Report No.SH16060047W01

FCC RF TEST REPORT

Issued to

Tabler Systems Inc

For

TABLER TOUCH TV

Model Name	:	TTV-65MH
Trade Name	:	Tabler TV
Brand Name	:	Tabler TV
Standard	:	47 CFR Part 15,Subpart C ANSI C63.10-2013
FCC ID	:	2AJIJ-TTV-65MH
Test Date	:	Oct.26,2016 - Oct.31,2016
Issue Date	:	Nov.16, 2016

By

Shanghai Skylabs Co., Ltd.

Tested by Wu Hongfei Approved by Gu Lenjun Review by Xiaodong Wei

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DIRECTORY

Change History

Issue	Date	Reason for change
1.0	Nov.16, 2016	First edition

1. General Information

1.1 Applicant

Tabler Systems Inc
Room A6646，No. 180，South changjiang Road，baoshan District，Shanghai，China

1.2 Manufacturer

Tabler Systems Inc
Room A6646，No. 180，South changjiang Road，baoshan District，Shanghai，China

1.3 Description of EUT

EUT Name ..... :	TABLER TOUCH TV
Model Name ..... :	TTV-65MH
Brand Name ..... :	Tabler TV
Trade Name ..... :	Tabler TV
Hardware Version ..... :	V2.1.0
Software Version..... :	TTV65MH-V2.1.0
Modulation Type ..... :	DSSS (802.11b), OFDM (802.11g/n)
Frequency Range ..... :	2.412GHz - 2.462GHz(at interval of 5 MHz)
Channel Number..... :	11
Antenna Type..... :	PIFA
Antenna Gain ..... :	1 dBi

NOTE 1:
The EUT contains WIFI Module operating at 2.4GHz ISM band, it supports IEEE802.11b, IEEE802.11g, IEEE802.11n and they are all tested in this report. And the WIFI module has a pair of antennas, it can transmitter and receiver with anyone respectively. The frequencies allocated is F (MHz) =2412+5(n-1) (1<=n<=11). The lowest, middle, highest channel numbers of the EUT used and tested in this report are separately 1(2412MHz), 6 (2437MHz) and 11 (2462MHz).*
For IEEE802.11n(40MHz), the lowest, middle, highest channel numbers of the EUT used and tested in this report are separately 3 (2422MHz), 6 (2437MHz) and 9 (2452MHz).
NOTE 2:
For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacture.

2. Facilities and Accreditations

2.1 Test Facility

Shanghai Skylabs Co., Ltd. is a third party testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6644. A 9*6*6(m) full/semi-anechoic chamber was used for the radiated emissions test.

2.2 Environmental Conditions

Ambient temperature: 15~35°C
Relative humidity: 30~60%
Atmosphere pressure: 86~106kPa

2.3 Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.
Uncertainty of Conducted Emission: ±1.76dB
Uncertainty of Radiated Emission: ±3.16dB

2.4 List of Equipment Used

Description	Manufacturer	Model	Serial No.	Cal.Date	Cal. Due
Service Simulator	Agilent	N4010A	MY47230669	2016.9.22	1year
Spectrum Analyzer	R&S	FSU26	200880	2016.6.17	1year
Power Splitter	Weinschel	1506A	NW521	(n.a.)	(n.a.)
Power Splitter	Mini-Circuits	ZFRSC-183-S+	76500F1016	(n.a.)	(n.a.)
Attenuator 1	Resnet	10dB	(n.a.)	(n.a.)	(n.a.)
Attenuator 2	Resnet	3dB	(n.a.)	(n.a.)	(n.a.)
Power supplier	NF	ES2000S	9087735	2016.10.17	1year
Full/Semi-Anechoie Chamber	CHENGYU	9.2×6.25×6.15m	SAR	2016.4.11	3year
EMI Test Receiver	R&S	ESCI7	100787	2016.1.28	1year
Antenna	R&S	HL562	100385	2016.6.17	1year
Antenna	R&S	HF906	100565	2016.6.17	1year
LISN	TESEQ	NNB 51	33285	2016.1.28	1year
Personal Computer	HP	(n.a.)	(n.a.)	(n.a.)	(n.a.)
Test Antenna-Horn	Schwarzbeck	BBHA9170	BBHA91970171	2016.7.25	1year
Test Antenna-Log	Schwarzbeck	VULB 9163	9163-561	2016.7.25	1year
Test Antenna-Loop	Rohde&Schwarz	FMZB 1519	1519-025	2016.7.25	1year
Test Antenna-Horn	Schwarzbeck	BBHA 9120D	BBHA-9120LFA	2016.7.25	1year
Temporary Antenna Connector	Farpu	SMA-K	(n.a.)	(n.a.)	(n.a.)
RF Cable	(n.a.)	0-25GHz	(n.a.)	(n.a.)	(n.a.)

NOTE:
Equipment listed above had been calibrated and are in the period of validation.

3. Test Standards and Results

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

FCC Part 15 Subpart C §15.247
ANSI C63.10-2013
June 2015KDB558074

NOTE:
(1)All test items were verified and recorded according to the standards and without any deviation during the test.
(2)This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart C(WIFI,2.4GHz ISM band radiators),recorded in a separate test report.

Test items and the results are as bellow:

No.	FCC Rules	Description	Result
1	15.203	Antenna Requirement	Pass
2	15.247(b)	Peak Output Power	Pass
3	15.247(a)	6dB &20dB Bandwidth	Pass
4	15.247(d)	Conducted Spurious Emission	Pass
5	15.247(d)	Band Edge	Pass
6	15.207	Conducted Emission	Pass
7	15.247(d) 15.209	Radiated Emission	Pass
8	15.247(e)	Power Spectral Density (PSD)	Pass

4. 47 CFR Part 15C

4.1 Antenna Requirement

4.1.1 Applicable Standard

According to FCC 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

4.1.2 Result: Compliant

The EUT has a permanently and irreplaceable attached antenna. Please refer to the EUT internal photos.

5. Test Result

5.1 Peak Output Power

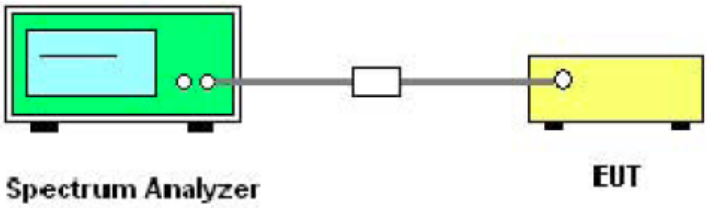
5.1.1 Requirement

According to FCC section 15.247(b)(3), For systems using digital modulation in the 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz bands: The maximum peak conducted output power of the intentional radiator shall not exceed 1 Watt.

5.1.2 Test Description

The measured output power was calculated by the reading of the spectrum analyze(SA) and calibration.

A. Test Setup:



The EUT (Equipment under the test) is coupled to the SA; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading, all test result in power meter.

a) Set span =30MHz
b) Set RBW = 100 KHz.
c) Set VBW = 300 KHz.
d) Number of points = 2 span / RBW.
e) Sweep time = auto.
f) Detector =Average
g) Free run.
h) 100 traces.
i) Compute power by integrating the spectrum across the OBW of the

5.1.3 Test Result

The lowest, middle and highest channels are selected to perform testing to verify the conducted RF output peak power of the WIFI Module.(Duty cycle > 98%)

Test result

Test Mode	CH	Frequency (MHz)	ANT 1(dBm)	ANT 2(dBm)	Limit (dBm)	Result
IEEE 802.11b	1	2412	19.13	19.11	30	Pass
	6	2437	18.95	18.92		Pass
	11	2462	19.03	19.17		Pass
IEEE 802.11g	1	2412	18.91	19.06		Pass
	6	2437	19.10	19.21		Pass
	11	2462	19.07	19.03		Pass

Test Mode	CH	Frequency (MHz)	ANT 1 (dBm)	ANT 2 (dBm)	Conducted Power(dBm)	Limit (dBm)	Result
IEEE 802.11n (20MHz)	1	2412	18.44	18.34	21.40	30	Pass
	6	2437	18.32	18.23	21.29		Pass
	11	2462	18.37	18.31	21.35		Pass
IEEE 802.11n (40MHz)	3	2422	18.14	18.29	21.23		Pass
	6	2437	18.47	18.26	21.38		Pass
	9	2452	18.39	18.33	21.37		Pass

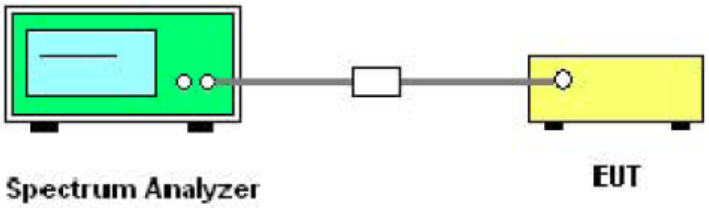
Conclusion: Pass

5.2 6dB &20dB Bandwidth

5.2.1 Requirement

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

5.2.2 Test Description



a) Set RBW = 100kHz
b) Set the video bandwidth (VBW) =300kHz
c) Set span =25MHz
d) Sweep time=auto couple
e) Detector=Peak
f) Trace mode= max hold
g) Allow the trace to stabilize
h) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

5.2.3 Test Result

The lowest, middle and highest channels are selected to perform testing to record the 6 dB bandwidth of the Module.

ANT 1 Test Result:

IEEE 802.11b Test mode

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Refer to plot	20dB Bandwidth (MHz)	Refer to plot	Limit (KHz)	Result
1	2412	9.535	Plot A1	16.306	Plot A2	≥500	Pass
6	2437	8.862	Plot B1	16.074	Plot B2	≥500	Pass
11	2462	9.655	Plot C1	16.306	Plot C2	≥500	Pass

IEEE 802.11g Test mode

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Refer to plot	20dB Bandwidth (MHz)	Refer to plot	Limit (KHz)	Result

1	2412	16.426	Plot D1	18.149	Plot D2	≥500	Pass
6	2437	16.426	Plot E1	18.109	Plot E2	≥500	Pass
11	2462	16.513	Plot F1	17.956	Plot F2	≥500	Pass

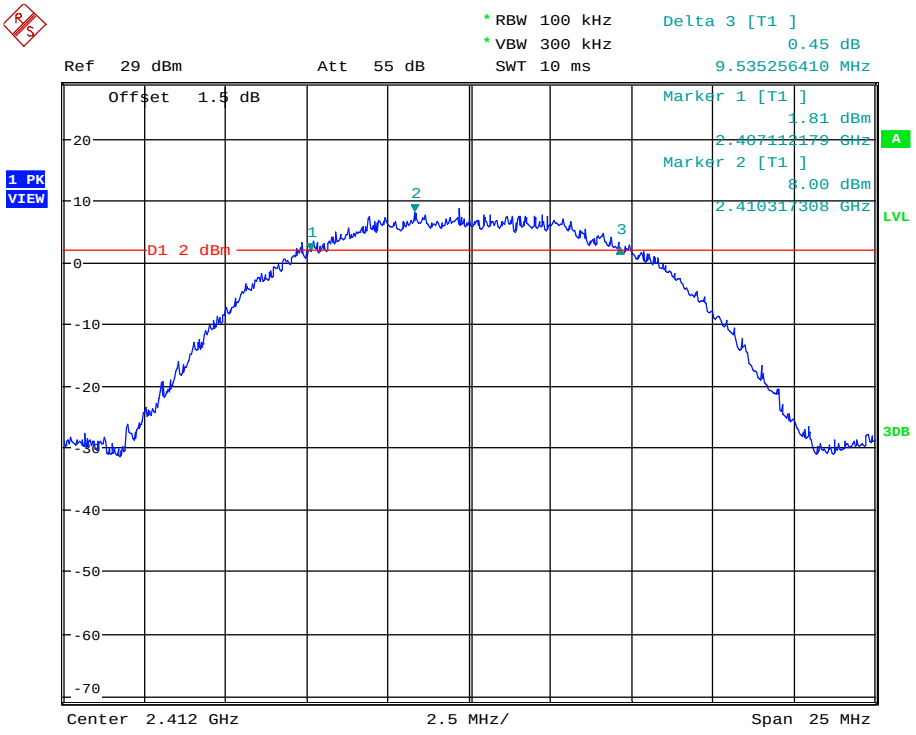
IEEE 802.11n (20MHz) Test mode

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Refer to plot	20dB Bandwidth (MHz)	Refer to plot	Limit (KHz)	Result
1	2412	16.506	Plot G1	17.909	Plot G2	≥500	Pass
6	2437	16.546	Plot H1	17.948	Plot H2	≥500	Pass
11	2462	16.546	Plot I1	17.829	Plot I2	≥500	Pass

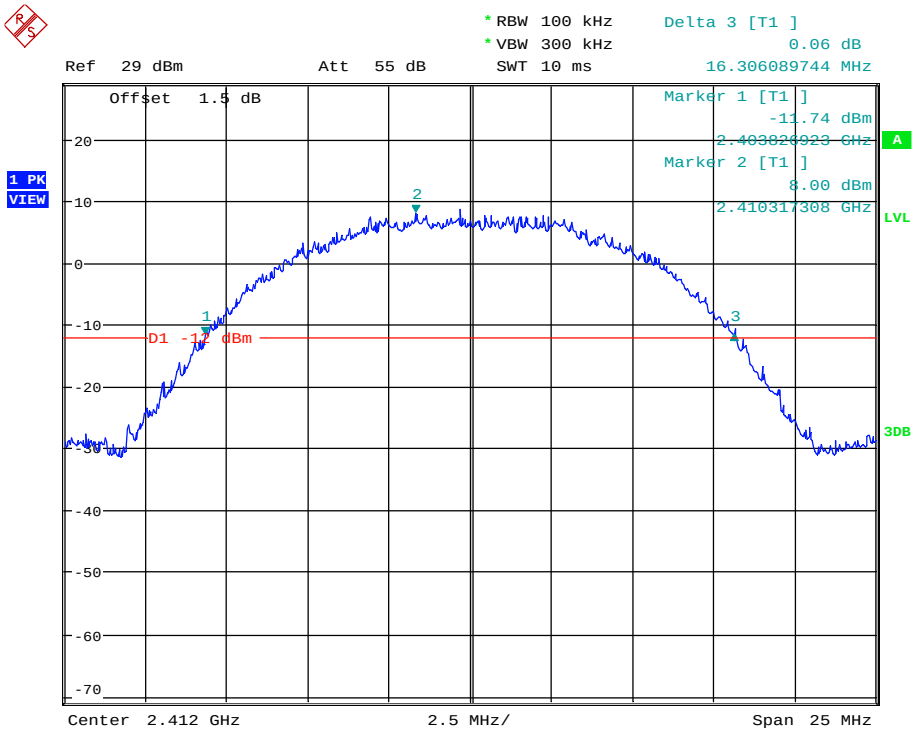
IEEE 802.11n (40MHz) Test mode

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Refer to plot	20dB Bandwidth (MHz)	Refer to plot	Limit (KHz)	Result
3	2422	36.522	Plot J1	38.125	Plot J2	≥500	Pass
6	2437	36.523	Plot K1	37.885	Plot K2	≥500	Pass
9	2452	36.506	Plot L1	37.708	Plot L2	≥500	Pass

Test Plots:

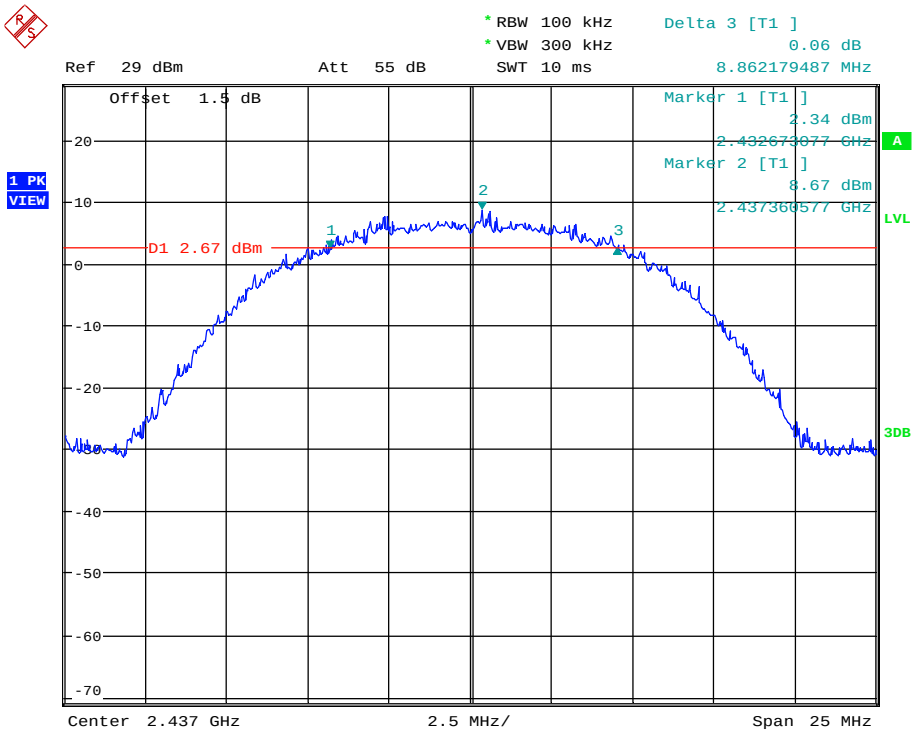


Plot A1



Date: 26.OCT.2016 18:47:55

Plot A2



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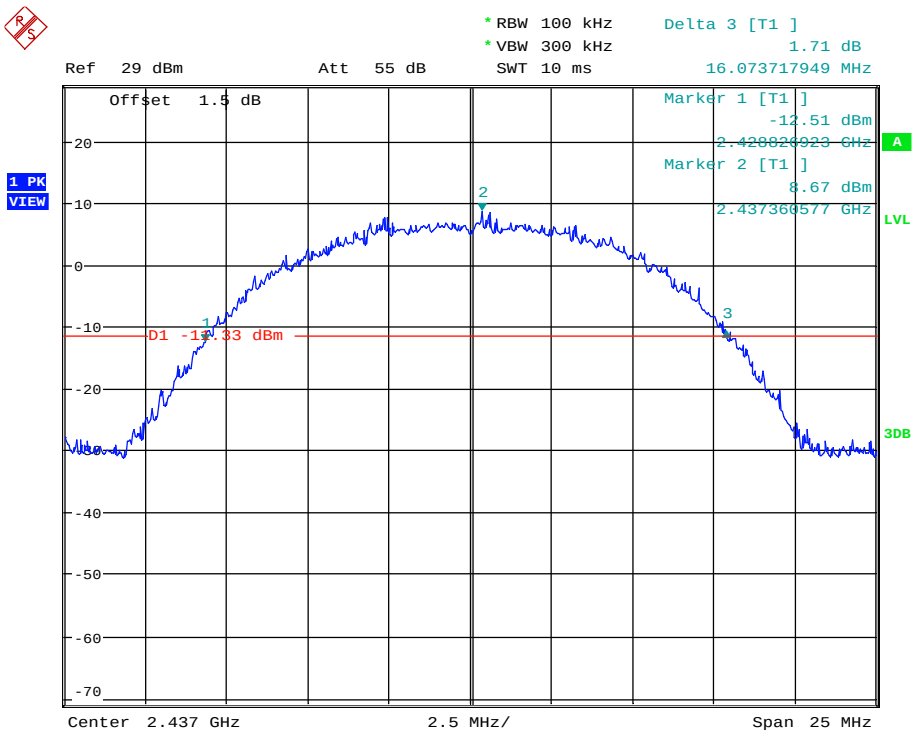
Plot B1



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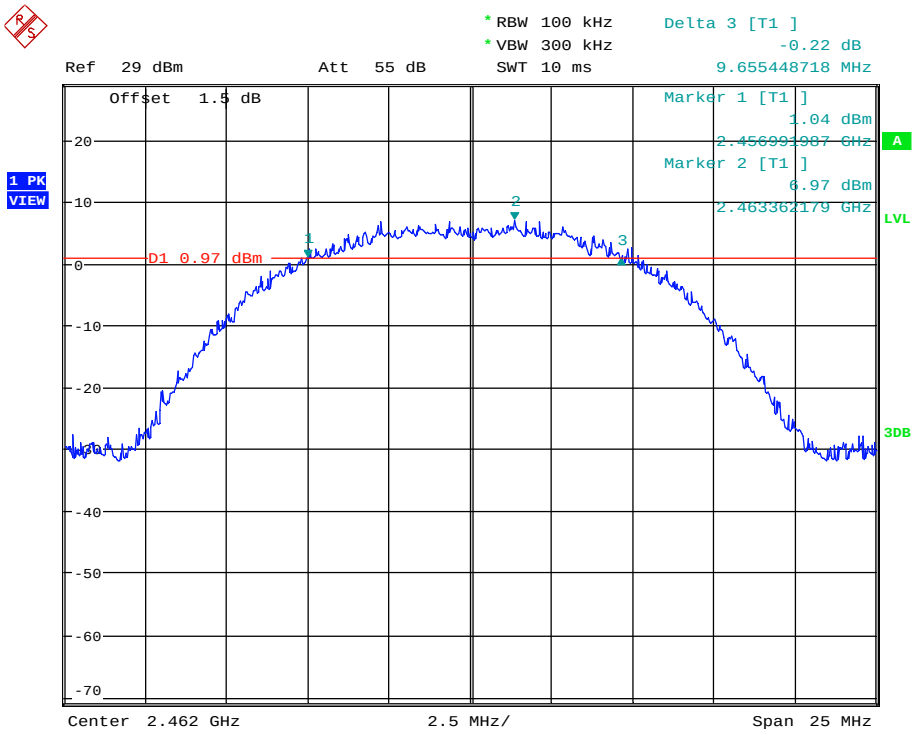
Plot B2



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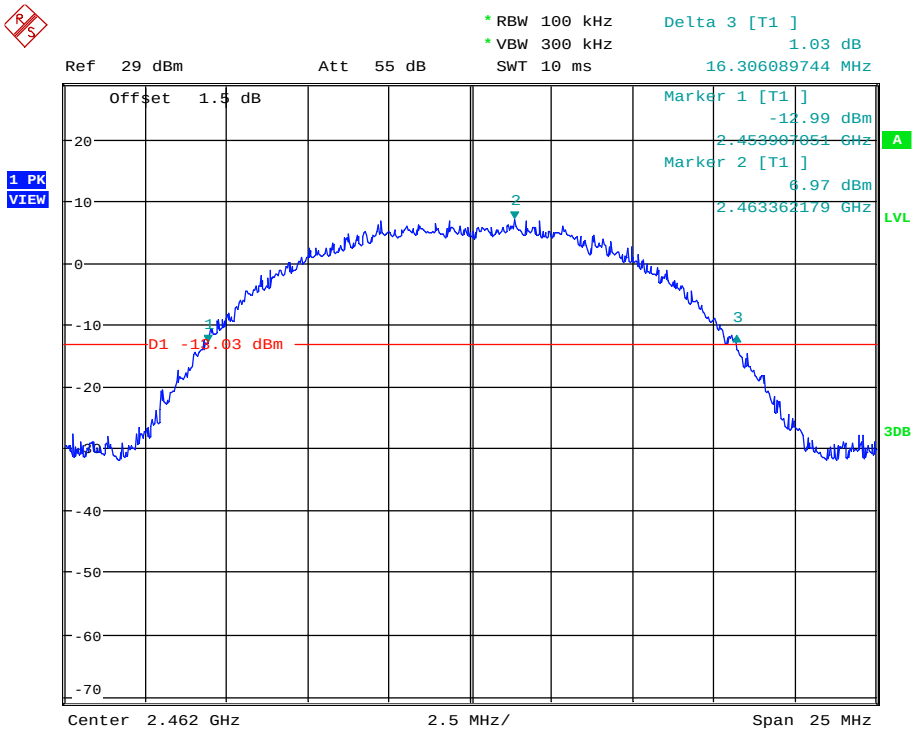
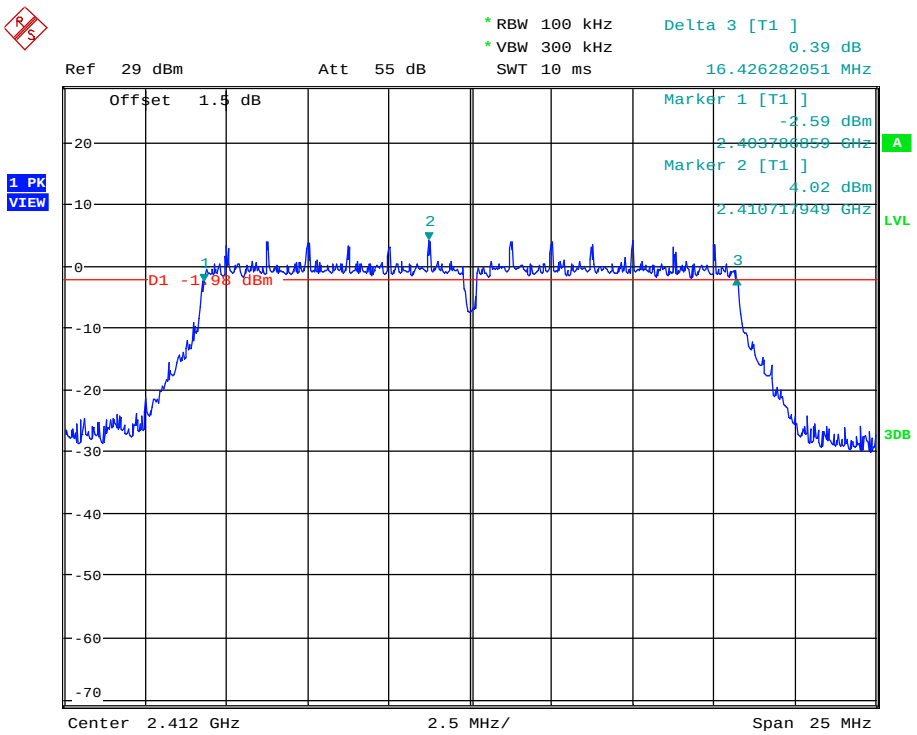
Plot C1



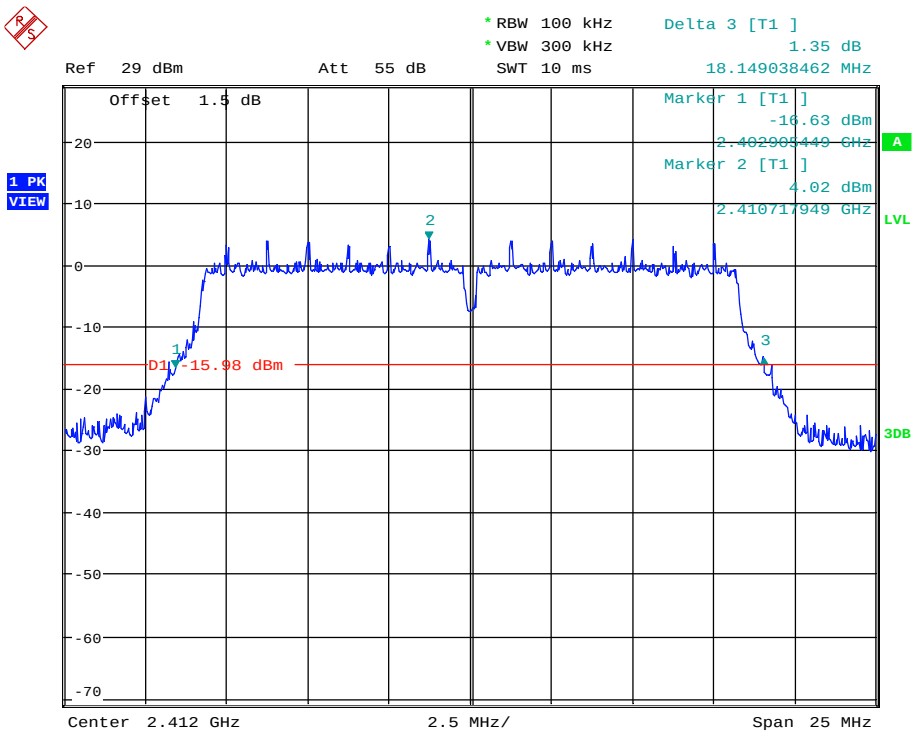
Date: 26.OCT.2016 19:06:58

Plot C2



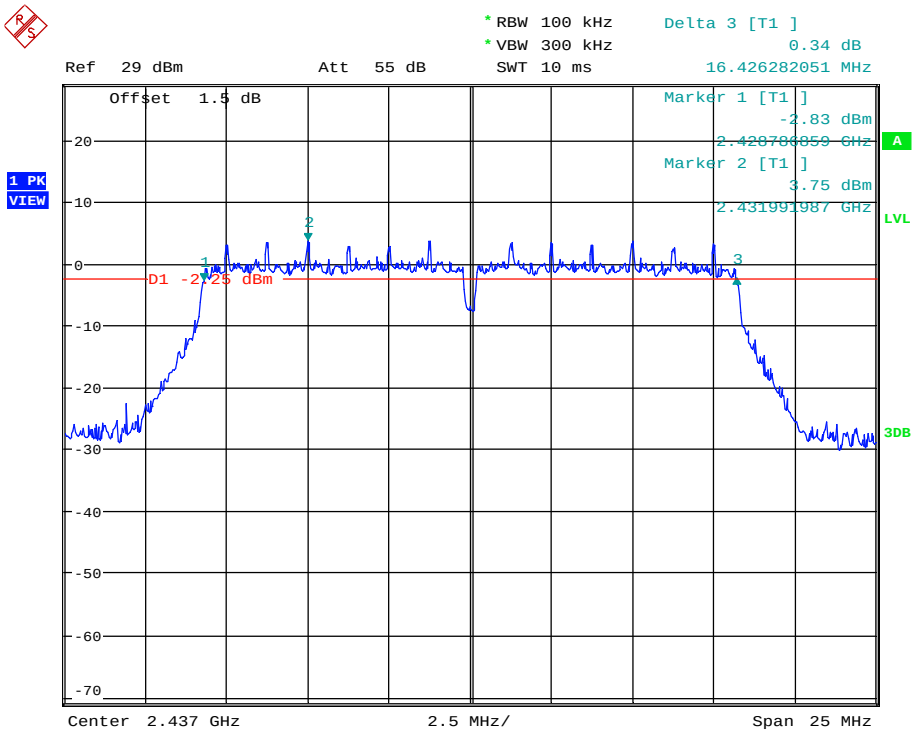
Date: 26.OCT.2016 19:14:32

Plot D1



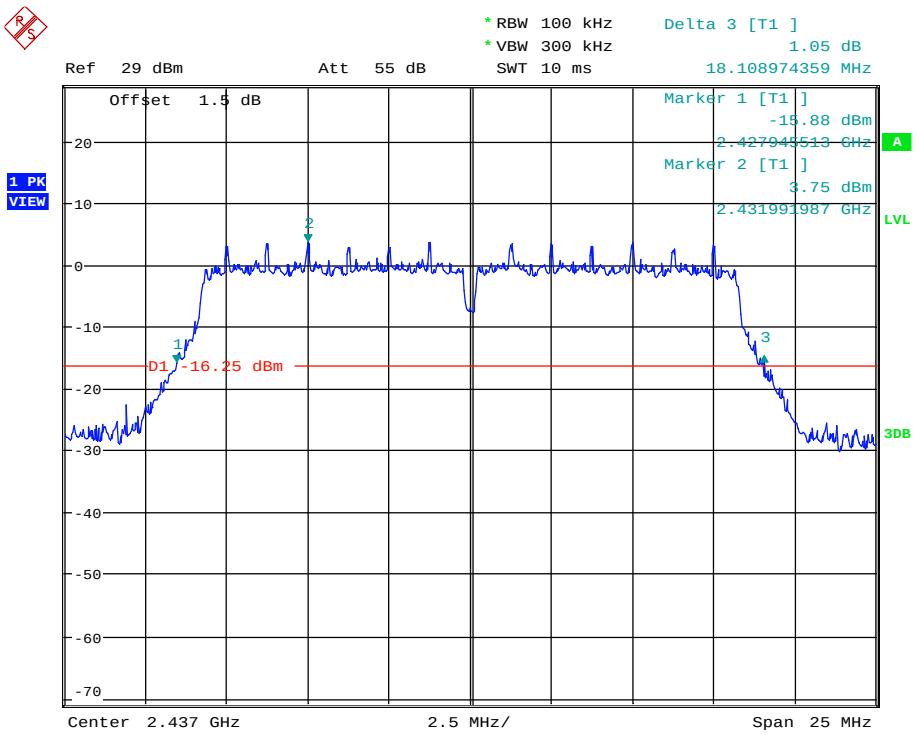
Date: 26.OCT.2016 19:13:50

Plot D2



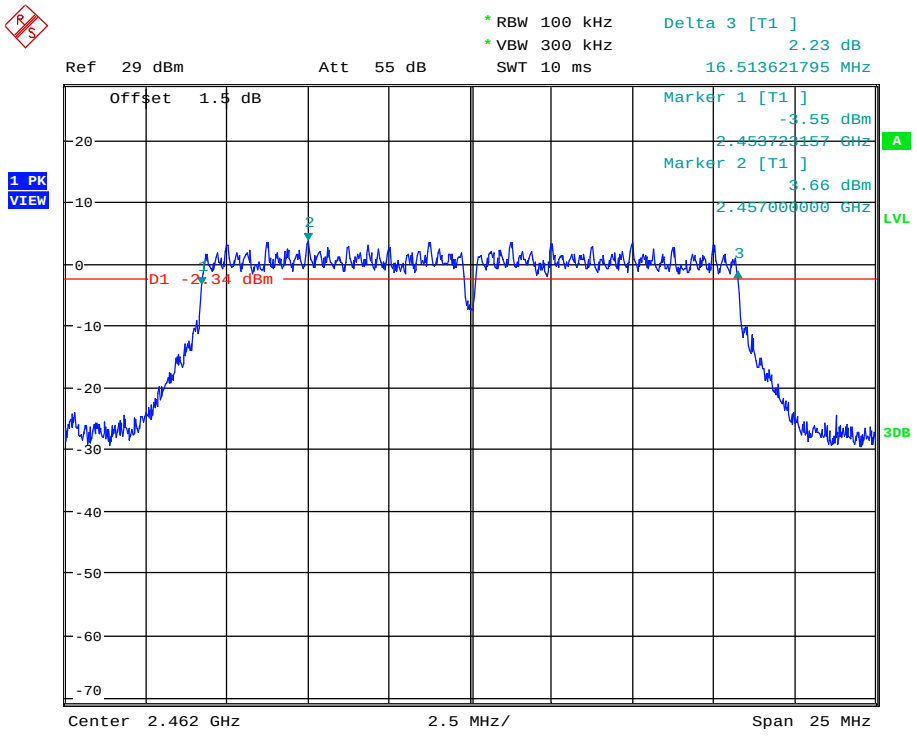
Date: 26.OCT.2016 19:19:44

Plot E1



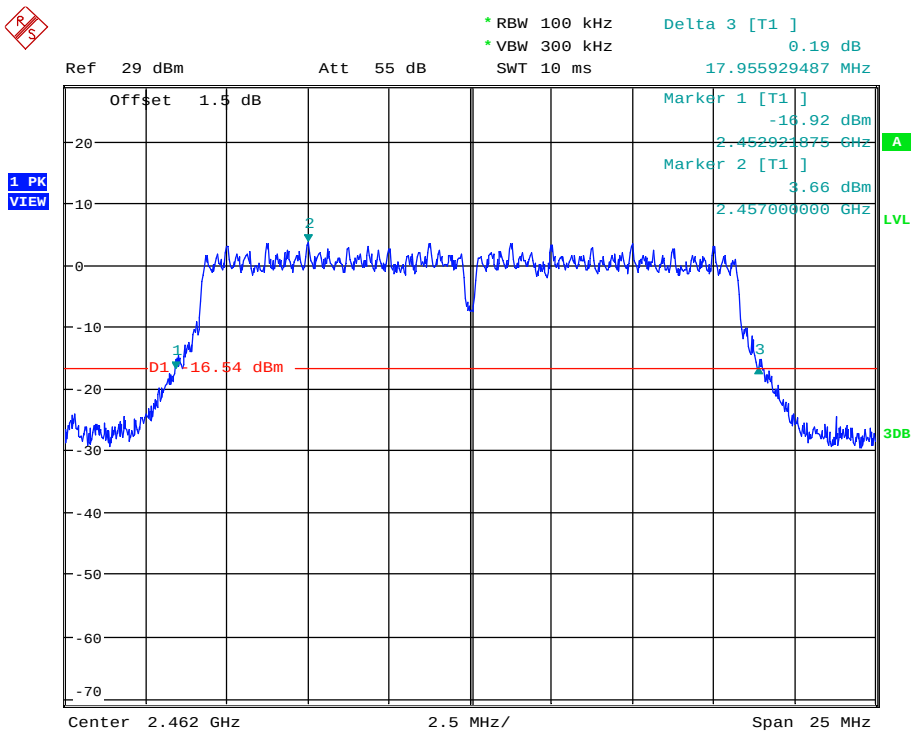
Date: 26.OCT.2016 19:18:49

Plot E2



Date: 27.OCT.2016 16:42:41

Plot F1



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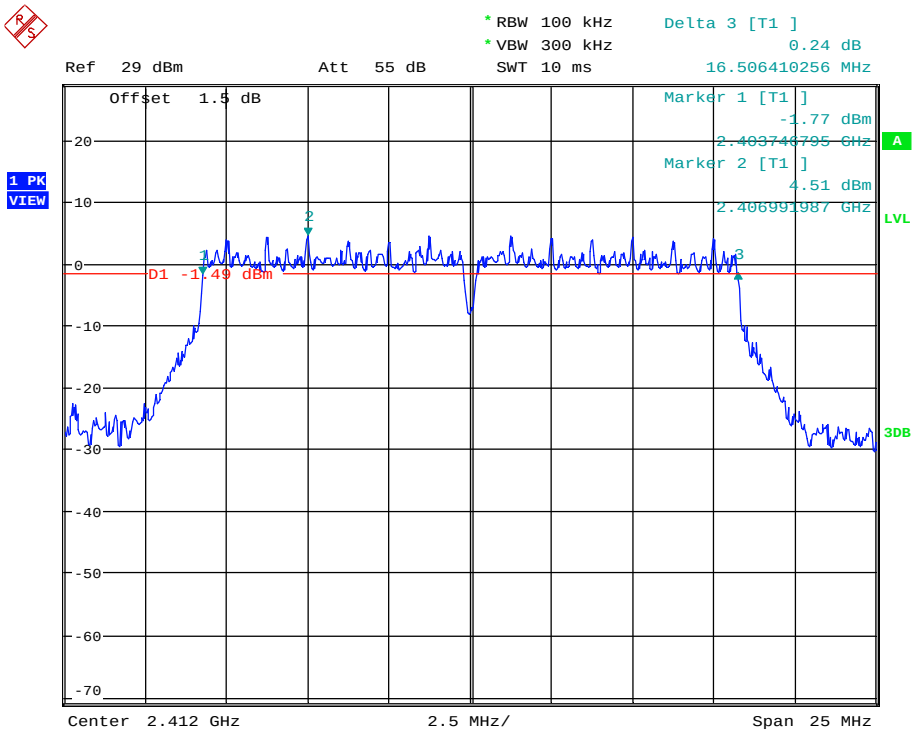
Plot F2



