Radio Test Report

FCC ID: PPQ-WN4615R

This report concerns (check one) : ☒ **Original Grant** ☐ **Class II Change**

Issued Date	:	Oct. 17, 2012
Project No.	:	1210095
Equipment	:	802.11b/g/n 2T2R Wireless Lan USB Module
Model Name	:	WN4615R
Applicant	:	LITE-ON TECHNOLOGY CORP.
Address	:	4F, 90, Chien 1 Road Chung Ho, New Taipei City, Taiwan R.O.C.

Tested by: Neutron Engineering Inc. EMC Laboratory
Date of Receipt: Oct. 09, 2012
Date of Test: Oct. 09, 2012 ~ Oct. 16, 2012

Testing Engineer : Gary Chou
(Gary Chou)

Technical Manager : Jeff Yang
(Jeff Yang)

Authorized Signatory : Andy Chiu
(Andy Chiu)

Neutron Engineering **Inc.**
B1, No. 37, Lane 365, YangGuang St.,
NeiHu District 114, Taipei, Taiwan.
TEL: +886-2-2657-3299
FAX: +886-2-2657-3331

Testing Laboratory
0659

Declaration

Neutron represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (**NML**) of **R.O.C**., or National Institute of Standards and Technology (**NIST**) of **U.S.A.**

Neutron's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **Neutron** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **Neutron** issued reports.

Neutron's reports must not be used by the client to claim product endorsement by the authorities or any agency of the Government.

This report is the confidential property of the client. As a mutual protection to the clients, the public and **Neutron-self**, extracts from the test report shall not be reproduced except in full with **Neutron**'s authorized written approval.

Neutron's laboratory quality assurance procedures are in compliance with the **ISO Guide 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

Table of Contents

Table of Contents

Table of Contents

REPORT ISSUED HISTORY

Revised Version No.	Description	Issued Date
-	Initial Issue.	Oct. 17, 2012

1 CERTIFICATION

Equipment	:	802.11b/g/n 2T2R Wireless Lan USB Module
Brand Name	:	LITEON
Model Name	:	WN4615R
Applicant	:	LITE-ON TECHNOLOGY CORP.
Date of Test	:	Oct. 09, 2012 ~ Oct. 16, 2012
Standards	:	FCC Part 15, Subpart C: 2010 ANSI C63.4: 2009

The above equipment has been tested and found compliance with the requirement of the relative standards by Neutron Engineering Inc. EMC Laboratory.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. NEI-FCCP-1-1210095) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of NVLAP and TAF according to the ISO-17025 quality assessment standard and technical standard(s).

2. SUMMARY OF TEST RESULTS

Standard Clause	Test Item	Result
15.207	Conducted Emission	**PASS**
15.247 (c)	Antenna conducted Spurious Emission	**PASS**
15.247 (a)(2)	6dB Bandwidth	**PASS**
15.247 (b)	Maximum Peak Conducted Output Power	**PASS**
15.247 (c)	Radiated Spurious Emission	**PASS**
15.247 (d)(e)	Power Spectral Density	**PASS**
15.205	Restricted Bands	**PASS**
15.203	Antenna Requirement	**PASS**
1.1307 1.1310 2.1091 2.1093	RF Exposure Compliance	**PASS**

NOTE:

1. **N/A**: denotes test is not applicable in this Test Report
2. Portable device; SAR report is required.

2.1 TEST FACILITY

The test facilities used to collect the test data in this report:

Conducted emission Test:

C02: (VCCI RN: C-3477; FCC RN: 614388; FCC DN: TW1054)
1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

Radiated emission Test (Below 1 GHz):

CB08: (FCC RN: 614388; FCC DN: TW1054; IC Assigned Code: 4428C-1)
1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

Radiated emission Test (Above 1 GHz):

CB08: (VCCI RN: G-91; FCC RN: 614388; FCC DN: TW1054; IC Assigned Code: 4428C-1)
1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

2.2 MEASUREMENT UNCERTAINTY

The measurement uncertainty is not specified by FCC rules and for reference only.

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

The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2.

A. Conducted emission test:

Test Site	Measurement Frequency Range	U，(dB)	NOTE
C02	150 kHz ~ 30 MHz	2.59	

B. Radiated emission test:

Test Site	Item	Measurement Frequency Range		Uncertainty	NOTE
CB08	Radiated emission at 3m	Horizontal Polarization	30 - 200MHz	3.35 dB	
			200 - 1000MHz	3.11 dB	
			1 - 18GHz	3.97 dB	
			18 - 40GHz	4.01 dB	
		Vertical Polarization	30 - 200MHz	3.22 dB	
			200 - 1000MHz	3.24 dB	
			1 - 18GHz	4.05 dB	
			18 - 40GHz	4.04 dB	

Our calculated Measurement Instrumentation Uncertainty is shown in the tables above. These are our U_{lab} values in CISPR 16-4-2 terminology.

Since Table 1 of CISPR 16-4-2 has values of measurement instrumentation uncertainty, called U_{CISPR}, as follows:

Conducted Disturbance (mains port) – 150 kHz – 30 MHz : 3.6 dB

Radiated Disturbance (electric field strength on an open area test site or alternative test site) – 30 MHz – 1000 MHz : 5.2 dB

It can be seen that our U_{lab} values are smaller than U_{CISPR}.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

<table>
<tr><td>Equipment</td><td>802.11b/g/n 2T2R Wireless Lan USB Module</td></tr>
<tr><td>Brand Name</td><td>LITEON</td></tr>
<tr><td>Model Name</td><td>WN4615R</td></tr>
<tr><td>OEM Brand/Model Name</td><td>N/A</td></tr>
<tr><td>Model Difference</td><td>N/A</td></tr>
<tr><td>Product Description</td><td>The EUT is a 802.11b/g/n 2T2R Wireless Lan USB Module.
<table>
<tr><td>Operation Frequency</td><td>2412 MHz ~ 2462 MHz</td></tr>
<tr><td>Modulation Type</td><td>IEEE 802.11b: CCK, DQPSK, DBPSK
IEEE 802.11g: OFDM
IEEE 802.11n: OFDM</td></tr>
<tr><td>Bit Rate of Transmitter</td><td>IEEE 802.11b: 1, 2, 5.5 and 11 Mbps
IEEE 802.11g: 6, 9, 12, 18, 24, 36, 48 and 54 Mbps
IEEE 802.11n: up to 300Mbps</td></tr>
<tr><td>Number Of Channel</td><td>Please refer to the Note 2.</td></tr>
<tr><td>Antenna Designation</td><td>Please refer to the Note 3.</td></tr>
<tr><td>Antenna Gain(Peak)</td><td>Please refer to the Note 3.</td></tr>
<tr><td>Maximum Peak Conducted Output Power:</td><td>IEEE 802.11b: 17.95 dBm
IEEE 802.11g: 21.02 dBm
IEEE 802.11n (20 MHz): 24.44 dBm
IEEE 802.11n (40 MHz): 22.83 dBm</td></tr>
</table>
Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.</td></tr>
<tr><td>Power Source</td><td>Supplied from System.</td></tr>
<tr><td>Power Rating</td><td>Please refer to the User's Manual</td></tr>
<tr><td>Connecting I/O Port(s)</td><td>Please refer to the User's Manual</td></tr>
<tr><td>Products Covered</td><td>N/A</td></tr>
<tr><td>EUT Modification(s)</td><td>N/A</td></tr>
</table>

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. Channel List:

IEEE 802.11b/g/n (20MHz)					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	05	2432	09	2452
02	2417	06	2437	10	2457
03	2422	07	2442	11	2462
04	2427	08	2447		

IEEE 802.11n (40MHz)					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
03	2422	06	2437	09	2452
04	2427	07	2442		
05	2432	08	2447		

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	MAG. LAYERS	MSA-2203-2G4C1-A1	PIFA	N/A	4.11
2	MAG. LAYERS	MSA-3410-25GC4-A3-B330IP	PIFA	I-PEX	5.31
3	MAG. LAYERS	MSA-3410-25GC4-A3-W150IP	PIFA	I-PEX	2.3
4	MAG. LAYERS	MSA-3410-25GC4-A3-BL170I	PIFA	I-PEX	2.3
5	MAG. LAYERS	MSA-3410-25GC4-A3-R290IP	PIFA	I-PEX	4.12
6	MAG. LAYERS	MSA-3410-25GC4-A3-B320IP	PIFA	I-PEX	4.48

4. The EUT incorporates MIMO function. Physically, the EUT provides two completed transmitters and two receivers (2T2R).

Modulated type	TX Function
IEEE 802.11b	1 TX
IEEE 802.11g	1 TX
IEEE 802.11n (20MHz)	2 TX
IEEE 802.11n (40MHz)	2 TX

3.2 DESCRIPTION OF TEST MODES

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

Test Items	IEEE	Mode	Data Rate	Channel
Conducted Emission	802.11b	DSSS	1 Mbps	06
Antenna conducted Spurious Emission	802.11b	DSSS	1 Mbps	01/06/11
	802.11g	OFDM	6 Mbps	01/06/11
	802.11n (20 MHz)	BPSK	MCS8	01/06/11
	802.11n (40 MHz)	BPSK	MCS8	03/06/09
6 dB Bandwidth	802.11b	DSSS	1 Mbps	01/06/11
	802.11g	OFDM	6 Mbps	01/06/11
	802.11n (20 MHz)	BPSK	MCS8	01/06/11
	802.11n (40 MHz)	BPSK	MCS8	03/06/09
Maximum Peak Conducted Output Power	802.11b	DSSS	1 Mbps	01/06/11
	802.11g	OFDM	6 Mbps	01/06/11
	802.11n (20 MHz)	BPSK	MCS8	01/06/11
	802.11n (40 MHz)	BPSK	MCS8	03/06/09
Radiated Spurious Emission (30 MHz to 1 GHz)	802.11b	DSSS	1 Mbps	06
Radiated Spurious Emission (above 1 GHz)	802.11b	DSSS	1 Mbps	01/06/11
	802.11g	OFDM	6 Mbps	01/06/11
	802.11n (20 MHz)	BPSK	MCS8	01/06/11
	802.11n (40 MHz)	BPSK	MCS8	03/06/09
Restricted Bands	802.11b	DSSS	1 Mbps	01/06/11
	802.11g	OFDM	6 Mbps	01/06/11
	802.11n (20 MHz)	BPSK	MCS8	01/06/11
	802.11n (40 MHz)	BPSK	MCS8	03/06/09
Antenna Requirement	---		---	---
RF Exposure Compliance	---		---	---

NOTE: The measurements are performed at the highest, middle, lowest available channels.

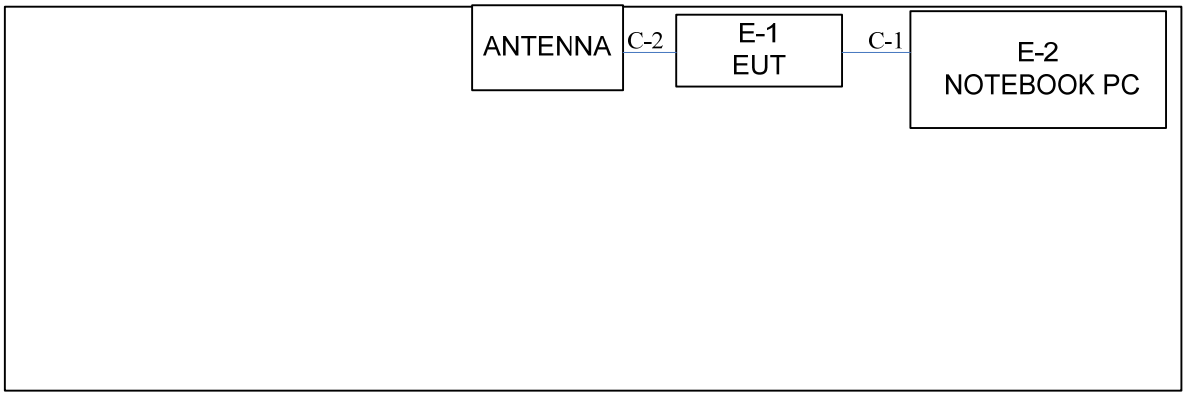
3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

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

IEEE	802.11b			802.11g		
Test software Version	RT5x7x V1.0.6.0			RT5x7x V1.0.6.0		
Frequency	2412 MHz	2437 MHz	2462 MHz	2412 MHz	2437 MHz	2462 MHz
Parameter	14	16	15	10	17	11

IEEE	802.11n (20 MHz)			802.11n (20 MHz)		
Test software Version	RT5x7x V1.0.6.0			RT5x7x V1.0.6.0		
Frequency	2412 MHz	2437 MHz	2462 MHz	2422 MHz	2437 MHz	2452 MHz
Parameter	14/14	13/13	16/16	14/15	10/0F	1D/1D

3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
E-1	802.11b/g/n 2T2R Wireless Lan USB Module	LITEON	WN4615R	PPQ-WN4615R	N/A	EUT
E-2	Notebook PC	ACER	ZH2	DOC	LXTCY0503560BDB52500	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	YES	N/A	1.0M	USB CABLE
C-2	YES	N/A	0.2M	ANTENNA CABLE

NOTE: The support equipment was authorized by Declaration of Conformity (DOC).

4 CONDUCTED EMISSION

4.1 LIMIT

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 - 5.0	73.00	60.00	56.00	46.00
5.0 - 30.0	73.00	60.00	60.00	50.00

NOTE:

1. The tighter limit applies at the band edges.
2. The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.
3. The test result calculated as following:
   Measurement Value = Reading Level + Correct Factor
   Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use)
   Margin Level = Measurement Value – Limit Value

4.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	TWO-LINE V-NETWORK	R&S	ENV216	101050	Apr. 24, 2013
2	LISN	EMCO	3816/2	00066528	Mar. 26, 2013
3	Test Cable	TIMES	CFD300-NL	130	Jun. 14, 2013
4	EMI Test Receiver	Agilent	N9038A	MY51210215	Jan. 26, 2013

NOTE: **N/A**: denotes No Model Name, No Serial No. or No Calibration specified.

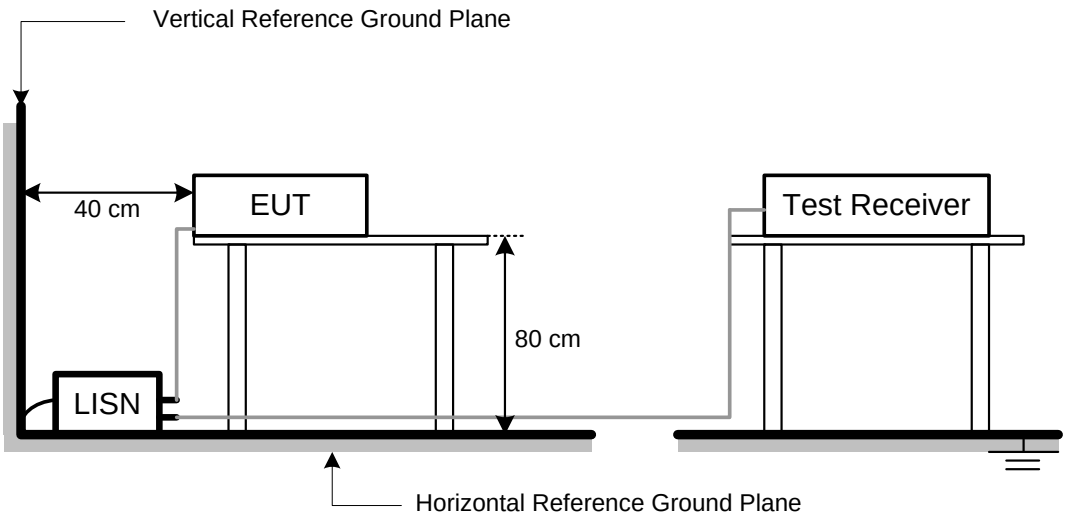
4.3 TEST PROCEDURES

a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

NOTE:

a. Reading in which marked as Peak, QP or AVG means measurements by using are Quasi-Peak or Average Mode with Detector BW=9 kHz (6 dB Bandwidth).
b. All readings are Peak Mode value unless otherwise stated QP or AVG in column of Note. If the Peak or QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only Peak or QP Mode was measured, but AVG Mode didn‘t perform.

4.4 TEST SETUP LAYOUT



4.5 DEVIATION FROM TEST STANDARD

No deviation

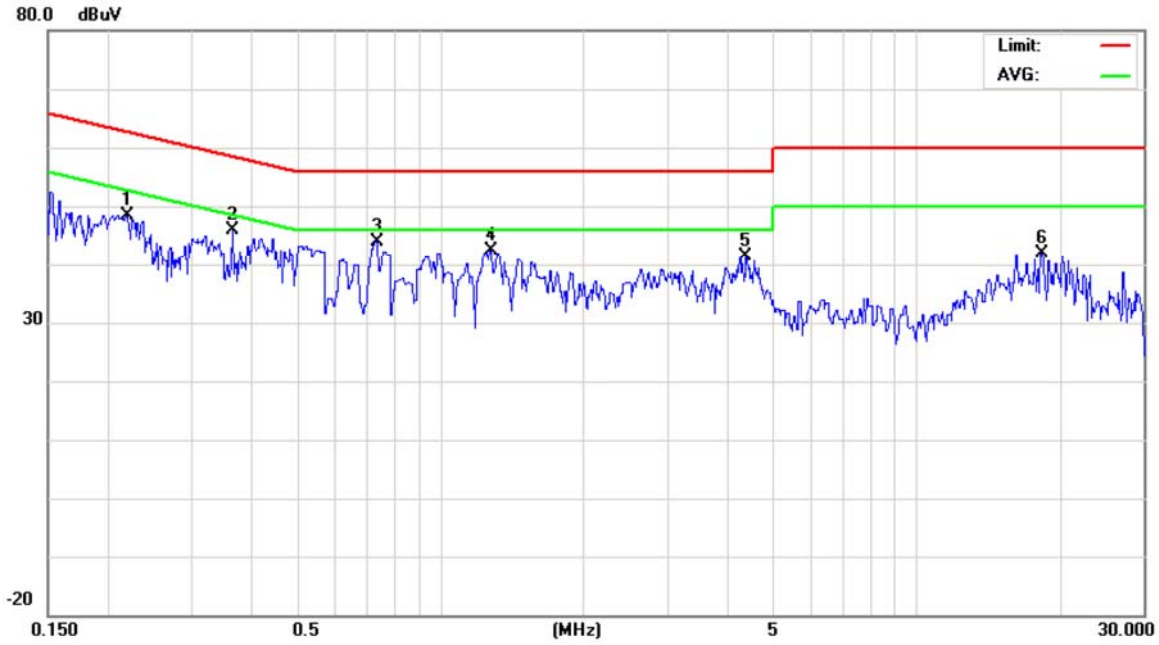
4.6 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

4.7 TEST RESULTS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2437 MHz		

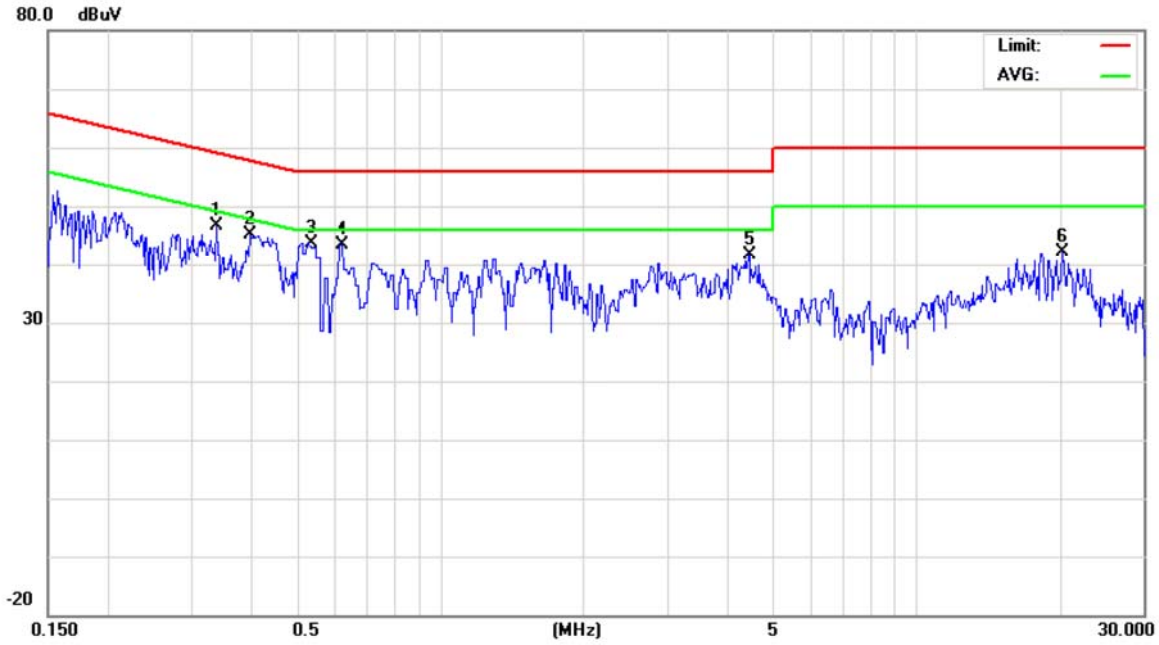
Phase: Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2191	38.67	9.75	48.42	62.85	-14.43	peak	
2		0.3661	36.12	9.72	45.84	58.59	-12.75	peak	
3	*	0.7362	34.15	9.71	43.86	56.00	-12.14	peak	
4		1.2762	32.65	9.70	42.35	56.00	-13.65	peak	
5		4.3812	31.52	9.78	41.30	56.00	-14.70	peak	
6		18.2500	32.02	9.86	41.88	60.00	-18.12	peak	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2437 MHz		

Phase: Neutral



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.3390	36.86	9.72	46.58	59.23	-12.65	peak	
2		0.3994	35.34	9.71	45.05	57.87	-12.82	peak	
3	*	0.5338	33.83	9.69	43.52	56.00	-12.48	peak	
4		0.6238	33.72	9.69	43.41	56.00	-12.59	peak	
5		4.4375	31.82	9.76	41.58	56.00	-14.42	peak	
6		20.2500	32.19	9.89	42.08	60.00	-17.92	peak	

5 ANTENNA CONDUCTED SPURIOUS EMISSION

5.1 LIMIT

Test Item	Frequency Range (MHz)	Limit
Antenna conducted Spurious Emission	30-25000	20 dB less than the peak value of fundamental frequency

5.2 MEASUREMENT INSTRUMENTS LIST

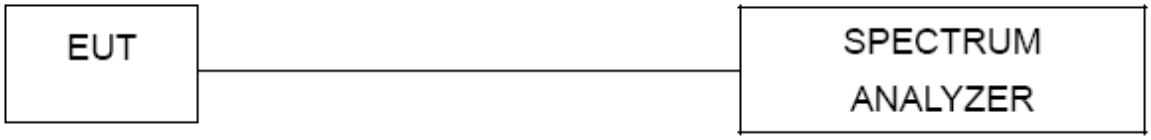
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Oct. 01, 2013

NOTE: **N/A**: denotes No Model Name, No Serial No. or No Calibration specified.

5.3 TEST PROCEDURES

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting: RBW= 100KHz, VBW=100KHz, Sweep time = Auto.

5.4 TEST SETUP LAYOUT



5.5 DEVIATION FROM TEST STANDARD

No deviation

5.6 EUT OPERATING CONDITIONS

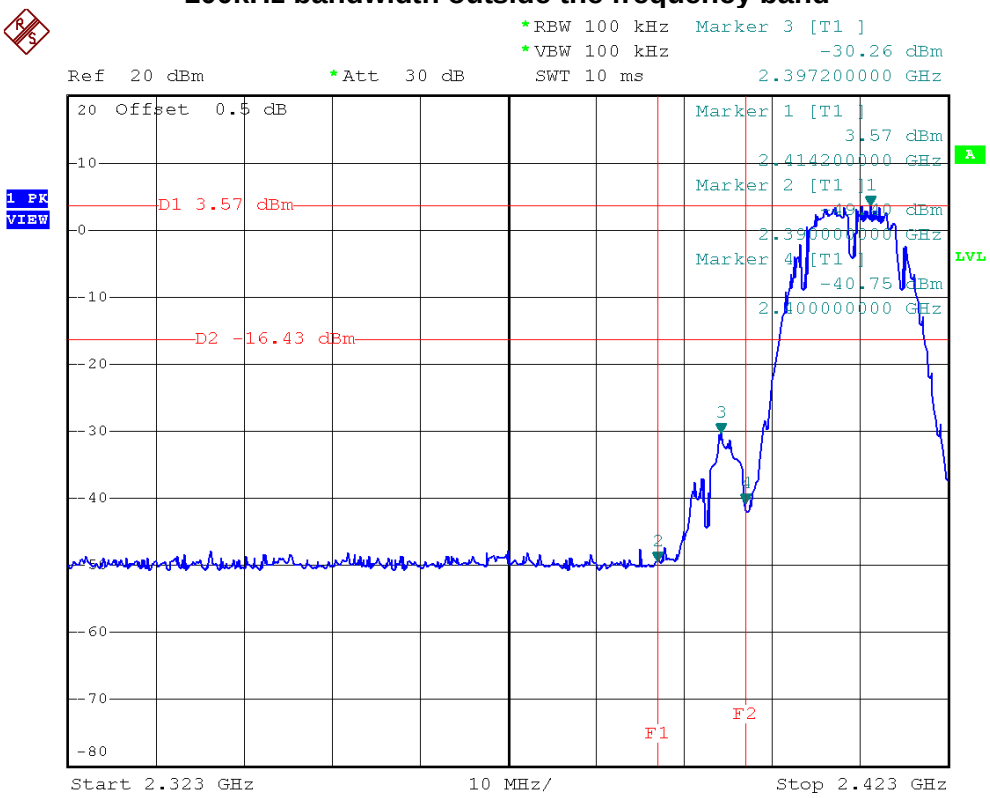
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

5.7 TEST RESULTS

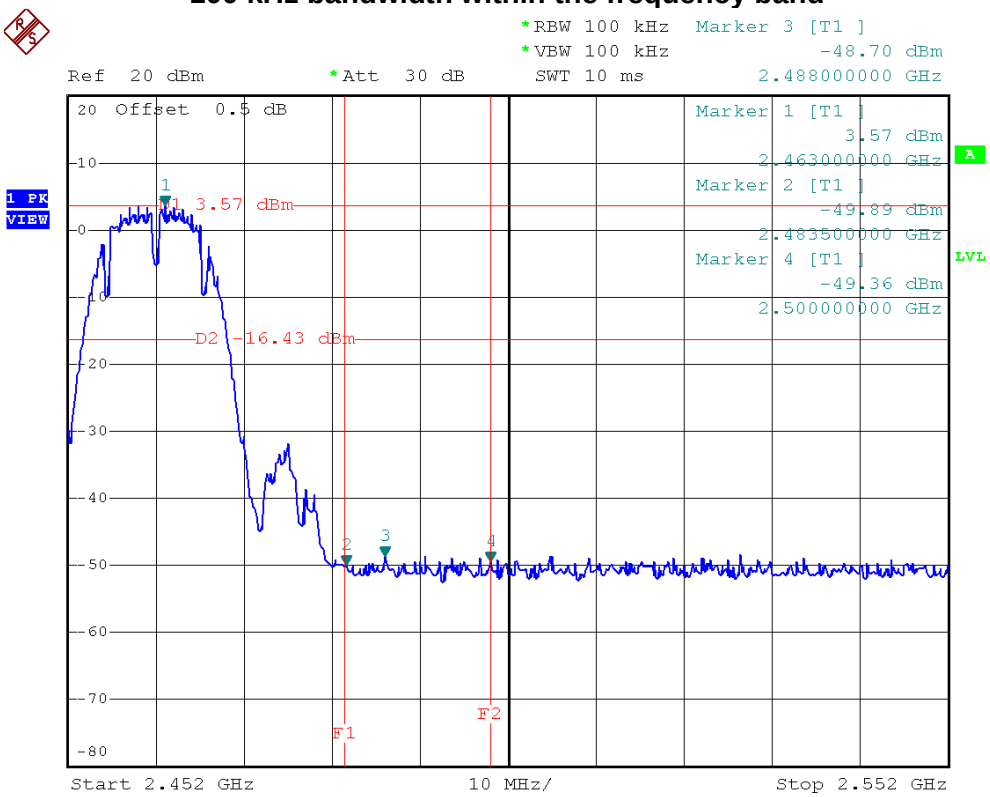
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b		

Channel of Worst Data			
The max. radio frequency power in any 100kHz bandwidth outside the frequency band		The max. radio frequency power in any 100 kHz bandwidth within the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
2397.20	-30.26	2488.00	-48.70
Result			
In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.			

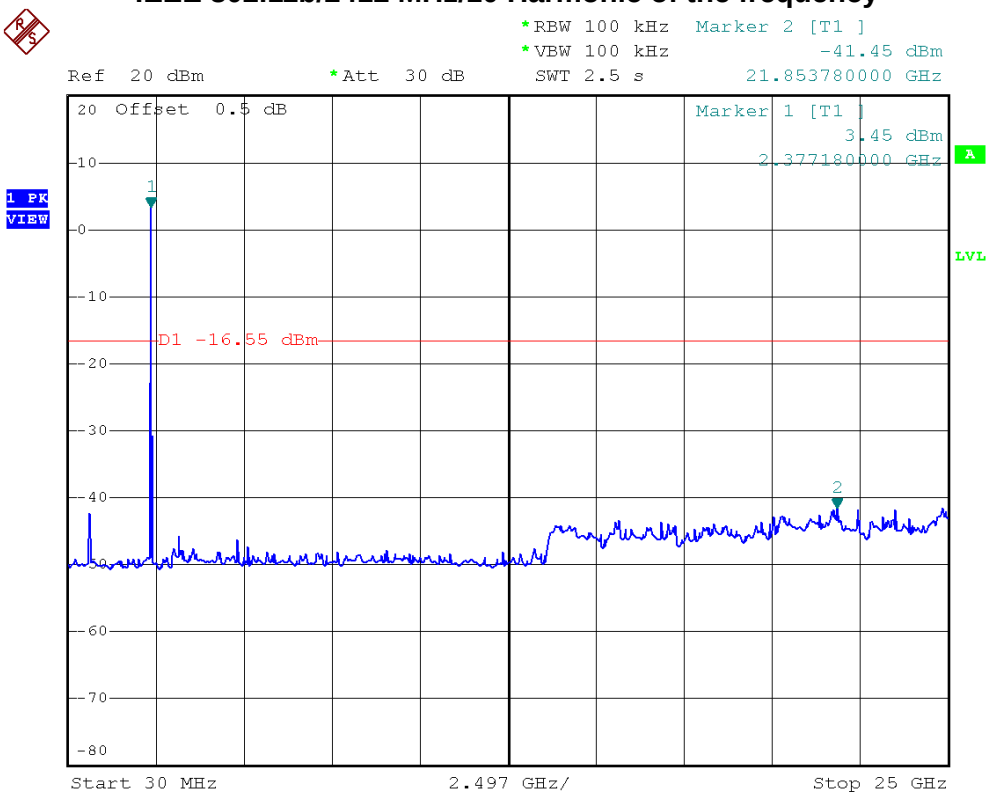
IEEE 802.11b/The max. radio frequency power in any 100kHz bandwidth outside the frequency band



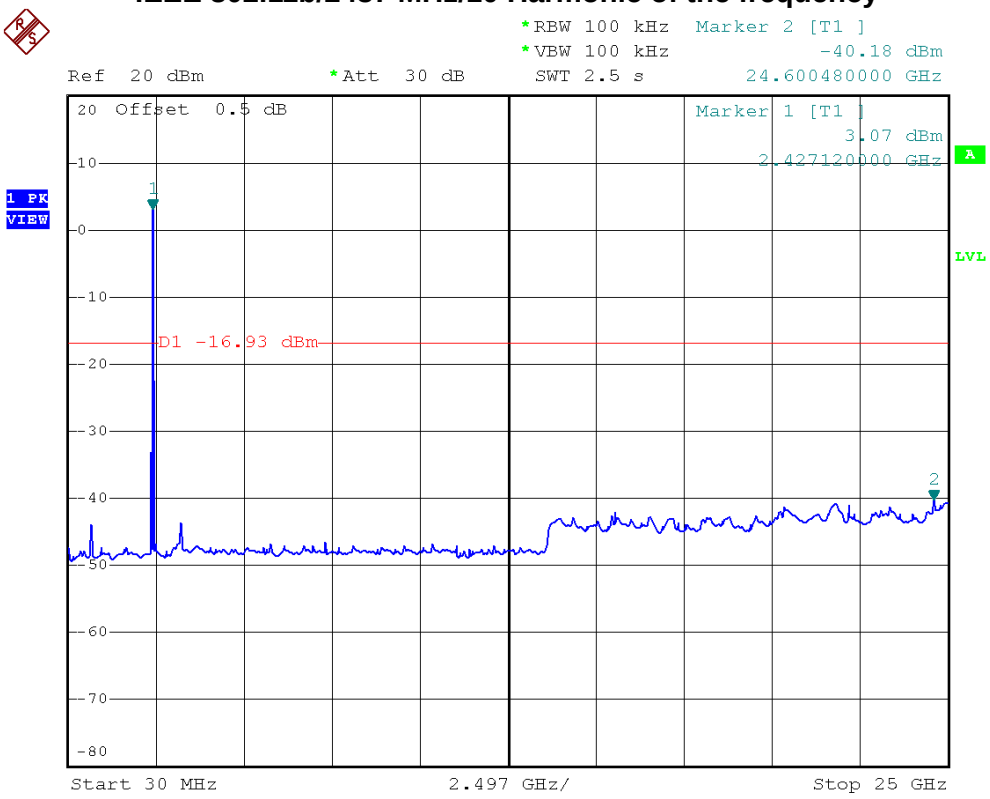
IEEE 802.11b/The max. radio frequency power in any 100 kHz bandwidth within the frequency band



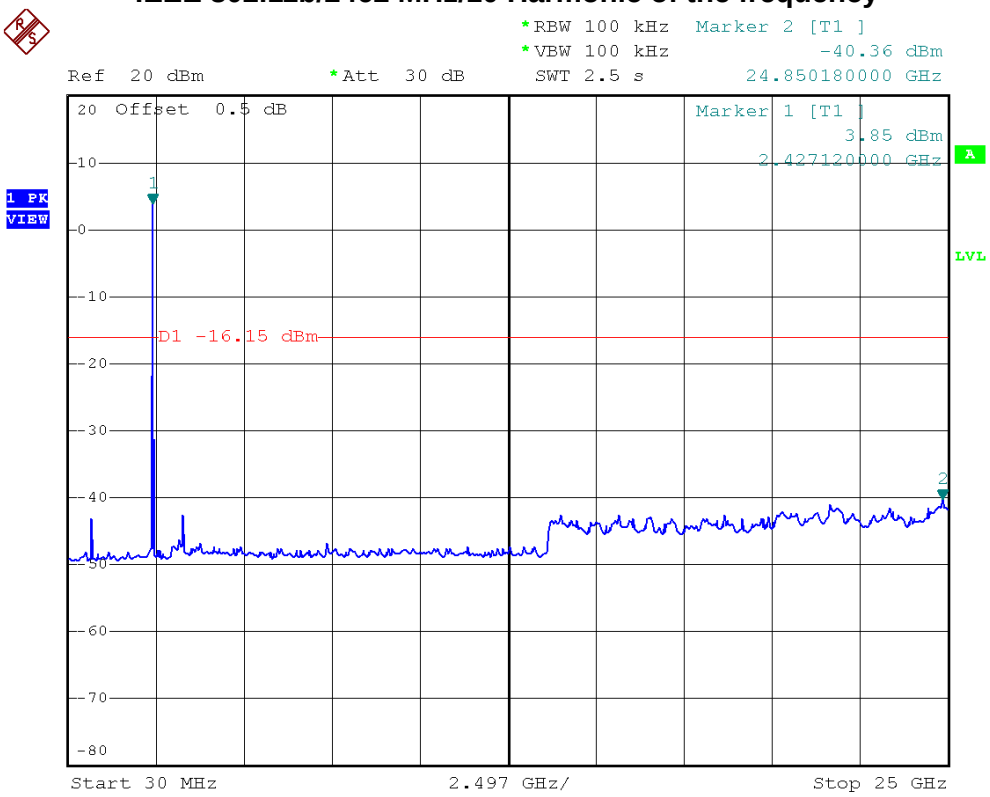
IEEE 802.11b/2412 MHz/10 Harmonic of the frequency



IEEE 802.11b/2437 MHz/10 Harmonic of the frequency



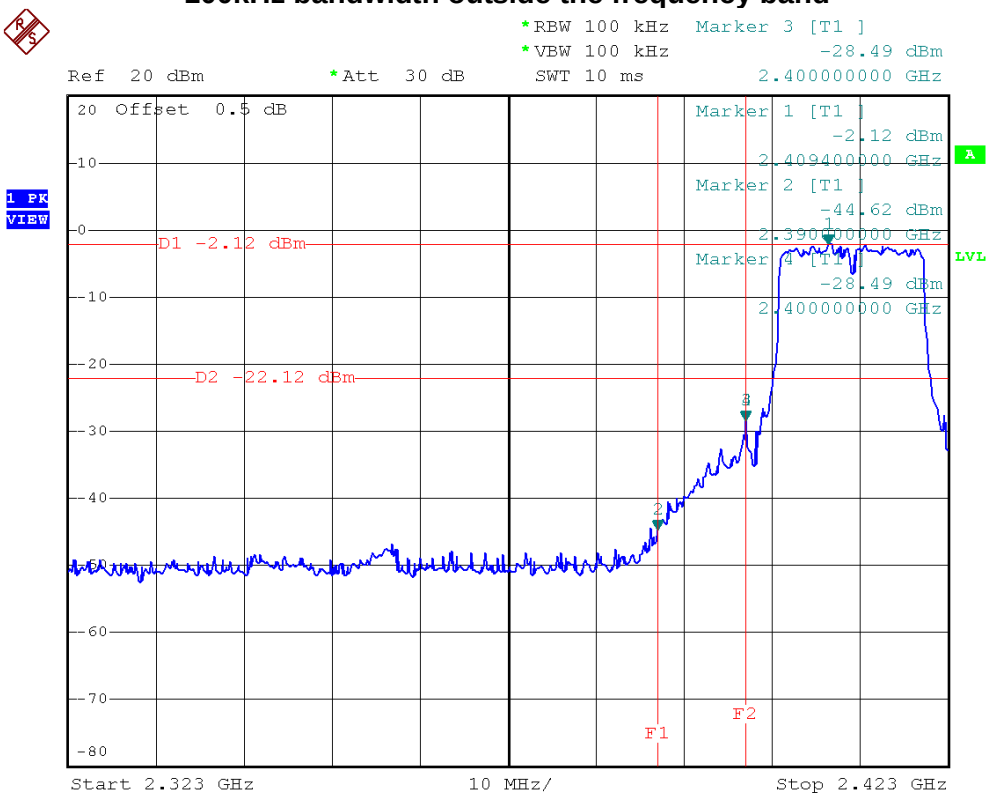
IEEE 802.11b/2462 MHz/10 Harmonic of the frequency



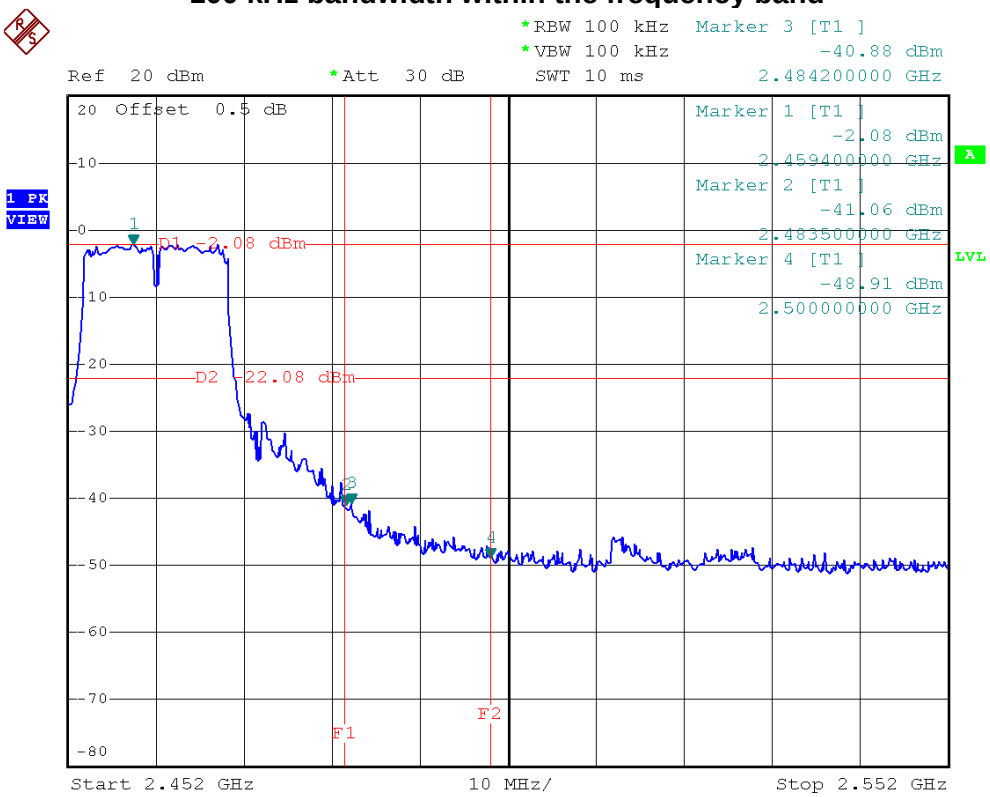
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g		

Channel of Worst Data			
The max. radio frequency power in any 100kHz bandwidth outside the frequency band		The max. radio frequency power in any 100 kHz bandwidth within the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
2400.00	-28.49	2484.20	-40.88
Result			
In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.			

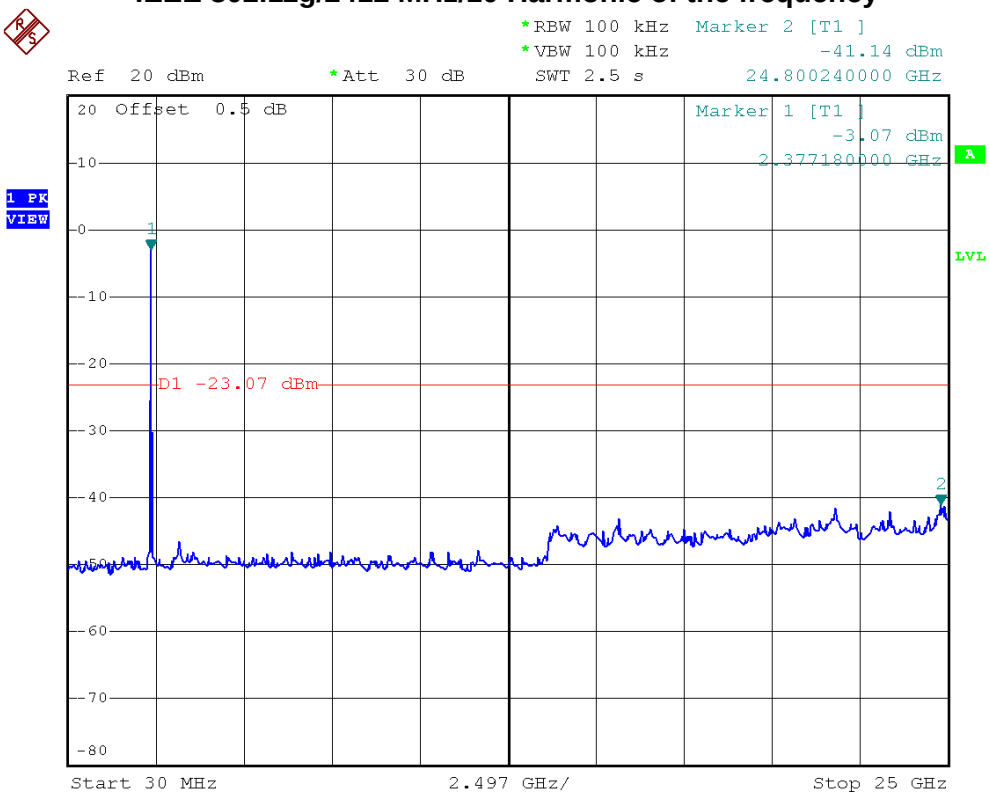
IEEE 802.11g/The max. radio frequency power in any 100kHz bandwidth outside the frequency band



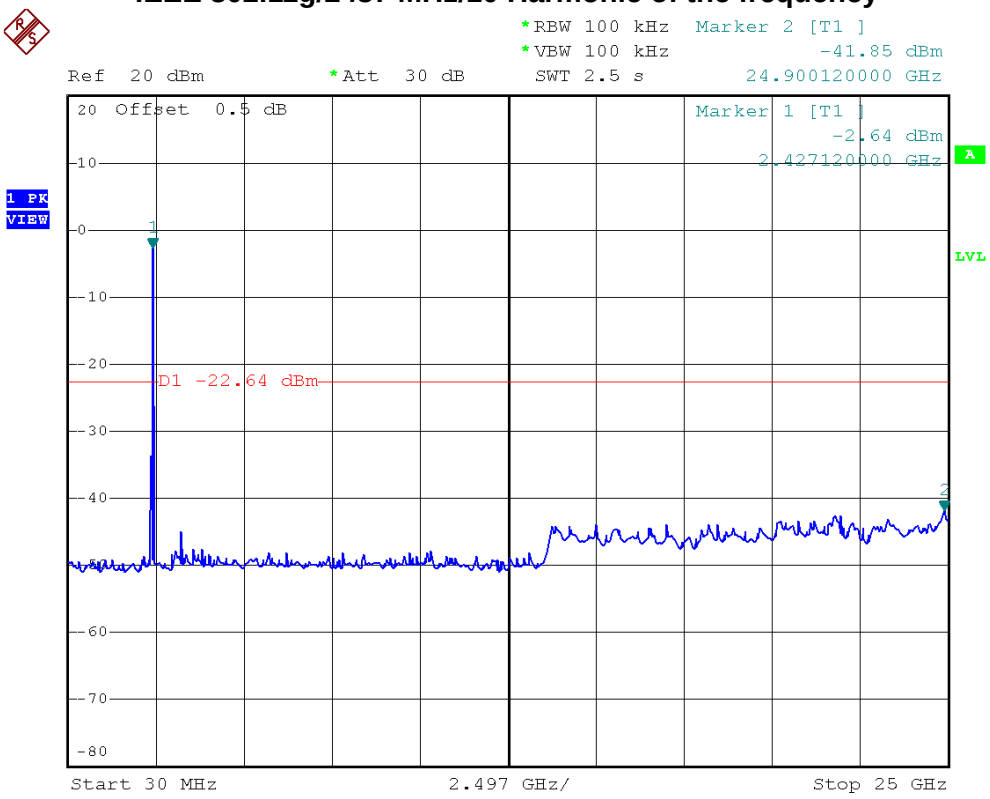
IEEE 802.11g/The max. radio frequency power in any 100 kHz bandwidth within the frequency band



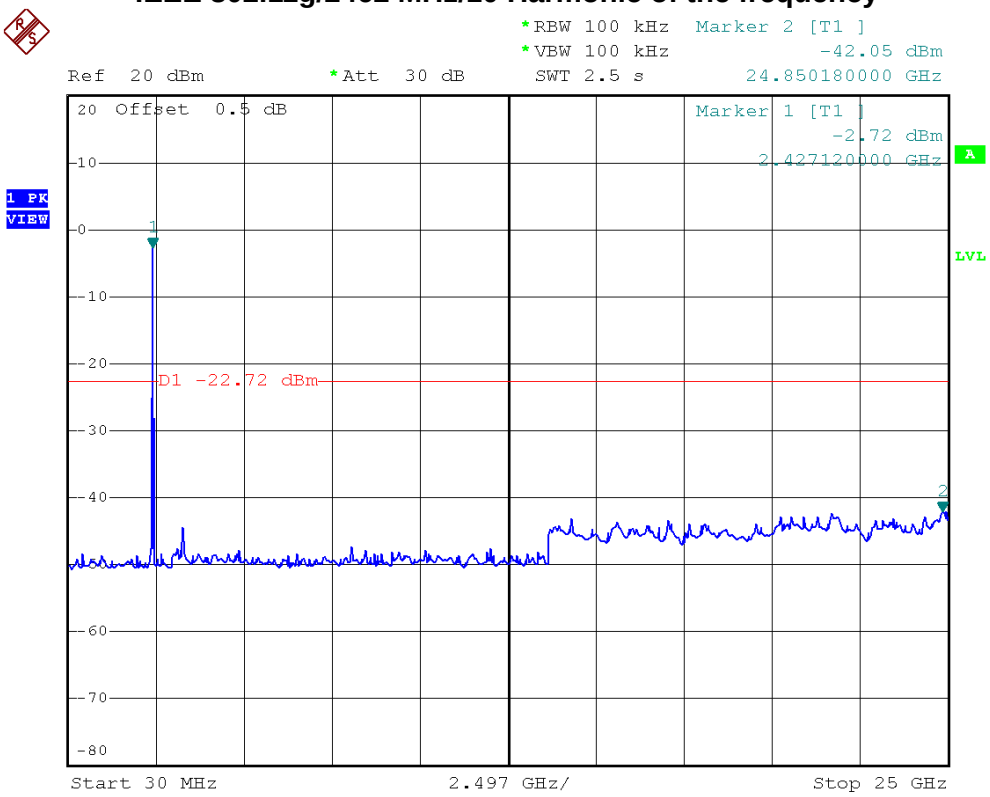
IEEE 802.11g/2412 MHz/10 Harmonic of the frequency



IEEE 802.11g/2437 MHz/10 Harmonic of the frequency



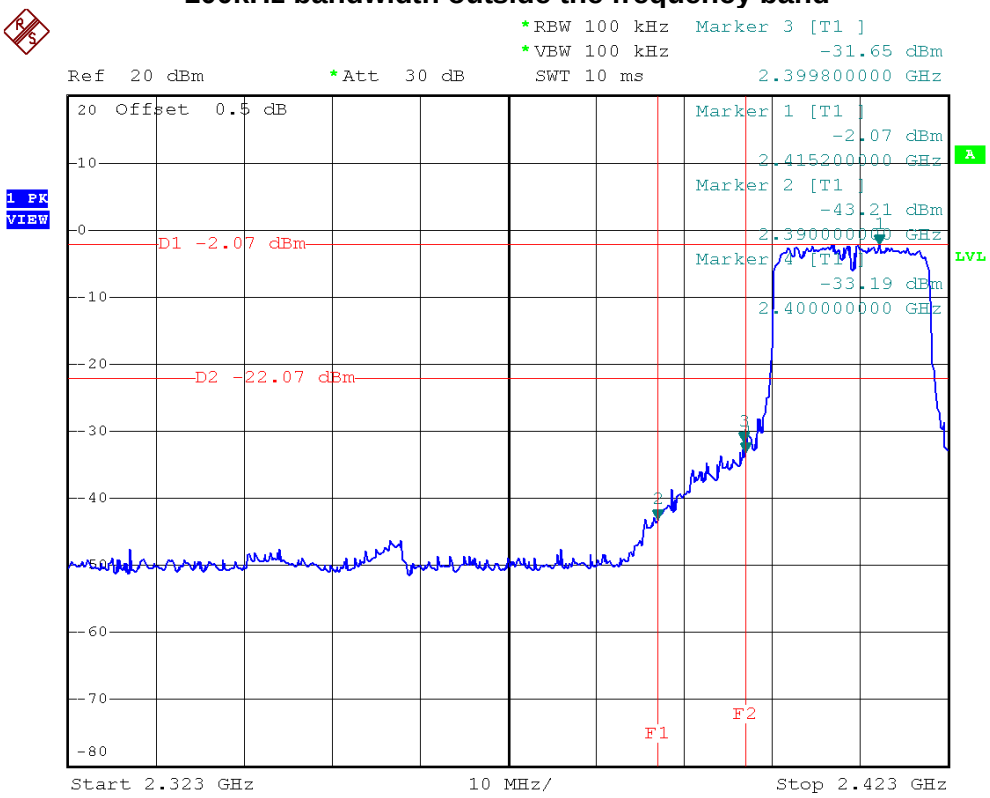
IEEE 802.11g/2462 MHz/10 Harmonic of the frequency



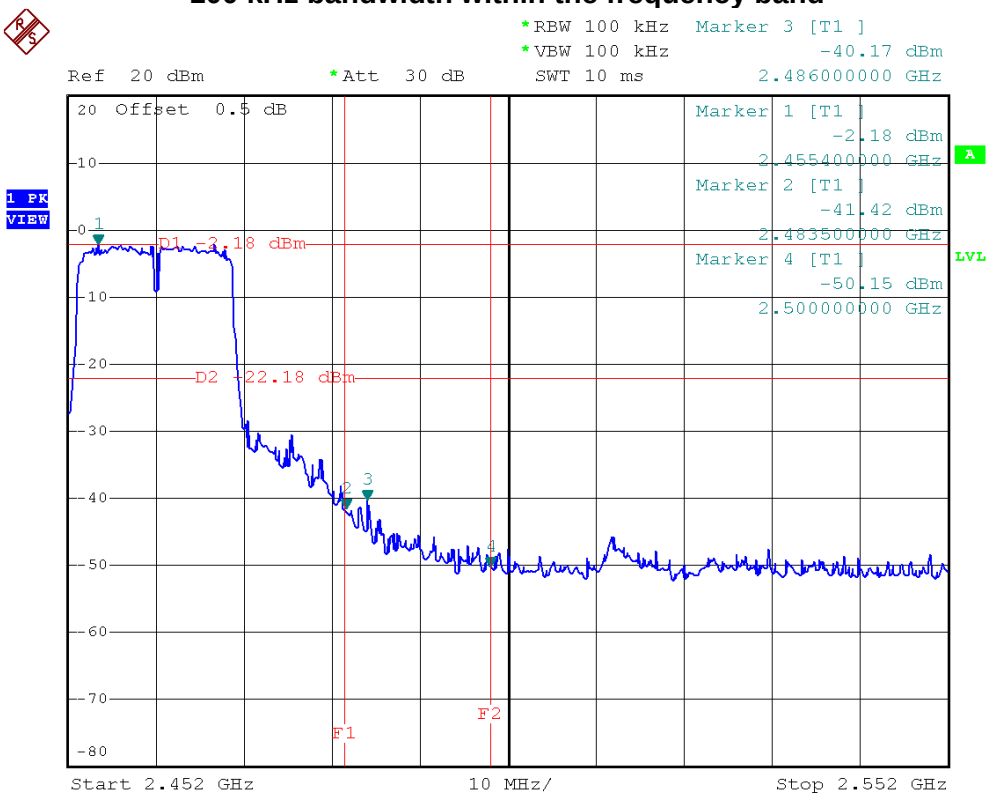
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/ANT.1		

Channel of Worst Data			
The max. radio frequency power in any 100kHz bandwidth outside the frequency band		The max. radio frequency power in any 100 kHz bandwidth within the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
2399.80	-31.65	2486.00	-40.17
Result			
In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.			

