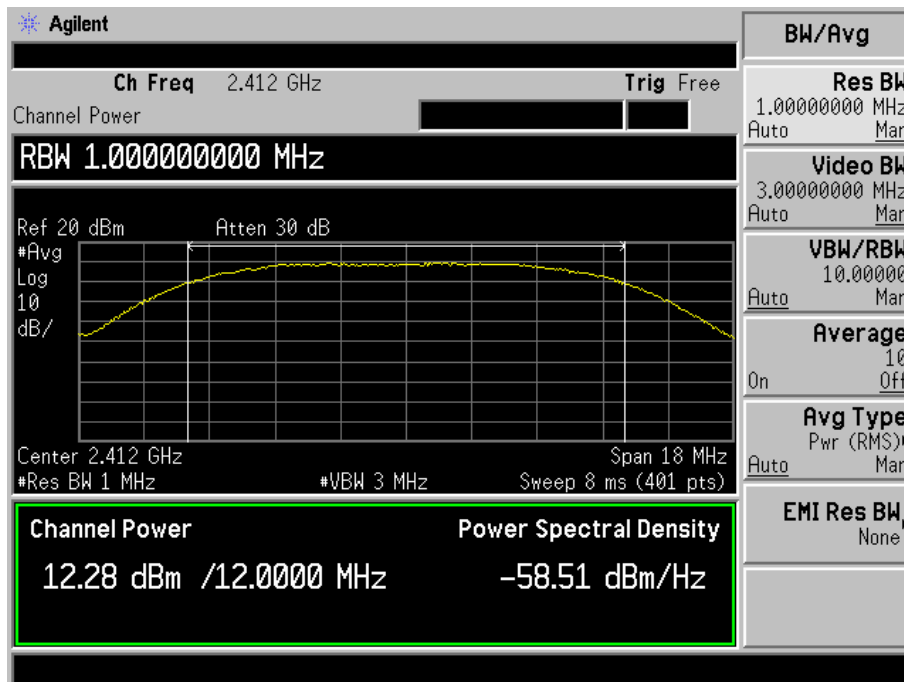
Temperature:	26° C
Relative Humidity:	57%
ATM Pressure:	1011 mbar

7.4 Summary of Test Results/Plots

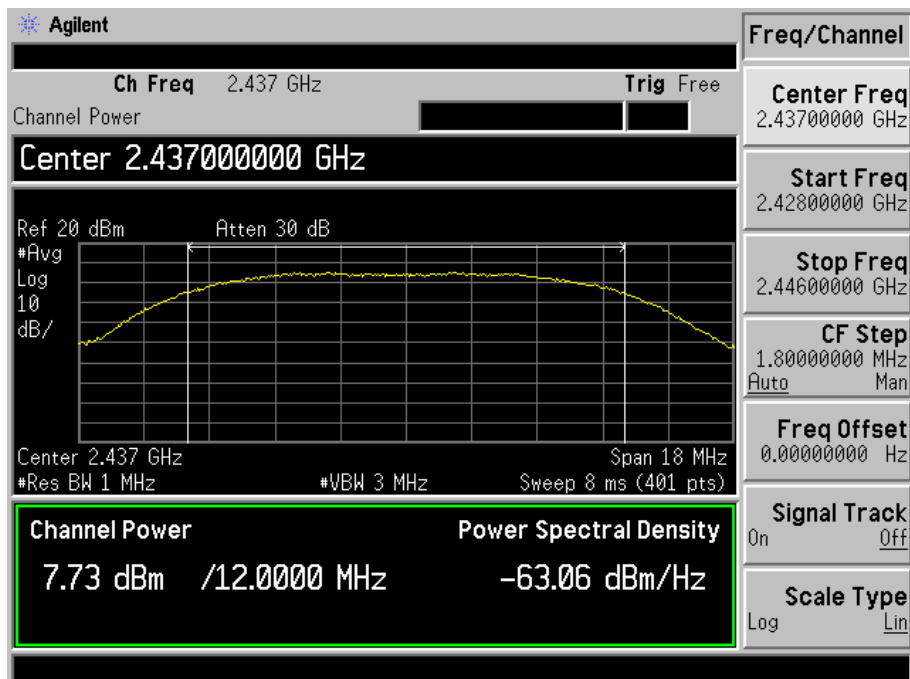
Test Mode	Frequency MHz	Reading dBm	Output Power mW	Limit mW
802.11b_11Mbps	2412	12.28	16.90	1000
	2437	7.73	5.93	1000
	2462	7.46	5.57	1000
802.11g_54Mbps	2412	9.58	9.08	1000
	2437	8.39	6.90	1000
	2462	7.06	5.08	1000
802.11n HT20_MCS7	2412	8.97	7.89	1000
	2437	8.45	7.00	1000
	2462	7.26	5.32	1000
802.11n HT40_MCS7	2422	8.67	7.36	1000
	2437	8.07	6.41	1000
	2452	8.15	6.53	1000

Please refer to the following test plots:

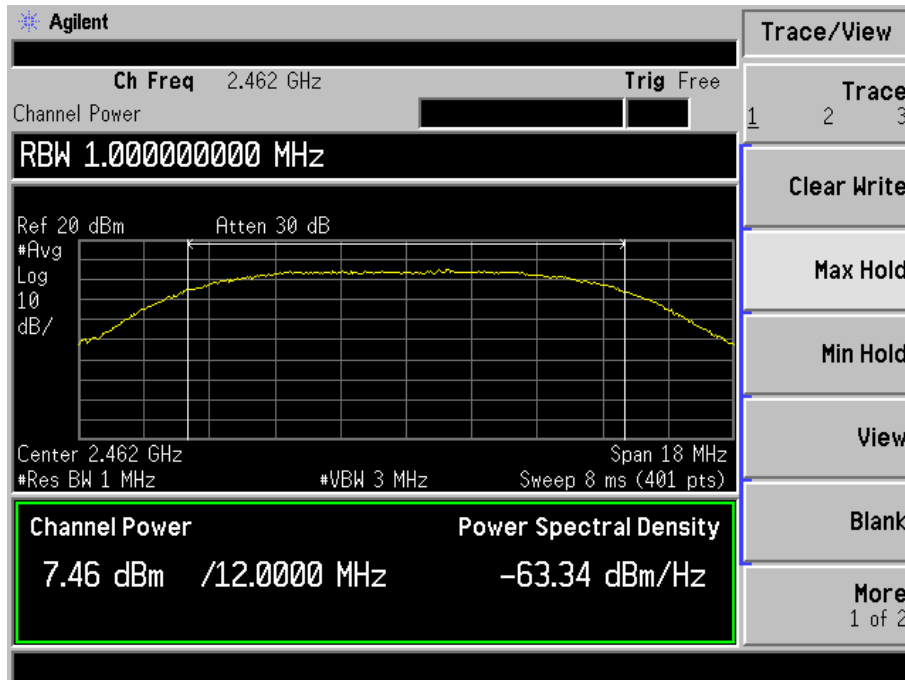
802.11b-11Mbps-Low Channel



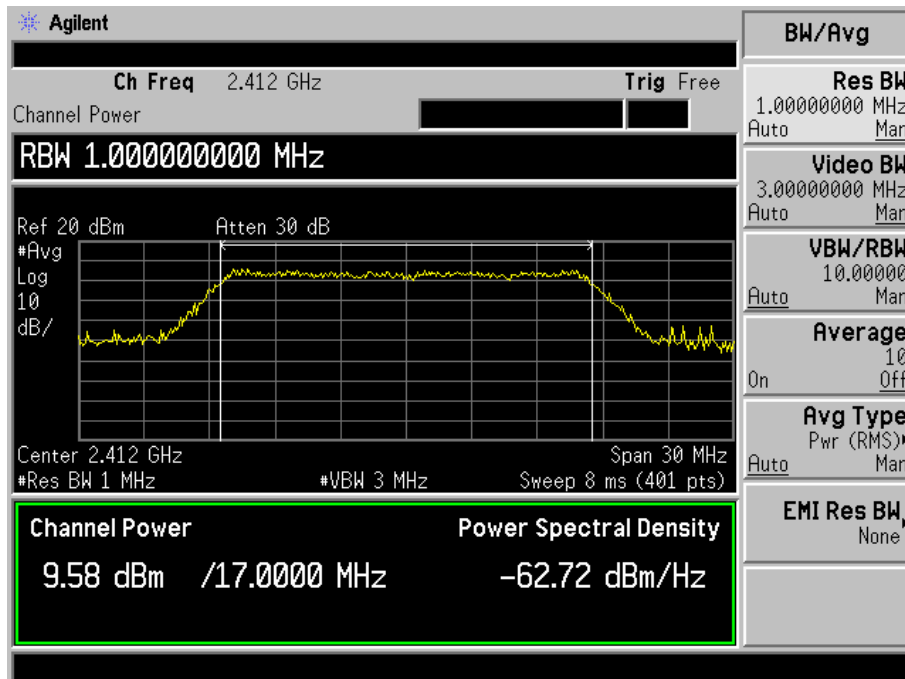
802.11b -11Mbps-Middle Channel



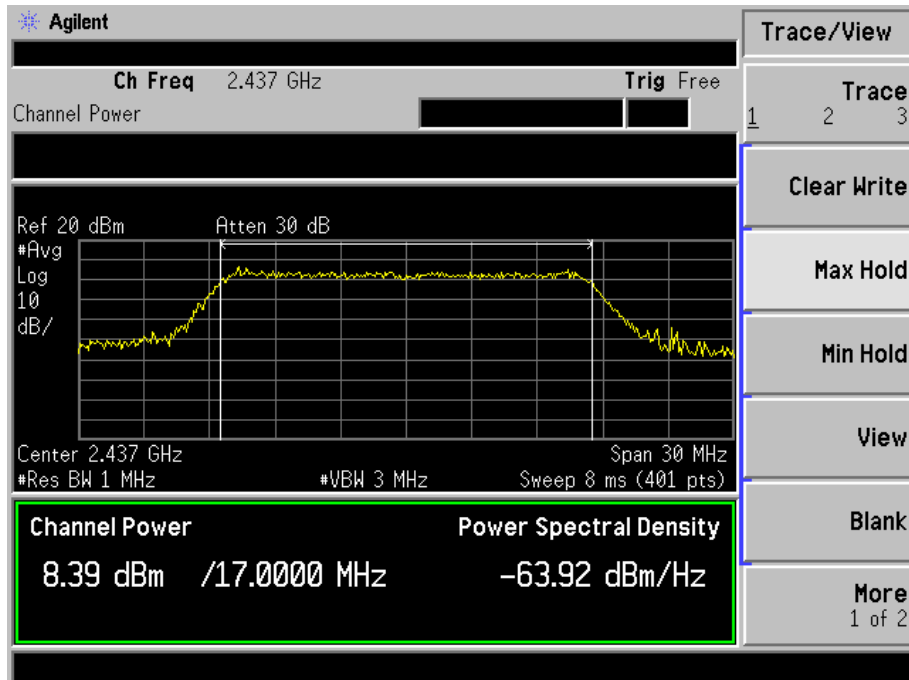
802.11b -11Mbps-High Channel



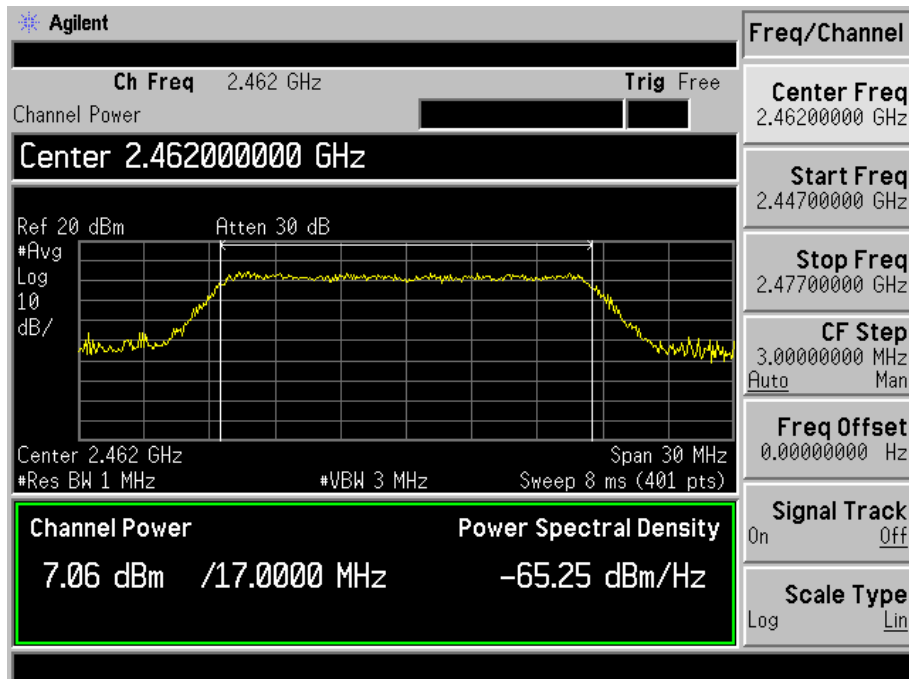
802.11g-54Mbps-Low Channel



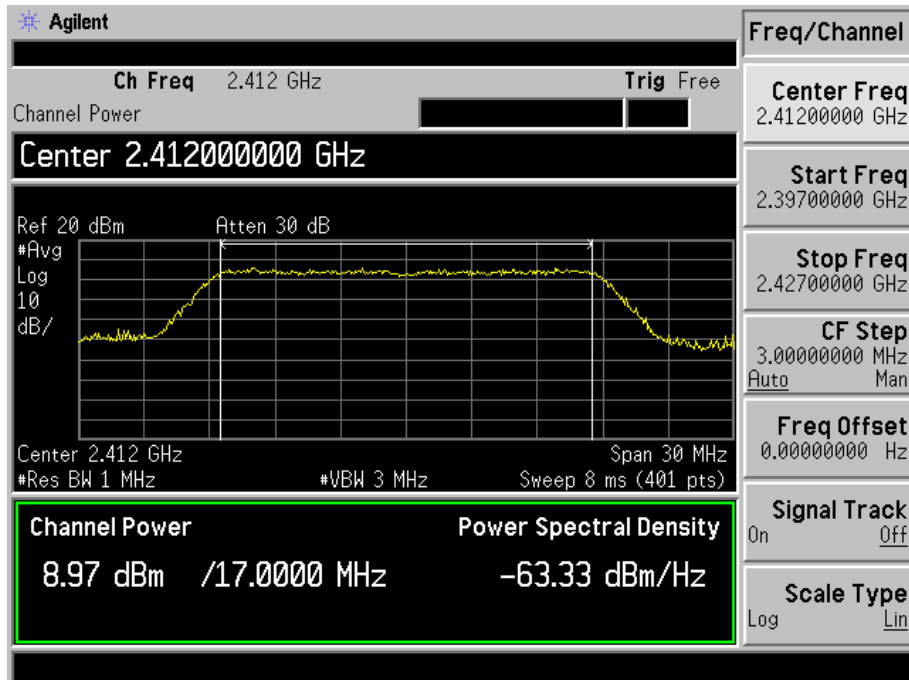
802.11g-54Mbps-Middle Channel



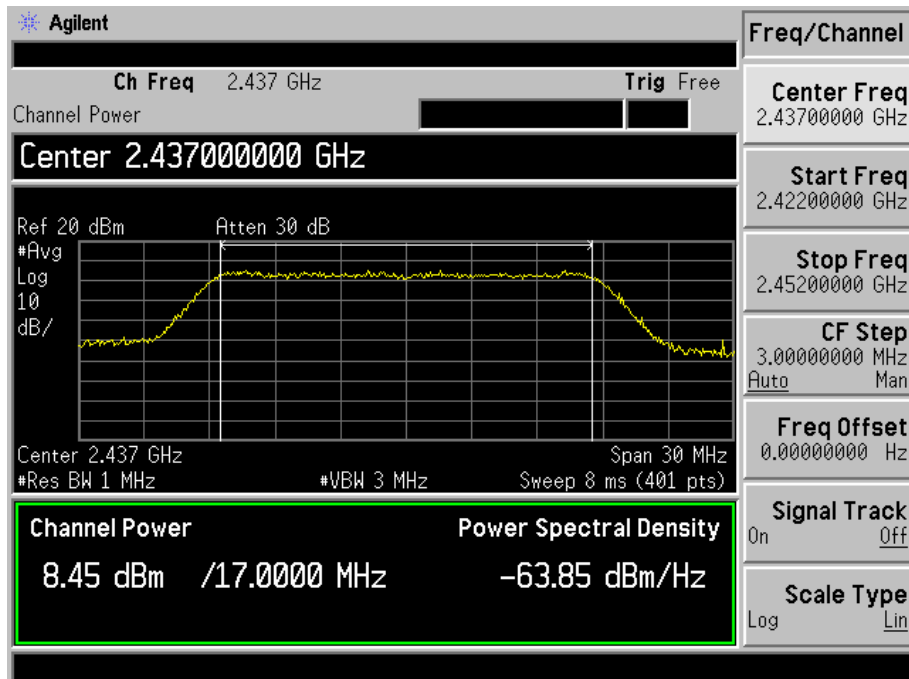
802.11g-54Mbps-High Channel



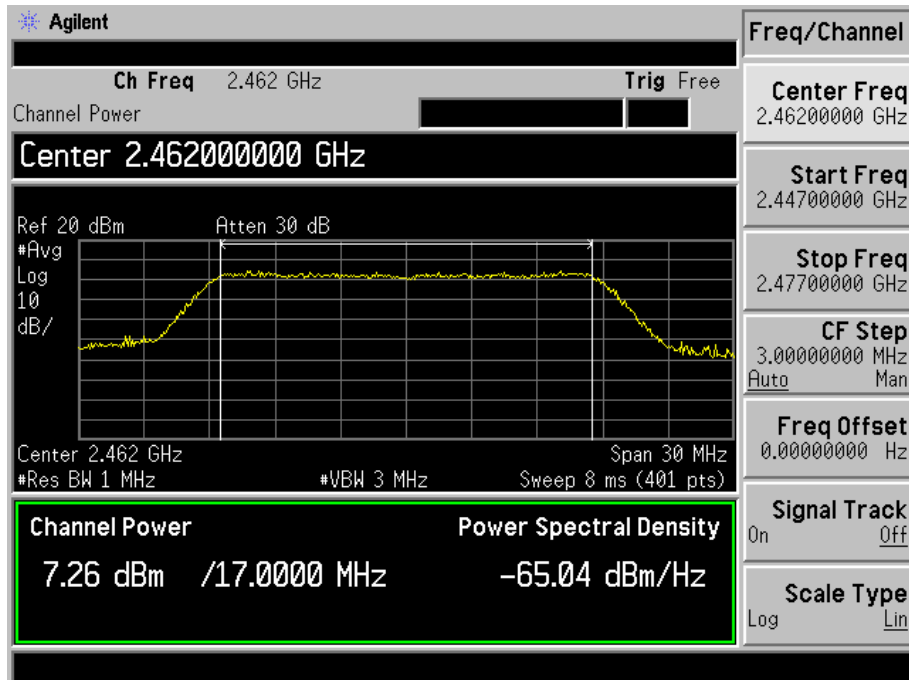
802.11n-HT20-MCS7-Low Channel



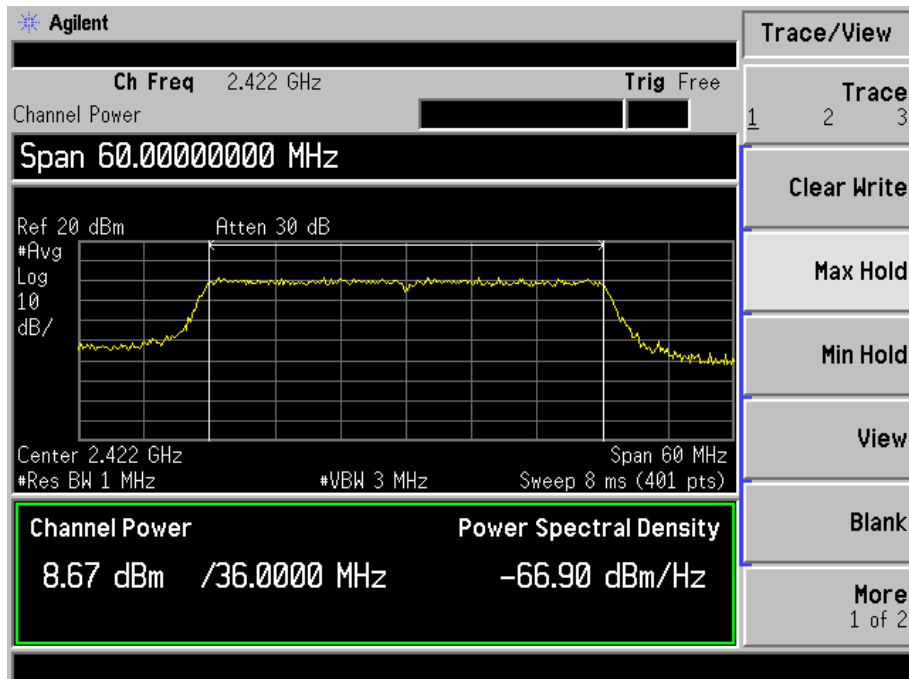
802.11n-HT20-MCS7-Middle Channel



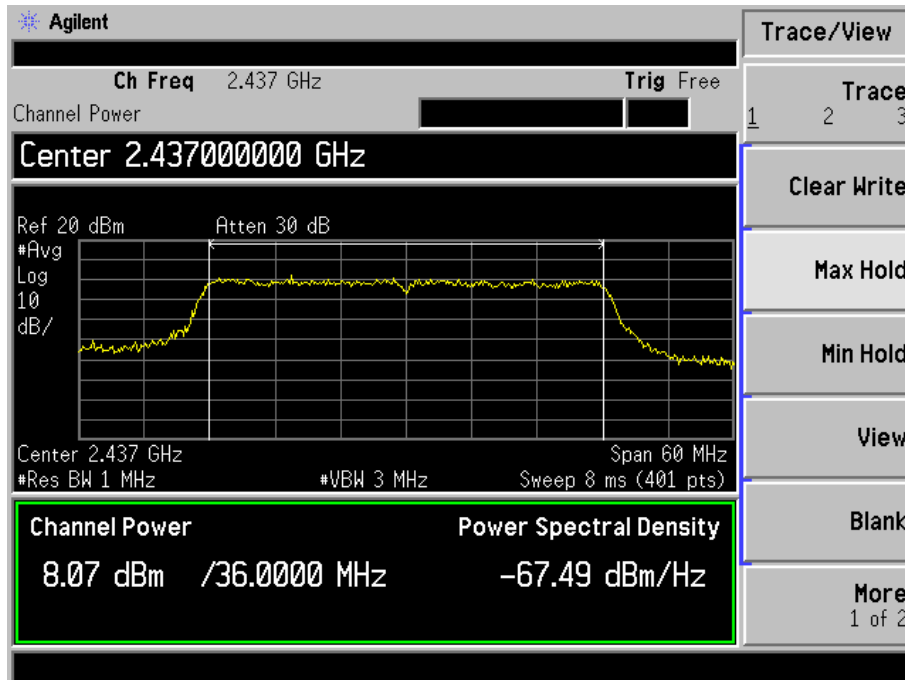
802.11n-HT20-MCS7-High Channel



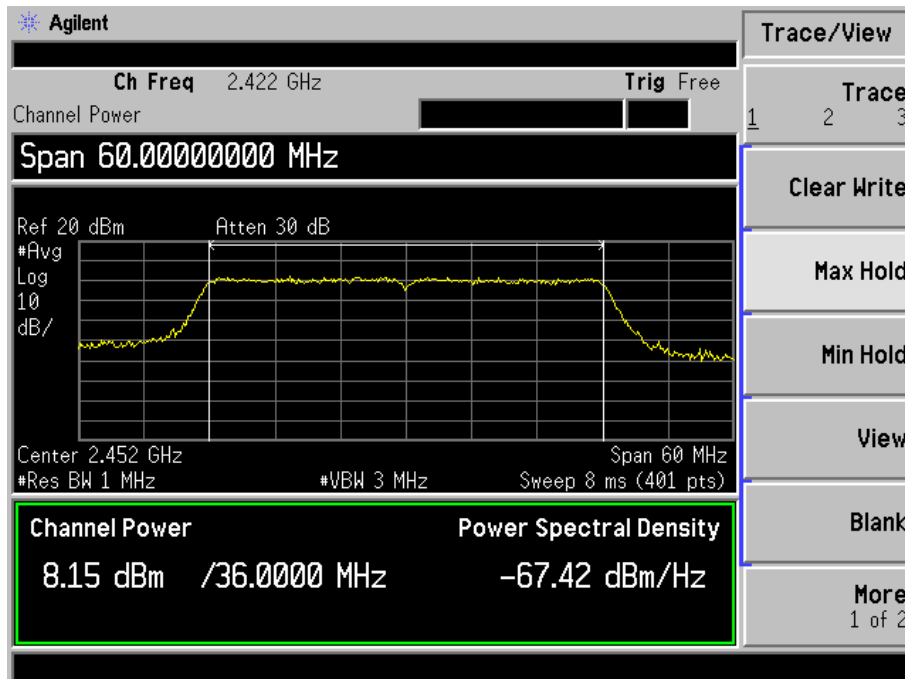
802.11n-HT40-MCS7-Low Channel



802.11n-HT40-MCS7-Middle Channel



802.11n-HT40-MCS7-High Channel



8. Field Strength of Spurious Emissions

8.1 Standard Applicable

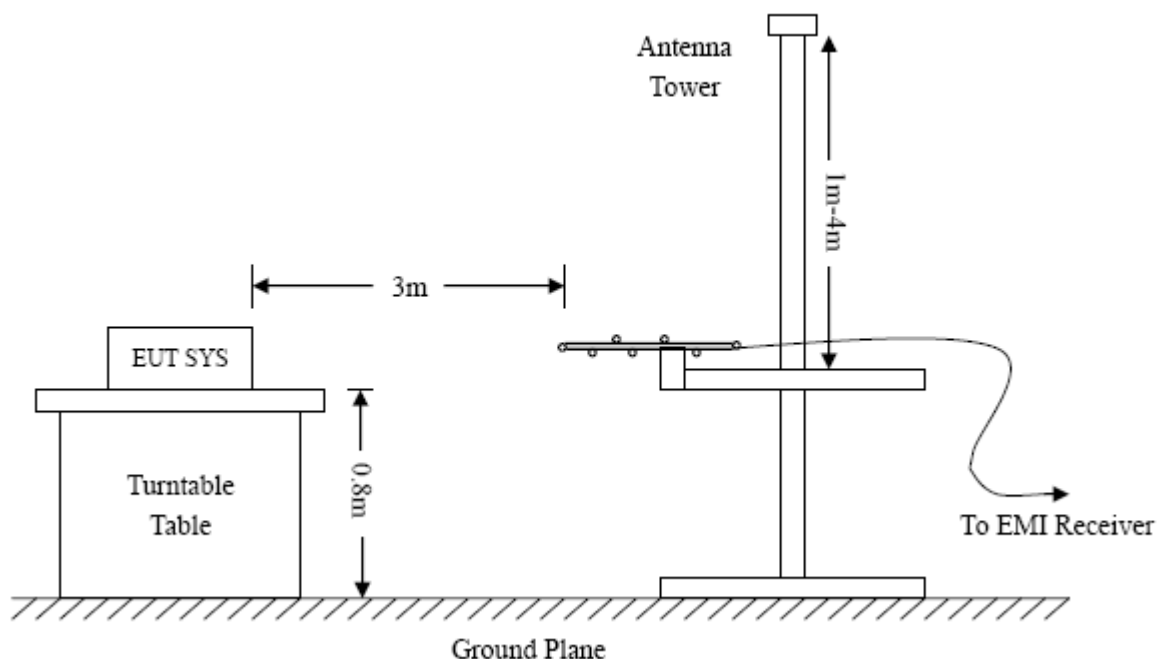
According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within 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).