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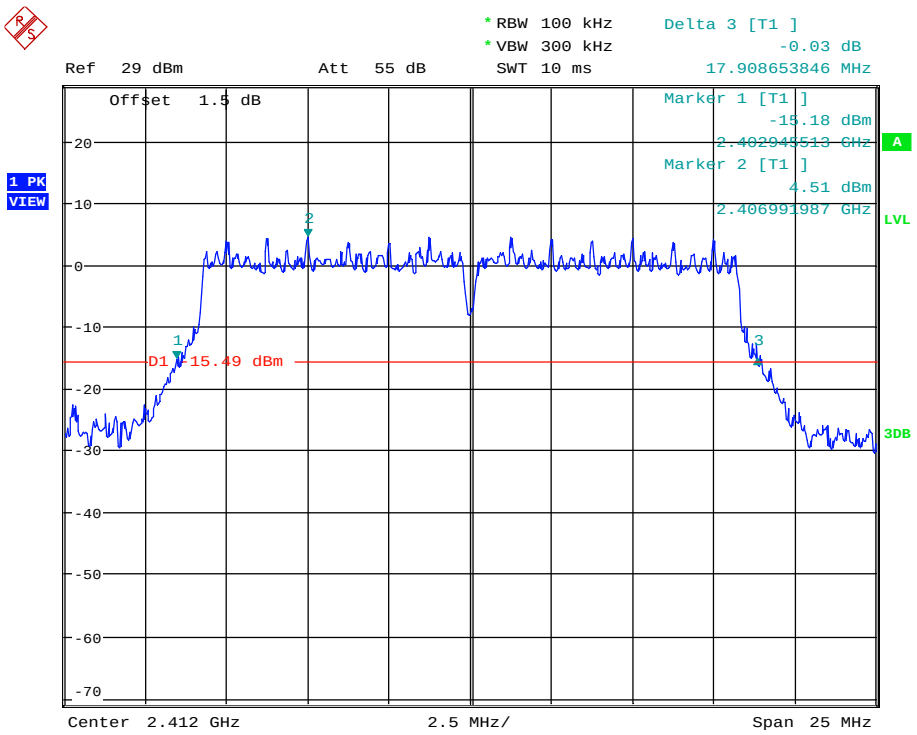
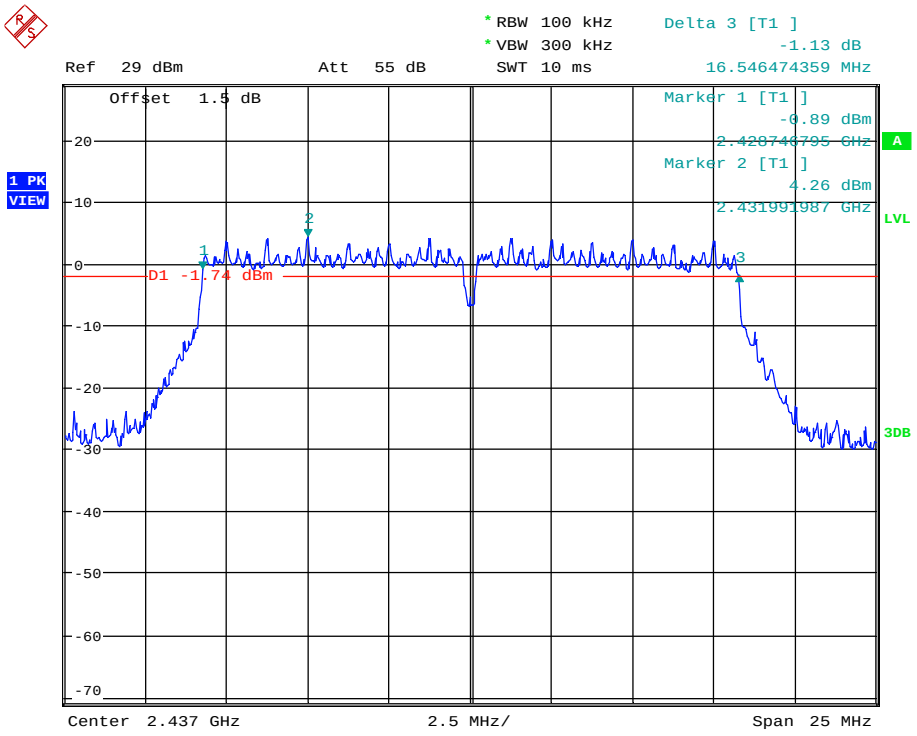
Plot G1



Date: 26.OCT.2016 19:39:45

Plot G2



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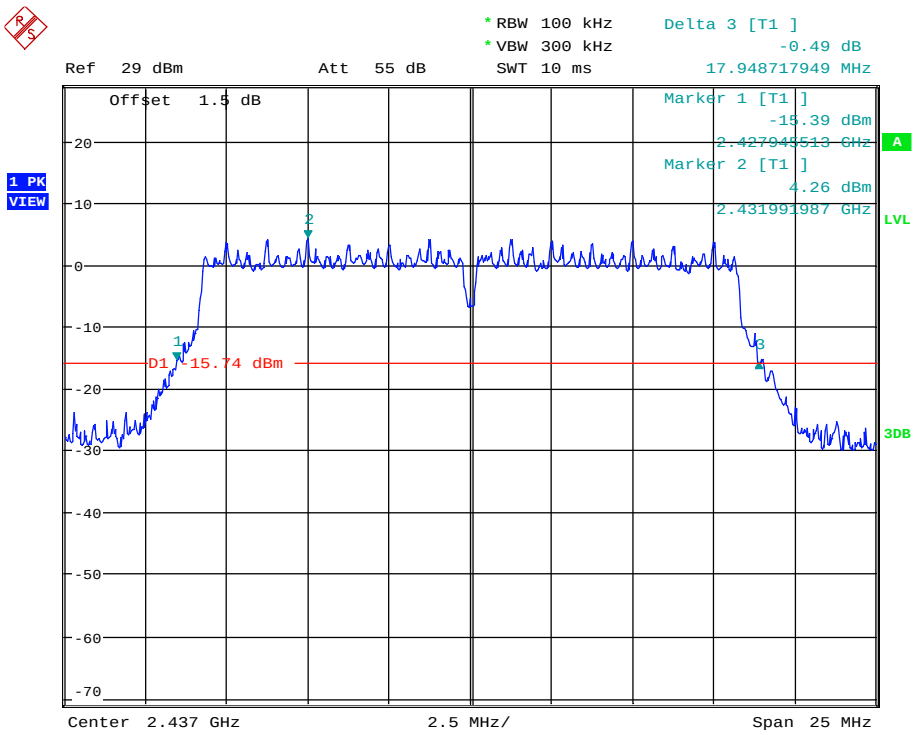
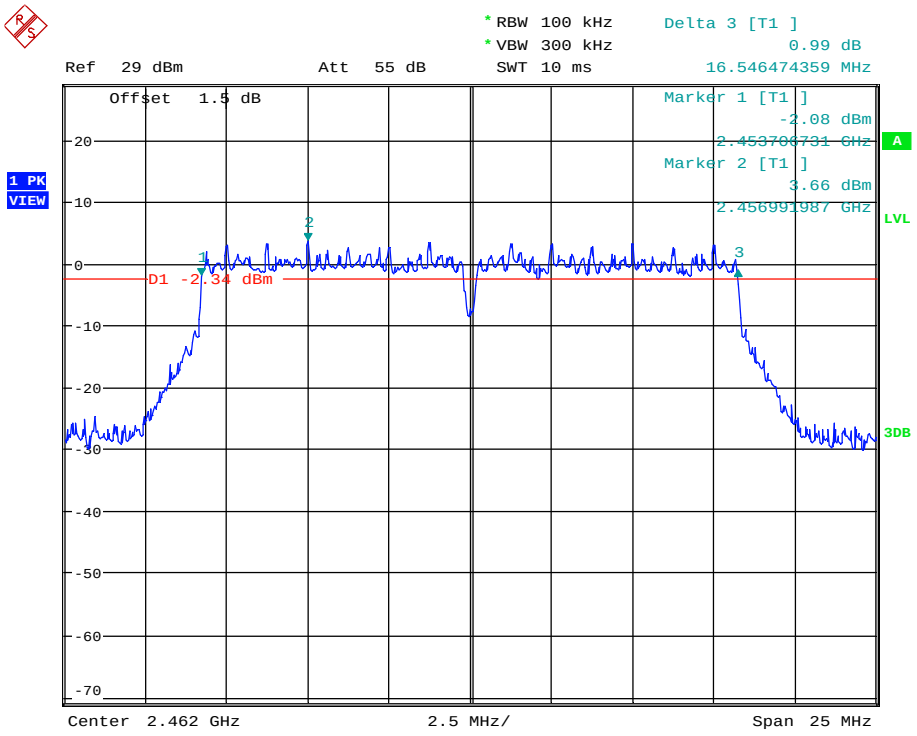
Plot H1



Date: 26.OCT.2016 20:32:09

Plot H2



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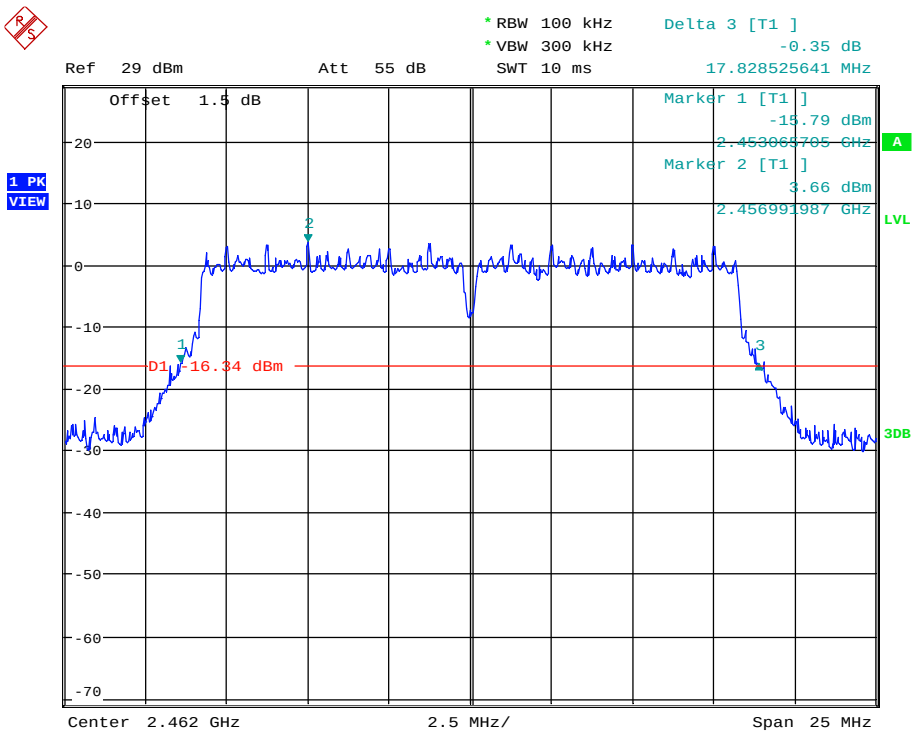
Plot I1



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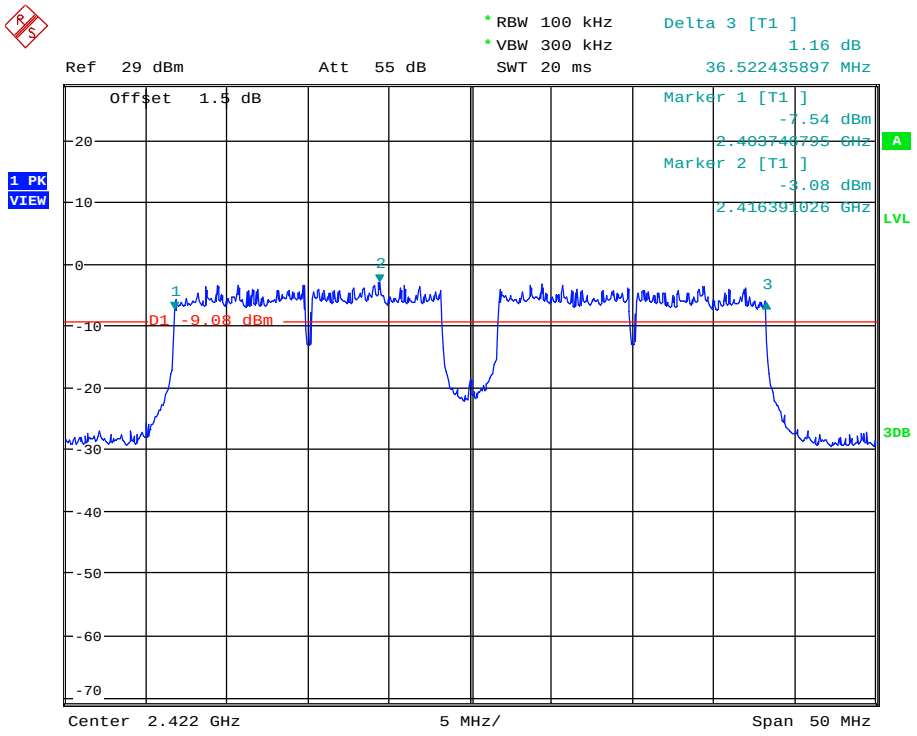
Plot I2



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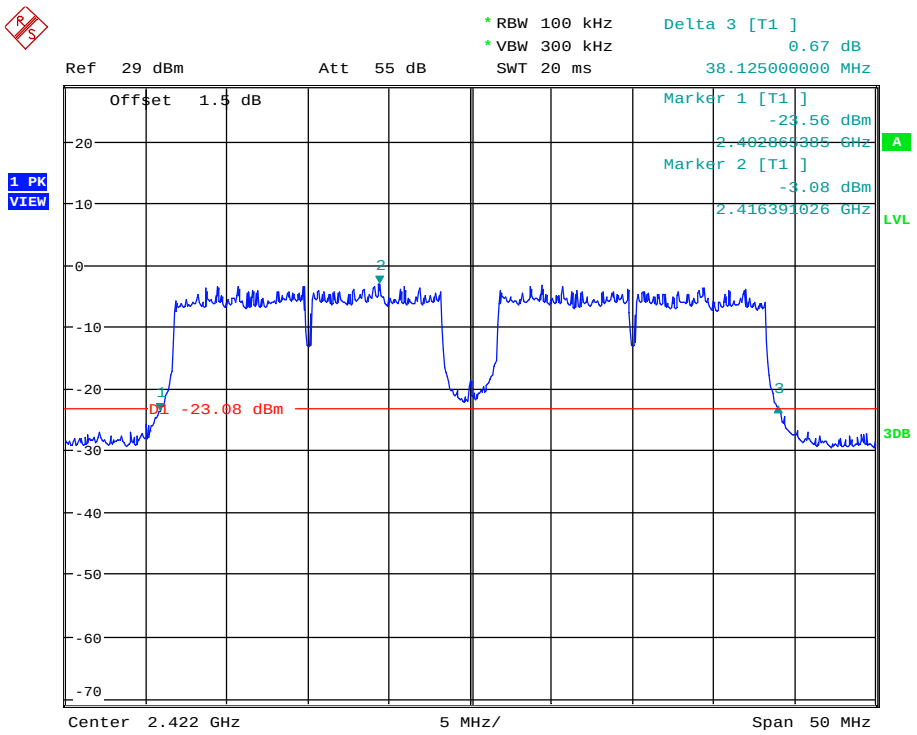
Plot J1



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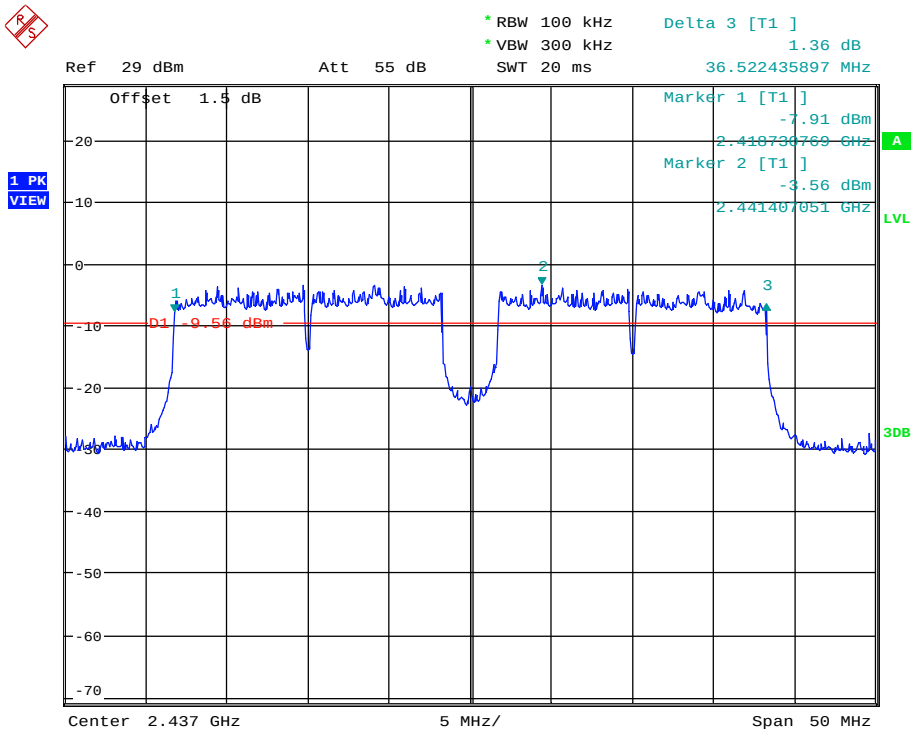
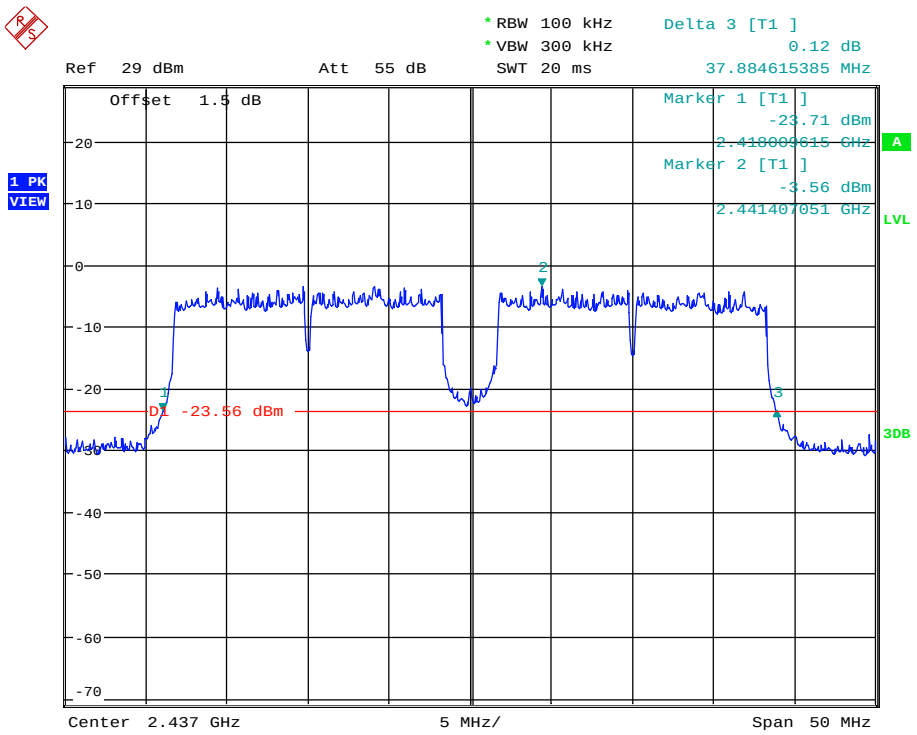
Plot J2



Date: 27.OCT.2016 18:34:59

Plot K1



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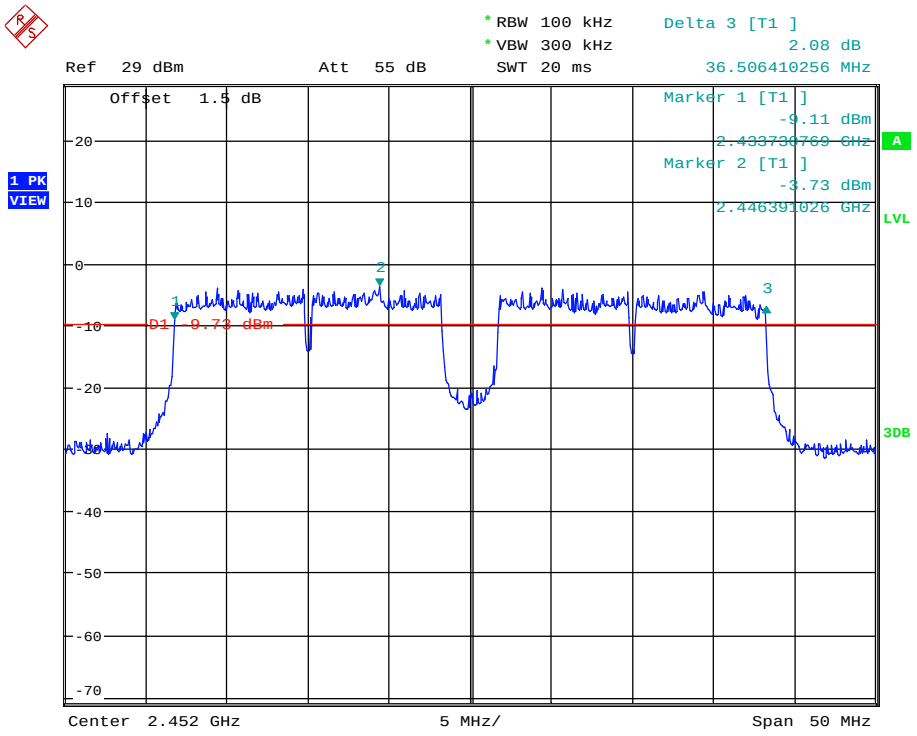
Plot K2



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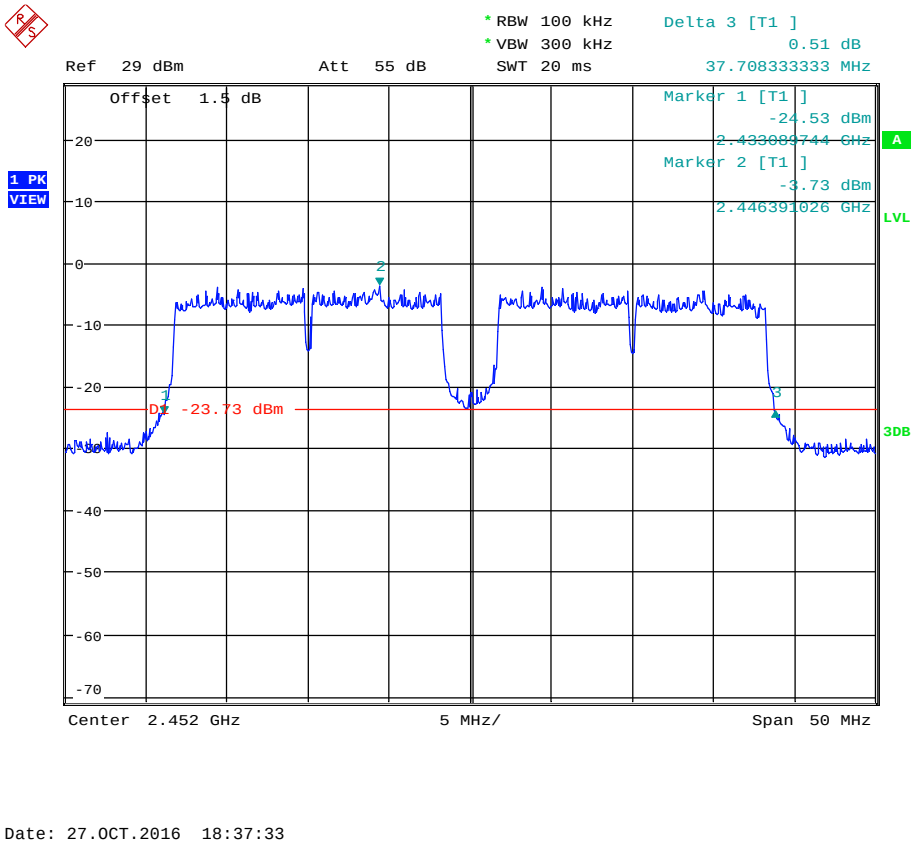
Plot L1



Plot L2

ANT 2 Test Result:

IEEE 802.11b Test mode:

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Refer to plot	20dB Bandwidth (MHz)	Refer to plot	Limit (KHz)	Result
1	2412	9.855	Plot A1	16.306	Plot A2	≥500	Pass
6	2437	10.464	Plot B1	16.354	Plot B2	≥500	Pass
11	2462	10.056	Plot C1	16.266	Plot C2	≥500	Pass

IEEE 802.11g Test mode:

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Refer to plot	20dB Bandwidth (MHz)	Refer to plot	Limit (KHz)	Result
1	2412	16.426	Plot D1	18.189	PlotD2	≥500	Pass
6	2437	16.266	Plot E1	18.108	Plot E2	≥500	Pass
11	2462	16.266	Plot F1	18.108	Plot F2	≥500	Pass

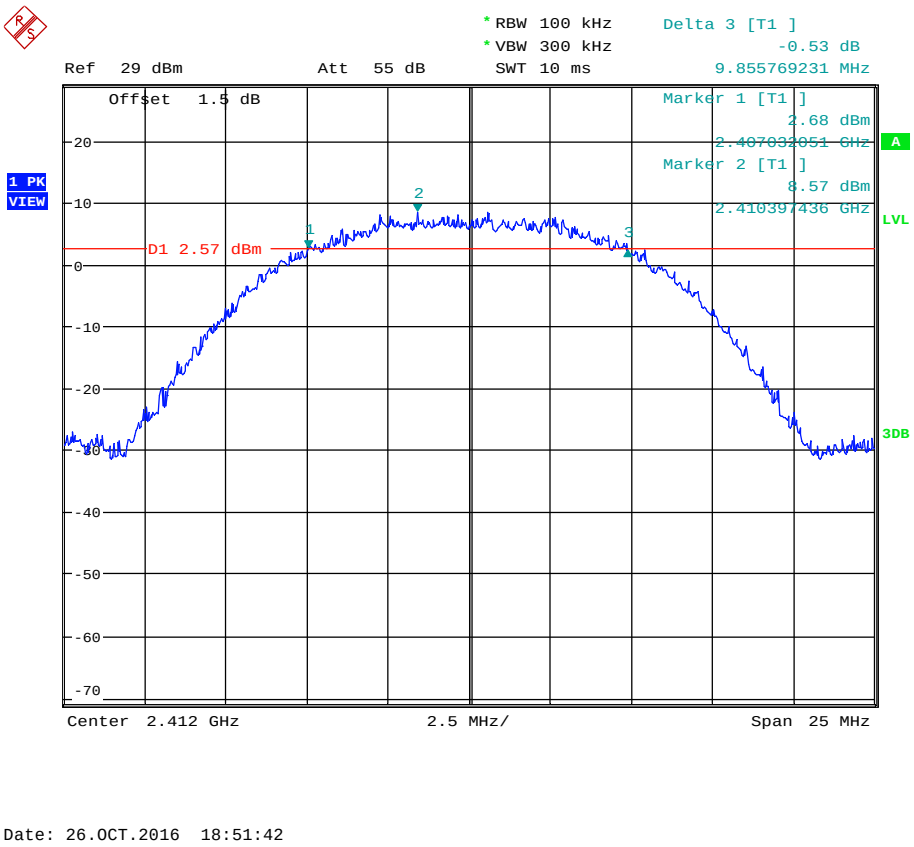
IEEE 802.11n (20MHz) Test mode:

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Refer to plot	20dB Bandwidth (MHz)	Refer to plot	Limit (KHz)	Result
1	2412	16.586	Plot G1	17.868	Plot G2	≥500	Pass
6	2437	16.506	Plot H1	18.029	Plot H2	≥500	Pass
11	2462	16.506	Plot I1	17.788	Plot I2	≥500	Pass

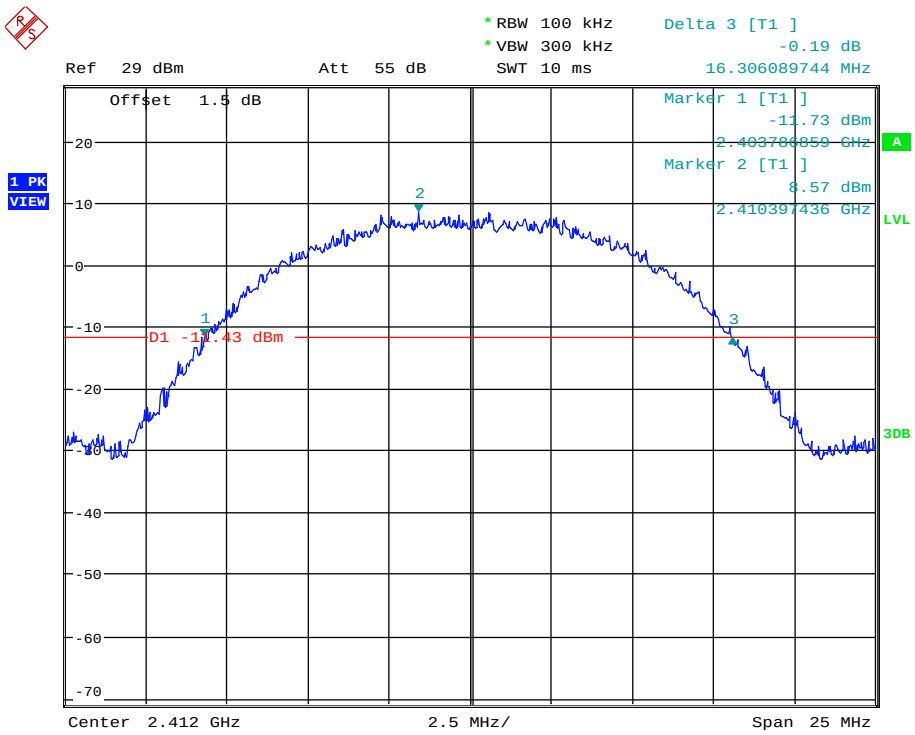
IEEE 802.11n (40MHz) Test mode:

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Refer to plot	20dB Bandwidth (MHz)	Refer to plot	Limit (KHz)	Result
3	2422	36.538	Plot J1	37.901	Plot J2	≥500	Pass
6	2437	36.522	Plot K1	37.644	Plot K2	≥500	Pass
9	2452	36.506	Plot L1	37.628	Plot L2	≥500	Pass

Test Plots:

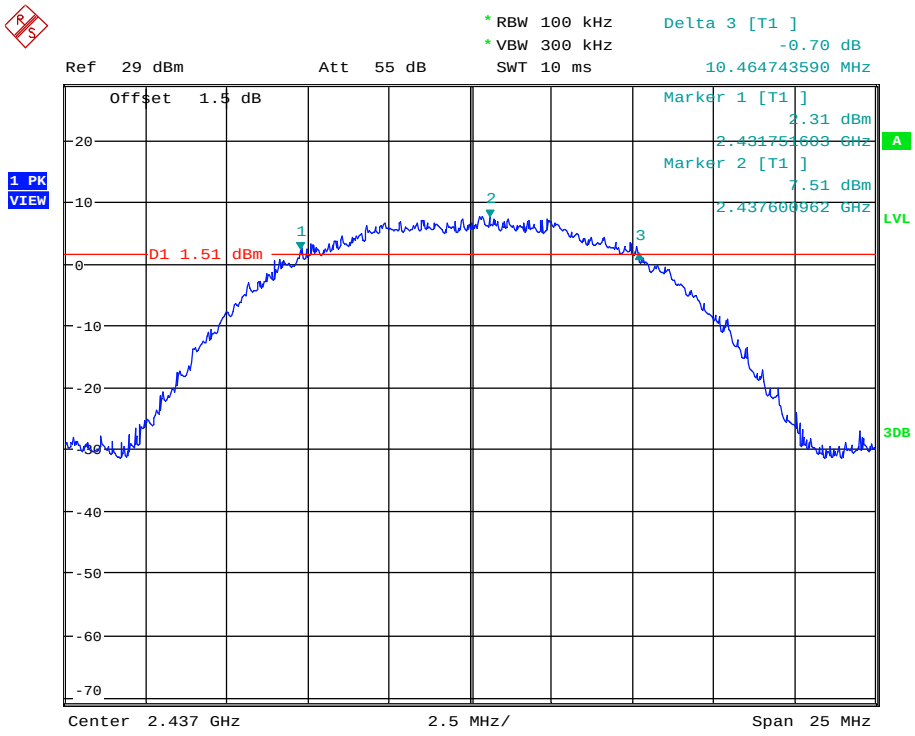


Plot A1



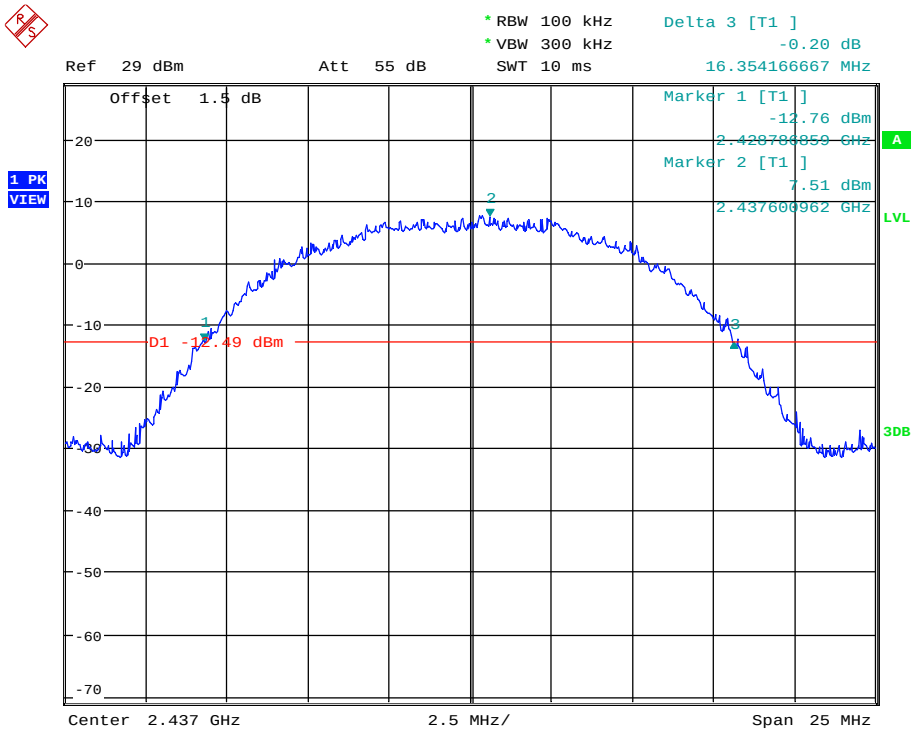
Date: 26.OCT.2016 18:50:10

Plot A2



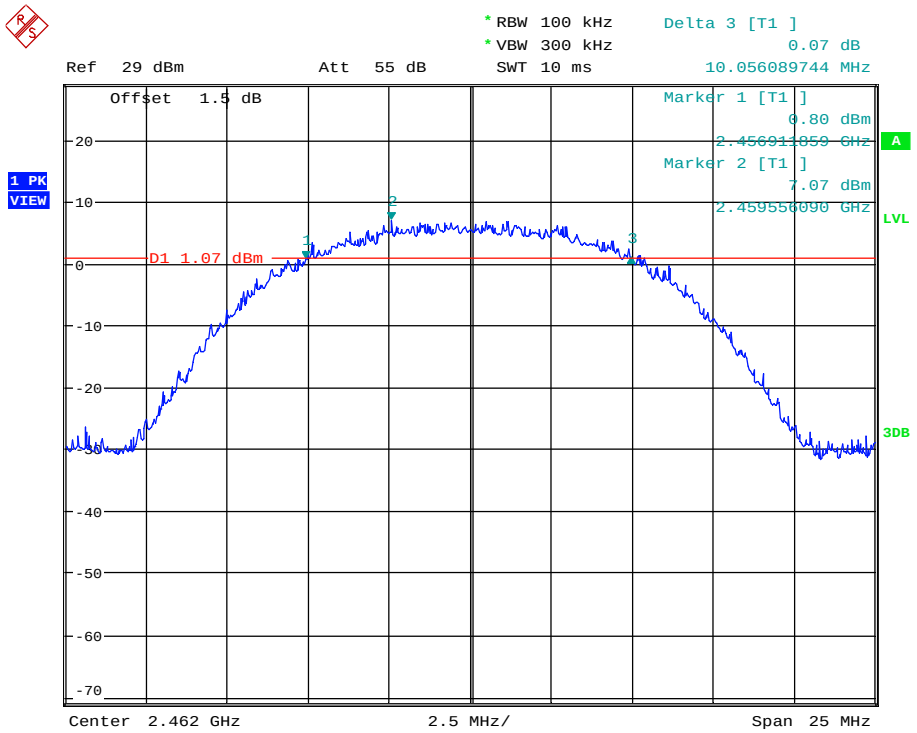
Date: 26.OCT.2016 18:56:18

Plot B1



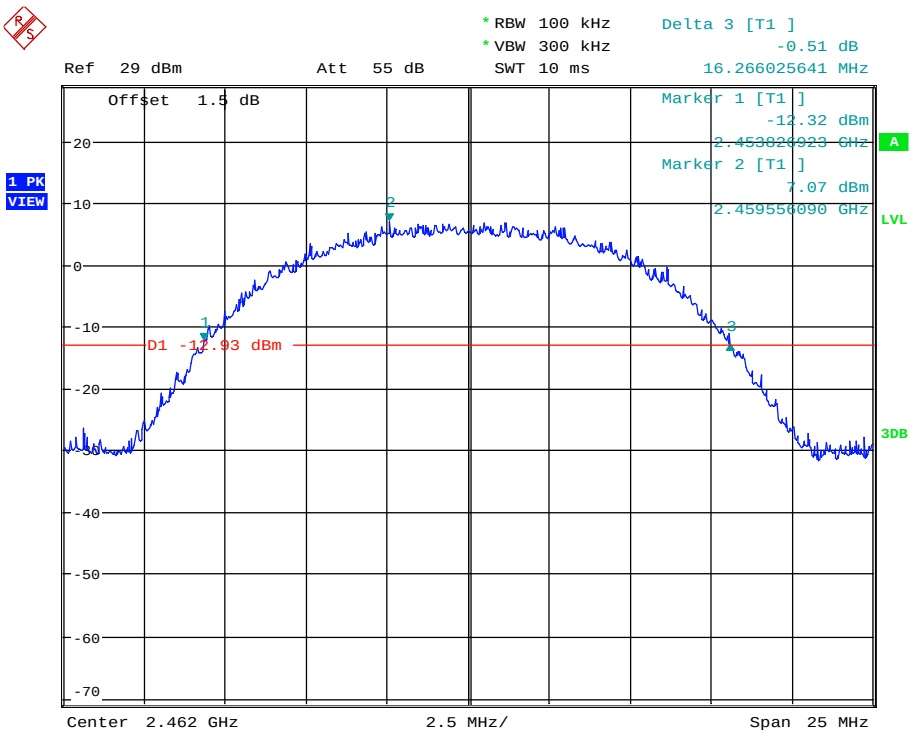
Date: 26.OCT.2016 18:57:26

Plot B2



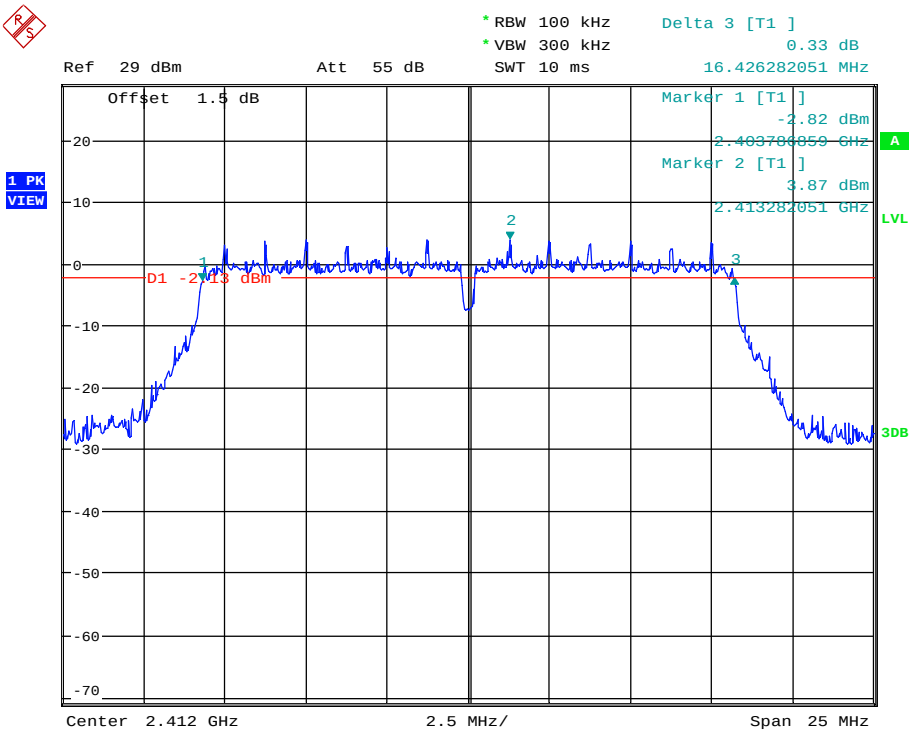
Date: 26.OCT.2016 19:03:18

Plot C1



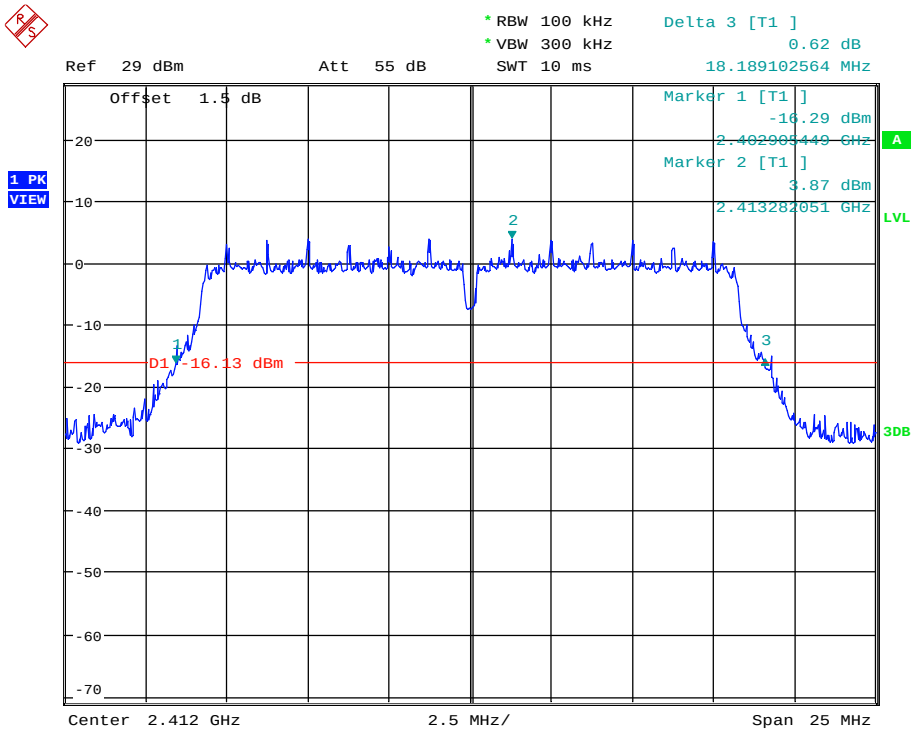
Date: 26.OCT.2016 19:04:11

Plot C2



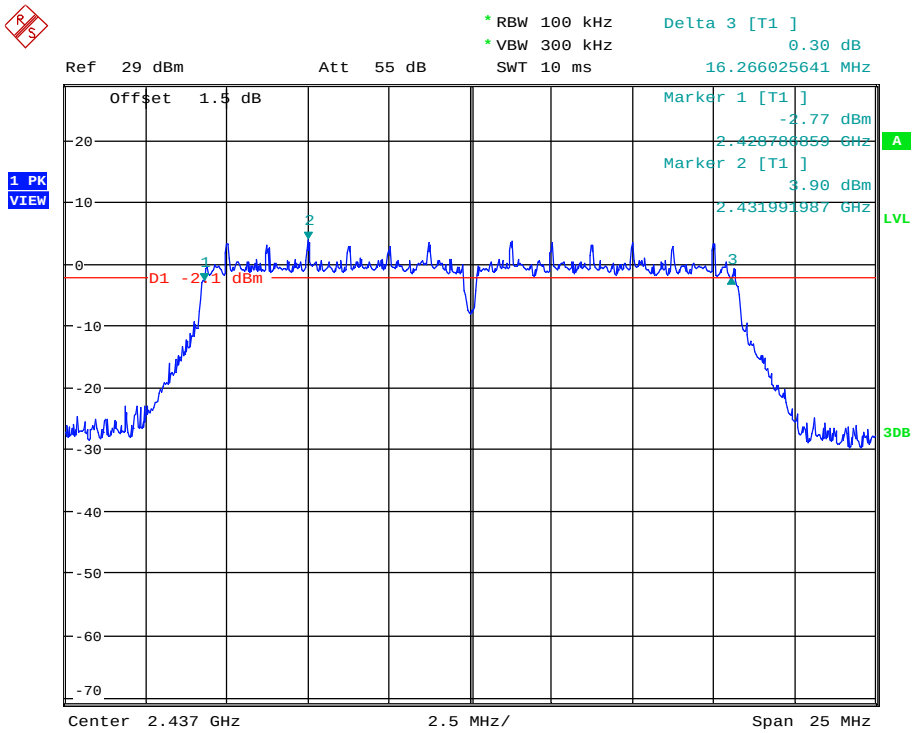
Date: 26.OCT.2016 19:09:23

Plot D1



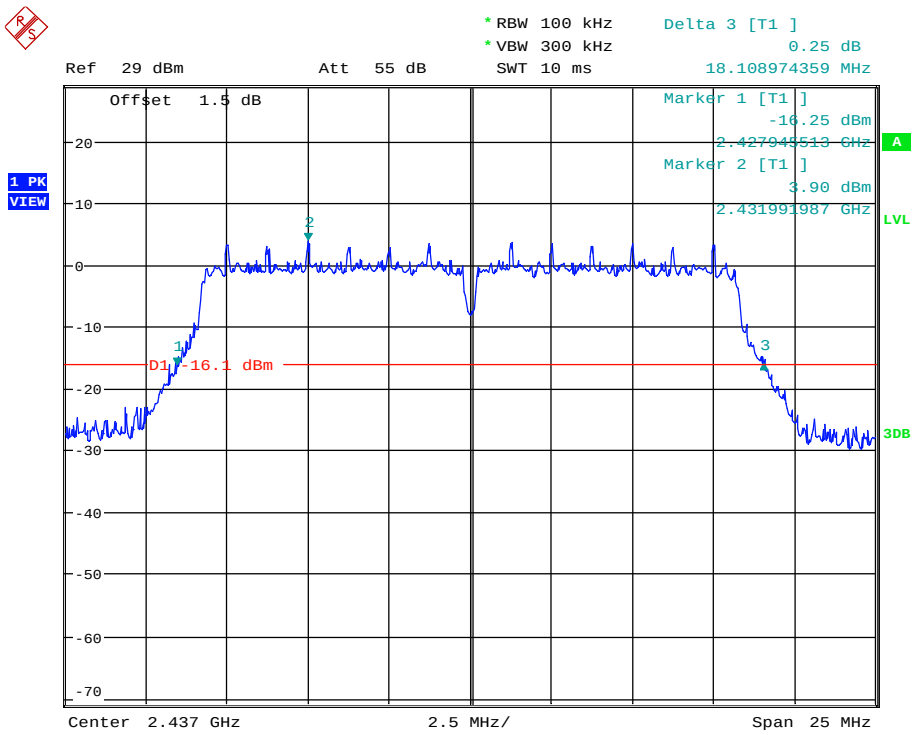
Date: 26.OCT.2016 19:11:34

Plot D2



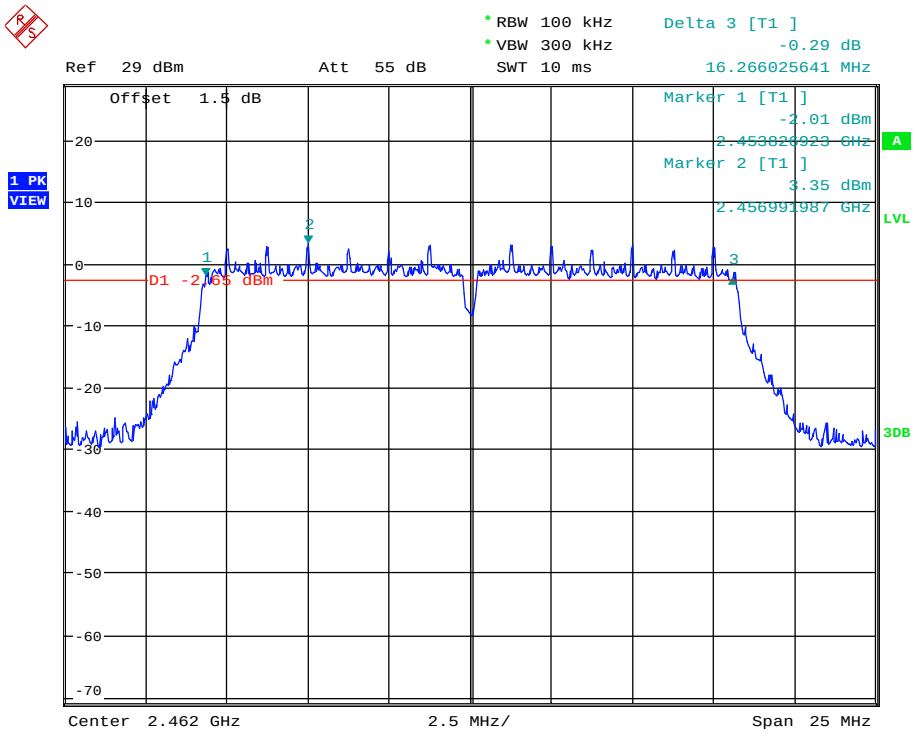
Date: 26.OCT.2016 19:16:46

Plot E1



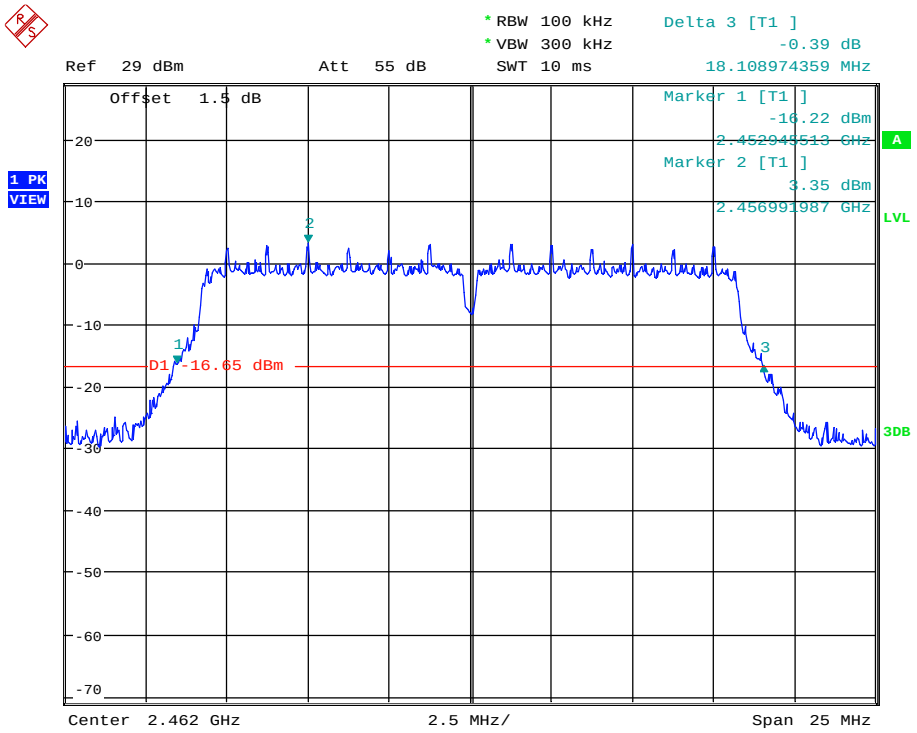
Date: 26.OCT.2016 19:17:38

Plot E2



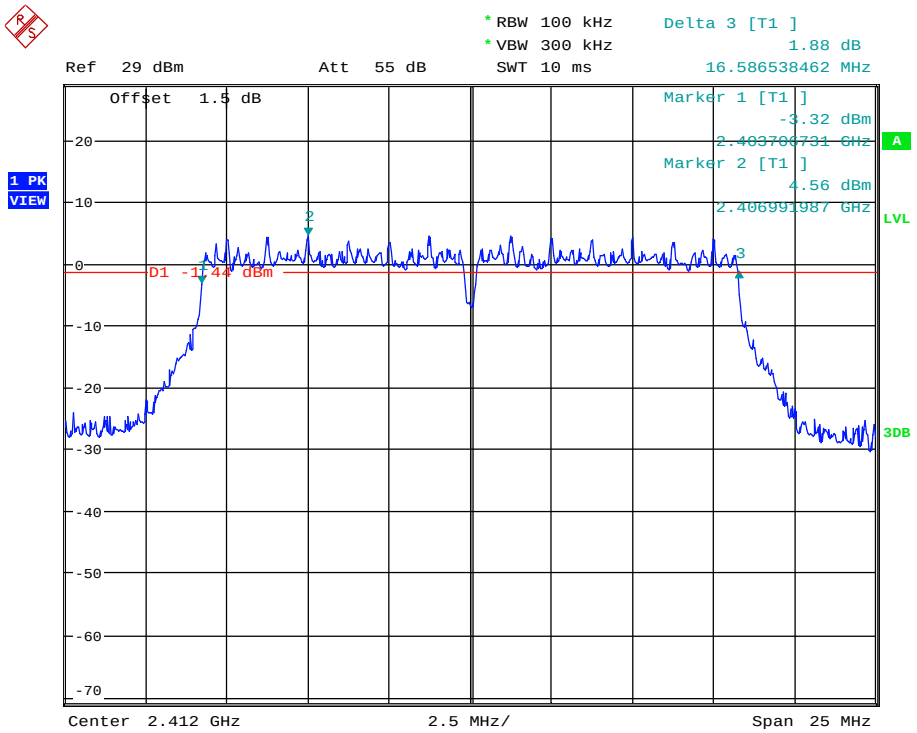
Date: 26.OCT.2016 19:22:27

Plot F1



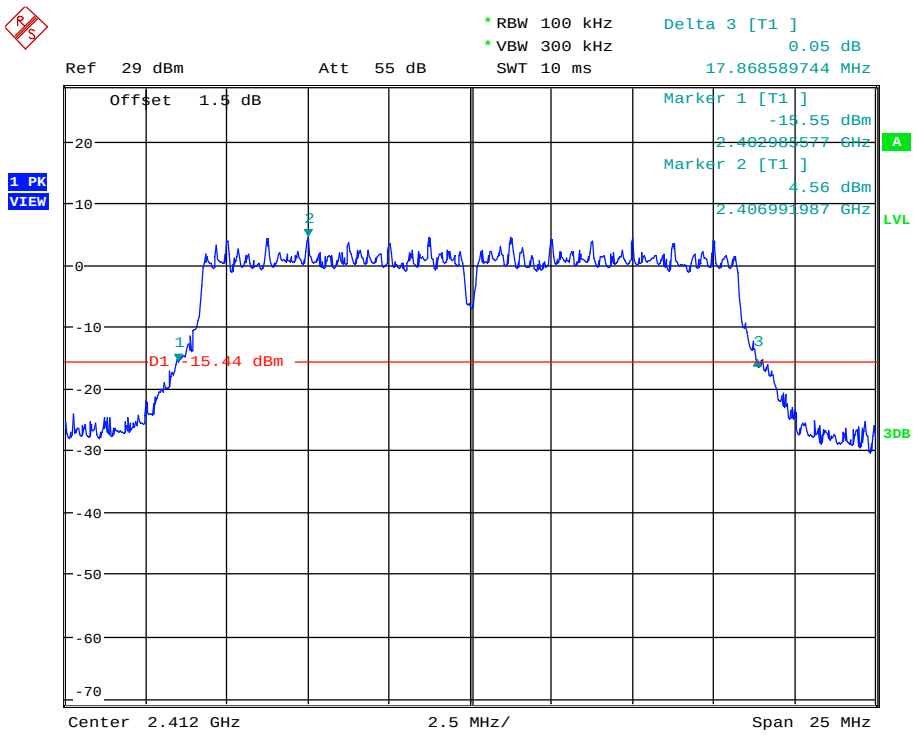
Date: 26.OCT.2016 19:24:07

Plot F2



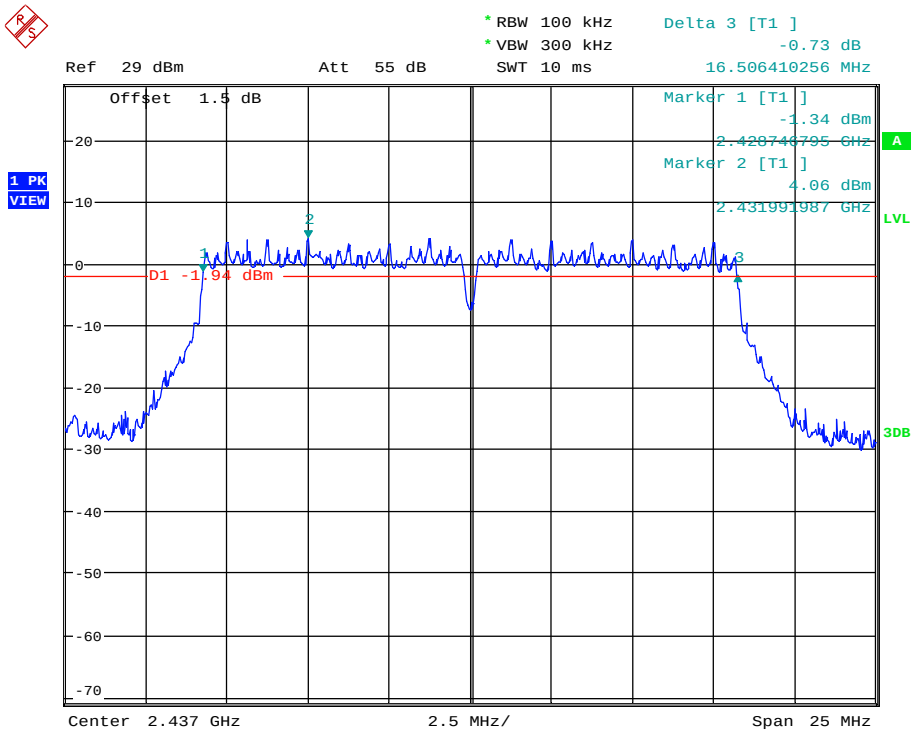
Date: 26.OCT.2016 19:37:21

Plot G1



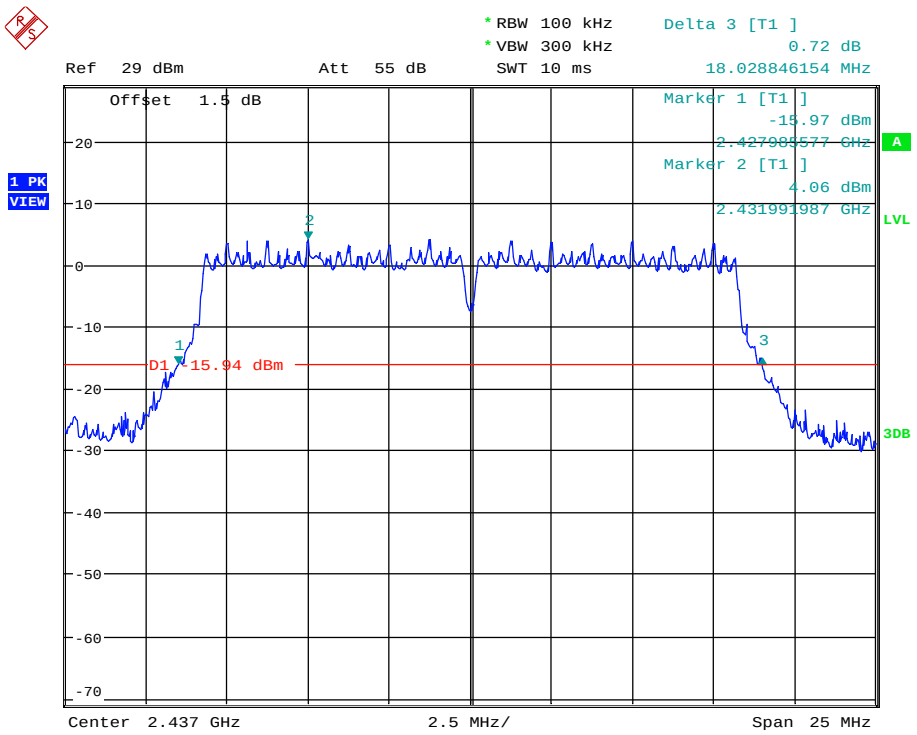
Date: 26.OCT.2016 19:38:14

Plot G2



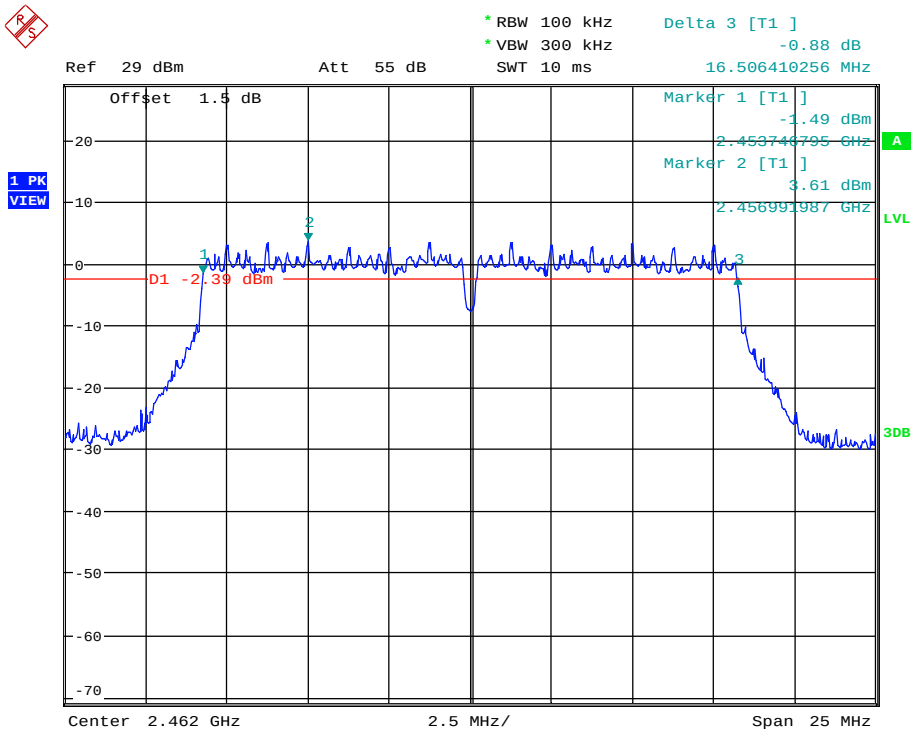
Date: 26.OCT.2016 20:29:27

Plot H1



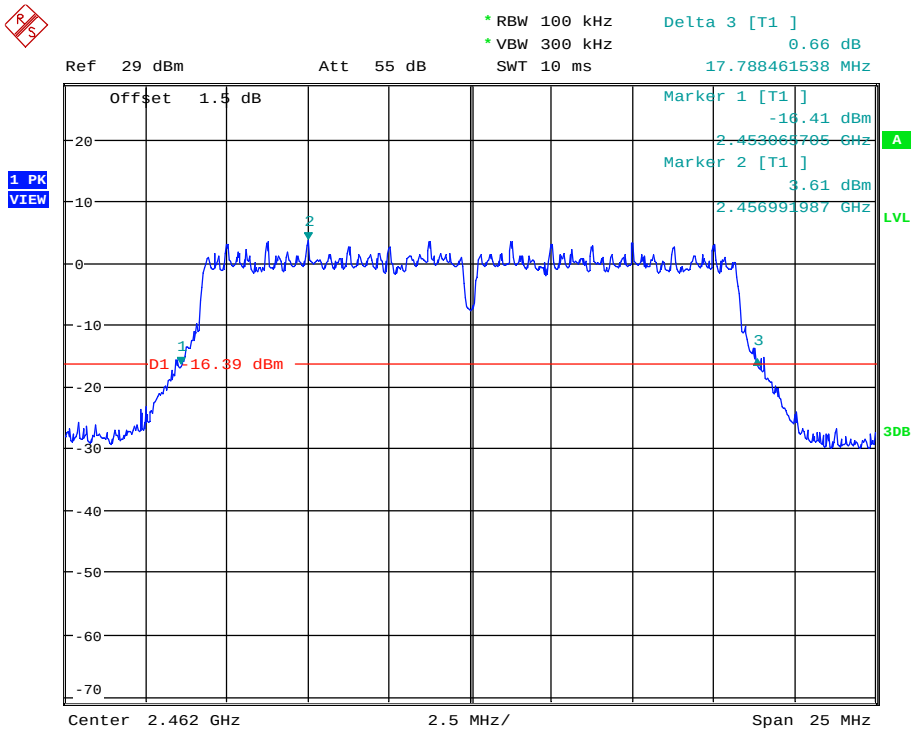
Date: 26.OCT.2016 20:30:40

Plot H2



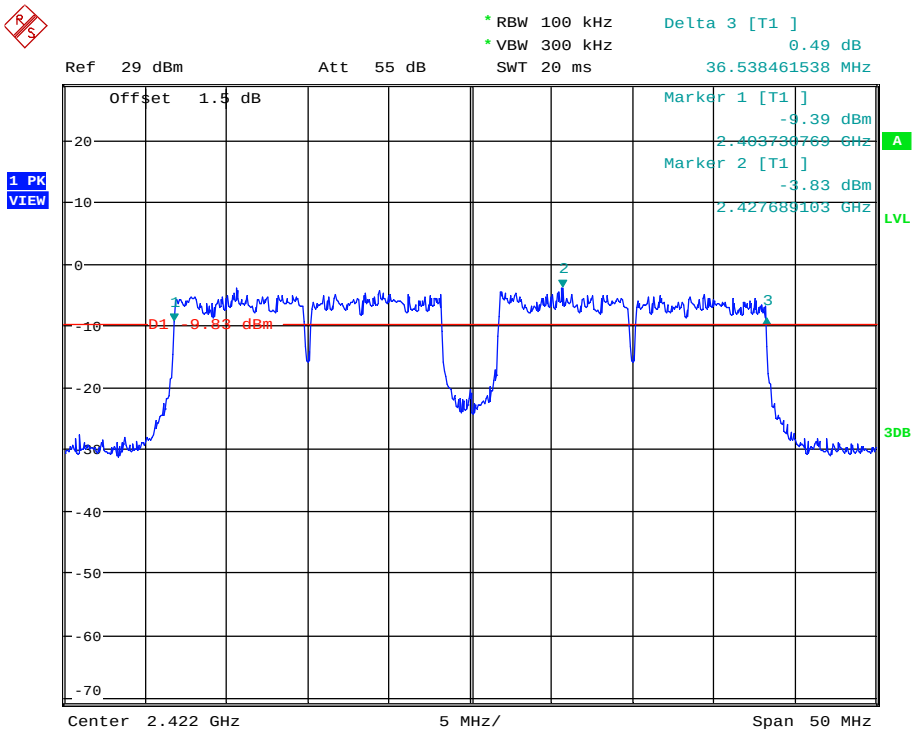
Date: 26.OCT.2016 20:34:08

Plot I1



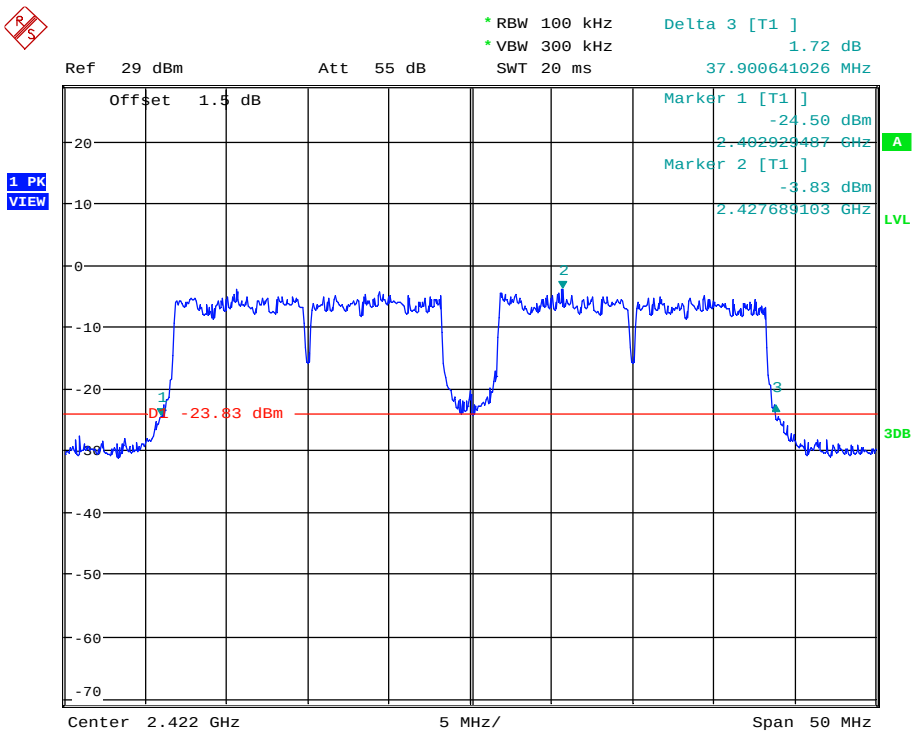
Date: 26.OCT.2016 20:35:00

Plot I2



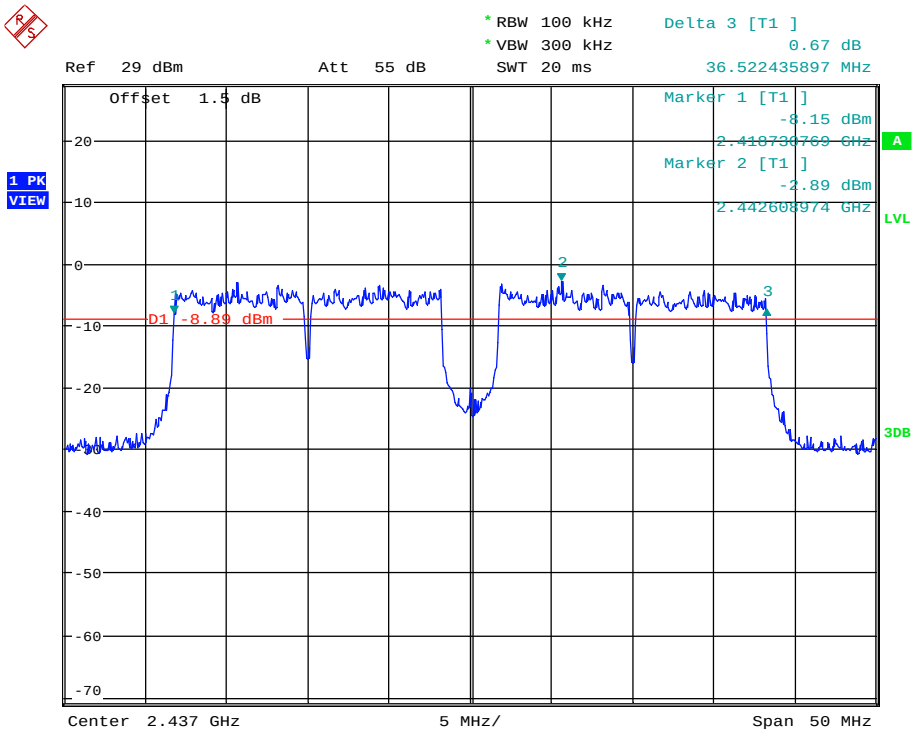
Date: 27.OCT.2016 18:40:45

Plot J1



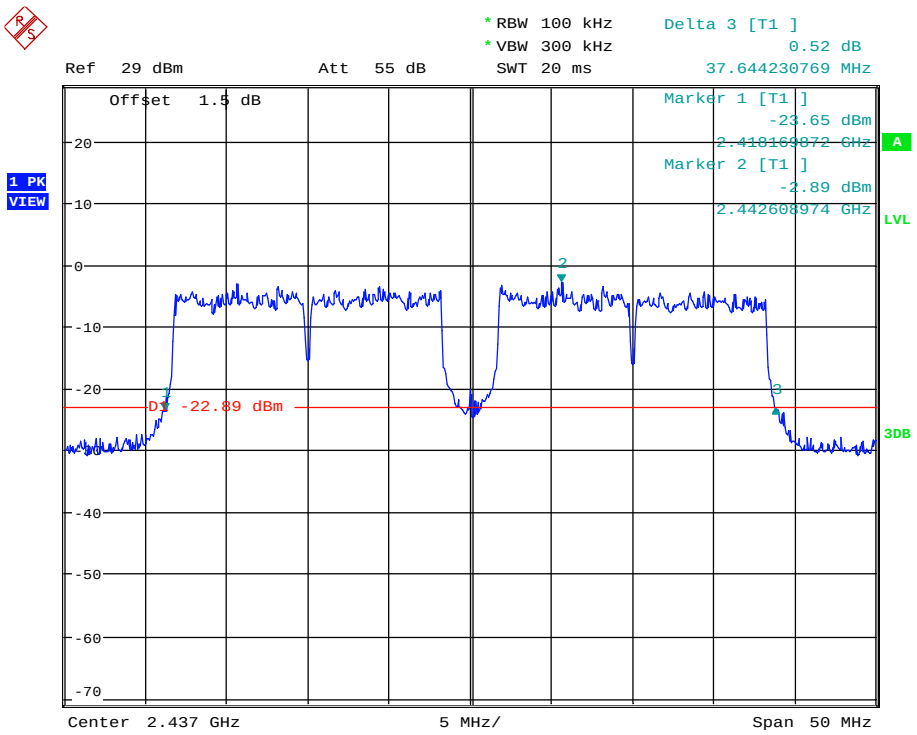
Date: 27.OCT.2016 18:40:15

Plot J2



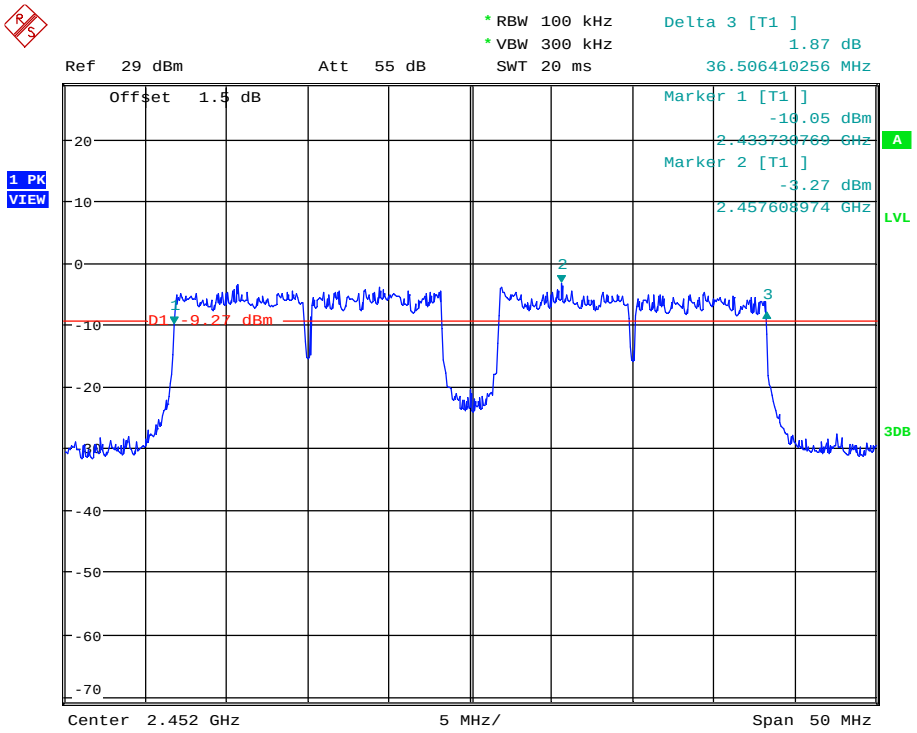
Date: 27.OCT.2016 18:42:00

Plot K1



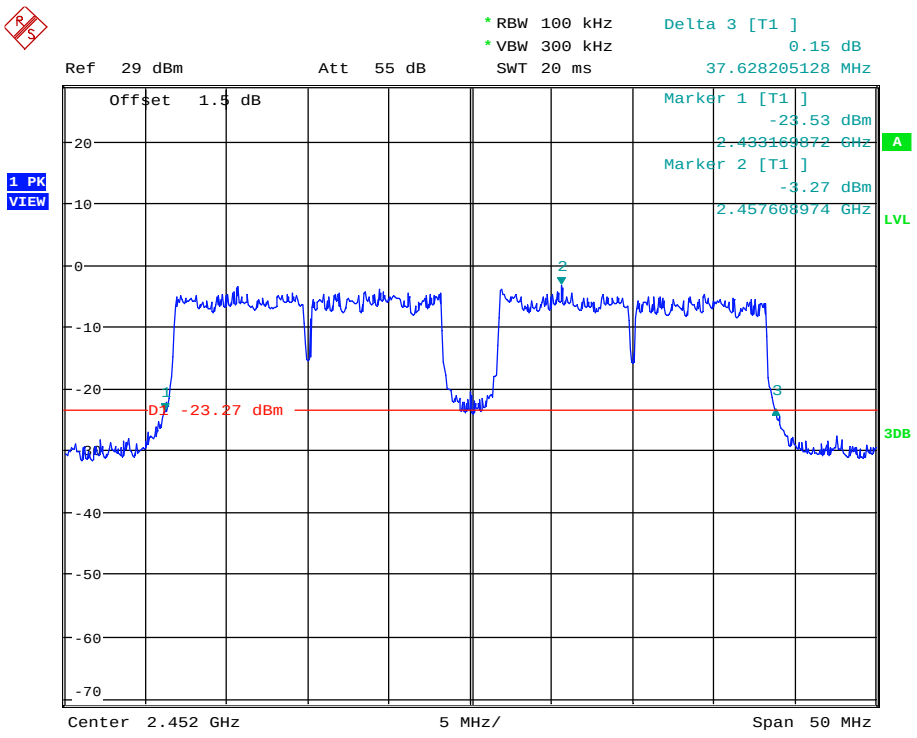
Date: 27.OCT.2016 18:42:35

Plot K2



Date: 27.OCT.2016 18:43:33

Plot L1



Date: 27.OCT.2016 18:44:09

Plot L2

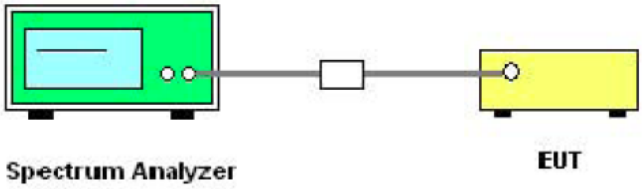
Conclusion: Pass

5.3 Conducted Spurious Emissions and Band Edge

5.3.1 Requirement

According to FCC section 15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

5.3.2 Test Description



5.3.3 Test Result

The WIFI Module operates at hopping-off test mode. The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions.

a) Set the center frequency and span to encompass frequency range to be measured.

b) Set the RBW = 100 kHz.

c) Set the VBW =300 kHz.

d) Detector = Average.

e) Sweep time = auto couple.

f) Trace mode = max hold.

g) Allow trace to fully stabilize.

h) Use the peak marker function to determine the maximum amplitude level.

ANT 1 Test Result:

IEEE 802.11b Test mode

Channel	Frequency (MHz)	Measured max out of band emission(dBm)	Refer to plot	Limit(dBm)		Result
				Carrier level	Calculated 30dBc limit	
1	2412	-48.98	Plot A	3.20	-26.80	Pass
6	2437	-48.88	Plot B	-0.94	-30.94	Pass
11	2462	-49.30	Plot C	-0.94	-30.94	Pass

IEEE 802.11g Test mode

Channel	Frequency (MHz)	Measured max out of band emission(dBm)	Refer to plot	Limit(dBm)		Result
				Carrier level	Calculated 30dBc limit	
1	2412	-48.99	Plot D	-6.39	-36.39	Pass
6	2437	-48.64	Plot E	-8.08	-38.08	Pass
11	2462	-48.92	Plot F	-8.00	-38.00	Pass

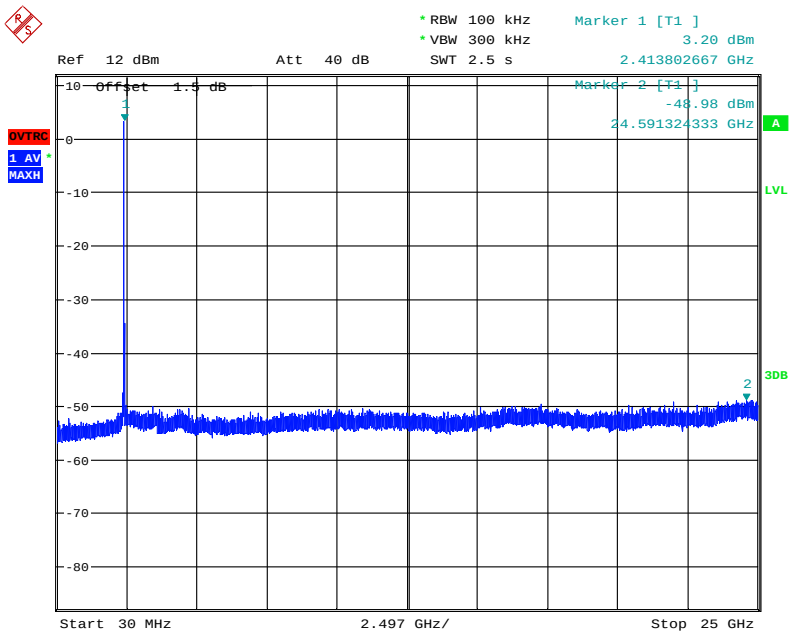
IEEE 802.11n (20MHz) Test mode

Channel	Frequency (MHz)	Measured max out of band emission(dBm)	Refer to plot	Limit(dBm)		Result
				Carrier level	Calculated 30dBc limit	
1	2412	-48.80	Plot G	-9.23	-39.23	Pass
6	2437	-49.25	Plot H	-9.93	-39.93	Pass
11	2462	-49.25	Plot I	-9.00	-39.00	Pass

IEEE 802.11n (40MHz) Test mode

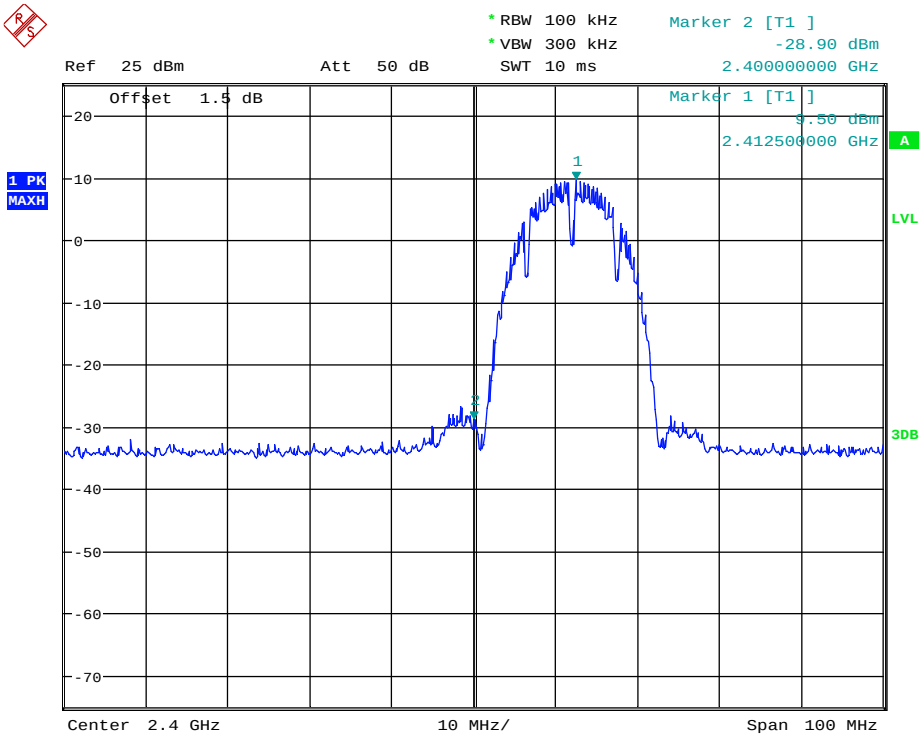
Channel	Frequency (MHz)	Measured max out of band emission(dBm)	Refer to plot	Limit(dBm)		Result
				Carrier level	Calculated 30dBc limit	
3	2422	-49.24	Plot J	-12.67	-42.67	Pass
6	2437	-49.21	Plot K	-13.89	-43.89	Pass
9	2452	-49.23	Plot L	-13.55	-43.55	Pass

Test Plots:



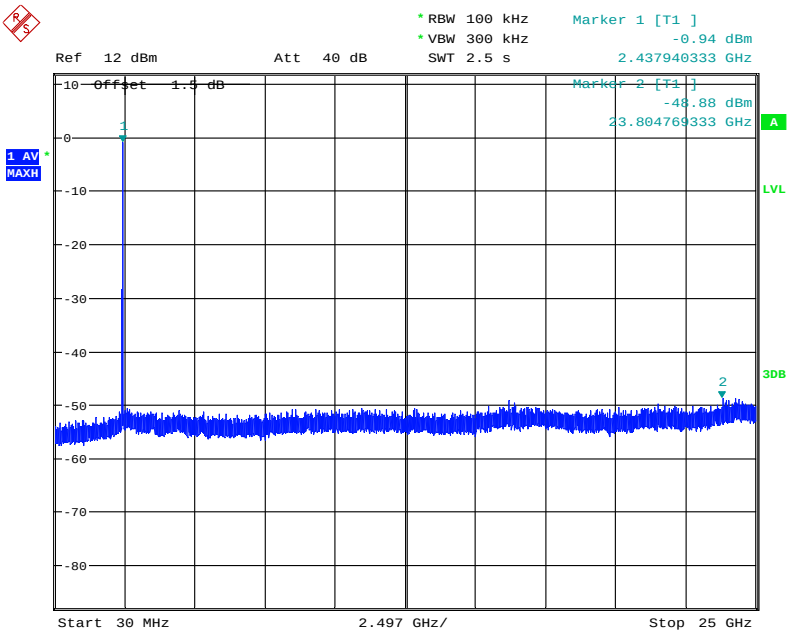
Date: 19.DEC.2016 19:30:35

Plot A



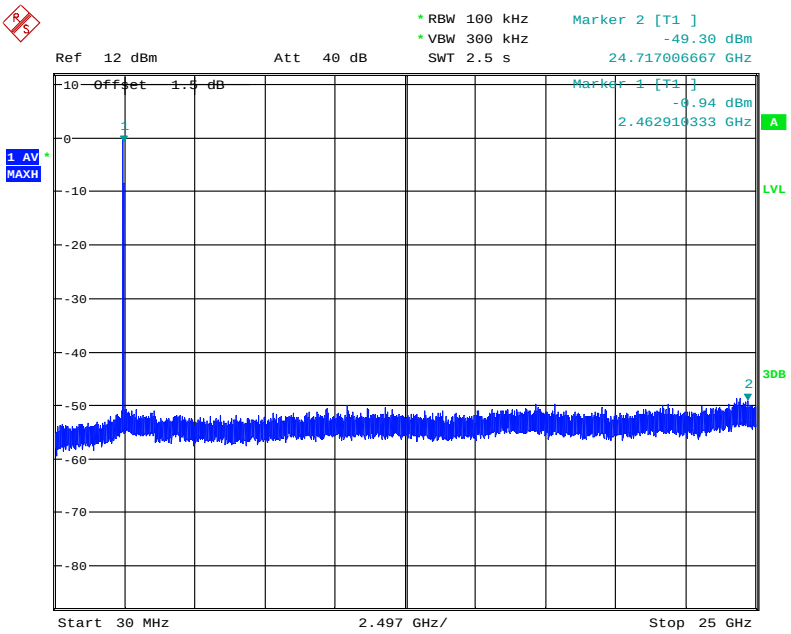
Date: 14.DEC.2016 17:25:00

(IEEE 802.11b -Band Edge at channel =1)



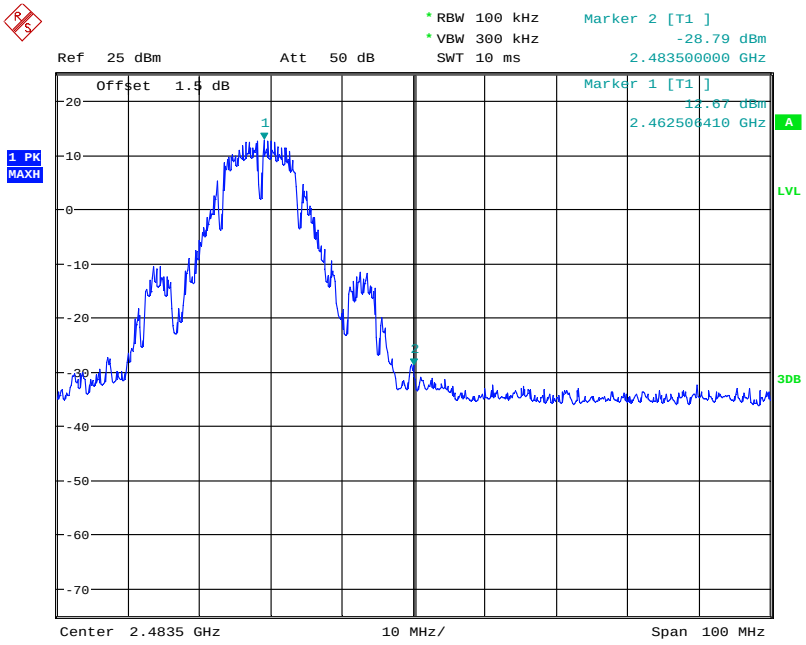
Date: 19.DEC.2016 19:32:17

Plot B

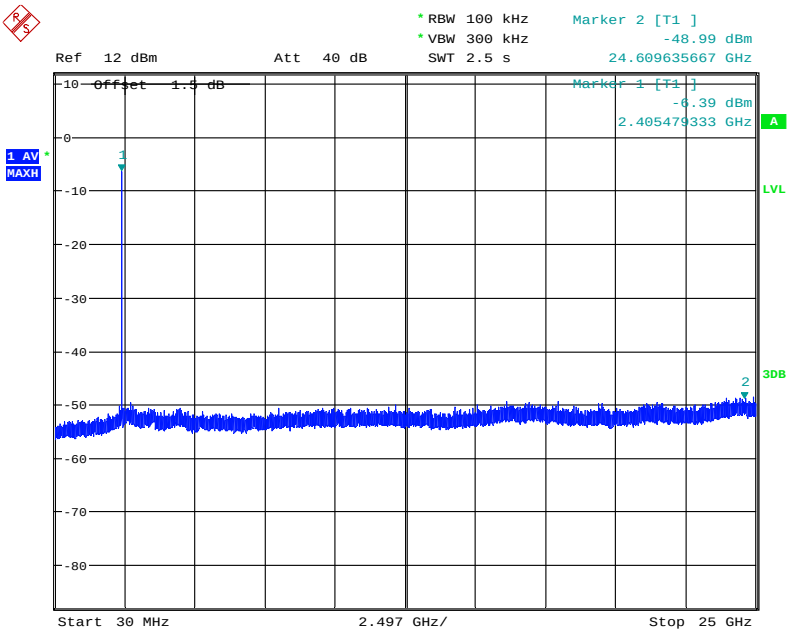


Date: 19.DEC.2016 19:35:53

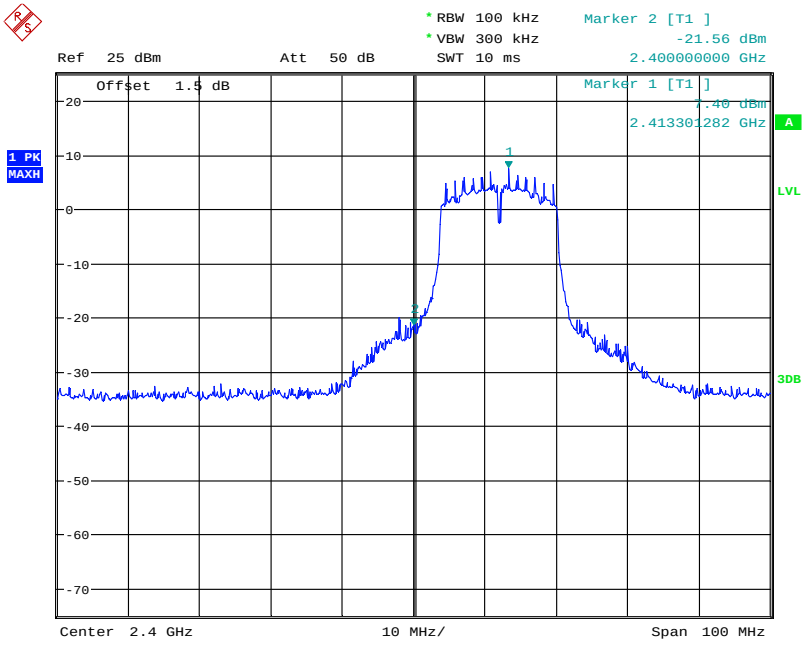
Plot C



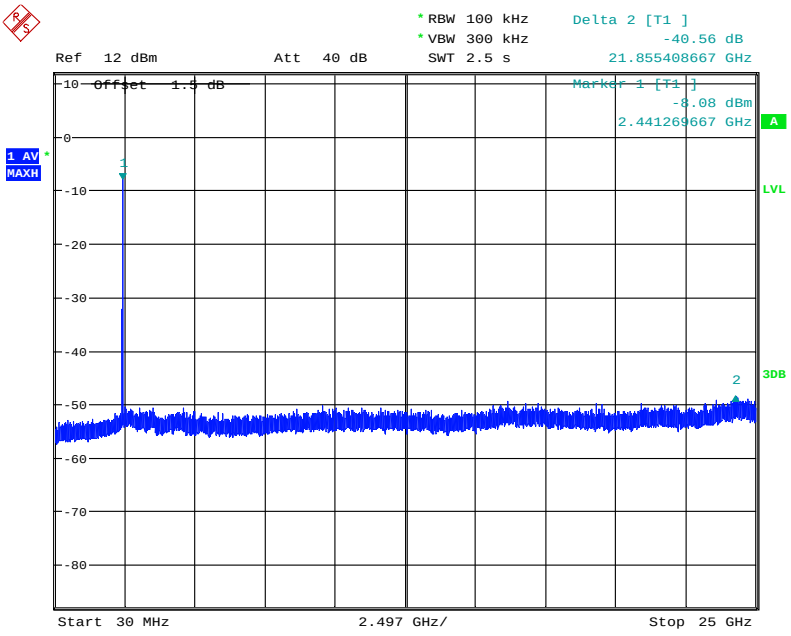
(IEEE 802.11b -Band Edge at channel =11)



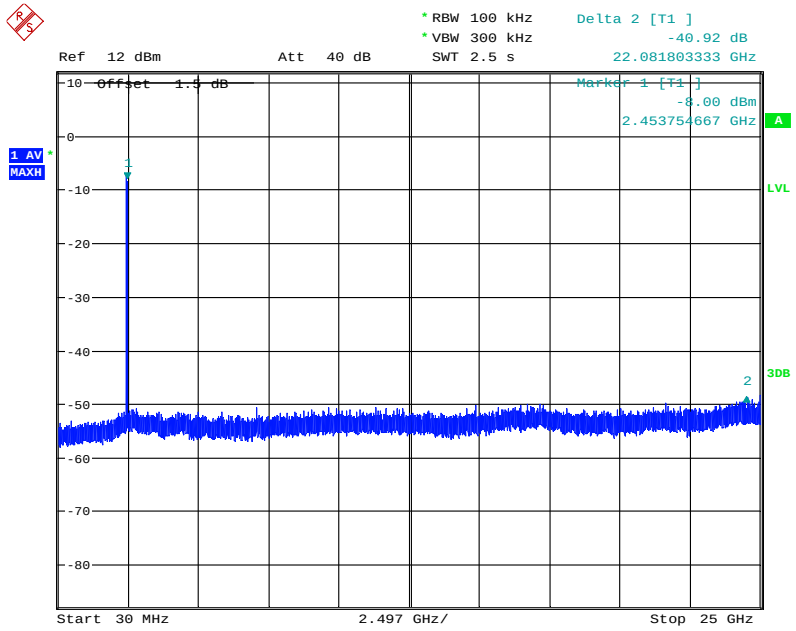
Plot D



(IEEE 802.11g- Band Edge at channel =1)

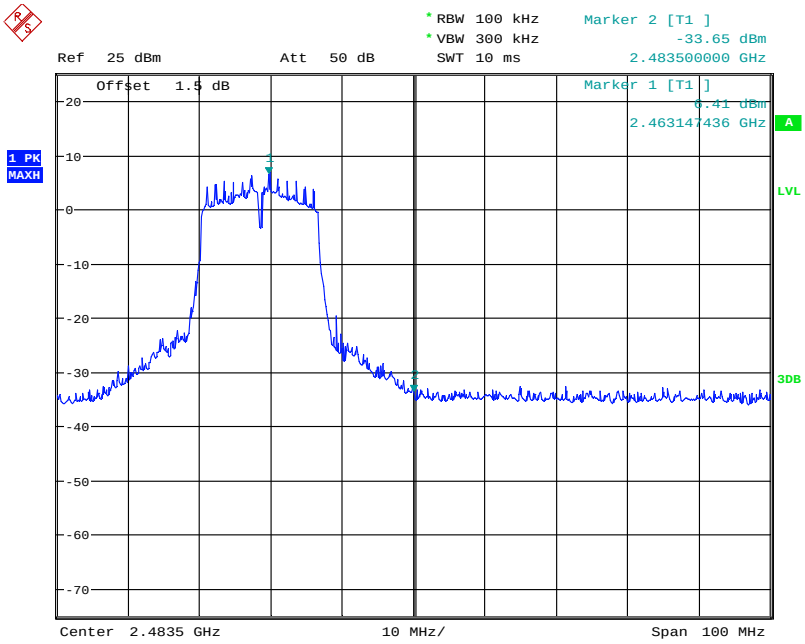


Plot E



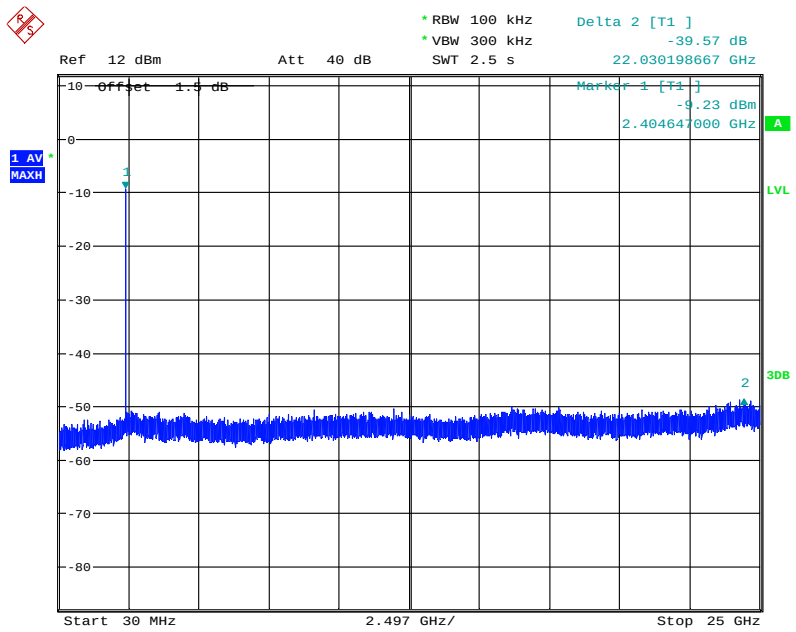
Date: 19.DEC.2016 19:44:23

Plot F



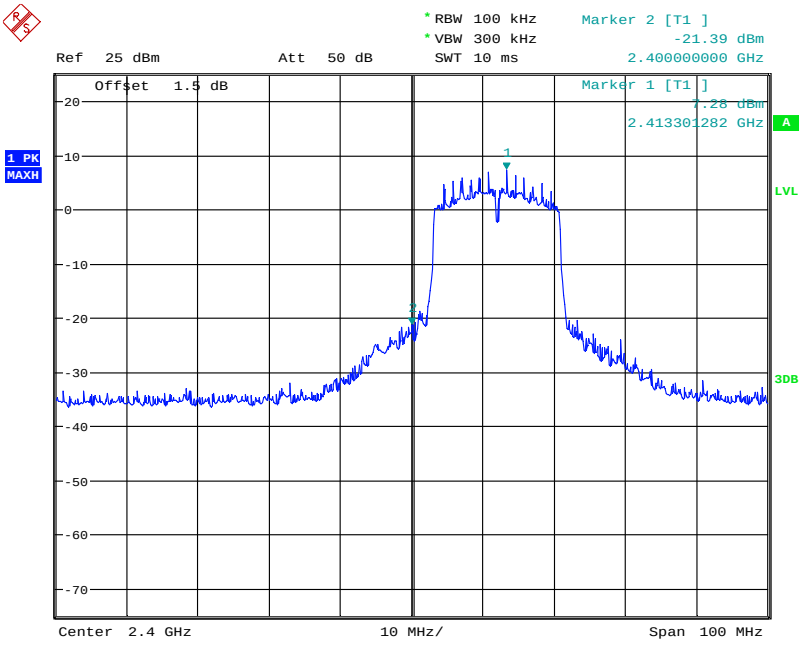
Date: 14.DEC.2016 17:34:16

(IEEE 802.11g- Band Edge at channel =11)



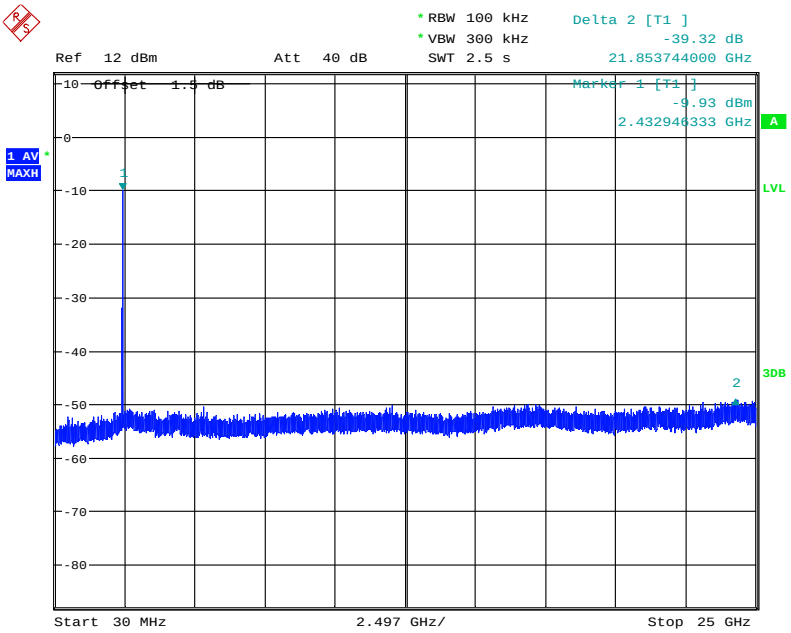
Date: 19.DEC.2016 19:45:59

Plot G



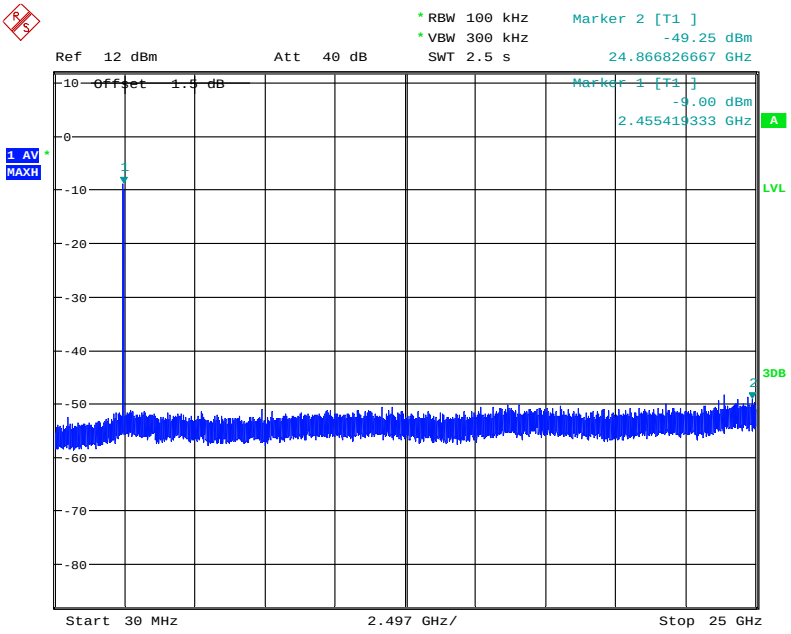
Date: 14.DEC.2016 17:29:49

(IEEE 802.11n20MHz- Band Edge at channel =1)



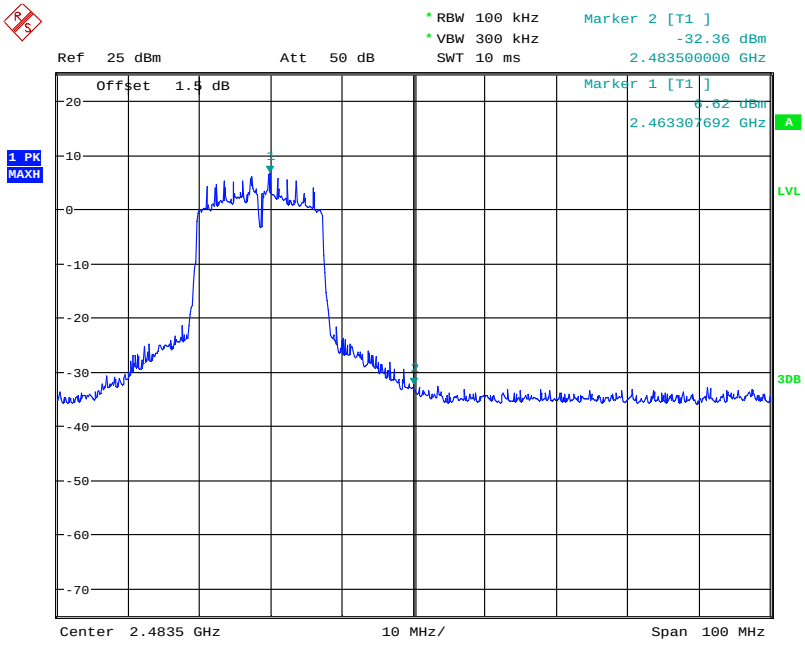
Date: 19.DEC.2016 19:48:21

Plot H



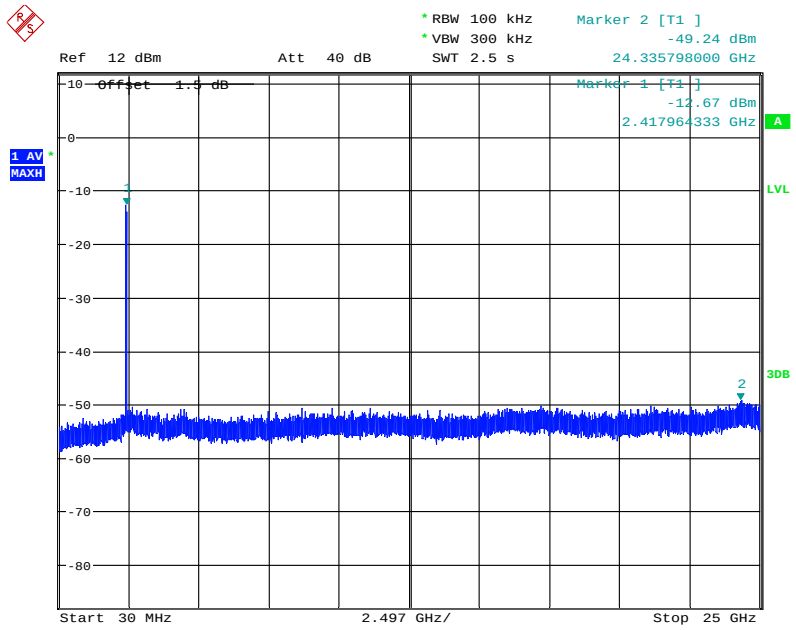
Date: 19.DEC.2016 19:50:22

Plot I



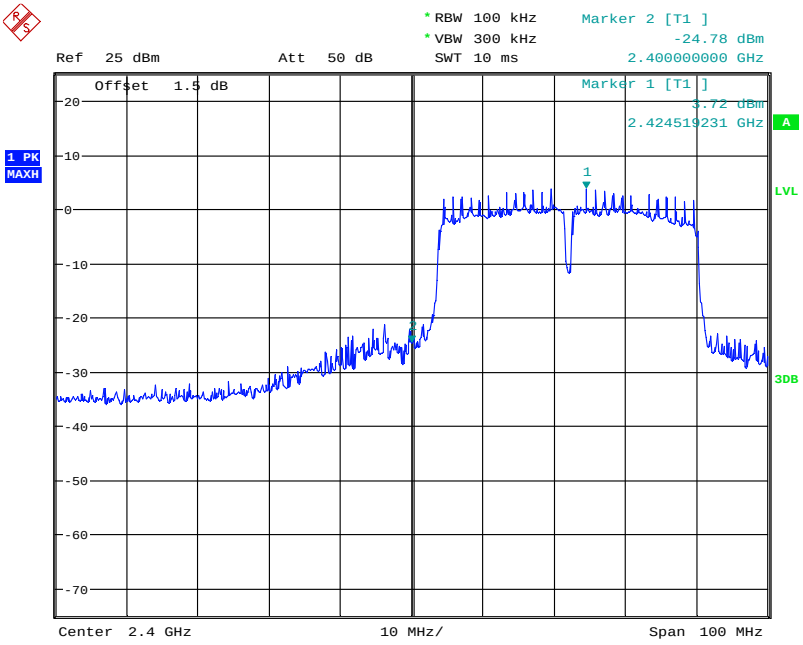
Date: 14.DEC.2016 17:33:21

(IEEE 802.11n20MHz- Band Edge at channel =11)