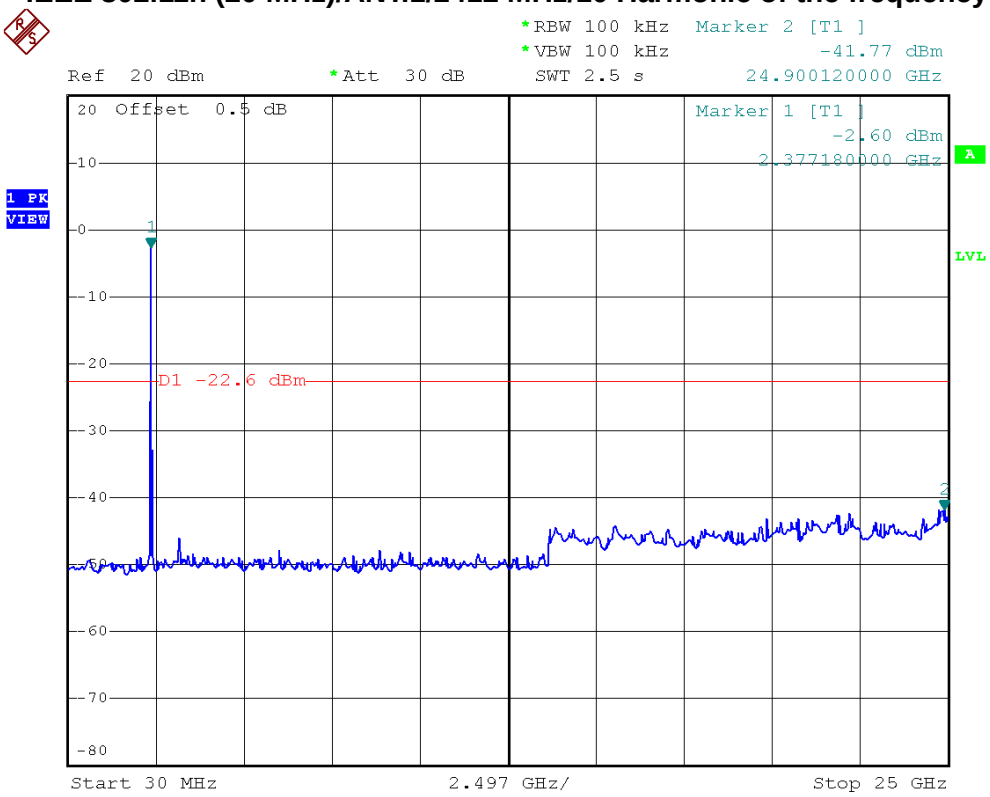
IEEE 802.11n (20 MHz)/ANT.1/The max. radio frequency power in any 100kHz bandwidth outside the frequency band



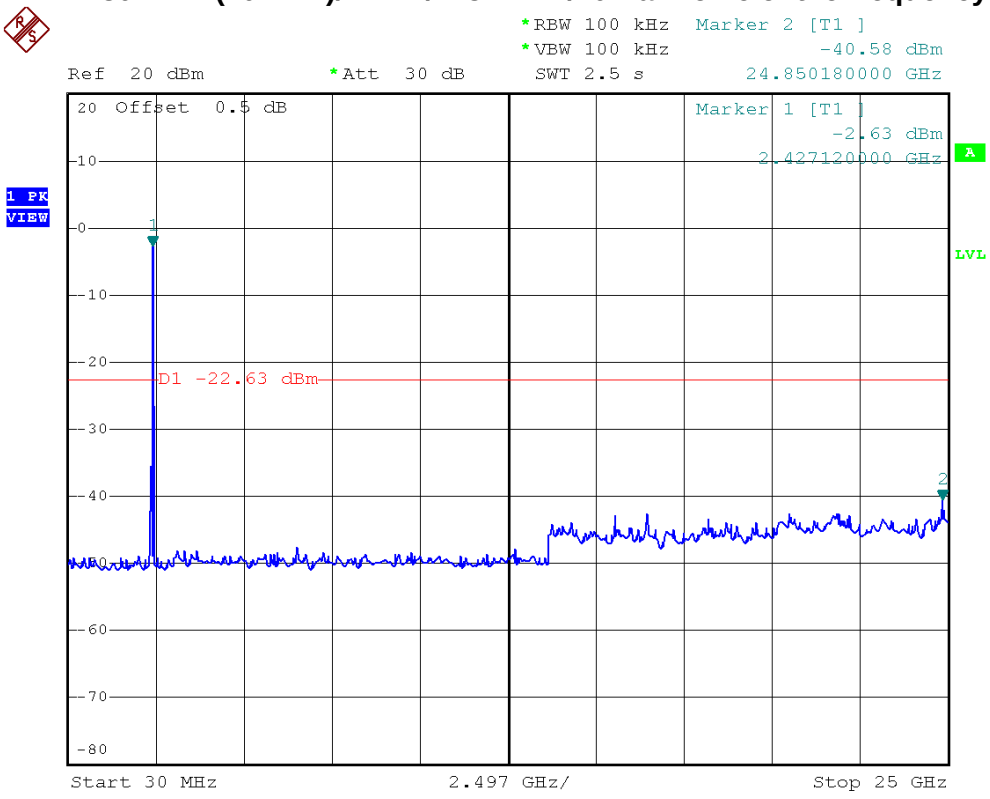
IEEE 802.11n (20 MHz)/ANT.1/The max. radio frequency power in any 100 kHz bandwidth within the frequency band



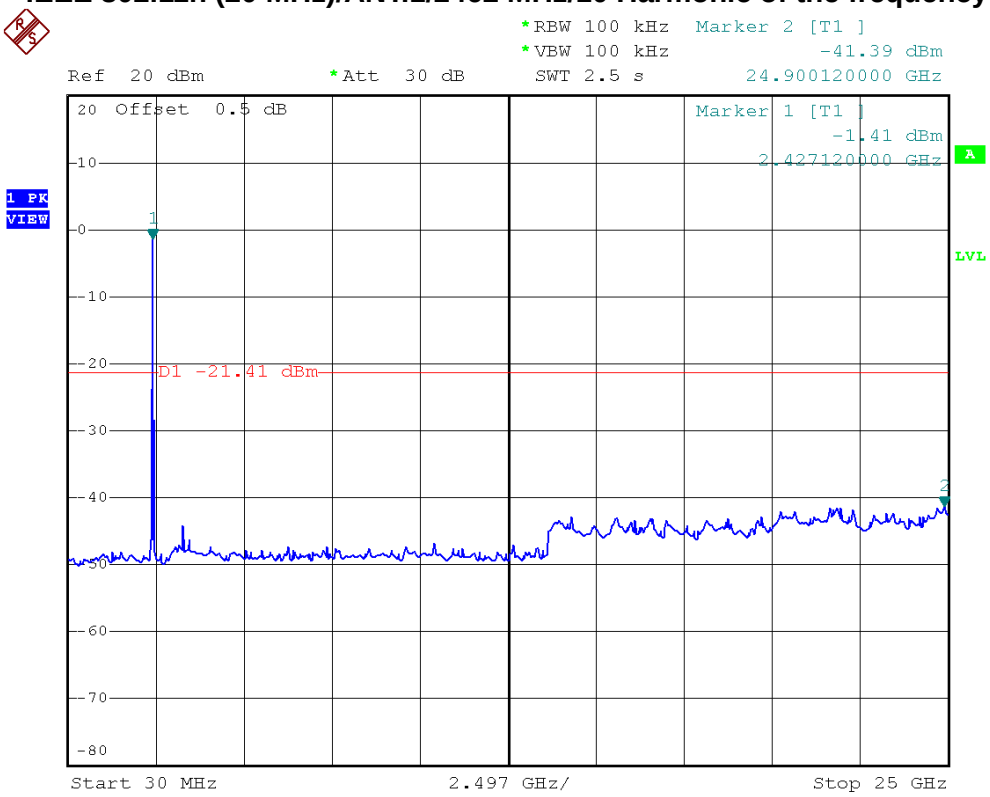
IEEE 802.11n (20 MHz)/ANT.1/2412 MHz/10 Harmonic of the frequency



IEEE 802.11n (20 MHz)/ANT.1/2437 MHz/10 Harmonic of the frequency



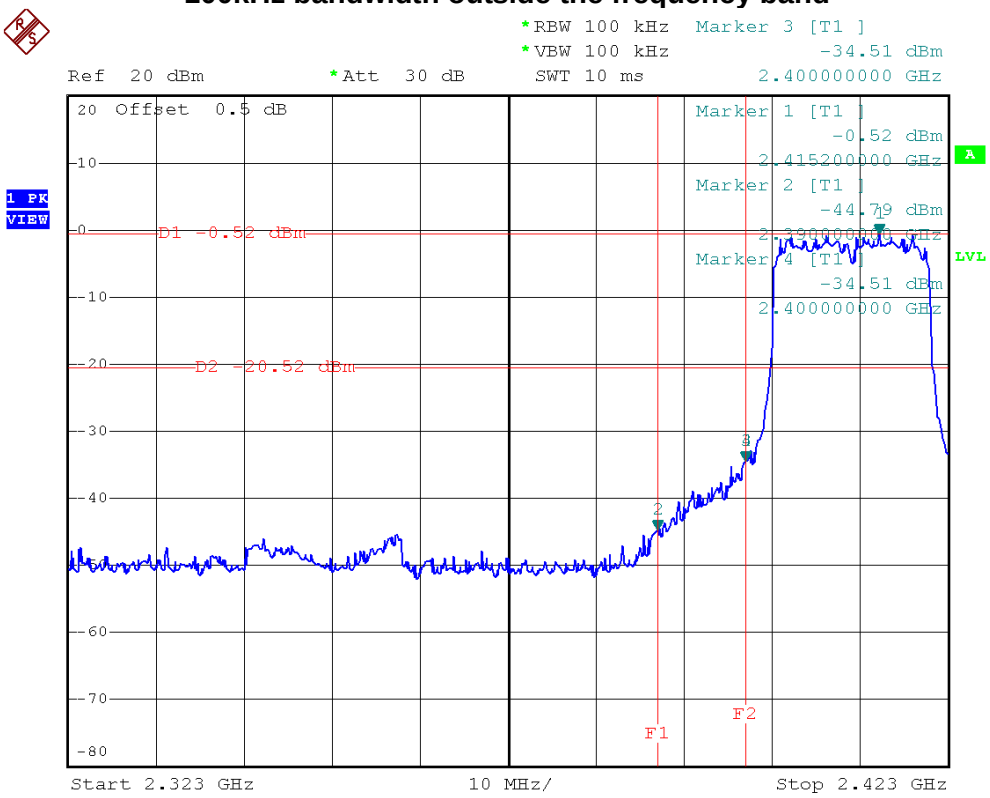
IEEE 802.11n (20 MHz)/ANT.1/2462 MHz/10 Harmonic of the frequency



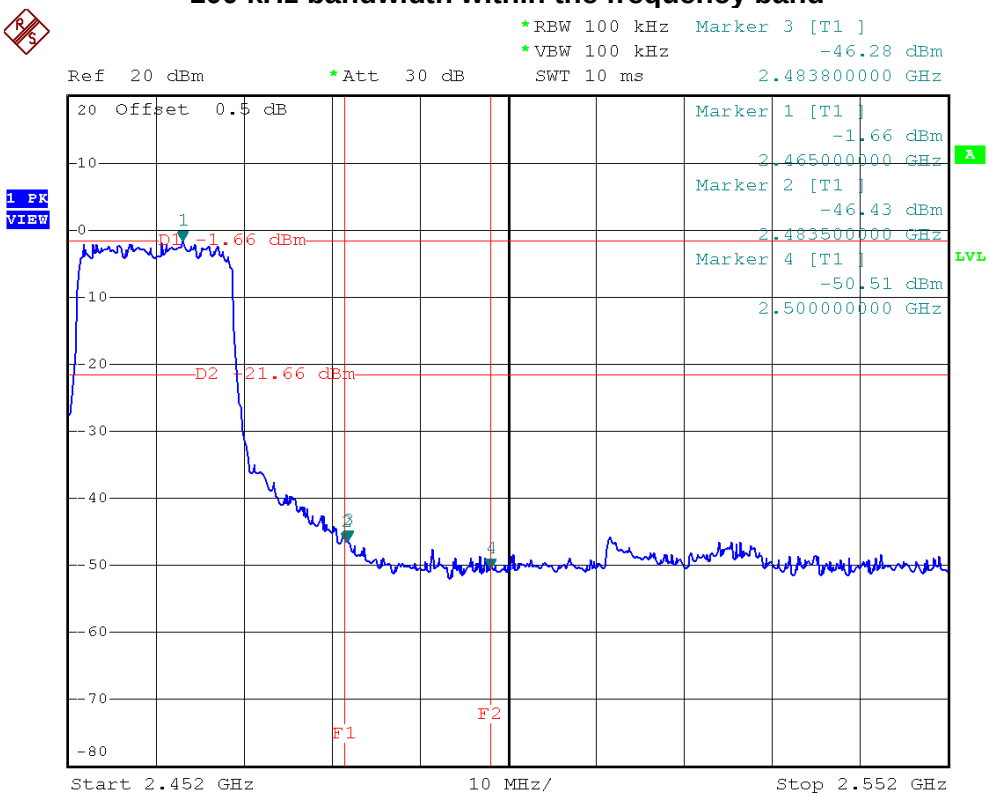
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/ANT.2		

Channel of Worst Data			
The max. radio frequency power in any 100kHz bandwidth outside the frequency band		The max. radio frequency power in any 100 kHz bandwidth within the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
2400.00	-34.51	2483.80	-46.28
Result			
In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.			

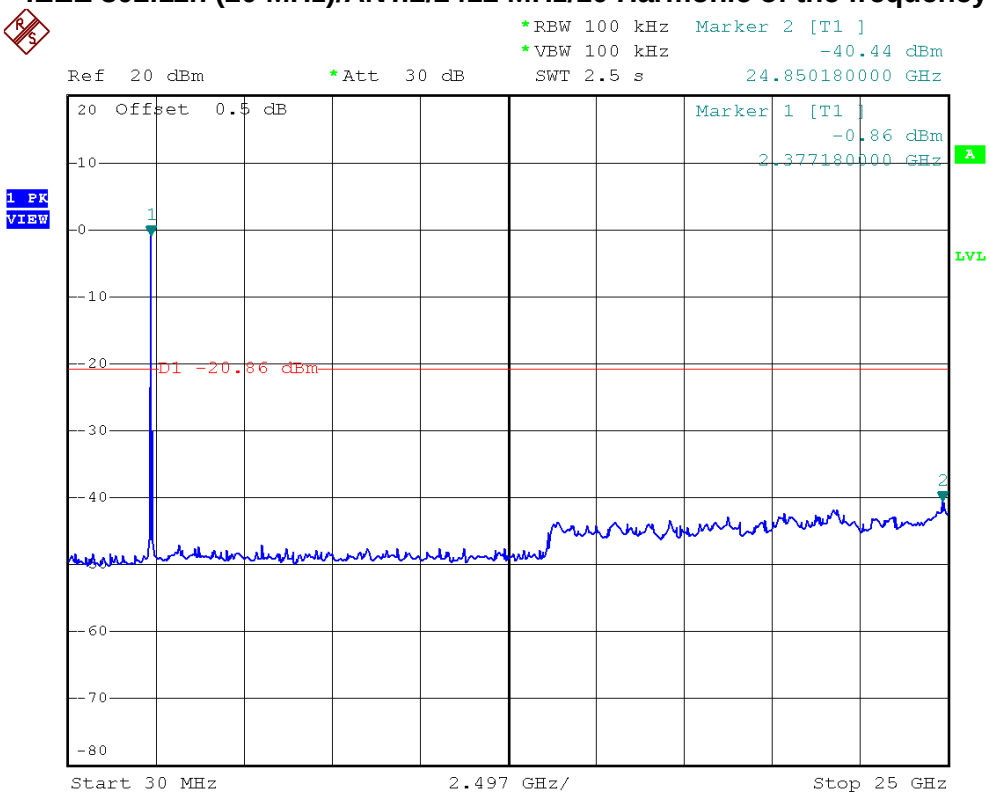
IEEE 802.11n (20 MHz)/ANT.2/The max. radio frequency power in any 100kHz bandwidth outside the frequency band



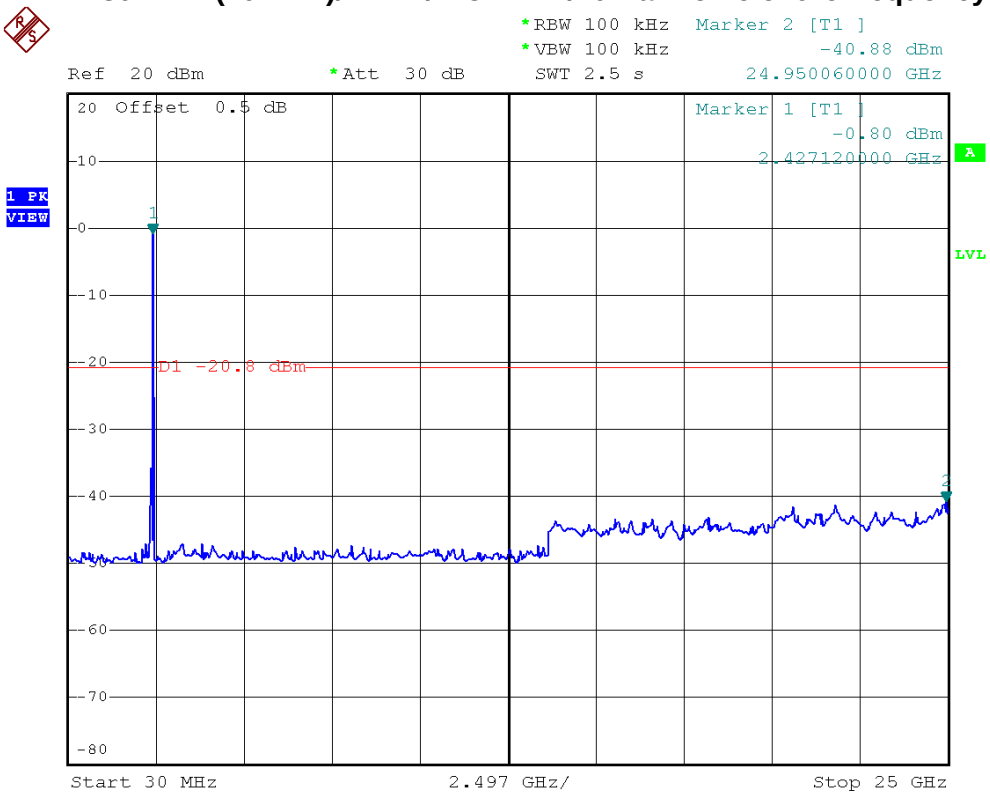
IEEE 802.11n (20 MHz)/ANT.2/The max. radio frequency power in any 100 kHz bandwidth within the frequency band



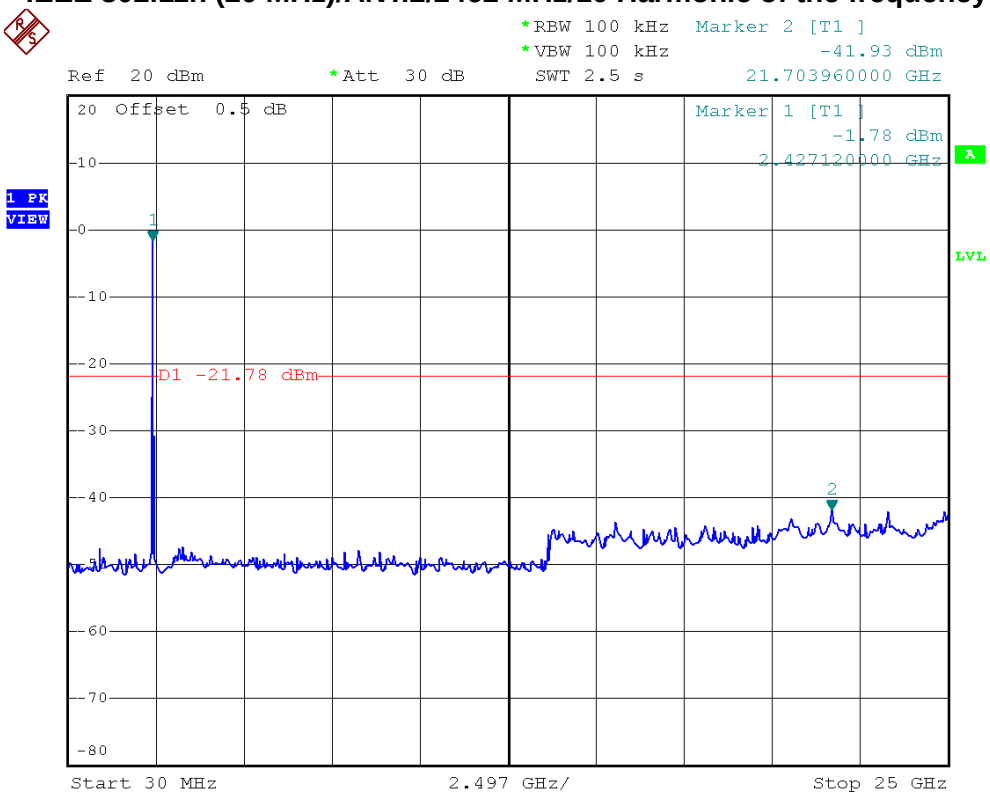
IEEE 802.11n (20 MHz)/ANT.2/2412 MHz/10 Harmonic of the frequency



IEEE 802.11n (20 MHz)/ANT.2/2437 MHz/10 Harmonic of the frequency



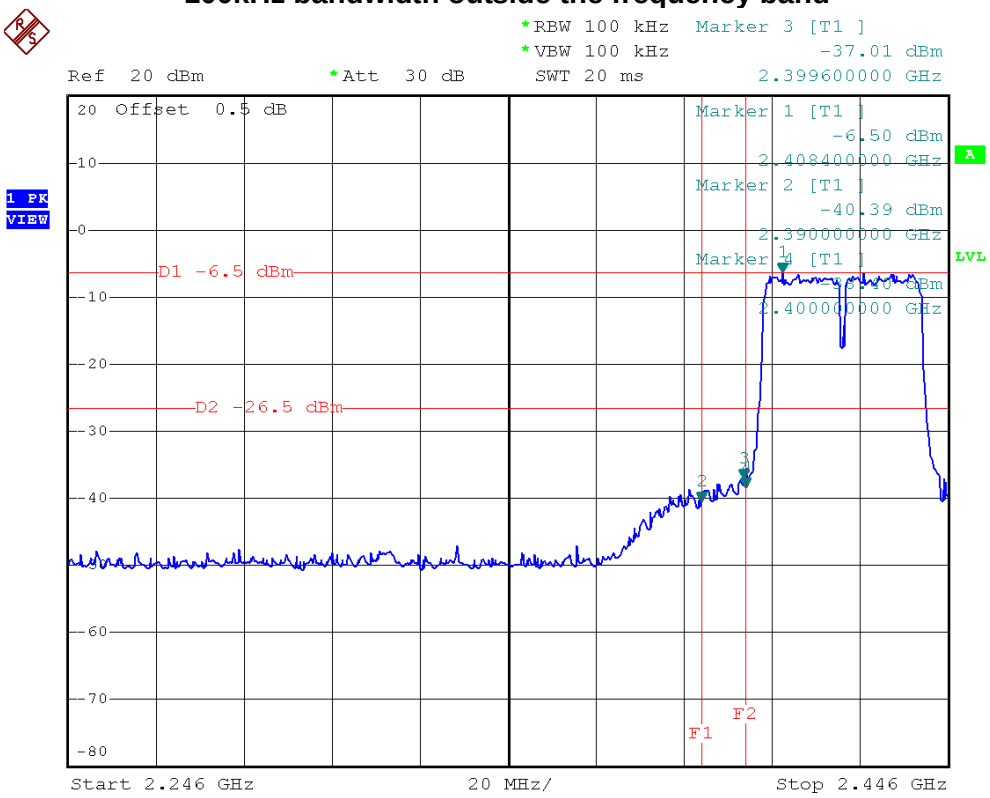
IEEE 802.11n (20 MHz)/ANT.2/2462 MHz/10 Harmonic of the frequency



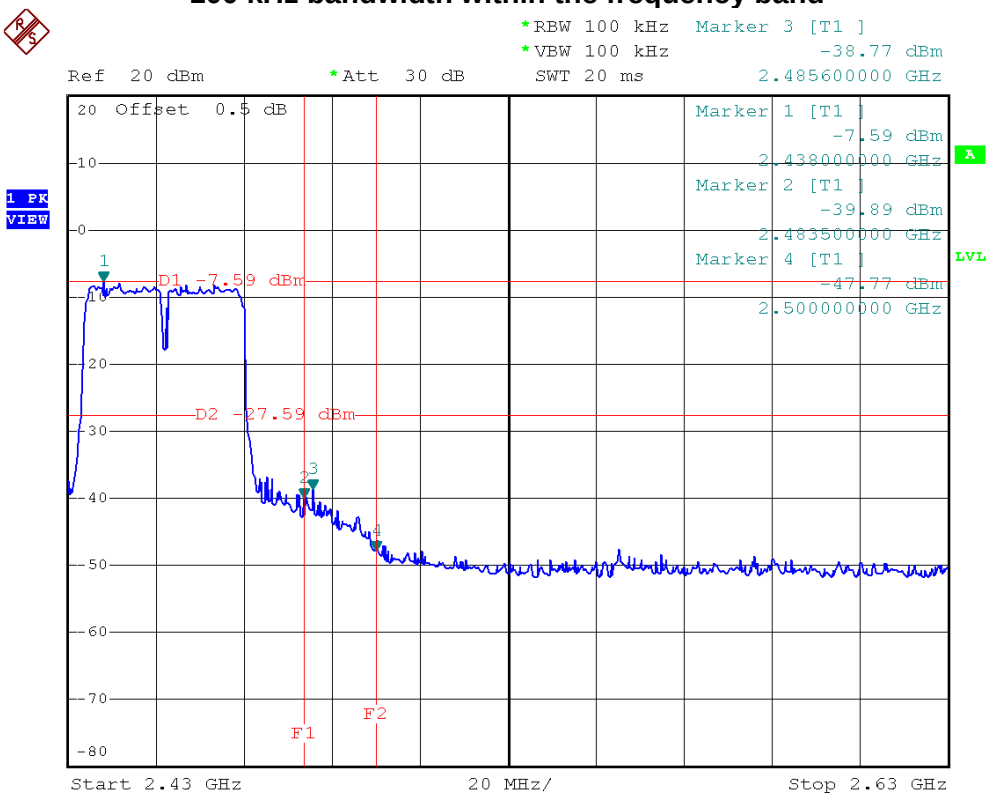
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/ANT.1		

Channel of Worst Data			
The max. radio frequency power in any 100kHz bandwidth outside the frequency band		The max. radio frequency power in any 100 kHz bandwidth within the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
2399.60	-37.01	2485.60	-38.77
Result			
In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.			

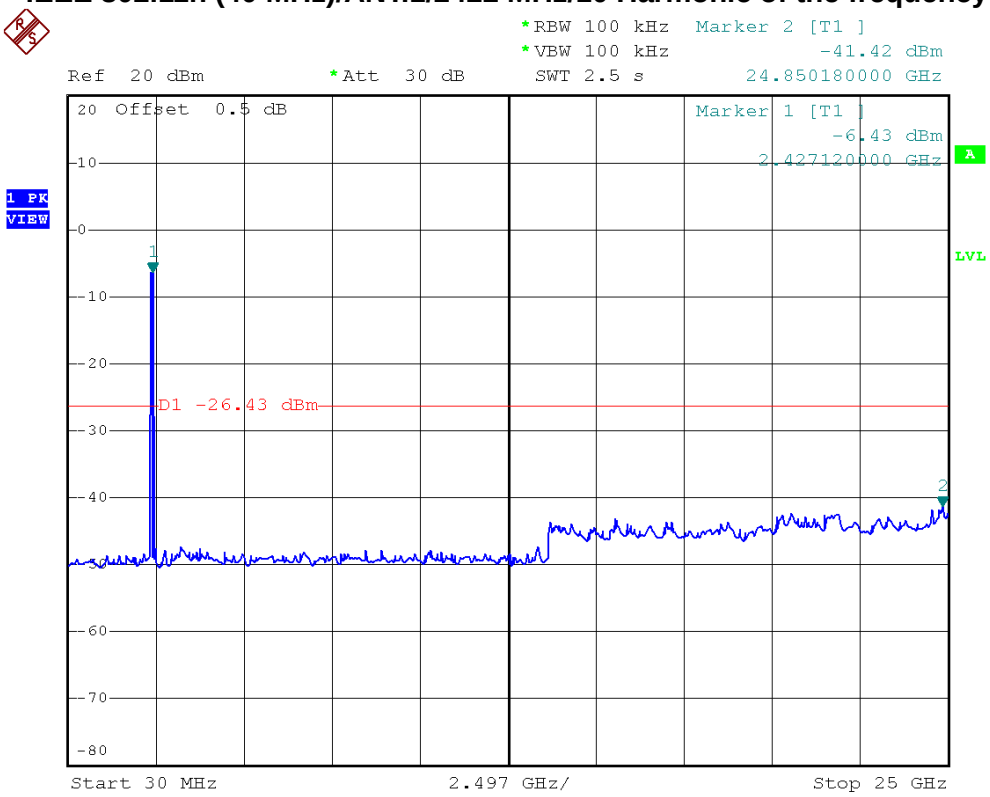
IEEE 802.11n (40 MHz)/ANT.1/The max. radio frequency power in any 100kHz bandwidth outside the frequency band



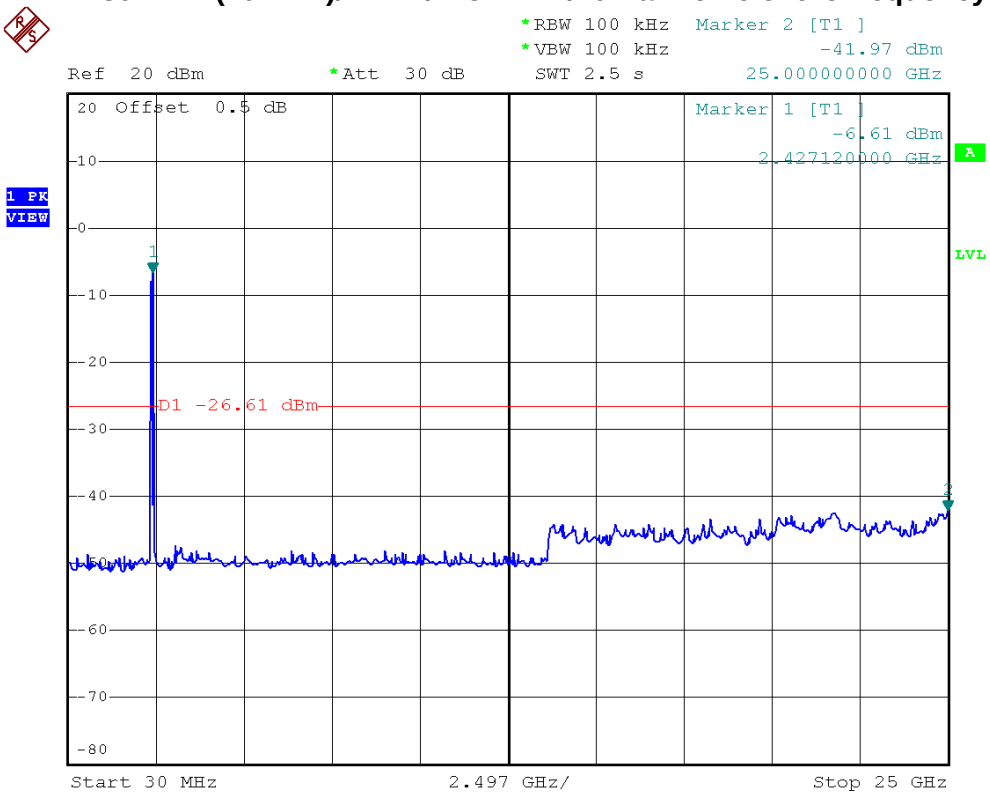
IEEE 802.11n (40 MHz)/ANT.1/The max. radio frequency power in any 100 kHz bandwidth within the frequency band



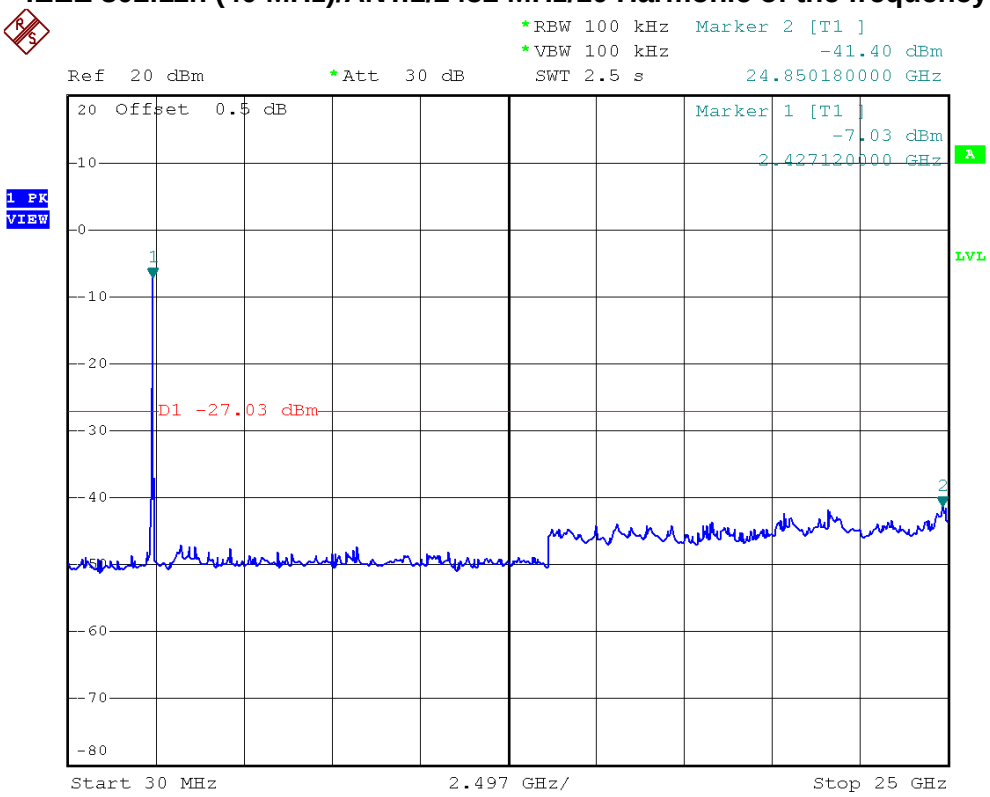
IEEE 802.11n (40 MHz)/ANT.1/2422 MHz/10 Harmonic of the frequency



IEEE 802.11n (40 MHz)/ANT.1/2437 MHz/10 Harmonic of the frequency



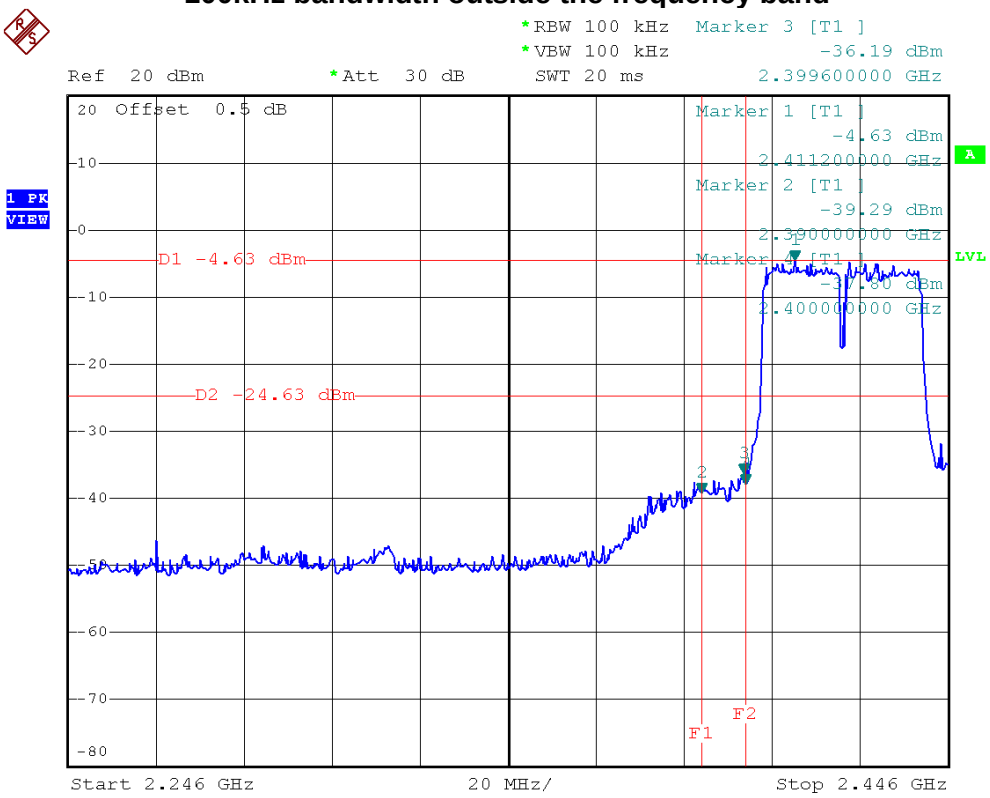
IEEE 802.11n (40 MHz)/ANT.1/2452 MHz/10 Harmonic of the frequency



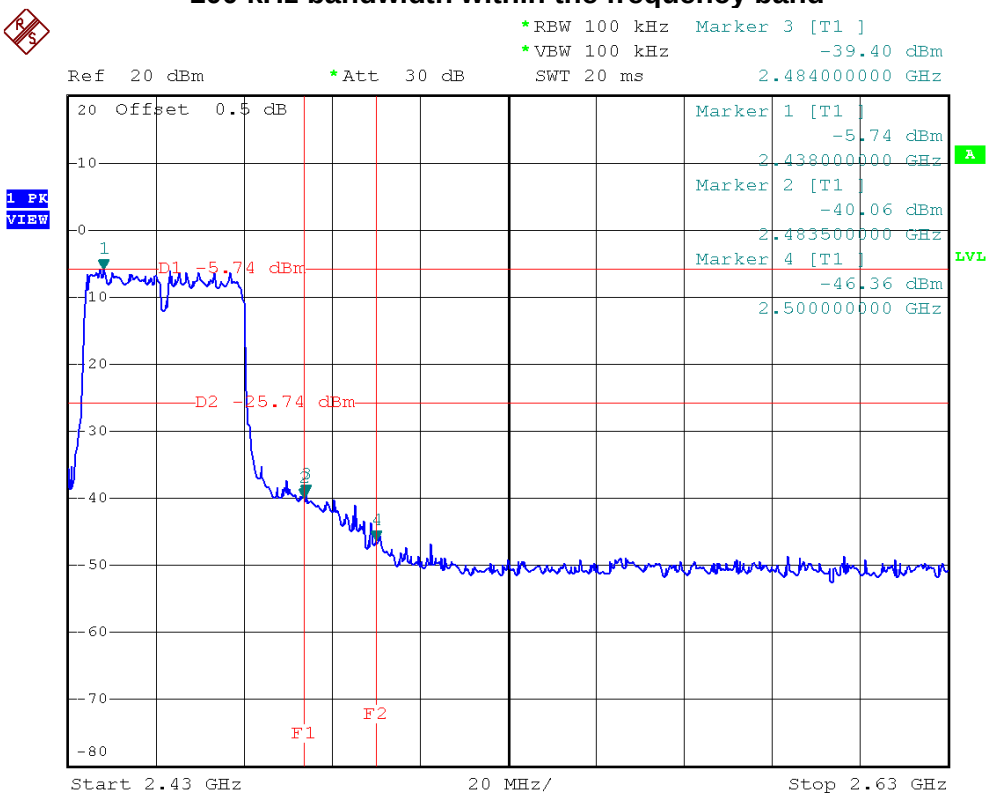
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/ANT.2		

Channel of Worst Data			
The max. radio frequency power in any 100kHz bandwidth outside the frequency band		The max. radio frequency power in any 100 kHz bandwidth within the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
2399.60	-36.19	2484.00	-39.40
Result			
In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.			

