FCC Part 15 Test Report

for DSSS System

Product Name : SD Card Mobile DVR
Model Name : RCM-MDR301WDG

Prepared for:
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Report Number : UL05420131204FCC003-3
Date of Report : 2014-01-14
Date of Test : 2013-12-04~2014-01-14

Notes：
The test results only relate to these samples which have been tested.
Partly using this report will not be admitted unless been allowed by Unilab.
Unilab is only responsible for the complete report with the reported stamp of Unilab.

Applicant:	Shenzhen Richda Technology Co., Ltd 3rd Floor, NO64 Building, Longguan West Road, Longhua, Shenzhen
Manufacturer:	Shenzhen Richda Technology Co., Ltd 3rd Floor, NO64 Building, Longguan West Road, Longhua, Shenzhen
Product Name:	SD Card Mobile DVR
Brand Name:	N/A
Model Name:	RCM-MDR301WDG
FCC ID:	2ABFI-RCM30113
Serial Number:	N/A
Technical Data:	Extreme Low:6V, Nominal:12V, Extreme High:48V
Date of Receipt:	2013-12-04
Test Standard:	FCC CFR Tile 47 Part 15 Subpart C ANSI C 63.4: 2009 KDB 558074 D01
Test Result:	Complied
Date of Test	2013-12-04~2014-01-14

Prepared by : Andy Wei
(Technical Engineer: Andy Wei)

Reviewed by : Forest Cao
(Senior Engineer: Forest Cao)

Approved by : Eva Wang
(Supervisor: Eva Wang)

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1. GENERAL INFORMATION

1.1 EUT DESCRIPTION

Product Name:	SD Card Mobile DVR
Model Name:	RCM-MDR301WDG
Hardware Version:	v0022
Software Version:	V101230
RF Exposure Environment:	Uncontrolled
WIFI	
Frequency Range:	2400MHz~2483.5MHz
Type of Modulation:	DSSS(BPSK/QPSK/CCK) OFDM(BPSK/QPSK/16QAM/64QAM) MIMO-OFDM(BPSK/QPSK/16QAM/64QAM)
Channel Number:	11
Antenna Type:	Internal
Antenna Peak Gain:	3.0dBi

Remark:
1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. The EUT satisfies the antenna requirement about FCC §15.203 requirement, as below description:
   a. 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.
   b. The antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited

1.2 TEST MODE

Unilab has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: 802.11b CH1
Mode 2: 802.11b CH7
Mode 3: 802.11b CH11
Mode 4: 802.11g CH1
Mode 5: 802.11g CH7
Mode 6: 802.11g CH11
Mode 7: 802.11n CH1
Mode 8: 802.11n CH7
Mode 9: 802.11n CH11

Note:
1. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.
2. For the ERP/EIRP and radiated emission test, every axis (X, Y, Z) was verified, and show the worst result on this report.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, 15.207, 15.209 and 15.247.

2.1 EUT CONFIGURATION

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

2.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

2.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4: 2009 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m

away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4: 2009.

2.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

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

1 Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

2 Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

2.5 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.
After verification, all tests were carried out with the worst case test modes as shown below

IEEE802.11b mode:

Channel Low (2412MHz)

Channel Mid (2442MHz)

Channel High (2462MHz) with 11Mbps data rate were chosen for full testing.

IEEE802.11g mode:

Channel Low (2412MHz)

Channel Mid (2442MHz)

Channel High (2462MHz) with 54Mbps data rate were chosen for full testing.

IEEE802.11n mode:

Channel Low (2412MHz)

Channel Mid (2442MHz)

Channel High (2462MHz) with 65Mbps data rate were chosen for full testing.

3. TECHNIACL SUMMARY

3.1 SUMMARY OF STANDARDS AND TEST RESULTS

The EUT have been tested according to the applicable standards as referenced below:

Test Item	FCC	Result
Occupied Bandwidth	§15.247 (a)	P
6 dB bandwidth	§15.247 (a)	P
Power spectral density	§15.247 (e)	P
Peak Output Power (Conduction)	§15.247 (b)	P
Spurious Emissions (Conduction)	§15.247 (d)	P
Band edge measurement	§15.247 (d)	P
Spurious Emissions (Radiation)	§15.247 (d) §15.35 (b) §15.209 (a)	P

Note: P means pass, F means failure, N/A means not applicable

3.2 TEST UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Test item	Value (dB)
Conducted disturbance	3.4
Radiated disturbance	4.2

3.3 TEST EQUIPMENT LIST

Equipment	Manufacturer	Model	Serial No.	Due Date
Receiver	Agilent	N9038A	MY51210142	2014/09/28
Wireless Connectivity Test Set	Agilent	N4010A	MY49080305	2014/09/28
3m Chamber & Accessory Equipment	ETS-LINDGREN	FACT-3	CT-0000336	2016/07/27
Microwave Preamplifier	EM Electronics	EM30180	3008A02425	2014/03/01
Power Splitter	Agilent	11667C/ 52401	MY53806148	2014/03/01
Loop Antenna	Schwarzbeck	FMZB1519	1519-020	2014/03/27
DC Power Supply	Agilent	6612C	MY43002989	2014/03/04
Bilog Antenna	Schwarzbeck	VULB9160	9160-3316	2014/07/19
VHF-UHF-Biconical Antenna	Schwarzbeck	VUBA9117	9117-263	2014/07/19
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-942	2014/07/19

Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-943	2014/07/19
Horn Antenna(18-40GHz)	ETS	3116	00070497	2014/07/19

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and has been calibrated by accredited calibration laboratories.

3.4 TEST FACILITY

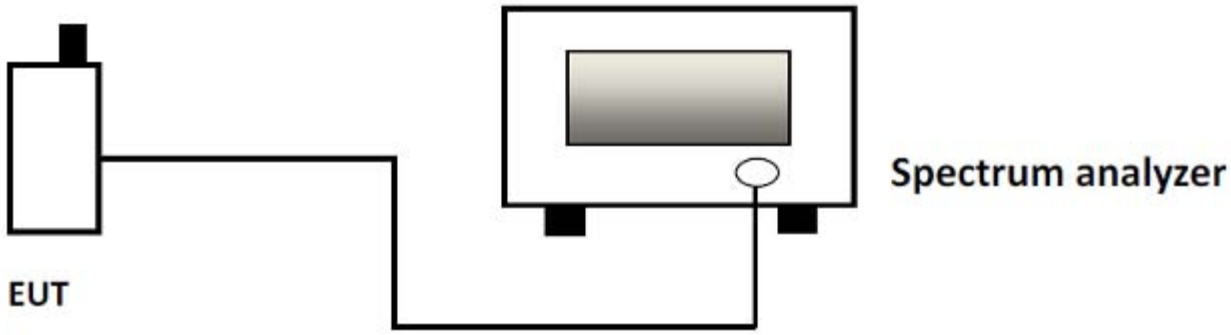
All test facilities used to collect the test data are located at No. 1350, Lianxi Rd. Pudong New District, Shanghai, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4: 2009, CISPR 16-1-1 and other equivalent standards. The laboratory is compliance with the requirements of the ISO/IEC/E 17025.

3.5 TEST SETUP CONFIGURATION

The information contained within this report is intended to show verification of compliance of the EUT to the requirements of CFR 47 FCC Part 15.247 and RSS-210. Unilab has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report.

4. OCCUPIED BANDWIDTH

4.1 TEST SETUP



4.2 LIMITS

Limits	≥25 kHz or 2 to 3 times the 20 dB bandwidth

4.3 TEST PROCEDURE

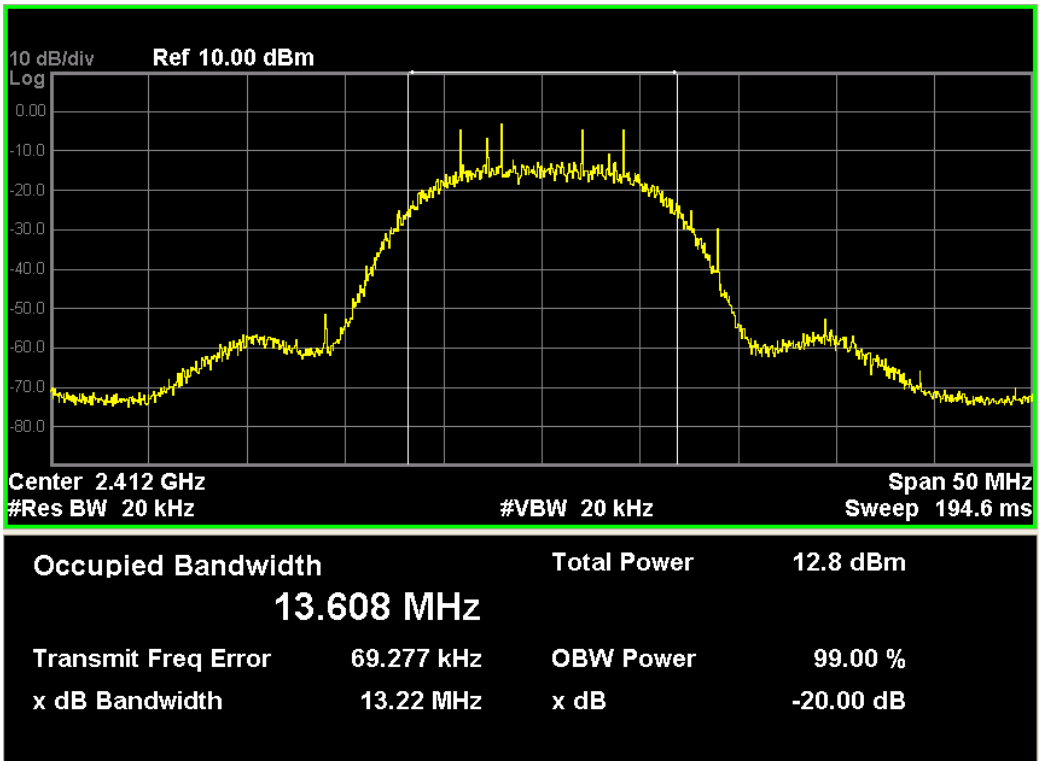
Use the following spectrum analyzer settings:
Span = approximately 2 to 3 times the 6 dB or 20 dB bandwidth, centered on a channel
RBW ≥ 1% of the 6 dB or 20 dB bandwidth
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 6 dB or 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 6 dB or 20 dB bandwidth of the emission. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation.

4.4 TEST RESULTS

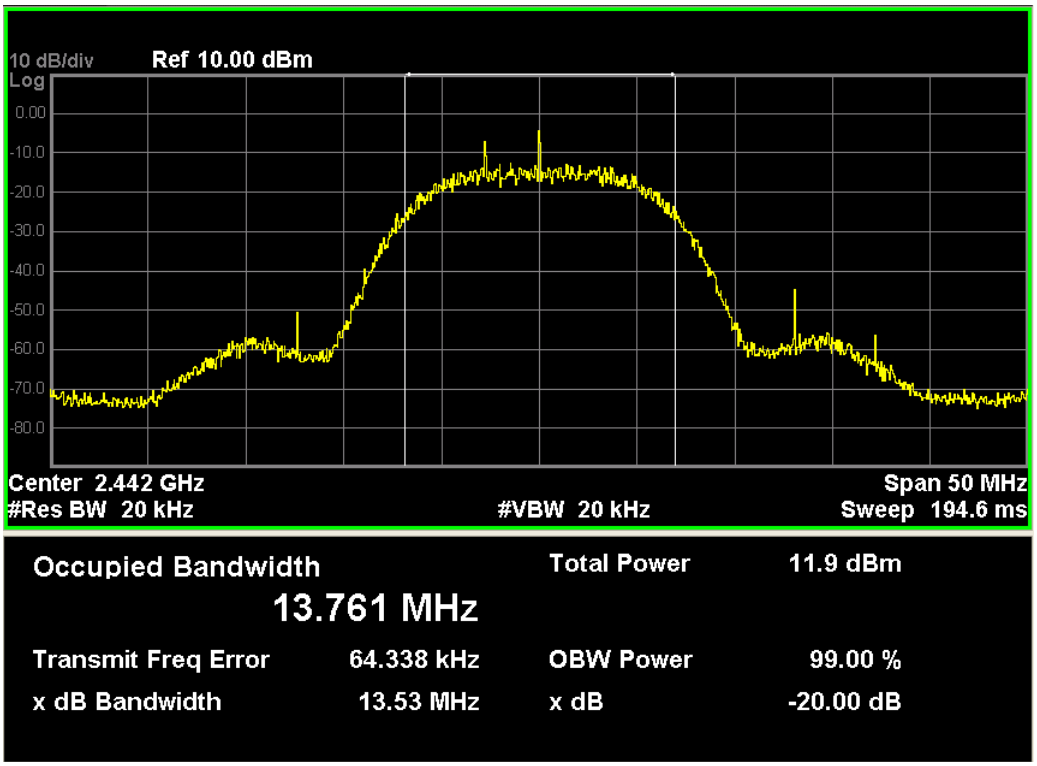
Channel	20dB bandwidth (MHz)	99% bandwidth (MHz)
802.11b		
802.11b CH1	13.22	13.608
802.11b CH7	15.53	13.761
802.11b CH11	16.33	14.307
802.11g		
802.11g CH1	17.58	16.387
802.11g CH7	17.54	16.392
802.11g CH11	17.14	16.314
802.11n		
802.11n CH1	18.33	17.532
802.11n CH7	18.23	17.547
802.11nCH11	18.25	17.417

802.11b

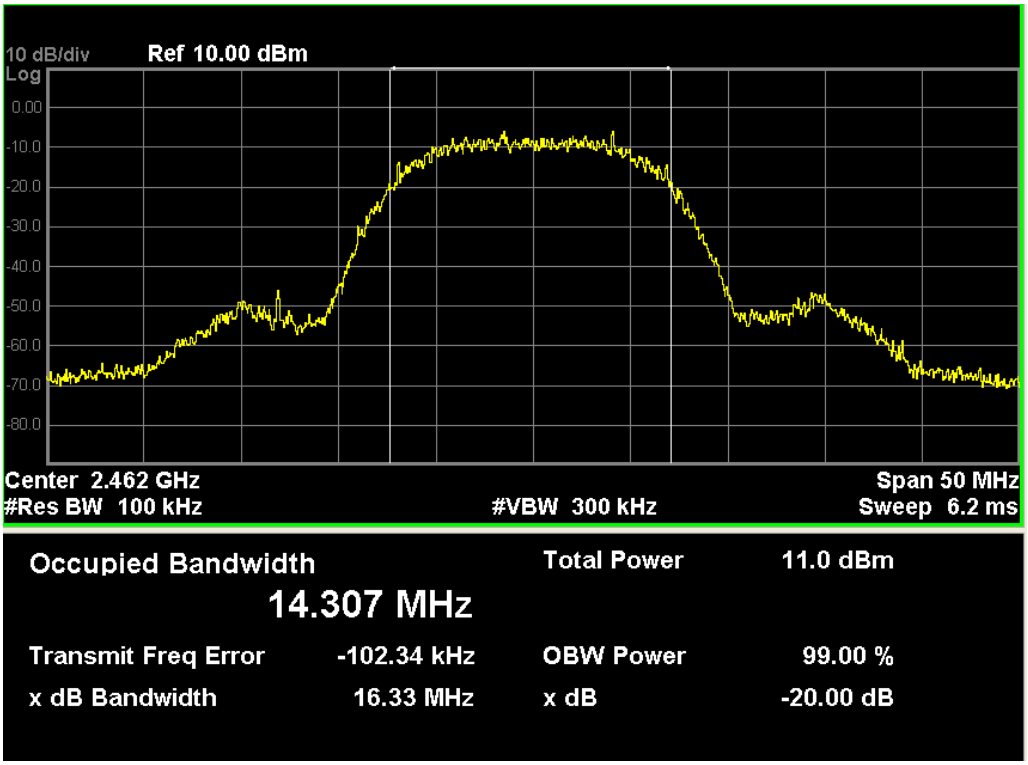
802.11b channel 1



802.11b channel 7

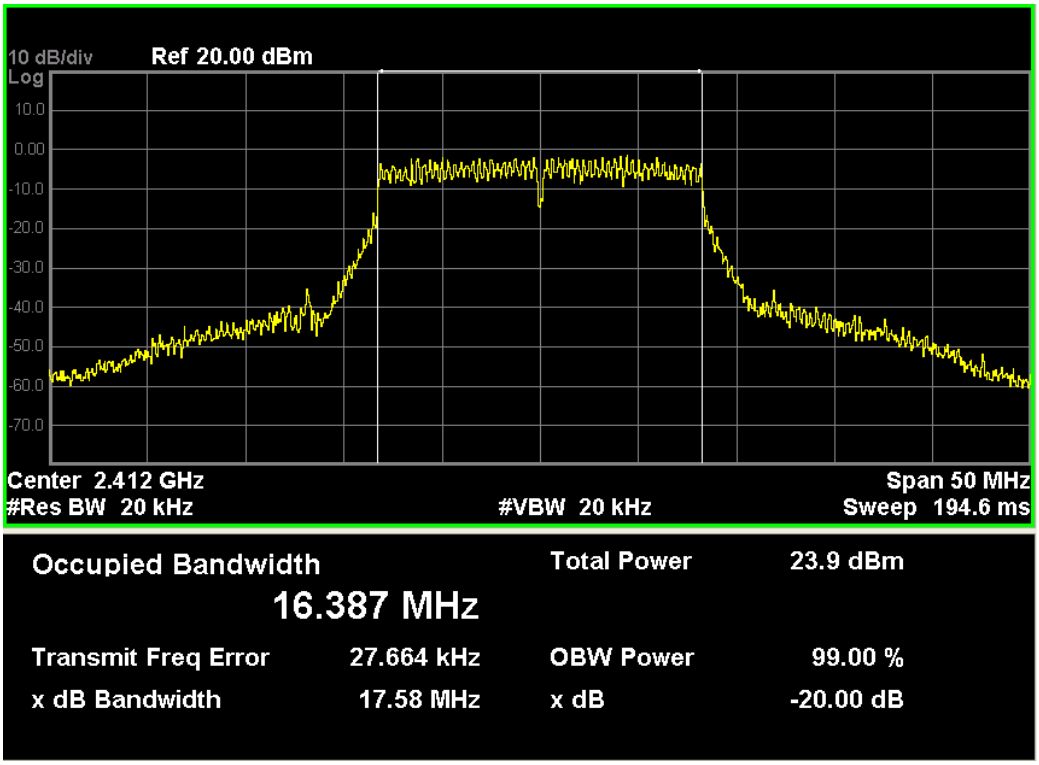


802.11b channel 11



802.11g

802.11g channel 1



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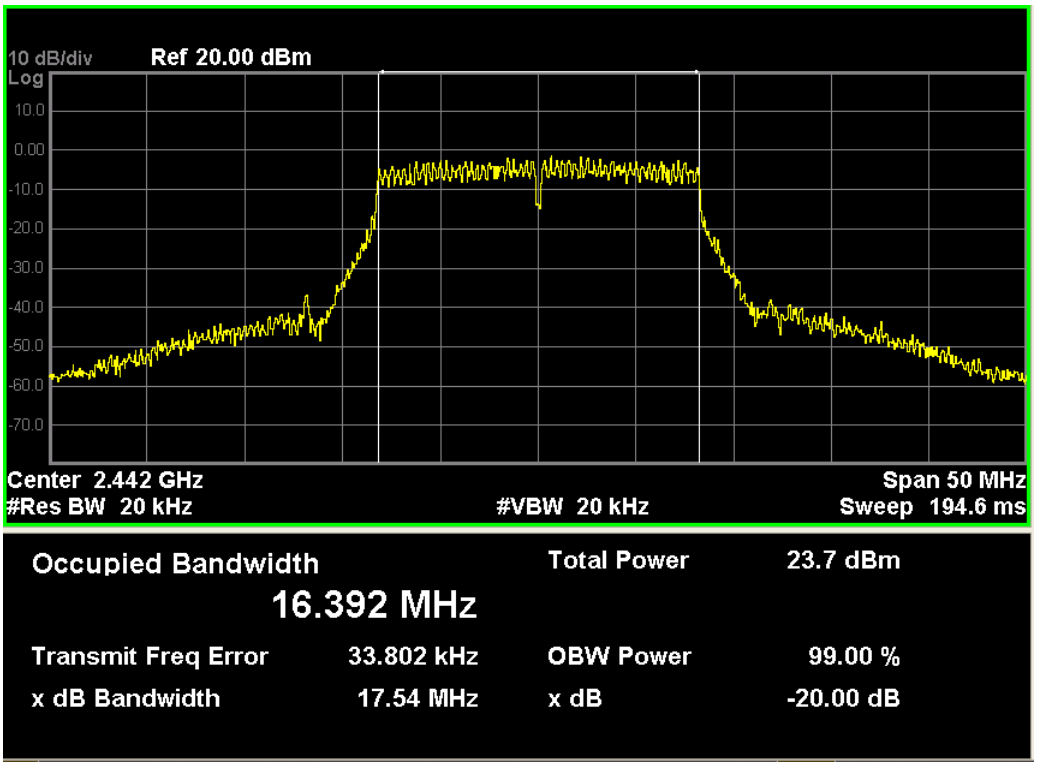

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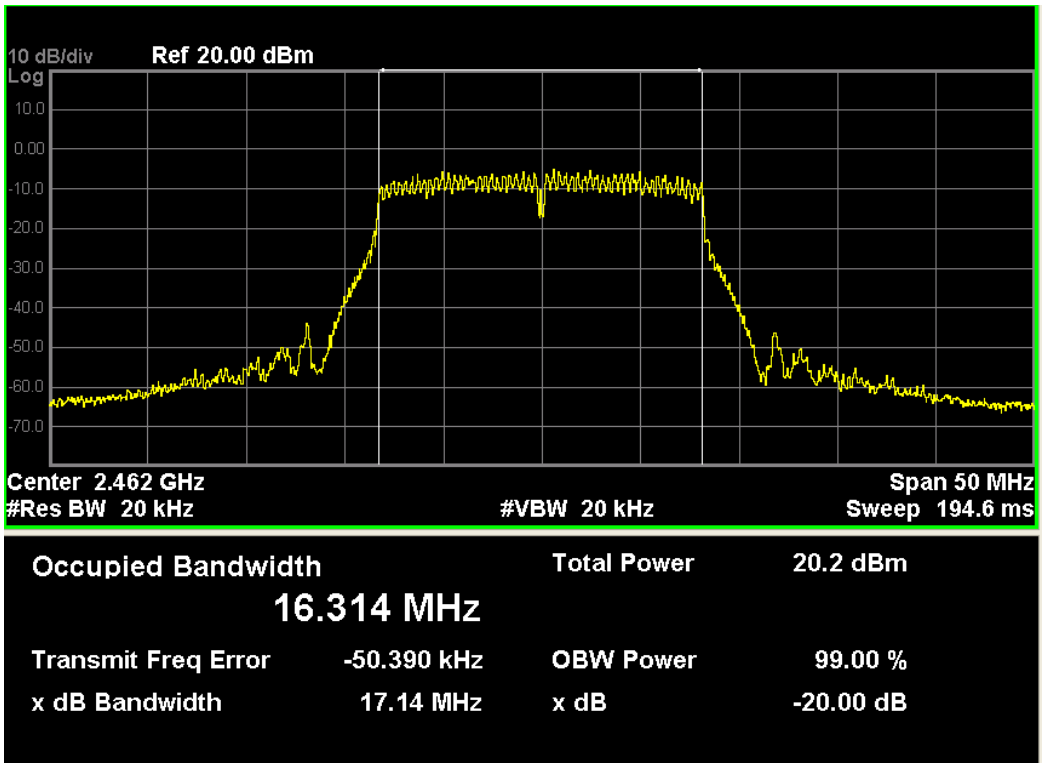
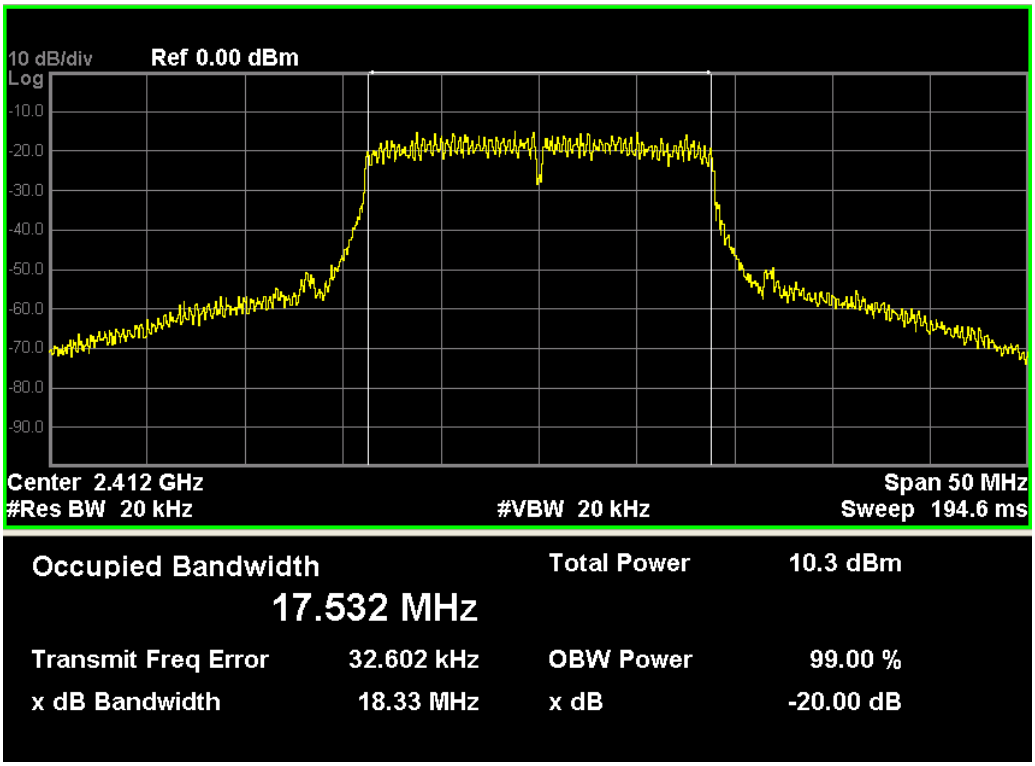
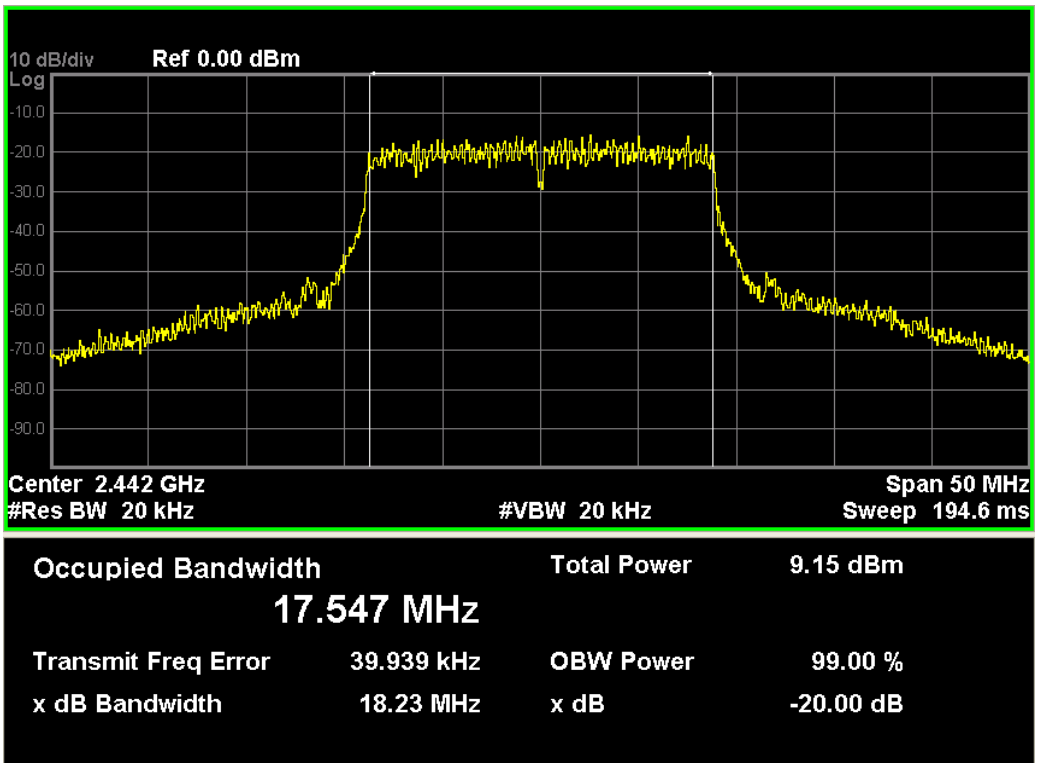


