Report No.SH16050078W01

FCC RF TEST REPORT

Issued to

Shanghai Information Technology Co., Ltd.

Titanium gong

For

TV

Model Name	:	M5500
Trade Name	:	TTV
Brand Name	:	TTV
Standard	:	47 CFR Part 15,Subpart C ANSI C63.10-2013
FCC ID	:	2AIWA-M5500
Test date	:	Jun.19, 2016 to Jul.27, 2016
Issue date	:	Aug.9, 2016

By

Shanghai Skylabs Co., Ltd.

Tested by Jin Peng ***Approved by*** Gu Tengyang ***Review by*** Leonard Bao

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DIRECTORY

Change History

Issue	Date	Reason for change
1.0	Jun.24, 2016	First edition
2.0	Jul.28, 2016	Second edition
3.0	Aug. 8, 2016	Update photoes

1. General Information

1.1 Applicant

Shanghai Information Technology Co., Ltd. Titanium gong
2150 Trade Zone Blvd, Suite 104, San Jose, CA95131, USA

1.2 Manufacturer

Titanium gong Information Technology
Baoshan District, Shanghai Yangtze River Road 180 A6646 Room

1.3 Description of EUT

EUT Name.....:	TV
Model Name.....:	M5500
Brand Name.....:	TTV
Trade Name .....:	TTV
Hardware Version .....:	PQ1210_M5500
Software Version .....:	2.1.0-R-20160222.1801
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……..:	WIFI antenna
Antenna Gain……..:	2dBi

NOTE 1:
The EUT contains WIFI Module operating at 2.4GHz ISM band; it supports 802.11b, 802.11g, 802.11n, and they are all tested in this report. 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 802.11n-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 detail description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

2. Facilities and Accreditations

2.1 Test Facility

Shanghai Skylabs Co., Ltd. Skylabs Laboratory 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 Equipments Used

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Service Simulator	Agilent	N4010A	MY47230669	2015.9.22	1year
Spectrum Analyzer	R&S	FSU26	200880	2016.2.24	1year
EMI Test Receiver	R&S	ESCI7	100787	2016.2.24	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.)
Shielding Room	CHENGYU	5m×4m×3m	CR	2015. 9.13	3year
Full/Semi-Anechoie Chamber	CHENGYU	9.2×6.25×6.15m	SAR	2015.9.13	2year
Broadband Log Antenna	Schwarzbeck	VULB 9163	9163-561	2015.7.24	2year
Broadband Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-1033	2015.7.24	2year
Broadband Horn Antenna	Schwarzbeck	BBHA 9170	BBHA91970171	2015.9.22	2year
Test Antenna-Loop	Rohde&Schwarz	HFH2-Z2	860004/001	2015.9.22	1year
Artificial Mains Network	TESEQ	NNB 51	33285	2016. 2.24	1year
Personal Computer	HP	(n.a.)	(n.a.)	(n.a.)	(n.a.)
EPM Series Power Meter	Agilent	E4418B	GB43318055	2016.5.24	1year
Power Sensor	Agilent	8482A	MY41091706	2016.5.24	1year
Temporary Antenna Connector	Farpu	SMA-K	(n.a.)	(n.a.)	(n.a.)
RF Cable	(n.a.)	(n.a.)	(n.a.)	(n.a.)	(n.a.)
Power Supplier	NF	ES2000S	9087735	2015. 9.25	1year

NOTE:

Equipments listed above have 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
ANSI C63.10-2013
June 2015 KDB558074

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)	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

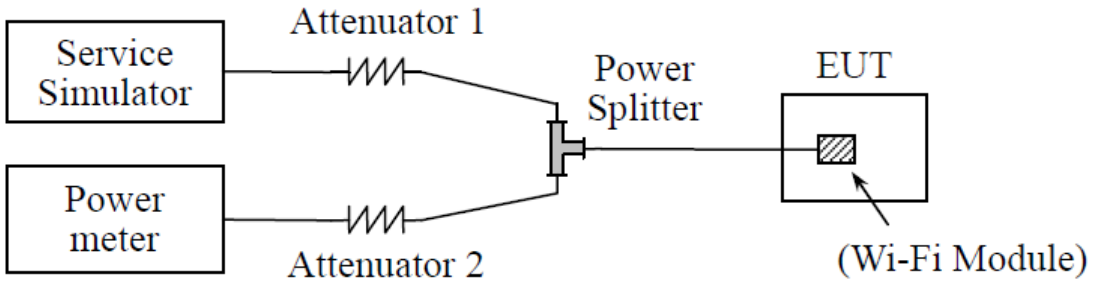
5.1.1 Requirement

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 analyzer and calibration.

A. Test Setup:



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

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 Module.(Duty cycle > 98%)

A.Test Verdict:

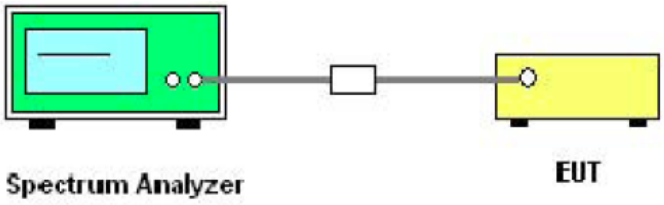
Mode	Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
			dBm	W	dBm	W	
802.11b	1	2412	18.71	0.07430	30	1	Pass
	6	2437	17.90	0.06166			Pass
	11	2462	18.39	0.06902			Pass
802.11g	1	2412	18.88	0.07727			Pass
	6	2437	19.54	0.08995			Pass
	11	2462	20.40	0.10965			Pass
802.11n (20MHz)	1	2412	20.46	0.11117			Pass
	6	2437	20.07	0.10162			Pass
	11	2462	20.70	0.11749			Pass
802.11n (40MHz)	3	2422	19.55	0.09016			Pass
	6	2437	20.26	0.10617			Pass
	9	2452	20.80	0.12023			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



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.

A.Test Verdict:

802.11b Test mode

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Refer to plot	20dB Bandwidth (MHz)	Refer to plot	Limit (KHz)	Result
1	2412	10.216	Plot A1	17.708	Plot A2	≥500	Pass
6	2437	10.216	Plot B1	17.708	Plot B2	≥500	Pass
11	2462	10.176	Plot C1	17.387	Plot C2	≥500	Pass

802.11g Test mode

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Refer to plot	20dB Bandwidth (MHz)	Refer to plot	Limit (KHz)	Result
1	2412	16.586	Plot D1	20.953	Plot D2	≥500	Pass
6	2437	16.506	Plot E1	21.233	Plot E2	≥500	Pass
11	2462	16.466	Plot F1	20.993	Plot F2	≥500	Pass

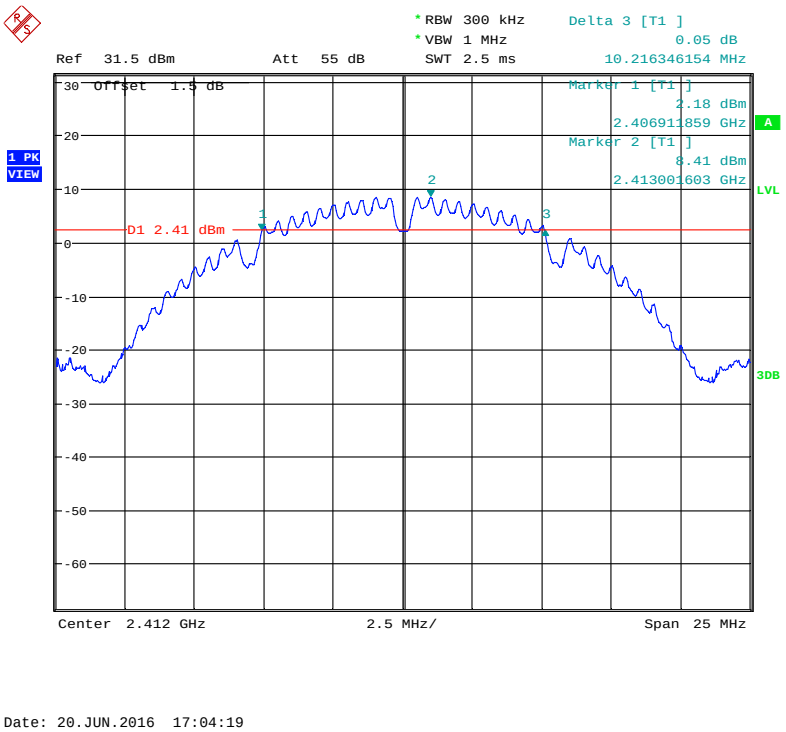
802.11n (20MHz) Test mode

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Refer to plot	20dB Bandwidth (MHz)	Refer to plot	Limit (KHz)	Result
1	2412	17.868	Plot G1	20.392	Plot G2	≥500	Pass
6	2437	17.903	Plot H1	20.352	Plot H2	≥500	Pass
11	2462	17.908	Plot I1	20.272	Plot I2	≥500	Pass

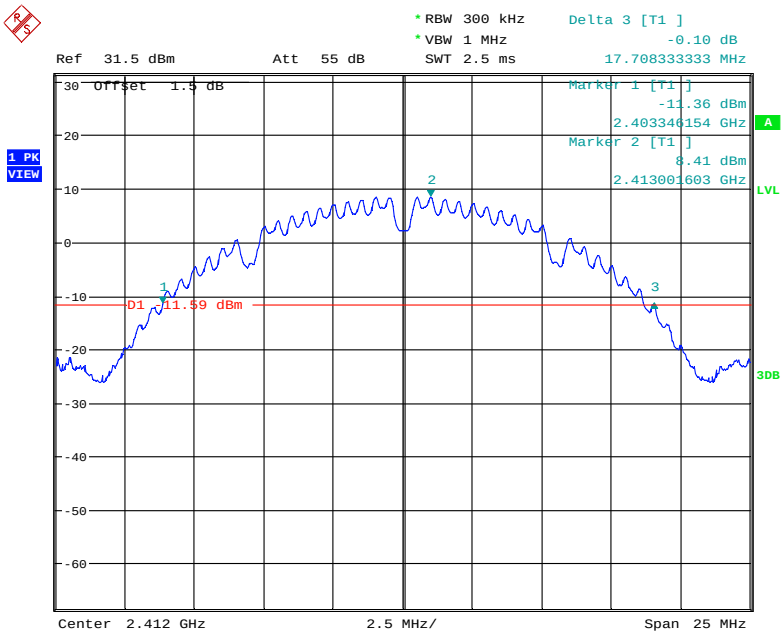
802.11n (40MHz) Test mode

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Refer to plot	20dB Bandwidth (MHz)	Refer to plot	Limit (KHz)	Result
3	2422	36.618	Plot J1	38.221	Plot J2	≥500	Pass
6	2437	36.602	Plot K1	37.964	Plot K2	≥500	Pass
9	2452	36.618	Plot L1	38.141	Plot L2	≥500	Pass

B. Test Plots:



Plot A1



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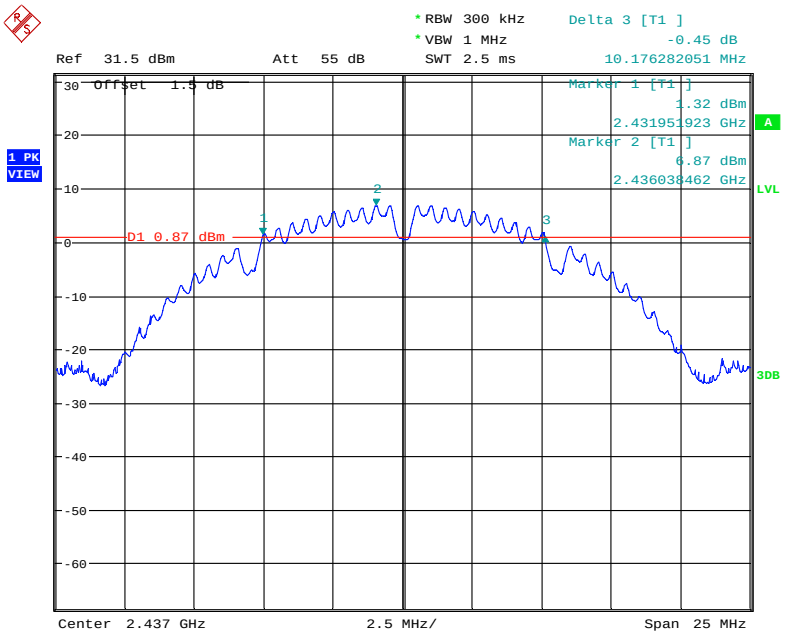
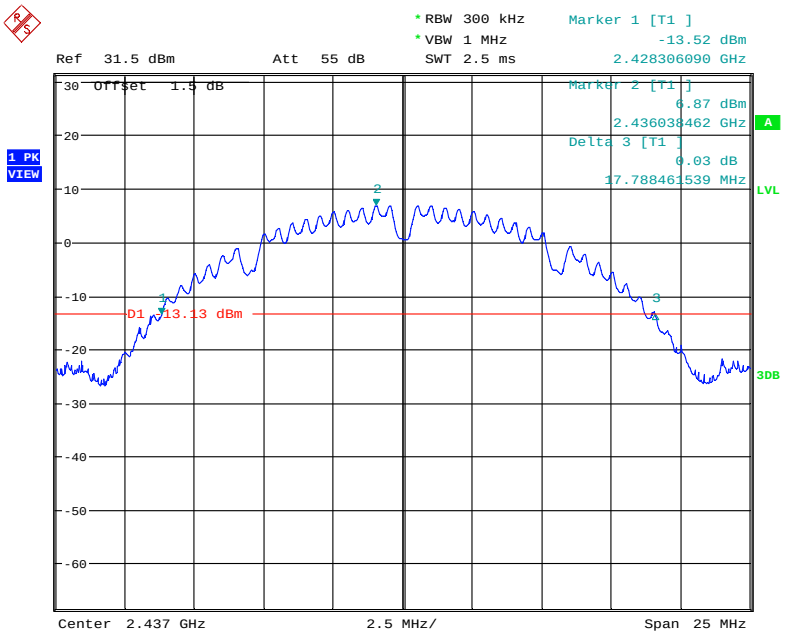
Plot A2



Date: 20.JUN.2016 19:05:43

Plot B1



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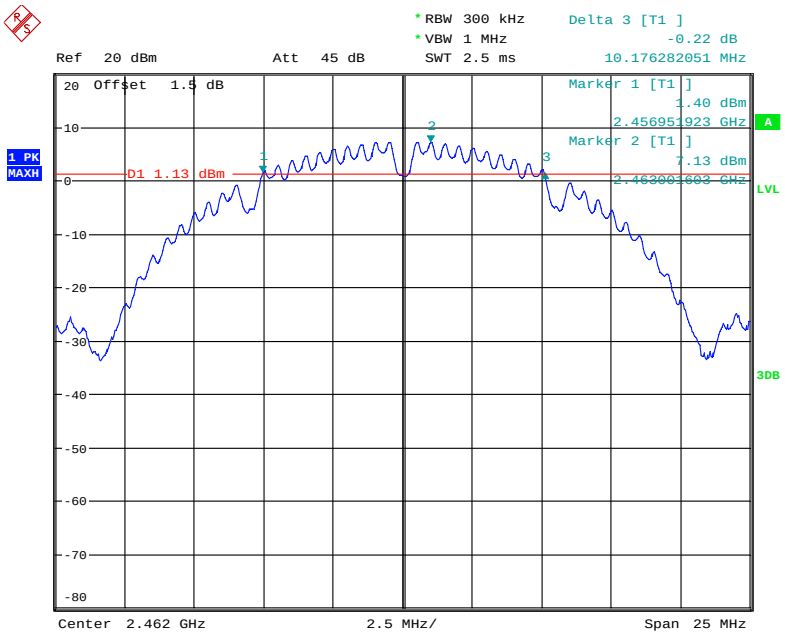
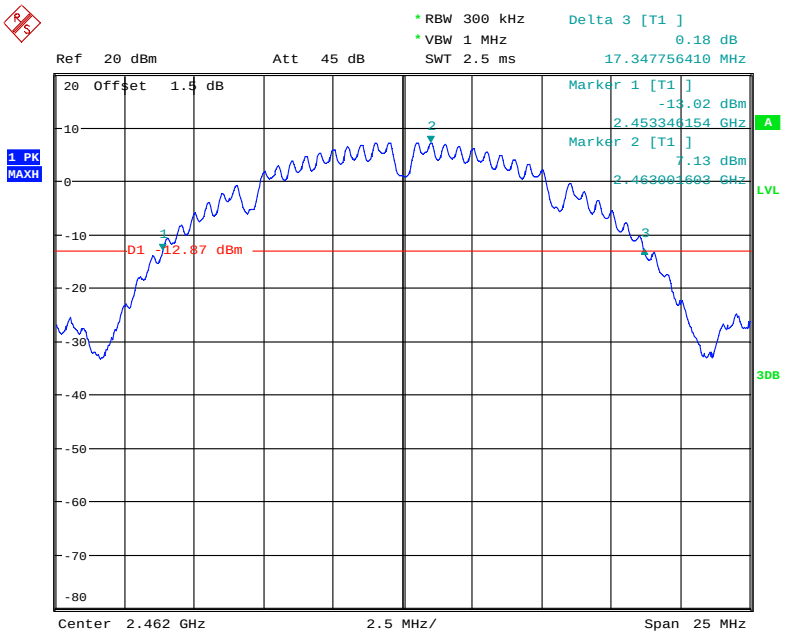
Plot B2