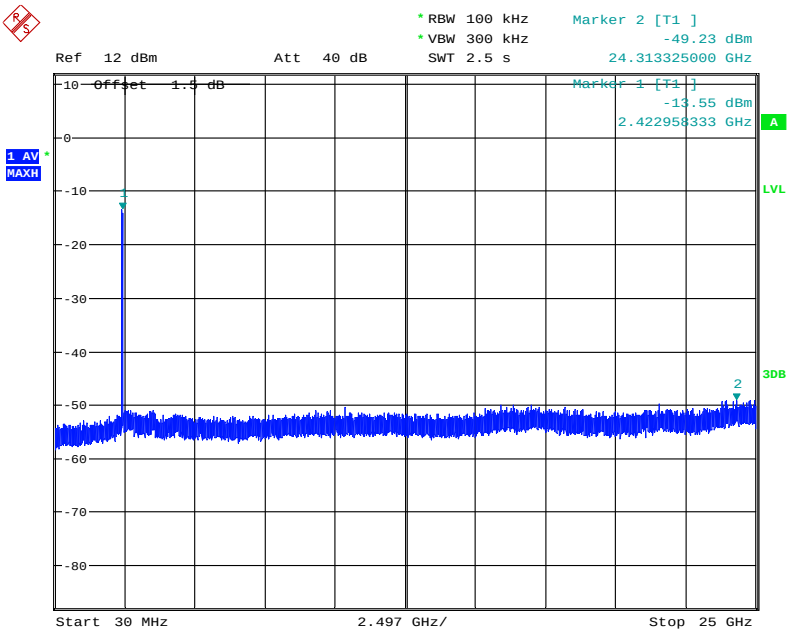
Date: 19.DEC.2016 19:51:53

Plot J



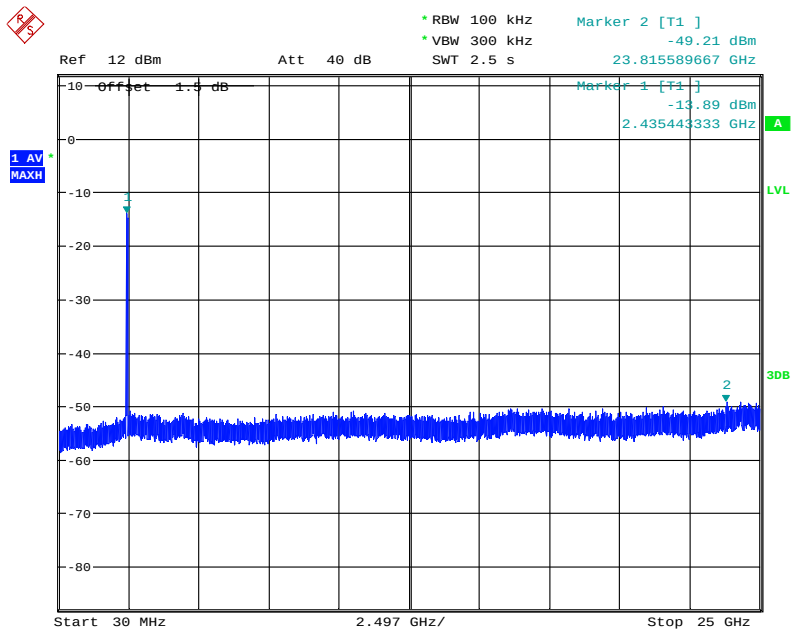
Date: 14.DEC.2016 17:31:19

(IEEE 802.11n40MHz- Band Edge at channel =1)



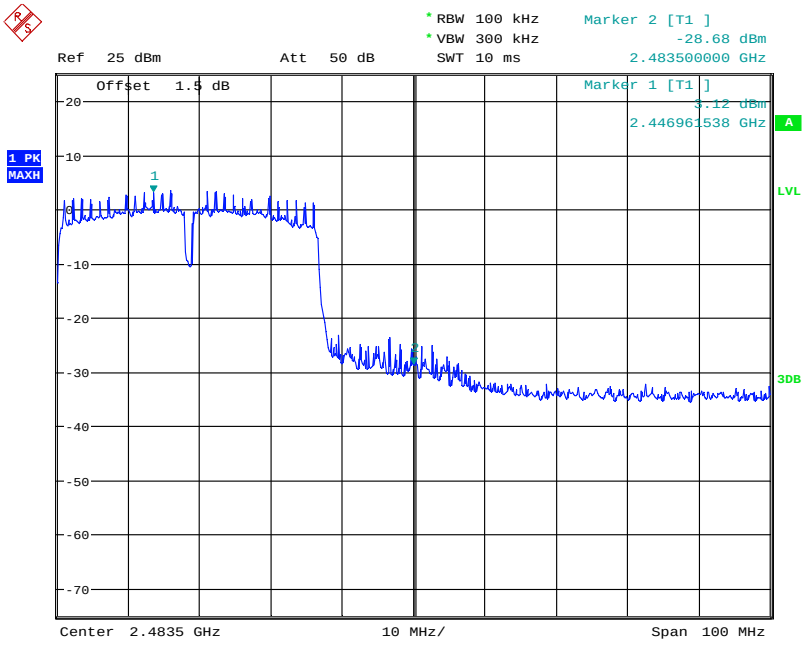
Date: 19.DEC.2016 19:53:24

Plot K



Date: 19.DEC.2016 19:54:13

Plot L



Date: 14.DEC.2016 17:32:32

(IEEE 802.11n40MHz- Band Edge at channel =11)

ANT 2 Test Result:

IEEE 802.11b Test mode

Channel	Frequency (MHz)	Measured max out of band emission(dBm)	Refer to plot	Limit(dBm)		Result
				Carrier level	Calculated 30dBc limit	
1	2412	-48.86	Plot A1	3.49	-26.51	Pass
6	2437	-49.07	Plot B1	-1.27	-31.27	Pass
11	2462	-48.31	Plot C1	-7.33	-37.33	Pass

IEEE 802.11g Test mode

Channel	Frequency (MHz)	Measured max out of band emission(dBm)	Refer to plot	Limit(dBm)		Result
				Carrier level	Calculated 30dBc limit	
1	2412	-49.33	Plot D1	-6.84	-36.84	Pass
6	2437	-48.94	Plot E1	-7.98	-37.98	Pass
11	2462	-49.32	Plot F1	-7.20	-37.20	Pass

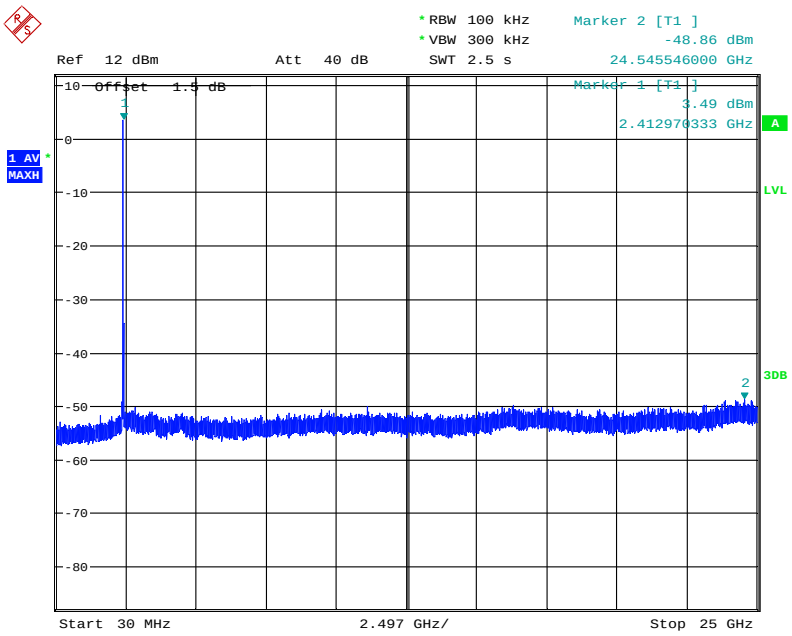
IEEE 802.11n (20MHz) Test mode

Channel	Frequency (MHz)	Measured max out of band emission(dBm)	Refer to plot	Limit(dBm)		Result
				Carrier level	Calculated 30dBc limit	
1	2412	-49.05	Plot G1	-9.21	-39.21	Pass
6	2437	-49.27	Plot H1	-9.85	-39.85	Pass
11	2462	-49.09	Plot I1	-9.37	-39.37	Pass

IEEE 802.11n (40MHz) Test mode

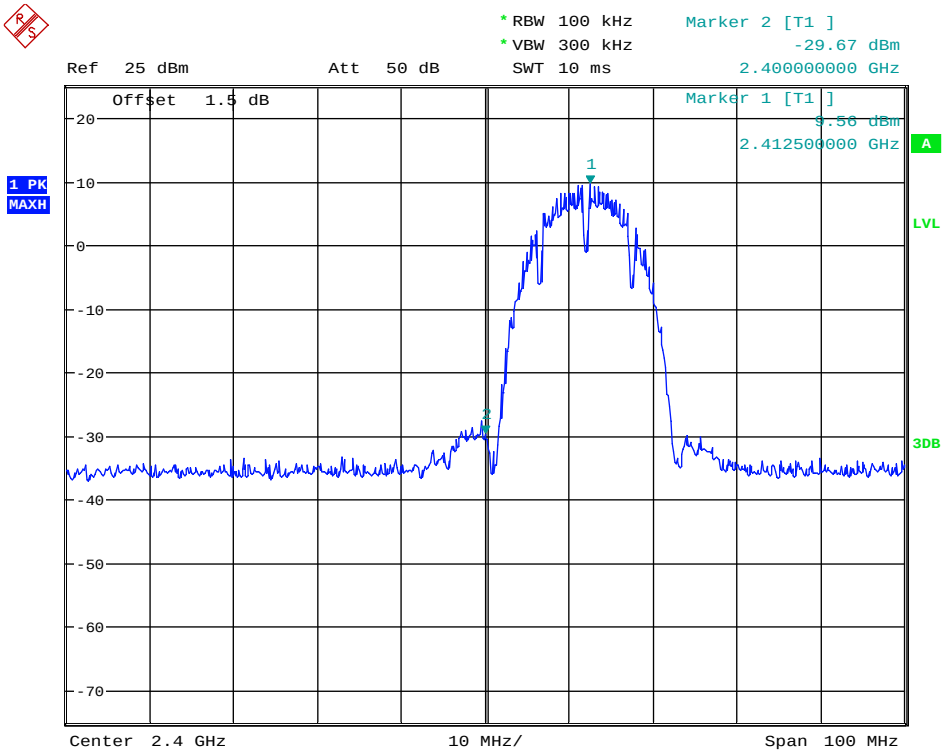
Channel	Frequency (MHz)	Measured max out of band emission(dBm)	Refer to plot	Limit(dBm)		Result
				Carrier level	Calculated 30dBc limit	
3	2422	-48.58	Plot J1	-13.52	-43.52	Pass
6	2437	-49.45	Plot K1	-14.92	-44.92	Pass
9	2452	-49.24	Plot L1	-13.43	-43.43	Pass

Test Plots:



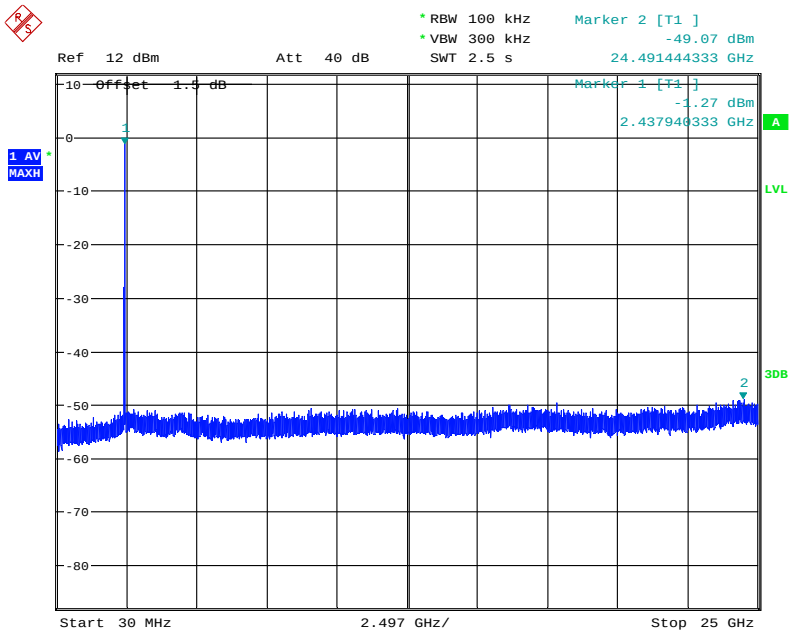
Date: 19.DEC.2016 19:31:20

Plot A1



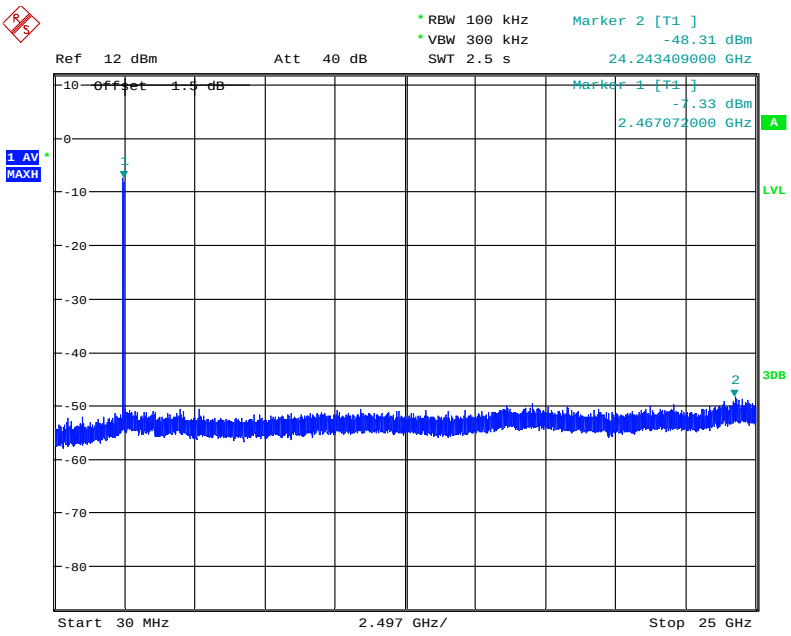
Date: 14.DEC.2016 17:25:20

(IEEE 802.11b- Band Edge at channel =1)



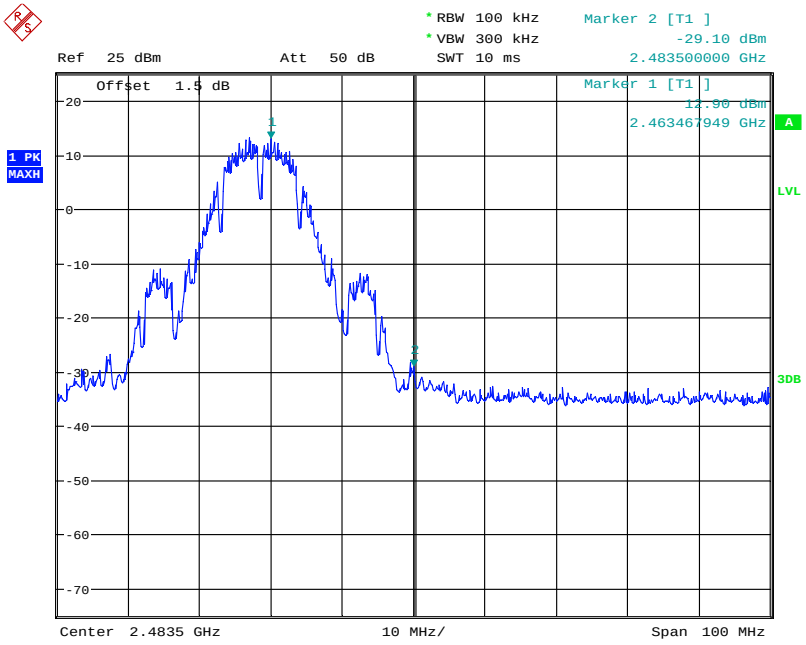
Date: 19.DEC.2016 19:32:48

Plot B1



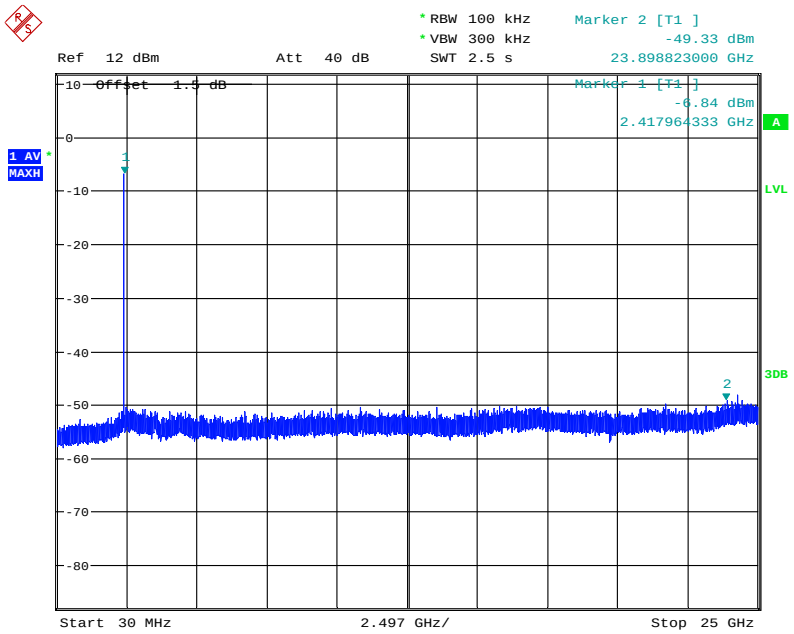
Date: 19.DEC.2016 19:35:20

Plot C1



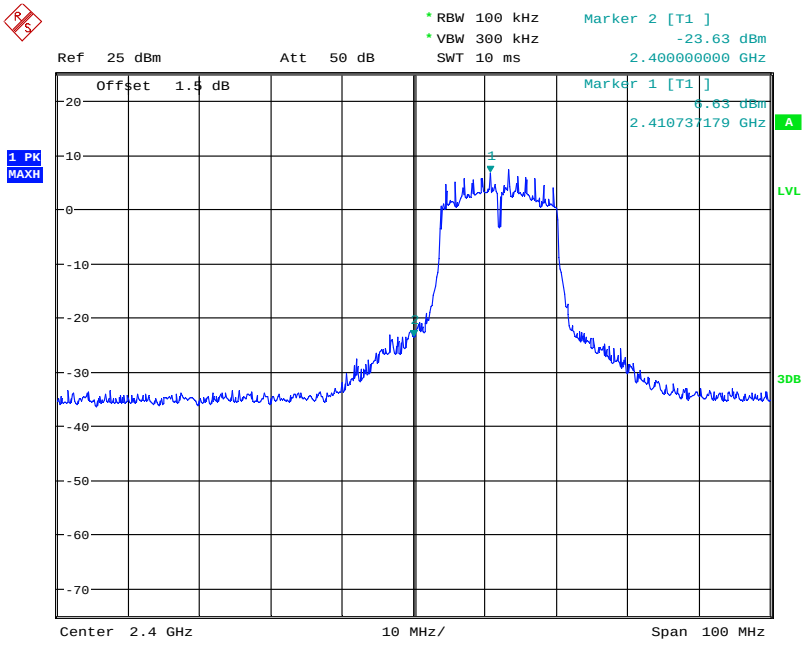
Date: 14.DEC.2016 17:35:36

(IEEE 802.11b- Band Edge at channel =11)

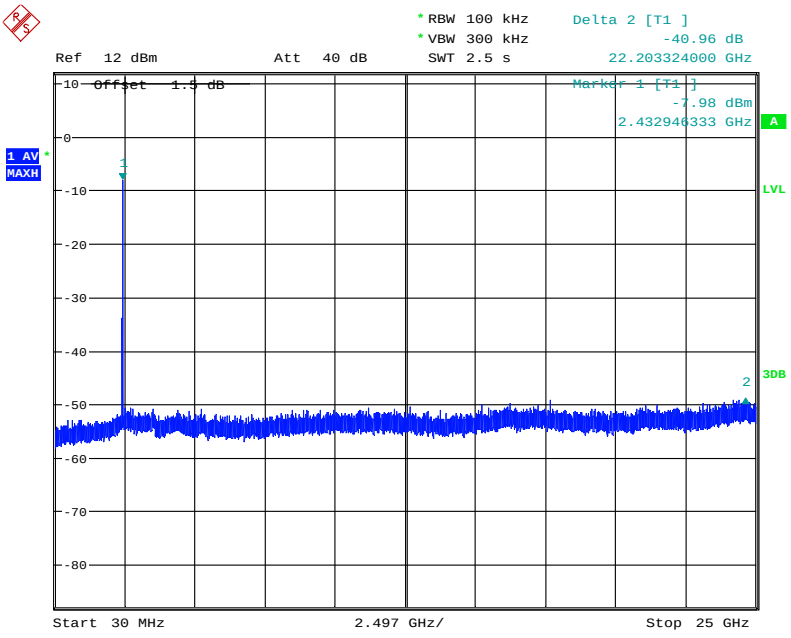


Date: 19.DEC.2016 19:41:00

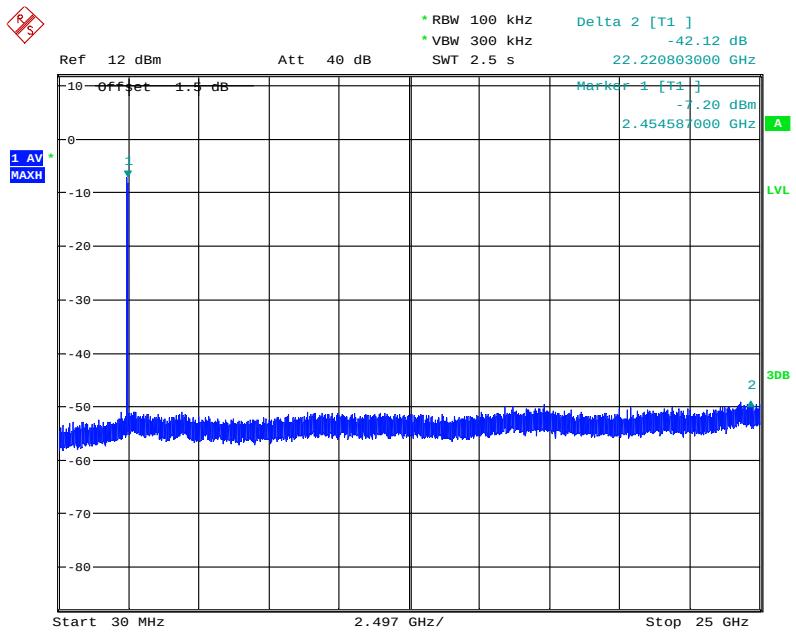
Plot D1



(IEEE 802.11g- Band Edge at channel =1)

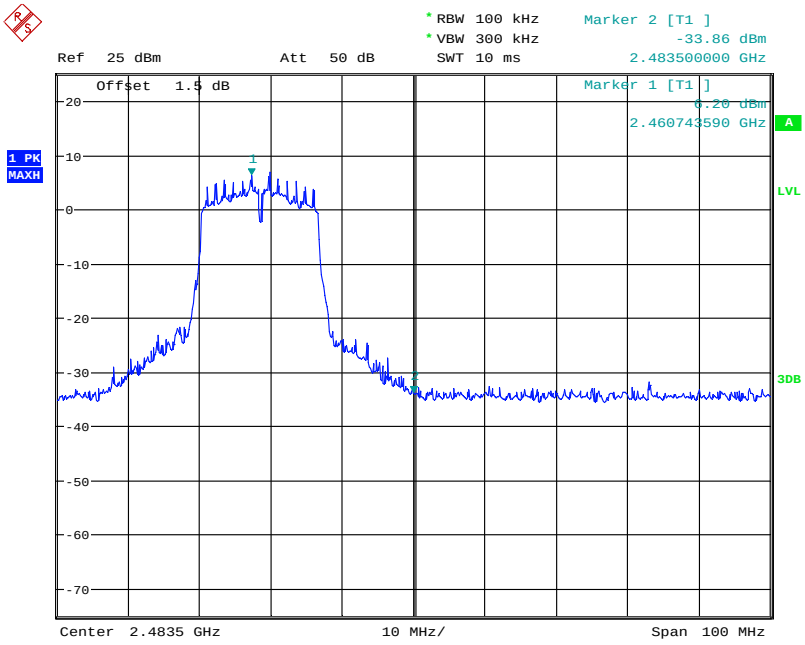


Plot E1



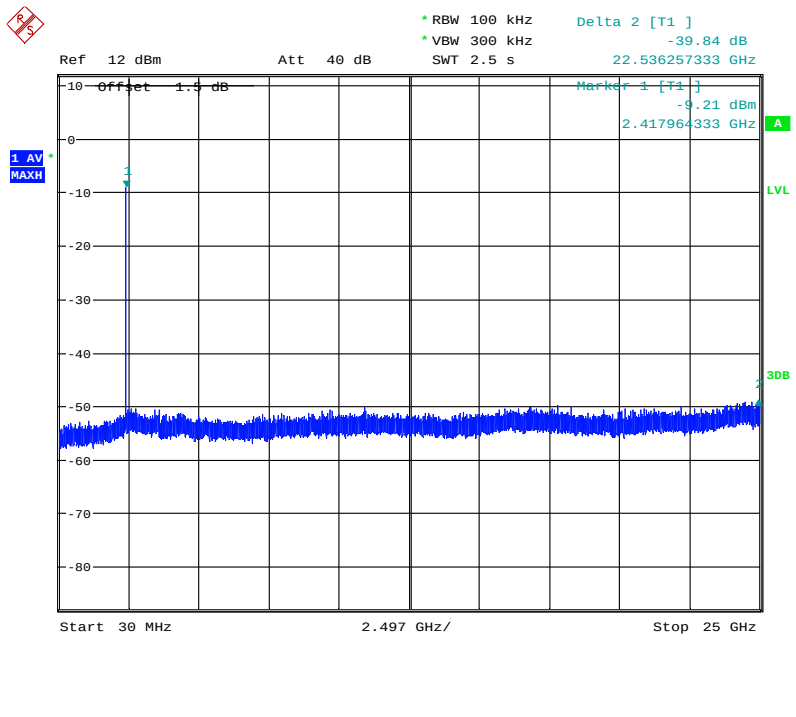
Date: 19.DEC.2016 19:44:58

Plot F1

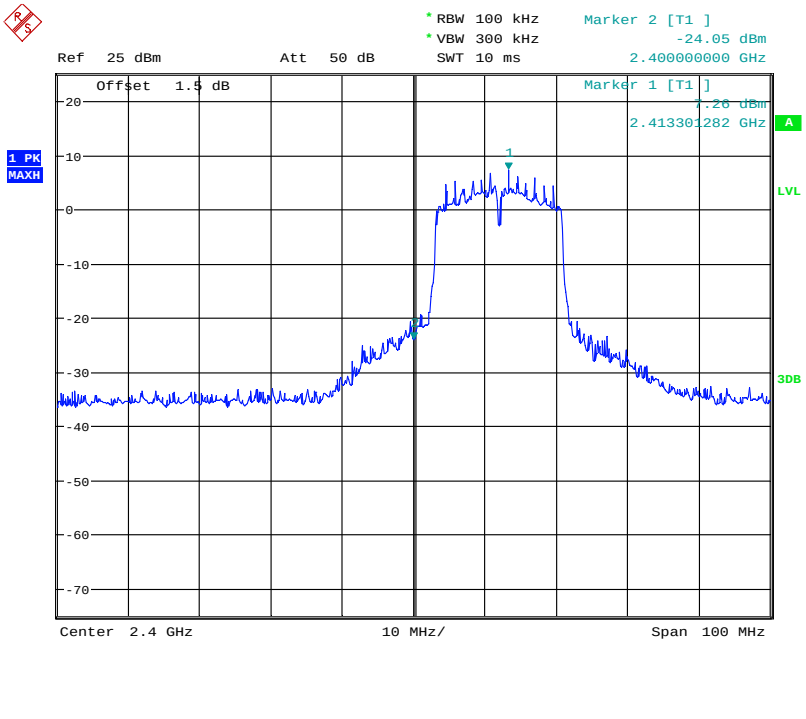


Date: 14.DEC.2016 17:34:48

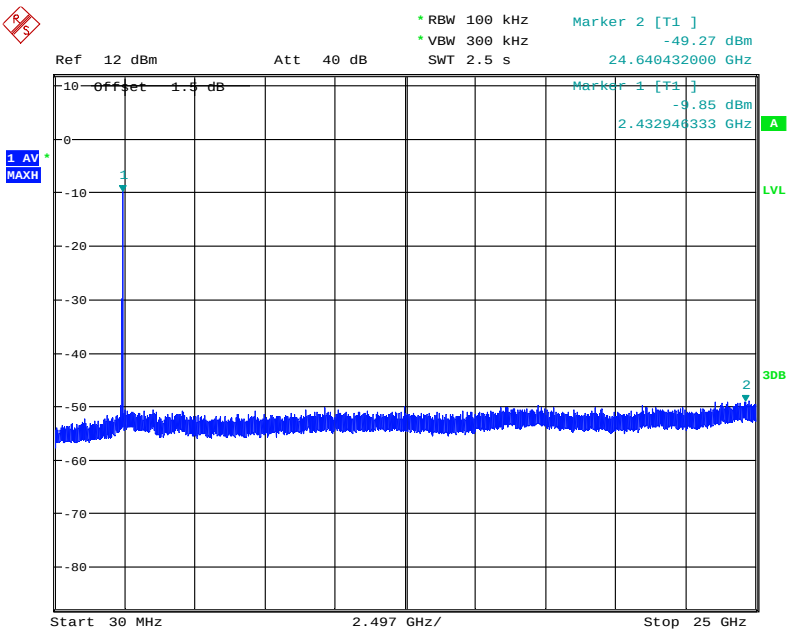
(IEEE 802.11g- Band Edge at channel =11)



Plot G1

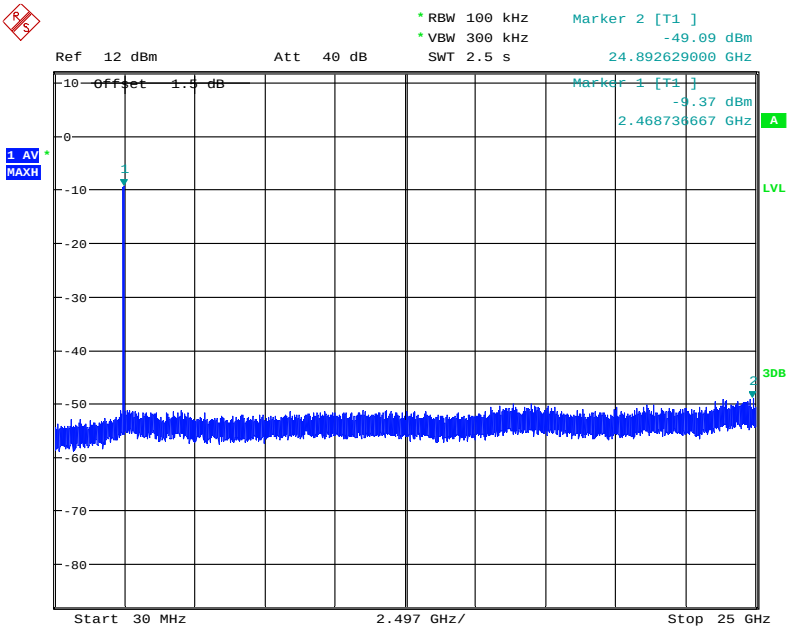


(IEEE 802.11n20MHz- Band Edge at channel =1)



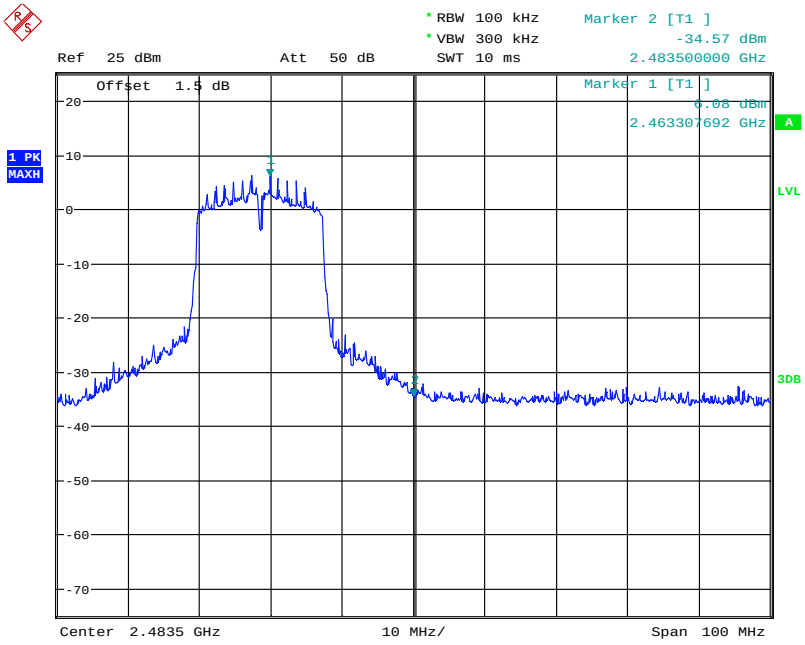
Date: 19.DEC.2016 19:49:29

Plot H1



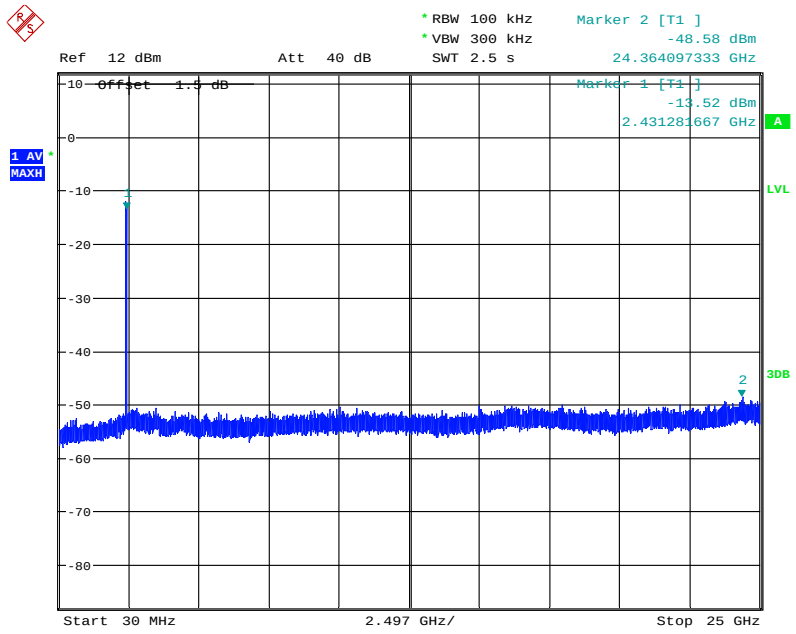
Date: 19.DEC.2016 19:50:47

Plot I1



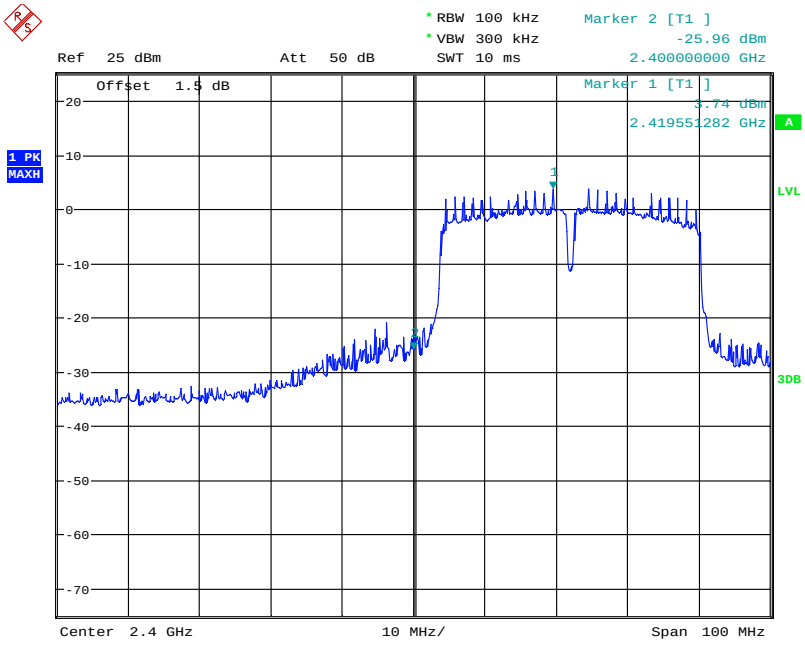
Date: 14.DEC.2016 17:33:33

(IEEE 802.11n20MHz- Band Edge at channel =11)



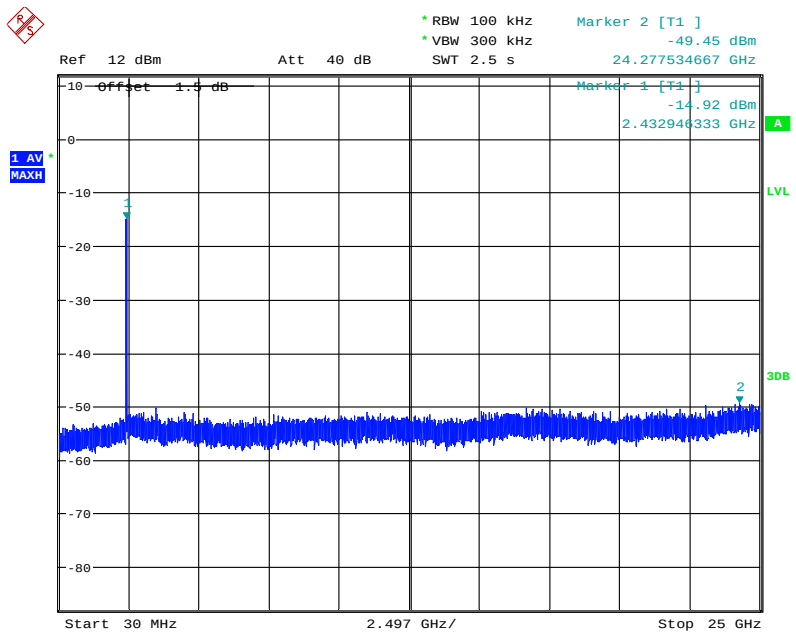
Date: 19.DEC.2016 19:52:41

Plot J1



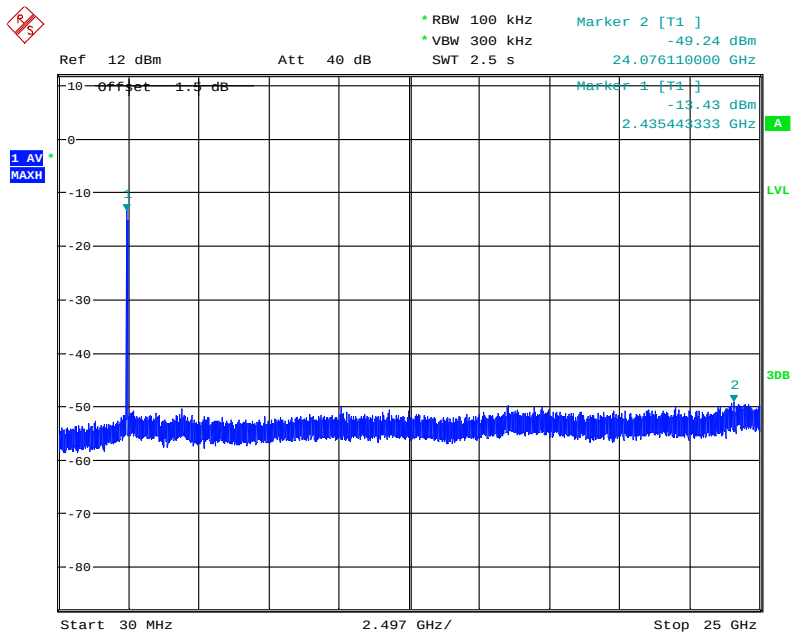
Date: 14.DEC.2016 17:31:34

(IEEE 802.11n40MHz- Band Edge at channel =1)

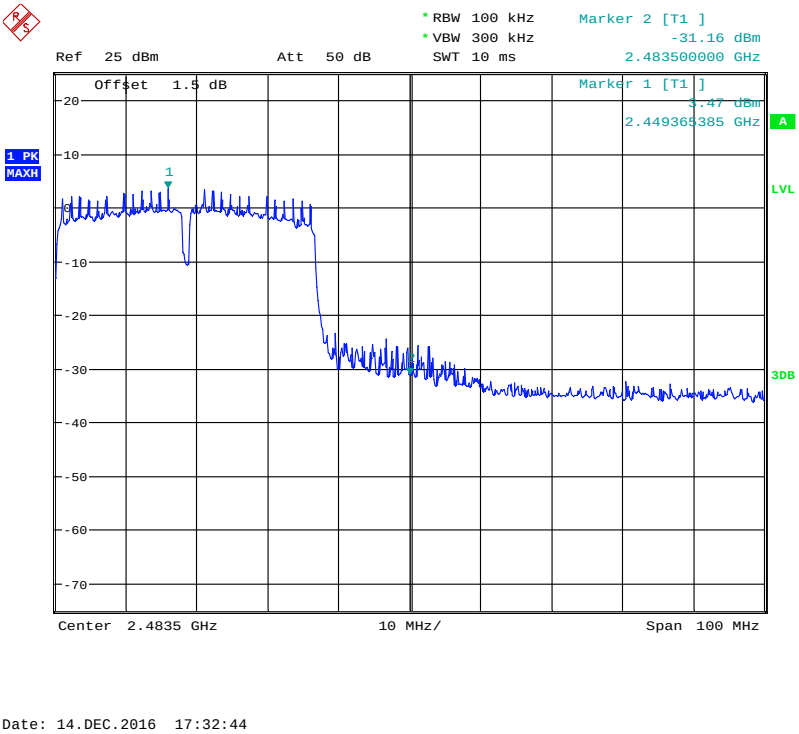


Date: 19.DEC.2016 19:53:39

Plot K1



Plot L1



(IEEE 802.11n40MHz- Band Edge at channel =11)

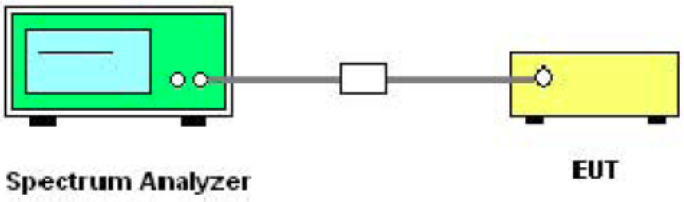
Conclusion: Pass

5.4 Power Spectral Density (PSD)

5.4.1 Requirement

According to FCC section 15.247(e), the same method of determining the conducted output power shall be used to determine the power spectral density. If a peak output power is measured, then a peak power spectral density measurement is required. If an average output power is measured, then an average power spectral density measurement should be used.