802.11n

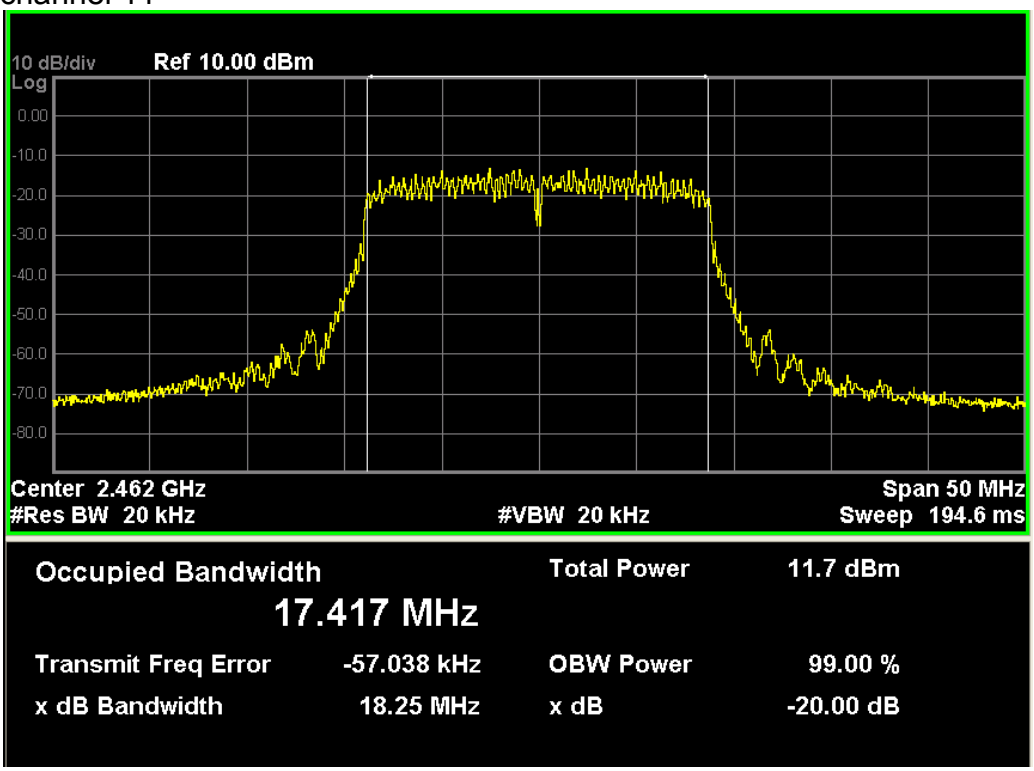
802.11n channel 1



802.11n channel 7

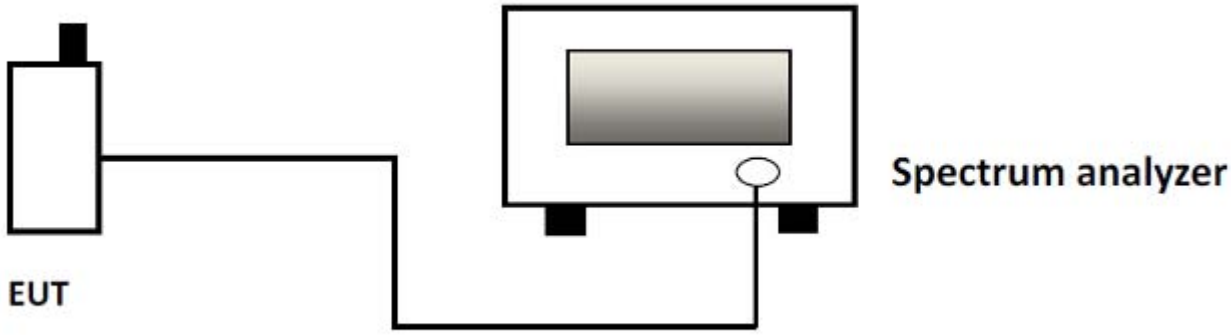


802.11n channel 11



5. 6 DB BANDWIDTH

5.1 TEST SETUP



5.2 LIMITS

Limit	≥500 kHz

5.3 TEST PROCEDURE

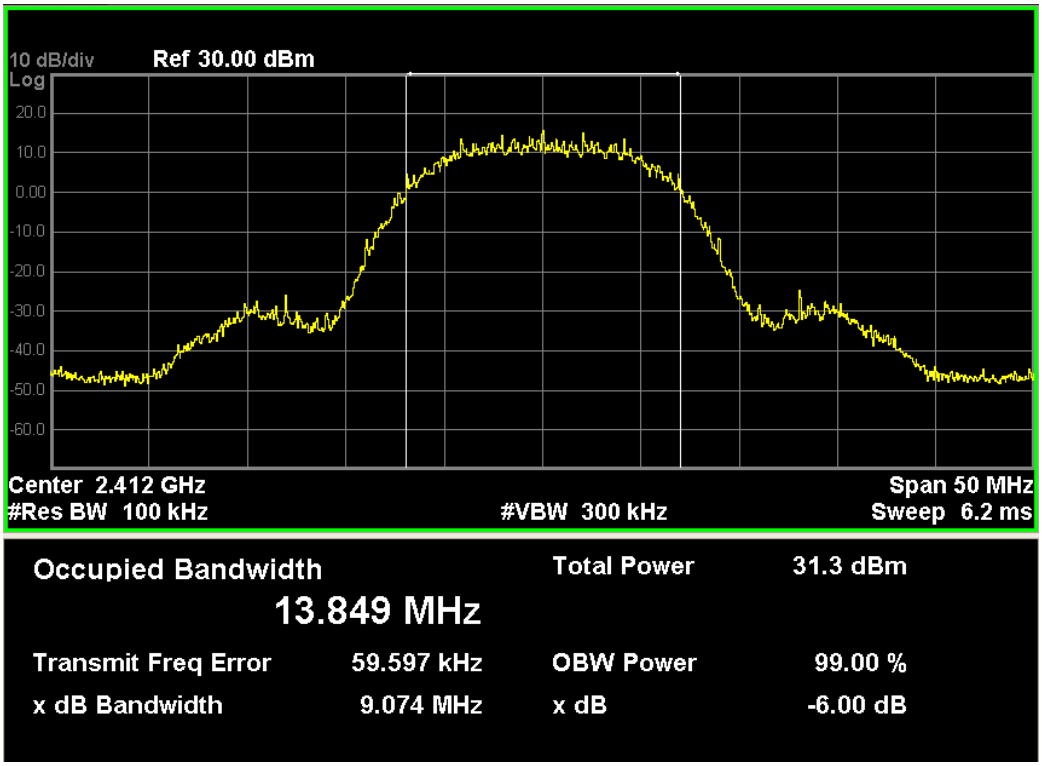
KDB 558074 D01 DTS Measurement Guidance V03 r01 April 9, 2013
Use the following spectrum analyzer settings:
Span = approximately 2 to 3 times the 6 dB bandwidth, centered on a channel
RBW=100KHz
VBW ≥ 3 x RBW
Sweep = auto
Detector function = peak
Trace = max hold
The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 6 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 6 dB bandwidth of the emission.
If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation.

5.4 RESULTS & PERFORMANCE

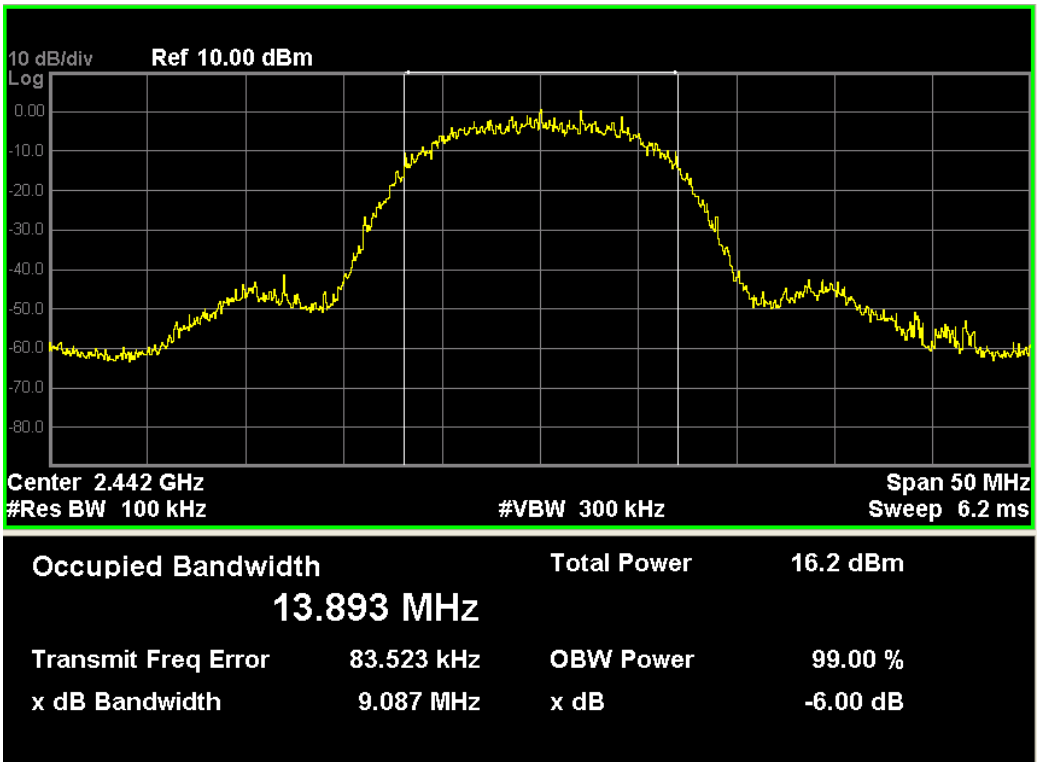
Channel	Measured 6dB bandwidth (MHz)	Limit (MHz)	Result
802.11b			
802.11b CH1	9.07	≥0.5	PASS
802.11b CH7	9.08	≥0.5	PASS
802.11b CH11	10.12	≥0.5	PASS
802.11g			
802.11g CH1	16.43	≥0.5	PASS
802.11g CH7	16.41	≥0.5	PASS
802.11g CH11	16.37	≥0.5	PASS
802.11n			
802.11g CH1	16.96	≥0.5	PASS
802.11g CH7	16.95	≥0.5	PASS
802.11g CH11	16.80	≥0.5	PASS

802.11b

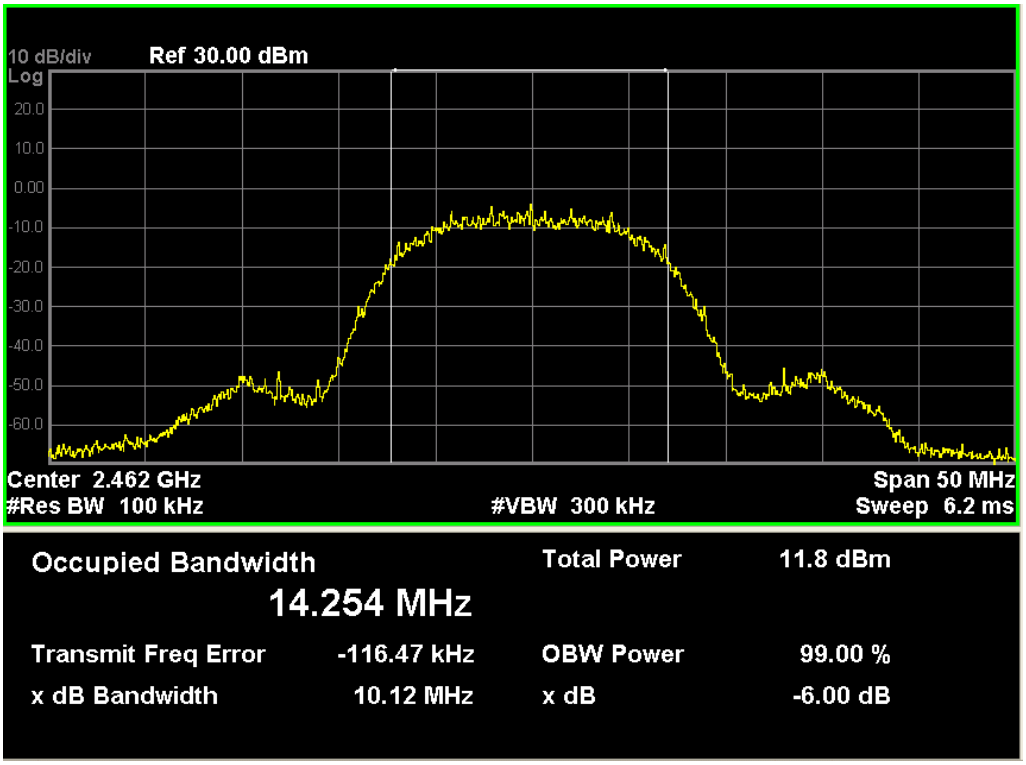
802.11b channel 1



802.11b channel 7

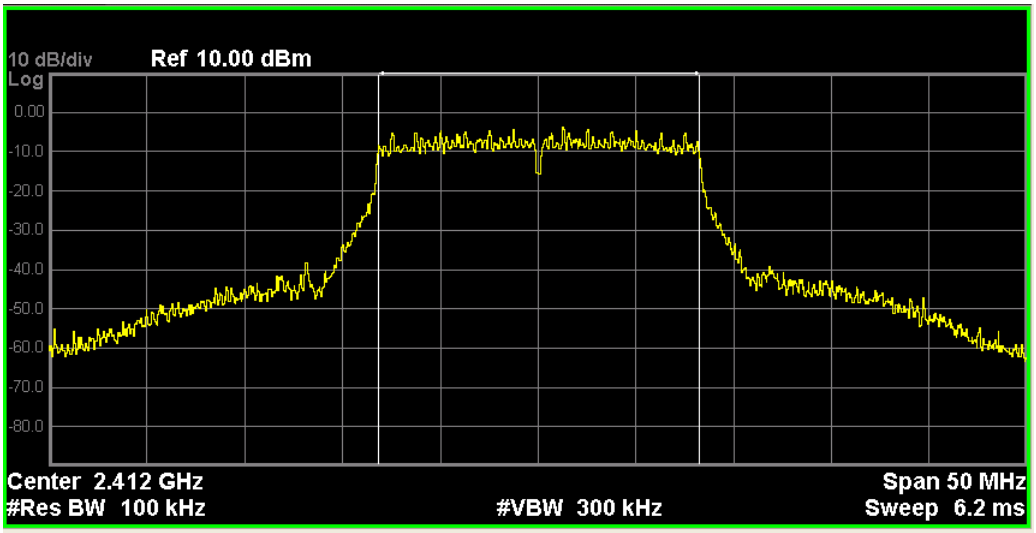


802.11b channel 11



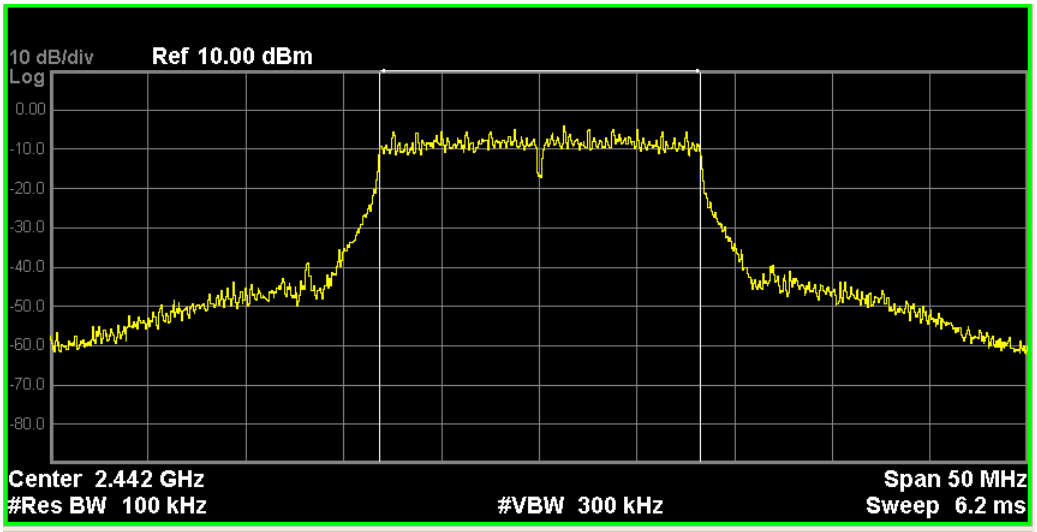
802.11g

802.11g channel 1



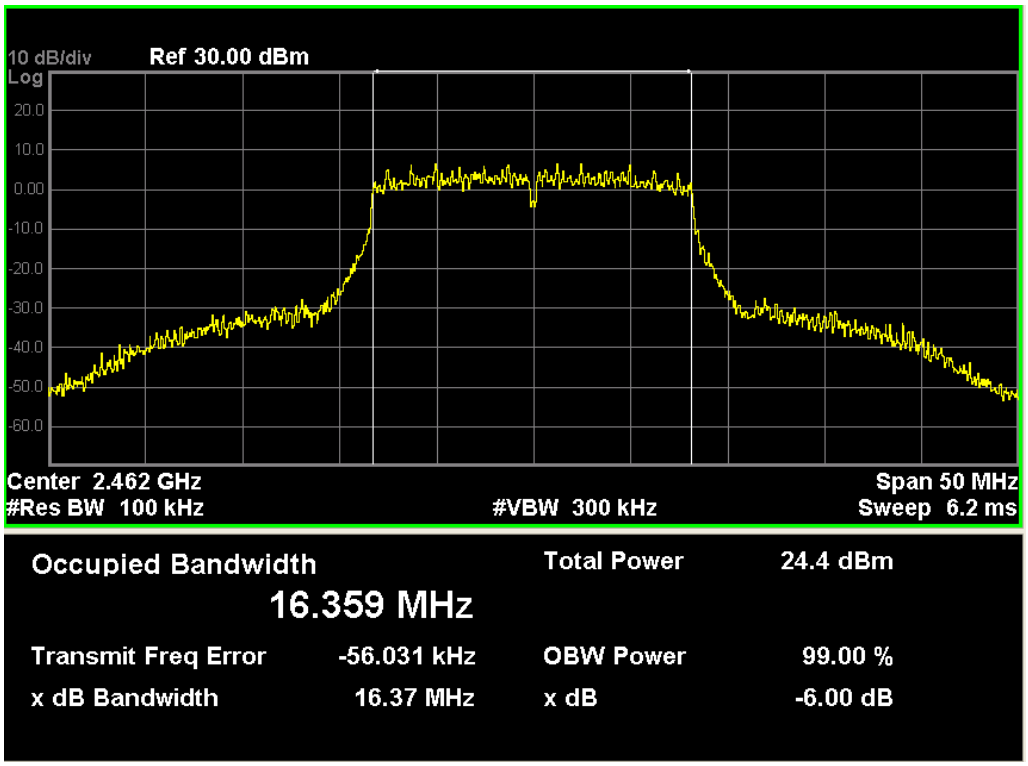
Occupied Bandwidth		Total Power	14.0 dBm
16.417 MHz			
Transmit Freq Error	41.282 kHz	OBW Power	99.00 %
x dB Bandwidth	16.43 MHz	x dB	-6.00 dB

802.11g channel 7



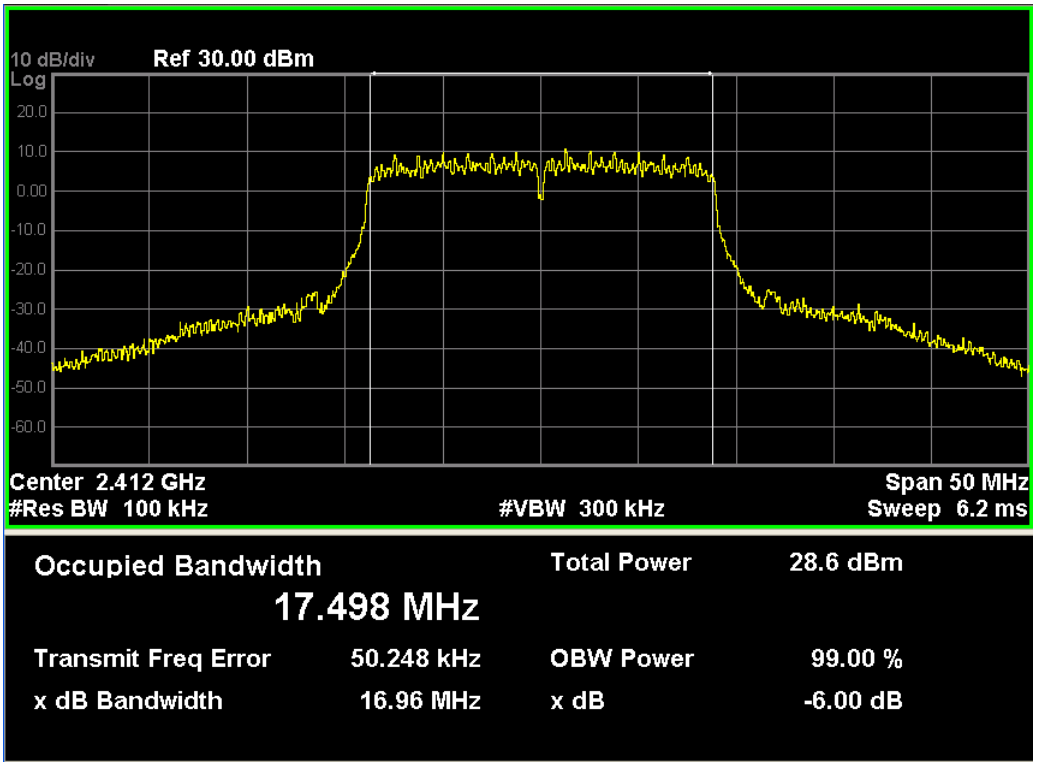
Occupied Bandwidth		Total Power	13.5 dBm
16.405 MHz			
Transmit Freq Error	46.606 kHz	OBW Power	99.00 %
x dB Bandwidth	16.41 MHz	x dB	-6.00 dB