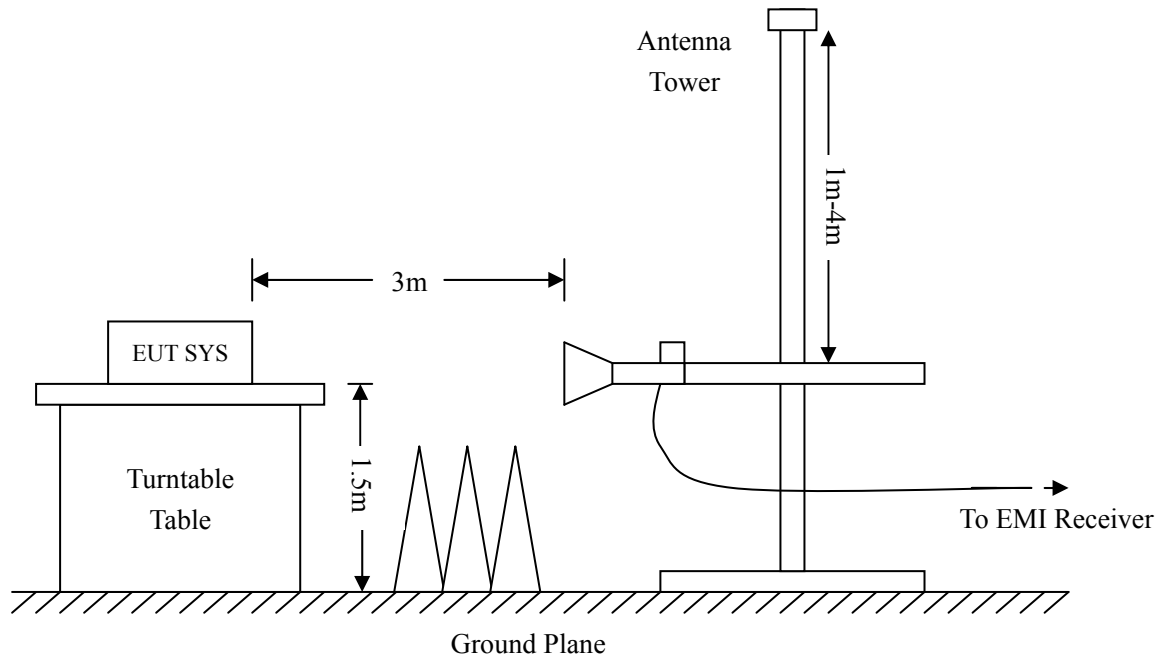
The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

8.2 Test Procedure

The setup of EUT is according with per ANSI C63.10-2015 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

RBW=10KHz,

VBW =30KHz

Sweep time= Auto

Trace = max hold

Detector function = peak

Frequency :30MHz-1GHz

RBW=120KHz,

VBW=300KHz

Sweep time= Auto

Trace = max hold

Detector function = peak, QP

Frequency :Above 1GHz

RBW=1MHz,

VBW=3MHz(Peak), 10Hz(AV)

Sweep time= Auto

Trace = max hold

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:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}$$

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:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15 Limit}$$

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)

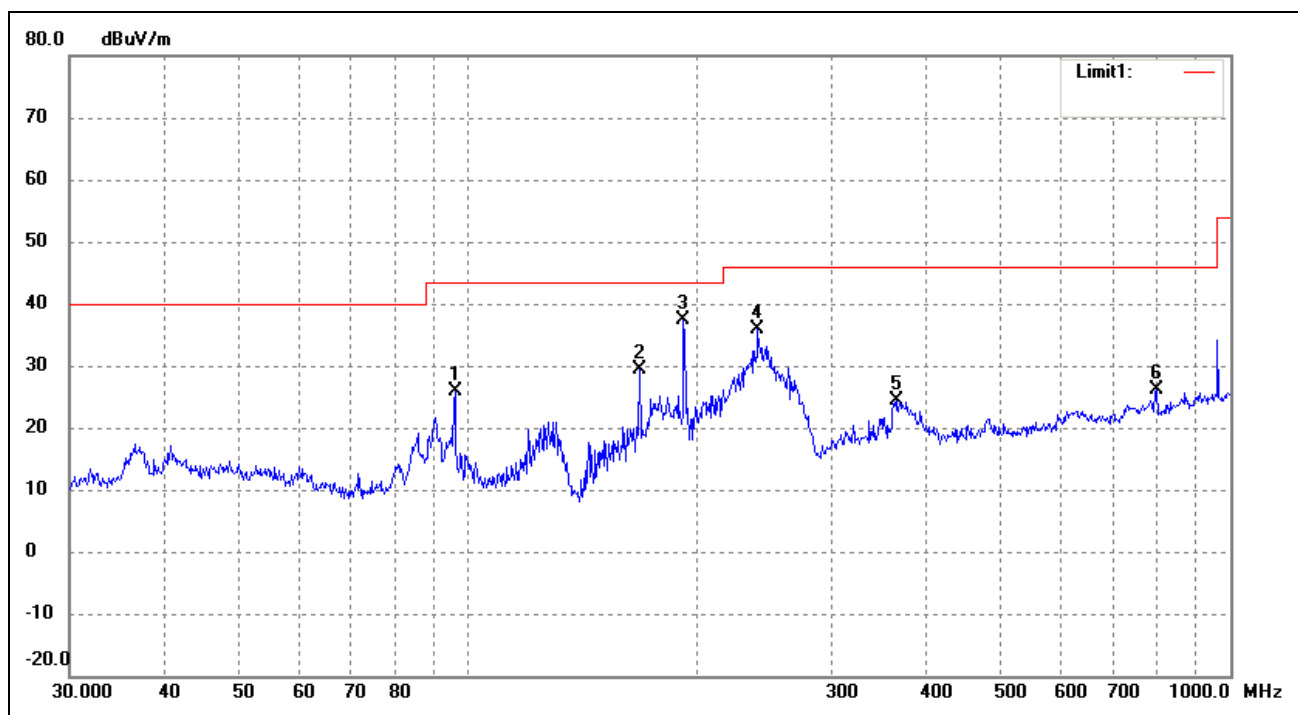
EUT: IP camera

Tested Model: DWIP-720

Operating Condition: 802.11b Transmitting Low Channel-2412MHz

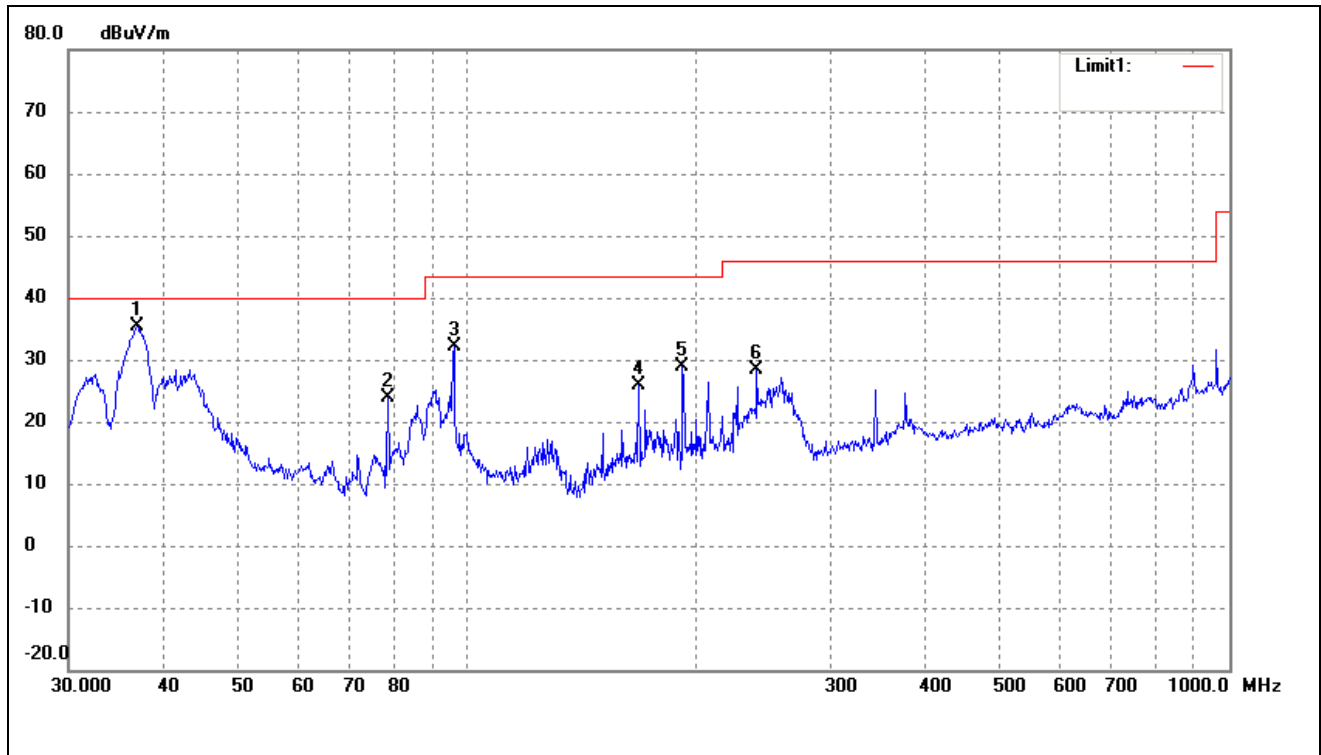
Comment: AC120V/60Hz; Adapter DC 5V

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	96.0986	37.70	-11.70	26.00	43.50	-17.50	120	100	peak
2	167.8243	41.40	-11.91	29.49	43.50	-14.01	145	100	peak
3	191.7450	47.14	-9.77	37.37	43.50	-6.13	175	100	peak
4	239.9874	44.14	-8.33	35.81	46.00	-10.19	210	100	peak
5	365.5391	27.23	-2.93	24.30	46.00	-21.70	250	100	peak
6	801.7863	24.26	1.87	26.13	46.00	-19.87	306	100	peak

Test Specification: Vertical

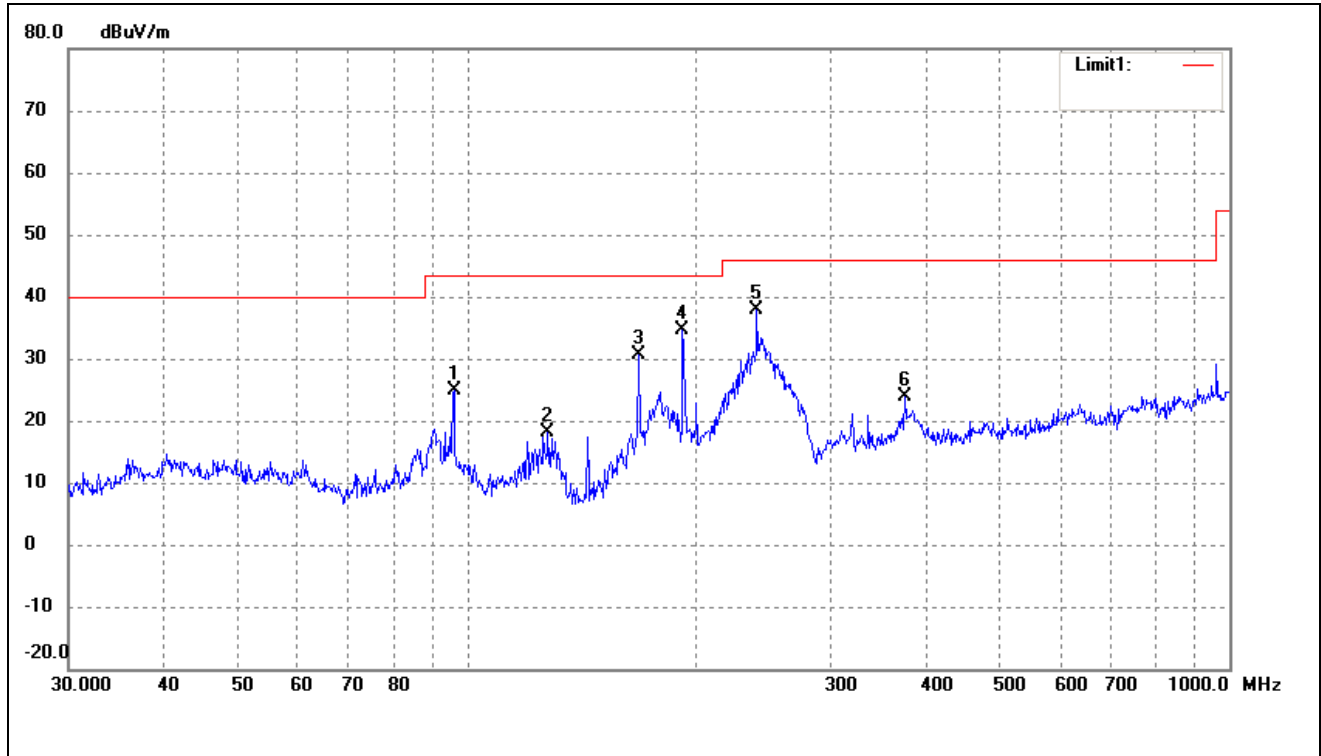


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	36.8953	43.85	-8.52	35.33	40.00	-4.67	114	100	peak
2	78.6888	35.96	-12.10	23.86	40.00	-16.14	270	100	peak
3	96.0986	43.74	-11.70	32.04	43.50	-11.46	360	100	peak
4	167.8243	37.79	-11.91	25.88	43.50	-17.62	116	100	peak
5	191.7450	38.67	-9.77	28.90	43.50	-14.60	240	100	peak
6	239.9874	36.60	-8.33	28.27	46.00	-17.73	280	100	peak

Operating Condition: 802.11b Transmitting Middle Channel-2437MHz

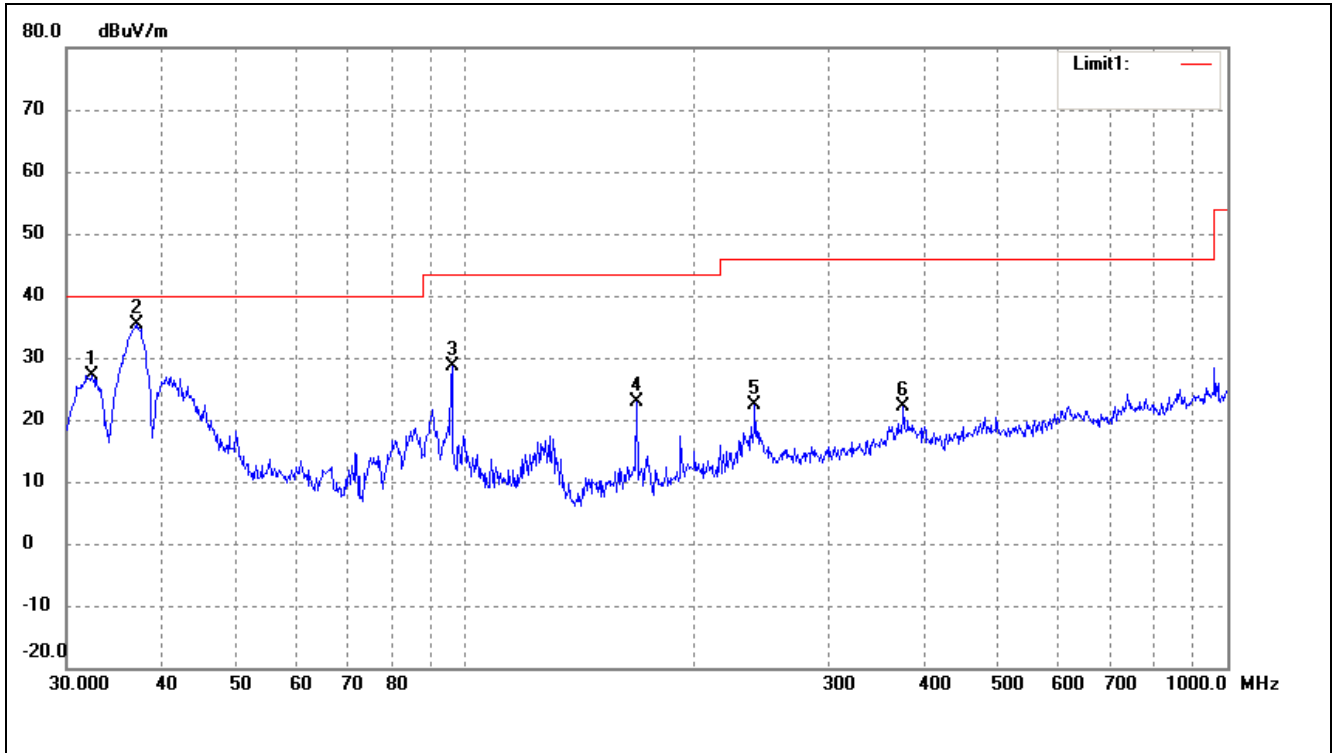
Comment: AC120V/60Hz; Adapter DC 5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	96.0986	36.50	-11.70	24.80	43.50	-18.70	178	100	peak
2	127.6645	30.00	-11.86	18.14	43.50	-25.36	224	100	peak
3	167.8243	42.52	-11.91	30.61	43.50	-12.89	160	100	peak
4	191.7450	44.33	-9.77	34.56	43.50	-8.94	290	100	peak
5	239.9874	46.12	-8.33	37.79	46.00	-8.21	306	100	peak
6	374.6226	26.24	-2.41	23.83	46.00	-22.17	350	100	peak

Test Specification: Vertical

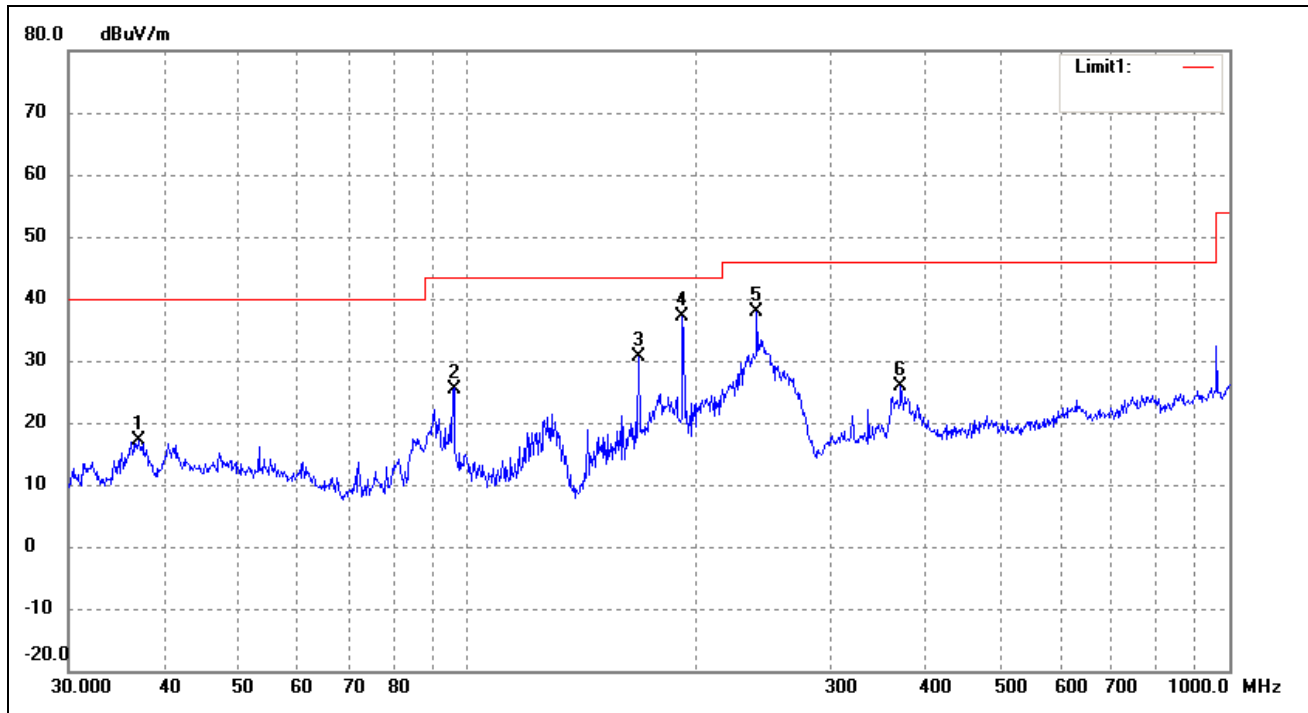


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	32.4059	36.81	-9.69	27.12	40.00	-12.88	256	100	peak
2	37.0249	43.74	-8.48	35.26	40.00	-4.74	360	100	peak
3	96.0986	40.23	-11.70	28.53	43.50	-14.97	360	100	peak
4	167.8243	34.83	-11.91	22.92	43.50	-20.58	360	100	peak
5	239.9874	30.65	-8.33	22.32	46.00	-23.68	140	100	peak
6	375.9385	24.35	-2.33	22.02	46.00	-23.98	270	100	peak

Operating Condition: 802.11b Transmitting High Channel-2462MHz

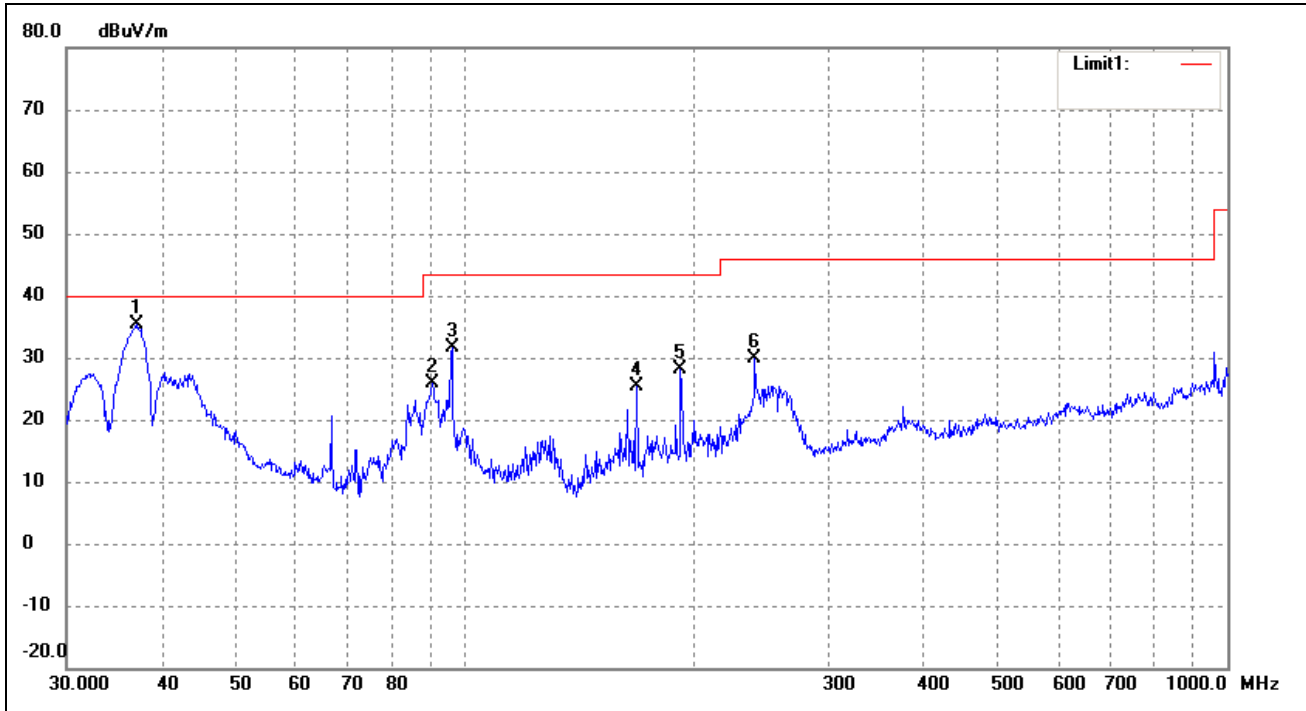
Comment: AC120V/60Hz; Adapter DC 5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	37.0249	25.51	-8.48	17.03	40.00	-22.97	176	100	peak
2	96.0986	37.20	-11.70	25.50	43.50	-18.00	255	100	peak
3	167.8243	42.52	-11.91	30.61	43.50	-12.89	360	100	peak
4	191.7450	46.83	-9.77	37.06	43.50	-6.44	178	100	peak
5	239.9874	46.12	-8.33	37.79	46.00	-8.21	240	100	peak
6	370.7023	28.50	-2.63	25.87	46.00	-20.13	310	100	peak

