

FCC Radio Test Report

FCC ID: 2AH3V-VPC2100WI

Original Grant

Report No. : TB-FCC147520
Applicant : VISIONPLUS (HK) LIMITED
Equipment Under Test (EUT)
EUT Name : HEAVY DUTY WIFI IP CAMERA
Model No. : VPC2100WI
Series No. : N/A
Brand Name : VISIONPLUS
Receipt Date : 2016-04-06
Test Date : 2016-04-06 to 2016-04-22
Issue Date : 2016-04-23
Standards : FCC Part 15, Subpart C (15.247:2015)
Test Method : ANSI C63.10: 2013
Conclusions : **PASS**

In the configuration tested, the EUT complied with the standards specified above,
The EUT technically complies with the FCC and IC requirements

Test/Witness Engineer :

IWAN SU

**Approved &
Authorized**

:

Ray



This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

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1. General Information about EUT

1.1 Client Information

Applicant : VISIONPLUS (HK) LIMITED
Address : UNIT 04, 7/F BRIGHT WAY TOWER NO.33 MONG KOK RD, KL, HONGKONG, CHINA
Manufacturer : VISIONPLUS (HK) LIMITED
Address : UNIT 04, 7/F BRIGHT WAY TOWER NO.33 MONG KOK RD, KL, HONGKONG, CHINA

1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	HEAVY DUTY WIFI IP CAMERA
Models No.	:	VPC2100WI
Model Difference	:	N/A
Product Description		Operation Frequency: 802.11b/g/n(HT20): 2412MHz~2462MHz
	Number of Channel:	802.11b/g/n(HT20):11 channels see note(3)
	RF Output Power:	802.11b: 15.29 dBm 802.11g: 12.94 dBm 802.11n (HT20): 11.47 dBm
	Antenna Gain:	3 dBi Dipole Antenna
	Modulation Type:	802.11b: CCK, QPSK, BPSK 802.11g: OFDM 802.11n: OFDM
	Bit Rate of Transmitter:	802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/6 Mbps 802.11n:up to 150Mbps
Power Supply	:	DC power from DC Cable.
Power Rating	:	DC 12~32V.
Connecting I/O Port(S)	:	Please refer to the User's Manual

Note:

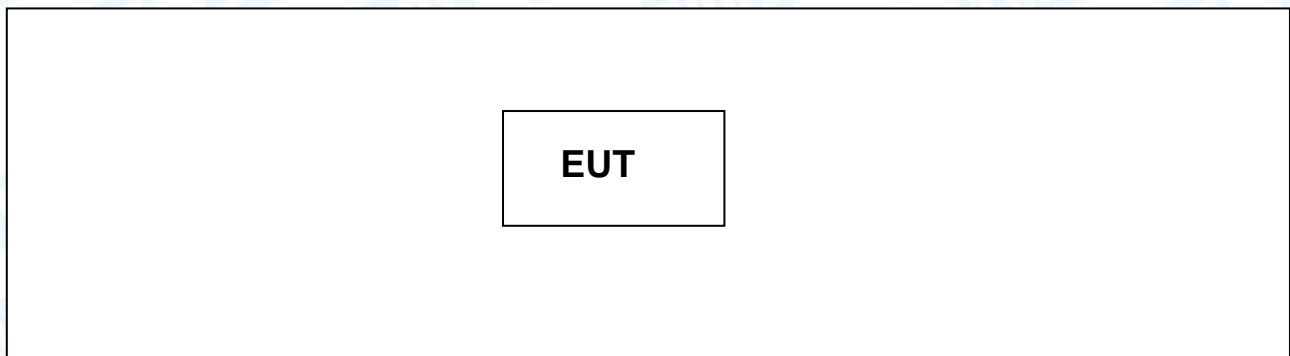
- (1) This Test Report is FCC Part 15.247 for 802.11b/g/n, the test procedure follows the FCC KDB 558074 D01 DTS Meas Guidance v03r05.
- (2) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- (3) Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	05	2432	09	2452
02	2417	06	2437	10	2457
03	2422	07	2442	11	2462
04	2427	08	2447		

(4) The Antenna information about the equipment is provided by the applicant.

1.3 Block Diagram Showing the Configuration of System Tested

TX Mode



1.4 Description of Support Units

The EUT has been test as an independent unit

1.5 Description of Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned follow was evaluated respectively.

For Conducted Test	
Final Test Mode	Description
Mode 1	TX B Mode

For Radiated Test	
Final Test Mode	Description
Mode 3	TX Mode B Mode Channel 01/06/11
Mode 4	TX Mode G Mode Channel 01/06/11
Mode 5	TX Mode N(HT20) Mode Channel 01/06/11

Note:

- (1) For all test, we have verified the construction and function in typical operation. And all the test modes were carried out with the EUT in transmitting operation in maximum power with all kinds of data rate.

According to ANSI C63.10 standards, the measurements are performed at the highest, middle, lowest available channels, and the worst case data rate as follows:

802.11b Mode: CCK (1 Mbps)
802.11g Mode: OFDM (6 Mbps)
802.11n (HT20) Mode: MCS 0 (6.5 Mbps)

- (2) During the testing procedure, the continuously transmitting with the maximum power mode was programmed by the customer.
- (3) The EUT is considered a mobile unit; in normal use it was positioned on X-plane. The worst case was found positioned on X-plane. Therefore only the test data of this X-plane was used for radiated emission measurement test.

1.6 Description of Test Software Setting

During testing channel& Power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of WLAN.

Test Software Version	RT5350QA.EXE		
Channel	CH 01	CH 06	CH 11
IEEE 802.11b DSSS	DEF	DEF	DEF
IEEE 802.11g OFDM	DEF	DEF	DEF
IEEE 802.11n (HT20)	DEF	DEF	DEF

1.7 Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

Test Item	Parameters	Expanded Uncertainty (U_{Lab})
Conducted Emission	Level Accuracy: 9kHz~150kHz 150kHz to 30MHz	± 3.42 dB ± 3.42 dB
Radiated Emission	Level Accuracy: 9kHz to 30 MHz	± 4.60 dB
Radiated Emission	Level Accuracy: 30MHz to 1000 MHz	± 4.40 dB
Radiated Emission	Level Accuracy: Above 1000MHz	± 4.20 dB

1.7 Test Facility

The testing report were performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at 1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, Guangdong, China. At the time of testing, the following bodies accredited the Laboratory:

CNAS (L5813)

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

FCC List No.: (811562)

The Laboratory is listed in the United States of American Federal Communications Commission (FCC), and the registration number is 811562.

IC Registration No.: (11950A-1)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A-1.

2. Test Summary

FCC Part 15 Subpart C(15.247)/ RSS 247 Issue 1				
Standard Section		Test Item	Judgment	Remark
FCC	IC			
15.203	/	Antenna Requirement	PASS	N/A
15.207	RSS-GEN 7.2.4	Conducted Emission	N/A	(1)
15.205	RSS-GEN 7.2.2	Restricted Bands	PASS	N/A
15.247(a)(2)	RSS 247 5.2 (1)	6dB Bandwidth	PASS	N/A
15.247(b)	RSS 247 5.4 (4)	Peak Output Power	PASS	N/A
15.247(e)	RSS 247 5.2 (2)	Power Spectral Density	PASS	N/A
15.247(d)	RSS 247 5.5	Transmitter Radiated Spurious Emission	PASS	N/A
Note: (1) The EUT is powered by DC battery, no requirement for this test item. N/A is an abbreviation for Not Applicable.				

3. Test Equipment

Conducted Emission Test					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
EMI Test Receiver	Rohde & Schwarz	ESCI	100321	Aug. 07, 2015	Aug. 06, 2016
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	34403	Aug. 07, 2015	Aug. 06, 2016
AMN	SCHWARZBECK	NNBL 8226-2	8226-2/164	Aug. 07, 2015	Aug. 06, 2016
LISN	Rohde & Schwarz	ENV216	101131	Aug. 08, 2015	Aug. 07, 2016
Radiation Emission Test					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Aug. 07, 2015	Aug. 06, 2016
EMI Test Receiver	Rohde & Schwarz	ESCI	100010/007	Aug. 07, 2015	Aug. 06, 2016
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar. 26, 2016	Mar. 25, 2017
Bilog Antenna	ETS-LINDGREN	3142E	00117542	Mar. 26, 2016	Mar. 25, 2017
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar. 26, 2016	Mar. 25, 2017
Horn Antenna	ETS-LINDGREN	3117	00143209	Mar. 26, 2016	Mar. 25, 2017
Pre-amplifier	Sonoma	310N	185903	Mar. 26, 2016	Mar. 25, 2017
Pre-amplifier	HP	8447B	3008A00849	Mar. 26, 2016	Mar. 25, 2017
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar. 26, 2016	Mar. 25, 2017
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A

4. Conducted Emission Test

4.1 Test Standard and Limit

4.1.1 Test Standard

FCC Part 15.207

4.1.2 Test Limit

Conducted Emission Test Limit

Frequency	Maximum RF Line Voltage (dB μ V)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

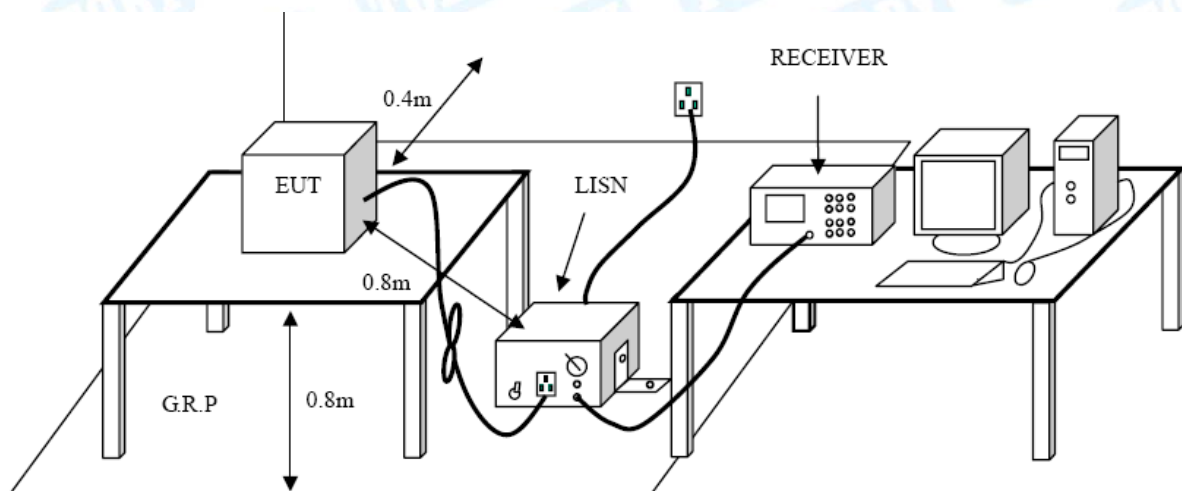
Notes:

(1) *Decreasing linearly with logarithm of the frequency.

(2) The lower limit shall apply at the transition frequencies.

(3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2 Test Setup



4.3 Test Procedure

The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

LISN at least 80 cm from nearest part of EUT chassis.

The bandwidth of EMI test receiver is set at 9kHz, and the test frequency band is from 0.15MHz to 30MHz.

4.4 EUT Operating Mode

Please refer to the description of test mode.

4.5 Test Data

The EUT is powered by DC battery, no requirement for this test item.

5. Radiated Emission Test

5.1 Test Standard and Limit

5.1.1 Test Standard

FCC Part 15.209

5.1.2 Test Limit

Radiated Emission Limits (9kHz~1000MHz)

Frequency (MHz)	Field Strength (microvolt/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

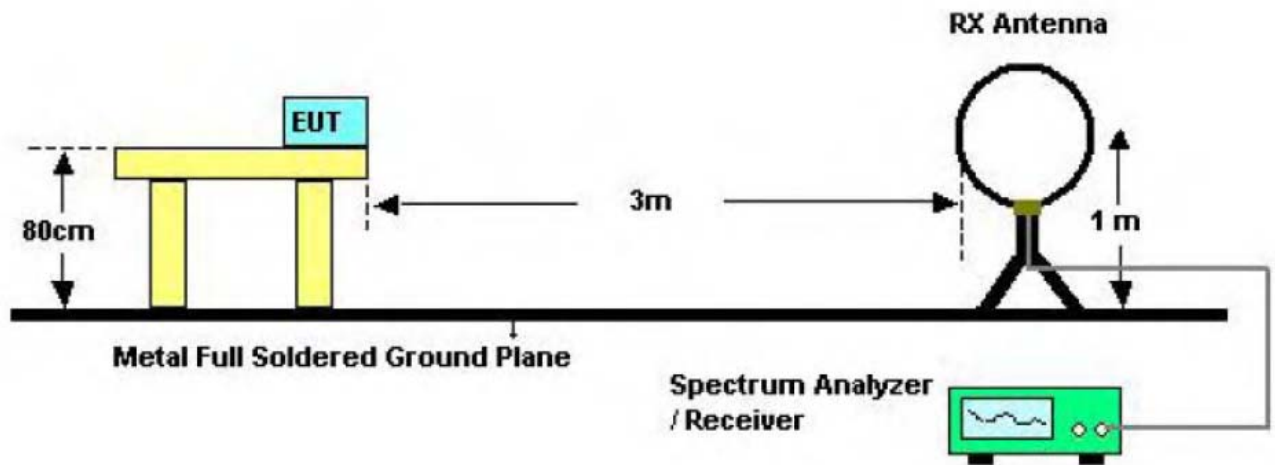
Radiated Emission Limit (Above 1000MHz)

Frequency (MHz)	Class A (dBuV/m)(at 3 M)		Class B (dBuV/m)(at 3 M)	
	Peak	Average	Peak	Average
Above 1000	80	60	74	54

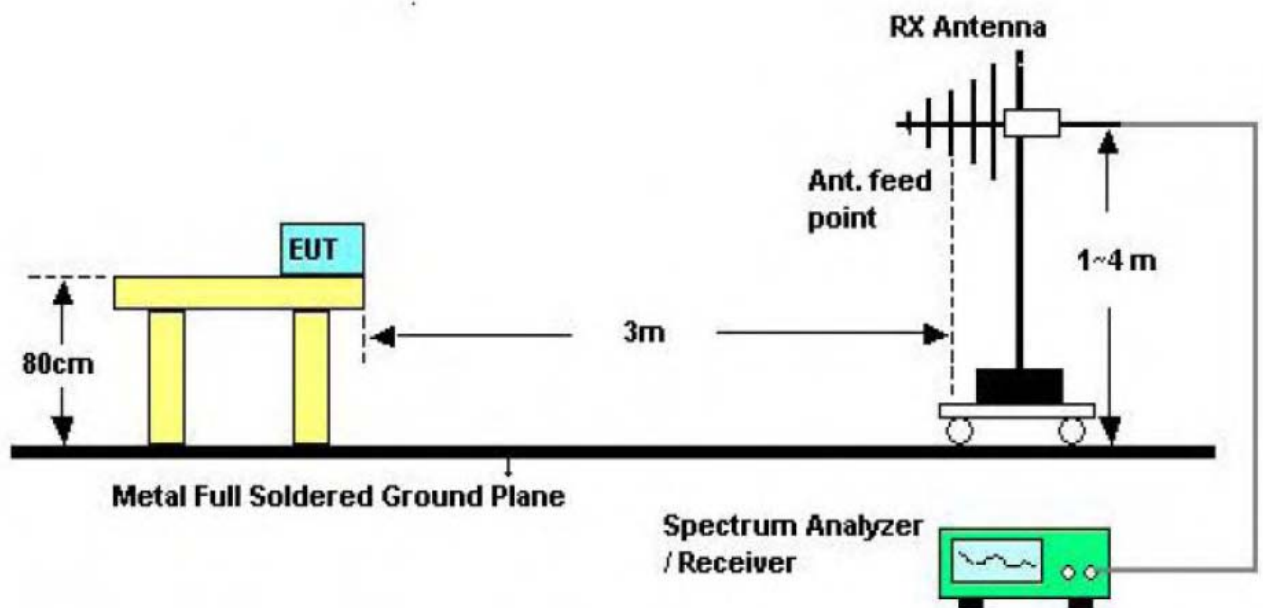
Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission Level(dBuV/m)=20log Emission Level(uV/m)

5.2 Test Setup



Below 30MHz Test Setup



Below 1000MHz Test Setup



Above 1GHz Test Setup

5.3 Test Procedure

- (1) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.
- (2) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (3) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- (4) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (5) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (6) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.
- (7) For the actual test configuration, please see the test setup photo.

5.4 EUT Operating Condition

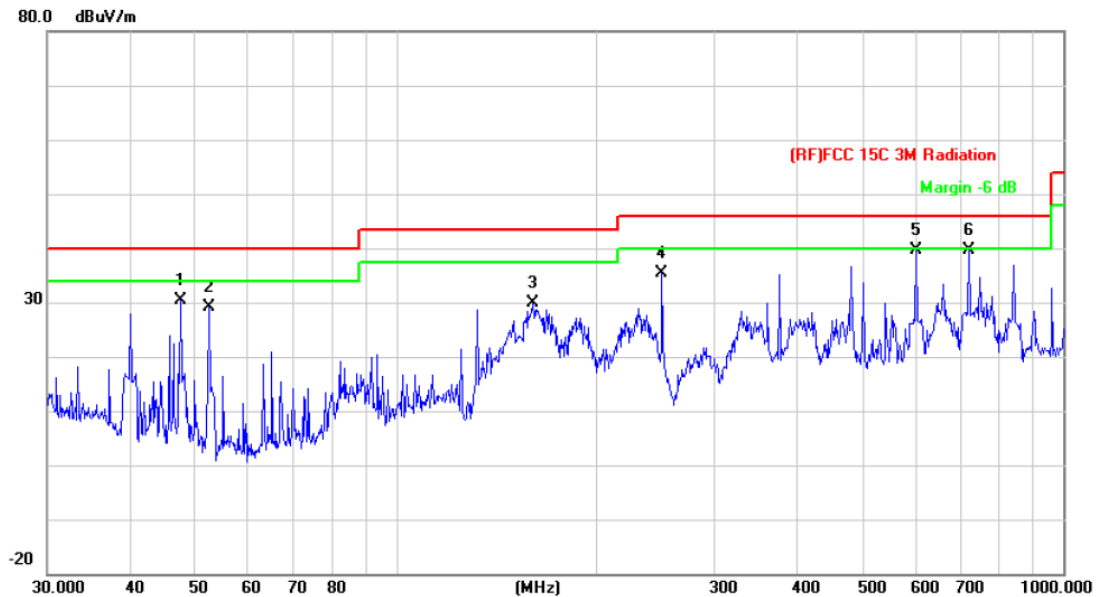
The Equipment Under Test was set to Continual Transmitting in maximum power.

5.5 Test Data

Remark: During testing above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.

Test data please refer the following pages.

EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2412MHz		
Remark:	Only worse case is reported		

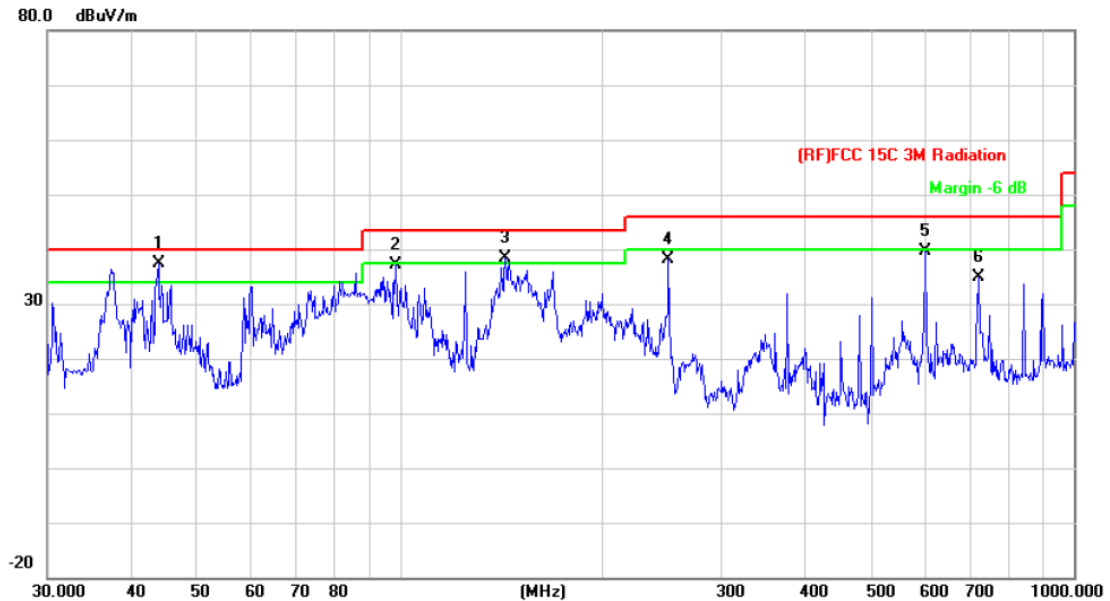


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		47.4917	53.61	-23.33	30.28	40.00	-9.72	peak
2		52.3912	53.49	-24.42	29.07	40.00	-10.93	peak
3		160.3456	50.45	-20.53	29.92	43.50	-13.58	peak
4		250.3011	53.53	-18.11	35.42	46.00	-10.58	peak
5		601.4265	48.97	-9.41	39.56	46.00	-6.44	peak
6	*	721.7259	46.85	-7.10	39.75	46.00	-6.25	peak

*:Maximum data x:Over limit !:over margin

Emission Level= Read Level+ Correct Factor

EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2412MHz		
Remark:	Only worse case is reported		

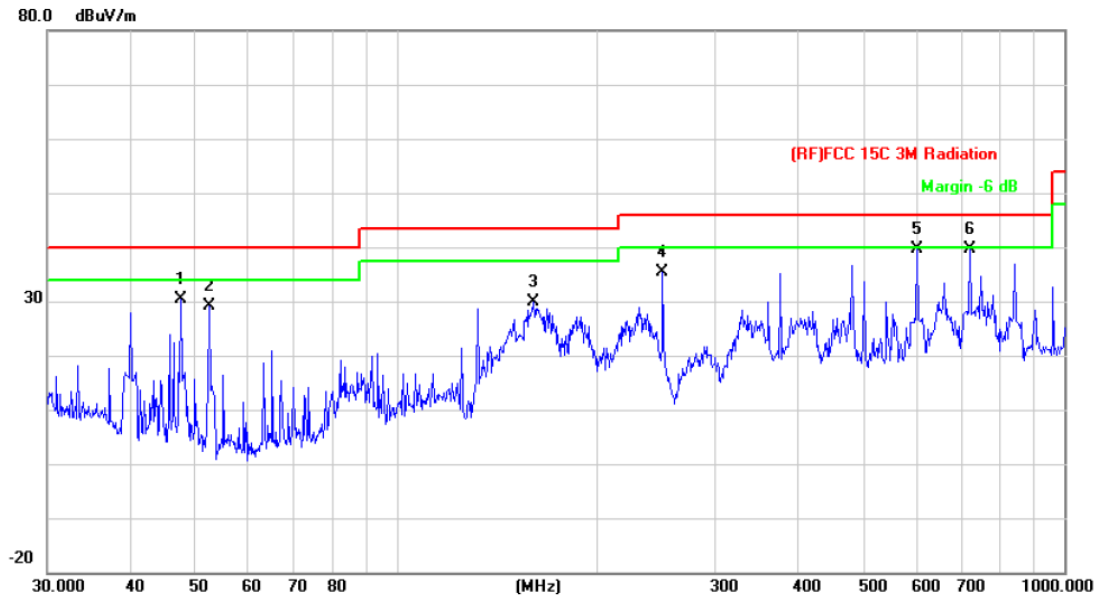


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	43.8119	59.21	-21.77	37.44	40.00	-2.56	peak
2		98.4865	59.07	-21.95	37.12	43.50	-6.38	peak
3	!	143.3260	60.08	-21.71	38.37	43.50	-5.13	peak
4		250.3011	56.33	-18.11	38.22	46.00	-7.78	peak
5		601.4265	48.92	-9.41	39.51	46.00	-6.49	peak
6		721.7259	41.87	-7.10	34.77	46.00	-11.23	peak

*:Maximum data x:Over limit !:over margin

Emission Level= Read Level+ Correct Factor

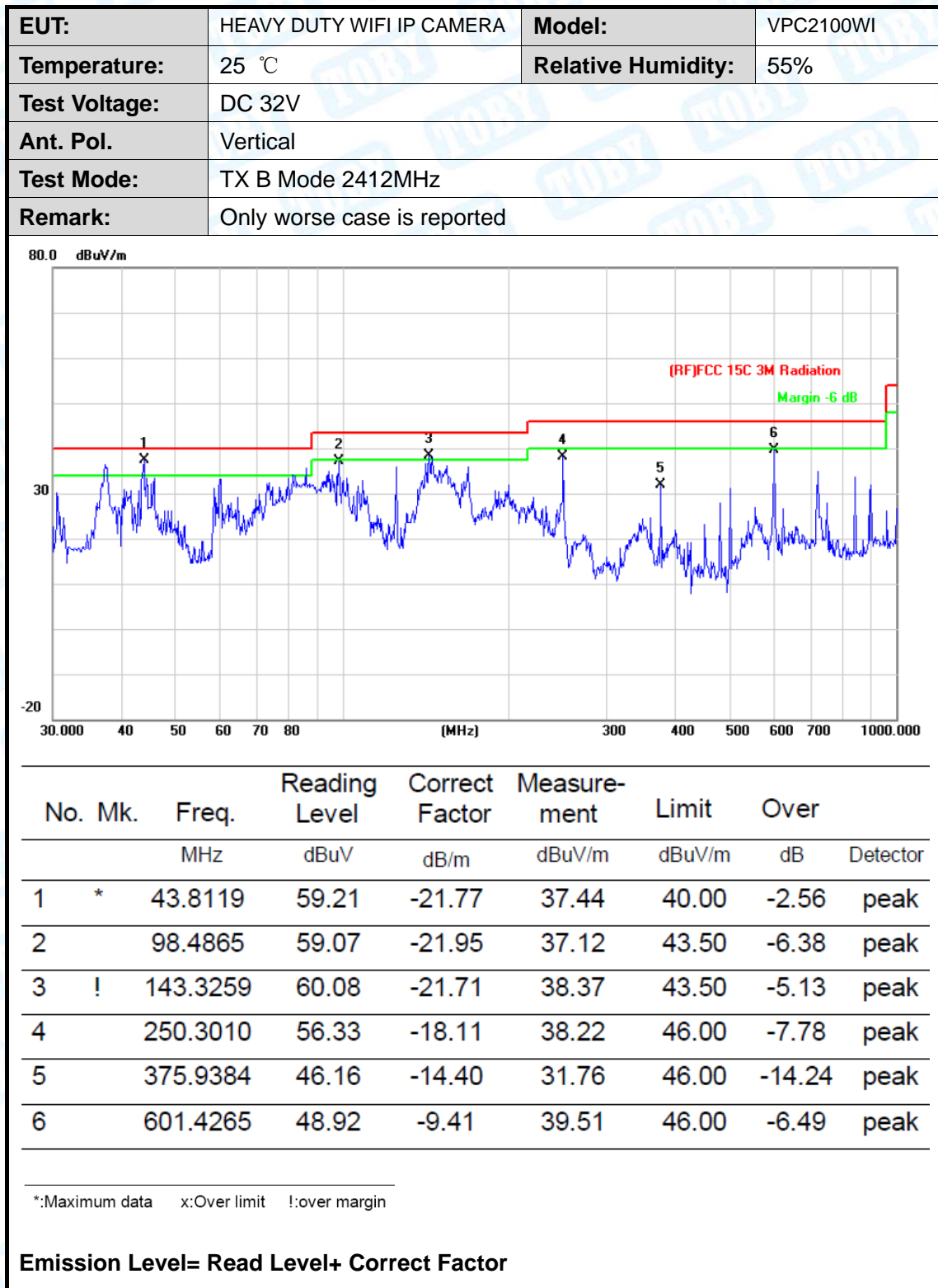
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 32V		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2412MHz		
Remark:	Only worse case is reported		



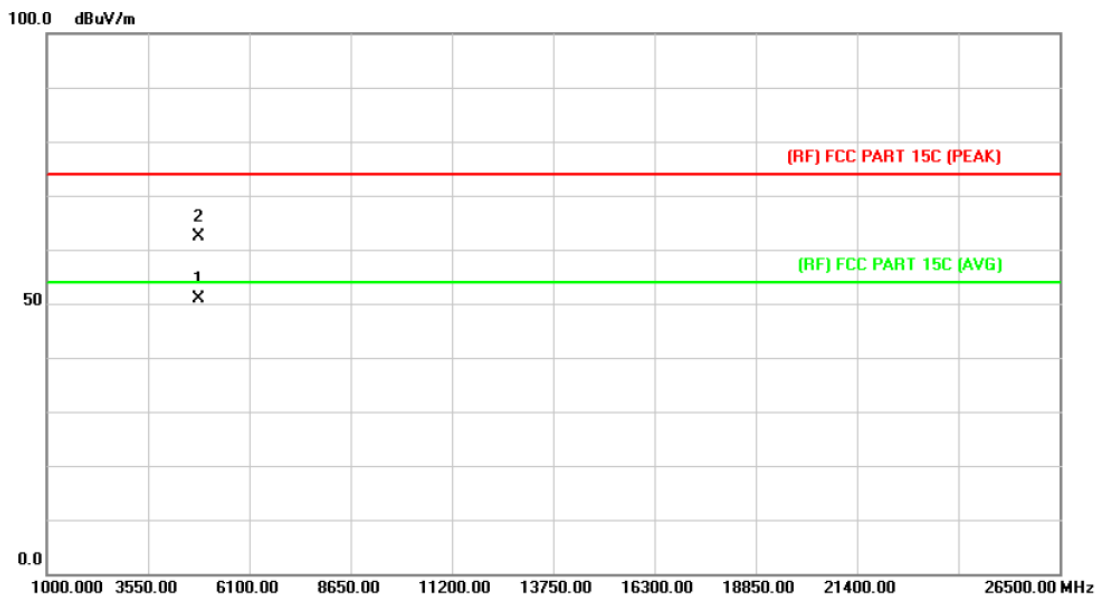
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		47.4917	53.61	-23.33	30.28	40.00	-9.72	peak
2		52.3912	53.49	-24.42	29.07	40.00	-10.93	peak
3		160.3455	50.45	-20.53	29.92	43.50	-13.58	peak
4		250.3010	53.53	-18.11	35.42	46.00	-10.58	peak
5		601.4265	48.97	-9.41	39.56	46.00	-6.44	peak
6	*	721.7259	46.85	-7.10	39.75	46.00	-6.25	peak

*:Maximum data x:Over limit !:over margin

Emission Level= Read Level+ Correct Factor



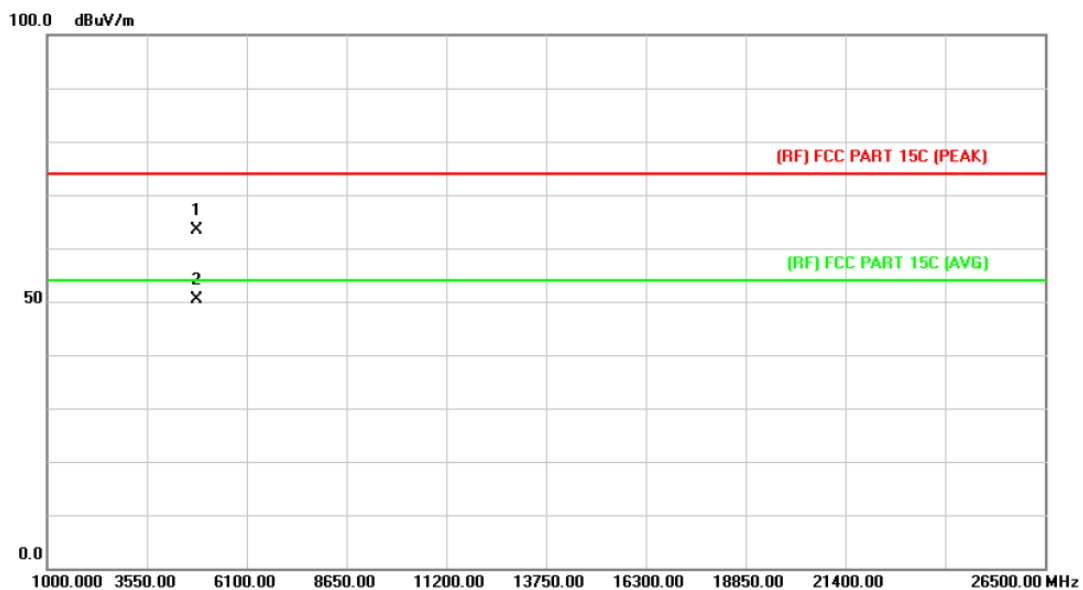
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2412MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4823.897	37.41	13.56	50.97	54.00	-3.03	AVG
2		4824.365	48.93	13.56	62.49	74.00	-11.51	peak

Emission Level= Read Level+ Correct Factor

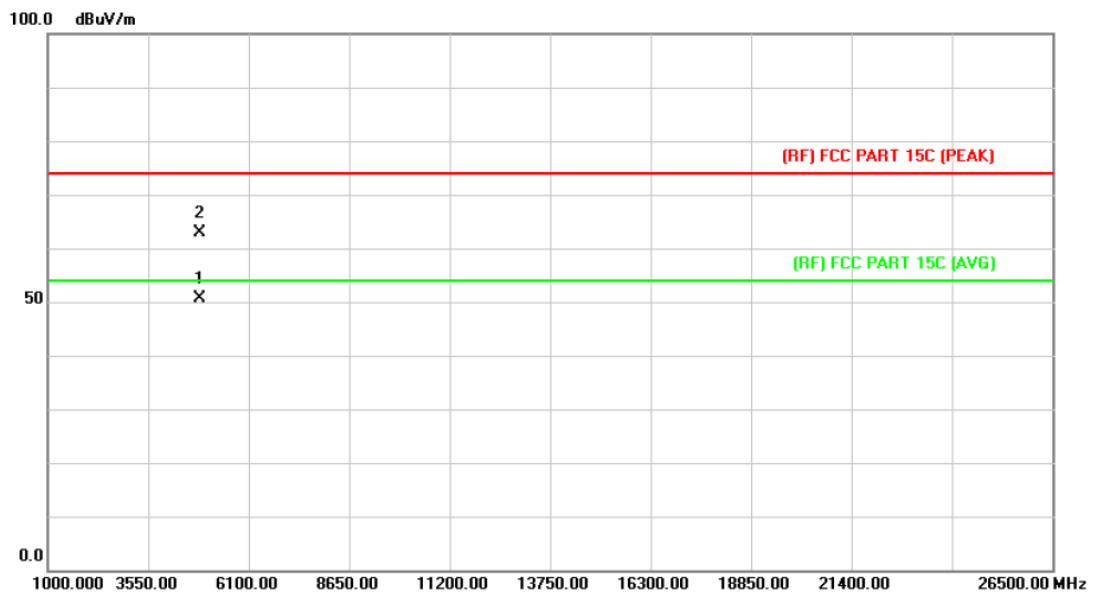
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2412MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4823.674	49.94	13.56	63.50	74.00	-10.50	peak
2	*	4824.034	36.80	13.56	50.36	54.00	-3.64	AVG

Emission Level= Read Level+ Correct Factor

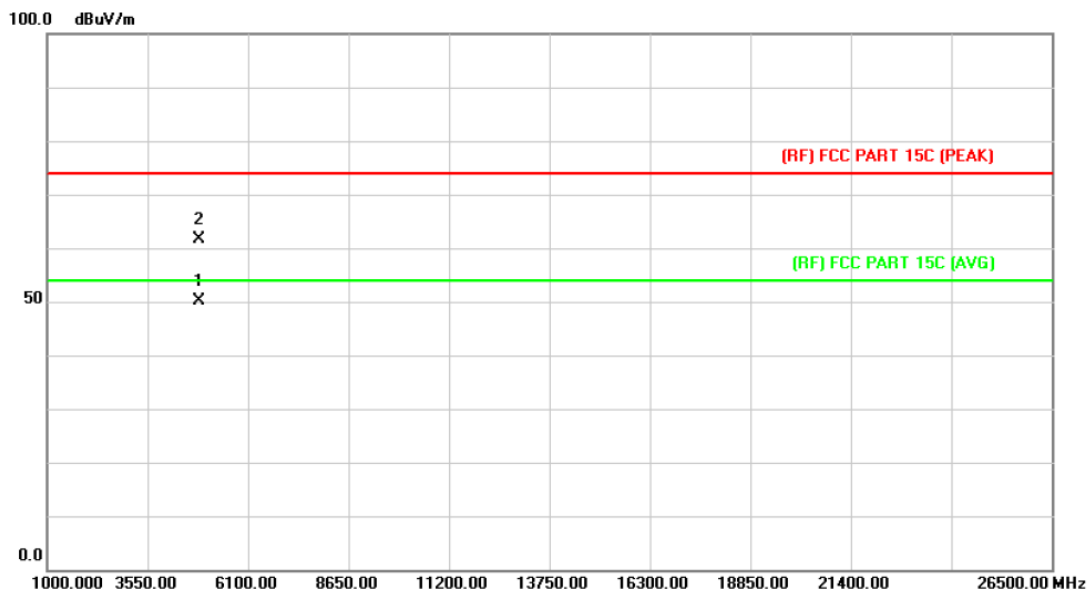
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2437MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4873.658	36.68	13.86	50.54	54.00	-3.46	AVG
2		4874.314	48.98	13.86	62.84	74.00	-11.16	peak

Emission Level= Read Level+ Correct Factor

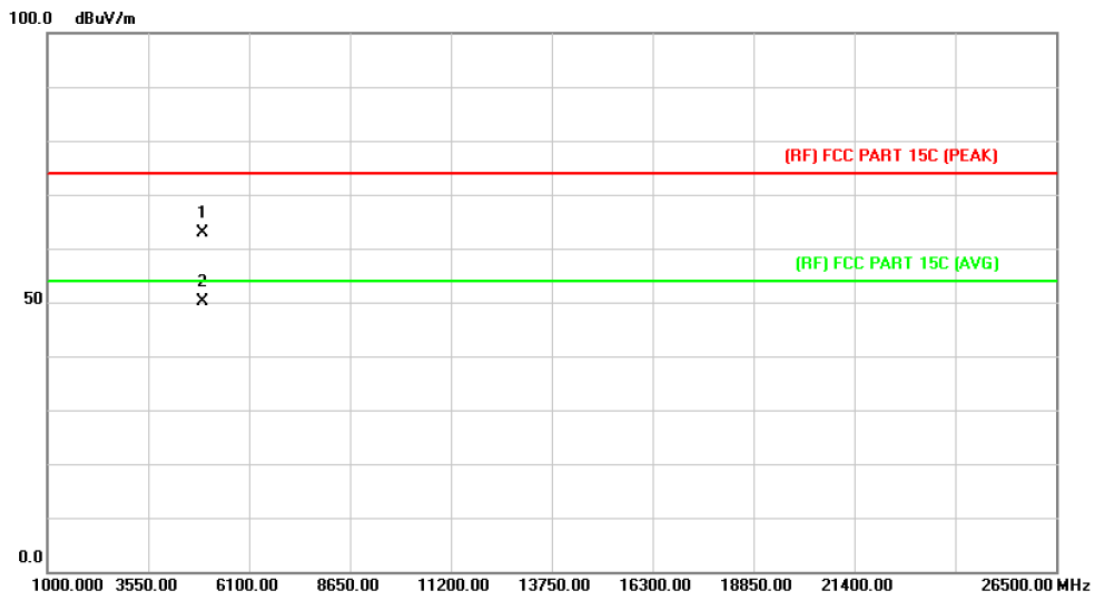
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2437MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4873.125	36.28	13.86	50.14	54.00	-3.86	AVG
2		4874.210	47.71	13.86	61.57	74.00	-12.43	peak

Emission Level= Read Level+ Correct Factor

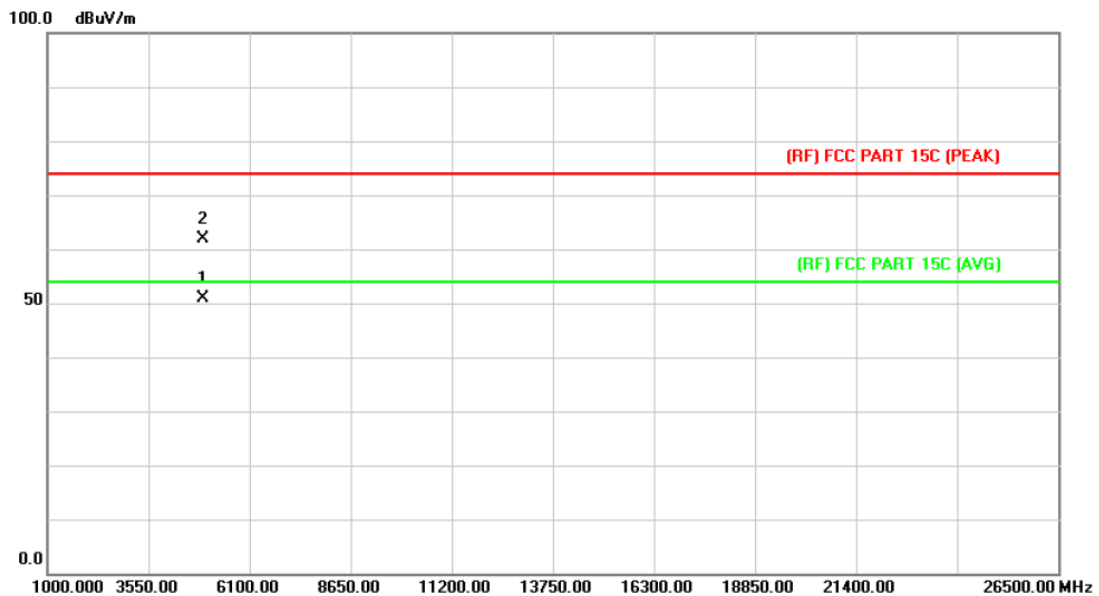
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2462MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4923.974	48.74	14.15	62.89	74.00	-11.11	peak
2	*	4924.310	36.06	14.15	50.21	54.00	-3.79	AVG