802.11g channel 11

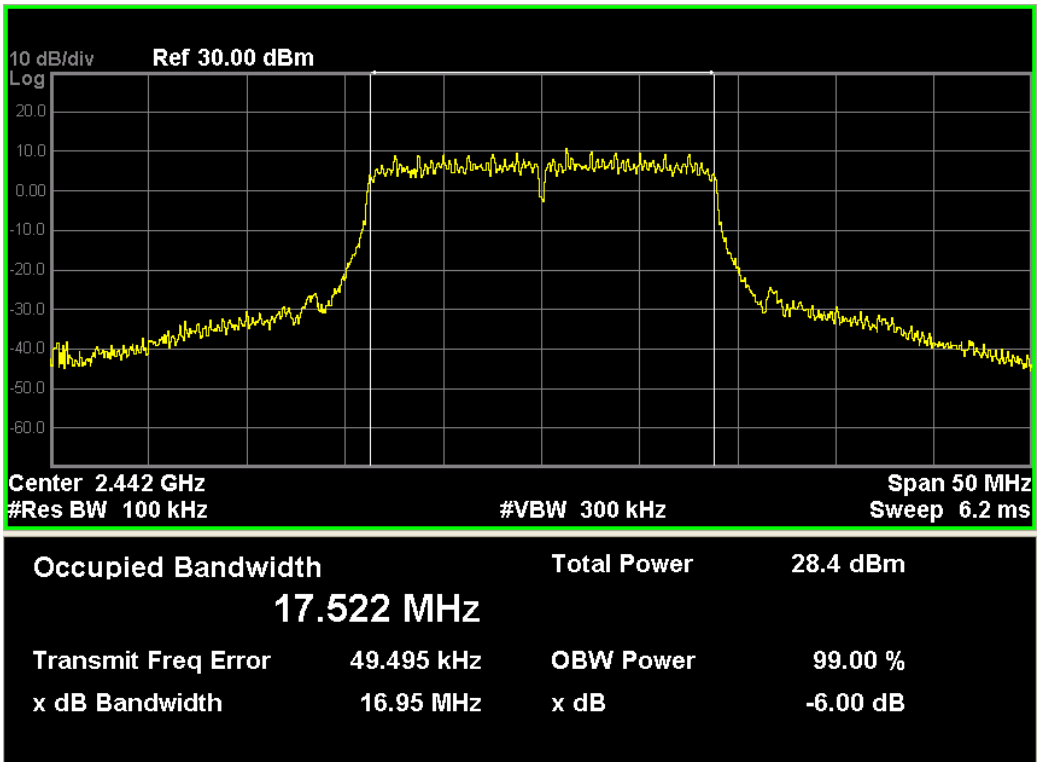


802.11n

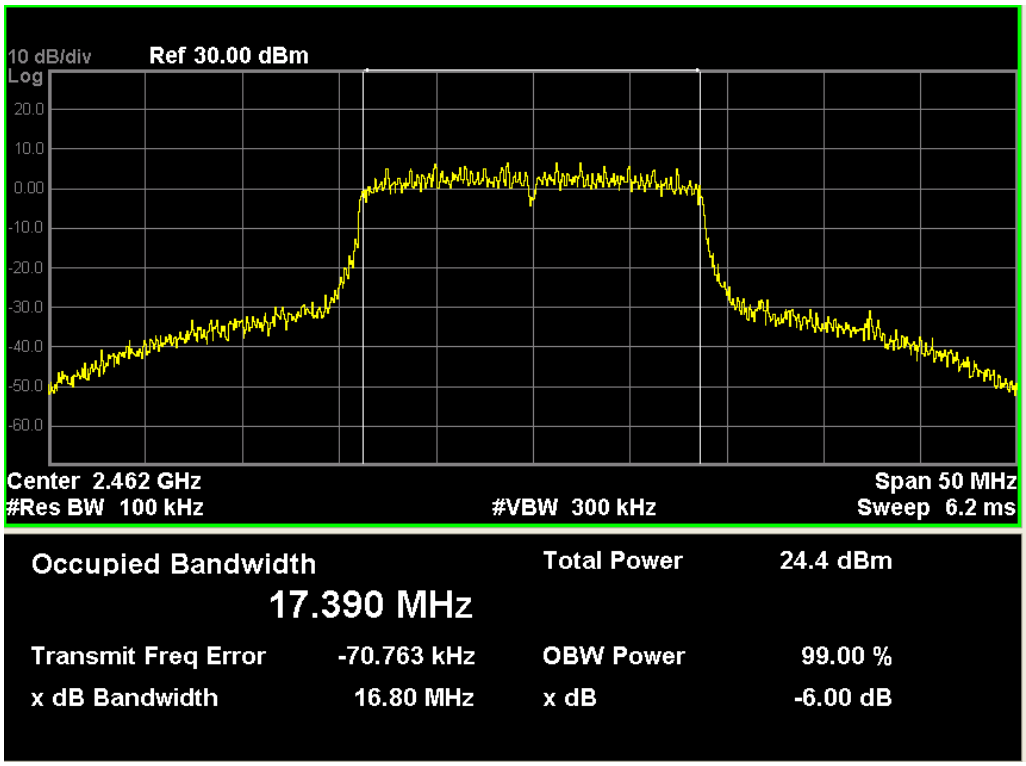
802.11n channel 1



802.11n channel 7

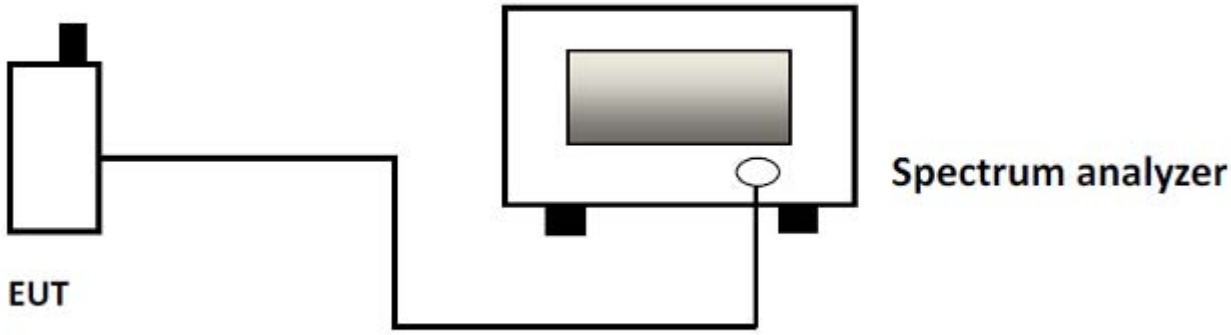


802.11n channel 11



6. POWER SPECTRAL DENSITY

6.1 TEST SETUP



6.2 LIMITS

Limits	≤8dBm

6.3 TEST PROCEDURE

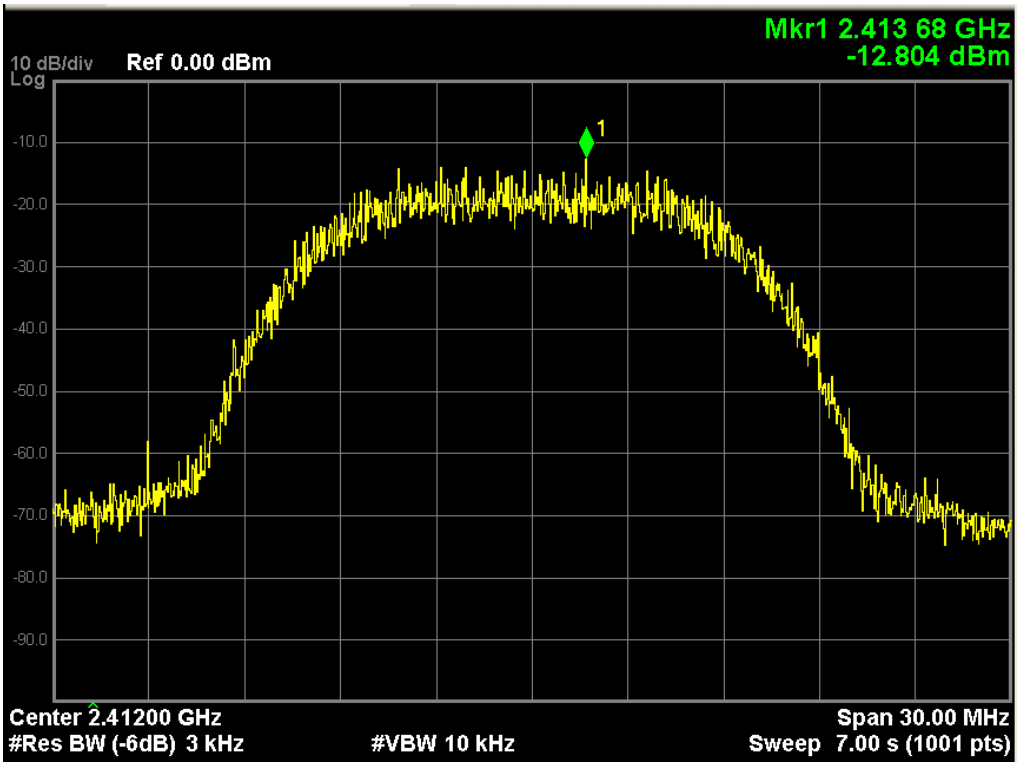
KDB 558074 D01 DTS Measurement Guidance V03 r01 April 9, 2013
Set analyzer center frequency to DTS channel center frequency.
Set the span to 1.5 times the DTS bandwidth.
Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
Set the VBW ≥ 3xRBW.
Detector = peak.
Sweep time = auto couple.
Trace mode = max hold.
Allow trace to fully stabilize.
Use the peak marker function to determine the maximum amplitude level within the RBW.
If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

6.4 RESULTS & PERFORMANCE

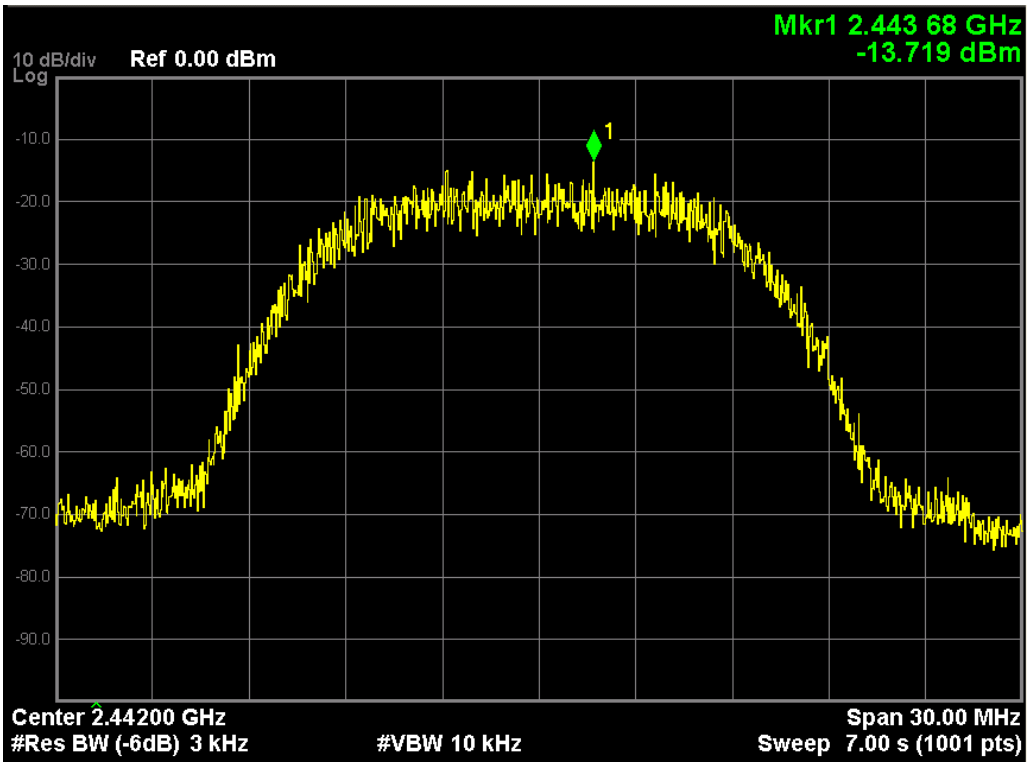
Channel	Mode	Measured level (dBm)	Limit (dBm)	Result
1 (2412MHz)	802.11b	-12.81	≤8.00	Pass
	802.11g	-22.81	≤8.00	Pass
	802.11n	-23.53	≤8.00	Pass
7 (2442 MHz)	802.11b	-13.72	≤8.00	Pass
	802.11g	-19.70	≤8.00	Pass
	802.11n	-19.19	≤8.00	Pass
11 (2462 MHz)	802.11b	-13.65	≤8.00	Pass
	802.11g	-20.10	≤8.00	Pass
	802.11n	-19.96	≤8.00	Pass

802.11b

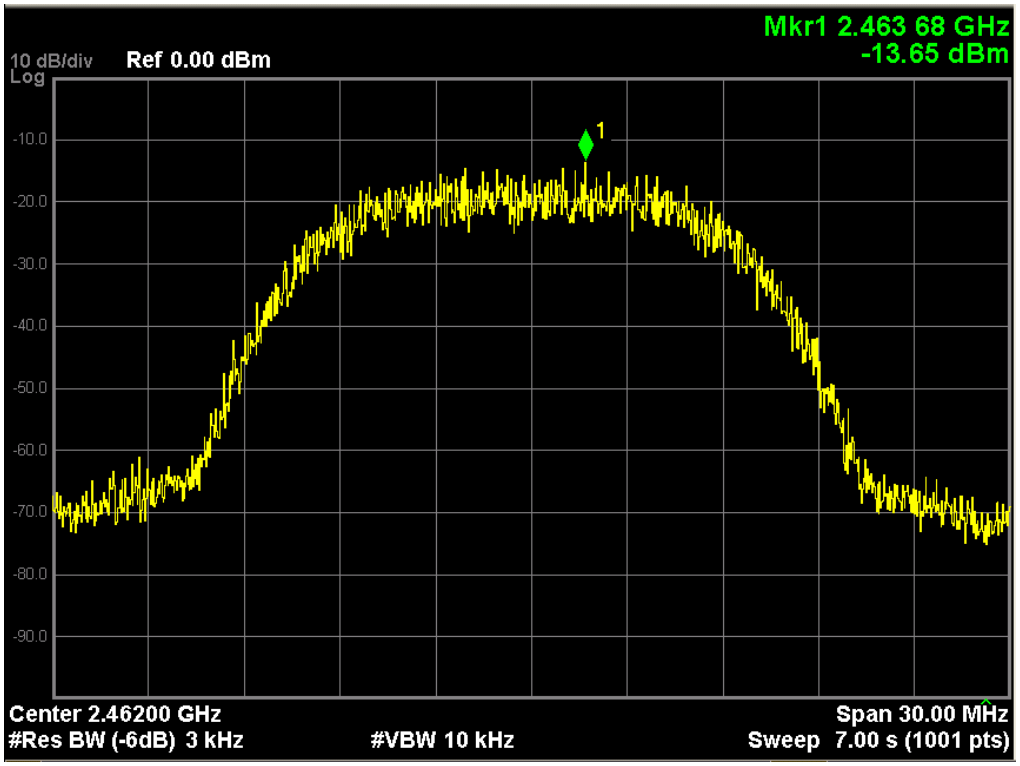
802.11b channel 1



802.11b channel 7

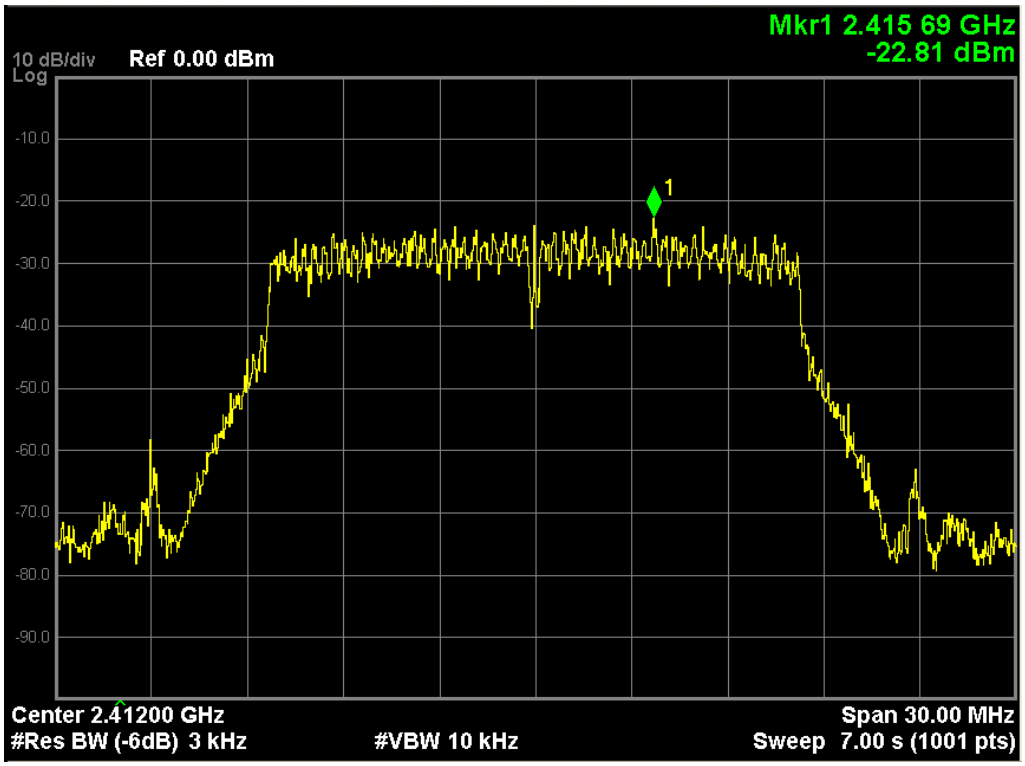


802.11b channel 11

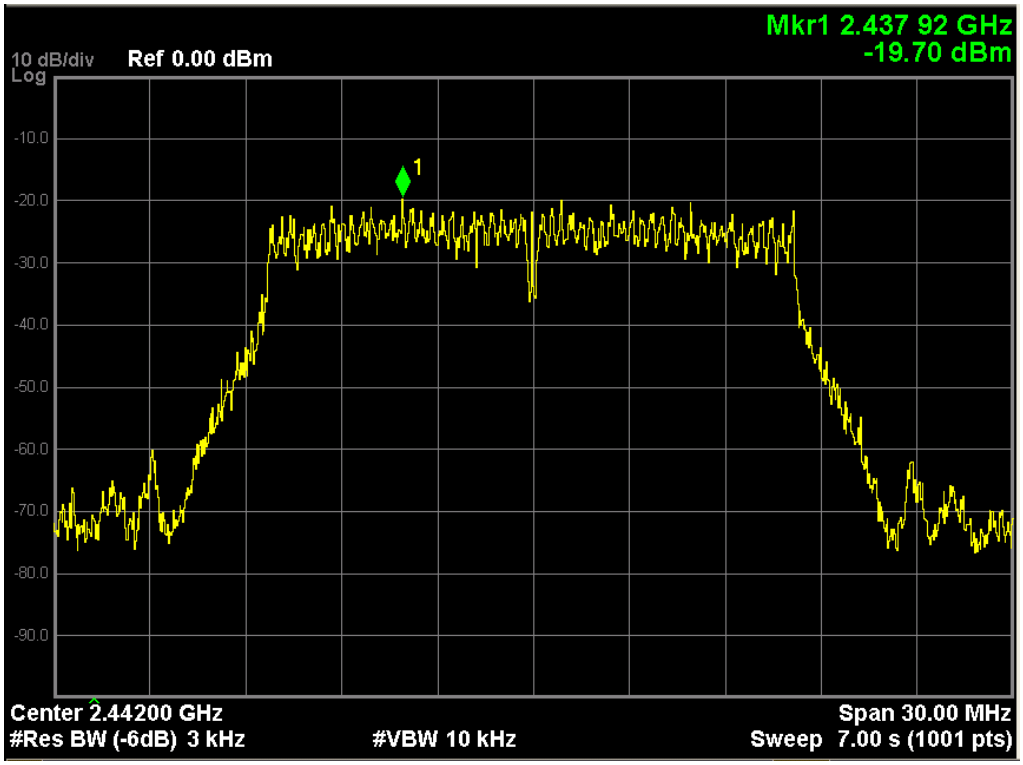


802.11g

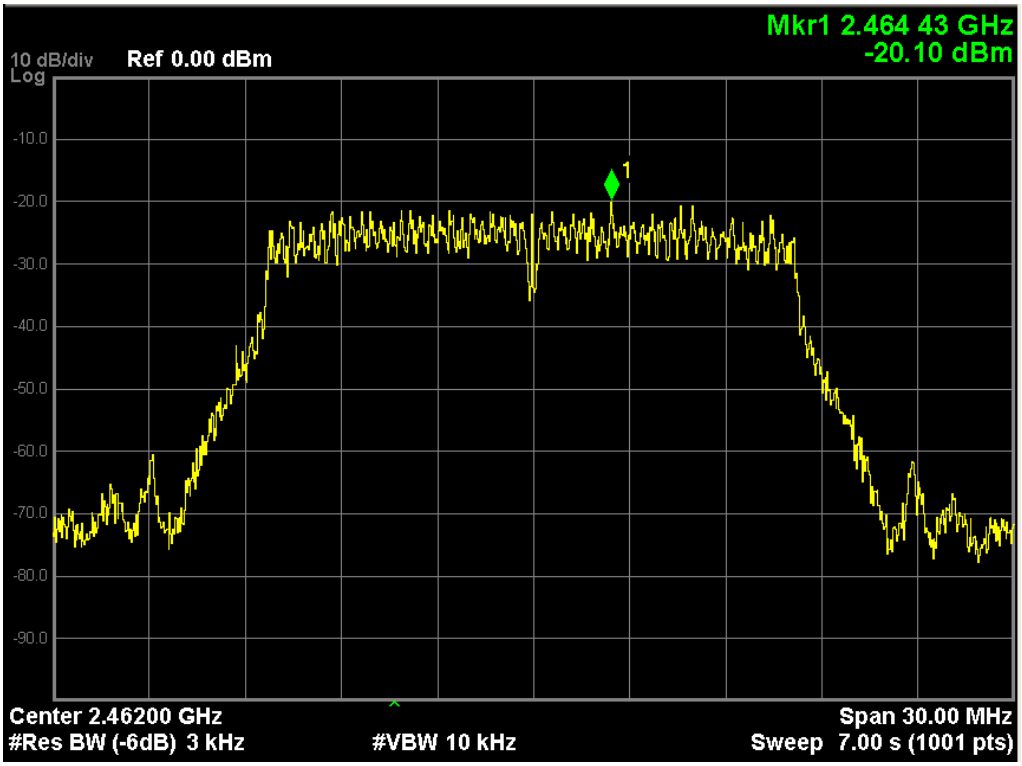
802.11g channel 1



802.11g channel 7

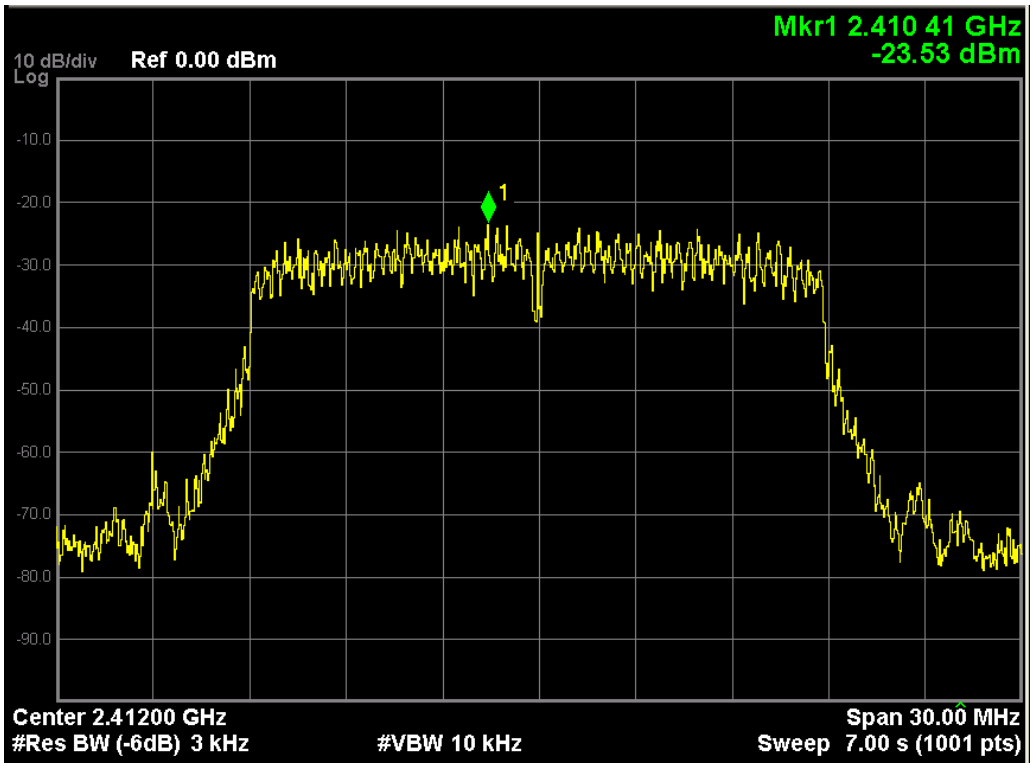


802.11g channel 11

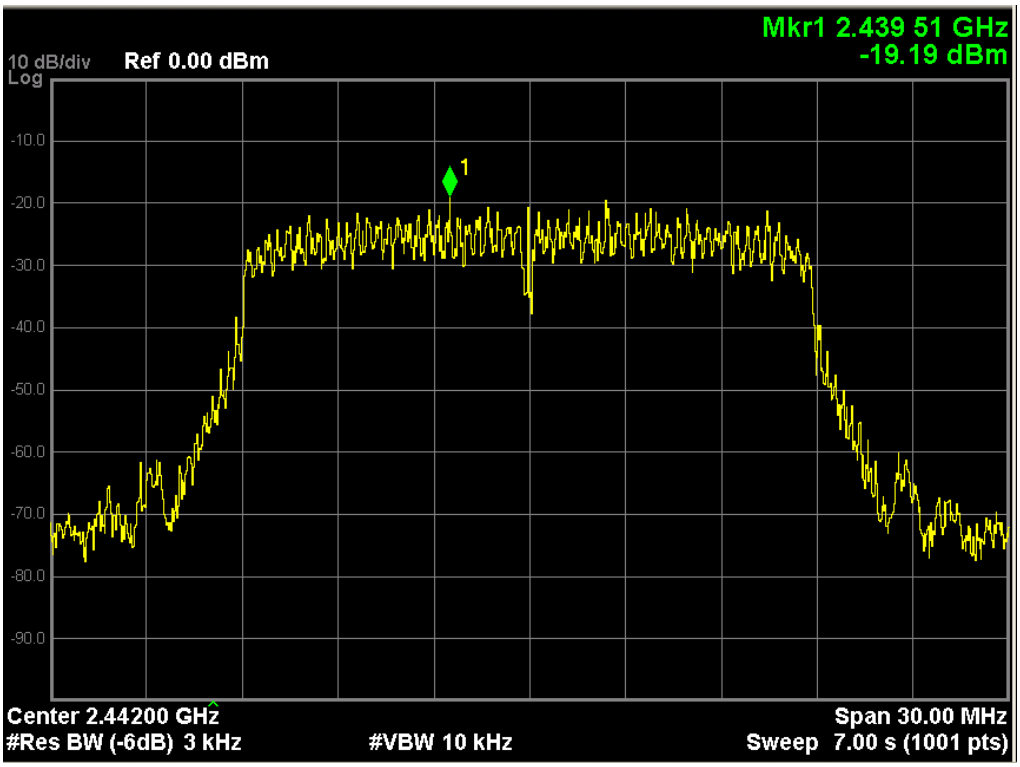


802.11n

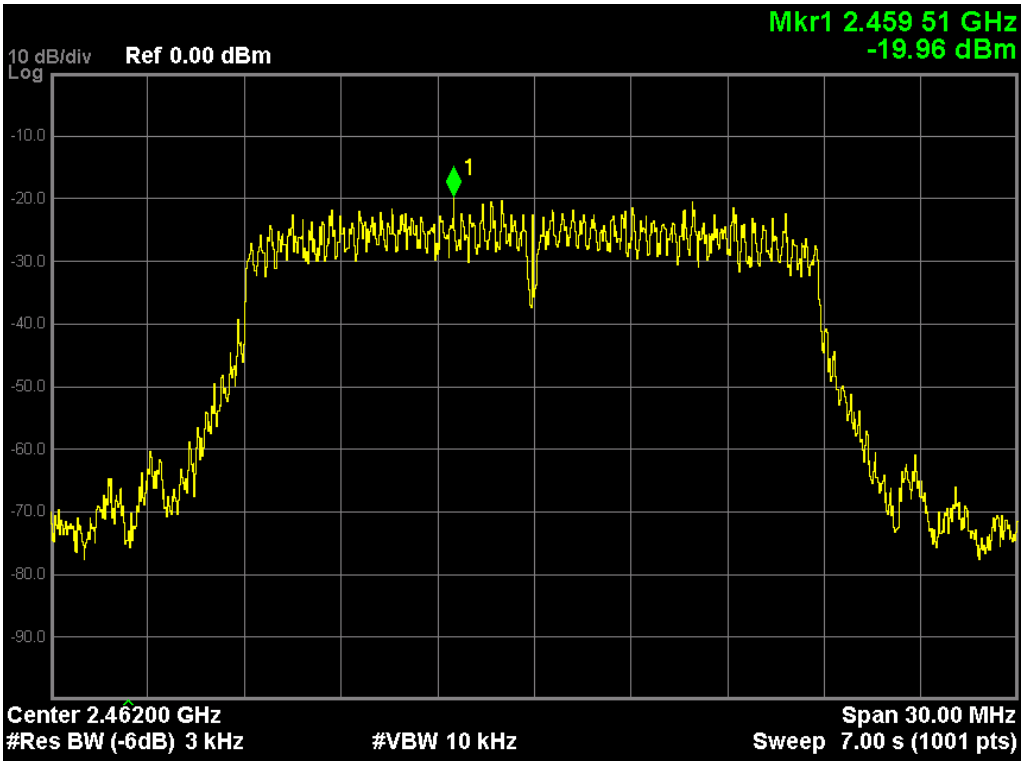
802.11n channel 1



802.11n channel 7

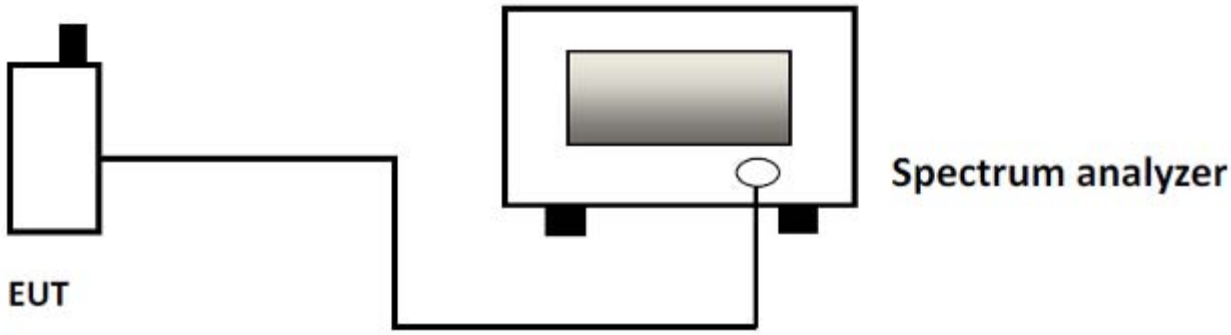


802.11n channel 11



7. PEAK OUTPUT POWER (CONDUCTION)

7.1 TEST SETUP



7.2 LIMITS

Limits	<30dBm

7.3 TEST PROCEDURE

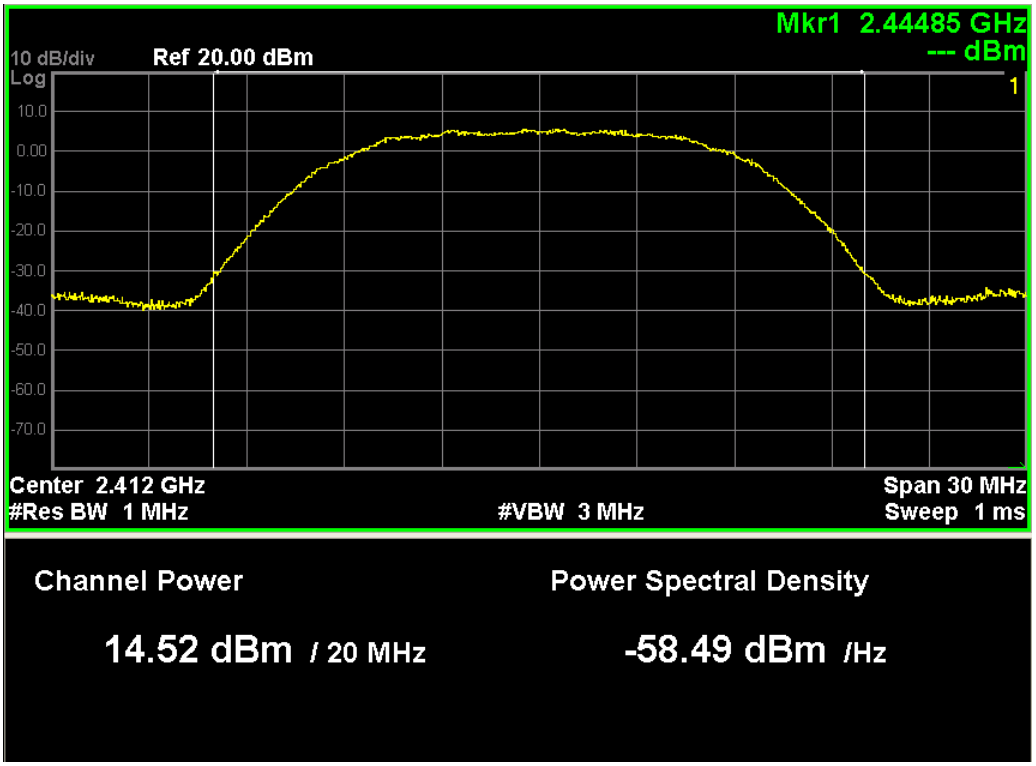
Place the EUT on the table and set it in transmitting mode. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to spectrum analyzer. The loss between RF output port of the EUT and the input port of the tester will be taken into consideration.
The measurement will be conducted at three channels.
WIFI: Low(1), Middle(7) and High (11).
Using Channel power measurement function of spectrum analyzer
and settings are: Integ BW = 20MHz RBW = 1MHz and VBW = 3MHz Trace = max hold