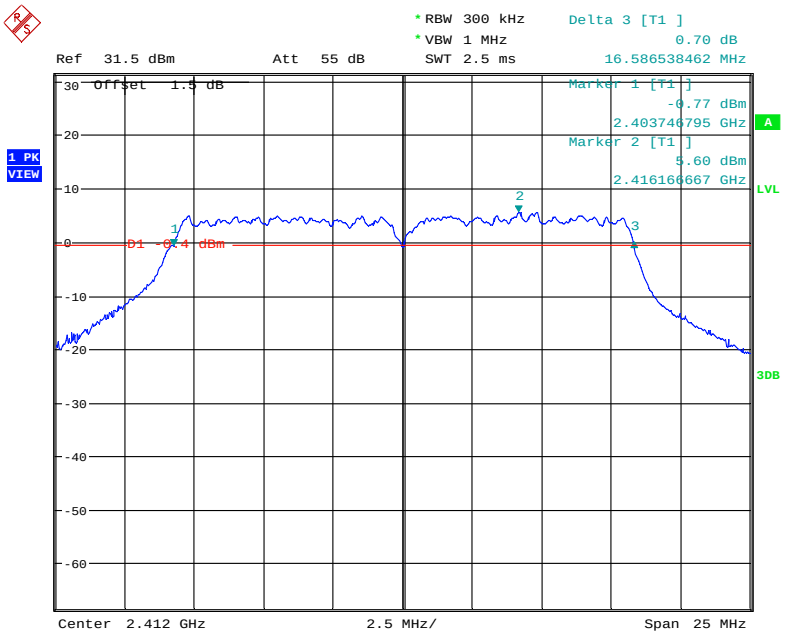
Date: 20.JUN.2016 18:56:08

Plot C1



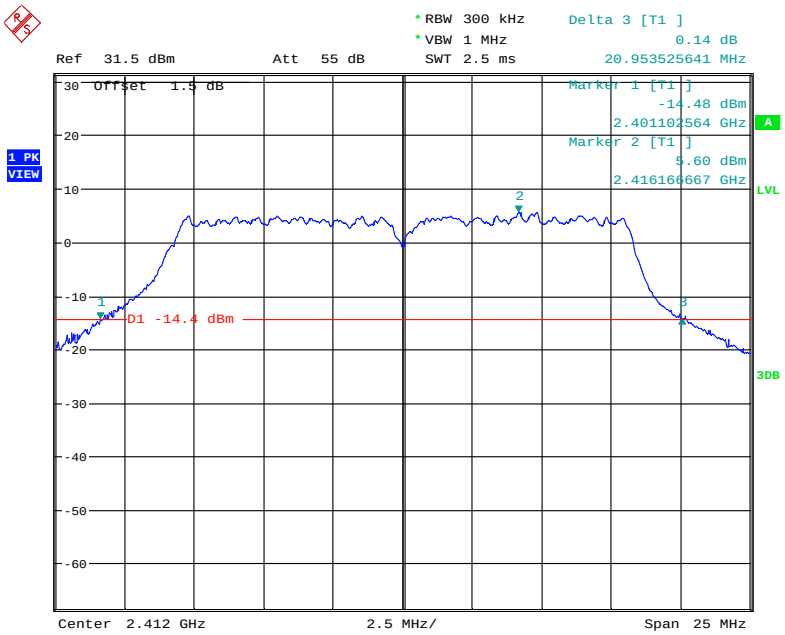
Date: 20.JUN.2016 18:57:53

Plot C2



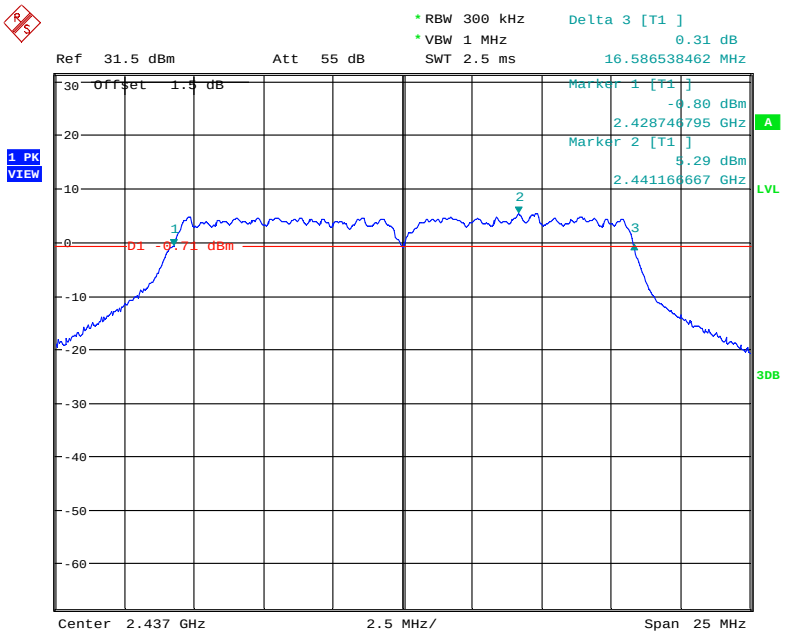
Date: 20.JUN.2016 17:43:50

Plot D1



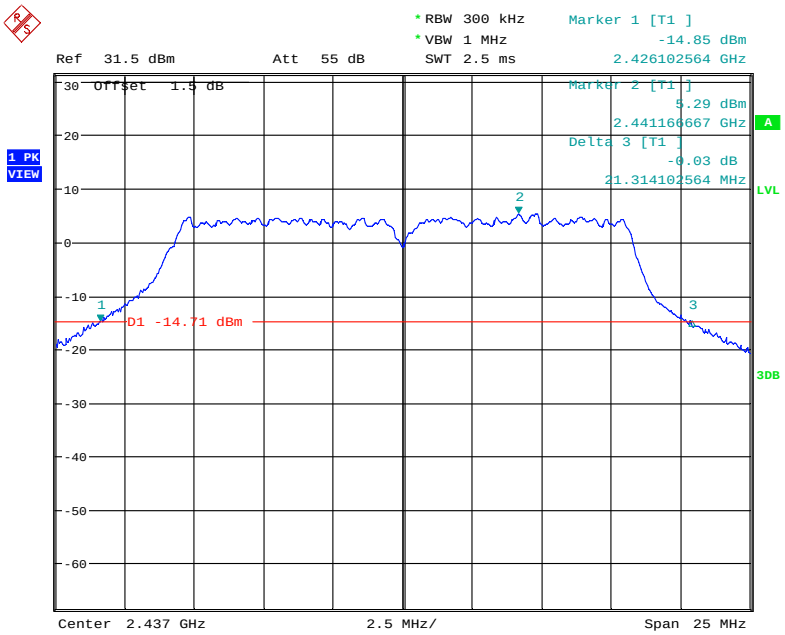
Date: 20.JUN.2016 17:45:22

Plot D2



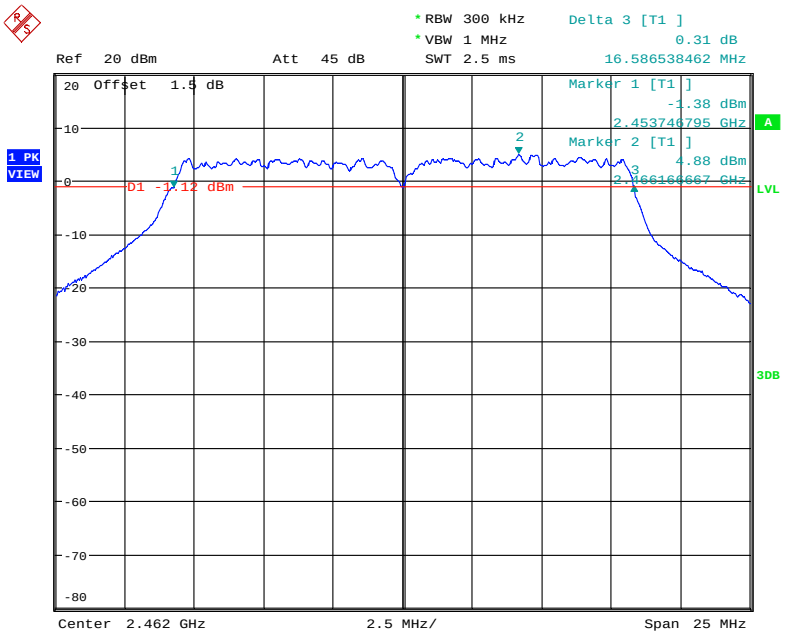
Date: 20.JUN.2016 19:02:57

Plot E1



Date: 20.JUN.2016 19:04:34

Plot E2



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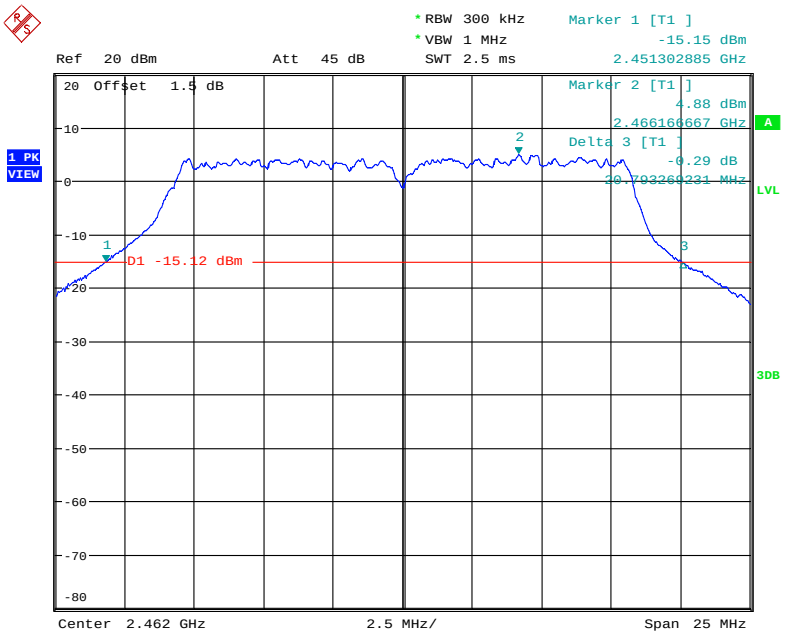
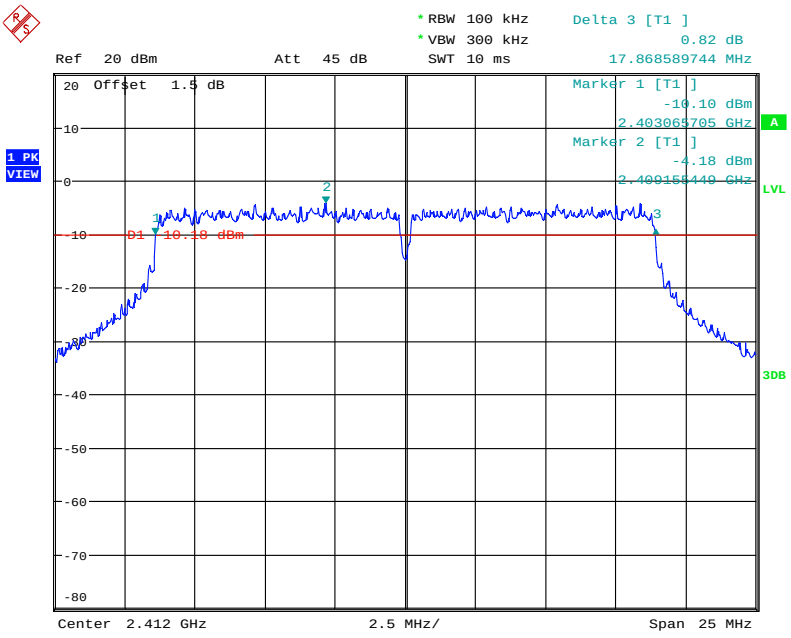
Plot F1



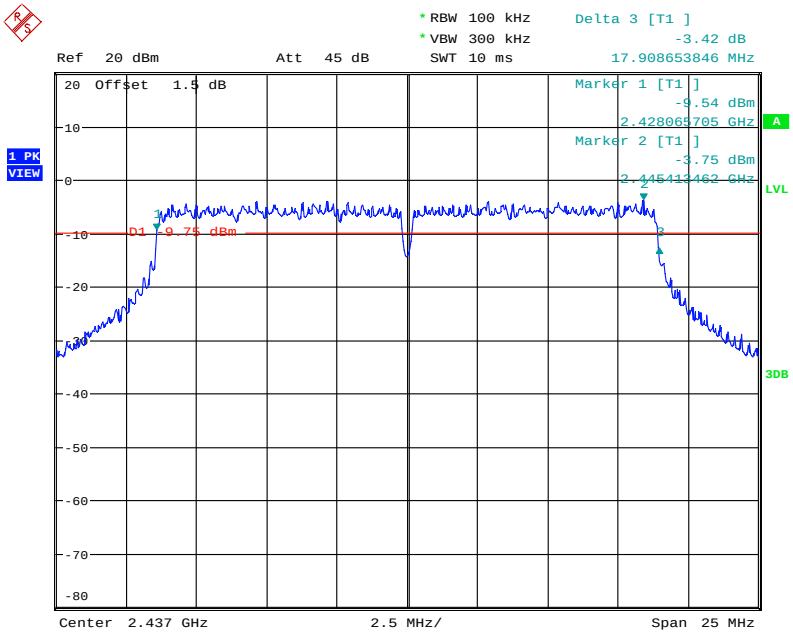
Date: 20.JUN.2016 19:00:43

Plot F2



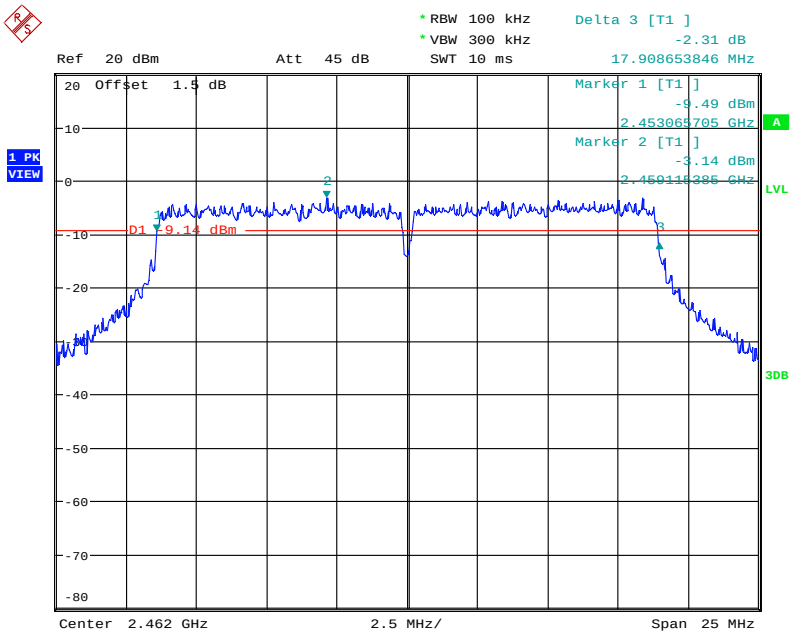
Date: 27.JUL.2016 17:54:27

Plot G1



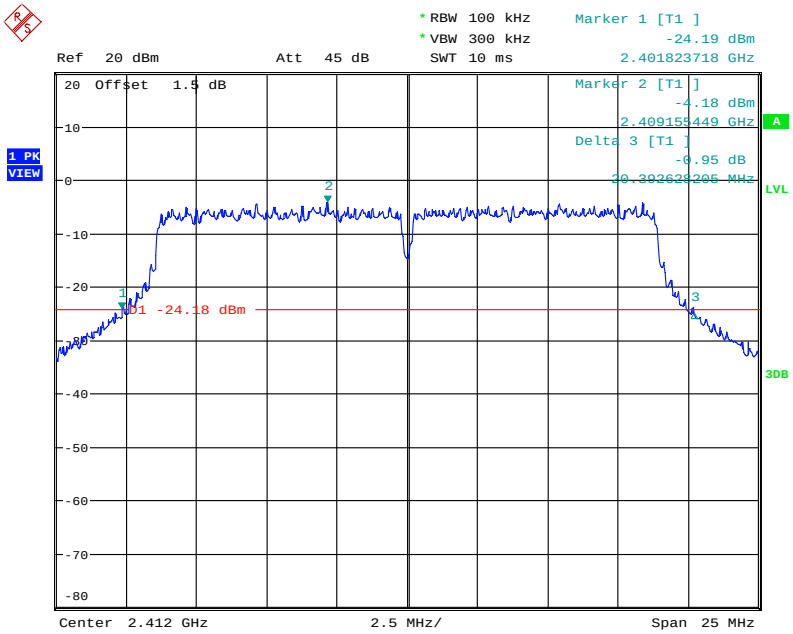
Date: 27.JUL.2016 17:56:11

Plot H1



Date: 27.JUL.2016 17:57:55

Plot I1



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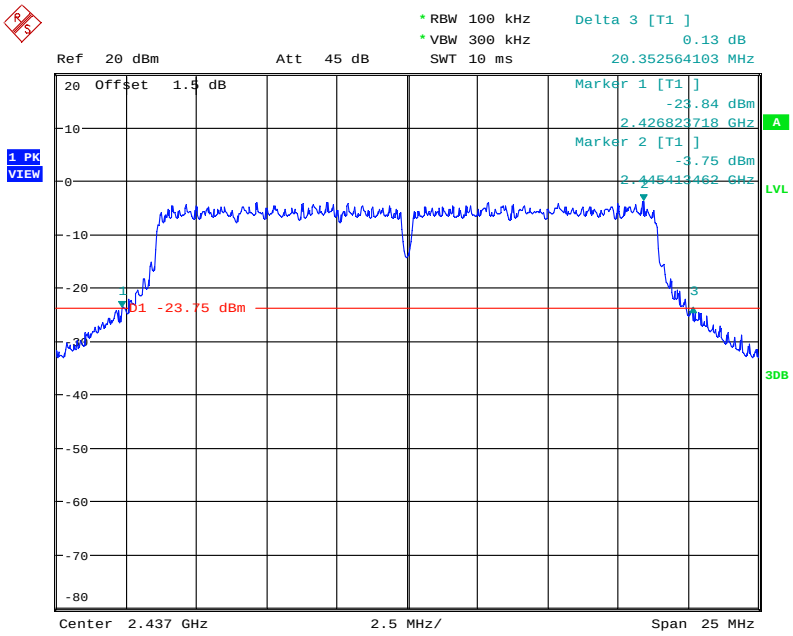
Plot G2



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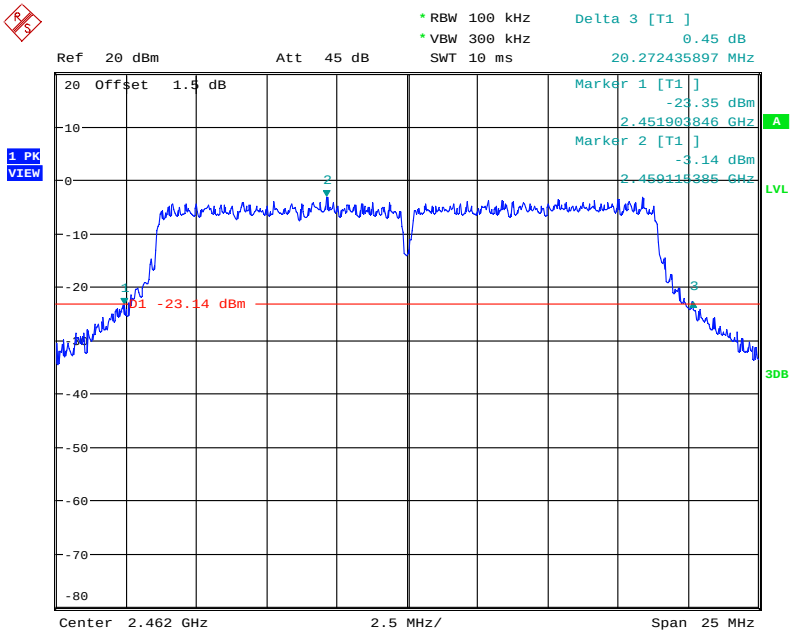
Plot H2