Emission Level= Read Level+ Correct Factor

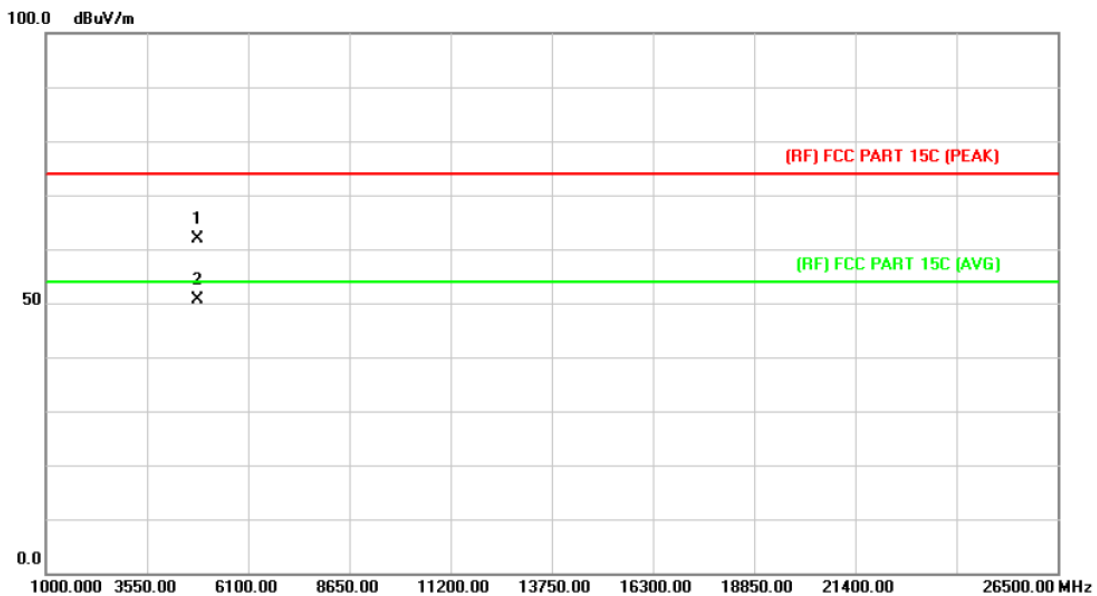
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2462MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4923.687	36.72	14.15	50.87	54.00	-3.13	AVG
2		4924.064	47.69	14.15	61.84	74.00	-12.16	peak

Emission Level= Read Level+ Correct Factor

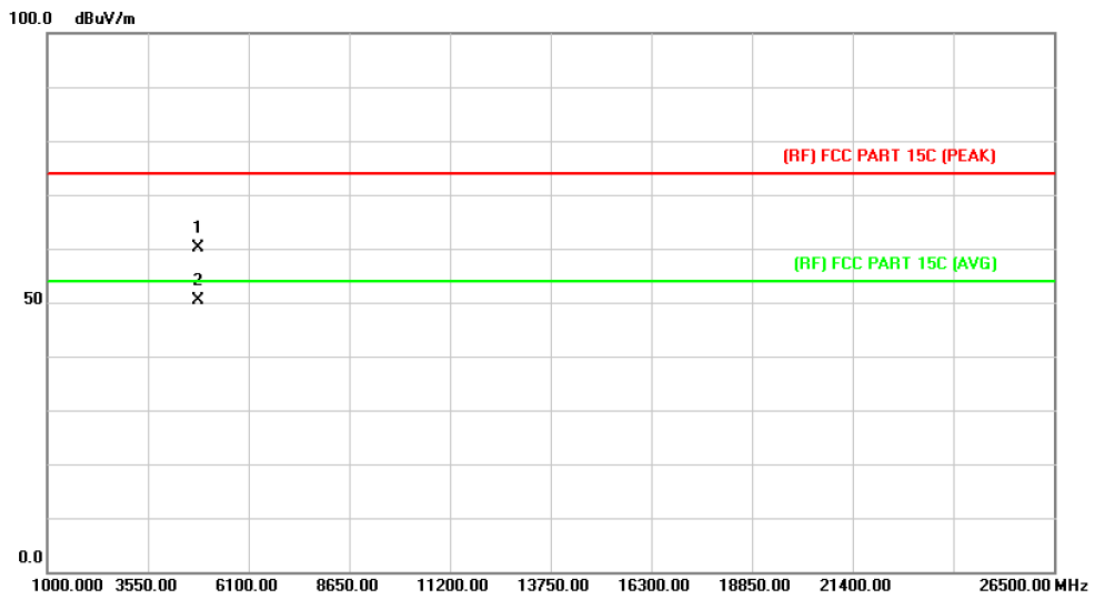
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX G Mode 2412MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4823.974	48.42	13.56	61.98	74.00	-12.02	peak
2	*	4824.067	37.13	13.56	50.69	54.00	-3.31	AVG

Emission Level= Read Level+ Correct Factor

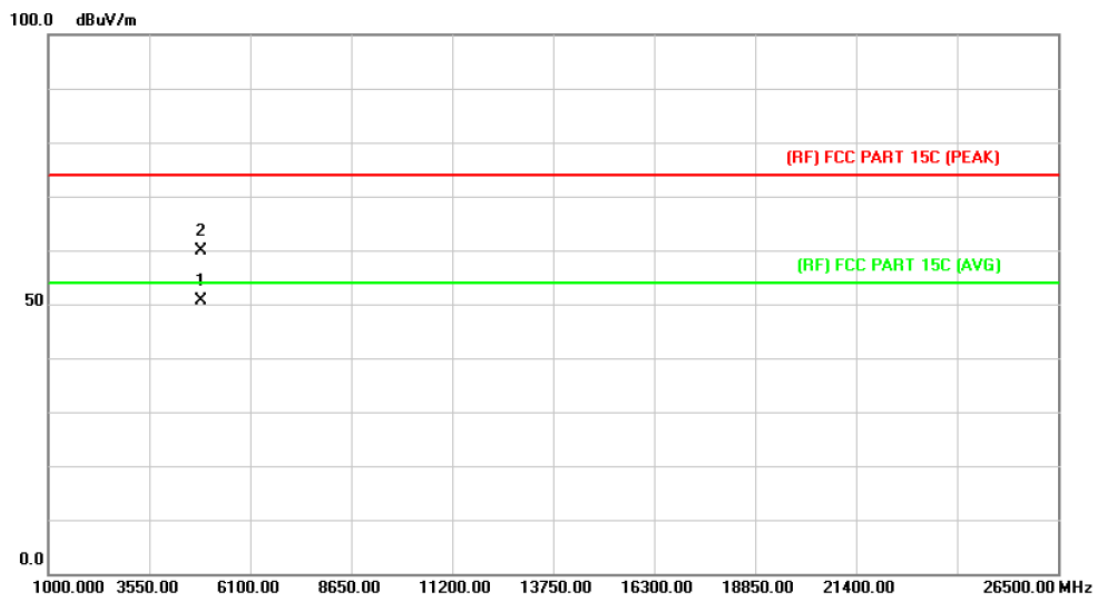
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX G Mode 2412MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4824.287	46.58	13.56	60.14	74.00	-13.86	peak
2	*	4824.317	36.76	13.56	50.32	54.00	-3.68	AVG

Emission Level= Read Level+ Correct Factor

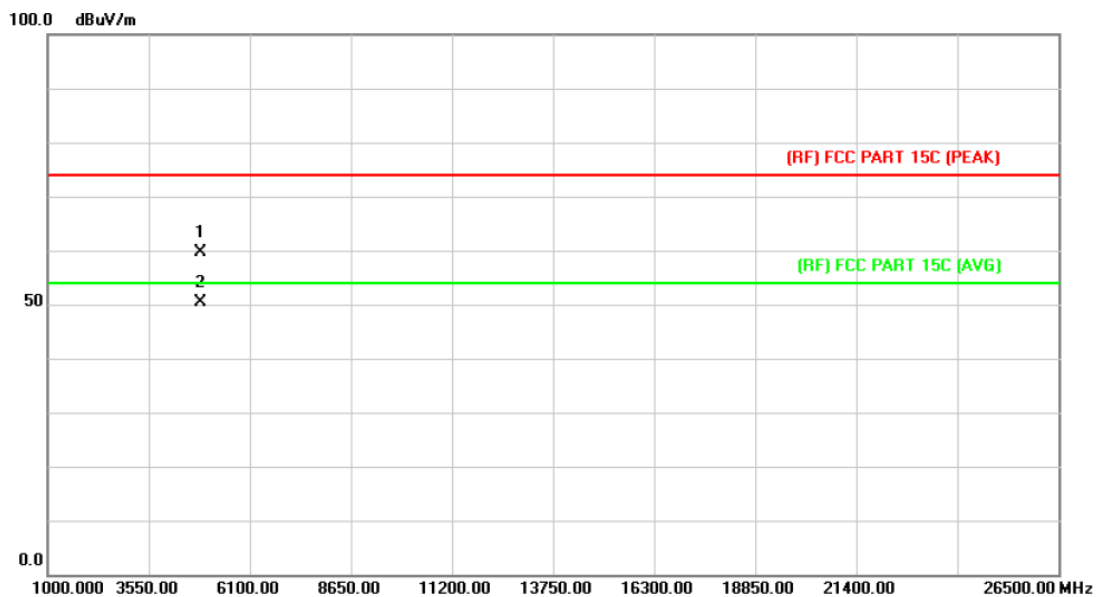
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX G Mode 2437MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4874.349	36.74	13.86	50.60	54.00	-3.40	AVG
2		4875.785	46.11	13.87	59.98	74.00	-14.02	peak

Emission Level= Read Level+ Correct Factor

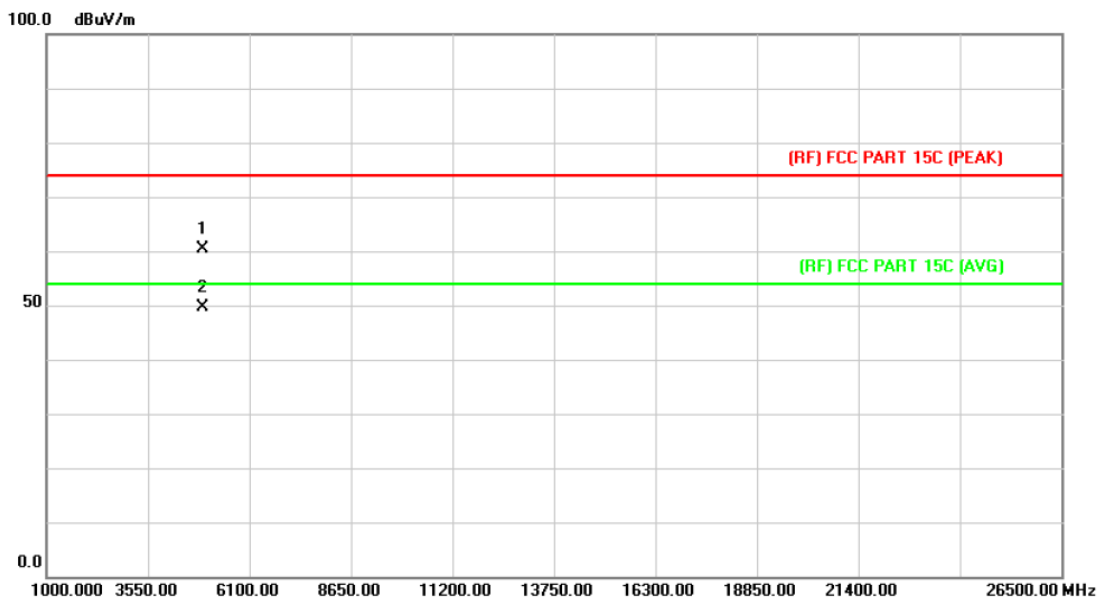
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX G Mode 2437MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4873.695	45.88	13.86	59.74	74.00	-14.26	peak
2	*	4874.641	36.48	13.86	50.34	54.00	-3.66	AVG

Emission Level= Read Level+ Correct Factor

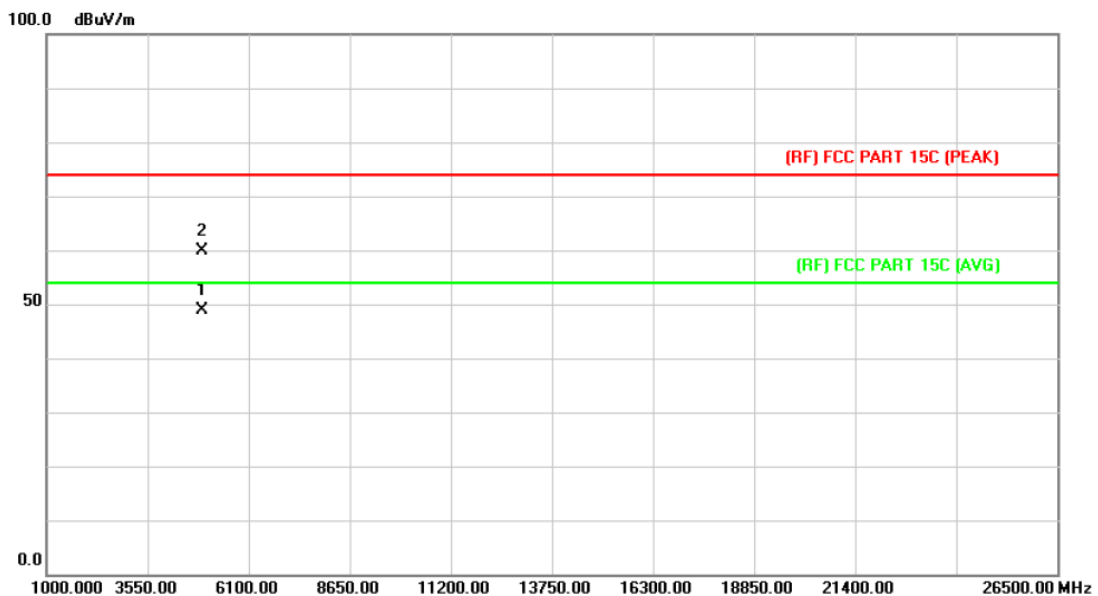
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX G Mode 2462MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4923.641	46.21	14.15	60.36	74.00	-13.64	peak
2	*	4924.312	35.50	14.15	49.65	54.00	-4.35	AVG

Emission Level= Read Level+ Correct Factor

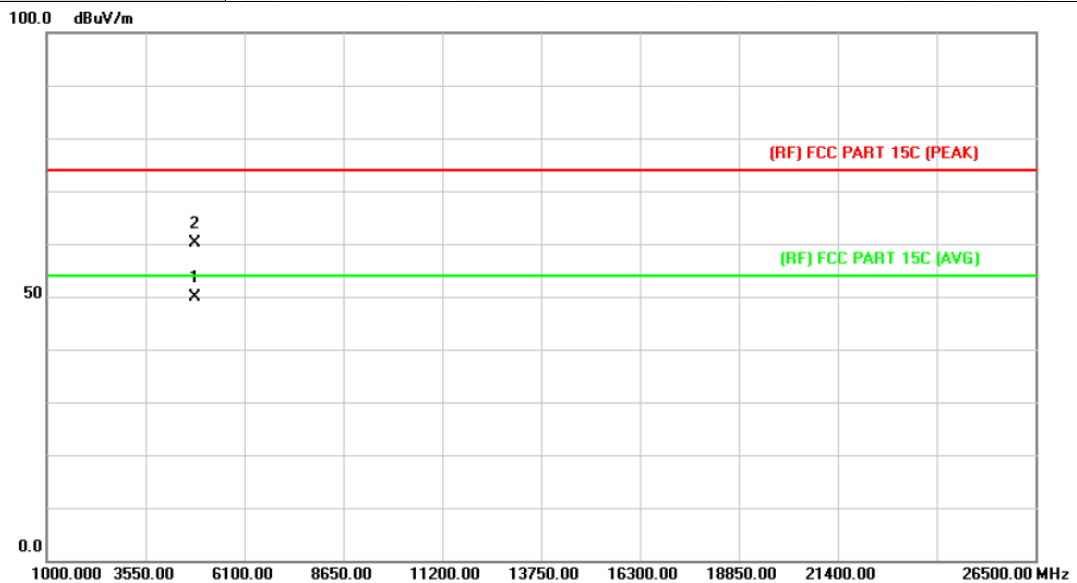
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX G Mode 2462MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4923.678	34.83	14.15	48.98	54.00	-5.02	AVG
2		4924.351	45.61	14.15	59.76	74.00	-14.24	peak

Emission Level= Read Level+ Correct Factor

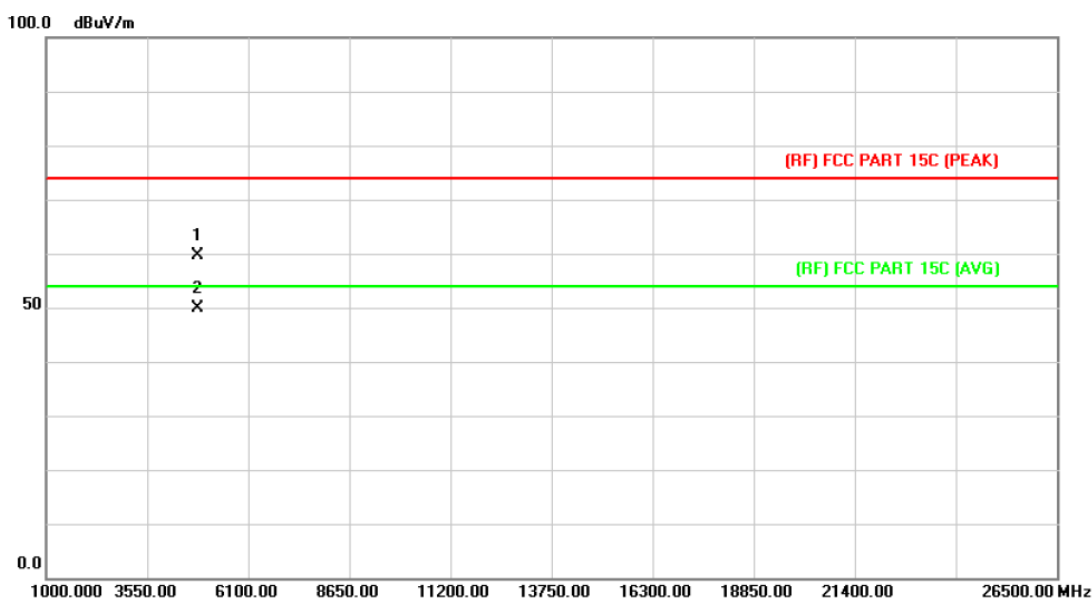
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT20) Mode 2412MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4823.654	36.41	13.56	49.97	54.00	-4.03	AVG
2		4824.254	46.63	13.56	60.19	74.00	-13.81	peak

Emission Level= Read Level+ Correct Factor

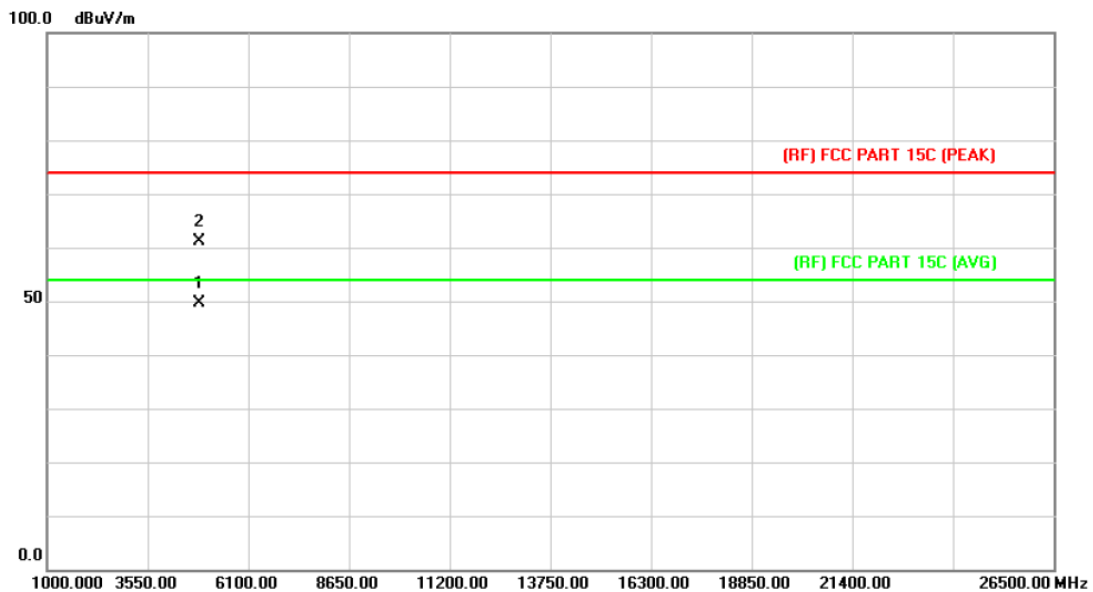
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX N(HT20) Mode 2412MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4823.598	46.11	13.56	59.67	74.00	-14.33	peak
2	*	4824.541	36.36	13.56	49.92	54.00	-4.08	AVG