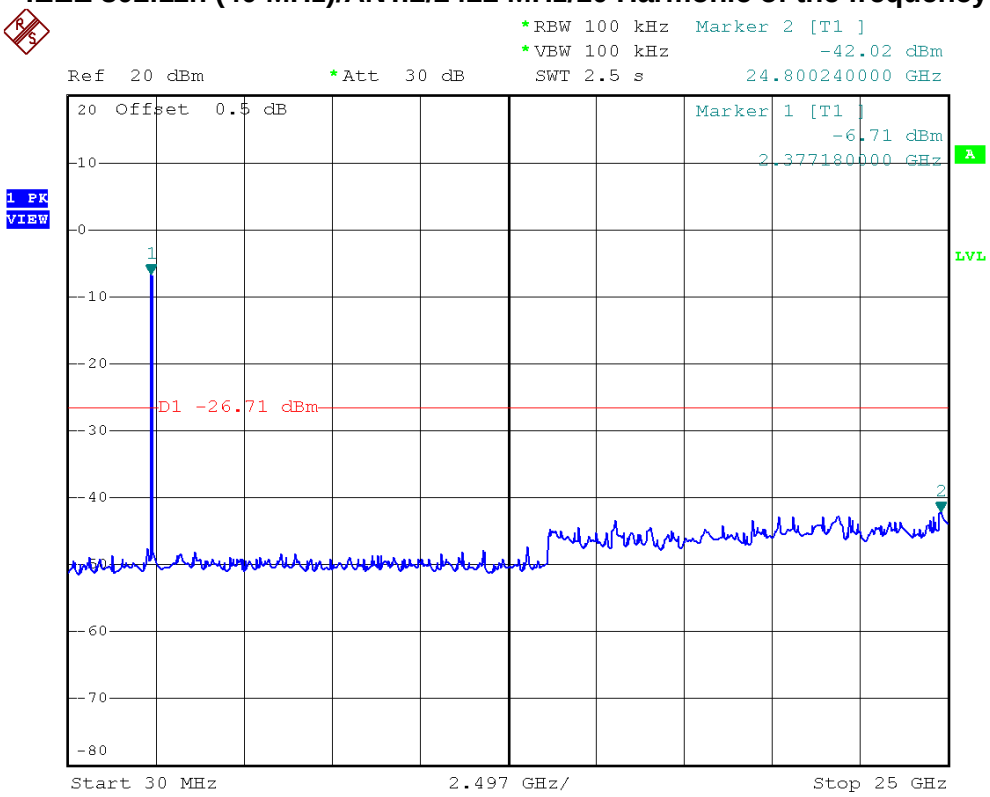
IEEE 802.11n (40 MHz)/ANT.2/The max. radio frequency power in any 100kHz bandwidth outside the frequency band



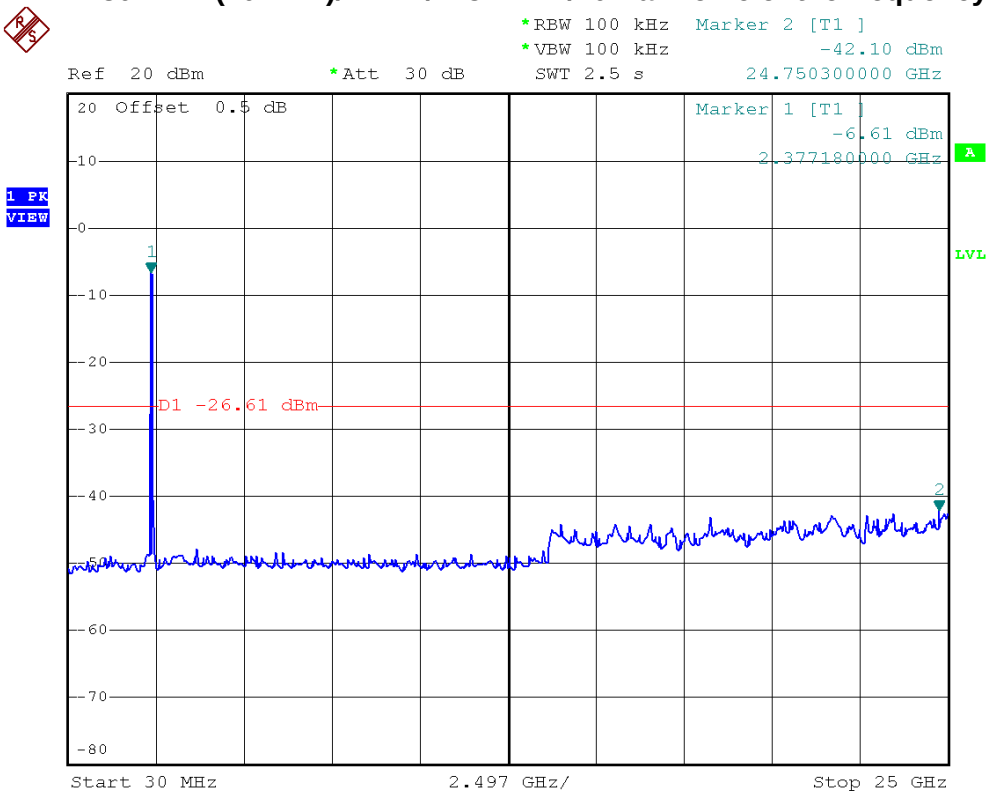
IEEE 802.11n (40 MHz)/ANT.2/The max. radio frequency power in any 100 kHz bandwidth within the frequency band



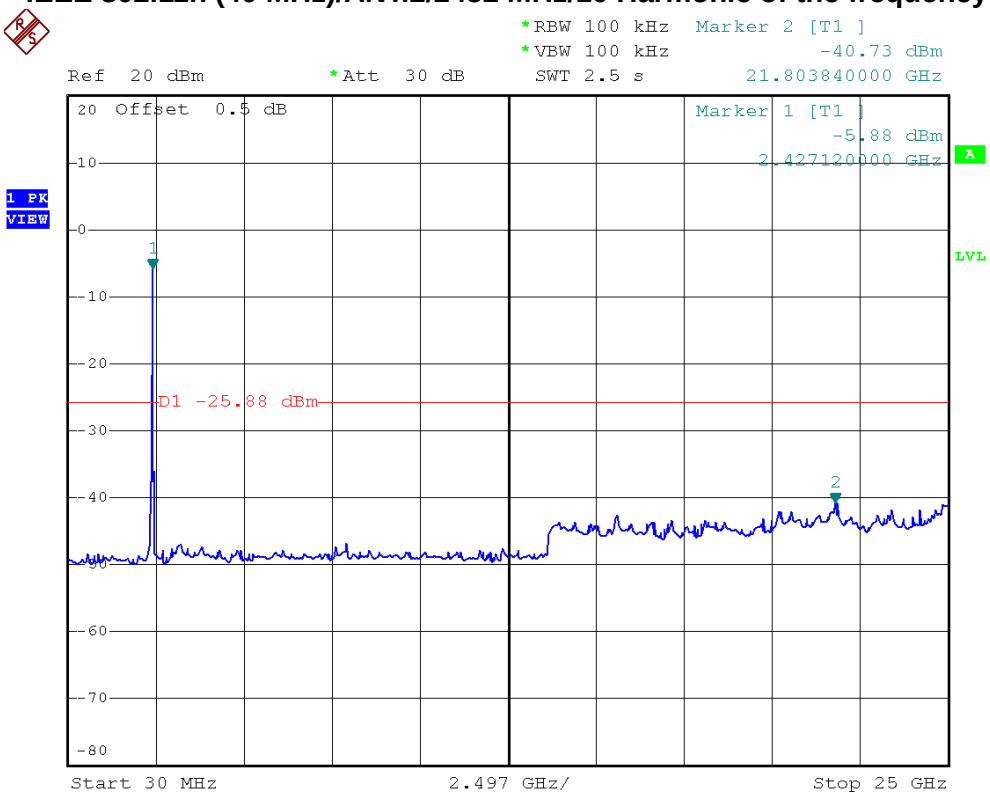
IEEE 802.11n (40 MHz)/ANT.2/2422 MHz/10 Harmonic of the frequency



IEEE 802.11n (40 MHz)/ANT.2/2437 MHz/10 Harmonic of the frequency



IEEE 802.11n (40 MHz)/ANT.2/2452 MHz/10 Harmonic of the frequency



6 6 DB BANDWIDTH

6.1 LIMIT

Test Item	Frequency Range (MHz)	Limit
Bandwidth	2400-2483.5	>= 500KHz (6dB bandwidth)

6.2 MEASUREMENT INSTRUMENTS LIST

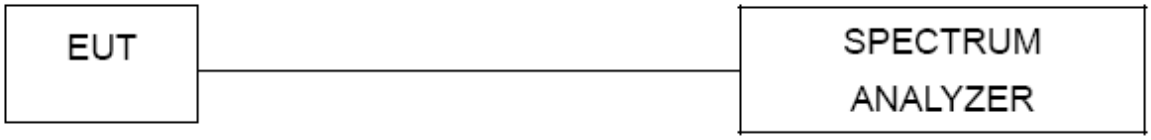
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Oct. 01, 2013

NOTE: **N/A**: denotes No Model Name, No Serial No. or No Calibration specified.

6.3 TEST PROCEDURES

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. Spectrum Setting: RBW= 100KHz, VBW=100KHz, Sweep time = Auto.

6.4 TEST SETUP LAYOUT



6.5 DEVIATION FROM TEST STANDARD

No deviation

6.6 EUT OPERATING CONDITIONS

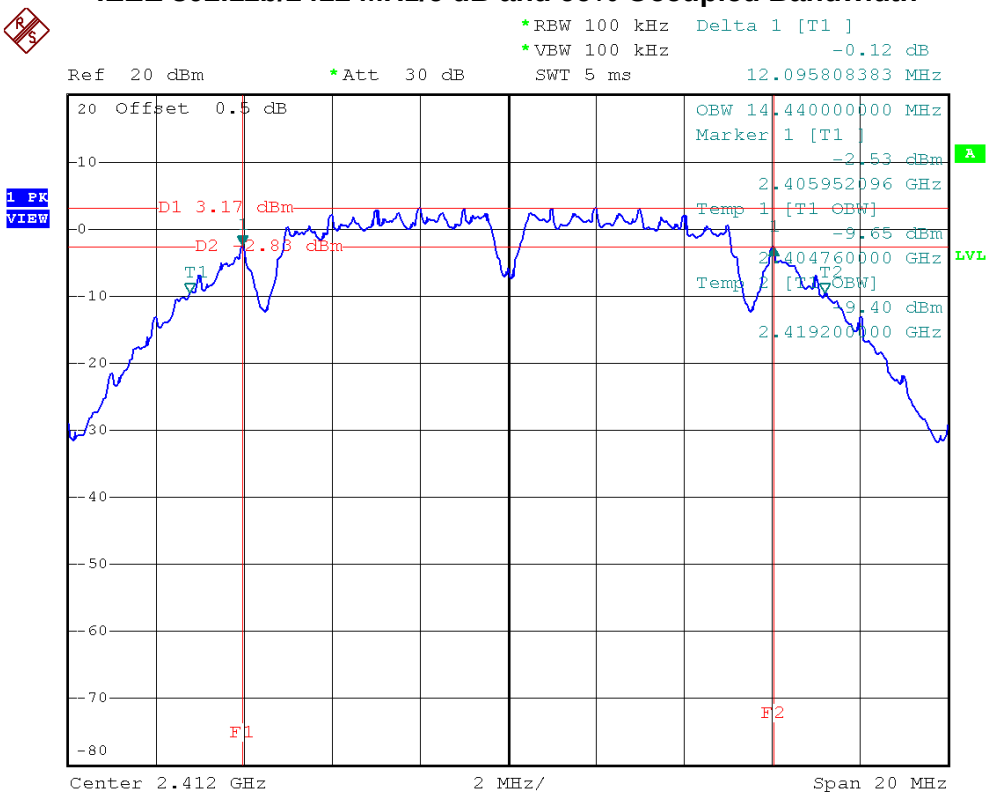
The EUT tested system was configured as the statements of 5.6 Unless otherwise a special operating condition is specified in the follows during the testing.

6.7 TEST RESULTS

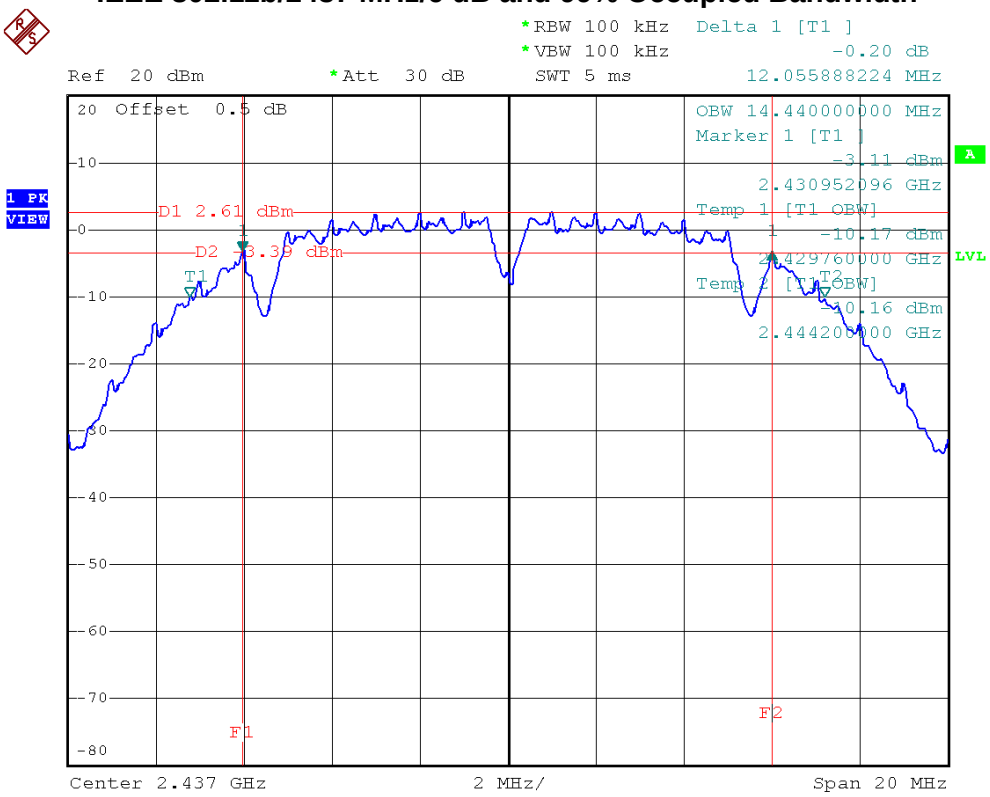
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	6 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit	Result
2412 MHz	14.44	12.10	>=500 kHz	PASS
2437 MHz	14.44	12.06	>=500 kHz	PASS
2462 MHz	14.44	12.10	>=500 kHz	PASS

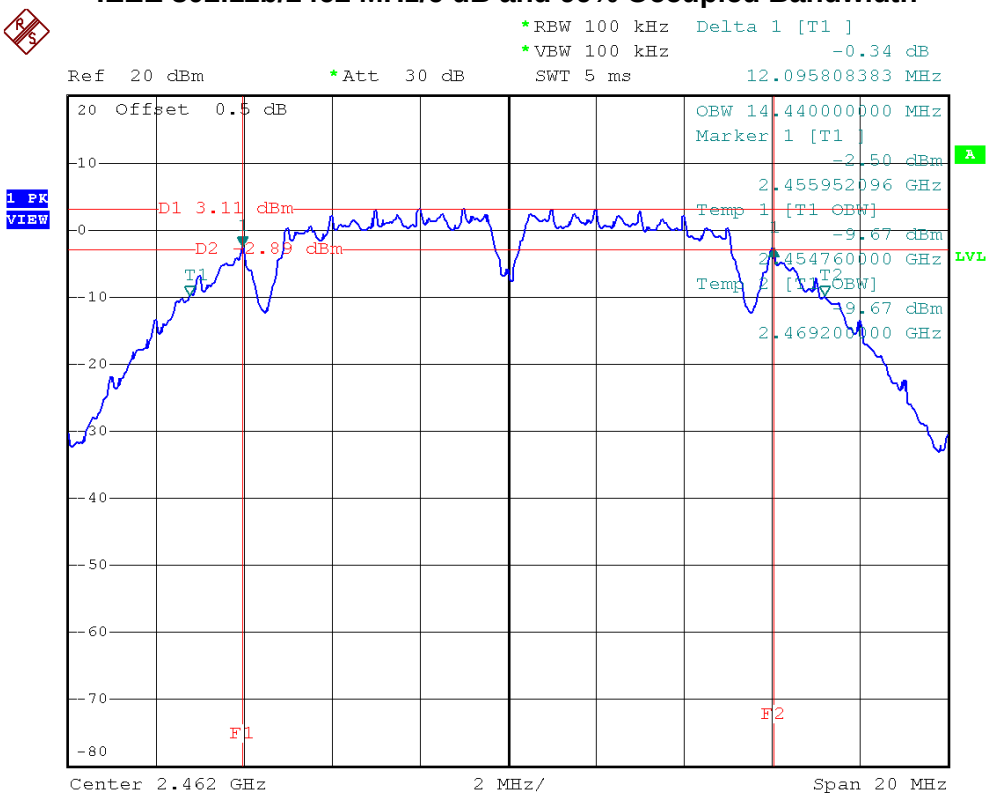
IEEE 802.11b/2412 MHz/6 dB and 99% Occupied Bandwidth



IEEE 802.11b/2437 MHz/6 dB and 99% Occupied Bandwidth



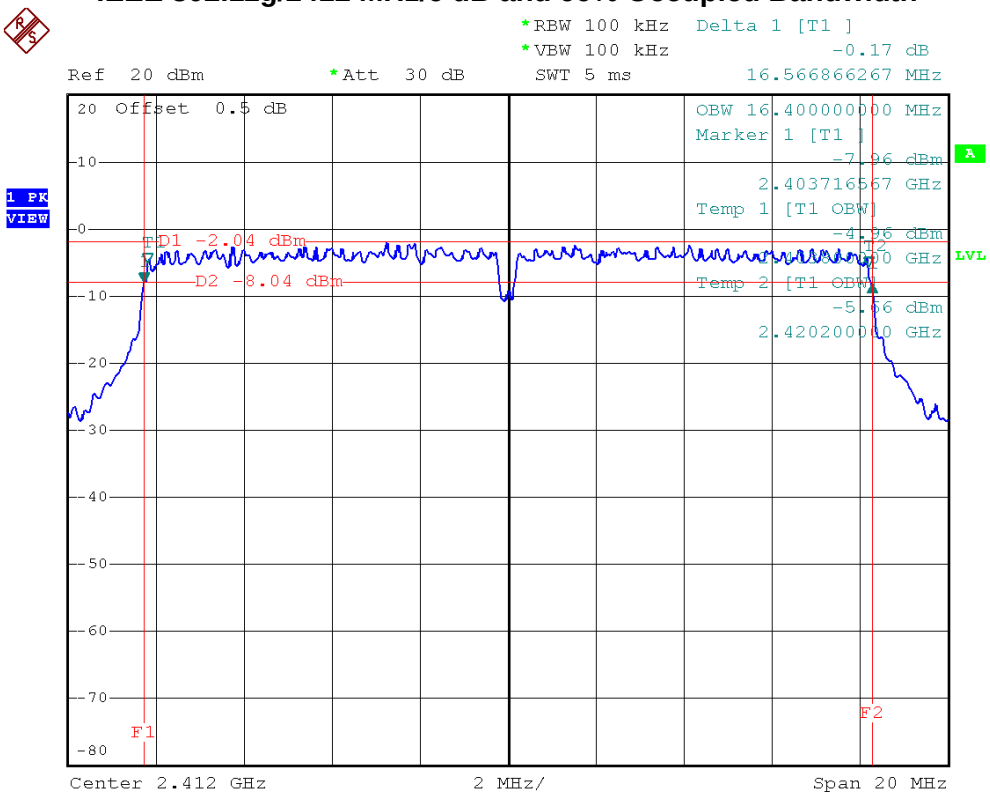
IEEE 802.11b/2462 MHz/6 dB and 99% Occupied Bandwidth



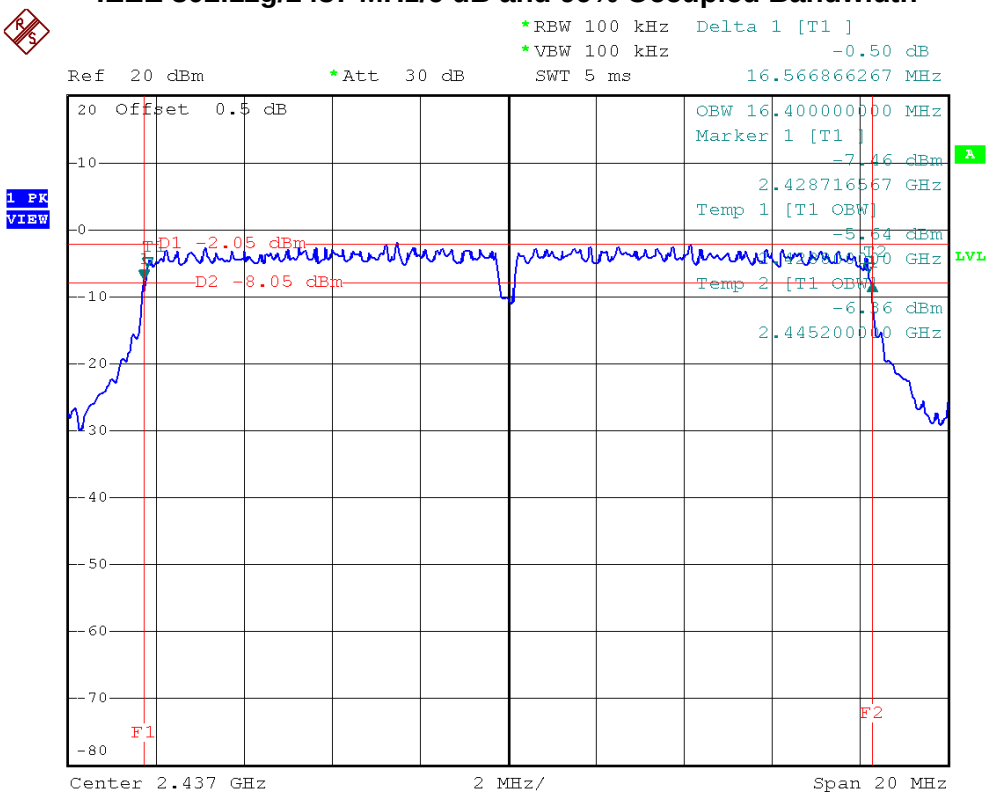
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	6 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit	Result
2412 MHz	16.40	16.57	>=500 kHz	PASS
2437 MHz	16.40	16.57	>=500 kHz	PASS
2462 MHz	16.44	16.61	>=500 kHz	PASS

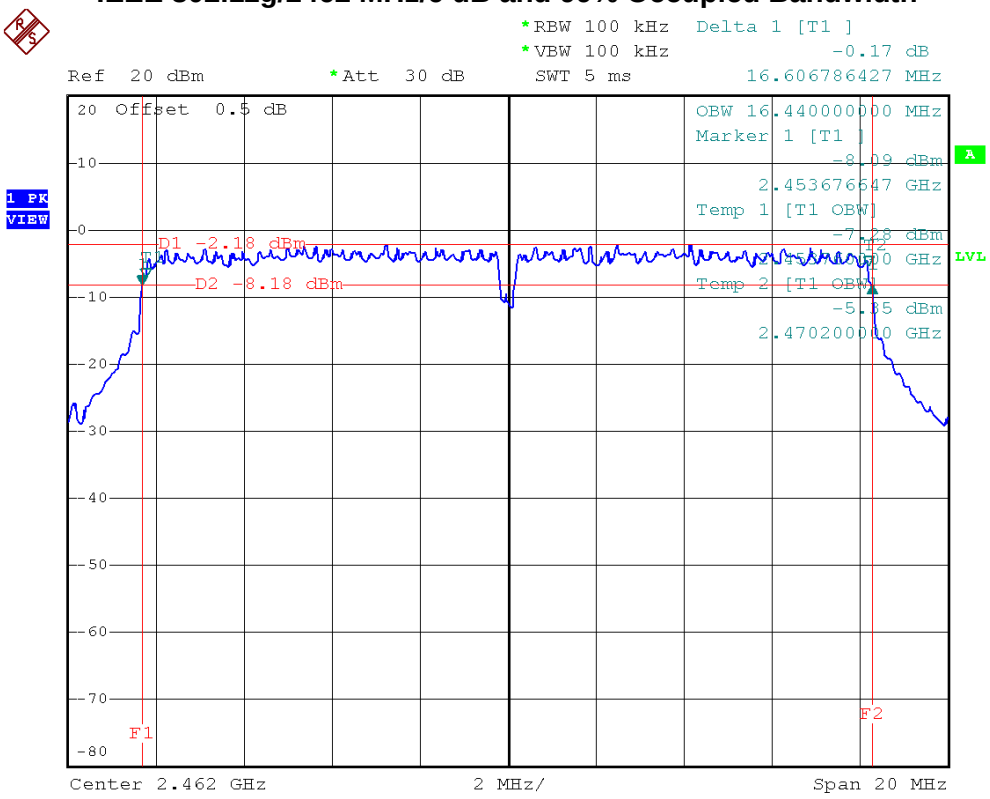
IEEE 802.11g/2412 MHz/6 dB and 99% Occupied Bandwidth



IEEE 802.11g/2437 MHz/6 dB and 99% Occupied Bandwidth



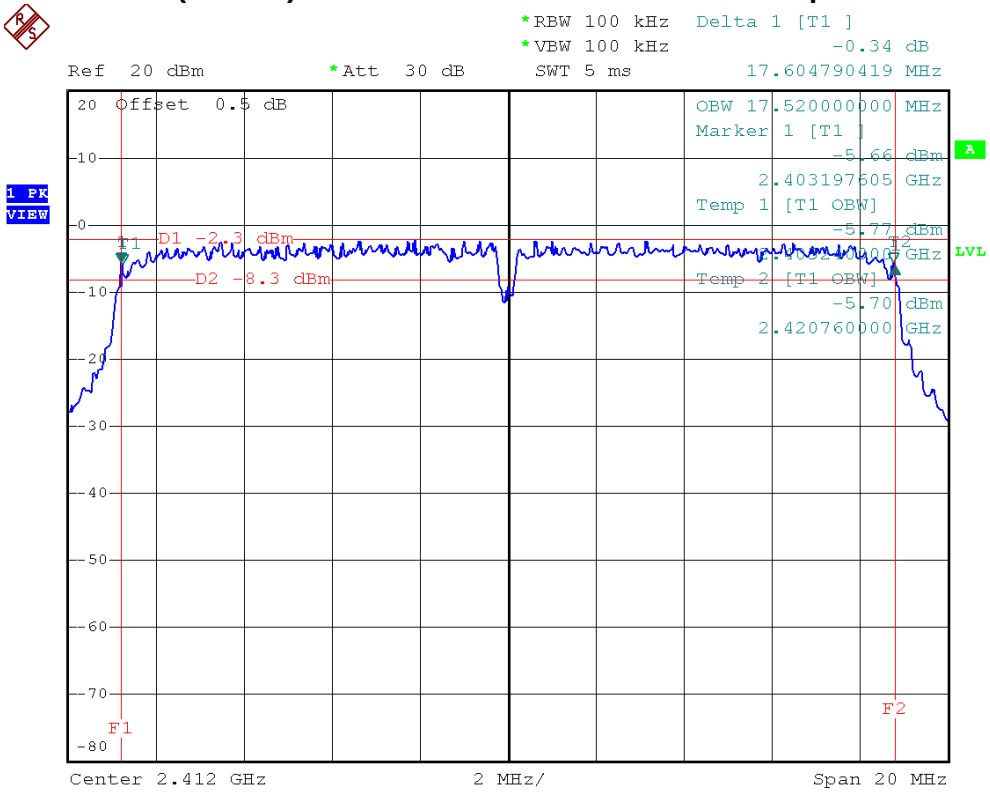
IEEE 802.11g/2462 MHz/6 dB and 99% Occupied Bandwidth



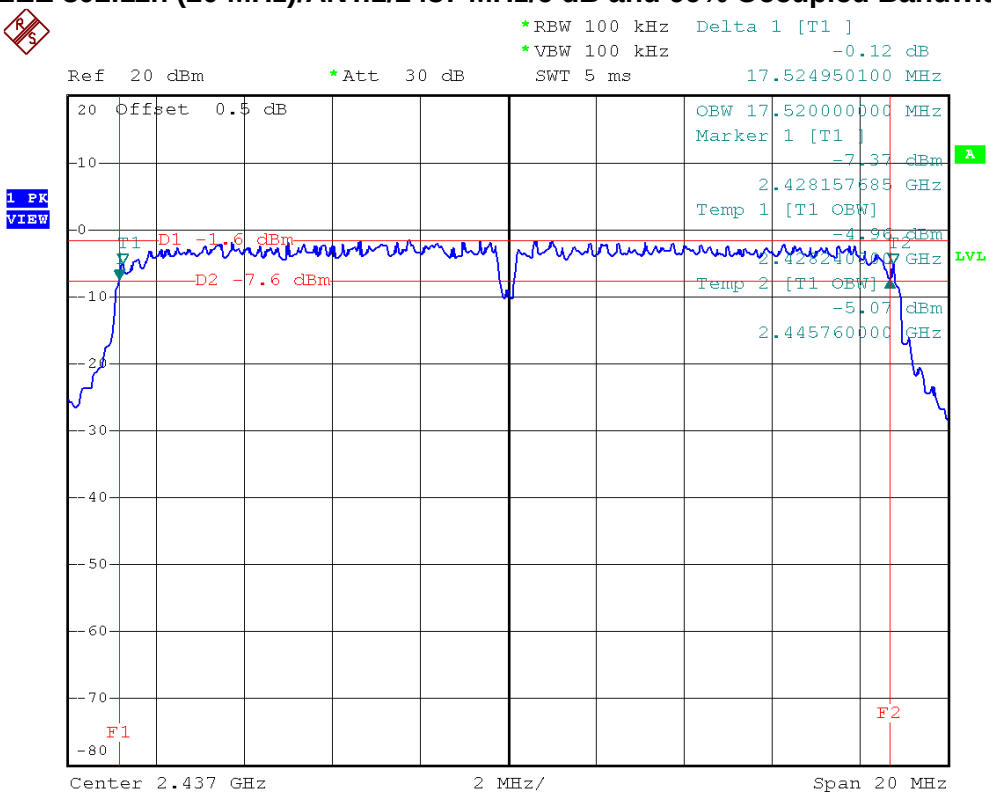
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/ANT.1/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	6 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit	Result
2412 MHz	17.52	17.60	>=500 kHz	PASS
2437 MHz	17.52	17.52	>=500 kHz	PASS
2462 MHz	17.52	17.56	>=500 kHz	PASS

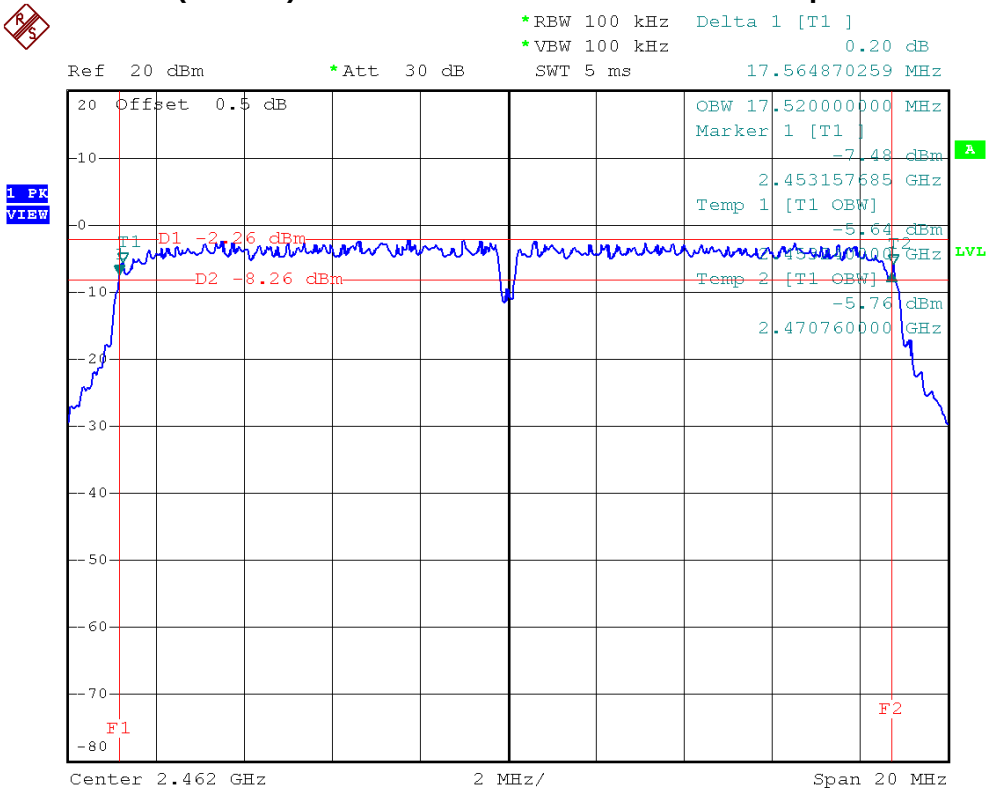
IEEE 802.11n (20 MHz)/ANT.1/2412 MHz/6 dB and 99% Occupied Bandwidth



IEEE 802.11n (20 MHz)/ANT.1/2437 MHz/6 dB and 99% Occupied Bandwidth



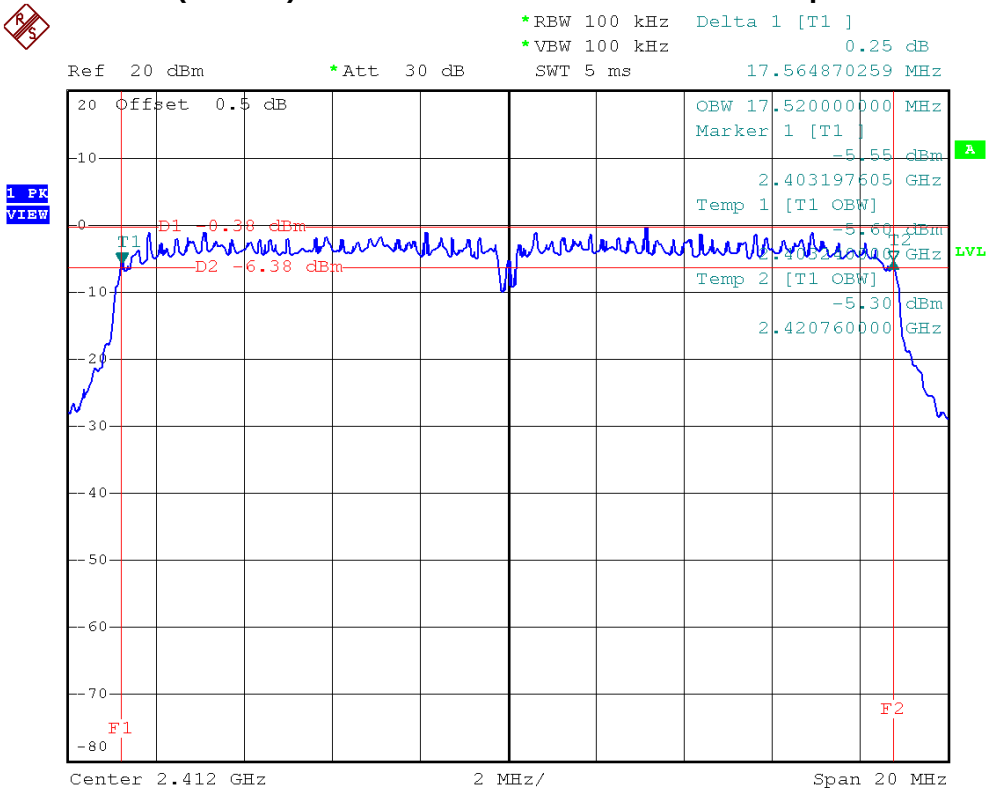
IEEE 802.11n (20 MHz)/ANT.1/2462 MHz/6 dB and 99% Occupied Bandwidth



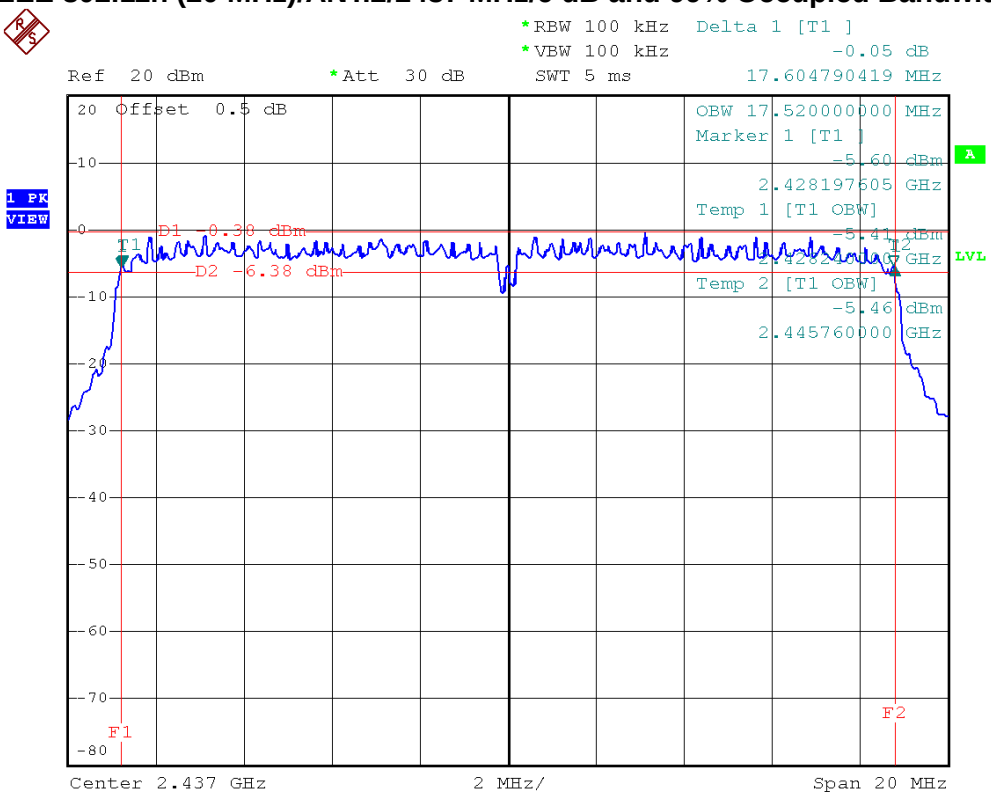
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/ANT.2/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	6 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit	Result
2412 MHz	17.52	17.56	>=500 kHz	PASS
2437 MHz	17.52	17.60	>=500 kHz	PASS
2462 MHz	17.52	17.64	>=500 kHz	PASS

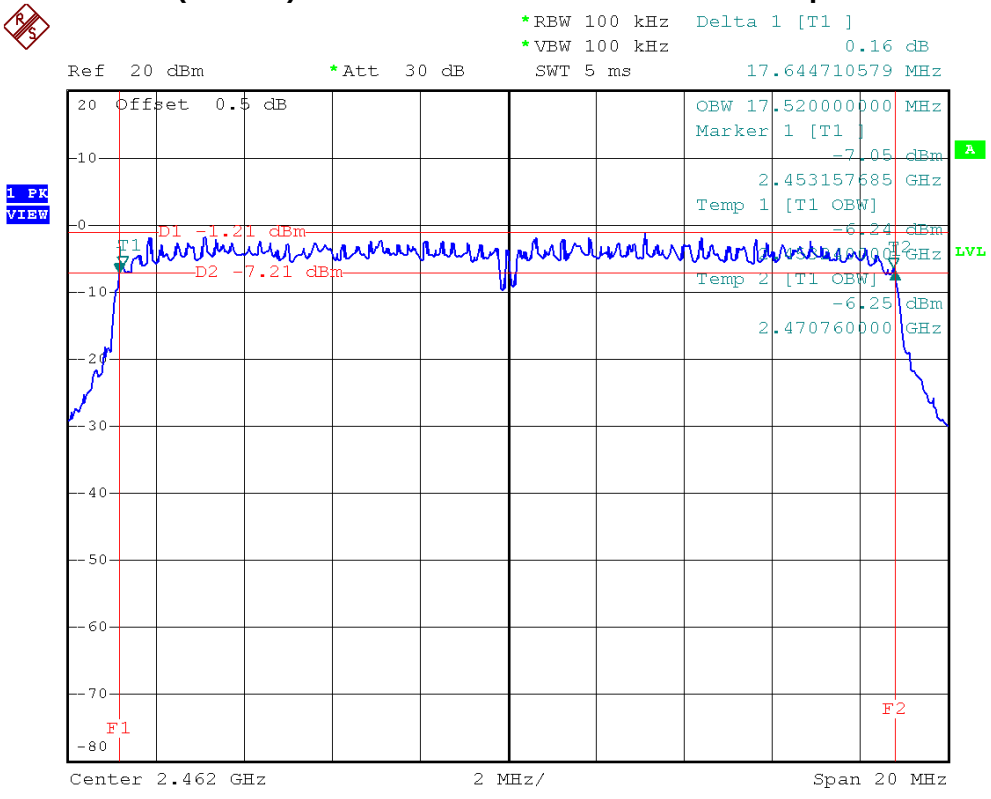
IEEE 802.11n (20 MHz)/ANT.2/2412 MHz/6 dB and 99% Occupied Bandwidth



IEEE 802.11n (20 MHz)/ANT.2/2437 MHz/6 dB and 99% Occupied Bandwidth



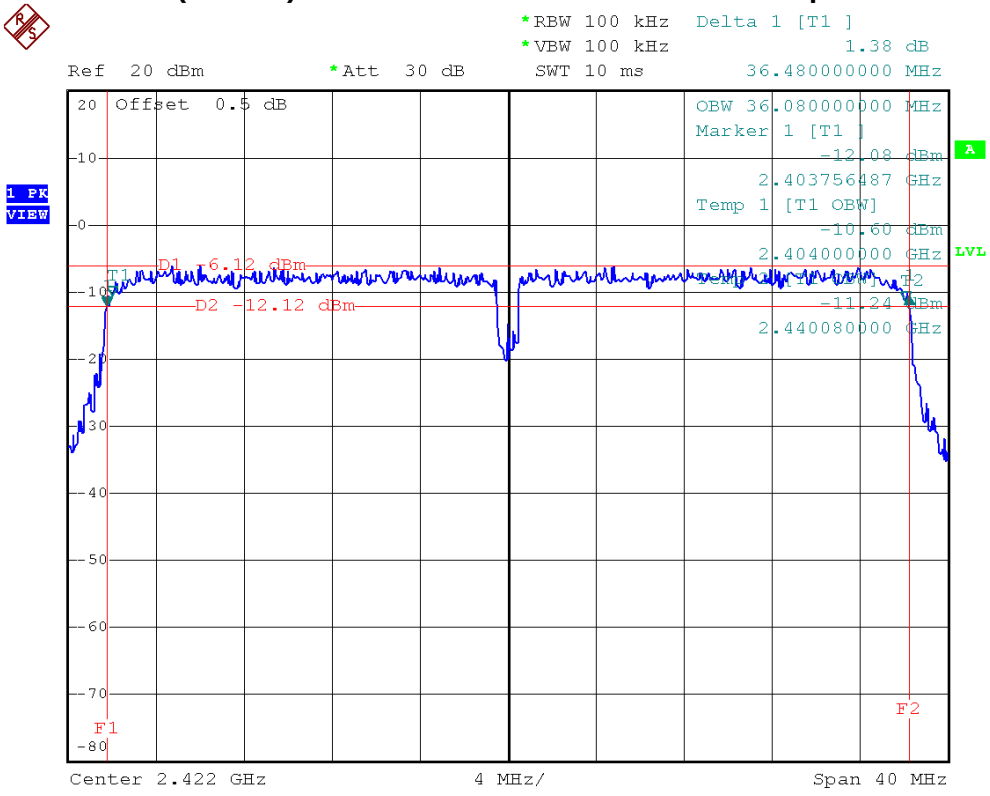
IEEE 802.11n (20 MHz)/ANT.2/2462 MHz/6 dB and 99% Occupied Bandwidth



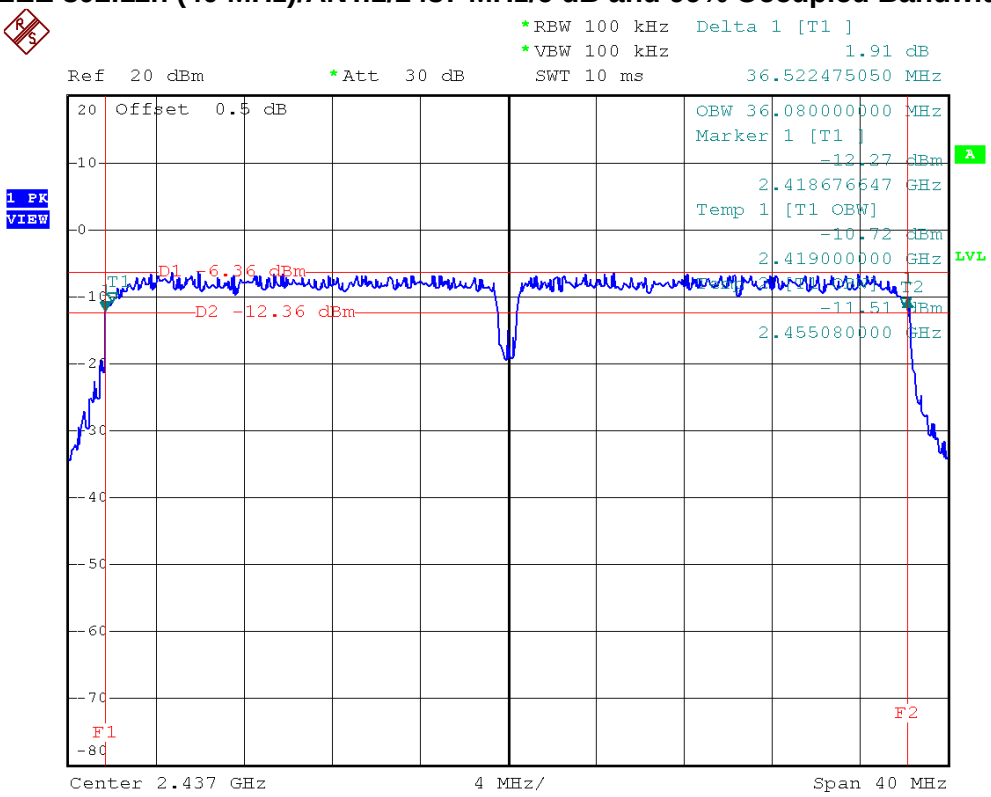
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/ANT.1/2422 MHz, 2437 MHz, 2452 MHz		

Frequency	6 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit	Result
2422 MHz	36.08	36.48	>=500 kHz	PASS
2437 MHz	36.08	36.52	>=500 kHz	PASS
2452 MHz	36.08	36.40	>=500 kHz	PASS

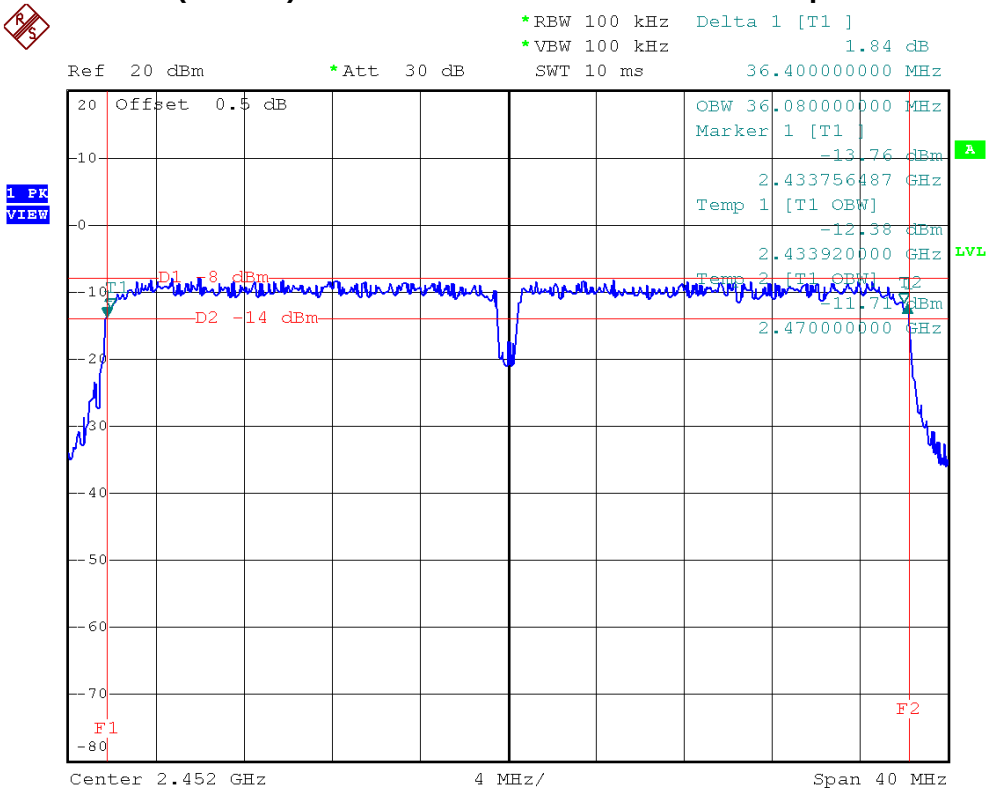
IEEE 802.11n (40 MHz)/ANT.1/2422 MHz/6 dB and 99% Occupied Bandwidth



IEEE 802.11n (40 MHz)/ANT.1/2437 MHz/6 dB and 99% Occupied Bandwidth



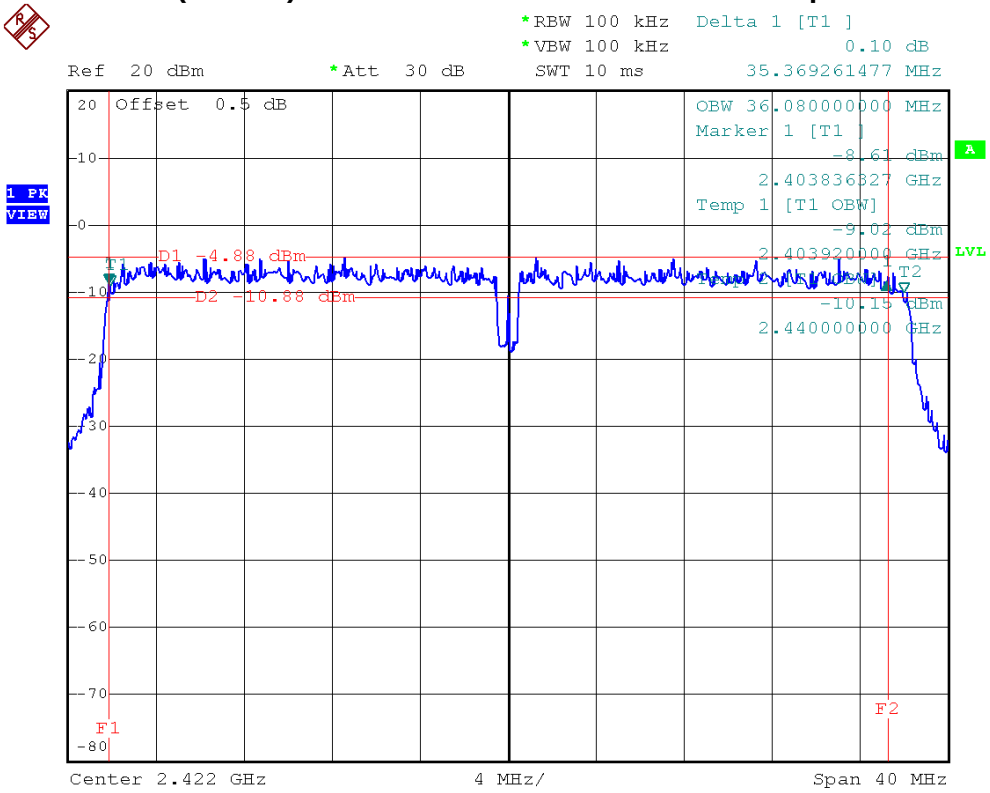
IEEE 802.11n (40 MHz)/ANT.1/2452 MHz/6 dB and 99% Occupied Bandwidth



E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/ANT.2/2422 MHz, 2437 MHz, 2452 MHz		

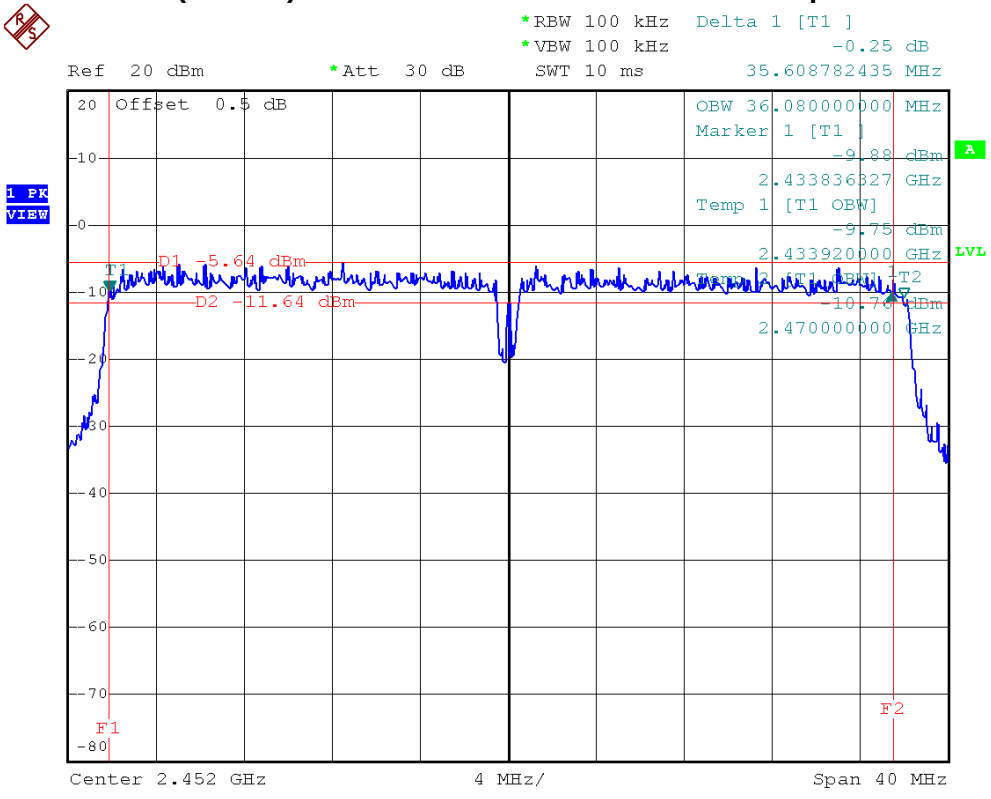
Frequency	6 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit	Result
2422 MHz	36.08	35.37	>=500 kHz	PASS
2437 MHz	36.08	36.17	>=500 kHz	PASS
2452 MHz	36.08	35.61	>=500 kHz	PASS

IEEE 802.11n (40 MHz)/ANT.2/2422 MHz/6 dB and 99% Occupied Bandwidth



IEEE 802.11n (40 MHz)/ANT.2/2437 MHz/6 dB and 99% Occupied Bandwidth

IEEE 802.11n (40 MHz)/ANT.2/2452 MHz/6 dB and 99% Occupied Bandwidth



7 MAXIMUM PEAK CONDUCTED OUTPUT POWER

7.1 LIMIT

Test Item	Frequency Range (MHz)	Limit
Maximum Peak Conducted Output Power	2400-2483.5	1 watt or 30 dBm

7.2 MEASUREMENT INSTRUMENTS LIST

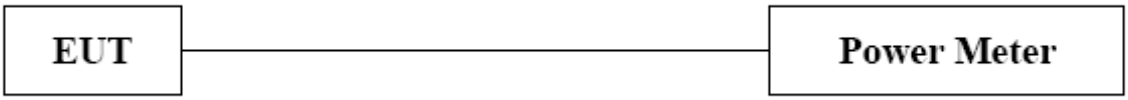
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Power Meter	Anritsu	ML2495A	1128008	Feb,20,2013
2	Power Meter Sensor	Anritsu	MA2411B	1126001	Feb,20,2013

NOTE: **N/A**: denotes No Model Name, No Serial No. or No Calibration specified.