Test Specification: Vertical

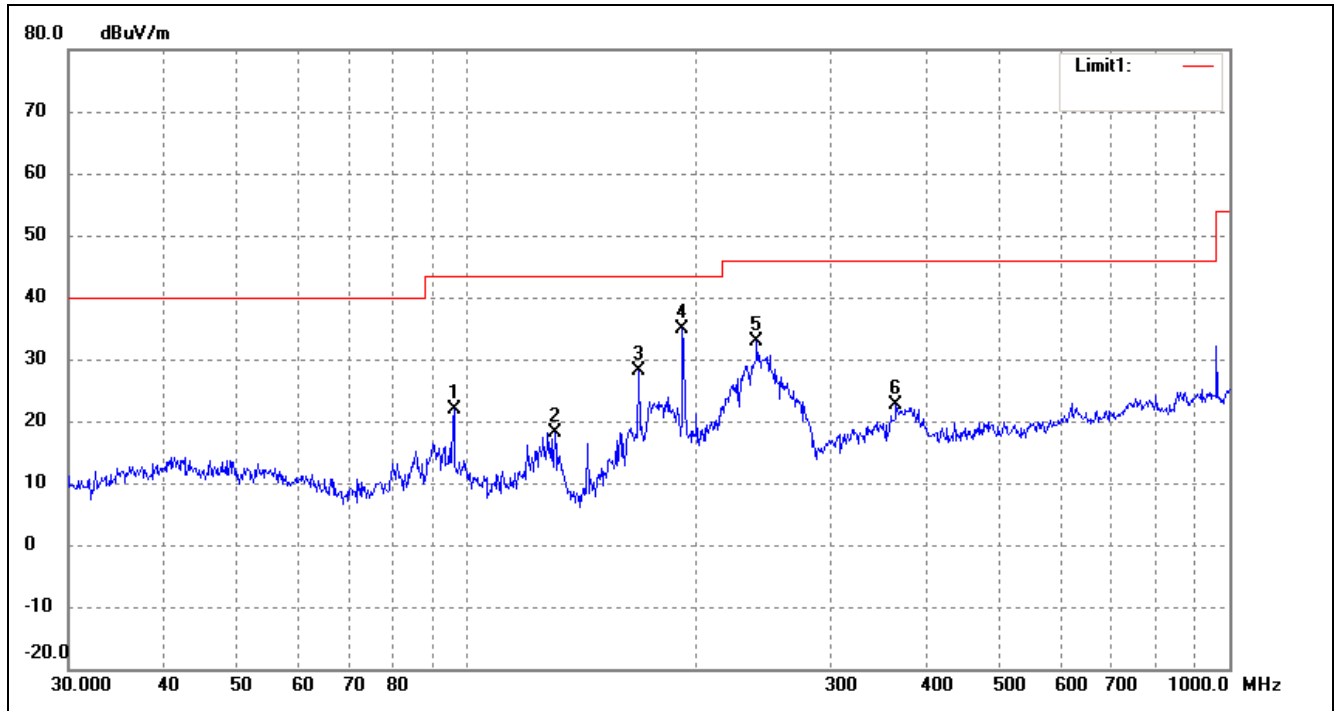


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	37.0249	43.74	-8.48	35.26	40.00	-4.74	360	100	peak
2	90.5374	38.73	-12.84	25.89	43.50	-17.61	225	100	peak
3	96.0986	43.33	-11.70	31.63	43.50	-11.87	160	100	peak
4	167.8243	37.22	-11.91	25.31	43.50	-18.19	310	100	peak
5	191.7450	37.91	-9.77	28.14	43.50	-15.36	150	100	peak
6	239.9874	38.18	-8.33	29.85	46.00	-16.15	274	100	peak

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

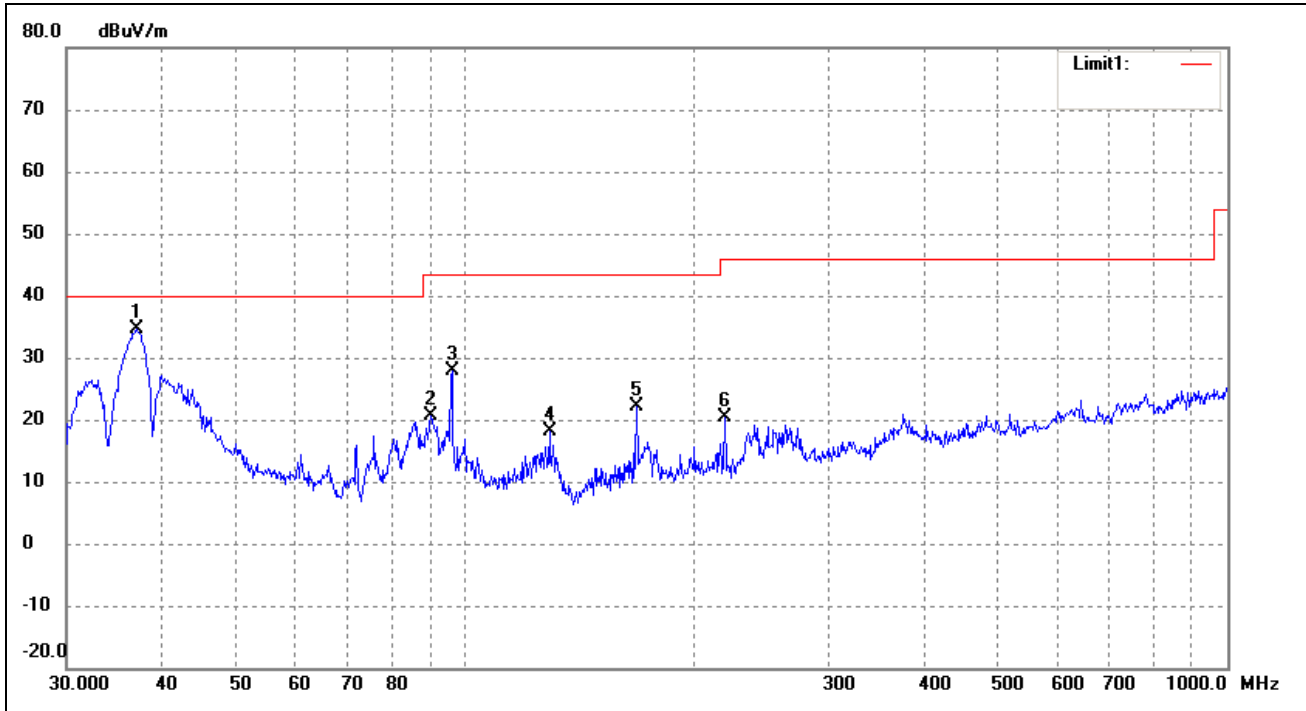
EUT: IP camera
Tested Model: DWIP-720
Operating Condition: 802.11g Transmitting Low Channel-2412MHz
Comment: AC120V/60Hz; Adapter DC 5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	96.0986	33.61	-11.70	21.91	43.50	-21.59	174	100	peak
2	130.3789	30.09	-12.02	18.07	43.50	-25.43	160	100	peak
3	167.8243	40.14	-11.91	28.23	43.50	-15.27	320	100	peak
4	191.7450	44.63	-9.77	34.86	43.50	-8.64	360	100	peak
5	239.9874	41.32	-8.33	32.99	46.00	-13.01	275	100	peak
6	365.5391	25.49	-2.93	22.56	46.00	-23.44	350	100	peak

Test Specification: Vertical

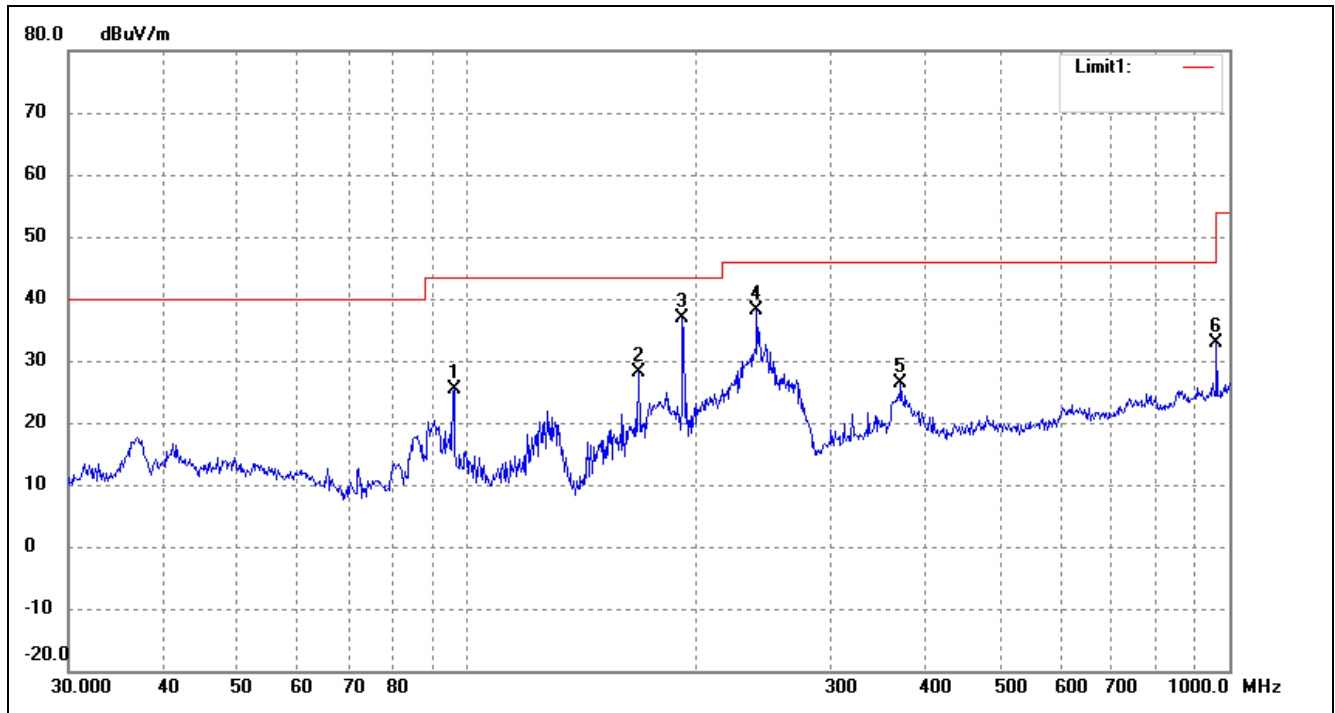


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	37.0249	43.05	-8.48	34.57	40.00	-5.43	177	100	peak
2	90.2205	33.51	-12.90	20.61	43.50	-22.89	90	100	peak
3	96.0986	39.51	-11.70	27.81	43.50	-15.69	336	100	peak
4	129.0146	30.16	-11.94	18.22	43.50	-25.28	360	100	peak
5	167.8243	34.11	-11.91	22.20	43.50	-21.30	350	100	peak
6	219.0753	29.24	-8.83	20.41	46.00	-25.59	270	100	peak

Operating Condition: 802.11g Transmitting Middle Channel-2437MHz

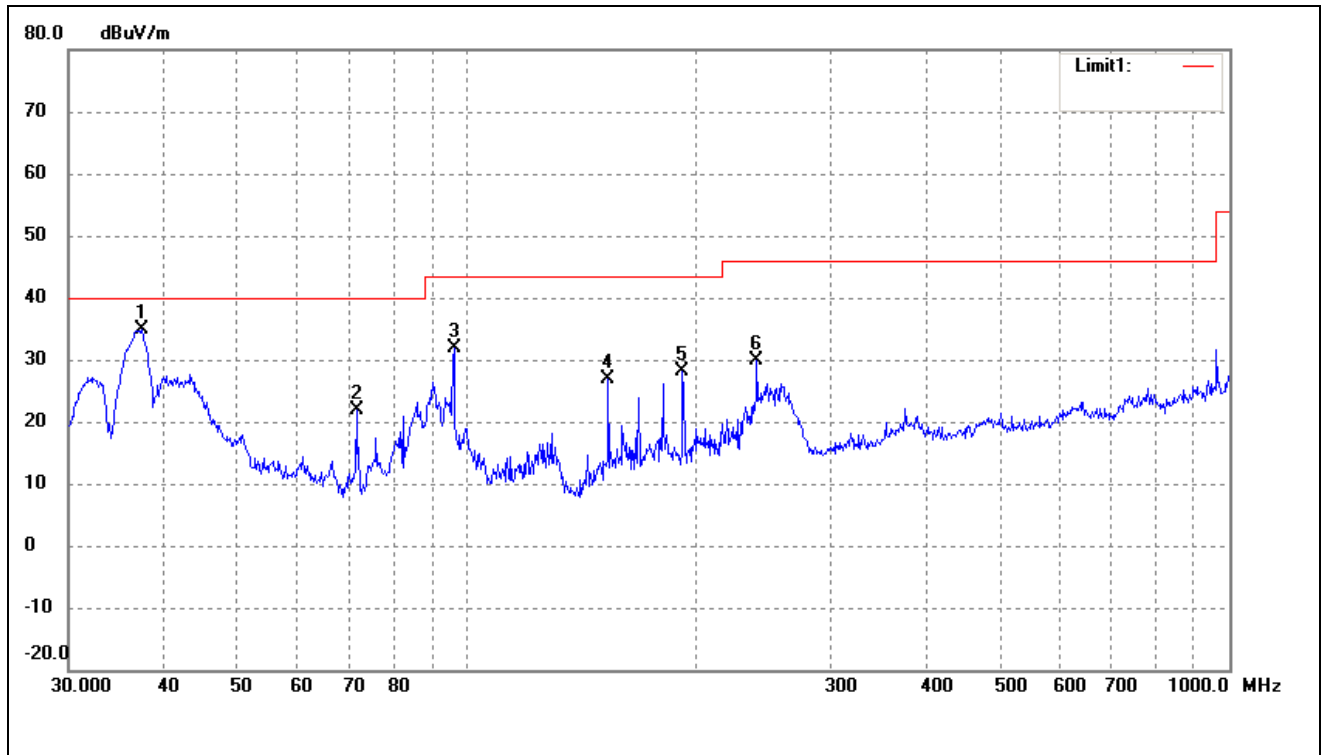
Comment: AC120V/60Hz; Adapter DC 5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	96.0986	37.20	-11.70	25.50	43.50	-18.00	270	100	peak
2	167.8243	40.14	-11.91	28.23	43.50	-15.27	164	100	peak
3	191.7450	46.69	-9.77	36.92	43.50	-6.58	228	100	peak
4	239.9874	46.49	-8.33	38.16	46.00	-7.84	130	100	peak
5	370.7023	28.92	-2.63	26.29	46.00	-19.71	360	100	peak
6	962.1623	29.37	3.61	32.98	54.00	-21.02	180	100	peak

Test Specification: Vertical

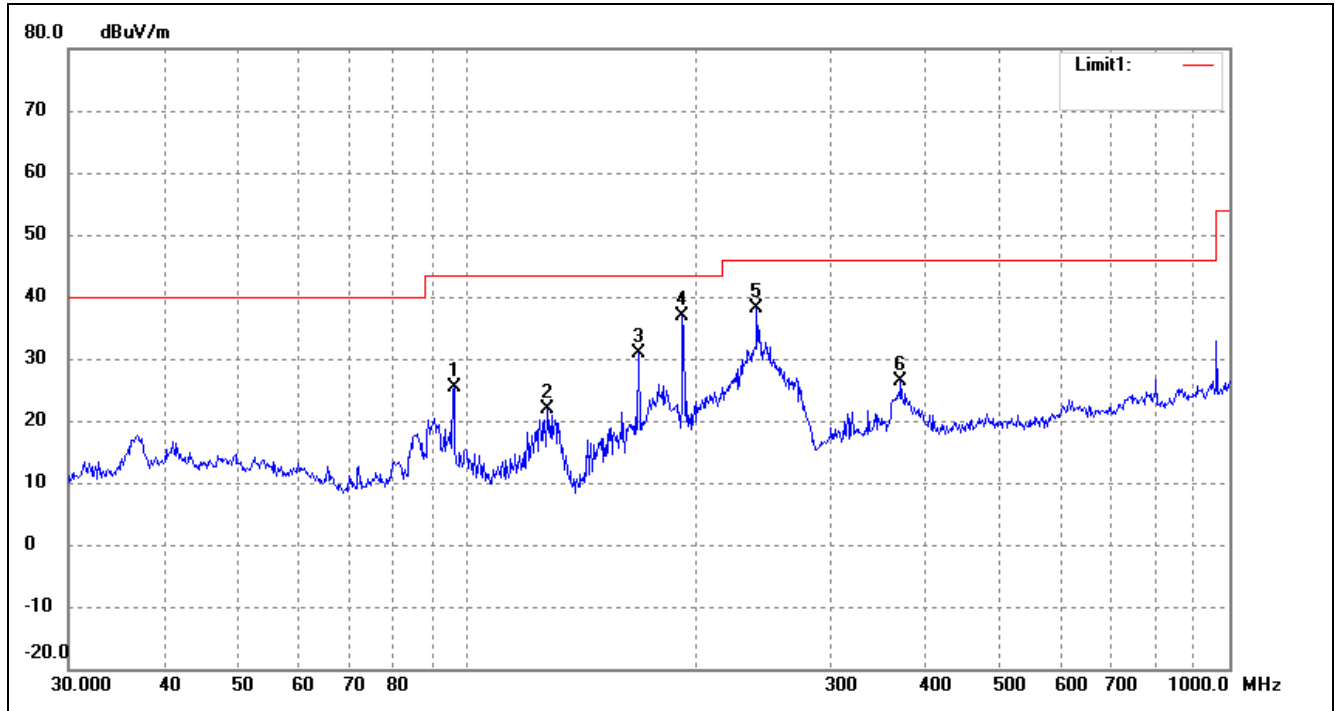


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	37.4165	43.18	-8.37	34.81	40.00	-5.19	360	100	peak
2	71.5806	34.51	-12.70	21.81	40.00	-18.19	255	100	peak
3	96.0986	43.67	-11.70	31.97	43.50	-11.53	270	100	peak
4	153.2004	39.32	-12.38	26.94	43.50	-16.56	180	100	peak
5	191.7450	37.86	-9.77	28.09	43.50	-15.41	200	100	peak
6	239.9874	38.28	-8.33	29.95	46.00	-16.05	280	100	peak

Operating Condition: 802.11g Transmitting High Channel-2462MHz

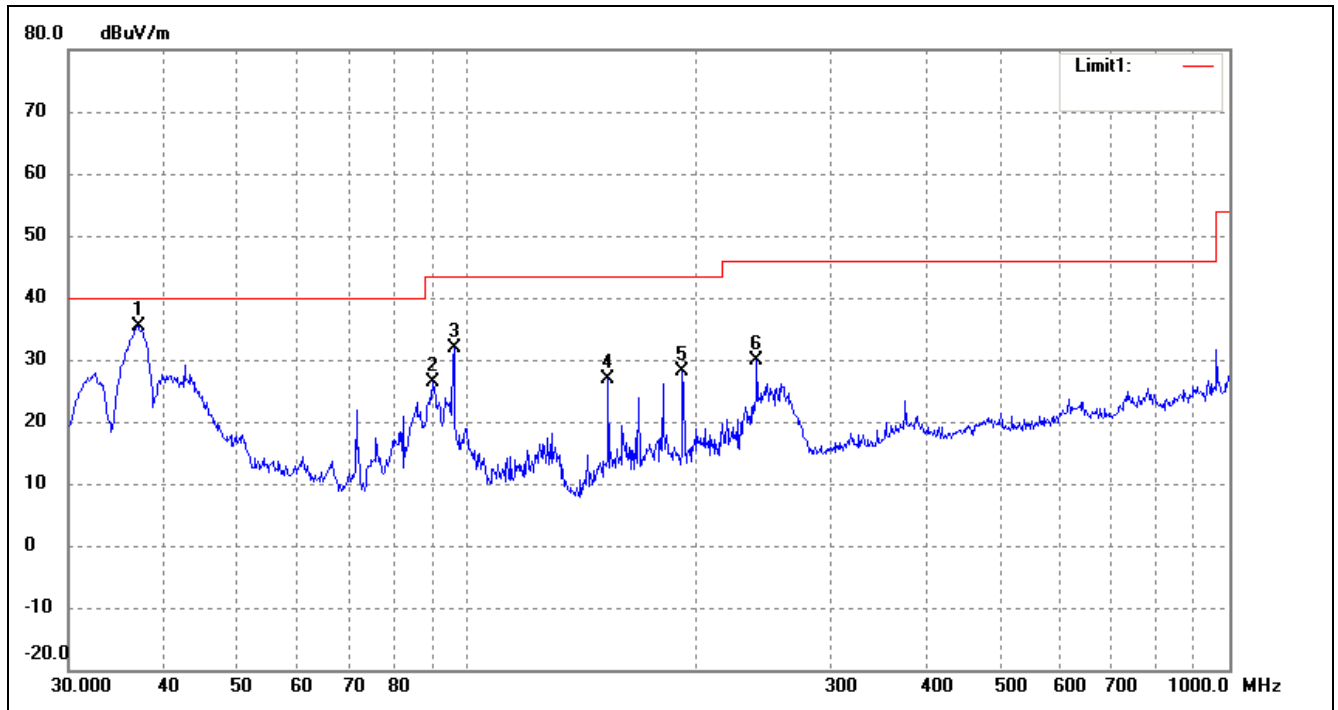
Comment: AC120V/60Hz; Adapter DC 5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	96.0986	37.20	-11.70	25.50	43.50	-18.00	270	100	peak
2	127.6645	33.74	-11.86	21.88	43.50	-21.62	51	100	peak
3	167.8243	42.67	-11.91	30.76	43.50	-12.74	360	100	peak
4	191.7450	46.69	-9.77	36.92	43.50	-6.58	360	100	peak
5	239.9874	46.49	-8.33	38.16	46.00	-7.84	150	100	peak
6	370.7023	28.92	-2.63	26.29	46.00	-19.71	274	100	peak

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	37.0249	43.83	-8.48	35.35	40.00	-4.65	360	100	peak
2	90.2205	39.23	-12.90	26.33	43.50	-17.17	180	100	peak
3	96.0986	43.67	-11.70	31.97	43.50	-11.53	225	100	peak
4	153.2004	39.32	-12.38	26.94	43.50	-16.56	67	100	peak
5	191.7450	37.86	-9.77	28.09	43.50	-15.41	150	100	peak
6	239.9874	38.28	-8.33	29.95	46.00	-16.05	360	100	peak

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

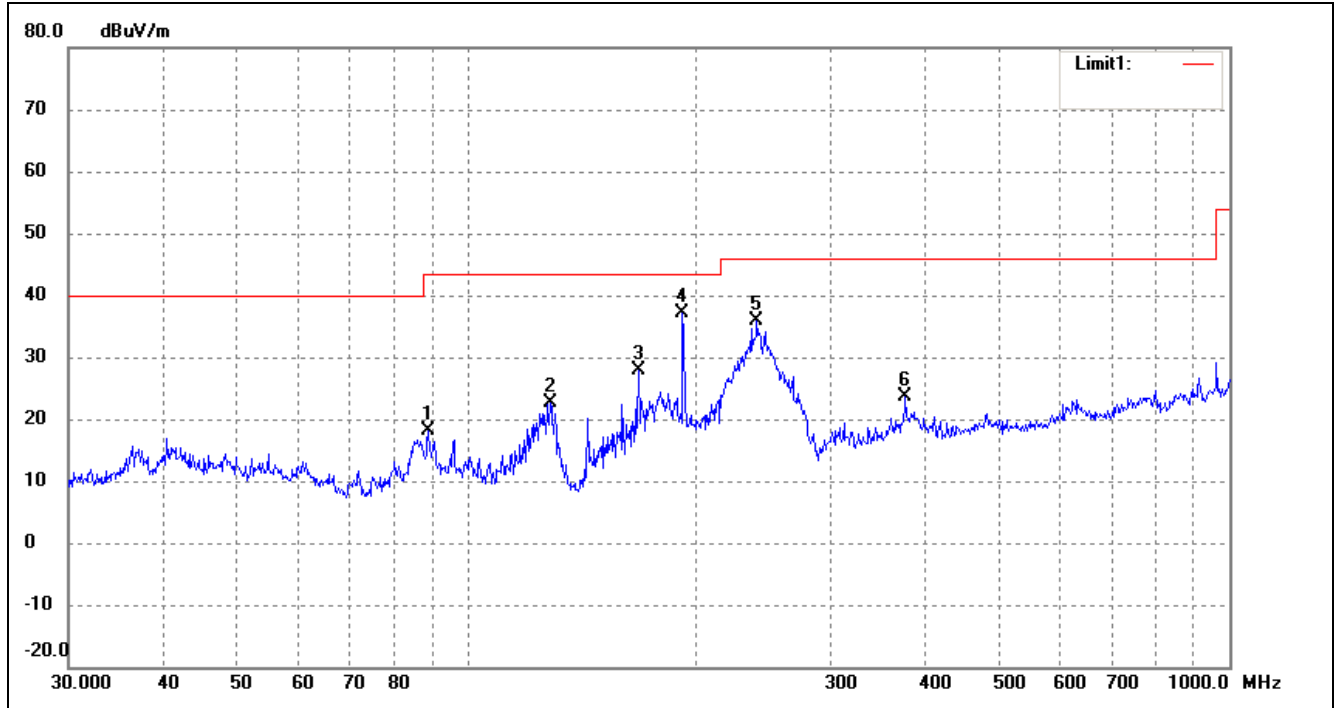
EUT: IP camera

Tested Model: DWIP-720

Operating Condition: 802.11n-HT20 Transmitting Low Channel-2412MHz

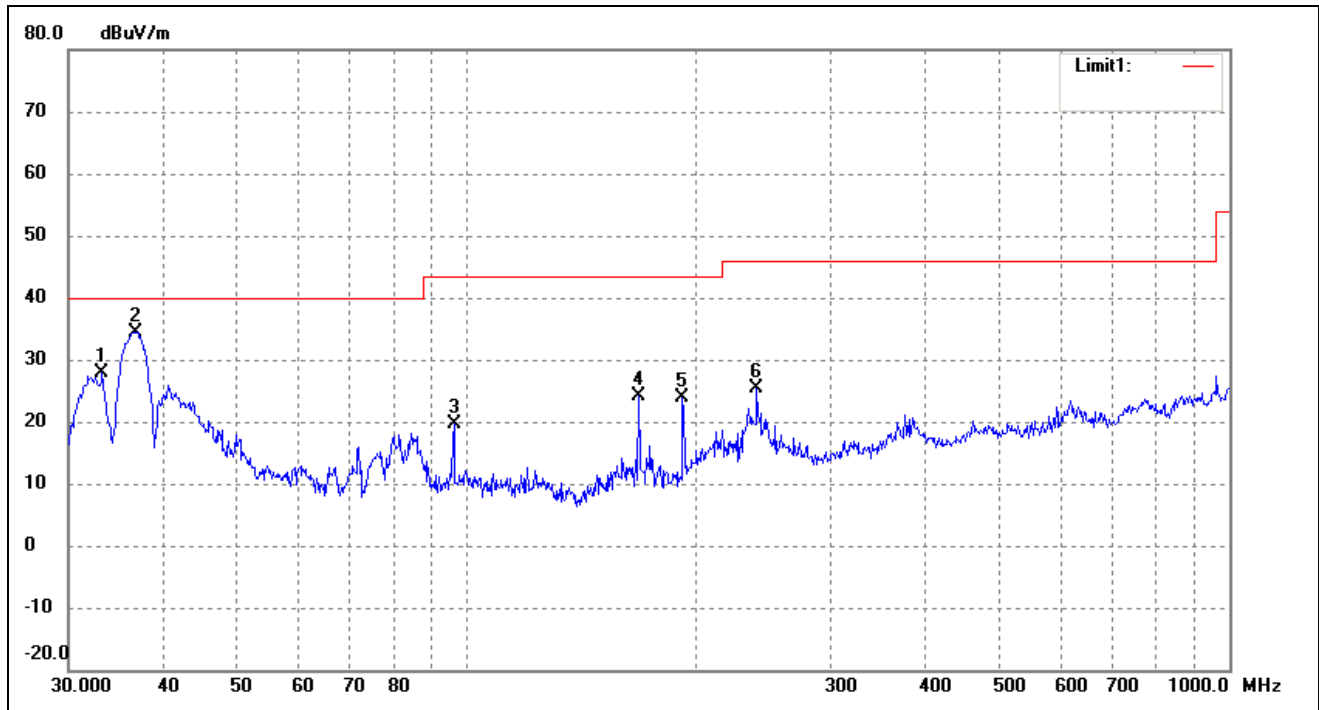
Comment: AC120V/60Hz; Adapter DC 5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	88.9639	30.86	-12.85	18.01	43.50	-25.49	260	100	peak
2	128.5630	34.51	-11.92	22.59	43.50	-20.91	131	100	peak
3	167.8243	39.71	-11.91	27.80	43.50	-15.70	285	100	peak
4	191.7450	46.93	-9.77	37.16	43.50	-6.34	224	100	peak
5	239.9874	44.11	-8.33	35.78	46.00	-10.22	150	100	peak
6	375.9385	26.08	-2.33	23.75	46.00	-22.25	284	100	peak