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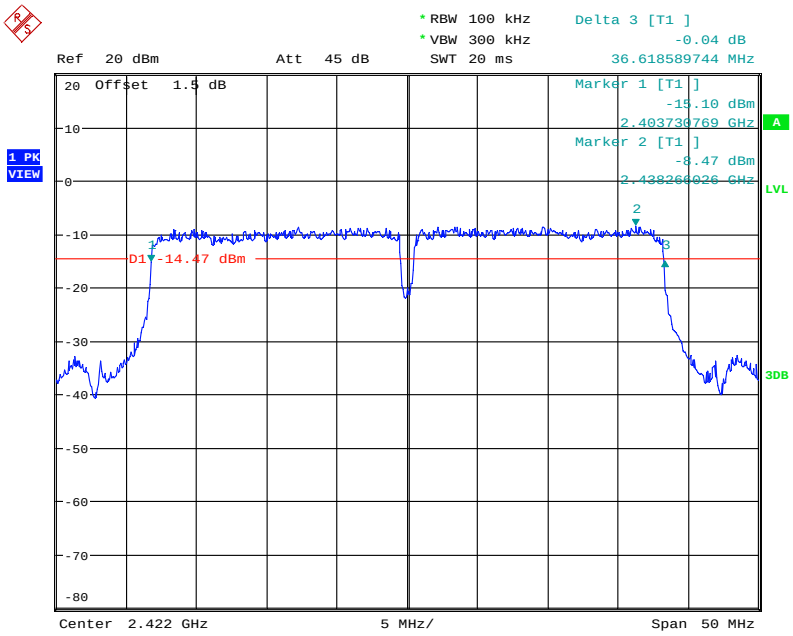
Plot I2



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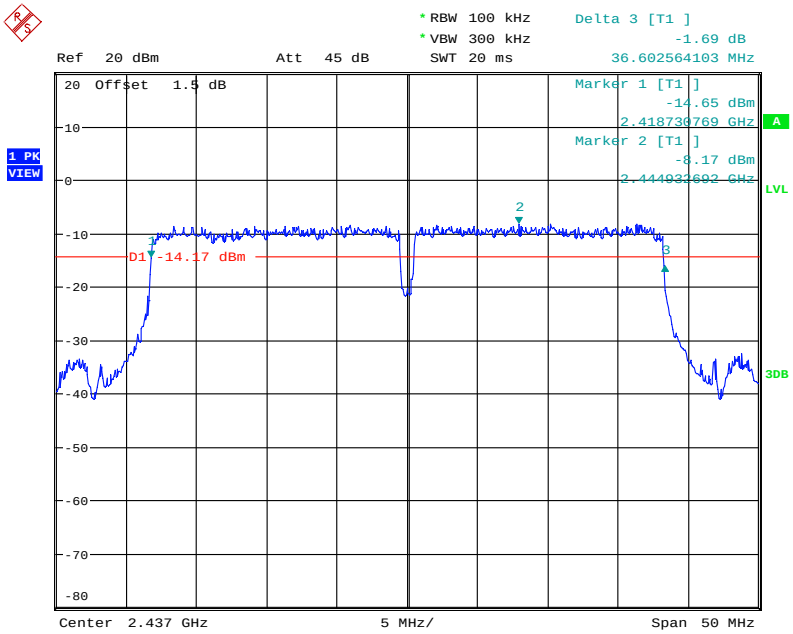
Plot J1



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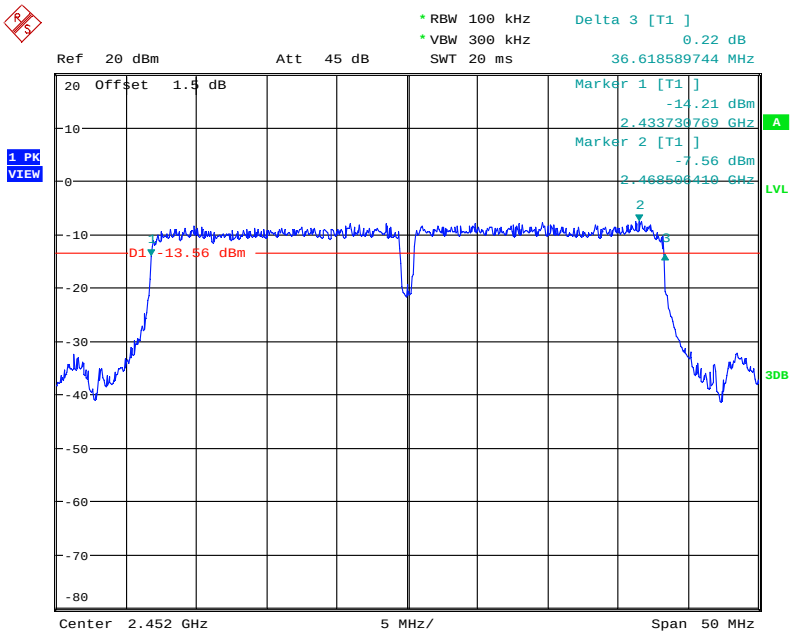
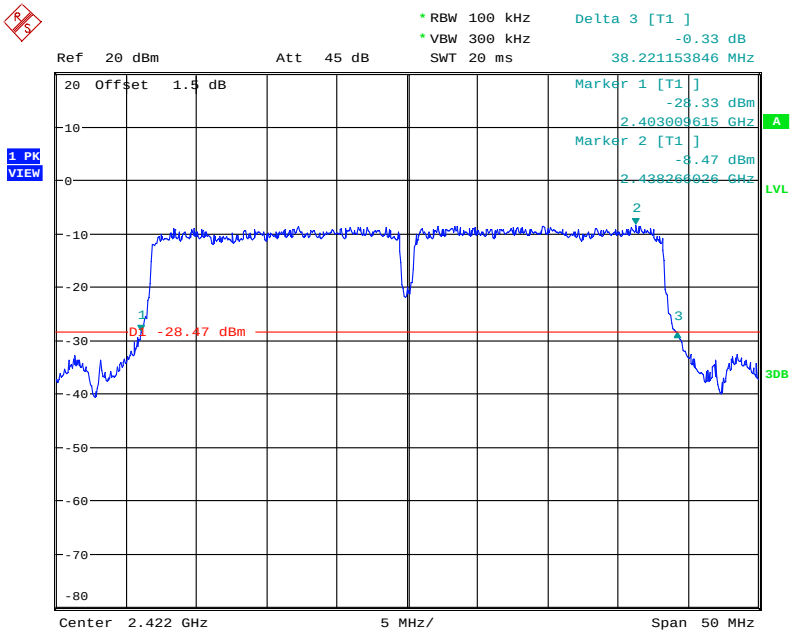
Plot K1



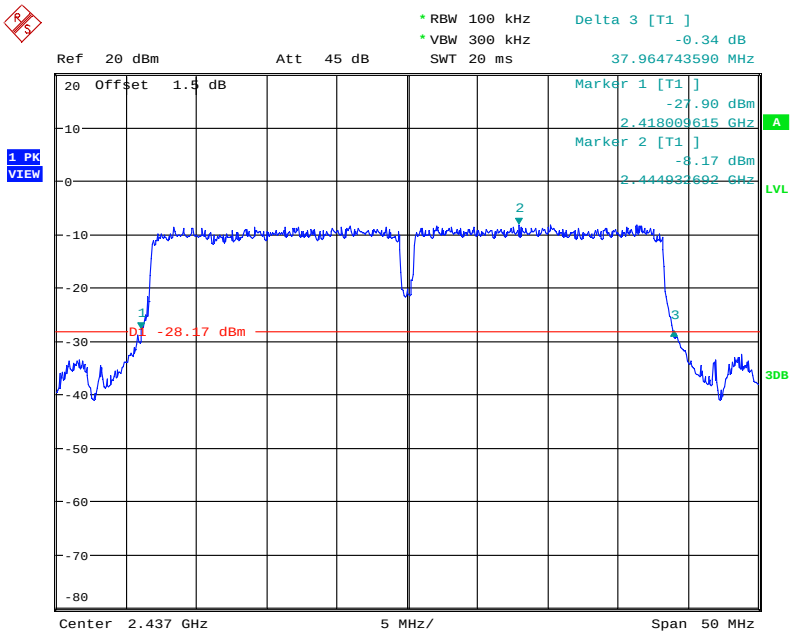
Date: 27.JUL.2016 18:05:16

Plot L1



Date: 27.JUL.2016 18:02:50

Plot J2



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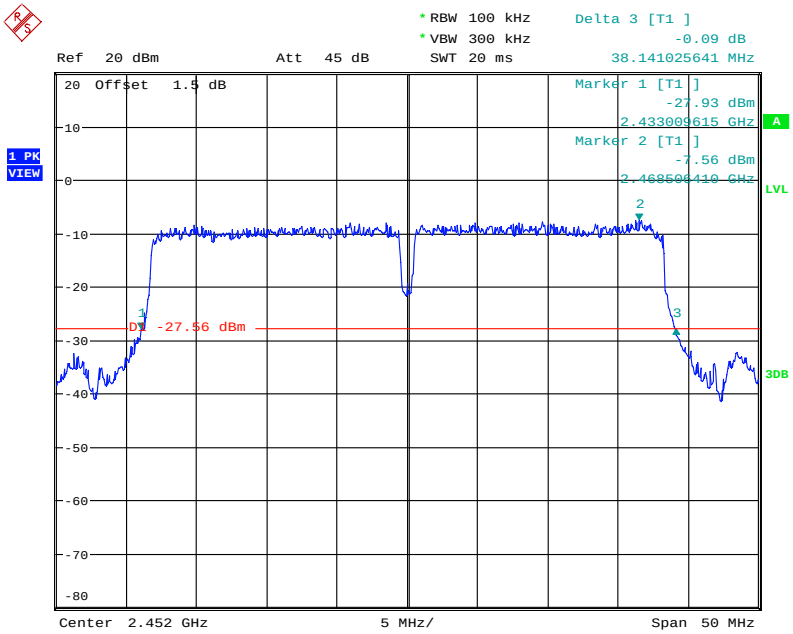
Plot K2



Date: 27.JUL.2016 18:06:25

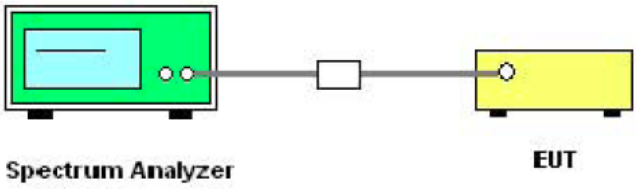
Plot L2

5.3 Conducted Spurious Emissions

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.Test Verdict:

802.11b Test mode

Channel	Frequency (MHz)	Measured max out of band emission(dBm)	Refer to plot	Limit(dBm)		Result
				Carrier level	Calculated 20dBc limit	
1	2412	-34.27	Plot A	5.84	-14.16	Pass
6	2437	-35.38	Plot B	4.89	-15.11	Pass
11	2462	-38.47	Plot C	4.71	-15.29	Pass

802.11g Test mode

Channel	Frequency (MHz)	Measured max out of band emission(dBm)	Refer to plot	Limit(dBm)		Result
				Carrier level	Calculated 20dBc limit	
1	2412	-34.94	Plot D	-1.69	-21.69	Pass
6	2437	-34.97	Plot E	-1.34	-21.34	Pass
11	2462	-33.40	Plot F	-0.70	-20.70	Pass

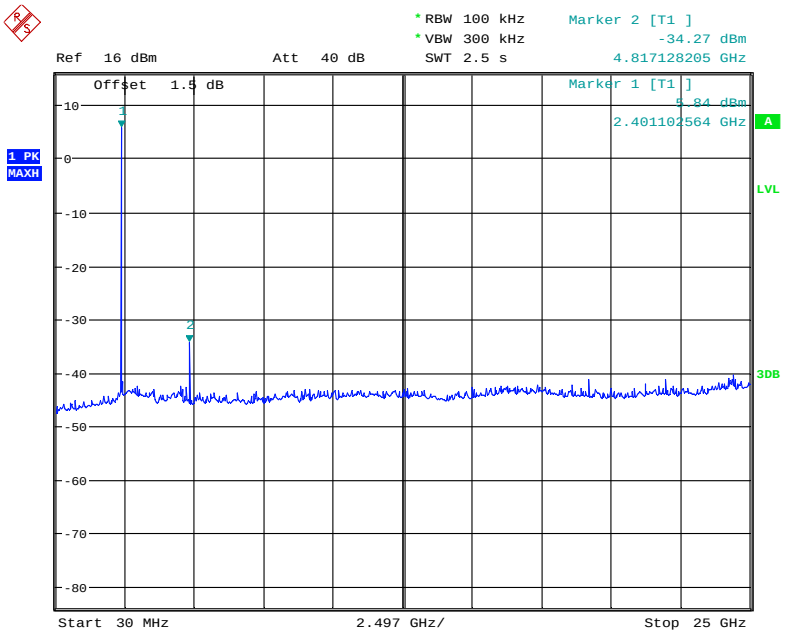
802.11n (20MHz) Test mode

Channel	Frequency (MHz)	Measured max out of band emission(dBm)	Refer to plot	Limit(dBm)		Result
				Carrier level	Calculated 20dBc limit	
1	2412	-33.49	Plot G	-5.01	-25.01	Pass
6	2437	-32.97	Plot H	-3.88	-23.88	Pass
11	2462	-33.74	Plot I	-4.78	-24.78	Pass

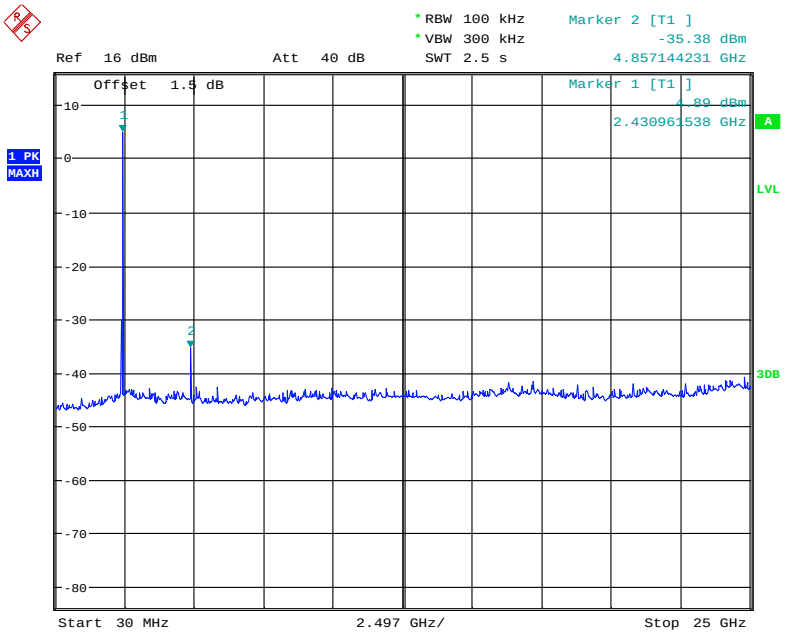
802.11n (40MHz) Test mode

Channel	Frequency (MHz)	Measured max out of band emission(dBm)	Refer to plot	Limit(dBm)		Result
				Carrier level	Calculated 20dBc limit	
3	2422	-35.08	Plot J	-8.94	-28.94	Pass
6	2437	-33.73	Plot K	-8.90	-28.90	Pass
9	2452	-34.62	Plot L	-8.13	-28.13	Pass

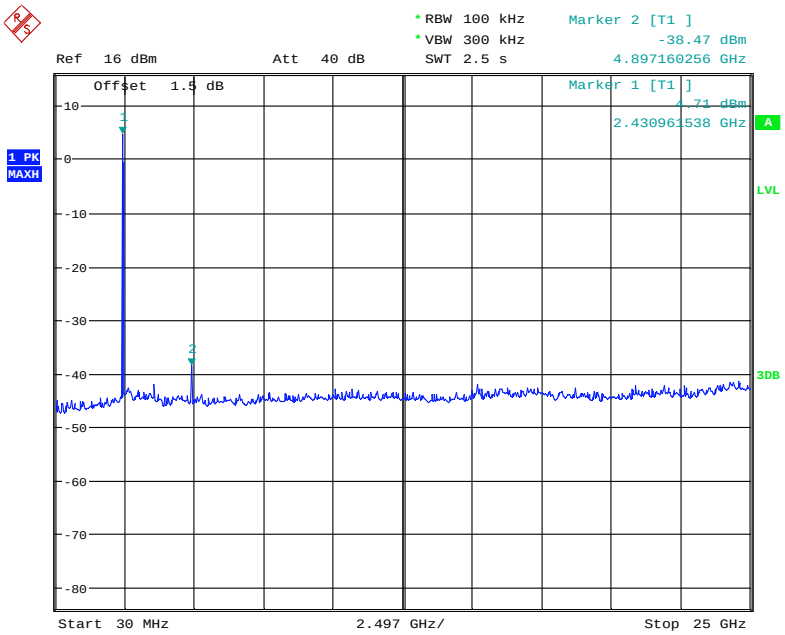
B. Test Plot:



Plot A

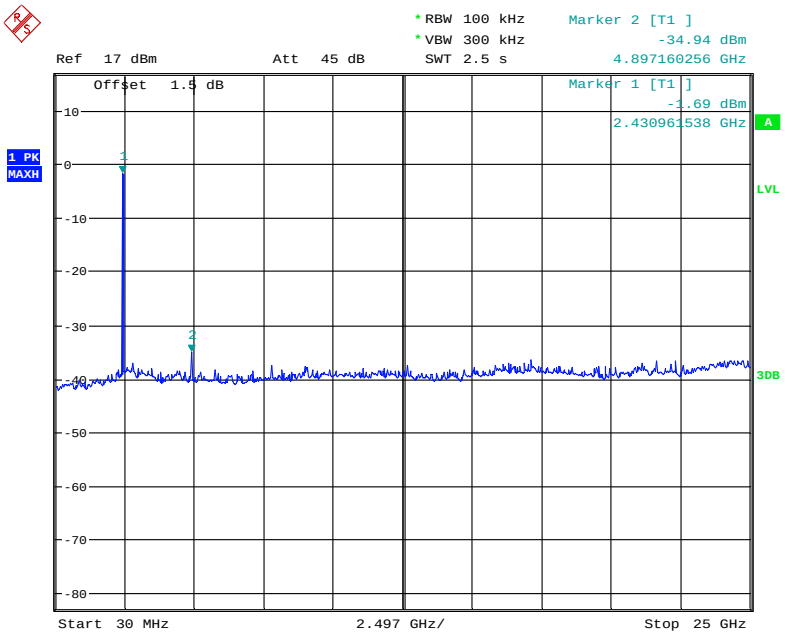


Plot B



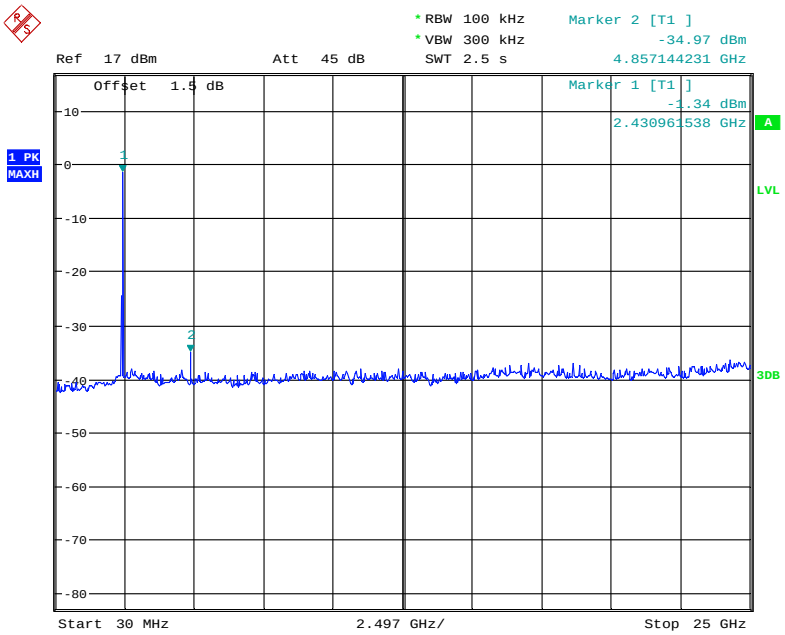
Date: 20.JUN.2016 18:09:03

Plot C



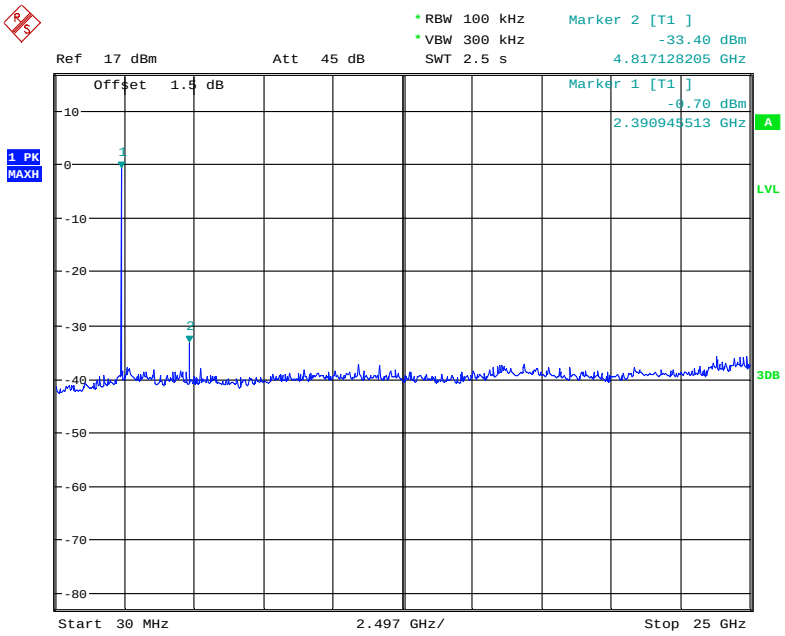
Date: 20.JUN.2016 18:11:37

Plot D



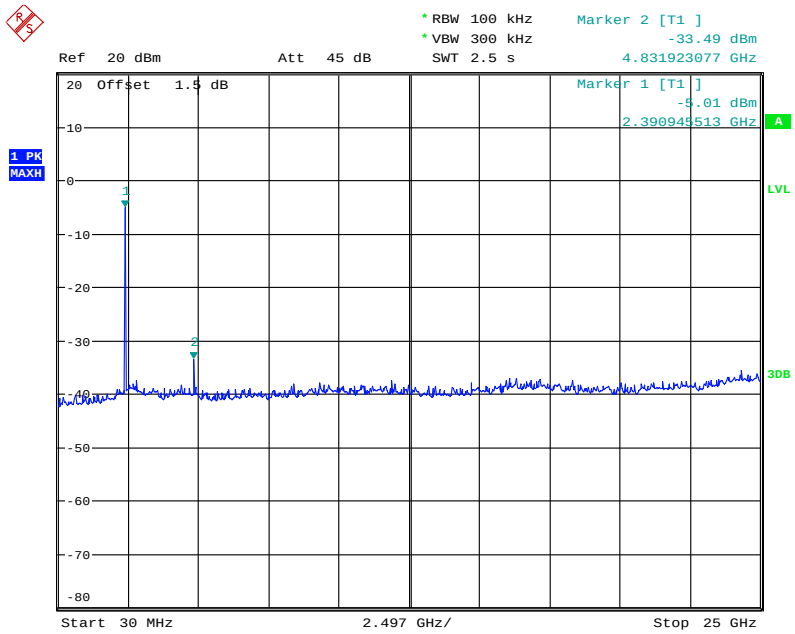
Date: 20.JUN.2016 18:12:52

Plot E



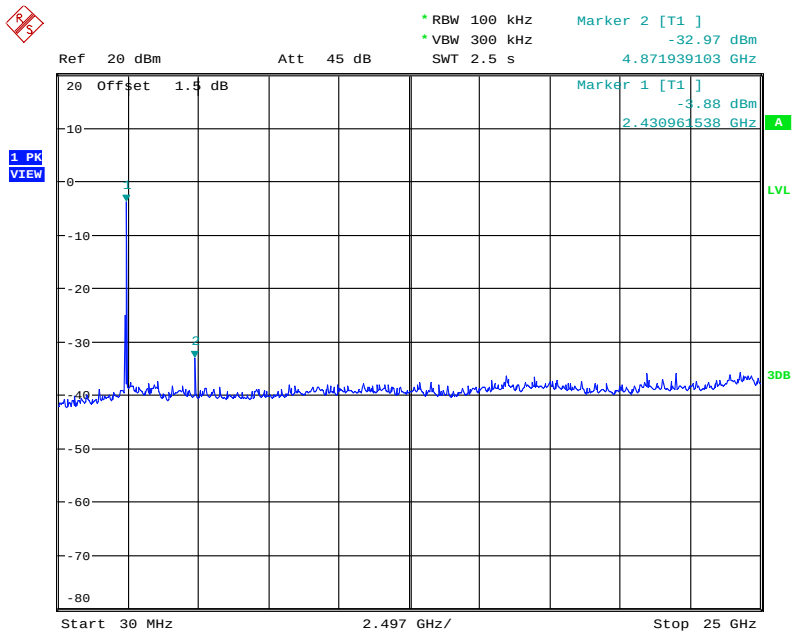
Date: 20.JUN.2016 18:13:39

Plot F



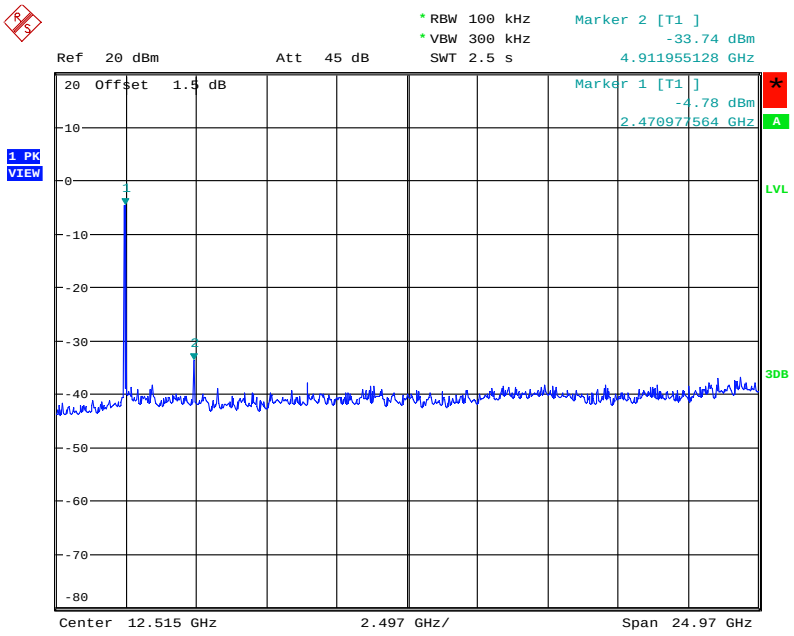
Date: 27.JUL.2016 18:09:12

Plot G



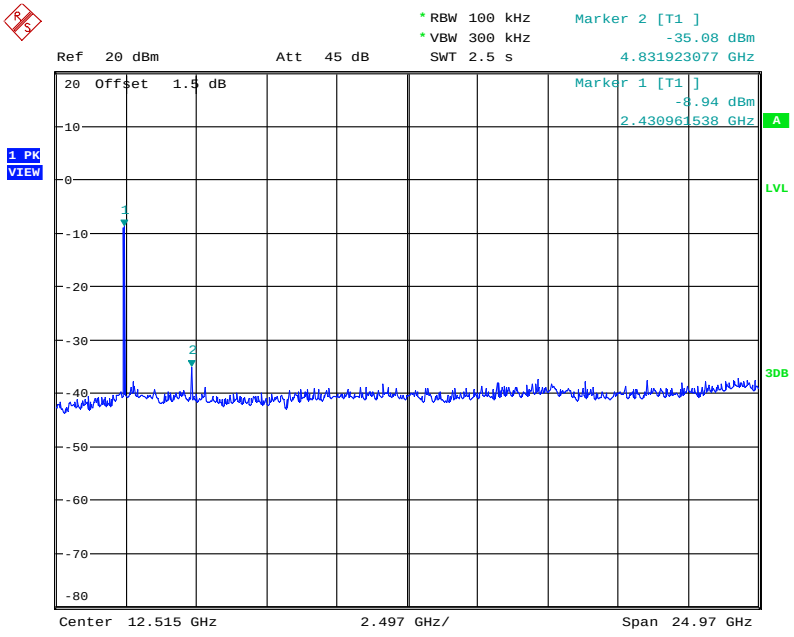
Date: 27.JUL.2016 18:11:12

Plot H



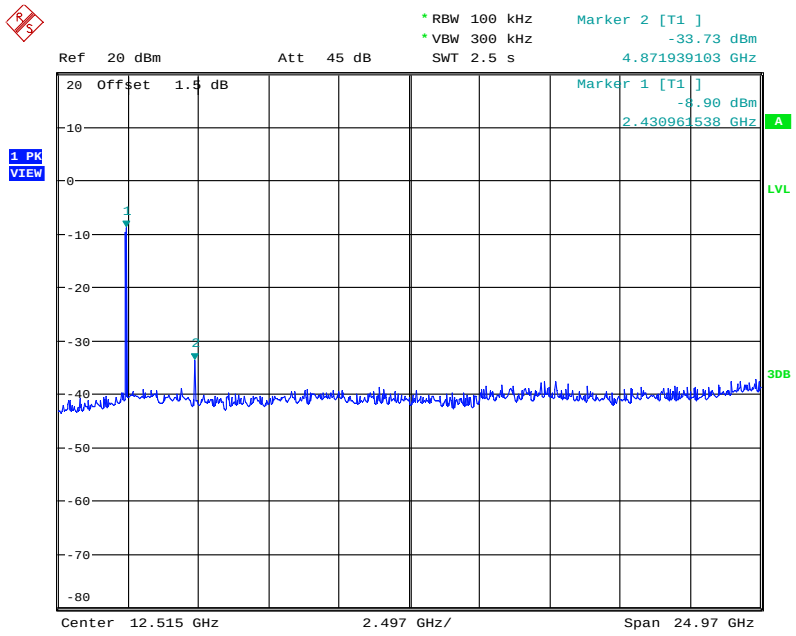
Date: 27.JUL.2016 18:12:22

Plot I



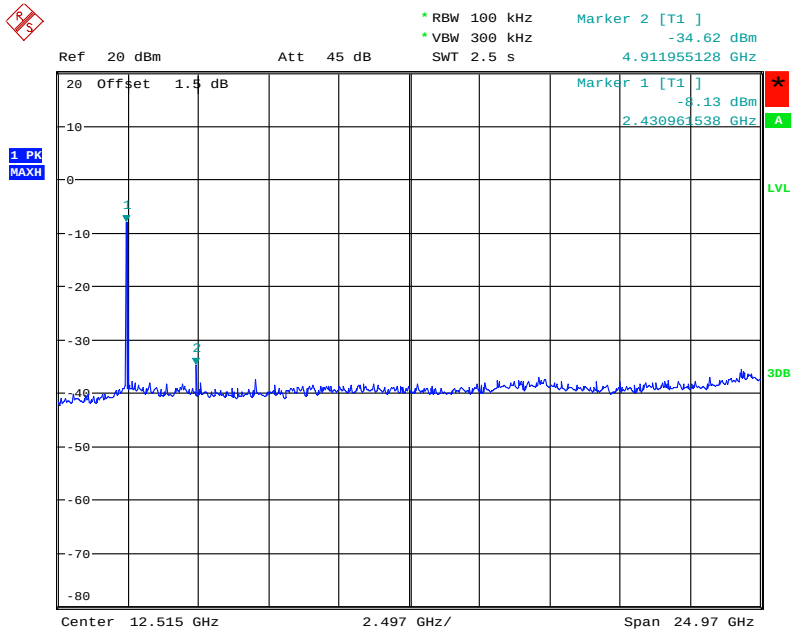
Date: 27.JUL.2016 18:17:45

Plot J



Date: 27.JUL.2016 18:20:06

Plot K



Date: 27.JUL.2016 18:22:10

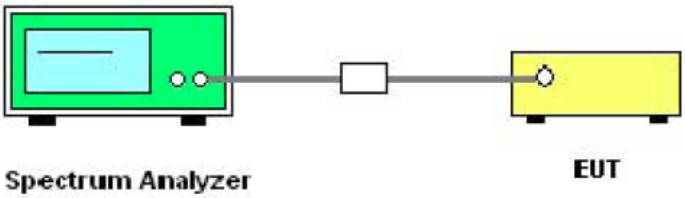
Plot L

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



5.4.3 Test Result

A.Test Verdict

802.11b Test mode

Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Refer to plot	Limit (dBm/3kHz)	Result
1	2412	-13.86	Plot A	8	Pass
6	2437	-14.98	Plot B	8	Pass
11	2462	-14.97	Plot C	8	Pass

802.11g Test mode

Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Refer to plot	Limit (dBm/3kHz)	Result
1	2412	-15.25	Plot D	8	Pass
6	2437	-15.07	Plot E	8	Pass
11	2462	-15.42	Plot F	8	Pass

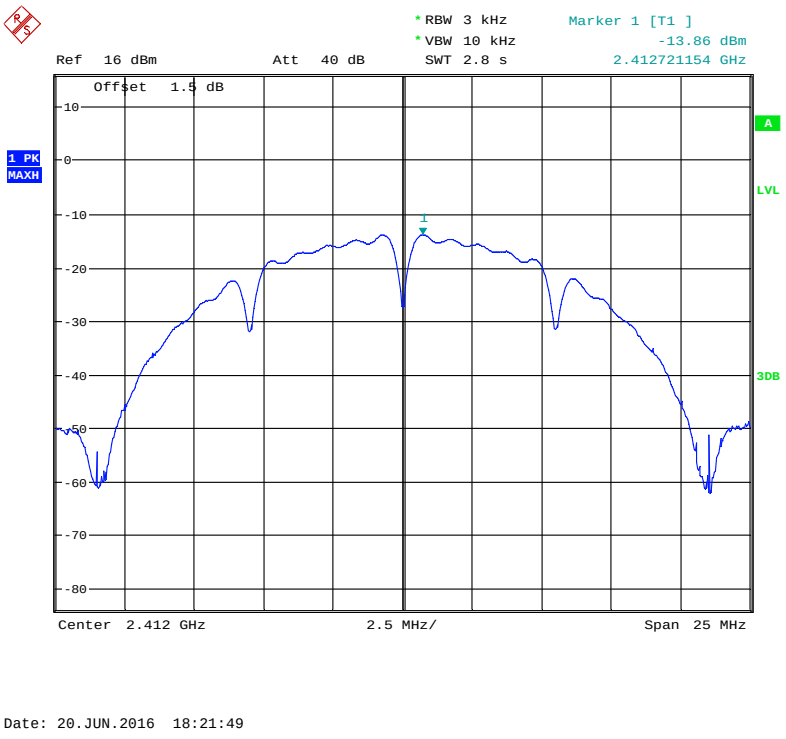
802.11n (20MHz) Test mode

Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Refer to plot	Limit (dBm/3kHz)	Result
1	2412	-17.52	Plot G	8	Pass
6	2437	-17.31	Plot H	8	Pass
11	2462	-16.47	Plot I	8	Pass

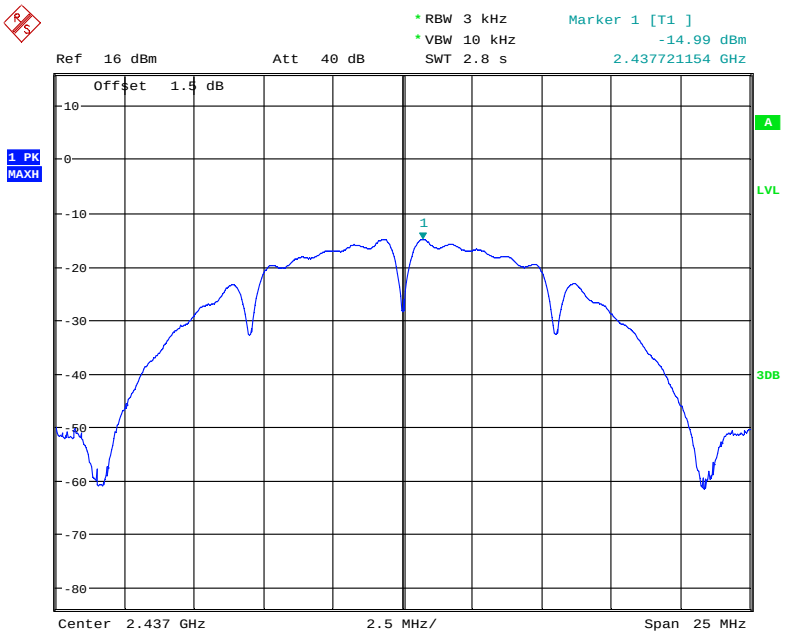
802.11n (40MHz) Test mode

Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Refer to plot	Limit (dBm/3kHz)	Result
3	2422	-20.49	Plot J	8	Pass
6	2437	-20.49	Plot K	8	Pass
9	2452	-19.94	Plot L	8	Pass