5.4.2 Test Description



a) Set analyzer center frequency to DTS channel center frequency.

b) Set the span =25mHz.

c) Set the RBW to: 3 kHz .

d) Set the VBW to: 10 kHz.

e) Detector = peak.

f) Sweep time = auto couple.

g) Trace mode = max hold.

h) Allow trace to fully stabilize.

i) Use the peak marker function to determine the maximum amplitude level within the RBW.

j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

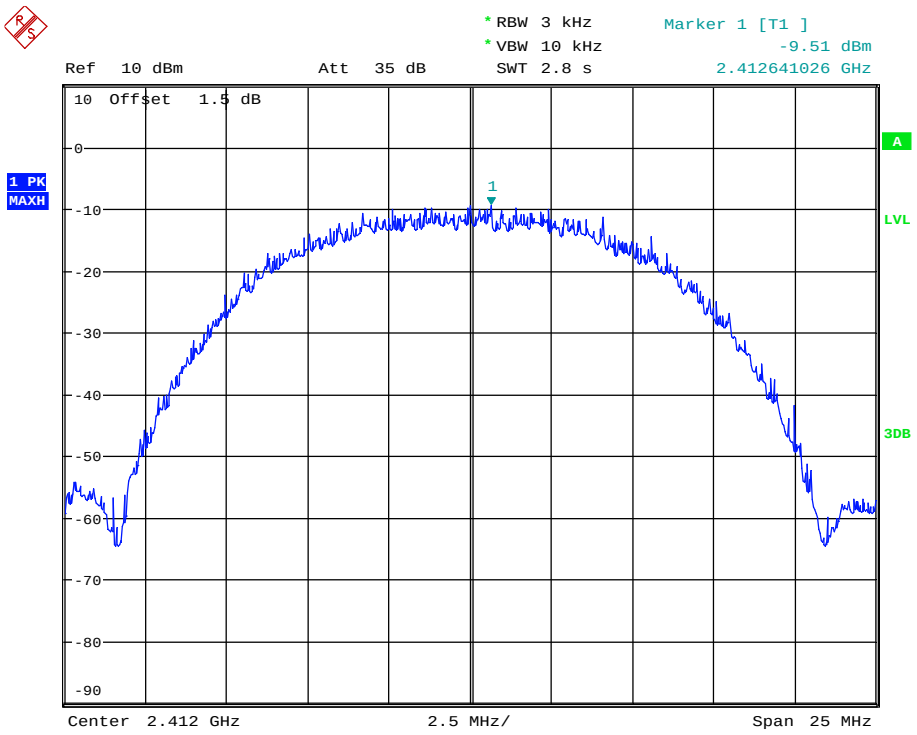
5.4.3 Test Result

Test Mode	CH	Frequency (MHz)	Measured PSD (dBm/3kHz)		Limit (dBm/3kHz)	Result
			ANT 1	ANT 2		
IEEE 802.11b	1	2412	-9.51	-9.42	8	Pass
	6	2437	-10.42	-11.01	8	Pass

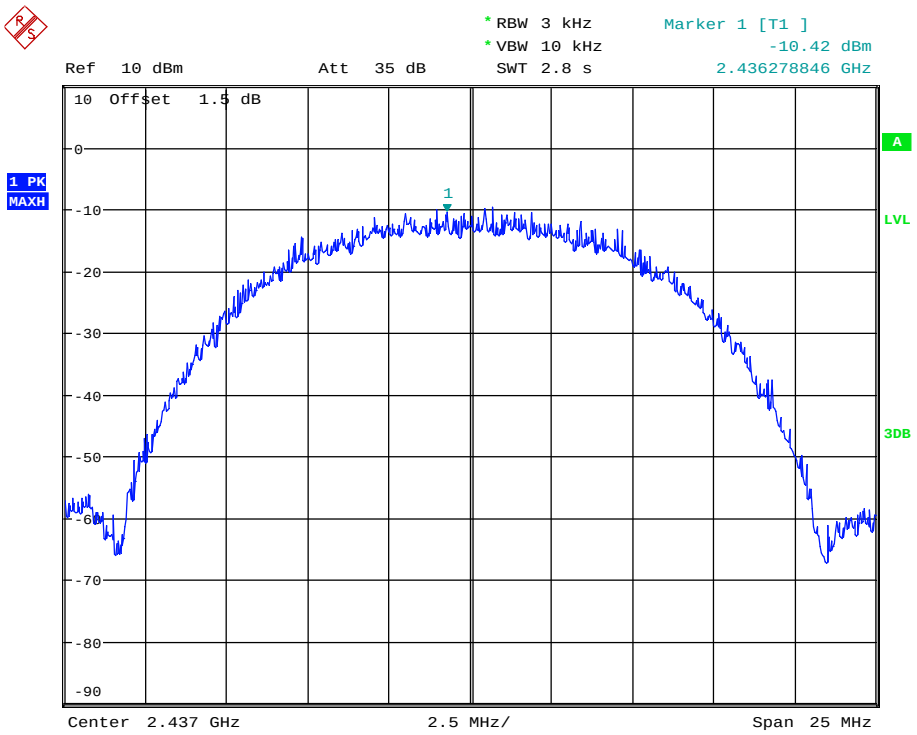
	11	2462	-9.92	-11.18	8	Pass
IEEE 802.11g	1	2412	-13.43	-14.19	8	Pass
	6	2437	-14.94	-13.57	8	Pass
	11	2462	-14.08	-15.06	8	Pass

Test Mode	CH	Frequency (MHz)	Measured PSD (dBm/3kHz)			Limit (dBm/3kHz)	Result
			ANT 1	ANT 2	ANT 1&2		
IEEE 802.11n (20MHz)	1	2412	-15.46	-14.48	-11.93	8	Pass
	6	2437	-15.13	-15.27	-12.19	8	Pass
	11	2462	-16.04	-16.64	-13.32	8	Pass
IEEE 802.11n (40MHz)	3	2422	-18.61	-17.88	-15.23	8	Pass
	6	2437	-17.79	-17.89	-14.84	8	Pass
	9	2452	-18.55	-18.07	-15.29	8	Pass

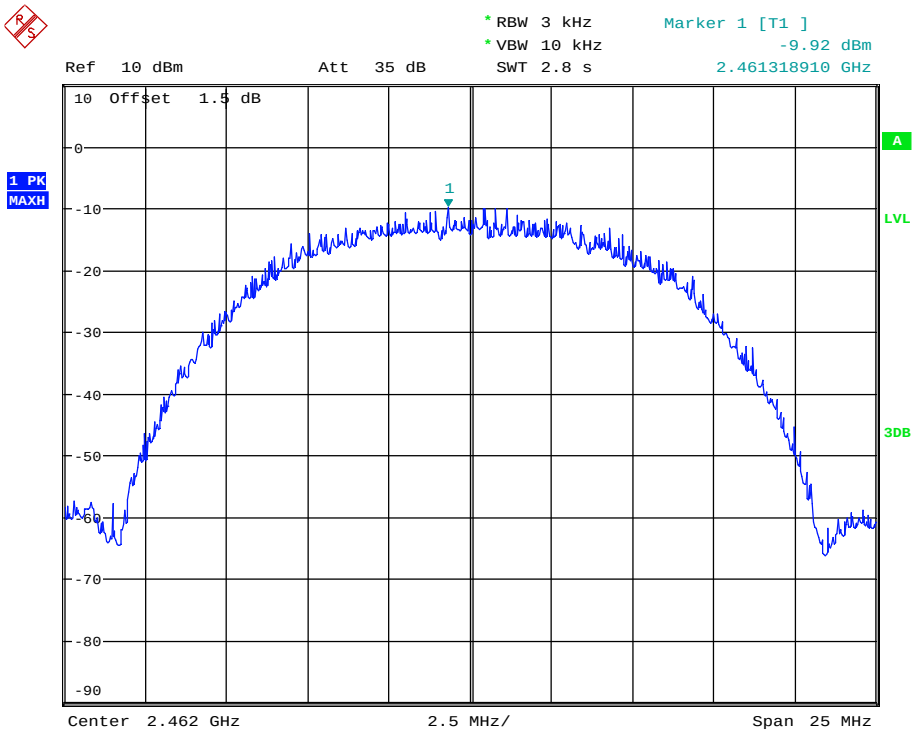
Test Plots



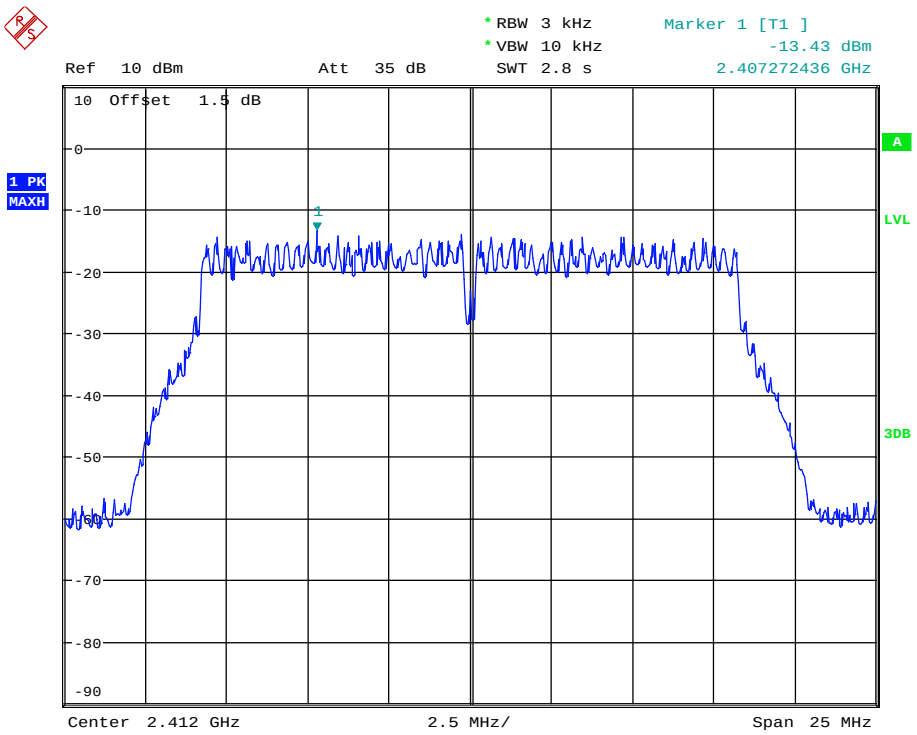
(IEEE 802.11b-CH1, ANT 1)



(IEEE 802.11b-CH6, ANT 1)

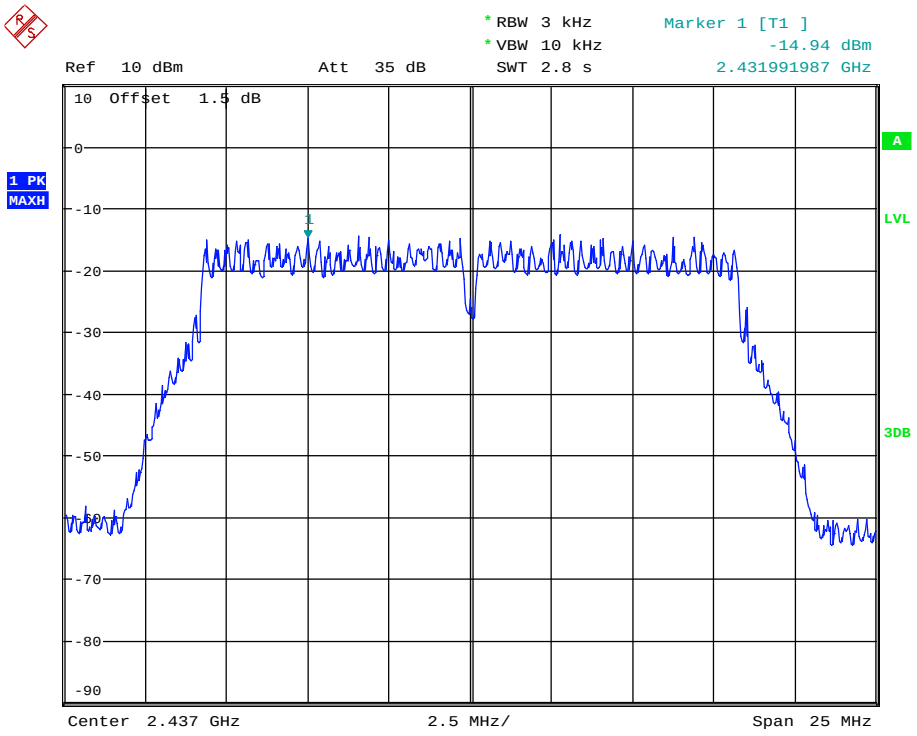


(IEEE 802.11b-CH11, ANT 1)



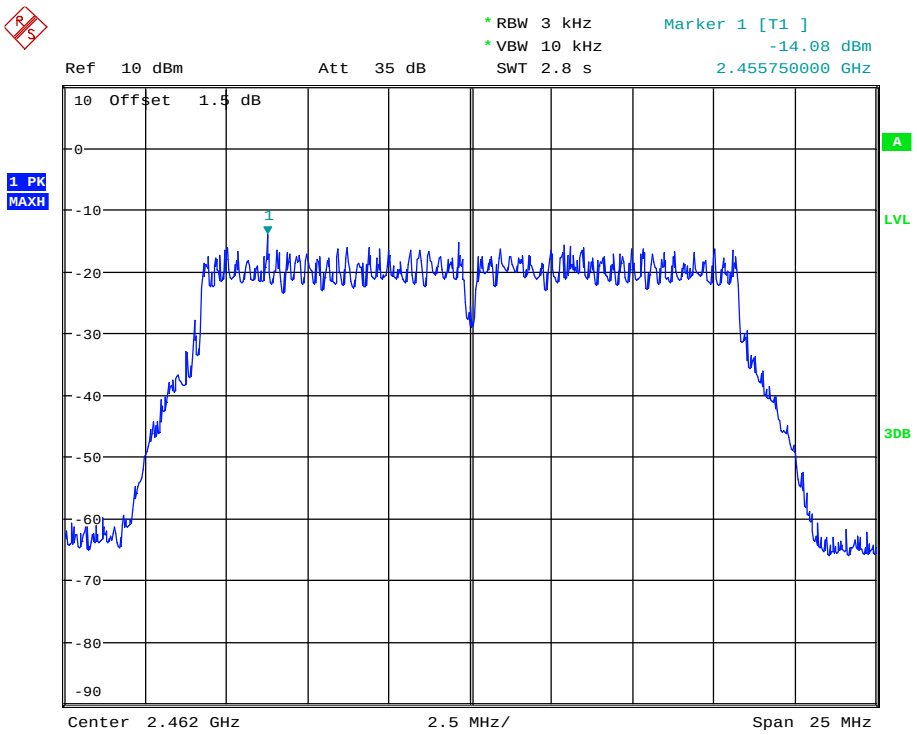
Date: 27.OCT.2016 19:30:06

(IEEE 802.11g-CH1, ANT 1)

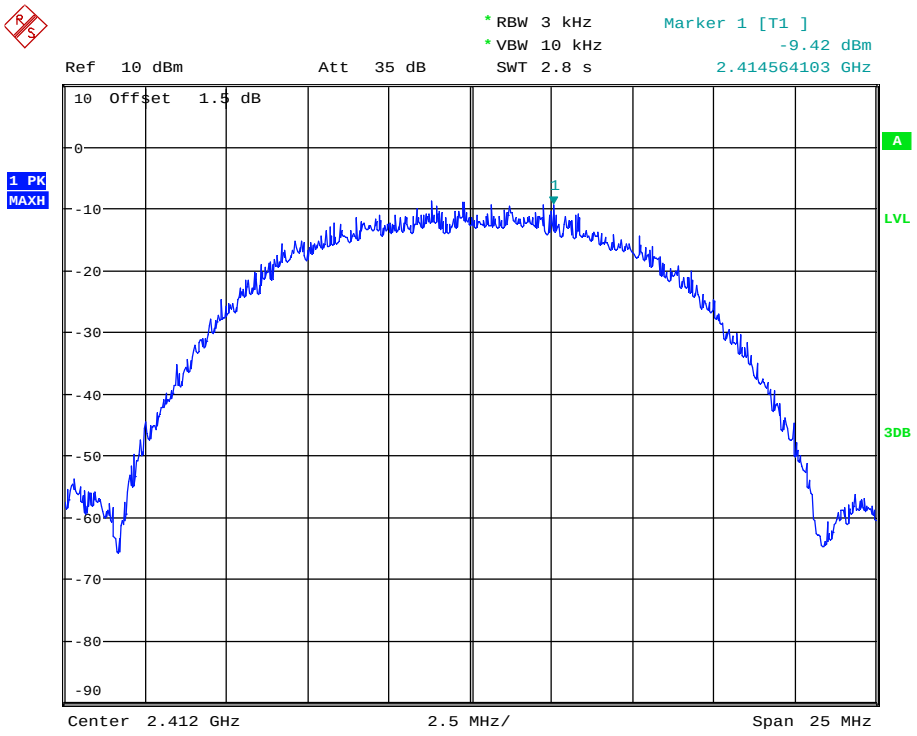


Date: 27.OCT.2016 19:31:20

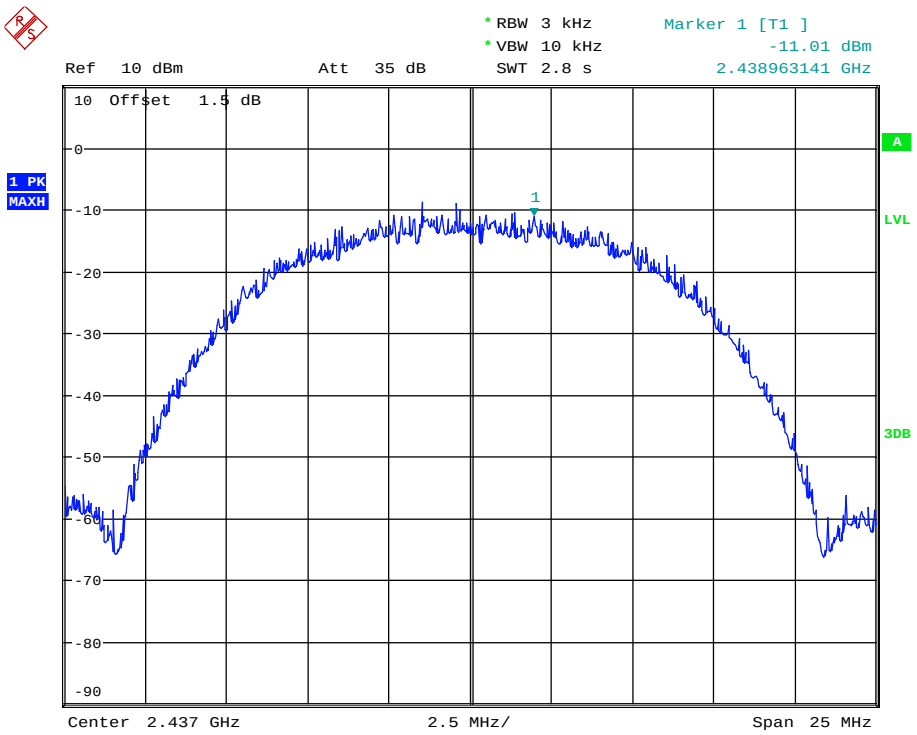
(IEEE 802.11g-CH6, ANT 1)



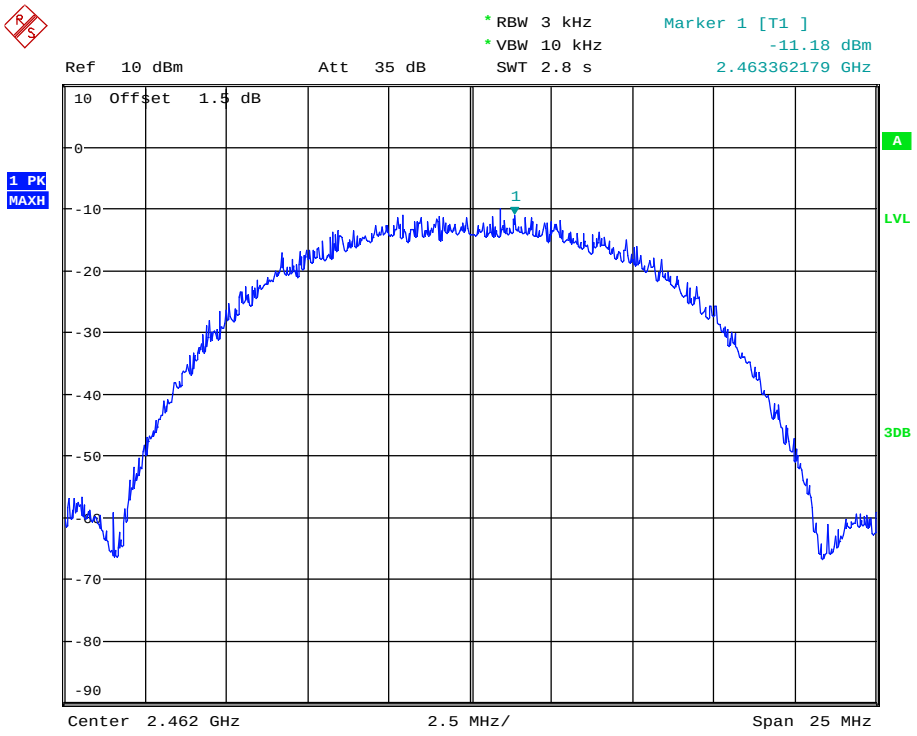
(IEEE 802.11g-CH11, ANT 1)



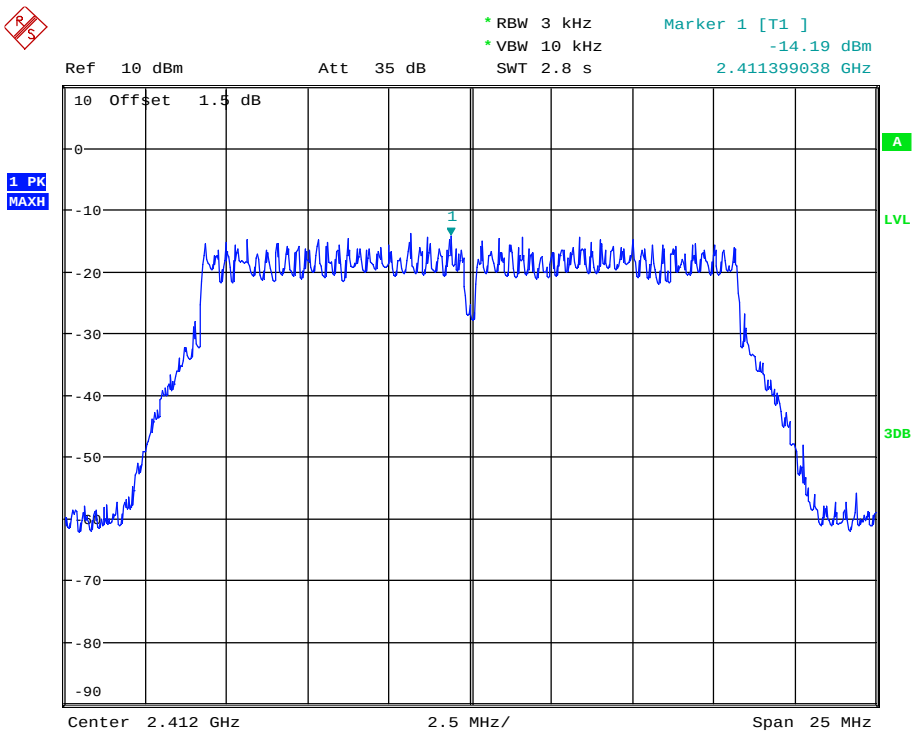
(IEEE 802.11b-CH1, ANT 2)



(IEEE 802.11b-CH6, ANT 2)

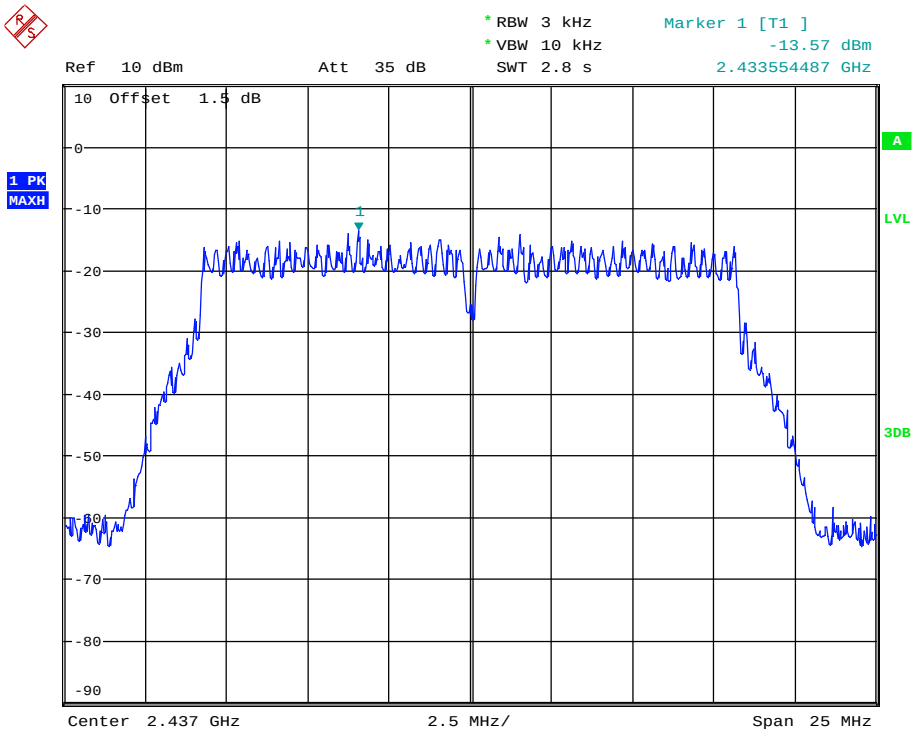


(IEEE 802.11b-CH11, ANT 2)



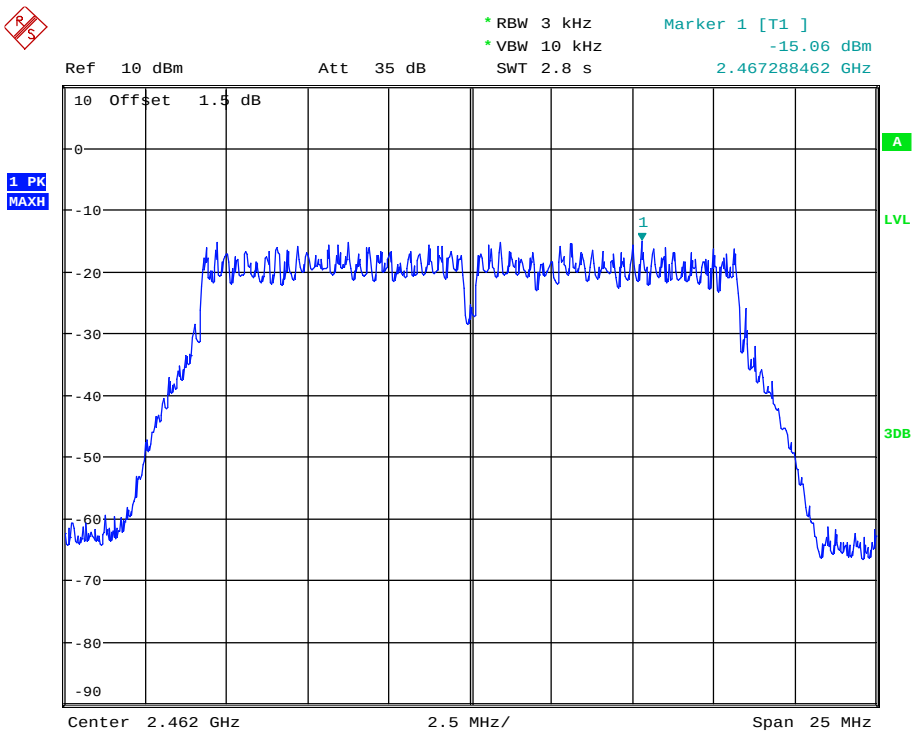
Date: 27.OCT.2016 19:30:29

(IEEE 802.11g-CH1, ANT 2)



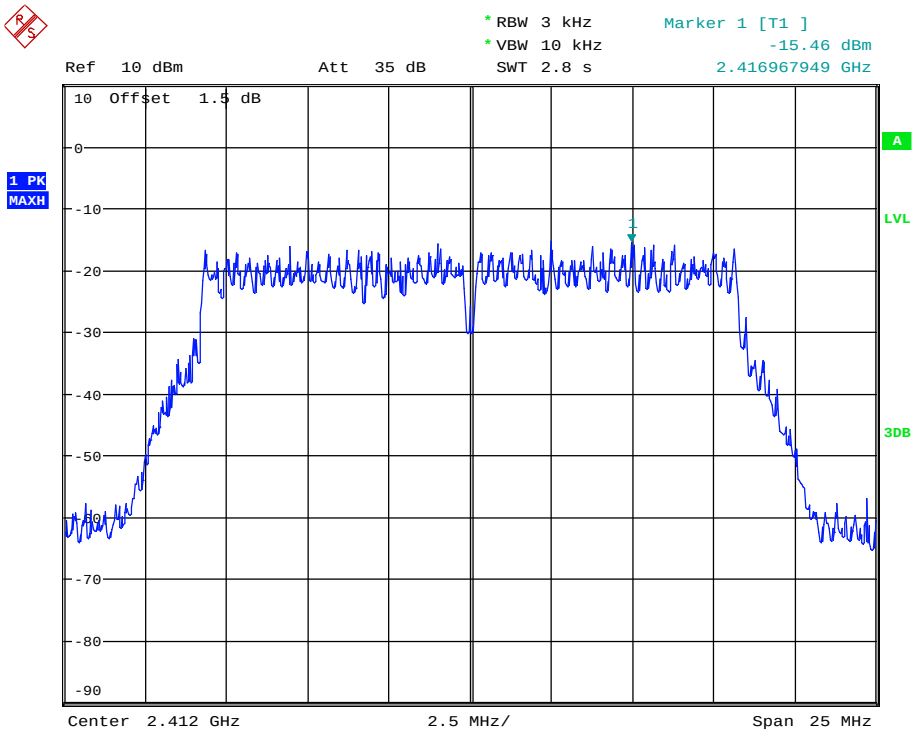
Date: 27.OCT.2016 19:31:52

(IEEE 802.11g-CH6, ANT 2)



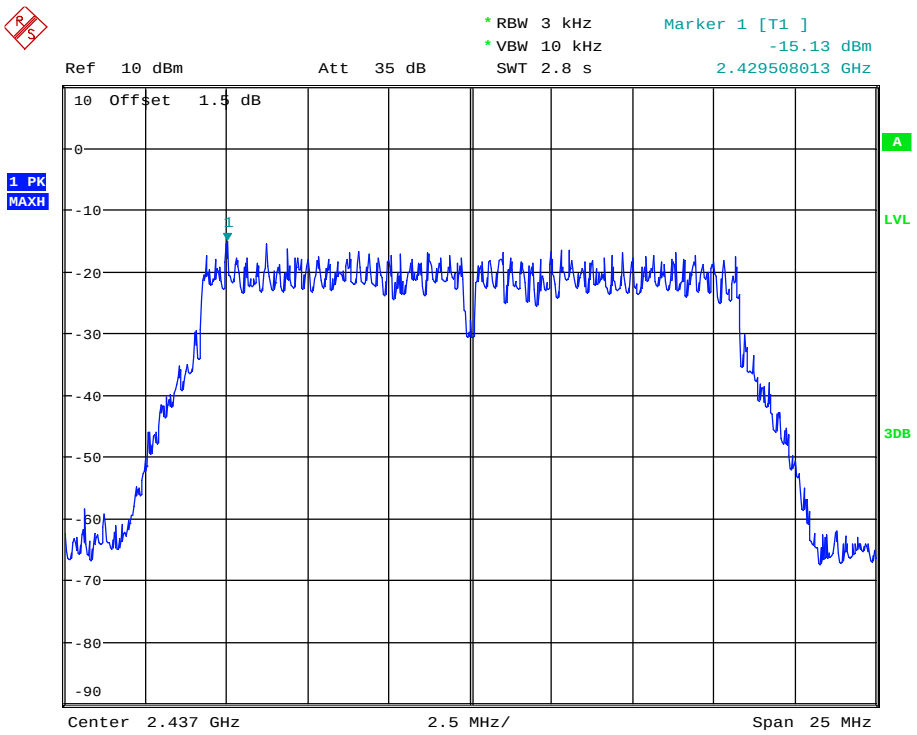
Date: 27.OCT.2016 19:33:09

(IEEE 802.11g-CH11, ANT 2)