Test Specification: Vertical

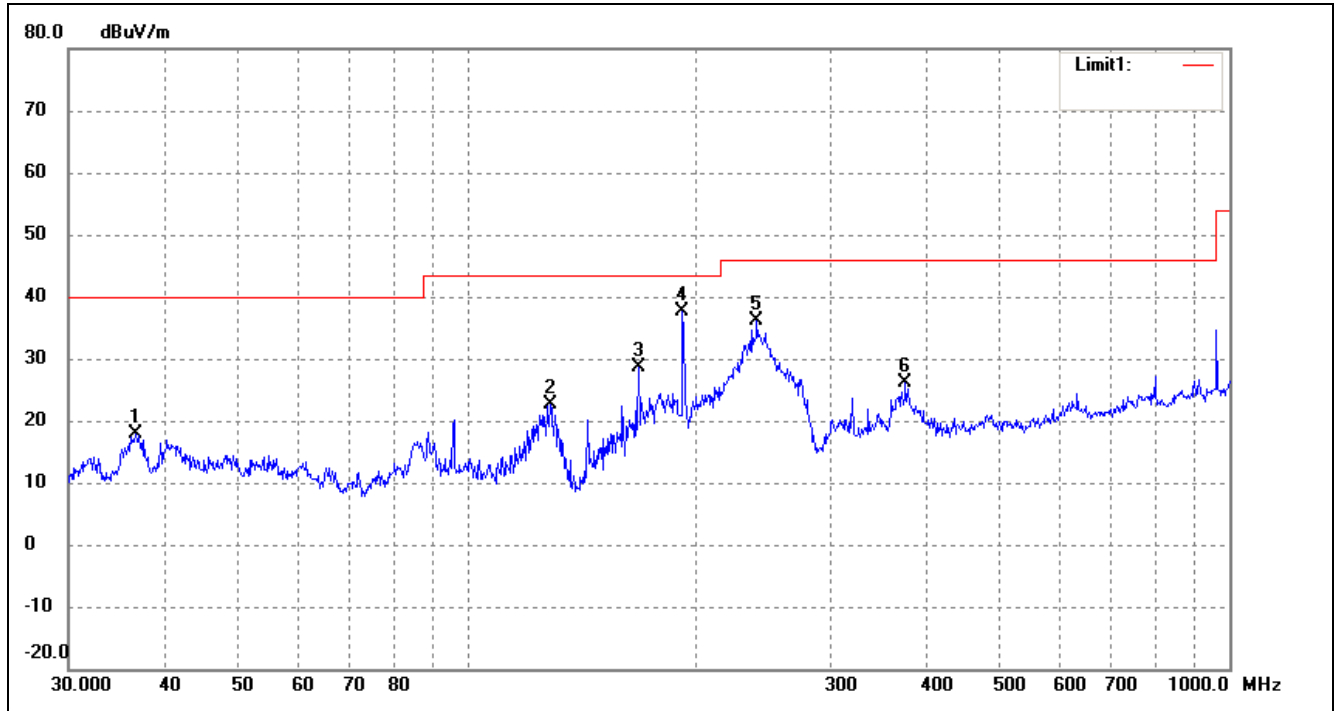


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	33.2112	37.31	-9.50	27.81	40.00	-12.19	155	100	peak
2	36.7662	43.03	-8.55	34.48	40.00	-5.52	197	100	peak
3	96.0986	31.22	-11.70	19.52	43.50	-23.98	310	100	peak
4	167.8243	35.93	-11.91	24.02	43.50	-19.48	229	100	peak
5	191.7450	33.54	-9.77	23.77	43.50	-19.73	130	100	peak
6	239.9874	33.66	-8.33	25.33	46.00	-20.67	310	100	peak

Operating Condition: 802.11n-HT20 Transmitting Middle Channel-2437MHz

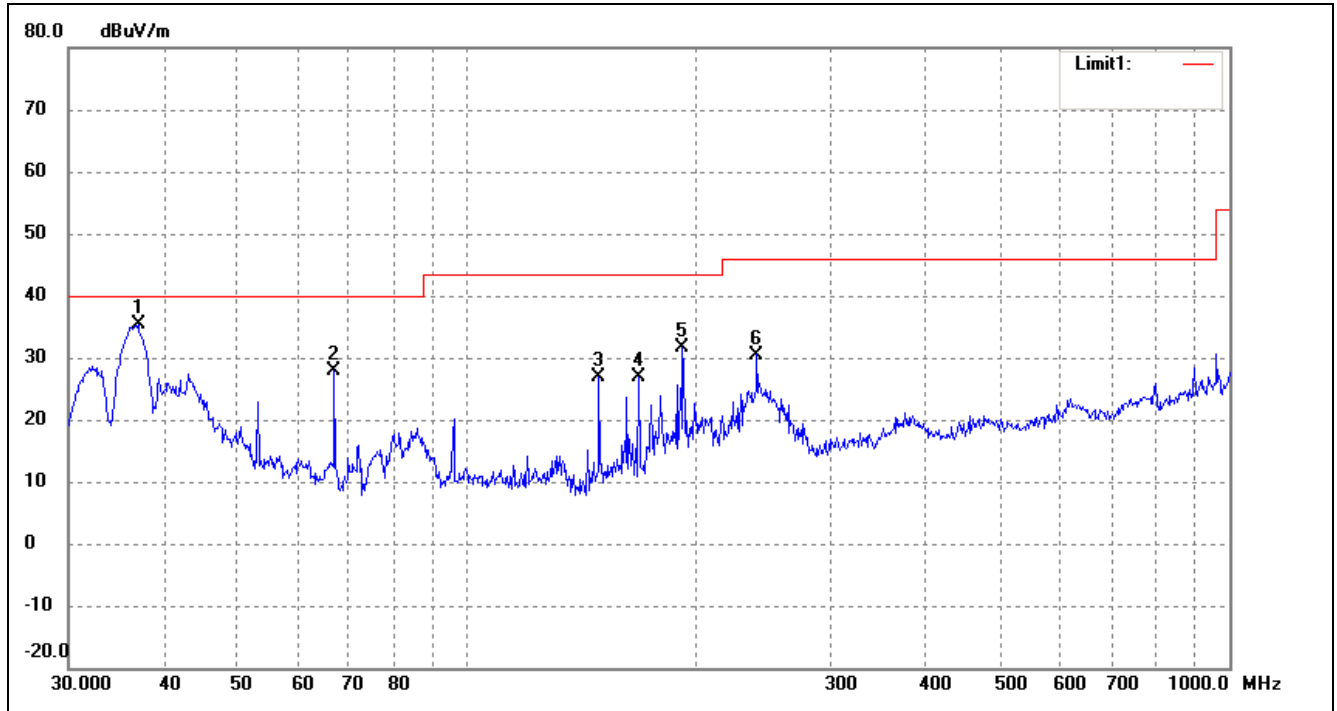
Comment: AC120V/60Hz; Adapter DC 5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	36.7662	26.31	-8.55	17.76	40.00	-22.24	274	100	peak
2	128.5630	34.51	-11.92	22.59	43.50	-20.91	116	100	peak
3	167.8243	40.58	-11.91	28.67	43.50	-14.83	82	100	peak
4	191.7450	47.40	-9.77	37.63	43.50	-5.87	134	100	peak
5	239.9874	44.36	-8.33	36.03	46.00	-9.97	154	100	peak
6	375.9385	28.51	-2.33	26.18	46.00	-19.82	265	100	peak

Test Specification: Vertical

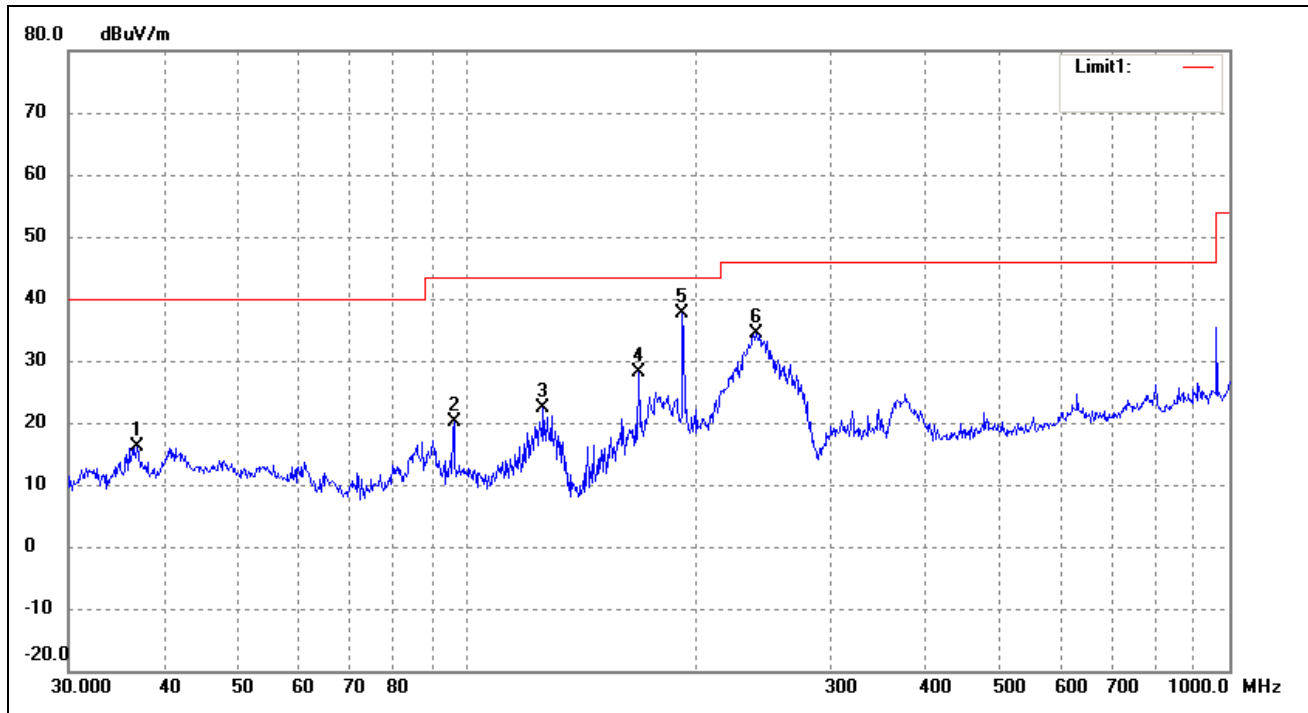


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	37.0249	43.78	-8.48	35.30	40.00	-4.70	264	100	peak
2	66.9669	39.68	-11.85	27.83	40.00	-12.17	110	100	peak
3	148.9625	39.38	-12.44	26.94	43.50	-16.56	136	100	peak
4	167.8243	38.87	-11.91	26.96	43.50	-16.54	90	100	peak
5	191.7450	41.43	-9.77	31.66	43.50	-11.84	241	100	peak
6	239.9874	38.83	-8.33	30.50	46.00	-15.50	280	100	peak

Operating Condition: 802.11n-HT20 Transmitting High Channel-2462MHz

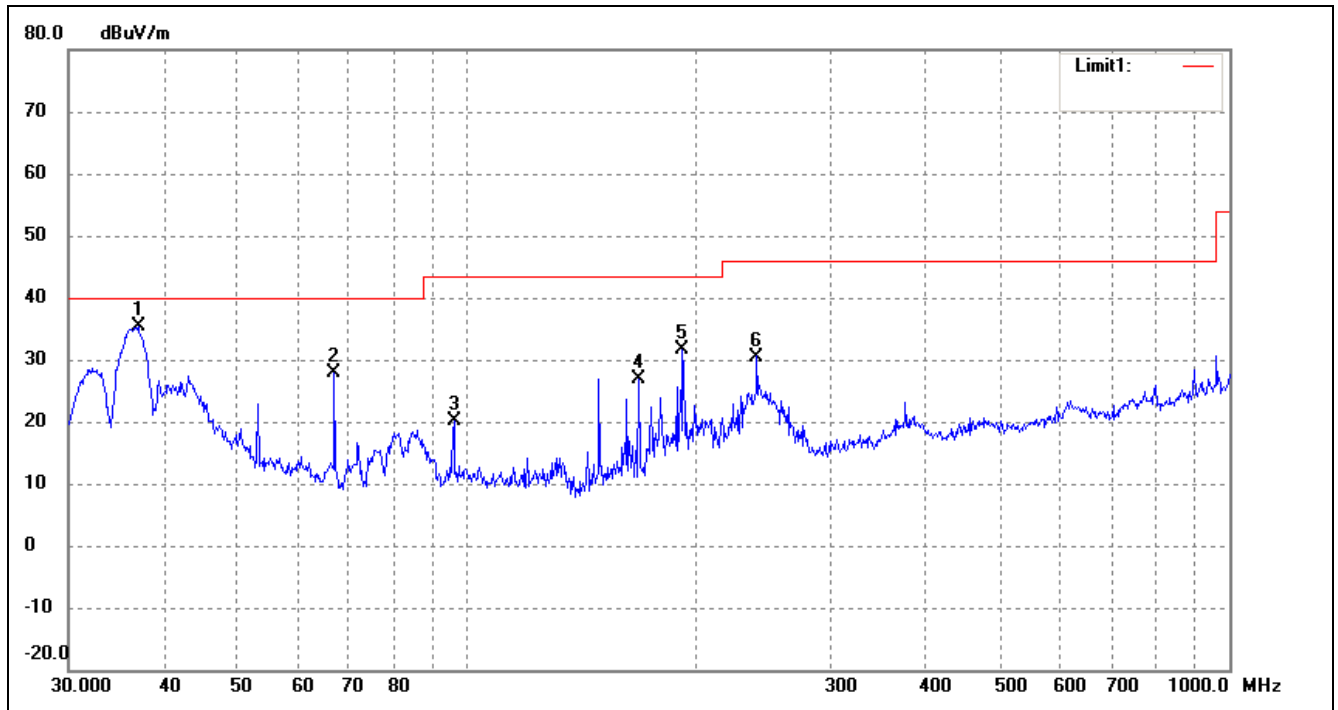
Comment: AC120V/60Hz; Adapter DC 5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	36.8953	24.70	-8.52	16.18	40.00	-23.82	360	100	peak
2	96.0986	31.81	-11.70	20.11	43.50	-23.39	112	100	peak
3	125.8864	34.07	-11.76	22.31	43.50	-21.19	180	100	peak
4	167.8243	40.07	-11.91	28.16	43.50	-15.34	270	100	peak
5	191.7450	47.30	-9.77	37.53	43.50	-5.97	245	100	peak
6	239.9874	42.80	-8.33	34.47	46.00	-11.53	310	100	peak

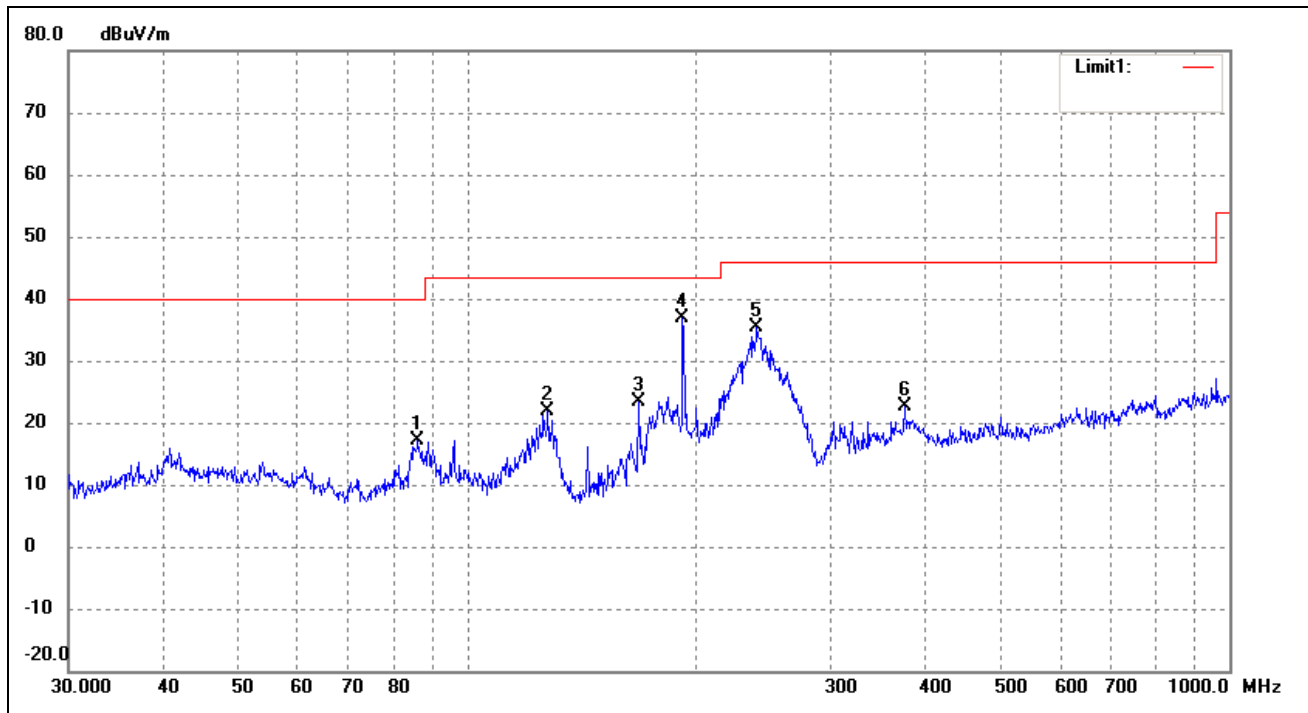
Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	37.0249	43.80	-8.48	35.32	40.00	-4.68	267	100	peak
2	66.9669	39.68	-11.85	27.83	40.00	-12.17	116	100	peak
3	96.0986	31.93	-11.70	20.23	43.50	-23.27	360	100	peak
4	167.8243	38.87	-11.91	26.96	43.50	-16.54	228	100	peak
5	191.7450	41.43	-9.77	31.66	43.50	-11.84	270	100	peak
6	239.9874	38.83	-8.33	30.50	46.00	-15.50	310	100	peak

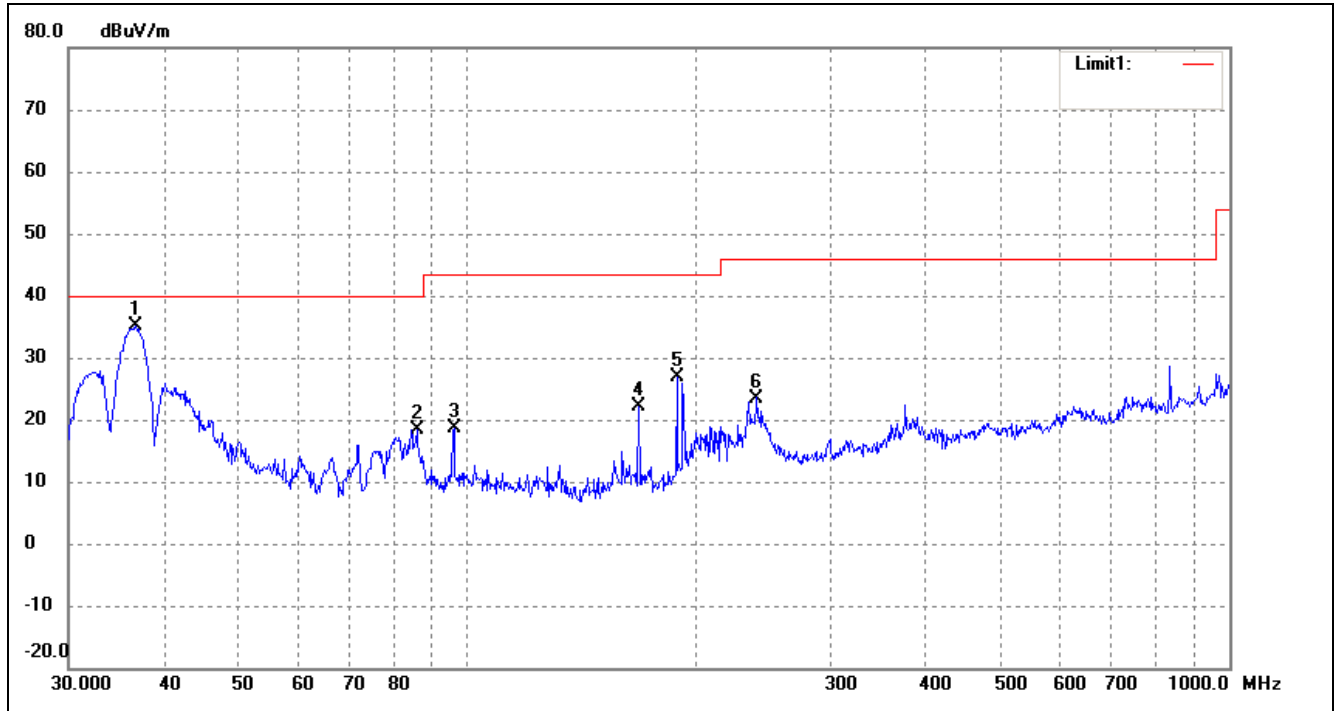
EUT: IP camera
Tested Model: DWIP-720
Operating Condition: 802.11n-HT40 Transmitting Low Channel-2422MHz
Comment: AC120V/60Hz; Adapter DC 5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	86.2001	29.66	-12.58	17.08	40.00	-22.92	267	100	peak
2	127.6645	33.73	-11.86	21.87	43.50	-21.63	114	100	peak
3	167.8243	35.20	-11.91	23.29	43.50	-20.21	35	100	peak
4	191.7450	46.62	-9.77	36.85	43.50	-6.65	81	100	peak
5	239.9874	43.65	-8.33	35.32	46.00	-10.68	310	100	peak
6	374.6226	25.05	-2.41	22.64	46.00	-23.36	270	100	peak

Test Specification: Vertical

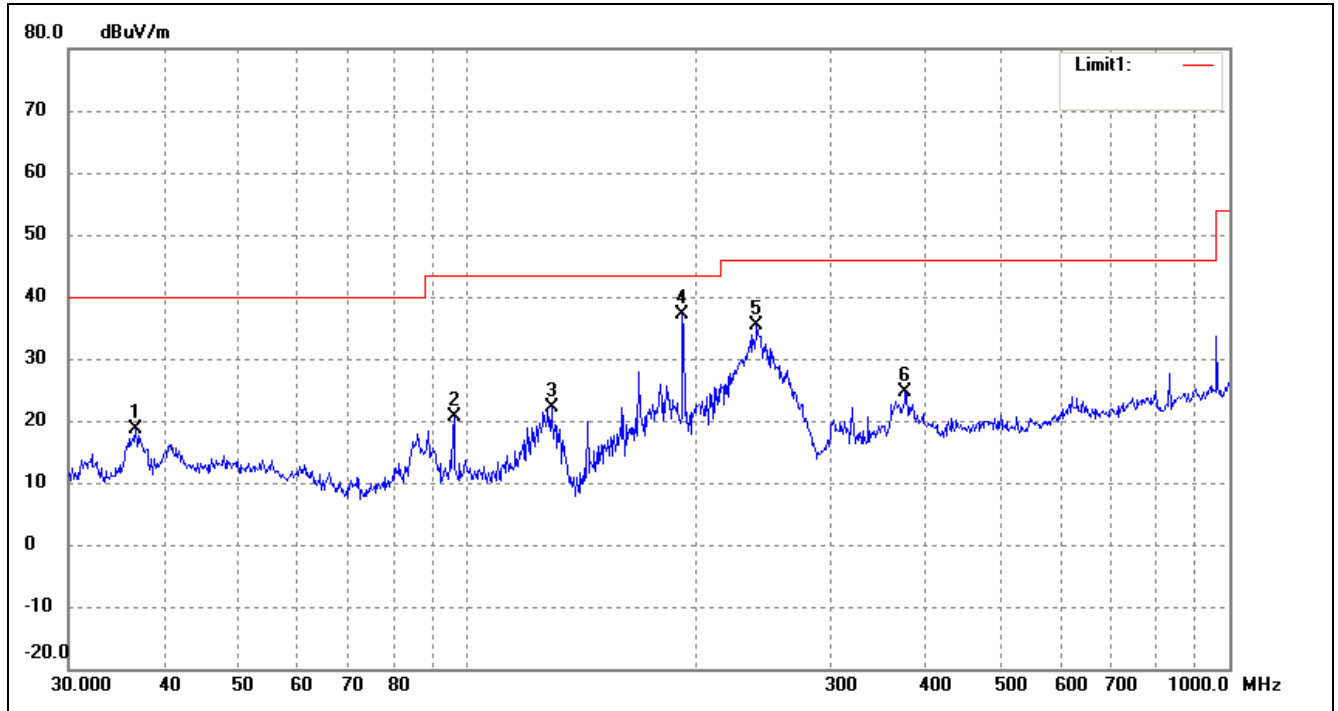


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	36.7662	43.56	-8.55	35.01	40.00	-4.99	360	100	peak
2	85.8984	31.00	-12.55	18.45	40.00	-21.55	258	100	peak
3	96.0986	30.42	-11.70	18.72	43.50	-24.78	347	100	peak
4	167.8243	34.12	-11.91	22.21	43.50	-21.29	270	100	peak
5	188.4125	37.04	-10.22	26.82	43.50	-16.68	90	100	peak
6	239.9874	31.83	-8.33	23.50	46.00	-22.50	312	100	peak