7.4 RESULTS & PERFORMANCE

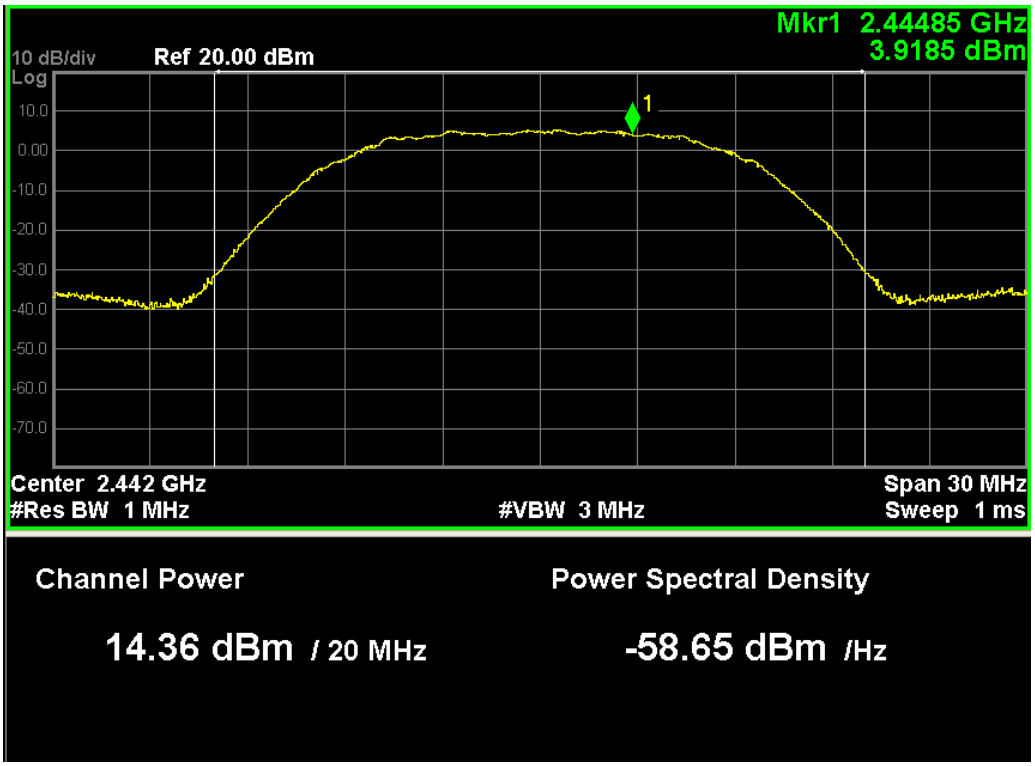
802.11b			
Channel	Peak power (dBm)	Limit (dBm)	Margin (dB)
1 (2412MHz)	14.52	30	15.48
7 (2442MHz)	14.36	30	15.64
11 (2462MHz)	14.19	30	15.81
802.11g			
Channel	Peak power (dBm)	Limit (dBm)	Margin (dB)
1 (2412MHz)	15.08	30	14.92
7 (2442MHz)	15.64	30	14.36
11 (2462MHz)	15.91	30	14.09
802.11n			
Channel	Peak power (dBm)	Limit (dBm)	Margin (dB)
1 (2412MHz)	18.69	30	11.31
7 (2442MHz)	17.84	30	12.16
11 (2462MHz)	18.29	30	11.71

802.11b

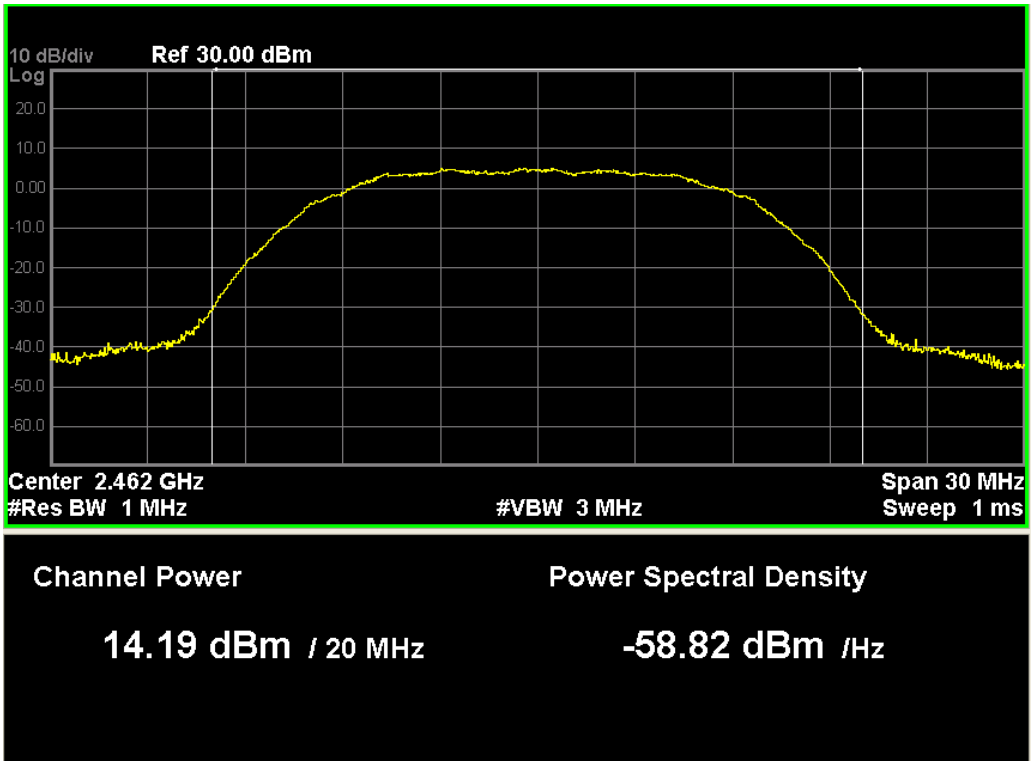
802.11b channel 1



802.11b channel 7

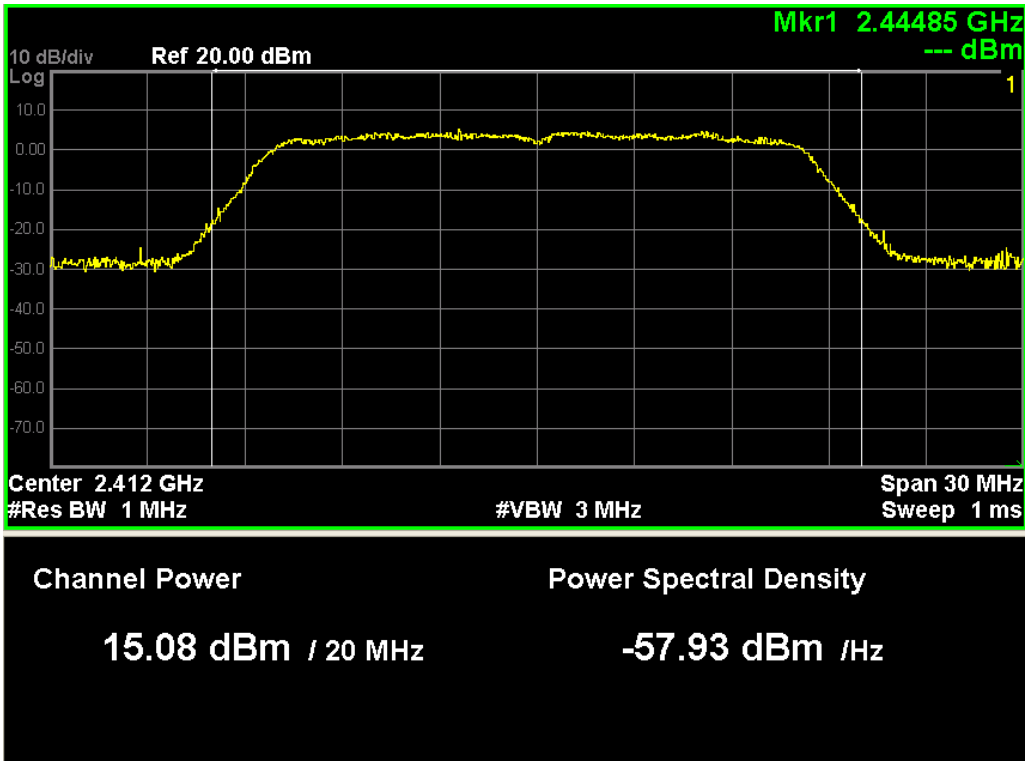


802.11b channel 11

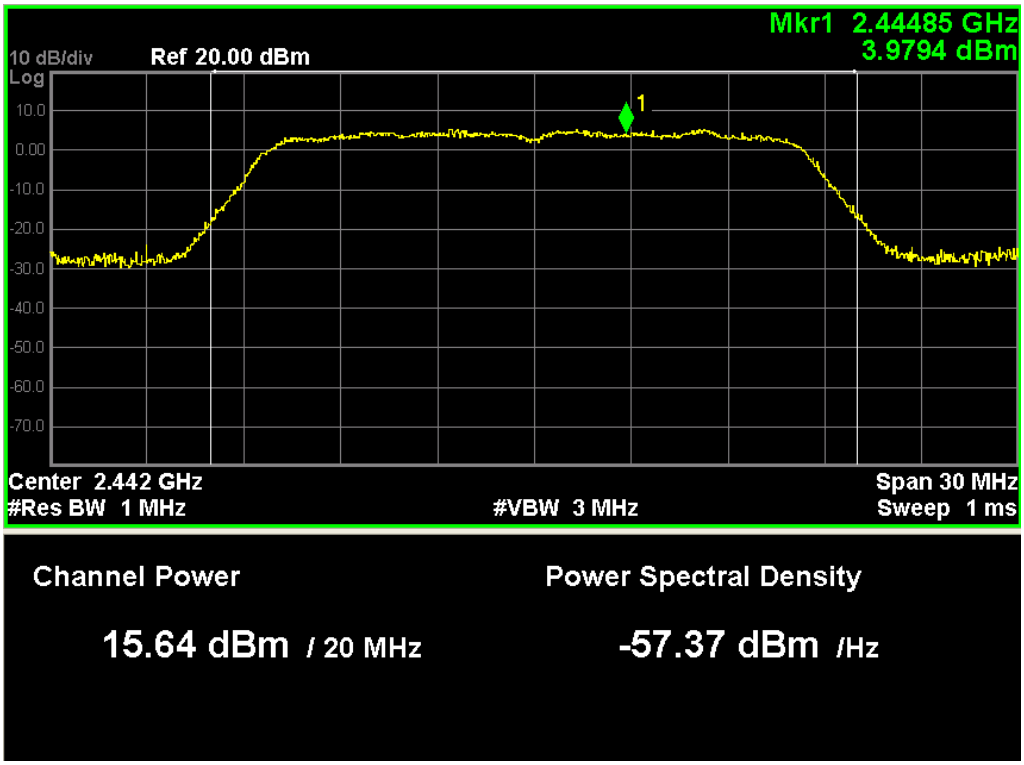


802.11g

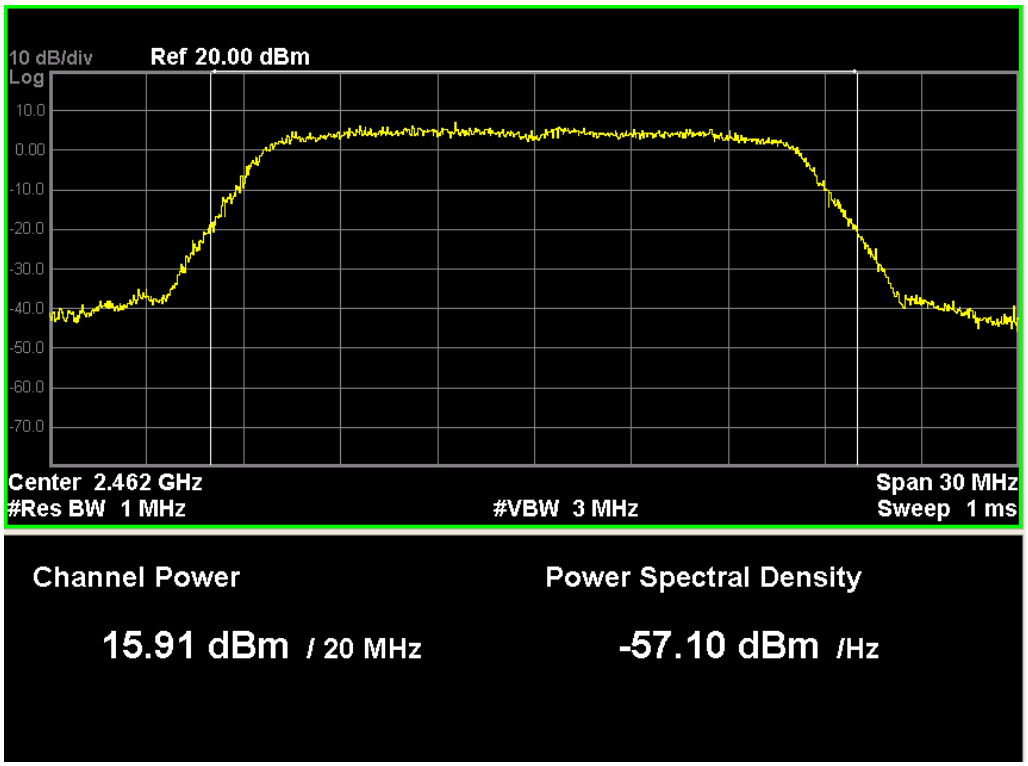
802.11g channel 1



802.11g channel 7

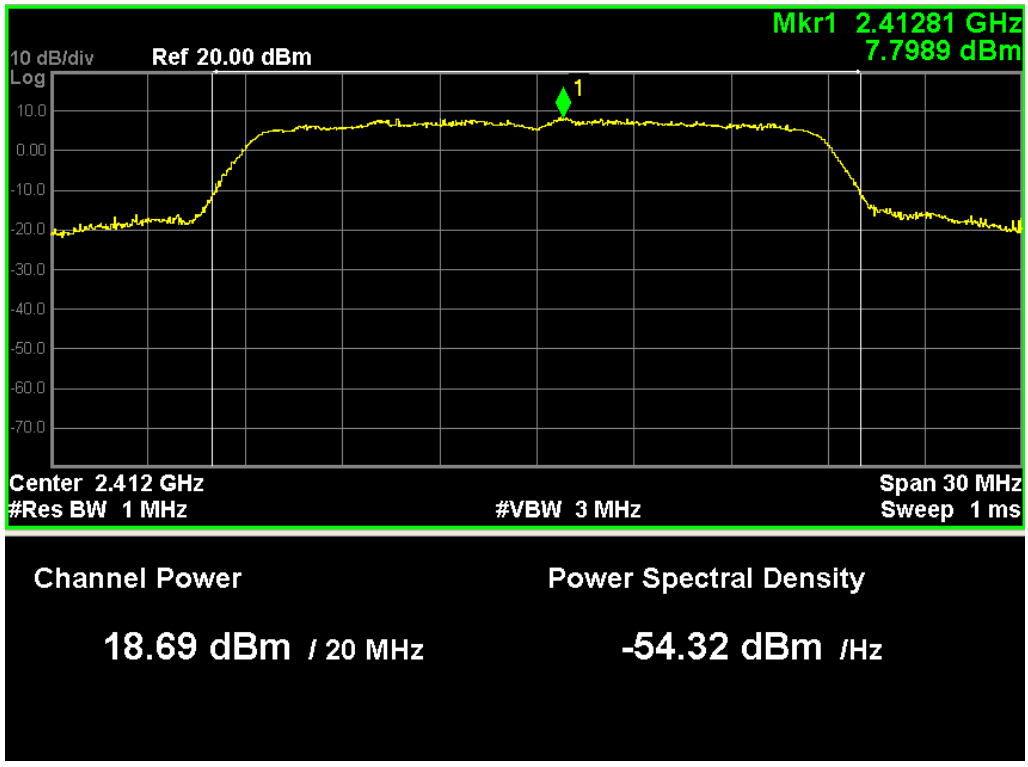


802.11g channel 11

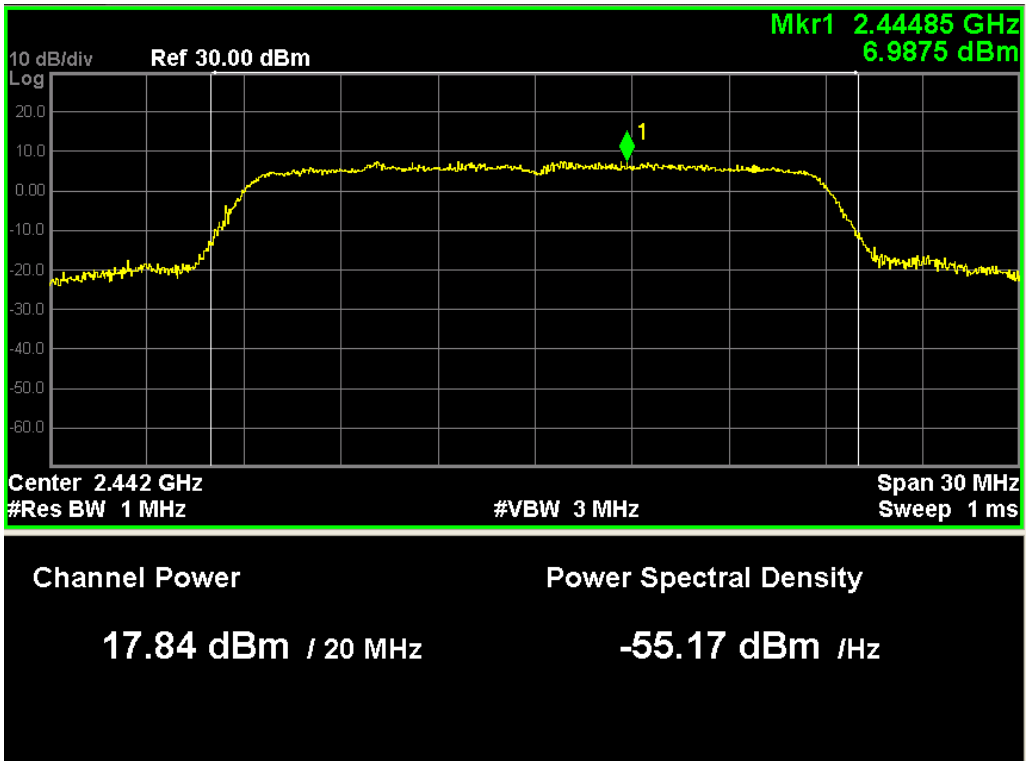


802.11n

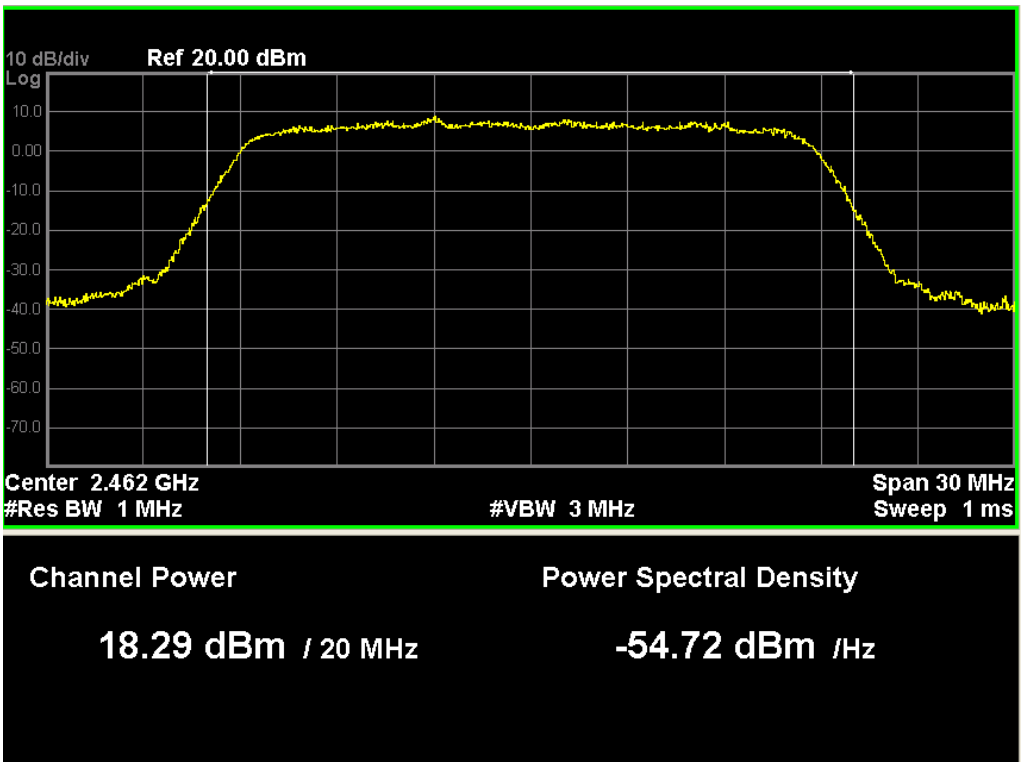
802.11n channel 1



802.11n channel 7

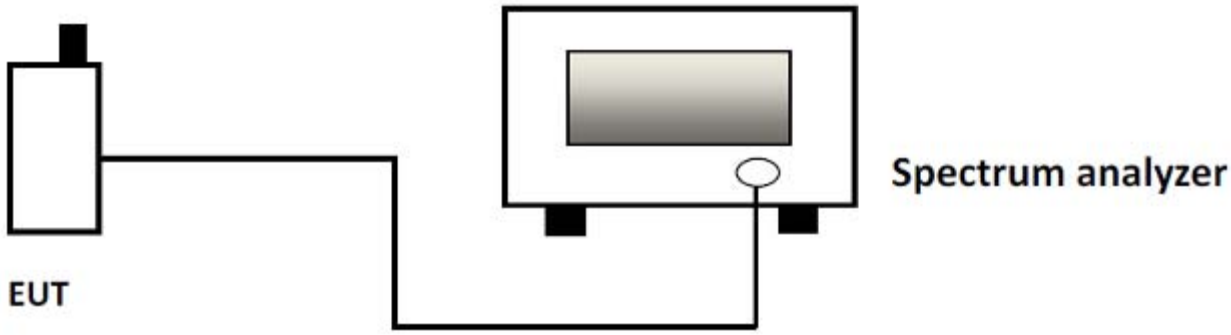


802.11n channel 11



8. SPURIOUS EMISSIONS (CONDUCTION)

8.1 TEST SETUP



8.2 LIMITS

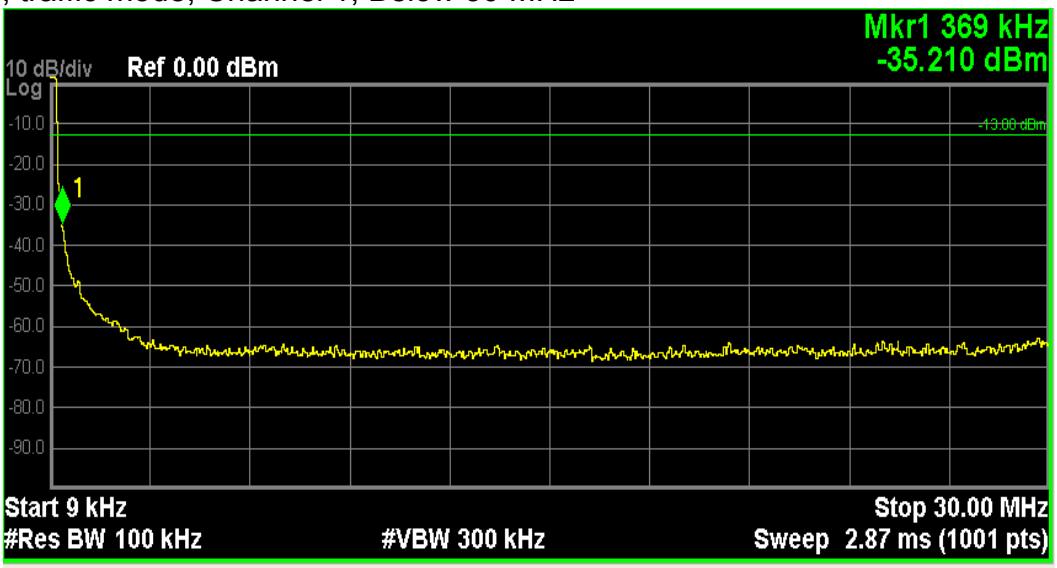
Limit	<(P-20dB)
Note: P is the highest level of the desired power	

8.3 TEST PROCEDURE

The EUT was connected to Spectrum Analyzer and Base Station via power divider. Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.
RBW = 100 kHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold
Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded. The level displayed must comply with the limit specified in this Section.