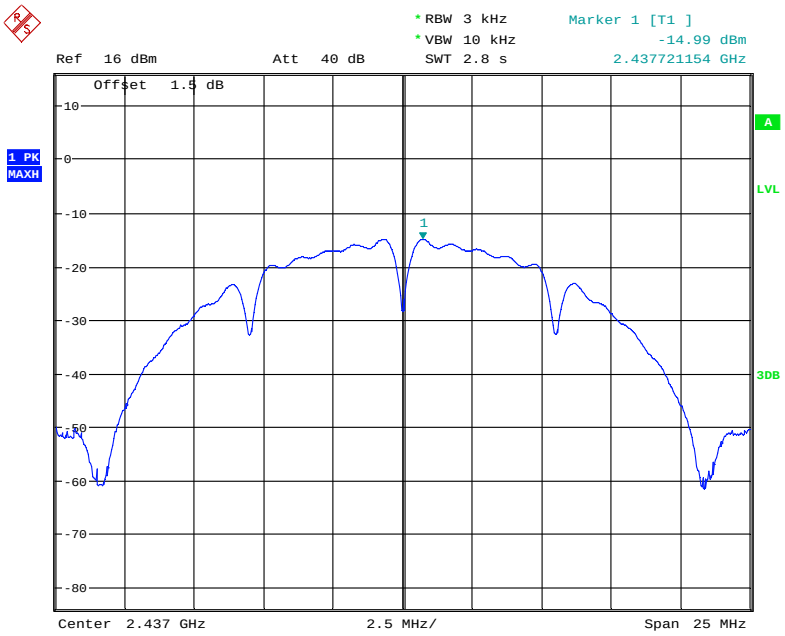
B. Test Plot



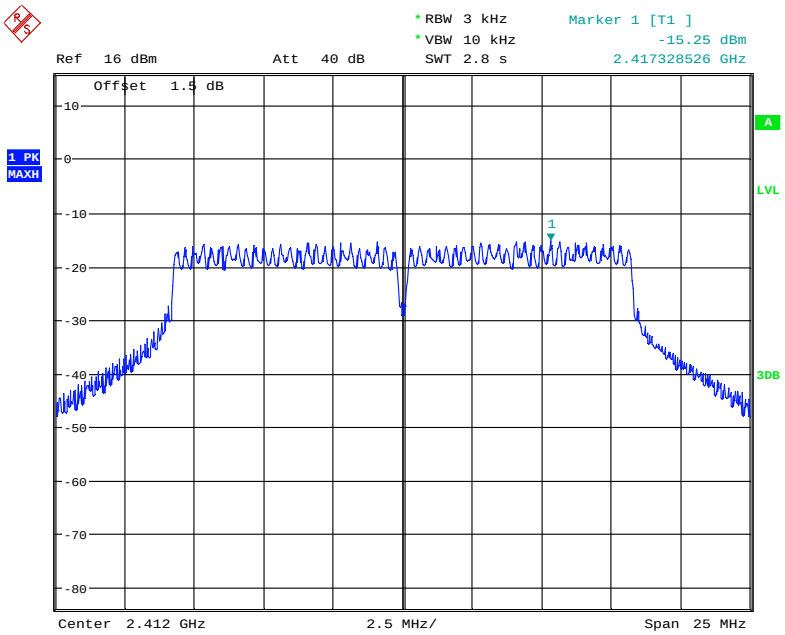
Plot A


RBW 3 kHz
VBW 10 kHz
SWT 2.8 s
Marker 1 [T1]
-14.99 dBm
2.437721154 GHz
Ref 16 dBm
Att 40 dB
Offset 1.5 dB
1 PK
MAXH
A
LVL
3DB
Center 2.437 GHz
2.5 MHz/
Span 25 MHz
Date: 20.JUN.2016 18:23:17

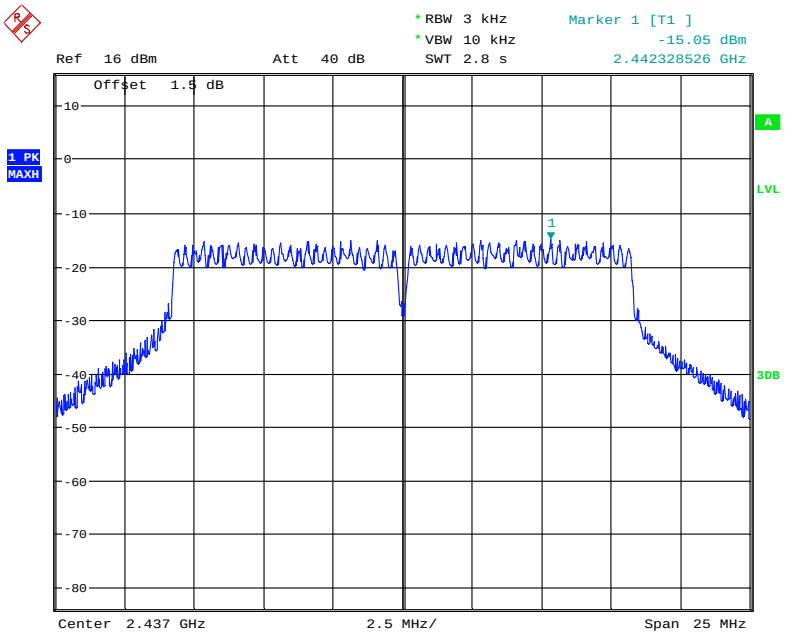
Plot B


RBW 3 kHz
VBW 10 kHz
SWT 2.8 s
Marker 1 [T1]
-14.99 dBm
2.437721154 GHz
Ref 16 dBm
Att 40 dB
Offset 1.5 dB
1 PK
MAXH
A
LVL
3DB
Center 2.437 GHz
2.5 MHz/
Span 25 MHz
Date: 20.JUN.2016 18:23:17

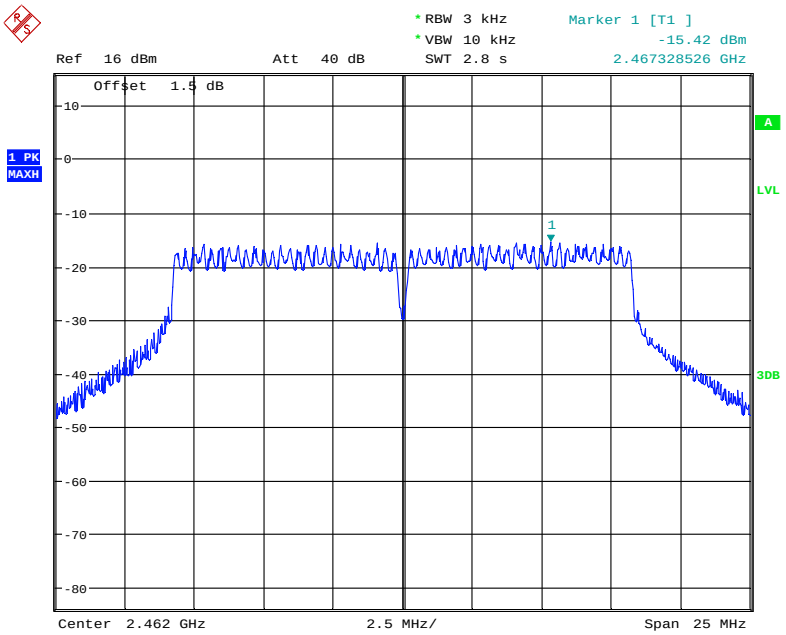
Plot C


RBW 3 kHz
VBW 10 kHz
SWT 2.8 s
Marker 1 [T1]
-15.25 dBm
2.417328526 GHz
Ref 16 dBm
Att 40 dB
Offset 1.5 dB
1 PK
MAXH
A
LVL
3DB
Center 2.412 GHz
2.5 MHz/
Span 25 MHz
Date: 20.JUN.2016 18:20:47

Plot D

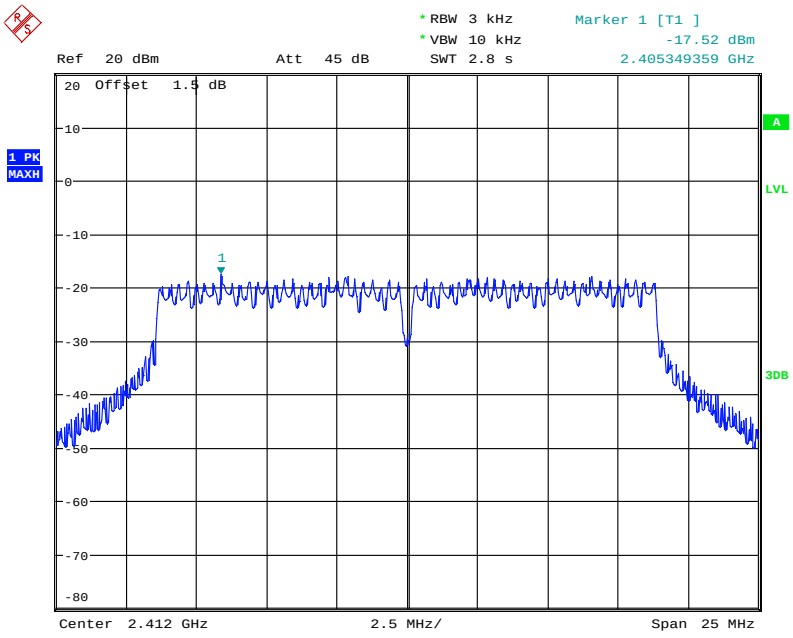

RBW 3 kHz
VBW 10 kHz
SWT 2.8 s
Marker 1 [T1]
-15.05 dBm
2.442328526 GHz
Ref 16 dBm
Att 40 dB
Offset 1.5 dB
1 PK
MAXH
A
LVL
3DB
Center 2.437 GHz
2.5 MHz/
Span 25 MHz
Date: 20.JUN.2016 18:24:07

Plot E



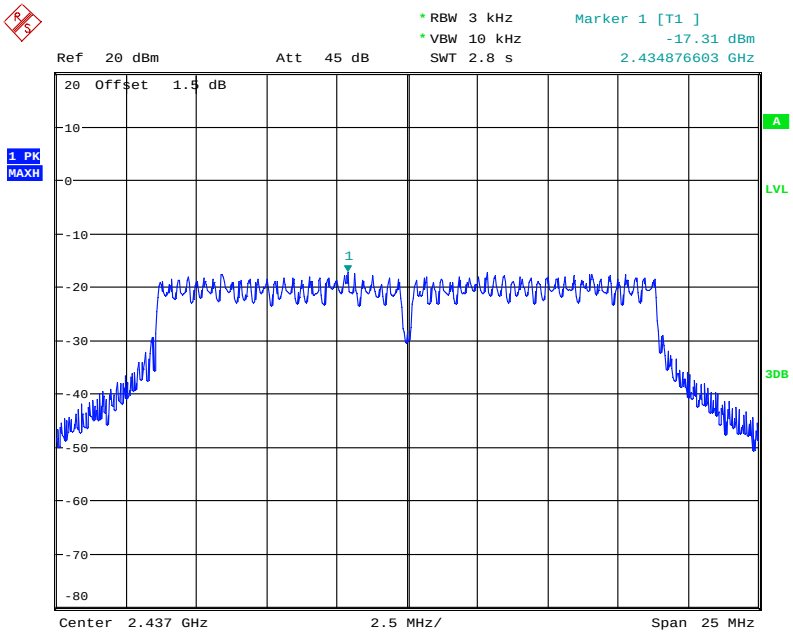
Date: 20.JUN.2016 18:25:35

Plot F

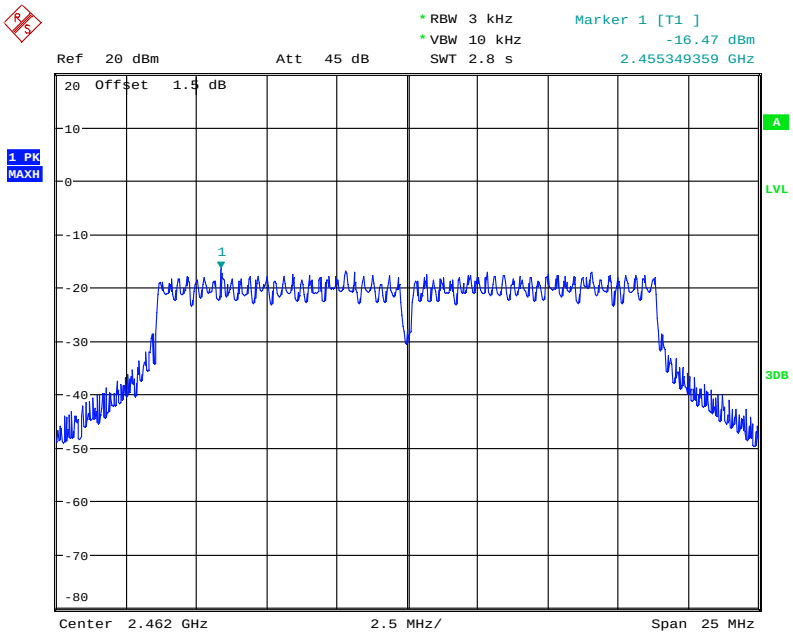


Date: 27.JUL.2016 18:24:30

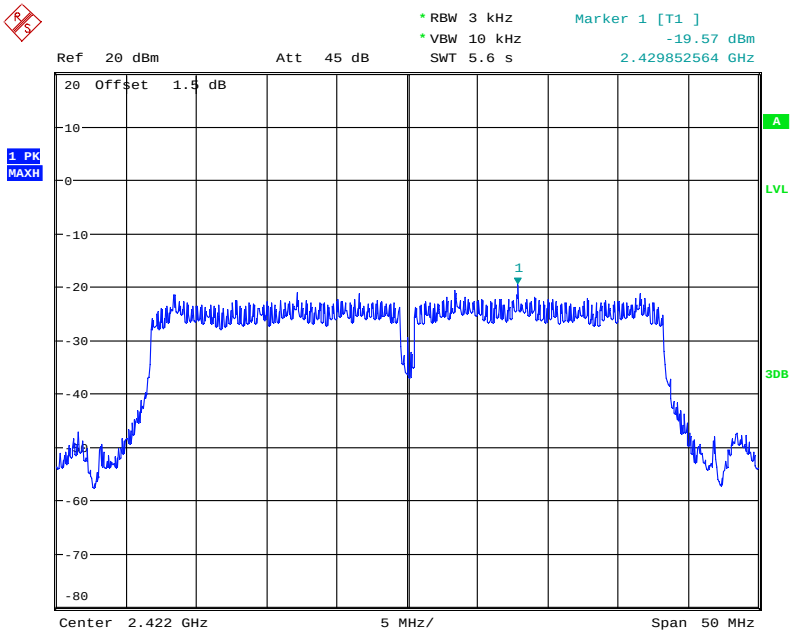
Plot G


RBW 3 kHz
VBW 10 kHz
SWT 2.8 s
Marker 1 [T1]
-17.31 dBm
2.434876603 GHz
Ref 20 dBm
Att 45 dB
Offset 1.5 dB
1 PK
MAXH
A
LVL
3DB
Center 2.437 GHz
2.5 MHz/
Span 25 MHz
Date: 27.JUL.2016 18:25:51

Plot H

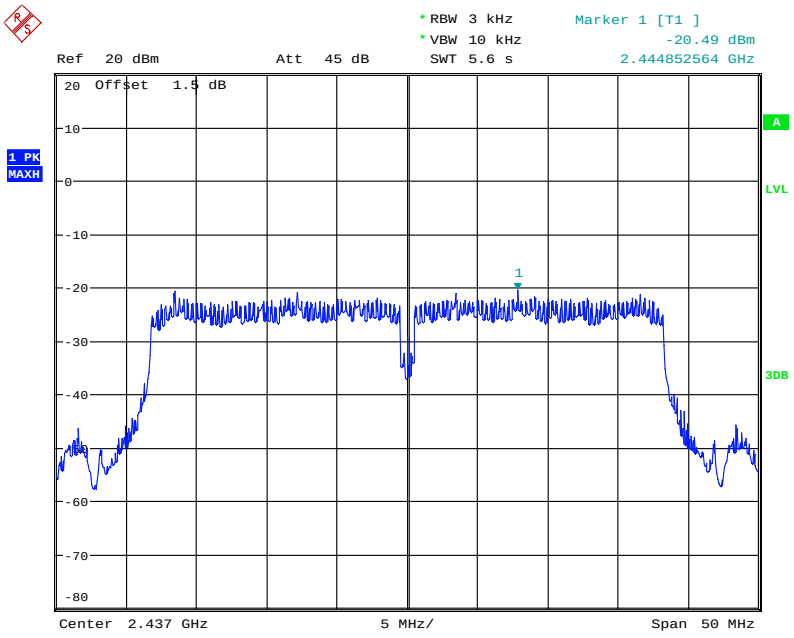

RBW 3 kHz
VBW 10 kHz
SWT 2.8 s
Marker 1 [T1]
-16.47 dBm
2.455349359 GHz
Ref 20 dBm
Att 45 dB
Offset 1.5 dB
1 PK
MAXH
A
LVL
3DB
Center 2.462 GHz
2.5 MHz/
Span 25 MHz
Date: 27.JUL.2016 18:26:36

Plot I



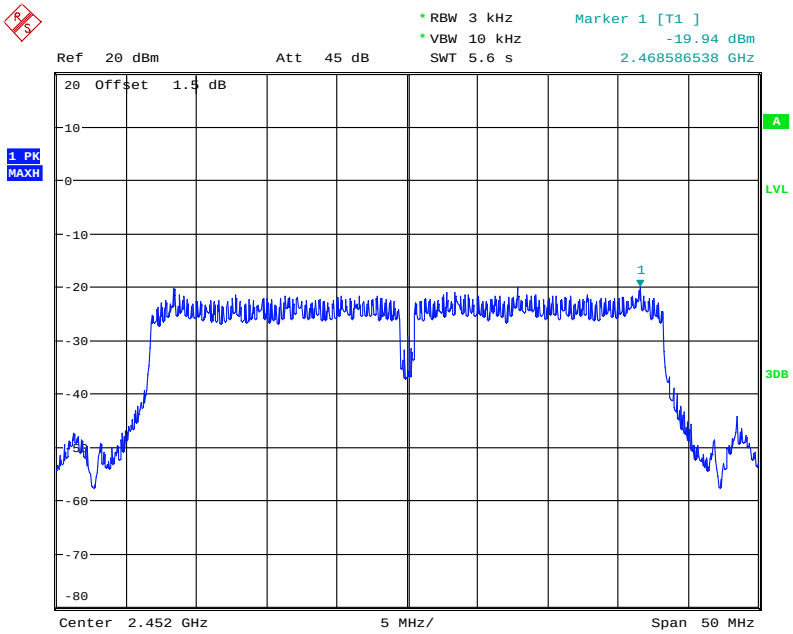
Date: 27.JUL.2016 18:29:32

Plot J



Date: 27.JUL.2016 18:28:26

Plot K


RBW 3 kHz
VBW 10 kHz
SWT 5.6 s
Marker 1 [T1]
-19.94 dBm
2.468586538 GHz
Ref 20 dBm
Att 45 dB
Offset 1.5 dB
1 PK
MAXH
A
LVL
3DB
Center 2.452 GHz
5 MHz/
Span 50 MHz
Date: 27.JUL.2016 18:27:37

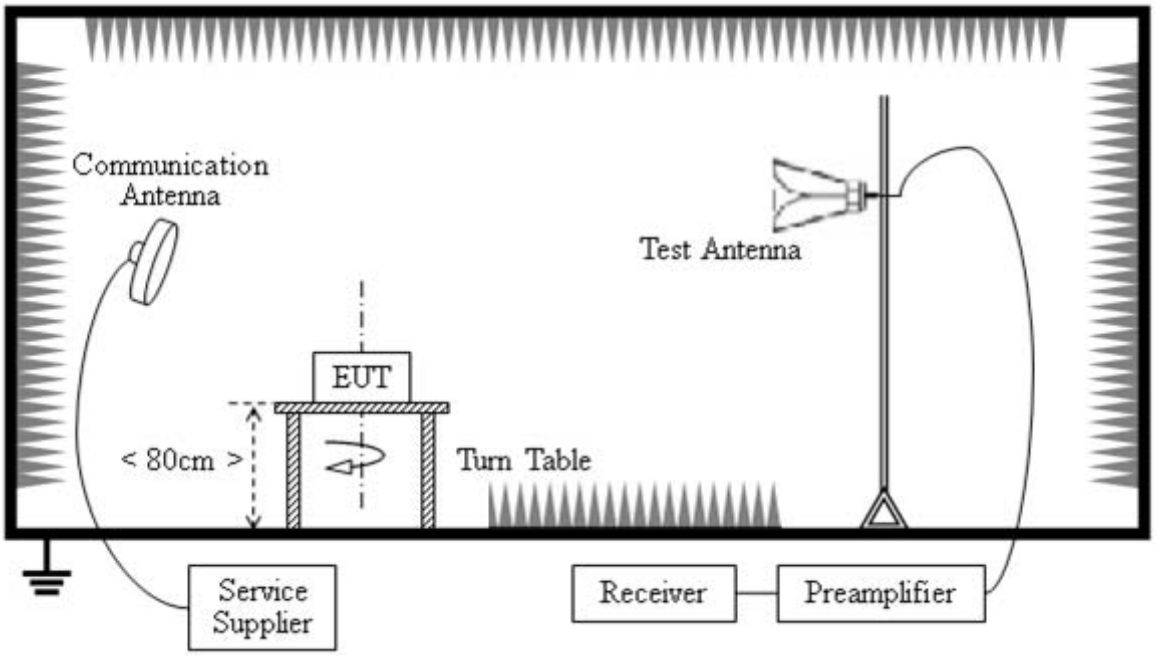
Plot L

5.5 Band Edge

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 Module 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.