Operating Condition: 802.11n-HT40 Transmitting Middle Channel-2437MHz

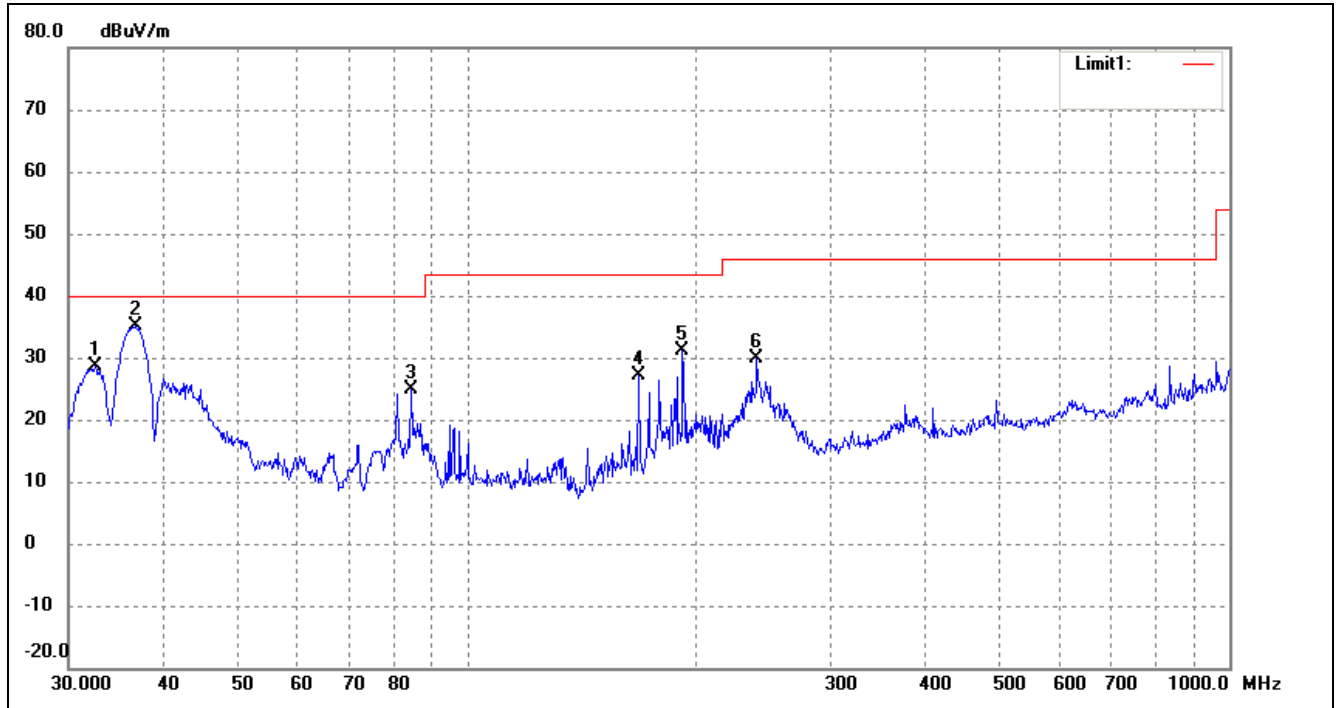
Comment: AC120V/60Hz; Adapter DC 5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	36.7662	27.09	-8.55	18.54	40.00	-21.46	251	100	peak
2	96.0986	32.21	-11.70	20.51	43.50	-22.99	167	100	peak
3	129.0146	34.06	-11.94	22.12	43.50	-21.38	44	100	peak
4	191.7450	46.86	-9.77	37.09	43.50	-6.41	130	100	peak
5	239.9874	43.65	-8.33	35.32	46.00	-10.68	310	100	peak
6	375.9385	26.86	-2.33	24.53	46.00	-21.47	270	100	peak

Test Specification: Vertical

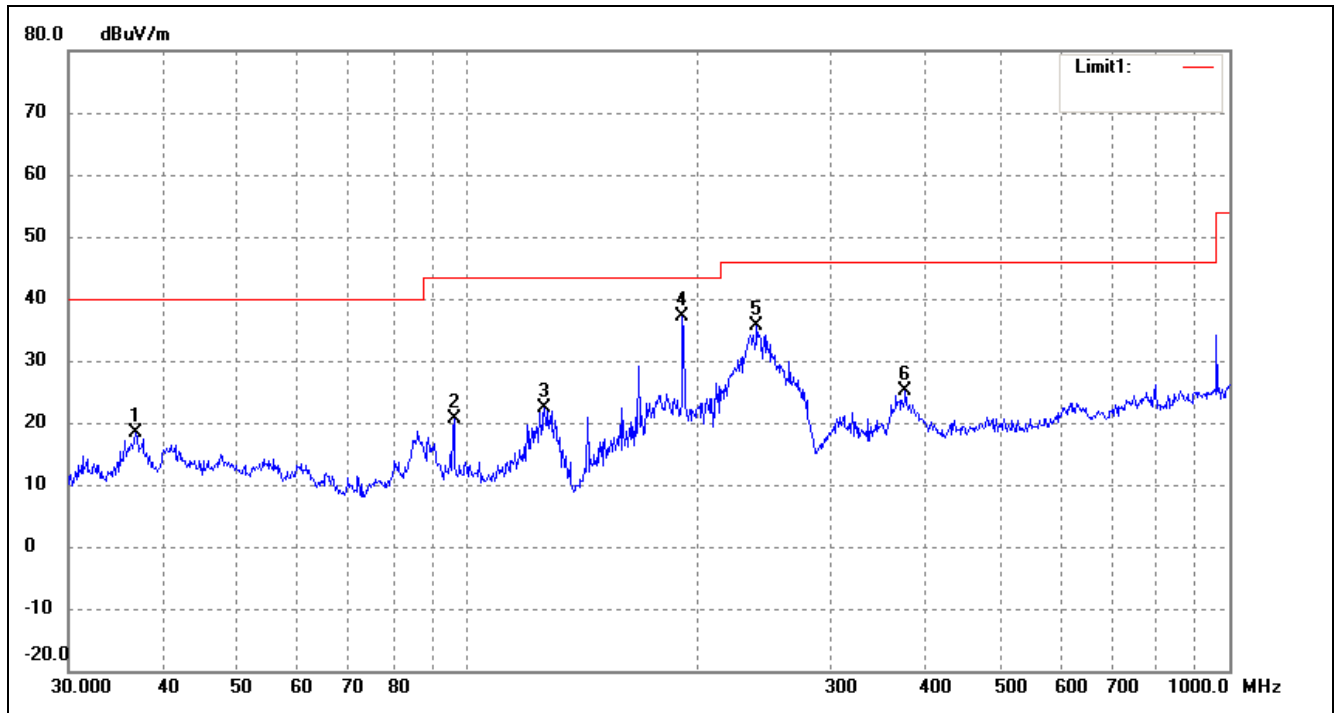


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	32.5198	38.35	-9.67	28.68	40.00	-11.32	47	100	peak
2	36.7662	43.72	-8.55	35.17	40.00	-4.83	264	100	peak
3	84.4054	37.29	-12.41	24.88	40.00	-15.12	225	100	peak
4	167.8243	39.05	-11.91	27.14	43.50	-16.36	180	100	peak
5	191.7450	41.00	-9.77	31.23	43.50	-12.27	315	100	peak
6	239.9874	38.32	-8.33	29.99	46.00	-16.01	321	100	peak

Operating Condition: 802.11n-HT40 Transmitting High Channel-2452MHz

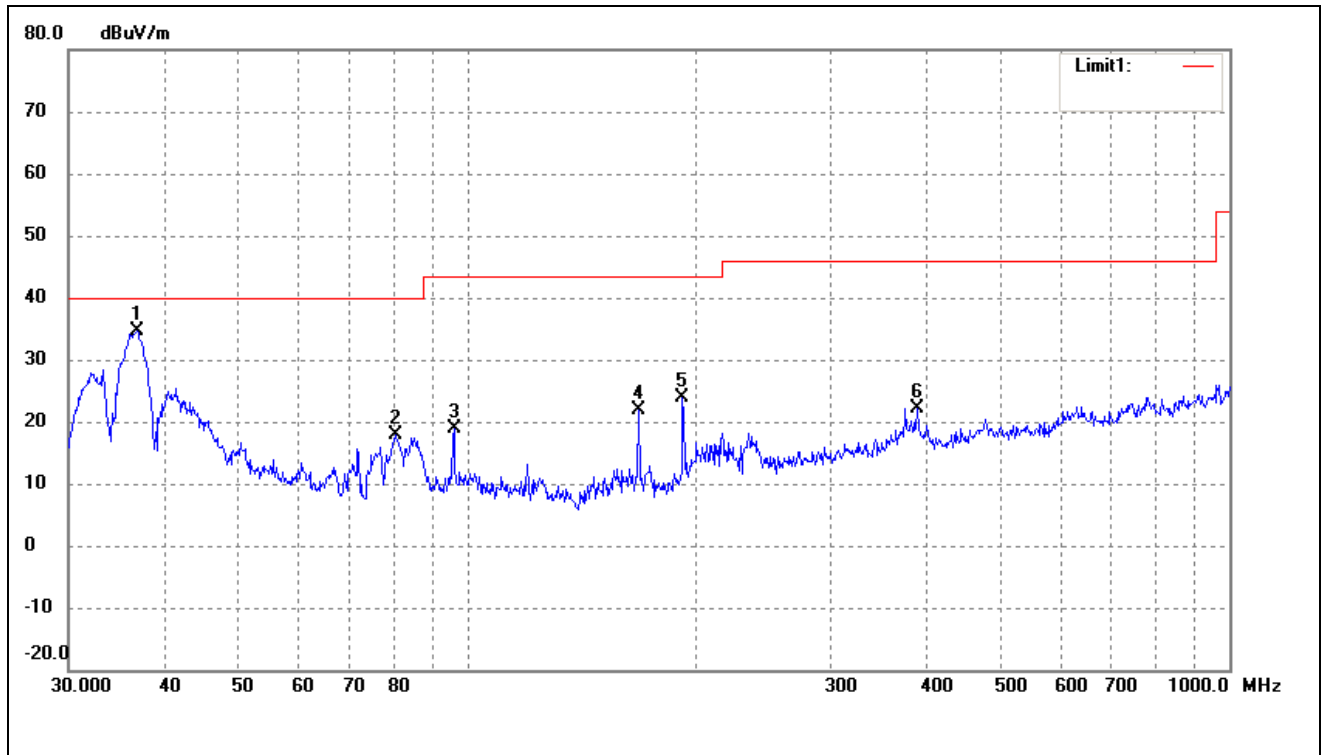
Comment: AC120V/60Hz; Adapter DC 5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	36.7662	26.96	-8.55	18.41	40.00	-21.59	360	100	peak
2	96.0986	32.30	-11.70	20.60	43.50	-22.90	287	100	peak
3	126.3286	34.09	-11.79	22.30	43.50	-21.20	168	100	peak
4	191.7450	46.90	-9.77	37.13	43.50	-6.37	122	100	peak
5	239.9874	44.01	-8.33	35.68	46.00	-10.32	241	100	peak
6	375.9385	27.34	-2.33	25.01	46.00	-20.99	340	100	peak

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	36.8953	43.04	-8.52	34.52	40.00	-5.48	78	100	peak
2	80.6442	29.84	-12.05	17.79	40.00	-22.21	136	100	peak
3	96.0986	30.55	-11.70	18.85	43.50	-24.65	284	100	peak
4	167.8243	33.77	-11.91	21.86	43.50	-21.64	60	100	peak
5	191.7450	33.73	-9.77	23.96	43.50	-19.54	330	100	peak
6	389.3549	24.82	-2.58	22.24	46.00	-23.76	275	100	peak

Spurious Emissions Above 1GHz

Test Mode: 802.11b

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2412MHz							
4824.000	55.09	-3.87	51.22	74.00	-22.78	H	PK
4824.000	39.84	-3.87	35.97	54.00	-18.03	H	AV
7236.000	47.3	1.14	48.44	74.00	-25.56	H	PK
7236.000	35.98	1.19	37.17	54.00	-16.83	H	AV
4824.000	58.31	-3.86	54.45	74.00	-19.55	V	PK
4824.000	41.5	-3.86	37.64	54.00	-16.36	V	AV
7236.000	48.11	1.10	49.21	74.00	-24.79	V	PK
7236.000	39.44	1.10	40.54	54.00	-13.46	V	AV
Middle Channel-2437MHz							
4874.000	54.74	-3.74	52	74.00	-22	H	PK
4874.000	39.99	-3.74	35.25	54.00	-18.75	H	AV
7311.000	47.77	1.47	50.24	74.00	-23.76	H	PK
7311.000	33.10	1.47	36.57	54.00	-17.43	H	AV
4874.000	53.97	-3.74	51.23	74.00	-22.77	V	PK
4874.000	40.89	-3.74	38.15	54.00	-15.85	V	AV
7311.000	47.98	1.47	50.45	74.00	-23.55	V	PK
7311.000	34.08	1.47	36.55	54.00	-17.45	V	AV
High Channel-2462MHz							
4924.000	55.82	-3.59	51.23	74.00	-22.77	H	PK
4924.000	41.76	-3.59	39.17	54.00	-14.83	H	AV
7386.000	46.38	1.79	47.17	74.00	-26.83	H	PK
7386.000	34.83	1.79	35.62	54.00	-18.38	H	AV
4924.000	54.94	-3.59	50.35	74.00	-23.65	V	PK
4924.000	42.04	-3.59	39.45	54.00	-14.55	V	AV
7386.000	47.99	1.79	48.78	74.00	-25.22	V	PK
7386.000	35.18	1.79	37.97	54.00	-16.03	V	AV

L

Test Mode: 802.11g

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2412MHz							
4824.000	55.50	-3.86	51.64	74.00	-22.36	H	PK
4824.000	42.23	-3.86	38.37	54.00	-15.63	H	AV
7236.000	48.42	1.10	49.52	74.00	-24.48	H	PK
7236.000	34.40	1.10	35.50	54.00	-18.50	H	AV
4824.000	55.99	-3.86	52.13	74.00	-21.87	V	PK
4824.000	42.65	-3.86	38.79	54.00	-15.21	V	AV
7236.000	49.22	1.10	50.32	74.00	-23.68	V	PK
7236.000	35.54	1.10	36.64	54.00	-17.36	V	AV
Middle Channel-2437MHz							
4874.000	55.10	-3.74	51.36	74.00	-22.64	H	PK
4874.000	43.28	-3.74	39.54	54.00	-14.46	H	AV
7311.000	47.38	1.47	48.85	74.00	-25.15	H	PK
7311.000	35.27	1.47	36.74	54.00	-17.26	H	AV
4874.000	57.07	-3.74	53.33	74.00	-20.67	V	PK
4874.000	43.86	-3.74	40.12	54.00	-13.88	V	AV
7311.000	48.40	1.47	49.87	74.00	-24.13	V	PK
7311.000	35.33	1.47	36.80	54.00	-17.20	V	AV
High Channel-2462MHz							
4924.000	54.00	-3.59	50.41	74.00	-23.59	H	PK
4924.000	40.75	-3.59	37.16	54.00	-16.84	H	AV
7386.000	47.18	1.79	48.97	74.00	-25.03	H	PK
7386.000	34.73	1.79	36.52	54.00	-17.48	H	AV
4924.000	56.11	-3.59	52.52	74.00	-21.48	V	PK
4924.000	42.69	-3.59	39.10	54.00	-14.90	V	AV
7386.000	48.58	1.79	50.37	74.00	-23.63	V	PK
7386.000	35.95	1.79	37.74	54.00	-16.26	V	AV

Test Mode: 802.11n-HT20

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2412MHz							
4824.000	55.60	-3.86	51.74	74.00	-22.26	H	PK
4824.000	40.54	-3.86	36.68	54.00	-17.32	H	AV
7236.000	47.26	1.10	48.36	74.00	-25.64	H	PK
7236.000	34.44	1.10	35.54	54.00	-18.46	H	AV
4824.000	56.71	-3.86	52.85	74.00	-21.15	V	PK
4824.000	43.18	-3.86	39.32	54.00	-14.68	V	AV
7236.000	49.21	1.10	50.31	74.00	-23.69	V	PK
7236.000	35.77	1.10	36.87	54.00	-17.13	V	AV
Middle Channel-2437MHz							
4874.000	54.16	-3.74	50.42	74.00	-23.58	H	PK
4874.000	42.48	-3.74	38.74	54.00	-15.26	H	AV
7311.000	48.74	1.47	50.21	74.00	-23.79	H	PK
7311.000	33.10	1.47	34.57	54.00	-19.43	H	AV
4874.000	54.92	-3.74	51.18	74.00	-22.82	V	PK
4874.000	42.62	-3.74	38.88	54.00	-15.12	V	AV
7311.000	48.49	1.47	49.96	74.00	-24.04	V	PK
7311.000	35.20	1.47	36.67	54.00	-17.33	V	AV
High Channel-2462MHz							
4924.000	53.90	-3.59	50.31	74.00	-23.69	H	PK
4924.000	43.23	-3.59	39.64	54.00	-14.36	H	AV
7386.000	48.31	1.79	50.10	74.00	-23.90	H	PK
7386.000	36.10	1.79	37.89	54.00	-16.11	H	AV
4924.000	55.70	-3.59	52.11	74.00	-21.89	V	PK
4924.000	41.48	-3.59	37.89	54.00	-16.11	V	AV
7386.000	48.55	1.79	50.34	74.00	-23.66	V	PK
7386.000	35.36	1.79	37.15	54.00	-16.85	V	AV

Test Mode: 802.11n-HT40

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2422MHz							
4844.000	53.25	-3.90	49.35	74.00	-24.65	H	PK
4824.000	38.25	-3.90	34.35	54.00	-19.65	H	AV
7266.000	46.48	1.06	47.54	74.00	-26.46	H	PK
7266.000	32.56	1.06	33.62	54.00	-20.38	H	AV
4844.000	54.22	-3.90	50.32	74.00	-23.68	V	PK
4824.000	39.42	-3.90	35.52	54.00	-18.48	V	AV
7266.000	48.81	1.06	49.87	74.00	-24.13	V	PK
7266.000	34.78	1.06	35.84	54.00	-18.16	V	AV
Middle Channel-2437MHz							
4874.000	52.53	-3.74	48.79	74.00	-25.21	H	PK
4874.000	37.88	-3.74	34.14	54.00	-19.86	H	AV
7311.000	44.88	1.47	46.35	74.00	-27.65	H	PK
7311.000	32.03	1.47	33.50	54.00	-20.50	H	AV
4874.000	53.74	-3.74	50.00	74.00	-24.00	V	PK
4874.000	39.95	-3.74	36.21	54.00	-17.79	V	AV
7311.000	45.78	1.47	47.25	74.00	-26.75	V	PK
7311.000	34.00	1.47	35.47	54.00	-18.53	V	AV
High Channel-2452MHz							
4904.000	52.65	-3.63	49.02	74.00	-24.98	H	PK
4904.000	39.37	-3.63	35.74	54.00	-18.26	H	AV
7356.000	45.63	1.62	47.25	74.00	-26.75	H	PK
7356.000	30.73	1.62	32.35	54.00	-21.65	H	AV
4904.000	54.84	-3.63	51.21	74.00	-22.79	V	PK
4904.000	40.83	-3.63	37.20	54.00	-16.80	V	AV
7356.000	48.18	1.62	49.80	74.00	-24.20	V	PK
7356.000	35.12	1.62	36.74	54.00	-17.26	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 v03r05, 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 v03r05, 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 $\geq$ 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.

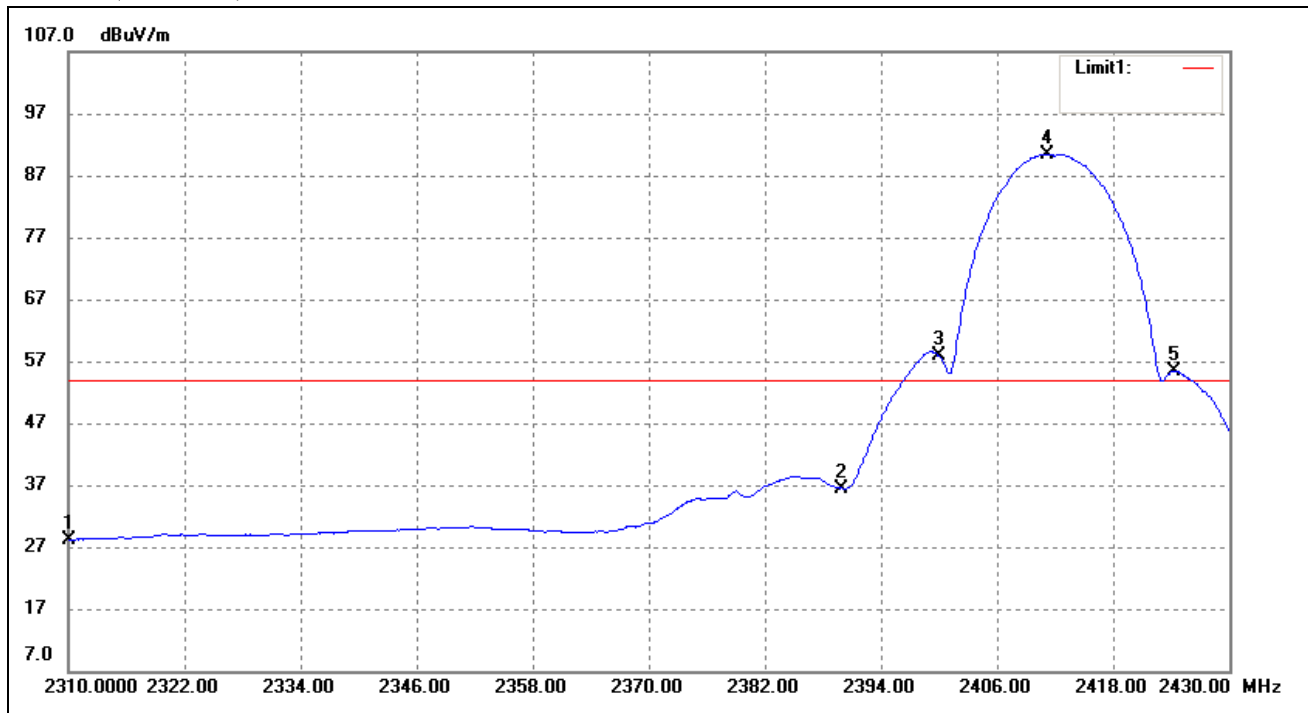
9.3 Environmental Conditions

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

9.4 Summary of Test Results/Plots

802.11b-Lowest Bandedge

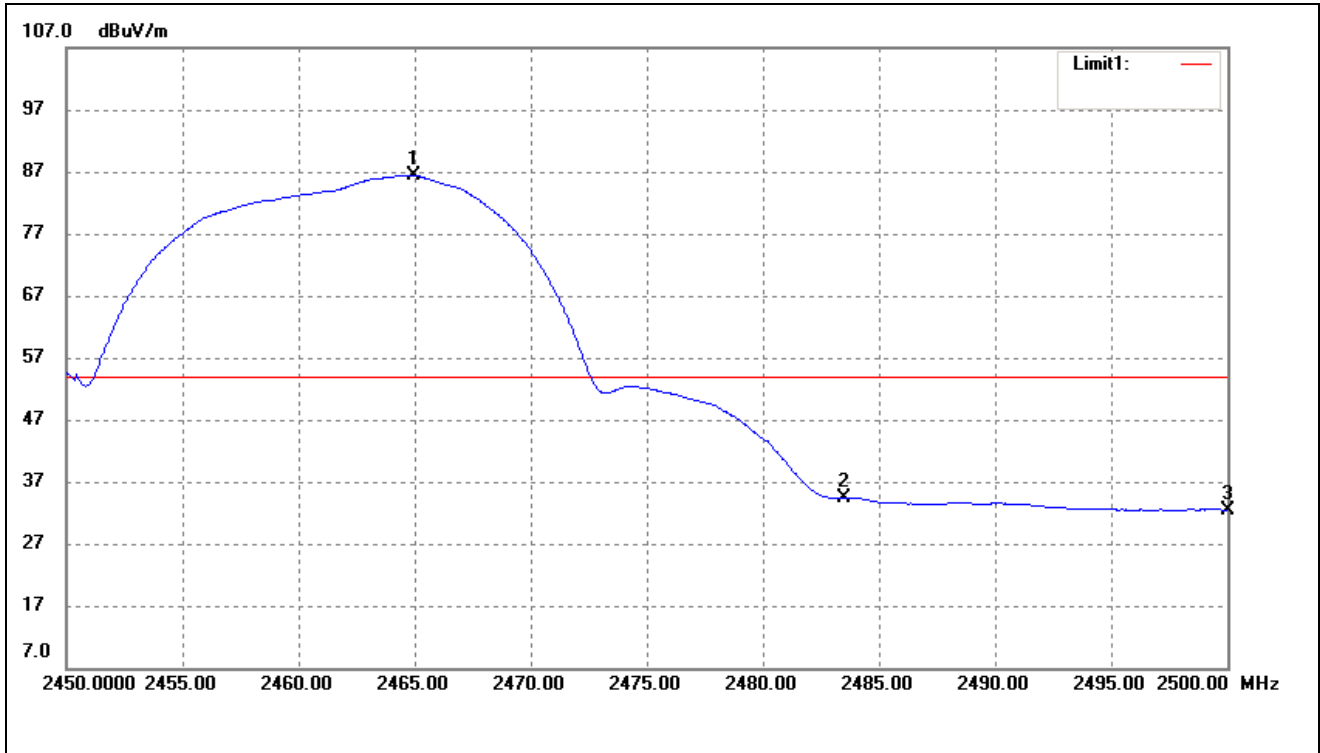
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	31.53	-3.35	28.18	54.00	-25.82	Average Detector
	2310.000	45.17	-3.35	41.82	74.00	-32.18	Peak Detector
2	2390.000	40.78	-4.29	36.49	54.00	-17.51	Average Detector
	2390.000	56.38	-4.29	52.09	74.00	-21.91	Peak Detector
3	2400.000	62.25	-4.40	57.85	Delta=32.59dBc		Average Detector
4	2411.160	94.88	-4.44	90.44			Average Detector