7.3 TEST PROCEDURES

The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.

7.4 TEST SETUP LAYOUT



7.5 DEVIATION FROM TEST STANDARD

No deviation

7.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 5.6 Unless otherwise a special operating condition is specified in the follows during the testing.

7.7 TEST RESULTS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	Peak Output Power (dBm)	LIMIT (dBm)	Result
2412 MHz	17.95	30	PASS
2437 MHz	17.69	30	PASS
2462 MHz	17.76	30	PASS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	Peak Output Power (dBm)	LIMIT (dBm)	Result
2412 MHz	20.74	30	PASS
2437 MHz	21.02	30	PASS
2462 MHz	20.84	30	PASS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/ANT.1/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	Peak Output Power (dBm)	LIMIT (dBm)	Result
2412 MHz	21.20	30	PASS
2437 MHz	21.04	30	PASS
2462 MHz	21.03	30	PASS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/ANT.2/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	Peak Output Power (dBm)	LIMIT (dBm)	Result
2412 MHz	21.36	30	PASS
2437 MHz	21.79	30	PASS
2462 MHz	21.27	30	PASS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/ANT.Total/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	Peak Output Power (dBm)	LIMIT (dBm)	Result
2412 MHz	24.29	30	PASS
2437 MHz	24.44	30	PASS
2462 MHz	24.16	30	PASS

NOTE:

1. The MIMO test requirement, RF conducted output power shall measure each transmitter chain by using channel power method.
   And after obtain each individual transmitter chain power, then sum the output power by using the following formula:
   ((dBm/Chain 1)/10^Log) + ((dBm/Chain 2)/10^log) + ((dBm/ChainN)/10^log) = Combined peak output power in mW.
2. Antenna Gain=2 dBi.

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/ANT.1/2422 MHz, 2437 MHz, 2452 MHz		

Frequency	Peak Output Power (dBm)	LIMIT (dBm)	Result
2422 MHz	19.64	30	PASS
2437 MHz	19.87	30	PASS
2452 MHz	19.8	30	PASS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/ANT.2/2422 MHz, 2437 MHz, 2452 MHz		

Frequency	Peak Output Power (dBm)	LIMIT (dBm)	Result
2422 MHz	19.82	30	PASS
2437 MHz	19.32	30	PASS
2452 MHz	19.84	30	PASS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (240 MHz)/ANT.Total/2422 MHz, 2437 MHz, 2452 MHz		

Frequency	Peak Output Power (dBm)	LIMIT (dBm)	Result
2422 MHz	22.74	30	PASS
2437 MHz	22.61	30	PASS
2452 MHz	22.83	30	PASS

NOTE:

1. The MIMO test requirement, RF conducted output power shall measure each transmitter chain by using channel power method.
   And after obtain each individual transmitter chain power, then sum the output power by using the following formula:
   ((dBm/Chain 1)/10^Log) + ((dBm/Chain 2)/10^log) + ((dBm/ChainN)/10^log) = Combined peak output power in mW.
2. Antenna Gain=2 dBi.

8 RADIATED SPURIOUS EMISSION (9 KHZ TO 1 GHZ)

8.1 LIMIT

20 dB in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequency Range: 9 kHz to 1 GHz		
FREQUENCY (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Frequency Range: above 1 GHz				
FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
above 1 GHz	80	60	74	54

NOTE:

1. The limit for radiated test was performed according to FCC PART 15B.
2. The tighter limit applies at the band edges.
3. Emission level (dBuV/m)=20log Emission level (uV/m).
4. The test result calculated as following:
   Measurement Value = Reading Level + Correct Factor
   Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain(if use)
   Margin Level = Measurement Value – Limit Value

8.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Oct. 01, 2013
2	Horn Antenna	Schwarzbeck	BBHA 9120	D-325	Apr. 16, 2013
3	Microwave Pre_amplifier	Agilent	8449B	3008A01714	Apr. 17, 2013
4	Microflex Cable	N/A	N/A	1m	Apr. 14, 2013
5	Microflex Cable	AISI	S104-SMAP-1	10m	Apr. 14, 2013
6	Microflex Cable	N/A	N/A	3m	Apr. 14, 2013
7	Test Cable	N/A	LMR-400	966_12m	May. 15, 2013
8	Test Cable	N/A	LMR-400	966_3m	May. 15, 2013
9	Pre-Amplifier	EMC	EMC-330	980081	Jun. 07, 2013
10	Log-Bicon Antenna	Schwarzbeck	VULB9168-352	9168-352	Jun. 12, 2013
11	Horn Antenna	Schwarzbeck	BBHA 9170	187	Dec. 18, 2012
12	Preamplifier With Adaptor	EMC	EMC2654045	980030	Feb. 19, 2013

Remark: “N/A” denotes No Model Name, No Serial No. or No Calibration specified.

8.3 MEASURING INSTRUMENTS SETTING

EMI Test Receiver	Parameter Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

8.4 TEST PROCEDURES

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1 GHz. For frequencies above 1 GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m Semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.
g. The testing follows the guidelines in ANSI C63.4 and FCC Public Notice DA 00-705 Measurement Guidelines. In case the emission is fail due to the used RBW/VBW is too wide, marker-delta method of FCC Public Notice DA 00-705 will be followed.

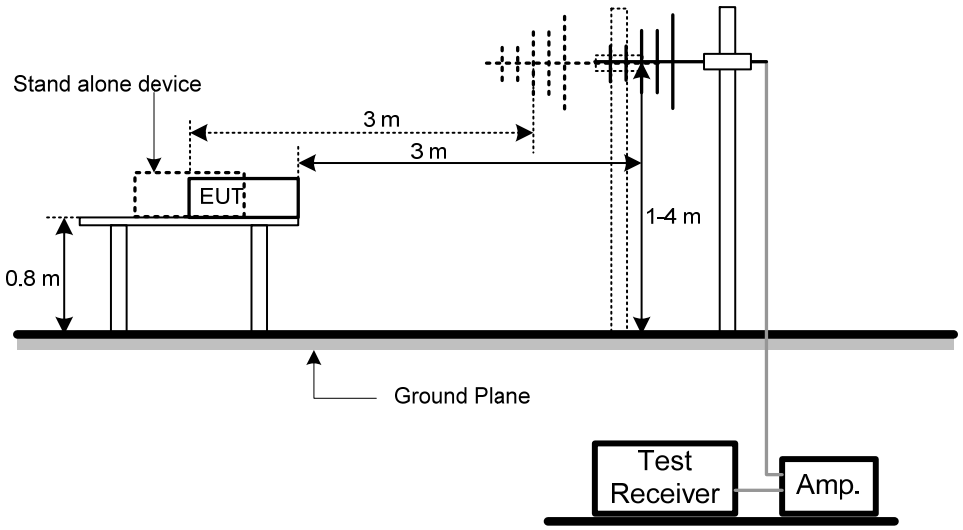
NOTE:

a. Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode with Detector BW=120 kHz; SPA setting in RBW=100 kHz, VBW =100 kHz, Swp. Time = 0.3 sec./ MHz.
b. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn‘t perform.

8.5 DEVIATION FROM TEST STANDARD

No deviation

8.6 TEST SETUP LAYOUT



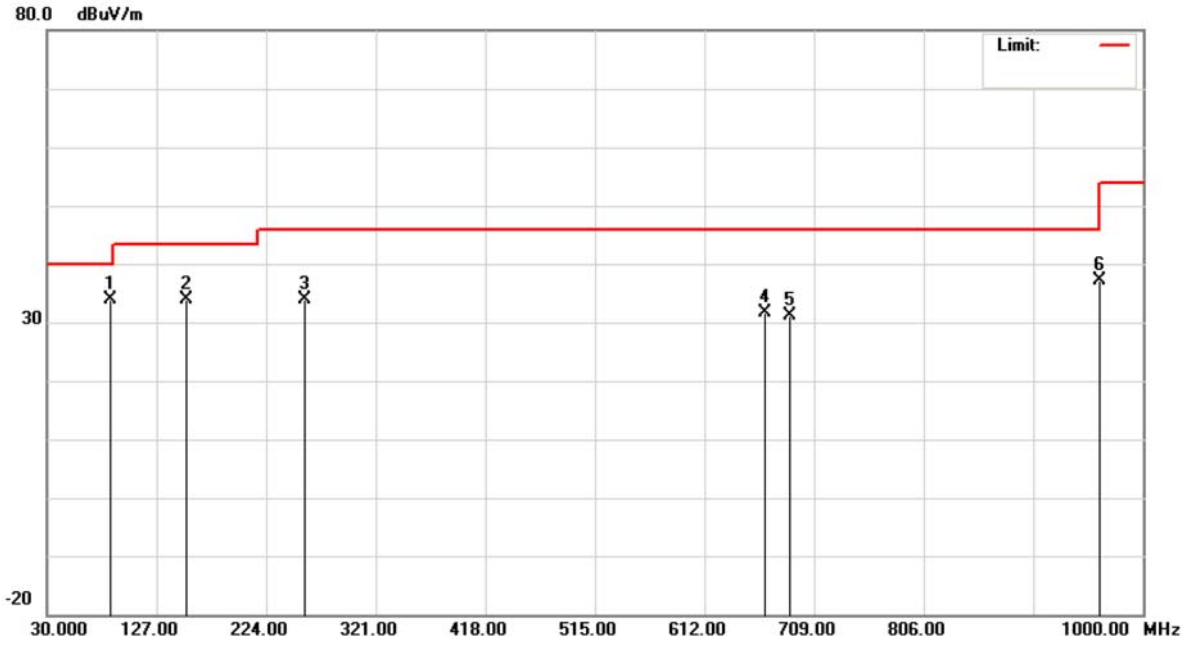
8.7 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 5.6 Unless otherwise a special operating condition is specified in the follows during the testing.

8.8 TEST RESULTS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2437 MHz		

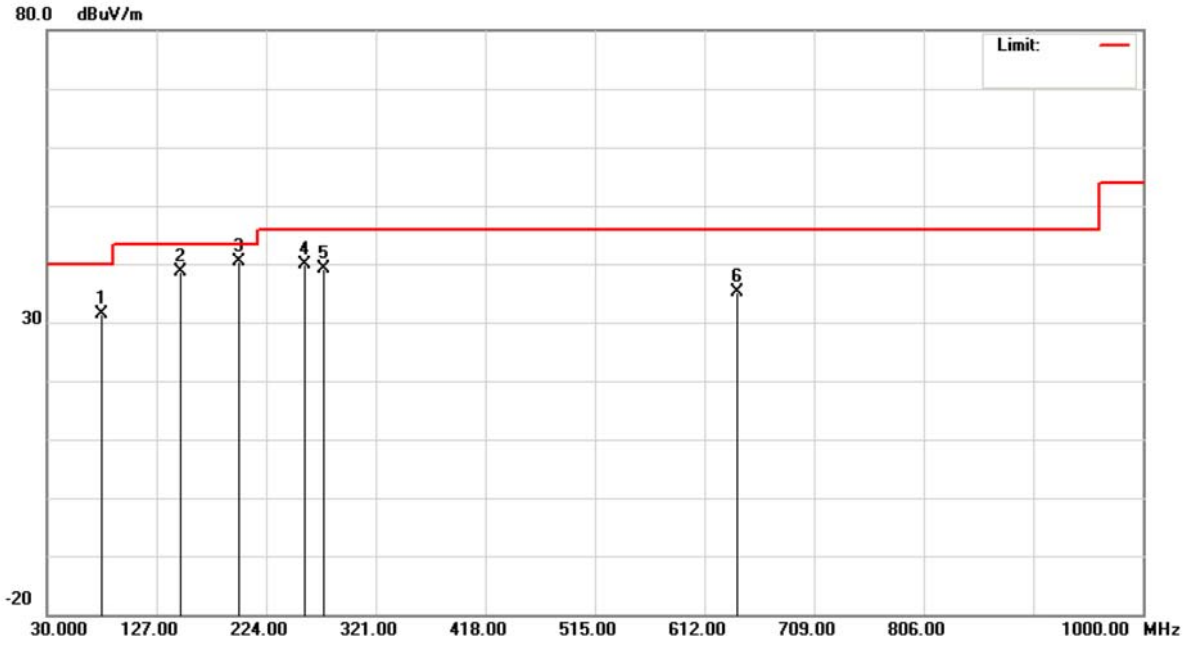
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	85.7750	58.57	-24.59	33.98	40.00	-6.02	peak	
2		153.6750	52.88	-18.93	33.95	43.50	-9.55	peak	
3		257.9500	53.65	-19.76	33.89	46.00	-12.11	peak	
4		665.3499	41.70	-10.06	31.64	46.00	-14.36	peak	
5		687.1749	41.01	-9.79	31.22	46.00	-14.78	peak	
6		961.2000	42.62	-5.40	37.22	54.00	-16.78	peak	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2437 MHz		

Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		78.5000	54.33	-23.02	31.31	40.00	-8.69	peak	
2		148.8249	57.37	-18.83	38.54	43.50	-4.96	peak	
3	*	199.7500	62.04	-21.71	40.33	43.50	-3.17	peak	
4		257.9500	59.68	-19.76	39.92	46.00	-6.08	peak	
5		274.9249	57.85	-18.81	39.04	46.00	-6.96	peak	
6		641.0999	45.43	-10.36	35.07	46.00	-10.93	peak	

9 RADIATED SPURIOUS EMISSION (ABOVE 1 GHZ)

9.1 LIMIT

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequency Range: 9 kHz to 1 GHz		
FREQUENCY (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Frequency Range: above 1 GHz				
FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
above 1 GHz	80	60	74	54

NOTE:

(1) The limit for radiated test was performed according to FCC PART 15B.
(2) The tighter limit applies at the band edges.
(3) Emission level (dBuV/m)=20log Emission level (uV/m).
(4) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain(if use)
Margin Level = Measurement Value – Limit Value

9.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Oct. 01, 2013
2	Horn Antenna	Schwarzbeck	BBHA 9120	D-325	Apr. 16, 2013
3	Microwave Pre_amplifier	Agilent	8449B	3008A01714	Apr. 17, 2013
4	Microflex Cable	N/A	N/A	1m	Apr. 14, 2013
5	Microflex Cable	AISI	S104-SMAP-1	10m	Apr. 14, 2013
6	Microflex Cable	N/A	N/A	3m	Apr. 14, 2013
7	Test Cable	N/A	LMR-400	966_12m	May. 15, 2013
8	Test Cable	N/A	LMR-400	966_3m	May. 15, 2013
9	Pre-Amplifier	EMC	EMC-330	980081	Jun. 07, 2013
10	Log-Bicon Antenna	Schwarzbeck	VULB9168-352	9168-352	Jun. 12, 2013
11	Horn Antenna	Schwarzbeck	BBHA 9170	187	Dec. 18, 2012
12	Preamplifier With Adaptor	EMC	EMC2654045	980030	Feb. 19, 2013

Remark: “N/A” denotes No Model Name, No Serial No. or No Calibration specified.

9.3 MEASURING INSTRUMENTS SETTING

Spectrum Analyzer	Parameter Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (other emission)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average

9.4 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m Semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
c. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
d. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.
f. The testing follows the guidelines in ANSI C63.4 and FCC Public Notice DA 00-705 Measurement Guidelines. In case the emission is fail due to the used RBW/VBW is too wide, marker-delta method of FCC Public Notice DA 00-705 will be followed.

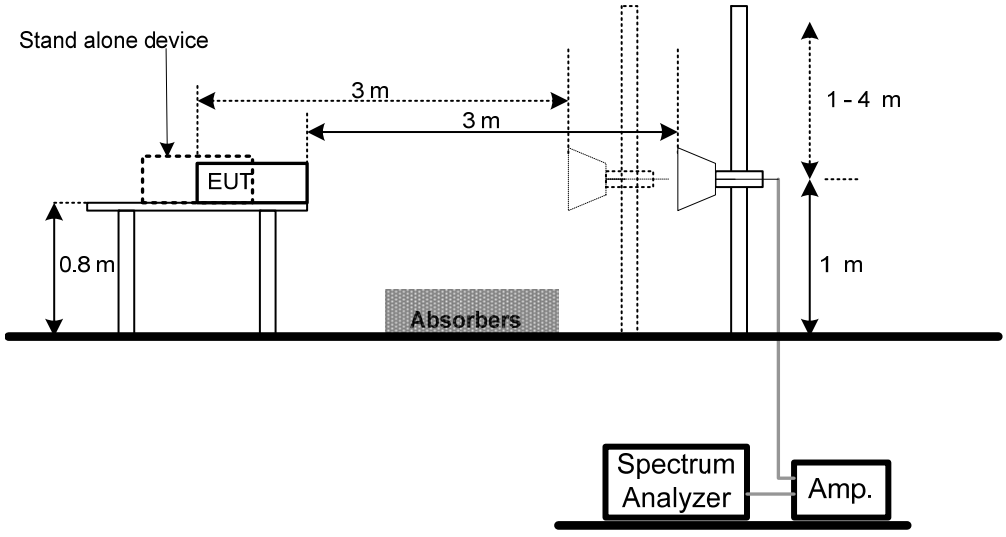
NOTE:

a. Reading in which marked as Peak means measurements by using are Peak Mode with instrument setting in RBW= 1 MHz, VBW= 1 MHz, Swp. Time = Auto.
Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW= 1 MHz, VBW= 10 Hz, Swp. Time = Auto.
b. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform.

9.5 DEVIATION FROM TEST STANDARD

No deviation

9.6 TEST SETUP LAYOUT



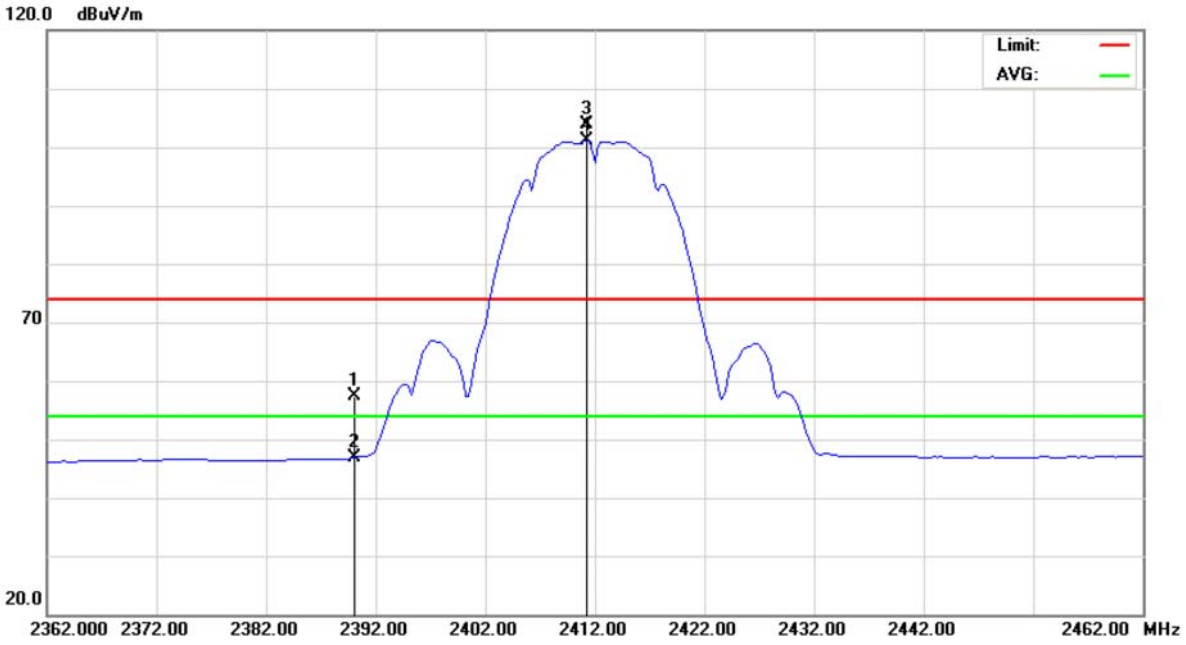
9.7 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 5.6 Unless otherwise a special operating condition is specified in the follows during the testing.

9.8 TEST RESULTS

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2412 MHz		

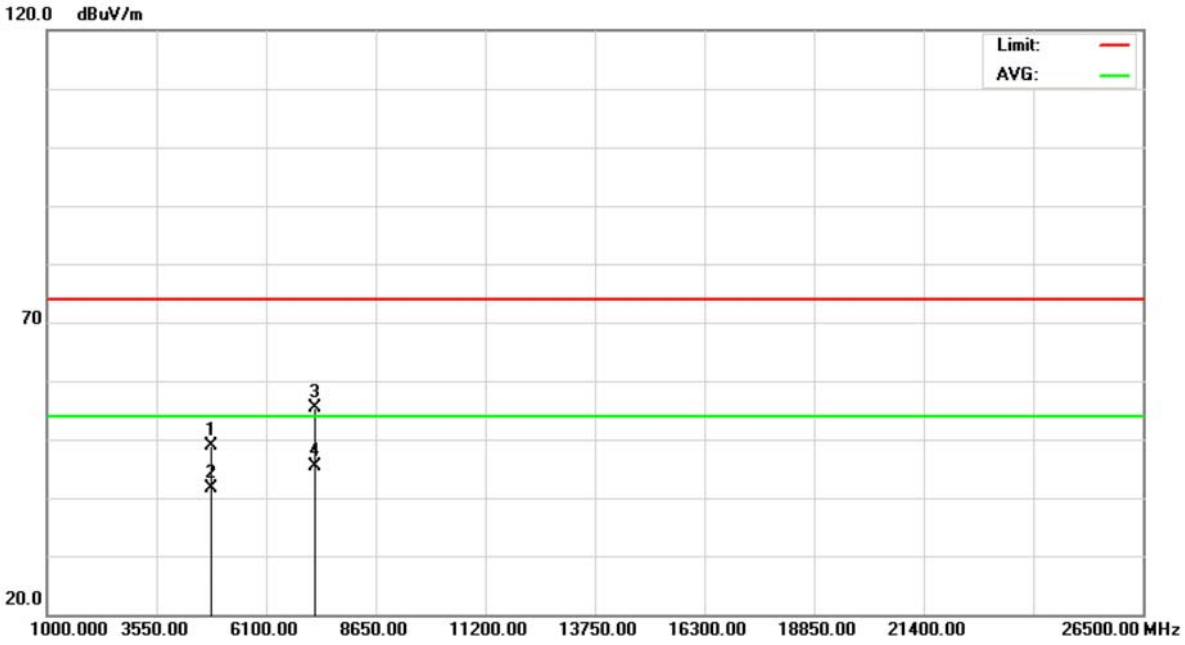
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	24.29	32.99	57.28	74.00	-16.72	peak	
2		2390.000	13.89	32.99	46.88	54.00	-7.12	AVG	
3	X	2411.250	70.78	33.11	103.89	74.00	29.89	peak	
4	*	2411.250	68.04	33.11	101.15	54.00	47.15	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2412 MHz		

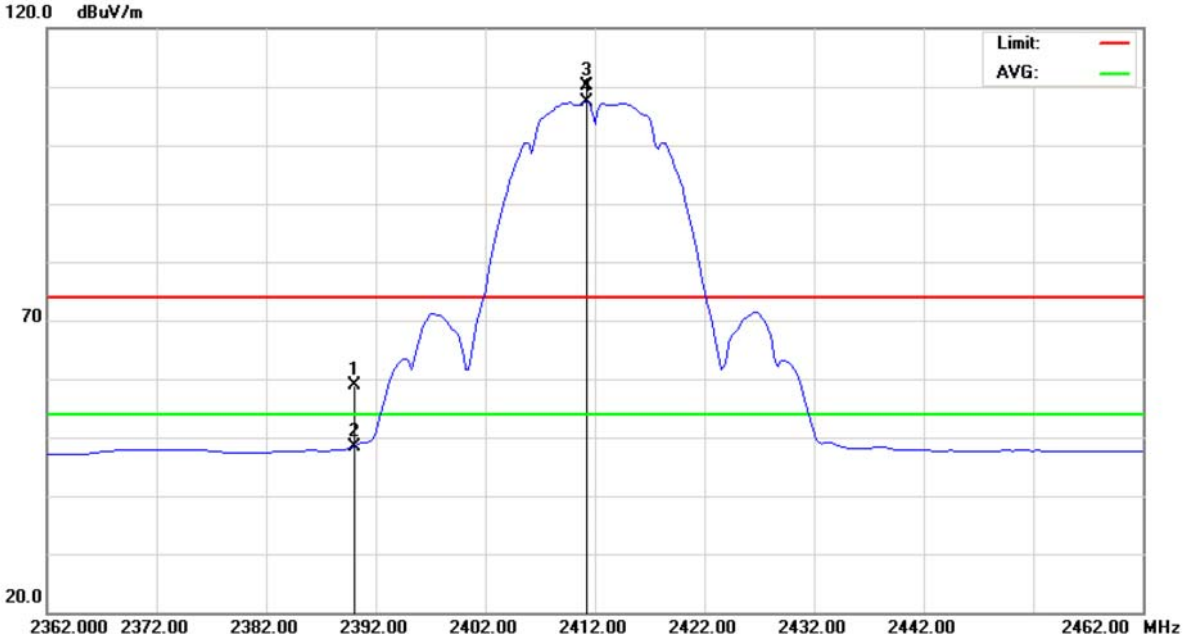
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4823.975	41.51	7.49	49.00	74.00	-25.00	peak	
2		4823.975	34.20	7.49	41.69	54.00	-12.31	AVG	
3		7234.000	40.49	14.86	55.35	74.00	-18.65	peak	
4	*	7234.000	30.44	14.86	45.30	54.00	-8.70	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2412 MHz		

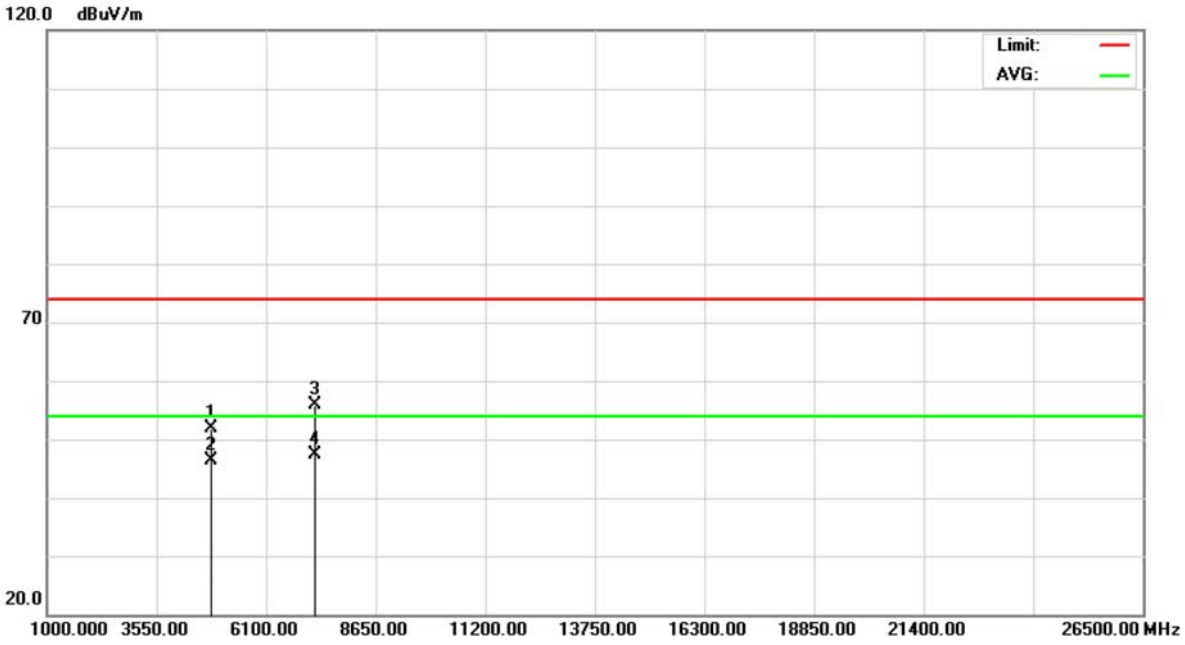
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	25.78	32.99	58.77	74.00	-15.23	peak	
2		2390.000	15.45	32.99	48.44	54.00	-5.56	AVG	
3	X	2411.250	77.01	33.11	110.12	74.00	36.12	peak	
4	*	2411.250	74.24	33.11	107.35	54.00	53.35	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2412 MHz		

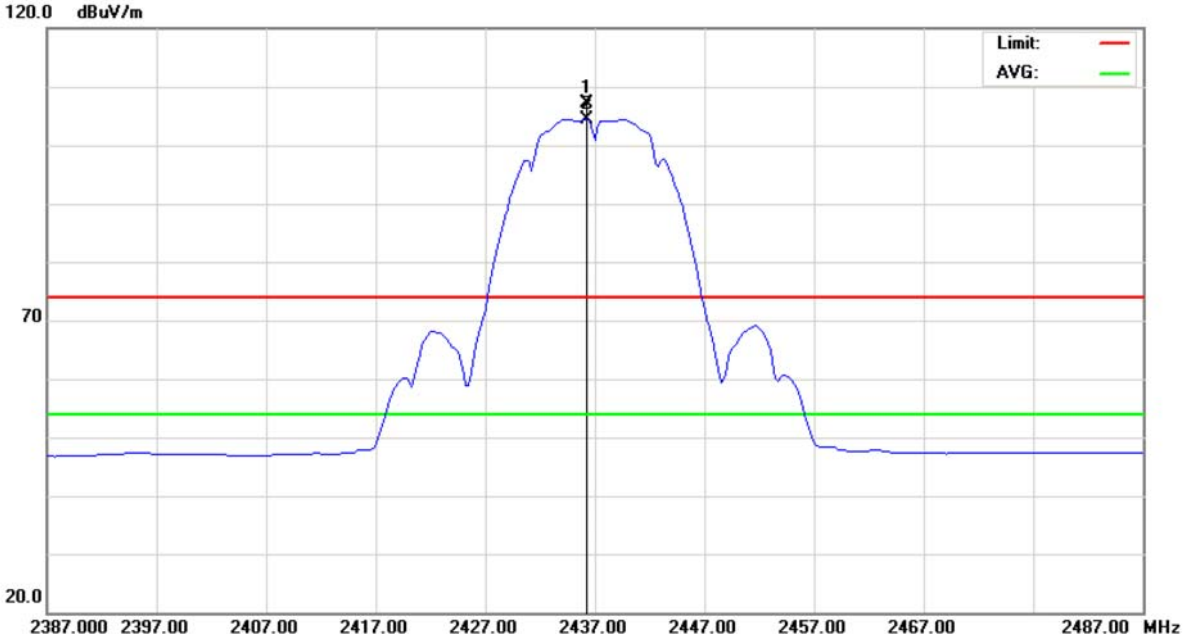
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4823.975	44.30	7.49	51.79	74.00	-22.21	peak	
2		4823.975	38.94	7.49	46.43	54.00	-7.57	AVG	
3		7233.375	41.01	14.86	55.87	74.00	-18.13	peak	
4	*	7233.375	32.50	14.86	47.36	54.00	-6.64	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2437 MHz		

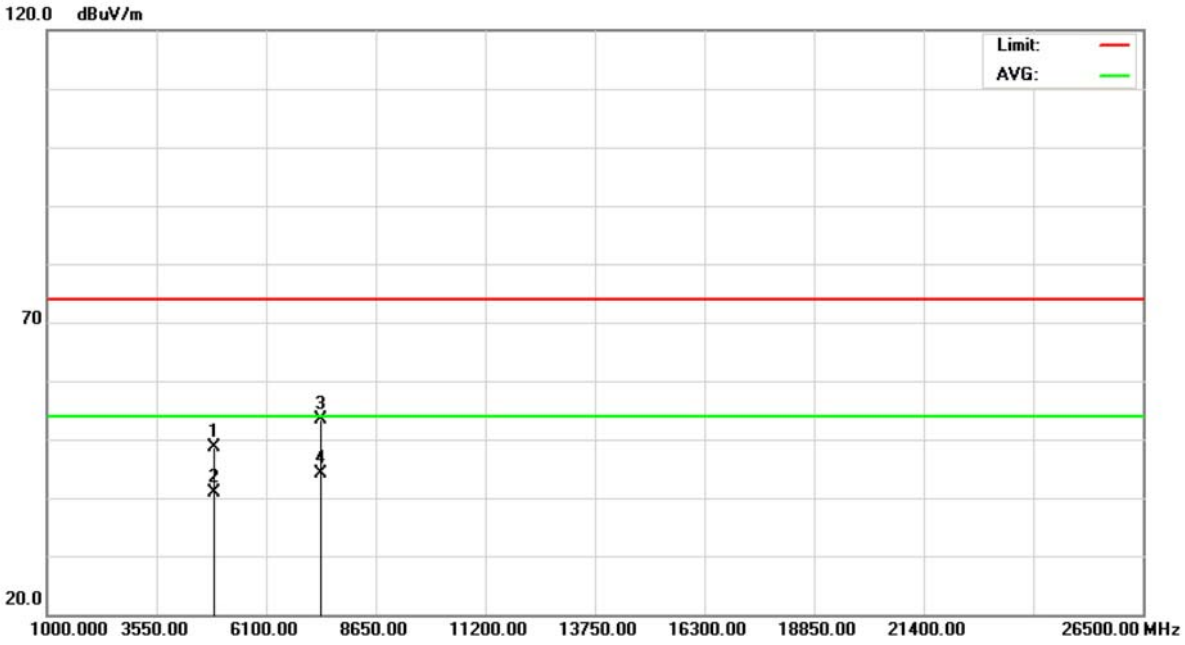
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2436.250	73.78	33.24	107.02	74.00	33.02	peak	
2	*	2436.250	71.18	33.24	104.42	54.00	50.42	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2437 MHz		

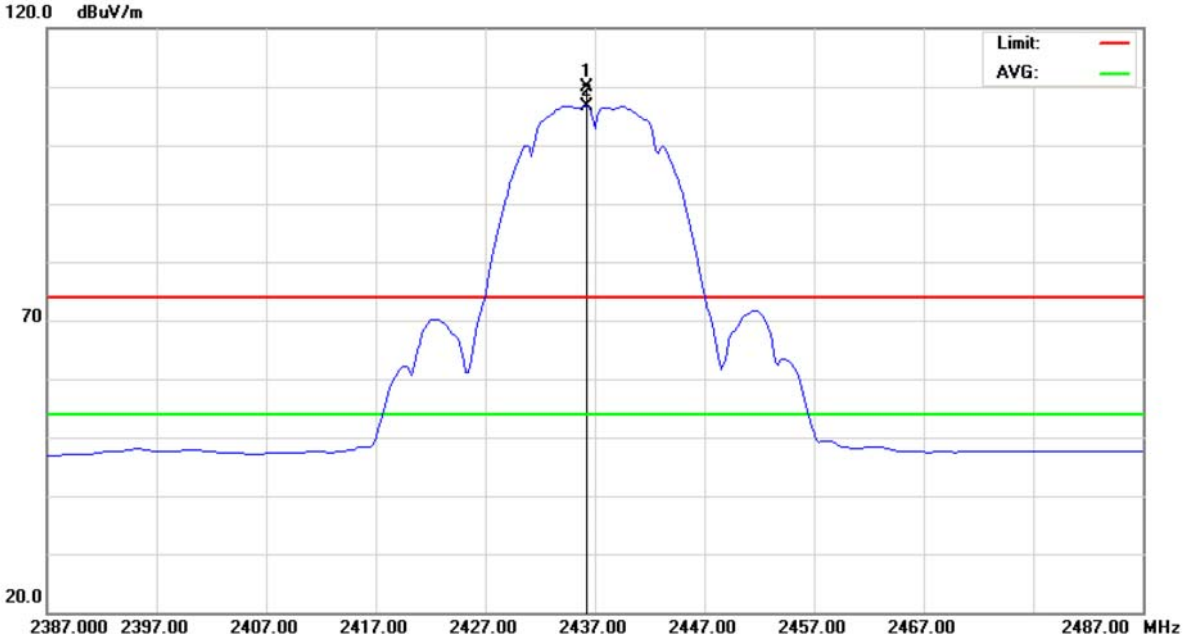
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4873.925	41.07	7.67	48.74	74.00	-25.26	peak	
2		4873.925	33.15	7.67	40.82	54.00	-13.18	AVG	
3		7311.375	38.30	15.07	53.37	74.00	-20.63	peak	
4	*	7311.375	28.99	15.07	44.06	54.00	-9.94	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2437 MHz		

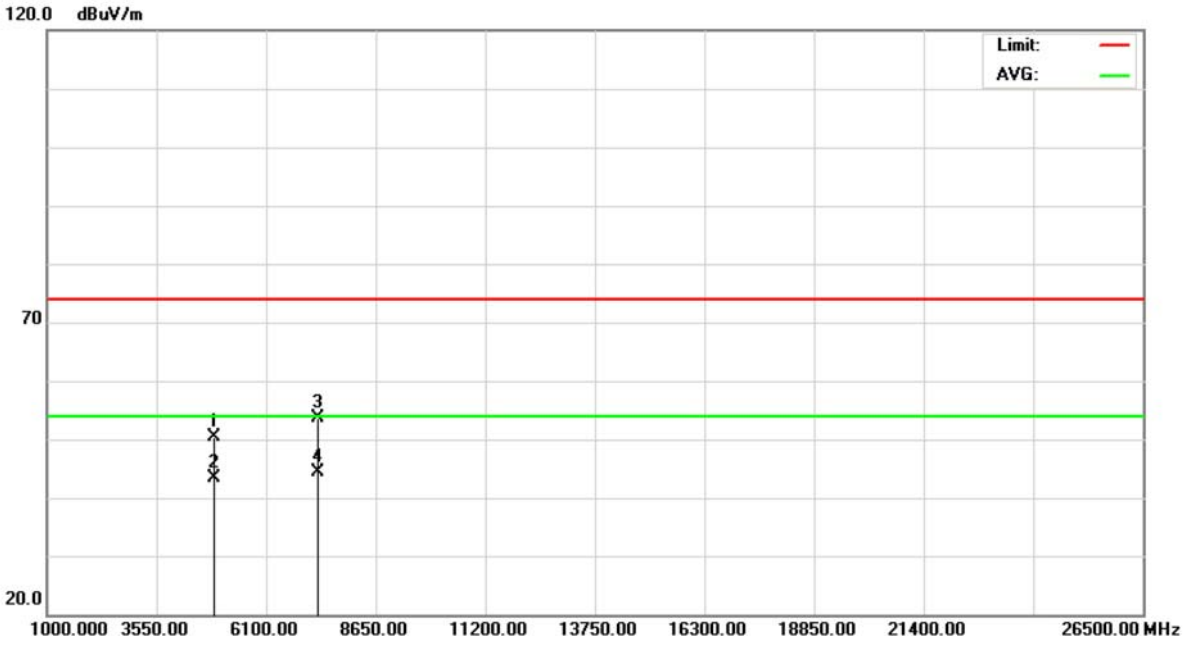
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2436.250	76.60	33.24	109.84	74.00	35.84	peak	
2	*	2436.250	73.43	33.24	106.67	54.00	52.67	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2437 MHz		

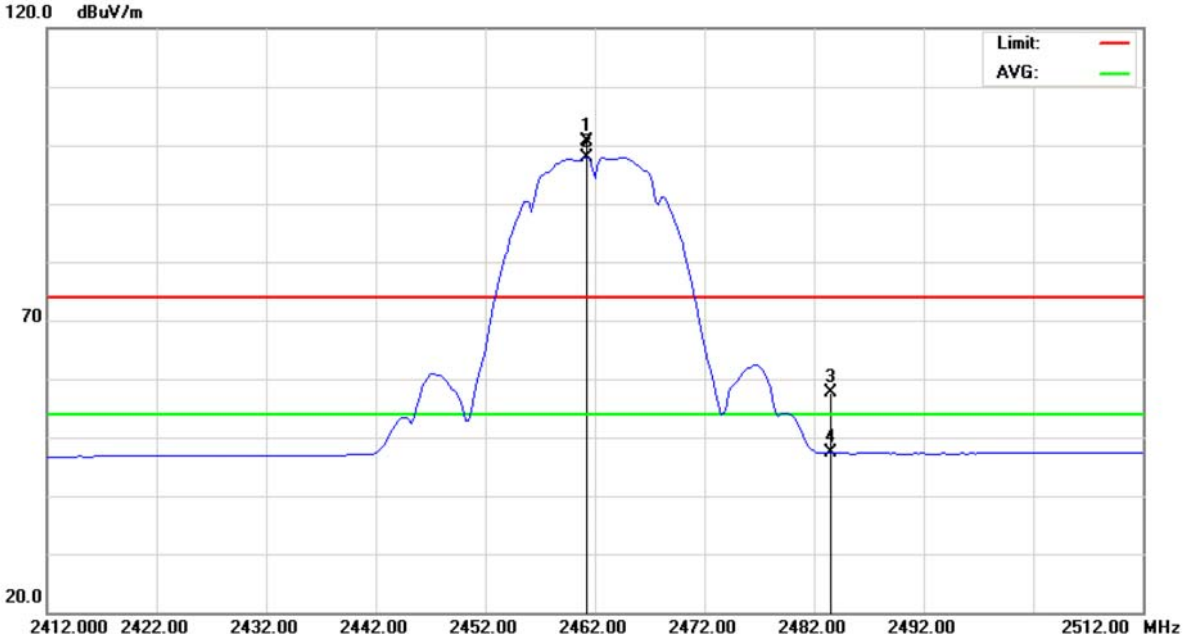
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4873.950	42.69	7.67	50.36	74.00	-23.64	peak	
2		4873.950	35.77	7.67	43.44	54.00	-10.56	AVG	
3		7309.750	38.69	15.06	53.75	74.00	-20.25	peak	
4	*	7309.750	29.31	15.06	44.37	54.00	-9.63	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2462 MHz		

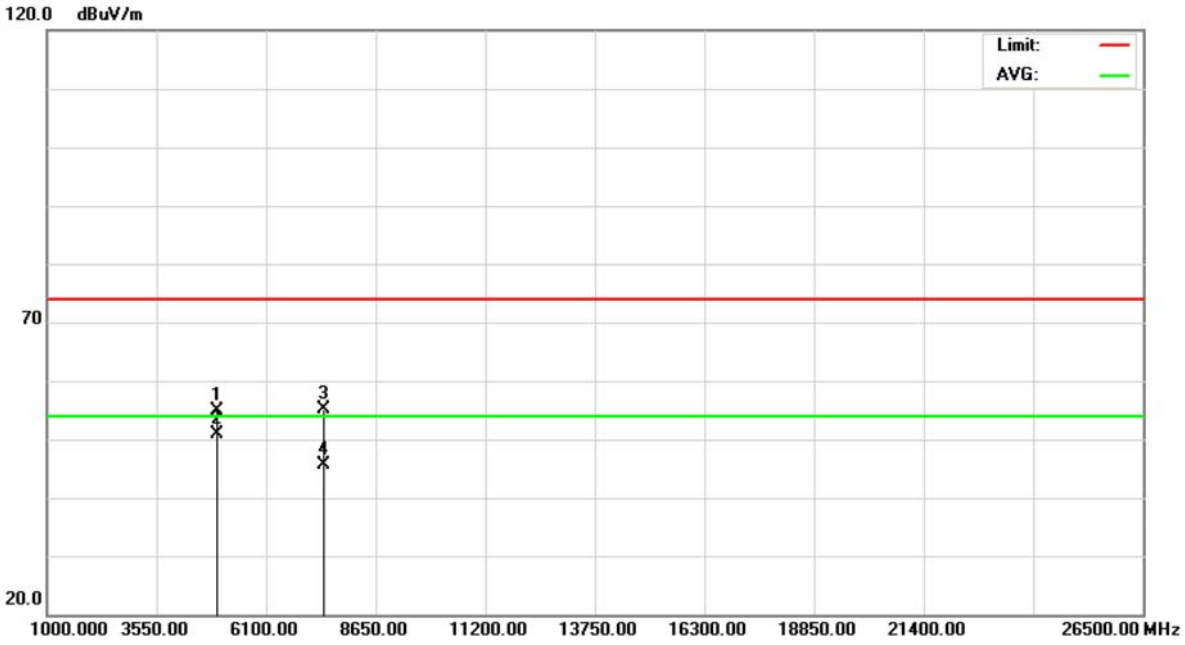
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2461.250	67.29	33.38	100.67	74.00	26.67	peak	
2	*	2461.250	64.52	33.38	97.90	54.00	43.90	AVG	
3		2483.500	24.17	33.50	57.67	74.00	-16.33	peak	
4		2483.500	14.00	33.50	47.50	54.00	-6.50	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2462 MHz		