5.5.3 Test Result

The lowest and highest channels are tested to verify the Restricted Frequency Bands.
The measurement results are obtained as below:
E [dBV/m] =UR + AT + AFactor [dB]; AT =Cable Loss [dB]-Gpreamp [dB]
AT: Total correction Factor except Antenna
UR: Receiver Reading
Gpreamp: Preamplifier Gain
AFactor: Antenna Factor at 3m
Note: Restricted Frequency Bands were performed when antenna was at vertical and horizontal polarity, and only the worse test condition (vertical) was recorded in this test report.

The lowest and highest channels are tested to verify the Restricted Frequency Bands

A.Test Verdict

802.11b Test mode

Ch	Frequency (MHz)	Detector PK/AV	Receiver Reading UR (dBuV/m)	AT (dB)	Afactor (dB@3m)	Max. Emission (dBuV/m)	Limit (dBuV/m)	Result
1	2375.54	PK	43.17	-32.2	32.56	43.53	74	Pass
1	2342.52	AV	39.38	-32.2	32.56	39.74	54	Pass
11	2485.44	PK	41.92	-30.7	32.50	43.72	74	Pass
11	2498.23	AV	38.64	-30.7	32.50	40.44	54	Pass

802.11g Test mode

Ch	Frequency (MHz)	Detector PK/AV	Receiver Reading UR (dBuV/m)	AT (dB)	Afactor (dB@3m)	Max. Emission (dBuV/m)	Limit (dBuV/m)	Result
1	2369.00	PK	42.37	-32.2	32.56	42.73	74	Pass
1	2354.14	AV	37.84	-32.2	32.56	38.20	54	Pass
11	2484.47	PK	42.44	-30.7	32.50	44.24	74	Pass
11	2484.83	AV	37.23	-30.7	32.50	39.03	54	Pass

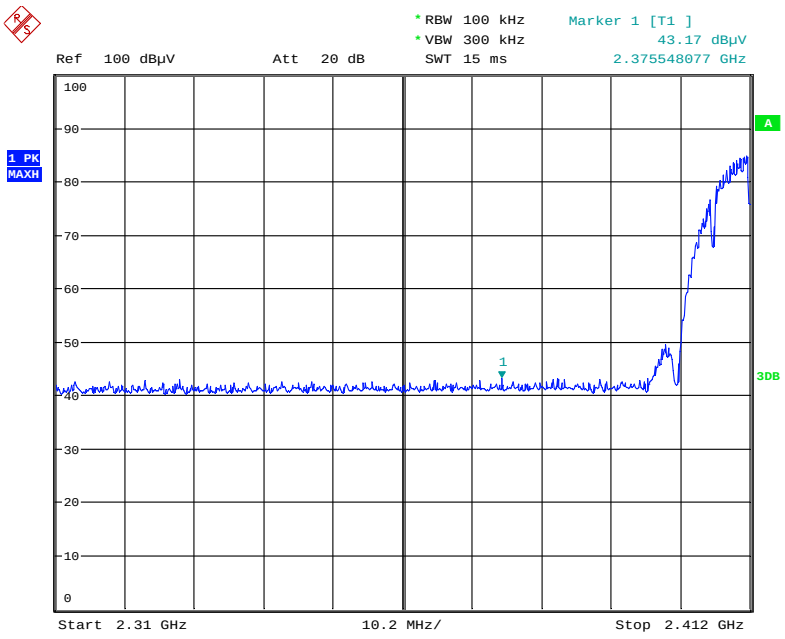
802.11n (20MHz) Test mode

Ch	Frequency (MHz)	Detector PK/AV	Receiver Reading UR (dBuV/m)	AT (dB)	Afactor (dB@3m)	Max. Emission (dBuV/m)	Limit (dBuV/m)	Result
1	2358.54	PK	43.22	-32.2	32.56	43.58	74	Pass
1	2329.77	AV	38.67	-32.2	32.56	39.03	54	Pass
11	2490.74	PK	43.29	-30.7	32.50	45.09	74	Pass
11	2486.48	AV	38.24	-30.7	32.50	40.04	54	Pass

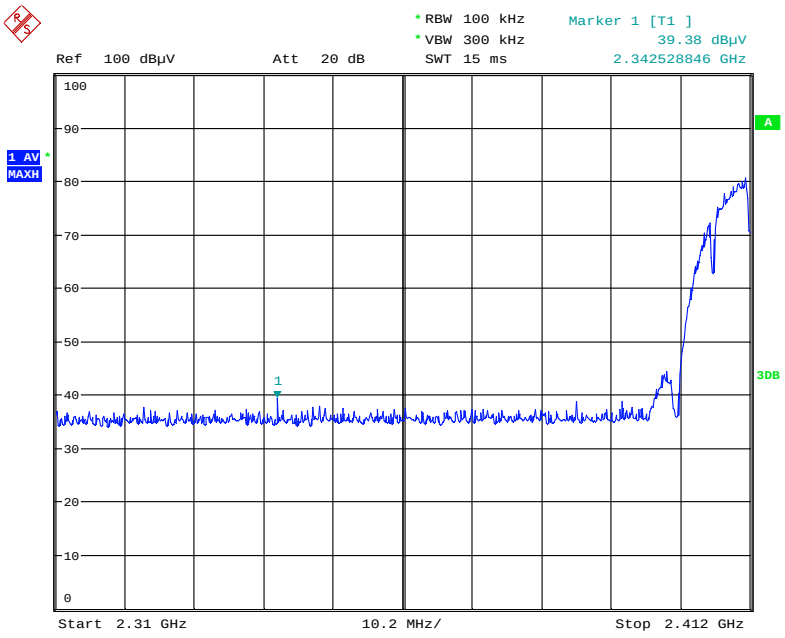
802.11n (40MHz) Test mode

Ch	Frequency (MHz)	Detector PK/AV	Receiver Reading UR (dBuV/m)	AT (dB)	Afactor (dB@3m)	Max. Emission (dBuV/m)	Limit (dBuV/m)	Result
3	2345.16	PK	42.85	-32.2	32.56	43.21	74	Pass
3	2375.00	AV	38.28	-32.2	32.56	38.64	54	Pass
9	2490.03	PK	44.01	-30.7	32.50	45.81	74	Pass
9	2491.573	AV	37.20	-30.7	32.50	39.00	54	Pass

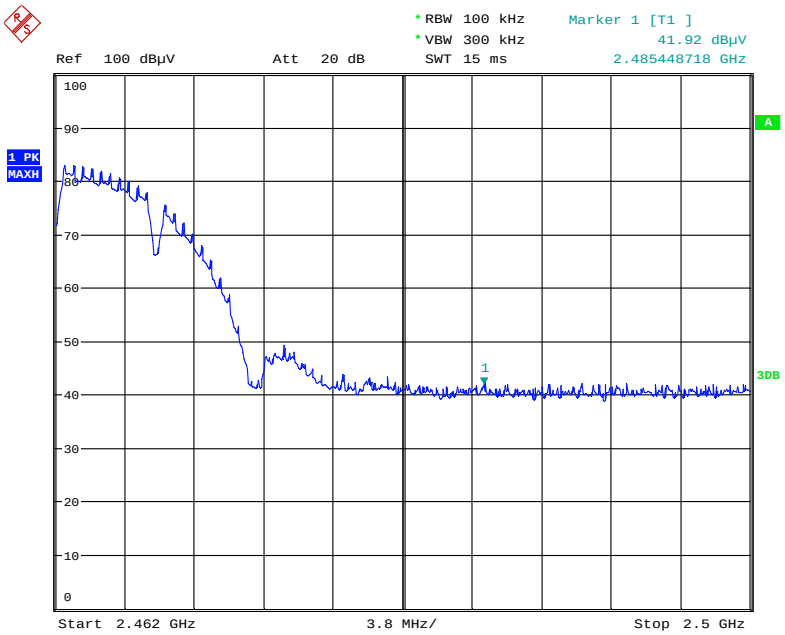
B. Test Plot



(802.11b Channel = 1 PK)

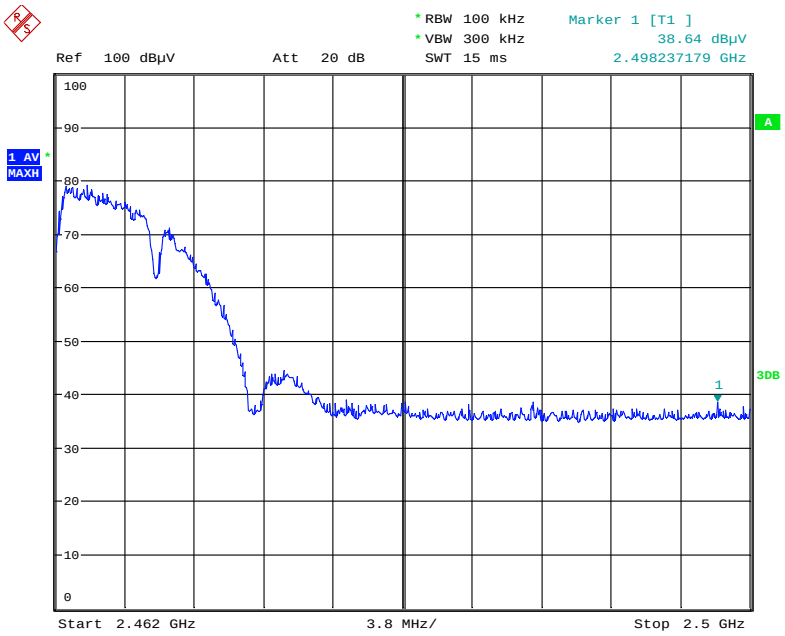


(802.11b Channel = 1 AV)



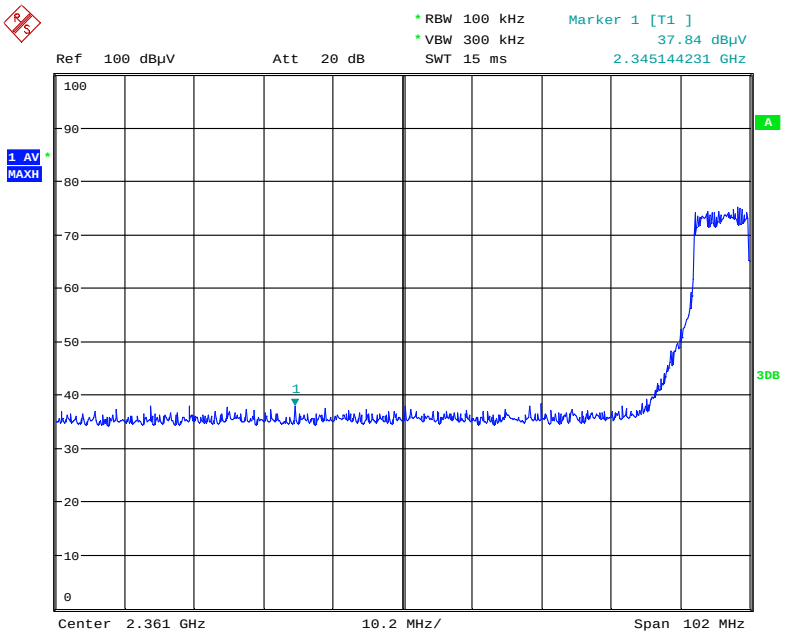
Date: 20.JUN.2016 18:50:22

(802.11b Channel = 11 PK)

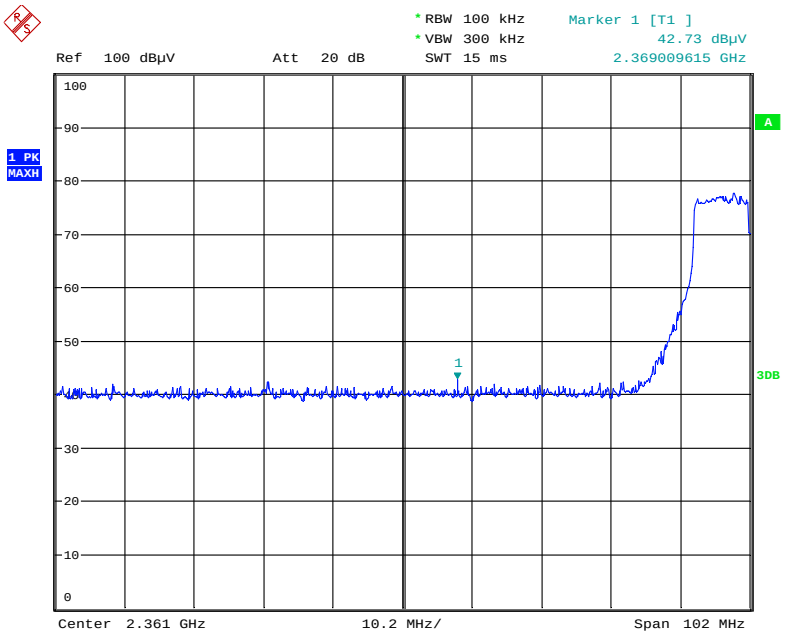


Date: 20.JUN.2016 18:49:46

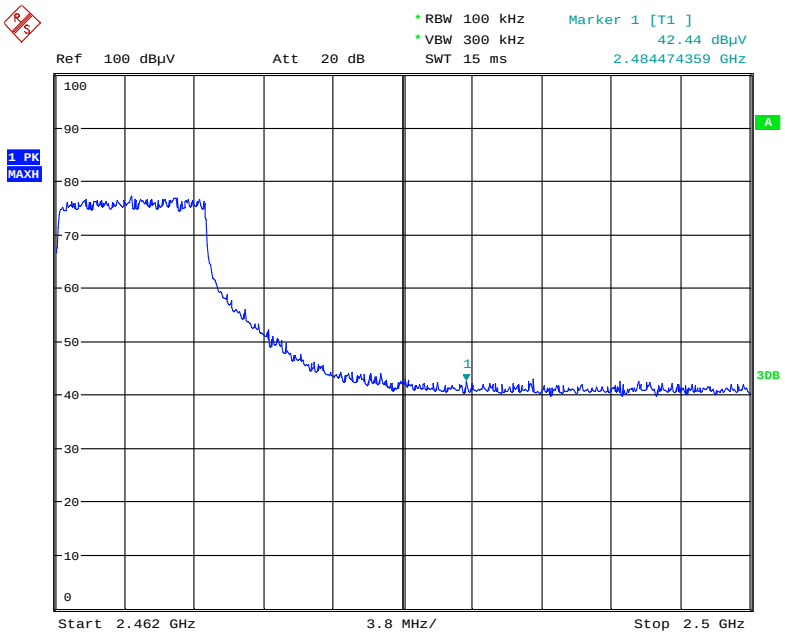
(802.11b Channel = 11 AV)



(802.11g Channel = 1 PK)

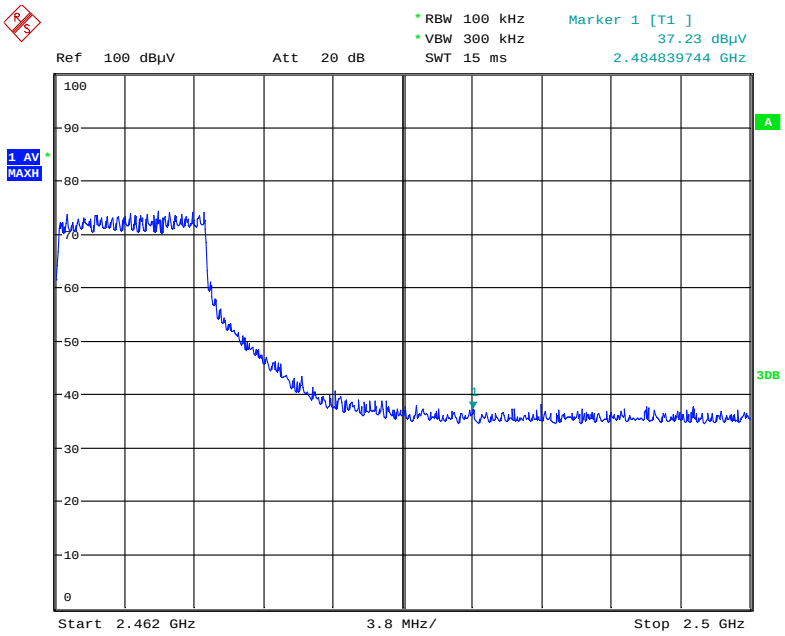


(802.11g Channel = 1 AV)



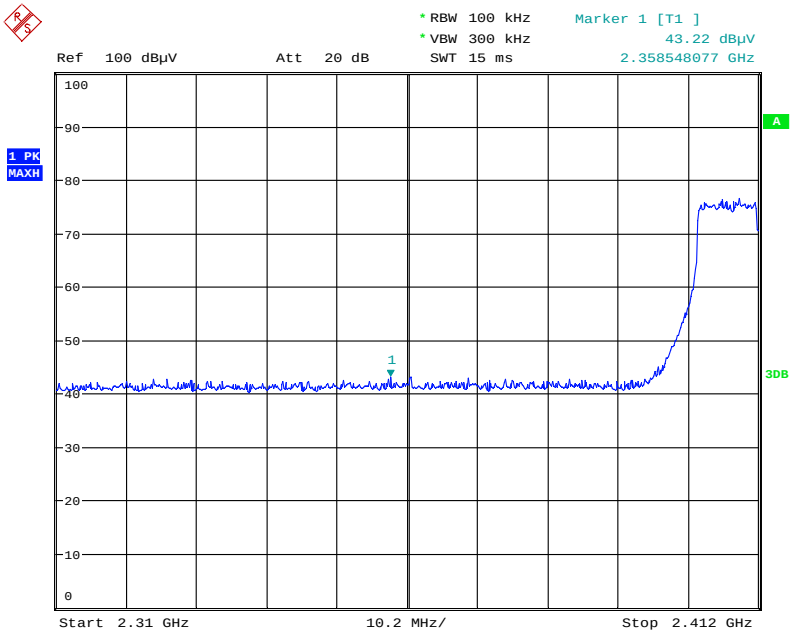
Date: 20.JUN.2016 18:46:16

(802.11g Channel = 11 PK)