802.11b-Highest Bandedge

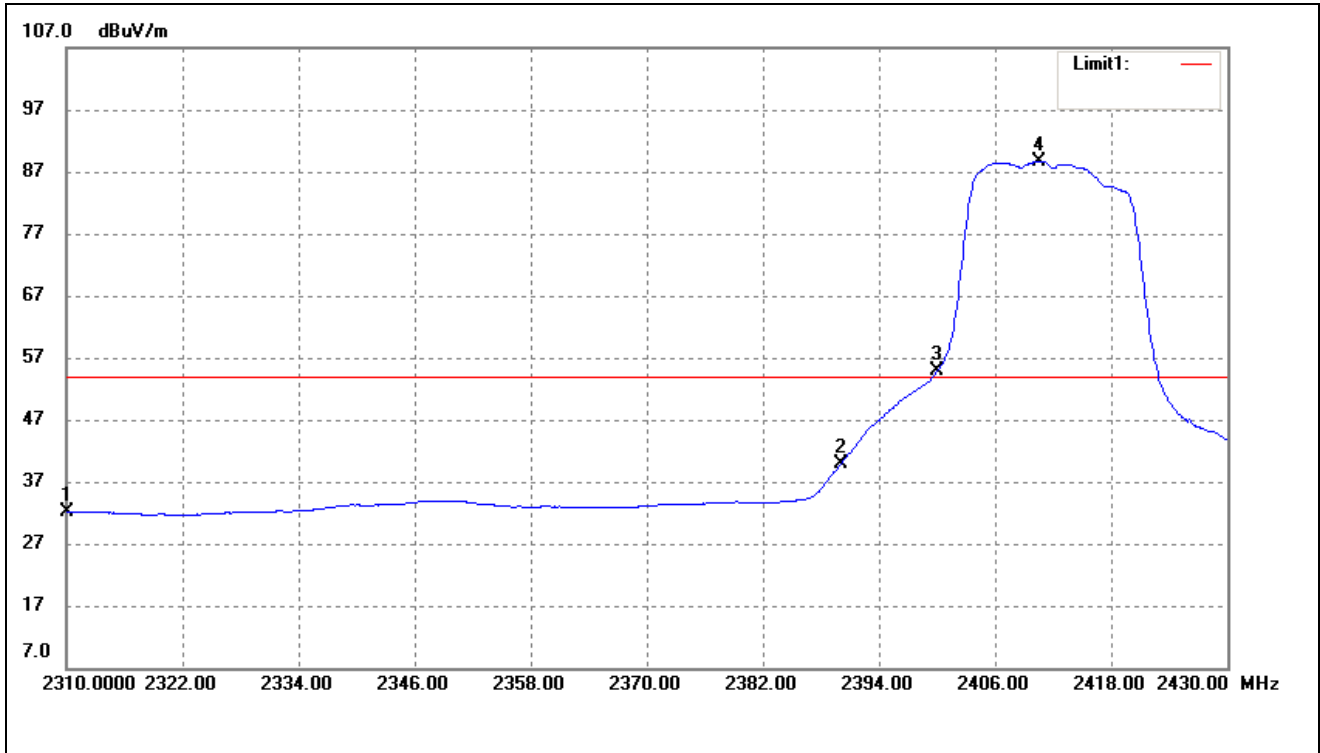
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2464.950	89.68	-3.29	86.39	/	/	Average Detector
	2463.650	97.45	-3.29	94.16	/	/	Peak Detector
2	2483.500	Delta = 51.96dBc		34.43	54.00	-19.57	Average Detector
	2483.500			46.87	74.00	-27.13	Peak Detector
3	2500.000	35.64	-3.20	32.44	54.00	-21.56	Average Detector
	2500.000	47.53	-3.20	44.33	74.00	-29.67	Peak Detector

802.11g-Lowest Bandedge

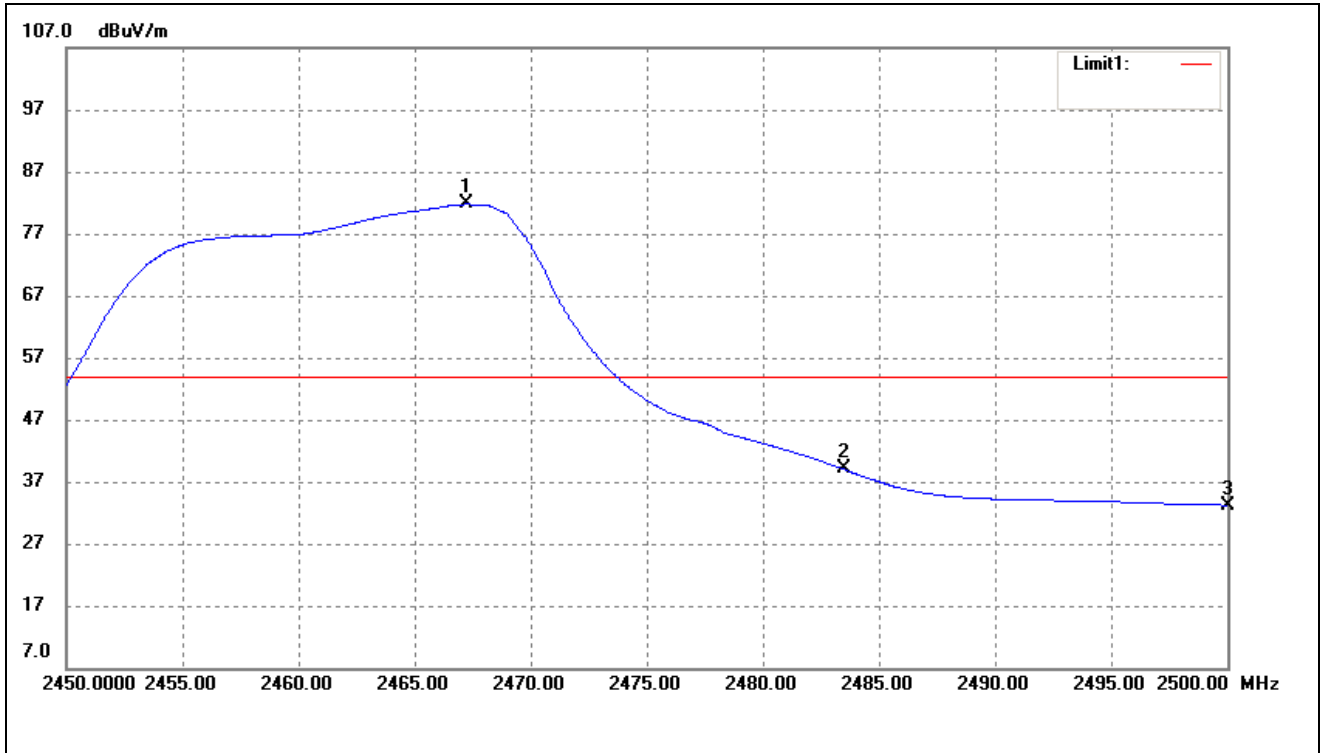
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	35.79	-3.69	32.10	54.00	-21.90	Average Detector
	2310.000	47.17	-3.69	43.48	74.00	-30.52	Peak Detector
2	2390.000	43.37	-3.49	39.88	54.00	-14.12	Average Detector
	2390.000	62.75	-3.49	59.26	74.00	-14.74	Peak Detector
3	2400.000	58.29	-3.46	54.83	Delta=33.78dBc		Average Detector
4	2410.560	92.04	-3.43	88.61			Average Detector

802.11g-Highest Bandedge

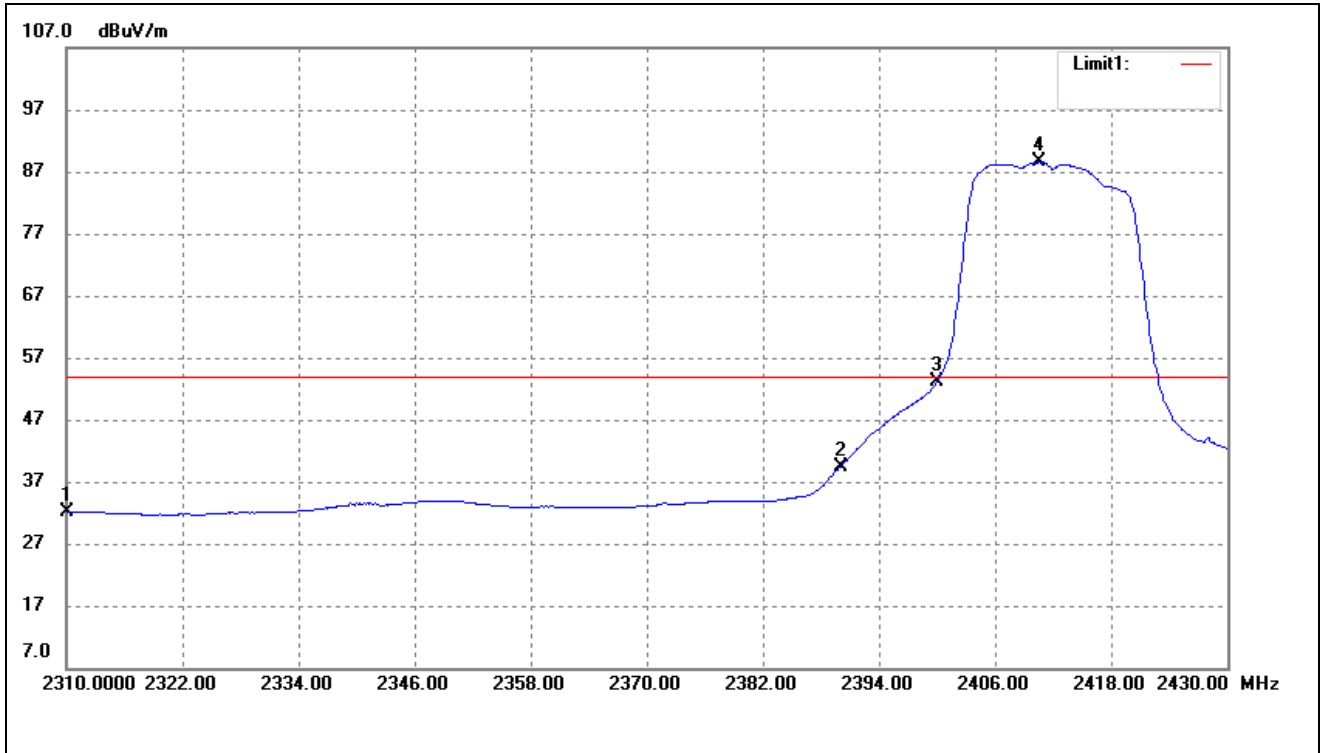
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2	2467.250	85.08	-3.28	81.80	/	/	Average Detector
	2469.100	97.30	-3.28	94.02	/	/	Peak Detector
1	2483.500	Delta = 42.77dBc		39.03	54.00	-14.97	Average Detector
	2483.500			53.65	74.00	-20.35	Peak Detector
3	2500.000	36.43	-3.20	33.23	54.00	-20.77	Average Detector
	2500.000	49.68	-3.20	46.48	74.00	-27.52	Peak Detector

802.11n-HT20-Lowest Bandedge

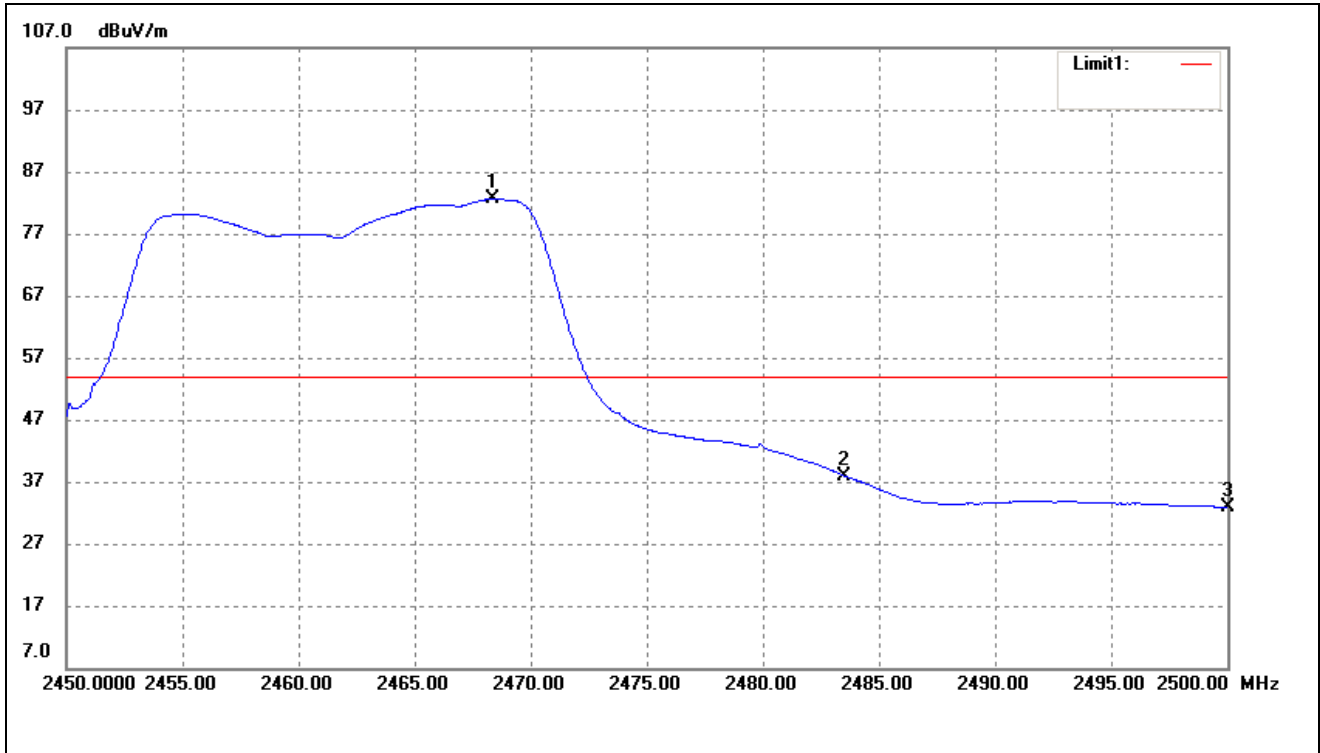
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	35.73	-3.69	32.04	54.00	-21.96	Average Detector
	2310.000	47.10	-3.69	43.41	74.00	-30.59	Peak Detector
2	2390.000	42.98	-3.49	39.49	54.00	-14.51	Average Detector
	2390.000	62.93	-3.49	59.44	74.00	-14.56	Peak Detector
3	2400.000	56.69	-3.46	53.23	Delta=35.2dBc		Average Detector
4	2410.560	91.94	-3.43	88.51			Average Detector

802.11n-HT20-Highest Bandedge

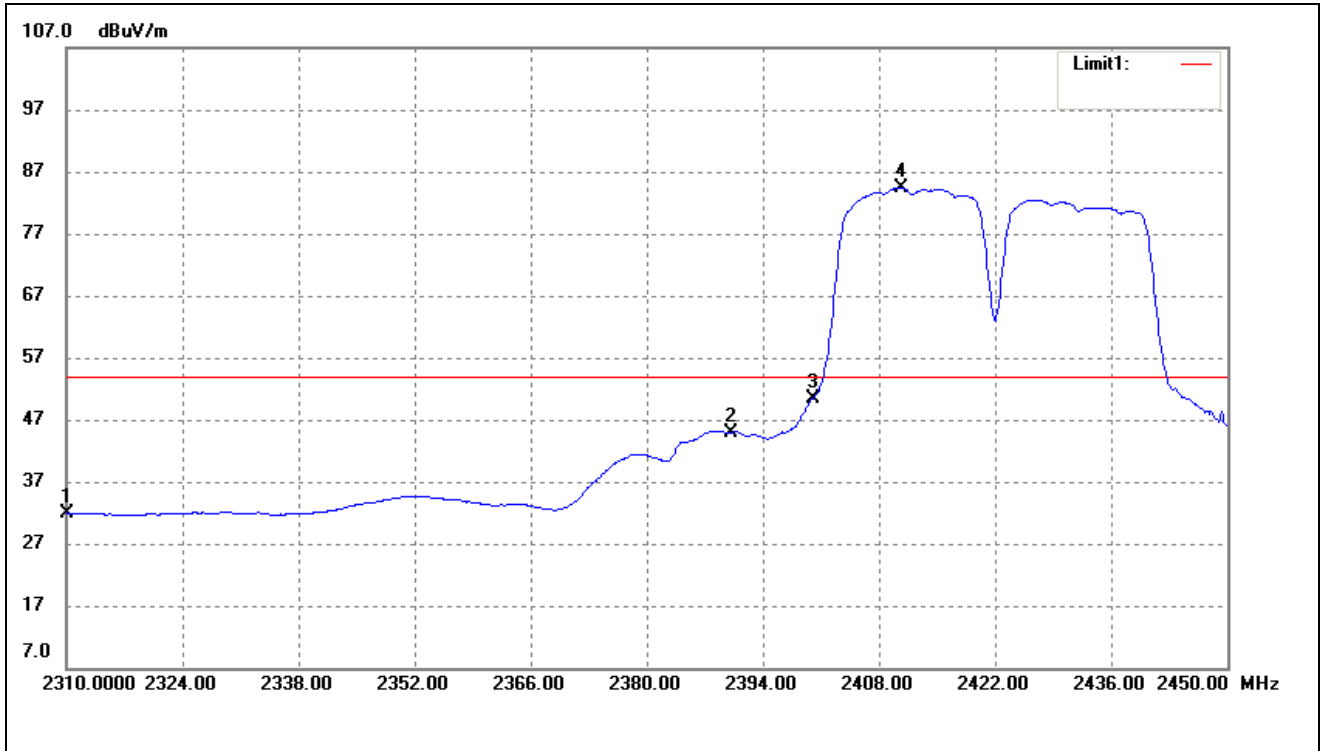
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2468.350	85.88	-3.28	82.60	/	/	Average Detector
	2469.150	97.31	-3.28	94.03	/	/	Peak Detector
2	2483.500	Delta = 39.78dBc		37.98	54.00	-16.02	Average Detector
	2483.500			54.25	74.00	-19.75	Peak Detector
3	2500.000	36.13	-3.20	32.93	54.00	-21.07	Average Detector
	2500.000	51.05	-3.20	47.85	74.00	-26.15	Peak Detector

802.11n-HT40-Lowest Bandedge

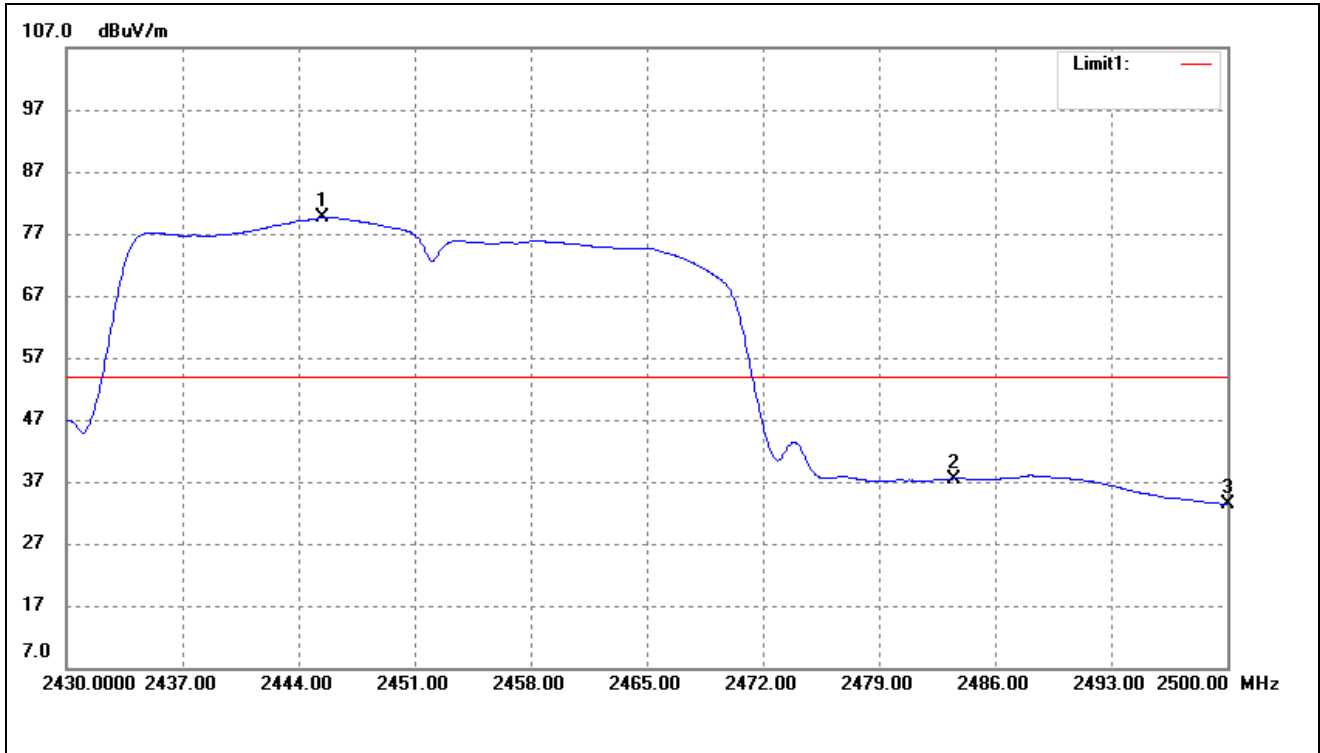
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	35.68	-3.69	31.99	54.00	-22.01	Average Detector
	2310.000	49.43	-3.69	45.74	74.00	-28.26	Peak Detector
2	2390.000	48.40	-3.49	44.91	54.00	-9.09	Average Detector
	2390.000	69.39	-3.49	65.90	74.00	-8.10	Peak Detector
3	2400.000	53.90	-3.46	50.44	Delta=33.94dBc		Average Detector
4	2410.660	87.81	-3.43	84.38			Average Detector

802.11n-HT40-Highest Bandedge

Vertical (Worst case)

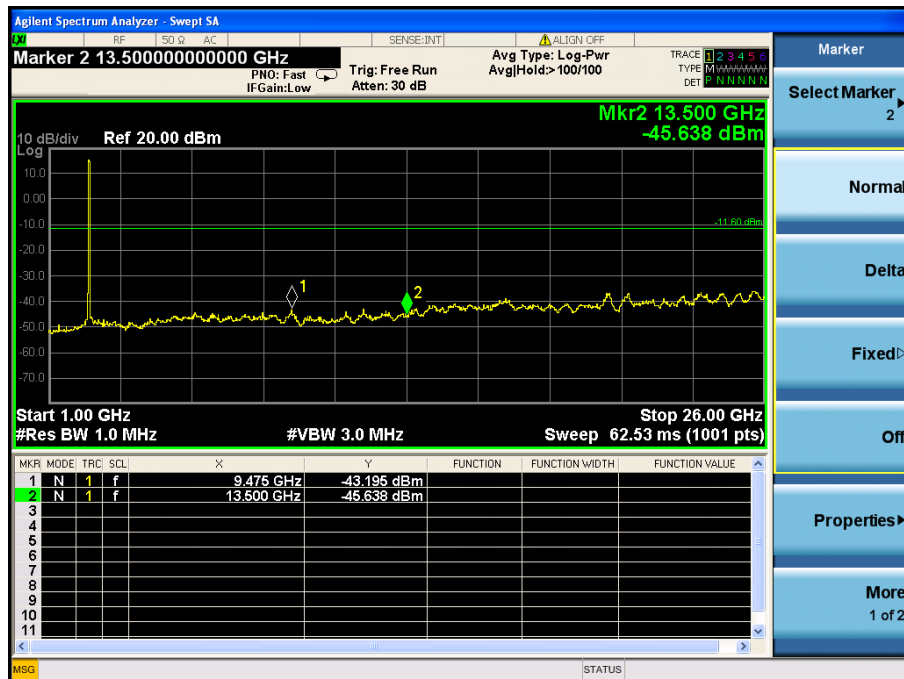
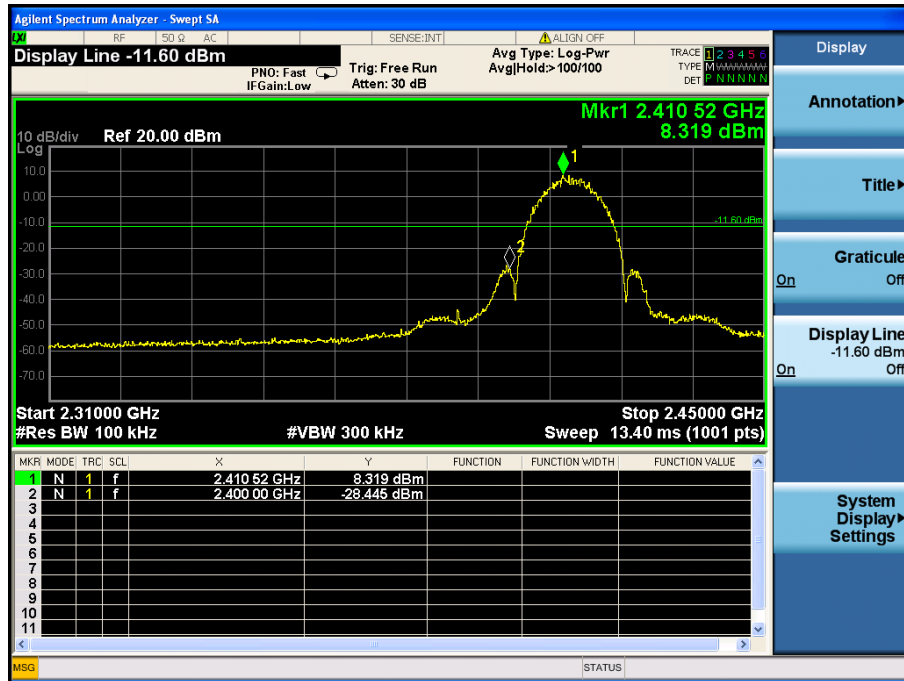