Emission Level= Read Level+ Correct Factor

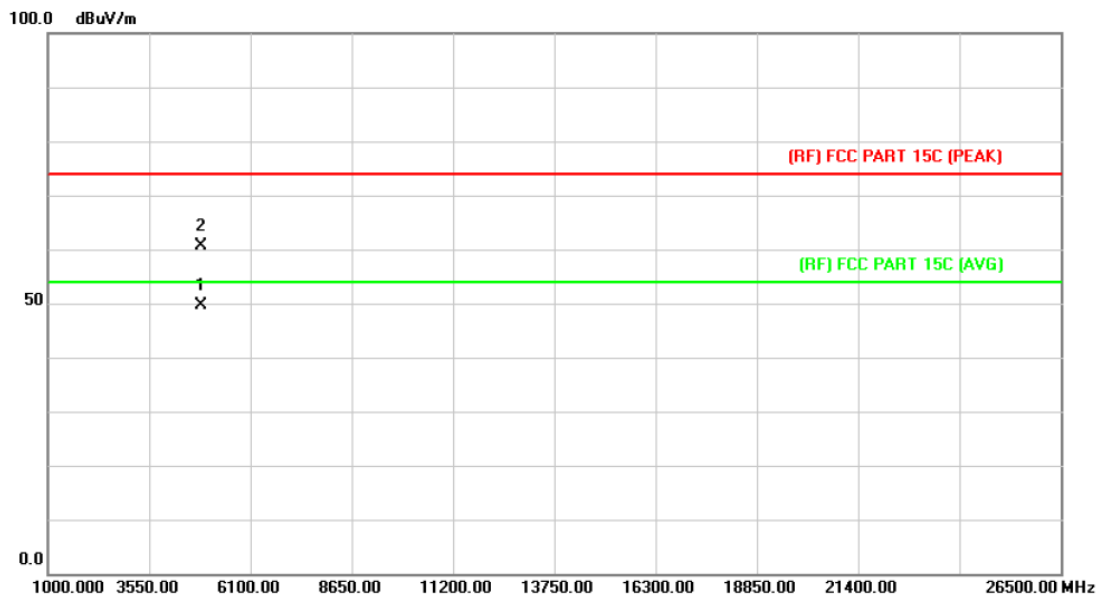
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT20) Mode 2437MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4873.598	35.79	13.86	49.65	54.00	-4.35	AVG
2		4875.012	47.15	13.87	61.02	74.00	-12.98	peak

Emission Level= Read Level+ Correct Factor

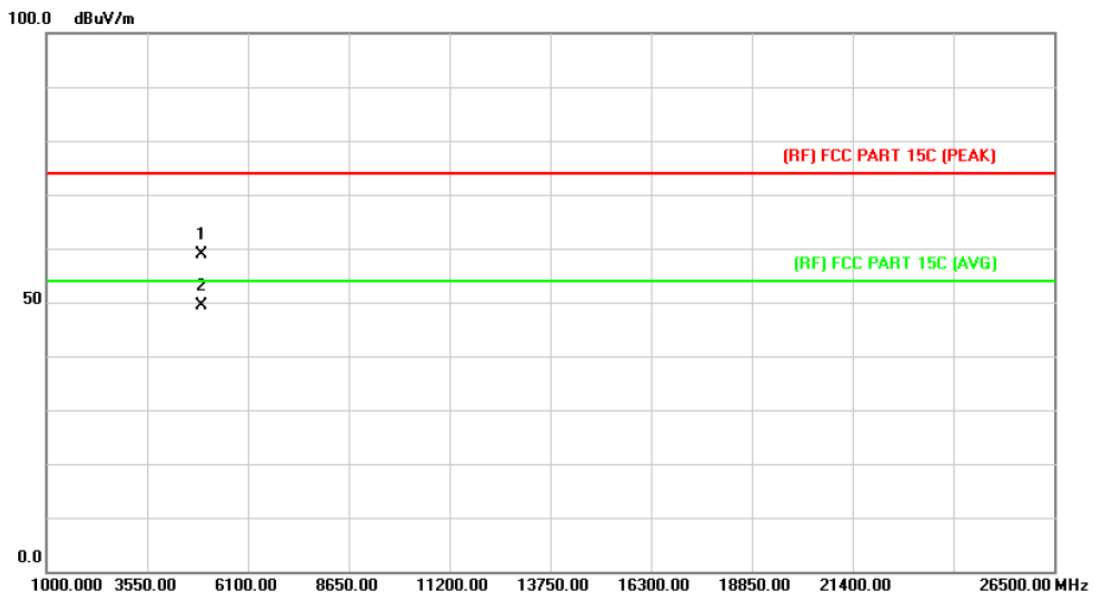
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX N(HT20) Mode 2437MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4873.854	35.83	13.86	49.69	54.00	-4.31	AVG
2		4874.651	46.83	13.86	60.69	74.00	-13.31	peak

Emission Level= Read Level+ Correct Factor

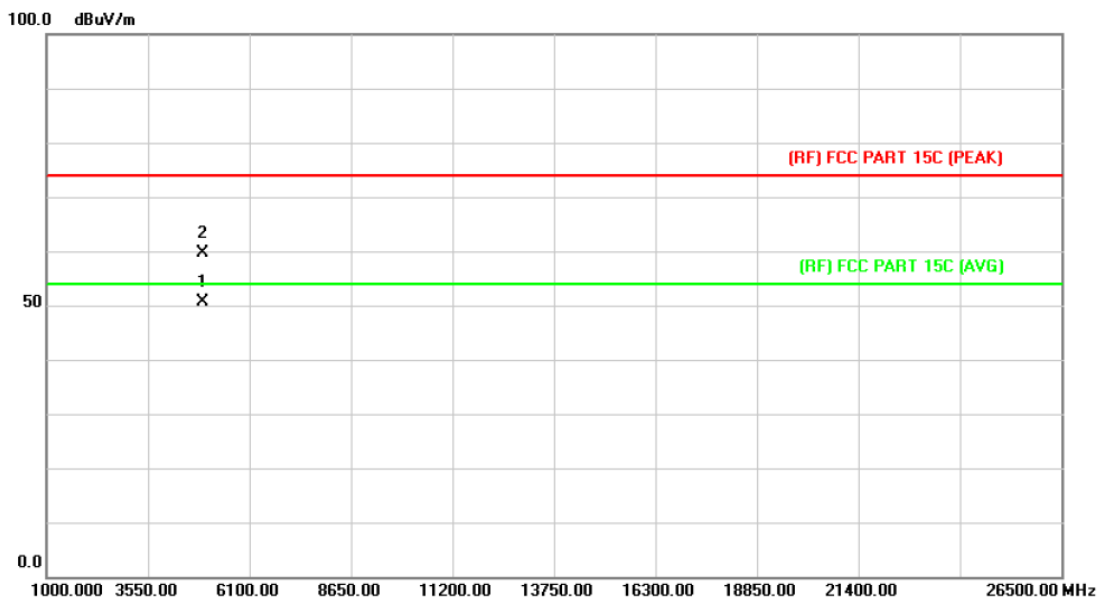
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT20) Mode 2462MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4923.899	44.82	14.15	58.97	74.00	-15.03	peak
2	*	4924.158	35.17	14.15	49.32	54.00	-4.68	AVG

Emission Level= Read Level+ Correct Factor

EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX N(HT20) Mode 2462MHz		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4923.654	36.48	14.15	50.63	54.00	-3.37	AVG
2		4924.265	45.53	14.15	59.68	74.00	-14.32	peak

Emission Level= Read Level+ Correct Factor

6. Restricted Bands Requirement

6.1 Test Standard and Limit

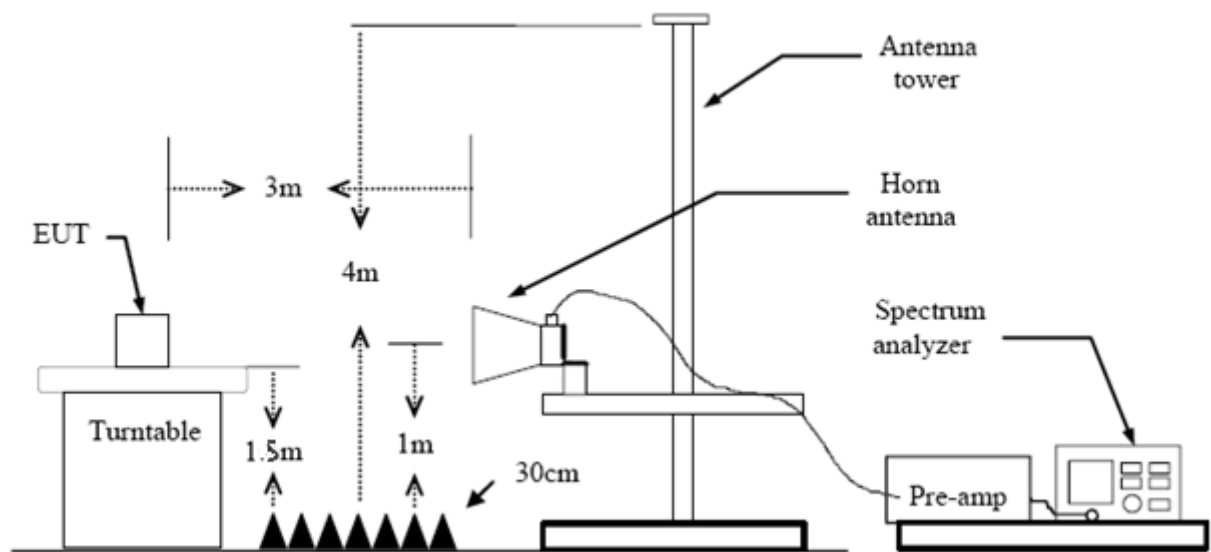
6.1.1 Test Standard

FCC Part 15.209 FCC Part 15.205

6.1.2 Test Limit

Restricted Frequency Band (MHz)	Class B (dBuV/m)(at 3 M)	
	Peak	Average
2310 ~2390	74	54
2483.5 ~2500	74	54

6.2 Test Setup



6.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- (2) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.
- (3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.

- (4) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- (5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (7) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.
- (8) For the actual test configuration, please see the test setup photo.

6.4 EUT Operating Condition

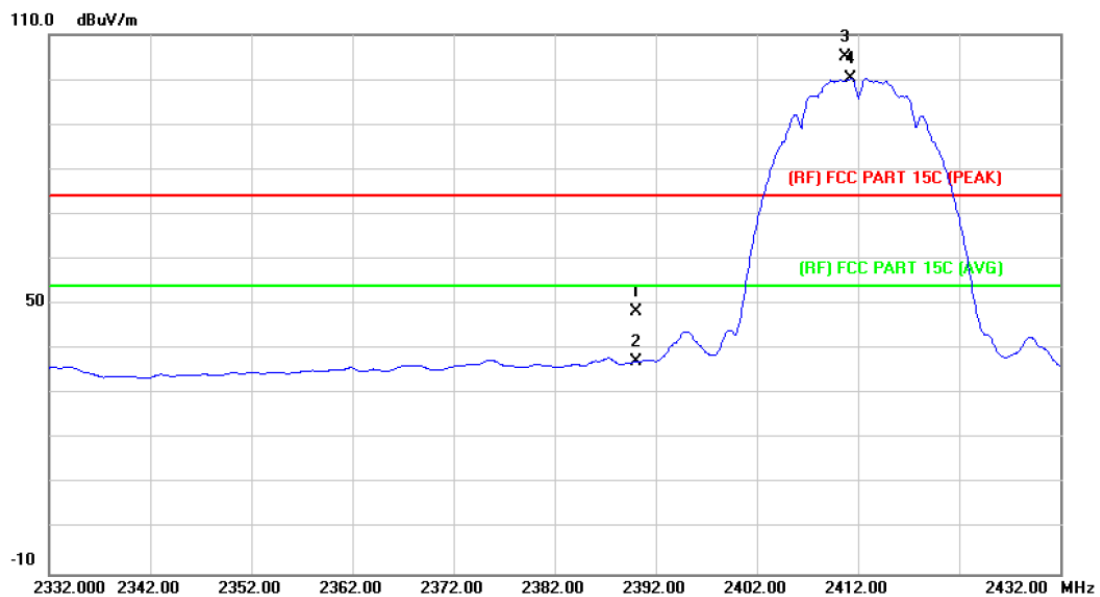
The Equipment Under Test was set to Continual Transmitting in maximum power.

6.5 Test Data

Please see the next page.

(1) Radiation Test

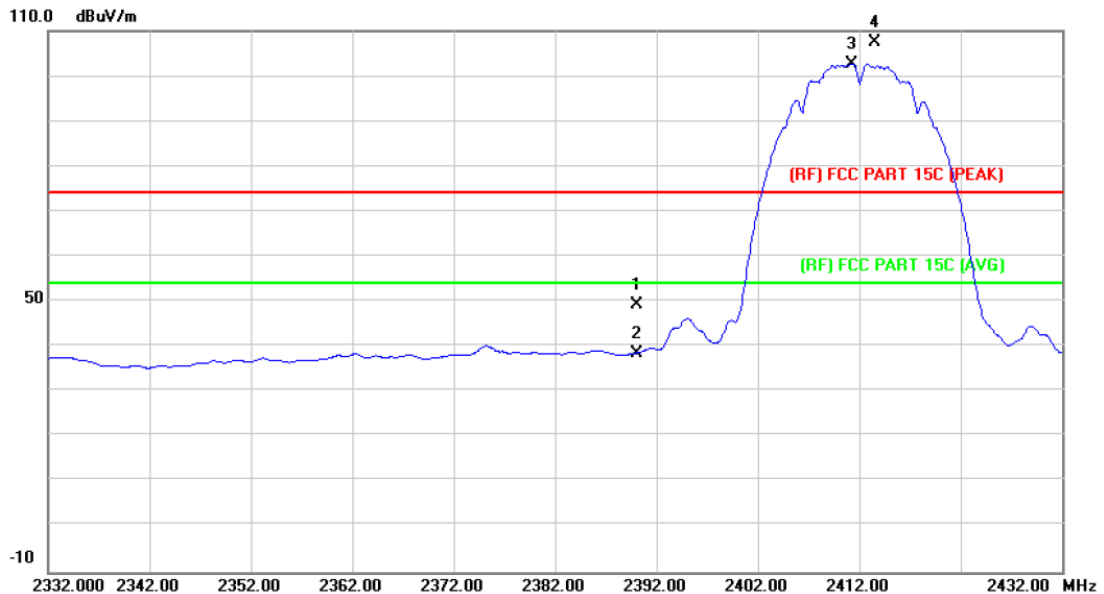
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2412MHz		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB Detector
1		2390.000	47.66	0.77	48.43	74.00	-25.57 peak
2		2390.000	36.40	0.77	37.17	54.00	-16.83 AVG
3	X	2410.700	104.15	0.86	105.01	Fundamental Frequency	peak
4	*	2411.300	99.48	0.86	100.34	Fundamental Frequency	AVG

Emission Level= Read Level+ Correct Factor

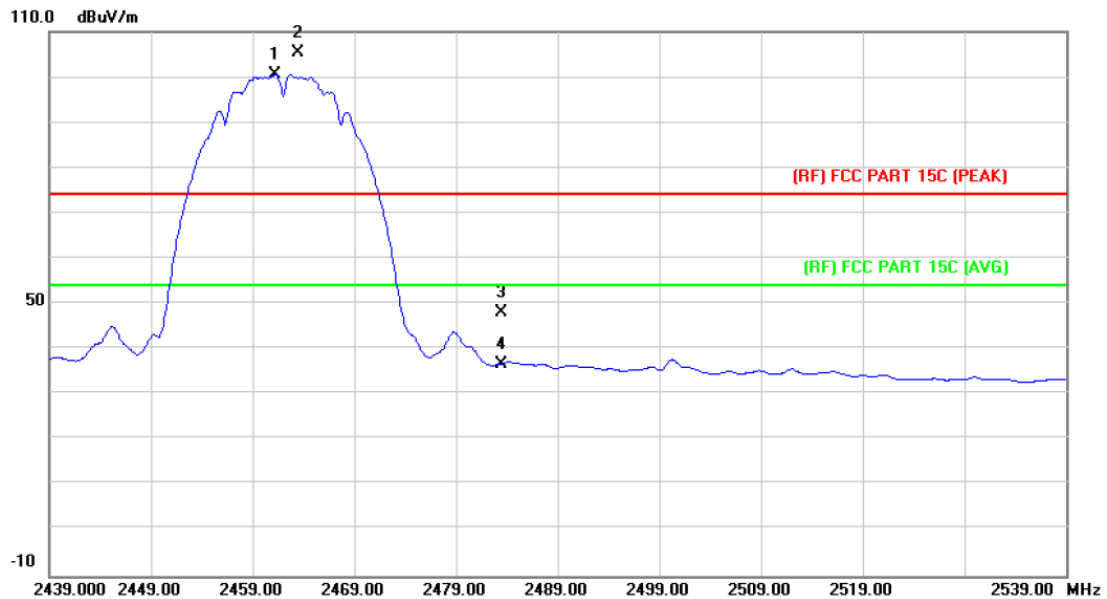
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2412MHz		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	48.45	0.77	49.22	74.00	-24.78	peak
2		2390.000	37.81	0.77	38.58	54.00	-15.42	AVG
3	*	2411.300	101.92	0.86	102.78	Fundamental Frequency		AVG
4	X	2413.500	106.62	0.86	107.48	Fundamental Frequency		peak

Emission Level= Read Level+ Correct Factor

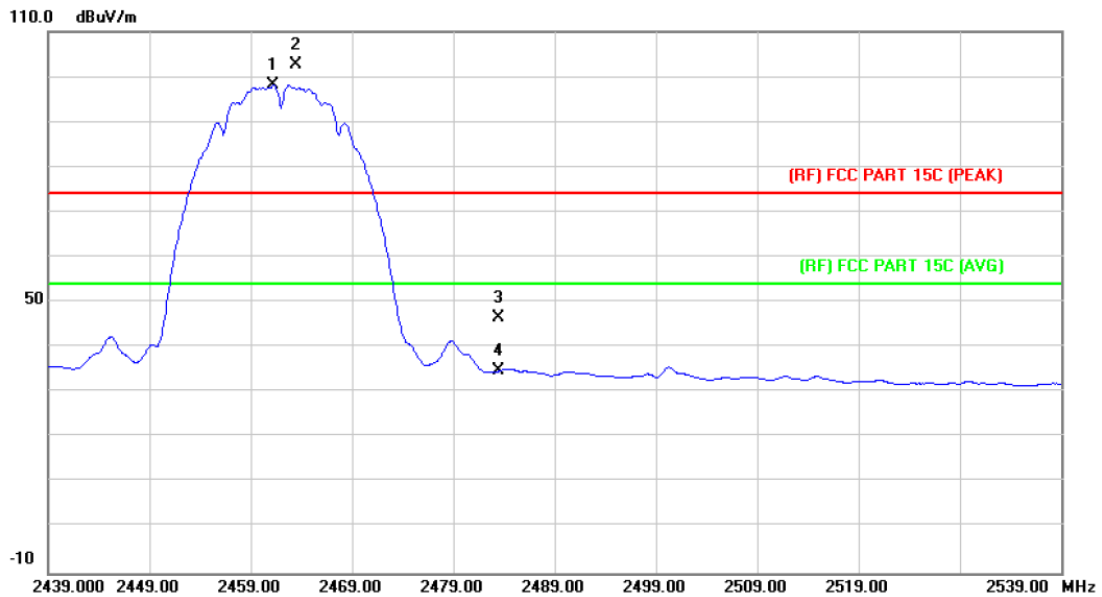
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2462MHz		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	*	2461.200	99.56	1.07	100.63	Fundamental Frequency		AVG
2	X	2463.400	104.20	1.08	105.28	Fundamental Frequency		peak
3		2483.500	46.98	1.17	48.15	74.00	-25.85	peak
4		2483.500	35.57	1.17	36.74	54.00	-17.26	AVG