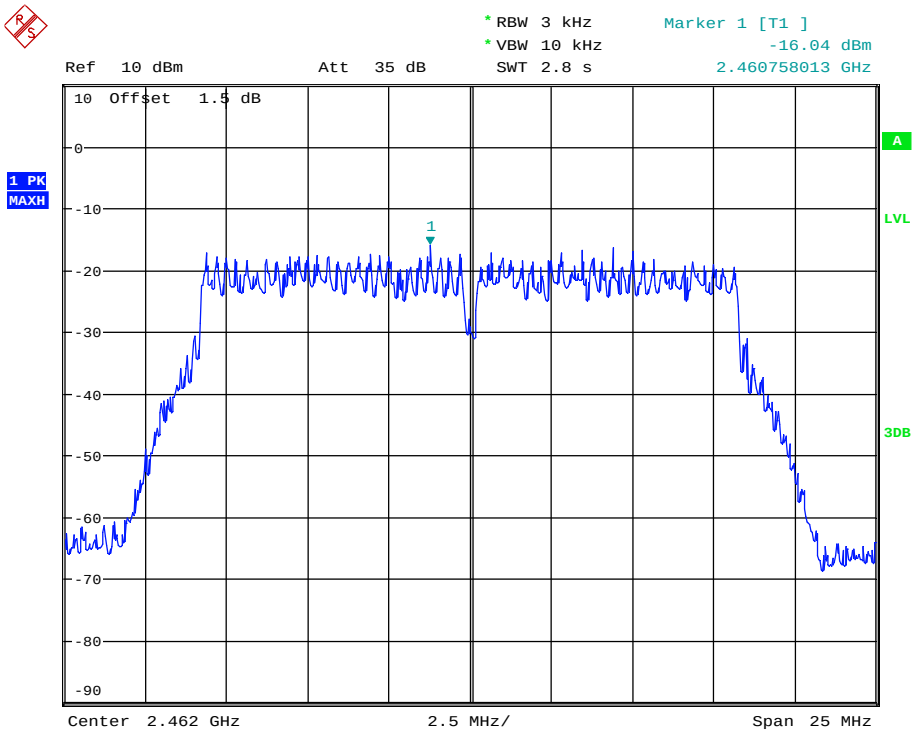


Date: 27.OCT.2016 19:33:54

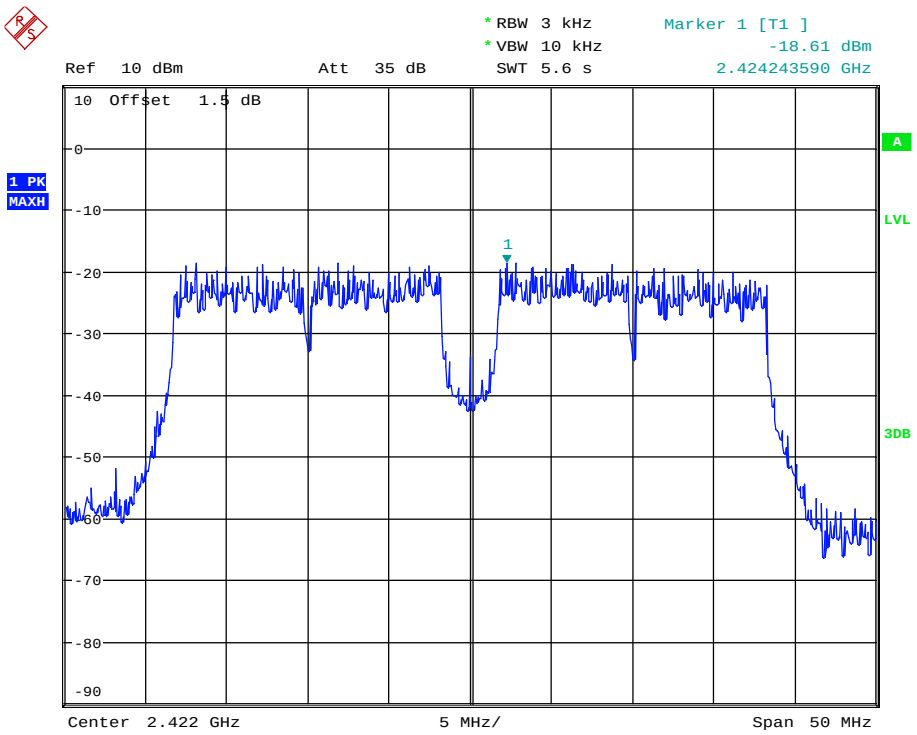
(IEEE 802.11n-20MHz-CH1, ANT 1)



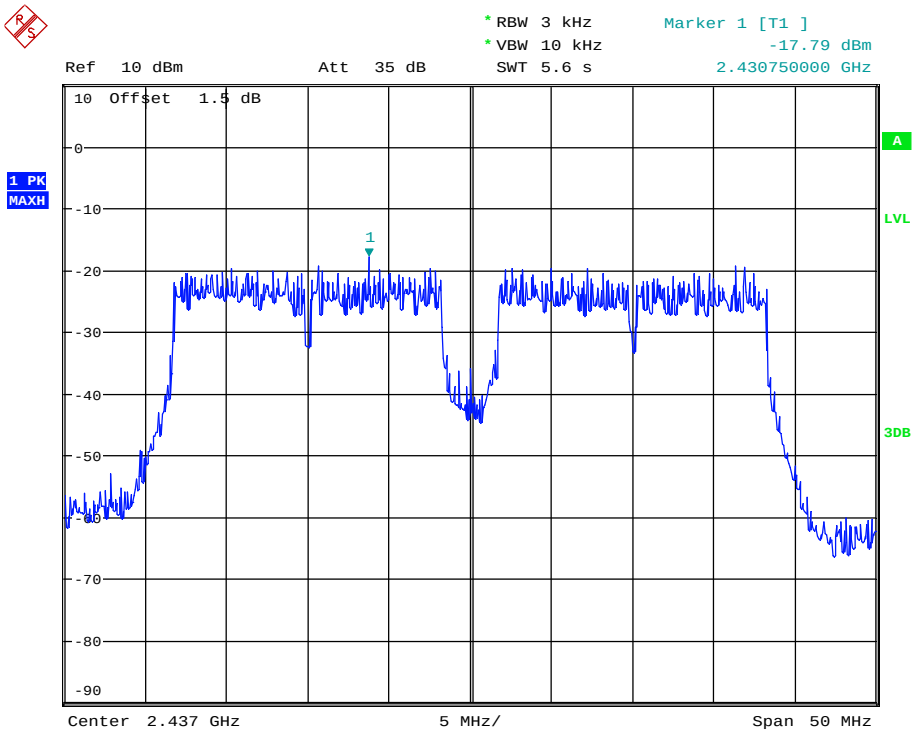
(IEEE 802.11n-20MHz-CH6, ANT 1)



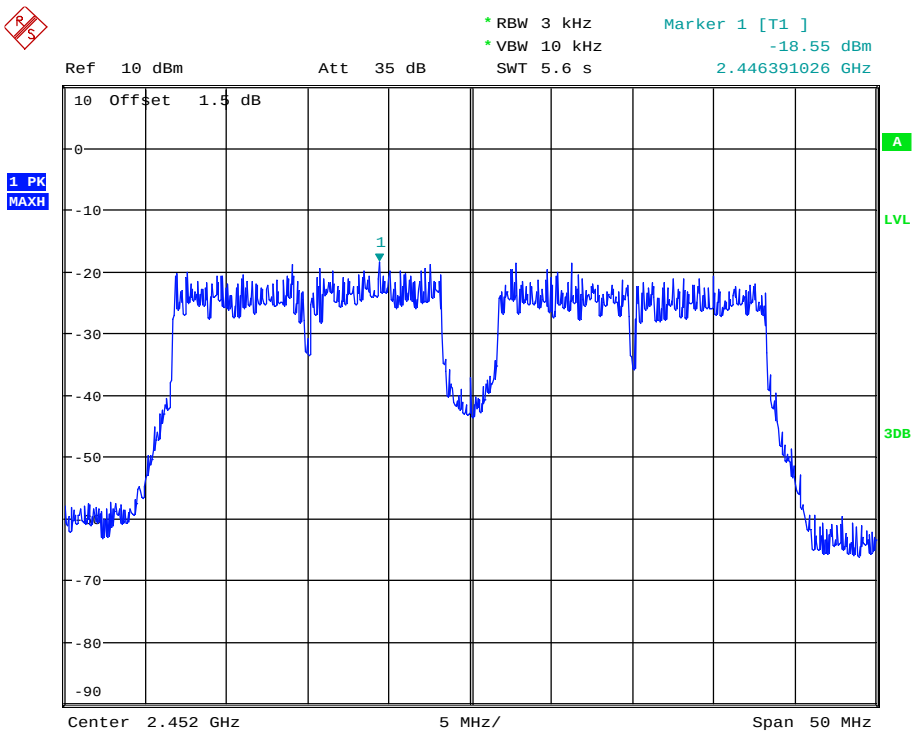
(IEEE 802.11n-20MHz-CH11, ANT 1)



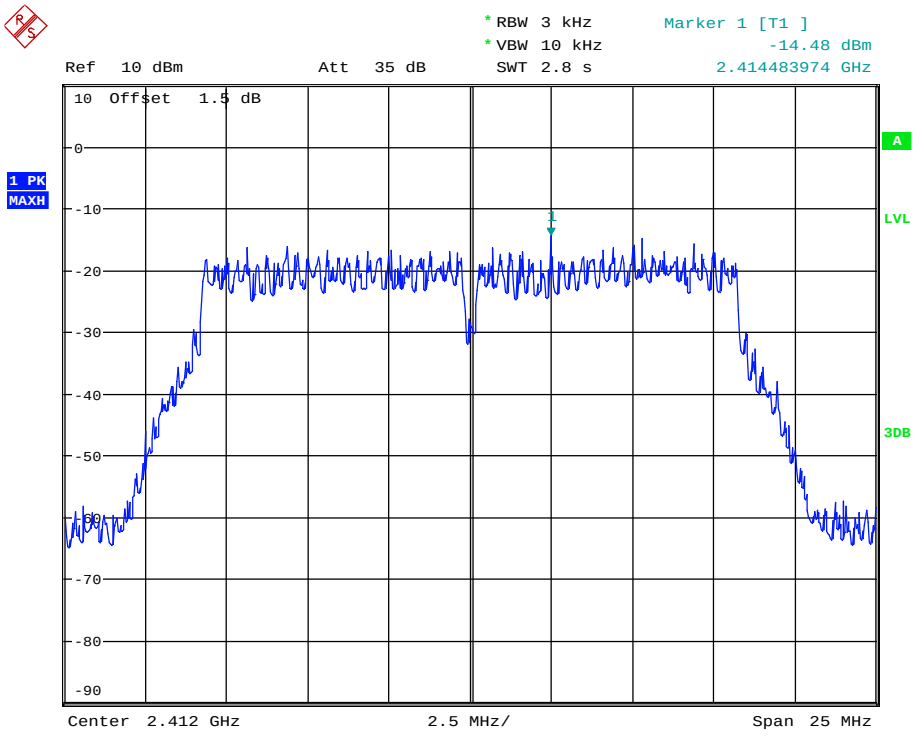
(IEEE 802.11n-40MHz-CH3, ANT 1)



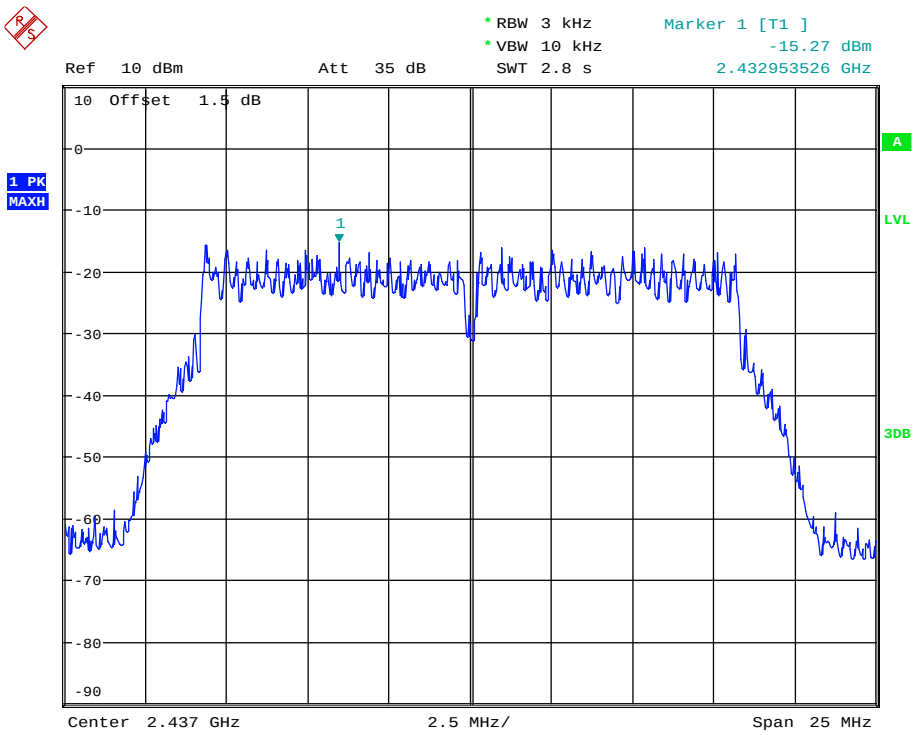
(IEEE 802.11n-40MHz-CH6, ANT 1)



(IEEE 802.11n-40MHz-CH9, ANT 1)

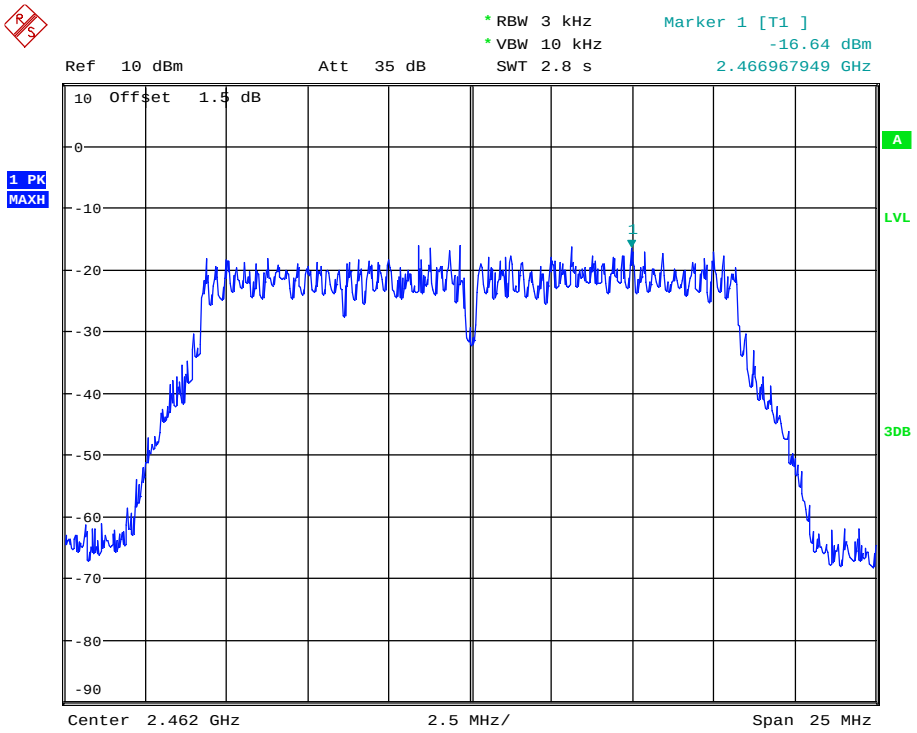


(IEEE 802.11n-20MHz-CH1, ANT 2)



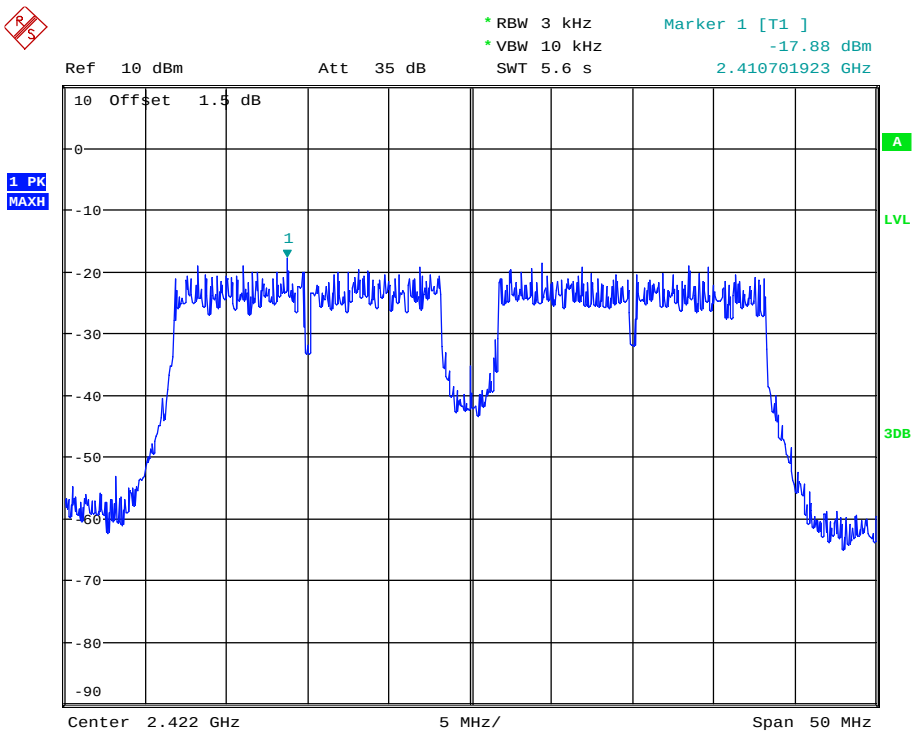
Date: 27.OCT.2016 19:35:38

(IEEE 802.11n-20MHz-CH6, ANT 2)



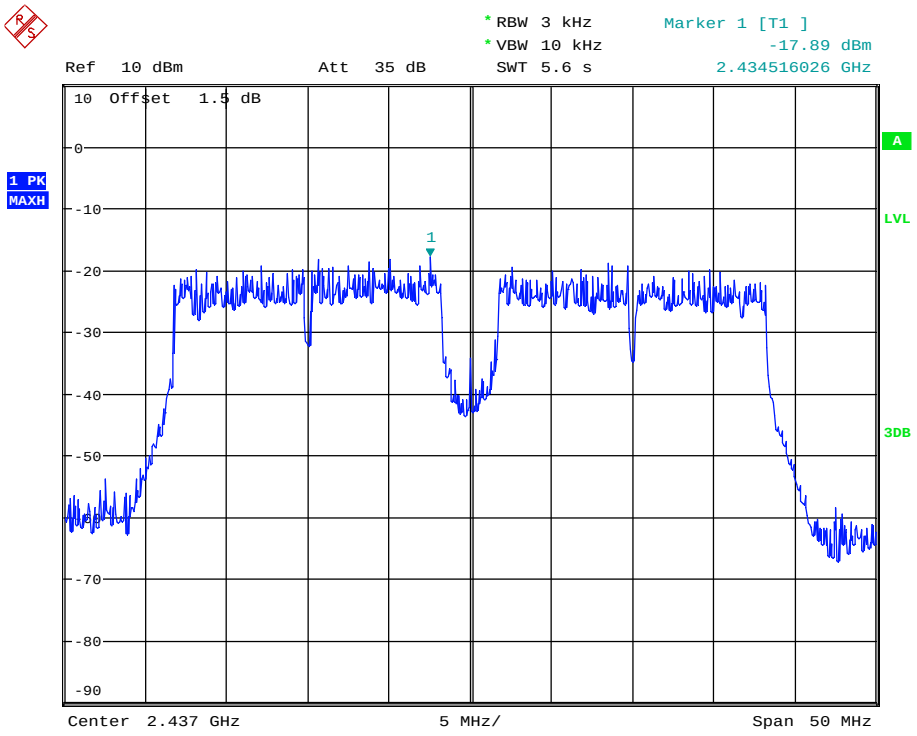
Date: 27.OCT.2016 19:36:29

(IEEE 802.11n-20MHz-CH11, ANT 2)



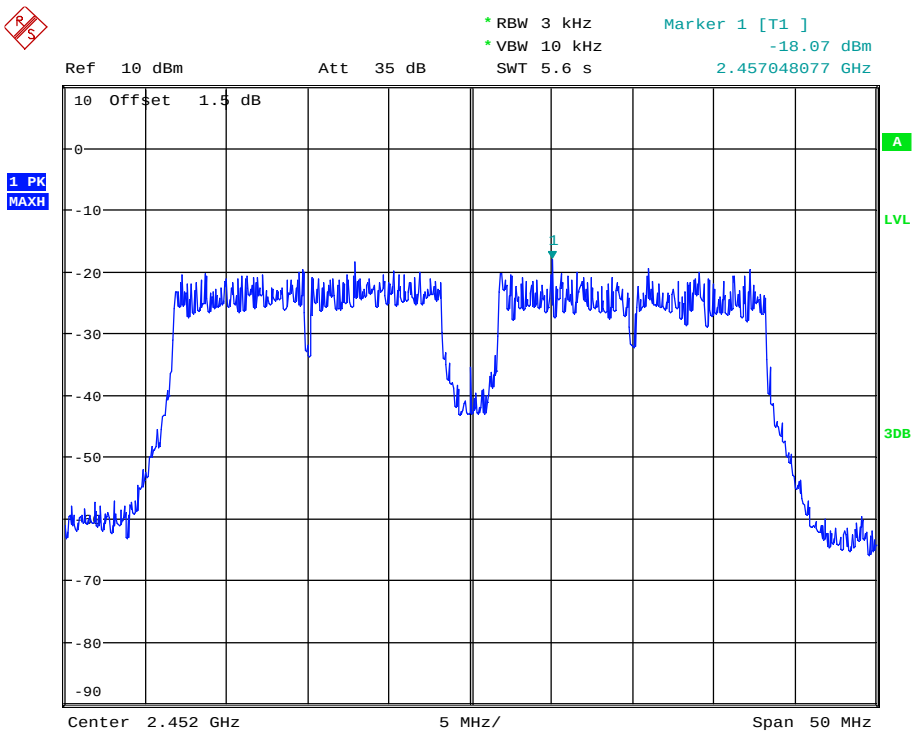
Date: 27.OCT.2016 19:37:47

(IEEE 802.11n-40MHz-CH3, ANT 2)



Date: 27.OCT.2016 19:38:35

(IEEE 802.11n-40MHz-CH6, ANT 2)



(IEEE 802.11n-40MHz-CH9, ANT 2)

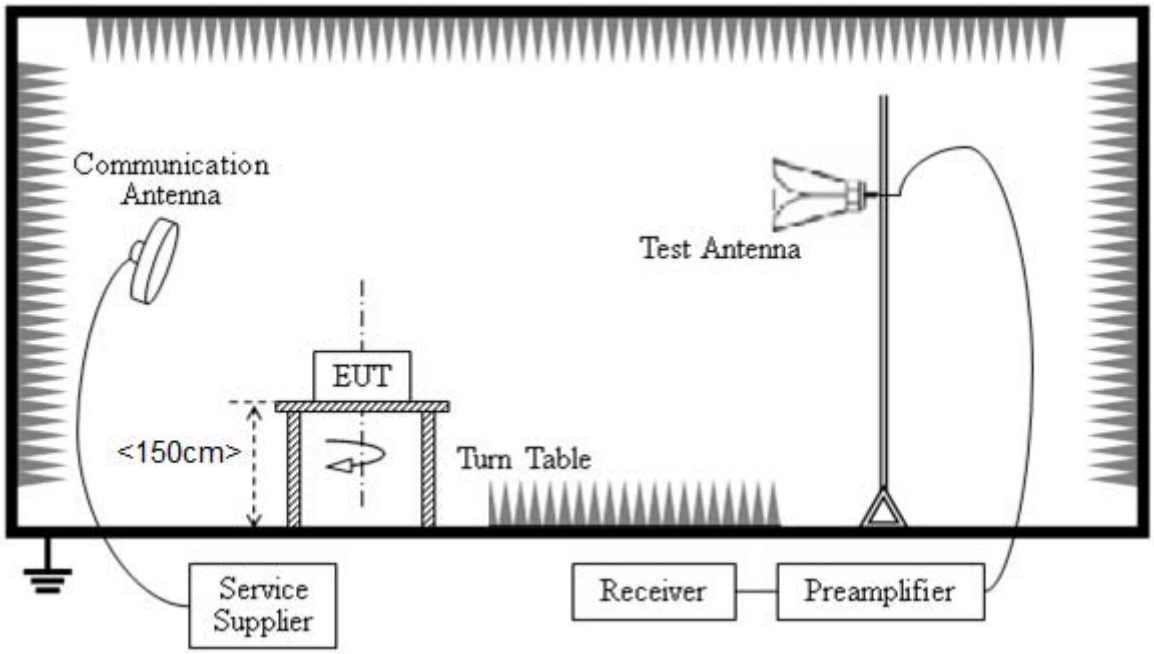
Conclusion: Pass

5.5 Restricted Frequency Bands

5.5.1 Requirement

According to FCC section 15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 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 in 15.209(a).

5.5.2 Test Description



The EUT is located in a 3m Semi-Anechoic Chamber; the antenna factors, cable loss and so on of the site as factors are calculated to correct the reading.
For the Test Antenna: Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength.

a) Set analyzer center frequency to 2360 mHz or 2470 mHz frequency.

b) Set the span =100 MHz.

c) Set the RBW to: 100 kHz .

d) Set the VBW to: 300 kHz.

e) Detector = peak.

f) Sweep time = auto couple.

g) Trace mode = max hold.

h) Allow trace to fully stabilize.

i) Use the peak marker function to determine the maximum amplitude level.

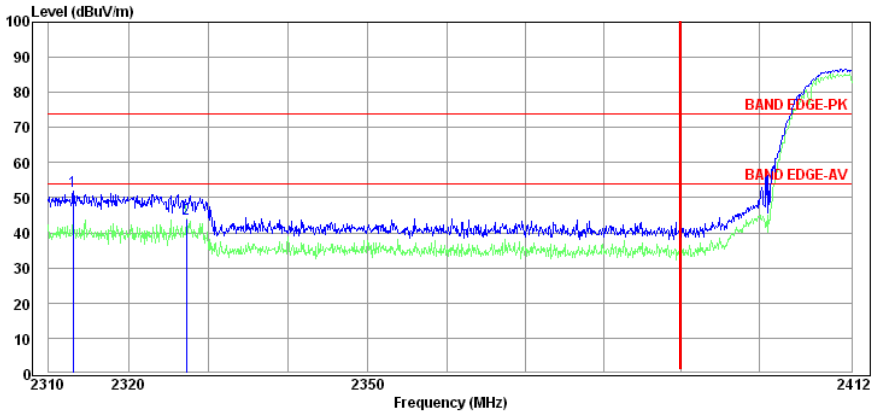
5.5.3 Test Result

ANT 1 Test Result

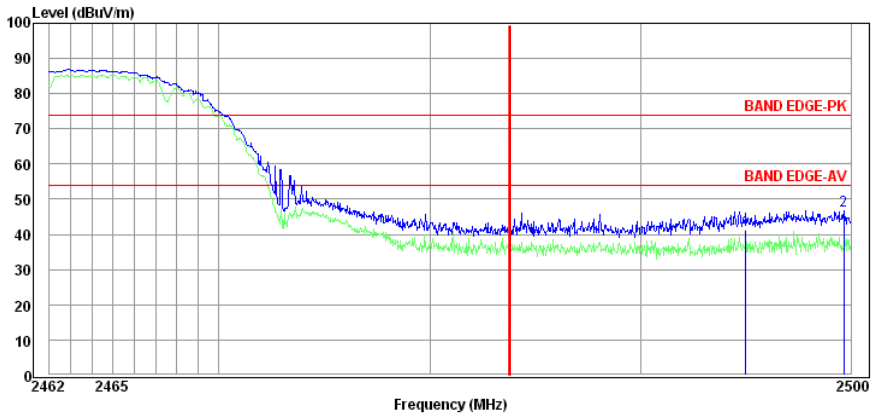
Test mode	CH	Frequency (MHz)	Detector PK/AV	Max. Emission (dBμV/m)	Limit (dBμV/m)	Result
IEEE 802.11b	1	2313.10	PK	57.37	74	Pass
	1	2327.23	AV	49.46	54	Pass
	11	2499.66	PK	52.07	74	Pass
	11	2494.99	AV	46.56	54	Pass
IEEE 802.11g	1	2312.10	PK	57.32	74	Pass
	1	2328.14	AV	50.25	54	Pass
	11	2496.52	PK	51.87	74	Pass
	11	2497.32	AV	46.18	54	Pass

Test mode	CH	Frequency (MHz)	Detector PK/AV	Max. Emission (dBμV/m)	Limit (dBμV/m)	Result
IEEE 802.11n (20MHz)	1	2312.50	PK	56.77	74	Pass
	1	2322.61	AV	49.11	54	Pass
	11	2498.28	PK	52.09	74	Pass
	11	2490.79	AV	46.18	54	Pass
IEEE 802.11n (40MHz)	3	2318.22	PK	57.20	74	Pass
	3	2314.71	AV	50.16	54	Pass
	9	2499.47	PK	52.50	74	Pass
	9	2499.23	AV	45.51	54	Pass

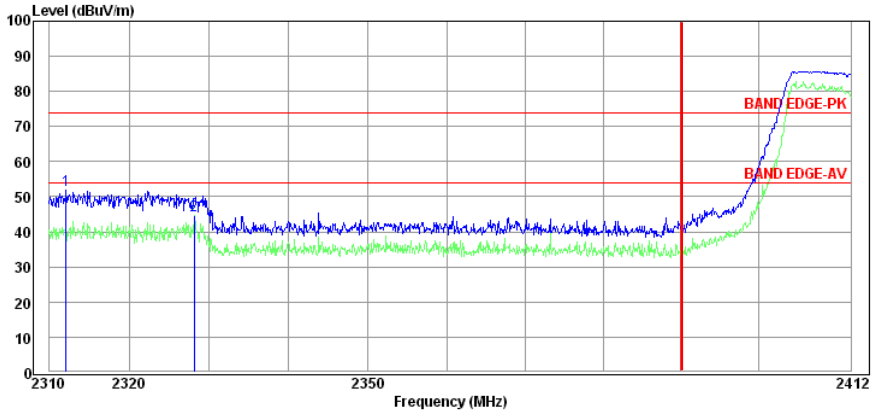
Test Plots:



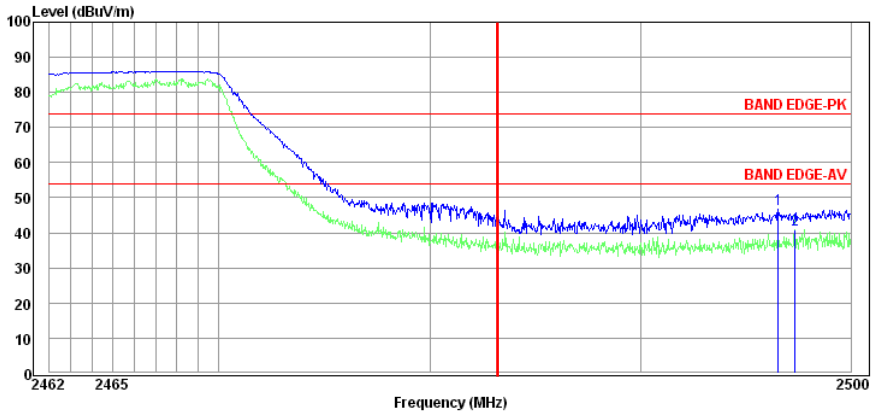
(IEEE 802.11b CH1PK&AV)



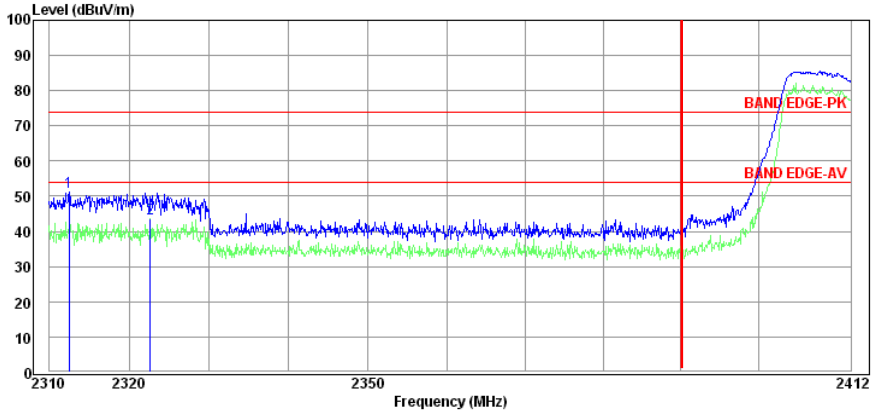
(IEEE 802.11b CH11 PK&AV)



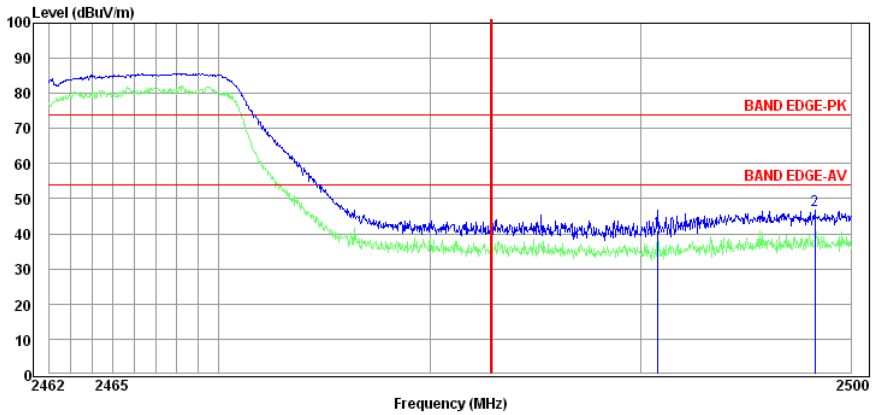
(IEEE 802.11g CH 1 PK&AV)



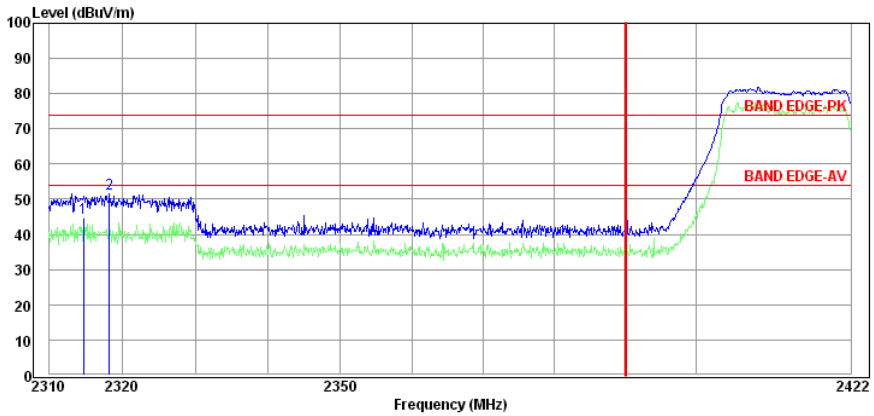
(IEEE 802.11g CH 11 PK&AV)



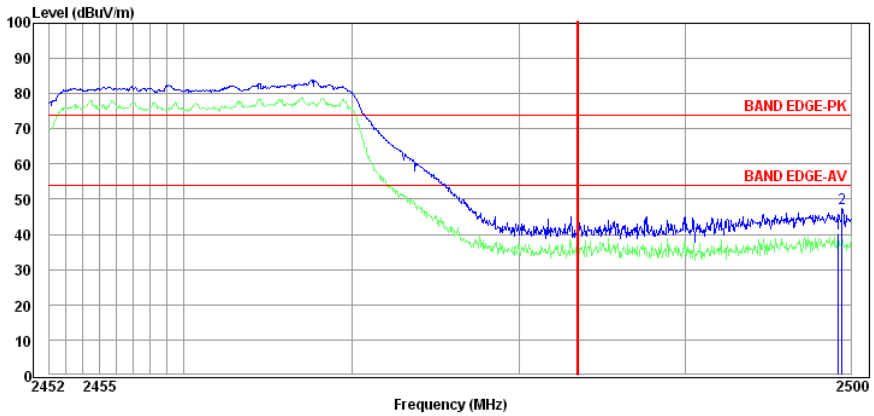
(IEEE 802.11n-20MHz CH 1 PK&AV)



(IEEE 802.11n-20MHz CH 11 PK&AV)



(IEEE 802.11n-40MHz CH 3 PK&AV)



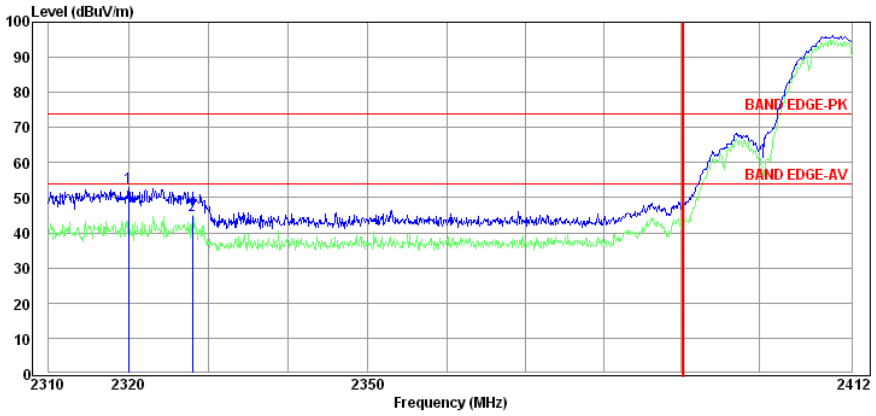
(IEEE 802.11n-40MHz CH 9 PK&AV)