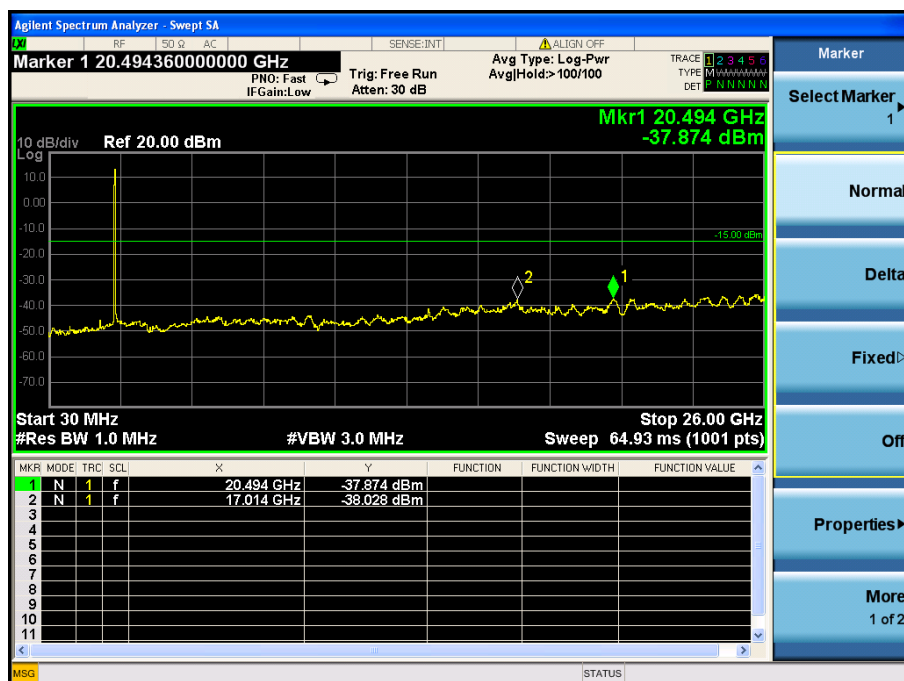
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2445.470	82.93	-3.35	79.58	/	/	Average Detector
	2444.560	94.22	-3.35	90.87	/	/	Peak Detector
2	2483.500	Delta = 42.08dBc		37.50	54.00	-16.50	Average Detector
	2483.500			53.03	74.00	-20.97	Peak Detector
3	2500.000	36.61	-3.20	33.41	54.00	-20.59	Average Detector
	2500.000	49.33	-3.20	46.13	74.00	-27.87	Peak Detector

Spurious Emission (Conducted)

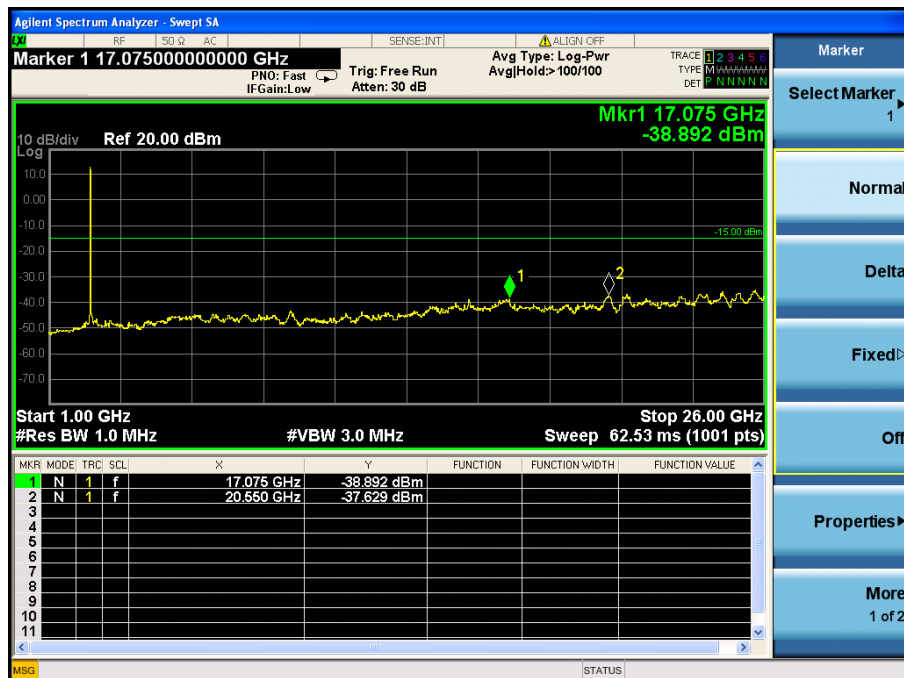
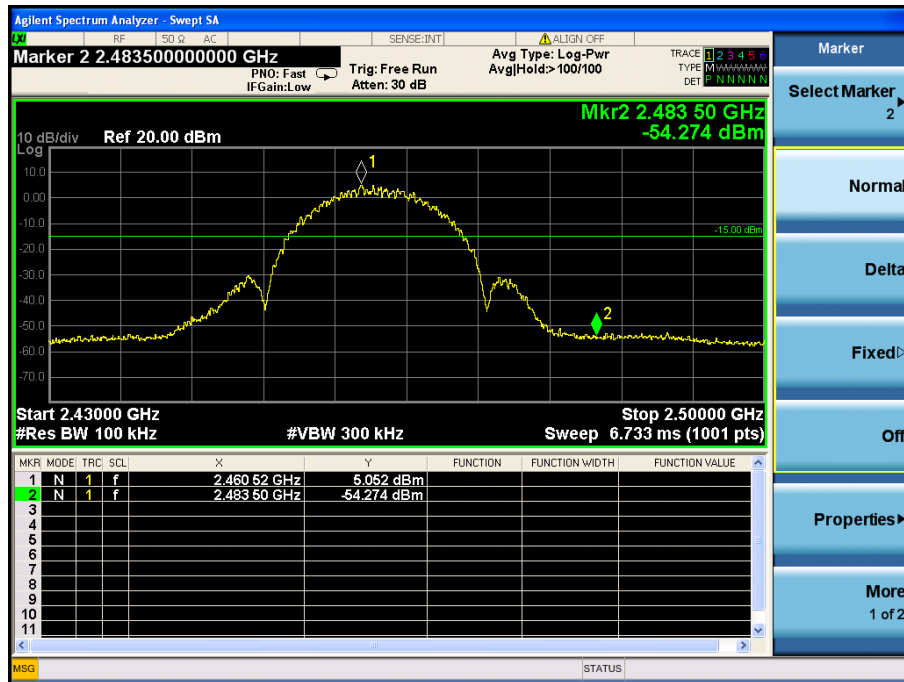
802.11b

Low Channel

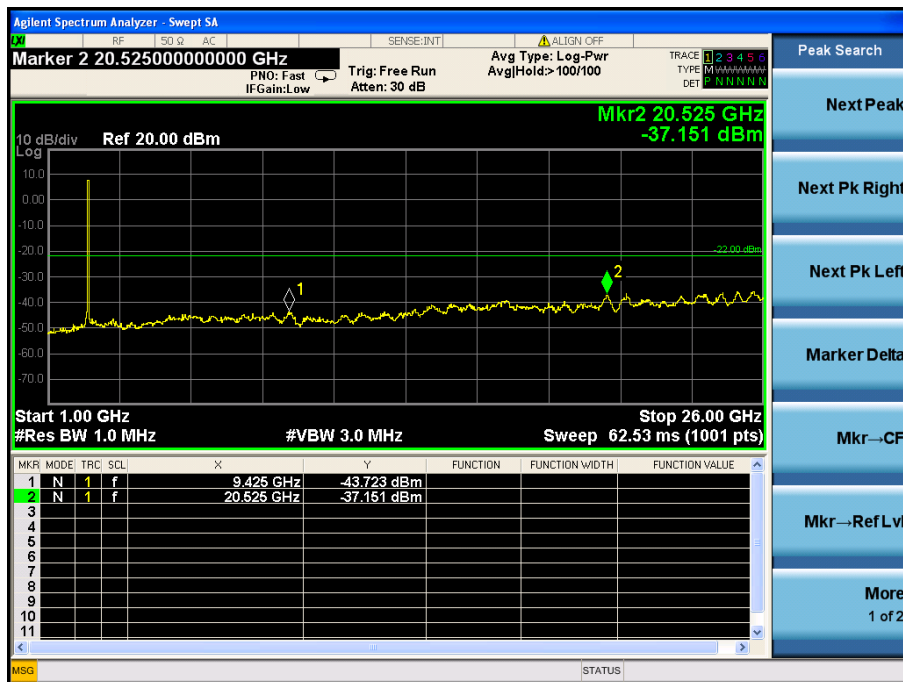
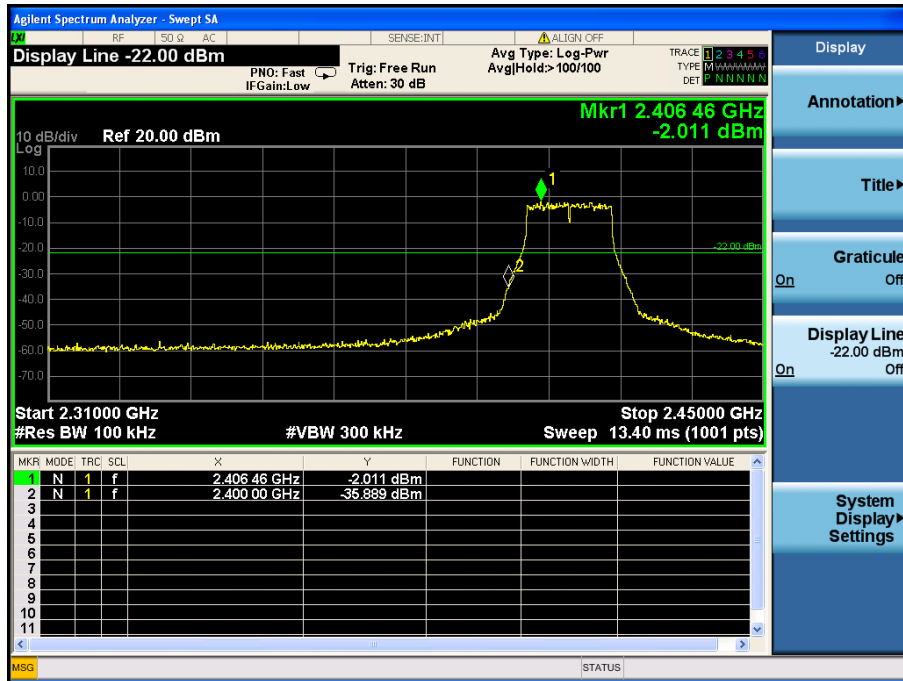




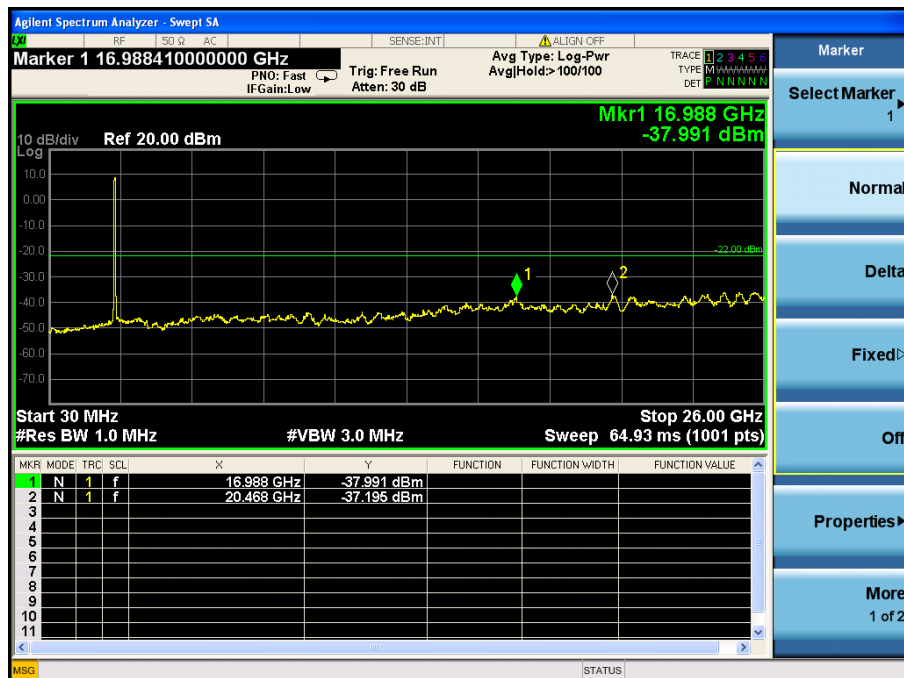
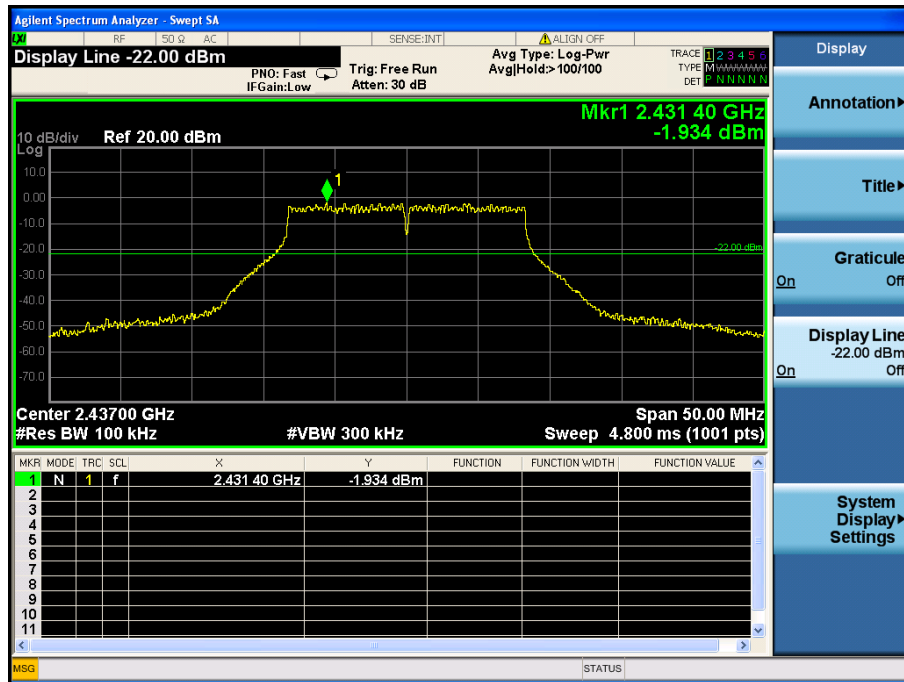
High Channel



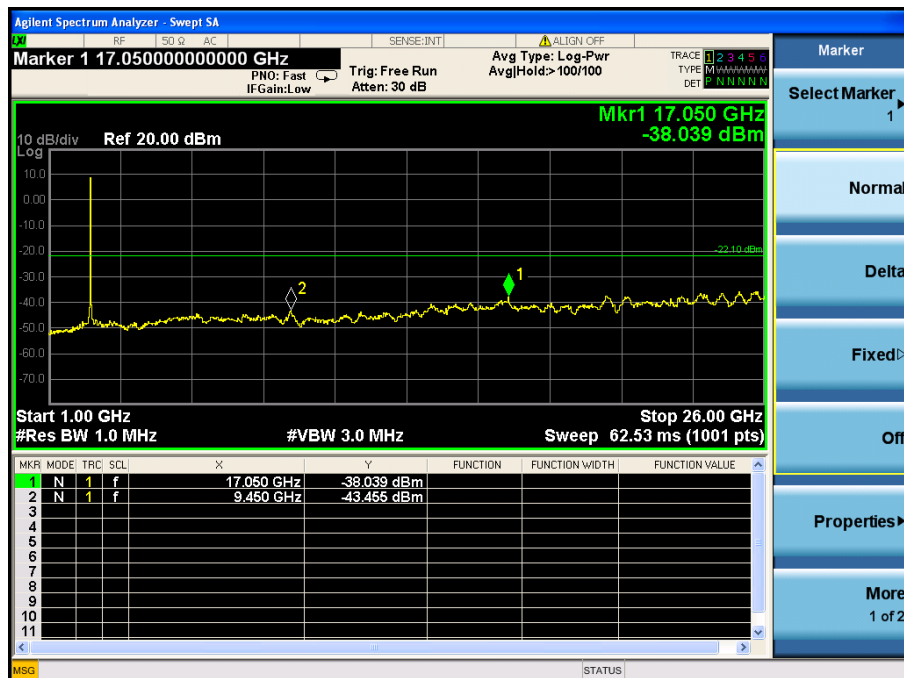
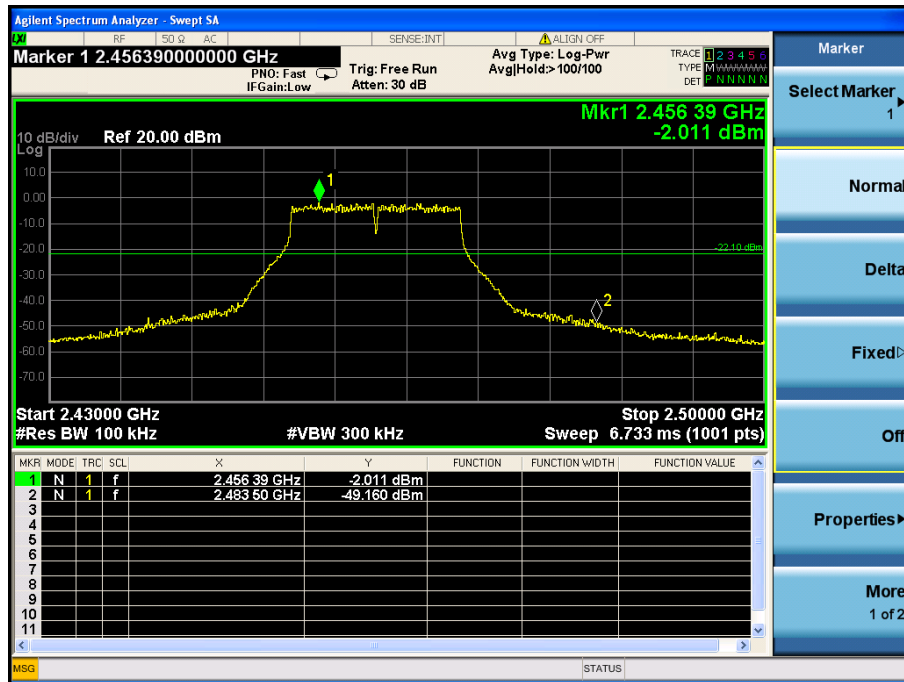
802.11g
Low Channel



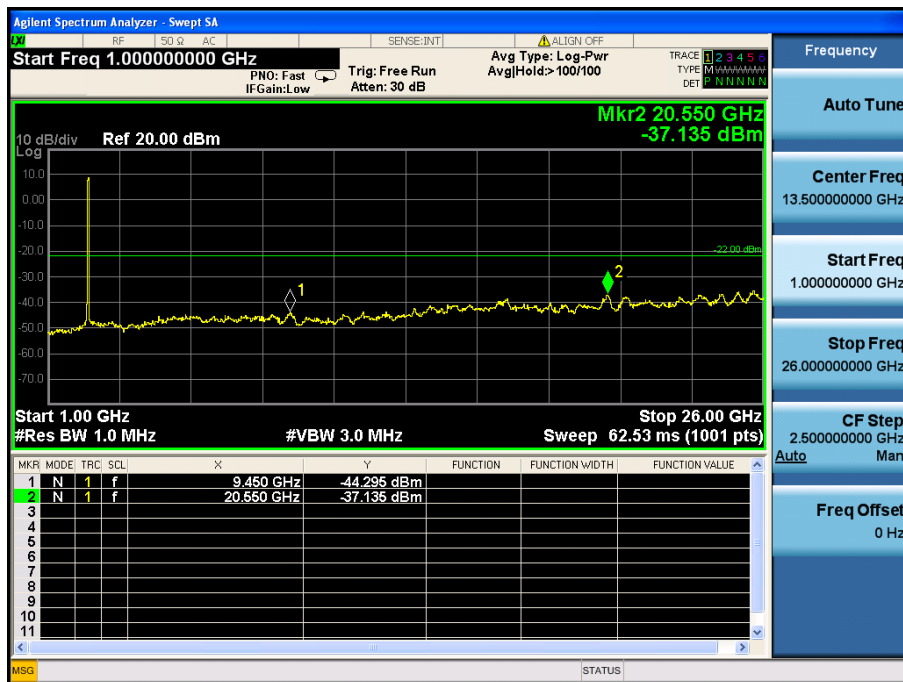
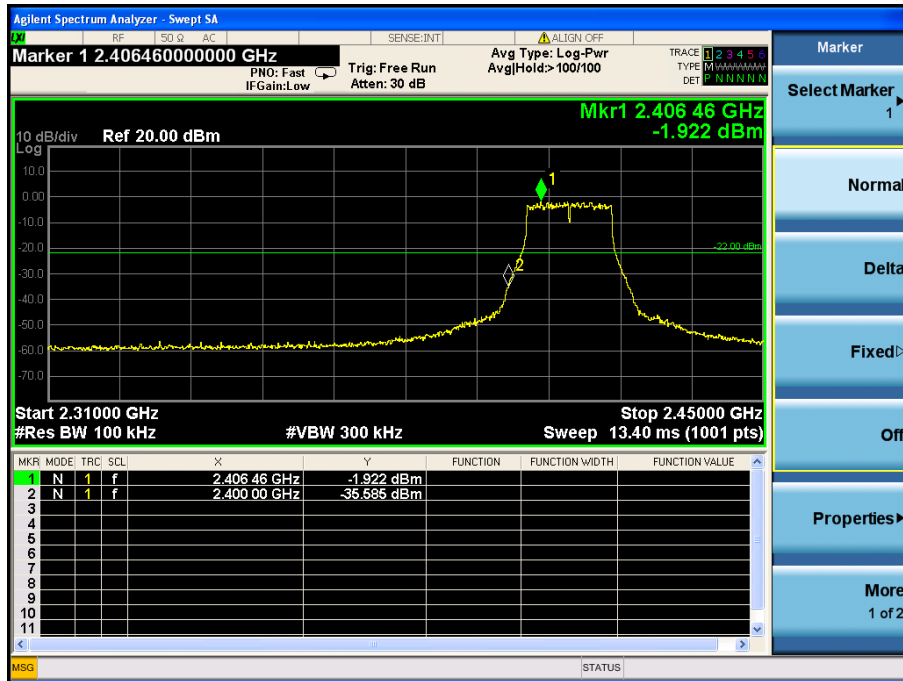
Middle Channel



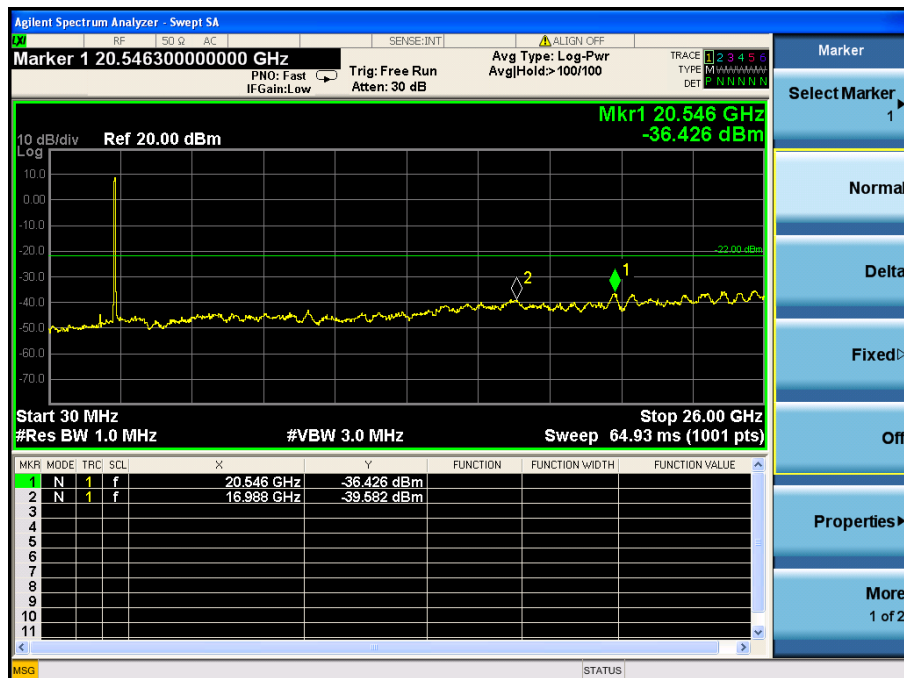
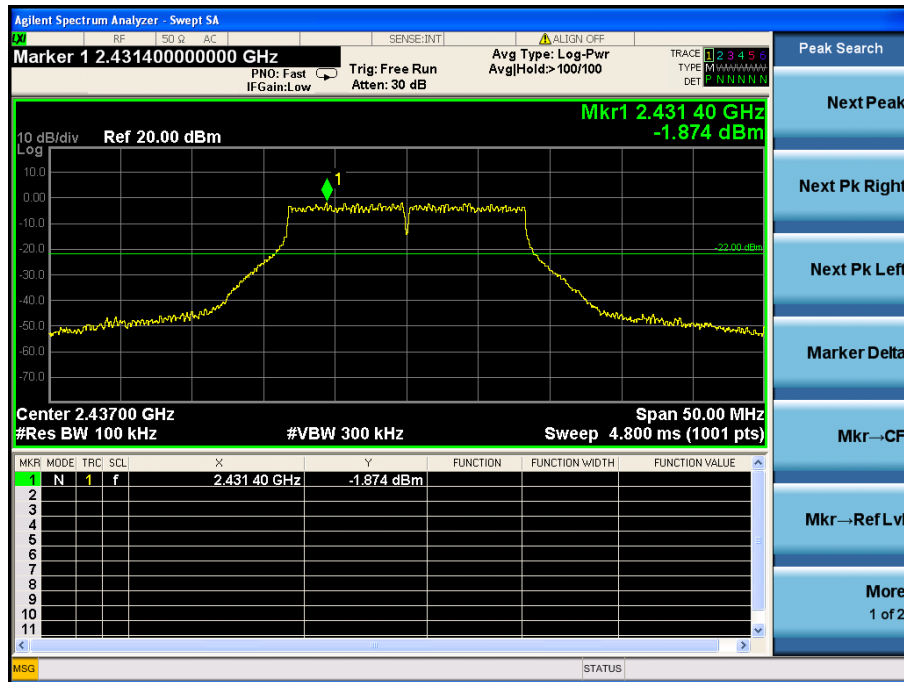
High Channel