Emission Level= Read Level+ Correct Factor

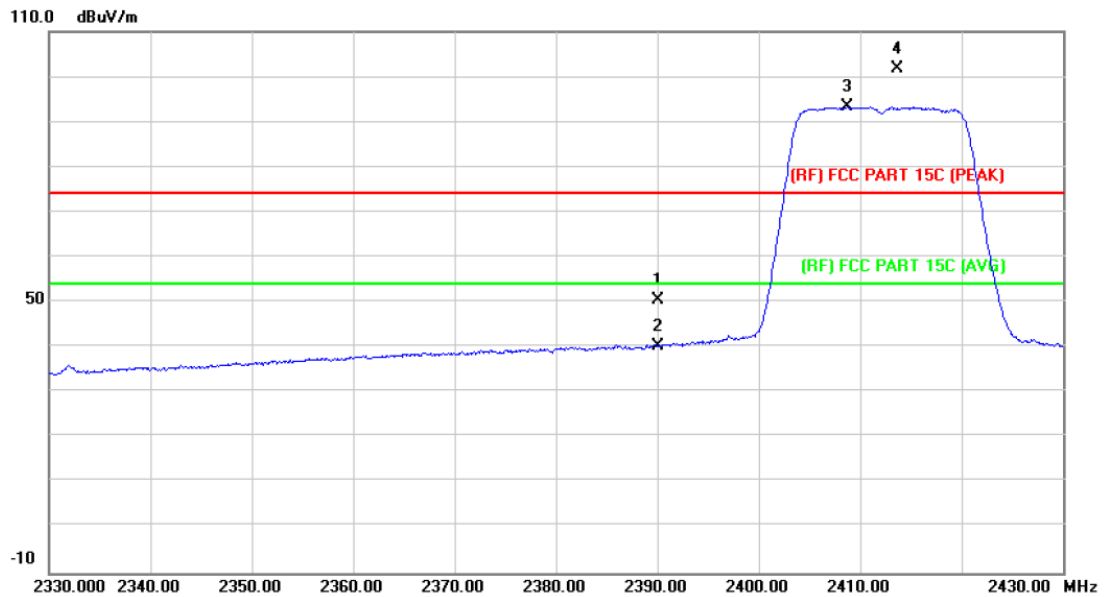
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2462MHz		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	*	2461.200	97.00	1.07	98.07	Fundamental Frequency		AVG
2	X	2463.400	101.63	1.08	102.71	Fundamental Frequency		peak
3		2483.500	45.51	1.17	46.68	74.00	-27.32	peak
4		2483.500	33.57	1.17	34.74	54.00	-19.26	AVG

Emission Level= Read Level+ Correct Factor

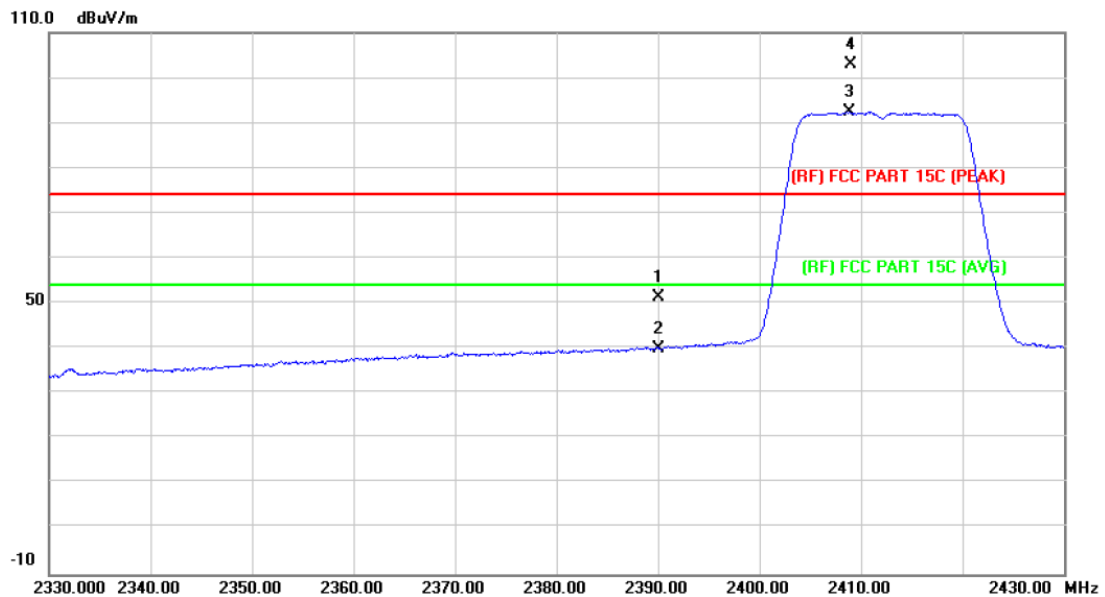
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX G Mode 2412MHz		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		2390.000	49.60	0.77	50.37	74.00	-23.63	peak
2		2390.000	39.62	0.77	40.39	54.00	-13.61	AVG
3	*	2408.700	92.46	0.85	93.31	Fundamental Frequency		AVG
4	X	2413.700	100.91	0.86	101.77	Fundamental Frequency		peak

Emission Level= Read Level+ Correct Factor

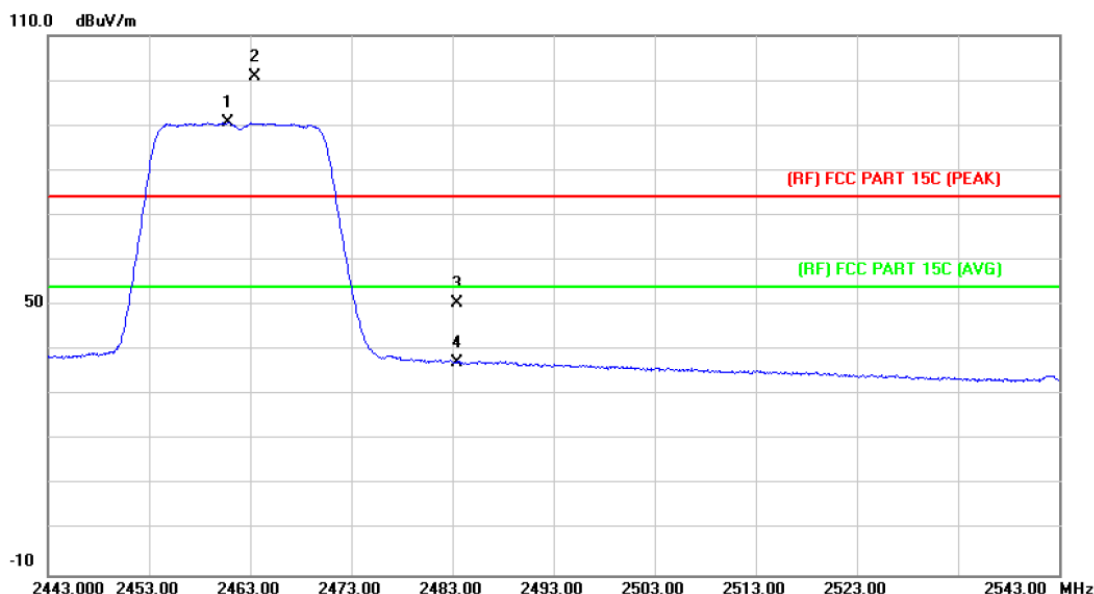
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX G Mode 2412MHz		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB Detector
1		2390.000	50.60	0.77	51.37	74.00	-22.63 peak
2		2390.000	39.30	0.77	40.07	54.00	-13.93 AVG
3	*	2408.800	91.57	0.85	92.42	Fundamental Frequency	
4	X	2409.000	101.97	0.85	102.82	Fundamental Frequency	

Emission Level= Read Level+ Correct Factor

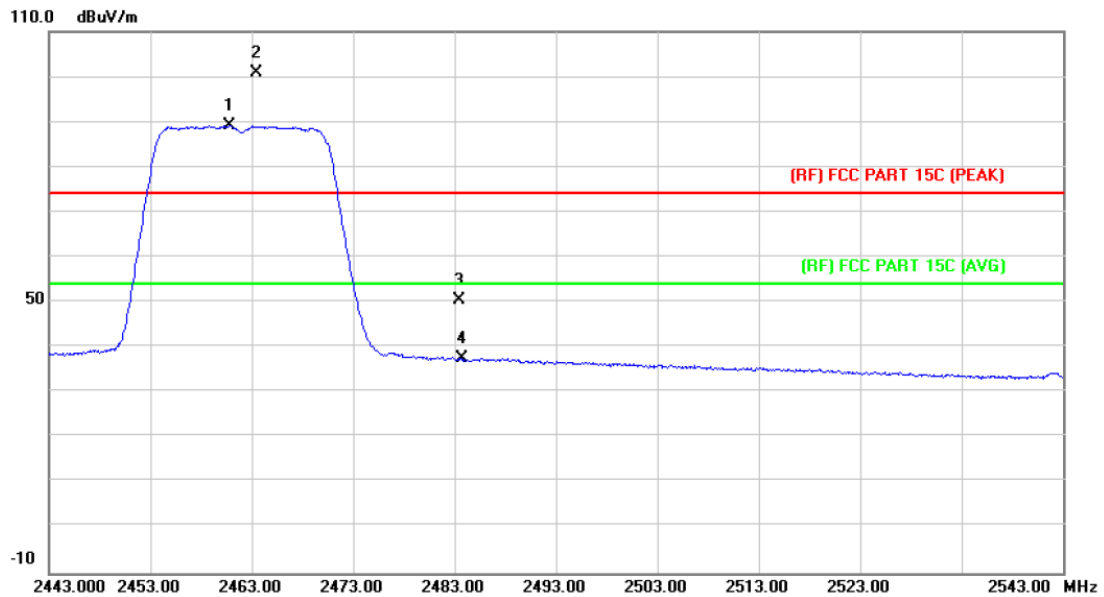
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX G Mode 2462MHz		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	2460.800	89.51	1.06	90.57	Fundamental Frequency		AVG
2	X	2463.500	99.81	1.08	100.89	Fundamental Frequency		peak
3		2483.500	49.43	1.17	50.60	74.00	-23.40	peak
4		2483.500	36.09	1.17	37.26	54.00	-16.74	AVG

Emission Level= Read Level+ Correct Factor

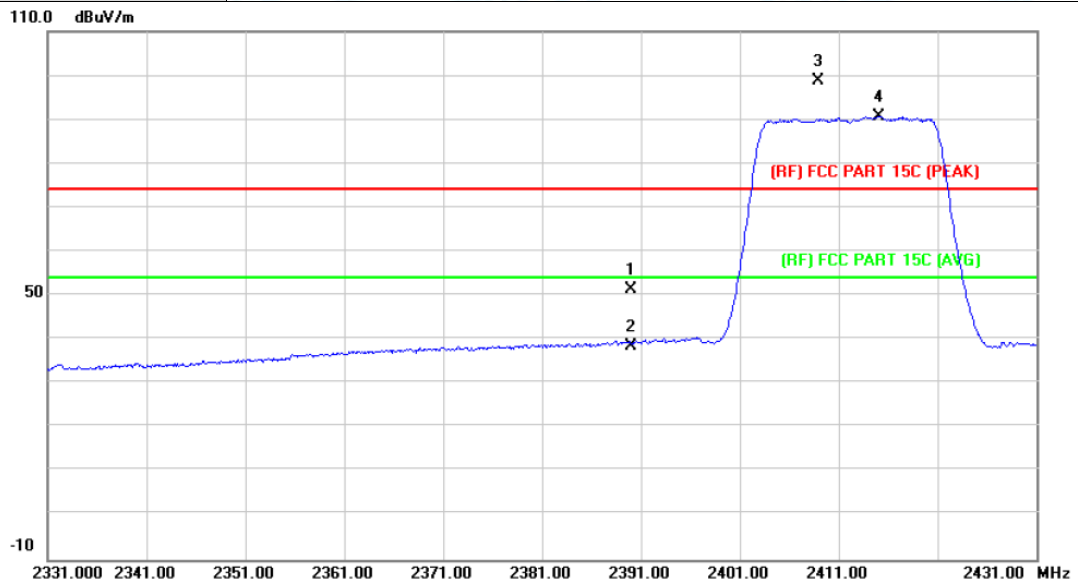
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX G Mode 2462MHz		
Remark:	N/A		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB Detector
1	*	2460.800	88.01	1.06	89.07	Fundamental Frequency	AVG
2	X	2463.500	99.81	1.08	100.89	Fundamental Frequency	peak
3		2483.500	49.43	1.17	50.60	74.00	-23.40 peak
4		2483.700	36.37	1.17	37.54	54.00	-16.46 AVG

Emission Level= Read Level+ Correct Factor

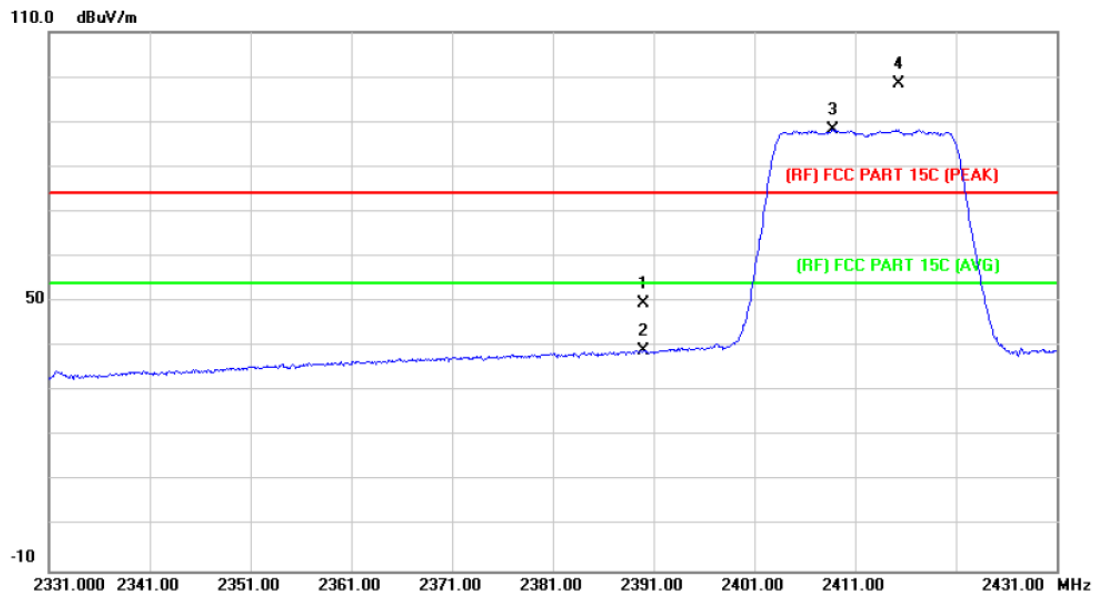
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT20) Mode 2412MHz		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		2390.000	50.55	0.77	51.32	74.00	-22.68	peak
2		2390.000	37.67	0.77	38.44	54.00	-15.56	AVG
3	*	2408.900	97.80	0.85	98.65	Fundamental Frequency		peak
4	X	2415.100	89.88	0.88	90.76	Fundamental Frequency		peak

Emission Level= Read Level+ Correct Factor

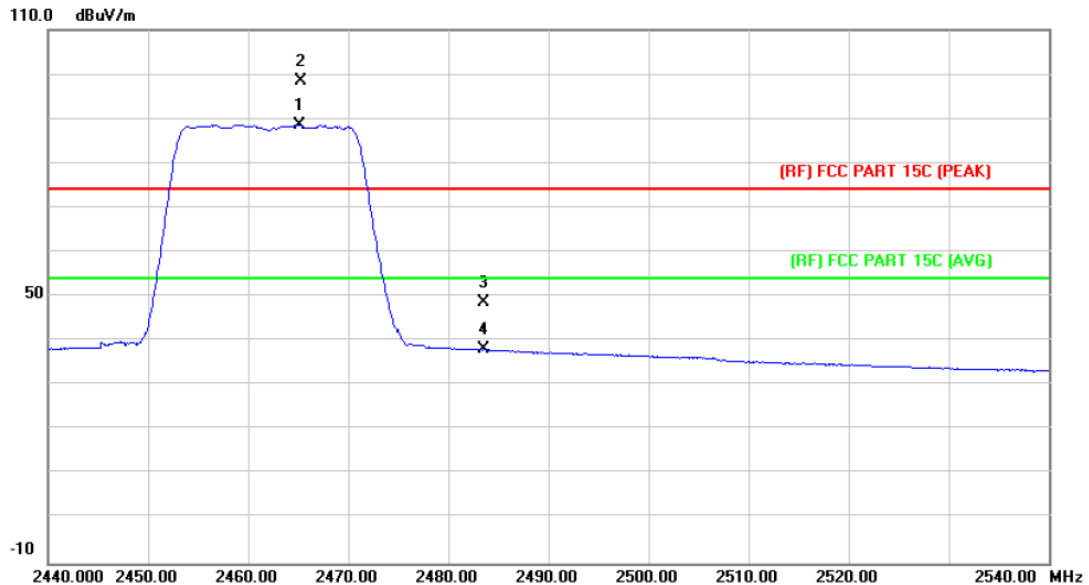
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX N(HT20) Mode 2412MHz		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		2390.000	48.83	0.77	49.60	74.00	-24.40	peak
2		2390.000	38.18	0.77	38.95	54.00	-15.05	AVG
3	*	2408.800	87.34	0.85	88.19	Fundamental Frequency		AVG
4	X	2415.300	97.44	0.88	98.32	Fundamental Frequency		peak

Emission Level= Read Level+ Correct Factor

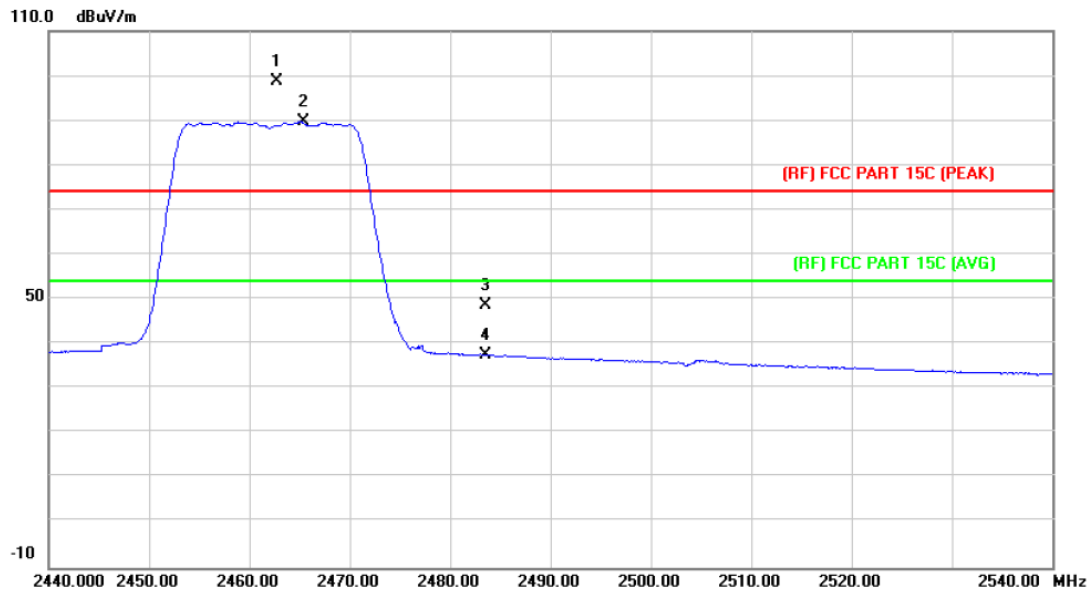
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Horizontal		
Test Mode:	TX N(HT20) Mode 2462MHz		
Remark:	N/A		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	X	2465.200	87.59	1.09	88.68	Fundamental Frequency		peak
2	*	2465.300	97.50	1.09	98.59	Fundamental Frequency		peak
3		2483.500	47.53	1.17	48.70	74.00	-25.30	peak
4		2483.500	36.84	1.17	38.01	54.00	-15.99	AVG

Emission Level= Read Level+ Correct Factor

EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Ant. Pol.	Vertical		
Test Mode:	TX N(HT20) Mode 2462MHz		
Remark:	N/A		