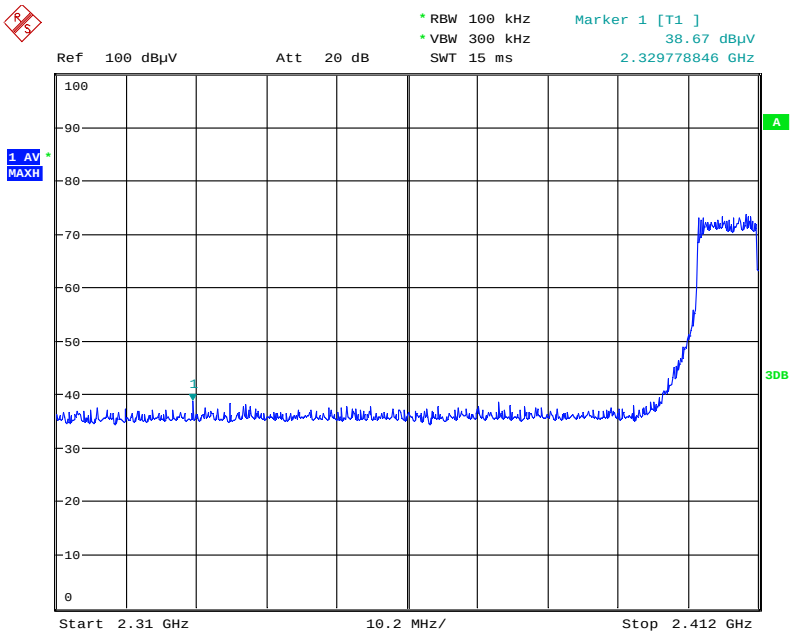
Date: 20.JUN.2016 18:47:17

(802.11g Channel = 11 AV)



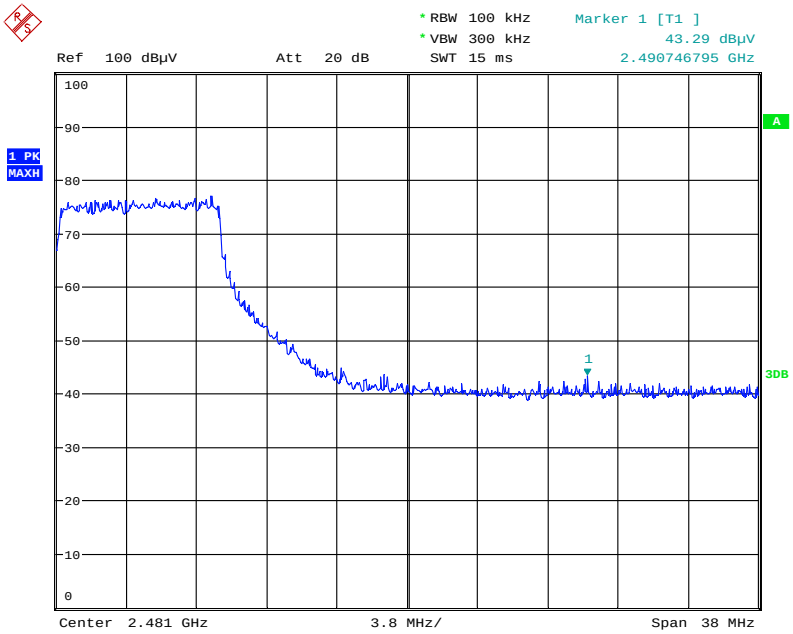
Date: 27.JUL.2016 18:41:53

(802.11n (20MHz) Channel = 1 PK)

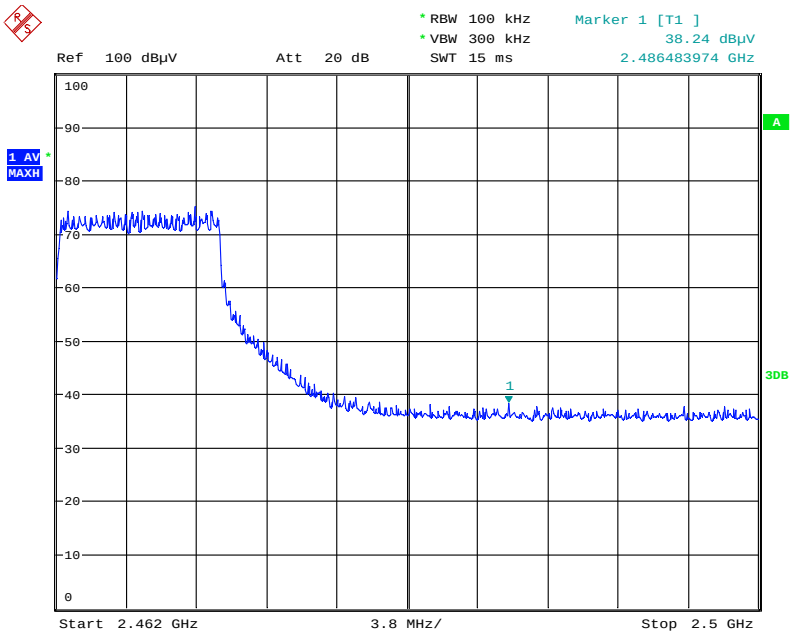


Date: 27.JUL.2016 18:42:36

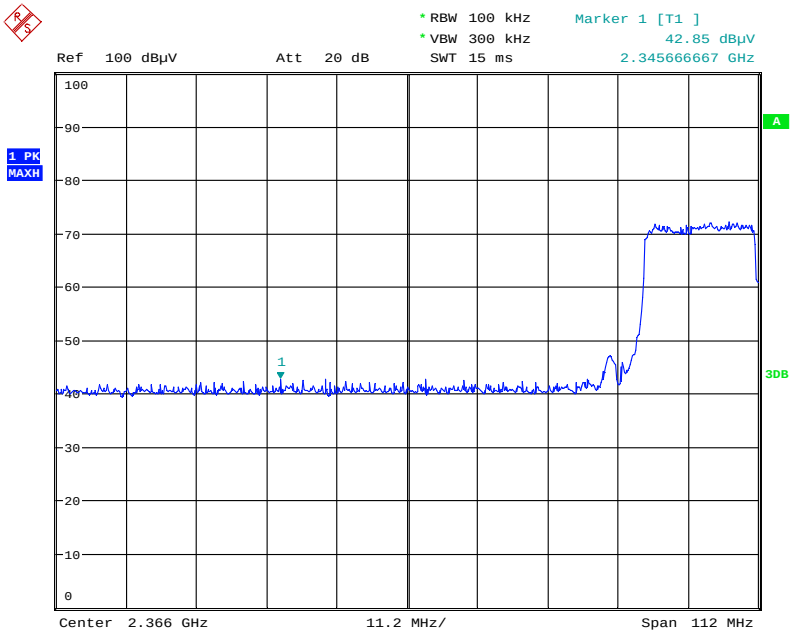
(802.11n (20MHz) Channel = 1 AV)



(802.11n (20MHz) Channel = 11 PK)

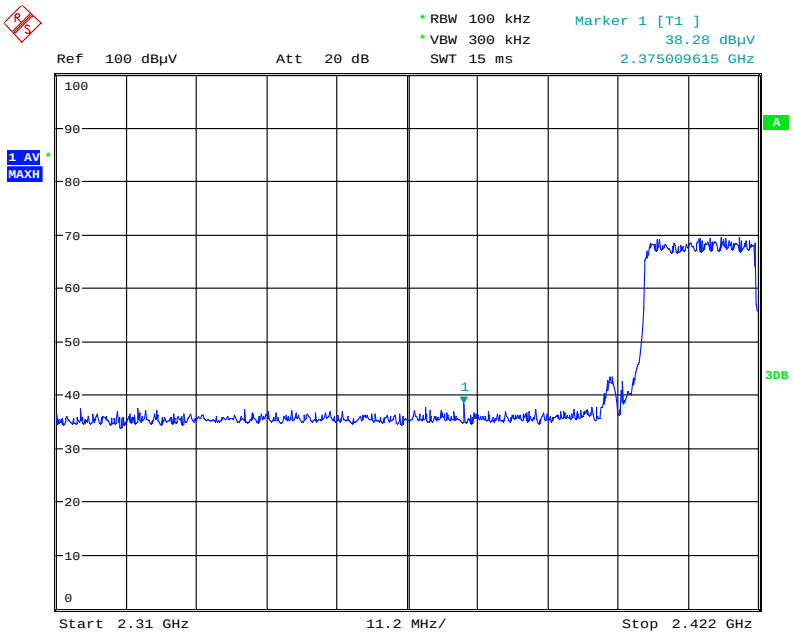


(802.11n (20MHz) Channel = 11 AV)



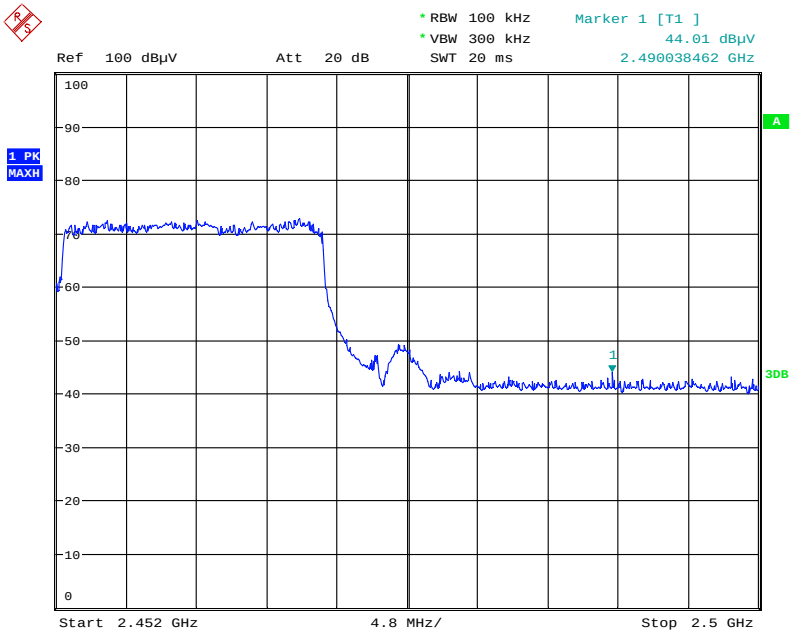
Date: 27.JUL.2016 18:45:02

(802.11n (40MHz) Channel = 3 PK)



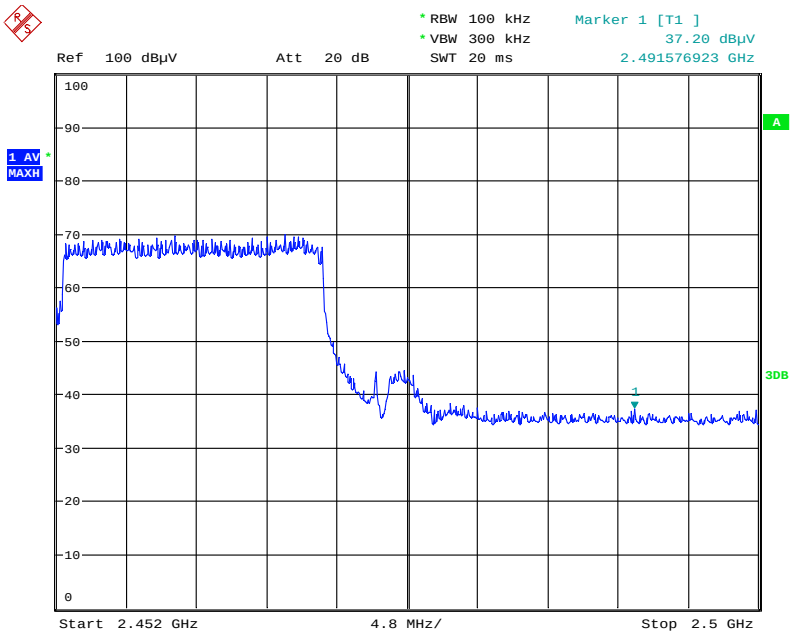
Date: 27.JUL.2016 18:43:47

(802.11n (40MHz) Channel = 3 AV)



Date: 27.JUL.2016 18:47:17

(802.11n (40MHz) Channel = 9 PK)



Date: 27.JUL.2016 18:48:08

(802.11n (40MHz) Channel = 9 AV)

5.6 Conducted Emission

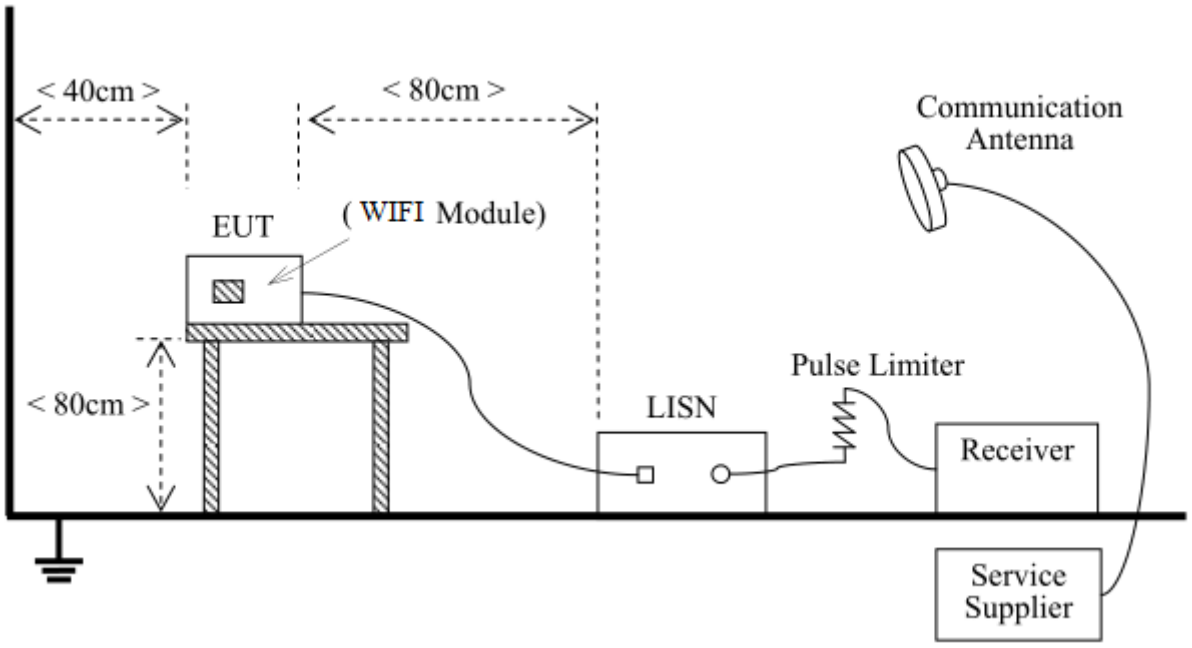
5.6.1 Requirement

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 Table-top EUT was placed upon a non-metallic table 0.8m above the horizontal metal reference ground plane. EUT connected to Class B Computer/Laptop via USB data cable. The Computer/Laptop installed by US power 120V/60Hz, through a Line Impedance Stabilization Network (LISN), which was supplied power source and was grounded to the ground plane.
. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.10-2013

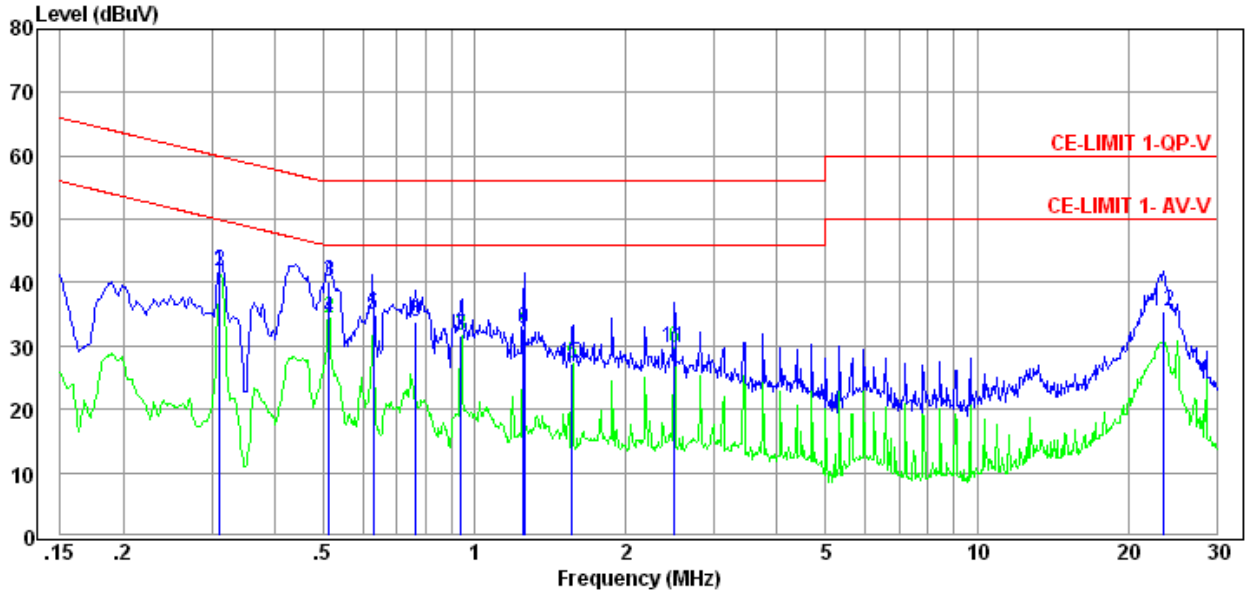
5.6.3 Test result

Test Verdict Recorded for Suspicious Points:

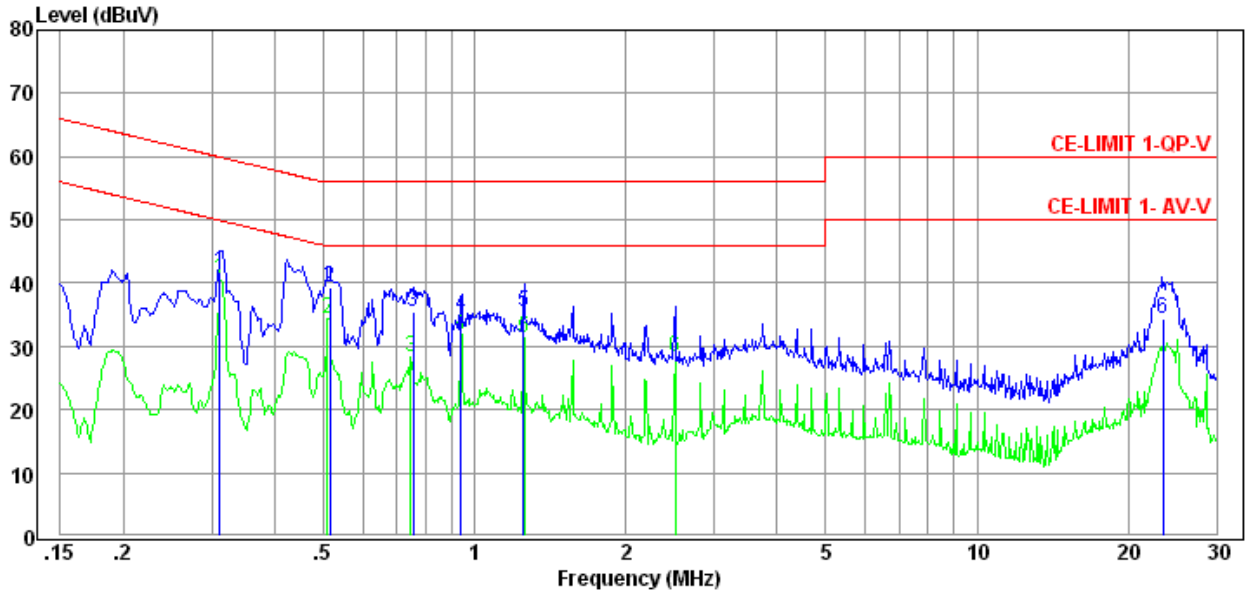
Line	Freq MHz	Result dBuV	Limit dBuV	Margin dB
QP	0.31	41.90	59.94	18.04
Average	0.31	41.82	49.93	8.11
QP	0.51	40.11	56.00	15.89
Average	0.51	34.42	46.00	11.58
QP	0.63	34.91	56.00	21.09
QP	0.76	33.72	56.00	22.28
Average	0.94	31.61	46.00	14.39
Average	1.25	32.79	46.00	13.21
QP	1.26	32.63	56.00	23.37
Average	1.57	27.20	46.00	18.80
Average	2.51	29.72	46.00	16.28
QP	23.52	35.35	60.00	24.65

Neutral	Freq MHz	Result dBuV	Limit dBuV	Margin dB
QP	0.31	41.73	59.94	18.21
QP	0.52	39.41	56.00	16.59
QP	0.76	35.56	56.00	20.44
QP	0.94	34.85	56.00	21.15
QP	1.25	35.45	56.00	20.55
QP	23.43	34.37	60.00	25.63

Test Plot:



(Plot A: L Phase)



(Plot B: N Phase)

5.7 Radiated Emission

5.7.1 Requirement

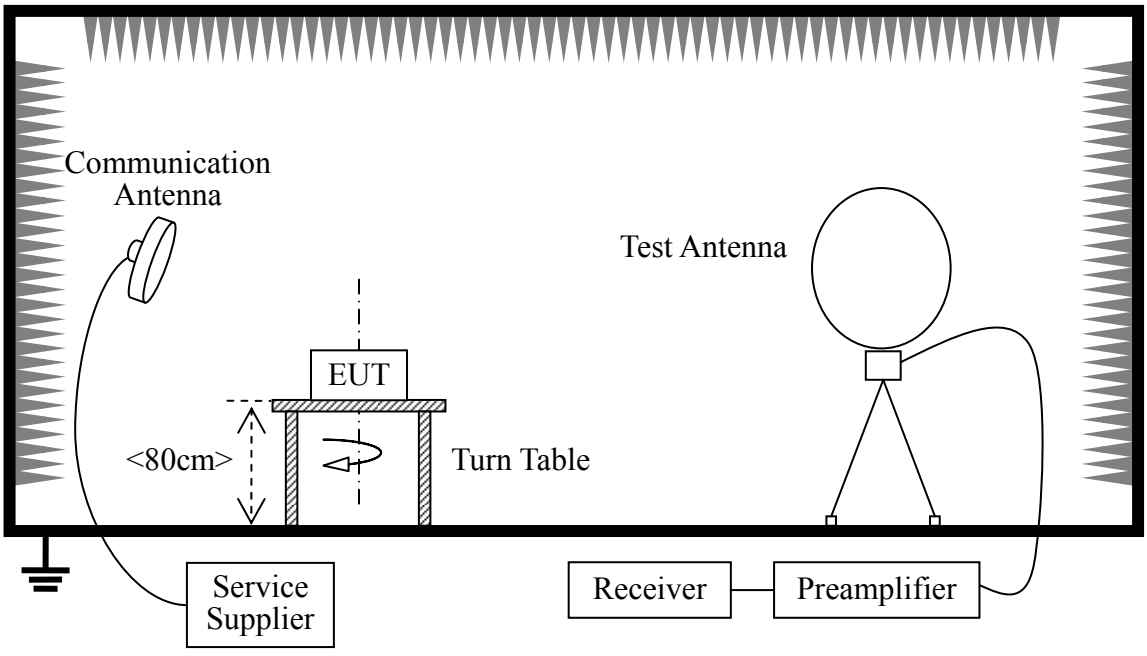
According to FCC section 15.247(c), radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the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

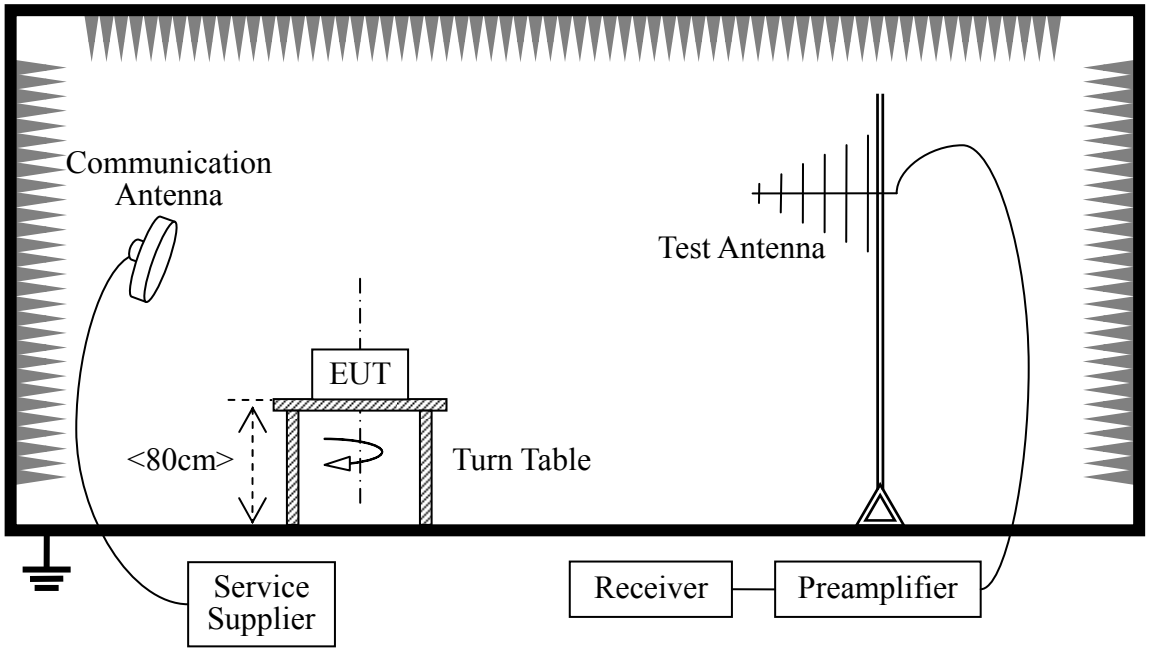
Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)	Limit(dBμV/m)	Detector
0.009-0.490	2400/F(kHz)	300	/	/
0.490-1.705	24000/F(kHz)	30	/	/
1.705-30	30	30	/	/
30 - 88	100	3	40	QP
88 - 216	150	3	43.5	QP
216 - 960	200	3	46	QP
960 - 1000	500	3	54	QP
Above 1000	500	3	54	AV

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)

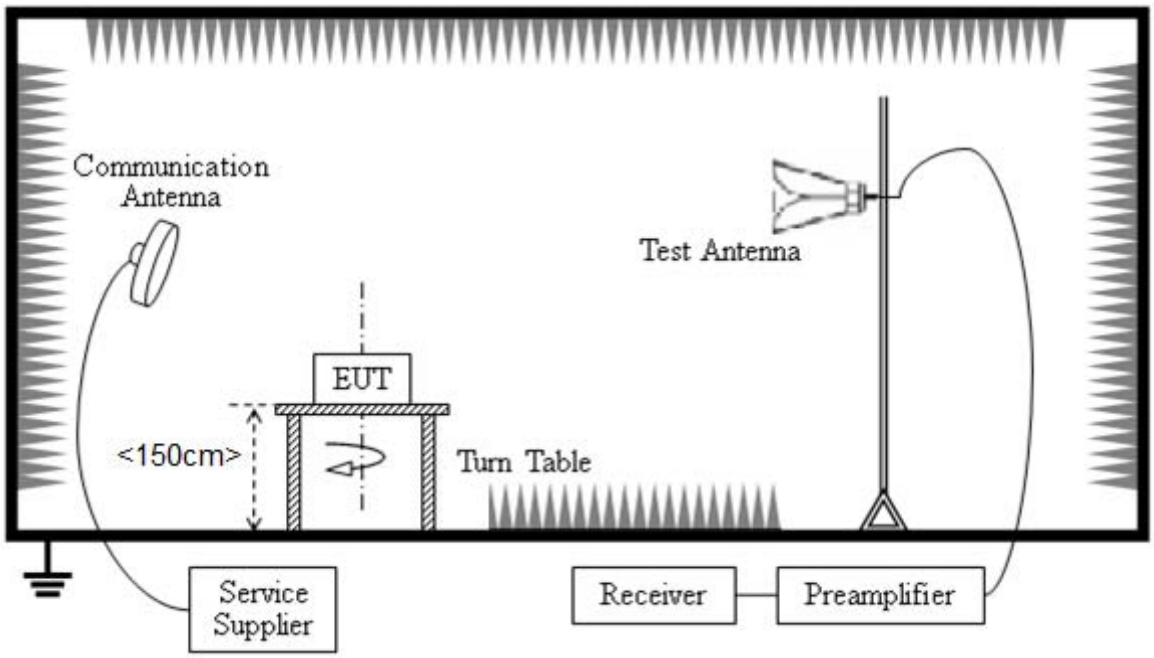
5.7.2 Test setup



Radiated Emissions below 30MHz



Radiated Emissions 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 setup and test methods were according to ANSI C63.10.

The Wi-Fi Module 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 Wi-Fi Module is activated and controlled by the Wi-Fi 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 beam width 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.

5.7.3 Test Result

A.Test Result for 9kHz ~ 30MHz

Frequency (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
--	--	10	--	See Note

Note:

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

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

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

B. Test Result for above 30MHz ~ 10th Harmonic

Frequency (MHz)	Level (dBuV)	Limit Line (dBuV)	Margin (dB)	Detector	Antenna Polarization	Result
54.07	26.48	40.00	13.52	QP	H	PASS
86.81	28.27	40.00	11.73	QP	H	PASS
188.41	35.81	43.50	7.69	QP	H	PASS
252.95	36.79	46.00	9.21	QP	H	PASS
499.43	38.40	46.00	7.60	QP	H	PASS
810.27	36.59	46.00	9.41	QP	H	PASS
1080.09	28.96	54.00	25.04	Average	H	PASS
1954.47	38.88	54.00	15.12	Average	H	PASS
2893.64	36.00	54.00	18.00	Average	H	PASS
3327.66	31.02	54.00	22.98	Average	H	PASS
4917.86	52.16	54.00	1.84	Average	H	PASS
5967.84	29.31	54.00	24.69	Average	H	PASS
30.21	32.27	40.00	7.73	QP	V	PASS
53.51	34.90	40.00	5.10	QP	V	PASS
163.18	35.75	43.50	7.75	QP	V	PASS
259.23	35.94	46.00	10.06	QP	V	PASS
501.18	37.54	46.00	8.46	QP	V	PASS
842.13	37.43	46.00	8.57	QP	V	PASS
1076.23	29.99	54.00	24.01	Average	V	PASS
1972.06	30.38	54.00	23.62	Average	V	PASS
2983.13	33.92	54.00	20.08	Average	V	PASS
3555.75	31.23	54.00	22.77	Average	V	PASS
4926.68	52.97	54.00	1.03	Average	V	PASS
5967.84	30.74	54.00	23.26	Average	V	PASS

Note:

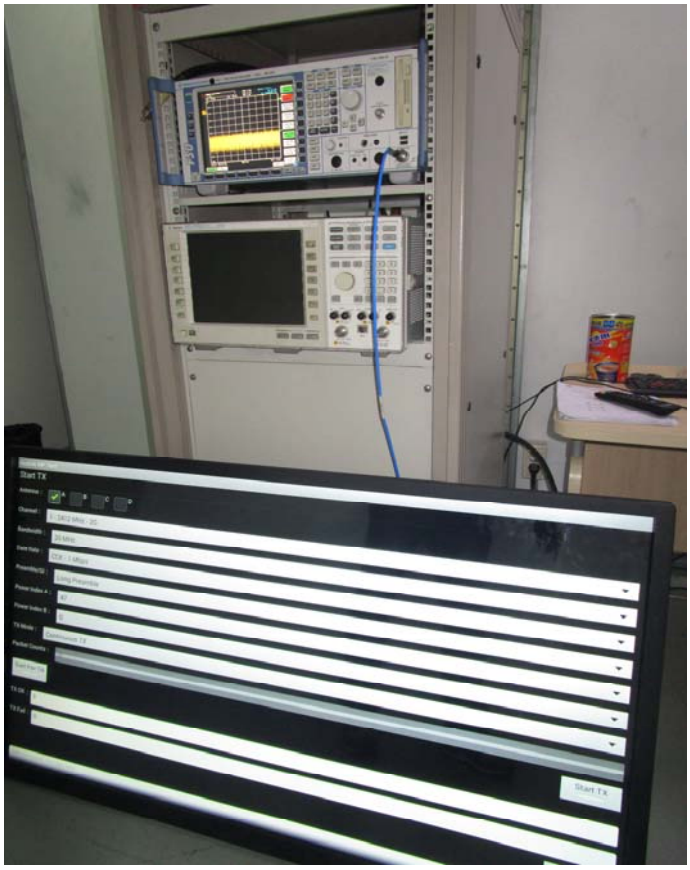
The worst case (802.11n Channel 1:2462MHz) is recorded in the report.

Annex A Photos of the EUT


HDMI
USB

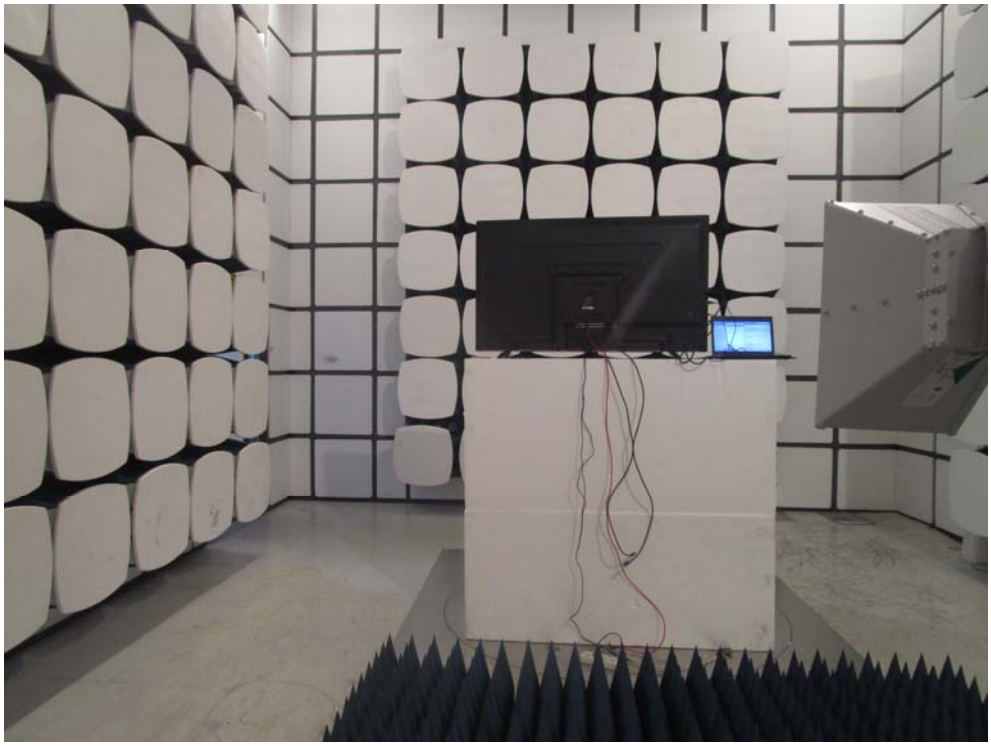
Annex B Photos of Setup

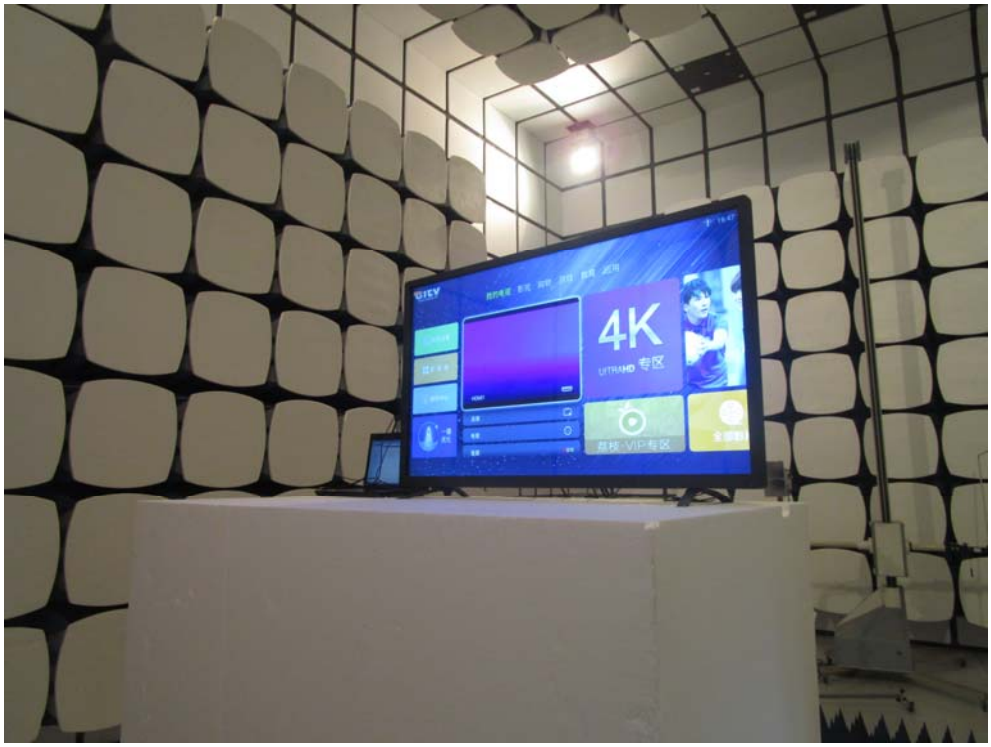
1. RF



2. Conducted Emission

3. Radiated Emission





** END OF REPORT **