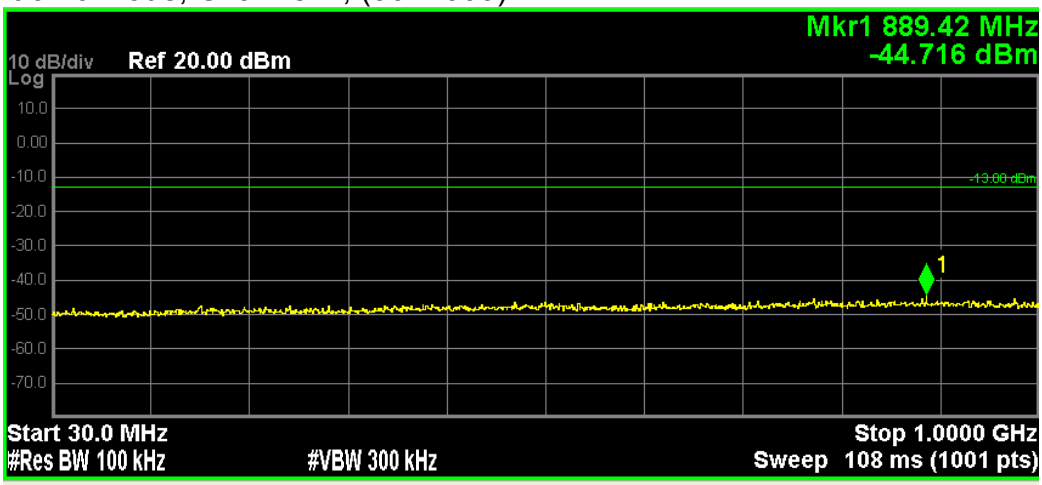
8.4 RESULTS & PERFORMANCE

802.11b, traffic mode; Channel 1; Below 30 MHz



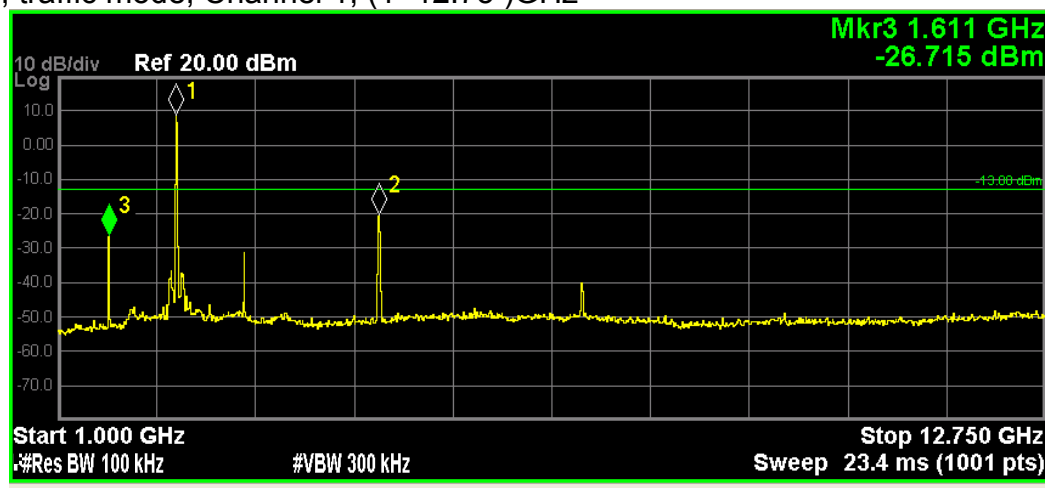
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	369 kHz	-35.210 dBm			
2								
3								
4								
5								
6								
7								

802.11b, traffic mode; Channel 1; (30~1000) MHz



MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	889.42 MHz	-44.716 dBm			
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

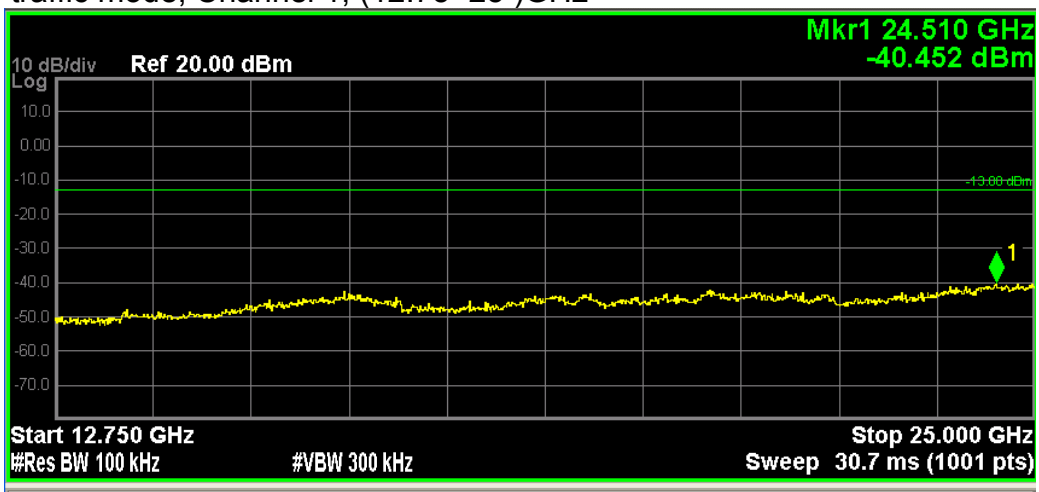
802.11b, traffic mode; Channel 1; (1~12.75)GHz



MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.410 GHz	8.249 dBm			
2	N	1	f	4.819 GHz	-20.748 dBm			
3	N	1	f	1.611 GHz	-26.715 dBm			
4								
5								
6								
7								
8								
9								
10								
11								
12								

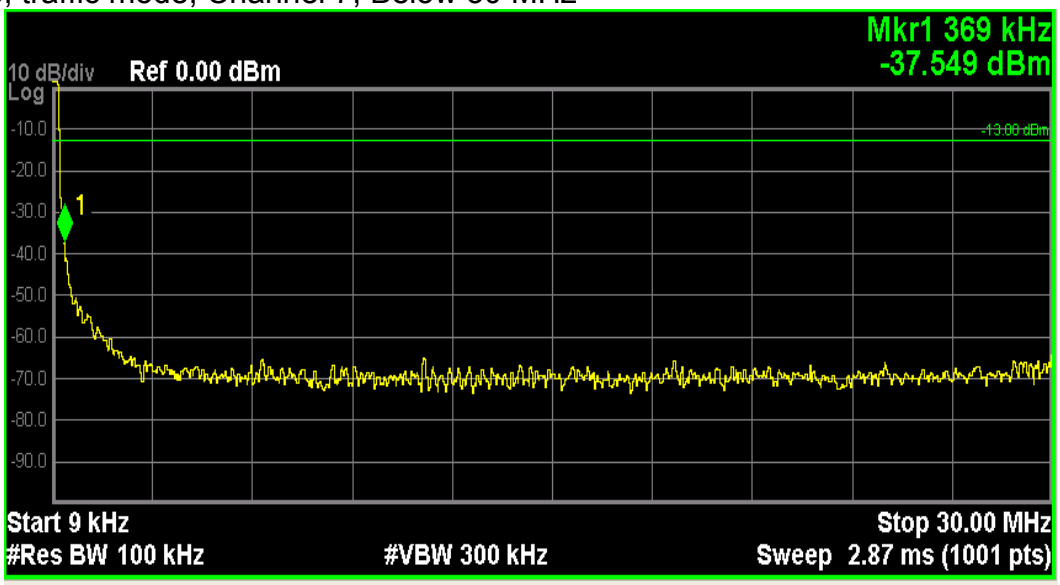
Note: The point mark1 is carrier.

802.11b, traffic mode; Channel 1; (12.75~25)GHz



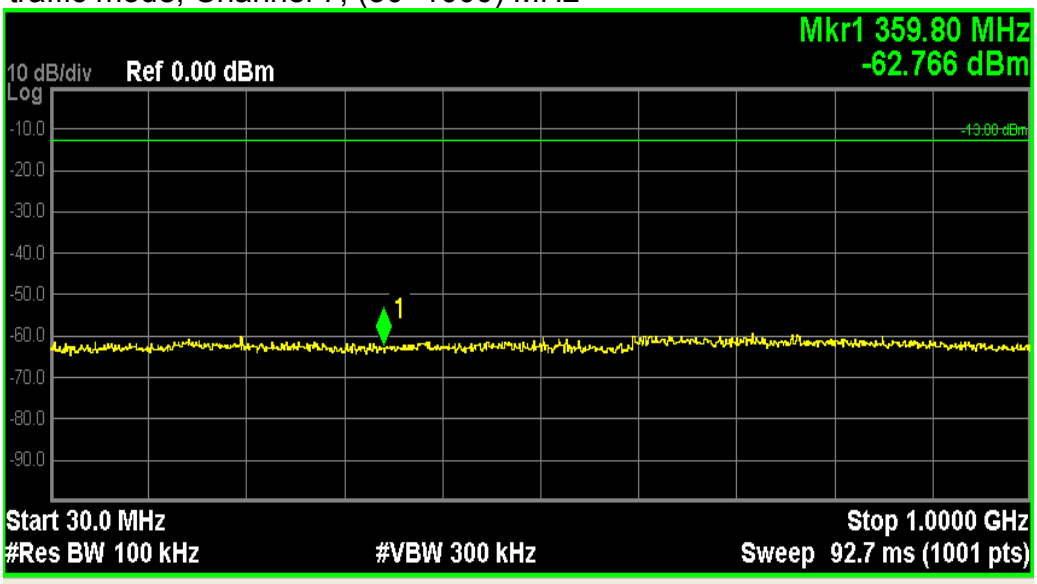
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	24.510 GHz	-40.452 dBm			
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

802.11b, traffic mode; Channel 7; Below 30 MHz



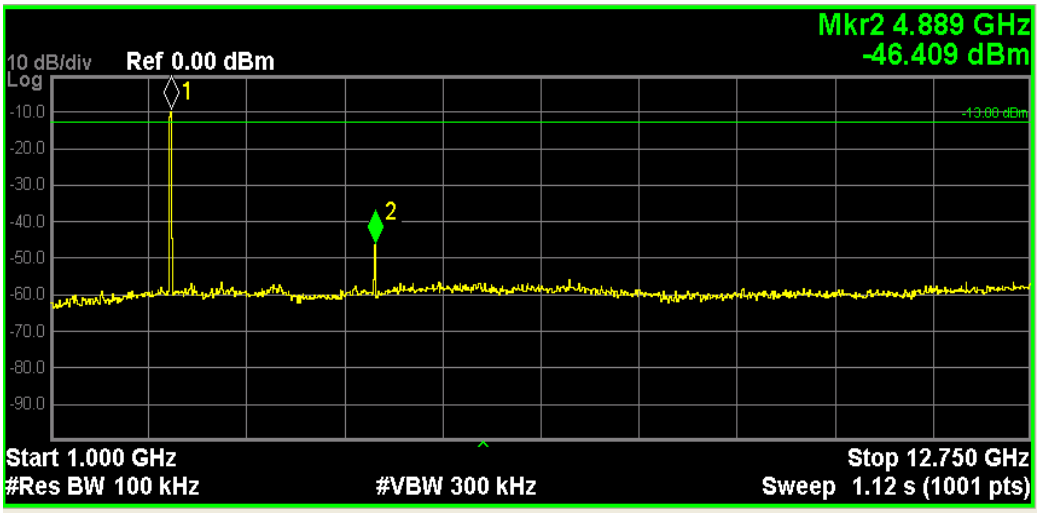
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	369 kHz	-37.549 dBm			
2								
3								
4								
5								
6								

802.11b, traffic mode; Channel 7; (30~1000) MHz



MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	359.80 MHz	-62.766 dBm			
2								
3								
4								
5								
6								

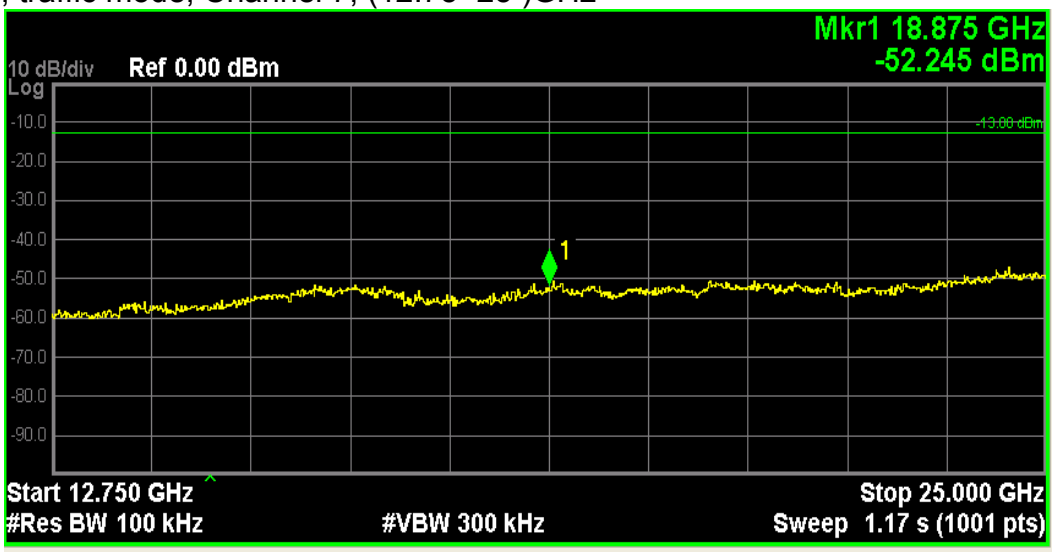
802.11b, traffic mode; Channel 7; (1~12.75)GHz



MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.445 GHz	-9.794 dBm			
2	N	1	f	4.889 GHz	-46.409 dBm			
3								
4								
5								
6								
7								
8								
9								
10								

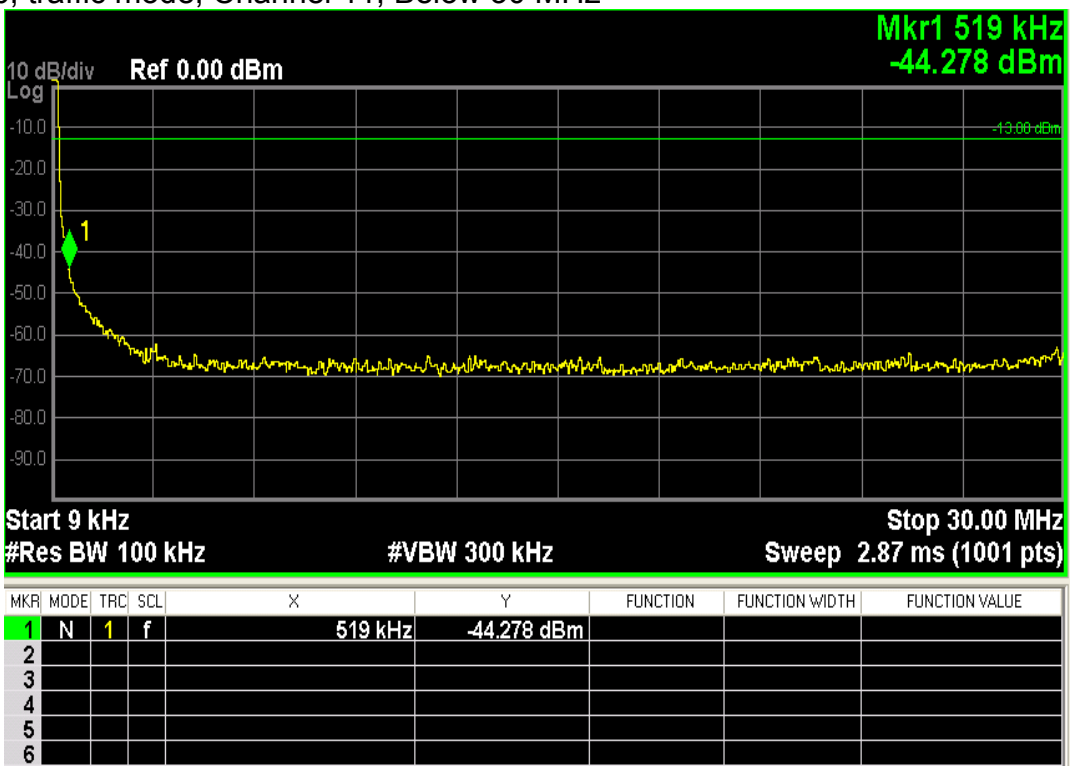
Note: The point mark1 is carrier.

802.11b, traffic mode; Channel 7; (12.75~25)GHz



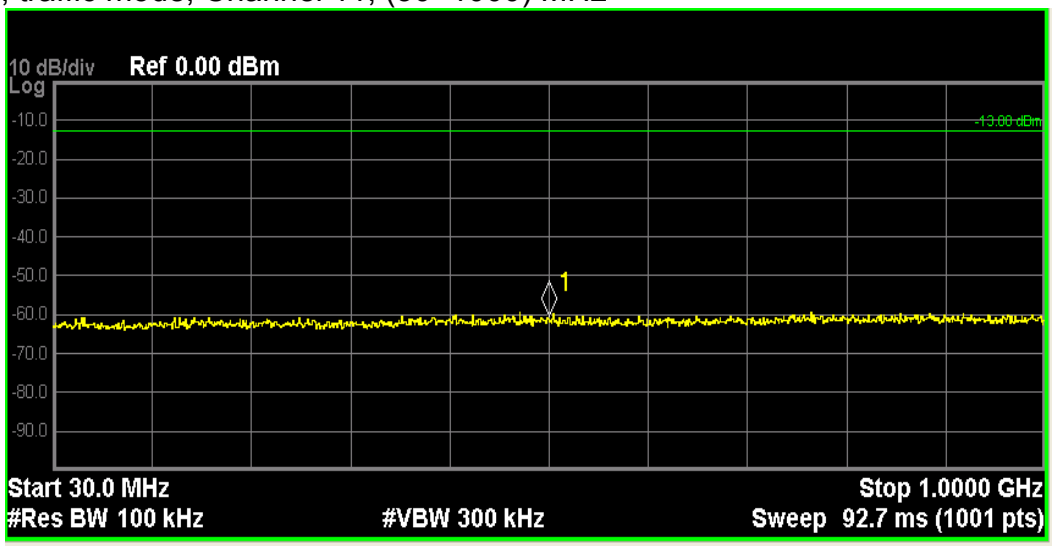
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	18.875 GHz	-52.245 dBm			
2								
3								
4								
5								
6								
7								
8								

802.11b, traffic mode; Channel 11; Below 30 MHz



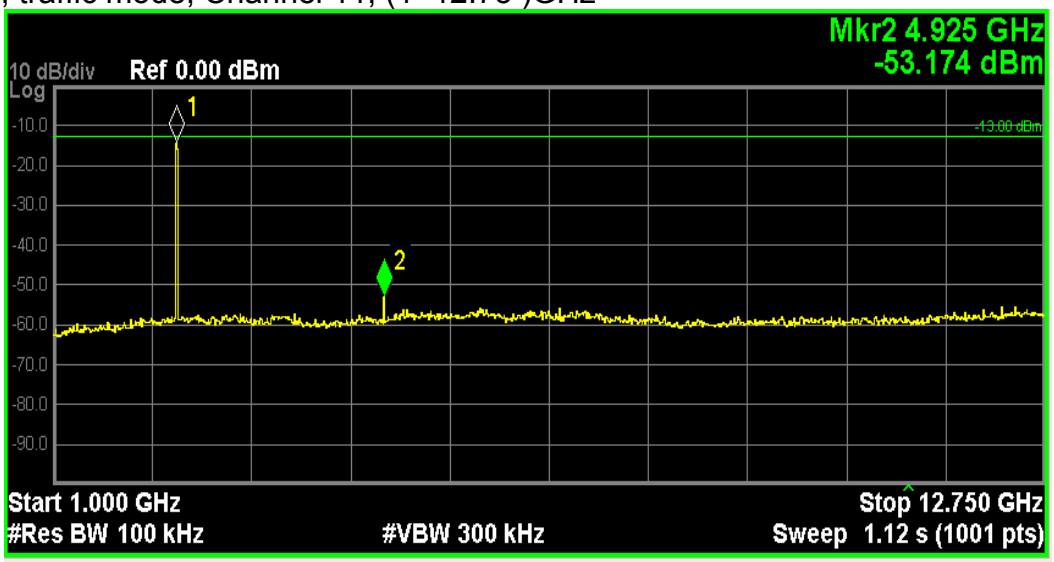
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	519 kHz	-44.278 dBm			
2								
3								
4								
5								
6								

802.11b, traffic mode; Channel 11; (30~1000) MHz



MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	515.00 MHz	-60.995 dBm			
2								
3								
4								
5								
6								
7								
8								

802.11b, traffic mode; Channel 11; (1~12.75)GHz



MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.457 GHz	-14.493 dBm			
2	N	1	f	4.925 GHz	-53.174 dBm			
3								
4								
5								
6								
7								

Note: The point mark1 is carrier.

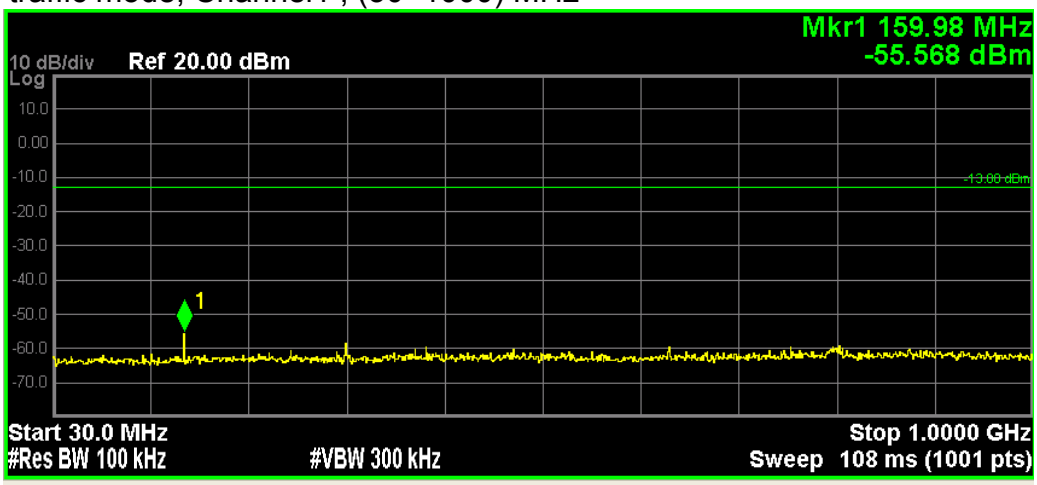
802.11b, traffic mode; Channel 11; (12.75~25)GHz

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	18.348 GHz	-55.947 dBm			
2								
3								
4								
5								
6								
7								

802.11g, traffic mode; Channel 1; Below 30 MHz

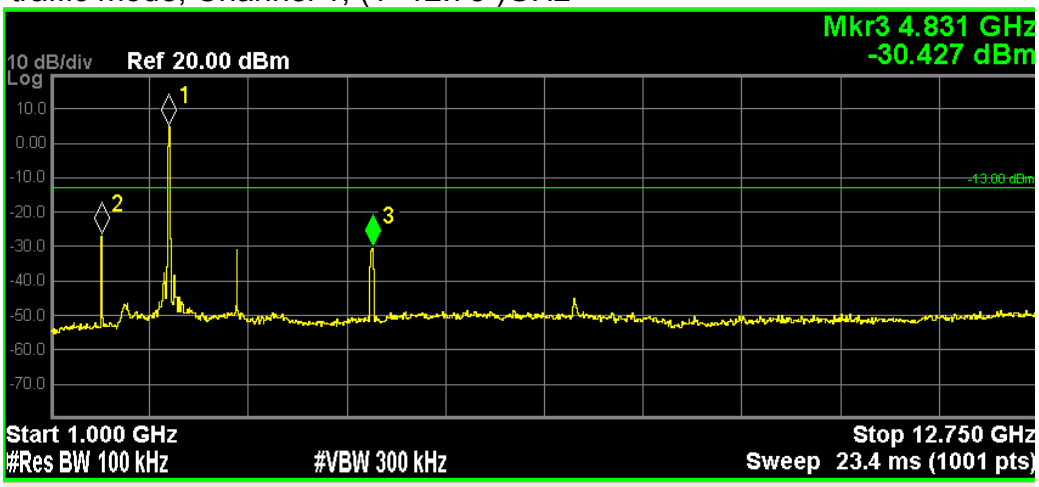
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	519 kHz	-42.232 dBm			
2								
3								
4								
5								
6								

802.11g, traffic mode; Channel1 ; (30~1000) MHz



MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	159.98 MHz	-55.568 dBm			
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

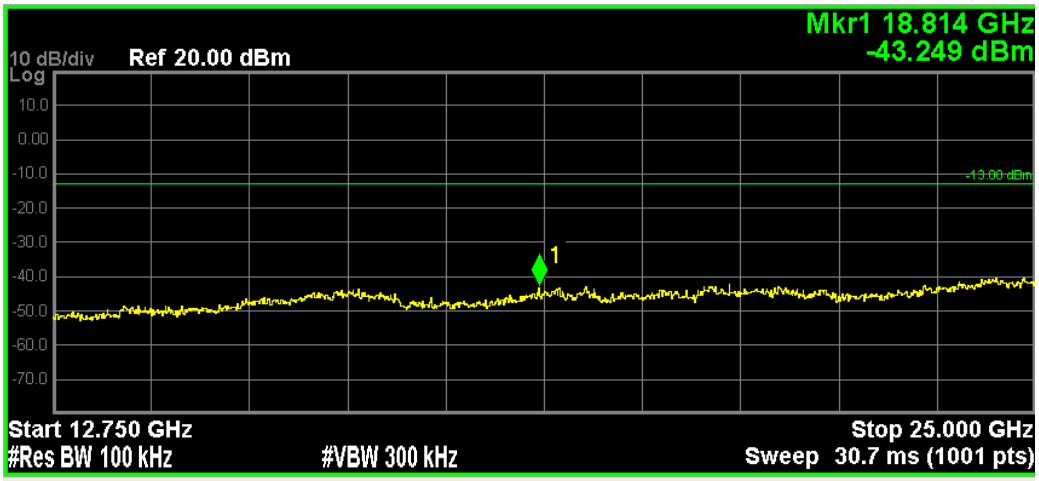
802.11g, traffic mode; Channel 1; (1~12.75)GHz



MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.410 GHz	4.572 dBm			
2	N	1	f	1.611 GHz	-26.909 dBm			
3	N	1	f	4.831 GHz	-30.427 dBm			
4								
5								
6								
7								
8								
9								
10								
11								
12								

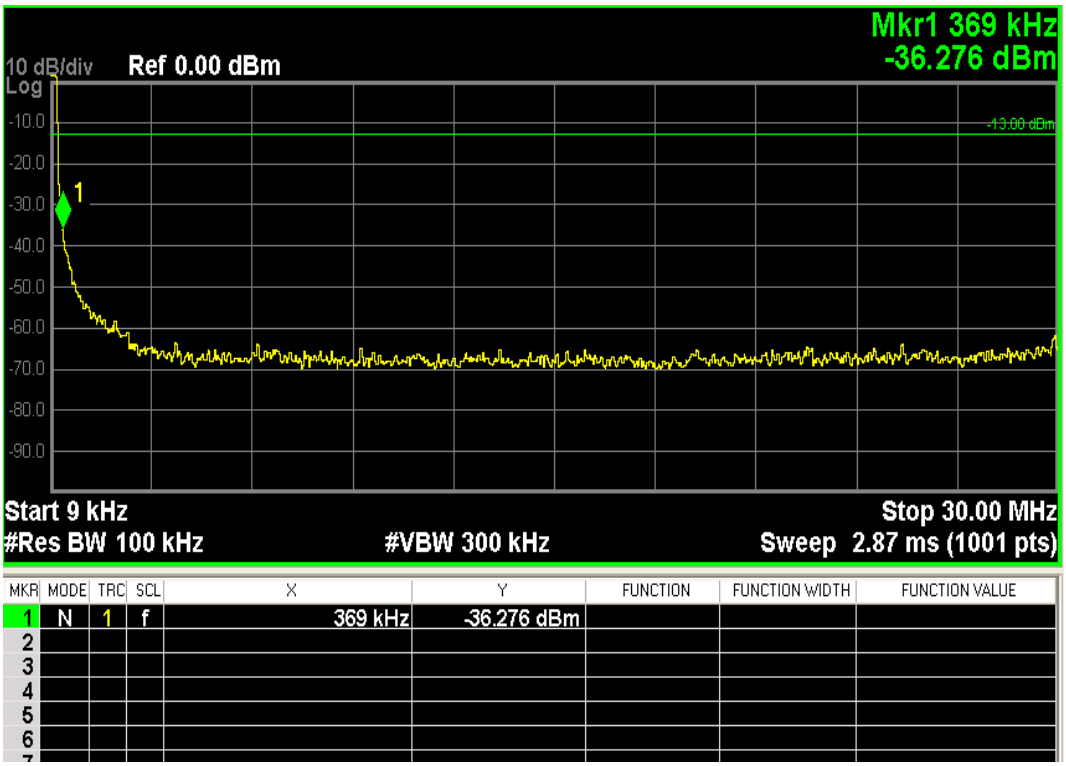
Note: The point mark1 is carrier.