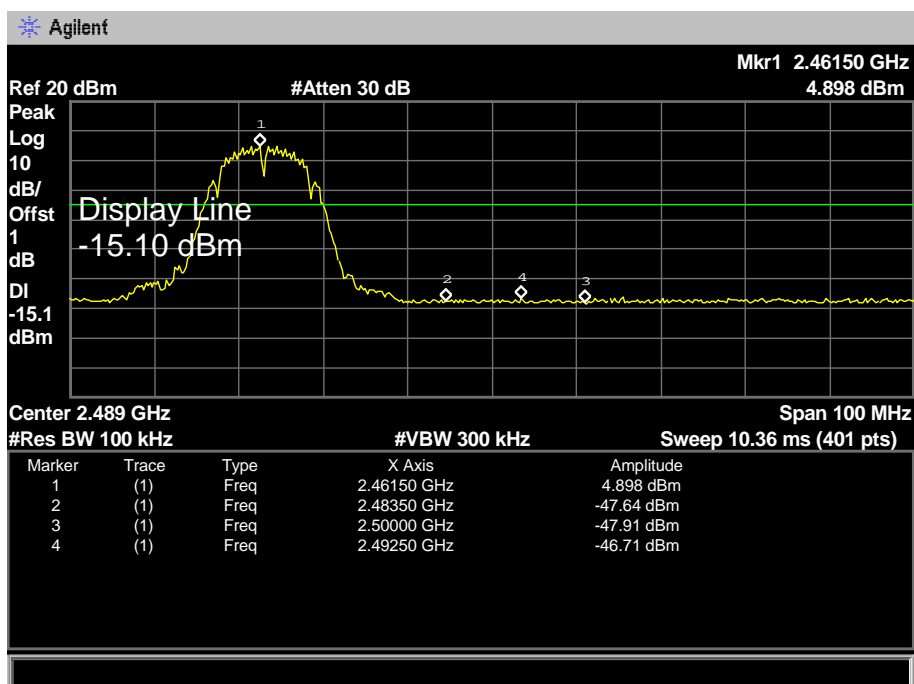
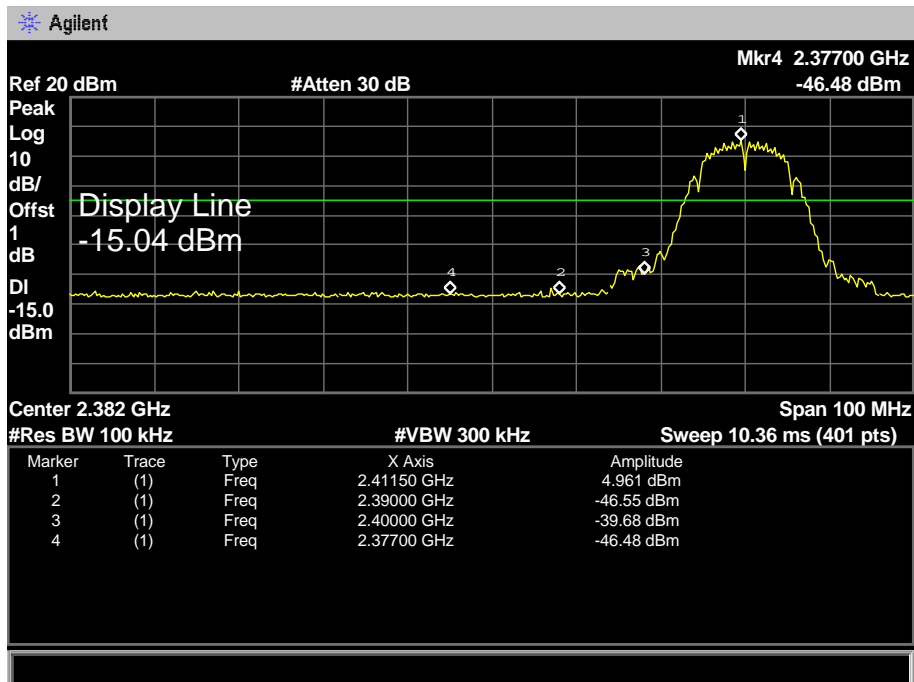


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	X	2462.700	97.59	1.08	98.67	Fundamental Frequency		peak
2	*	2465.400	88.59	1.09	89.68	Fundamental Frequency		AVG
3		2483.500	47.53	1.17	48.70	74.00	-25.30	peak
4		2483.500	36.34	1.17	37.51	54.00	-16.49	AVG

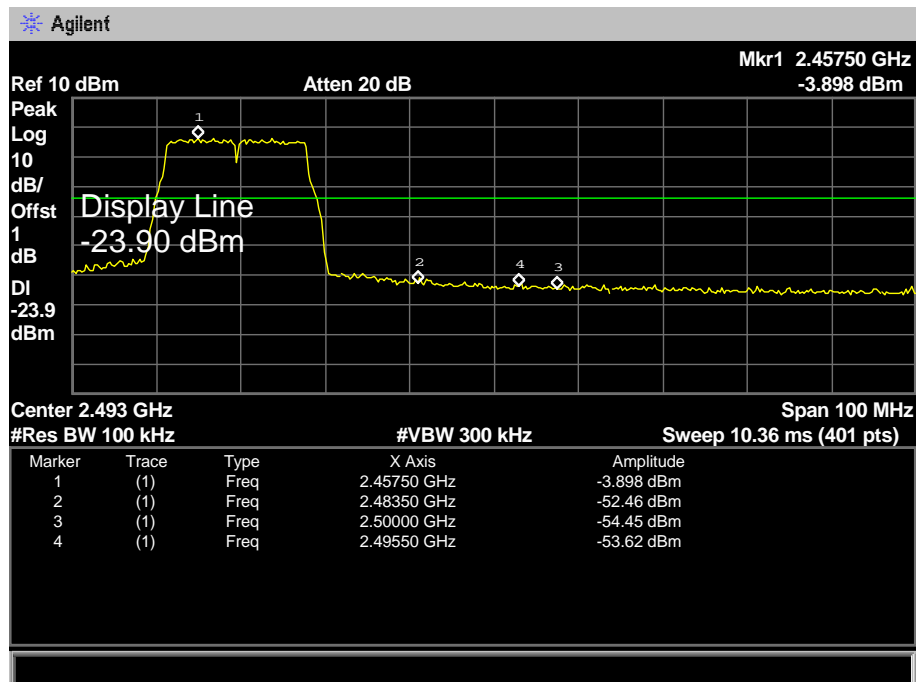
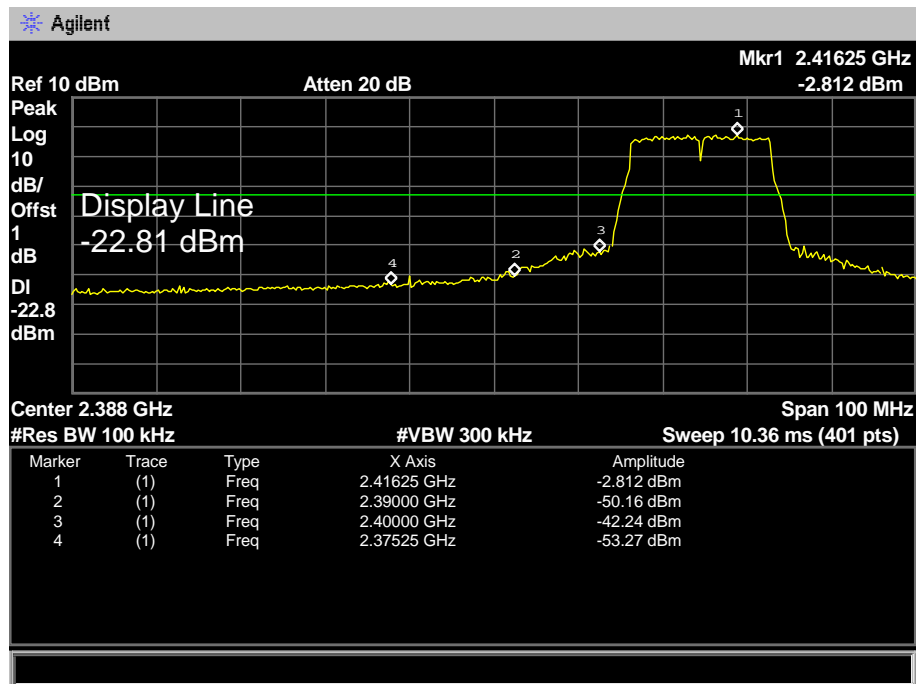
Emission Level= Read Level+ Correct Factor

(2) Conducted Test

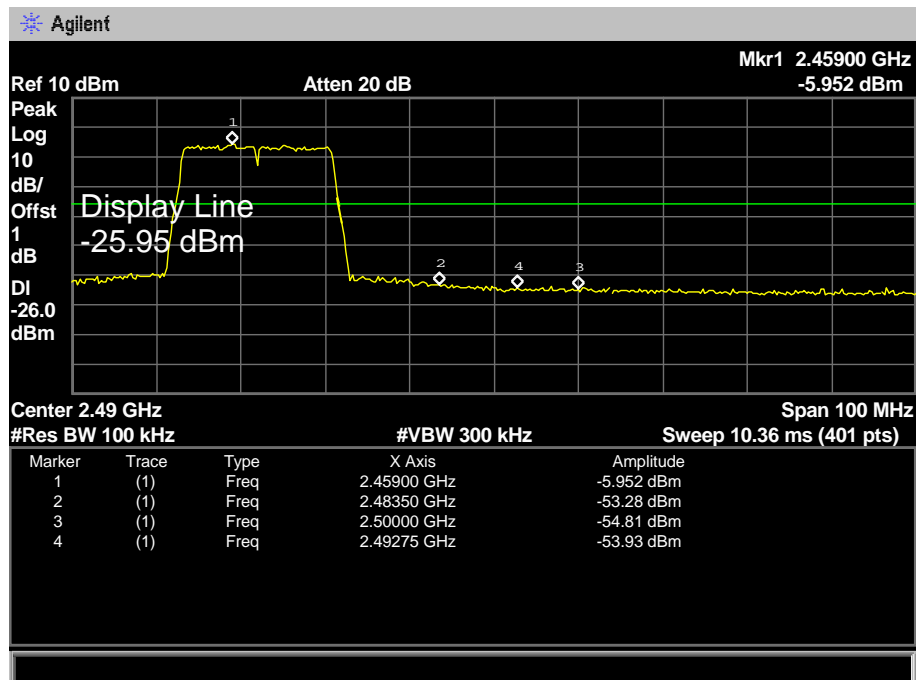
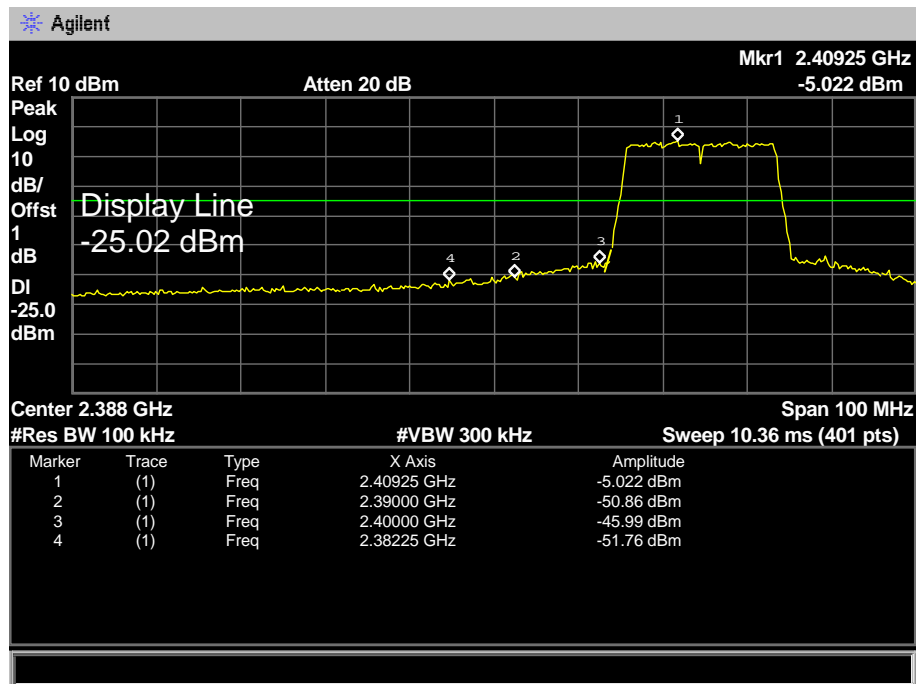
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Test Mode:	TX B Mode 2412MHz / TX B Mode 2462MHz		
Remark:	The EUT is programed in continuously transmitting mode		



EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Test Mode:	TX G Mode 2412MHz / TX G Mode 2462MHz		
Remark:	The EUT is programed in continuously transmitting mode		



EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Test Mode:	TX N(HT20) Mode 2412MHz / TX N(HT20) Mode 2462MHz		
Remark:	The EUT is programmed in continuously transmitting mode		



7. Bandwidth Test

7.1 Test Standard and Limit

7.1.1 Test Standard

FCC Part 15.247 (a)(2)

7.1.2 Test Limit

FCC Part 15 Subpart C(15.247)/RSS-210		
Test Item	Limit	Frequency Range(MHz)
Bandwidth	≥ 500 KHz (6dB bandwidth)	2400~2483.5

7.2 Test Setup



7.3 Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) The bandwidth is measured at an amplitude level reduced 6dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst -case (i.e the widest) bandwidth.
- (3) Measure the channel separation the spectrum analyzer was set to Resolution Bandwidth:100 kHz, and Video Bandwidth:300 kHz, Detector: Peak, Sweep Time set auto.

7.4 EUT Operating Condition

The EUT was set to continuously transmitting in each mode and low, middle and high channel for the test.

7.5 Test Data

EUT:	HEAVY DUTY WIFI IP CAMERA		Model:	VPC2100WI
Temperature:	25 °C		Relative Humidity:	55%
Test Voltage:	DC 12V			
Test Mode:	TX 802.11B Mode			
Channel frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)	
2412	10.075	14.6491	>=0.5	
2437	10.068	14.5683		
2462	10.070	14.5671		

802.11B Mode

2412 MHz

Agilent

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

1

dB

Center

2.41200000 GHz

Center 2.412 GHz

#Res BW 100 kHz

#VBW 300 kHz

Span 20 MHz

Sweep 4 ms (401 pts)