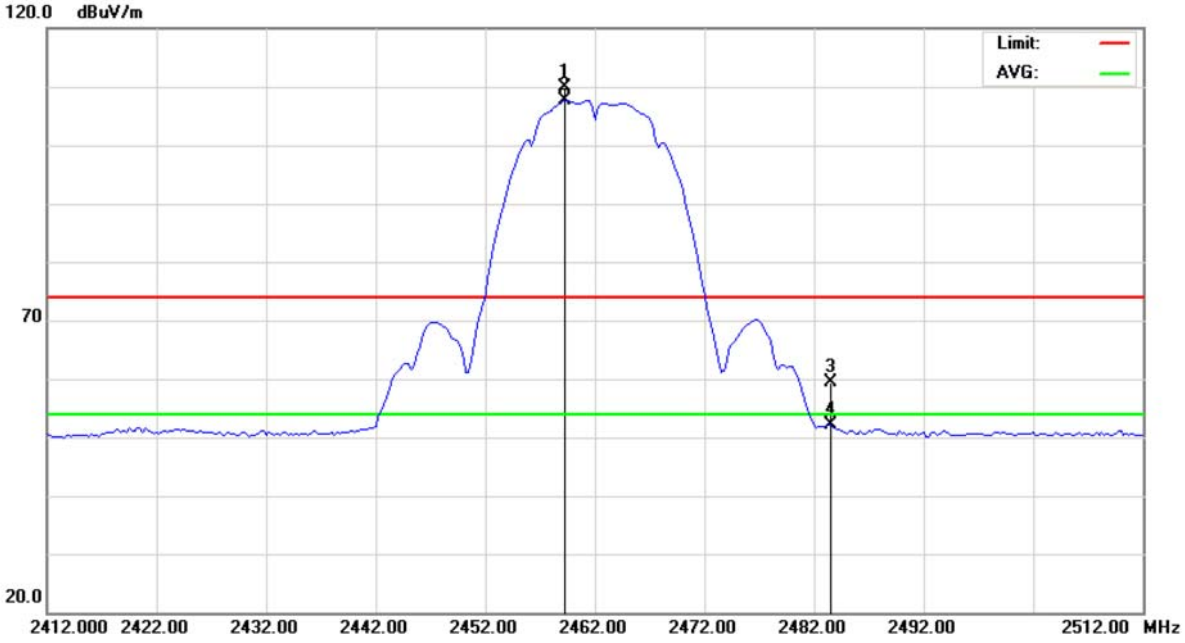
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4923.975	47.02	7.85	54.87	74.00	-19.13	peak	
2	*	4923.975	42.94	7.85	50.79	54.00	-3.21	AVG	
3		7388.875	39.95	15.27	55.22	74.00	-18.78	peak	
4		7388.875	30.42	15.27	45.69	54.00	-8.31	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2462 MHz		

Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2459.250	76.51	33.37	109.88	74.00	35.88	peak	
2	*	2459.250	74.23	33.37	107.60	54.00	53.60	AVG	
3		2483.500	25.91	33.50	59.41	74.00	-14.59	peak	
4		2483.500	18.60	33.50	52.10	54.00	-1.90	AVG	

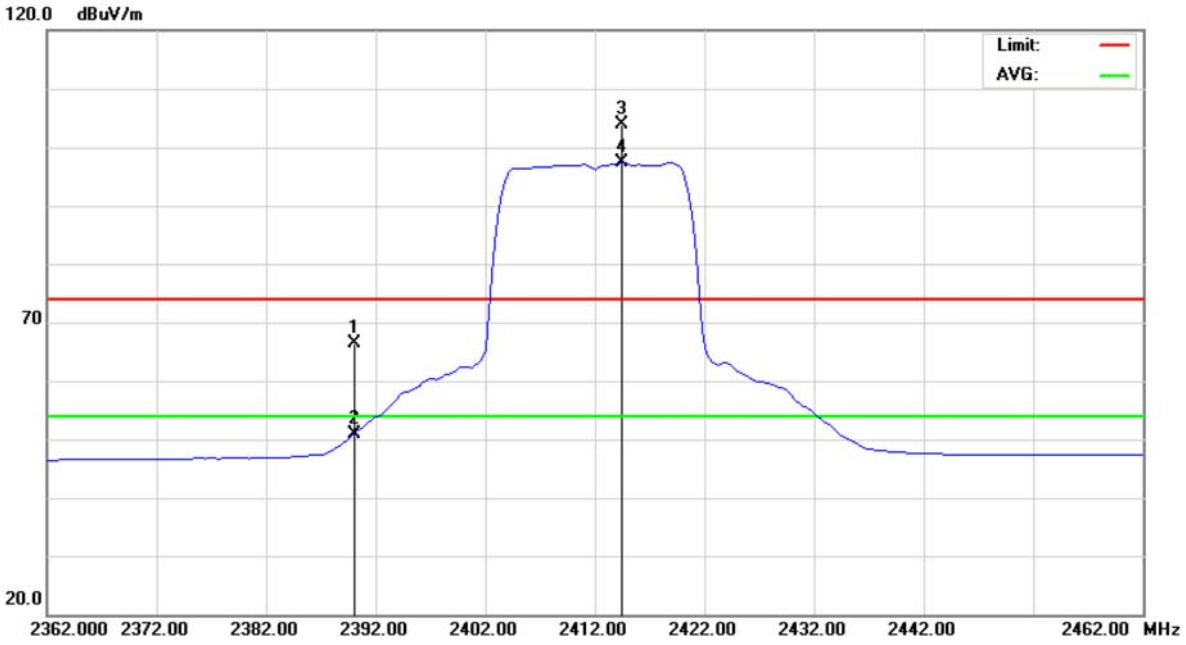
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2462 MHz		

Polarization: Horizontal

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4924.250	41.37	7.85	49.22	74.00	-24.78	peak	
2	*	4924.250	34.14	7.85	41.99	54.00	-12.01	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2412 MHz		

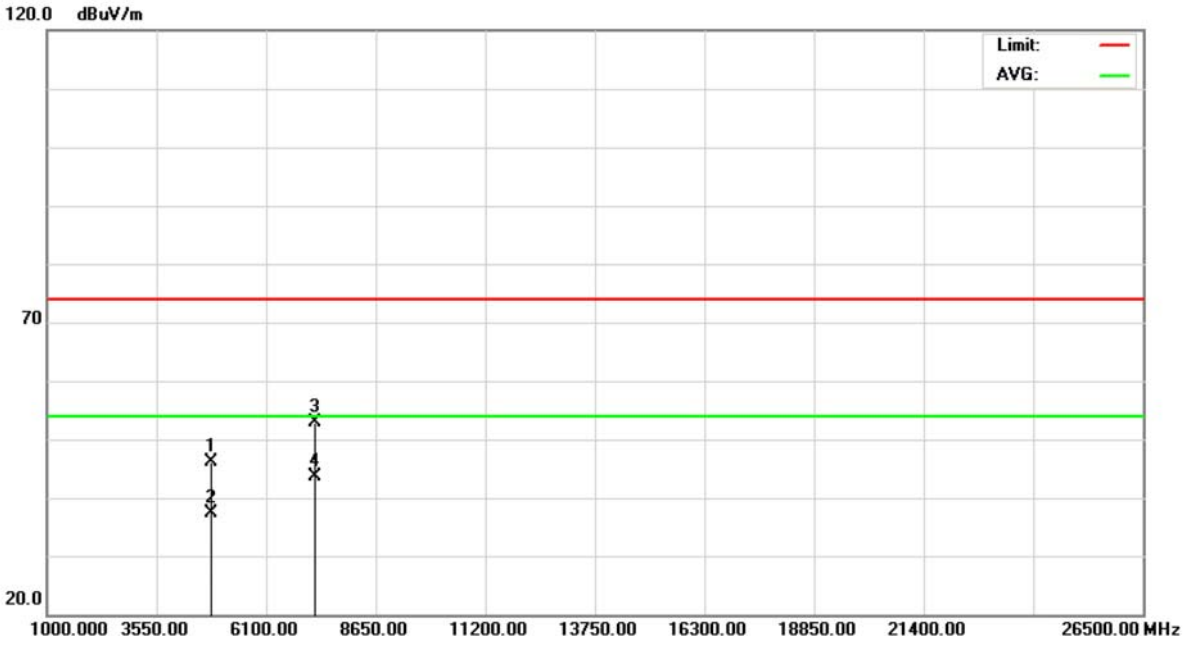
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	33.42	32.99	66.41	74.00	-7.59	peak	
2		2390.000	17.96	32.99	50.95	54.00	-3.05	AVG	
3	X	2414.500	70.81	33.12	103.93	74.00	29.93	peak	
4	*	2414.500	64.16	33.12	97.28	54.00	43.28	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2412 MHz		

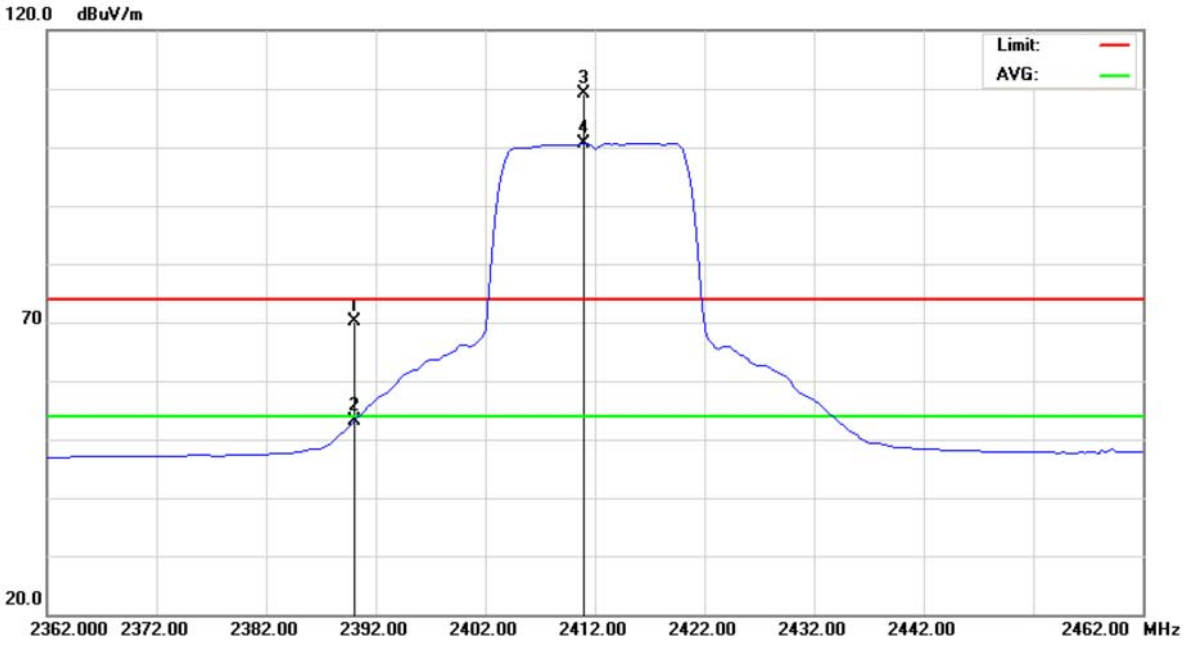
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4824.250	38.68	7.49	46.17	74.00	-27.83	peak	
2		4824.250	29.98	7.49	37.47	54.00	-16.53	AVG	
3		7236.050	38.05	14.87	52.92	74.00	-21.08	peak	
4	*	7236.050	28.83	14.87	43.70	54.00	-10.30	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2412 MHz		

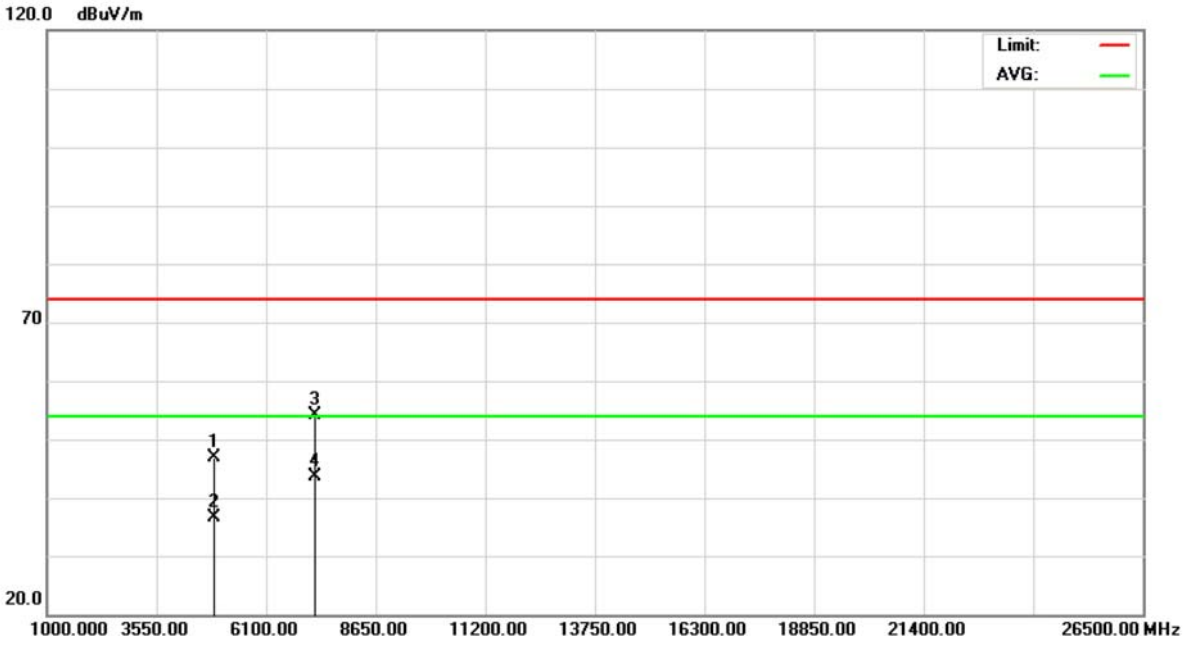
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	37.09	32.99	70.08	74.00	-3.92	peak	
2		2390.000	20.19	32.99	53.18	54.00	-0.82	AVG	
3	X	2411.000	76.04	33.11	109.15	74.00	35.15	peak	
4	*	2411.000	67.48	33.11	100.59	54.00	46.59	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2412 MHz		

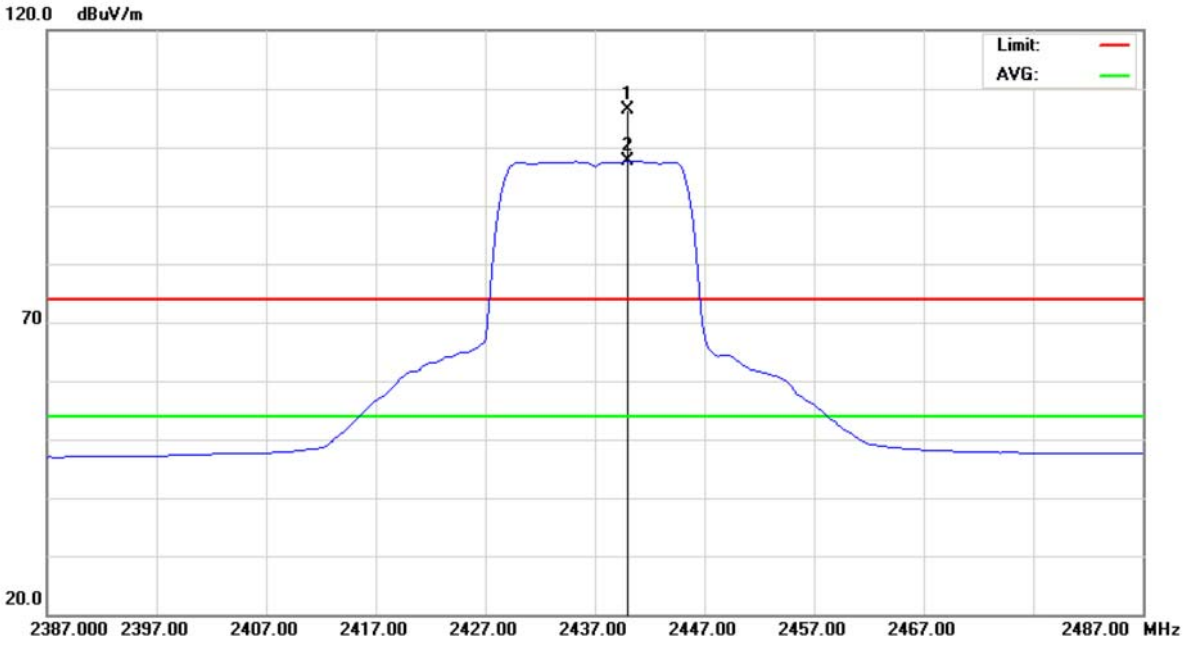
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4826.000	39.34	7.49	46.83	74.00	-27.17	peak	
2		4826.000	29.26	7.49	36.75	54.00	-17.25	AVG	
3		7237.750	39.25	14.87	54.12	74.00	-19.88	peak	
4	*	7237.750	28.80	14.87	43.67	54.00	-10.33	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2437 MHz		

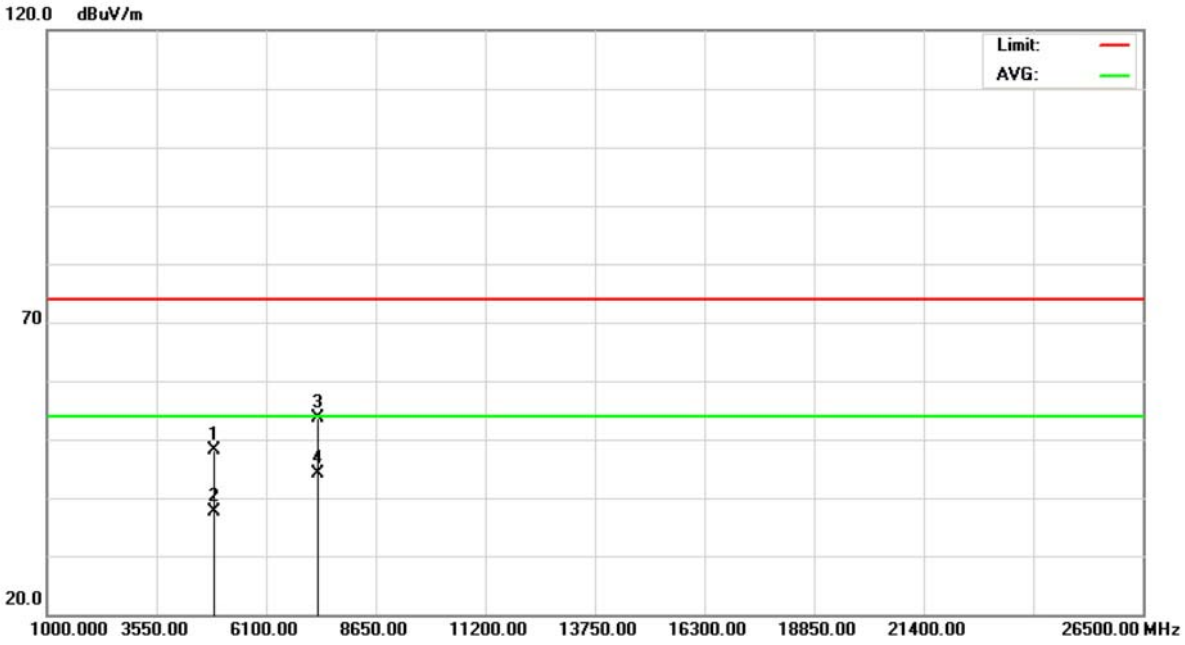
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2440.000	73.02	33.26	106.28	74.00	32.28	peak	
2	*	2440.000	64.28	33.26	97.54	54.00	43.54	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2437 MHz		

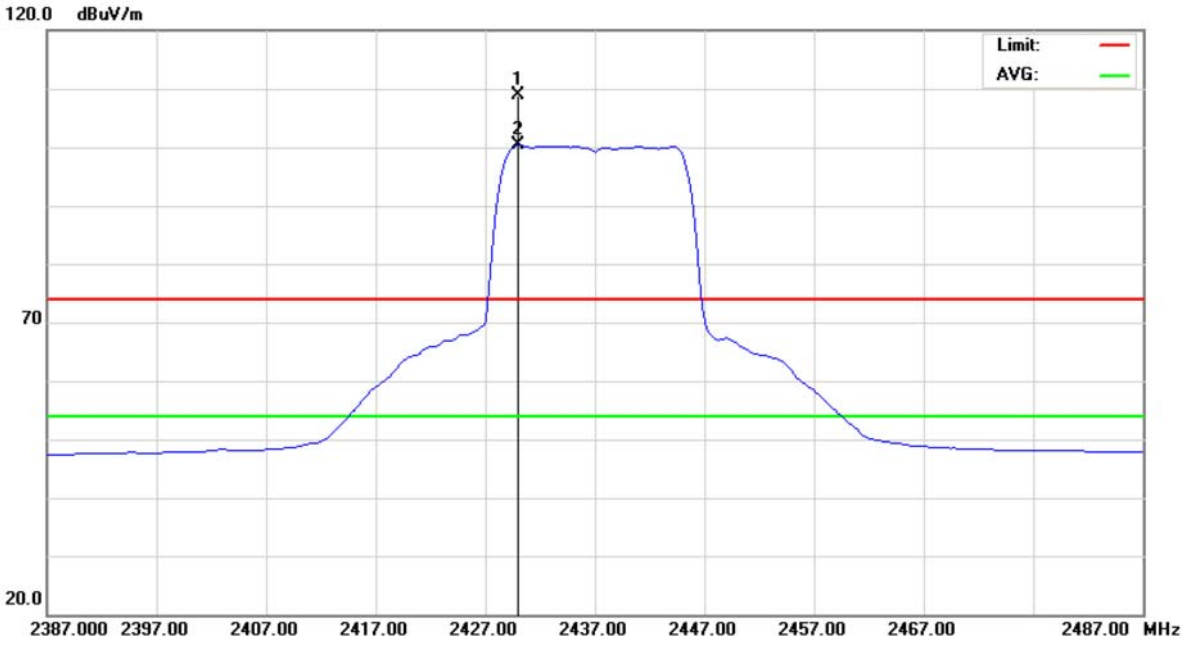
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4875.000	40.34	7.67	48.01	74.00	-25.99	peak	
2		4875.000	30.08	7.67	37.75	54.00	-16.25	AVG	
3		7307.500	38.60	15.06	53.66	74.00	-20.34	peak	
4	*	7307.500	29.10	15.06	44.16	54.00	-9.84	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2437 MHz		

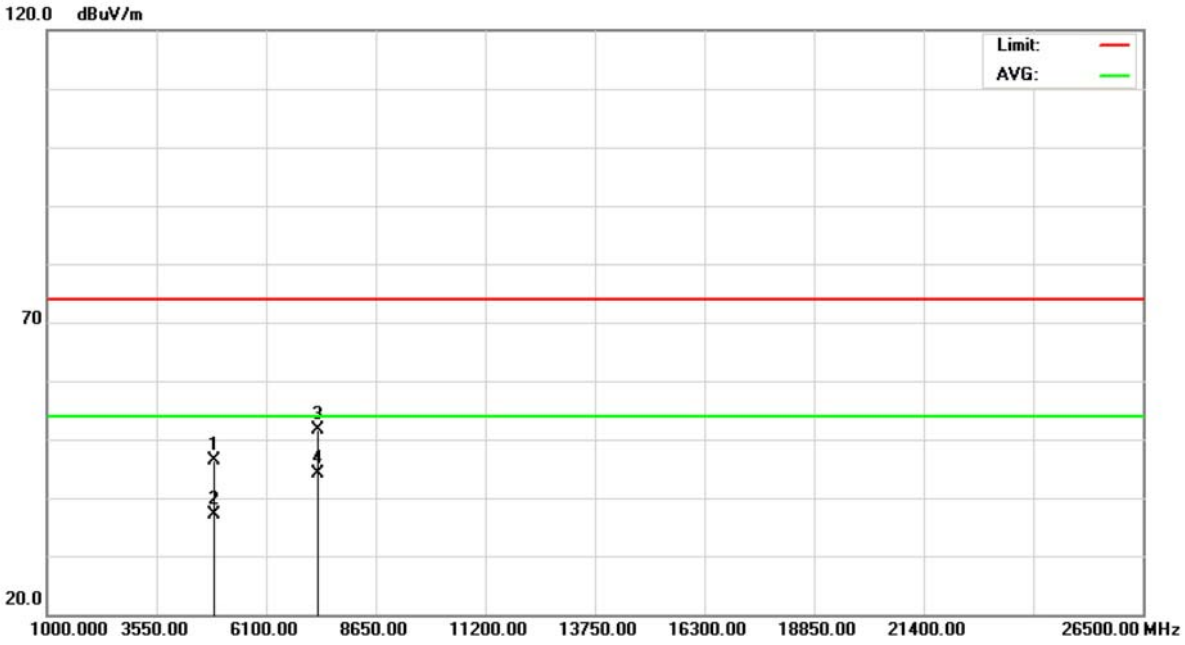
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2430.000	75.59	33.21	108.80	74.00	34.80	peak	
2	*	2430.000	67.11	33.21	100.32	54.00	46.32	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2437 MHz		

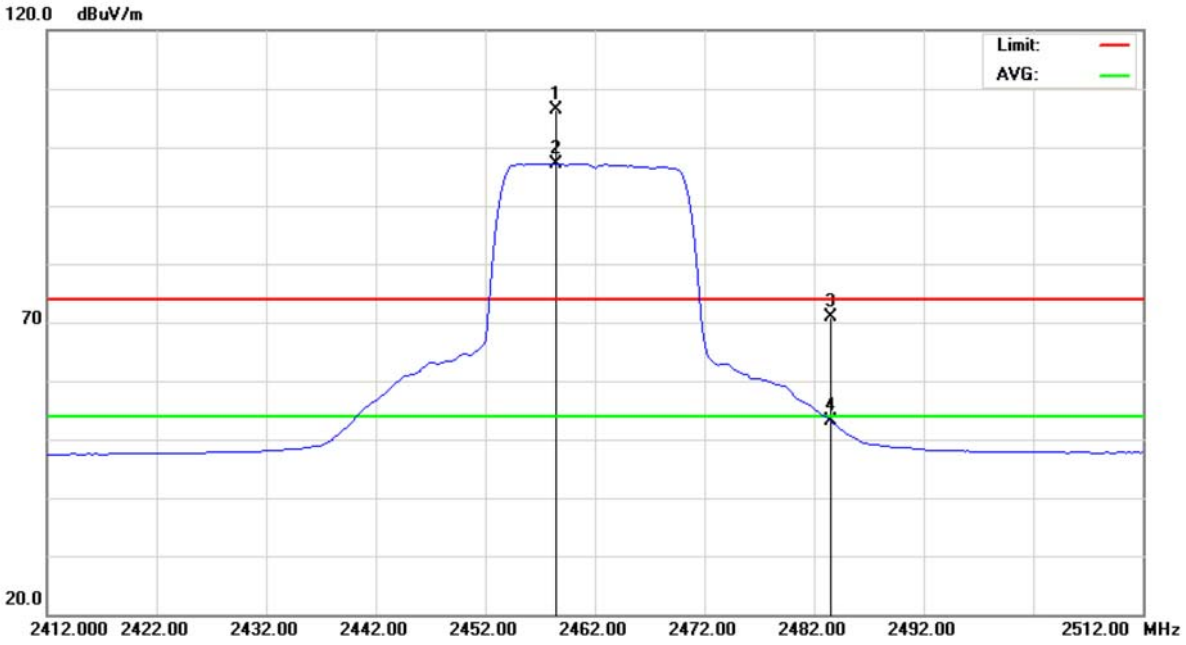
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4876.750	38.60	7.68	46.28	74.00	-27.72	peak	
2		4876.750	29.38	7.68	37.06	54.00	-16.94	AVG	
3		7310.000	36.48	15.06	51.54	74.00	-22.46	peak	
4	*	7310.000	29.02	15.06	44.08	54.00	-9.92	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2462 MHz		

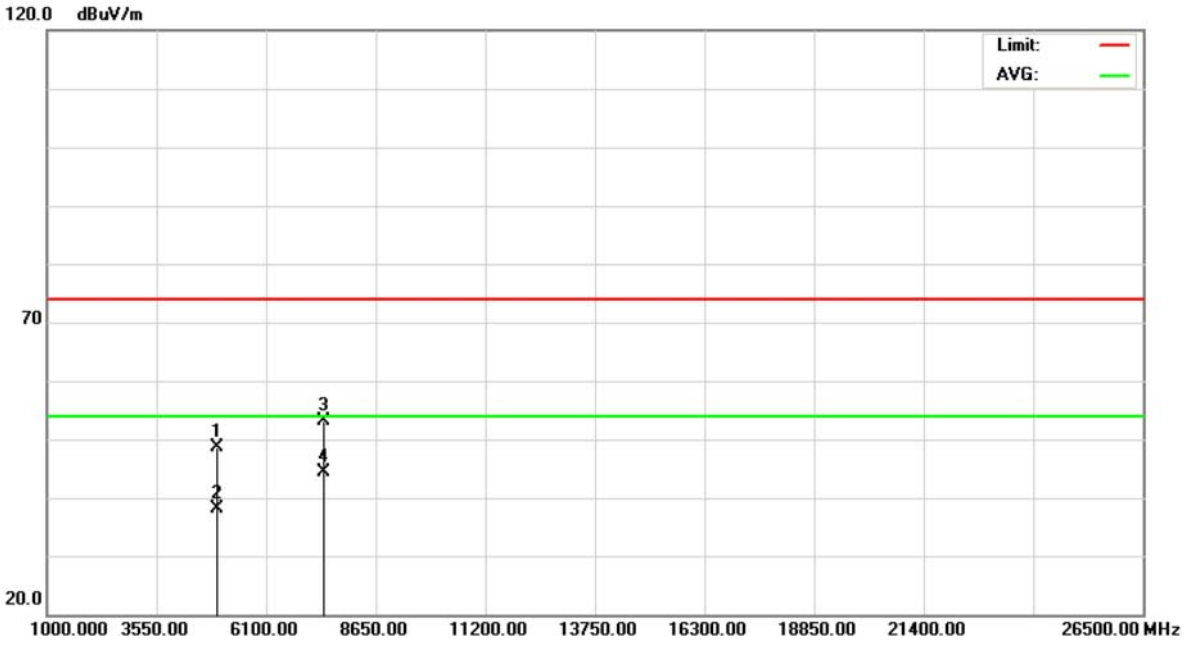
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2458.500	72.95	33.36	106.31	74.00	32.31	peak	
2	*	2458.500	63.87	33.36	97.23	54.00	43.23	AVG	
3		2483.500	37.32	33.50	70.82	74.00	-3.18	peak	
4		2483.500	19.65	33.50	53.15	54.00	-0.85	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2462 MHz		

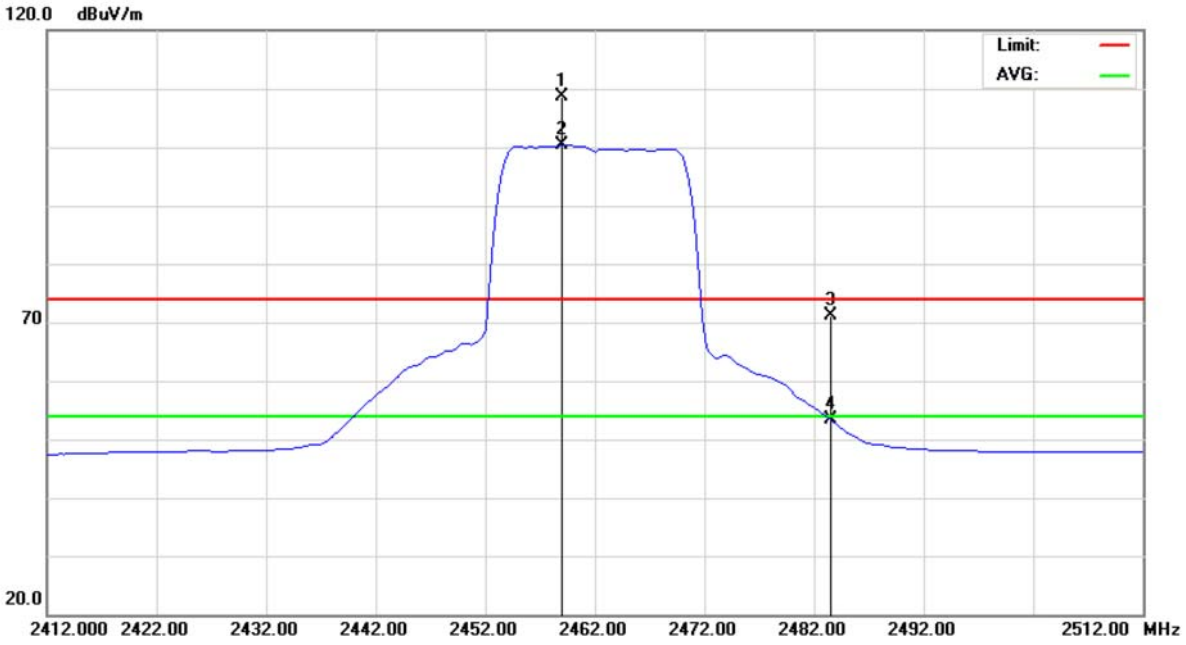
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4924.000	40.87	7.85	48.72	74.00	-25.28	peak	
2		4924.000	30.26	7.85	38.11	54.00	-15.89	AVG	
3		7384.750	37.97	15.26	53.23	74.00	-20.77	peak	
4	*	7384.750	29.23	15.26	44.49	54.00	-9.51	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2462 MHz		

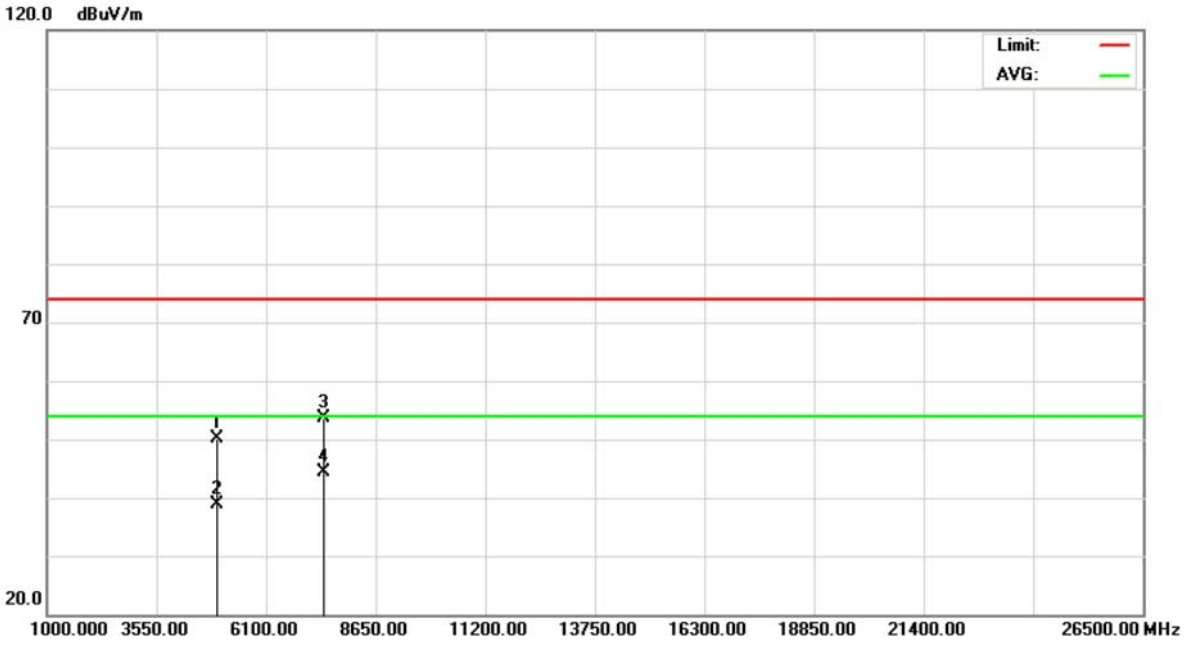
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2459.000	75.34	33.37	108.71	74.00	34.71	peak	
2	*	2459.000	66.92	33.37	100.29	54.00	46.29	AVG	
3		2483.500	37.58	33.50	71.08	74.00	-2.92	peak	
4		2483.500	19.78	33.50	53.28	54.00	-0.72	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2462 MHz		

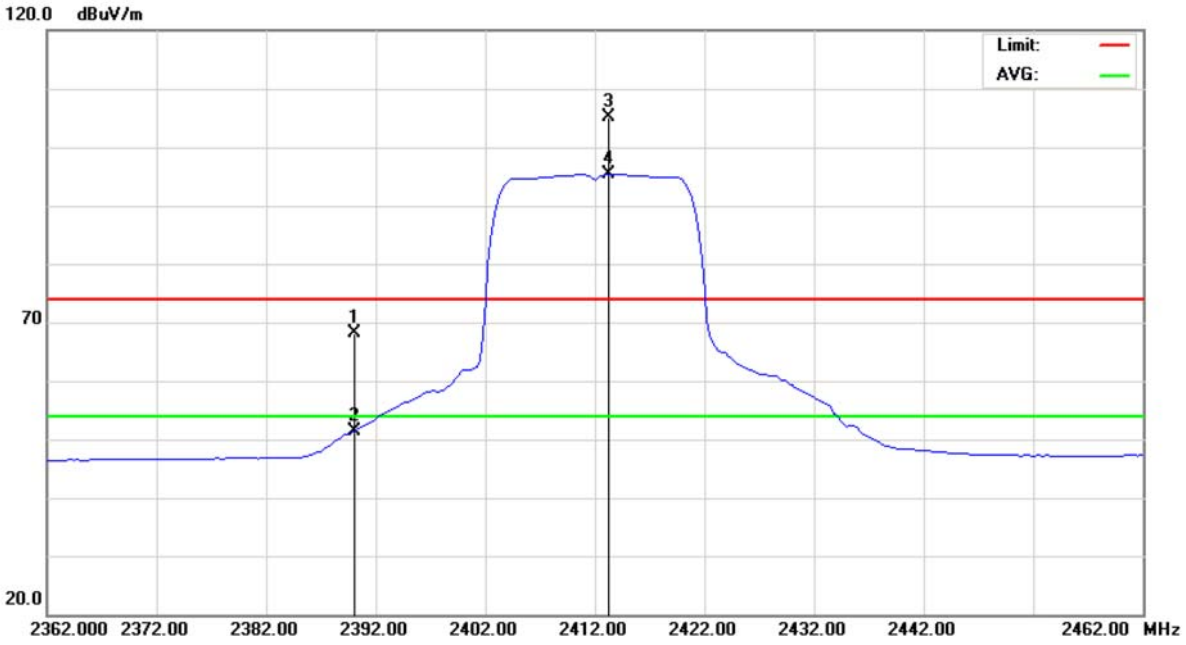
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4924.000	42.26	7.85	50.11	74.00	-23.89	peak	
2		4924.000	30.94	7.85	38.79	54.00	-15.21	AVG	
3		7385.000	38.44	15.26	53.70	74.00	-20.30	peak	
4	*	7385.000	29.12	15.26	44.38	54.00	-9.62	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2412 MHz		

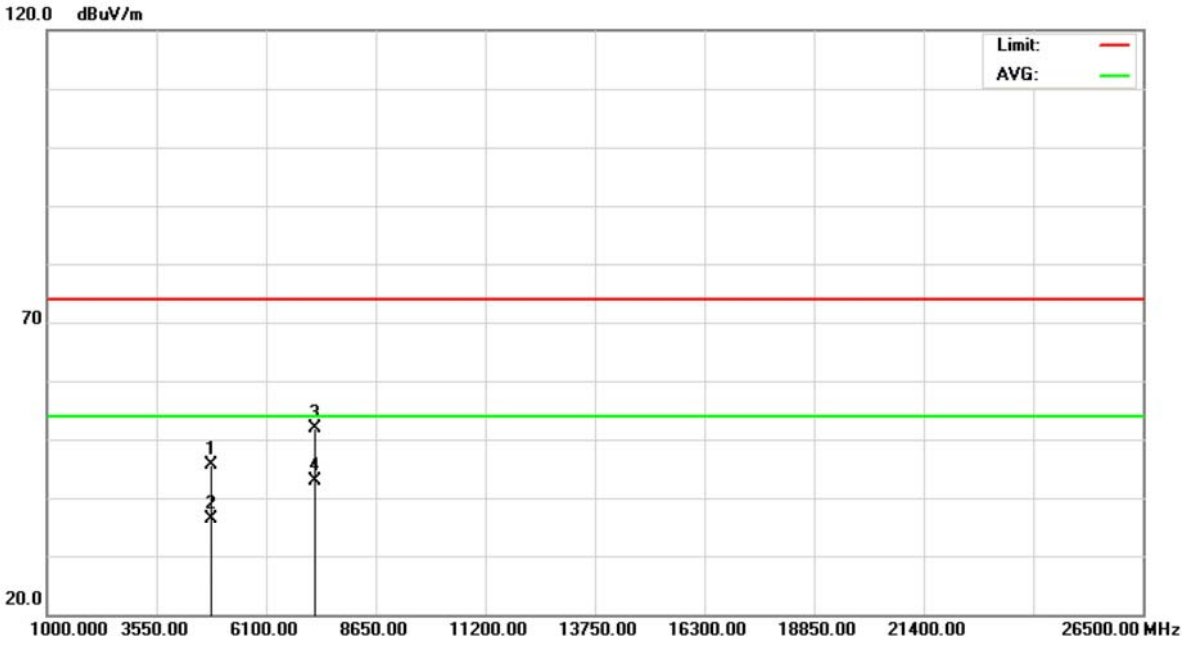
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	35.09	32.99	68.08	74.00	-5.92	peak	
2		2390.000	18.49	32.99	51.48	54.00	-2.52	AVG	
3	X	2413.250	71.91	33.12	105.03	74.00	31.03	peak	
4	*	2413.250	62.23	33.12	95.35	54.00	41.35	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2412 MHz		

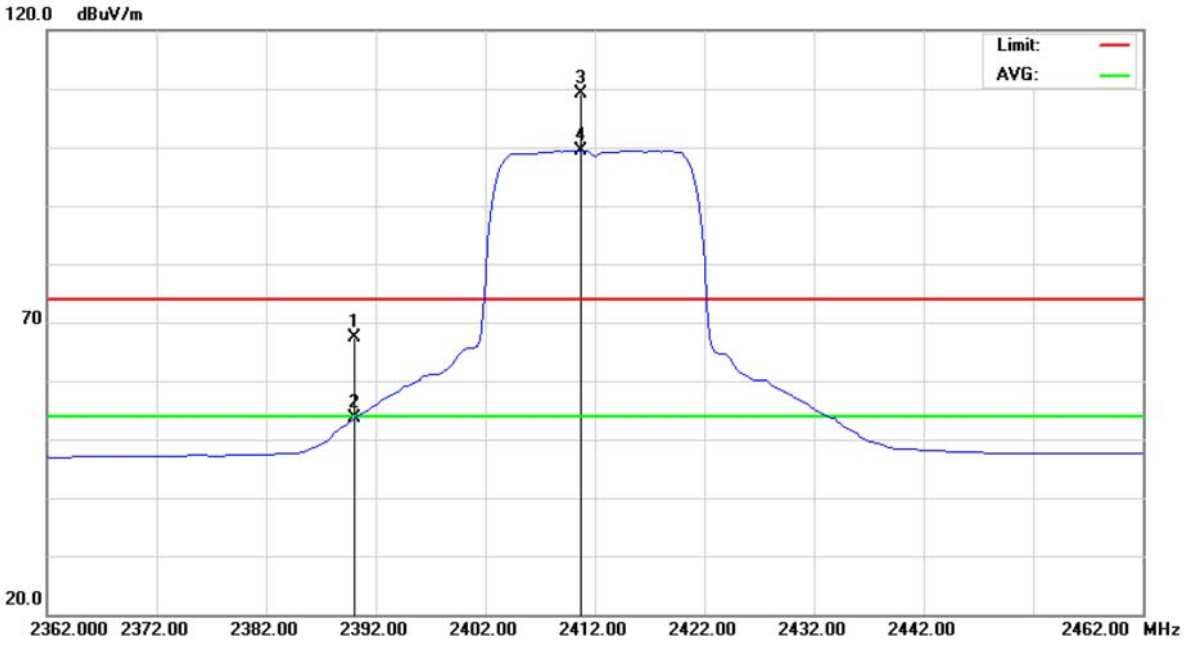
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4823.250	38.90	6.63	45.53	74.00	-28.47	peak	
2		4823.250	29.70	6.63	36.33	54.00	-17.67	AVG	
3		7235.250	38.19	13.65	51.84	74.00	-22.16	peak	
4	*	7235.250	29.21	13.65	42.86	54.00	-11.14	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2412 MHz		

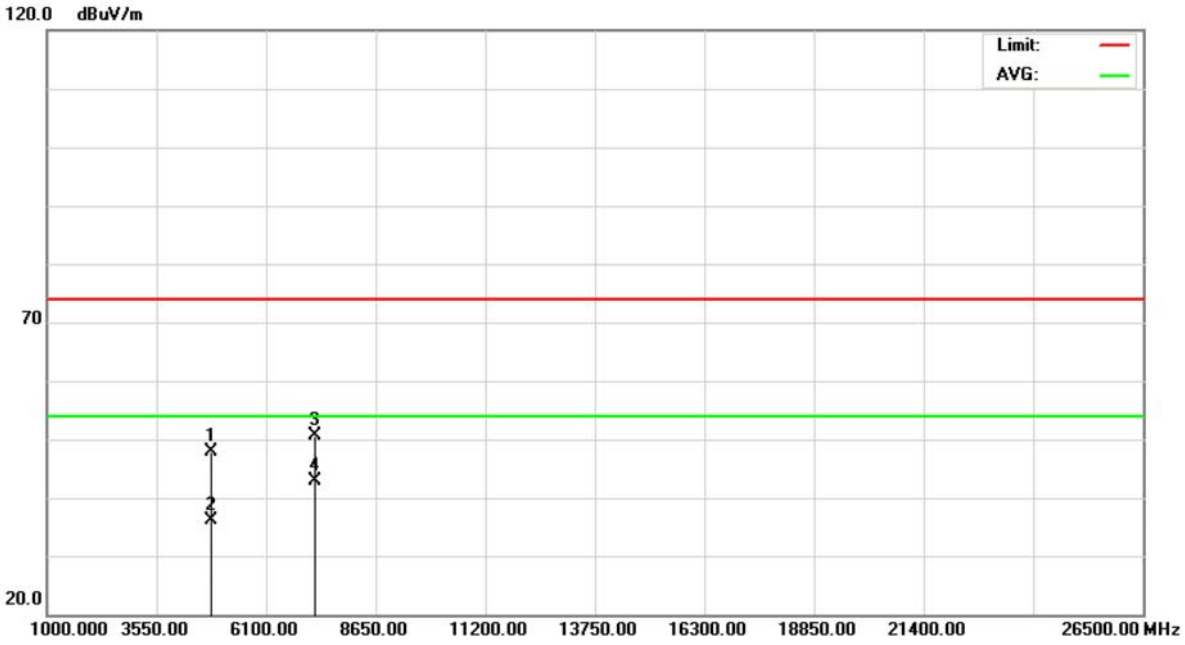
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	34.42	32.99	67.41	74.00	-6.59	peak	
2		2390.000	20.59	32.99	53.58	54.00	-0.42	AVG	
3	X	2410.750	75.99	33.10	109.09	74.00	35.09	peak	
4	*	2410.750	66.25	33.10	99.35	54.00	45.35	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2412 MHz		