802.11g, traffic mode; Channel 1; (12.75~25) GHz



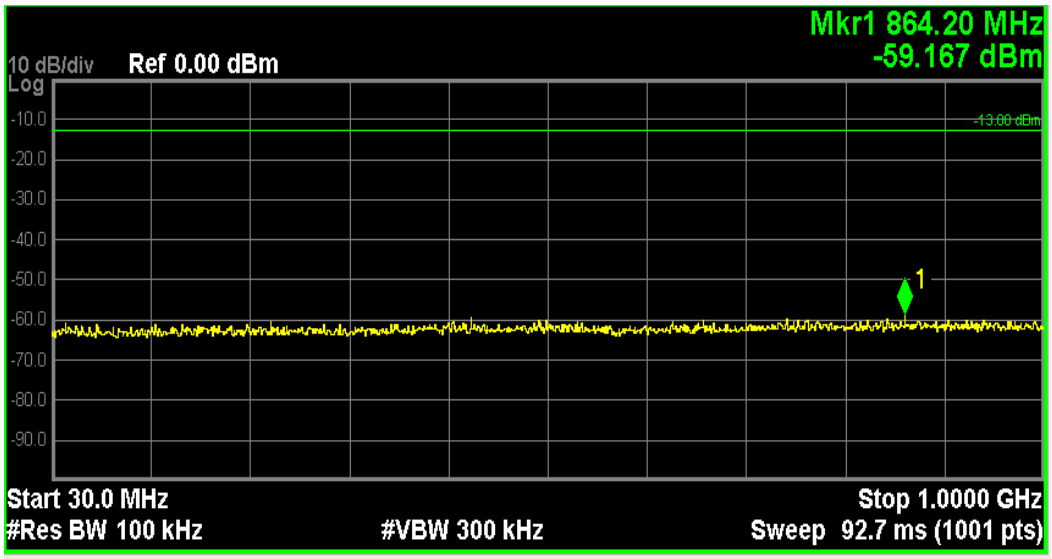
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	18.814 GHz	-43.249 dBm			
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

802.11g, traffic mode; Channel 7; Below 30 MHz



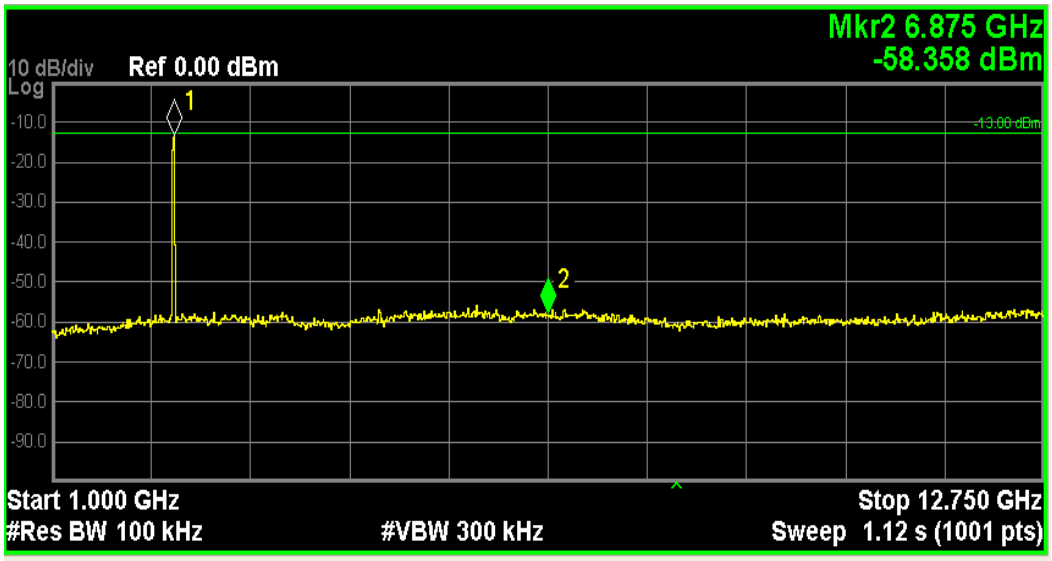
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	369 kHz	-36.276 dBm			
2								
3								
4								
5								
6								

802.11g, traffic mode; Channel7; (30~1000) MHz



MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	864.20 MHz	-59.167 dBm			
2								
3								
4								
5								
6								
7								

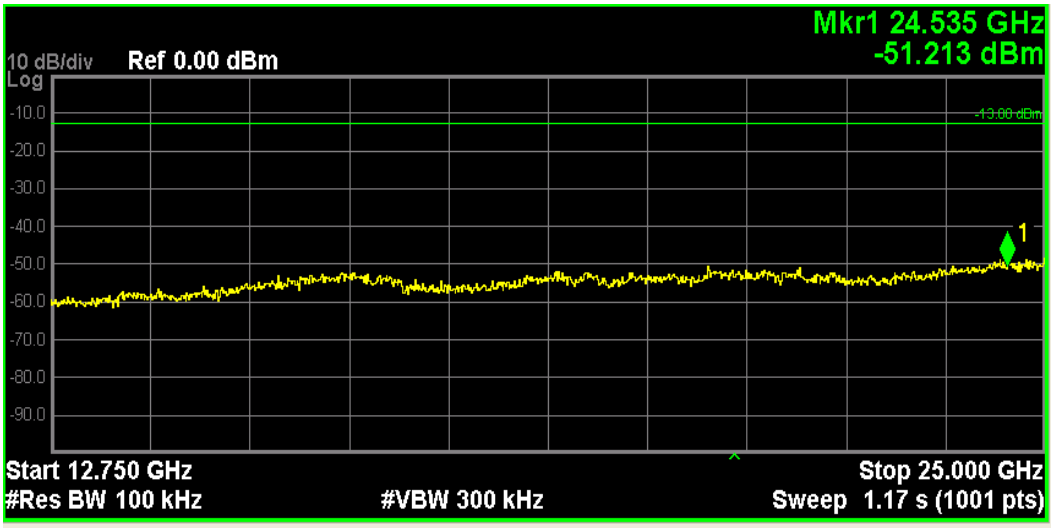
802.11g, traffic mode; Channel7 ; (1~12.75) MHz



MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.445 GHz	-13.799 dBm			
2	N	1	f	6.875 GHz	-58.358 dBm			
3								
4								
5								
6								
7								

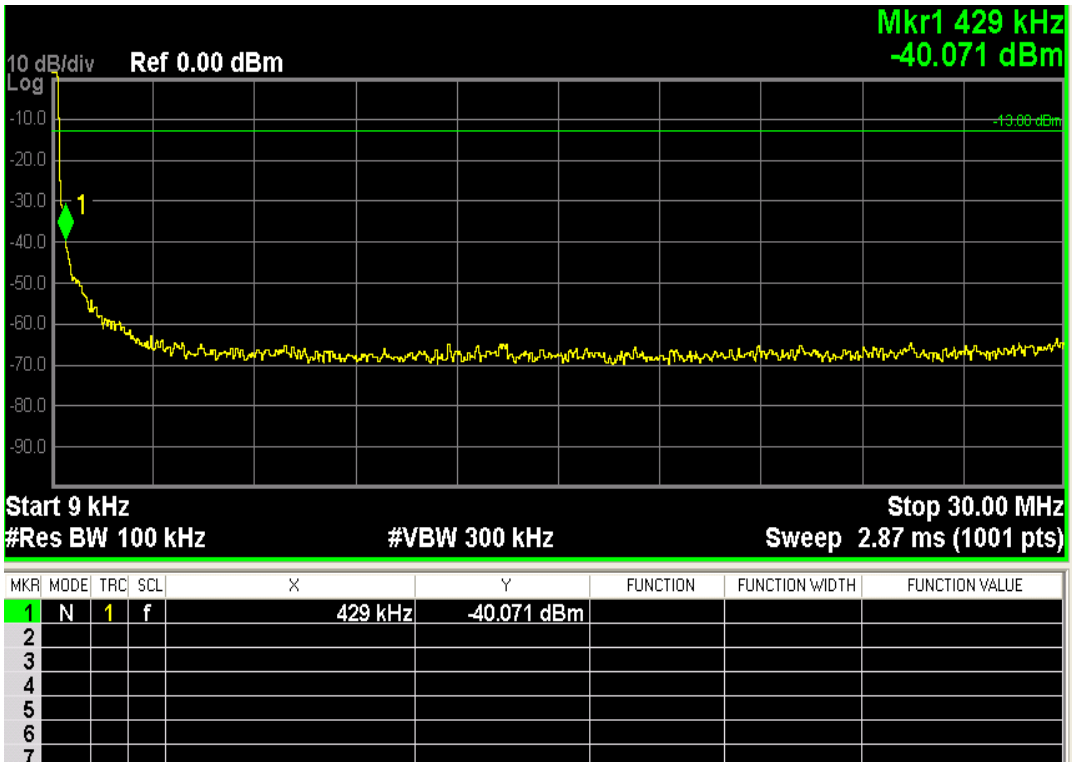
Note: The point mark1 is carrier.

802.11g, traffic mode; Channel7 ; (12.75~25) MHz

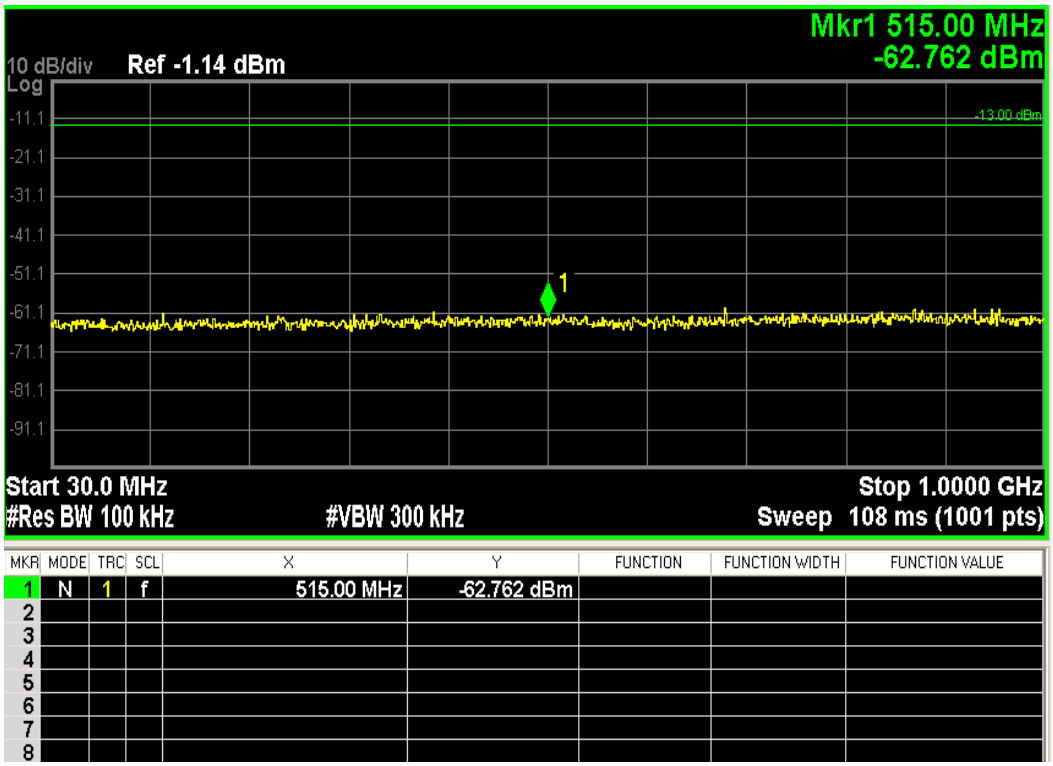


MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	24.535 GHz	-51.213 dBm			
2								
3								
4								
5								
6								
7								
8								
9								

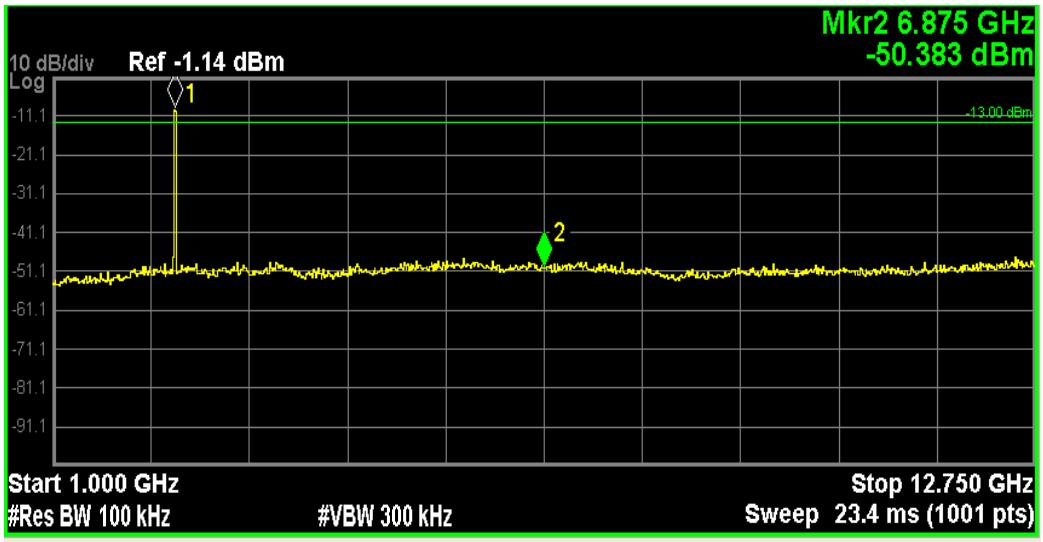
802.11g, traffic mode; Channel 11; Below 30 MHz



802.11g, traffic mode; Channel11; (30~1000) MHz



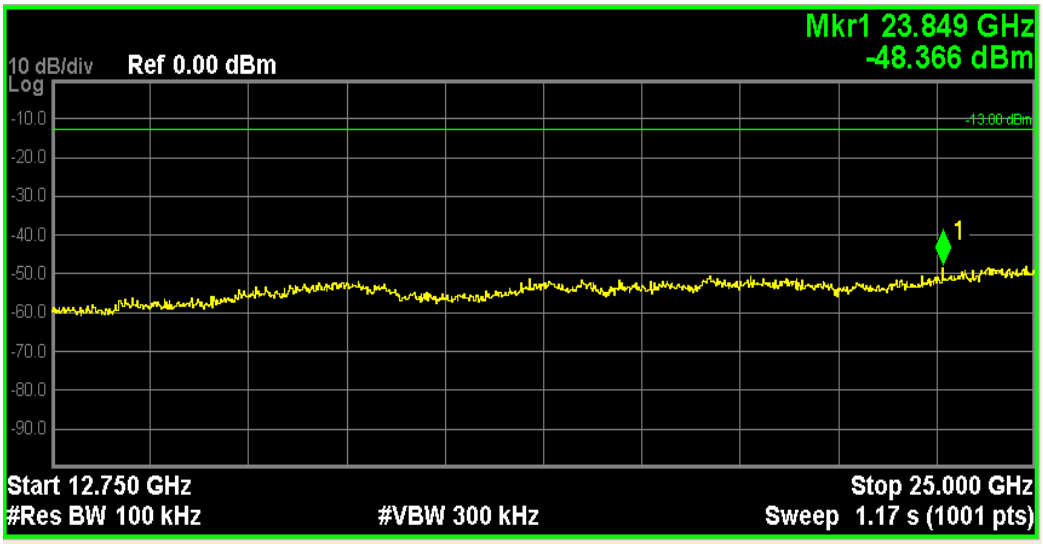
802.11g, traffic mode; Channel11 ; (1~12.75) MHz



MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.457 GHz	-9.546 dBm			
2	N	1	f	6.875 GHz	-50.383 dBm			
3								
4								
5								
6								
7								
8								

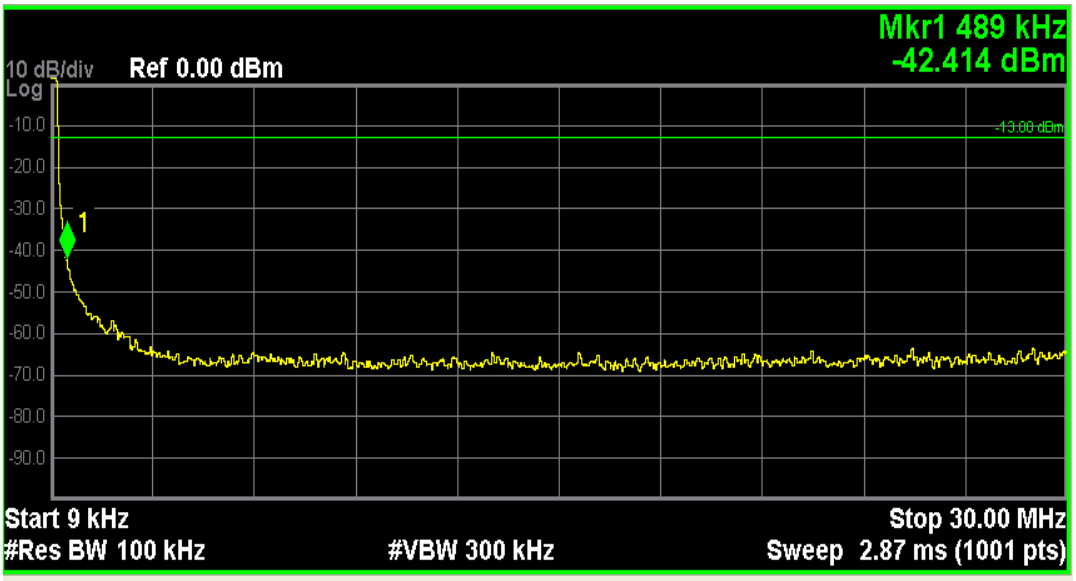
Note: The point mark1 is carrier.

802.11g, traffic mode; Channel11 ; (12.75~25) MHz



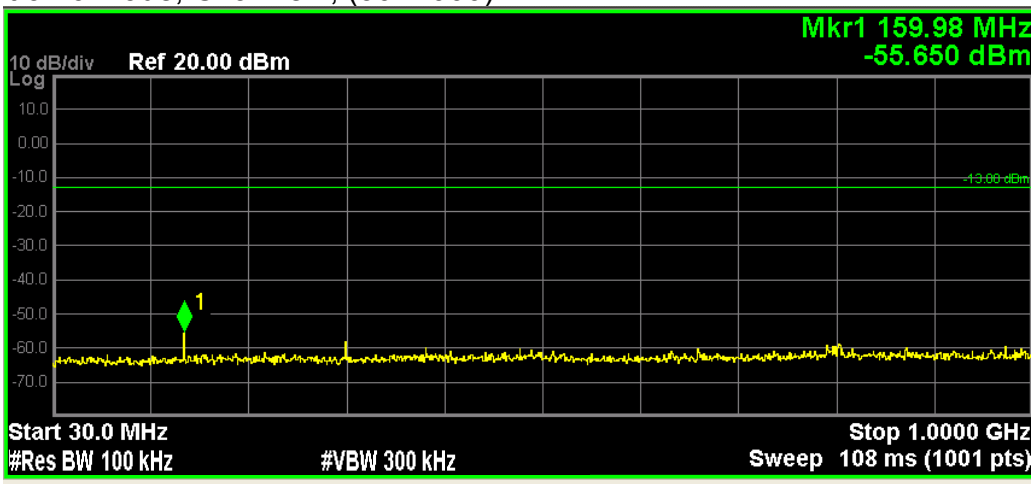
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	23.849 GHz	-48.366 dBm			
2								
3								
4								
5								
6								
7								
8								

802.11n, traffic mode; Channel 1; Below 30 MHz



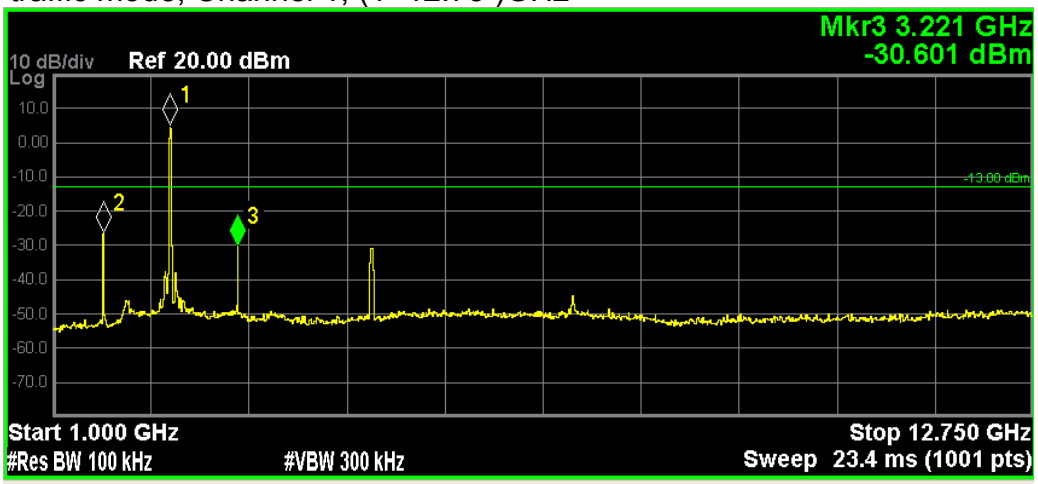
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	489 kHz	-42.414 dBm			
2								
3								
4								
5								
6								

802.11n, traffic mode; Channel1; (30~1000) MHz



MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	159.98 MHz	-55.650 dBm			
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

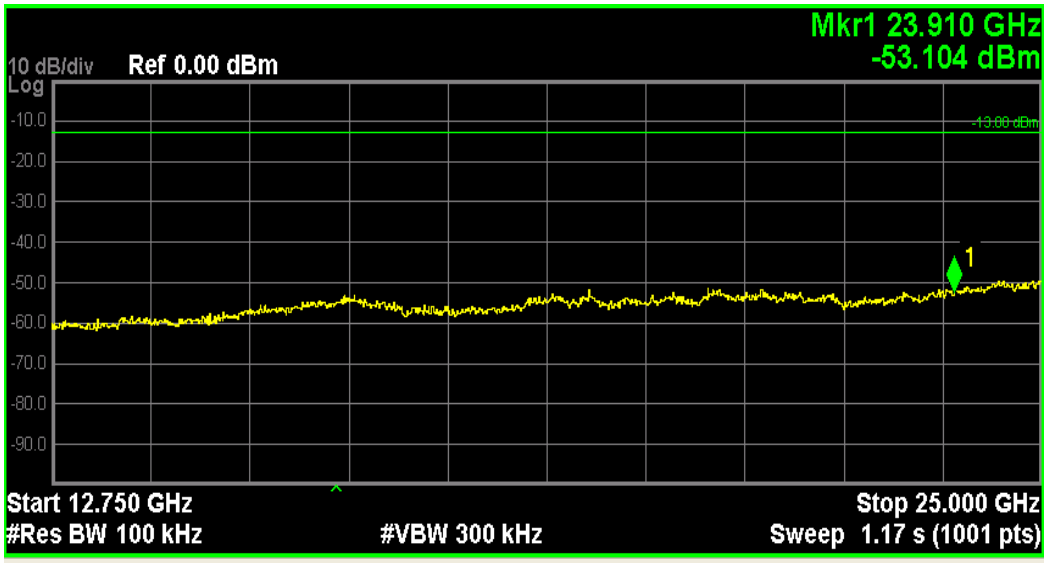
802.11n, traffic mode; Channel 1; (1~12.75)GHz



MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.410 GHz	4.595 dBm			
2	N	1	f	1.611 GHz	-26.675 dBm			
3	N	1	f	3.221 GHz	-30.601 dBm			
4								
5								
6								
7								
8								
9								
10								
11								
12								

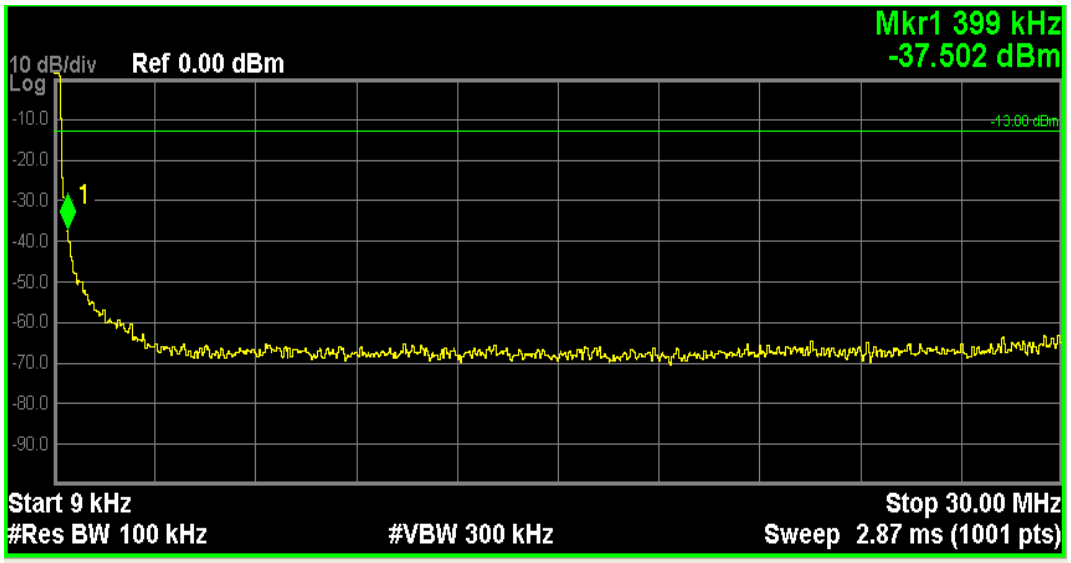
Note: The point mark1 is carrier.