Occupied Bandwidth

14.6491 MHz

Transmit Freq Error

-37.349 kHz

x dB Bandwidth

10.075 MHz

Occ BW % Pwr

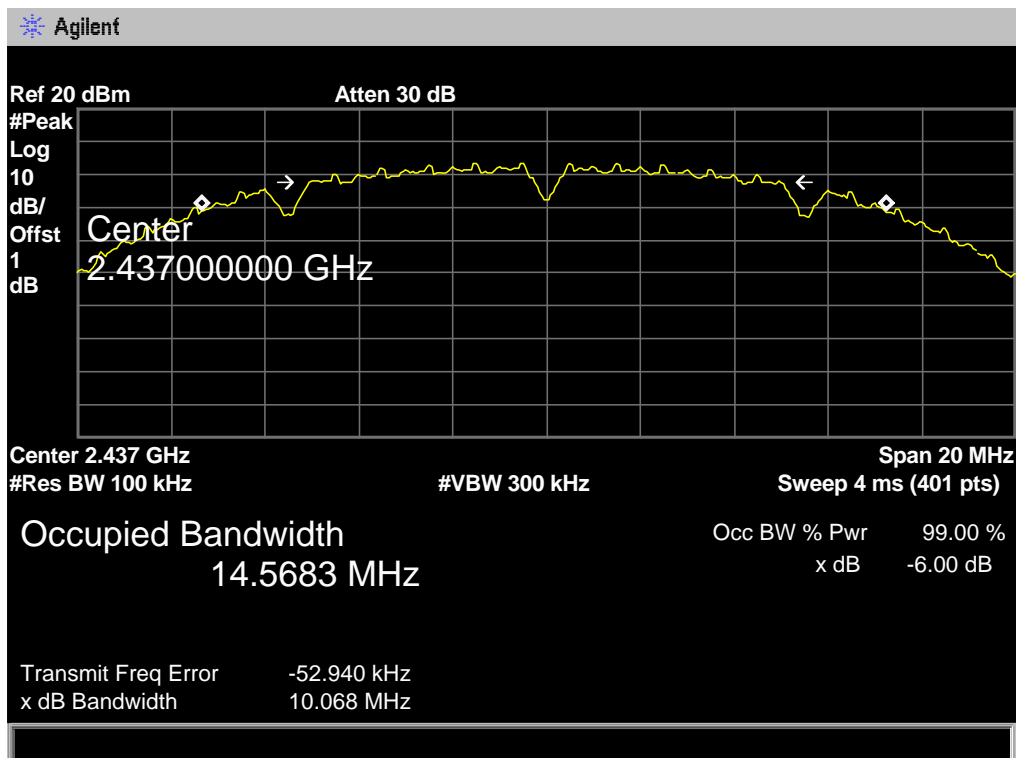
99.00 %

x dB

-6.00 dB

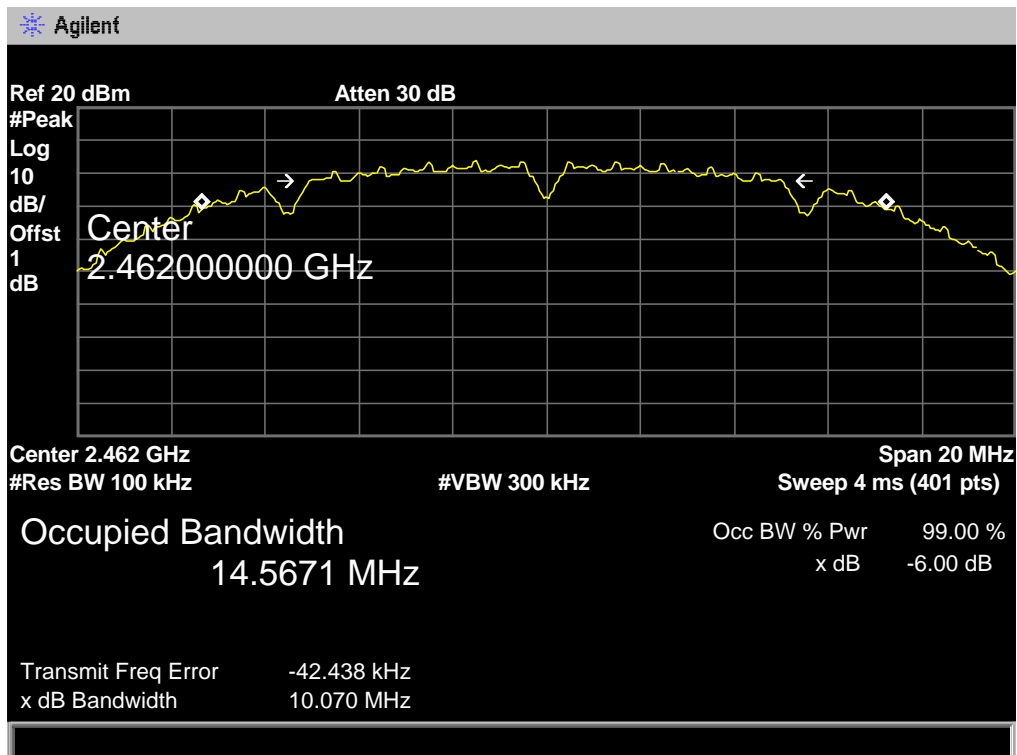
802.11B Mode

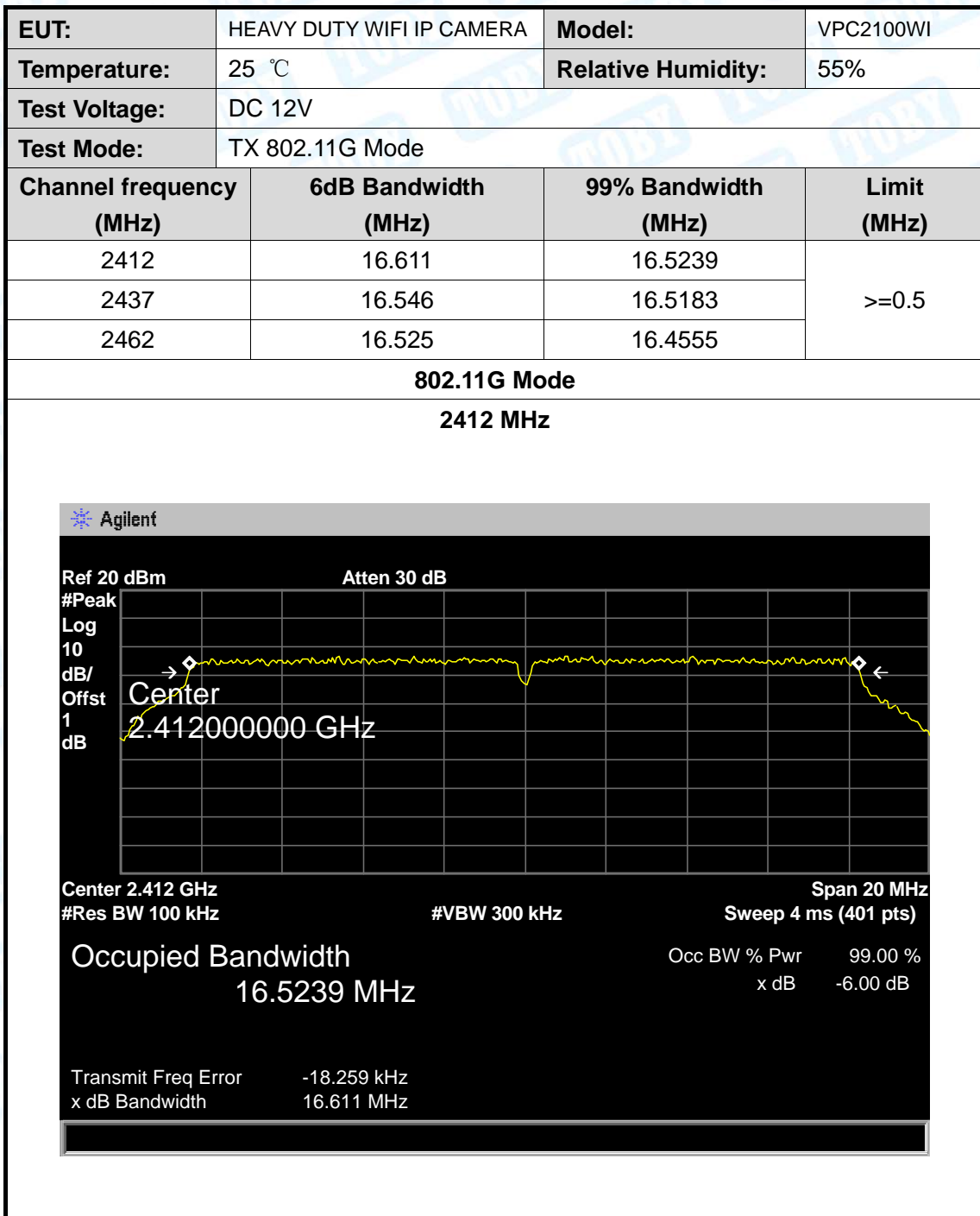
2437 MHz



802.11B Mode

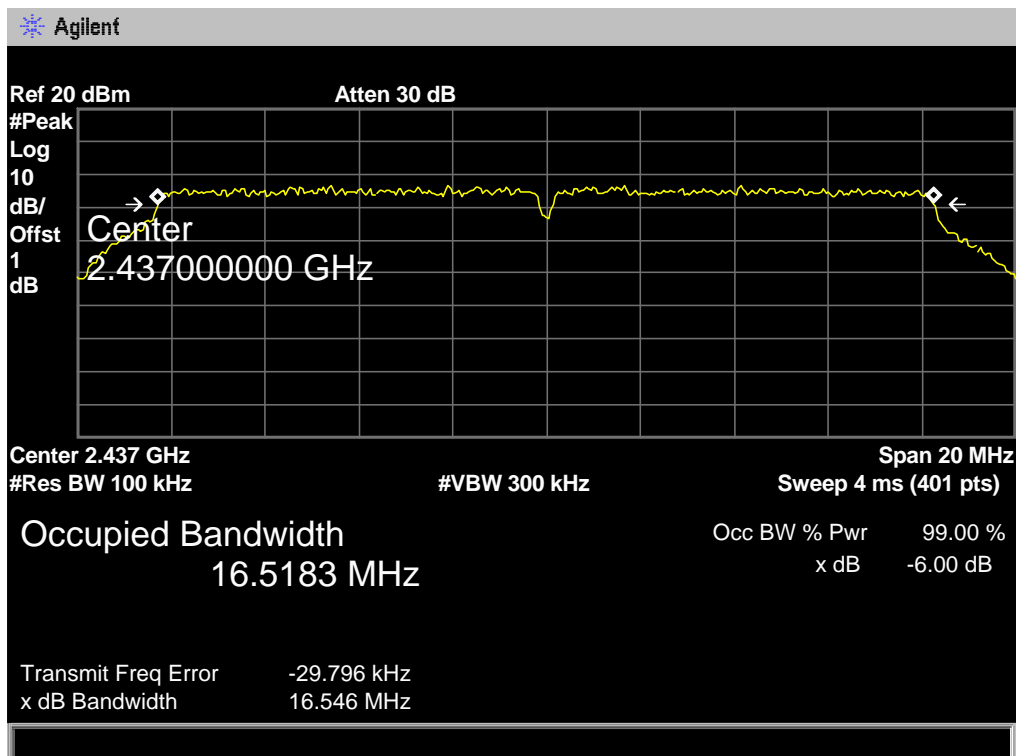
2462 MHz





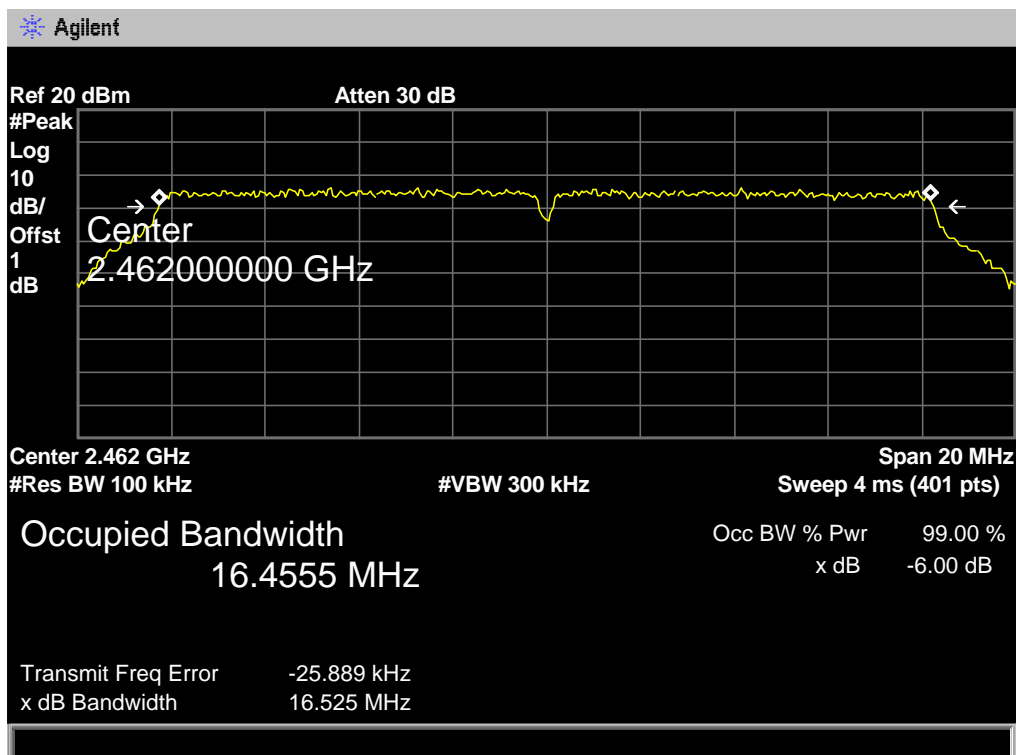
802.11G Mode

2437 MHz



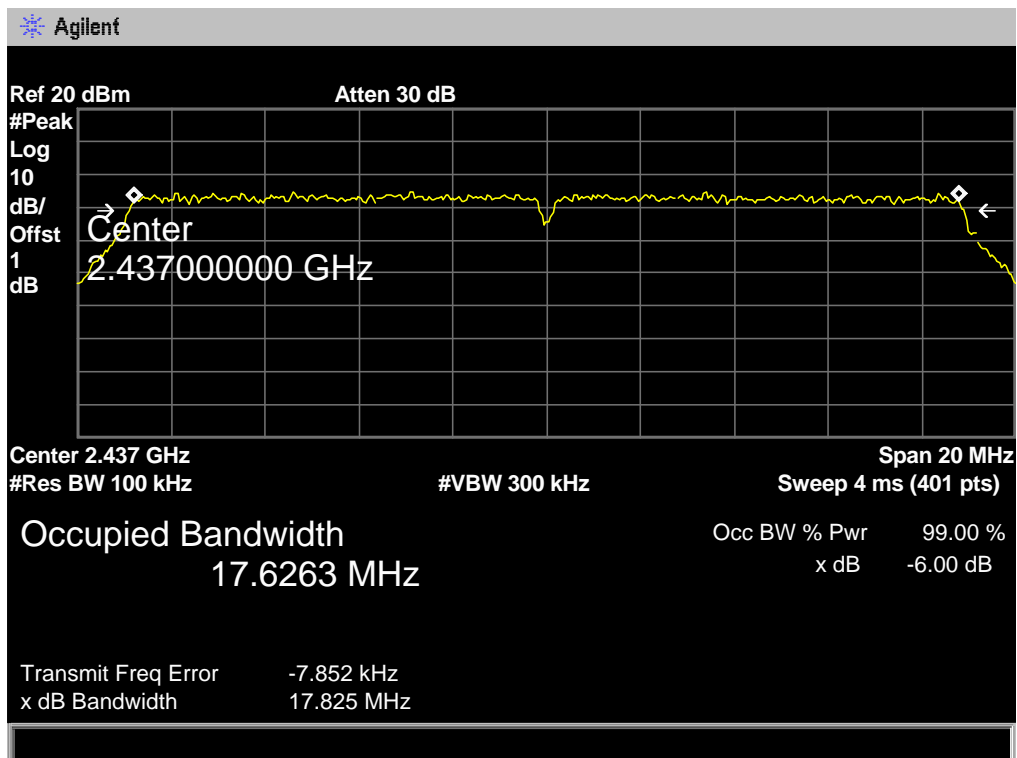
802.11G Mode

2462 MHz



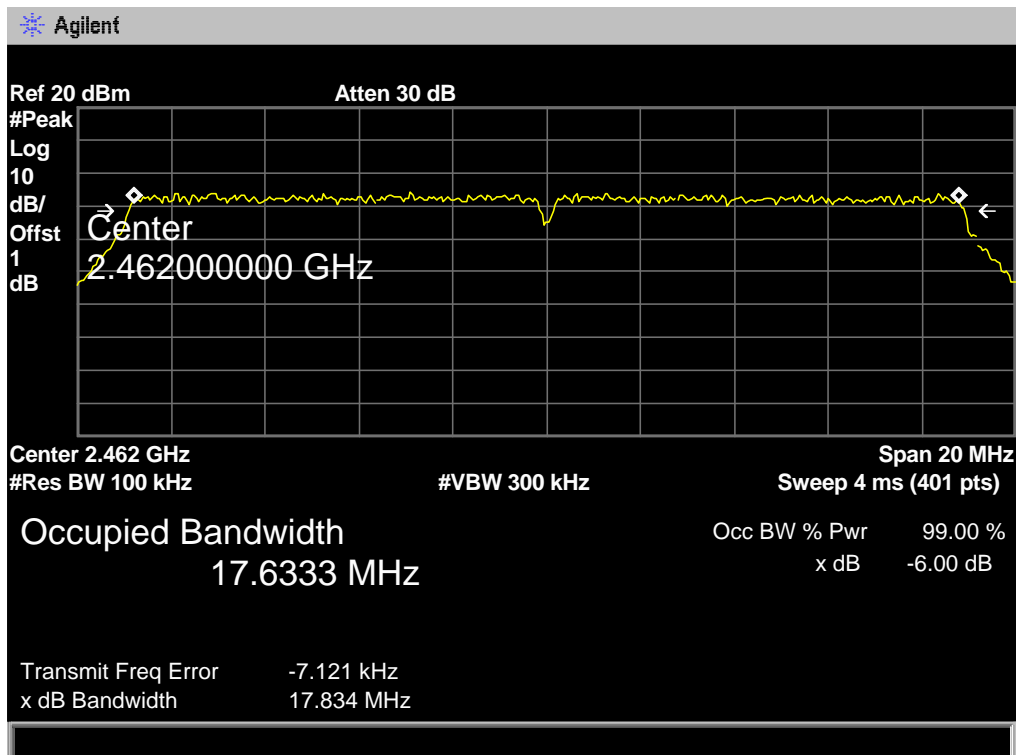
802.11N(HT20) Mode

2437 MHz



802.11N(HT20) Mode

2462 MHz



8. Peak Output Power Test

8.1 Test Standard and Limit

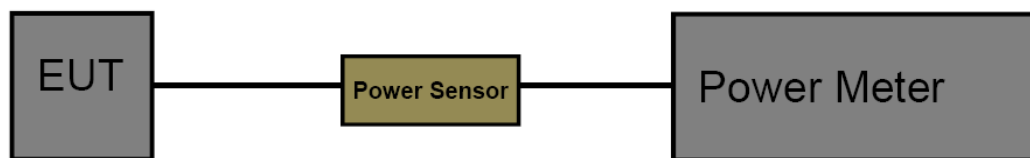
8.1.1 Test Standard

FCC Part 15.247 (b)

8.1.2 Test Limit

FCC Part 15 Subpart C(15.247)/RSS-210		
Test Item	Limit	Frequency Range(MHz)
Peak Output Power	1 Watt or 30 dBm	2400~2483.5

8.2 Test Setup



8.3 Test Procedure

The measurement is according to section 9.1.2 of KDB 558074 D01 DTS Meas Guidance v03r05.

The EUT was connected to RF power meter via a broadband power sensor as show the block above. The power sensor video bandwidth is greater than or equal to the DTS bandwidth of the equipment.

8.4 EUT Operating Condition

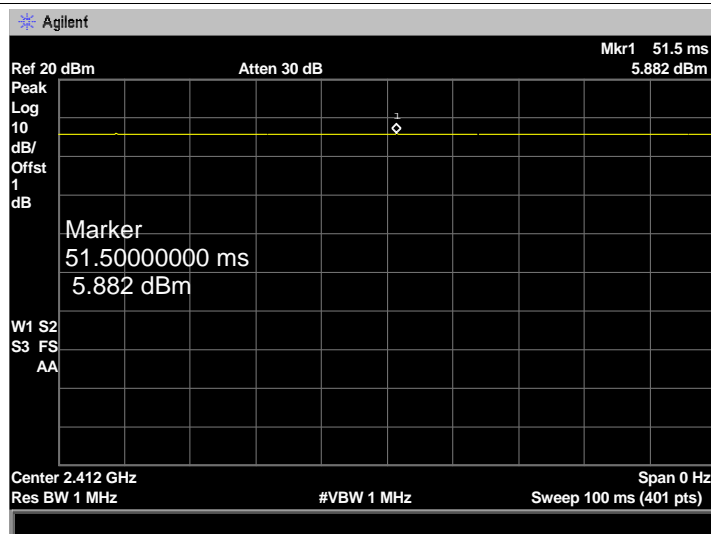
The EUT was set to continuously transmitting in the max power during the test.

8.5 Test Data

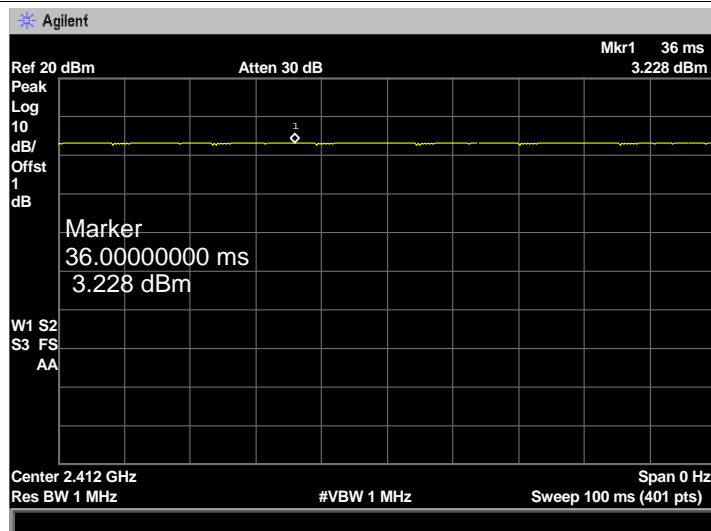
EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Relative Humidity:	55%
Test Voltage:	DC 12V		
Mode	Channel frequency (MHz)	Test Result (dBm)	Limit (dBm)
802.11b	2412	15.29	30
	2437	14.40	
	2462	14.48	
802.11g	2412	12.94	
	2437	12.84	
	2462	12.41	
802.11n (HT20)	2412	11.47	
	2437	11.33	
	2462	11.00	
Result: PASS			

Duty Cycle		
Mode	Channel frequency (MHz)	Test Result
802.11b	2412	>98%
802.11g	2412	
802.11n (HT20)	2412	
Please see below plots(only show the CH 01 data).		

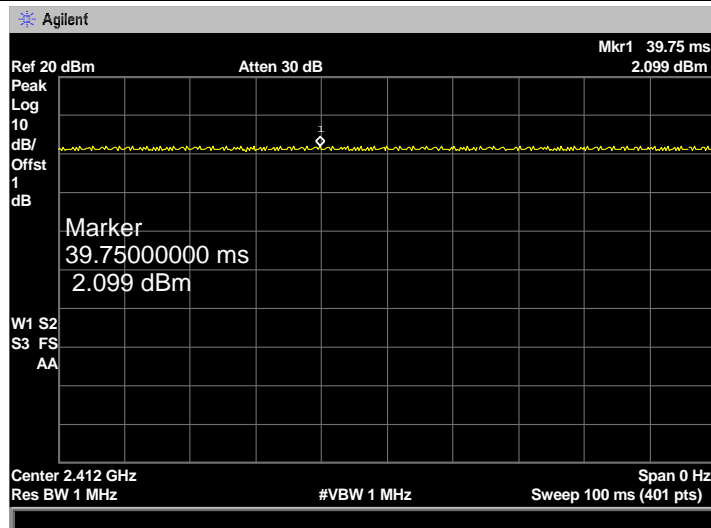
802.11 B Mode 2412 MHz



802.11 G Mode 2412 MHz



802.11 N(HT20) Mode 2412 MHz



9. Power Spectral Density Test

9.1 Test Standard and Limit

9.1.1 Test Standard

FCC Part 15.247 (e)

9.1.2 Test Limit

FCC Part 15 Subpart C(15.247)		
Test Item	Limit	Frequency Range(MHz)
Power Spectral Density	8dBm(in any 3 kHz)	2400~2483.5

9.2 Test Setup



9.3 Test Procedure

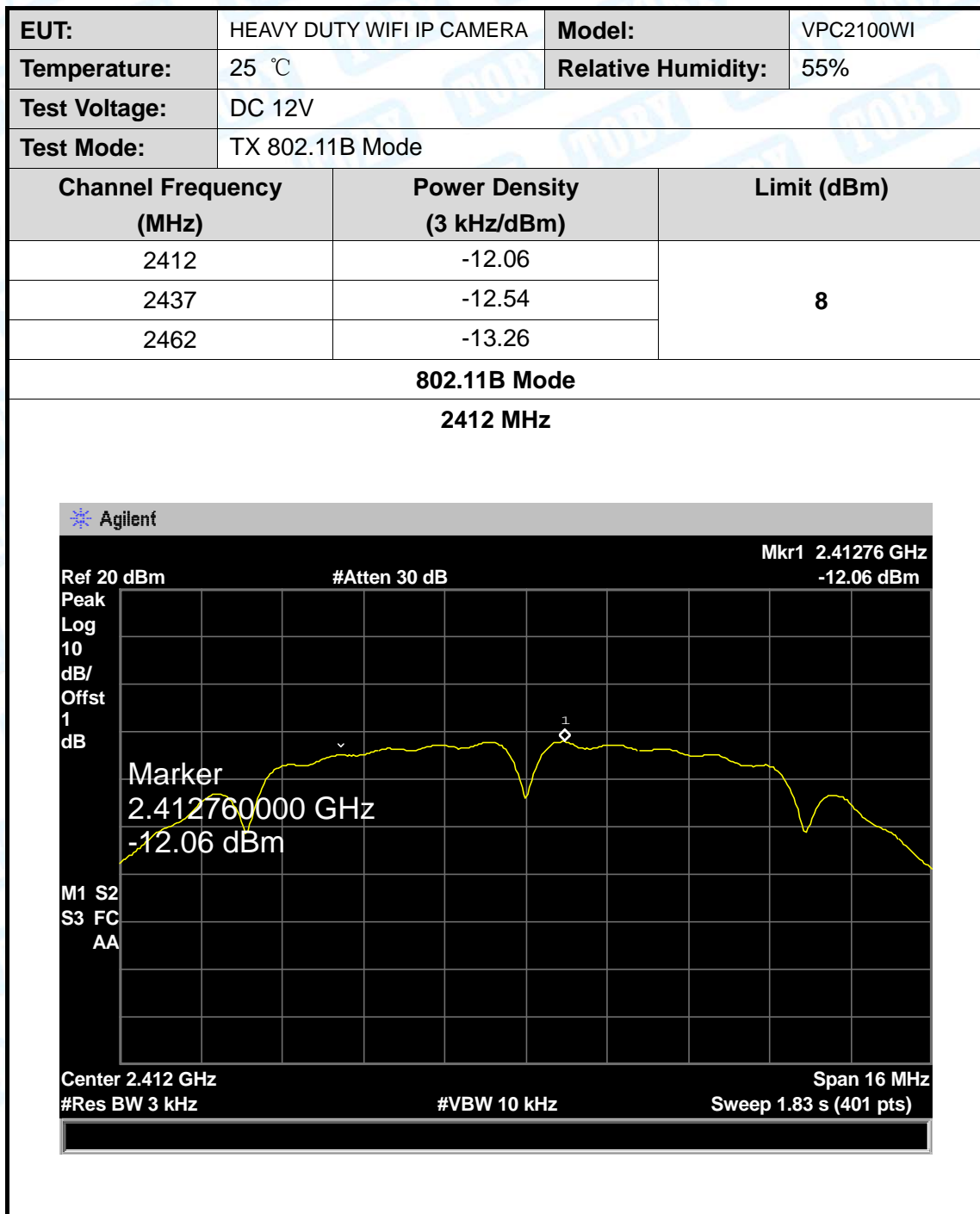
The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v03r05.