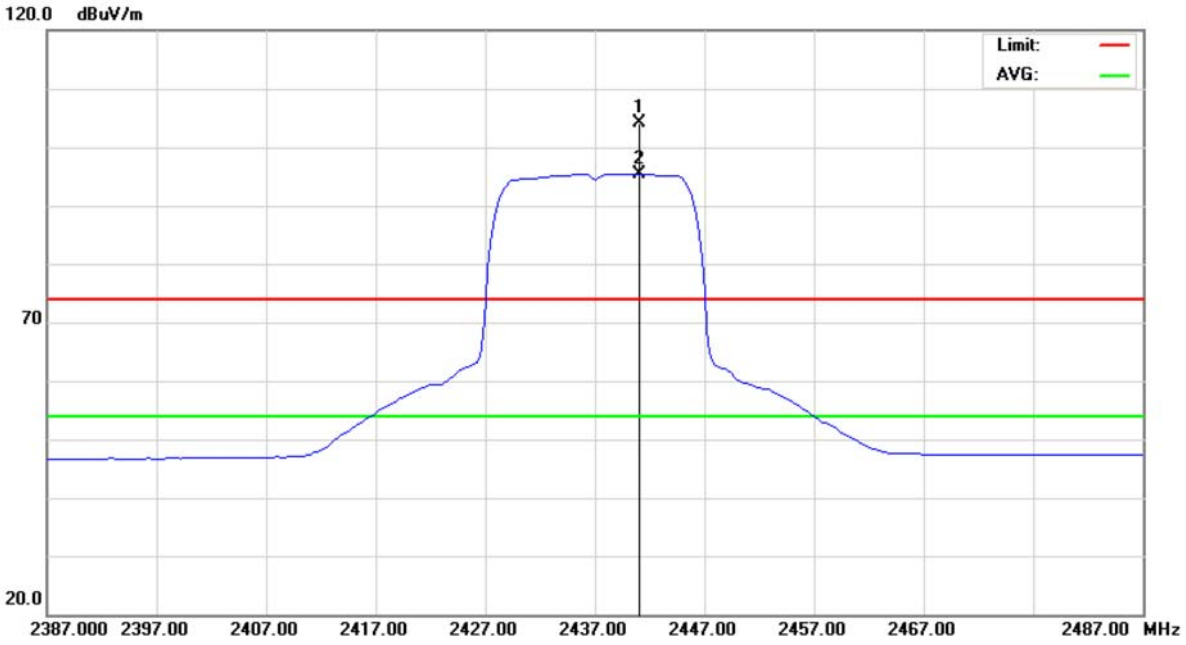
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4823.250	41.15	6.63	47.78	74.00	-26.22	peak	
2		4823.250	29.55	6.63	36.18	54.00	-17.82	AVG	
3		7235.250	37.06	13.65	50.71	74.00	-23.29	peak	
4	*	7235.250	29.21	13.65	42.86	54.00	-11.14	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2437 MHz		

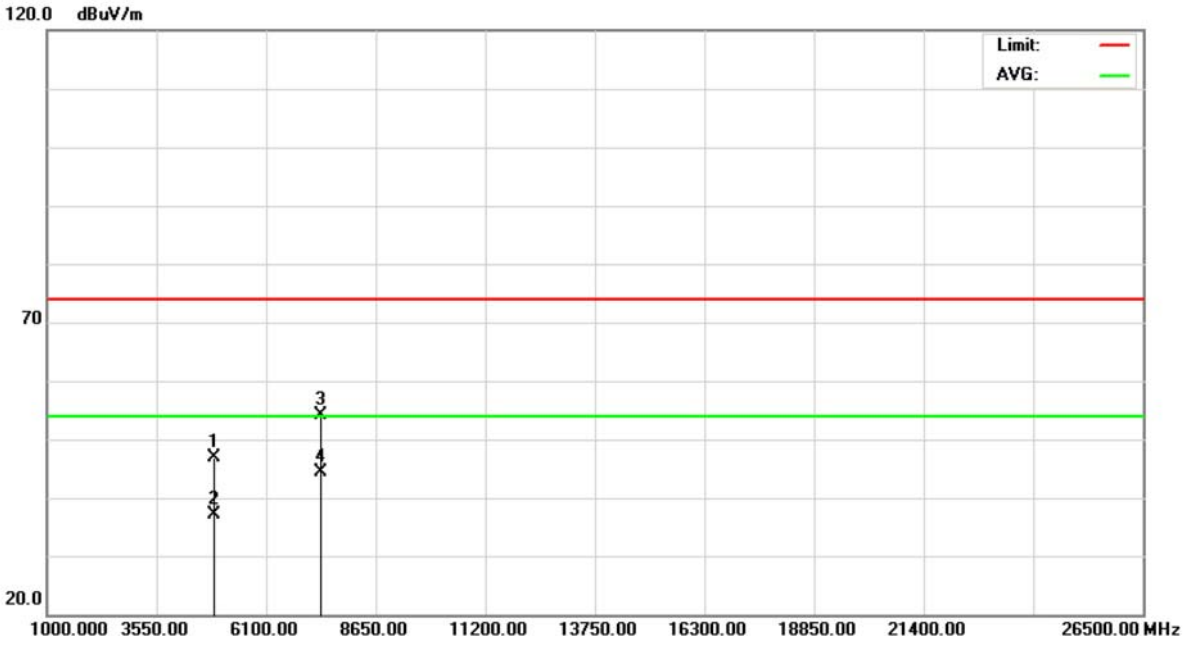
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2441.000	70.87	33.27	104.14	74.00	30.14	peak	
2	*	2441.000	62.17	33.27	95.44	54.00	41.44	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2437 MHz		

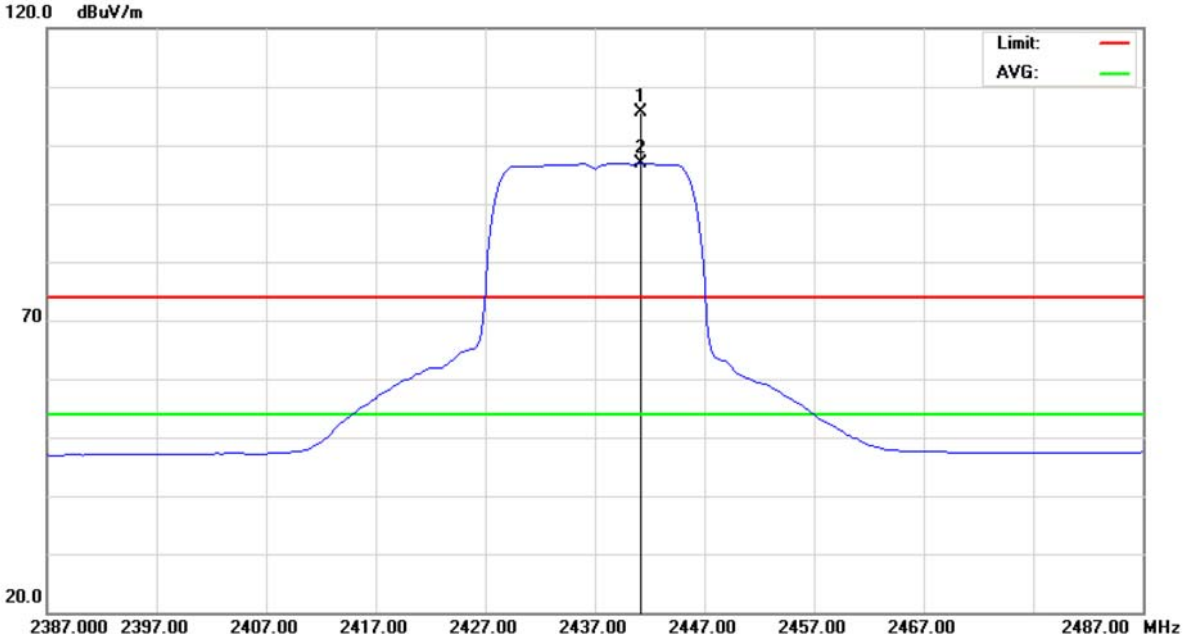
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4872.250	39.25	7.66	46.91	74.00	-27.09	peak	
2		4872.250	29.52	7.66	37.18	54.00	-16.82	AVG	
3		7312.000	39.06	15.07	54.13	74.00	-19.87	peak	
4	*	7312.000	29.23	15.07	44.30	54.00	-9.70	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2437 MHz		

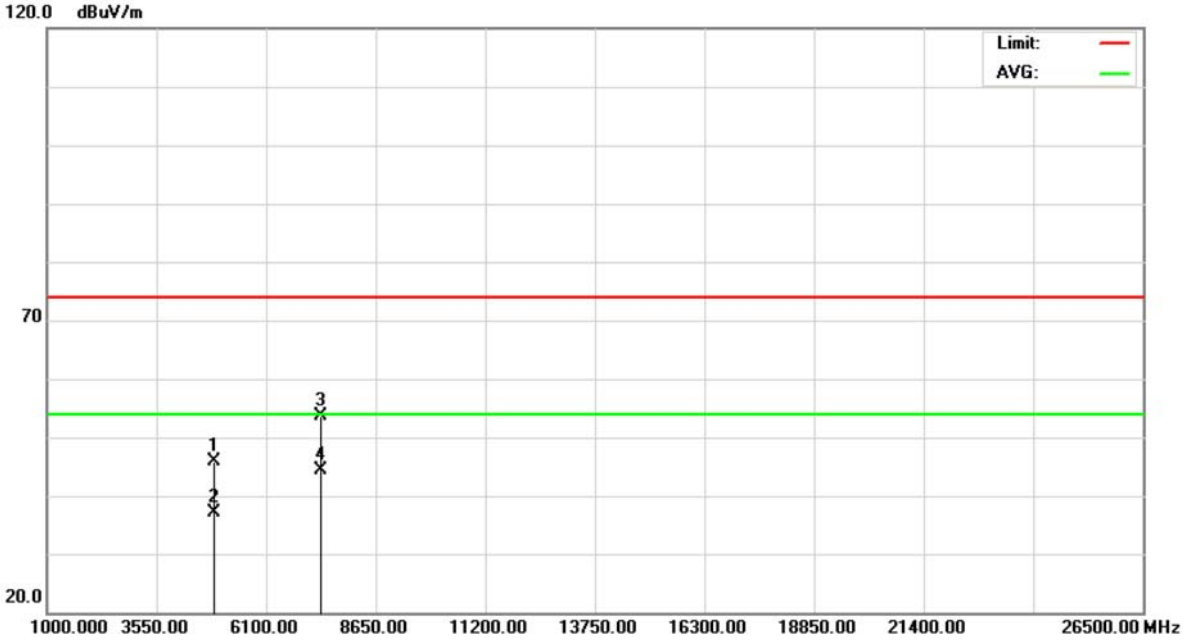
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2441.250	72.24	33.27	105.51	74.00	31.51	peak	
2	*	2441.250	63.62	33.27	96.89	54.00	42.89	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2437 MHz		

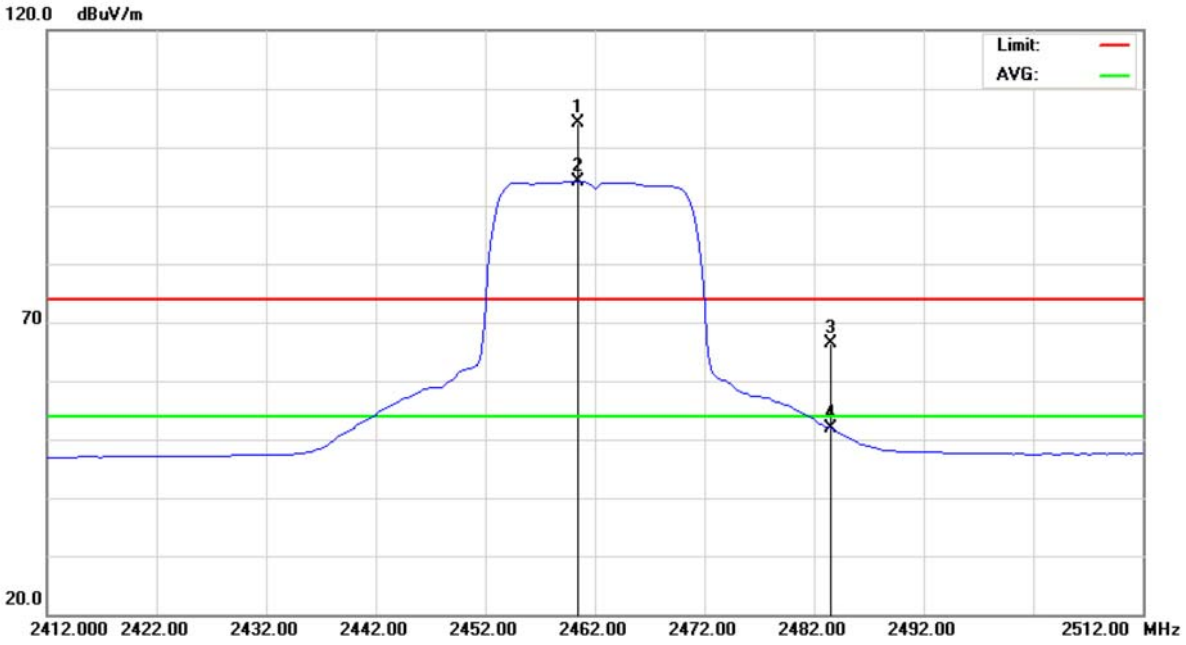
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4875.000	38.29	7.67	45.96	74.00	-28.04	peak	
2		4875.000	29.53	7.67	37.20	54.00	-16.80	AVG	
3		7312.000	38.59	15.07	53.66	74.00	-20.34	peak	
4	*	7312.000	29.21	15.07	44.28	54.00	-9.72	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2462 MHz		

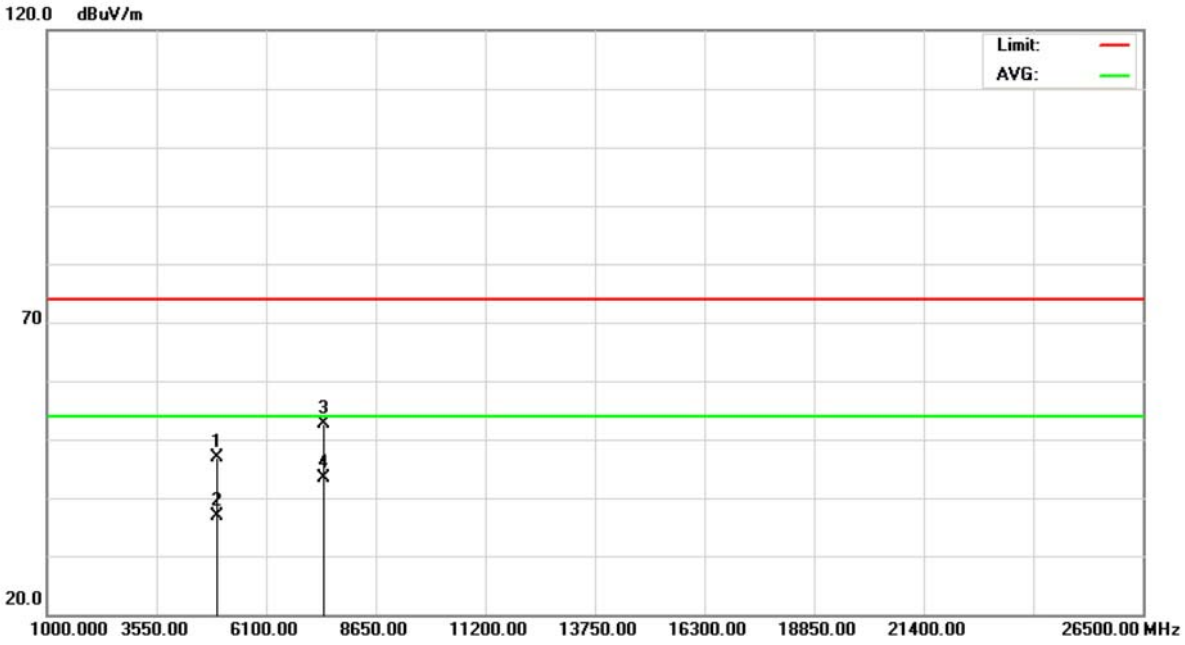
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2460.500	70.71	33.38	104.09	74.00	30.09	peak	
2	*	2460.500	60.74	33.38	94.12	54.00	40.12	AVG	
3		2483.500	32.78	33.50	66.28	74.00	-7.72	peak	
4		2483.500	18.41	33.50	51.91	54.00	-2.09	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2462 MHz		

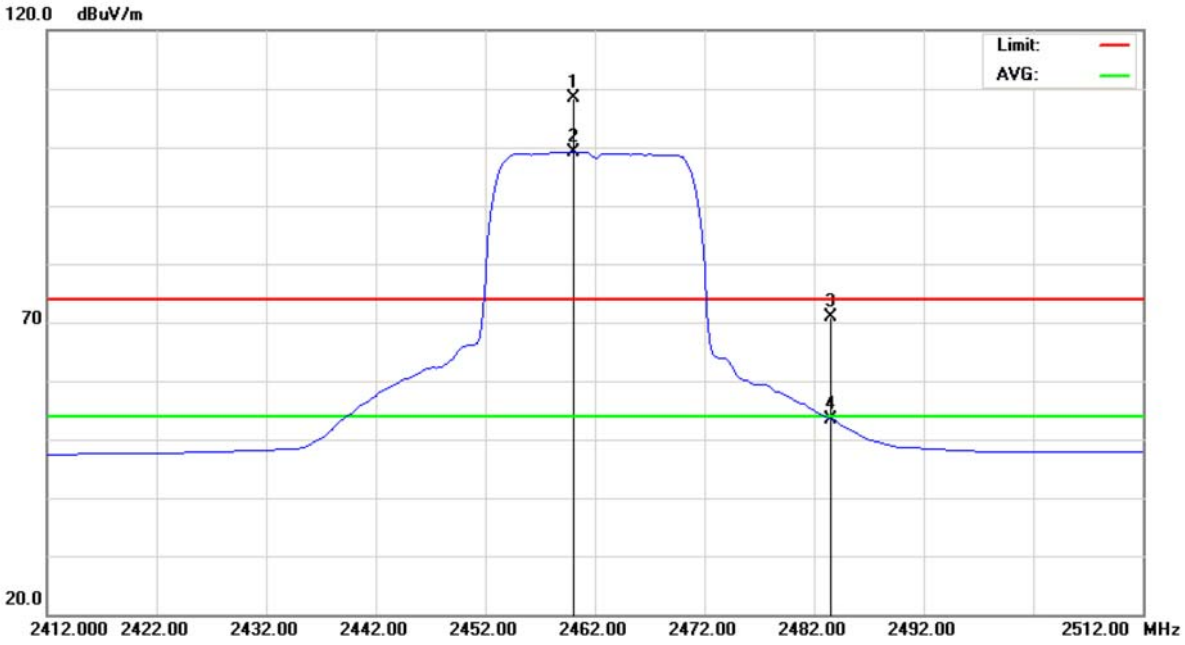
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4924.500	39.84	7.02	46.86	74.00	-27.14	peak	
2		4924.500	29.74	7.02	36.76	54.00	-17.24	AVG	
3		7384.500	38.74	13.97	52.71	74.00	-21.29	peak	
4	*	7384.500	29.39	13.97	43.36	54.00	-10.64	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2462 MHz		

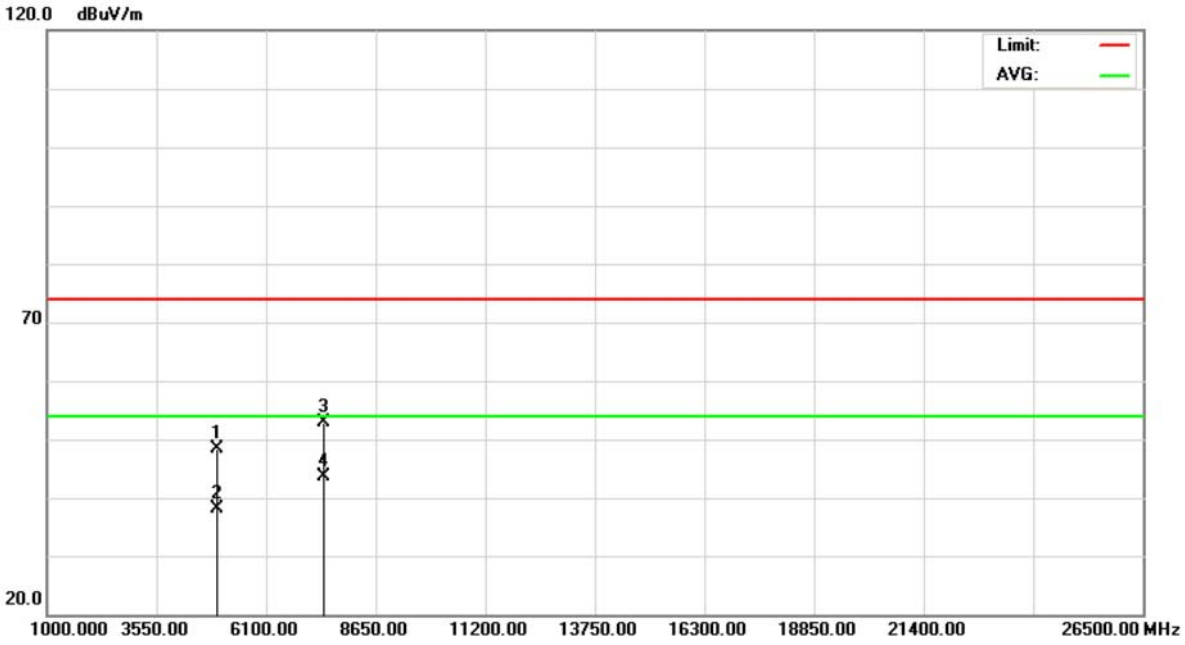
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2460.000	74.91	33.37	108.28	74.00	34.28	peak	
2	*	2460.000	65.72	33.37	99.09	54.00	45.09	AVG	
3		2483.500	37.47	33.50	70.97	74.00	-3.03	peak	
4		2483.500	19.94	33.50	53.44	54.00	-0.56	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2462 MHz		

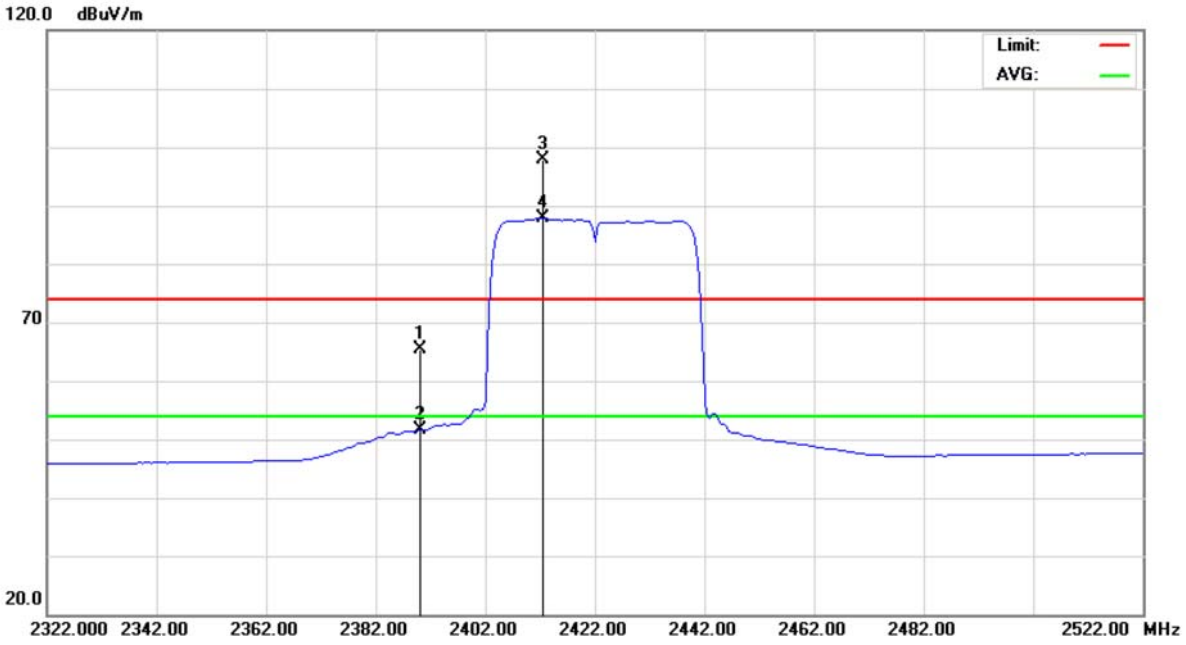
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4924.250	41.38	7.02	48.40	74.00	-25.60	peak	
2		4924.250	31.21	7.02	38.23	54.00	-15.77	AVG	
3		7385.000	38.95	13.97	52.92	74.00	-21.08	peak	
4	*	7385.000	29.77	13.97	43.74	54.00	-10.26	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2422 MHz		

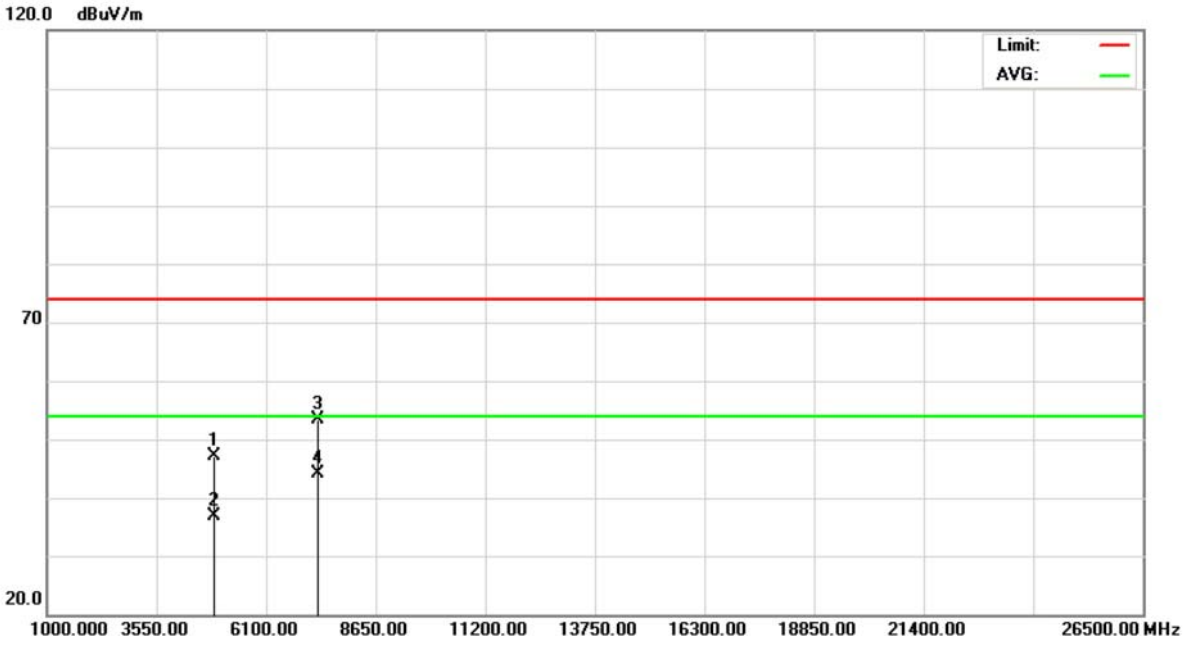
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	32.31	32.99	65.30	74.00	-8.70	peak	
2		2390.000	18.55	32.99	51.54	54.00	-2.46	AVG	
3	X	2412.500	64.69	33.11	97.80	74.00	23.80	peak	
4	*	2412.500	54.71	33.11	87.82	54.00	33.82	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2422 MHz		

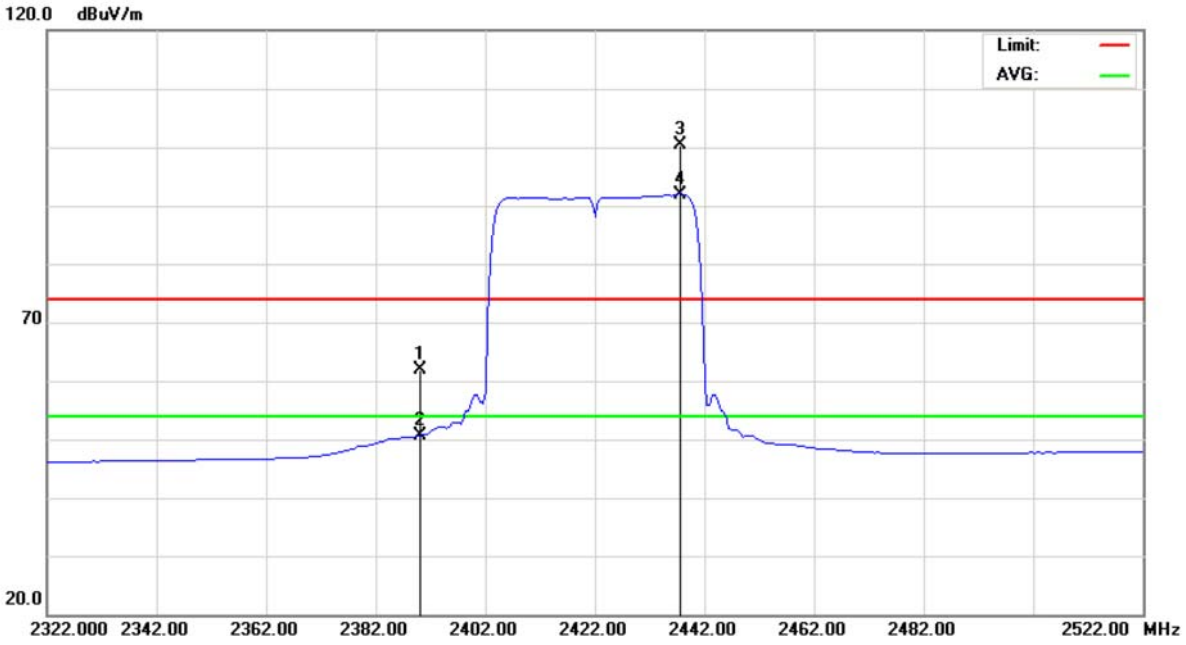
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4845.250	39.58	7.56	47.14	74.00	-26.86	peak	
2		4845.250	29.28	7.56	36.84	54.00	-17.16	AVG	
3		7267.000	38.37	14.95	53.32	74.00	-20.68	peak	
4	*	7267.000	29.23	14.95	44.18	54.00	-9.82	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2422 MHz		

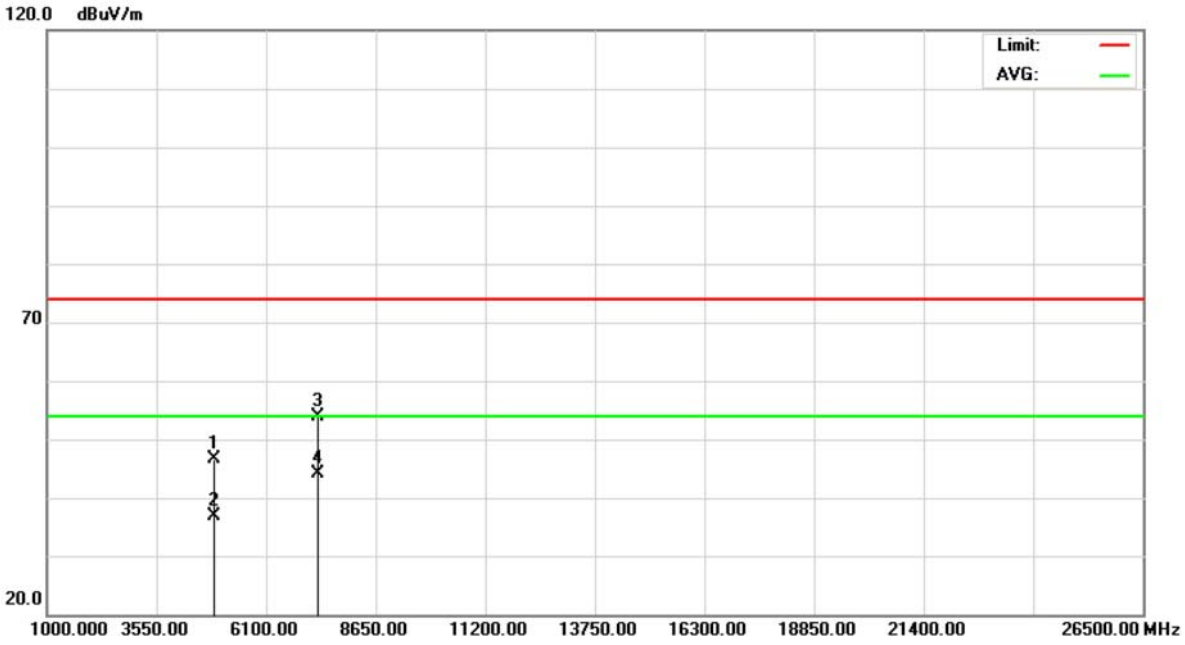
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	28.97	32.99	61.96	74.00	-12.04	peak	
2		2390.000	17.75	32.99	50.74	54.00	-3.26	AVG	
3	X	2437.500	67.13	33.25	100.38	74.00	26.38	peak	
4	*	2437.500	58.66	33.25	91.91	54.00	37.91	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2422 MHz		

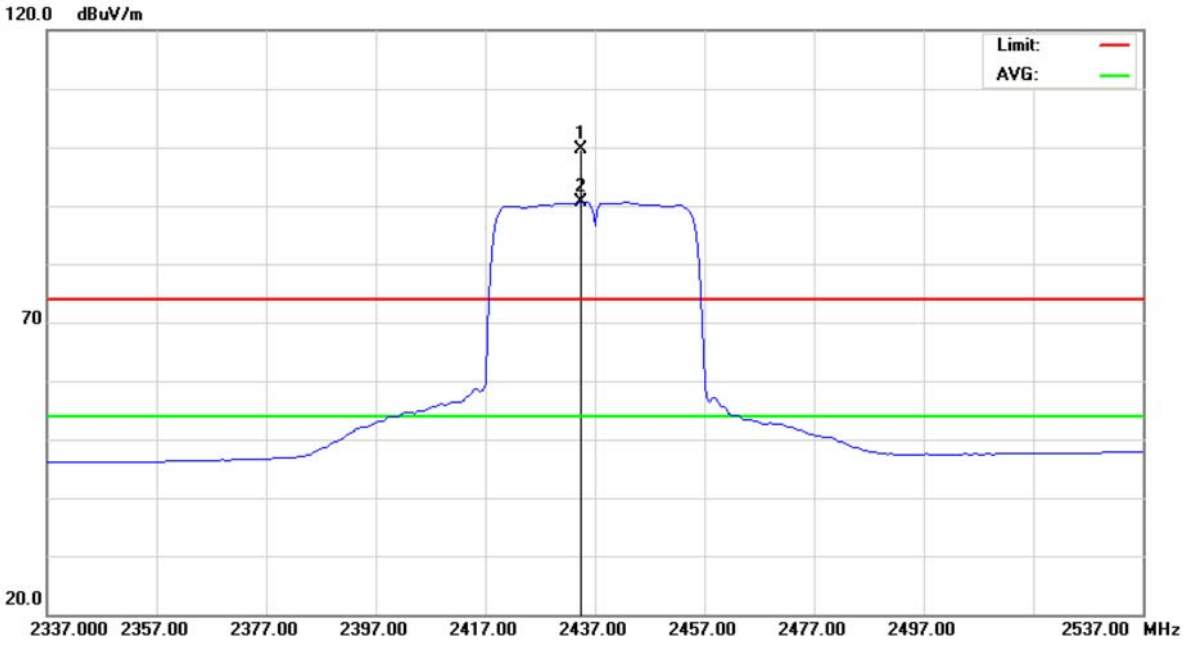
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4842.500	39.16	7.55	46.71	74.00	-27.29	peak	
2		4842.500	29.31	7.55	36.86	54.00	-17.14	AVG	
3		7265.250	39.00	14.94	53.94	74.00	-20.06	peak	
4	*	7265.250	29.19	14.94	44.13	54.00	-9.87	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2437 MHz		

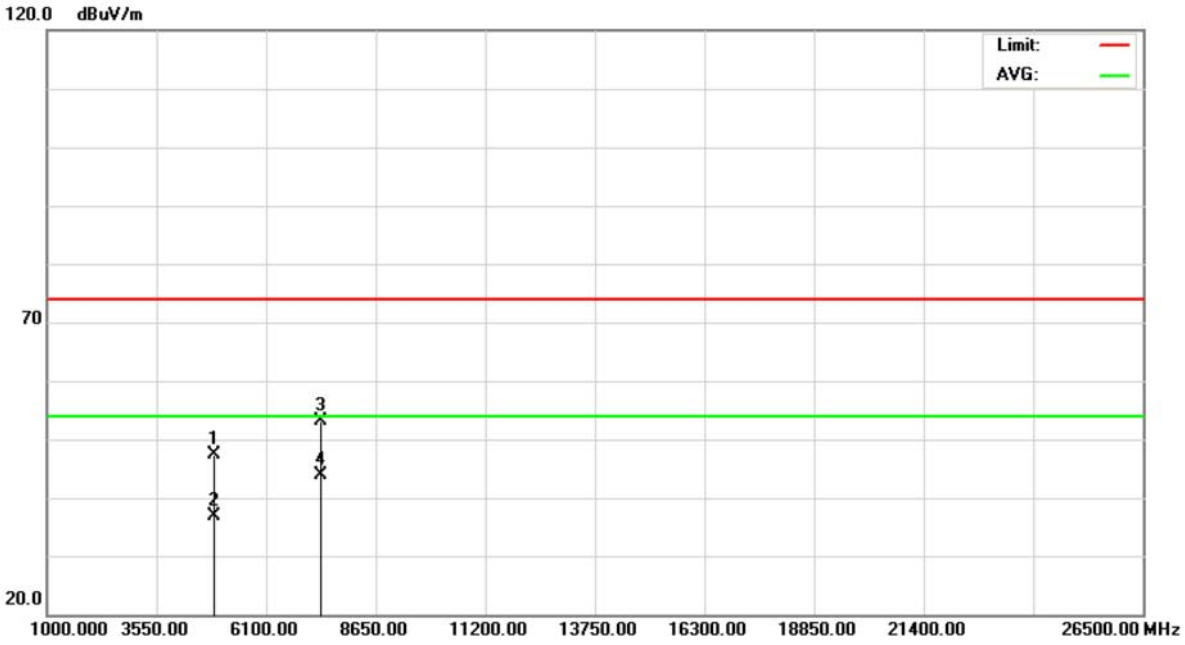
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2434.500	66.39	33.23	99.62	74.00	25.62	peak	
2	*	2434.500	57.28	33.23	90.51	54.00	36.51	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2437 MHz		

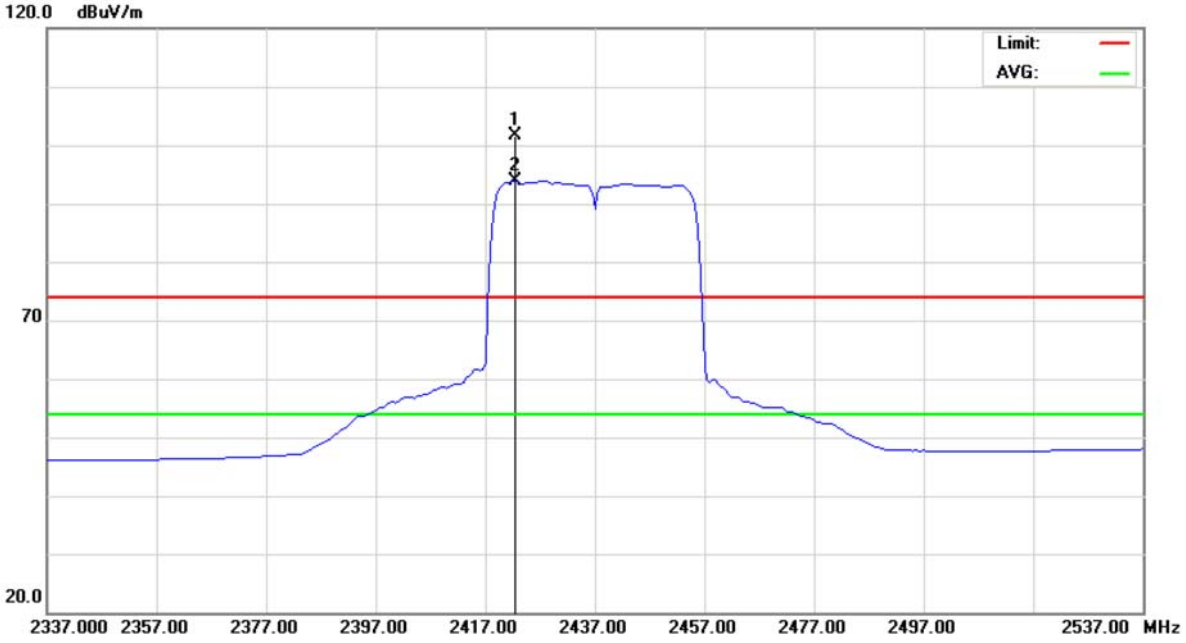
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4876.000	39.77	7.67	47.44	74.00	-26.56	peak	
2		4876.000	29.17	7.67	36.84	54.00	-17.16	AVG	
3		7314.500	38.18	15.07	53.25	74.00	-20.75	peak	
4	*	7314.500	28.93	15.07	44.00	54.00	-10.00	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2437 MHz		

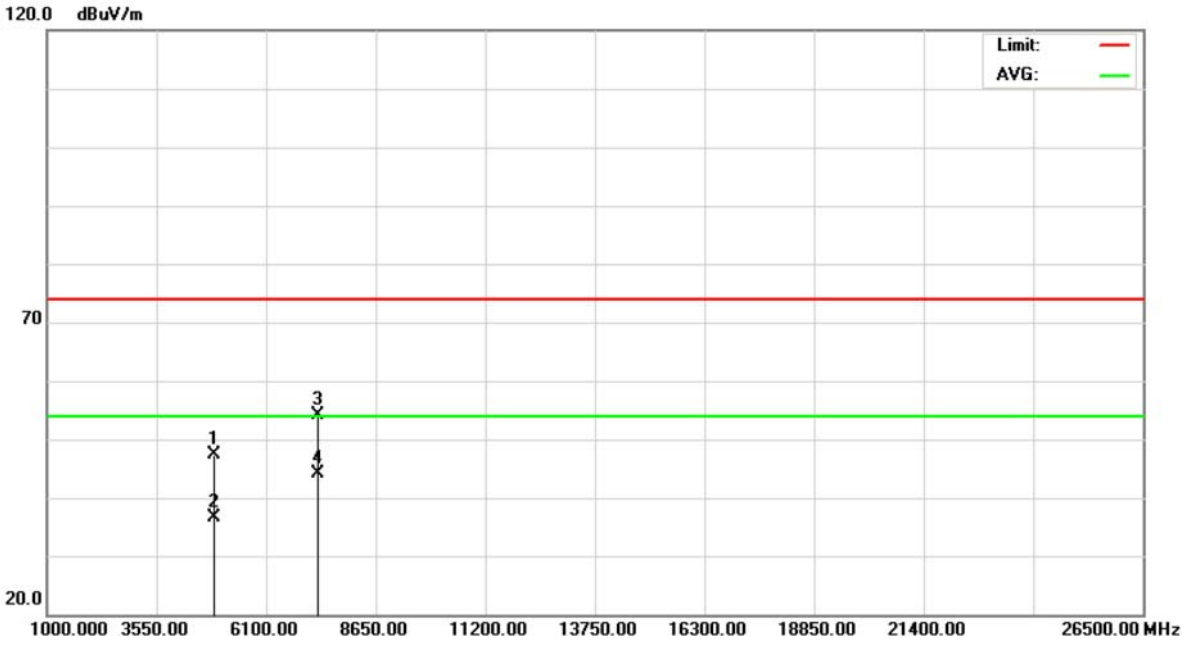
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2422.500	68.53	33.17	101.70	74.00	27.70	peak	
2	*	2422.500	60.60	33.17	93.77	54.00	39.77	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2437 MHz		

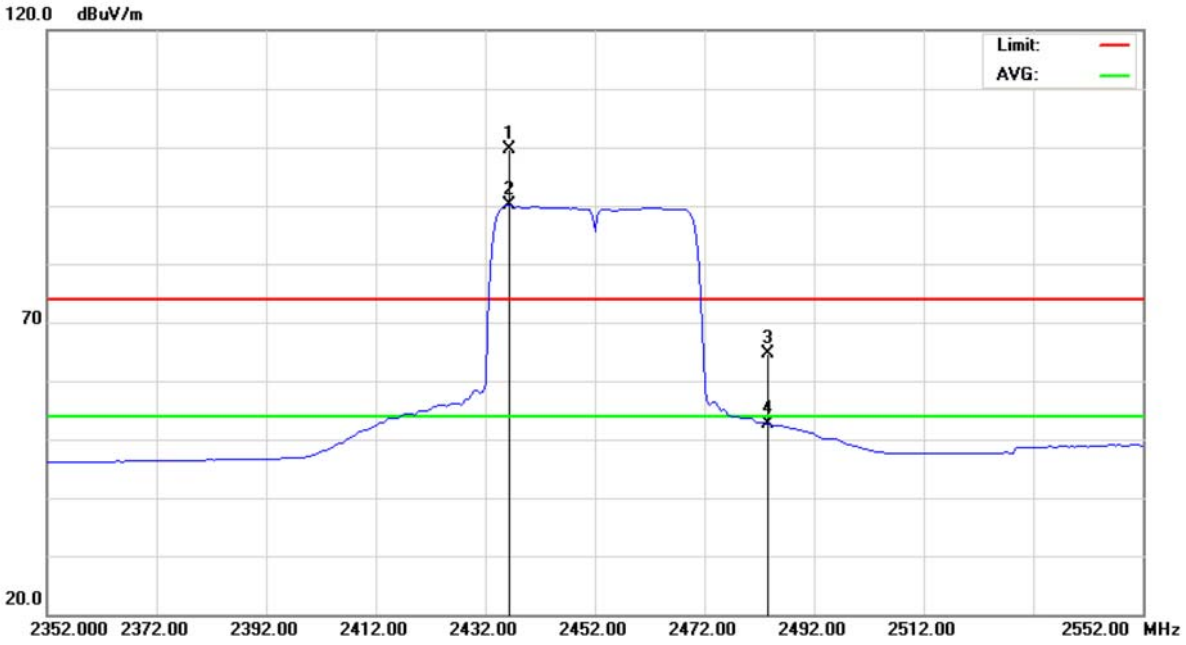
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4872.000	39.82	7.66	47.48	74.00	-26.52	peak	
2		4872.000	29.09	7.66	36.75	54.00	-17.25	AVG	
3		7309.000	38.97	15.06	54.03	74.00	-19.97	peak	
4	*	7309.000	29.02	15.06	44.08	54.00	-9.92	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2452 MHz		

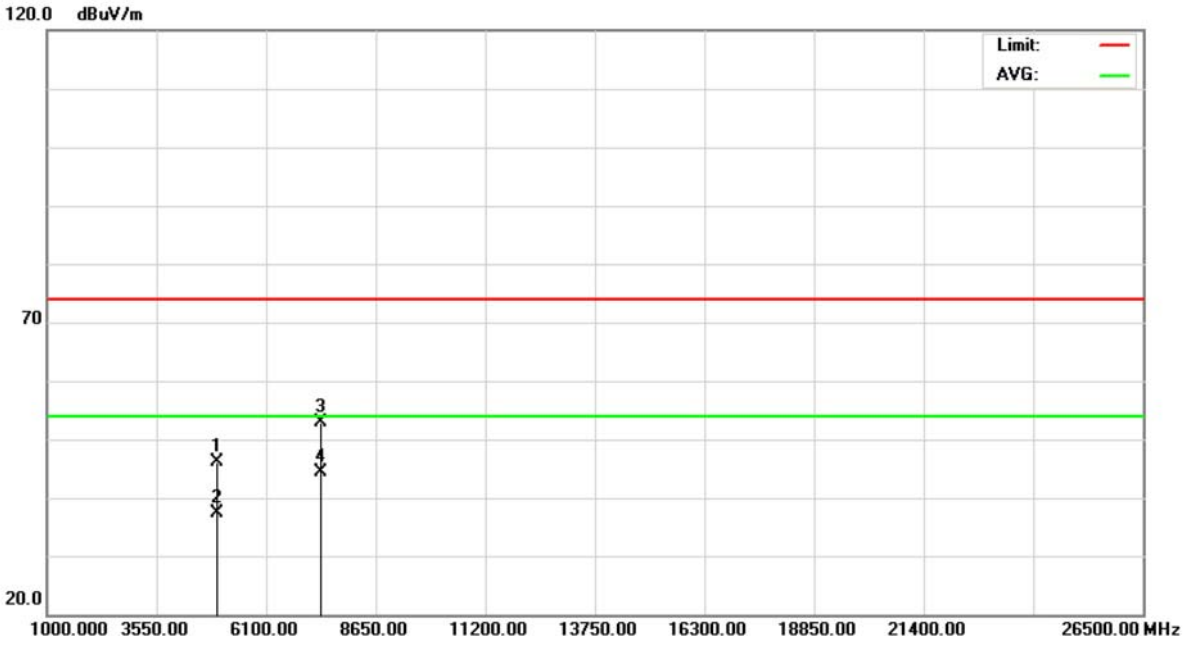
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2436.500	66.48	33.24	99.72	74.00	25.72	peak	
2	*	2436.500	56.96	33.24	90.20	54.00	36.20	AVG	
3		2483.500	31.03	33.50	64.53	74.00	-9.47	peak	
4		2483.500	19.06	33.50	52.56	54.00	-1.44	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2452 MHz		