802.11n, traffic mode; Channel 1; (12.75~25)GHz



MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	23.910 GHz	-53.104 dBm			
2								
3								
4								
5								
6								
7								

802.11n, traffic mode; Channel 7; Below 30 MHz

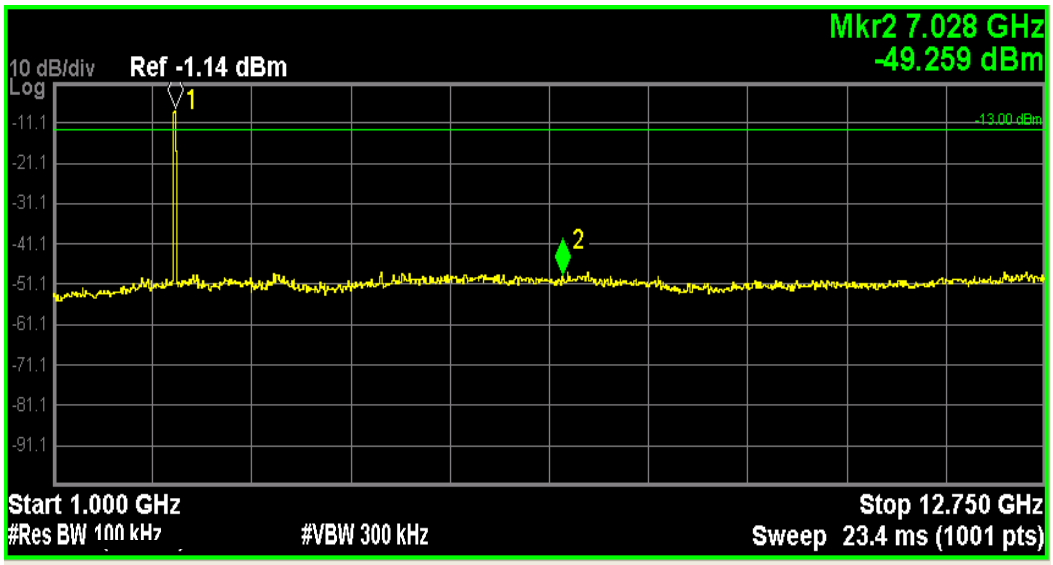


MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	399 kHz	-37.502 dBm			
2								
3								
4								
5								
6								
7								

802.11n, traffic mode; Channel7; (30~1000) MHz

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	745.86 MHz	-58.985 dBm			
2								
3								
4								
5								
6								
7								

802.11n, traffic mode; Channel7; (1~12.75) GHz



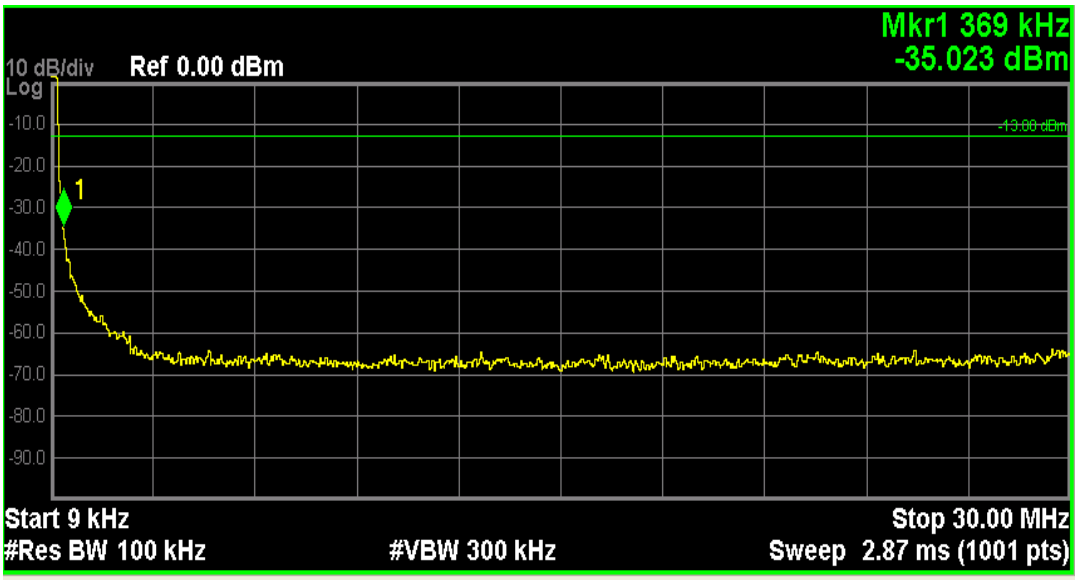
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.445 GHz	-8.123 dBm			
2	N	1	f	7.028 GHz	-49.259 dBm			
3								
4								
5								
6								
7								

Note: The point mark1 is carrier.

802.11n, traffic mode; Channel7; (12.75~25) GHz

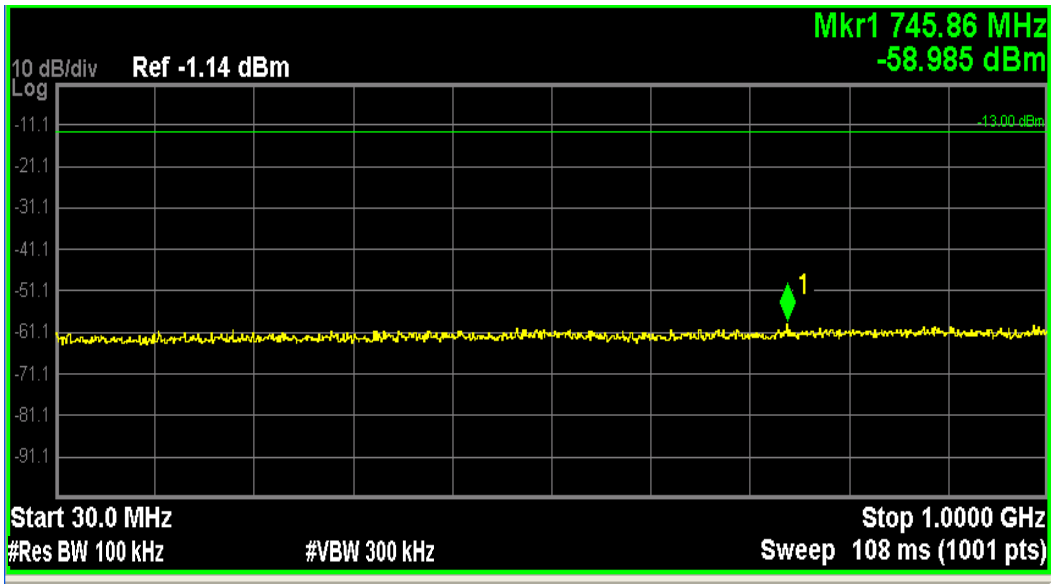
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	20.884 GHz	-42.883 dBm			
2								
3								
4								
5								
6								
7								
8								

802.11n, traffic mode; Channel 11; Below 30 MHz



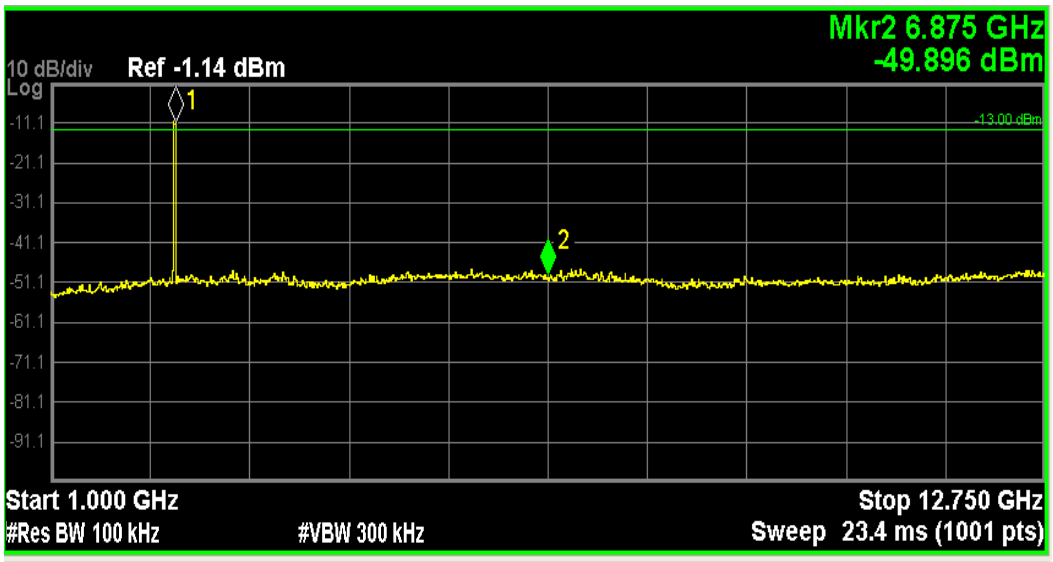
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	369 kHz	-35.023 dBm			
2								
3								
4								
5								
6								

802.11n, traffic mode; Channel11; (30~1000) MHz



MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	745.86 MHz	-58.985 dBm			
2								
3								
4								
5								
6								

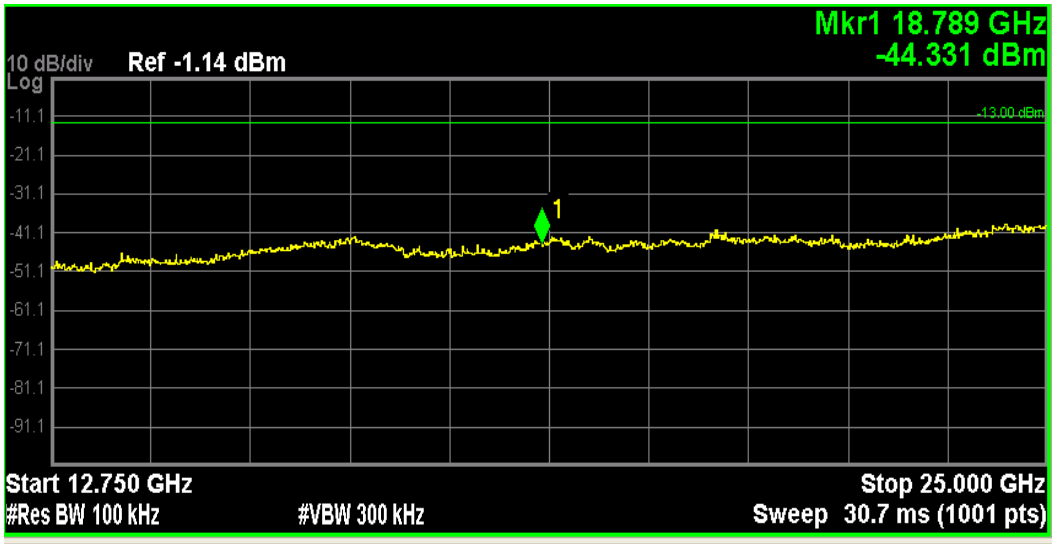
802.11n, traffic mode; Channel11; (1~12.75) GHz



MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.469 GHz	-11.565 dBm			
2	N	1	f	6.875 GHz	-49.896 dBm			
3								
4								
5								
6								
7								

Note: The point mark1 is carrier.

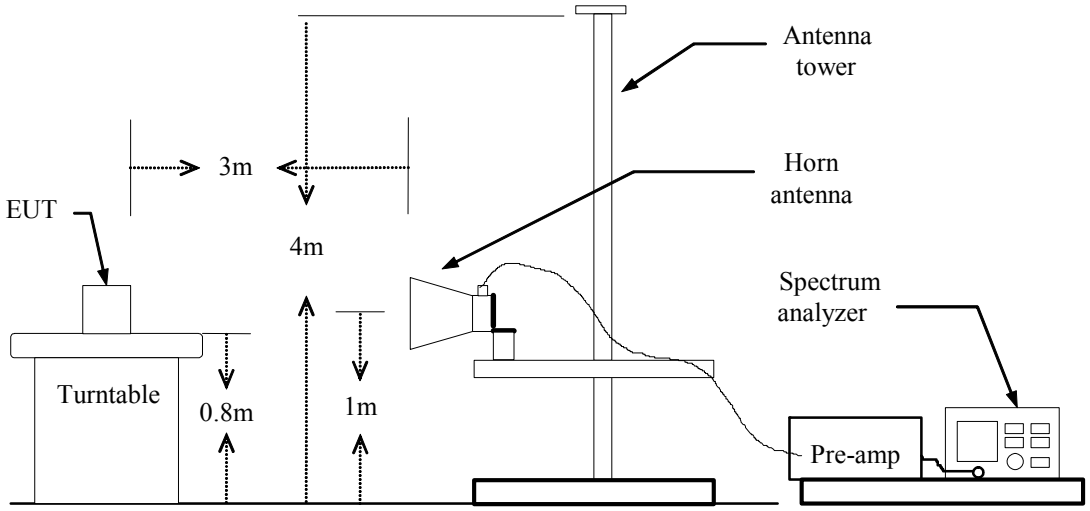
802.11n, traffic mode; Channel11; (12.75~25) GHz



MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	18.789 GHz	-44.331 dBm			
2								
3								
4								
5								
6								
7								
8								

9. BAND EDGE MEASUREMENT

9.1 TEST SETUP



9.2 LIMITS

According to §15.247(c), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, 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 in15.209(a).

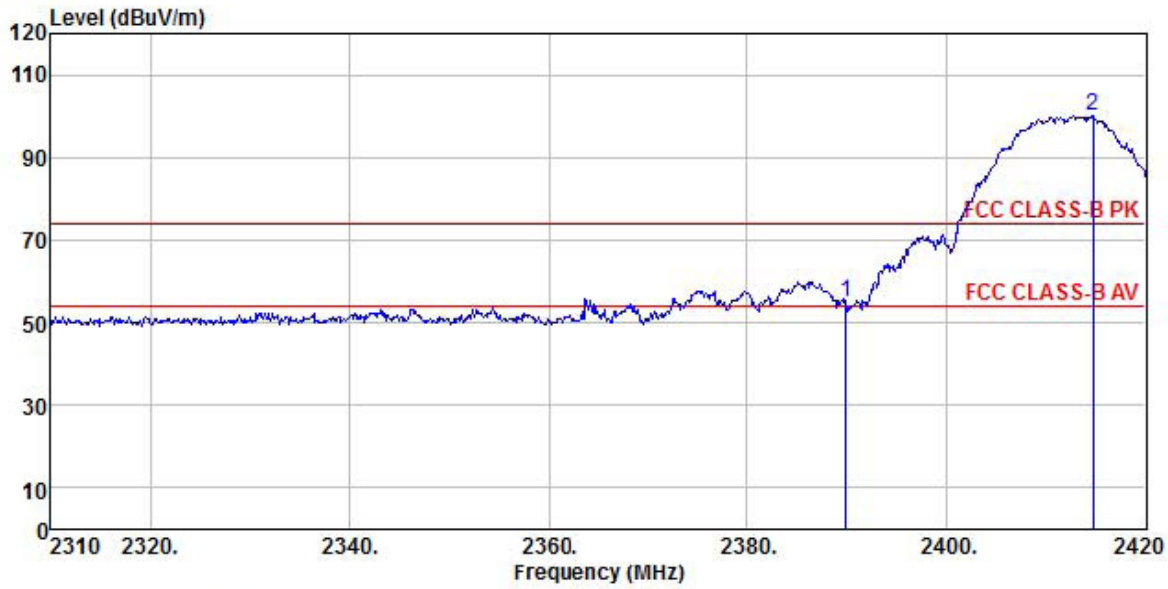
9.3 TEST PROCEDURE

The EUT is placed on a turntable, which is 0.8m above the ground plane.
The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
PEAK: RBW=VBW=1MHz / Sweep=AUTO
AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

9.4 RESULTS & PERFORMANCE

802.11b (low channel)

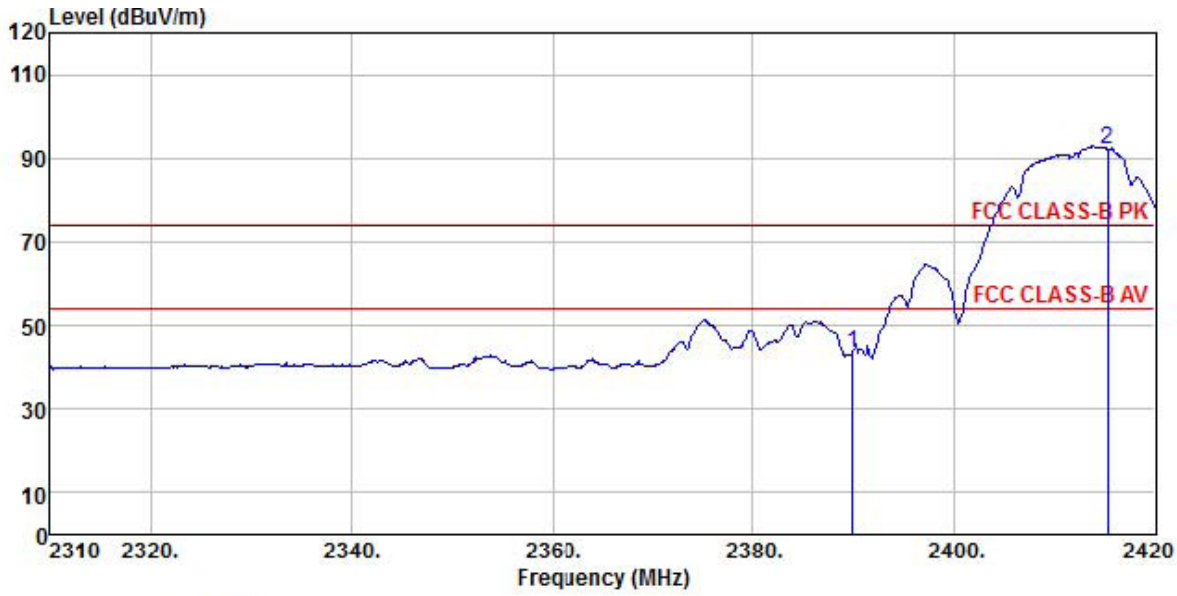
Detector mode: Peak Polarity: Horizontal



Site : chamber
Condition : FCC CLASS-B PK 3m BBHA9120D(943) HORIZONTAL
EUT : SD Card Mobile DVR
Model Name : RCM-MDR301WDG
Temp/Humi : 21℃/54%
Power Rating: DC 12V
Mode : 802.11 b ch1
Memo :

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2389.97	58.66	27.58	7.13	38.34	55.03	74.00	-18.97	Peak
2 pp	2414.72	103.75	27.54	7.21	38.34	100.16	74.00	26.16	Peak

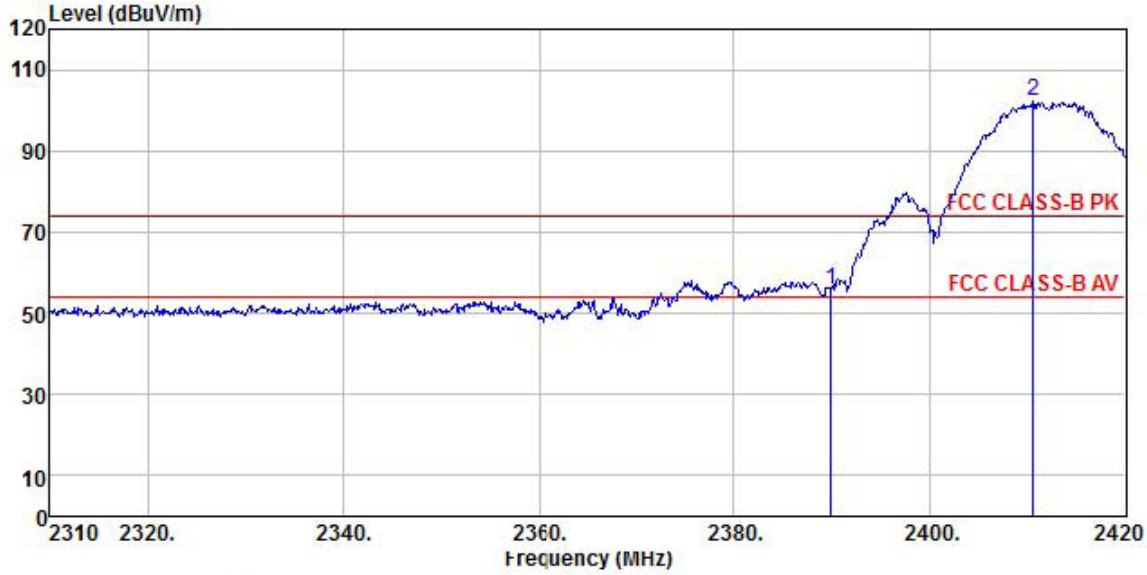
Detector mode: Average Polarity: Horizontal



Site : chamber
Condition : FCC CLASS-B PK 3m BBHA9120D(943) HORIZONTAL
EUT : SD Card Mobile DVR
Model Name : RCM-MDR301WDG
Temp/Humi : 21℃/54%
Power Rating: DC 12V
Mode : 802.11 b ch1
Memo :

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2389.97	47.18	27.58	7.13	38.34	43.55	54.00	-10.45	Average
2 pp	2415.27	95.87	27.54	7.21	38.34	92.28	54.00	38.28	Average

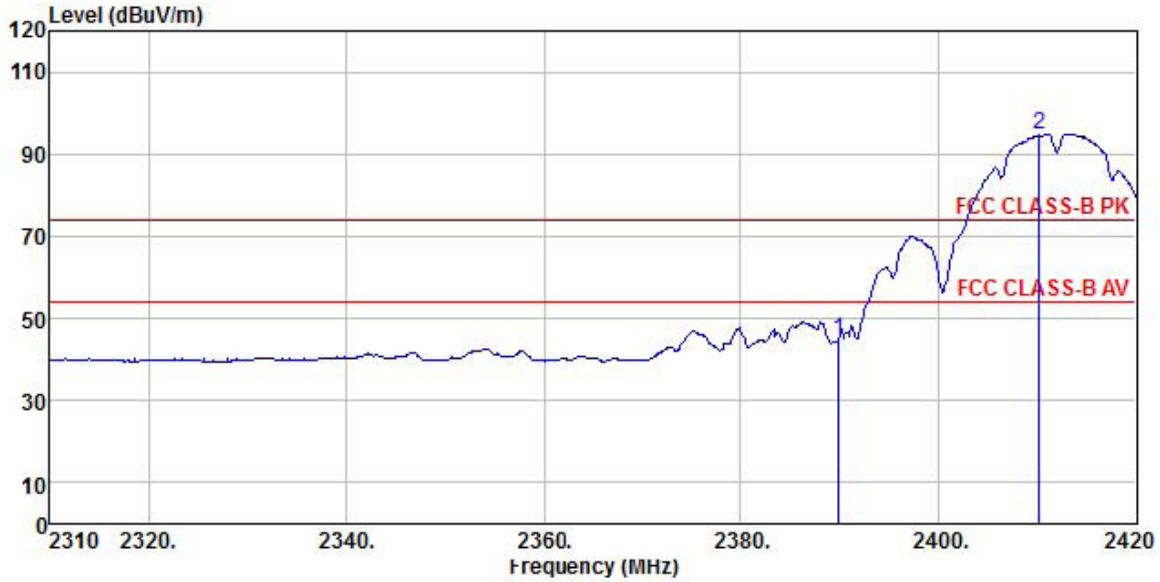
Detector mode: Peak Polarity: Vertical



Site : chamber
Condition : FCC CLASS-B PK 3m BBHA9120D(943) VERTICAL
EUT : SD Card Mobile DVR
Model Name : RCM-MDR301WDG
Temp/Humi : 21℃/54%
Power Rating: DC 12V
Mode : 802.11 b ch1
Memo :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2389.97	59.51	27.58	7.13	38.34	55.88	74.00	-18.12	Peak
2 pp	2410.54	105.82	27.54	7.21	38.34	102.23	74.00	28.23	Peak

Detector mode: Average Polarity: Vertical

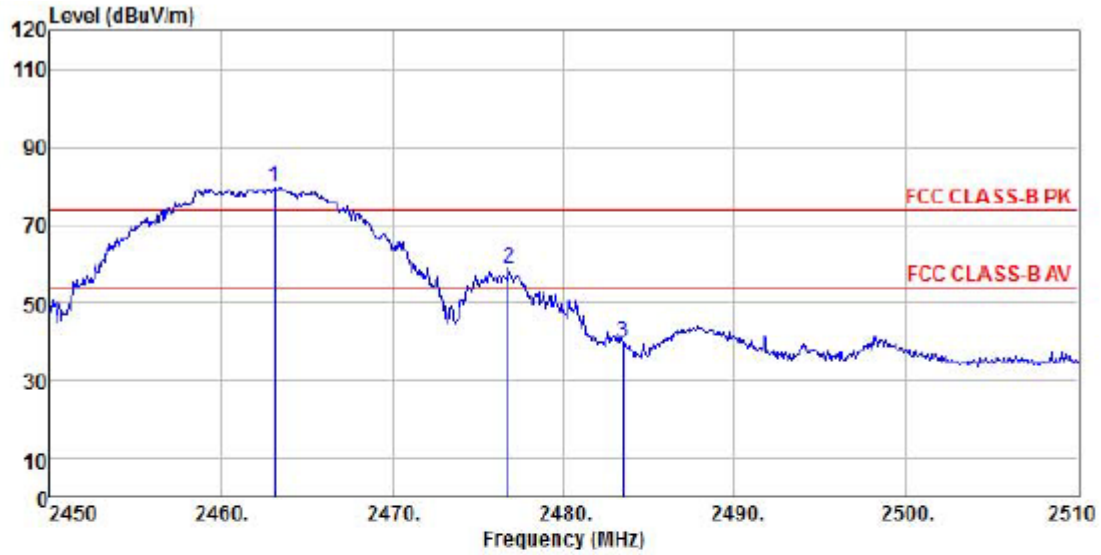


Site : chamber
Condition : FCC CLASS-B PK 3m BBHA9120D(943) VERTICAL
EUT : SD Card Mobile DVR
Model Name : RCM-MDR301WDG
Temp/Humi : 21℃/54%
Power Rating: DC 12V
Mode : 802.11 b ch1
Memo :

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2389.97	48.57	27.58	7.13	38.34	44.94	54.00	-9.06	Average
2 pp	2410.21	98.18	27.54	7.21	38.34	94.59	54.00	40.59	Average

802.11b (high channel)

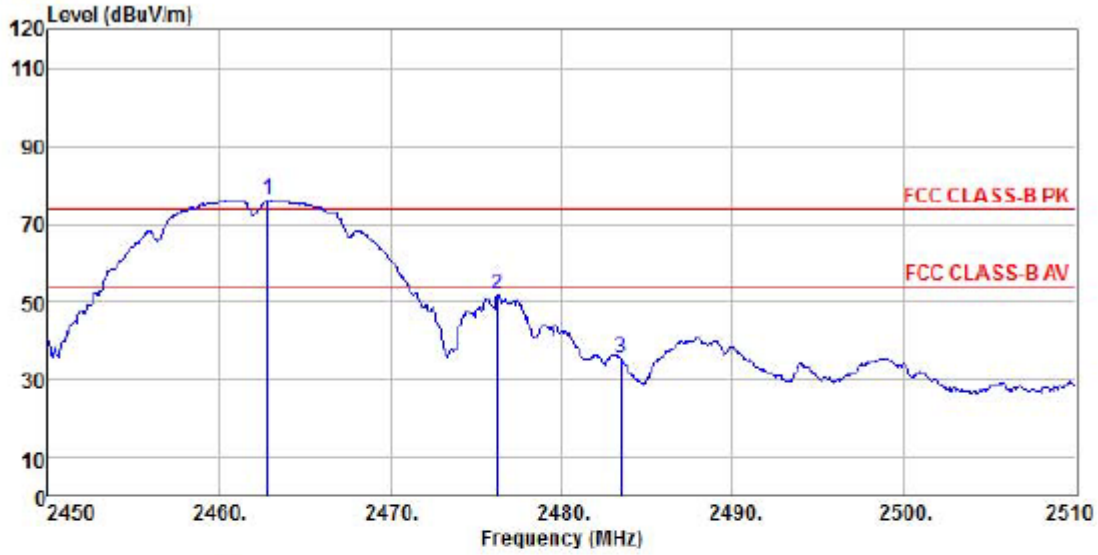
Detector mode: Peak Polarity: Horizontal