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Set analyser center frequency to DTS channel center frequency.
- (3) Set the span to 1.5 times the DTS bandwidth.
- (4) Set the RBW to: 3 kHz
- (5) Set the VBW to: 10 kHz
- (6) Detector: peak
- (7) Sweep time: auto
- (8) Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

9.4 EUT Operating Condition

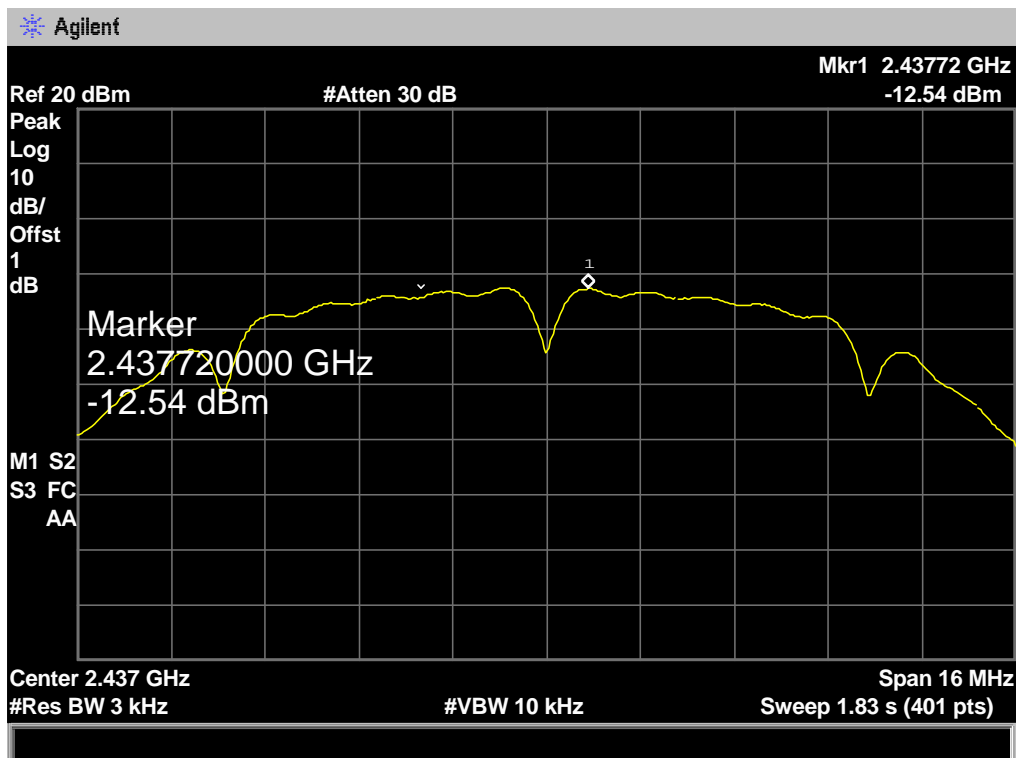
The EUT was set to continuously transmitting in each mode and low, middle and high channel for the test.

9.5 Test Data



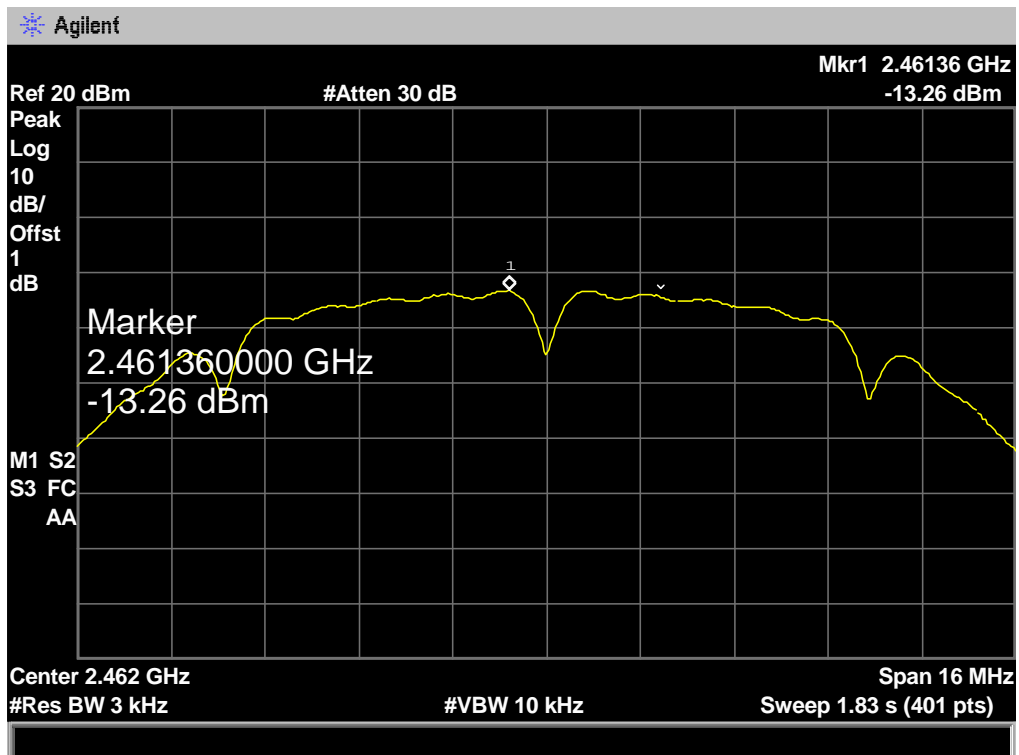
802.11B Mode

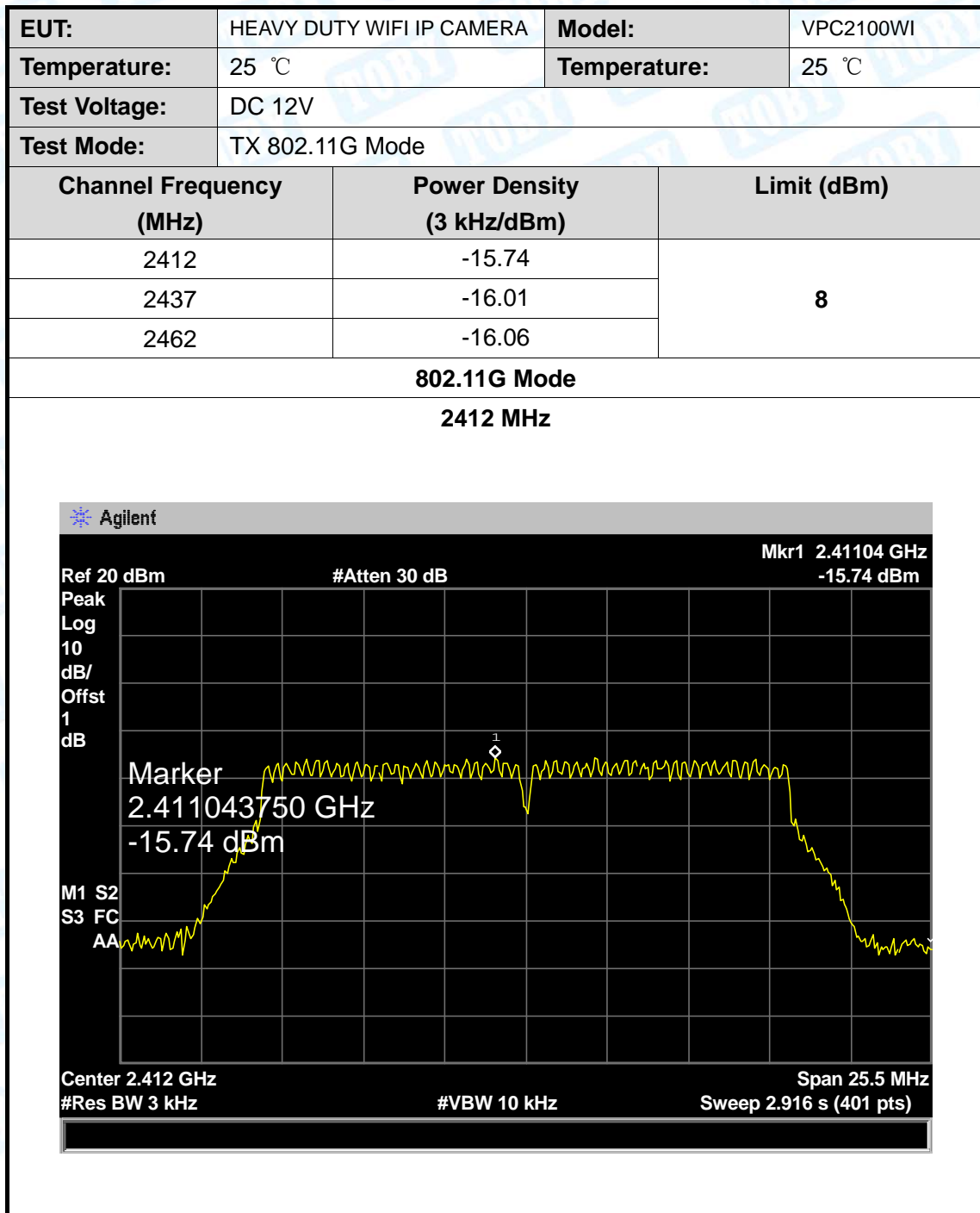
2437 MHz



802.11B Mode

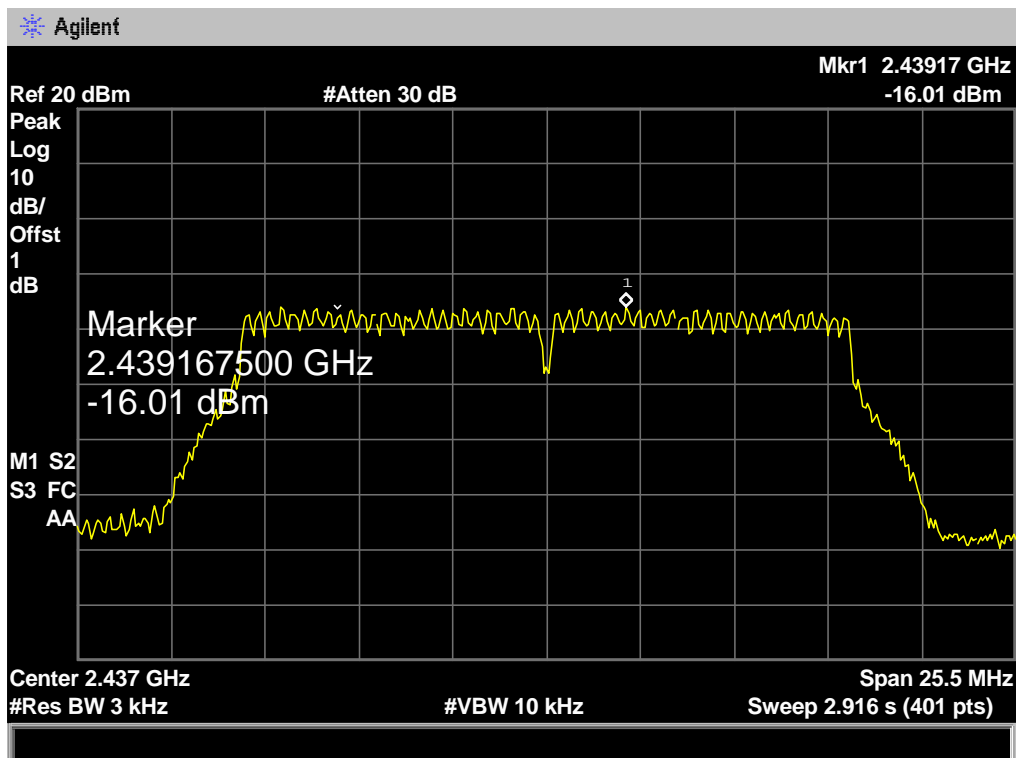
2462 MHz





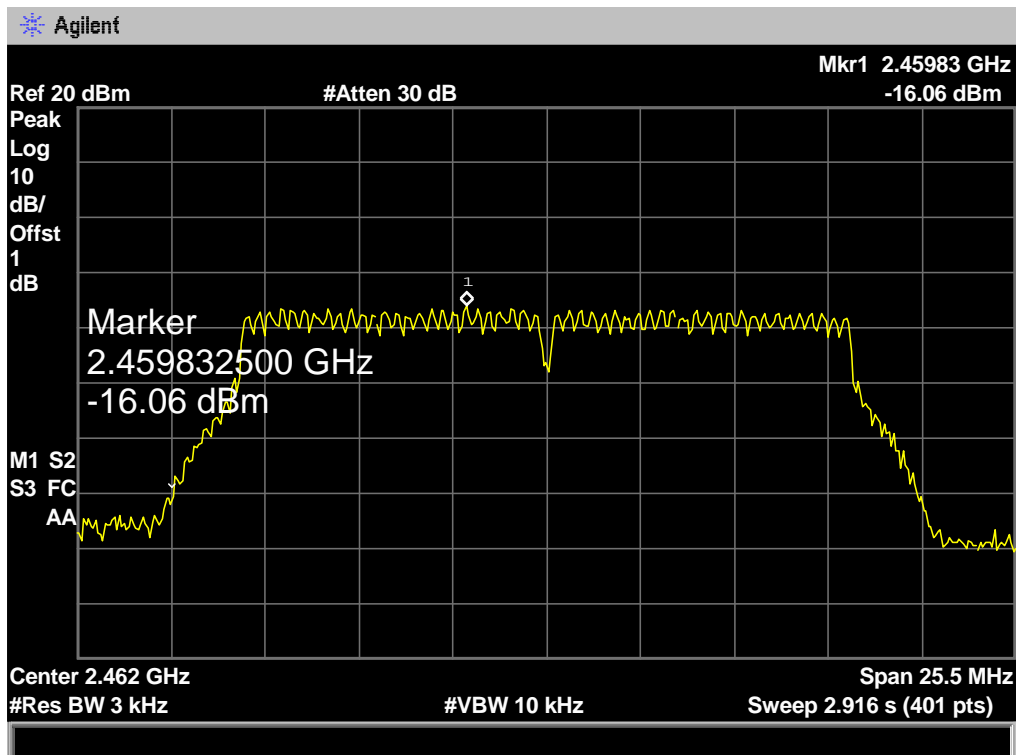
802.11G Mode

2437 MHz



802.11G Mode

2462 MHz



EUT:	HEAVY DUTY WIFI IP CAMERA	Model:	VPC2100WI
Temperature:	25 °C	Temperature:	25 °C
Test Voltage:	DC 12V		
Test Mode:	TX 802.11N(HT20) Mode		
Channel Frequency (MHz)	Power Density (3 kHz/dBm)	Limit (dBm)	
2412	-16.94	8	
2437	-17.09		
2462	-17.00		
802.11N(HT20) Mode			
2412 MHz			

Agilent

Ref 20 dBm

#Atten 30 dB

Mkr1 2.4098400 GHz
-16.94 dBm

Peak Log 10 dB/ Offst 1 dB

Marker 2.409840000 GHz
-16.94 dBm

M1 S2
S3 FC
AA

Center 2.412 GHz

#Res BW 3 kHz

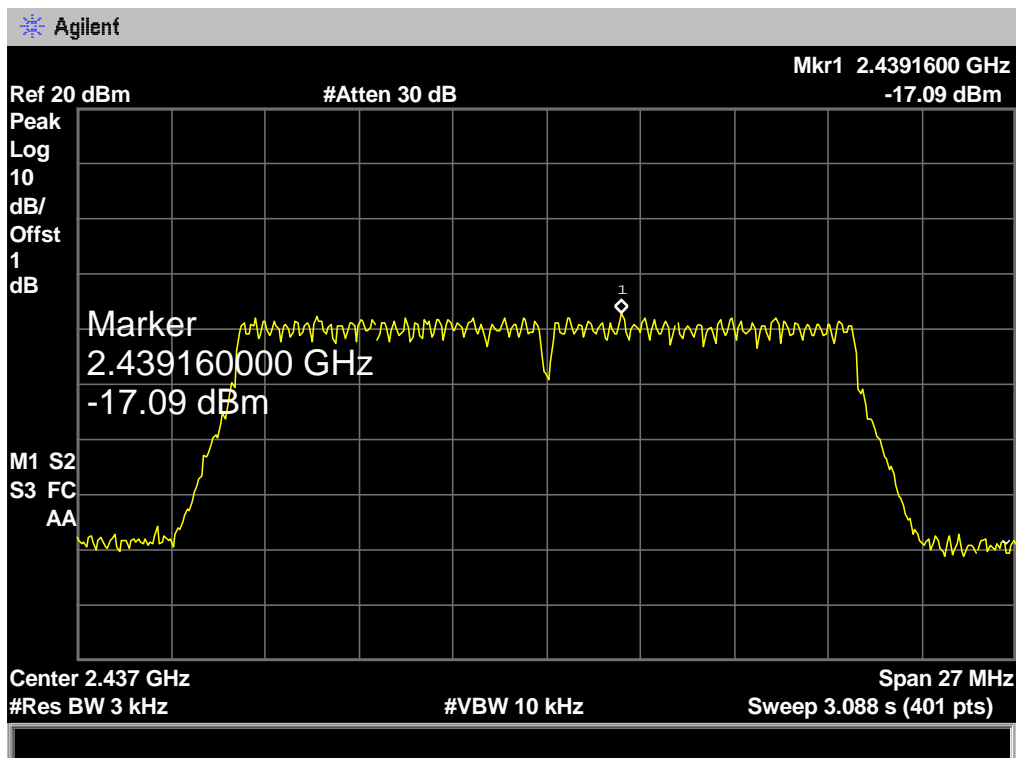
#VBW 10 kHz

Sweep 3.088 s (401 pts)

Span 27 MHz

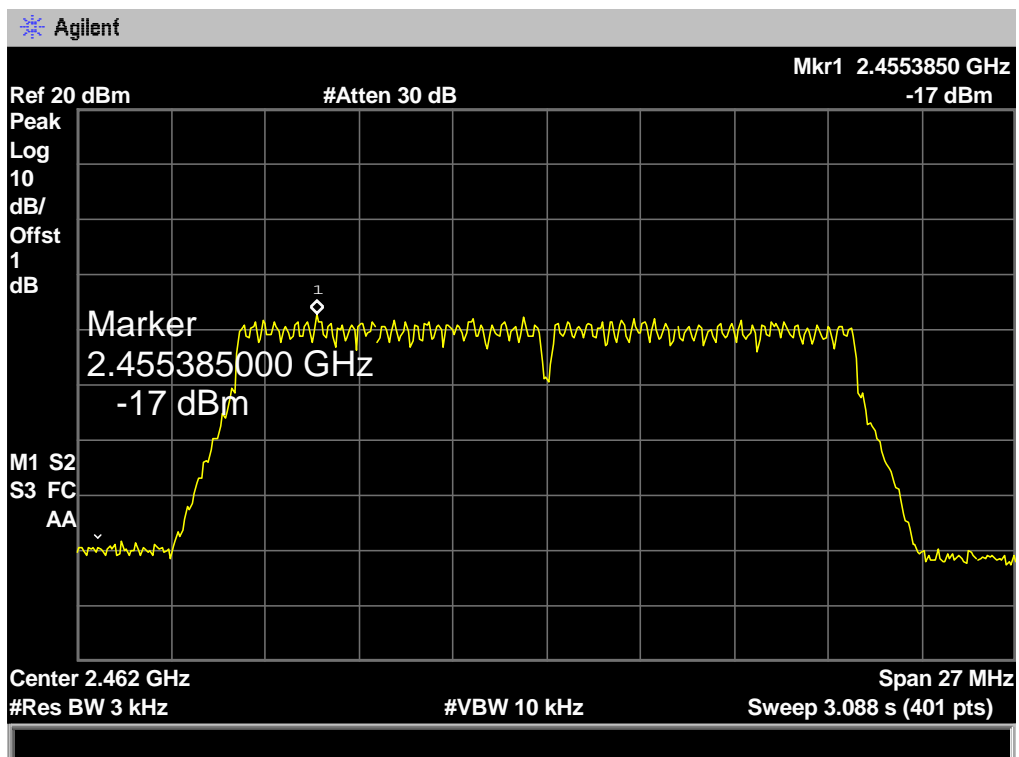
802.11N(HT20) Mode

2437 MHz



802.11N(HT20) Mode

2462 MHz



10. Antenna Requirement

10.1 Standard Requirement

10.1.1 Standard

FCC Part 15.203

10.1.2 Requirement

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. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

10.2 Antenna Connected Construction

The directional gains of the antenna used for transmitting is 3 dBi, and the antenna de-signed with permanent attachment and no consideration of replacement. Please see the EUT photo for details.

Result

The EUT antenna is a Dipole Antenna. It complies with the standard requirement.

Antenna Type
<input type="checkbox"/> Permanent attached antenna
<input checked="" type="checkbox"/> Unique connector antenna
<input type="checkbox"/> Professional installation antenna