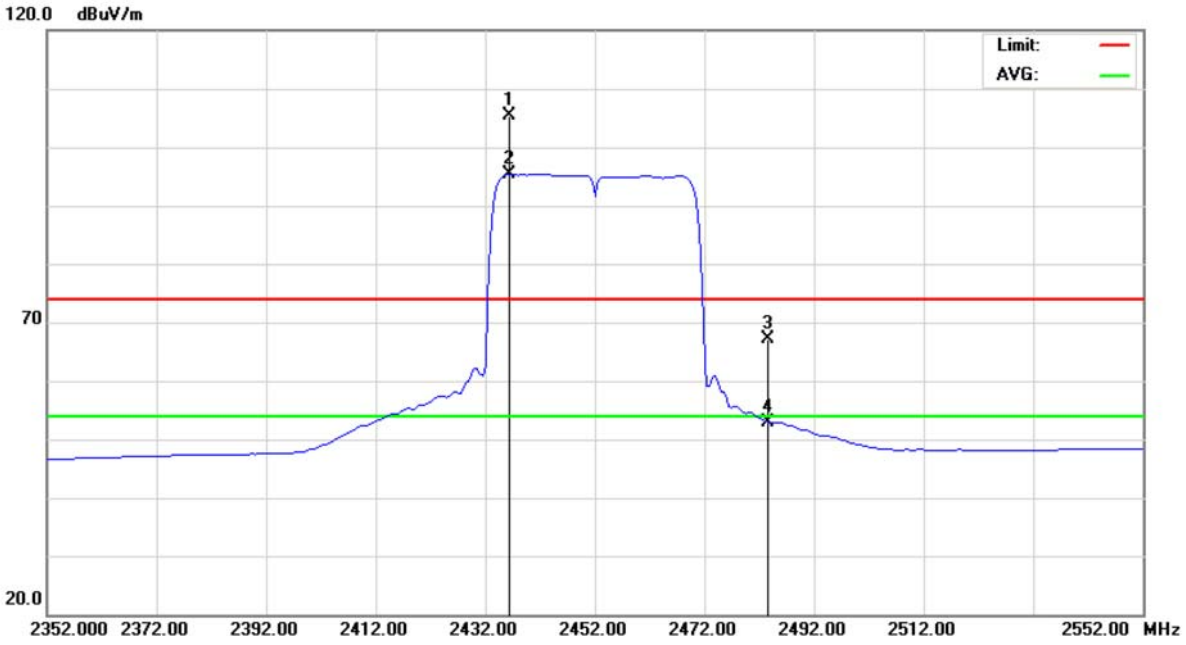
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4904.500	38.41	7.78	46.19	74.00	-27.81	peak	
2		4904.500	29.71	7.78	37.49	54.00	-16.51	AVG	
3		7354.500	37.78	15.18	52.96	74.00	-21.04	peak	
4	*	7354.500	29.32	15.18	44.50	54.00	-9.50	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2452 MHz		

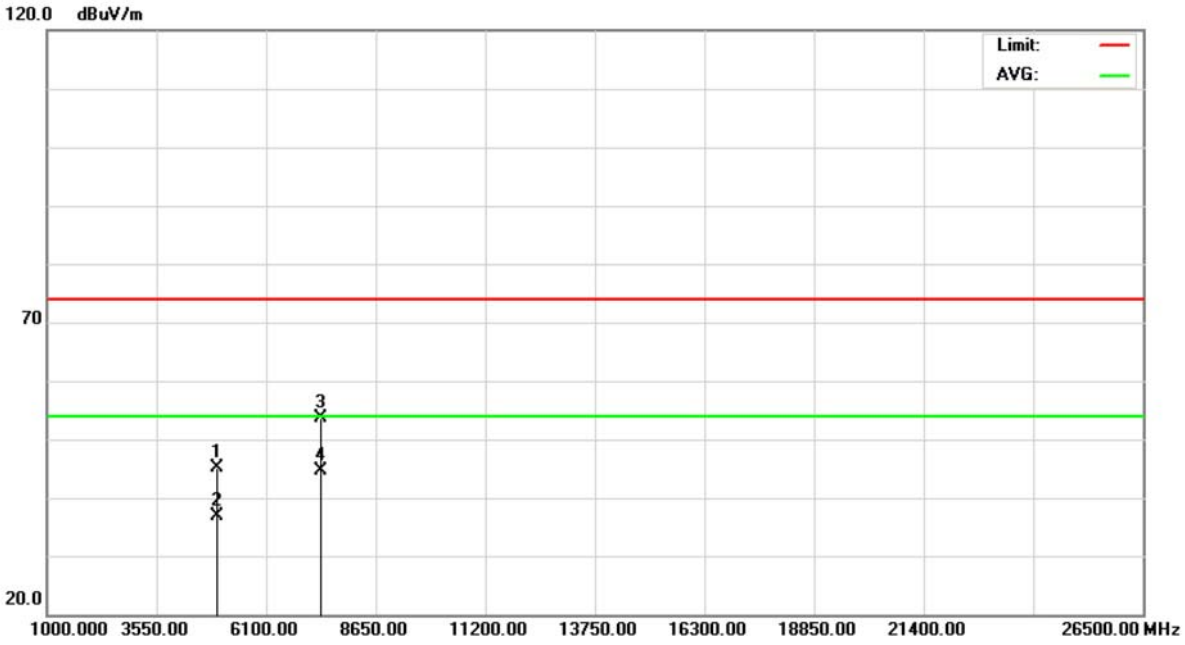
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2436.500	72.09	33.24	105.33	74.00	31.33	peak	
2	*	2436.500	62.21	33.24	95.45	54.00	41.45	AVG	
3		2483.500	33.59	33.50	67.09	74.00	-6.91	peak	
4		2483.500	19.49	33.50	52.99	54.00	-1.01	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2452 MHz		

Polarization: Horizontal

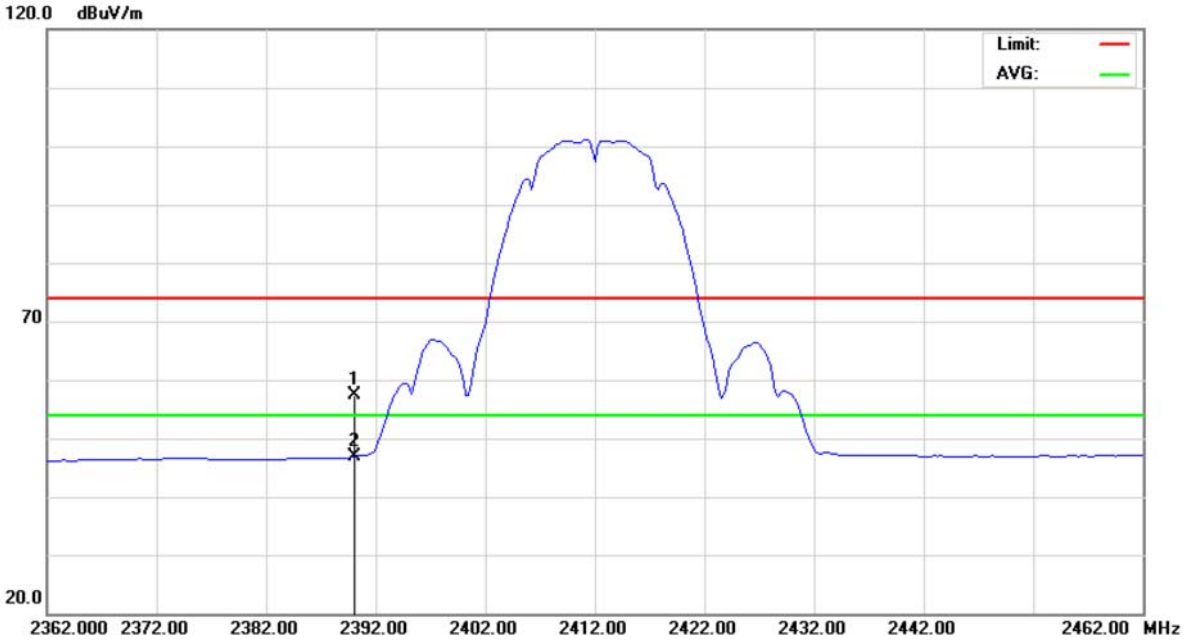


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4903.000	37.43	7.77	45.20	74.00	-28.80	peak	
2		4903.000	29.01	7.77	36.78	54.00	-17.22	AVG	
3		7354.500	38.56	15.18	53.74	74.00	-20.26	peak	
4	*	7354.500	29.33	15.18	44.51	54.00	-9.49	AVG	

9.9 TEST RESULTS (RESTRICTED BANDS)

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2412 MHz		
NOTE	The transmitter was setup to transmit at the lowest channel and the field strength was measured at 2310-2390 MHz.		

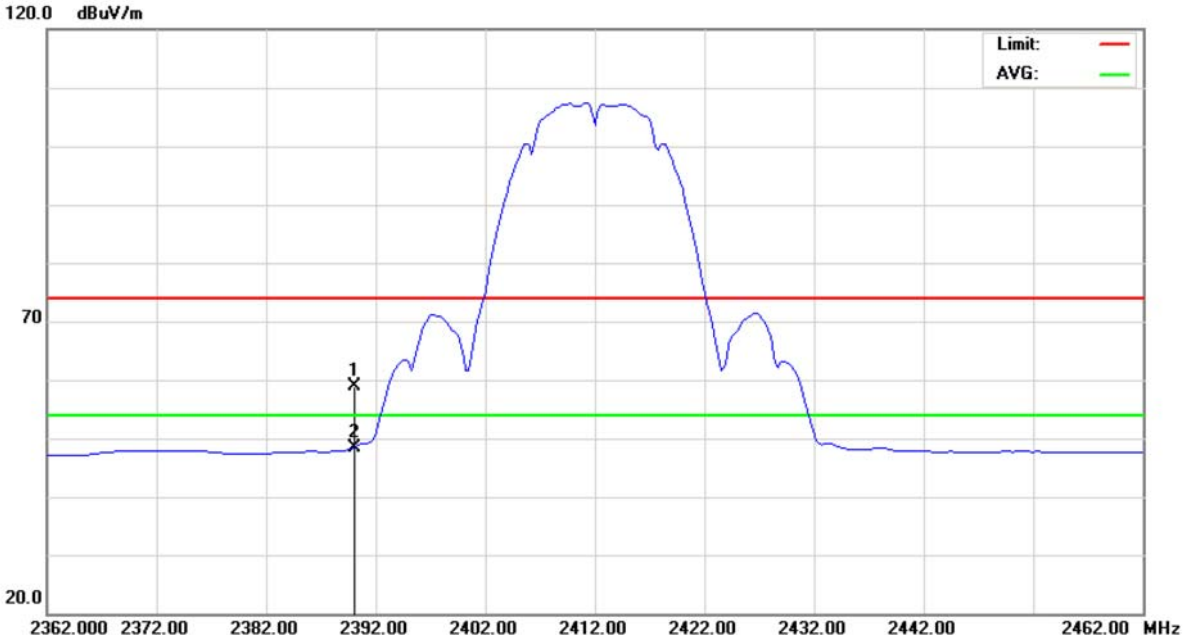
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	24.29	32.99	57.28	74.00	-16.72	peak	
2	*	2390.000	13.89	32.99	46.88	54.00	-7.12	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2412 MHz		
NOTE	The transmitter was setup to transmit at the lowest channel and the field strength was measured at 2310-2390 MHz.		

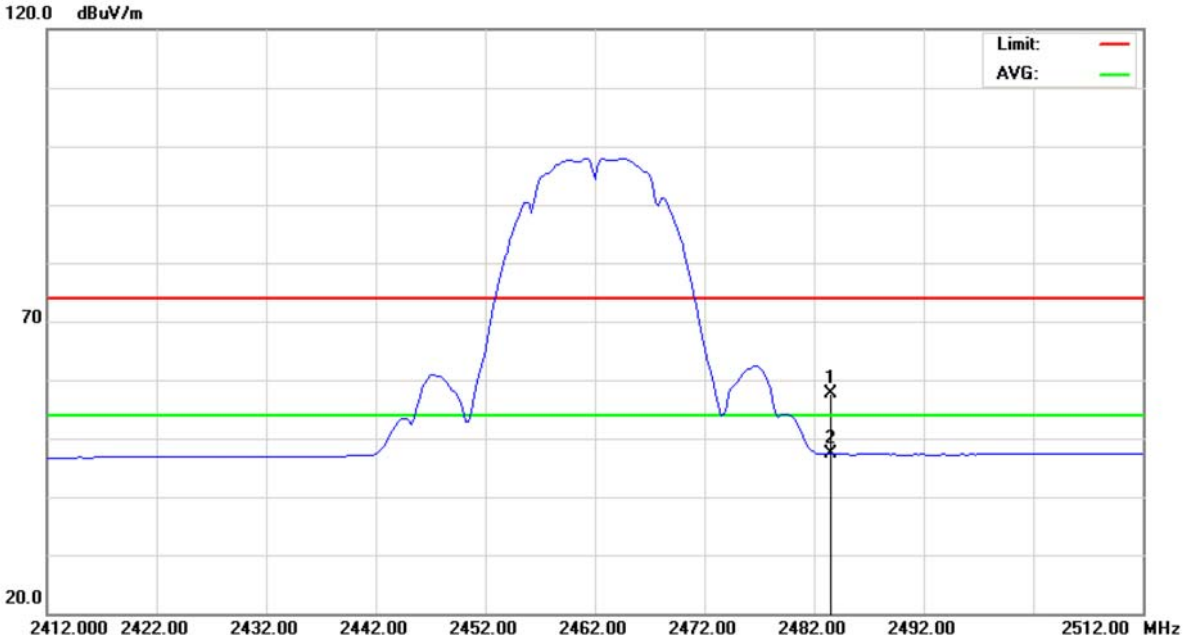
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	25.78	32.99	58.77	74.00	-15.23	peak	
2	*	2390.000	15.45	32.99	48.44	54.00	-5.56	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2462 MHz		
NOTE	The transmitter was setup to transmit at the highest channel and the field strength was measured at 2483.5-2500 MHz.		

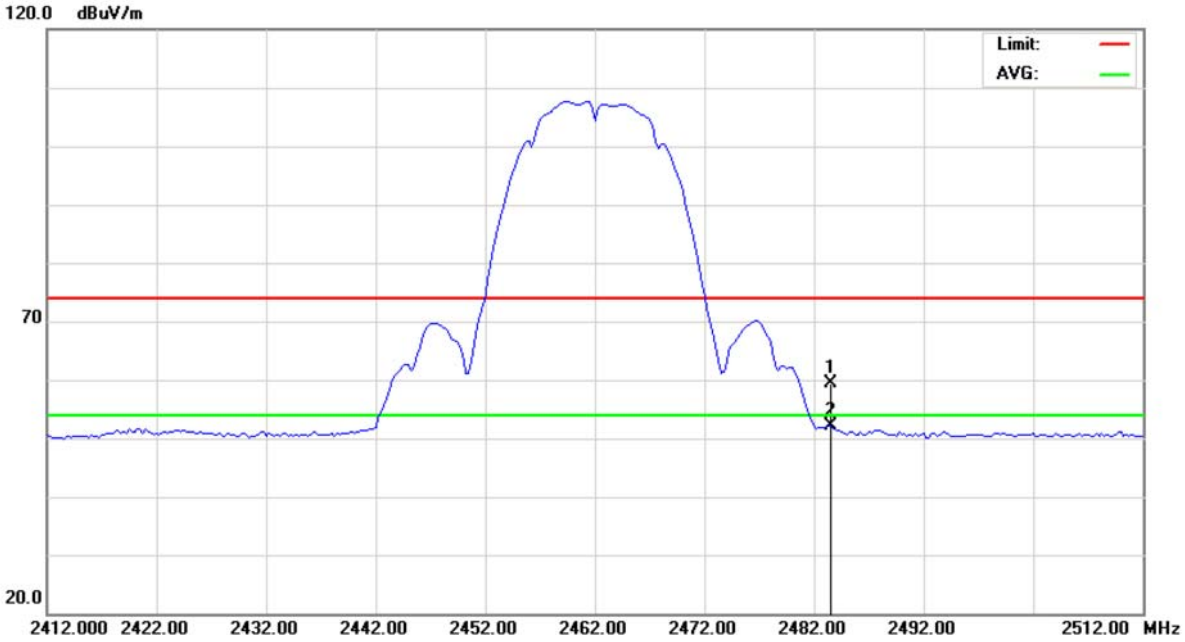
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	24.17	33.50	57.67	74.00	-16.33	peak	
2	*	2483.500	14.00	33.50	47.50	54.00	-6.50	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2462 MHz		
NOTE	The transmitter was setup to transmit at the highest channel and the field strength was measured at 2483.5-2500 MHz.		

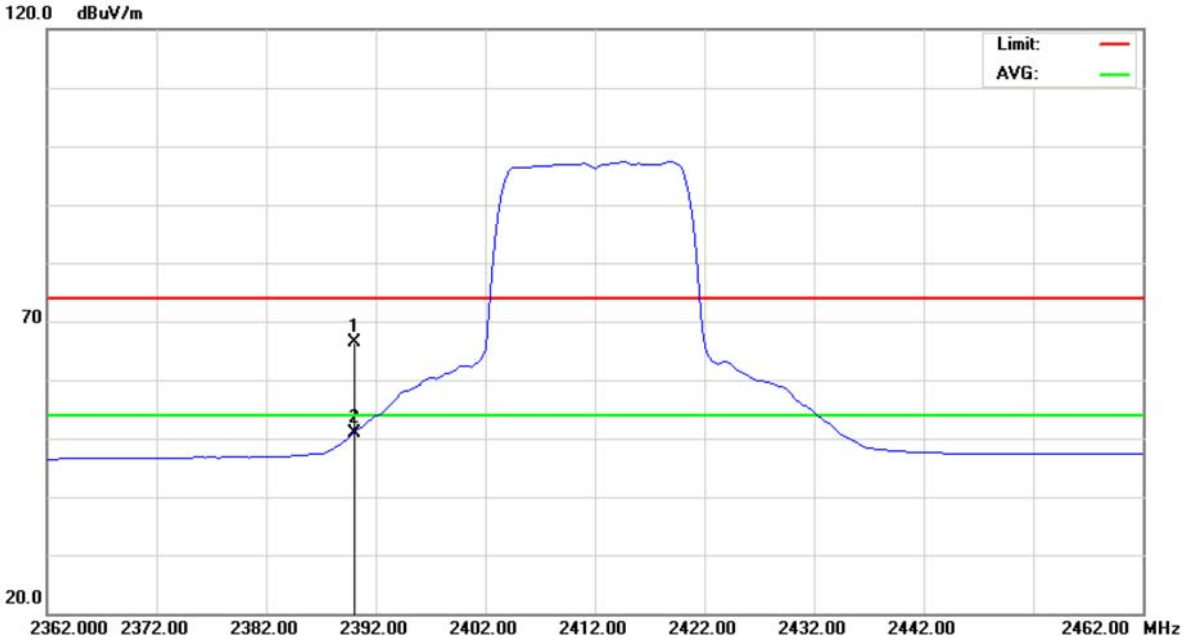
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	25.91	33.50	59.41	74.00	-14.59	peak	
2	*	2483.500	18.60	33.50	52.10	54.00	-1.90	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2412 MHz		
NOTE	The transmitter was setup to transmit at the lowest channel and the field strength was measured at 2310-2390 MHz.		

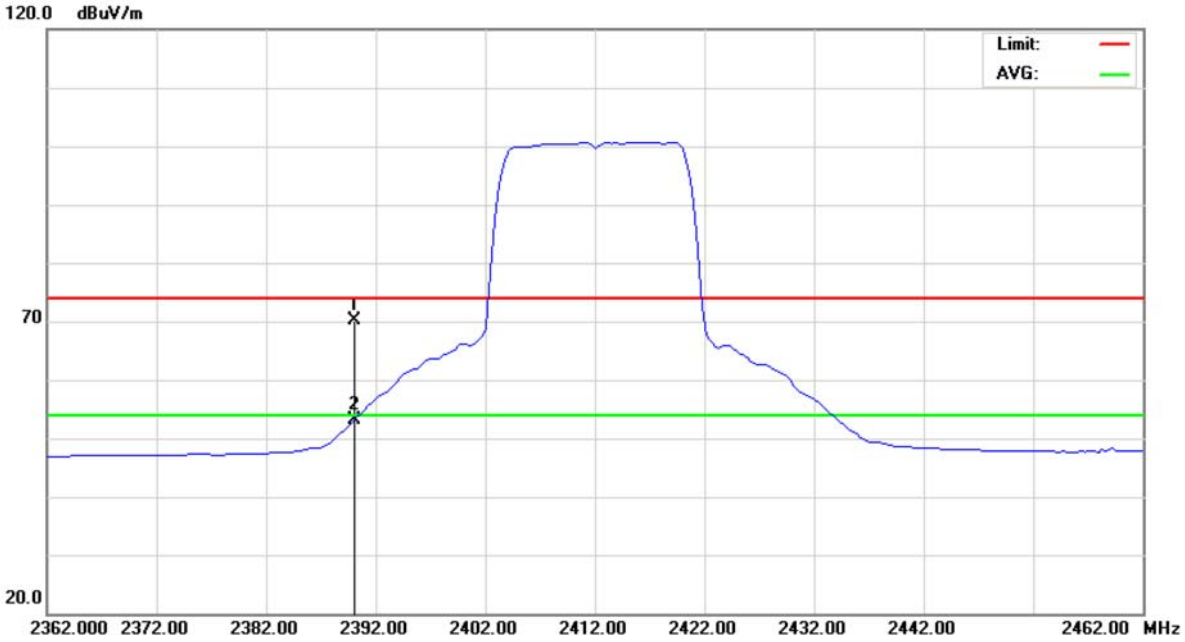
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	33.42	32.99	66.41	74.00	-7.59	peak	
2	*	2390.000	17.96	32.99	50.95	54.00	-3.05	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2412 MHz		
NOTE	The transmitter was setup to transmit at the lowest channel and the field strength was measured at 2310-2390 MHz.		

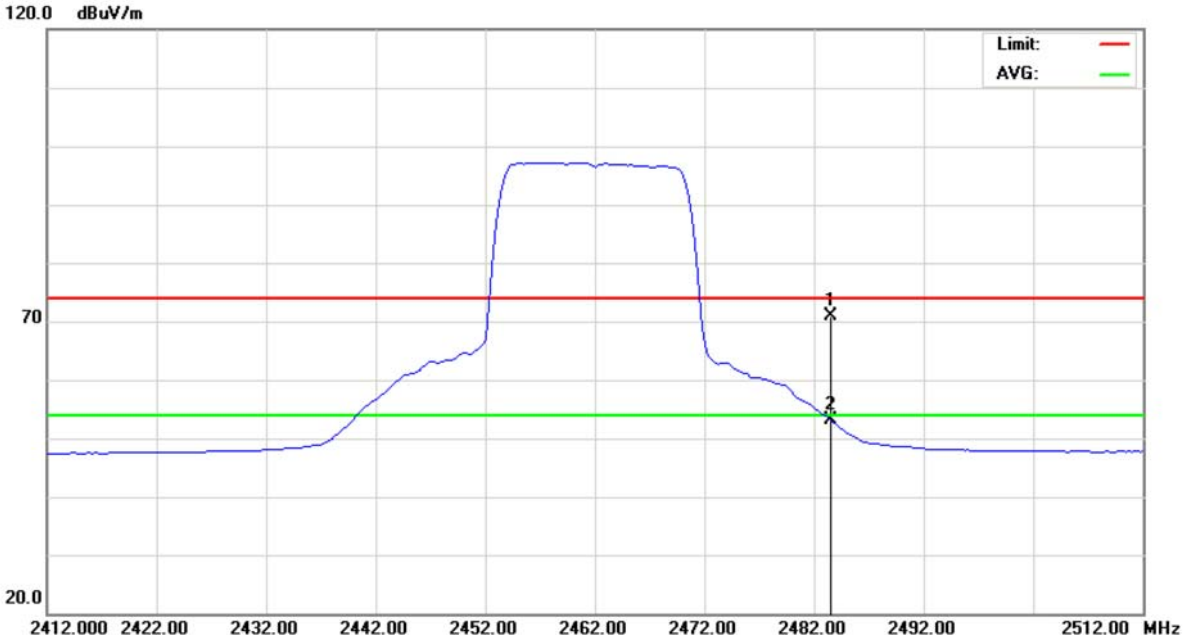
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	37.09	32.99	70.08	74.00	-3.92	peak	
2	*	2390.000	20.19	32.99	53.18	54.00	-0.82	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2462 MHz		
NOTE	The transmitter was setup to transmit at the highest channel and the field strength was measured at 2483.5-2500 MHz.		

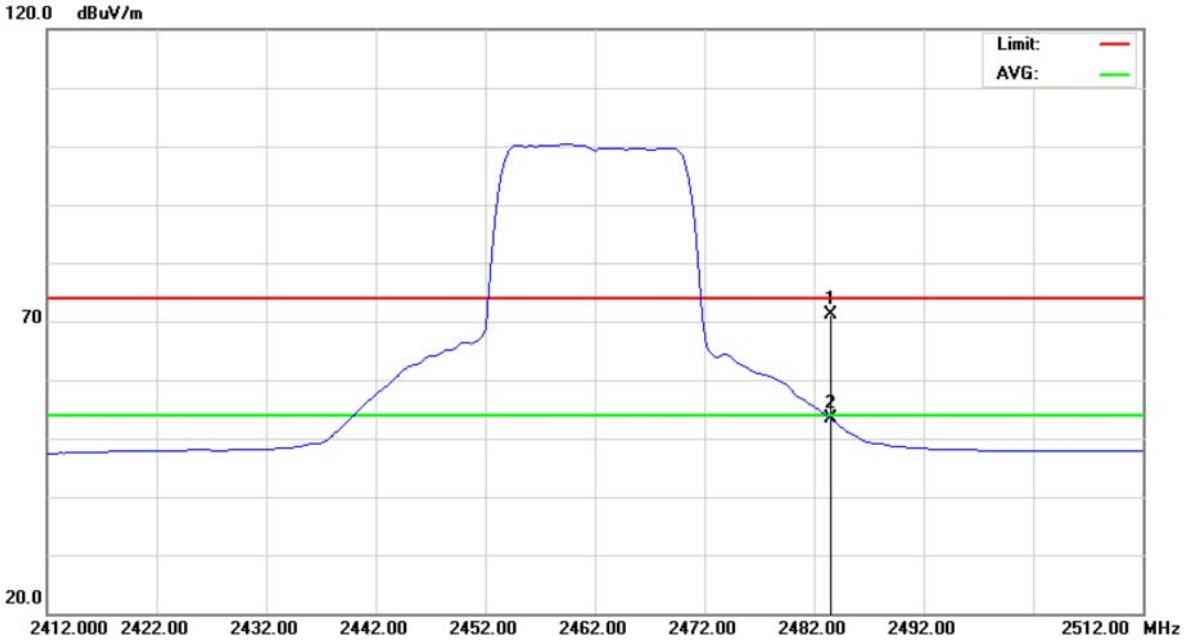
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	37.32	33.50	70.82	74.00	-3.18	peak	
2	*	2483.500	19.65	33.50	53.15	54.00	-0.85	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2462 MHz		
NOTE	The transmitter was setup to transmit at the highest channel and the field strength was measured at 2483.5-2500 MHz.		

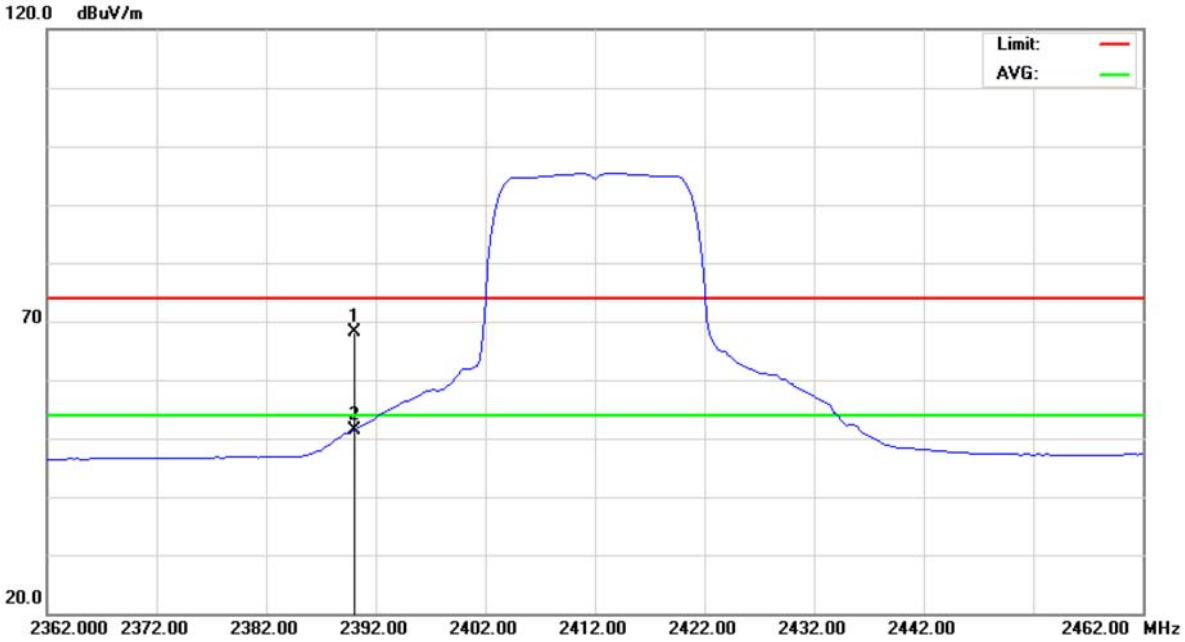
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	37.58	33.50	71.08	74.00	-2.92	peak	
2	*	2483.500	19.78	33.50	53.28	54.00	-0.72	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2412 MHz		
NOTE	The transmitter was setup to transmit at the lowest channel and the field strength was measured at 2310-2390 MHz.		

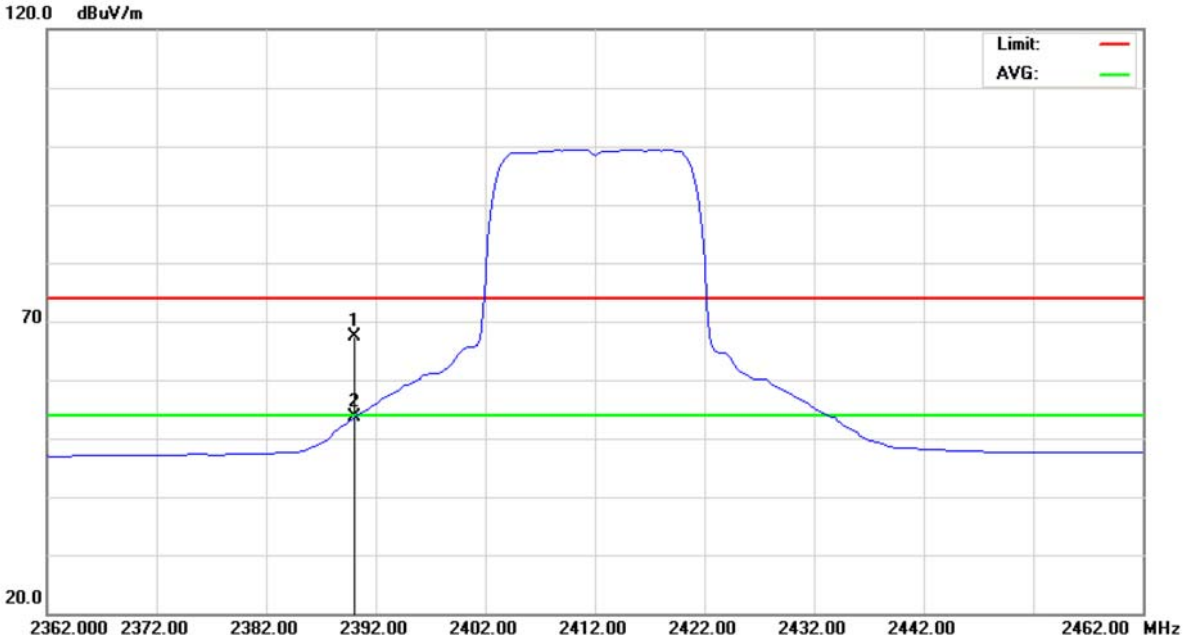
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	35.09	32.99	68.08	74.00	-5.92	peak	
2	*	2390.000	18.49	32.99	51.48	54.00	-2.52	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2412 MHz		
NOTE	The transmitter was setup to transmit at the lowest channel and the field strength was measured at 2310-2390 MHz.		

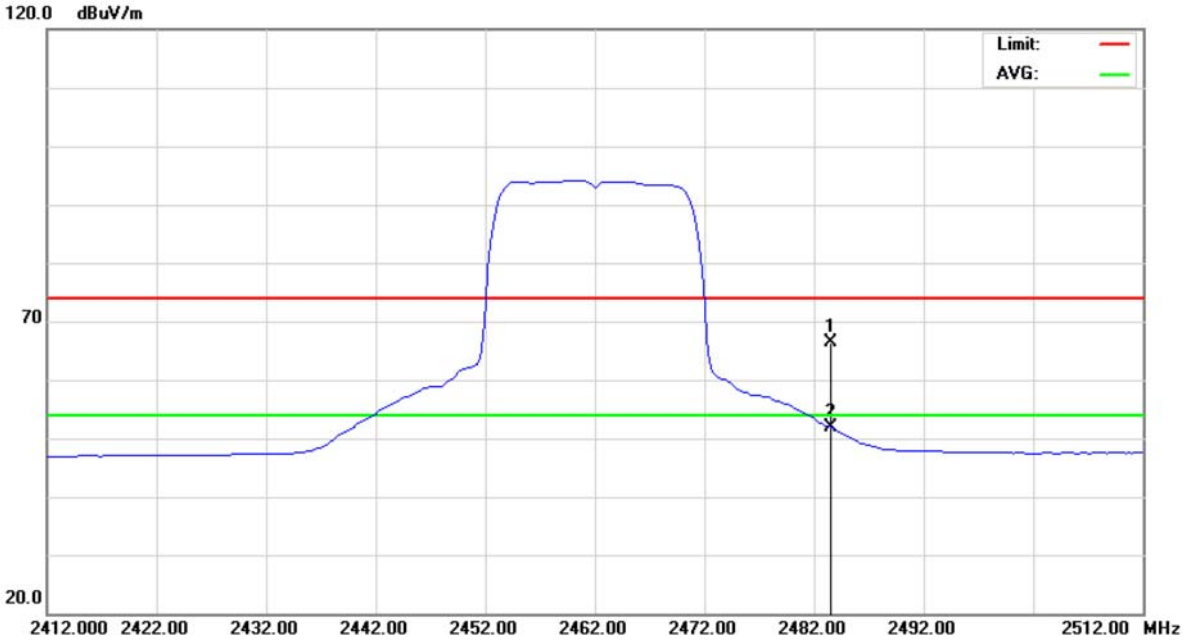
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	34.42	32.99	67.41	74.00	-6.59	peak	
2	*	2390.000	20.59	32.99	53.58	54.00	-0.42	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2462 MHz		
NOTE	The transmitter was setup to transmit at the highest channel and the field strength was measured at 2483.5-2500 MHz.		

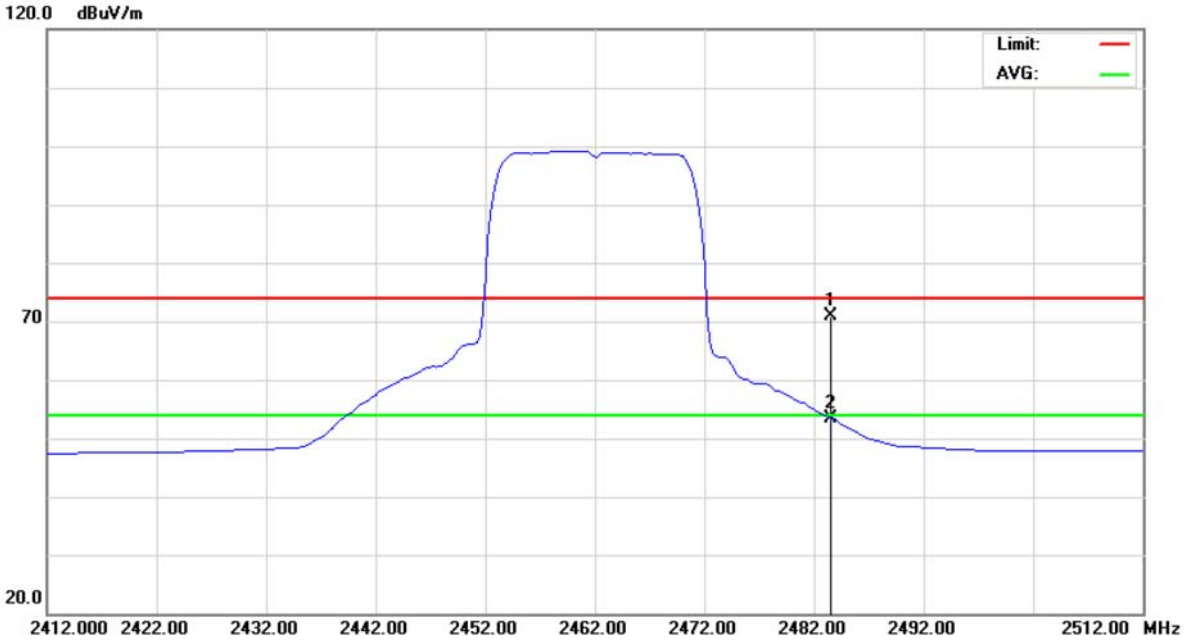
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	32.78	33.50	66.28	74.00	-7.72	peak	
2	*	2483.500	18.41	33.50	51.91	54.00	-2.09	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/2462 MHz		
NOTE	The transmitter was setup to transmit at the highest channel and the field strength was measured at 2483.5-2500 MHz.		

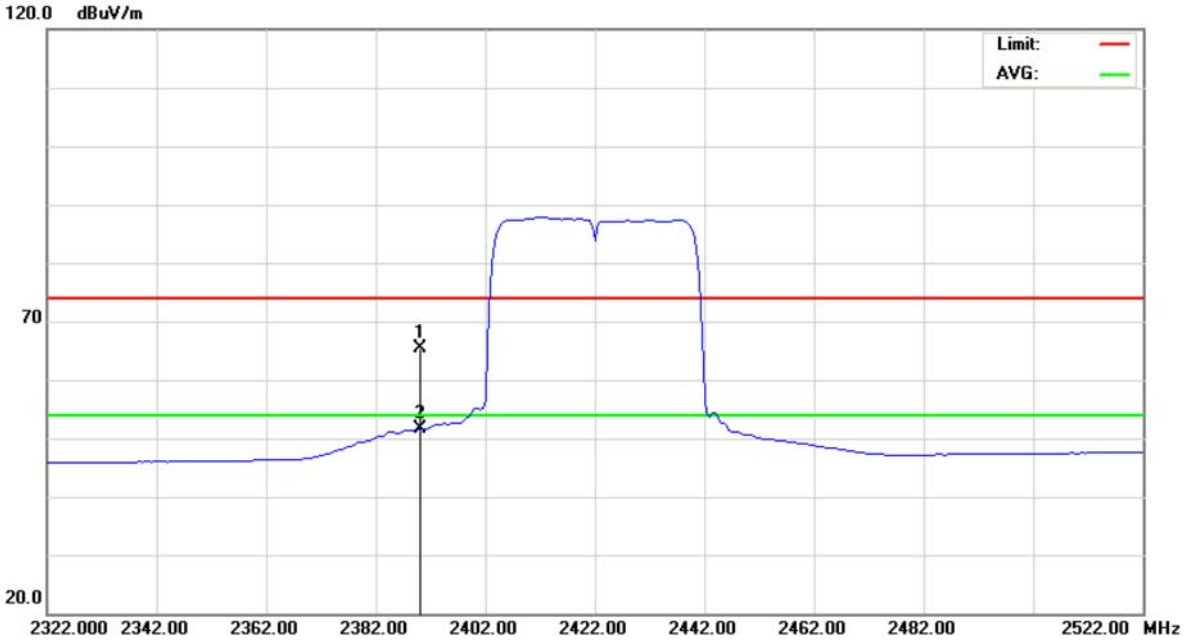
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	37.47	33.50	70.97	74.00	-3.03	peak	
2	*	2483.500	19.94	33.50	53.44	54.00	-0.56	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2422 MHz		
NOTE	The transmitter was setup to transmit at the lowest channel and the field strength was measured at 2310-2390 MHz.		

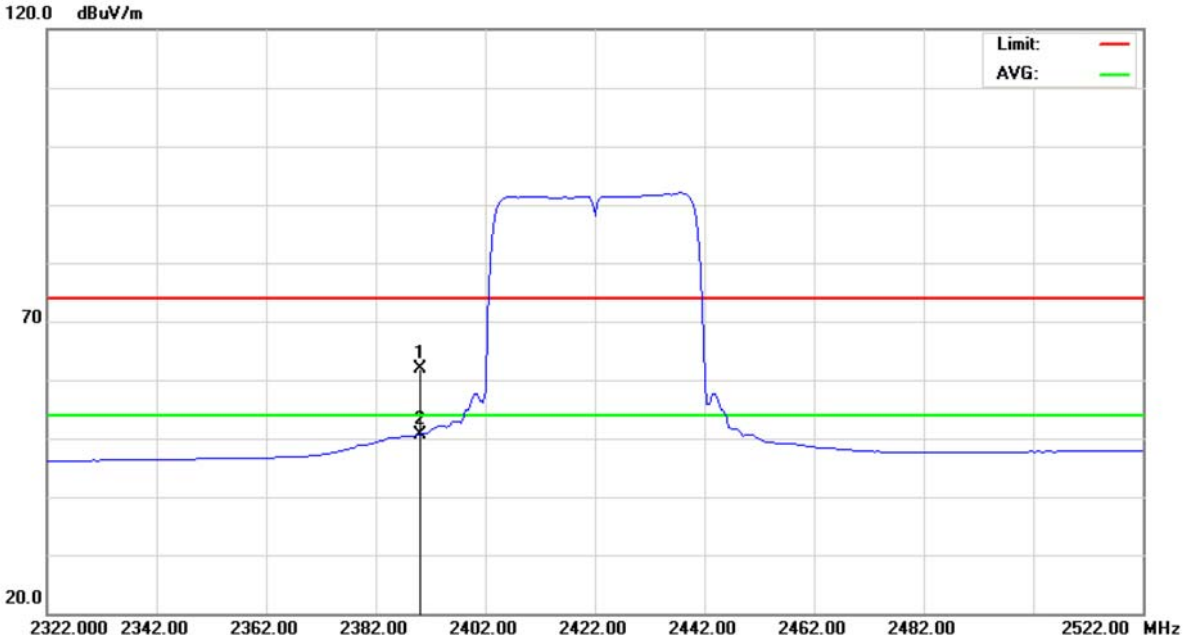
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	32.31	32.99	65.30	74.00	-8.70	peak	
2	*	2390.000	18.55	32.99	51.54	54.00	-2.46	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2422 MHz		
NOTE	The transmitter was setup to transmit at the lowest channel and the field strength was measured at 2310-2390 MHz.		

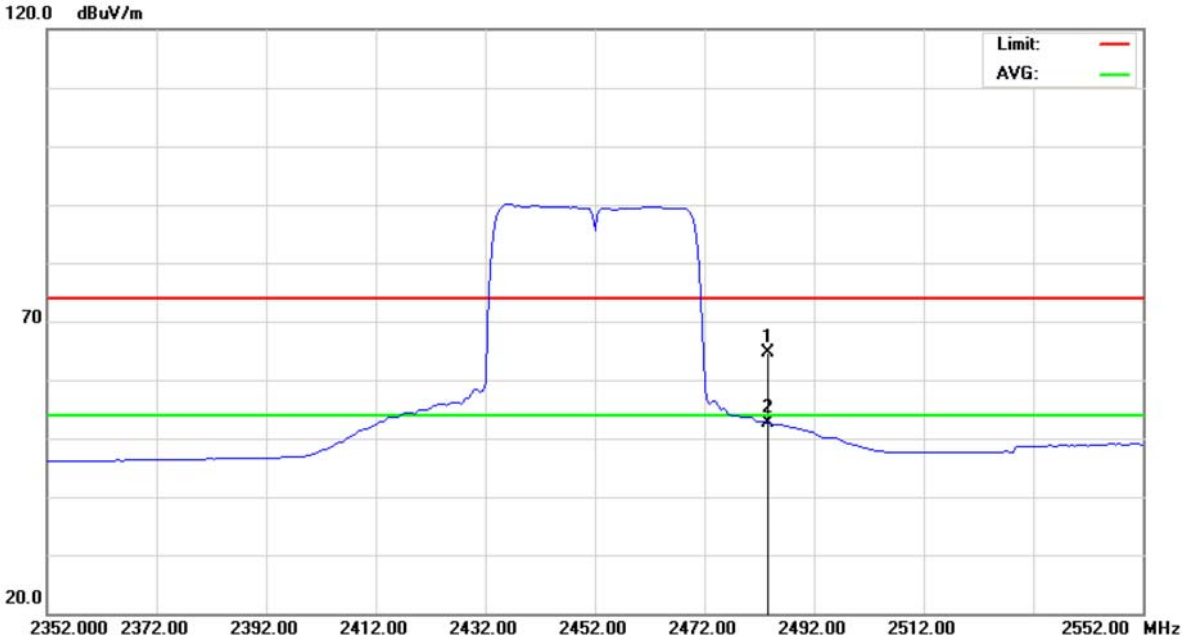
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	28.97	32.99	61.96	74.00	-12.04	peak	
2	*	2390.000	17.75	32.99	50.74	54.00	-3.26	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2452 MHz		
NOTE	The transmitter was setup to transmit at the highest channel and the field strength was measured at 2483.5-2500 MHz.		

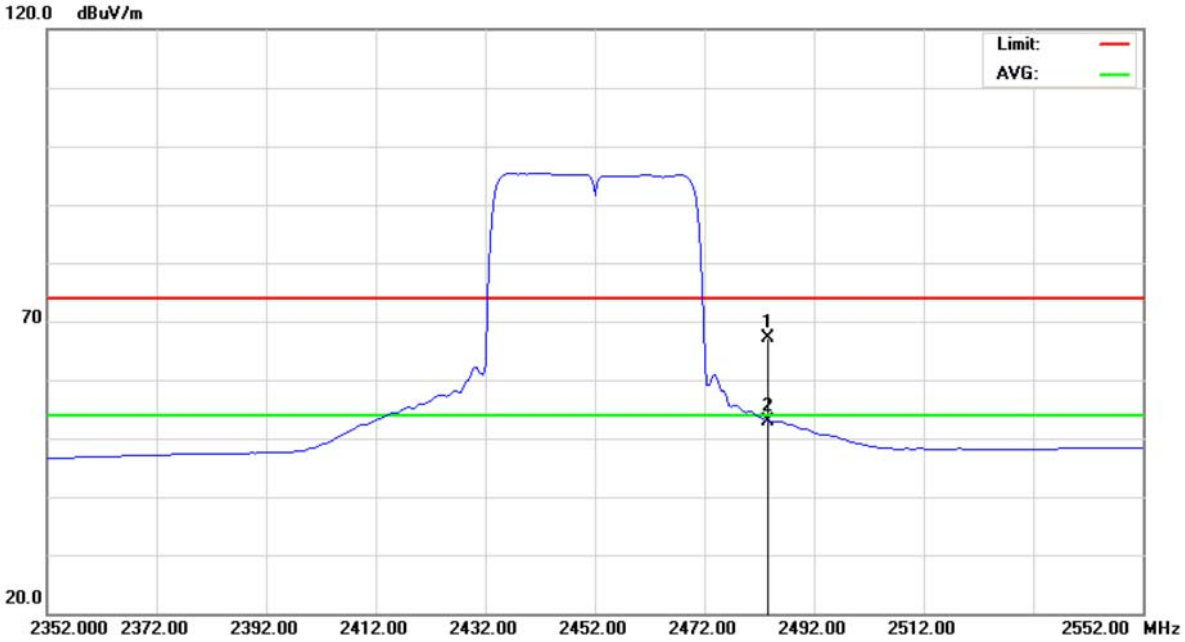
Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	31.03	33.50	64.53	74.00	-9.47	peak	
2	*	2483.500	19.06	33.50	52.56	54.00	-1.44	AVG	

E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	24°C	Relative Humidity	46%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/2452 MHz		
NOTE	The transmitter was setup to transmit at the highest channel and the field strength was measured at 2483.5-2500 MHz.		

Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2483.500	33.59	33.50	67.09	74.00	-6.91	peak	
2	*	2483.500	19.49	33.50	52.99	54.00	-1.01	AVG	

10 POWER SPECTRAL DENSITY

10.1 LIMIT

Test Item	Frequency Range (MHz)	Limit
Power Spectral Density	2400-2483.5	8 dBm (in any 3 kHz)

10.2 MEASUREMENT INSTRUMENTS LIST

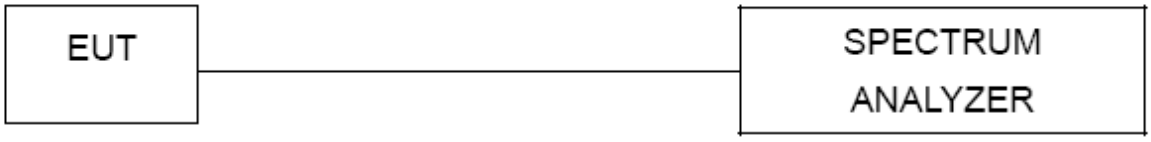
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Oct. 01, 2013

NOTE: **N/A**: denotes No Model Name, No Serial No. or No Calibration specified.