ANT 2 Test Result

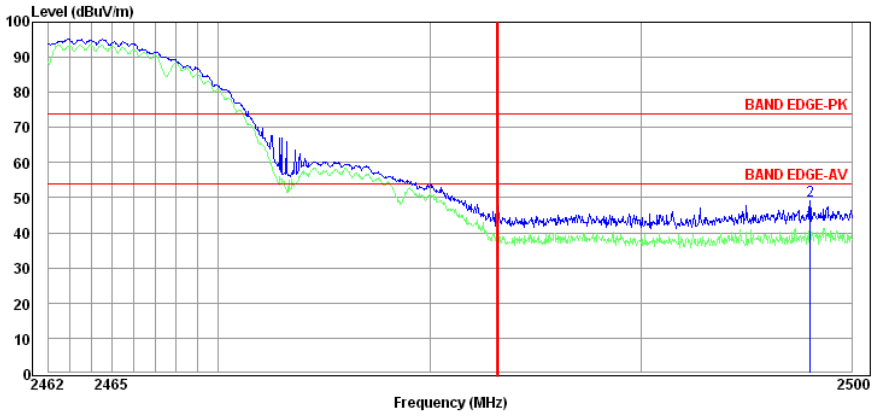
Test mode	CH	Frequency (MHz)	Detector PK/AV	Max. Emission (dBμV/m)	Limit (dBμV/m)	Result
IEEE 802.11b	1	2320.00	PK	52.78	74	Pass
	1	2327.94	AV	44.92	54	Pass
	11	2498.01	PK	49.21	74	Pass
	11	2498.01	AV	42.51	54	Pass
IEEE 802.11g	1	2313.10	PK	57.37	74	Pass
	1	2327.23	AV	49.46	54	Pass
	11	2484.05	PK	54.55	74	Pass
	11	2484.20	AV	45.80	54	Pass

Test mode	CH	Frequency (MHz)	Detector PK/AV	Max. Emission (dBμV/m)	Limit (dBμV/m)	Result
IEEE 802.11n (20MHz)	1	2332.16	PK	44.04	74	Pass
	1	2332.16	AV	41.70	54	Pass
	11	2483.51	PK	53.87	74	Pass
	11	2483.55	AV	45.76	54	Pass
IEEE 802.11n (40MHz)	3	2385.69	PK	63.61	74	Pass
	3	2389.54	AV	52.73	54	Pass
	9	2483.61	PK	50.77	74	Pass
	9	2484.54	AV	43.55	54	Pass

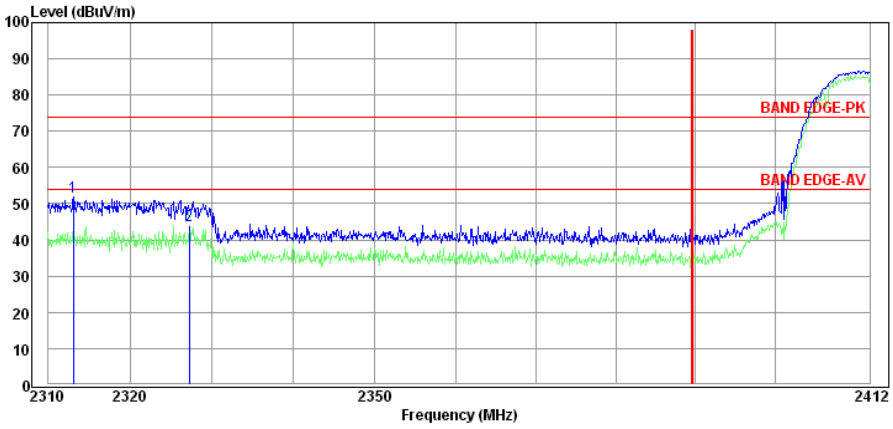
Test Plots



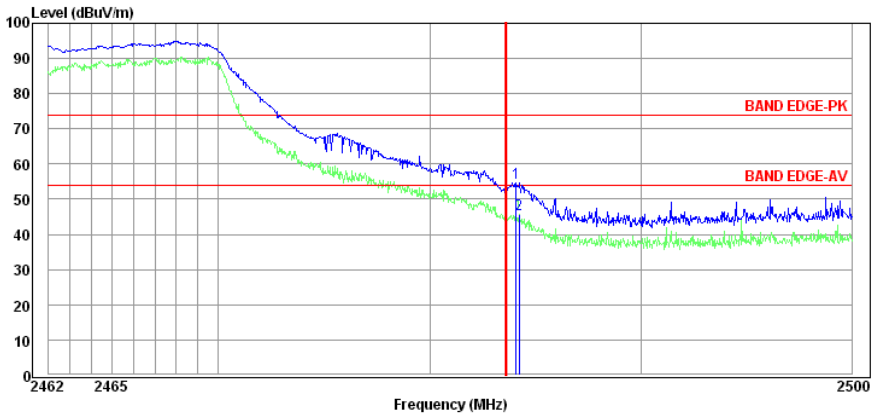
(IEEE 802.11b CH 1PK&AV)



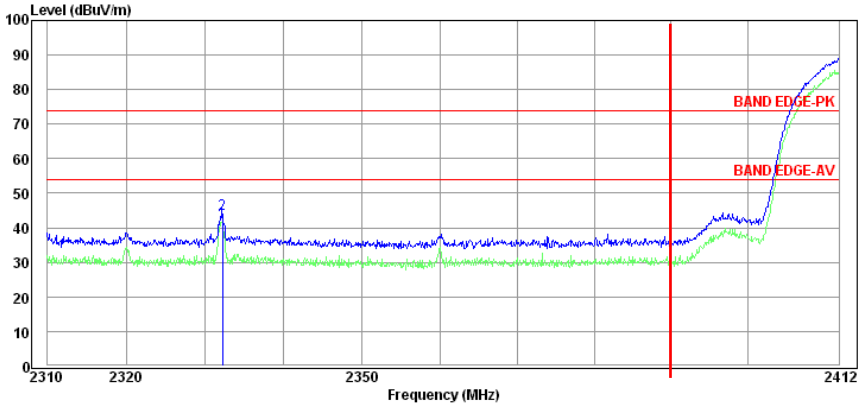
(IEEE 802.11b CH11PK&AV)



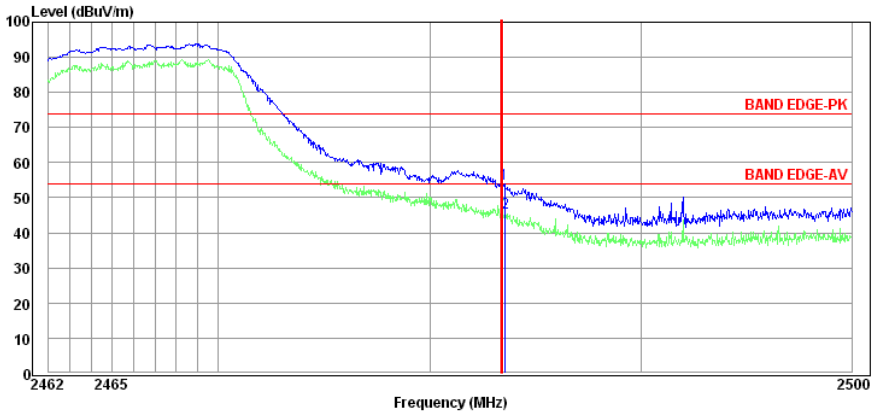
(IEEE 802.11g CH 1PK&AV)



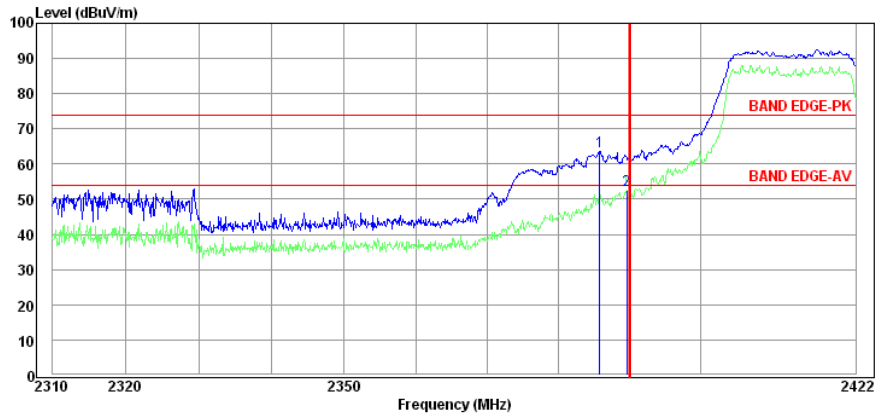
(IEEE 802.11g CH 11PK&AV)



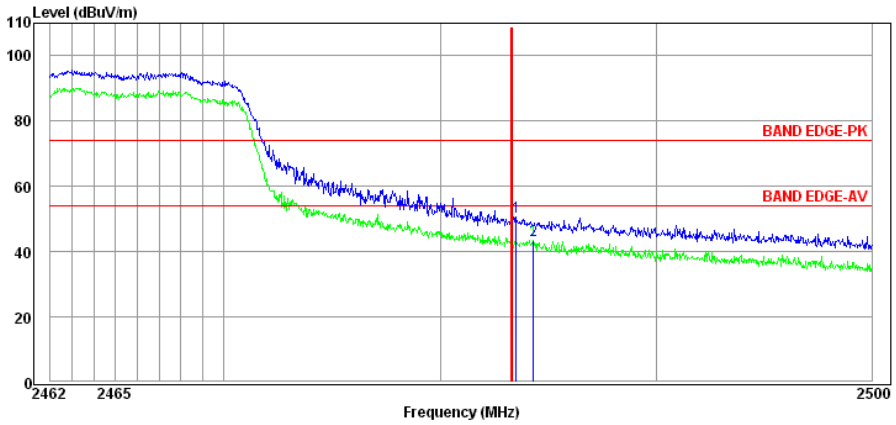
(IEEE 802.11n-20MHz CH 1 PK&AV)



(IEEE 802.11n-20MHz CH 11 PK&AV)



(IEEE 802.11n-40MHz CH3 PK&AV)



(IEEE 802.11n-40MHz CH9 PK&AV)

Conclusion: Pass

5.6 Conducted Emission

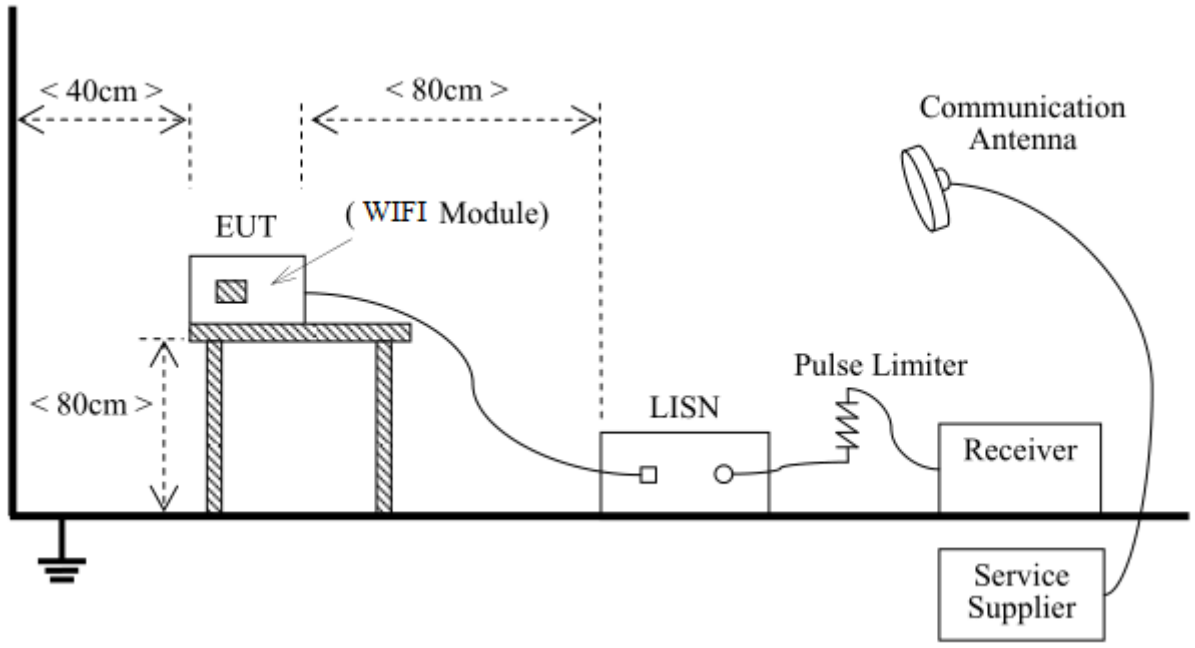
5.6.1 Requirement

According to FCC section 15.207, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50μH/50Ω Line Impedance Stabilization Network (LISN).

Frequency range (MHz)	Conducted Limit (dBμV)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

NOTE:
(a) The lower limit shall apply at the band edges.
(b) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

5.6.2 Test Description



The EUT was placed upon a non-metallic table 80cm above the horizontal metal reference ground plane. EUT was connected to LISN, and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. Power supplier is setting to 120V/60Hz. The set-up and test methods were according to ANSI C63.10:2013.

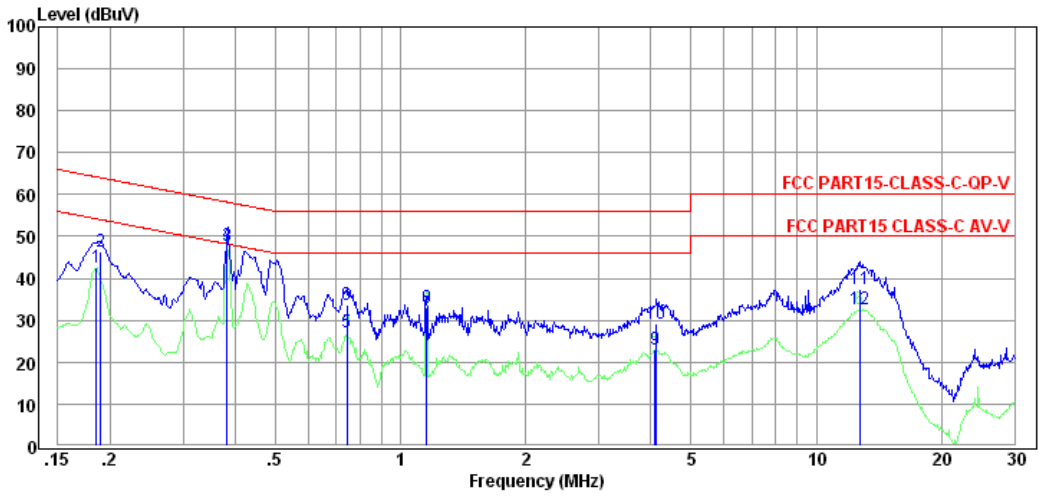
5.6.3 Test result

ANT 1 Test Verdict Recorded for Spurious Points:

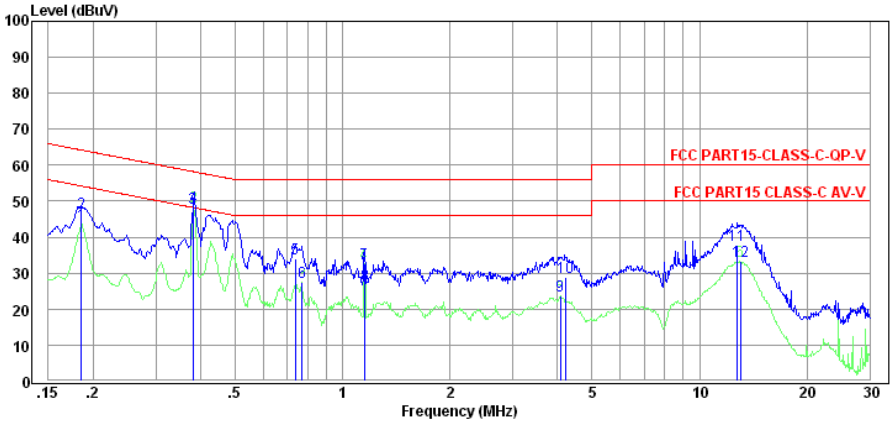
Line	Freq MHz	Result dBµV	Limit dBµV	Margin dB
QP	0.19	46.23	64.04	17.81
QP	0.38	48.24	58.20	9.96
QP	0.74	33.74	56.00	22.26
QP	1.16	31.46	56.00	24.54
QP	4.13	29.17	56.00	26.83
QP	12.70	37.31	60.00	22.69

Neutral	Freq MHz	Result dBµV	Limit dBµV	Margin dB
QP	0.19	46.66	64.21	17.55
QP	0.38	48.21	58.23	10.02
QP	0.74	34.08	56.00	21.92
QP	1.16	26.83	56.00	29.17
QP	4.22	28.76	56.00	27.24
QP	12.79	37.95	60.00	22.05

Test Plots:



ANT1-L Line



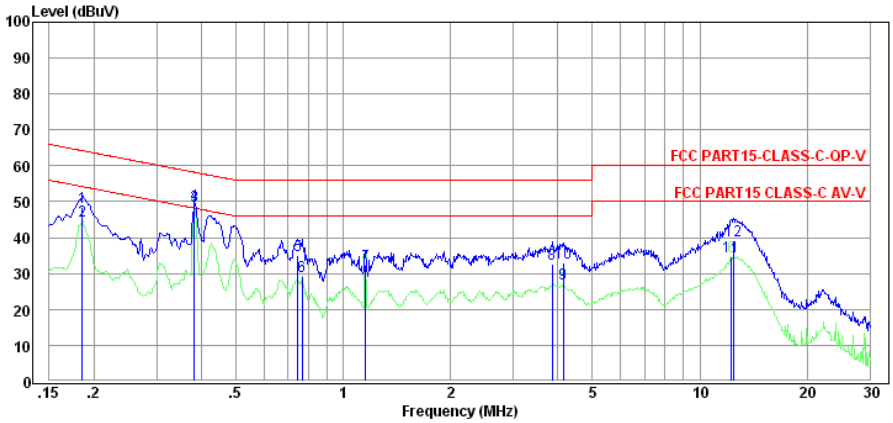
ANT1-N Line

ANT 2 Test Verdict Recorded for Spurious Points:

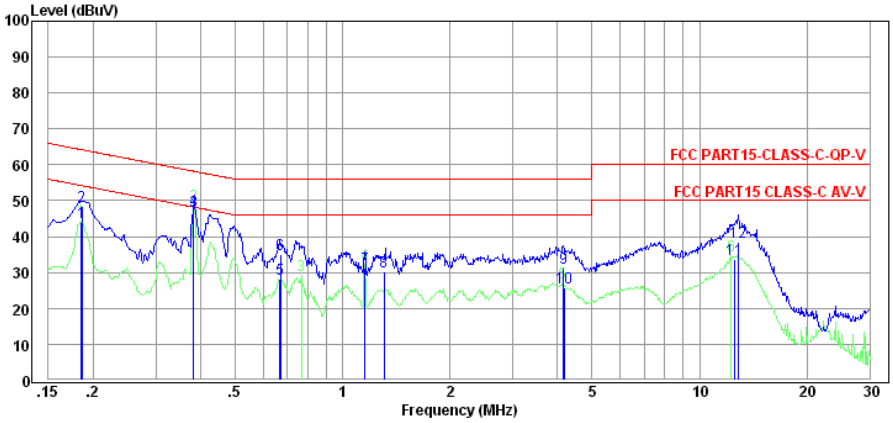
Line	Freq MHz	Result dBµV	Limit dBµV	Margin dB
QP	0.19	48.53	64.21	15.68
QP	0.38	49.22	58.21	8.99
QP	0.75	34.94	56.00	21.06
QP	3.87	32.74	56.00	23.26
QP	4.15	32.88	56.00	23.12
QP	12.43	39.28	60.00	20.72

Neutral	Freq MHz	Result dBµV	Limit dBµV	Margin dB
QP	0.19	48.35	64.21	15.85
QP	0.38	47.59	58.21	10.62
QP	0.67	34.90	56.00	21.10
QP	1.31	30.31	56.00	25.69
QP	4.16	31.26	56.00	24.74
QP	12.84	38.32	60.00	21.68

Test plots:



ANT2-L Line



ANT2-N Line

Conclusion: Pass

5.7 Radiated Emission

5.7.1 Requirement

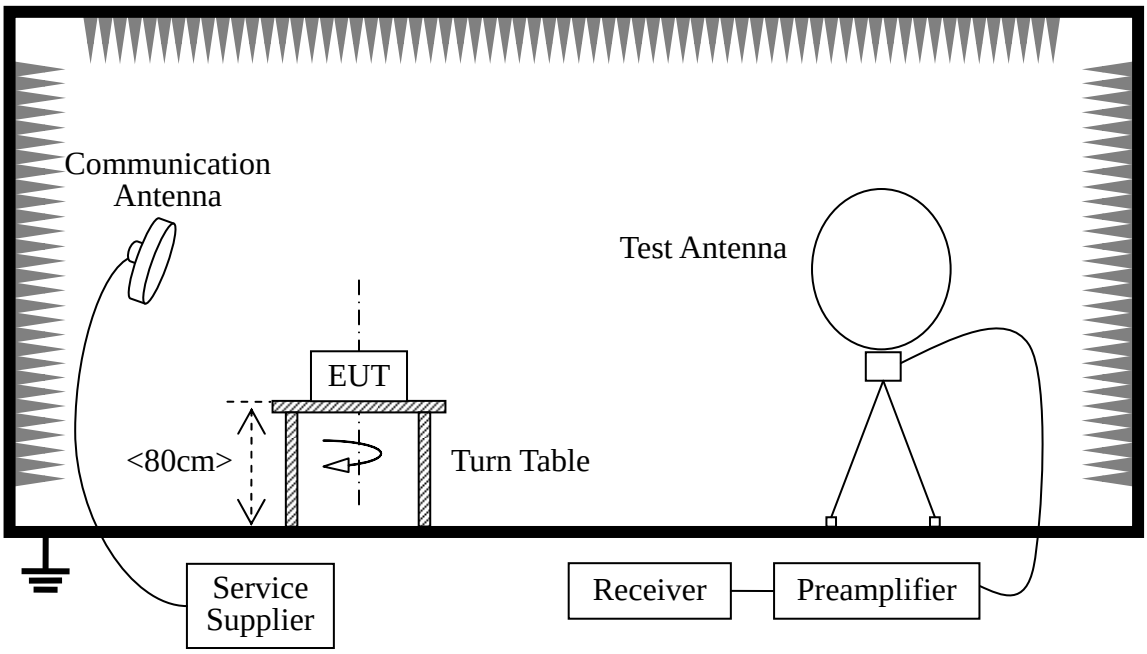
According to FCC section 15.247(c), radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table

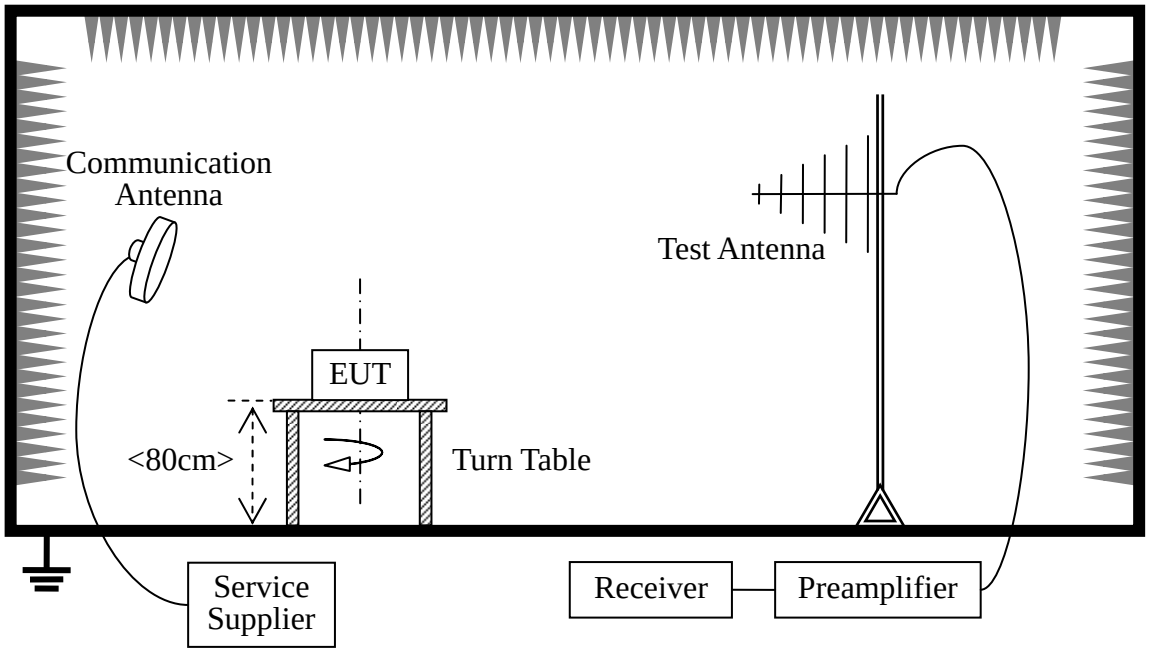
Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)	Limit(dBμV/m)	Detector
0.009-0.490	2400/F(kHz)	300	/	/
0.490-1.705	24000/F(kHz)	30	/	/
1.705-30	30	30	/	/
30 - 88	100	3	40	QP
88 - 216	150	3	43.5	QP
216 - 960	200	3	46	QP
960 - 1000	500	3	54	QP
Above 1000	500	3	54	AV

In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a)(above table)

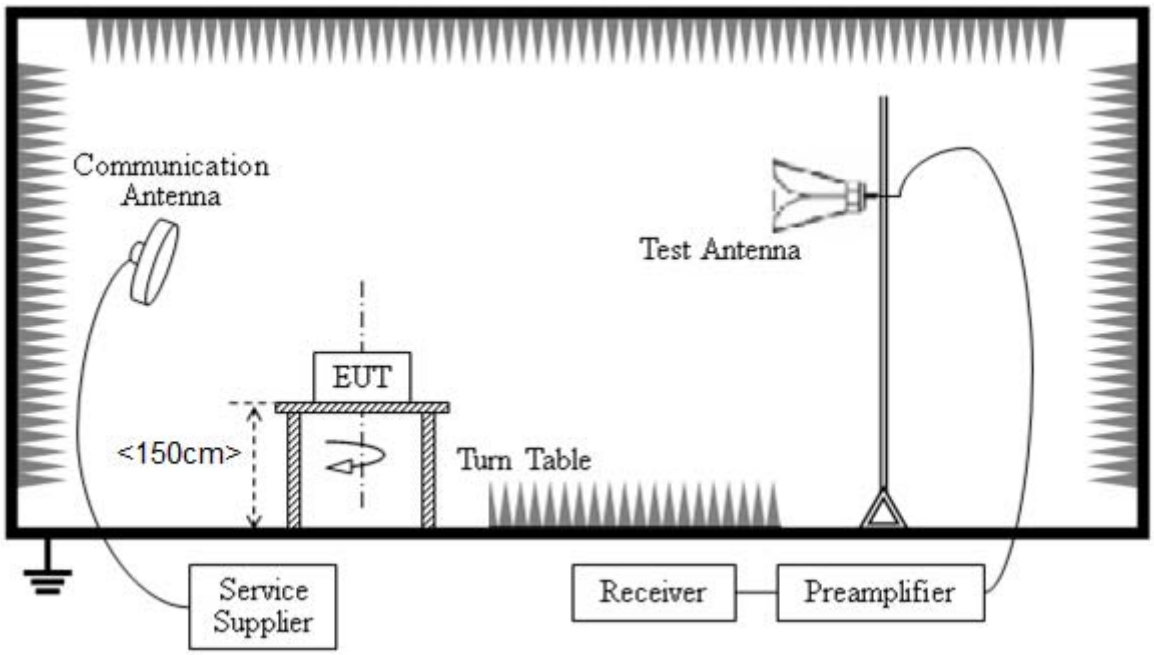
5.7.2 Test setup



Radiated Emissions below 30MHz



Radiated Emissions at 30-1000MHz



Radiated Emissions above 1000MHz

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.10-2013. Below 1GHz, the EUT was set-up on insulator 80cm above the Ground Plane. Above 1GHz, the EUT was set-up on insulator 150cm above the Ground Plane.The set-up and test methods were according to ANSI C63.10.

The EUT is located in a 3m Semi-Anechoic Chamber; the antenna factors, cable loss and so on of the site as factors are calculated to correct the reading. During the measurement, the EUT is activated and controlled by the WIFI Service Supplier (SS) via a Common Antenna, and is set to operate under transmitting at maximum power.

For the Test Antenna: In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and

Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength, the azimuth range of turntable was 0°to 360°， the receive antenna has two polarizations horizontal and vertical. When doing measurements above 1GHz, the EUT was placed within the 3dB beamwidth range of the horn antenna, and the EUT was tested in 3 orthogonal positions as recommended in ANSI C63.10 for Radiated Emissions and the worst-case data was presented. Receiver Setting: (9-150kHz): RBW=200Hz, VBW=1kHz, Detector: PK, Max Hold. (0.15-30MHz): RBW=9kHz, VBW=30kHz, Detector: PK, Max Hold. (30MHz-1GHz): RBW=120kHz, VBW=300kHz, Detector: QK, Max Hold. (Above 1GHz): RBW=1MHz, VBW=3MHz, Detector: AV, Max Hold.

5.7.3 Test Result

A. Test Result for 9kHz -30MHz

Frequency (MHz)	Level (dBμV)	Over Limit (dB)	Limit Line (dBμV)	Remark
--	--	20	--	See Note

Note:

a) The amplitude of spurious emissions that are attenuated by more than 20dB below the permissiblevalue has no need to be reported.

b) Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

c)Limit line = specific limits (dBμV) + distance extrapolation factor.

B. Test Result for above 30MHz - 10thHarmonic

ANT1 Test Result:

Frequency (MHz)	Level (dBμV)	Limit Line (dBμV)	Margin (dB)	Antenna Polarization	Result
42.15	29.30	40.00	10.70	Horizontal	PASS
180.02	39.26	43.50	4.24	Horizontal	PASS
278.07	36.93	46.00	9.07	Horizontal	PASS
417.64	40.65	46.00	5.35	Horizontal	PASS
2227.58	34.39	54.00	19.61	Horizontal	PASS
4830.53	49.56	54.00	4.44	Horizontal	PASS
5525.31	45.87	54.00	8.13	Horizontal	PASS
77.32	34.69	40.00	5.31	Vertical	PASS
136.94	35.37	43.50	8.13	Vertical	PASS
300.37	37.97	46.00	8.03	Vertical	PASS
417.64	42.64	46.00	3.36	Vertical	PASS
2088.43	37.17	54.00	16.83	Vertical	PASS
4832.07	47.14	54.00	6.86	Vertical	PASS
5244.33	50.27	54.00	3.73	Vertical	PASS

Note:

The worst case (IEEE 802.11bChannel 1:2412MHz) is recorded in the report.

ANT2 Test Result:

Frequency (MHz)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Antenna Polarization	Result
47.33	23.51	40.00	16.49	Horizontal	PASS
147.40	39.66	43.50	3.84	Horizontal	PASS
305.68	37.31	46.00	8.69	Horizontal	PASS
419.11	41.44	46.00	4.56	Horizontal	PASS
2133.82	34.47	54.00	19.53	Horizontal	PASS
4874.65	50.45	54.00	3.55	Horizontal	PASS
4885.74	42.32	54.00	11.68	Horizontal	PASS
56.00	29.72	40.00	10.28	Vertical	PASS
126.33	36.77	43.50	6.73	Vertical	PASS
302.48	38.69	46.00	7.31	Vertical	PASS
416.18	42.69	46.00	3.31	Vertical	PASS
2766.88	34.76	54.00	19.24	Vertical	PASS
4874.00	52.73	54.00	1.27	Vertical	PASS
4882.74	45.01	54.00	8.99	Vertical	PASS

Note:

The worst case (IEEE 802.11g Channel 6:2437MHz) is recorded in the report.

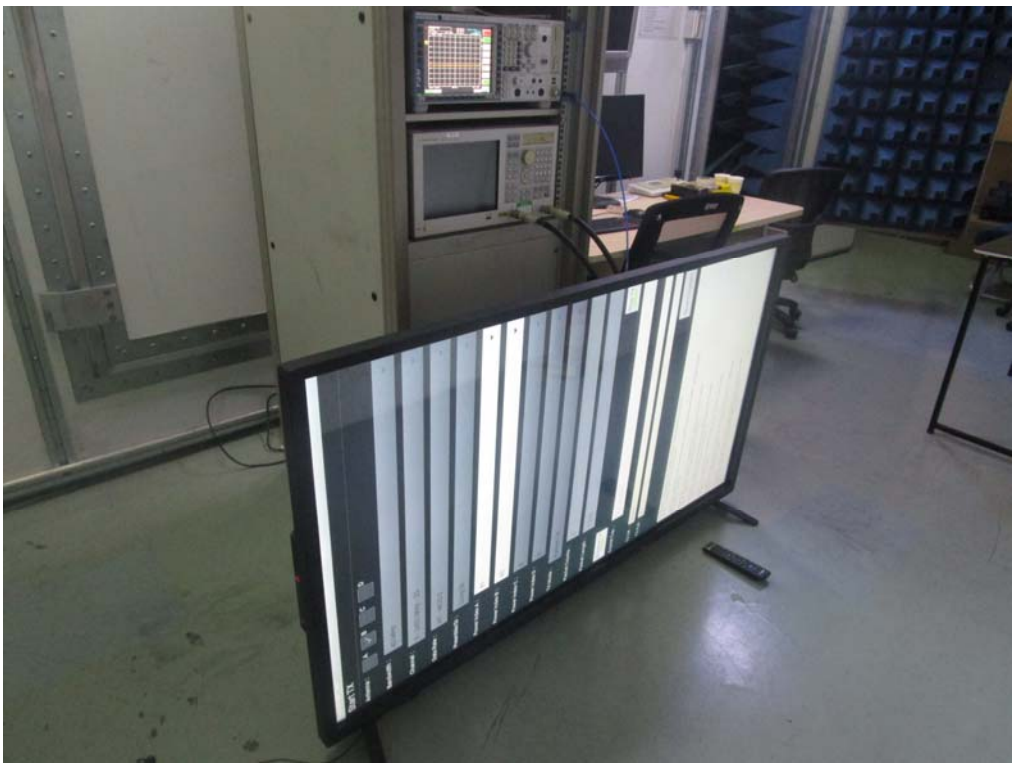
Conclusion: Pass

Annex A Photos of the EUT


Android
PC
PC
HDMI 3

Annex B Photos of Setup

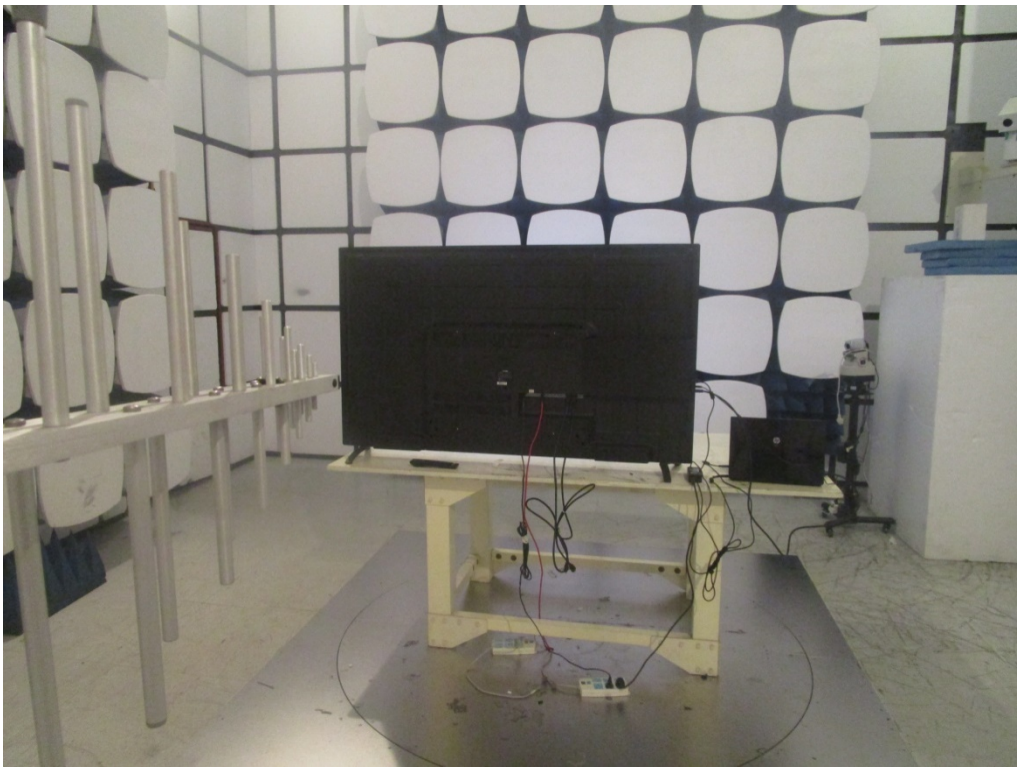
1. RF



2. Conducted Emission

3. Radiated Emission

Radiated Emissions at 30-1000MHz



Radiated Emissions above 1000MHz

** END OF REPORT **