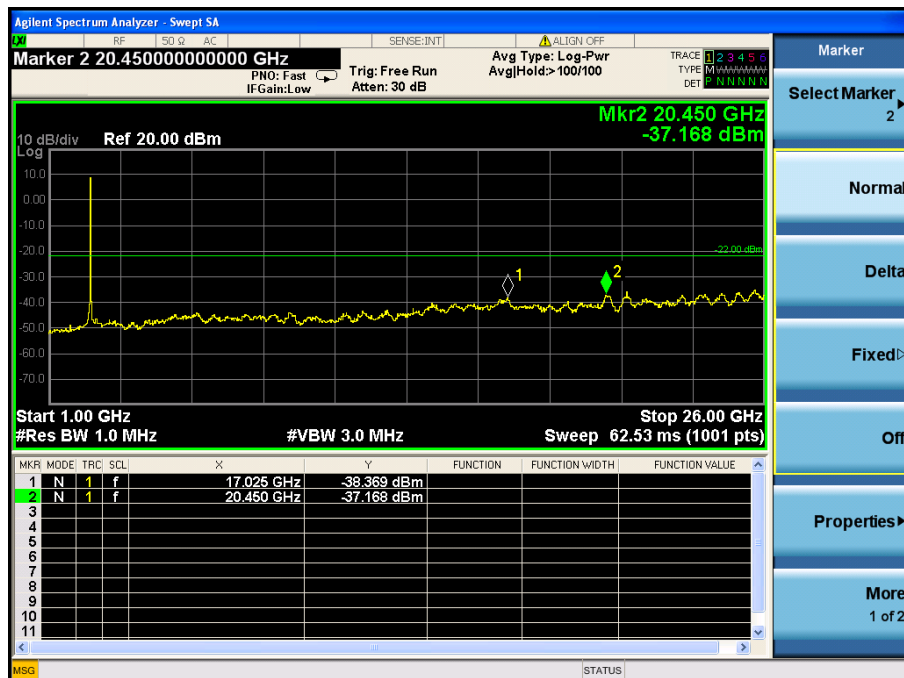
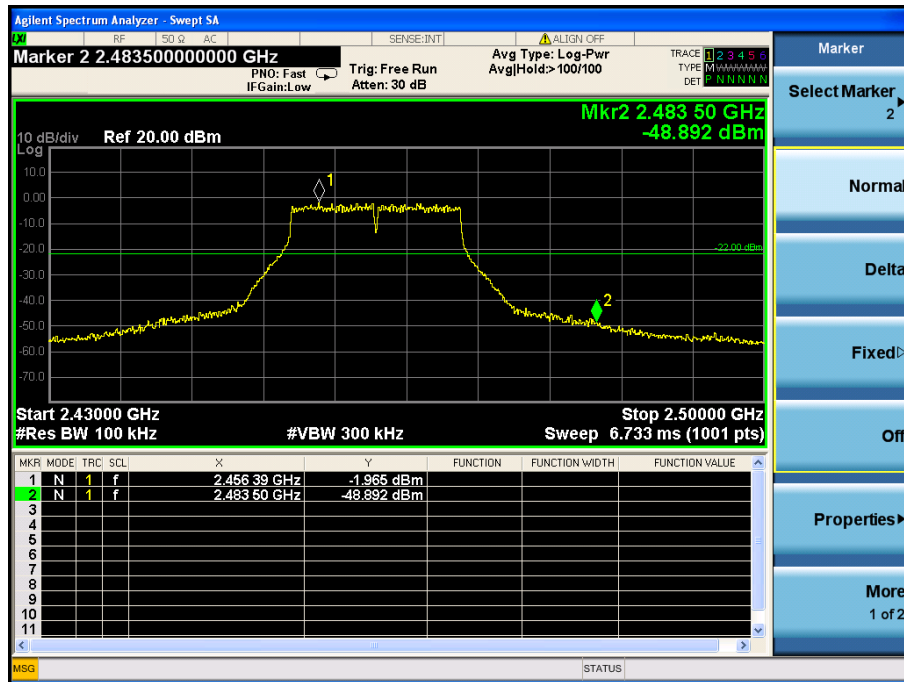
11n-HT20
Low Channel



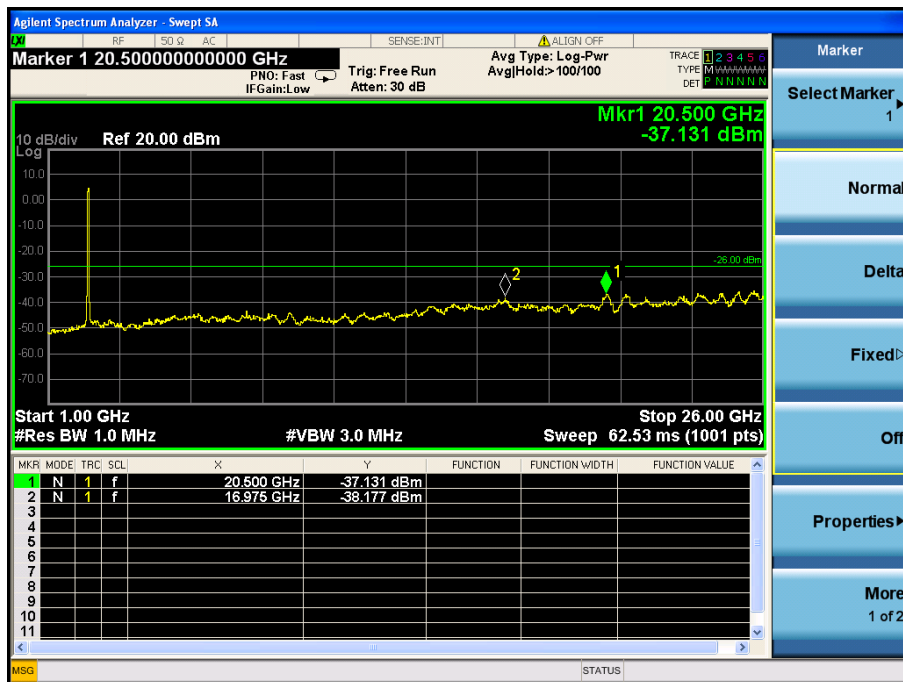
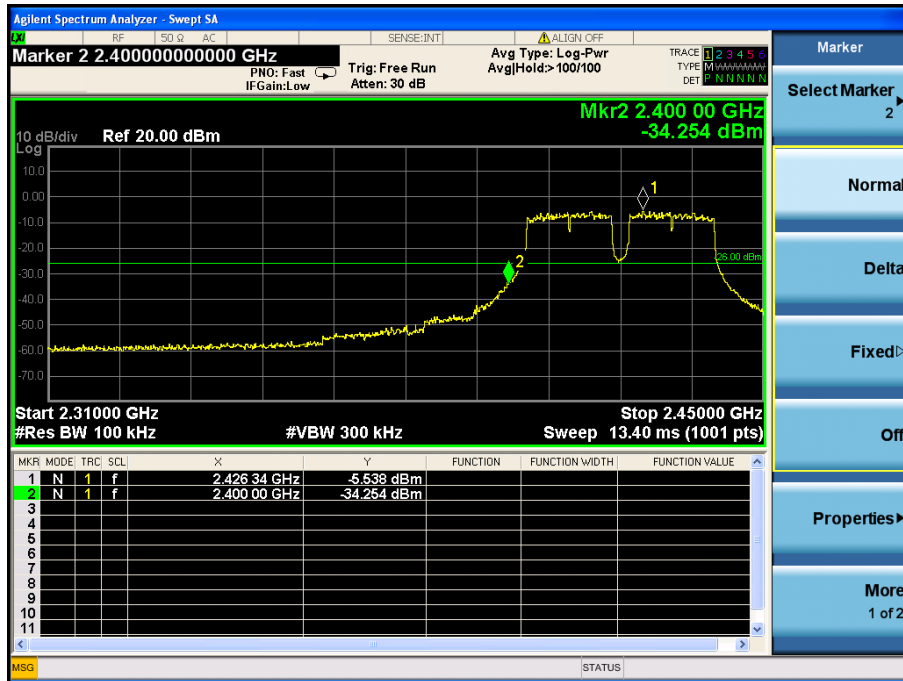
Middle Channel



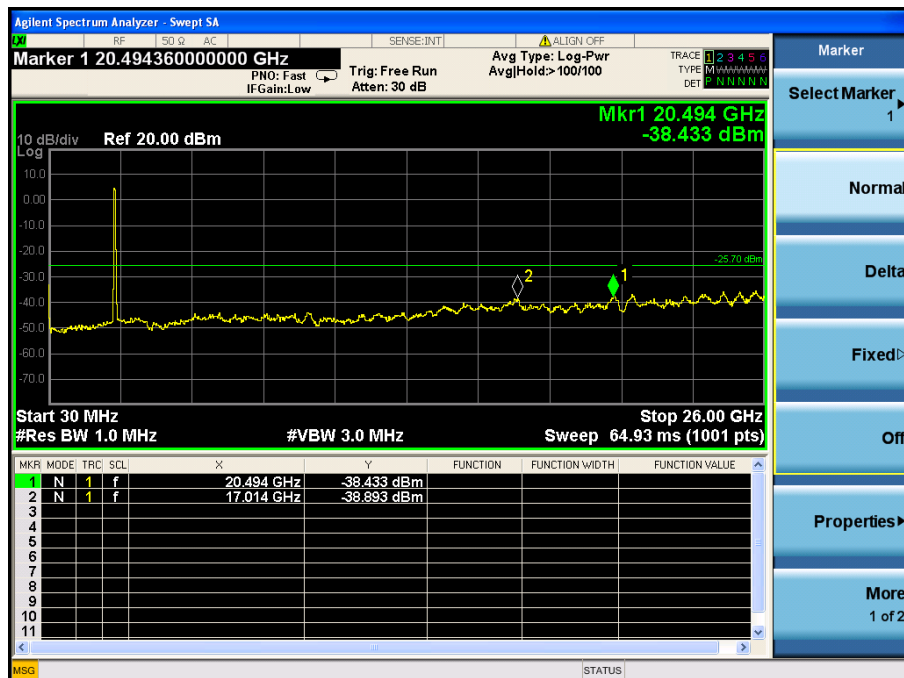
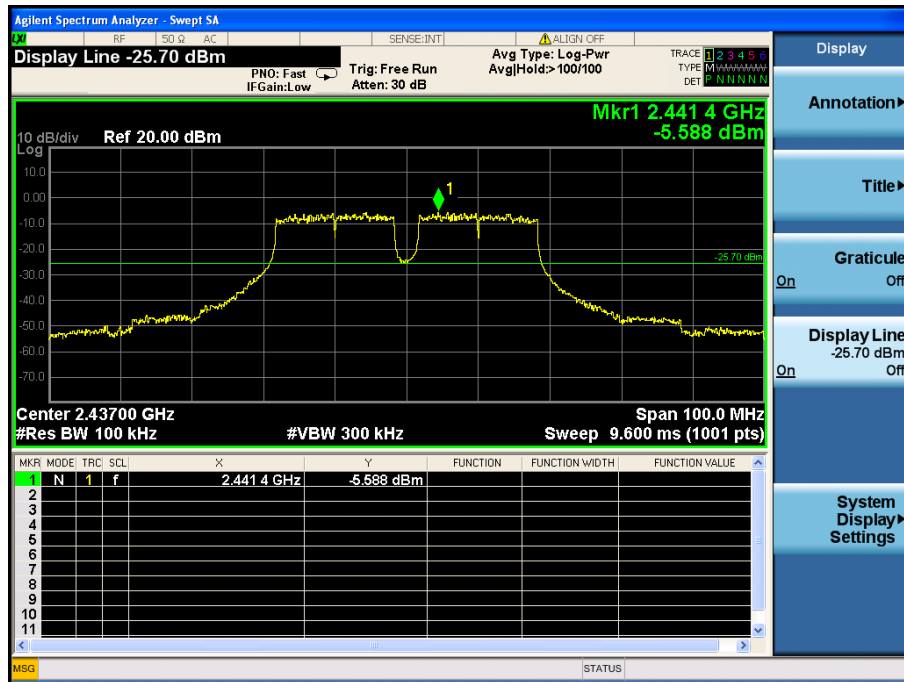
High Channel



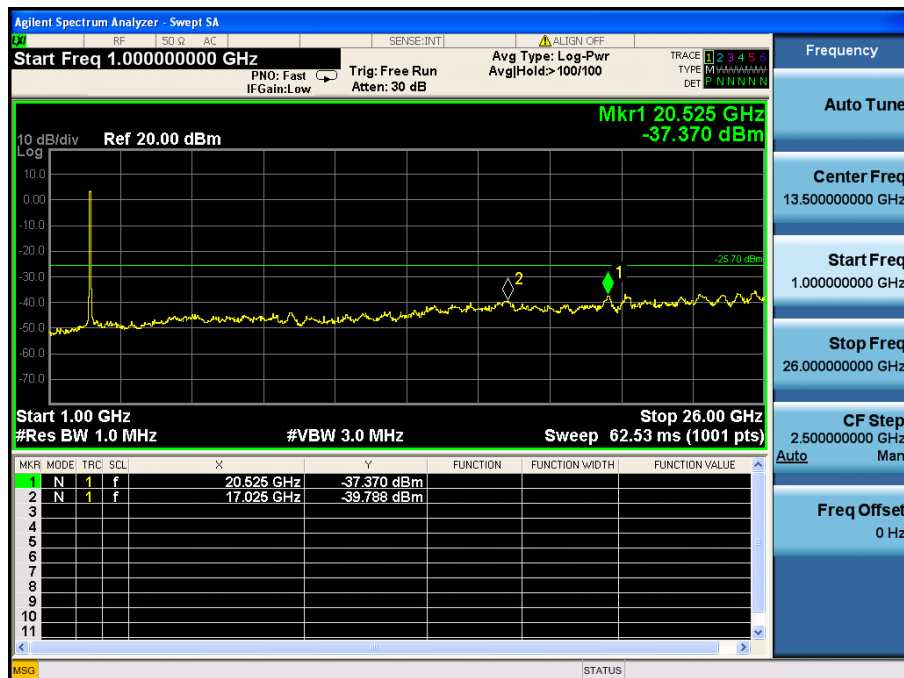
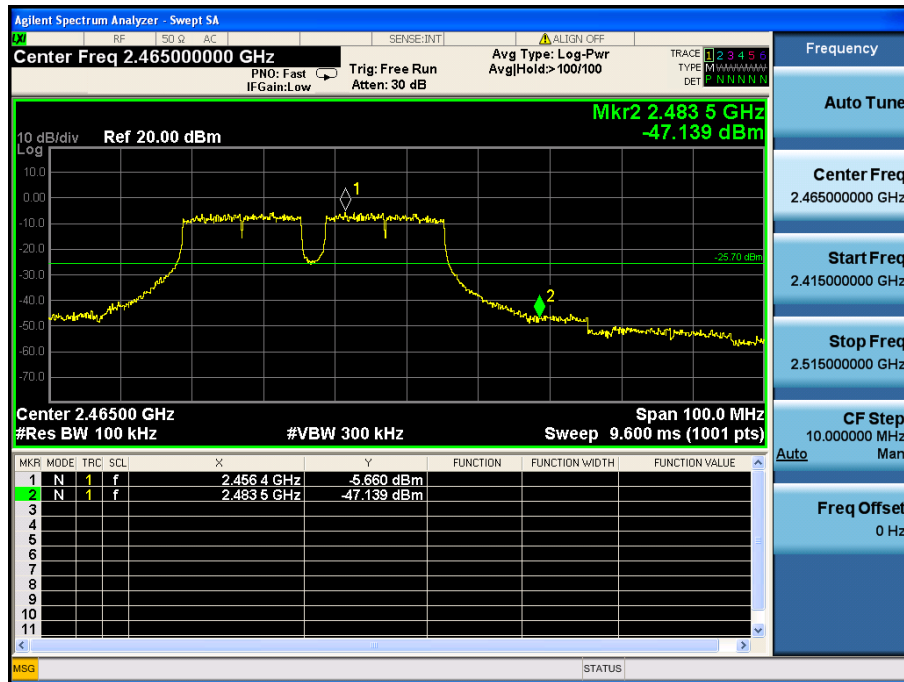
11n-HT40
Low Channel



Middle Channel



High Channel



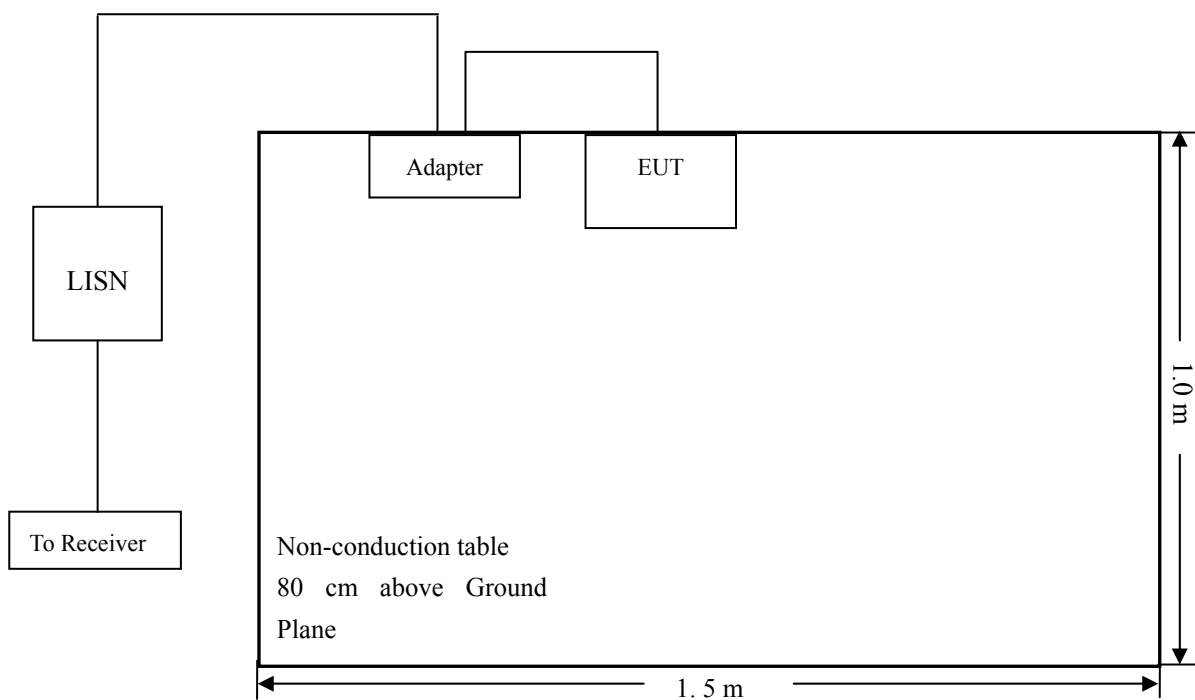
10. Conducted Emissions

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:

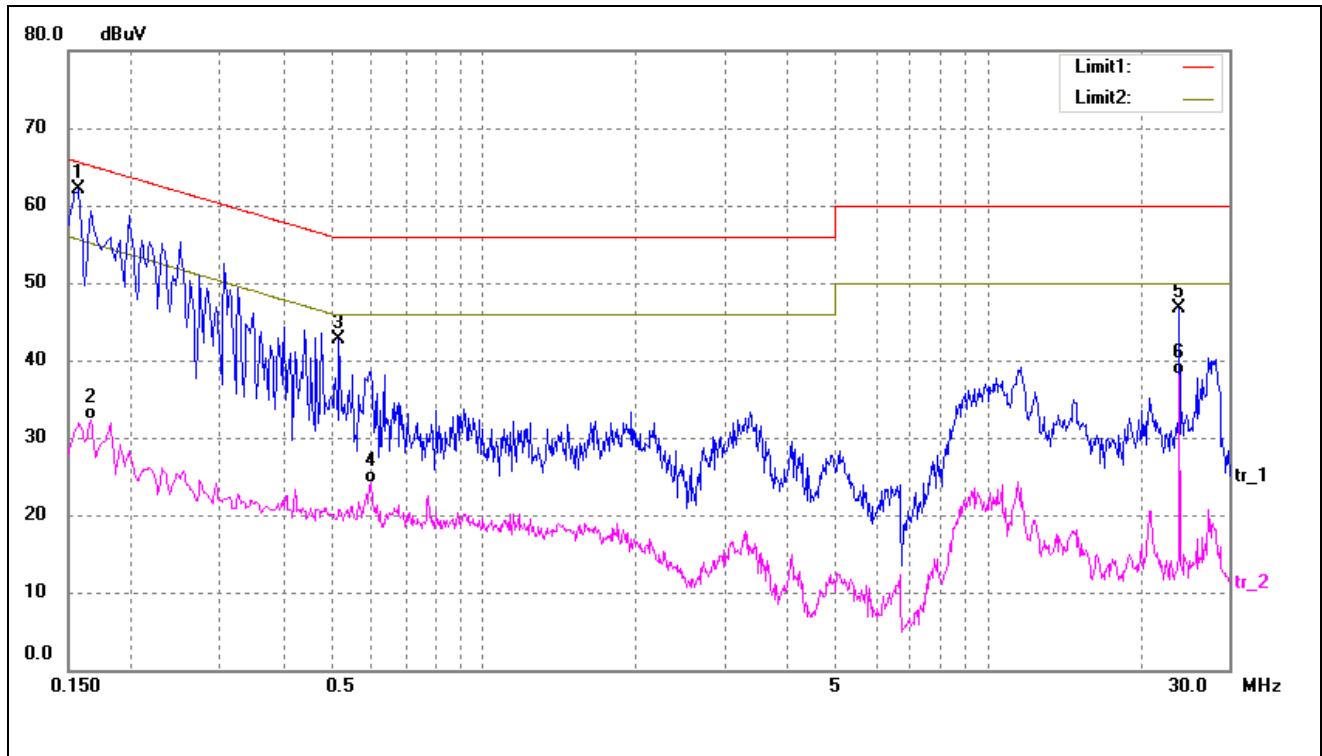
-3.50 dB at 0.158 MHz in the **Neutral** mode, **Peak** detector, **0.15-30MHz**

10.6 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

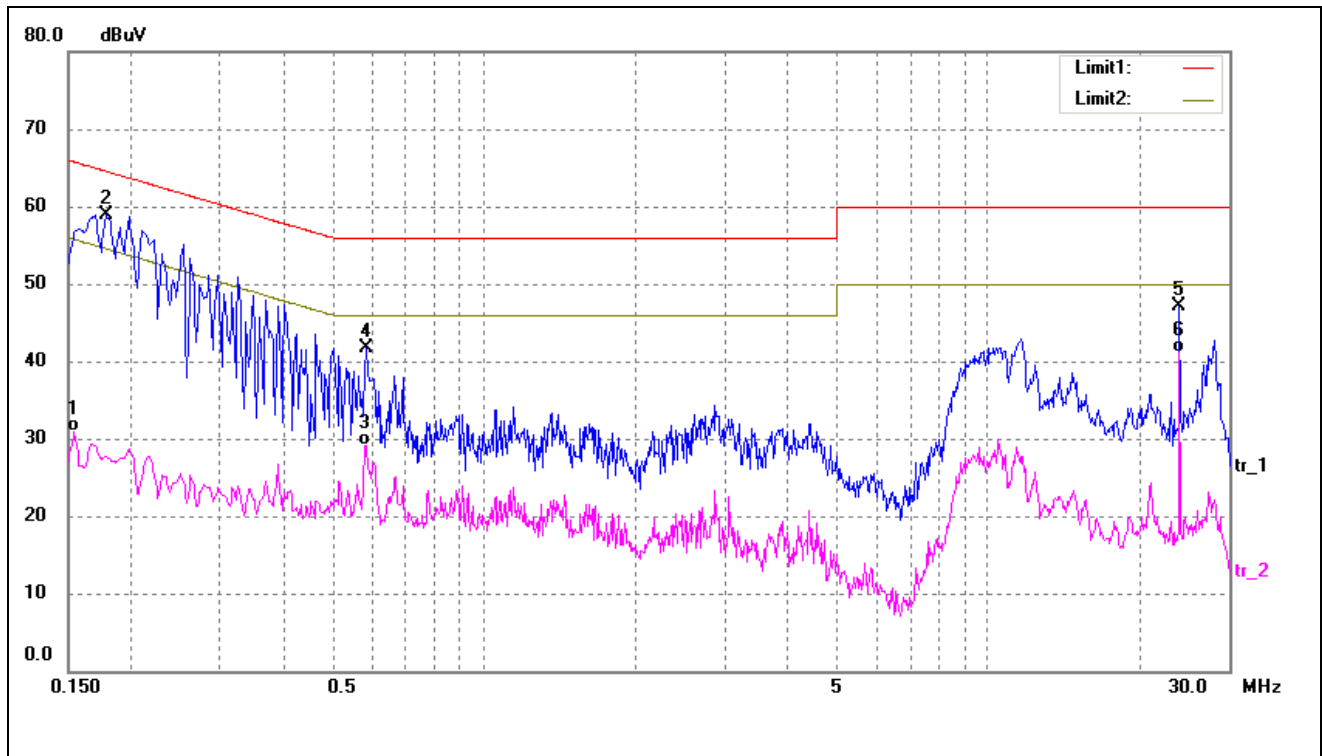
EUT: IP camera
Tested Model: DWIP-720
Operating Condition: Transmitting(Wi-Fi)
Comment: AC120V/60Hz; Adapter DC 5V

Test Specification: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1580	52.57	9.50	62.07	65.57	-3.50	peak
2	0.1660	22.80	9.50	32.30	55.16	-22.86	AVG
3	0.5180	33.16	9.56	42.72	56.00	-13.28	peak
4	0.5980	14.54	9.58	24.12	46.00	-21.88	AVG
5	24.0020	36.21	10.52	46.73	60.00	-13.27	peak
6	24.0020	27.60	10.52	38.12	50.00	-11.88	AVG

Test Specification: Live



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1540	21.38	9.50	30.88	55.78	-24.90	AVG
2*	0.1780	49.47	9.50	58.97	64.58	-5.61	peak
3	0.5820	19.51	9.58	29.09	46.00	-16.91	AVG
4	0.5860	32.22	9.58	41.80	56.00	-14.20	peak
5	24.0020	36.61	10.52	47.13	60.00	-12.87	peak
6	24.0020	30.49	10.52	41.01	50.00	-8.99	AVG

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