10.3 TEST PROCEDURES

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. Spectrum Setting: RBW=3 kHz, VBW=30 kHz, Sweep time = 500s.

10.4 TEST SETUP LAYOUT



10.5 DEVIATION FROM TEST STANDARD

No deviation

10.6 EUT OPERATING CONDITIONS

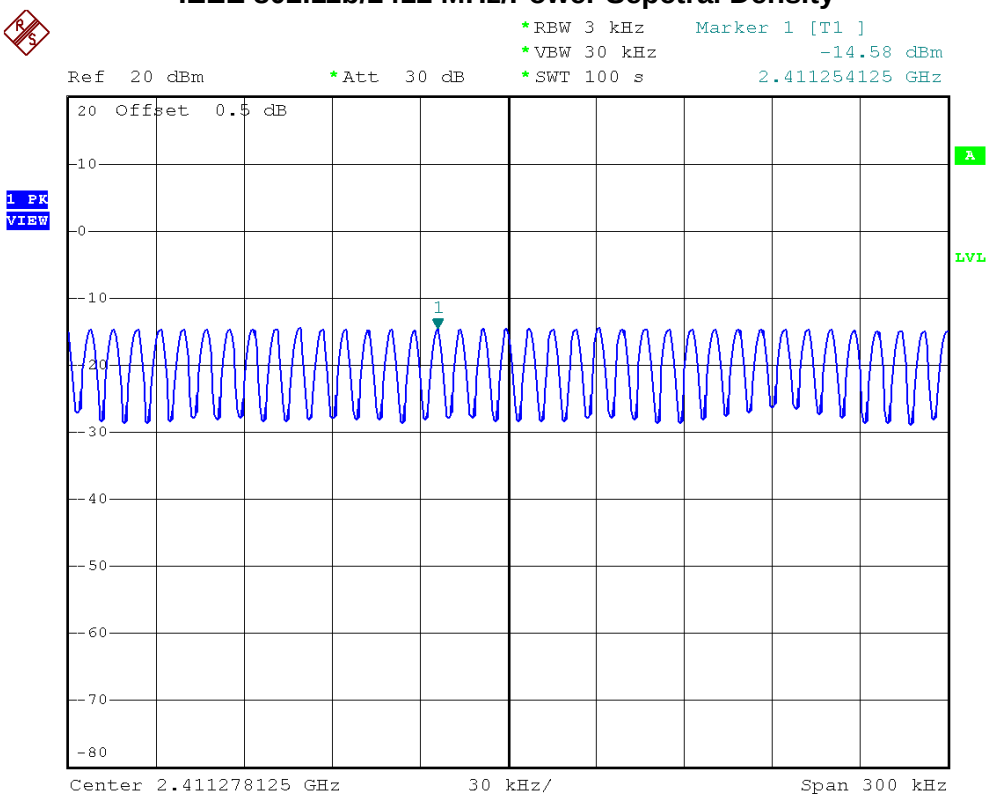
The EUT tested system was configured as the statements of 5.6 Unless otherwise a special operating condition is specified in the follows during the testing.

10.7TEST RESULTS

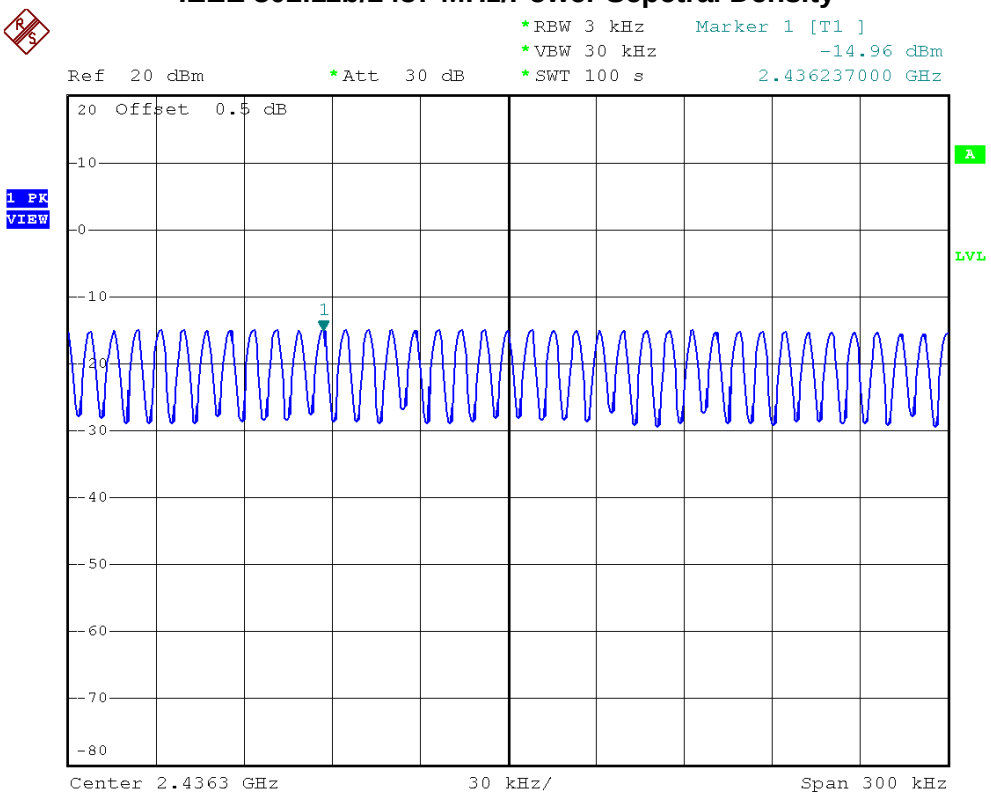
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11b/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-14.58	8	PASS
2437 MHz	-14.96	8	PASS
2462 MHz	-14.39	8	PASS

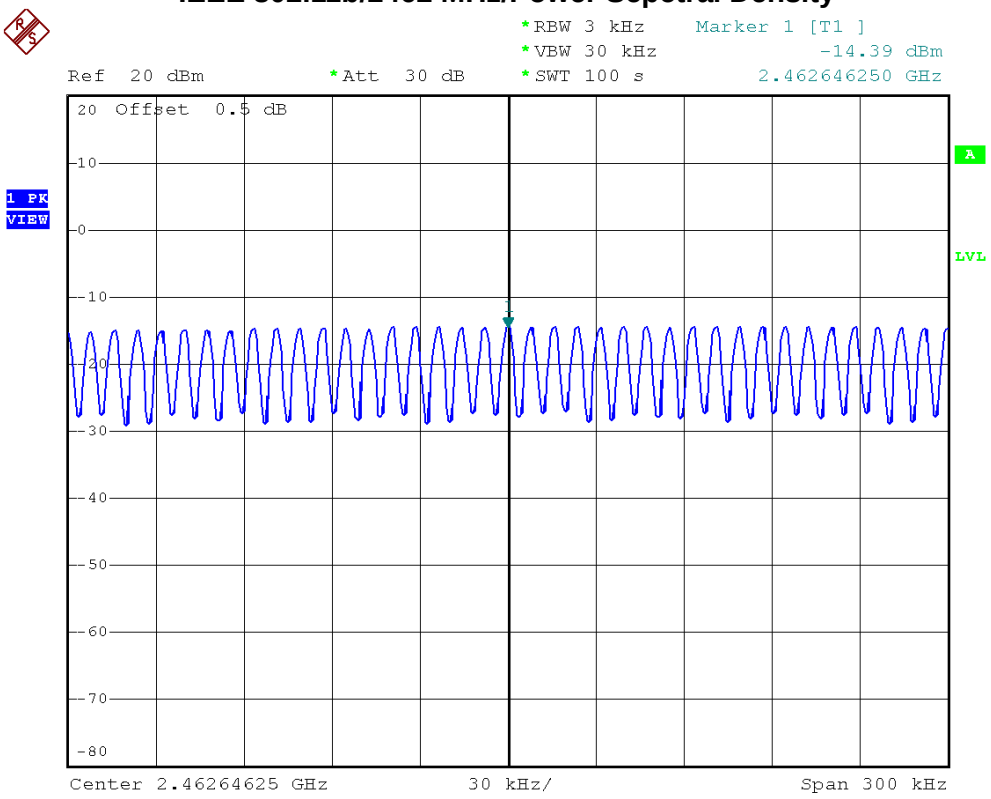
IEEE 802.11b/2412 MHz/Power Sepctral Density



IEEE 802.11b/2437 MHz/Power Sepctral Density



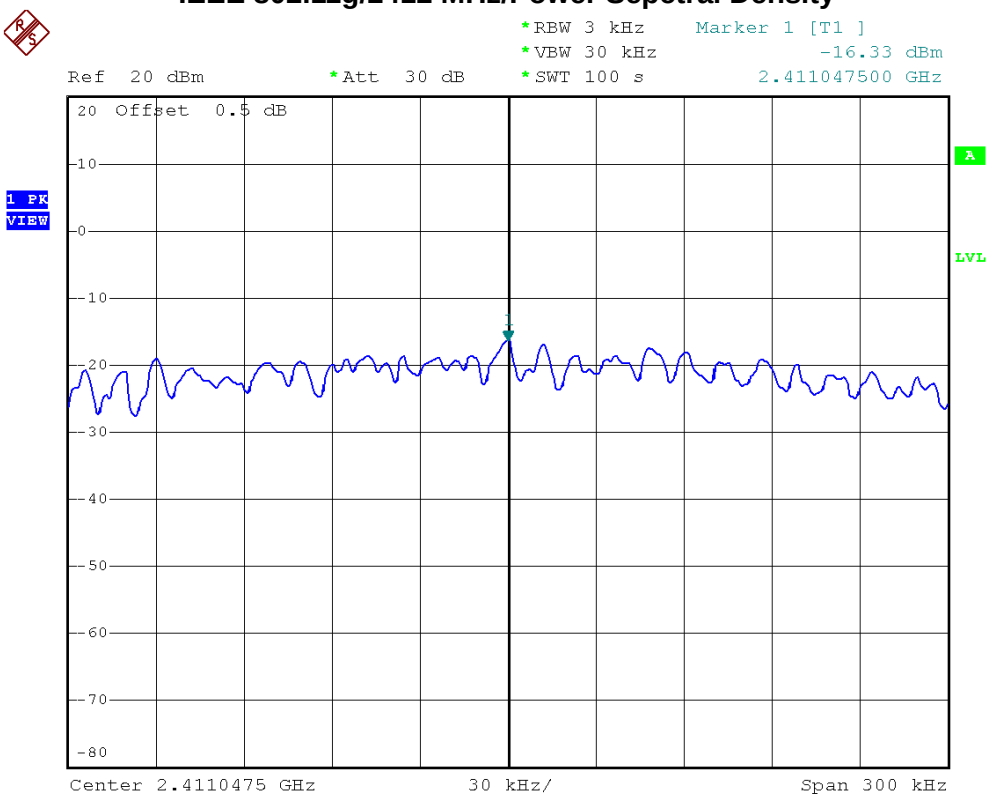
IEEE 802.11b/2462 MHz/Power Sepctral Density



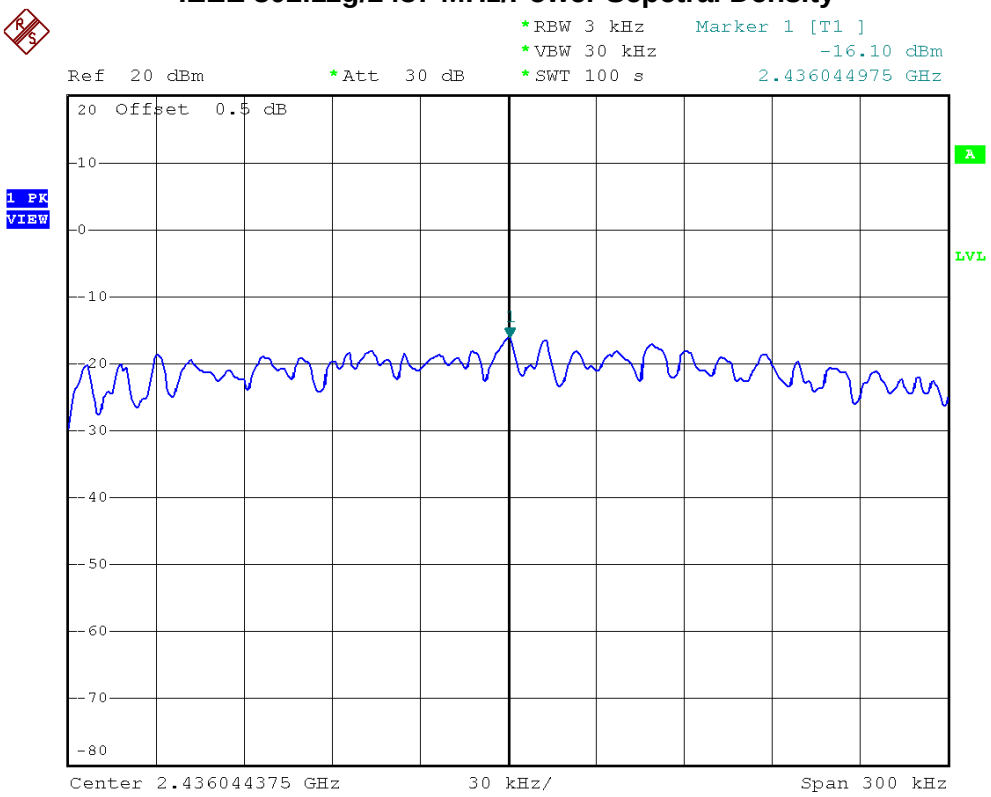
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11g/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-16.33	8	PASS
2437 MHz	-16.10	8	PASS
2462 MHz	-16.75	8	PASS

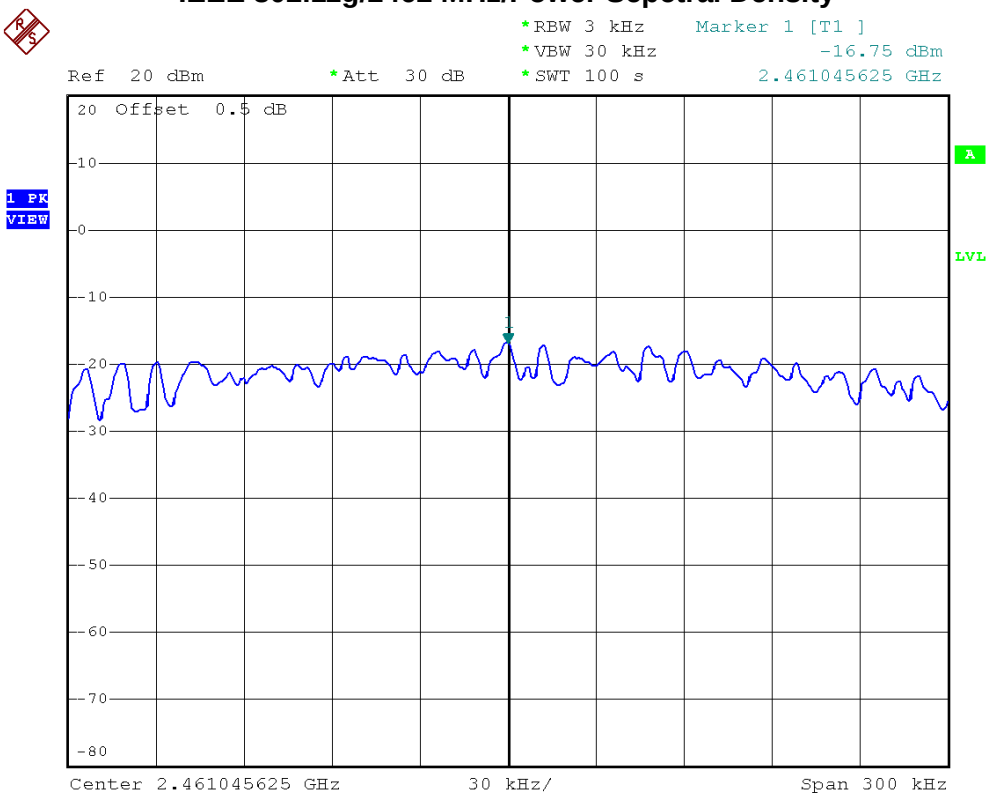
IEEE 802.11g/2412 MHz/Power Sepctral Density



IEEE 802.11g/2437 MHz/Power Sepctral Density



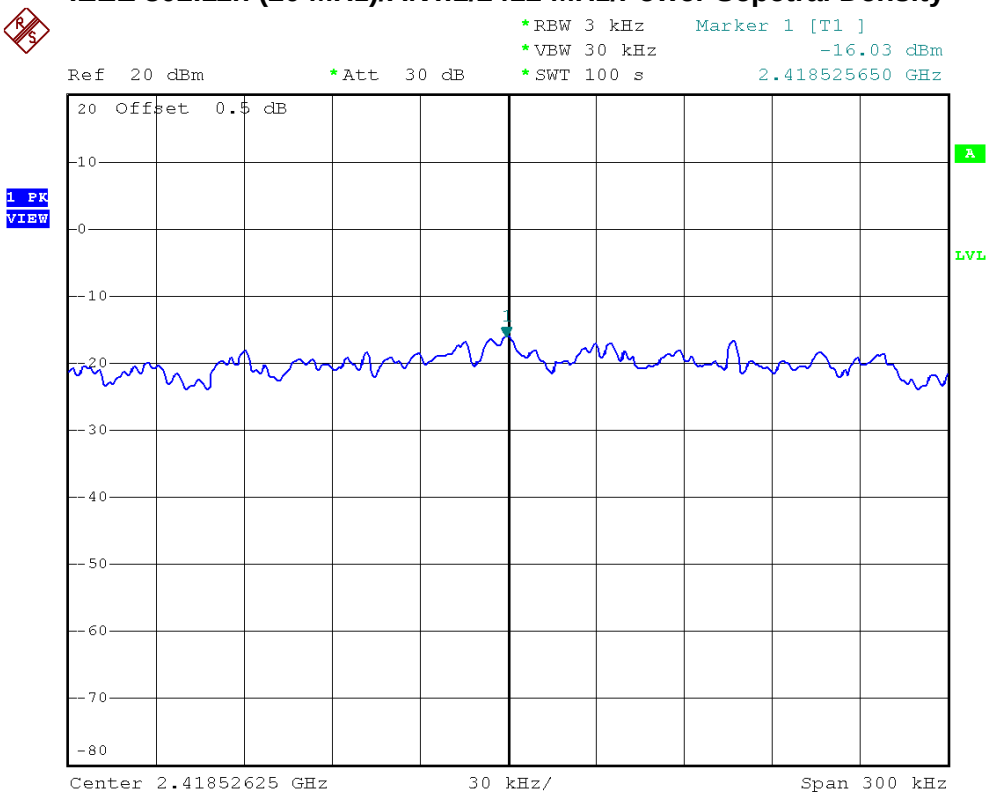
IEEE 802.11g/2462 MHz/Power Sepctral Density



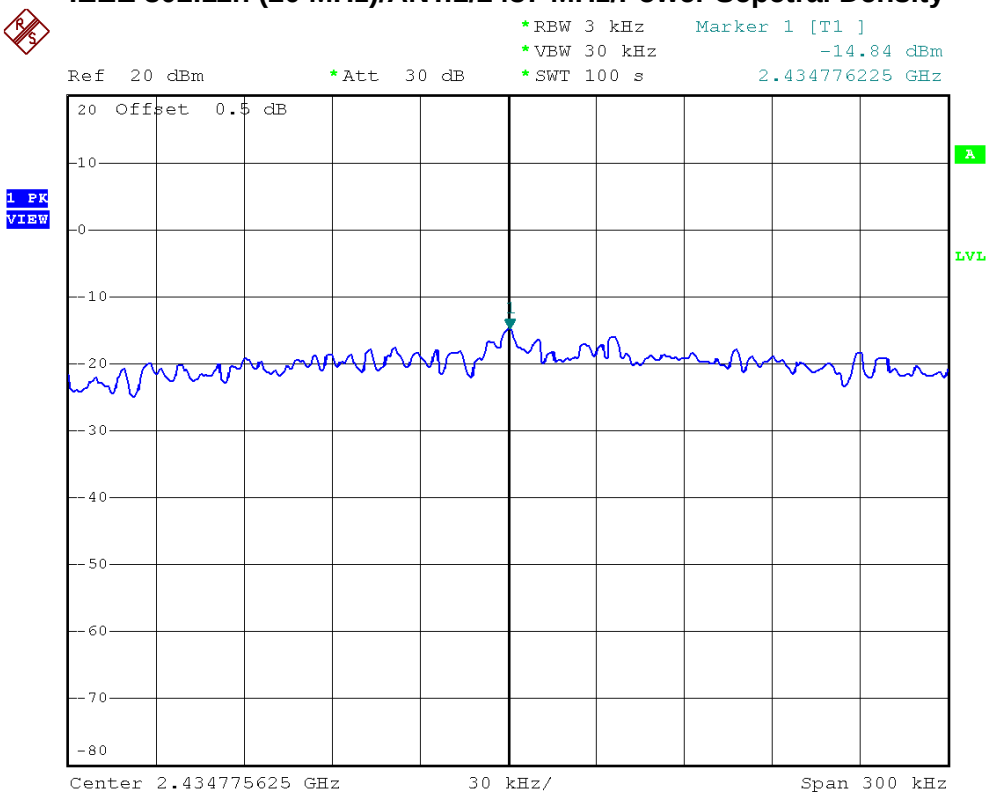
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/ANT.1/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-16.03	8	PASS
2437 MHz	-14.84	8	PASS
2462 MHz	-14.30	8	PASS

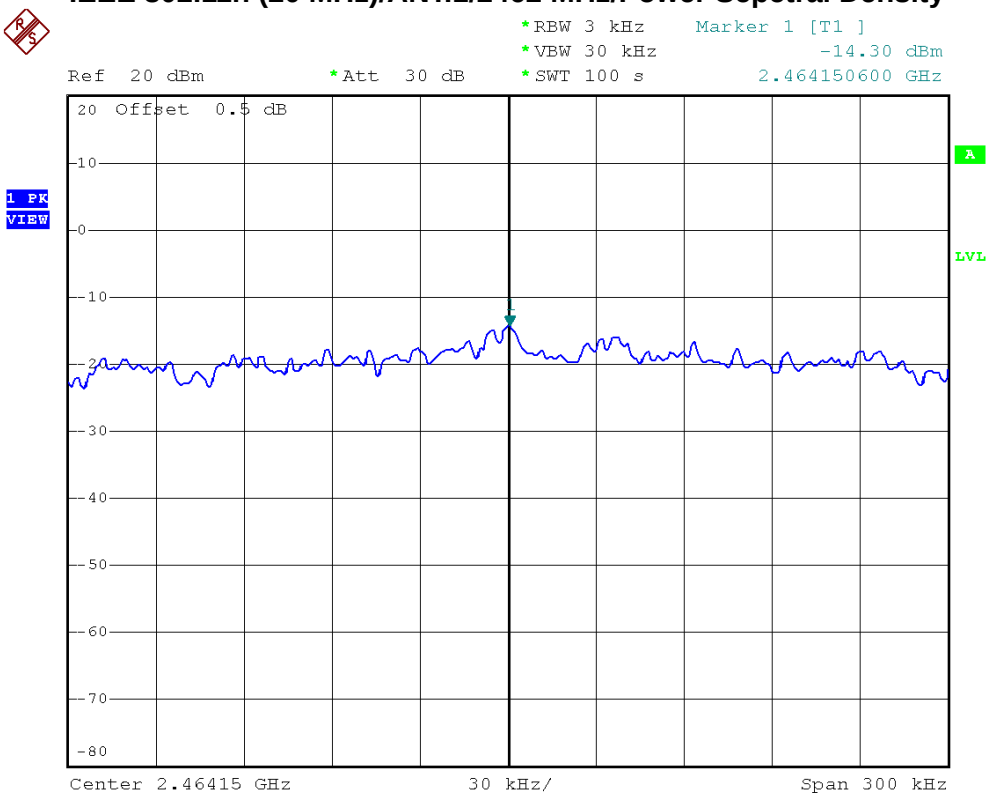
IEEE 802.11n (20 MHz)/ANT.1/2412 MHz/Power Sepctral Density



IEEE 802.11n (20 MHz)/ANT.1/2437 MHz/Power Sepctral Density



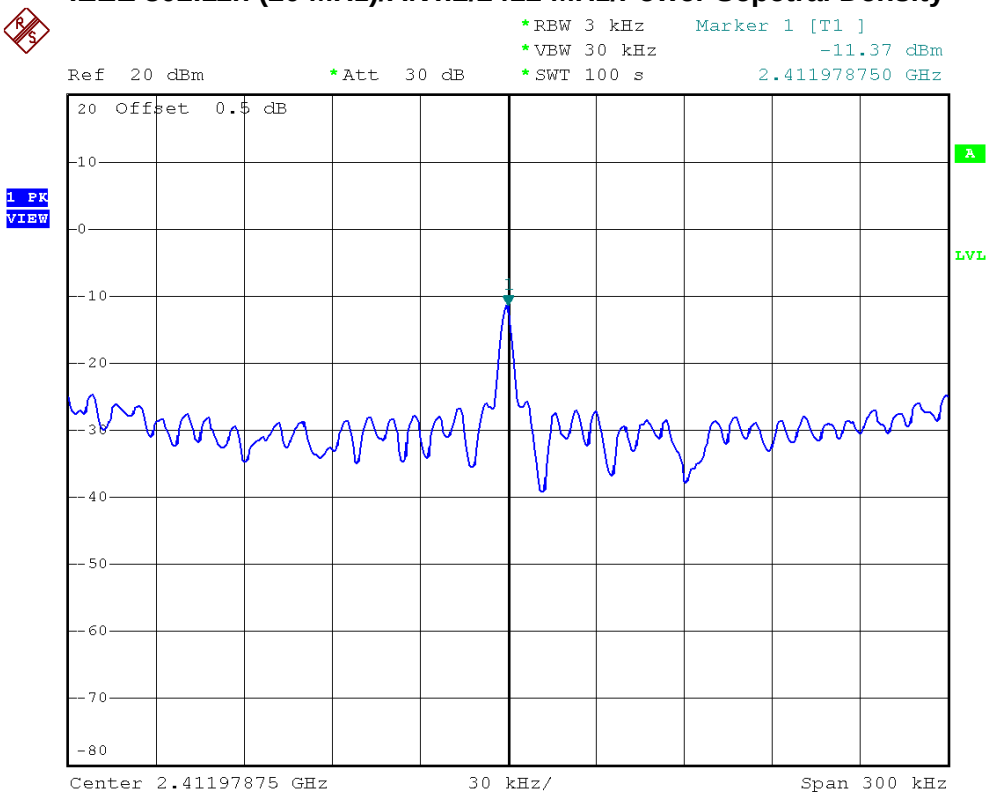
IEEE 802.11n (20 MHz)/ANT.1/2462 MHz/Power Sepctral Density



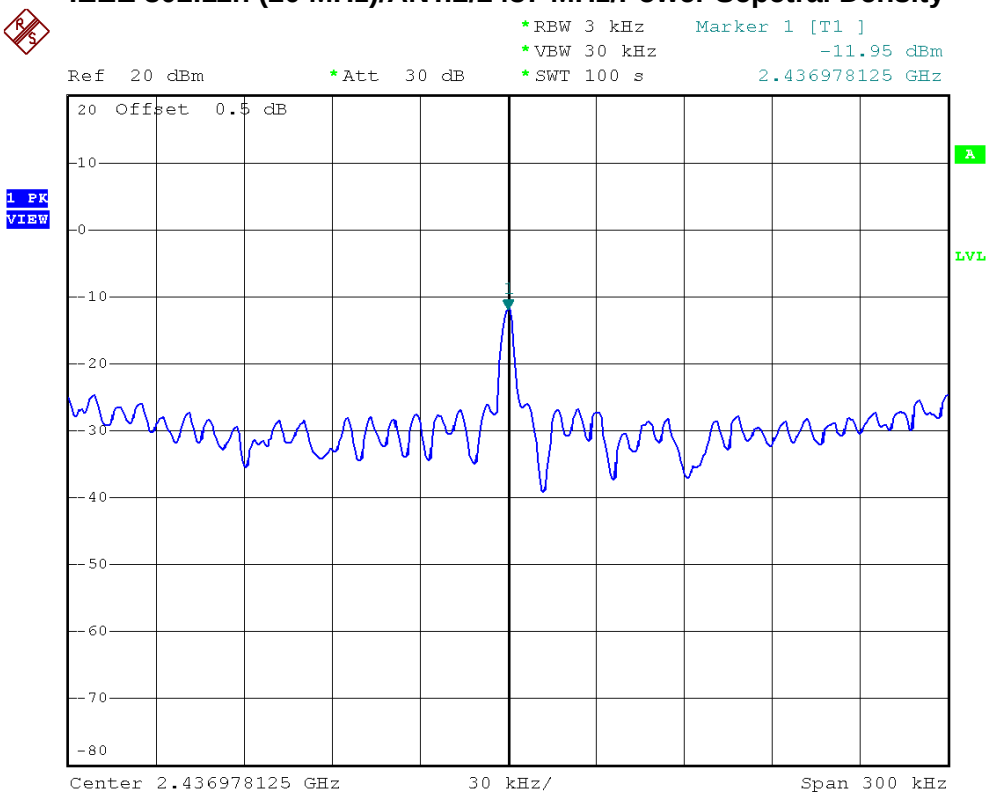
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/ANT.2/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-11.37	8	PASS
2437 MHz	-11.95	8	PASS
2462 MHz	-9.72	8	PASS

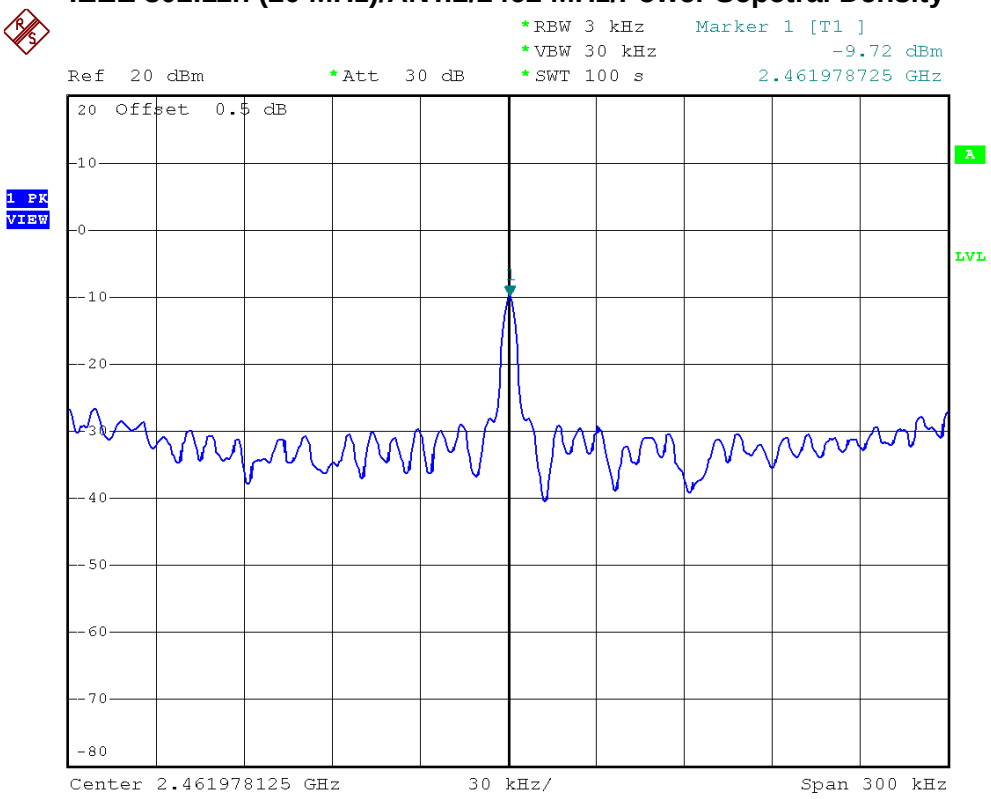
IEEE 802.11n (20 MHz)/ANT.2/2412 MHz/Power Sepctral Density



IEEE 802.11n (20 MHz)/ANT.2/2437 MHz/Power Sepctral Density



IEEE 802.11n (20 MHz)/ANT.2/2462 MHz/Power Sepctral Density



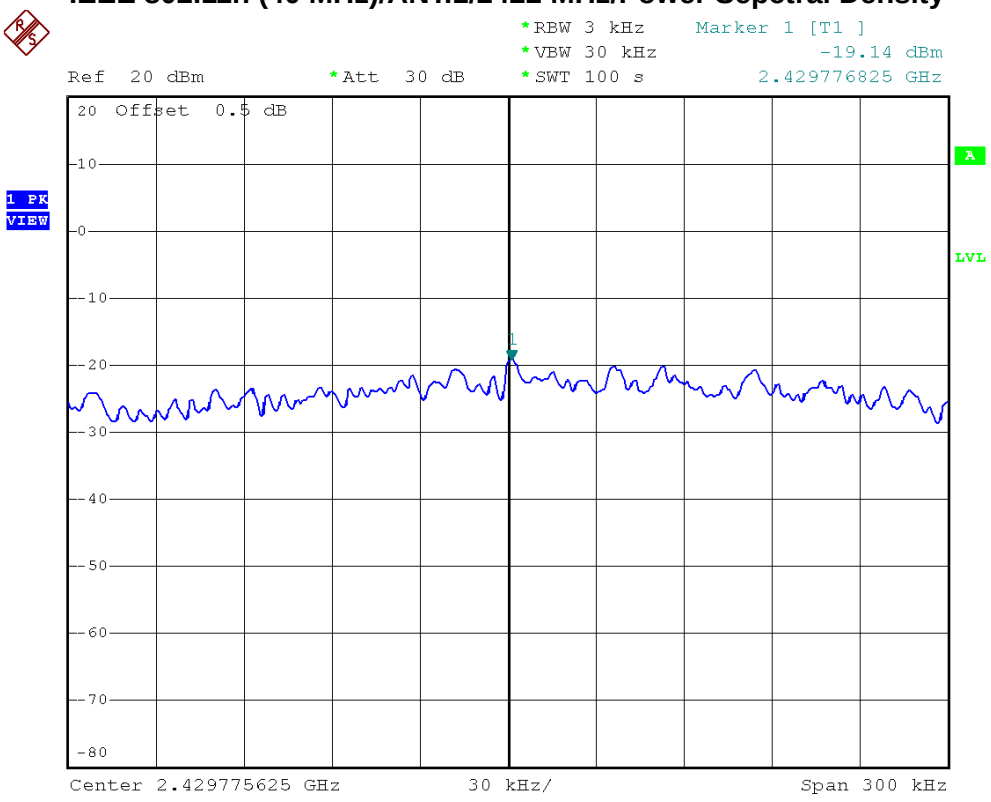
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (20 MHz)/ANT.Total/2412 MHz, 2437 MHz, 2462 MHz		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-10.09	8	PASS
2437 MHz	-10.15	8	PASS
2462 MHz	-8.42	8	PASS

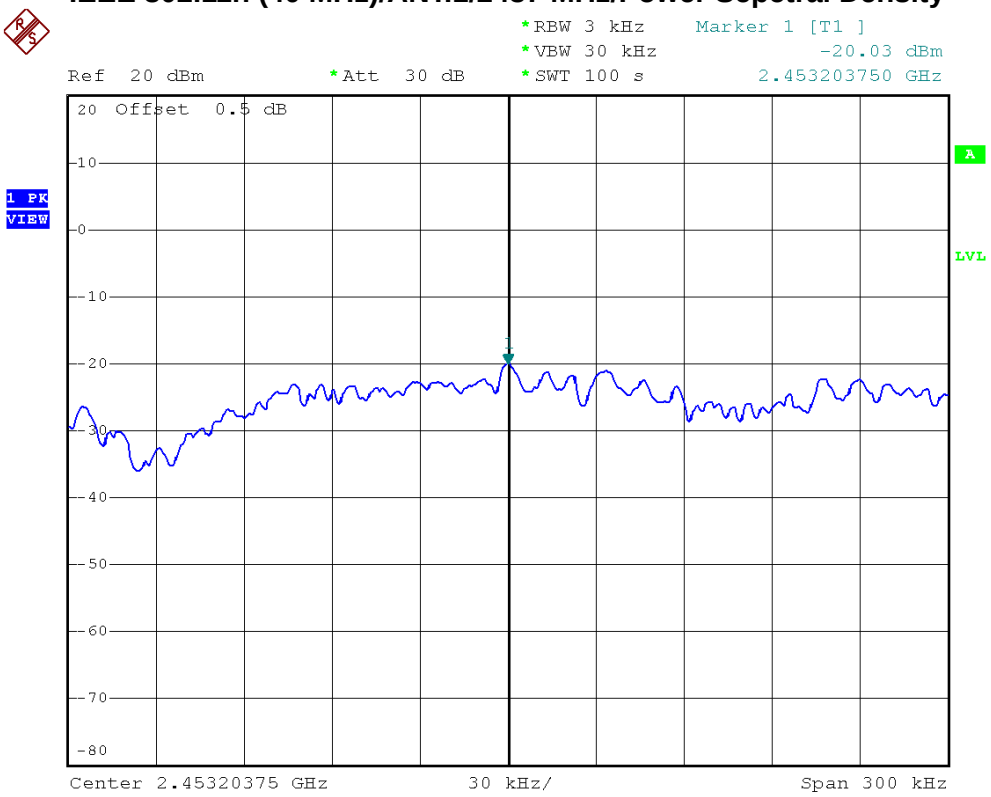
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/ANT.1/2422 MHz, 2437 MHz, 2452 MHz		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2422 MHz	-19.14	8	PASS
2437 MHz	-20.03	8	PASS
2452 MHz	-20.23	8	PASS

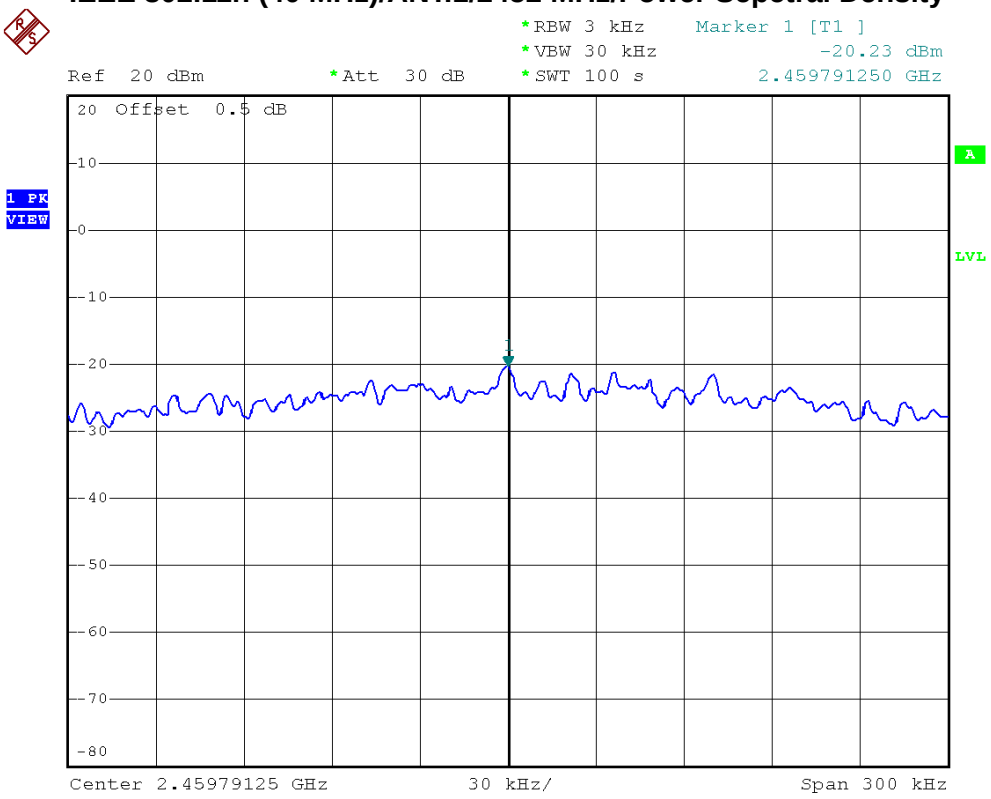
IEEE 802.11n (40 MHz)/ANT.1/2422 MHz/Power Sepctral Density



IEEE 802.11n (40 MHz)/ANT.1/2437 MHz/Power Sepctral Density



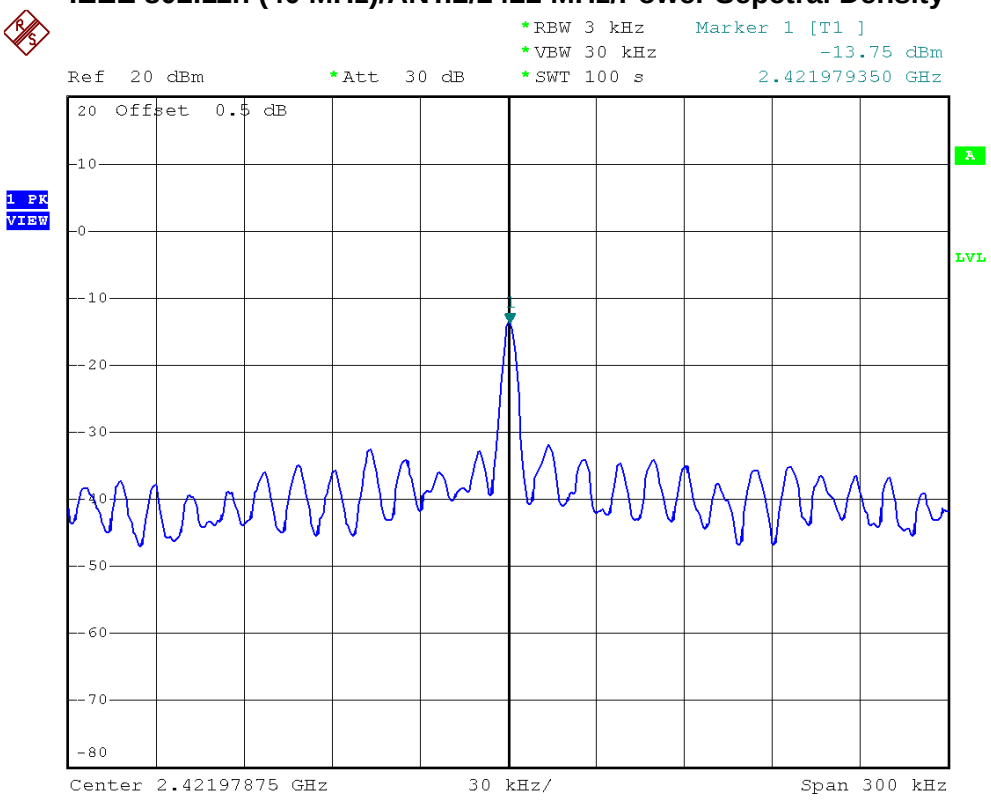
IEEE 802.11n (40 MHz)/ANT.1/2452 MHz/Power Sepctral Density



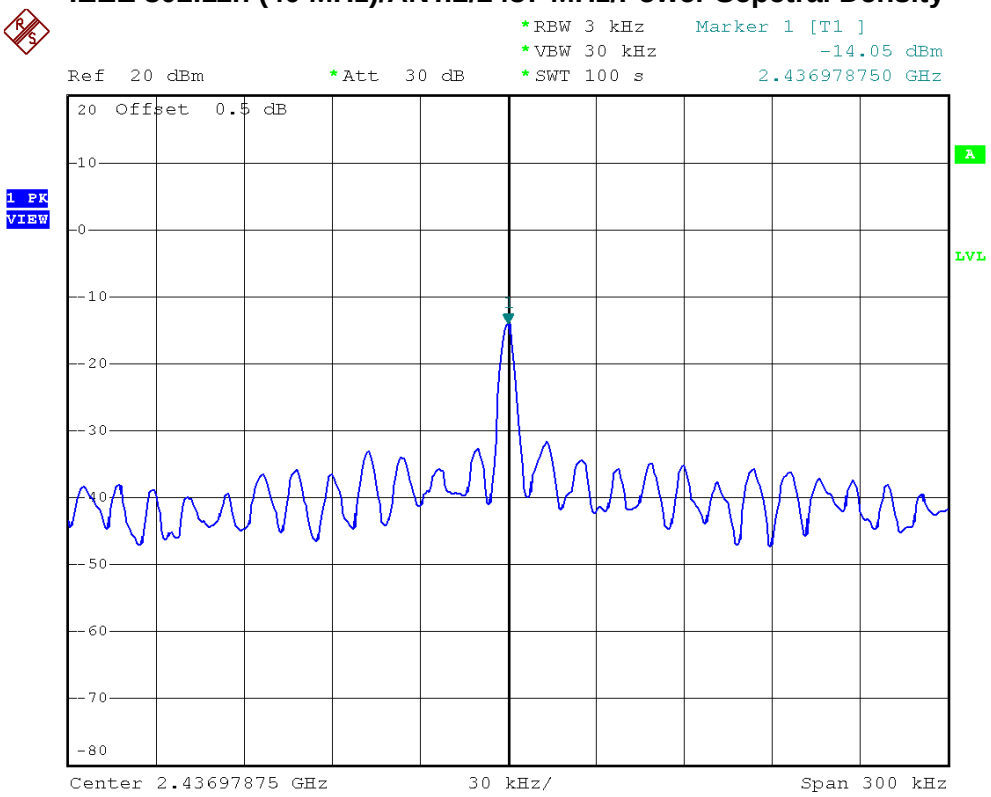
E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/ANT.2/2422 MHz, 2437 MHz, 2452 MHz		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2422 MHz	-13.75	8	PASS
2437 MHz	-14.05	8	PASS
2452 MHz	-14.71	8	PASS

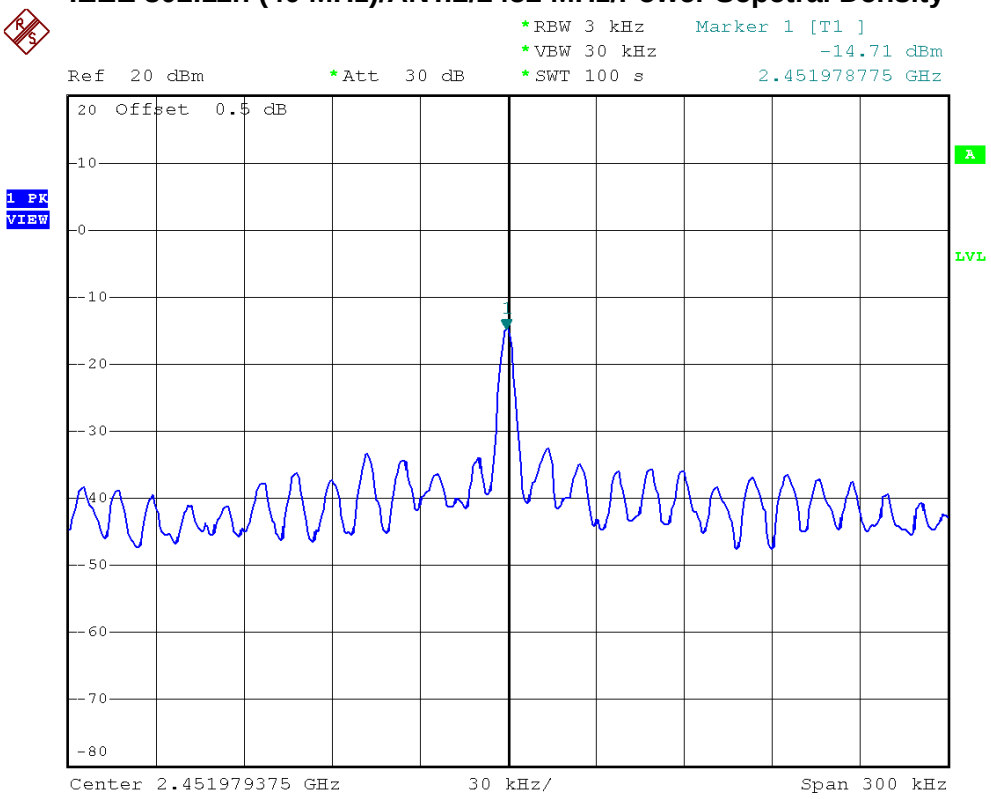
IEEE 802.11n (40 MHz)/ANT.2/2422 MHz/Power Sepctral Density



IEEE 802.11n (40 MHz)/ANT.2/2437 MHz/Power Sepctral Density



IEEE 802.11n (40 MHz)/ANT.2/2452 MHz/Power Sepctral Density



E.U.T	802.11b/g/n 2T2R Wireless Lan USB Module	Model Name	WN4615R
Temperature	26°C	Relative Humidity	60%
Test Voltage	AC 120V/60Hz		
Test Mode	IEEE 802.11n (40 MHz)/ANT.Total/2422 MHz, 2437 MHz, 2452 MHz		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2422 MHz	-12.65	8	PASS
2437 MHz	-13.07	8	PASS
2452 MHz	-13.64	8	PASS