Site : chamber
Condition : FCC CLASS-B PK 3m BBHA9120D(943) HORIZONTAL
EUT : SD Card Mobile DVR
Model Name : RCM-MDR301WDG
Temp/Humi : 21℃/54%
Power Rating: DC 12V
Mode : 802.11b ch11
Memo :

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 pp	2463.08	83.05	27.49	7.39	38.32	79.61	74.00	5.61	Peak
2	2476.82	62.09	27.52	7.41	38.31	58.71	74.00	-15.29	Peak
3	2483.48	43.38	27.52	7.41	38.31	40.00	74.00	-34.00	Peak

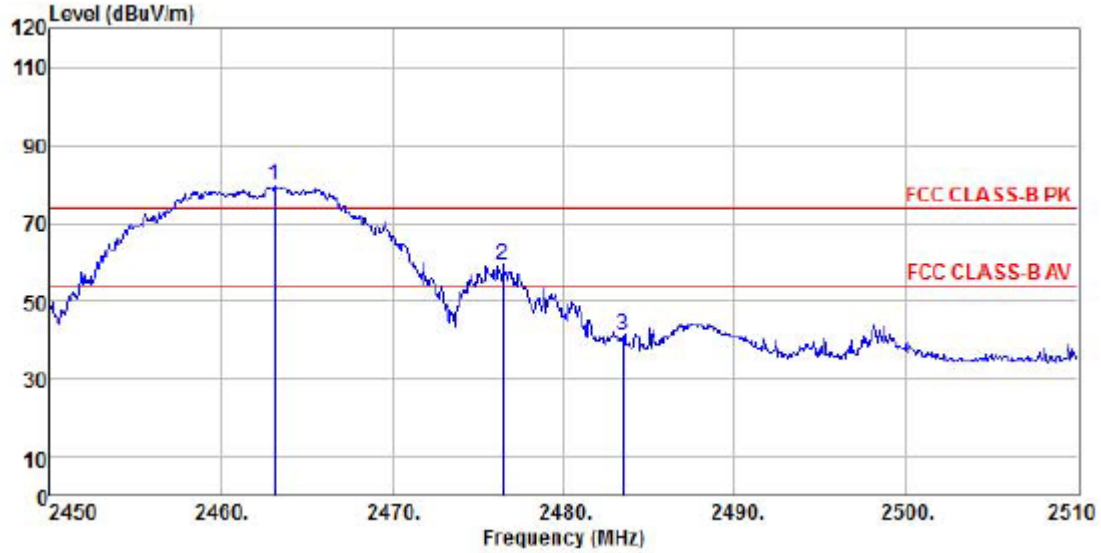
Detector mode: Average Polarity: Horizontal



Site : chamber
Condition : FCC CLASS-B PK 3m BBHA9120D(943) HORIZONTAL
EUT : SD Card Mobile DVR
Model Name : RCM-MDR301WDG
Temp/Humi : 21℃/54%
Power Rating: DC 12V
Mode : 802.11b ch11
Memo :

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 pp	2462.84	79.59	27.49	7.39	38.32	76.15	54.00	22.15	Average
2	2476.28	55.11	27.52	7.41	38.31	51.73	54.00	-2.27	Average
3	2483.48	38.72	27.52	7.41	38.31	35.34	54.00	-18.66	Average

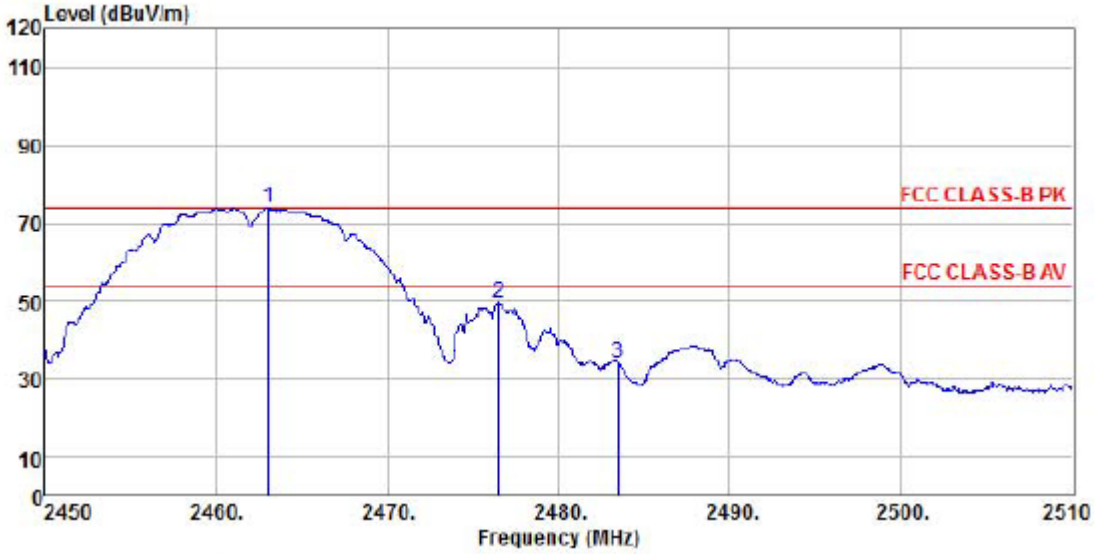
Detector mode: Peak Polarity: Vertical



Site : chamber
Condition : FCC CLASS-B PK 3m BBHA9120D(943) VERTICAL
EUT : SD Card Mobile DVR
Model Name : RCM-MDR301WDG
Temp/Humi : 21℃/54%
Power Rating: DC 12V
Mode : 802.11b ch11
Memo :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 pp	2463.08	83.12	27.49	7.39	38.32	79.68	74.00	5.68	Peak
2	2476.46	62.63	27.52	7.41	38.31	59.25	74.00	-14.75	Peak
3	2483.48	44.50	27.52	7.41	38.31	41.12	74.00	-32.88	Peak

Detector mode: Average Polarity: Vertical

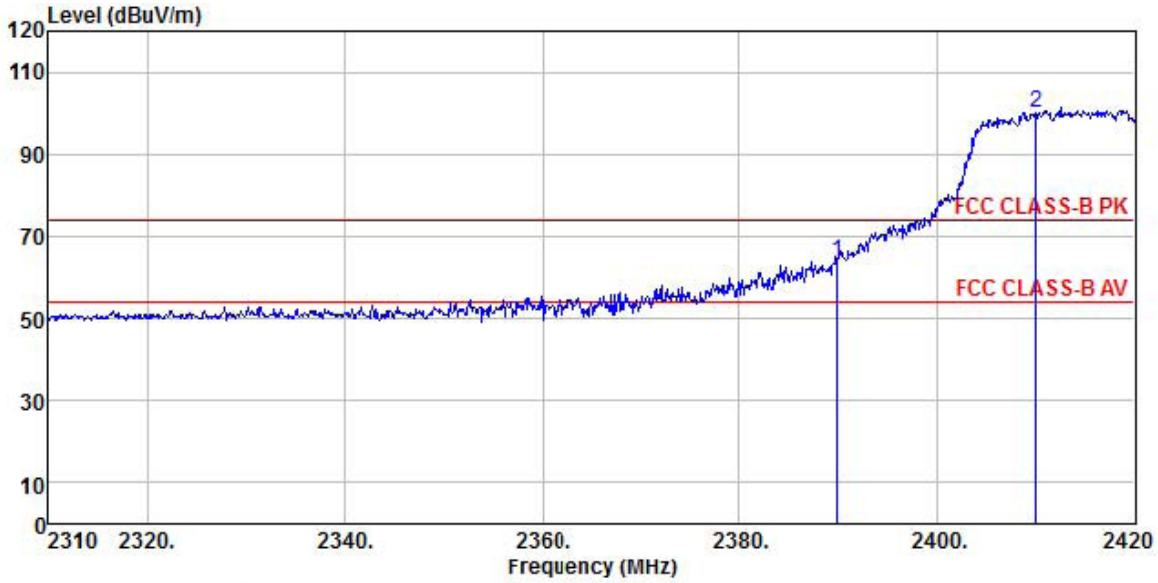


Site : chamber
Condition : FCC CLASS-B PK 3m BBHA9120D(943) VERTICAL
EUT : SD Card Mobile DVR
Model Name : RCM-MDR301WDG
Temp/Humi : 21℃/54%
Power Rating: DC 12V
Mode : 802.11b ch11
Memo :

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 pp	2463.02	77.37	27.49	7.39	38.32	73.93	54.00	19.93	Average
2	2476.52	53.14	27.52	7.41	38.31	49.76	54.00	-4.24	Average
3	2483.48	37.48	27.52	7.41	38.31	34.10	54.00	-19.90	Average

802.11g (low channel)

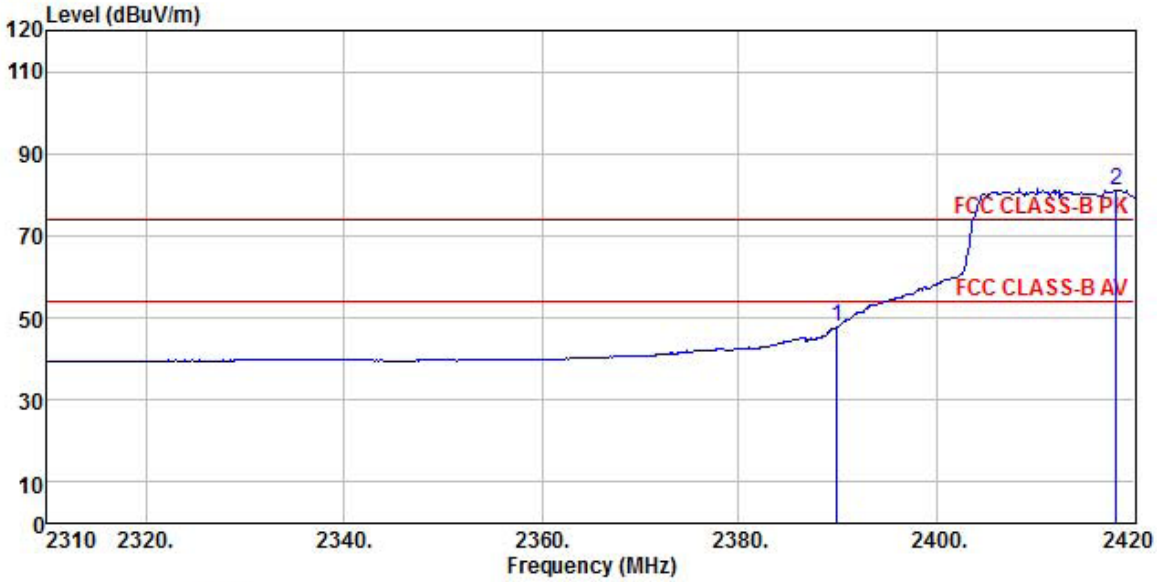
Detector mode: Peak Polarity: Horizontal



Site : chamber
Condition : FCC CLASS-B PK 3m BBHA9120D(943) HORIZONTAL
EUT : SD Card Mobile DVR
Model Name : RCM-MDR301WDG
Temp/Humi : 21℃/54%
Power Rating: DC 12V
Mode : 802.11 g ch1
Memo :

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2389.97	67.25	27.58	7.13	38.34	63.62	74.00	-10.38	Peak
2 pp	2409.99	103.74	27.54	7.21	38.34	100.15	74.00	26.15	Peak

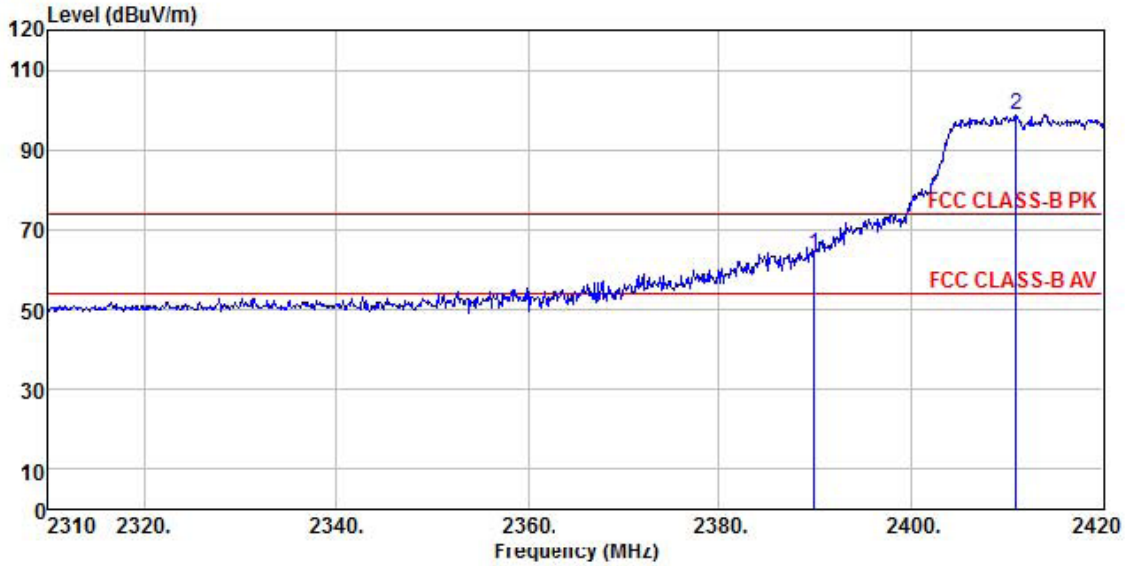
Detector mode: Average Polarity: Horizontal



Site : chamber
Condition : FCC CLASS-B PK 3m BBHA9120D(943) HORIZONTAL
EUT : SD Card Mobile DVR
Model Name : RCM-MDR301WDG
Temp/Humi : 21℃/54%
Power Rating: DC 12V
Mode : 802.11 g ch1
Memo :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2389.97	51.32	27.58	7.13	38.34	47.69	54.00	-6.31	Average
2 pp	2418.13	84.62	27.54	7.21	38.34	81.03	54.00	27.03	Average

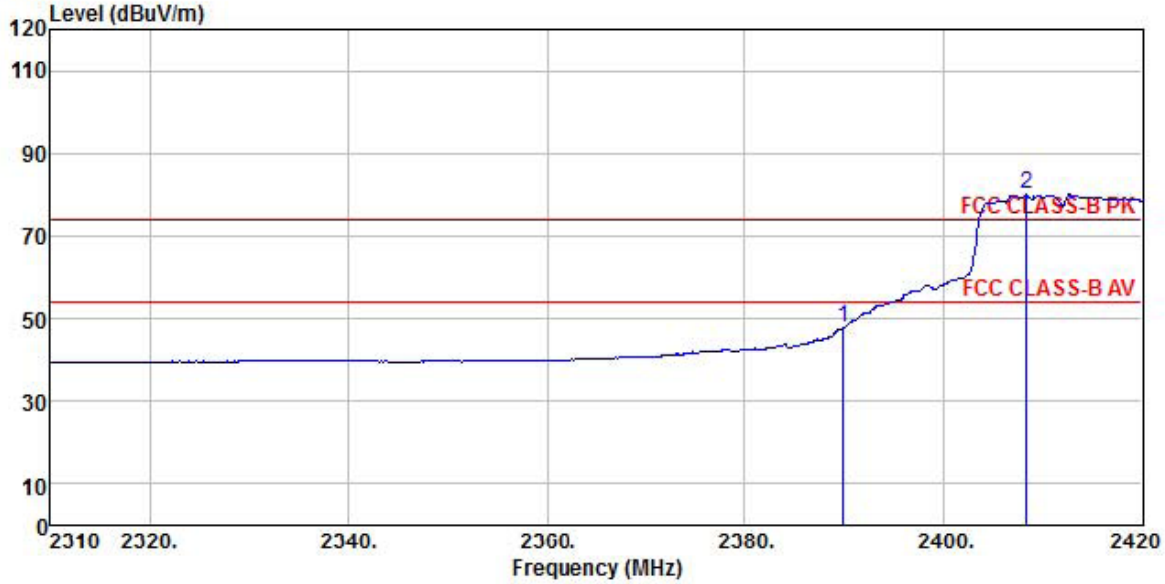
Detector mode: Peak Polarity: Vertical



Site : chamber
Condition : FCC CLASS-B PK 3m BBHA9120D(943) VERTICAL
EUT : SD Card Mobile DVR
Model Name : RCM-MDR301WDG
Temp/Humi : 21℃/54%
Power Rating: DC 12V
Mode : 802.11 g ch1
Memo :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2389.97	67.25	27.58	7.13	38.34	63.62	74.00	-10.38	Peak
2 pp	2410.98	102.15	27.54	7.21	38.34	98.56	74.00	24.56	Peak

Detector mode: Average Polarity: Vertical

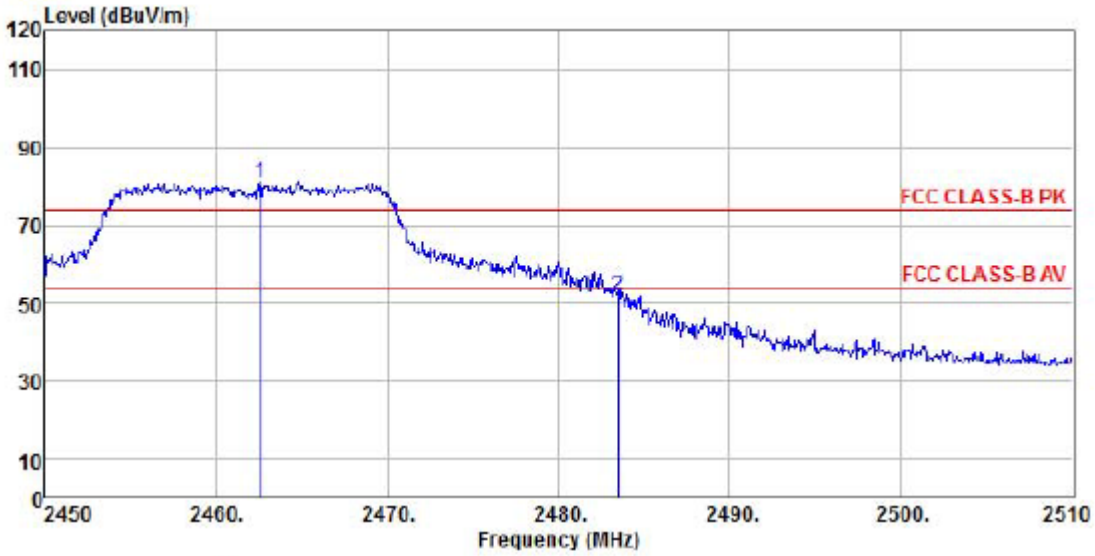


Site : chamber
Condition : FCC CLASS-B PK 3m BBHA9120D(943) VERTICAL
EUT : SD Card Mobile DVR
Model Name : RCM-MDR301WDG
Temp/Humi : 21℃/54%
Power Rating: DC 12V
Mode : 802.11 g ch1
Memo :

	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2389.97	51.32	27.58	7.13	38.34	47.69	54.00	-6.31	Average
2 pp	2408.34	83.91	27.54	7.21	38.34	80.32	54.00	26.32	Average

802.11g (high channel)

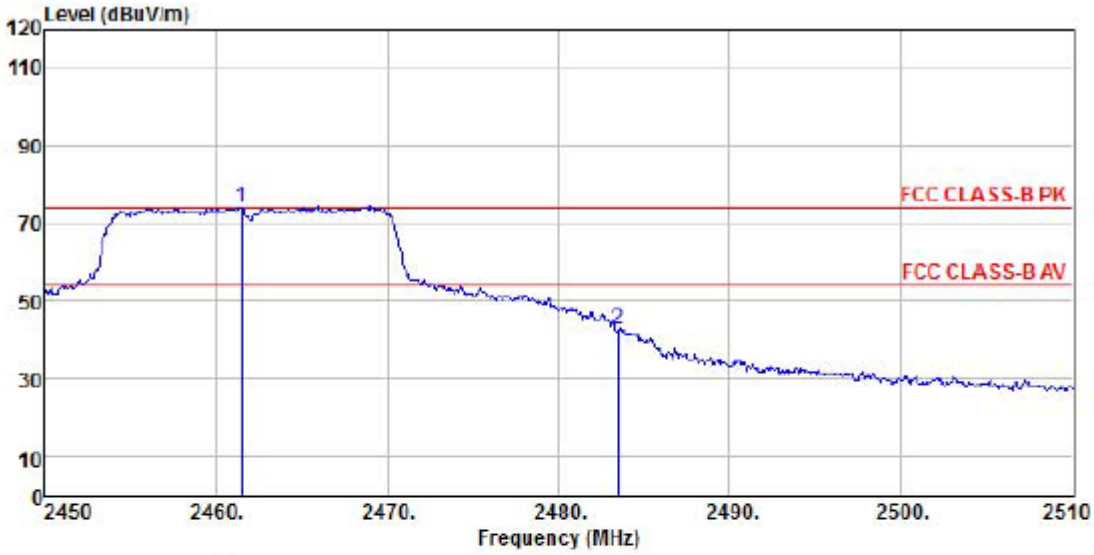
Detector mode: Peak Polarity: Horizontal



Site : chamber
Condition : FCC CLASS-B PK 3m BBHA9120D(943) HORIZONTAL
EUT : SD Card Mobile DVR
Model Name : RCM-MDR301WDG
Temp/Humi : 21℃/54%
Power Rating: DC 12V
Mode : 802.11g ch11
Memo :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 pp	2462.60	84.44	27.49	7.39	38.32	81.00	74.00	7.00	Peak
2	2483.48	55.40	27.52	7.41	38.31	52.02	74.00	-21.98	Peak

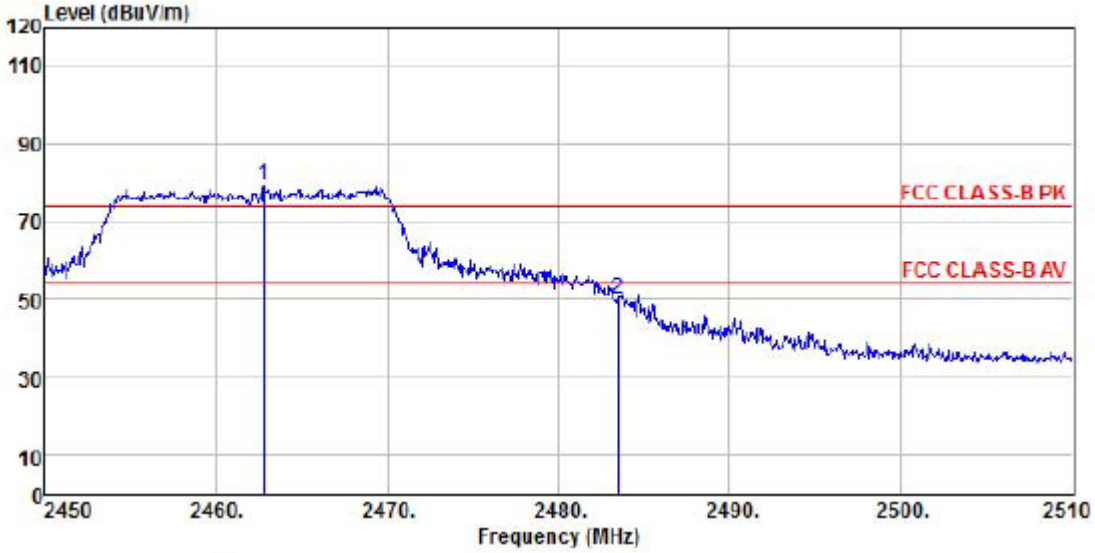
Detector mode: Average Polarity: Horizontal



Site : chamber
Condition : FCC CLASS-B PK 3m BBHA9120D(943) HORIZONTAL
EUT : SD Card Mobile DVR
Model Name : RCM-MDR301WDG
Temp/Humi : 21℃/54%
Power Rating: DC 12V
Mode : 802.11g ch11
Memo :

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 pp	2461.46	77.43	27.49	7.39	38.32	73.99	54.00	19.99	Average
2	2483.48	45.95	27.52	7.41	38.31	42.57	54.00	-11.43	Average

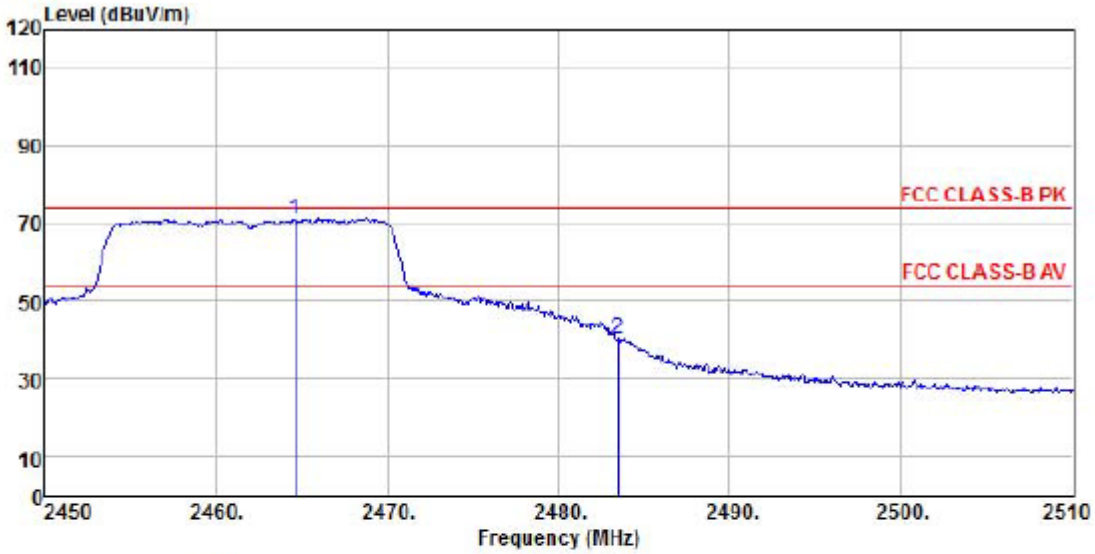
Detector mode: Peak Polarity: Vertical



Site : chamber
Condition : FCC CLASS-B PK 3m BBHA9120D(943) VERTICAL
EUT : SD Card Mobile DVR
Model Name : RCM-MDR301WDG
Temp/Humi : 21℃/54%
Power Rating: DC 12V
Mode : 802.11g ch11
Memo :

	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 pp	2462.78	82.70	27.49	7.39	38.32	79.26	74.00	5.26	Peak
2	2483.48	53.51	27.52	7.41	38.31	50.13	74.00	-23.87	Peak

Detector mode: Average Polarity: Vertical



Site : chamber
Condition : FCC CLASS-B PK 3m BBHA9120D(943) VERTICAL
EUT : SD Card Mobile DVR
Model Name : RCM-MDR301WDG
Temp/Humi : 21℃/54%
Power Rating: DC 12V
Mode : 802.11g ch11
Memo :

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 pp	2464.58	74.34	27.49	7.39	38.32	70.90	54.00	16.90	Average
2	2483.48	43.75	27.52	7.41	38.31	40.37	54.00	-13.63	Average